FCC Part 15.247

TEST REPORT

For

Waylens Inc.

2711 Centerville Road - Suite 400, Wilmington, Delaware, United States, 19808

FCC ID: 2AKAF-TW06V1C

Report Type:	**Product Type:**
Original Report	Secure 4K

Report Producer : Jojo Lu

Report Number : RXZ211109004RF01

Report Date : 2022-02-18

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Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ211109004	RXZ211109004RF01	2022-02-18	Original Report	Jojo Lu

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1 General Information

Product Description for Equipment under Test (EUT)

Applicant	Waylens Inc.
	2711 Centerville Road - Suite 400, Wilmington, Delaware, United States, 19808
Manufacturer	Waylens Inc.
	2711 Centerville Road - Suite 400, Wilmington, Delaware, United States, 19808
Brand(Trade) Name	N/A
Product (Equipment)	Secure 4K
Main Model Name	TW06V1C
Frequency Range	IEEE 802.11b/g /IEEE 802.11n HT20 Mode: 2412 ~ 2462 MHz IEEE 802.11n HT40 Mode: 2422 ~ 2452 MHz BLE(1M): 2402 ~ 2480 MHz
Peak Conducted Output Power	IEEE 802.11b Mode: 19.46 dBm IEEE 802.11g Mode: 20.95 dBm IEEE 802.11n HT20 Mode: 20.12 dBm IEEE 802.11n HT40 Mode: 19.23 dBm BLE(1M) Mode : 6.25 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 BLE(1M) Mode: GFSK
Power Operation (Voltage Range)	☐ AC 120V/60Hz ☐ Adapter ☐ By AC Power Cord ☐ PoE
	☒ DC Type ☐ Battery 12V ☐ DC Power Supply ☒ External from USB Cable ☐ External DC Adapter
	☐ Host System
Received Date	Nov 09, 2021
Date of Test	Nov 09, 2021 ~ Jan 15, 2022

*All measurement and test data in this report was gathered from production sample serial number:

RXZ211109004 (Assigned by BACL, New Taipei Laboratory).

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Objective

This report is prepared on behalf of *Waylens Inc.* 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.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS submissions with FCC ID: 2AKAF-TW06V1C

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

Statement of Compliance

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

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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.

1.1 Measurement Uncertainty

Parameter		Uncertainty
RF output power, conducted		+/- 0.93 dB
Power Spectral Density, conducted		+/- 0.93 dBm
Occupied Bandwidth		+/- 0.35 MHz
Unwanted Emissions, conducted		+/- 1.69 dBm
Radiated Emissions	30 MHz~1GHz	+/- 5.22 dB
	1 GHz~18 GHz	+/- 6.12 dB
	18 GHz~40 GHz	+/- 4.99 dB
Temperature		+/- 1.27 ℃
Humidity		+/- 3 %

1.2 Environmental Conditions

Test Site	Test Data	Temperature (℃)	Relative Humidity (%)	ATM Pressure (hPa)	Test Engineer
Radiation Spurious Emissions	2021/12/7~2021/12/10	20.4~22.2	63~70	1010	Aaron Pan
Conducted Spurious Emissions	2021/12/8~2021/12/11	23.2~24.9	48~53	1010	Howard Ho
6 dB Emission Bandwidth	2021/12/8~2021/12/11	23.2~24.9	48~53	1010	Howard Ho
Maximum Output Power	2021/12/8~2021/12/11	23.2~24.9	48~53	1010	Howard Ho
100 kHz Bandwidth of Frequency Band Edge	2021/12/8~2022/1/15	22.2~24.9	45~55	1010	Howard Ho
Power Spectral Density	2021/12/8~2021/12/11	23.2~24.9	48~53	1010	Howard Ho

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 22183, 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.

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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.

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2.3 EUT Exercise Software

The test software was used "SecureCRTSecureFX_HH_x64_7.0.0.326"

Test Frequency		Low	Mid	High
Power Level Setting	B Mode	44	44	44
	G Mode	44	44	44
	N20 Mode	44	44	44
	N40 Mode	44	44	44
	BLE 1M	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.

802.11b: 1Mbps

802.11g: 6Mbps

802.11n HT20: MCS0

802.11n HT40: MCS0

BLE 1M : 1 Mbps

2.4 Test Mode

Full System (model: TW06V1C) for all test item.

2.5 Support Equipment List and Details

Description	Manufacturer	Model Number	S/N
NB	DELL	E6410	8N7PXN1
ADAPTER	FUJIA	FJ-SW266B50502000U	N/A
fixture	Ambarella	AB023-202-V10	N/A

2.6 External Cable List and Details

Cable Description	Length (m)	From	To
RS-232 to USB Cable	3	EUT	NB
Micro USB Cable	1	Adapter	EUT

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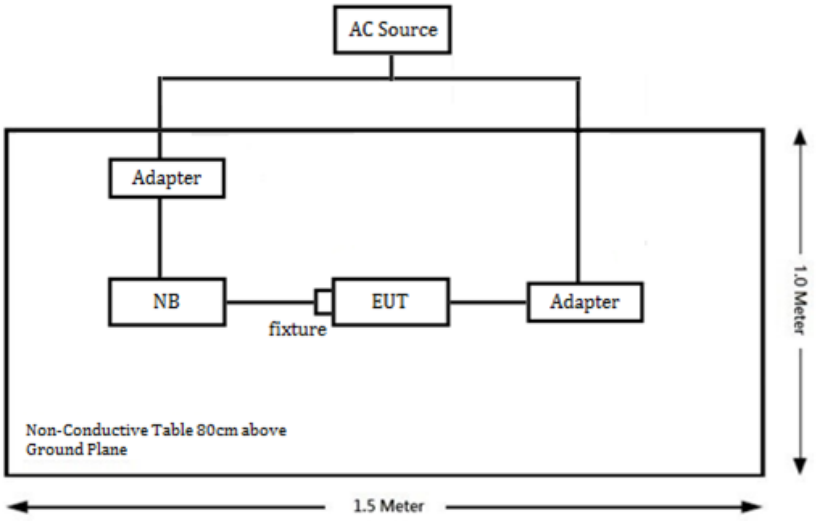
2.7 Block Diagram of Test Setup

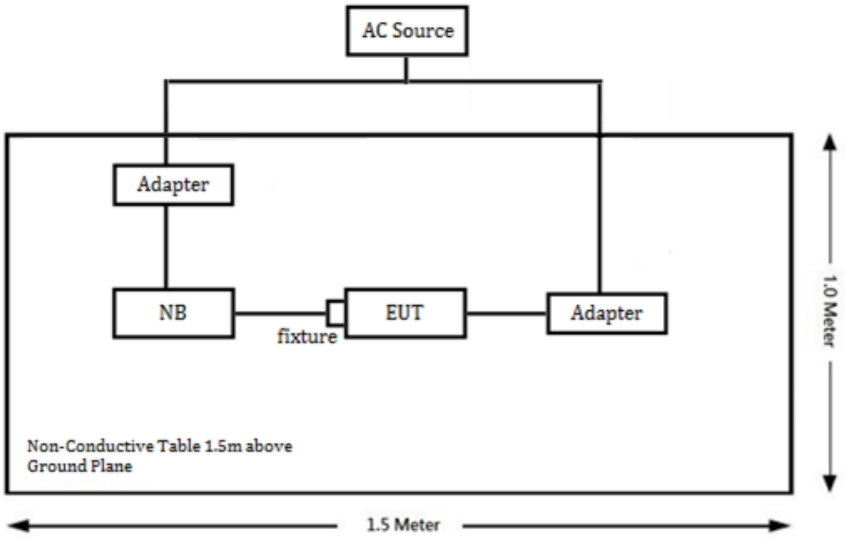
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

Below 1GHz:



Above 1GHz:



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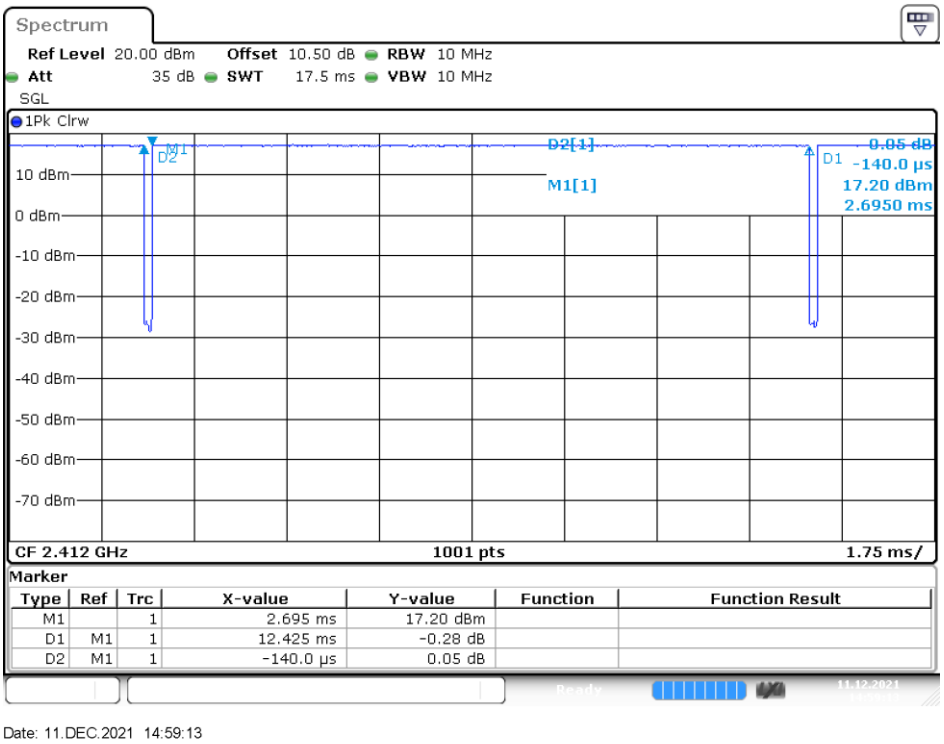
2.8 Duty Cycle

The duty cycle as below:

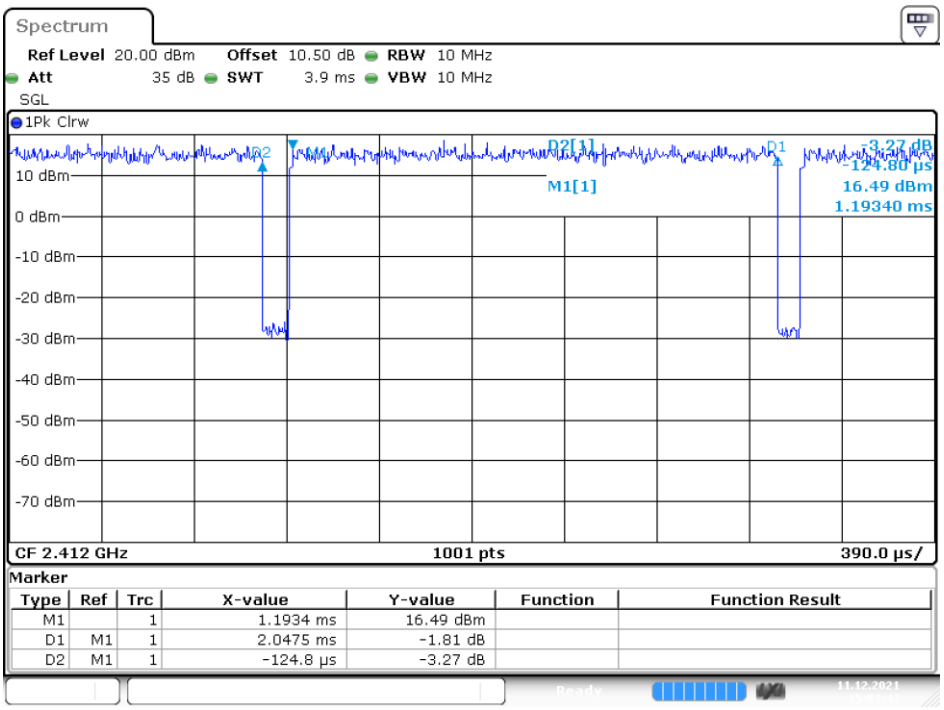
Radio Mode	On Time (ms)	Off Time (ms)	Duty Cycle (%)
802.11b	12.425	0.14	99
802.11g	2.048	0.125	94
802.11n20	1.907	0.121	94
802.11n40	0.936	0.140	87
BLE(1M)	0.392	0.233	63

Please refer to the following plots.

B Mode

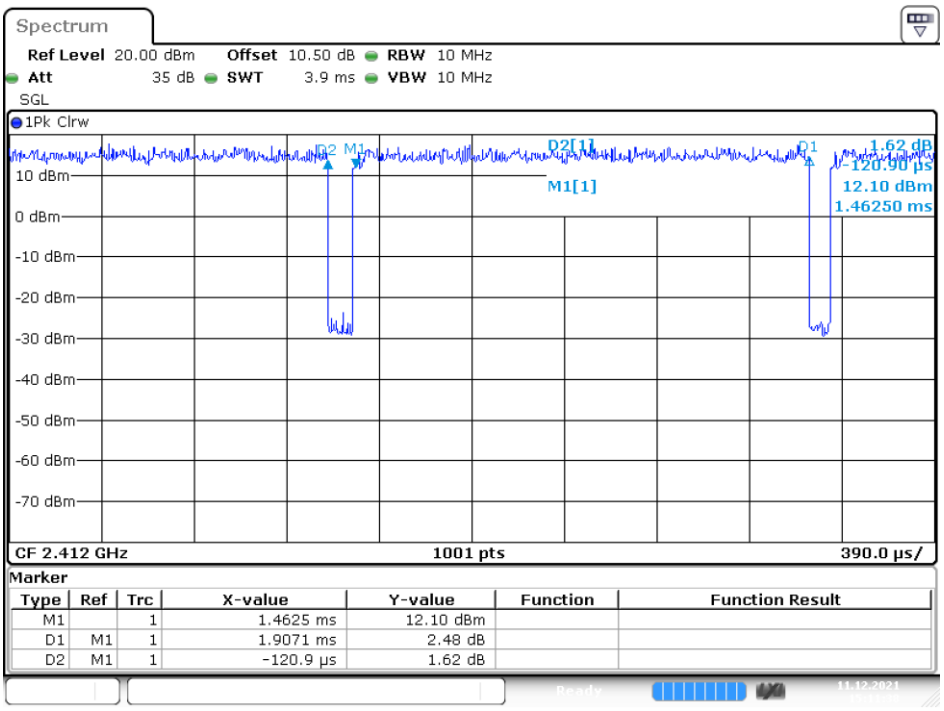


G Mode



Date: 11.DEC.2021 15:01:43

N20 Mode



Date: 11.DEC.2021 15:11:38

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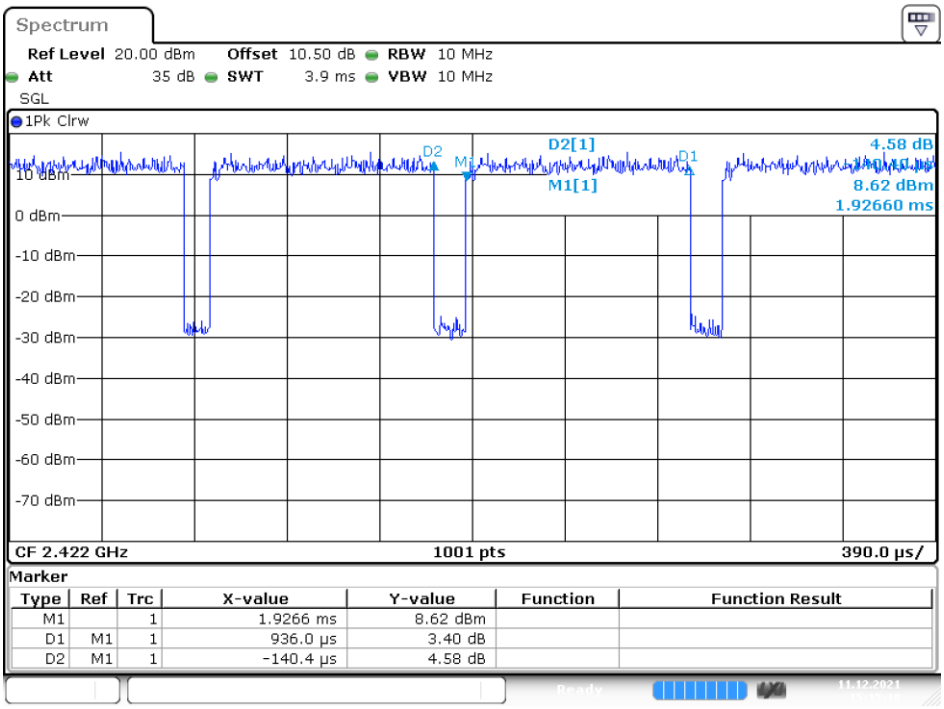
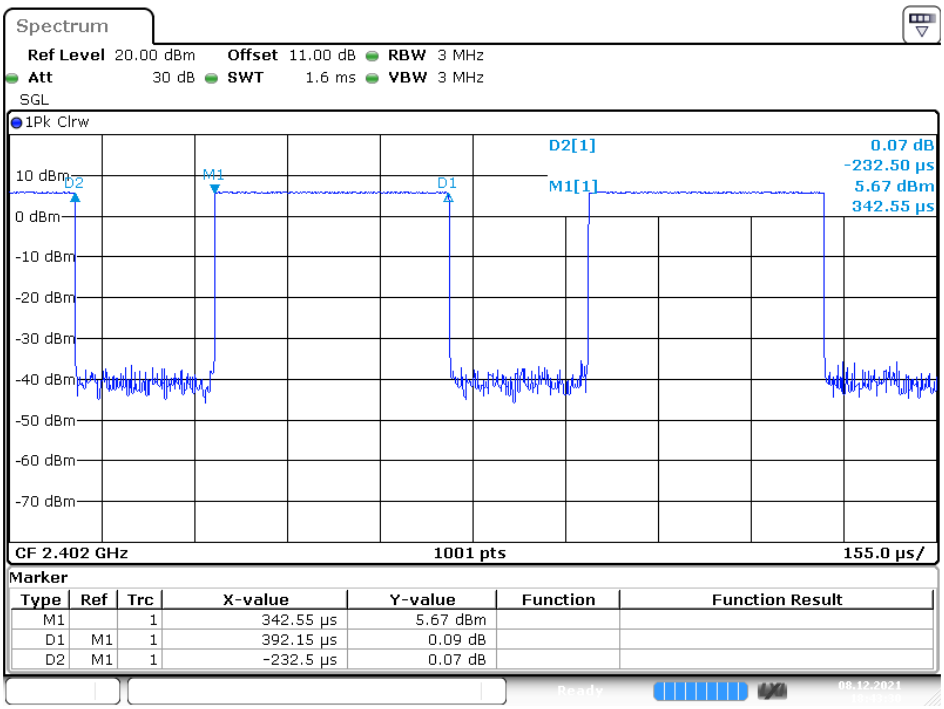
N40 Mode



Date: 11.DEC.2021 15:15:18

BLE(1M) Mode



Date: 8.DEC.2021 18:43:31

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3 Summary of Test Results

FCC Rules	Description of Test	Results
§15.247(i), §1.1310, §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207(a)	AC Line Conducted Emissions	Not Applicable
§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

Not Applicable: The device will only be used in the car and will be powered by the onboard DC.

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4 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Room (966-A)					
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2021/1/19	2022/1/18
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2021/11/9	2022/11/8
Horn Antenna	EMCO	SAS-571	1020	2021/4/23	2022/4/22
Horn Antenna	ETS-Lindgren	3116	62638	2021/8/11	2022/8/10
Preamplifier	Sonoma	310N	130602	2021/6/8	2022/6/7
Preamplifier	A.H. system Inc.	PAM-0118P	470	2021/3/15	2022/3/14
Microware Preamplifier	EM Electronics Corporation	EM18G40G	60656	2020/12/30	2021/12/29
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2021/1/7	2022/1/6
Micro flex Cable	UTIFLEX	UFB197C-1-2362-70U-70U	225757-001	2021/2/1	2022/1/31
Coaxial Cable	COMMATE	PEWC	8Dr	2020/12/25	2021/12/24
Coaxial Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2021/2/1	2022/1/31
Coaxial Cable	JUNFLON	J12J102248-00-B-5	AUG-07-15-044	2020/12/25	2021/12/24
Cable	EMC	EMC105-SM-SM-10000	201003	2021/2/3	2022/2/2
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2021/2/1	2022/1/31
Coaxial Cable	ROSNOL	K1K50-UP0264-K1K50-50CM	15120-1	2021/1/28	2022/1/27
Software	Farad	EZ_EMC	BACL-03A1	N.C.R	N.C.R
Conducted Room					
Spectrum Analyzer	Rohde & Schwarz	FSV40	101140	2021/1/7	2022/1/6
Cable	UTIFLEX	UFA210A	9435	2021/10/5	2022/10/4
Power Sensor	KEYSIGHT	U2021XA	MY54080018	2021/1/28	2022/1/27
Attenuator	MINI-CIRCUITS	BW-S10W5+	1419	2021/1/28	2022/1/27

***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.

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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/cm^2);

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		Target Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
WI-FI 2.4G	2412-2462	1.5	1.413	21	125.893	20	0.0354	1
BT	2402-2480	1.5	1.413	8	6.310	20	0.0018	1
BLE	2402-2480	1.5	1.413	6.5	4.467	20	0.0013	1

Note: Wi-Fi 2.4G and BT/BLE can't transmit simultaneously.

Result: MPE evaluation meets the requirements of the **20cm** standard.

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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

Model	Antenna Type	Antenna Gain
N/A	PCB	1.5 dBi

Result: Compliance

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

7.1 Applicable Standard

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

As Per 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

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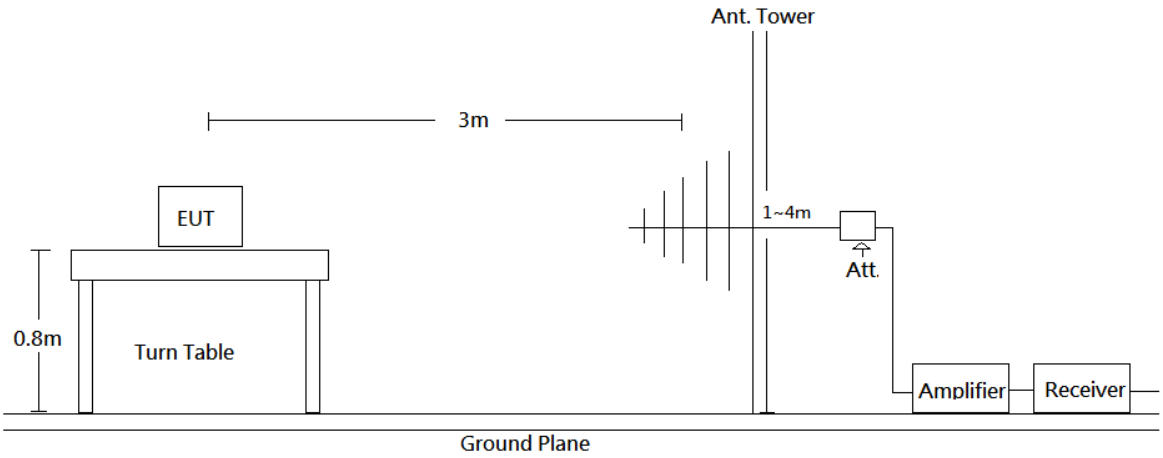
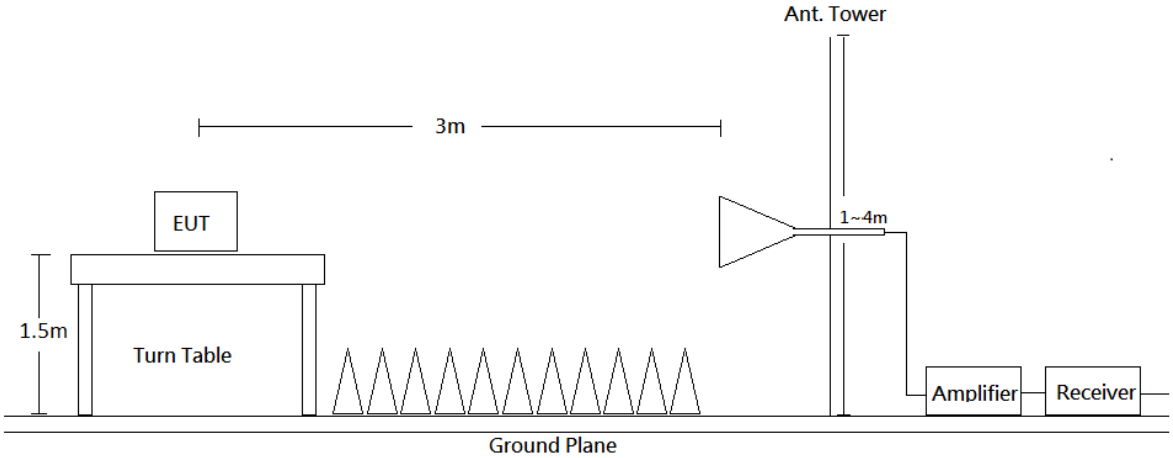
intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the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

7.2 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.

