

TEST REPORT

Applicant:	Aurodi Corporation
Address of Applicant:	Suite 1100, 7887 E Belleview Ave, Denver, CO 80111, United States
Manufacturer:	Jingrui Inspire Co.,Ltd.
Address of Manufacturer:	RM1306, Block 3 (C-1), Runhui Science Park,18 Shenzhou Rd., Huangpu Dist., Guangzhou, Guangdong Prov., P.R. China, 510663
Product name:	Android Tab Gateway(NA)
Model(s):	VGW12W0X-EC25-900
Rating(s):	INPUT: AC 100-240V, 50/60 Hz, 1.5A OUTPUT: DC 12V 3A
Trademark:	V-MARK
Standards:	47 CFR PART 15 Subpart C section 15.247
FCC ID:	2BBTA-VGW12W0X900
Data of Receipt:	2025-07-30
Date of Test:	2025-07-30~2026-01-22
Date of Issue:	2026-01-22
Test Result	Pass*

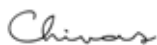
* In the configuration tested, the test item complied with the standards specified above.

Authorized for issue by:

Test by:

Jan.22, 2026

Chivas Tsang

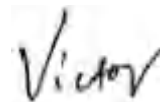


Project Engineer

Reviewed by:

Jan.22, 2026

Victor Meng



Project Manager

Date

Name/Position

Signature

Date

Name/Position

Signature

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Testing Laboratory information:

Testing Laboratory Name: ITL Co., Ltd

Address : No. 8, Jinqianling Street 5, Huangjiang Town, Dongguan,
Guangdong, China

Testing location : Same as above

Tel : 0086-769-39001678

Fax : 0086-20-62824387

E-mail : itl@i-testlab.com

Possible test case verdicts:

- test case does not apply to the test object . : N/A
- test object does meet the requirement : P (Pass)
- test object does not meet the requirement . : F (Fail)

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report would be invalid test report without all the signatures of testing technician and approver.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

This device doesn't support Resource Units characteristic.

1 Test Summary

Test	Test Requirement	Test method	Result
Antenna Requirement	FCC PART 15 C section 15.247 (c) and Section 15.203	FCC PART 15 C section 15.247 (c) and Section 15.203	PASS
Occupied Bandwidth	FCC PART 15 C section 15.247 (a)(2)	ANSI C63.10:2020	PASS
Maximum Conducted Output Power	FCC PART 15 C section 15.247(b)(3)	ANSI C63.10:2020	PASS
Power Spectral Density	FCC PART 15 C section 15.247(e)	ANSI C63.10:2020	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 C section 15.209&15.247(d)	ANSI C63.10:2020	PASS
Radiated Spurious Emission (30 MHz to 25 GHz)	FCC PART 15 C section 15.209&15.247(d)	ANSI C63.10:2020	PASS
Radiated Emissions which fall in the restricted bands	FCC PART 15 C section 15.209	ANSI C63.10:2020	PASS
Band Edges Measurement	FCC PART 15 C section 15.209&15.247(d)	ANSI C63.10:2020	PASS
AC power-line conducted emissions	FCC PART 15 C section 15.207	ANSI C63.10:2020	PASS

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3 General Information

3.1 Client Information

Applicant: Aurodi Corporation
Address of Applicant: Suite 1100, 7887 E Belleview Ave, Denver, CO 80111, United States

3.2 General Description of E.U.T.

Name: Android Tab Gateway(NA)
Model No.: VGW12W0X-EC25-900
Operating Frequency: 2402 MHz to 2480 MHz for Bluetooth
40 channels with 2MHz step

Channels:

channel	Frequency	channel	Frequency	channel	Frequency	channel	Frequency
1	2402	11	2422	21	2442	31	2462
2	2404	12	2424	22	2444	32	2464
3	2406	13	2426	23	2446	33	2466
4	2408	14	2428	24	2448	34	2468
5	2410	15	2430	25	2450	35	2470
6	2412	16	2432	26	2452	36	2472
7	2414	17	2434	27	2454	37	2474
8	2416	18	2436	28	2456	38	2476
9	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460	40	2480

Type of Modulation: GFSK
Antenna Type: FPC Antenna with -2.94 dBi peak Gain
Function: Android Tab Gateway(NA)

3.3 Details of E.U.T.

EUT Power Supply: AC 100-240V, 50/60 Hz, 1.5A
Test mode: The program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel lowest (2402MHz), middle (2440MHz) and highest (2480MHz) are chosen for full testing.

3.4 Description of Support Units

The EUT has been tested as an independent unit for fixed frequency by testing lab.

3.5 Test Location

All the tests were performed in ITL Co., Ltd. Which is located at No. 8, Jinqianling Street 5, Huangjiang Town, Dongguan, Guangdong, China.
Tel: 0086-769-39001678, Fax: 0086-20-62824387
No tests were sub-contracted.

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3.6 Deviation from Standards

None.

3.7 Abnormalities from Standard Conditions

None.

3.8 Other Information Requested by the Customer

None.

3.9 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- CNAS Lab code:L9342
- FCC Designation No.:CN5035
- IC Registration No.: 12593A
- NVLAP LAB CODE: 600199-0

3.10 Measurement Uncertainty

The below measurement uncertainties given below are based on a 95% confidence level (base on a coverage factor (k=2).)

Parameter	Uncertainty
Radio frequency	2.25%
total RF power, conducted	±1.34 dB
RF power density, conducted	±1.49 dB
All emissions, radiated	±2.72 dB
Temperature	±5.02 dB
Humidity	±0.8°C
DC and low frequency voltages	±1.5 %
All emissions, conducted	±2.30 dB

4 Instruments Used during Test

No.	Test Equipment	Manufacturer	Model	Serial No.	Cal Data	Due Date
DGITL-115	50Ω Coaxial Cable	Mini-circuits	CBL	C001	2025.03.14	2026.03.14
DGITL-182	Test software	2.0.0.0	MTS 8310	/	/	/
DGITL-190	Filter	COM-MW	K6-2400-2483.5-100S5010-007	12230496	2025.01.10 2026.01.14	2026.01.09 2027.01.13
DGITL-191	Filter	COM-MW	K6-5150-5850-100S5010-003	12234382	2025.01.10 2026.01.14	2026.01.09 2027.01.13
DGITL-301	Semi-Anechoic chamber	ETS•Lindgren	9*6*6	CT000874-1181	2023.08.02	2026.08.02
DGITL-307	EMI test receiver	SCHWARZBECK	ESVS10	833616/003	2025.03.14	2026.03.13
DGITL-376	Wideband Radio Communication Tester	SCHWARZBECK	CMW500	LR114195	2025.03.14	2026.03.13
DGITL-349a	Vector Signal Generator	ROHDE&SCHWARZ	SMBV100A	259268	2025.03.14	2026.03.13
DGITL-194	Power Meter	MWRFTest	MW100-PSB	MW202006002	2025.03.14	2026.03.13
DGITL-306	Spectrum Analyzer	Agilent Technologies	N9010A	MY54200334	2025.03.14	2026.03.13
DGITL-352	Pre Amplifier	MInI-CIrcuits	ZFC-1000HX	SN292801110	2025.03.14	2026.03.13
DGITL-375	Spectrum Analyzer	SCHWARZBECK	FSV40-N	6625-01-588-5515	2025.03.14	2026.03.13
DGITL-309	Horn Antenna	ETS Lindgren	3117	SN00152265	2025.05.13	2026.05.12
DGITL-308	Bilog Antenna	ETS· Lindgren	3142E	156975	2025.05.13	2026.05.12
DGITL-350	Wideband Amplifier Super Ultra	MInI-CIrcuits	ZVA-183X-S+	SN986401426	2025.03.14	2026.03.12
DGITL-371	Pre Amplifier	teramicrowave	TALA-0040G35	18081001	2025.03.14	2026.03.12
DGITL-363	Active Loop Antenna	SCHWARZBECK	FMZB1519B	00062	2024.05.15	2026.05.14
DGITL-302	Shielded Room	ETS• Lindgren	8*4*3	CT09010	2023.08.02	2026.08.02
DGITL-304	L.I.S.N.#1	R&S	ESH3-Z5	100272	2025.03.13	2026.03.12

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5 Test Results

5.1 E.U.T. test conditions

Test Voltage: AC 120V, 60Hz

Temperature: 23.2 -25.0 °C

Humidity: 38-50 % RH

Atmospheric Pressure: 1000 -1010 mbar

Requirements: **15.31(e):** For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

15.32: Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows: Testing shall be in accordance with the procedures specified in Section 15.31 of this part.

Test frequencies and frequency range: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

According to the 15.33 (a) For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the frequency shown in the following table:

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 KHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

EUT channels and frequencies list:

channel	Frequency	channel	Frequency	channel	Frequency	channel	Frequency
1	2402	11	2422	21	2442	31	2462
2	2404	12	2424	22	2444	32	2464
3	2406	13	2426	23	2446	33	2466
4	2408	14	2428	24	2448	34	2468
5	2410	15	2430	25	2450	35	2470
6	2412	16	2432	26	2452	36	2472
7	2414	17	2434	27	2454	37	2474
8	2416	18	2436	28	2456	38	2476
9	2418	19	2438	29	2458	39	2478
10	2420	20	2440	30	2460	40	2480

Test frequencies are the lowest channel: 1 channel (2402MHz), middle channel: 20 channel (2440 MHz) and highest channel: 40 channel (2480 MHz)

Test the EUT in continuous transmission mode, duty cycle > 98%.

5.2 Antenna Requirement

Standard requirement

15.203 requirement:

For intentional device. 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.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz bands that are used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.2.1 Test Result (Antenna Requirement)

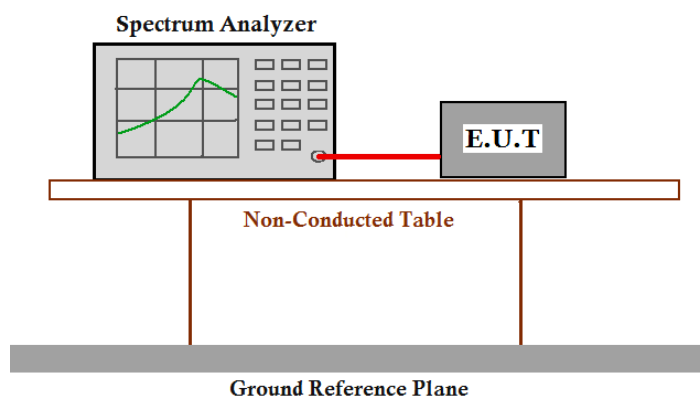
The antenna is an FPC Antenna and no consideration of replacement. The best-case gain of the antenna is -2.94 dBi.

Test Result: The unit does meet the FCC requirements.

5.3 Occupied Bandwidth

Test Requirement:	FCC Part 15 C section 15.247 (a)(2) Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 KHz.
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.3.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10:2020 Section 11.8 and 6.9.3.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the spectrum analyzer "Channel Bandwidth" function to measurement the 6dB EBW and 99% OBW.
5. For 6dB EBW: Use the following spectrum analyzer settings:
6. RBW: 100 kHz / VBW: 300 kHz / Detector: Peak / Trace mode: Maxhold / Sweep time: Auto couple
Allow trace to fully stabilize.
7. For 99% OBW Use the following spectrum analyzer settings:
Set RBW = approximately 1% EBW or 1.5 times to 5.0 times the OBW, $VBW \geq 3 \times RBW$.
8. Record the measurement results in the test report.

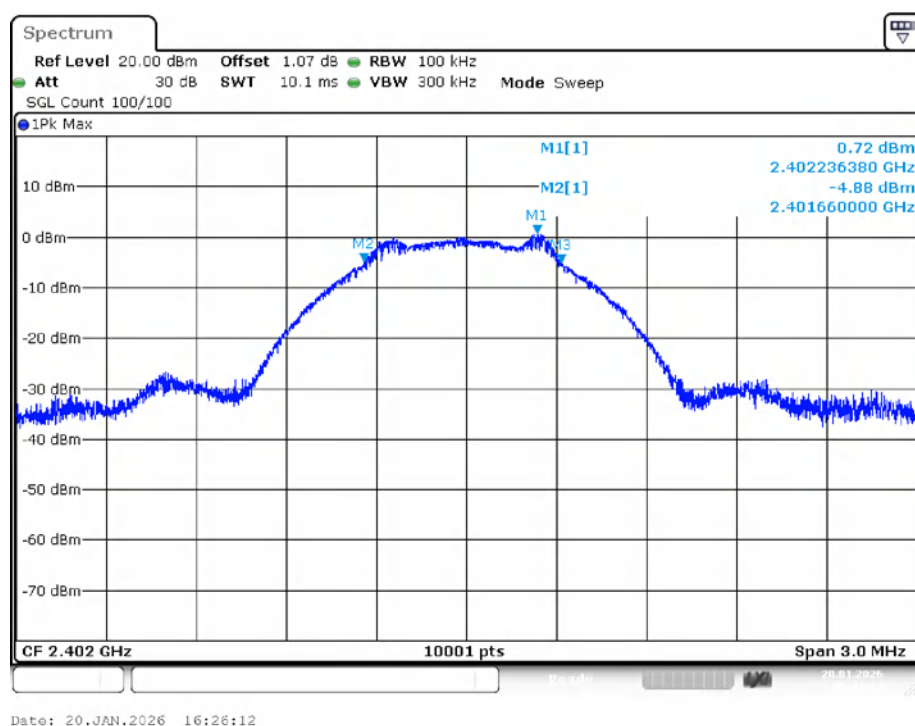
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5.3.2 Test Result (-6dB bandwidth)

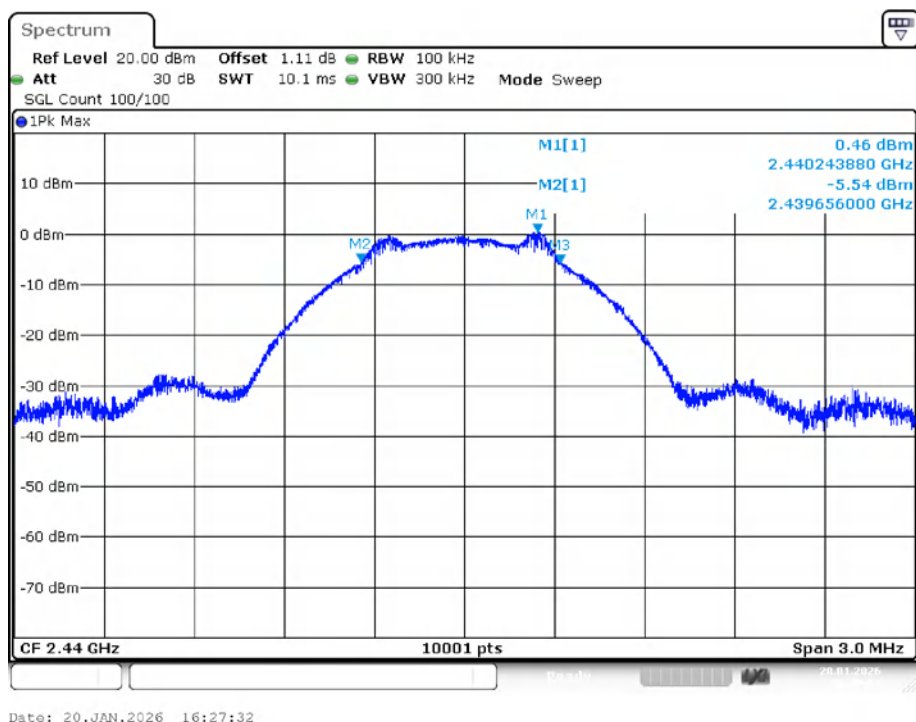
Test mode	Test Frequency (MHz)	-6db bandwidth (MHz)	Limit for -6 dB Bandwidth (MHz)	Test Result
BLE 1M	2402	0.656	≥ 0.5	Pass
	2440	0.662	≥ 0.5	Pass
	2480	0.662	≥ 0.5	Pass
BLE 2M	2402	1.235	≥ 0.5	Pass
	2440	1.236	≥ 0.5	Pass
	2480	1.242	≥ 0.5	Pass

-6db bandwidth:

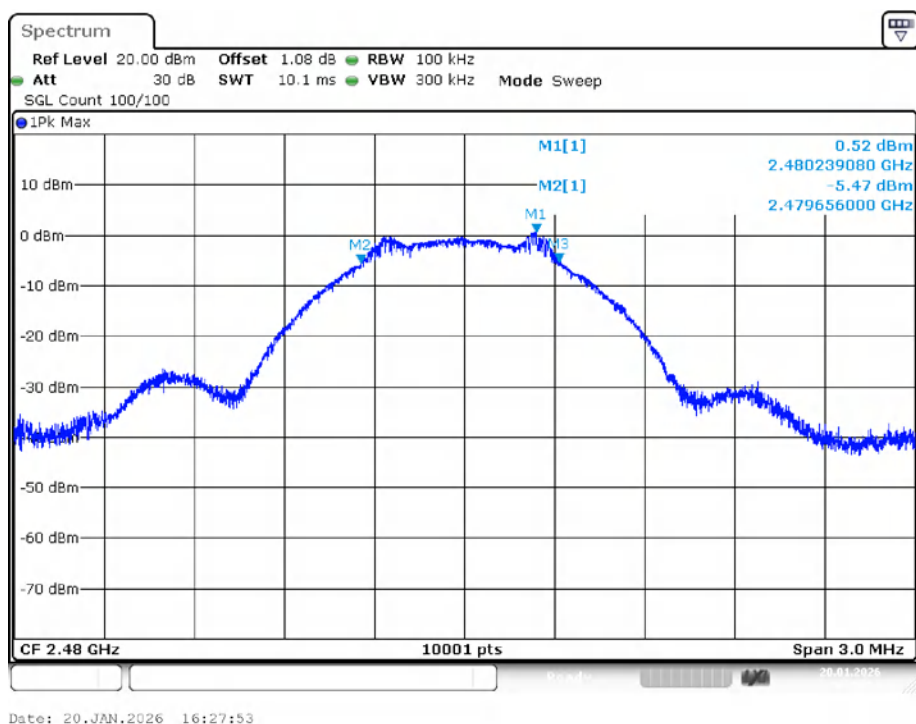
Result plot as follows:



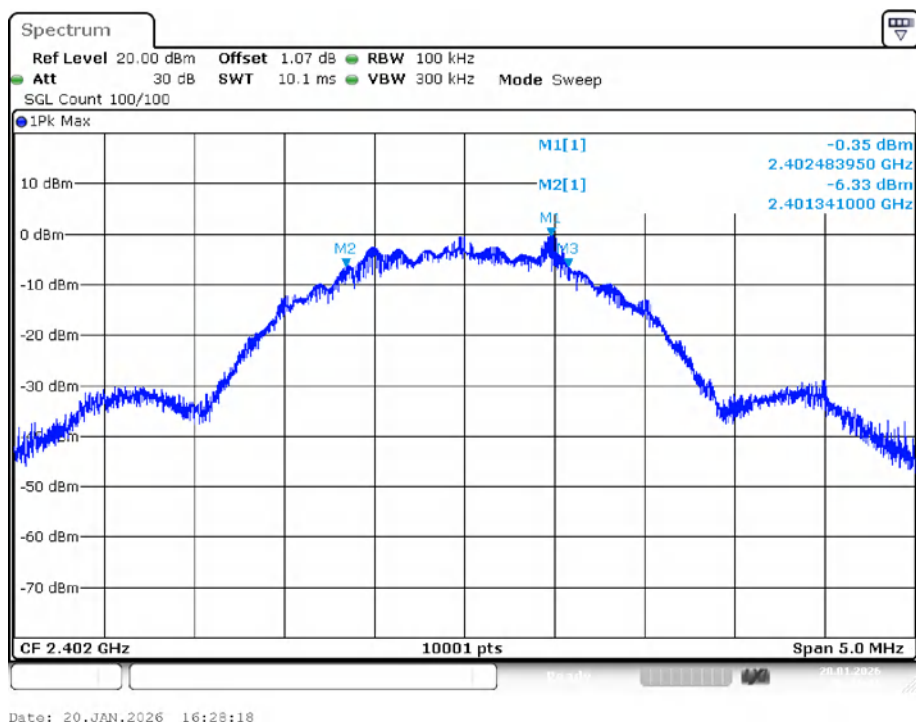
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



