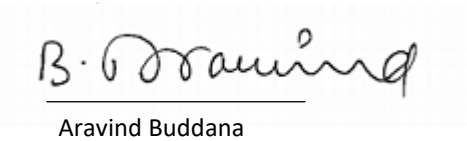
Regulatory Test Report

Prepared for Harman International Industries, Inc.

This report presents detailed information on

R1 EXT NA 2B HW4

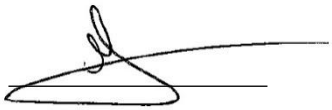
Prepared by



Aravind Buddana

Engineer II

Approved by



Jason Kanakry

General Manager

Issue date: 01/25/2025

Report No: J23133-R1 EXT NA 2B HW4-TR1 v2

Contents

1. Test Request Information

Test Request #:	7700206789
Test Requested By:	Pranav Patel Harman International Industries, Inc. 30001 Cabot Drive, Novi, MI 48377
Test item Description:	R1 EXT NA 2B HW4
Part Number:	P68583503ZZ
DUT Sample Number:	J23133#3 NA 2B
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-BE2879
ISED ID:	6434C-BE2879
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, FCC KDB 558074 D01 15.247 Measurement Guidance v05r02 and ANSI C63.10-2013
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:	07-25-2024
Date Test Finished:	10-25-2024

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 1.43dBi 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 EXT NA 2B HW4** a direct sequence spread spectrum transmitter that operates in the 2412-2462MHz frequency range.

Details	Description
Frequency Range (MHz)	2412 – 2462
Tested Modes	802.11b, 802.11g, 802.11n (HT20).
Number of Channels	11
Tested Channels	1, 6 ,11
DUT Antenna Type	Integrated PCB antenna
Number of transmit Chains	1
Equipment Type	Equipment with wideband modulation other than frequency hopping
DUT Antenna Gain	1.43dBi ☒ Provided by Customer with Gain Report ☐ Not Provided by Customer
DUT/EUT Operation	EUT is configured/programmed by an External Test Laptop with USB and Ethernet interfaces to set WLAN Test Mode, data rates, channels, bandwidth, band configurations etc., using labtool (MFGBridge_Tool).

Channels and Frequency

Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	**2412**	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	**11**	**2462**
5	2432		
6	**2437**		
7	2442		

Notes:

1. Channels marked bold were tested.
2. Output power measurements performed at the lowest and highest data rate of each supported 802.11 mode.
3. Worst-case modulations 802.11g and 802.11n are selected for full testing.

Power Settings

802.11b		802.11g	
Channel	**Power Setting**	**Channel**	**Power Setting**
1	8	**1**	8
6	8	**6**	8
11	8	**11**	8
802.11n (HT20)			
Channel	**Power Setting**		
1	7		
6	7		
11	7		

Test Results

Test	Frequency (MHz)	802.11b	802.11g	802.11n (HT20)
RF Output Power	**2412/2437/2462**	PASS	PASS	PASS
Power Spectral Density	**2412/2437/2462**	PASS	PASS	PASS
DTS Bandwidth (6dB)	**2412/2437/2462**	PASS	PASS	PASS
Occupied Channel Bandwidth 99%	**2412/2437/2462**	PASS	PASS	PASS
Band Edges Low	**2412**	PASS	PASS	PASS
Band Edges High	**2462**	PASS	PASS	PASS
Conducted Spurious Emissions	**2412/2437/2462**	PASS	PASS	PASS

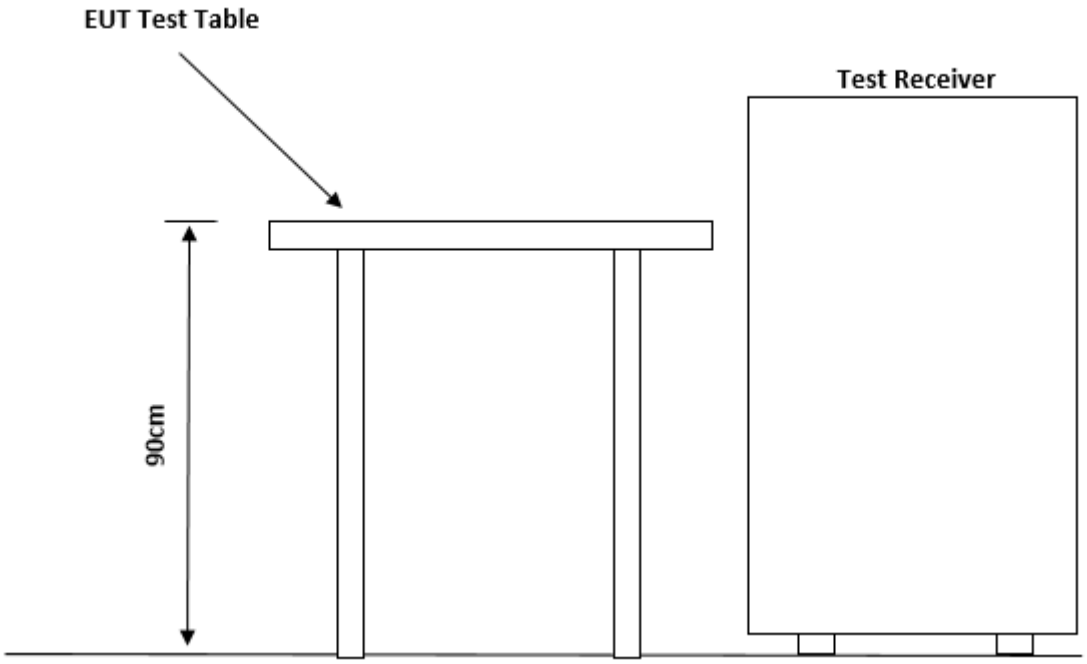
We found that the product met the requirements. Test samples received in good condition and remains good and functional post testing.

Test Item	Sample #	Result
FCC 15.247 2.4G WLAN	J23133#3 NA 2B	Meets Requirements

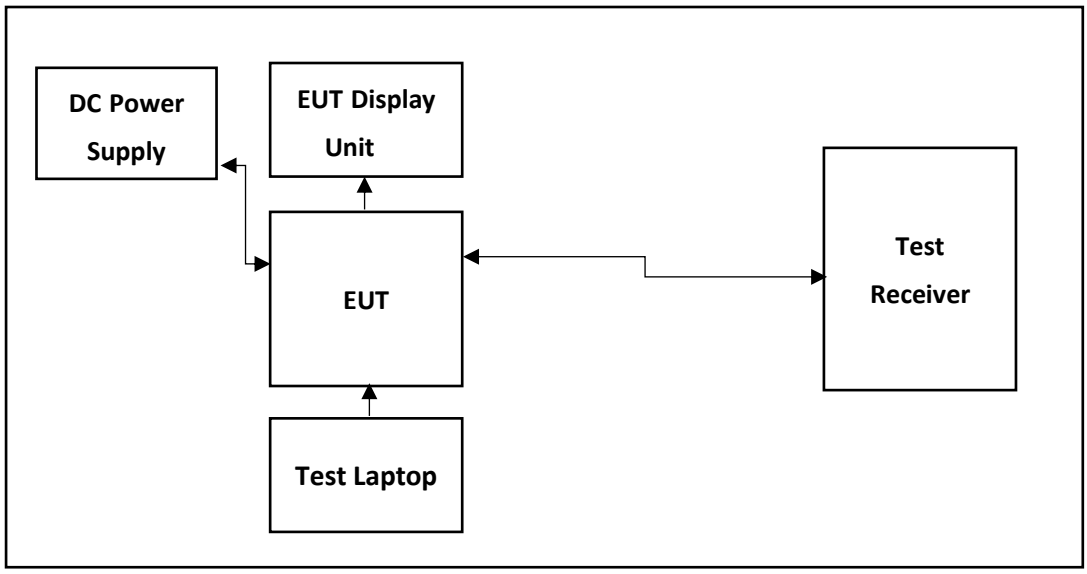
4.2 Test Setup

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	11/17/2024
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.

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 RF 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 11.9.2.3.2, RSS-247 5.4 (d)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.

Expanded Combined Uncertainty of absolute Level Measurement (K=2) < 1 dB

802.11b

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)	Power Setting
1 Mbps	6.484	6.564	4.819	30	99.887	8

802.11g

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)	Power Setting
6 Mbps	6.884	7.163	5.508	30	98.866	8

802.11n (HT20)

Data Rate	Gated RMS (dBm) 2412 MHz	Gated RMS (dBm) 2437 MHz	Gated RMS (dBm) 2462 MHz	Limit (dBm)	Duty Cycle (%)	Power Setting
MCS0	7.014	7.326	6.044	30	98.793	7

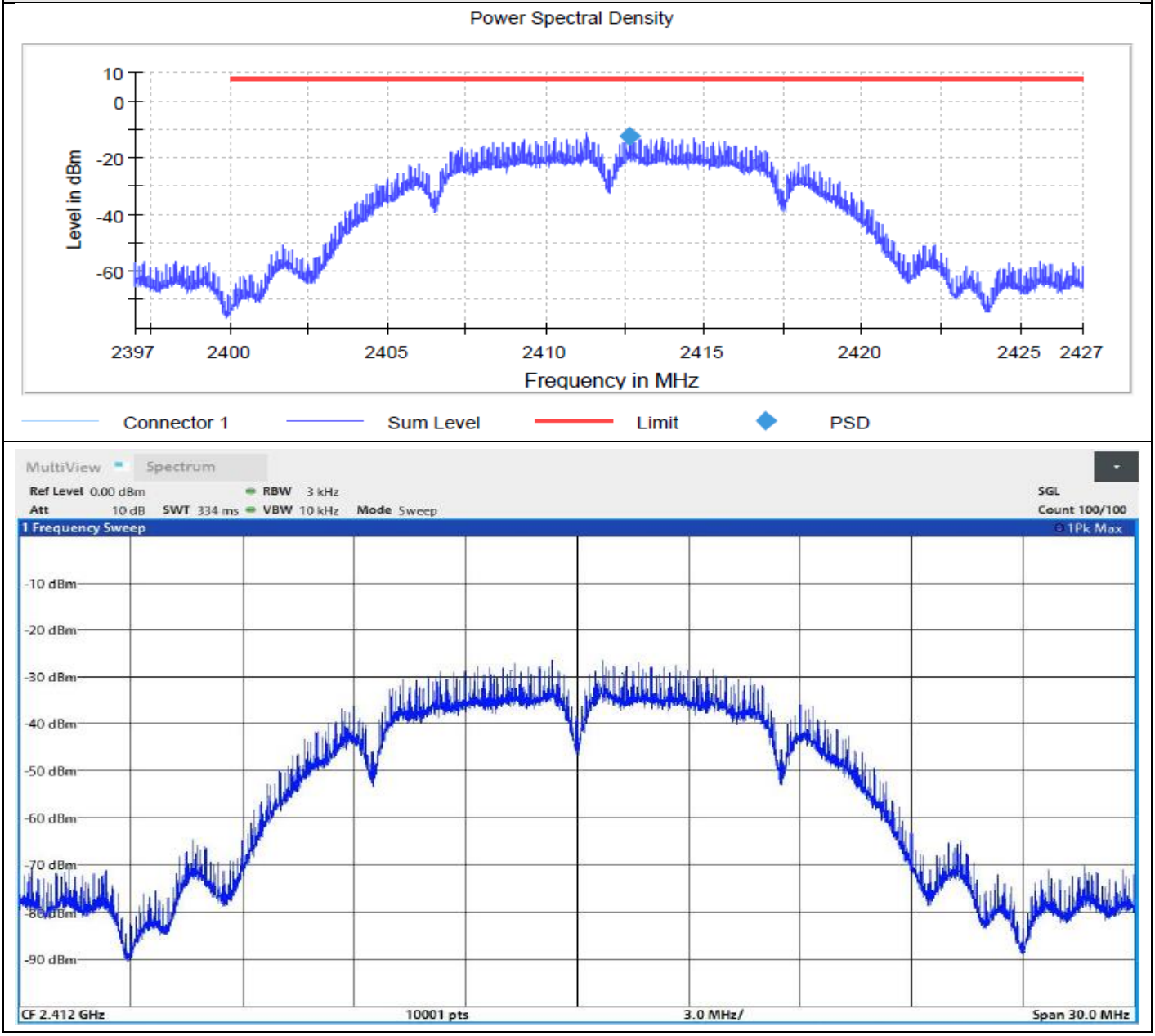
4.4.2 Power Spectral Density

Test according to FCC title 47 part 15 §15.247(e), KDB 558074 D01 DTS Meas Guidance v05r02 F and ANSI C63.10-2013 Section 11.10.2, RSS-247 5.2 (b)

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.3 dB

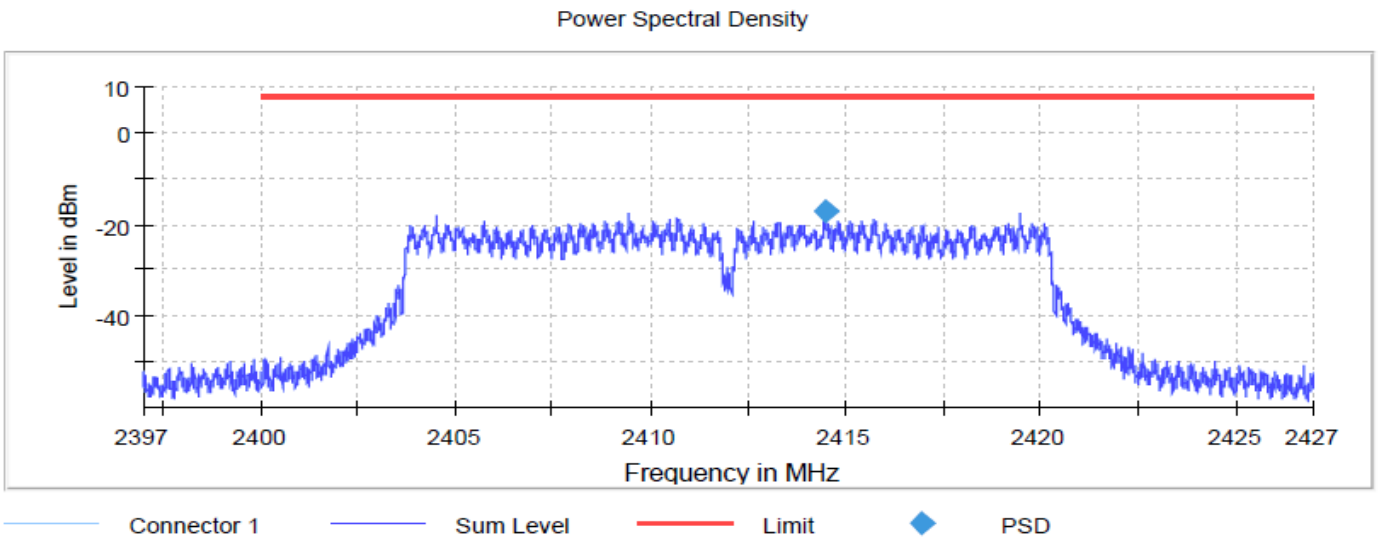
Mode	Data Rate	PSD (dBm) 2412 MHz	PSD (dBm) 2437 MHz	PSD (dBm) 2462 MHz	Limit (dBm)
802.11b	1 Mbps	-12.303	-11.928	-13.825	8.0

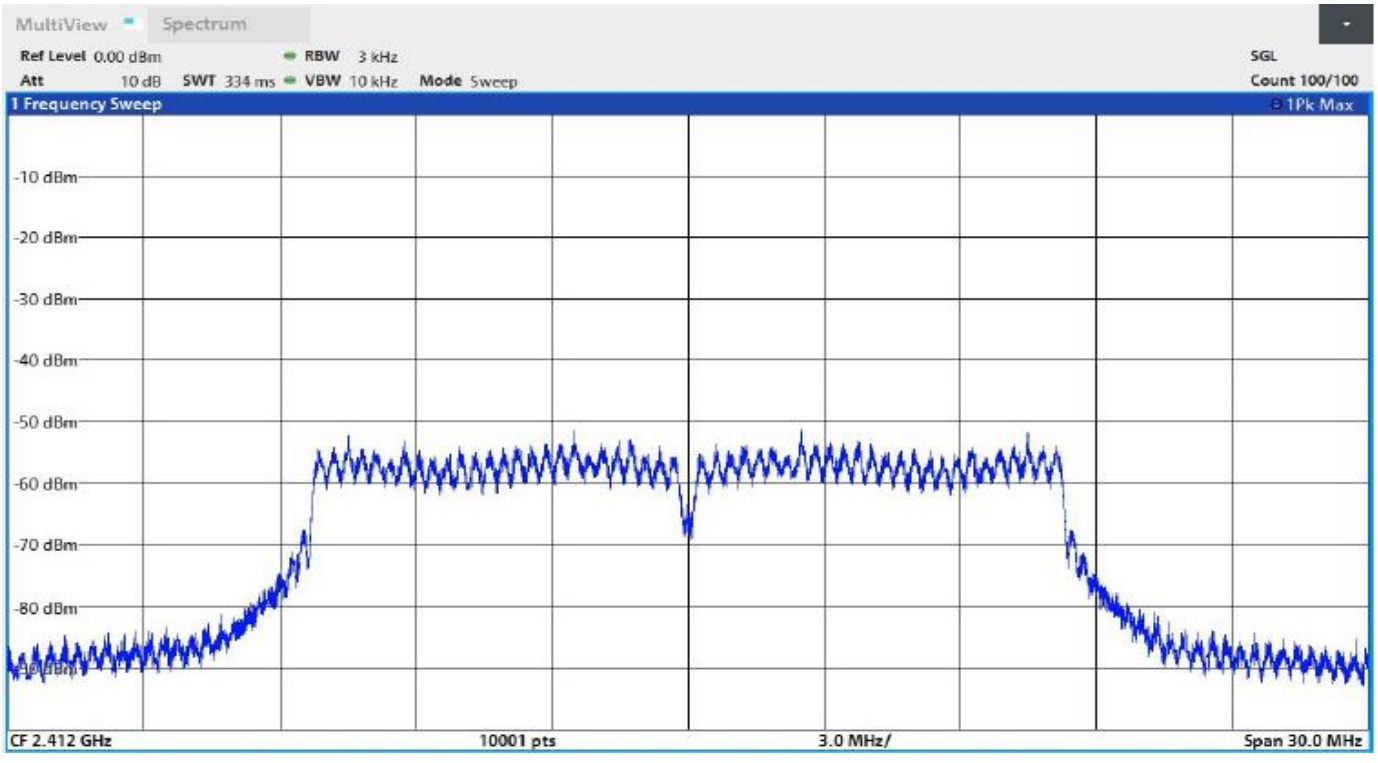
802.11b 2412MHz 1Mbps



Mode	Data Rate	PSD (dBm) 2412 MHz	PSD (dBm) 2437 MHz	PSD (dBm) 2462 MHz	Limit (dBm)
802.11g	6 Mbps	-17.126	-17.357	-18.899	8.0

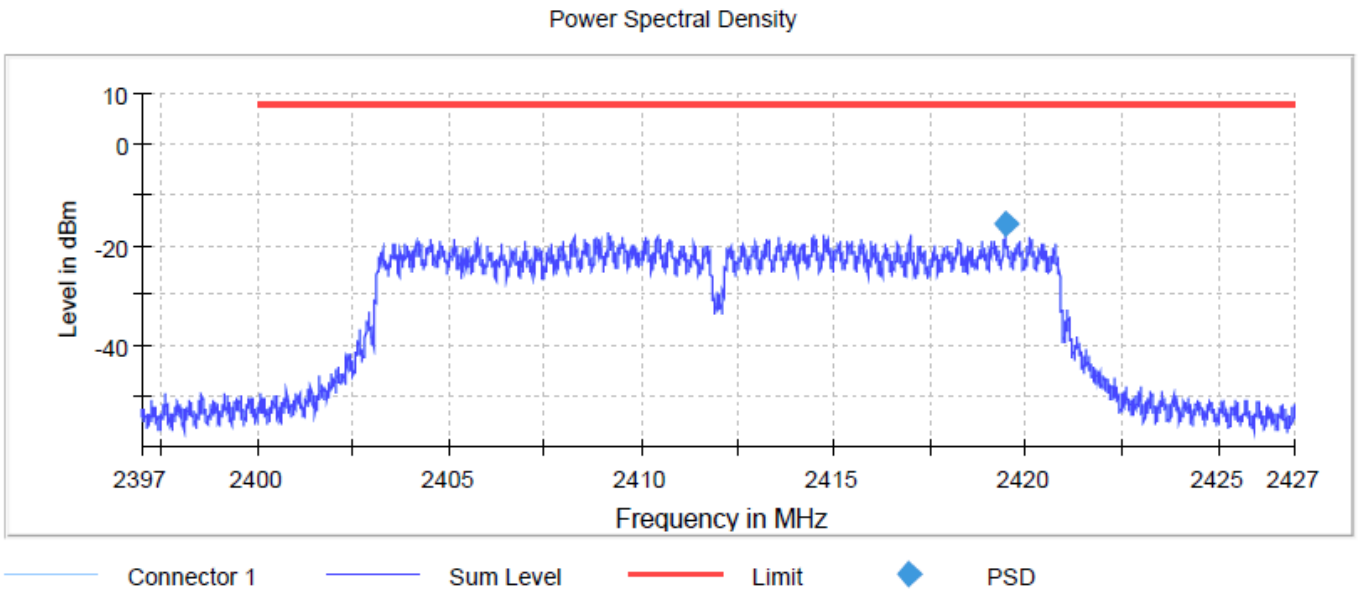
802.11g 2412MHz 6Mbps

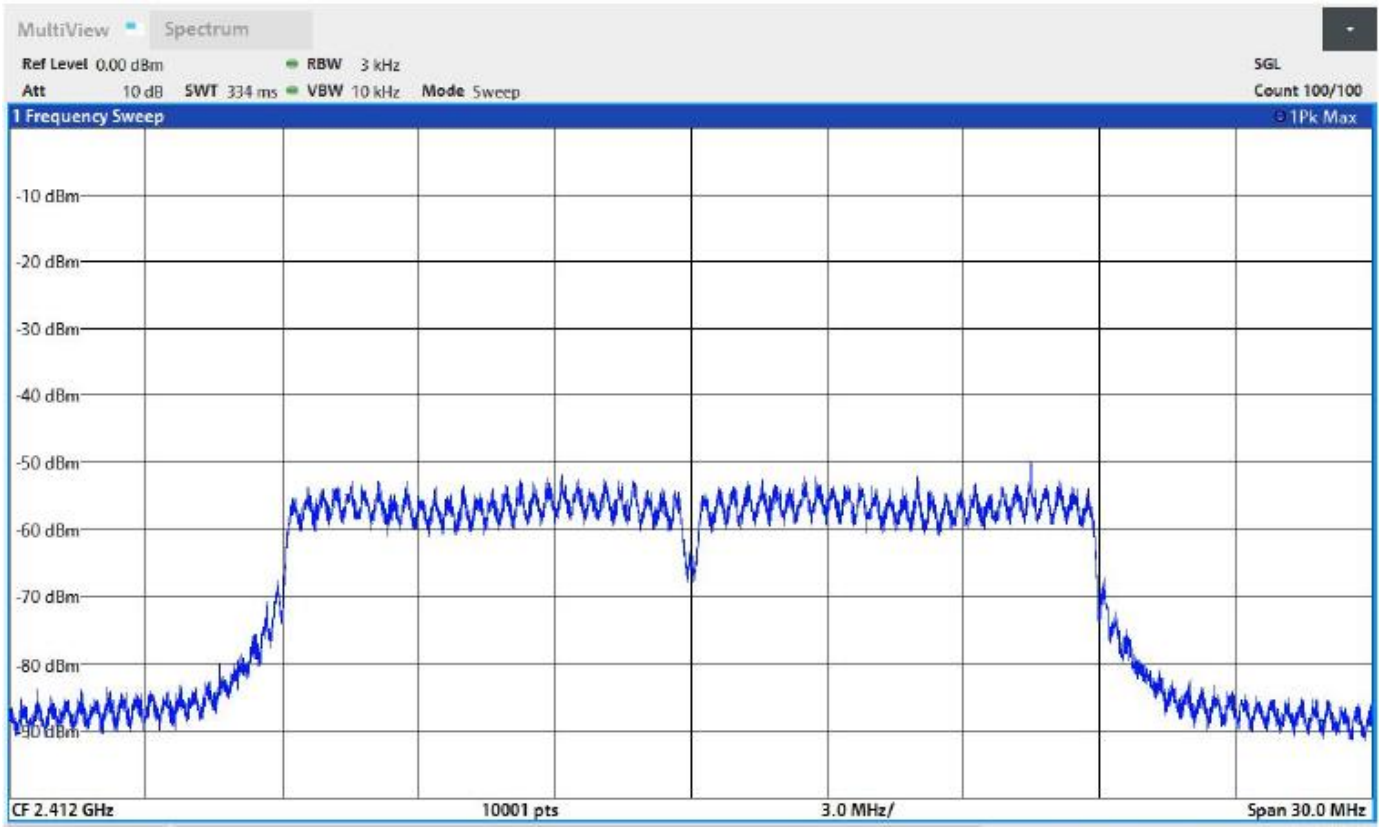




Mode	Data Rate	PSD (dBm) 2412 MHz	PSD (dBm) 2437 MHz	PSD (dBm) 2462 MHz	Limit (dBm)
802.11n	**MCS0**	-15.598	-15.361	-17.220	8.0

