FCC Part 15.247

TEST REPORT

For

Main Technology Co.,Ltd.

5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.

FCC ID: 2A625-BMST1040Y

Report Type:	**Product Type:**
Original Report	MYSHOW-T MULTIMEDIA COMPUTER

Report Producer : Nana Hsu

Report Number : RLK220518001RF02

Report Date : 2022-07-15

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RLK220518001	RLK220518001RF02	2022-07-15	Original Report	Nana Hsu

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	Main Technology Co.,Ltd. 5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.
Manufacturer	Main Technology Co.,Ltd. 5F.,No.132,Wugong 1st Rd., Wugu Dist.,New Taipei City 24887 , Taiwan R.O.C.
Brand(Trade) Name	MyShow
Product (Equipment)	MYSHOW-T MULTIMEDIA COMPUTER
Main Model Name	BMST1040Y
Series Model Name	BMST1040R 、 BMST1040B 、 BMST1040W 、 BMST1040G 、 BMST1040P、BMST1040O
Model Discrepancy	The major electrical and mechanical constructions of series models are identical to the basic model, except different appearance color. The model, BMST1040Y is the testing sample, and the final test data are shown on this test report.
Frequency Range	IEEE 802.11b/g / IEEE 802.11n HT20 Mode: 2412 ~ 2462 MHz IEEE BLE(1M) : 2402 ~ 2480 MHz
Transmit Power	IEEE 802.11b Mode: 16.78 dBm (0.048W) IEEE 802.11g Mode: 25.63 dBm (0.366W) IEEE 802.11n HT20 Mode: 25.57 dBm (0.361W) BLE(1M) Mode : 4.4dBm (0.00275W)
Modulation Technique	IEEE 802.11b Mode: DSSS IEEE 802.11g Mode: OFDM IEEE 802.11n HT20 Mode: OFDM BLE(1M): GFSK
Power Operation (Voltage Range)	☒ AC 120V/60Hz ☒ Adapter Brand name: K.D. Intellingent Power Model: PDN-60E-120400 I/P:100-240V 1.4A 50-60Hz O/P:12.0V ⎓ 4.0A ☐ By AC Power Cord ☐ PoE
	☐ DC Type ☐ Battery ☐ DC Power Supply ☐ External from USB Cable ☐ External DC Adapter
	☐ Host System
Received Date	Jun. 08, 2022

Date of Test	Jun. 16, 2022 ~ Jul 11, 2022

**All measurement and test data in this report was gathered from production sample serial number: RLK220518001-01 (Assigned by BACL, Linkou Laboratory).*

1.2 Objective

This report is prepared on behalf of *Main Technology Co.,Ltd.* in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communication Commission's rules.
The objective is to determine compliance with FCC Part 15.247 rules for Output Power, Antenna Requirements, 6 dB Bandwidth, Power Spectral Density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Radiated Spurious Emissions.

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 662911 D01 Multiple Transmitter Output v02r01
KDB 558074 D01 DTS Meas Guidance v05

1.4 Statement of Compliance

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

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. (Linkou 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		+/- 2.36 dB
RF output power, conducted		±0.74 dBm
Power Spectral Density, conducted		±1.14 dBm
Occupied Bandwidth		±0.94 MHz
Unwanted Emissions, conducted		±0.66 dBm
Emissions, radiated	±1.36 dBm	+/- 5.46 dB
	±2.3 dBm	+/- 5.24 dB
	±2.23 dBm	+/- 5.62 dB
	±2.23 dBm	+/- 5.86 dB
Temperature		+/- 1.71°C
Humidity		+/- 3.00 %

1.6 Environmental Conditions

Test Site	Test Data	Temperature (℃)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
AC Line Conducted Emissions	2022/7/11	24	58	1010	Sandy Yang
Radiation Spurious Emissions	2022/6/22-2022/6/28	26.3-27	55-56	1010	Allen Cheng
Conducted Spurious Emissions	2022/6/16	23.6	51	1010	Rory Cheng
6 dB Emission Bandwidth	2022/6/16	23.6	51	1010	Rory Cheng
Maximum Output Power	2022/6/16	23.6	51	1010	Rory Cheng
100 kHz Bandwidth of Frequency Band Edge	2022/6/16	23.6	51	1010	Rory Cheng
Power Spectral Density	2022/6/16	23.6	51	1010	Rory Cheng

1.7 Test Facility

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

☒ No.6, Wende 2Rd., Guishan Dist., Taoyuan City 33382, Taiwan (R.O.C.).

Bay Area Compliance Laboratories Corp. (Linkou Laboratory) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3546) by Mutual Recognition Agreement (MRA). The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database. The FCC Registration No.: 0027578244. Designation No.: TW1119. The Test Firm Registration No.: 311381.

2 System Test Configuration

2.1 Description of Test Configuration

For WIFI 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/n20 Modes were tested with channel 1, 6 and 11.

For 802.11n40 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.

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

2.2 Equipment Modifications

No modification was made to the EUT.

2.3 EUT Exercise Software

Used “ADB command” software.

Engineering Mode		Power Level Setting					
Test Frequency		Low		Middle		High	
		Chain 0	Chain 1	Chain 0	Chain 1	Chain 0	Chain 1
Mode	802.11b Mode MIMO(CDD)	63	63	63	63	63	63
	802.11g Mode MIMO(CDD)	53	60	55	57	55	63
	802.11n HT20 Mode MIMO(CDD)	51	55	54	57	52	61
	BLE Mode	Default		Default		Default	

The EUT was configured for testing in an engineering mode which was provided by the manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

The device supports MIMO (CDD) at all modes.

802.11b: 1Mbps

802.11g: 6Mbps

802.11n HT20: MCS0

802.11n HT40: MCS0

BLE 1M : 1 Mbps

2.4 Test Mode

Pre-Scan

Mode 1: Full System for all test item.

2.5 Support Equipment List and Details

No.	Description	Manufacturer	Model Number
A	Monitor	DELL	P2415Q
B	SD Card	SanDisk	7204DVGDB0GG
C	USB flash	SanDisk	N/A
D	MIC 1	G&V	GV-MIO01
E	MIC 2	G&V	GV-MIO01
F	AP	D-Link	DIR-850L

2.6 External Cable List and Details

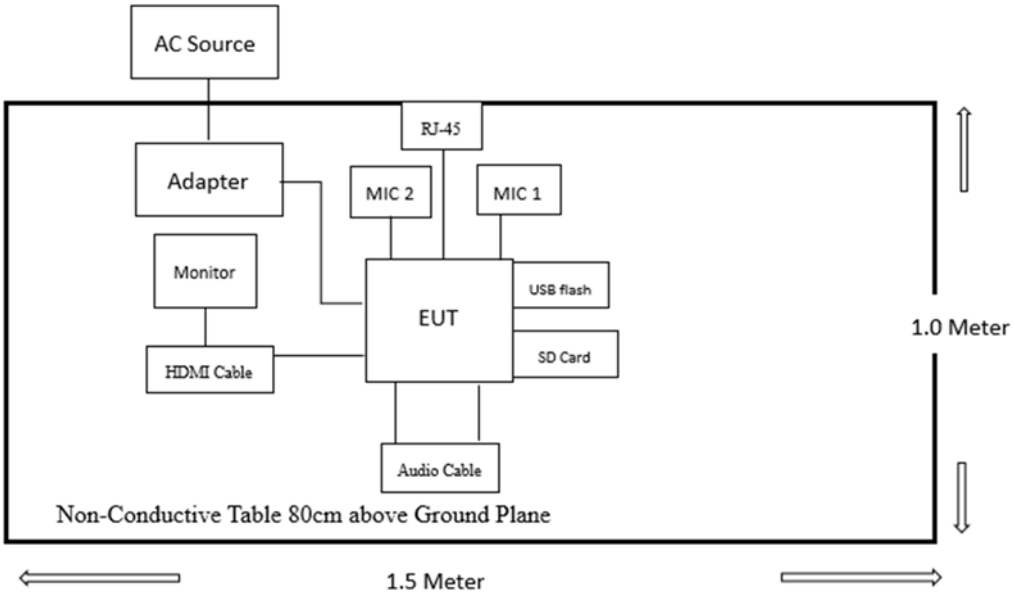
No.	Cable Description	Length (m)	From	To
1	HDMI Cable	1.06M	EUT	Monitor
2	RJ-45 Cable	2M	EUT	PC
3	Audio Cable	1.55M	EUT	EUT
4	MIC 1	5M	EUT	MIC1
5	MIC 2	5M	EUT	MIC2

2.7 Block Diagram of Test Setup

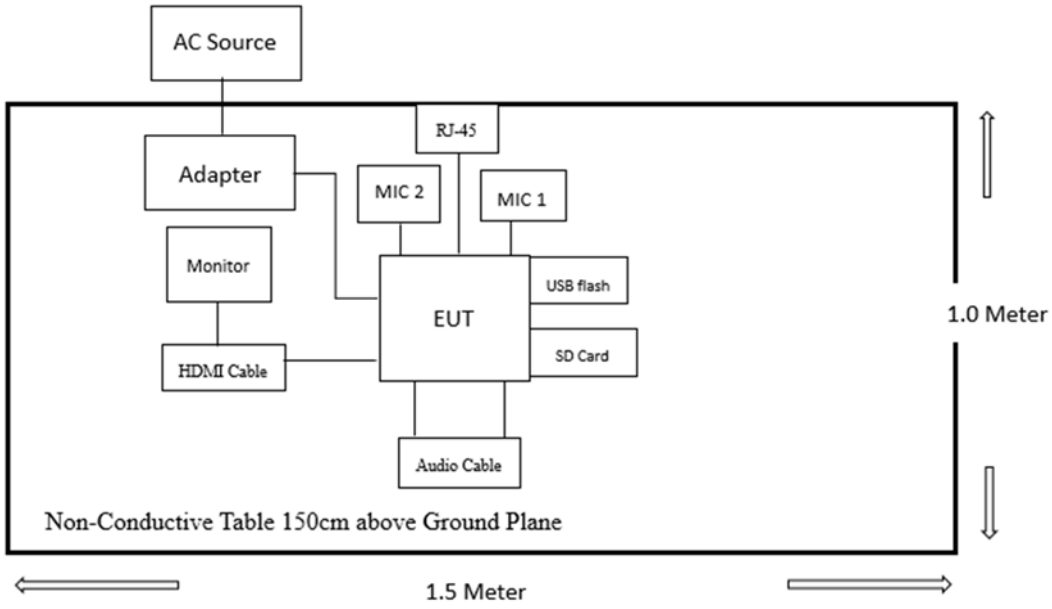
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

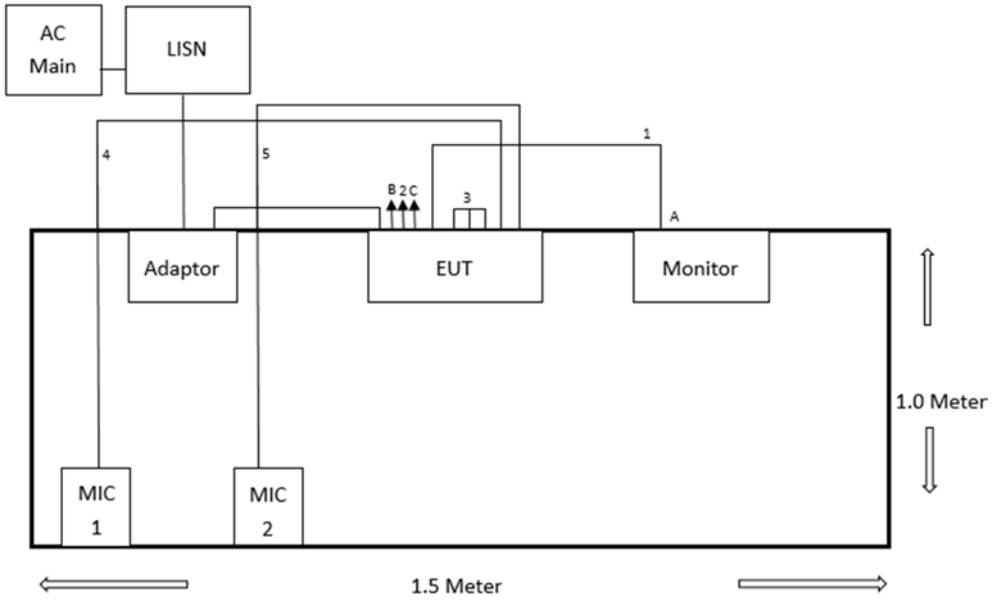
Below 1GHz:



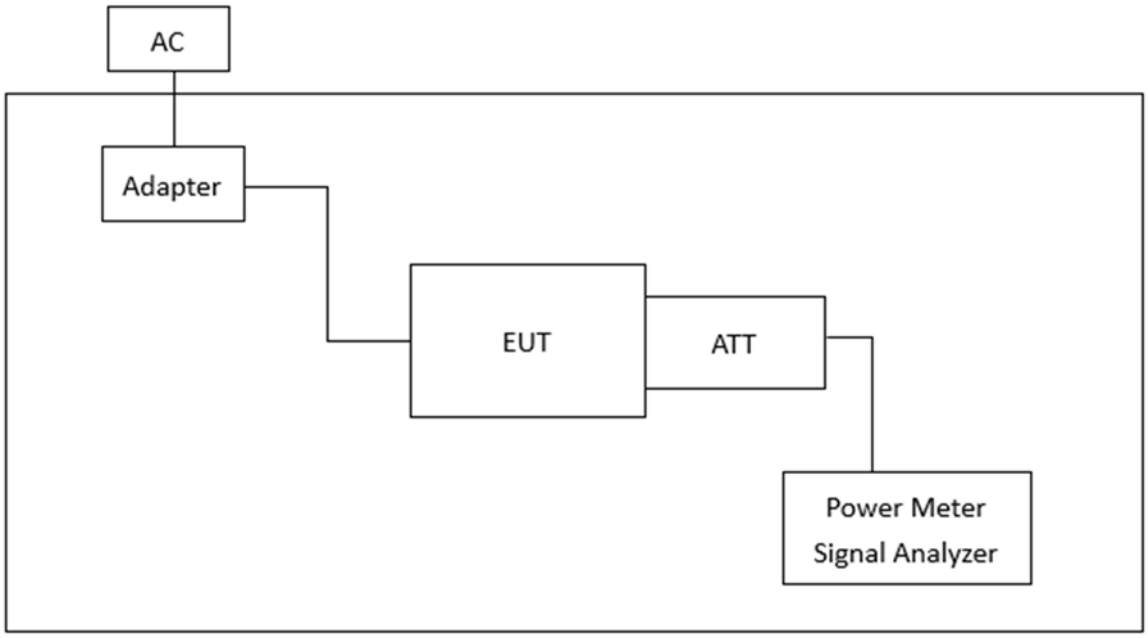
Above 1GHz:



Conduction:



Conducted:



2.8 Duty Cycle

According to KDB 558074 D01 15.247 Meas Guidance v05 section 6.0:

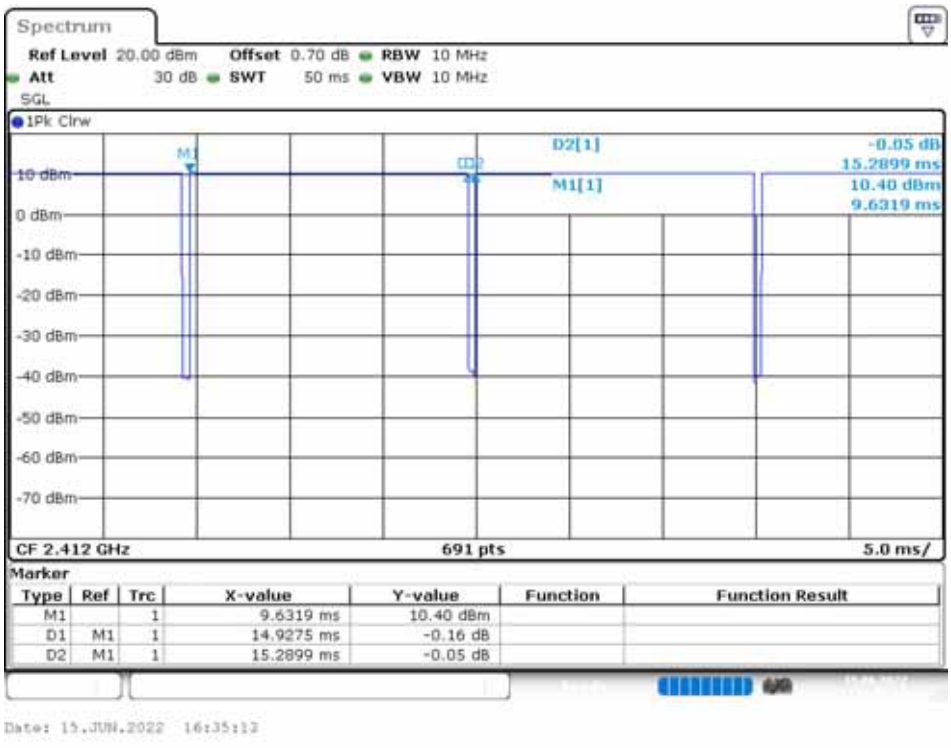
All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximumpower transmission duration, T, are required for each tested mode of operation.

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11b	14.92	0.36	98	0.09
802.11g	2.44	0.2	92	0.36
802.11n20	12.34	0.23	98	0.09
BLE(1M)	0.1	0.52609	16	7.96

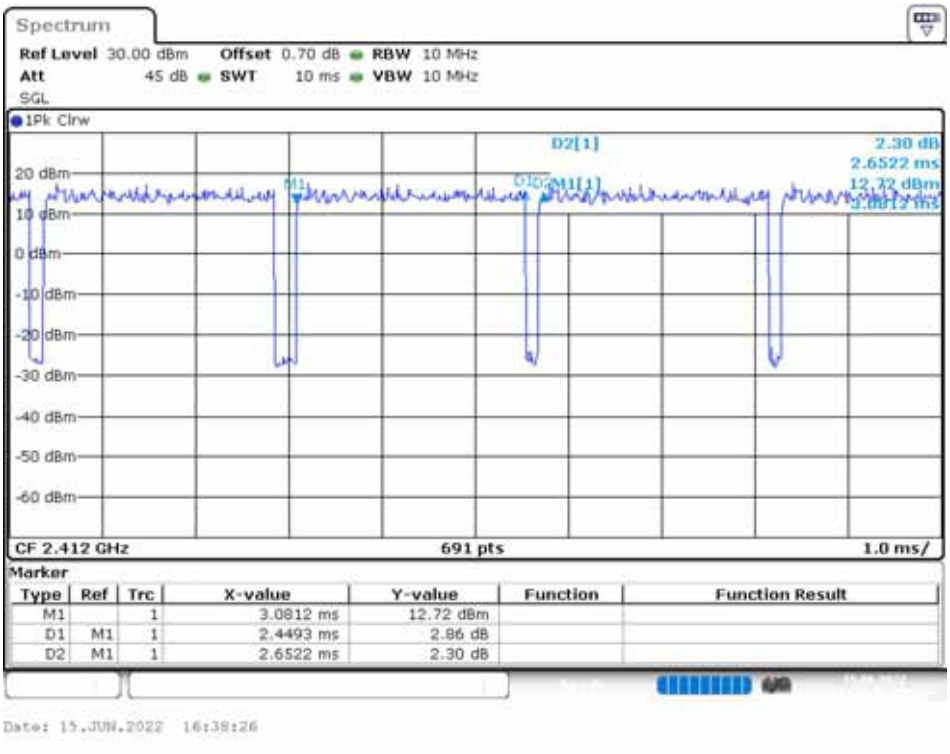
Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

Please refer to the following plots.

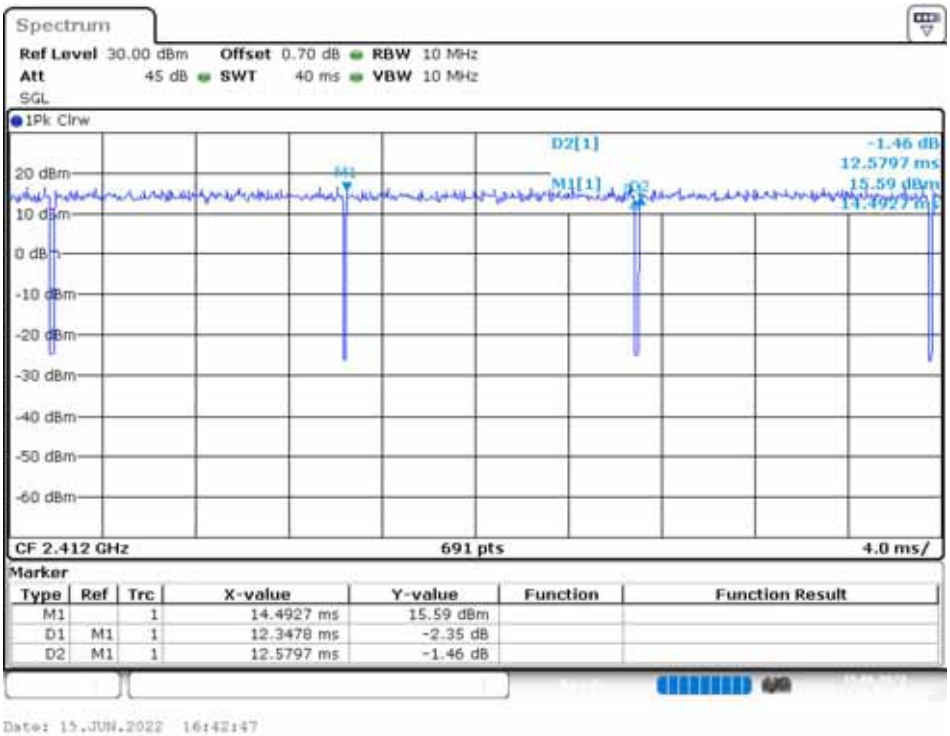
B Mode



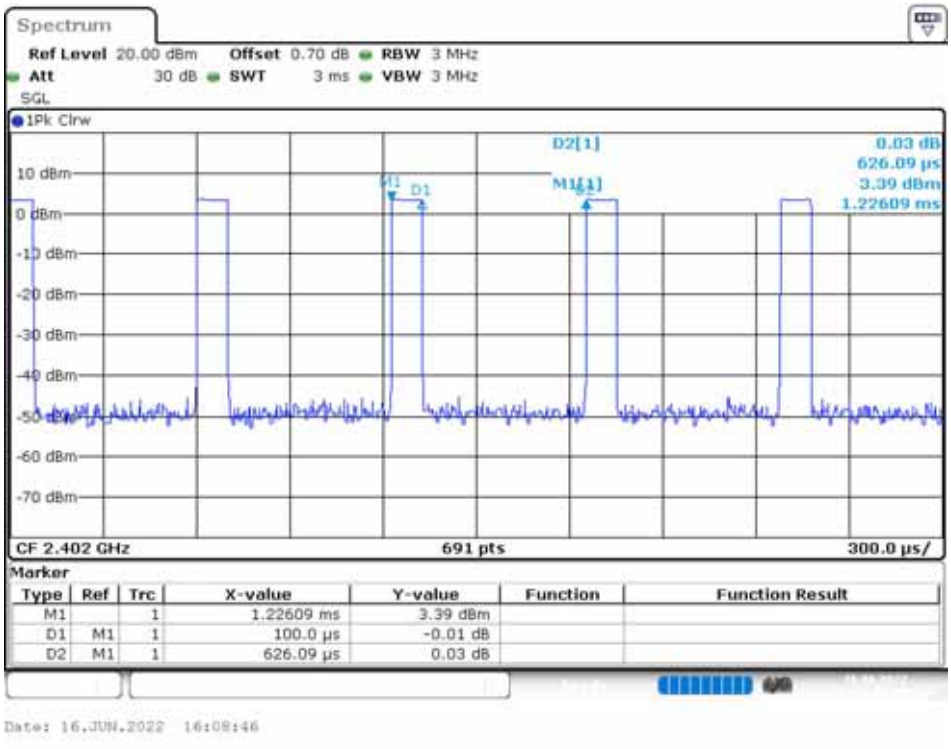
G Mode



N20 Mode



BLE Mode


Spectrum
Ref Level 20.00 dBm Offset 0.70 dB RBW 3 MHz
Att 30 dB SWT 3 ms VBW 3 MHz
SGL
1Pk Clrw
D2[1] 0.03 dB
626.09 µs
M1[1] 3.39 dBm
1.22609 ms
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.402 GHz
691 pts
300.0 µs/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 1.22609 ms 3.39 dBm
D1 M1 1 100.0 µs -0.01 dB
D2 M1 1 626.09 µs 0.03 dB
Date: 16.JUN.2022 16:08:46

3 Summary of Test Results

FCC Rules	Description of Test	Results
§15.247(i), §1.1307(b)(3)(i)	RF Exposure	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247(a)(2)	6 dB Emission Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§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)					
Coaxial Cable 5C-2V (1.5M)	PX	P5C-2P-1.5M	PTP246-01	2021/11/5	2022/11/4
Coaxial Cable 5C-2V (3M)	HER YING	RG-10-3M	LKTE059	2021/11/5	2022/11/4
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00432	2021/9/1	2022/8/31
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102430	2022/04/28	2023/04/27
Line Impedance Stabilization Network	COM-POWER	LI-550C	20140014	2020/9/11	2022/9/10
Line Impedance Stabilization Network	COM-POWER	LI-550C	20140015	2020/9/11	2022/9/10
RF Cable	EMCI	EMCCFD300-BM-BM-8000	180526	2021/8/17	2022/8/16
Two-Line V-Network	Rohde & Schwarz	ENV216	100037	2021/9/10	2022/9/9
Radiated Room					
Bilog Antenna & 6 dB Attenuator	SUNOL SCIENCES & EMCI	JB3 & N-6-06	A111513 & AT-N0668	2022/4/11	2023/4/10
Horn Antenna	ETS-Lindgren	3115	109141	2021/7/12	2022/7/11
Horn Antenna	ETS-Lindgren	3160-09	123852	2021/7/13	2022/7/12
Horn Antenna	ETS-Lindgren	3160-10	123855	2021/7/13	2022/7/12
Spectrum Analyzer	Rohde & Schwarz	FSV40	101940	2021/12/15	2022/12/14
ESR EMI Test Receiver	Rohde & Schwarz	ESR3	102448	2021/9/28	2022/9/27
Preamplifier	A.H. Systems	PAM-1840VH	174	2022/3/23	2023/3/22
Preamplifier with 1W input limiter	A.H. Systems	PAM-0118P	470	2022/3/23	2023/3/22

Microflex Cable (1m)	MTJ	00000-MT26A-100	H0919	2021/8/7	2022/8/6
Microflex Cable (2m)	EMCI	EMC106-SM-SM-2000	180515	2021/8/7	2022/8/6
Microflex Cable (8m)	UTIFLEX	UFA210A-1-3149-300300	MFR 64639 232490-001	2021/8/7	2022/8/6
Band Reject Filter	Xi'an Xingbo	XBLBQ-DZA81	190329-1-08	2022/4/14	2023/4/13
Band Reject Filter	Xi'an Xingbo	XBLBQ-DZA62	190329-1-01	2022/4/14	2023/4/13
Temperature and Humidity Recorder	N/A	HTC-1	N/A	2021/11/5	2022/11/4
Conducted Room					
Signal and Spectrum Analyzer (with B21)	Rohde & Schwarz	FSV40	1321.3008K40-101938-Gt	2021/12/7	2022/12/6
Coaxial Cable	HER YING	RG-10-3M	LKTE059	2021/11/05	2022/11/04
Attenuator	HAEFELY TEST AG	PAT50A & PAT1000	187177 & 187176	2021/10/20	2022/10/19
Power Sensor	AGILENT	E9301A	MY41498915	2022/03/29	2023/03/28

***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), §1.1307(b)(3)(i) - RF Exposure

5.1 Applicable Standard

According to subpart 15.247(i) and subpart §1.1307(b)(3)(i), 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.

For single RF sources (*i.e.,* any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold *Pth* (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). *Pth* is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

The sequence to apply for single portable RF sources includes the following steps:

1) determination of 1 mW blanket exemption under § 1.1307(b)(3)(i)(A)

2) determination of exemption under the MPE-based § 1.1307(b)(3)(i)(C) if 1) is not met

3) determination of exemption under the SAR-based § 1.1307(b)(3)(i)(B) if both 1) and 2) are not met

5.2 RF Exposure Evaluation Result

The EUT can be used in the WIFI and Bluetooth modes, selecting the worst mode for evaluation.

Wi-Fi and Bluetooth cannot transmit simultaneously.

Project info

Band	Freq (MHz)	Tune-up (dBm)	Ant Gain (dBi)	Distances (mm)	Duty (%)	Tune-up (mW)	ERP (dBm)	ERP (mW)
WIFI 2.4G	2412	15.5	3	200	100%	35.48	16.35	43.15
Bluetooth LE	2402	4	2	200	100%	2.51	3.85	2.43

§ 1.1307(b)(3)(i)(A) method is not applicable.

§ 1.1307(b)(3)(i)(C)

Band	Freq (MHz)	λ/2π (mm)	Distances applies	ERP Limit (mW)	Ratio	Result
WIFI 2.4G	2412	19.8	apply	768.00	0.06	exempt
Bluetooth LE	2402	19.88	apply	768.00	< 0.01	exempt

The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates

ERP (watts) is no more than the calculated value prescribed for that frequency

R must be at least $\lambda/2\pi$

λ is the free-space operating wavelength in meters

Result: The EUT meets exemption requirement

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.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6dBi.

6.2 Antenna List and Details

For WIFI

Manufacturer	Model	Antenna Type	Antenna Gain
SHENZHEN FEISHENG	L=300M	FPC Antenna	3.0 dBi

For BLE

Manufacturer	Model	Type	Antenna Gain
SHENZHEN FEISHENG	L250MM	FPC Antenna	2.0 dBi

Result: Compliance

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

7.1 Applicable Standard

According to §15.207

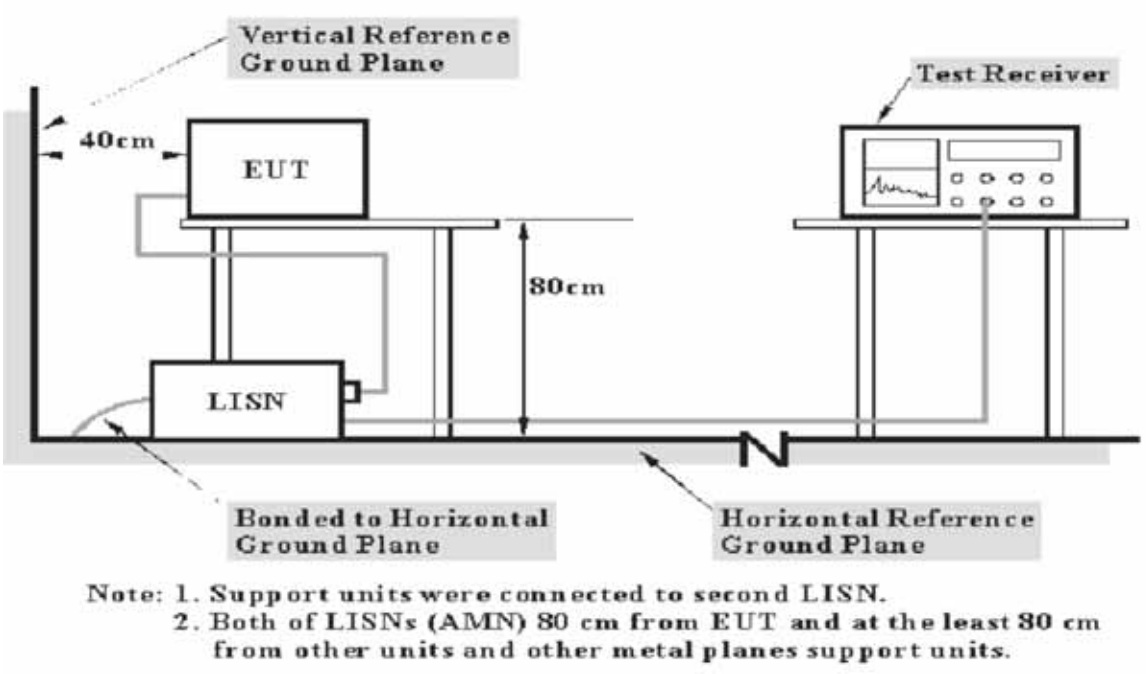
For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured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

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 2
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.

