RF TEST REPORT

FCC ID: 2A4ND-KY-2027

Product Name: Soundbar Speaker

Brand Name: N/A

Model Name: KY-2027

Report No.: N26060408820E

Prepared for

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Prepared by

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1. Revision History

Revision History			
Report No.	Version	Description	Issued Date
N26060408820E	Rev.01	Initial issue of report	Oct. 12, 2026

2. Tets Summary

FCC Rule	Test Item	Method	Tested By	Result
47 CFR Part 15.203/15.247 (b)(4)	Antenna requirement	---	Abel Chen	Pass
47 CFR 15.207	Conducted Emission at AC power line	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 6.2	---	N/A
47 CFR 15.247(a)(2)	6dB Bandwidth	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 11.8.1 KDB 558074 D01 15.247 Meas Guidance v05r02	Leo wang	Pass
47 CFR 15.247(b)(3)	Maximum Conducted Output Power	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 11.9.1.1 KDB 558074 D01 15.247 Meas Guidance v05r02	Leo wang	Pass
47 CFR 15.247(e)	Power Spectral Density	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 11.10.2 KDB 558074 D01 15.247 Meas Guidance v05r02	Leo wang	Pass
47 CFR 15.247(d)	Emissions in non-restricted frequency bands	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02	Leo wang	Pass
47 CFR 15.247(d), 15.209, 15.205	Band edge emissions (Radiated)	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.10.4 KDB 558074 D01 15.247 Meas Guidance v05r02	Harry Huang	Pass
47 CFR 15.247(d), 15.209, 15.205	Emissions in frequency bands (below 30MHz)	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.4 KDB 558074 D01 15.247 Meas Guidance v05r02	Pass Qiu	Pass
47 CFR 15.247(d), 15.209, 15.205	Emissions in frequency bands (30M - 1GHz)	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.5.4 KDB 558074 D01 15.247 Meas Guidance v05r02	Pass Qiu	Pass
47 CFR 15.247(d), 15.209, 15.205	Emissions in frequency bands (1G - 18GHz)	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.6 KDB 558074 D01 15.247 Meas Guidance v05r02	Harry Huang	Pass
47 CFR 15.247(d), 15.209, 15.205	Emissions in frequency bands (above 18GHz)	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.6 KDB 558074 D01 15.247 Meas Guidance v05r02	Harry Huang	Pass

Remark:
1. "N/A" denotes test is not applicable in this Test Report.
2. All test items were verified and recorded according to the standards and without any deviation during the test.
3. The antenna gain provided by customer. NTEK is not responsible for the accuracy of antenna gain parameter.

3. Test Result Certification

CLIENT INFORMATION	
Applicant:	JiangXi MeiDong Technology Co., Ltd.
Address of Applicant:	No.1, Food Avenue,Jingshan Comprehensive District, Shanggao Prefecture Industrial Park Yichun, Jiangxi, China
Manufacturer:	JiangXi MeiDong Technology Co., Ltd.
Address of Manufacturer:	No.1, Food Avenue,Jingshan Comprehensive District, Shanggao Prefecture Industrial Park Yichun, Jiangxi, China
EUT INFORMATION	
Product Name:	Soundbar Speaker
Brand Name:	N/A
Model Name:	KY-2027
Sample Received Date:	Jun. 12, 2026
Sample Number:	S2606050110-1#
Applicable Standards	47 CFR Part 15.247
Measurement Procedures	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 KDB 558074 D01 15.247 Meas Guidance v05r02
This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report. This report shall not be reproduced except in full, without the written approval of Shenzhen NTEK Testing Technology Co., Ltd., this document may be altered or revised by Shenzhen NTEK Testing Technology Co., Ltd., personnel only, and shall be noted in the revision of the document. The test results of this report relate only to the tested sample identified in this report.	
Date of Test:	Sept. 18, 2026 to Oct. 12, 2026
Issue Date:	Oct. 12, 2026

Prepared By:	Reviewed by:	Approved By:
Mary Hu (Project Engineer)	Aaron Cheng (Supervisor)	Alex Li (Manager)

4. Facilities and Accreditations

4.1 Facilities

All measurement facilities used to collect the measurement data are located at
No. 24 Xinfa East Road, Xiangshan Community, Xinqiao Street, Baoan District, Shenzhen, Guangdong, People's Republic of China.
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 16-1-4.

4.2 Laboratory Accreditations And Listings

Site Description

CNAS-Lab.	:	Registration Code L5516
A2LA-Lab.	:	Certificate Number 4298.01
FCC-Accredited	:	Test Firms Registration Number: 463705 Designation Number: CN1184
ISED Wireless Device Testing Laboratories	:	The ISED Company Number is 9270A CAB identifier:CN0074

4.3 Measurement Uncertainty

The reported uncertainty of measurement y±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.	
Item	Uncertainty
Conductions emission-power port(0.15MHz ~ 30MHz)	3.30dB
FCC_Occupied bandwidth(2G/3G/4G/5G)	0.01
RF Power, conducted	1.34dB
Spurious emissions, conducted	2.71dB
Radiated Spurious Emissions(1GHz ~ 18GHz)	4.9dB
Radiated Spurious Emissions(9kHz ~ 30MHz)	5.26dB
Radiated Spurious Emissions(30MHz ~ 1GHz)	5.1dB
Radiated Spurious Emissions(18GHz ~ 40GHz)	5.76dB

5. General Description of EUT

5.1 Details of E.U.T.

Product Name	Soundbar Speaker
Brand Name	N/A
Model Name	KY-2027
Family Model	KY-2027M，KY-2027C，KY-2027D, KY-2023, KY-2023D, KY-2023M
Model Difference	All of the models are identical, The model KY-2027 selected for testing serves as the main representative model for the entire family model (KY-2027M, KY-2027C, KY-2027D, KY-2023, KY-2023D, KY-2023M) and represents the most stringent test conditions of the whole series. It can cover other models and is compatible with risks associated with other models, the only difference is the soundbar grille, where cloth and iron.

5.2 EUT Feature And Specification

Operation Frequency	2402MHz to 2480MHz		
Modulation	GFSK		
Number of Channels	39		
Antenna Type	On-board Antenna		
Antenna Gain	1.9 dBi		
Rating	DC 24V, 2A Adapter: Model: GA240020U INPUT:100-240V~, 50/60Hz 1.8A OUTPUT: 24.0V⎓2.0A 48W		
Power Supply	DC24V, 2A		
Hardware Version	N/A		
Software Version	N/A		
Frequency and Channel list:			
Channel	Frequency(MHz)	Channel	Frequency(MHz)
0	2402	19	2440
1	2404	20	2442
...	...	...	...
17	2436	38	2478
18	2438	39	2480
Note 1: The above information was declared by manufacturer. Note 2: F=2402MHz+k×2MHz (k=0,1,2,⋯,39)			

Note: Laboratory evaluation test cloth soundbar grille and iron soundbar grille, iron soundbar grille is the worst case

5.3 Deviation from Standards

None

5.4 Abnormalities from Standard Condition

None

6. Description of Test Modes and Operation Configuration of EUT

6.1 Description of Test Modes

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases were recorded in this report.
b. AC power line Conducted Emission was tested under maximum output power.
c. The measurements are performed at the highest, middle, lowest available channels.
d. The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

The following summary table is showing all test modes to demonstrate in compliance with the standard

No	Title	Description
TM1	TX-BLE 1M mode	Keep the EUT in continuously transmitting mode with GFSK modulation at lowest, middle and highest channel.

Note: Model KY-2027 selected as representative model for the test and its data was recorded in this report.

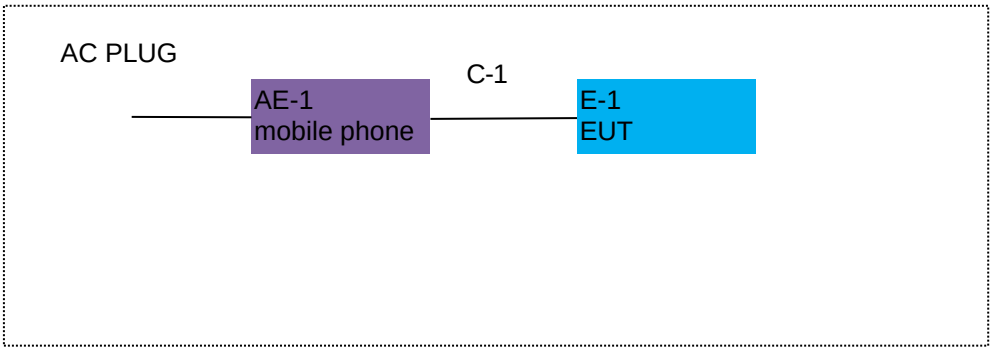
6.2 Operation Configuration of EUT

Test Software	MV_AP82xx_BP10xx_PC_Tools_V2.2.15(2021.11.12)			
RF Power Setting as following:				
Mode	Occupied Bandwidth	Channel	Frequency(MHz)	Power Setting Value
GFSK	1MHz	0	2402	default
GFSK	1MHz	19	2440	default
GFSK	1MHz	39	2480	default
Note: The above information was declared by manufacturer.				

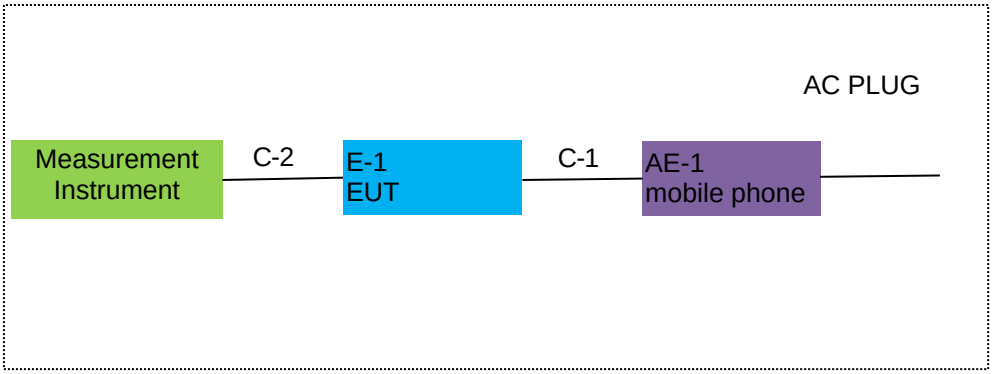
7. Setup Of Equipment Under Test

7.1 Block Diagram Configuration Of Test System

For Radiated Test Cases



For Conducted Test Cases



Note: 1. The temporary antenna connector is soldered on the PCB board in order to perform conducted tests.

7.2 Support Equipment

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Title	Manufacturer	Model No.	Serial No.
/	/	/	/

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	mobile phone	xiaomi13	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	DC cable	NO	NO	1.5m
C-2	RF cable	YES	NO	0.1m

Note:
Notes:
(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

8. Equipment List

Conducted measurements at antenna port					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Cal Due Date
Power meter	MWRFtest	MW100-PSB	N/A	2026-09-01	2027-08-31
Power meter	MWRFtest	MW100-PSB	N/A	2026-09-01	2027-08-31
Power meter	MWRFtest	MW100-PSB	N/A	2026-09-01	2027-08-31
Power meter	MWRFtest	MW100-PSB	N/A	2026-09-01	2027-08-31
Spread spectrum device	MWRFtest	MW100-7UD	N/A	2026-09-01	2027-08-31
Spectrum Analyzer	R&S	FSV40	101417	2026-04-08	2027-04-07
MXG Vector Signal Generator	Agilent	N5182A	MY47070317	2026-04-08	2027-04-07
Shielding Room	Taihe Mao Rui Electronic	743	N/A	2025-01-03	2028-01-02
USB RF Power Sensor	DARE	RPR3006W	15I00041SNO84	2026-04-08	2027-04-07

Radiated spurious emissions					
Equipment	Manufacturer	Model No	Serial No.	Cal Date	Cal Due Date
Low Noise Amplifier	EMC Solutions	TRLA-180400G50	25102901	2026-04-08	2027-04-07
Wideband Radio Communication Tester	R&S	CMW500	153336	2026-04-08	2027-04-07
Spectrum Analyzer	Keysight	N9020B	MY60112710	2025-12-25	2026-12-24
Semi Anechoic Chamber	N/A	966	N/A	2024-05-20	2027-05-19
Spectrum Analyzer	Keysight	N9020A	MY53280244	2026-04-15	2027-04-14
Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2816	2024-05-18	2027-05-17
AMPLIFIER	Sonoma	310N	186604	2026-04-08	2027-04-07
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	803	2024-05-12	2027-05-11
Active Loop Antenna	SCHWARZBECK	FMZB 1519 B	055	2024-05-17	2027-05-16
Spectrum Analyzer	R&S	FSV40	101417	2026-04-08	2027-04-07
Low Noise Amplifier	B&Z	BZ-P540-550850-452727	16476-11729	2026-04-16	2027-04-15
Pre-Amplifier	EMC	EMC051835SE	980246	2026-04-08	2027-04-07
Broadband Horn Antenna	EM	EM-AH-10180	2011071402	2024-05-12	2027-05-11

Measurement Software

Manufacturer	Software Name	Software Version	Description
MWRFtest	MTS 8310 2.4GHz/5GHz	2.0	RF Conducted Test
Farad	EZ-EMC_RE	AIT-03A	Radiated Test

9. Evaluation Results (Evaluation)

9.1 Antenna requirement

Test Requirement:	Refer to 47 CFR Part 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.
Test Method:	---

9.2 Conclusion:

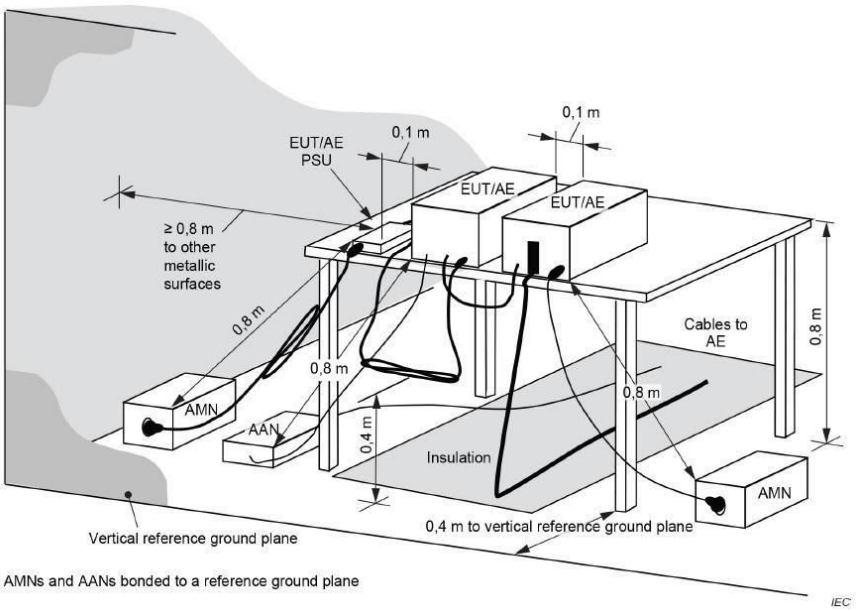
The EUT uses a On-board Antenna, the max antenna gain is 1.9 dBi, which is deemed to comply with the antenna requirement.

10. Radio Spectrum Matter Test Results (RF)

10.1 Conducted Emission at AC power line

<table>
<tr><td>Test Requirement:</td><td>Refer to 47 CFR 15.207(a), Except as shown in paragraphs (b)and (c)of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).</td></tr>
<tr><td>Test Limit:</td><td><table>
<tr><td rowspan="2">Frequency of emission (MHz)</td><td colspan="2">Conducted limit (dBμV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>*Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 6.2
KDB 558074 D01 15.247 Meas Guidance v05r02</td></tr>
<tr><td>Procedure:</td><td>a) The mains terminal disturbance voltage test was conducted in a shielded room.
b) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω 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.
c) 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,
d) 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.
e) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
f) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver’s pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
g) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.</td></tr>
</table>

10.1.1 Test Setup Diagram:

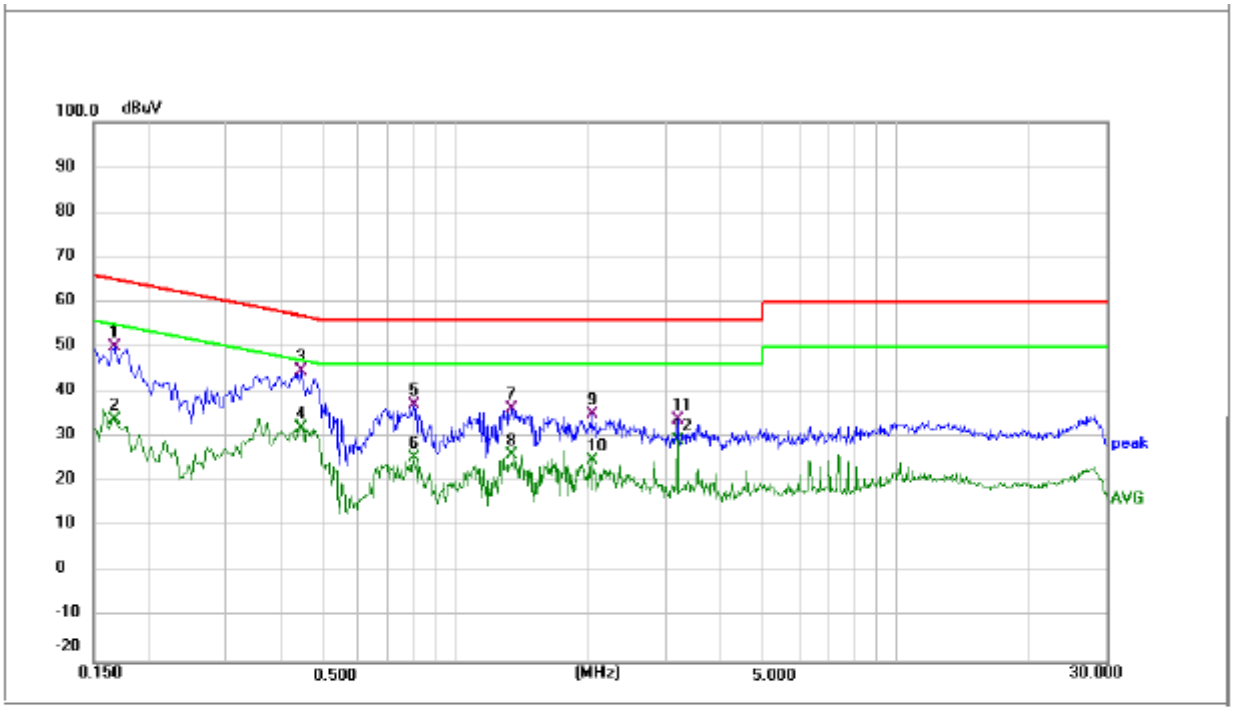


10.1.2 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	61 %	Atmospheric Pressure:	1001 mbar
Pre test mode:	TM1				
Final test mode:	TM1				

