

Test report No: 6183426.50

TEST REPORT

Radio Spectrum Matters (RF)

Identification of item tested	KitchenAid Smart Thermometer
Trademark	KitchenAid
Model and /or type reference	KTH11BM
Features	USB 5Vdc, 0.35A; Repeater battery : 0.35AH, 1.3Wh
FCC ID	A5UTTIVNWMT01
ISED Number	10248A-TTIVNWMT01
Applicant's name / address	Whirlpool Corporation 2000 N M-63 Benton Harbor, Michigan 49022, United States
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10: 2013 RSS-Gen Issue 5 / RSS-247 Issue 3
Verdict Summary	IN COMPLIANCE
Prepared by (name / position & signature)	Adrian Shi Technical Supervisor
Approved by (name / position & signature)	Lei Chen Senior Project Manager
Date of issue	2024-11-06
Report template No	TRF_Part15C_247_RF03 V1.0

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COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
☐ Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	☒	Comma (,)	☐ Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
Tx	: Transmitter
Rx	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
6183426.50	2024-11-06	First release.

REMARKS AND COMMENTS

The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

The test results relate only to the samples tested.

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1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	KitchenAid Smart Thermometer
Model / Type number	KTH11BM
Trademark.....	KitchenAid
FCC ID	A5UTTIVNWMT01
ISED Number	10248A-TTIVNWMT01
Test Sample Number	6183426.01
Manufacturer.....	KitchenAid Global LLC Kitchenaid Portable Appliance Tech,ST JOSEPH TECHNOLOGY CENTER, 303 Upton Dr., St Joseph, MI, 49085, USA

Mode of Operation	Bluetooth BLE					
Operating frequency range(s).....	2402~2480 MHz					
Type of Modulation	GFSK					
PHYs	☒	LE 1M	☒	LE 2M	☐	LE Coded S=2/8
Data Rate	☒	1 Mbps	☒	2 Mbps	☐	500/125 Kbps
Antenna type.....	Repeater: PCB Antenna Probe: Metal antenna					
Antenna gain.....	Repeater: 3.8 dBi Probe: -3.76 dBi					
Number of channel	40					

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 5V (Repeater)					
	☒	Battery: 3V (Probe)					
Mounting position.....	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☒	Hand-held equipment					
	☐	Other:					

Intended use of the Equipment Under Test (EUT)
The product is KitchenAid Smart Thermometer which supports BLE function and it is divided into probe and repeater two parts, each part using different Bluetooth modules.

1.2 **Test date**

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. No.250, Jiangchangsan Road, Jing'an District, Shanghai, China
Date of receipt of test item	2024-02-27
Date (s) of performance of tests	2024-07-29~2024-10-14

2 DESCRIPTION OF TEST SETUP

2.1 Operating mode(s) used for tests

During the tests the following operating mode(s) has(have) been used.

Operating mode	Operating mode description	Used for methos	
		Conducted	Radiated
1	Transmitting (Repeater)	☒	☒
2	Transmitting (Probe)	☒	☒
Supplemental information: ---			

2.2 Support / Auxiliary equipment / unit / software for the EUT

The EUT has been tested with the following auxiliary equipment / unit / software:

Auxiliary equipment / unit / software	Type / Version	Serial number	Manufacturer	Supplied by
nRFgo Studio	V1.21.2.10	N/A	N/A	Applicant
Laptop	Latitude 3430	7XB4DS3	DELL	DEKRA
Supplemental information: ---				

2.3 Test Configuration / Block diagram used for tests

Refer to Annex 3.

3 VERDICT SUMMARY SECTION

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

3.1 Standards

Standard	Year	Description
FCC CFR Title 47 Part 15 Subpart C Section 15.247	2022	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
ANSI C63.10	2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074 D01 v05r02	2019	Guidance for performing compliance measurements on Digital Transmission System (DTS) operating under section 15.247
RSS-Gen Issue 5 Amendment 1 Amendment 2	2018 2019 2021	General Requirements for Compliance of Radio Apparatus
RSS-247 Issue 3	2023	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

3.2 Deviation(s) from the Standard(s) / Test Specification(s)

The following deviation(s) was / were made from the published requirements of the listed standards: N/A.

3.3 Overview of results

FCC measurement			
Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	FCC 15.207	PASS	---
Emissions in restricted frequency bands	FCC 15.247(d), 15.209, 15.205	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	FCC 15.247(d)	PASS	---
Radiated Emission Band Edge	FCC 15.247(d), 15.209, 15.205	PASS	---
Fundamental emission output power	FCC 15.247(b)(3)	PASS	---
DTS Bandwidth	FCC 15.247(a)(2)	PASS	---
Power Spectral Density	FCC 15.247(e)	PASS	---
Antenna Requirement	FCC 15.203	PASS	---
Supplementary information: ---			

RSS measurement			
Requirement – Test case	Basic standard(s)	Verdict	Remark
AC Power Line Conducted Emission	RSS-Gen Issue 5 Section 8.8	PASS	---
Emissions in restricted frequency bands	RSS-Gen Issue 5 Section 8.9 & 8.10	PASS	---
Duty cycle	ANSI C63.10:2013	PASS	---
Emissions in non-restricted frequency bands	RSS-247 Issue 2 Section 5.5	PASS	---
Radiated Emission Band Edge	RSS-Gen Issue 5 Section 8.9 & 8.10	PASS	---
Fundamental emission output power	RSS-247 Issue 2 Section 5.4(d)	PASS	---
DTS Bandwidth & Occupied Bandwidth	RSS-Gen Issue 5 Section 6.7 RSS-247 Issue 2 Section 5.2(a)	PASS	---
Power Spectral Density	RSS-247 Issue 2 Section 5.2(b)	PASS	---
Antenna Requirement	RSS-Gen Issue 5 Section 6.8	PASS	---
Supplementary information: ---			

3.4 Test Facility

FCC Designation Number	:	A5UTTIVNWMT01
ISED CAB identifier Number	:	10248A-TTIVNWMT01

3.5 Measurement procedure

The EUT was controlled by USB Cable provided by applicant which connected to laptop. After connected, run the software “nRFgo Studio” supplied by manufacturer to control the EUT work in required test mode as below table.

Repeater

Mode	Modulation	Data Rate	Channel Number	Frequency (MHz)	Power Setting
BLE	GFSK	1Mbps	00	2402	0
			19	2440	0
			39	2480	0
BLE	GFSK	2Mbps	00	2402	0
			19	2440	0
			39	2480	0

Probe

Mode	Modulation	Data Rate	Channel Number	Frequency (MHz)	Power Setting
BLE	GFSK	1Mbps	00	2402	0
			19	2440	0
			39	2480	0
BLE	GFSK	2Mbps	00	2402	0
			19	2440	0
			39	2480	0

4 TEST RESULTS

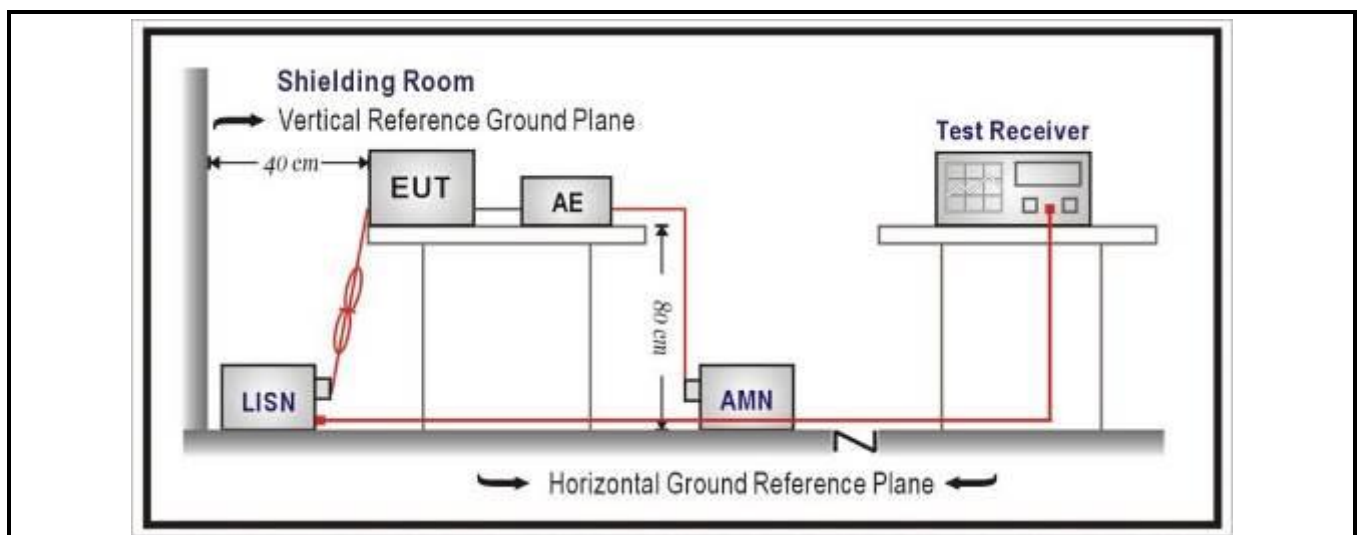
4.1	AC Power Line Conducted Emission	VERDICT: PASS
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Limit

FCC Part 15 Subpart C Paragraph 15.207 & RSS-Gen Issue 5 Section 8.8				
Frequency range [MHz]	Limit: QP [dB(μV) ¹⁾	Limit: AV [dB(μV) ¹⁾	IF BW	Detector(s)
0,15 - 0,50	66 - 56 ²⁾	56 - 46 ²⁾	9 KHz	QP, AV
0,50 - 5,0	56	46	9 KHz	QP, AV
5,0 - 30	60	50	9 KHz	QP, AV

¹⁾ At the transition frequency, the lower limit applies.
²⁾ The limit decreases linearly with the logarithm of the frequency.

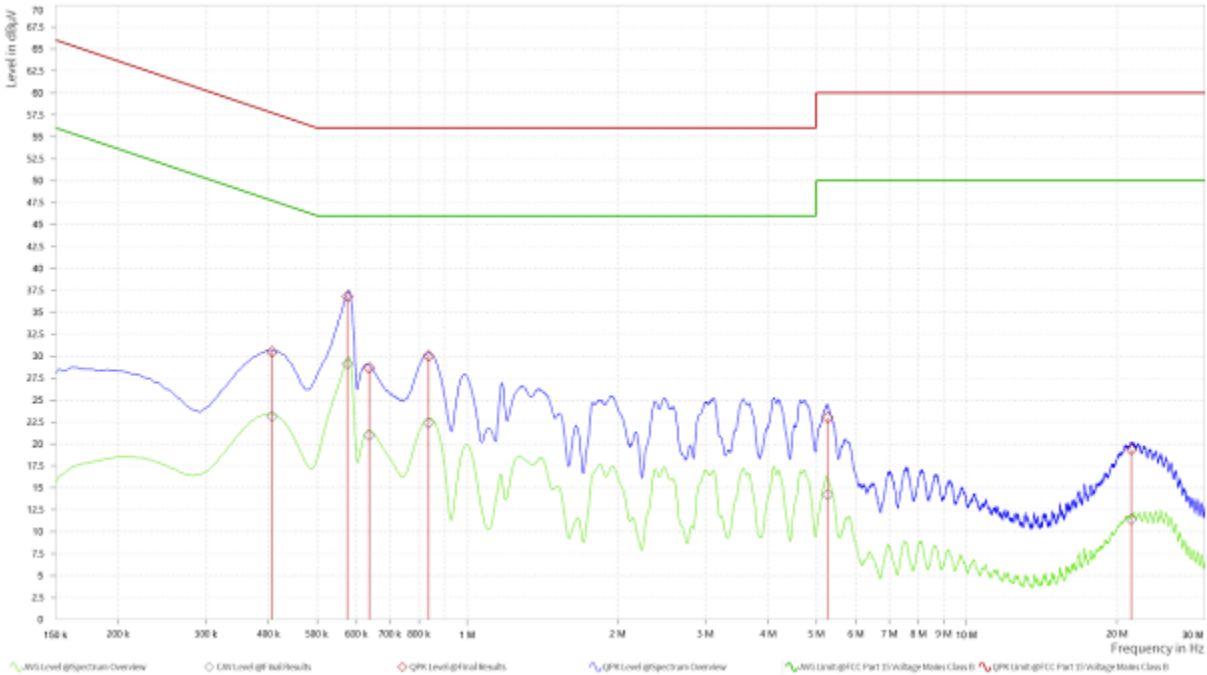
Test Configuration

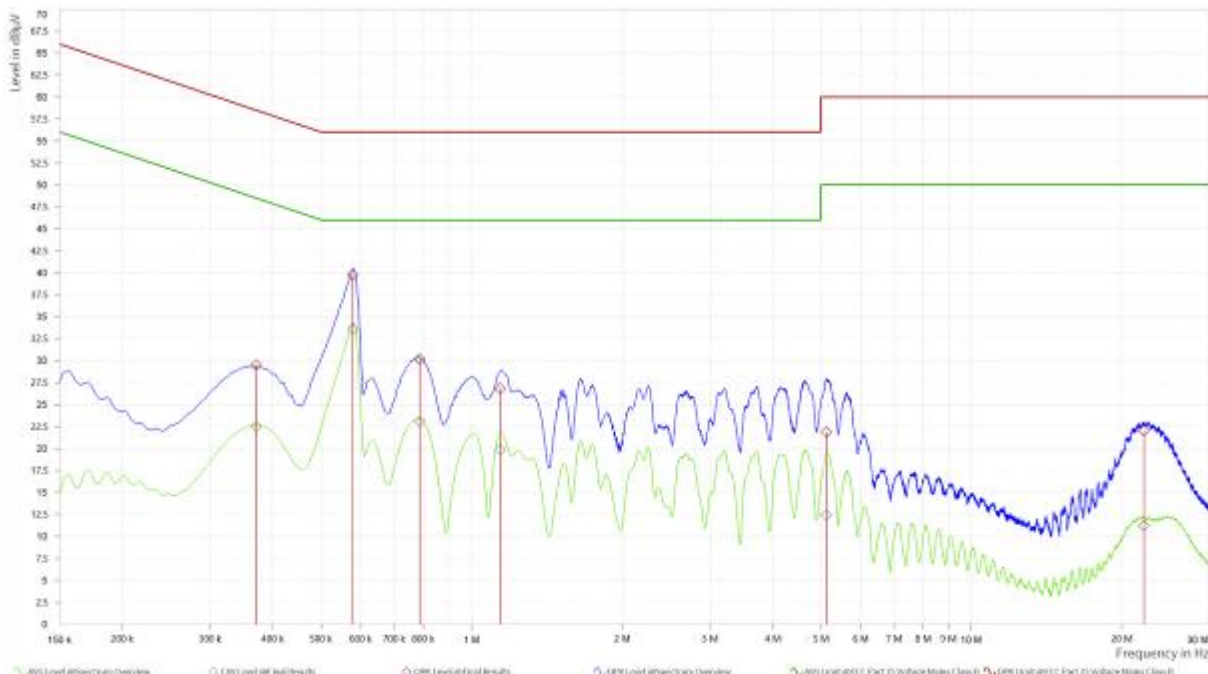


Performed measurements

Port under test			Terminal							
☒	AC mains input power		☒	N	☒	L1	☐	L2	☐	L3
☐	DC input power		☐	Positive (+)			☐	Negative (-)		
Test method applied			☒	Artificial mains network						
			☐	Voltage probe						
Test setup			☒	Table top	☐	Artificial hand applied				
			☐	Floor standing	☐	Other:				
			Refer to the Annex 2 for test setup photo(s).							
Operating mode(s) used			Mode 1, Mode 2							
Remark			All above modes were evaluated but only shown the worst data in the report.							

See next page.

Measurement data		Port under test	AC mains input power					
Operating mode / voltage / frequency used during the test			Mode 1 / 120 Vac / 60 Hz					
								
Frequency [MHz]	QPK Level [dBµV]	QPK Limit [dBµV]	QPK Margin [dB]	CAV Level [dBµV]	CAV: AVG Limit [dBµV]	CAV Margin [dB]	Correction [dB]	Line
0.407	30.48	57.72	27.24	23.14	47.72	24.58	9.73	N
0.575	36.76	56.00	19.24	29.13	46.00	16.87	9.67	N
0.636	28.64	56.00	27.36	20.97	46.00	25.03	9.62	N
0.836	30.02	56.00	25.98	22.37	46.00	23.63	9.62	N
5.267	22.99	60.00	37.01	14.21	50.00	35.79	9.71	N
21.368	19.35	60.00	40.65	11.39	50.00	38.61	9.97	N
Remark	1. QPK Level [dBµV]=Reading QPK Level [dBµV] + Correction [dB] 2. CAV Level [dBµV]=Reading CAV Level [dBµV] + Correction [dB] 3. Correction [dB]= AMN VDF [dB] + Cable Loss [dB]							

Measurement data		Port under test	AC mains input power					
Operating mode / voltage / frequency used during the test			Mode 1 / 120 Vac / 60 Hz					
								
Frequency [MHz]	QPK Level [dBμV]	QPK Limit [dBμV]	QPK Margin [dB]	CAV Level [dBμV]	CAV: AVG Limit [dBμV]	CAV Margin [dB]	Correction [dB]	Line
0.371	29.48	58.49	29.01	22.50	48.49	25.99	9.69	L1
0.578	39.75	56.00	16.25	33.57	46.00	12.43	9.70	L1
0.787	30.15	56.00	25.85	23.06	46.00	22.94	9.68	L1
1.140	26.80	56.00	29.20	19.84	46.00	26.16	9.68	L1
5.120	21.84	60.00	38.16	12.40	50.00	37.60	9.78	L1
22.151	22.03	60.00	37.97	11.19	50.00	38.81	9.96	L1
Remark	1. QPK Level [dBμV]=Reading QPK Level [dBμV] + Correction [dB] 2. CAV Level [dBμV]=Reading CAV Level [dBμV] + Correction [dB] 3. Correction [dB]= AMN VDF [dB] + Cable Loss [dB]							

4.2	Emissions in restricted frequency bands	VERDICT: PASS
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Limit

Standard		FCC Part 15 Subpart C Paragraph 15.247(d), 15.205, 15.209 & RSS-Gen Issue 5 Section 8.9 & 8.10	
Restricted Bands of operation for FCC			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (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
8.81425 – 8.81475	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	--	--	--
Restricted Bands of operation for ISED			
0.090 - 0.110	13.36 - 13.41	960 - 1427	9.0 - 9.2
0.495 - 0.505	16.42 - 16.423	1435 - 1626.5	9.3 - 9.5
2.1735 - 2.1905	16.69475 - 16.69525	1645.5 - 1646.5	10.6 - 12.7
3.020 - 3.026	16.80425 - 16.80475	1660 - 1710	13.25 - 13.4
4.125 - 4.128	25.5 - 25.67	1718.8 - 1722.2	14.47 - 14.5
4.17725 - 4.17775	37.5 - 38.25	2200 - 2300	15.35 - 16.2
4.20725 - 4.20775	73 - 74.6	2310 - 2390	17.7 - 21.4
5.677 - 5.683	74.8 - 75.2	2483.5 - 2500	22.01 - 23.12
6.215 - 6.218	108 - 138	2655 - 2900	23.6 - 24.0
6.26775 - 6.26825	149.9 - 150.05	3260 - 3267	31.2 - 31.8
6.31175 - 6.31225	156.52475 - 156.52525	3332 - 3339	36.43 - 36.5
8.291 - 8.294	156.7 - 156.9	3345.8 - 3358	Above 38.6
8.362 - 8.366	162.0125 - 167.17	3500 - 4400	--
8.37625 - 8.38675	167.72 - 173.2	4500 - 5150	--
8.41425 - 8.41475	240 - 285	5350 - 5460	--
12.29 - 12.293	322 - 335.4	7250 - 7750	--
12.51975 - 12.52025	399.9 - 410	8025 - 8500	--
12.57675 - 12.57725	608 - 614	--	--

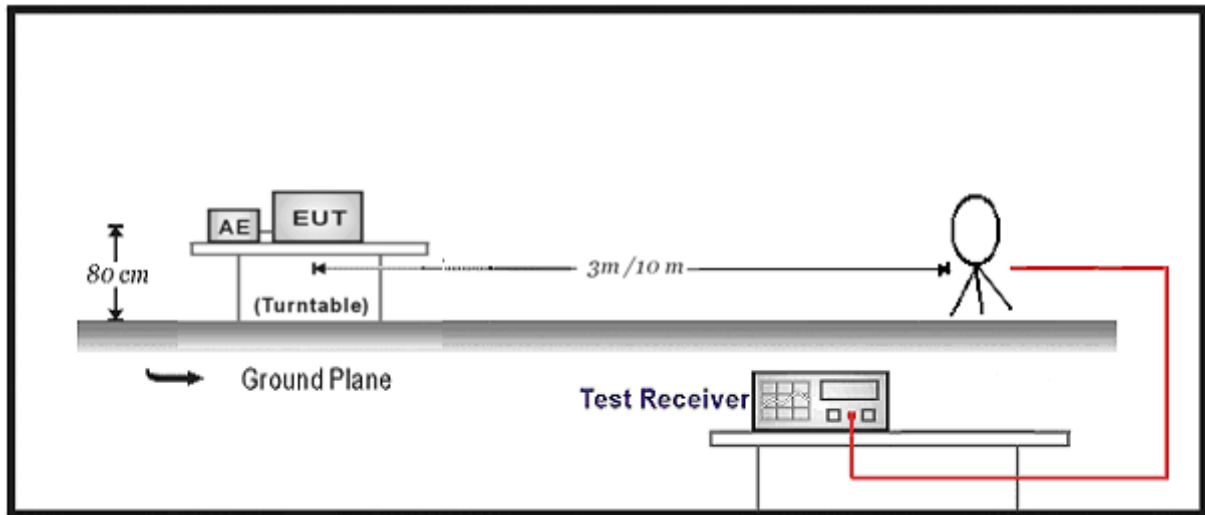
Restricted Band Emissions Limit			
Frequency (MHz)	Field strength ($\mu\text{V/m}$)	Field strength (dB $\mu\text{V/m}$)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

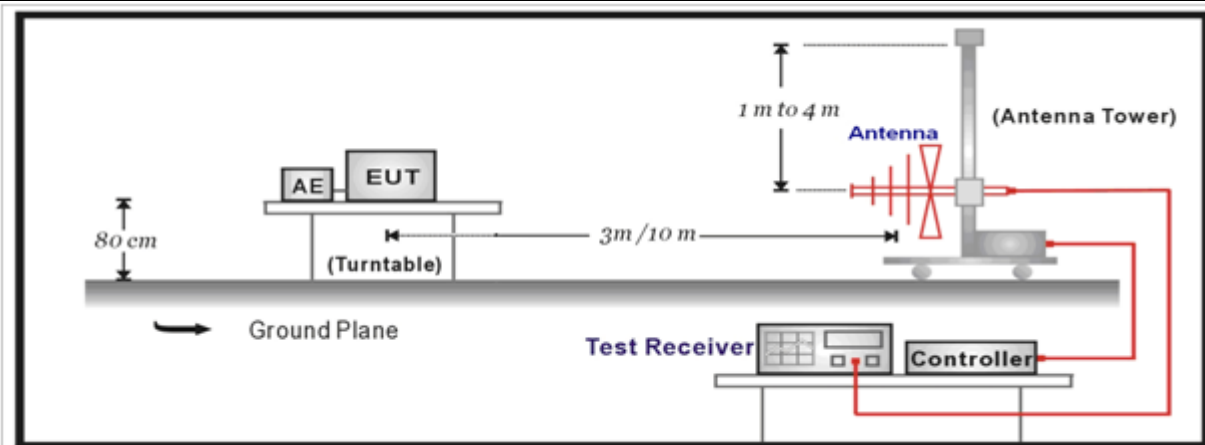
Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

Test Configuration

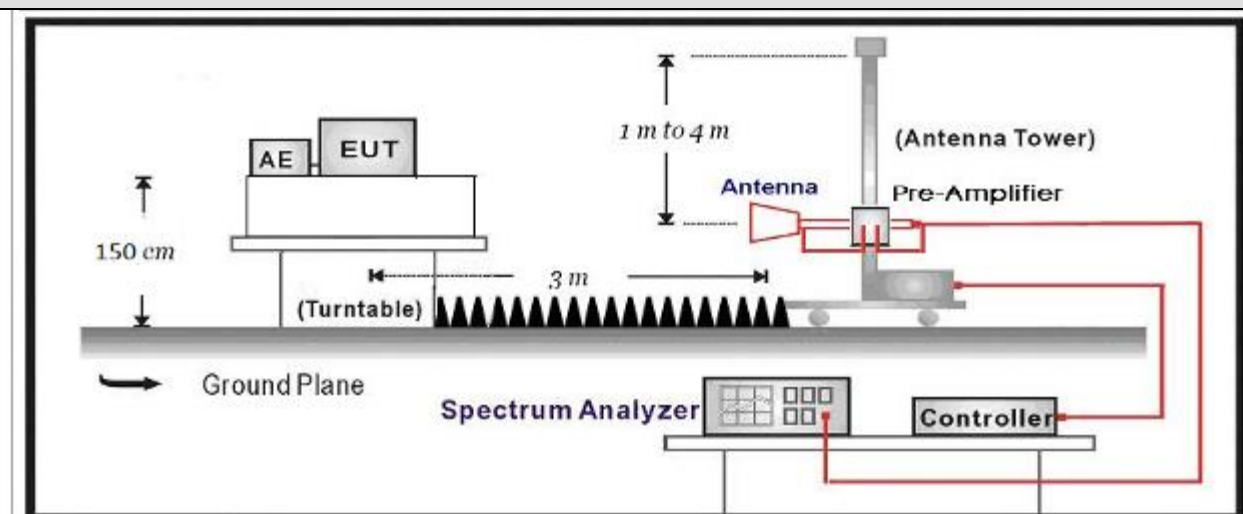
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



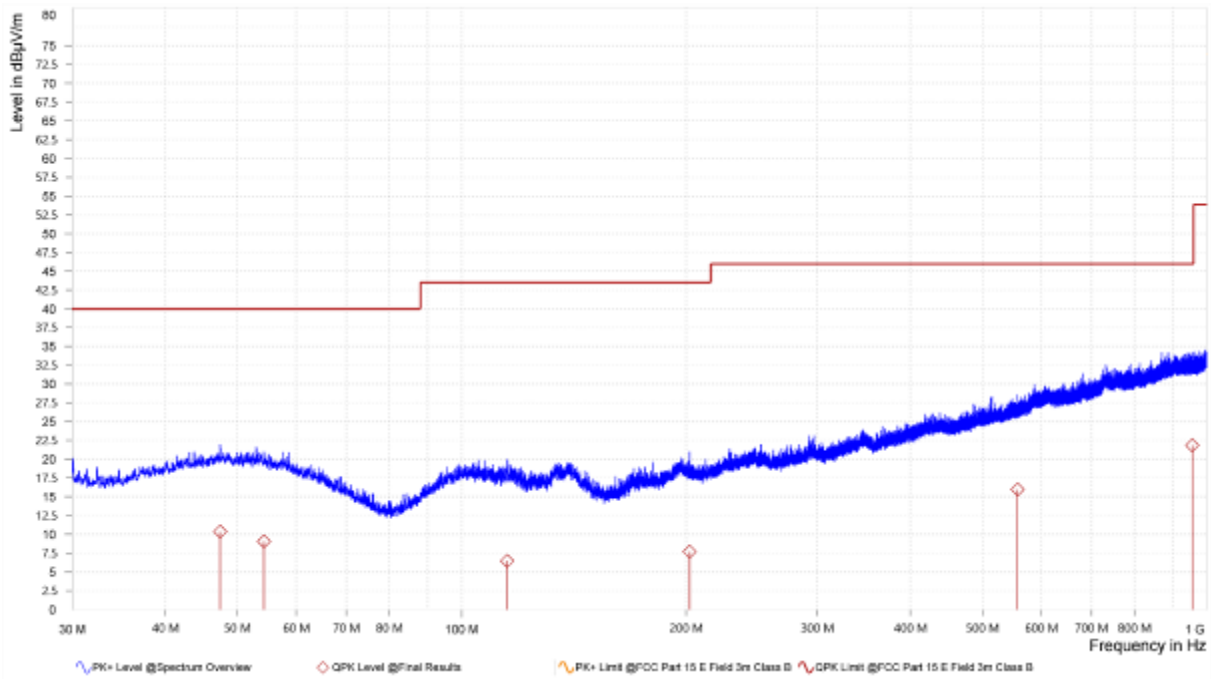
Performed measurements

Port under test	Enclosure port	
Test method applied	☐	Conducted measurement
	☒	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	1. The test frequency range, 9kHz~30MHz, 18GHz~26GHz, both of the worst case are at least 20dB below the limits, therefore no data appear in the report. 2. The EUT is working in the Normal link mode below 1 GHz.	

Results

Emissions in restricted frequency bands

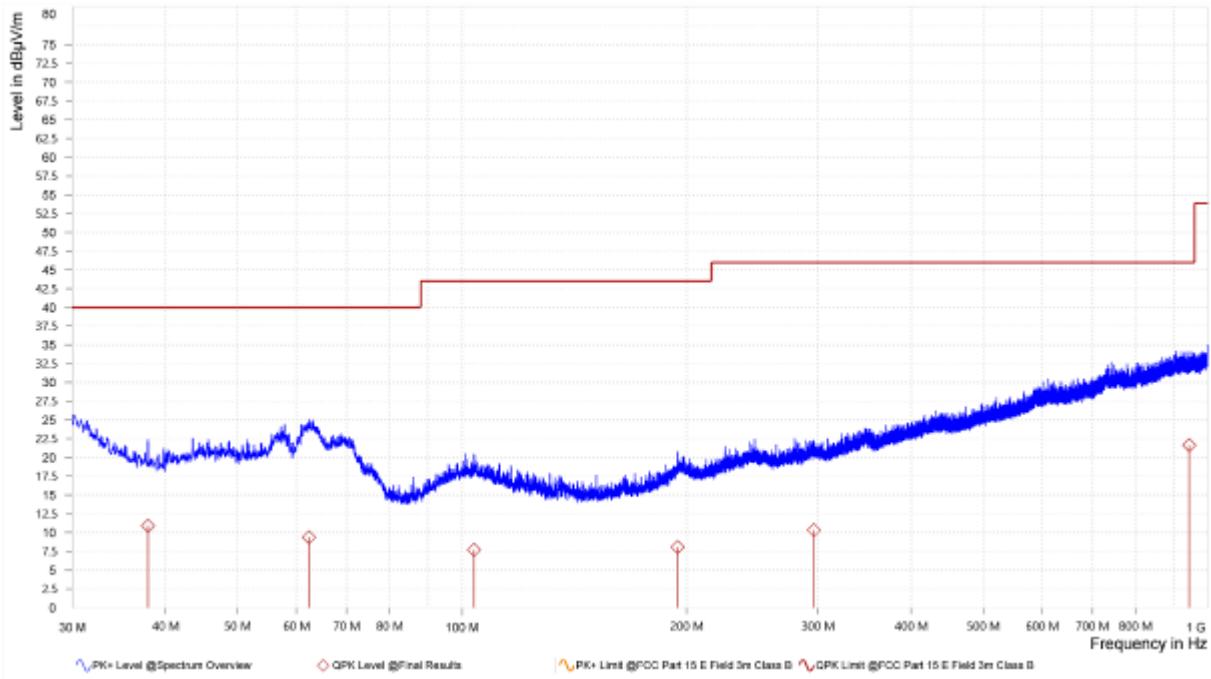
30MHz – 1GHz, Normal Mode, Repeater



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	47.400	10.36	40.00	29.64	21.21	H	8.8	2
1	54.300	9.09	40.00	30.91	20.82	H	350.4	1
1	115.110	6.47	43.50	37.03	17.77	H	227.2	1
1	202.260	7.70	43.50	35.80	18.90	H	152.7	1
1	557.190	15.97	46.00	30.03	26.63	H	111.7	2
1	956.100	21.84	46.00	24.16	31.78	H	160	1

1. QPK Level [dBµV/m]=Reading QPK Level [dBµV/m] + Correction [dB/m]
2. Correction [dB/m]=Antenna Factor [dB/m] + Cable Loss [dB]

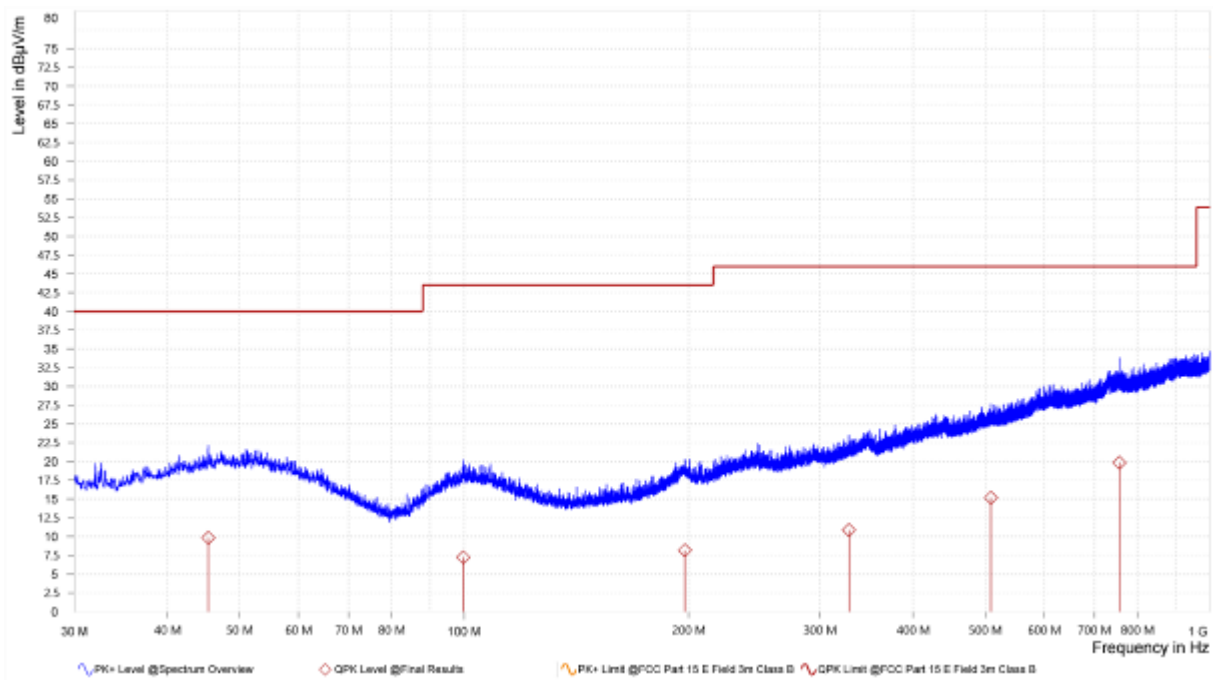
30MHz – 1GHz, Normal Mode, Repeater



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	37.920	10.92	40.00	29.08	19.05	V	265.2	1
1	62.340	9.38	40.00	30.62	19.24	V	21	1
1	103.800	7.70	43.50	35.80	19.12	V	21	1
1	194.640	8.06	43.50	35.44	19.37	V	133.3	1.5
1	296.400	10.34	46.00	35.66	21.41	V	280.6	1.5
1	944.340	21.66	46.00	24.34	31.79	V	140.9	1.5