Note 2: A linear average detector is required

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 & Margin Calculation

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

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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

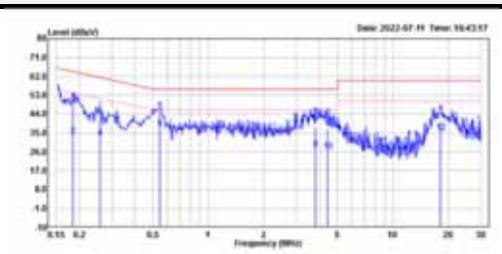
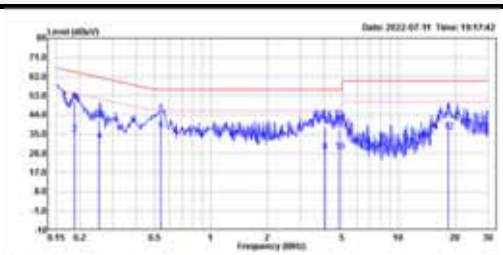
Over Limit = Level – Limit Line

7.6 Test Results

Test Mode: Transmitting

Main: AC120 V, 60 Hz, Line

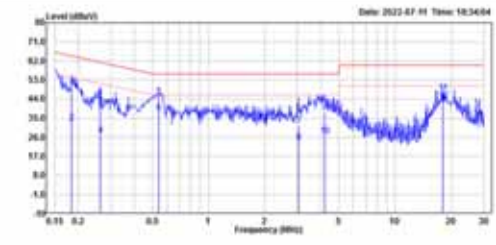
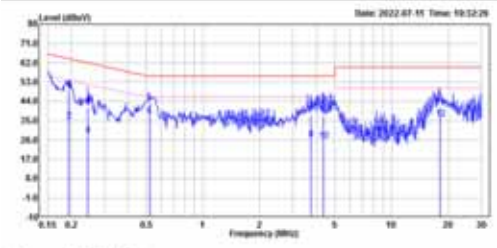
WIFI (802.11G_2412 MHz)

Line	Neutral
	

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.185	29.95	49.76	19.81	64.28	-14.52	QP
2	0.185	13.52	33.33	19.81	54.28	-20.95	Average
3	0.258	22.19	42.01	19.82	61.50	-19.49	QP
4	0.258	13.06	32.88	19.82	51.50	-18.62	Average
5 *	0.545	25.76	45.60	19.84	56.00	-10.40	QP
6 *	0.545	17.44	37.28	19.84	46.00	-8.72	Average
7	1.810	17.86	37.88	20.02	56.00	-18.12	QP
8	1.810	7.50	27.52	20.02	46.00	-18.48	Average
9	4.433	17.20	37.24	20.04	56.00	-18.76	QP
10	4.433	6.23	26.27	20.04	46.00	-19.73	Average
11	18.816	20.45	40.76	20.31	60.00	-19.24	QP
12	18.816	14.70	35.07	20.31	50.00	-14.93	Average

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.187	30.24	50.06	19.82	64.15	-14.09	QP
2	0.187	15.23	35.04	19.82	54.15	-19.11	Average
3	0.254	21.77	41.60	19.83	61.63	-20.03	QP
4	0.254	12.00	31.83	19.83	51.63	-19.80	Average
5 *	0.541	24.97	44.82	19.85	56.00	-11.18	QP
6 *	0.541	17.85	36.90	19.85	46.00	-9.10	Average
7	4.061	18.41	38.43	20.02	56.00	-17.57	QP
8	4.061	6.78	26.80	20.02	46.00	-19.20	Average
9	4.039	16.75	36.81	20.06	56.00	-19.19	QP
10	4.039	6.55	26.61	20.06	46.00	-19.39	Average
11	18.306	20.89	41.32	20.43	60.00	-18.68	QP
12	18.306	15.74	36.17	20.43	50.00	-13.83	Average

BLE

Line	Neutral
	

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.185	29.53	48.93	19.81	64.28	-15.35	QP
2	0.185	12.82	32.63	19.81	54.28	-21.65	Average
3	0.262	20.84	40.66	19.82	61.37	-20.71	QP
4	0.262	7.21	27.03	19.82	51.37	-24.34	Average
5 *	0.541	25.56	45.40	19.84	56.00	-10.60	QP
6	0.541	17.78	37.62	19.84	46.00	-8.38	Average
7	3.048	11.35	31.33	19.98	56.00	-24.67	QP
8	3.048	3.53	23.51	19.98	46.00	-22.49	Average
9	4.192	17.90	37.92	20.02	56.00	-18.08	QP
10	4.192	6.80	26.82	20.02	46.00	-19.18	Average
11	18.816	26.79	47.10	20.31	60.00	-12.90	QP
12 *	18.816	23.07	43.38	20.31	50.00	-6.62	Average

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	
1	0.194	29.70	49.52	19.82	63.88	-14.36	QP
2	0.194	14.96	34.78	19.82	53.88	-19.10	Average
3	0.246	21.51	41.34	19.83	61.90	-20.56	QP
4	0.246	8.65	28.48	19.83	51.90	-23.42	Average
5 *	0.528	23.78	43.62	19.84	56.00	-12.38	QP
6 *	0.528	17.29	37.13	19.84	46.00	-8.87	Average
7	3.750	17.47	37.49	20.02	56.00	-18.51	QP
8	3.750	6.23	26.25	20.02	46.00	-19.75	Average
9	4.128	17.02	37.06	20.04	56.00	-18.94	QP
10	4.128	5.73	25.77	20.04	46.00	-20.23	Average
11	18.816	20.86	41.28	20.42	60.00	-18.72	QP
12	18.816	15.28	35.70	20.42	50.00	-14.30	Average

Note:

Wifi measured according to the worst power.

Level = Read Level + Factor

Over Limit = Level – 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

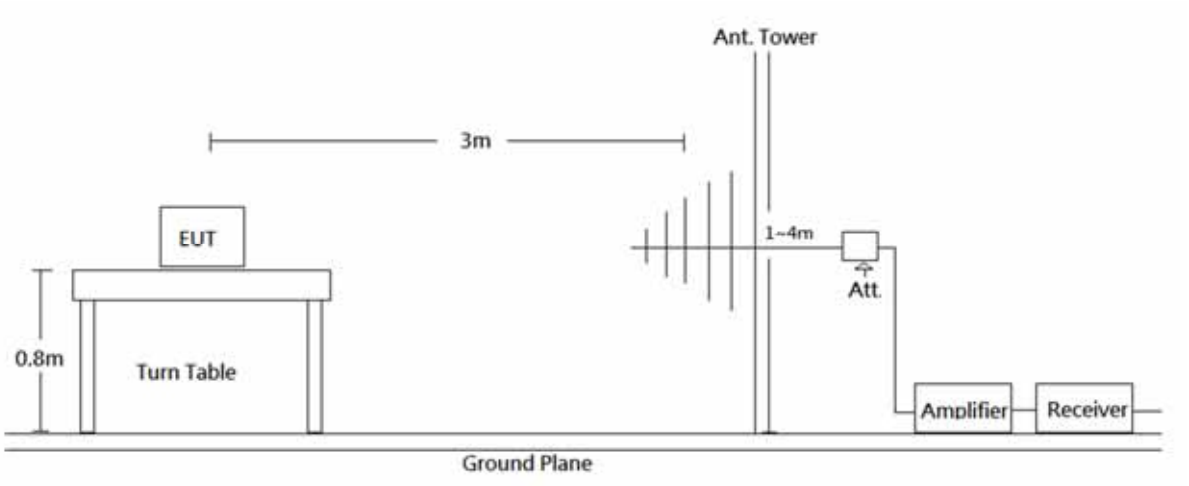
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this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

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

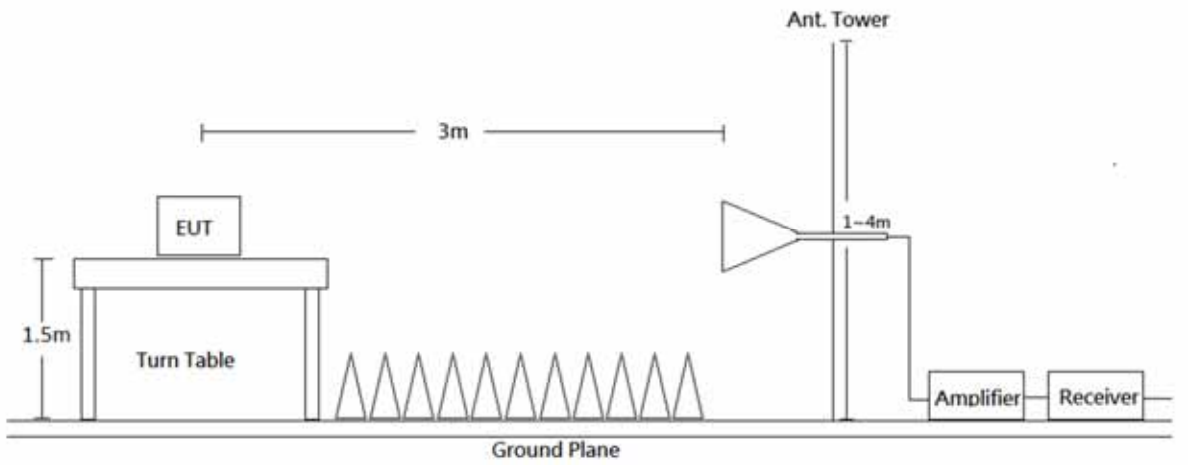
intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the 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

Below 1 GHz:



Above 1 GHz:



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

8.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz 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	Detector	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	QP		QP
Above 1 GHz	1 MHz	3 MHz	PK		PK
	1 MHz	3 MHz	RMS	>98%	Ave
	1 MHz	1/T	PK	<98%	Ave

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 the 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:

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Margin = Result – Limit

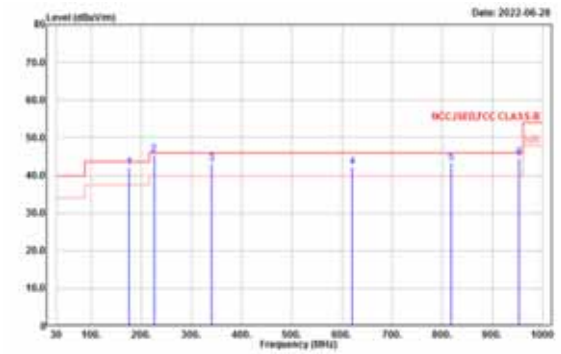
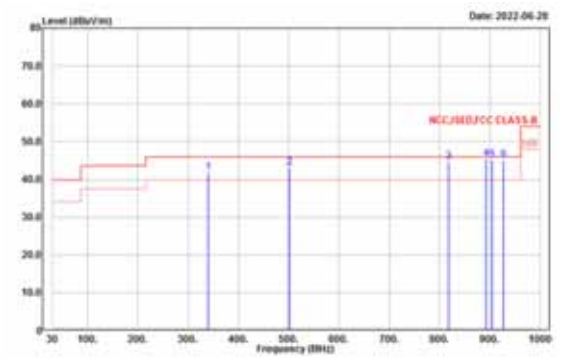
8.6 Test Results

Test Mode: Transmitting

(Pre-scan with three orthogonal axis, and worse case as Y axis.)

(worst case is 802.11b mode Low channel)

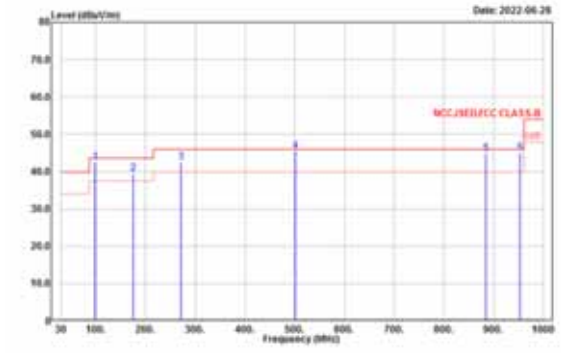
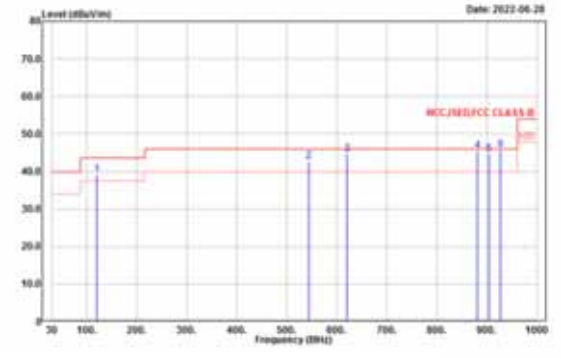
WIFI 30MHz-1GHz:

Horizontal	Vertical
	

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	174.530	42.04	43.50	-1.46	63.16	-21.12	Peak
2	224.970	45.49	46.00	-0.51	67.31	-21.82	Peak
3	339.430	43.20	46.00	-2.80	62.09	-18.89	Peak
4	620.730	42.35	46.00	-3.65	55.73	-13.38	Peak
5	816.670	43.30	46.00	-2.70	54.09	-10.79	Peak
6	952.470	44.68	46.00	-1.32	53.68	-9.00	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	339.430	41.92	46.00	-4.08	60.81	-18.89	Peak
2	500.450	43.08	46.00	-2.92	58.54	-15.46	Peak
3	816.670	44.57	46.00	-1.43	55.36	-10.79	Peak
4	892.330	45.61	46.00	-0.39	55.34	-9.73	Peak
5	903.970	45.18	46.00	-0.82	54.76	-9.58	Peak
6	926.280	45.12	46.00	-0.88	54.42	-9.30	QP

BLE 30MHz-1GHz:

Horizontal	Vertical
	

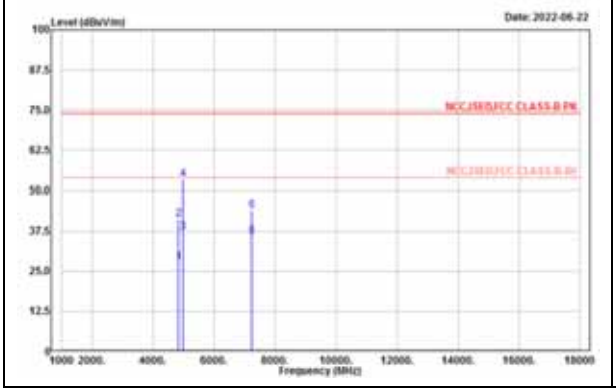
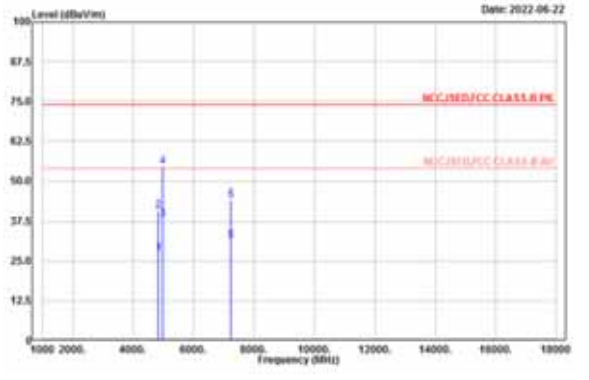
	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	97.900	42.59	43.50	-0.91	65.20	-22.61	Peak
2	174.530	39.51	43.50	-3.99	60.63	-21.12	Peak
3	271.530	42.45	46.00	-3.55	62.24	-19.79	Peak
4	500.450	45.43	46.00	-0.57	60.89	-15.46	Peak
5	884.570	44.80	46.00	-1.20	54.60	-9.80	Peak
6	952.470	45.05	46.00	-0.95	54.05	-9.00	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	119.240	39.23	43.50	-4.27	58.07	-18.84	Peak
2	544.100	42.69	46.00	-3.31	57.28	-14.59	Peak
3	620.730	44.57	46.00	-1.43	57.95	-13.38	Peak
4	880.690	45.61	46.00	-0.39	55.46	-9.85	Peak
5	903.970	44.76	46.00	-1.24	54.34	-9.58	Peak
6	926.280	45.66	46.00	-0.34	54.96	-9.30	Peak

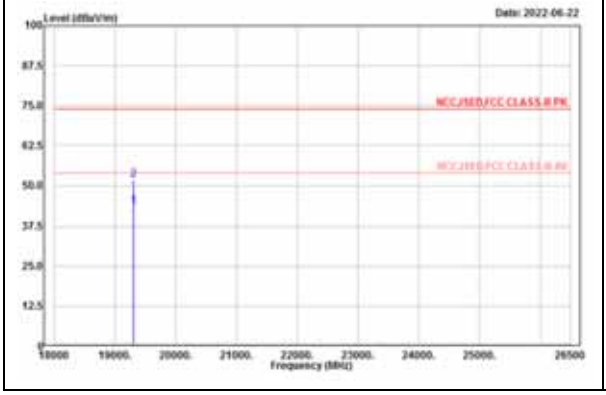
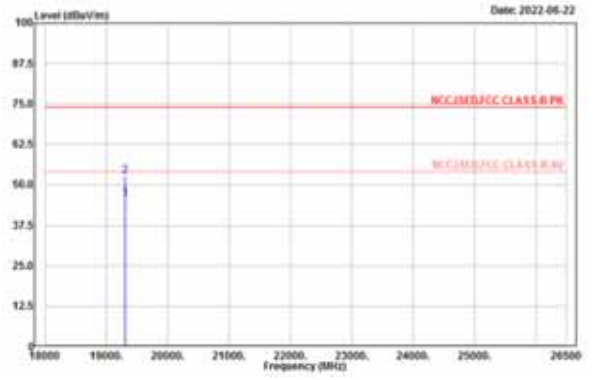
Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

802.11b Mode (worst case is low channel)

1GHz-18GHz:

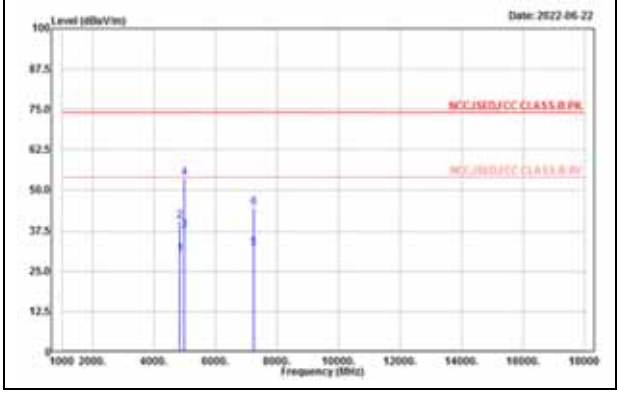
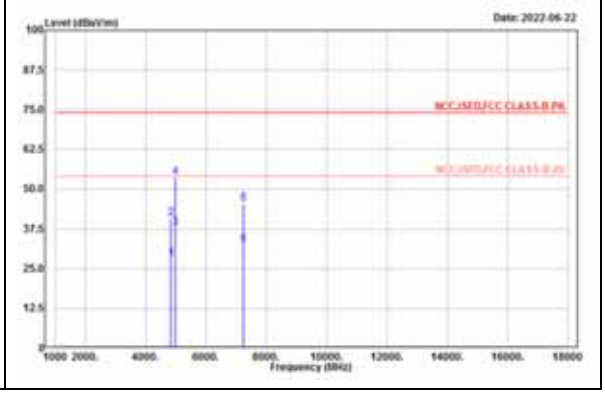
Horizontal	Vertical
	

18GHz-26.5GHz:

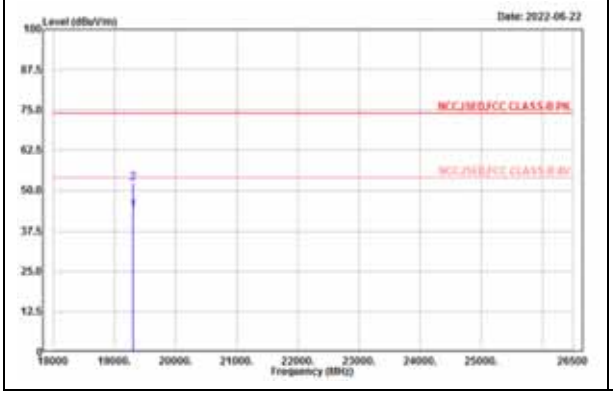
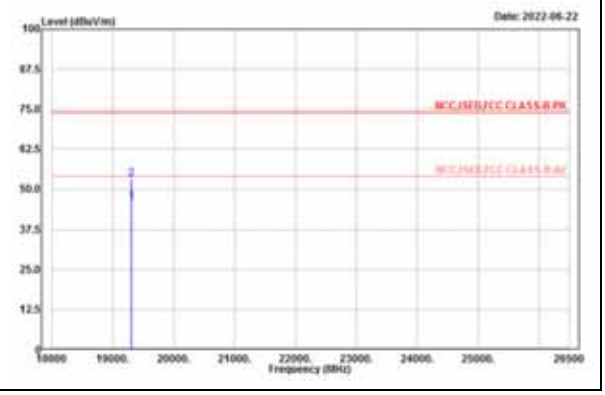
Horizontal	Vertical
	

802.11g Mode (worst case is low channel)

1GHz-18GHz:

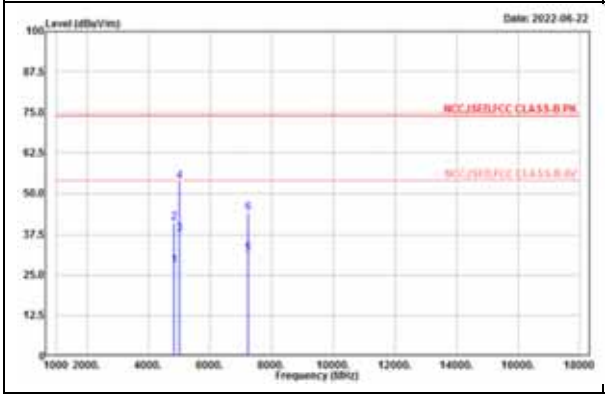
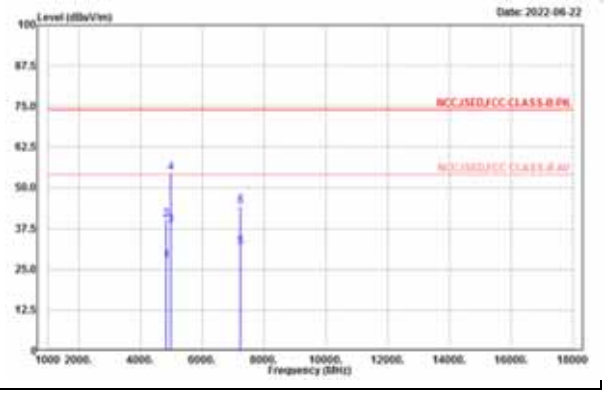
Horizontal	Vertical
	

18GHz-26.5GHz:

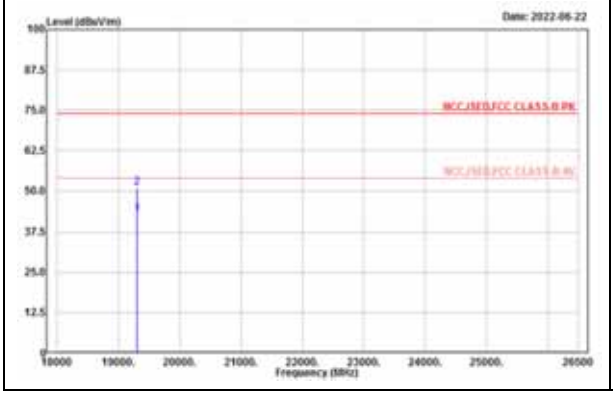
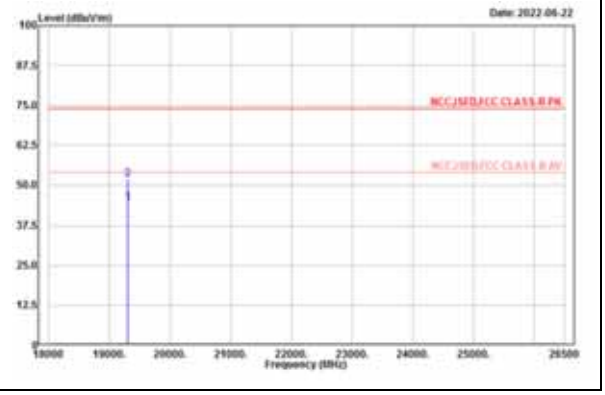
Horizontal	Vertical
	

802.11n HT20 Mode (worst case is low channel)

1GHz--18GHz:

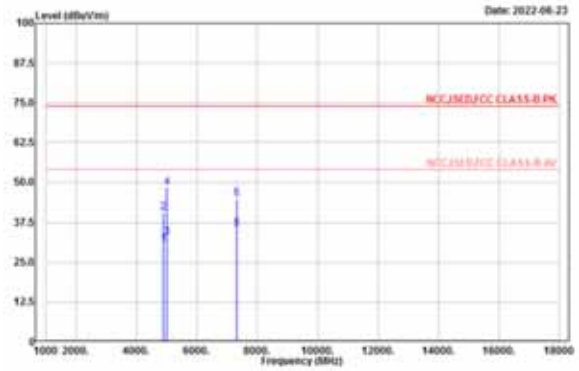
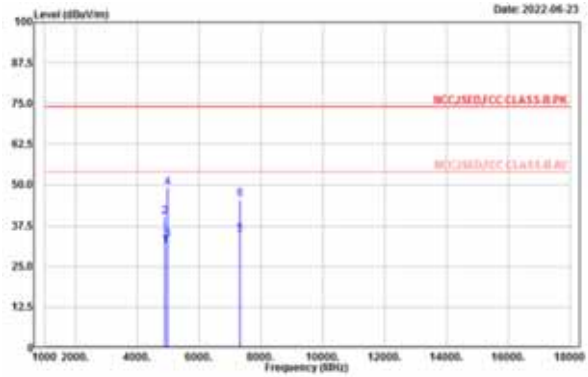
Horizontal	Vertical
	

18GHz--26.5GHz:

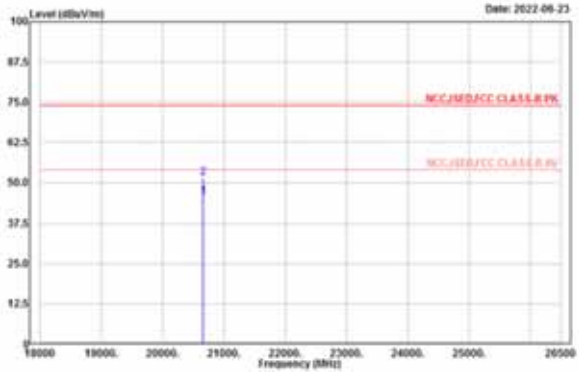
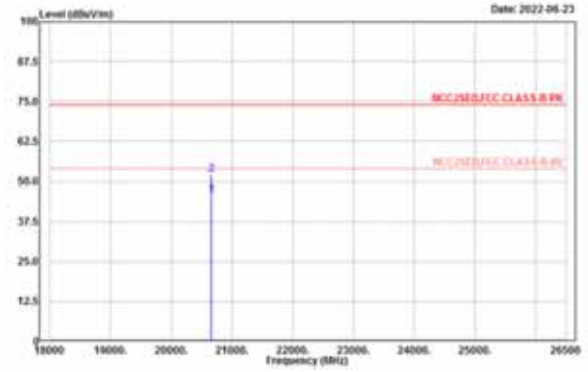
Horizontal	Vertical
	

BLE

1GHz-18GHz

Horizontal	Vertical
	

18GHz-26.5GHz

Horizontal	Vertical
	

Level (Result) = Reading + Factor.

Over Limit (Margin) = Level – Limit Line.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

Spurious emissions more than 20 dB below the limit were not reported.