802.11n (HT20) 2412MHz MCS0





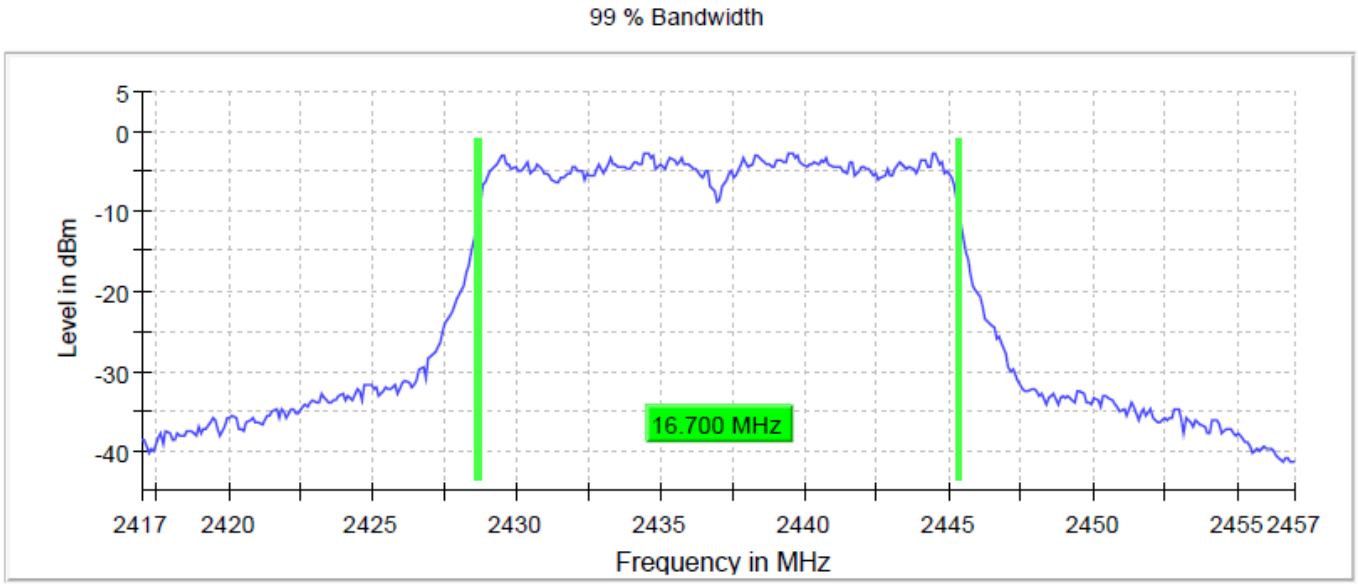
4.4.3 Occupied Channel Bandwidth

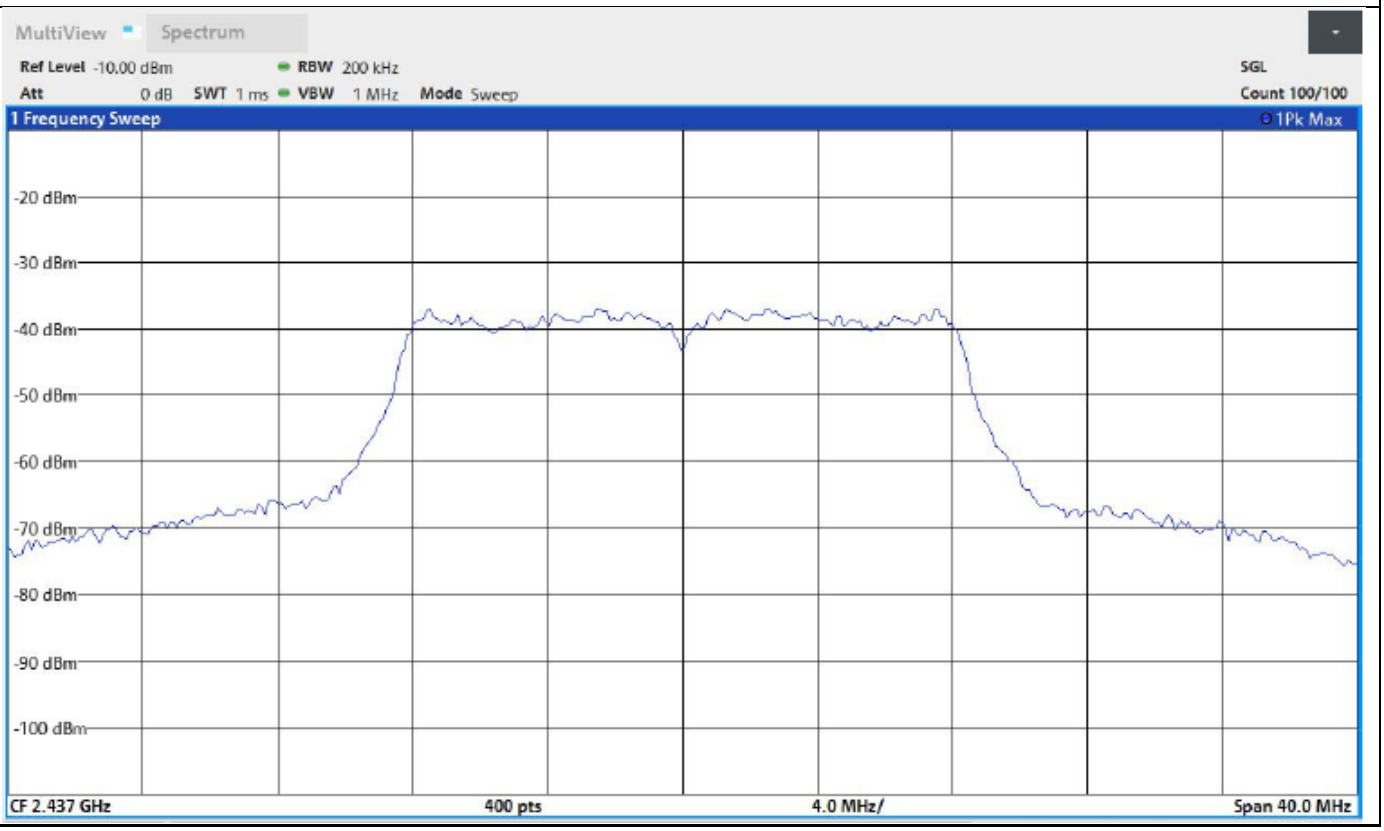
Test according to RSS-GEN Section 6.7, KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 Section 6.9.3

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

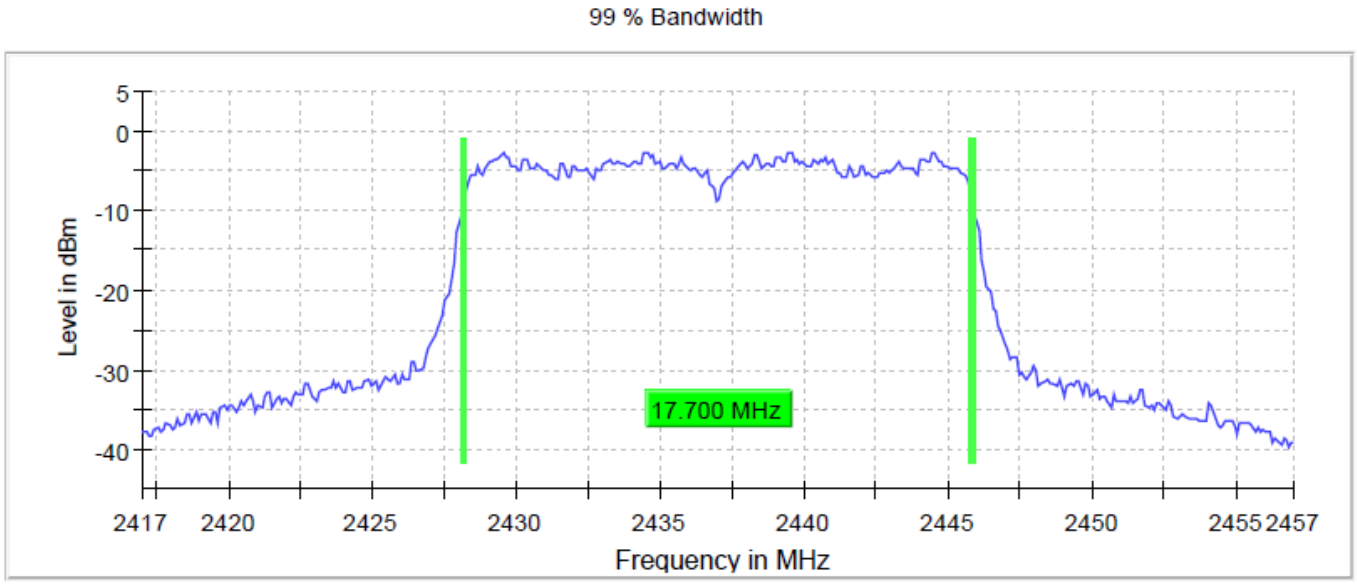
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
802.11b 1Mbps	2412.000000	13.300000	2405.350000	2418.650000
802.11g 6Mbps	2412.000000	16.700000	2403.650000	2420.350000
802.11n (HT20) MCS0	2412.000000	17.700000	2403.150000	2420.850000
802.11b 1Mbps	2437.000000	13.300000	2430.350000	2443.650000
802.11g 6Mbps	2437.000000	16.700000	2428.650000	2445.350000
802.11n (HT20) MCS0	2437.000000	17.700000	2428.150000	2445.850000
802.11b 1Mbps	2462.000000	13.300000	2455.350000	2468.650000
802.11g 6Mbps	2462.000000	16.700000	2453.650000	2470.350000
802.11n (HT20) MCS0	2462.000000	17.700000	2453.150000	2470.850000

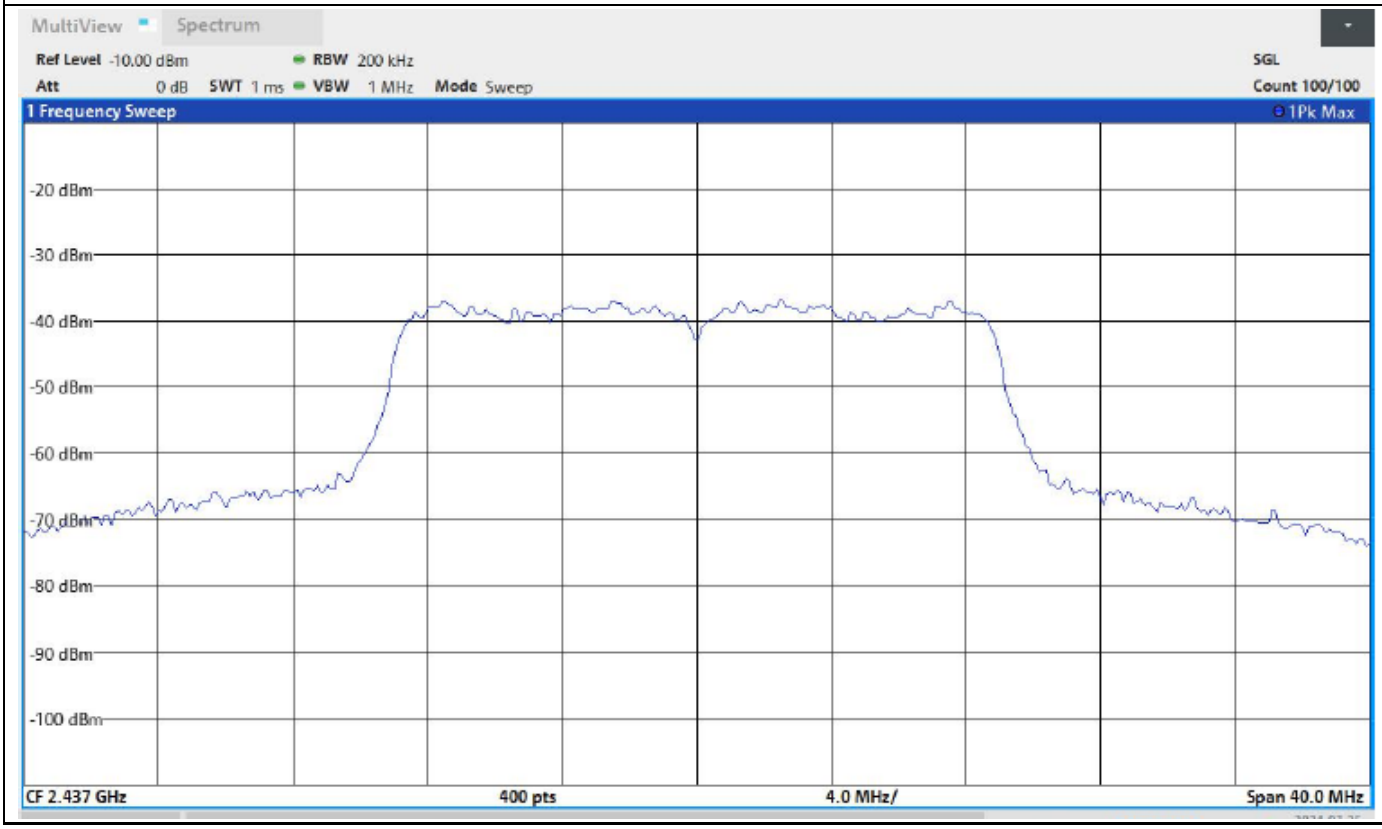
802.11g 6Mbps 2437MHz





802.11n MCS0 2437MHz





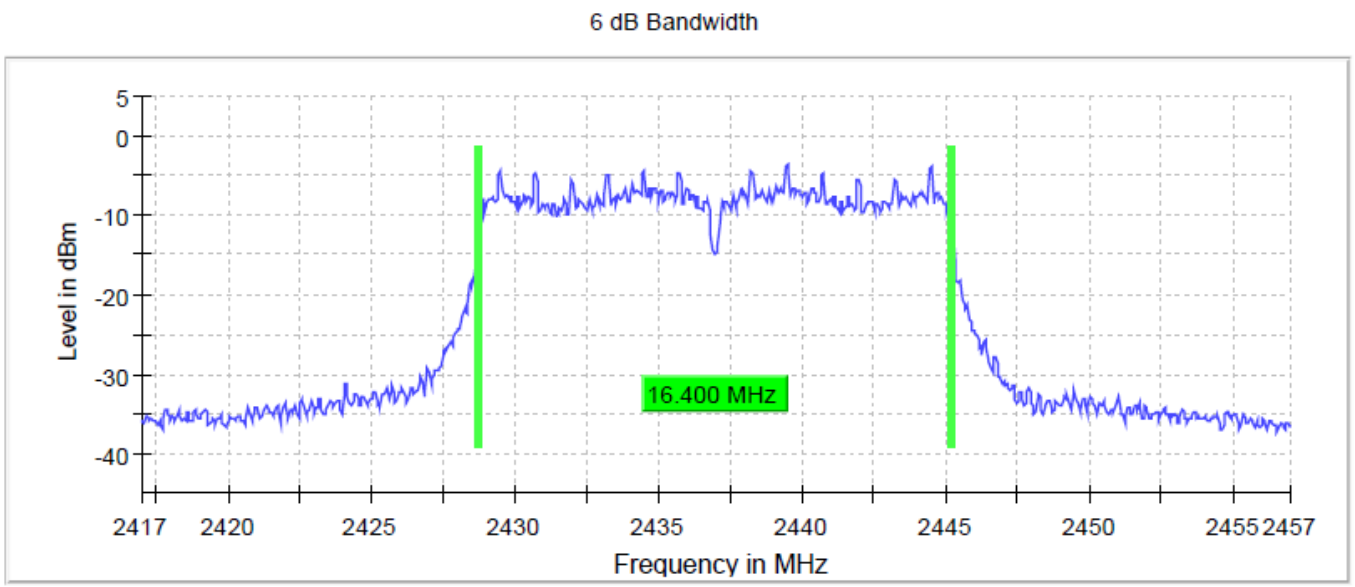
4.4.4 DTS Bandwidth (6dB)

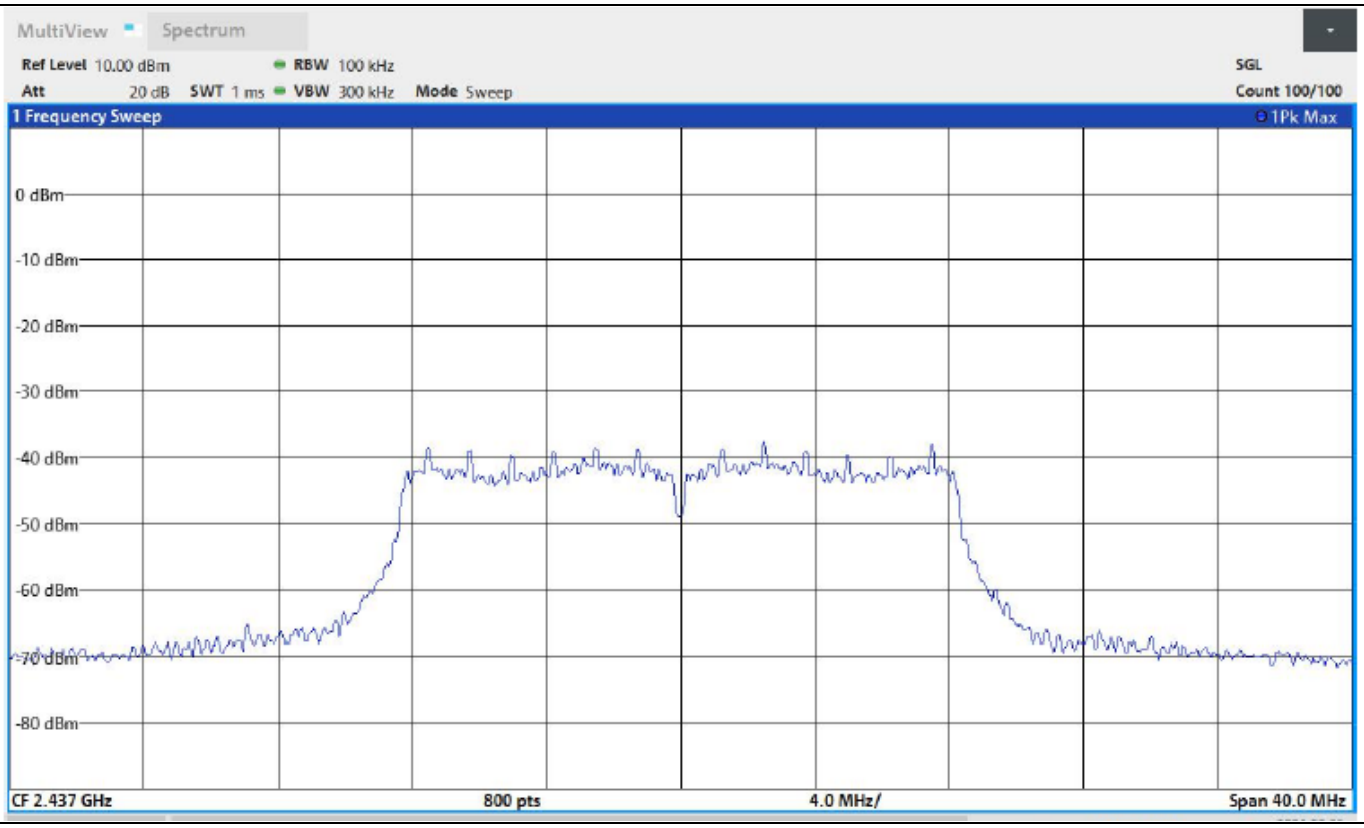
Definition: Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v05r02 and ANSI C63.10-2013 11.8.1, RSS-247 5.2(a)

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

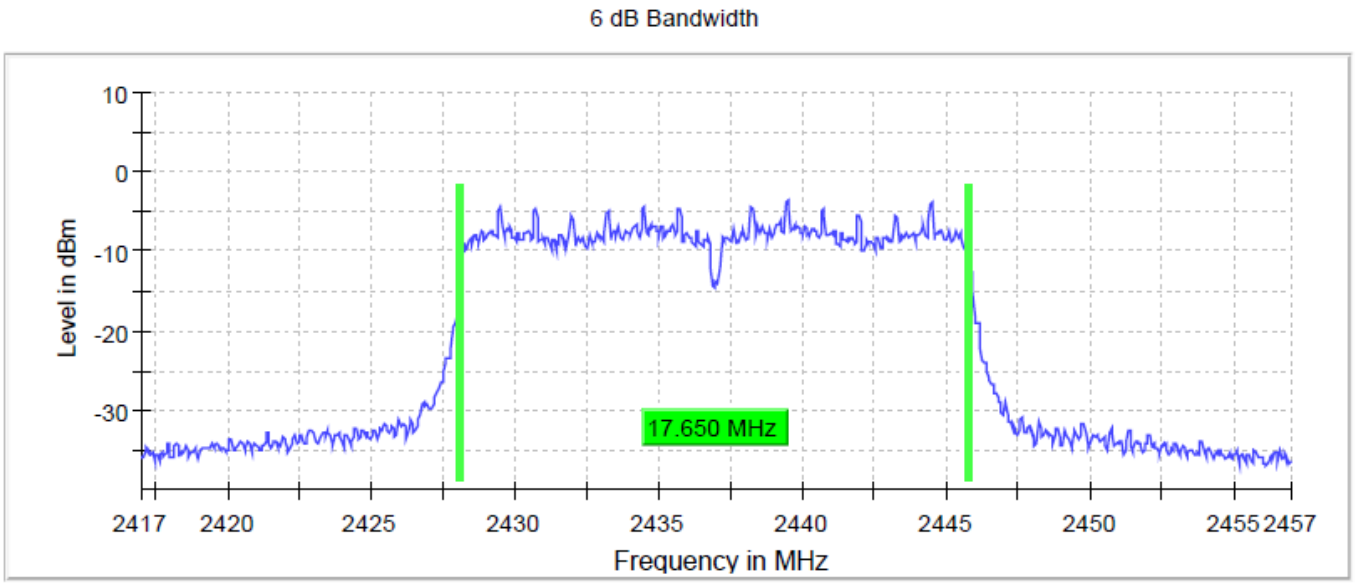
Data Rate	DUT Frequency (MHz)	Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)	Minimum Limit (MHz)
802.11b 1Mbps	2412.000000	10.150000	2406.925000	2417.075000	0.500000
802.11g 6Mbps	2412.000000	16.400000	2403.775000	2420.175000	0.500000
802.11n (HT20) MCS0	2412.000000	17.600000	2403.175000	2420.775000	0.500000
802.11b 1Mbps	2437.000000	10.200000	2431.875000	2442.075000	0.500000
802.11g 6Mbps	2437.000000	16.400000	2428.775000	2445.175000	0.500000
802.11n (HT20) MCS0	2437.000000	17.650000	2428.125000	2445.775000	0.500000
802.11b 1Mbps	2462.000000	10.150000	2456.925000	2467.075000	0.500000
802.11g 6Mbps	2462.000000	16.400000	2453.775000	2470.175000	0.500000
802.11n (HT20) MCS0	2462.000000	17.650000	2453.125000	2470.775000	0.500000