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7.3 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	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	/	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	>98%	Ave
	1 MHz	1/T	<98%	Ave

Note: T is minimum transmission duration

7.4 Test Procedure

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

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

7.5 Corrected Factor & Margin Calculation

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

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Margin = Result – Limit

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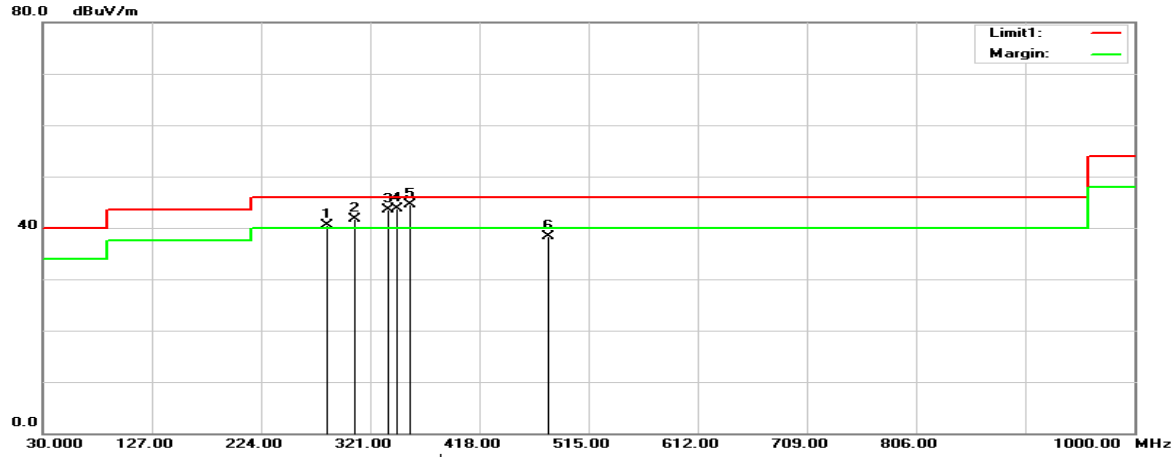
7.6 Test Results

Test Mode: Transmitting

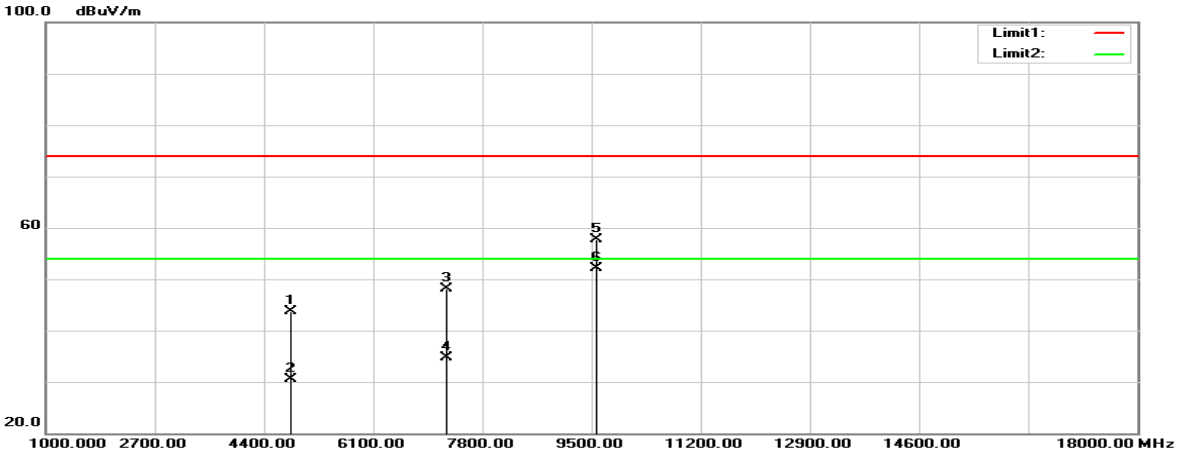
WIFI Mode

Horizontal (worst case is 802.11n HT40 mode Low channel)

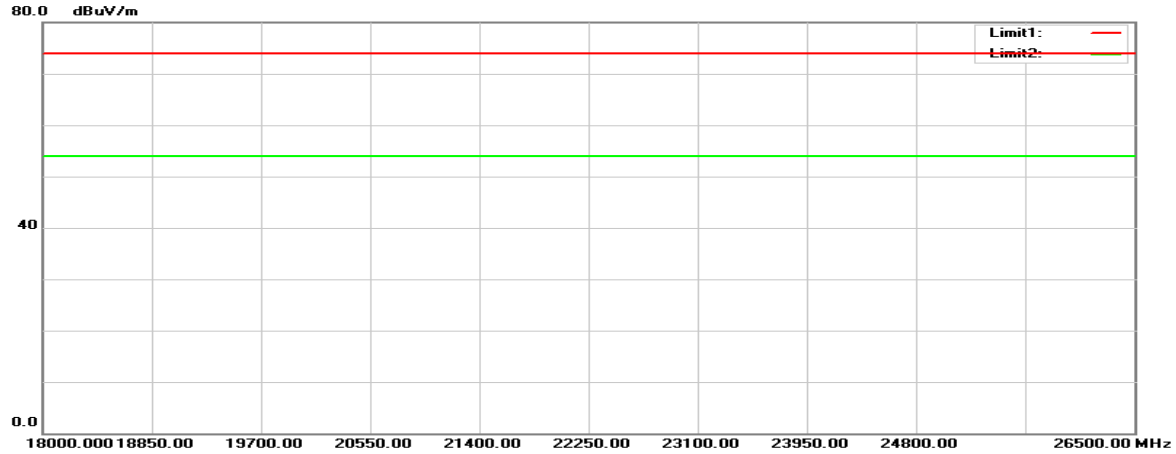
30MHz-1GHz



1GHz-18GHz:



18GHz-26.5GHz:

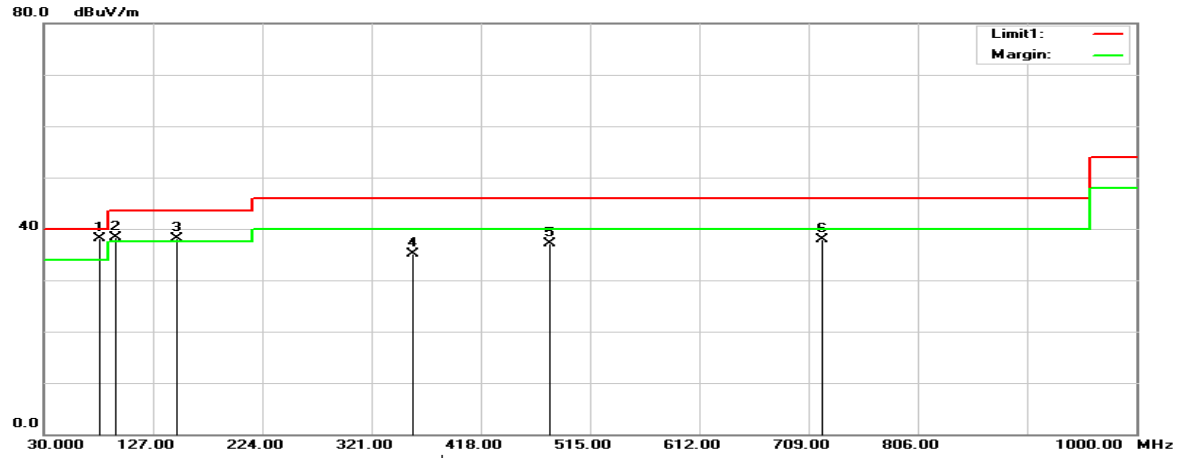


Note: Test 18GHz-26.5GHz, no product signal is detected, it is background noise, so there is no punctuation.

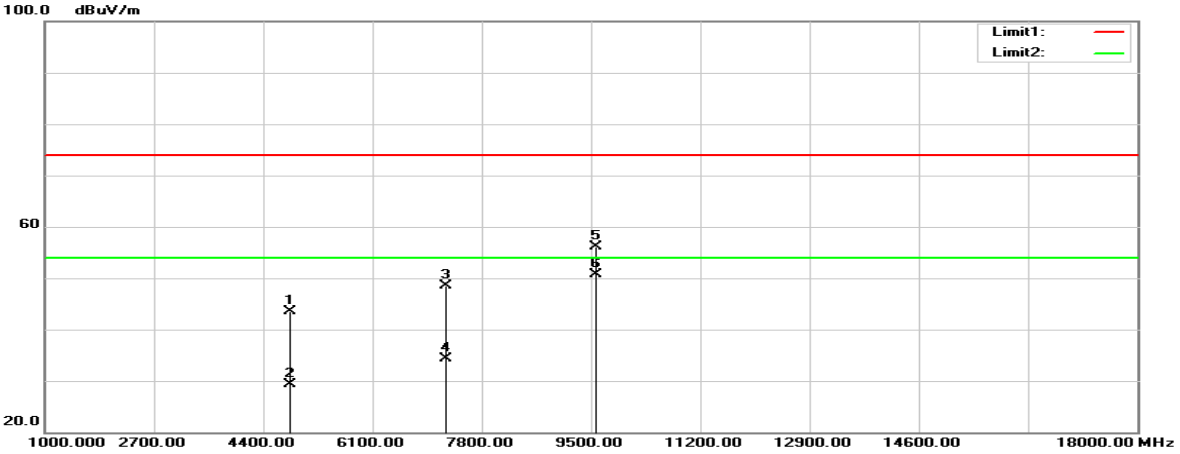
Note: It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)

Vertical

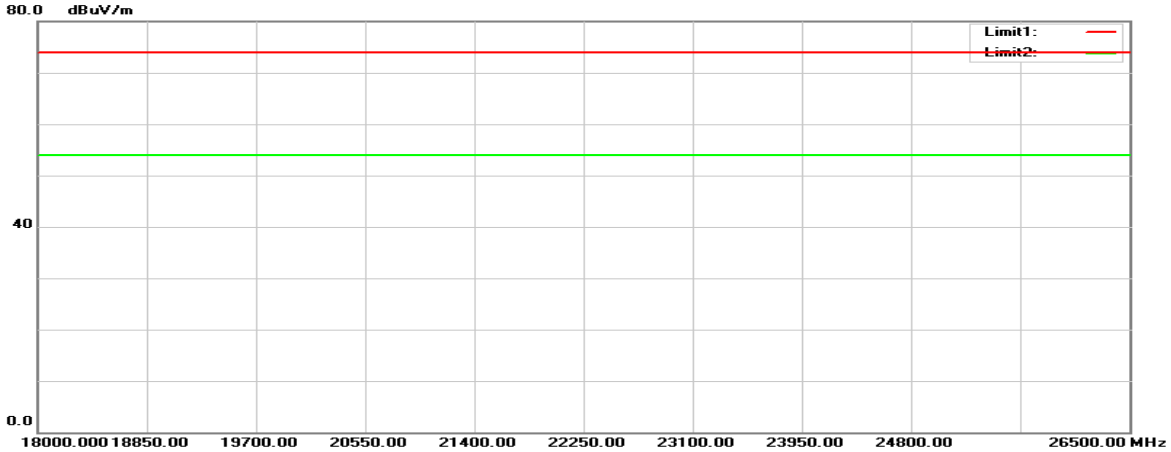
30MHz-1GHz



1GHz-18GHz:



18GHz-26.5GHz:



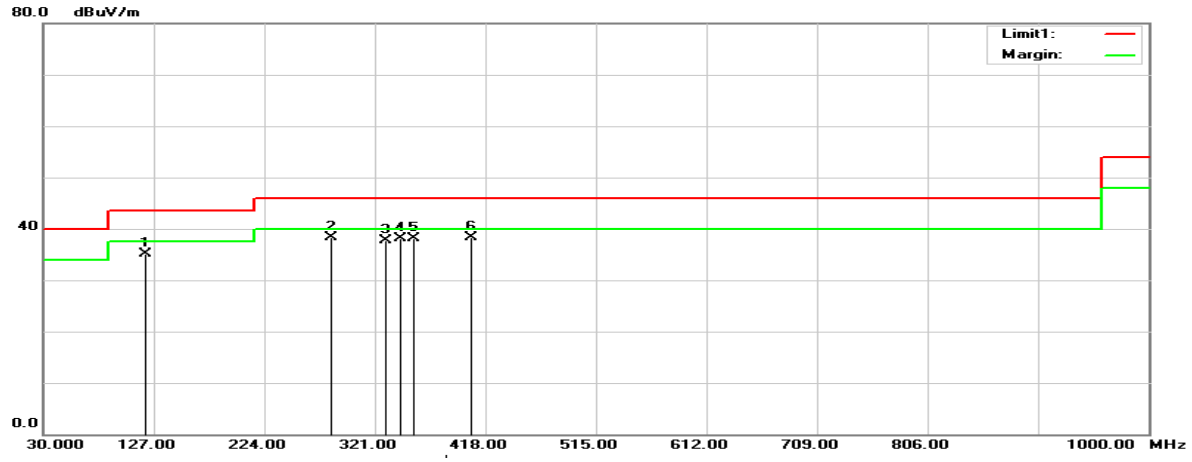
Note: Test 18GHz-26.5GHz, no product signal is detected, it is background noise, so there is no punctuation.

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

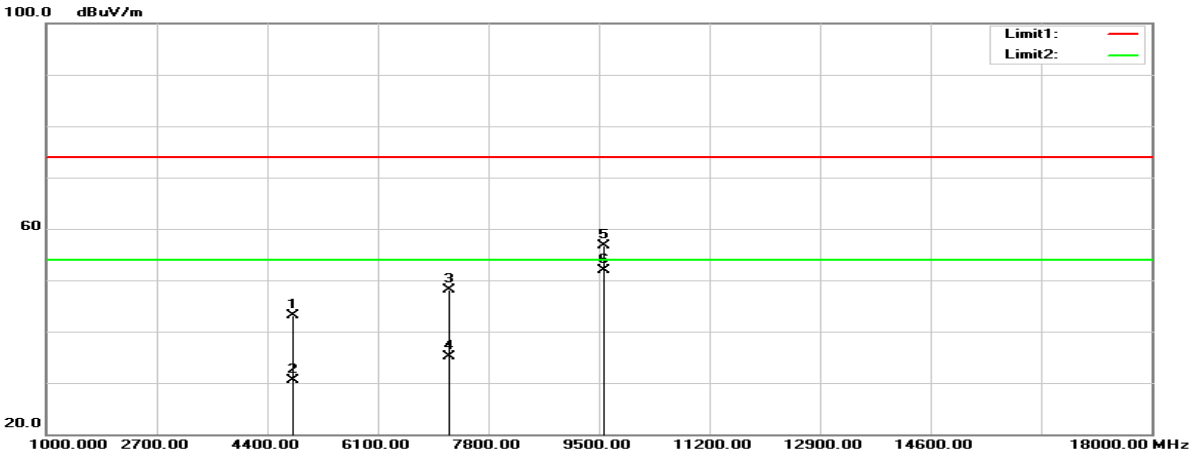
BLE(1M) Mode

Horizontal (worst case is BLE 1M mode low channel)

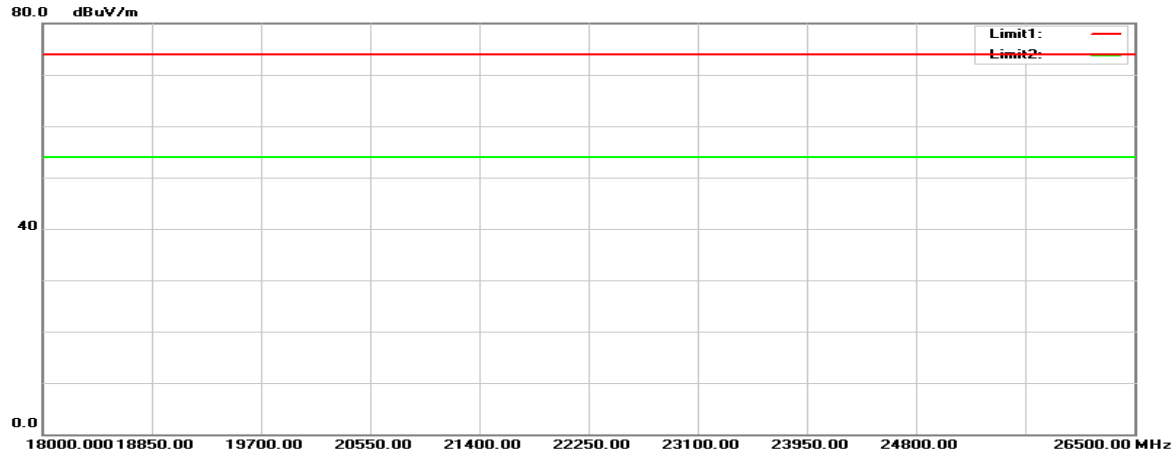
30MHz-1GHz



1GHz-18GHz



18GHz-26.5GHz:

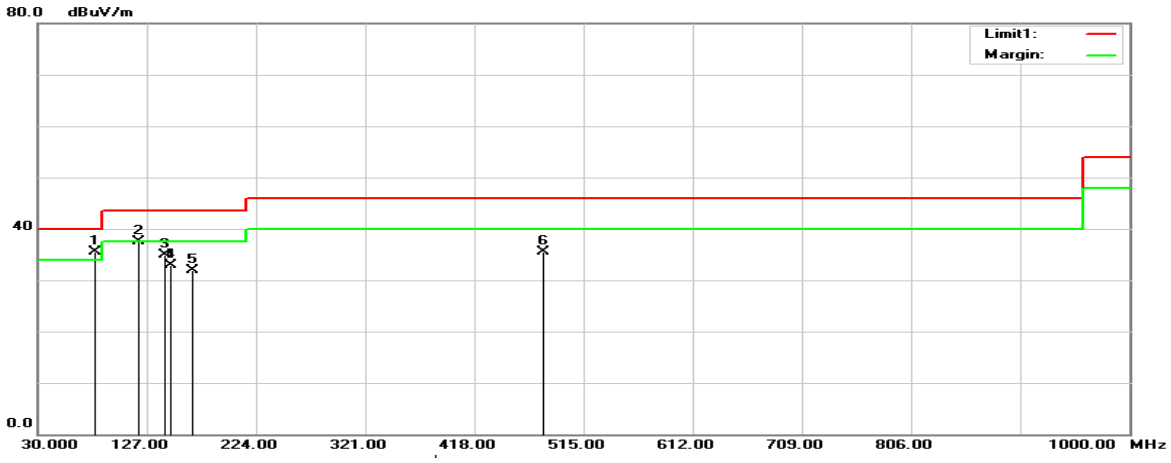


Note: Test 18GHz-26.5GHz, no product signal is detected, it is background noise, so there is no punctuation.

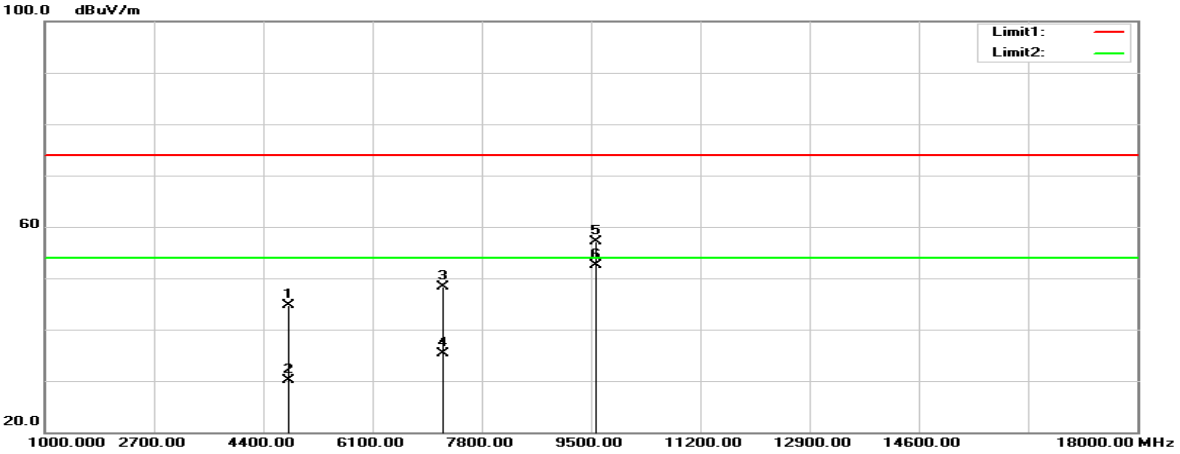
Note: It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)

Vertical

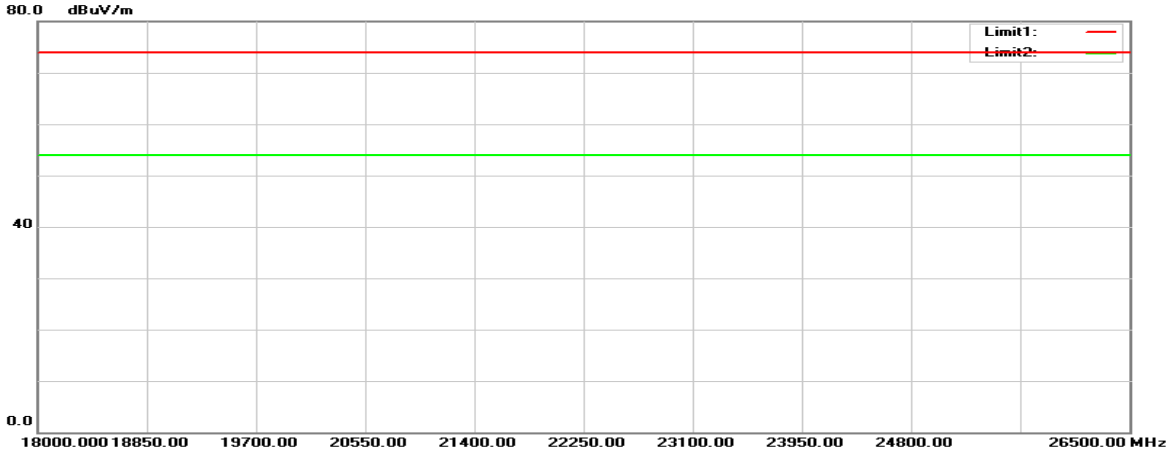
30MHz-1GHz



1GHz-18GHz



18GHz-26.5GHz:



Note: Test 18GHz-26.5GHz, no product signal is detected, it is background noise, so there is no punctuation.

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

Below 1GHz

WIFI 2.4G Mode

Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
282.2000	50.67	-10.23	40.44	46.00	-5.56	100	174	peak
307.4200	51.54	-9.93	41.61	46.00	-4.39	100	59	peak
337.4900	52.98	-9.46	43.52	46.00	-2.48	100	336	peak
344.2800	53.14	-9.40	43.74	46.00	-2.26	100	213	peak
356.8900	53.55	-9.00	44.55	46.00	-1.45	100	159	peak
479.1100	44.38	-6.04	38.34	46.00	-7.66	100	144	peak

Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
79.4700	54.44	-16.42	38.02	40.00	-1.98	100	317	peak
94.0200	54.14	-15.85	38.29	43.50	-5.21	100	49	peak
148.3400	49.02	-11.00	38.02	43.50	-5.48	100	145	peak
357.8600	44.02	-8.97	35.05	46.00	-10.95	100	235	peak
479.1100	43.20	-6.04	37.16	46.00	-8.84	100	222	peak
720.6400	40.50	-2.54	37.96	46.00	-8.04	100	24	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.

