

TEST REPORT

Report Number: 104799910MPK-003
Project Number: G104799910
Original Issue Date: November 12, 2021
Revision Date: February 7, 2022

Testing performed on the
Minibadge
Model: C1000

FCC ID: QGZC1000
IC: 4362A-C1000

to

FCC Part 15 Subpart C (15.247)
ISED RSS-247, Issue 2

For

Vocera Communications, Inc.

Test Performed by:

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1365 Adams Court
Menlo Park, CA 94025 USA

Test Authorized by:

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San Jose, CA 95126 USA

Prepared by: _____

Minh Ly

Date: February 7, 2022

Reviewed by: _____

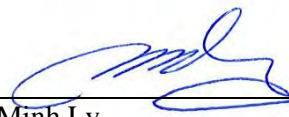
Krishna K Vemuri

Date: February 7, 2022

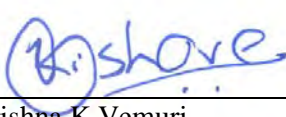
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Report No. 104799910MPK-003	
Equipment Under Test:	Minibadge
Model Number:	C1000
Applicant:	Vocera Communications, Inc.
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Address:	Vocera Communications, Inc. 525 Race St, Ste 150 San Jose, CA 95126
Country:	USA
Tel. Number:	(408) 882-5100
Email:	Pguda@vocera.com
Applicable Regulation:	FCC Part 15 Subpart C (15.247) ISED RSS-247 Issue 2
Date of Test:	October 04 – 22, 2021

We attest to the accuracy of this report:



Minh Ly
Senior Project Engineer



Krishna K Vemuri
EMC Manager

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1.0 Summary of Tests

Test	Reference FCC	Reference Industry Canada	Result
RF Output Power	15.247(b)(3)	RSS-247, 5.4.d)	Complies
6 dB Bandwidth	15.247(a)(2)	RSS-247, 5.2.a)	Complies
Power Density	15.247(e)	RSS-247, 5.2.b)	Complies
Out of Band Antenna Conducted Emission	15.247(d)	RSS-247, 5.5	Complies
Transmitter Radiated Emissions	15.247(d), 15.209, 15.205	RSS-247, 5.5	Complies
AC Line Conducted Emission	15.207	RSS-GEN	Complies
Antenna Requirement	15.203	RSS-GEN	Complies (Internal Antenna)
RF Exposure	15.247(i), 2.1093(d)	RSS-102	Complies

EUT receive date: October 04, 2021

EUT receive condition: The pre-production version of the EUT was received in good condition with no apparent damage. As declared by the Applicant, it is identical to the production units.

Test start date: October 06, 2021

Test completion date: October 22, 2021

The test results in this report pertain only to the item tested.

2.0 General Information

2.1 Product Description

Vocera Communications, Inc. supplied the following description of the EUT:

A small, lightweight, wearable communication device designed to simplify hospital communication and workflow and improve staff safety. A user can “wake up” and operate the device using only their voice, to stay connected even under restrictive PPE. They can make and receive calls; listen and respond to messages and alarm notifications. Visual indicators enable fast triaging of events. A dedicated panic button provides a direct connection to security personnel. The device can be used as a smartphone companion, or by itself.

For more information, see user’s manual provided by the manufacturer.

This test report covers only the 2.4GHz WiFi radio.

Information about the WiFi radio is presented below:

The EUT supports a wide range of data rates in the 2.4GHz band:

IEEE 802.11b
IEEE 802.11g
IEEE 802.11n 20MHz

Radio Information	
Applicant	Vocera Communications, Inc.
Model Number	C1000
FCC Identifier	QGZC1000
IC Identifier	4362A-C1000
Modulation Technique	DSSS (BPSK, QPSK, CCK), OFDM (BPSK, QPSK, 16QAM, 64QAM)
Rated RF Output	802.11b: 17.45 dBm 802.11g: 15.71 dBm 802.11n 20MHz: 15.90 dBm
Frequency Range	2412 – 2462 MHz, 802.11b/g/n
Type of modulation	BPSK, QPSK, 16QAM, 64QAM
Number of Channel(s)	11 for 802.11b/g/n
Antenna(s) & Gain	Internal Antenna, Gain: +1.45 dBi
Applicant Name & Address	Vocera Communications, Inc. 525 Race St, Ste 150 San Jose, CA 95126 USA

The EUT supports the following configurations:

Channels in 2.4 GHz band			
Channel no.	Frequency (MHz)	IEEE 802.11b/g/n HT 20 mode	
1	2412	√	X
2	2417	√	
3	2422	√	
4	2427	√	
5	2432	√	
6	2437	√	X
7	2442	√	
8	2447	√	
9	2452	√	
10	2457	√	
11	2462	√	X

√ = available

X = to be tested

2.2 Related Submittal(s) Grants

None.

2.3 Test Facility

The test site used to collect the radiated data is site 1 (10-m semi-anechoic chamber). This test facility and site measurement data have been fully placed on file with the FCC, IC and A2LA accredited.

2.4 Test Methodology

Antenna conducted measurements were performed according to the FCC documents “Guidance for Performing Compliance Measurement on Digital Transmission Systems (DTS) Operating under §15.247” (KDB 558074 D01 DTS Meas Guidance v05r02), and RSS-247 Issue 2, RSS-GEN Issue 5.

Radiated emissions and AC mains conducted emissions measurements were performed according to the procedures in ANSI C63.10: 2013. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the “Data Sheet” of this report.

2.5 Measurement Uncertainty

Compliance with the limits was based on the results of the measurements and doesn’t take into account the measurement uncertainty.

Estimated Measurement Uncertainty

Measurement	Expanded Uncertainty (k=2)		
	0.15 MHz – 1 GHz	1 GHz – 2.5 GHz	> 2.5 GHz
RF Power and Power Density – antenna conducted	-	0.7 dB	-
Unwanted emissions – antenna conducted	1.1 dB	1.3 dB	1.9 dB
Bandwidth – antenna conducted	-	30 Hz	-

Measurement	Expanded Uncertainty (k=2)			
	0.15 MHz – 30MHz	30 – 200 MHz	200 MHz – 1 GHz	1 GHz – 18 GHz
Radiated emissions	-	4.7	4.6	5.1 dB
AC mains conducted emissions	2.1 dB	-	-	-

3.0 System Test Configuration

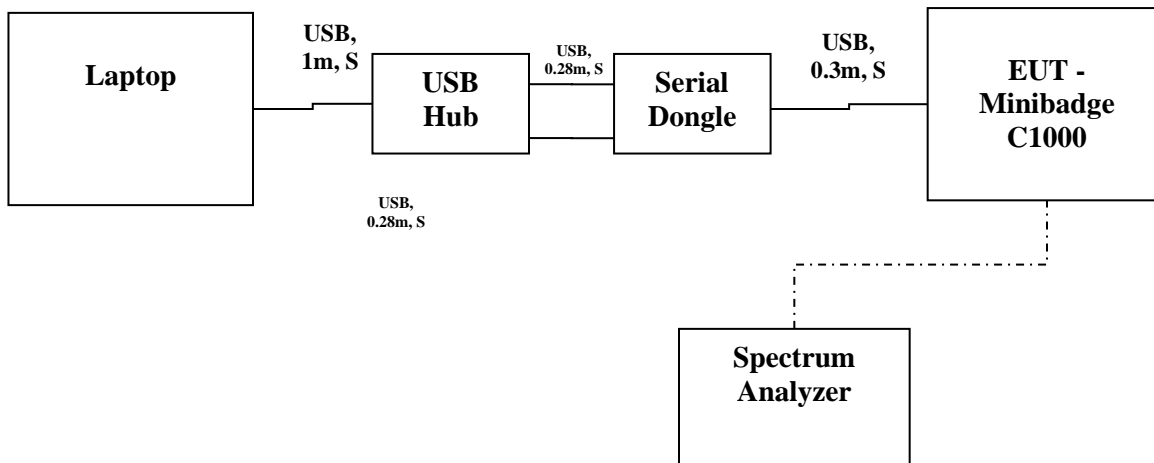
3.1 Support Equipment and description

Support Equipment		
Description	Manufacturer	Model
Laptop	Lenovo	T440P
USB Hub	Tendak	CP-029-BK
Serial Dongle	Vocera	210-01516-B04

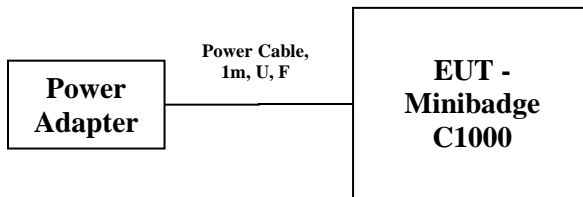
3.2 Block Diagram of Test Setup

Equipment Under Test			
Description	Manufacturer	Model	Serial Number/ID
Minibadge – Conducted Unit	Vocera Communications, Inc.	C1000	AA3301J26008A6
Minibadge – Radiated Unit	Vocera Communications, Inc.	C1000	AA3301J2600878
Power Adapter	Vocera	WB-10E05R	D0714N55000843
Wired Headset	Vocera	V5000 Headset	230-02162

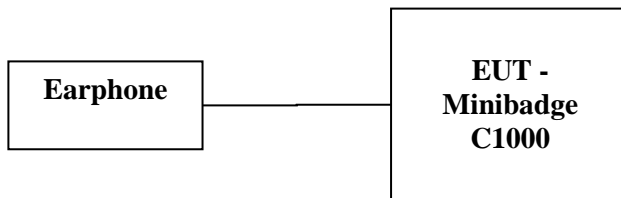
Antenna was removed and co-axial connector was installed for Conducted Measurements.