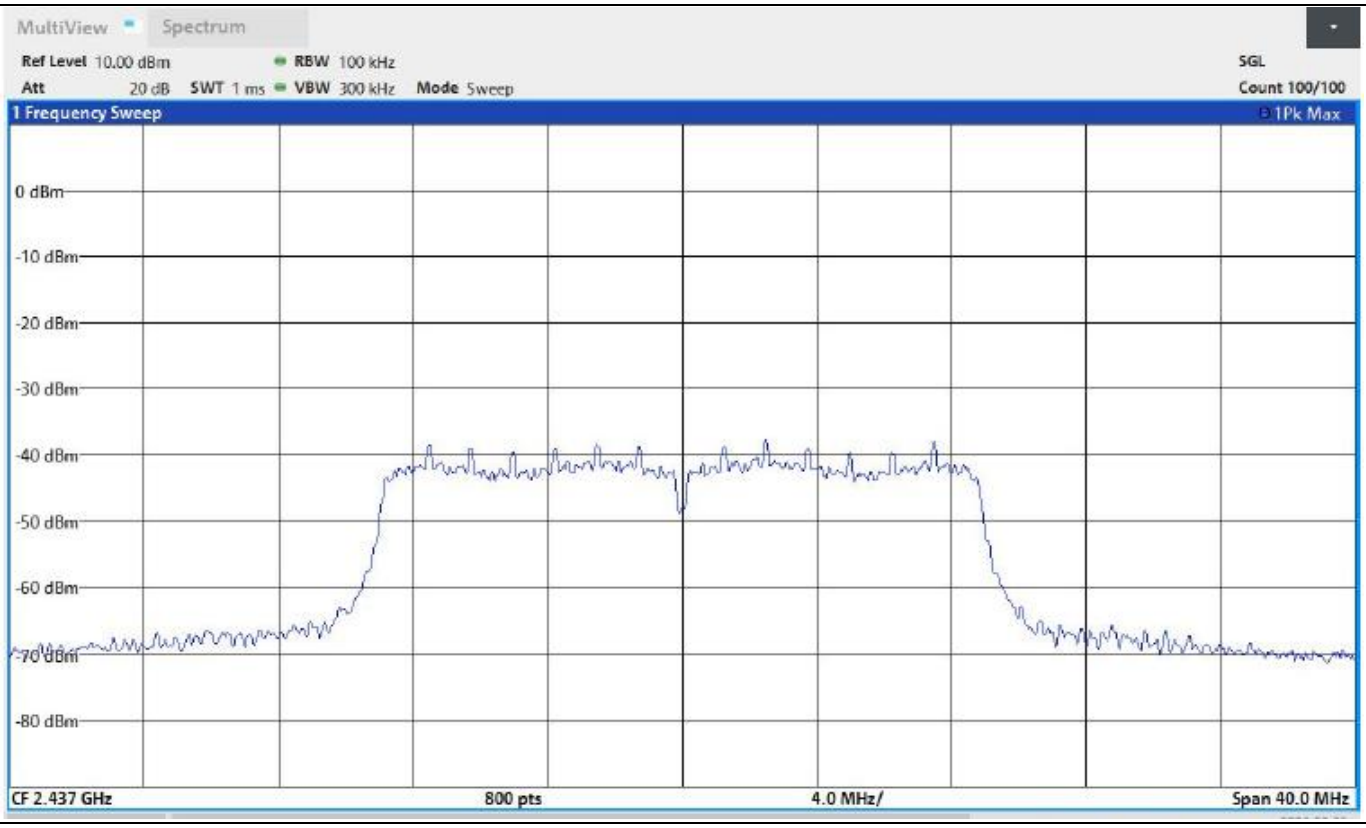
802.11g 2437MHz 6Mbps





802.11n 2412MHz MCS0





4.4.5 Conducted Band Edge

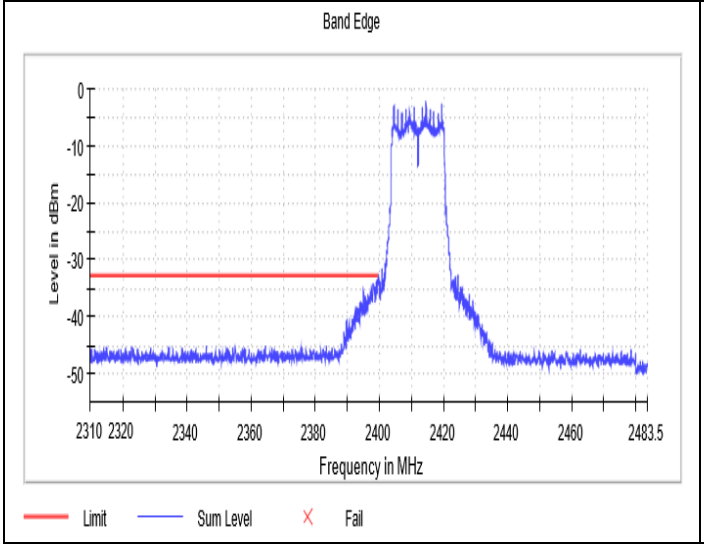
Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 Section 8.7 andANSI C63.10-2013 Section 11.11.3, RSS-247 5.5

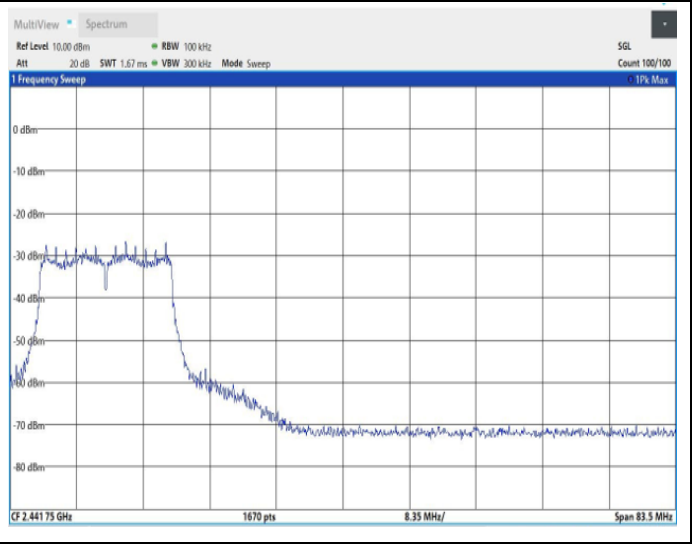
Measurement uncertainty calculated in accordance with ETSI TR 100 028-1.Expanded Uncertainty (K=2) < 0.8 dB

Band Edge Low (802.11g 6Mbps 2412MHz)

Frequency (MHz)	Level (dBm)
2414.475000	-2.5

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.775000	-33.0	0.5	-32.5	PASS
2399.725000	-33.1	0.6	-32.5	PASS
2399.175000	-33.3	0.8	-32.5	PASS
2399.125000	-33.5	1.0	-32.5	PASS
2399.825000	-33.8	1.2	-32.5	PASS
2399.525000	-33.8	1.3	-32.5	PASS
2399.475000	-33.8	1.3	-32.5	PASS
2399.875000	-34.0	1.5	-32.5	PASS
2399.075000	-34.1	1.6	-32.5	PASS
2399.625000	-34.1	1.6	-32.5	PASS
2399.675000	-34.3	1.8	-32.5	PASS
2399.925000	-34.3	1.8	-32.5	PASS
2398.275000	-34.3	1.8	-32.5	PASS
2397.975000	-34.4	1.9	-32.5	PASS
2398.025000	-34.4	1.9	-32.5	PASS

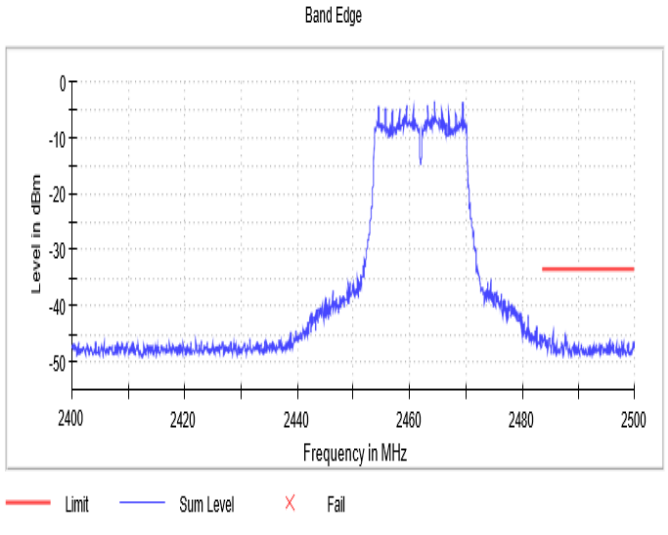


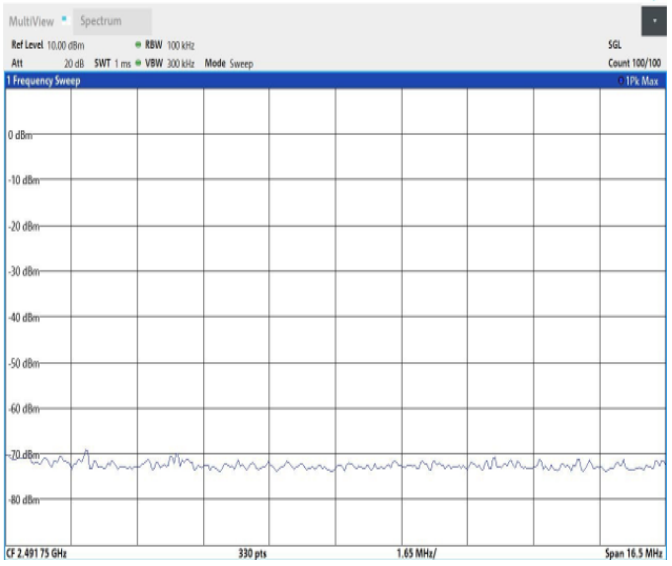


Band Edge High (802.11g 6Mbps 2462MHz)

Frequency (MHz)	Level (dBm)
2464.475000	-3.4

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2485.525000	-44.2	10.8	-33.4	PASS
2485.575000	-44.5	11.0	-33.4	PASS
2487.775000	-45.0	11.6	-33.4	PASS
2484.075000	-45.1	11.7	-33.4	PASS
2483.525000	-45.2	11.8	-33.4	PASS
2487.825000	-45.3	11.9	-33.4	PASS
2483.575000	-45.3	11.9	-33.4	PASS
2484.125000	-45.4	12.0	-33.4	PASS
2484.875000	-45.6	12.2	-33.4	PASS
2487.625000	-45.6	12.2	-33.4	PASS
2485.475000	-45.6	12.2	-33.4	PASS
2487.675000	-45.7	12.3	-33.4	PASS
2483.825000	-45.7	12.3	-33.4	PASS
2483.625000	-45.7	12.3	-33.4	PASS
2484.925000	-45.8	12.4	-33.4	PASS

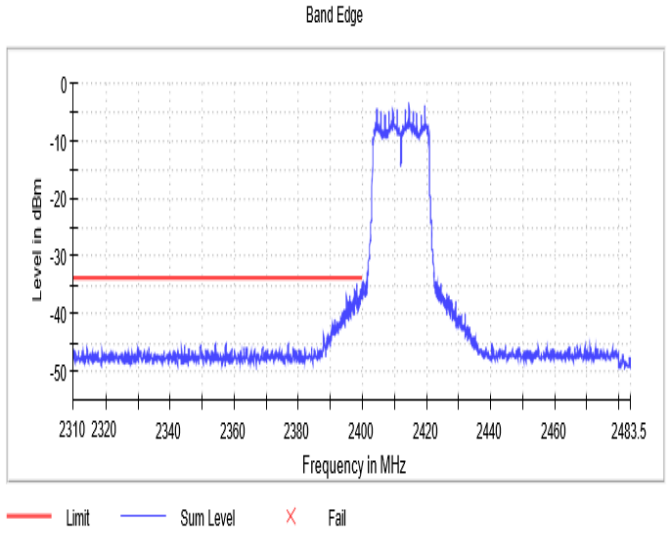


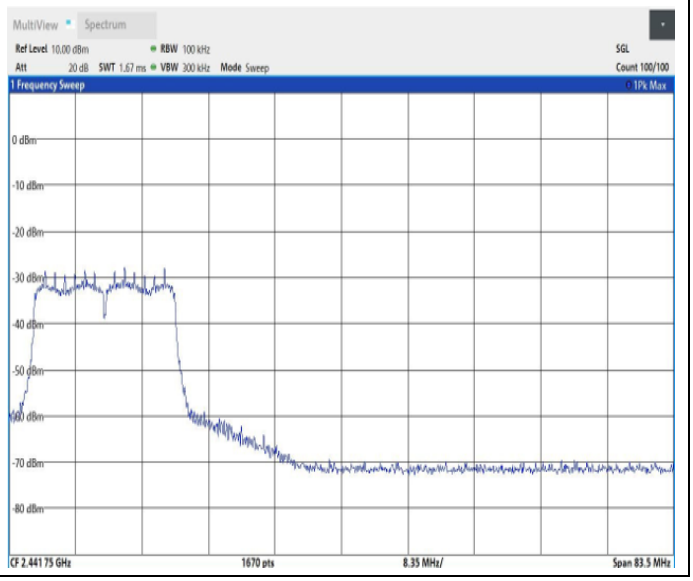


Band Edge Low (802.11n (HT20) MCS0 2412MHz)

Frequency (MHz)	Level (dBm)
2414.525000	-3.5

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.875000	-34.5	0.9	-33.5	PASS
2398.275000	-34.9	1.3	-33.5	PASS
2398.225000	-34.9	1.4	-33.5	PASS
2399.825000	-35.0	1.5	-33.5	PASS
2399.925000	-35.0	1.5	-33.5	PASS
2397.625000	-35.6	2.1	-33.5	PASS
2399.225000	-35.7	2.2	-33.5	PASS
2398.325000	-35.8	2.3	-33.5	PASS
2399.525000	-35.8	2.3	-33.5	PASS
2399.475000	-35.8	2.3	-33.5	PASS
2399.275000	-35.8	2.3	-33.5	PASS
2399.725000	-35.9	2.4	-33.5	PASS
2399.775000	-35.9	2.4	-33.5	PASS
2397.675000	-36.0	2.5	-33.5	PASS
2397.825000	-36.1	2.6	-33.5	PASS

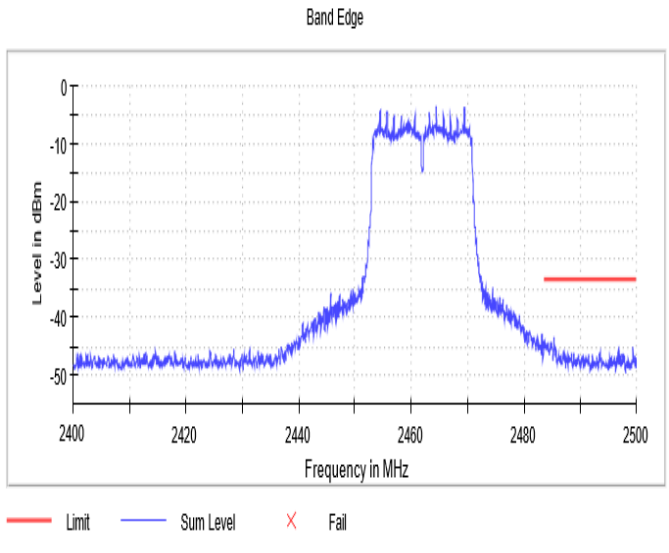


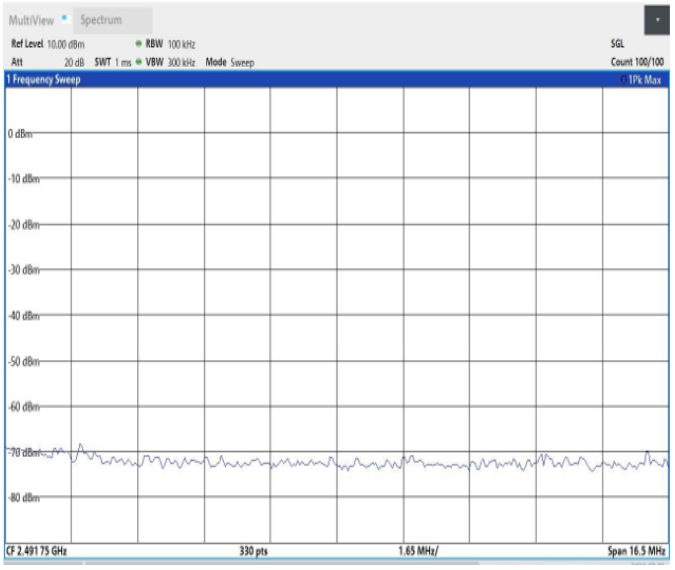


Band Edge High (802.11n (HT20) MCS0 2462MHz)

Frequency (MHz)	Level (dBm)
2464.525000	-3.4

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2485.375000	-43.3	9.9	-33.4	PASS
2485.425000	-43.9	10.4	-33.4	PASS
2483.725000	-44.0	10.6	-33.4	PASS
2483.525000	-44.1	10.7	-33.4	PASS
2483.875000	-44.4	10.9	-33.4	PASS
2484.875000	-44.4	11.0	-33.4	PASS
2484.775000	-44.4	11.0	-33.4	PASS
2483.625000	-44.4	11.0	-33.4	PASS
2483.575000	-44.4	11.0	-33.4	PASS
2484.725000	-44.4	11.0	-33.4	PASS
2484.375000	-44.4	11.0	-33.4	PASS
2484.925000	-44.5	11.0	-33.4	PASS
2483.975000	-44.7	11.3	-33.4	PASS
2484.025000	-44.7	11.3	-33.4	PASS
2484.125000	-44.8	11.3	-33.4	PASS





4.4.6 Tx Spurious Emissions

Test according to FCC title 47 part 15 §15.247(d), KDB 558074 D01 DTS Meas Guidance v05r02 8.5 and ANSI C63.10-2013 11.11.2 & 11.11.3, RSS-247 5.5.

Measurement uncertainty calculated in accordance with ETSI TR 100 028-1. Expanded Uncertainty (K=2) < 1.8 dB

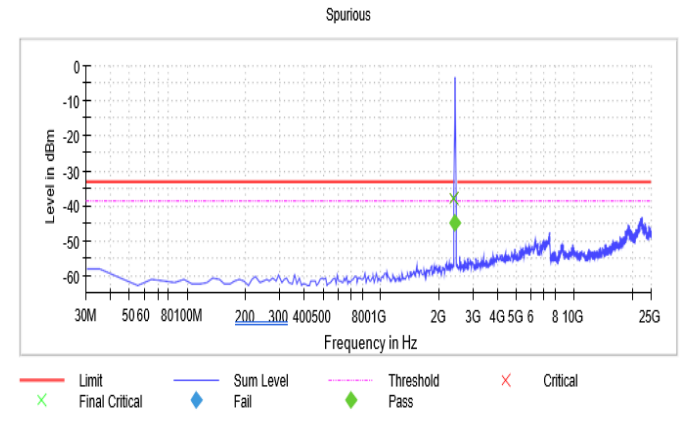
802.11g 6Mbps 2412MHz

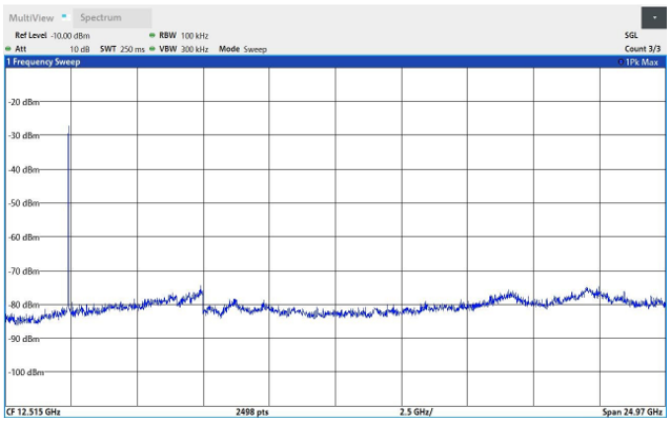
Final Measurement

Frequency (MHz)	Level Pre-Measurement (dBm)	Level (dBm)	Margin (dB)	Limit (dBm)
2399.788904	-19.8	-44.8	11.8	-33.0

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2394.053243	-37.8	4.7	-33.0
22466.014812	-43.3	10.3	-33.0
21986.206966	-43.7	10.7	-33.0
22046.182946	-43.8	10.7	-33.0
22396.042834	-44.0	11.0	-33.0
22116.154924	-44.0	11.0	-33.0
22156.138911	-44.2	11.2	-33.0
22006.198959	-44.2	11.2	-33.0
22036.186950	-44.2	11.2	-33.0
22056.178943	-44.4	11.4	-33.0
21976.210969	-44.4	11.4	-33.0
22106.158927	-44.5	11.4	-33.0
22256.098879	-44.5	11.5	-33.0
22016.194956	-44.5	11.5	-33.0
22096.162930	-44.6	11.6	-33.0