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

BLE (1M) Mode

Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
119.2400	45.68	-10.54	35.14	43.50	-8.36	100	140	peak
282.2000	48.59	-10.23	38.36	46.00	-7.64	100	90	peak
330.7000	47.18	-9.44	37.74	46.00	-8.26	100	269	peak
343.3100	47.53	-9.41	38.12	46.00	-7.88	100	144	peak
354.9500	47.19	-9.05	38.14	46.00	-7.86	100	358	peak
405.3900	46.12	-7.80	38.32	46.00	-7.68	100	179	peak

Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
81.4100	52.12	-16.62	35.50	40.00	-4.50	100	122	peak
119.2400	47.95	-10.54	37.41	43.50	-6.09	100	347	peak
143.4900	45.84	-10.85	34.99	43.50	-8.51	100	287	peak
148.3400	43.84	-11.00	32.84	43.50	-10.66	100	98	peak
167.7400	43.81	-11.89	31.92	43.50	-11.58	100	314	peak
479.1100	41.45	-6.04	35.41	46.00	-10.59	100	249	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.

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Above 1GHz

Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
B Mode, Low channel								
2387.392	60.65	-9.48	51.17	74.00	-22.83	114	360	peak
2387.392	49.25	-9.48	39.77	54.00	-14.23	114	360	AVG
4824.000	49.06	-2.15	46.91	74.00	-27.09	110	192	peak
4824.000	42.39	-2.15	40.24	54.00	-13.76	110	192	AVG
7236.000	47.43	4.55	51.98	74.00	-22.02	112	192	peak
7236.000	37.84	4.55	42.39	54.00	-11.61	112	192	AVG
9568.000	50.50	6.88	57.38	74.00	-16.62	106	10	peak
9568.000	45.35	6.88	52.23	54.00	-1.77	106	10	AVG
B Mode, Middle channel								
4874.000	48.44	-1.92	46.52	74.00	-27.48	100	195	peak
4874.000	40.78	-1.92	38.86	54.00	-15.14	100	195	AVG
7311.000	48.63	5.08	53.71	74.00	-20.29	101	191	peak
7311.000	39.71	5.08	44.79	54.00	-9.21	101	191	AVG
9568.000	50.68	6.88	57.56	74.00	-16.44	106	15	peak
9568.000	45.45	6.88	52.33	54.00	-1.67	106	15	AVG
B Mode, High channel								
2484.736	57.64	-8.43	49.21	74.00	-24.79	125	230	peak
2484.736	43.72	-8.43	35.29	54.00	-18.71	125	230	AVG
4924.000	48.31	-1.63	46.68	74.00	-27.32	133	168	peak
4924.000	40.50	-1.63	38.87	54.00	-15.13	133	168	AVG
7386.000	48.72	5.20	53.92	74.00	-20.08	101	193	peak
7386.000	40.13	5.20	45.33	54.00	-8.67	101	193	AVG
9568.000	50.55	6.88	57.43	74.00	-16.57	105	10	peak
9568.000	44.64	6.88	51.52	54.00	-2.48	105	10	AVG

Result = Reading + Correct Factor
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Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
B Mode, Low channel								
2387.392	63.67	-9.48	54.19	74.00	-19.81	100	55	peak
2387.392	52.75	-9.48	43.27	54.00	-10.73	100	55	AVG
4824.000	47.34	-2.15	45.19	74.00	-28.81	132	176	peak
4824.000	37.09	-2.15	34.94	54.00	-19.06	132	176	AVG
7236.000	45.74	4.55	50.29	74.00	-23.71	114	173	peak
7236.000	34.25	4.55	38.80	54.00	-15.20	114	173	AVG
9568.000	47.81	6.88	54.69	74.00	-19.31	165	353	peak
9568.000	41.54	6.88	48.42	54.00	-5.58	165	353	AVG
B Mode, Middle channel								
4874.000	45.67	-1.92	43.75	74.00	-30.25	152	171	peak
4874.000	32.90	-1.92	30.98	54.00	-23.02	152	171	AVG
7311.000	46.21	5.08	51.29	74.00	-22.71	101	170	peak
7311.000	35.40	5.08	40.48	54.00	-13.52	101	170	AVG
9568.000	50.15	6.88	57.03	74.00	-16.97	210	17	peak
9568.000	43.63	6.88	50.51	54.00	-3.49	210	17	AVG
B Mode, High channel								
2483.872	60.47	-8.44	52.03	74.00	-21.97	106	57	peak
2483.872	47.77	-8.44	39.33	54.00	-14.67	106	57	AVG
4924.000	45.44	-1.63	43.81	74.00	-30.19	149	215	peak
4924.000	31.24	-1.63	29.61	54.00	-24.39	149	215	AVG
7386.000	45.78	5.20	50.98	74.00	-23.02	112	170	peak
7386.000	35.00	5.20	40.20	54.00	-13.80	112	170	AVG
9568.000	49.39	6.88	56.27	74.00	-17.73	210	20	peak
9568.000	43.44	6.88	50.32	54.00	-3.68	210	20	AVG

Result = Reading + Correct Factor
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Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
G Mode, Low channel								
2389.520	73.01	-9.46	63.55	74.00	-10.45	100	360	peak
2389.520	49.72	-9.46	40.26	54.00	-13.74	100	360	AVG
4824.000	45.79	-2.15	43.64	74.00	-30.36	158	142	peak
4824.000	32.66	-2.15	30.51	54.00	-23.49	158	142	AVG
7236.000	43.56	4.55	48.11	74.00	-25.89	147	248	peak
7236.000	30.11	4.55	34.66	54.00	-19.34	147	248	AVG
9568.000	50.74	6.88	57.62	74.00	-16.38	104	8	peak
9568.000	45.14	6.88	52.02	54.00	-1.98	104	8	AVG
G Mode, Middle channel								
4874.000	45.79	-1.92	43.87	74.00	-30.13	165	39	peak
4874.000	31.39	-1.92	29.47	54.00	-24.53	165	39	AVG
7311.000	43.31	5.08	48.39	74.00	-25.61	144	221	peak
7311.000	30.24	5.08	35.32	54.00	-18.68	144	221	AVG
9568.000	50.62	6.88	57.50	74.00	-16.50	106	13	peak
9568.000	45.86	6.88	52.74	54.00	-1.26	106	13	AVG
G Mode, High channel								
2483.632	68.15	-8.45	59.70	74.00	-14.30	129	230	peak
2483.632	47.63	-8.45	39.18	54.00	-14.82	129	230	AVG
4924.000	45.40	-1.63	43.77	74.00	-30.23	144	339	peak
4924.000	32.19	-1.63	30.56	54.00	-23.44	144	339	AVG
7386.000	43.67	5.20	48.87	74.00	-25.13	152	211	peak
7386.000	29.58	5.20	34.78	54.00	-19.22	152	211	AVG
9568.000	50.60	6.88	57.48	74.00	-16.52	106	15	peak
9568.000	45.50	6.88	52.38	54.00	-1.62	106	15	AVG

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.

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Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
G Mode, Low channel								
2389.632	76.31	-9.46	66.85	74.00	-7.15	100	53	peak
2389.632	52.66	-9.46	43.20	54.00	-10.80	100	53	AVG
4824.000	45.61	-2.15	43.46	74.00	-30.54	152	159	peak
4824.000	31.39	-2.15	29.24	54.00	-24.76	152	159	AVG
7236.000	44.02	4.55	48.57	74.00	-25.43	139	244	peak
7236.000	29.80	4.55	34.35	54.00	-19.65	139	244	AVG
9568.000	49.31	6.88	56.19	74.00	-17.81	208	18	peak
9568.000	43.82	6.88	50.70	54.00	-3.30	208	18	AVG
G Mode, Middle channel								
4874.000	45.52	-1.92	43.60	74.00	-30.40	154	232	peak
4874.000	31.40	-1.92	29.48	54.00	-24.52	154	232	AVG
7311.000	43.88	5.08	48.96	74.00	-25.04	149	331	peak
7311.000	29.66	5.08	34.74	54.00	-19.26	149	331	AVG
9568.000	49.65	6.88	56.53	74.00	-17.47	103	18	peak
9568.000	43.66	6.88	50.54	54.00	-3.46	103	18	AVG
G Mode, High channel								
2483.632	72.88	-8.45	64.43	74.00	-9.57	134	13	peak
2483.632	51.80	-8.45	43.35	54.00	-10.65	134	13	AVG
4924.000	45.80	-1.63	44.17	74.00	-29.83	155	243	peak
4924.000	31.49	-1.63	29.86	54.00	-24.14	155	243	AVG
7386.000	43.94	5.20	49.14	74.00	-24.86	142	28	peak
7386.000	29.86	5.20	35.06	54.00	-18.94	142	28	AVG
9568.000	49.77	6.88	56.65	74.00	-17.35	208	18	peak
9568.000	43.93	6.88	50.81	54.00	-3.19	208	18	AVG

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.

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Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
N20 Mode, Low channel								
2390.000	74.08	-9.46	64.62	74.00	-9.38	100	356	peak
2390.000	50.62	-9.46	41.16	54.00	-12.84	100	356	AVG
4824.000	45.29	-2.15	43.14	74.00	-30.86	151	66	peak
4824.000	31.56	-2.15	29.41	54.00	-24.59	151	66	AVG
7236.000	43.87	4.55	48.42	74.00	-25.58	144	179	peak
7236.000	29.97	4.55	34.52	54.00	-19.48	144	179	AVG
9568.000	50.64	6.88	57.52	74.00	-16.48	107	14	peak
9568.000	45.72	6.88	52.60	54.00	-1.40	107	14	AVG
N20 Mode, Middle channel								
4874.000	45.64	-1.92	43.72	74.00	-30.28	137	154	peak
4874.000	31.90	-1.92	29.98	54.00	-24.02	137	154	AVG
7311.000	44.31	5.08	49.39	74.00	-24.61	155	314	peak
7311.000	32.27	5.08	37.35	54.00	-16.65	155	314	AVG
9568.000	51.08	6.88	57.96	74.00	-16.04	105	12	peak
9568.000	45.82	6.88	52.70	54.00	-1.30	105	12	AVG
N20 Mode, High channel								
2483.824	68.99	-8.44	60.55	74.00	-13.45	130	232	peak
2483.824	49.43	-8.44	40.99	54.00	-13.01	130	232	AVG
4924.000	46.35	-1.63	44.72	74.00	-29.28	153	16	peak
4924.000	32.36	-1.63	30.73	54.00	-23.27	153	16	AVG
7386.000	43.79	5.20	48.99	74.00	-25.01	149	283	peak
7386.000	31.82	5.20	37.02	54.00	-16.98	149	283	AVG
9568.000	51.14	6.88	58.02	74.00	-15.98	107	14	peak
9568.000	45.19	6.88	52.07	54.00	-1.93	107	14	AVG

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.

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Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
N20 Mode, Low channel								
2389.744	77.18	-9.46	67.72	74.00	-6.28	121	58	peak
2389.744	53.02	-9.46	43.56	54.00	-10.44	121	58	AVG
4824.000	45.05	-2.15	42.90	74.00	-31.10	143	228	peak
4824.000	31.82	-2.15	29.67	54.00	-24.33	143	228	AVG
7236.000	44.89	4.55	49.44	74.00	-24.56	156	327	peak
7236.000	30.07	4.55	34.62	54.00	-19.38	156	327	AVG
9568.000	49.68	6.88	56.56	74.00	-17.44	210	25	peak
9568.000	44.20	6.88	51.08	54.00	-2.92	210	25	AVG
N20 Mode, Middle channel								
4874.000	45.58	-1.92	43.66	74.00	-30.34	152	139	peak
4874.000	31.74	-1.92	29.82	54.00	-24.18	152	139	AVG
7311.000	44.09	5.08	49.17	74.00	-24.83	143	227	peak
7311.000	30.29	5.08	35.37	54.00	-18.63	143	227	AVG
9568.000	49.83	6.88	56.71	74.00	-17.29	210	32	peak
9568.000	43.58	6.88	50.46	54.00	-3.54	210	32	AVG
N20 Mode, High channel								
2484.160	73.94	-8.44	65.50	74.00	-8.50	110	55	peak
2484.160	54.05	-8.44	45.61	54.00	-8.39	110	55	AVG
4924.000	45.84	-1.63	44.21	74.00	-29.79	124	332	peak
4924.000	32.21	-1.63	30.58	54.00	-23.42	124	332	AVG
7386.000	44.19	5.20	49.39	74.00	-24.61	155	295	peak
7386.000	30.49	5.20	35.69	54.00	-18.31	155	295	AVG
9568.000	49.42	6.88	56.30	74.00	-17.70	226	31	peak
9568.000	43.74	6.88	50.62	54.00	-3.38	226	31	AVG

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.

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

Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
N40 Mode, Low channel								
2389.596	72.95	-9.46	63.49	74.00	-10.51	122	0	peak
2389.596	53.86	-9.46	44.40	54.00	-9.60	122	0	AVG
4844.000	45.72	-2.11	43.61	74.00	-30.39	144	311	peak
4844.000	33.20	-2.11	31.09	54.00	-22.91	144	311	AVG
7266.000	44.18	4.83	49.01	74.00	-24.99	159	264	peak
7266.000	30.52	4.83	35.35	54.00	-18.65	159	264	AVG
9568.000	51.41	6.88	58.29	74.00	-15.71	106	14	peak
9568.000	45.98	6.88	52.86	54.00	-1.14	106	14	AVG
N40 Mode, Middle channel								
4874.000	45.50	-1.92	43.58	74.00	-30.42	157	114	peak
4874.000	32.03	-1.92	30.11	54.00	-23.89	157	114	AVG
7311.000	43.87	5.08	48.95	74.00	-25.05	146	138	peak
7311.000	30.75	5.08	35.83	54.00	-18.17	146	138	AVG
9568.000	50.59	6.88	57.47	74.00	-16.53	106	14	peak
9568.000	45.72	6.88	52.60	54.00	-1.40	106	14	AVG
N40 Mode, High channel								
2488.712	73.67	-8.38	65.29	74.00	-8.71	149	232	peak
2488.712	55.79	-8.38	47.41	54.00	-6.59	149	232	AVG
4904.000	45.71	-1.63	44.08	74.00	-29.92	148	186	peak
4904.000	32.84	-1.63	31.21	54.00	-22.79	148	186	AVG
7356.000	43.53	5.20	48.73	74.00	-25.27	153	342	peak
7356.000	30.74	5.20	35.94	54.00	-18.06	153	342	AVG
9568.000	50.98	6.88	57.86	74.00	-16.14	106	14	peak
9568.000	45.44	6.88	52.32	54.00	-1.68	106	14	AVG

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.

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Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
N40 Mode, Low channel								
2389.860	76.73	-9.46	67.27	74.00	-6.73	125	57	peak
2389.860	56.47	-9.46	47.01	54.00	-6.99	125	57	AVG
4844.000	45.23	-2.11	43.12	74.00	-30.88	150	333	peak
4844.000	32.20	-2.11	30.09	54.00	-23.91	150	333	AVG
7266.000	43.80	4.83	48.63	74.00	-25.37	144	274	peak
7266.000	30.51	4.83	35.34	54.00	-18.66	144	274	AVG
9568.000	50.05	6.88	56.93	74.00	-17.07	210	30	peak
9568.000	44.86	6.88	51.74	54.00	-2.26	210	30	AVG
N40 Mode, Middle channel								
4874.000	45.57	-1.92	43.65	74.00	-30.35	154	197	peak
4874.000	32.27	-1.92	30.35	54.00	-23.65	154	197	AVG
7311.000	43.86	5.08	48.94	74.00	-25.06	146	311	peak
7311.000	30.42	5.08	35.50	54.00	-18.50	146	311	AVG
9568.000	50.17	6.88	57.05	74.00	-16.95	210	31	peak
9568.000	44.89	6.88	51.77	54.00	-2.23	210	31	AVG
N40 Mode, High channel								
2486.060	77.57	-8.41	69.16	74.00	-4.84	134	12	peak
2486.060	60.08	-8.41	51.67	54.00	-2.33	134	12	AVG
4904.000	46.00	-1.63	44.37	74.00	-29.63	155	244	peak
4904.000	32.39	-1.63	30.76	54.00	-23.24	155	244	AVG
7356.000	43.65	5.20	48.85	74.00	-25.15	148	99	peak
7356.000	30.39	5.20	35.59	54.00	-18.41	148	99	AVG
9568.000	50.17	6.88	57.05	74.00	-16.95	210	31	peak
9568.000	45.07	6.88	51.95	54.00	-2.05	210	31	AVG

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.

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Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
BLE(1M) Mode, Low channel								
2366.600	56.23	-9.65	46.58	74.00	-27.42	148	142	peak
2366.600	43.56	-9.65	33.91	54.00	-20.09	148	142	AVG
4804.000	45.32	-2.17	43.15	74.00	-30.85	148	237	peak
4804.000	32.64	-2.17	30.47	54.00	-23.53	148	237	AVG
7206.000	43.85	4.18	48.03	74.00	-25.97	150	176	peak
7206.000	30.99	4.18	35.17	54.00	-18.83	150	176	AVG
9568.000	49.74	6.88	56.62	74.00	-17.38	100	0	peak
9568.000	45.00	6.88	51.88	54.00	-2.12	100	0	AVG
BLE(1M) Mode, Middle channel								
4880.000	45.62	-1.88	43.74	74.00	-30.26	157	27	peak
4880.000	32.61	-1.88	30.73	54.00	-23.27	157	27	AVG
7320.000	44.03	5.10	49.13	74.00	-24.87	144	218	peak
7320.000	30.74	5.10	35.84	54.00	-18.16	144	218	AVG
9568.000	49.70	6.88	56.58	74.00	-17.42	223	0	peak
9568.000	44.84	6.88	51.72	54.00	-2.28	223	0	AVG
BLE(1M) Mode, High channel								
2498.080	56.03	-8.23	47.80	74.00	-26.20	163	139	peak
2498.080	43.55	-8.23	35.32	54.00	-18.68	163	139	AVG
4960.000	45.78	-1.49	44.29	74.00	-29.71	149	268	peak
4960.000	32.96	-1.49	31.47	54.00	-22.53	149	268	AVG
7440.000	44.11	5.23	49.34	74.00	-24.66	152	358	peak
7440.000	30.69	5.23	35.92	54.00	-18.08	152	358	AVG
9568.000	50.03	6.88	56.91	74.00	-17.09	217	0	peak
9568.000	44.69	6.88	51.57	54.00	-2.43	217	0	AVG

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.

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Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
BLE(1M) Mode, Low channel								
2383.700	56.67	-9.51	47.16	74.00	-26.84	107	44	peak
2383.700	43.98	-9.51	34.47	54.00	-19.53	107	44	AVG
4804.000	46.82	-2.17	44.65	74.00	-29.35	149	182	peak
4804.000	32.35	-2.17	30.18	54.00	-23.82	149	182	AVG
7206.000	44.15	4.18	48.33	74.00	-25.67	154	294	peak
7206.000	31.09	4.18	35.27	54.00	-18.73	154	294	AVG
9568.000	50.14	6.88	57.02	74.00	-16.98	228	359	peak
9568.000	45.54	6.88	52.42	54.00	-1.58	228	359	AVG
BLE(1M) Mode, Middle channel								
4880.000	45.14	-1.88	43.26	74.00	-30.74	152	229	peak
4880.000	32.92	-1.88	31.04	54.00	-22.96	152	229	AVG
7320.000	44.16	5.10	49.26	74.00	-24.74	160	143	peak
7320.000	30.74	5.10	35.84	54.00	-18.16	160	143	AVG
9568.000	49.95	6.88	56.83	74.00	-17.17	228	359	peak
9568.000	45.41	6.88	52.29	54.00	-1.71	228	359	AVG
BLE(1M) Mode, High channel								
2484.430	56.49	-8.44	48.05	74.00	-25.95	100	44	peak
2484.430	44.29	-8.44	35.85	54.00	-18.15	100	44	AVG
4960.000	46.34	-1.49	44.85	74.00	-29.15	151	131	peak
4960.000	33.15	-1.49	31.66	54.00	-22.34	151	131	AVG
7440.000	44.17	5.23	49.40	74.00	-24.60	139	259	peak
7440.000	30.74	5.23	35.97	54.00	-18.03	139	259	AVG
9568.000	50.22	6.88	57.10	74.00	-16.90	227	358	peak
9568.000	45.46	6.88	52.34	54.00	-1.66	227	358	AVG

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.

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

Conducted Spurious Emissions:

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
B Mode				
Low	2412	45.04	≥ 20	PASS
Middle	2437	46.91	≥ 20	PASS
High	2462	45.69	≥ 20	PASS
G Mode				
Low	2412	37.80	≥ 20	PASS
Middle	2437	39.33	≥ 20	PASS
High	2462	38.90	≥ 20	PASS
N20 Mode				
Low	2412	38.05	≥ 20	PASS
Middle	2437	38.95	≥ 20	PASS
High	2462	37.59	≥ 20	PASS
N40 Mode				
Low	2422	37.40	≥ 20	PASS
Middle	2437	36.75	≥ 20	PASS
High	2452	36.96	≥ 20	PASS
BLE(1M) Mode				
Low	2402	45.22	≥ 20	PASS
Middle	2440	44.01	≥ 20	PASS
High	2480	42.53	≥ 20	PASS

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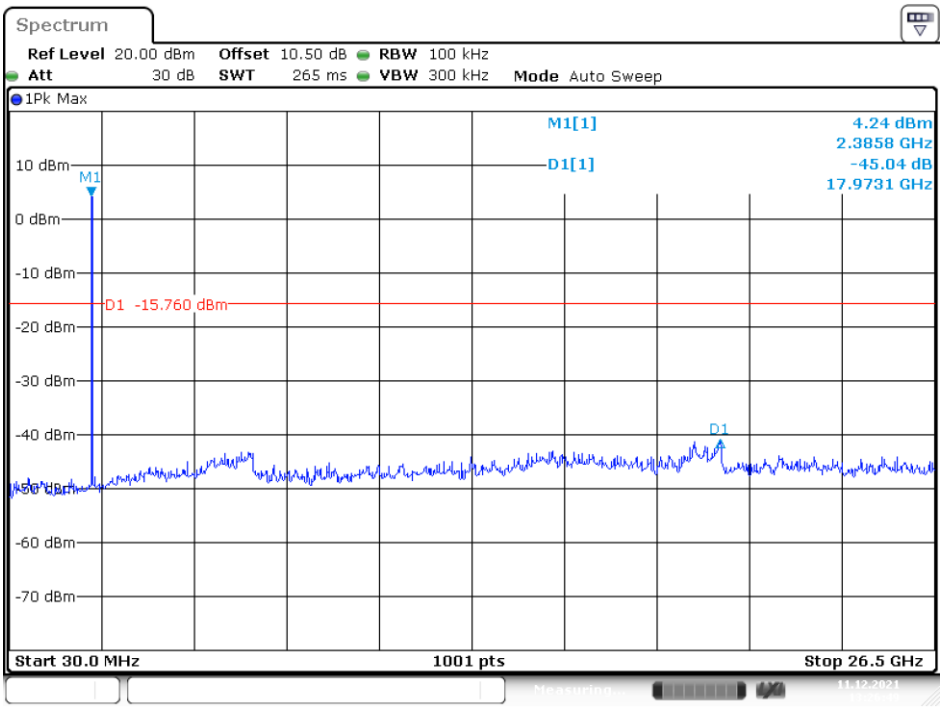
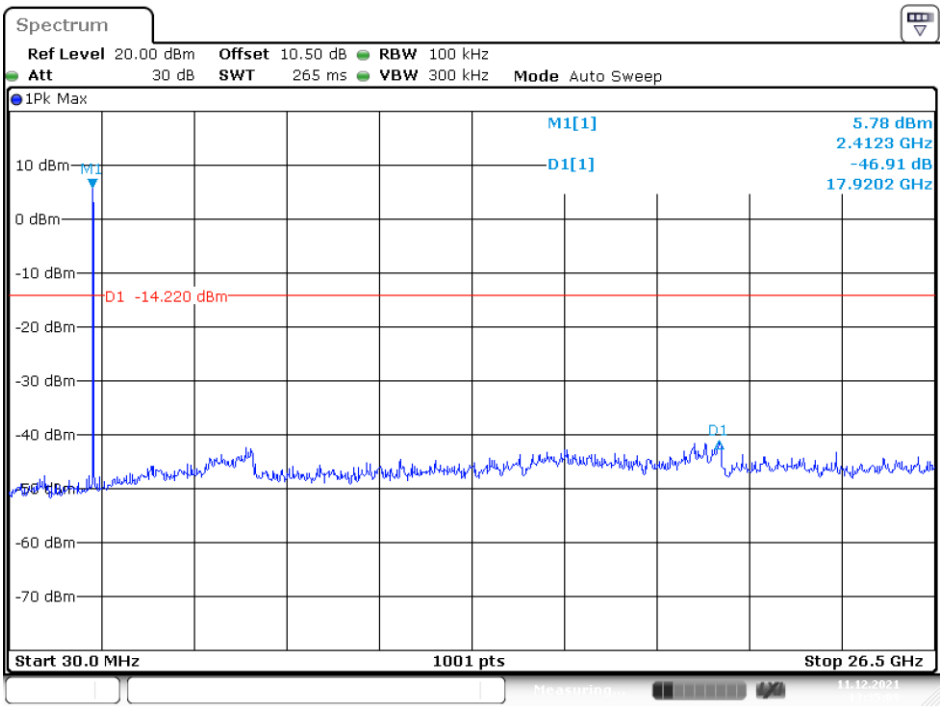
B Mode

