

FCC Part 15.247 TEST REPORT

For

MERCURY Corporation

90, Gajaeul-ro, Seo-Gu, Incheon, 22830, Republic of Korea

FCC ID: 2AVW5-MCR-AP8400

Report Type: Original Report	Product Type: Wireless Access Point
Report Producer : <u>Jojo Lu</u>	
Report Number : <u>RXZ241119045RF01</u>	
Report Date : <u>2025-01-24</u>	
Reviewed By: <u>Andy Shih</u> <i>andy.shih</i>	
Prepared By: Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) 70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 221, Taiwan, R.O.C. Tel: +886 (2) 2647 6898 Fax: +886 (2) 2647 6895 www.bacl.com.tw	

Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ241119045	RXZ241119045RF01	2025-01-24	Original Report	Jojo Lu

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	MERCURY Corporation
	90, Gajaeul-ro, Seo-Gu, Incheon, 22830, Republic of Korea
Brand(Trade) Name	MERCURY
Product (Equipment)	Wireless Access Point
Main Model Name	MCR-AP8400
Series Model Name	N/A
Frequency Range	IEEE 802.11b/ g/ n HT20/ ax HE20 Mode: 2412 ~ 2462 MHz IEEE 802.11n HT40/ axHE40 Mode: 2422 ~ 2452 MHz BLE: 2402 ~ 2480 MHz
Maximum Conducted Peak Output Power	IEEE 802.11b Mode: 27.84 dBm IEEE 802.11g Mode: 29.42 dBm IEEE 802.11n HT20 Mode: 28.86 dBm IEEE 802.11n HT40 Mode: 28.31 dBm IEEE 802.11ax HE20 Mode: 29.13 dBm IEEE 802.11ax HE40 Mode: 29.19 dBm BLE(1M) Mode : 1.11 dBm BLE(2M) Mode : 1.09 dBm
Modulation Technique	IEEE 802.11b Mode: DSSS IEEE 802.11g Mode: OFDM IEEE 802.11n HT20 Mode: OFDM IEEE 802.11n HT40 Mode: OFDM IEEE 802.11ax HE20 Mode: OFDMA IEEE 802.11ax HE40 Mode: OFDMA BLE Mode : GFSK
Power Operation (Voltage Range)	12Vdc from Adapter
Received Date	2024/11/21

*All measurement and test data in this report was gathered from production sample serial number:
RXZ241119045-1 (Assigned by BACL, New Taipei Laboratory).

1.2 Objective

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

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.
KDB 558074 D01 15.247 Meas Guidance v05r02.

1.4 Statement

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

It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory).

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.

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

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.

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
Power Spectral Density, conducted		+/- 0.60 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 °C
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 (°C)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
AC Line Conducted Emissions	2024/12/23~2025/1/20	19~20.2	55~58	1020.9	Wayne Pan
Radiation Spurious Emissions	2024/12/12~2025/1/18	18.4~22.8	49~68	1019.4~1023.8	Aaron Pan
Duty Cycle	2024/12/11	24.8	59	1017	Wayne Pan
Conducted Spurious Emissions	2024/12/13~2025/1/17	22.7~24.6	45~58	1020.5~1023.6	Wayne Pan
Emission Bandwidth	2024/12/13~2025/1/17	22.7~24.6	45~58	1020.5~1023.6	Wayne Pan
Maximum Output Power	2024/12/11~2025/1/17	22.7~24.8	45~59	1020.5~1023.6	Wayne Pan
100 kHz Bandwidth of Frequency Band Edge	2024/12/13~2025/1/17	22.7~24.6	45~58	1020.5~1023.6	Wayne Pan
Power Spectral Density	2024/12/11~2025/1/17	22.7~24.6	45~58	1020.5~1023.6	Wayne Pan

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.

2 System Test Configuration

2.1 Description of Test Configuration

For WIFI 2.4GHz mode, there are totally 11 channels.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

For 802.11 b/g/n HT20/ax HE20 Modes were tested with channel 1, 6 and 11.

For 802.11n HT40/ax HE40 Mode were tested with channel 3, 6 and 9.

For BLE mode, there are totally 40 channels.

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	--	--
2	2406	--	--
3	2408	37	2476
--	--	38	2478
19	2440	39	2480

For BLE Modes were tested with channel 0, 19 and 39.

2.2 Support Equipment List and Details

Description	Manufacturer	Model Number	S/N
NB	DELL	E6410	1CKD0M1
NB	DELL	E6410	7ODSQM1
NB	DELL	E6410	8N7PXN1
NB	DELL	E6410	C88PXN1
Adapter	Shenzhen Keyu Power Supply Technology Co., Ltd	KA4801A-1204000US	N/A

2.3 External Cable List and Details

Description	Manufacturer	Model Number
RJ-45 Cable*4	BACL	8m

2.4 EUT Exercise Software

The test software was used “QATool v0.0.2.73”

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

WIFI

Mode MIMO(CDD)	Channel	Frequency (MHz)	Power Setting MIMO(CDD)			
			Chain 0	Chain 1	Chain 2	Chain 3
802.11b	Low	2412	10	10	10	10
	Middle	2437	10	10	10	10
	High	2462	10	10	10	10
802.11g	Low	2412	4	4	4	4
	Middle	2437	4	4	4	4
	High	2462	4	4	4	4
802.11n HT20	Low	2412	4	4	4	4
	Middle	2437	4	4	4	4
	High	2462	4	4	4	4
802.11n HT40	Low	2422	4	4	4	4
	Middle	2437	4	4	4	4
	High	2452	4	4	4	4
802.11ax HE20	Low	2412	4	4	4	4
	Middle	2437	4	4	4	4
	High	2462	4	4	4	4
802.11ax HE40	Low	2422	4.5	4.5	4.5	4.5
	Middle	2437	4.5	4.5	4.5	4.5
	High	2452	4.5	4.5	4.5	4.5

The device support SISO and MIMO(CDD).

SISO mode and MIMO mode have the same power level setting and base on output power testing, MIMO mode power large than SISO mode, MIMO mode was selected for full testing.

The worst case data rates are as follows:

802.11b: 1Mbps

802.11g: 6Mbps

802.11n HT20: MCS0

802.11n HT40: MCS0

802.11ax HE20: MCS0

802.11ax HE40: MCS0

BLE

Test Frequency		Low	Middle	High
Power Level Setting	BLE 1M	0	0	0
	BLE 2M	0	0	0

The worst case data rates are as follows:

BLE 1M: 1Mbps

BLE 2M: 2Mbps

2.5 Test Mode

Full System(model: MCR-AP8400) for all test item.

The 802.11ax mode is investigated among different tones, full resource units (RU), partial resource units.

The partial RU has no higher power than full RU, thus the full RU is chosen as main test configuration. partial RU test Output Power and Power Spectral Density.

2.6 Equipment Modifications

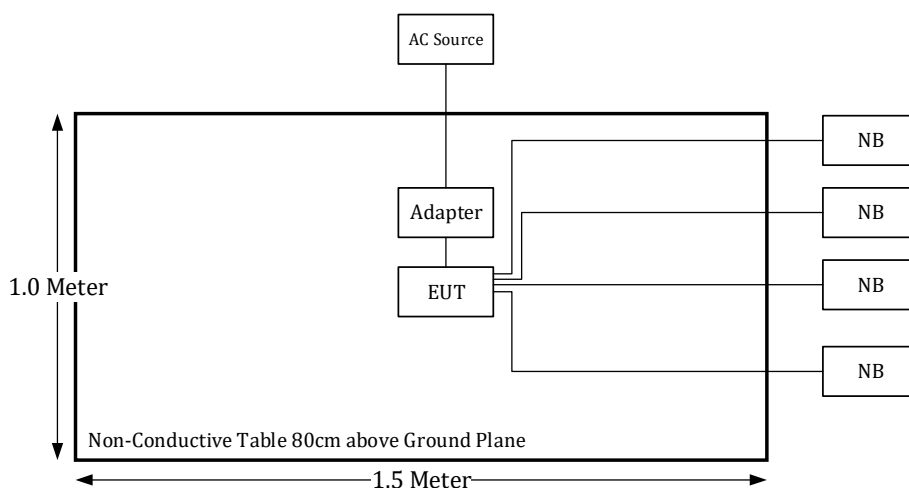
No modification was made to the EUT.

2.7 Block Diagram of Test Setup

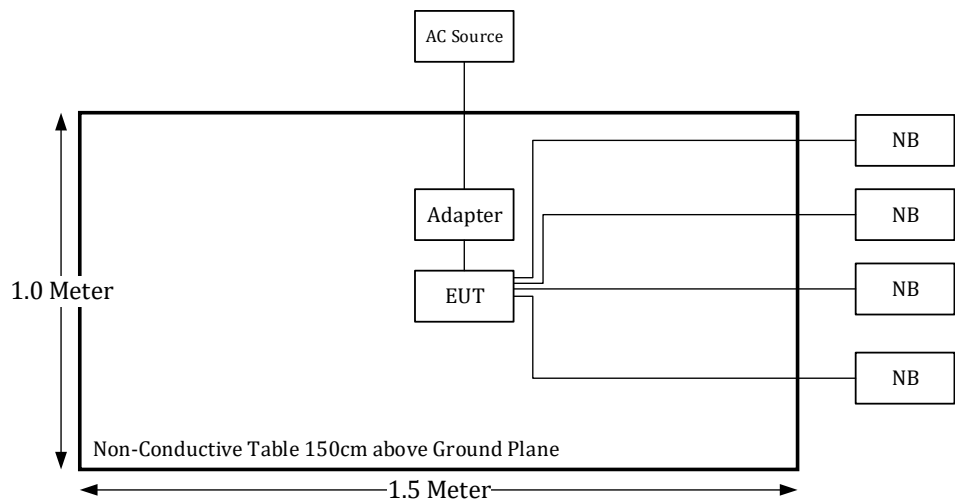
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

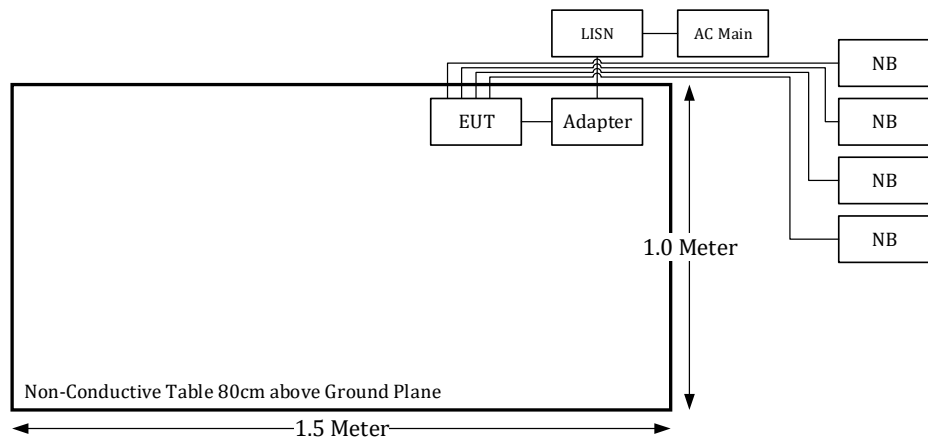
Below 1GHz



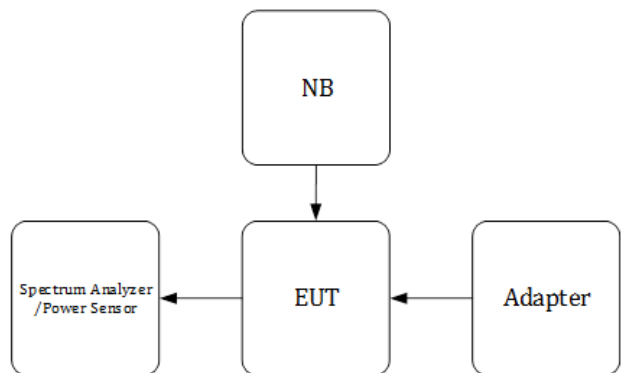
Above 1GHz:



Conduction:



Conducted:



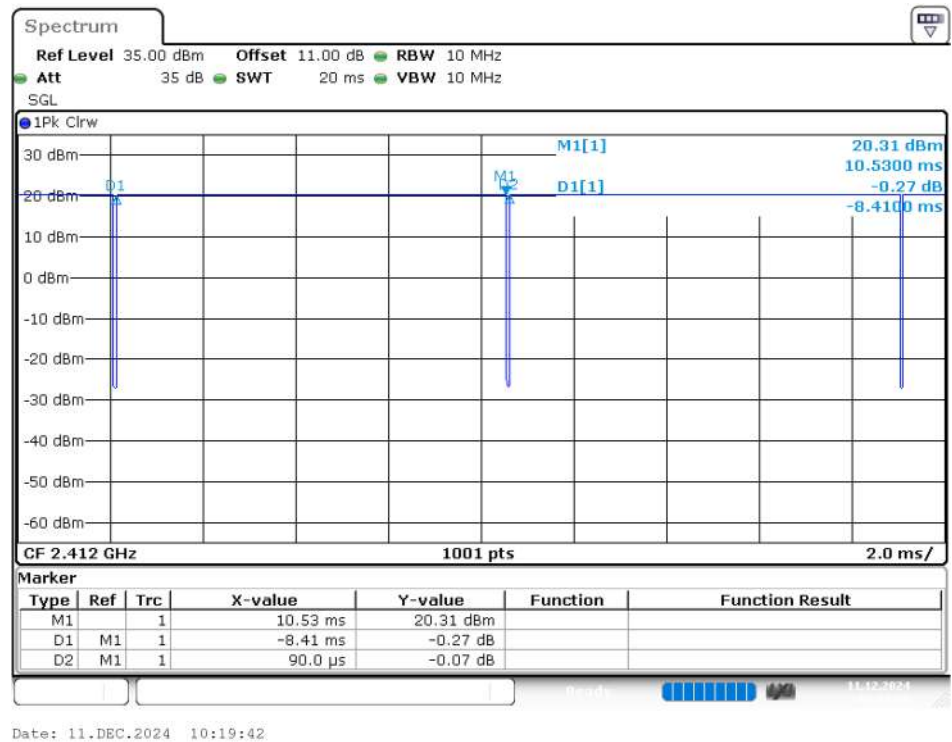
2.8 Duty Cycle

The duty cycle as below:

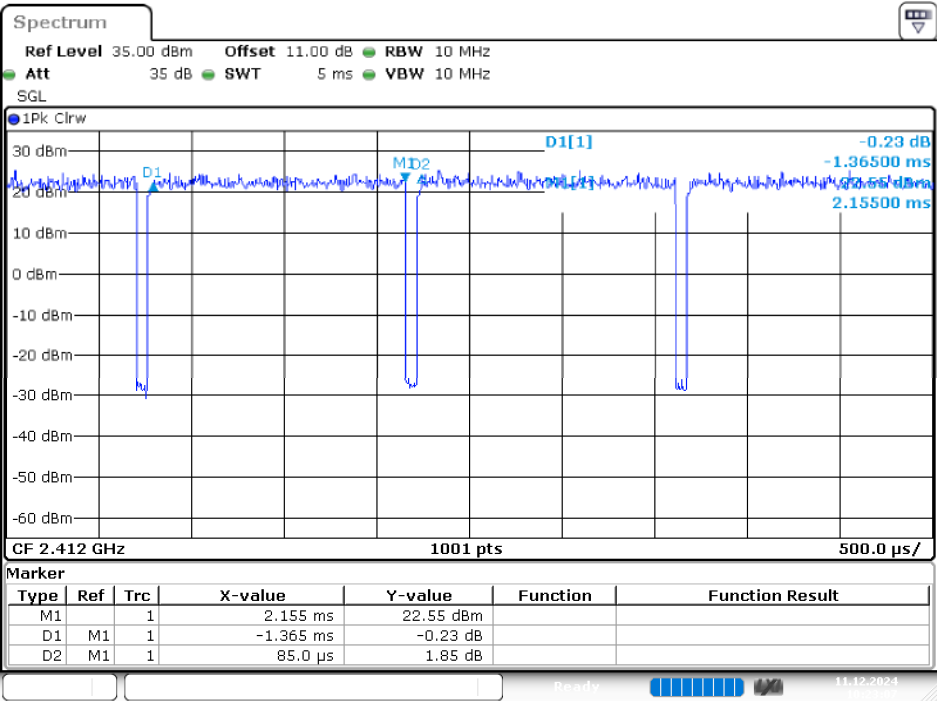
Radio Mode	On Time (ms)	Off Time (ms)	Duty Cycle (%)	1/T (kHz)	VBW Setting (kHz)
802.11b	8.41	0.09	99	/	0.01
802.11g	1.365	0.085	94	0.73	1
802.11n20	1.285	0.085	94	0.78	1
802.11n40	0.636	0.066	91	1.57	2
802.11ax20	1.00	0.09	92	1	1
802.11ax40	0.552	0.064	90	1.81	2
BLE 1M	0.394	0.232	63	2.54	3
BLE 2M	1.068	0.797	57	0.94	1

Please refer to the following plots.

B Mode

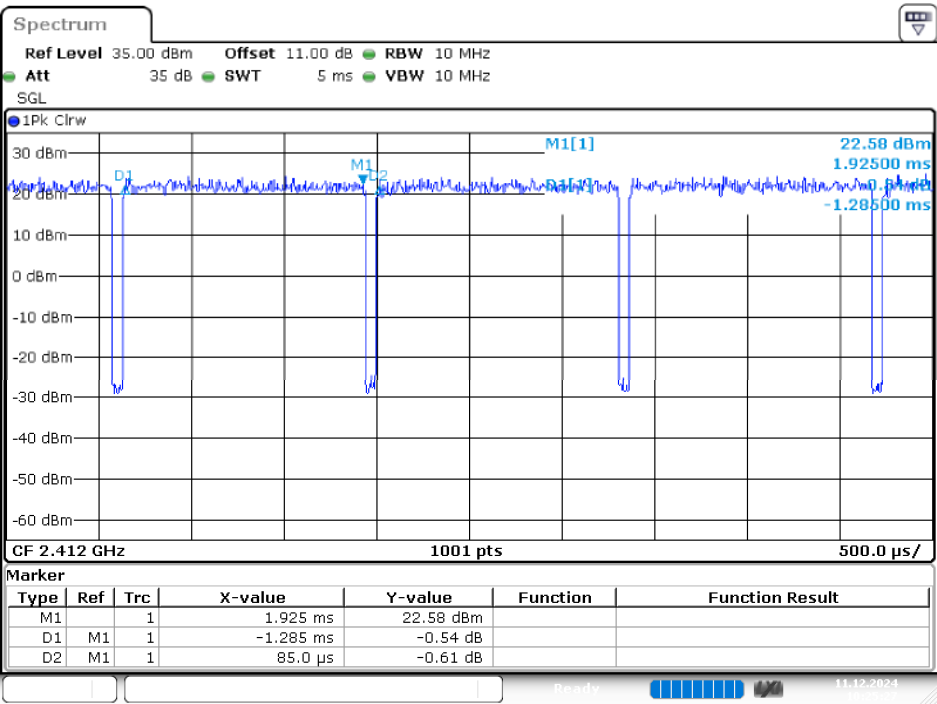


G Mode



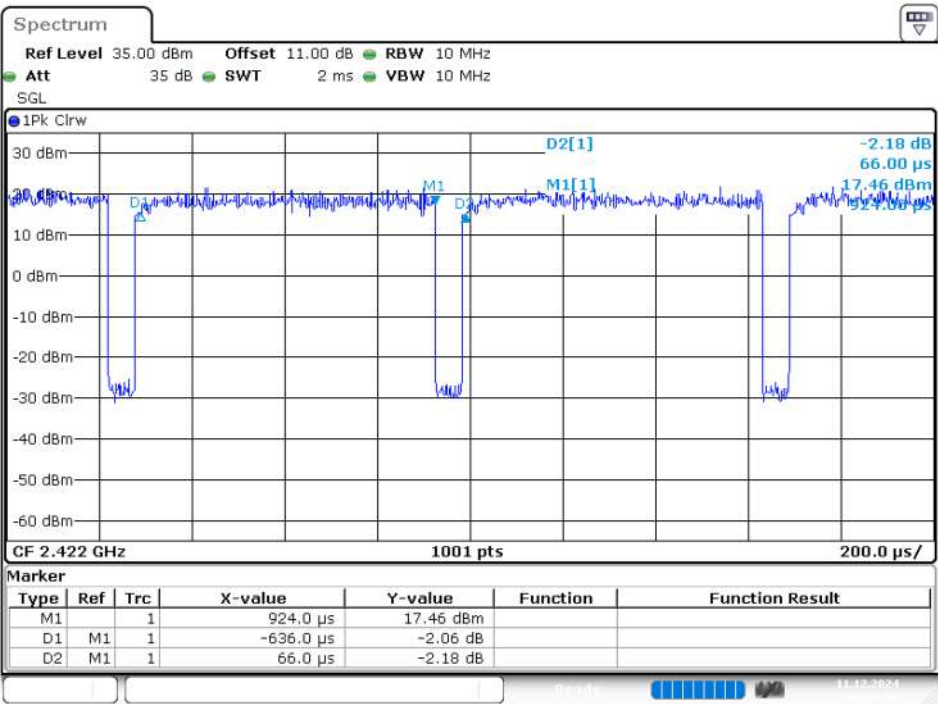
Date: 11.DEC.2024 10:23:07

N20 Mode



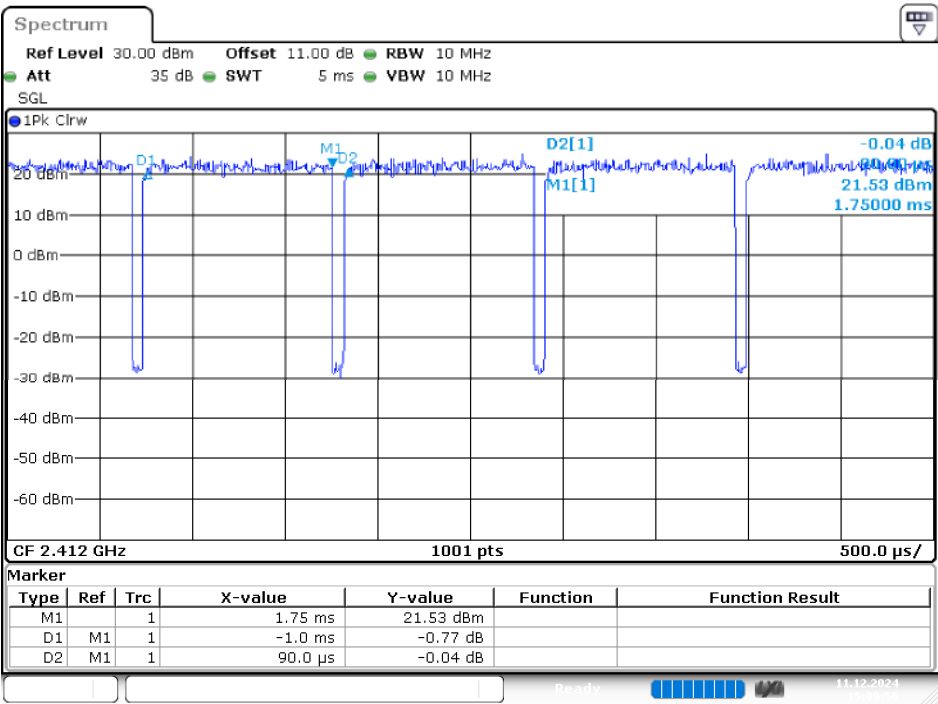
Date: 11.DEC.2024 10:25:27

N40 Mode



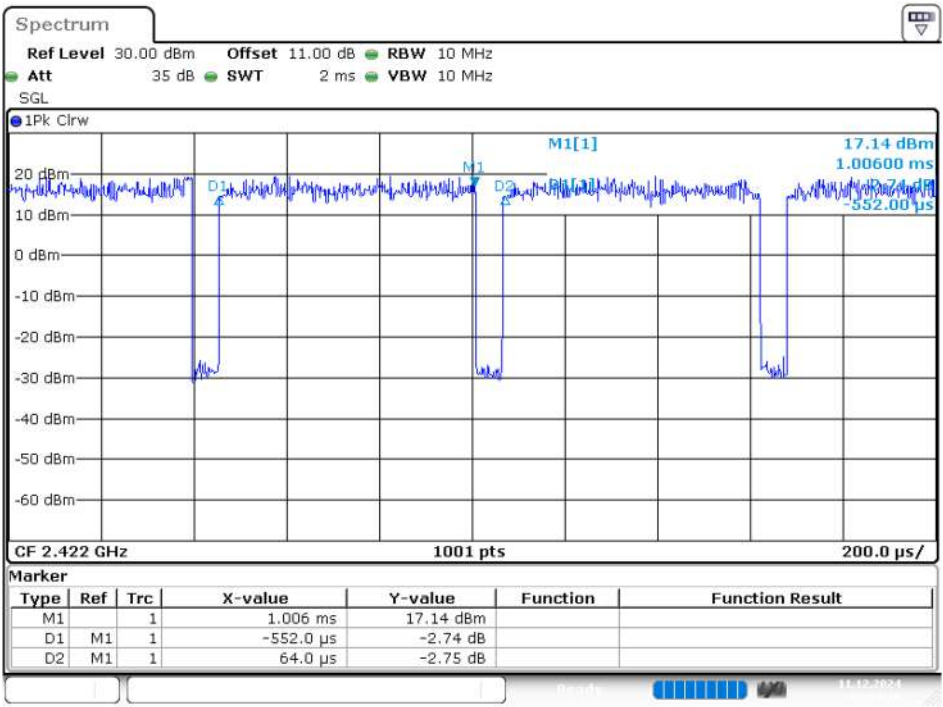
Date: 11.DEC.2024 10:33:06

AX20 Mode



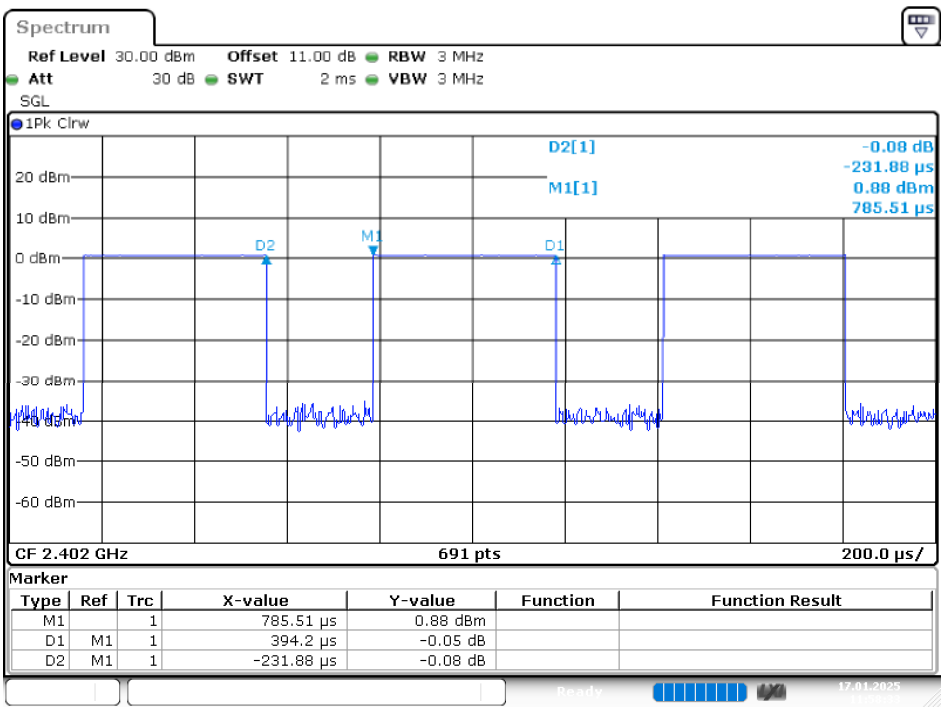
Date: 11.DEC.2024 15:09:57

AX40 Mode



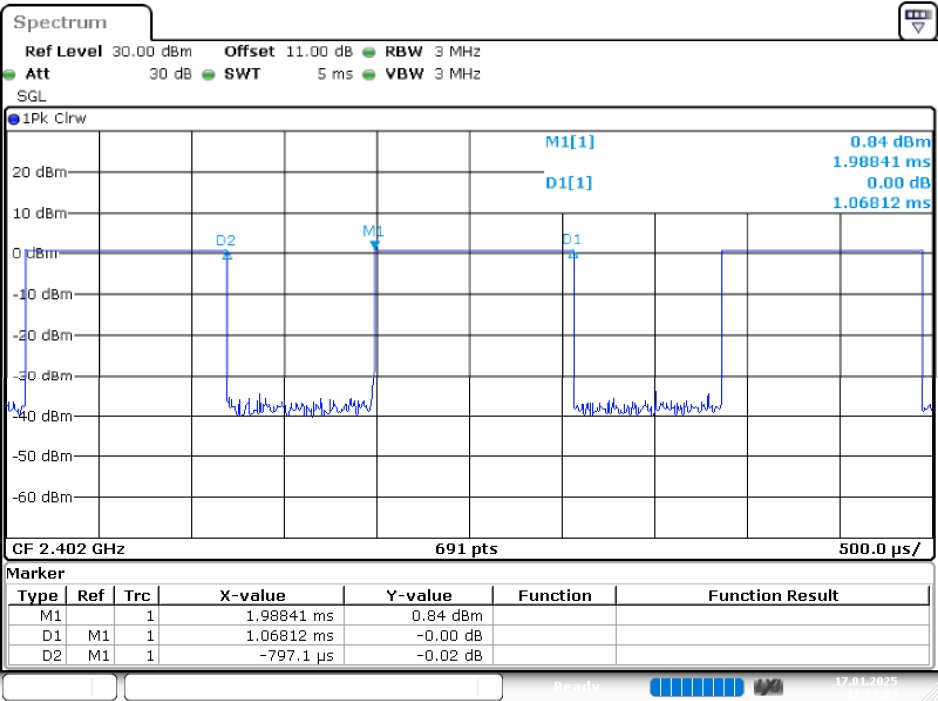
Date: 11.DEC.2024 15:15:17

BLE 1M Mode



Date: 17.JAN.2025 11:58:34

BLE 2M Mode



Date: 17.JAN.2025 12:00:05

3 Summary of Test Results

Rules	Description of Test	Results
FCC §15.247(i), §2.1091	RF Exposure	Compliance
FCC §15.203	Antenna Requirement	Compliance
FCC §15.207(a)	AC Line Conducted Emissions	Compliance
FCC §15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
FCC §15.247(a)(2)	Emission Bandwidth	Compliance
FCC §15.247(b)(3)	Maximum Peak Output Power	Compliance
FCC §15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
FCC §15.247(e)	Power Spectral Density	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	2024/2/16	2025/2/16
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	2024/3/27	2025/3/27
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/1554 2_01	2024/1/19	2025/1/19
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	130601	2024/1/29	2025/1/29
Preamplifier	Channel	ERA-100M-18G-01D1748	EC2300051	2024/3/29	2025/3/29
Microwave Preamplifier	EM Electronics Corporation	EM18G40G	60656	2024/1/8	2025/1/8
Preamplifier	BACL	BACL-1313-A1840	4011511	2024/2/1	2025/2/1
Spectrum Analyzer	Rohde & Schwarz	FSV40	101939	2024/3/27	2025/3/27
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	2024/1/23	2025/1/23
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2024/1/23	2025/1/23
Coaxial Cable	COMMATE	PEWC	8Dr	2023/12/23	2024/12/23
				2024/12/20	2025/12/20
Cable	EMC	EMC105-SM-SM-10000	201003	2024/1/23	2025/1/23
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2023/12/23	2024/12/23
				2024/12/20	2025/12/20
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2024/1/23	2025/1/23
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2024/1/23	2025/1/23
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	2024/2/23	2025/2/23

***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 §15.247(i), §1.1310, §2.1091 - Maximum Permissible Exposure (MPE)

5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

5.2 RF Exposure Evaluation Result

MPE evaluation:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
WIFI 5G Band 1	5150-5250	4.4	2.754	19.8	95.499	20	0.0523	1
WIFI 5G Band 2	5250-5350	4.4	2.754	20.0	100.000	20	0.0548	1
WIFI 5G Band 3	5470-5725	4.38	2.742	21.2	131.826	20	0.0719	1
WIFI 5G Band 4	5725-5850	4.92	3.105	21.4	138.038	20	0.0853	1
WIFI 2.4G	2412-2462	4.42	2.767	29.5	891.25	20	0.4906	1
BLE	2402-2480	6.08	4.055	1.5	1.413	20	0.0011	1

Mode	Frequency Range (MHz)	EIRP including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBm)	(mW)			
WIFI 6E	5925-6425	18.5	70.79	20	0.014	1
WIFI 6E	6425-6525	18.5	70.79	20	0.014	1
WIFI 6E	6525-6875	19.0	79.43	20	0.016	1
WIFI 6E	6875-7125	18.5	70.79	20	0.014	1

Note: The Tune-up output power was declared by the Applicant.

Wi-Fi and BLE can't transmit simultaneously.

Result: The device compliant RF Exposure at 20cm distances.

6 FCC §15.203 – Antenna Requirements

6.1 Applicable Standard

According to § 15.203,

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

6.2 Antenna Information

WIFI

Manufacturer	Model	Type	Antenna Gain	
K-Marui	KI-DW2050DEC50180P2	PCB	Chain 0	4 dBi
K-Marui	KI-DW2050DEC18080P4	PCB	Chain 1	3.39 dBi
K-Marui	KI-DW5020DEC50180P5	PCB	Chain 2	2 dBi
K-Marui	KI-DW2050DEC80180P3	PCB	Chain 3	4.42 dBi

BLE

Manufacturer	Model	Type	Antenna Gain
Mercury Corporation	MCR-SBI	PCB	6.08 dBi

The antenna uses non-standard connectors and meets the requirements of this section. Please refer to EUT photos.

Result: Compliance

7 FCC §15.207(a) – AC Line Conducted Emissions

7.1 Applicable Standard

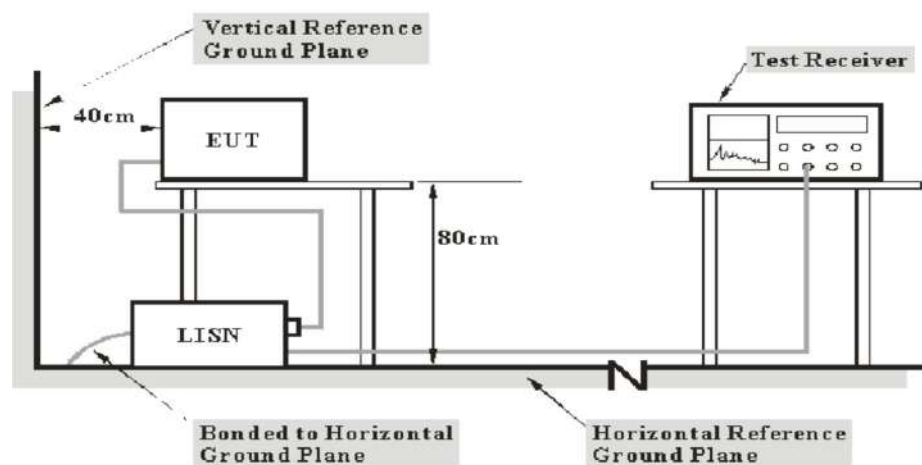
According to §15.207

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 μ H/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.

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.

7.2 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 limits.

7.3 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

7.4 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.

7.5 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:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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:

$$\text{Over Limit} = \text{Result} - \text{Limit Line}$$

7.6 Test Results

Test Mode: Transmitting

Main: AC120 V, 60 Hz

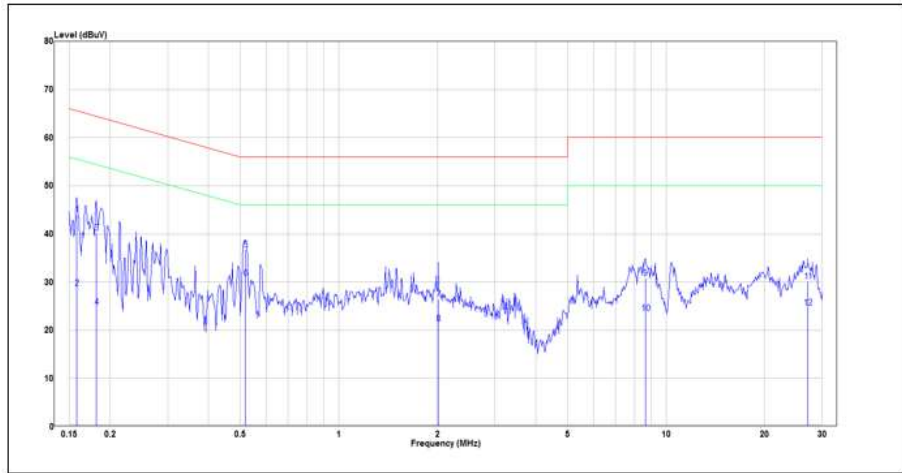
WIFI mode

(Worst case is 802.11g mode, low channel)

Line

Description:	WiFi 2.4G, RBW: 9kHz/VBW: 30kHz
--------------	---------------------------------

2024-12-23 19:24:19

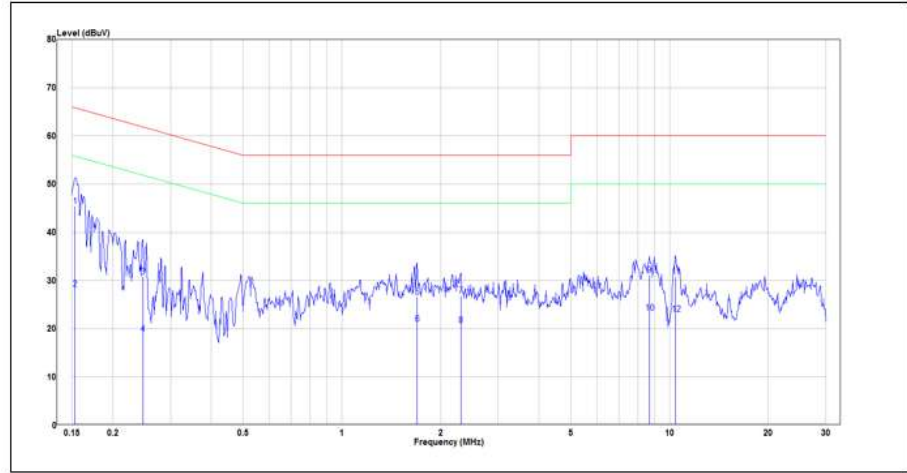


No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.158	34.11	9.85	43.96	65.56	-21.60	QP	Line
2	0.158	18.85	9.85	28.70	55.56	-26.86	Average	Line
3	0.182	30.23	9.95	40.18	64.42	-24.23	QP	Line
4	0.182	14.89	9.95	24.85	54.42	-29.57	Average	Line
5	0.518	26.51	10.26	36.77	56.00	-19.23	QP	Line
6	0.518	20.46	10.26	30.73	46.00	-15.27	Average	Line
7	2.012	16.06	10.34	26.40	56.00	-29.60	QP	Line
8	2.012	11.00	10.34	21.34	46.00	-24.66	Average	Line
9	8.637	20.39	10.44	30.83	60.00	-29.17	QP	Line
10	8.637	13.10	10.44	23.54	50.00	-26.46	Average	Line
11	27.127	19.57	10.55	30.13	60.00	-29.87	QP	Line
12	27.127	14.07	10.55	24.63	50.00	-25.37	Average	Line

Neutral

Description:	WiFi 2.4G, RBW: 9kHz/VBW: 30kHz
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2024-12-23 19:50:28



No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.153	35.59	9.84	45.43	65.82	-20.39	QP	Neutral
2	0.153	18.34	9.84	28.18	55.82	-27.65	Average	Neutral
3	0.247	20.76	10.08	30.84	61.86	-31.03	QP	Neutral
4	0.247	8.88	10.08	18.96	51.86	-32.90	Average	Neutral
5	1.698	16.26	10.35	26.61	56.00	-29.39	QP	Neutral
6	1.698	10.69	10.35	21.04	46.00	-24.96	Average	Neutral
7	2.309	16.51	10.36	26.87	56.00	-29.13	QP	Neutral
8	2.309	10.43	10.36	20.78	46.00	-25.22	Average	Neutral
9	8.683	20.71	10.45	31.16	60.00	-28.84	QP	Neutral
10	8.683	12.81	10.45	23.27	50.00	-26.73	Average	Neutral
11	10.452	20.31	10.48	30.79	60.00	-29.21	QP	Neutral
12	10.452	12.53	10.48	23.01	50.00	-26.99	Average	Neutral

Note:

Result = Reading + Factor

Over Limit = Result – Limit Line

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

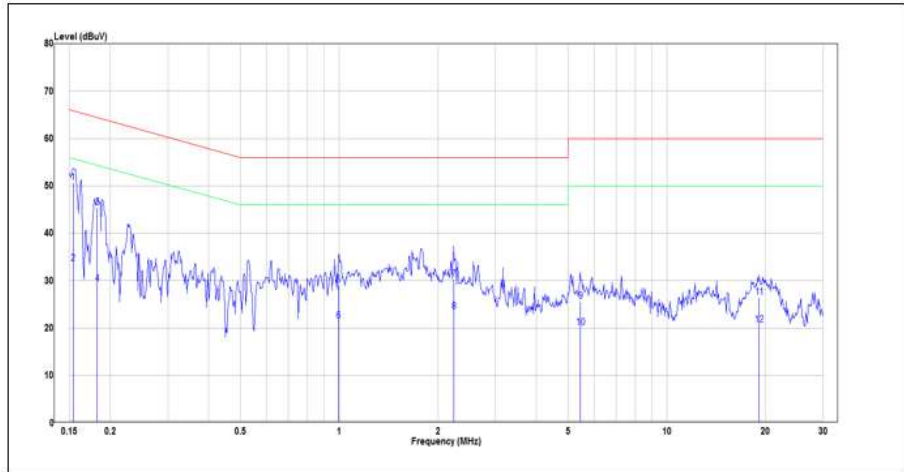
BLE mode

(Worst case is BLE 1M mode, low channel)

Line

Description:	BLE, RBW: 9kHz/VBW: 30kHz
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2025-01-20 09:57:21

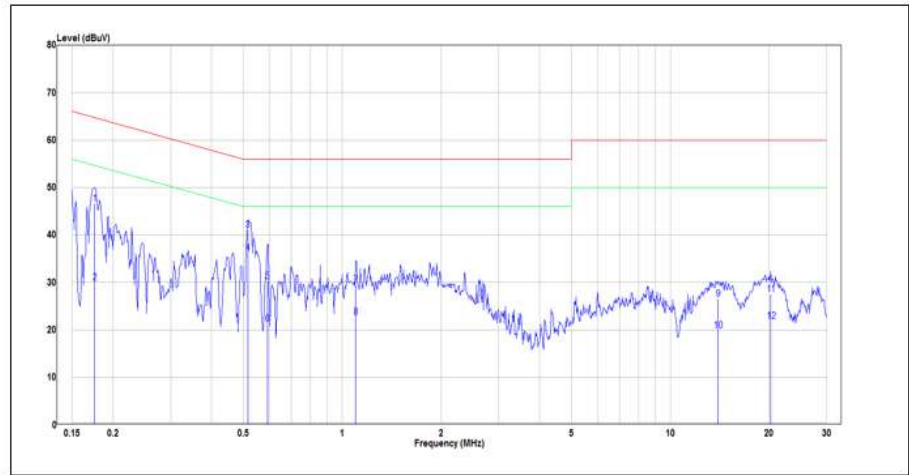


No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.154	40.85	9.84	50.68	65.78	-15.10	QP	Line
2	0.154	23.81	9.84	33.65	55.78	-22.13	Average	Line
3	0.182	35.49	9.96	45.45	64.37	-18.92	QP	Line
4	0.182	19.32	9.96	29.28	54.37	-25.10	Average	Line
5	0.994	18.74	10.34	29.08	56.00	-26.92	QP	Line
6	0.994	11.12	10.34	21.45	46.00	-24.55	Average	Line
7	2.237	19.93	10.35	30.28	56.00	-25.72	QP	Line
8	2.237	13.10	10.35	23.45	46.00	-22.55	Average	Line
9	5.447	15.20	10.41	25.61	60.00	-34.39	QP	Line
10	5.447	9.61	10.41	20.02	50.00	-29.98	Average	Line
11	19.122	15.91	10.60	26.52	60.00	-33.48	QP	Line
12	19.122	10.02	10.60	20.63	50.00	-29.37	Average	Line

Neutral

Description:	BLE, RBW: 9kHz/VBW: 30kHz
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2025-01-20 09:59:47



No.	Frequency (MHz)	Reading dBuV	Correct Factor(dB)	Result dBuV	Limit dBuV	Over limit (dB)	Remark	Phase
1	0.176	36.62	9.94	46.56	64.68	-18.12	QP	Neutral
2	0.176	19.91	9.94	29.85	54.68	-24.83	Average	Neutral
3	0.516	30.79	10.27	41.06	56.00	-14.94	QP	Neutral
4	0.516	25.85	10.27	36.12	46.00	-9.88	Average	Neutral
5	0.592	19.86	10.29	30.15	56.00	-25.85	QP	Neutral
6	0.592	10.94	10.29	21.23	46.00	-24.77	Average	Neutral
7	1.100	19.10	10.35	29.45	56.00	-26.55	QP	Neutral
8	1.100	12.25	10.35	22.60	46.00	-23.40	Average	Neutral
9	13.989	15.88	10.59	26.47	60.00	-33.53	QP	Neutral
10	13.989	9.25	10.59	19.83	50.00	-30.17	Average	Neutral
11	20.270	16.87	10.68	27.54	60.00	-32.46	QP	Neutral
12	20.270	11.04	10.68	21.72	50.00	-28.28	Average	Neutral

Note:

Result = Reading + Factor

Over Limit = Result – Limit Line

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

8 FCC §15.209, §15.205, §15.247(d) – Spurious Emissions

8.1 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 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.