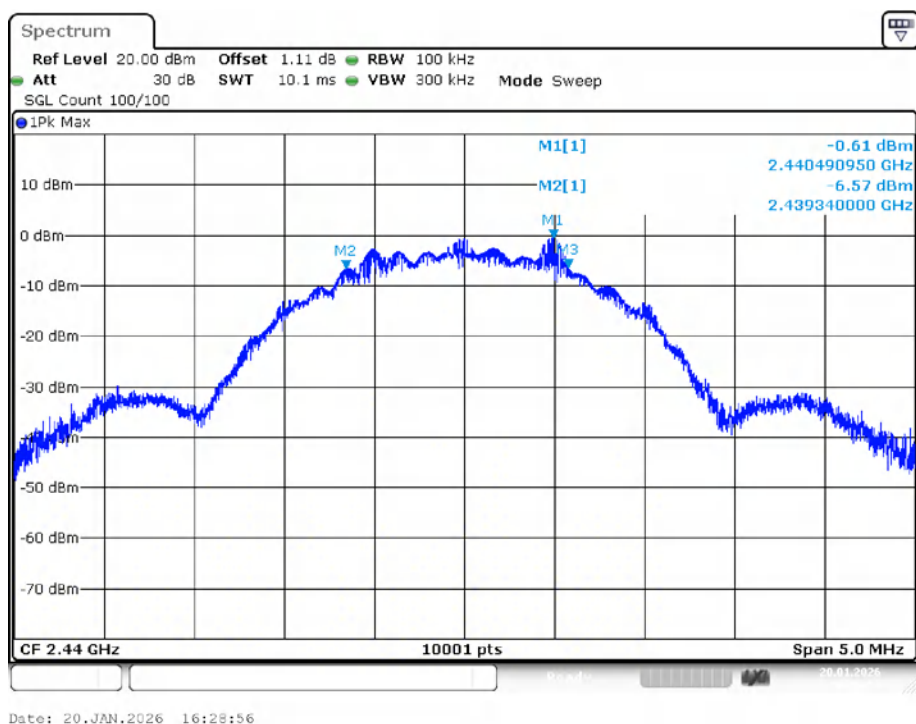
-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



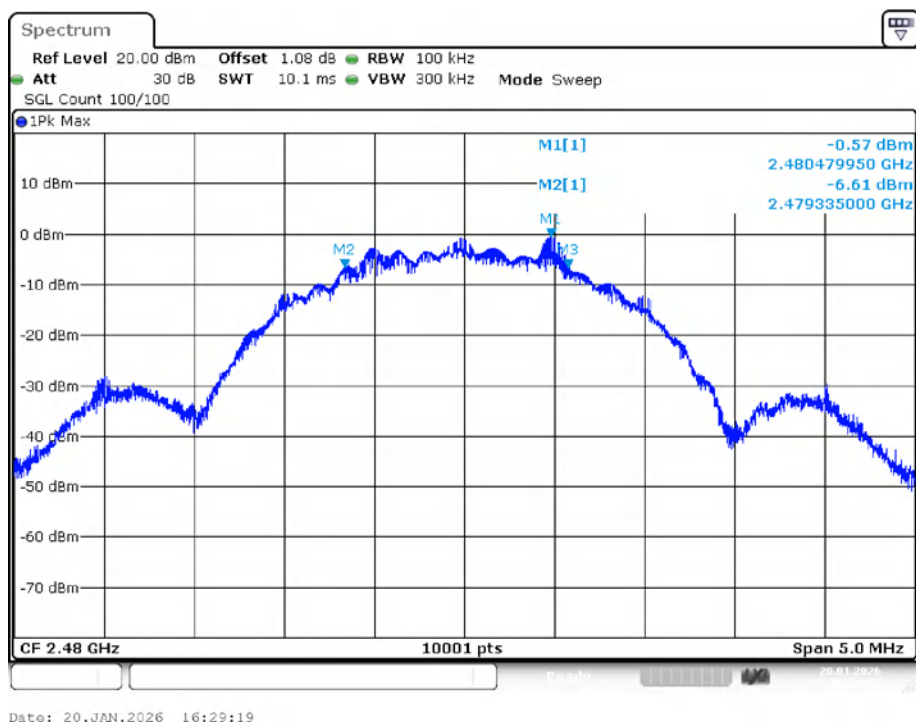
-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1

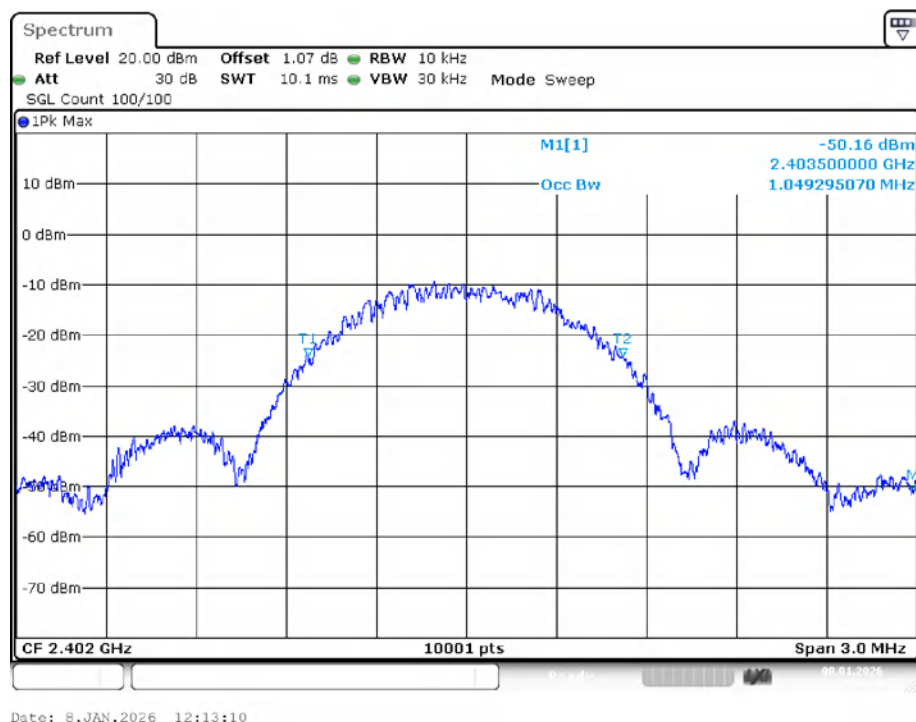
Test Result: The unit does meet the FCC requirements.

5.3.3 Test Result (99% power bandwidth)

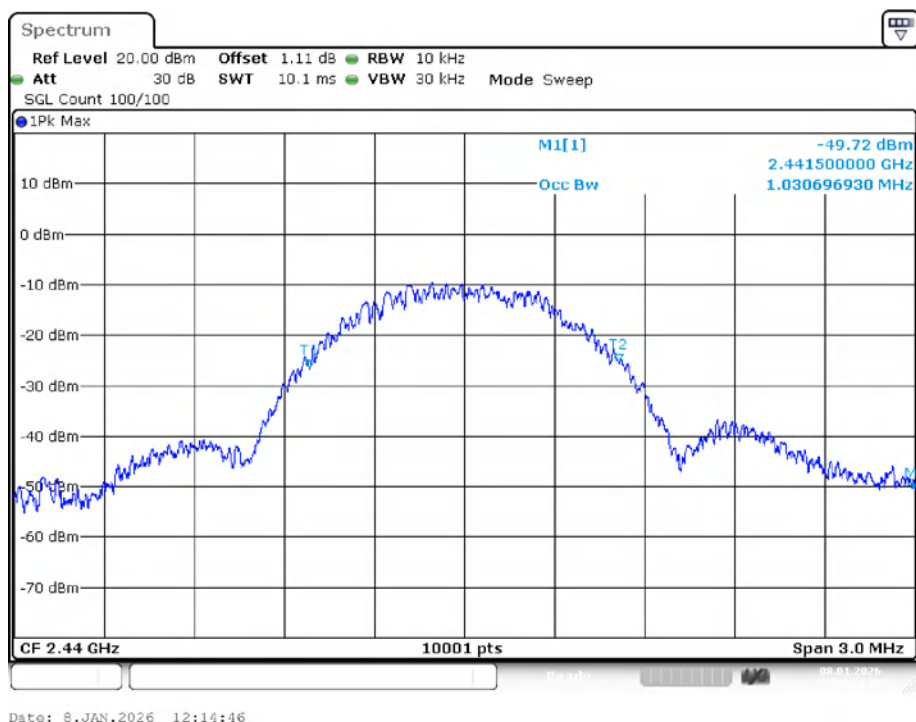
Test mode	Test Frequency (MHz)	99% bandwidth (MHz)	Test Result
BLE 1M	2402	1.049	Pass
	2440	1.031	Pass
	2480	1.04	Pass
BLE 2M	2402	2.131	Pass
	2440	2.077	Pass
	2480	2.139	Pass

99% power bandwidth:

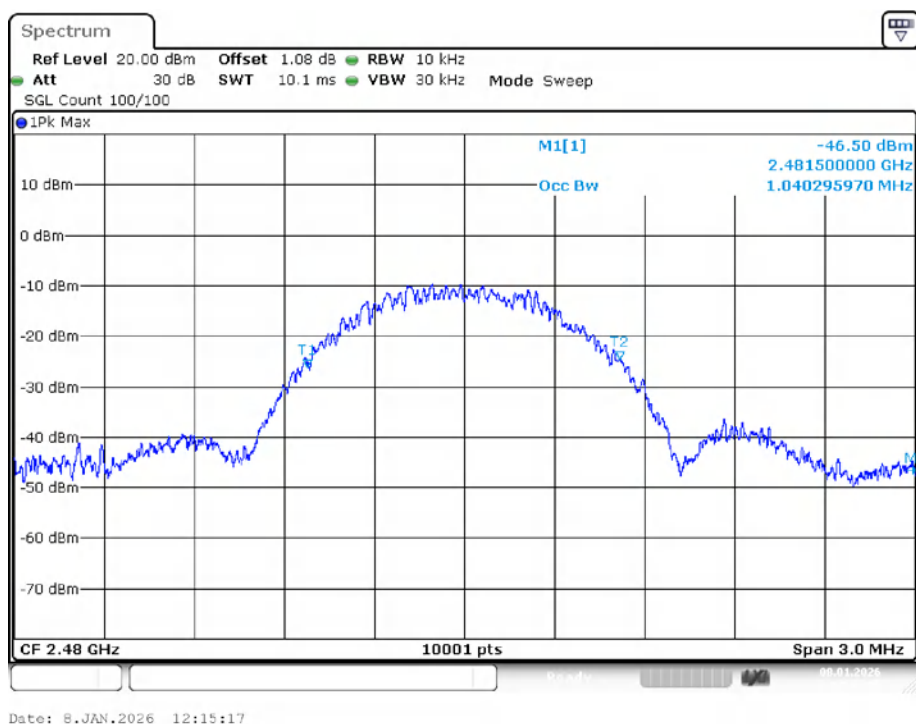
Result plot as follows:



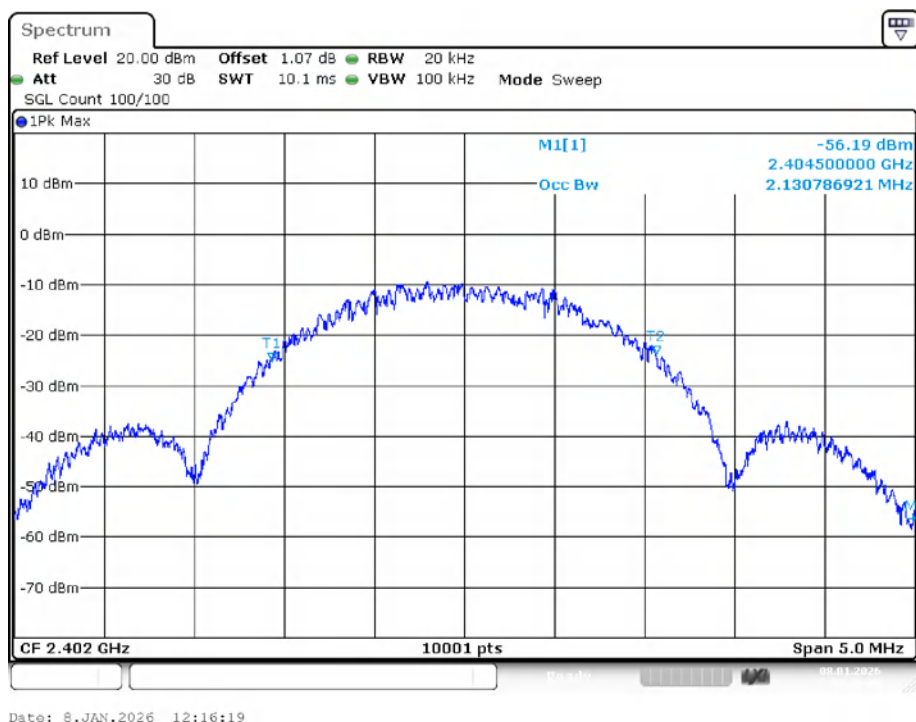
OBW NVNT BLE 1M 2402MHz Ant1



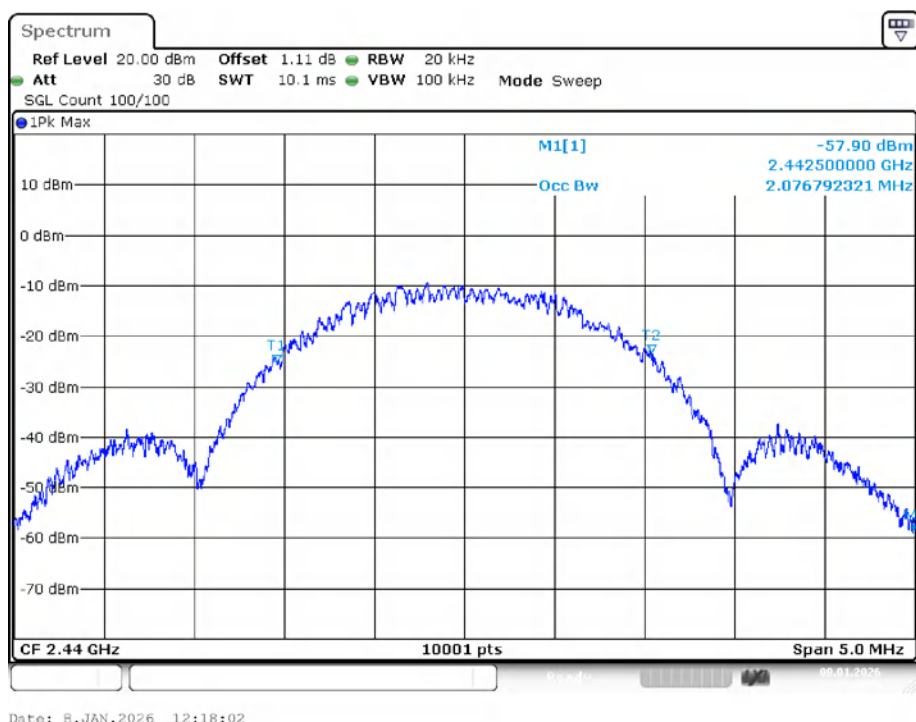
OBW NVNT BLE 1M 2440MHz Ant1



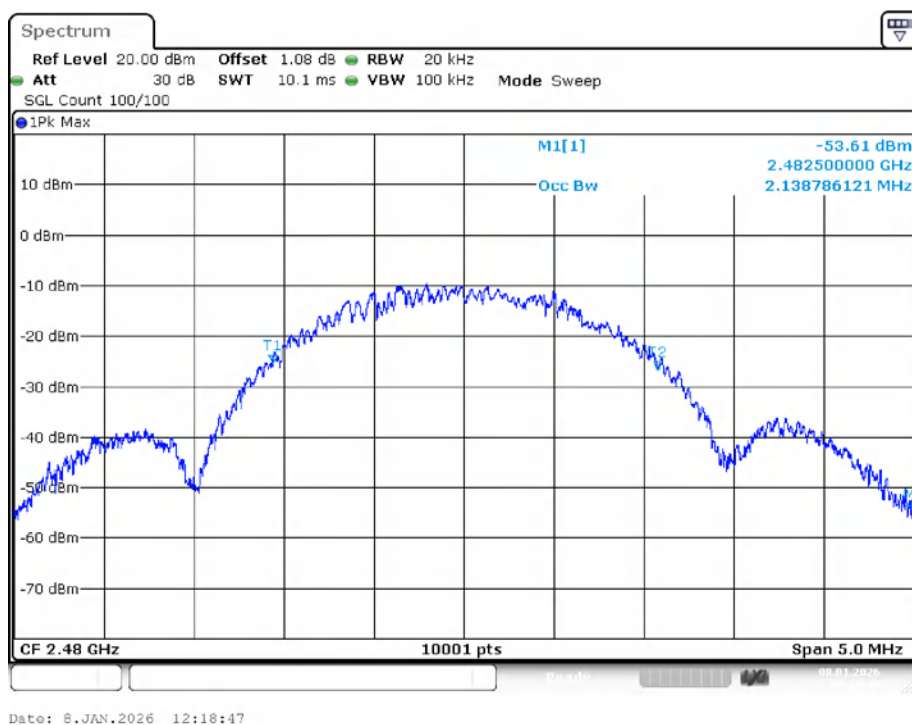
OBW NVNT BLE 1M 2480MHz Ant1



OBW NVNT BLE 2M 2402MHz Ant1



OBW NVNT BLE 2M 2440MHz Ant1



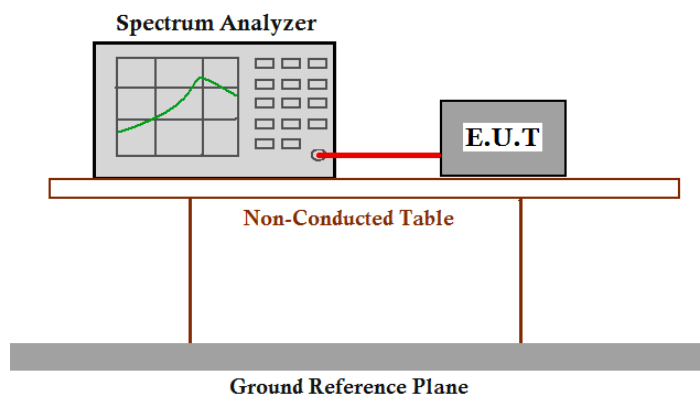
OBW NVNT BLE 2M 2480MHz Ant1

Test Result: The unit does meet the FCC requirements.

5.4 Maximum Conducted Output Power

Test Requirement:	FCC Part 15 C section 15.247 (b)(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1 Watt. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b) (1), (b) (2), and (b) (3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.4.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10:2020 Section 11.9.2.2.4.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
 - a) Set the RBW $>$ DTS bandwidth.
 - b) Set VBW $\geq [3 \times \text{RBW}]$.
 - c) Set span $\geq [3 \times \text{RBW}]$.
 - d) Sweep time = No faster than coupled (auto) time.

