Regulatory Test Report

Prepared for Harman International Industries, Inc.

This report presents detailed information on

R1 INT NA 2B HW4

Prepared by

Sharon Spratt

Engineer II

Approved by

Jason Kanakry

General Manager

Issue date: 03/19/2025

Report No: J24179-R1 INT NA 2B HW4-TR3 v2

Contents

1. Test Request Information

Test Request #:	7700206788
Test Requested By:	Pranav Patel Harman International Industries, Inc. 30001 Cabot Drive, Novi, MI 48377
Test item Description:	R1 INT NA 2B HW4
Part Number:	P68581660ZZ
DUT Sample Number:	J24179#1
FVIN :	FCA-MY24.MNL-OD.3426
Hardware Version of DUT:	N/A
Software Version of DUT:	N/A
Component Category of DUT:	N/A
FCC ID:	2AHPN-BE2881
ISED ID:	6434C-BE2881
Type of Test:	FCC/ISED Certification
Test Method:	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 3, ISED Canada RSS-Gen Issue 5 and ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02
Deviations from standard:	None
Approved Test Plan Number:	N/A
Test Plan Revision:	N/A
Date test Sample Received:	06-26-2024
Date Test Started:	12/10/2024
Date Test Finished:	12/19/2024

2. Test Laboratory Information

Location of Test Lab:	The radiated and conducted emissions test sites are located at Bureau Veritas 815 N. Opdyke Rd #100, Auburn Hills, MI 48326, Phone: +1-248-836-4700
Key Contact:	Jason Kanakry (General Manager) Jason.Kanakry@BureauVeritas.com Phone: +1-248-836-4747
Laboratory Accreditations:	BUREAU VERITAS CONSUMER PRODUCTS SERVICES, INC is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.
ISO/IEC 17025:2017:	5678.01
FCC Test Site Number:	US1278 (242530)
IC Test Site Number:	US0229 (26240)

3. Statement of Conformity

RSS-GEN	RSS 247	Part 15	Comments
6.4		15.15(b)	There are no controls accessible to the user that varies the output power to operate in violation of the regulatory requirements.
		15.19	The label shown in the label exhibit.
		15.21	Information to the user shown in the instruction manual exhibit.
		15.27	No special accessories are required for compliance.
3.2		15.31	The EUT tested in accordance with the measurement standards in this section.
6.13.2		15.33	Frequency range investigated according to this section, unless noted in specific rule section under which the equipment operates.
6.13.1		15.35	The EUT emissions are measured using the measurement detector and bandwidth specified in this section, unless noted in specific rule section under which the equipment operates.
6.8		15.203	EUT employs integrated PCB antenna with -1.24dBi gain.
8.10		15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209 or RSS-Gen as applicable
8.8		15.207	N/A. EUT is vehicle battery powered only.

4. Conducted Testing

4.1 Test Summary

This test report supports an application for certification of a transmitter operating pursuant to:

CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 3

The product is **R1 INT NA 2B HW4** frequency hopping spread spectrum transmitter that operates in the 2402 – 2480 MHz frequency range.

Details	Description
Frequency Range (MHz)	2402 – 2480
Supported Modulation	GFSK, π/4 DQPSK, 8DPSK
Tested Modulation	GFSK (DH1), 8DPSK (3-DH1) - Highest Emissions
Number of Channels	79
Tested Channels	0,39,78
DUT Antenna Type	Integrated PCB antenna
Number of transmit chains	1
Equipment type	Frequency Hopping Spread Spectrum
Dwell Time	350ms
DUT Antenna Gain	-1.24dBi ☒ Provided by Customer with Gain Report ☐ Not Provided by Customer
DUT Power Class/Power Settings	Power Class: 1 (MRVL_Class1)
DUT Software Tool/Settings	MFGBridge_Tool/Dut labtool is used to configure device Bluetooth modes and data rates.

79 channels are provided for BT mode:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	**2402**	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	**78**	**2480**
19	2421	**39**	**2441**	59	2461		

Notes: The channels 0, 39 and 78 were selected as representative test channels.

Full testing is performed on worst case modulation 3-DH1 from EDR and on DH1 from BDR Family.

Test Results Summary

Test	Frequency (MHz)	DH1 Result	DH3 Result	DH5 Result	2-DH1 Result	2-DH3 Result	2-DH5 Result	3-DH1 Result	3-DH3 Result	3-DH5 Result
Hopping Frequencies	--- (hopping)	Pass	--	--	--	--	--	Pass	--	--
Band Edge High	--- (hopping)	Pass	--	--	--	--	--	Pass	--	--
Carrier Frequency Separation	2402.000 (hopping)	Pass	--	--	--	--	--	Pass	--	--
Carrier Frequency Separation	2480.000 (hopping)	Pass	--	--	--	--	--	Pass	--	--
Time of Channel Occupancy	2402.000 (hopping)	Pass	--	--	--	--	--	Pass	--	--
Time of Channel Occupancy	2441.000 (hopping)	Pass	--	--	--	--	--	Pass	--	--
Time of Channel Occupancy	2480.000 (hopping)	Pass	--	--	--	--	--	Pass	--	--
Emissions Bandwidth 20dB	2402.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Occupied Channel Bandwidth 99%	2402.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Band Edge Low	2402.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Peak Output Power	2402.000 (single)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Tx Spurious	2402.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Emissions Bandwidth 20dB	2441.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Occupied Channel Bandwidth 99%	2441.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Peak Output Power	2441.000 (single)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Tx Spurious	2441.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Emissions Bandwidth 20dB	2480.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Occupied Channel Bandwidth 99%	2480.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Band Edge High	2480.000 (single)	Pass	--	--	--	--	--	Pass	--	--
Peak Output Power	2480.000 (single)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Tx Spurious	2480.000 (single)	Pass	--	--	--	--	--	Pass	--	--

Test Item	Sample #	Result
FCC 15.247 Bluetooth Classic	J24179#1	Meets Requirement

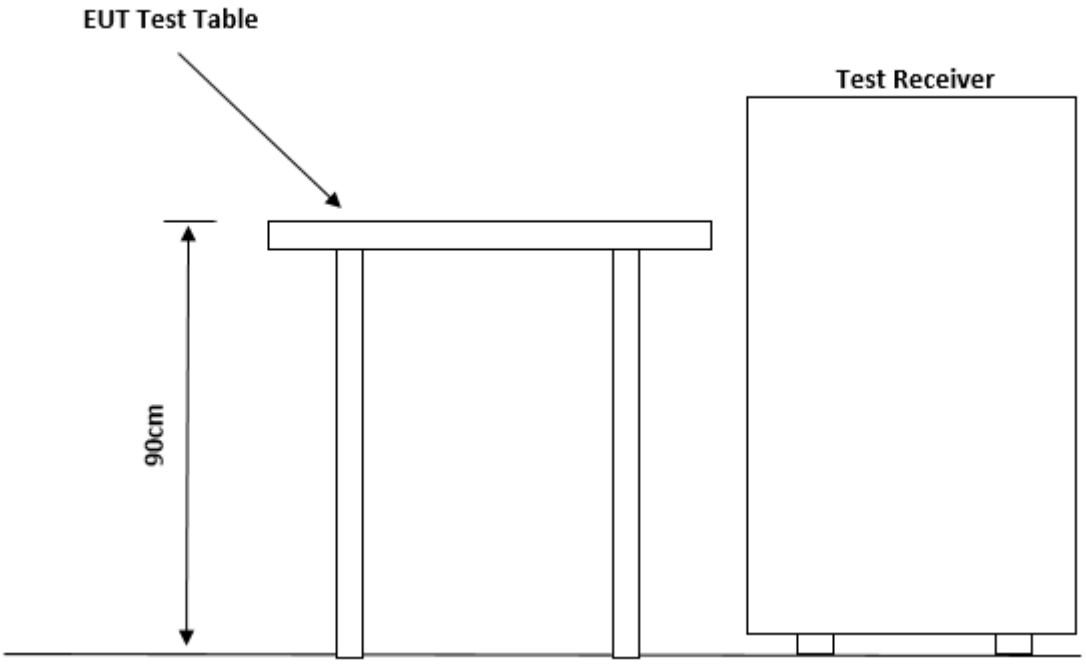
We found that the product met the above requirements without modification.

Test samples received in good condition.

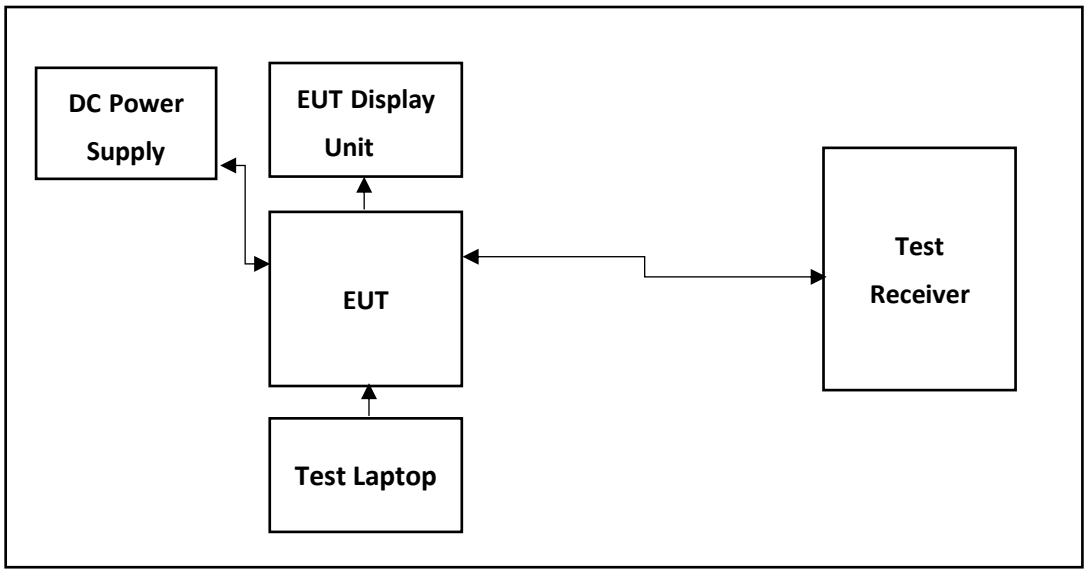
4.2 Test Setup

Conducted Test Site Description

The site is accommodated to test tabletop and floor standing test equipment.



TEST SETUP DIAGRAM



4.3 Test Equipment Used

ID #	Equipment	Manufacturer	Model #	Serial #	Cal Due
BVD0226	Spectrum Analyzer 10Hz-44GHz	Rohde & Schwarz	FSV3044	101018	4/20/2025
BVD0227	8 port switch unit for Wireless Test system	Rohde & Schwarz	OSP150	101100	11/24/2025
BVD0228	8 port switch unit for Wireless Test system	Rohde & Schwarz	OSP220	101632	11/14/2025
BVD0224	Signal Generator 100kHz-40GHz	Rohde & Schwarz	SMB100A	181741	4/20/2025
BVD0225	Signal Generator 100k-6GHz with GPS simulator	Rohde & Schwarz	SMW200A	107664	4/20/2025
BVD0250	Wireless Connectivity Tester 70M-6GHz	Rohde & Schwarz	CMW270	102113	4/20/2025
BVD0302	DC power supply 1-15VDC 60A 110/220 11.5A max input	BK Precision	1693	257F17180	N/A
BVD0321	Fixed Attenuator 2W 20dB -40GHz	Mini-Circuits	BW-K20-2W44+	2103	12/11/2024
BVD0430	Multimeter	Fluke	117	49710262SV	11/07/2025
BVD0229	Temp and Humidity Meter	Fluke	971	12001009	5/23/2025
N/A	Test-PC	Lenovo ThinkPad	E480	SL10Q37355	N/A

Notes:-

- DC power supply verified before use with calibrated Multimeter.
- All the conducted testing completed by 12/06/2024.

Customer Supplied Equipment

ID #	Equipment	Manufacturer	Model	Serial #	Version No.
N/A	Harness	Harman	N/A	N/A	N/A
N/A	Display Unit	MOBIS	BMM6100000	231107 01	N/A
N/A	Shark Fin Antenna	Alfa Romeo	B901	719147	N/A
N/A	Antenna	Aptiv	APN35409682	N/A	N/A
N/A	Camera	N/A	23295906C	N/A	N/A
N/A	MFGBridge_Tool/Dut labtool	N/A	N/A	N/A	2.0.0.89

Equipment List (Software)

ID #	Equipment	Manufacturer	Model	Version No	
N/A	EMC Test Software	Rodhe & Schwarz	EMC32	11.20.00	N/A

4.4 Test Data

4.4.1 Number of Hopping Frequencies

Test according to FCC title 47 part 15 §15.247(a),(g), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.3, RSS-247 Section 5.1(d)

Spectrum Analyzer Settings

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	200.000 kHz	<= 200.000 kHz
VBW	200.000 kHz	>= 200.000 kHz
SweepPoints	418	~ 418
Sweeptime	200.000 ms	200.000 ms
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	FFT
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 10	max. 10
Stable	1 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

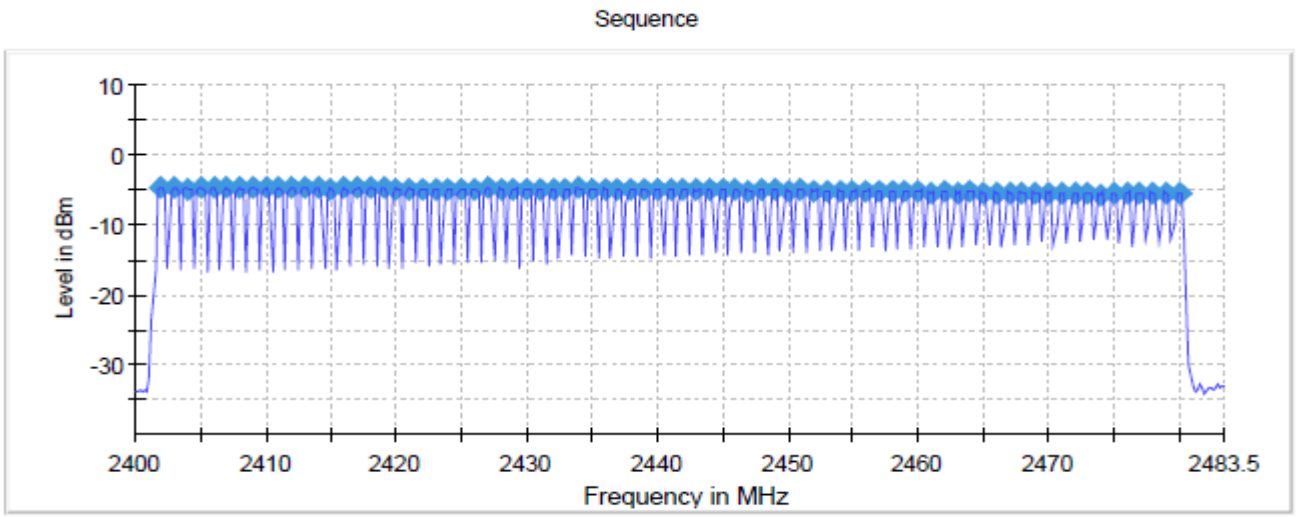
4.4.1.1 DH1

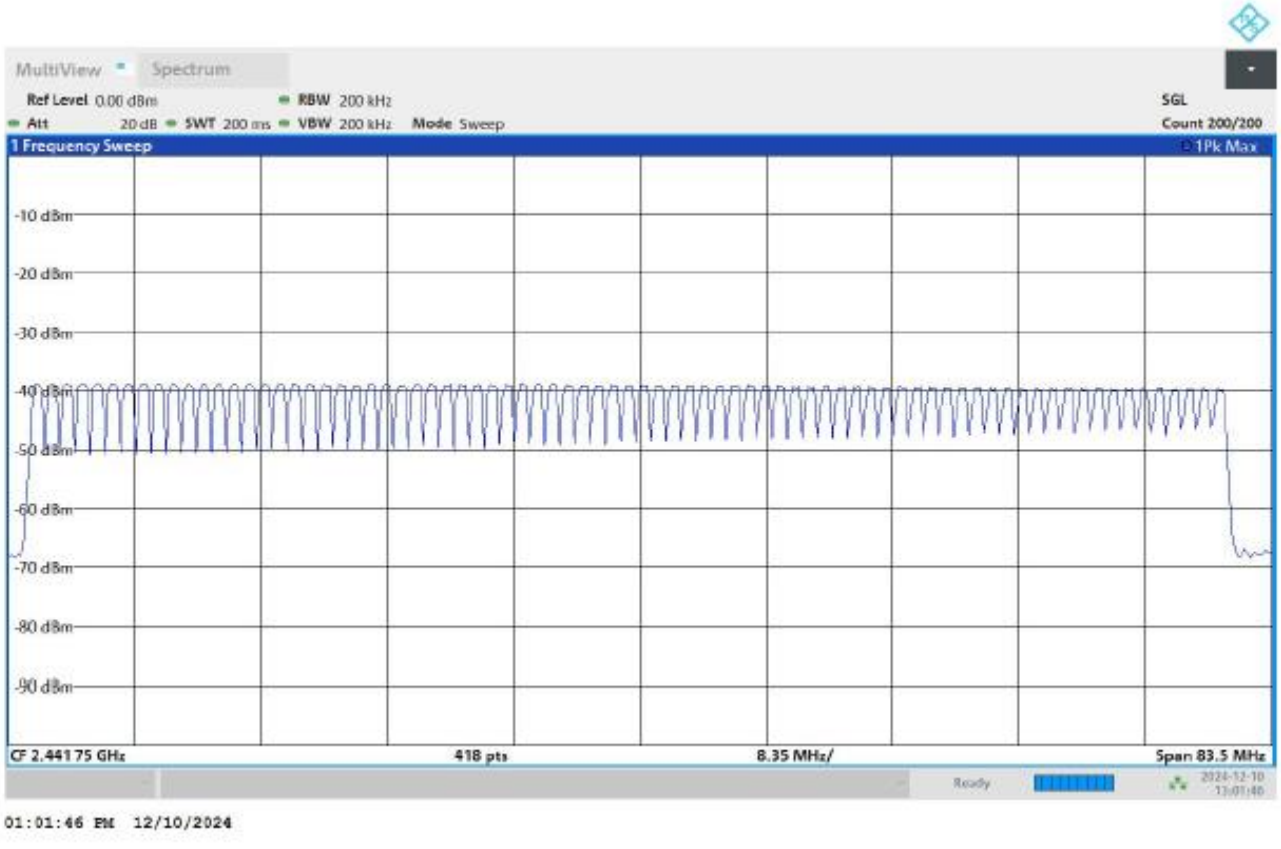
Channels:

Channels	Limit Min	Result
79	15	PASS

Plots:

Hopping Frequencies





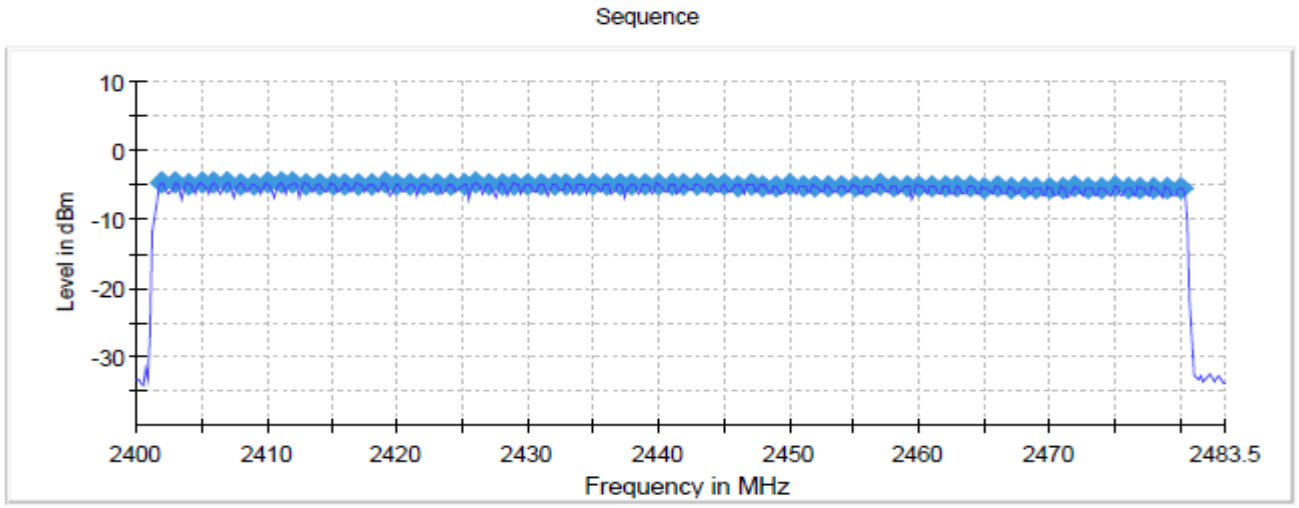
4.4.1.1 3-DH1

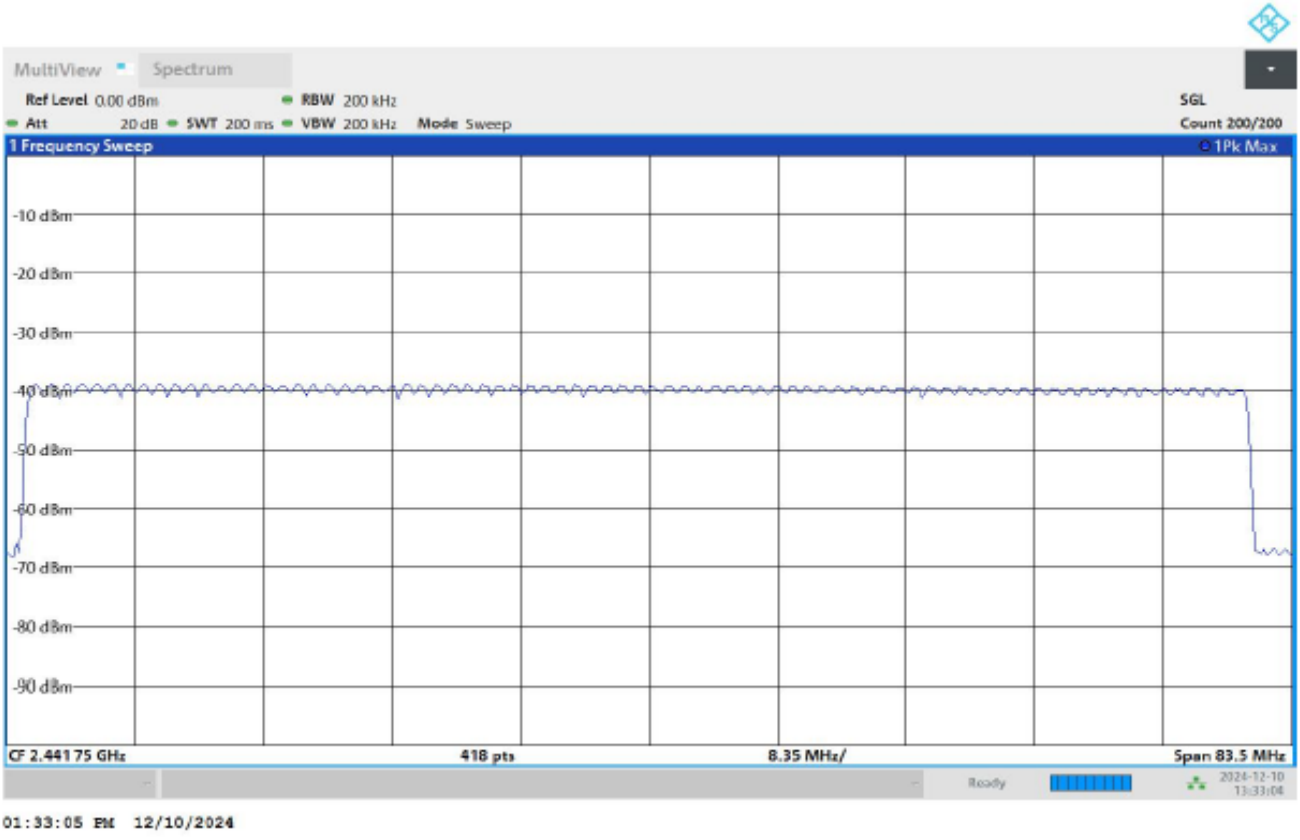
Channels:

Channels	Limit Min	Result
79	15	PASS

Plots:

Hopping Frequencies





4.4.2 Band Edge (Hopping)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.6, RSS-247 Section 5.5

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

Data Rate	Frequency (MHz)	Level (dBm)
DH1	2401.825	-5.0
3-DH1	2401.975	-5.6

Spectrum Analyzer Settings

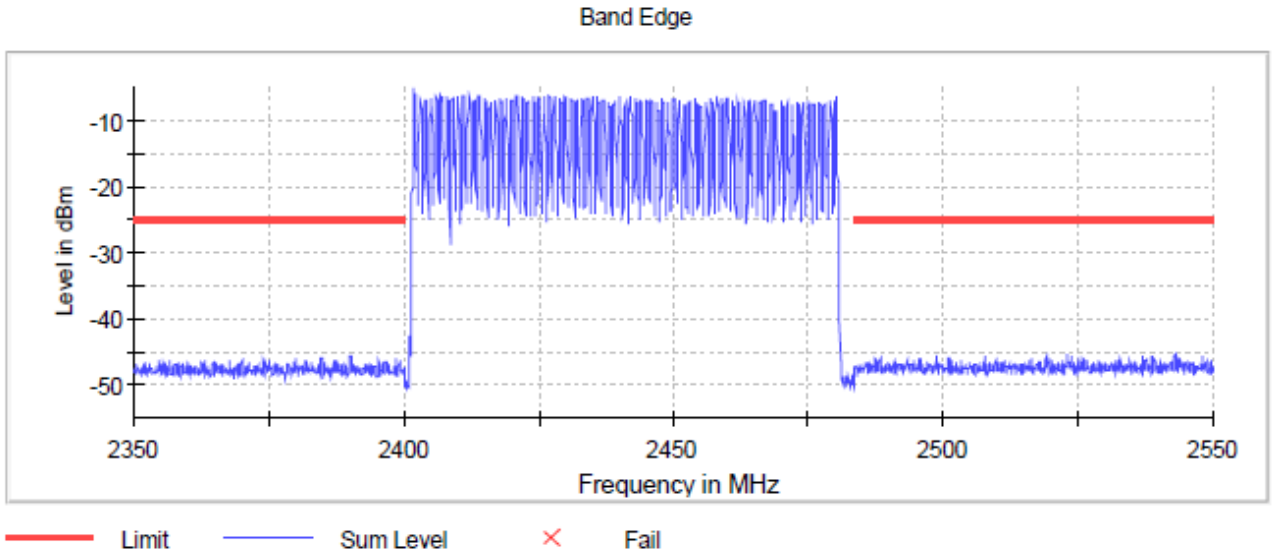
Setting	Instrument Value	Target Value
Start Frequency	2.35000 GHz	2.35000 GHz
Stop Frequency	2.55000 GHz	2.55000 GHz
Span	200.000 MHz	200.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	4000	~ 4000
Sweeptime	4.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	50 / max. 50	max. 50
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

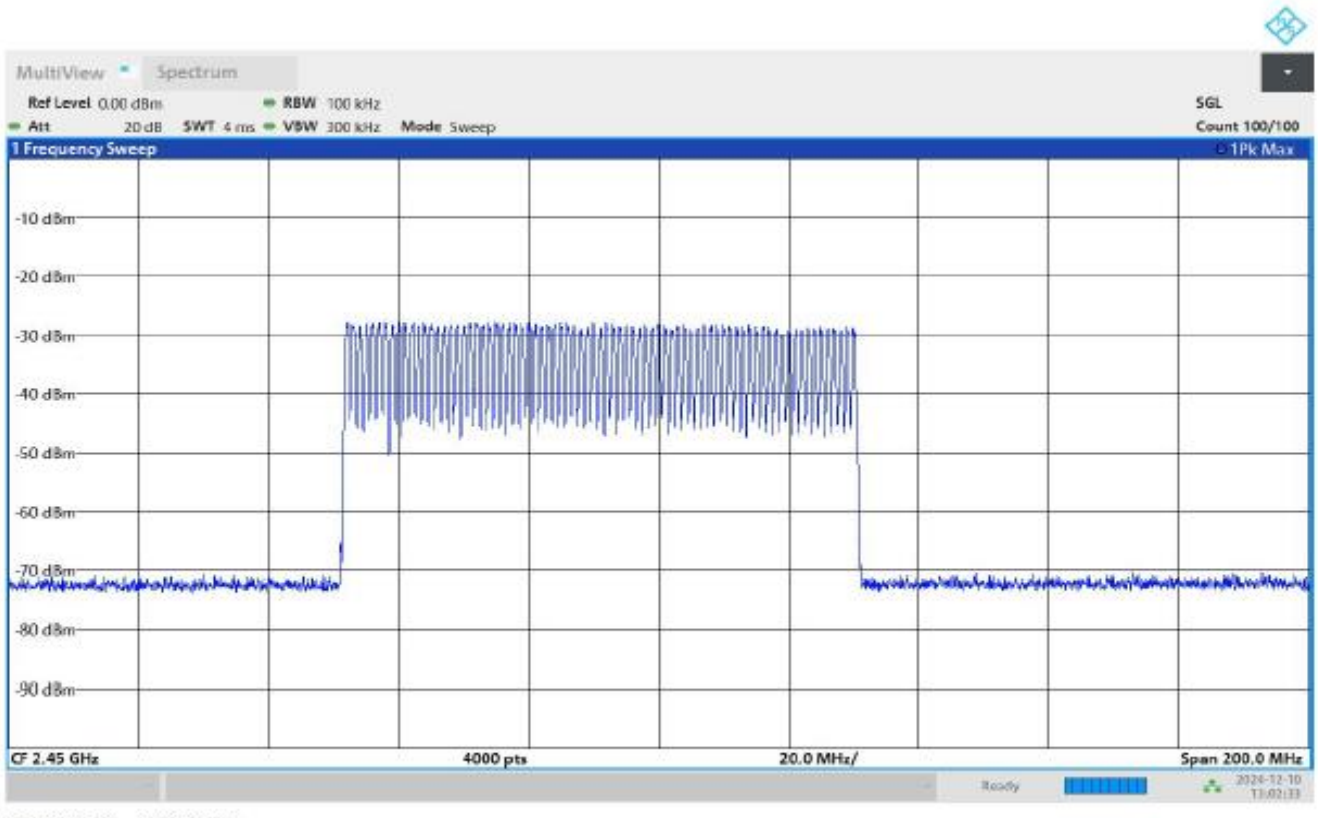
4.4.2.1 DH1

Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2522.975000	-45.4	20.3	-25.0	PASS
2542.825000	-45.4	20.4	-25.0	PASS
2522.925000	-45.5	20.4	-25.0	PASS
2390.025000	-45.5	20.5	-25.0	PASS
2498.725000	-45.6	20.5	-25.0	PASS
2538.425000	-45.6	20.5	-25.0	PASS
2390.075000	-45.7	20.6	-25.0	PASS
2523.675000	-45.7	20.7	-25.0	PASS
2547.825000	-45.7	20.7	-25.0	PASS
2523.725000	-45.7	20.7	-25.0	PASS
2547.875000	-45.7	20.7	-25.0	PASS
2498.775000	-45.7	20.7	-25.0	PASS
2542.775000	-45.7	20.7	-25.0	PASS
2507.575000	-45.7	20.7	-25.0	PASS
2519.025000	-45.8	20.7	-25.0	PASS

Plots:


Band Edge
Level in dBm
-10
-20
-30
-40
-50
2350
2400
2450
2500
2550
Frequency in MHz
Limit
Sum Level
Fail

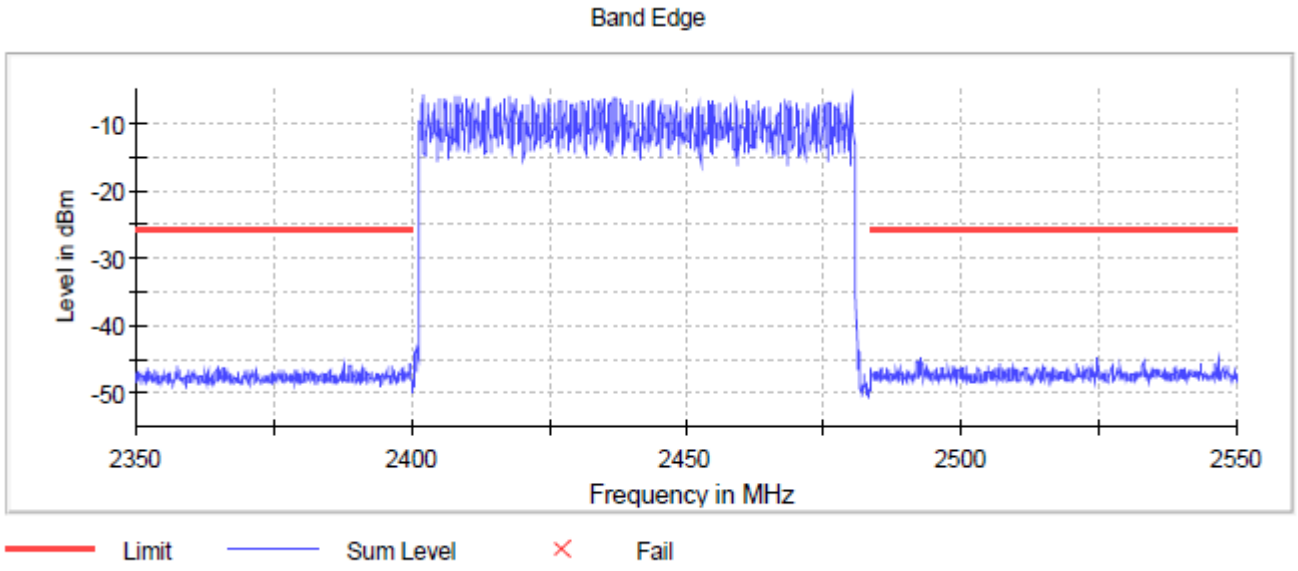

MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
Att 20 dB
SWT 4 ms
VBW 300 kHz
Mode Sweep
SGL
Count 100/100
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.45 GHz
4000 pts
20.0 MHz/
Span 200.0 MHz
Ready
01:02:34 PM 12/10/2024

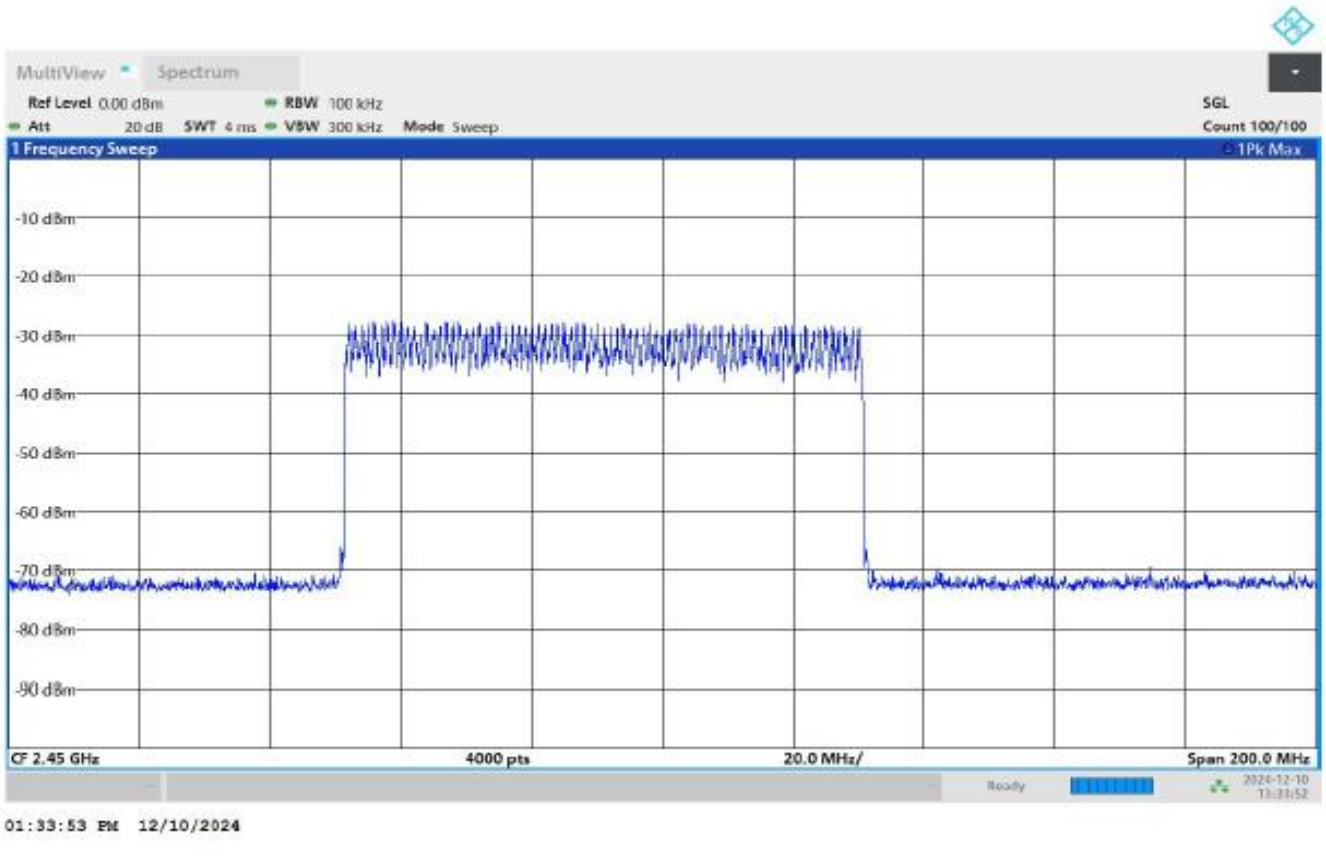
4.4.2.2 3-DH1

Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2524.675	-44.6	19.0	-25.6	PASS
2524.725	-44.6	19.0	-25.6	PASS
2492.375	-44.8	19.1	-25.6	PASS
2492.425	-44.8	19.2	-25.6	PASS
2546.525	-45.0	19.4	-25.6	PASS
2546.575	-45.0	19.4	-25.6	PASS
2491.875	-45.2	19.6	-25.6	PASS
2491.925	-45.3	19.6	-25.6	PASS
2532.975	-45.3	19.7	-25.6	PASS
2533.025	-45.3	19.7	-25.6	PASS
2492.675	-45.5	19.9	-25.6	PASS
2492.325	-45.5	19.9	-25.6	PASS
2387.625	-45.6	20.0	-25.6	PASS
2387.675	-45.6	20.0	-25.6	PASS
2492.725	-45.6	20.0	-25.6	PASS

Plots:


Band Edge
Level in dBm
-10
-20
-30
-40
-50
2350
2400
2450
2500
2550
Frequency in MHz
Limit
Sum Level
Fail


MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
Att 20 dB
SWT 4 ms
VBW 300 kHz
Mode Sweep
SGL
Count 100/100
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.45 GHz
4000 pts
20.0 MHz/
Span 200.0 MHz
Ready
01:33:53 PM 12/10/2024

4.4.3 Carrier Frequency Separation

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.2, RSS-247 Section 5.1(b)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (k = 2) < 1%

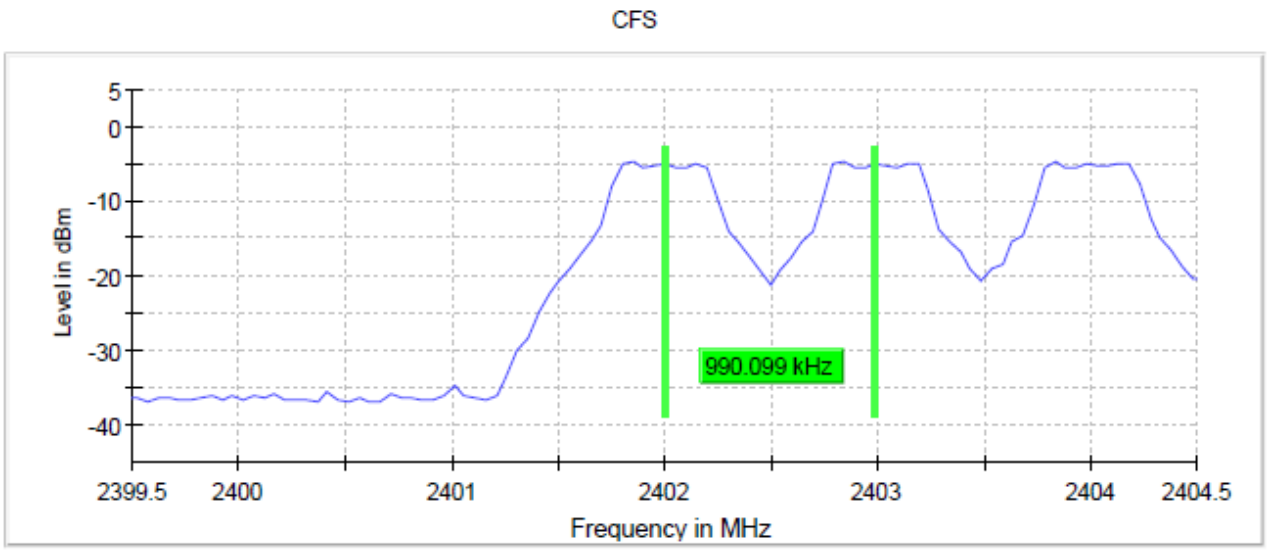
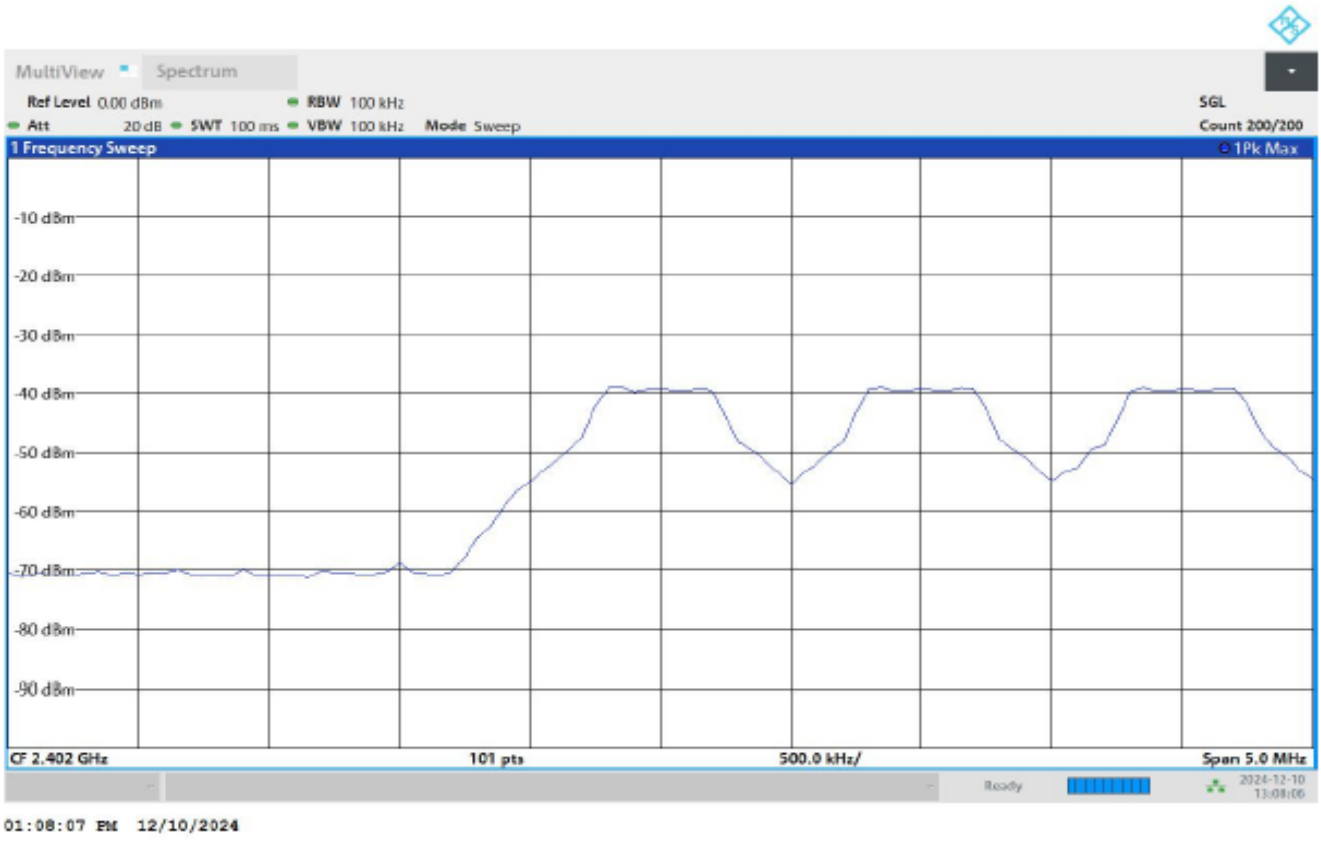
Hopping Mode				
Packet Type	2402MHz		2480MHz	
	Frequency Separation (MHz)	Minimum Limit (MHz)	Frequency Separation (MHz)	Minimum Limit (MHz)
DH1	0.990099	0.666667	0.990099	0.666667
3-DH1	0.990099	0.871287	0.990099	0.871287