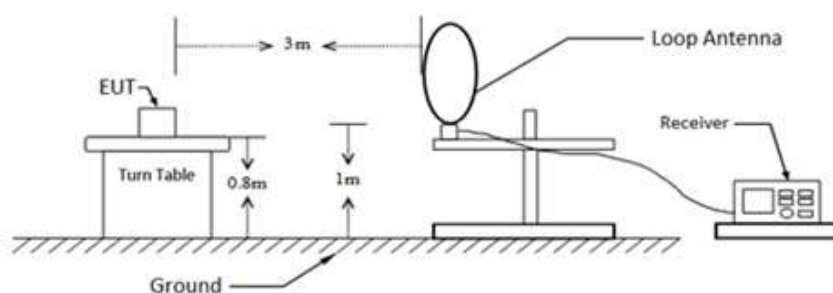
According to ANSI C63.10-2013, section 5.3.3

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).

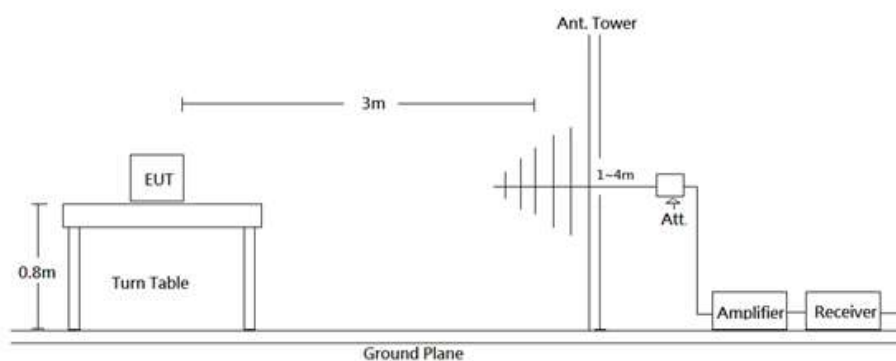
As per FCC §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the 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)).

8.2 EUT Setup

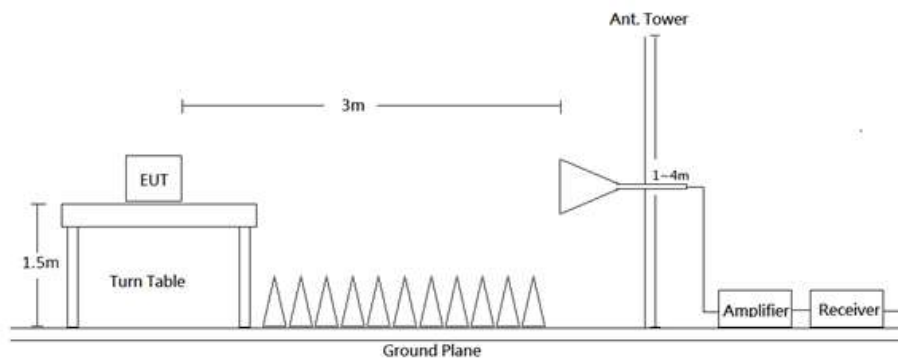
9kHz-30MHz:



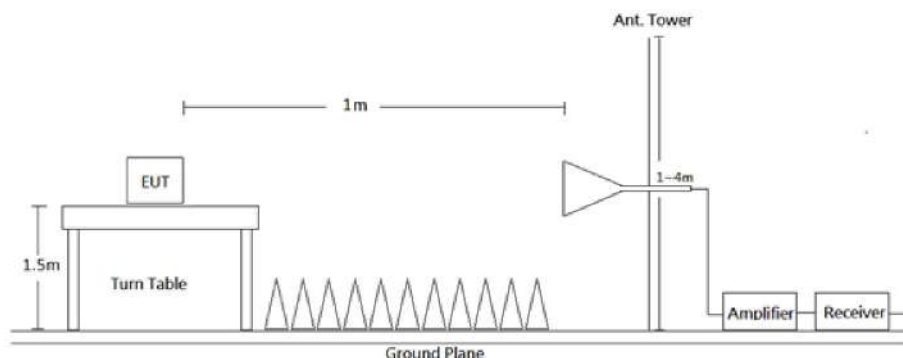
30MHz-1GHz:



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, FCC 15.247 Limits.

8.3 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	Duty cycle	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	>98%	Ave	PK
	1 MHz	$\geq 1/\text{Ton}$, not less than 1 kHz	<98%	Ave	PK
	Final measurement for emission identified during pre-scan :				
	1 MHz	3 MHz	/	PK	PK
	1 MHz	10 Hz	>98%	Ave	PK
	1 MHz	$\geq 1/\text{Ton}$	<98%	Ave	PK

Note: Ton is minimum transmission duration

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

8.4 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.

8.5 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:

$$\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Level} - \text{Limit}$$

8.6 Test Results

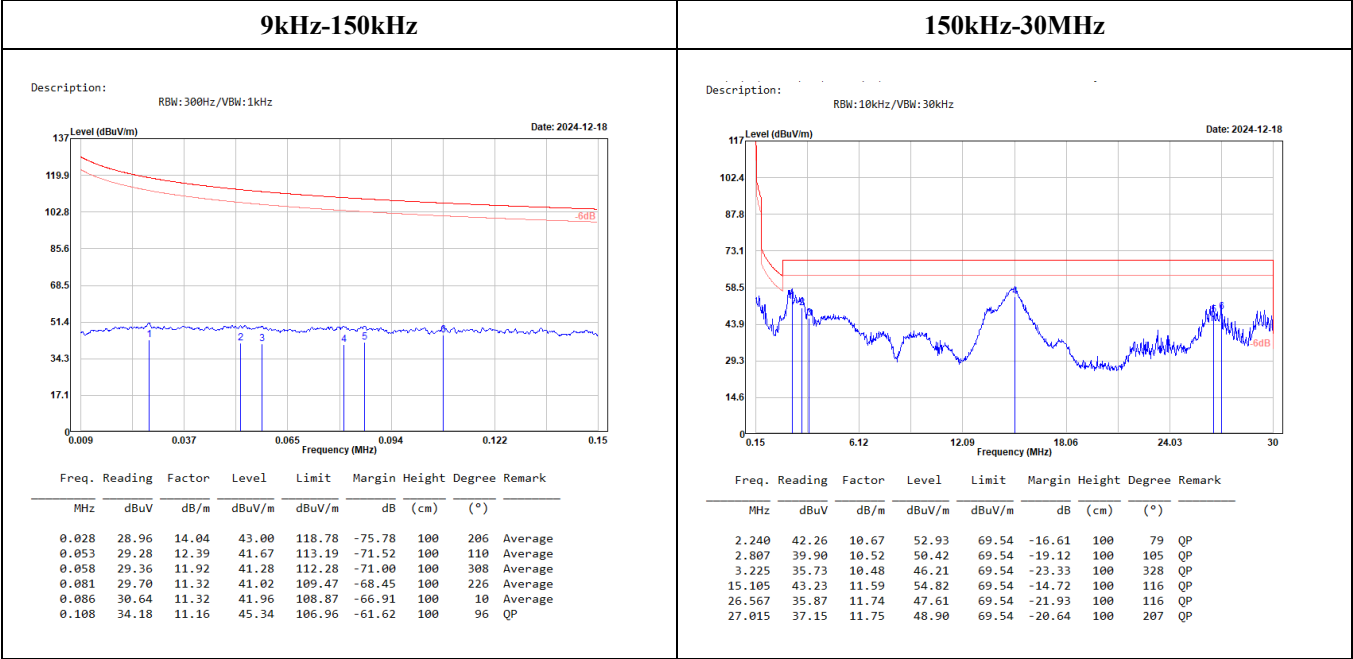
Test Mode: Transmitting (Test for Y axis.)

WIFI

9kHz-30MHz:

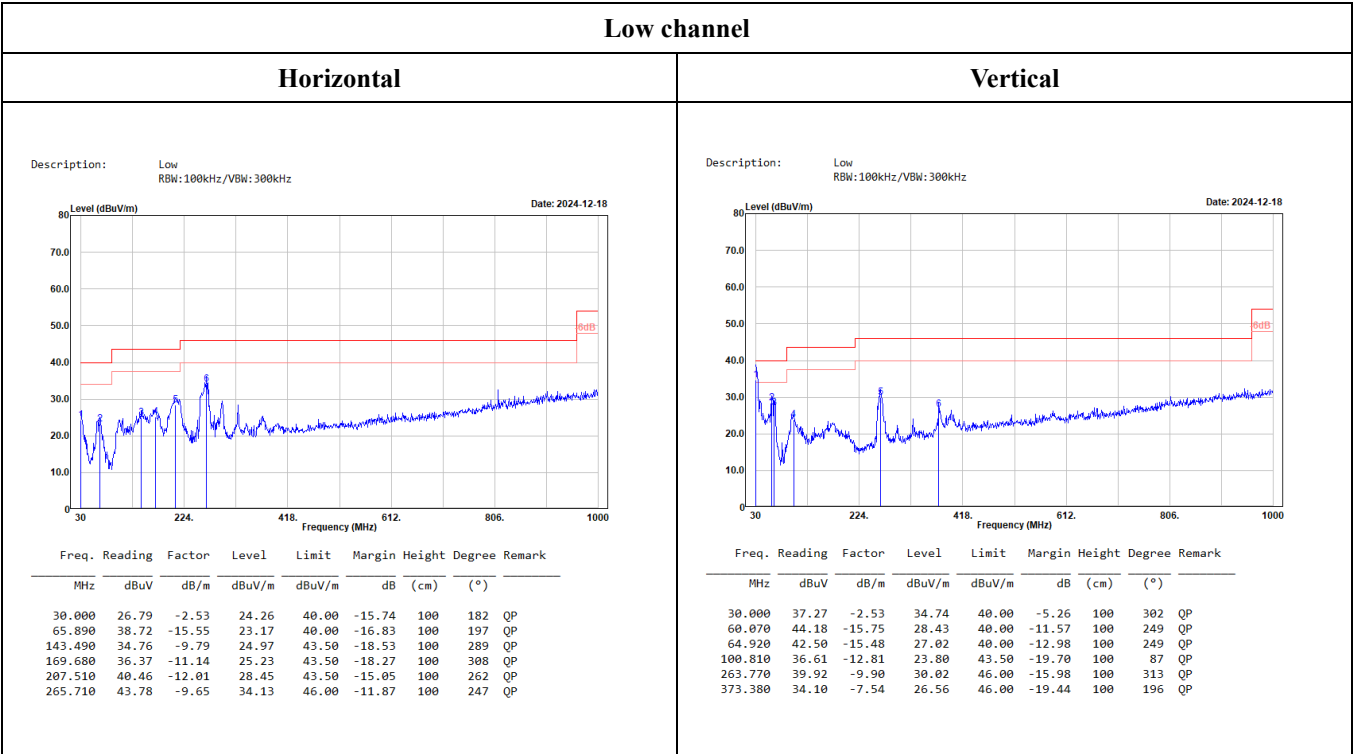
(Worst case is 802.11g mode, low channel)

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



30MHz-1GHz:

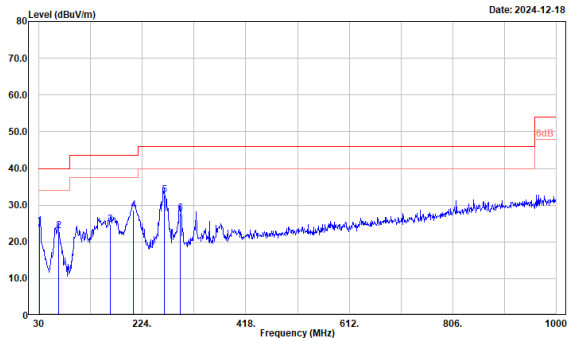
(Worst case is 802.11g mode)



Middle channel

Horizontal

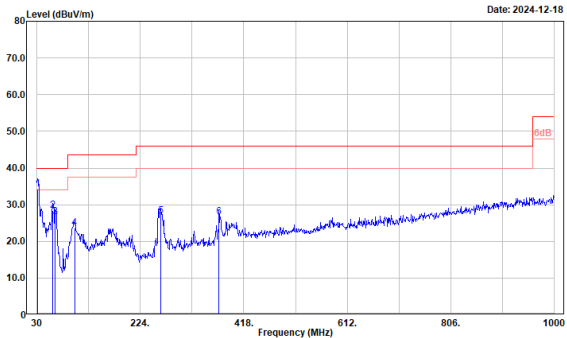
Description: Middle
RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
31.940	28.34	-3.95	24.39	40.00	-15.61	100	235	QP
66.860	38.36	-15.29	23.07	40.00	-16.93	100	186	QP
163.860	35.30	-10.49	24.81	43.50	-18.69	100	309	QP
207.510	40.69	-12.01	28.68	43.50	-14.82	100	259	QP
264.740	42.44	-9.73	32.71	46.00	-13.29	100	51	QP
295.780	36.64	-8.81	27.83	46.00	-18.17	100	189	QP

Vertical

Description: Middle
RBW:100kHz/VBW:300kHz

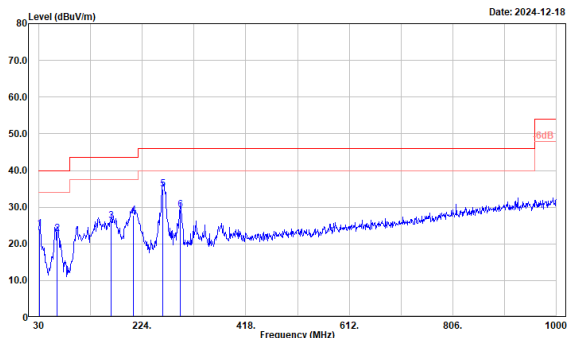


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
31.940	38.31	-3.95	34.36	40.00	-5.64	100	273	QP
60.070	44.15	-15.75	28.40	40.00	-11.60	100	282	QP
64.920	42.08	-15.48	26.60	40.00	-13.40	100	250	QP
100.810	36.34	-12.81	23.53	43.50	-19.97	100	64	QP
261.830	37.18	-10.21	26.97	46.00	-19.03	100	360	QP
371.440	34.23	-7.63	26.60	46.00	-19.40	100	209	QP

High channel

Horizontal

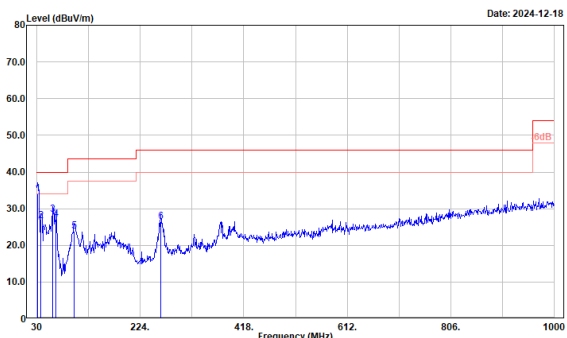
Description: High
RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
31.940	27.97	-3.95	24.02	40.00	-15.98	100	109	QP
64.920	38.25	-15.48	22.77	40.00	-17.23	100	185	QP
165.800	36.93	-10.70	26.23	43.50	-17.27	100	289	QP
207.510	39.71	-12.01	27.70	43.50	-15.80	100	168	QP
262.800	44.92	-10.05	34.87	46.00	-11.13	100	174	QP
295.780	38.10	-8.81	29.29	46.00	-16.71	100	163	QP

Vertical

Description: High
RBW:100kHz/VBW:300kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
31.940	38.08	-3.95	34.13	40.00	-5.87	100	283	QP
37.760	34.77	-8.18	26.59	40.00	-13.41	100	306	QP
60.070	44.21	-15.75	28.46	40.00	-11.54	100	264	QP
65.890	42.63	-15.55	27.08	40.00	-12.92	100	287	QP
99.840	37.10	-13.16	23.94	43.50	-19.56	100	67	QP
262.800	36.60	-10.05	26.55	46.00	-19.45	100	310	QP

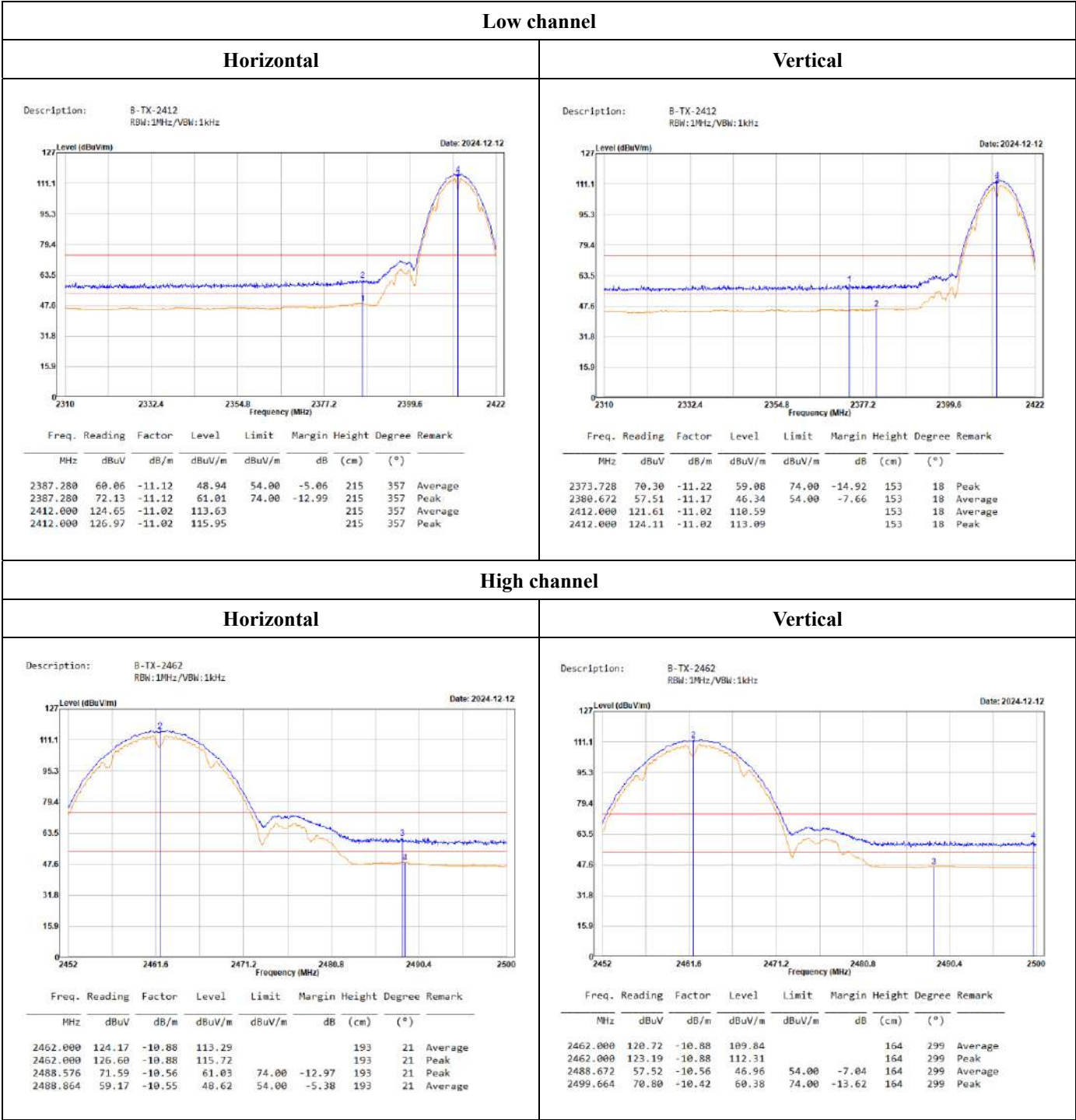
Level = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

Band-Edge:

802.11b Mode

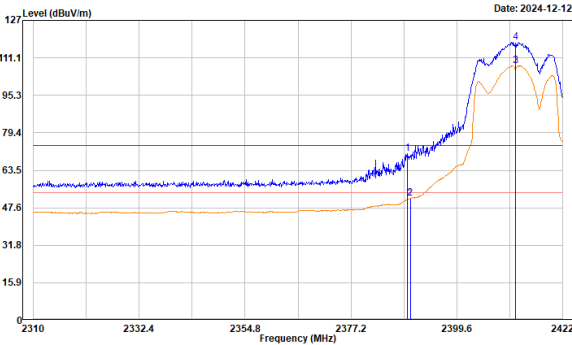


802.11g Mode

Low channel

Horizontal

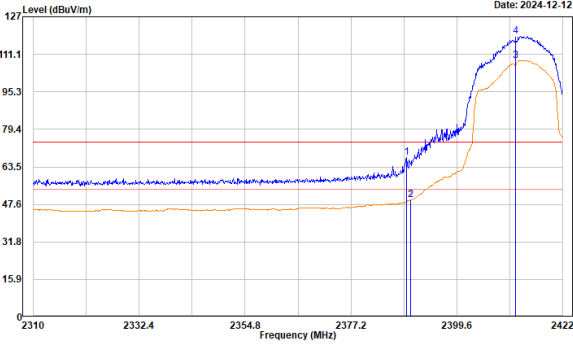
Description: G-TX-2412
RBW: 1MHz/VBW: 1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2389.072	81.77	-11.10	70.67	74.00	-3.33	205	31	Peak
2389.744	62.79	-11.09	51.70	54.00	-2.30	205	31	Average
2412.000	118.83	-11.02	107.81			205	31	Average
2412.000	128.85	-11.02	117.83			205	31	Peak

Vertical

Description: G-TX-2412
RBW: 1MHz/VBW: 1kHz

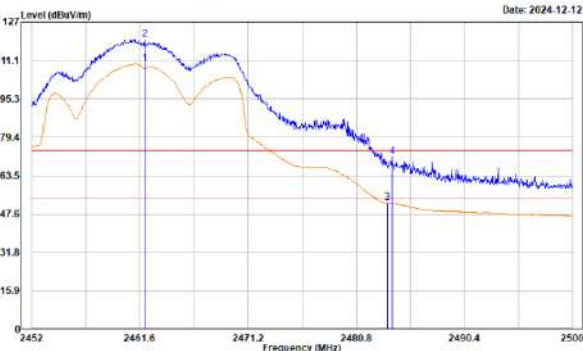


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2388.960	78.42	-11.10	67.32	74.00	-6.68	180	289	Peak
2389.856	60.58	-11.09	49.49	54.00	-4.51	180	289	Average
2412.000	119.57	-11.02	108.55			180	289	Average
2412.000	129.81	-11.02	118.79			180	289	Peak

High channel

Horizontal

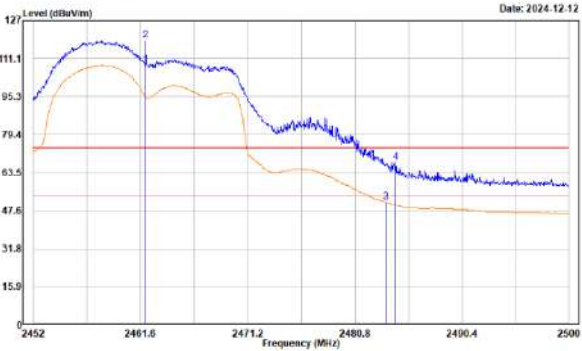
Description: G-TX-2462
RBW: 1MHz/VBW: 1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2462.000	120.64	-10.88	109.76			191	18	Average
2462.000	130.52	-10.88	119.64			191	18	Peak
2483.550	62.81	-10.61	52.20	54.00	-1.80	191	18	Average
2483.968	81.77	-10.60	71.17	74.00	-2.83	191	18	Peak

Vertical

Description: G-TX-2462
RBW: 1MHz/VBW: 1kHz



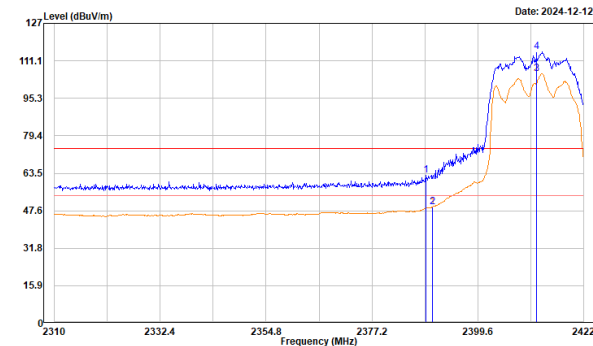
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2462.000	119.17	-10.88	108.29			168	1	Average
2462.000	129.45	-10.88	118.57			168	1	Peak
2483.550	61.98	-10.61	51.37	54.00	-2.63	168	1	Average
2484.448	78.36	-10.60	67.76	74.00	-6.24	168	1	Peak

802.11n HT20 Mode

Low channel

Horizontal

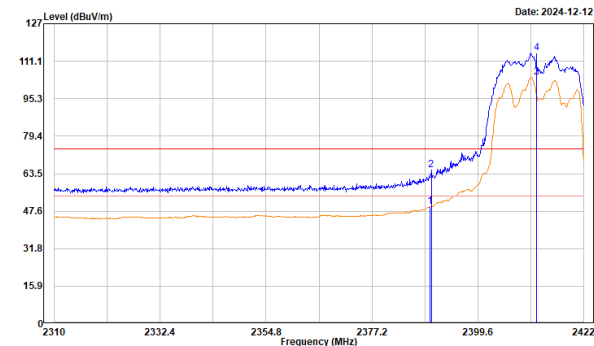
Description: N20-TX-2412
RBW: 1MHz/VBW: 1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2388.624	73.66	-11.10	62.56	74.00	-11.44	210	13	Peak
2389.968	60.24	-11.09	49.15	54.00	-4.85	210	13	Average
2412.000	116.56	-11.02	105.54			210	13	Average
2412.000	125.98	-11.02	114.96			210	13	Peak

Vertical

Description: N20-TX-2412
RBW: 1MHz/VBW: 1kHz

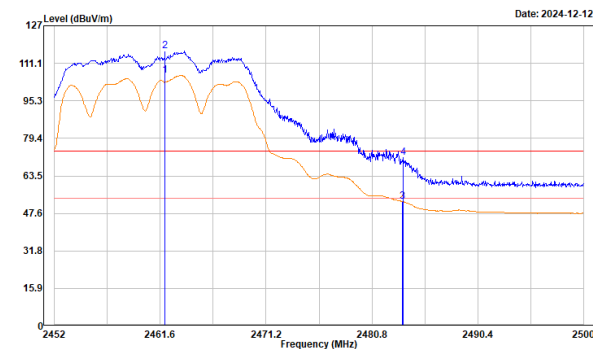


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2389.520	60.69	-11.09	49.60	54.00	-4.40	170	360	Average
2389.744	76.04	-11.09	64.95	74.00	-9.05	170	360	Peak
2412.000	115.26	-11.02	104.24			170	360	Average
2412.000	125.74	-11.02	114.72			170	360	Peak

High channel

Horizontal

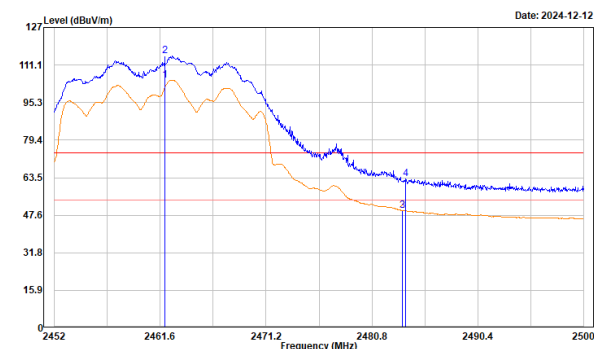
Description: N20-TX-2462
RBW: 1MHz/VBW: 1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2462.000	116.90	-10.88	106.02			224	6	Average
2462.000	127.10	-10.88	116.22			224	6	Peak
2483.536	63.33	-10.61	52.72	54.00	-1.28	224	6	Average
2483.632	81.70	-10.61	71.09	74.00	-2.91	224	6	Peak

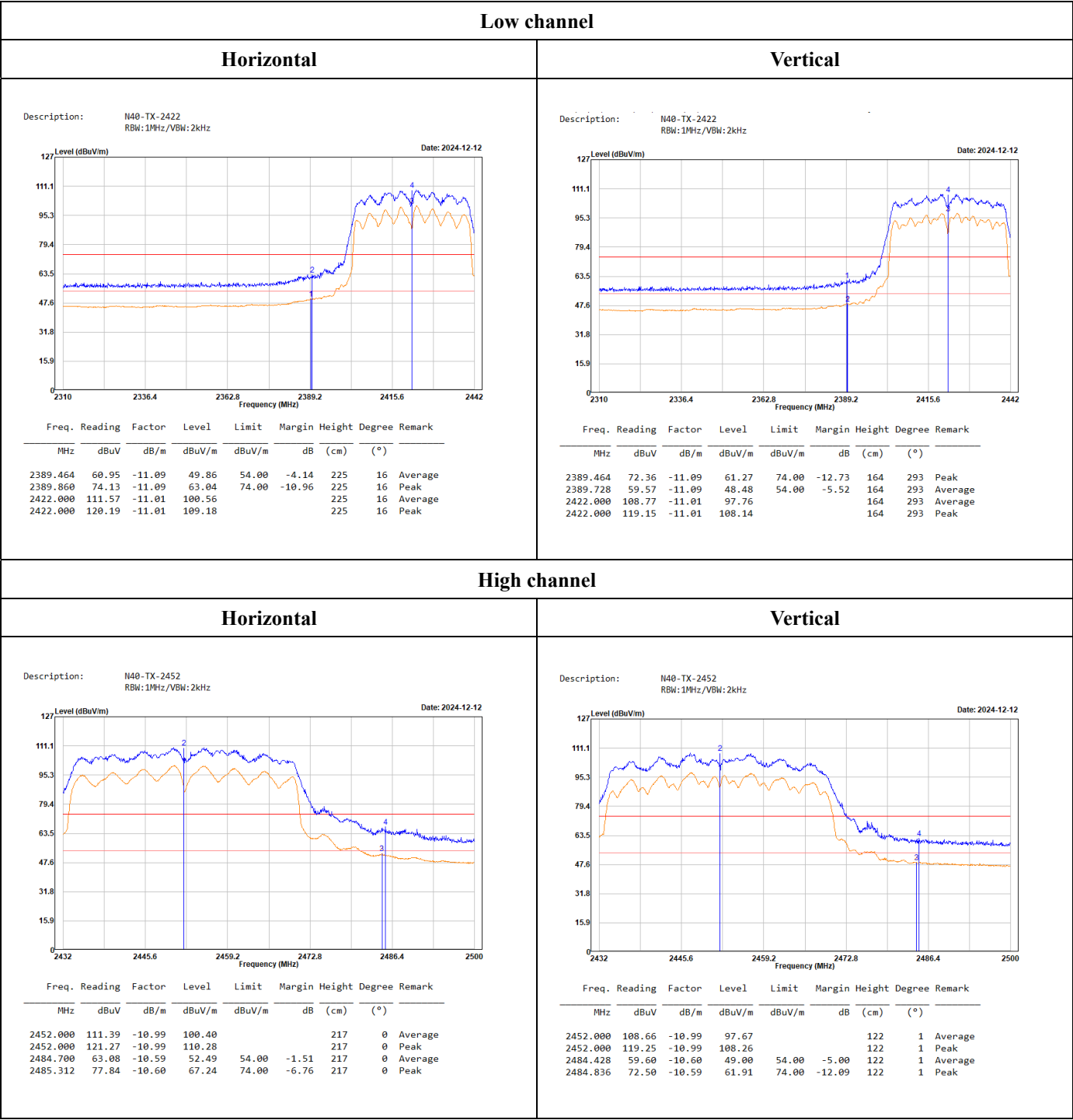
Vertical

Description: N20-TX-2462
RBW: 1MHz/VBW: 1kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2462.000	115.56	-10.88	104.68			224	3	Average
2462.000	125.98	-10.88	115.10			224	3	Peak
2483.584	60.26	-10.61	49.65	54.00	-4.35	224	3	Average
2483.824	73.71	-10.60	63.11	74.00	-10.89	224	3	Peak

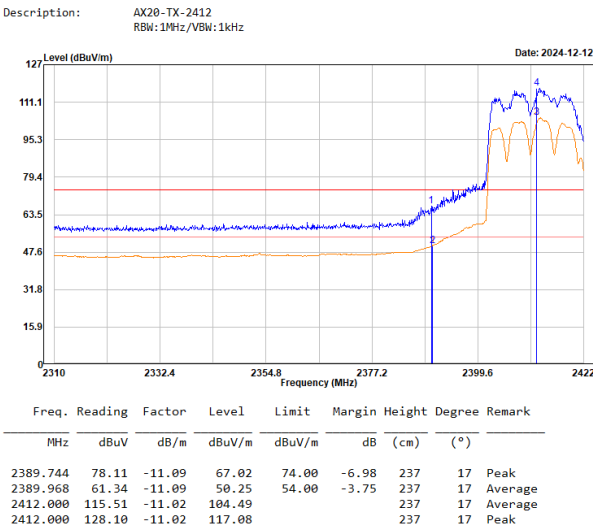
802.11n HT40 Mode



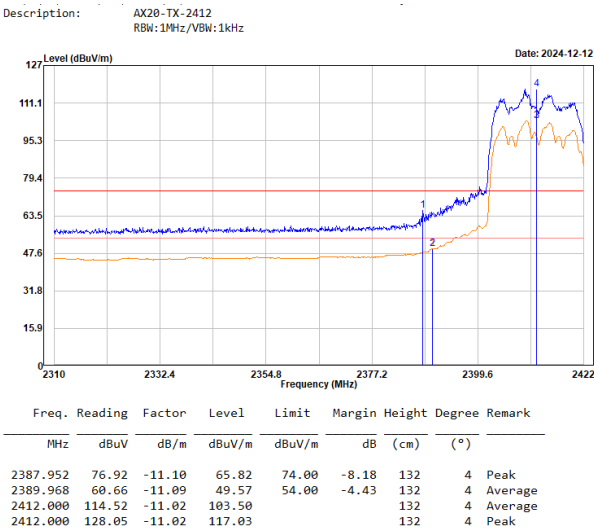
802.11ax HE20 Mode

Low channel

Horizontal



Vertical

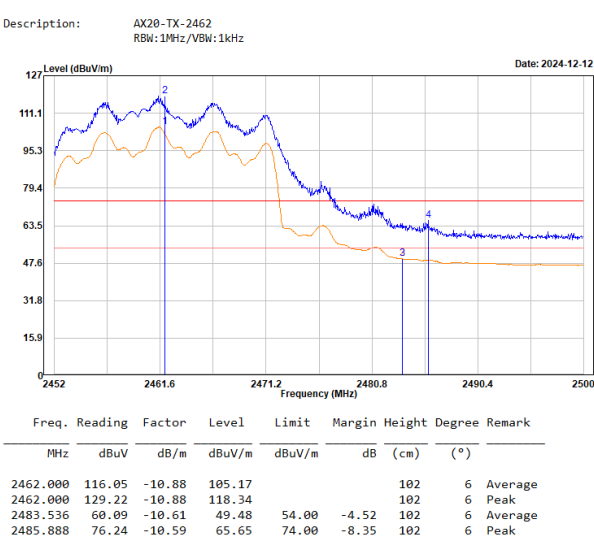


High channel

Horizontal



Vertical

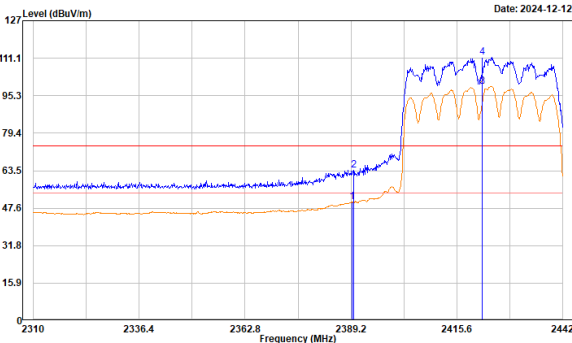


802.11ax HE40 Mode

Low channel

Horizontal

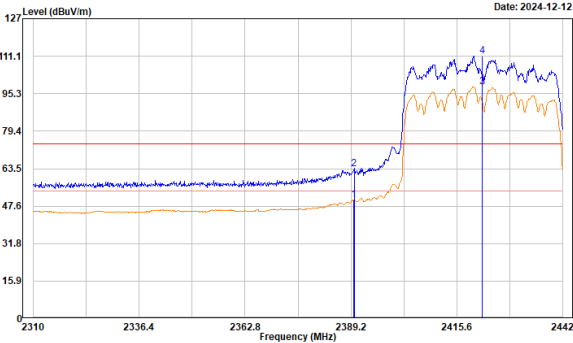
Description: AX40-TX-2422
RBW: 1MHz/VBW: 2kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2389.464	61.41	-11.09	50.32	54.00	-3.68	204	20	Average
2389.860	74.81	-11.09	63.72	74.00	-10.28	204	20	Peak
2422.000	110.28	-11.01	99.27			204	20	Average
2422.000	122.67	-11.01	111.66			204	20	Peak

Vertical

Description: AX40-TX-2422
RBW: 1MHz/VBW: 2kHz

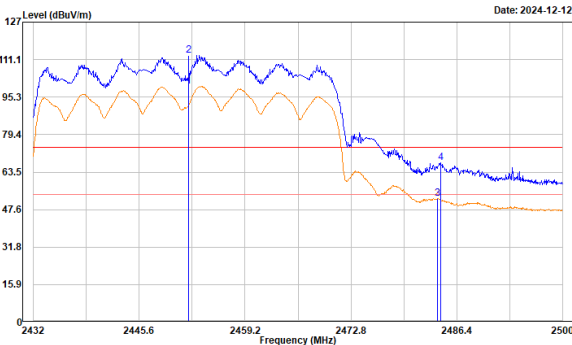


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2389.860	61.44	-11.09	50.35	54.00	-3.65	157	7	Average
2389.992	74.49	-11.09	63.40	74.00	-10.60	157	7	Peak
2422.000	109.20	-11.01	98.19			157	7	Average
2422.000	122.27	-11.01	111.26			157	7	Peak

High channel

Horizontal

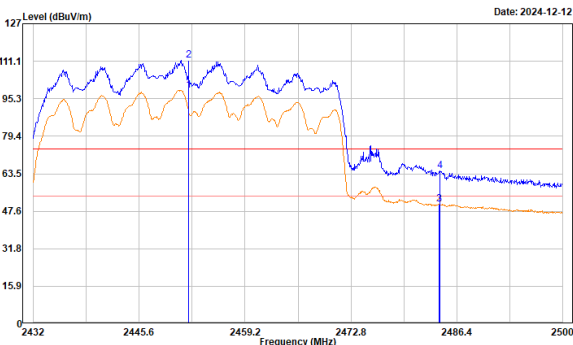
Description: AX40-TX-2452
RBW: 1MHz/VBW: 2kHz



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2452.000	110.91	-10.99	99.92			217	17	Average
2452.000	123.96	-10.99	112.97			217	17	Peak
2483.884	62.78	-10.60	52.18	54.00	-1.82	217	17	Average
2484.292	78.20	-10.60	67.60	74.00	-6.40	217	17	Peak

Vertical

Description: AX40-TX-2452
RBW: 1MHz/VBW: 2kHz



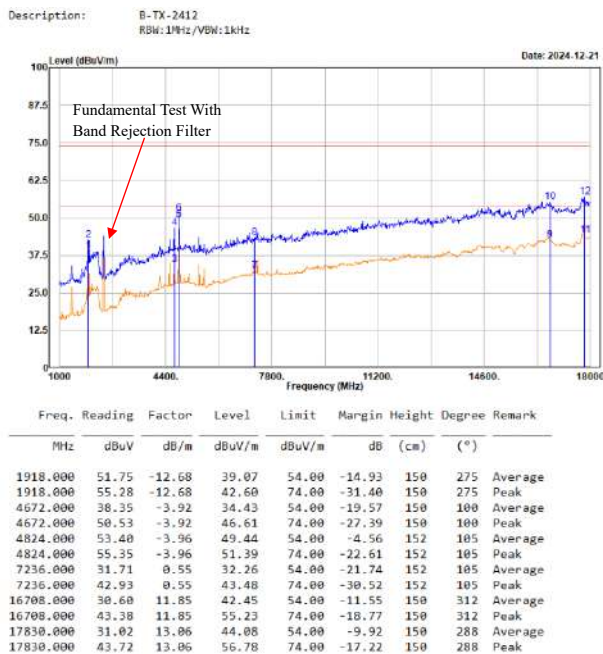
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2452.000	109.90	-10.99	98.91			167	359	Average
2452.000	122.40	-10.99	111.41			167	359	Peak
2484.156	61.23	-10.60	50.63	54.00	-3.37	167	359	Average
2484.224	75.36	-10.60	64.76	74.00	-9.24	167	359	Peak

1GHz-18GHz:

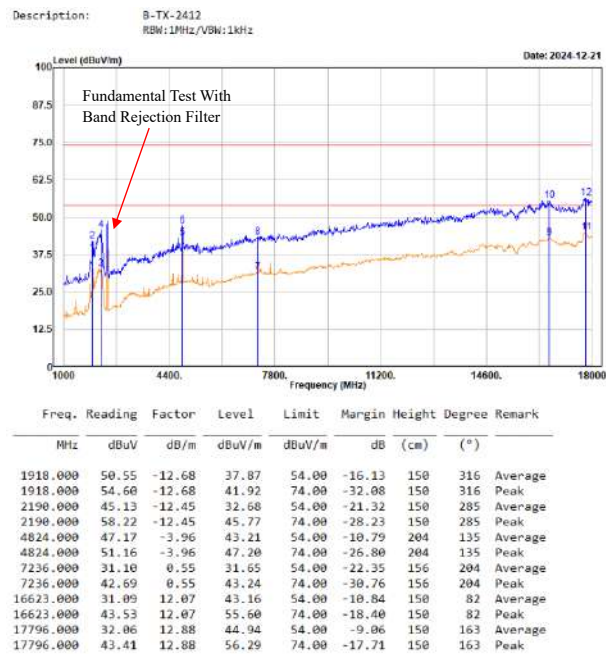
(802.11b mode)