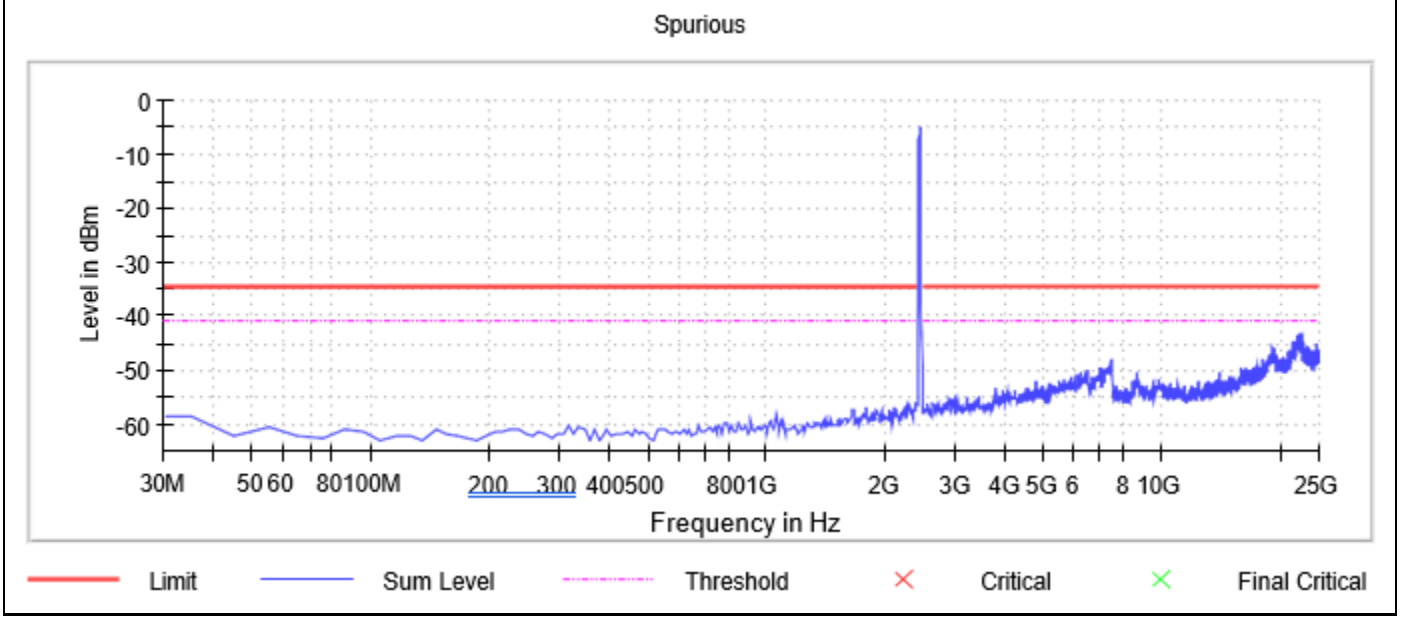




802.11g 6Mbps 2437MHz

Pre-Measurement

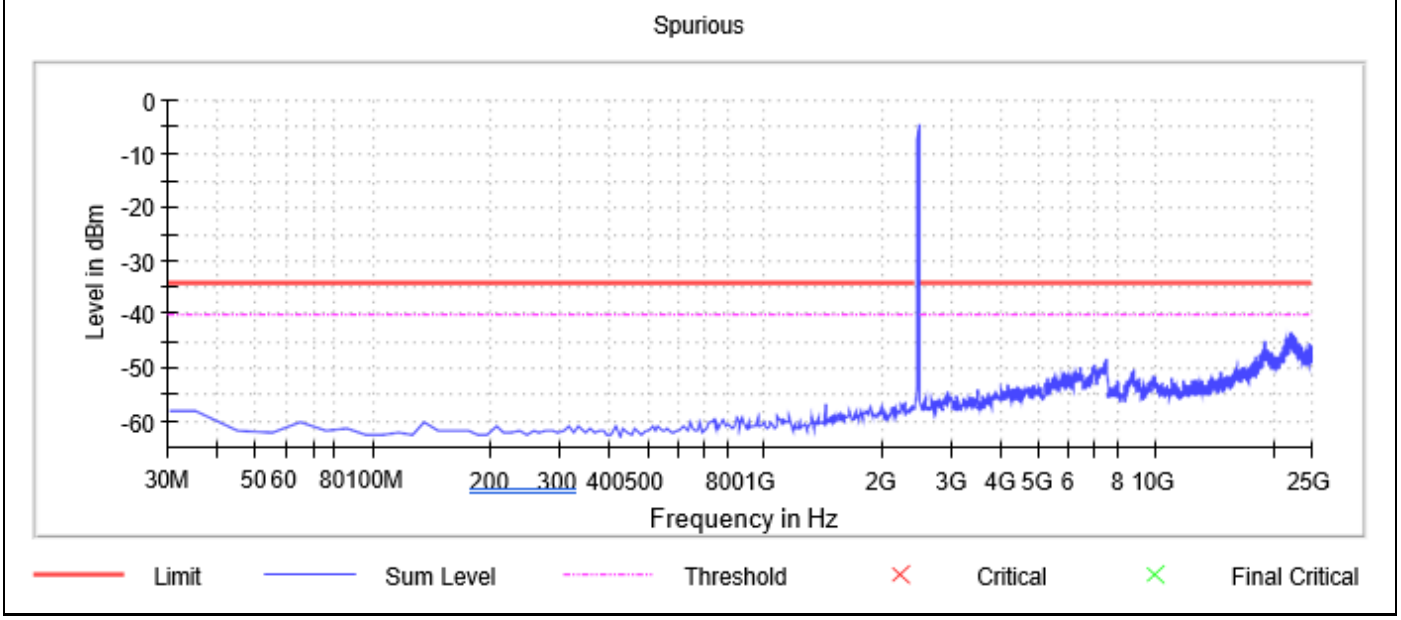
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22396.042834	-43.2	8.5	-34.7
22016.194956	-43.7	9.0	-34.7
22336.066853	-43.7	9.0	-34.7
22555.978783	-43.8	9.1	-34.7
21966.214972	-43.8	9.1	-34.7
22086.166934	-43.9	9.2	-34.7
22056.178943	-44.1	9.4	-34.7
22006.198959	-44.1	9.4	-34.7
22066.174940	-44.1	9.5	-34.7
22136.146918	-44.2	9.5	-34.7
21986.206966	-44.2	9.5	-34.7
22146.142914	-44.2	9.5	-34.7
22026.190953	-44.4	9.7	-34.7
22645.942754	-44.5	9.8	-34.7
22166.134908	-44.5	9.8	-34.7



802.11g 6Mbps 2462MHz

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2484.017214	-43.2	8.9	-34.3
22116.154924	-43.3	9.0	-34.3
22126.150921	-43.5	9.2	-34.3
21986.206966	-43.7	9.4	-34.3
21996.202962	-43.7	9.4	-34.3
22326.070857	-43.7	9.4	-34.3
21976.210969	-43.9	9.6	-34.3
22106.158927	-43.9	9.6	-34.3
22086.166934	-44.0	9.7	-34.3
21946.222978	-44.0	9.7	-34.3
22256.098879	-44.1	9.8	-34.3
22076.170937	-44.2	9.9	-34.3
22066.174940	-44.3	10.0	-34.3
22166.134908	-44.4	10.1	-34.3
22625.950761	-44.4	10.1	-34.3



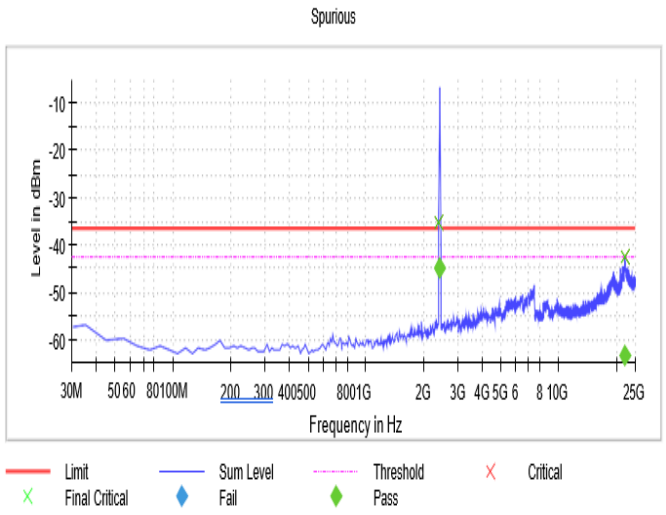
802.11n (HT20) MCS0 2412MHz

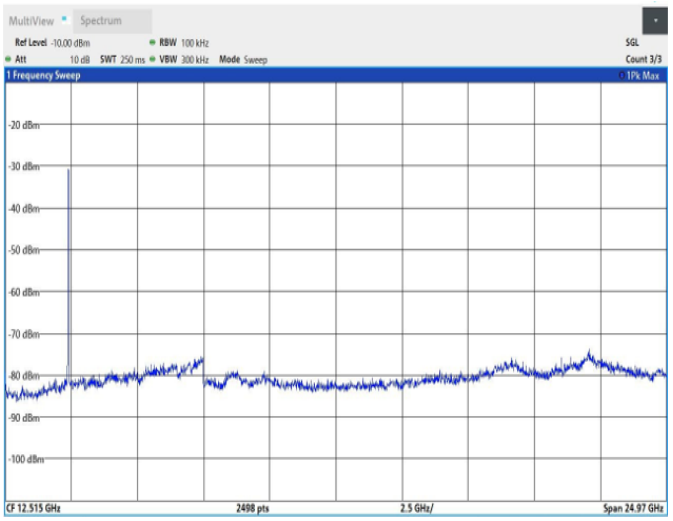
Final Measurement

Frequency (MHz)	Level Pre-Measurement (dBm)	Level (dBm)	Margin (dB)	Limit (dBm)
2399.140525	-20.6	-44.9	8.5	-36.5
22059.541524	-43.8	-63.3	26.9	-36.5

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2394.053243	-35.2	-1.3	-36.5
22066.174940	-42.4	5.9	-36.5
22026.190953	-43.4	7.0	-36.5
22036.186950	-43.8	7.3	-36.5
22136.146918	-43.8	7.3	-36.5
22086.166934	-43.9	7.4	-36.5
22216.114892	-44.0	7.5	-36.5
22226.110889	-44.1	7.6	-36.5
22196.122898	-44.2	7.8	-36.5
22046.182946	-44.3	7.8	-36.5
21896.242994	-44.5	8.0	-36.5
22116.154924	-44.5	8.0	-36.5
22056.178943	-44.6	8.1	-36.5
21386.447158	-44.6	8.1	-36.5
22236.106886	-44.6	8.1	-36.5

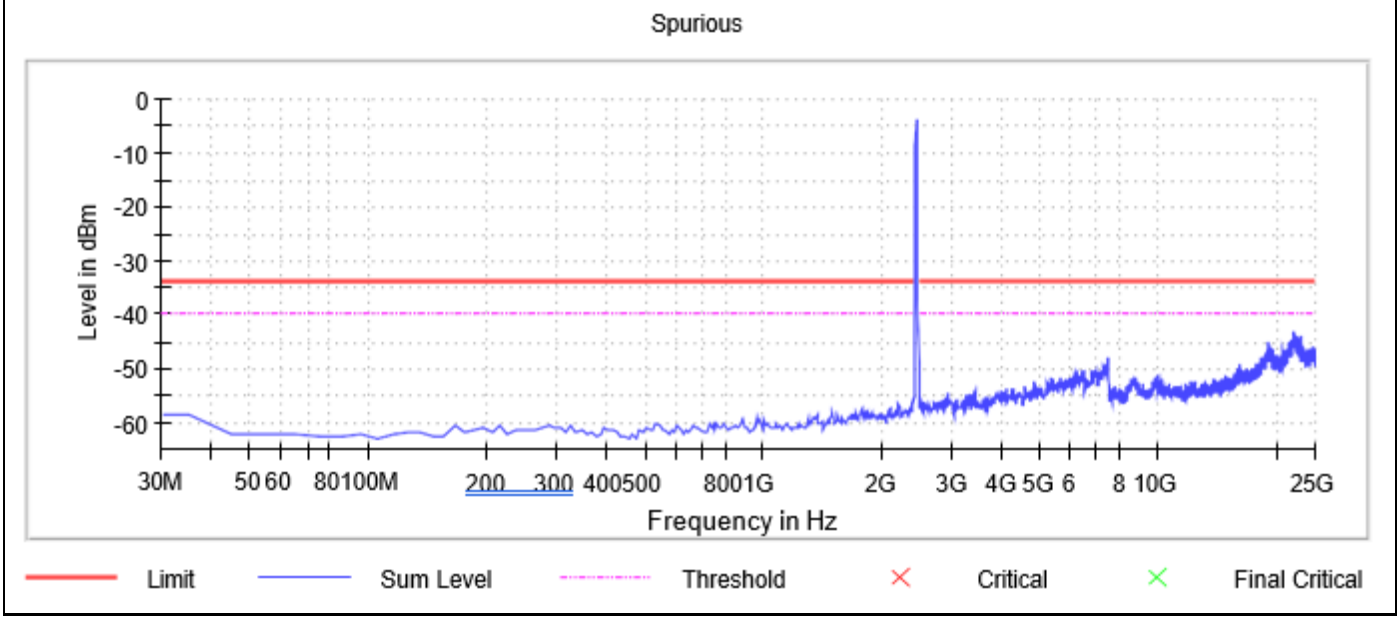




802.11n (HT20) MCS0 2437MHz

Pre-Measurement

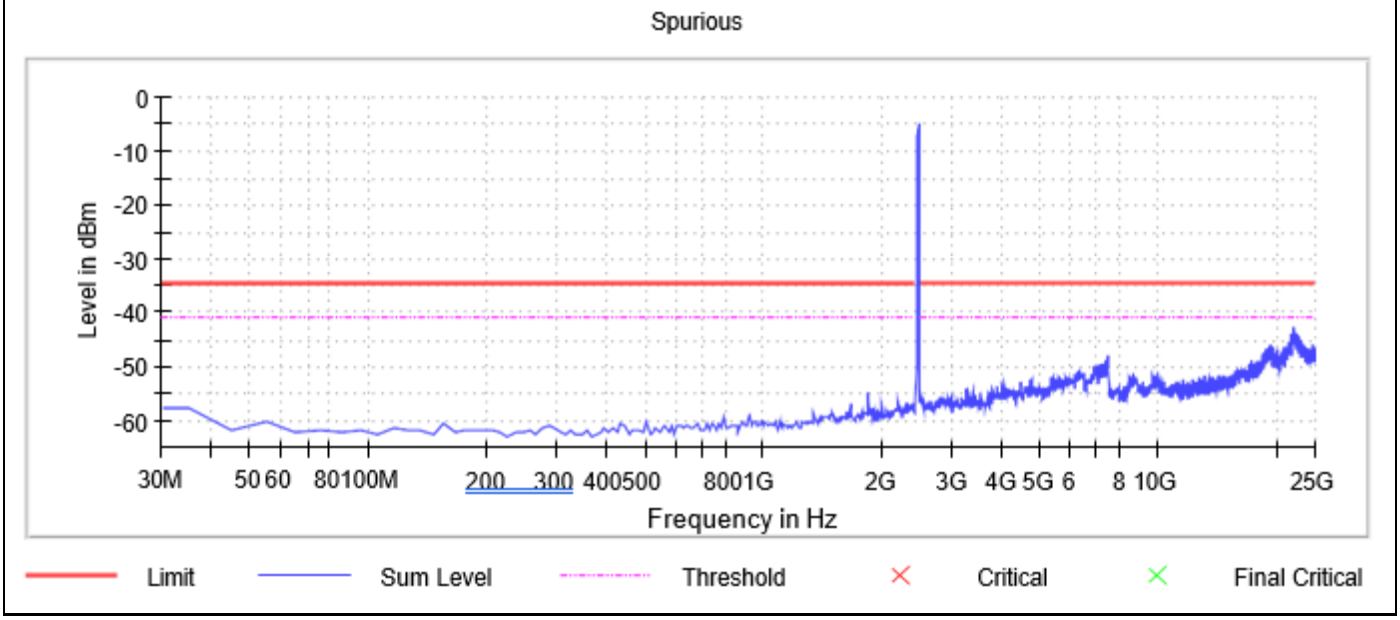
Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
22106.158927	-43.1	9.4	-33.7
21976.210969	-43.6	9.9	-33.7
22036.186950	-43.7	10.0	-33.7
22456.018815	-43.7	10.0	-33.7
23075.770616	-43.8	10.0	-33.7
22096.162930	-43.8	10.1	-33.7
21966.214972	-43.9	10.1	-33.7
22166.134908	-44.0	10.3	-33.7
21996.202962	-44.0	10.3	-33.7
22076.170937	-44.1	10.4	-33.7
22136.146918	-44.2	10.4	-33.7
22006.198959	-44.2	10.5	-33.7
22156.138911	-44.2	10.5	-33.7
22356.058847	-44.3	10.5	-33.7
22645.942754	-44.3	10.6	-33.7



802.11n (HT20) MCS0 2462MHz

Pre-Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2484.017214	-40.9	6.3	-34.7
22036.186950	-42.8	8.1	-34.7
22186.126902	-43.7	9.0	-34.7
21906.238991	-43.7	9.1	-34.7
22266.094876	-43.9	9.2	-34.7
22416.034828	-44.0	9.4	-34.7
22006.198959	-44.1	9.4	-34.7
22146.142914	-44.2	9.5	-34.7
21946.222978	-44.2	9.5	-34.7
21896.242994	-44.3	9.6	-34.7
21866.255004	-44.3	9.7	-34.7
22685.926741	-44.4	9.7	-34.7
22505.998799	-44.4	9.7	-34.7
22116.154924	-44.5	9.8	-34.7
21856.259007	-44.5	9.8	-34.7



5. Radiated Testing

5.1 Test Summary

Start: 07/25/2024	End: 10/25/2024	Temperature: 22.6°C Humidity: 49.4%R.H	Initials: AP/AB

DUT S/N	J23133#3 NA 2B		DUT Operating Mode		2.4GHz WLAN
Comment	The modulation with highest power 802.11g 6Mbps and 802.11n MCS0 selected for full testing.				
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	√

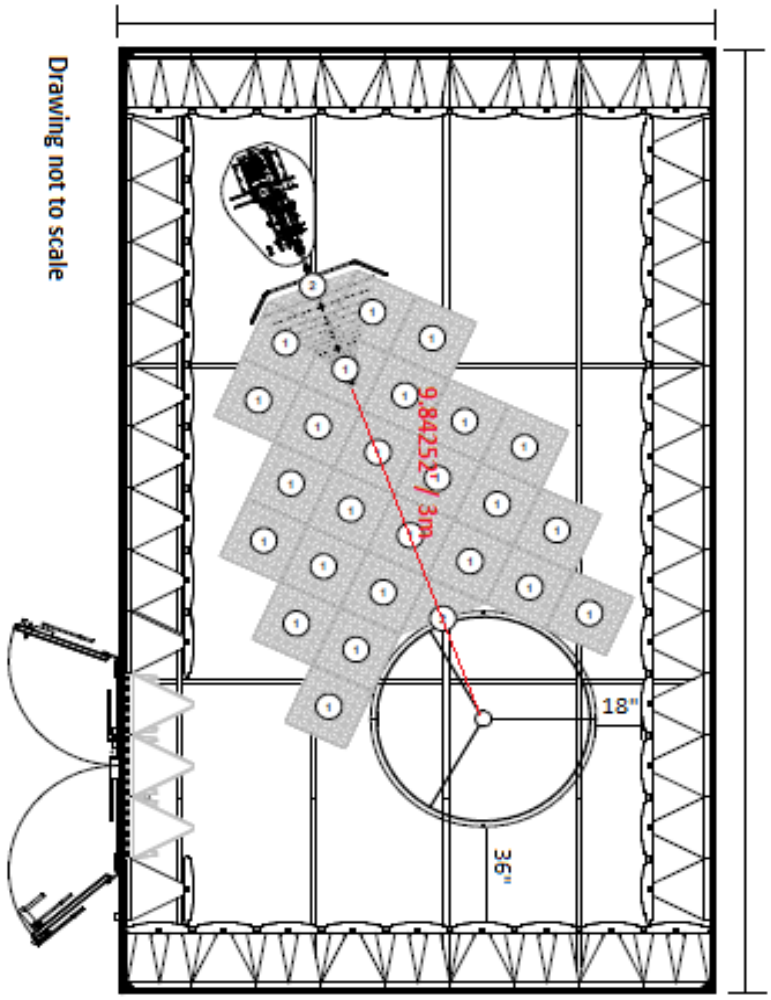
Notes: √ meets the requirements of the acceptance criteria.

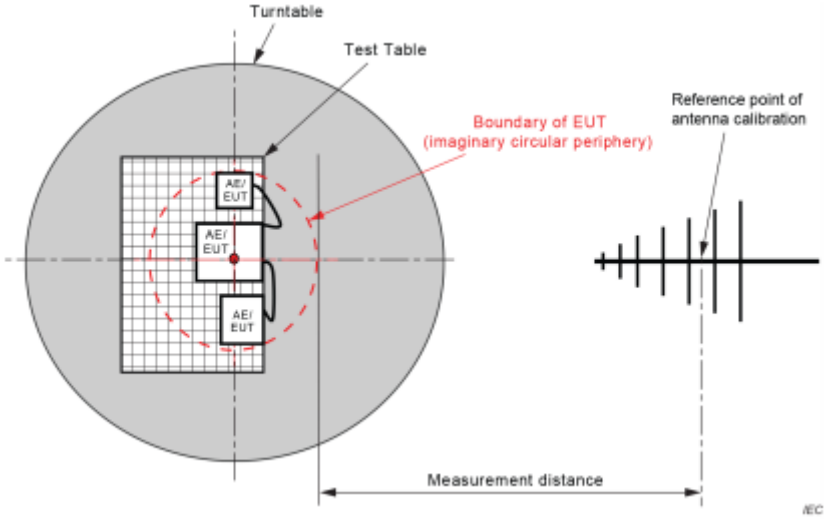
5.2 Test Setup

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	10/17/2024
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	11.20.00	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

Radiated emissions that fall in restricted bands, as defined in RSS-GEN Section 8.10 must also comply with radiated emissions limits specified in RSS-GEN Section 8.9

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 Data

Uncertainty

Radiated Emissions (30MHz to 40GHz)

Test Engineer Initials: AP/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:

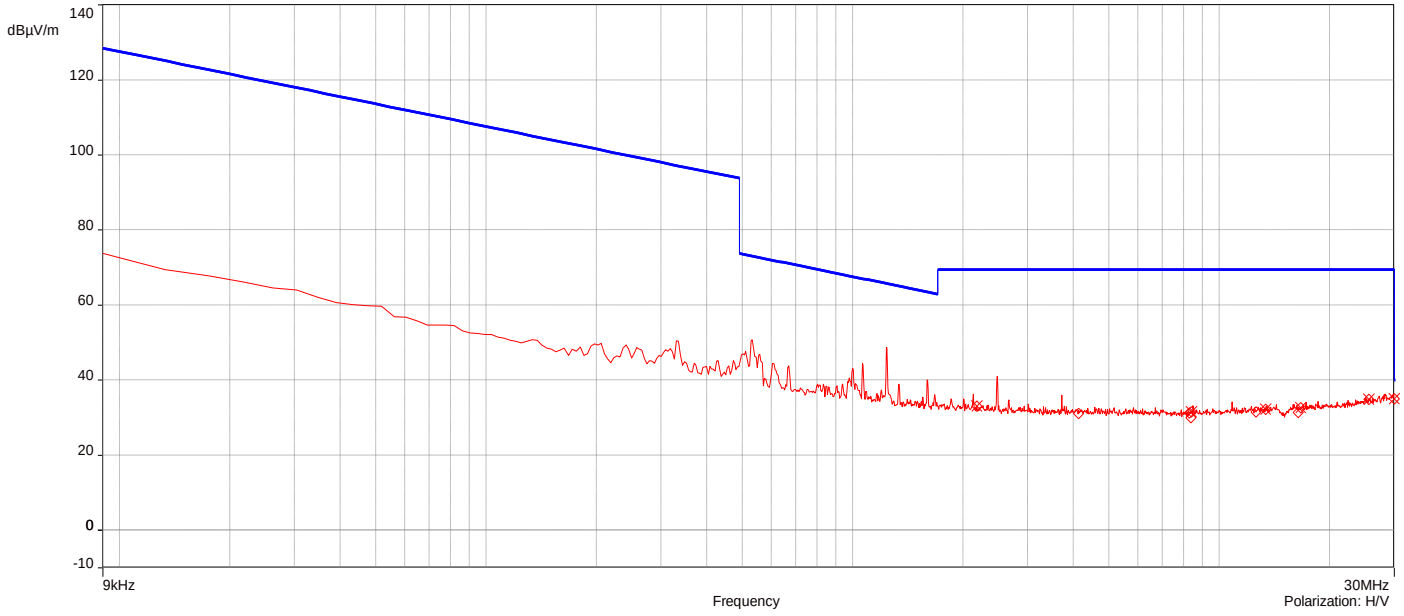
1. Level Average Reading (dBµV/m) = Raw Average Level + Correction Factor
2. Correction Factor (dB) = Antenna Factor + Cable Loss – Preamplifier Gain
3. Margin = Level Average Reading – Limit