1. QPK Level [dBµV/m]=Reading QPK Level [dBµV/m] + Correction [dB/m]
2. Correction [dB/m]=Antenna Factor [dB/m] + Cable Loss [dB]

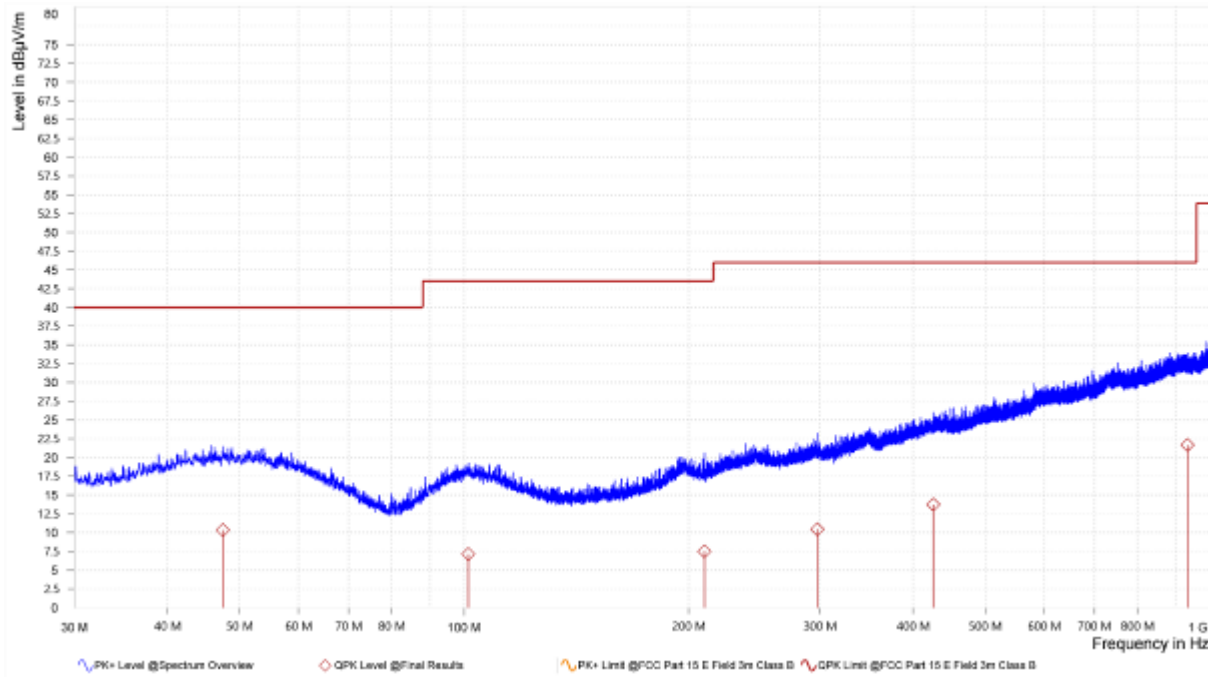
30MHz – 1GHz, Normal Mode, Probe



Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	45.390	9.83	40.00	30.17	20.86	H	94.3	1
1	99.780	7.23	43.50	36.27	19.05	H	171.5	2
1	197.820	8.19	43.50	35.31	19.48	H	57.6	1
1	328.050	10.88	46.00	35.12	22.22	H	325	2
1	508.710	15.18	46.00	30.82	25.96	H	87.1	1
1	756.630	19.85	46.00	26.15	30.31	H	242.5	1

1. QPK Level [dBμV/m]=Reading QPK Level [dBμV/m] + Correction [dB/m]
2. Correction [dB/m]=Antenna Factor [dB/m] + Cable Loss [dB]

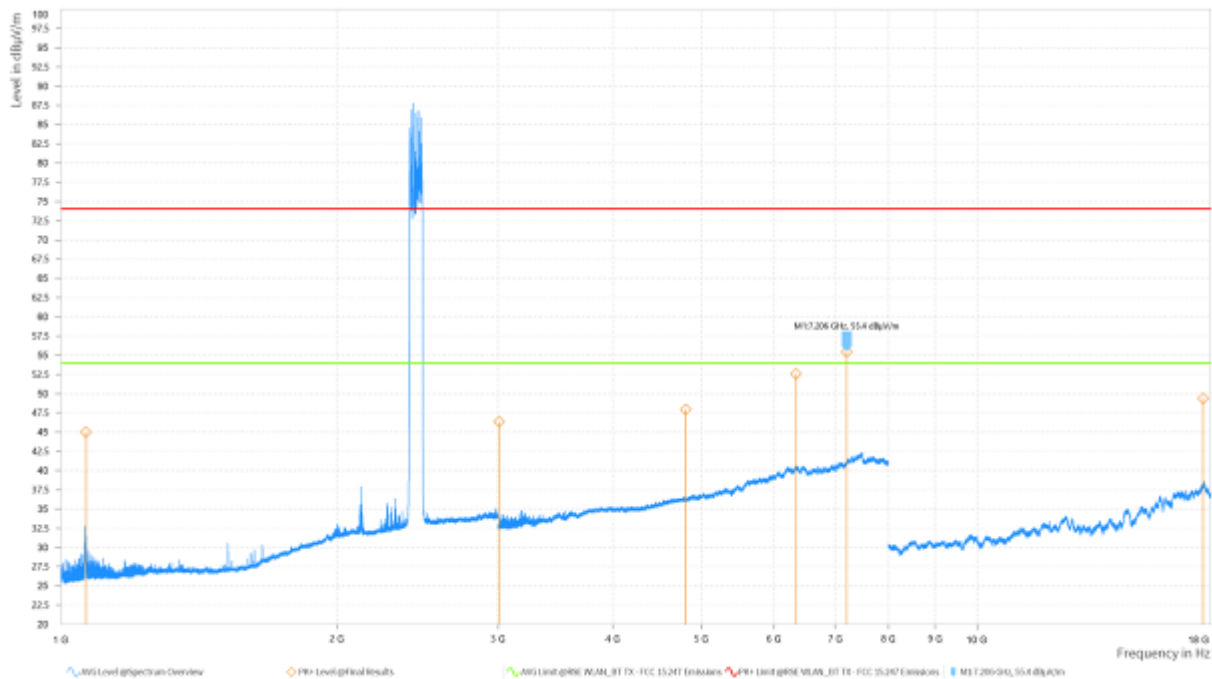
30MHz – 1GHz, Normal Mode, Probe



Rg	Frequency [MHz]	QPK Level [dBμV/m]	QPK Limit [dBμV/m]	QPK Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	47.490	10.35	40.00	29.65	21.23	V	269.3	1
1	101.310	7.15	43.50	36.35	19.18	V	218.2	1
1	210.000	7.50	43.50	36.00	18.71	V	225.8	1
1	297.660	10.43	46.00	35.57	21.41	V	237.8	1.5
1	425.730	13.75	46.00	32.25	24.74	V	332.5	1.5
1	933.570	21.67	46.00	24.33	31.77	V	274.2	1.5

1. QPK Level [dBμV/m]=Reading QPK Level [dBμV/m] + Correction [dB/m]
2. Correction [dB/m]=Antenna Factor [dB/m] + Cable Loss [dB]

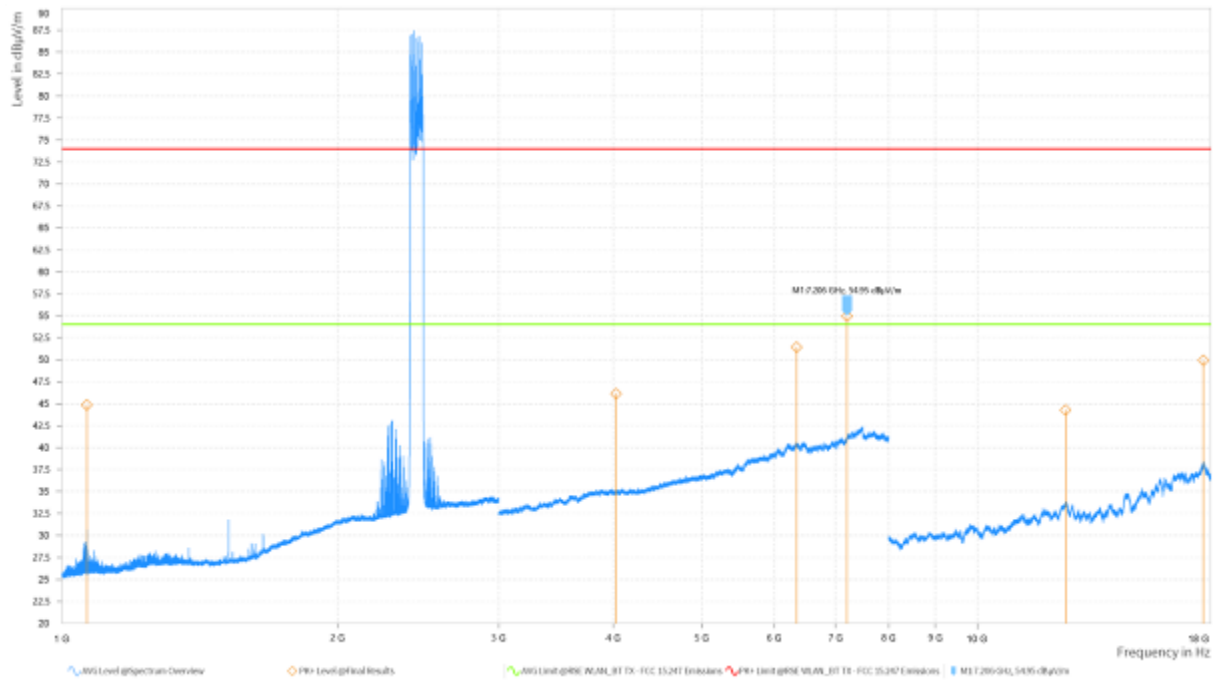
1GHz – 10th Harmonic, Repeater 2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,064.500	33.21	54.00	20.79	-1.03	V
2	3,007.250	35.37	54.00	18.63	6.55	V
2	4,808.750	36.77	54.00	17.23	9.89	V
2	6,346.000	40.71	54.00	13.29	14.94	V
2	7,206.250	44.62	54.00	9.38	15.25	V
3	17,652.500	38.69	54.00	15.31	17.01	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,064.500	44.97	74.00	29.03	-1.03	V
2	3,007.250	46.31	74.00	27.69	6.55	V
2	4,808.750	47.93	74.00	26.07	9.89	V
2	6,346.000	52.56	74.00	21.44	14.94	V
2	7,206.250	55.40	74.00	18.60	15.25	V
3	17,652.500	49.35	74.00	24.65	17.01	V

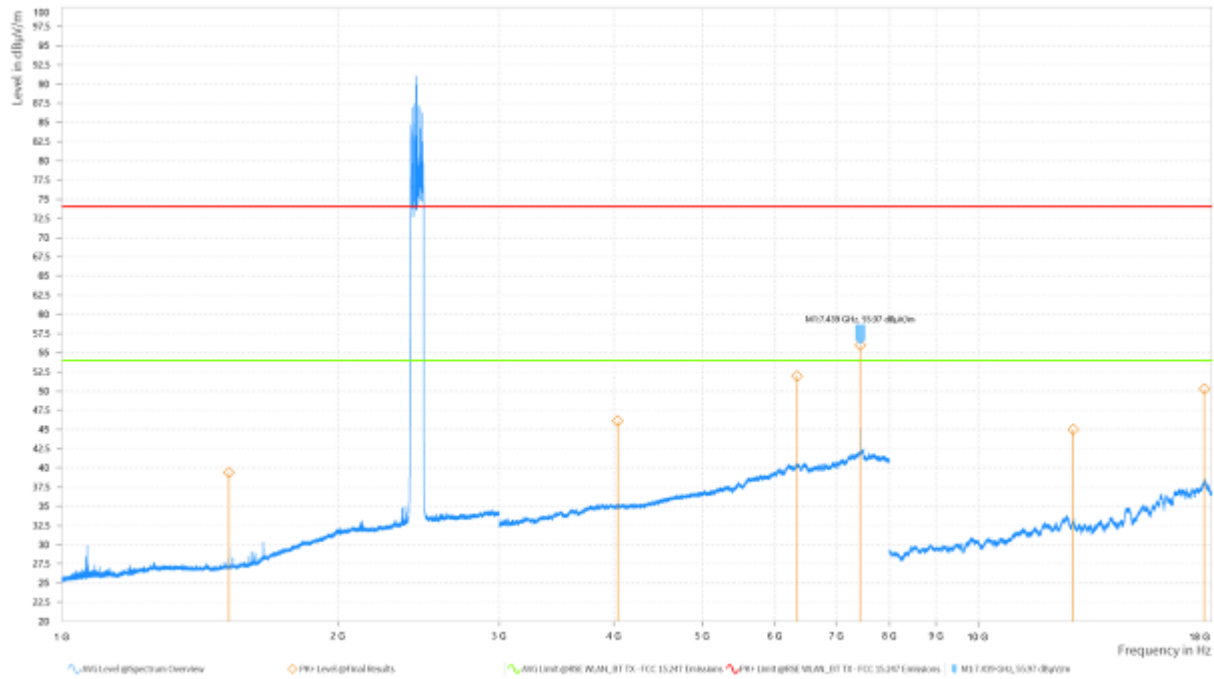
2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,064.400	32.80	54.00	21.20	-1.03	H
2	4,031.000	35.39	54.00	18.61	8.95	H
2	6,350.000	40.69	54.00	13.31	14.93	H
2	7,206.000	44.83	54.00	9.17	15.25	H
3	12,488.000	33.88	54.00	20.12	8.85	H
3	17,670.500	38.52	54.00	15.48	16.89	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,064.400	44.84	74.00	29.16	-1.03	H
2	4,031.000	46.10	74.00	27.90	8.95	H
2	6,350.000	51.40	74.00	22.60	14.93	H
2	7,206.000	54.95	74.00	19.05	15.25	H
3	12,488.000	44.27	74.00	29.73	8.85	H
3	17,670.500	49.92	74.00	24.08	16.89	H

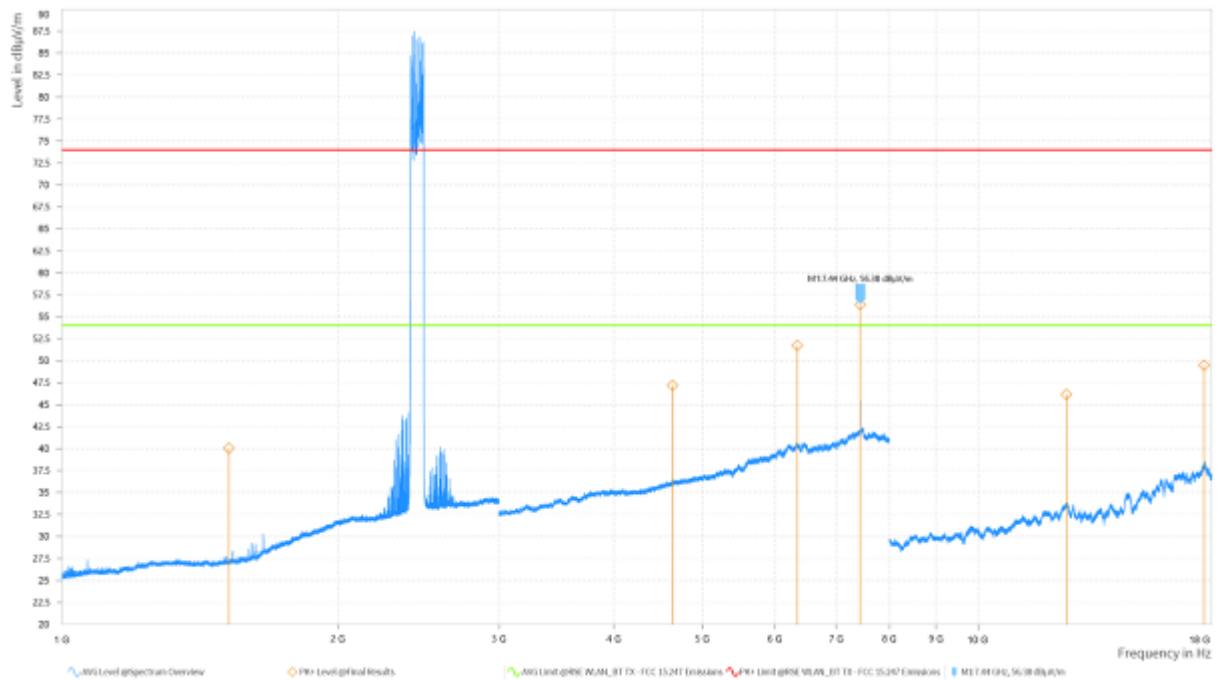
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,520.900	30.16	54.00	23.84	0.93	V
2	4,041.250	35.42	54.00	18.58	8.94	V
2	6,342.000	40.69	54.00	13.31	14.95	V
2	7,439.250	45.17	54.00	8.83	15.87	V
3	12,707.000	33.56	54.00	20.44	9.13	V
3	17,660.000	38.78	54.00	15.22	16.96	V

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,520.900	39.38	74.00	34.62	0.93	V
2	4,041.250	46.10	74.00	27.90	8.94	V
2	6,342.000	51.92	74.00	22.08	14.95	V
2	7,439.250	55.97	74.00	18.03	15.87	V
3	12,707.000	44.98	74.00	29.02	9.13	V
3	17,660.000	50.25	74.00	23.75	16.96	V

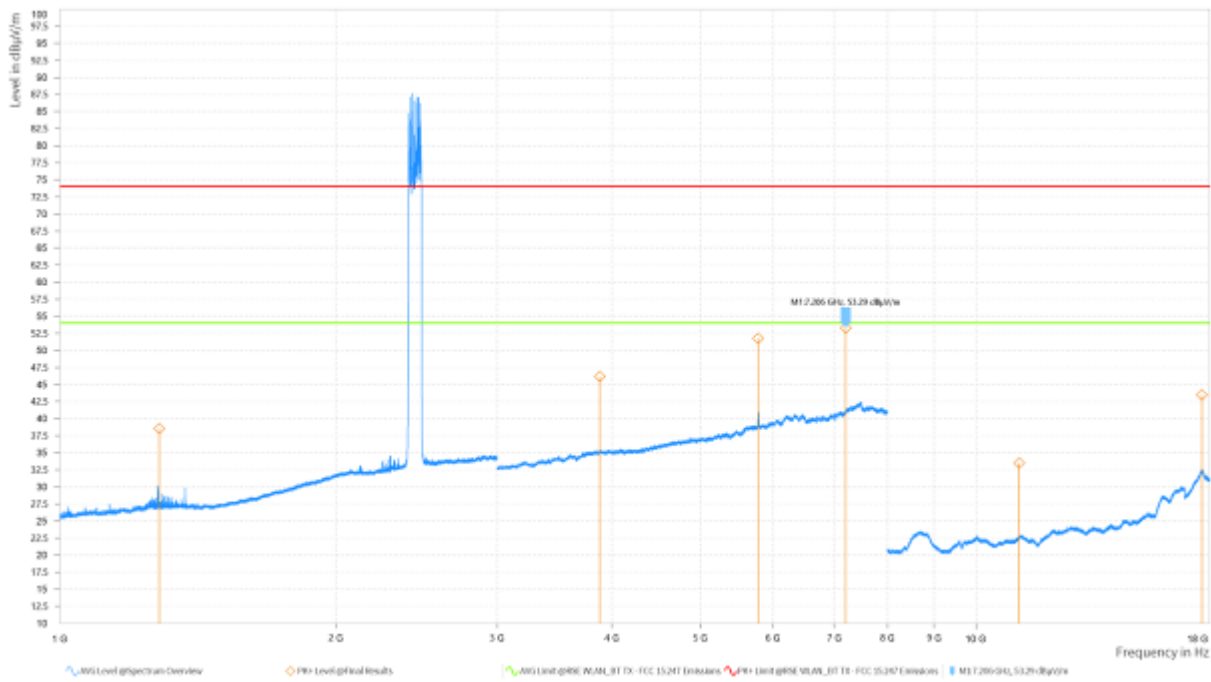
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,521.400	29.85	54.00	24.15	0.93	H
2	4,639.500	36.34	54.00	17.66	9.51	H
2	6,346.750	40.78	54.00	13.22	14.94	H
2	7,439.500	45.88	54.00	8.12	15.87	H
3	12,488.500	34.07	54.00	19.93	8.85	H
3	17,655.000	38.76	54.00	15.24	16.99	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,521.400	40.02	74.00	33.98	0.93	H
2	4,639.500	47.19	74.00	26.81	9.51	H
2	6,346.750	51.70	74.00	22.30	14.94	H
2	7,439.500	56.38	74.00	17.62	15.87	H
3	12,488.500	46.15	74.00	27.85	8.85	H
3	17,655.000	49.47	74.00	24.53	16.99	H

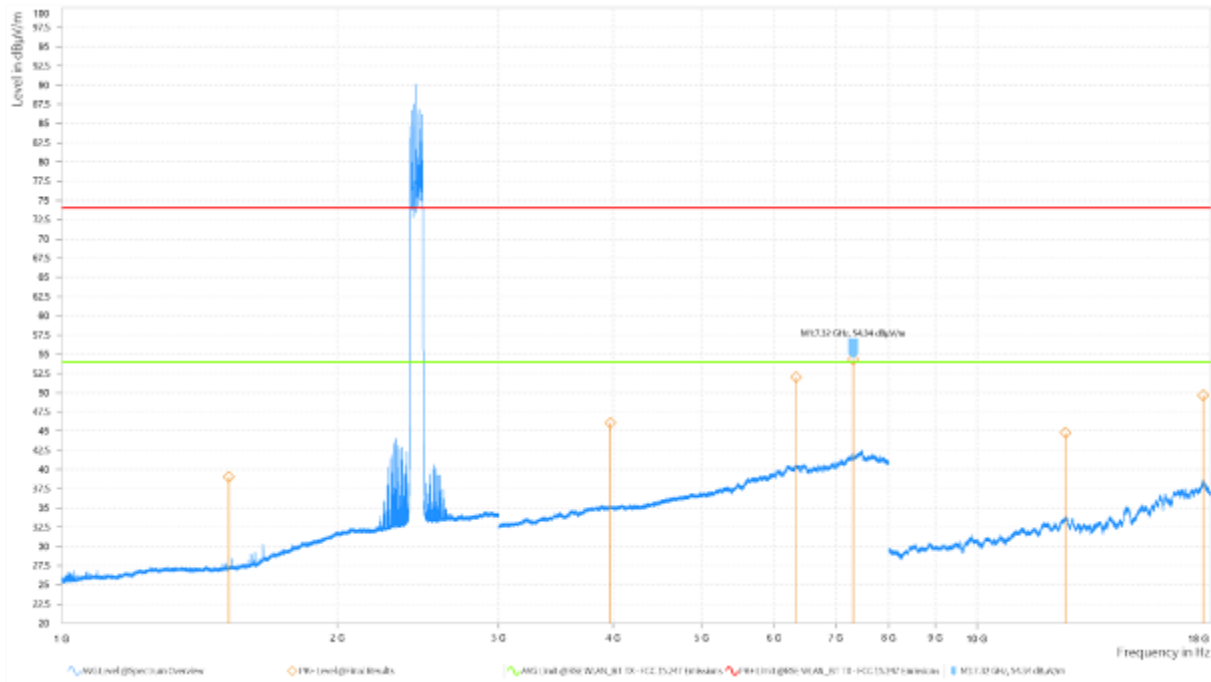
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,283.600	30.25	54.00	23.75	0.31	V
2	3,885.500	35.58	54.00	18.42	9.04	V
2	5,783.250	41.09	54.00	12.91	13.64	V
2	7,206.000	44.32	54.00	9.68	15.25	V
3	11,148.500	22.88	54.00	31.12	7.03	V
3	17,641.000	32.62	54.00	21.38	16.98	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,283.600	38.53	74.00	35.47	0.31	V
2	3,885.500	46.16	74.00	27.84	9.04	V
2	5,783.250	51.76	74.00	22.24	13.64	V
2	7,206.000	53.29	74.00	20.71	15.25	V
3	11,148.500	33.48	74.00	40.52	7.03	V
3	17,641.000	43.46	74.00	30.54	16.98	V

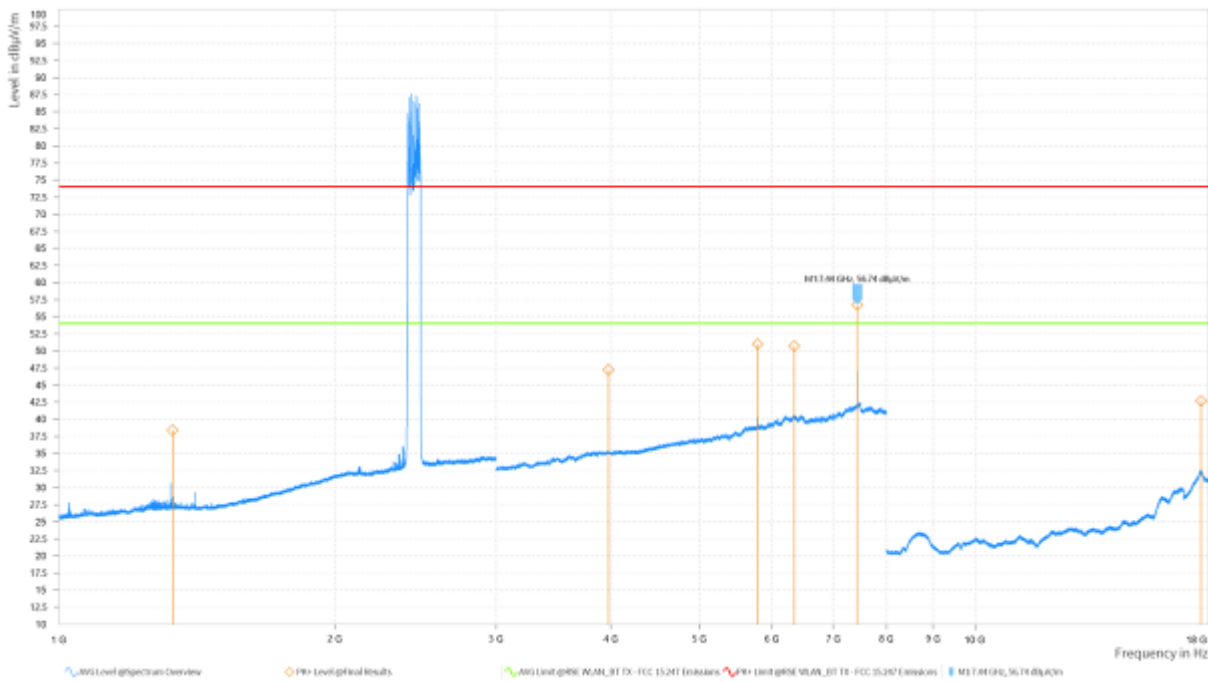
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,521.100	30.67	54.00	23.33	0.93	H
2	3,973.500	35.50	54.00	18.50	8.95	H
2	6,341.000	40.76	54.00	13.24	14.95	H
2	7,319.500	43.53	54.00	10.47	15.60	H
3	12,485.000	34.05	54.00	19.95	8.84	H
3	17,654.000	38.63	54.00	15.37	17.00	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,521.100	39.01	74.00	34.99	0.93	H
2	3,973.500	46.04	74.00	27.96	8.95	H
2	6,341.000	52.01	74.00	21.99	14.95	H
2	7,319.500	54.34	74.00	19.66	15.60	H
3	12,485.000	44.77	74.00	29.23	8.84	H
3	17,654.000	49.65	74.00	24.35	17.00	H

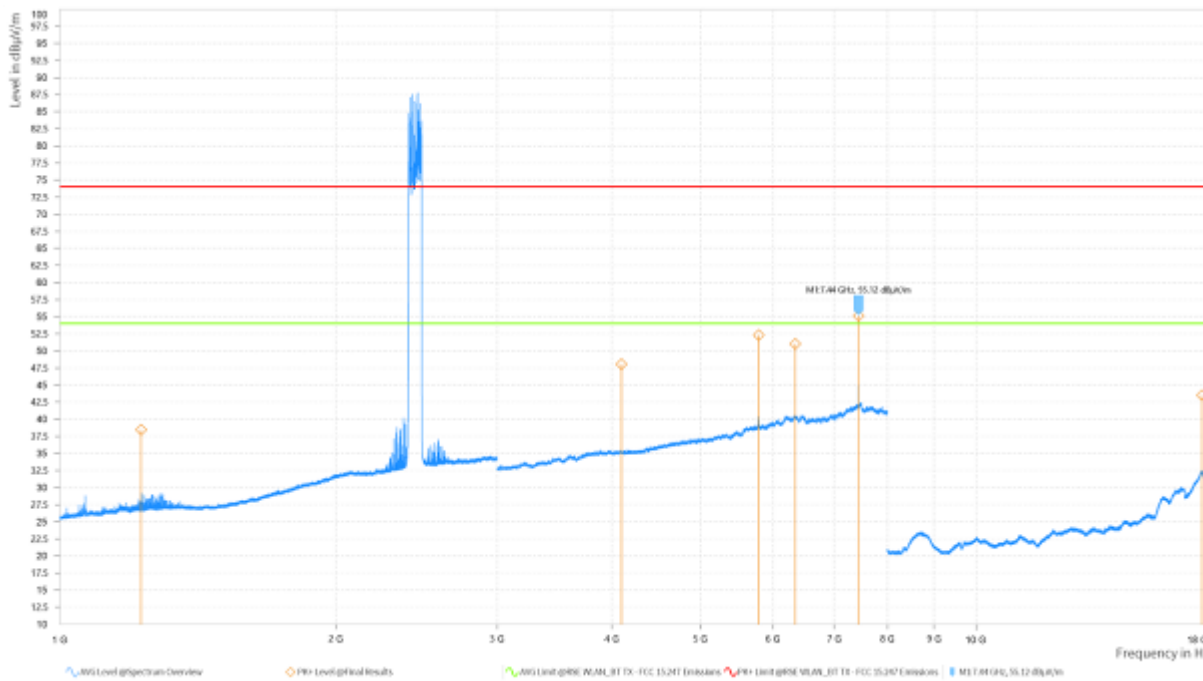
2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,329.900	31.24	54.00	22.76	0.42	V
2	3,979.250	35.52	54.00	18.48	8.95	V
2	5,791.500	40.17	54.00	13.83	13.65	V
2	6,347.000	40.72	54.00	13.28	14.93	V
3	7,440.000	47.16	54.00	6.84	15.87	V
3	17,653.500	32.81	54.00	21.19	17.00	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,329.900	38.37	74.00	35.63	0.42	V
2	3,979.250	47.20	74.00	26.80	8.95	V
2	5,791.500	50.97	74.00	23.03	13.65	V
2	6,347.000	50.68	74.00	23.32	14.93	V
2	7,440.000	56.74	74.00	17.26	15.87	V
3	17,653.500	42.69	74.00	31.31	17.00	V

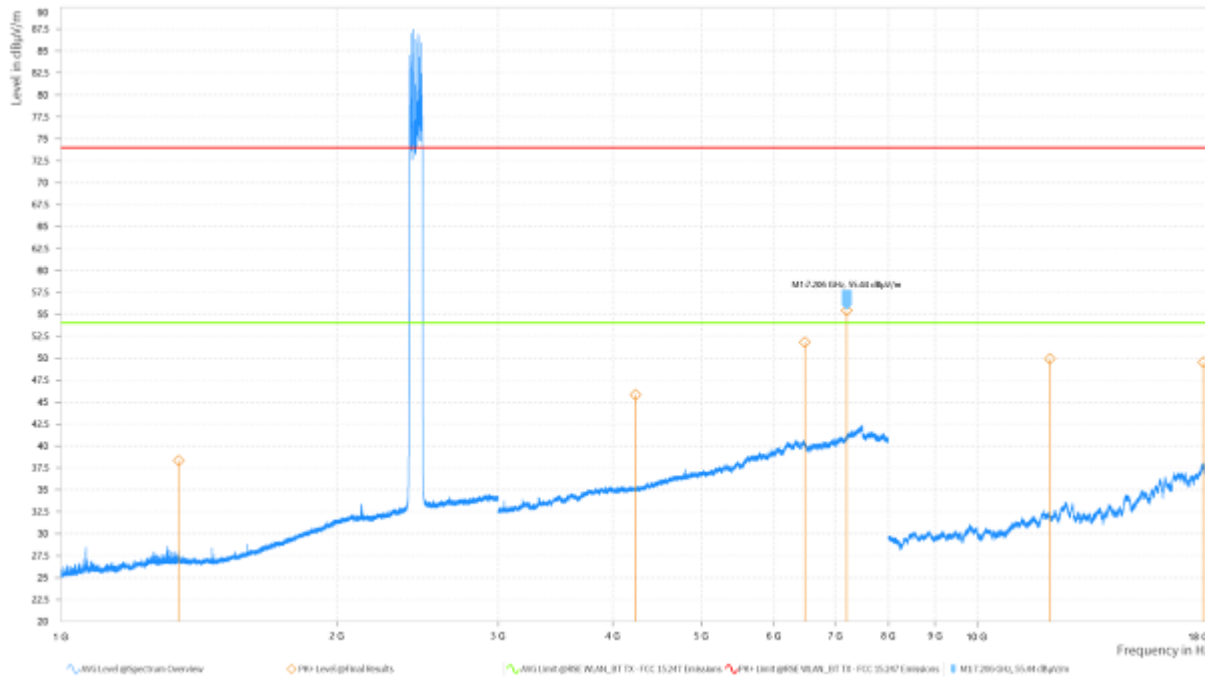
2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,226.200	29.85	54.00	24.15	0.00	H
2	4,100.500	35.63	54.00	18.37	8.90	H
2	5,792.000	40.39	54.00	13.61	13.65	H
2	6,349.750	40.62	54.00	13.38	14.93	H
3	7,440.250	45.02	54.00	8.98	15.87	H
3	17,648.000	32.63	54.00	21.37	17.01	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,226.200	38.46	74.00	35.54	0.00	H
2	4,100.500	48.05	74.00	25.95	8.90	H
2	5,792.000	52.30	74.00	21.70	13.65	H
2	6,349.750	51.01	74.00	22.99	14.93	H
2	7,440.250	55.12	74.00	18.88	15.87	H
3	17,648.000	43.49	74.00	30.51	17.01	H