Low channel

Horizontal

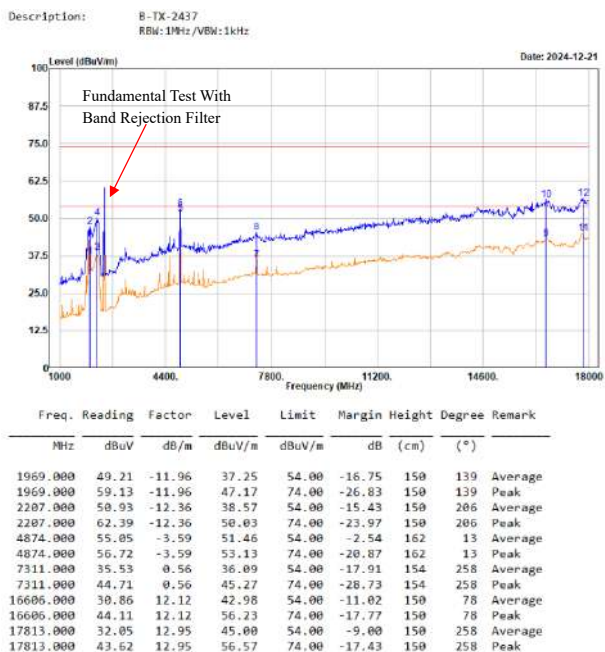


Vertical

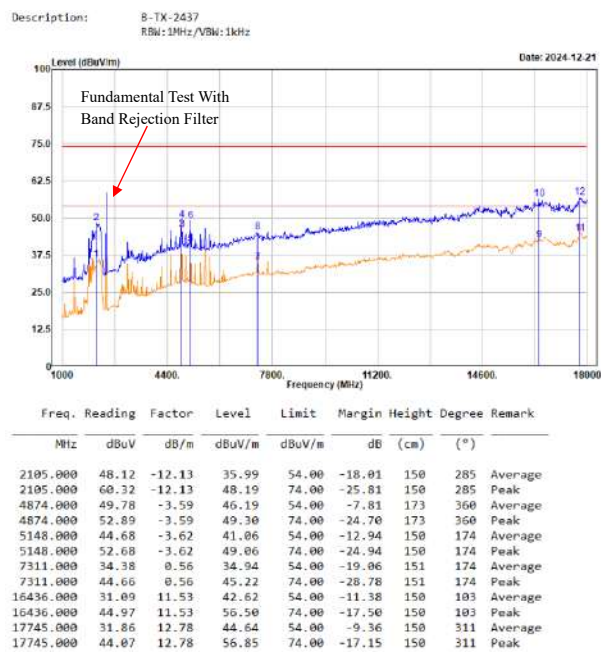


Middle channel

Horizontal

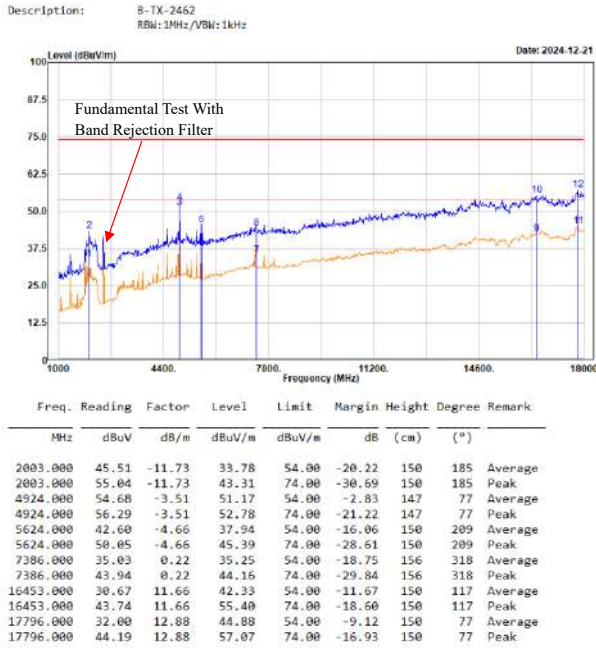


Vertical

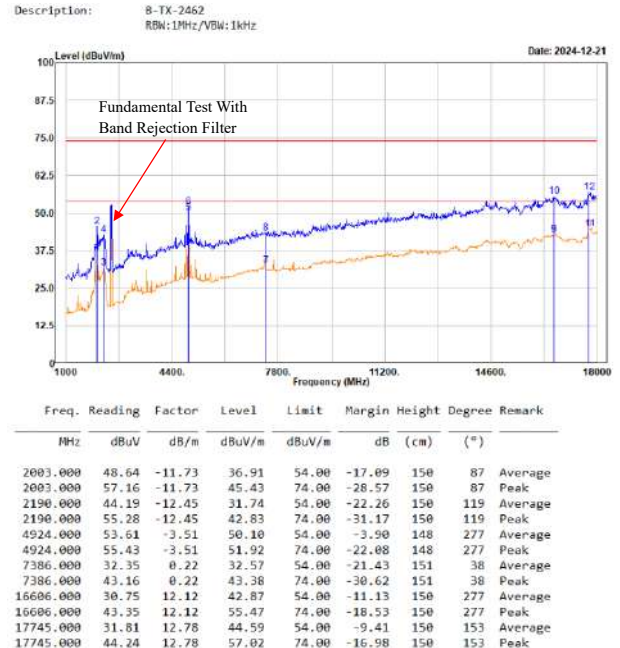


High channel

Horizontal



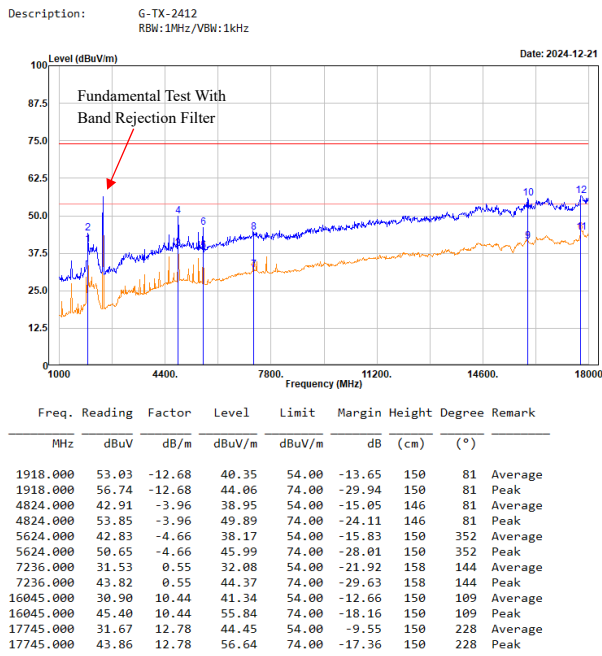
Vertical



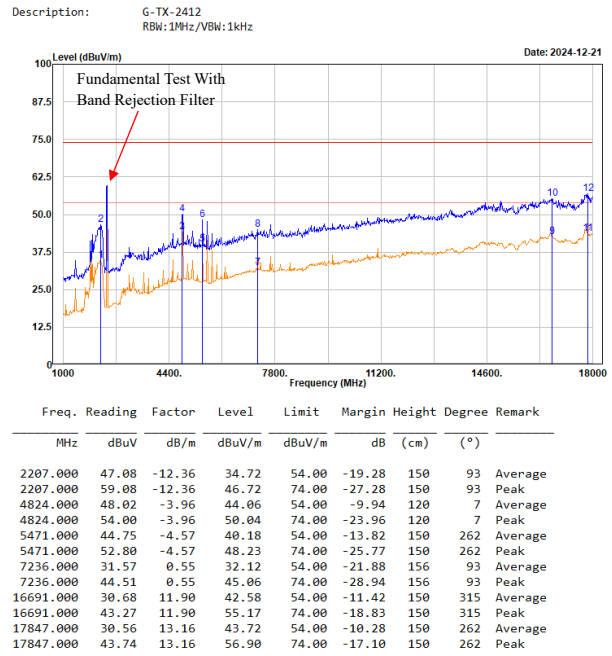
(802.11g mode)

Low channel

Horizontal

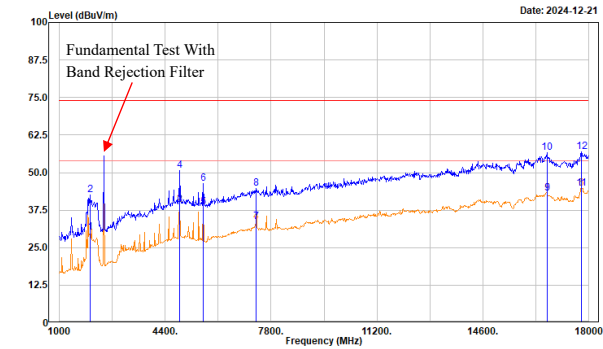


Vertical



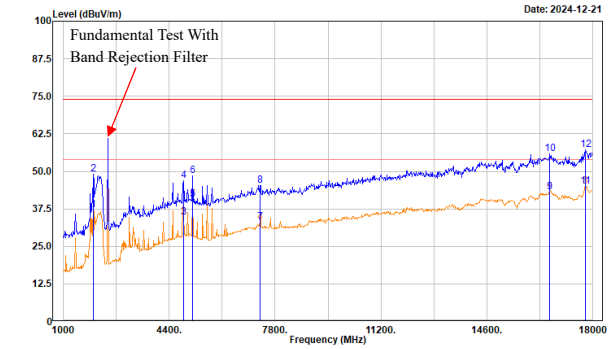
Middle channel

Horizontal

Description: G-TX-2437
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1986.000	42.04	-11.84	30.20	54.00	-23.80	150	289	Average
1986.000	54.27	-11.84	42.43	74.00	-31.57	150	289	Peak
4874.000	42.96	-3.59	39.37	54.00	-14.63	151	75	Average
4874.000	54.40	-3.59	50.81	74.00	-23.19	151	75	Peak
5624.000	43.03	-4.66	38.37	54.00	-15.63	150	106	Average
5624.000	50.98	-4.66	46.32	74.00	-27.68	150	106	Peak
7311.000	32.92	0.56	33.48	54.00	-20.52	158	231	Average
7311.000	44.27	0.56	44.83	74.00	-29.17	158	231	Peak
16657.000	31.11	11.99	43.10	54.00	-10.90	150	38	Average
16657.000	44.78	11.99	56.77	74.00	-17.23	150	38	Peak
17762.000	31.78	12.83	44.61	54.00	-9.39	150	75	Average
17762.000	44.02	12.83	56.85	74.00	-17.15	150	75	Peak

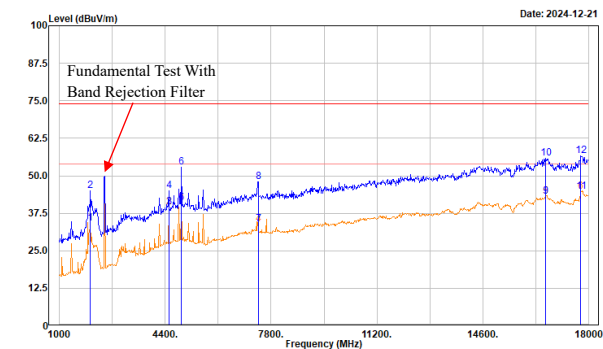
Vertical

Description: G-TX-2437
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1969.000	49.11	-11.96	37.15	54.00	-16.85	150	221	Average
1969.000	60.92	-11.96	48.96	74.00	-25.04	150	221	Peak
4874.000	38.30	-3.59	34.71	54.00	-19.29	165	360	Average
4874.000	50.58	-3.59	46.99	74.00	-27.01	165	360	Peak
5148.000	44.28	-3.62	40.66	54.00	-13.34	150	163	Average
5148.000	52.14	-3.62	48.52	74.00	-25.48	150	163	Peak
7311.000	32.57	0.56	33.13	54.00	-20.87	159	142	Average
7311.000	44.70	0.56	45.26	74.00	-28.74	159	142	Peak
16623.000	31.02	12.07	43.09	54.00	-10.91	150	89	Average
16623.000	43.89	12.07	55.96	74.00	-18.04	150	89	Peak
17762.000	32.08	12.83	44.91	54.00	-9.09	150	110	Average
17762.000	44.41	12.83	57.24	74.00	-16.76	150	110	Peak

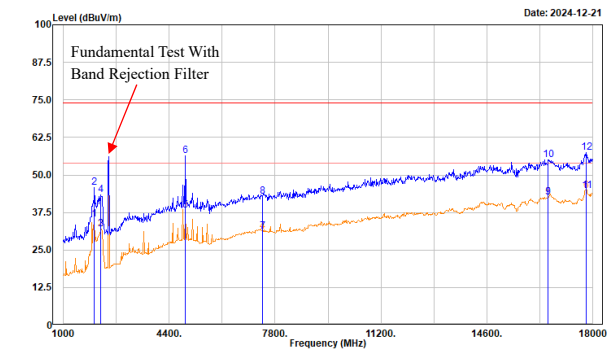
High channel

Horizontal

Description: G-TX-2462
RBW: 1MHz/VBW: 1kHz

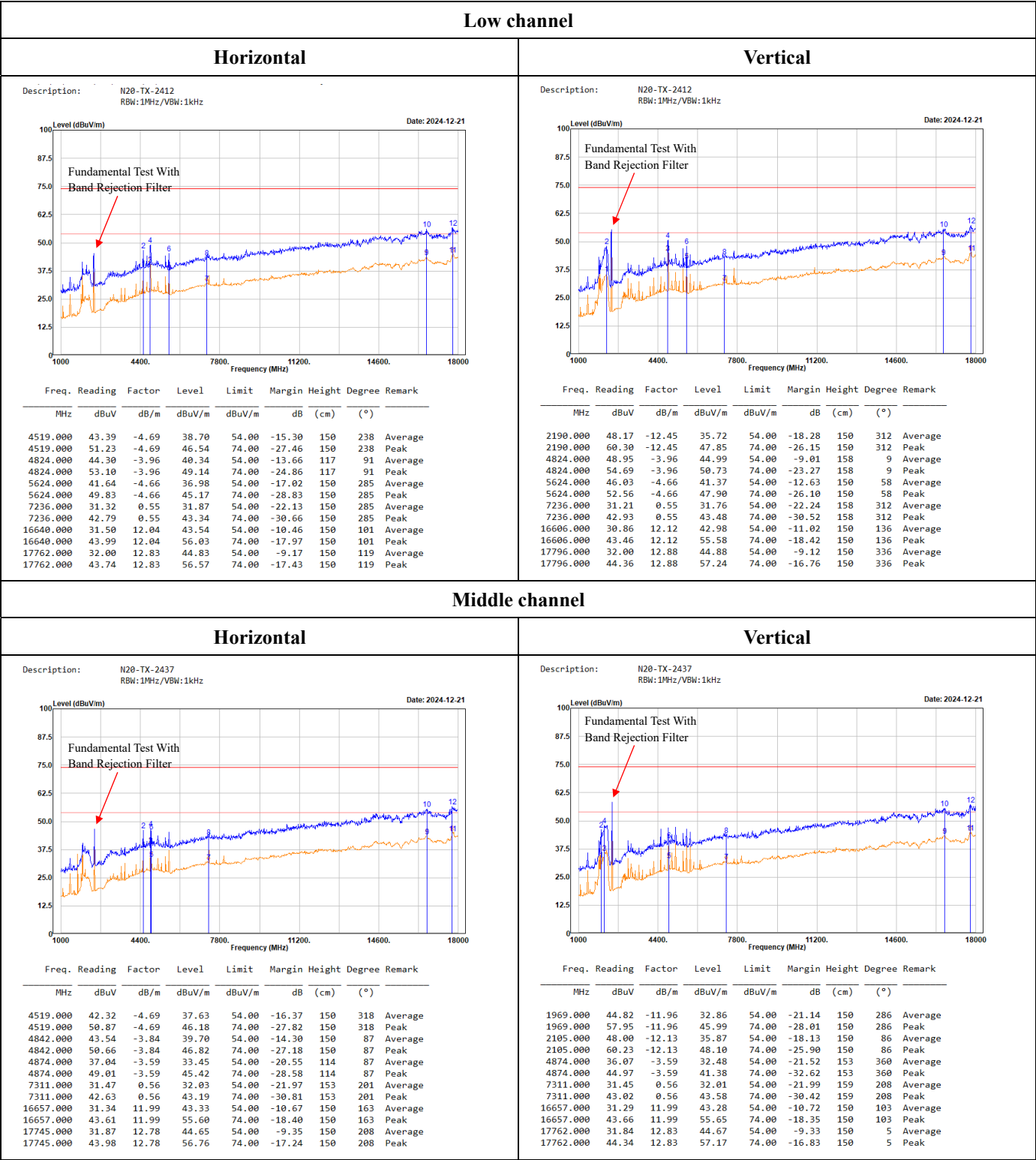
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2003.000	45.88	-11.73	34.15	54.00	-19.85	150	189	Average
2003.000	56.67	-11.73	44.94	74.00	-29.06	150	189	Peak
4519.000	44.32	-4.69	39.63	54.00	-14.37	150	356	Average
4519.000	49.73	-4.69	45.04	74.00	-28.96	150	356	Peak
4924.000	44.44	-3.51	40.93	54.00	-13.07	192	76	Average
4924.000	56.23	-3.51	52.72	74.00	-21.28	192	76	Peak
7386.000	33.74	0.22	33.96	54.00	-20.04	157	209	Average
7386.000	47.62	0.22	47.84	74.00	-26.16	157	209	Peak
16606.000	31.03	12.12	43.15	54.00	-10.85	150	189	Average
16606.000	43.68	12.12	55.80	74.00	-18.20	150	189	Peak
17745.000	32.01	12.78	44.79	54.00	-9.21	150	26	Average
17745.000	43.91	12.78	56.69	74.00	-17.31	150	26	Peak

Vertical

Description: G-TX-2462
RBW: 1MHz/VBW: 1kHz

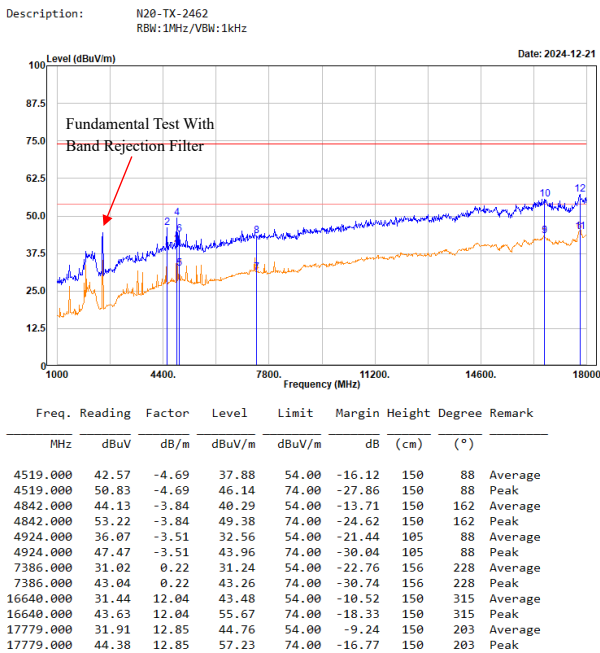
Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2003.000	46.84	-11.73	35.11	54.00	-18.89	150	39	Average
2003.000	57.43	-11.73	45.70	74.00	-28.30	150	39	Peak
2207.000	44.33	-12.36	31.97	54.00	-22.03	150	106	Average
2207.000	55.61	-12.36	43.25	74.00	-30.75	150	106	Peak
4924.000	41.81	-3.51	38.30	54.00	-15.70	179	275	Average
4924.000	59.76	-3.51	56.25	74.00	-17.75	179	275	Peak
7386.000	31.03	0.22	31.25	54.00	-22.75	155	103	Average
7386.000	42.54	0.22	42.76	74.00	-31.24	155	103	Peak
16572.000	30.40	12.10	42.50	54.00	-11.50	150	275	Average
16572.000	42.96	12.10	55.06	74.00	-18.94	150	275	Peak
17796.000	31.79	12.88	44.67	54.00	-9.33	150	158	Average
17796.000	44.44	12.88	57.32	74.00	-16.68	150	158	Peak

(802.11n HT20 mode)

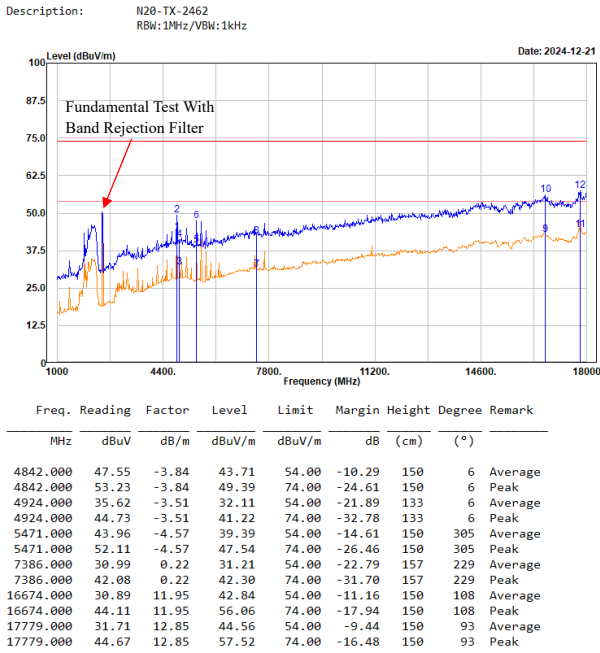


High channel

Horizontal



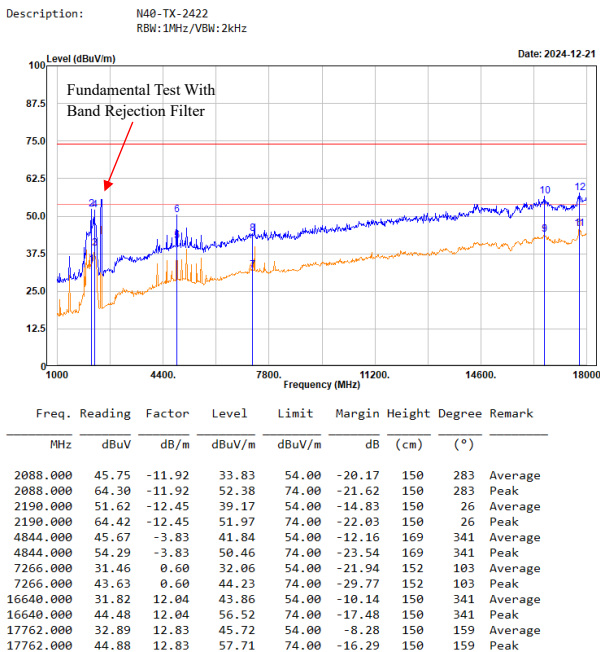
Vertical



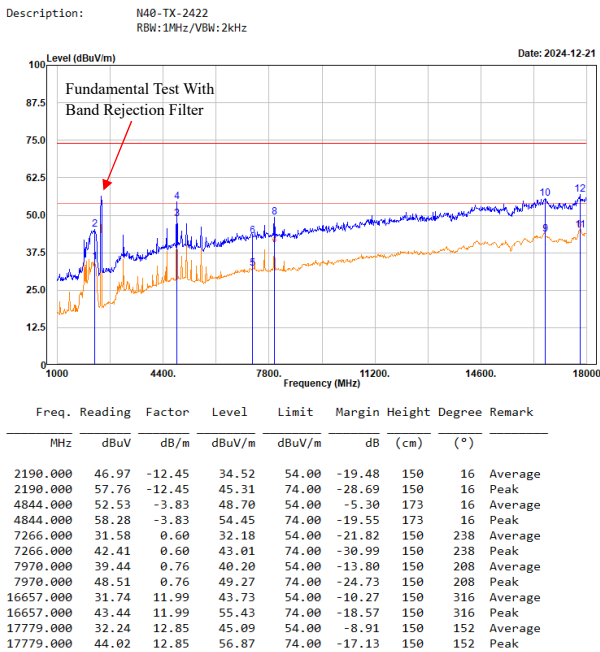
(802.11n HT40 mode)

Low channel

Horizontal

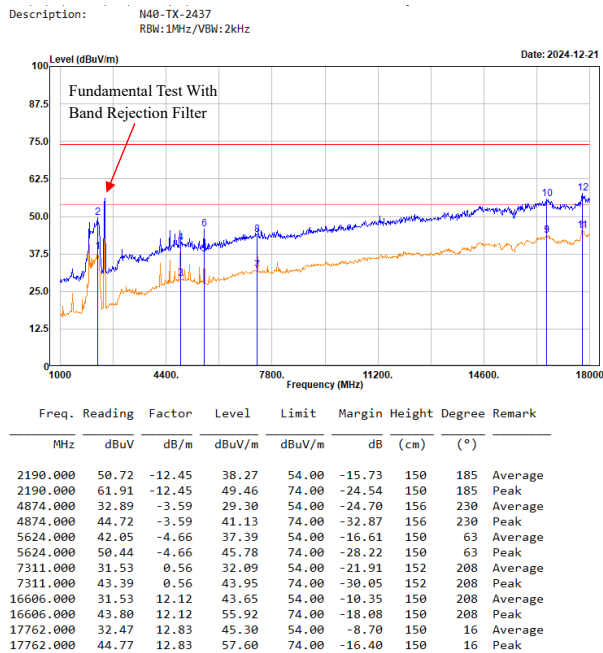


Vertical

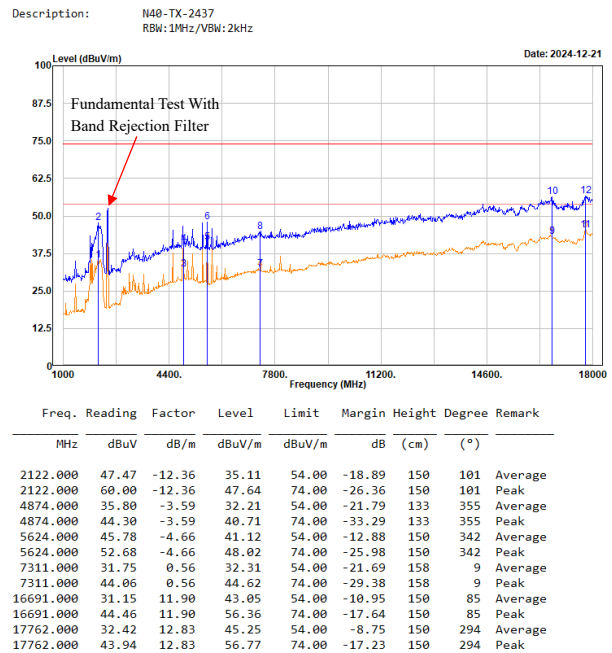


Middle channel

Horizontal

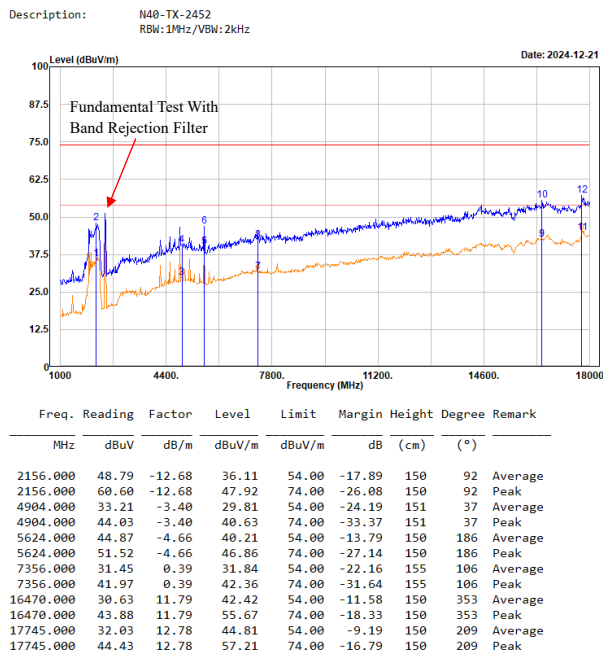


Vertical

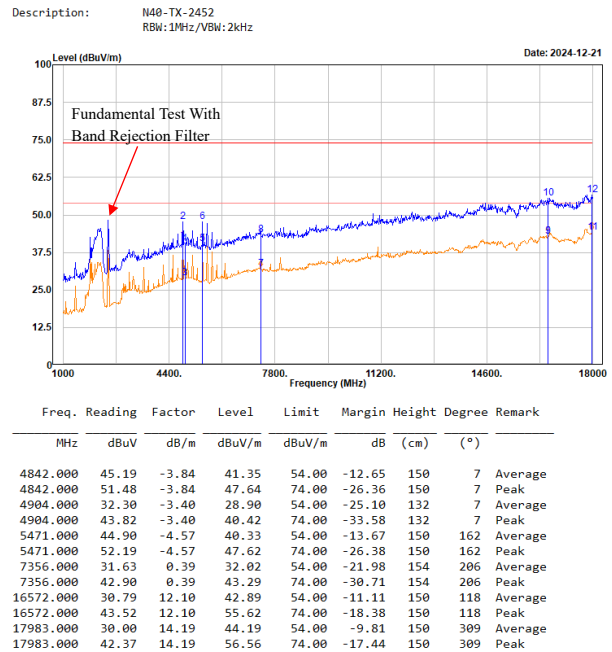


High channel

Horizontal



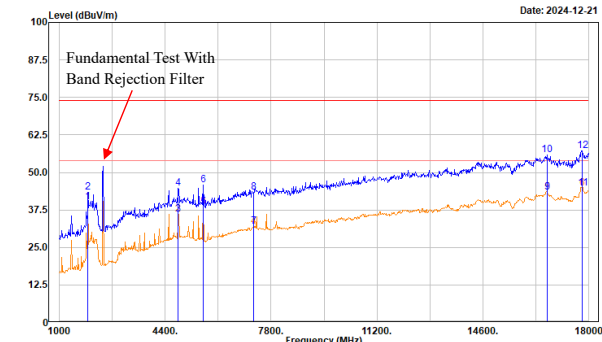
Vertical



(802.11ax HE20 mode)

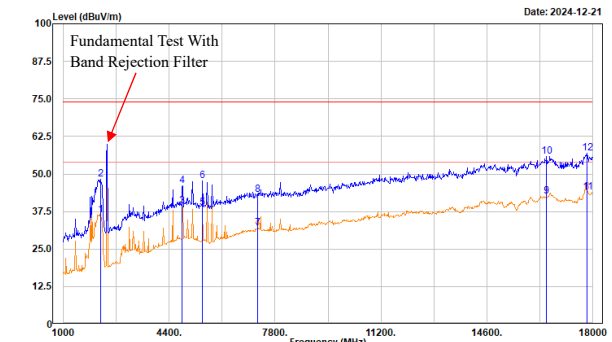
Low channel

Horizontal

Description: AX20-TX-2412
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1918.000	52.82	-12.68	40.14	54.00	-13.86	150	28	Average
1918.000	56.13	-12.68	43.45	74.00	-30.55	150	28	Peak
4824.000	39.89	-3.96	35.93	54.00	-18.07	142	78	Average
4824.000	48.56	-3.96	44.60	74.00	-29.40	142	78	Peak
5624.000	43.20	-4.66	38.54	54.00	-15.46	150	174	Average
5624.000	50.53	-4.66	45.87	74.00	-28.13	150	174	Peak
7236.000	31.37	0.55	31.92	54.00	-22.08	153	5	Average
7236.000	42.68	0.55	43.23	74.00	-30.77	153	5	Peak
16657.000	31.33	11.99	43.32	54.00	-10.68	150	209	Average
16657.000	43.73	11.99	55.72	74.00	-18.28	150	209	Peak
17796.000	31.88	12.88	44.76	54.00	-9.24	150	256	Average
17796.000	44.32	12.88	57.20	74.00	-16.80	150	256	Peak

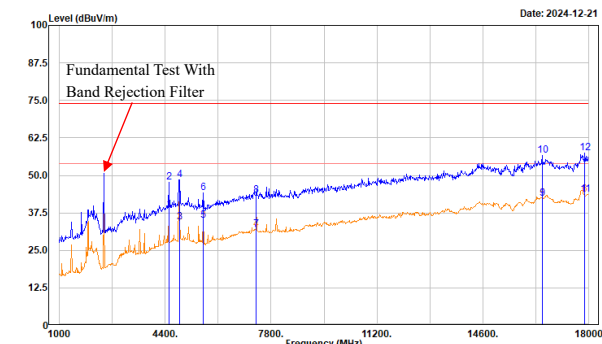
Vertical

Description: AX20-TX-2412
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2207.000	48.72	-12.36	36.36	54.00	-17.64	150	89	Average
2207.000	60.70	-12.36	48.34	74.00	-25.66	150	89	Peak
4824.000	43.12	-3.96	39.16	54.00	-14.84	140	360	Average
4824.000	49.94	-3.96	45.98	74.00	-28.02	140	360	Peak
5471.000	43.41	-4.57	38.84	54.00	-15.16	150	153	Average
5471.000	52.26	-4.57	47.69	74.00	-26.31	150	153	Peak
7236.000	31.39	0.55	31.94	54.00	-22.06	157	9	Average
7236.000	42.64	0.55	43.19	74.00	-30.81	157	9	Peak
16521.000	30.43	12.05	42.48	54.00	-11.52	150	153	Average
16521.000	43.83	12.05	55.88	74.00	-18.12	150	153	Peak
17830.000	30.82	13.06	43.88	54.00	-10.12	150	287	Average
17830.000	43.82	13.06	56.88	74.00	-17.12	150	287	Peak

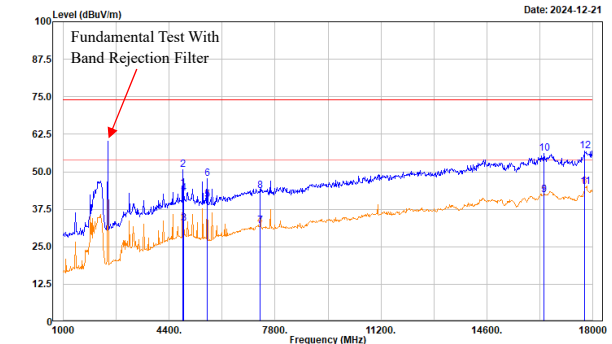
Middle channel

Horizontal

Description: AX20-TX-2437
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4519.000	43.13	-4.69	38.44	54.00	-15.56	150	89	Average
4519.000	52.29	-4.69	47.60	74.00	-26.40	150	89	Peak
4874.000	38.09	-3.59	34.50	54.00	-19.50	102	89	Average
4874.000	52.16	-3.59	48.57	74.00	-25.43	102	89	Peak
5624.000	39.50	-4.66	34.84	54.00	-19.16	150	163	Average
5624.000	48.81	-4.66	44.15	74.00	-29.85	150	163	Peak
7311.000	31.48	0.56	32.04	54.00	-21.96	153	62	Average
7311.000	42.82	0.56	43.38	74.00	-30.62	153	62	Peak
16504.000	30.26	12.04	42.30	54.00	-11.70	150	308	Average
16504.000	44.49	12.04	56.53	74.00	-17.47	150	308	Peak
17881.000	30.21	13.36	43.57	54.00	-10.43	150	226	Average
17881.000	43.98	13.36	57.34	74.00	-16.66	150	226	Peak

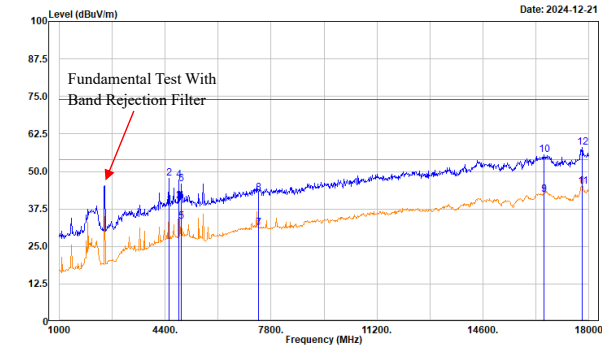
Vertical

Description: AX20-TX-2437
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4842.000	48.16	-3.84	44.32	54.00	-9.68	150	28	Average
4842.000	54.45	-3.84	50.61	74.00	-23.39	150	28	Peak
4874.000	36.50	-3.59	32.91	54.00	-21.09	154	7	Average
4874.000	46.37	-3.59	42.78	74.00	-31.22	154	7	Peak
5624.000	45.33	-4.66	40.67	54.00	-13.33	150	116	Average
5624.000	52.44	-4.66	47.78	74.00	-26.22	150	116	Peak
7311.000	31.51	0.56	32.07	54.00	-21.93	154	332	Average
7311.000	43.08	0.56	43.64	74.00	-30.36	154	332	Peak
16436.000	30.64	11.53	42.17	54.00	-11.83	150	309	Average
16436.000	44.50	11.53	56.03	74.00	-17.97	150	309	Peak
17745.000	32.28	12.78	45.06	54.00	-8.94	150	285	Average
17745.000	44.19	12.78	56.97	74.00	-17.03	150	285	Peak

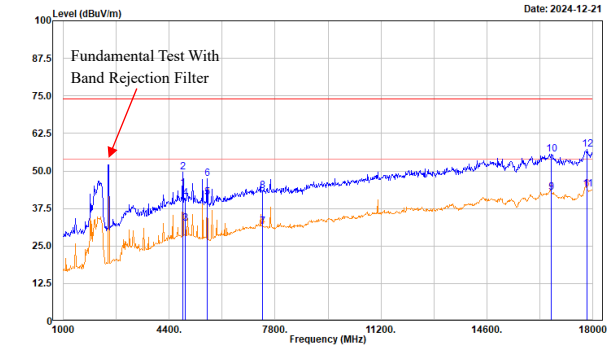
High channel

Horizontal

Description: AX20-TX-2462
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4519.000	43.50	-4.69	38.81	54.00	-15.19	150	285	Average
4519.000	52.50	-4.69	47.81	74.00	-26.19	150	285	Peak
4842.000	44.07	-3.84	40.23	54.00	-13.77	150	42	Average
4842.000	50.97	-3.84	47.13	74.00	-26.87	150	42	Peak
4924.000	36.85	-3.51	33.34	54.00	-20.66	107	95	Average
4924.000	49.43	-3.51	45.92	74.00	-28.08	107	95	Peak
7386.000	31.08	0.22	31.30	54.00	-22.70	156	221	Average
7386.000	42.65	0.22	42.87	74.00	-31.13	156	221	Peak
16555.000	30.21	12.09	42.30	54.00	-11.70	150	309	Average
16555.000	43.57	12.09	55.66	74.00	-18.34	150	309	Peak
17796.000	32.08	12.88	44.96	54.00	-9.04	150	42	Average
17796.000	45.11	12.88	57.99	74.00	-16.01	150	42	Peak

Vertical

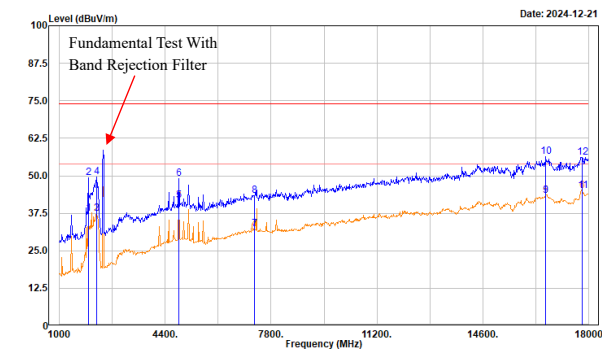
Description: AX20-TX-2462
RBW: 1MHz/VBW: 1kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4842.000	48.14	-3.84	44.30	54.00	-9.70	150	7	Average
4842.000	53.48	-3.84	49.64	74.00	-24.36	150	7	Peak
4924.000	36.13	-3.51	32.62	54.00	-21.38	133	7	Average
4924.000	44.33	-3.51	40.82	74.00	-33.18	133	7	Peak
5624.000	45.94	-4.66	41.28	54.00	-12.72	150	115	Average
5624.000	52.05	-4.66	47.39	74.00	-26.61	150	115	Peak
7386.000	31.23	0.22	31.45	54.00	-22.55	151	208	Average
7386.000	43.25	0.22	43.47	74.00	-30.53	151	208	Peak
16674.000	30.97	11.95	42.92	54.00	-11.08	150	82	Average
16674.000	43.72	11.95	55.67	74.00	-18.33	150	82	Peak
17830.000	30.97	13.06	44.03	54.00	-9.97	150	261	Average
17830.000	44.02	13.06	57.08	74.00	-16.92	150	261	Peak

(802.11ax HE40 mode)

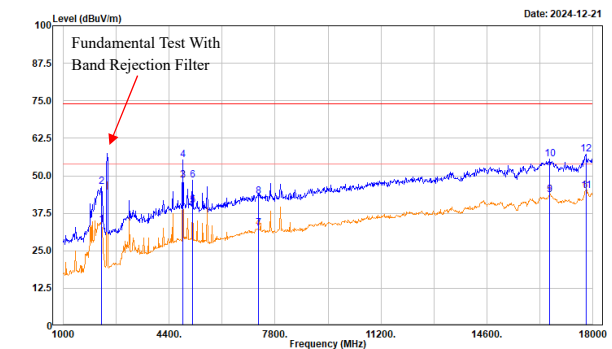
Low channel

Horizontal

Description: AX40-TX-2422
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1935.000	49.88	-12.36	37.52	54.00	-16.48	150	96	Average
1935.000	61.73	-12.36	49.37	74.00	-24.63	150	96	Peak
2207.000	49.82	-12.36	37.46	54.00	-16.54	150	135	Average
2207.000	61.92	-12.36	49.56	74.00	-24.44	150	135	Peak
4844.000	45.43	-3.83	41.60	54.00	-12.40	169	338	Average
4844.000	52.82	-3.83	48.99	74.00	-25.01	169	338	Peak
7266.000	31.60	0.60	32.20	54.00	-21.80	143	285	Average
7266.000	42.71	0.60	43.31	74.00	-30.69	143	285	Peak
16623.000	31.32	12.07	43.39	54.00	-10.61	150	110	Average
16623.000	44.27	12.07	56.34	74.00	-17.66	150	110	Peak
17796.000	32.19	12.88	45.07	54.00	-8.93	150	286	Average
17796.000	43.34	12.88	56.22	74.00	-17.78	150	286	Peak

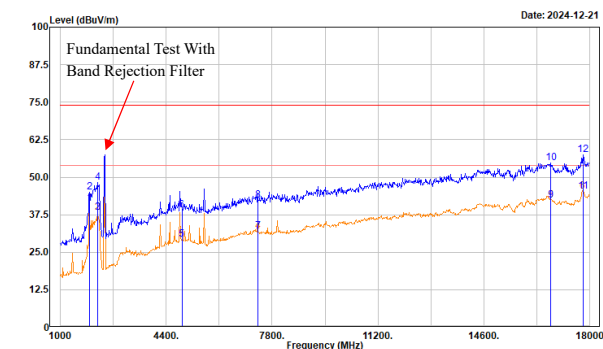
Vertical

Description: AX40-TX-2422
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2224.000	45.96	-12.29	33.67	54.00	-20.33	150	16	Average
2224.000	58.73	-12.29	46.44	74.00	-27.56	150	16	Peak
4844.000	52.46	-3.83	48.63	54.00	-5.37	173	16	Average
4844.000	59.09	-3.83	55.26	74.00	-18.74	173	16	Peak
5148.000	43.63	-3.62	40.01	54.00	-13.99	150	230	Average
5148.000	52.24	-3.62	48.62	74.00	-25.38	150	230	Peak
7266.000	31.80	0.60	32.40	54.00	-21.60	152	203	Average
7266.000	42.58	0.60	43.18	74.00	-30.82	152	203	Peak
16623.000	31.68	12.07	43.75	54.00	-10.25	150	158	Average
16623.000	43.46	12.07	55.53	74.00	-18.47	150	158	Peak
17779.000	32.20	12.85	45.05	54.00	-8.95	150	193	Average
17779.000	44.34	12.85	57.19	74.00	-16.81	150	193	Peak

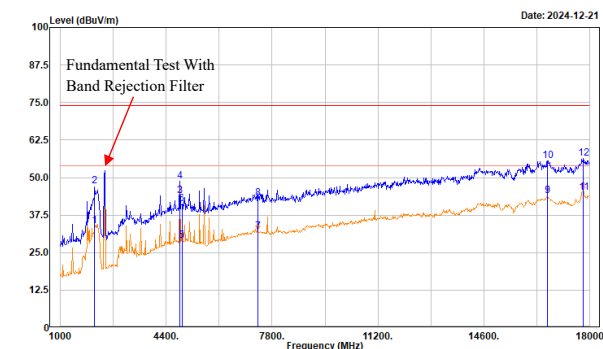
Middle channel

Horizontal

Description: AX40-TX-2437
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
1935.000	53.54	-12.36	41.18	54.00	-12.82	150	289	Average
1935.000	57.47	-12.36	45.11	74.00	-28.89	150	289	Peak
2190.000	50.73	-12.45	38.28	54.00	-15.72	150	110	Average
2190.000	60.60	-12.45	48.15	74.00	-25.85	150	110	Peak
4904.000	32.59	-3.40	29.19	54.00	-24.81	156	306	Average
4904.000	42.44	-3.40	39.04	74.00	-34.96	156	306	Peak
7356.000	31.59	0.39	31.98	54.00	-22.02	159	306	Average
7356.000	41.81	0.39	42.20	74.00	-31.80	159	306	Peak
16742.000	30.63	11.76	42.39	54.00	-11.61	150	311	Average
16742.000	42.98	11.76	54.74	74.00	-19.26	150	311	Peak
17779.000	32.28	12.85	45.13	54.00	-8.87	150	19	Average
17779.000	44.48	12.85	57.33	74.00	-16.67	150	19	Peak

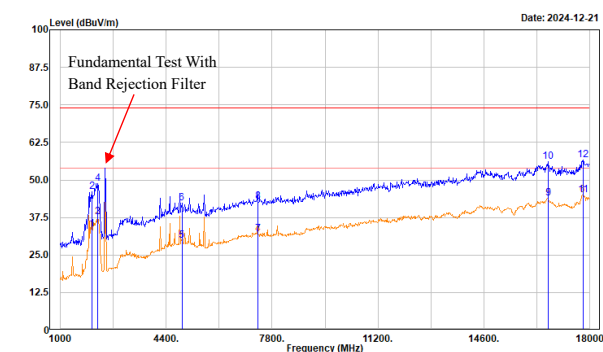
Vertical

Description: AX40-TX-2437
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2105.000	45.91	-12.13	33.78	54.00	-20.22	150	316	Average
2105.000	59.15	-12.13	47.02	74.00	-26.98	150	316	Peak
4842.000	47.64	-3.84	43.80	54.00	-10.20	150	82	Average
4842.000	52.75	-3.84	48.91	74.00	-25.09	150	82	Peak
4904.000	32.43	-3.40	29.03	54.00	-24.97	154	6	Average
4904.000	44.54	-3.40	41.14	74.00	-32.86	154	6	Peak
7356.000	31.67	0.39	32.06	54.00	-21.94	149	208	Average
7356.000	42.62	0.39	43.01	74.00	-30.99	149	208	Peak
16640.000	31.99	12.04	44.03	54.00	-9.97	150	316	Average
16640.000	43.53	12.04	55.57	74.00	-18.43	150	316	Peak
17796.000	32.10	12.88	44.98	54.00	-9.02	150	225	Average
17796.000	43.47	12.88	56.35	74.00	-17.65	150	225	Peak

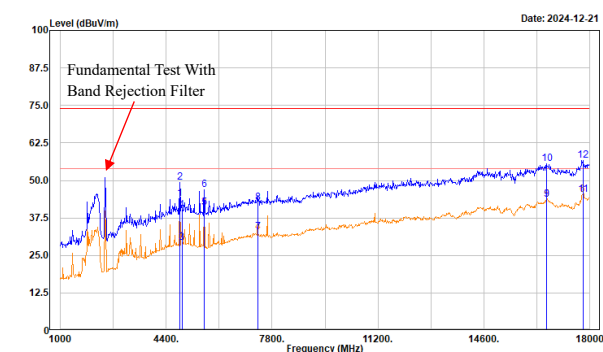
High channel

Horizontal

Description: AX40-TX-2452
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
2020.000	45.27	-11.64	33.63	54.00	-20.37	150	193	Average
2020.000	57.78	-11.64	46.14	74.00	-27.86	150	193	Peak
2207.000	50.15	-12.36	37.79	54.00	-16.21	150	266	Average
2207.000	61.06	-12.36	48.70	74.00	-25.30	150	266	Peak
4904.000	33.08	-3.40	29.68	54.00	-24.32	157	63	Average
4904.000	45.68	-3.40	42.28	74.00	-31.72	157	63	Peak
7356.000	31.64	0.39	32.03	54.00	-21.97	154	208	Average
7356.000	42.48	0.39	42.87	74.00	-31.13	154	208	Peak
16657.000	31.88	11.99	43.87	54.00	-10.13	150	317	Average
16657.000	44.03	11.99	56.02	74.00	-17.98	150	317	Peak
17779.000	32.25	12.85	45.10	54.00	-8.90	150	118	Average
17779.000	43.69	12.85	56.54	74.00	-17.46	150	118	Peak

Vertical

Description: AX40-TX-2452
RBW: 1MHz/VBW: 2kHz

Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4842.000	47.63	-3.84	43.79	54.00	-10.21	150	86	Average
4842.000	53.18	-3.84	49.34	74.00	-24.66	150	86	Peak
4904.000	32.59	-3.40	29.19	54.00	-24.81	151	7	Average
4904.000	43.52	-3.40	40.12	74.00	-33.88	151	7	Peak
5624.000	45.50	-4.66	40.84	54.00	-13.16	150	135	Average
5624.000	51.44	-4.66	46.78	74.00	-27.22	150	135	Peak
7356.000	32.32	0.39	32.71	54.00	-21.29	154	135	Average
7356.000	42.25	0.39	42.64	74.00	-31.36	154	135	Peak
16606.000	31.38	12.12	43.50	54.00	-10.50	150	291	Average
16606.000	43.51	12.12	55.63	74.00	-18.37	150	291	Peak
17779.000	32.34	12.85	45.19	54.00	-8.81	150	228	Average
17779.000	43.83	12.85	56.68	74.00	-17.32	150	228	Peak

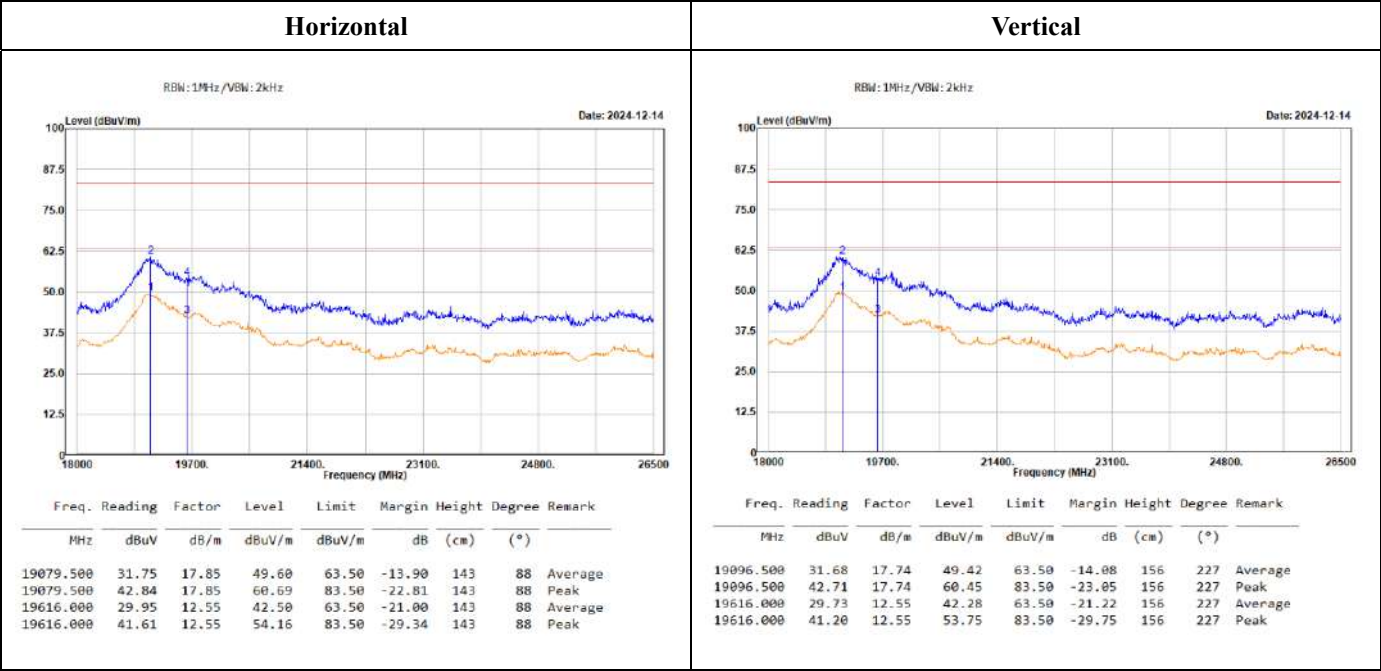
Level = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

18GHz-26.5GHz:

(worst case is 802.11n HT40 Mode, High channel)



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 meter:

Conversion factor = $20 \log(1\text{m}/3\text{m}) = 9.5 \text{ dB}$.