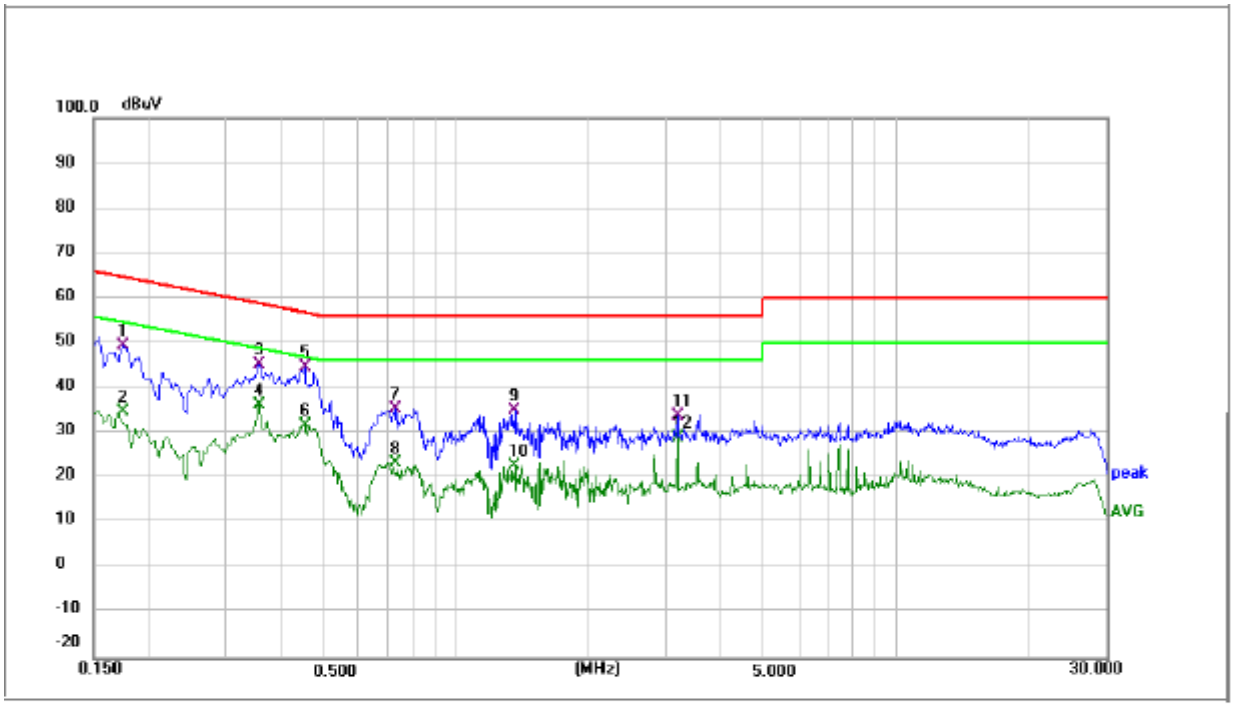
10.1.3 Test Data:

TM1 / Line: Line / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1660	29.62	20.38	50.00	65.16	-15.16	QP	P	
2	0.1660	13.51	20.38	33.89	55.16	-21.27	AVG	P	
3 *	0.4420	24.09	20.45	44.54	57.02	-12.48	QP	P	
4	0.4420	11.72	20.45	32.17	47.02	-14.85	AVG	P	
5	0.8059	16.82	20.43	37.25	56.00	-18.75	QP	P	
6	0.8059	4.98	20.43	25.41	46.00	-20.59	AVG	P	
7	1.3380	15.99	20.28	36.27	56.00	-19.73	QP	P	
8	1.3380	5.71	20.28	25.99	46.00	-20.01	AVG	P	
9	2.0420	14.78	20.27	35.05	56.00	-20.95	QP	P	
10	2.0420	4.57	20.27	24.84	46.00	-21.16	AVG	P	
11	3.1740	13.49	20.27	33.76	56.00	-22.24	QP	P	
12	3.1740	8.95	20.27	29.22	46.00	-16.78	AVG	P	

TM1 / Line: Neutral / Band: 2400-2483.5 MHz / BW: 1 / CH: N

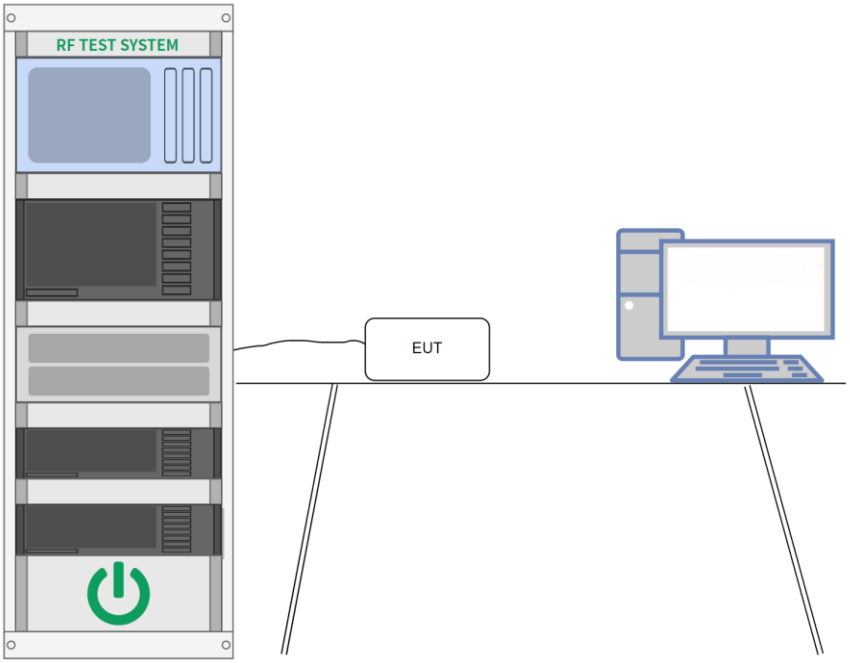


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1740	28.96	20.37	49.33	64.77	-15.44	QP	P	
2	0.1740	14.36	20.37	34.73	54.77	-20.04	AVG	P	
3	0.3540	24.70	20.47	45.17	58.87	-13.70	QP	P	
4	0.3540	15.77	20.47	36.24	48.87	-12.63	AVG	P	
5 *	0.4500	24.18	20.39	44.57	56.88	-12.31	QP	P	
6	0.4500	11.41	20.39	31.80	46.88	-15.08	AVG	P	
7	0.7300	14.90	20.50	35.40	56.00	-20.60	QP	P	
8	0.7300	2.86	20.50	23.36	46.00	-22.64	AVG	P	
9	1.3619	14.84	20.25	35.09	56.00	-20.91	QP	P	
10	1.3619	2.36	20.25	22.61	46.00	-23.39	AVG	P	
11	3.1780	13.72	20.18	33.90	56.00	-22.10	QP	P	
12	3.1780	8.73	20.18	28.91	46.00	-17.09	AVG	P	

10.2 Duty cycle

Test Requirement:	Reporting purposes only
Test Limit:	---
Test Method:	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 11.6 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer. Use the following spectrum analyzer settings: a) Set the center frequency of the instrument to the center frequency of the transmission. b) Set RBW ⩾ OBW if possible; otherwise, set RBW to the largest available value. c) Set VBW ⩾ RBW. Set detector = peak or average.

10.2.1 Test Setup Diagram:



10.2.2 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	54 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

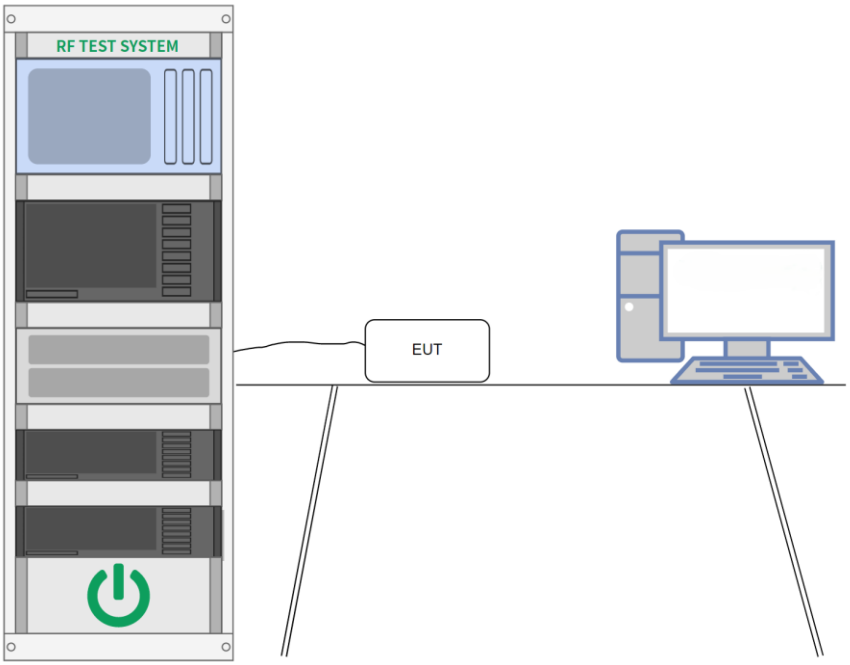
10.2.3 Test Data:

Please Refer to Appendix for Details.

10.3 6dB Bandwidth

Test Requirement:	47 CFR 15.247(a)(2)
Test Limit:	Refer to 47 CFR 15.247(a)(2), Systems using digital modulation techniques may operate in the 902-928 MHz, and 2400-2483.5 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Test Method:	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 11.8 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	11.8.1 Option 1 The steps for the first option are as follows: a) Set RBW = shall be in the range of 1% to 5% of the OBW but not less than 100 kHz. b) Set the VBW ≥ [3 × RBW]. c) Detector = peak. d) Trace mode = max-hold. e) Sweep = No faster than coupled (auto) time. f) Allow the trace to stabilize. g) Measure the maximum width of the emission by placing two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−6 dB down amplitude". If a marker is below this "−6 dB down amplitude" value, then it shall be as close as possible to this value. 11.8.2 Option 2 The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz, VBW ≥ 3 × RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB. Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

10.3.1 Test Setup Diagram:



10.3.2 E.U.T. Operation:

Operating Environment:

Temperature:	25 °C	Humidity:	54 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

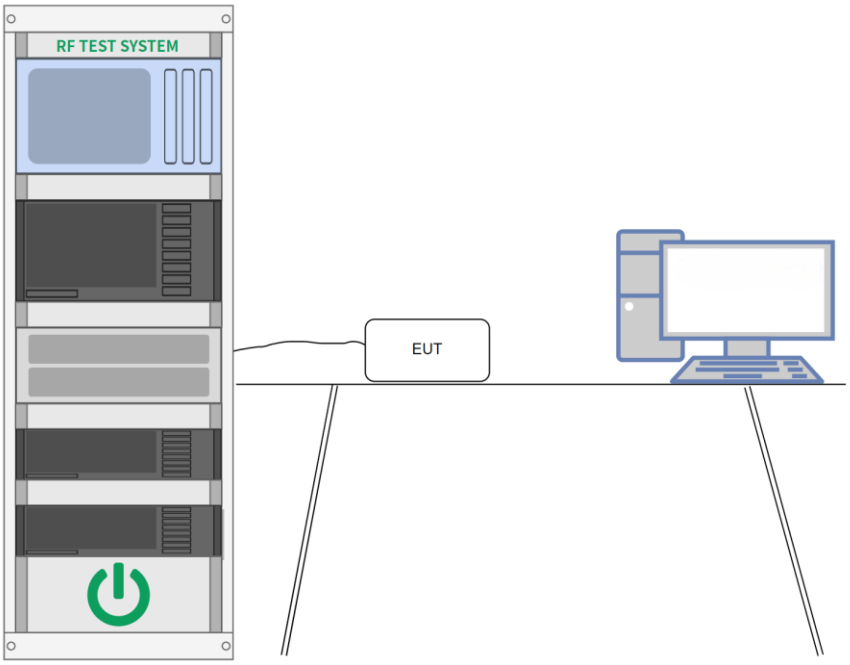
10.3.3 Test Data:

Please Refer to Appendix for Details.

10.4 Maximum Conducted Output Power

Test Requirement:	47 CFR 15.247(b)(3)
Test Limit:	Refer to 47 CFR 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. 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.
Test Method:	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 11.9.1 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer. Use the following spectrum analyzer settings: a) Set the RBW ⩾ DTS bandwidth. b) Set VBW ⩾ [3 × RBW]. c) Set span ⩾ [3 × RBW]. d) Sweep time = No faster than coupled (auto) time. 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. Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

10.4.1 Test Setup Diagram:



10.4.2 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	54 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

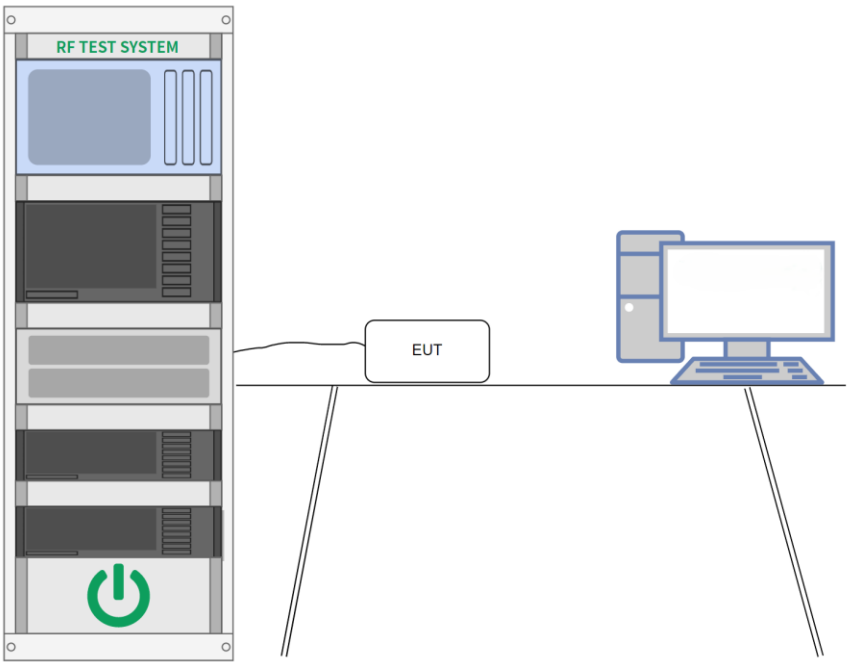
10.4.3 Test Data:

Please Refer to Appendix for Details.

10.5 Power Spectral Density

Test Requirement:	47 CFR 15.247(e)
Test Limit:	Refer to 47 CFR 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+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024, section 11.10 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer. 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 kHz ⩽ RBW ⩽ 100 kHz. d) Set the VBW ⩾ [3 × RBW]. 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. Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

10.5.1 Test Setup Diagram:



10.5.2 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	54 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

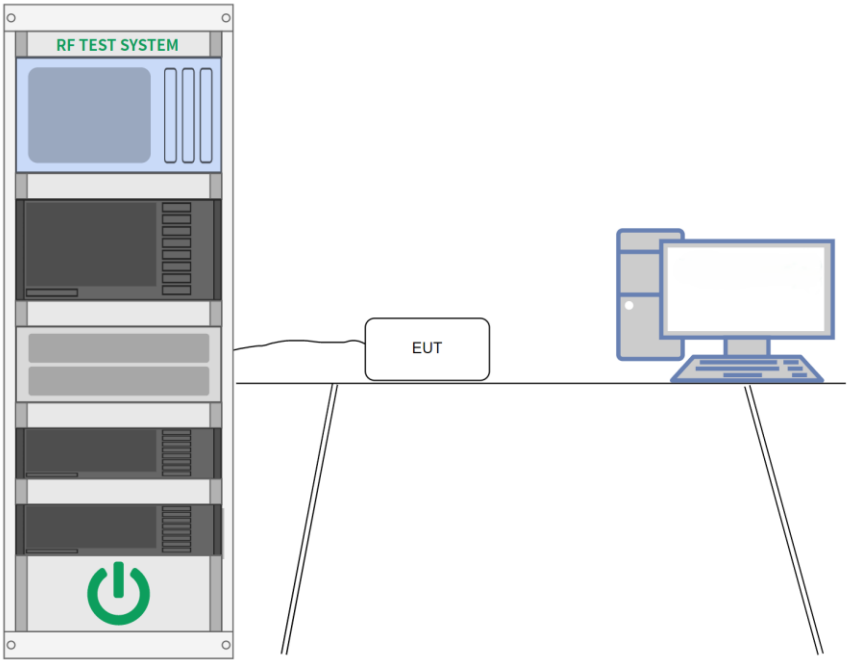
10.5.3 Test Data:

Please Refer to Appendix for Details.

10.6 Emissions in non-restricted frequency bands

Test Requirement:	47 CFR 15.247(d)
Test Limit:	Refer to 47 CFR 15.247(d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required.
Test Method:	ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 11.11 KDB 558074 D01 15.247 Meas Guidance v05r02
Procedure:	Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer. Use the following spectrum analyzer settings: Step 1: Reference level measurement Establish a reference level by using the following procedure: a) Set instrument center frequency to DTS channel center frequency. b) Set the span to ⩾ 1.5 times the DTS bandwidth. c) Set the RBW = 100 kHz. d) Set the VBW ⩾ [3 × RBW]. 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 PSD level. Note that the channel found to contain the maximum PSD level can be used to establish the reference level. Step 2: Emission level measurement Establish an emission level by using the following procedure: a) Set the center frequency and span to encompass frequency range to be measured. Note that the frequency range might need to be divided into multiple frequency ranges to retain frequency resolution. NOTE—the number of points can also be increased for large spans to retain frequency resolution b) Set the RBW = 100 kHz. c) Set the VBW ⩾ [3 × RBW]. d) Detector = peak. e) Sweep time = No faster than coupled (auto) time. f) Trace mode = max-hold. g) Allow trace to fully stabilize. h) Use the peak marker function to determine the maximum amplitude level. Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

10.6.1 Test Setup Diagram:



10.6.2 E.U.T. Operation:

Operating Environment:					
Temperature:	25 °C	Humidity:	54 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

10.6.3 Test Data:

Please Refer to Appendix for Details.