WIFI

Above 1GHz-18GHz

802.11b Mode

Low channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	27.67	54.00	-26.33	30.32	-2.65	Average
2	4824.000	41.23	74.00	-32.77	43.88	-2.65	Peak
3	4978.000	37.16	54.00	-16.84	39.40	-2.24	Average
4	4978.000	53.45	74.00	-20.55	55.69	-2.24	Peak
5	7236.000	35.73	54.00	-18.27	31.80	3.93	Average
6	7236.000	43.95	74.00	-30.05	40.02	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2390.000	37.36	54.00	-16.64	47.05	-9.69	Average
2	2390.000	50.92	74.00	-23.08	60.61	-9.69	Peak
3 *	2412.000	92.76			102.39	-9.63	Average
4 *	2412.000	98.24			107.87	-9.63	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	27.40	54.00	-26.60	30.05	-2.65	Average
2	4824.000	40.84	74.00	-33.16	43.49	-2.65	Peak
3	4978.000	38.23	54.00	-15.77	40.47	-2.24	Average
4	4978.000	54.48	74.00	-19.52	56.72	-2.24	Peak
5	7236.000	31.49	54.00	-22.51	27.56	3.93	Average
6	7236.000	44.16	74.00	-29.84	40.23	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2384.786	38.24	54.00	-15.76	47.96	-9.72	Average
2	2384.786	50.89	74.00	-23.11	60.61	-9.72	Peak
3 *	2412.000	94.23			103.86	-9.63	Average
4 *	2412.000	98.74			108.37	-9.63	Peak

Middle channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	27.71	54.00	-26.29	30.23	-2.52	Average
2	4874.000	40.46	74.00	-33.54	42.98	-2.52	Peak
3	4978.000	38.06	54.00	-15.94	40.30	-2.24	Average
4	4978.000	53.82	74.00	-20.18	56.06	-2.24	Peak
5	7311.000	32.32	54.00	-21.68	28.18	4.14	Average
6	7311.000	44.76	74.00	-29.24	40.62	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	95.21			104.76	-9.55	Average
2 *	2437.000	99.75			109.30	-9.55	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	27.63	54.00	-26.37	30.15	-2.52	Average
2	4874.000	40.97	74.00	-33.03	43.49	-2.52	Peak
3	4978.000	38.14	54.00	-15.86	40.38	-2.24	Average
4	4978.000	54.04	74.00	-19.96	56.28	-2.24	Peak
5	7311.000	32.25	54.00	-21.75	28.11	4.14	Average
6	7311.000	45.13	74.00	-28.87	40.99	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	94.87			104.42	-9.55	Average
2 *	2437.000	99.55			109.10	-9.55	Peak

High channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.24	54.00	-25.76	30.62	-2.38	Average
2	4924.000	46.27	74.00	-27.73	48.65	-2.38	Peak
3	4995.000	39.45	54.00	-14.55	41.63	-2.18	Average
4	4995.000	55.28	74.00	-18.72	57.46	-2.18	Peak
5	7386.000	35.00	54.00	-19.00	30.67	4.33	Average
6	7386.000	52.98	74.00	-21.02	48.65	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	93.77			103.24	-9.47	Average
2 *	2462.000	98.34			107.81	-9.47	Peak
3	2494.600	37.74	54.00	-16.26	47.10	-9.36	Average
4	2494.600	50.26	74.00	-23.74	59.62	-9.36	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.44	54.00	-25.56	30.82	-2.38	Average
2	4924.000	44.80	74.00	-29.20	47.18	-2.38	Peak
3	4978.000	38.31	54.00	-15.69	40.55	-2.24	Average
4	4978.000	54.18	74.00	-19.82	56.42	-2.24	Peak
5	7386.000	35.09	54.00	-18.91	30.76	4.33	Average
6	7386.000	53.90	74.00	-20.10	49.57	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	93.24			102.71	-9.47	Average
2 *	2462.000	97.75			107.22	-9.47	Peak
3	2488.600	38.31	54.00	-15.69	47.70	-9.39	Average
4	2488.600	50.92	74.00	-23.08	60.31	-9.39	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

802.11g Mode

Low channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	30.35	54.00	-23.65	33.00	-2.65	Average
2	4824.000	40.69	74.00	-33.31	43.34	-2.65	Peak
3	4978.000	37.72	54.00	-16.28	39.96	-2.24	Average
4	4978.000	53.75	74.00	-20.25	55.99	-2.24	Peak
5	7236.000	32.26	54.00	-21.74	28.33	3.93	Average
6	7236.000	44.62	74.00	-29.38	40.69	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2374.064	37.99	54.00	-16.01	47.74	-9.75	Average
2	2374.064	51.38	74.00	-22.62	61.13	-9.75	Peak
3 *	2412.000	92.72			102.35	-9.63	Average
4 *	2412.000	101.39			111.02	-9.63	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	28.11	54.00	-25.89	30.76	-2.65	Average
2	4824.000	40.97	74.00	-33.03	43.62	-2.65	Peak
3	4978.000	37.81	54.00	-16.19	40.05	-2.24	Average
4	4978.000	53.61	74.00	-20.39	55.85	-2.24	Peak
5	7236.000	32.45	54.00	-21.55	28.52	3.93	Average
6	7236.000	45.56	74.00	-28.44	41.63	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2389.968	38.34	54.00	-15.66	48.03	-9.69	Average
2	2389.968	51.66	74.00	-22.34	61.35	-9.69	Peak
3 *	2412.000	92.07			101.70	-9.63	Average
4 *	2412.000	101.35			110.98	-9.63	Peak

Middle channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	28.51	54.00	-25.49	31.03	-2.52	Average
2	4874.000	41.50	74.00	-32.50	44.02	-2.52	Peak
3	4978.000	37.94	54.00	-16.06	40.18	-2.24	Average
4	4978.000	54.65	74.00	-19.35	56.89	-2.24	Peak
5	7311.000	33.02	54.00	-20.98	28.88	4.14	Average
6	7311.000	44.80	74.00	-29.20	40.66	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	92.59			102.14	-9.55	Average
2 *	2437.000	101.41			110.96	-9.55	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	32.61	54.00	-21.39	35.13	-2.52	Average
2	4874.000	40.69	74.00	-33.31	43.21	-2.52	Peak
3	4978.000	37.87	54.00	-16.13	40.11	-2.24	Average
4	4978.000	53.93	74.00	-20.07	56.17	-2.24	Peak
5	7311.000	33.03	54.00	-20.97	28.89	4.14	Average
6	7311.000	44.28	74.00	-29.72	40.14	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	93.12			102.67	-9.55	Average
2 *	2437.000	102.45			112.00	-9.55	Peak

High channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.83	54.00	-25.17	31.21	-2.38	Average
2	4924.000	41.48	74.00	-32.52	43.86	-2.38	Peak
3	4978.000	38.66	54.00	-15.34	40.90	-2.24	Average
4	4978.000	52.78	74.00	-21.22	55.02	-2.24	Peak
5	7386.000	33.10	54.00	-20.90	28.77	4.33	Average
6	7386.000	44.32	74.00	-29.68	39.99	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	92.83			102.30	-9.47	Average
2 *	2462.000	103.15			112.62	-9.47	Peak
3	2488.480	39.93	54.00	-14.07	49.32	-9.39	Average
4	2488.480	56.98	74.00	-17.02	66.37	-9.39	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.96	54.00	-25.04	31.34	-2.38	Average
2	4924.000	40.38	74.00	-33.62	42.76	-2.38	Peak
3	4978.000	37.75	54.00	-16.25	39.99	-2.24	Average
4	4978.000	53.78	74.00	-20.22	56.02	-2.24	Peak
5	7386.000	33.13	54.00	-20.87	28.80	4.33	Average
6	7386.000	44.57	74.00	-29.43	40.24	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	92.21			101.68	-9.47	Average
2 *	2462.000	101.99			111.46	-9.47	Peak
3	2486.992	39.20	54.00	-14.80	48.59	-9.39	Average
4	2486.992	57.18	74.00	-16.82	66.57	-9.39	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

802.11n HT20 Mode

Low channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	27.79	54.00	-26.21	30.44	-2.65	Average
2	4824.000	41.22	74.00	-32.78	43.87	-2.65	Peak
3	4995.000	37.55	54.00	-16.45	39.73	-2.18	Average
4	4995.000	53.57	74.00	-20.43	55.75	-2.18	Peak
5	7236.000	31.65	54.00	-22.35	27.72	3.93	Average
6	7236.000	44.23	74.00	-29.77	40.30	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2389.968	37.77	54.00	-16.23	47.46	-9.69	Average
2	2389.968	49.15	74.00	-24.85	58.84	-9.69	Peak
3 *	2412.000	91.22			100.85	-9.63	Average
4 *	2412.000	100.72			110.35	-9.63	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4824.000	27.69	54.00	-26.31	30.34	-2.65	Average
2	4824.000	40.30	74.00	-33.70	42.95	-2.65	Peak
3	4978.000	38.62	54.00	-15.38	40.86	-2.24	Average
4	4978.000	54.39	74.00	-19.61	56.63	-2.24	Peak
5	7236.000	31.96	54.00	-22.04	28.03	3.93	Average
6	7236.000	44.45	74.00	-29.55	40.52	3.93	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2389.072	38.29	54.00	-15.71	47.99	-9.70	Average
2	2389.072	52.00	74.00	-22.00	61.70	-9.70	Peak
3 *	2412.000	91.69			101.32	-9.63	Average
4 *	2412.000	100.74			110.37	-9.63	Peak

Middle channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	27.93	54.00	-26.07	30.45	-2.52	Average
2	4874.000	41.48	74.00	-32.52	44.00	-2.52	Peak
3	4978.000	39.85	54.00	-14.15	42.09	-2.24	Average
4	4978.000	55.70	74.00	-18.30	57.94	-2.24	Peak
5	7311.000	32.39	54.00	-21.61	28.25	4.14	Average
6	7311.000	43.71	74.00	-30.29	39.57	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	92.46			102.01	-9.55	Average
2 *	2437.000	101.70			111.25	-9.55	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4874.000	27.96	54.00	-26.04	30.48	-2.52	Average
2	4874.000	40.62	74.00	-33.38	43.14	-2.52	Peak
3	4978.000	38.54	54.00	-15.46	40.78	-2.24	Average
4	4978.000	52.70	74.00	-21.30	54.94	-2.24	Peak
5	7311.000	32.48	54.00	-21.52	28.34	4.14	Average
6	7311.000	44.05	74.00	-29.95	39.91	4.14	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2437.000	92.07			101.62	-9.55	Average
2 *	2437.000	101.82			111.37	-9.55	Peak

High channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.13	54.00	-25.87	30.51	-2.38	Average
2	4924.000	41.24	74.00	-32.76	43.62	-2.38	Peak
3	4995.000	36.70	54.00	-17.30	38.88	-2.18	Average
4	4995.000	52.77	74.00	-21.23	54.95	-2.18	Peak
5	7386.000	32.59	54.00	-21.41	28.26	4.33	Average
6	7386.000	44.14	74.00	-29.86	39.81	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	90.34			99.81	-9.47	Average
2 *	2462.000	100.17			109.64	-9.47	Peak
3	2483.488	39.31	54.00	-14.69	48.71	-9.40	Average
4	2483.488	52.00	74.00	-22.00	61.40	-9.40	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4924.000	28.41	54.00	-25.59	30.79	-2.38	Average
2	4924.000	40.50	74.00	-33.50	42.88	-2.38	Peak
3	4978.000	38.85	54.00	-15.15	41.09	-2.24	Average
4	4978.000	53.85	74.00	-20.15	56.09	-2.24	Peak
5	7386.000	32.79	54.00	-21.21	28.46	4.33	Average
6	7386.000	43.72	74.00	-30.28	39.39	4.33	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2462.000	91.04			100.51	-9.47	Average
2 *	2462.000	101.79			111.26	-9.47	Peak
3	2483.488	39.19	54.00	-14.81	48.59	-9.40	Average
4	2483.488	52.68	74.00	-21.32	62.08	-9.40	Peak

Result = Reading + Correct Factor
Margin = Result – Limit
Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain
Spurious emissions more than 20 dB below the limit were not reported.

BLE

Above 1GHz-18GHz

Low channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4804.000	31.19	54.00	-22.81	33.89	-2.70	Average
2	4804.000	40.15	74.00	-33.85	42.85	-2.70	Peak
3	4978.000	36.55	54.00	-17.45	38.79	-2.24	Average
4	4978.000	51.45	74.00	-22.55	53.69	-2.24	Peak
5	7206.000	33.73	54.00	-20.27	29.93	3.80	Average
6	7206.000	43.28	74.00	-30.72	39.48	3.80	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2327.500	36.24	54.00	-17.76	46.13	-9.89	Average
2	2327.500	45.23	74.00	-28.77	55.12	-9.89	Peak
3 *	2402.000	92.31			101.97	-9.66	Average
4 *	2402.000	92.77			102.43	-9.66	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4804.000	32.11	54.00	-21.89	34.81	-2.70	Average
2	4804.000	39.49	74.00	-34.51	42.19	-2.70	Peak
3	4995.000	35.35	54.00	-18.65	37.53	-2.18	Average
4	4995.000	51.81	74.00	-22.19	53.99	-2.18	Peak
5	7206.000	33.86	54.00	-20.14	30.06	3.80	Average
6	7206.000	42.26	74.00	-31.74	38.46	3.80	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	2386.700	37.07	54.00	-16.93	46.78	-9.71	Average
2	2386.700	46.50	74.00	-27.50	56.21	-9.71	Peak
3 *	2402.000	91.98			101.64	-9.66	Average
4 *	2402.000	92.78			102.44	-9.66	Peak

Middle channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4880.000	30.66	54.00	-23.34	33.15	-2.49	Average
2	4880.000	40.58	74.00	-33.42	43.07	-2.49	Peak
3	4995.000	32.88	54.00	-21.12	35.06	-2.18	Average
4	4995.000	48.30	74.00	-25.70	50.48	-2.18	Peak
5	7320.000	35.56	54.00	-18.44	31.40	4.16	Average
6	7320.000	44.91	74.00	-29.09	40.75	4.16	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2440.000	94.00			103.54	-9.54	Average
2 *	2440.000	94.40			103.94	-9.54	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4880.000	31.53	54.00	-22.47	34.02	-2.49	Average
2	4880.000	40.44	74.00	-33.56	42.93	-2.49	Peak
3	4978.000	33.29	54.00	-20.71	35.53	-2.24	Average
4	4978.000	48.96	74.00	-25.04	51.20	-2.24	Peak
5	7320.000	35.03	54.00	-18.97	30.87	4.16	Average
6	7320.000	45.53	74.00	-28.47	41.37	4.16	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2440.000	93.95			103.49	-9.54	Average
2 *	2440.000	94.38			103.92	-9.54	Peak

High channel

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4960.000	31.25	54.00	-22.75	33.52	-2.27	Average
2	4960.000	40.83	74.00	-33.17	43.10	-2.27	Peak
3	4995.000	32.93	54.00	-21.07	35.11	-2.18	Average
4	4995.000	49.80	74.00	-24.20	51.98	-2.18	Peak
5	7440.000	36.19	54.00	-17.81	31.72	4.47	Average
6	7440.000	45.62	74.00	-28.38	41.15	4.47	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2480.000	92.44			101.86	-9.42	Average
2 *	2480.000	92.93			102.35	-9.42	Peak
3	2489.020	36.96	54.00	-17.04	46.35	-9.39	Average
4	2489.020	46.15	74.00	-27.85	55.54	-9.39	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	4960.000	31.93	54.00	-22.07	34.20	-2.27	Average
2	4960.000	41.15	74.00	-32.85	43.42	-2.27	Peak
3	4995.000	32.09	54.00	-21.91	34.27	-2.18	Average
4	4995.000	48.87	74.00	-25.13	51.05	-2.18	Peak
5	7440.000	36.30	54.00	-17.70	31.83	4.47	Average
6	7440.000	46.11	74.00	-27.89	41.64	4.47	Peak

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1 *	2480.000	94.89			104.31	-9.42	Average
2 *	2480.000	95.35			104.77	-9.42	Peak
3	2489.080	38.38	54.00	-15.62	47.77	-9.39	Average
4	2489.080	48.64	74.00	-25.36	58.03	-9.39	Peak

Level (Result) = Reading + Factor.

Over Limit (Margin) = Level – Limit Line.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

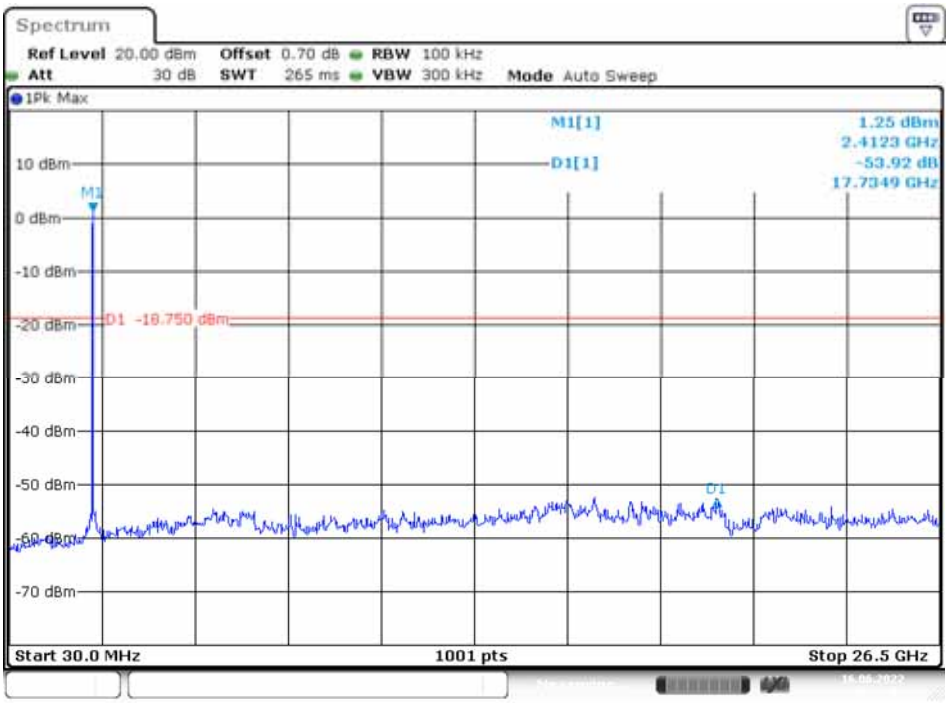
Spurious emissions more than 20 dB below the limit were not reported.

Conducted Spurious Emissions:

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	Result
		Chain 0	Chain 1		
B Mode					
Low	2412	53.92	49.95	≥ 20	PASS
Mid	2437	52.70	48.49	≥ 20	PASS
High	2462	51.53	47.47	≥ 20	PASS
G Mode					
Low	2412	49.76	49.32	≥ 20	PASS
Mid	2437	52.10	46.50	≥ 20	PASS
High	2462	49.01	48.22	≥ 20	PASS
N20 Mode					
Low	2412	49.83	49.48	≥ 20	PASS
Mid	2437	49.13	48.54	≥ 20	PASS
High	2462	47.99	49.57	≥ 20	PASS
BLE Mode					
Low	2402	49.32		≥ 20	PASS
Mid	2441	53.35		≥ 20	PASS
High	2480	56.96		≥ 20	PASS

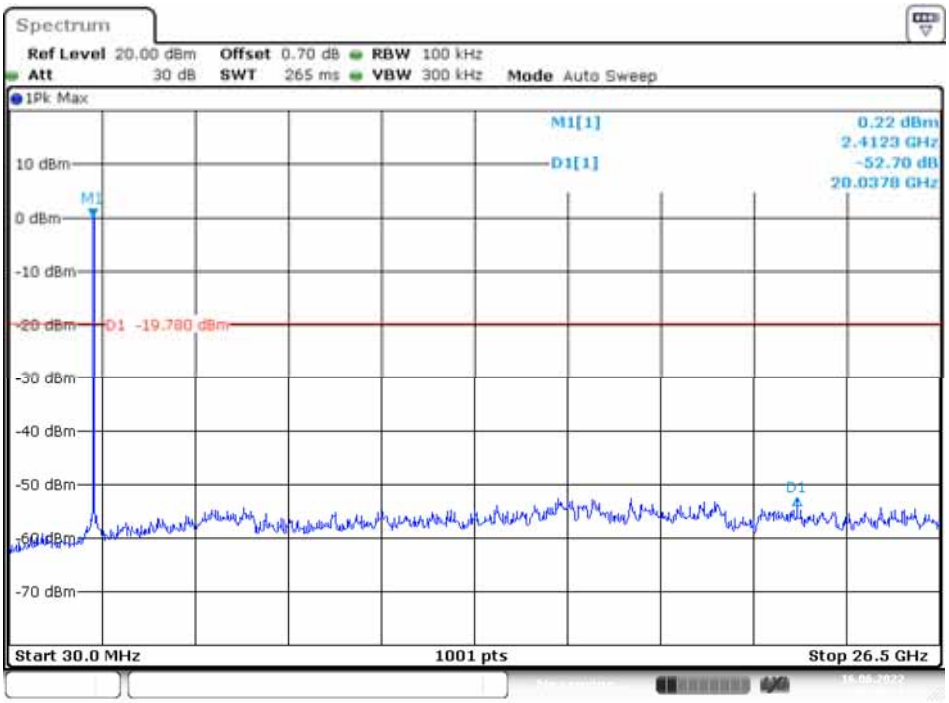
B Mode (Chain 0)

Low Channel



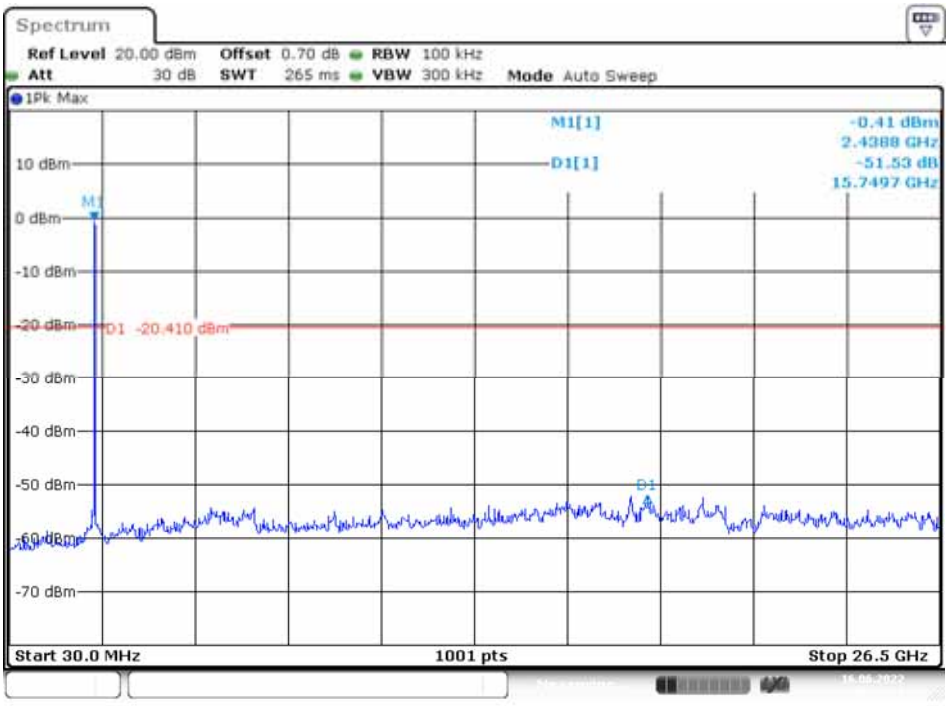
Date: 16.JUN.2022 18:17:08

Middle Channel



Date: 16.JUN.2022 18:20:59

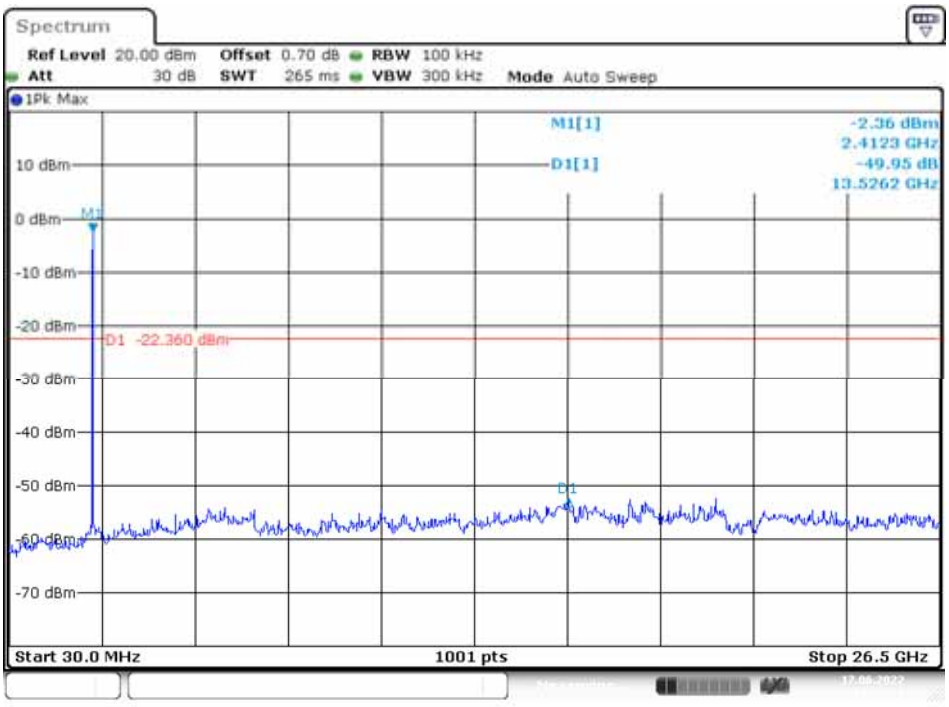
High Channel



Date: 16.JUN.2022 18:23:30

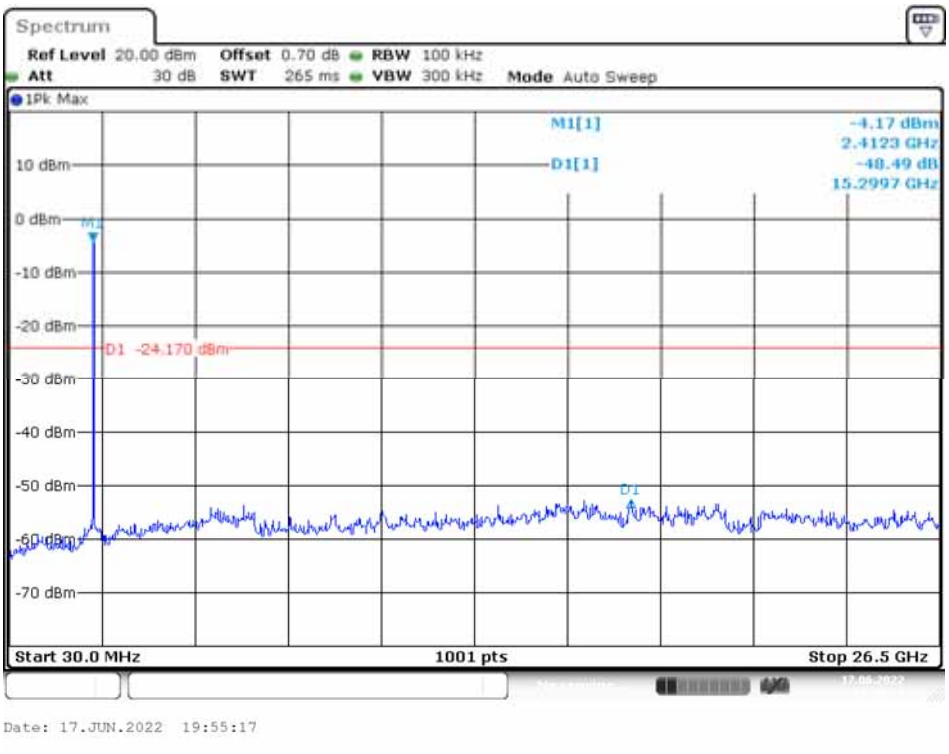
B Mode (Chain 1)

Low Channel



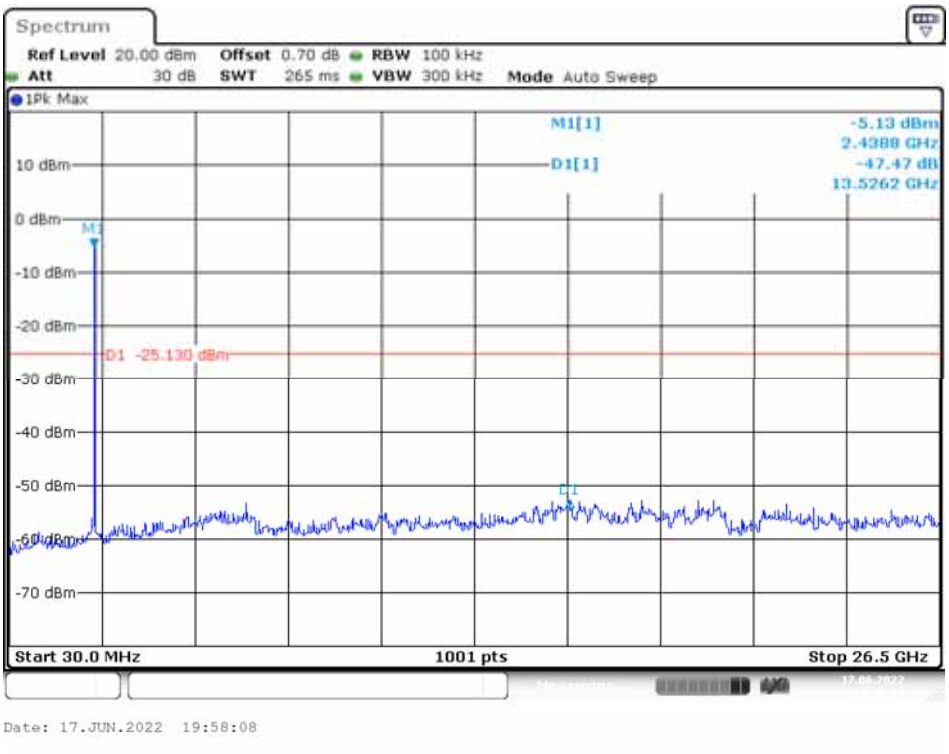
Date: 17.JUN.2022 19:53:30

Middle Channel



Date: 17.JUN.2022 19:55:17

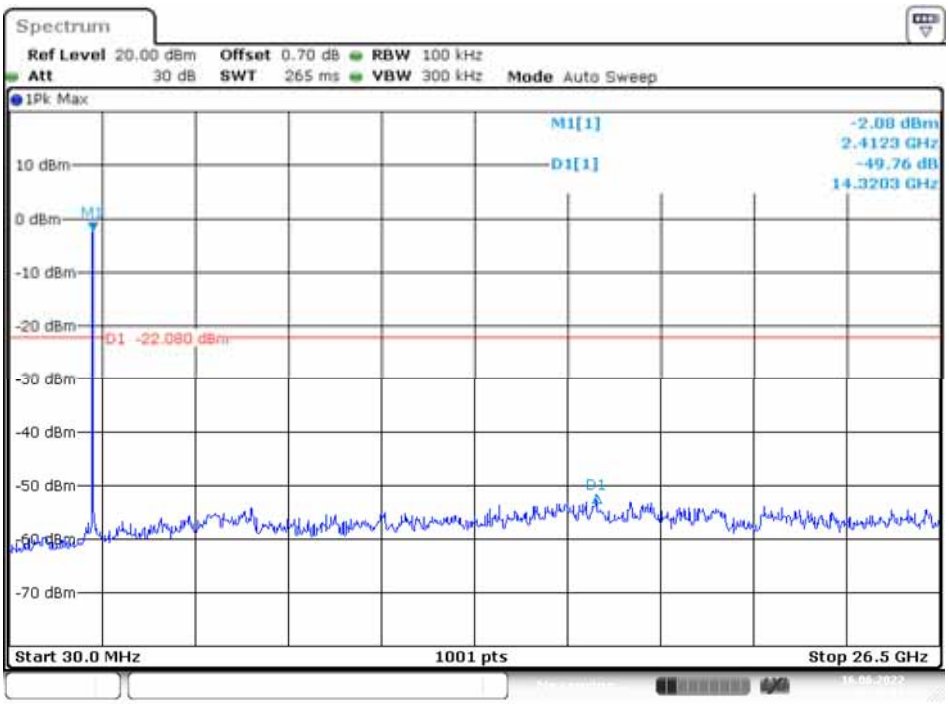
High Channel



Date: 17.JUN.2022 19:58:08

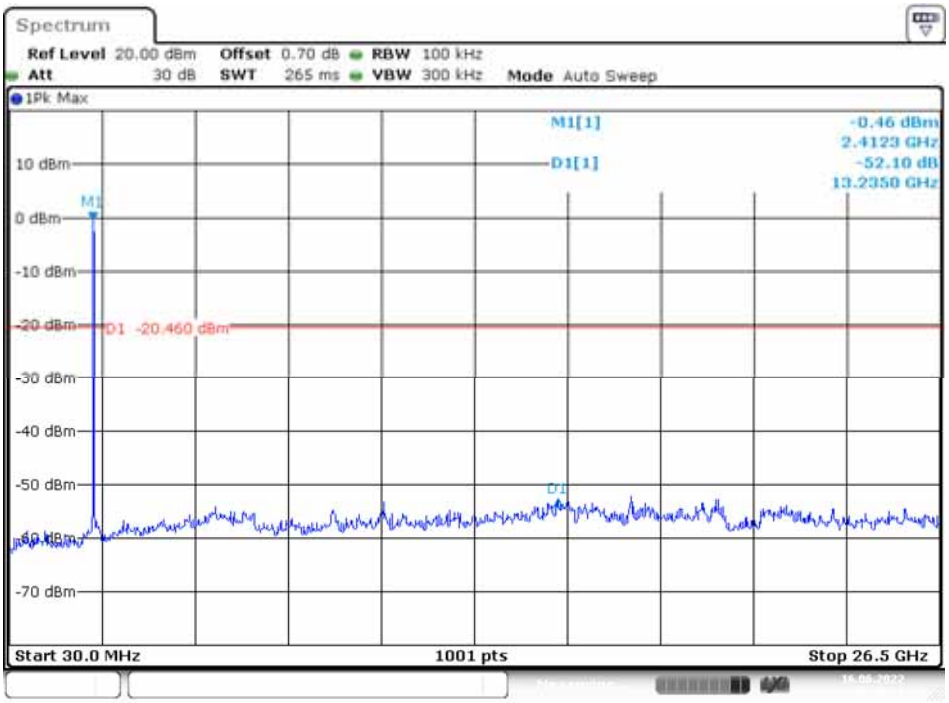
G Mode (Chain 0)