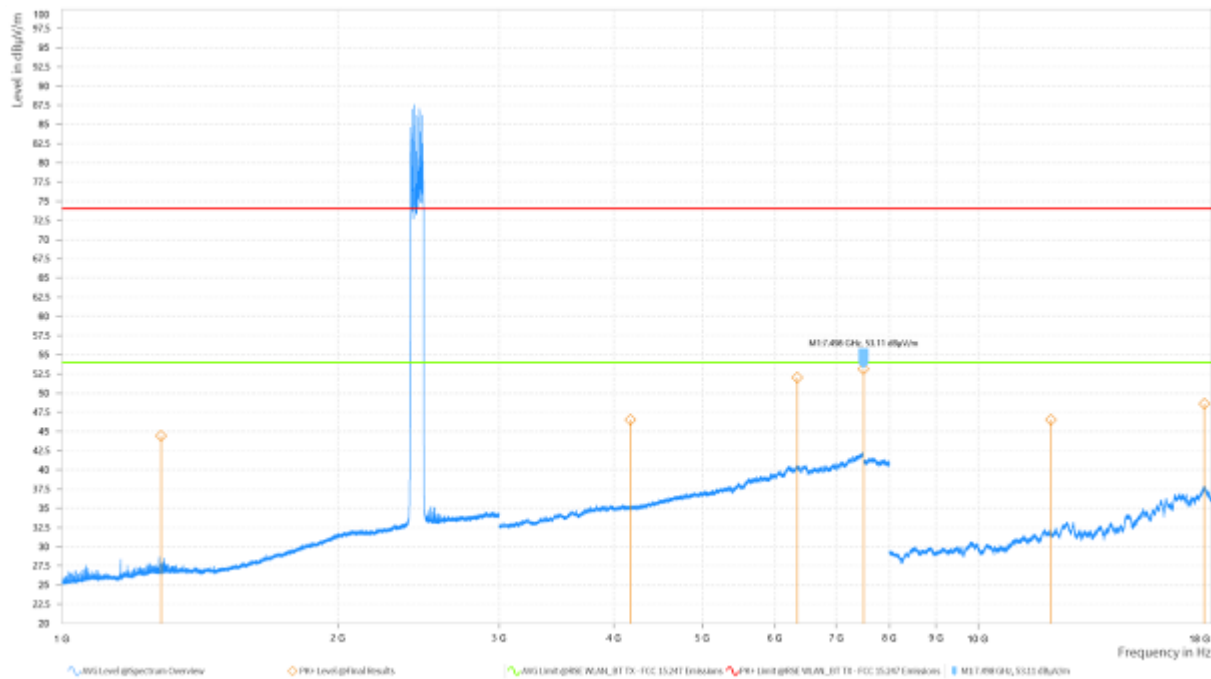
1GHz – 10th Harmonic, Probe
2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,344.000	28.96	54.00	25.04	0.46	V
2	4,238.000	35.46	54.00	18.54	8.73	V
2	6,485.500	40.69	54.00	13.31	14.75	V
2	7,205.500	42.61	54.00	11.39	15.25	V
3	12,008.500	34.68	54.00	19.32	8.34	V
3	17,661.000	38.11	54.00	15.89	16.95	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,344.000	38.33	74.00	35.67	0.46	V
2	4,238.000	45.82	74.00	28.18	8.73	V
2	6,485.500	51.82	74.00	22.18	14.75	V
2	7,205.500	55.44	74.00	18.56	15.25	V
3	12,008.500	49.93	74.00	24.07	8.34	V
3	17,661.000	49.53	74.00	24.47	16.95	V

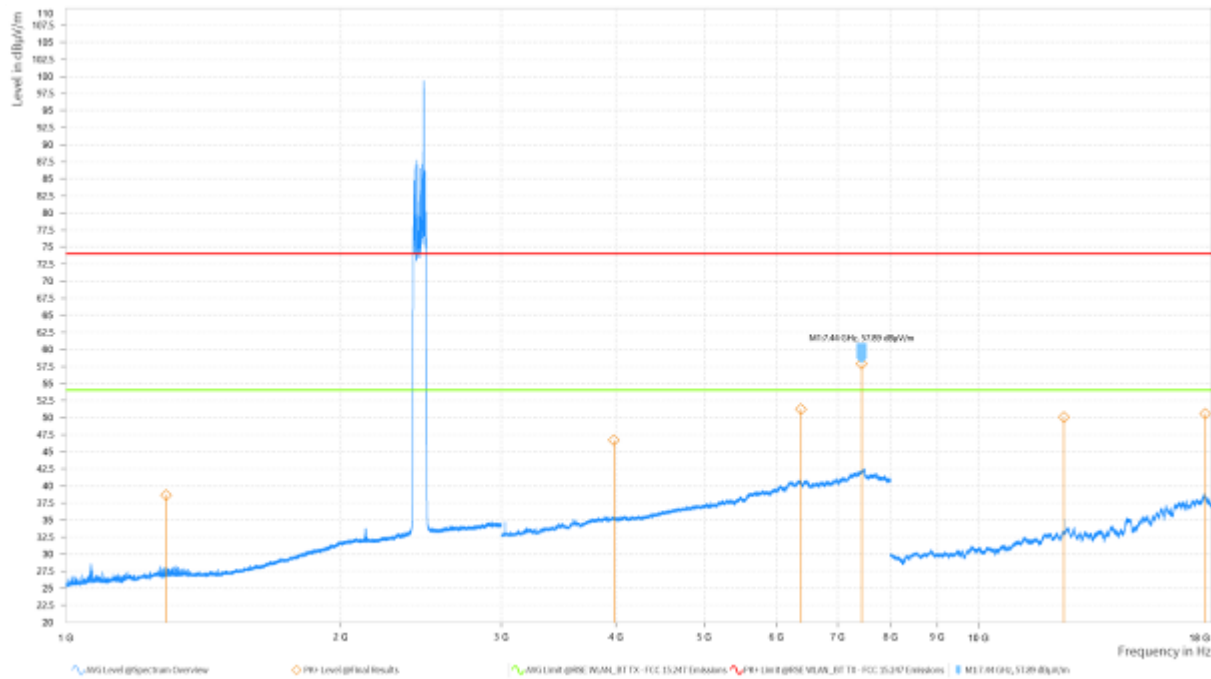
2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,282.400	28.87	54.00	25.13	0.31	H
2	4,174.750	35.45	54.00	18.55	8.80	H
2	6,346.250	40.72	54.00	13.28	14.94	H
2	7,497.750	42.39	54.00	11.61	15.96	H
3	12,009.000	32.85	54.00	21.15	8.35	H
3	17,660.500	37.96	54.00	16.04	16.96	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,282.400	44.42	74.00	29.58	0.31	H
2	4,174.750	46.50	74.00	27.50	8.80	H
2	6,346.250	52.01	74.00	21.99	14.94	H
2	7,497.750	53.11	74.00	20.89	15.96	H
3	12,009.000	46.49	74.00	27.51	8.35	H
3	17,660.500	48.59	74.00	25.41	16.96	H

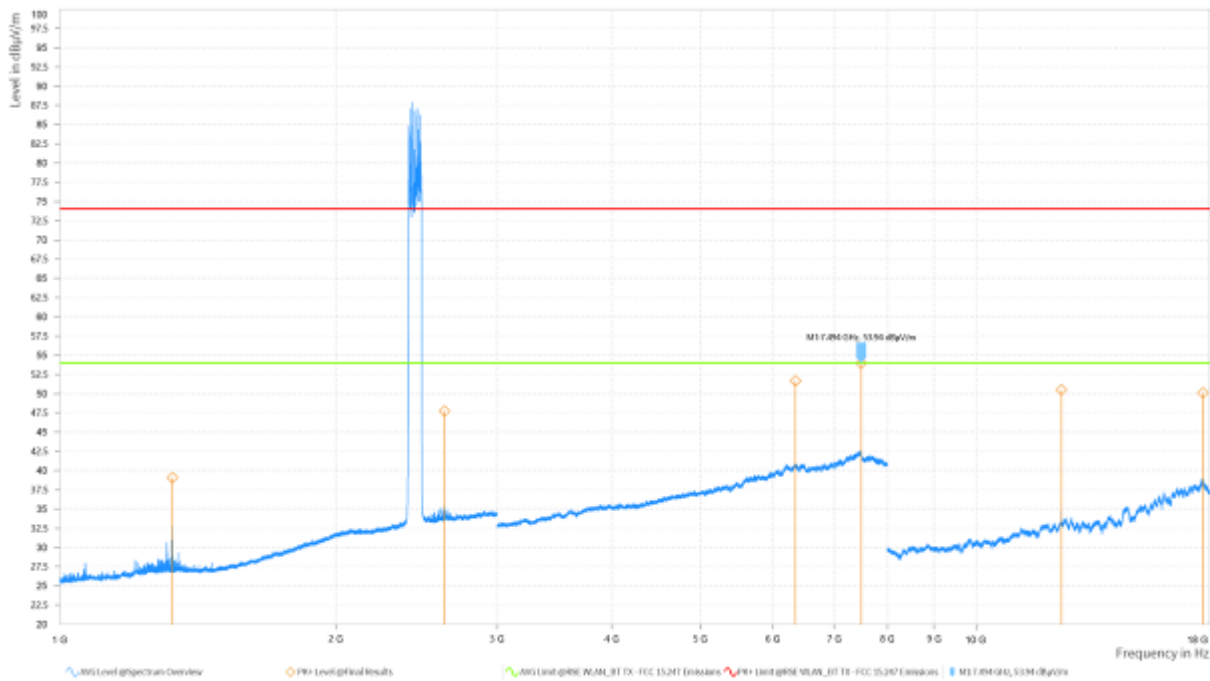
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,287.000	29.10	54.00	24.90	0.32	V
2	3,983.000	36.22	54.00	17.78	8.96	V
2	6,386.500	41.29	54.00	12.71	14.88	V
2	7,439.500	43.94	54.00	10.06	15.87	V
3	12,398.500	34.77	54.00	19.23	8.55	V
3	17,694.000	39.02	54.00	14.98	16.73	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,287.000	38.61	74.00	35.39	0.32	V
2	3,983.000	46.71	74.00	27.29	8.96	V
2	6,386.500	51.24	74.00	22.76	14.88	V
2	7,439.500	57.89	74.00	16.11	15.87	V
3	12,398.500	50.04	74.00	23.96	8.55	V
3	17,694.000	50.56	74.00	23.44	16.73	V

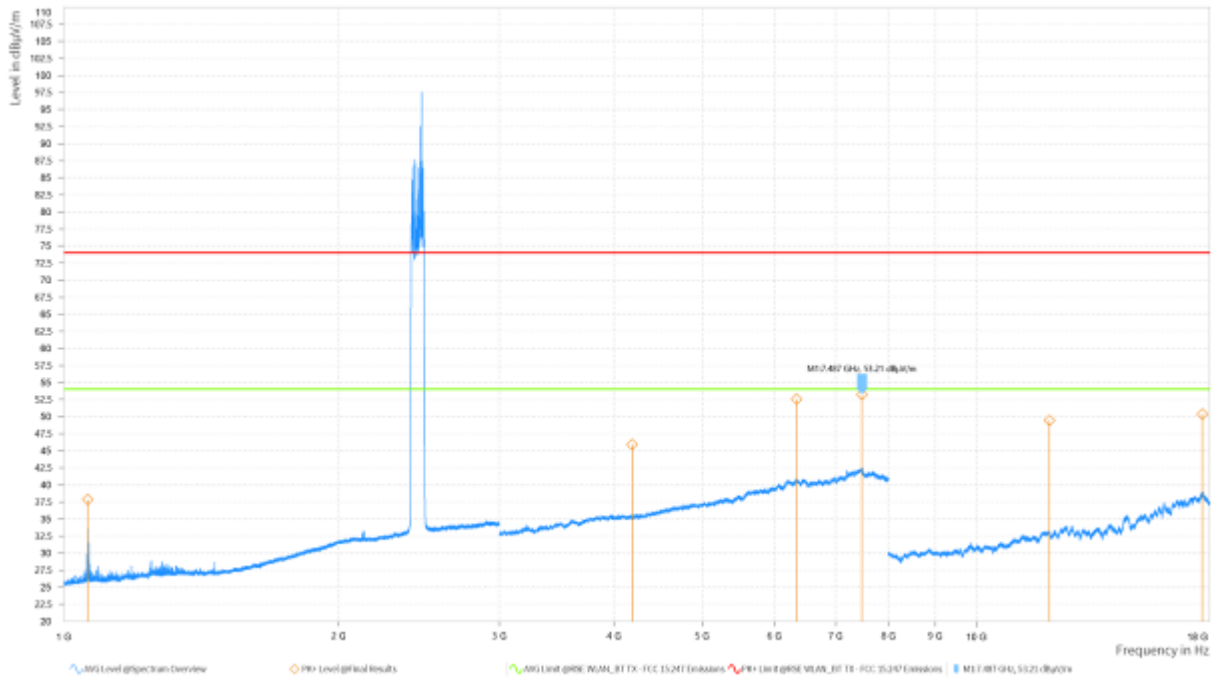
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,326.100	35.88	54.00	18.12	0.41	H
1	2,628.000	35.79	54.00	18.21	7.34	H
2	6,350.500	40.99	54.00	13.01	14.93	H
2	7,494.000	42.61	54.00	11.39	15.95	H
3	12,398.500	34.73	54.00	19.27	8.55	H
3	17,688.500	38.99	54.00	15.01	16.77	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,326.100	39.05	74.00	34.95	0.41	H
1	2,628.000	47.72	74.00	26.28	7.34	H
2	6,350.500	51.64	74.00	22.36	14.93	H
2	7,494.000	53.94	74.00	20.06	15.95	H
3	12,398.500	50.48	74.00	23.52	8.55	H
3	17,688.500	50.10	74.00	23.90	16.77	H

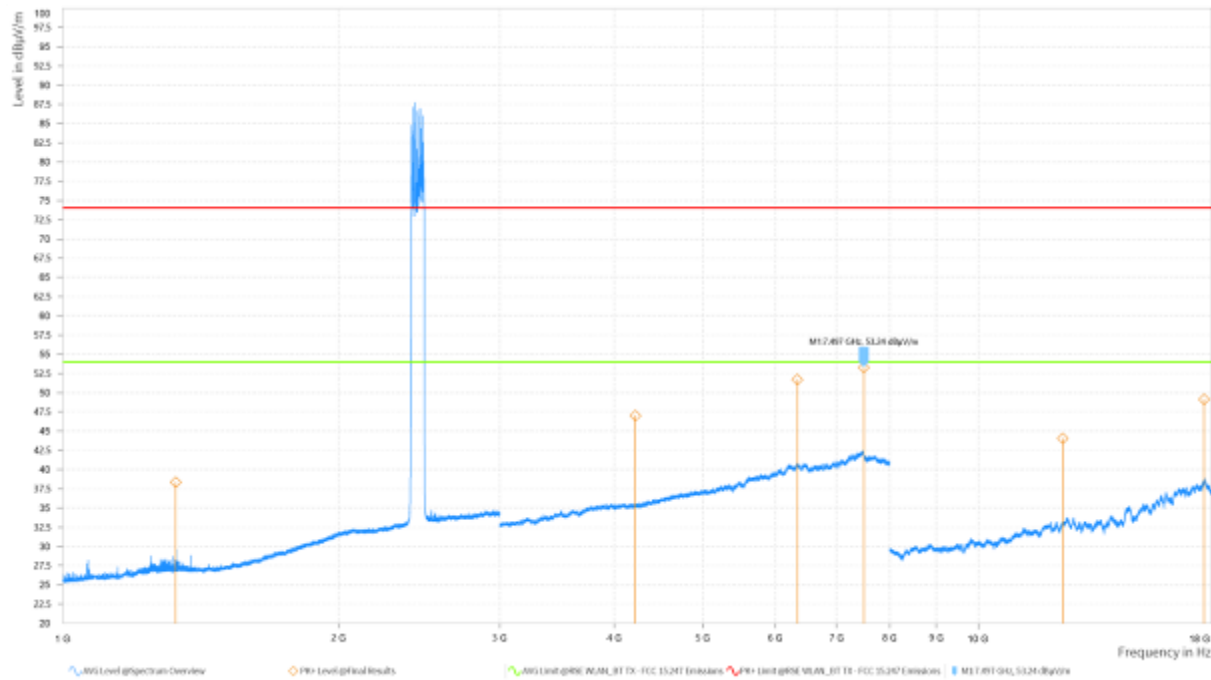
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,062.100	34.75	54.00	19.25	-1.05	V
2	4,191.250	35.72	54.00	18.28	8.76	V
2	6,346.250	40.91	54.00	13.09	14.94	V
2	7,486.750	42.62	54.00	11.38	15.94	V
3	12,008.000	34.10	54.00	19.90	8.34	V
3	17,659.500	39.05	54.00	14.95	16.96	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,062.100	37.84	74.00	36.16	-1.05	V
2	4,191.250	45.90	74.00	28.10	8.76	V
2	6,346.250	52.54	74.00	21.46	14.94	V
2	7,486.750	53.21	74.00	20.79	15.94	V
3	12,008.000	49.41	74.00	24.59	8.34	V
3	17,659.500	50.38	74.00	23.62	16.96	V

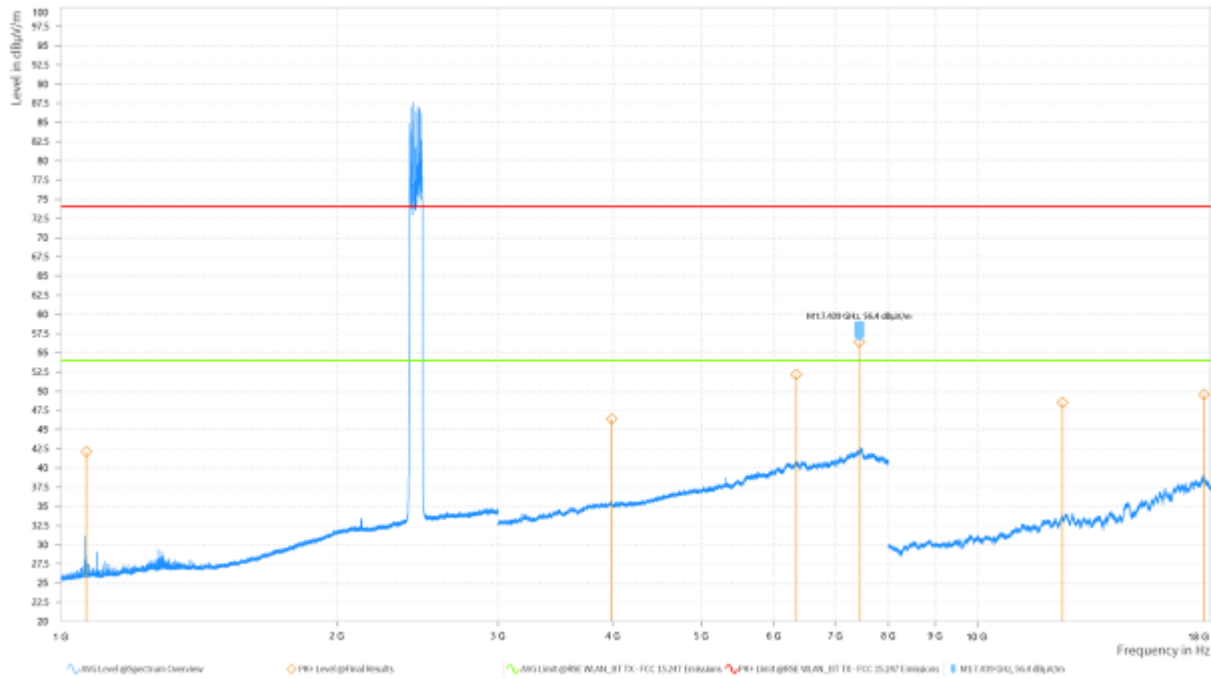
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,328.700	29.67	54.00	24.33	0.42	H
2	4,220.000	35.64	54.00	18.36	8.73	H
2	6,345.000	40.94	54.00	13.06	14.94	H
2	7,497.250	42.65	54.00	11.35	15.96	H
3	12,369.500	33.30	54.00	20.70	8.56	H
3	17,649.500	38.94	54.00	15.06	17.02	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,328.700	38.34	74.00	35.66	0.42	H
2	4,220.000	46.98	74.00	27.02	8.73	H
2	6,345.000	51.69	74.00	22.31	14.94	H
2	7,497.250	53.24	74.00	20.76	15.96	H
3	12,369.500	44.04	74.00	29.96	8.56	H
3	17,649.500	49.12	74.00	24.88	17.02	H

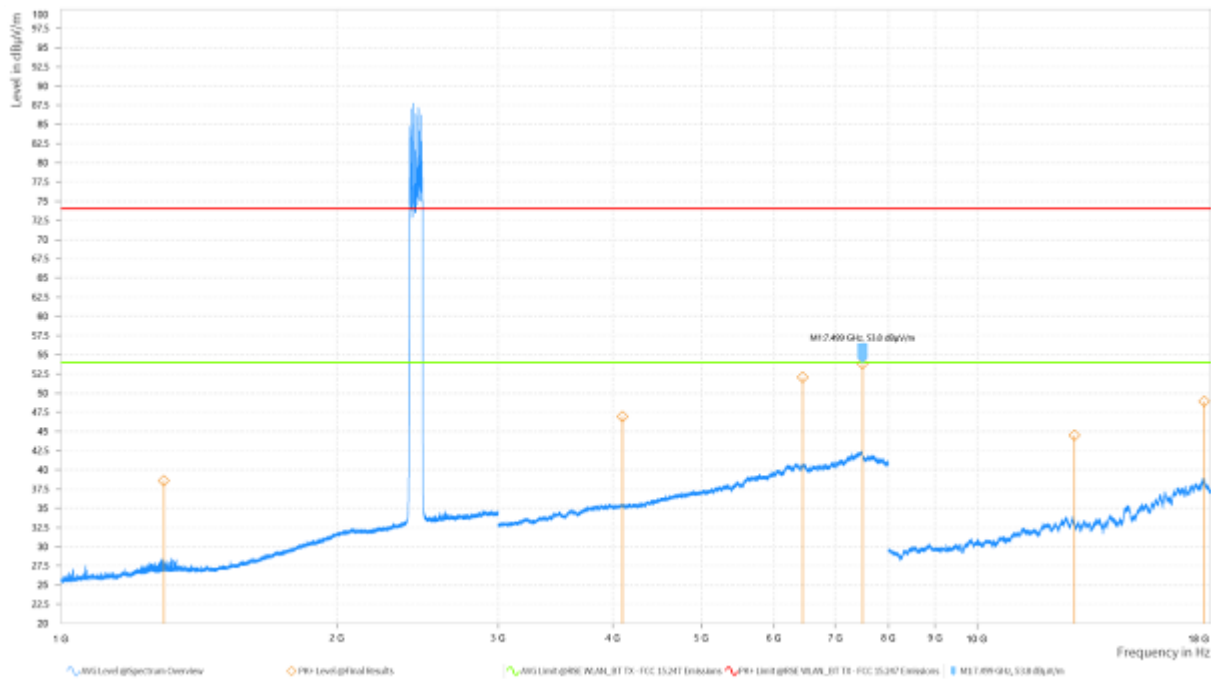
2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,065.700	32.67	54.00	21.33	-1.02	V
2	3,992.500	36.70	54.00	17.30	8.97	V
2	6,349.250	40.94	54.00	13.06	14.93	V
2	7,439.000	42.80	54.00	11.20	15.86	V
3	12,398.000	34.34	54.00	19.66	8.55	V
3	17,688.000	39.12	54.00	14.88	16.77	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,065.700	42.08	74.00	31.92	-1.02	V
2	3,992.500	46.37	74.00	27.63	8.97	V
2	6,349.250	52.13	74.00	21.87	14.93	V
2	7,439.000	56.40	74.00	17.60	15.86	V
3	12,398.000	48.49	74.00	25.51	8.55	V
3	17,688.000	49.52	74.00	24.48	16.77	V

2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	1,294.900	29.30	54.00	24.70	0.34	H
2	4,100.250	35.64	54.00	18.36	8.90	H
2	6,449.250	40.97	54.00	13.03	14.80	H
2	7,499.250	42.54	54.00	11.46	15.96	H
3	12,773.000	32.92	54.00	21.08	9.17	H
3	17,695.000	38.95	54.00	15.05	16.72	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	1,294.900	38.59	74.00	35.41	0.34	H
2	4,100.250	46.92	74.00	27.08	8.90	H
2	6,449.250	52.05	74.00	21.95	14.80	H
2	7,499.250	53.80	74.00	20.20	15.96	H
3	12,773.000	44.48	74.00	29.52	9.17	H
3	17,695.000	48.91	74.00	25.09	16.72	H

4.3 Emissions in non-restricted frequency band	VERDICT: PASS
---	----------------------

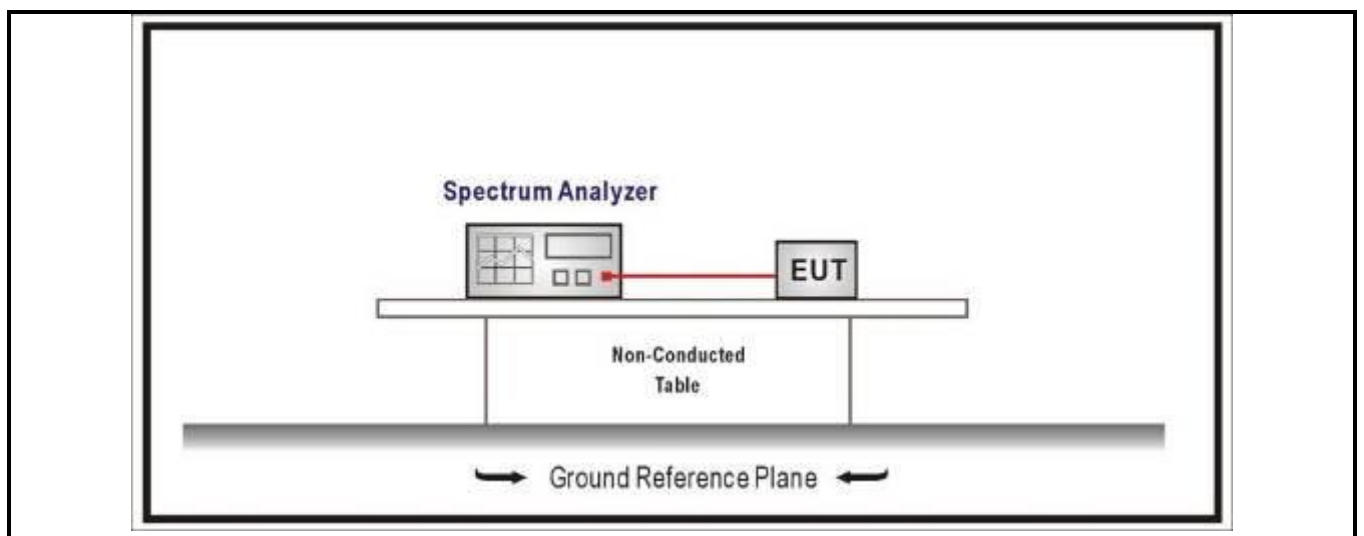
Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d) & RSS-247 Issue 2 Section 5.5	
RF Output power (Detection methods)	Limit(dB)	
RF Output power(Average detector)	30dBc(Note1)	
RF Output power(PK detector)	20dBc(Note2)	

Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD by Level in 100 kHz (i.e., 30 dBc).

Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD by Level in 100 kHz (i.e., 20 dBc).

Test Configuration

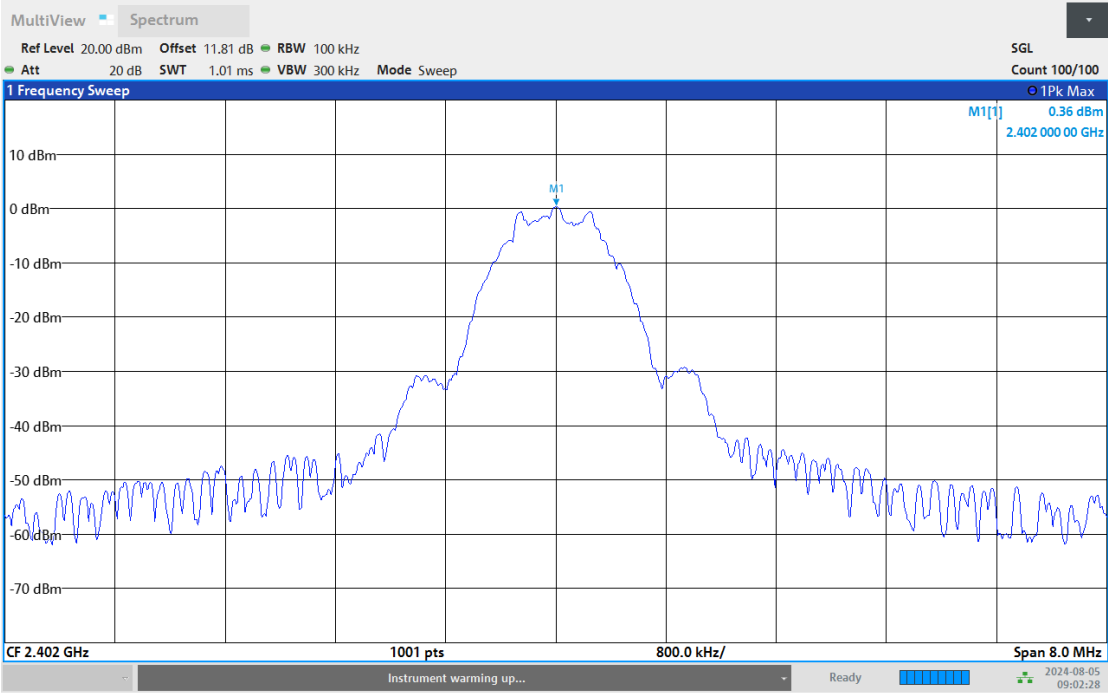


Performed measurements

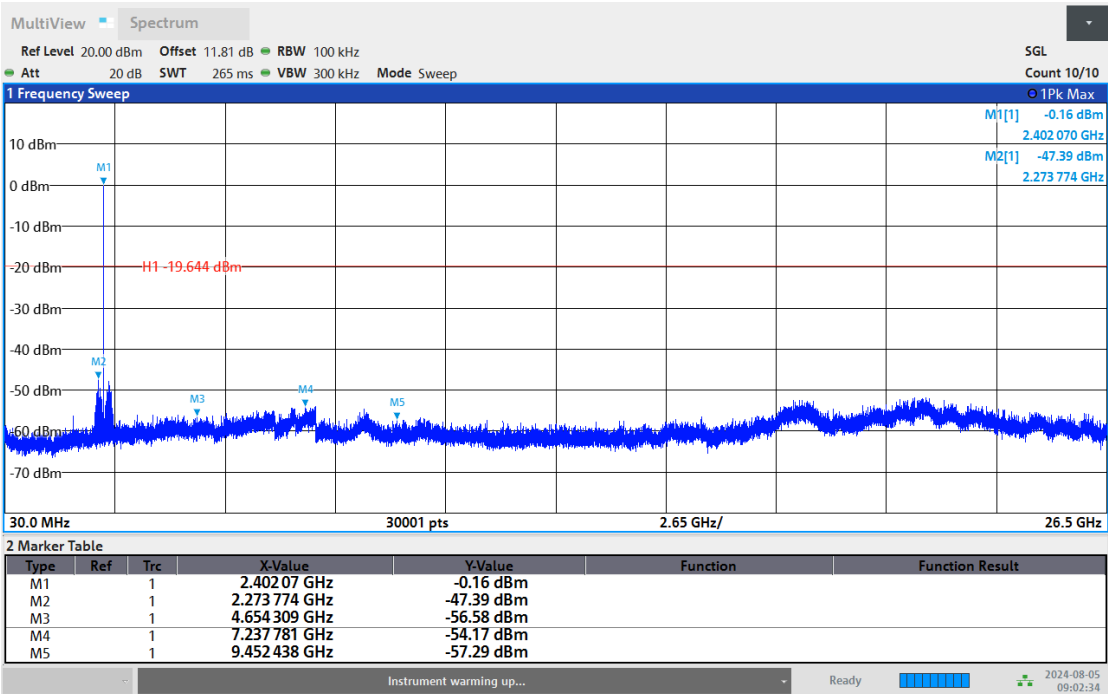
Port under test	Antenna port	
Test method applied	☒	Conducted measurement
	☐	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	---	