J23133#3_2.4G 802.11g_Ch 6_9kHz-30MHz_Ground-Parallel

8/2/2024 12:32:29 PM

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	33.03	19.59	69.54	-36.51	1.00	23.70	H/V	Passed
2.	8.386255MHz	31.59	19.52	69.54	-37.95	1.00	156.90	H/V	Passed
3.	13.386897MHz	32.27	19.90	69.54	-37.27	1.00	249.10	H/V	Passed
4.	16.694949MHz	32.62	20.11	69.54	-36.92	1.00	158.90	H/V	Passed
5.	25.547843MHz	34.94	21.14	69.54	-34.60	1.00	71.00	H/V	Passed
6.	30MHz	35.00	22.04	40.00	-5.00	1.00	245.10	H/V	Passed

Overall Graphs:

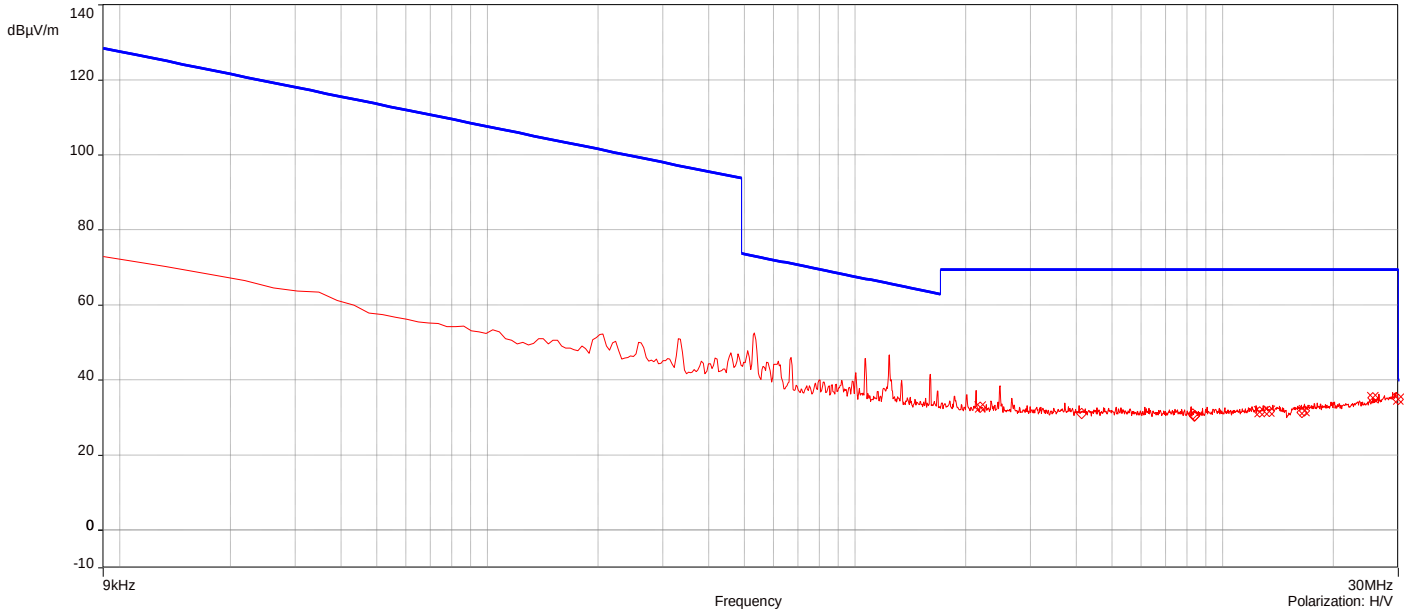


J23133#3_2.4G 802.11g_Ch 6_9kHz-30MHz_Parallel

8/2/2024 12:48:25 PM

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.190086MHz	32.76	19.59	69.54	-36.78	1.00	0.10	H/V	Passed
2.	12.577024MHz	31.52	19.84	69.54	-38.02	1.00	242.30	H/V	Passed
3.	13.361187MHz	31.66	19.90	69.54	-37.88	1.00	229.40	H/V	Passed
4.	16.694949MHz	31.78	20.11	69.54	-37.76	1.00	298.20	H/V	Passed
5.	25.560698MHz	35.38	21.15	69.54	-34.16	1.00	59.40	H/V	Passed
6.	30MHz	34.92	22.04	40.00	-5.08	1.00	334.80	H/V	Passed

Overall Graphs:

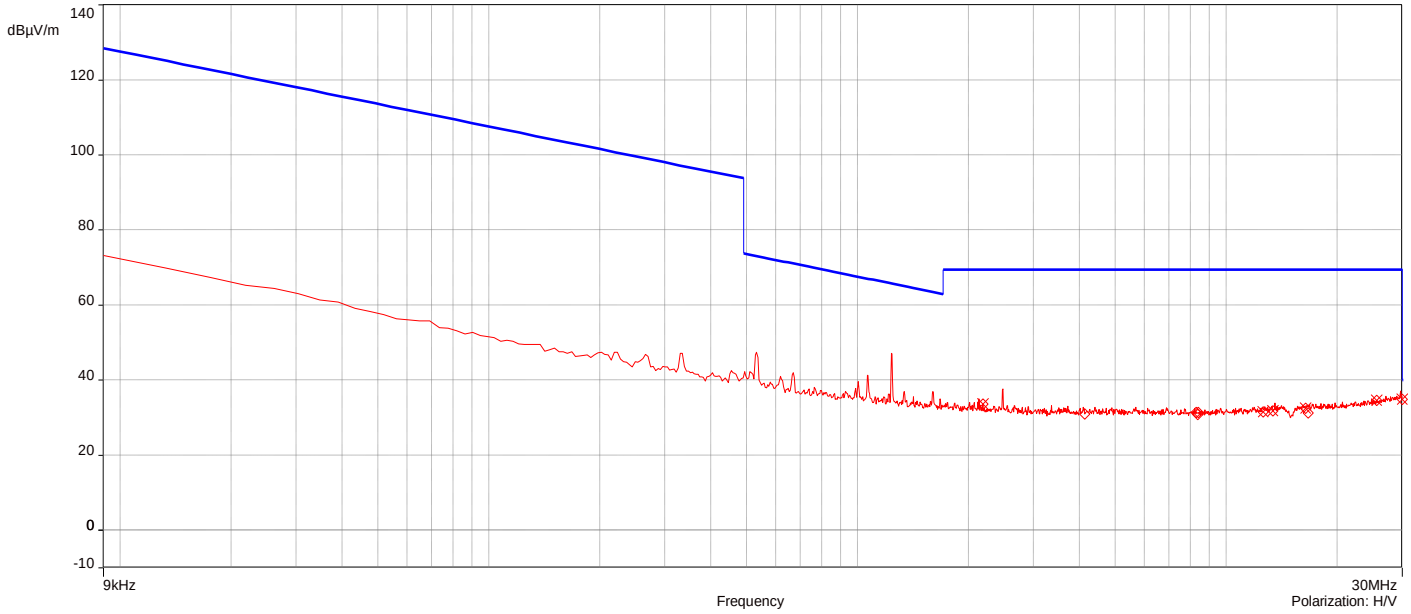


J23133#3_2.4G 802.11g_Ch 6_9kHz-30MHz_Perpendicular

8/2/2024 12:54:24 PM

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	33.62	19.59	69.54	-35.92	1.00	172.90	H/V	Passed
2.	12.577024MHz	31.61	19.84	69.54	-37.93	1.00	188.60	H/V	Passed
3.	13.369757MHz	31.78	19.90	69.54	-37.76	1.00	50.70	H/V	Passed
4.	16.420706MHz	32.51	20.07	69.54	-37.03	1.00	295.80	H/V	Passed
5.	25.594978MHz	34.60	21.15	69.54	-34.94	1.00	327.00	H/V	Passed
6.	30MHz	34.92	22.04	40.00	-5.08	1.00	222.80	H/V	Passed

Overall Graphs:

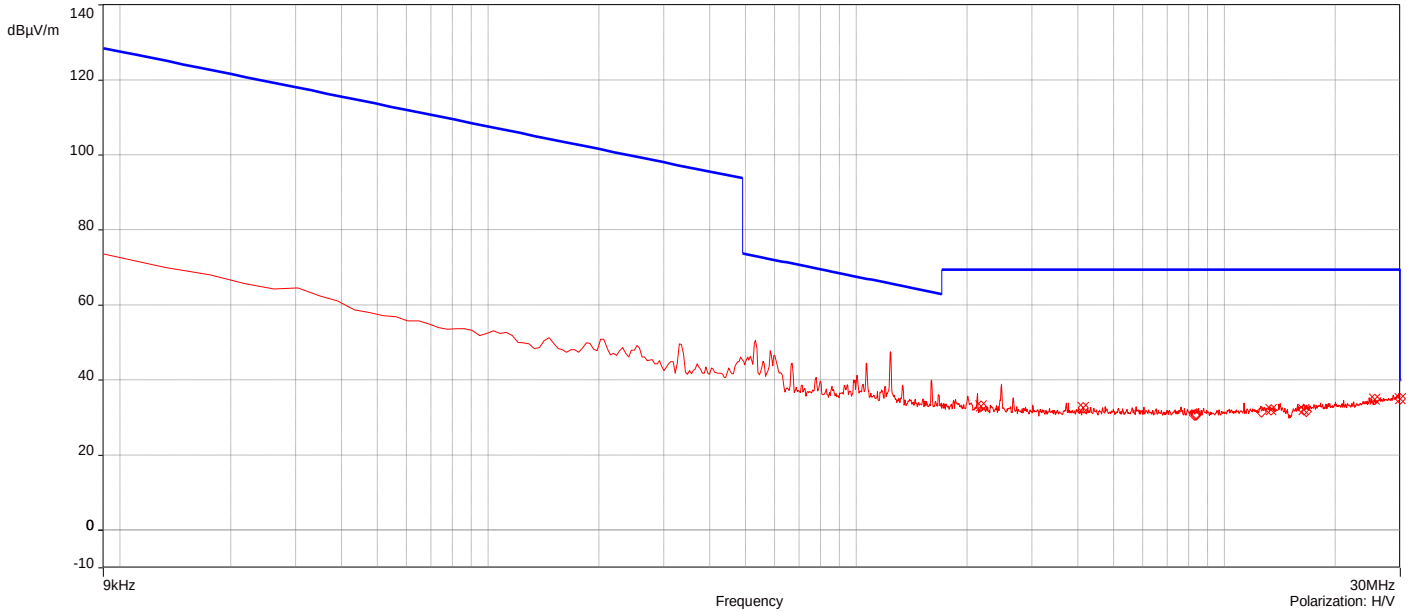


J23133#3_2.4G 802.11n_Ch 6_9kHz-30MHz_Ground-Parallel

8/2/2024 12:36:50 PM

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	33.13	19.59	69.54	-36.41	1.00	84.40	H/V	Passed
2.	4.126924MHz	32.61	19.74	69.54	-36.93	1.00	30.20	H/V	Passed
3.	13.386897MHz	32.18	19.90	69.54	-37.36	1.00	114.70	H/V	Passed
4.	16.420706MHz	32.07	20.07	69.54	-37.47	1.00	215.70	H/V	Passed
5.	25.539273MHz	34.87	21.14	69.54	-34.67	1.00	177.10	H/V	Passed
6.	30MHz	35.03	22.04	40.00	-4.97	1.00	47.50	H/V	Passed

Overall Graphs:

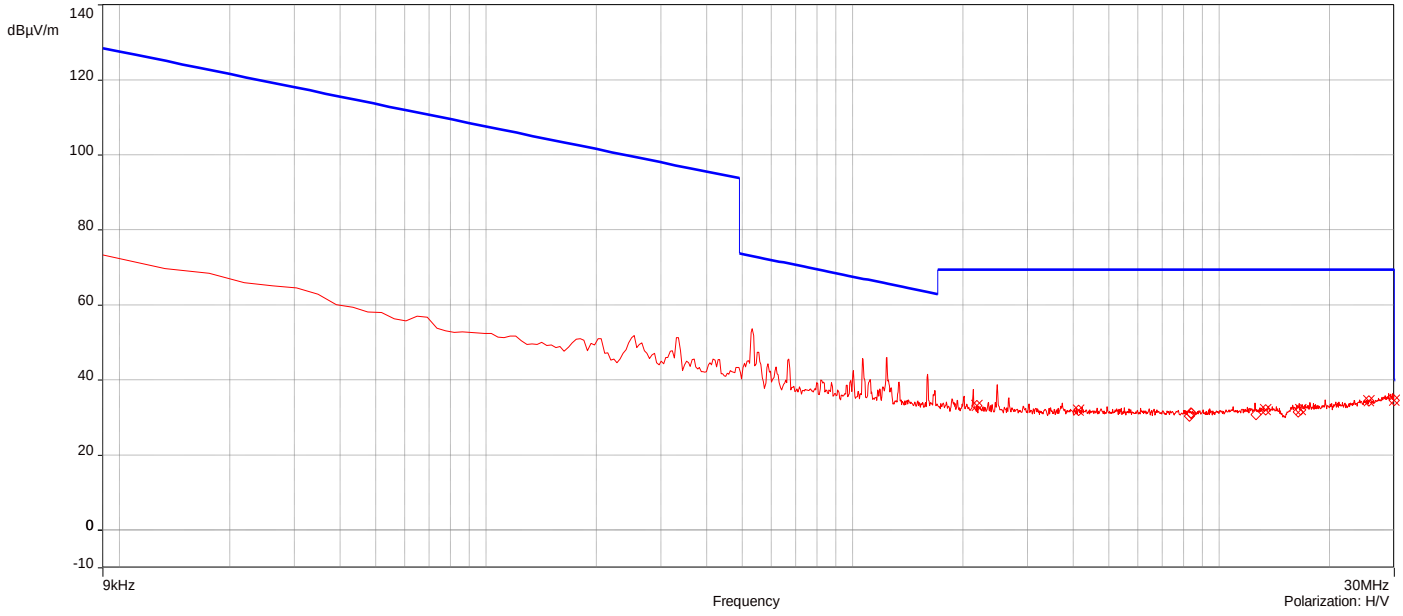


J23133#3_2.4G 802.11n_Ch 6_9kHz-30MHz_Parallel

8/2/2024 12:43:22 PM

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	33.24	19.59	69.54	-36.30	1.00	145.30	H/V	Passed
2.	4.126924MHz	32.03	19.74	69.54	-37.51	1.00	338.60	H/V	Passed
3.	13.374042MHz	32.15	19.90	69.54	-37.39	1.00	169.40	H/V	Passed
4.	16.694949MHz	32.17	20.11	69.54	-37.37	1.00	73.90	H/V	Passed
5.	25.616403MHz	34.45	21.15	69.54	-35.09	1.00	39.40	H/V	Passed
6.	30MHz	34.55	22.04	40.00	-5.45	1.00	78.30	H/V	Passed

Overall Graphs:

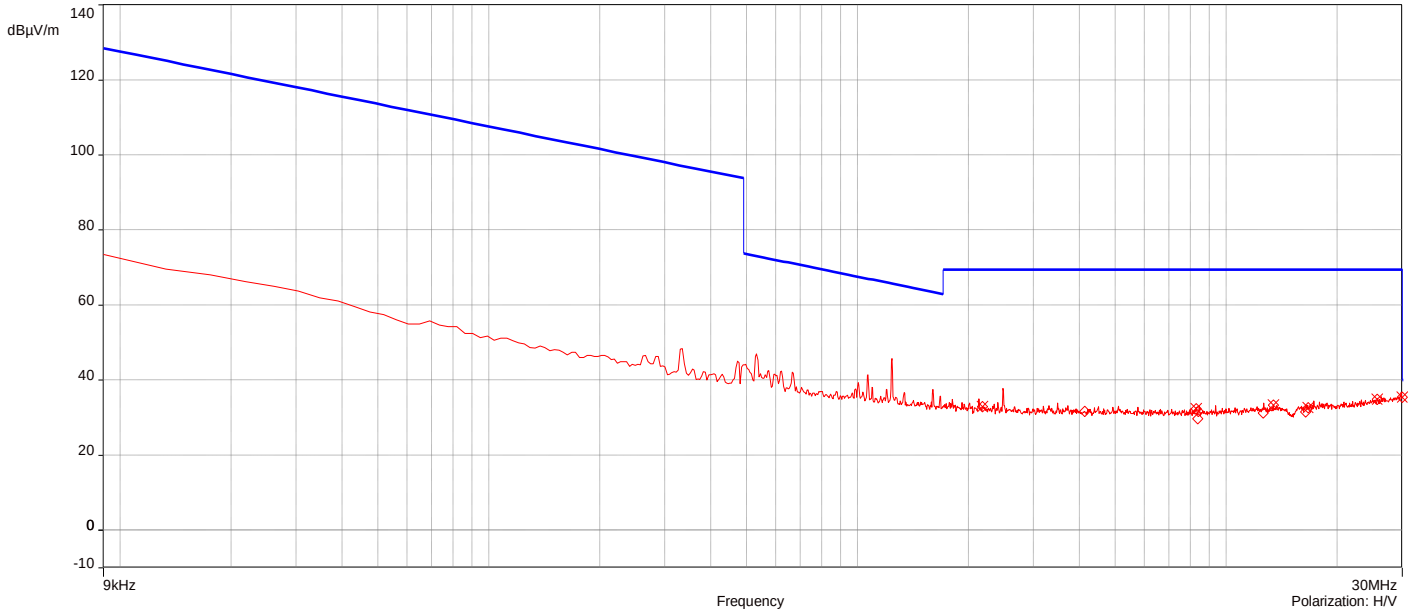


J23133#3_2.4G 802.11n_Ch 6_9kHz-30MHz_Perpendicular

8/2/2024 12:59:08 PM

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	32.97	19.59	69.54	-36.57	1.00	0.10	H/V	Passed
2.	8.291984MHz	32.41	19.53	69.54	-37.13	1.00	357.90	H/V	Passed
3.	13.404037MHz	33.32	19.90	69.54	-36.22	1.00	130.10	H/V	Passed
4.	16.694949MHz	32.72	20.11	69.54	-36.82	1.00	218.30	H/V	Passed
5.	25.667824MHz	34.85	21.15	69.54	-34.69	1.00	181.50	H/V	Passed
6.	30MHz	35.39	22.04	40.00	-4.61	1.00	332.50	H/V	Passed

Overall Graphs:

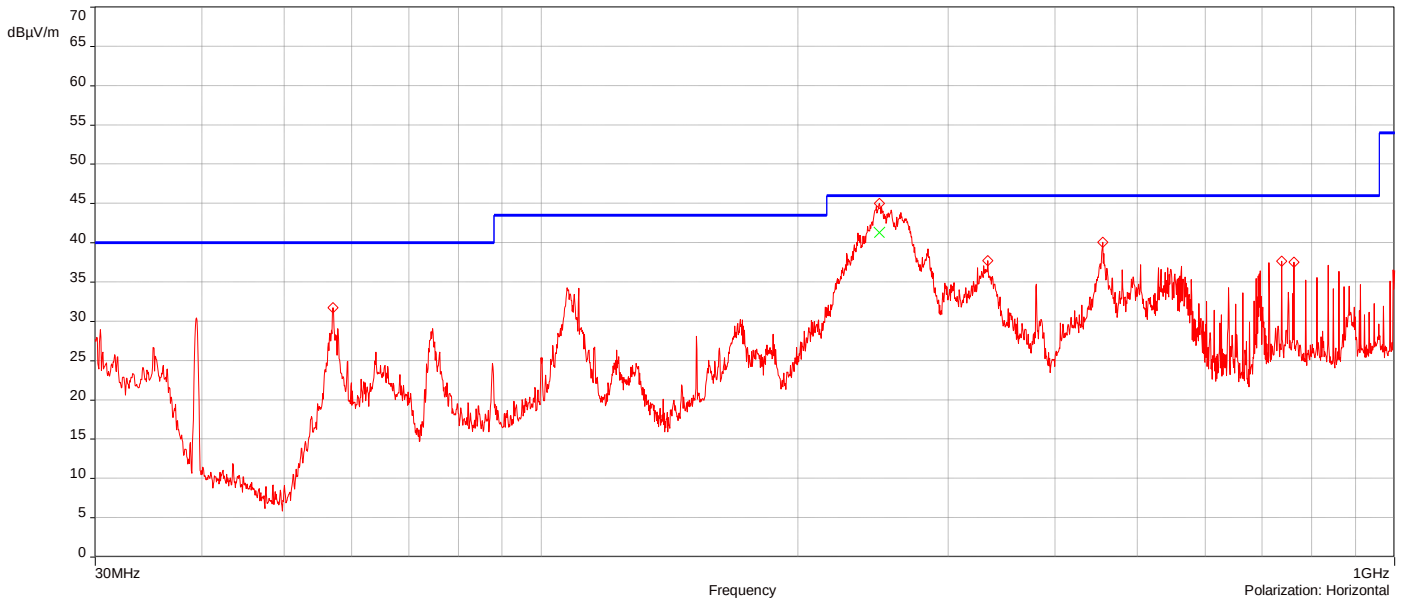


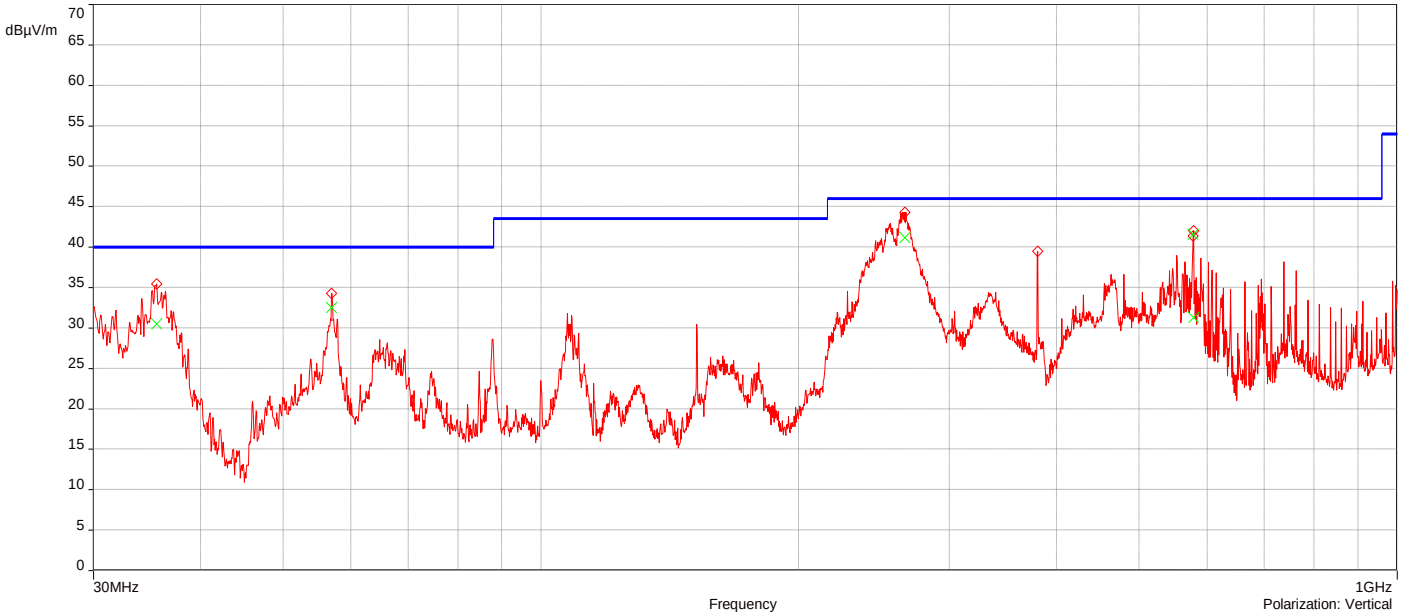
J23133#3_2.4G_802.11g_6Mbps_Ch 6_30MHz-1GHz