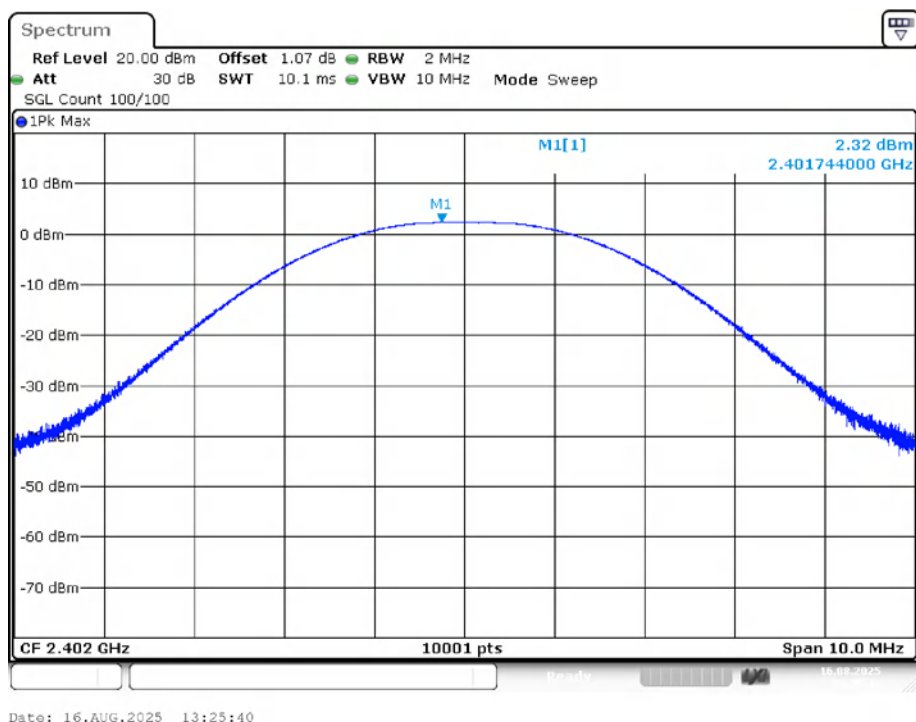
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- e) Detector = peak.
 - f) Trace mode = max-hold.
 - g) Allow trace to fully stabilize.
 - h) Use peak marker function to determine the peak amplitude level.
5. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges.
6. Record the measurement results in the test report.

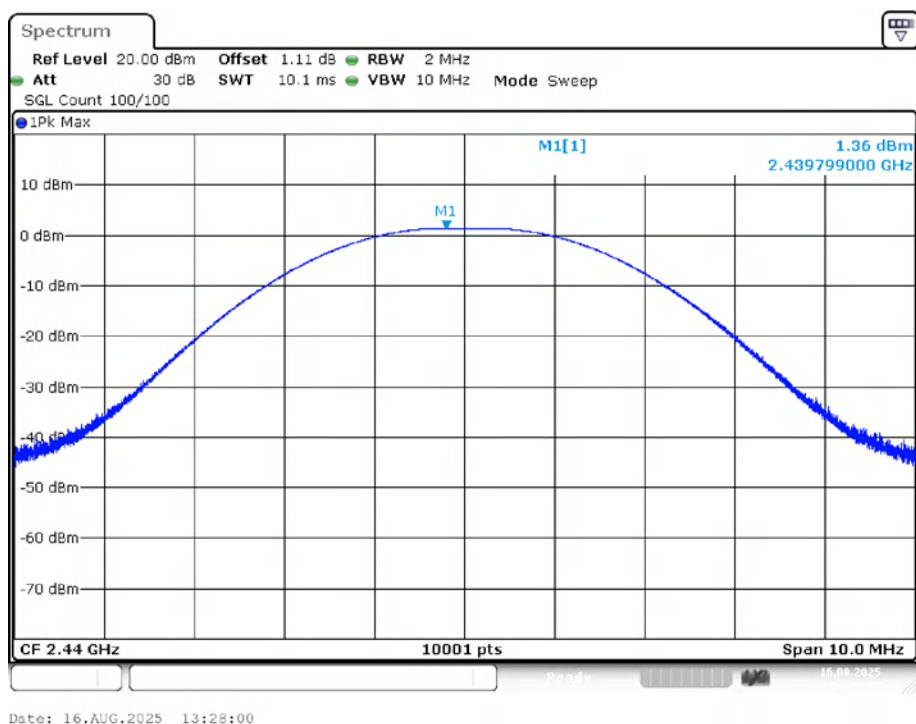
5.4.2 Test Result (Maximum Conducted Output Power)

Test mode	Test Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Test Result
BLE 1M	2402	2.319	30	Pass
	2440	1.36	30	Pass
	2480	0.396	30	Pass
BLE 2M	2402	2.364	30	Pass
	2440	1.387	30	Pass
	2480	0.433	30	Pass

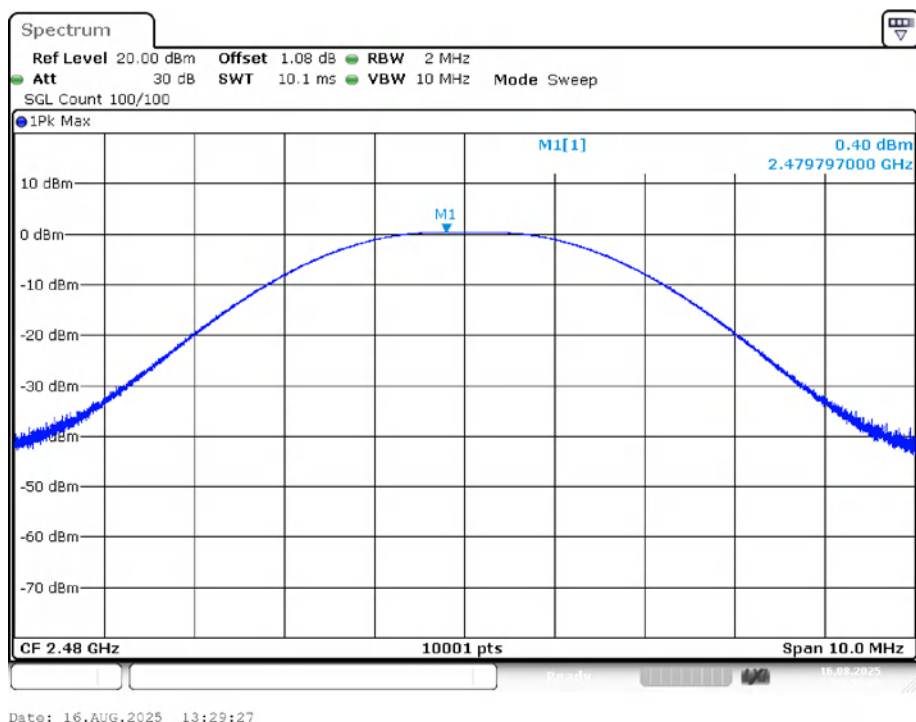
Result plot as follows:



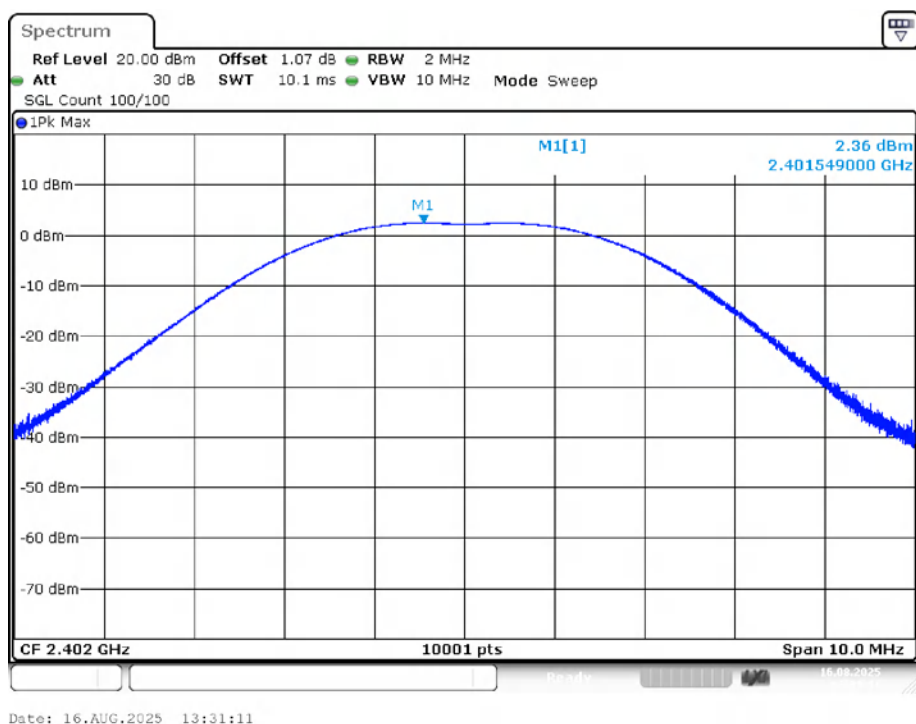
Power NVNT BLE 1M 2402MHz Ant1



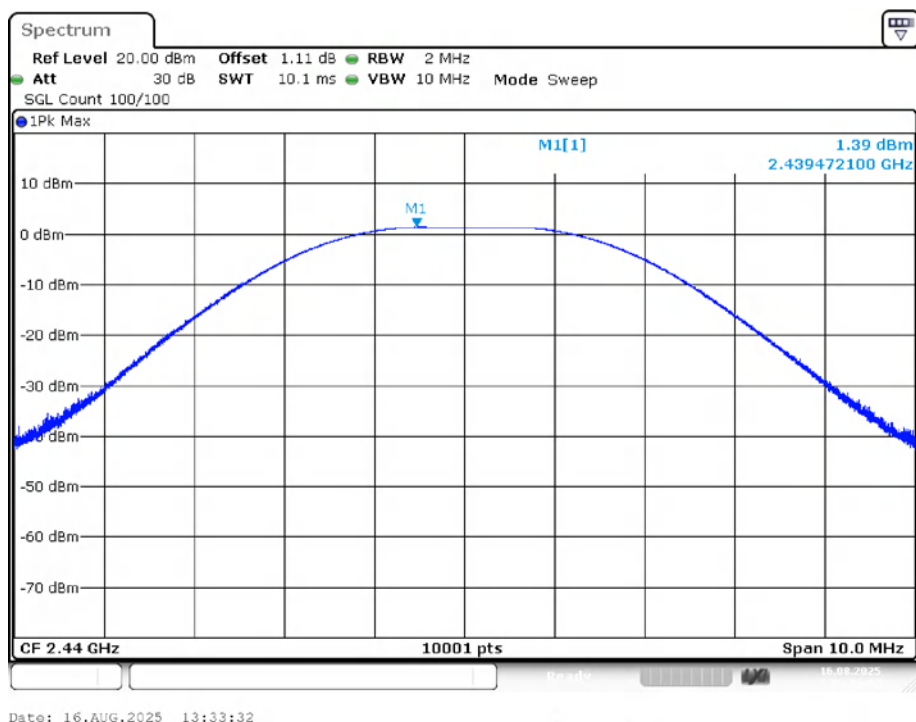
Power NVNT BLE 1M 2440MHz Ant1



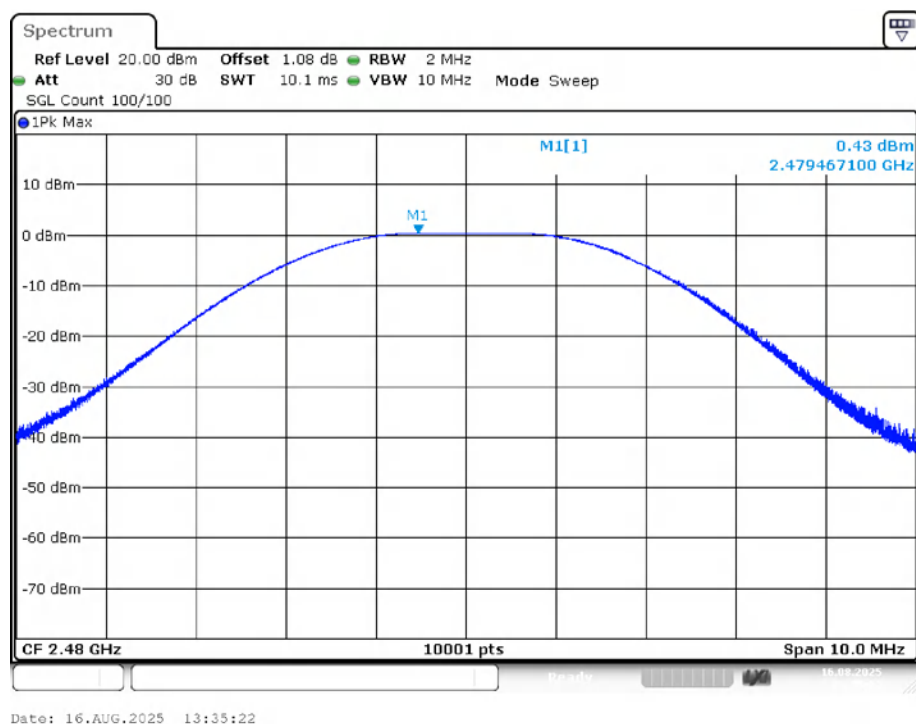
Power NVNT BLE 1M 2480MHz Ant1



Power NVNT BLE 2M 2402MHz Ant1



Power NVNT BLE 2M 2440MHz Ant1



Power NVNT BLE 2M 2480MHz Ant1

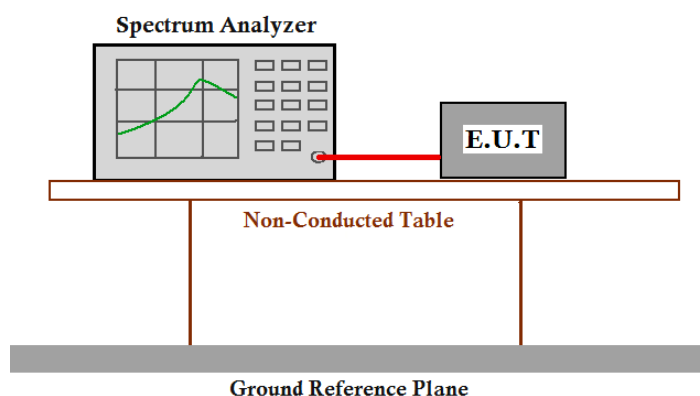
Test Result: The unit does meet the FCC requirements.

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5.5 Power Spectral Density

Test Requirement:	FCC Part 15 C section 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.
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channel and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.5.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10:2020 Section 11.10.5.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
 - a) Set analyzer center frequency to DTS channel center frequency.
 - b) Set the span >1.5 times the DTS bandwidth.
 - c) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - d) Set the VBW $\geq [3 \times \text{RBW}]$.

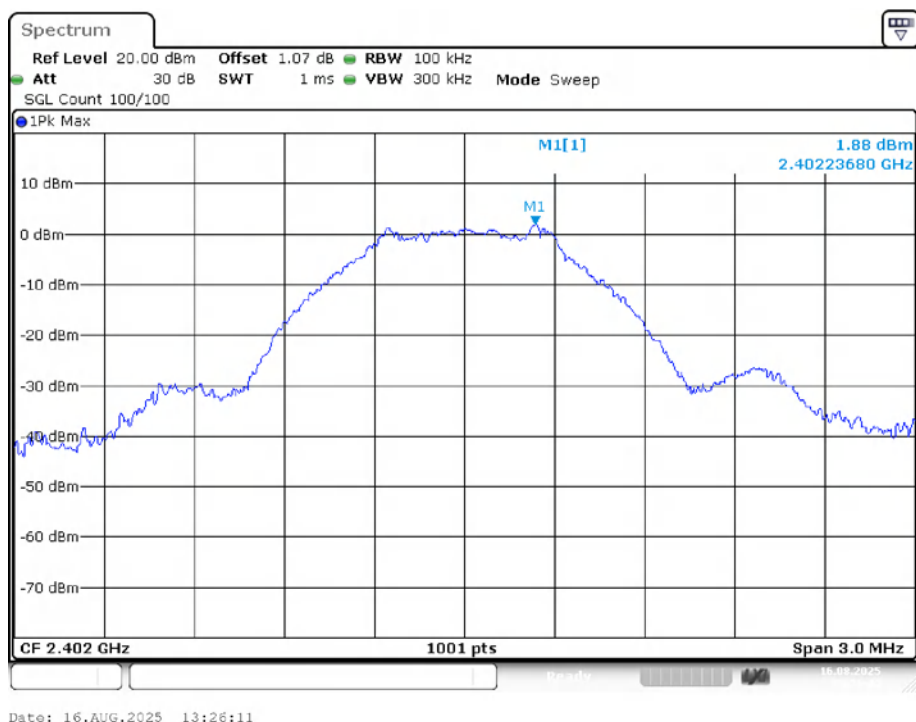
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- e) Detector = peak.
 - f) Sweep time = No faster than coupled (auto) time.
 - g) Trace mode = max-hold.
 - h) Allow trace to fully stabilize.
 - i) Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
5. Record the measurement results in the test report.