Low Channel



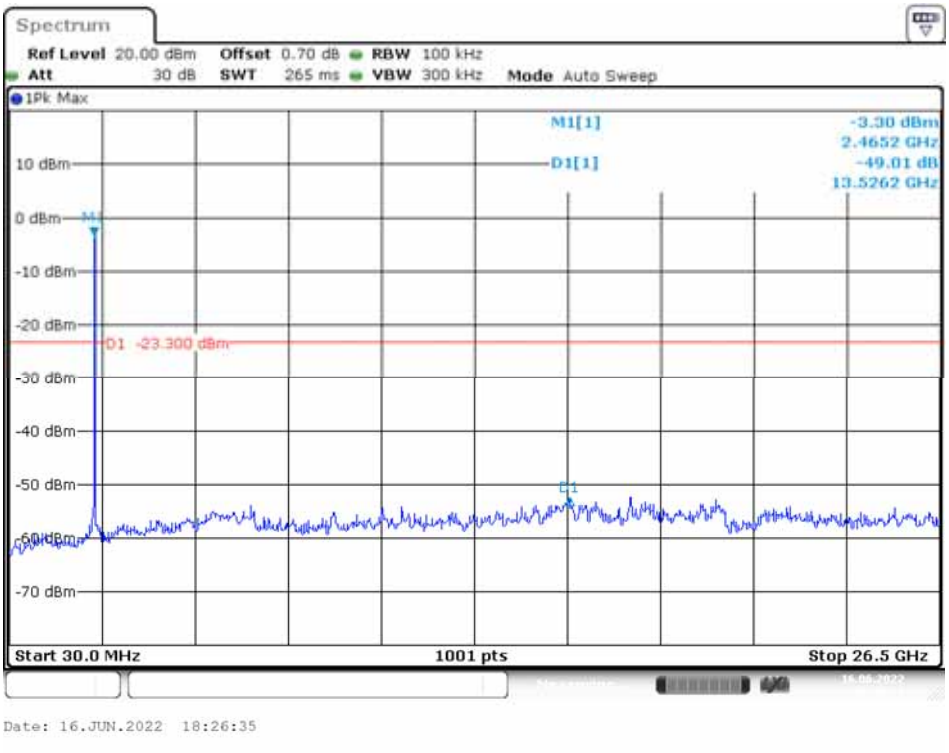
Date: 16.JUN.2022 18:47:00

Middle Channel



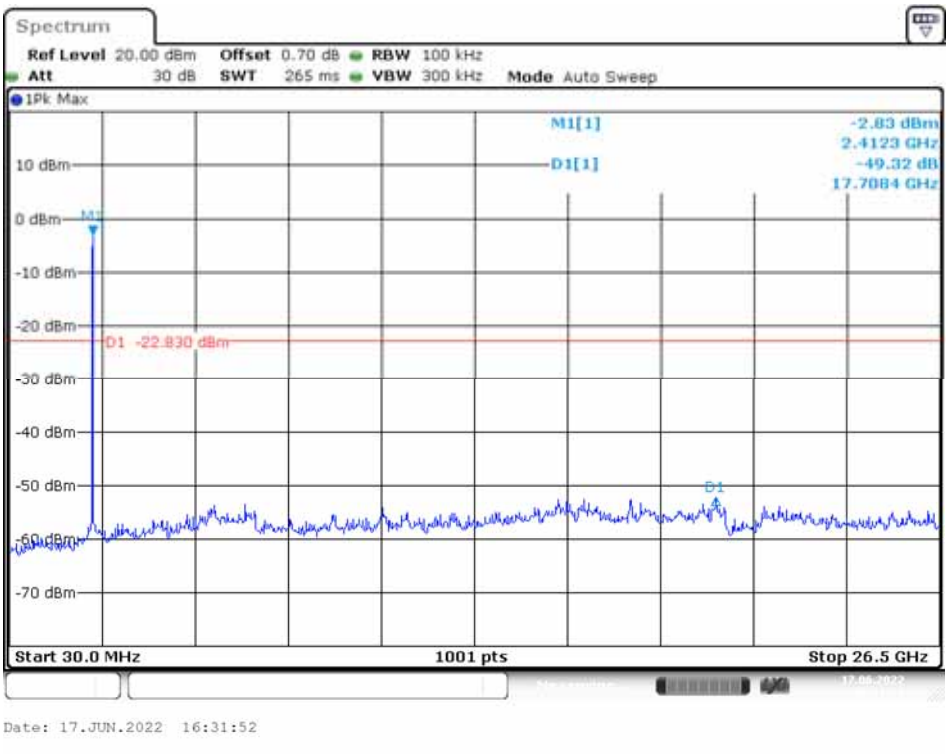
Date: 16.JUN.2022 18:30:00

High Channel

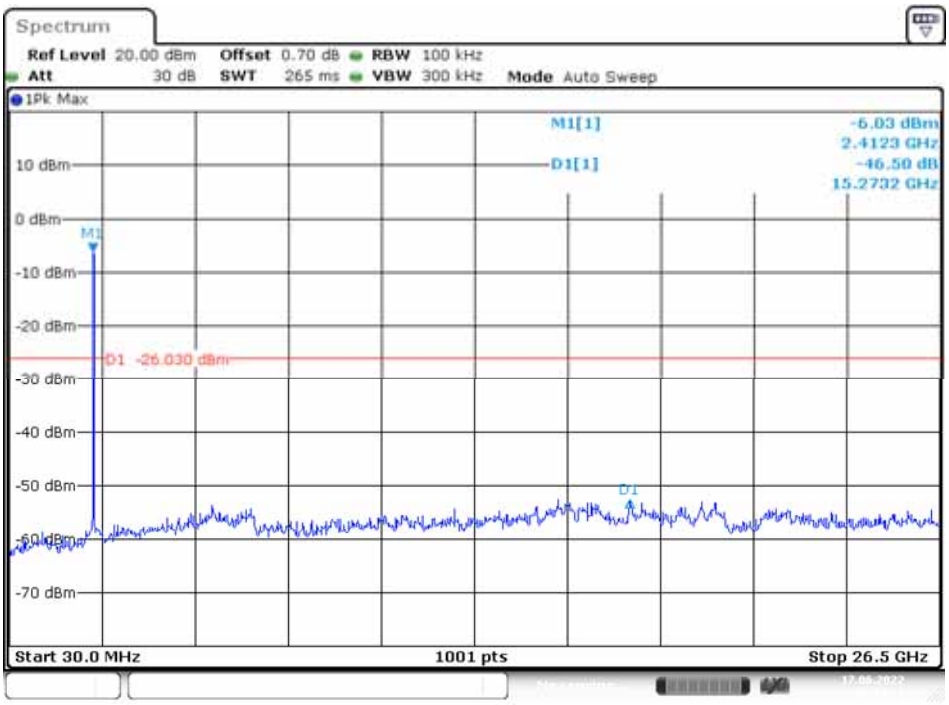


G Mode (Chain 1)

Low Channel

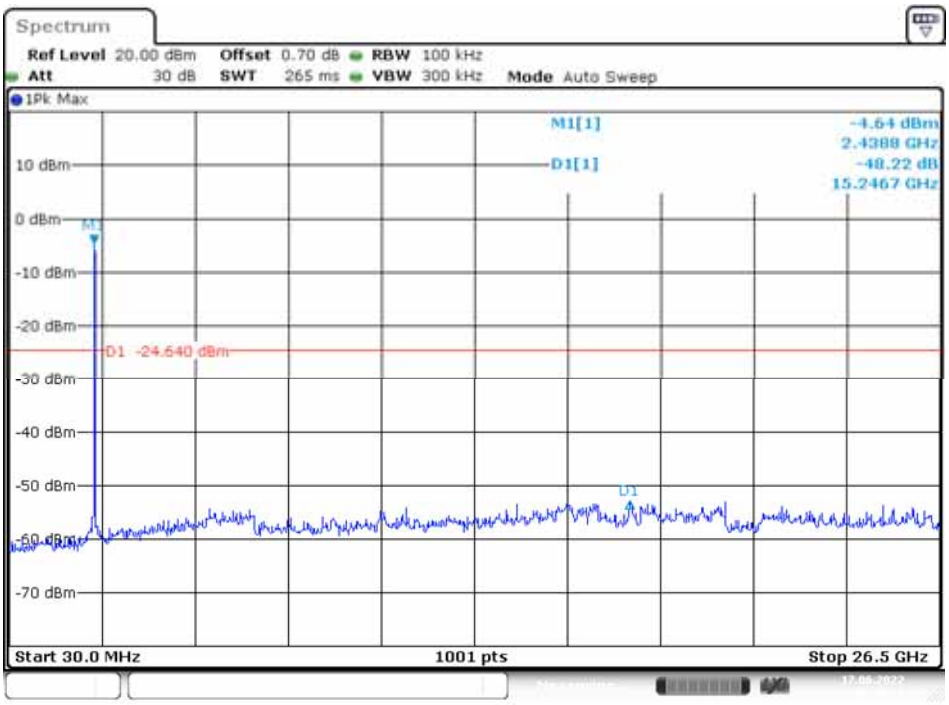


Middle Channel



Date: 17.JUN.2022 16:44:53

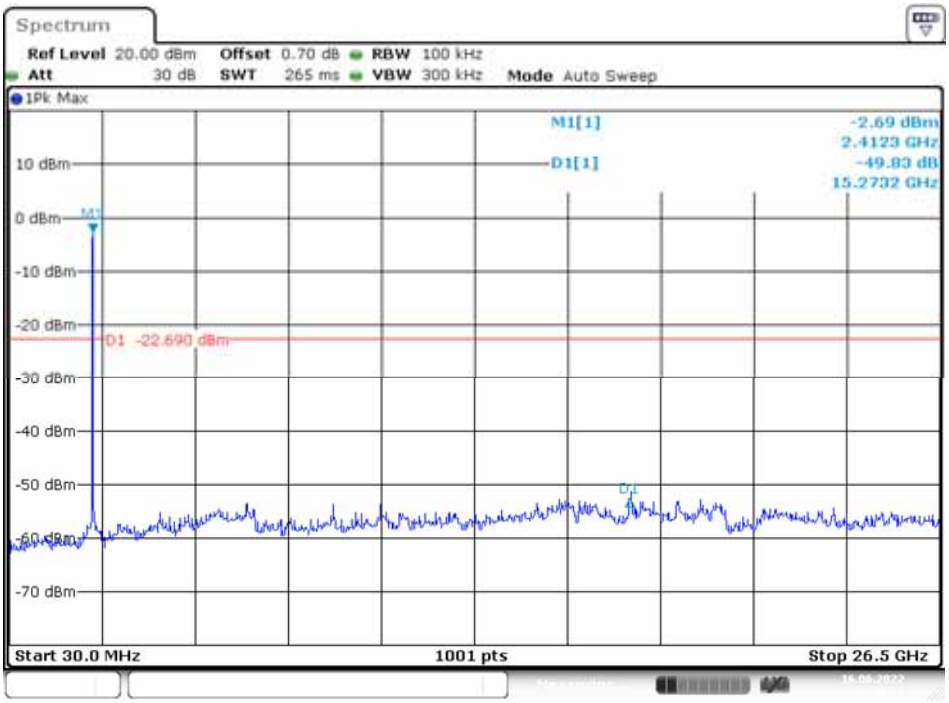
High Channel



Date: 17.JUN.2022 16:55:31

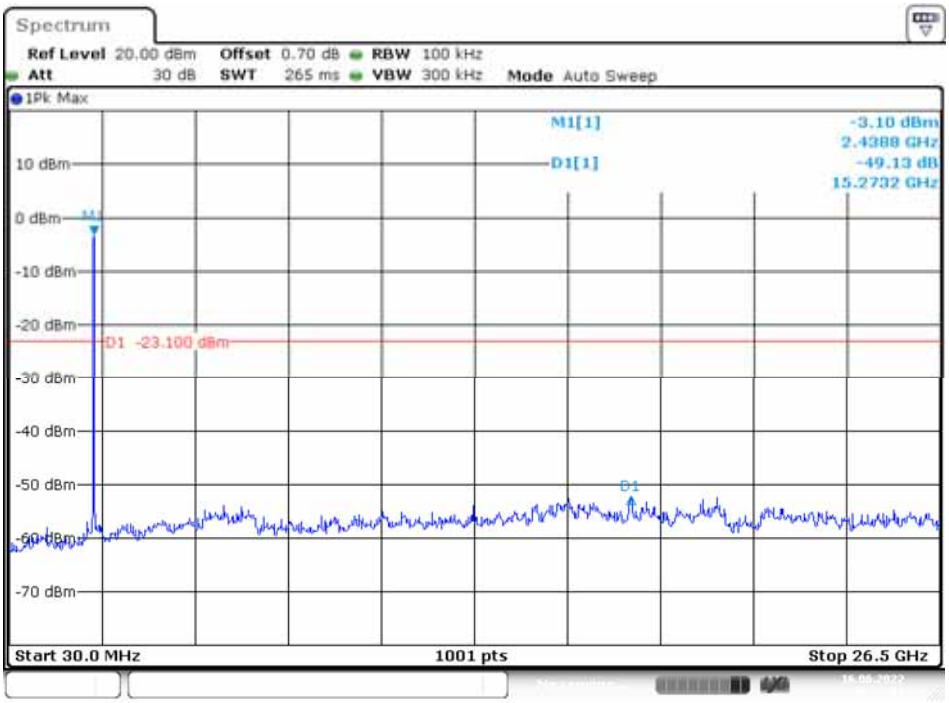
N20 Mode (Chain 0)

Low Channel



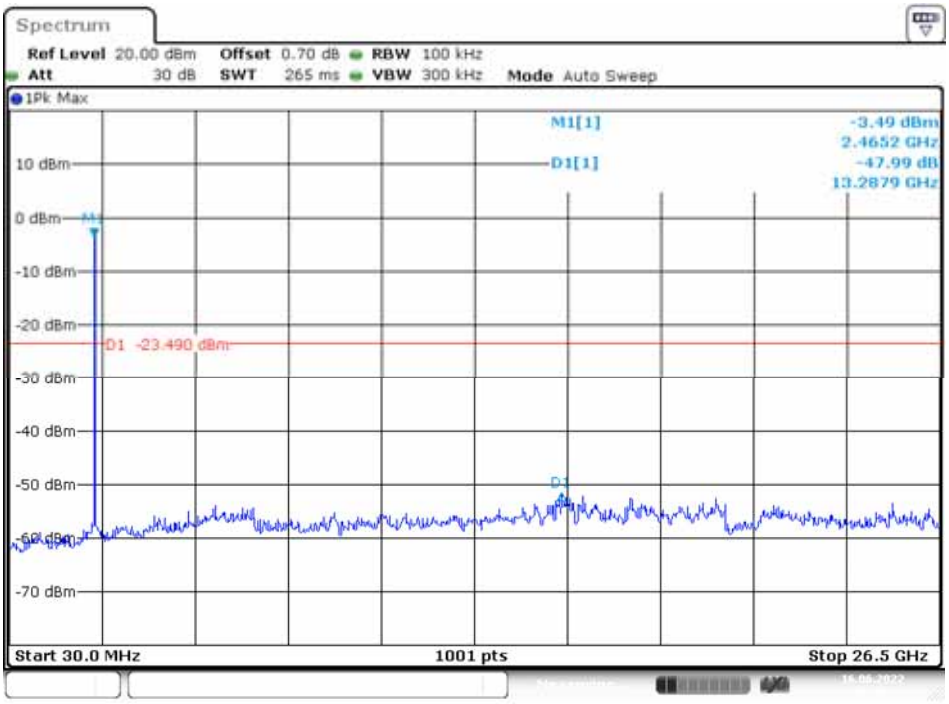
Date: 16.JUN.2022 18:50:17

Middle Channel



Date: 16.JUN.2022 18:53:04

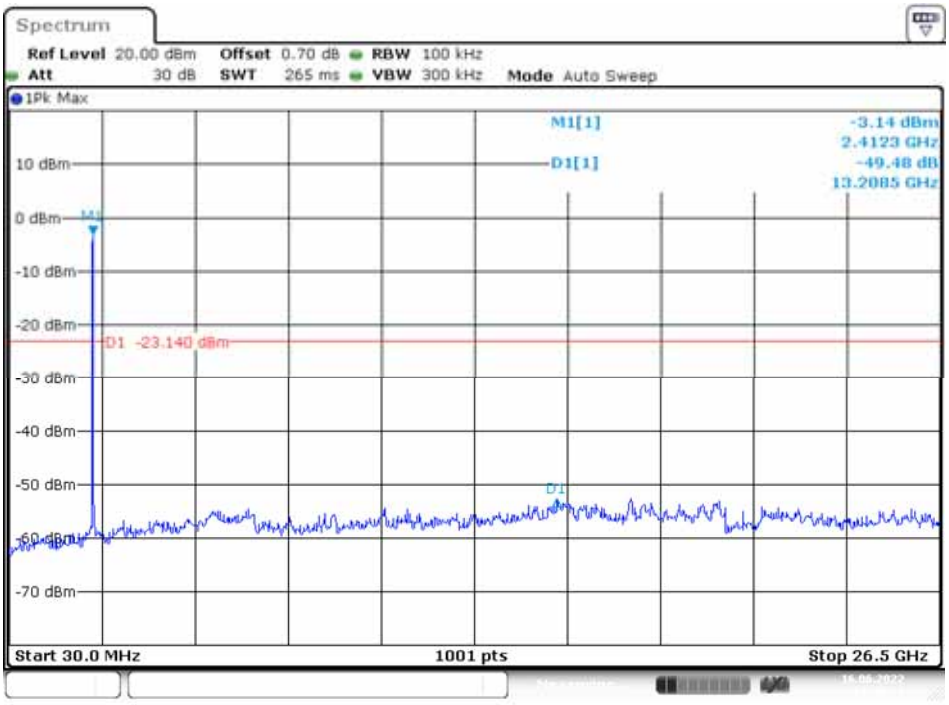
High Channel



Date: 16.JUN.2022 18:56:46

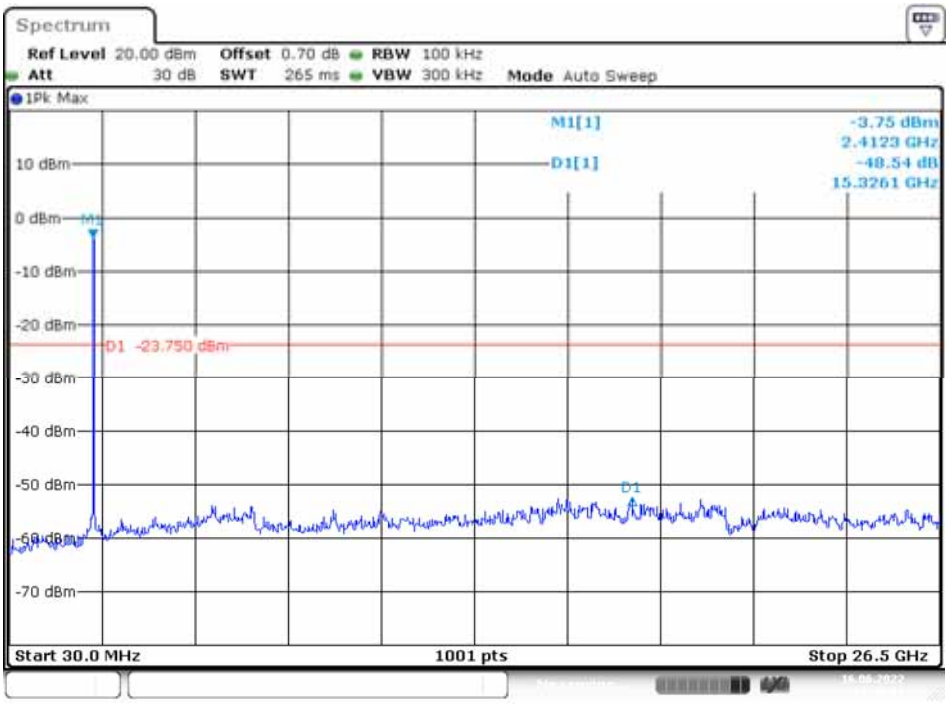
N20 Mode (Chain 1)

Low Channel



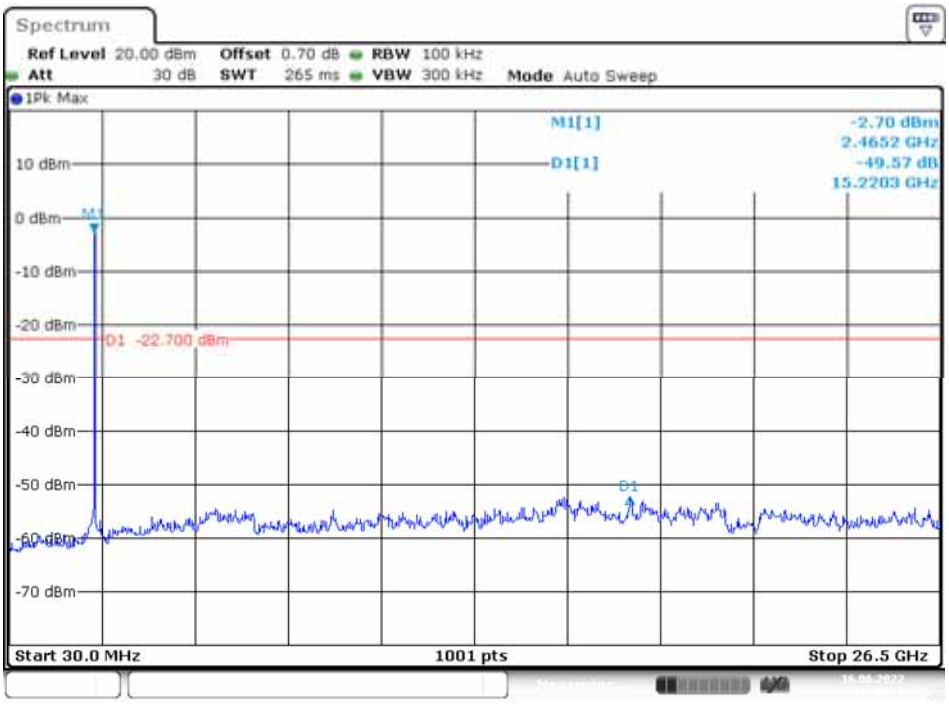
Date: 16.JUN.2022 19:50:34

Middle Channel



Date: 16.JUN.2022 19:45:06

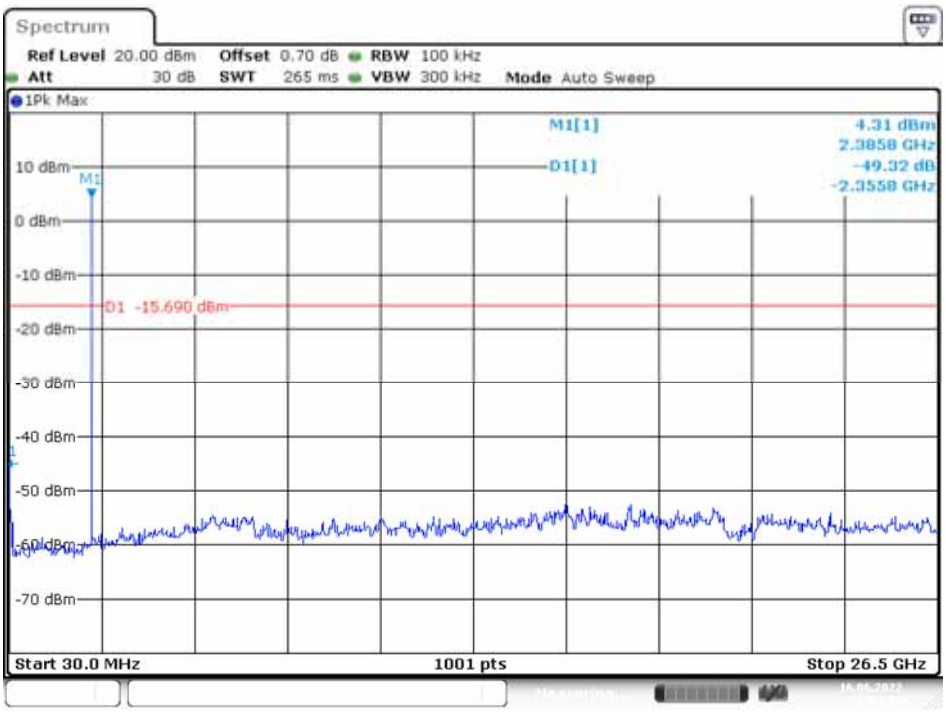
High Channel



Date: 16.JUN.2022 19:42:28

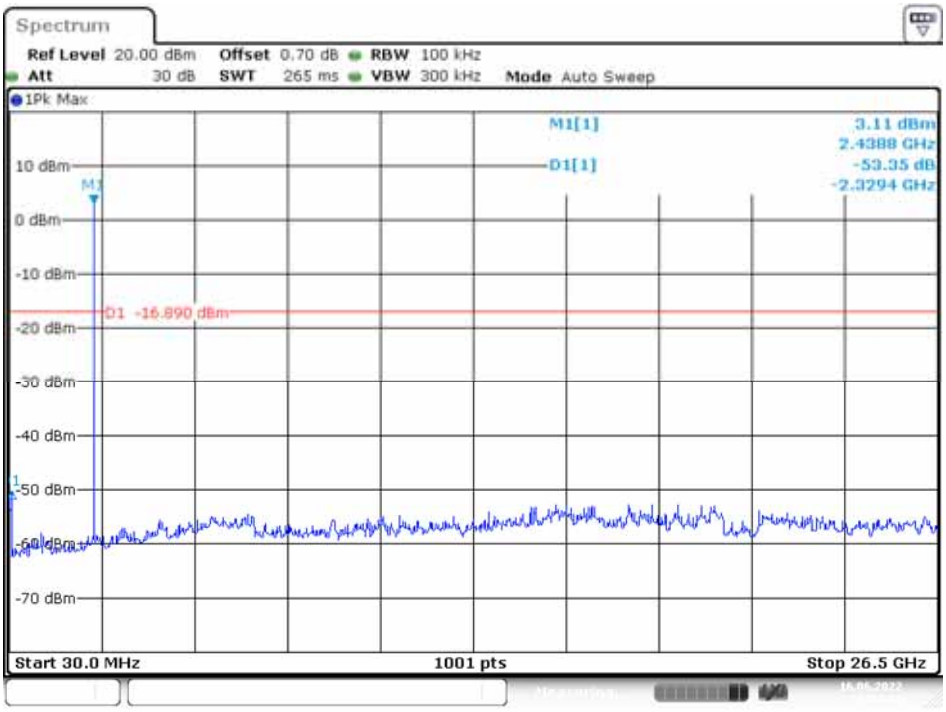
BLE(1M) Mode

Low Channel



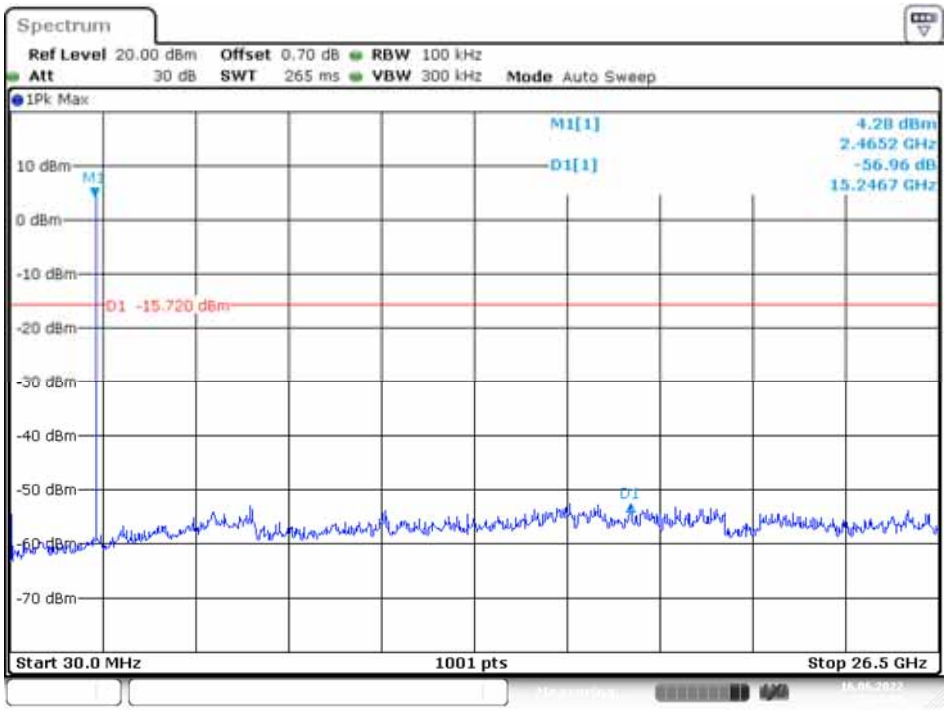
Date: 16.JUN.2022 16:08:54

Middle Channel



Date: 16.JUN.2022 16:06:44

High Channel



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

The steps for the first option are as follows:

a) Set RBW = 100 kHz.

b) Set the VBW ≥ [3 × 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.