See next page

Results
Emissions in non-restricted frequency band (Repeater)
2402MHz, 1Mbps

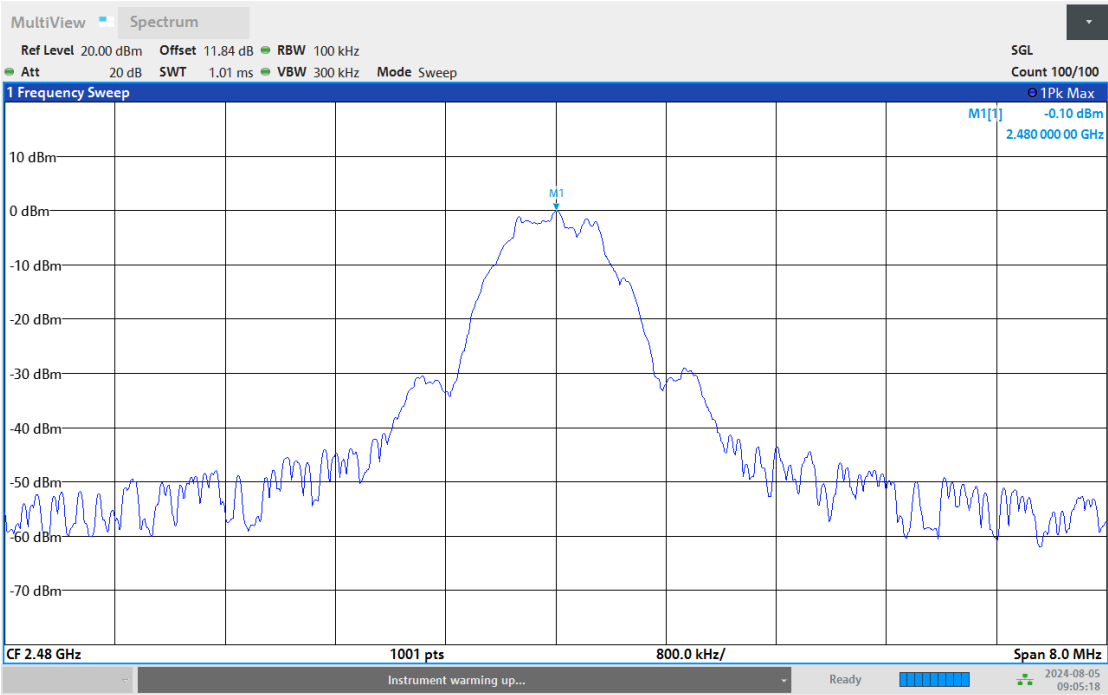


09:02:28 AM 08/05/2024

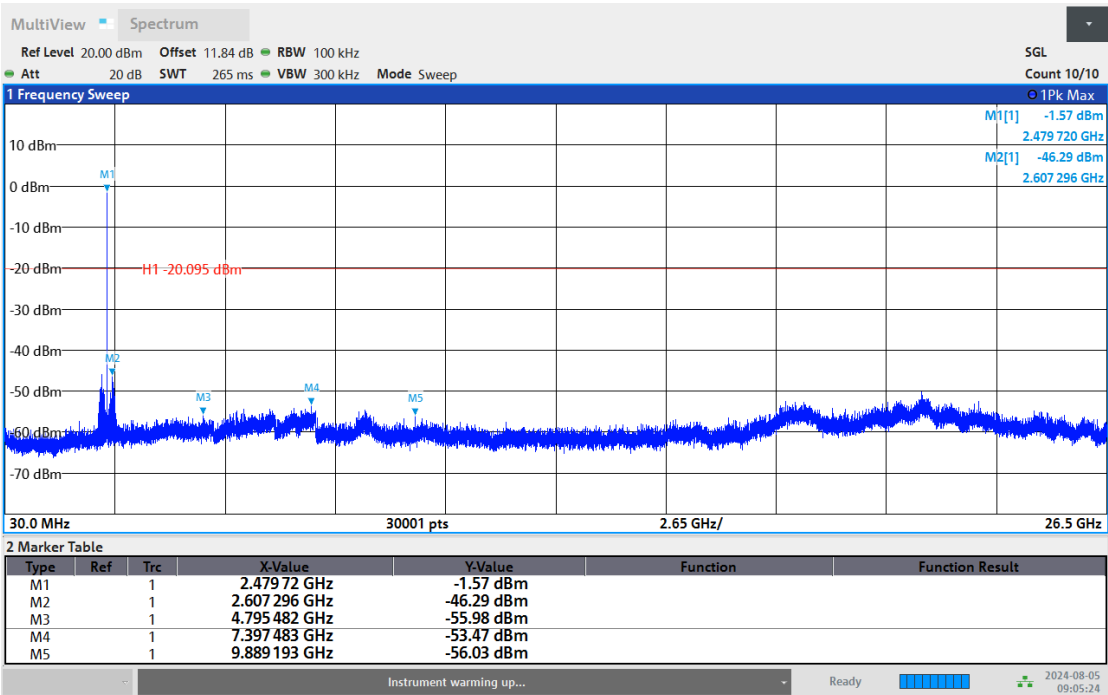


09:02:34 AM 08/05/2024

2480MHz, 1Mbps

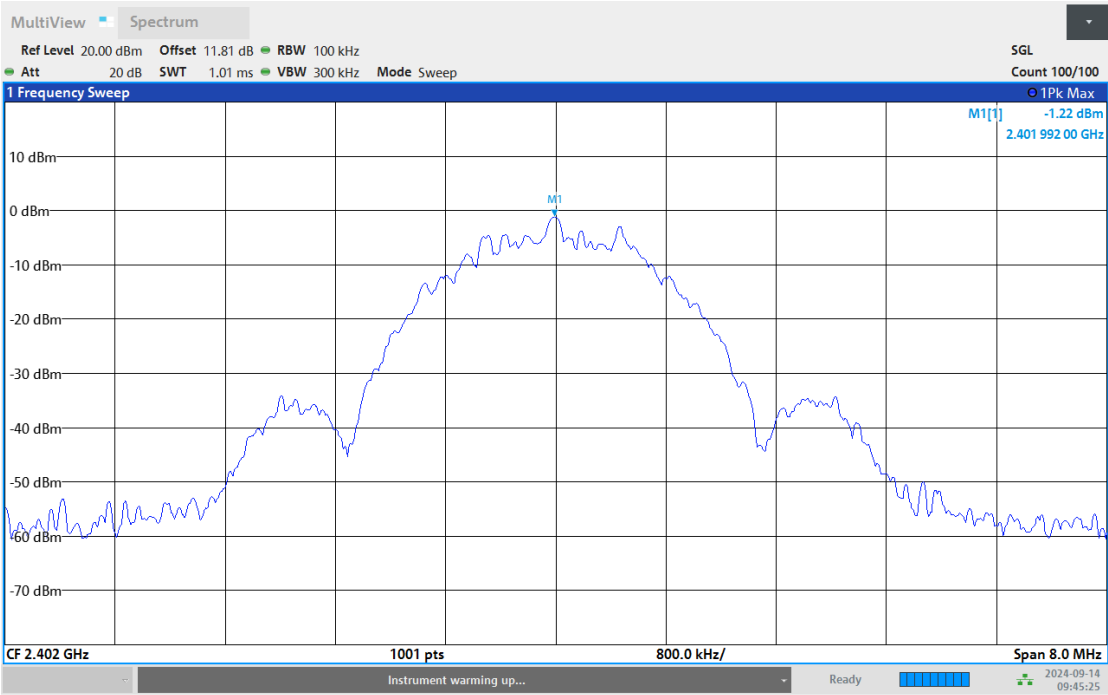


09:05:19 AM 08/05/2024

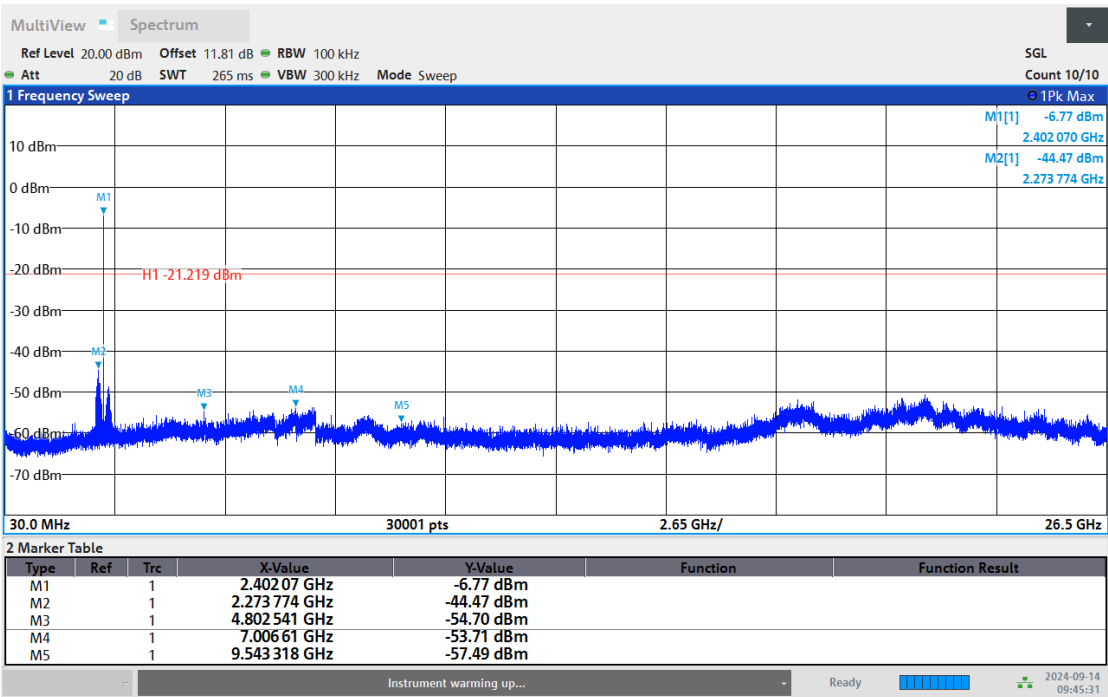


09:05:24 AM 08/05/2024

2402MHz, 2Mbps

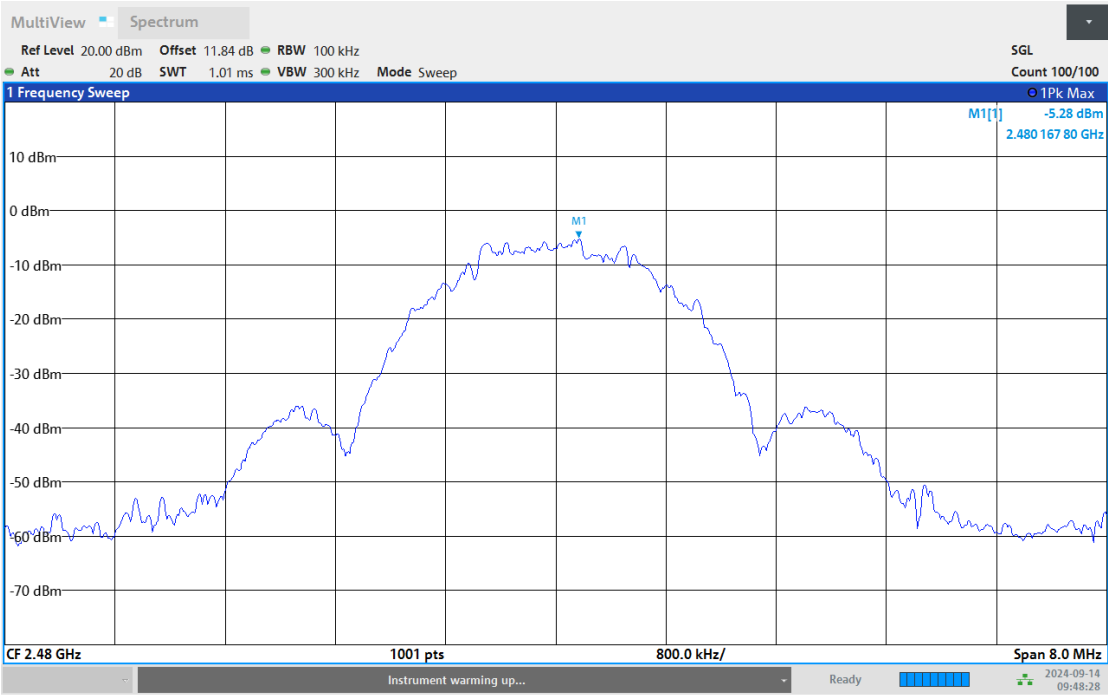


09:45:25 AM 09/14/2024

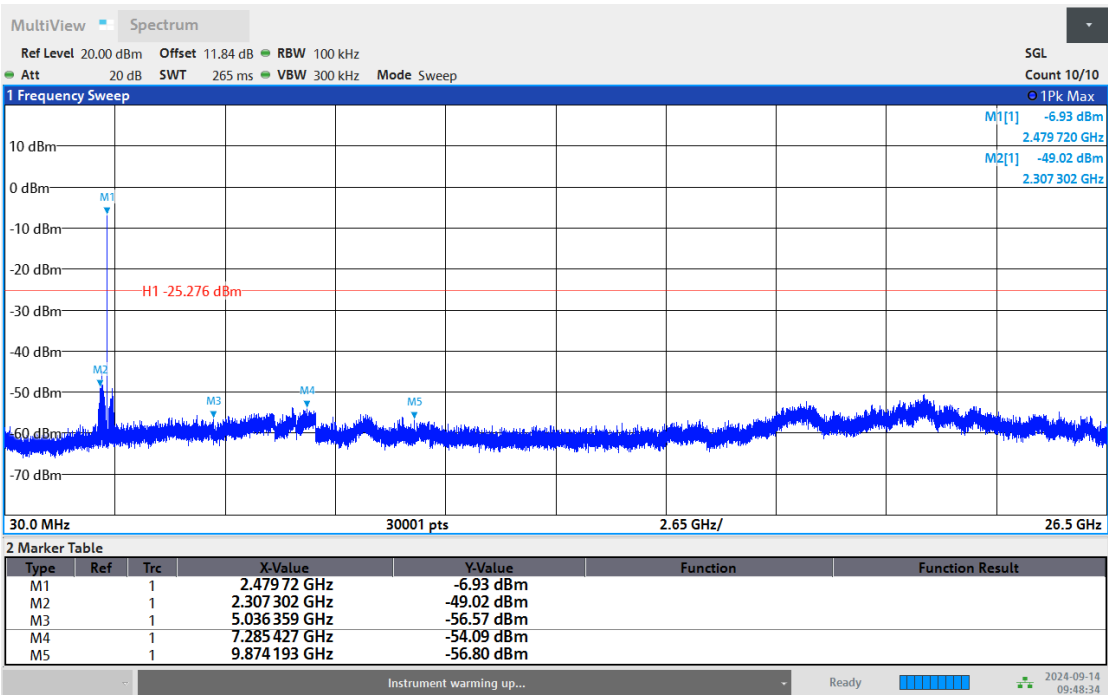


09:45:31 AM 09/14/2024

2480MHz, 2Mbps



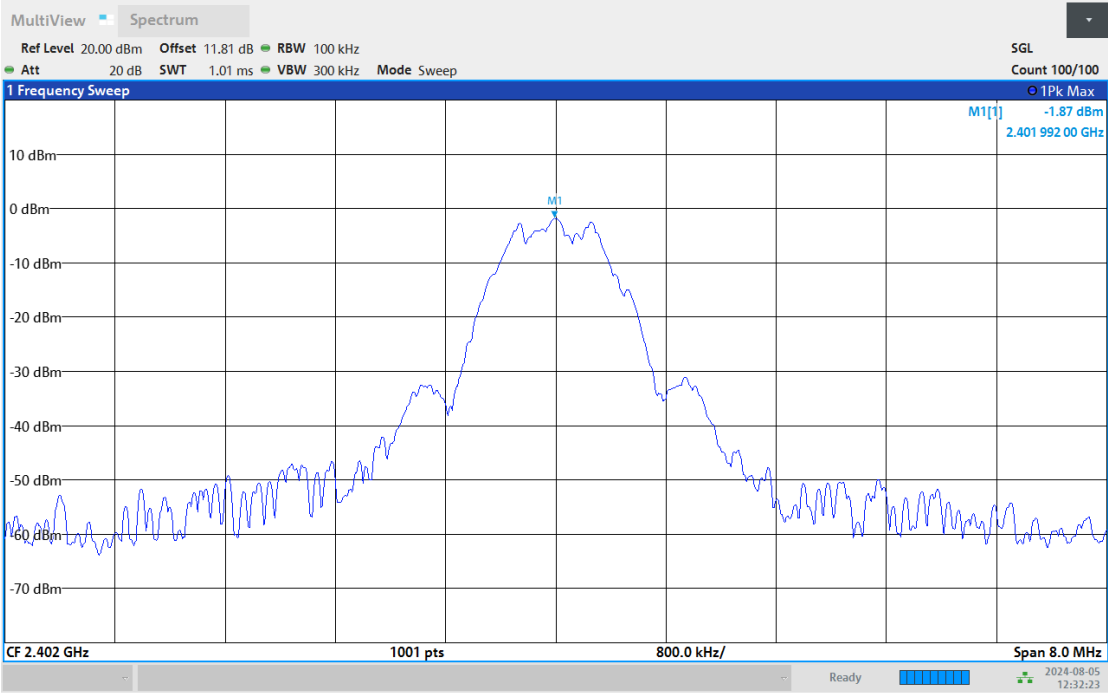
09:48:29 AM 09/14/2024



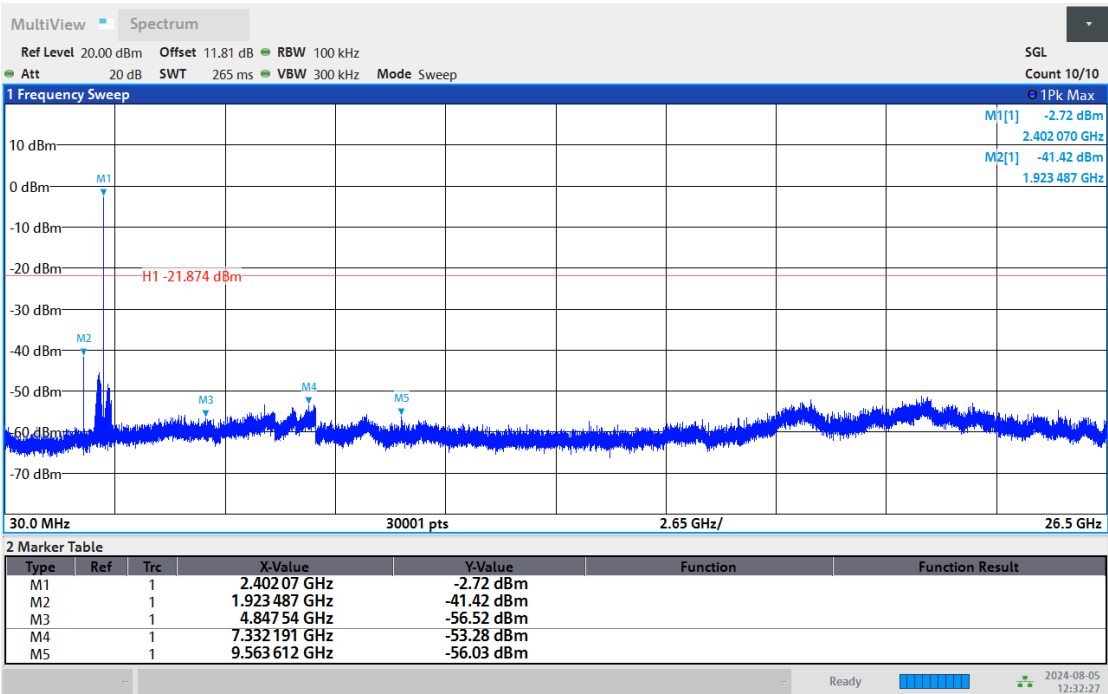
09:48:34 AM 09/14/2024

Emissions in non-restricted frequency band (Probe)

2402MHz, 1Mbps

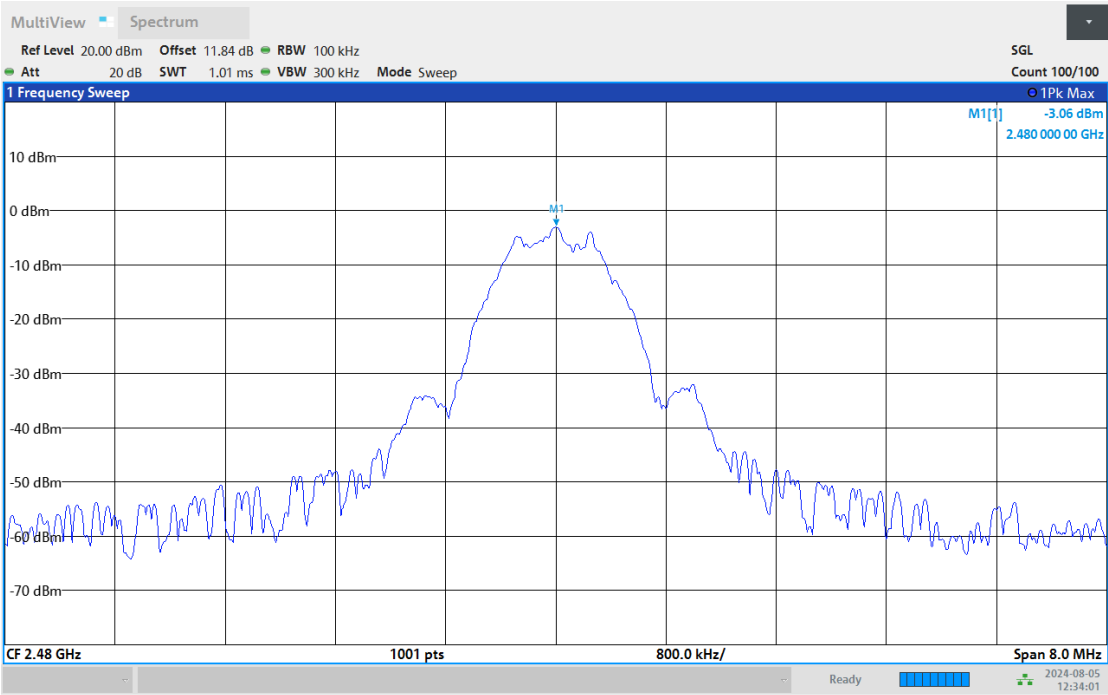


12:32:23 PM 08/05/2024

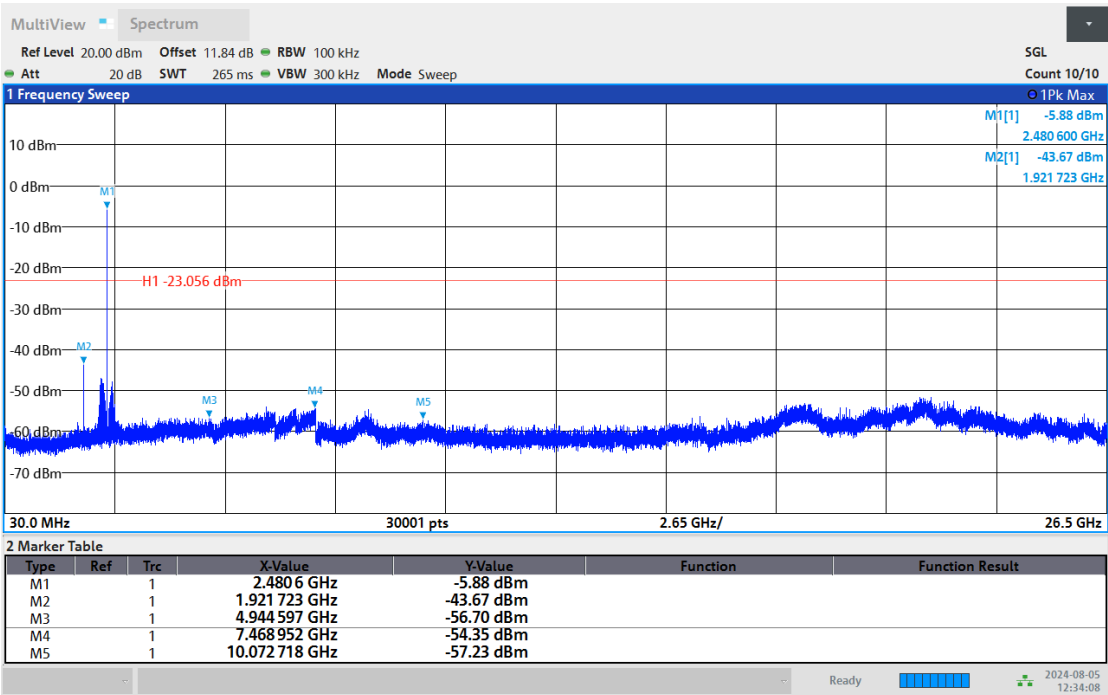


12:32:28 PM 08/05/2024

2480MHz, 1Mbps

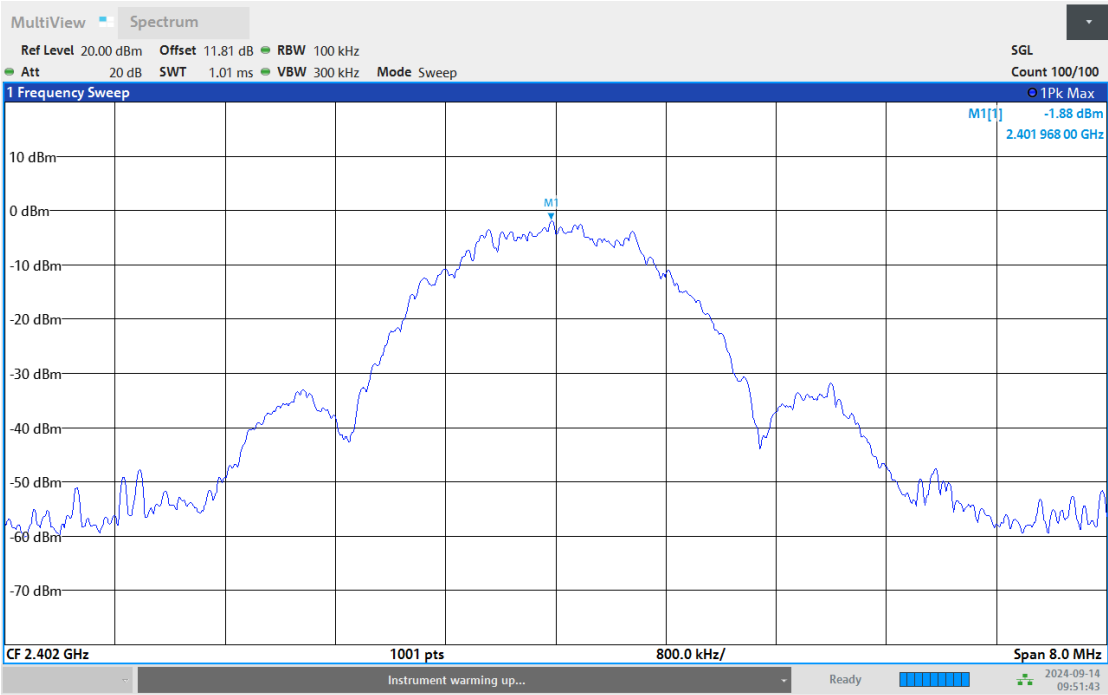


12:34:02 PM 08/05/2024

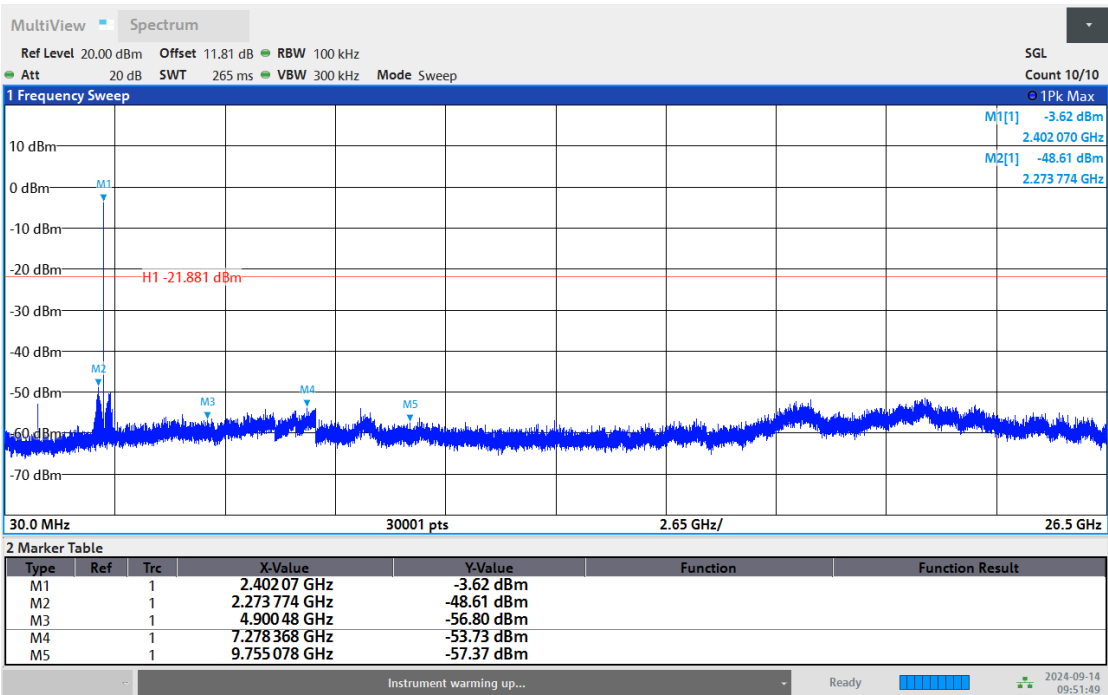


12:34:08 PM 08/05/2024

2402MHz, 2Mbps

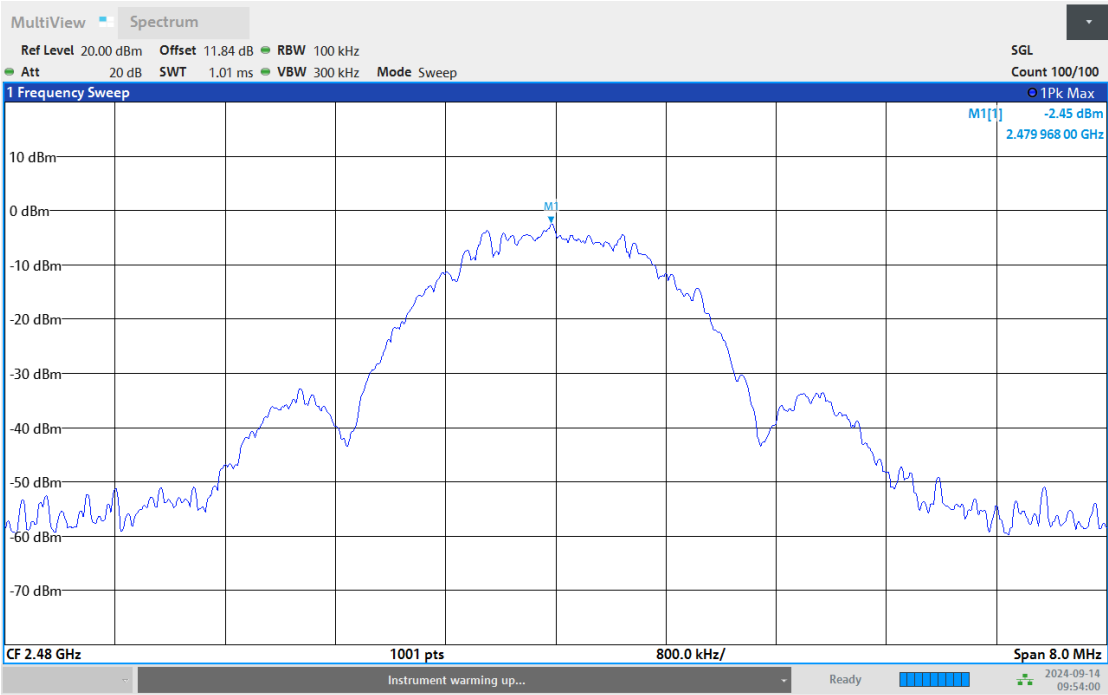


09:51:44 AM 09/14/2024

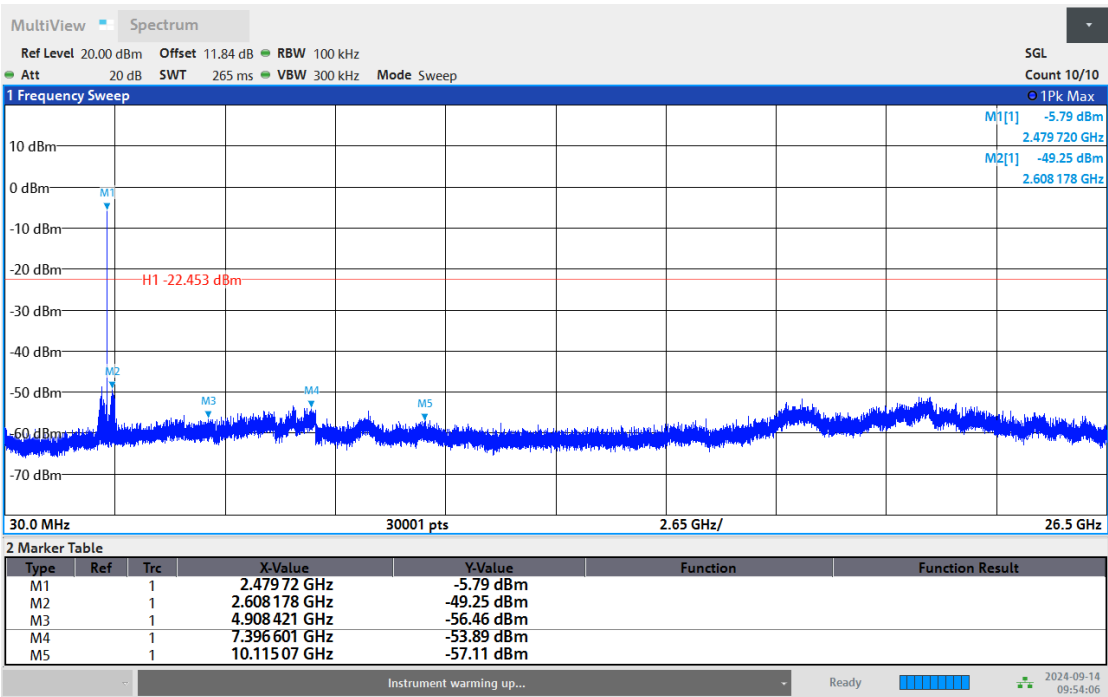


09:51:49 AM 09/14/2024

2480MHz, 2Mbps



09:54:01 AM 09/14/2024



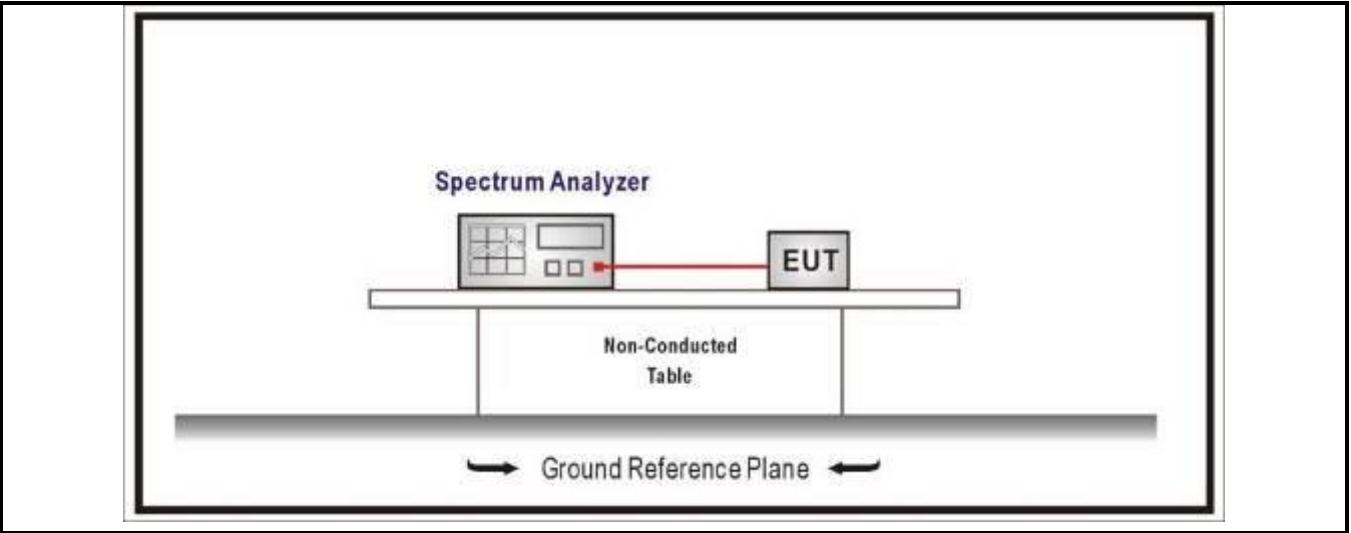
09:54:07 AM 09/14/2024

4.4	Duty Cycle	VERDICT: PASS
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Limit

N/A

Test Configuration



Performed measurements

Port under test	Antenna port	
Test method applied	☒	Conducted measurement
	☐	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	For reporting purpose only	

See next page.

Results Repeater

Mode	CH.	Test Freq. (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
BLE 1Mbps	00	2402	63.12	2.00	2.53
	19	2440	63.20	1.99	2.53
	39	2480	63.12	2.00	2.53
BLE 2Mbps	00	2402	57.65	2.39	0.93
	19	2440	57.65	2.39	0.93
	39	2480	57.63	2.39	0.93

Probe

Mode	CH.	Test Freq. (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
BLE 1Mbps	00	2402	63.20	1.99	2.53
	19	2440	63.20	1.99	2.53
	39	2480	63.12	2.00	2.53
BLE 2Mbps	00	2402	57.64	2.39	0.93
	19	2440	57.64	2.39	0.93
	39	2480	57.63	2.39	0.93

Note:

According to KDB 558074, when test for Radiated Emission Band Edge and Radiated Emission, for average detector set: VBW $\geq$ 1/T will be used.