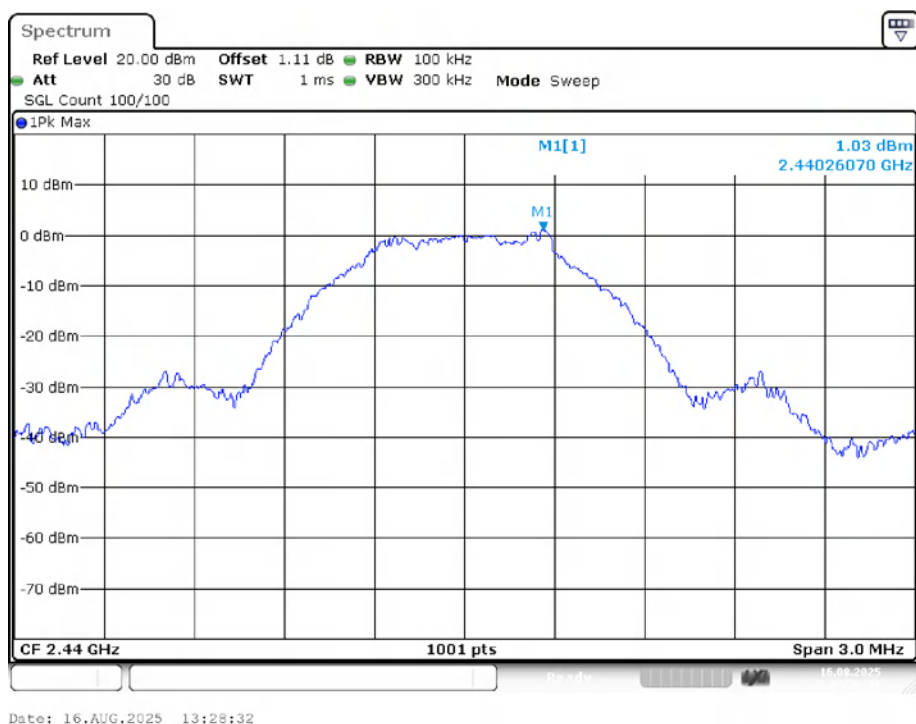
5.5.2 Test Result (Power Spectral Density)

Test mode	Test Frequency (MHz)	Max PSD (dBm/100KHz)	Limit (dBm/3KHz)	Test Result
BLE 1M	2402	1.88	8	Pass
	2440	1.028	8	Pass
	2480	-0.37	8	Pass
BLE 2M	2402	0.944	8	Pass
	2440	0.06	8	Pass
	2480	-1.547	8	Pass

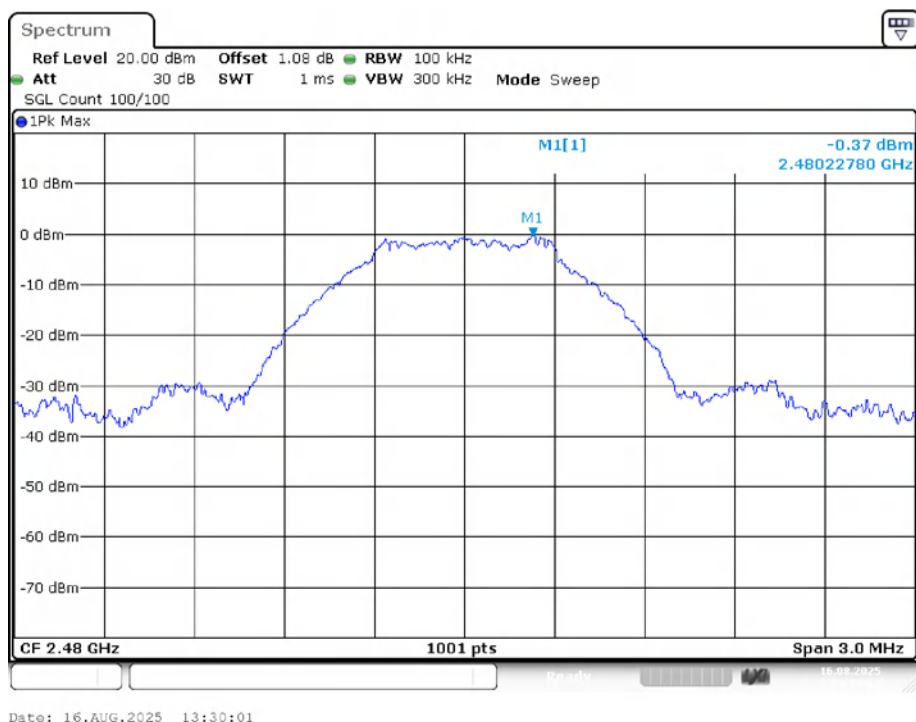
Result plot as follows:



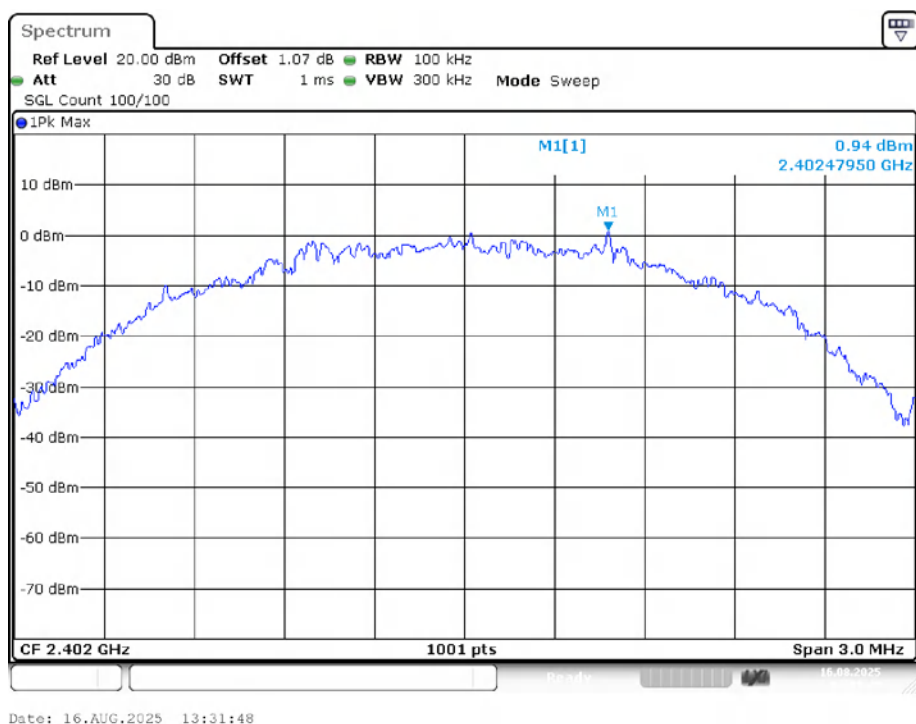
PSD NVNT BLE 1M 2402MHz Ant1



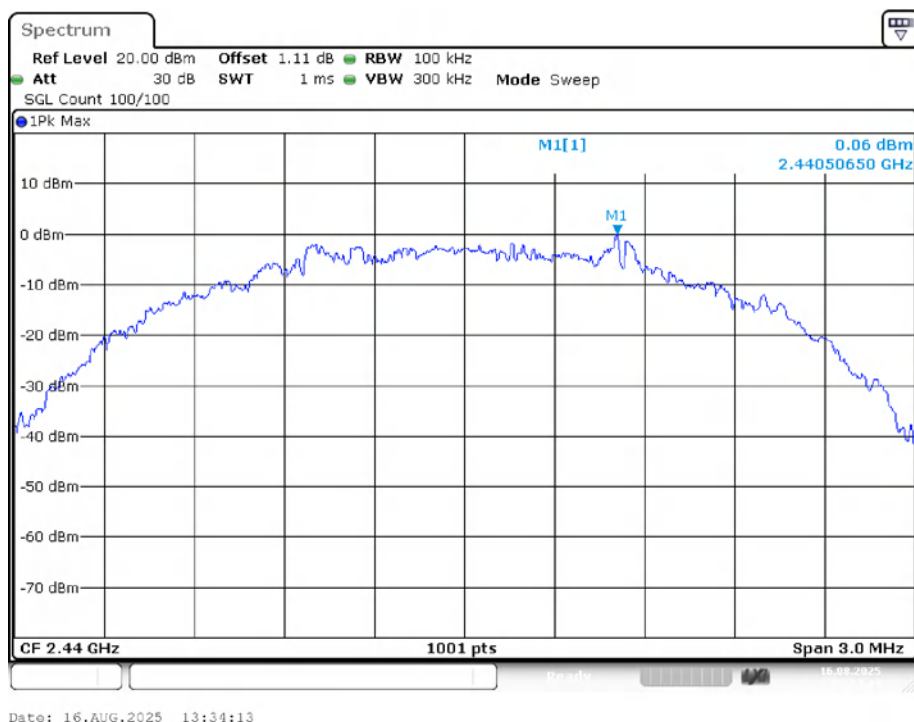
PSD NVNT BLE 1M 2440MHz Ant1



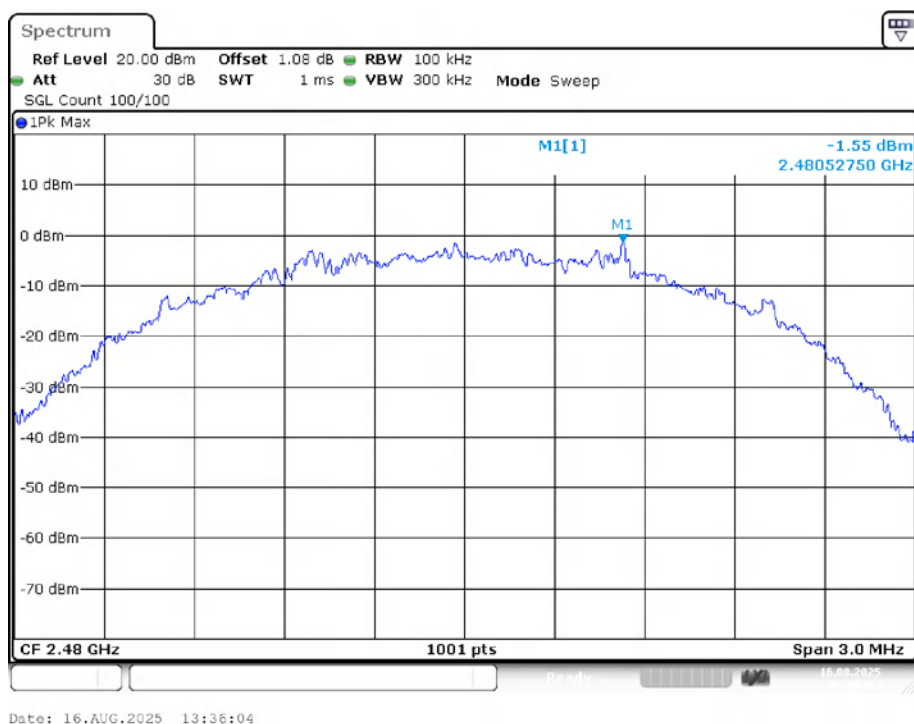
PSD NVNT BLE 1M 2480MHz Ant1



PSD NVNT BLE 2M 2402MHz Ant1



PSD NVNT BLE 2M 2440MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1

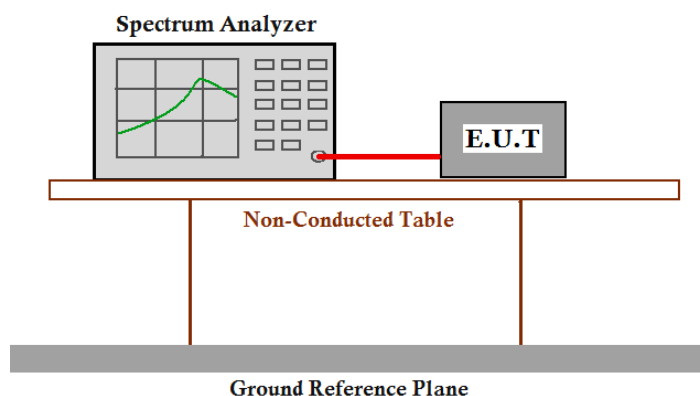
Test Result: The unit does meet the FCC requirements.

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5.6 Conducted Spurious Emissions

Test Requirement:	FCC Part 15 C section 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.
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channel and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.6.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10:2020 Section 11.11 and 11.13.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center frequency / Set the span to >1.5 times the DTS bandwidth /RBW: 100 KHz/VBW: 300 KHz/Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize Use the peak marker function to determine the maximum PSD level and attenuate it by 20dB.Emission level

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measurement: Set the center frequency and span to encompass frequency range to be measured

/RBW: 100 KHz/VBW: 300 KHz/ Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold /

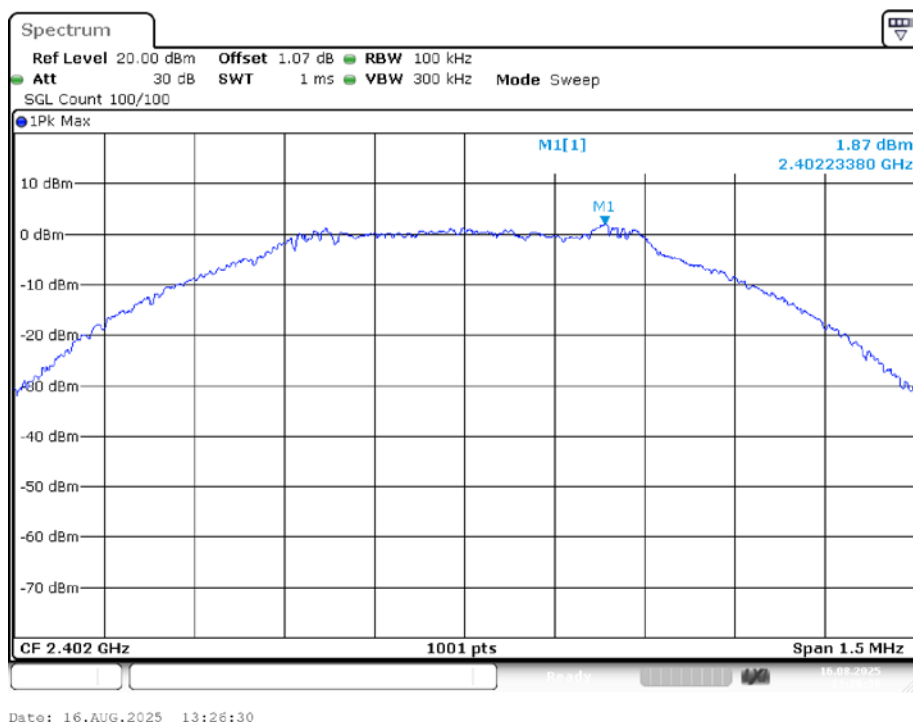
Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

5. Record the measurement results in the test report.

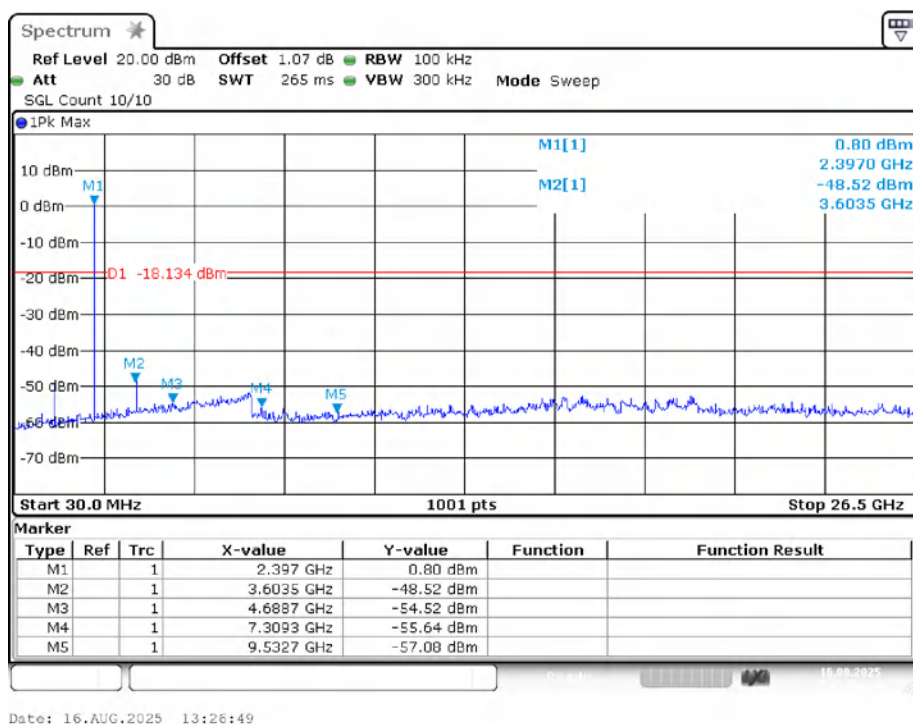
5.6.2 Test Result (Conducted Spurious Emissions)

Test mode	Test Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Test Result
BLE 1M	2402	-50.38	-20	Pass
	2440	-49.66	-20	Pass
	2480	-48.81	-20	Pass
BLE 2M	2402	-49.12	-20	Pass
	2440	-51.21	-20	Pass
	2480	-48.51	-20	Pass

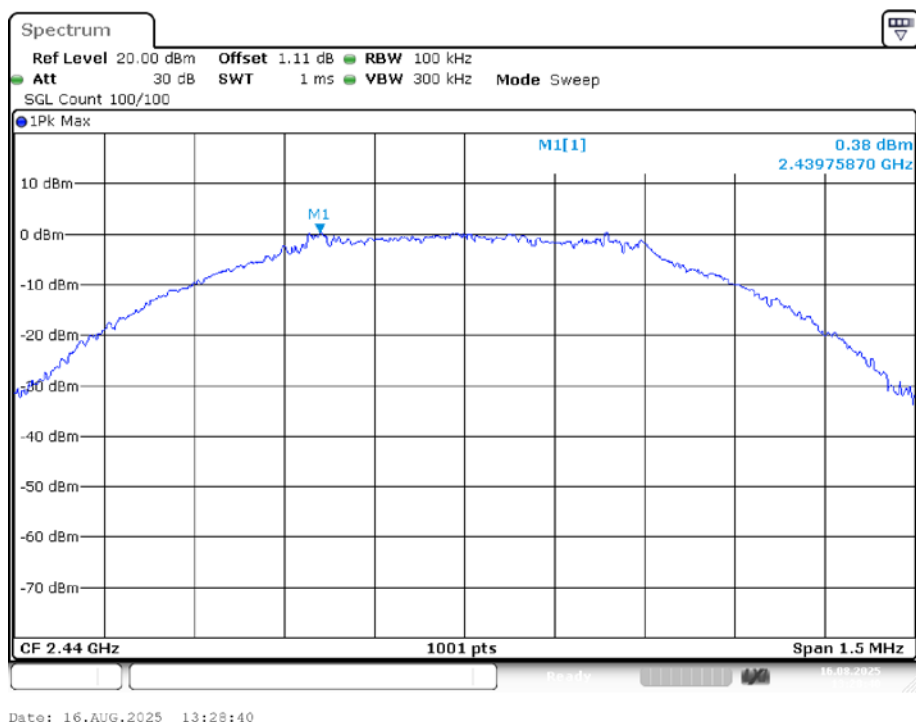
Result plot as follows:



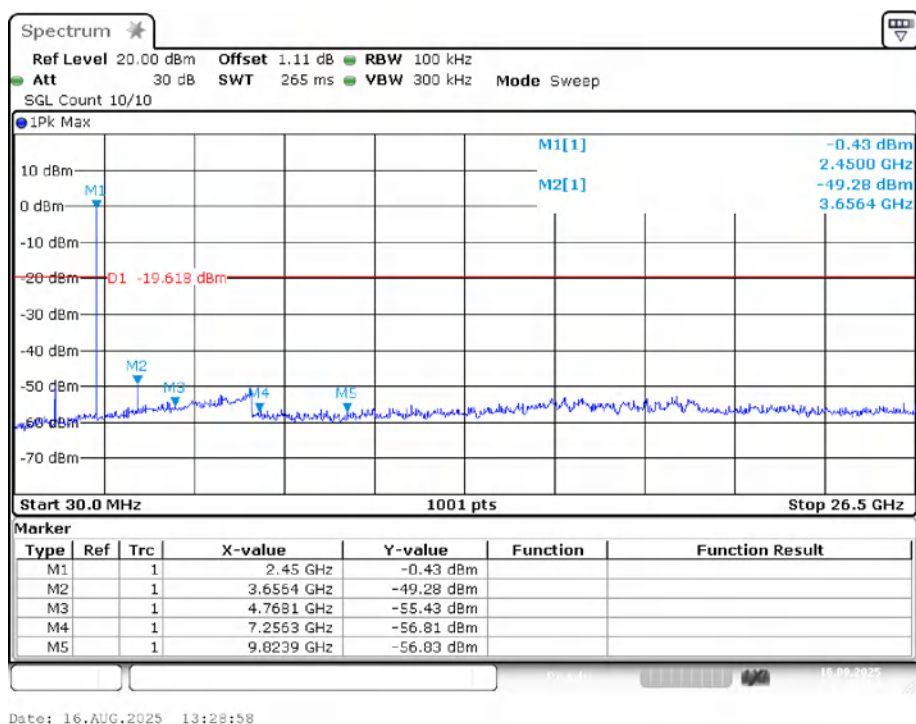
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