Radiated Measurements Charging Mode



Radiated Measurements Normal Mode



S = Shielded
U = Unshielded

F = With Ferrite
m = Length in Meters

3.3 Justification

Preliminary testing was performed for all modulation/data rate modes. The worse-case data rate with highest power and widest spectrum were selected for final measurements:

CCK 1 Mbps – for 802.11b
OFDM 6 Mbps – for 802.11g
OFDM MCS0 – for 802.11n

For radiated emission measurements the EUT is placed on a non-conductive table. The EUT was configured to continuously transmit. Different orientation of the EUT were tested and only the worse-case emissions were reported.

The EUT was tested in 2 configurations with EUT in horizontal and upright positions:

- A/ Charging mode: tested with power adapter
- B/ Normal mode: tested in battery mode and earphone.

3.4 Software Exercise Program

The EUT exercise program used during radiated and conducted testing was provided by Vocera Communications, Inc.

3.5 Mode of Operation During Test

During transmitter testing, the transmitter was setup to transmit continuously using the RF power setting provided by the manufacturers via test scripts. The corresponding output power in dBm can be found in section 4.2 of this report.

The table below reflects the RF power setting needed to be compliant with radiated restricted band edge requirements of 15.205 & 15.209.

Channels	802.11b	802.11g	802.11n 20MHz
1 - 11	18	16	17

3.6 Modifications Required for Compliance

No modifications were made by the manufacturer or Intertek to the EUT in order to bring the EUT into compliance.

3.7 Additions, Deviations and Exclusions from Standards

No additions, deviations or exclusions from the standard were made.

4.0 Measurement Results

4.1 6-dB Bandwidth and 99% Occupied Bandwidth FCC Rule: 15.247(a)(2); RSS-247, 5.2.a) and RSS-GEN;

4.1.1 Requirement

The minimum 6-dB bandwidth shall be at least 500 kHz

4.1.2 Procedure

A spectrum analyzer was connected to the antenna port of the transmitter.

For FCC 6dB Channel Bandwidth the Procedure described in the FCC Publication KDB 558074 D01 Meas Guidance v05r02 was used to determine the DTS occupied bandwidth. Section 11.8.1 Option 1 of ANSI 63.10 was used.

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

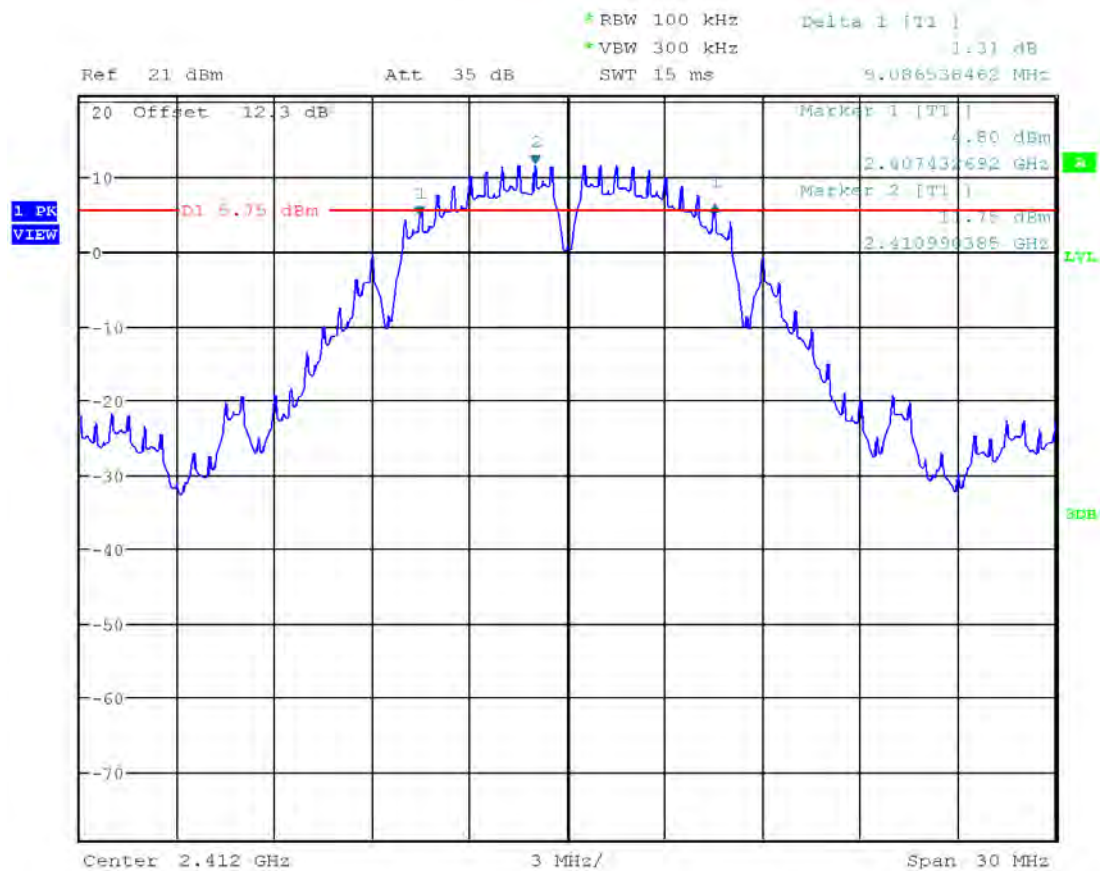
For 99% power bandwidth measurement, the bandwidth was determined by using the built-in 99% occupied bandwidth function of the spectrum analyzer. The resolution bandwidth is set to 1% of the selected span as is without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth.

Tested By	Test Date
Minh Ly	October 06, 2021

4.1.3 Test Result

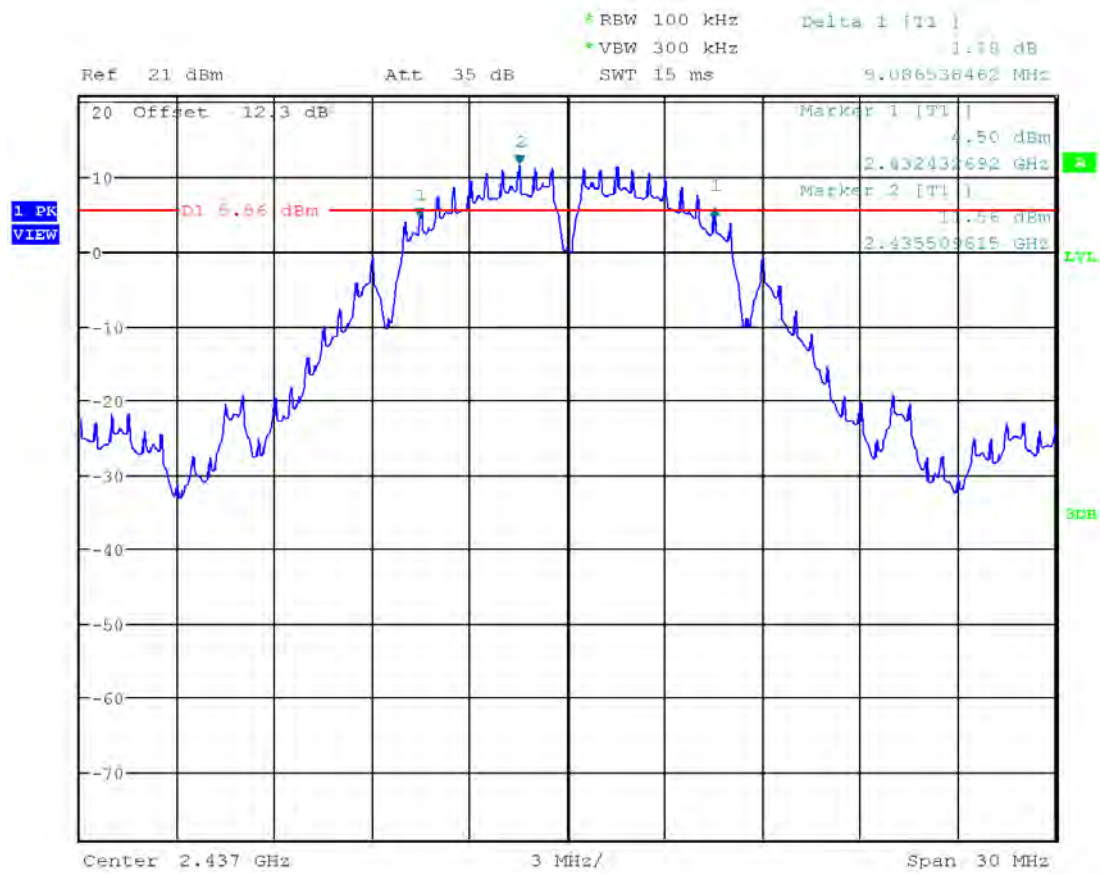
Frequency MHz	Ch.	Frequency MHz	6 dB FCC Bandwidth, MHz	Plot #	99% Bandwidth, MHz	Plot #
802.11b	1	2412	9.086	1.1	12.215	1.4
	6	2437	9.086	1.2	12.211	1.5
	11	2462	9.086	1.3	12.307	1.6
802.11g	1	2412	16.057	1.7	16.875	1.10
	6	2437	16.346	1.8	17.019	1.11
	11	2462	16.057	1.9	16.826	1.12
802.11n 20MHz	1	2412	17.307	1.13	18.028	1.16
	6	2437	17.548	1.14	18.173	1.17
	11	2462	17.115	1.15	17.932	1.18