10.7 Band edge emissions (Radiated)

Test Requirement:

Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).

Test Limit:

Frequency (MHz)	Field strength (microvolts/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., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Table 1 – Restricted frequency bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Test Method:

ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.10
KDB 558074 D01 15.247 Meas Guidance v05r02

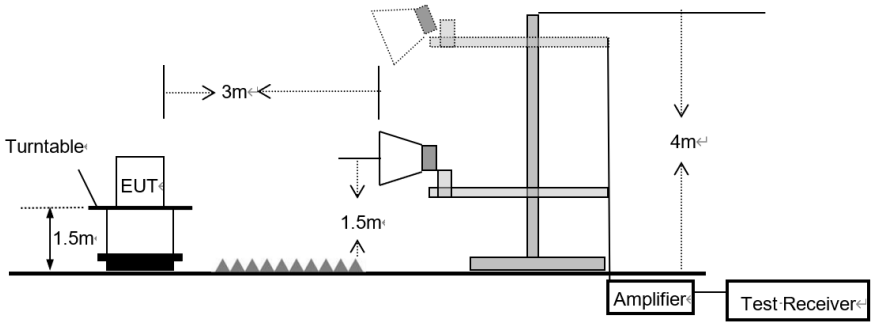
Procedure:

Radiated band edge measurements at 2390 MHz and 2483.5 MHz were made with the unit transmitting in the low end of the channel range and the high end closest to the restricted bands respectively. The emissions were made on the 966 Semi-Chamber. Use (resolution bandwidth (RBW) = 1 MHz, video bandwidth (VBW) = 3 MHz for peak levels and RBW = 1 MHz and VBW = 10 Hz or 1/T for average levels).
a) Use radiated spurious emission test procedure described in clause 10.12. The transmitter output (antenna port) was connected to the antenna.
b) Set the PK and AV limit line.
c) Record the fundamental emission and emissions out of the band-edge.
d) Determine band-edge compliance as required.

Where,

	a) Factor = Antenna Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically. b) Level = Reading + Factor. c) Margin = Level – Limit

10.7.1 Test Setup Diagram:

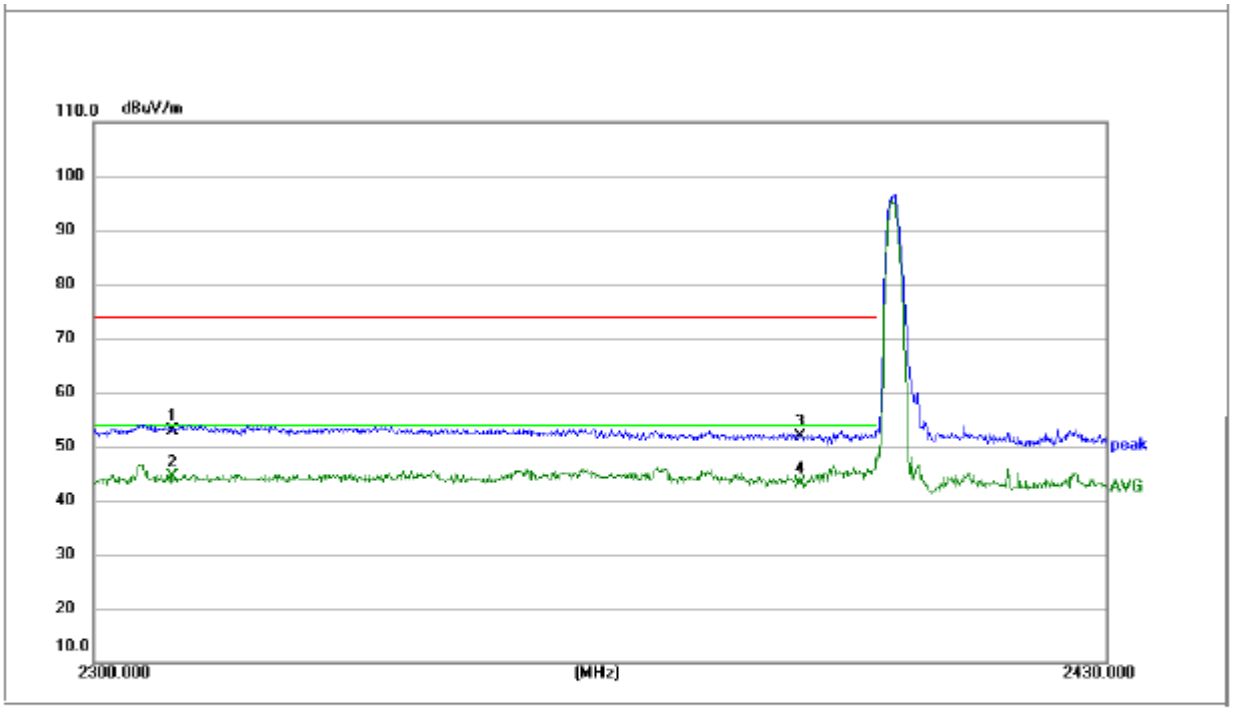


10.7.2 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	52 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1				
Final test mode:	TM1				

10.7.3 Test Data:

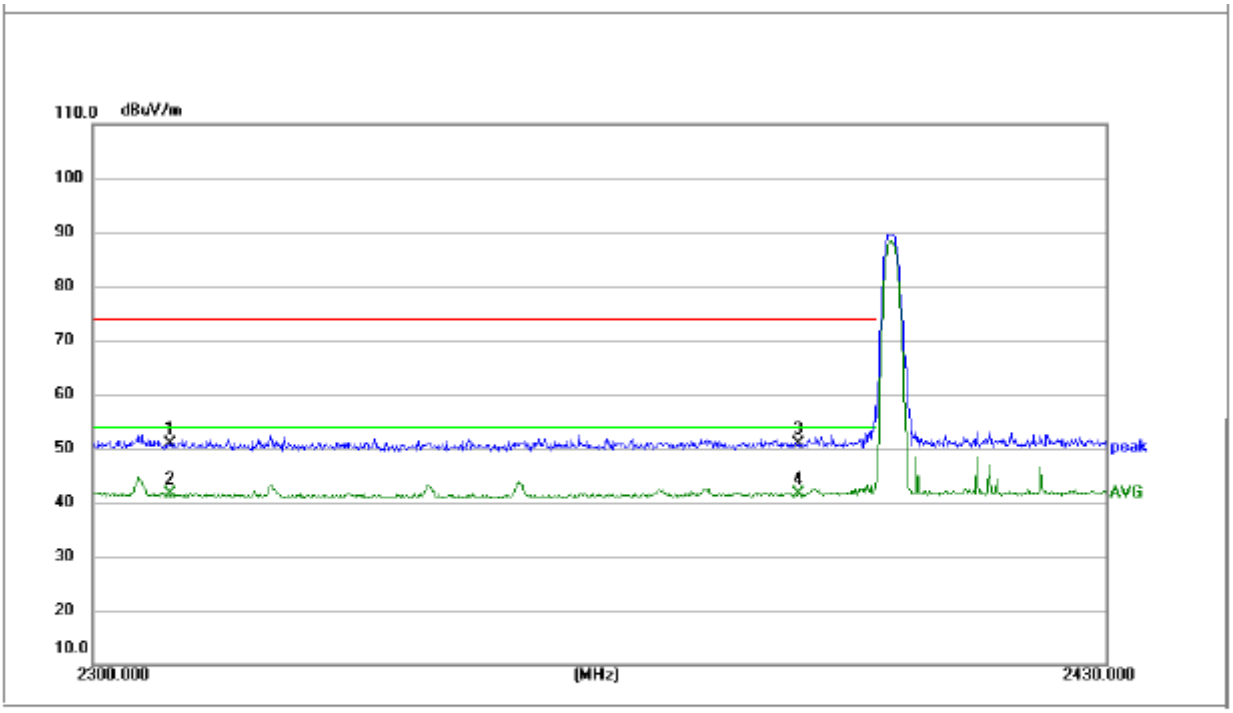
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2310.000	23.01	29.97	52.98	74.00	-21.02	peak	P	
2 *	2310.000	14.30	29.97	44.27	54.00	-9.73	AVG	P	
3	2390.000	21.94	29.88	51.82	74.00	-22.18	peak	P	
4	2390.000	13.21	29.88	43.09	54.00	-10.91	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

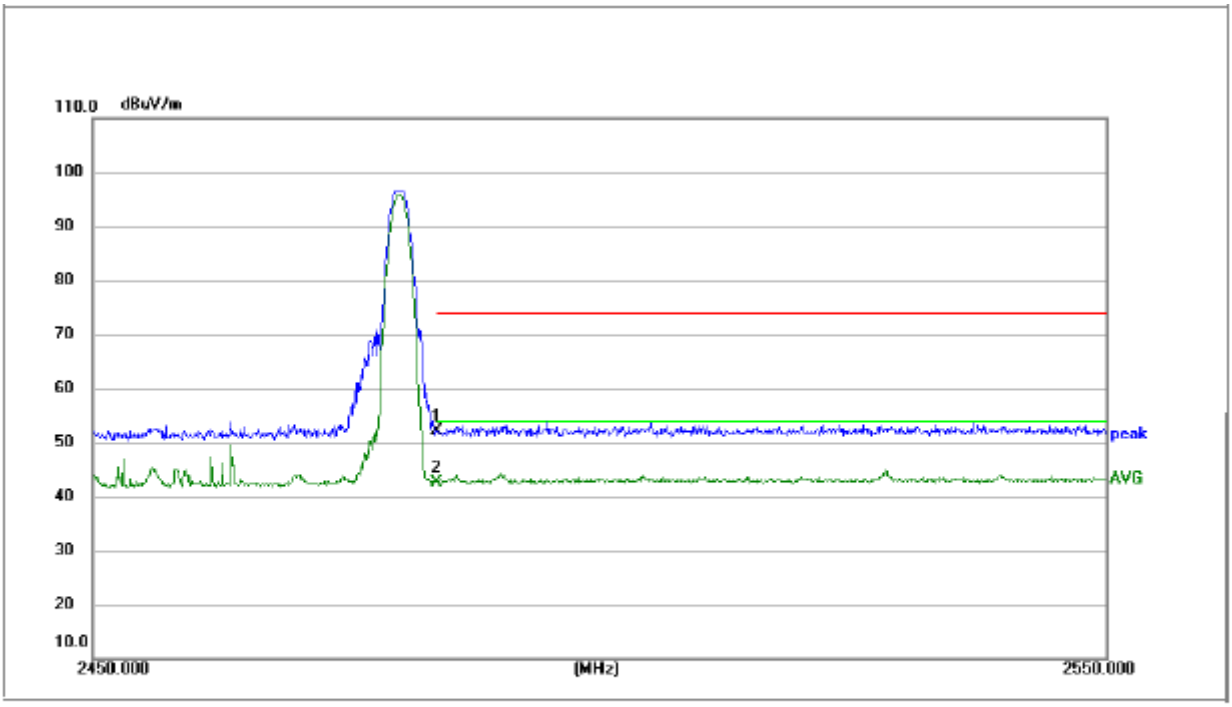
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2310.000	20.89	29.97	50.86	74.00	-23.14	peak	P	
2 *	2310.000	11.75	29.97	41.72	54.00	-12.28	AVG	P	
3	2390.000	21.03	29.88	50.91	74.00	-23.09	peak	P	
4	2390.000	11.74	29.88	41.62	54.00	-12.38	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

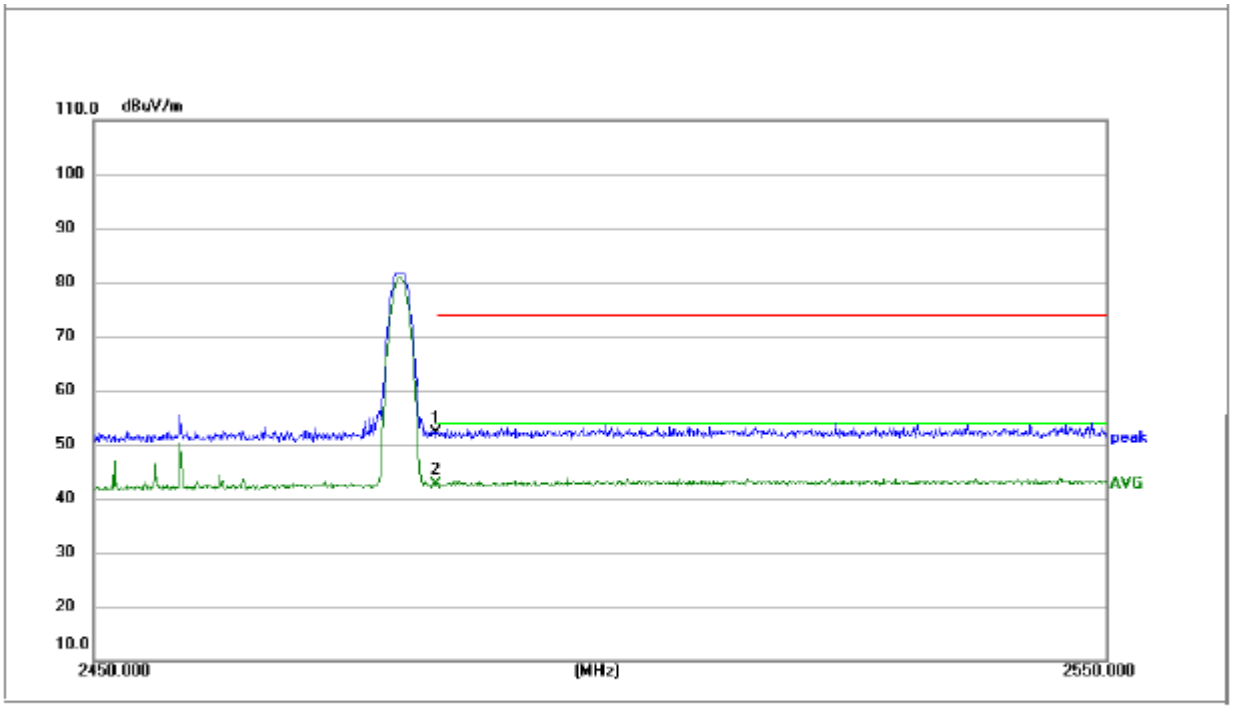
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	21.38	30.69	52.07	74.00	-21.93	peak	P	
2 *	2483.500	12.04	30.69	42.73	54.00	-11.27	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	2483.500	21.50	30.69	52.19	74.00	-21.81	peak	P	
2 *	2483.500	11.98	30.69	42.67	54.00	-11.33	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

10.8 Emissions in frequency bands (below 30MHz)

Test Requirement:

Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).

Test Limit:

Frequency (MHz)	Field strength (microvolts/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., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Table 1 – Restricted frequency bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Test Method:

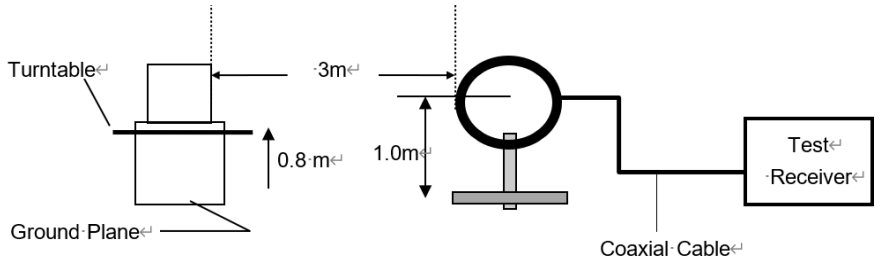
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.4
KDB 558074 D01 15.247 Meas Guidance v05r02

Procedure:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna.
c) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights 1 meter and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
d) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
e) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

	f) The radiation measurements are performed in X, Y, Z axis positioning. only the test worst case mode is recorded in the report.(for portable and mobile devices) Where, a) Factor = Antenna Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically. b) Level = Reading + Factor. c) Margin = Level – Limit

10.8.1 Test Setup Diagram:



10.8.2 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	52 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1, TM2				
Final test mode:	TM1				

10.8.3 Test Data:

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

10.9 Emissions in frequency bands (30M - 1GHz)

Test Requirement:

Refer to 47 CFR 15.247(d), In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).

Test Limit:

Frequency (MHz)	Field strength (microvolts/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., §§ 15.231 and 15.241.