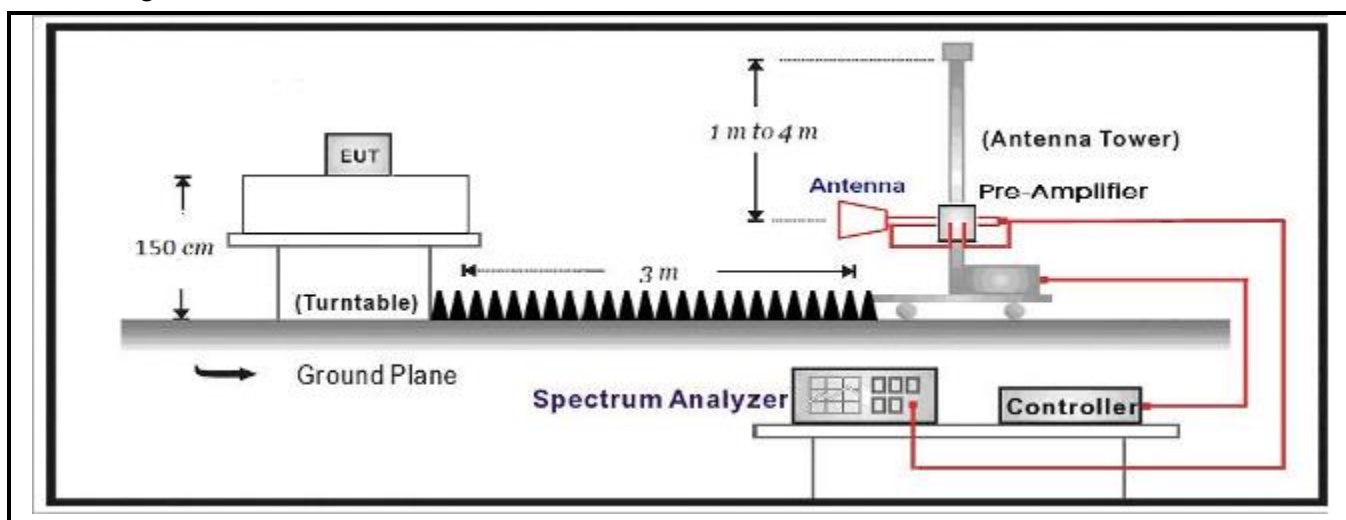
4.5	Radiated Emission Band Edge	VERDICT: PASS
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Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247(d), 15.205, 15.209 & RSS-Gen Issue 5 Section 8.9 & 8.10			
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

Test Configuration



Performed measurements

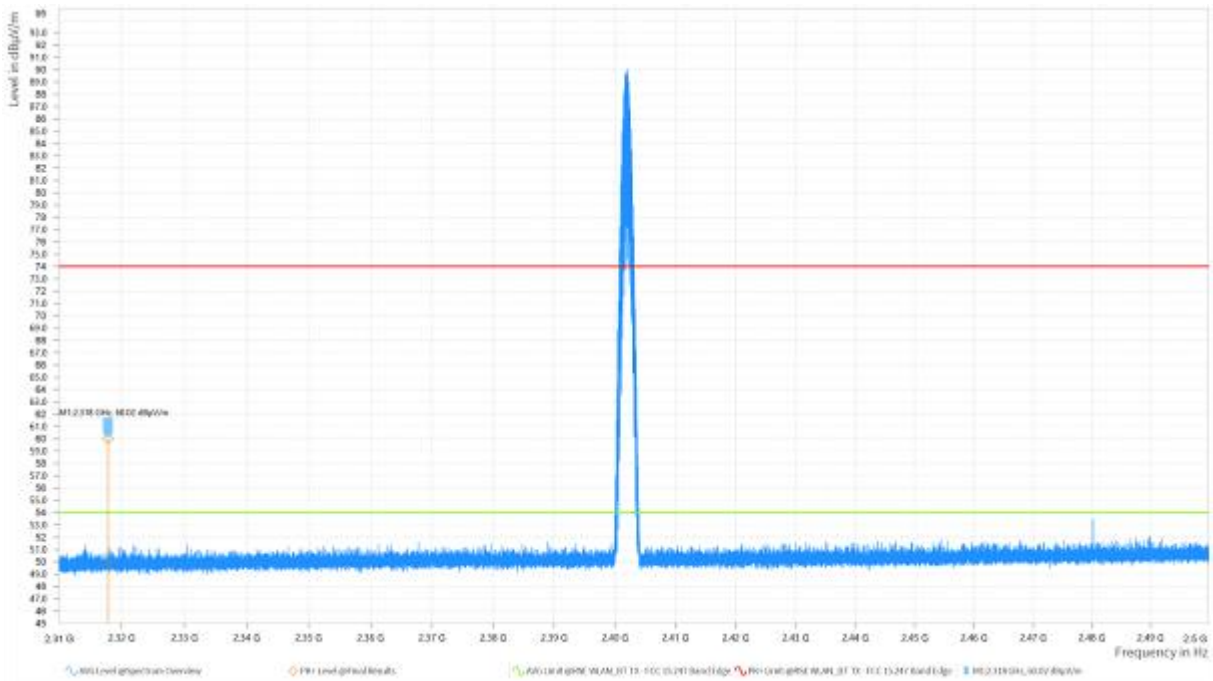
Port under test	Enclosure port	
Test method applied	☐	Conducted measurement
	☒	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	---	

See next page

Results

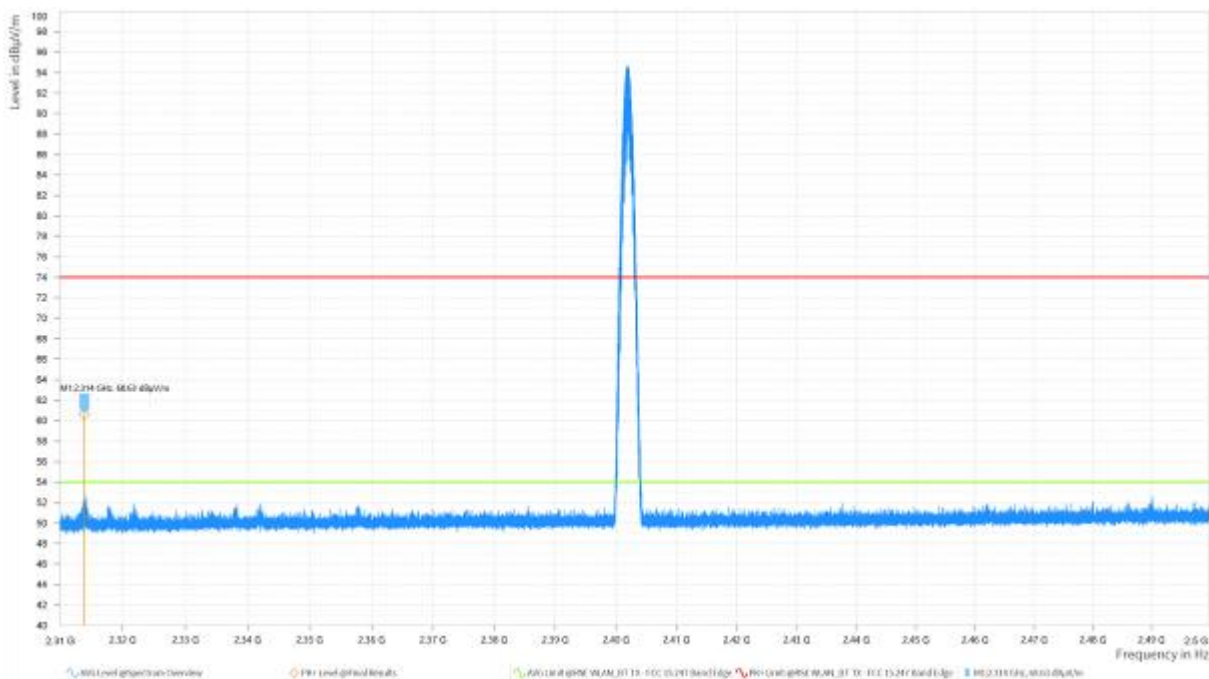
Radiated Emission Band Edge (Repeater)

2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,317.758	48.25	54.00	5.75	5.17	V

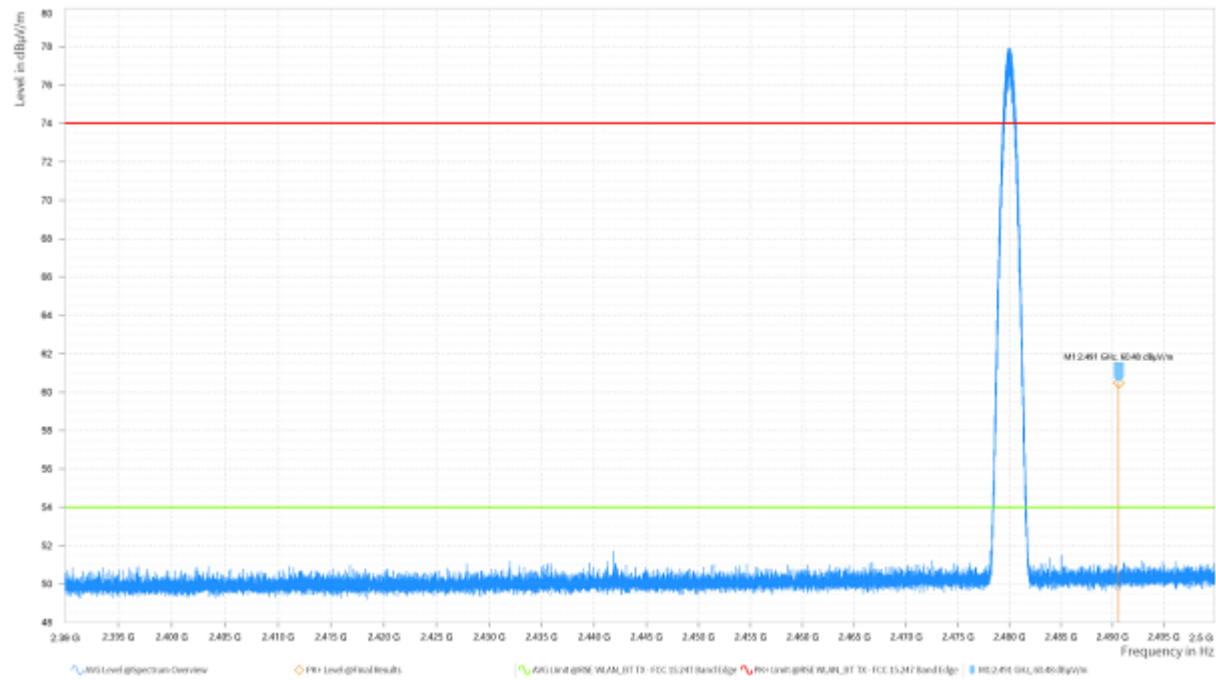
Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,317.758	60.02	74.00	13.98	5.17	V



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,313.879	48.36	54.00	5.64	5.14	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,313.879	60.63	74.00	13.37	5.14	H

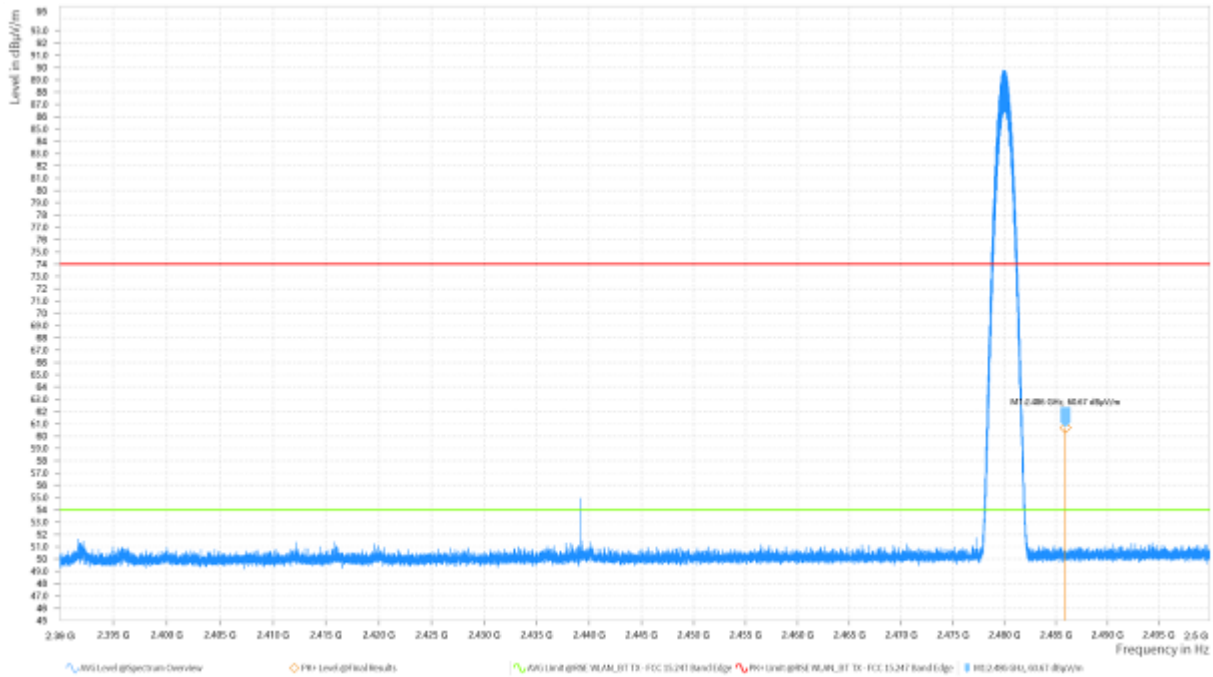
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,490.612	49.64	54.00	4.36	5.85	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,490.612	60.48	74.00	13.52	5.85	V

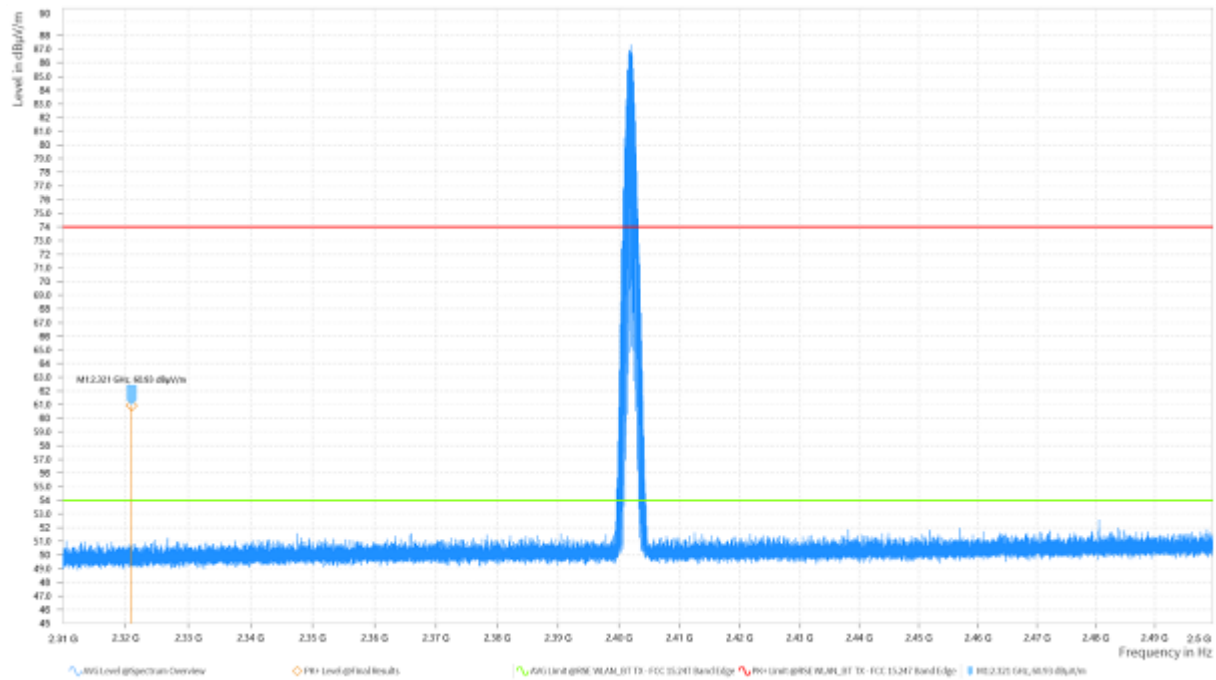
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,485.920	49.74	54.00	4.26	5.83	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,485.920	60.67	74.00	13.33	5.83	H

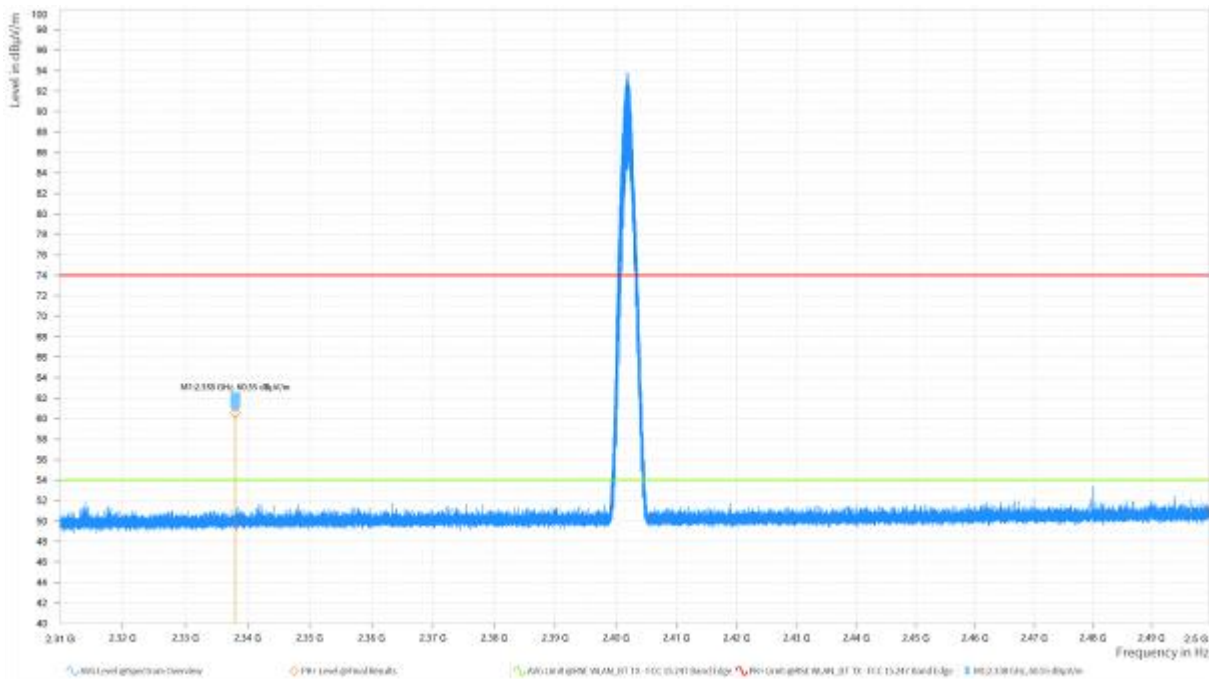
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,320.925	48.28	54.00	5.72	5.19	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,320.925	60.93	74.00	13.07	5.19	V

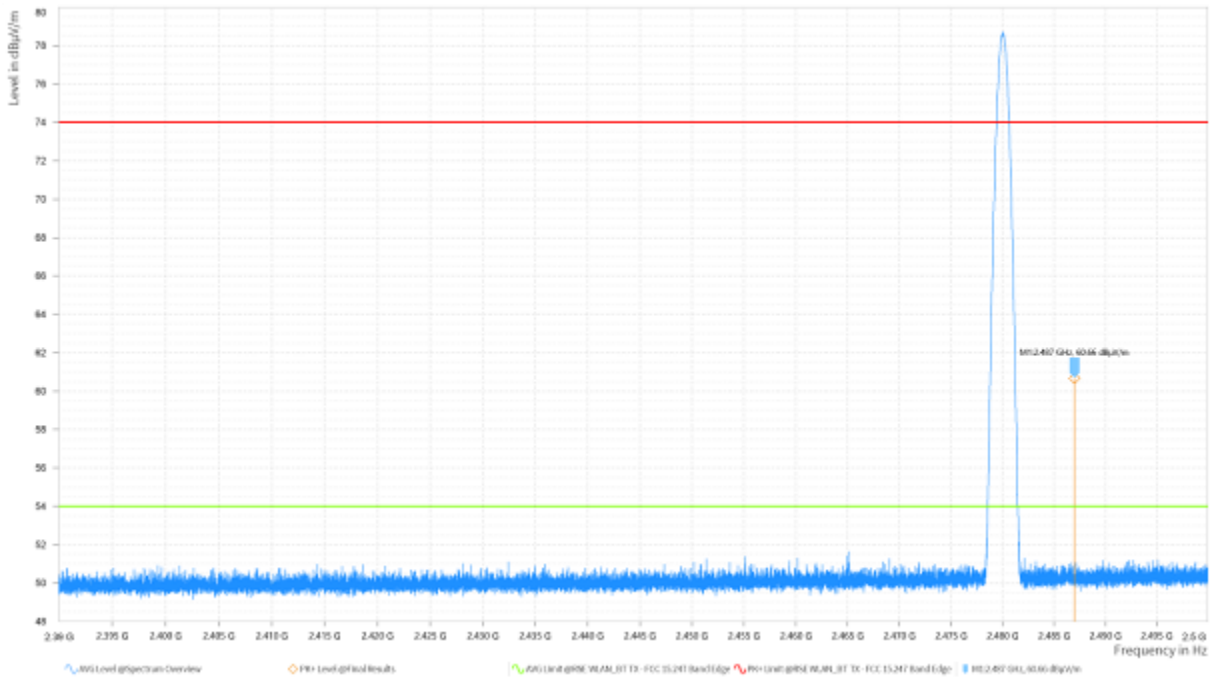
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,338.014	48.38	54.00	5.62	5.30	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,338.014	60.55	74.00	13.45	5.30	H

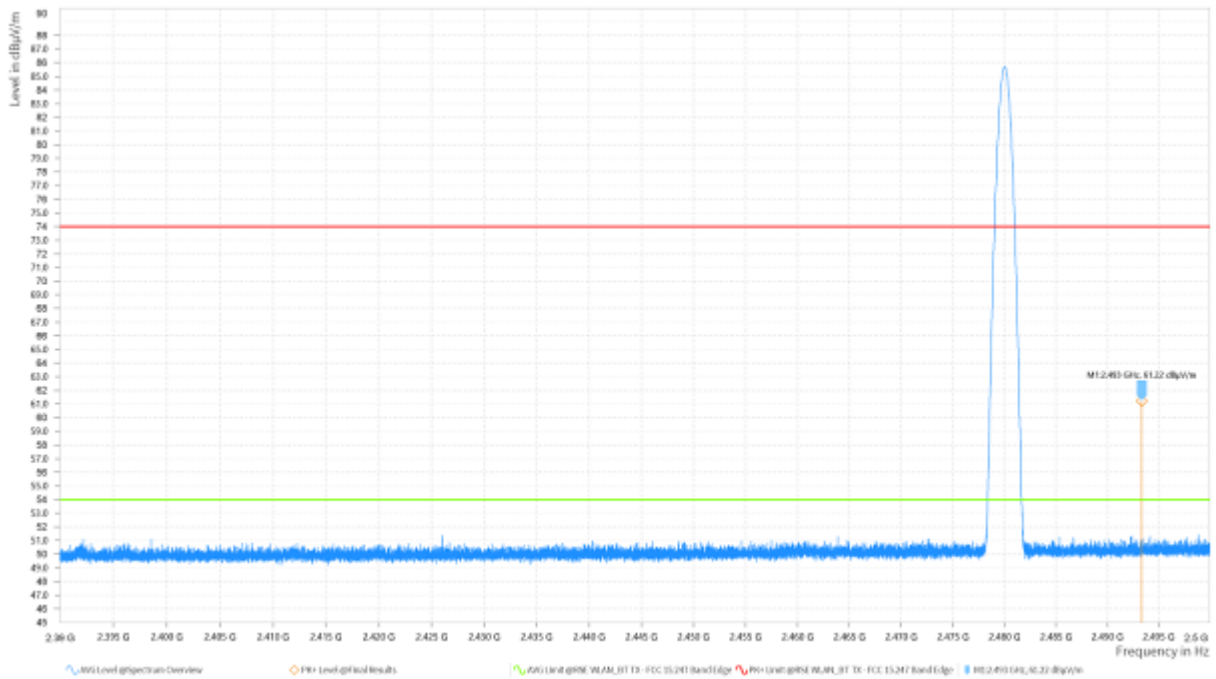
2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,486.987	49.14	54.00	4.86	5.83	V

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,486.987	60.66	74.00	13.34	5.83	V

2480MHz, 2Mbps

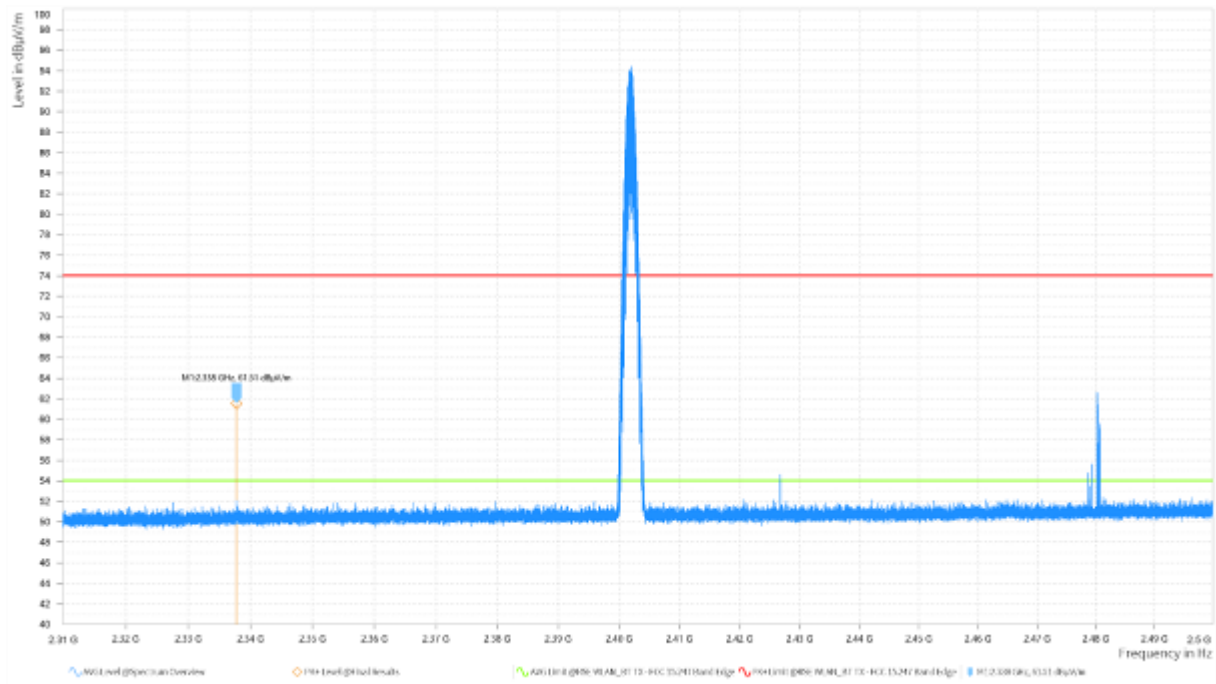


Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,493.356	49.30	54.00	4.70	5.86	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,493.356	61.22	74.00	12.78	5.86	H

Radiated Emission Band Edge (Probe)

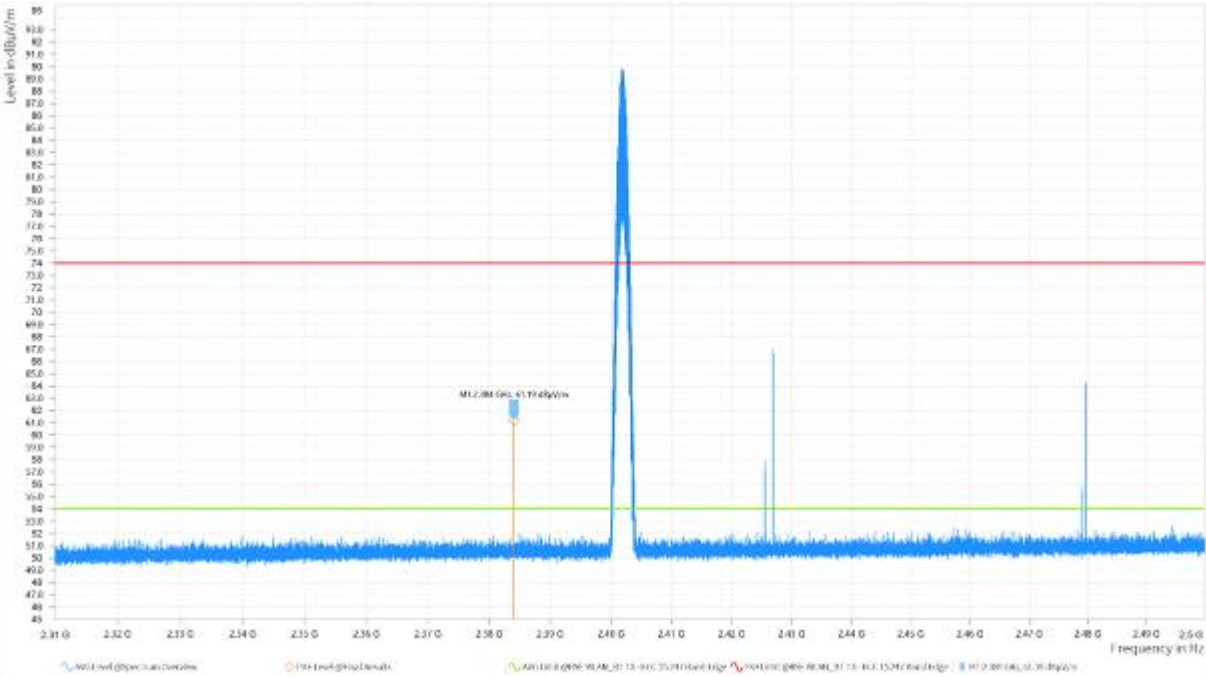
2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,337.729	48.68	54.00	5.32	5.30	V

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,337.729	61.51	74.00	12.49	5.30	V

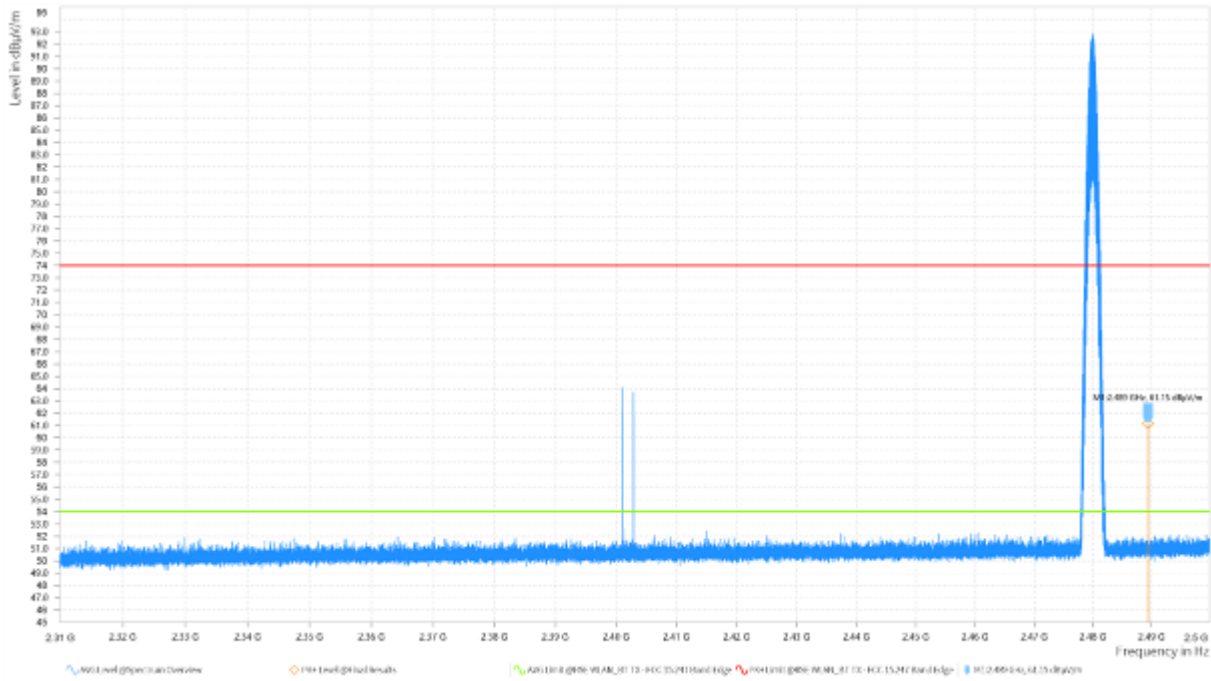
2402MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,384.042	49.69	54.00	4.31	5.52	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,384.042	61.19	74.00	12.81	5.52	H

2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,489.397	48.79	54.00	5.21	5.84	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,489.397	61.15	74.00	12.85	5.84	V

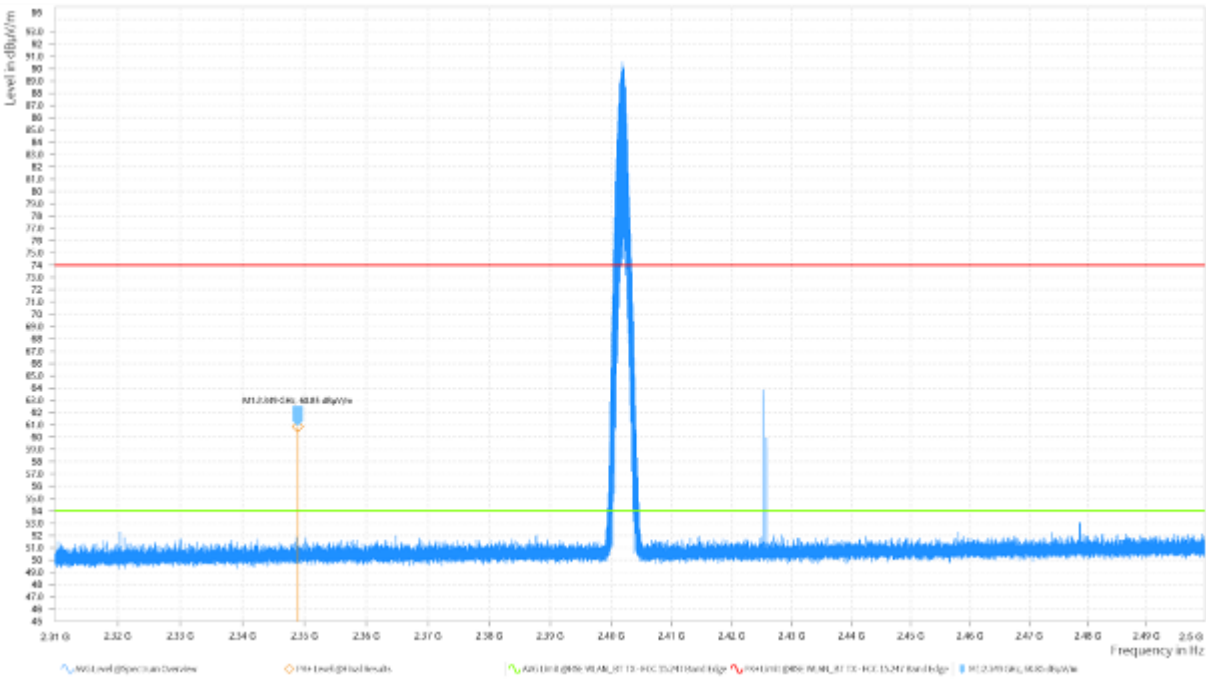
2480MHz, 1Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,486.114	49.19	54.00	4.81	5.83	H