Plot 1.1 – 6dB Bandwidth (FCC)



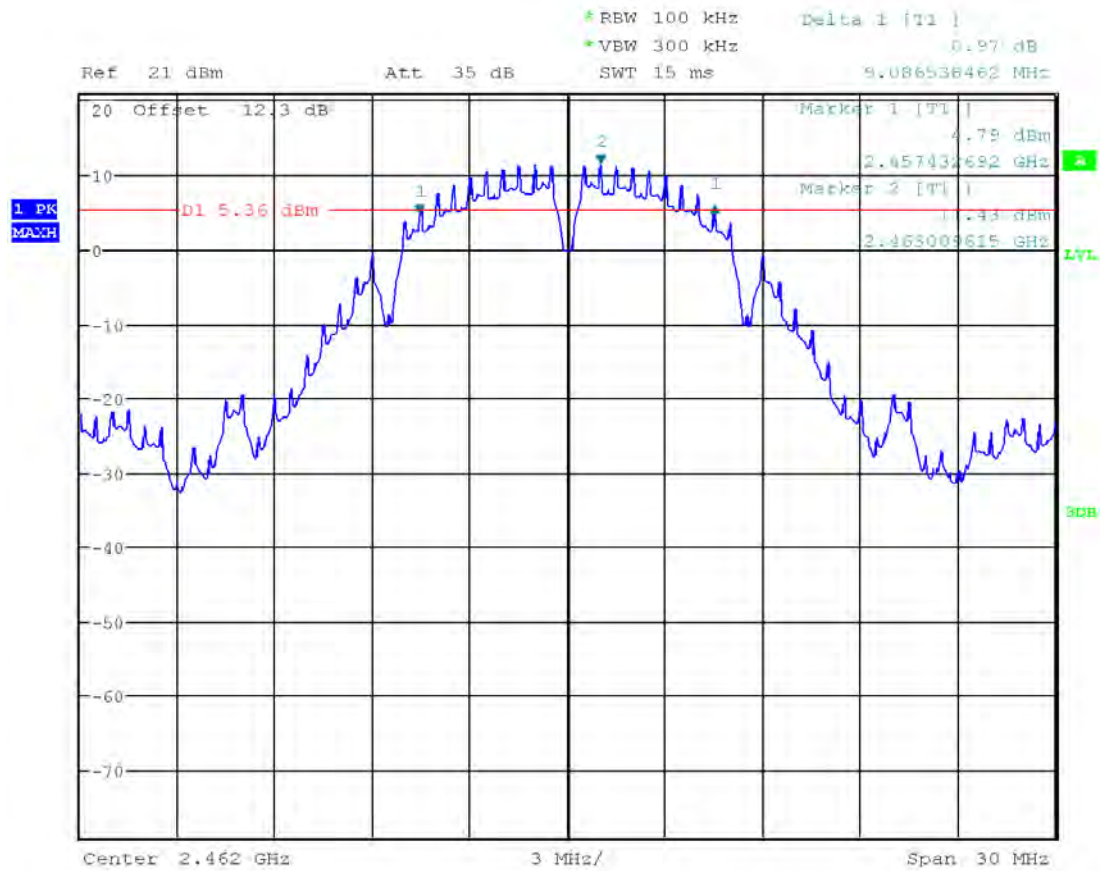
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Plot 1.2 – 6dB Bandwidth (FCC)



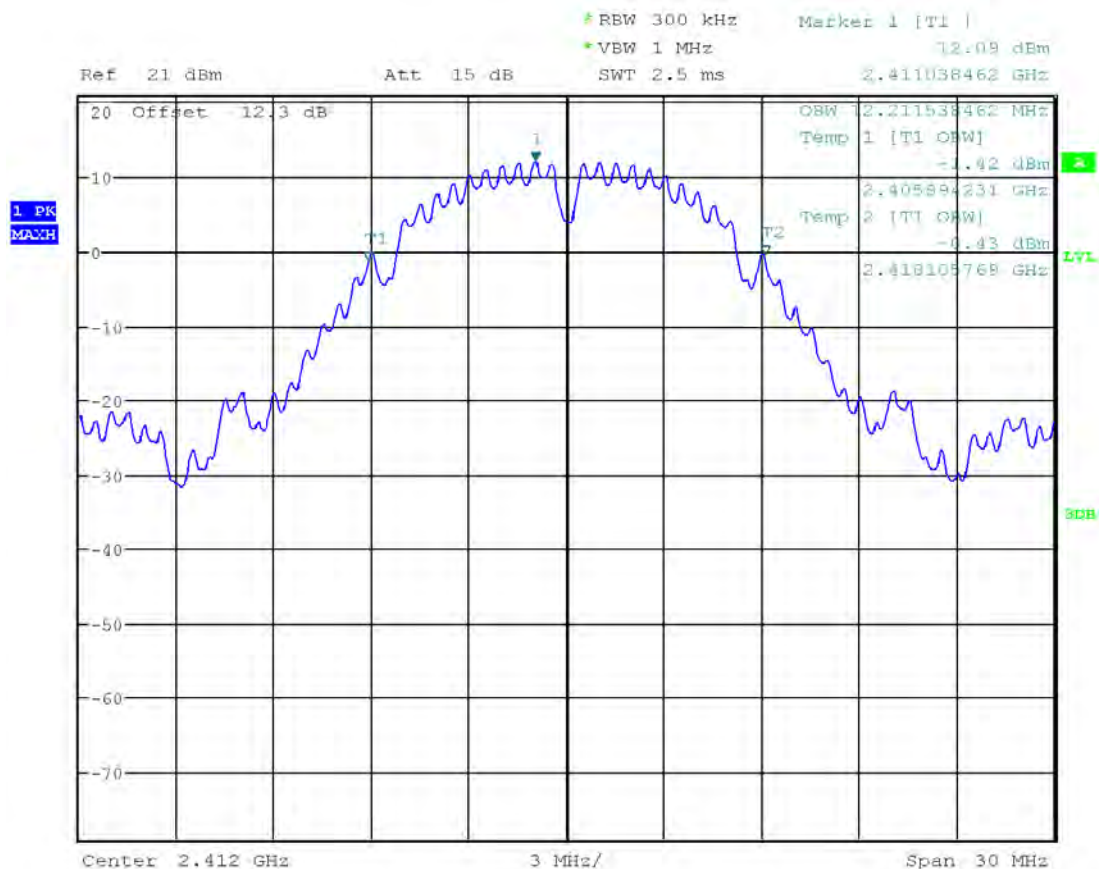
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Plot 1 3 – 6dB Bandwidth (FCC)