7/31/2024 7:59:37 PM

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	35.535031MHz	30.51	-10.03	40.00	-9.49	1.00	192.10	Vertical	Passed
2.	56.933349MHz	32.54	-19.61	40.00	-7.46	3.00	272.10	Vertical	Passed
3.	266.1233MHz	41.19	-12.79	46.00	-4.81	1.00	207.10	Vertical	Passed
4.	577.56868MHz	41.61	-5.79	46.00	-4.39	1.00	330.10	Vertical	Passed
5.	578.48167MHz	31.32	-5.74	46.00	-14.68	1.00	347.90	Vertical	Passed
6.	248.83346MHz	41.34	-12.94	46.00	-4.66	1.50	299.10	Horizontal	Passed

Overall Graphs:



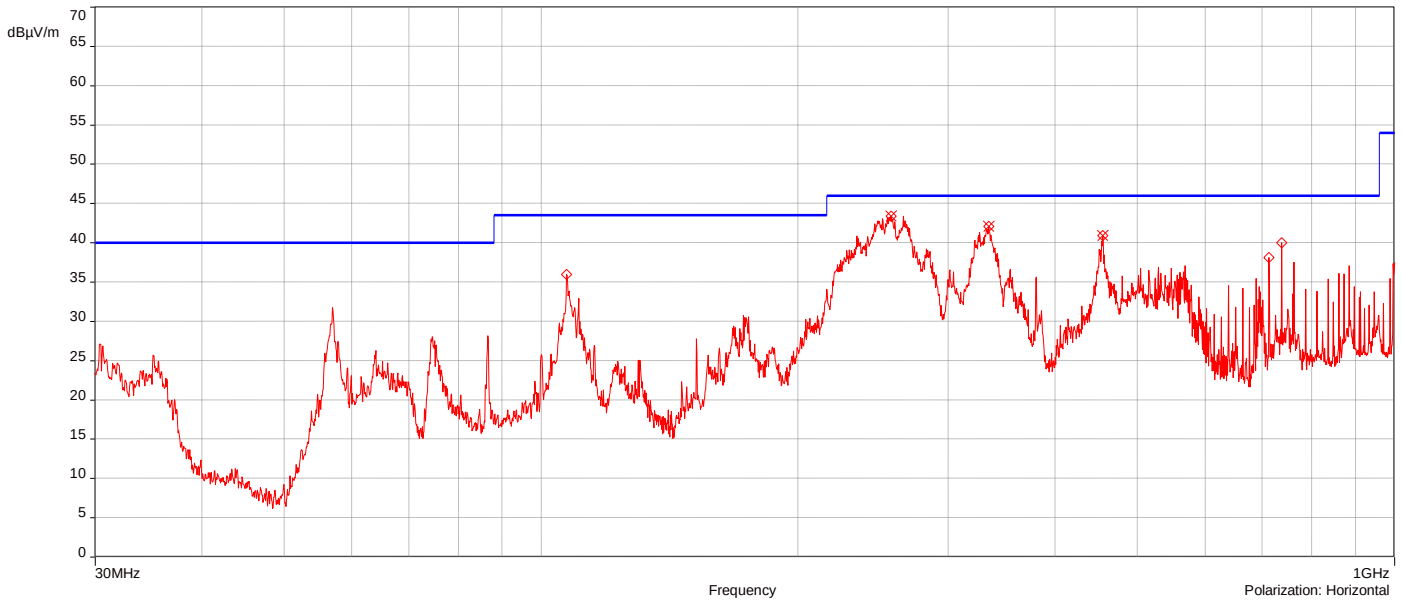

dBµV/m
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
30MHz
1GHz
Frequency
Polarization: Vertical

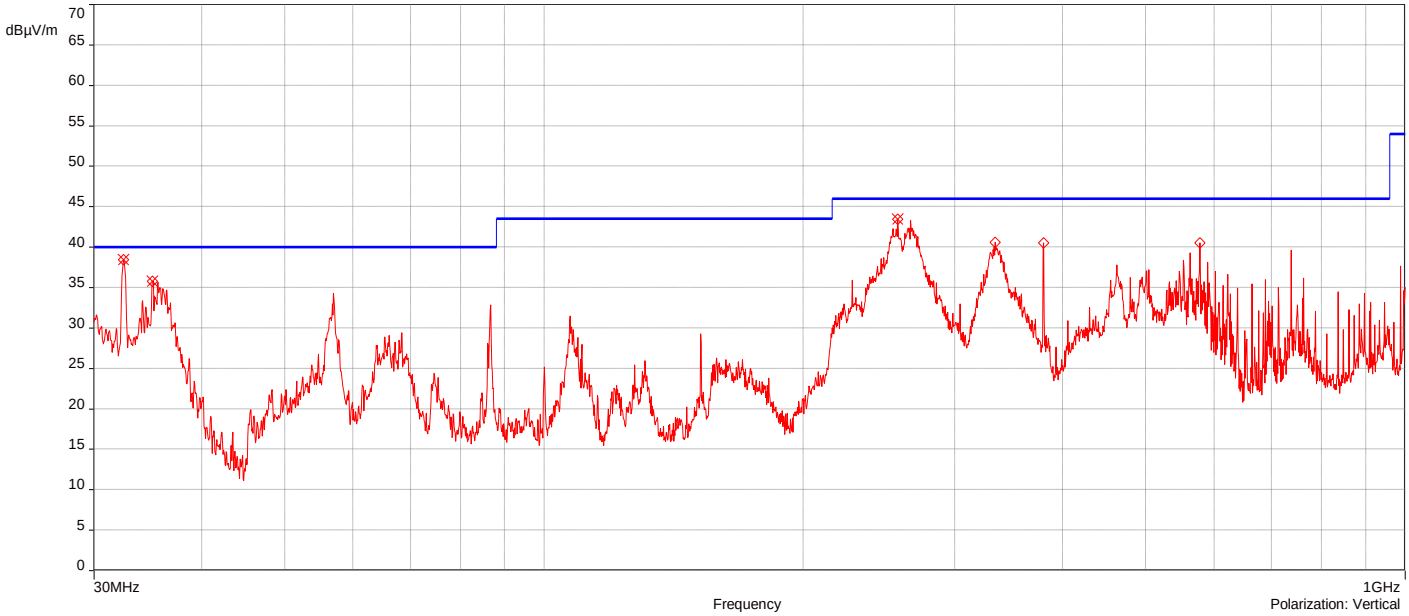
J23133#3_2.4G_802.11n_MCS0_Ch 6_30MHz-1GHz

7/31/2024 8:30:46 PM

No	Frequency (MHz)	Level Q-Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	32.453674MHz	38.47	-8.32	40.00	-1.53	3.50	158.60	Vertical	Passed
2.	35.078534MHz	35.81	-9.76	40.00	-4.19	1.00	34.80	Vertical	Passed
3.	257.50691MHz	43.48	-13.11	46.00	-2.52	2.00	358.90	Vertical	Passed
4.	256.87923MHz	43.37	-12.62	46.00	-2.63	1.00	54.10	Horizontal	Passed
5.	334.59792MHz	42.08	-10.08	46.00	-3.92	1.00	300.80	Horizontal	Passed
6.	454.65675MHz	40.95	-7.36	46.00	-5.05	1.00	91.50	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

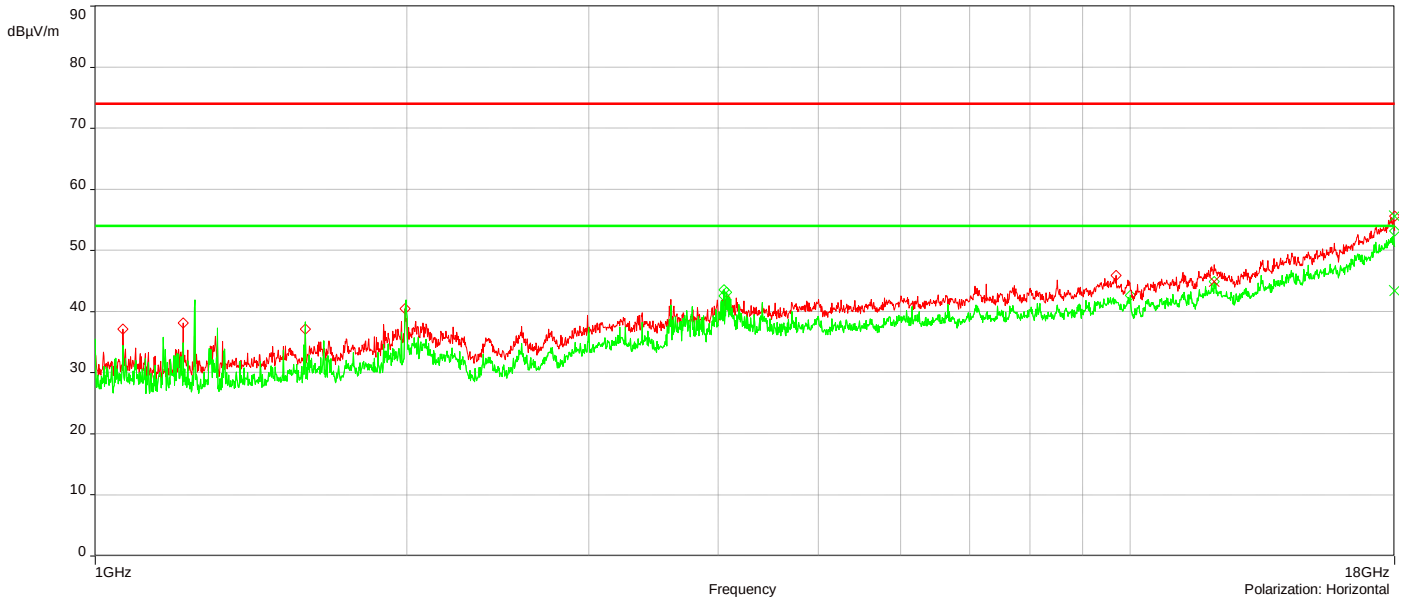
J23133#3_2.4G_802.11n_MCS0_Ch 1_1-18GHz

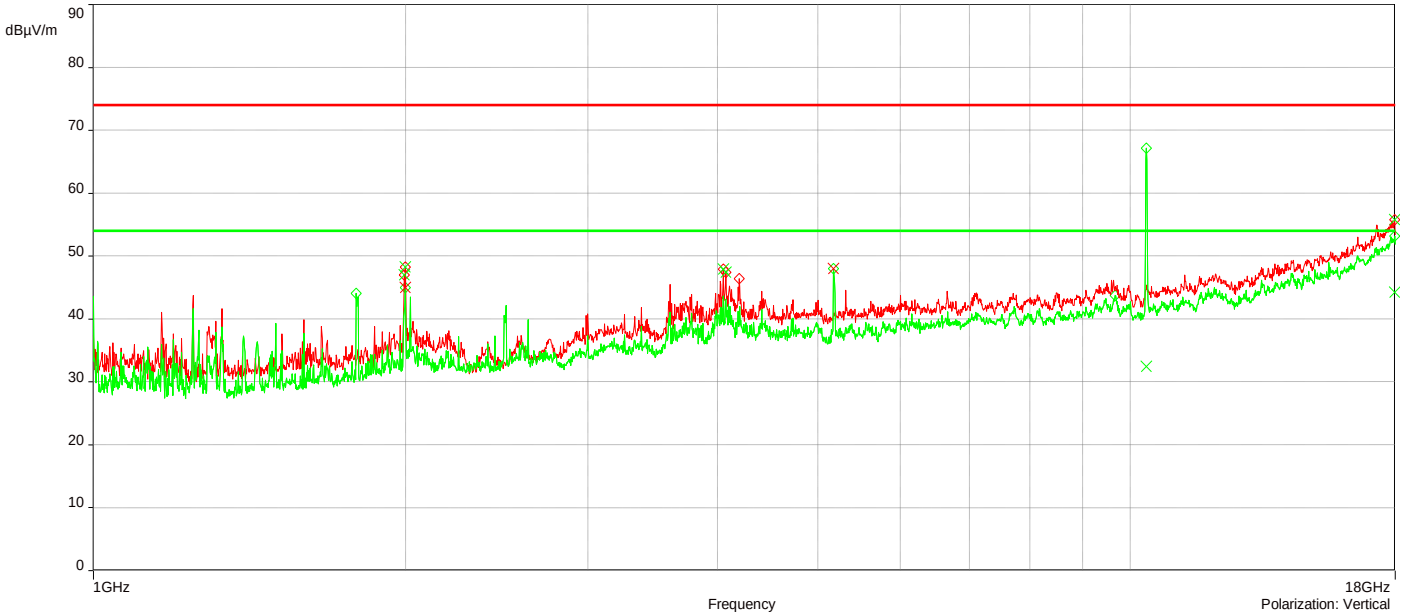
7/25/2024 9:19:28 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	1.9940292GHz	47.03	-2.26	74.00	-26.97	2.50	97.10	Vertical	Passed
2.	1.9990294GHz	48.26	-2.21	74.00	-25.74	2.50	97.10	Vertical	Passed
3.	4.0515898GHz	47.89	3.29	74.00	-26.11	3.00	86.60	Vertical	Passed
4.	4.0725904GHz	47.46	3.21	74.00	-26.54	3.00	86.60	Vertical	Passed
5.	17.979999GHz	55.78	21.63	74.00	-18.22	3.50	318.70	Vertical	Passed
6.	17.9905GHz	55.65	21.82	74.00	-18.35	2.00	353.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	1.9990294GHz	45.01	-2.21	54.00	-8.99	2.50	97.10	Vertical	Passed
2.	5.1721227GHz	48.06	5.34	54.00	-5.94	1.00	0.10	Vertical	Passed
3.	10.358775GHz	32.46	10.08	54.00	-21.54	1.00	0.10	Vertical	Passed
4.	17.9895GHz	44.23	21.85	54.00	-9.77	1.00	0.10	Vertical	Passed
5.	12.052825GHz	44.94	12.20	54.00	-9.06	2.50	259.00	Horizontal	Passed
6.	17.9985GHz	43.38	22.01	54.00	-10.62	4.00	357.90	Horizontal	Passed

Overall Graphs:




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

J23133#3_2.4G_802.11n_MCS0_Ch 6_1-18GHz

7/25/2024 9:50:25 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	3.583076GHz	46.01	2.00	74.00	-27.99	2.00	97.80	Vertical	Passed
2.	4.1165917GHz	45.99	3.01	74.00	-28.01	3.50	87.50	Vertical	Passed
3.	4.4096003GHz	46.02	4.42	74.00	-27.98	4.00	0.0	Vertical	Passed
4.	17.852496GHz	55.99	21.22	74.00	-18.01	4.00	50.10	Vertical	Passed
5.	9.6467543GHz	45.81	10.64	74.00	-28.19	1.50	10.70	Horizontal	Passed
6.	17.865996GHz	55.57	21.12	74.00	-18.43	1.50	205.30	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	4.4096003GHz	44.71	4.42	54.00	-9.29	4.00	0.0	Vertical	Passed
2.	17.9985GHz	43.13	22.06	54.00	-10.87	1.00	359.90	Vertical	Passed
3.	4.4076002GHz	43.92	4.41	54.00	-10.08	4.00	0.0	Horizontal	Passed
4.	4.4096003GHz	44.04	4.43	54.00	-9.96	4.00	0.0	Horizontal	Passed
5.	12.201829GHz	44.79	12.26	54.00	-9.21	4.00	0.0	Horizontal	Passed
6.	17.827495GHz	42.70	20.96	54.00	-11.30	4.00	296.10	Horizontal	Passed

Overall Graphs:


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

J23133#3_2.4G_802.11n_MCS0_Ch 11_1-18GHz

7/25/2024 10:14:18 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	1.9930292GHz	46.50	-2.27	74.00	-27.50	1.00	87.80	Vertical	Passed
2.	1.9970293GHz	48.65	-2.23	74.00	-25.35	3.00	63.10	Vertical	Passed
3.	4.4096003GHz	46.93	4.42	74.00	-27.07	4.00	358.10	Vertical	Passed
4.	17.866996GHz	55.41	21.23	74.00	-18.59	4.00	359.90	Vertical	Passed
5.	1.8740257GHz	47.15	-3.66	74.00	-26.85	1.00	129.10	Horizontal	Passed
6.	17.831995GHz	55.15	20.98	74.00	-18.85	4.00	1.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	1.9965293GHz	45.78	-2.23	54.00	-8.22	3.00	63.10	Vertical	Passed
2.	4.4096003GHz	45.51	4.42	54.00	-8.49	4.00	358.10	Vertical	Passed
3.	17.833995GHz	43.01	21.12	54.00	-10.99	1.00	359.90	Vertical	Passed
4.	1.9965293GHz	45.82	-2.19	54.00	-8.18	3.00	0.10	Horizontal	Passed
5.	4.4096003GHz	45.52	4.43	54.00	-8.48	4.00	0.10	Horizontal	Passed
6.	17.790494GHz	51.92	20.74	54.00	-2.08	1.50	168.70	Horizontal	Passed

Overall Graphs:


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

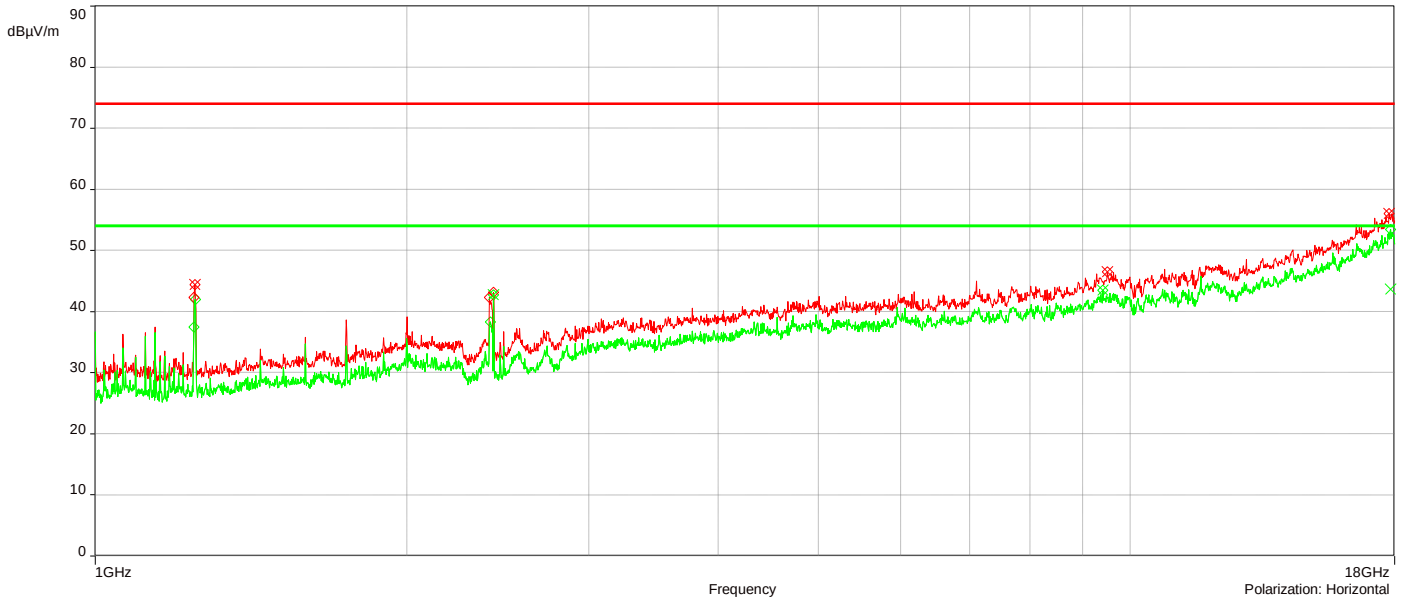
J23133#3_2.4G_802.11g_6Mbps_Ch 1_1-18GHz

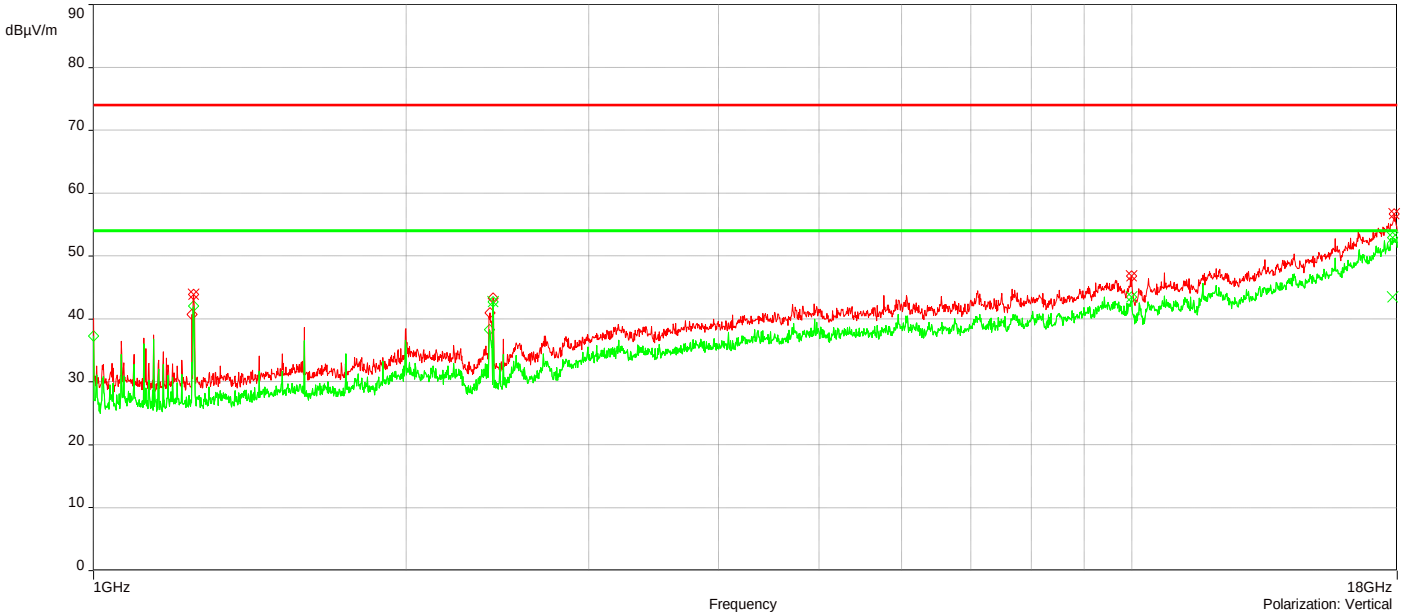
10/25/2024 2:12:02 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	1.2490073GHz	43.91	-7.67	74.00	-30.09	2.50	23.40	Vertical	Passed
2.	9.9877643GHz	46.81	10.62	74.00	-27.19	2.50	310.50	Vertical	Passed
3.	17.876496GHz	56.70	21.57	74.00	-17.30	1.00	69.50	Vertical	Passed
4.	1.2480073GHz	44.43	-7.54	74.00	-29.57	3.00	168.10	Horizontal	Passed
5.	9.5027501GHz	46.52	10.05	74.00	-27.48	1.50	114.90	Horizontal	Passed
6.	17.774493GHz	56.05	21.17	74.00	-17.95	1.50	337.70	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.4260419GHz	42.73	-1.38	54.00	-11.27	2.50	359.90	Vertical	Passed
2.	9.9917645GHz	43.47	10.55	54.00	-10.53	3.50	217.10	Vertical	Passed
3.	17.815495GHz	52.98	21.40	54.00	-1.02	3.50	0.20	Vertical	Passed
4.	2.4260419GHz	42.73	-1.38	54.00	-11.27	2.50	292.20	Horizontal	Passed
5.	9.4072473GHz	43.47	9.88	54.00	-10.53	3.00	0.0	Horizontal	Passed
6.	17.826995GHz	43.64	21.50	54.00	-10.36	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