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,486.114	60.44	74.00	13.56	5.83	H

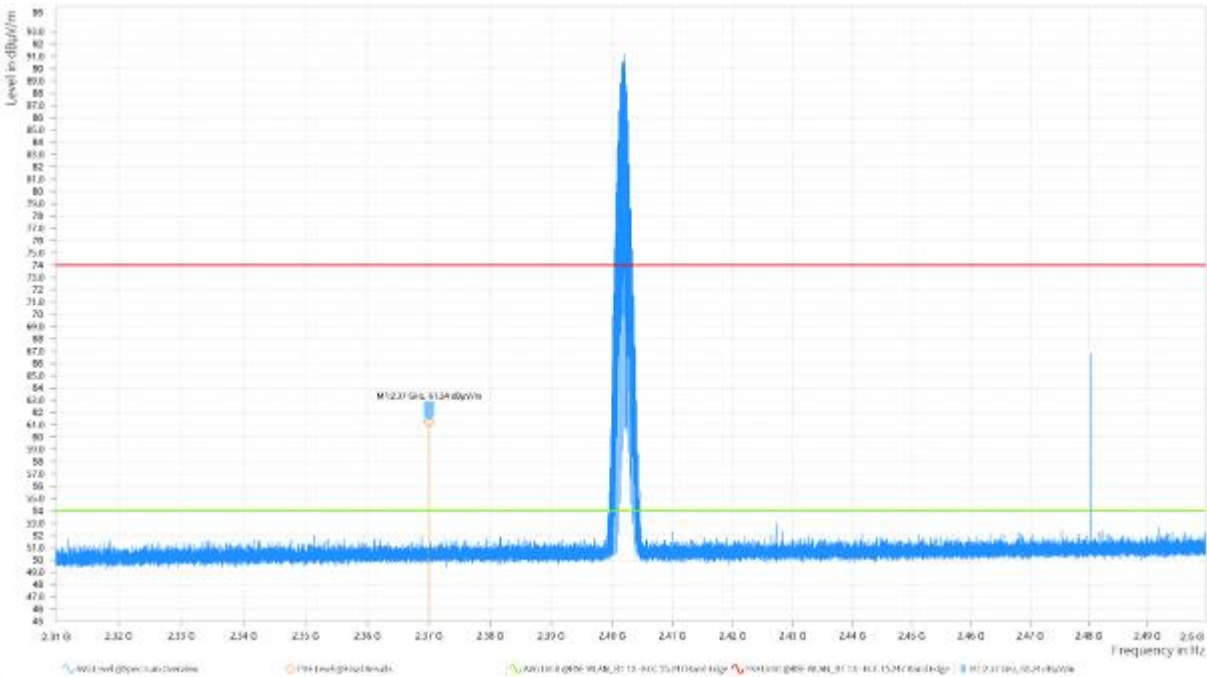
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,348.876	48.82	54.00	5.18	5.38	V

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,348.876	60.85	74.00	13.15	5.38	V

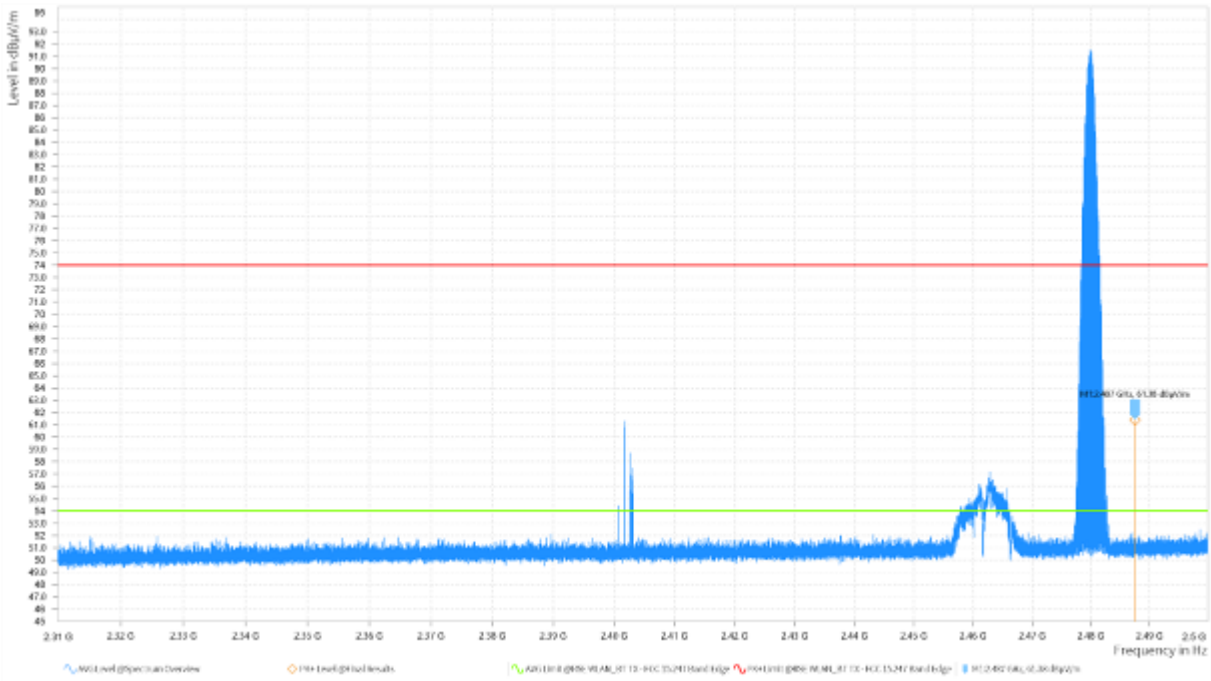
2402MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,370.003	49.52	54.00	4.48	5.47	H

Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,370.003	61.24	74.00	12.76	5.47	H

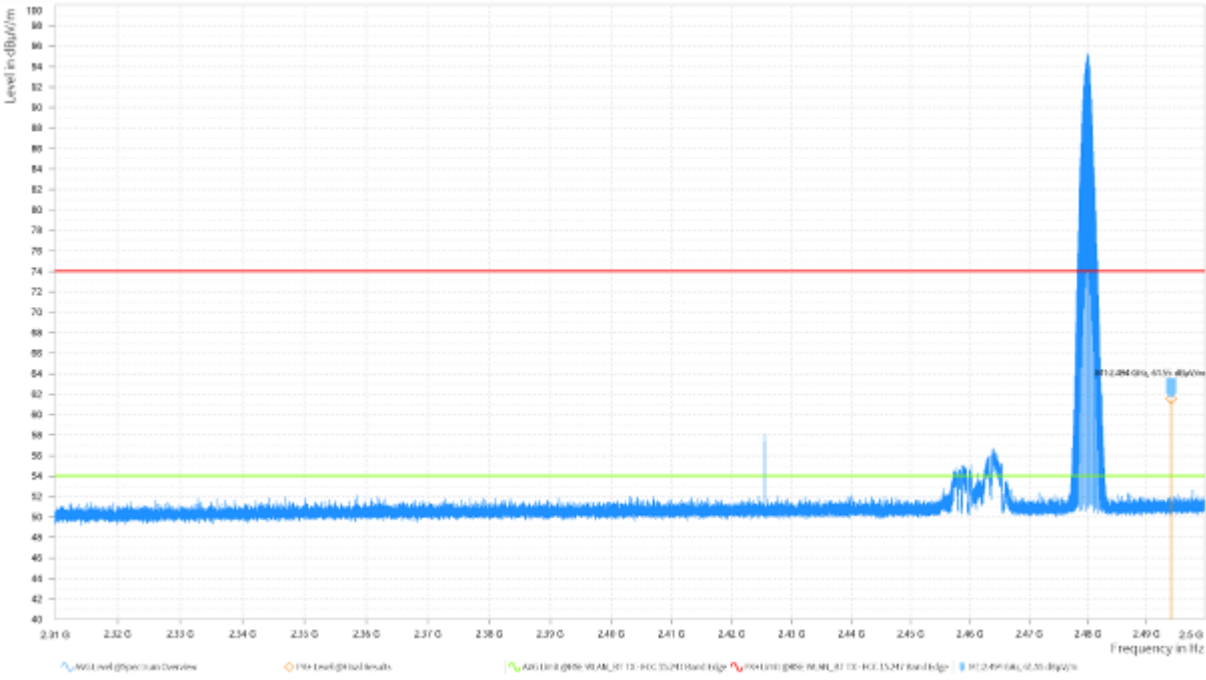
2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBμV/m]	AVG Limit [dBμV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,487.497	49.32	54.00	4.68	5.83	V

Rg	Frequency [MHz]	PK+ Level [dBμV/m]	PK+ Limit [dBμV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,487.497	61.38	74.00	12.62	5.83	V

2480MHz, 2Mbps



Rg	Frequency [MHz]	AVG Level [dBµV/m]	AVG Limit [dBµV/m]	AVG Margin [dB]	Correction [dB]	Polarization
1	2,494.226	49.91	54.00	4.09	5.86	H

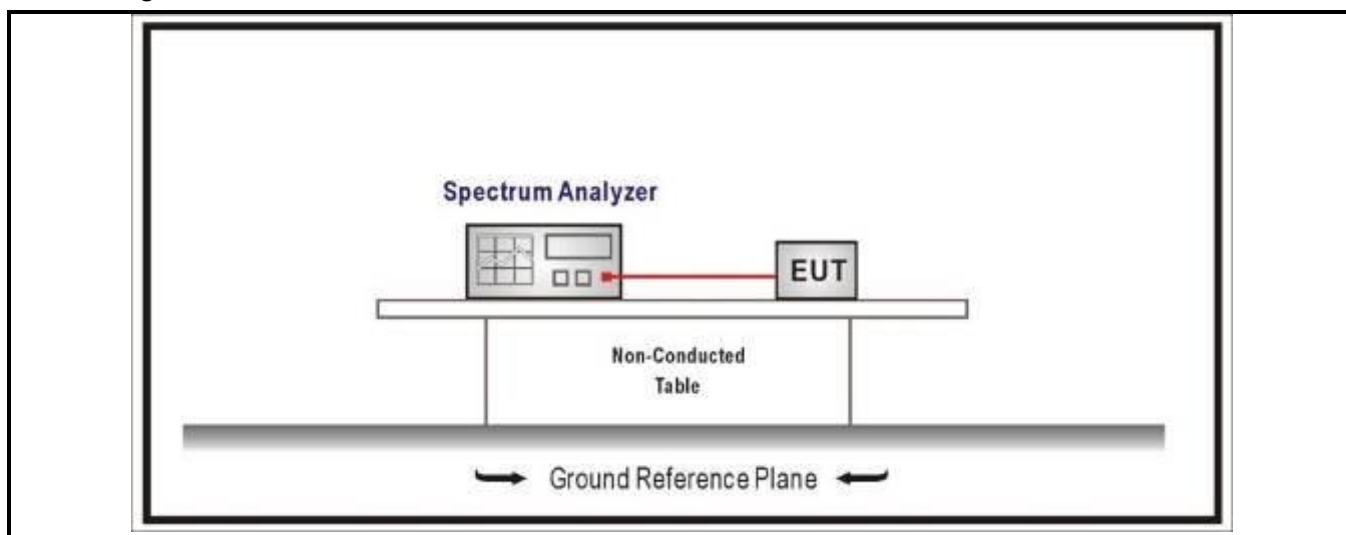
Rg	Frequency [MHz]	PK+ Level [dBµV/m]	PK+ Limit [dBµV/m]	PK+ Margin [dB]	Correction [dB]	Polarization
1	2,494.226	61.55	74.00	12.45	5.86	H

4.6	DTS Bandwidth & Occupied Bandwidth	VERDICT: PASS
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Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247 (a)(2)
Systems using digital modulation techniques operate in the 2400-2483.5 MHz .The minimum 6 dB bandwidth shall be at least 500 kHz	
Standard	RSS-Gen Issue 5 Section 6.7 & RSS-247 Issue 2 Section 5.2(a)
The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs. The occupied bandwidth should within the required frequency range.	
The minimum 6 dB bandwidth shall be 500 kHz.	

Test Configuration



Performed measurements

Port under test	Antenna port	
Test method applied	☒	Conducted measurement
	☐	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	---	

Results

Repeater

Mode	CH.	Test Freq. (MHz)	6dB Occupied Bandwidth (MHz)	Limit (MHz)	Result
BLE 1Mbps	00	2402	0.694	>0.5	Pass
	19	2440	0.695	>0.5	Pass
	39	2480	0.704	>0.5	Pass

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
BLE 2Mbps	00	2402	1.044	Within frequency range	Pass
	19	2440	1.046	Within frequency range	Pass
	39	2480	1.047	Within frequency range	Pass

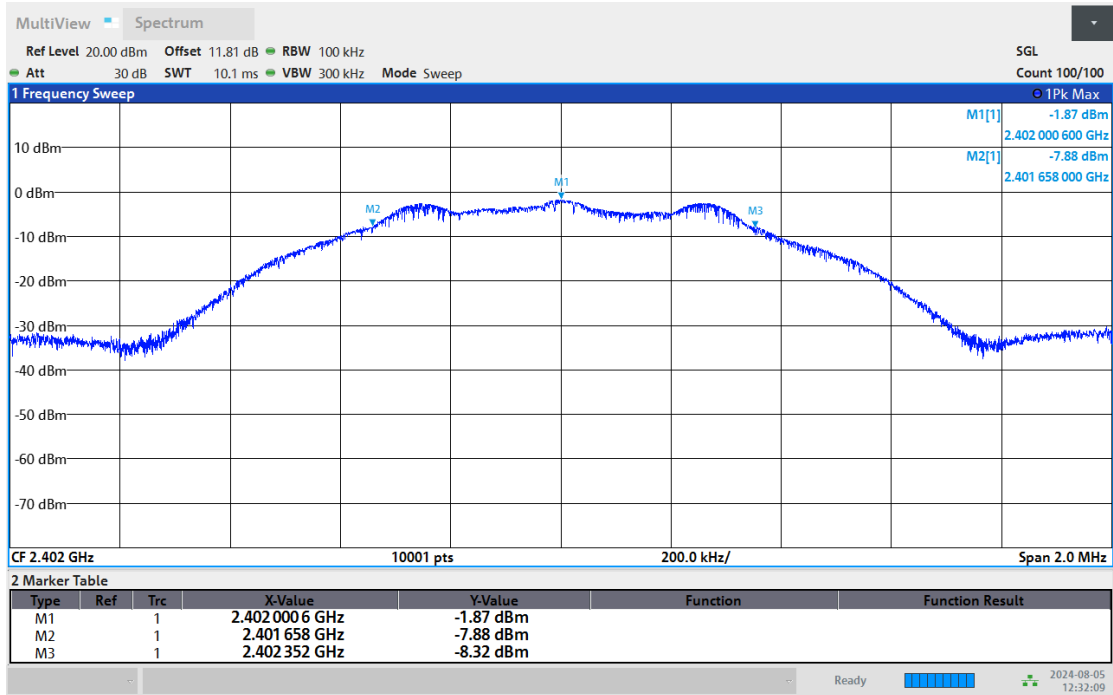
Probe

Mode	CH.	Test Freq. (MHz)	6dB Occupied Bandwidth (MHz)	Limit (MHz)	Result
BLE 1Mbps	00	2402	0.704	>0.5	Pass
	19	2440	0.692	>0.5	Pass
	39	2480	0.689	>0.5	Pass

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
BLE 2Mbps	00	2402	1.044	Within frequency range	Pass
	19	2440	1.047	Within frequency range	Pass
	39	2480	1.045	Within frequency range	Pass

DTS Bandwidth (Repeater)

2402MHz, 1Mbps



12:32:11 PM 08/05/2024

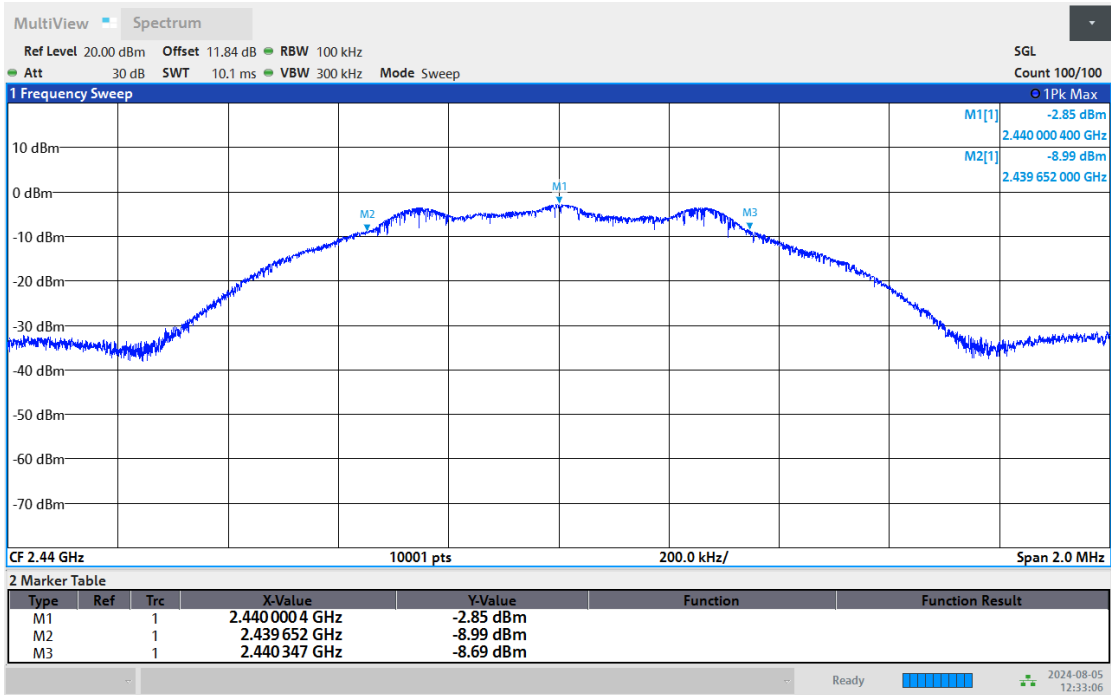
6dB Bandwidth



12:32:04 PM 08/05/2024

99% Occupied Bandwidth

2440MHz, 1Mbps



12:33:06 PM 08/05/2024

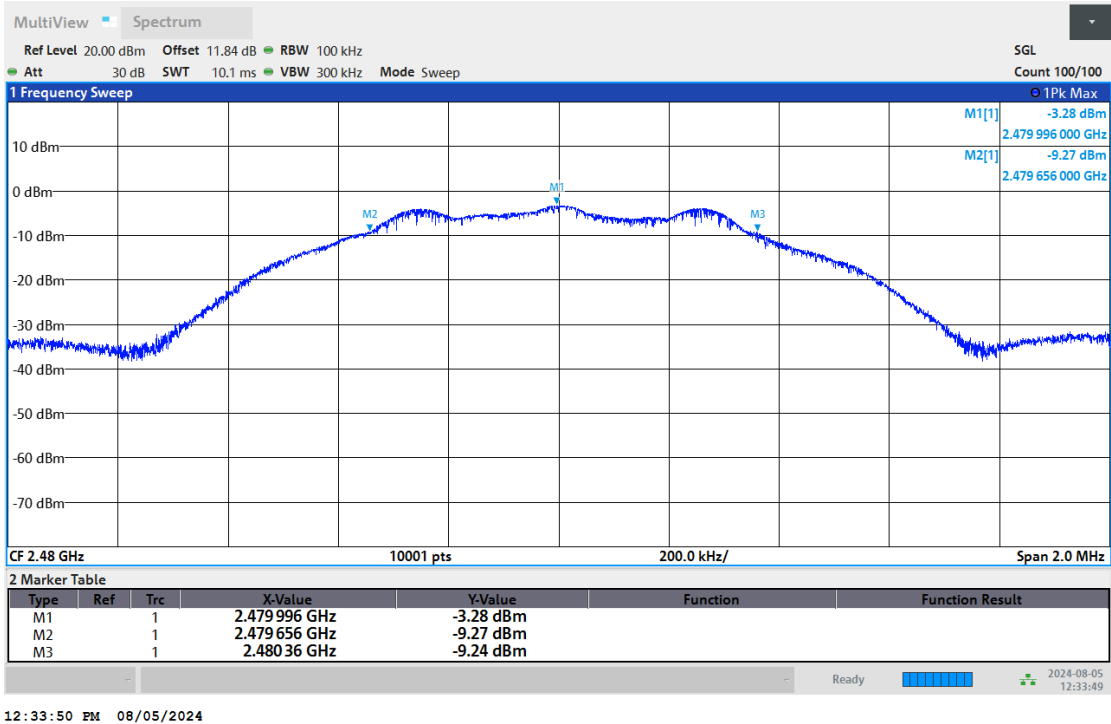
6dB Bandwidth



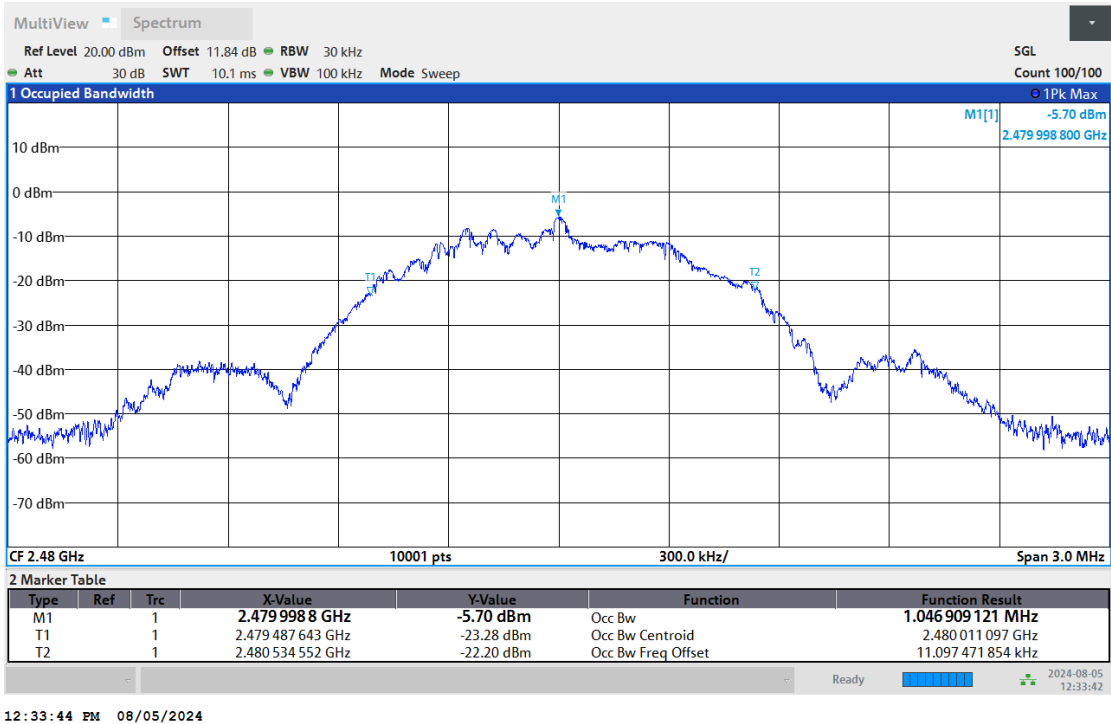
12:33:00 PM 08/05/2024

99% Occupied Bandwidth

2480MHz, 1Mbps

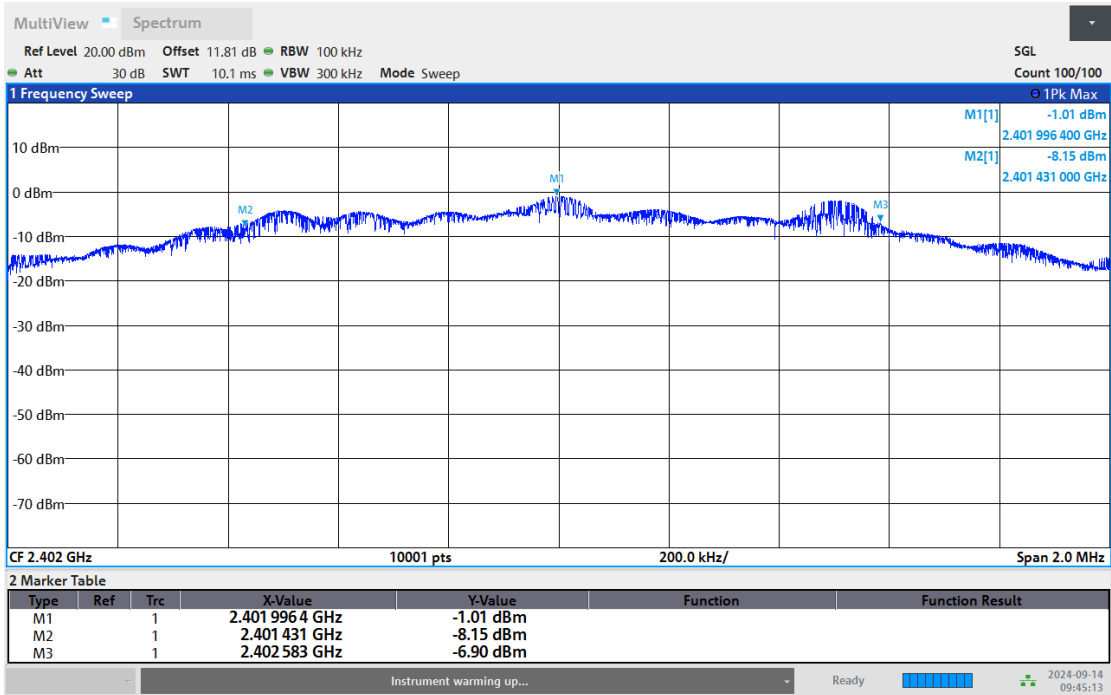


6dB Bandwidth



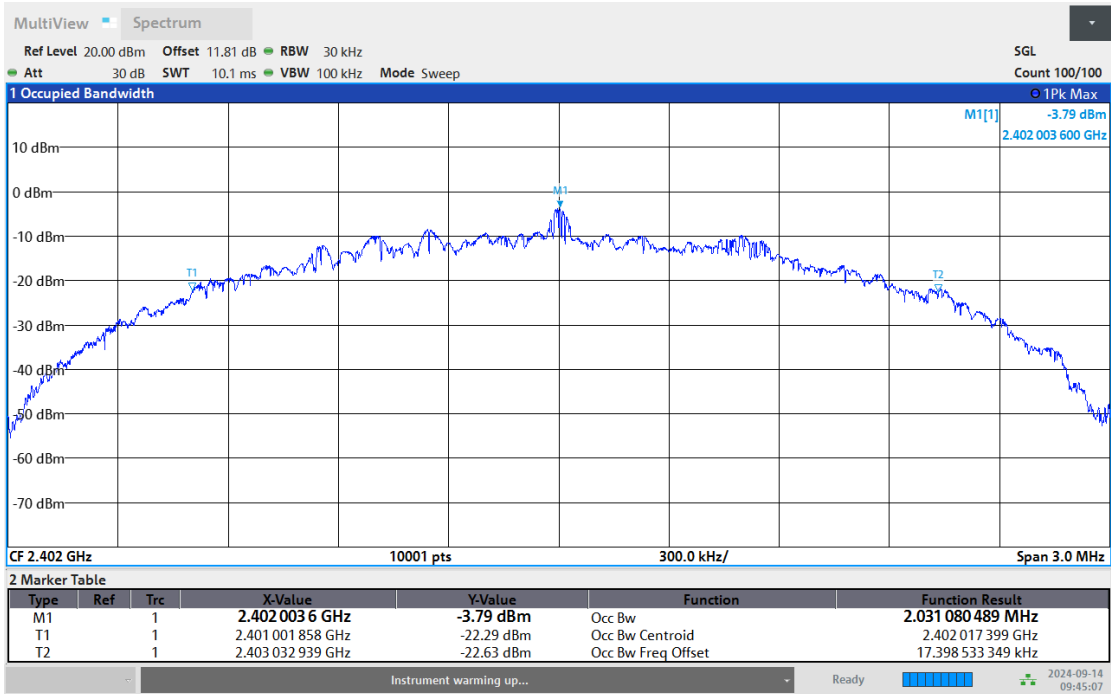
99% Occupied Bandwidth

2402MHz, 2Mbps



09:45:13 AM 09/14/2024

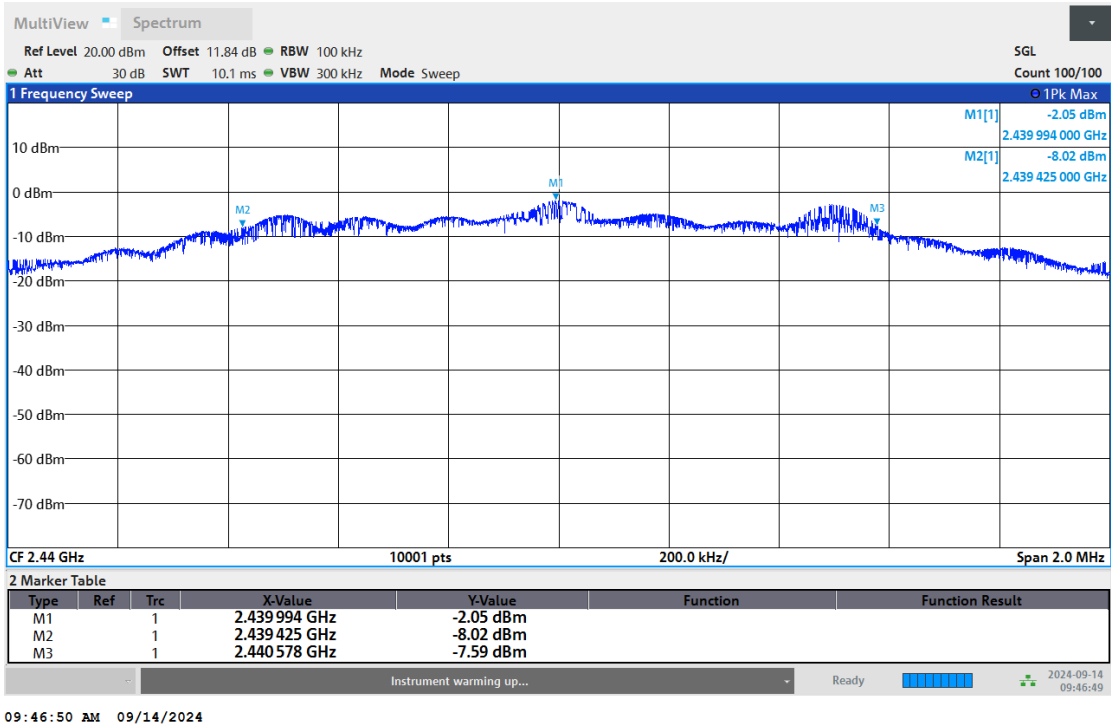
6dB Bandwidth



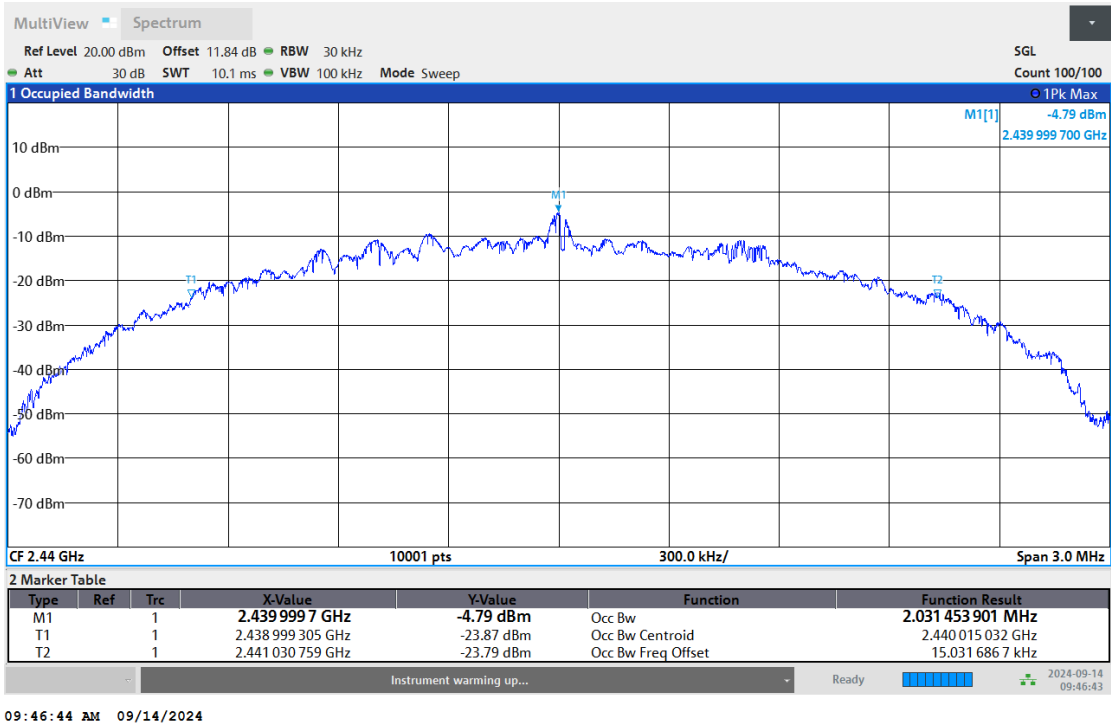
09:45:07 AM 09/14/2024

99% Occupied Bandwidth

2440MHz, 2Mbps

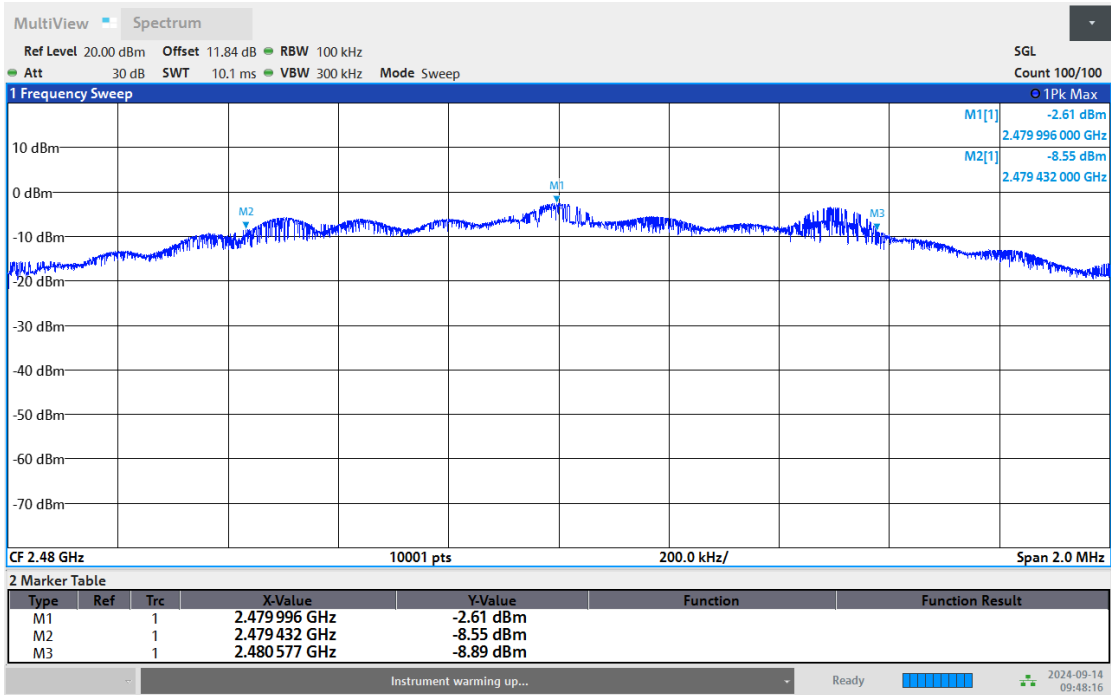


6dB Bandwidth



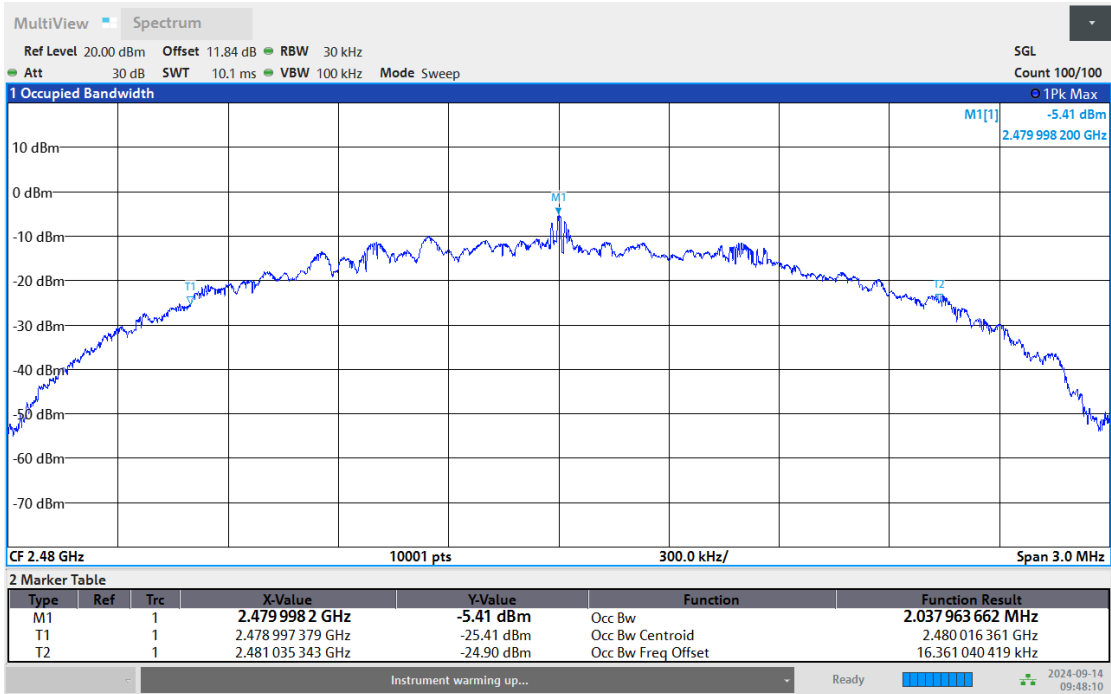
99% Occupied Bandwidth

2480MHz, 2Mbps



09:48:16 AM 09/14/2024

6dB Bandwidth



09:48:11 AM 09/14/2024

99% Occupied Bandwidth

DTS Bandwidth (Probe)