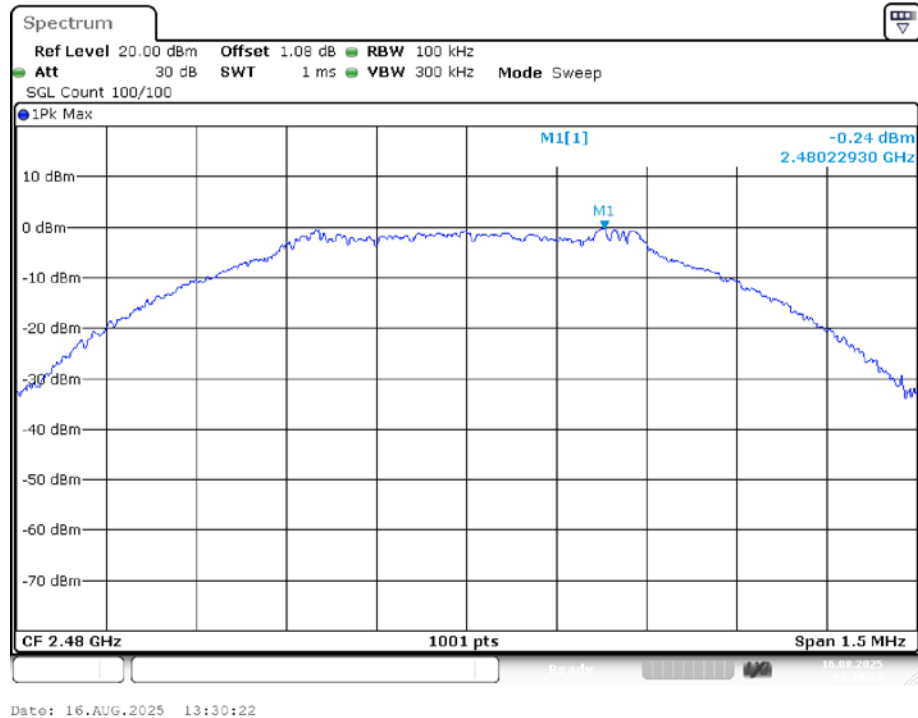
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



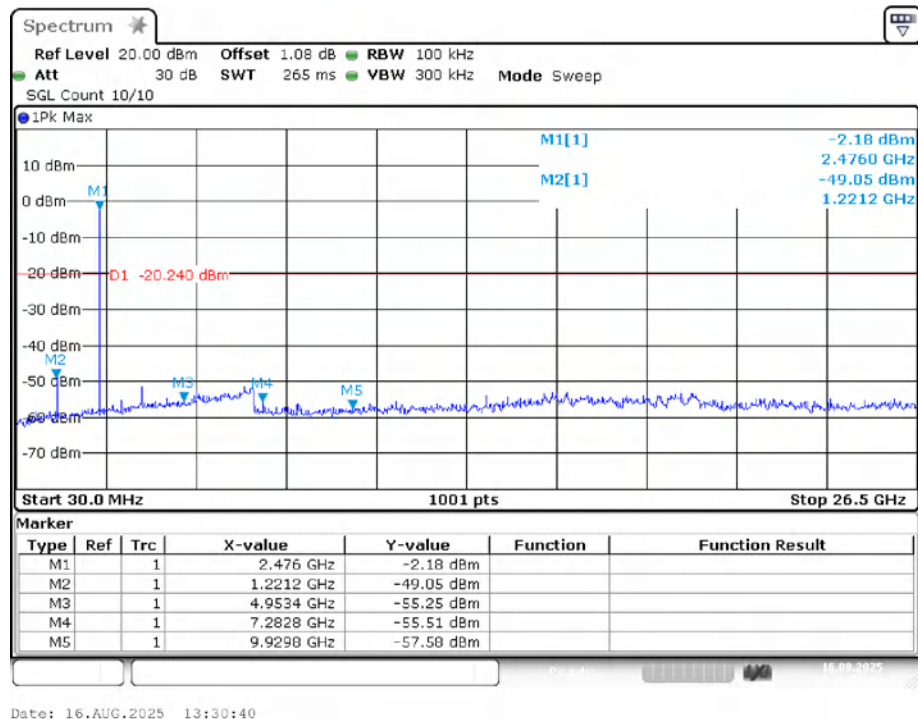
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



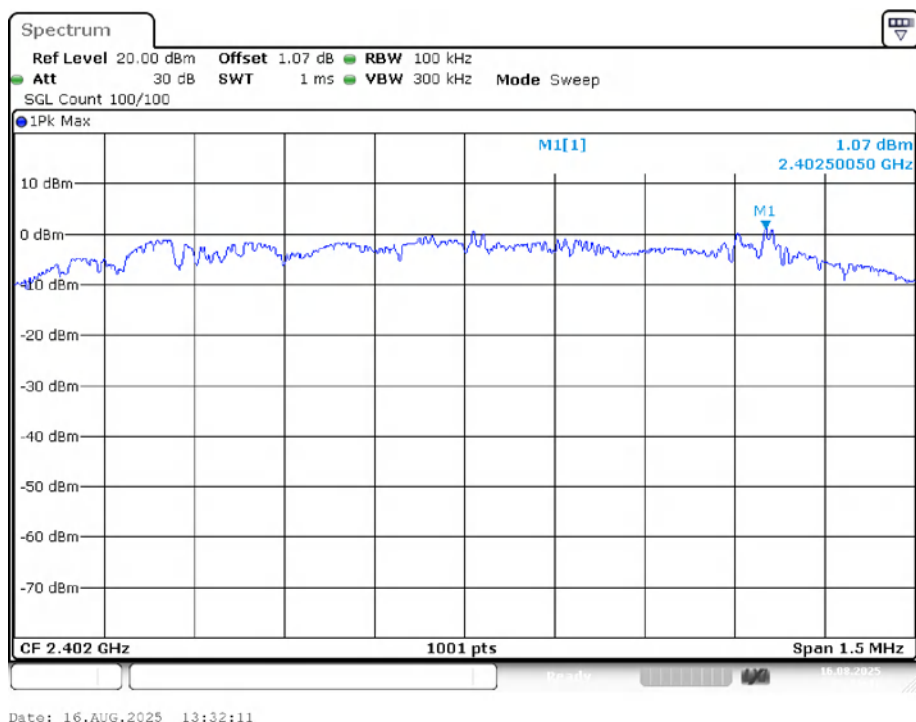
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



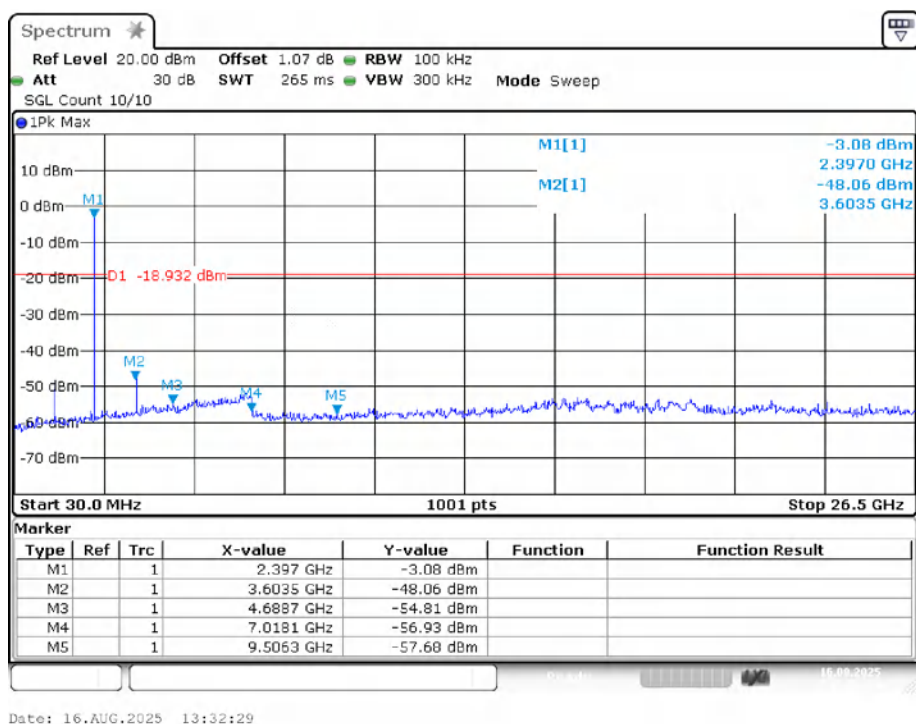
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



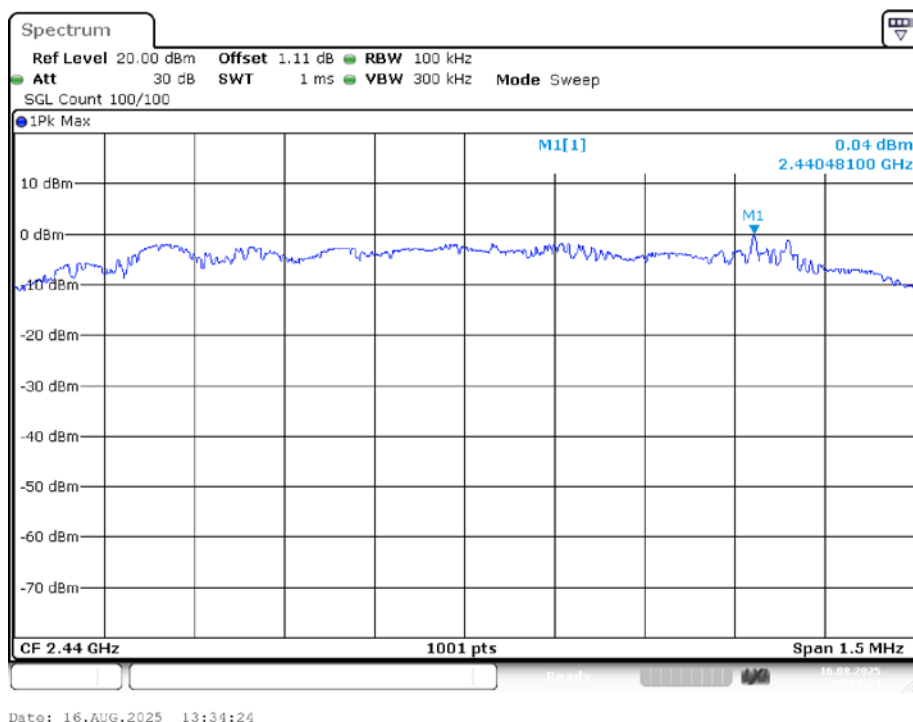
Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



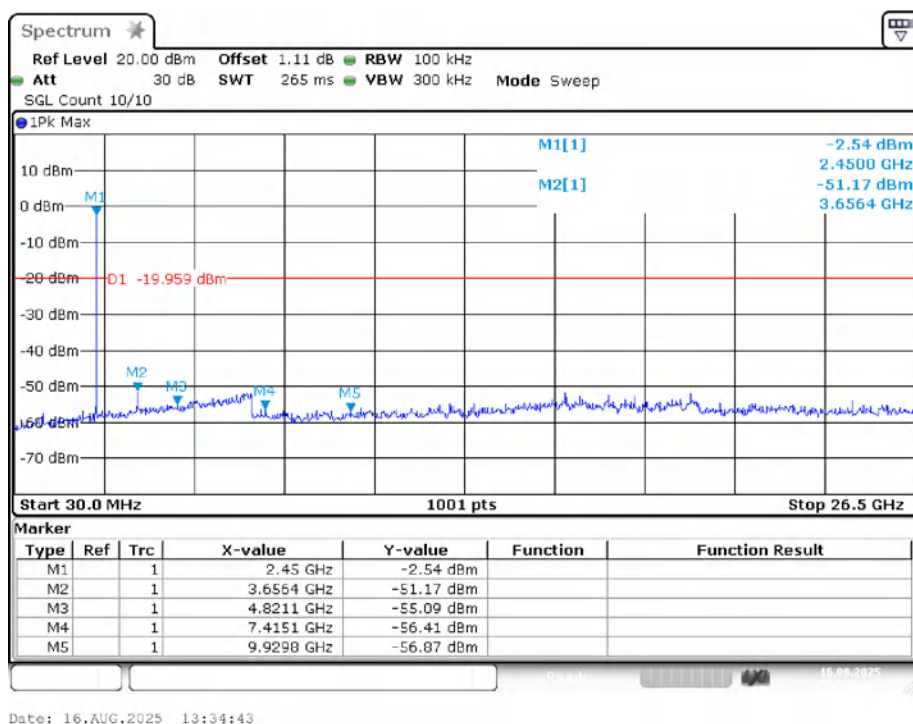
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref



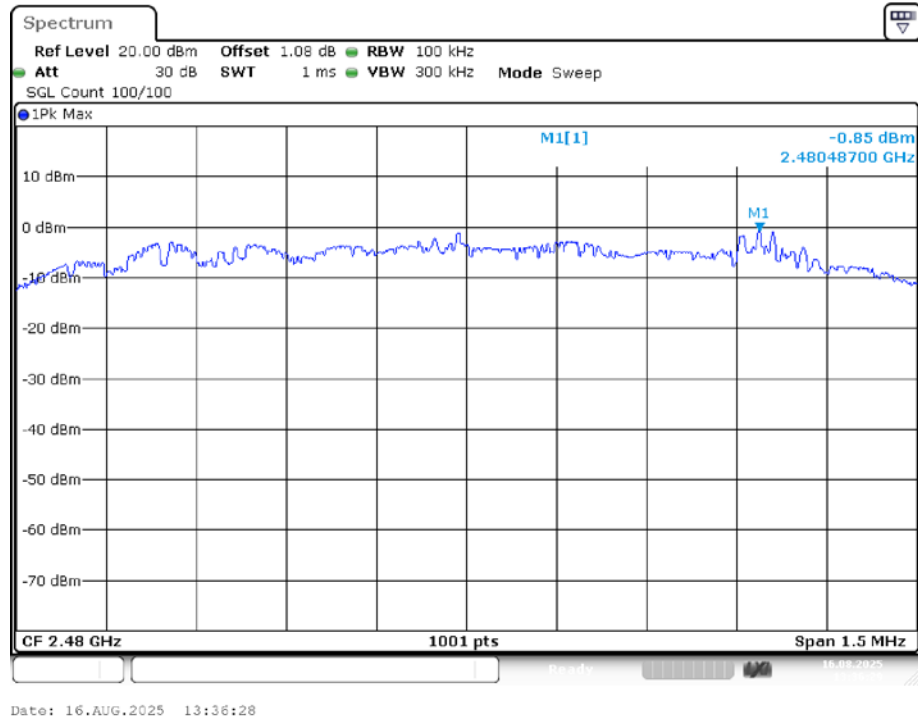
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission



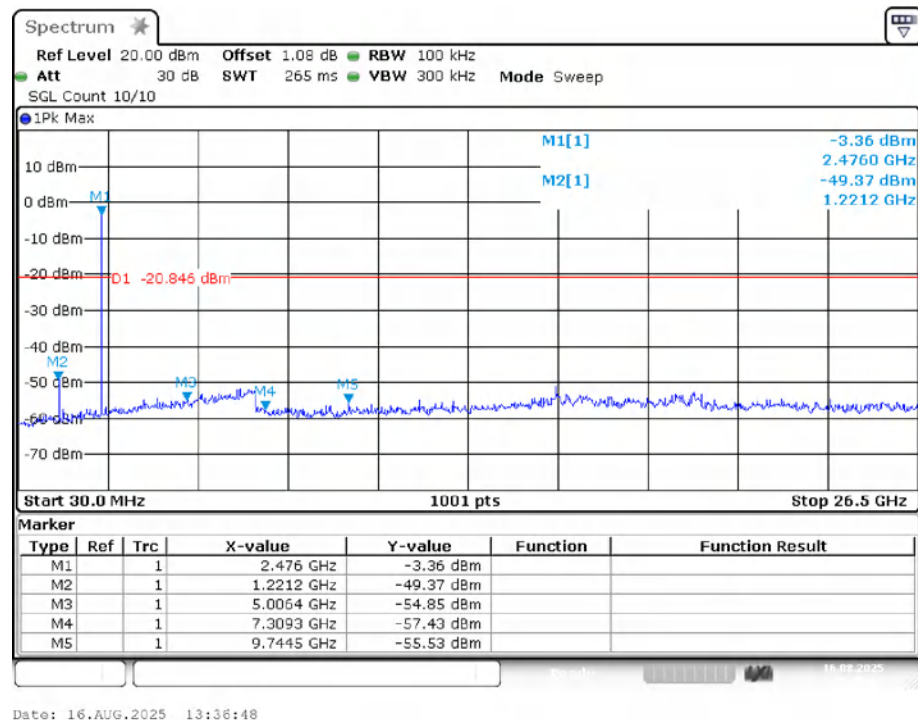
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission

Test Result: The unit does meet the FCC requirements.

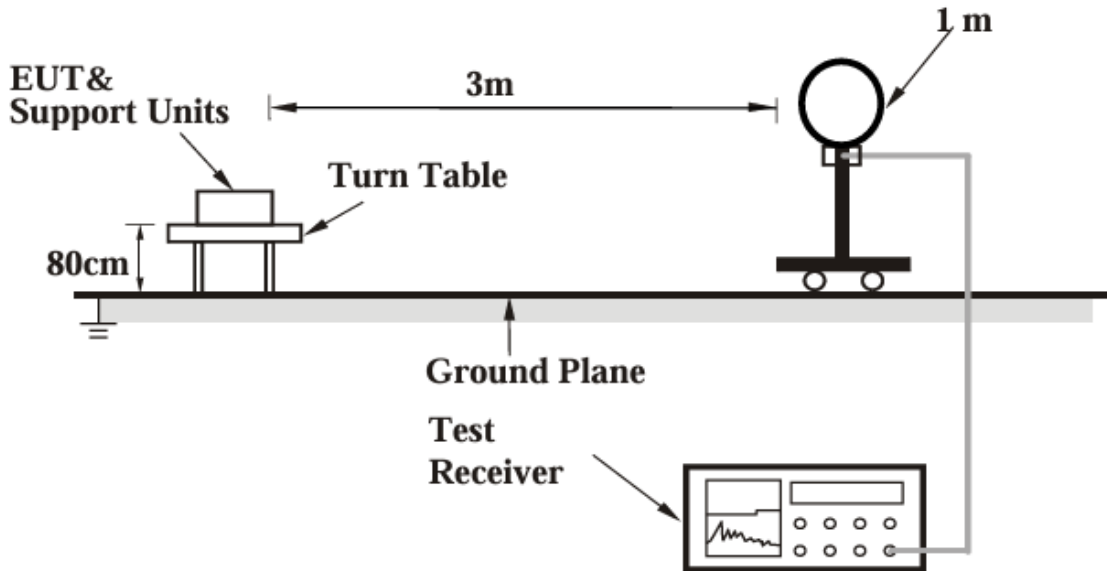
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5.7 Radiated Spurious Emissions

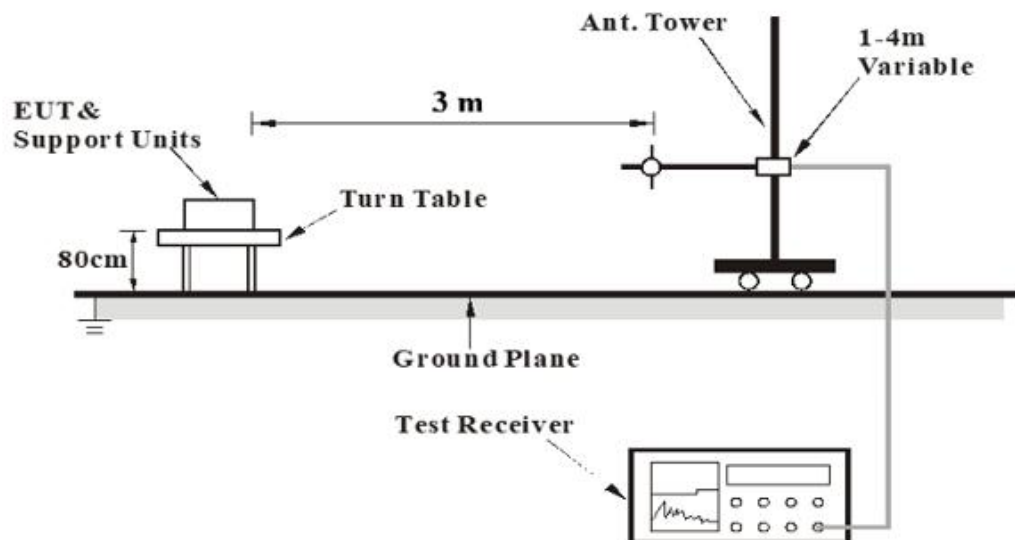
Test Requirement:	FCC Part 15 C section 15.247 (d) In any 100 KHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating. The radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 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, and provided the transmitter demonstrates compliance with the peak conducted power limits.
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz VBW $\geq$ RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz, 9KHz for < 30 MHz VBW = 10 Hz Sweep = auto Detector function = peak Trace = max hold
Limit:	40.0 dB μ V/m between 30 MHz & 88 MHz 43.5 dB μ V/m between 88 MHz & 216 MHz 46.0 dB μ V/m between 216 MHz & 960 MHz 54.0 dB μ V/m above 960 MHz