Low Channel



Date: 11.DEC.2021 13:26:49

Middle Channel



Date: 11.DEC.2021 13:35:10

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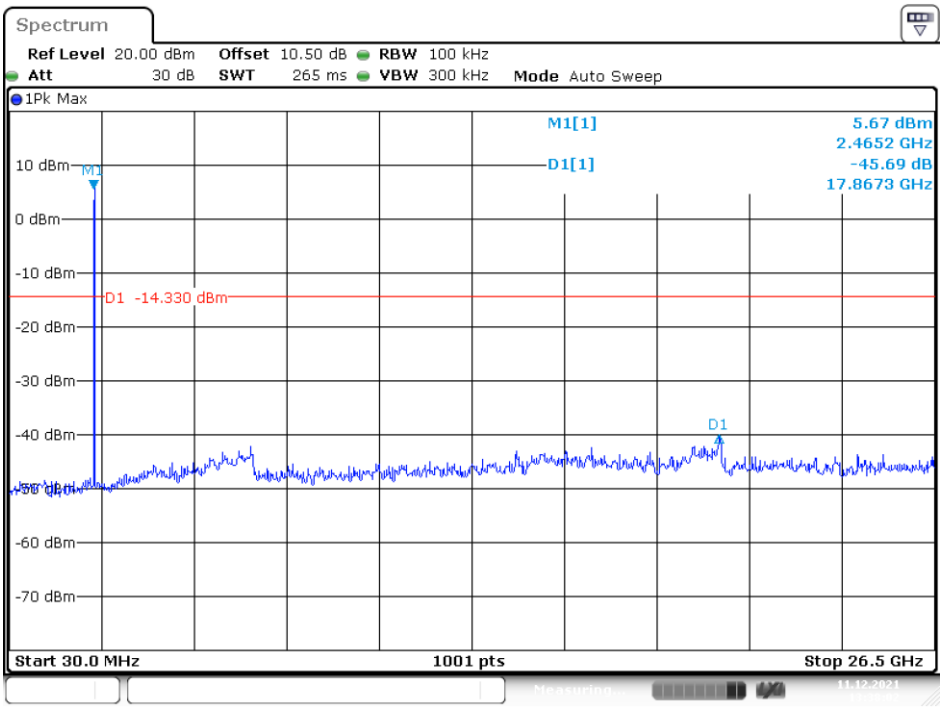
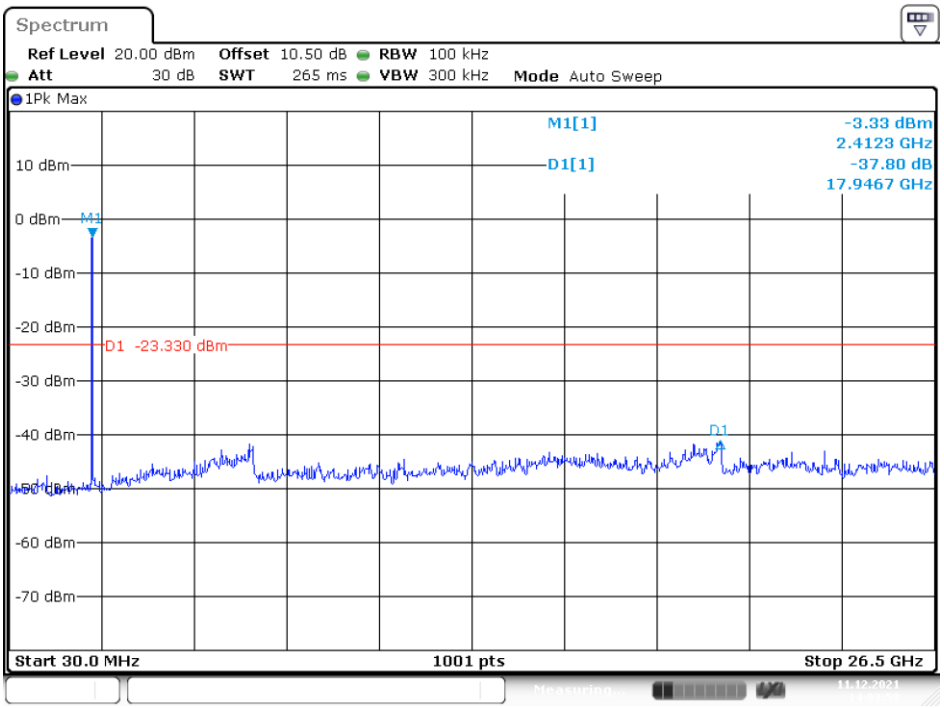
High Channel



Date: 11.DEC.2021 13:38:03

G Mode

Low Channel



Date: 11.DEC.2021 14:03:59

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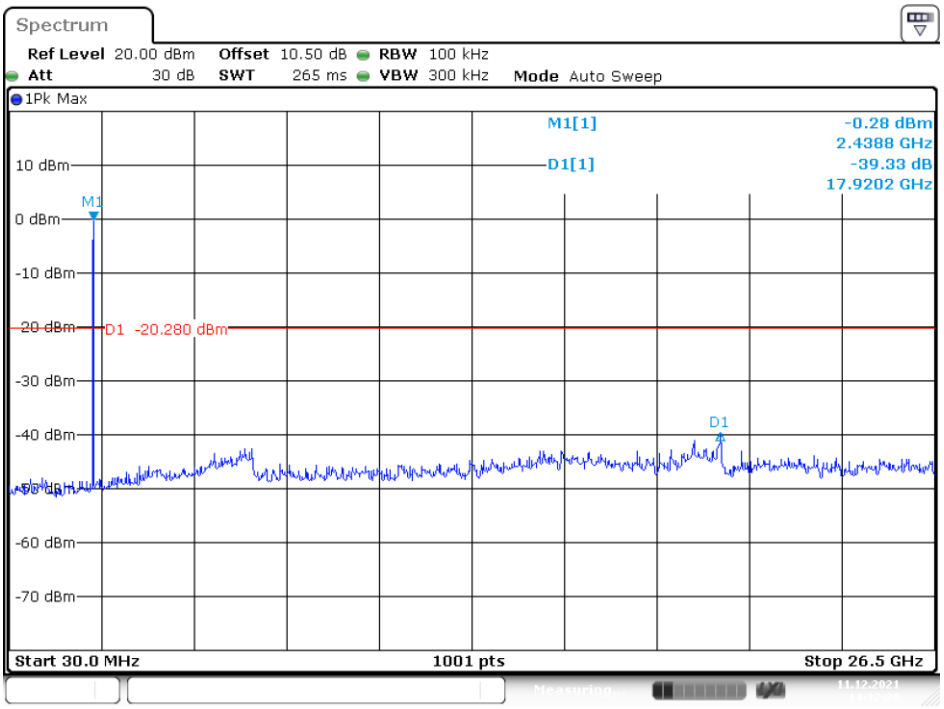
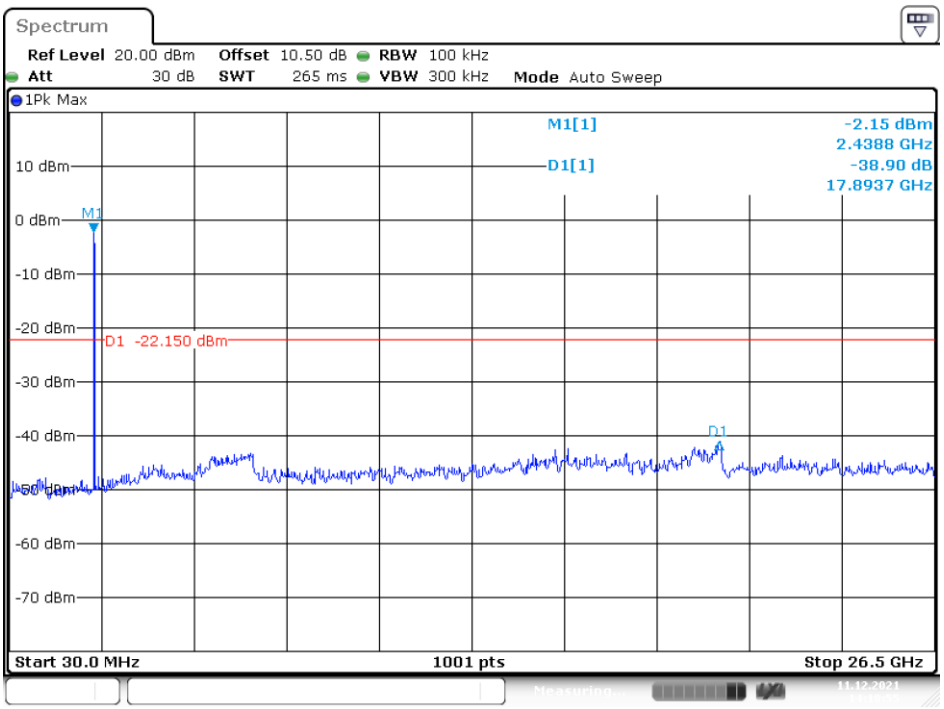
Middle Channel



Date: 11.DEC.2021 14:12:20

High Channel



Date: 11.DEC.2021 14:18:56

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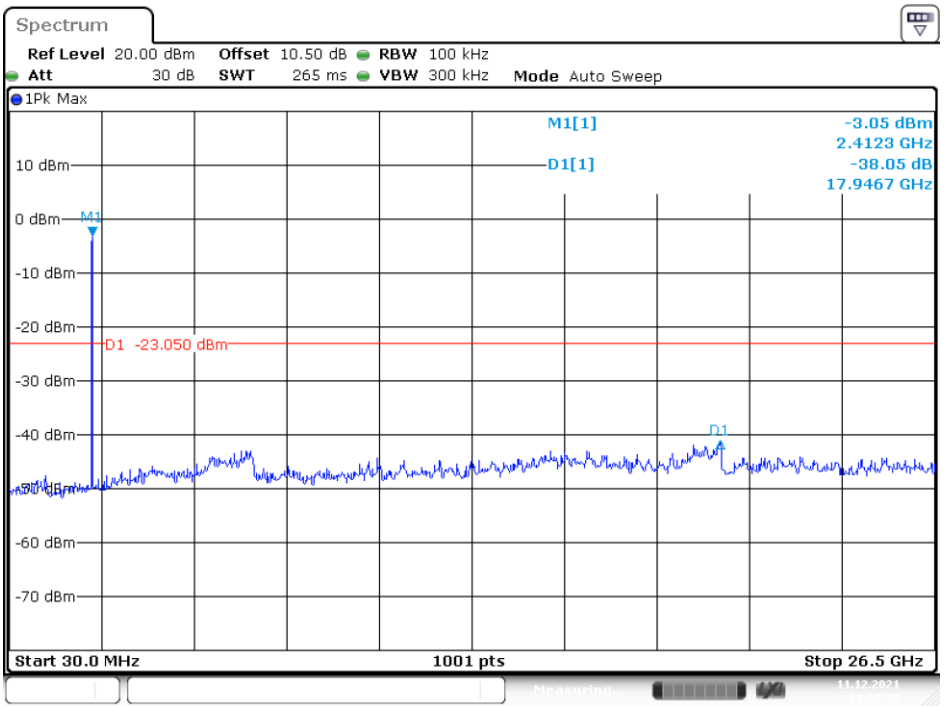
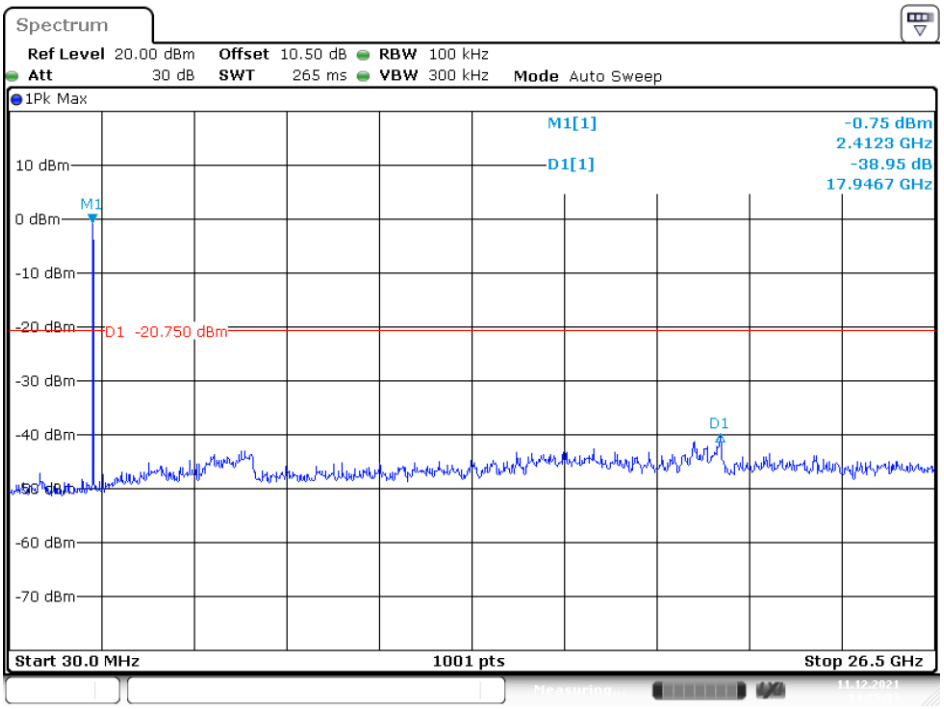
N20 Mode

Low Channel



Date: 11.DEC.2021 14:22:36

Middle Channel



Date: 11.DEC.2021 14:25:33

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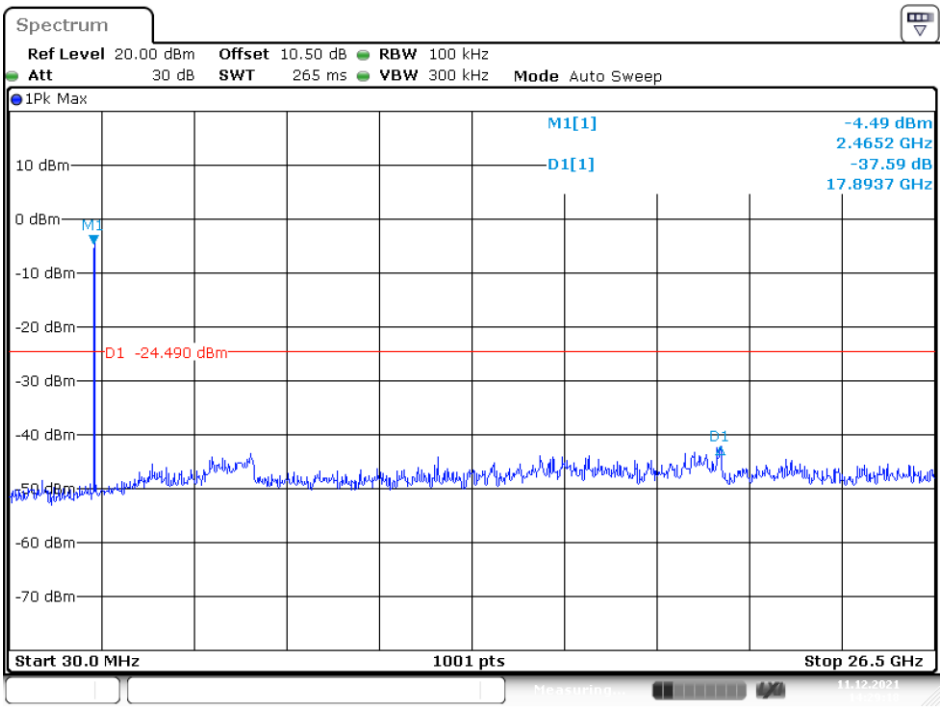
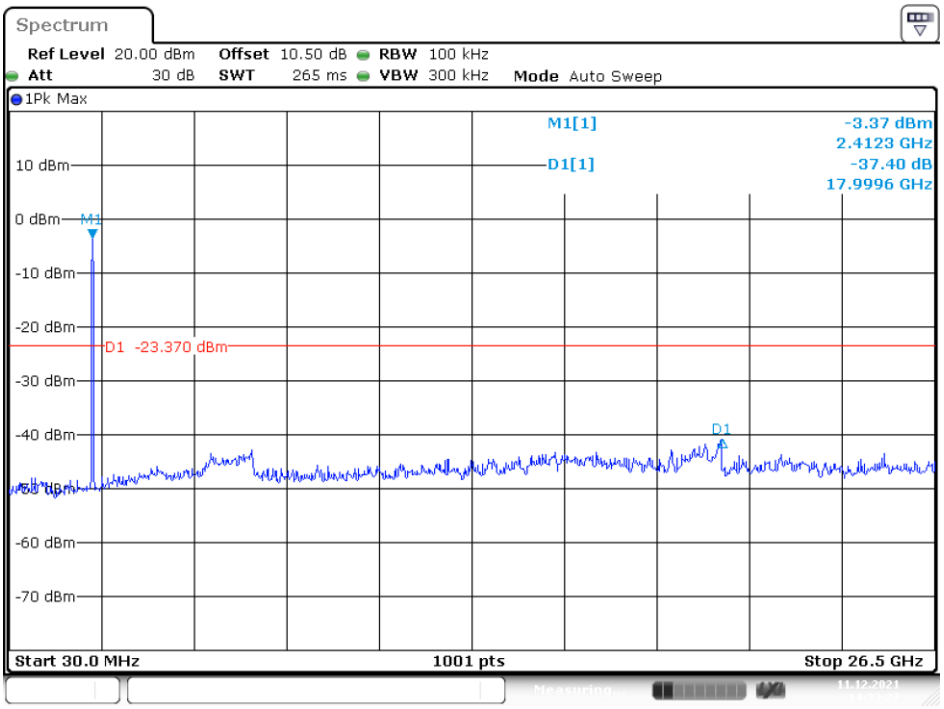
High Channel



Date: 11.DEC.2021 14:29:18

N40 Mode

Low Channel



Date: 11.DEC.2021 14:33:28

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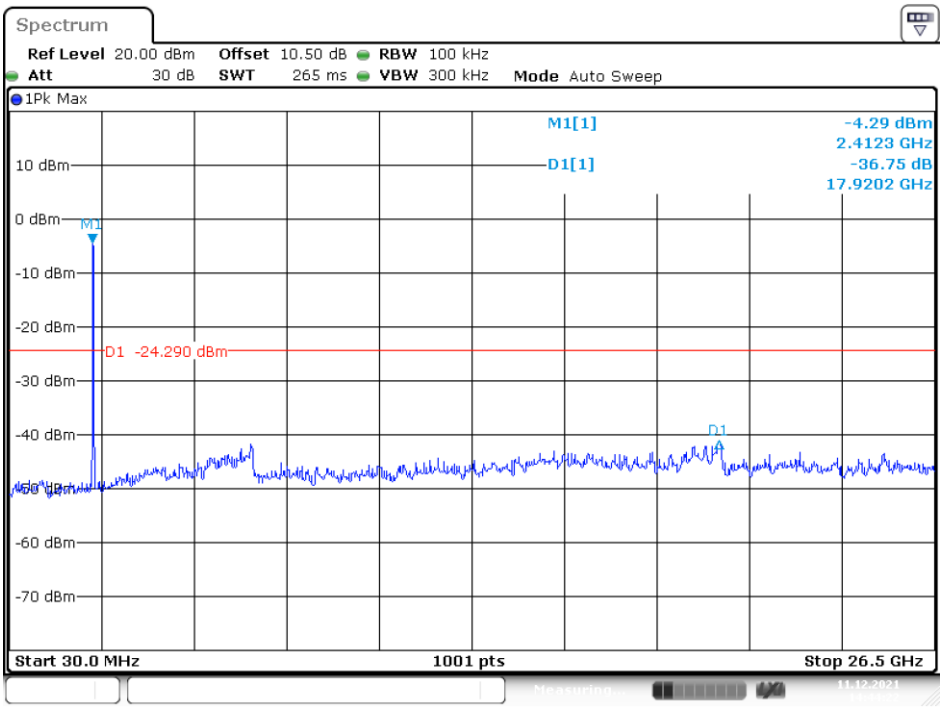
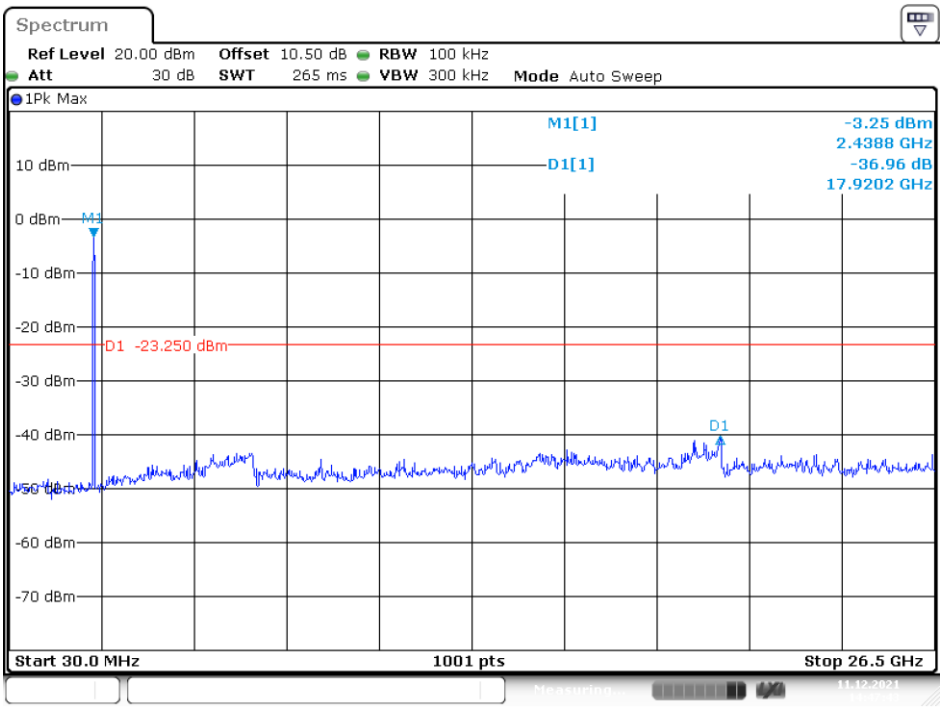
Middle Channel