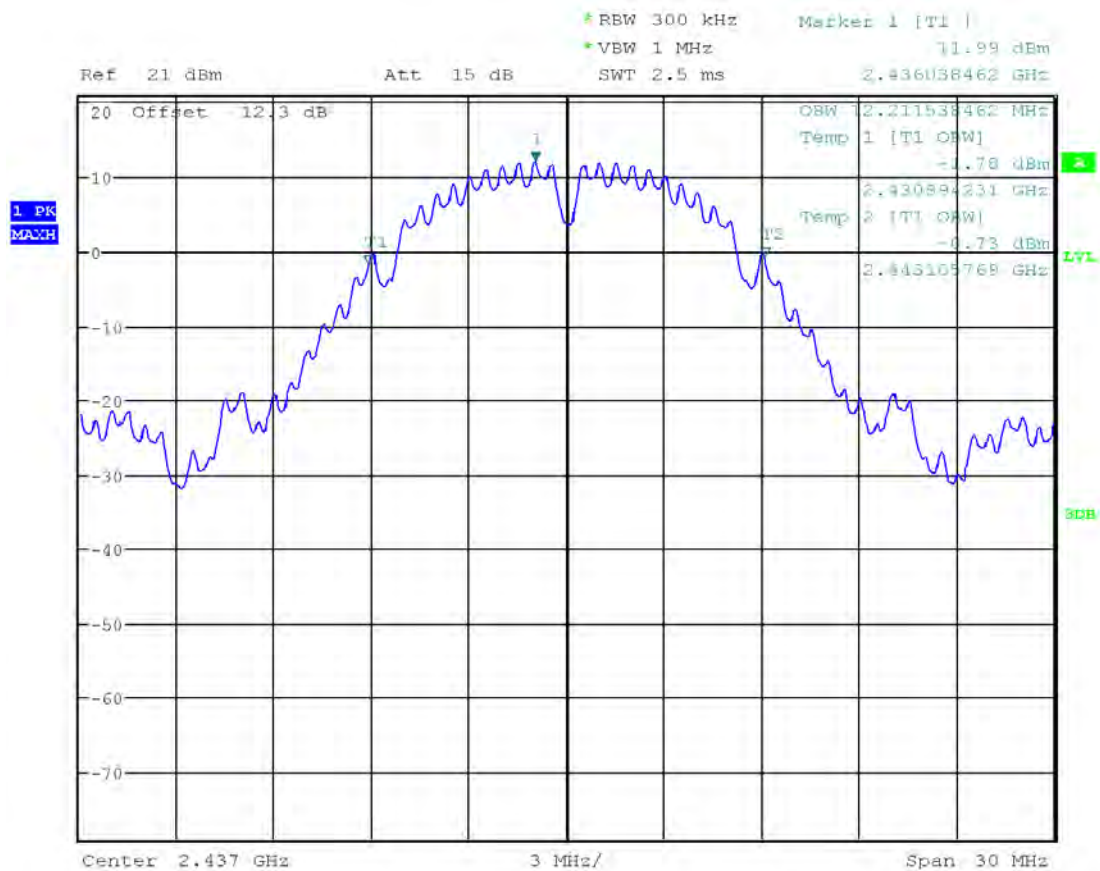
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Plot 1.4 – 99% Bandwidth



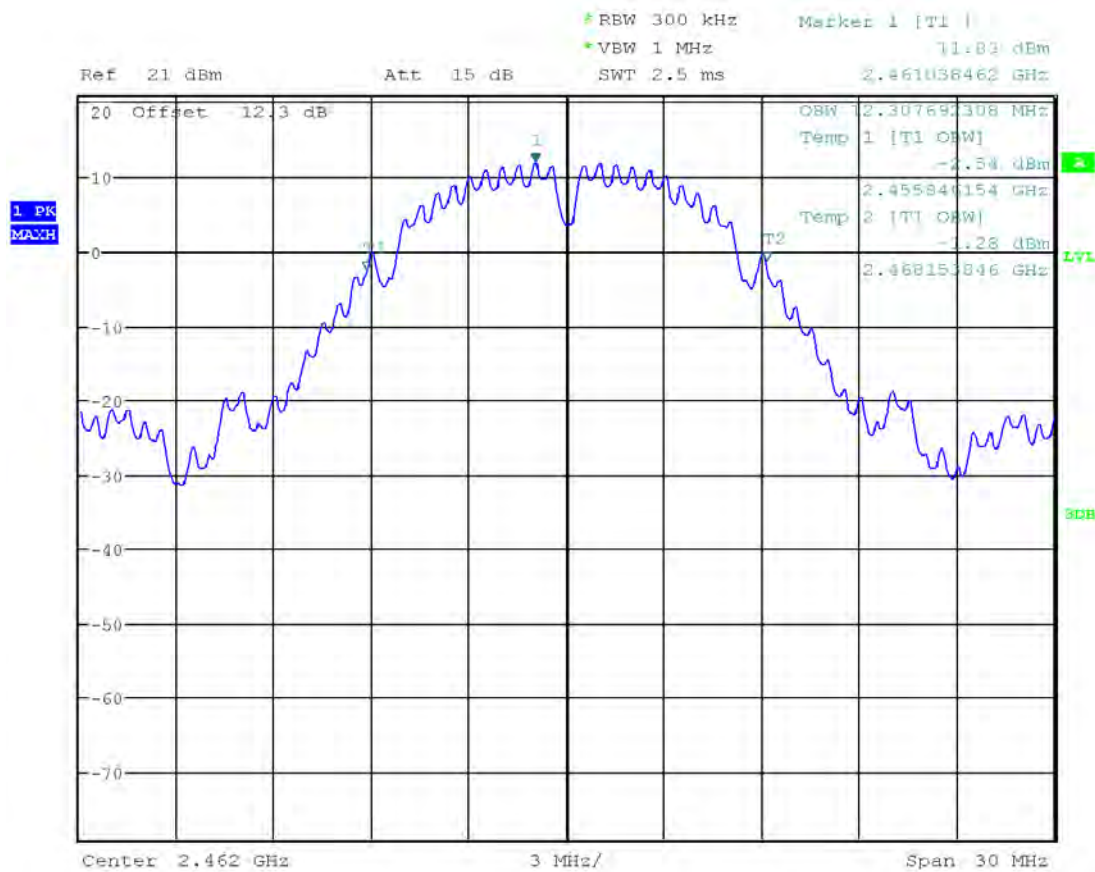
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Plot 1.5 – 99% Bandwidth



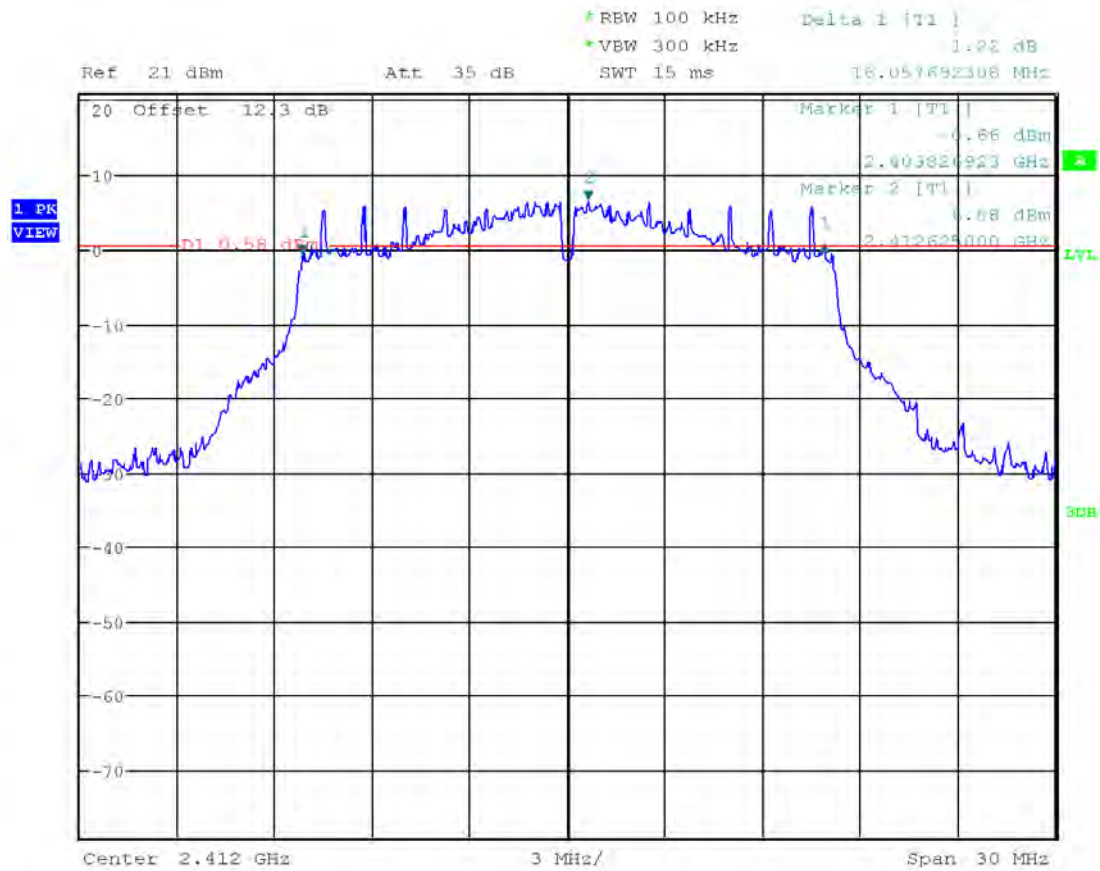
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Plot 1.6 – 99% Bandwidth