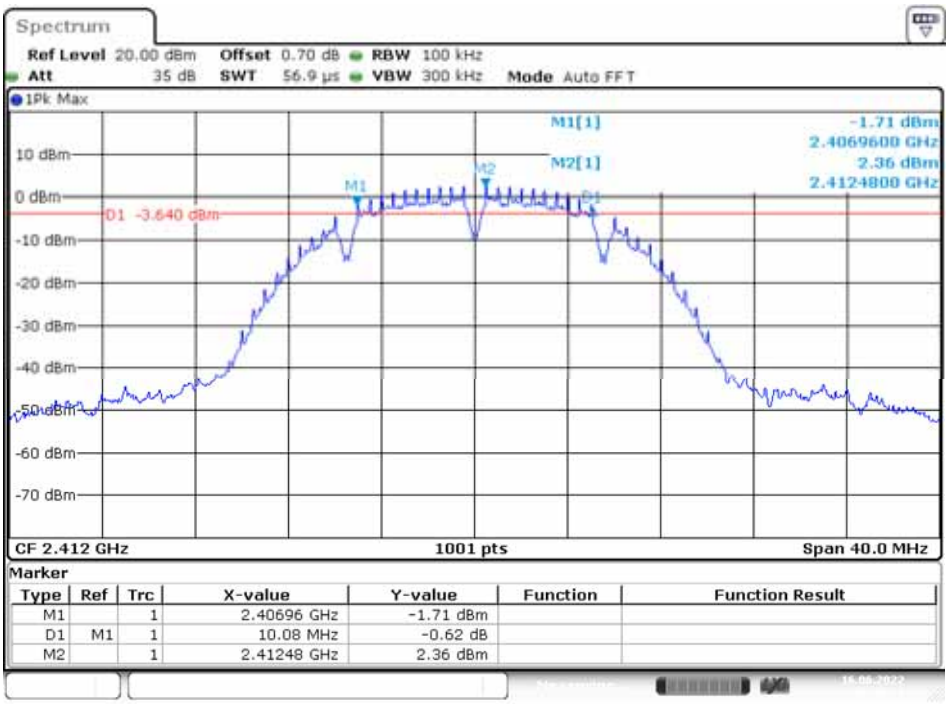
9.3 Test Results

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)		Limit (kHz)	Result
		Chain 0	Chain 1		
B Mode					
Low	2412	10.08	10.08	> 500	PASS
Middle	2437	10.08	10.08	> 500	PASS
High	2462	10.08	10.08	> 500	PASS
G Mode					
Low	2412	16.32	16.32	> 500	PASS
Middle	2437	16.32	16.32	> 500	PASS
High	2462	16.32	16.32	> 500	PASS
N20 Mode					
Low	2412	17.56	17.56	> 500	PASS
Middle	2437	17.16	17.20	> 500	PASS
High	2462	17.16	17.36	> 500	PASS
BLE Mode					
Low	2402	0.51		> 500	PASS
Middle	2440	0.51		> 500	PASS
High	2480	0.51		> 500	PASS

Please refer to the following plots

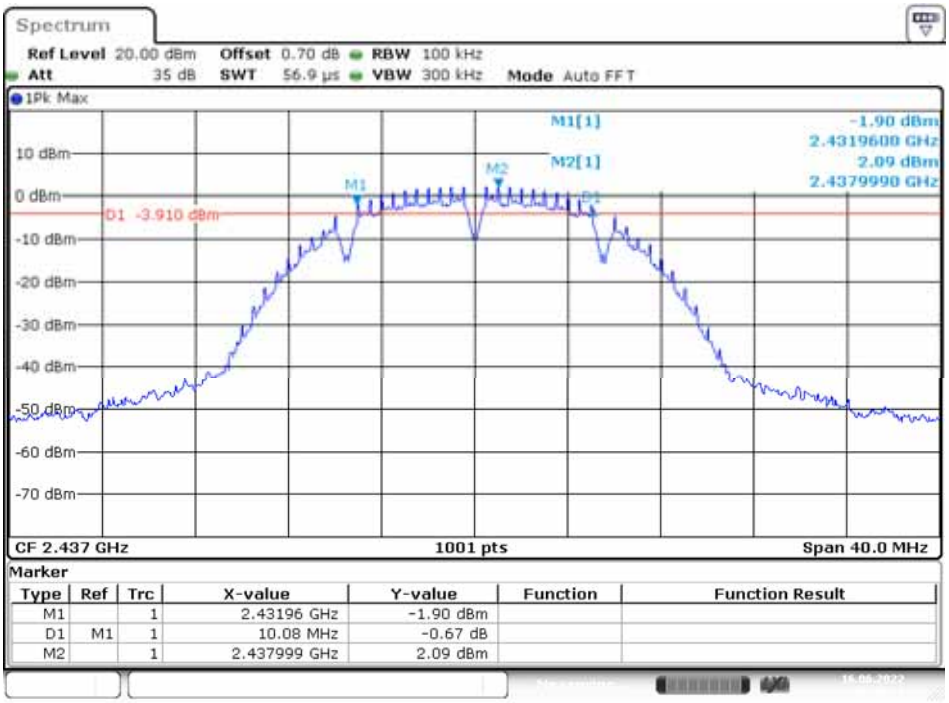
B Mode (Chain 0)

Low Channel



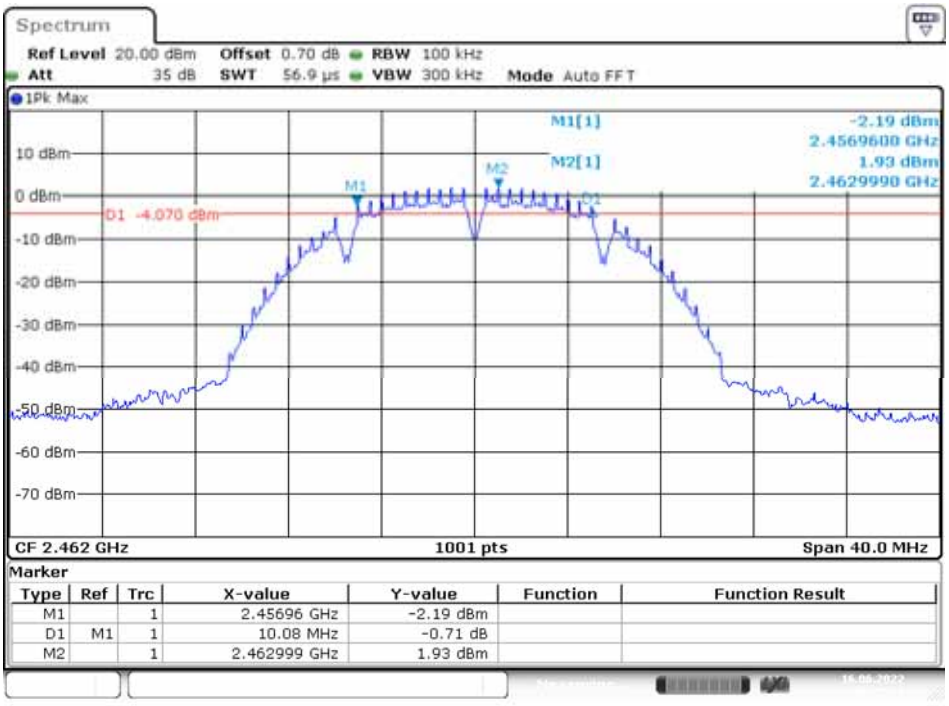
Date: 16.JUN.2022 18:16:19

Middle Channel



Date: 16.JUN.2022 18:20:30

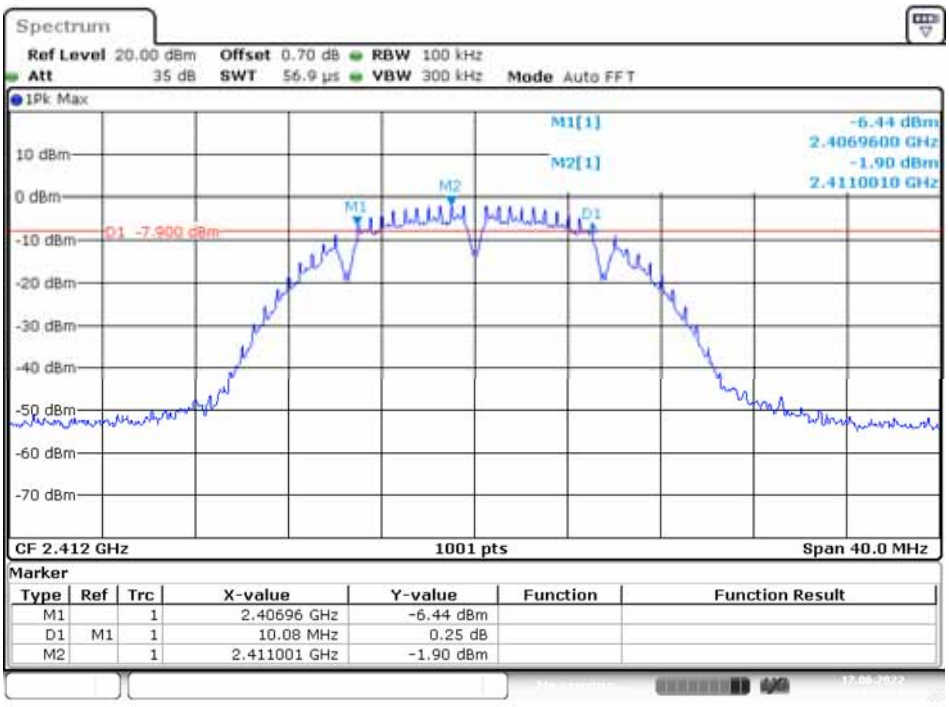
High Channel



Date: 16.JUN.2022 18:22:42

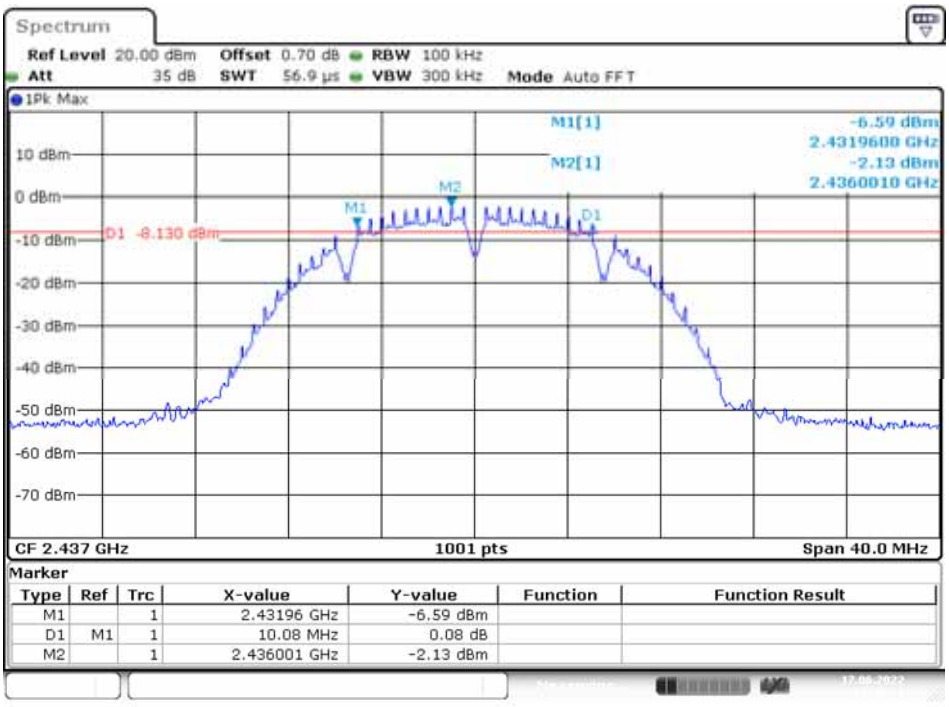
B Mode (Chain 1)

Low Channel

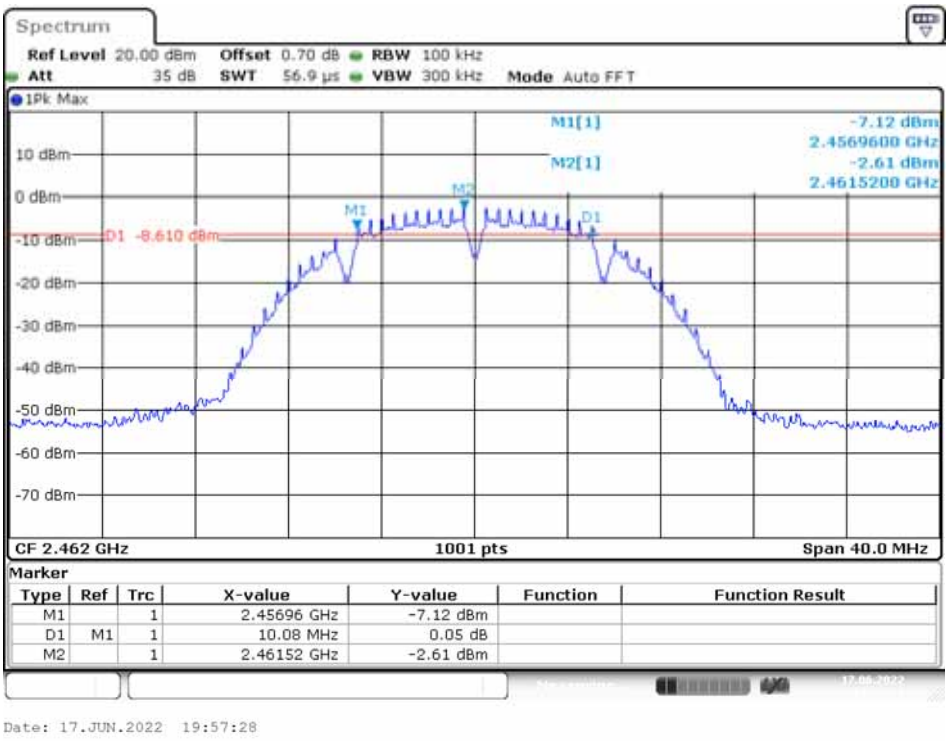


Date: 17.JUN.2022 19:52:50

Middle Channel

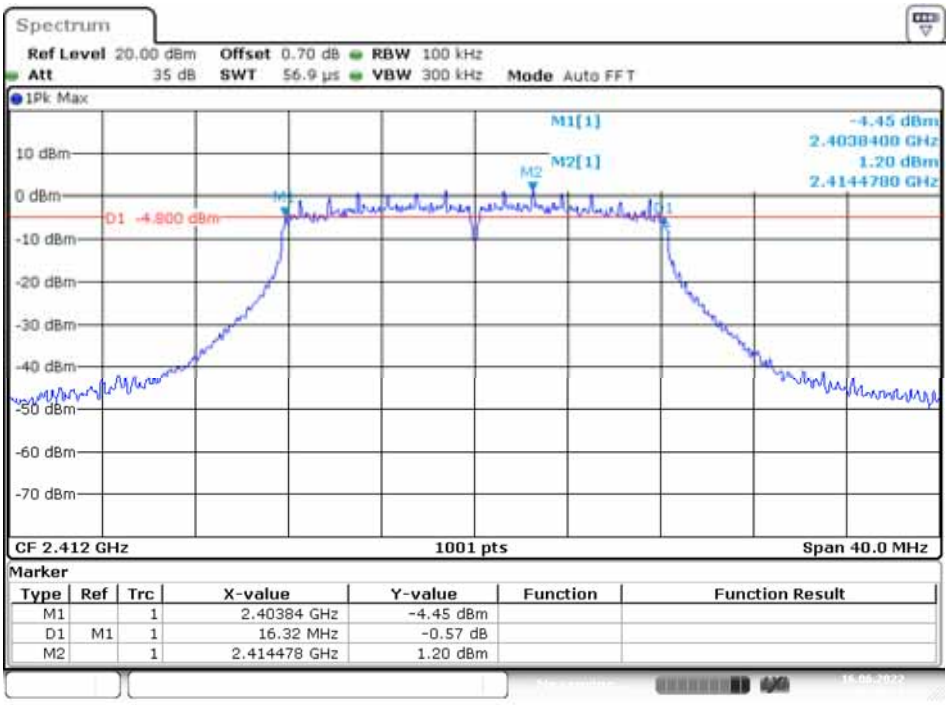


High Channel



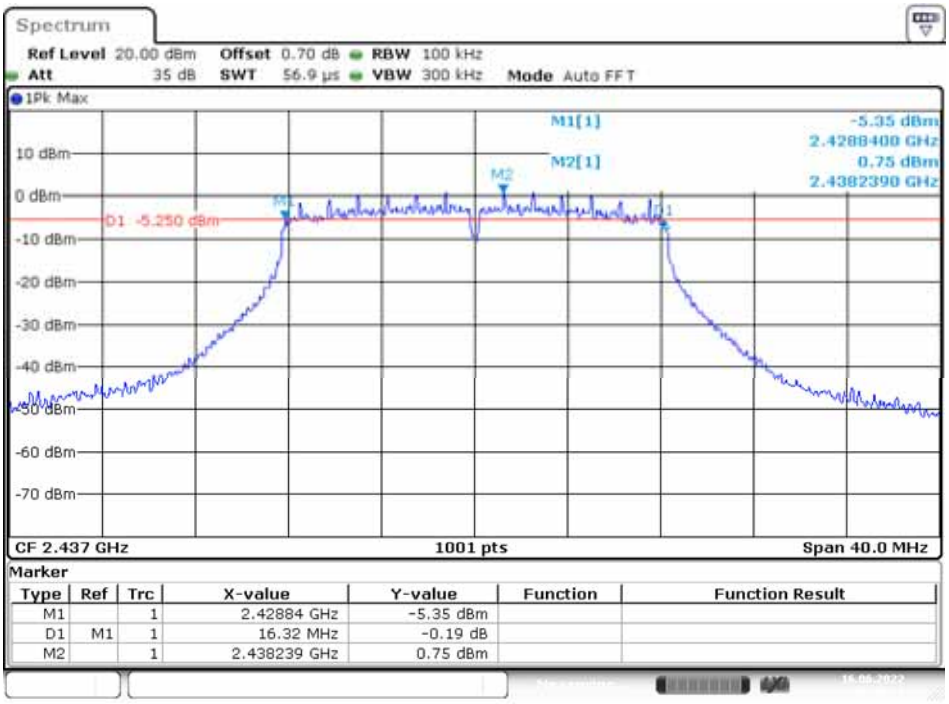
G Mode (Chain 0)

Low Channel



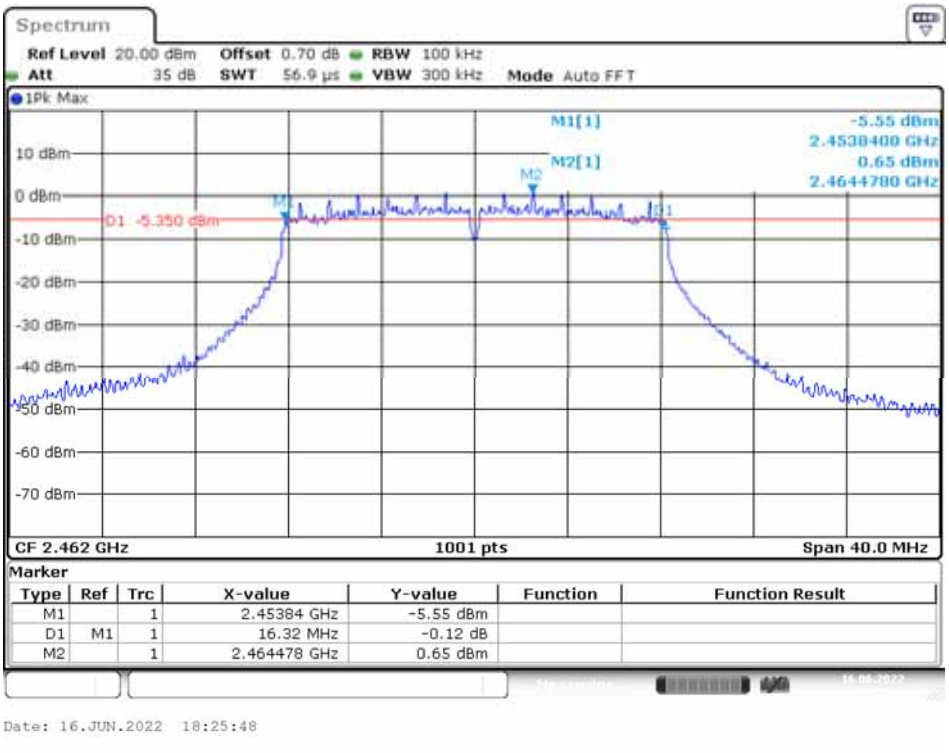
Date: 16.JUN.2022 18:46:13

Middle Channel



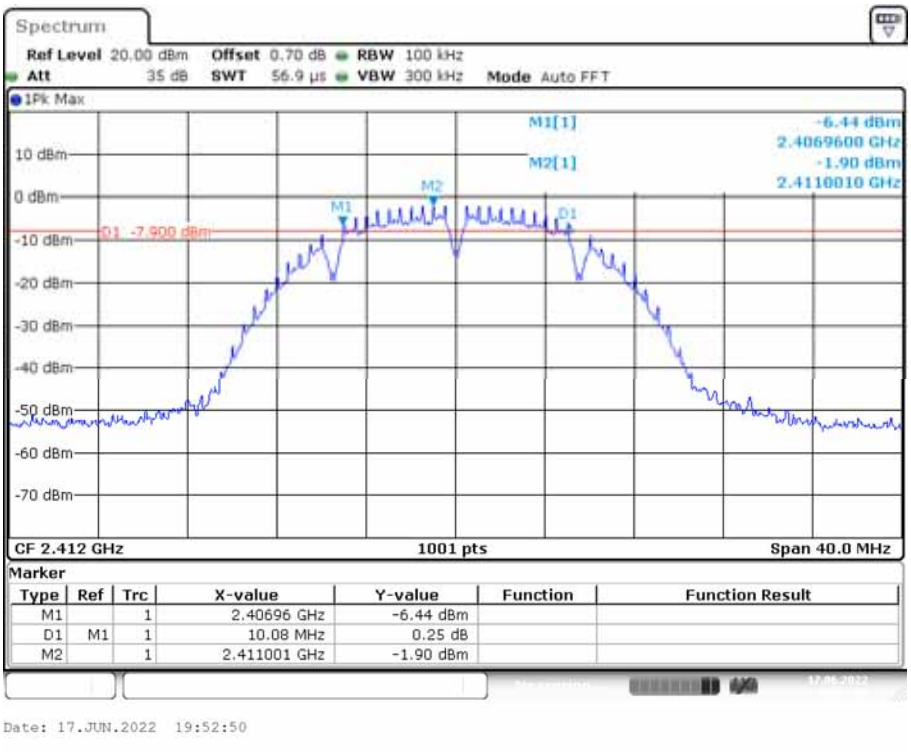
Date: 16.JUN.2022 18:29:31

High Channel

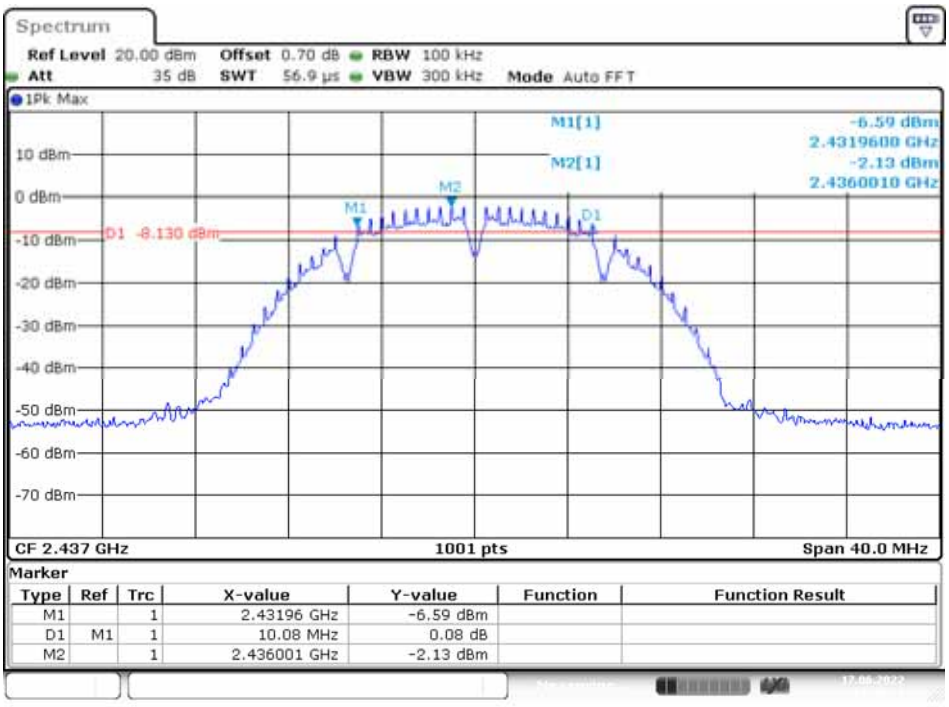


G Mode (Chain 1)

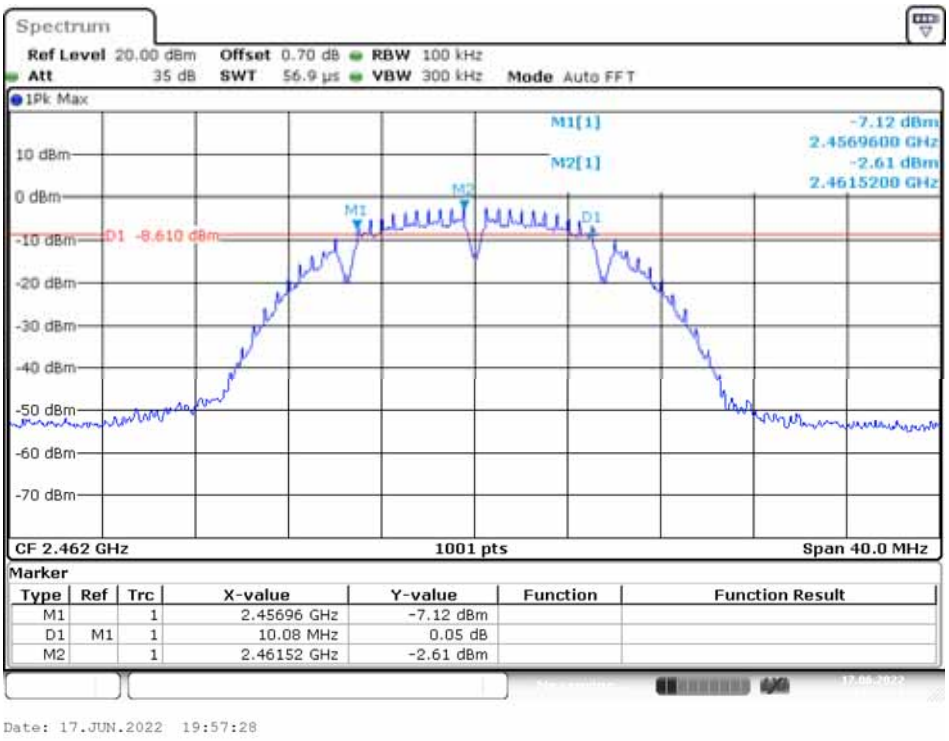
Low Channel



Middle Channel

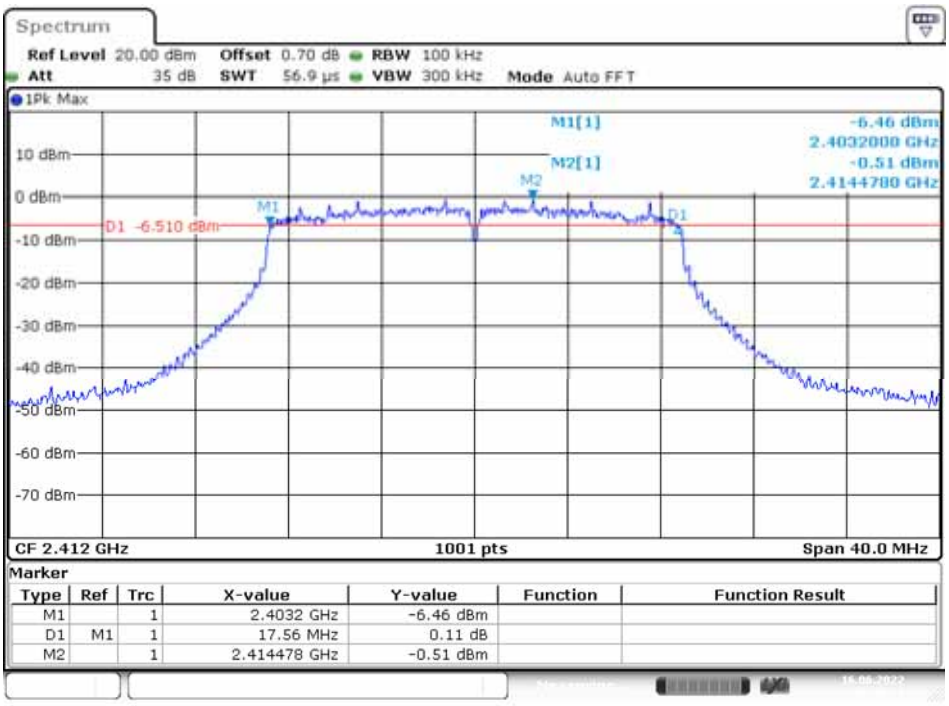


High Channel

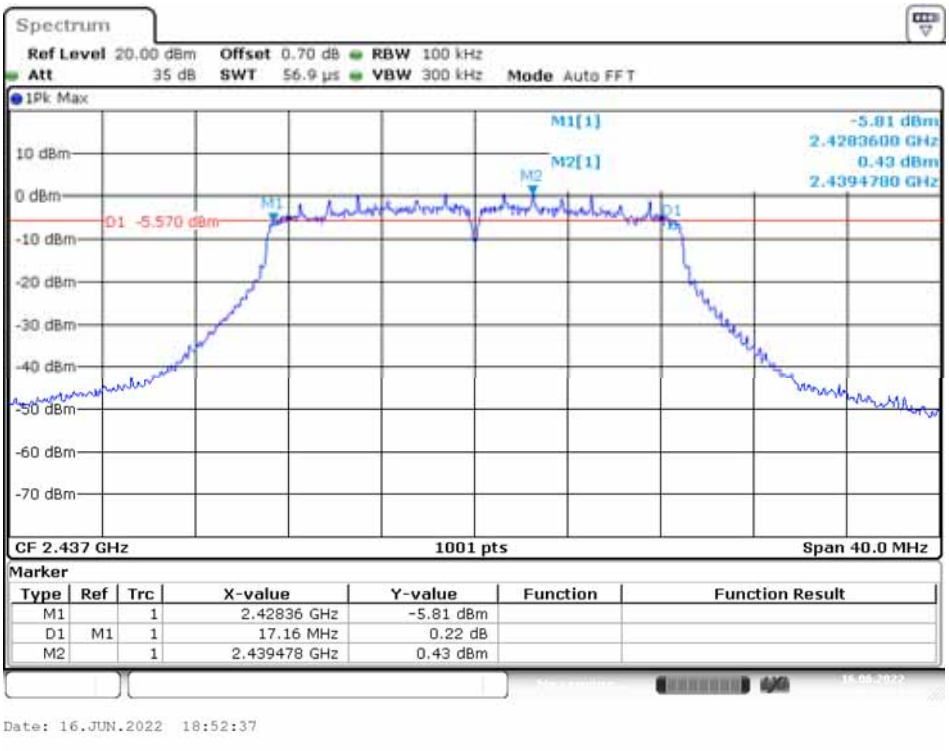


N20 Mode (Chain 0)