Date: 11.DEC.2021 14:44:22

High Channel



Date: 11.DEC.2021 14:47:43

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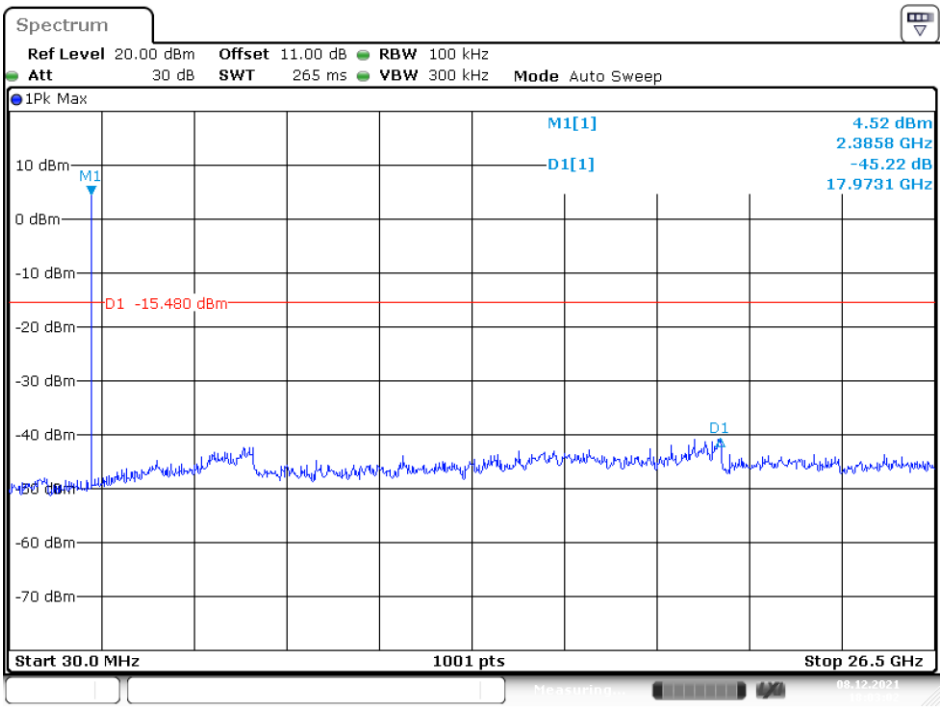
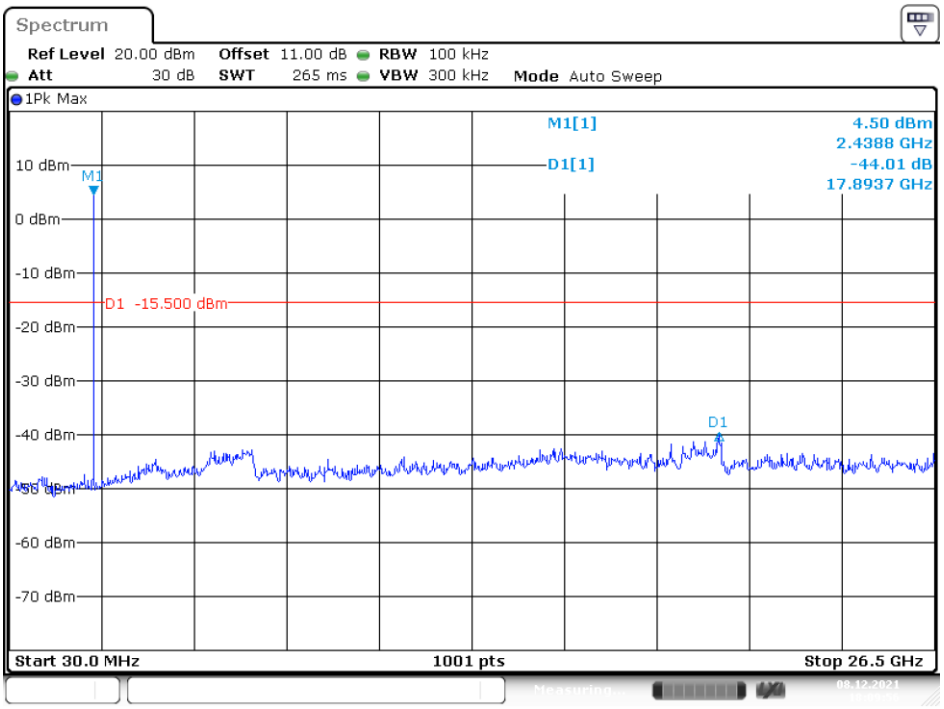
BLE(1M) Mode

Low Channel



Date: 8.DEC.2021 18:03:02

Middle Channel



Date: 8.DEC.2021 18:09:56

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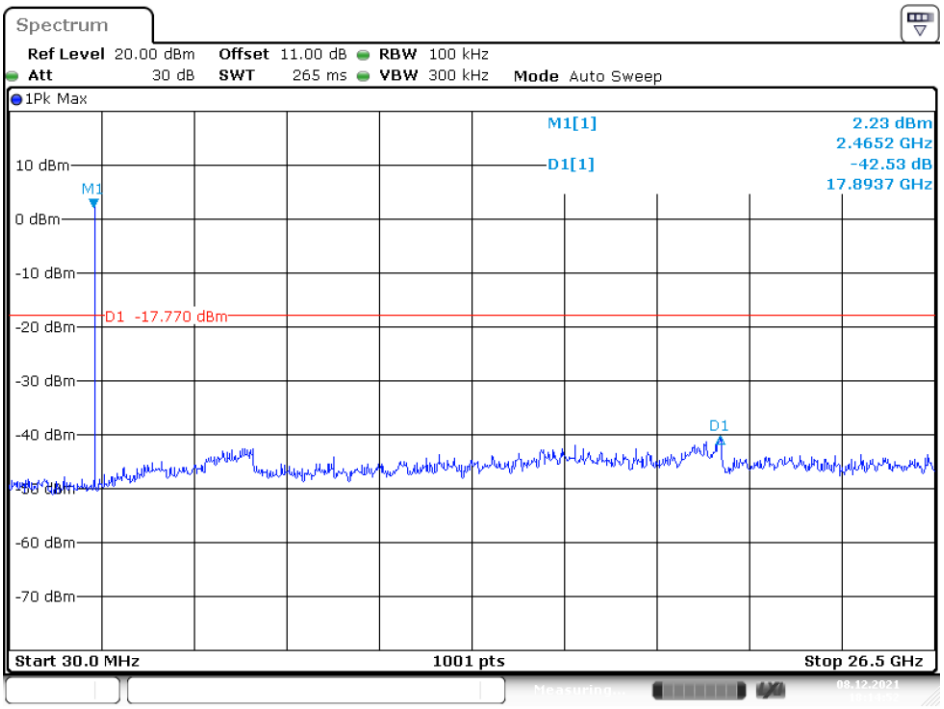
High Channel



Date: 8.DEC.2021 18:14:52

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

8.1 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.

8.2 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.

8.3 Test Results

Channel	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	Limit (kHz)	Result
B Mode				
Low	2412	10.04	> 500	PASS
Middle	2437	10.08	> 500	PASS
High	2462	10.08	> 500	PASS
G Mode				
Low	2412	16.32	> 500	PASS
Middle	2437	16.32	> 500	PASS
High	2462	16.32	> 500	PASS
N20 Mode				
Low	2412	17.56	> 500	PASS
Middle	2437	17.60	> 500	PASS
High	2462	17.56	> 500	PASS
N40 Mode				
Low	2422	35.28	> 500	PASS
Middle	2437	35.36	> 500	PASS
High	2452	35.36	> 500	PASS
BLE(1M) Mode				
Low	2402	0.75	> 500	PASS
Middle	2440	0.73	> 500	PASS
High	2480	0.73	> 500	PASS

Please refer to the following plots

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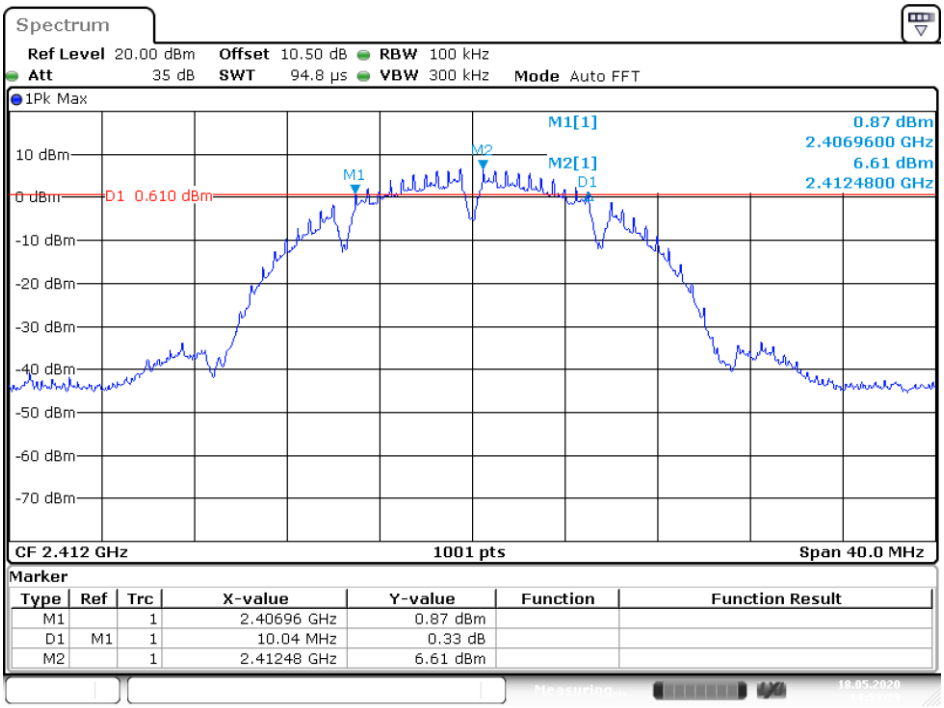
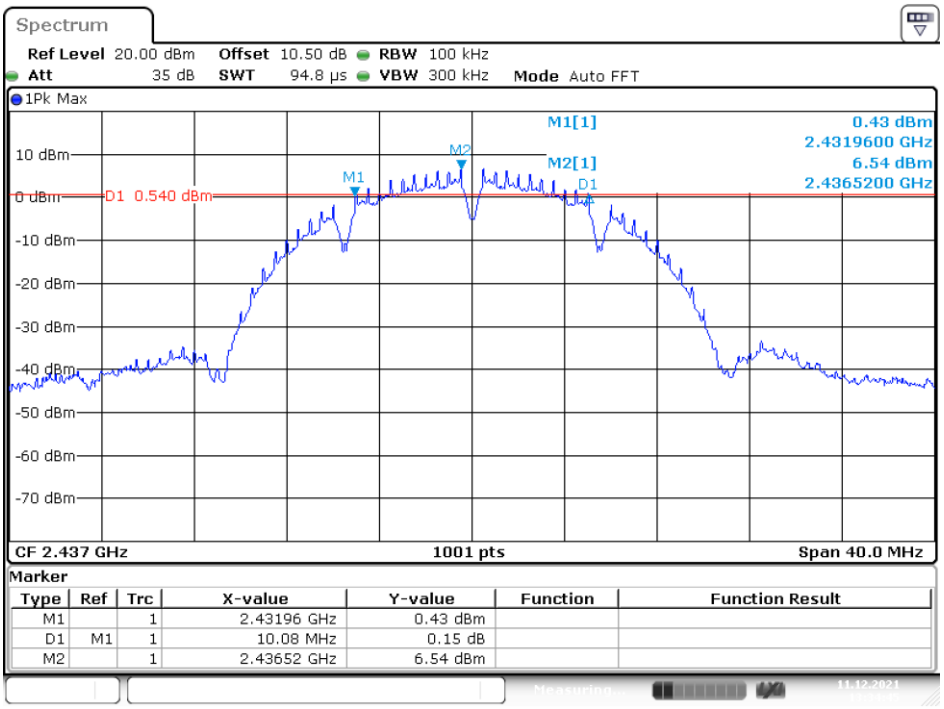
B Mode

Low Channel



Date: 11.DEC.2021 13:26:09

Middle Channel



Date: 11.DEC.2021 13:34:45

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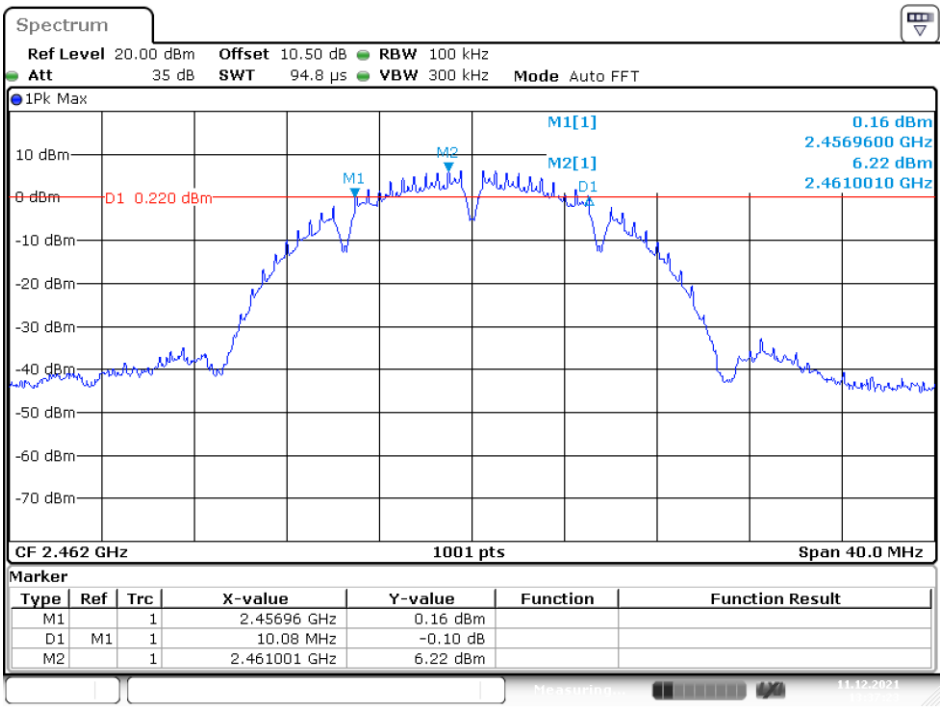
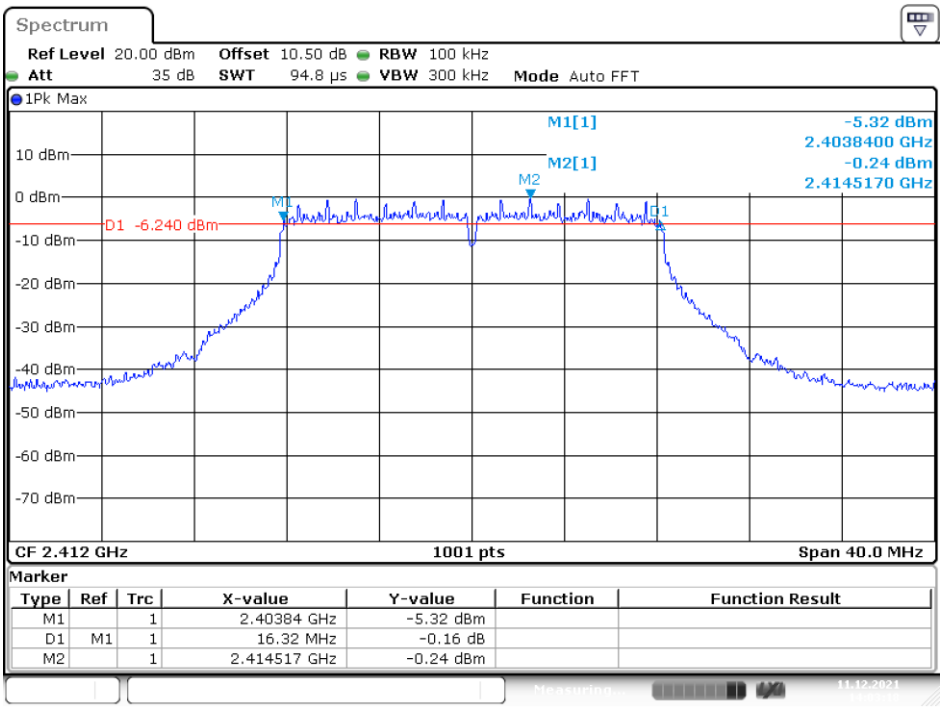
High Channel



Date: 11.DEC.2021 13:37:23

G Mode

Low Channel



Date: 11.DEC.2021 14:03:19

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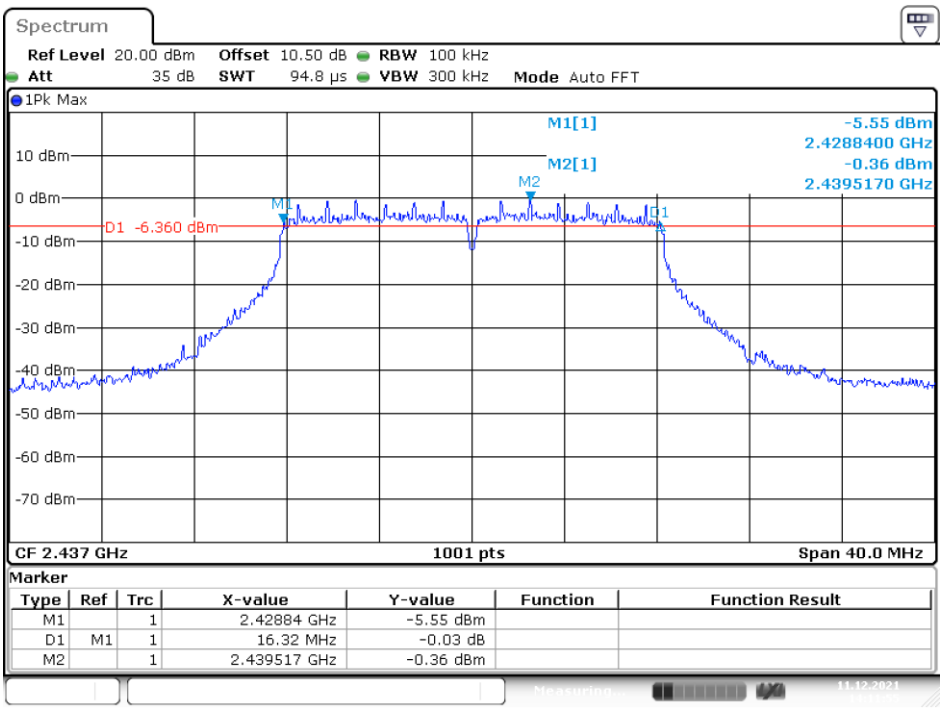
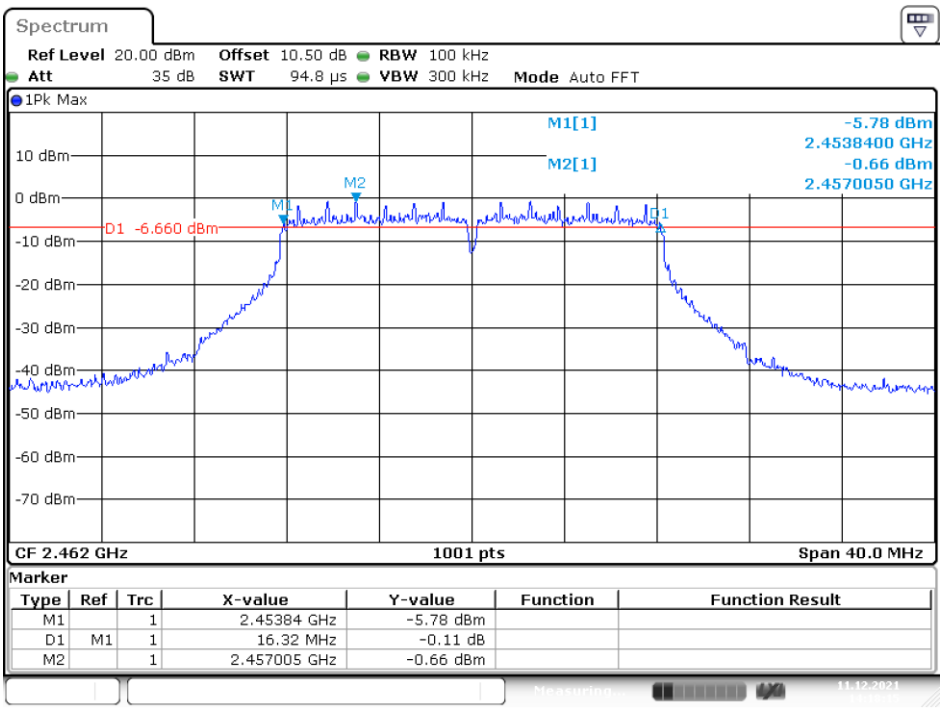
Middle Channel



Date: 11.DEC.2021 14:11:55

High Channel



Date: 11.DEC.2021 14:18:15

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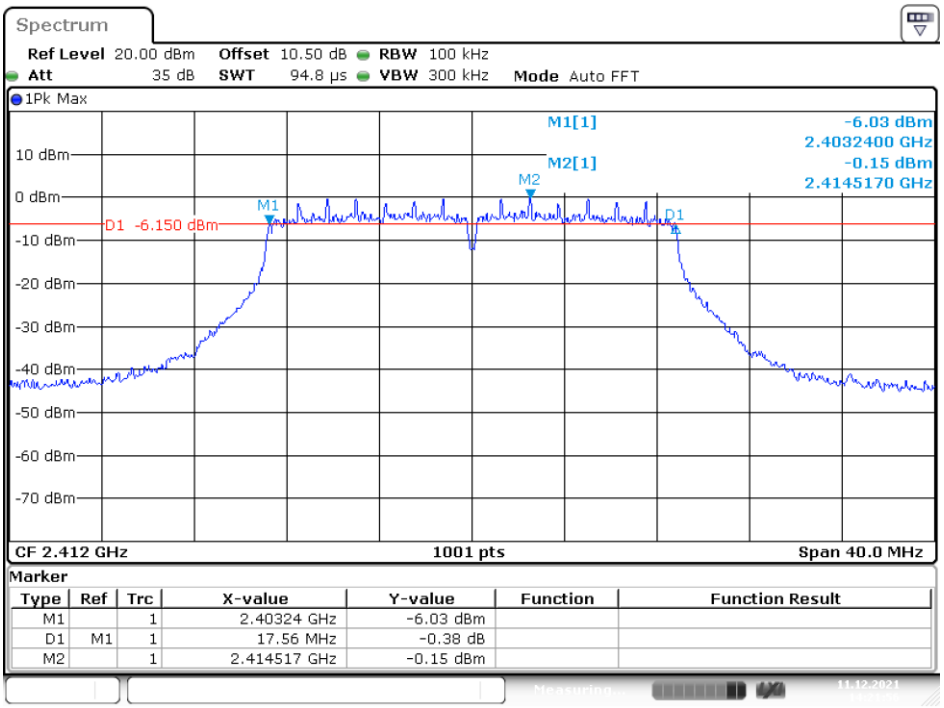
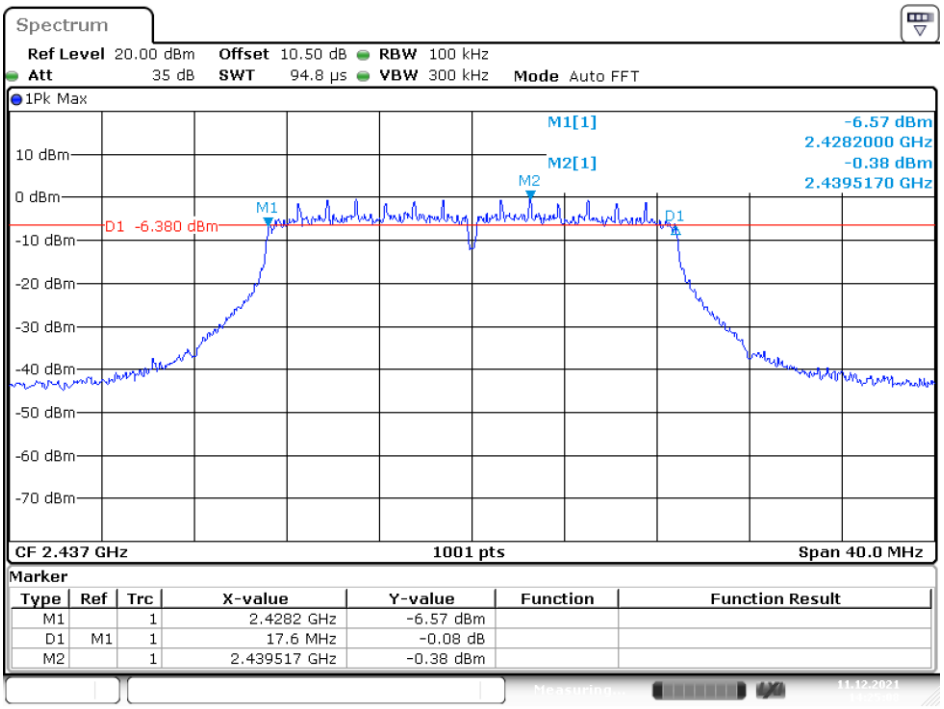
N20 Mode