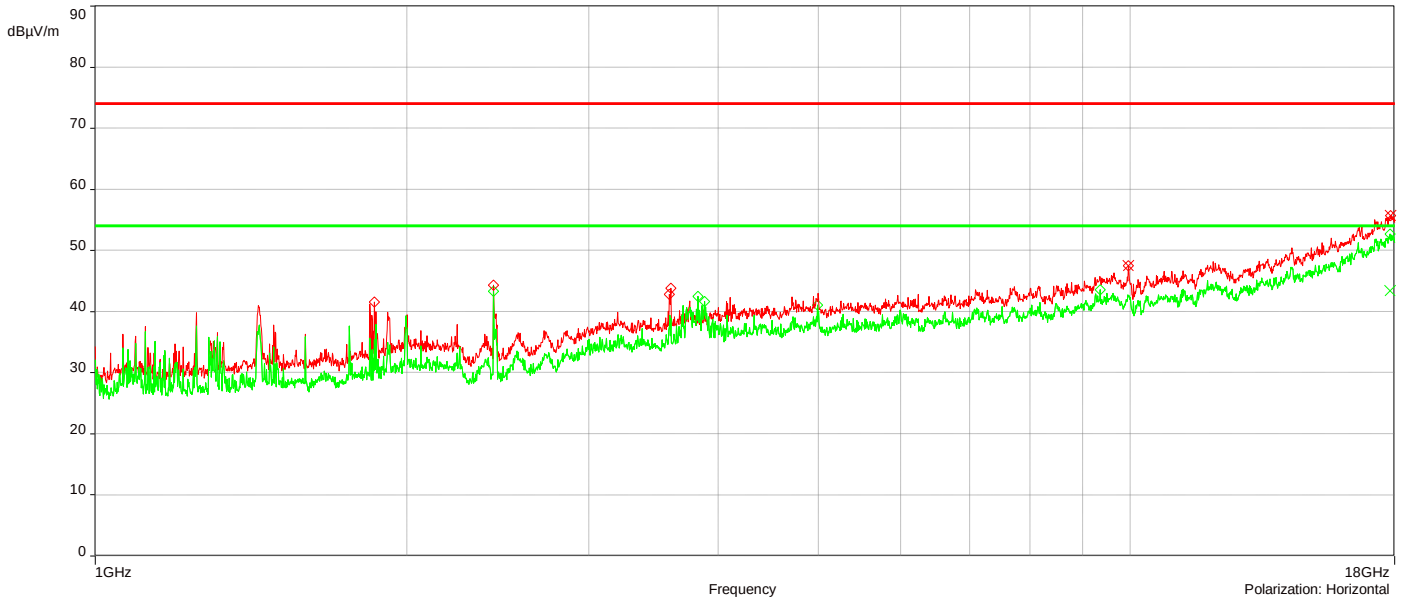
J23133#3_2.4G_802.11g_6Mbps_Ch 6_1-18GHz

10/25/2024 2:50:34 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	1.2520074GHz	46.57	-7.64	74.00	-27.43	1.50	241.00	Vertical	Passed
2.	5.9866467GHz	46.70	6.21	74.00	-27.30	1.00	93.20	Vertical	Passed
3.	9.3522457GHz	46.98	9.88	74.00	-27.02	3.00	302.10	Vertical	Passed
4.	17.837995GHz	56.11	21.49	74.00	-17.89	4.00	229.70	Vertical	Passed
5.	9.9582635GHz	47.54	11.09	74.00	-26.46	2.00	262.80	Horizontal	Passed
6.	17.840495GHz	55.75	21.61	74.00	-18.25	2.50	39.80	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	1.2520074GHz	45.07	-7.64	54.00	-8.93	1.50	241.00	Vertical	Passed
2.	1.7605224GHz	44.36	-4.47	54.00	-9.64	1.00	359.90	Vertical	Passed
3.	1.7690226GHz	47.14	-4.47	54.00	-6.86	1.00	359.90	Vertical	Passed
4.	9.3522457GHz	43.62	9.88	54.00	-10.38	3.00	302.10	Vertical	Passed
5.	17.995GHz	43.79	22.36	54.00	-10.21	1.00	359.90	Vertical	Passed
6.	17.810994GHz	43.39	21.38	54.00	-10.61	2.00	263.10	Horizontal	Passed

Overall Graphs:




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

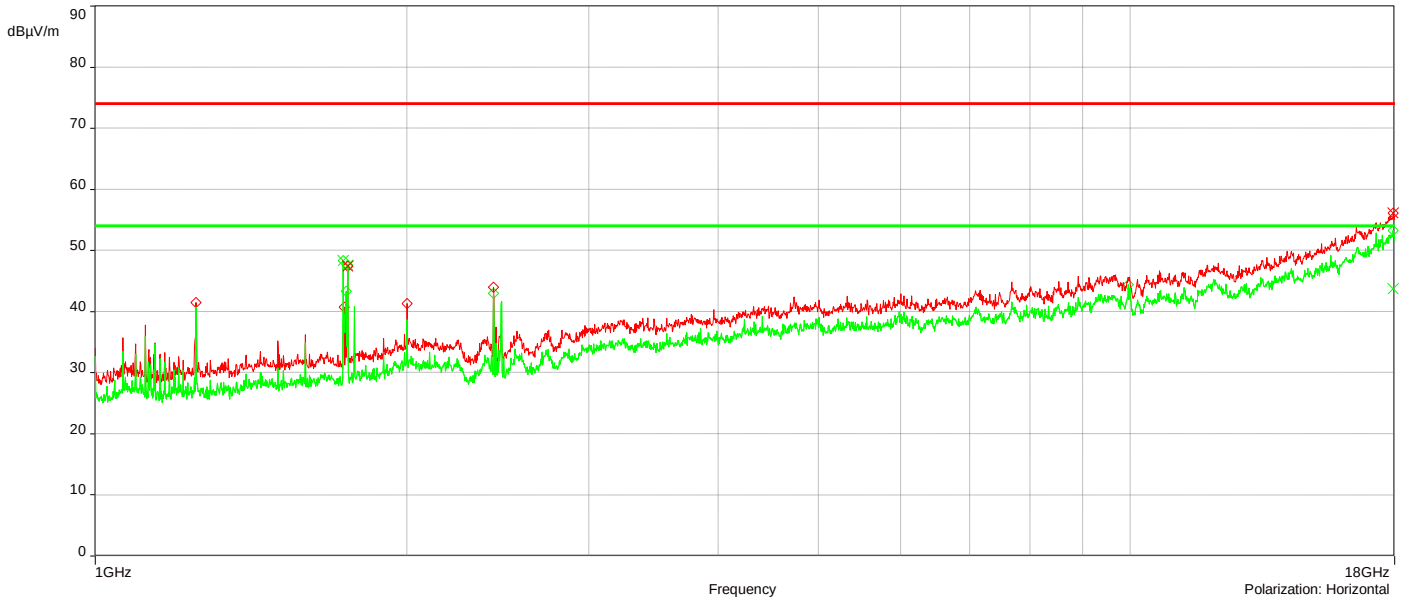
J23133#3_2.4G_802.11g_6Mbps_Ch 11_1-18GHz

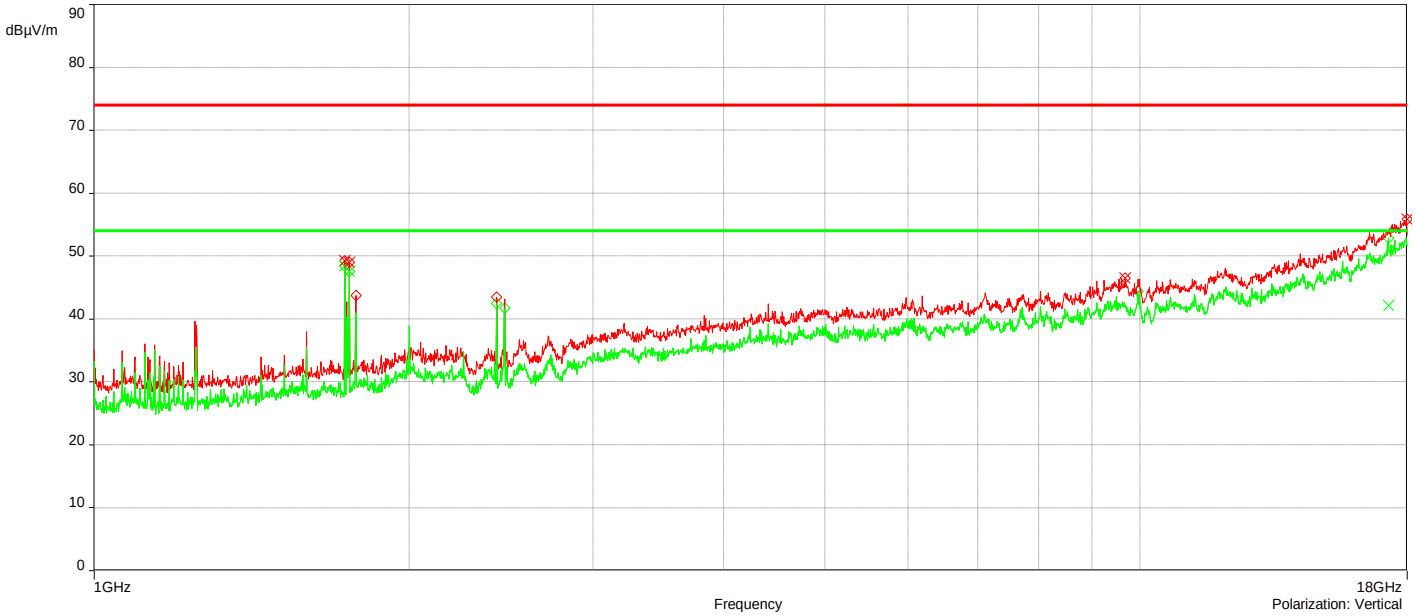
10/24/2024 10:25:40 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	1.7360216GHz	49.25	-4.41	74.00	-24.75	3.00	68.90	Vertical	Passed
2.	1.7540222GHz	49.00	-4.45	74.00	-25.00	2.00	355.70	Vertical	Passed
3.	9.6737551GHz	46.52	11.04	74.00	-27.48	4.00	162.70	Vertical	Passed
4.	17.994GHz	55.92	22.34	74.00	-18.08	1.00	145.30	Vertical	Passed
5.	1.7530221GHz	47.39	-4.49	74.00	-26.61	2.00	64.30	Horizontal	Passed
6.	17.940998GHz	56.12	21.50	74.00	-17.88	4.00	206.30	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	1.7360216GHz	48.46	-4.41	54.00	-5.54	3.00	68.90	Vertical	Passed
2.	1.7540222GHz	47.61	-4.45	54.00	-6.39	2.00	355.70	Vertical	Passed
3.	17.275479GHz	42.20	20.16	54.00	-11.80	4.00	293.90	Vertical	Passed
4.	1.7360216GHz	48.33	-4.54	54.00	-5.67	3.00	359.90	Horizontal	Passed
5.	1.7540222GHz	47.56	-4.49	54.00	-6.44	2.00	359.90	Horizontal	Passed
6.	17.940998GHz	43.78	21.50	54.00	-10.22	4.00	206.30	Horizontal	Passed

Overall Graphs:




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

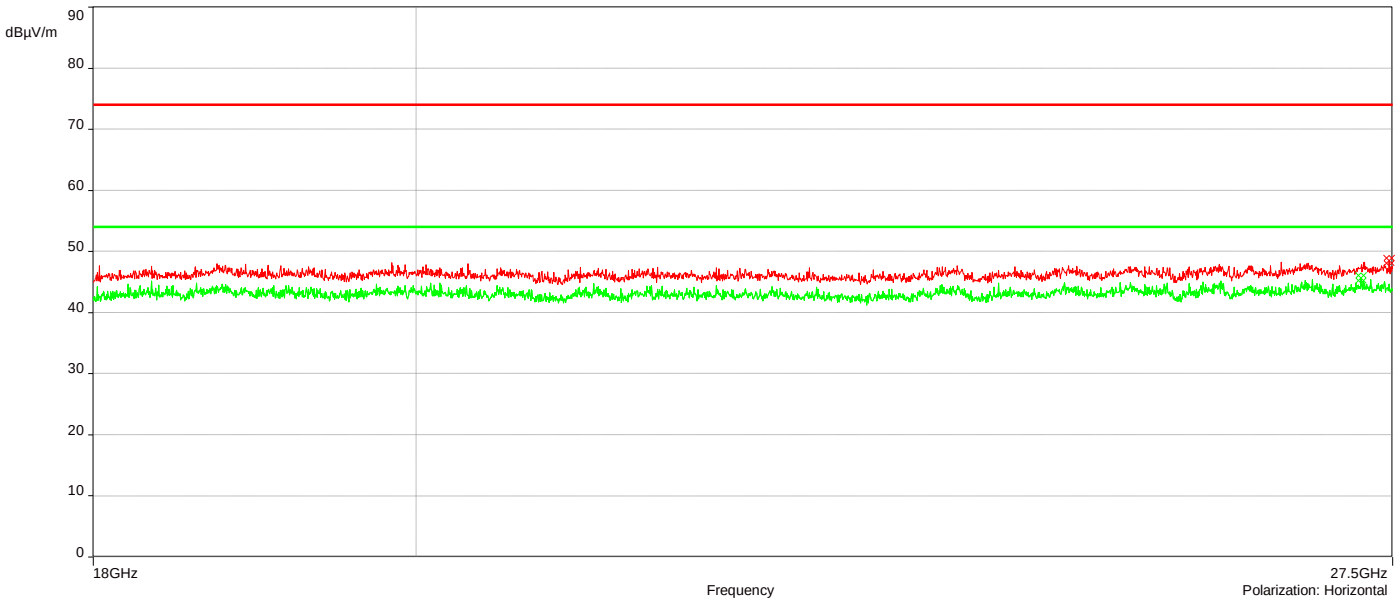
J23133#3_2.4G_802.11b_1Mbps_Ch 6_18-27.5GHz

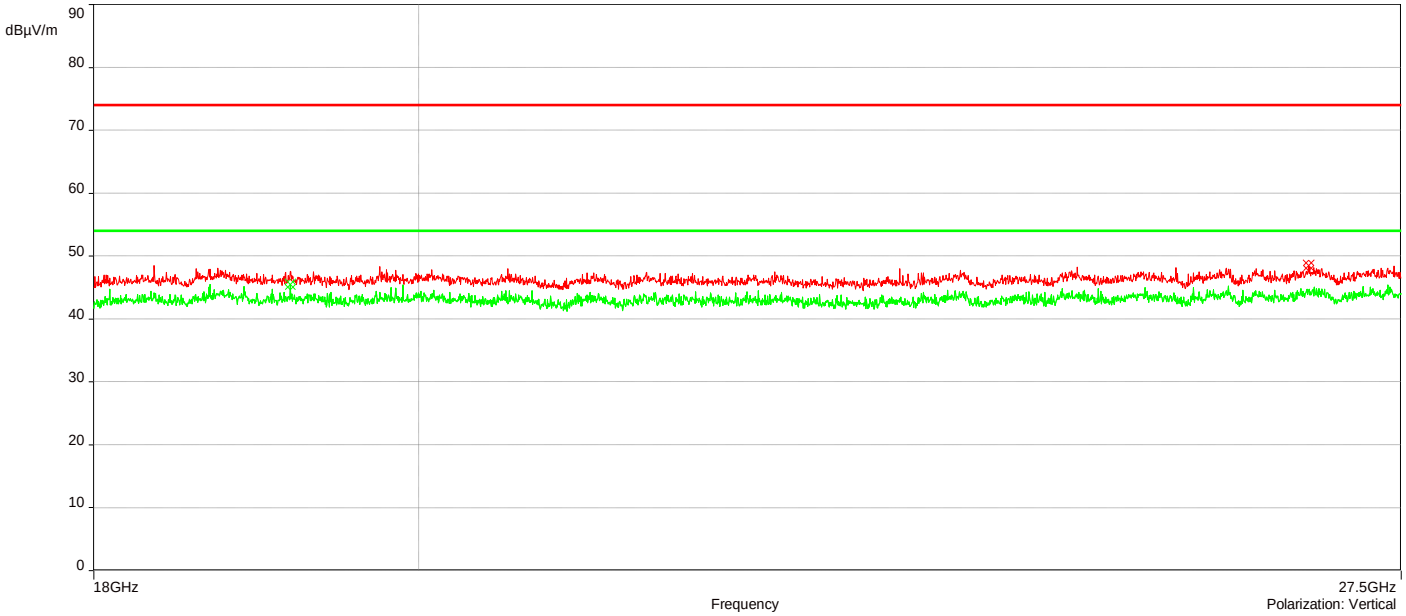
7/30/2024 6:33:30 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	26.687709GHz	48.56	1.25	74.00	-25.44	1.80	179.90	Vertical	Passed
2.	27.466273GHz	48.49	1.52	74.00	-25.51	1.03	337.40	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	19.183759GHz	45.49	-2.00	54.00	-8.51	2.21	247.40	Vertical	Passed
2.	27.217836GHz	45.66	1.10	54.00	-8.34	3.42	44.90	Horizontal	Passed

Overall Graphs:




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

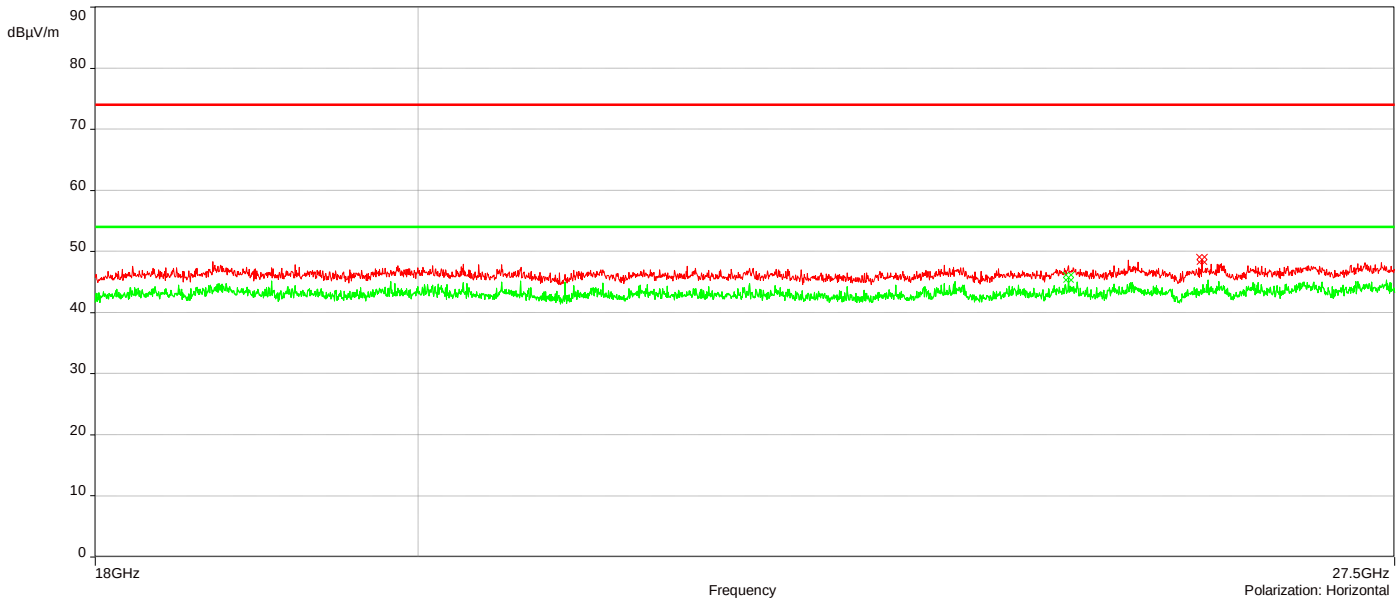
J23133#3_2.4G_802.11g_6Mbps_Ch 6_18-27.5GHz

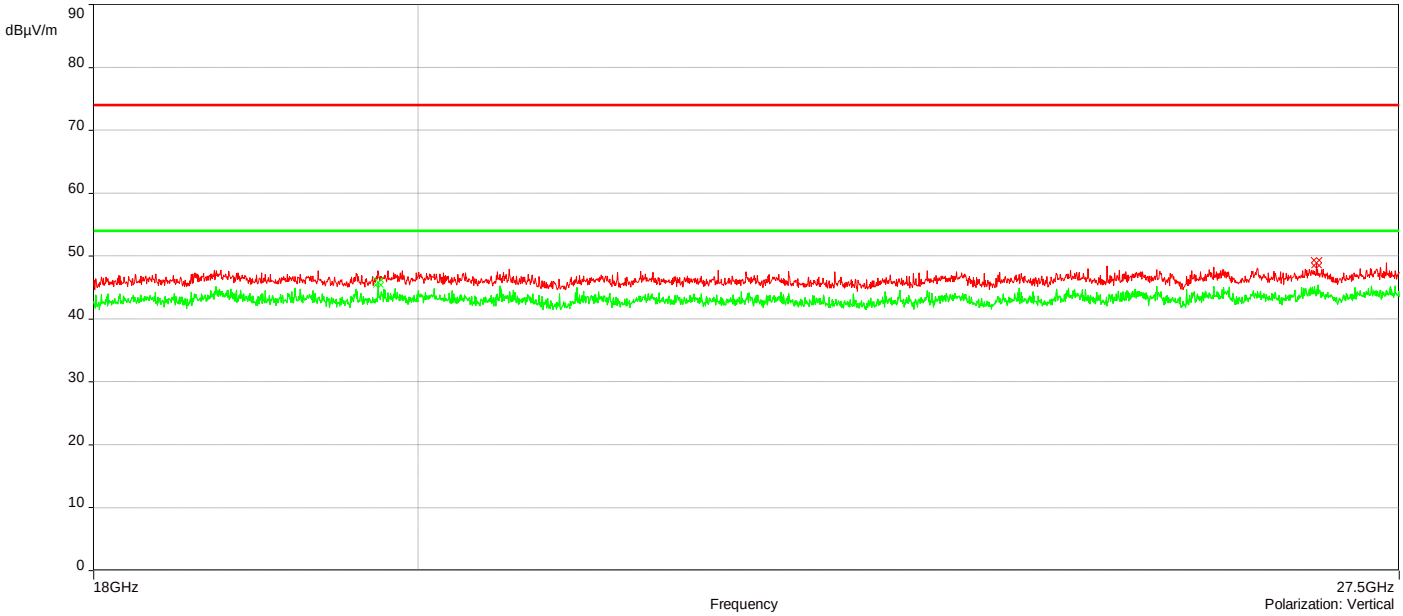
7/30/2024 6:56:13 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	26.772739GHz	48.95	1.50	74.00	-25.05	1.93	225.20	Vertical	Passed
2.	25.823641GHz	48.67	1.11	74.00	-25.33	3.97	22.60	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	19.740962GHz	45.85	-1.71	54.00	-8.15	4.00	292.60	Vertical	Passed
2.	24.724436GHz	45.80	1.06	54.00	-8.20	3.12	315.10	Horizontal	Passed