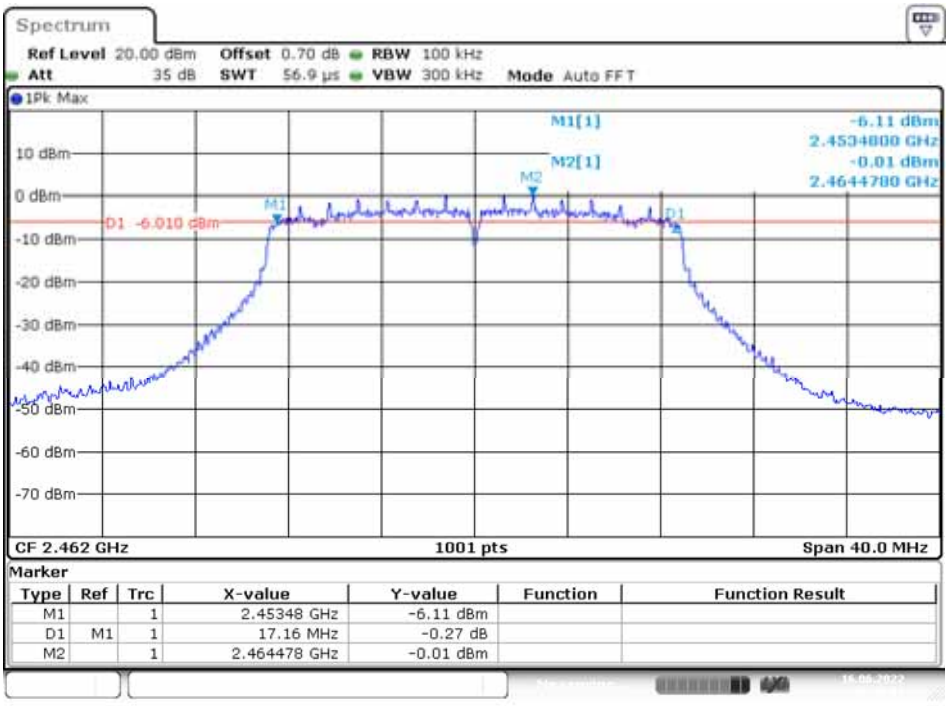
Low Channel



Middle Channel



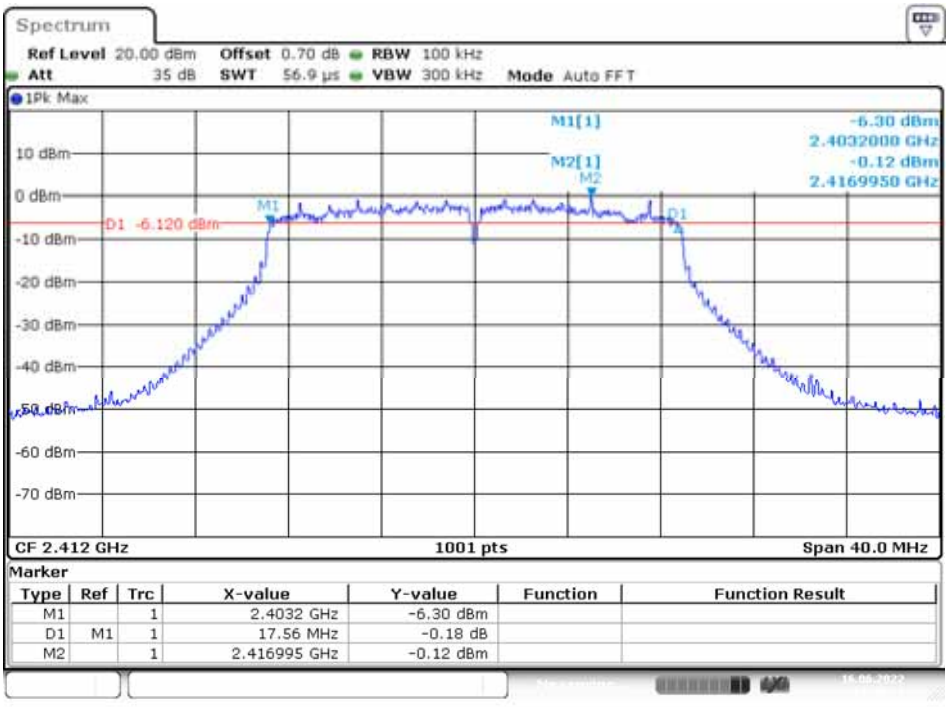
High Channel



Date: 16.JUN.2022 18:56:02

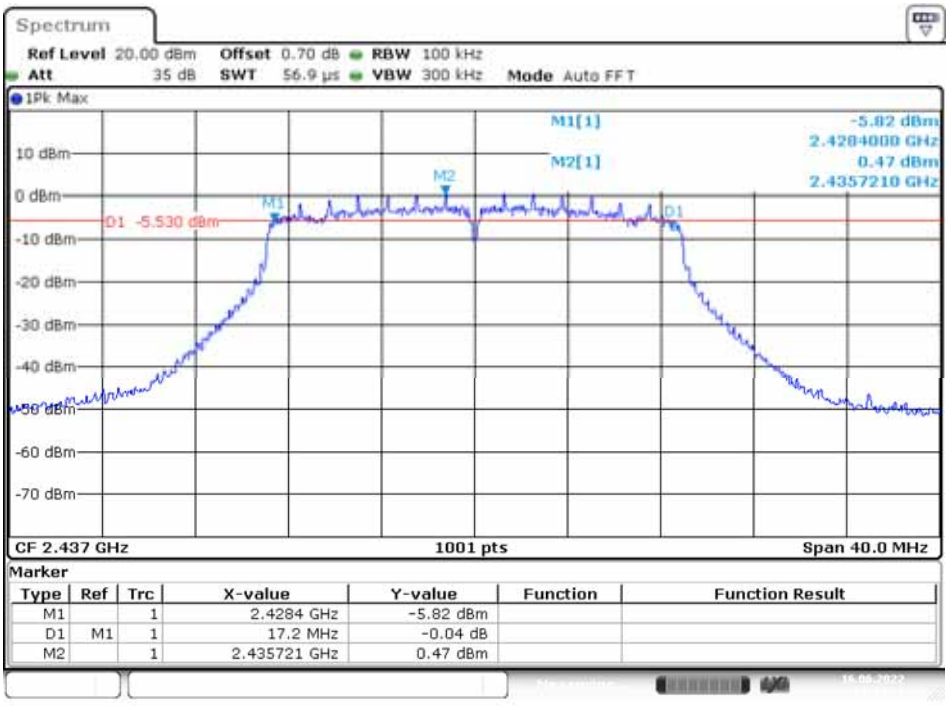
N20 Mode (Chain 1)

Low Channel



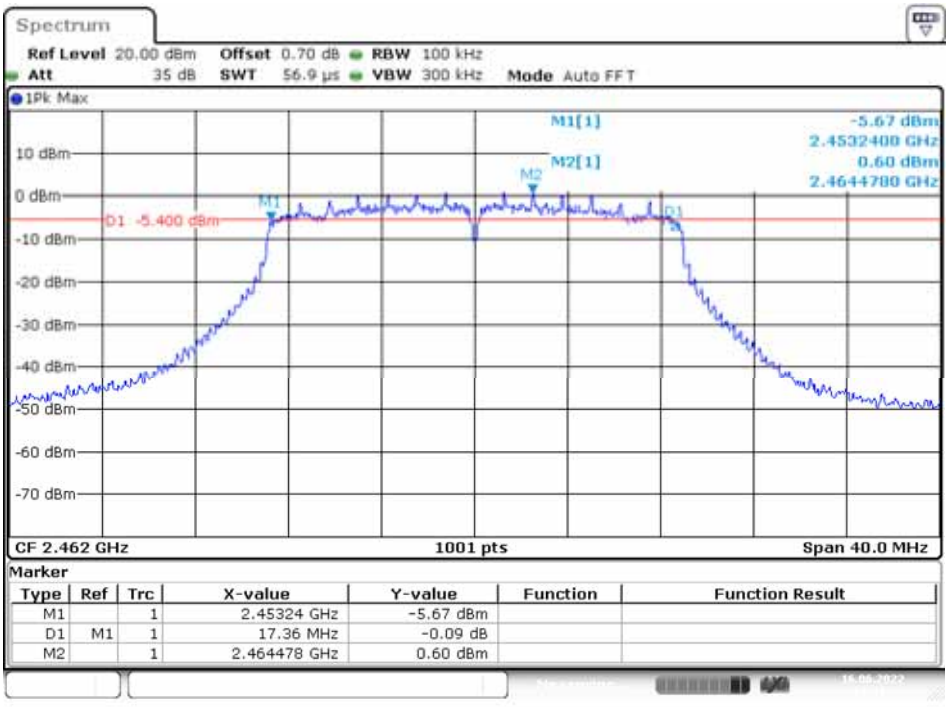
Date: 16.JUN.2022 19:49:50

Middle Channel



Date: 16.JUN.2022 19:44:39

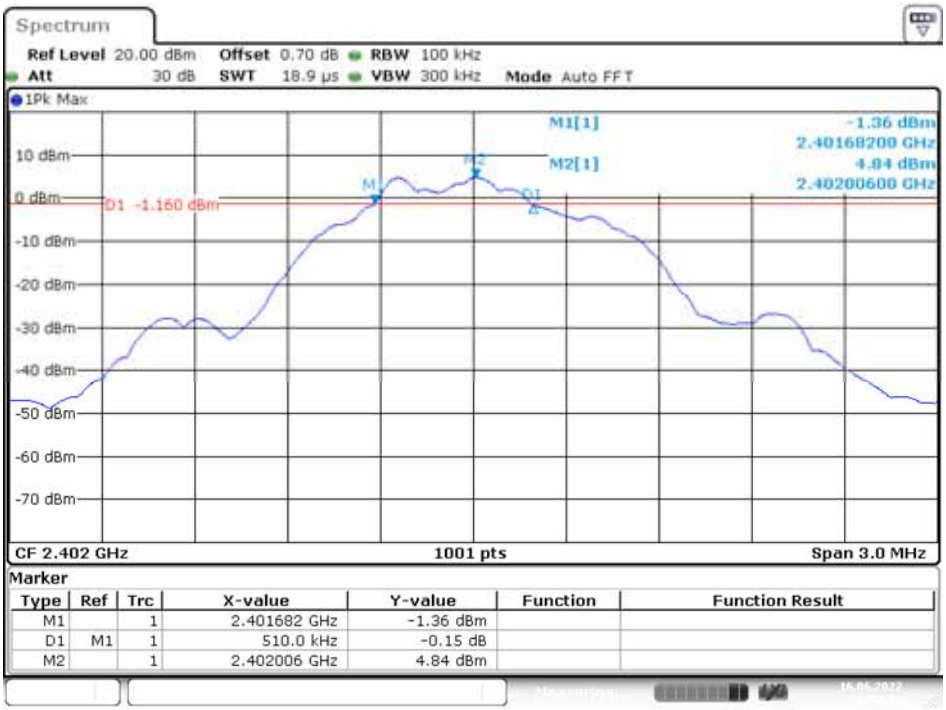
High Channel



Date: 16.JUN.2022 19:41:43

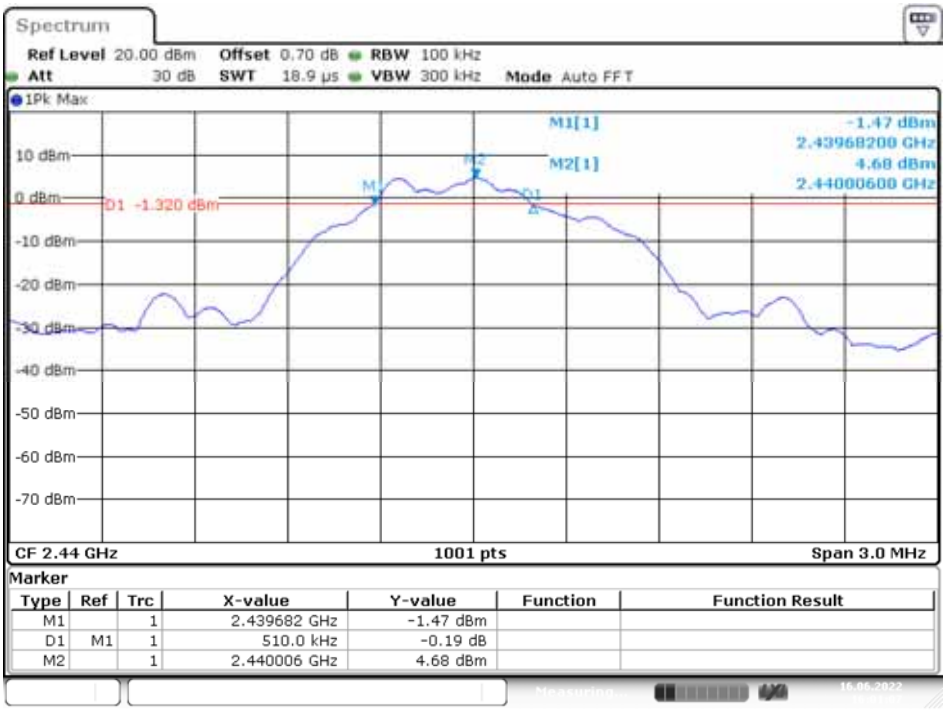
BLE Mode

Low Channel



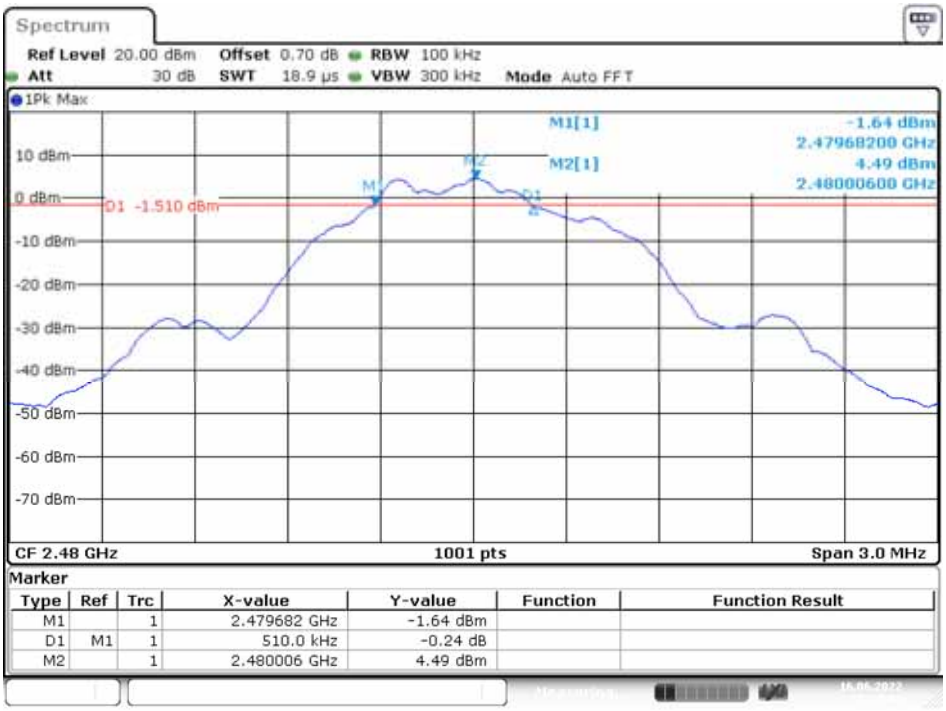
Date: 16.JUN.2022 16:07:52

Middle Channel



Date: 16.JUN.2022 16:01:07

High Channel



10 FCC §15.247(b)(3) – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.247(b) (3).

Systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

10.2 Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to measuring equipment.

10.3 Test Results

Conducted Peak Output Power

Channel	Frequency (MHz)	Power Chain 0 (dBm)	Power Chain 1 (dBm)	Total Power (dBm)	Total Power (W)	Limit (W)	Result
B Mode							
Low	2412	14.87	12.28	16.78	0.048	1	PASS
Middle	2437	13.73	11.71	15.85	0.038	1	PASS
High	2462	13.59	11.37	15.63	0.037	1	PASS
G Mode							
Low	2412	22.58	22.66	25.63	0.366	1	PASS
Middle	2437	22.40	21.34	24.91	0.310	1	PASS
High	2462	21.91	21.91	24.92	0.310	1	PASS
N20 Mode							
Low	2412	22.59	22.52	25.57	0.361	1	PASS
Middle	2437	22.31	21.64	25.00	0.316	1	PASS
High	2462	22.36	22.31	25.35	0.343	1	PASS

Conducted Average Output Power

Channel	Frequency (MHz)	Power Chain 0 (dBm)	Power Chain 1 (dBm)	Total Power (dBm)	Duty Factor (dB)	Output Power With Duty Factor (dB)	Result
B Mode							
Low	2412	10.27	10.04	13.17	0.09	13.26	N/A
Middle	2437	11.67	9.56	13.75	0.09	13.84	N/A
High	2462	11.52	9.21	13.53	0.09	13.62	N/A
G Mode							
Low	2412	11.91	12.03	14.98	0.36	15.34	N/A
Middle	2437	11.84	10.84	14.38	0.36	14.74	N/A
High	2462	11.68	11.58	14.64	0.36	15.00	N/A
N20 Mode							
Low	2412	11.45	11.13	14.30	0.09	14.39	N/A
Middle	2437	11.74	10.80	14.31	0.09	14.40	N/A
High	2462	11.30	11.59	14.46	0.09	14.55	N/A

Channel	Frequency	Maximum peak Conducted Output Power		Limit	Result
	(MHz)	(dBm)	(W)	(W)	
BLE Mode					
Low	2402	4.29	0.00269	1	PASS
Middle	2440	4.40	0.00275	1	PASS
High	2480	4.06	0.00255	1	PASS

Channel	Frequency	Maximum Average Conducted Output Power		Limit	Result
	(MHz)	(dBm)	(W)	(W)	
BLE Mode					
Low	2402	3.52	0.00225	N/A	N/A
Middle	2440	3.46	0.00222	N/A	N/A
High	2480	3.38	0.00218	N/A	N/A

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

The device have four antenna, so array gain is 0 dB.

11 FCC§15.247(d) – 100 kHz Bandwidth of Frequency Band Edge

11.1 Applicable Standard

According to FCC §15.247(d).

In any 100kHz 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 20dB below that in the 100kHz 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 30dB instead of 20dB. 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)).

11.2 Test Procedure

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

2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.

3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.

4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

5. Repeat above procedures until all measured frequencies were complete.

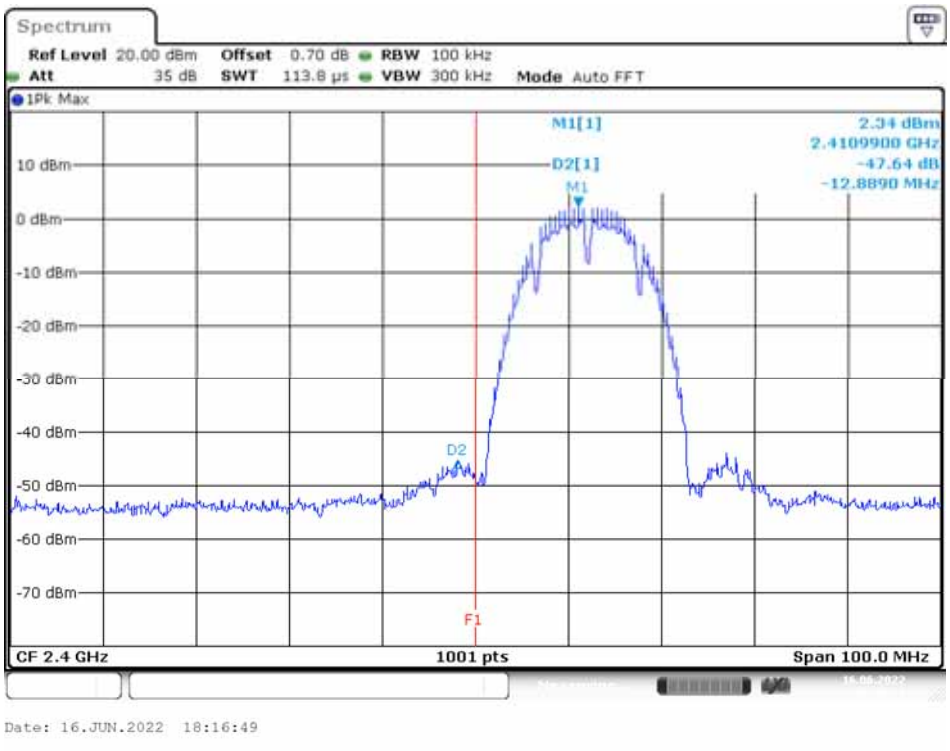
11.3 Test Results

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)		Limit (dBc)	Result
		Chain 0	Chain 1		
B Mode					
Low	2412	47.64	49.23	≥ 20	PASS
High	2462	52.96	48.05	≥ 20	PASS
G Mode					
Low	2412	40.66	40.22	≥ 20	PASS
High	2462	51.49	50.44	≥ 20	PASS
N20 Mode					
Low	2412	36.40	36.83	≥ 20	PASS
High	2462	51.14	50.71	≥ 20	PASS
BLE Mode					
Low	2402	52.18		≥ 20	PASS
High	2480	60.49		≥ 20	PASS

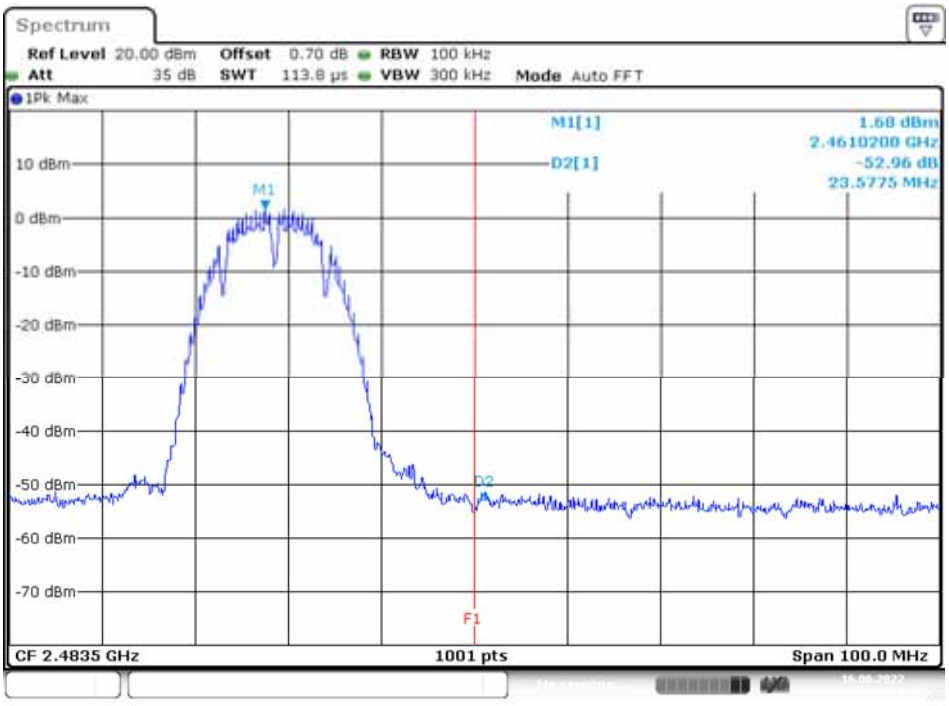
Please refer to the following plots.

B Mode (Chain 0)

Band Edge, Left Side

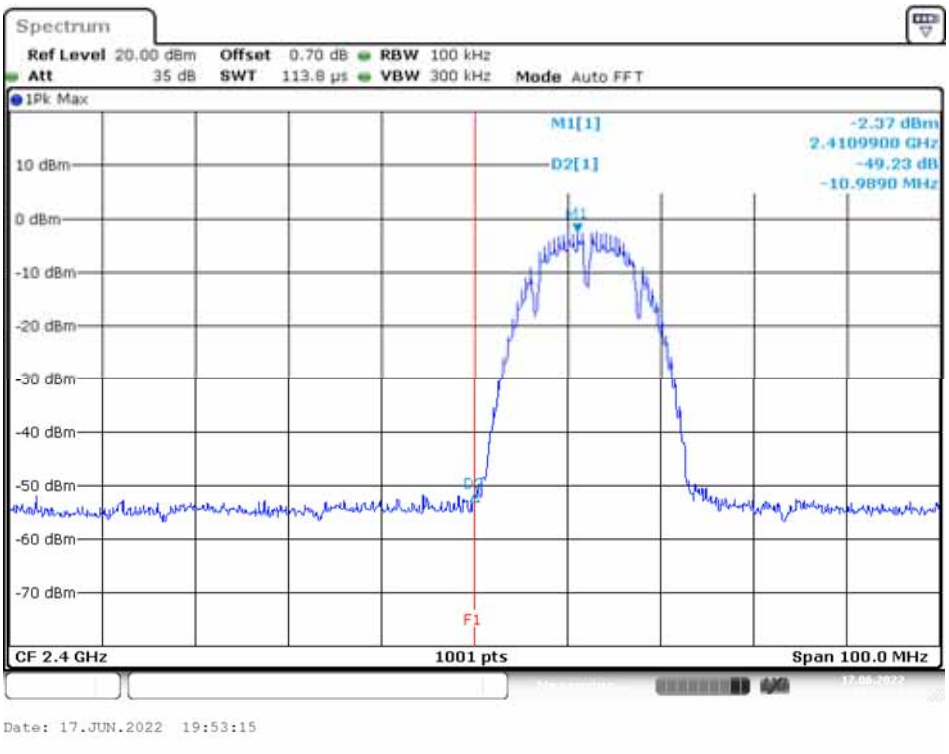


Band Edge, Right Side

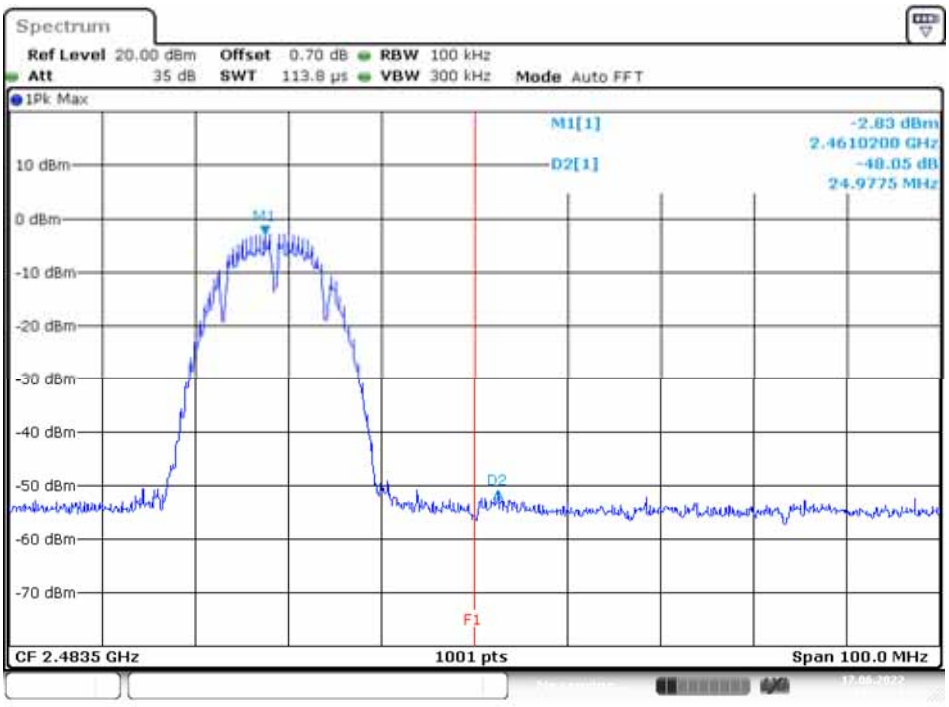


B Mode (Chain 1)

Band Edge, Left Side

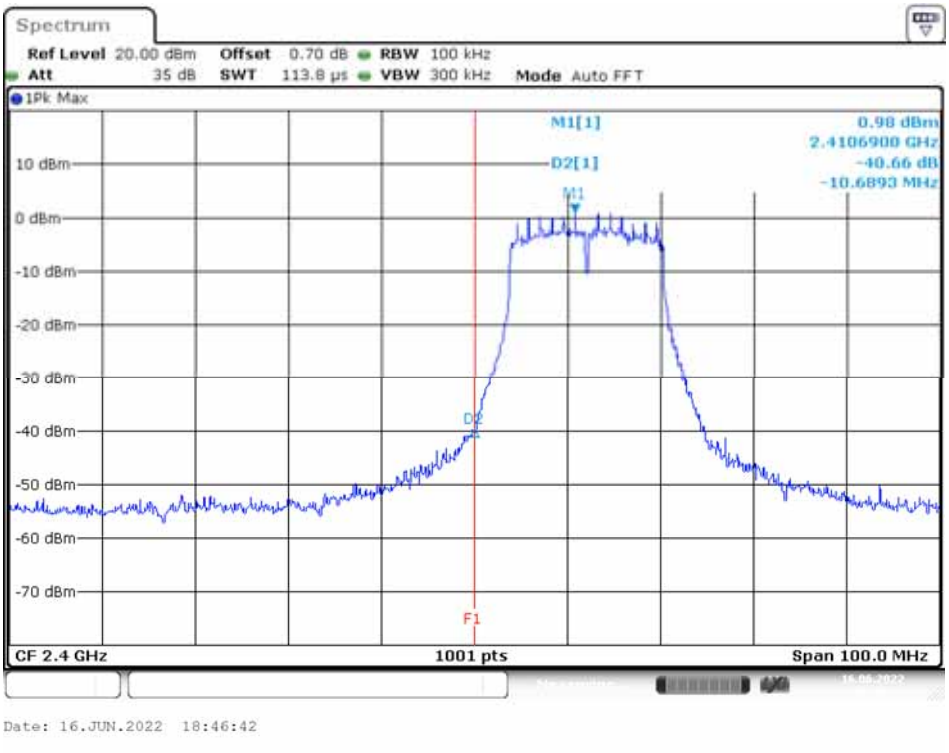


Band Edge, Right Side

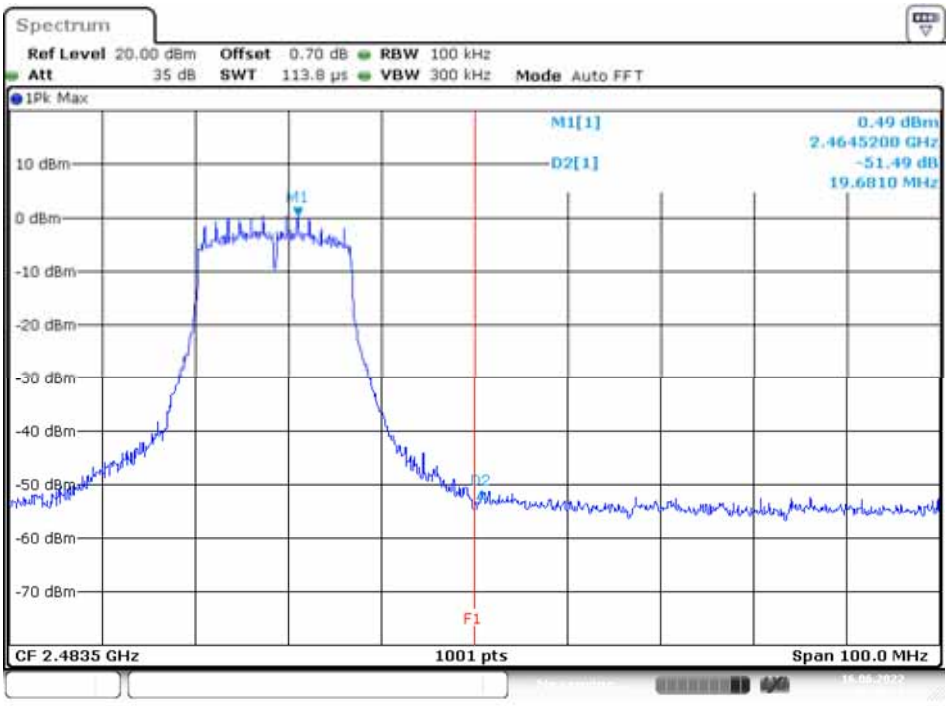


G Mode (Chain 0)

Band Edge, Left Side

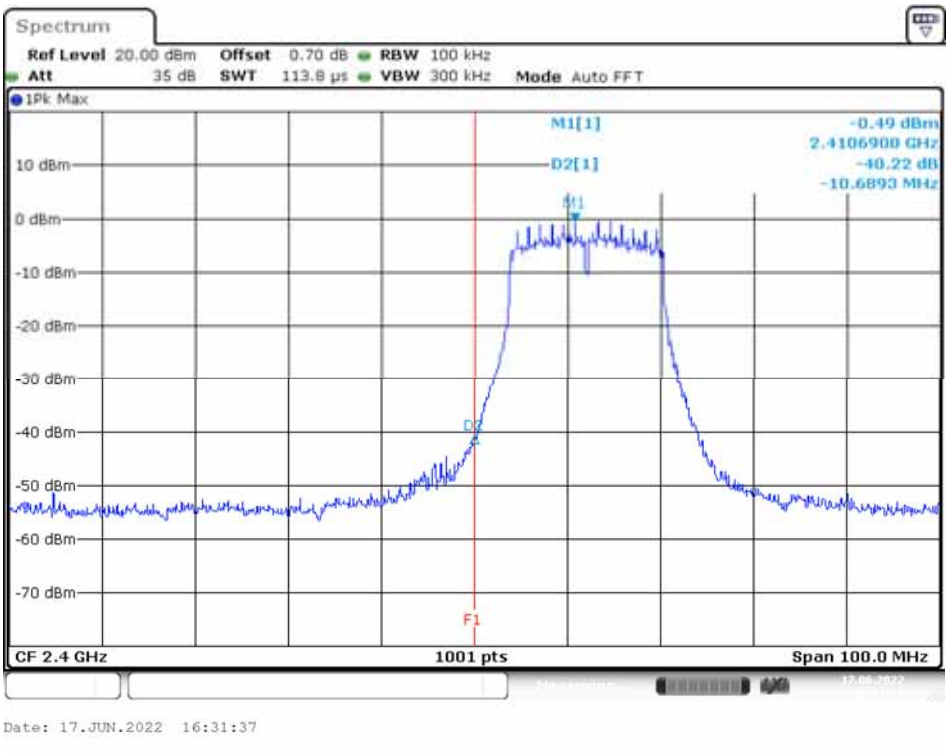


Band Edge, Right Side

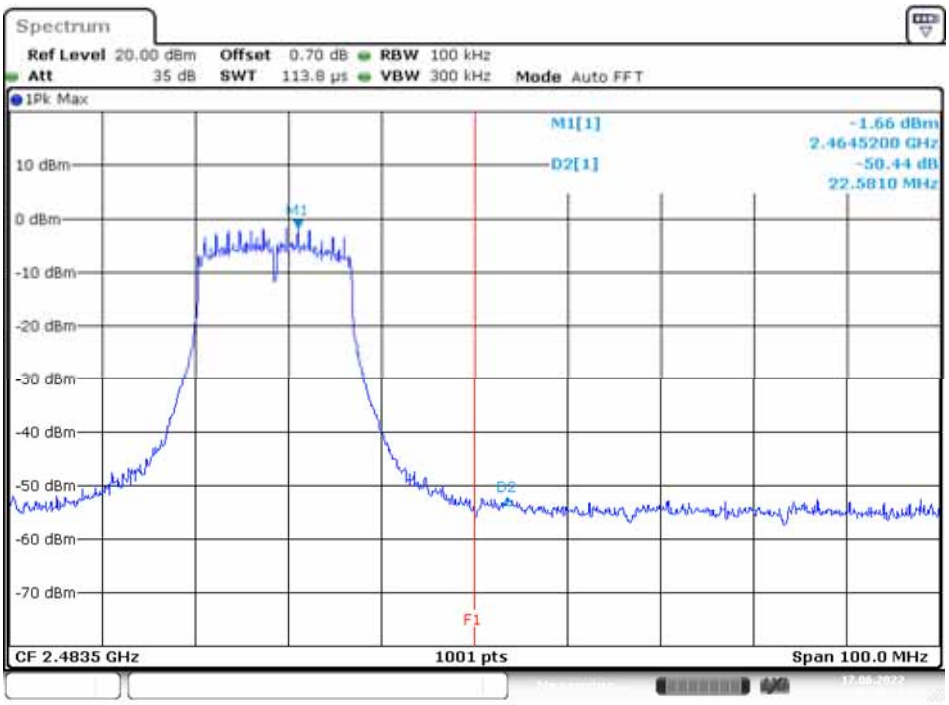


G Mode (Chain 1)