2402MHz, 1Mbps



09:02:10 AM 08/05/2024

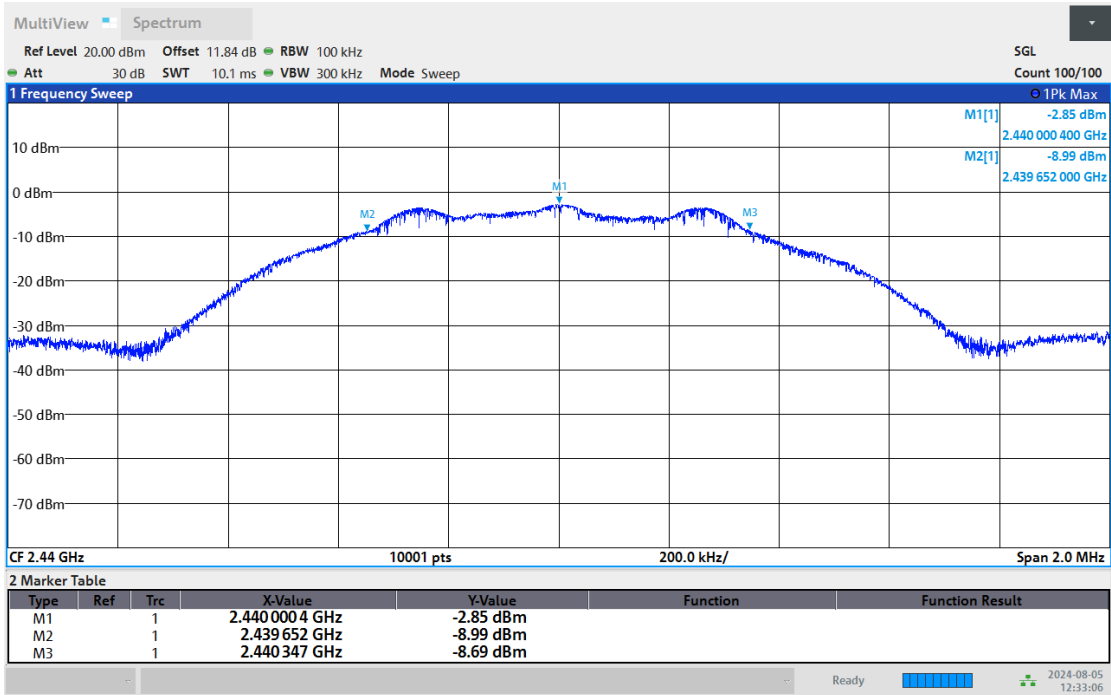
6dB Bandwidth



12:32:04 PM 08/05/2024

99% Occupied Bandwidth

2440MHz, 1Mbps



12:33:06 PM 08/05/2024

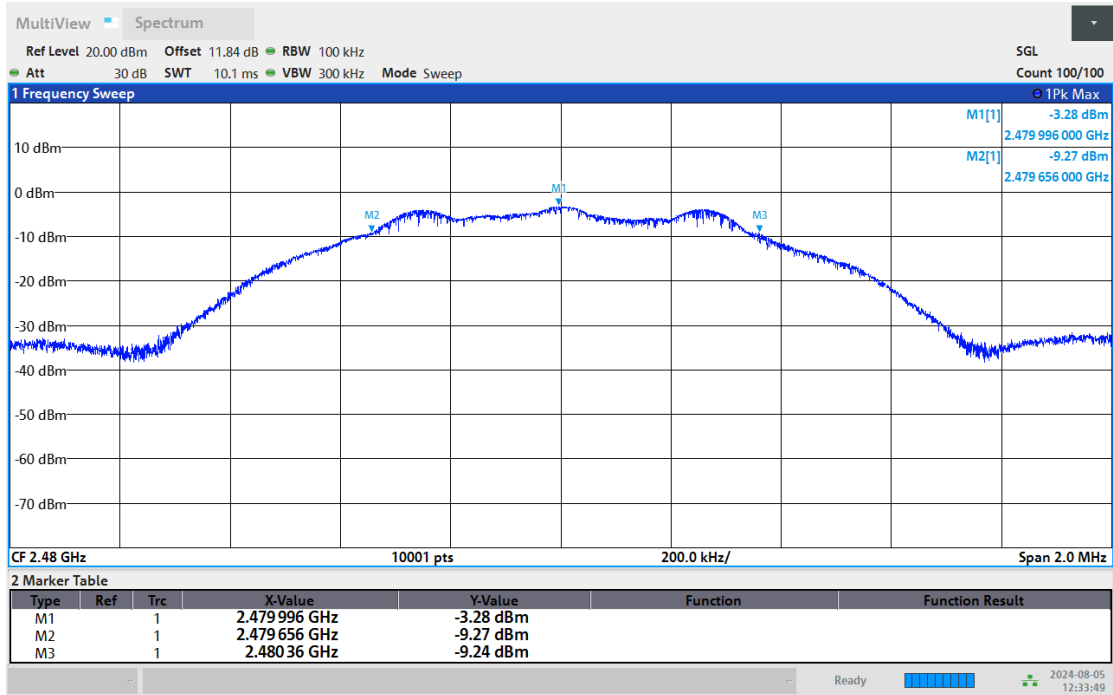
6dB Bandwidth



12:33:00 PM 08/05/2024

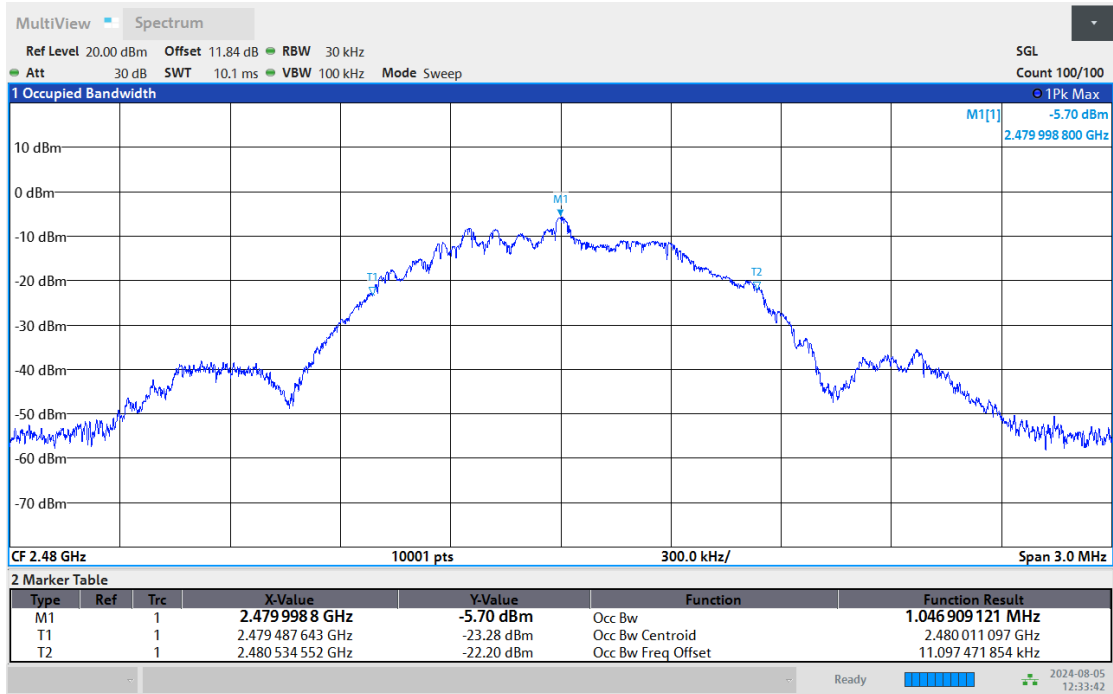
99% Occupied Bandwidth

2480MHz, 1Mbps



12:33:50 PM 08/05/2024

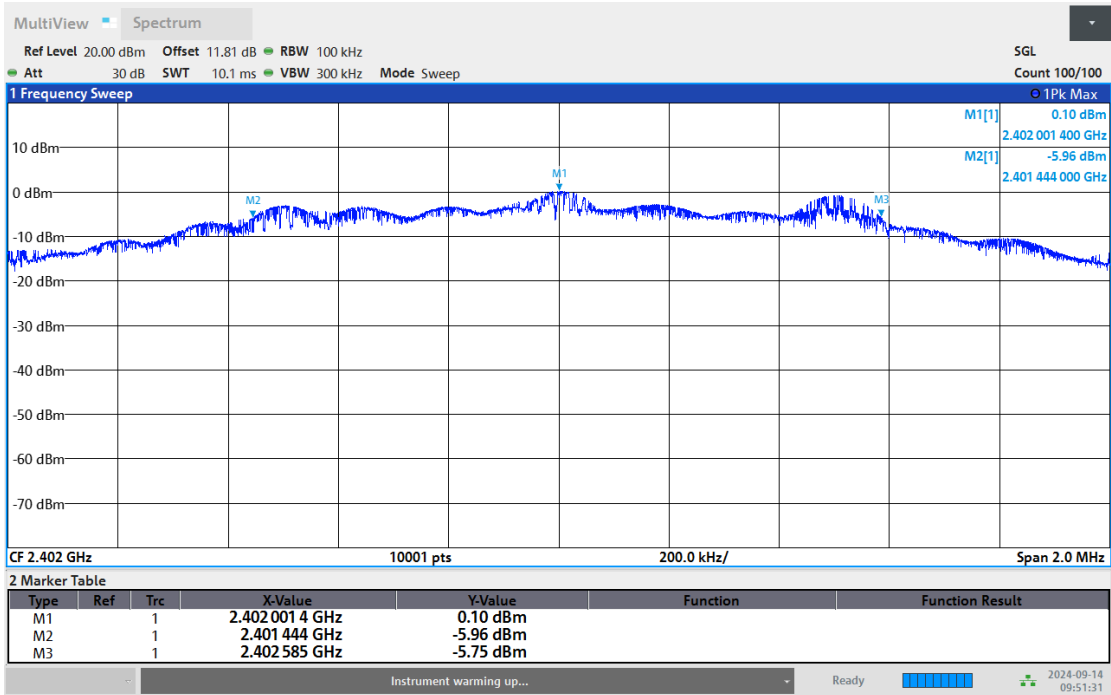
6dB Bandwidth



12:33:44 PM 08/05/2024

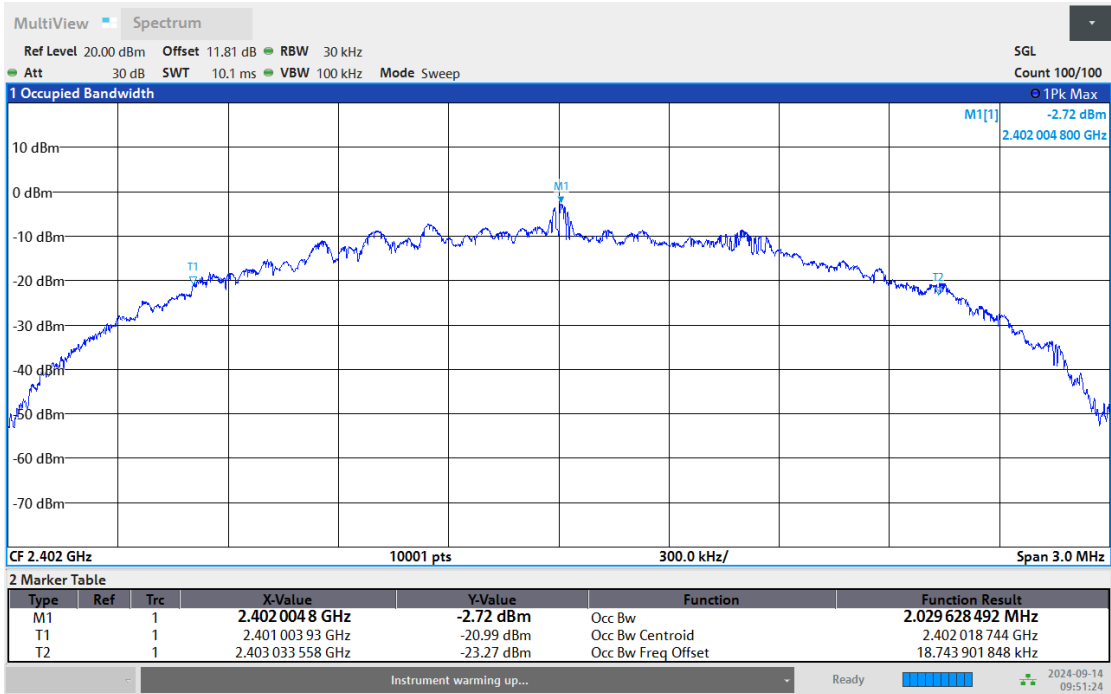
99% Occupied Bandwidth

2402MHz, 2Mbps



09:51:31 AM 09/14/2024

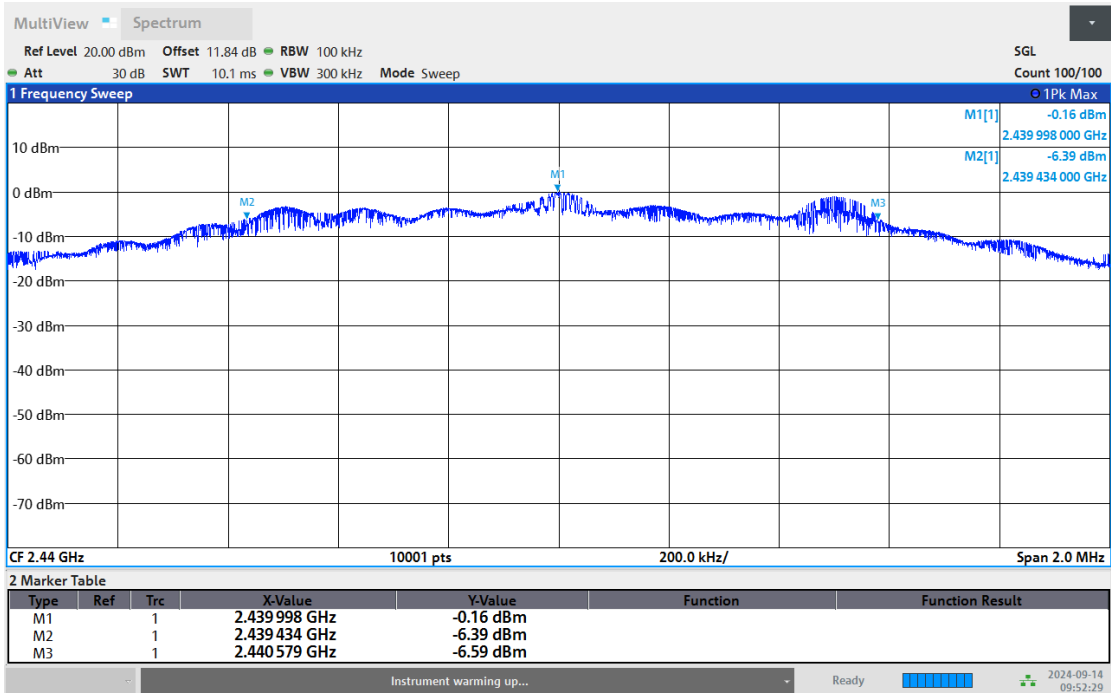
6dB Bandwidth



09:51:25 AM 09/14/2024

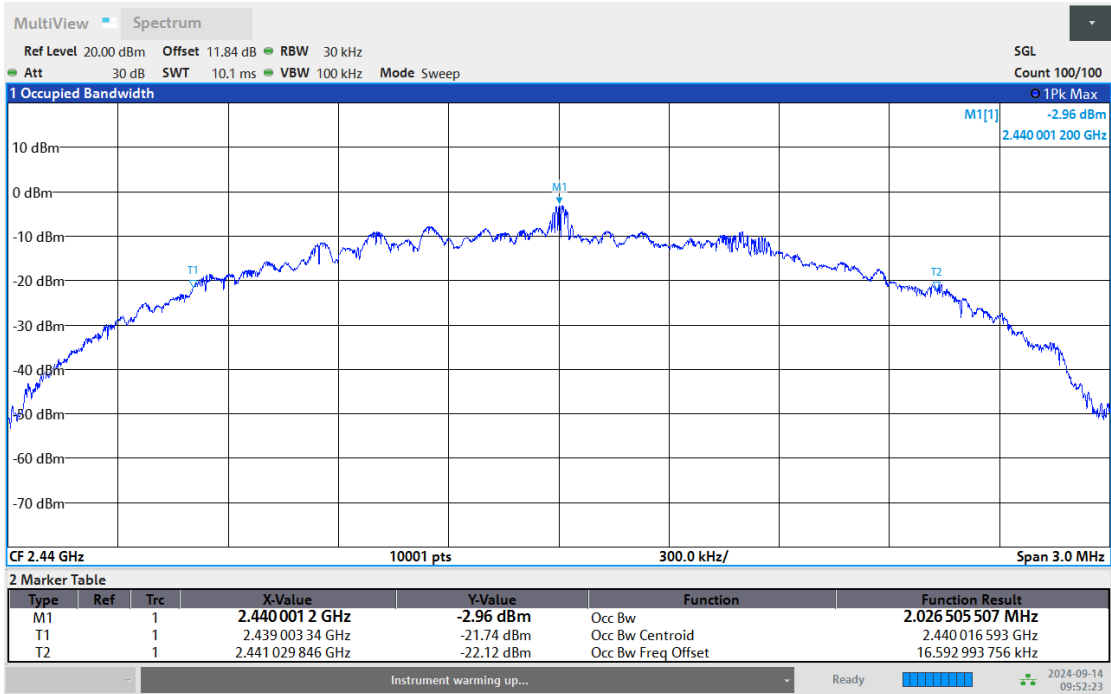
99% Occupied Bandwidth

2440MHz, 2Mbps



09:52:30 AM 09/14/2024

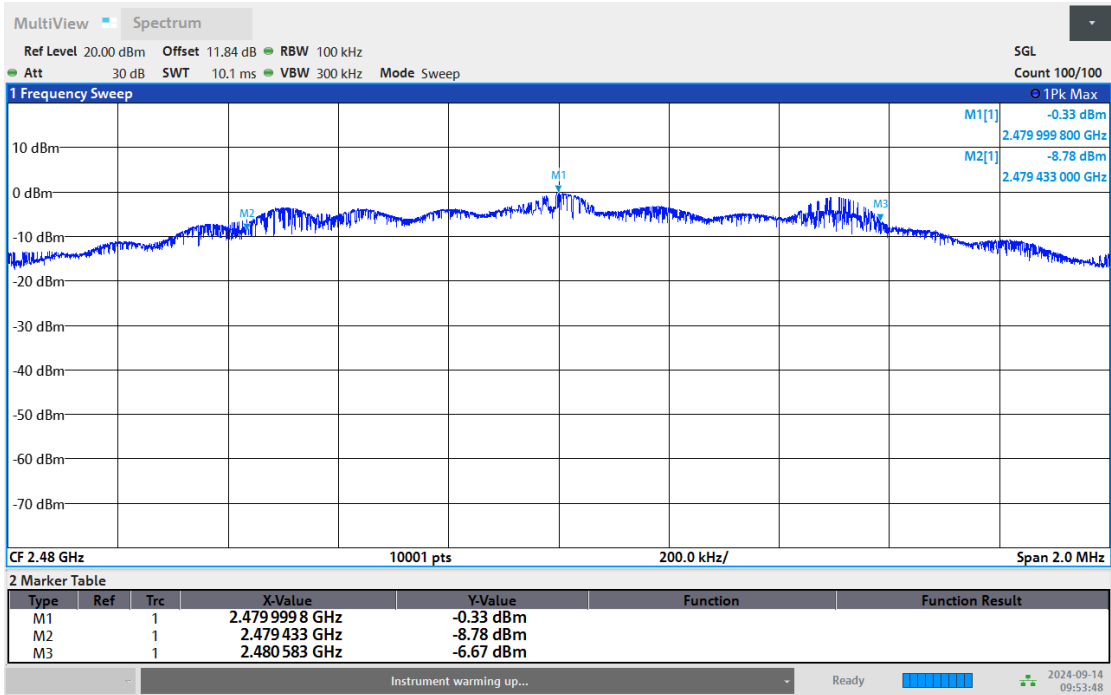
6dB Bandwidth



09:52:24 AM 09/14/2024

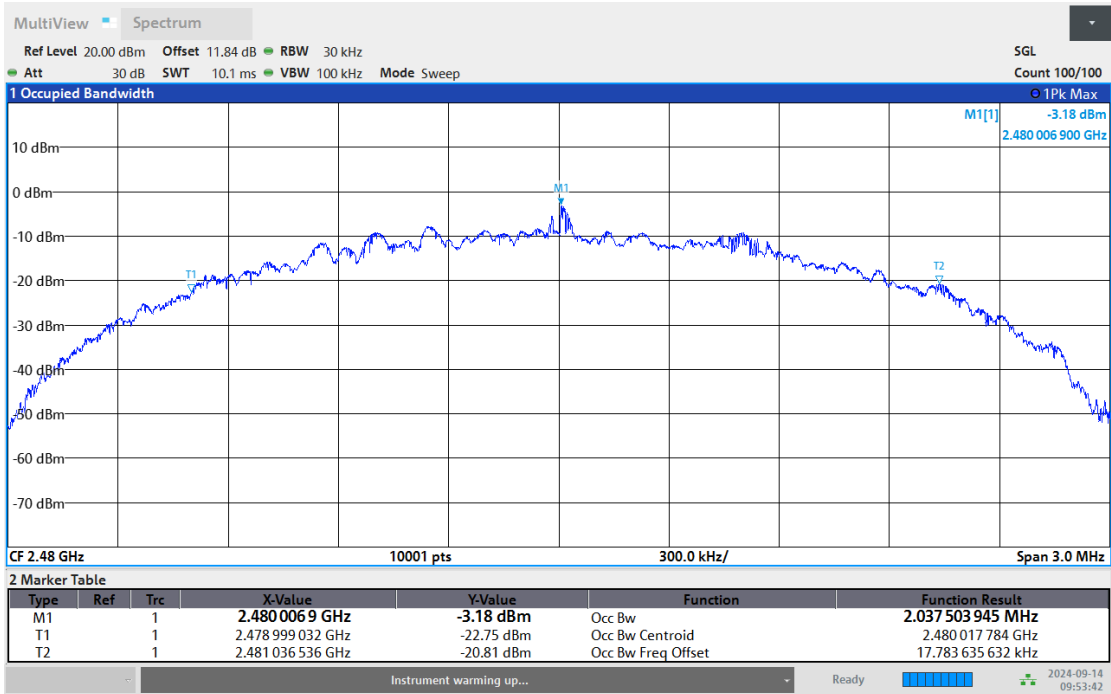
99% Occupied Bandwidth

2480MHz, 2Mbps



09:53:49 AM 09/14/2024

6dB Bandwidth



09:53:43 AM 09/14/2024

99% Occupied Bandwidth

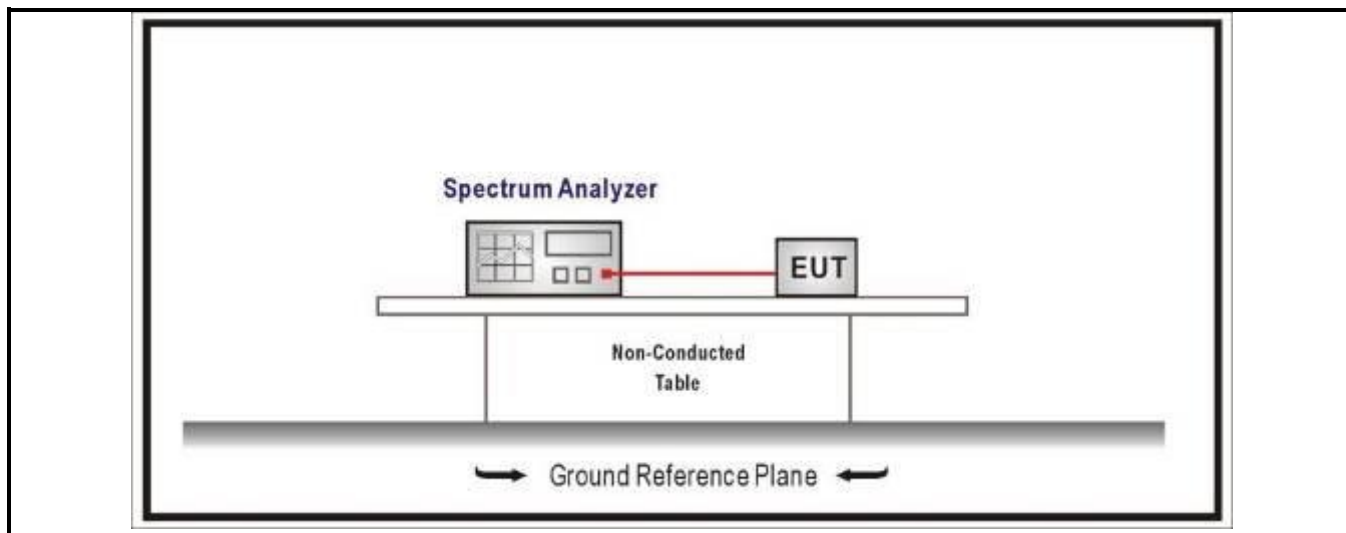
4.7	Fundamental emission output power	VERDICT: PASS
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Limit

Standard		FCC Part 15 Subpart C Paragraph 15.247 (b)(3) & RSS-247 Issue 2 Section 5.4(d)
☒	GTX < 6dBi	Pout≤30dBm, EIRP≤36dBm
☐	GTX > 6dBi	
☐	Non-Fix point-point	Pout≤30-(GTX -6), EIRP≤36dBm
☐	Fix point-point	Pout≤30-[(GTX-6)]/3, EIRP≤36dBm
☐	Point-to-multipoint	Pout≤30-(GTX-6) , EIRP≤36dBm
☐	Overlap Beams	Pout≤30-[(GTX-6)]/3, EIRP≤36dBm
☐	Aggregate power transmitted simultaneously on all beams	Pout≤30-[(GTX-6)]/3, EIRP≤36dBm
☐	single LE directional beam	Pout≤30-[(GTX-6)]/3+8dB, EIRP≤36dBm

Note 1 : GTX directional gain of transmitting antennas.
Note 2 : Pout is maximum peak conducted output power .
Note 3 : EIRP is equivalent isotropically radiated power.

Test Configuration



Performed measurements

Port under test	Antenna port	
Test method applied	☒	Conducted measurement
	☐	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	---	

See next page.

Results

Repeater

Mode	Channel	Test Frequency (MHz)	Output Power (dBm)	Output Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE 1Mbps	00	2402	-1.66	≤30	2.14	≤36	Pass
	19	2440	-2.63	≤30	1.17	≤36	Pass
	39	2480	-3.04	≤30	0.76	≤36	Pass
BLE 2Mbps	00	2402	-0.77	≤30	3.03	≤36	Pass
	19	2440	-1.77	≤30	2.03	≤36	Pass
	39	2480	-2.36	≤30	1.44	≤36	Pass

Note: EIRP = Output Power + Antenna Gain

Repeater: 3.8 dBi

Probe

Mode	Channel	Test Frequency (MHz)	Output Power (dBm)	Output Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Result
BLE 1Mbps	00	2402	0.38	≤30	-3.38	≤36	Pass
	19	2440	0.08	≤30	-3.68	≤36	Pass
	39	2480	0.04	≤30	-3.72	≤36	Pass
BLE 2Mbps	00	2402	0.34	≤30	-3.42	≤36	Pass
	19	2440	0.05	≤30	-3.71	≤36	Pass
	39	2480	-0.10	≤30	-3.86	≤36	Pass

Note: EIRP = Output Power + Antenna Gain

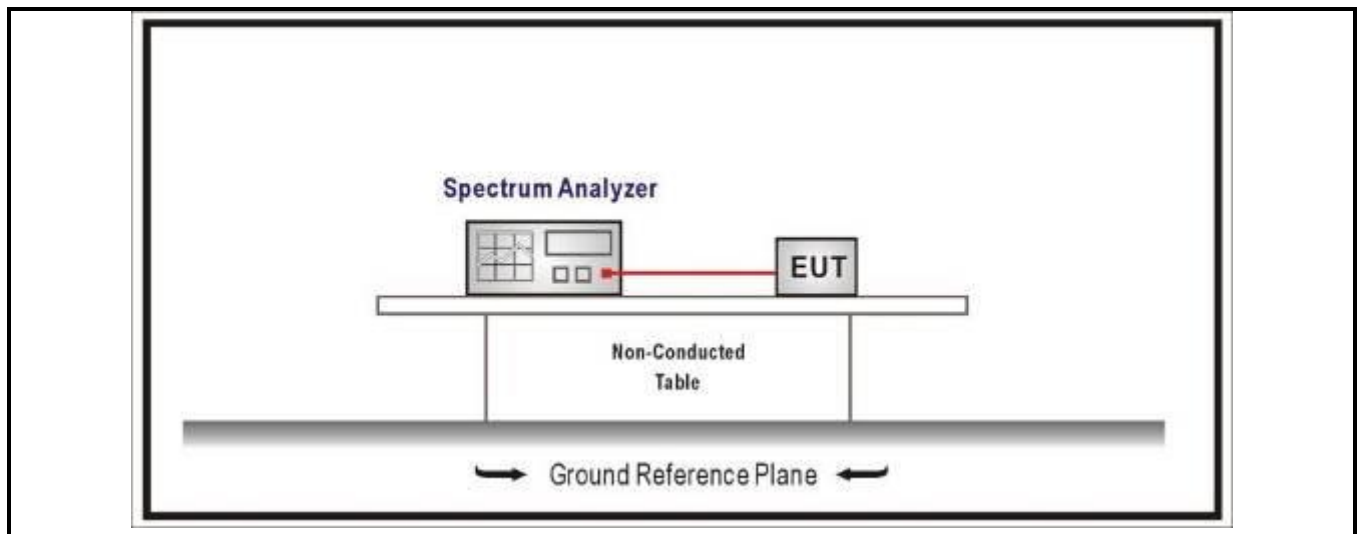
Probe: -3.76 dBi

4.8	Power Spectral Density	VERDICT: PASS
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Limit

Standard	FCC Part 15 Subpart C Paragraph 15.247 (b)(3) & RSS-247 Issue 2 Section 5.2(b)
Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$	

Test Configuration



Performed measurements

Port under test	Antenna port	
Test method applied	☒	Conducted measurement
	☐	Radiated measurement
Test setup	Refer to the Annex 3 for test setup photo(s).	
Operating mode(s) used	Mode 1, Mode 2	
Remark	---	

See next page.