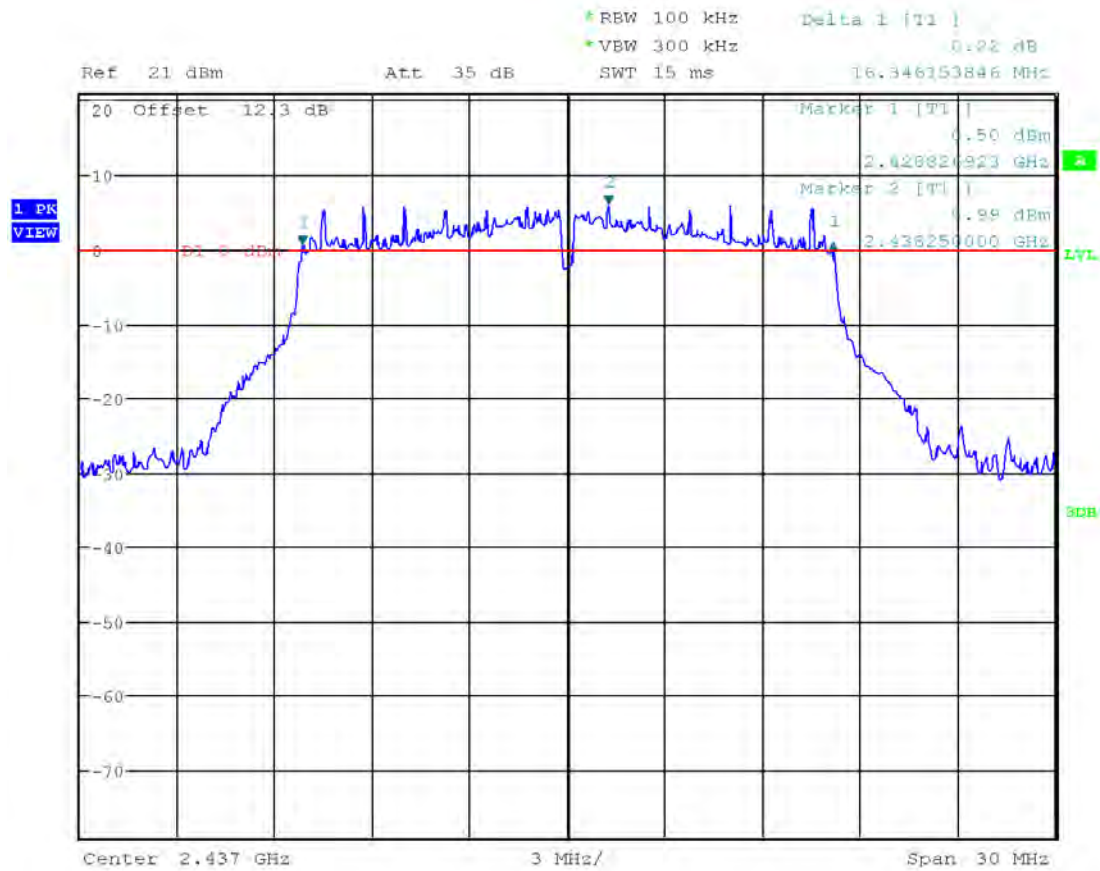
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Plot 1.7 – 6dB Bandwidth (FCC)



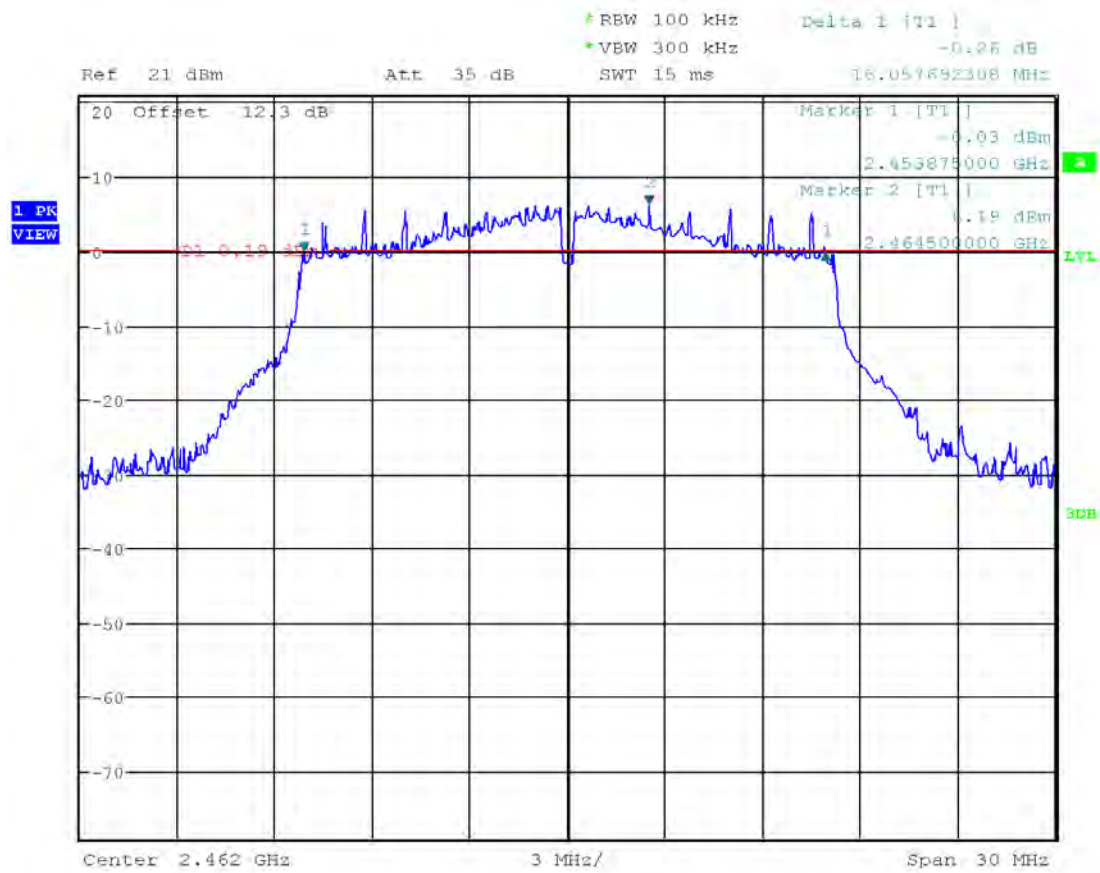
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Plot 1.8 – 6dB Bandwidth (FCC)



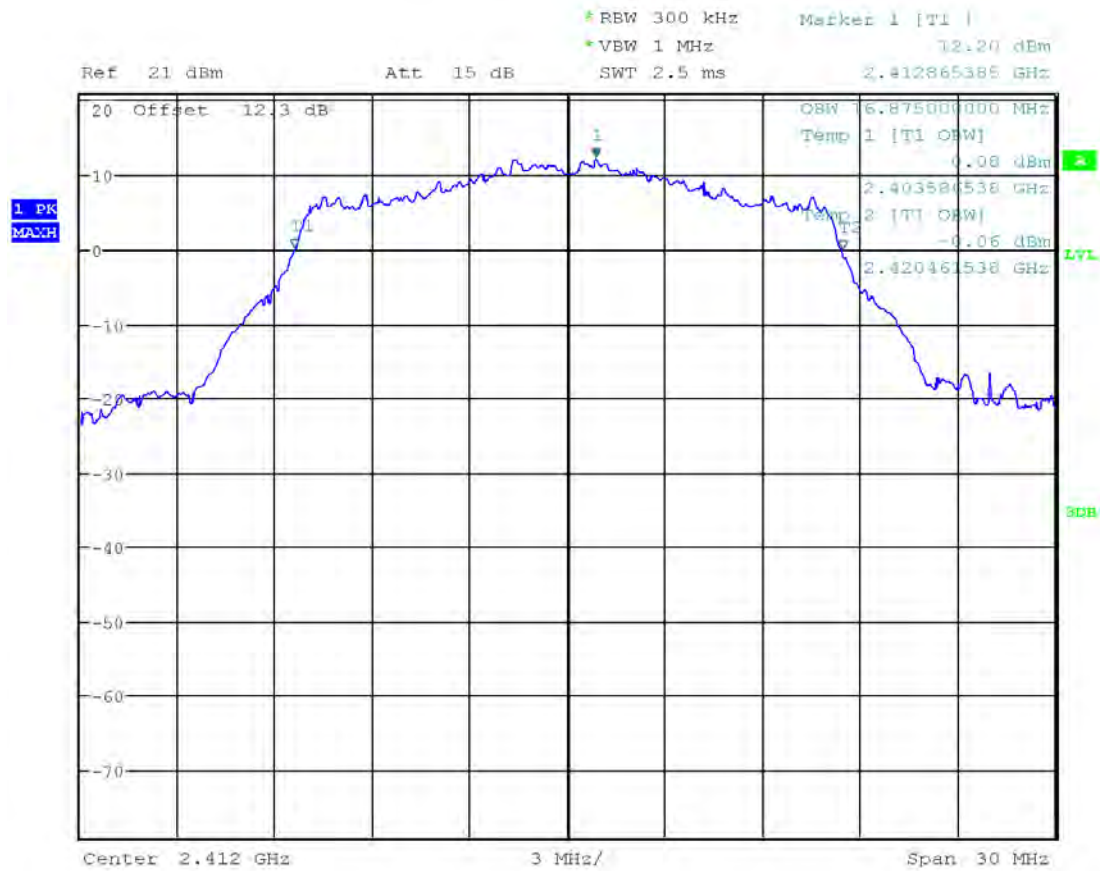
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Plot 1.9 – 6dB Bandwidth (FCC)