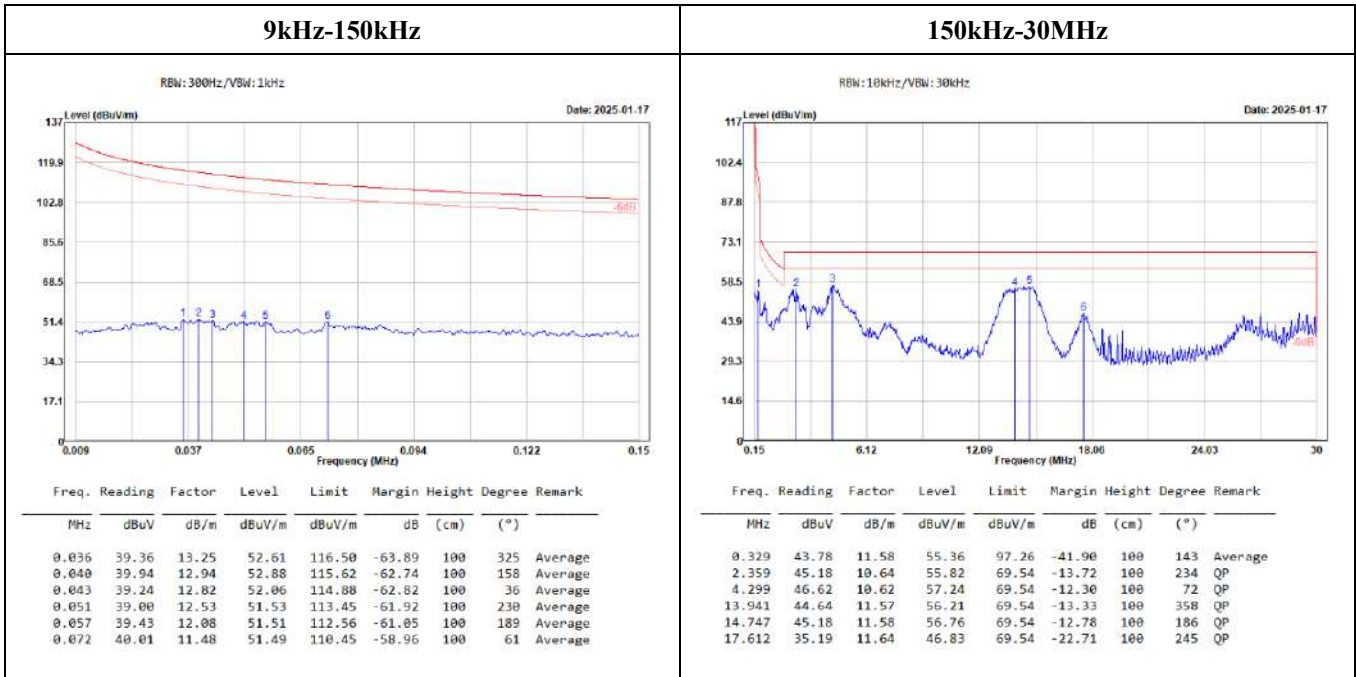
Average Limit = $54 + 9.5 = 63.50 \text{ dBuV/m@1m}$, Peak Limit = $63.50 + 20 = 83.50 \text{ dBuV/m@1m}$

BLE

9kHz-30MHz:

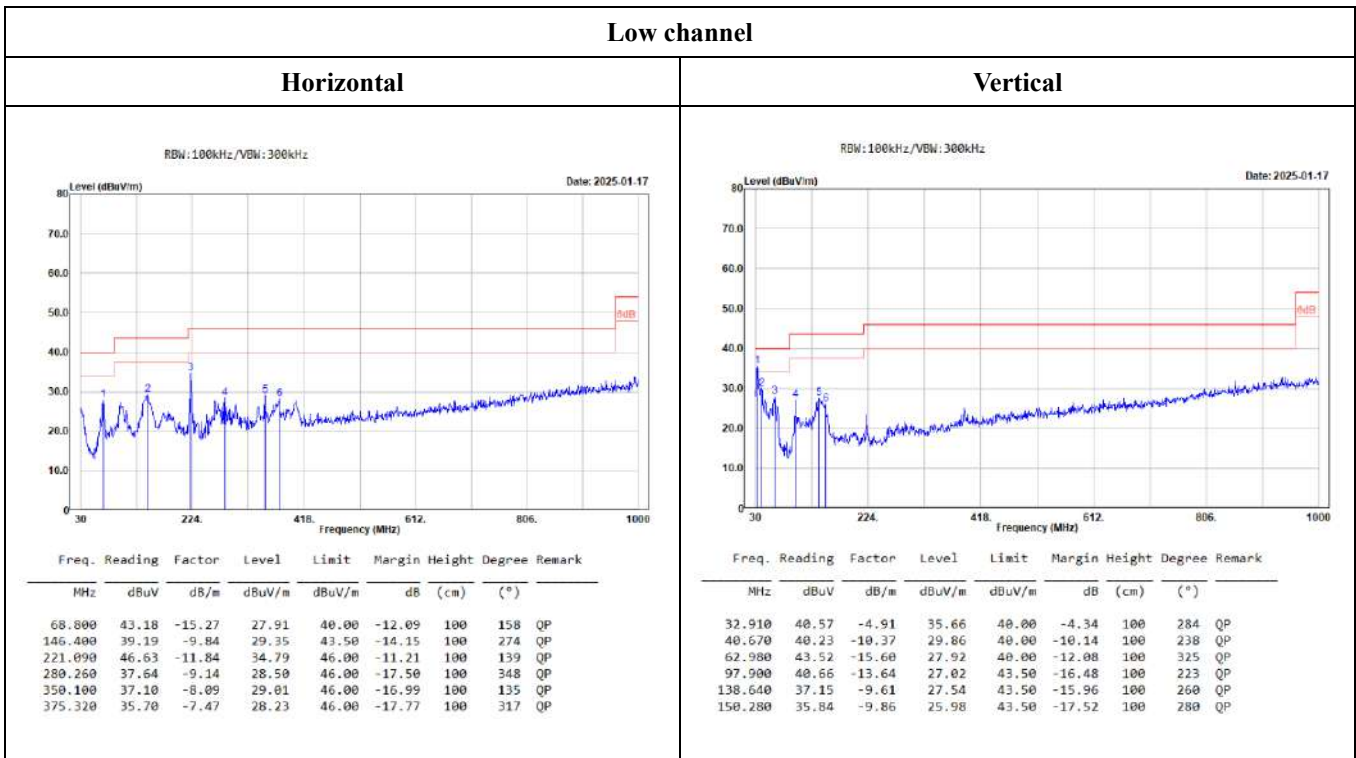
(Worst case is BLE 1M mode, low channel)

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



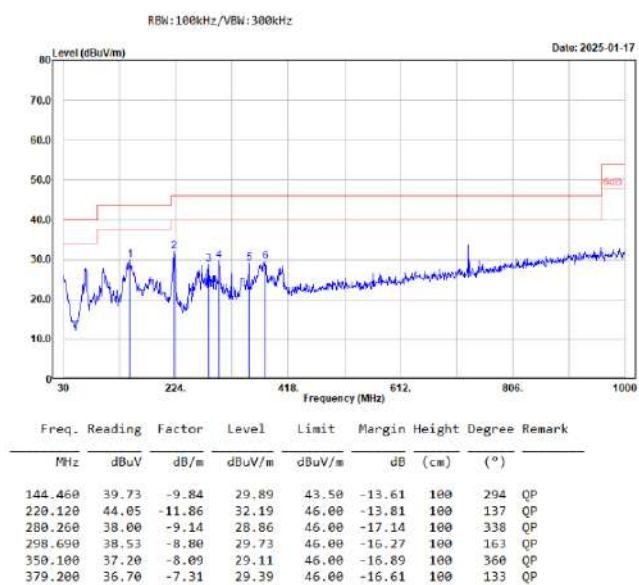
30MHz-1GHz:

(Worst case is BLE 1M mode)

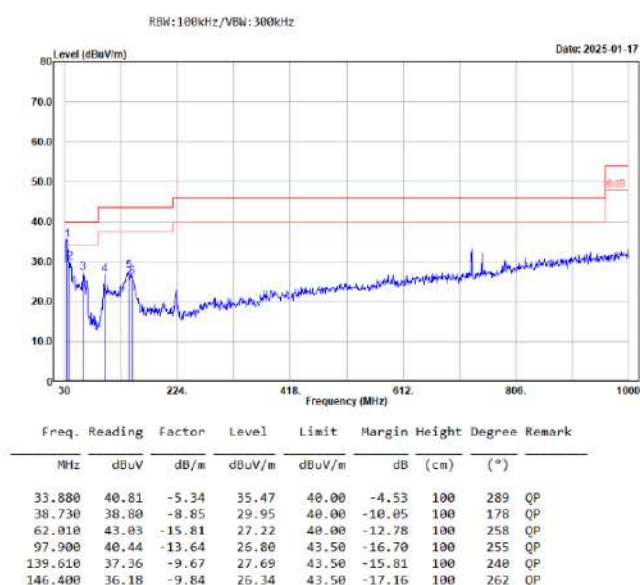


Middle channel

Horizontal

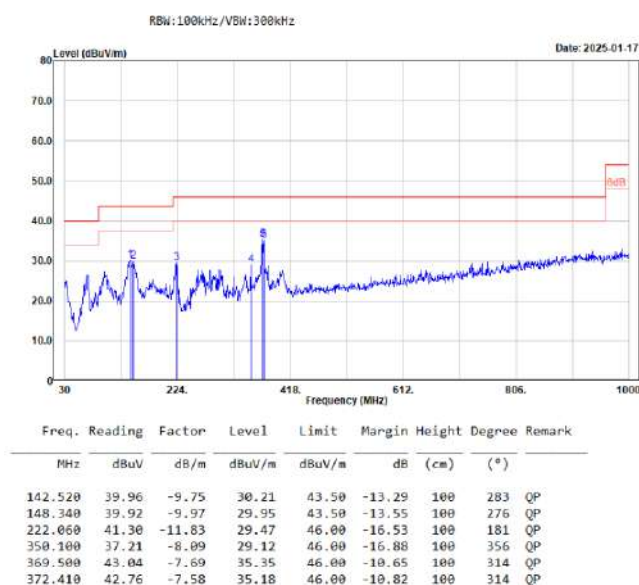


Vertical

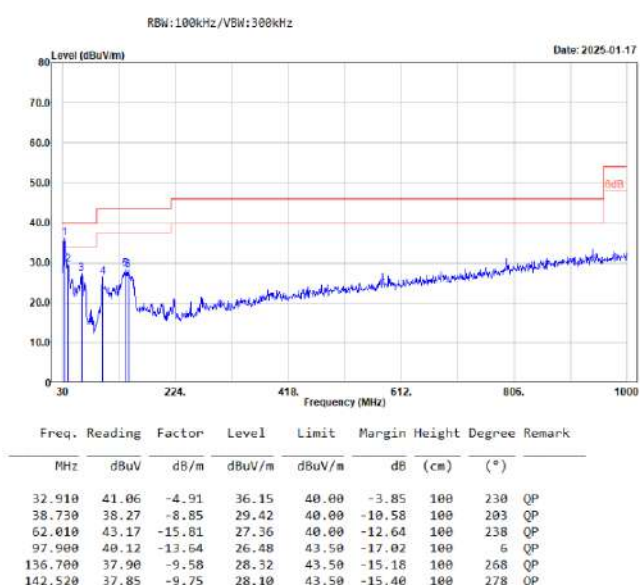


High channel

Horizontal



Vertical



Level = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

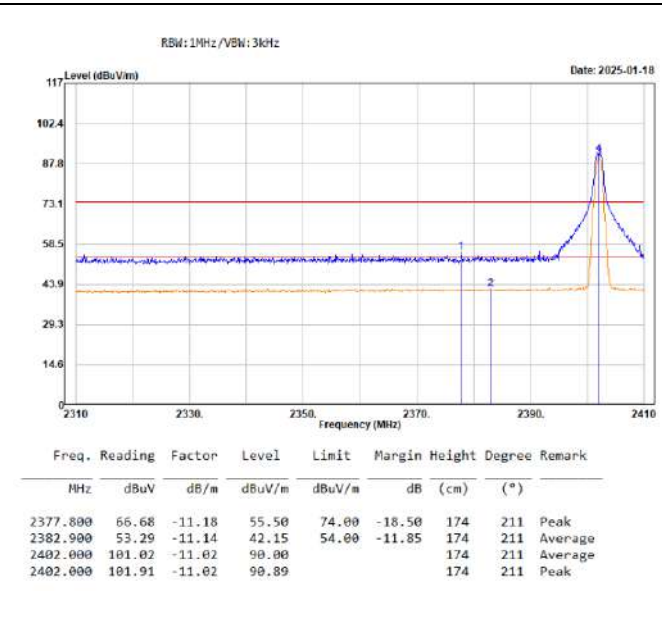
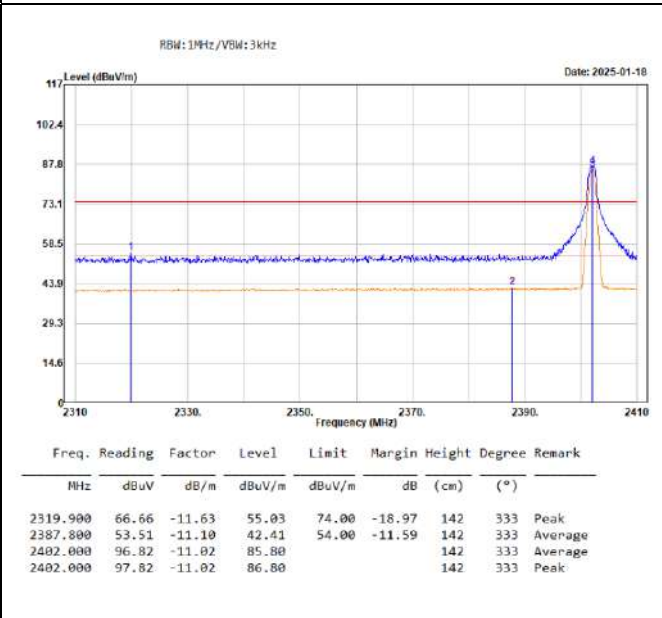
Band-Edge:

BLE 1M Mode

Low channel

Horizontal

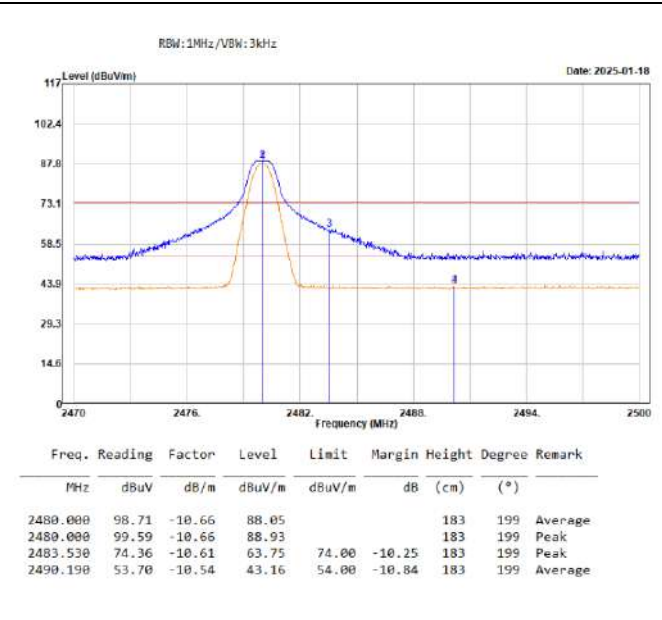
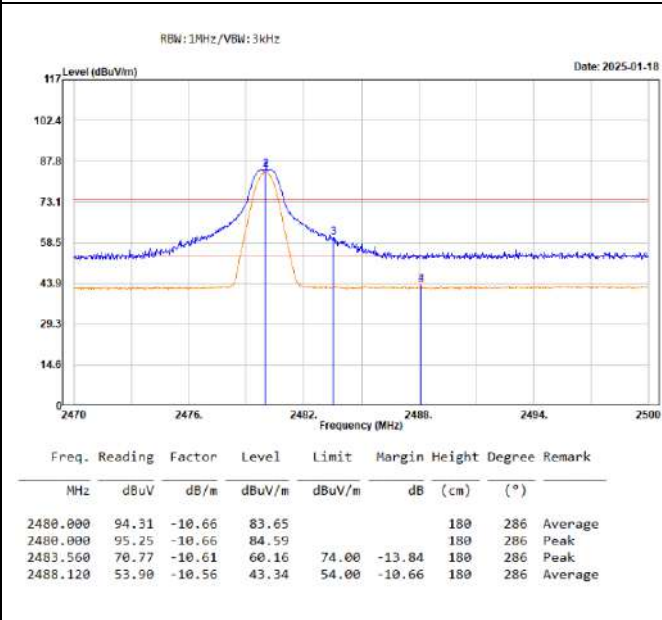
Vertical



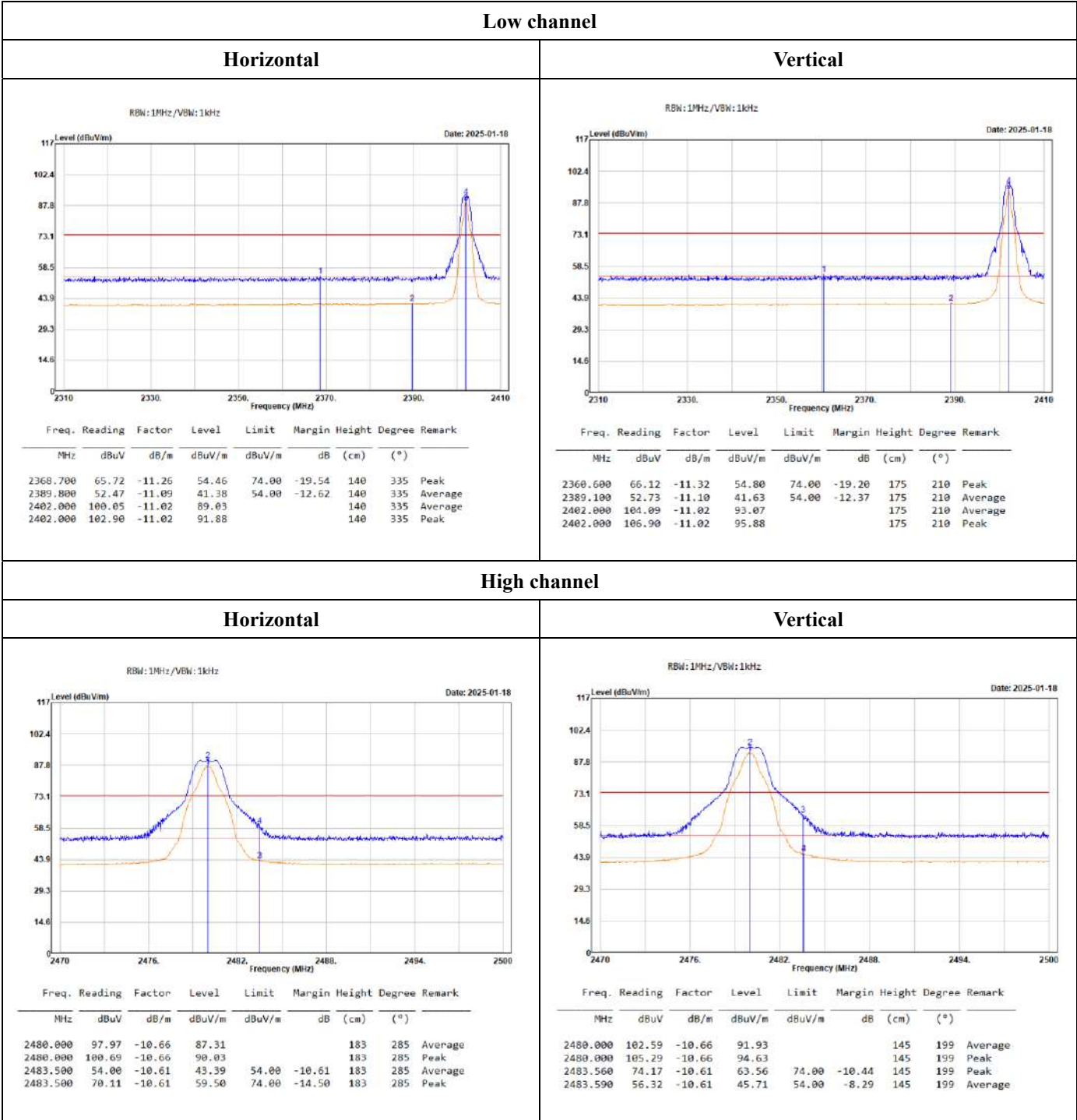
High channel

Horizontal

Vertical



BLE 2M Mode

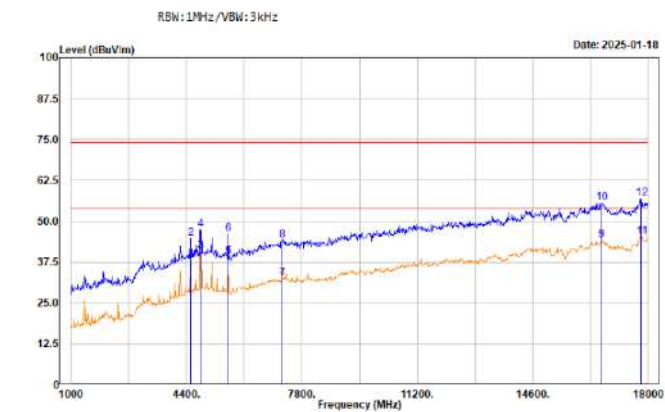


1GHz-18GHz:

(BLE 1M mode)

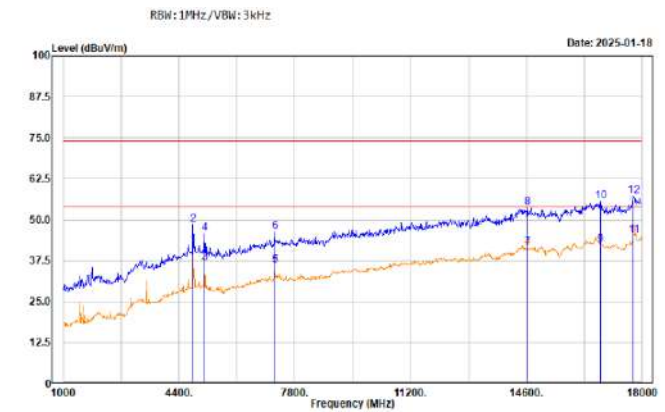
Low channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4519.000	43.00	-4.69	38.31	54.00	-15.69	150	322	Average
4519.000	49.44	-4.69	44.75	74.00	-29.25	150	322	Peak
4804.000	44.99	-4.09	40.90	54.00	-13.10	176	31	Average
4804.000	51.54	-4.09	47.45	74.00	-26.55	176	31	Peak
5624.000	43.74	-4.66	39.08	54.00	-14.92	150	164	Average
5624.000	50.65	-4.66	45.99	74.00	-28.01	150	164	Peak
7206.000	32.15	0.43	32.58	54.00	-21.42	155	134	Average
7206.000	43.73	0.43	44.16	74.00	-29.84	155	134	Peak
16623.000	32.19	12.07	44.26	54.00	-9.74	150	83	Average
16623.000	43.43	12.07	55.50	74.00	-18.50	150	83	Peak
17796.000	32.51	12.88	45.39	54.00	-8.61	150	109	Average
17796.000	44.16	12.88	56.98	74.00	-17.02	150	109	Peak

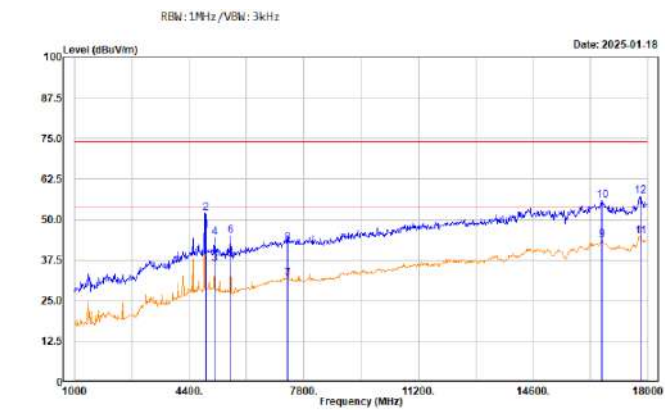
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4804.000	46.43	-4.09	42.34	54.00	-11.66	133	259	Average
4804.000	52.55	-4.09	48.46	74.00	-25.54	133	259	Peak
5148.000	40.55	-3.62	36.93	54.00	-17.07	150	209	Average
5148.000	49.38	-3.62	45.76	74.00	-28.24	150	209	Peak
7206.000	35.74	0.43	36.17	54.00	-17.83	158	106	Average
7206.000	45.85	0.43	46.28	74.00	-27.72	158	106	Peak
14634.000	30.00	11.43	41.43	54.00	-12.57	150	77	Average
14634.000	42.30	11.43	53.73	74.00	-20.27	150	77	Peak
16776.000	30.73	11.66	42.39	54.00	-11.61	150	335	Average
16776.000	43.98	11.66	55.64	74.00	-18.36	150	335	Peak
17745.000	32.42	12.78	45.20	54.00	-8.80	150	168	Average
17745.000	44.42	12.78	57.20	74.00	-16.80	150	168	Peak

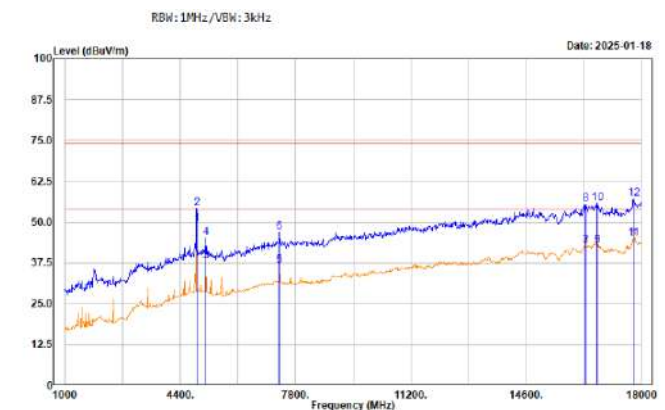
Middle channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4880.000	50.28	-3.54	46.74	54.00	-7.26	168	31	Average
4880.000	55.45	-3.54	51.91	74.00	-22.09	168	31	Peak
5148.000	39.96	-3.62	36.34	54.00	-17.66	150	285	Average
5148.000	48.11	-3.62	44.49	74.00	-29.51	150	285	Peak
5624.000	42.41	-4.66	37.75	54.00	-16.25	150	0	Average
5624.000	49.63	-4.66	44.97	74.00	-29.03	150	0	Peak
7320.000	31.11	0.53	31.64	54.00	-22.36	157	285	Average
7320.000	42.27	0.53	42.80	74.00	-31.20	157	285	Peak
16640.000	31.55	12.04	43.59	54.00	-10.41	150	109	Average
16640.000	43.81	12.04	55.85	74.00	-18.15	150	109	Peak
17779.000	31.87	12.85	44.72	54.00	-9.28	150	312	Average
17779.000	44.41	12.85	57.26	74.00	-16.74	150	312	Peak

Vertical

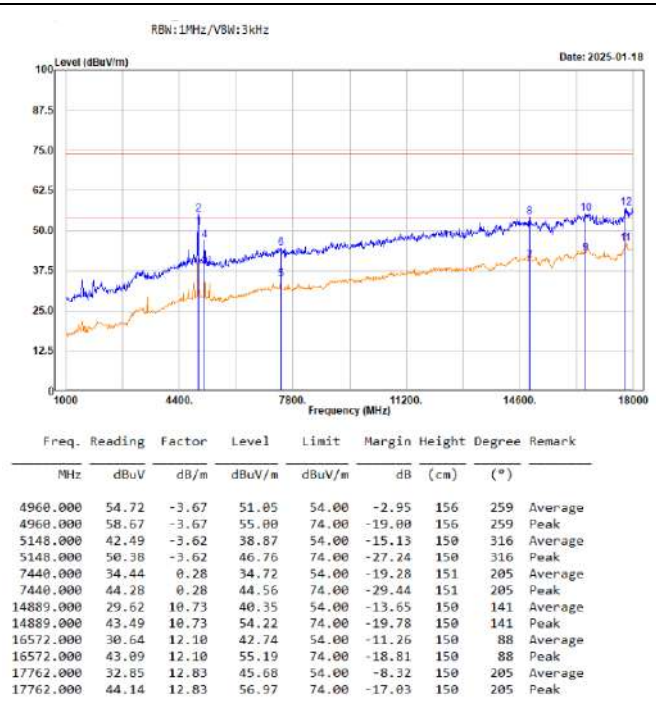
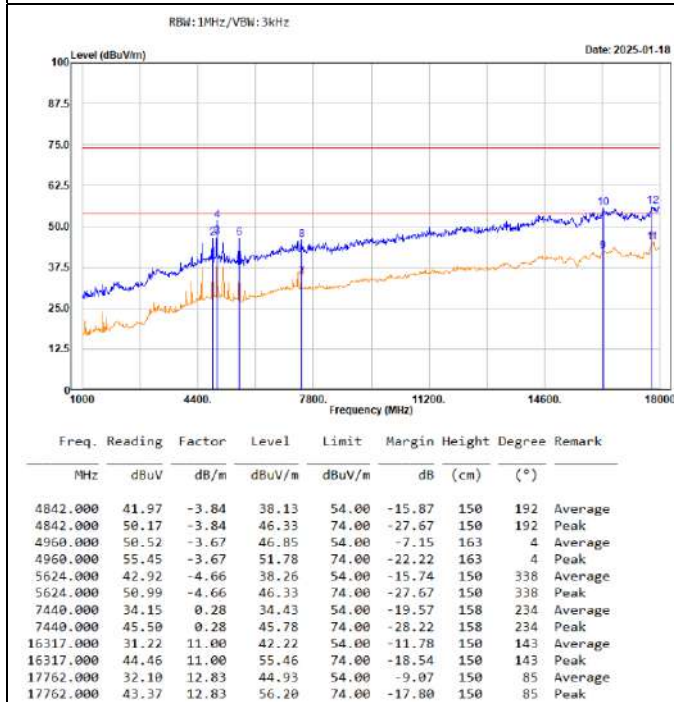


Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4880.000	52.77	-3.54	49.23	54.00	-4.77	177	259	Average
4880.000	57.70	-3.54	54.16	74.00	-19.84	177	259	Peak
5148.000	41.47	-3.62	37.85	54.00	-16.15	150	318	Average
5148.000	48.92	-3.62	45.30	74.00	-28.70	150	318	Peak
7320.000	36.13	0.53	36.66	54.00	-17.34	143	143	Average
7320.000	46.40	0.53	46.93	74.00	-27.07	143	143	Peak
16351.000	31.33	11.10	42.43	54.00	-11.57	150	202	Average
16351.000	44.48	11.10	55.58	74.00	-18.42	150	202	Peak
16691.000	30.91	11.90	42.81	54.00	-11.19	150	49	Average
16691.000	44.03	11.90	55.93	74.00	-18.07	150	49	Peak
17762.000	32.24	12.83	45.07	54.00	-8.93	150	182	Average
17762.000	44.38	12.83	57.21	74.00	-16.79	150	182	Peak

High channel

Horizontal

Vertical

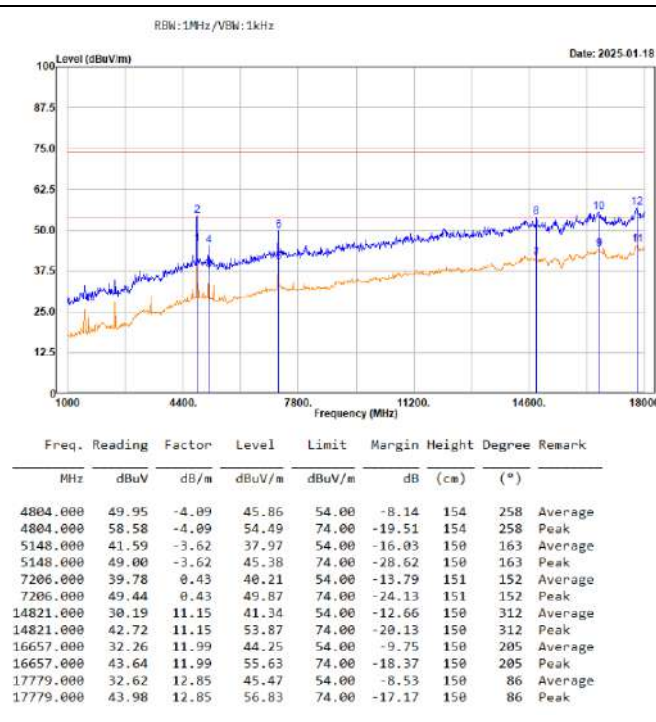
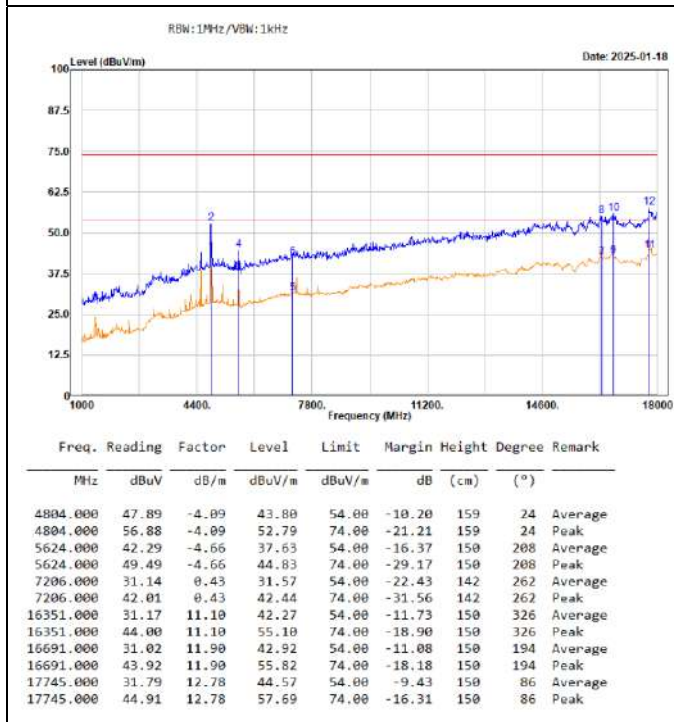


(BLE 2M mode)

Low channel

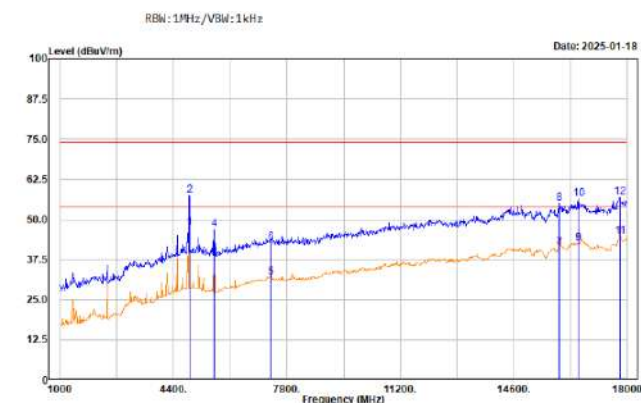
Horizontal

Vertical



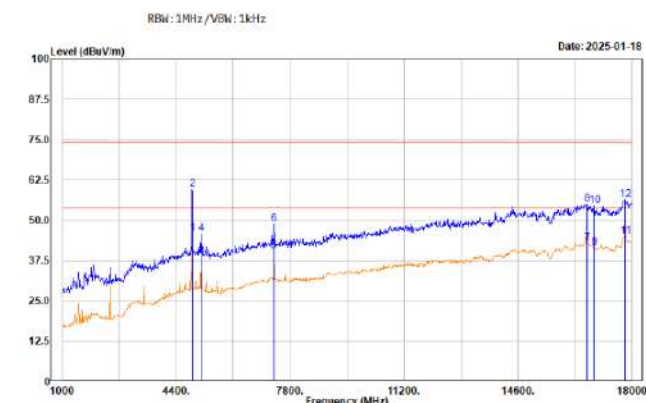
Middle channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4880.000	51.07	-3.54	47.53	54.00	-6.47	153	21	Average
4880.000	60.86	-3.54	57.32	74.00	-16.68	153	21	Peak
5624.000	42.86	-4.66	38.20	54.00	-15.80	150	128	Average
5624.000	51.43	-4.66	46.77	74.00	-27.23	150	128	Peak
7320.000	31.33	0.53	31.86	54.00	-22.14	159	325	Average
7320.000	42.20	0.53	42.73	74.00	-31.27	159	325	Peak
15960.000	31.22	10.04	41.26	54.00	-12.74	150	106	Average
15960.000	44.94	10.04	54.98	74.00	-19.02	150	106	Peak
16538.000	30.45	12.07	42.52	54.00	-11.48	150	228	Average
16538.000	44.31	12.07	56.38	74.00	-17.62	150	228	Peak
17779.000	31.94	12.85	44.79	54.00	-9.21	150	21	Average
17779.000	44.13	12.85	56.98	74.00	-17.02	150	21	Peak

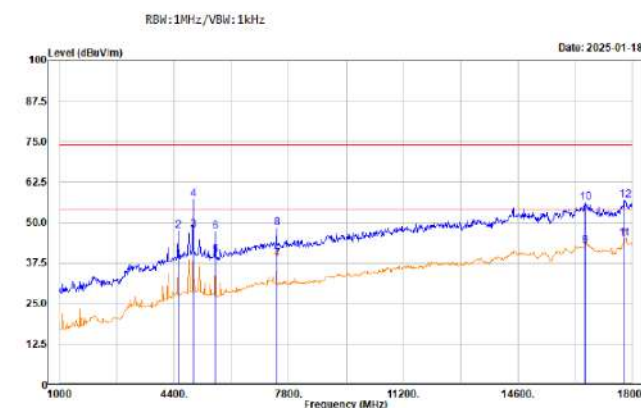
Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4880.000	49.37	-3.54	45.83	54.00	-8.17	163	261	Average
4880.000	63.17	-3.54	59.63	74.00	-14.37	163	261	Peak
5148.000	42.46	-3.62	38.84	54.00	-15.16	150	141	Average
5148.000	49.50	-3.62	45.88	74.00	-28.12	150	141	Peak
7320.000	39.80	0.53	40.33	54.00	-13.67	154	326	Average
7320.000	48.33	0.53	48.86	74.00	-25.14	154	326	Peak
16674.000	30.91	11.95	42.86	54.00	-11.14	150	228	Average
16674.000	42.99	11.95	54.94	74.00	-19.06	150	228	Peak
16878.000	29.82	11.53	41.35	54.00	-12.65	150	261	Average
16878.000	43.02	11.53	54.55	74.00	-19.45	150	261	Peak
17796.000	32.18	12.88	45.06	54.00	-8.94	150	152	Average
17796.000	43.43	12.88	56.31	74.00	-17.69	150	152	Peak

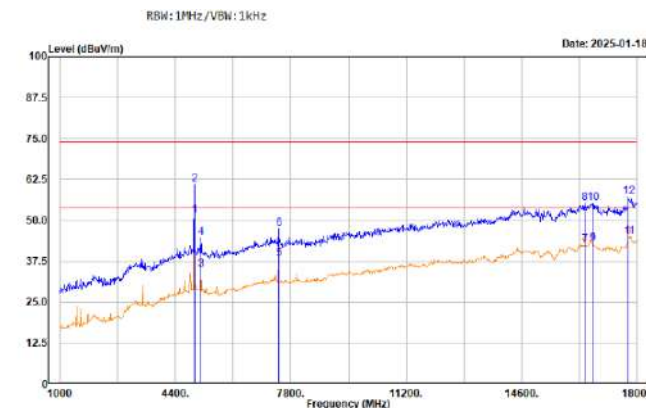
High channel

Horizontal



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4519.000	43.09	-4.69	38.40	54.00	-15.60	150	137	Average
4519.000	51.99	-4.69	47.30	74.00	-26.70	150	137	Peak
4960.000	51.35	-3.67	47.68	54.00	-6.32	159	5	Average
4960.000	60.81	-3.67	57.14	74.00	-16.86	159	5	Peak
5624.000	44.44	-4.66	39.78	54.00	-14.22	150	311	Average
5624.000	51.78	-4.66	47.12	74.00	-26.88	150	311	Peak
7440.000	38.44	0.28	38.72	54.00	-15.28	153	236	Average
7440.000	47.83	0.28	48.11	74.00	-25.89	153	236	Peak
16589.000	30.73	12.13	42.86	54.00	-11.14	150	137	Average
16589.000	43.97	12.13	56.10	74.00	-17.90	150	137	Peak
17762.000	32.03	12.83	44.86	54.00	-9.14	150	0	Average
17762.000	44.19	12.83	57.02	74.00	-16.98	150	0	Peak

Vertical



Freq.	Reading	Factor	Level	Limit	Margin	Height	Degree	Remark
MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	(cm)	(°)	
4960.000	55.14	-3.67	51.47	54.00	-2.53	133	258	Average
4960.000	64.60	-3.67	60.93	74.00	-13.07	133	258	Peak
5148.000	38.51	-3.62	34.89	54.00	-19.11	150	129	Average
5148.000	48.26	-3.62	44.64	74.00	-29.36	150	129	Peak
7440.000	38.02	0.28	38.30	54.00	-15.70	155	162	Average
7440.000	47.22	0.28	47.50	74.00	-26.50	155	162	Peak
16453.000	30.87	11.66	42.53	54.00	-11.47	150	328	Average
16453.000	43.52	11.66	55.18	74.00	-18.82	150	328	Peak
16691.000	30.87	11.90	42.77	54.00	-11.23	150	160	Average
16691.000	43.37	11.90	55.27	74.00	-18.73	150	160	Peak
17745.000	32.26	12.78	45.04	54.00	-8.96	150	189	Average
17745.000	44.34	12.78	57.12	74.00	-16.88	150	189	Peak

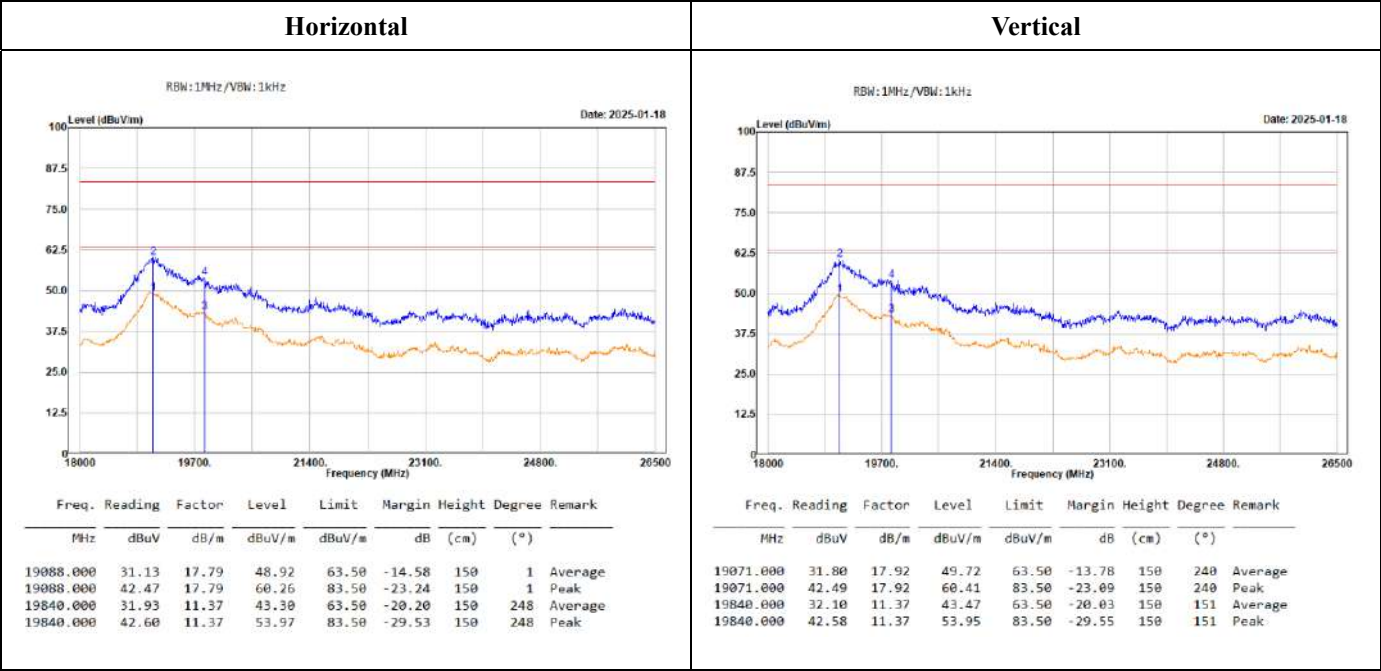
Level = Reading + Factor.