Results

Repeater

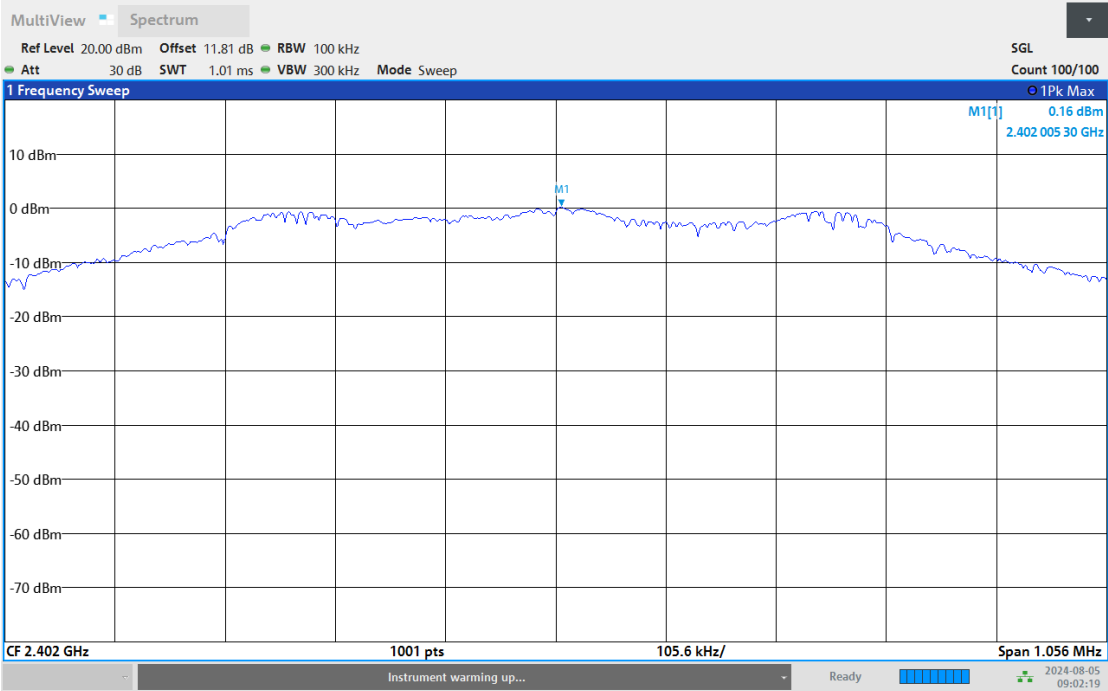
Mode	Channel	Test Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm/3kHz)	Result
BLE 1Mbps	00	2402	0.16	≤8	Pass
	19	2440	-0.22	≤8	Pass
	39	2480	-0.34	≤8	Pass
BLE 2Mbps	00	2402	-1.40	≤8	Pass
	19	2440	-2.03	≤8	Pass
	39	2480	-2.85	≤8	Pass

Probe

Mode	Channel	Test Frequency (MHz)	Power Spectral Density (dBm)	Limit (dBm/3kHz)	Result
BLE 1Mbps	00	2402	-1.86	≤8	Pass
	19	2440	-2.84	≤8	Pass
	39	2480	-3.28	≤8	Pass
BLE 2Mbps	00	2402	0.08	≤8	Pass
	19	2440	-1.16	≤8	Pass
	39	2480	-0.32	≤8	Pass

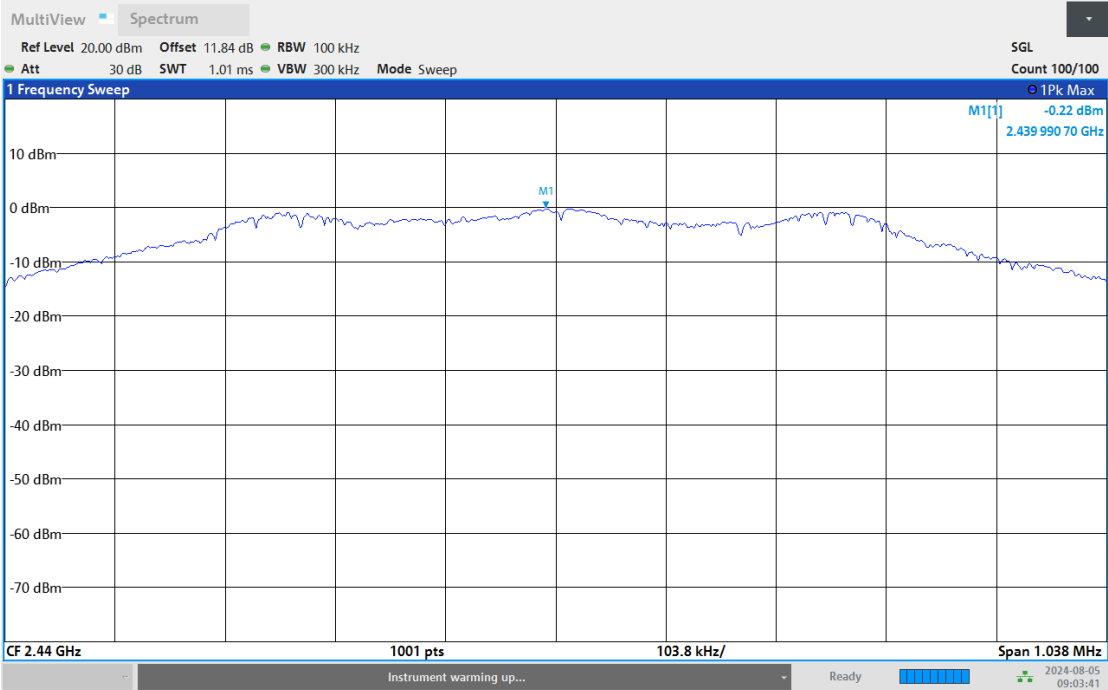
Power Spectral Density (Repeater)

2402MHz, 1Mbps



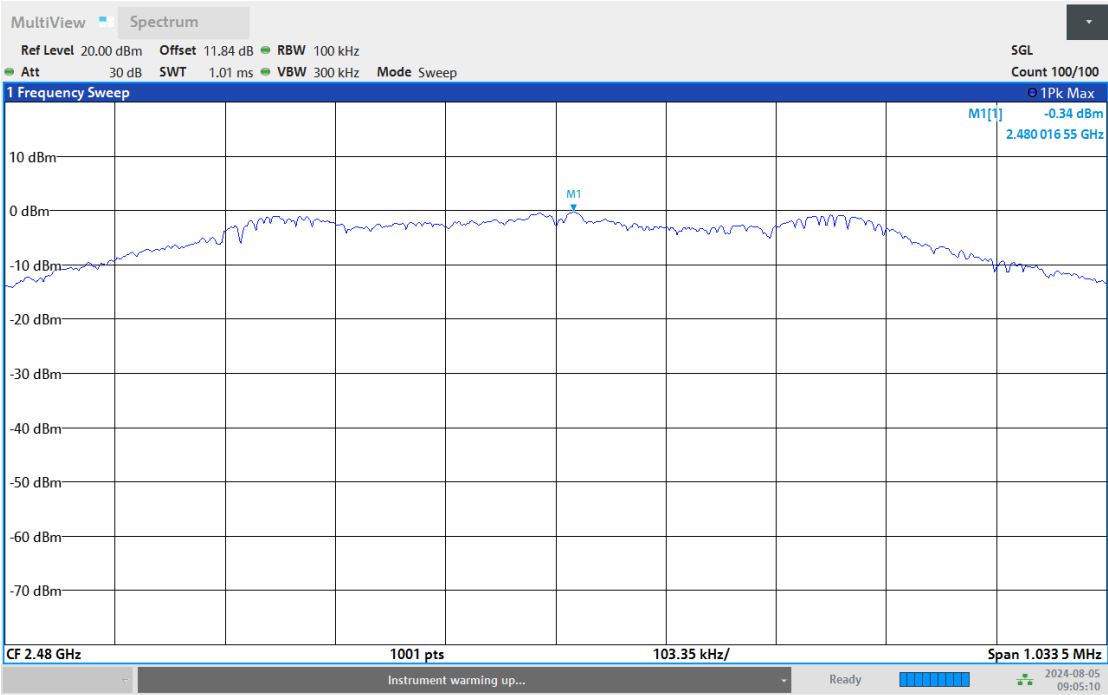
09:02:20 AM 08/05/2024

2440MHz, 1Mbps



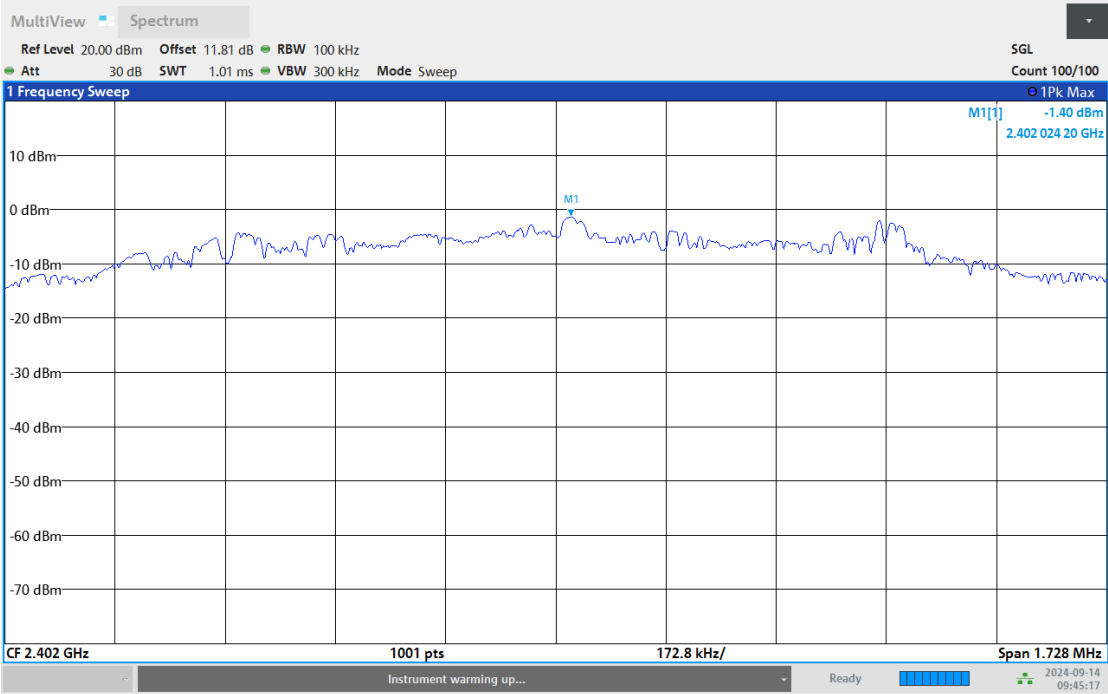
09:03:41 AM 08/05/2024

2480MHz, 1Mbps



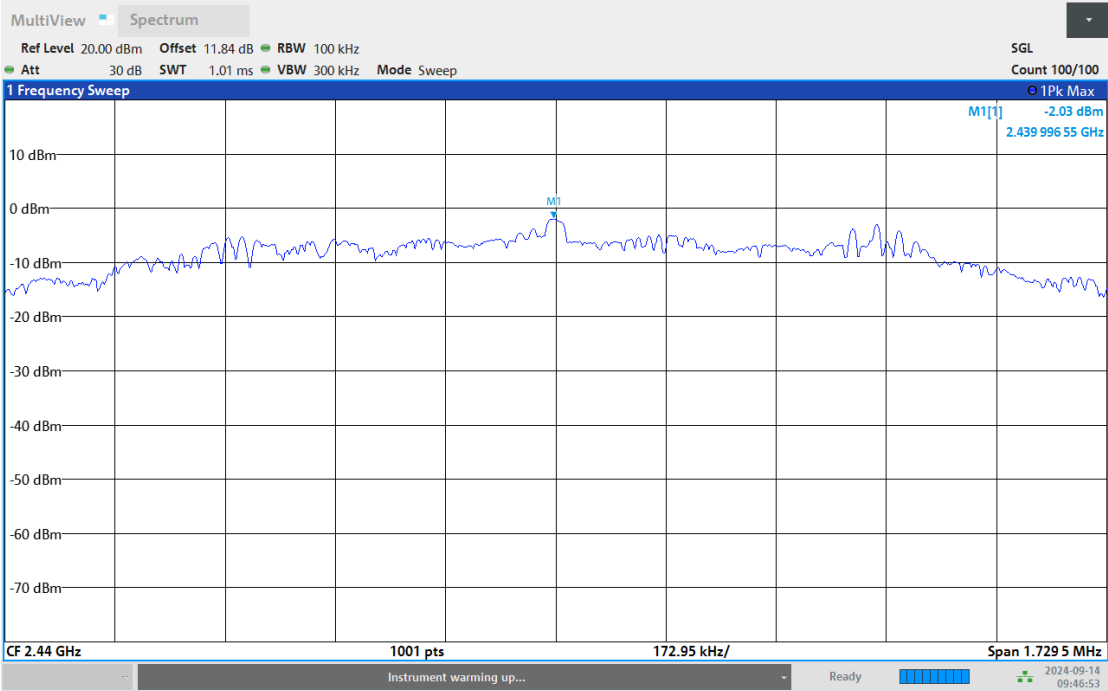
09:05:10 AM 08/05/2024

2402MHz, 2Mbps



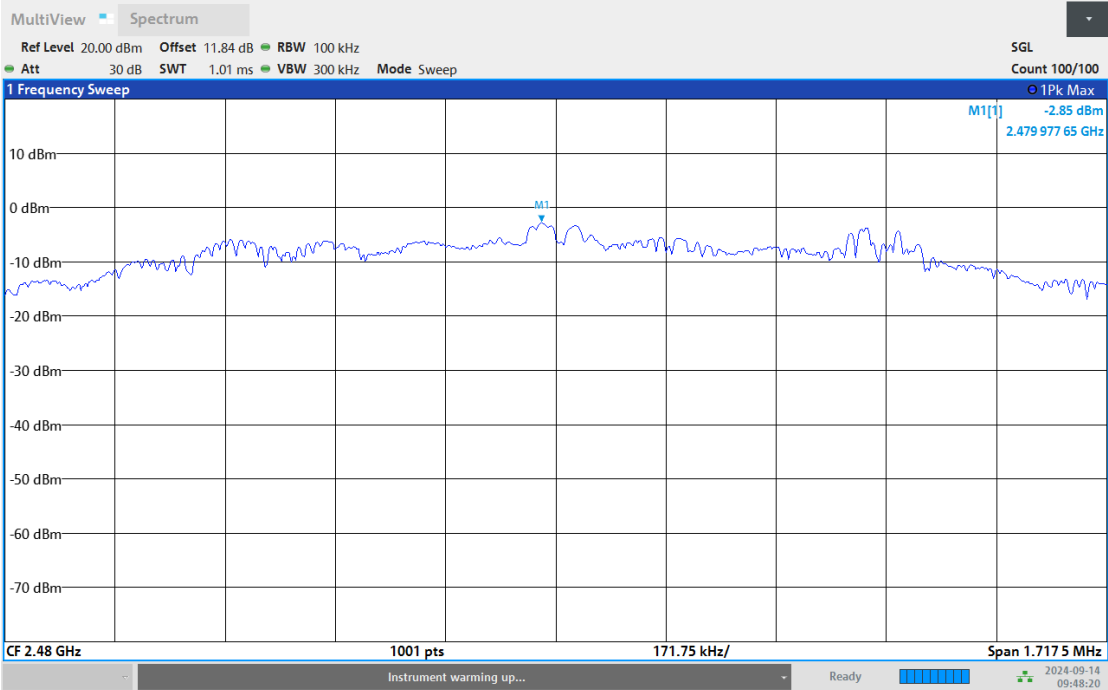
09:45:17 AM 09/14/2024

2440MHz, 2Mbps



09:46:53 AM 09/14/2024

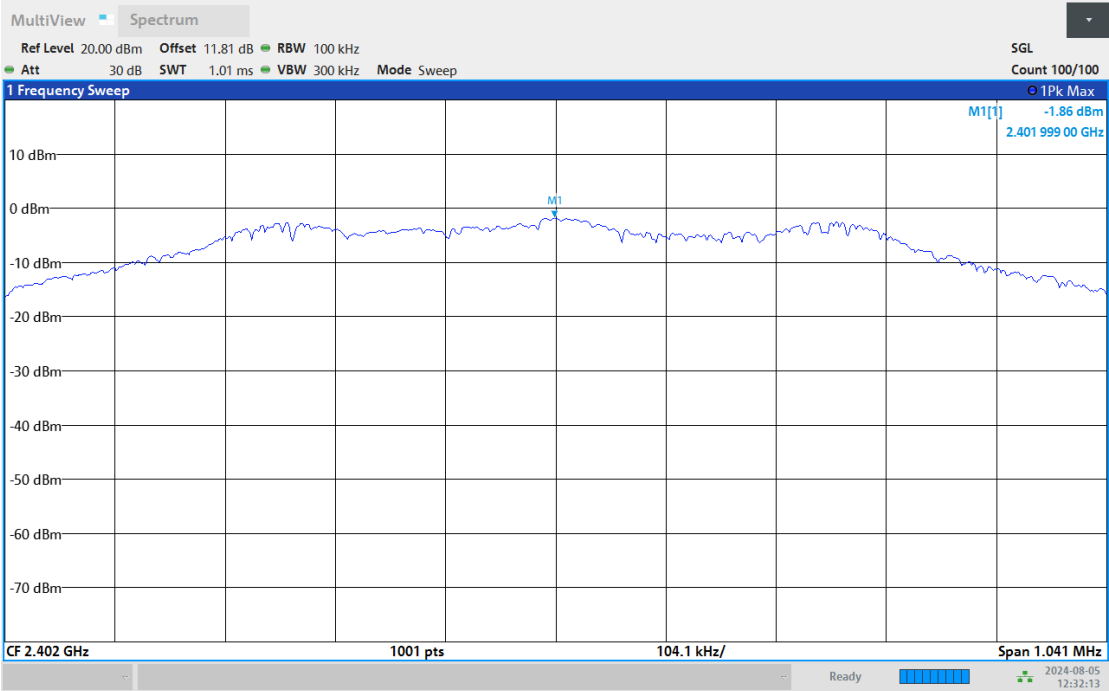
2480MHz, 2Mbps



09:48:20 AM 09/14/2024

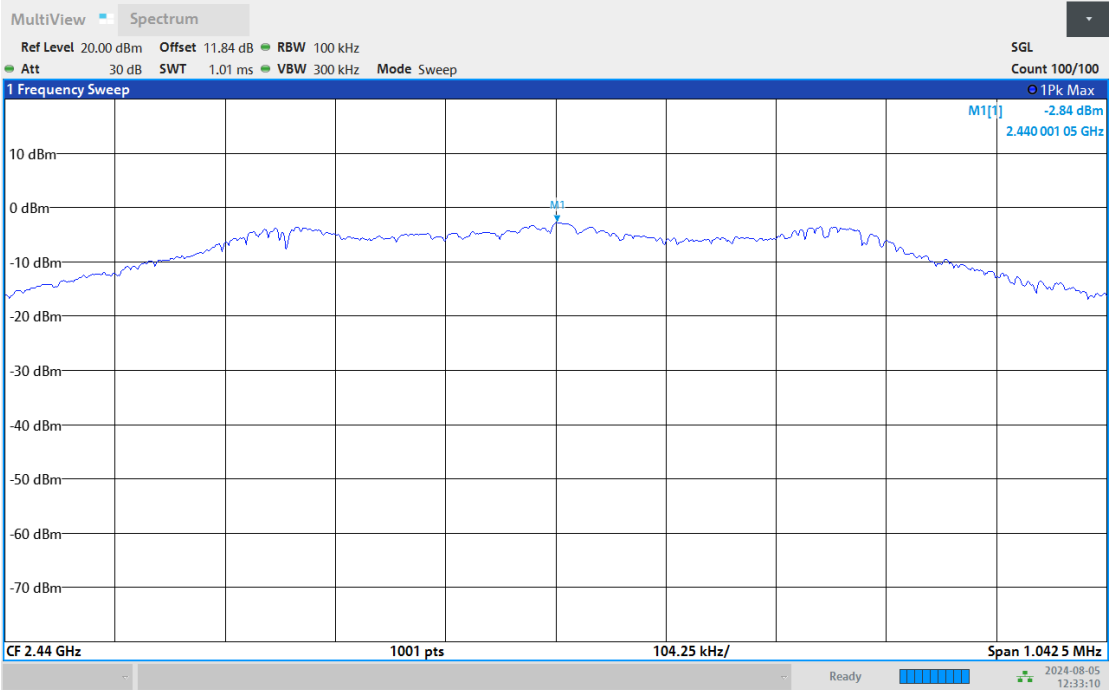
Power Spectral Density (Probe)

2402MHz, 1Mbps



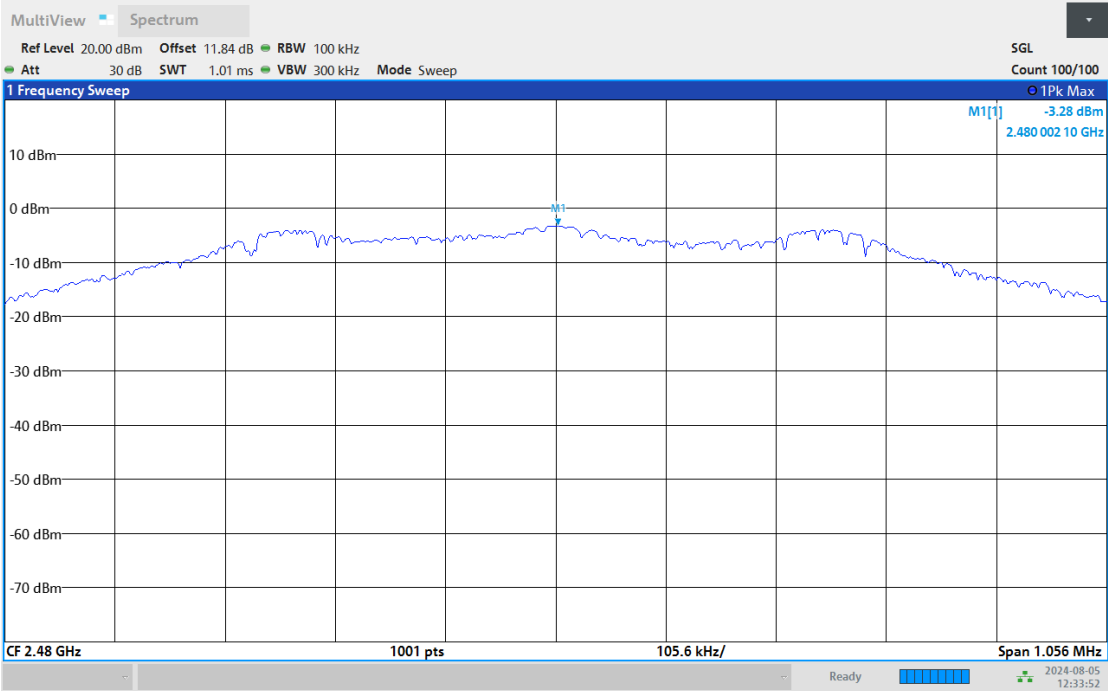
12:32:14 PM 08/05/2024

2440MHz, 1Mbps



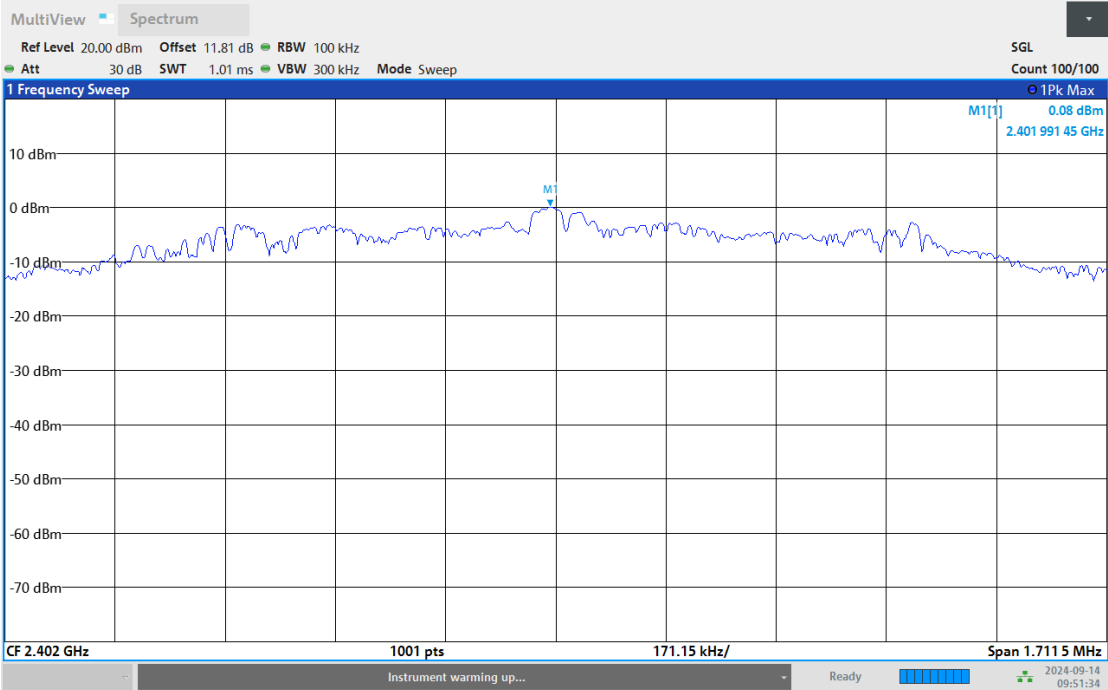
12:33:10 PM 08/05/2024

2480MHz, 1Mbps



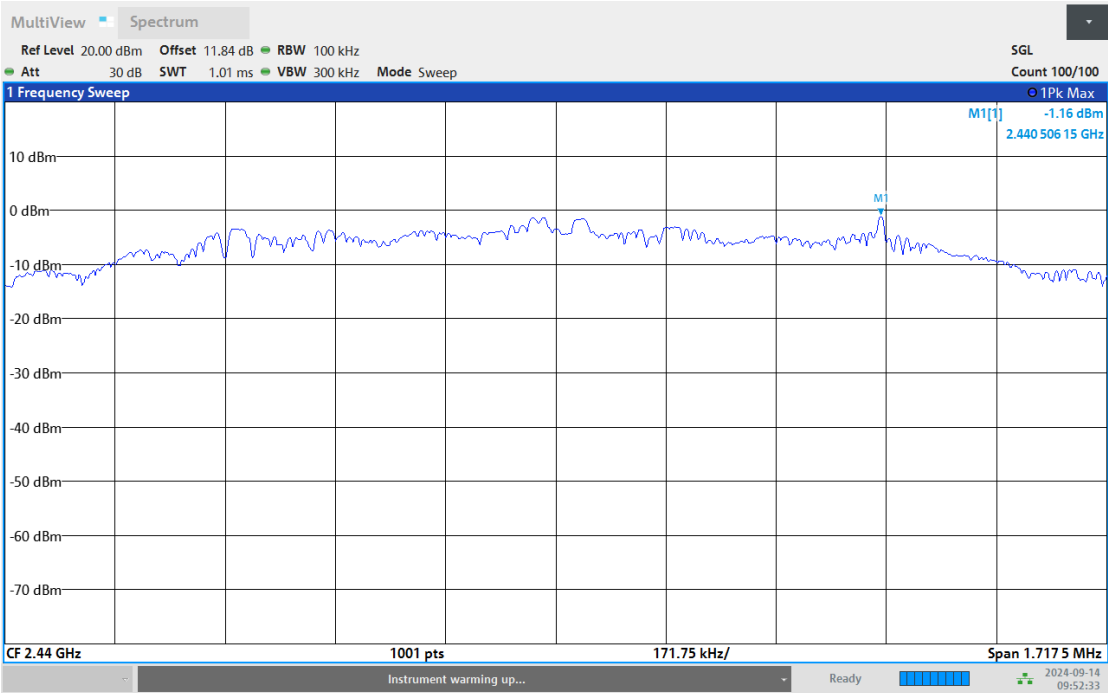
12:33:53 PM 08/05/2024

2402MHz, 2Mbps



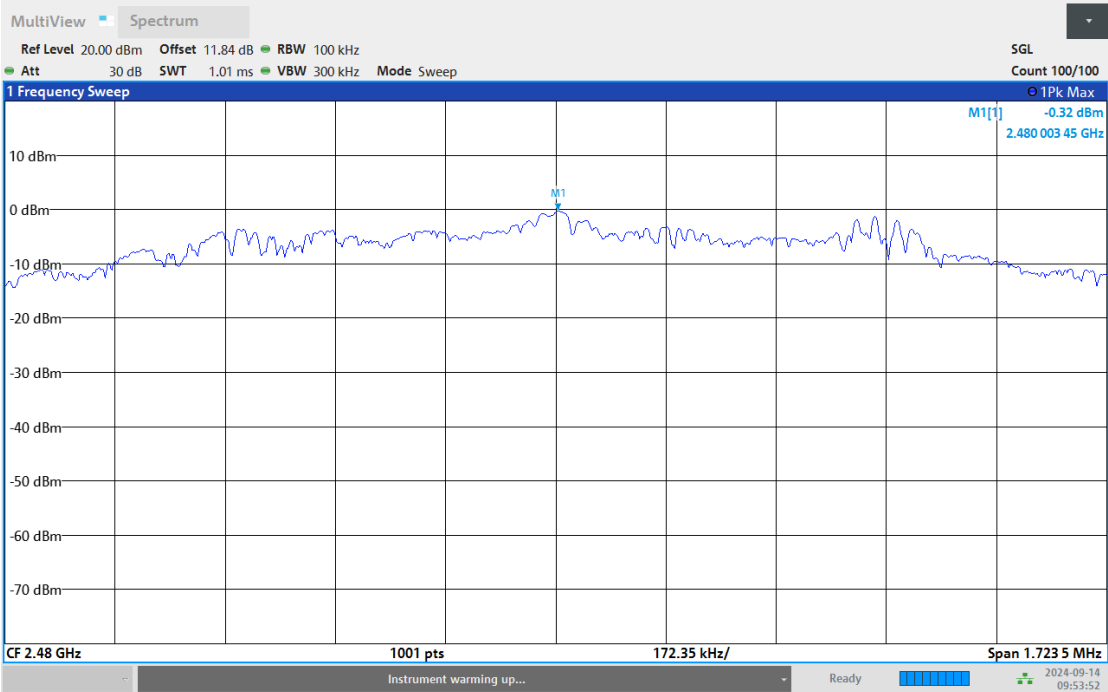
09:51:35 AM 09/14/2024

2440MHz, 2Mbps



09:52:34 AM 09/14/2024

2480MHz, 2Mbps



09:53:53 AM 09/14/2024

4.9	Antenna Requirement	VERDICT: PASS
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Limit

Standard	FCC Part 15 Subpart C Paragraph 15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	
Standard	RSS-Gen Issue 5 Section 6.8
A transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns.	

Antenna Connector Construction

☒	The use of a permanently attached antenna
☒	The antenna use of a unique coupling to the intentional radiator
☐	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

5 IDENTIFICATION OF THE EQUIPMENT UNDER TEST

Remark: The test setup photo and EUT Photo please see appendix.

ANNEX 1 – MEASUREMENT UNCERTAINTY

Emission tests		U_{LAB}	U_{CISPR}
Conducted disturbance - Shielded Room No.1 150 kHz – 30 MHz	AMN: R&S ENV216	2.6 dB	3.4 dB
Radiated disturbance - Anechoic Chamber No.1 30 MHz – 1000 MHz	Horizontal polarization	4.8 dB	6.3 dB
	Vertical polarization	5.4 dB	

Test Item	Uncertainty	
Radio frequency & Bandwidth	2 ppm	
RF power, conducted	0.16 dB	
Dwell Time	2.02 ms	
Spurious emissions, radiated - Anechoic Chamber No.2	(30MHz~1GHz)	Horizontal: 4.00 dB
		Vertical: 3.99 dB
	(1GHz~8GHz)	Horizontal: 4.39 dB
		Vertical: 4.14 dB
	(8GHz~12.75GHz)	Horizontal: 4.27 dB
		Vertical: 4.19 dB
	(12.75GHz~18GHz)	Horizontal: 4.70 dB
		Vertical: 4.04 dB
	(18GHz~40GHz)	Horizontal: 4.01 dB
		Vertical: 4.03 dB
Humidity	1.4 %	
Temperature	0.5 °C	

ANNEX 2 – USED EQUIPMENT

For AC Power Line Conducted Emission - Shielded Room No.1

Equipment Name	Manufacturer	Type/Model	Serial Number	Last Cal Date	Cal Due date
EMI test receiver	R&S	ESR3	102958	2024/06/14	2025/06/13
Artificial Mains Network	R&S	ENV216	102772	2024/06/14	2025/06/13
Software	R&S	ELEKTRA	4.32.0	N/A	N/A

For Radiated Emission (30 MHz to 1000 MHz) - Anechoic Chamber No.1

Equipment Name	Manufacturer	Type/Model	Serial Number	Last Cal Date	Cal Due date
EMI test receiver	R&S	ESR7	102433	2023/11/29	2024/11/28
Trilog broadband antenna+Attenuator	SCHWARZBECK	VULB9163/6dB	01514	2024/03/13	2025/03/12
Open Switch and control unit	R&S	OSP220	102232	N/A	N/A
Software	R&S	ELEKTRA	4.20.2	N/A	N/A

For Spurious Emissions Test (1 GHz to 18 GHz)- Anechoic Chamber No.2

Equipment Name	Manufacturer	Type/Model	Serial Number	Last Cal Date	Cal Due date
WIDEBAND RADIO COMMUNICATION TESTER	ROHDE & SCHWARZ	CMW500	171082	2024/01/22	2025/01/21
Signal & Spectrum Analyzer	ROHDE & SCHWARZ	FSV3044	101286	2024/01/22	2025/01/21
FILTERBANK	ROHDE & SCHWARZ	N/A	100778	N/A	N/A
Open Switch and Control Unit	ROHDE & SCHWARZ	OSP220	102454	N/A	N/A
SYSTEM CONTROLLER INTERFACE	ROHDE & SCHWARZ	SCI-200	520020123	N/A	N/A
Trilog Broadband antenna	Schwarzbeck	VULB9163	01514	2024/02/29	2025/02/28
WAVE GUIDE ANTENNA	Schwarzbeck	3117	00240298	2024/03/01	2025/02/28
Antenna	Schwarzbeck	QMS-00208	27745	2024/03/01	2025/02/28
Antenna	Schwarzbeck	QMS-00880	27646	2024/03/01	2025/02/28
Pre-Amplifier	ROHDE & SCHWARZ	SCU08F1	101136	2024/01/22	2025/01/21
Pre-Amplifier	ROHDE & SCHWARZ	SCU18F	100971	2024/03/13	2025/03/12
Pre-Amplifier	ROHDE & SCHWARZ	SCU18F	100970	2024/03/13	2025/03/12
Pre-Amplifier	ROHDE &	SCU40F1	100631	2024/03/13	2025/03/12

	SCHWARZ				
Software	ROHDE & SCHWARZ	ELEKTRA	4.52.1	N/A	N/A

For other test items

Equipment Name	Manufacturer	Type/Model	Serial Number	Last Cal Date	Cal Due date
Vector signal generator	ROHDE & SCHWARZ	SMM100A	101780	2024/01/22	2025/01/21
Open switch and control platform	ROHDE & SCHWARZ	OSP150	100856	2023/11/29	2024/11/28
Signal and Spectrum analyzer	ROHDE & SCHWARZ	FSV3044	101287	2024/04/02	2025/04/01
Wireless connectivity tester	ROHDE & SCHWARZ	CMW270	102651	2024/01/22	2025/01/21
SIGNAL GENERATOR	ROHDE & SCHWARZ	SMB100A	183222	2024/01/22	2025/01/21
DC power supply	apc	ADC-0800100-15	D222120022	2023/11/23	2024/11/22
AC power supply	apc	KDF-11005GS	F322120041	2023/11/23	2024/11/22
Temperature & Humidity Chamber	HESON	HS-225B	CDW230301-01	2024/03/13	2025/03/12
Software	MWRFTtest	MTS 8310	2.0.0.0	N/A	N/A

--- END ---