Overall Graphs:




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

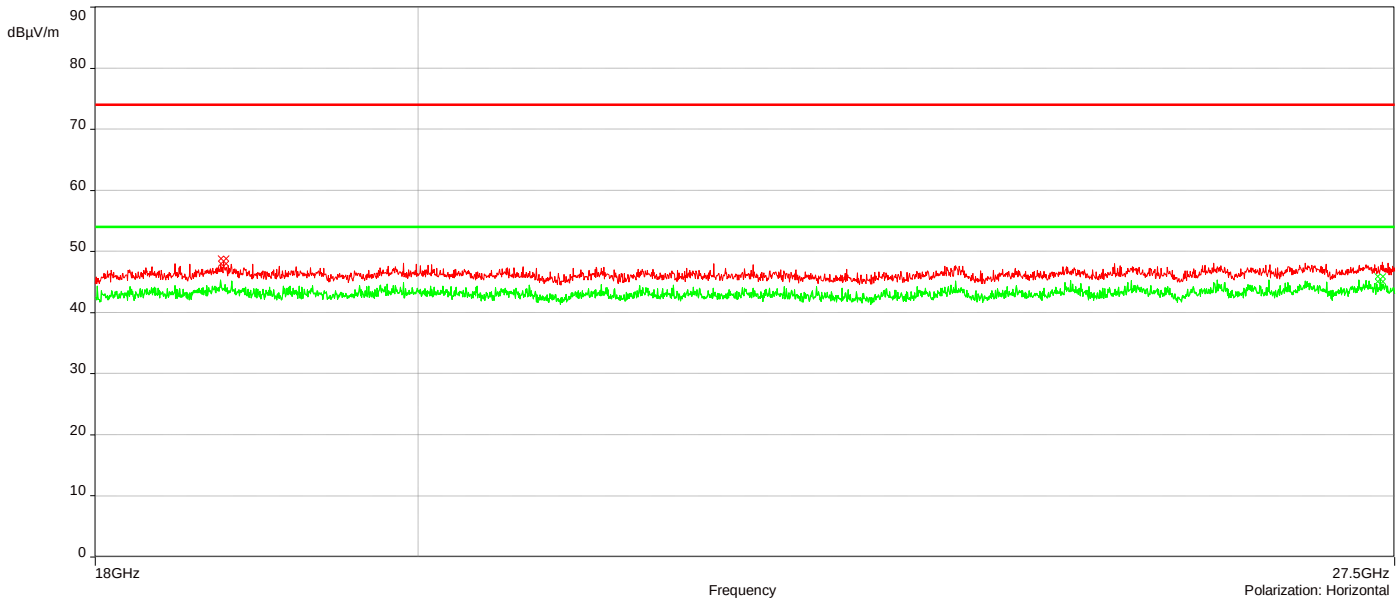
J23133#3_2.4G_802.11n_MCS0_Ch 6_18-27.5GHz

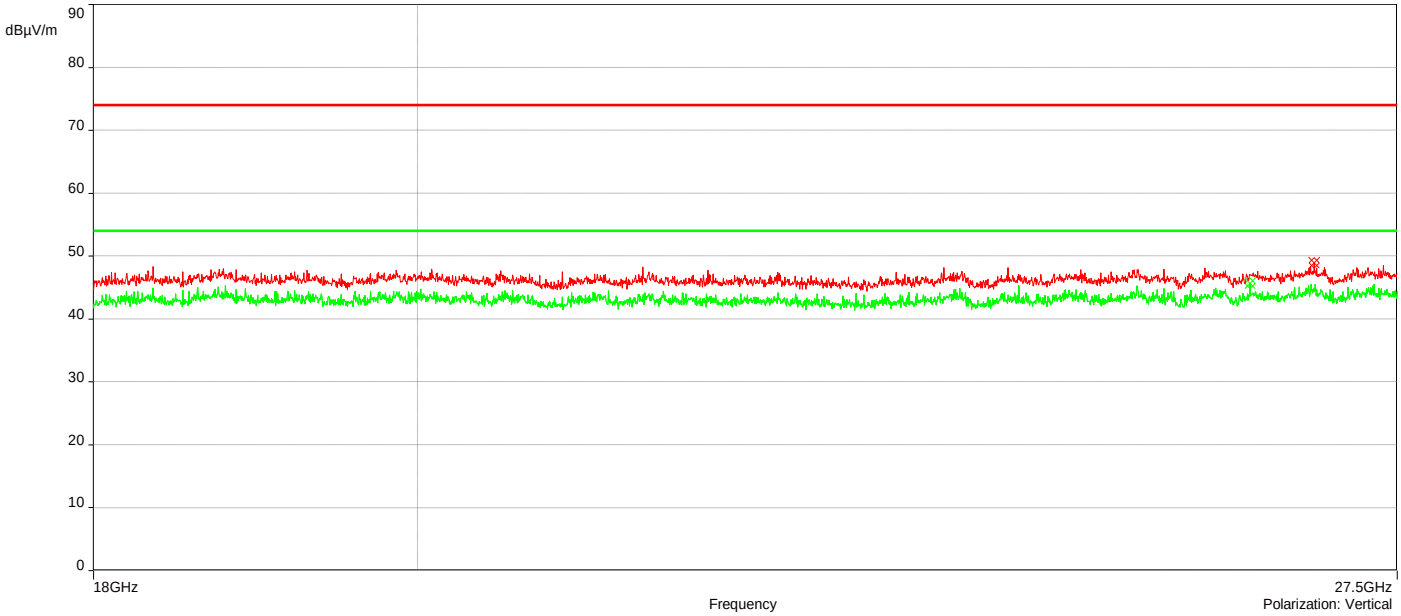
7/30/2024 7:18:05 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	26.768938GHz	48.98	1.50	74.00	-25.02	3.80	179.90	Vertical	Passed
2.	18.769538GHz	48.40	-1.02	74.00	-25.60	3.97	224.90	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	26.216486GHz	45.70	0.99	54.00	-8.30	2.19	224.90	Vertical	Passed
2.	27.370794GHz	45.54	1.45	54.00	-8.46	1.28	112.40	Horizontal	Passed

Overall Graphs:




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

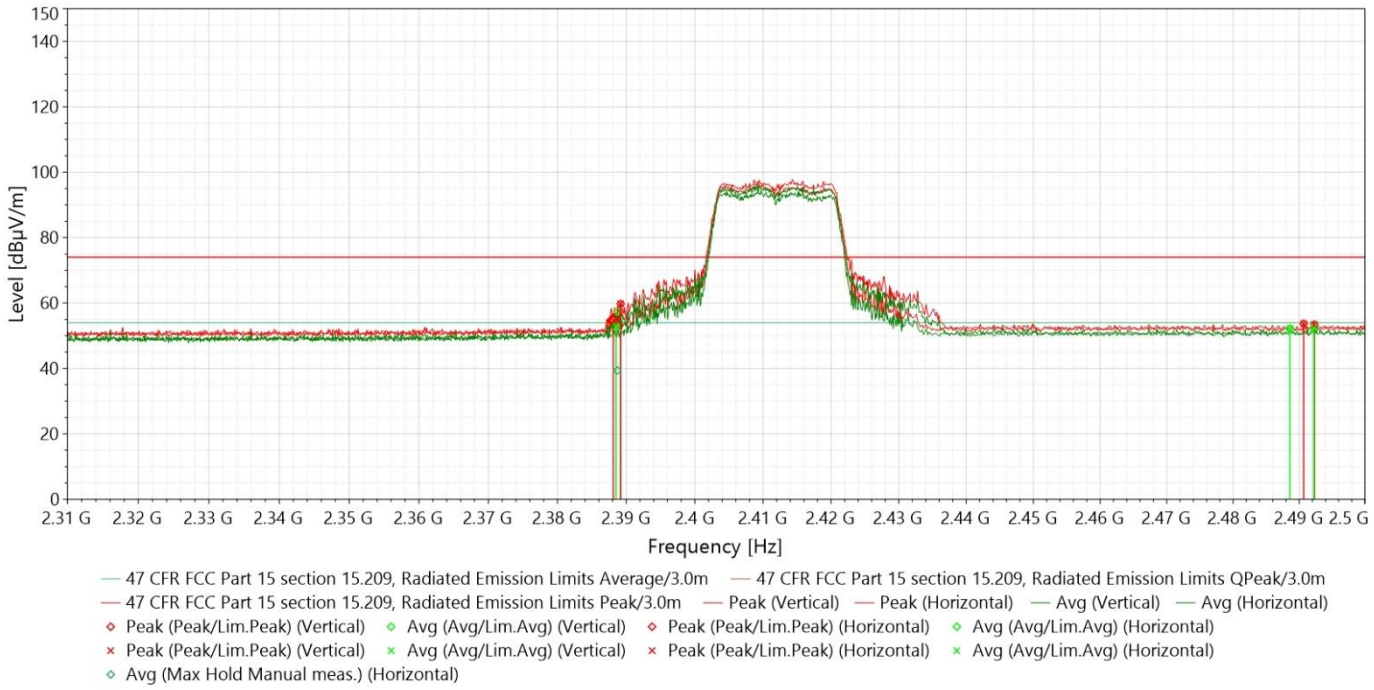
J23133#3_2.4G_Restricted Bandedge_802.11n_MCS0_Ch 1

7/29/2024 12:44:14 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3881291GHz	54.69	-2.31	74.00	-19.31	1.00	137.00	Vertical	Passed
2.	2.4923012GHz	53.42	-1.84	74.00	-20.58	1.00	55.30	Vertical	Passed
3.	2.3891746GHz	59.75	-2.38	74.00	-14.25	2.00	297.10	Horizontal	Passed
4.	2.4906853GHz	53.68	-1.81	74.00	-20.32	2.00	23.40	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3885093GHz	52.93	-2.31	54.00	-1.07	1.50	145.10	Vertical	Passed
2.	2.4922061GHz	52.39	-1.84	54.00	-1.61	3.00	15.70	Vertical	Passed
3.	2.3886993GHz	39.37	-2.38	54.00	-14.63	3.00	311.10	Horizontal	Passed
4.	2.4885943GHz	52.22	-1.80	54.00	-1.78	2.00	58.80	Horizontal	Passed

Overall Graphs:



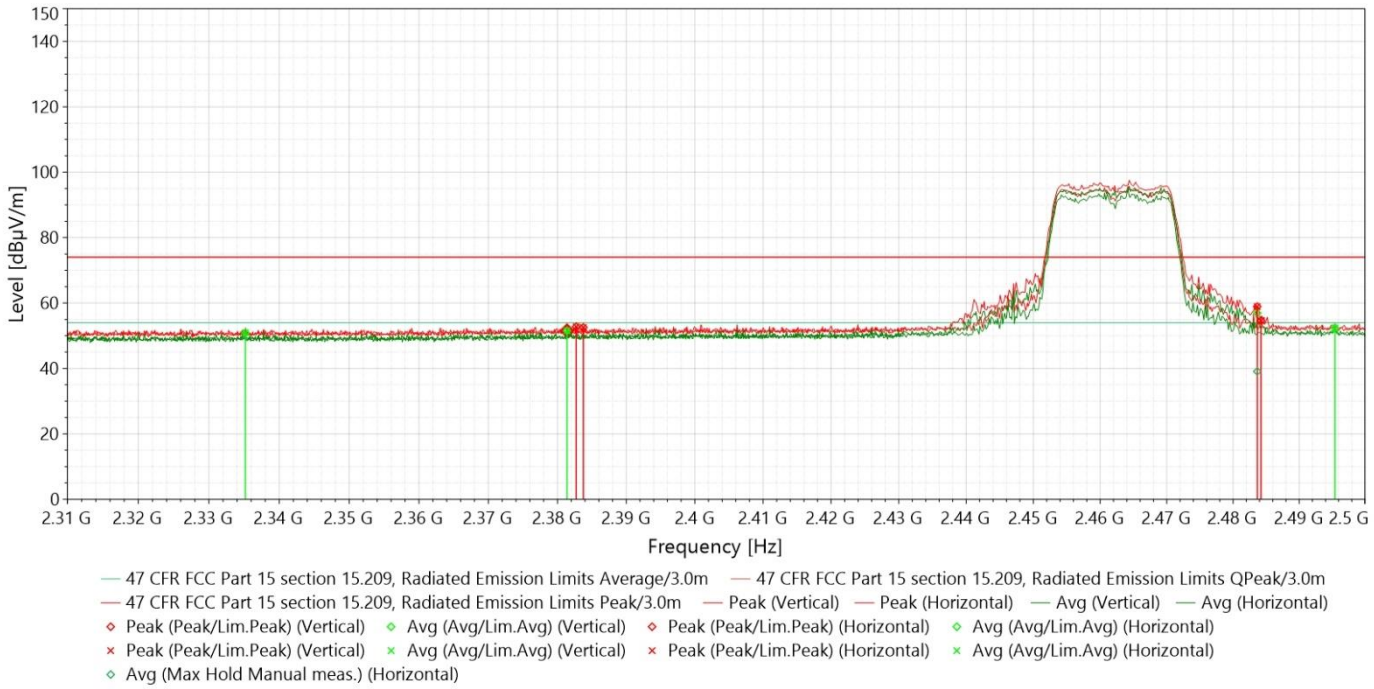
J23133#3_2.4G_Restricted Bandedge_802.11n_MCS0_Ch 11

7/29/2024 1:03:12 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3837569GHz	52.54	-2.32	74.00	-21.46	2.00	131.70	Vertical	Passed
2.	2.4842221GHz	54.59	-1.87	74.00	-19.41	3.50	46.00	Vertical	Passed
3.	2.3827114GHz	52.75	-2.45	74.00	-21.25	4.00	247.60	Horizontal	Passed
4.	2.4836518GHz	58.92	-1.79	74.00	-15.08	2.50	168.10	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3813807GHz	51.53	-2.32	54.00	-2.47	3.50	0.10	Vertical	Passed
2.	2.4954377GHz	52.37	-1.85	54.00	-1.63	2.00	126.70	Vertical	Passed
3.	2.3351876GHz	50.91	-2.87	54.00	-3.09	1.50	66.40	Horizontal	Passed
4.	2.4836518GHz	39.11	-1.79	54.00	-14.89	2.50	168.10	Horizontal	Passed

Overall Graphs:



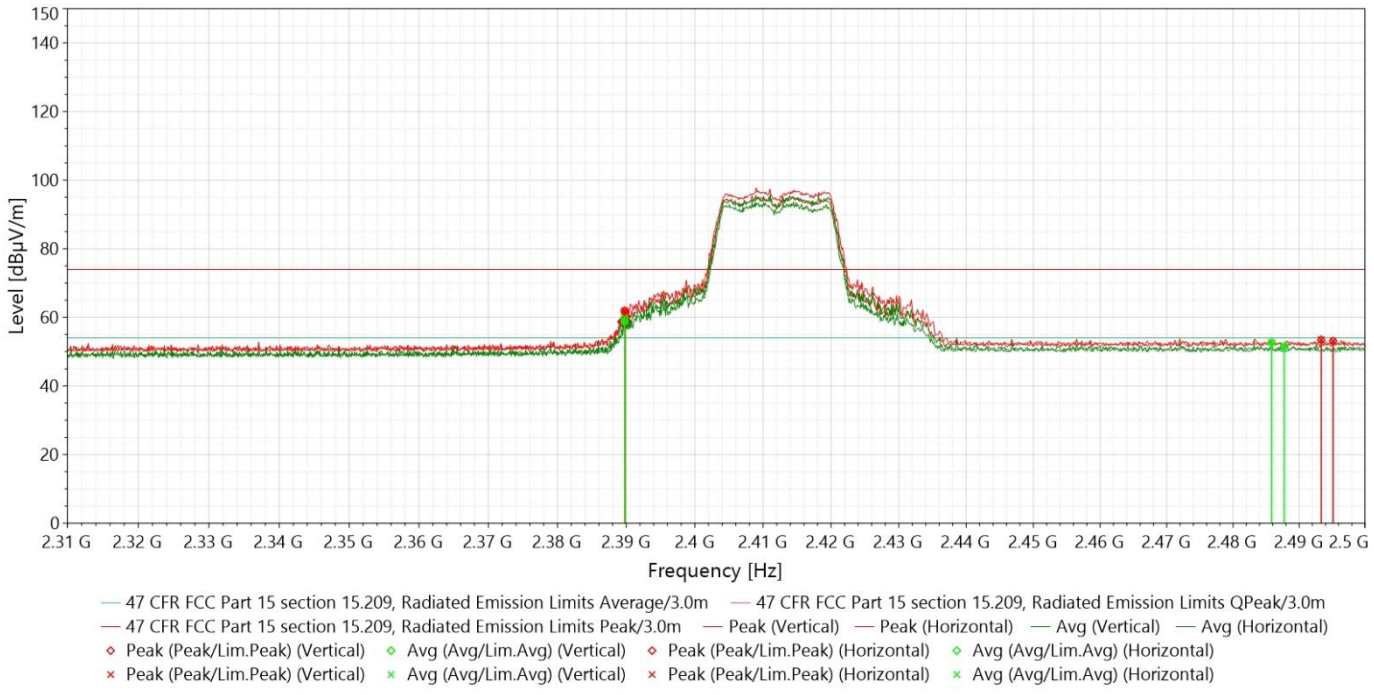
J23133#3_2.4G_Restricted Bandedge_802.11g_6Mbps_Ch 1

10/24/2024 9:27:15 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3898399GHz	61.37	-2.42	74.00	-12.63	3.00	149.50	Vertical	Passed
2.	2.4951526GHz	53.10	-1.84	74.00	-20.90	2.00	262.60	Vertical	Passed
3.	2.3897449GHz	61.95	-2.42	74.00	-12.05	3.00	70.80	Horizontal	Passed
4.	2.4933467GHz	53.45	-1.83	74.00	-20.55	2.00	239.40	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	44.27	-2.43	54.00	-9.73	3.00	147.10	Vertical	Passed
2.	2.4877389GHz	27.90	-1.84	54.00	-26.1	4.00	341.90	Vertical	Passed
3.	2.3897449GHz	31.94	-2.42	54.00	-22.06	3.00	70.80	Horizontal	Passed
4.	2.4858379GHz	27.47	-1.85	54.00	-26.53	2.50	217.70	Horizontal	Passed

Overall Graphs:



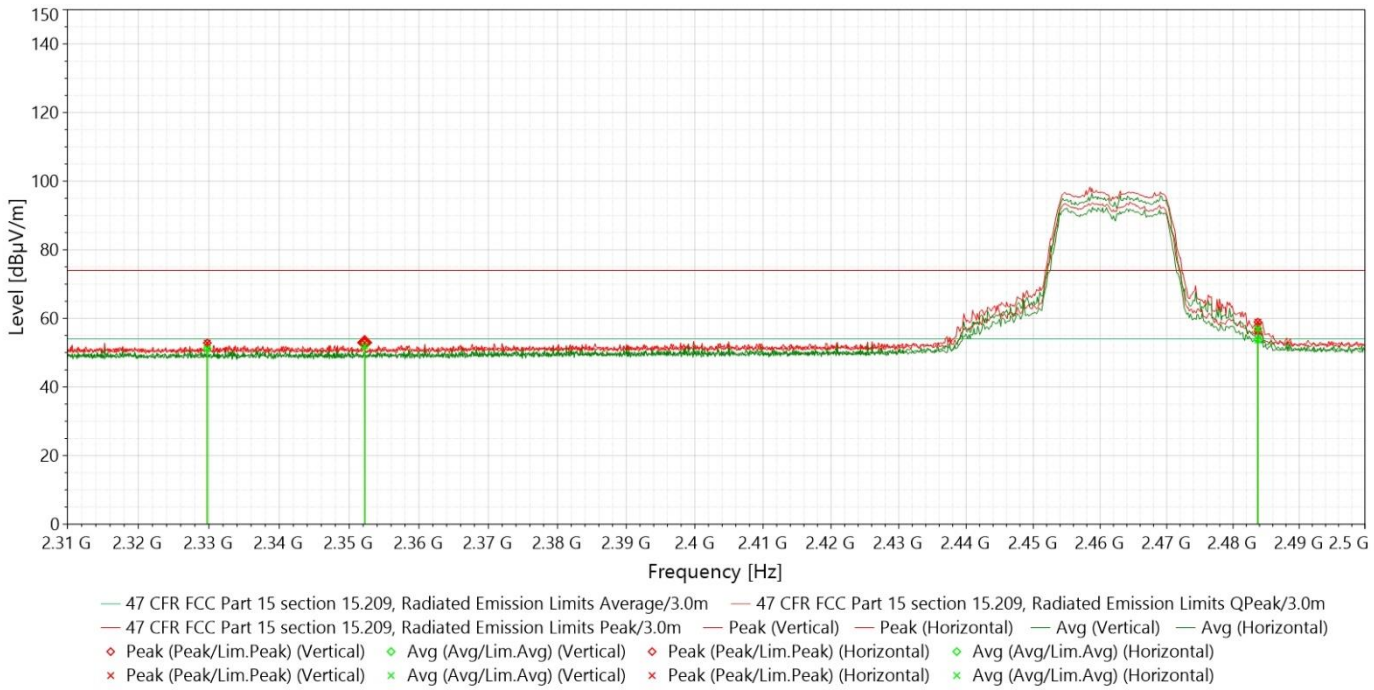
J23133#3_2.4G_Restricted Bandedge_802.11g_6Mbps_Ch 11

10/24/2024 9:57:24 PM

No	Frequency (MHz)	Level Peak Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgement
1.	2.3522011GHz	52.94	-2.69	74.00	-21.06	3.00	214.70	Vertical	Passed
2.	2.4837469GHz	56.25	-1.86	74.00	-17.75	3.50	65.50	Vertical	Passed
3.	2.3297699GHz	52.83	-2.83	74.00	-21.17	1.00	82.50	Horizontal	Passed
4.	2.4837469GHz	58.93	-1.87	74.00	-15.07	1.50	257.30	Horizontal	Passed

No	Frequency (MHz)	Level Average Reading (dBµV/m)	Correction Factor (dB)	Limit dBµV/m	Margin (dB)	Height (m)	Angle (°)	Polarization	Judgment
1.	2.3522011GHz	26.34	-2.69	54.00	-27.66	3.00	214.70	Vertical	Passed
2.	2.4837469GHz	39.45	-1.86	54.00	-14.55	3.50	65.50	Vertical	Passed
3.	2.3297699GHz	26.22	-2.83	54.00	-27.78	1.00	82.50	Horizontal	Passed
4.	2.4837469GHz	43.47	-1.87	54.00	-10.53	1.50	257.30	Horizontal	Passed

Overall Graphs:



Document Revisions

Version	Date	Modifier	Changes
1.0	10/30/2024	Aravind Buddana	• Initial Release
2.0	01/25/2025	Aravind Buddana	• Updated Section 1 and Section 4.1 with RSS 247 Issue version. • Updated Section 1 with EUT FVIN Information • Updated Section 4.1 with DUT/EUT Operation Information. • Updated Section 4.4.3 Ansi Reference.

End of Report