Margin = Level - Limit.

Factor = Antenna Factor + Cable Loss - Amplifier Gain.

18GHz-26.5GHz:

(worst case is BLE 2M Mode, High channel)



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 meter:

Conversion factor = $20 \log (1\text{m}/3\text{m}) = 9.5 \text{ dB}$,

Average Limit = $54+9.5 = 63.50 \text{ dBuV/m@1m}$, Peak Limit = $63.50+20 = 83.50 \text{ dBuV/m@1m}$

Conducted Spurious Emissions:**WIFI**

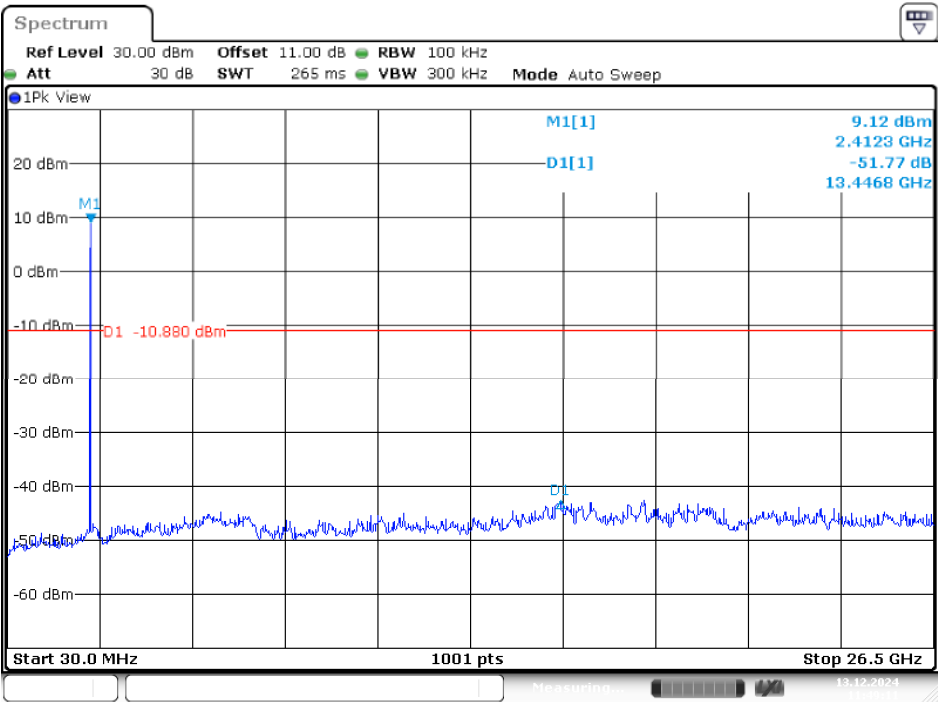
Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)				Limit (dBc)	Result
		Chain 0	Chain 1	Chain 2	Chain 3		
B mode							
Low	2412	51.77	50.96	49.64	48.41	≥ 20	PASS
Mid	2437	50.32	52.52	50.76	50.74	≥ 20	PASS
High	2462	48.70	52.19	48.39	44.09	≥ 20	PASS
G mode							
Low	2412	41.62	42.83	39.74	40.28	≥ 20	PASS
Mid	2437	40.39	43.74	42.48	39.22	≥ 20	PASS
High	2462	42.46	43.47	41.80	40.67	≥ 20	PASS
N20 mode							
Low	2412	41.35	40.36	42.43	40.07	≥ 20	PASS
Mid	2437	41.23	41.78	41.04	33.00	≥ 20	PASS
High	2462	41.72	41.54	37.30	41.57	≥ 20	PASS
N40 mode							
Low	2422	37.64	39.12	39.39	37.60	≥ 20	PASS
Mid	2437	38.92	40.40	39.98	38.88	≥ 20	PASS
High	2452	36.99	39.16	39.55	37.02	≥ 20	PASS
AX20 mode							
Low	2412	41.84	44.40	40.63	41.06	≥ 20	PASS
Mid	2437	41.38	43.72	39.13	39.88	≥ 20	PASS
High	2462	40.43	45.36	41.89	43.77	≥ 20	PASS
AX40 mode							
Low	2422	40.78	41.86	39.09	40.47	≥ 20	PASS
Mid	2437	39.15	42.13	39.18	35.29	≥ 20	PASS
High	2452	37.95	40.58	39.78	41.09	≥ 20	PASS

BLE

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
BLE 1M Mode				
Low	2402	38.04	≥ 20	PASS
Mid	2440	41.16	≥ 20	PASS
High	2480	39.64	≥ 20	PASS
BLE 2M Mode				
Low	2402	40.80	≥ 20	PASS
Mid	2440	36.27	≥ 20	PASS
High	2480	40.09	≥ 20	PASS