Low Channel



Date: 11.DEC.2021 14:21:56

Middle Channel



Date: 11.DEC.2021 14:25:09

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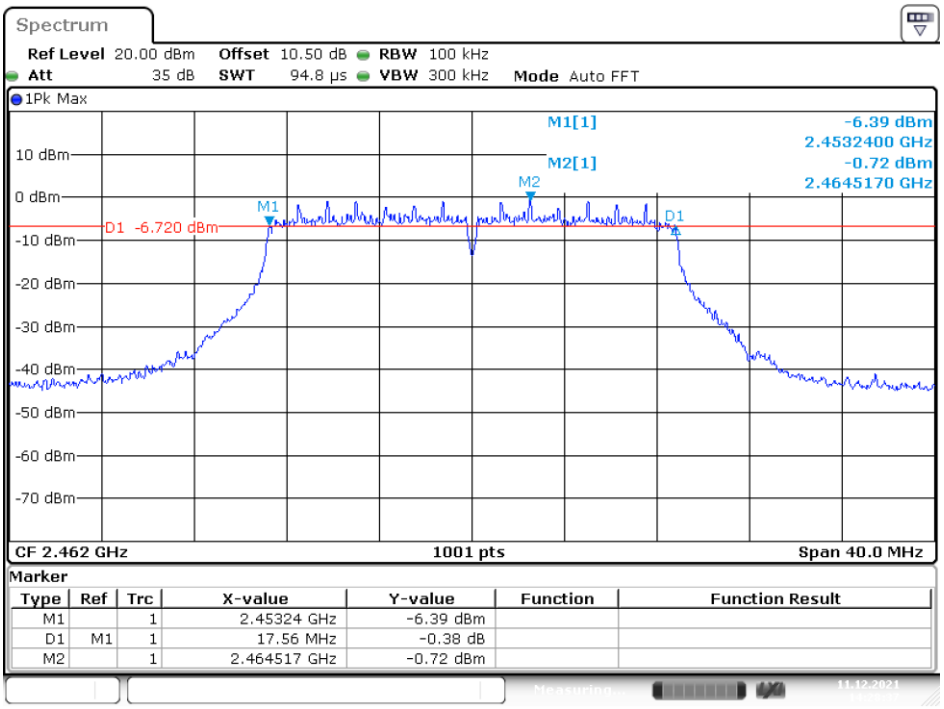
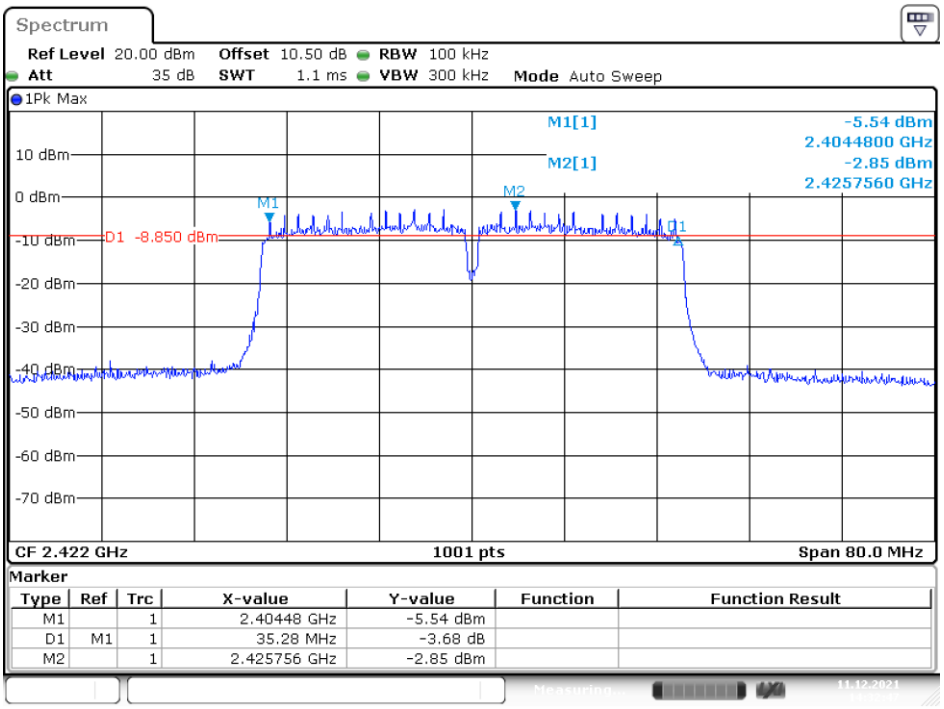
High Channel



Date: 11.DEC.2021 14:28:37

N40 Mode

Low Channel



Date: 11.DEC.2021 14:32:48

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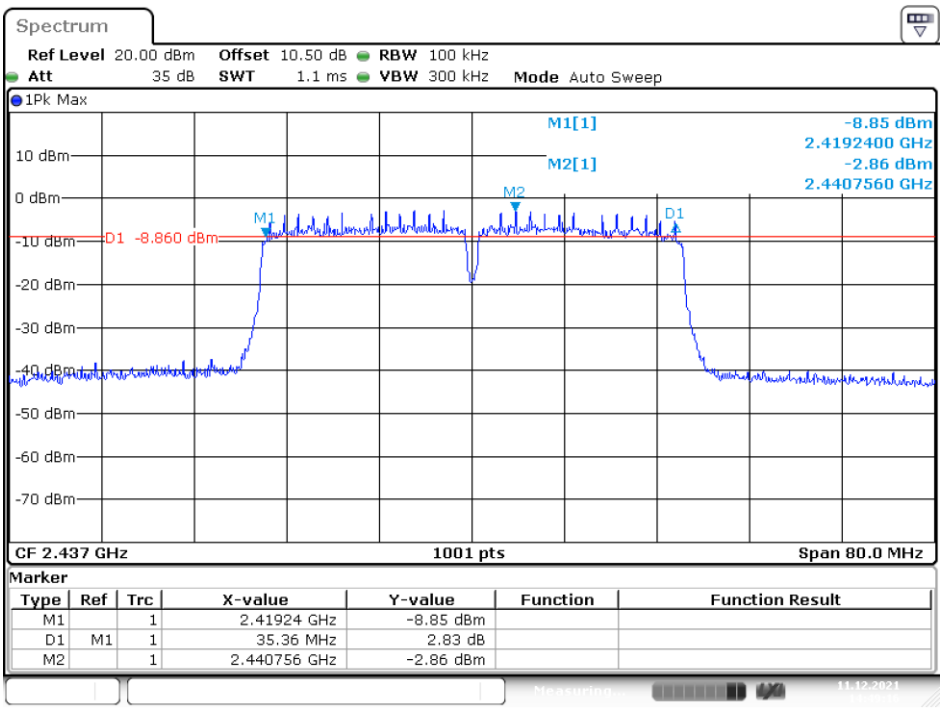
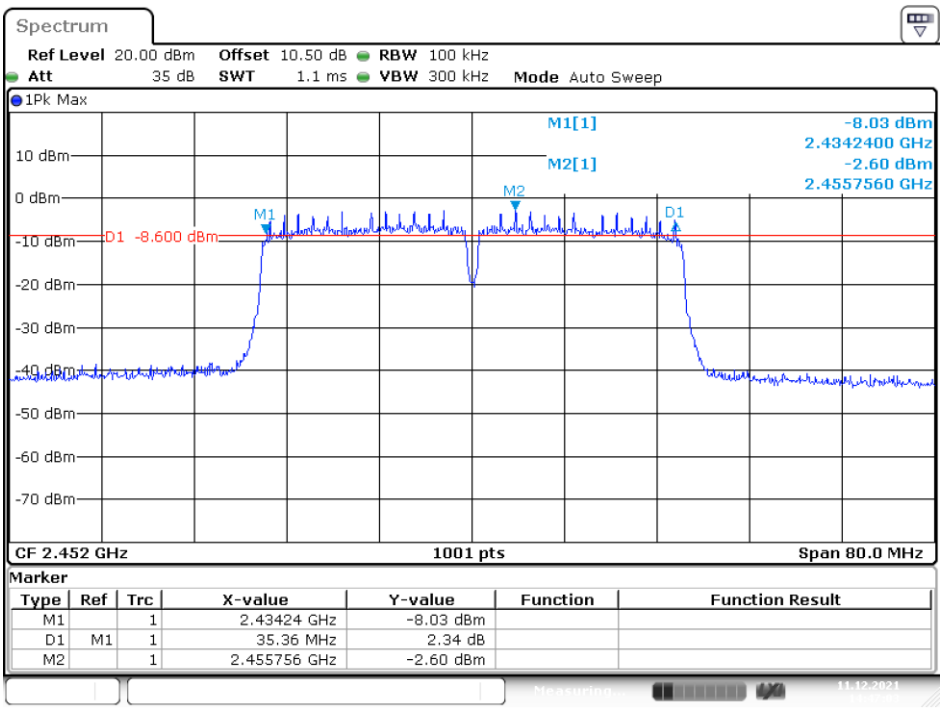
Middle Channel



Date: 11.DEC.2021 14:49:16

High Channel



Date: 11.DEC.2021 14:47:03

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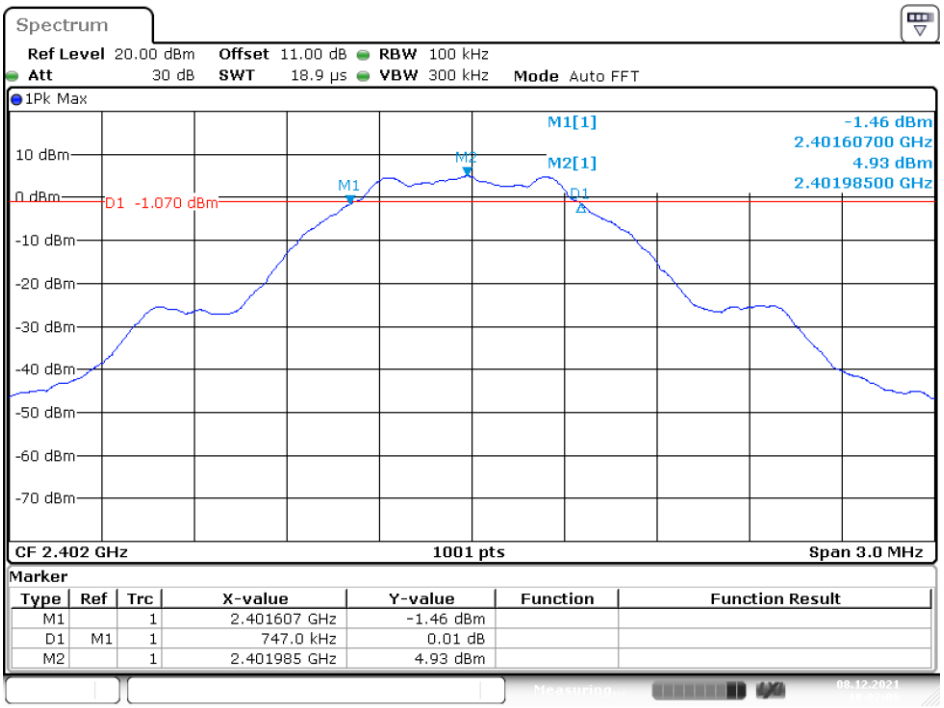
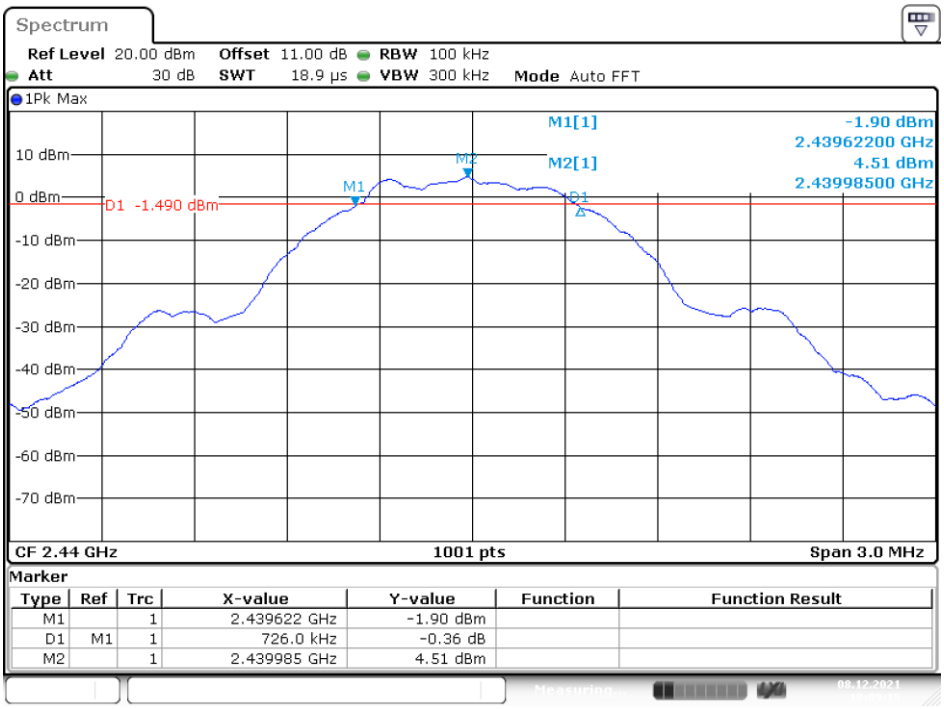
BLE(1M) Mode

Low Channel



Date: 8.DEC.2021 18:02:07

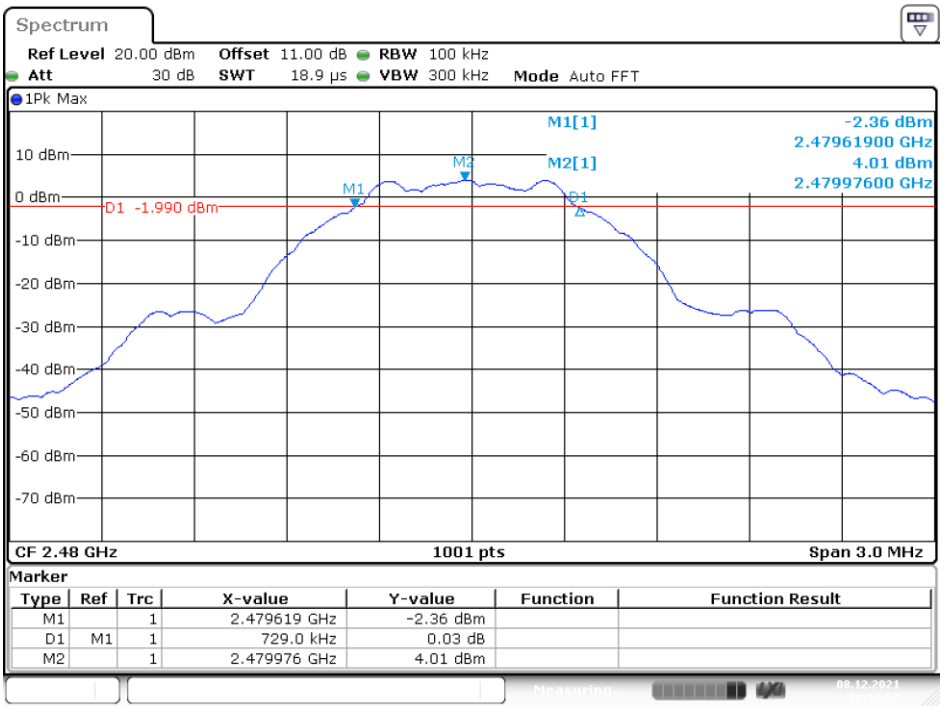
Middle Channel



Date: 8.DEC.2021 18:09:16

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

High Channel



Date: 8.DEC.2021 18:13:57

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

9.1 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.

9.2 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.

9.3 Test Results

Conducted Peak Output Power

Channel	Frequency (MHz)	Power (dBm)	Power (W)	Limit (W)	Result
802.11b Mode					
Low	2412	19.46	0.088	1	PASS
Middle	2437	18.81	0.076	1	PASS
High	2462	18.26	0.067	1	PASS
802.11g Mode					
Low	2412	20.95	0.124	1	PASS
Middle	2437	20.75	0.119	1	PASS
High	2462	20.15	0.104	1	PASS
802.11n HT20 Mode					
Low	2412	20.12	0.103	1	PASS
Middle	2437	20.11	0.103	1	PASS
High	2462	19.71	0.094	1	PASS
802.11n HT40 Mode					
Low	2422	19.23	0.084	1	PASS
Middle	2437	19.16	0.082	1	PASS
High	2452	18.82	0.076	1	PASS
BLE(1M) Mode					
Low	2402	6.25	0.004	1	PASS
Middle	2440	5.88	0.004	1	PASS
High	2480	5.32	0.003	1	PASS

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

10.1 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)).

10.2 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.

10.3 Test Results

Channel	Frequency (MHz)	Delta Peak to Band Emission (dBc)	Limit (dBc)	Result
B Mode				
Low	2412	41.95	≥ 20	PASS
High	2462	47.44	≥ 20	PASS
G Mode				
Low	2412	35.74	≥ 20	PASS
High	2462	41.47	≥ 20	PASS
N20 Mode				
Low	2412	37.30	≥ 20	PASS
High	2462	41.92	≥ 20	PASS
N40 Mode				
Low	2422	36.43	≥ 20	PASS
High	2452	38.26	≥ 20	PASS
BLE(1M) Mode				
Low	2402	50.06	≥ 20	PASS
High	2480	52.08	≥ 20	PASS

Please refer to the following plots.

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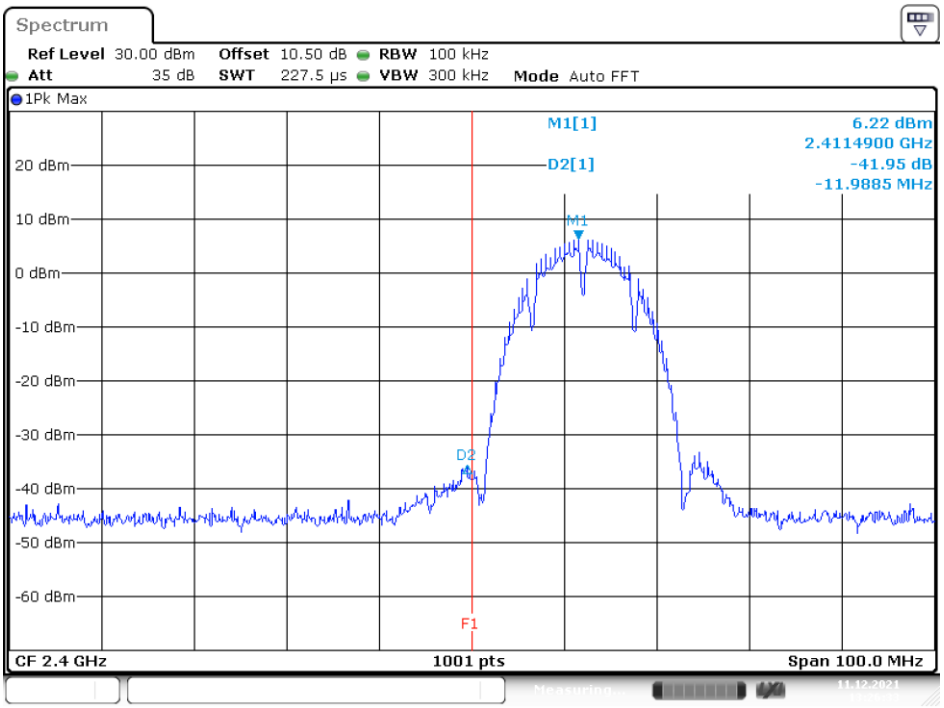
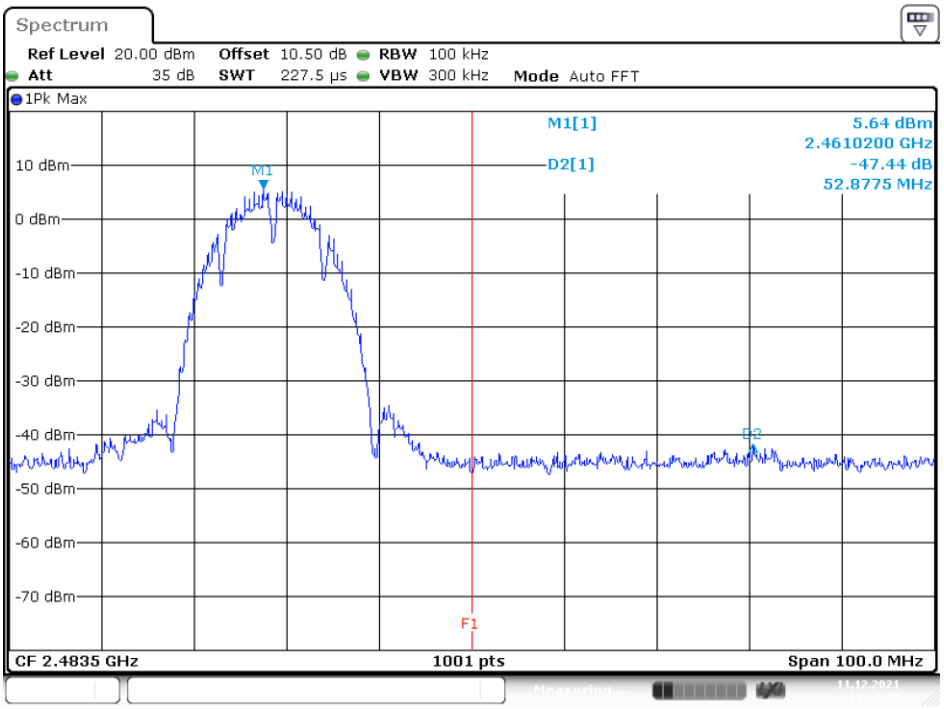
B Mode

Band Edge, Left Side



Date: 11.DEC.2021 13:26:34

Band Edge, Right Side



Date: 11.DEC.2021 13:37:47

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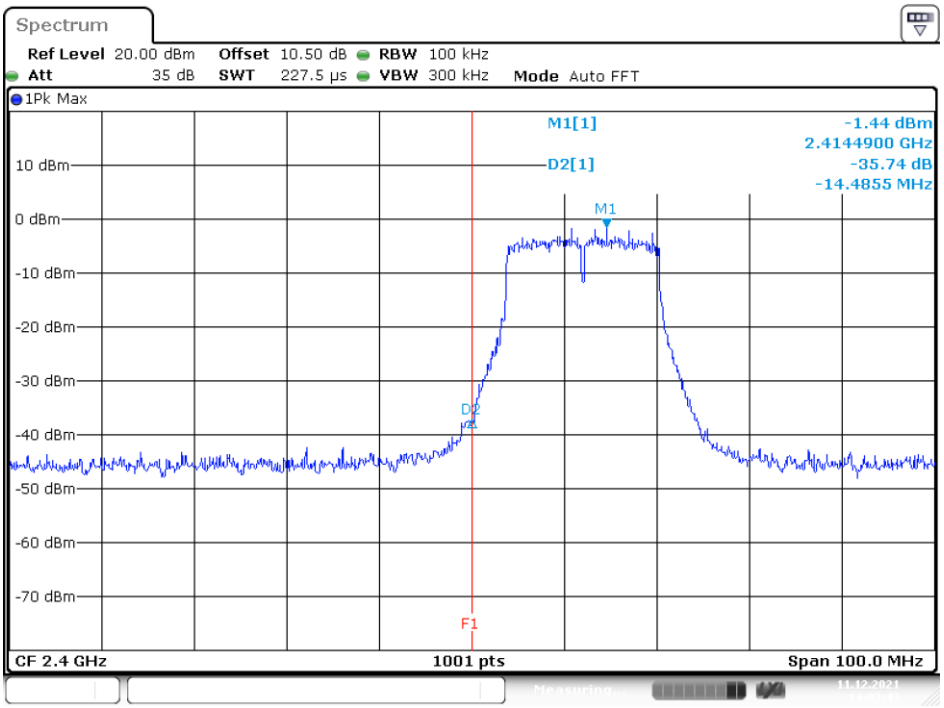
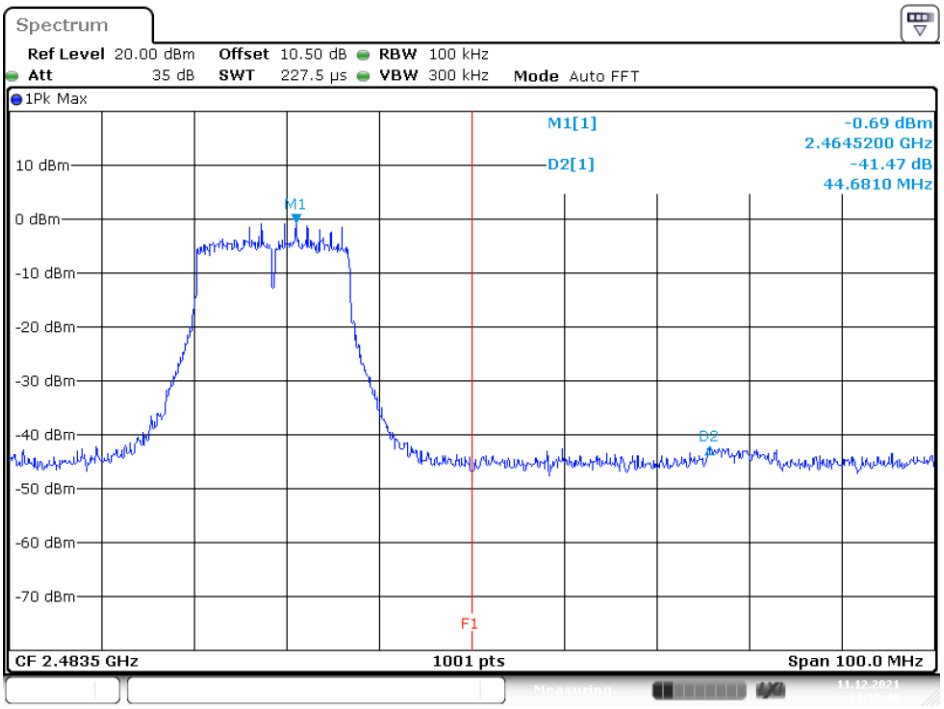
G Mode