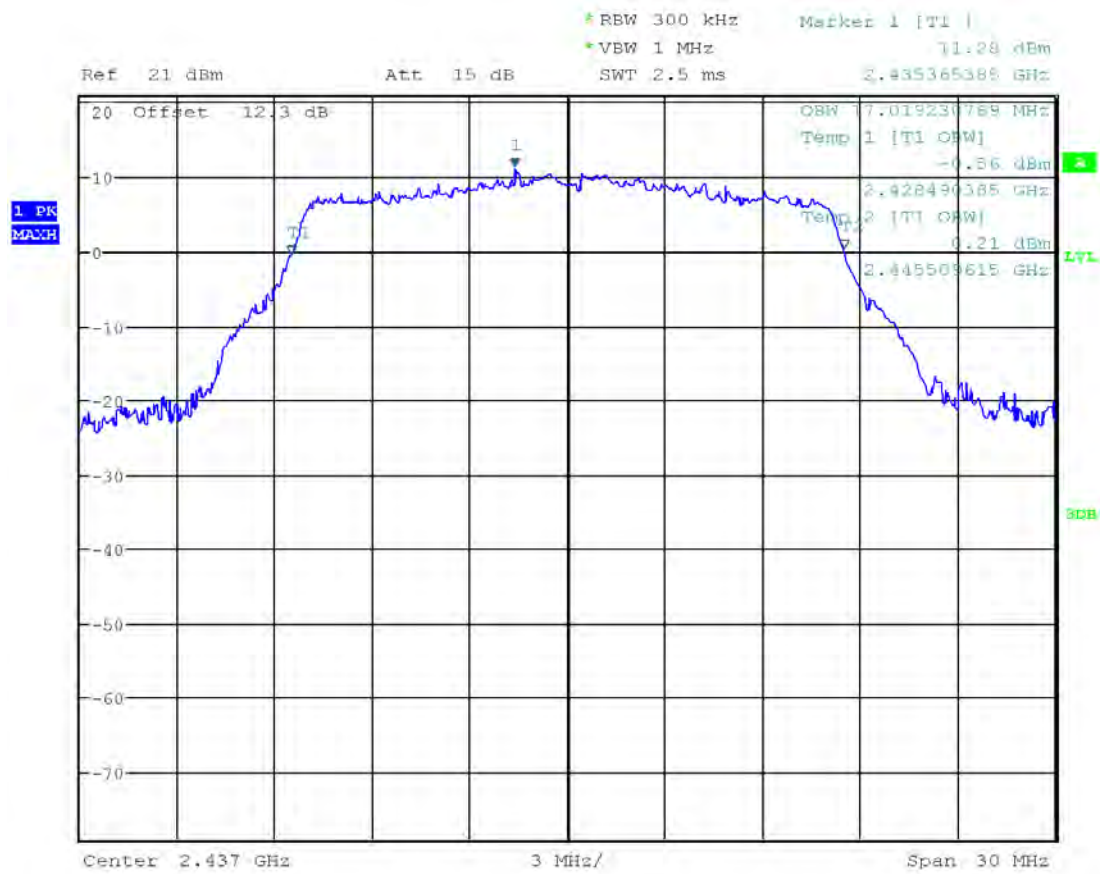
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Plot 1.10 – 99% Bandwidth



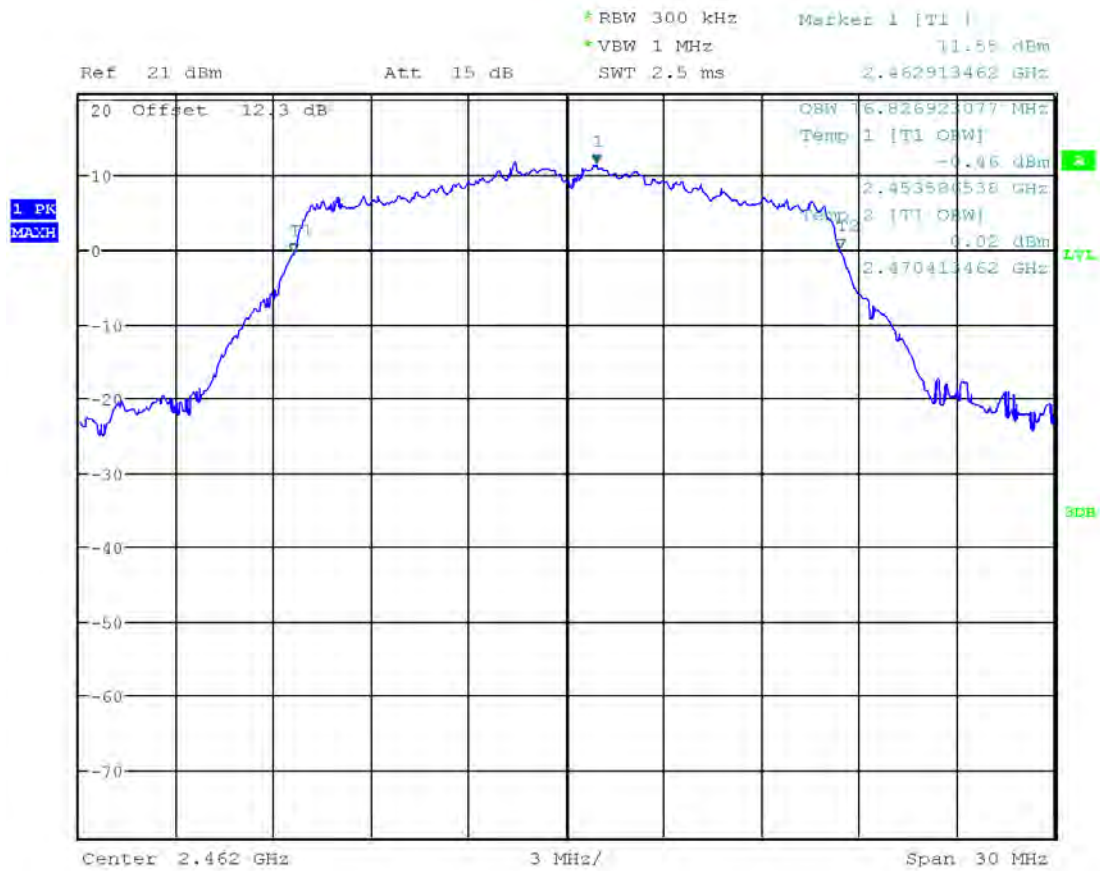
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Plot 1.11 – 99% Bandwidth



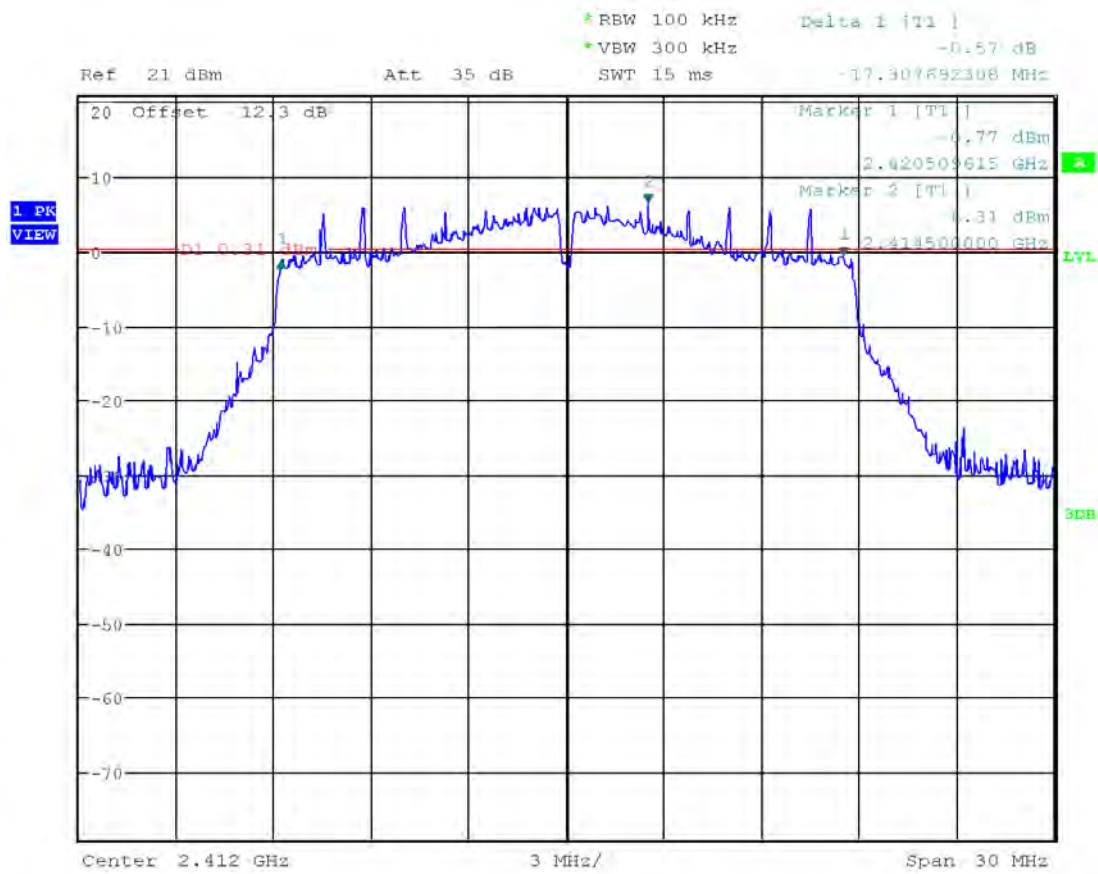
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Plot 1.12 – 99% Bandwidth