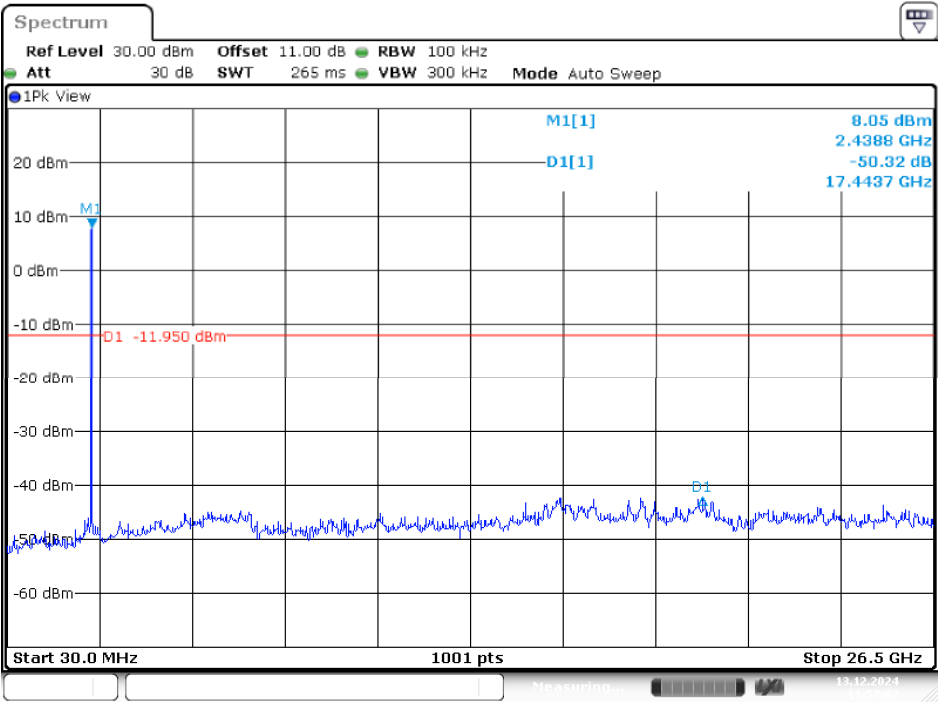
WIFI

Chain 0
B Mode
Low Channel



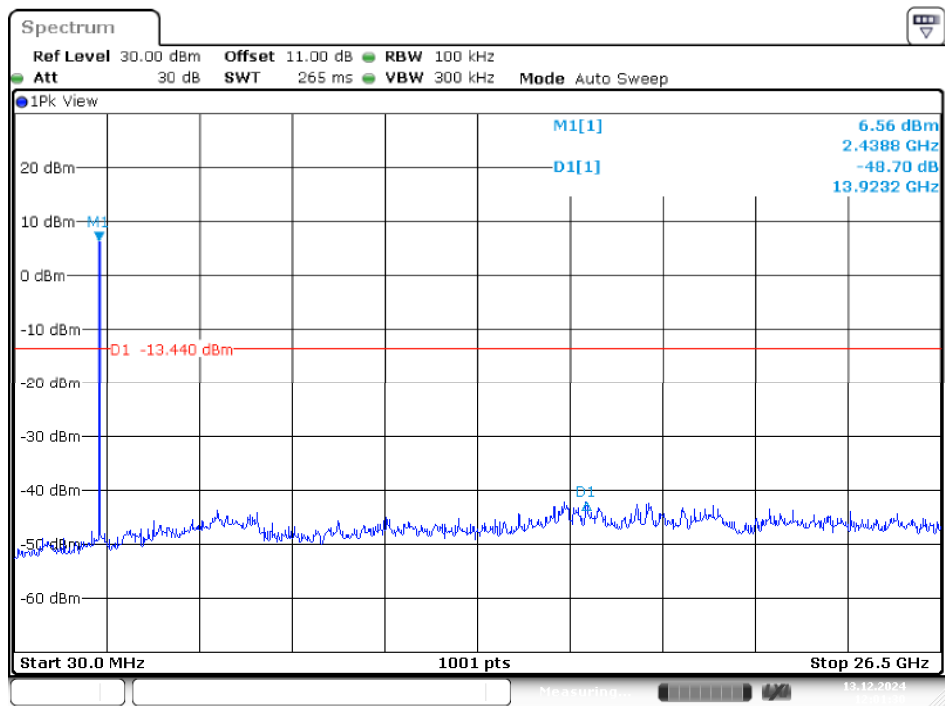
Date: 13.DEC.2024 11:49:11

Middle Channel



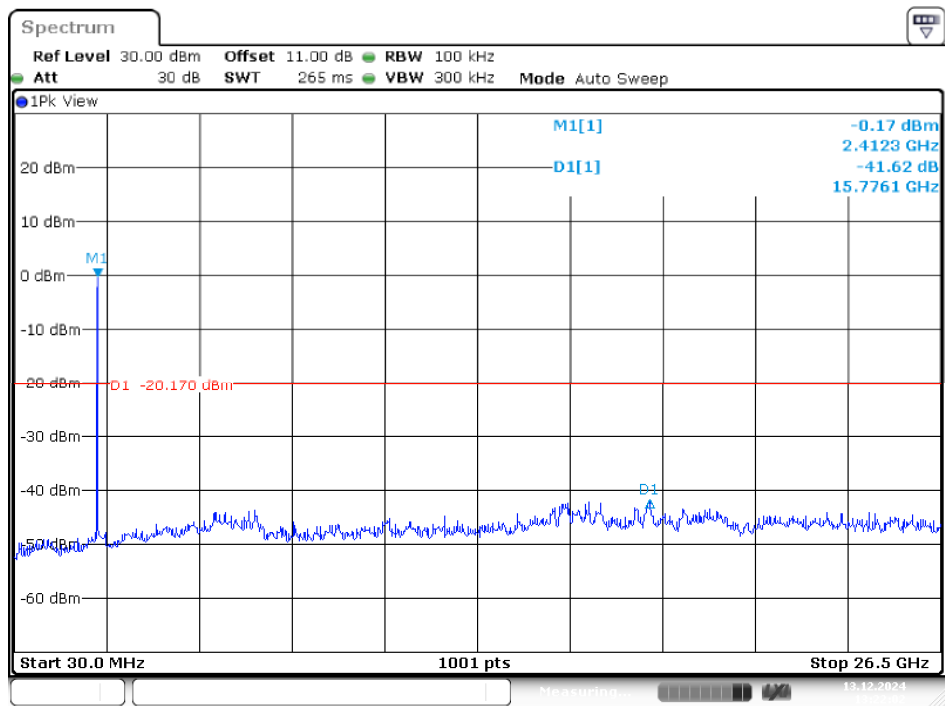
Date: 13.DEC.2024 11:57:02

High Channel



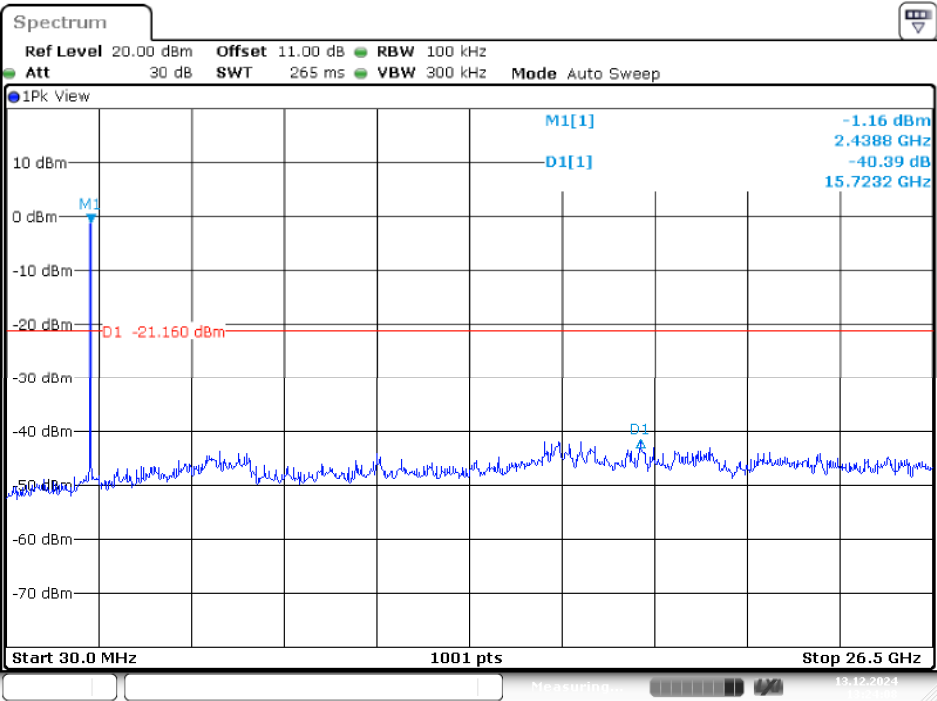
Date: 13.DEC.2024 12:01:30

G Mode
Low Channel



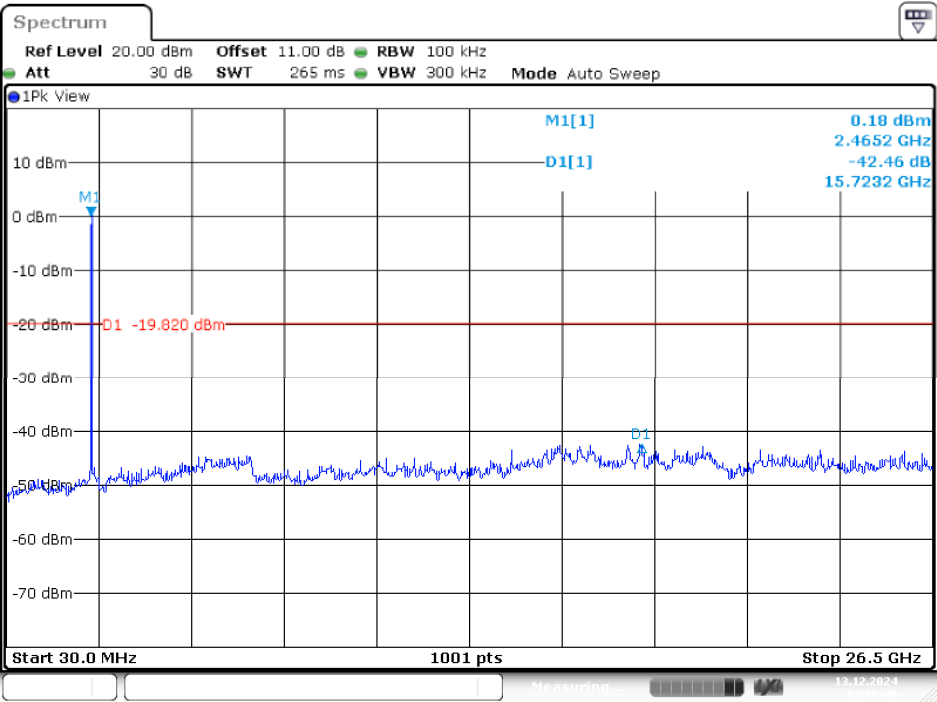
Date: 13.DEC.2024 13:22:02

Middle Channel



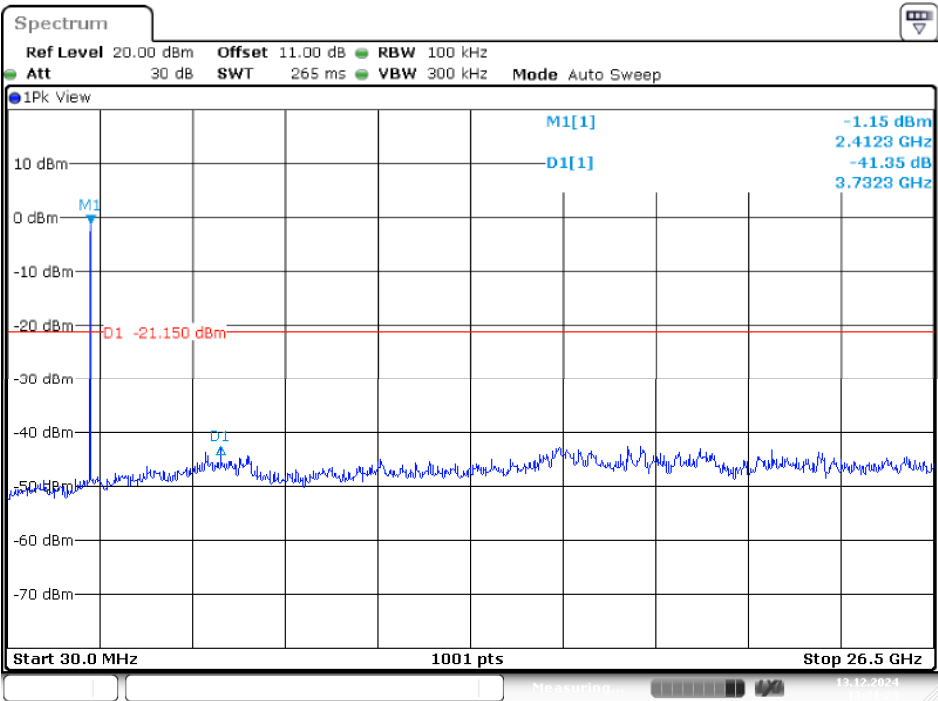
Date: 13.DEC.2024 13:24:08

High Channel



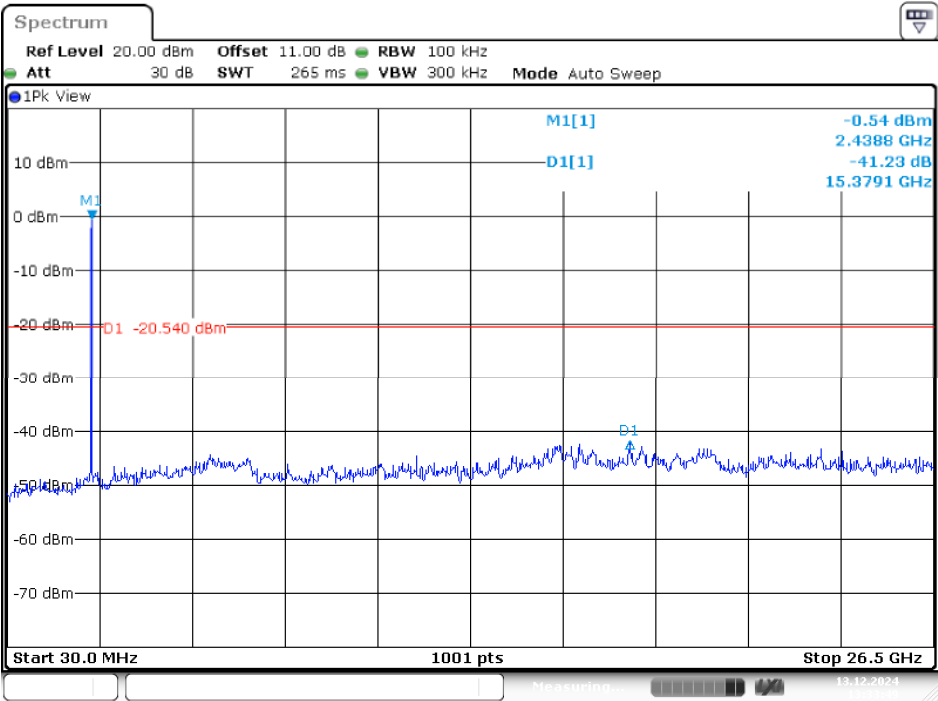
Date: 13.DEC.2024 13:26:48

N20 Mode
Low Channel



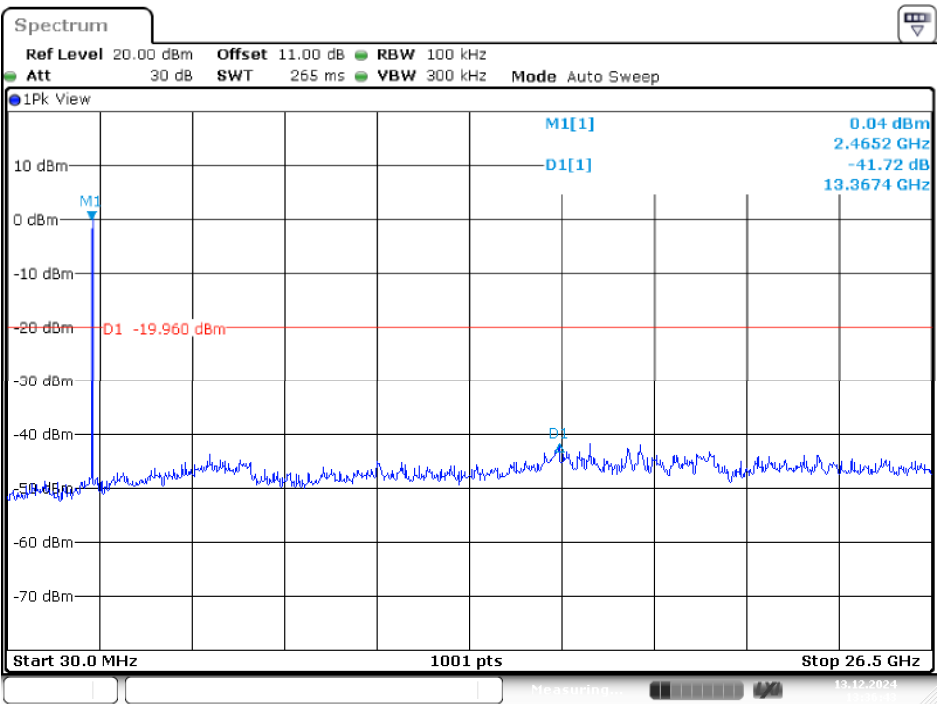
Date: 13.DEC.2024 13:31:23

Middle Channel



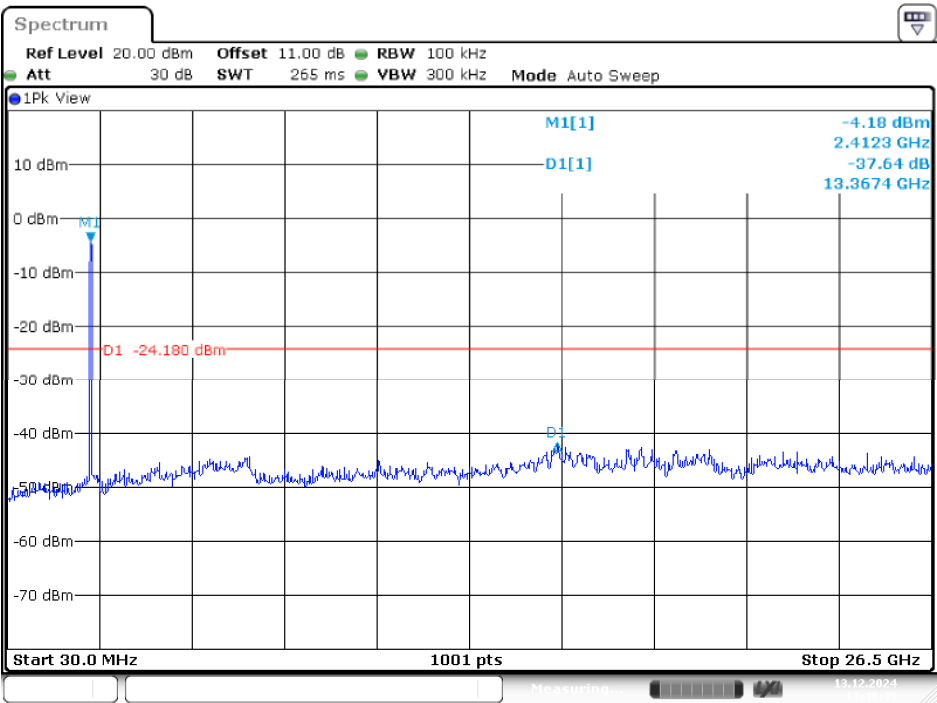
Date: 13.DEC.2024 13:33:49

High Channel



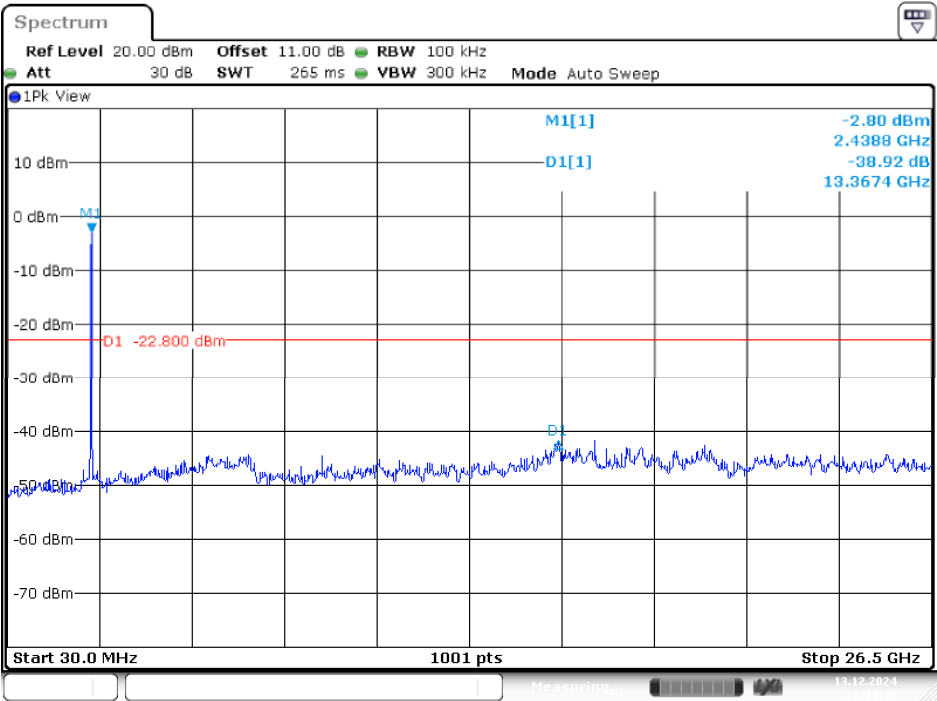
Date: 13.DEC.2024 13:36:43

N40 Mode
Low Channel



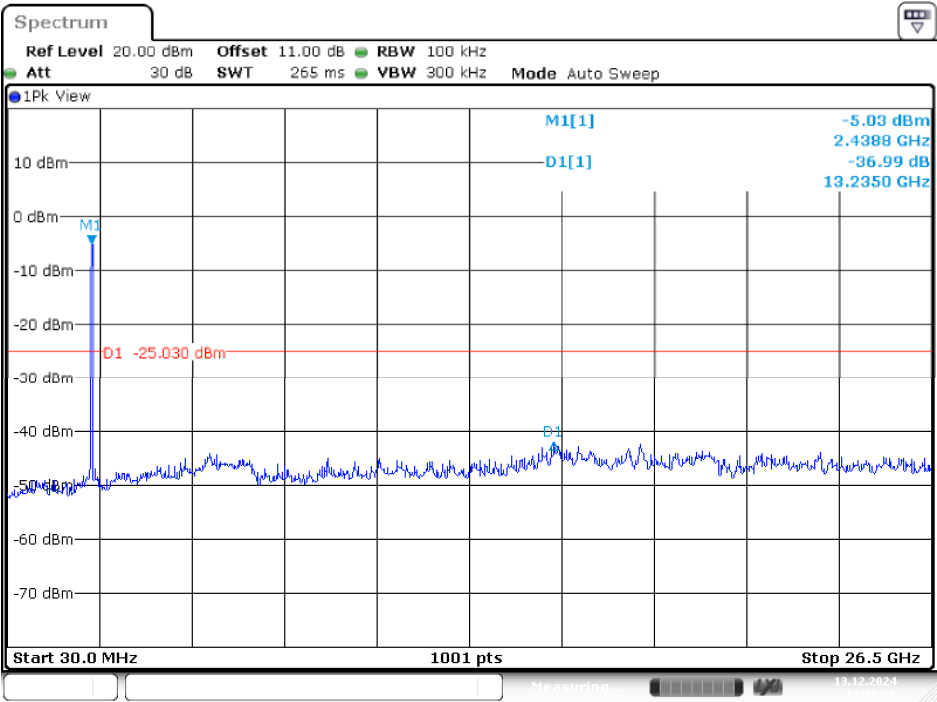
Date: 13.DEC.2024 13:40:49

Middle Channel



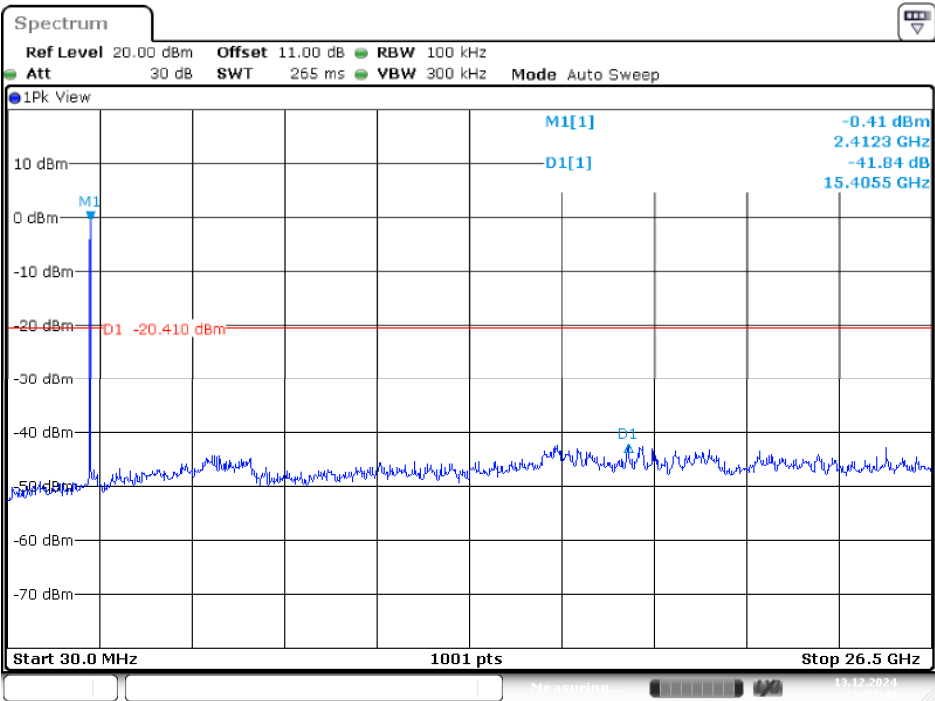
Date: 13.DEC.2024 13:44:36

High Channel



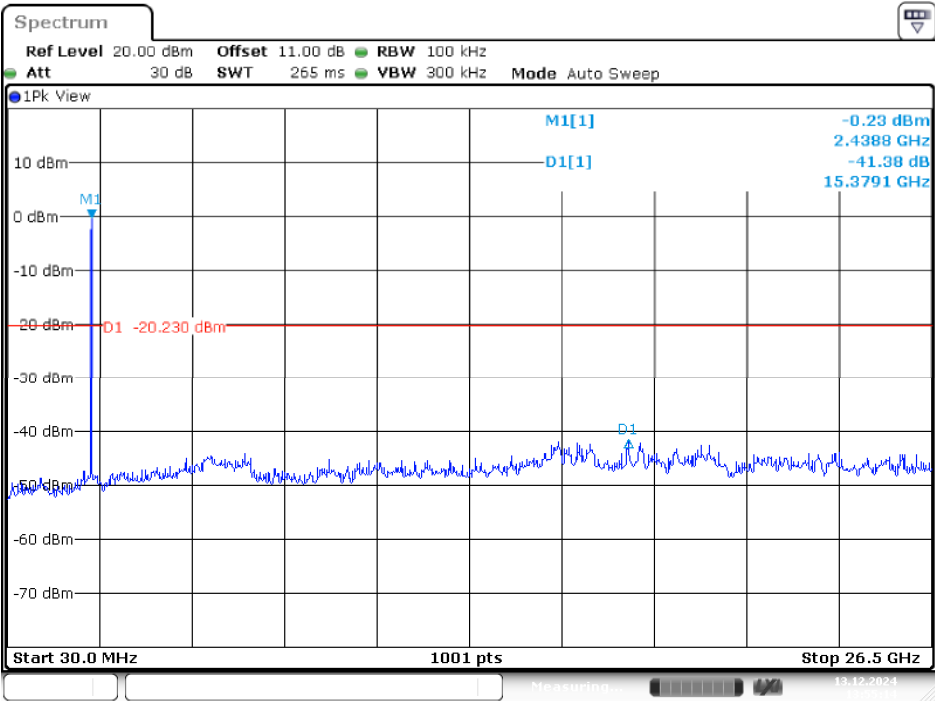
Date: 13.DEC.2024 13:48:26

AX20 Mode
Low Channel



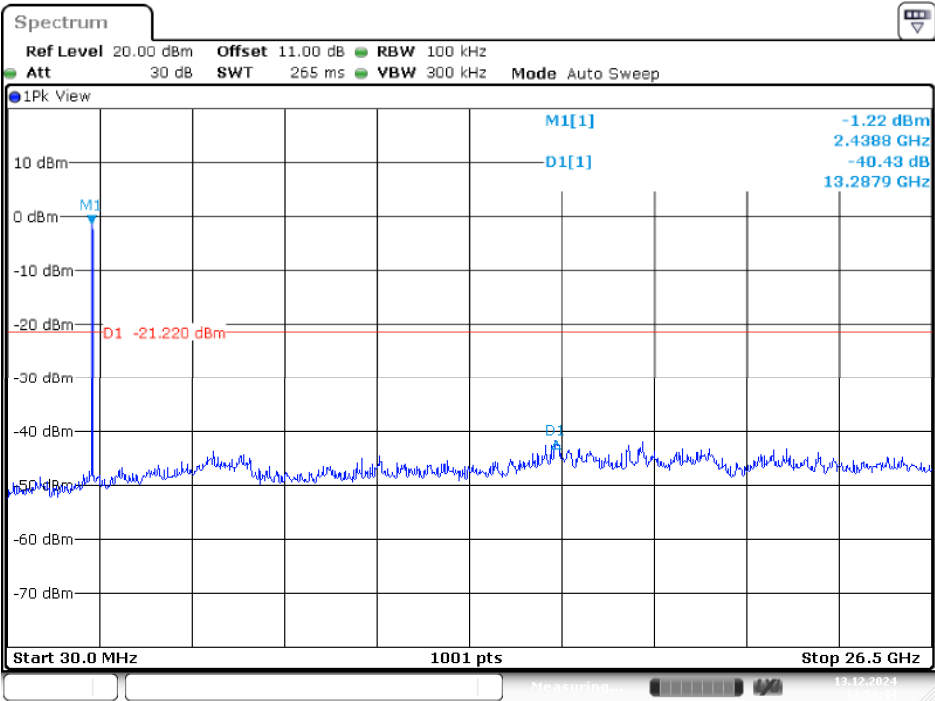
Date: 13.DEC.2024 13:52:44

Middle Channel



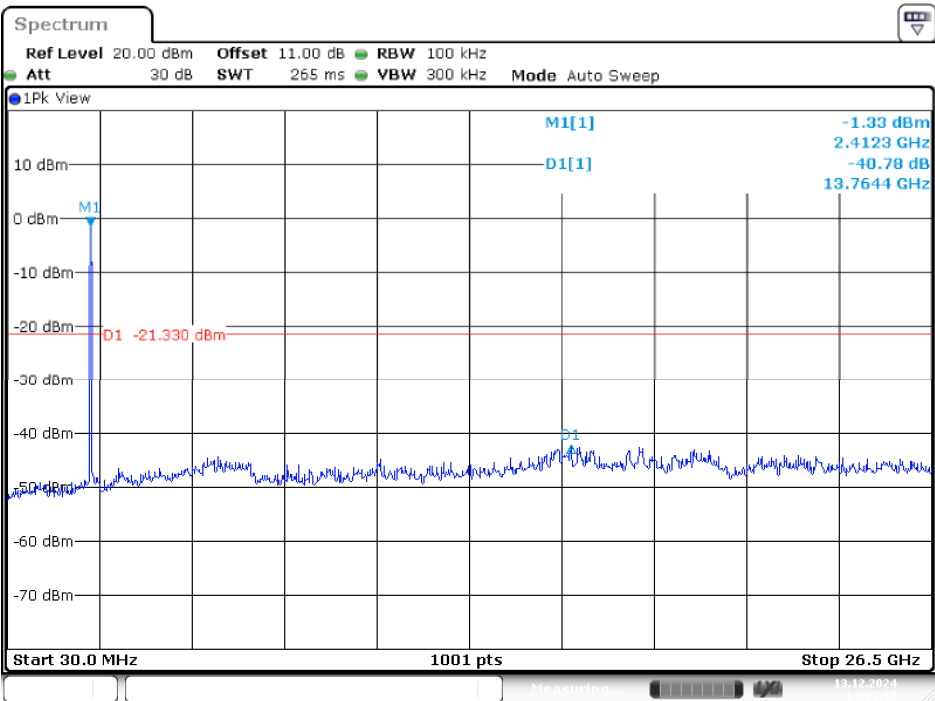
Date: 13.DEC.2024 13:55:14

High Channel



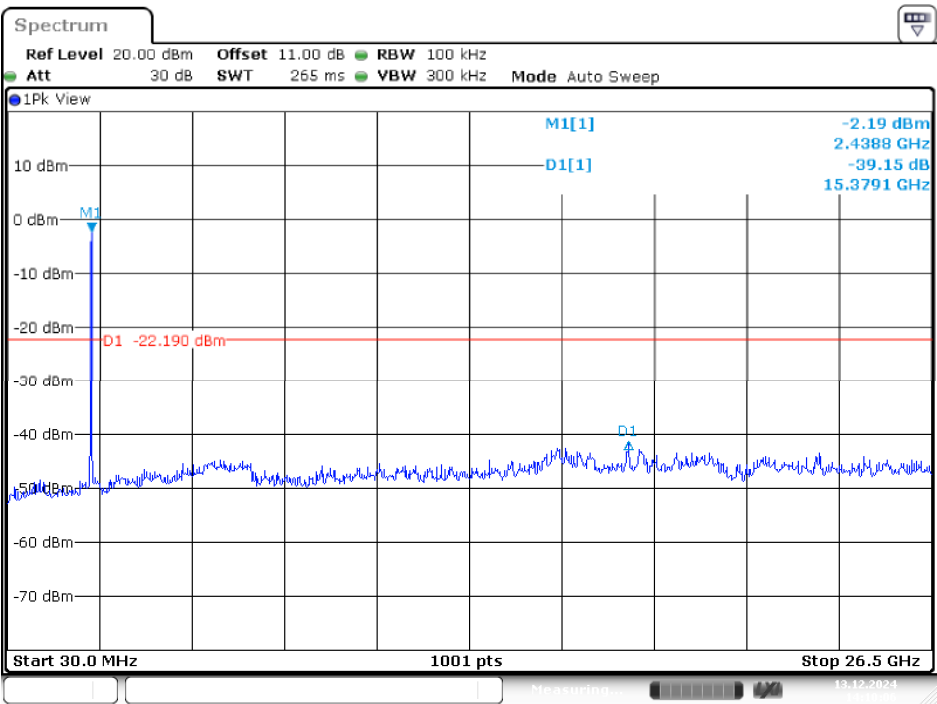
Date: 13.DEC.2024 13:58:44

AX40 Mode
Low Channel



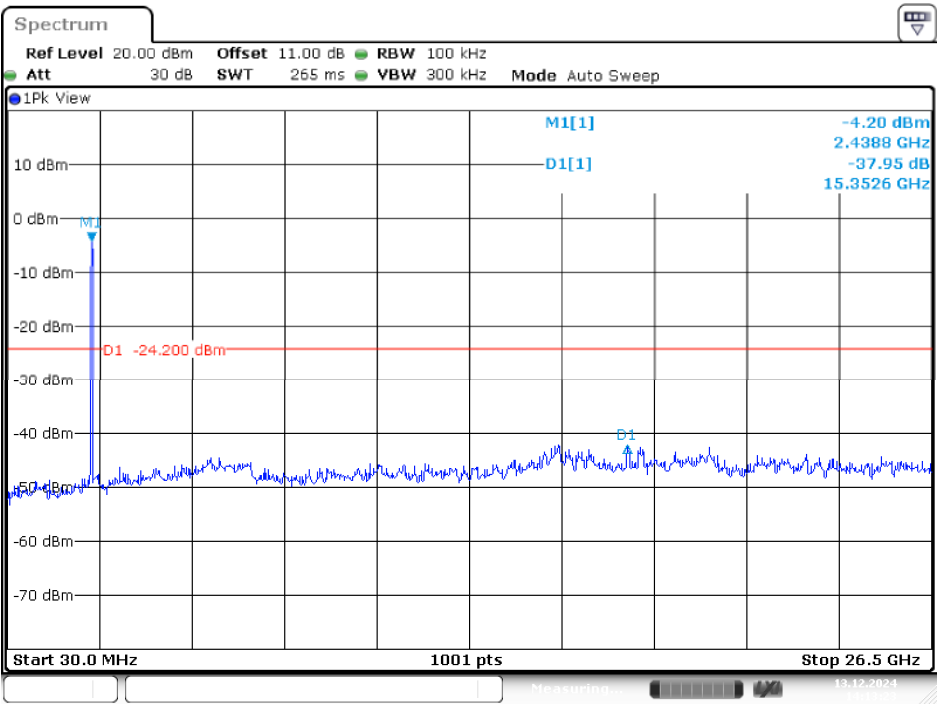
Date: 13.DEC.2024 14:03:17

Middle Channel



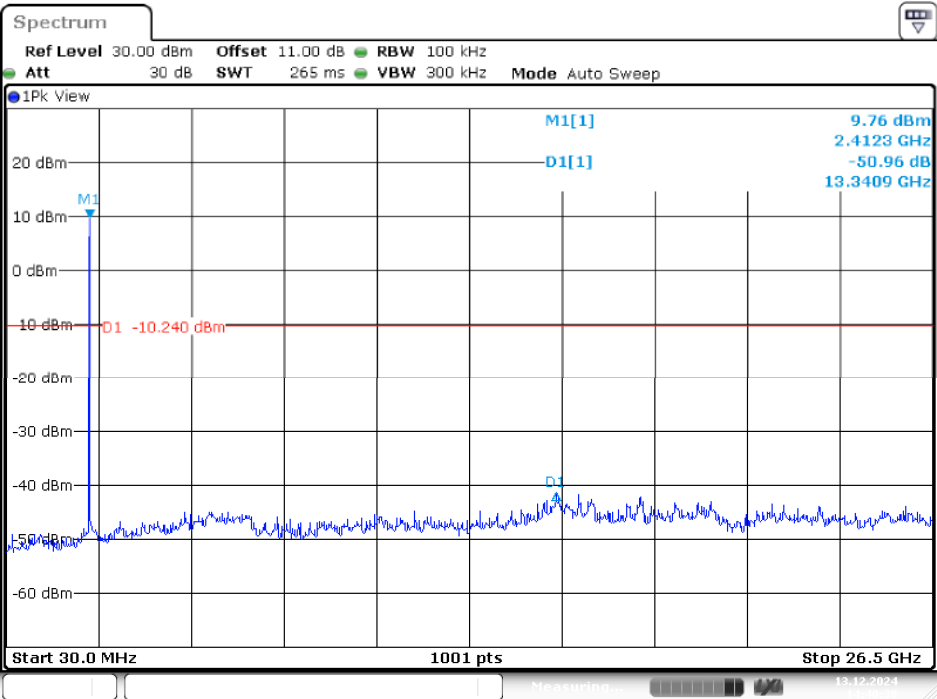
Date: 13.DEC.2024 14:10:06

High Channel

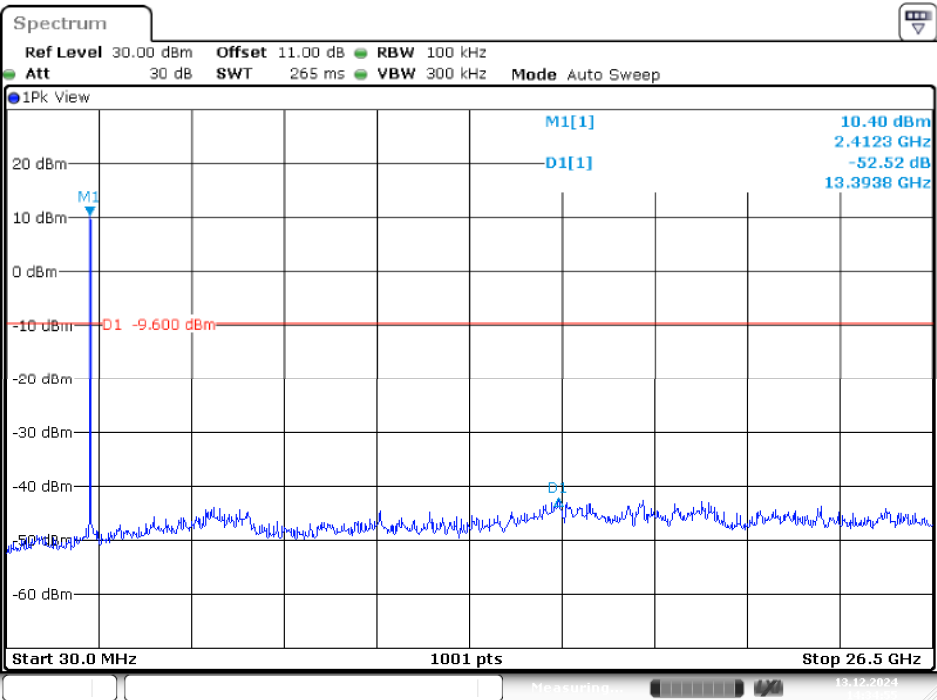


Date: 13.DEC.2024 14:13:23

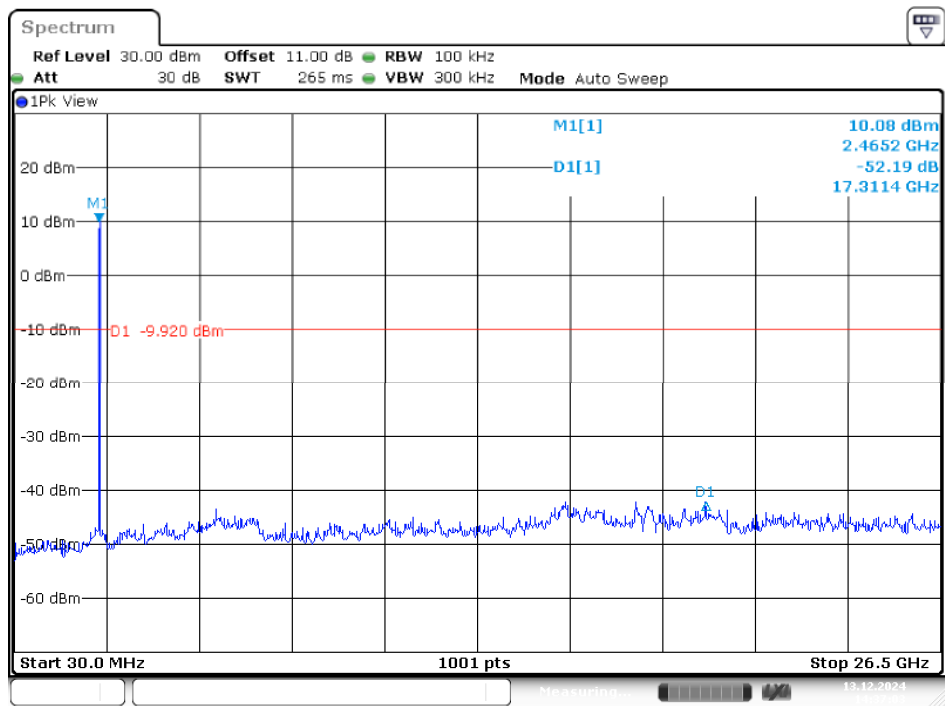
Chain 1
B Mode
Low Channel



Middle Channel

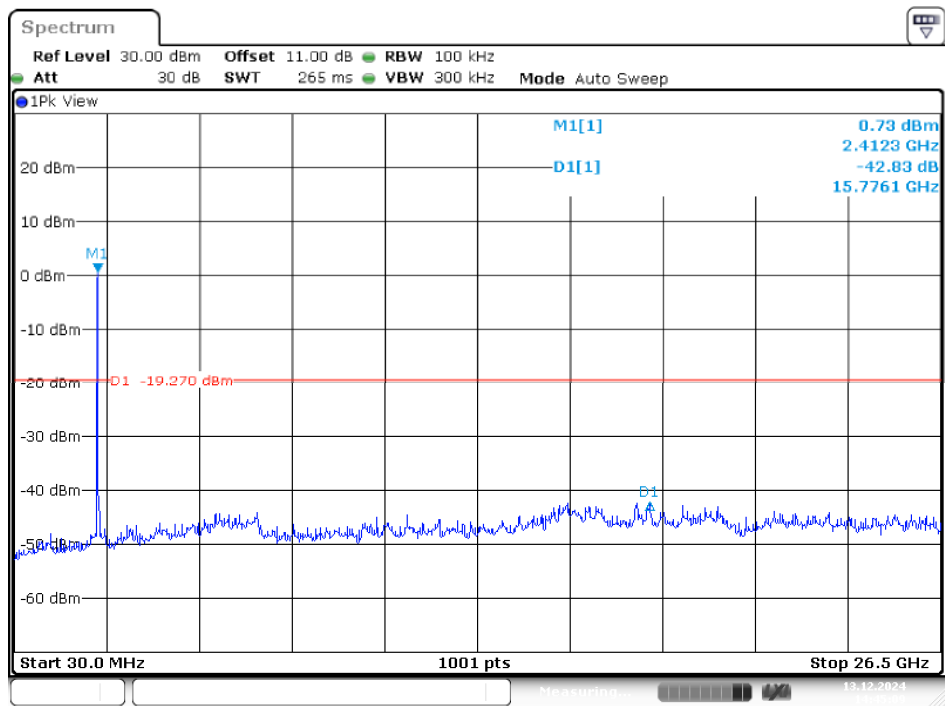


High Channel



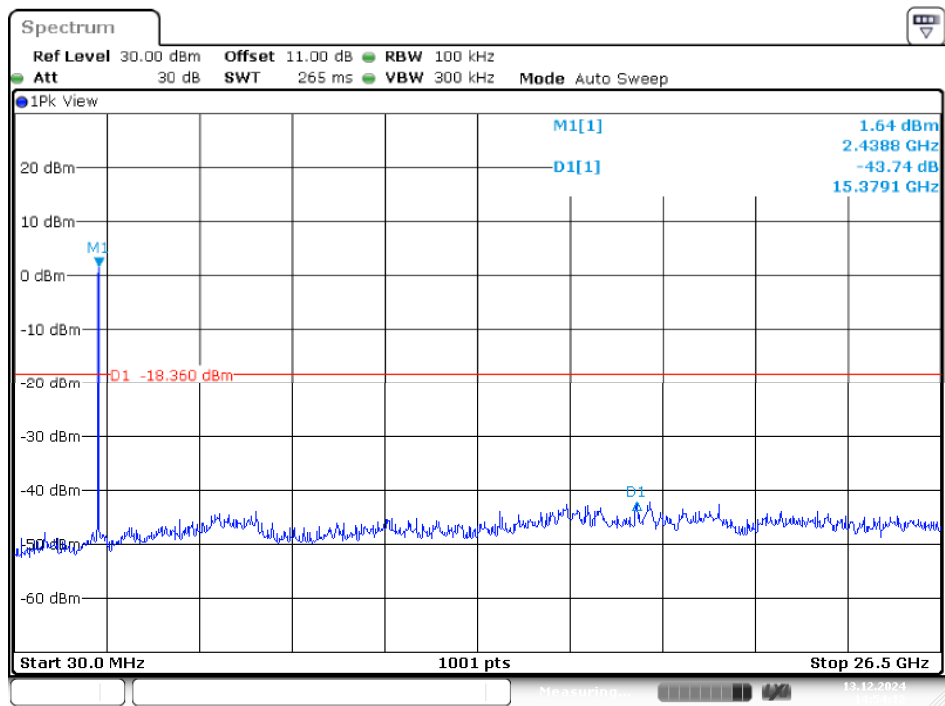
Date: 13.DEC.2024 14:37:03

G Mode
Low Channel



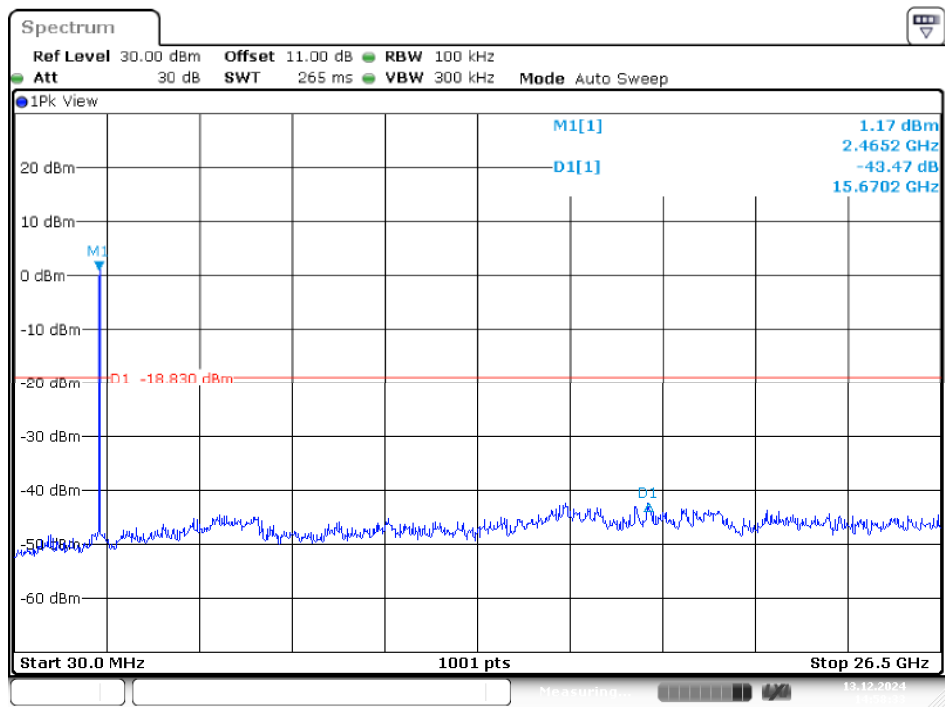
Date: 13.DEC.2024 14:45:09

Middle Channel



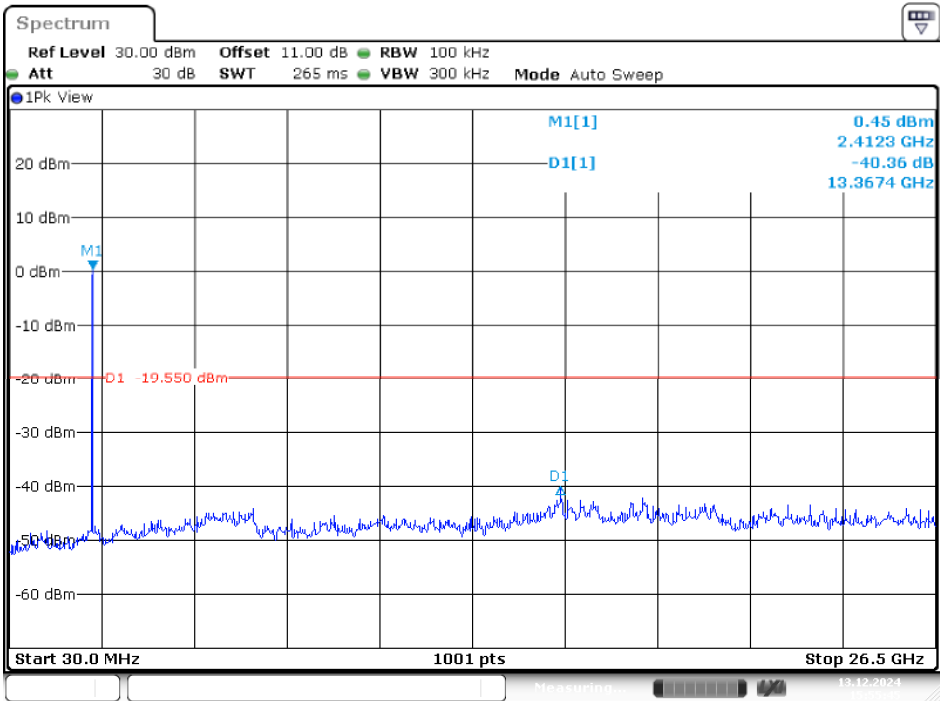
Date: 13.DEC.2024 14:54:12

High Channel

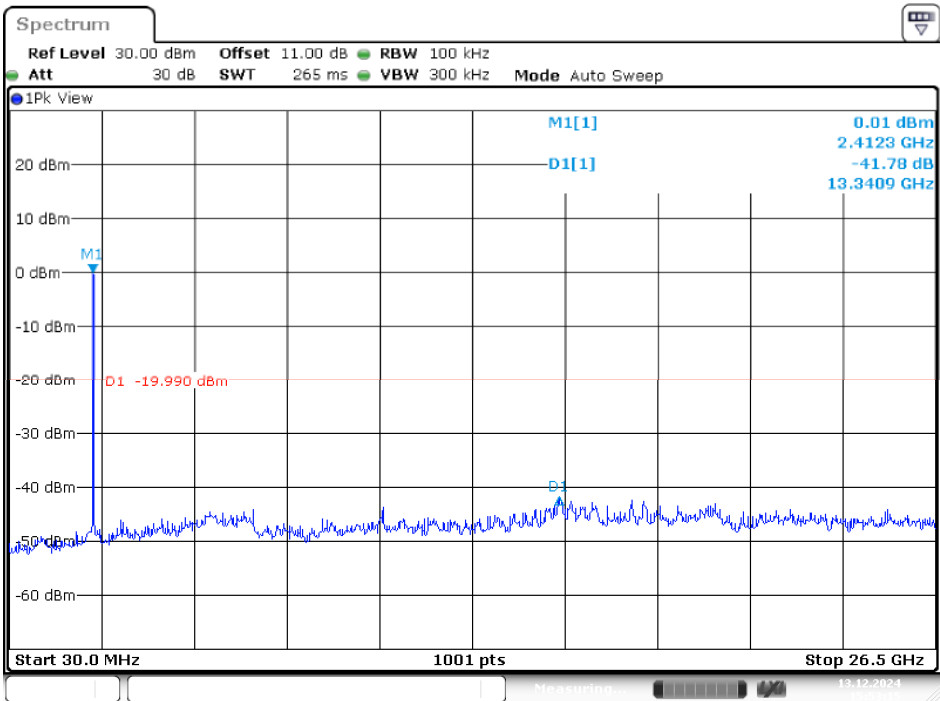


Date: 13.DEC.2024 14:58:33

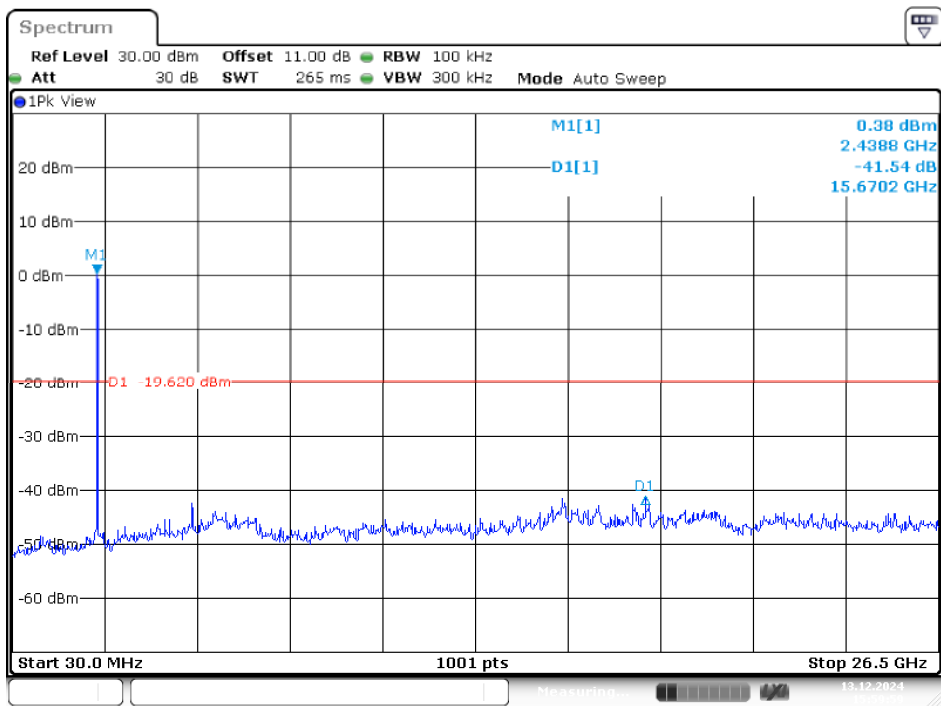
N20 Mode
Low Channel



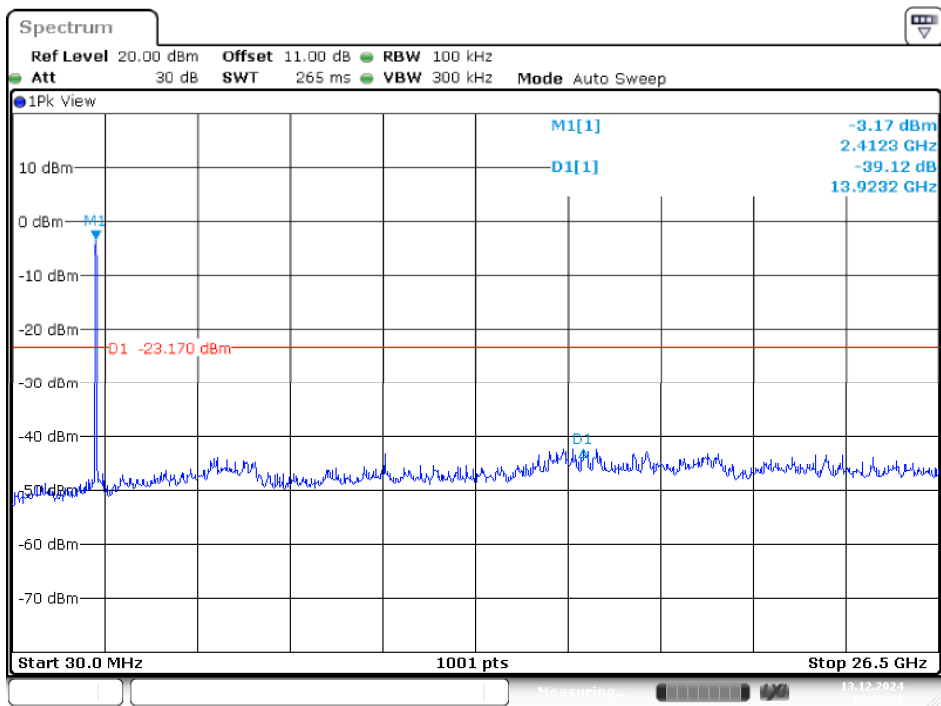
Middle Channel



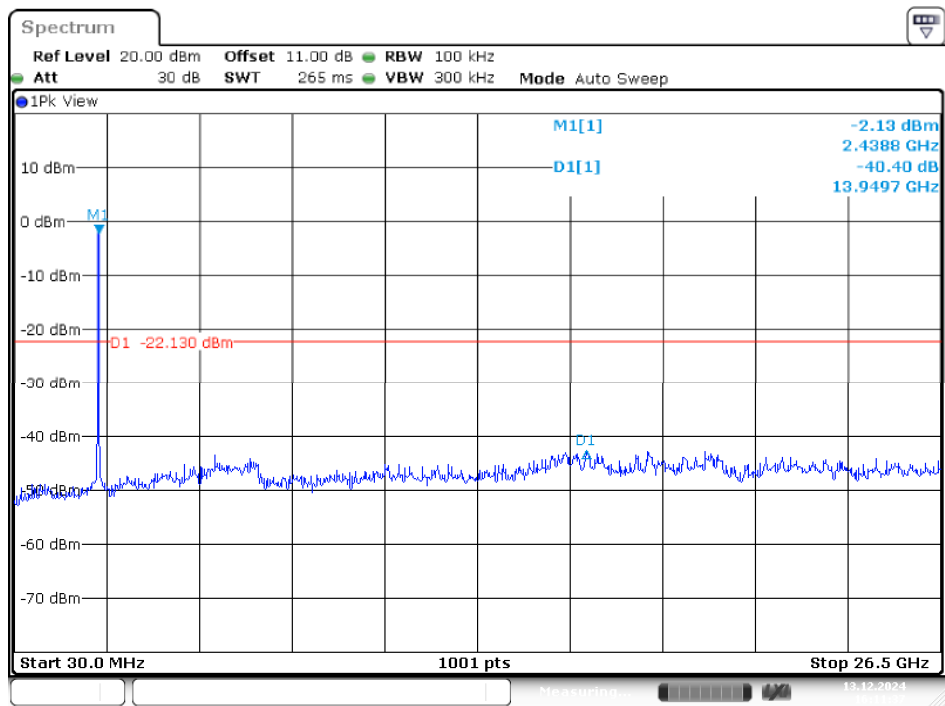
High Channel



N40 Mode
Low Channel

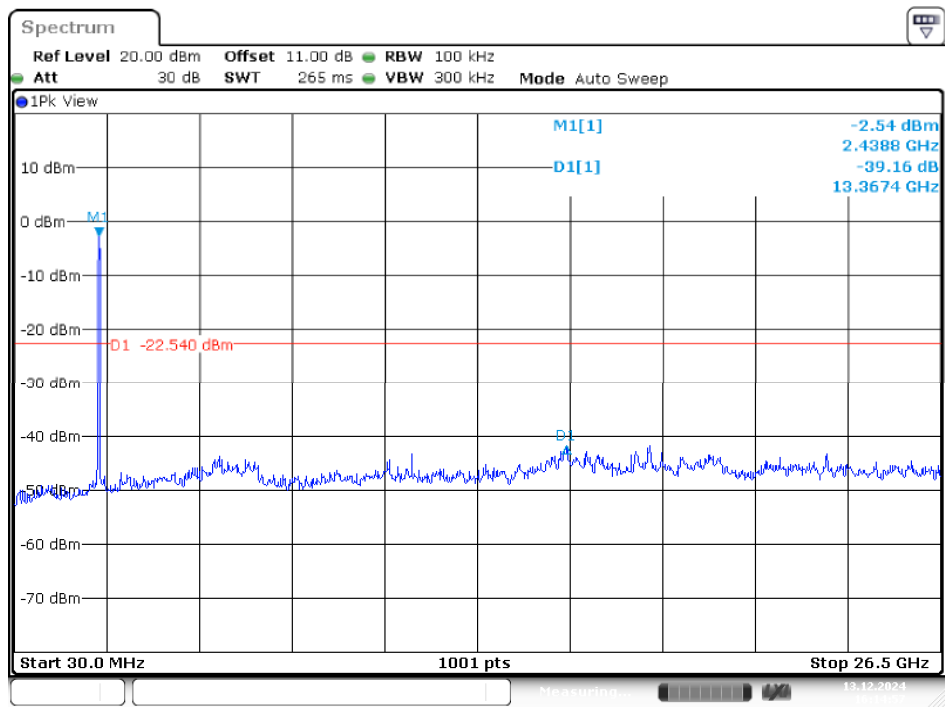


Middle Channel



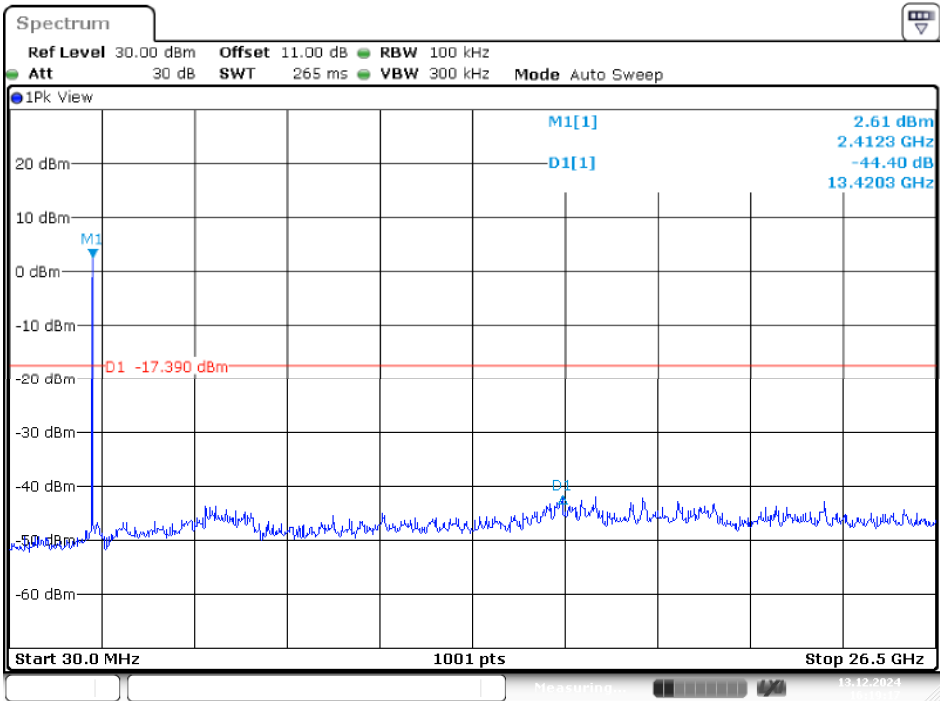
Date: 13.DEC.2024 16:11:38

High Channel



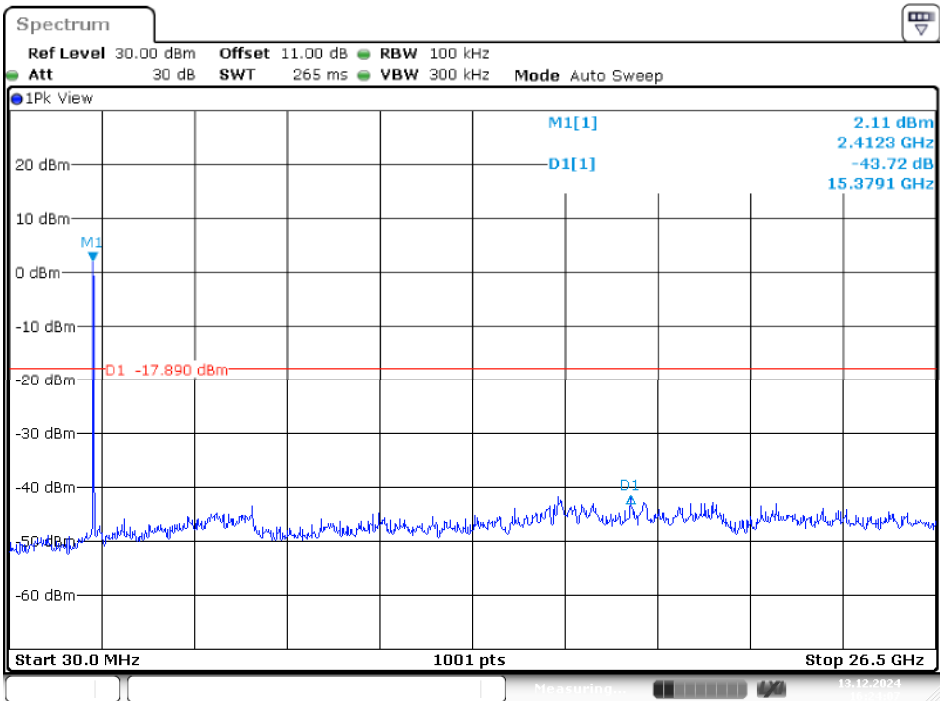
Date: 13.DEC.2024 16:14:57

AX20 Mode
Low Channel



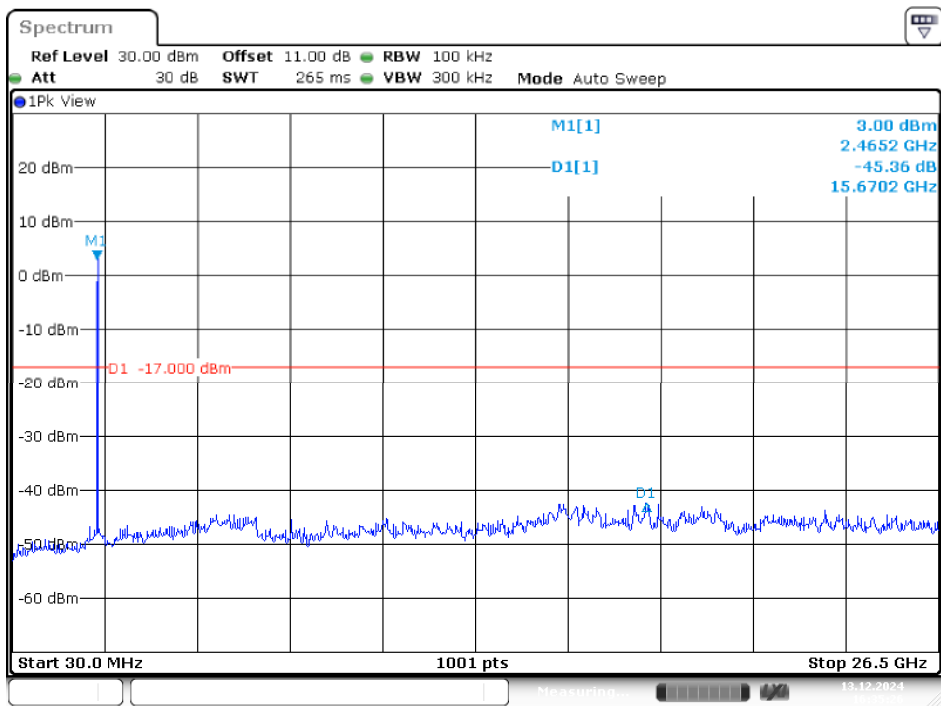
Date: 13.DEC.2024 16:19:17