5.7.1 Test Configuration

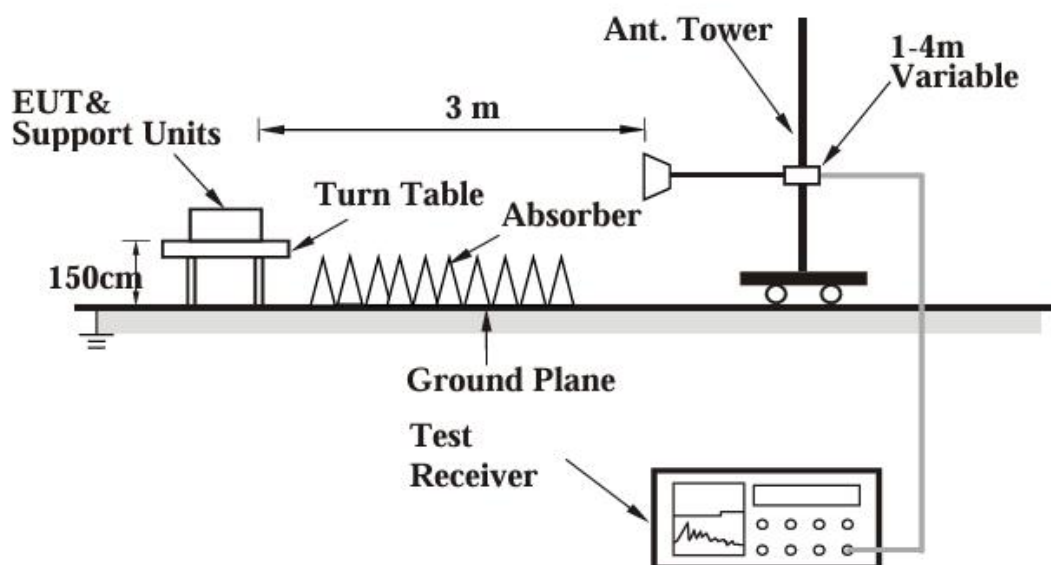
- 1) 9KHz to 30MHz emissions:



- 2) 30 MHz to 1 GHz emissions:



3) 1 GHz to 40 GHz emissions:

**Test Procedure:**

- (1) The receiver was scanned from 0.009MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. After pre-test, it was found that the worse radiation emission was get at the X position. So the data shown was the X position only. The worst case emissions were reported.
- (2) Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
- (3) Pre-test under all modes below 1GHz; choose the worst case mode record on the report.

5.7.2 Harmonic and other spurious emissions

5.7.3 Test Result (Radiated Spurious Emissions 30 MHz~1 GHz)

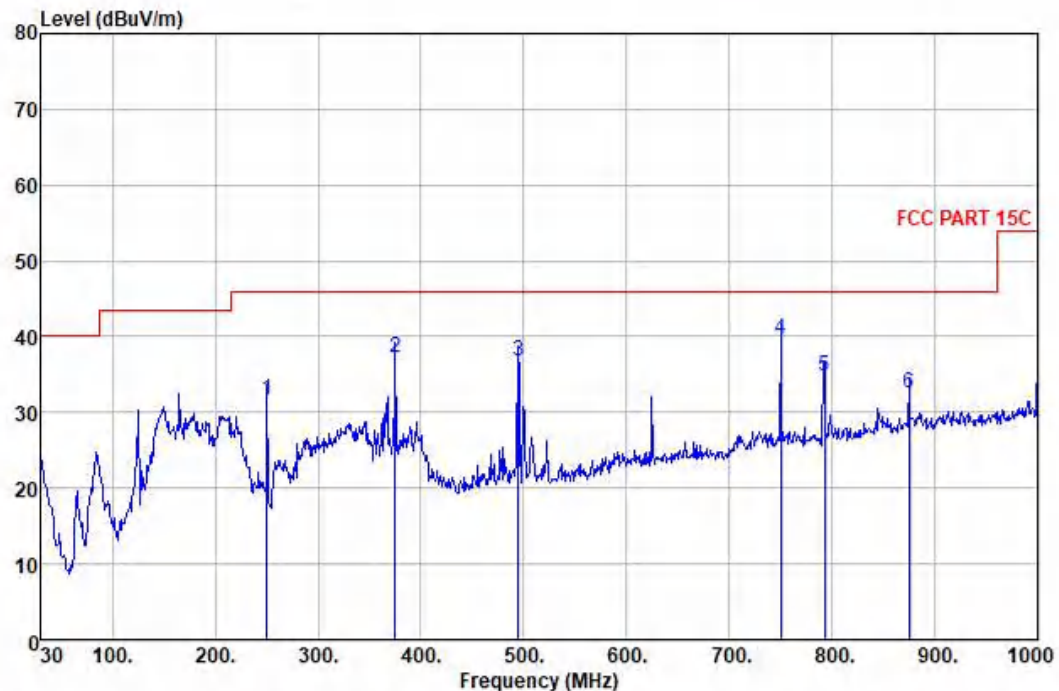
Worst case mode BLE 2M

The Low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not report.

Horizontal:

Peak scan

Level (dB μ V/m)



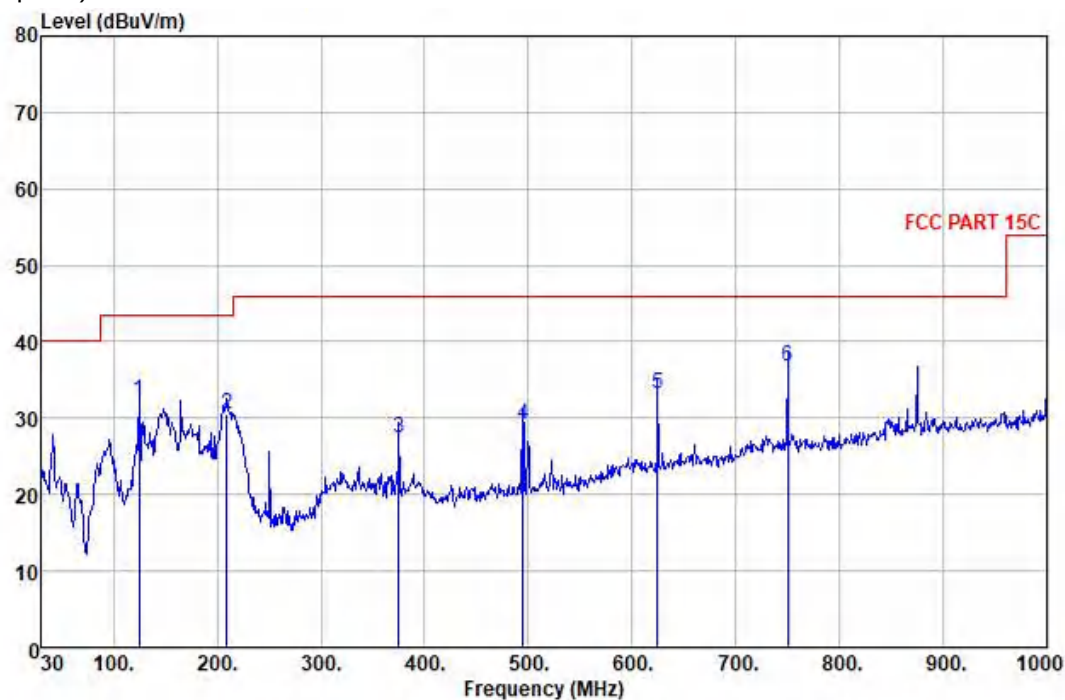
No.	Freq MHz	Read Level dB μ V	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dB μ V/m	Limit Line dB μ V/m	Over Limit dB	Pol/Phase	Remark
1	250.190	43.79	13.20	1.93	27.31	31.61	46.00	-14.39	HORIZONTAL	QP
2	375.320	48.06	15.28	2.36	28.40	37.30	46.00	-8.70	HORIZONTAL	QP
3	494.630	45.78	16.99	2.76	28.72	36.81	46.00	-9.19	HORIZONTAL	QP
4	749.740	43.20	20.60	3.44	27.50	39.74	46.00	-6.26	HORIZONTAL	QP
5	792.420	38.19	20.55	3.55	27.61	34.68	46.00	-11.32	HORIZONTAL	QP
6	874.870	33.72	22.19	3.74	27.20	32.45	46.00	-13.55	HORIZONTAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Quasi-peak measurement

Vertical:

Peak scan

Level (dB μ V/m)

No.	Freq MHz	Read Level dB μ V	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dB μ V/m	Limit dB μ V/m	Over Limit dB	Pol/Phase	Remark
1	125.060	49.65	9.69	1.33	28.45	32.22	43.50	-11.28	VERTICAL	QP
2	209.450	45.54	10.76	1.75	27.52	30.53	43.50	-12.97	VERTICAL	QP
3	375.320	38.14	15.28	2.36	28.40	27.38	46.00	-18.62	VERTICAL	QP
4	494.630	38.15	16.99	2.76	28.72	29.18	46.00	-16.82	VERTICAL	QP
5	624.610	39.19	19.37	3.13	28.59	33.10	46.00	-12.90	VERTICAL	QP
6	749.740	40.14	20.60	3.44	27.50	36.68	46.00	-9.32	VERTICAL	QP

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Quasi-peak measurement

5.7.4 Test Result (Radiated Spurious Emissions above 1GHz)

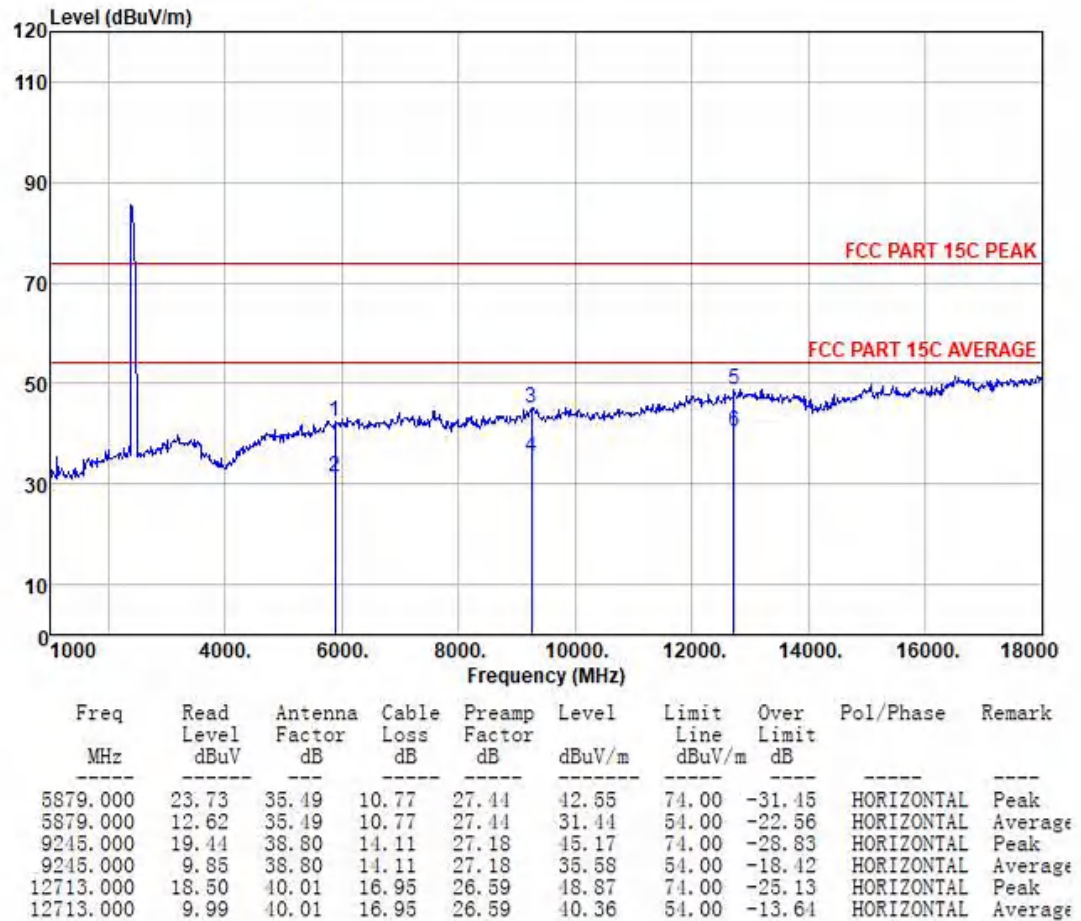
Worst case mode BLE 2M

Test at low Channel in transmitting status

Horizontal:

Peak scan

Level (dBμV/m)



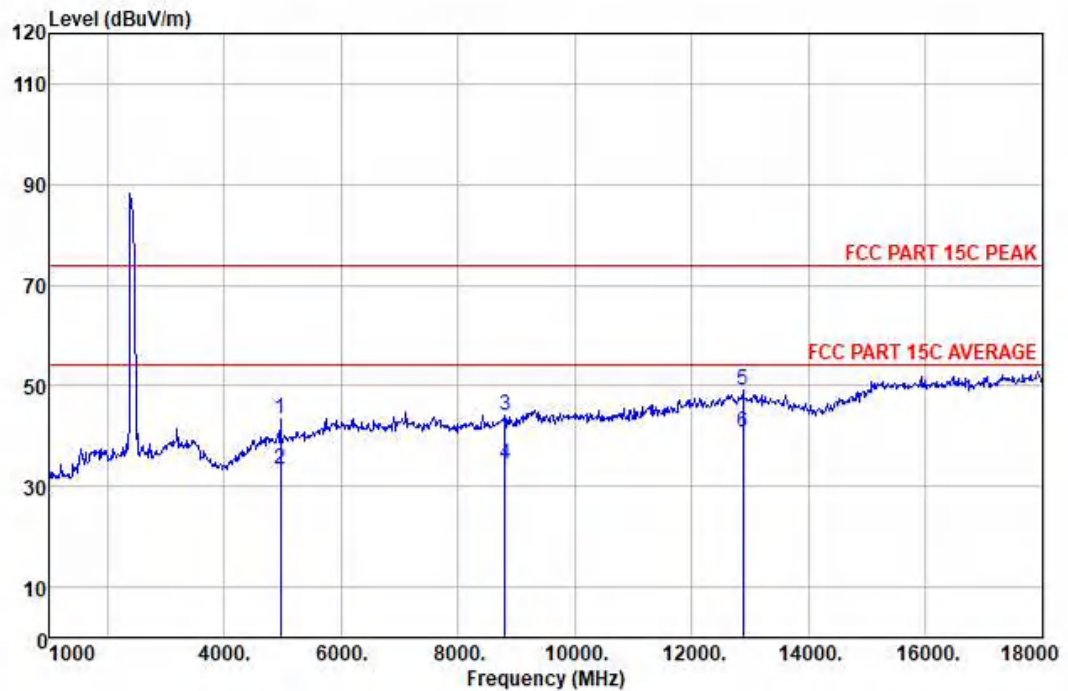
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
4961.000	27.76	33.47	9.76	27.60	43.39	74.00	-30.61	VERTICAL	Peak
4961.000	17.85	33.47	9.76	27.60	33.48	54.00	-20.52	VERTICAL	Average
8803.000	19.29	38.41	13.70	27.23	44.17	74.00	-29.83	VERTICAL	Peak
8803.000	9.48	38.41	13.70	27.23	34.36	54.00	-19.64	VERTICAL	Average
12866.000	18.33	40.38	17.07	26.53	49.25	74.00	-24.75	VERTICAL	Peak
12866.000	9.88	40.38	17.07	26.53	40.80	54.00	-13.20	VERTICAL	Average

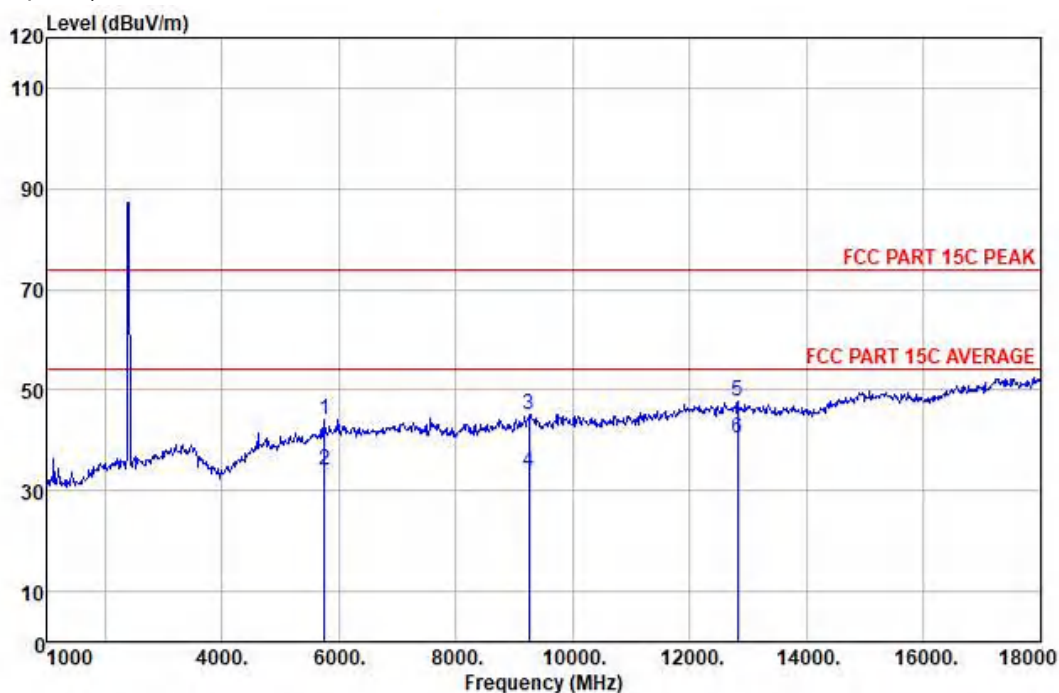
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at Middle Channel in transmitting status**Horizontal:**

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
5760.000	25.83	34.99	10.64	27.45	44.01	74.00	-29.99	HORIZONTAL	Peak
5760.000	15.96	34.99	10.64	27.45	34.14	54.00	-19.86	HORIZONTAL	Average
9245.000	19.36	38.80	14.11	27.18	45.09	74.00	-28.91	HORIZONTAL	Peak
9245.000	8.15	38.80	14.11	27.18	33.88	54.00	-20.12	HORIZONTAL	Average
12815.000	17.02	40.26	17.03	26.55	47.76	74.00	-26.24	HORIZONTAL	Peak
12815.000	9.86	40.26	17.03	26.55	40.60	54.00	-13.40	HORIZONTAL	Average