Spectrum Analyzer Settings:

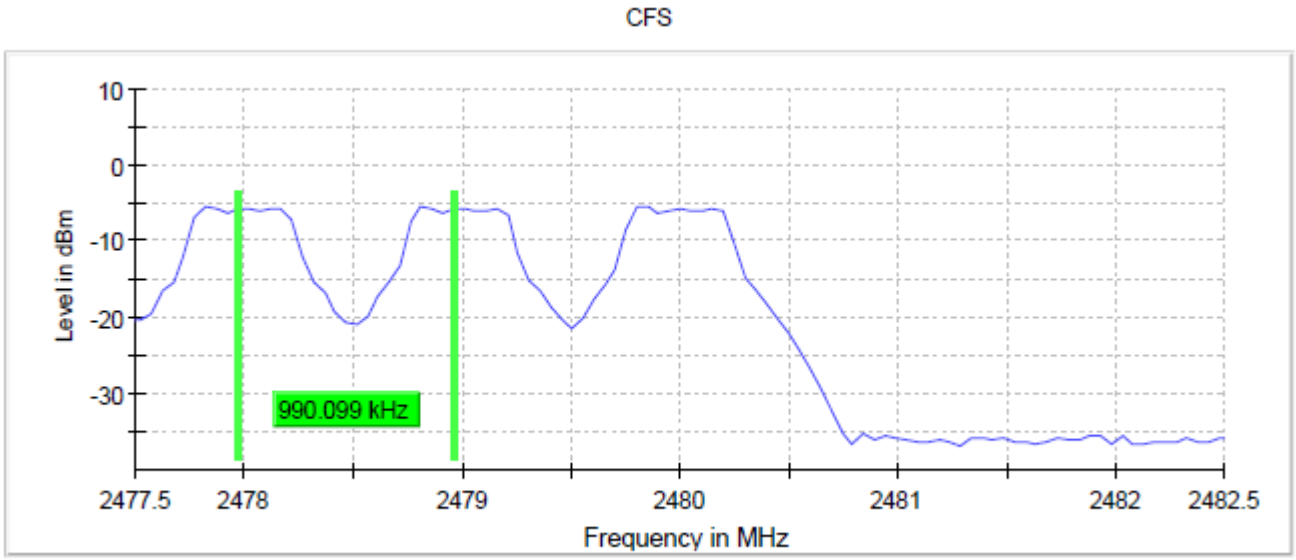
Setting	Instrument Value	Target Value
Start Frequency	2.39950 GHz	2.39950 GHz
Stop Frequency	2.40450 GHz	2.40450 GHz
Span	5.000 MHz	5.000 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	100.000 kHz	>= 100.000 kHz
SweepPoints	101	~ 50
Sweeptime	100.000 ms	100.000 ms
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	FFT
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 50	max. 50
Stable	10 / 10	10
Max Stable Difference	0.13 dB	0.50 dB

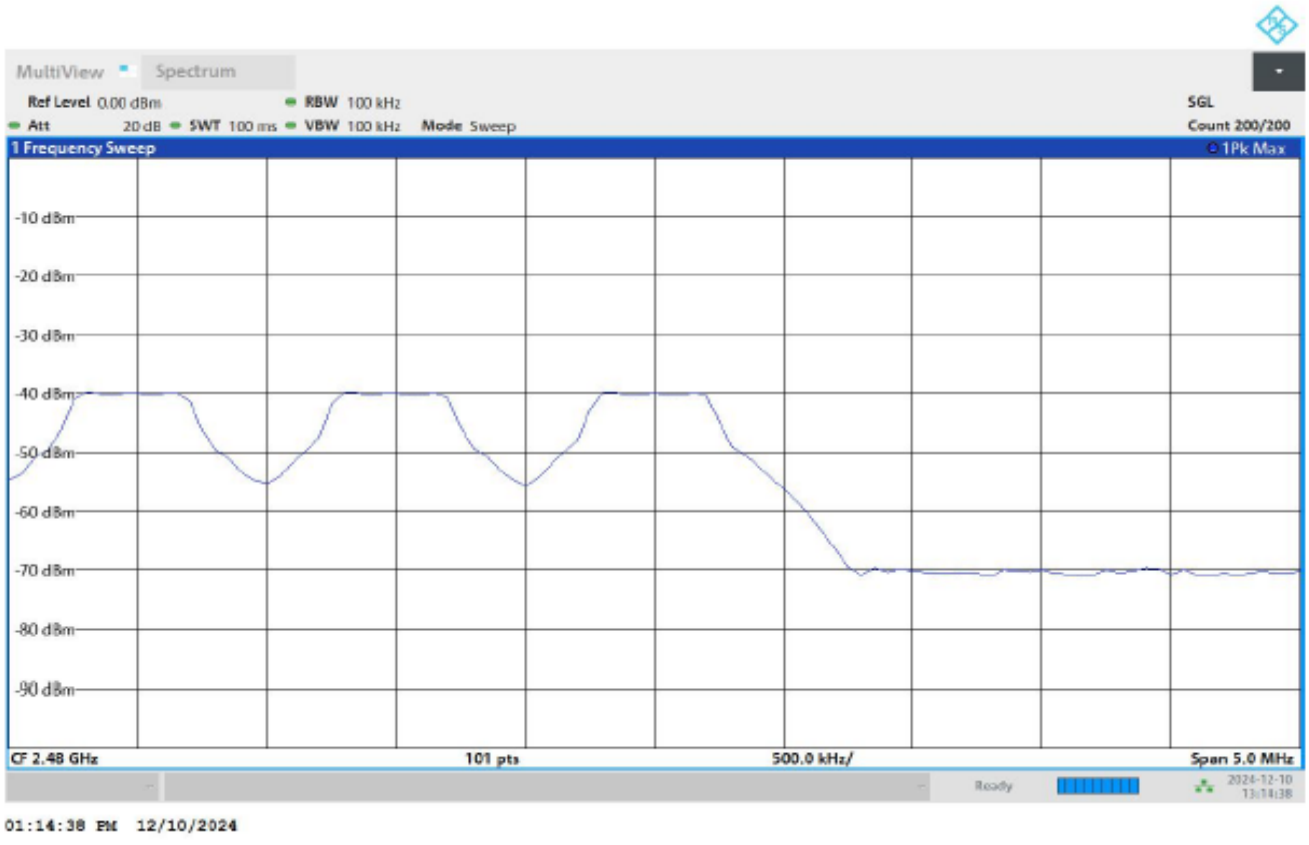
4.4.3.1 DH1

Plots:

2402MHz



2480MHz

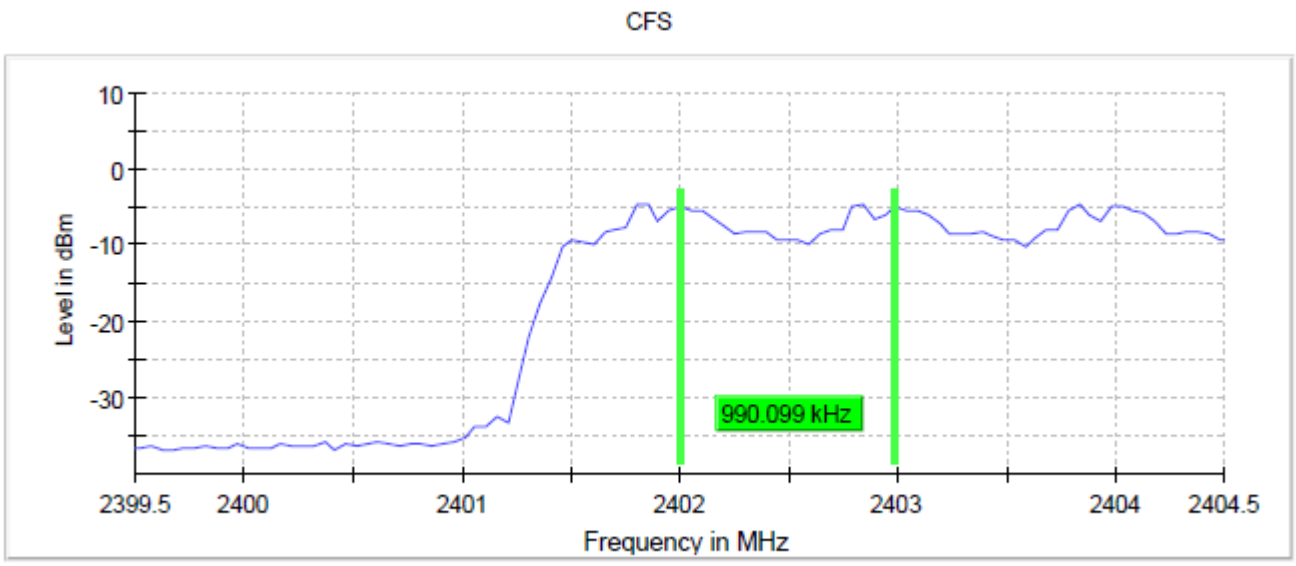

CFS
10
0
-10
-20
-30
Level in dBm
990.099 kHz
2477.5
2478
2479
2480
2481
2482
2482.5
Frequency in MHz

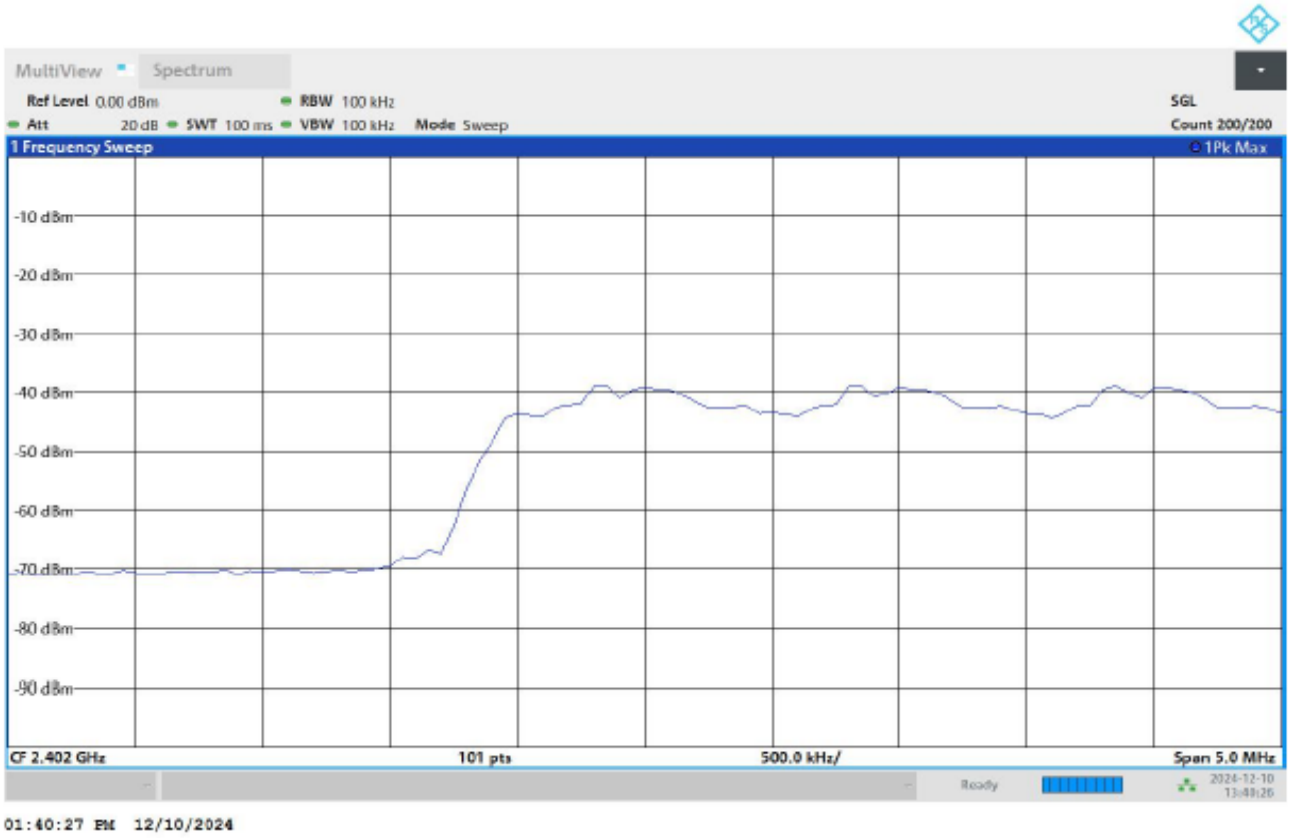

MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
Att 20 dB SWT 100 ms VBW 100 kHz Mode Sweep
SGL
Count 200/200
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.48 GHz
101 pts
500.0 kHz/
Span 5.0 MHz
Ready
01:14:38 PM 12/10/2024

4.4.3.2 3-DH1

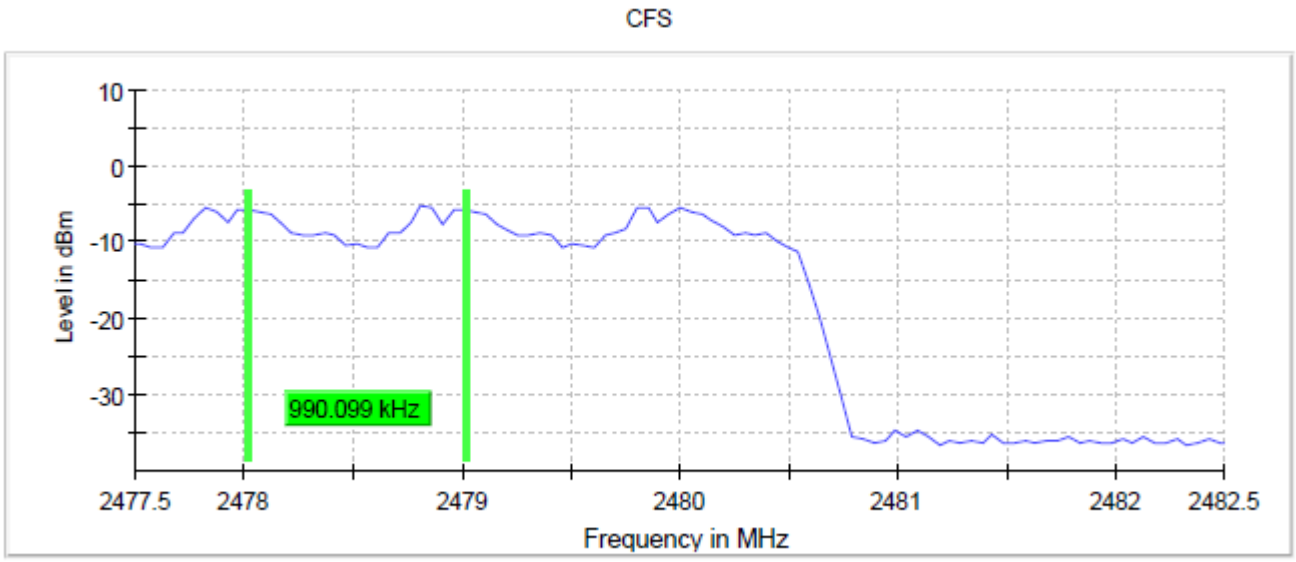
Plots:

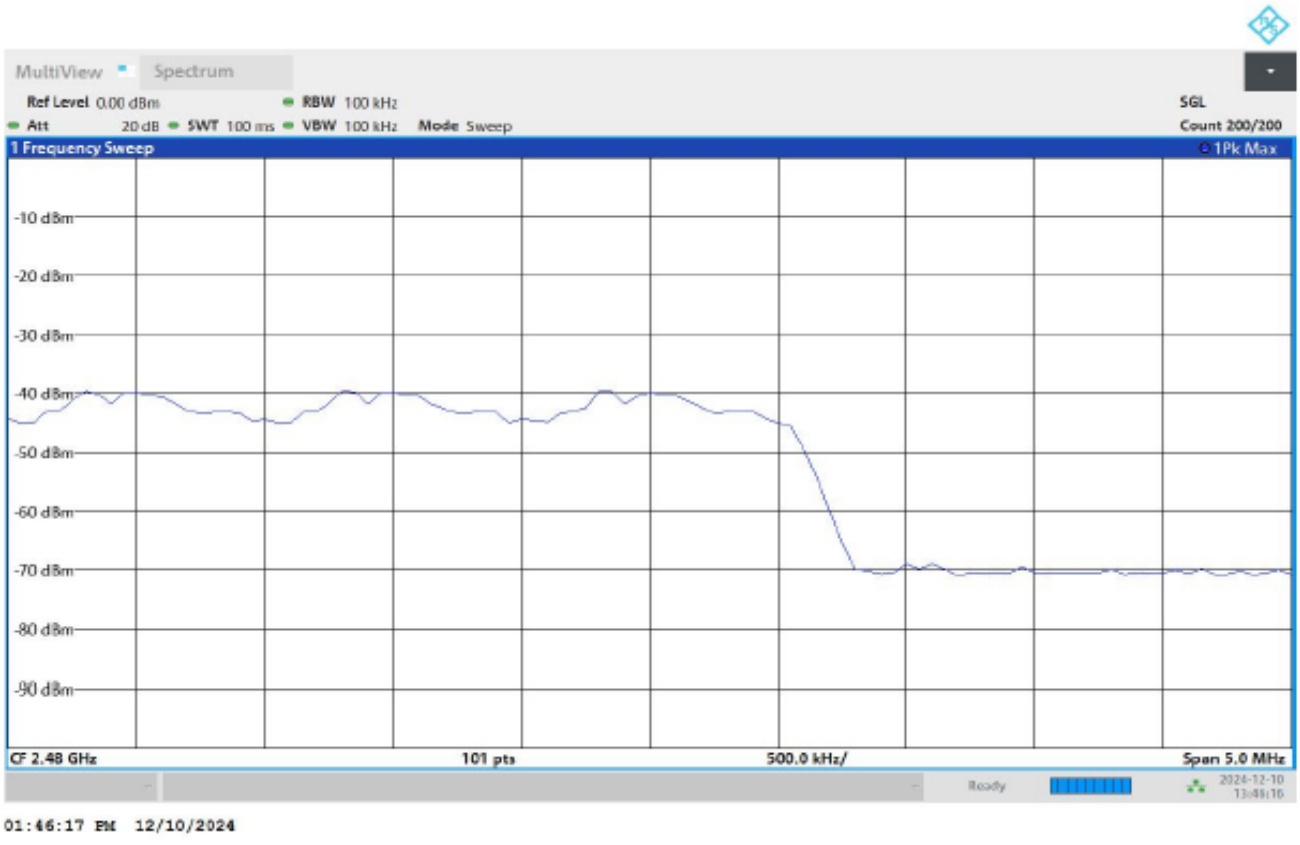
2402MHz





2480MHz


CFS
10
0
-10
-20
-30
Level in dBm
990.099 kHz
2477.5
2478
2479
2480
2481
2482
2482.5
Frequency in MHz


MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
Att 20 dB
SWT 100 ms
VBW 100 kHz
Mode Sweep
SGL
Count 200/200
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.48 GHz
101 pts
500.0 kHz/
Span 5.0 MHz
Ready
01:46:17 PM 12/10/2024

4.4.4 Time of Channel Occupancy

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.4, RSS-247 Section 5.1(d)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1%

The transmit time per hop was measured by summing the sweep points above a threshold at least 10dB from the maximum level on the spectrum analyzer display.

Frequency	Data Rate	Mean Transmit Time per Hop (ms)	Number of Hops	Time (ms)	Limit Max (ms)	Result
2402	DH1	0.397	316	125.940	400.000	PASS
2402	3-DH1	0.345	319	110.460	400.000	PASS
2441	DH1	0.396	317	125.840	400.000	PASS
2441	3-DH1	0.344	318	109.800	400.000	PASS
2480	DH1	0.393	319	125.760	400.000	PASS
2480	3-DH1	0.331	317	105.370	400.000	PASS

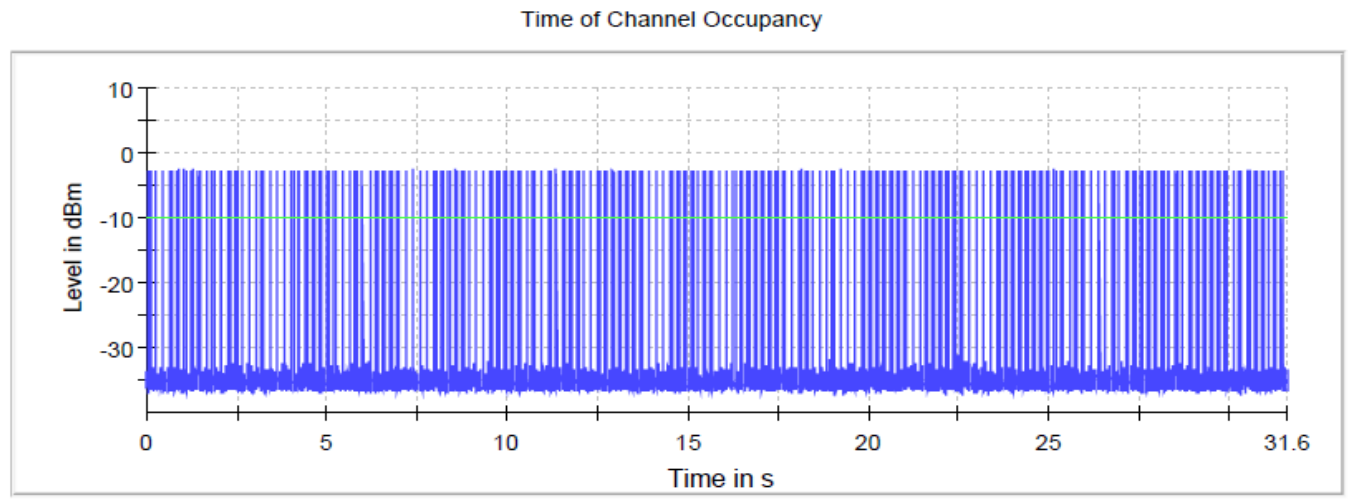
Spectrum Analyzer Settings:

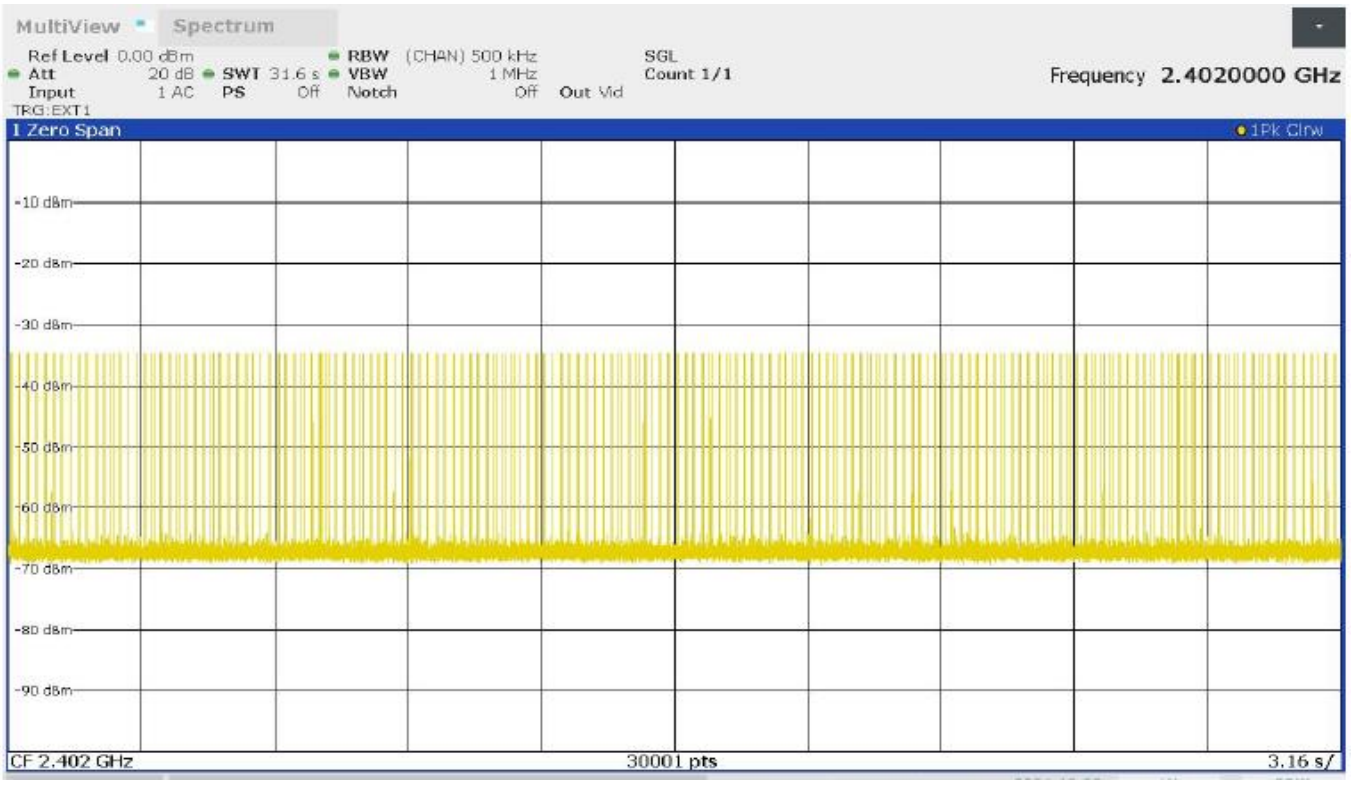
Setting	Instrument Value	Target Value
Center Frequency	2.40200 GHz	2.40200 GHz
Span	ZeroSpan	ZeroSpan
RBW	500.000 kHz	~ 500.000 kHz
VBW	1.000 MHz	~ 1.500 MHz
SweepPoints	30001	~ 30001
Sweeptime	31.600 s	31.600 s
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	1	1
Filter	Channel	Channel
Trace Mode	Clear Write	Clear Write
Sweeptype	Sweep	AUTO
Preamp	off	off
Trigger	External	External
Trigger Offset	0.000 s	0.000 s

4.4.4.1 DH1

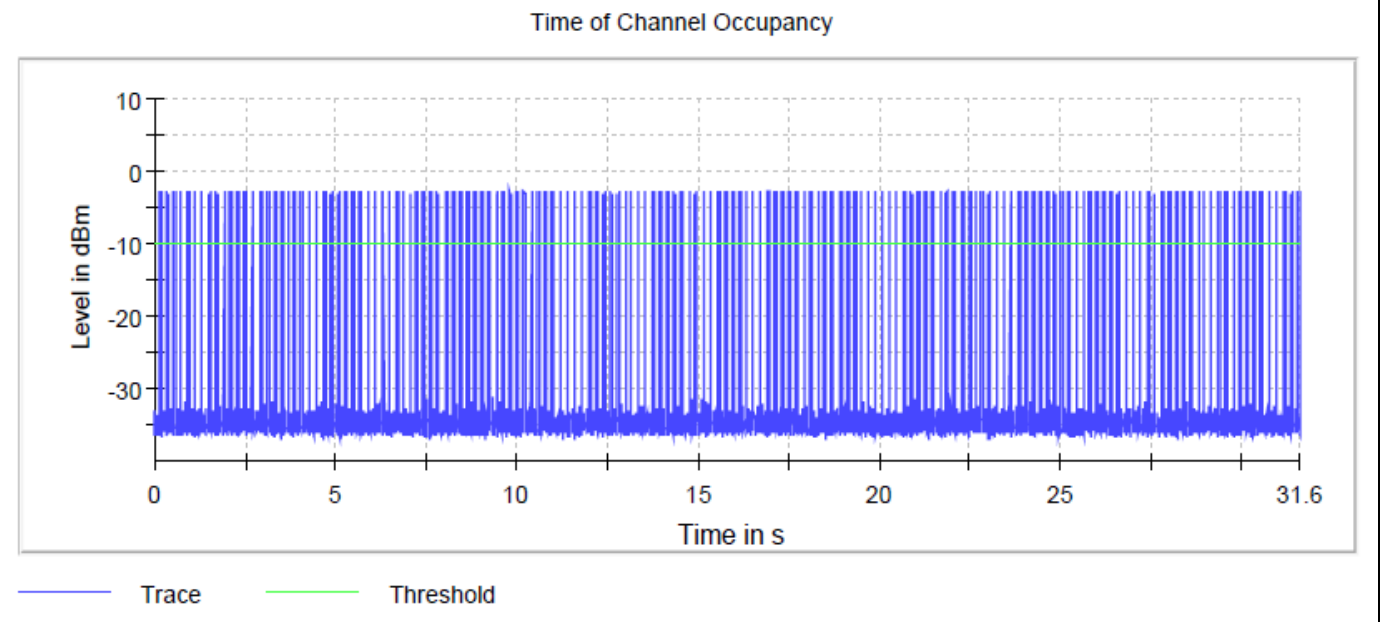
Plots:

2402MHz

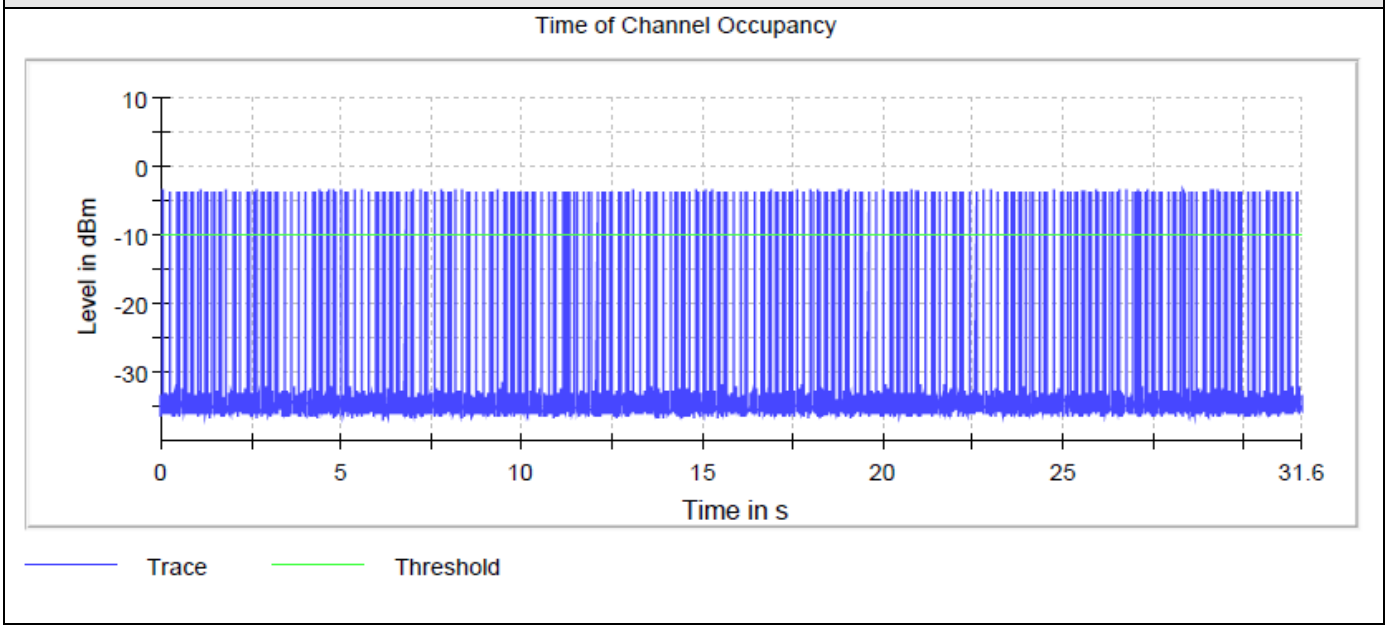




2441MHz



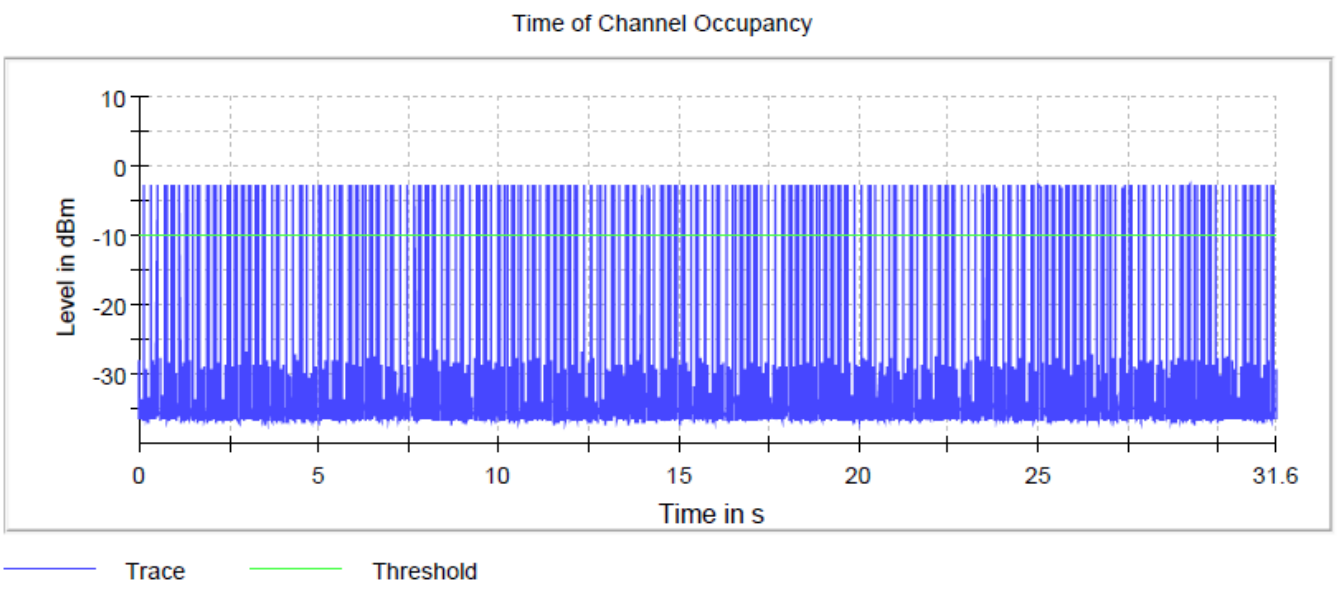
2480MHz

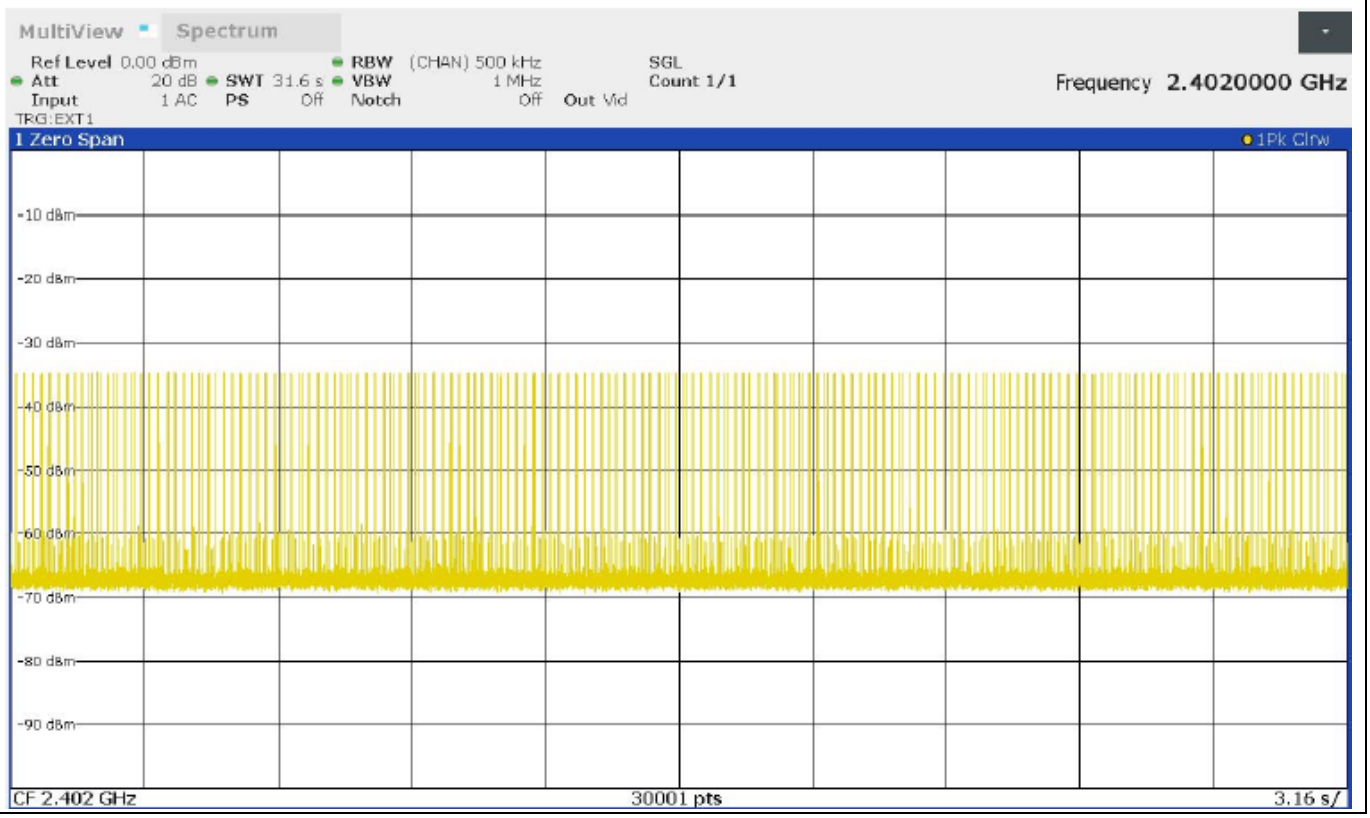


4.4.4.2 3-DH1

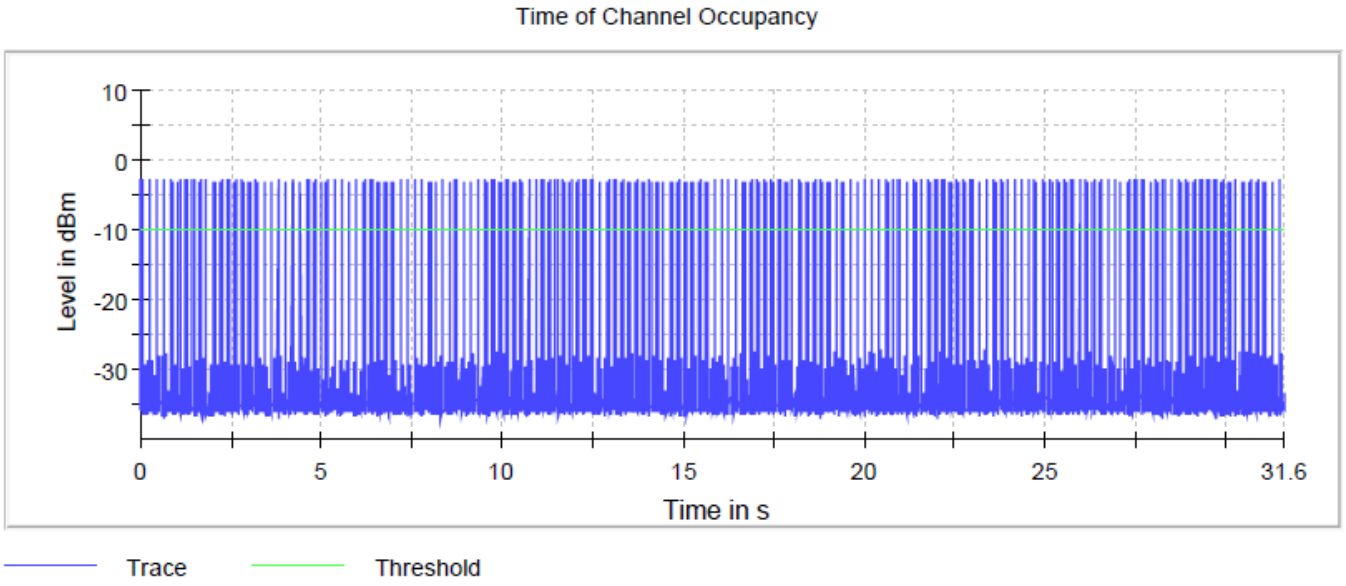
Plots:

2402MHz

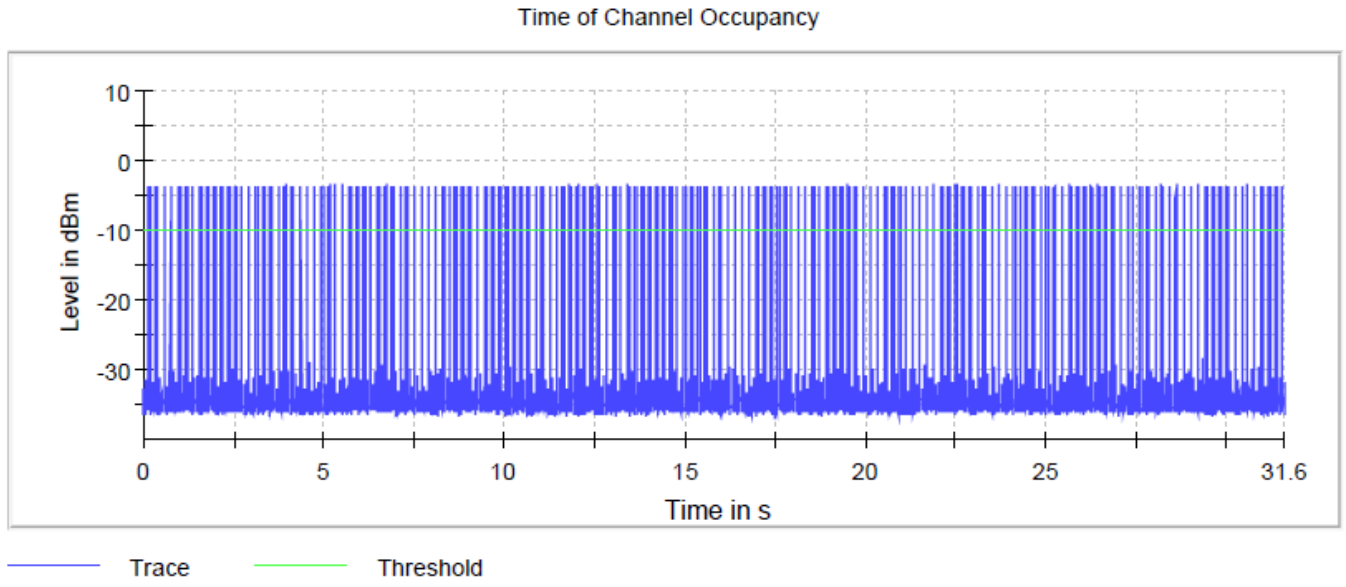




2441MHz



2480MHz



4.4.5 Peak Output Power

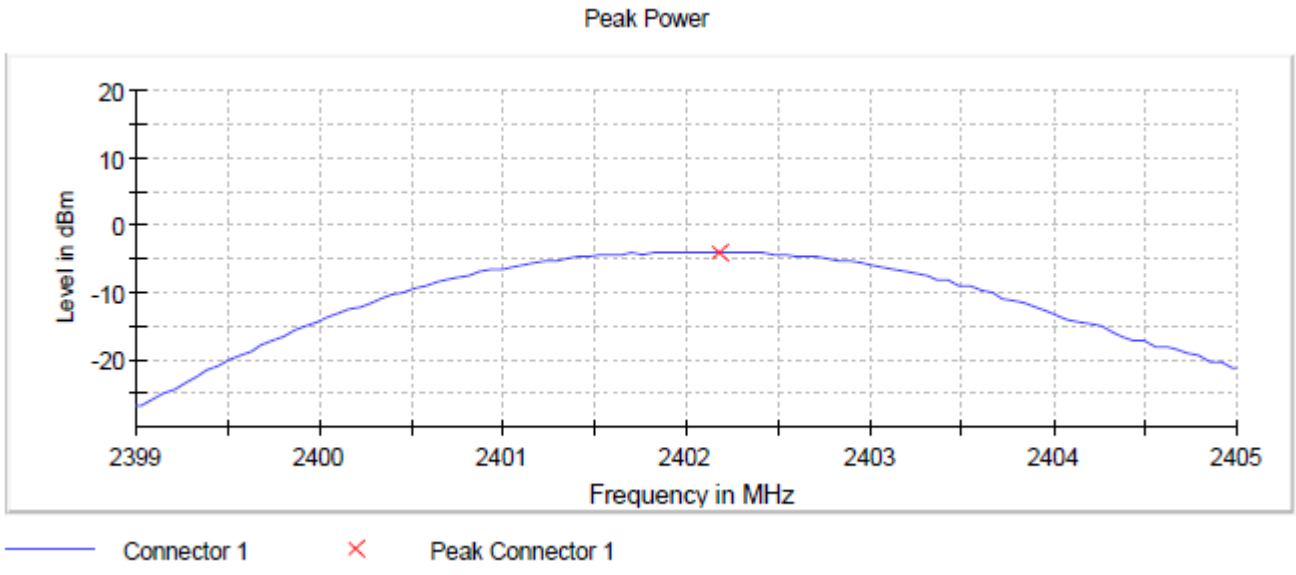
Test according to FCC title 47 part 15 §15.247(b), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.5, RSS-247 Section 5.4 (b)

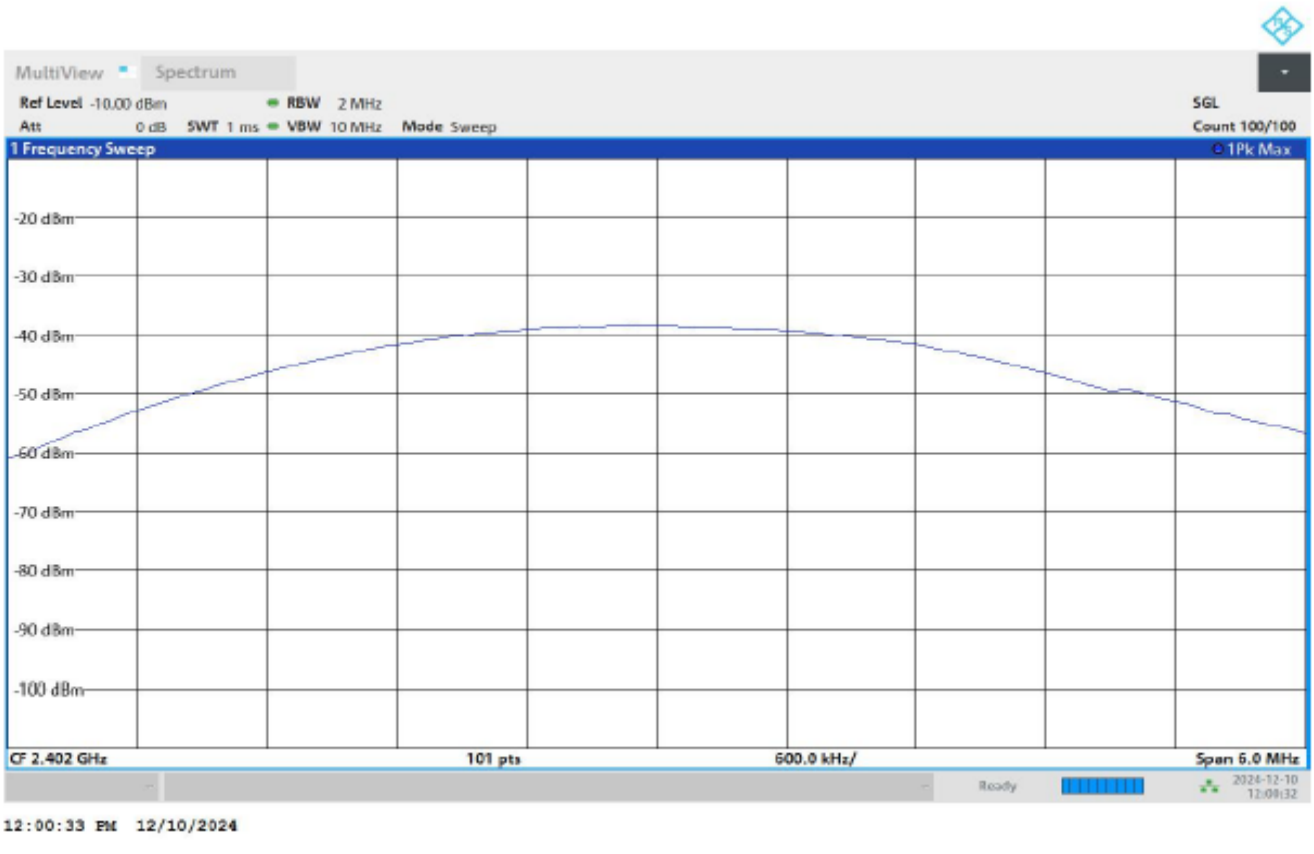
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

Data Rate	2402 MHz	2441 MHz	2480 MHz	Limit dBm
DH1	-3.967	-4.824	-4.759	21.0
DH3	-4.268	-4.794	-4.645	21.0
DH5	-4.350	-4.810	-4.978	21.0
2-DH1	-2.340	-2.720	-2.848	21.0
2-DH3	-2.453	-2.740	-3.233	21.0
2-DH5	-2.448	-2.667	-3.217	21.0
3-DH1	**-2.117**	-2.398	-2.895	21.0
3-DH3	-2.277	-2.535	-3.021	21.0
3-DH5	-2.258	-2.523	-3.000	21.0

4.4.5.1 DH1

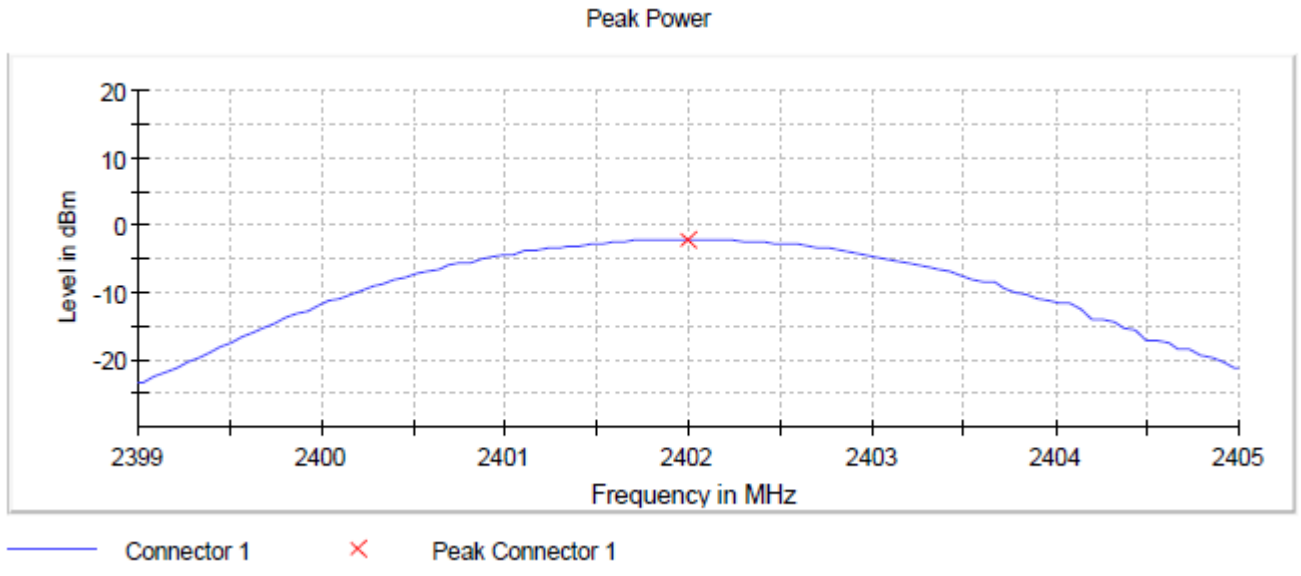
2402MHz

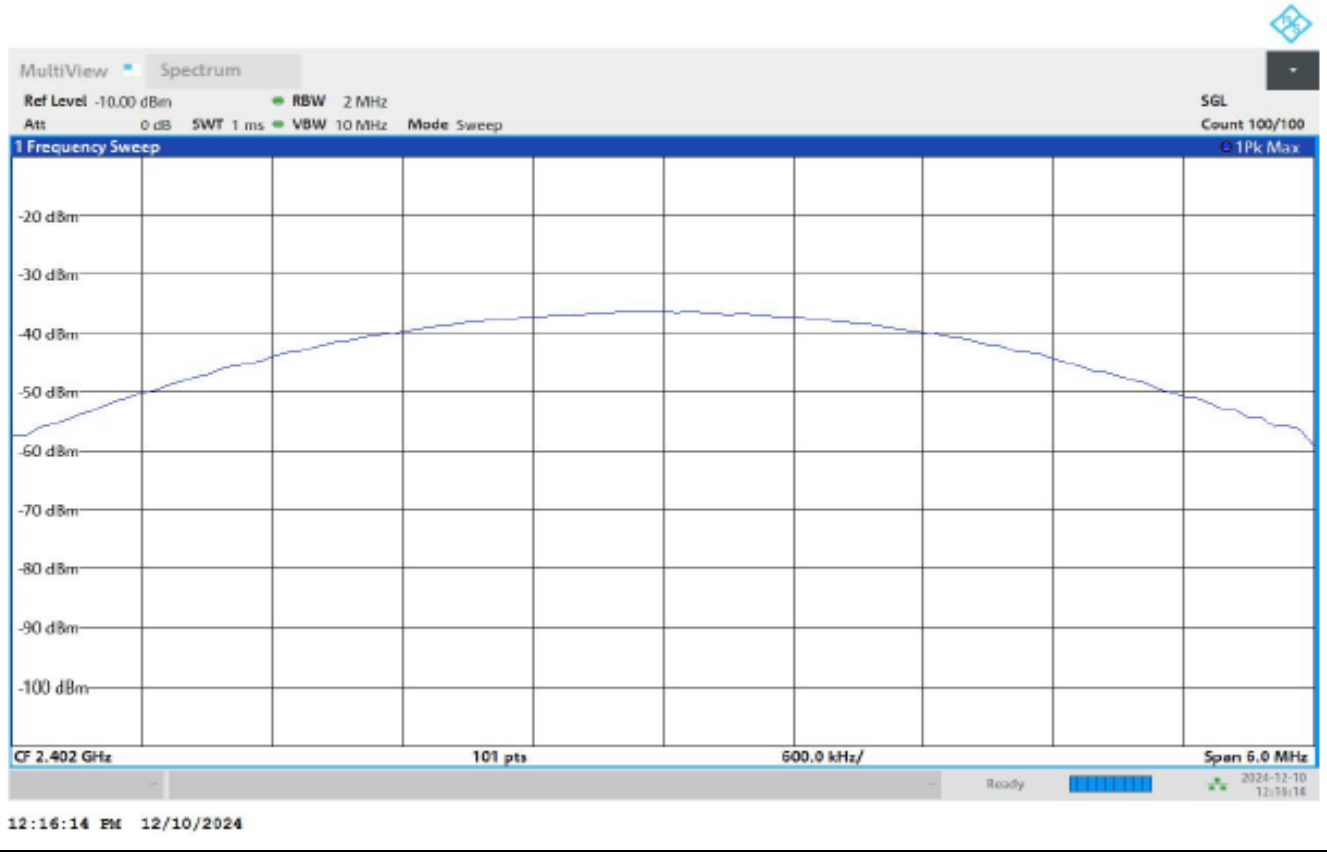




4.4.5.2 3-DH1

2402MHz





4.4.6 Emission Bandwidth 20dB

Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.7, RSS-247 Section 5.1(a)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

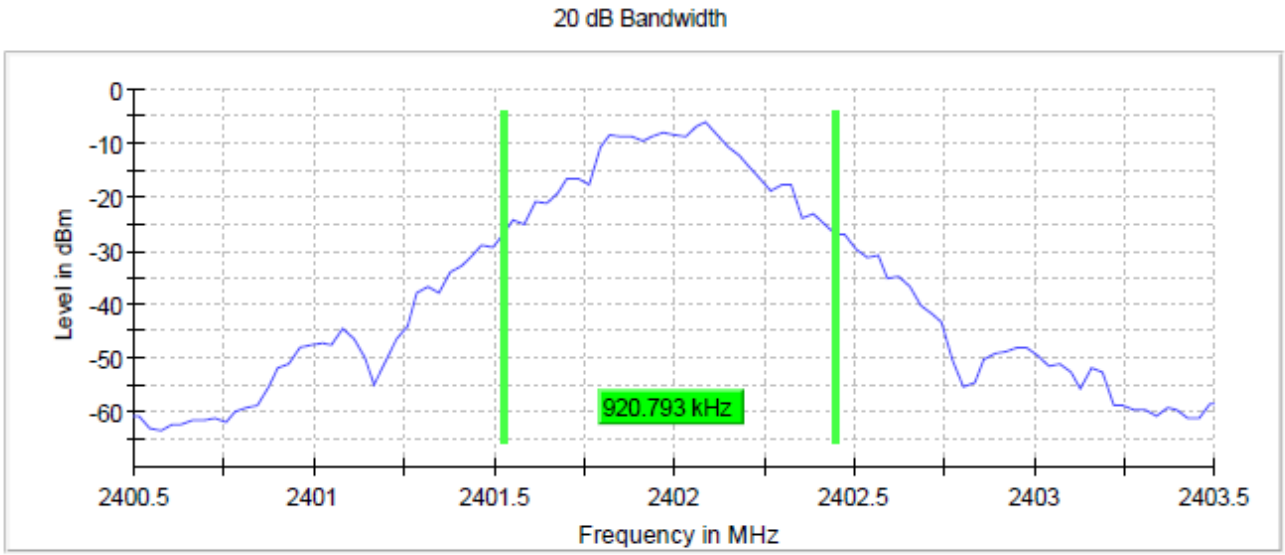
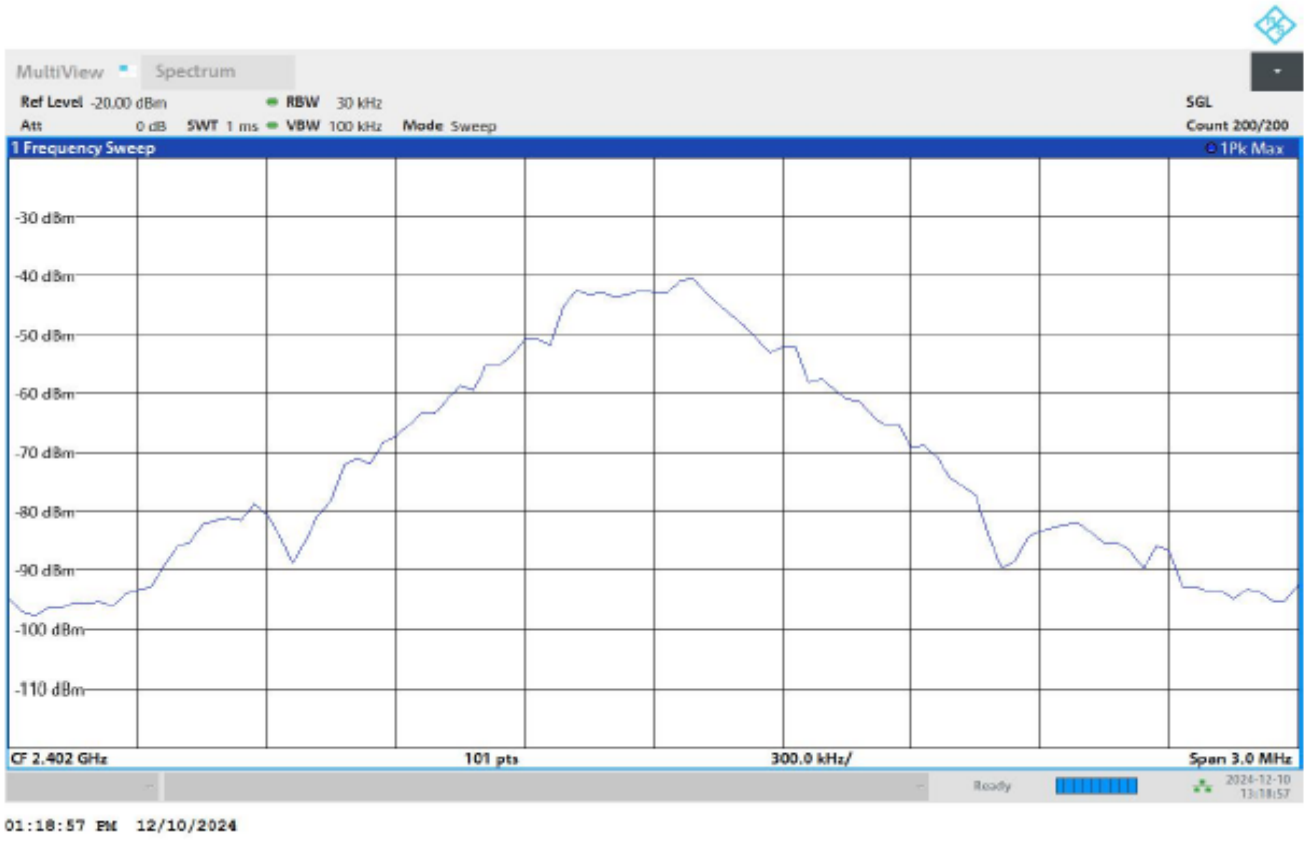
Channel / Frequency (MHz)	Packet Type	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
0 / 2402	**DH1**	0.920793	2401.524752	2402.445545	PASS
	3-DH1	1.306930	2401.346535	2402.653465	PASS
39 / 2441	**DH1**	0.920793	2440.524752	2441.445545	PASS
	3-DH1	1.306930	2440.346535	2441.653465	PASS
78 / 2480	**DH1**	0.920793	2479.524752	2480.445545	PASS
	3-DH1	1.306930	2479.346535	2480.653465	PASS

Spectrum Analyzer Settings:

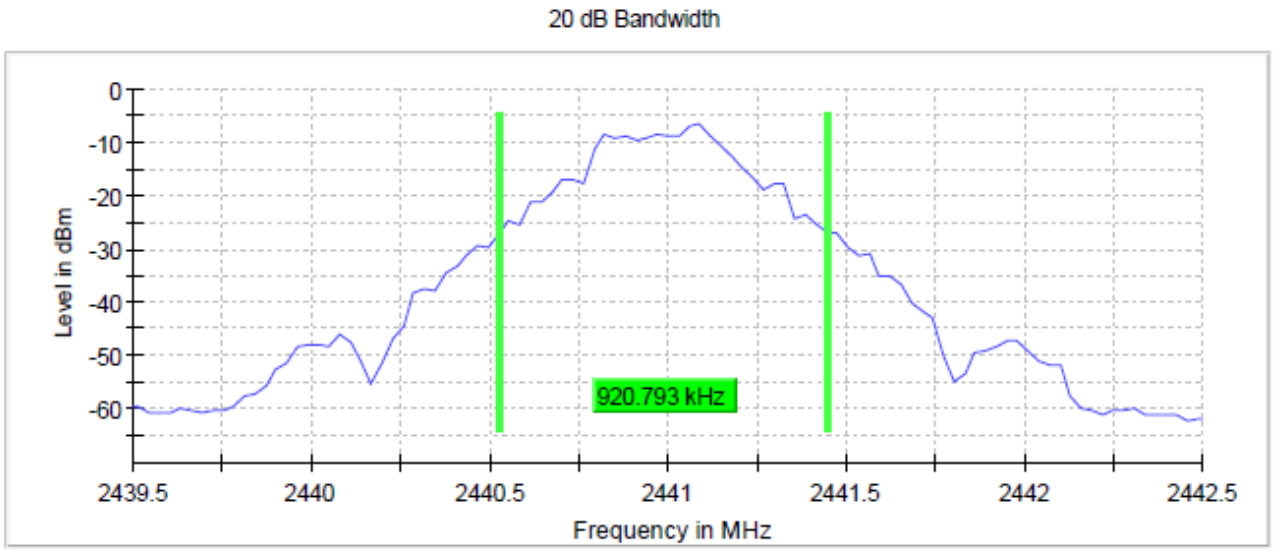
Setting	Instrument Value	Target Value
Start Frequency	2.40050 GHz	2.40050 GHz
Stop Frequency	2.40350 GHz	2.40350 GHz
Span	3.000 MHz	3.000 MHz
RBW	30.000 kHz	>= 30.000 kHz
VBW	100.000 kHz	>= 90.000 kHz
SweepPoints	101	~ 101
Sweeptime	1.000 ms	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	6 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.16 dB	0.50 dB

4.4.6.1 DH1

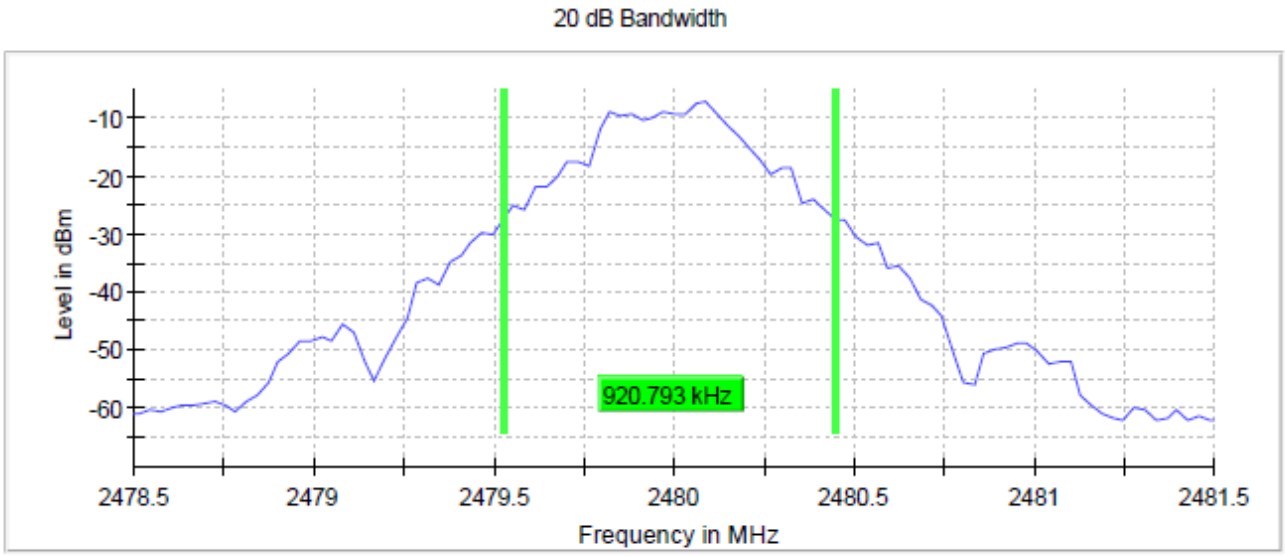
Plots:

2402MHz



2441MHz

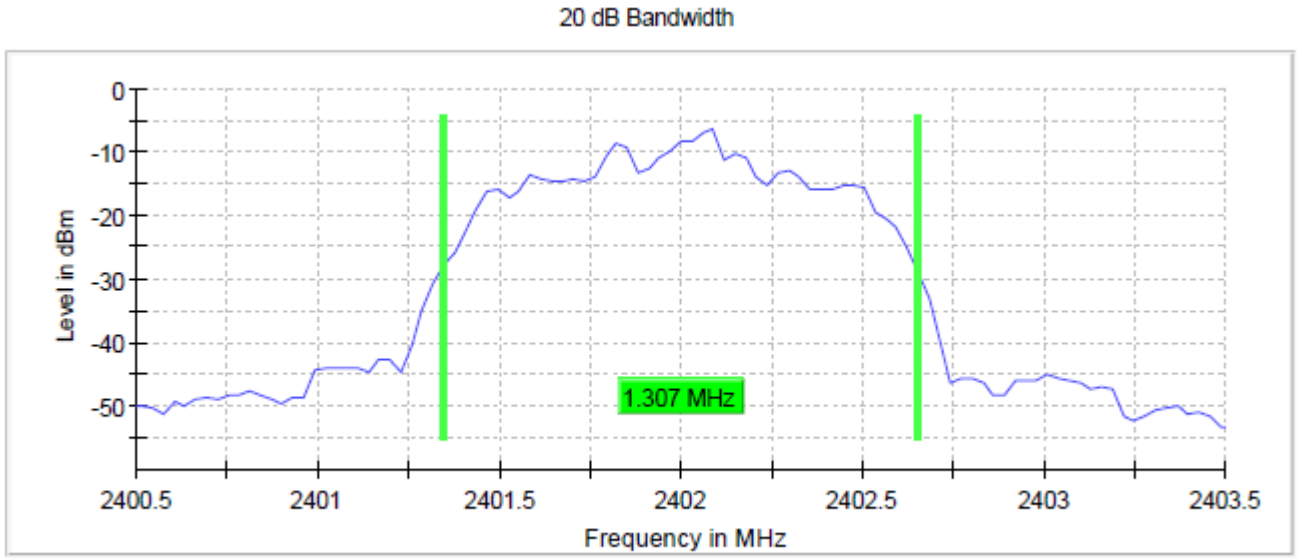
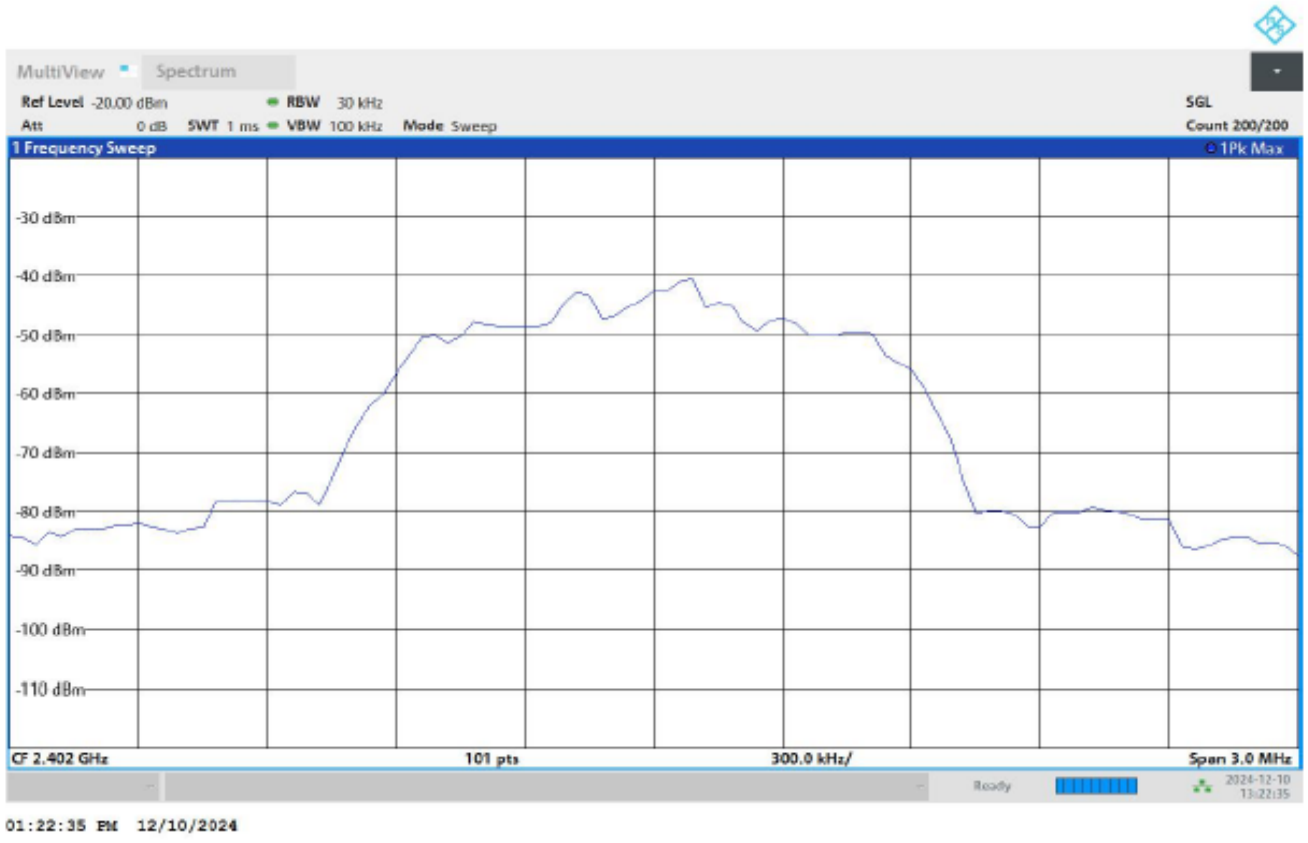


2480MHz

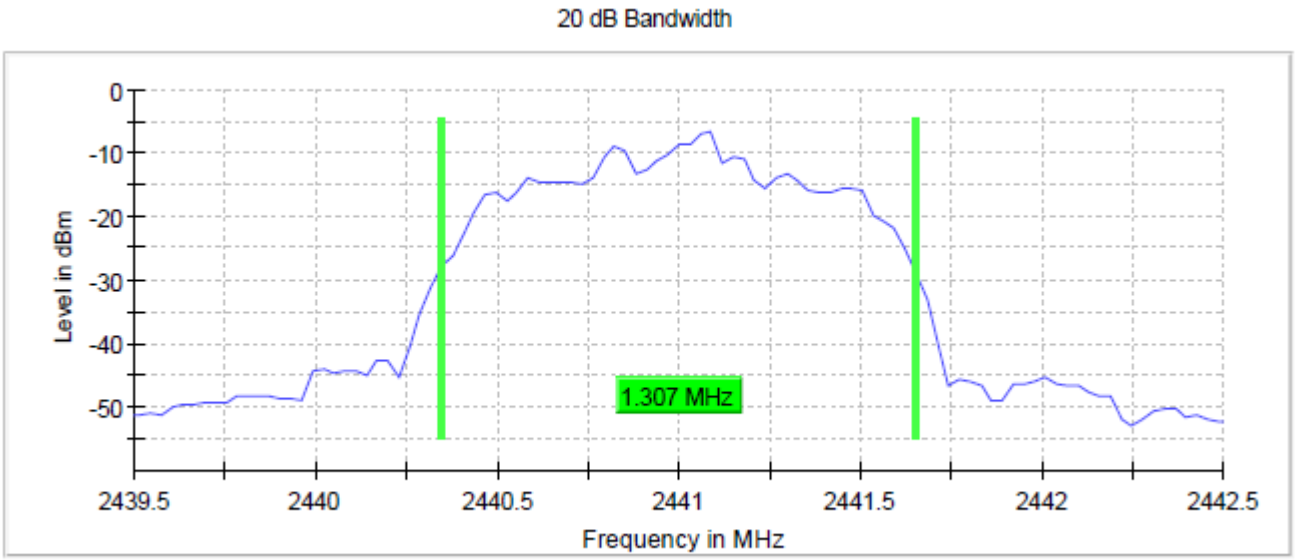


4.4.6.2 3-DH1

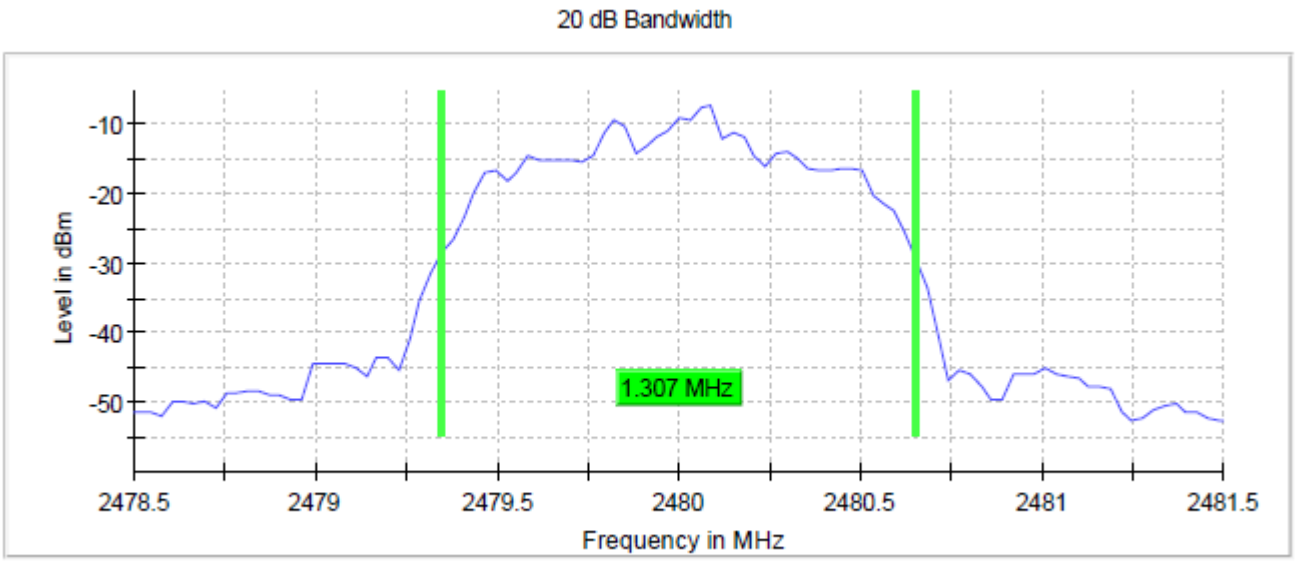
Plots:

2402MHz



2441MHz



2480MHz



4.4.7 Occupied Channel Bandwidth 99%

Test according to RSS-GEN Section 6.7, KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 2%

Channel / Frequency (MHz)	Packet Type	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Result
0 / 2402	**DH1**	0.845000	2401.572500	2402.417500	PASS
	3-DH1	1.150000	2401.427500	2402.577500	PASS
39 / 2441	**DH1**	0.845000	2440.572500	2441.417500	PASS
	3-DH1	1.155000	2440.427500	2441582500	PASS
78 / 2480	**DH1**	0.850000	2479.567500	2480.417500	PASS
	3-DH1	1.160000	2479.422500	2480.582500	PASS

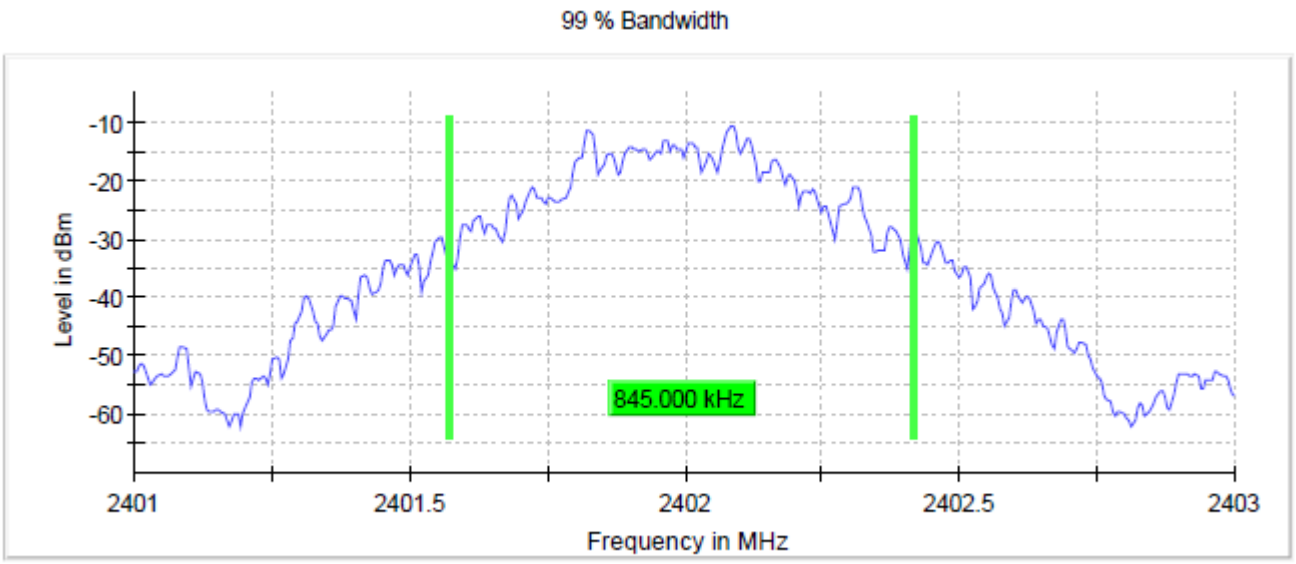
Spectrum Analyzer Settings:

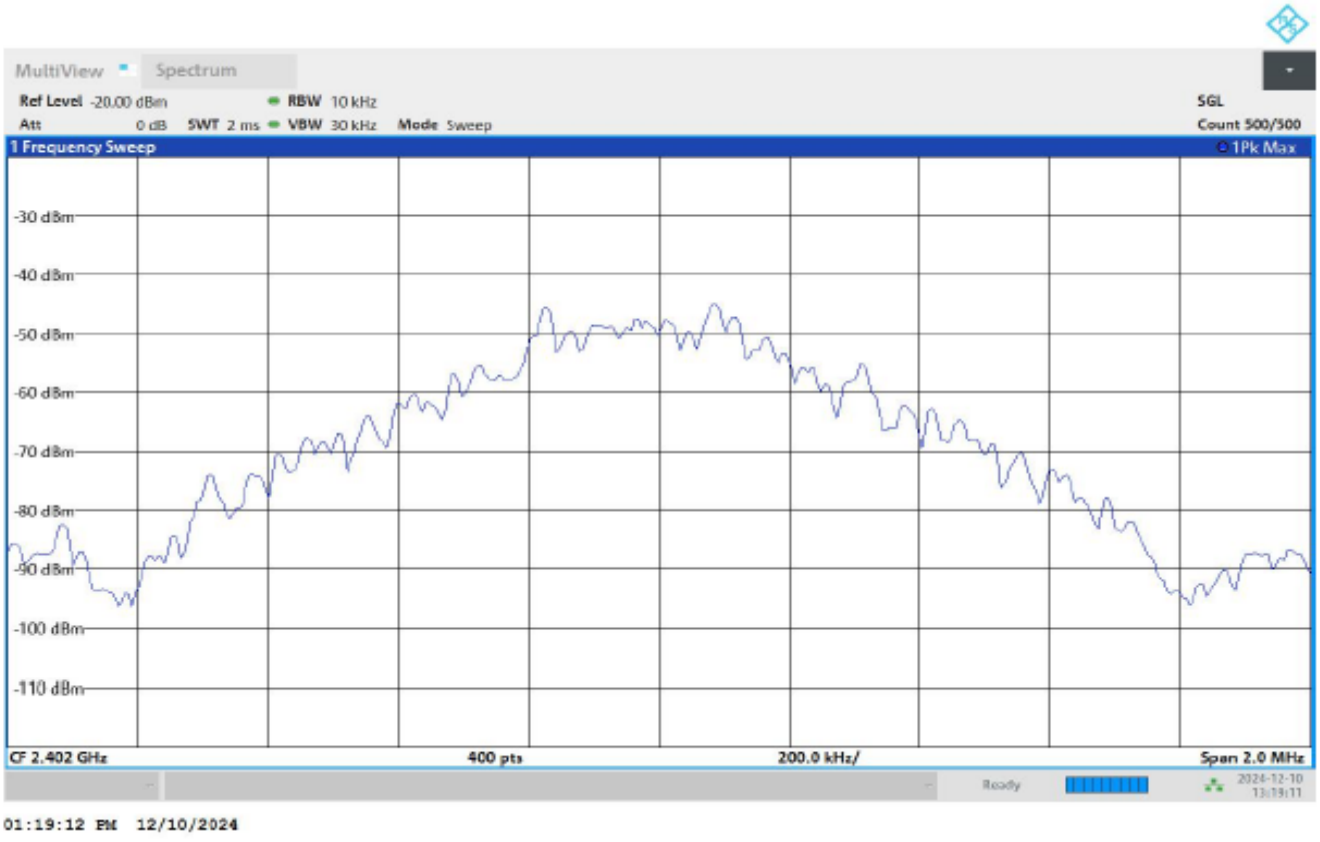
Setting	Instrument Value	Target Value
Start Frequency	2.40100 GHz	2.40100 GHz
Stop Frequency	2.40300 GHz	2.40300 GHz
Span	2.000 MHz	2.000 MHz
RBW	10.000 kHz	>= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	400	~ 400
Sweeptime	2.000 ms	AUTO
Reference Level	-20.000 dBm	-20.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	500	500
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 150	max. 150
Stable	3 / 3	3
Max Stable Difference	0.07 dB	0.30 dB