Band Edge, Left Side



Band Edge, Right Side



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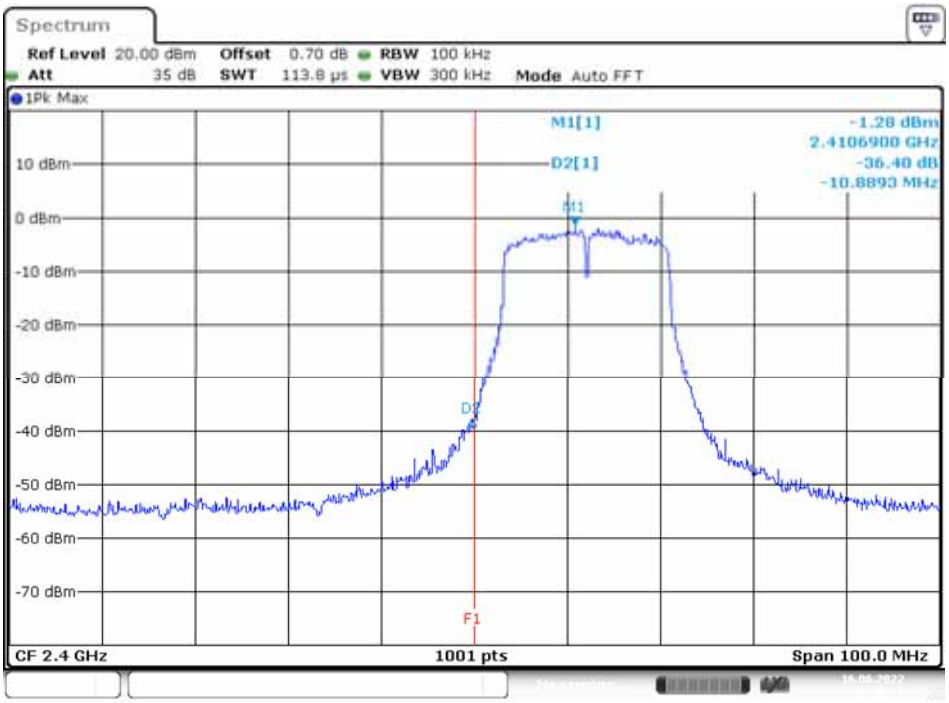
N20 Mode (Chain 0)

Band Edge, Left Side



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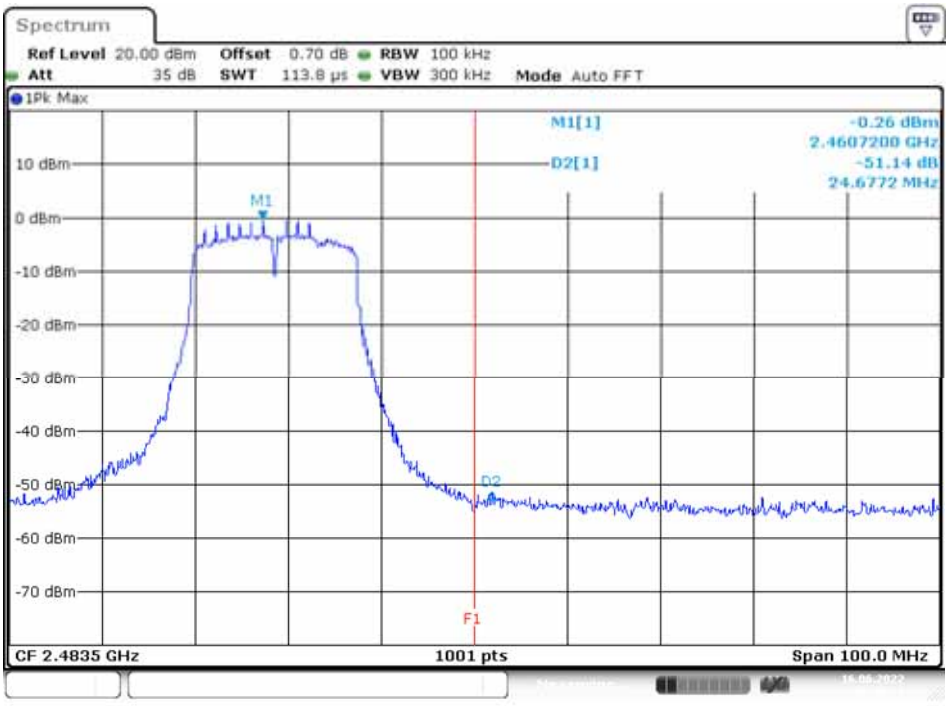
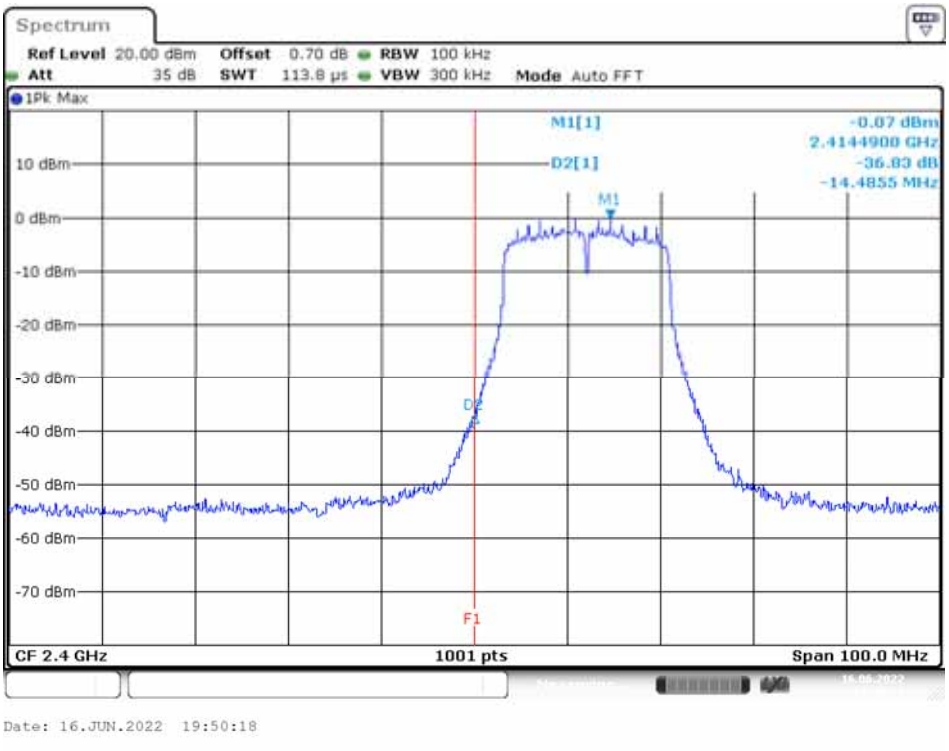
Band Edge, Right Side

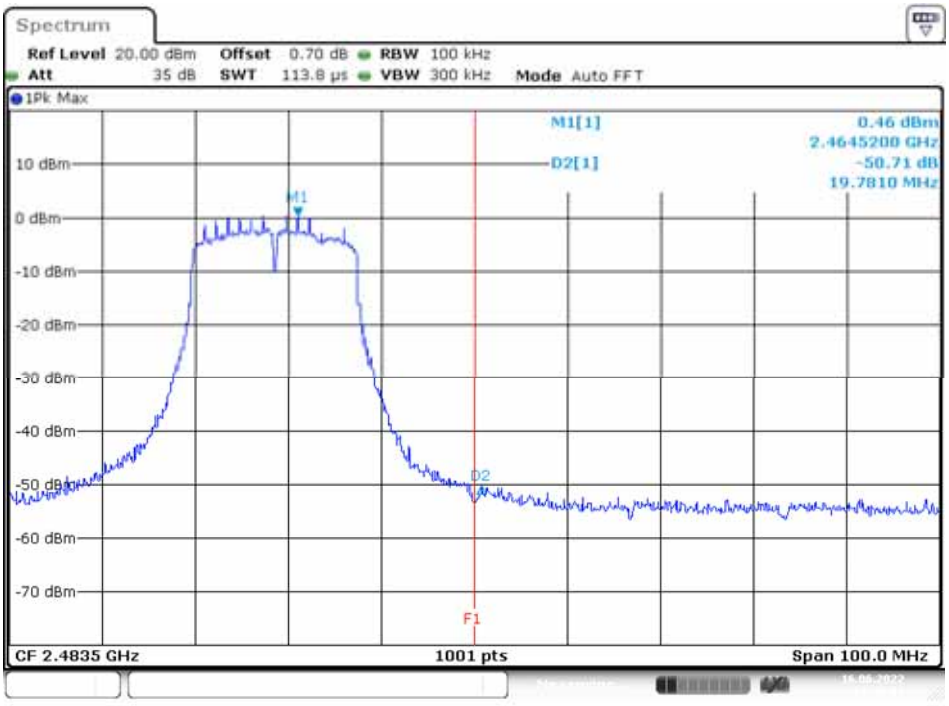


N20 Mode (Chain 1)

Band Edge, Left Side



Band Edge, Right Side



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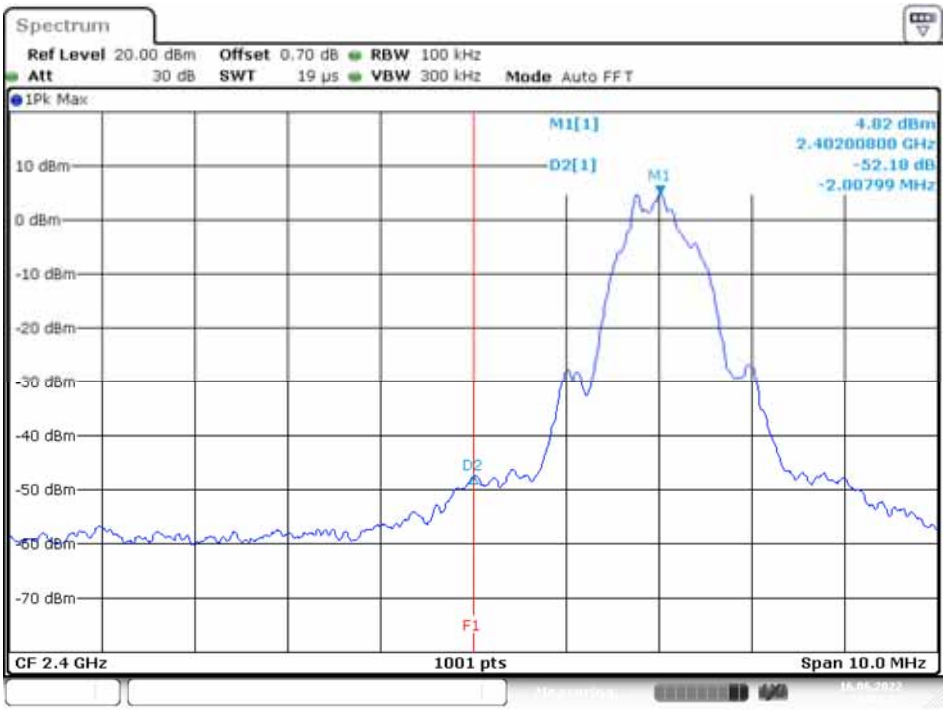
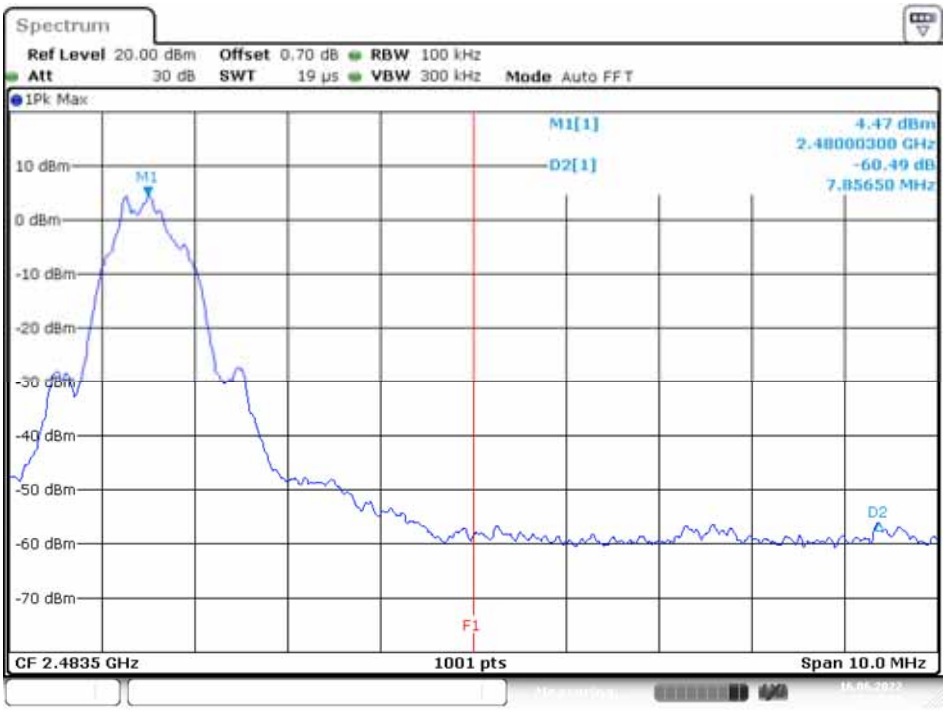
BLE Mode

Band Edge, Left Side



Date: 16.JUN.2022 16:08:38

Band Edge, Right Side



12 FCC §15.247(e) – Power Spectral Density

12.1 Applicable Standard

According to FCC §15.247(e).

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

12.2 Test Procedure

According to ANSI C63.10-2013

a) Set analyzer center frequency to DTS channel center frequency.

b) Set the span to 1.5 times the DTS bandwidth.

c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.

d) Set the VBW ≥ [3 × RBW].

e) Detector = peak.

f) Sweep time = auto couple.

g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat

12.3 Test Results

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)			Limit (dBm/3 kHz)	Result
		Chain 0	Chain 1	Total		
B Mode						
Low	2412	-10.56	-15.20	-9.28	7.99	PASS
Middle	2437	-11.08	-15.07	-9.62	7.99	PASS
High	2462	-10.66	-15.72	-9.48	7.99	PASS
G Mode						
Low	2412	-12.74	-13.34	-10.02	7.99	PASS
Middle	2437	-13.49	-15.62	-11.42	7.99	PASS
High	2462	-13.70	-14.77	-11.19	7.99	PASS
N20 Mode						
Low	2412	-13.03	-13.00	-10.00	7.99	PASS
Middle	2437	-13.18	-14.04	-10.58	7.99	PASS
High	2462	-13.72	-12.81	-10.23	7.99	PASS

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
BLE Mode				
Low	2402	-11.13	8	PASS
Middle	2440	-10.65	8	PASS
High	2480	-9.72	8	PASS

The device is a client device. the 2 antenna maximum antenna gain are 3 dBi, and employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for Power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

So:

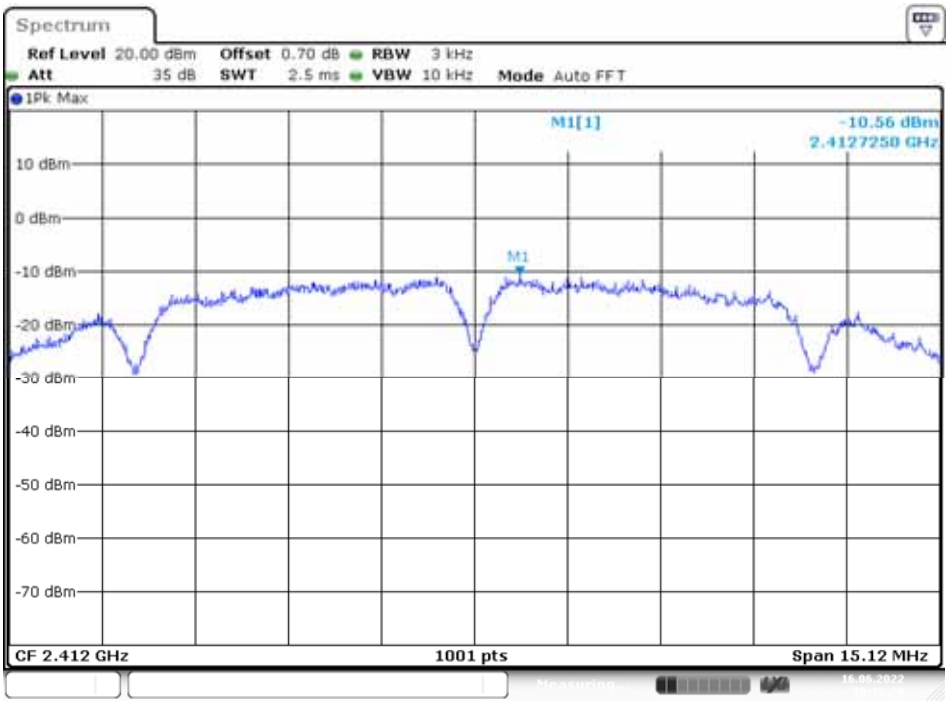
Directional gain = GANT + Array Gain =3 +10*log(2) =6.01 dBi

The Power density Limits was reduce 0.01 dB

Please refer to the following plots

B Mode (Chain 0)

Low Channel



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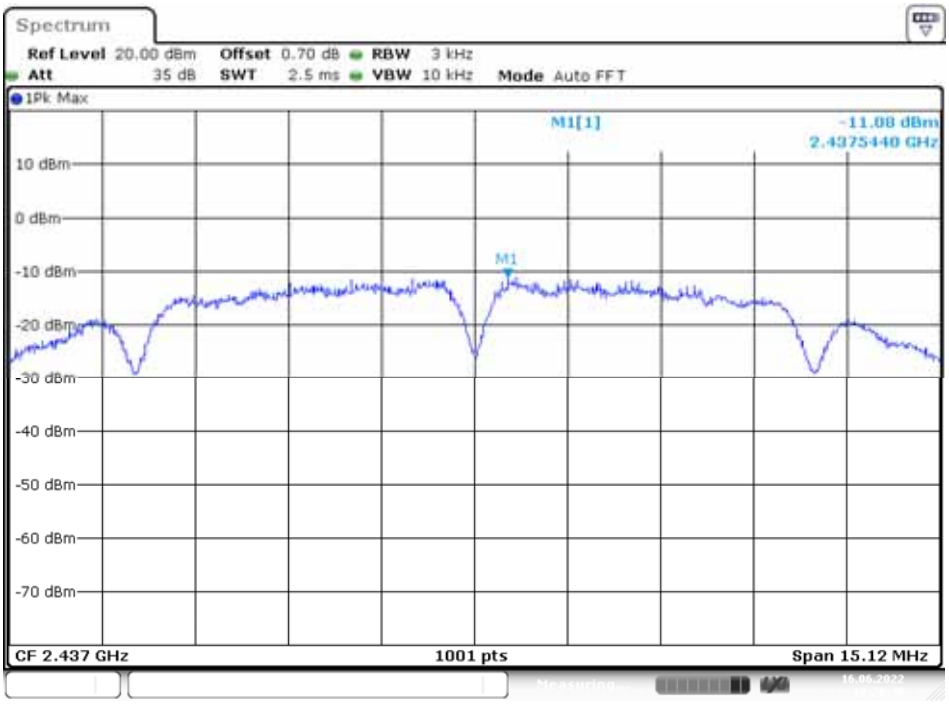
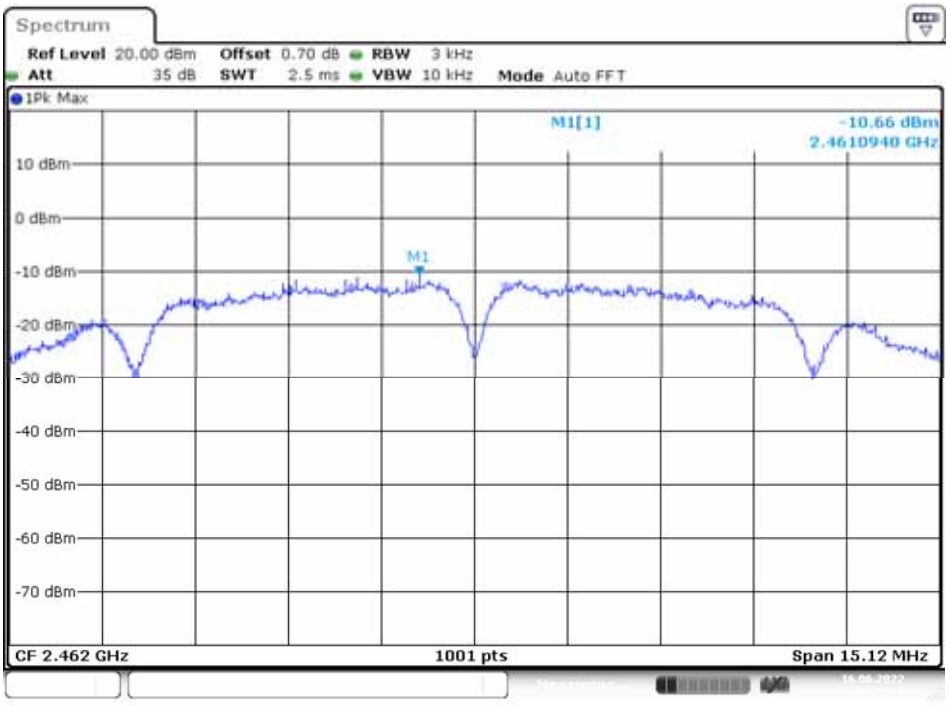
Middle Channel



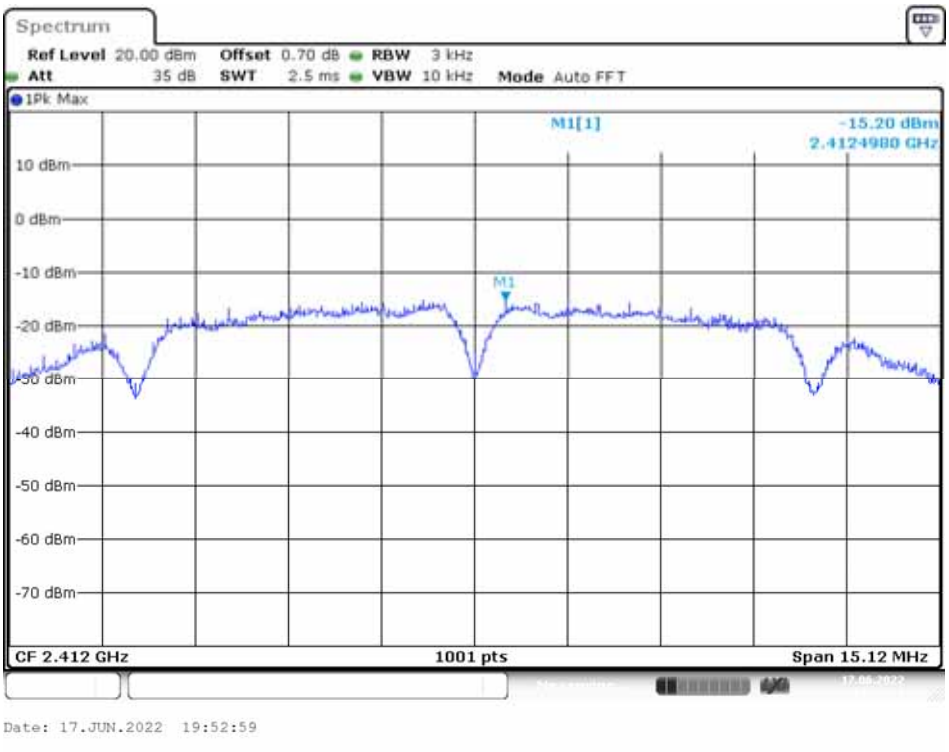
Date: 16.JUN.2022 18:20:41

High Channel

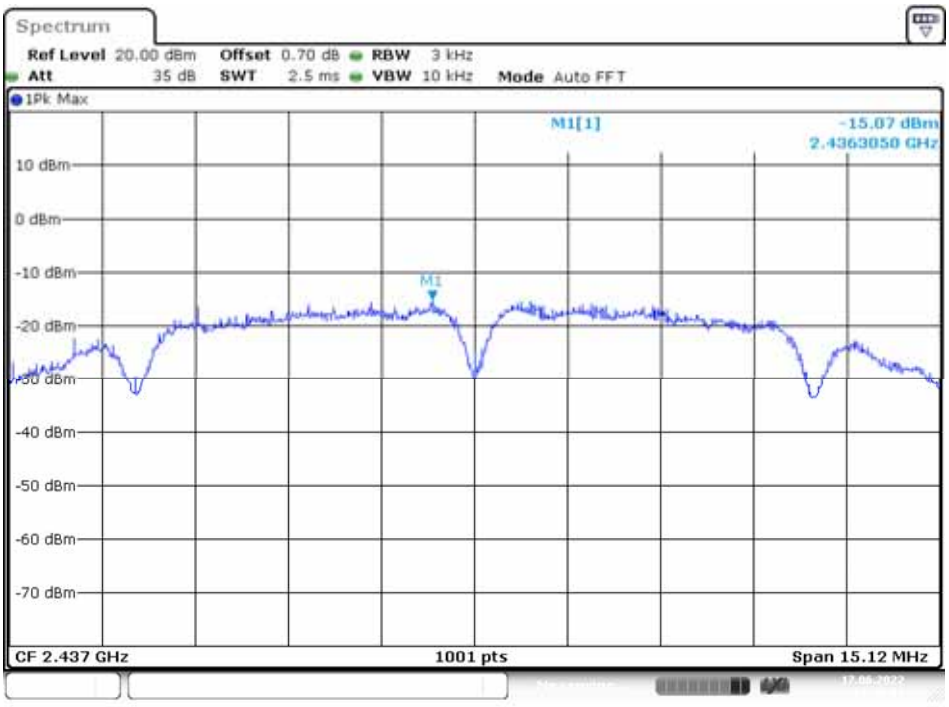


B Mode (Chain 1)

Low Channel

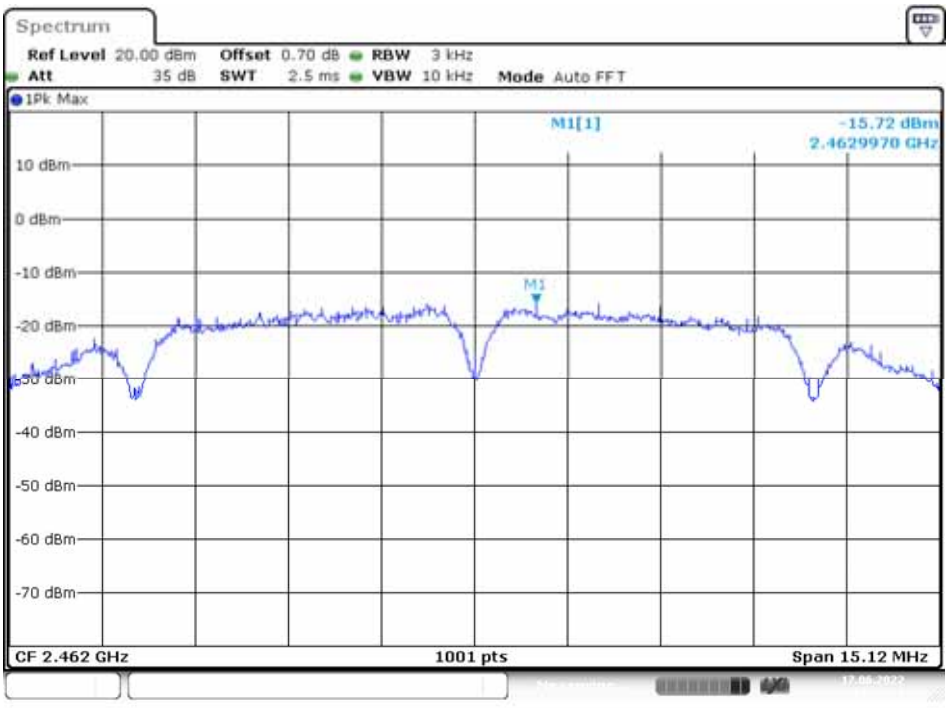


Middle Channel



Date: 17.JUN.2022 19:55:02

High Channel



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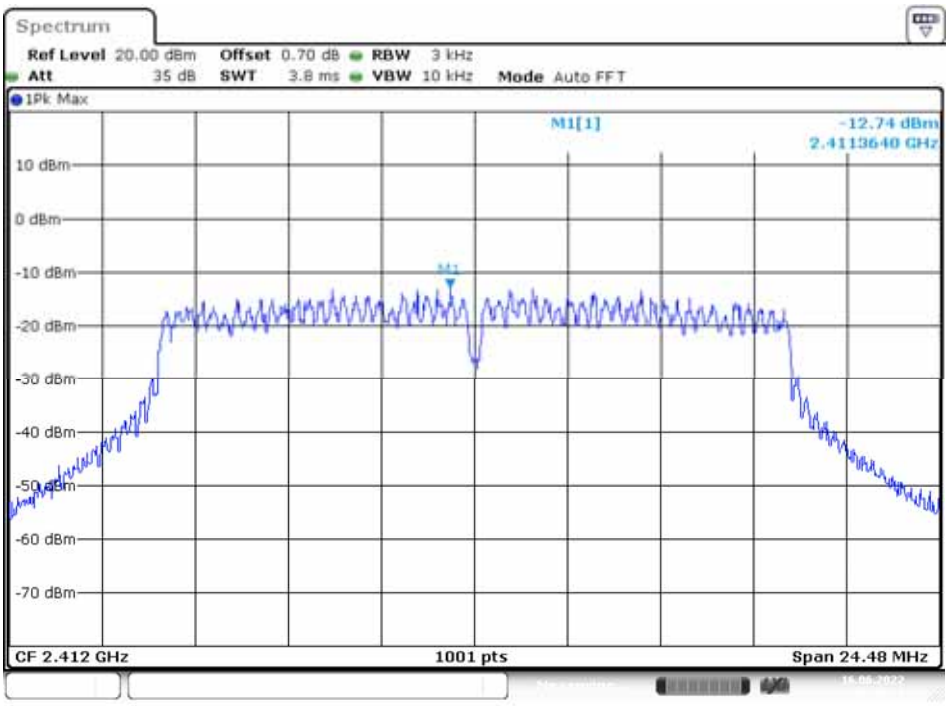
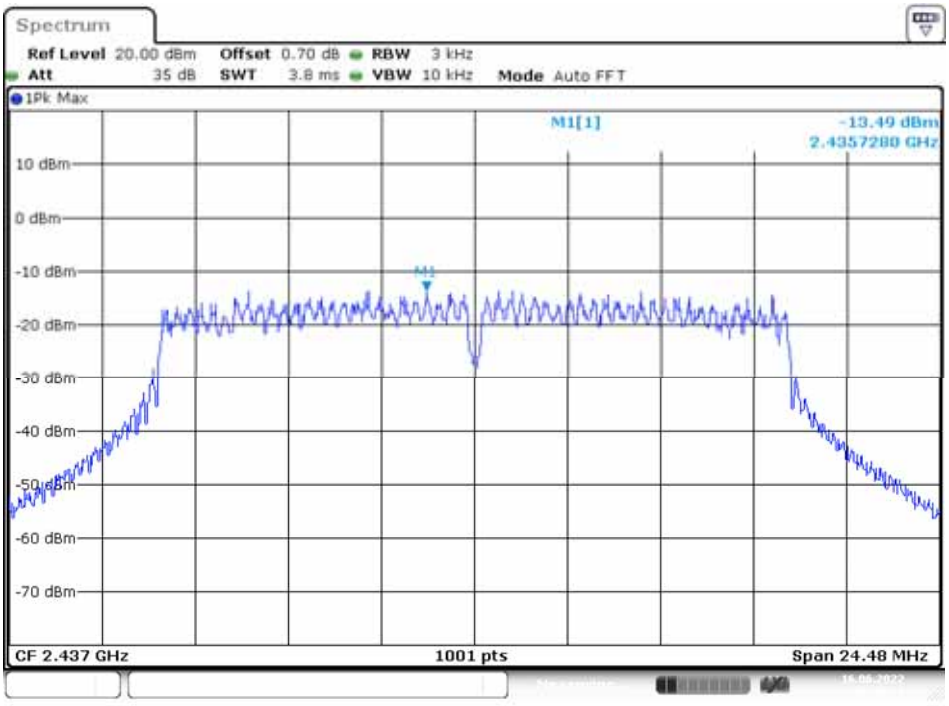
G Mode (Chain 0)