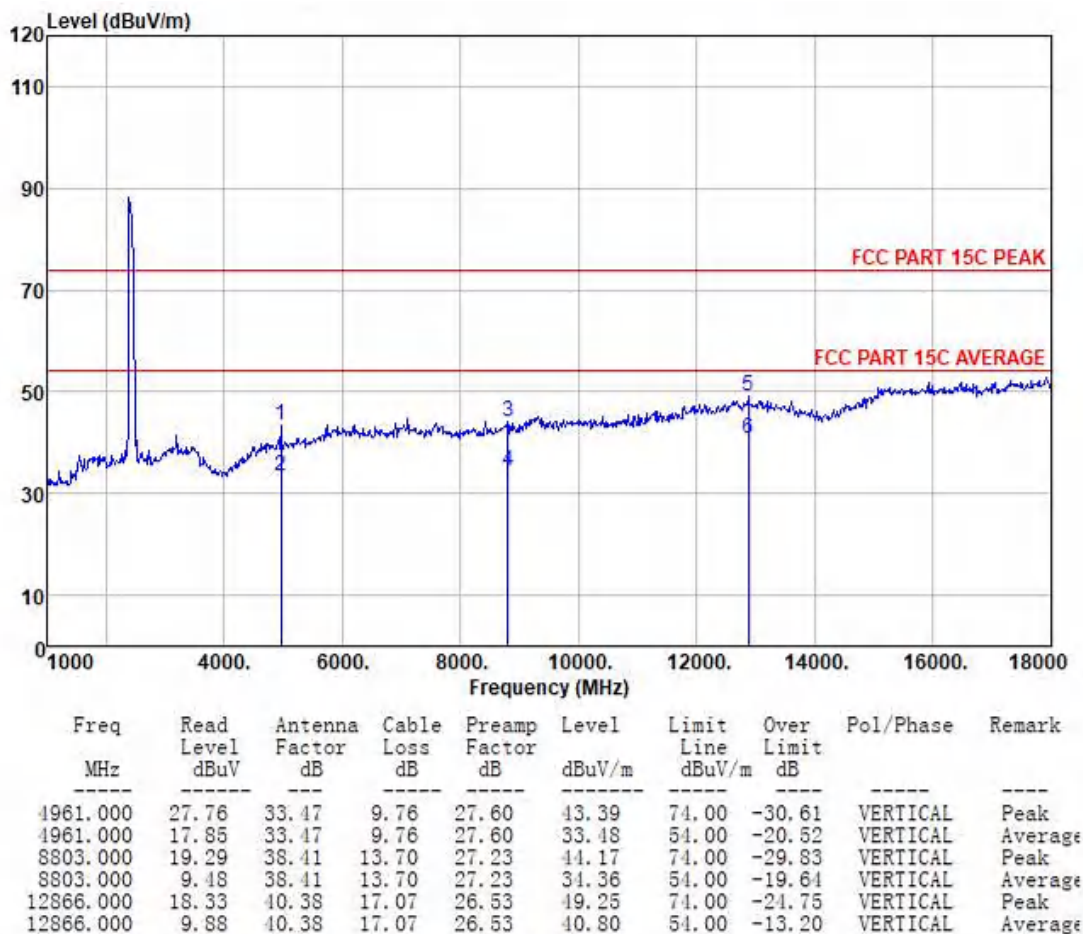
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

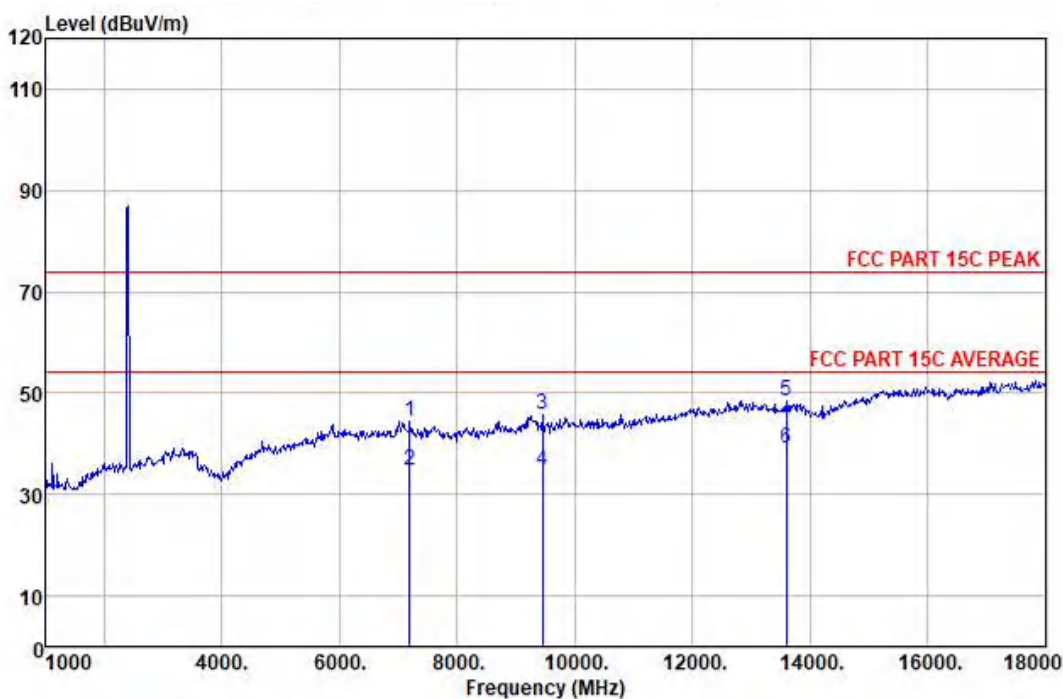
Level (dB μ V/m)**Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor**

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Test at high Channel in transmitting status**Horizontal:**

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
7188.000	23.08	36.70	12.11	27.33	44.56	74.00	-29.44	HORIZONTAL	Peak
7188.000	13.22	36.70	12.11	27.33	34.70	54.00	-19.30	HORIZONTAL	Average
9449.000	19.78	38.80	14.29	27.16	45.71	74.00	-28.29	HORIZONTAL	Peak
9449.000	8.75	38.80	14.29	27.16	34.68	54.00	-19.32	HORIZONTAL	Average
13597.000	17.42	39.84	17.66	26.30	48.62	74.00	-25.38	HORIZONTAL	Peak
13597.000	7.97	39.84	17.66	26.30	39.17	54.00	-14.83	HORIZONTAL	Average

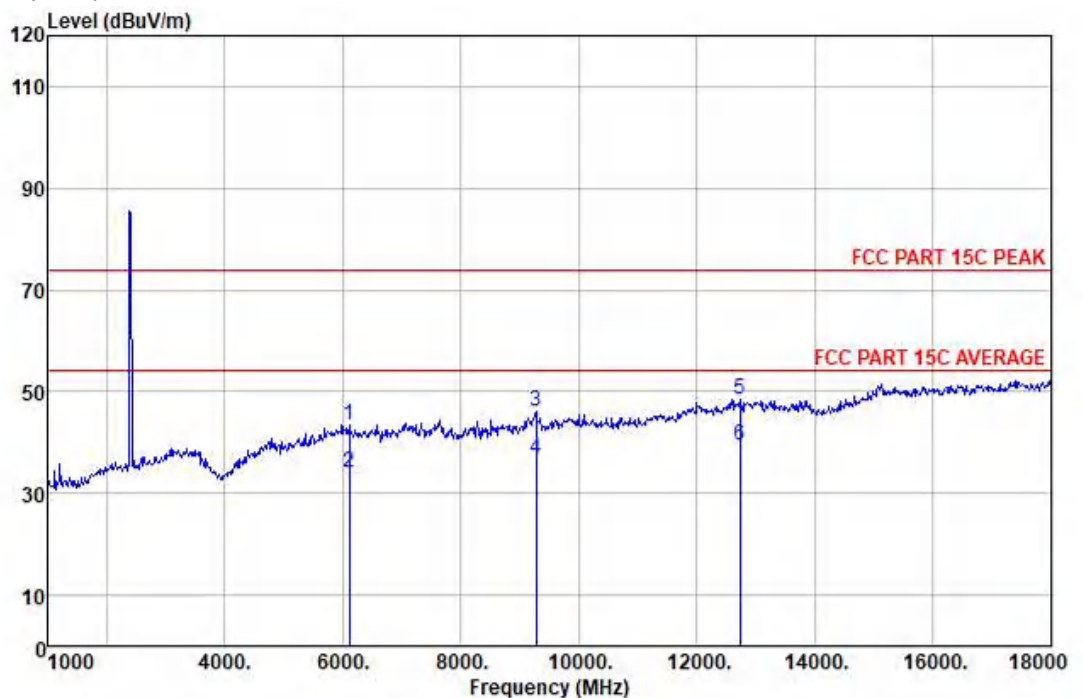
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

Vertical:

Peak scan

Level (dB μ V/m)

Freq MHz	Read Level dBuV	Antenna Factor dB	Cable Loss dB	Preamp Factor dB	Level dBuV/m	Limit Line dBuV/m	Over Limit dB	Pol/Phase	Remark
6117.000	24.04	35.88	11.02	27.41	43.53	74.00	-30.47	VERTICAL	Peak
6117.000	14.63	35.88	11.02	27.41	34.12	54.00	-19.88	VERTICAL	Average
9279.000	20.30	38.80	14.14	27.18	46.06	74.00	-27.94	VERTICAL	Peak
9279.000	10.96	38.80	14.14	27.18	36.72	54.00	-17.28	VERTICAL	Average
12730.000	18.06	40.05	16.96	26.59	48.48	74.00	-25.52	VERTICAL	Peak
12730.000	9.16	40.05	16.96	26.59	39.58	54.00	-14.42	VERTICAL	Average

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Peak and Average Measurement

Note: The emission above limit is fundamental emission, which is not subject to the limit.

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), the amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

The emission levels of 18~25 GHz are lower than the limit at least 20dB and not show the plots in test report.

Test Result: The unit does meet the FCC requirements.

5.8 Radiated Emissions which fall in the restricted bands

Test Requirement:	FCC Part 15 C section 15.247 (d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	40.0 dB μ V/m between 30MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.

5.8.1 Test Configuration

Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz VBW $\geq$ RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 KHz for $f < 1$ GHz VBW = 10Hz Sweep = auto Detector function = peak Trace = max hold
-----------	--

Section 15.205 Restricted bands of operation.

(a) Except as shown 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	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

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5.8.2 Test Result (Radiated Emissions which fall in the restricted bands)**Worst case mode BLE 2M**

Frequency (MHz)	Reading Level (dBμV/m)	Correct (dB/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Antenna polarization	Detector
Low Channel							
2310.000	33.46	6.54	37.51	74.00	-36.49	H	PK
2310.000	22.97	6.54	26.13	54.00	-27.87	H	AV
2390.000	33.83	6.61	37.53	74.00	-36.47	V	PK
2390.000	22.41	6.61	25.52	54.00	-28.48	V	AV
High Channel							
2483.500	33.61	6.54	36.99	74.00	-37.01	H	PK
2483.500	21.59	6.54	24.72	54.00	-29.28	H	AV
2500.000	34.69	6.61	37.95	74.00	-36.05	V	PK
2500.000	23.98	6.61	26.10	54.00	-27.9	V	AV

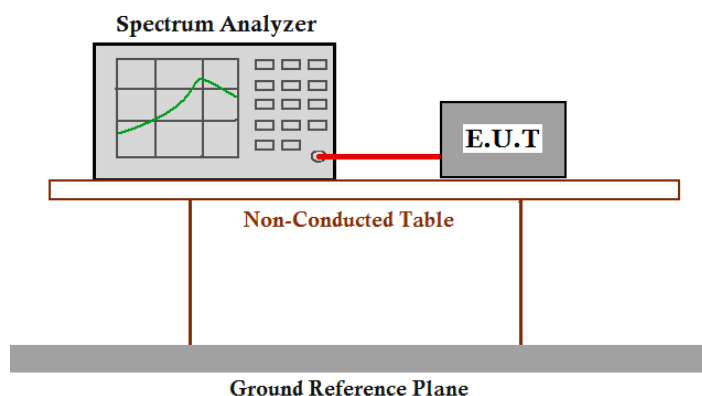
Remark: No any other emission which falls in restricted bands can be detected and be reported.

Test Result: The unit does meet the FCC requirements.

5.9 Band Edges Requirement

Test Requirement:	FCC Part 15 C section 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.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10:2020
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

5.9.1 Test Configuration



Test Procedure:

1. The testing follows the Measurement Procedure of ANSI C63.10:2020 Section 11.12.2.2.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings

Reference level measurement: Set spectrum analyzer center frequency to DTS channel center

frequency / Set the span to >1.5 times the DTS bandwidth /RBW: 100 KHz/VBW: 300 KHz/Detector:

Peak / Sweep time: Auto couple / Trace mode: Max hold / Allow trace to fully stabilize Use the peak

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marker function to determine the maximum PSD level and attenuate it by 20dB.Emission level

measurement: Set the center frequency and span to encompass frequency range to be measured

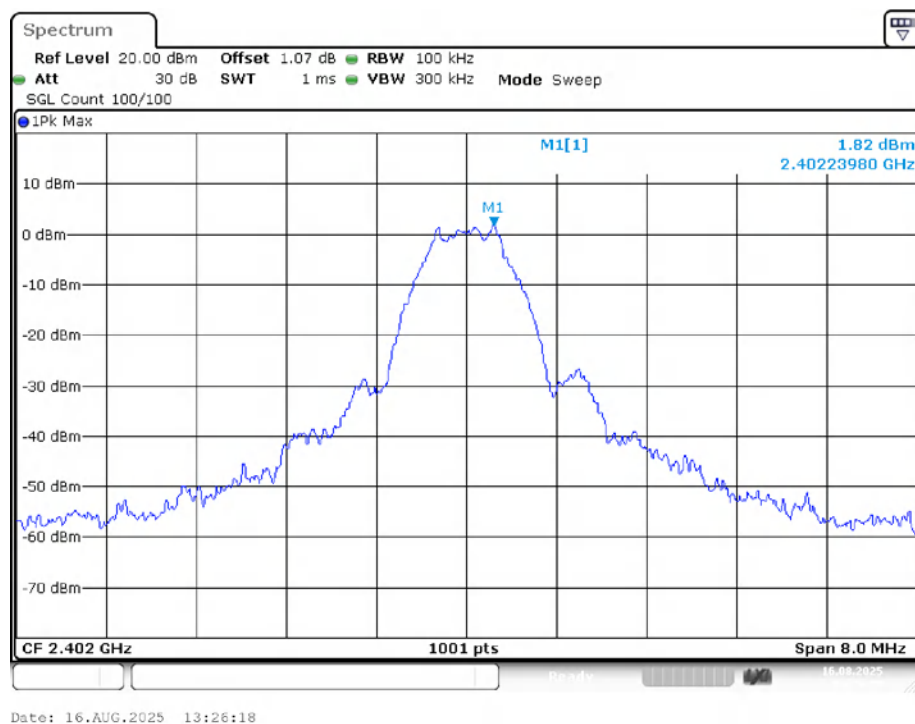
/RBW: 100 KHz/VBW: 300 KHz/ Detector: Peak / Sweep time: Auto couple / Trace mode: Max hold /

Allow trace to fully stabilize / Use the peak marker function to determine the maximum amplitude level.

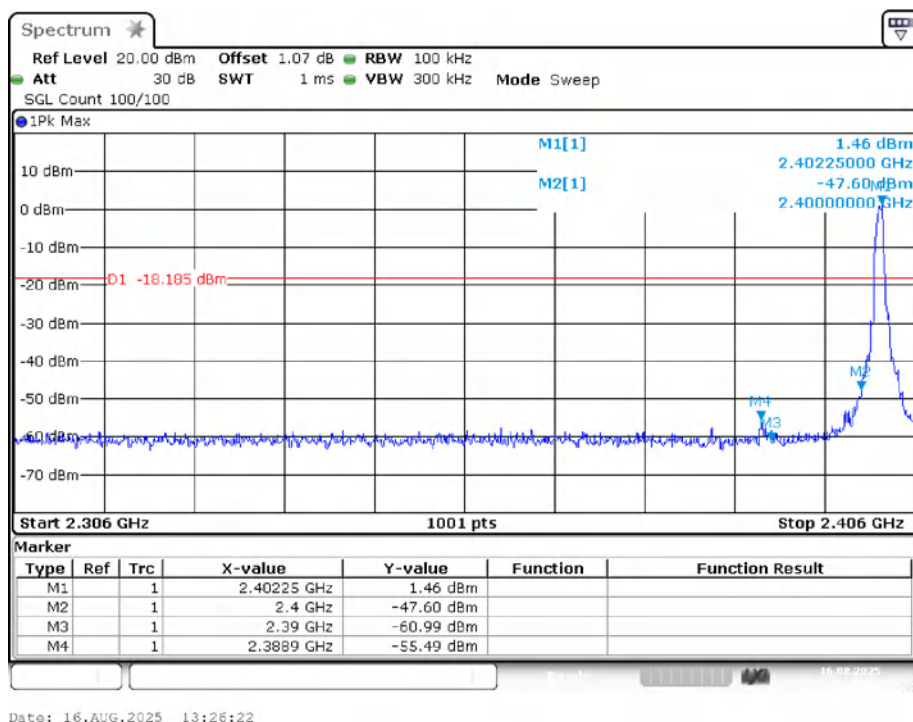
5. Record the measurement results in the test report.