4.4.7.1 DH1

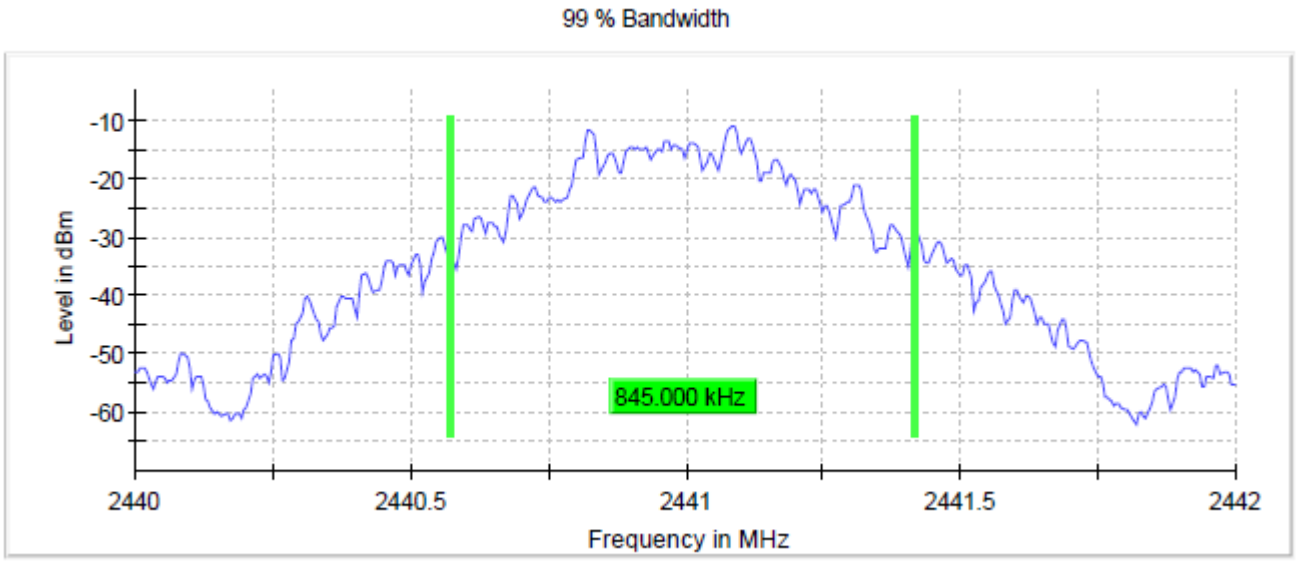
Plots:

2402MHz

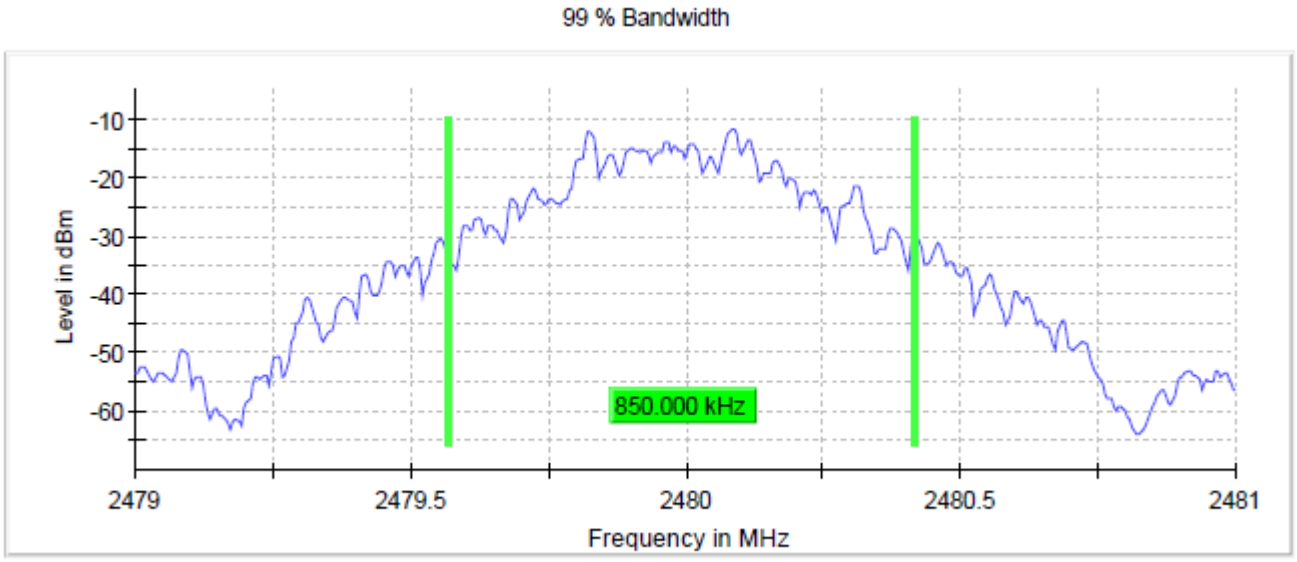




2441MHz

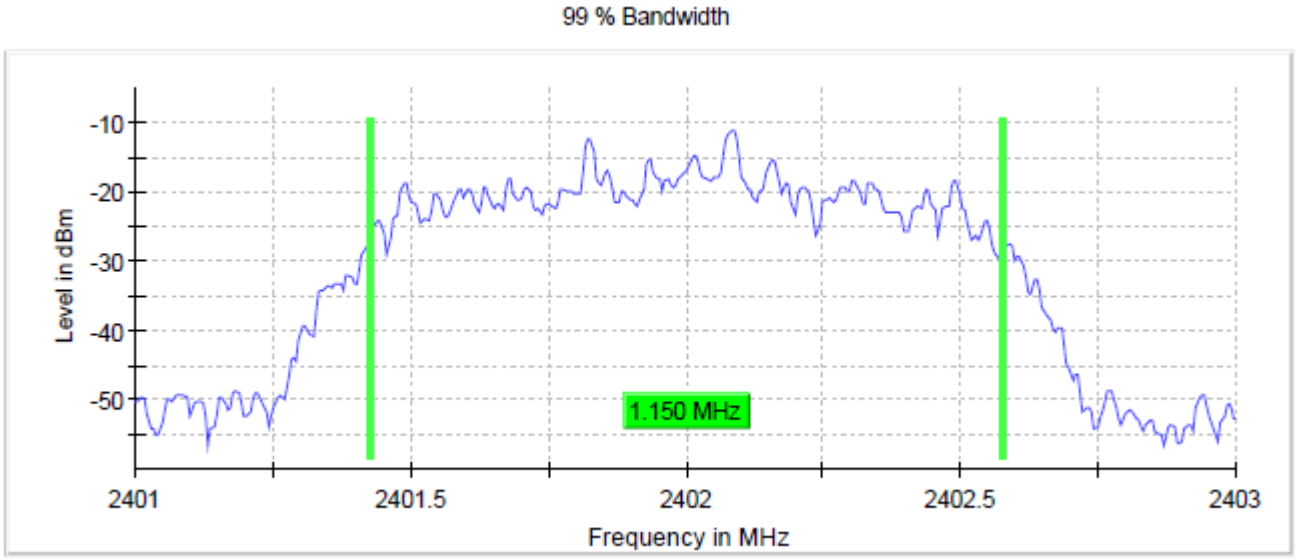
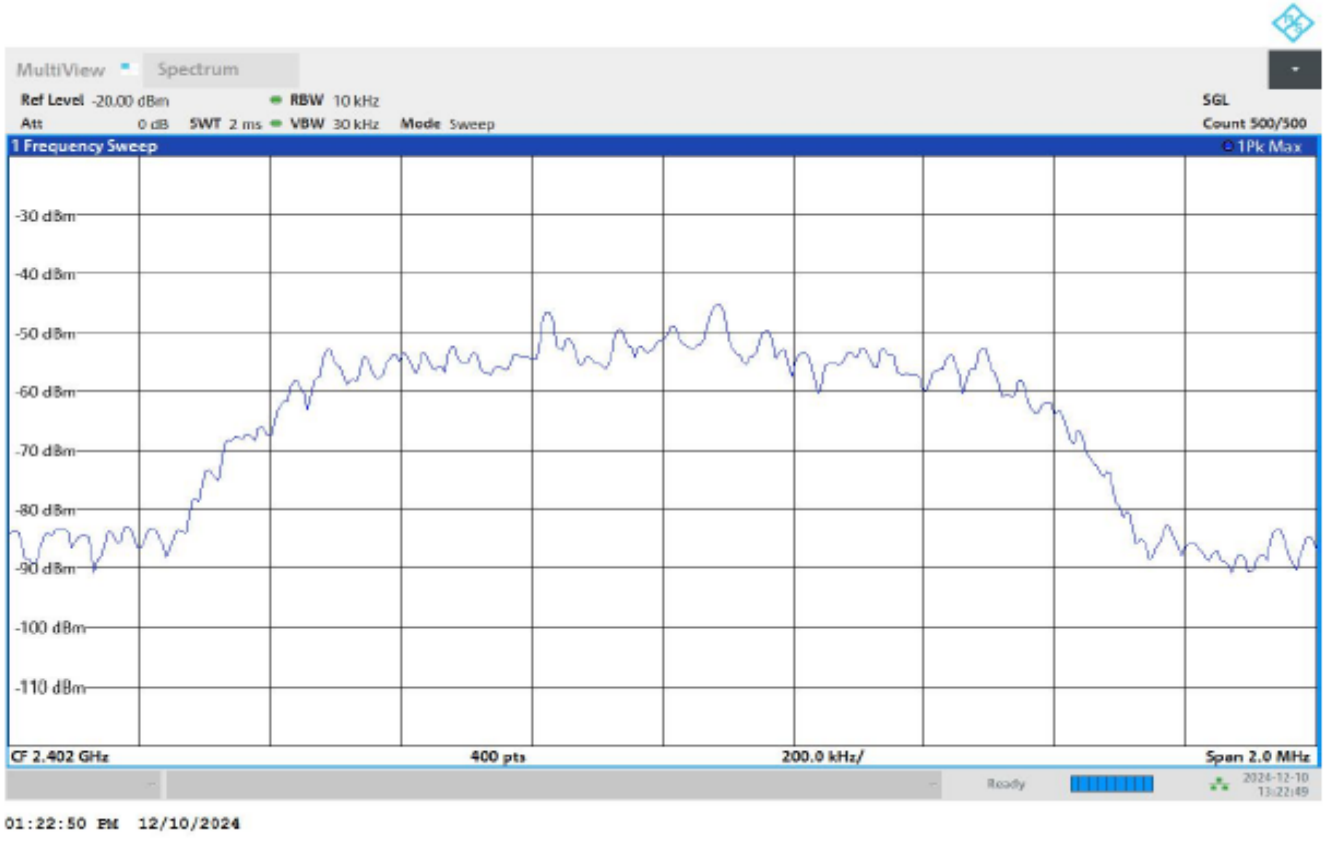


2480MHz

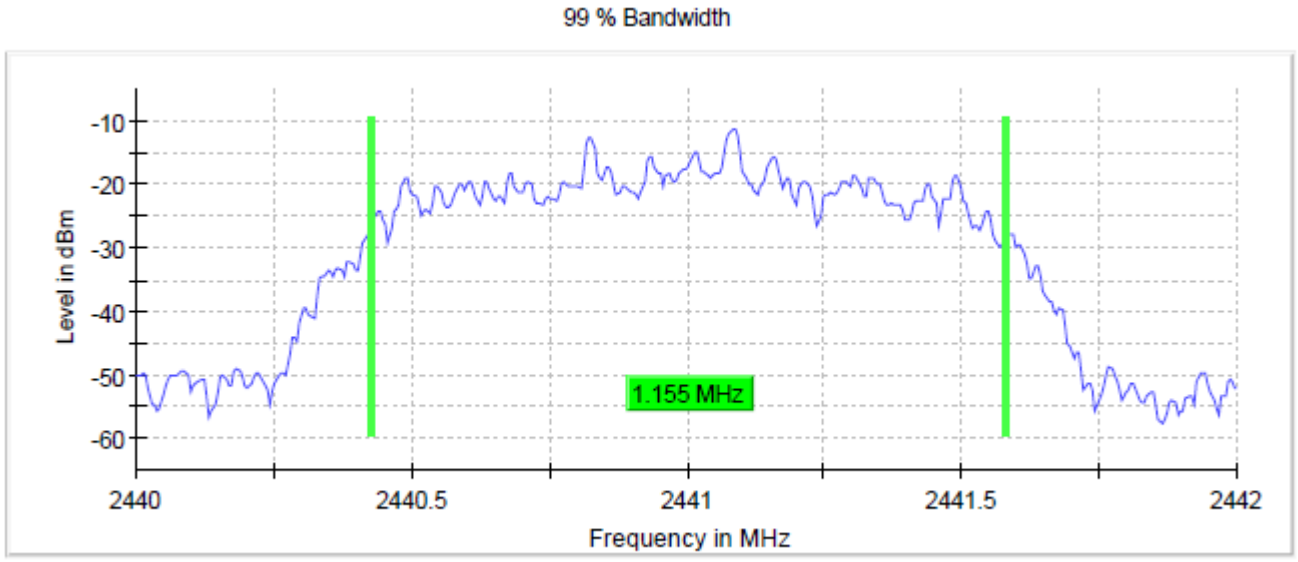


4.4.7.2 3-DH1

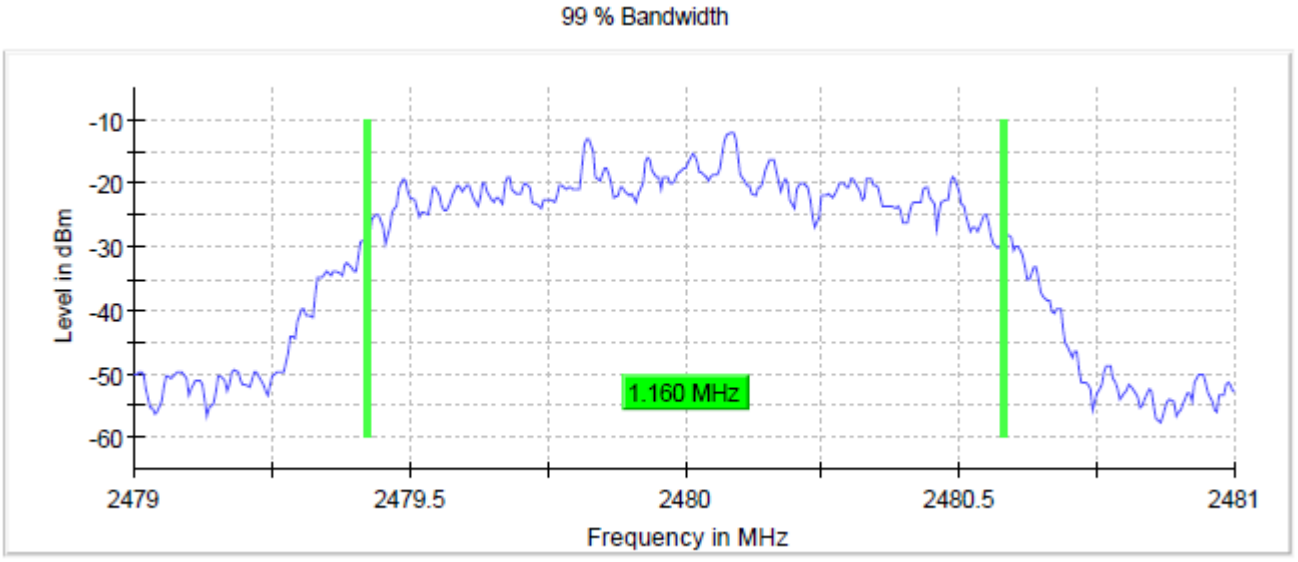
Plots:

2402MHz



2441MHz



2480MHz



4.4.8 Band Edge Low (2402 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.6, RSS-247 Section 5.5

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

Data Rate	Frequency (MHz)	Level(dBm)
DH1	2401.825000	-4.8
3-DH1	2401.825000	-4.8

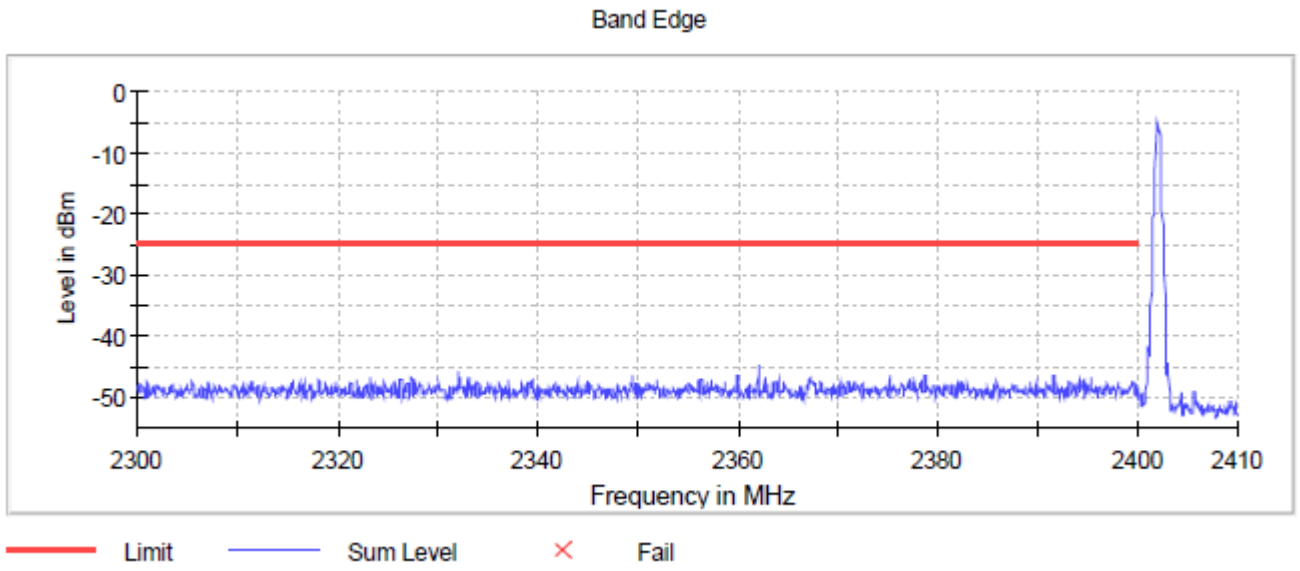
4.4.8.1 DH1

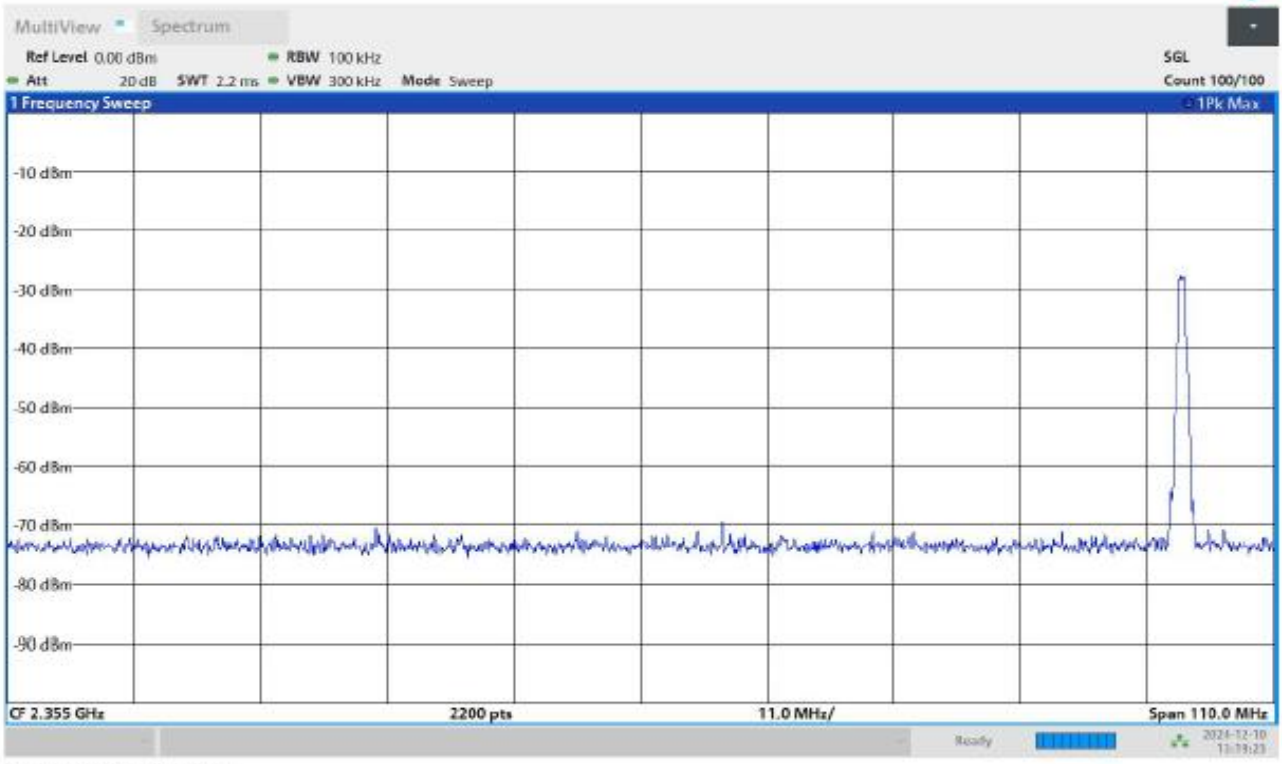
Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2362.075000	-44.6	19.8	-24.8	PASS
2362.125000	-44.6	19.8	-24.8	PASS
2332.075000	-45.6	20.8	-24.8	PASS
2332.025000	-45.8	21.0	-24.8	PASS
2362.025000	-46.3	21.6	-24.8	PASS
2349.475000	-46.3	21.6	-24.8	PASS
2349.525000	-46.3	21.6	-24.8	PASS
2359.975000	-46.4	21.6	-24.8	PASS
2359.925000	-46.4	21.6	-24.8	PASS
2332.125000	-46.4	21.6	-24.8	PASS
2391.625000	-46.4	21.6	-24.8	PASS
2378.675000	-46.4	21.6	-24.8	PASS
2375.175000	-46.5	21.7	-24.8	PASS
2391.575000	-46.5	21.8	-24.8	PASS
2378.725000	-46.6	21.8	-24.8	PASS

Plots:

2402MHz




MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
SGL
Att 20 dB
SWT 2.2 ms
VBW 300 kHz
Mode Sweep
Count 100/100
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.355 GHz
2200 pts
11.0 MHz/
Span 110.0 MHz
Ready
01:19:23 PM 12/10/2024

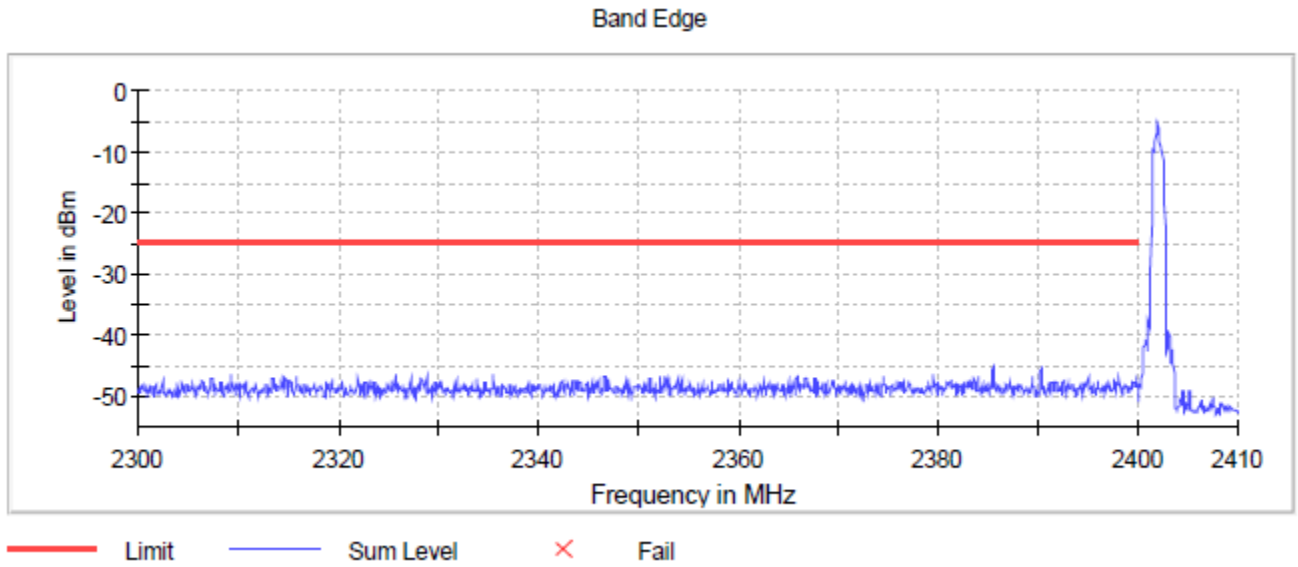
4.4.7.2 3-DH1

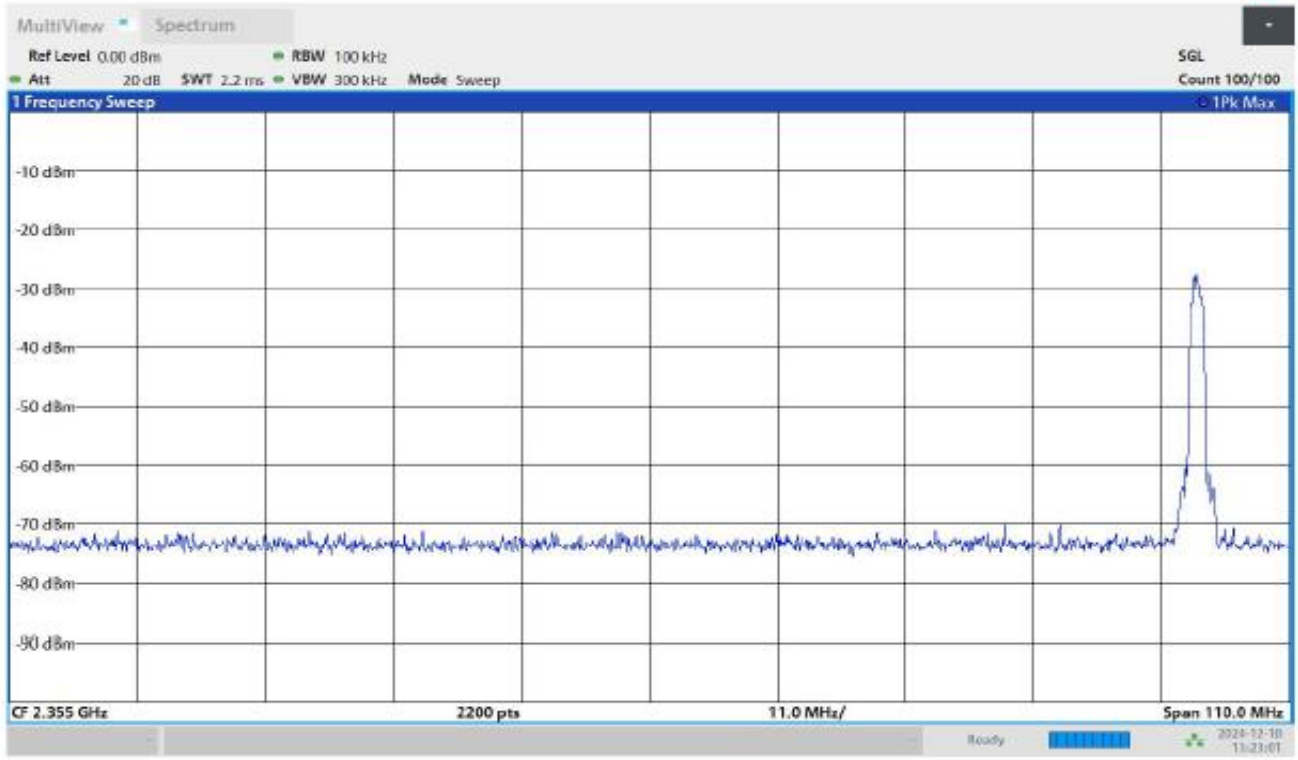
Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2385.525000	-45.0	20.2	-24.8	PASS
2385.575000	-45.2	20.4	-24.8	PASS
2390.275000	-45.3	20.5	-24.8	PASS
2390.325000	-45.6	20.8	-24.8	PASS
2385.475000	-45.8	21.0	-24.8	PASS
2390.225000	-46.0	21.2	-24.8	PASS
2379.525000	-46.4	21.6	-24.8	PASS
2309.275000	-46.5	21.7	-24.8	PASS
2325.725000	-46.5	21.7	-24.8	PASS
2335.475000	-46.6	21.8	-24.8	PASS
2352.225000	-46.6	21.8	-24.8	PASS
2346.675000	-46.6	21.9	-24.8	PASS
2374.525000	-46.7	21.9	-24.8	PASS
2374.575000	-46.7	21.9	-24.8	PASS
2314.525000	-46.7	21.9	-24.8	PASS

Plots:

2402MHz




MultiView
Spectrum
Ref Level 0.00 dBm
RBW 100 kHz
SGL
Att 20 dB
SWT 2.2 ms
VBW 300 kHz
Mode Sweep
Count 100/100
1 Frequency Sweep
1Pk Max
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.355 GHz
2200 pts
11.0 MHz/
Span 110.0 MHz
Ready
01:23:02 PM 12/10/2024

4.4.9 Band Edge High (2480 MHz)

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 7.8.6,

RSS-247 Section 5.5

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 0.8 dB

Data Rate	Frequency (MHz)	Level(dBm)
DH1	2480.025000	-5.9
3-DH1	2480.025000	-5.8

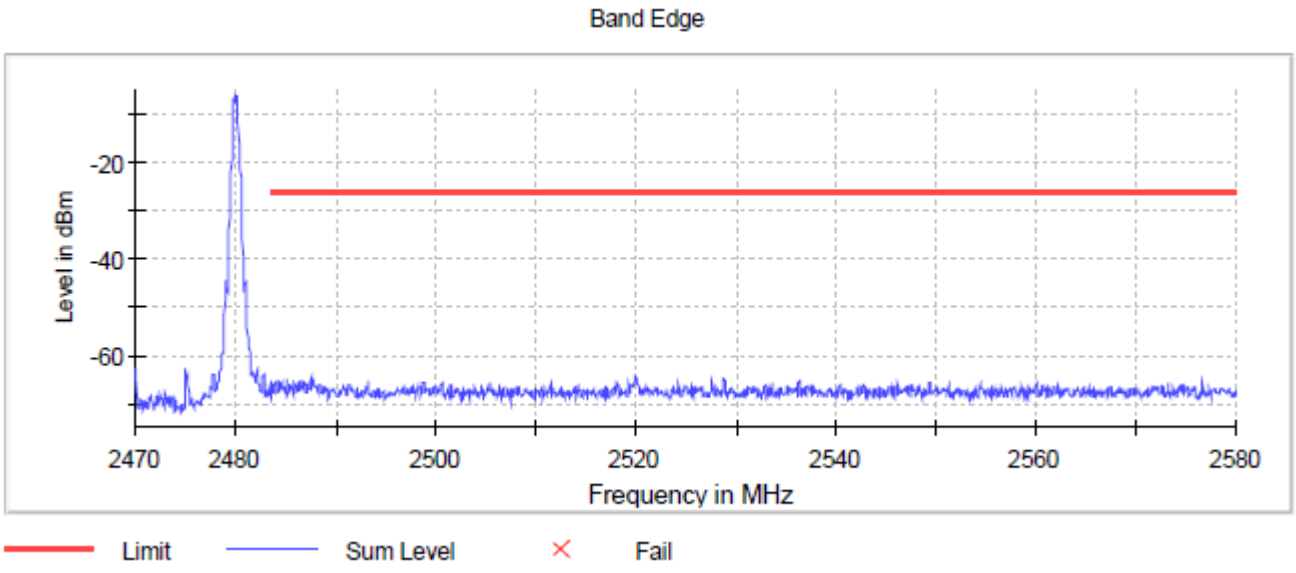
4.4.9.1 DH1

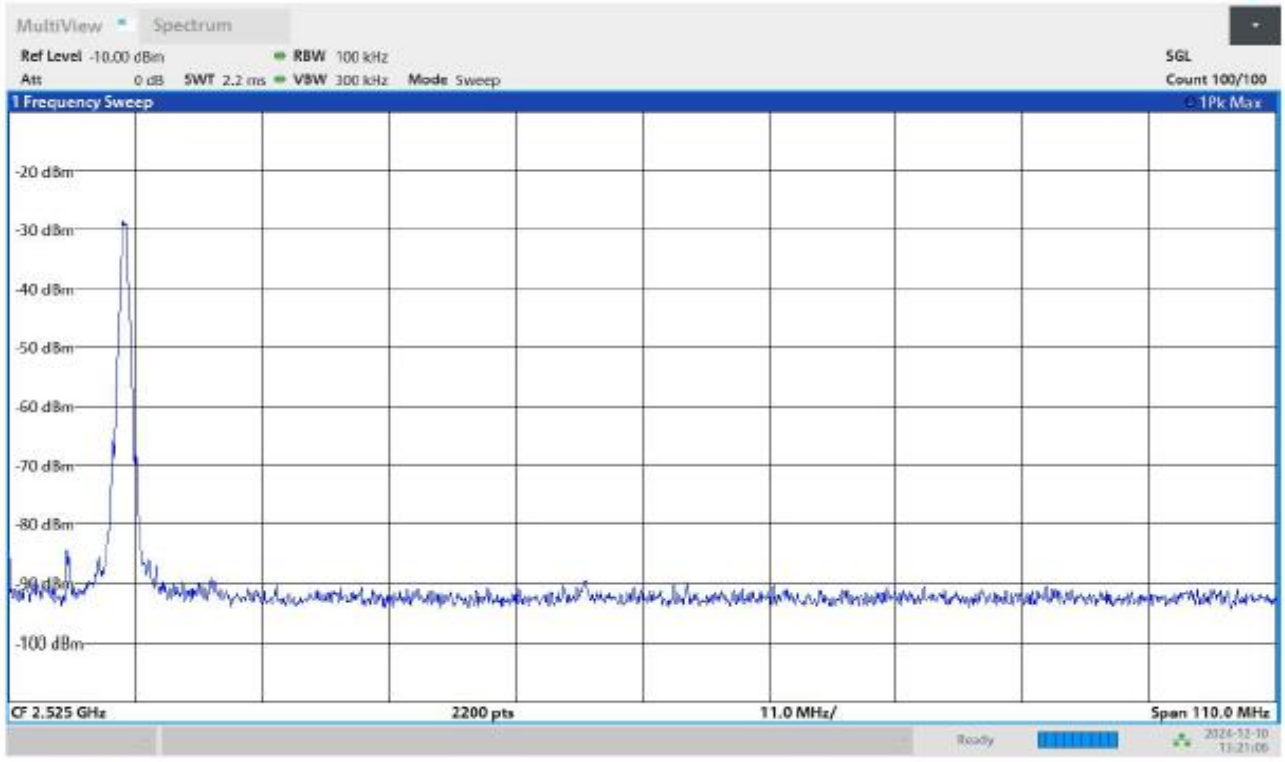
Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2487.625000	-64.3	38.4	-25.9	PASS
2487.575000	-64.3	38.5	-25.9	PASS
2487.525000	-64.4	38.6	-25.9	PASS
2520.025000	-64.7	38.8	-25.9	PASS
2519.975000	-64.7	38.8	-25.9	PASS
2520.075000	-64.8	38.9	-25.9	PASS
2520.125000	-64.8	38.9	-25.9	PASS
2487.825000	-64.8	38.9	-25.9	PASS
2487.875000	-64.9	39.0	-25.9	PASS
2485.125000	-65.0	39.2	-25.9	PASS
2485.075000	-65.0	39.2	-25.9	PASS
2528.825000	-65.1	39.3	-25.9	PASS
2528.875000	-65.2	39.3	-25.9	PASS
2519.925000	-65.2	39.3	-25.9	PASS
2486.475000	-65.2	39.4	-25.9	PASS

Plots:

2480MHz




MultiView
Spectrum
Ref Level -10.00 dBm
RBW 100 kHz
SGL
Att 0 dB SWT 2.2 ms VBW 300 kHz Mode Sweep
Count 100/100
1 Frequency Sweep
1Pk Max
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
CF 2.525 GHz
2200 pts
11.0 MHz/
Span 110.0 MHz
Ready
01:21:07 PM 12/10/2024

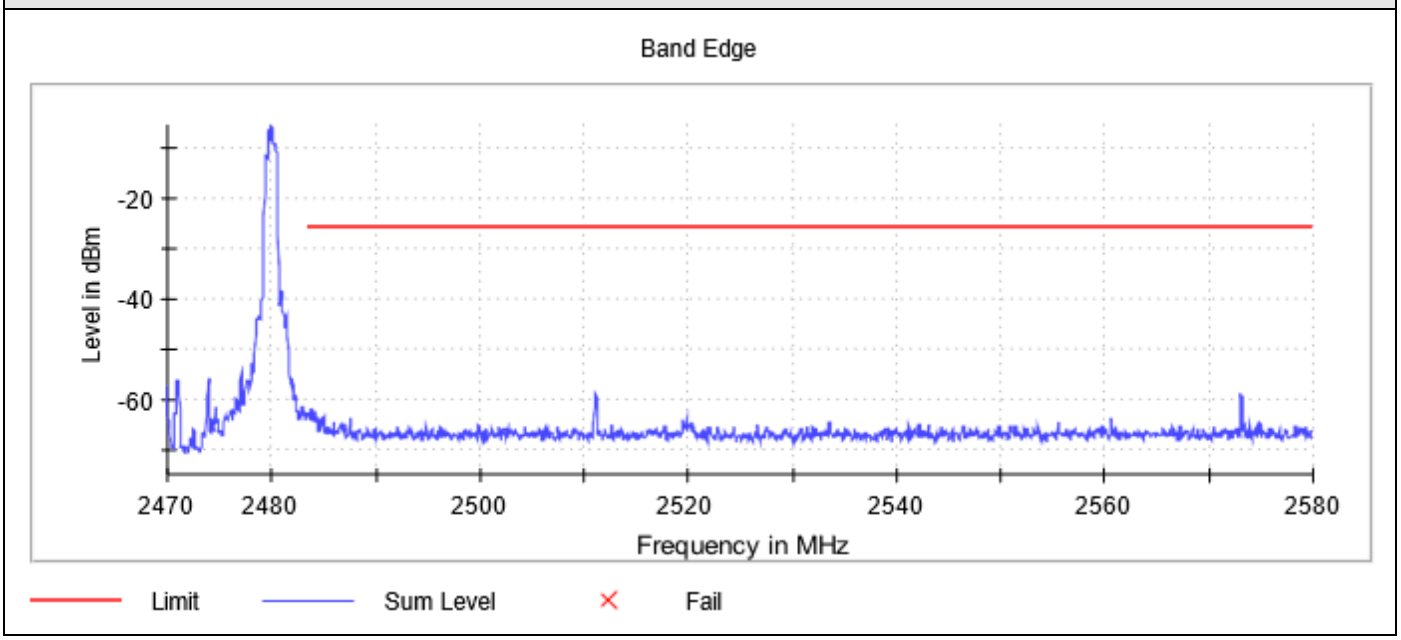
4.4.9.2 3-DH1

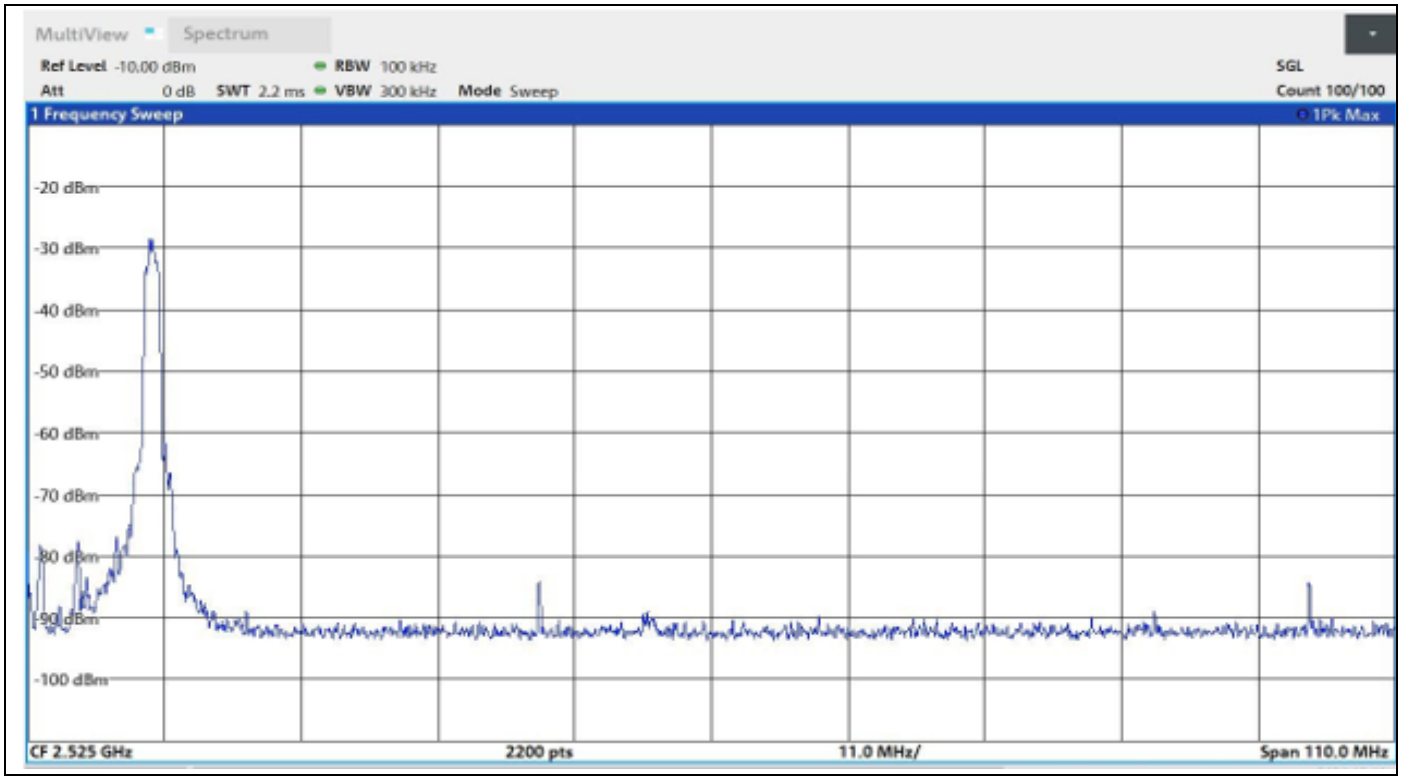
Measurements:

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2511.125000	-59.2	33.4	-25.8	PASS
2573.025000	-59.3	33.5	-25.8	PASS
2511.175000	-59.3	33.5	-25.8	PASS
2511.075000	-59.5	33.7	-25.8	PASS
2573.075000	-59.5	33.7	-25.8	PASS
2573.175000	-59.8	34.0	-25.8	PASS
2573.125000	-60.0	34.2	-25.8	PASS
2511.225000	-60.3	34.5	-25.8	PASS
2572.975000	-60.5	34.7	-25.8	PASS
2573.225000	-60.9	35.1	-25.8	PASS
2511.025000	-62.0	36.2	-25.8	PASS
2483.925000	-62.2	36.4	-25.8	PASS
2483.875000	-62.2	36.4	-25.8	PASS
2484.175000	-62.9	37.1	-25.8	PASS
2484.225000	-62.9	37.1	-25.8	PASS

Plots:

2480MHz




MultiView
Spectrum
Ref Level -10.00 dBm
RBW 100 kHz
SGL
Att 0 dB
SWT 2.2 ms
VBW 300 kHz
Mode Sweep
Count 100/100
1 Frequency Sweep
1Pk Max
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
CF 2.525 GHz
2200 pts
11.0 MHz/
Span 110.0 MHz

4.4.10 Tx Spurious Emission

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 Section 7.8.8, RSS-247 Section 5.5. Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.8 dB

Spectrum Analyzer Pre-Measurement Settings:

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	238	~ 238
Sweeptime	23.700 ms	AUTO
Reference Level	-30.000 dBm	-30.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	5 / max. 40	max. 40
Stable	3 / 3	3
Max Stable Difference	0.00 dB	0.50 dB

Spectrum Analyzer Final-Measurement Settings:

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	401	~ 401
Sweeptime	1.000 ms	AUTO
Reference Level	-10.000 dBm	-10.000 dBm
Attenuation	0.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Average Linear	Average Linear
Sweeptype	Sweep	AUTO
Preamp	off	off

4.4.10.1 DH1

2402MHz

Final Measurement

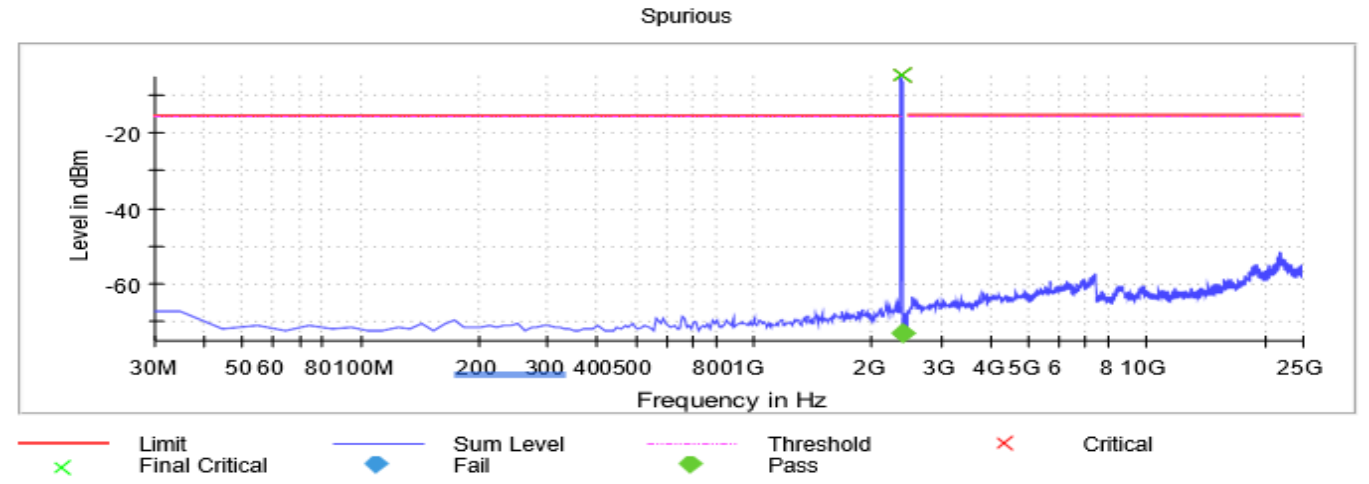
Frequency (MHz)	Level Pre-Measurement (dBm)	Level (dBm)	Margin (dB)	Limit (dBm)
2399.958664	-7.2	-73.0	57.0	-16.0

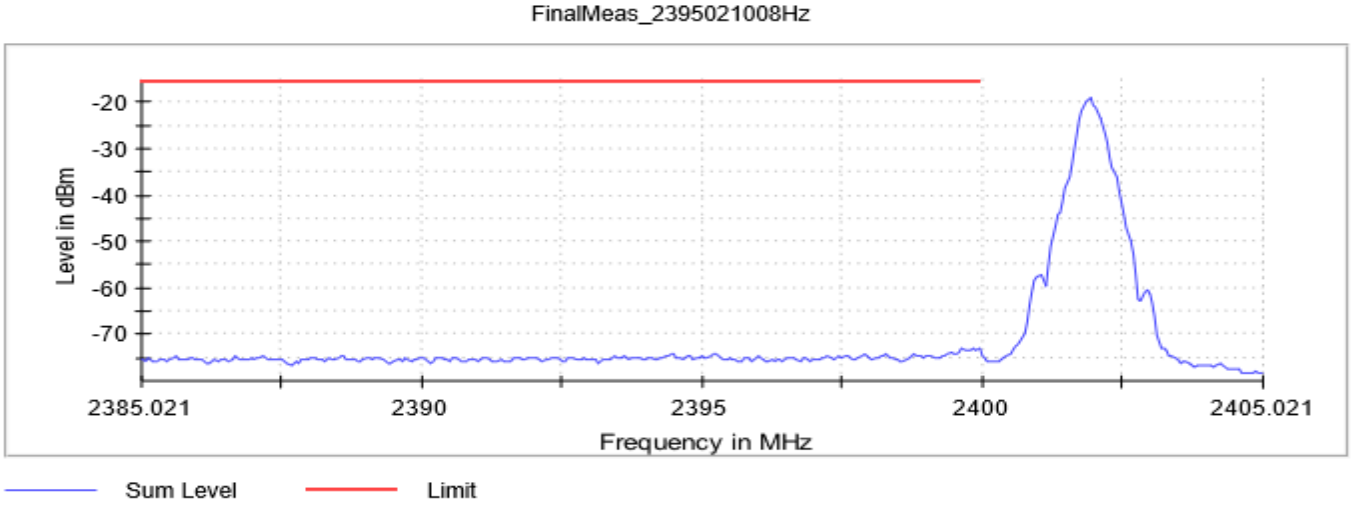
Pre-Measurement

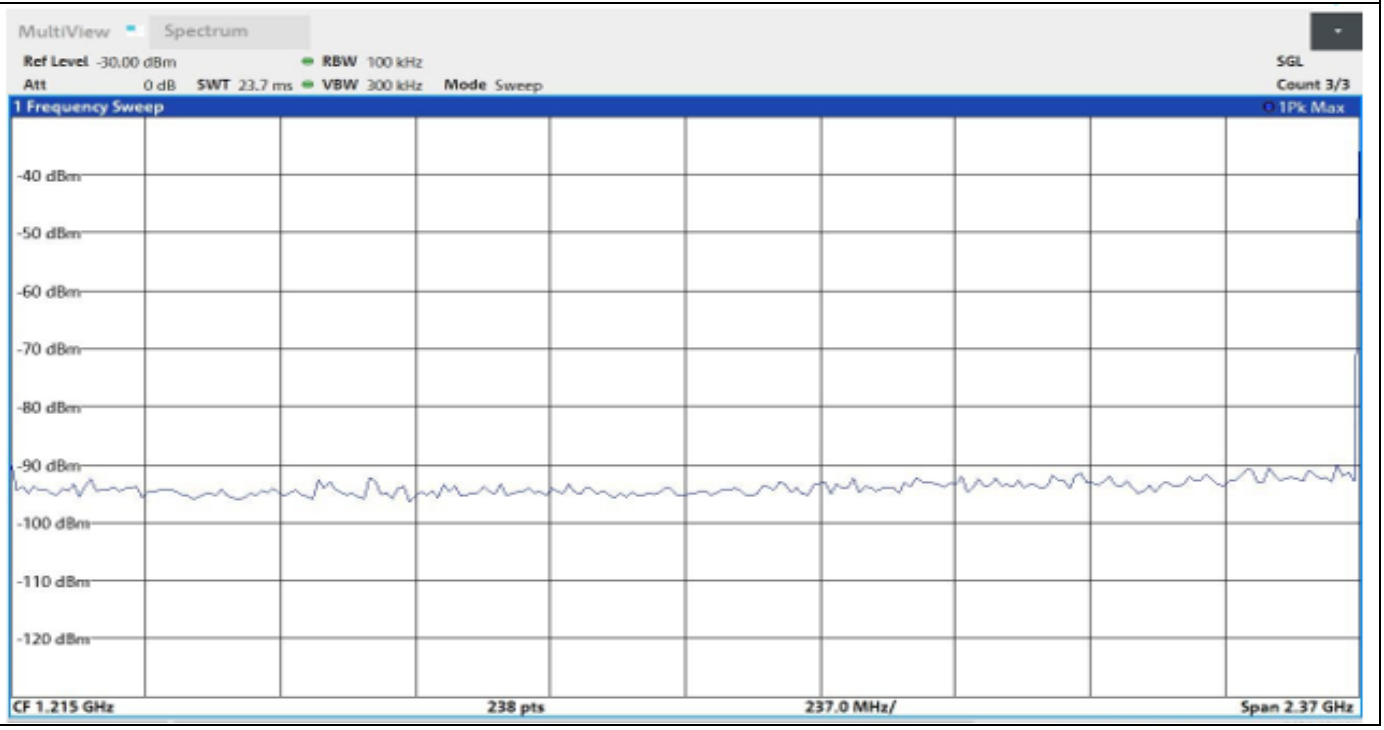
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-5.2	-10.8	-16.0
22006.794607	-52.2	36.2	-16.0
22056.764647	-52.2	36.2	-16.0
22086.746671	-53.1	37.1	-16.0
22026.782623	-53.3	37.2	-16.0
22066.758655	-53.4	37.3	-16.0
21936.836551	-53.4	37.4	-16.0
21896.860519	-53.4	37.4	-16.0
22016.788615	-53.4	37.4	-16.0
22036.776631	-53.4	37.4	-16.0
22096.740679	-53.5	37.5	-16.0
22326.602863	-53.7	37.7	-16.0
22076.752663	-53.7	37.7	-16.0
22186.686751	-53.7	37.7	-16.0
21886.866511	-53.7	37.7	-16.0

Plots:

2402MHz



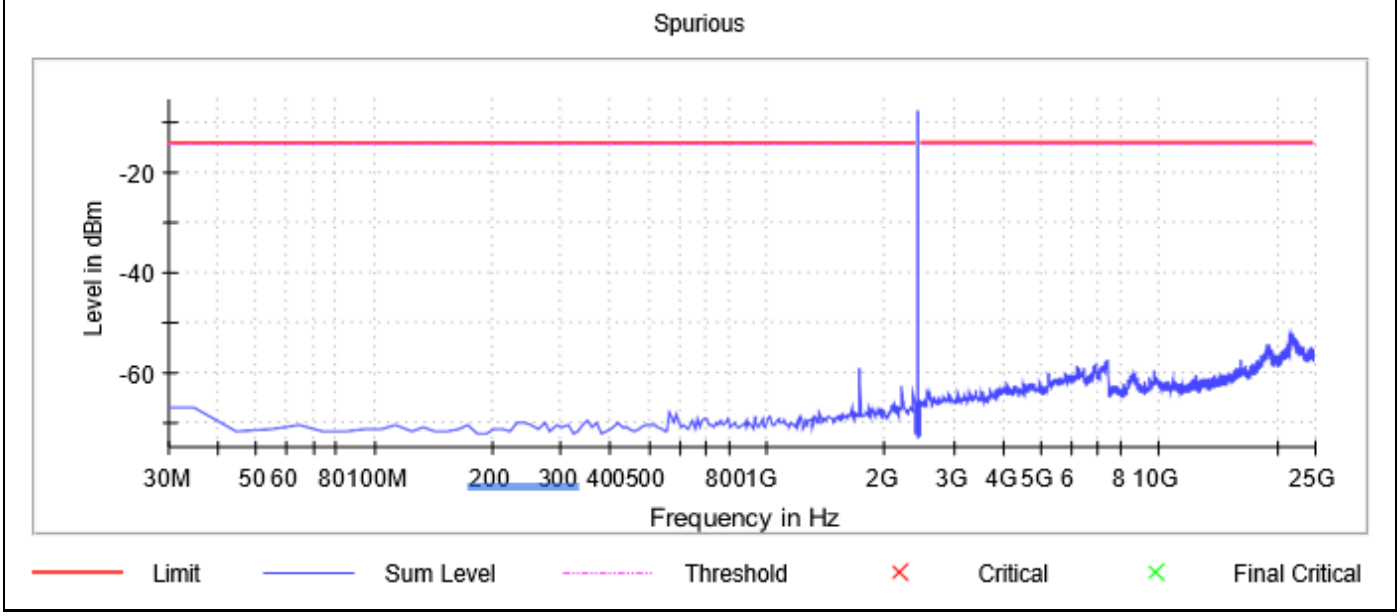




2441MHz

Pre-Measurement

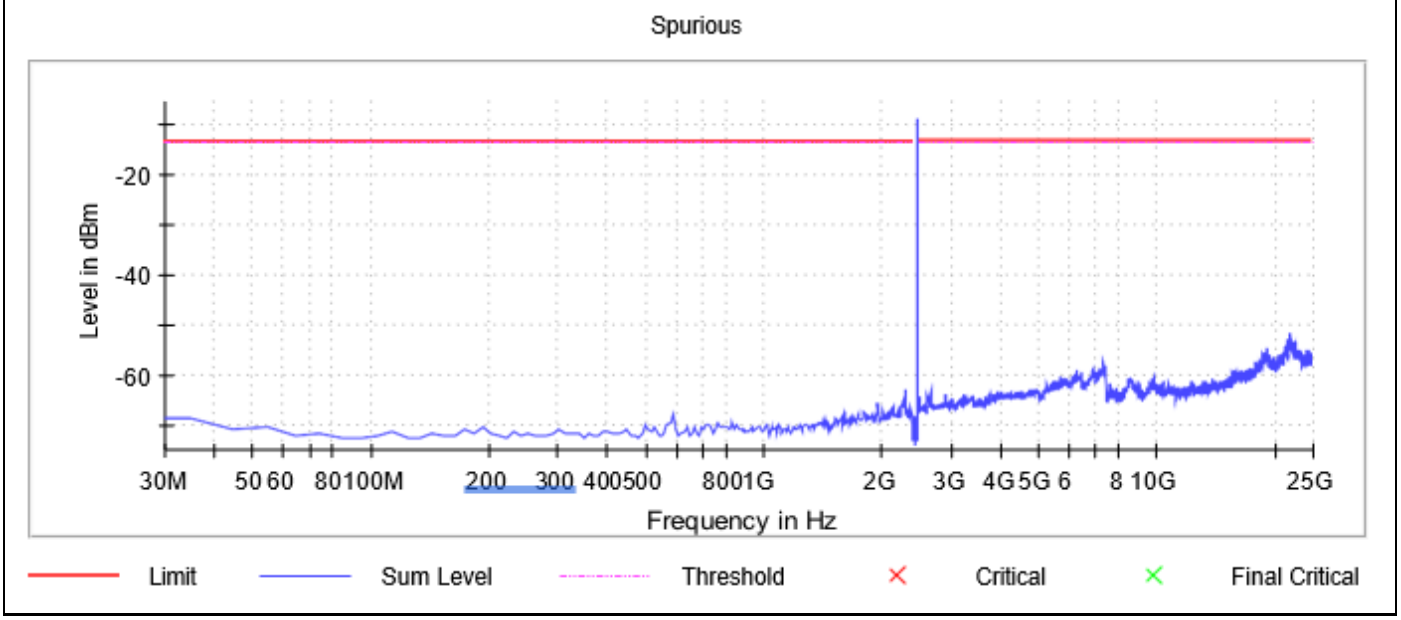
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22016.788615	-52.5	38.5	-14.1
21886.866511	-52.6	38.5	-14.1
21936.836551	-52.7	38.6	-14.1
21966.818575	-52.8	38.8	-14.1
22226.662783	-53.0	38.9	-14.1
22236.656791	-53.1	39.0	-14.1
22166.698735	-53.1	39.0	-14.1
22086.746671	-53.3	39.3	-14.1
22116.728695	-53.3	39.3	-14.1
22066.758655	-53.4	39.3	-14.1
22046.770639	-53.4	39.3	-14.1
22056.764647	-53.5	39.4	-14.1
21926.842543	-53.5	39.5	-14.1
22096.740679	-53.5	39.5	-14.1
22076.752663	-53.5	39.5	-14.1



2480MHz

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22006.794607	-51.9	38.4	-13.5
22126.722703	-52.8	39.3	-13.5
21896.860519	-53.0	39.5	-13.5
21966.818575	-53.1	39.6	-13.5
22146.710719	-53.2	39.7	-13.5
21956.824567	-53.2	39.7	-13.5
22056.764647	-53.2	39.7	-13.5
22086.746671	-53.4	39.9	-13.5
22456.524967	-53.5	40.0	-13.5
22426.542943	-53.5	40.0	-13.5
22076.752663	-53.6	40.1	-13.5
22156.704727	-53.6	40.1	-13.5
22686.387150	-53.6	40.1	-13.5
22326.602863	-53.6	40.1	-13.5
22036.776631	-53.6	40.1	-13.5



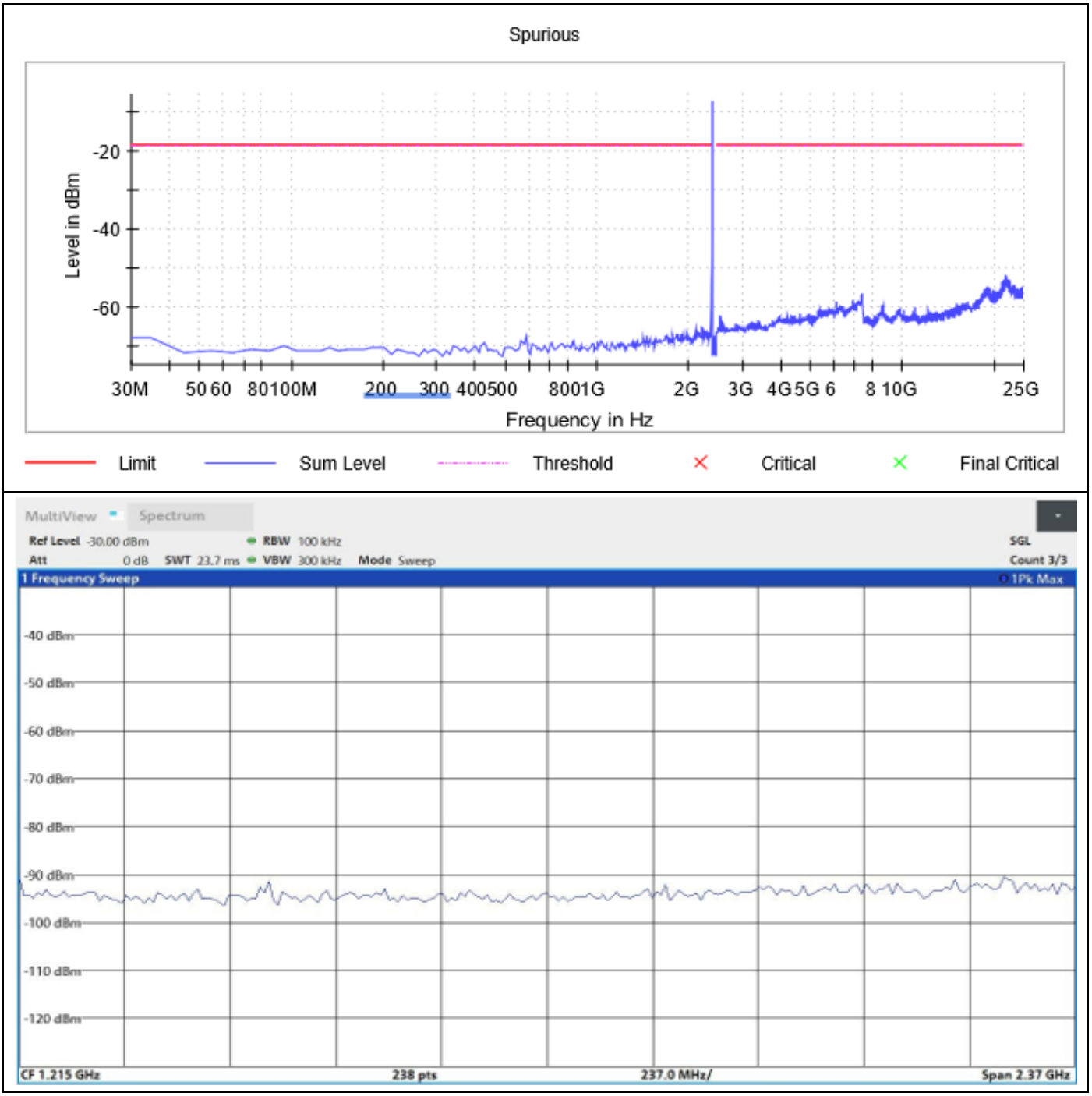
4.4.10.2 3-DH1

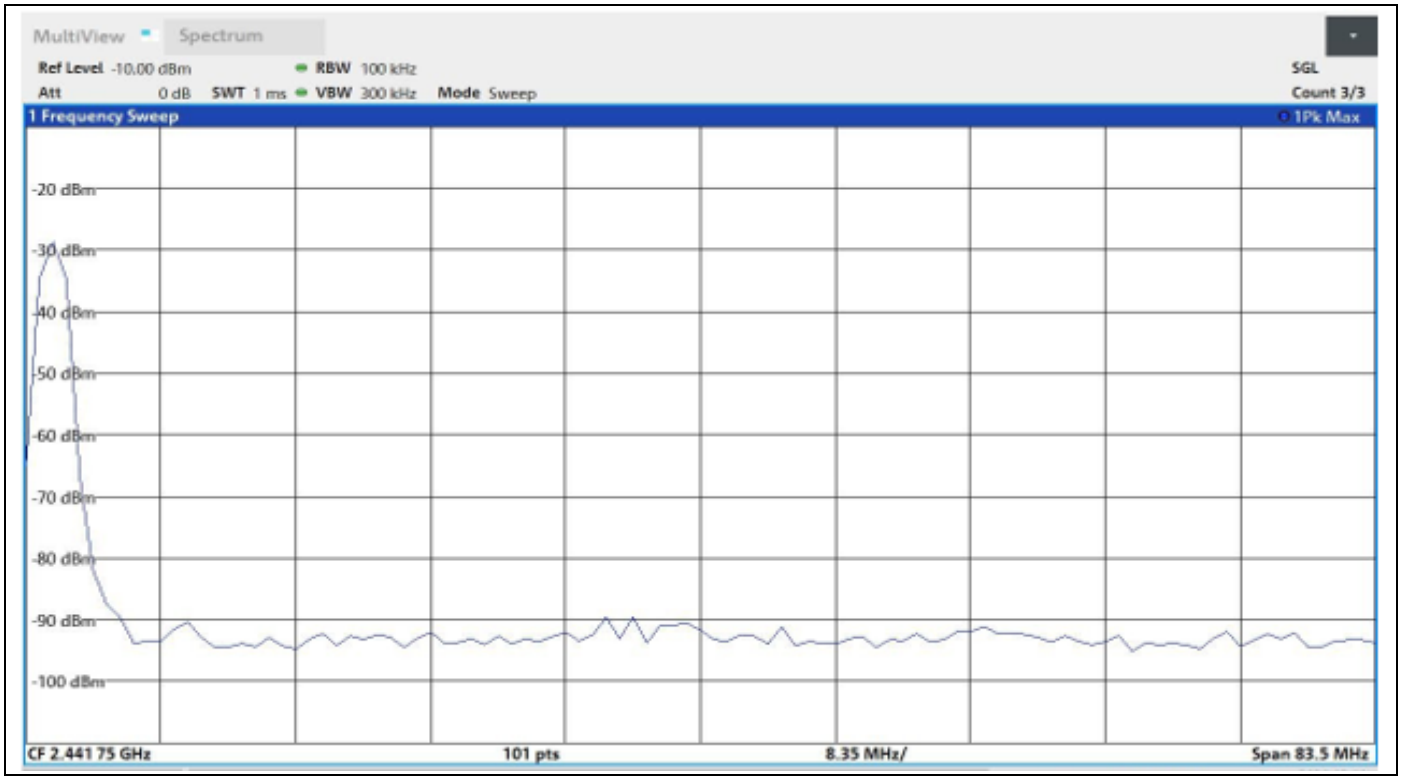
2402MHz

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22036.776631	-52.4	33.6	-18.8
22186.686751	-52.9	34.1	-18.8
22086.746671	-52.9	34.1	-18.8
22096.740679	-52.9	34.2	-18.8
22146.710719	-53.0	34.2	-18.8
22076.752663	-53.2	34.4	-18.8
22106.734687	-53.2	34.5	-18.8
22066.758655	-53.4	34.6	-18.8
22366.578895	-53.5	34.8	-18.8
21906.854527	-53.6	34.8	-18.8
22576.453063	-53.6	34.8	-18.8
21896.860519	-53.6	34.8	-18.8
22126.722703	-53.6	34.8	-18.8
22496.500999	-53.6	34.9	-18.8
22026.782623	-53.7	35.0	-18.8

Plots:

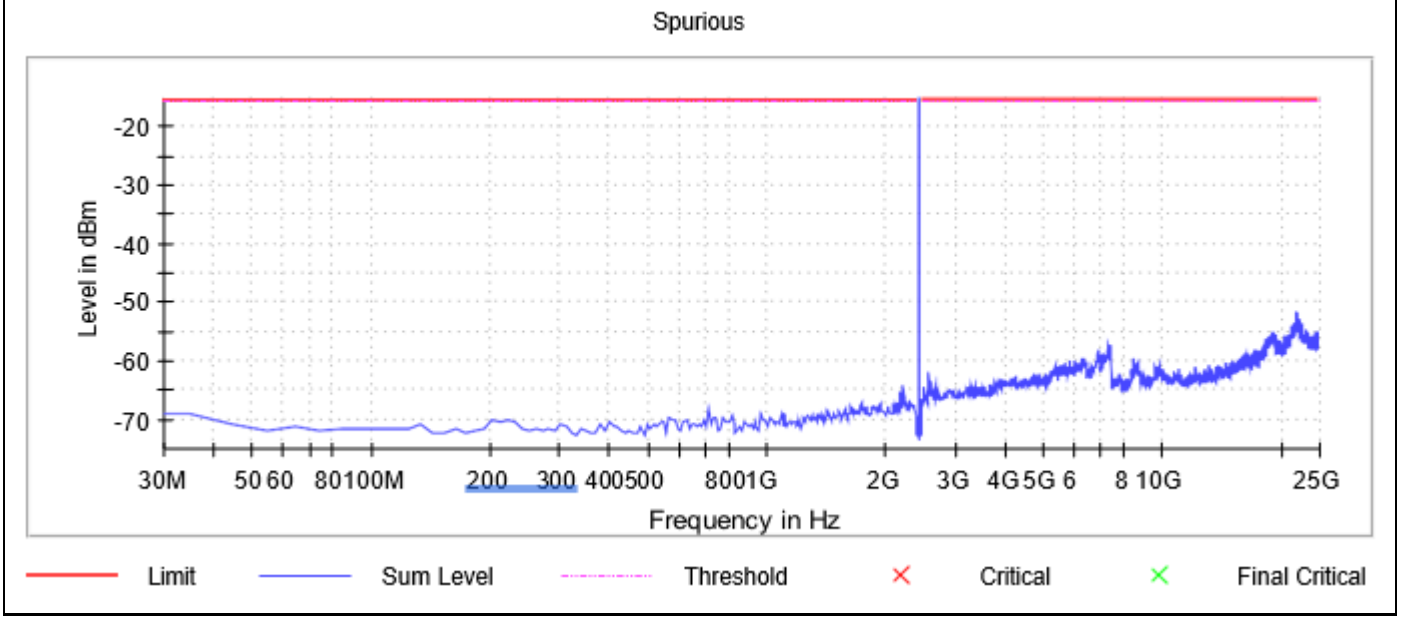

Spurious
Level in dBm
-20
-40
-60
30M
50 60
80100M
200
300 400500
8001G
2G
3G
4G5G 6
8 10G
25G
Frequency in Hz
Limit
Sum Level
Threshold
Critical
Final Critical
MultiView
Spectrum
Ref Level -30.00 dBm
RBW 100 kHz
SGL
Att 0 dB
SWT 23.7 ms
VBW 300 kHz
Mode Sweep
Count 3/3
1 Frequency Sweep
1Pk Max
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
-110 dBm
-120 dBm
CF 1.215 GHz
238 pts
237.0 MHz/
Span 2.37 GHz


MultiView
Spectrum
Ref Level -10.00 dBm
RBW 100 kHz
SGL
Att 0 dB SWT 1 ms VBW 300 kHz Mode Sweep
Count 3/3
1 Frequency Sweep
1Pk Max
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
CF 2.441 75 GHz
101 pts
8.35 MHz/
Span 83.5 MHz

2441MHz

Pre-Measurement

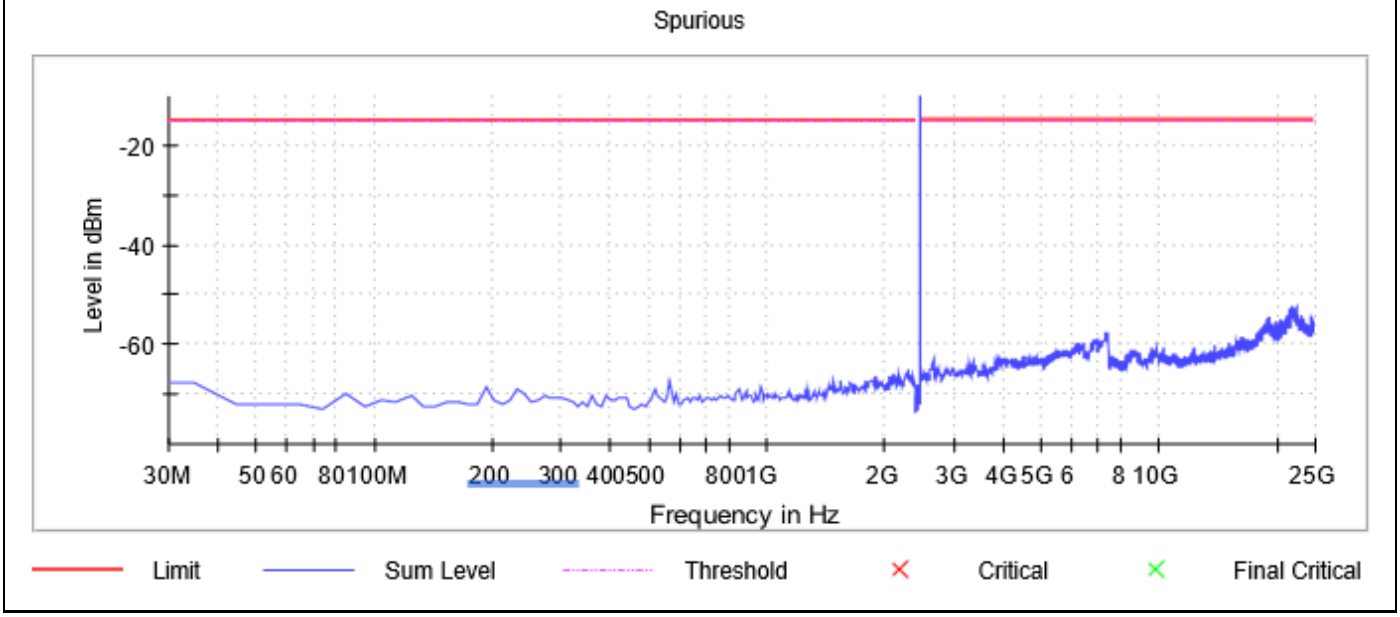
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22096.740679	-52.2	36.6	-15.6
22036.776631	-52.2	36.6	-15.6
22456.524967	-53.1	37.4	-15.6
22116.728695	-53.1	37.4	-15.6
22086.746671	-53.2	37.6	-15.6
22106.734687	-53.4	37.7	-15.6
22076.752663	-53.4	37.8	-15.6
22066.758655	-53.4	37.8	-15.6
22146.710719	-53.4	37.8	-15.6
22016.788615	-53.6	37.9	-15.6
22386.566911	-53.7	38.0	-15.6
22126.722703	-53.7	38.1	-15.6
22136.716711	-53.7	38.1	-15.6
22156.704727	-53.7	38.1	-15.6
21986.806591	-53.8	38.1	-15.6



2480MHz

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22026.782623	-52.9	37.4	-15.5
21976.812583	-52.9	37.4	-15.5
22556.465047	-53.0	37.5	-15.5
21926.842543	-53.2	37.8	-15.5
22176.692743	-53.4	37.9	-15.5
22126.722703	-53.4	37.9	-15.5
22166.698735	-53.4	38.0	-15.5
22066.758655	-53.6	38.2	-15.5
22546.471039	-53.6	38.2	-15.5
21986.806591	-53.6	38.2	-15.5
21886.866511	-53.7	38.2	-15.5
22006.794607	-53.7	38.3	-15.5
21936.836551	-53.8	38.3	-15.5
22106.734687	-53.8	38.4	-15.5
21996.800599	-53.9	38.4	-15.5



5. Radiated Testing

5.1 Test Summary

Start: 12/11/2024	End: 12/19/2024	Temperature: 20.7°C Humidity: 31.3%R.H	Initials: SS/AB

DUT S/N	J24179#1		DUT Operating Mode	BT Classic
Comment	Worst case modulation 3-DH1 from EDR and on DH1 from BDR Family are tested.			
Antenna	Frequency Range	Polarization	Result Over/Under Limit	Notes
Loop	9kHz-30MHz	Parallel	☐Over ☒Under	√
		Perpendicular	☐Over ☒Under	√
		Ground-Parallel	☐Over ☒Under	√
Log Periodic	30MHz-1GHz	Horizontal	☐Over ☒Under	√
		Vertical	☐Over ☒Under	√
Horn	1GHz-18GHz	Horizontal	☐Over ☒Under	√
		Vertical	☐Over ☒Under	√
Horn	18GHz-27.5GHz	Horizontal	☐Over ☒Under	√
		Vertical	☐Over ☒Under	√

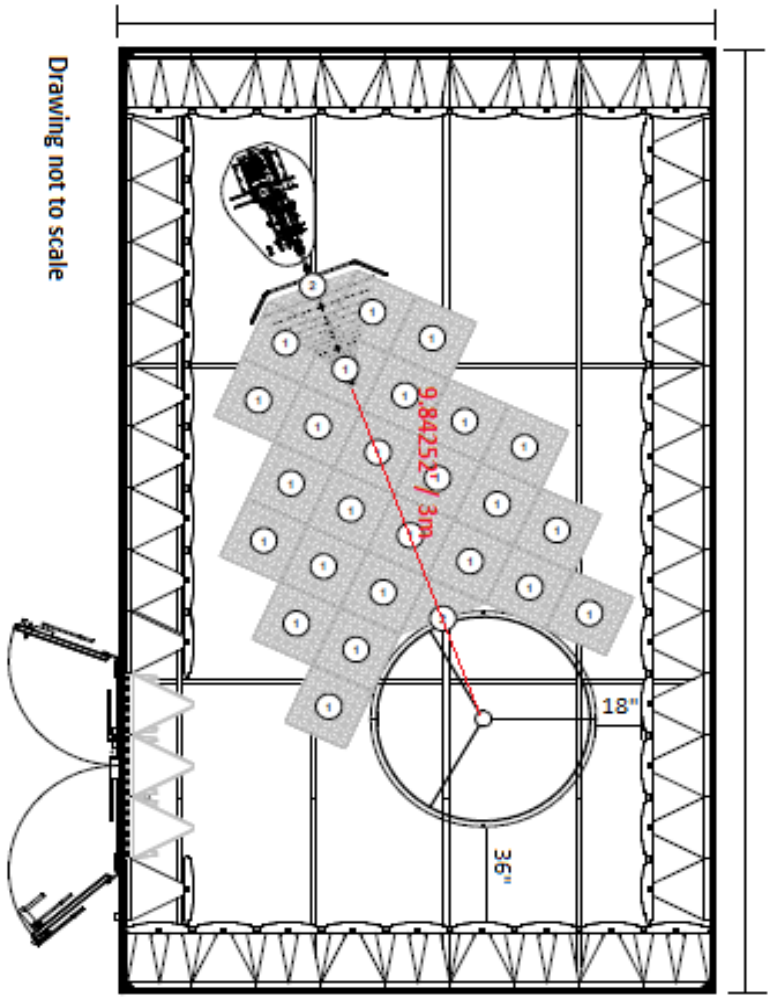
Notes: √ meets the requirements of the acceptance criteria.

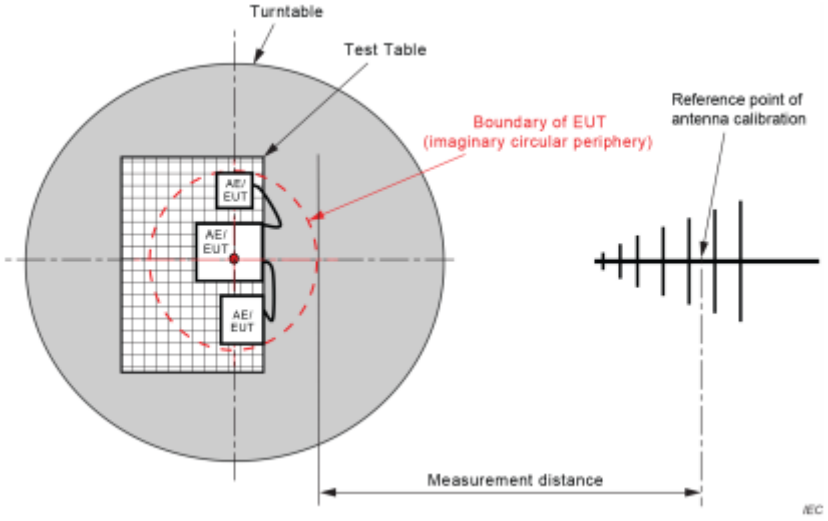
5.2 Test Setup

Semi-Anechoic Chamber Test Site-3 meter

Chamber Location	815 N Opdyke Rd Auburn Hills, Michigan 48326
Chamber Manufacturer:	ETS-Lindgren
Chamber Type	Semi-Anechoic
Model	FACT™ 3-2.0 Plus
Chamber Dimensions (L x W x H)	18'x18'x30'
Quiet Zone Diameter	2.0 meters
Quiet Zone Test Heights	1 & 2 meters (front only)
Test Distance	3.0 meters
Test Frequency Range	1-40 GHz
Measured Performance	4.87 dB Site *s*VSWR

Chamber Dimensions




Turntable
Test Table
Boundary of EUT
(imaginary circular periphery)
Reference point of
antenna calibration
AE/
EUT
AE/
EUT
AE/
EUT
Measurement distance
IEC

5.3 Test Equipment Used

ID #	Equipment	Manufacturer	Model #	Serial #	Cal Due
BVD0217	Receiver 2Hz-44GHz	Rohde & Schwarz	ESW44	101871	4/21/2025
BVD0118	Antenna Mast Position Controller	ETS	7006-001	00214778/00214648	N/A
BVD0111	3 Meter Anechoic Chamber	ETS	N/A	N/A	N/A
BVD0247	Turn Table	ETS	920250	N/A	N/A
BVD0323	Foam Test Table For 3 Meter Chamber	ETS-Lindgren	LDT-1.5	N/A	N/A
BVD0069	Bore Sight Tower	ETS	2171B	226732	N/A
BVD0312	Optima 12V Blue top Marine battery	Optima	D34M	N/A	N/A
BVD0187	Preamplifier 25dB cal to 100kHz-1GHz	Rohde & Schwarz	TS-PR1	102080	1/23/2025
BVD0184	Preamplifier 29dB 1-18GHz	Rohde & Schwarz	TS-PR18	101646	6/20/2025
BVD0185	Preamplifier 45dB 18-40GHz	Rohde & Schwarz	TS-PR1840	100064	6/20/2025
BVD0011	Loop Antenna 9kHz-30MHz	Rohde & Schwarz	FMZB1519B	145	6/10/2025
BVD0021	UltraLog Antenna 30-6000MHz	Rohde & Schwarz	HL562E	101113	6/26/2025
BVD0267	Double Ridge Waveguide 800MHz-18GHz	Rohde & Schwarz	HF907	102832	6/27/2025
BVD0320	18-40GHz Horn Antenna	L3 Narda ATM	PNR 180-442-KF	136164-01	7/15/2025
BVD0045	Field Probe Mast	Rohde & Schwarz	TS-FPMA	N/A	N/A
BVD0480	Band Reject Filter 50dB from 2400 to 2500MHz	Micro-Tronics	BRM50702	G482	6/17/2025
BVD0394	Double Shielded N-Type Cable 6.9 Meter	Rohde & Schwarz	N-Type	N/A	4/8/2025
BVD0398	Double Shielded N-Type Cable 2 Meter	Rohde & Schwarz	N-Type	N/A	4/8/2025
BVD0563	RF Cable Assembly	Huber+Suhner, inc	SUCOFLEX 102A	502215/2A	10/30/2025
BVD0407	Double Shielded N-Type Cable 410mm (For PreAmp)	Rohde & Schwarz	N-Type	N/A	10/15/2025
BVD0495	SMA Shielded Cable approx 100mm (for Pre-Amp)	Rohde & Schwarz	SMA-Type	N/A	7/15/2025
BVD0587	Double Shielded N-Type Cable 440mm (For PreAmp)	Winchester Interconnect	250-251-660157 REV A	N/A	1/9/2025
BVD0229	Temp and Humidity Meter	Fluke	971	12001009	5/23/2025

Equipment List (Software)

ID #	Equipment	Manufacturer	Model	Version No.	
N/A	EMC Test Software	Rodhe & Schwarz	EMC32	2024.0.8.0	N/A

Customer Supplied Equipment

ID #	Equipment	Manufacturer	Model	Serial #	Version No.
N/A	Harness	Harman	N/A	N/A	N/A
N/A	Display Unit	MOBIS	BMM6100000	231107 01	N/A
N/A	Shark Fin Antenna	Alfa Romeo	B901	719147	N/A
N/A	Antenna	Aptiv	APN35409682	N/A	N/A
N/A	Camera	N/A	23295906C	N/A	N/A
N/A	MFGBridge_Tool/Dut labtool	N/A	N/A	N/A	2.0.0.89

5.4 Test Limits and Procedures

Radiated emissions that fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). Other emissions shall be at least 20dB below the highest level of the desired power.