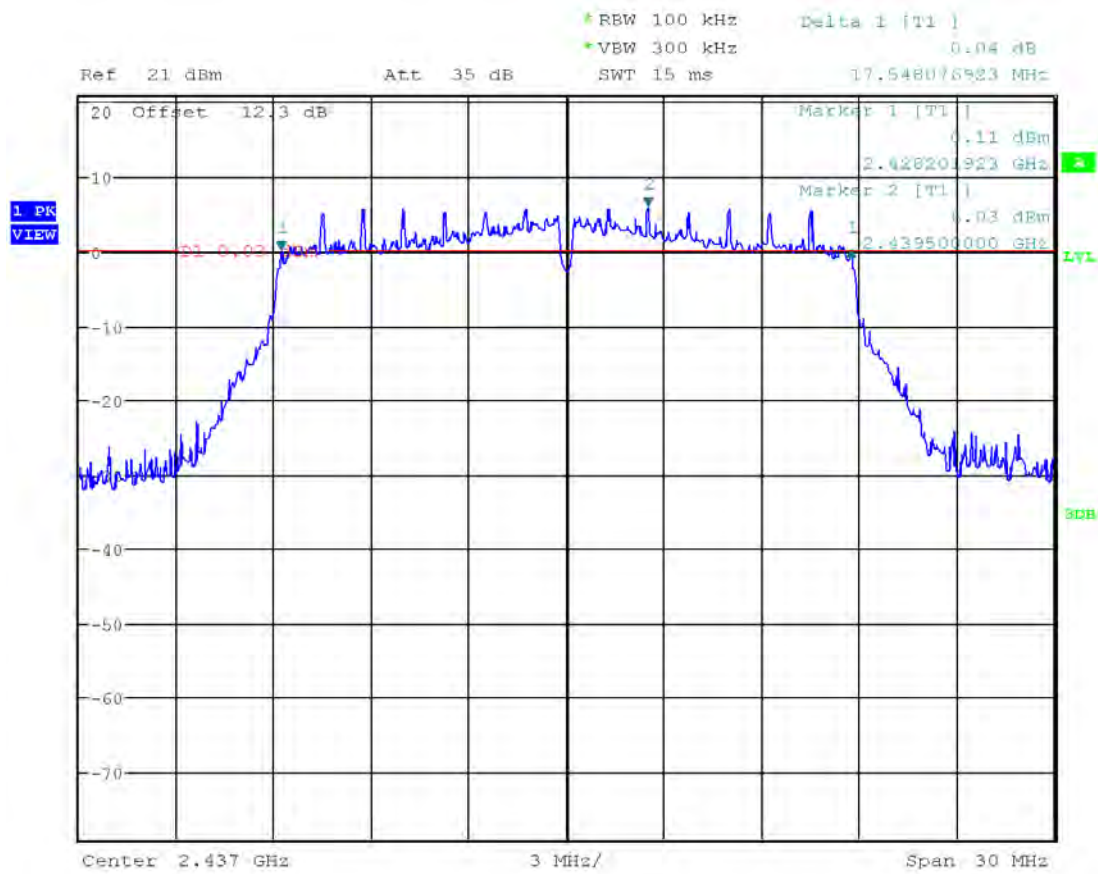
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Plot 1.13 – 6dB Bandwidth (FCC)



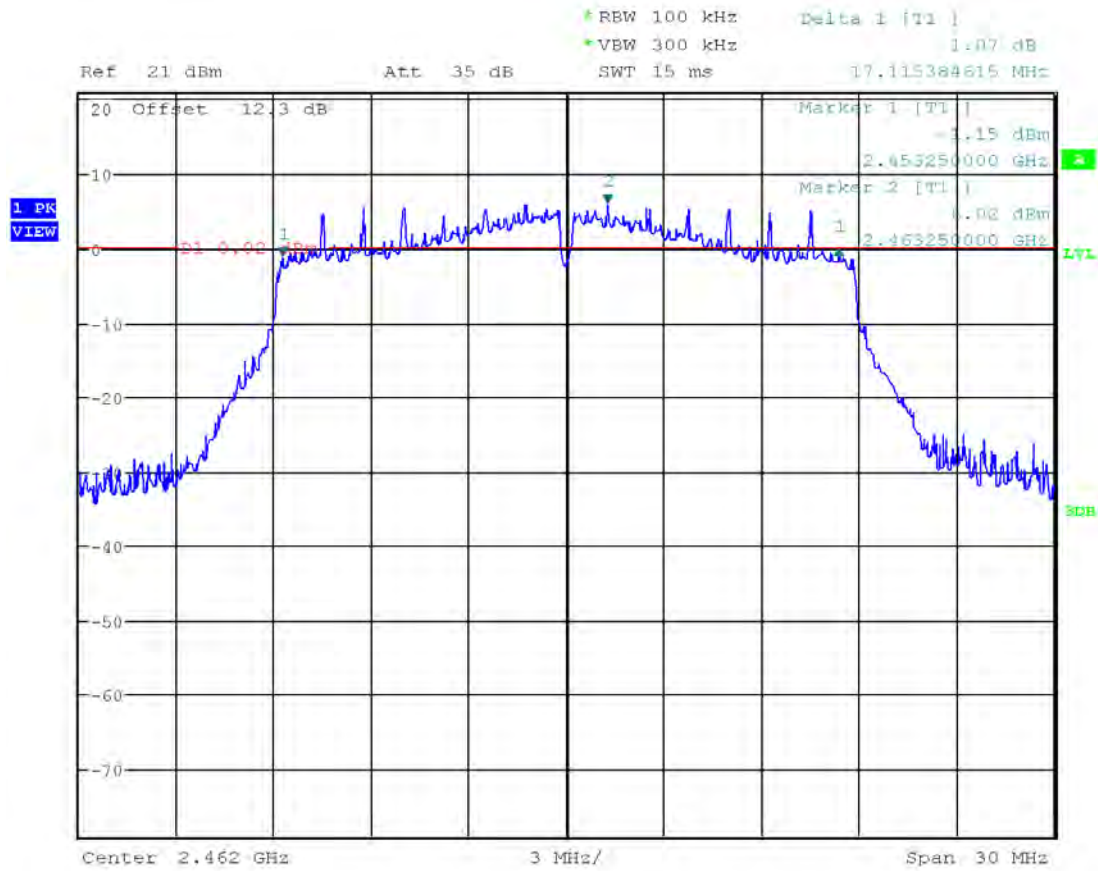
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Plot 1.14 – 6dB Bandwidth (FCC)



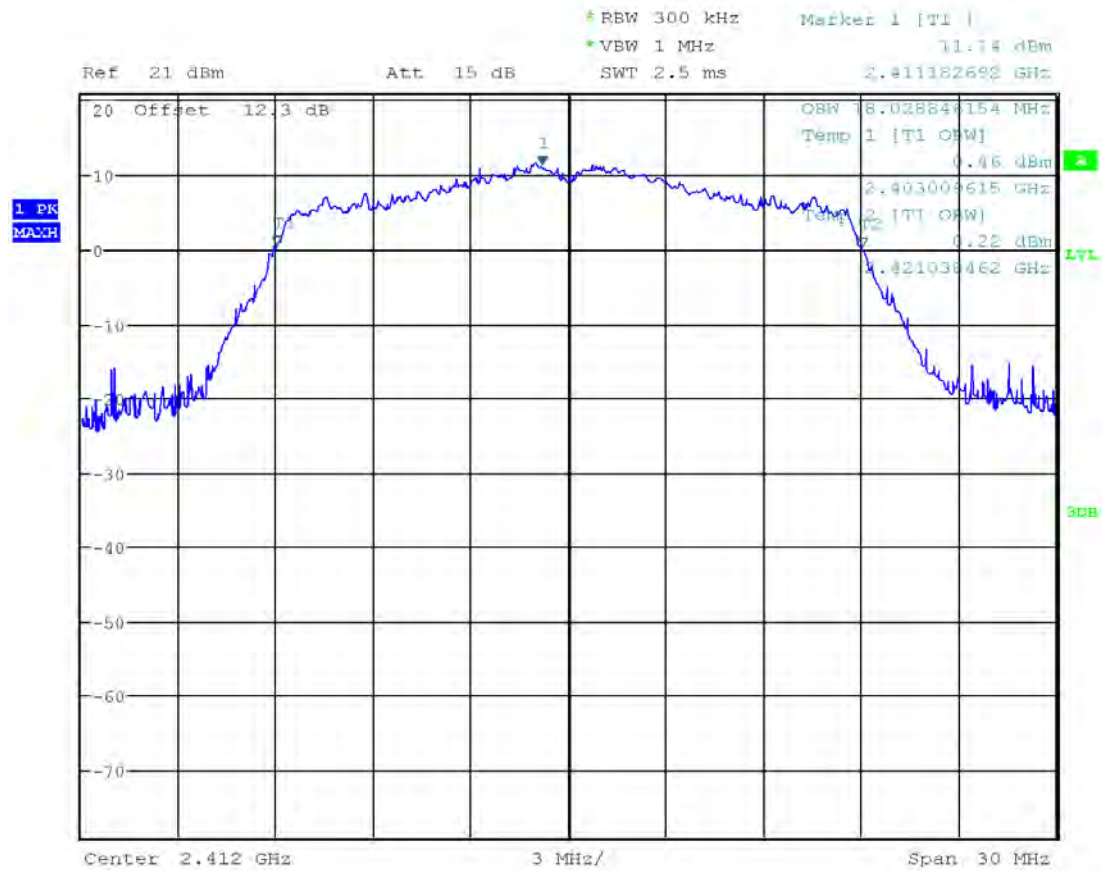
Date: 6.OCT.2021 22:06:11

Plot 1.15 – 6dB Bandwidth (FCC)