Middle Channel



Date: 13.DEC.2024 16:24:07

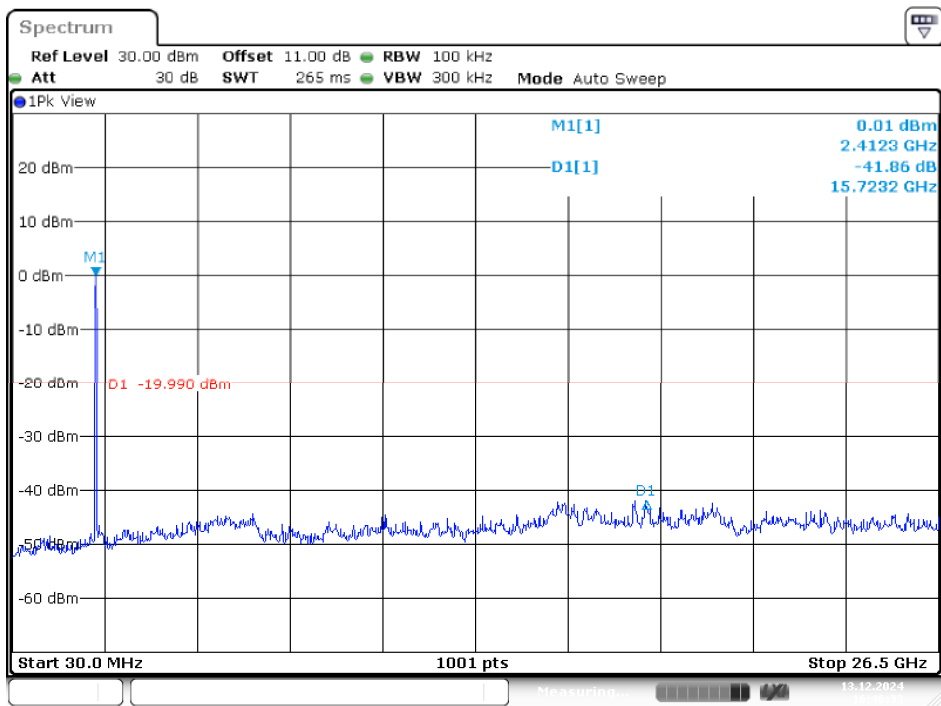
High Channel



Date: 13.DEC.2024 16:35:26

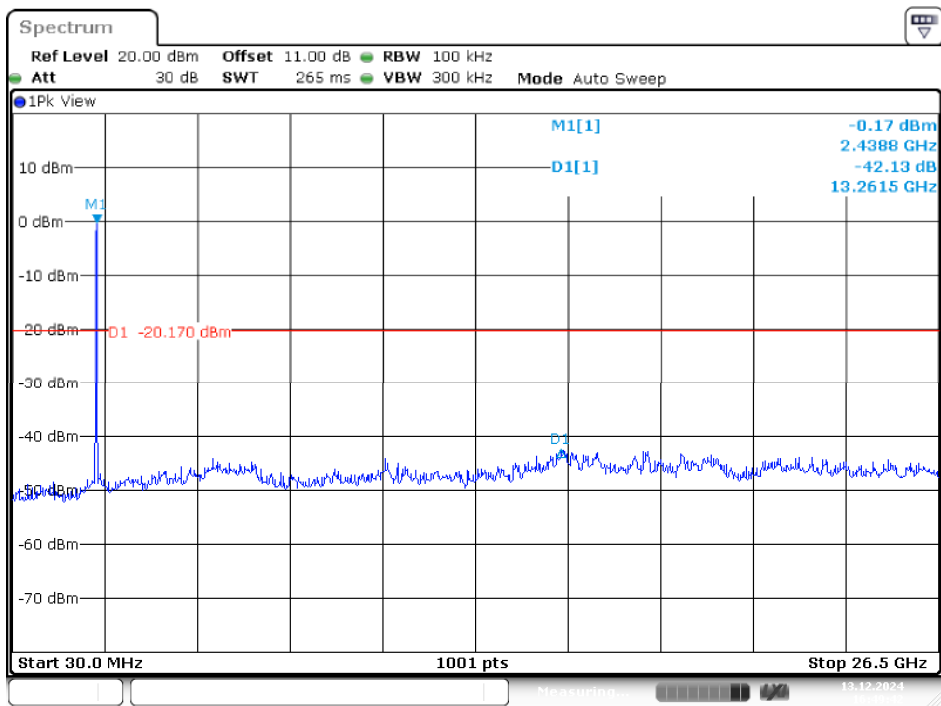
AX40 Mode

Low Channel



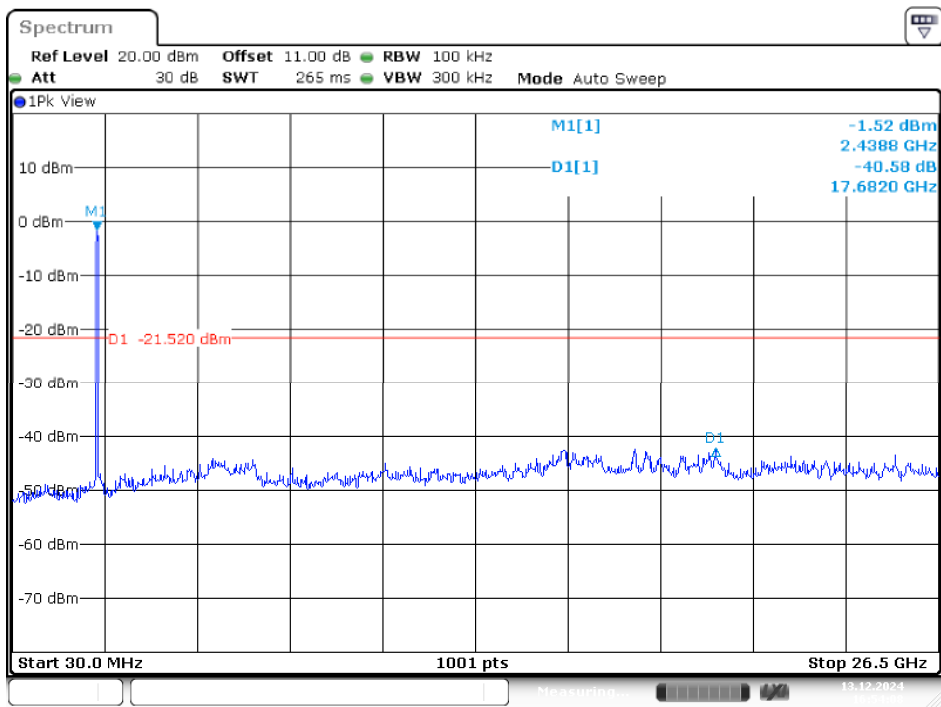
Date: 13.DEC.2024 16:46:33

Middle Channel



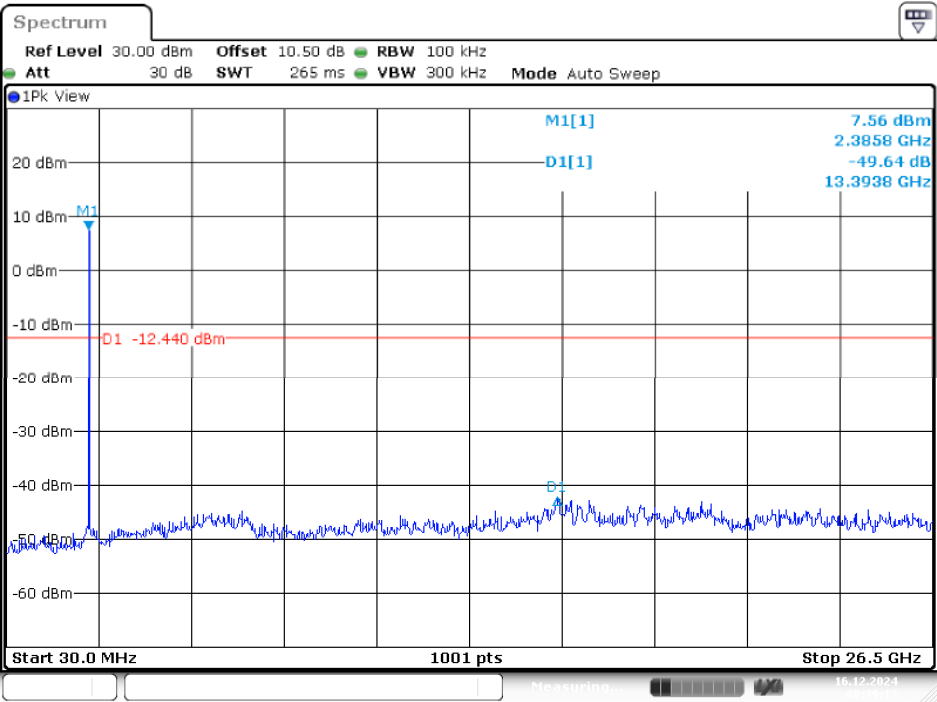
Date: 13.DEC.2024 16:49:42

High Channel



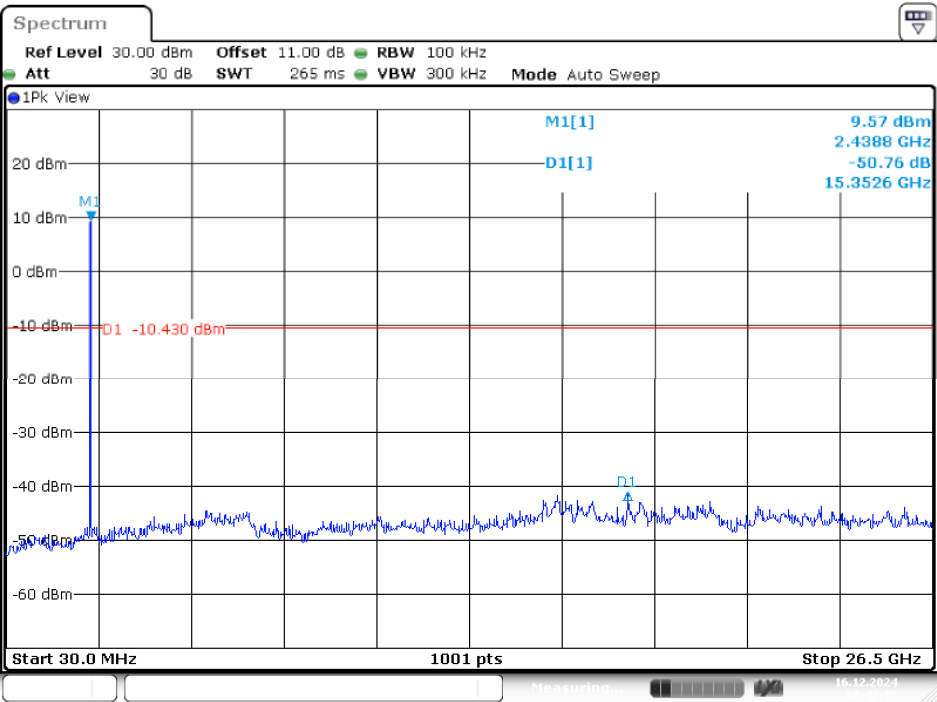
Date: 13.DEC.2024 16:54:08

Chain 2
B Mode
Low Channel



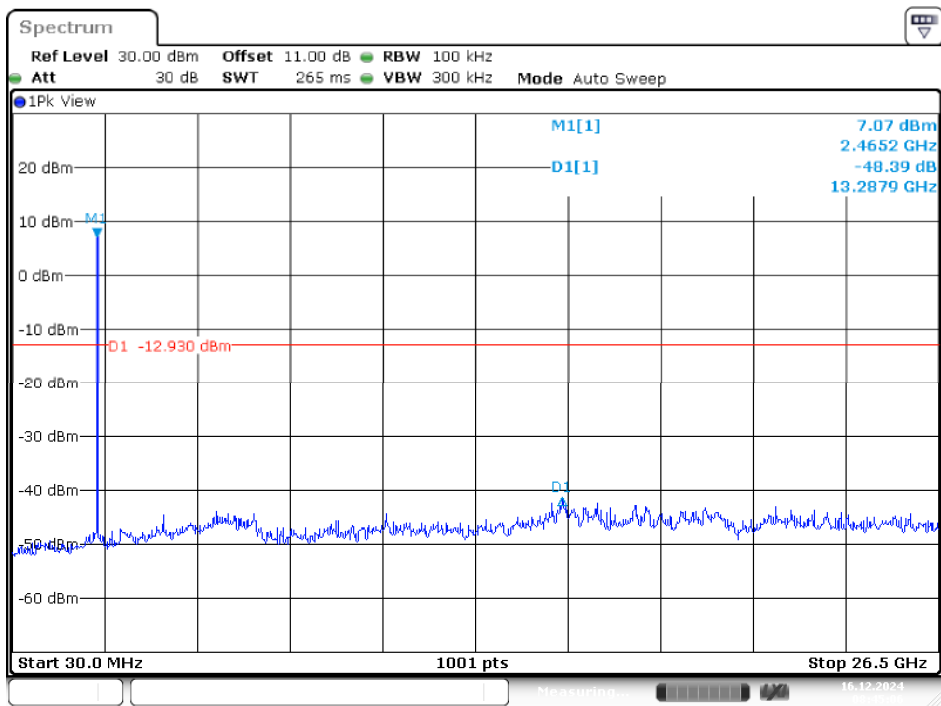
Date: 16.DEC.2024 08:39:13

Middle Channel



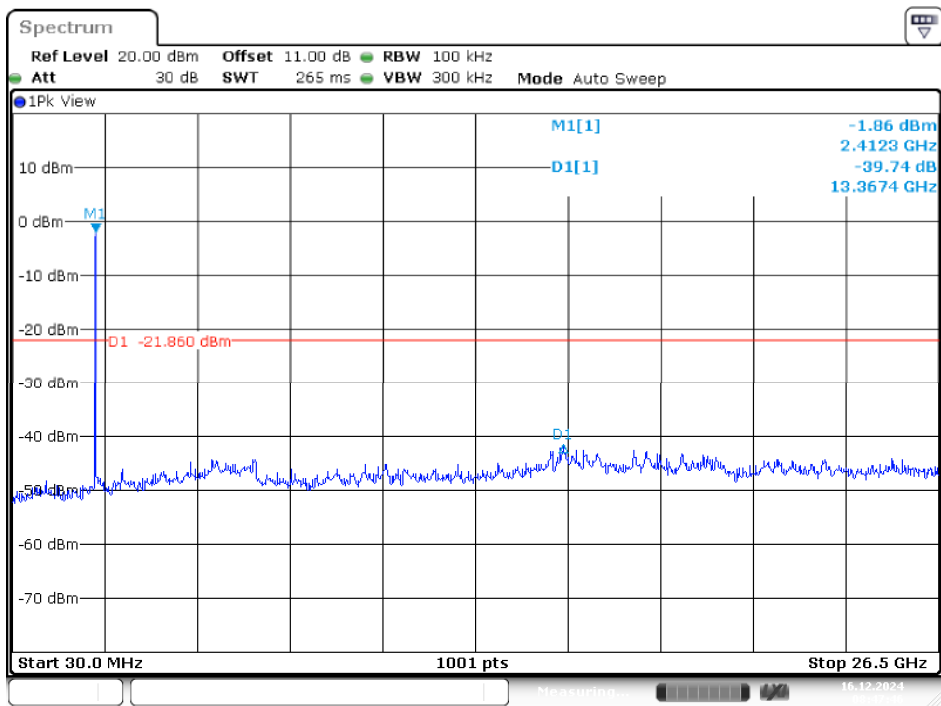
Date: 16.DEC.2024 08:42:16

High Channel



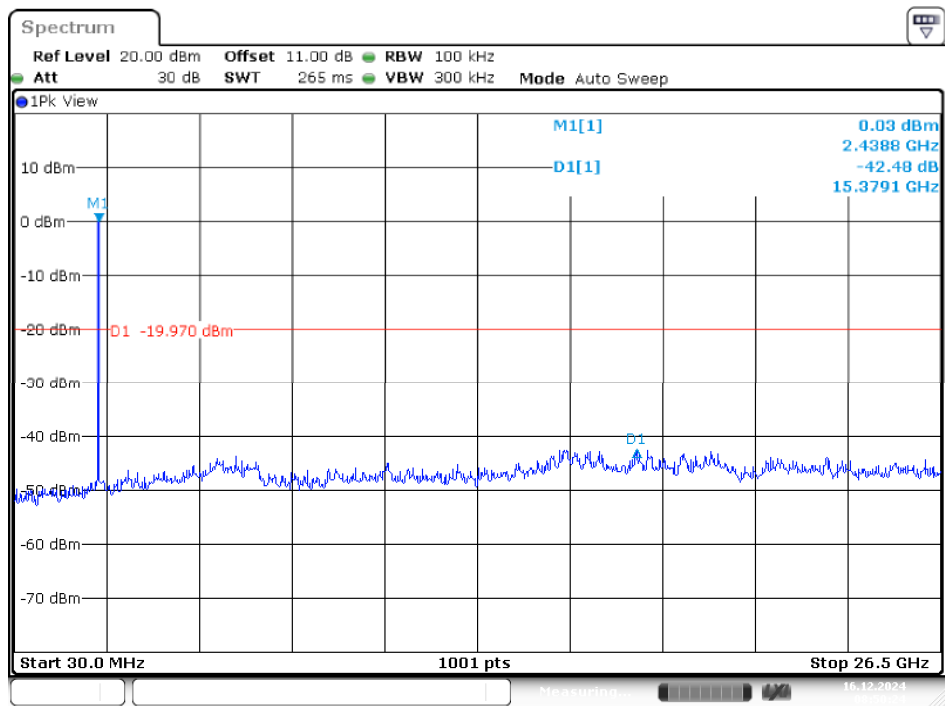
Date: 16.DEC.2024 08:45:06

G Mode
Low Channel



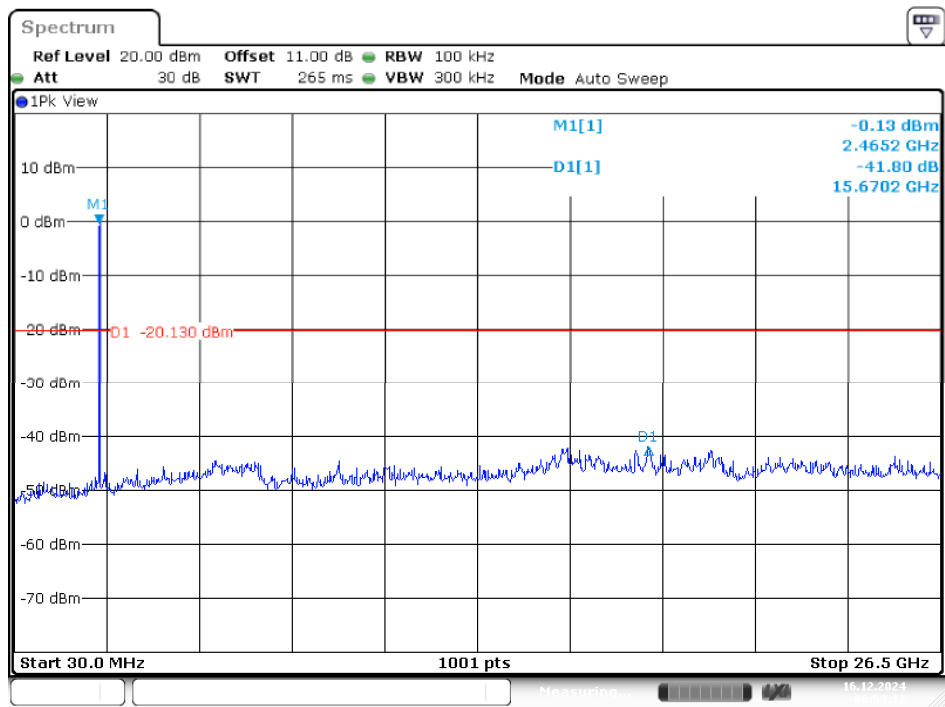
Date: 16.DEC.2024 08:47:46

Middle Channel



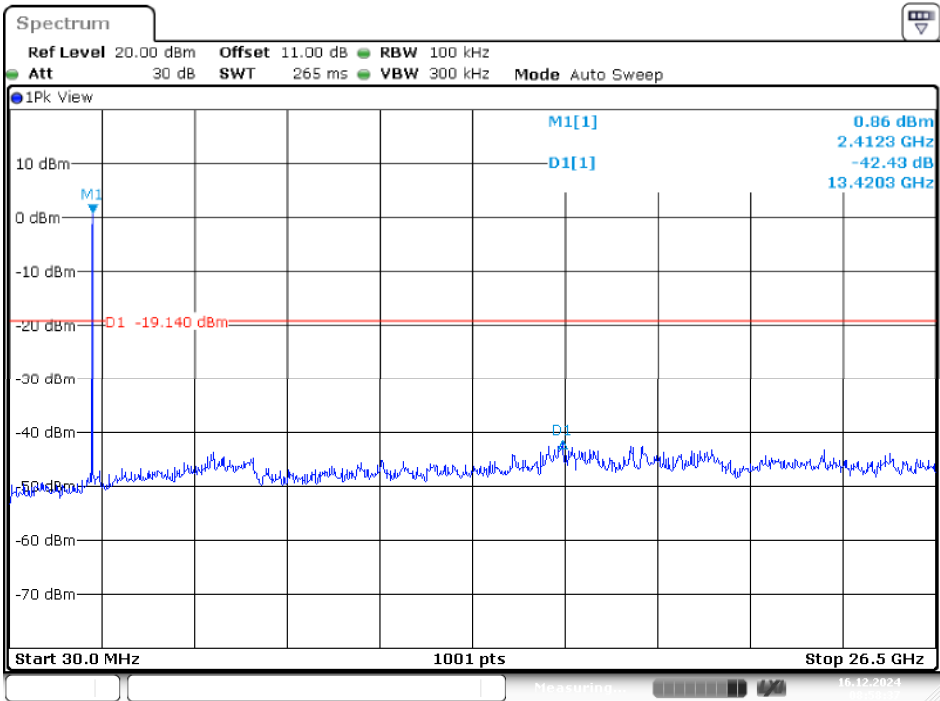
Date: 16.DEC.2024 08:50:24

High Channel

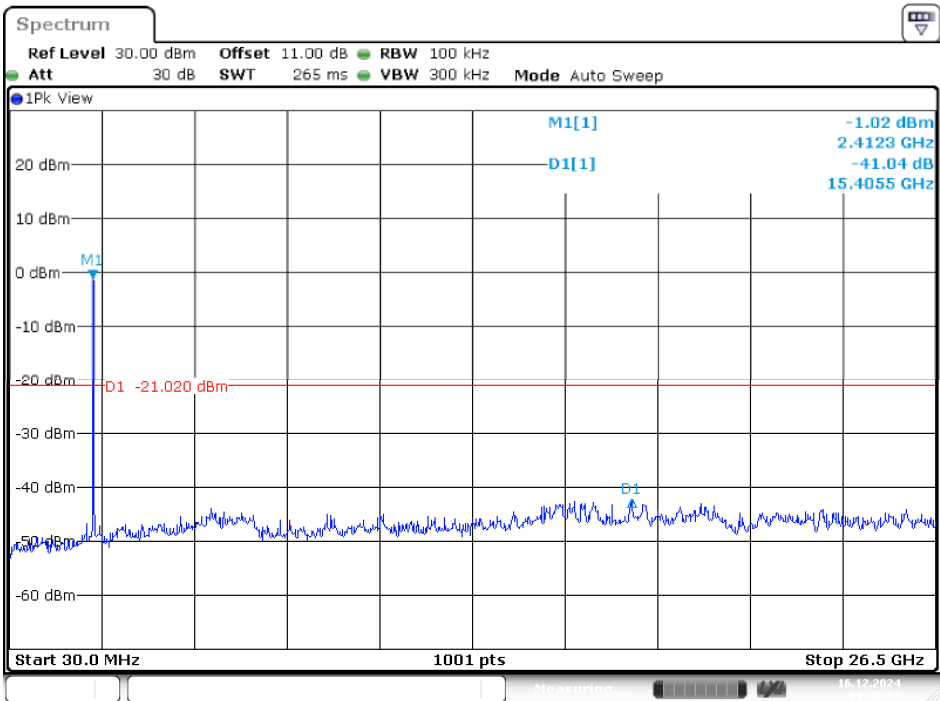


Date: 16.DEC.2024 08:53:12

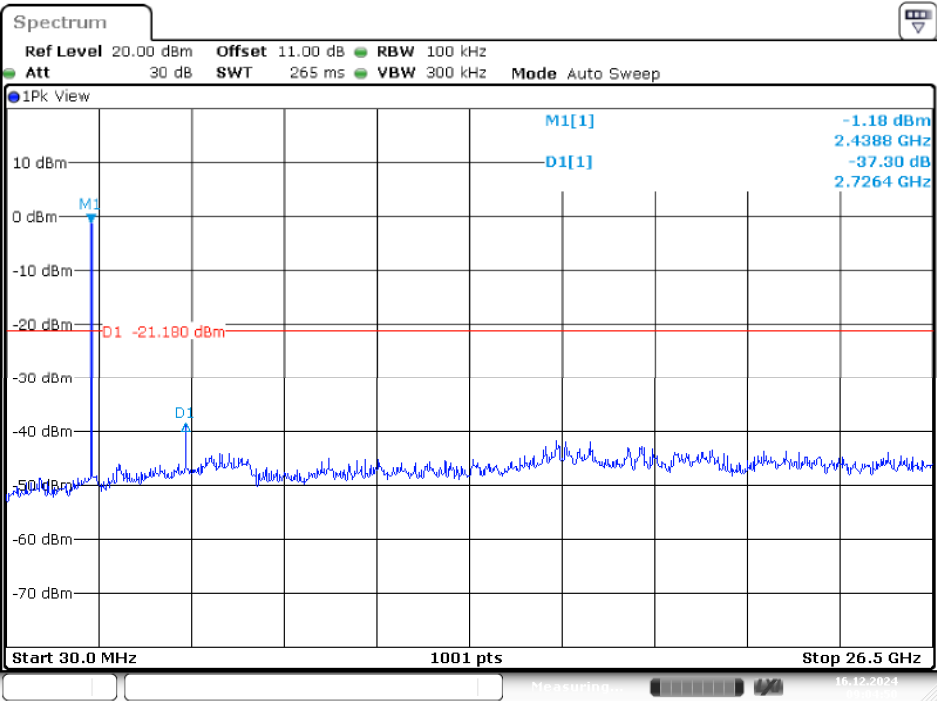
N20 Mode
Low Channel



Middle Channel

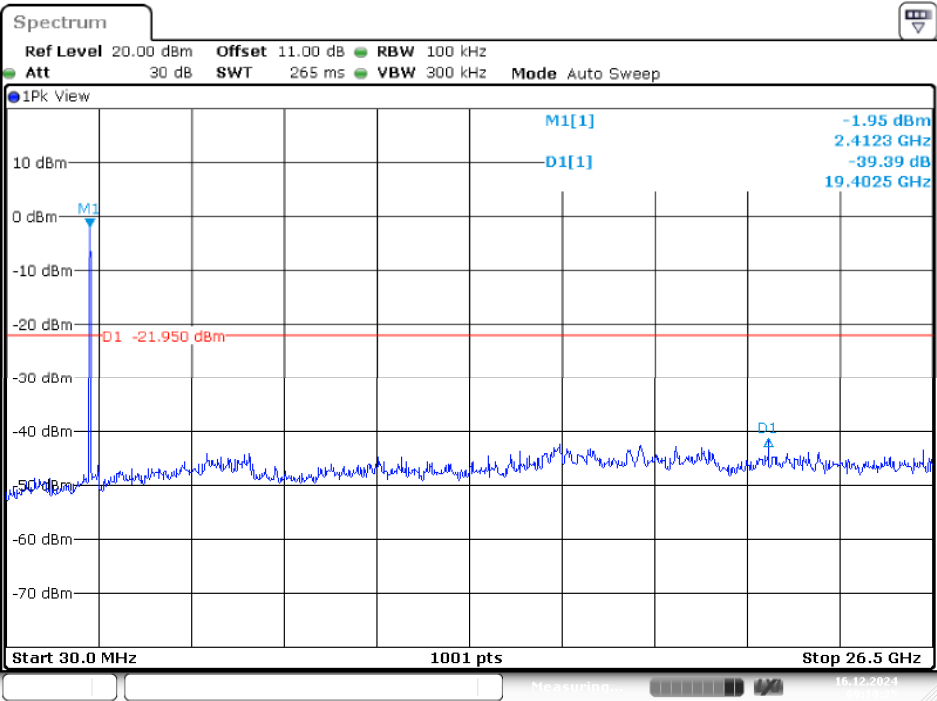


High Channel



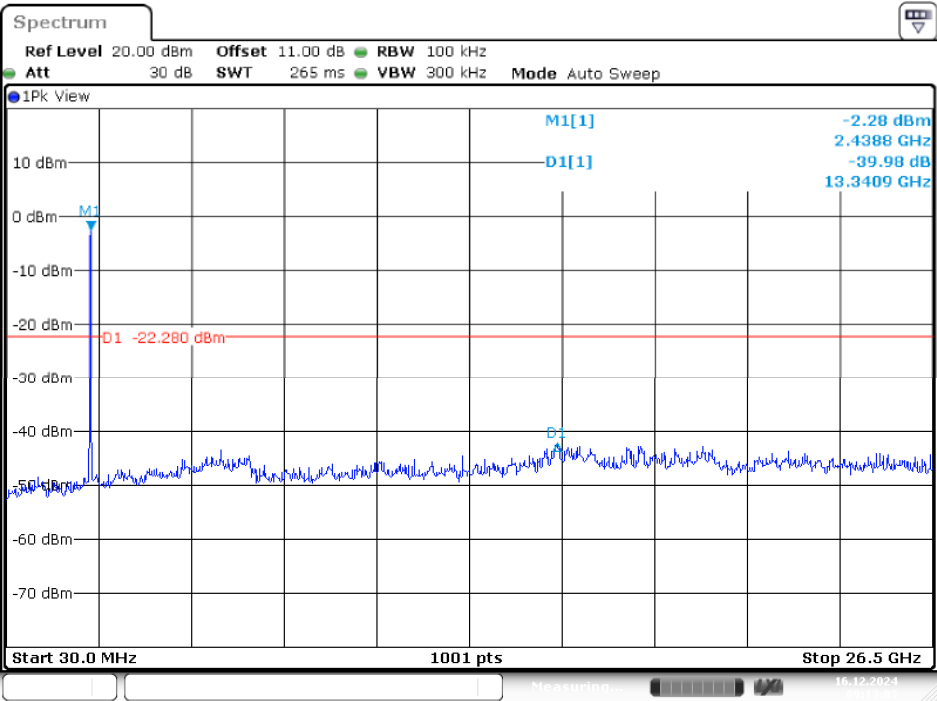
Date: 16.DEC.2024 09:04:51

N40 Mode
Low Channel



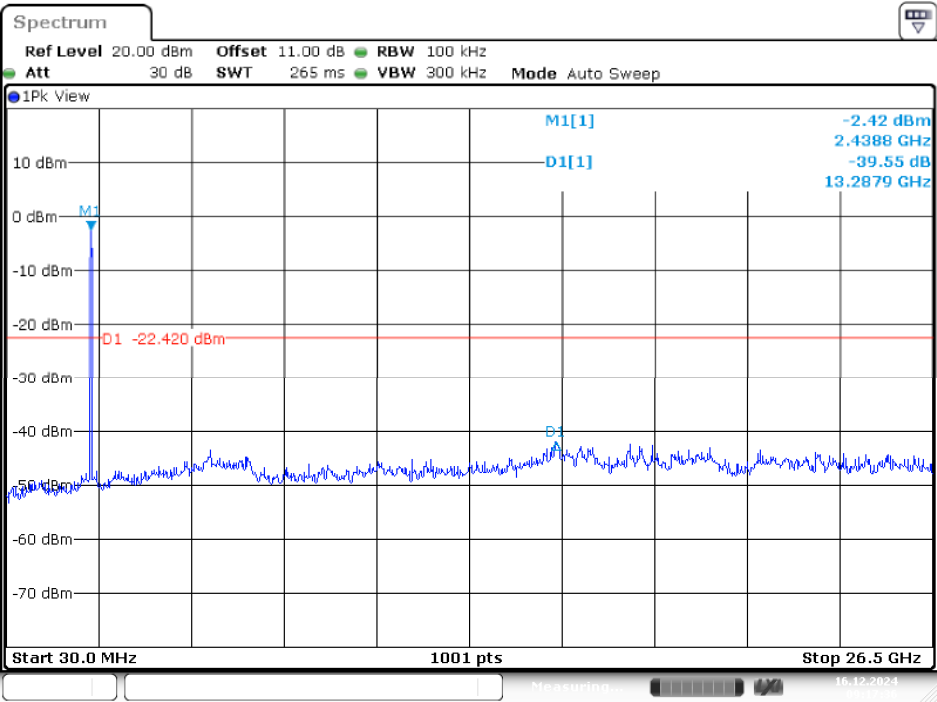
Date: 16.DEC.2024 09:10:25

Middle Channel



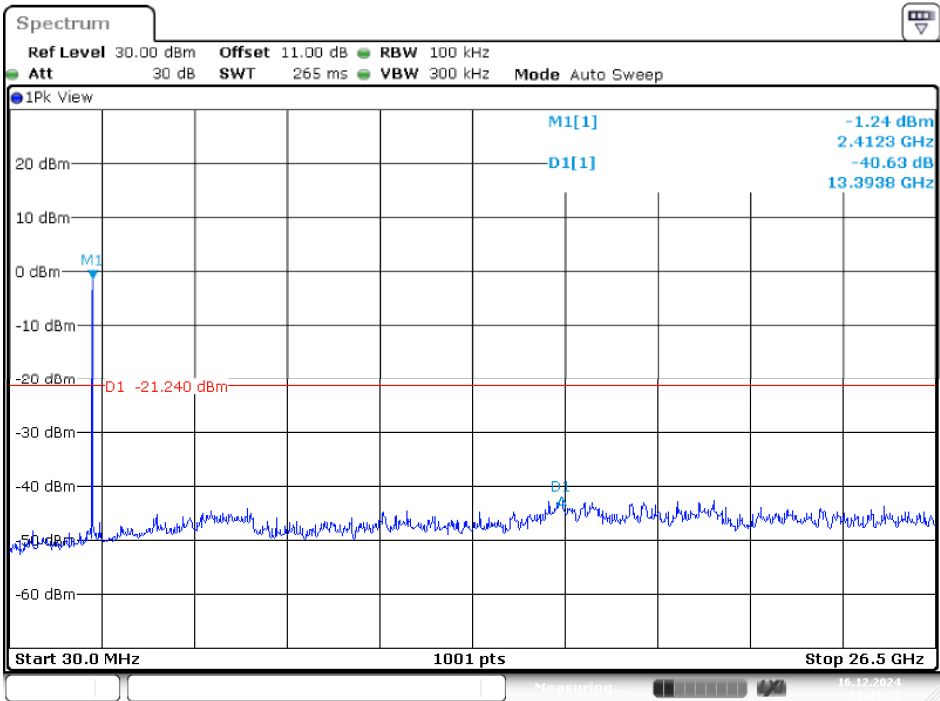
Date: 16.DEC.2024 09:13:03

High Channel



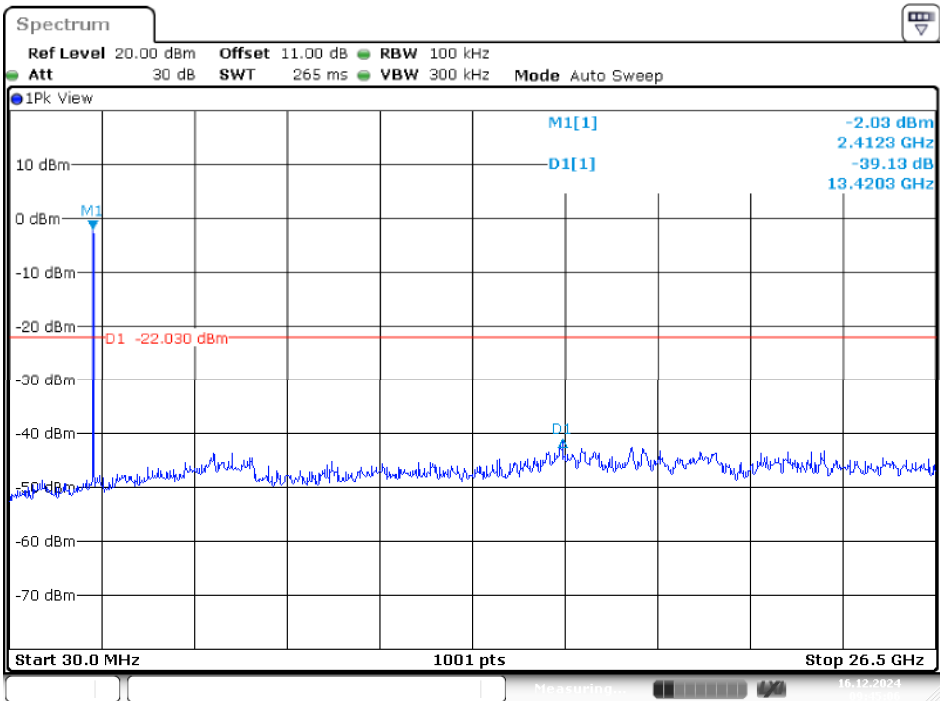
Date: 16.DEC.2024 09:17:36

AX20 Mode
Low Channel



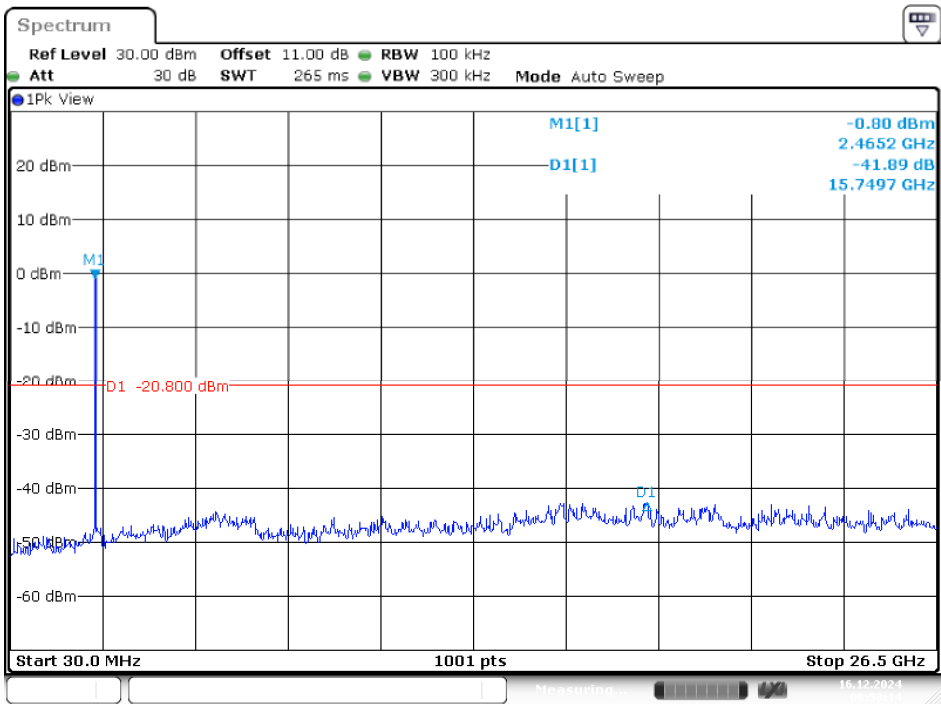
Date: 16.DEC.2024 09:21:18

Middle Channel



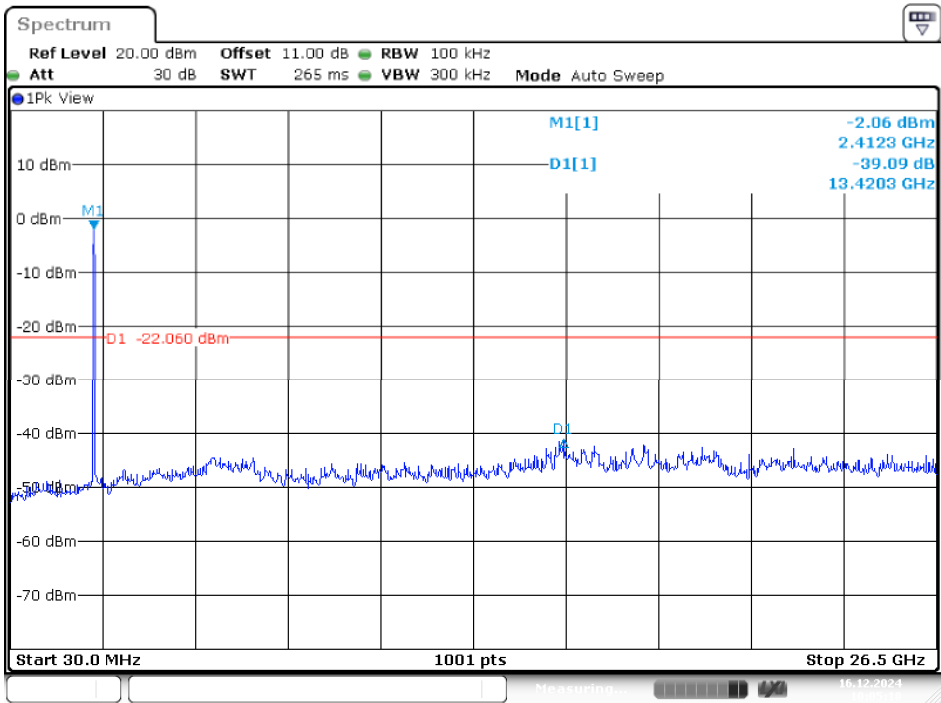
Date: 16.DEC.2024 09:45:06

High Channel

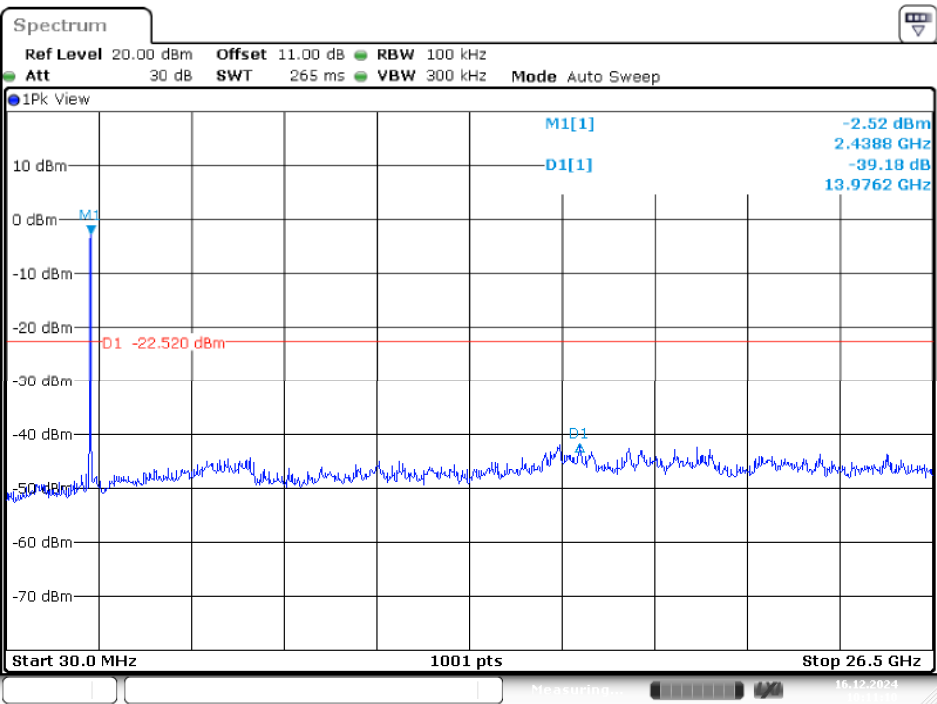


AX40 Mode

Low Channel

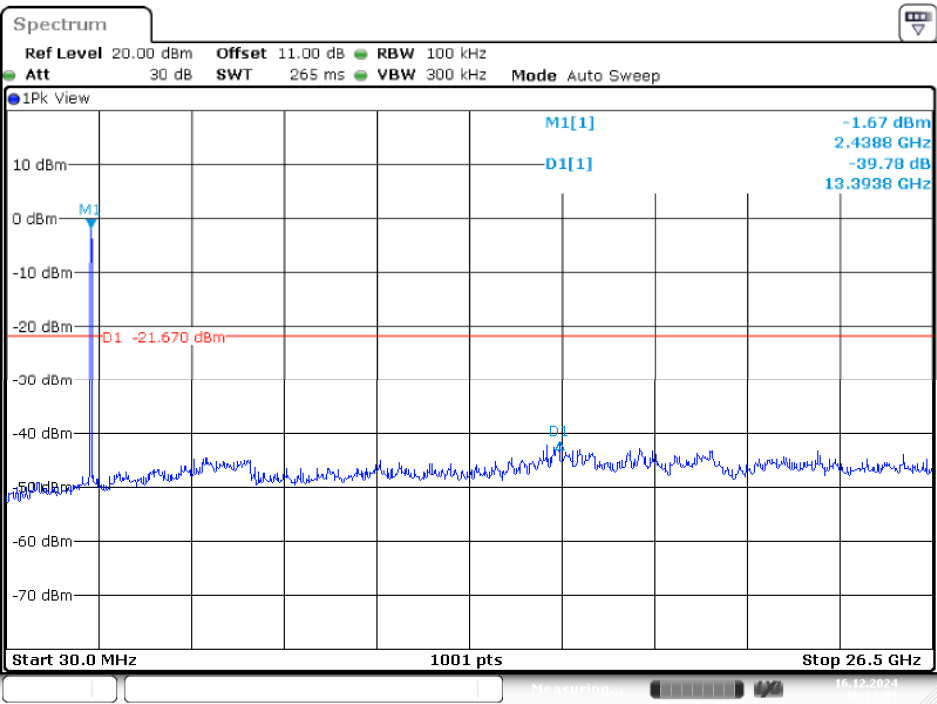


Middle Channel



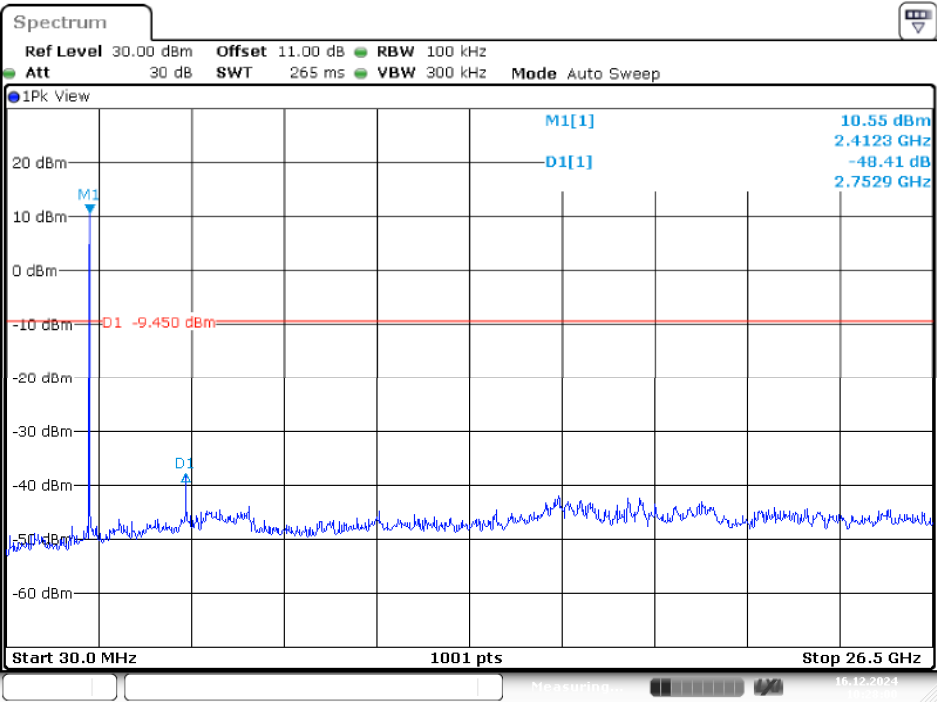
Date: 16.DEC.2024 10:11:10

High Channel

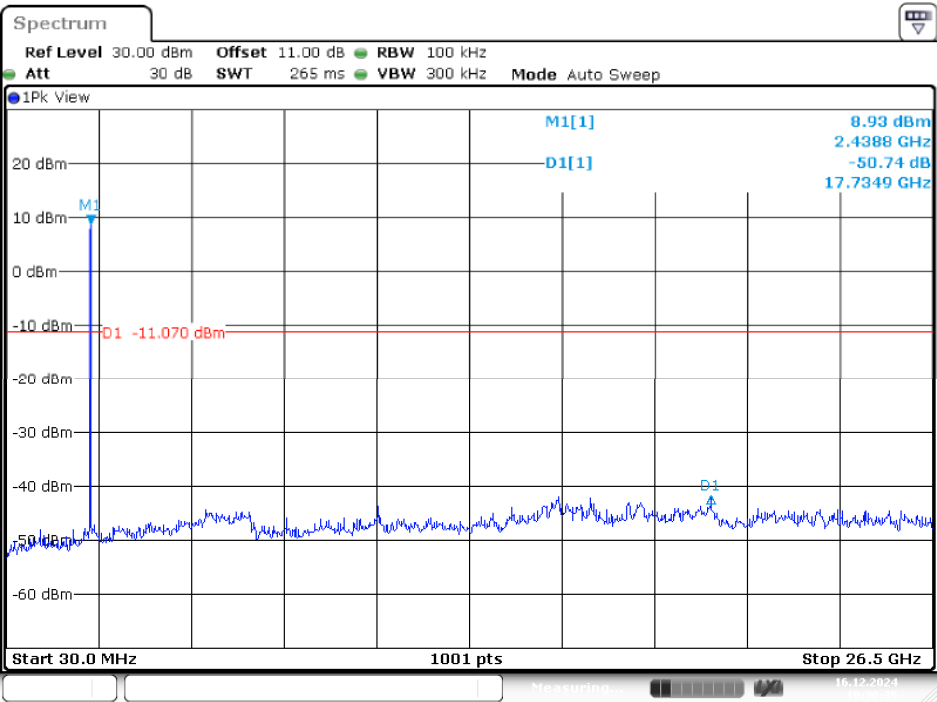


Date: 16.DEC.2024 10:14:52

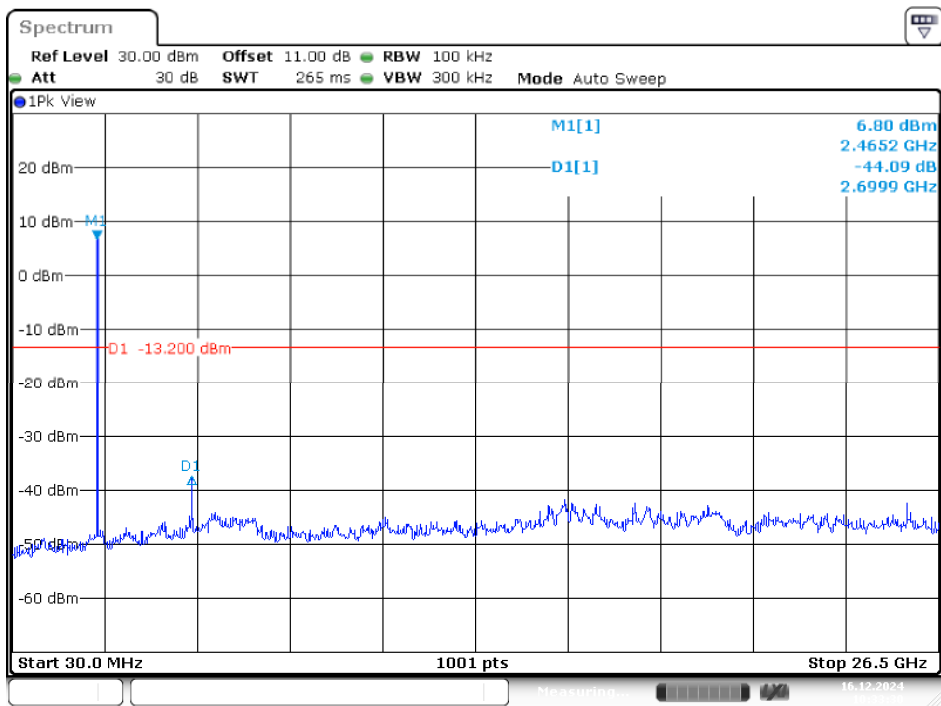
Chain 3
B Mode
Low Channel



Middle Channel

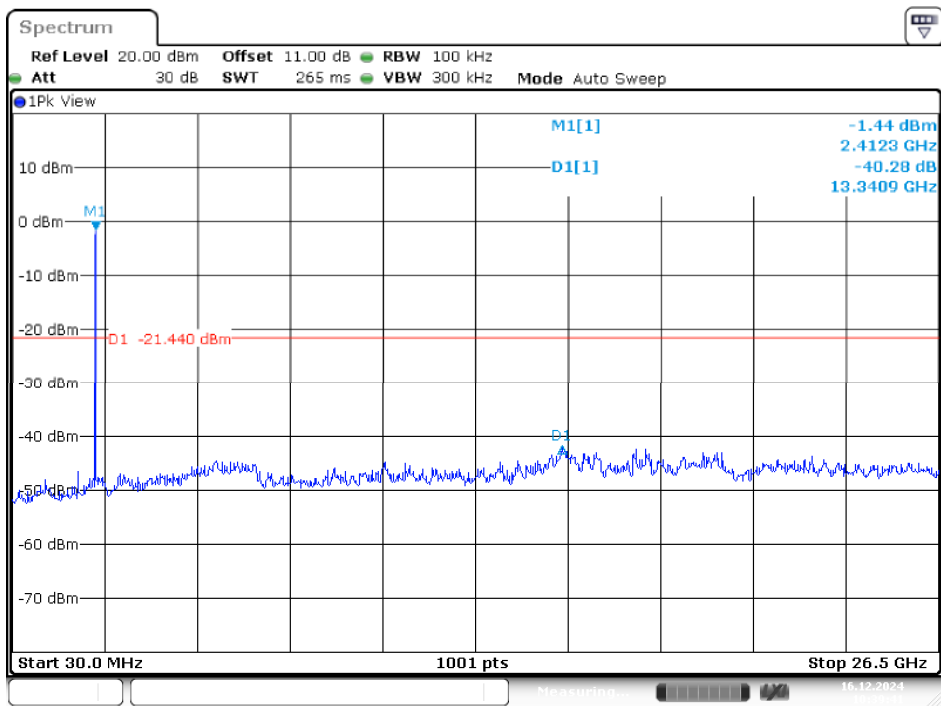


High Channel



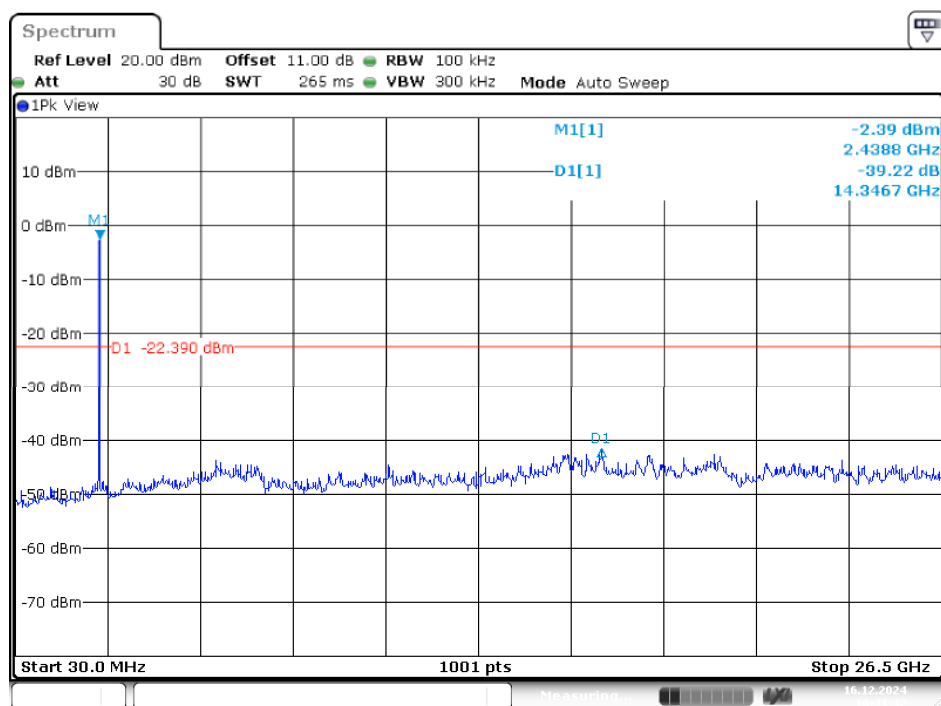
Date: 16.DEC.2024 10:33:31

G Mode
Low Channel



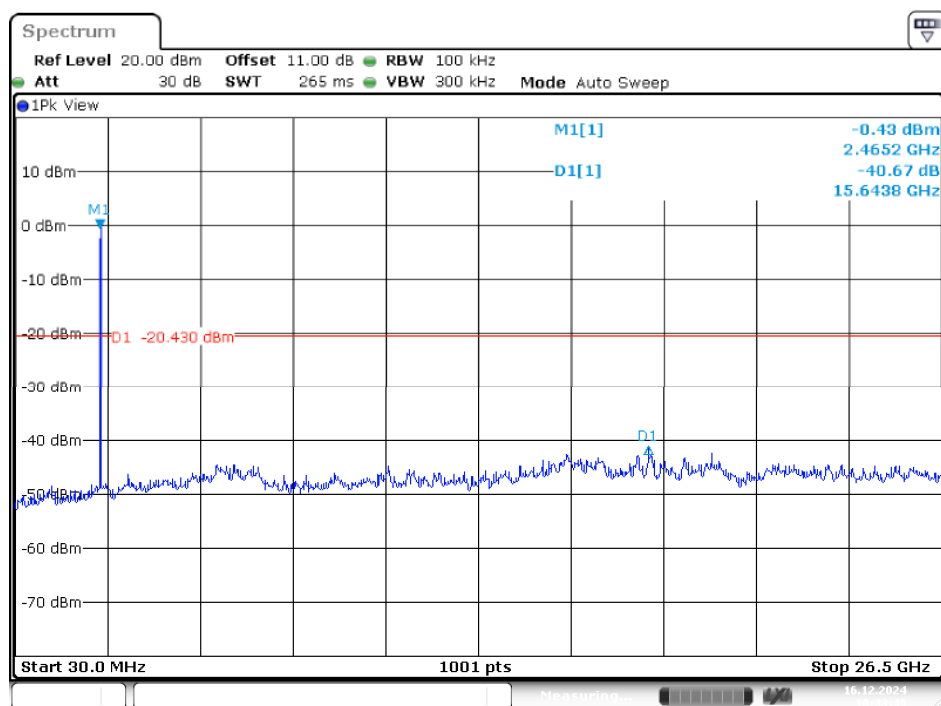
Date: 16.DEC.2024 10:39:41

Middle Channel



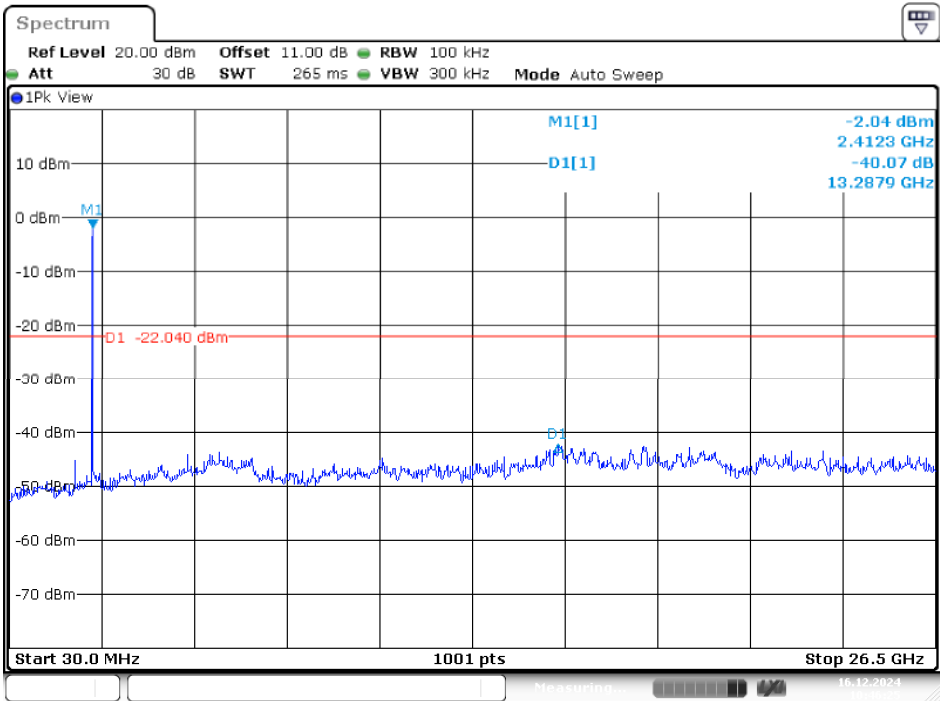
Date: 16.DEC.2024 10:41:42

High Channel

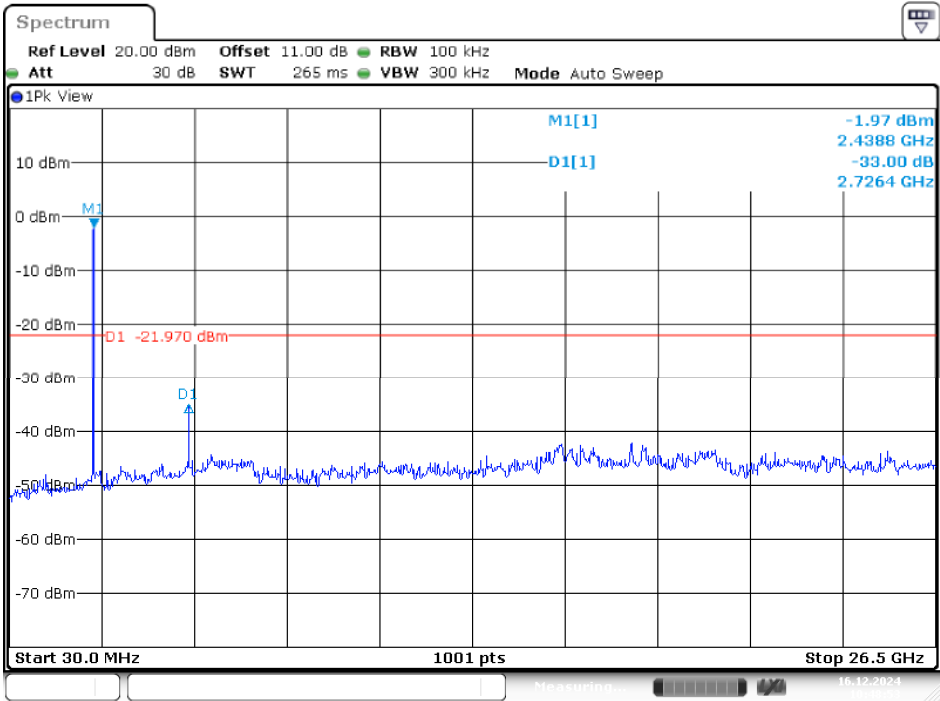


Date: 16.DEC.2024 10:43:50

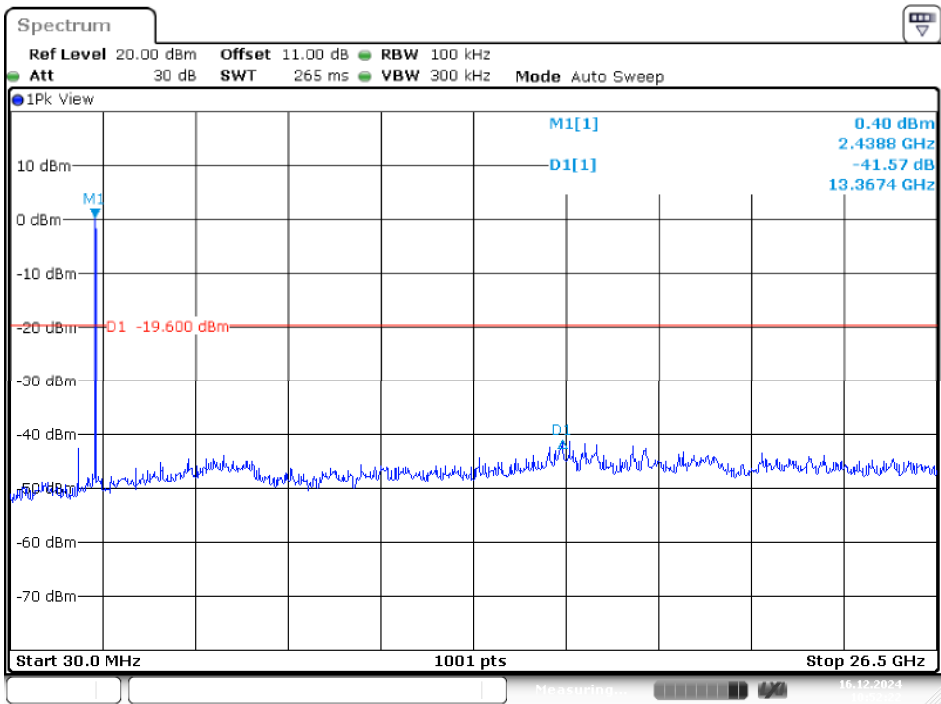
N20 Mode
Low Channel



Middle Channel

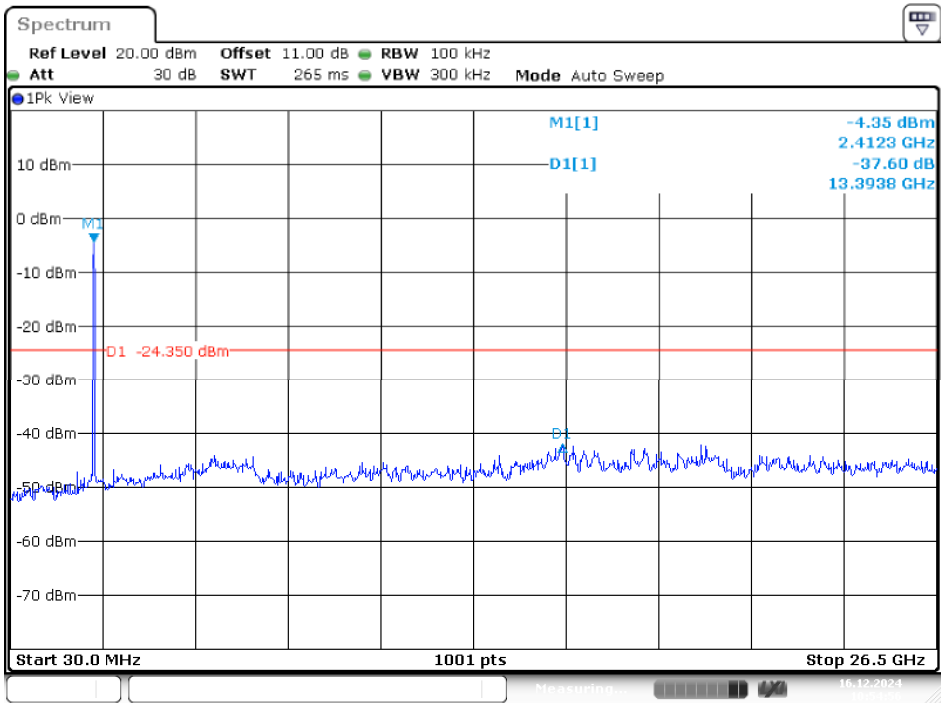


High Channel



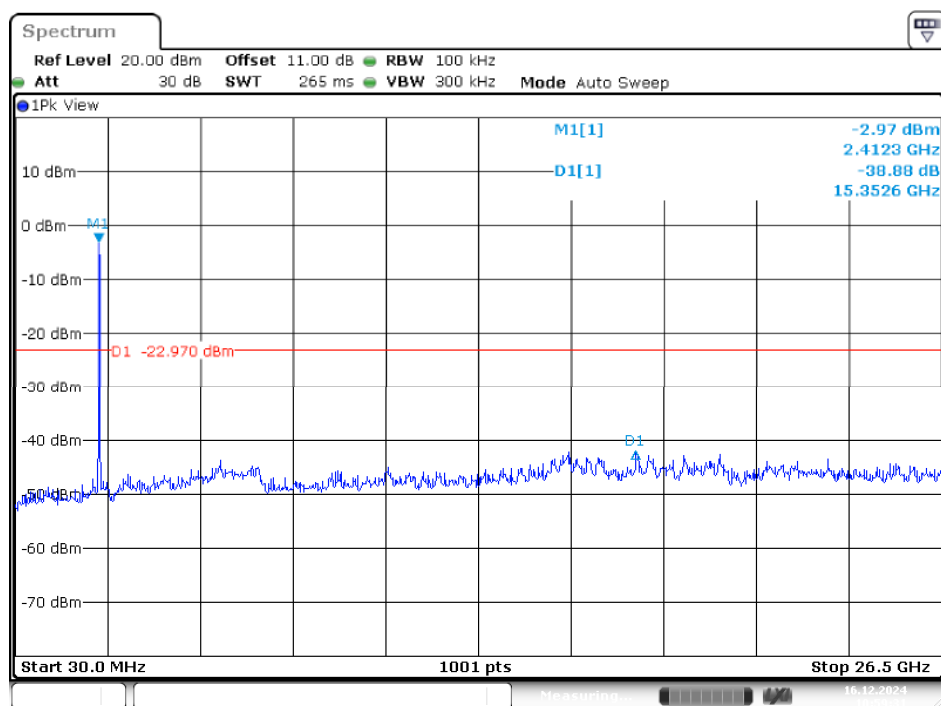
Date: 16.DEC.2024 10:52:23

N40 Mode
Low Channel