Frequencies (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (meters)
0.009 ~ 0.490	2400/F(kHz)	48.5 - 13.8	300
0.490 ~ 1.705	24000/F(kHz)	33.8 - 23	30
1.705 ~ 30.0	30	29.54	30
30 ~ 88	100	40.0	3
88 ~ 216	150	43.5	3
216 ~ 960	200	46.0	3
Above 960	500	54.0	3

Note:

a) The lower limit shall apply at the transition frequencies.

b) As per 15.35(b), for frequencies above 1000MHz, the field strength limits based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

c) For performing measurements at a specified distance of 3m, the values are extrapolated using extrapolation factor.
Frequencies below 30MHz are extrapolated using 40dB/decade.
Frequencies above 30MHz are extrapolated using 20dB/decade.

Frequencies (MHz)	Formula for Limits derivation for below 30MHz	Limits for frequencies below 30MHz (dBuV/m)
0.009 ~ 0.490	2400/F(kHz) + 40 Log (300m/3m)	128.5 ~ 93.8
0.490 ~ 1.705	24000/F(kHz) + 40 Log (30m/3m)	73.8 ~ 62.96
1.705 ~ 30.0	29.54 + 40 Log (30m/3m)	69.54

The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω.

The measurement procedures are as per ANSI C63.10-2013 Sections 6.3, Section 6.4, Section 6.5, and Section 6.6

1. The table height for emissions measurements
   i) Below 1 GHz, the table height is 80 cm above the reference ground plane.
   ii) Above 1 GHz, the table height is 1.5 m
2. Radiated emission tests are performed in the frequency range
   i) 9 kHz to 30 MHz, using a calibrated loop antenna
   ii) 30 MHz to 1GHz, using a calibrated log antenna
   iii) Above 1 GHz using a calibrated horn antenna
3. Measurements performed with the EUT rotated from 0° to 360°, the antenna height scanned between 1m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

5.5 EMI Test Receiver/Spectrum Analyzer Settings

Below 1GHz

Frequency	RBW	Detector
9KHz to 30MHz	9KHz	Peak

Frequency	RBW	Detector
30MHz to 1GHz	120KHz	Peak/Quasi Peak

Above 1GHz

Frequency	RBW	Detector
1GHz to 40GHz	1 MHz	Peak/ Power Averaging (RMS)

Note: Trace average is 100 traces for continuous transmission else the traces shall be increased by a factor of 1/x, where x is the duty cycle. Duty cycle > 98% no correction factor needed and for Duty cycle < 98% the correction factor 10 log (1/x), where x is the duty cycle.

5.6 Test Plots

Uncertainty

Radiated Emissions (30MHz to 40GHz)

Test Engineer Initials: SS/AB

The test is to measure the radiated emissions of the EUT. Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

30MHz to 1GHZ

Source of Uncertainty	Value (dB)	ProbabilityDistribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter – Receiver	0.25	U-Shape	2.449	1	0.1768033
NSA Calibration	4.0	Triangular	1.414	1	1.633332
ETS Foam Table (LDT-1.5)	1.8	Rectangular	1.732	1	1.039261
Combined Standard Uncertainty (square root of the sum of the squares)					2.113781
Expanded Uncertainty (K=2)					**4.227562**

The total derived measurement uncertainty is +/- 4.228 dB

1GHz to 40GHz

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105000
Filter Insertion Loss	0.25	Normal	2	1	0.125000
Antenna Factor	0.65	Normal	2	1	0.325000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.866051
PRF Response	1.5	Rectangular	1.732	1	0.866051
Mismatch Filter – Receiver	0.25	U-Shape	1.414	1	0.176803
VSWR Calibration	2.0	Triangular	2.449	1	0.816659
ETS Foam Table (LDT-1.5)	1.8	Rectangular	1.732	1	1.039261
Combined Standard Uncertainty (square root of the sum of the squares)					1.869213
Expanded Uncertainty (K=2)					**3.738426**

The total derived measurement uncertainty is +/- 3.738 dB.

Remarks:

1. Level Q-Peak Reading (dBµV/m) = Raw Q-Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Q-Peak Reading – Limit

Remarks:

1. Level Peak Reading (dBµV/m) = Raw Peak Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Peak Reading – Limit

Remarks:

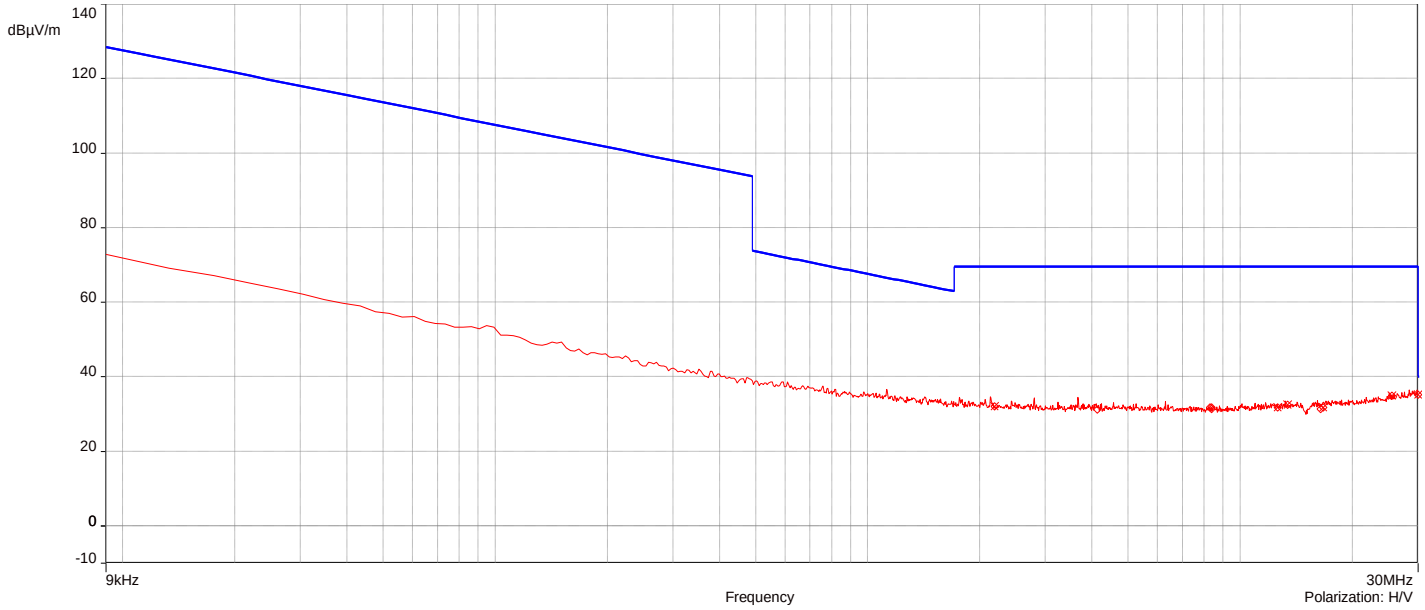
1. Level Average Reading (dBµV/m) = Raw Average Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Average Reading – Limit

J24179#1_BT_DH1_Ch 39_9kHz-30MHz_Ground-Parallel

12/18/2024 11:02:17

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.185801MHz	32.12	19.59	69.54	-37.42	3.05	337.10	H/V	Passed
2.	12.577024MHz	31.75	19.84	69.54	-37.79	3.05	0.10	H/V	Passed
3.	13.374042MHz	32.52	19.90	69.54	-37.02	3.05	143.80	H/V	Passed
4.	16.694949MHz	31.79	20.11	69.54	-37.75	3.05	304.60	H/V	Passed
5.	25.539273MHz	34.97	21.14	69.54	-34.57	3.05	309.30	H/V	Passed
6.	30MHz	35.20	22.04	40.00	-4.80	3.05	354.60	H/V	Passed

Overall Graphs:

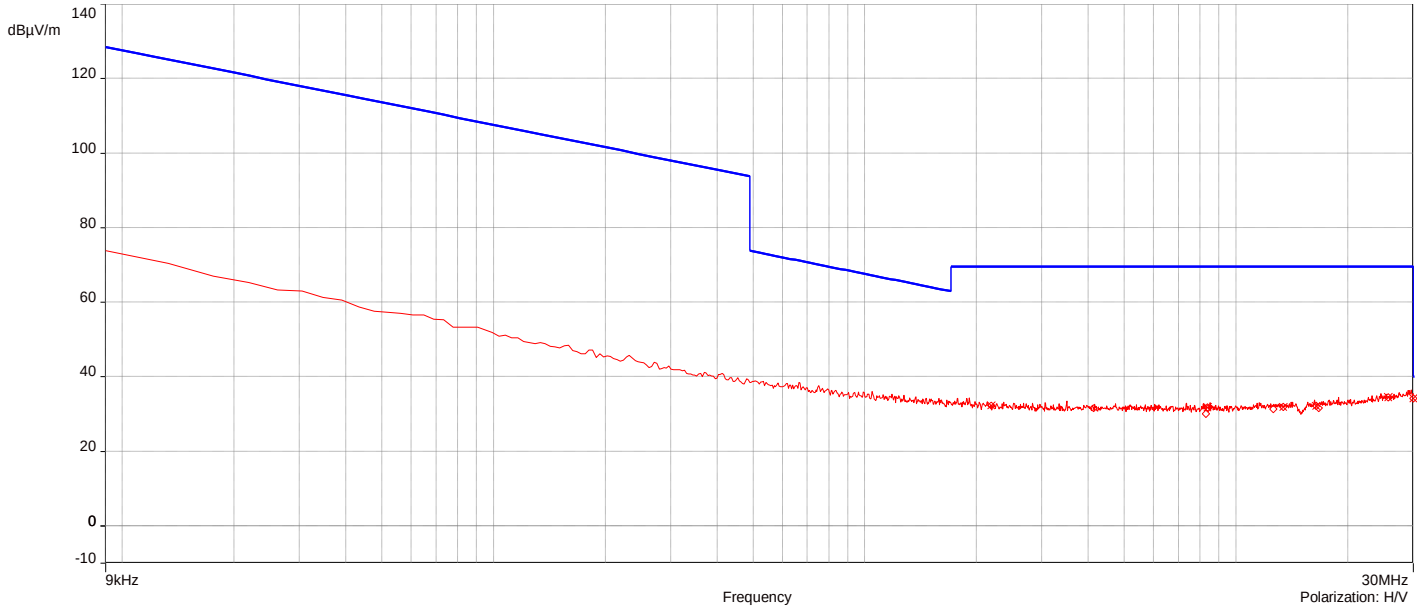


J24179#1_BT_DH1_Ch 39_9kHz-30MHz_Parallel

12/18/2024 11:20:47

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.185801MHz	32.40	19.59	69.54	-37.14	3.05	321.10	H/V	Passed
2.	8.364829MHz	31.81	19.52	69.54	-37.73	3.05	148.70	H/V	Passed
3.	13.369757MHz	31.95	19.90	69.54	-37.59	3.05	161.40	H/V	Passed
4.	16.420706MHz	32.21	20.07	69.54	-37.33	3.05	235.40	H/V	Passed
5.	25.663539MHz	34.46	21.15	69.54	-35.08	3.05	150.80	H/V	Passed
6.	30MHz	34.25	22.04	40.00	-5.75	3.05	358.90	H/V	Passed

Overall Graphs:

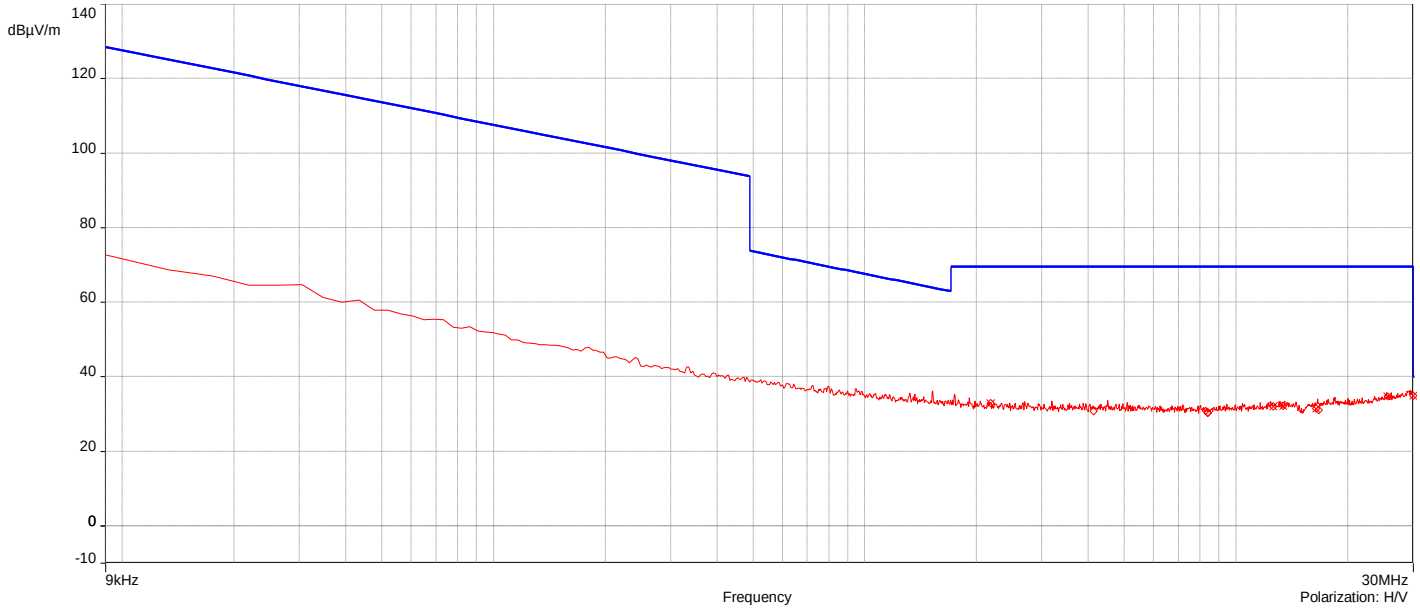


J24179#1_BT_DH1_Ch 39_9kHz-30MHz_Perpendicular

12/18/2024 10:27:59

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.181516MHz	32.92	19.59	69.54	-36.62	3.05	357.60	H/V	Passed
2.	12.577024MHz	32.08	19.84	69.54	-37.46	3.05	79.80	H/V	Passed
3.	13.395467MHz	32.15	19.90	69.54	-37.39	3.05	152.60	H/V	Passed
4.	16.420706MHz	31.47	20.07	69.54	-38.07	3.05	358.90	H/V	Passed
5.	25.616403MHz	34.81	21.15	69.54	-34.73	3.05	62.00	H/V	Passed
6.	30MHz	34.97	22.04	40.00	-5.03	3.05	79.80	H/V	Passed

Overall Graphs:

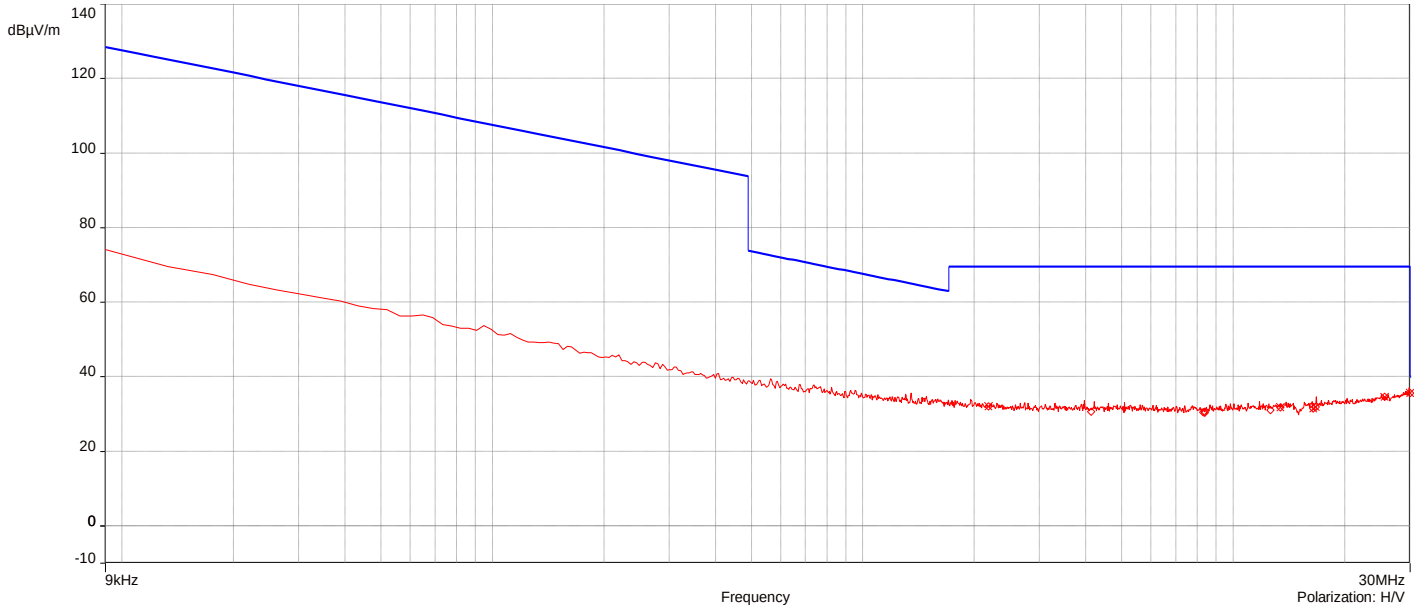


J24179#1_BT_3-DH1_Ch 0_9kHz-30MHz_Ground-Parallel

12/18/2024 12:31:34

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.177231MHz	32.04	19.59	69.54	-37.50	3.05	72.00	H/V	Passed
2.	13.404037MHz	31.86	19.90	69.54	-37.68	3.05	321.00	H/V	Passed
3.	16.420706MHz	31.47	20.07	69.54	-38.07	3.05	17.40	H/V	Passed
4.	16.694949MHz	31.99	20.11	69.54	-37.55	3.05	306.10	H/V	Passed
5.	25.616403MHz	34.62	21.15	69.54	-34.92	3.05	222.70	H/V	Passed
6.	30MHz	35.57	22.04	40.00	-4.43	3.05	119.80	H/V	Passed

Overall Graphs:

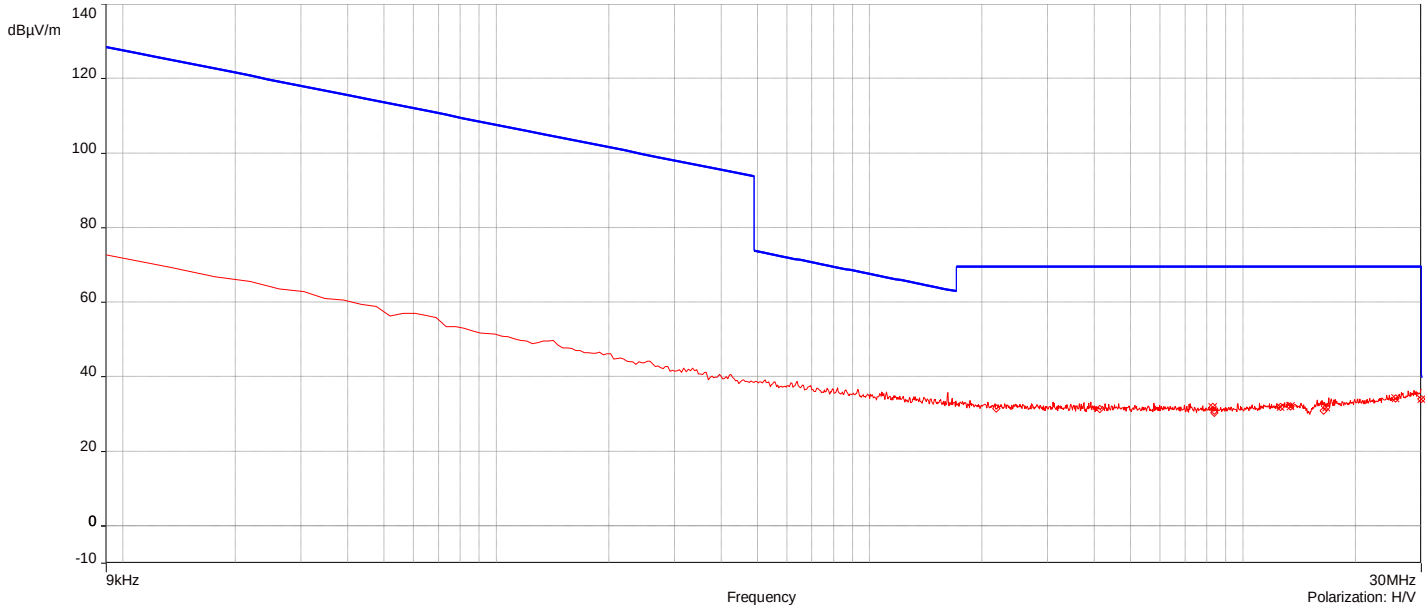


J24179#1_BT_3-DH1_Ch 0_9kHz-30MHz_Parallel

12/18/2024 12:10:59

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	8.291984MHz	31.99	19.53	69.54	-37.55	3.05	29.60	H/V	Passed
2.	12.577024MHz	31.92	19.84	69.54	-37.62	3.05	238.20	H/V	Passed
3.	13.408322MHz	32.05	19.91	69.54	-37.49	3.05	225.50	H/V	Passed
4.	16.694949MHz	31.81	20.11	69.54	-37.73	3.05	326.80	H/V	Passed
5.	25.612118MHz	34.19	21.15	69.54	-35.35	3.05	249.00	H/V	Passed
6.	30MHz	34.03	22.04	40.00	-5.97	3.05	234.10	H/V	Passed

Overall Graphs:

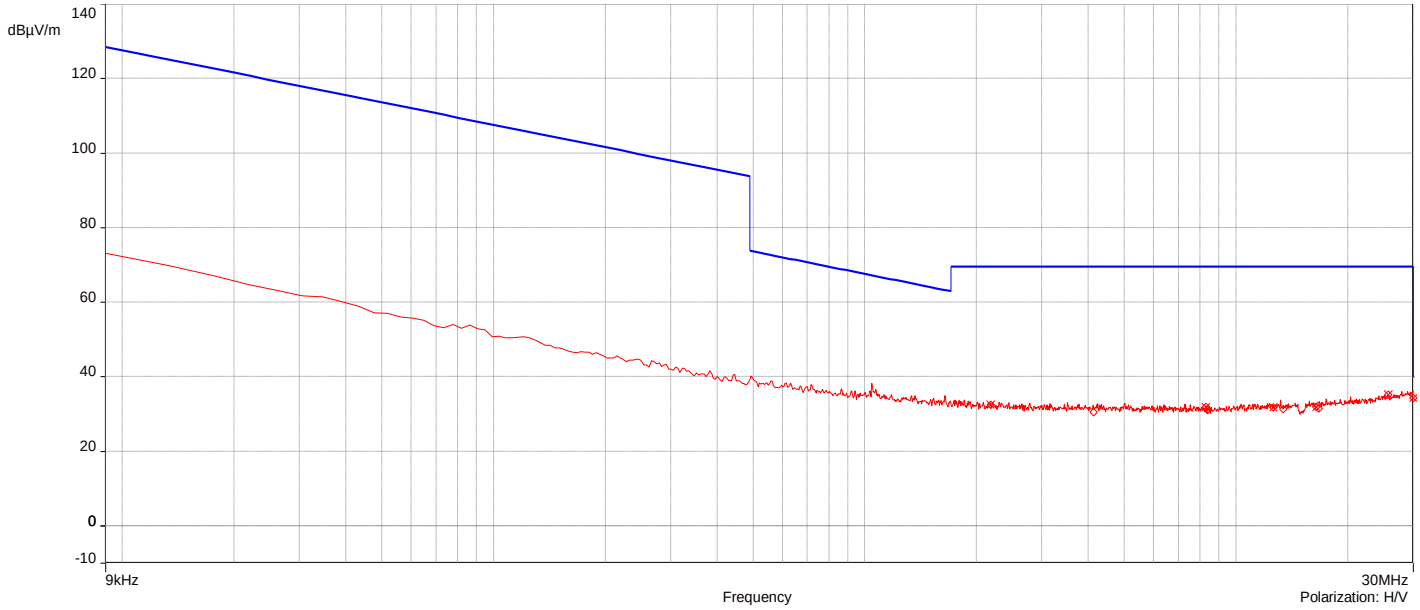


J24179#1_BT_3-DH1_Ch 0_9kHz-30MHz_Perpendicular

12/18/2024 13:02:18

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.177231MHz	32.50	19.59	69.54	-37.04	3.05	262.00	H/V	Passed
2.	8.291984MHz	31.87	19.53	69.54	-37.67	3.05	8.90	H/V	Passed
3.	12.577024MHz	31.79	19.84	69.54	-37.75	3.05	214.30	H/V	Passed
4.	16.420706MHz	31.98	20.07	69.54	-37.56	3.05	257.70	H/V	Passed
5.	25.650684MHz	35.16	21.15	69.54	-34.38	3.05	283.50	H/V	Passed
6.	30MHz	34.33	22.04	40.00	-5.67	3.05	18.70	H/V	Passed

Overall Graphs:

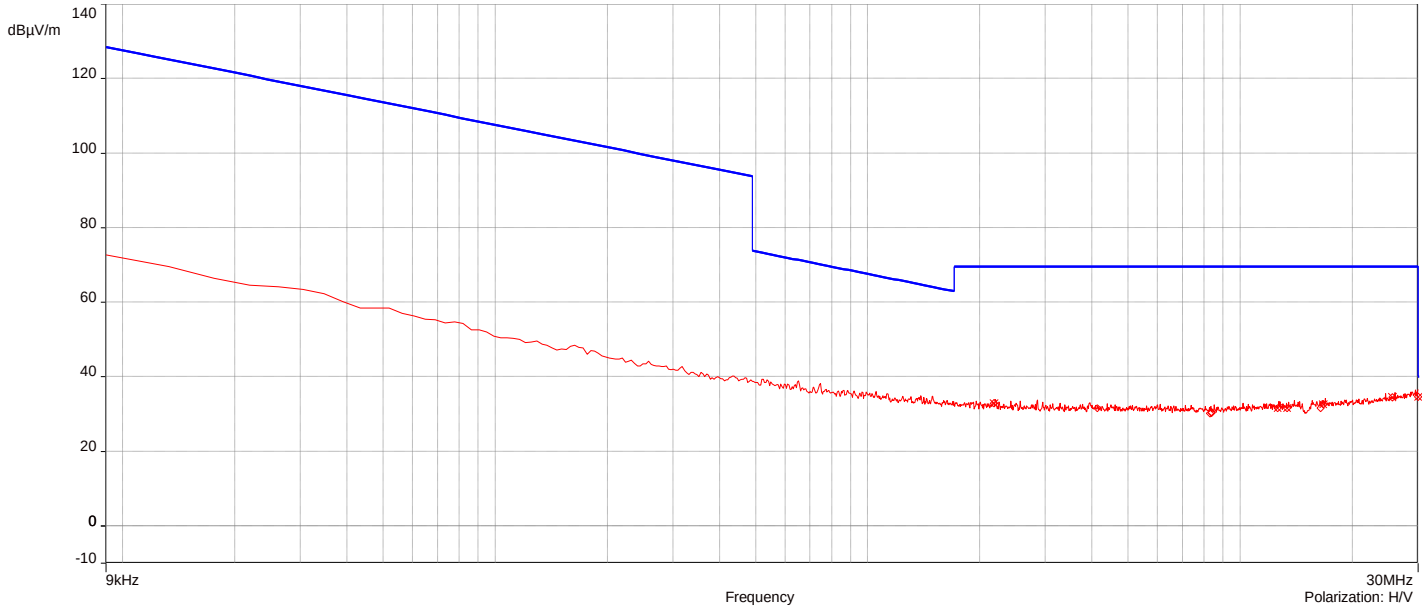


J24179#1_BT_3-DH1_Ch 39_9kHz-30MHz_Ground-Parallel

12/18/2024 13:41:00

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.177231MHz	32.96	19.59	69.54	-36.58	3.05	223.50	H/V	Passed
2.	12.577024MHz	31.71	19.84	69.54	-37.83	3.05	225.80	H/V	Passed
3.	13.361187MHz	31.70	19.90	69.54	-37.84	3.05	126.50	H/V	Passed
4.	16.694949MHz	32.61	20.11	69.54	-36.93	3.05	158.50	H/V	Passed
5.	25.629258MHz	34.51	21.15	69.54	-35.03	3.05	208.30	H/V	Passed
6.	30MHz	34.70	22.04	40.00	-5.30	3.05	0.10	H/V	Passed

Overall Graphs:

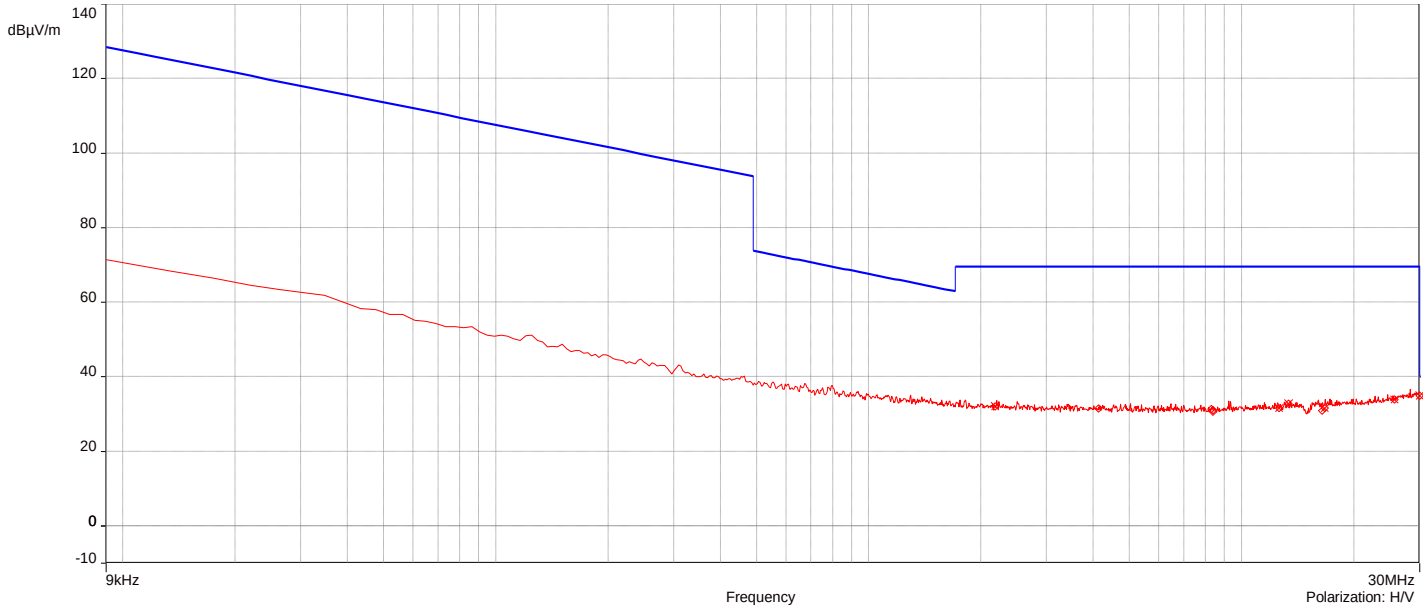


J24179#1_BT_3-DH1_Ch 39_9kHz-30MHz_Parallel

12/18/2024 13:58:55

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.181516MHz	32.12	19.59	69.54	-37.42	3.05	179.80	H/V	Passed
2.	12.577024MHz	31.63	19.84	69.54	-37.91	3.05	358.90	H/V	Passed
3.	13.365472MHz	32.75	19.90	69.54	-36.79	3.05	244.50	H/V	Passed
4.	16.694949MHz	31.58	20.11	69.54	-37.96	3.05	110.50	H/V	Passed
5.	25.667824MHz	33.99	21.15	69.54	-35.55	3.05	294.30	H/V	Passed
6.	30MHz	34.97	22.04	40.00	-5.03	3.05	2.50	H/V	Passed

Overall Graphs:

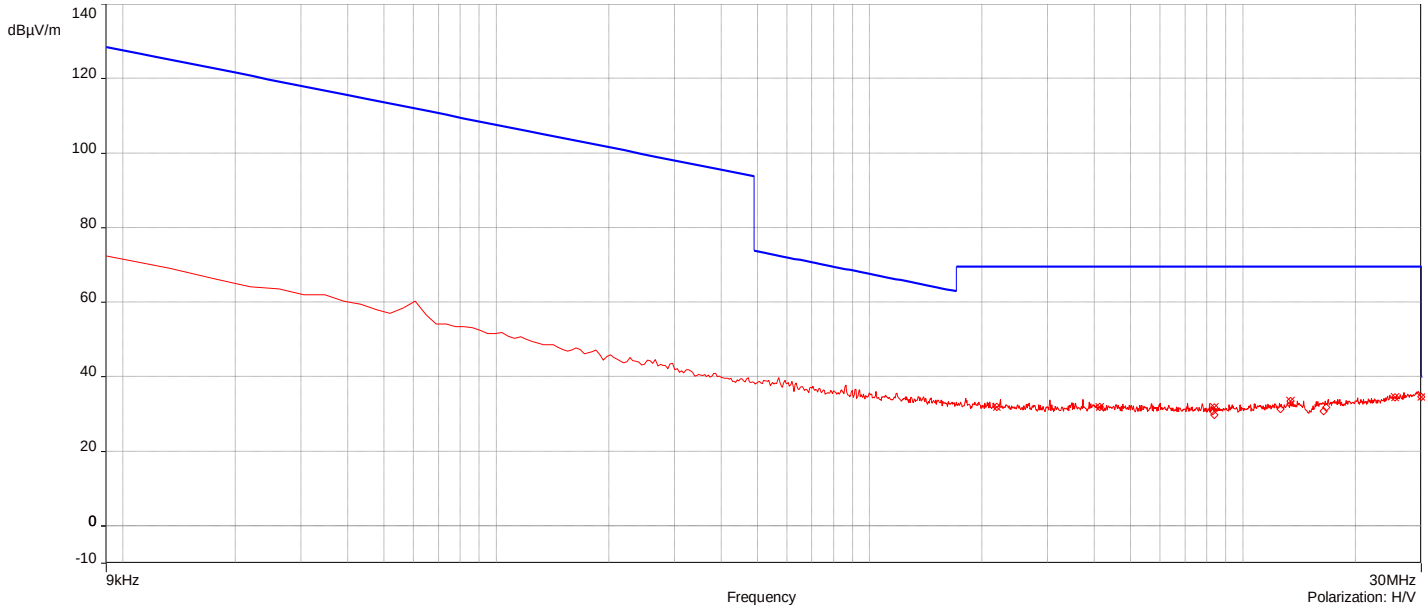


J24179#1_BT_3-DH1_Ch 39_9kHz-30MHz_Perpendicular

12/18/2024 13:22:59

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.185801MHz	31.99	19.59	69.54	-37.55	3.05	180.20	H/V	Passed
2.	4.126924MHz	31.92	19.74	69.54	-37.62	3.05	358.90	H/V	Passed
3.	8.377685MHz	31.85	19.52	69.54	-37.69	3.05	193.10	H/V	Passed
4.	13.395467MHz	33.47	19.90	69.54	-36.07	3.05	336.30	H/V	Passed
5.	25.522132MHz	34.51	21.14	69.54	-35.03	3.05	188.70	H/V	Passed
6.	30MHz	34.63	22.04	40.00	-5.37	3.05	43.90	H/V	Passed

Overall Graphs:

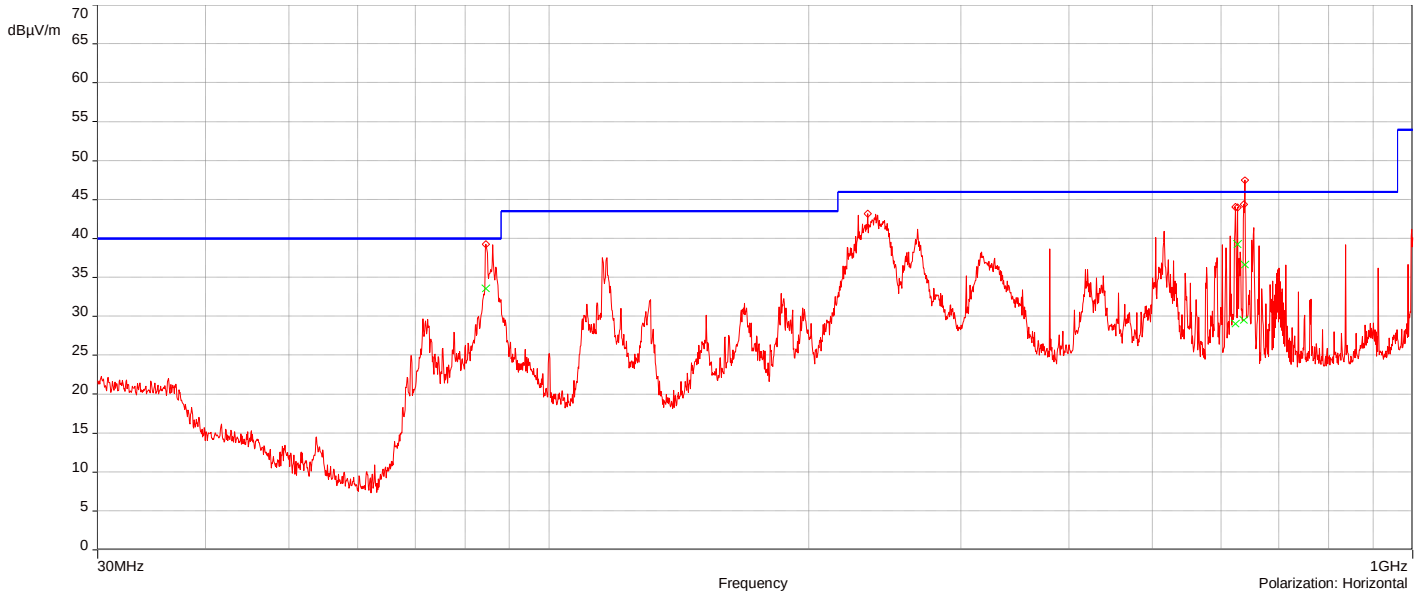


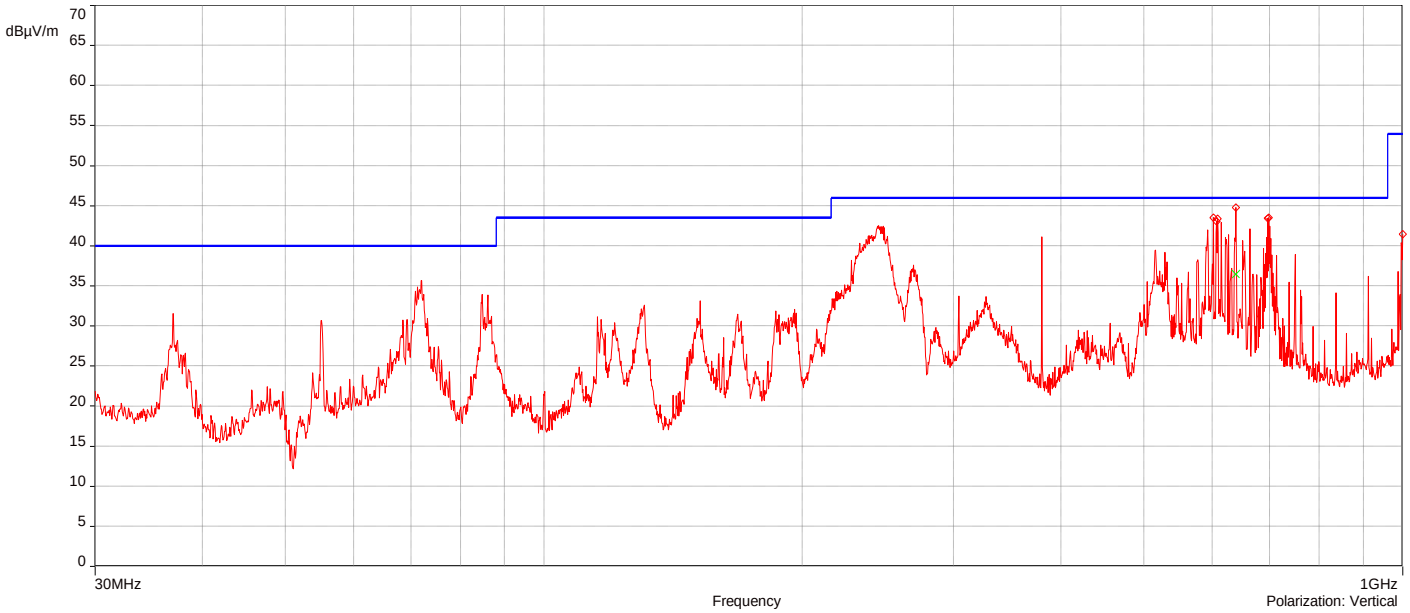
J24179#1_BT_DH1_Ch 0_30MHz-1GHz

12/19/2024 10:26:08

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	639.02465MHz	36.50	-8.11	46.00	-9.50	1.75	44.10	Vertical	Passed
2.	84.43732MHz	33.58	-16.49	40.00	-6.42	3.75	358.90	Horizontal	Passed
3.	623.27549MHz	29.08	-7.09	46.00	-16.92	1.25	78.10	Horizontal	Passed
4.	626.69922MHz	39.29	-7.09	46.00	-6.71	1.25	62.10	Horizontal	Passed
5.	637.71222MHz	29.53	-6.92	46.00	-16.47	1.25	78.10	Horizontal	Passed
6.	639.02465MHz	36.68	-6.91	46.00	-9.32	1.50	280.10	Horizontal	Passed

Overall Graphs:



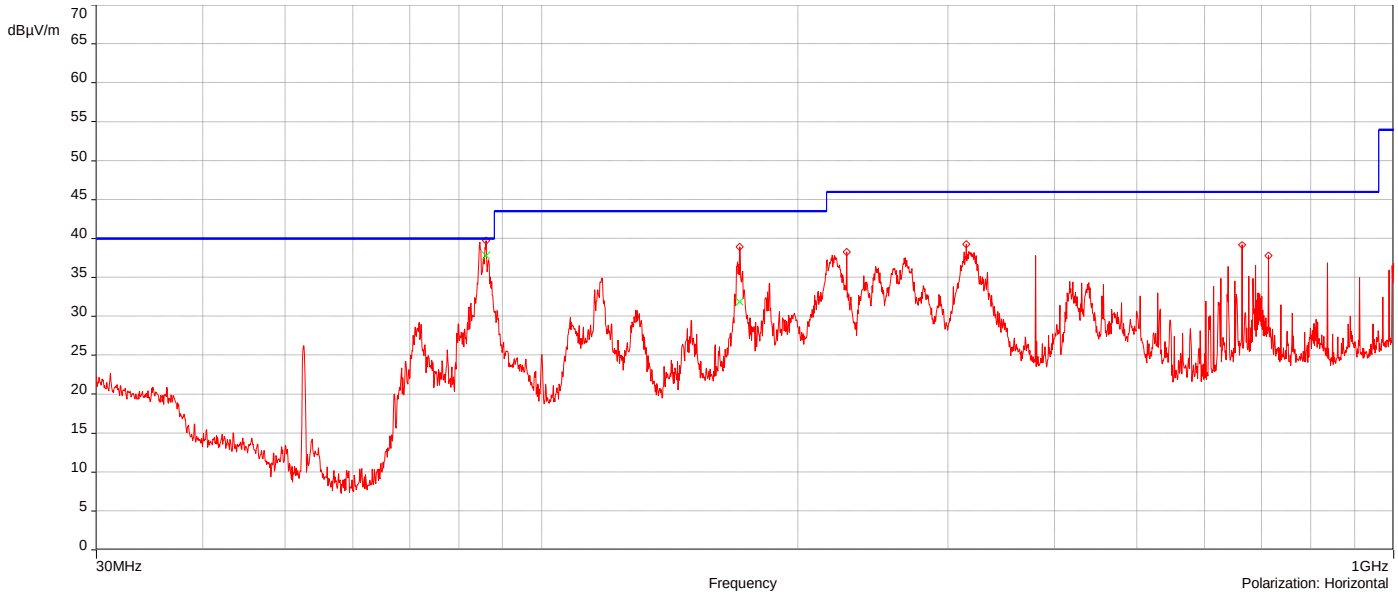

dBµV/m
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
30MHz
Frequency
1GHz
Polarization: Vertical

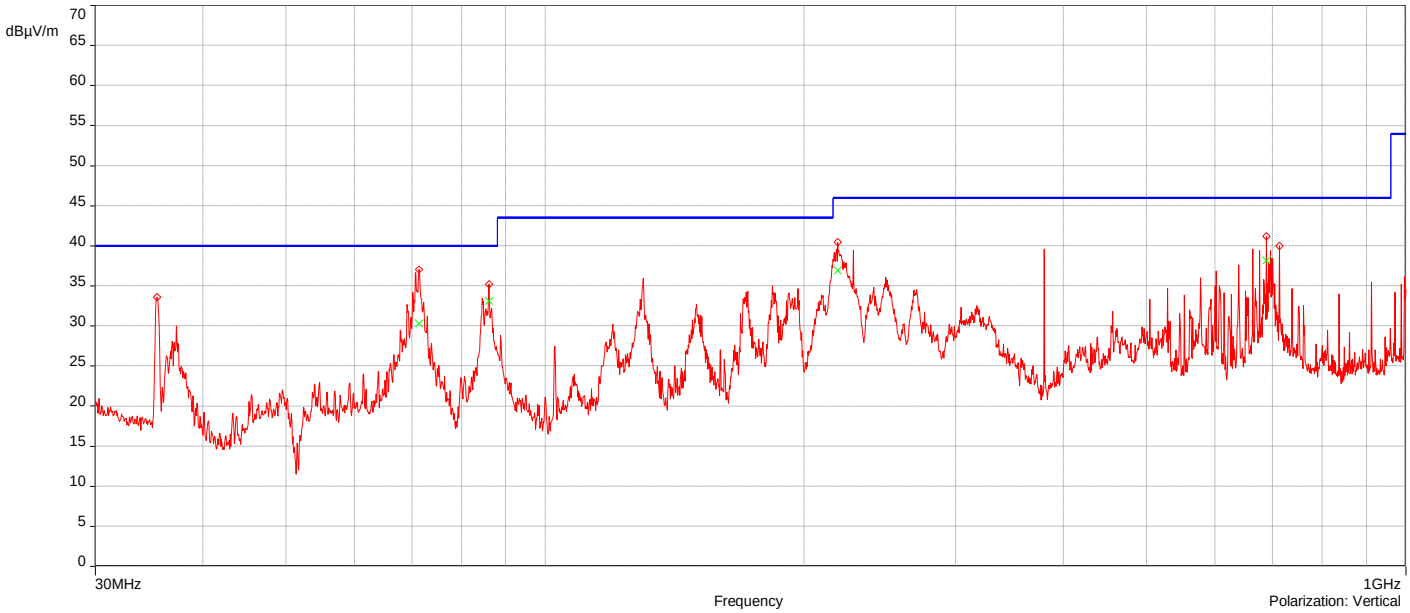
J24179#1_BT_DH1_Ch 39_30MHz-1GHz

12/19/2024 13:33:53

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	71.313018MHz	30.32	-17.88	40.00	-9.68	2.00	337.90	Vertical	Passed
2.	86.035061MHz	33.12	-16.38	40.00	-6.88	3.75	97.10	Vertical	Passed
3.	218.64757MHz	36.96	-17.12	46.00	-9.04	1.00	36.10	Vertical	Passed
4.	688.09812MHz	38.19	-7.39	46.00	-7.81	1.00	49.10	Vertical	Passed
5.	86.035061MHz	37.81	-16.48	40.00	-2.19	3.75	13.10	Horizontal	Passed
6.	170.7724MHz	31.85	-17.56	43.50	-11.65	2.00	195.10	Horizontal	Passed

Overall Graphs:



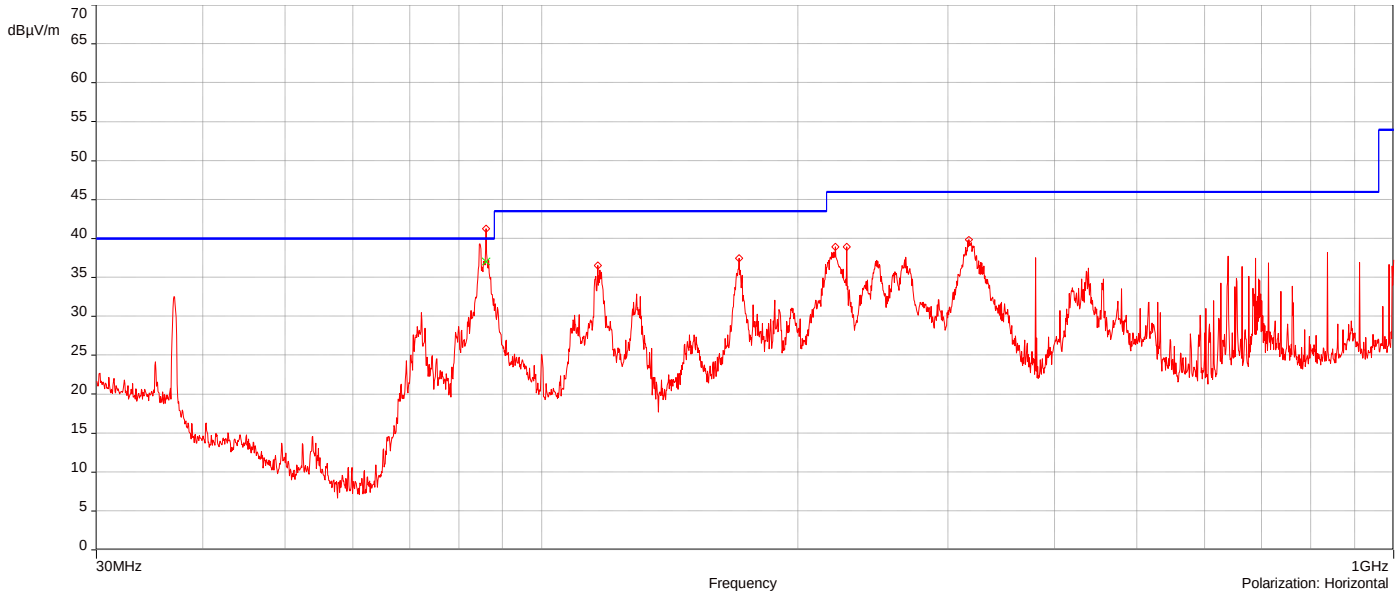

dBµV/m
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
30MHz
Frequency
1GHz
Polarization: Vertical

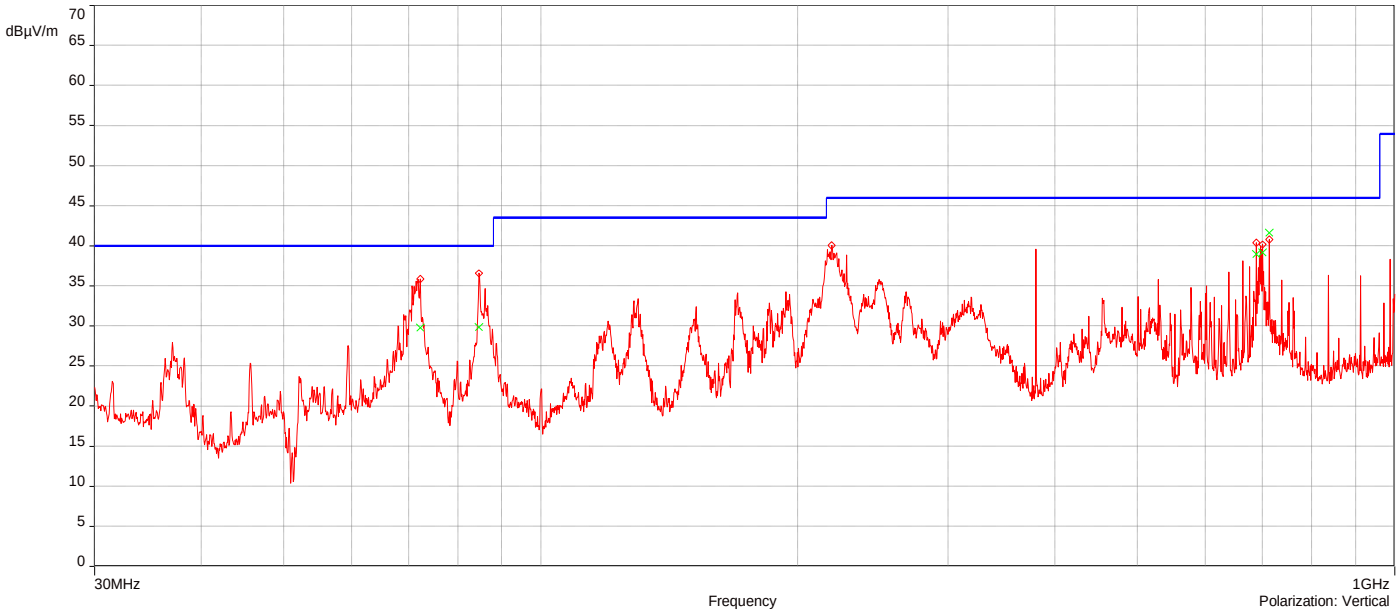
J24179#1_BT_3-DH1_Ch 0_30MHz-1GHz

12/19/2024 12:53:06

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	72.168951MHz	29.78	-17.69	40.00	-10.22	1.00	358.90	Vertical	Passed
2.	84.608506MHz	29.88	-16.52	40.00	-10.12	4.00	112.10	Vertical	Passed
3.	688.09812MHz	39.00	-7.39	46.00	-7.00	1.00	46.90	Vertical	Passed
4.	700.42355MHz	39.18	-7.30	46.00	-6.82	1.50	355.90	Vertical	Passed
5.	712.74898MHz	41.68	-7.20	46.00	-4.32	1.50	25.10	Vertical	Passed
6.	85.977999MHz	37.04	-16.49	40.00	-2.96	2.00	357.90	Horizontal	Passed

Overall Graphs:



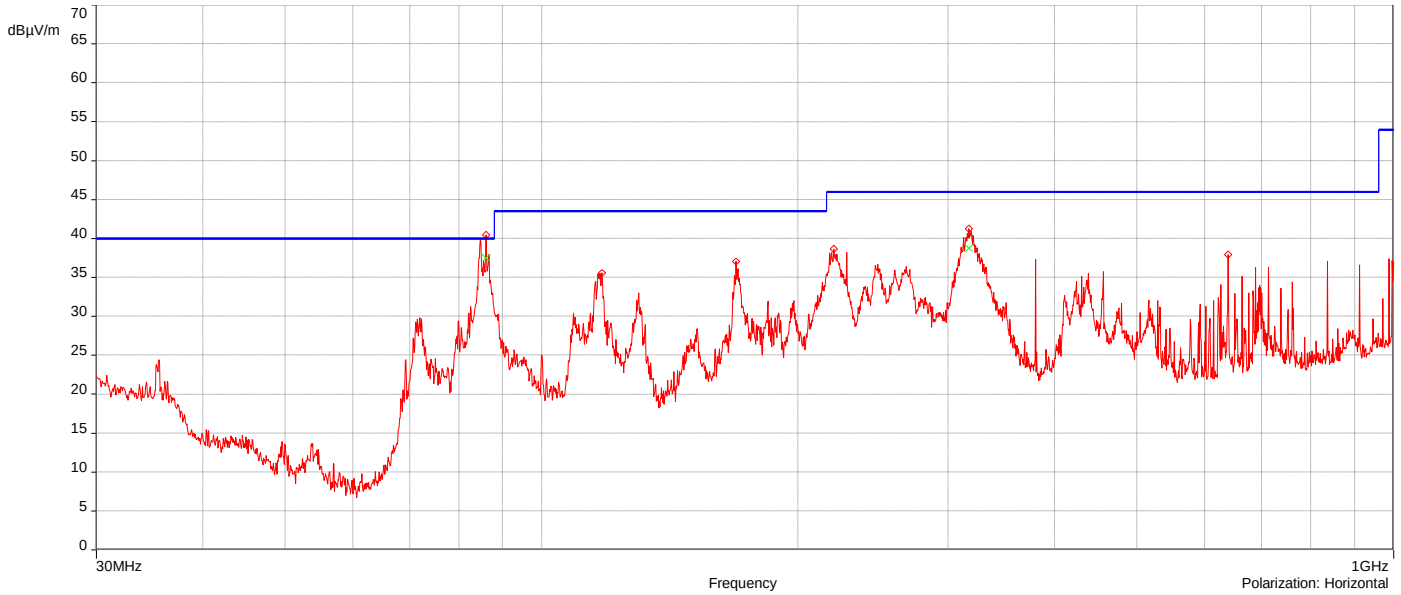

dBµV/m
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
30MHz
Frequency
1GHz
Polarization: Vertical

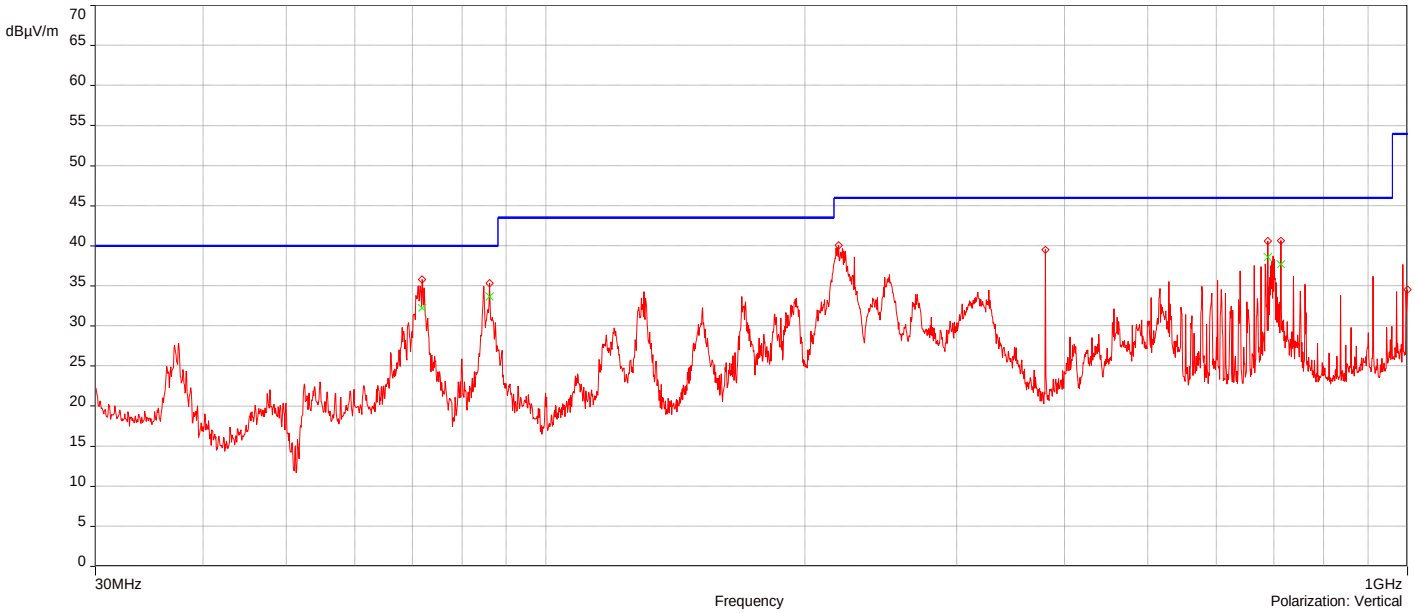
J24179#1_BT_3-DH1_Ch 39_30MHz-1GHz

12/19/2024 12:14:05

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	71.826578MHz	32.28	-17.78	40.00	-7.72	1.00	84.10	Vertical	Passed
2.	85.977999MHz	33.68	-16.39	40.00	-6.32	3.00	103.90	Vertical	Passed
3.	688.09812MHz	38.63	-7.39	46.00	-7.37	1.00	36.90	Vertical	Passed
4.	712.74898MHz	37.73	-7.20	46.00	-8.27	1.50	12.10	Vertical	Passed
5.	85.977999MHz	37.55	-16.49	40.00	-2.45	3.75	358.90	Horizontal	Passed
6.	317.30808MHz	38.78	-13.24	46.00	-7.22	1.00	299.90	Horizontal	Passed

Overall Graphs:




dBµV/m
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
30MHz
Frequency
1GHz
Polarization: Vertical

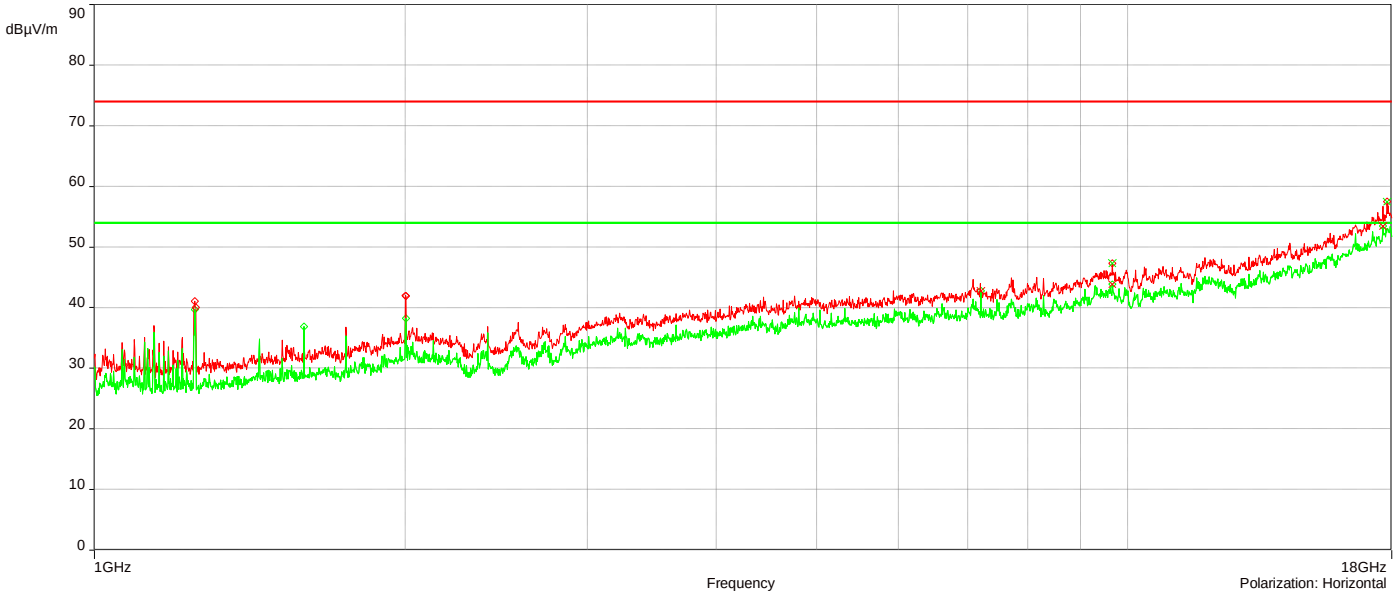
J24179#1_BT_DH1_Ch 0_1-18GHz

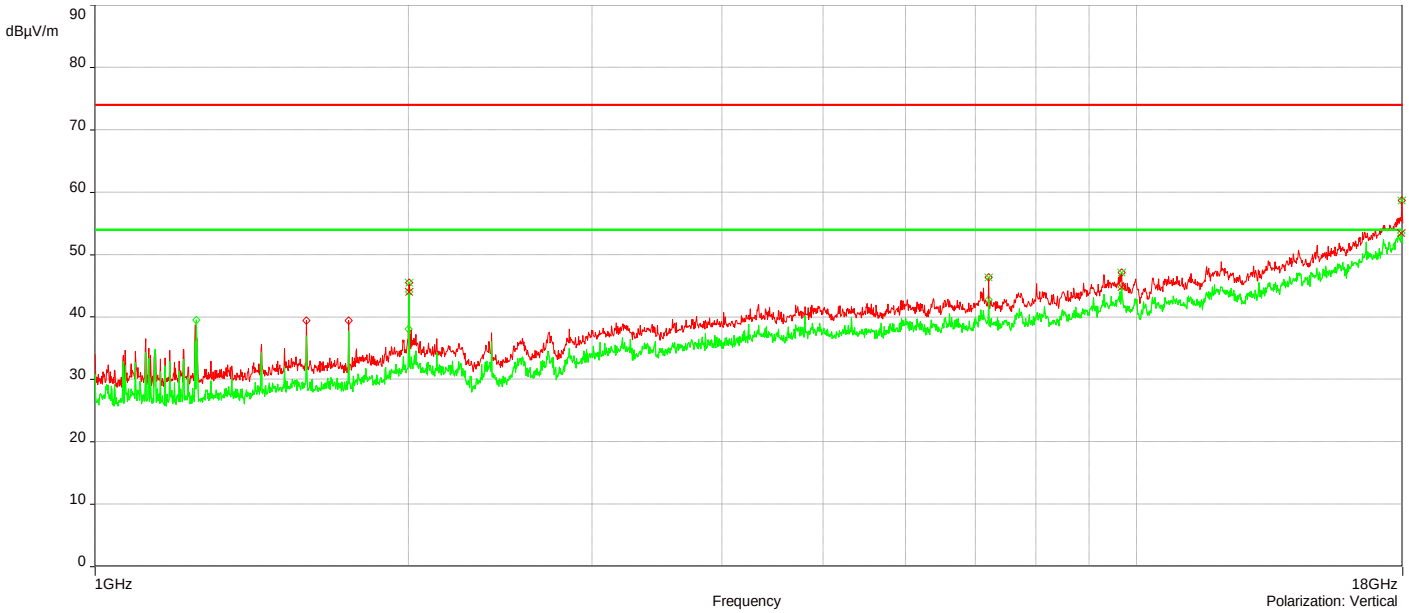
12/11/2024 19:27:02

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.0025295GHz	45.52	-2.15	74.00	-28.48	2.50	199.00	Vertical	Passed
2.	7.2056825GHz	46.38	7.98	74.00	-27.62	1.00	88.20	Vertical	Passed
3.	9.669755GHz	47.13	11.10	74.00	-26.87	1.50	341.00	Vertical	Passed
4.	17.962999GHz	58.71	21.71	74.00	-15.29	1.00	8.00	Vertical	Passed
5.	9.6547546GHz	47.27	10.98	74.00	-26.73	3.00	227.90	Horizontal	Passed
6.	17.809994GHz	57.51	21.38	74.00	-16.49	3.50	152.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.0025295GHz	44.05	-2.15	54.00	-9.95	2.50	199.00	Vertical	Passed
2.	9.669755GHz	44.80	11.10	54.00	-9.20	1.50	341.00	Vertical	Passed
3.	17.948498GHz	52.17	21.49	54.00	-1.83	2.50	0.10	Vertical	Passed
4.	7.2056825GHz	42.74	7.98	54.00	-11.26	1.00	0.10	Horizontal	Passed
5.	9.6547546GHz	43.92	10.98	54.00	-10.08	3.00	227.90	Horizontal	Passed
6.	17.64799GHz	50.92	21.04	54.00	-3.08	2.00	41.80	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

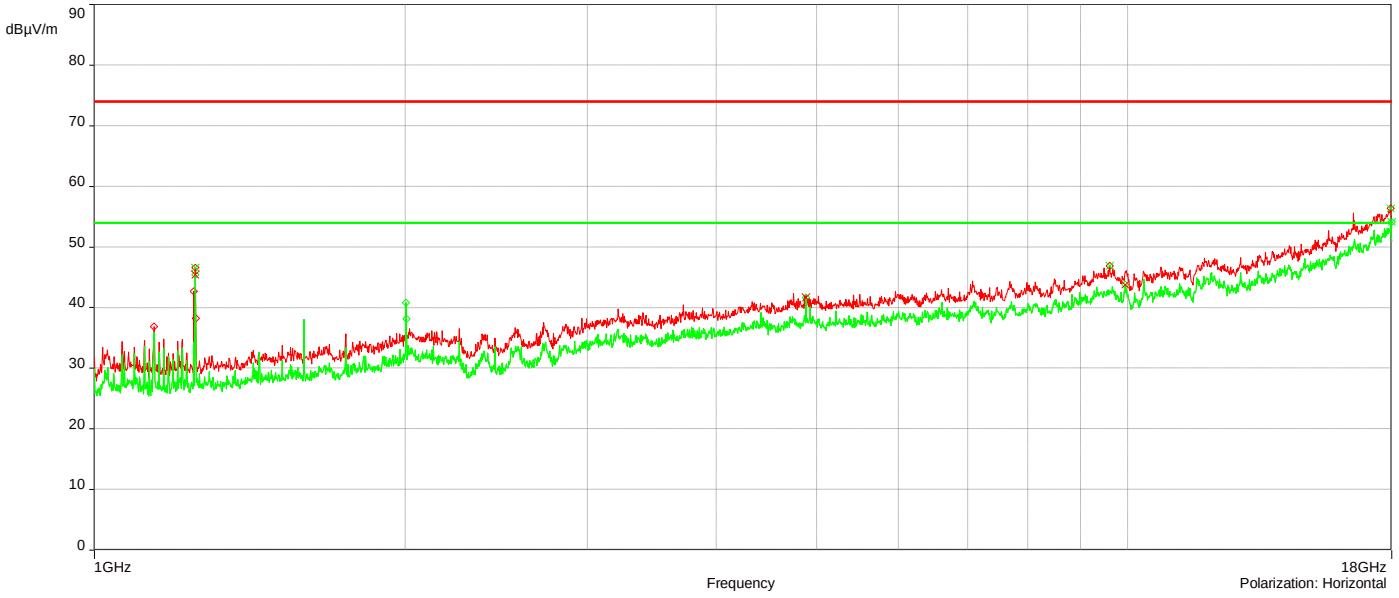
J24179#1_BT_DH1_Ch 39_1-18GHz

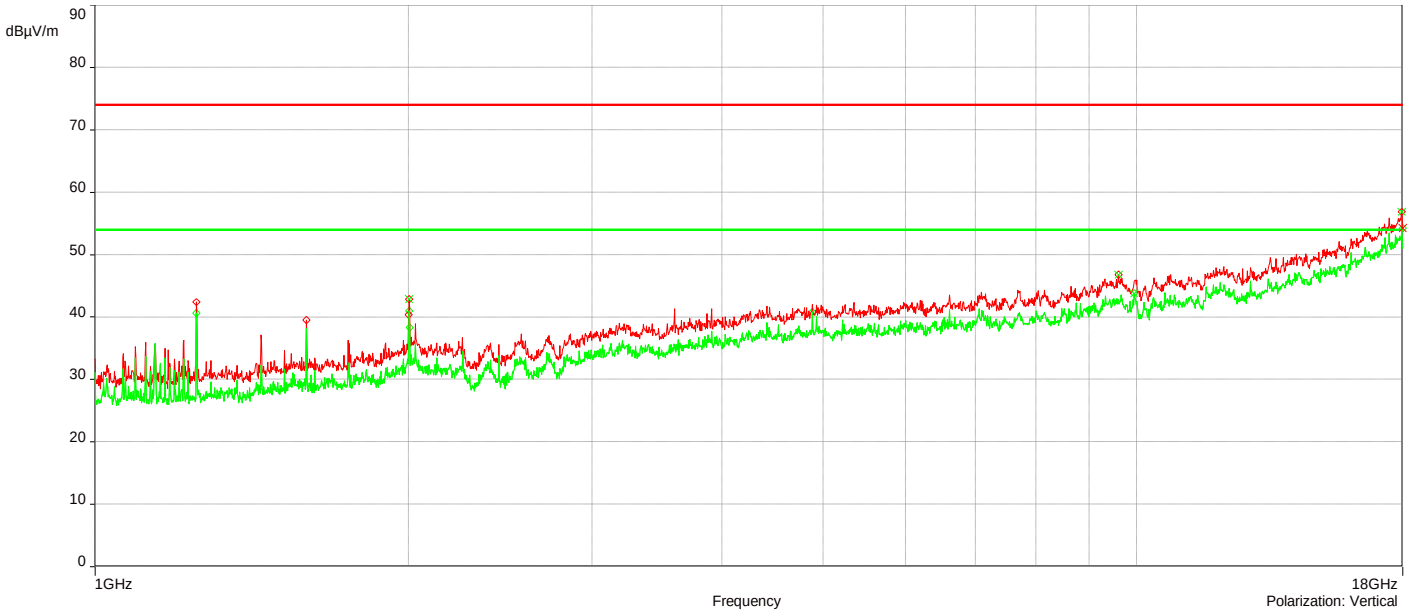
12/11/2024 18:57:51

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.0020295GHz	42.90	-2.15	74.00	-31.10	4.00	202.40	Vertical	Passed
2.	9.6042531GHz	46.78	10.48	74.00	-27.22	2.50	156.00	Vertical	Passed
3.	17.966499GHz	56.94	21.76	74.00	-17.06	1.00	136.50	Vertical	Passed
4.	1.2520074GHz	46.67	-7.52	74.00	-27.33	1.00	166.40	Horizontal	Passed
5.	9.601753GHz	46.92	10.47	74.00	-27.08	1.00	62.70	Horizontal	Passed
6.	17.963499GHz	56.42	21.68	74.00	-17.58	4.00	195.00	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	9.9437631GHz	43.82	10.98	54.00	-10.18	3.50	0.00	Vertical	Passed
2.	17.9965GHz	53.18	22.40	54.00	-0.82	3.00	148.70	Vertical	Passed
3.	1.2520074GHz	45.45	-7.52	54.00	-8.55	1.00	166.40	Horizontal	Passed
4.	4.8821142GHz	41.68	5.37	54.00	-12.32	1.00	53.20	Horizontal	Passed
5.	9.9437631GHz	43.78	10.94	54.00	-10.22	3.50	234.20	Horizontal	Passed
6.	17.9965GHz	52.86	22.35	54.00	-1.14	3.00	0	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

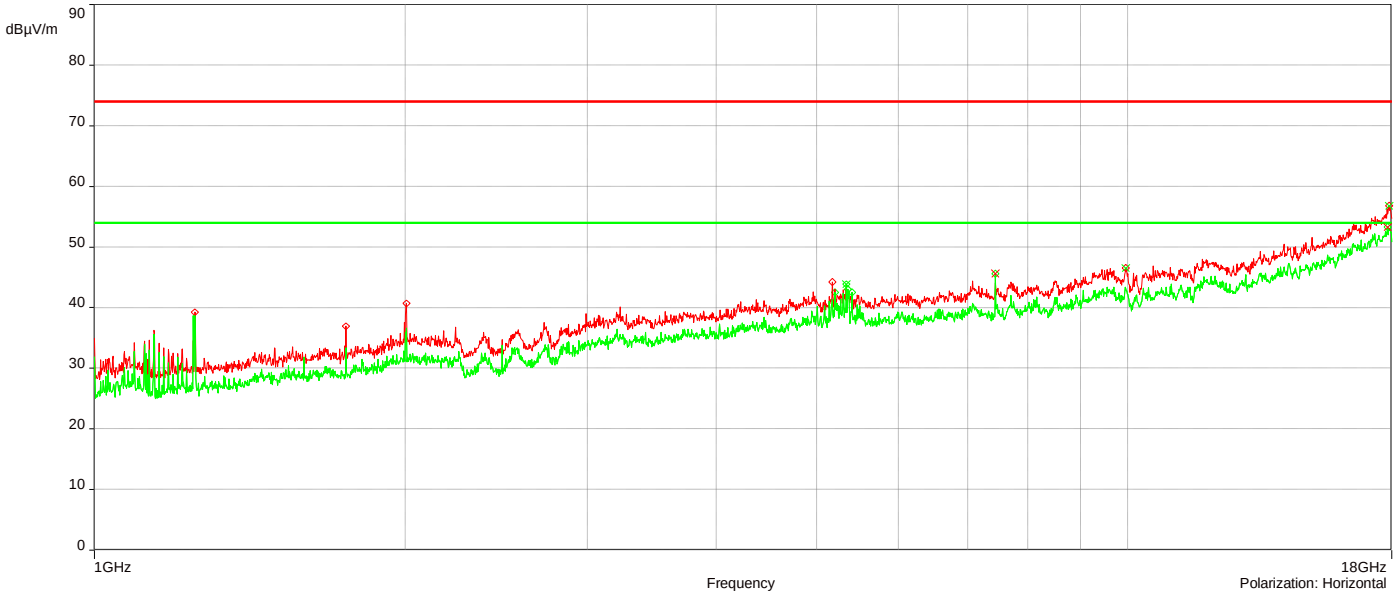
J24179#1_BT_DH1_Ch 78_1-18GHz

12/11/2024 18:08:53

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	5.3386276GHz	47.10	5.63	74.00	-26.90	4.00	280.50	Vertical	Passed
2.	5.3596282GHz	46.53	5.64	74.00	-27.47	4.00	261.60	Vertical	Passed
3.	7.4396894GHz	47.19	7.97	74.00	-26.81	1.00	92.30	Vertical	Passed
4.	17.825995GHz	56.03	21.44	74.00	-17.97	3.00	165.60	Vertical	Passed
5.	9.9522633GHz	46.59	11.03	74.00	-27.41	3.50	0.00	Horizontal	Passed
6.	17.887497GHz	56.81	21.69	74.00	-17.19	2.50	297.90	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	5.3401277GHz	43.86	5.63	54.00	-10.14	4.00	261.60	Vertical	Passed
2.	7.4396894GHz	45.62	7.97	54.00	-8.38	1.00	92.30	Vertical	Passed
3.	17.948998GHz	52.60	21.49	54.00	-1.40	3.50	0.10	Vertical	Passed
4.	5.3401277GHz	43.87	5.64	54.00	-10.13	4.00	0.00	Horizontal	Passed
5.	7.4396894GHz	45.64	7.99	54.00	-8.36	1.00	359.90	Horizontal	Passed
6.	17.832995GHz	53.17	21.55	54.00	-0.83	1.50	0.10	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

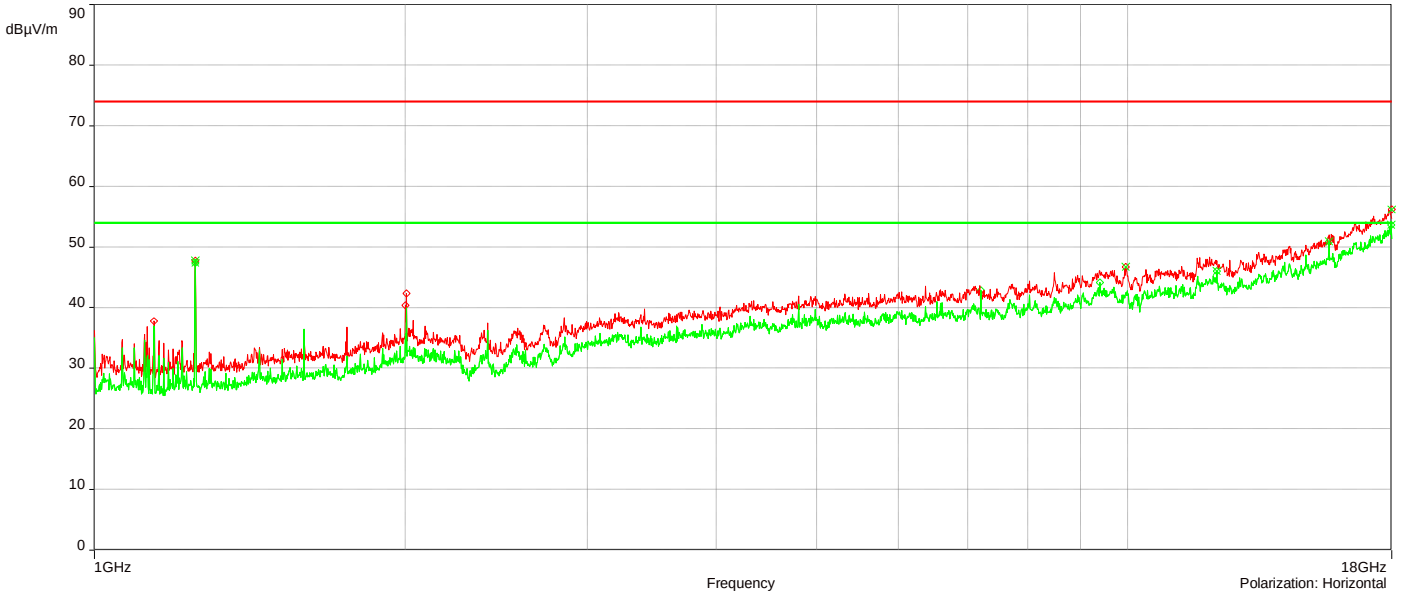
J24179#1_BT_3-DH1_Ch 0_1-18GHz

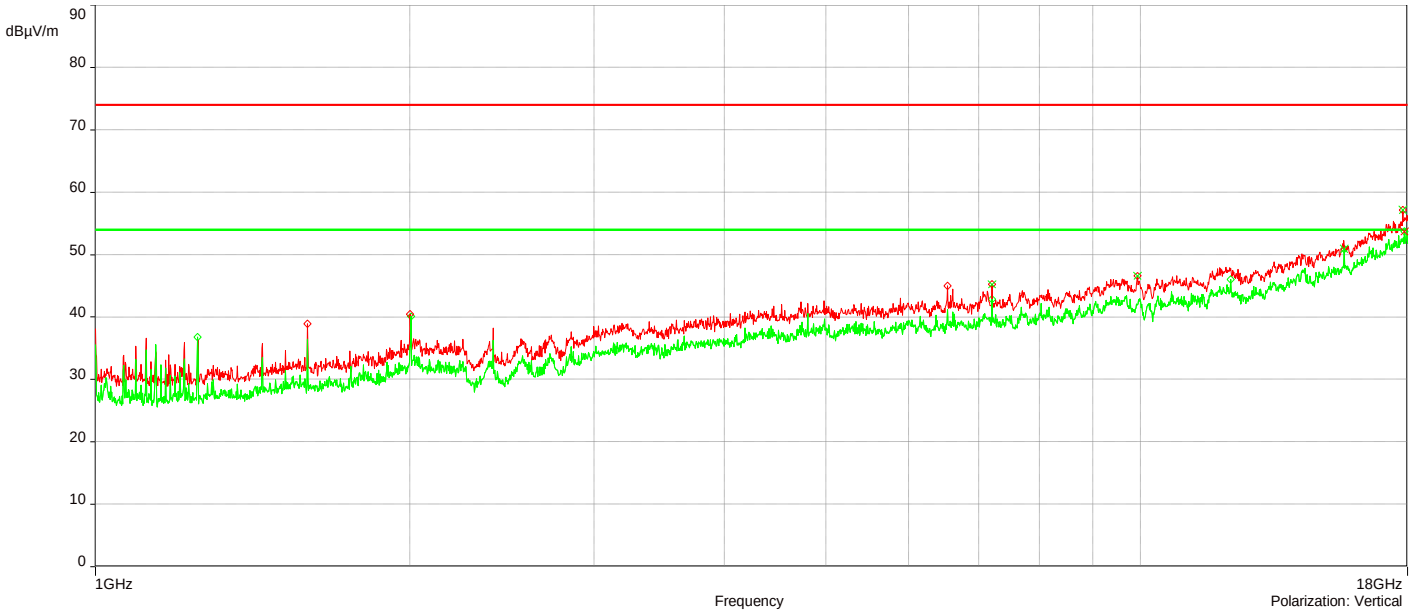
12/11/2024 17:48:42

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	7.2056825GHz	45.30	7.98	74.00	-28.70	1.00	92.20	Vertical	Passed
2.	9.9322627GHz	46.65	10.84	74.00	-27.35	2.50	207.80	Vertical	Passed
3.	17.817995GHz	57.15	21.41	74.00	-16.85	1.00	359.90	Vertical	Passed
4.	1.2515074GHz	47.71	-7.52	74.00	-26.29	2.00	153.50	Horizontal	Passed
5.	9.9557634GHz	46.71	11.07	74.00	-27.29	3.50	251.20	Horizontal	Passed
6.	17.997GHz	56.24	22.36	74.00	-17.76	1.00	50.90	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	15.654431GHz	50.90	17.05	54.00	-3.10	1.50	0.10	Vertical	Passed
2.	17.884997GHz	53.57	21.59	54.00	-0.43	4.00		Vertical	Passed
3.	1.2515074GHz	47.40	-7.52	54.00	-6.60	2.00	153.50	Horizontal	Passed
4.	12.195829GHz	46.06	12.76	54.00	-7.94	2.50	110.90	Horizontal	Passed
5.	15.654431GHz	50.89	17.03	54.00	-3.11	1.50	0.10	Horizontal	Passed
6.	17.978499GHz	52.69	21.94	54.00	-1.31	2.00	0.10	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