5.9.2 Test Result (Band Edges)

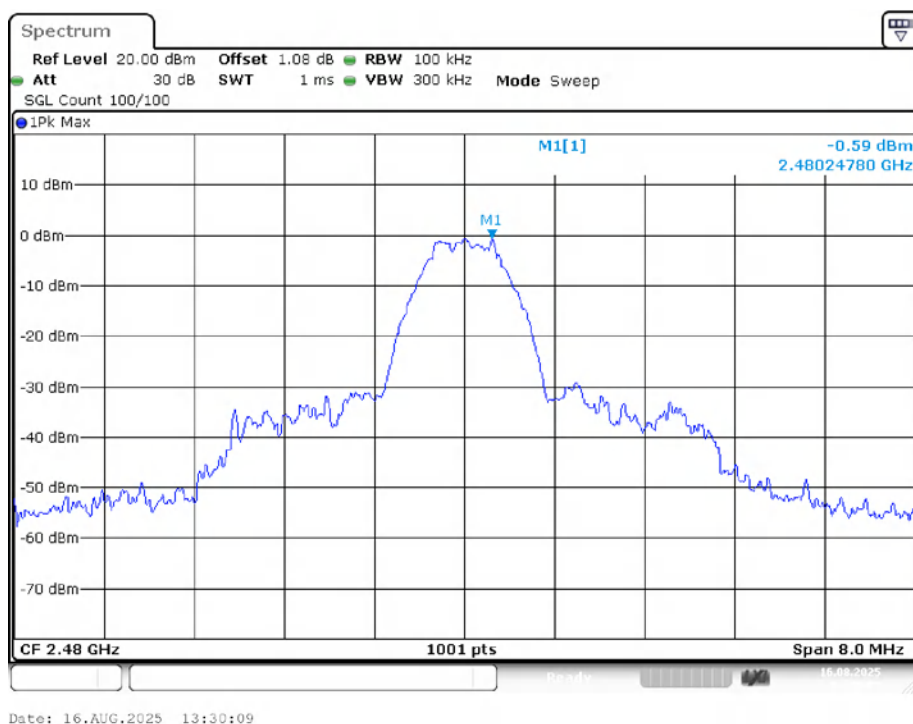
Test mode	Test Frequency (MHz)	Max Value (dBc)	Limit (dBc)
BLE 1M	2402	-57.31	-20
	2480	-52.56	-20
BLE 2M	2402	-57.82	-20
	2480	-50.45	-20



Band Edge NVNT BLE 1M 2402MHz Ant1 Ref

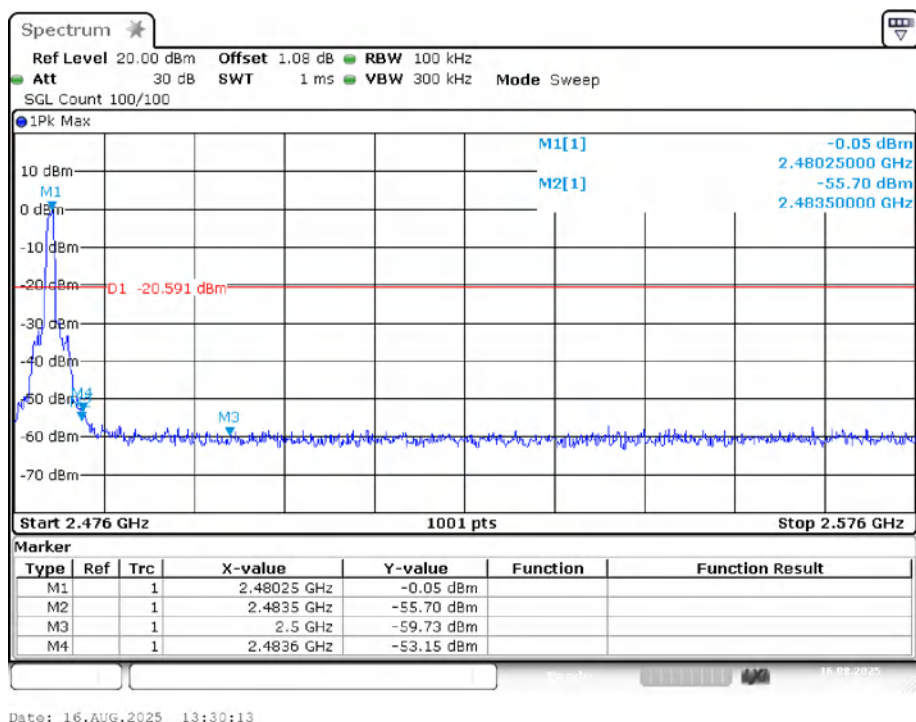


Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

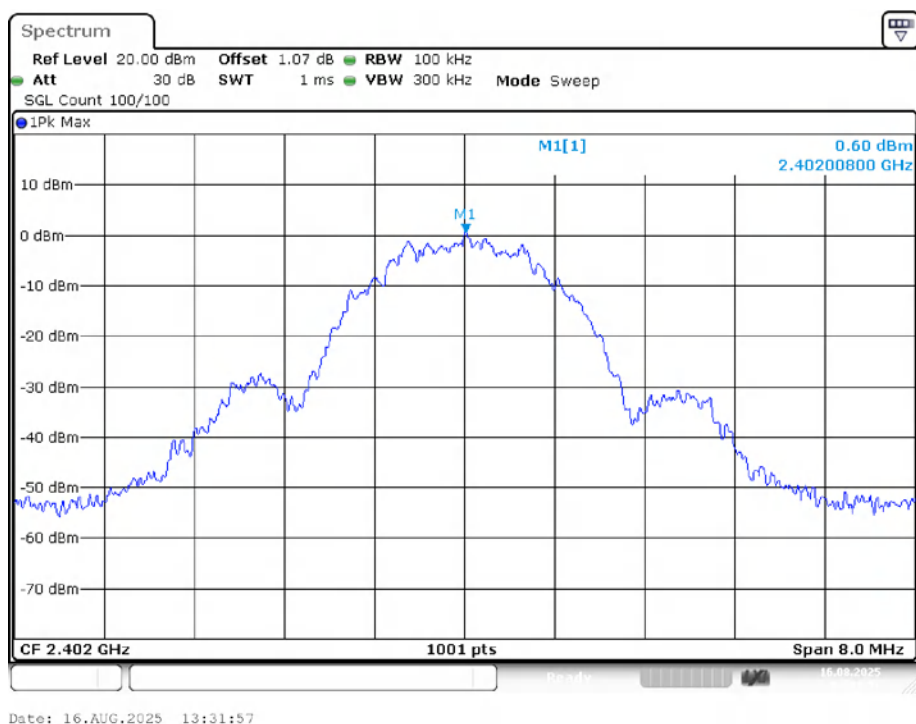


Band Edge NVNT BLE 1M 2480MHz Ant1 Ref

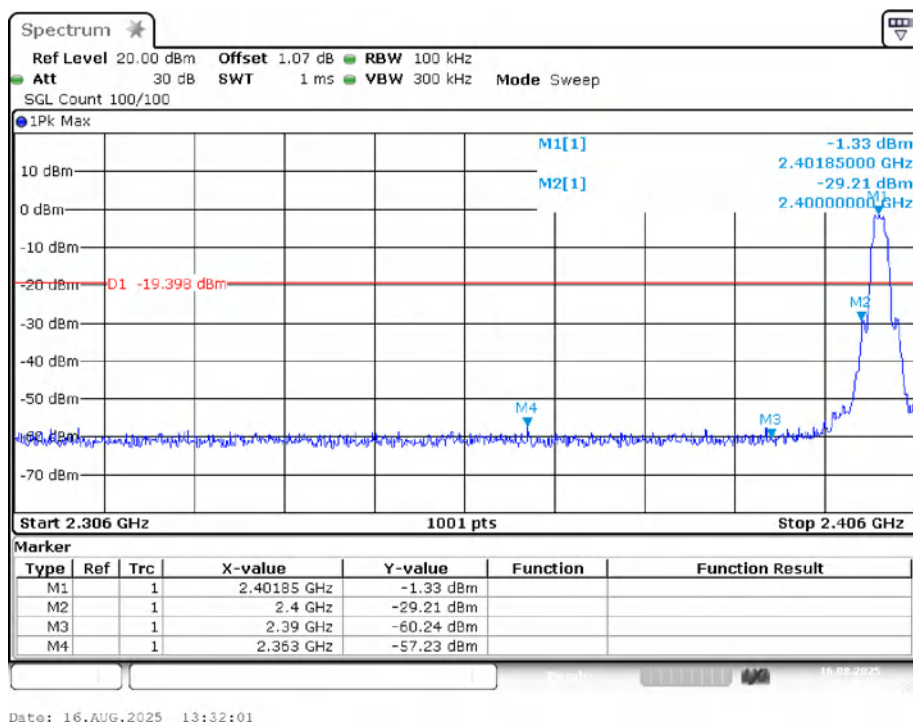
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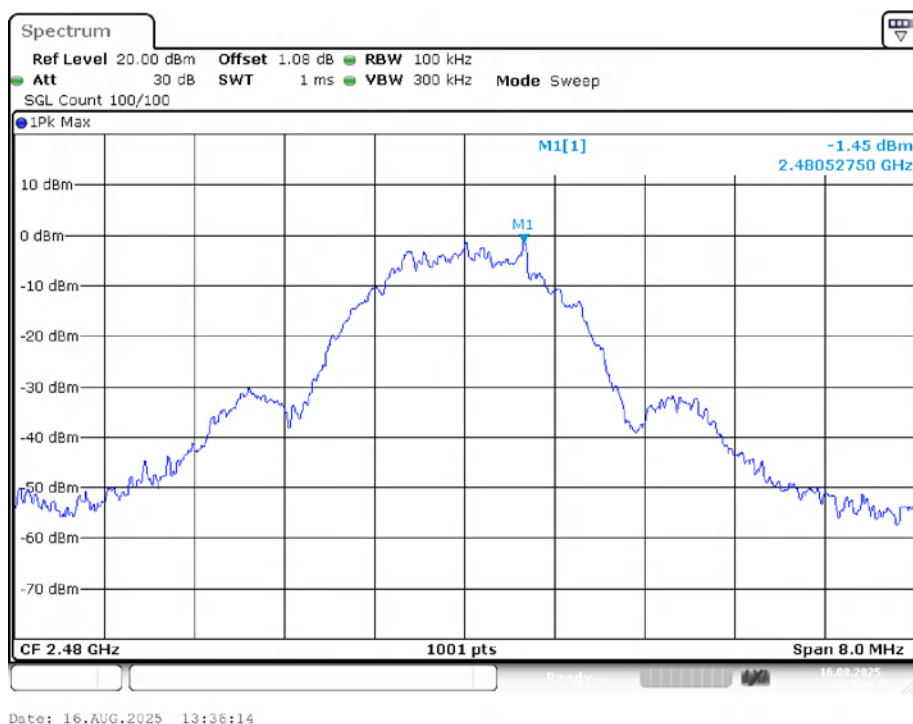
Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



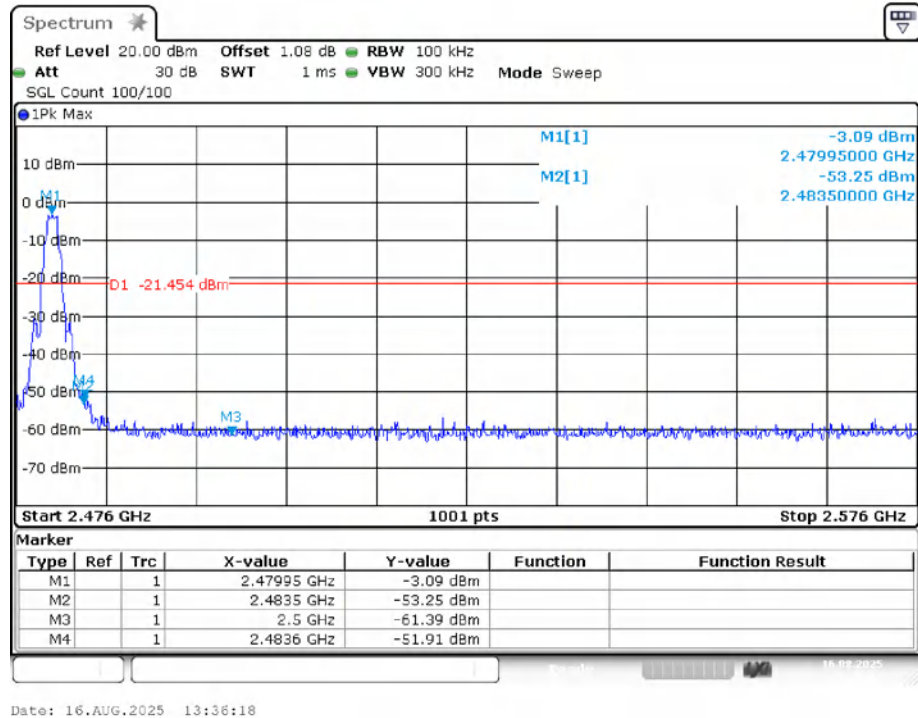
Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



Band Edge NVNT BLE 2M 2480MHz Ant1 Emission

Note: This line in the plots is a reference line for the 20dB down limit, not the limit.

Test Result: The unit does meet the FCC requirements.

5.10 AC power-line conducted emissions 150 KHz to 30MHz

Test Requirement:	FCC Part 15 C section 15.207
Test Voltage:	AC 120V, 60Hz
Test Method:	ANSI C63.10:2020 Section 6.2
Frequency Range:	150 KHz to 30 MHz
Detector:	Peak for pre-scan (9 KHz Resolution Bandwidth)
Test Limit:	

Limits for conducted disturbance at the mains ports of class B

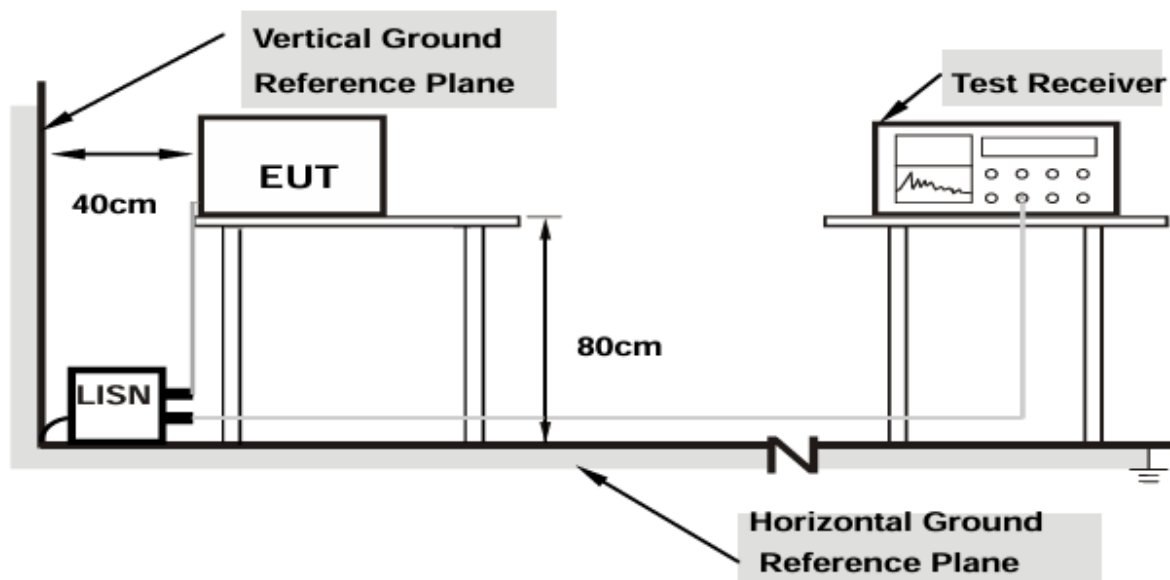
Frequency Range	Class B Limit dB(μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

EUT Operation:

Test in normal operating mode. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, channels and antenna ports (if EUT with antenna diversity architecture).

5.10.1 Test Configuration



Test procedure:

1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

5.10.2 Test Result (AC power-line conducted emissions 150 KHz to 30 MHz)

An initial pre-scan was performed on the live and neutral lines with peak detector.

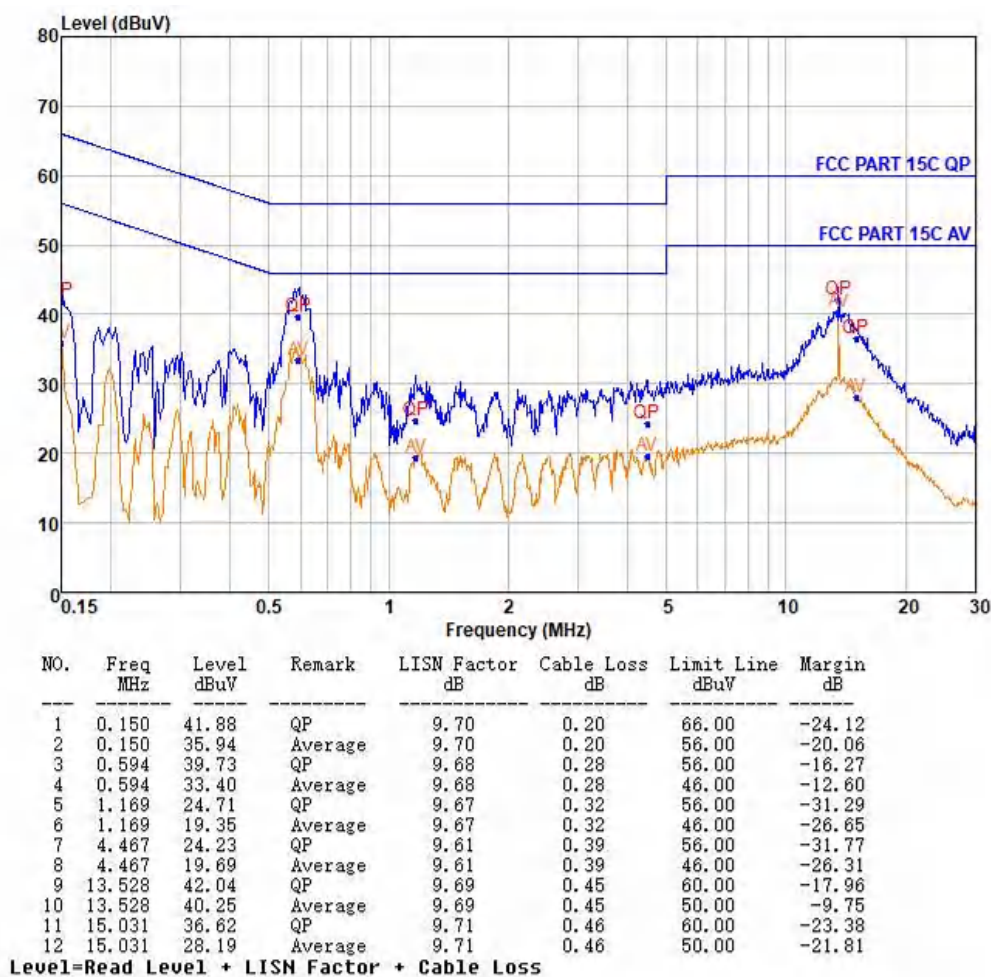
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected. For EUT the mode BLE 2M was worst case mode.

The following Quasi-Peak and Average measurements were performed on the EUT

Live Line:

Peak scan:

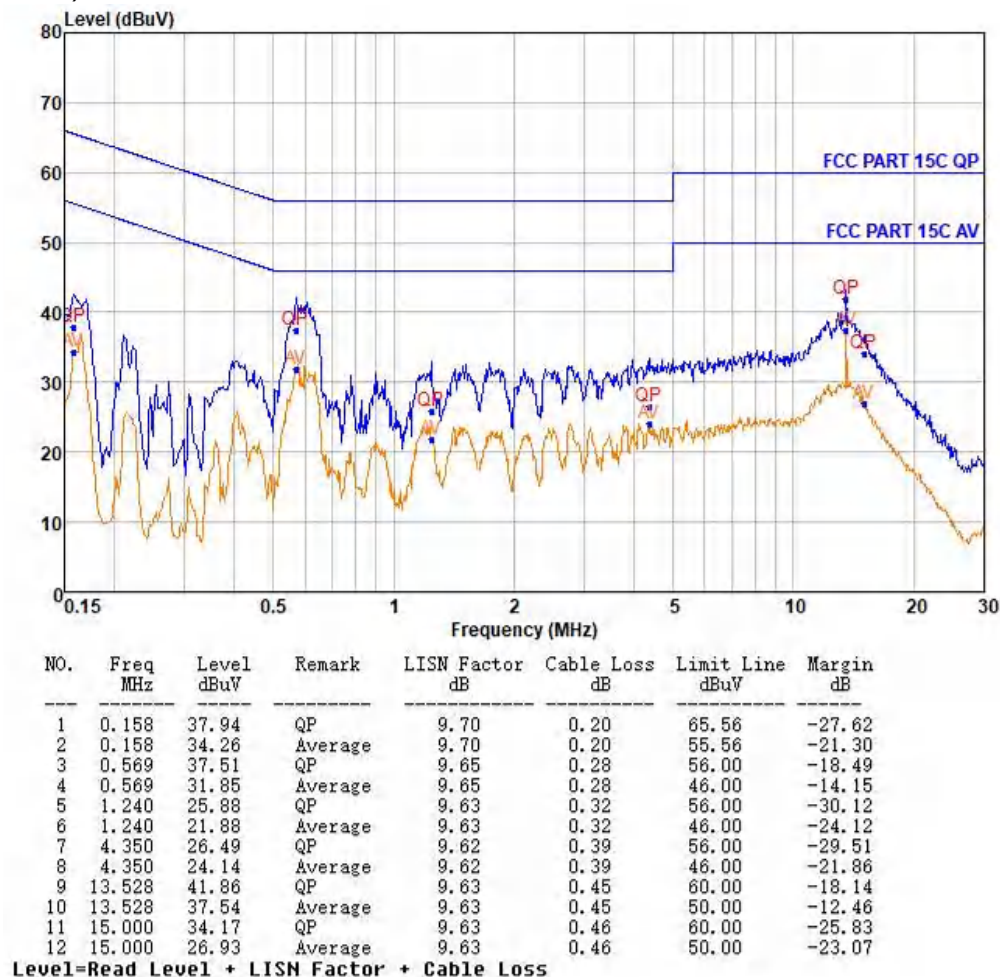
Level (dBμV)



Quasi-peak and Average measurement

Neutral Line:

Peak Scan:

Level (dB μ V)

Quasi-peak and Average measurement

Test Result: The unit does meet the FCC requirements.**-- End of test report --**