In the emission table above, the tighter limit applies at the band edges.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Table 1 – Restricted frequency bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Test Method:

ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.5.4

KDB 558074 D01 15.247 Meas Guidance v05r02

Procedure:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

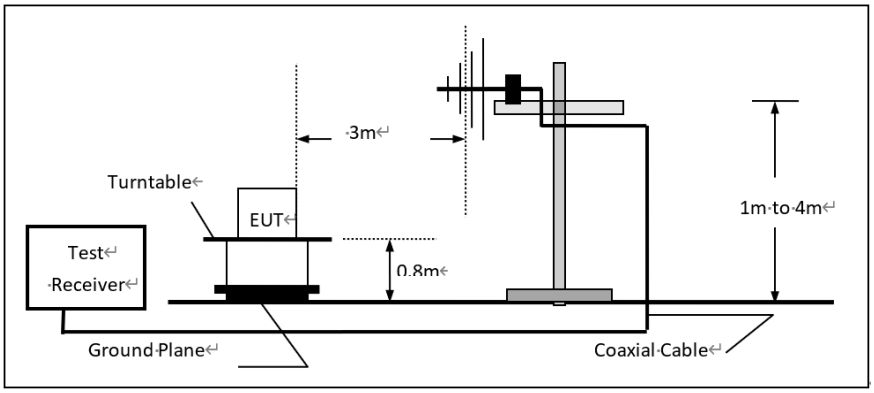
c) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

	f) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Where, a) Factor = Antenna Factor + Cable Loss, the value was added to Original Receiver Reading by the software automatically. b) Level = Reading + Factor. c) Margin = Level – Limit

10.9.1 Test Setup Diagram:

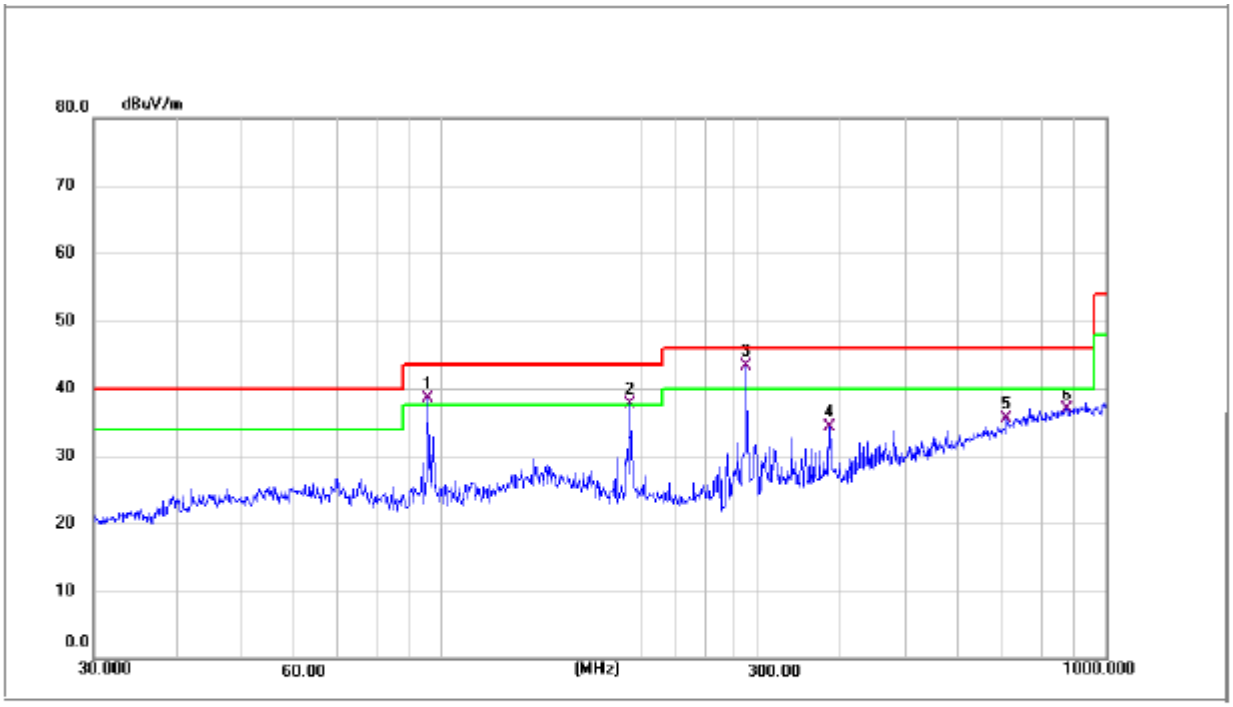


10.9.2 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	52 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1, TM2				
Final test mode:	TM1				

10.9.3 Test Data:

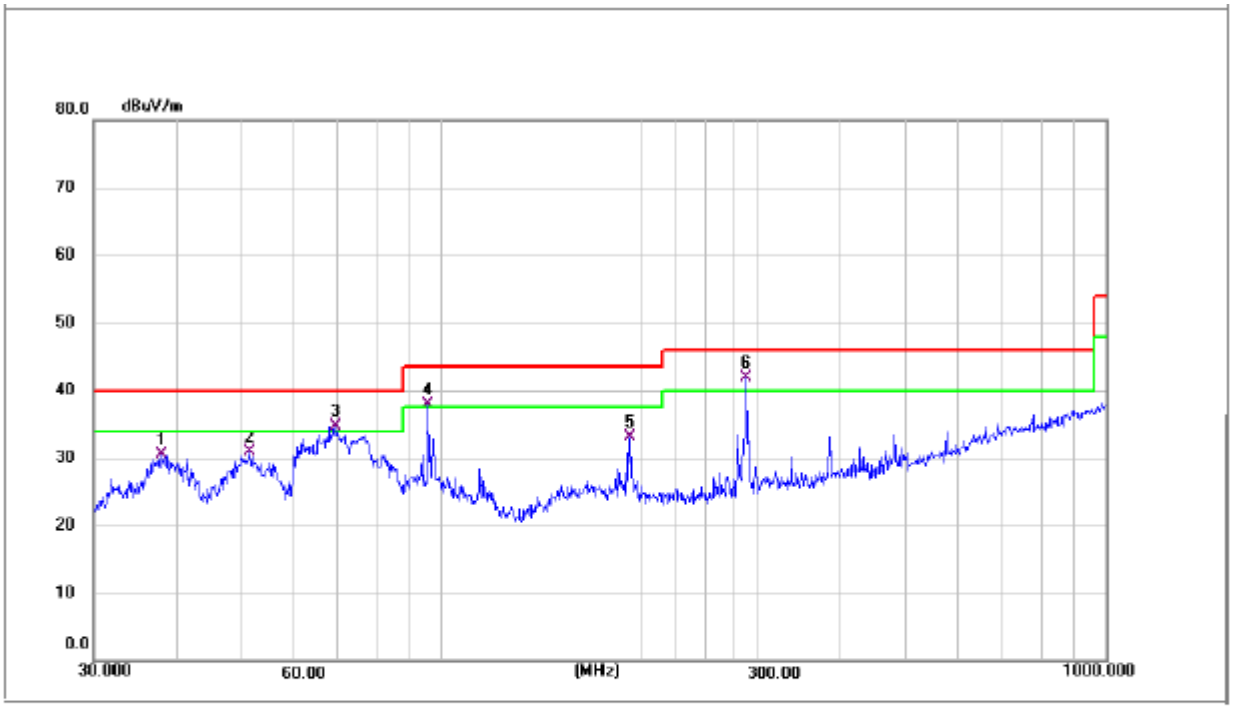
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 !	95.4270	21.41	17.16	38.57	43.50	-4.93	QP	P	
2 !	192.4182	20.62	17.06	37.68	43.50	-5.82	QP	P	
3 *	287.9904	23.21	20.01	43.22	46.00	-2.78	QP	P	
4	383.9318	11.98	22.24	34.22	46.00	-11.78	QP	P	
5	709.1820	7.40	28.16	35.56	46.00	-10.44	QP	P	
6	875.2470	7.08	29.87	36.95	46.00	-9.05	QP	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	37.9450	12.28	18.19	30.47	40.00	-9.53	QP	P	
2	51.4806	11.15	19.69	30.84	40.00	-9.16	QP	P	
3 !	69.3568	18.27	16.39	34.66	40.00	-5.34	QP	P	
4 !	95.4270	20.82	17.16	37.98	43.50	-5.52	QP	P	
5	192.4182	16.04	17.06	33.10	43.50	-10.40	QP	P	
6 *	287.9904	21.94	20.01	41.95	46.00	-4.05	QP	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

10.10 Emissions in frequency bands (1G - 18GHz)

Test Requirement:

Refer to 47 CFR 15.247(d), in addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).

Test Limit:

Frequency (MHz)	Field strength (microvolts/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., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Table 1 – Restricted frequency bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Test Method:

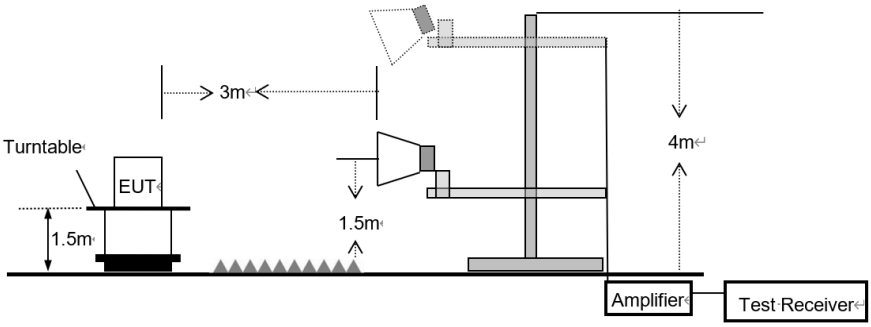
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.6
KDB 558074 D01 15.247 Meas Guidance v05r02

Procedure:

a) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

	e) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g) Test the EUT in the lowest channel ,middle channel, the Highest channel h) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, only the test worst case is recorded in the report. i) Repeat above procedures until all frequencies measured was complete. Where, a) Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically. b) Level = Reading + Factor. c) Margin = Level – Limit

10.10.1 Test Setup Diagram:

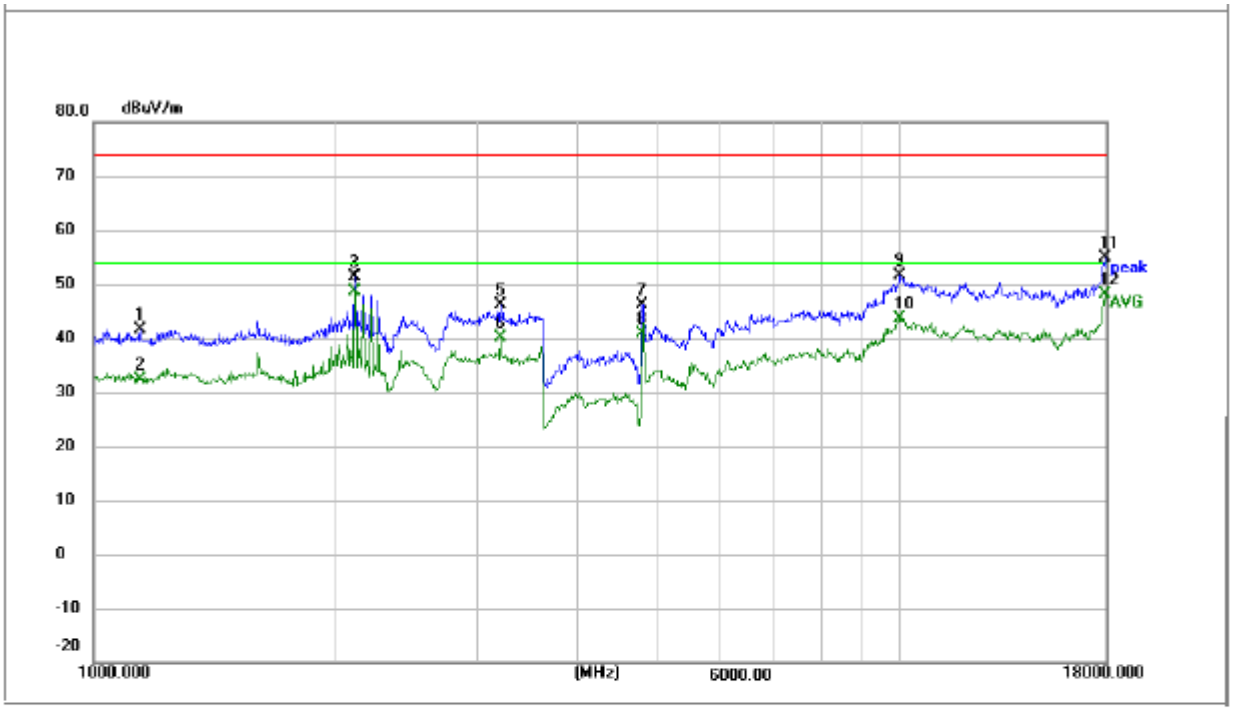


10.10.2 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	52 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1, TM2				
Final test mode:	TM1				

10.10.3 Test Data:

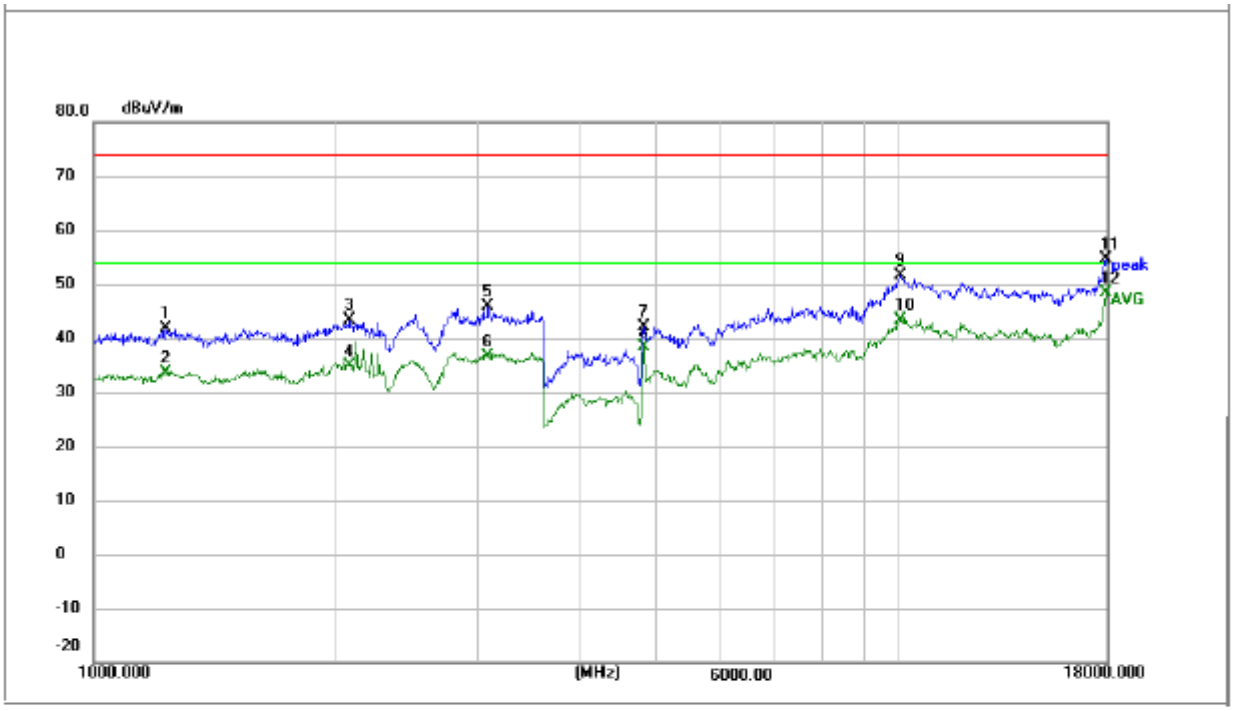
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1145.350	59.85	-18.13	41.72	74.00	-32.28	peak	P	
2	1145.350	50.49	-18.13	32.36	54.00	-21.64	AVG	P	
3	2113.925	63.33	-11.91	51.42	74.00	-22.58	peak	P	
4 *	2113.925	60.53	-11.91	48.62	54.00	-5.38	AVG	P	
5	3203.200	54.90	-8.78	46.12	74.00	-27.88	peak	P	
6	3203.200	48.98	-8.78	40.20	54.00	-13.80	AVG	P	
7	4803.750	52.51	-6.35	46.16	74.00	-27.84	peak	P	
8	4803.750	47.25	-6.35	40.90	54.00	-13.10	AVG	P	
9	10026.575	45.17	6.40	51.57	74.00	-22.43	peak	P	
10	10026.575	37.14	6.40	43.54	54.00	-10.46	AVG	P	
11	17996.600	41.27	13.63	54.90	74.00	-19.10	peak	P	
12	17996.600	34.42	13.63	48.05	54.00	-5.95	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

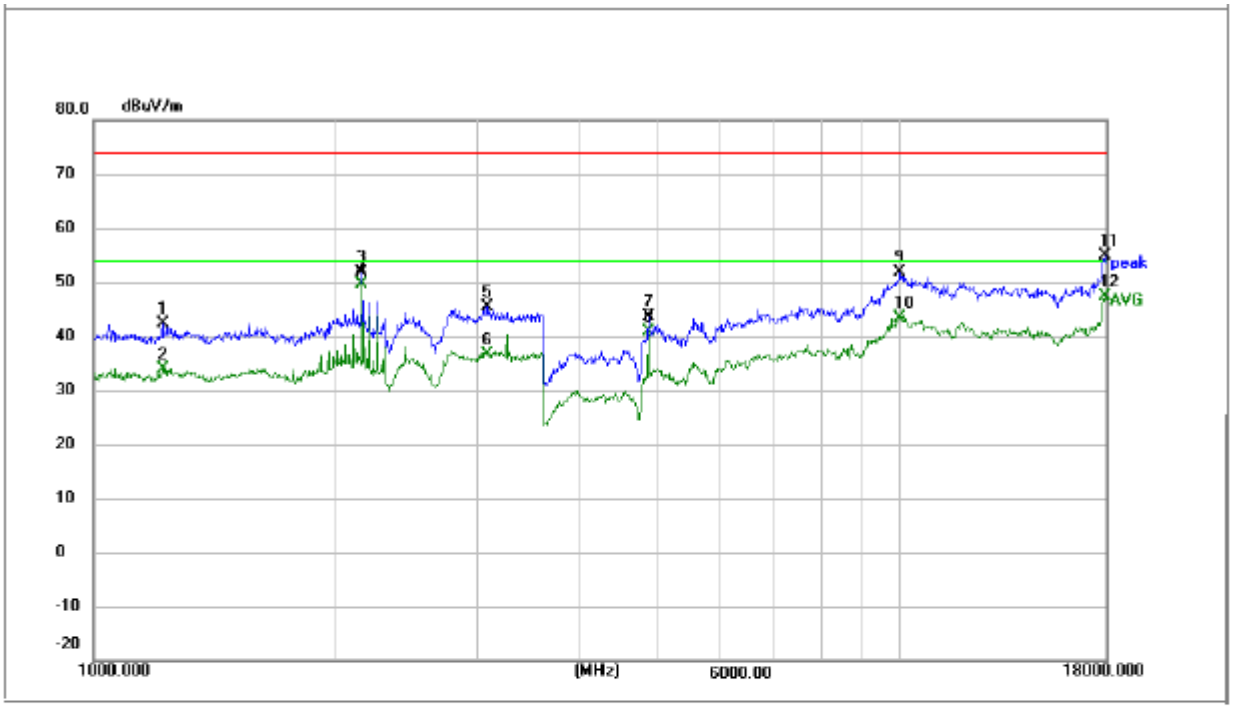
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1230.350	59.25	-17.38	41.87	74.00	-32.13	peak	P	
2	1230.350	51.08	-17.38	33.70	54.00	-20.30	AVG	P	
3	2075.675	55.44	-12.03	43.41	74.00	-30.59	peak	P	
4	2075.675	46.81	-12.03	34.78	54.00	-19.22	AVG	P	
5	3085.050	55.06	-9.18	45.88	74.00	-28.12	peak	P	
6	3085.050	45.84	-9.18	36.66	54.00	-17.34	AVG	P	
7	4804.600	48.36	-6.34	42.02	74.00	-31.98	peak	P	
8	4804.600	44.62	-6.34	38.28	54.00	-15.72	AVG	P	
9	10032.525	45.17	6.45	51.62	74.00	-22.38	peak	P	
10	10032.525	36.94	6.45	43.39	54.00	-10.61	AVG	P	
11	17990.650	41.06	13.61	54.67	74.00	-19.33	peak	P	
12 *	17990.650	34.67	13.61	48.28	54.00	-5.72	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