Band Edge, Left Side



Date: 11.DEC.2021 14:03:43

Band Edge, Right Side



Date: 11.DEC.2021 14:18:40

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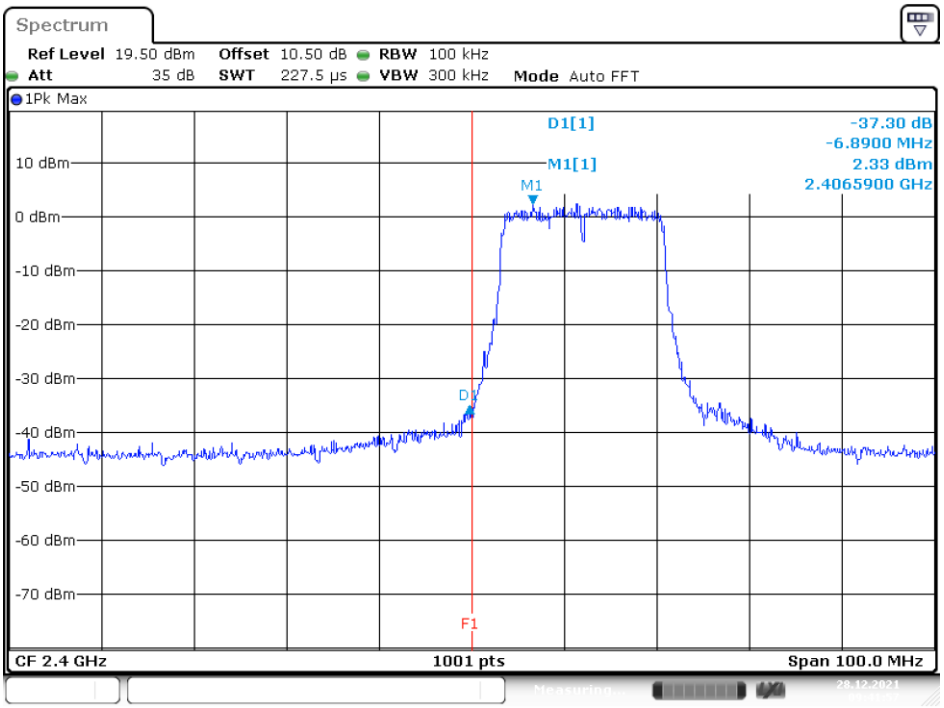
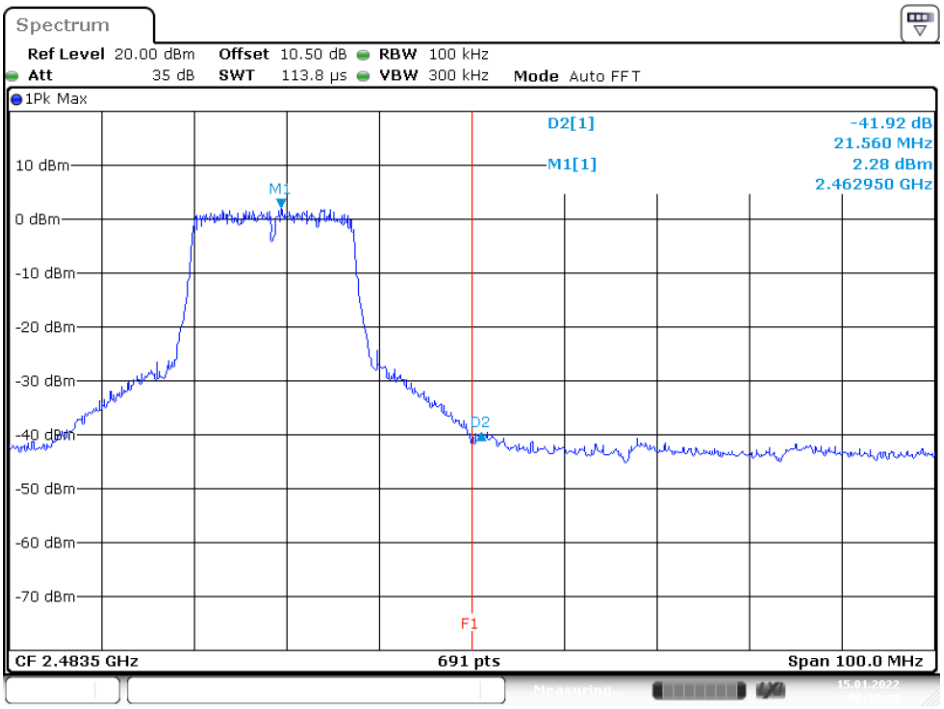
N20 Mode

Band Edge, Left Side



Date: 28.DEC.2021 09:41:57

Band Edge, Right Side



Date: 15.JAN.2022 08:33:45

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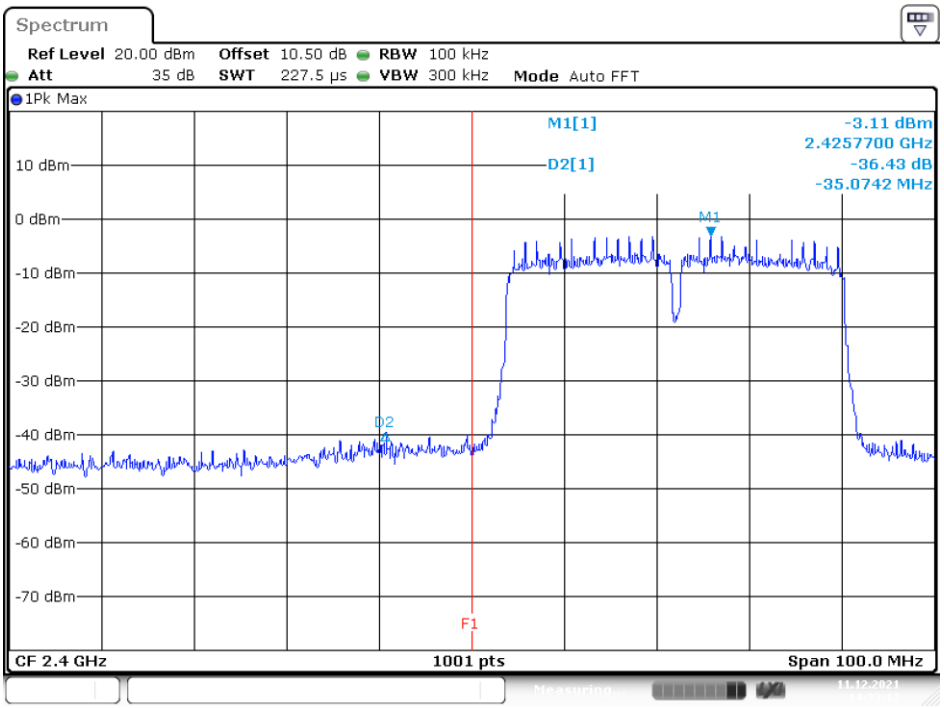
N40 Mode

Band Edge, Left Side



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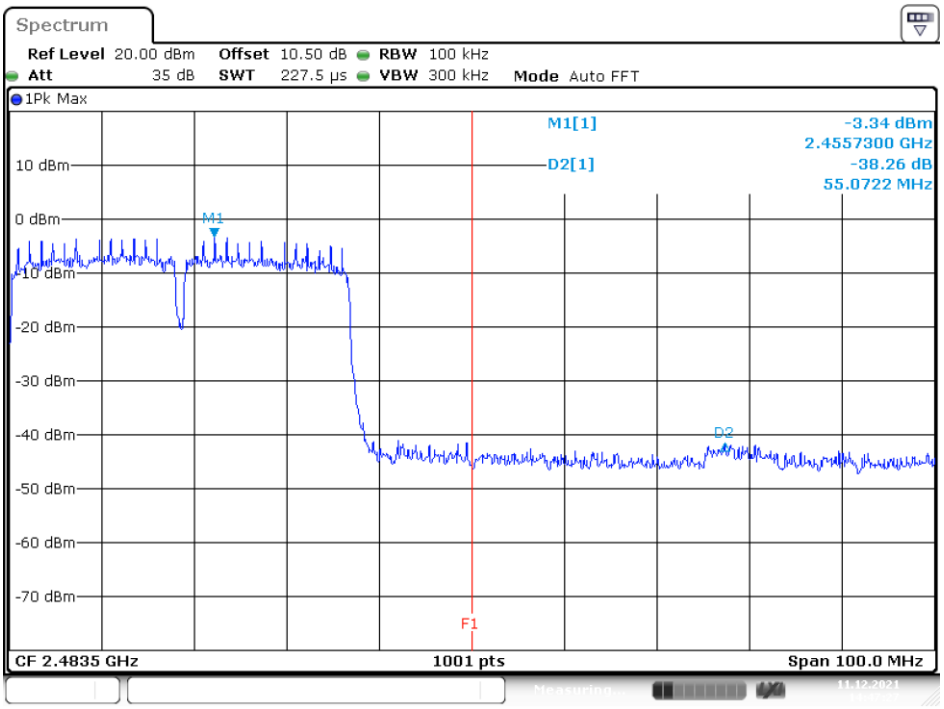
Band Edge, Right Side



Date: 11.DEC.2021 14:47:27

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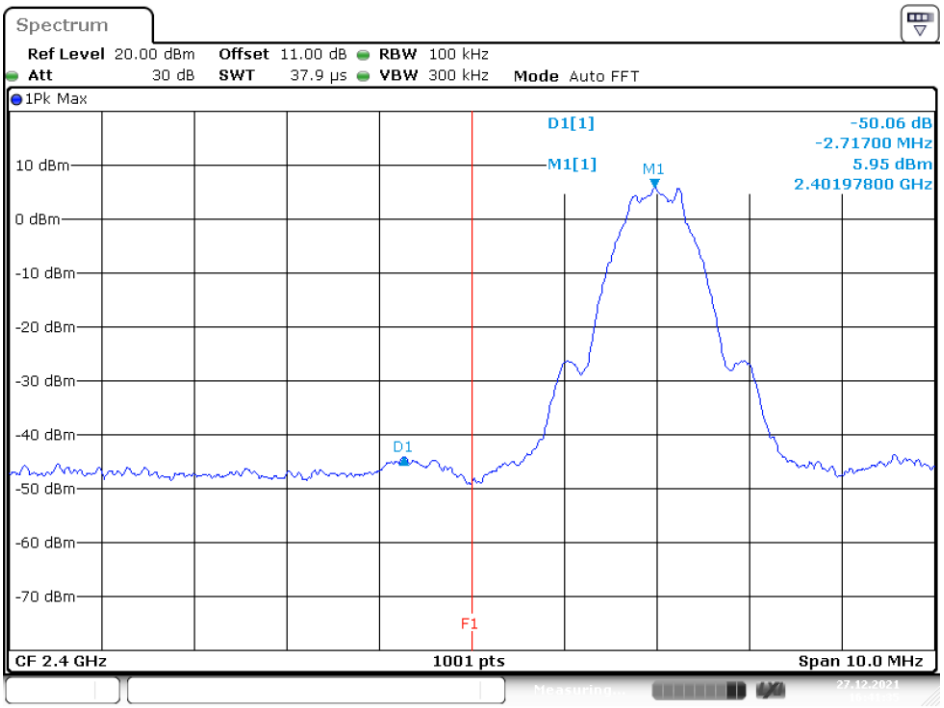
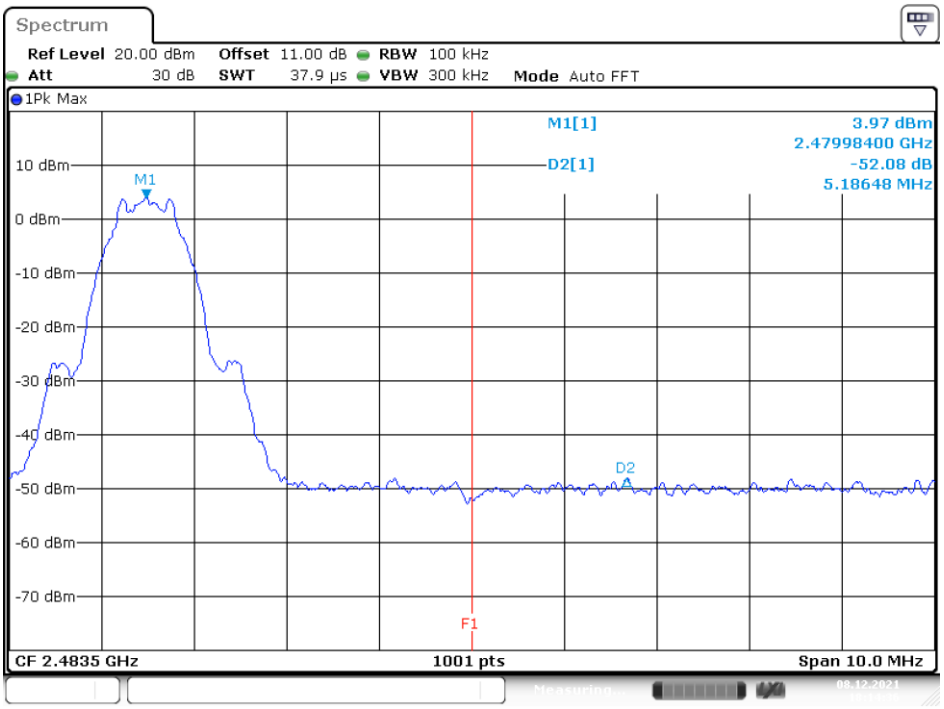
BLE(1M) Mode

Band Edge, Low Channel



Date: 27.DEC.2021 16:41:35

Band Edge, High Channel



Date: 8.DEC.2021 18:14:37

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11 FCC §15.247(e) – Power Spectral Density

11.1 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.

11.2 Test Procedure

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

11.3 Test Results

Channel	Frequency (MHz)	Power Spectral Density (dBm/3 kHz)	Limit (dBm/3 kHz)	Result
B Mode				
Low	2412	-6.19	8	PASS
Middle	2437	-6.15	8	PASS
High	2462	-7.07	8	PASS
G Mode				
Low	2412	-14.21	8	PASS
Middle	2437	-13.15	8	PASS
High	2462	-13.67	8	PASS
N20 Mode				
Low	2412	-13.31	8	PASS
Middle	2437	-14.47	8	PASS
High	2462	-14.67	8	PASS
N40 Mode				
Low	2422	-17.09	8	PASS
Middle	2437	-17.08	8	PASS
High	2452	-17.37	8	PASS
BLE(1M) Mode				
Low	2402	-9.58	8	PASS
Middle	2440	-10.57	8	PASS
High	2480	-10.07	8	PASS

Please refer to the following plots

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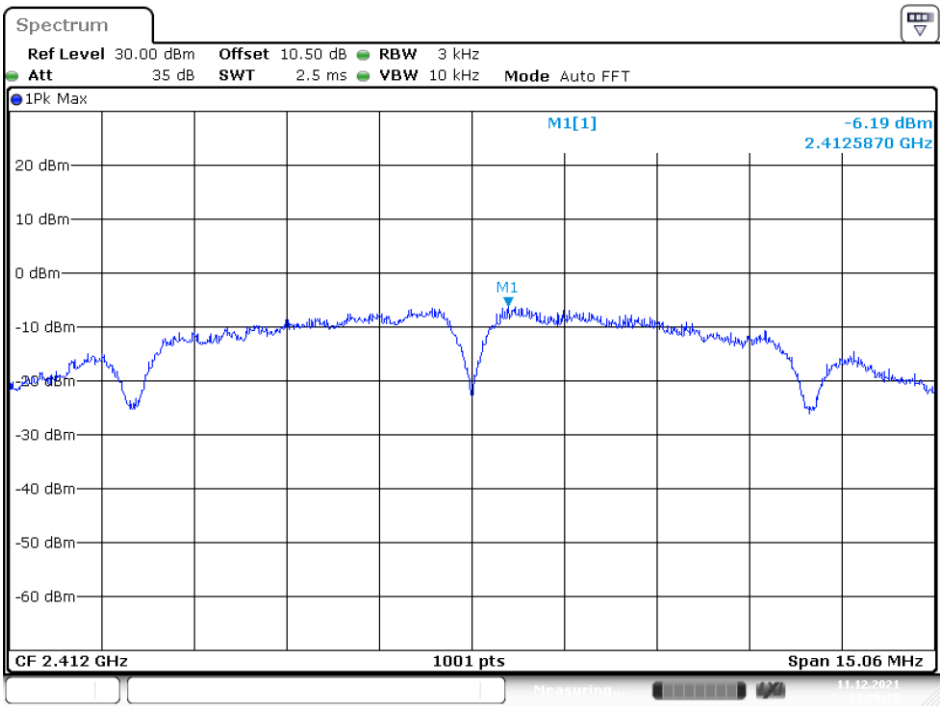
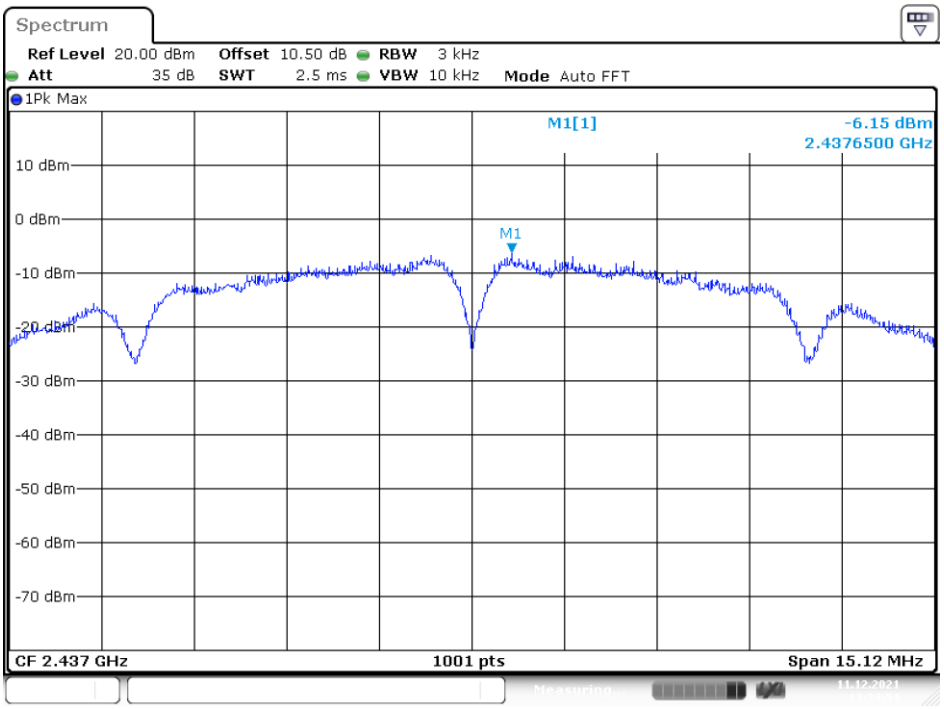
B Mode

Low Channel



Date: 11.DEC.2021 13:26:18

Middle Channel



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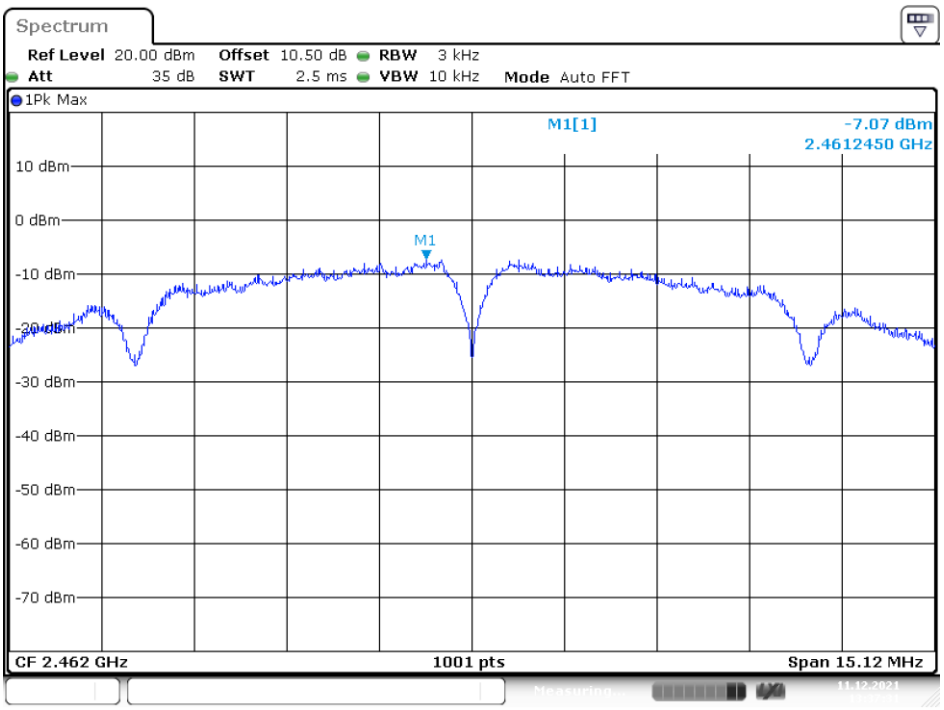
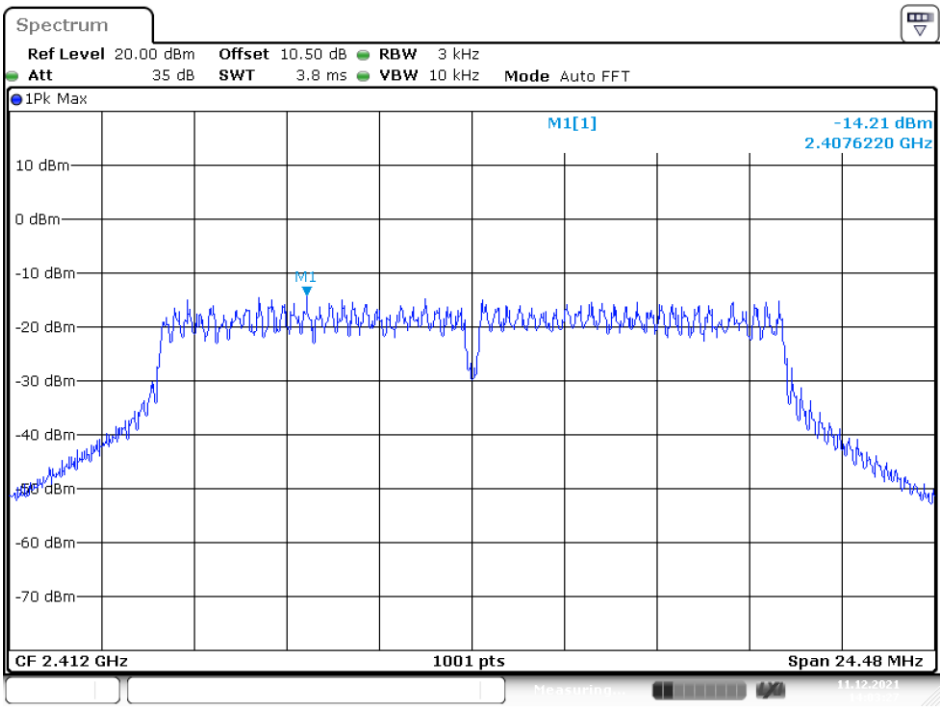
High Channel