Low Channel



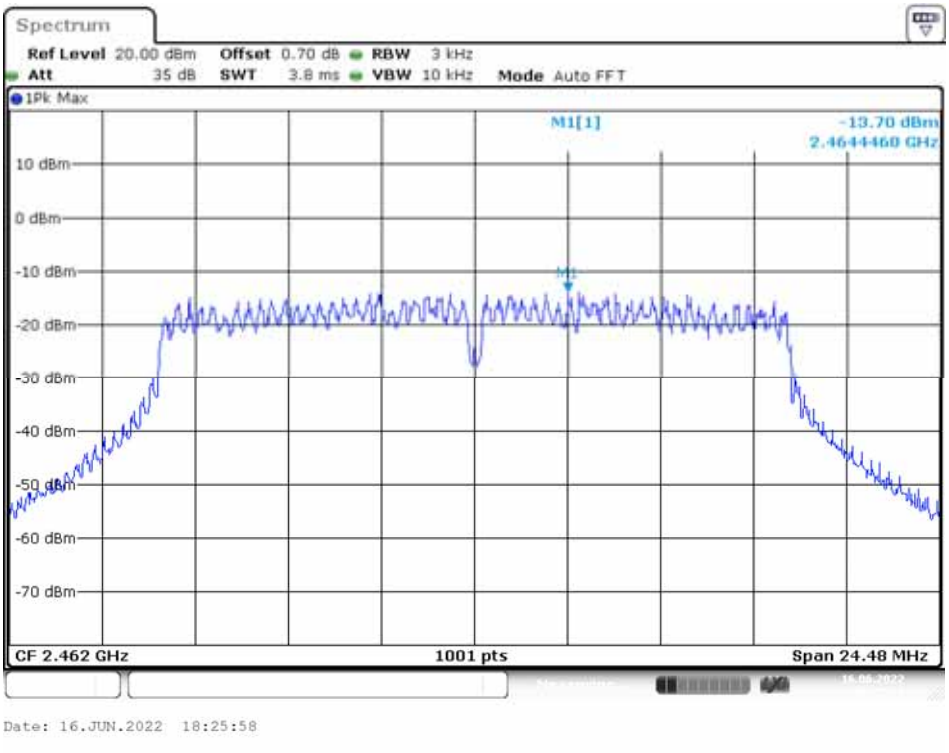
Date: 16.JUN.2022 18:46:23

Middle Channel



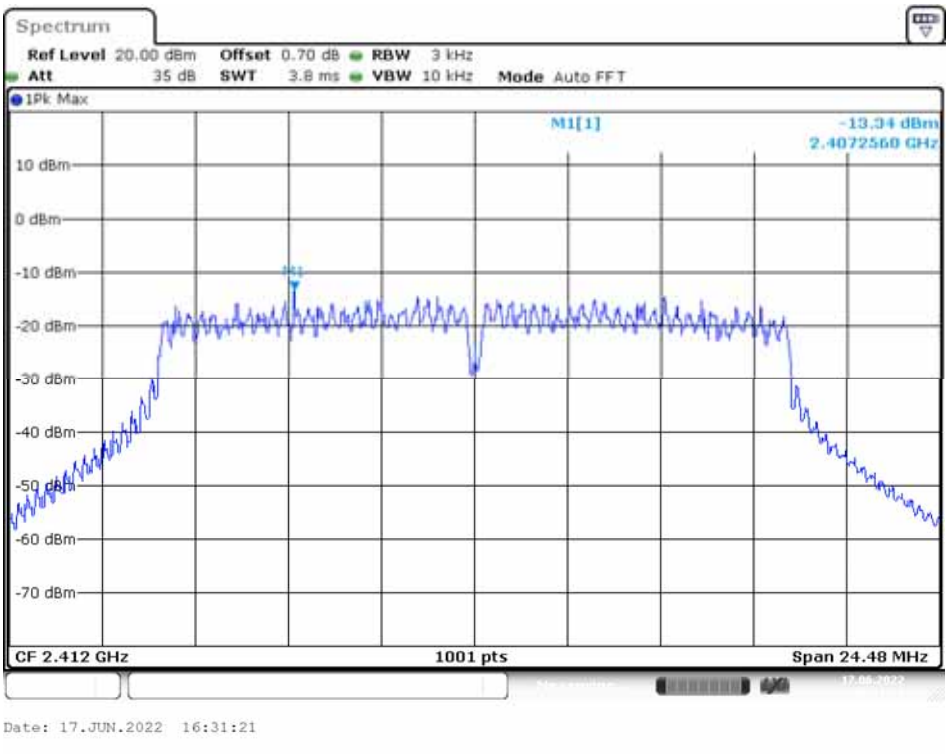
Date: 16.JUN.2022 18:29:41

High Channel

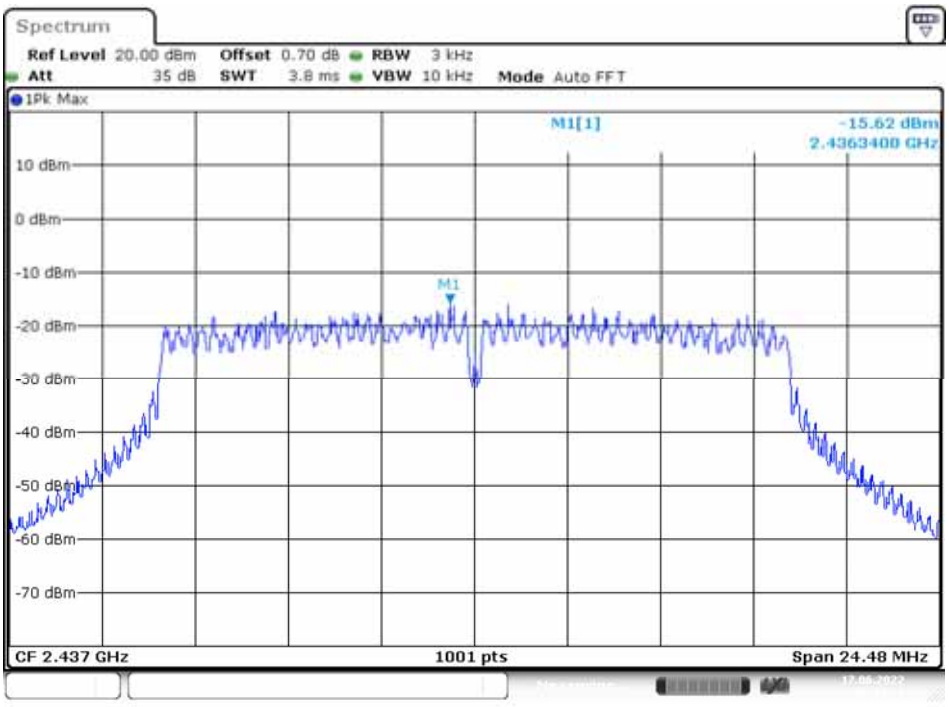


G Mode (Chain 1)

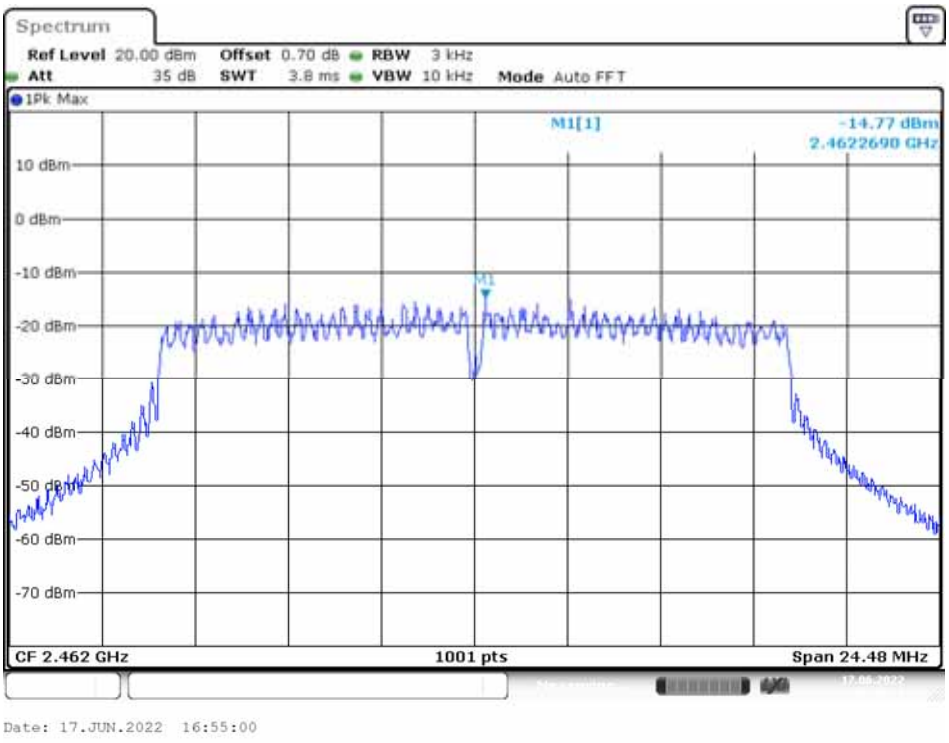
Low Channel



Middle Channel

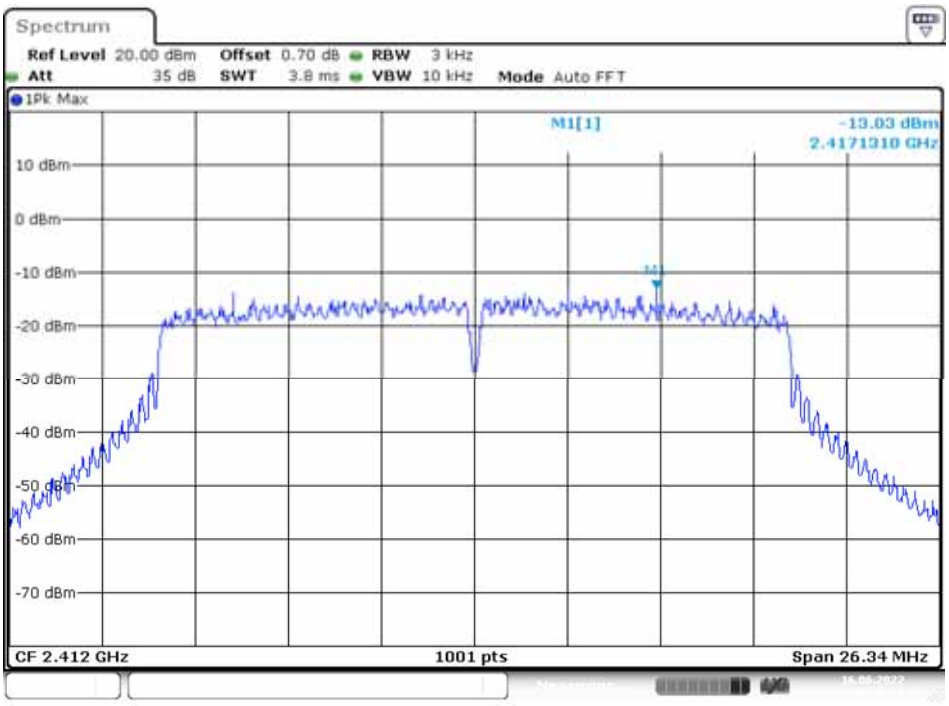


High Channel



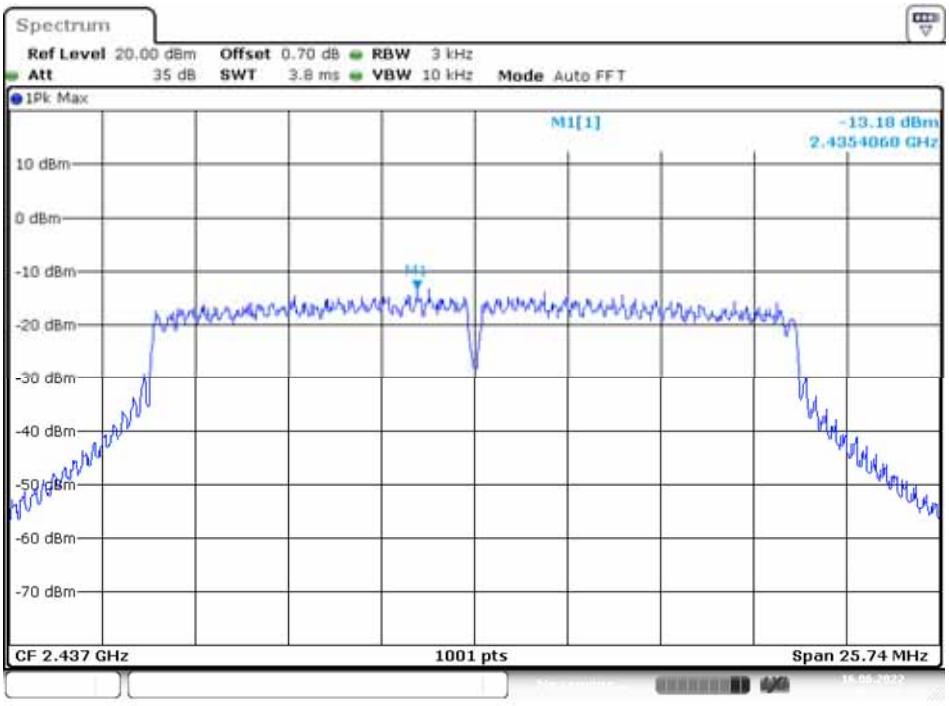
N20 Mode (Chain 0)

Low Channel



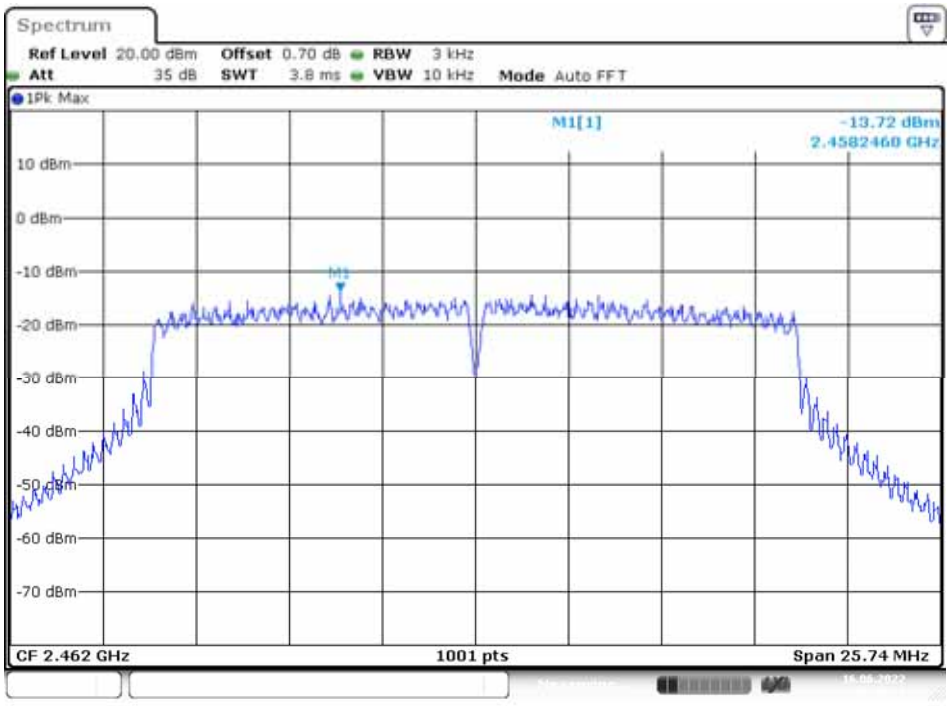
Date: 16.JUN.2022 18:49:41

Middle Channel



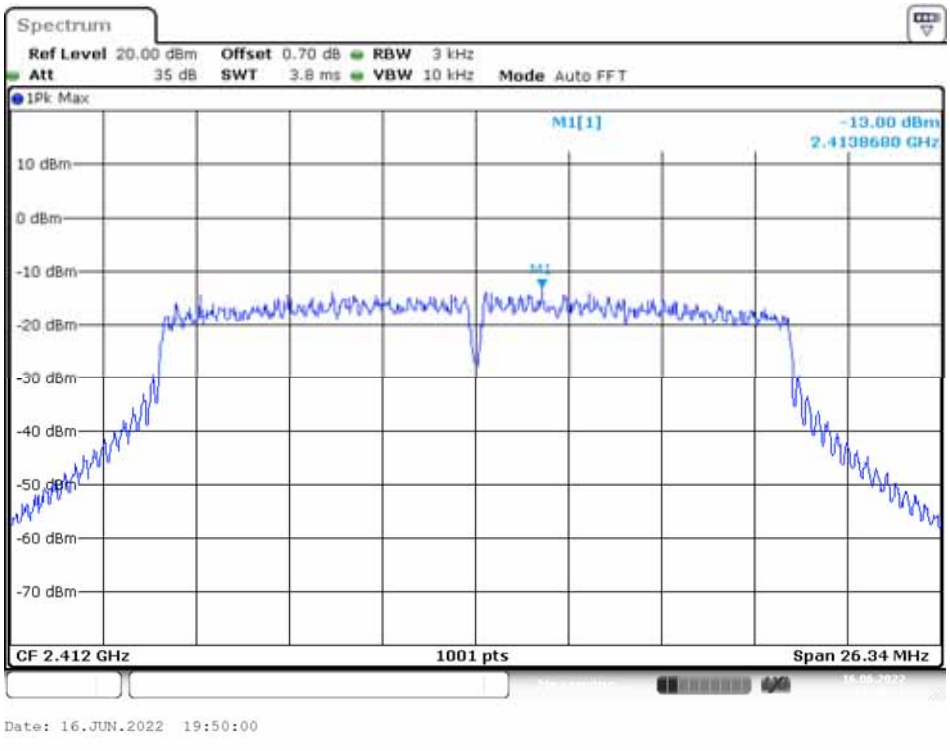
Date: 16.JUN.2022 18:52:47

High Channel

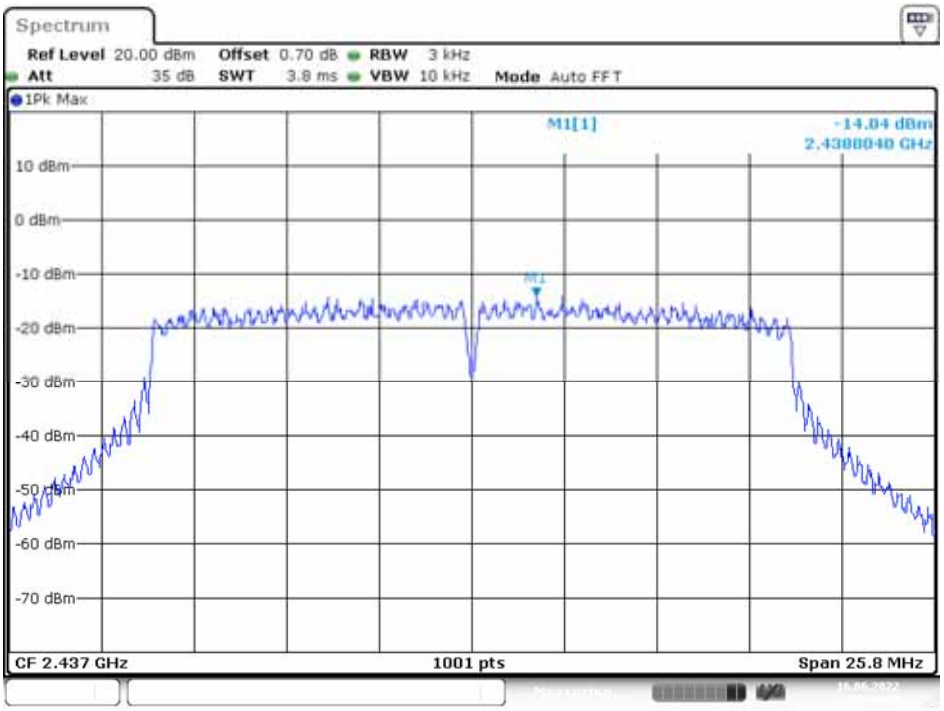


N20 Mode (Chain 1)

Low Channel

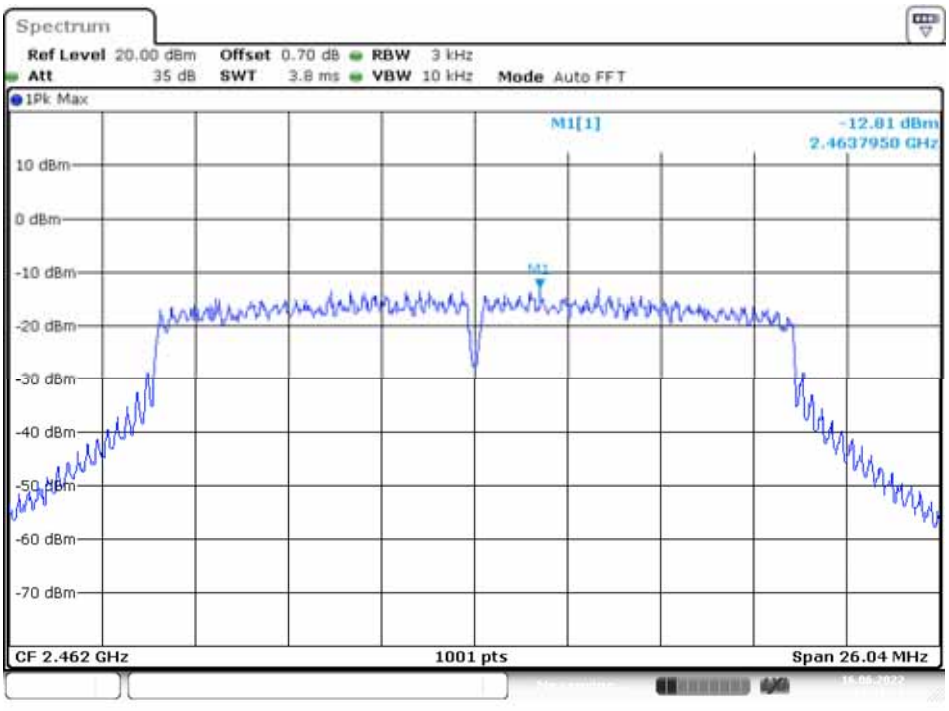


Middle Channel



Date: 16.JUN.2022 19:44:49

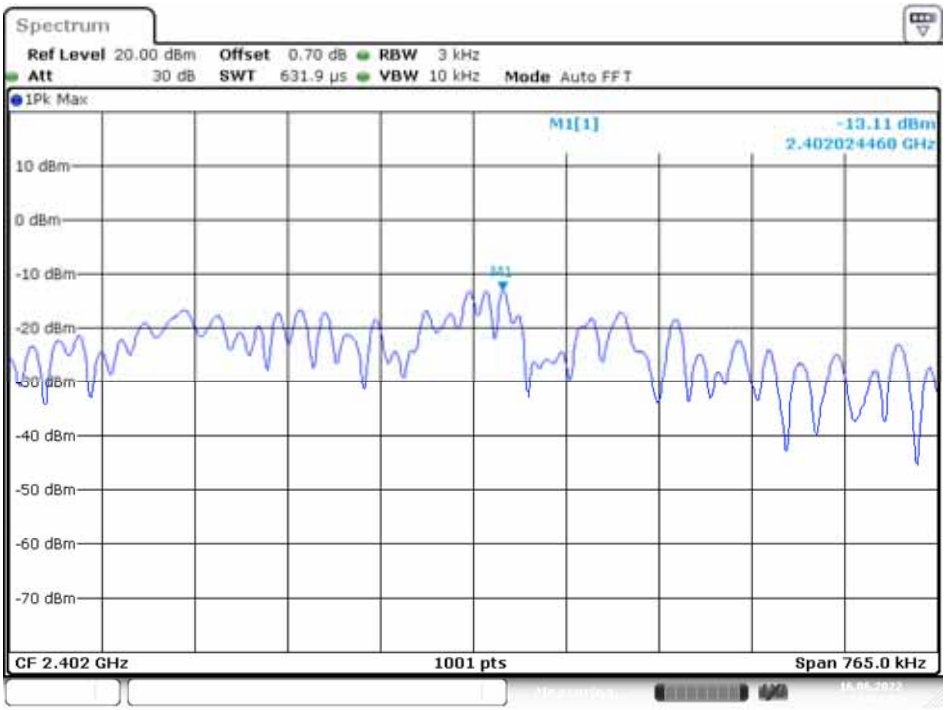
High Channel



Date: 16.JUN.2022 19:41:52

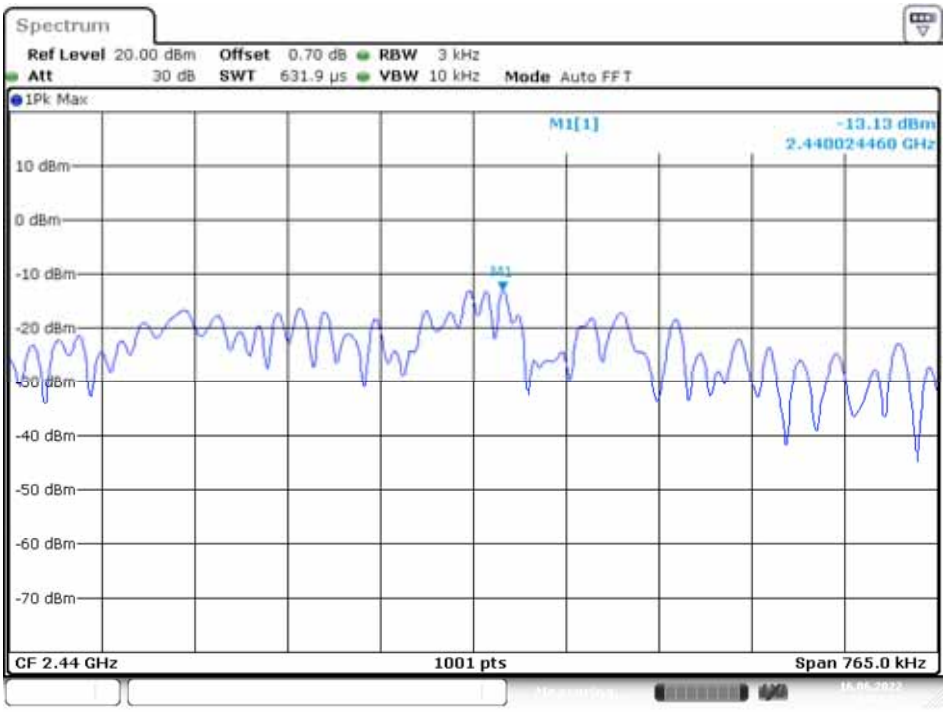
BLE Mode

Low Channel



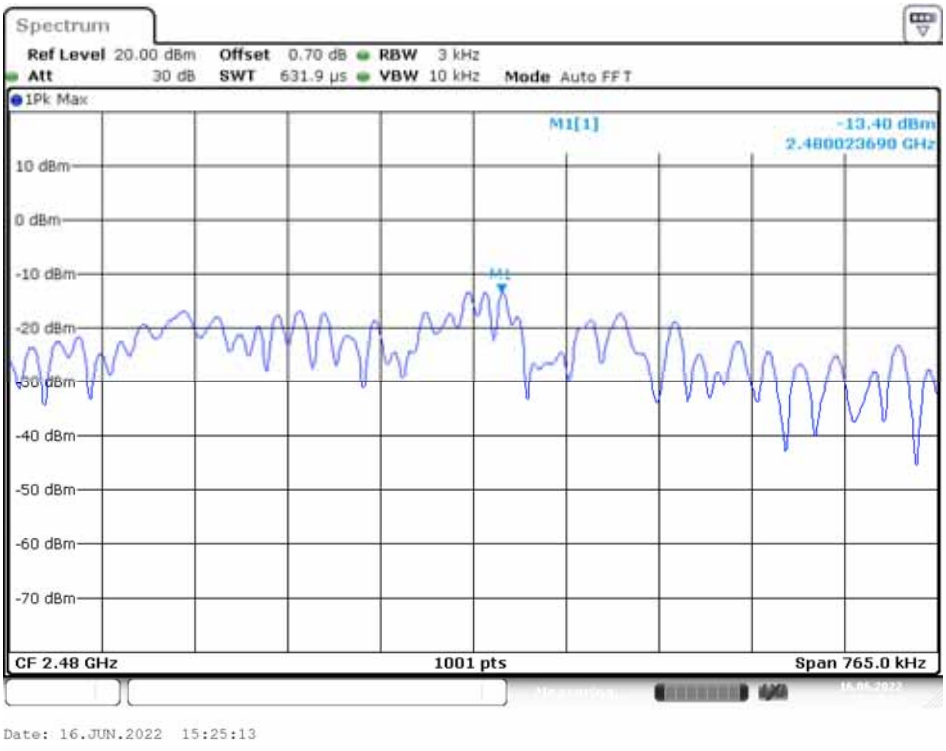
Date: 16.JUN.2022 16:08:02

Middle Channel



Date: 16.JUN.2022 16:01:18

High Channel



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