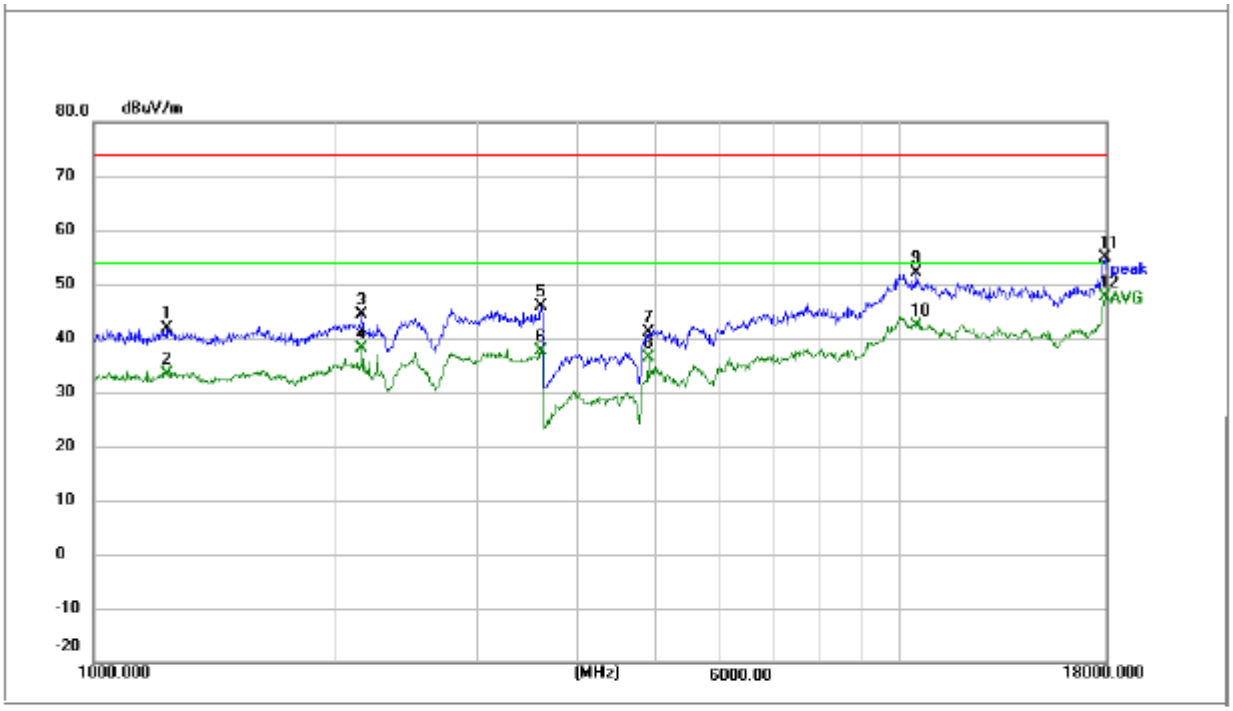
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1219.725	59.76	-17.49	42.27	74.00	-31.73	peak	P	
2	1219.725	51.40	-17.49	33.91	54.00	-20.09	AVG	P	
3	2151.750	63.99	-12.17	51.82	74.00	-22.18	peak	P	
4 *	2151.750	61.70	-12.17	49.53	54.00	-4.47	AVG	P	
5	3077.400	54.69	-9.20	45.49	74.00	-28.51	peak	P	
6	3077.400	45.87	-9.20	36.67	54.00	-17.33	AVG	P	
7	4880.250	50.11	-6.55	43.56	74.00	-30.44	peak	P	
8	4880.250	47.42	-6.55	40.87	54.00	-13.13	AVG	P	
9	10019.775	45.59	6.36	51.95	74.00	-22.05	peak	P	
10	10019.775	37.02	6.36	43.38	54.00	-10.62	AVG	P	
11	17972.800	41.35	13.55	54.90	74.00	-19.10	peak	P	
12	17972.800	33.82	13.55	47.37	54.00	-6.63	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

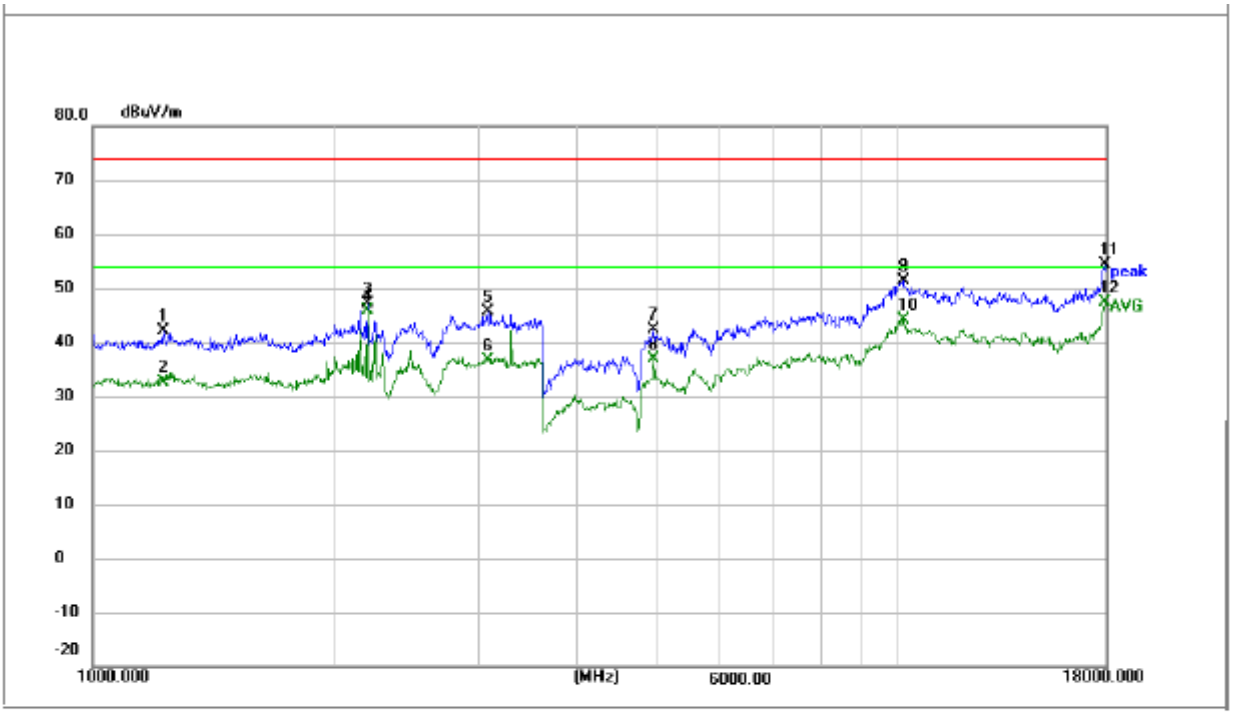
TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: M



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1238.425	59.24	-17.29	41.95	74.00	-32.05	peak	P	
2	1238.425	50.63	-17.29	33.34	54.00	-20.66	AVG	P	
3	2151.750	56.65	-12.17	44.48	74.00	-29.52	peak	P	
4	2151.750	50.31	-12.17	38.14	54.00	-15.86	AVG	P	
5	3598.025	54.26	-8.49	45.77	74.00	-28.23	peak	P	
6	3598.025	46.08	-8.49	37.59	54.00	-16.41	AVG	P	
7	4880.675	47.76	-6.56	41.20	74.00	-32.80	peak	P	
8	4880.675	42.83	-6.56	36.27	54.00	-17.73	AVG	P	
9	10486.850	46.91	5.33	52.24	74.00	-21.76	peak	P	
10	10486.850	36.99	5.33	42.32	54.00	-11.68	AVG	P	
11	17999.150	41.16	13.64	54.80	74.00	-19.20	peak	P	
12 *	17999.150	34.05	13.64	47.69	54.00	-6.31	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

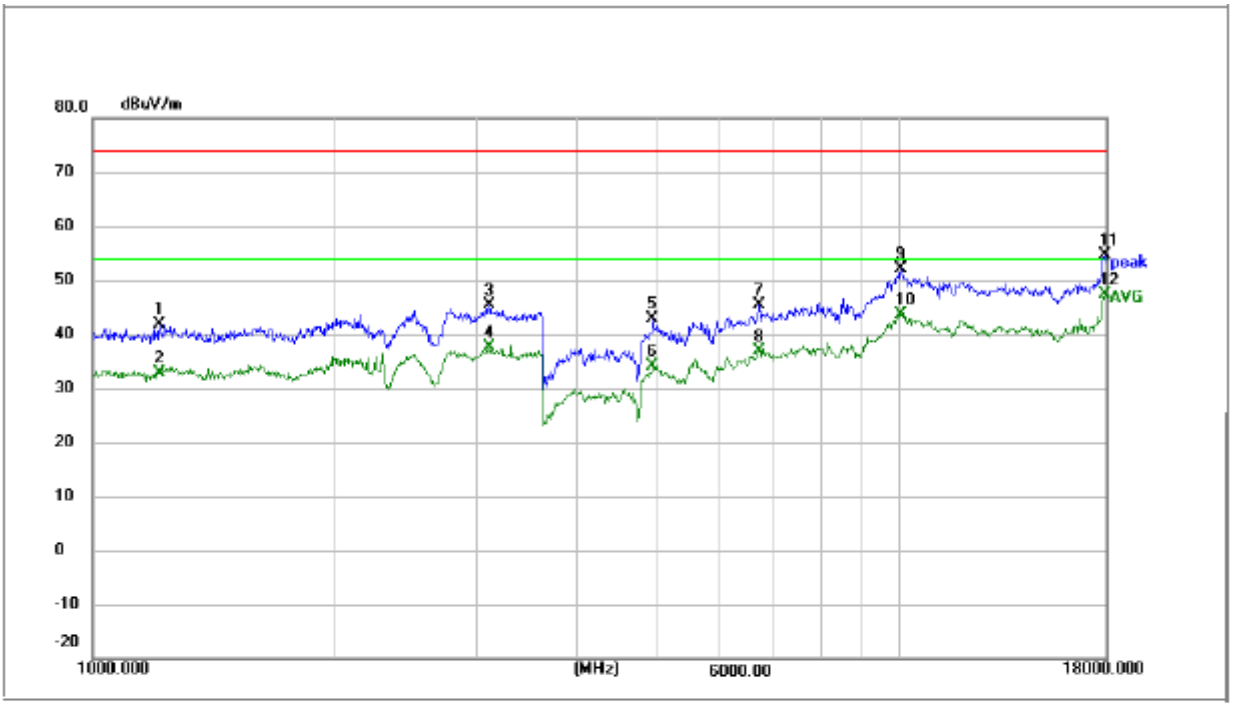
TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1224.400	59.52	-17.44	42.08	74.00	-31.92	peak	P	
2	1224.400	50.01	-17.44	32.57	54.00	-21.43	AVG	P	
3	2192.125	60.21	-12.98	47.23	74.00	-26.77	peak	P	
4	2192.125	58.75	-12.98	45.77	54.00	-8.23	AVG	P	
5	3087.600	54.73	-9.17	45.56	74.00	-28.44	peak	P	
6	3087.600	45.90	-9.17	36.73	54.00	-17.27	AVG	P	
7	4960.575	47.69	-5.40	42.29	74.00	-31.71	peak	P	
8	4960.575	42.30	-5.40	36.90	54.00	-17.10	AVG	P	
9	10098.400	44.52	6.94	51.46	74.00	-22.54	peak	P	
10	10098.400	37.23	6.94	44.17	54.00	-9.83	AVG	P	
11	17998.300	40.72	13.63	54.35	74.00	-19.65	peak	P	
12 *	17998.300	33.79	13.63	47.42	54.00	-6.58	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: H



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	1212.925	59.40	-17.56	41.84	74.00	-32.16	peak	P	
2	1212.925	50.50	-17.56	32.94	54.00	-21.06	AVG	P	
3	3097.375	54.67	-9.17	45.50	74.00	-28.50	peak	P	
4	3097.375	46.70	-9.17	37.53	54.00	-16.47	AVG	P	
5	4956.325	48.17	-5.37	42.80	74.00	-31.20	peak	P	
6	4956.325	39.47	-5.37	34.10	54.00	-19.90	AVG	P	
7	6698.825	47.86	-2.54	45.32	74.00	-28.68	peak	P	
8	6698.825	39.45	-2.54	36.91	54.00	-17.09	AVG	P	
9	10044.850	45.62	6.53	52.15	74.00	-21.85	peak	P	
10	10044.850	37.19	6.53	43.72	54.00	-10.28	AVG	P	
11	17997.450	41.03	13.63	54.66	74.00	-19.34	peak	P	
12 *	17997.450	33.63	13.63	47.26	54.00	-6.74	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

10.11 Emissions in frequency bands (above 18GHz)

Test Requirement:

Refer to 47 CFR 15.247(d), in addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)(see § 15.205(c)).

Test Limit:

Frequency (MHz)	Field strength (microvolts/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., §§ 15.231 and 15.241.
In the emission table above, the tighter limit applies at the band edges.
The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Table 1 – Restricted frequency bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Test Method:

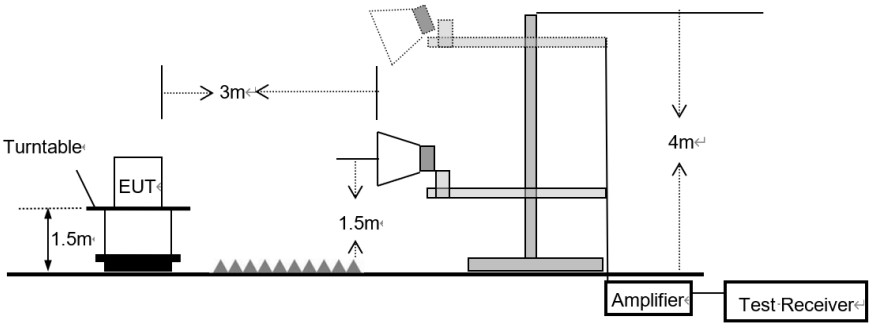
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024 section 6.6
KDB 558074 D01 15.247 Meas Guidance v05r02

Procedure:

a) The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

	e) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. g) Test the EUT in the lowest channel ,middle channel, the Highest channel h) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, only the test worst case is recorded in the report. i) Repeat above procedures until all frequencies measured was complete. Where, a) Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically. b) Level = Reading + Factor. c) Margin = Level – Limit

10.11.1 Test Setup Diagram:

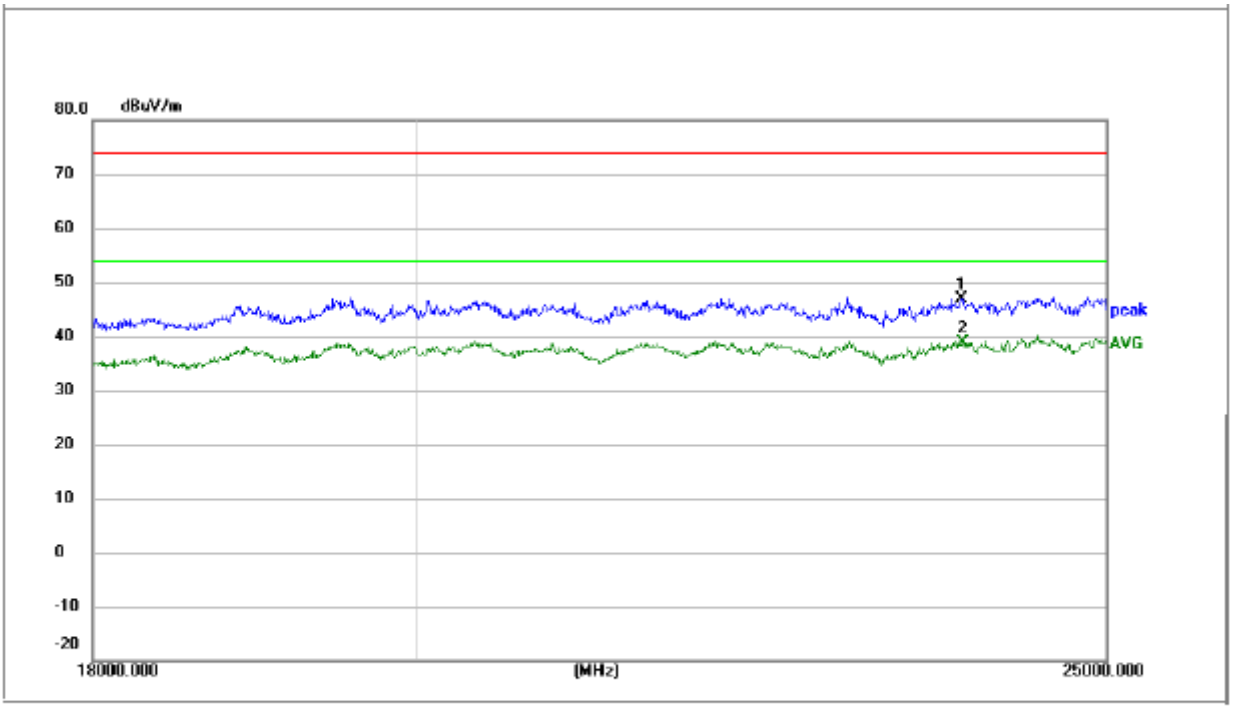


10.11.2 E.U.T. Operation:

Operating Environment:					
Temperature:	23 °C	Humidity:	52 %	Atmospheric Pressure:	1010 mbar
Per-test mode:	TM1, TM2				
Final test mode:	TM1				

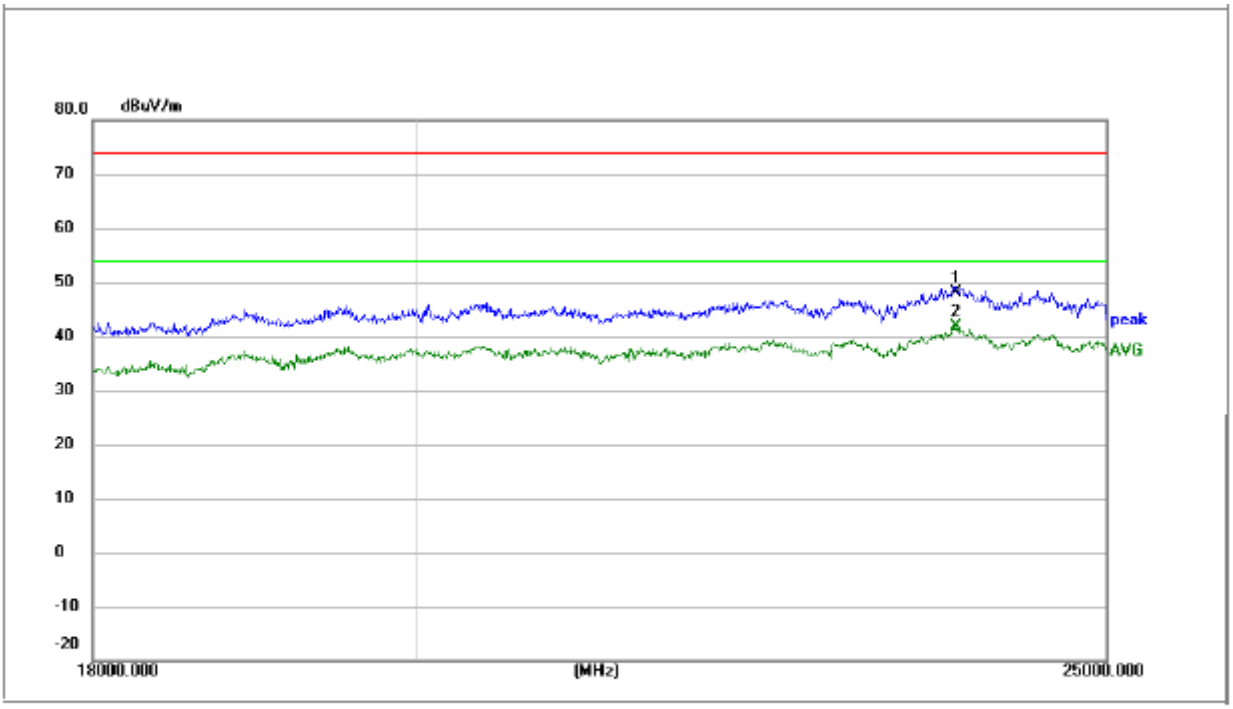
10.11.3 Test Data:

TM1 / Polarization: Horizontal / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	23864.250	58.28	-11.33	46.95	74.00	-27.05	peak	P	
2 *	23871.600	50.25	-11.31	38.94	54.00	-15.06	AVG	P	

TM1 / Polarization: Vertical / Band: 2400-2483.5 MHz / BW: 1 / CH: L



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	23821.200	59.65	-11.42	48.23	74.00	-25.77	peak	P	
2 *	23826.625	53.29	-11.40	41.89	54.00	-12.11	AVG	P	

Note: All the modulation modes have been tested, and the worst case result was reported.