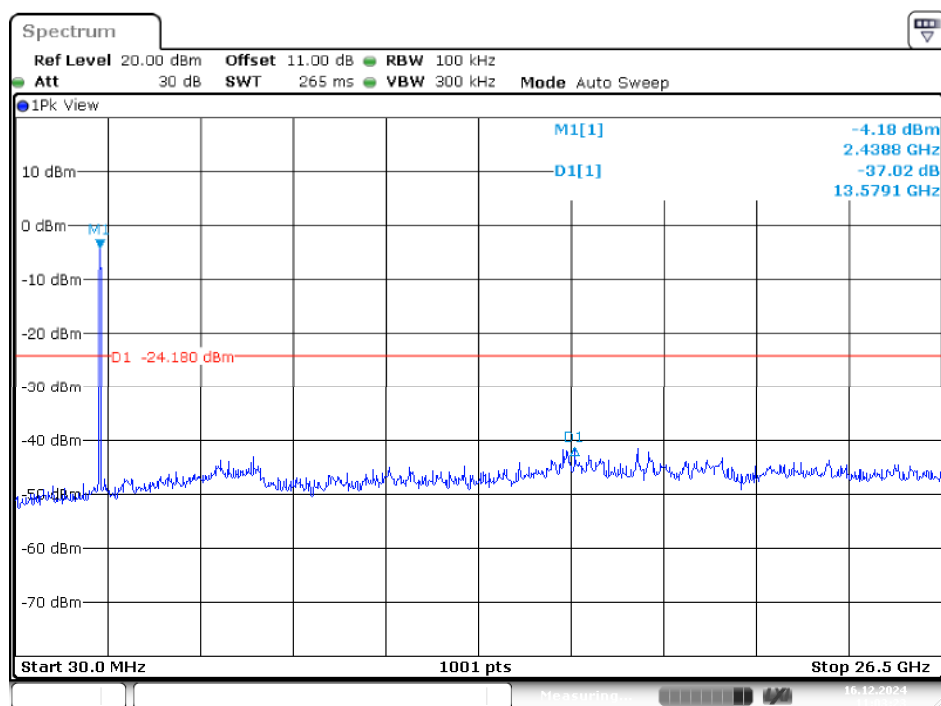
Date: 16.DEC.2024 10:54:56

Middle Channel



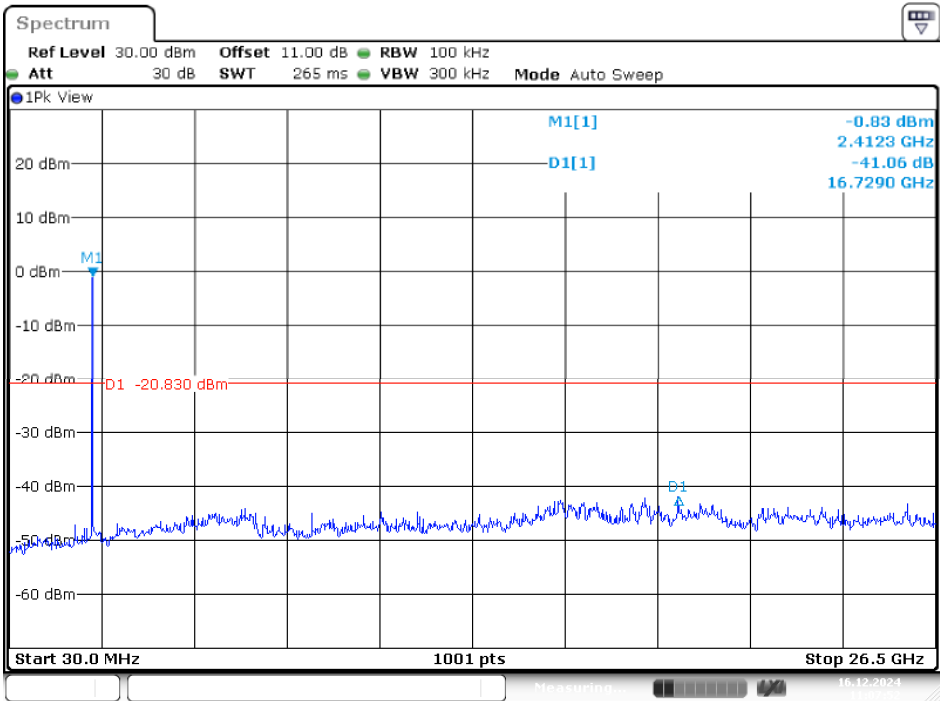
Date: 16.DEC.2024 10:59:31

High Channel



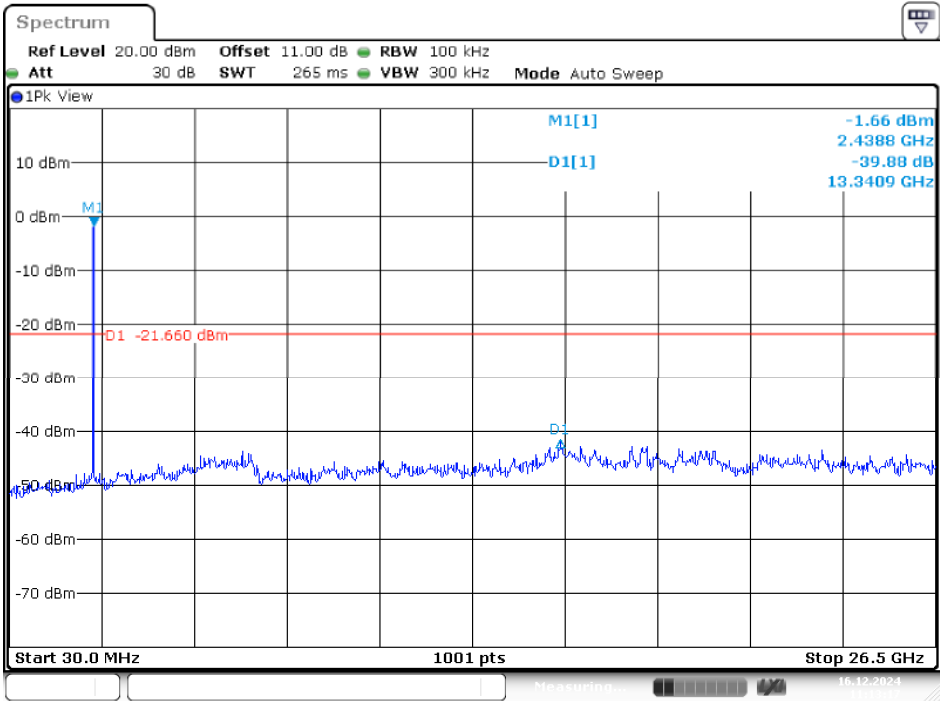
Date: 16.DEC.2024 11:03:24

AX20 Mode
Low Channel



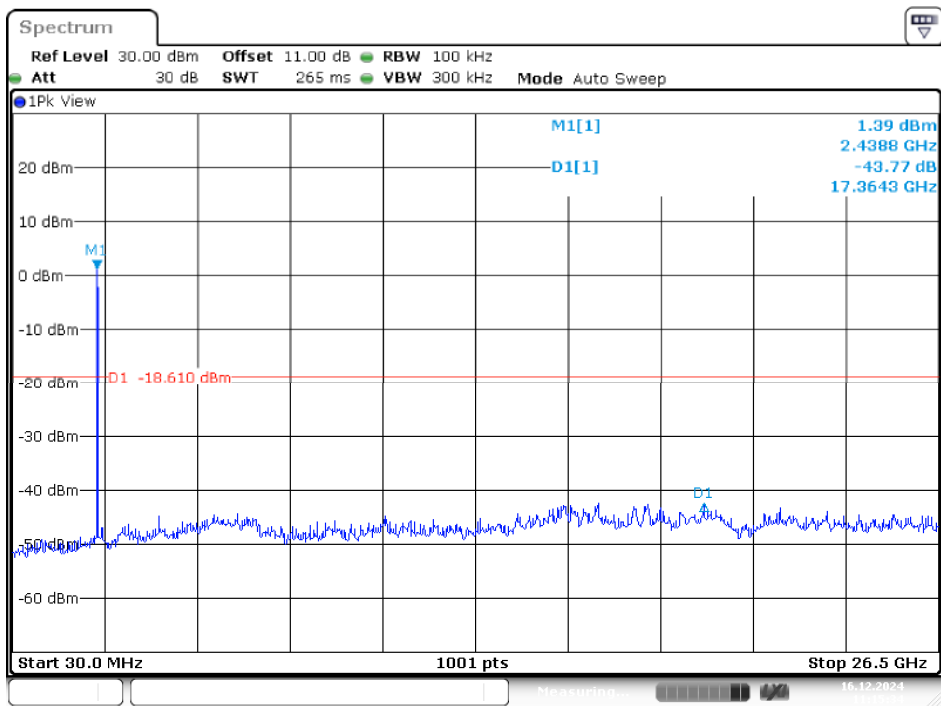
Date: 16.DEC.2024 11:07:53

Middle Channel



Date: 16.DEC.2024 11:13:17

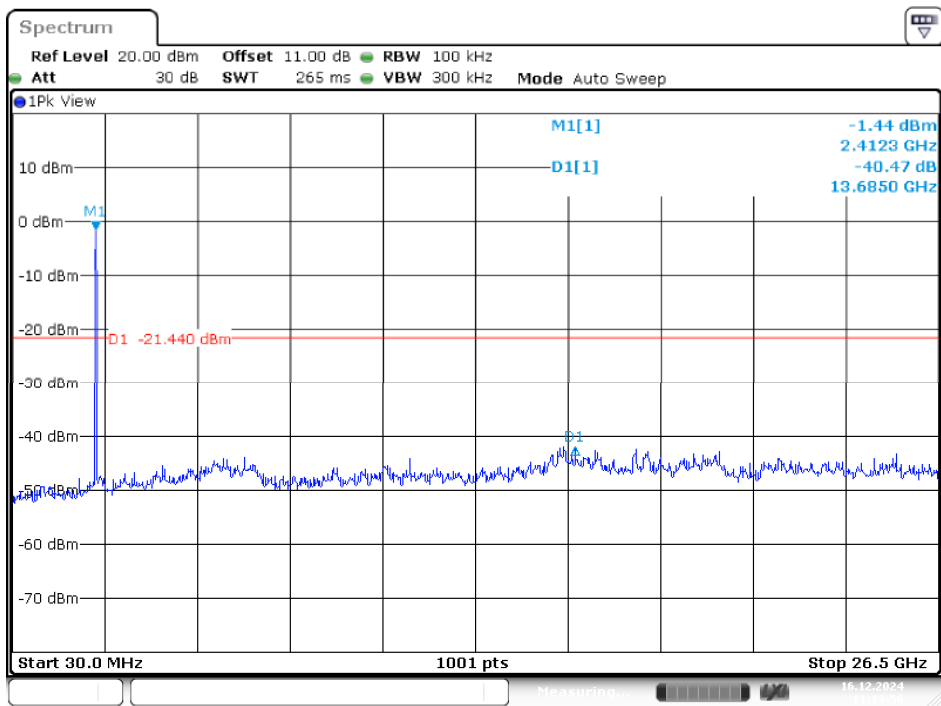
High Channel



Date: 16.DEC.2024 11:15:34

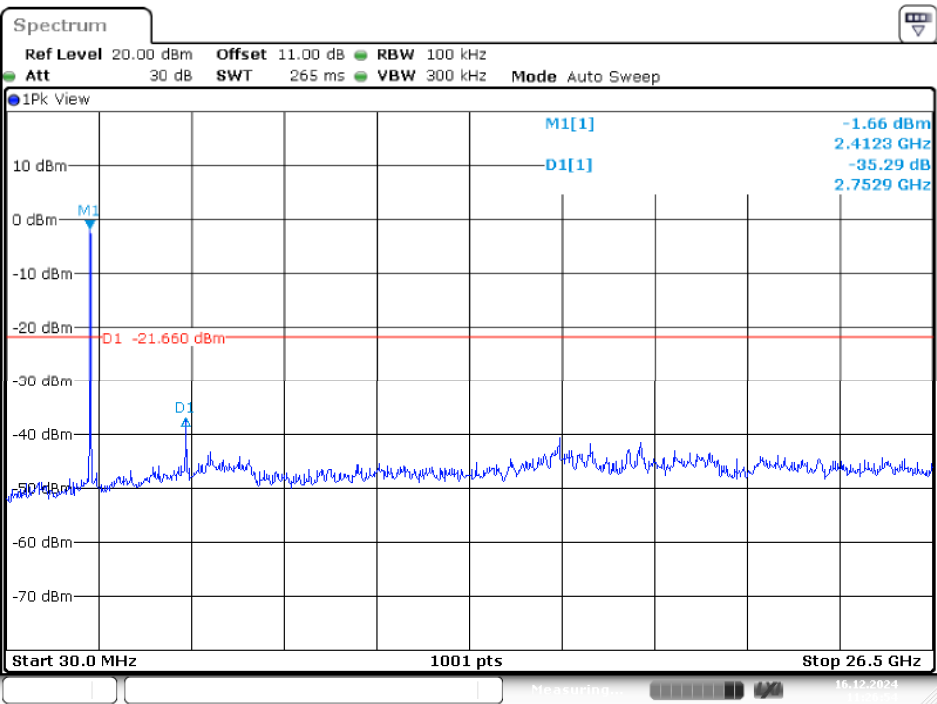
AX40 Mode

Low Channel



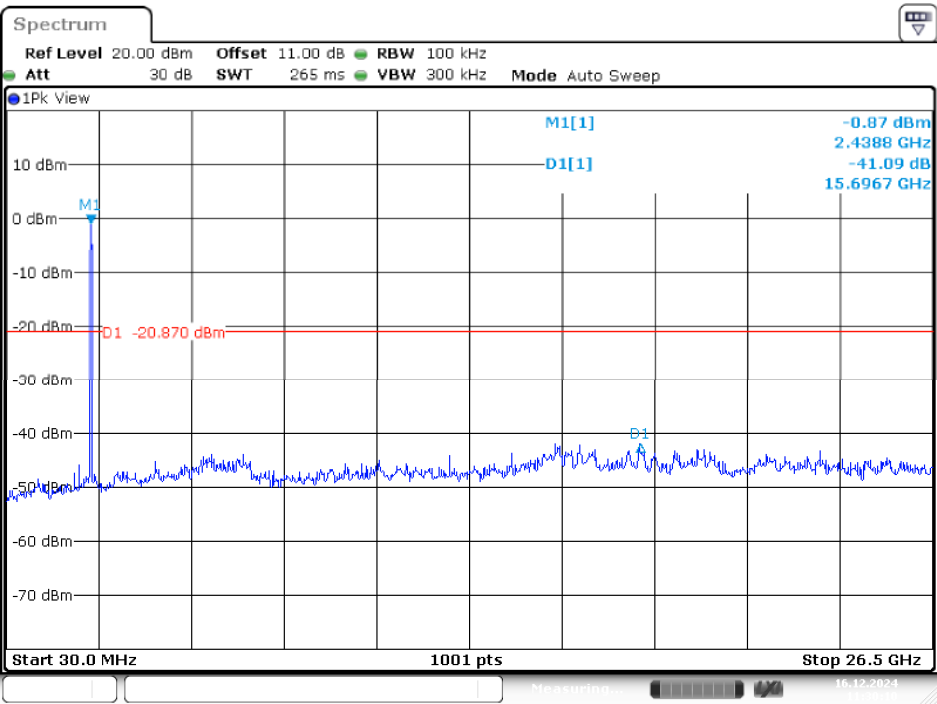
Date: 16.DEC.2024 11:19:56

Middle Channel



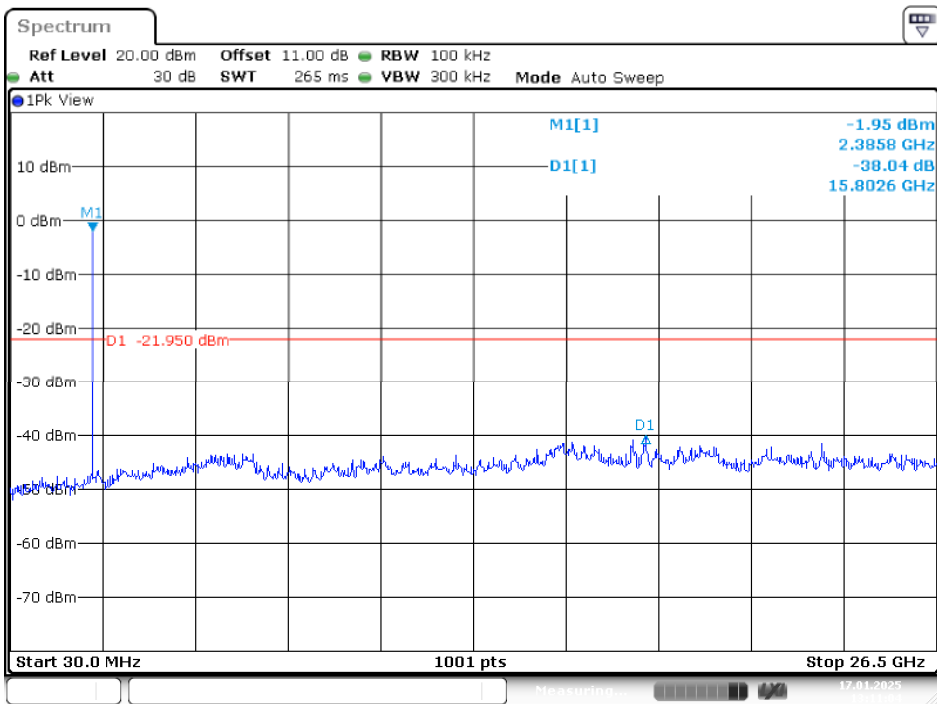
Date: 16.DEC.2024 11:26:55

High Channel



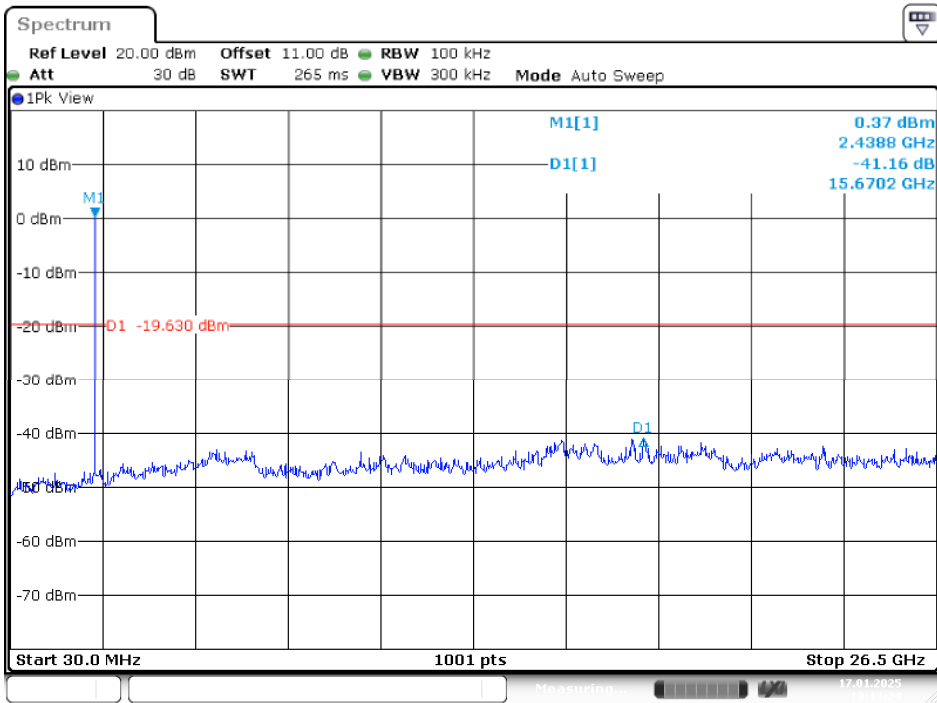
Date: 16.DEC.2024 11:30:11

BLE 1M Mode
Low Channel



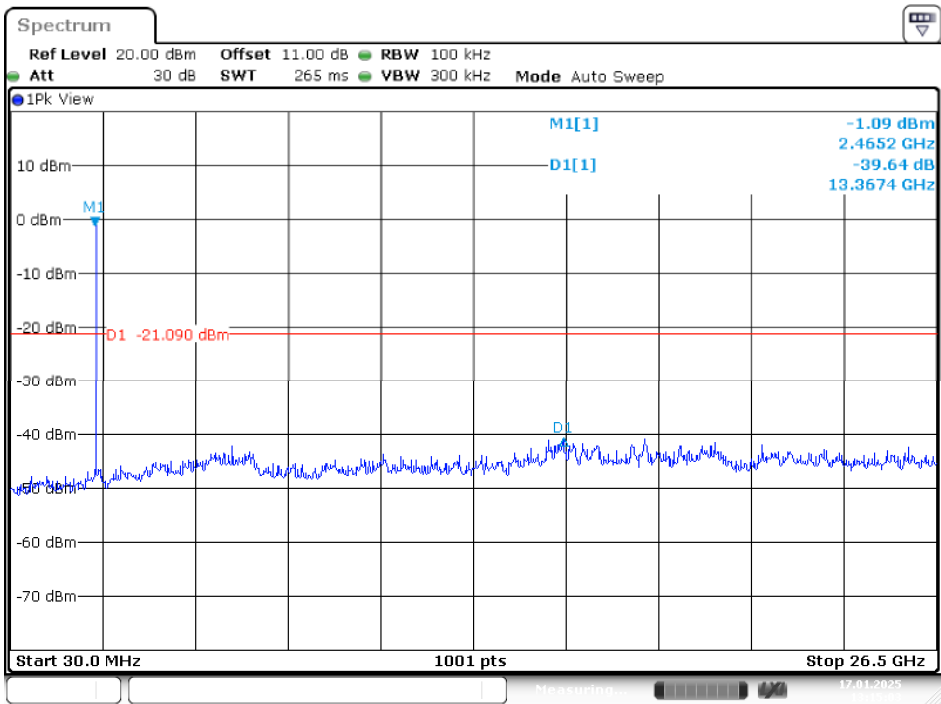
Date: 17.JAN.2025 13:11:04

Middle Channel



Date: 17.JAN.2025 13:13:24

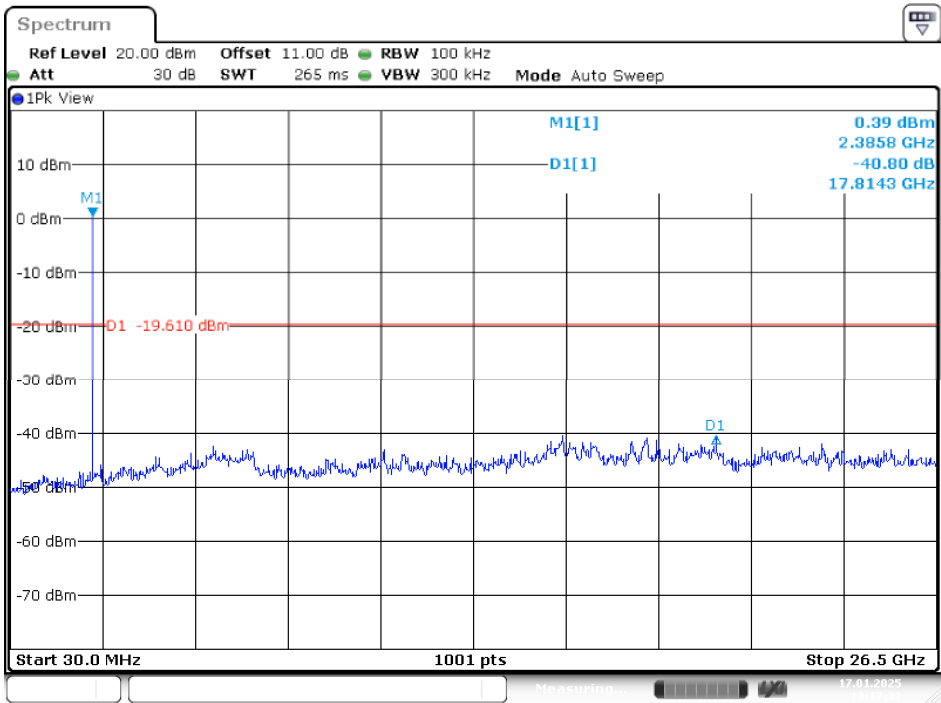
High Channel



Date: 17.JAN.2025 13:15:04

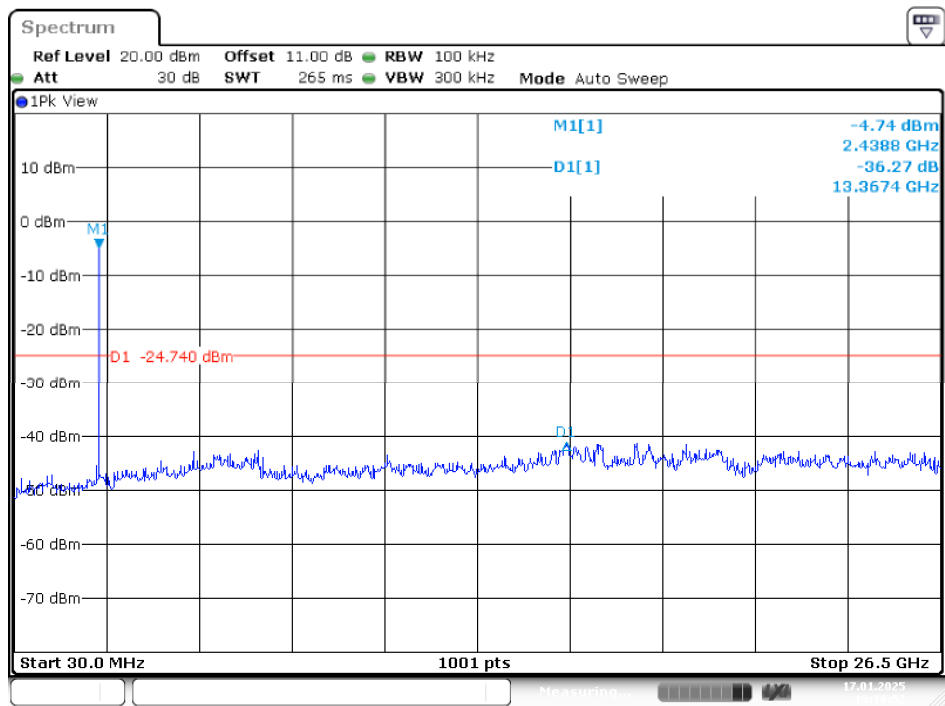
BLE 2M Mode

Low Channel



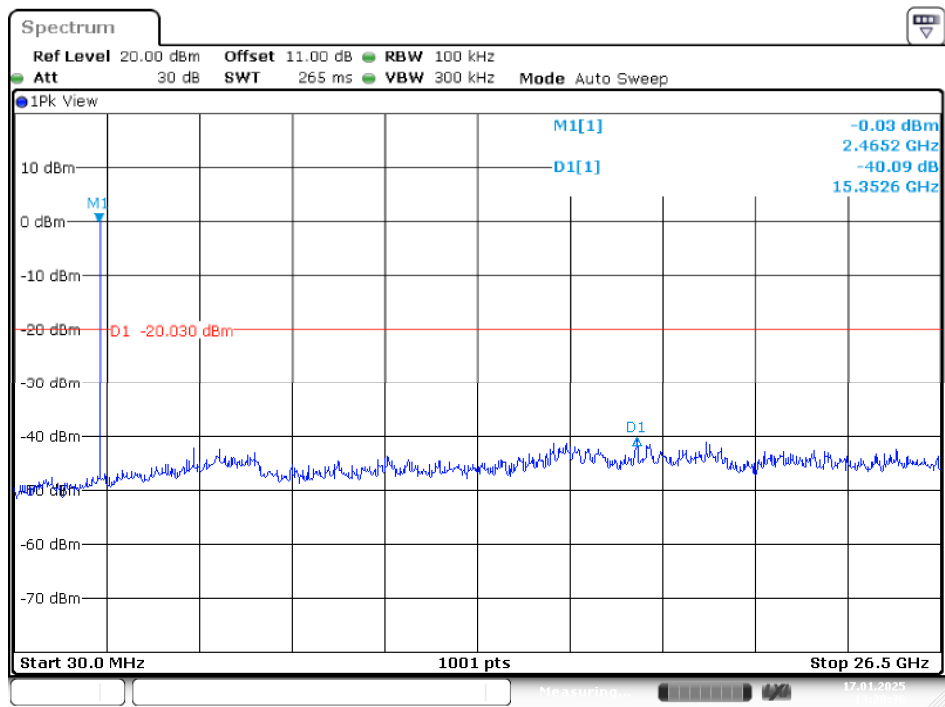
Date: 17.JAN.2025 13:17:34

Middle Channel



Date: 17.JAN.2025 13:18:52

High Channel



Date: 17.JAN.2025 13:20:36

9 FCC §15.247(a)(2) – 6 dB Emission Bandwidth

9.1 Applicable Standard

According to FCC §15.247(a)(2).

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Test Procedure

According to ANSI C63.10-2013, section 11.8

The steps for the first option are as follows:

- a) Set RBW = 100 kHz.
- b) Set the VBW $\geq [3 \times \text{RBW}]$.
- c) Detector = peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

9.3 Test Results

WIFI

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)				Limit (kHz)	Result
		Chain 0	Chain 1	Chain 2	Chain 3		
B mode							
Low	2412	8.04	8.04	8.08	8.04	> 500	PASS
Mid	2437	8.04	8.04	8.04	8.04	> 500	PASS
High	2462	8.04	8.04	8.08	8.04	> 500	PASS
G mode							
Low	2412	16.32	16.04	15.44	15.12	> 500	PASS
Mid	2437	16.32	16.28	15.64	15.12	> 500	PASS
High	2462	15.68	16.28	15.32	15.32	> 500	PASS
N20 mode							
Low	2412	17.56	17.28	17.16	15.36	> 500	PASS
Mid	2437	16.68	16.56	16.32	15.72	> 500	PASS
High	2462	16.08	16.92	16.28	16.04	> 500	PASS
N40 mode							
Low	2422	35.12	35.12	35.12	35.12	> 500	PASS
Mid	2437	35.12	35.12	35.12	35.12	> 500	PASS
High	2452	35.12	35.12	35.12	35.12	> 500	PASS
AX20 mode							
Low	2412	18.00	18.28	18.04	18.44	> 500	PASS
Mid	2437	16.80	18.28	17.28	17.80	> 500	PASS
High	2462	17.56	18.04	17.08	17.76	> 500	PASS
AX40 mode							
Low	2422	35.12	33.36	36.88	36.72	> 500	PASS
Mid	2437	35.12	37.28	36.88	36.32	> 500	PASS
High	2452	35.04	37.04	37.36	36.40	> 500	PASS