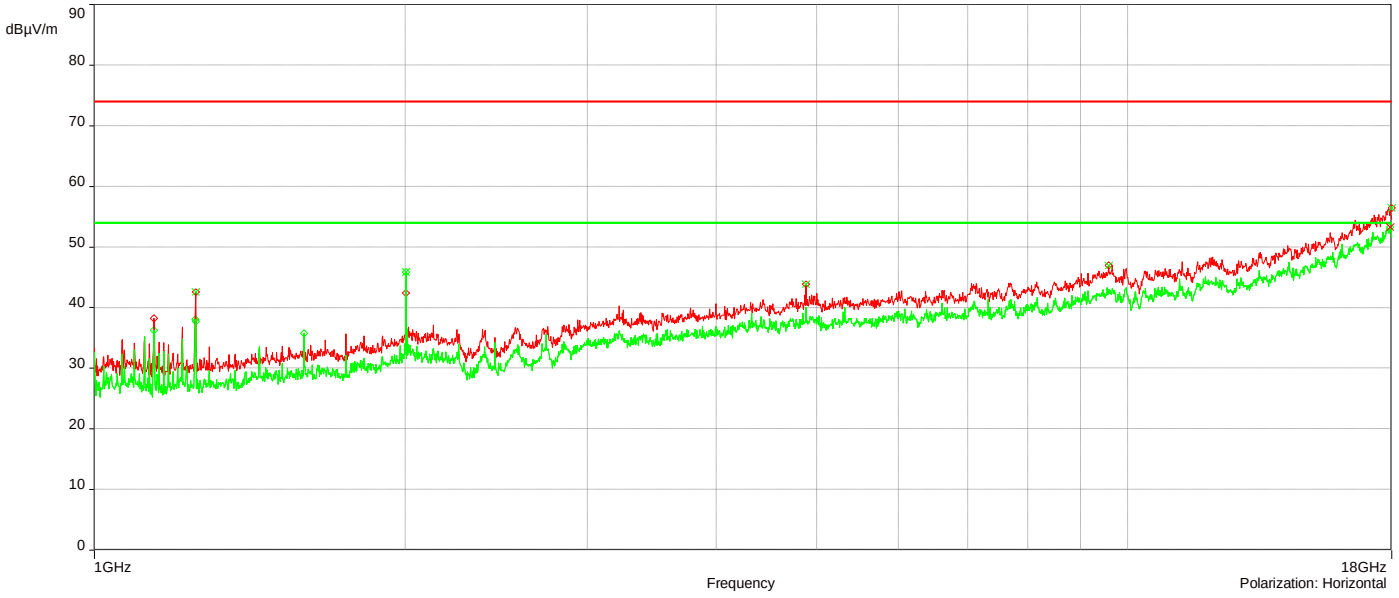
J24179#1_BT_3-DH1_Ch 39_1-18GHz

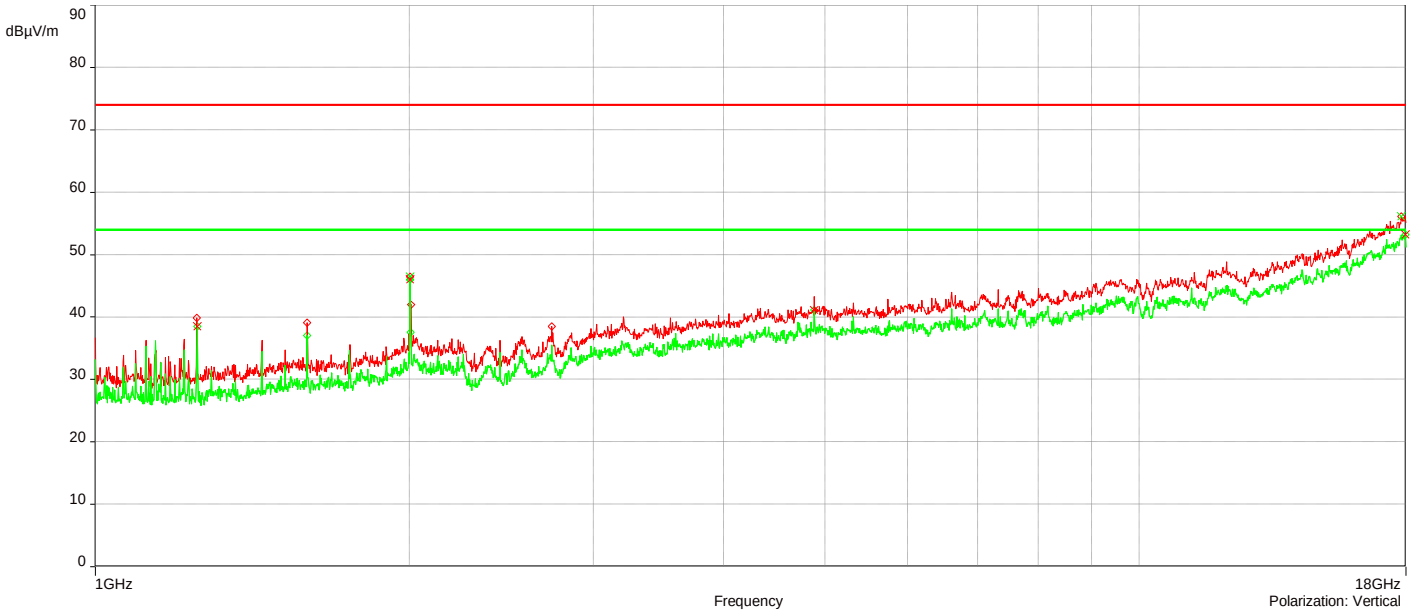
12/11/2024 17:13:39

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.0015295GHz	46.50	-2.15	74.00	-27.50	2.00	184.50	Vertical	Passed
2.	17.811994GHz	56.09	21.39	74.00	-17.91	2.50	139.30	Vertical	Passed
3.	1.2540075GHz	42.62	-7.51	74.00	-31.38	2.00	129.10	Horizontal	Passed
4.	4.8821142GHz	43.92	5.37	74.00	-30.08	1.00	42.80	Horizontal	Passed
5.	9.5827524GHz	47.01	10.25	74.00	-26.99	4.00	278.50	Horizontal	Passed
6.	17.9945GHz	56.47	22.30	74.00	-17.53	1.00	358.10	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	1.2515074GHz	38.48	-7.65	54.00	-15.52	2.50	359.90	Vertical	Passed
2.	2.0015295GHz	46.04	-2.15	54.00	-7.96	2.00	184.50	Vertical	Passed
3.	4.8816142GHz	41.11	5.42	54.00	-12.89	1.50	359.90	Vertical	Passed
4.	17.988GHz	52.78	22.19	54.00	-1.22	3.50	213.20	Vertical	Passed
5.	2.0015295GHz	45.83	-2.37	54.00	-8.17	2.00	0.00	Horizontal	Passed
6.	17.930498GHz	53.28	21.55	54.00	-0.72	1.00	185.20	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

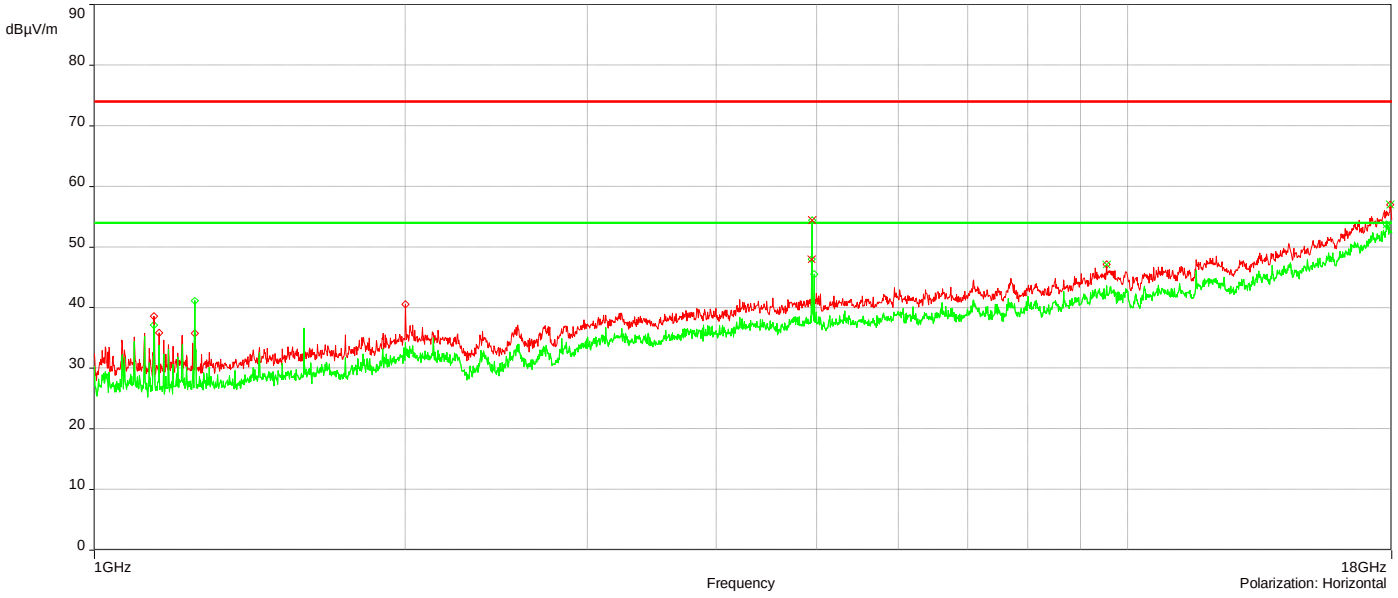
J24179#1_BT_3-DH1_Ch 78_1-18GHz

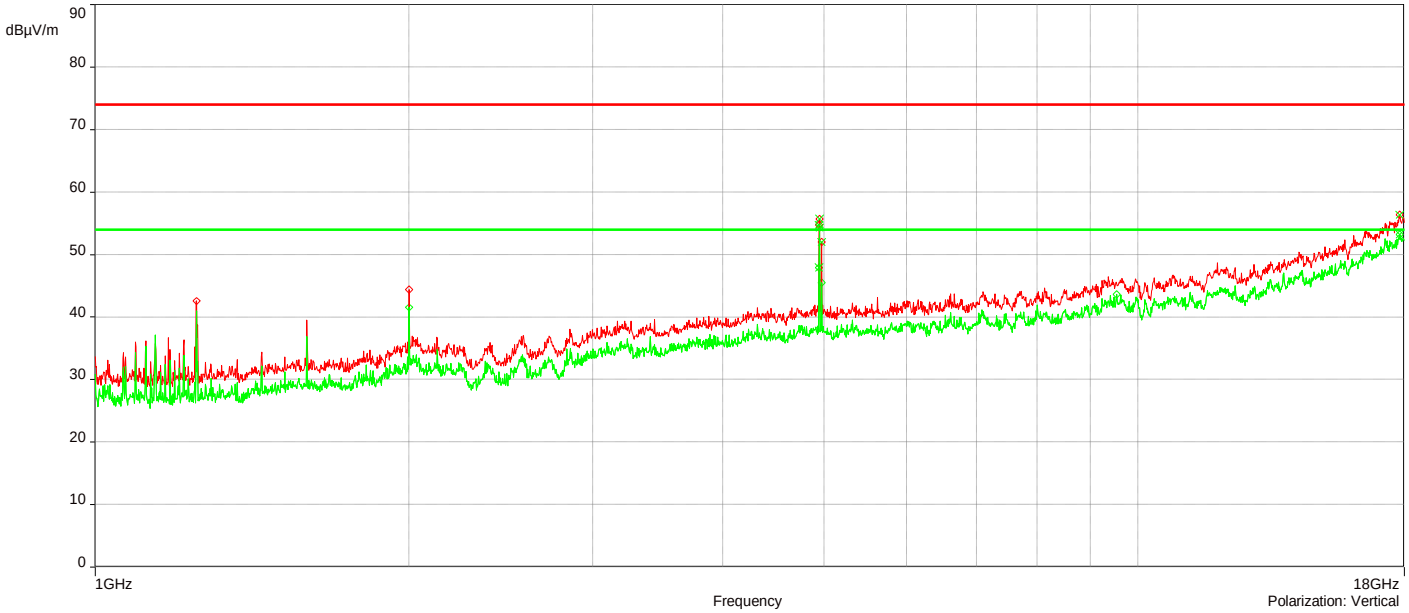
12/11/2024 16:56:51

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	4.9401159GHz	54.77	5.48	74.00	-19.23	2.00	31.10	Vertical	Passed
2.	4.9501162GHz	55.68	5.61	74.00	-18.32	2.00	31.10	Vertical	Passed
3.	4.9741169GHz	52.03	5.77	74.00	-21.97	2.00	31.10	Vertical	Passed
4.	17.814995GHz	56.36	21.40	74.00	-17.64	1.50	248.40	Vertical	Passed
5.	9.5387511GHz	47.11	10.09	74.00	-26.89	3.50	56.80	Horizontal	Passed
6.	17.931498GHz	56.95	21.54	74.00	-17.05	1.00	276.70	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	4.9401159GHz	47.95	5.48	54.00	-6.05	2.00	31.10	Vertical	Passed
2.	4.9501162GHz	34.77	5.61	54.00	-19.23	2.00	31.10	Vertical	Passed
3.	17.813995GHz	52.70	21.40	54.00	-1.30	1.50	275.70	Vertical	Passed
4.	4.9401159GHz	48.01	5.55	54.00	-5.99	2.00	0.00	Horizontal	Passed
5.	4.9501162GHz	34.43	5.69	54.00	-19.57	2.00	0.00	Horizontal	Passed
6.	17.798994GHz	52.63	21.30	54.00	-1.37	3.00	359.90	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
1GHz
Frequency
18GHz
Polarization: Vertical

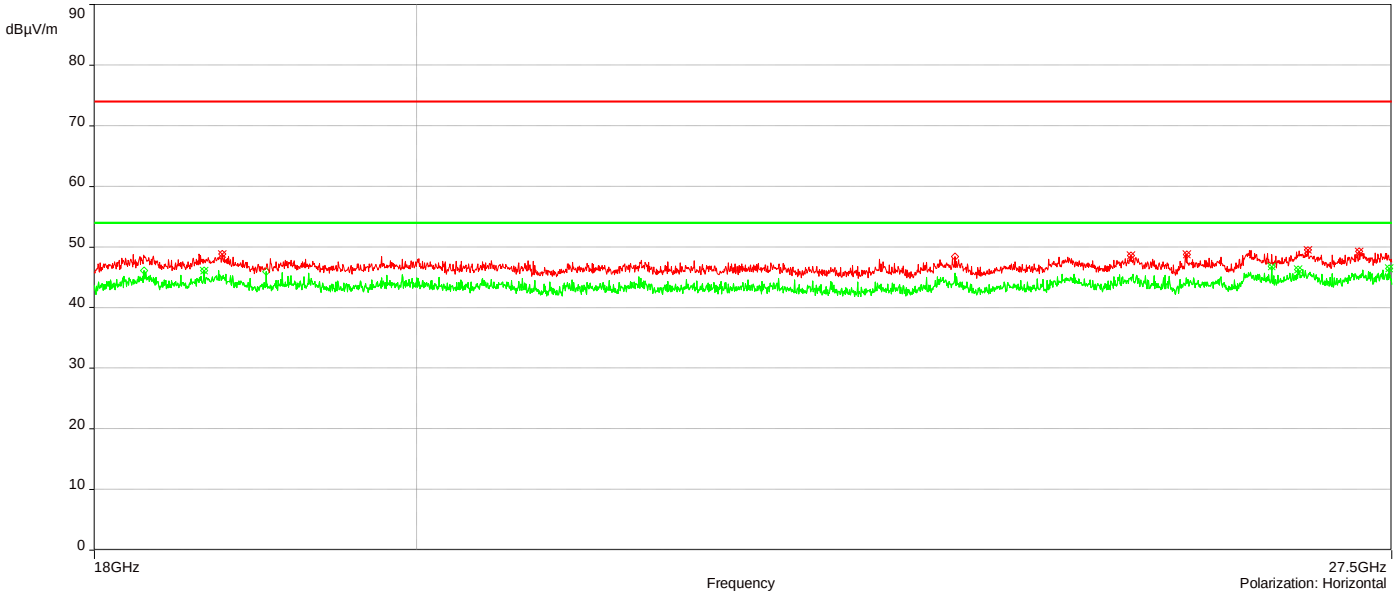
J24179#1_BT_DH1_Ch 0_18-27.5GHz

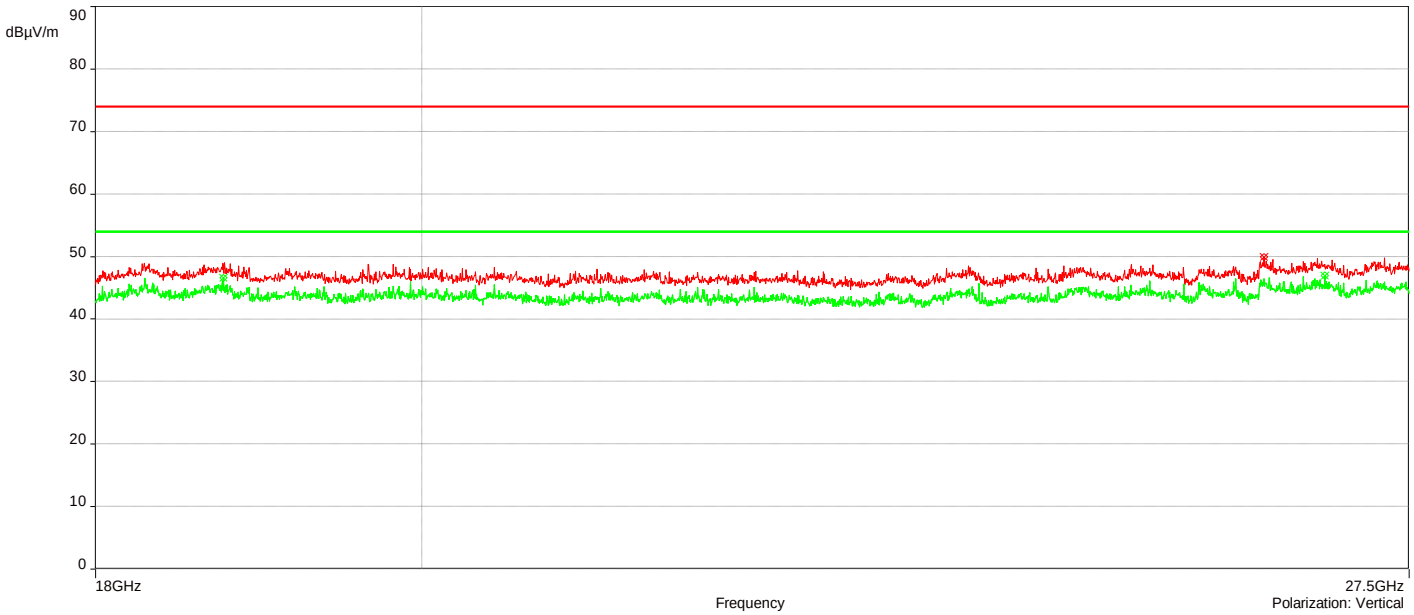
12/16/2024 17:25:58

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	26.242137GHz	49.97	1.21	74.00	-24.03	1.41	247.50	Vertical	Passed
2.	18.768113GHz	48.89	-0.48	74.00	-25.11	1.41	90.10	Horizontal	Passed
3.	25.254563GHz	48.64	0.91	74.00	-25.36	4.00	180.10	Horizontal	Passed
4.	25.719136GHz	48.76	1.75	74.00	-25.24	2.06	45.10	Horizontal	Passed
5.	26.755163GHz	49.51	1.70	74.00	-24.49	2.71	0.10	Horizontal	Passed
6.	27.210711GHz	49.29	1.37	74.00	-24.71	1.40	135.00	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	18.758138GHz	46.64	-0.32	54.00	-7.36	2.91	180.10	Vertical	Passed
2.	26.763713GHz	46.95	1.79	54.00	-7.05	2.23	337.40	Vertical	Passed
3.	18.655533GHz	46.14	0.15	54.00	-7.86	1.03	180.10	Horizontal	Passed
4.	26.442597GHz	46.81	1.38	54.00	-7.19	3.36	225.20	Horizontal	Passed
5.	26.672984GHz	46.33	1.78	54.00	-7.67	2.45	270.10	Horizontal	Passed
6.	27.474824GHz	46.48	1.73	54.00	-7.52	1.18	112.70	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
18GHz
Frequency
27.5GHz
Polarization: Vertical

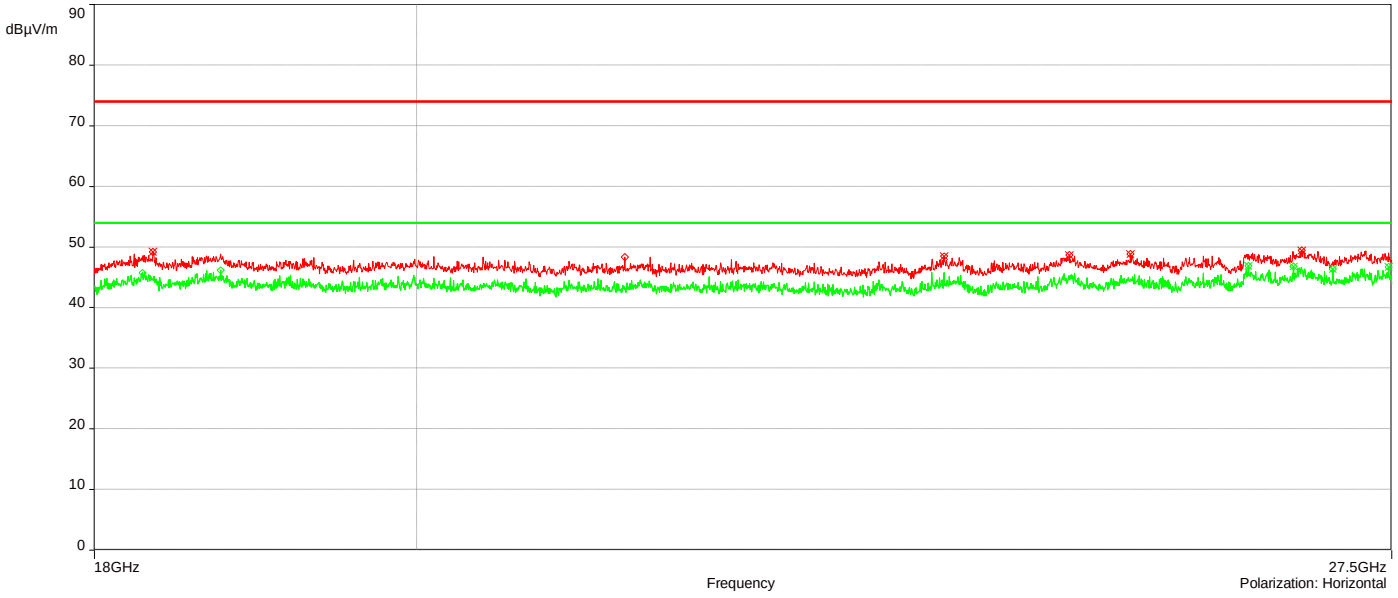
J24179#1_BT_3-DH1_Ch 0_18-27.5GHz

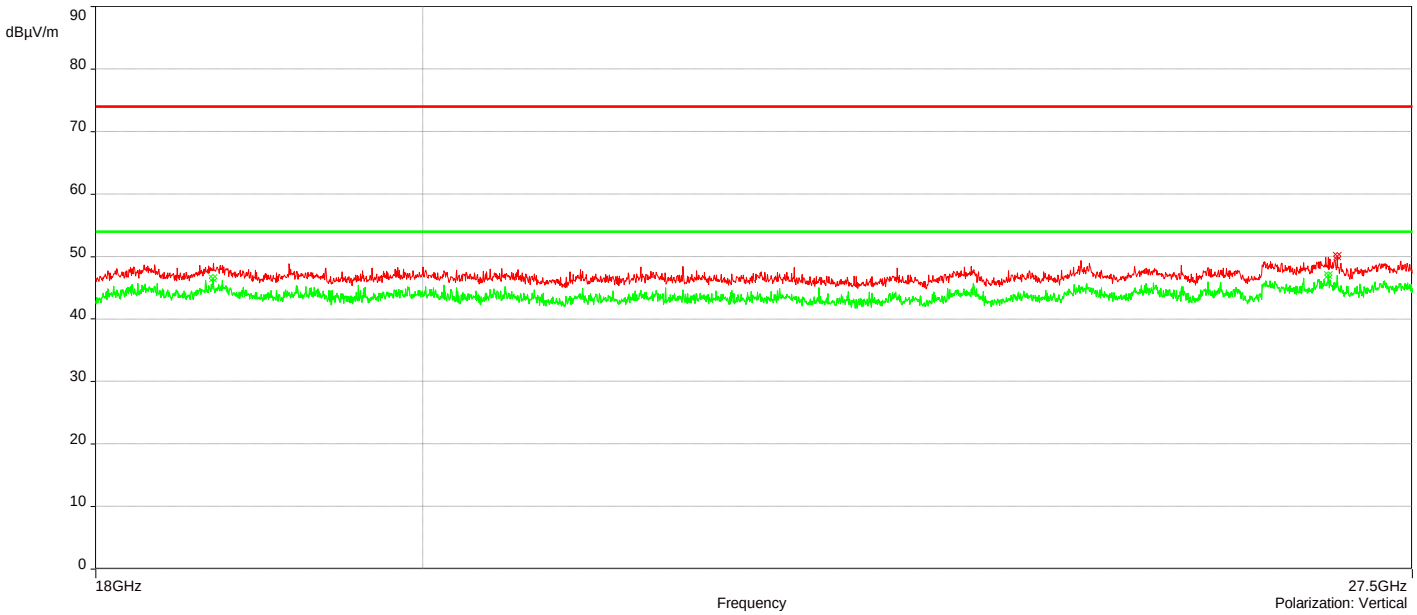
12/16/2024 17:51:29

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	26.844942GHz	50.03	1.75	74.00	-23.97	3.97	67.40	Vertical	Passed
2.	18.348667GHz	49.16	1.30	74.00	-24.84	1.03	247.40	Horizontal	Passed
3.	23.758713GHz	48.49	1.90	74.00	-25.51	4.00	112.40	Horizontal	Passed
4.	24.749137GHz	48.67	1.43	74.00	-25.33	2.45	202.40	Horizontal	Passed
5.	25.250288GHz	48.87	0.90	74.00	-25.13	3.97	112.40	Horizontal	Passed
6.	26.702435GHz	49.43	1.72	74.00	-24.57	4.00	157.40	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	18.69021GHz	46.51	-0.15	54.00	-7.49	1.30	0.10	Vertical	Passed
2.	26.765613GHz	47.03	1.80	54.00	-6.97	1.00	292.40	Vertical	Passed
3.	26.239762GHz	46.89	1.20	54.00	-7.11	3.30	314.90	Horizontal	Passed
4.	26.628806GHz	46.77	1.61	54.00	-7.23	1.33	314.90	Horizontal	Passed
5.	26.977474GHz	46.36	1.26	54.00	-7.64	1.28	202.40	Horizontal	Passed
6.	27.472924GHz	46.75	1.75	54.00	-7.25	3.26	22.40	Horizontal	Passed

Overall Graphs:




dBµV/m
90
80
70
60
50
40
30
20
10
0
18GHz
Frequency
27.5GHz
Polarization: Vertical

J24179#1_Restricted Bandedge_BT Classic_DH1_Ch 0

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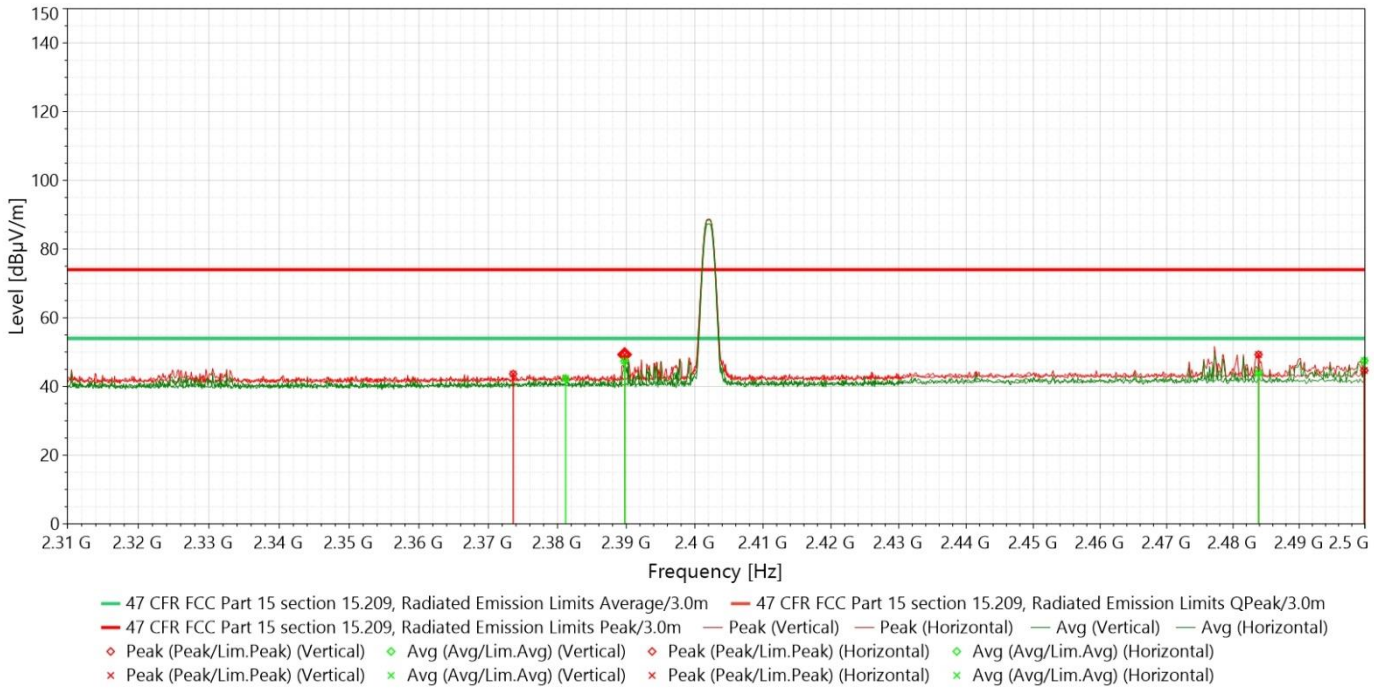
No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3897449GHz	49.28	-2.43	74.00	-24.72	2.27	269.90	Vertical	Passed
2.	2.4838419GHz	49.28	-1.86	74.00	-24.72	2.62	269.90	Vertical	Passed
3.	2.3735868GHz	43.65	-2.50	74.00	-30.35	1.38	224.90	Horizontal	Passed
4.	2.499905GHz	44.67	-1.84	74.00	-29.33	4.00	157.40	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3897449GHz	47.43	-2.43	54.00	-6.57	2.27	269.90	Vertical	Passed
2.	2.4999050GHz	47.53	-1.83	54.00	-6.47	2.44	269.90	Vertical	Passed
3.	2.3811906GHz	42.32	-2.46	54.00	-11.68	1.00	314.90	Horizontal	Passed
4.	2.4838419GHz	43.90	-1.87	54.00	-10.10	3.69	314.90	Horizontal	Passed

Overall Graphs:



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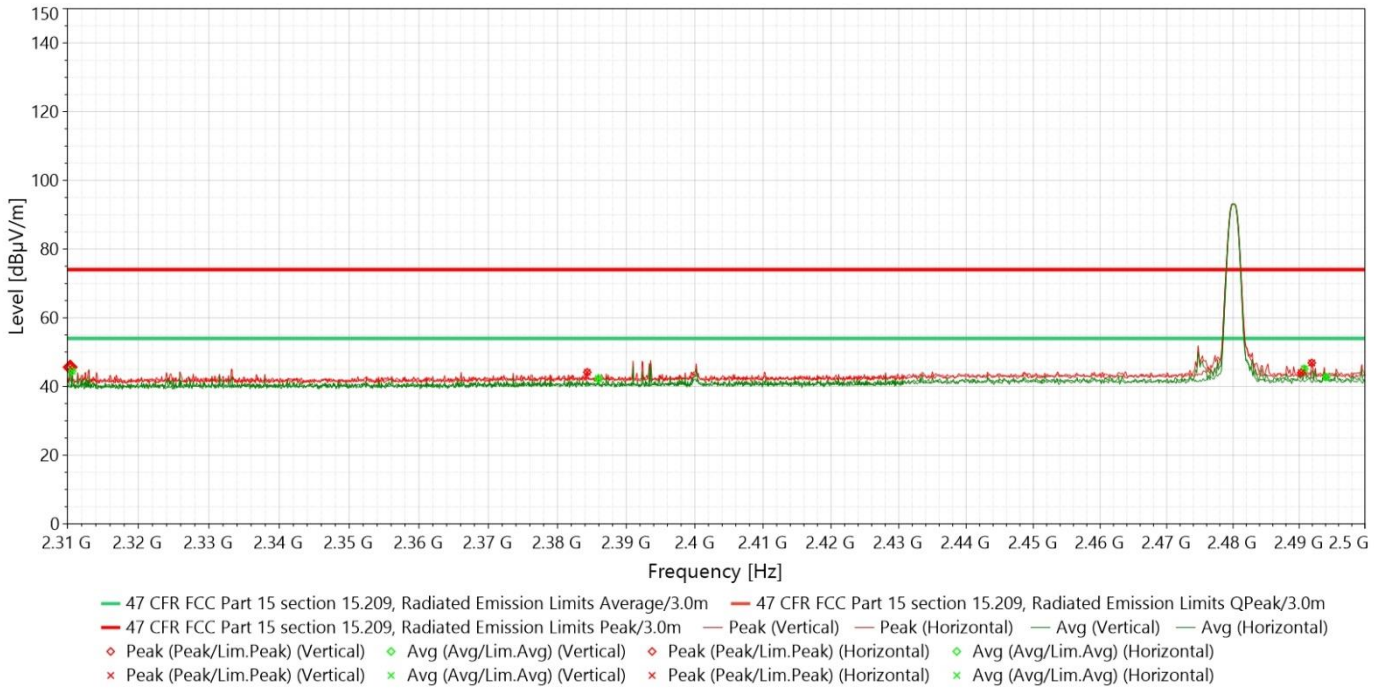
No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3103802GHz	45.63	-2.78	74.00	-28.37	1.20	269.10	Vertical	Passed
2.	2.491921GHz	46.87	-1.83	74.00	-27.13	2.64	269.10	Vertical	Passed
3.	2.3843272GHz	44.14	-2.45	74.00	-29.86	3.41	314.10	Horizontal	Passed
4.	2.4903052GHz	44.03	-1.82	74.00	-29.97	1.75	111.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3106653GHz	44.45	-2.78	54.00	-9.55	2.19	269.10	Vertical	Passed
2.	2.4907804GHz	45.16	-1.82	54.00	-8.84	2.37	269.10	Vertical	Passed
3.	2.385943GHz	42.28	-2.44	54.00	-11.72	1.00	89.00	Horizontal	Passed
4.	2.4941071GHz	42.75	-1.84	54.00	-11.25	3.06	44.10	Horizontal	Passed

Overall Graphs:



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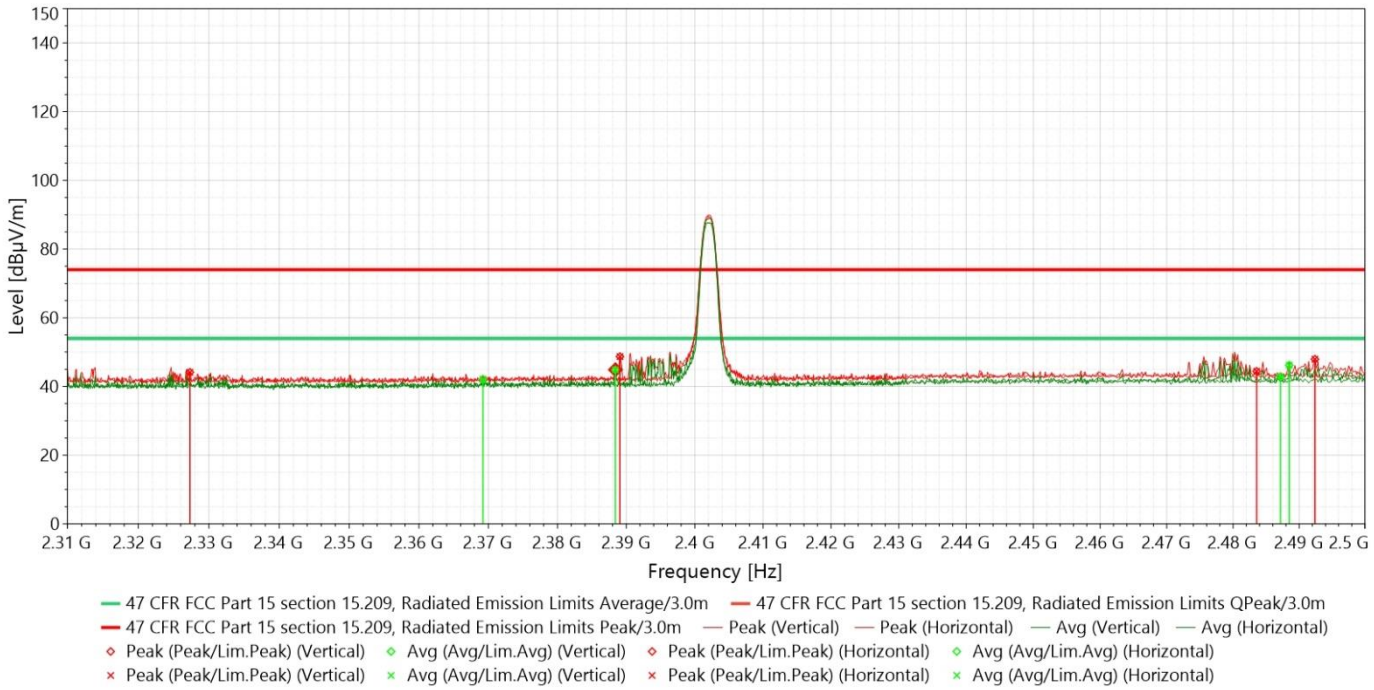
No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3890795GHz	48.69	-2.43	74.00	-25.31	1.02	269.90	Vertical	Passed
2.	2.4923962GHz	47.94	-1.83	74.00	-26.06	2.56	269.90	Vertical	Passed
3.	2.3272986GHz	44.13	-2.82	74.00	-29.87	3.42	314.90	Horizontal	Passed
4.	2.4835568GHz	44.43	-1.87	74.00	-29.57	2.77	314.90	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3884142GHz	44.87	-2.43	54.00	-9.13	2.01	269.90	Vertical	Passed
2.	2.4884992GHz	46.20	-1.83	54.00	-7.80	2.38	269.90	Vertical	Passed
3.	2.3692146GHz	42.09	-2.54	54.00	-11.91	3.97	269.90	Horizontal	Passed
4.	2.4871686GHz	42.90	-1.84	54.00	-11.10	1.74	292.40	Horizontal	Passed

Overall Graphs:



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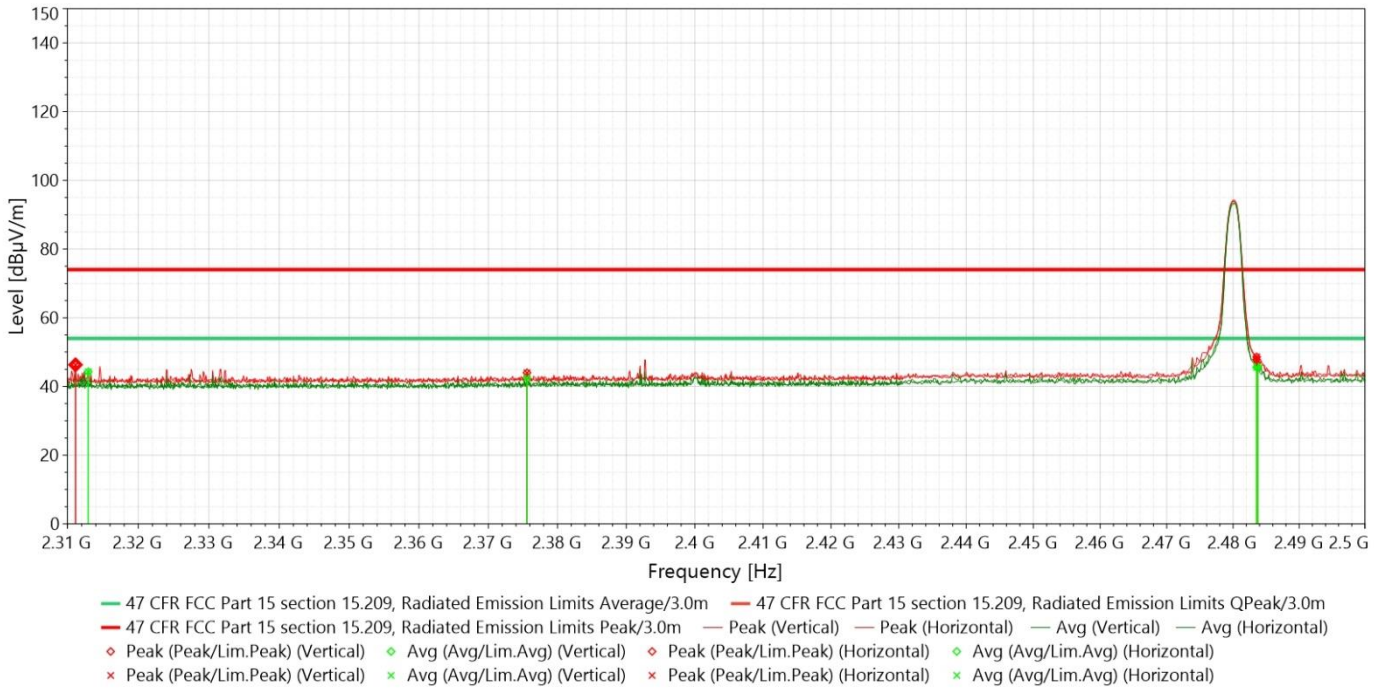
No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3111406GHz	46.31	-2.78	74.00	-27.69	2.19	269.10	Vertical	Passed
2.	2.4835568GHz	48.61	-1.87	74.00	-25.39	1.30	224.10	Vertical	Passed
3.	2.3755828GHz	43.98	-2.48	74.00	-30.02	1.74	21.70	Horizontal	Passed
4.	2.4835568GHz	47.84	-1.87	74.00	-26.16	1.29	336.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3129465GHz	44.30	-2.78	54.00	-9.70	1.39	269.10	Vertical	Passed
2.	2.4837469GHz	45.76	-1.86	54.00	-8.24	1.11	134.00	Vertical	Passed
3.	2.3755828GHz	42.55	-2.48	54.00	-11.45	1.74	21.70	Horizontal	Passed
4.	2.4835568GHz	45.61	-1.87	54.00	-8.39	1.29	336.60	Horizontal	Passed

Overall Graphs:



Document Revisions

Version	Date	Modifier	Changes
1.0	1/06/2025	Sharon Spratt	• Initial Release
2.0	03/19/2025	Aravind Buddana	• Added a Note in Section 4.3 under Test Equipment table on conducted tests completion date to avoid discrepancies on over testing completion date indicated on cover page.

End of Report