11. Test Setup Photos

Refer to Appendix - Test Setup Photos

12. EUT Constructional Details (EUT Photos)

Refer to Appendix - EUT Photos

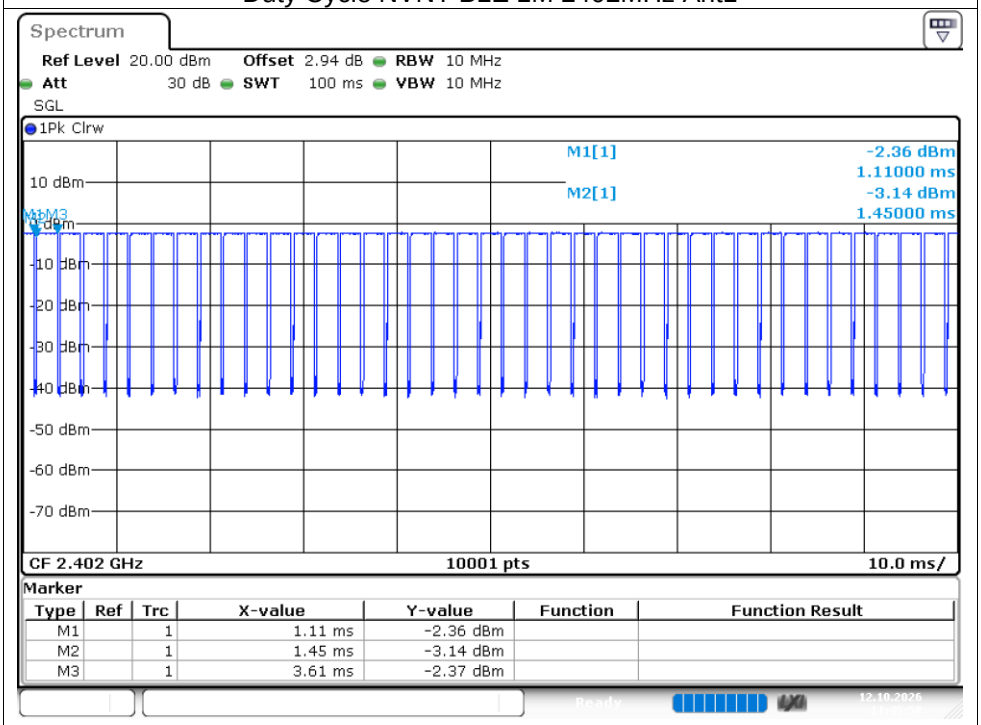
Appendix A

A1 Duty Cycle

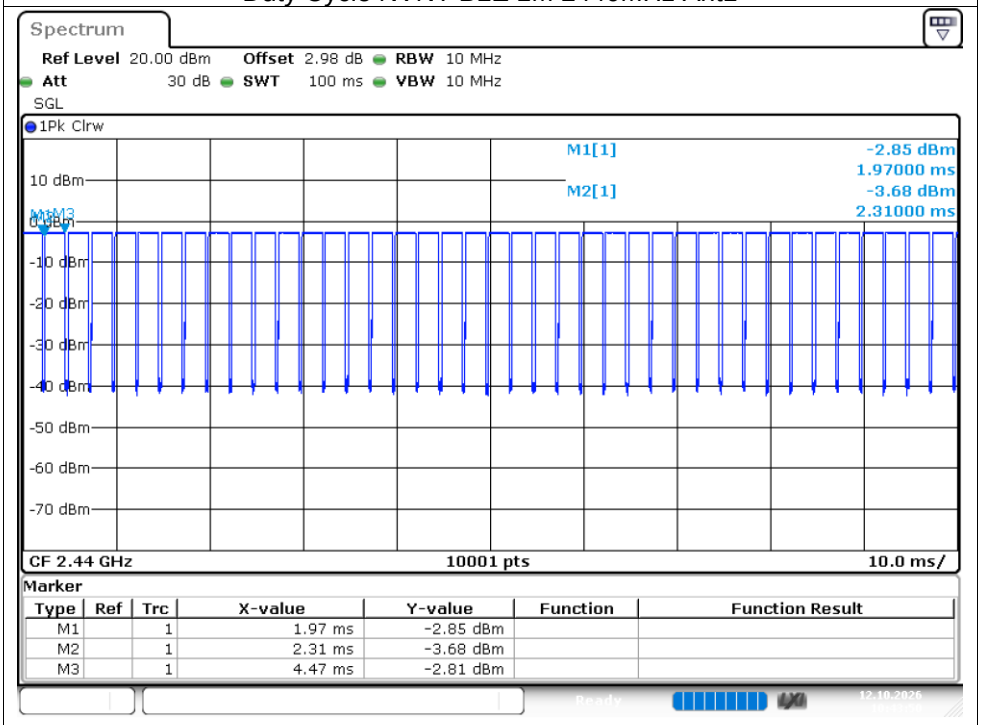
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	86.8	0.61	0.46
NVNT	BLE 1M	2440	Ant1	86.8	0.61	0.46
NVNT	BLE 1M	2480	Ant1	86.8	0.61	0.46

Test Graphs

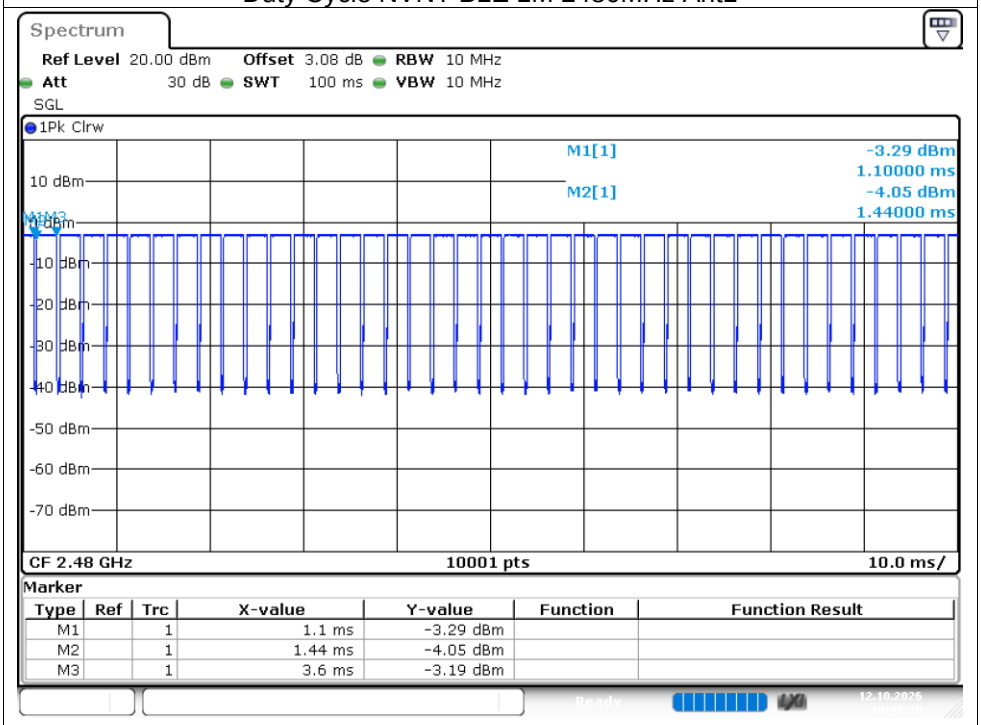
Duty Cycle NVNT BLE 1M 2402MHz Ant1



Duty Cycle NVNT BLE 1M 2440MHz Ant1



Duty Cycle NVNT BLE 1M 2480MHz Ant1

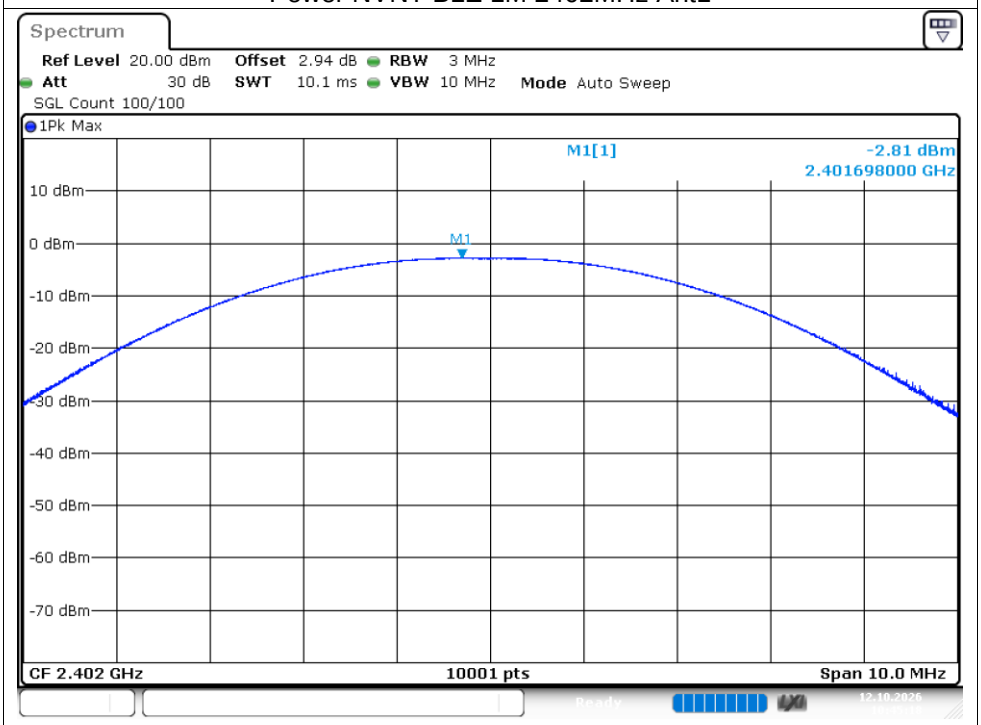


A2 Maximum Conducted Output Power

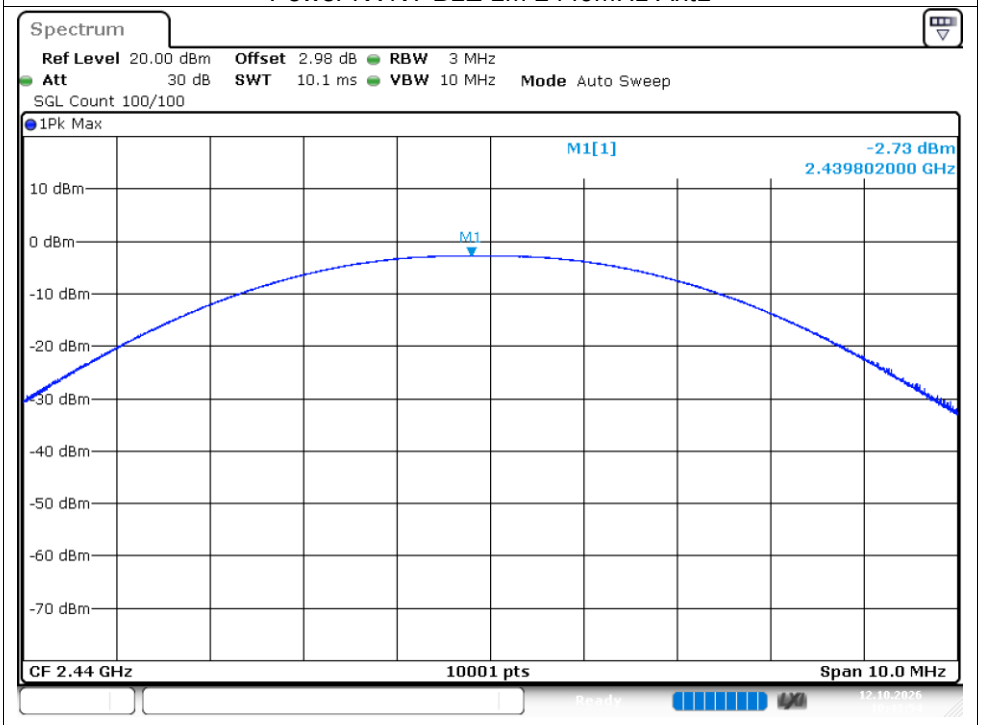
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	-2.81	30	Pass
NVNT	BLE 1M	2440	Ant1	-2.73	30	Pass
NVNT	BLE 1M	2480	Ant1	-3.07	30	Pass

Test Graphs

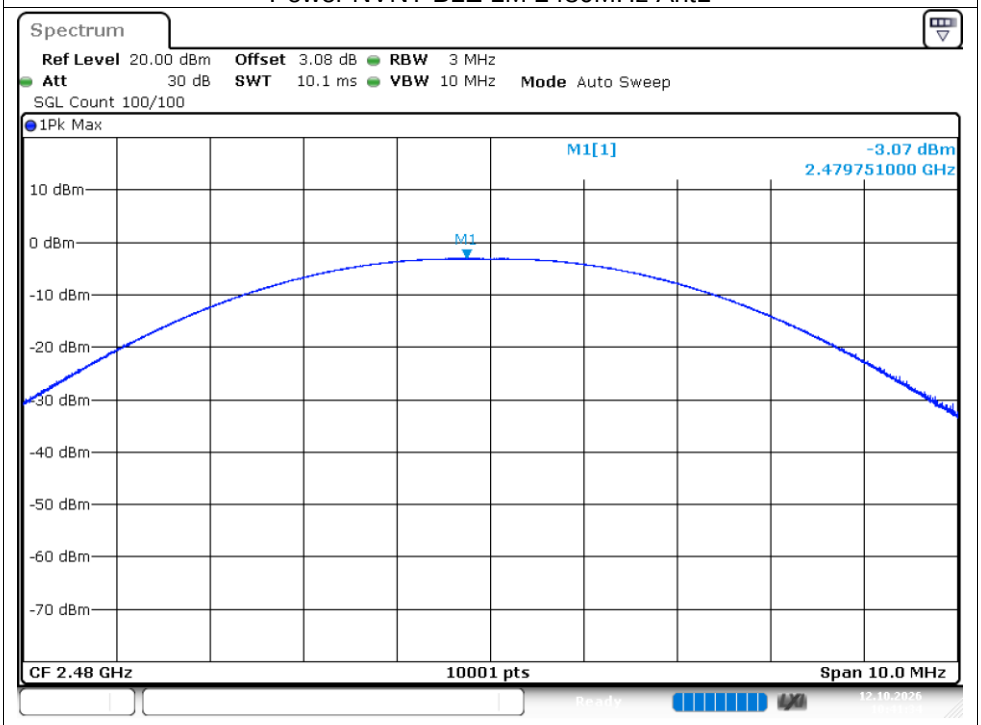
Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1