Date: 11.DEC.2021 13:37:32

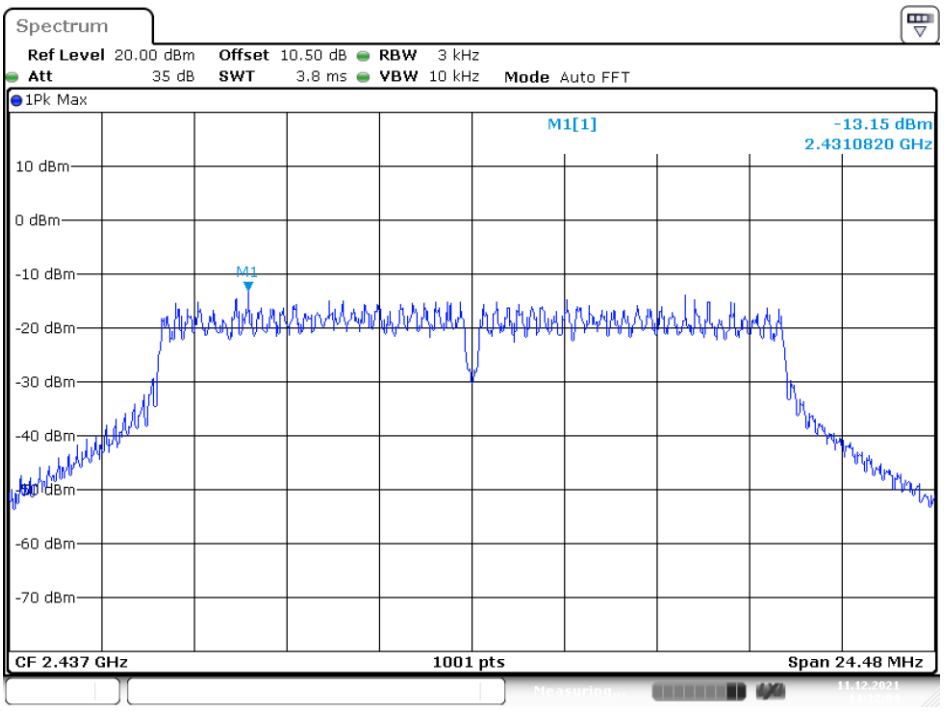
G Mode

Low Channel



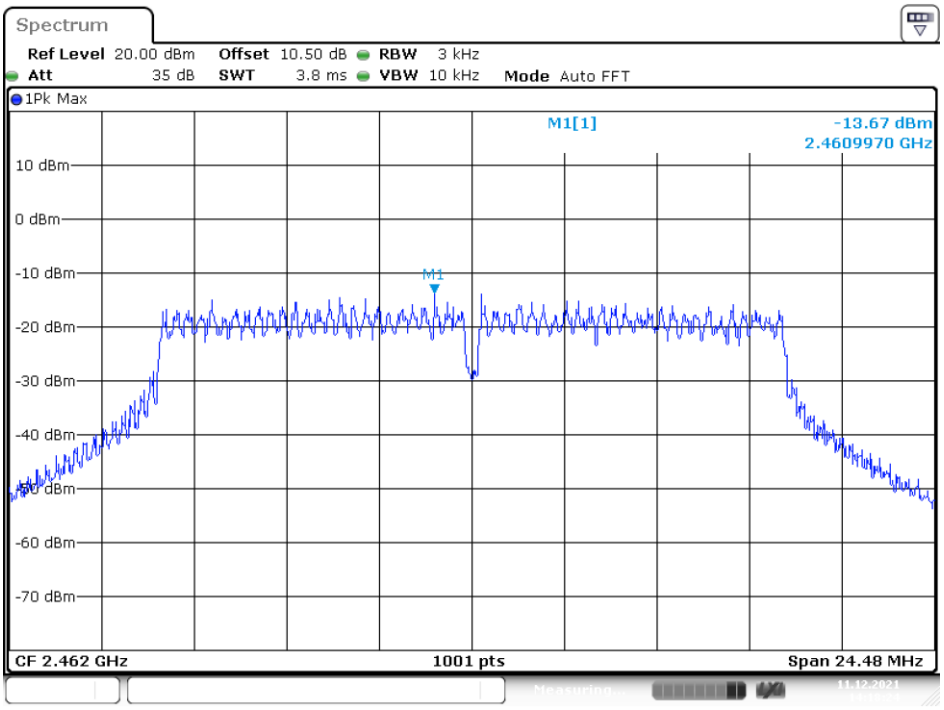
Date: 11.DEC.2021 14:03:28

Middle Channel



Date: 11.DEC.2021 14:12:04

High Channel



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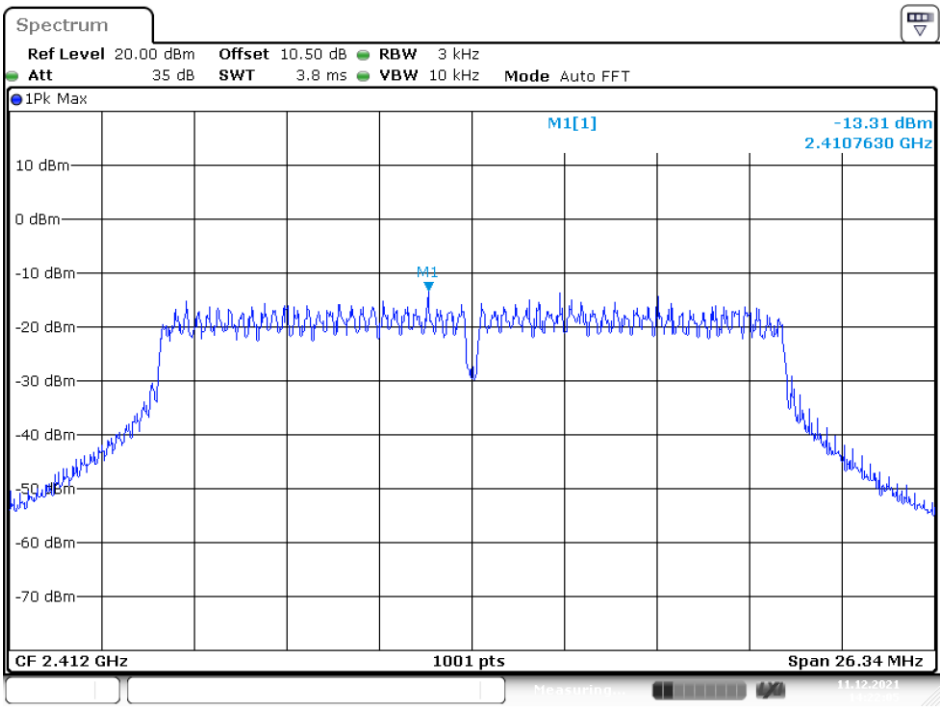
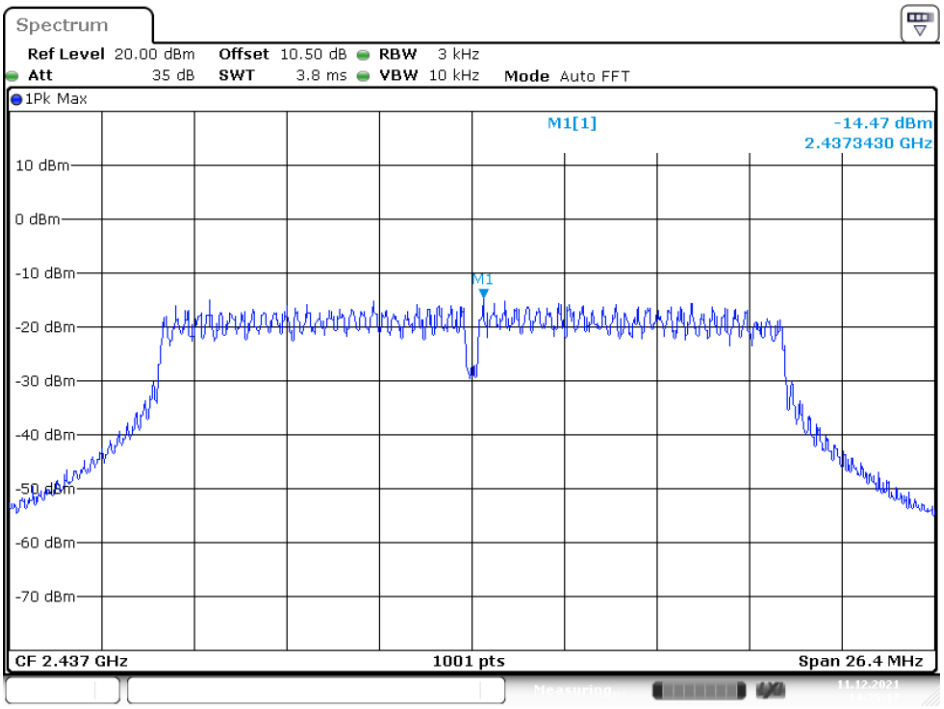
N20 Mode

Low Channel



Date: 11.DEC.2021 14:22:05

Middle Channel



Date: 11.DEC.2021 14:25:18

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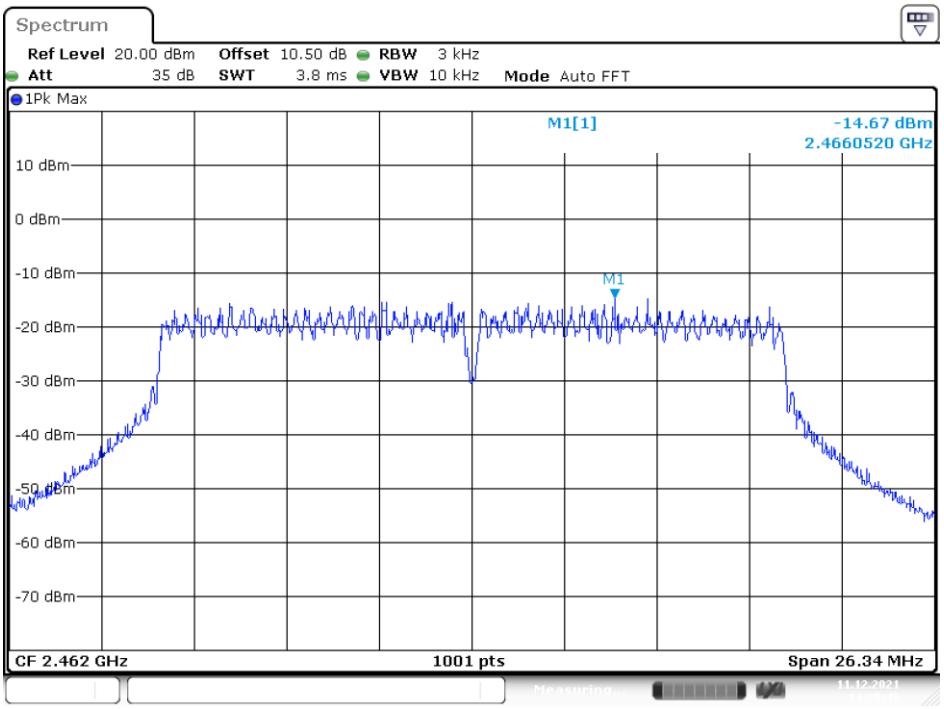
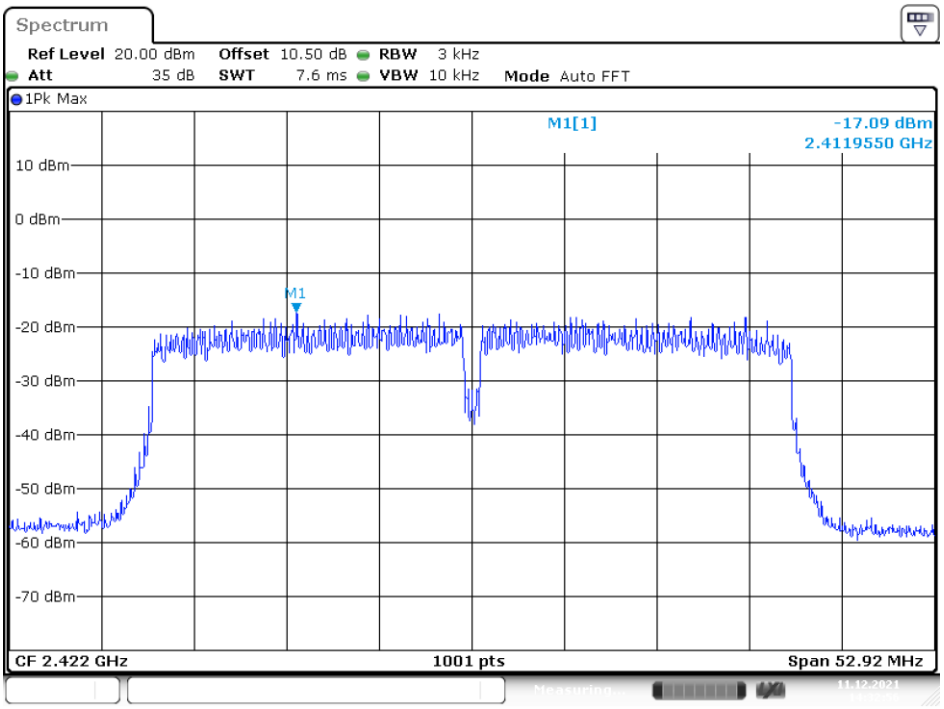
High Channel



Date: 11.DEC.2021 14:28:46

N40 Mode

Low Channel



Date: 11.DEC.2021 14:32:57

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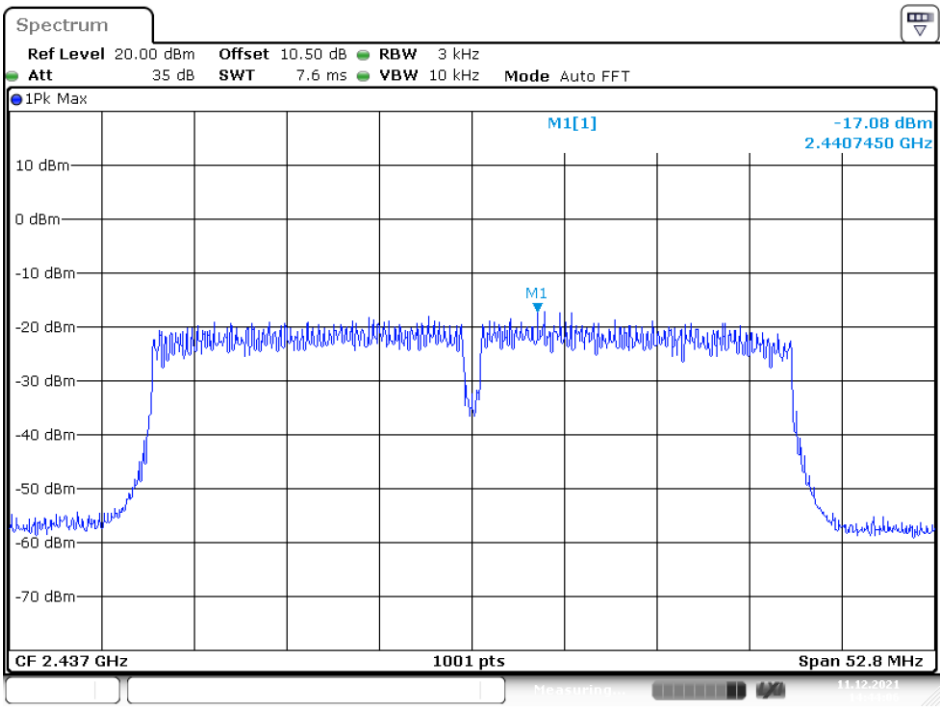
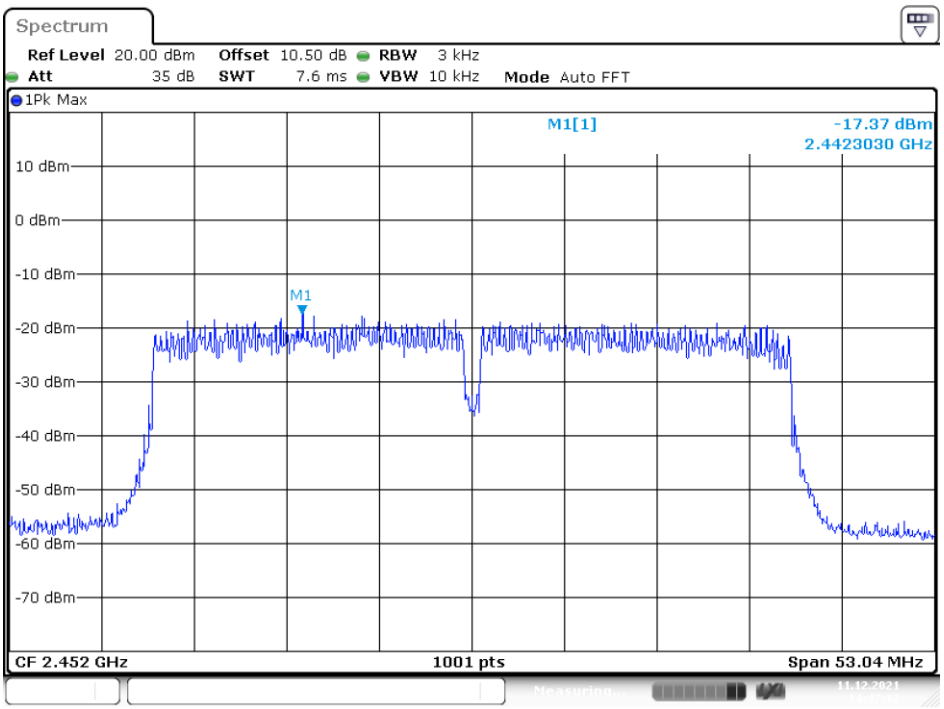
Middle Channel



Date: 11.DEC.2021 14:44:07

High Channel

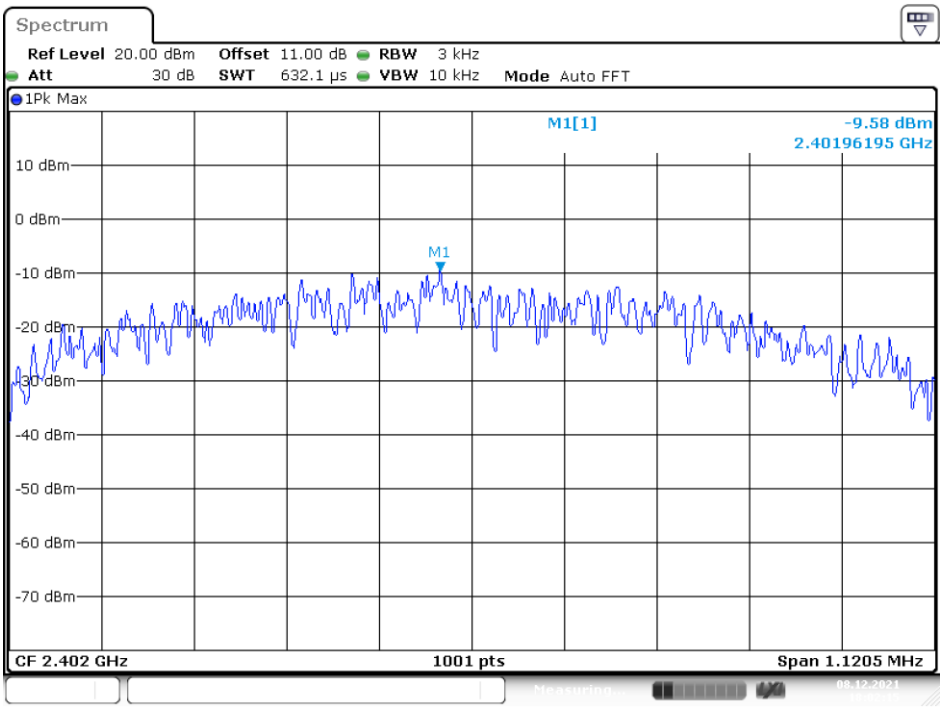


Date: 11.DEC.2021 14:47:12

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

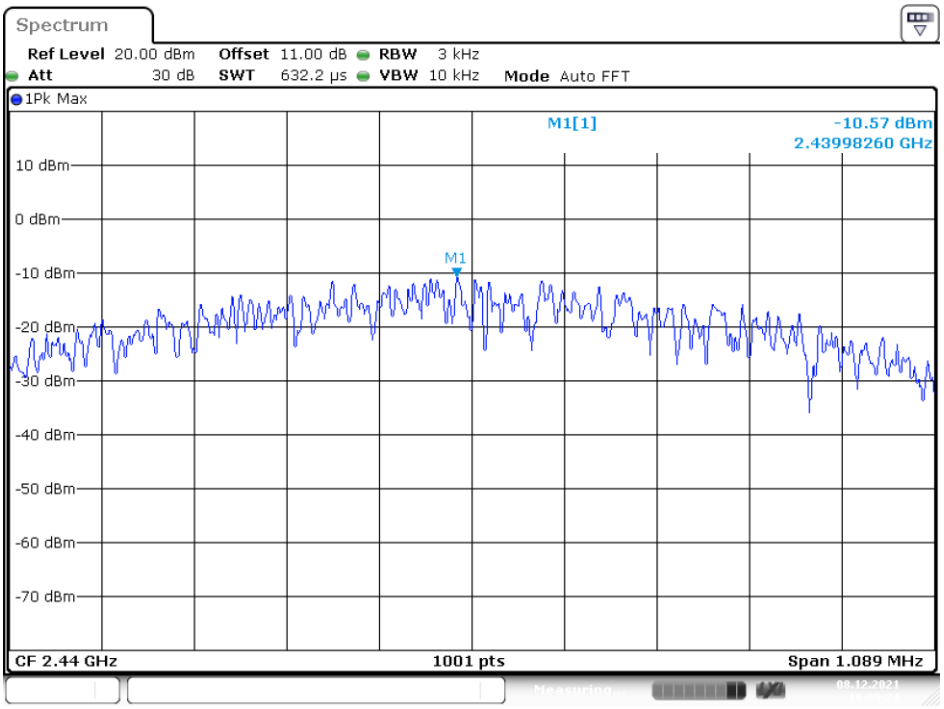
BLE(1M) Mode

Low Channel



Date: 8.DEC.2021 18:02:16

Middle Channel



Date: 8.DEC.2021 18:09:25

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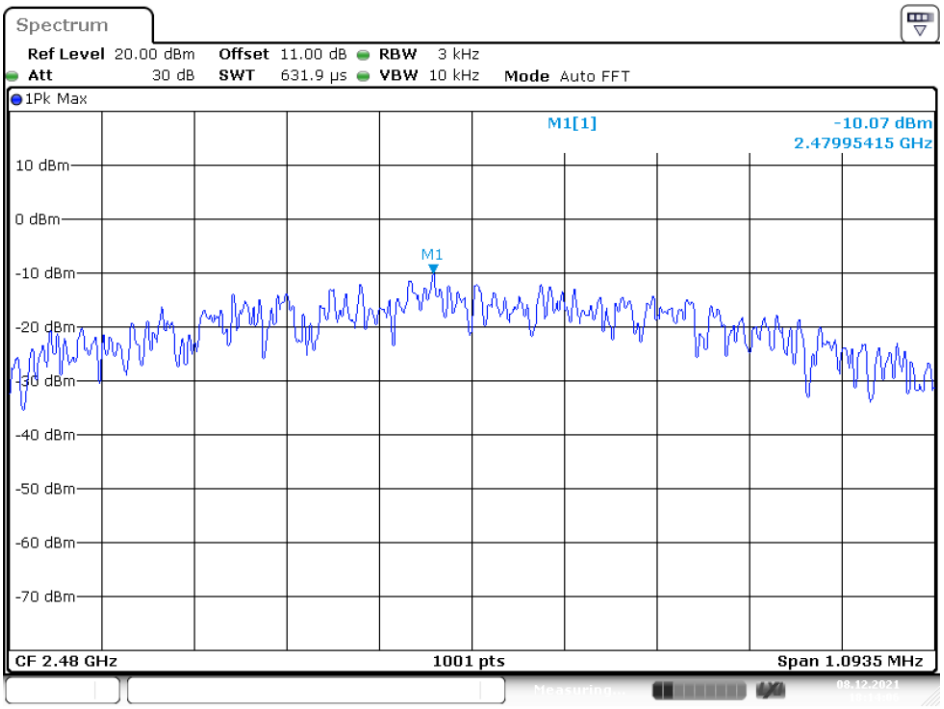
High Channel



Date: 8.DEC.2021 18:14:06

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