Power NVNT BLE 1M 2480MHz Ant1

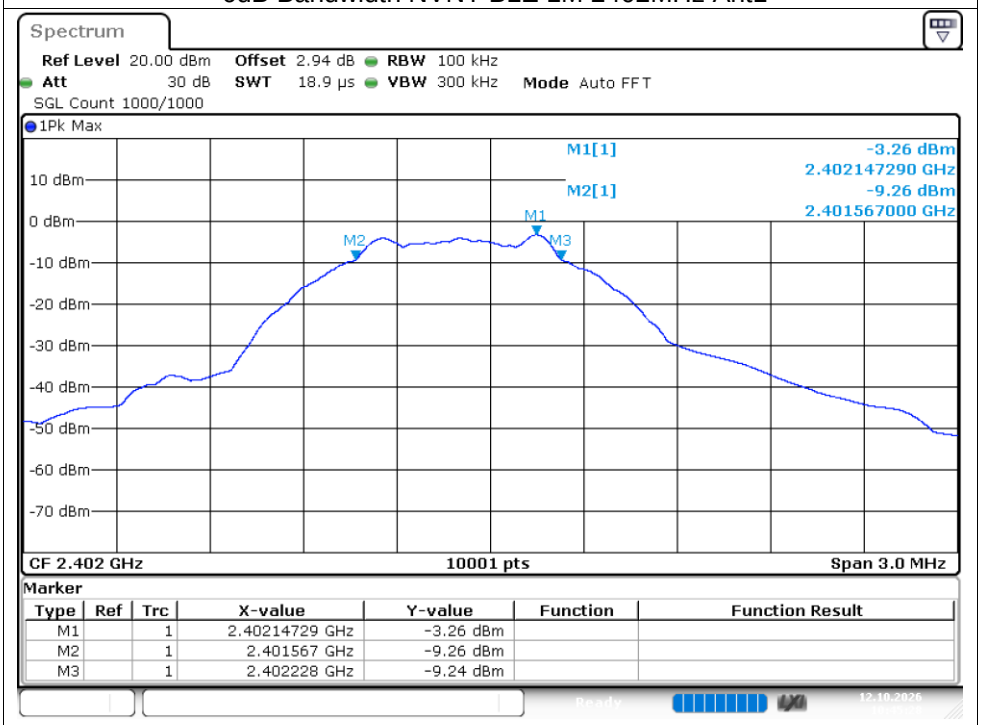


A3 -6dB Bandwidth

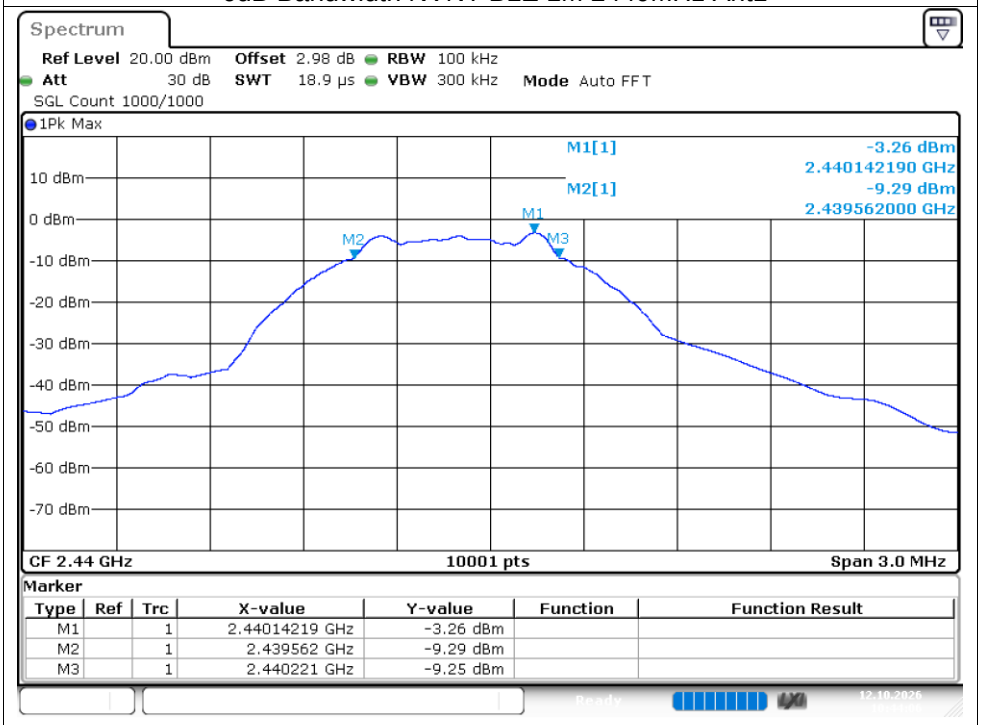
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.661	0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.659	0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.662	0.5	Pass

Test Graphs

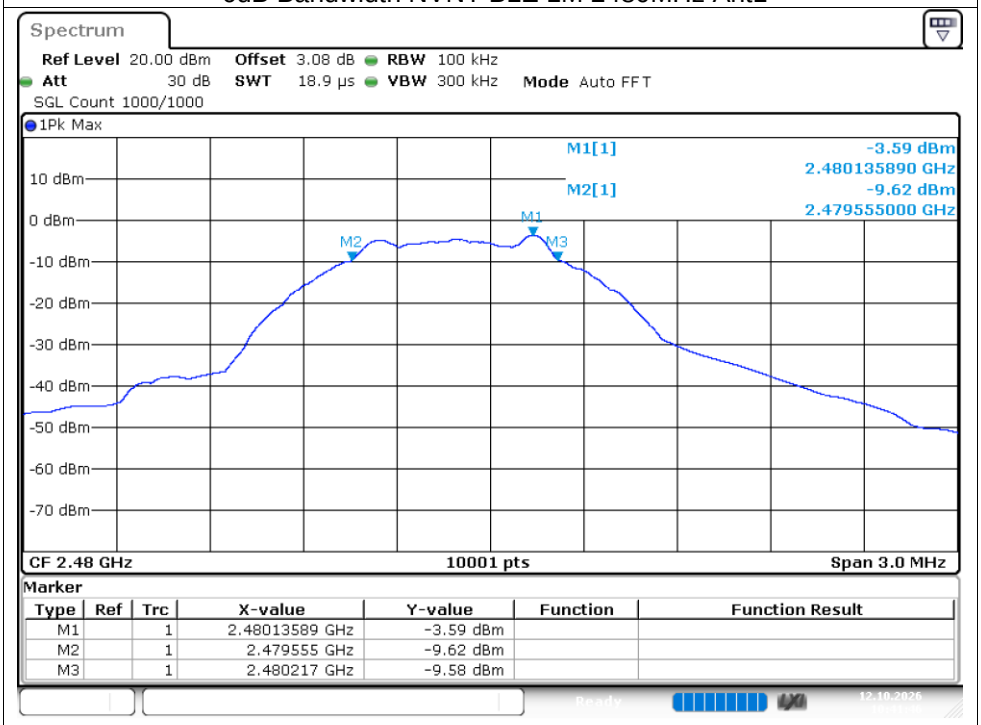
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



Marker

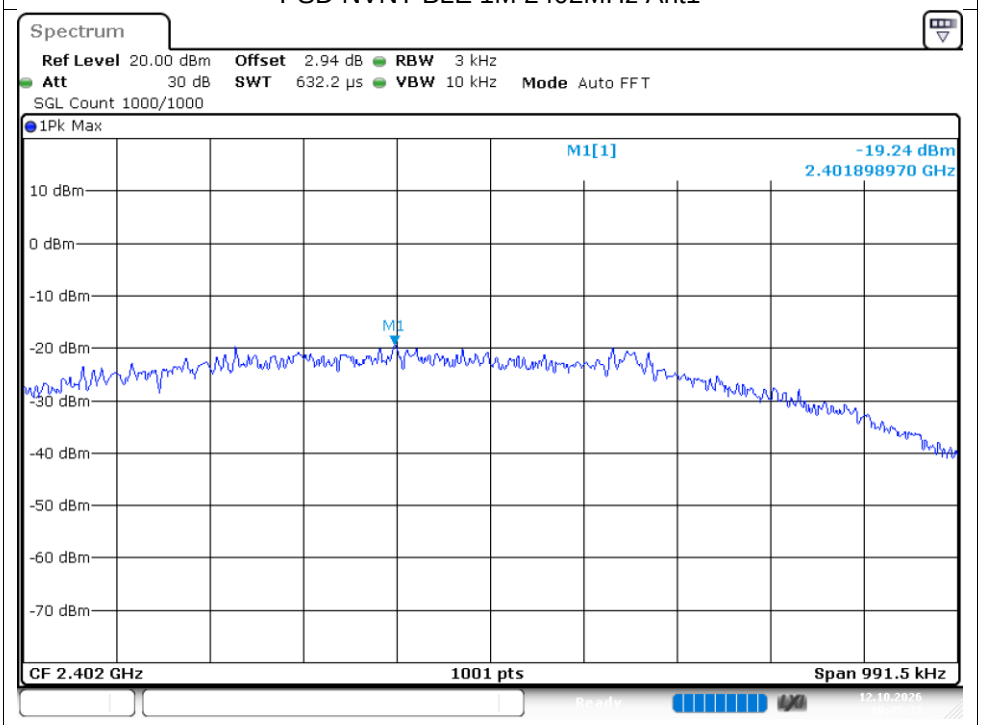
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48013589 GHz	-3.59 dBm		
M2		1	2.479555 GHz	-9.62 dBm		
M3		1	2.480217 GHz	-9.58 dBm		

A5 Maximum Power Spectral Density Level

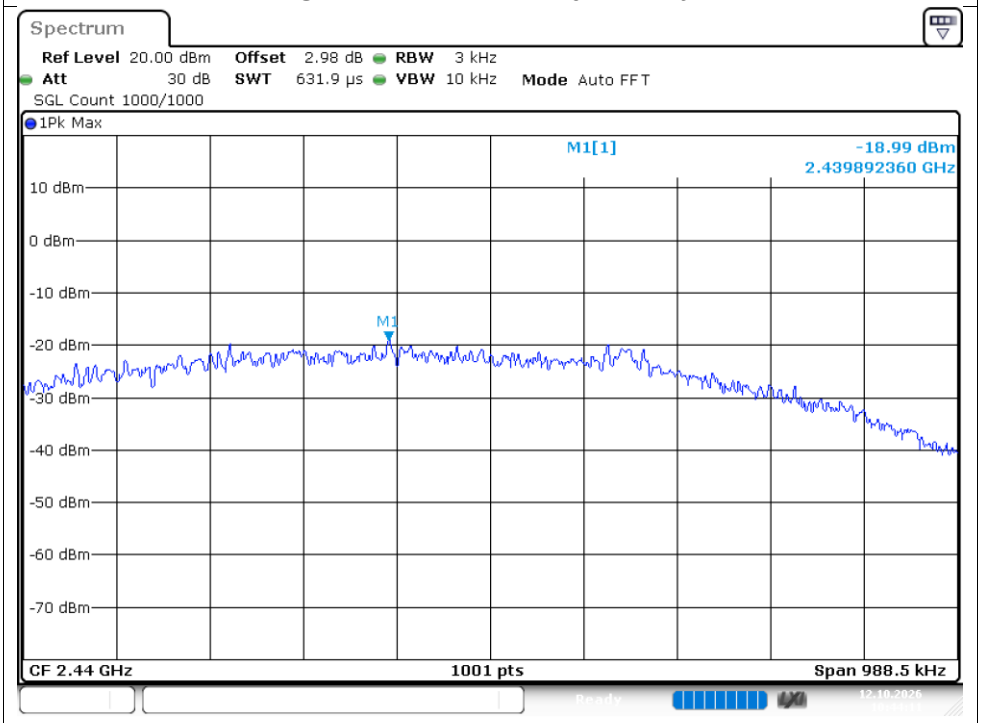
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-19.24	8	Pass
NVNT	BLE 1M	2440	Ant1	-18.99	8	Pass
NVNT	BLE 1M	2480	Ant1	-19.42	8	Pass

Test Graphs

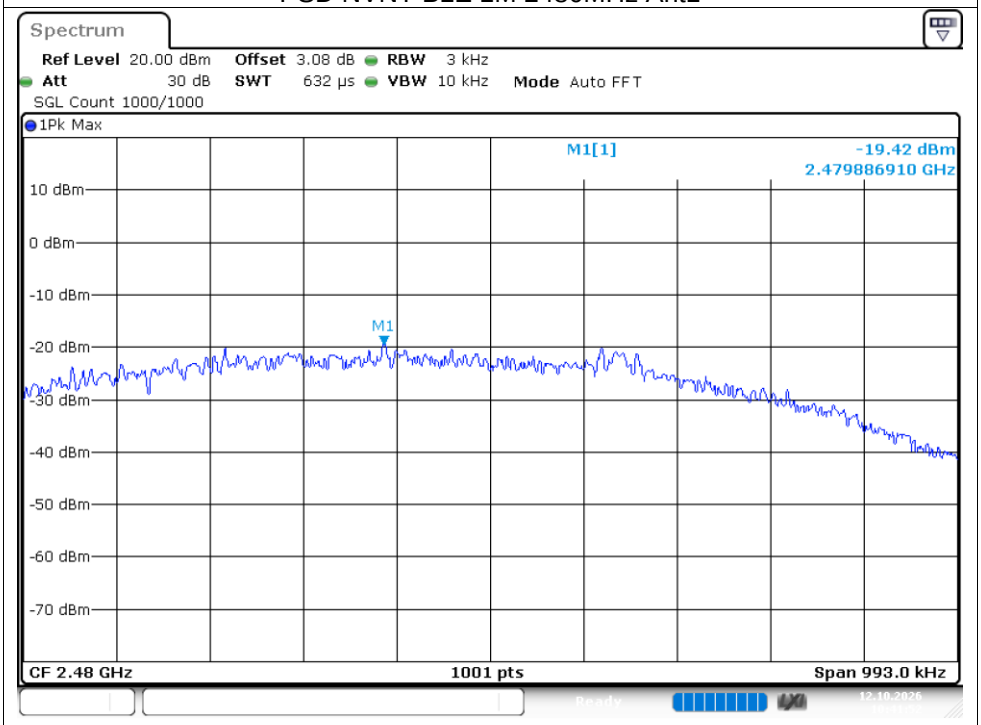
PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1



PSD NVNT BLE 1M 2480MHz Ant1

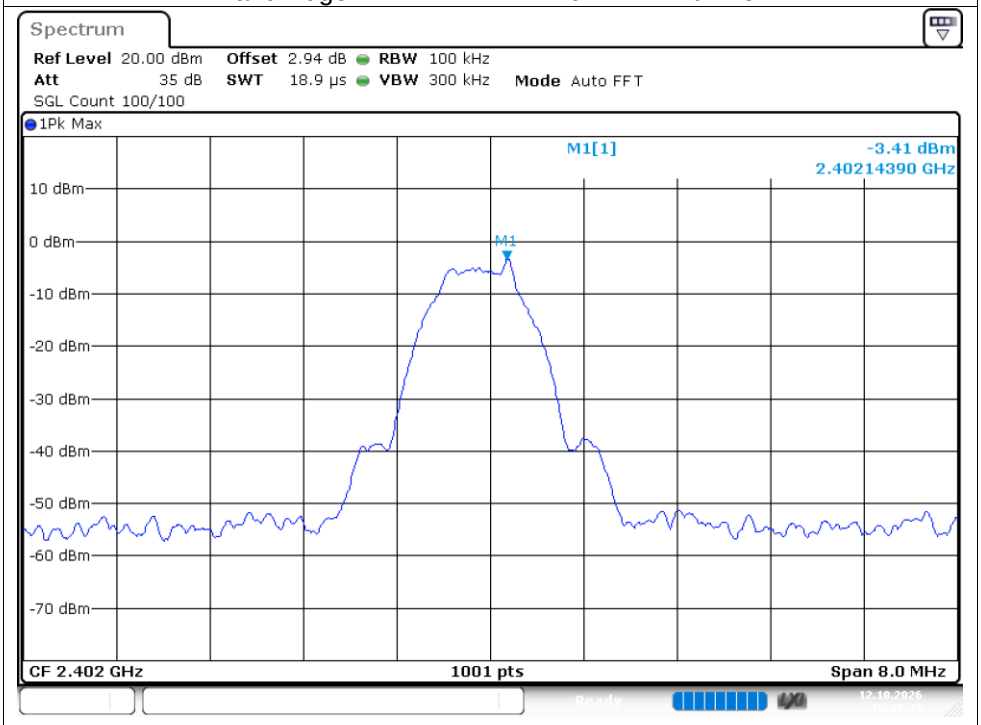


A6 Band Edge

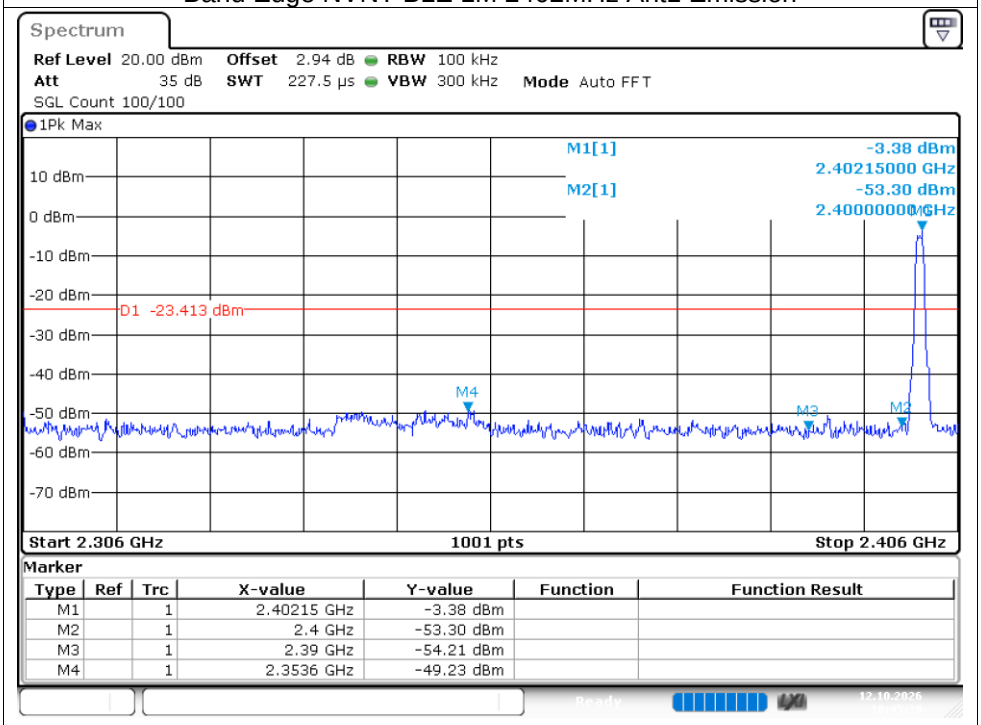
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-45.81	-20	Pass
NVNT	BLE 1M	2480	Ant1	-47.18	-20	Pass

Test Graphs

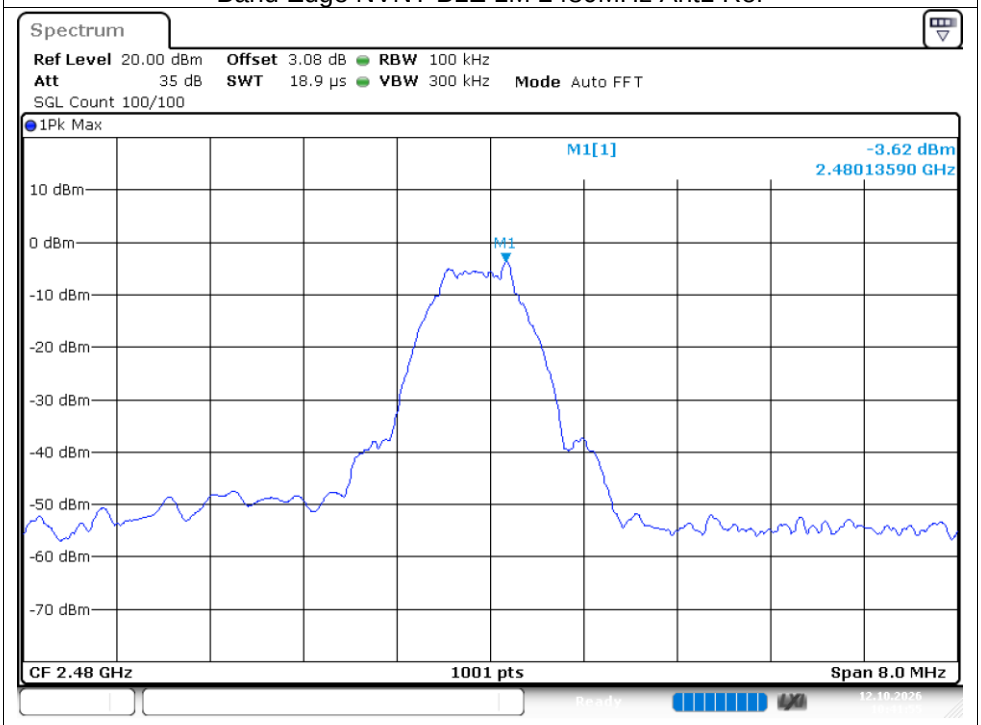
Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



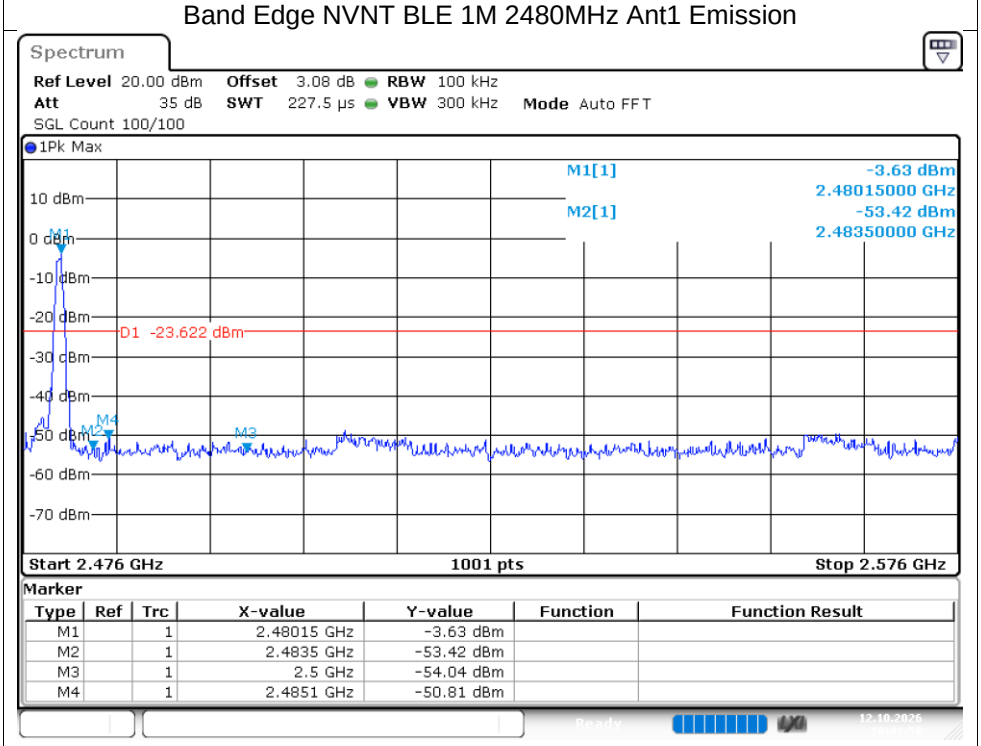
Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



Marker

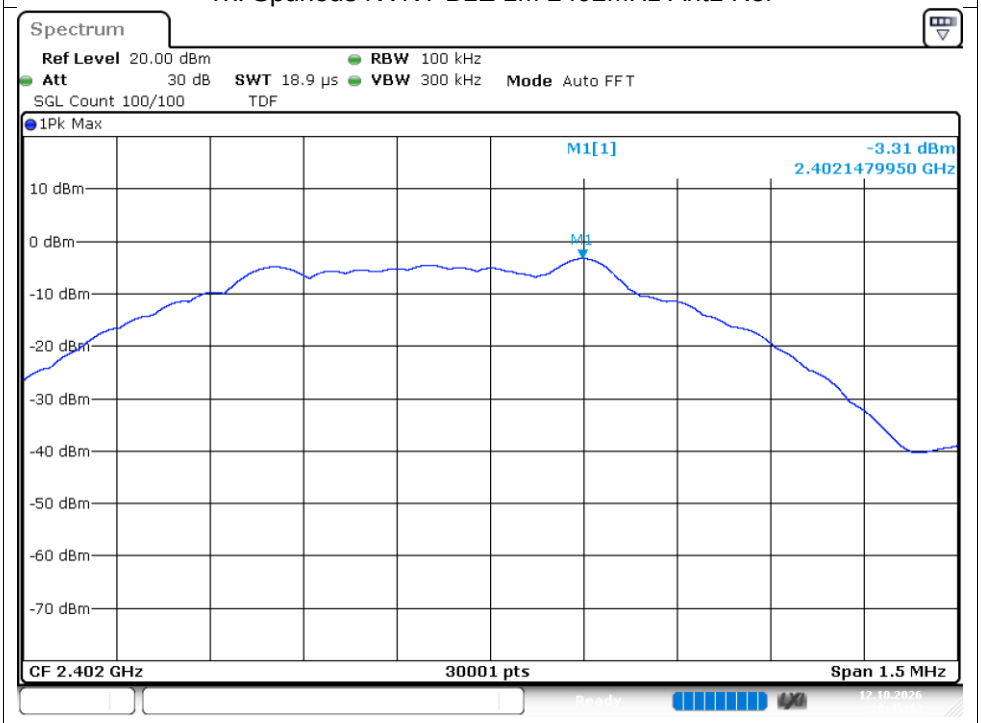
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48015 GHz	-3.63 dBm		
M2		1	2.4835 GHz	-53.42 dBm		
M3		1	2.5 GHz	-54.04 dBm		
M4		1	2.4851 GHz	-50.81 dBm		

A7 Conducted RF Spurious Emission

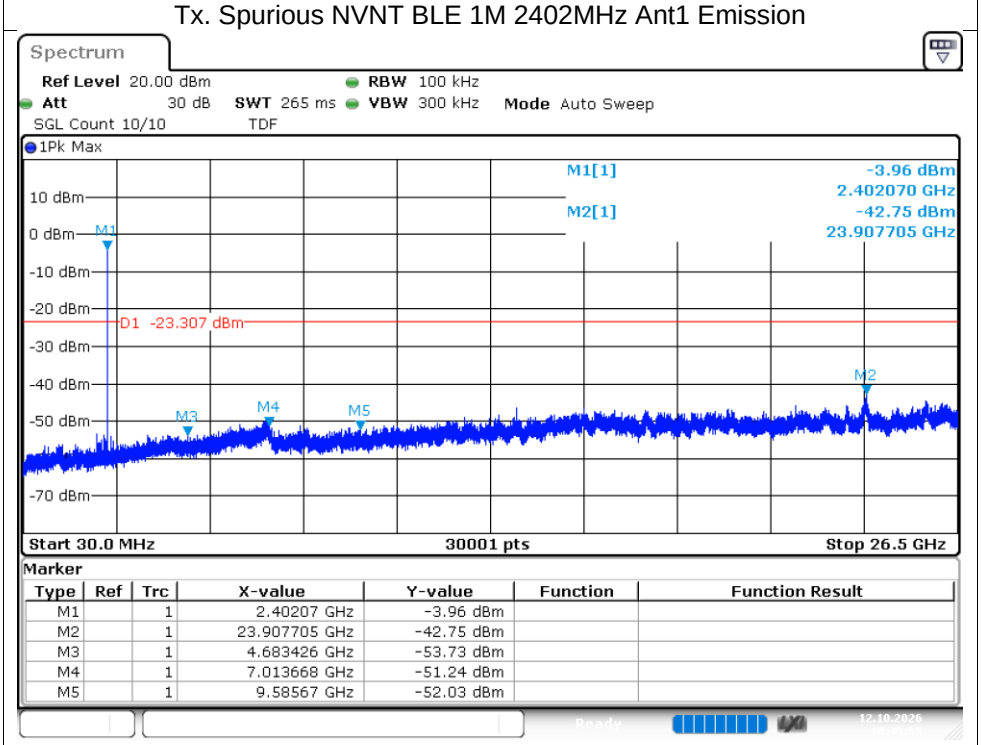
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-39.43	-20	Pass
NVNT	BLE 1M	2440	Ant1	-40.21	-20	Pass
NVNT	BLE 1M	2480	Ant1	-39.11	-20	Pass

Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



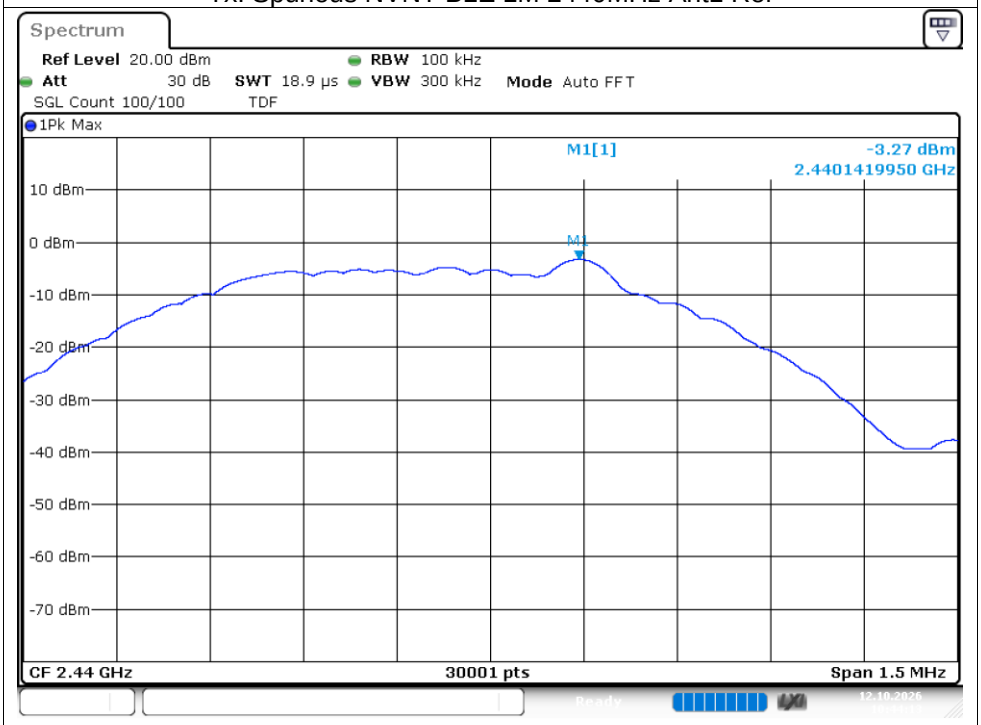
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



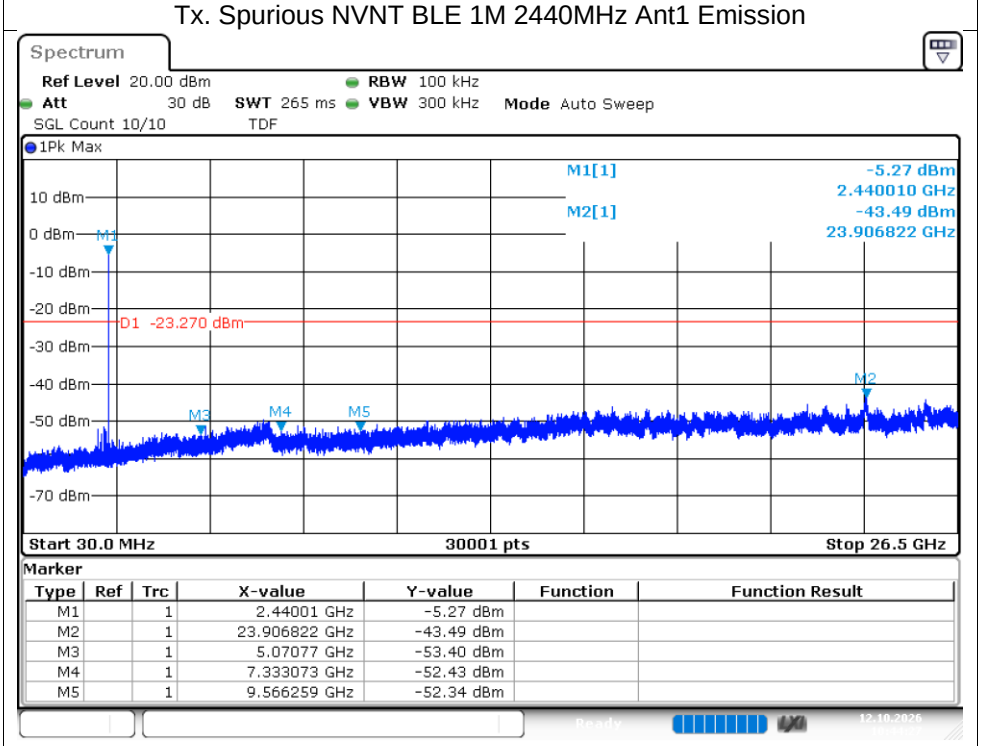
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40207 GHz	-3.96 dBm		
M2		1	23.907705 GHz	-42.75 dBm		
M3		1	4.683426 GHz	-53.73 dBm		
M4		1	7.013668 GHz	-51.24 dBm		
M5		1	9.58567 GHz	-52.03 dBm		

Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



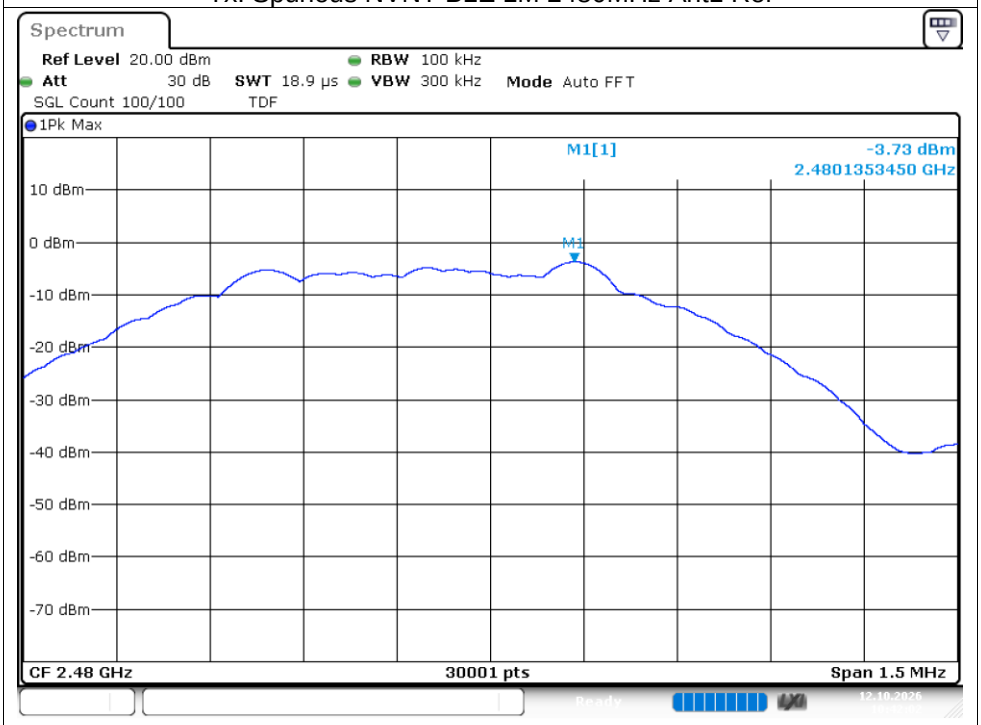
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



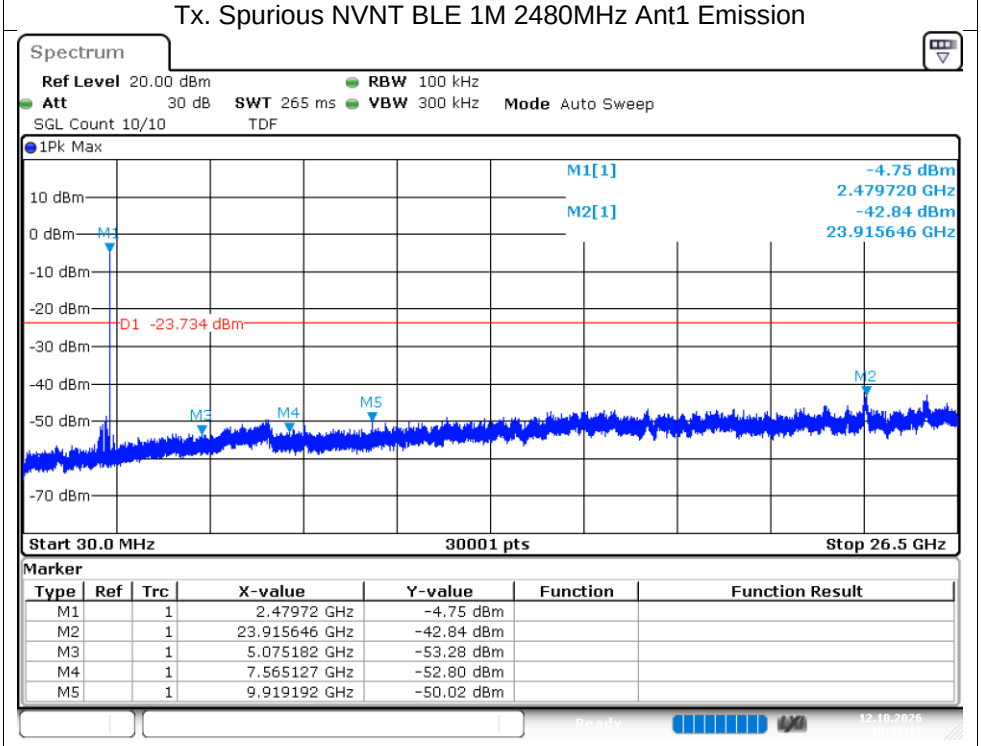
Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.44001 GHz	-5.27 dBm		
M2		1	23.906822 GHz	-43.49 dBm		
M3		1	5.07077 GHz	-53.40 dBm		
M4		1	7.333073 GHz	-52.43 dBm		
M5		1	9.566259 GHz	-52.34 dBm		

Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47972 GHz	-4.75 dBm		
M2		1	23.915646 GHz	-42.84 dBm		
M3		1	5.075182 GHz	-53.28 dBm		
M4		1	7.565127 GHz	-52.80 dBm		
M5		1	9.919192 GHz	-50.02 dBm		

--- End of Report ---