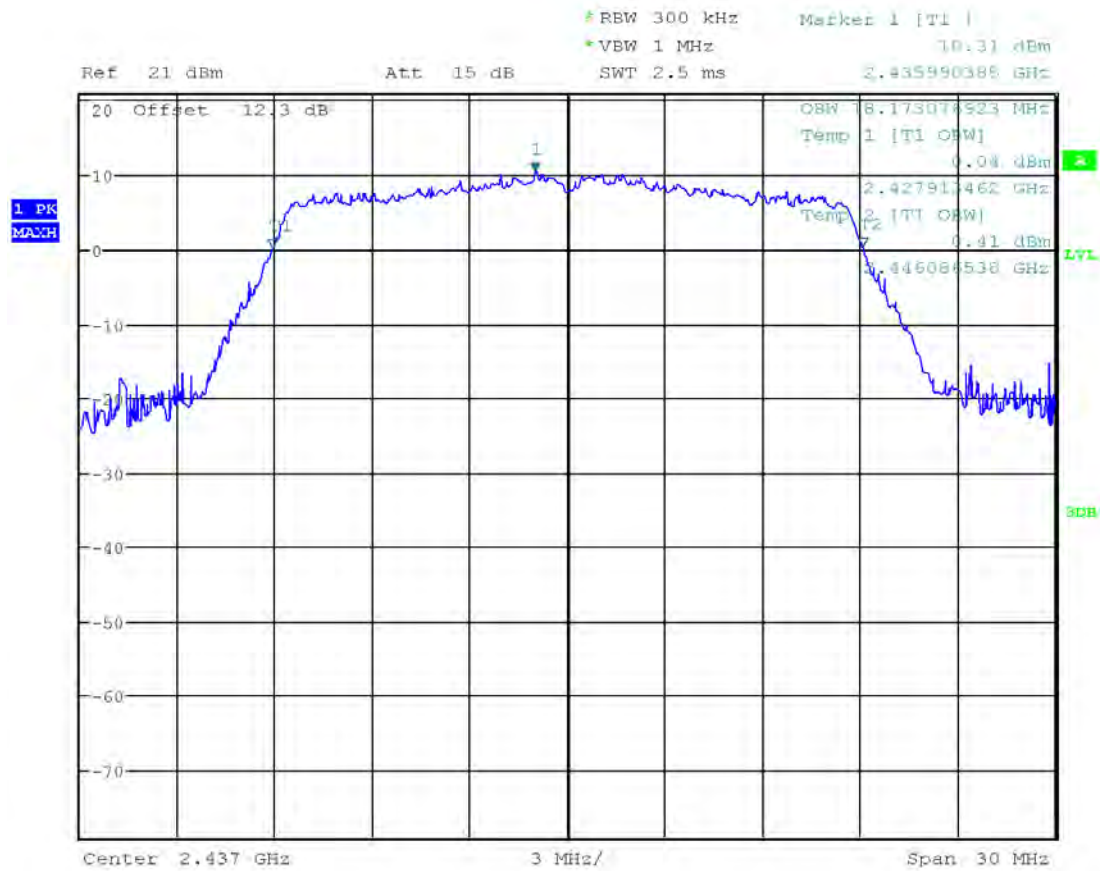
Date: 6.OCT.2021 22:15:55

Plot 1.16 – 99% Bandwidth



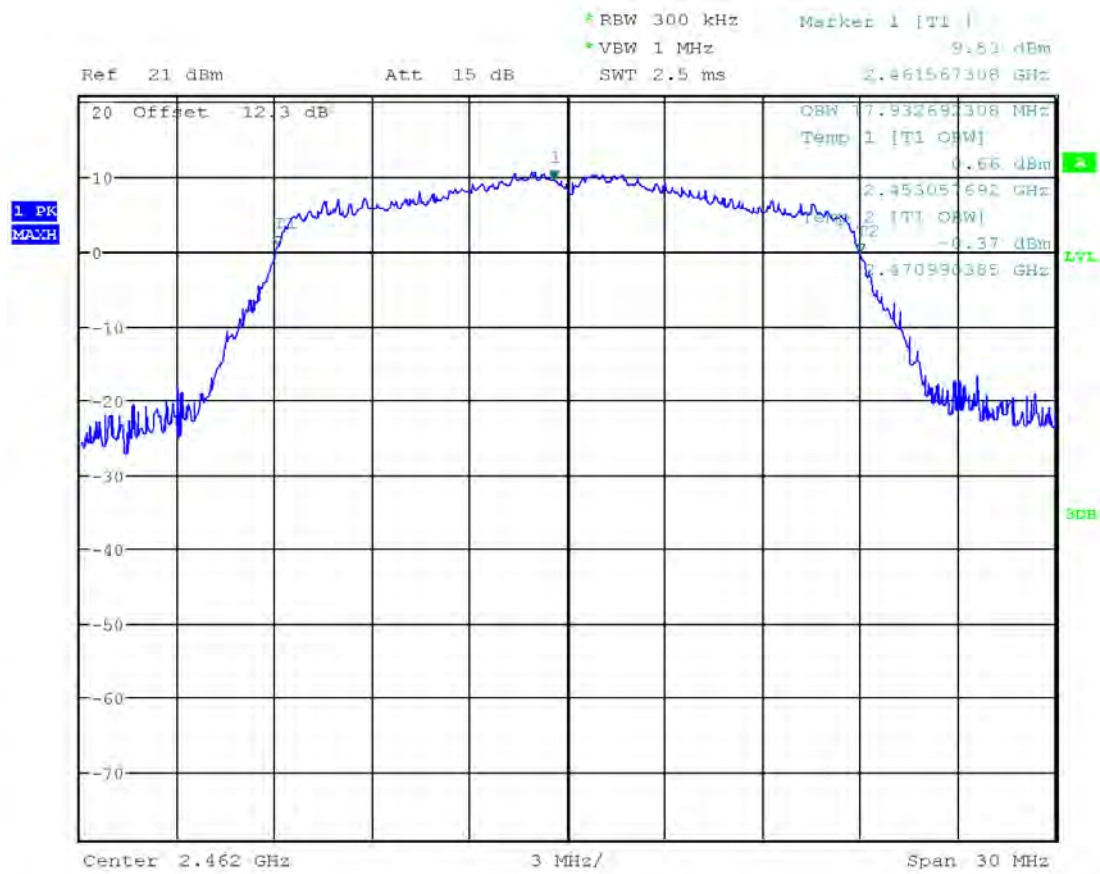
Date: 6.OCT.2021 22:22:30

Plot 1.17 – 99% Bandwidth



Date: 6.OCT.2021 22:20:16

Plot 1.18 – 99% Bandwidth



Date: 6.OCT.2021 22:18:33

4.2 Maximum Conducted Output Power at Antenna Terminals FCC Rule: 15.247(b)(3); RSS-247, 5.4.d);

4.2.1 Requirement

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm).
For antennas with gains greater than 6 dBi, transmitter output level must be decreased appropriately, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.2.2 Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer to measure the Maximum Conducted Transmitter Output Power. The offset programmed on the analyzer is corrected to include cable loss, attenuator and duty cycle correction.

The procedure described in FCC Publication KDB 558074 D01 Meas Guidance v05r02 was used. Specifically, section 11.9.2.2.2 Method AVGSA-1 in ANSI 63.10.

The procedure for this method is as follows:

1. Set span to at least 1.5 times the OBW.
2. Set RBW = 1% to 5% of the OBW, not to exceed 1 MHz.
3. Set VBW $\geq [3 \cdot \text{RBW}]$.
4. Number of points in sweep $\geq [2 \cdot \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.
5. Sweep time = auto.
6. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
7. If transmit duty cycle $< 98\%$, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at the maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no OFF intervals) or at duty cycle $\geq 98\%$, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run."
8. Trace average at least 100 traces in power averaging (rms) mode.
9. Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

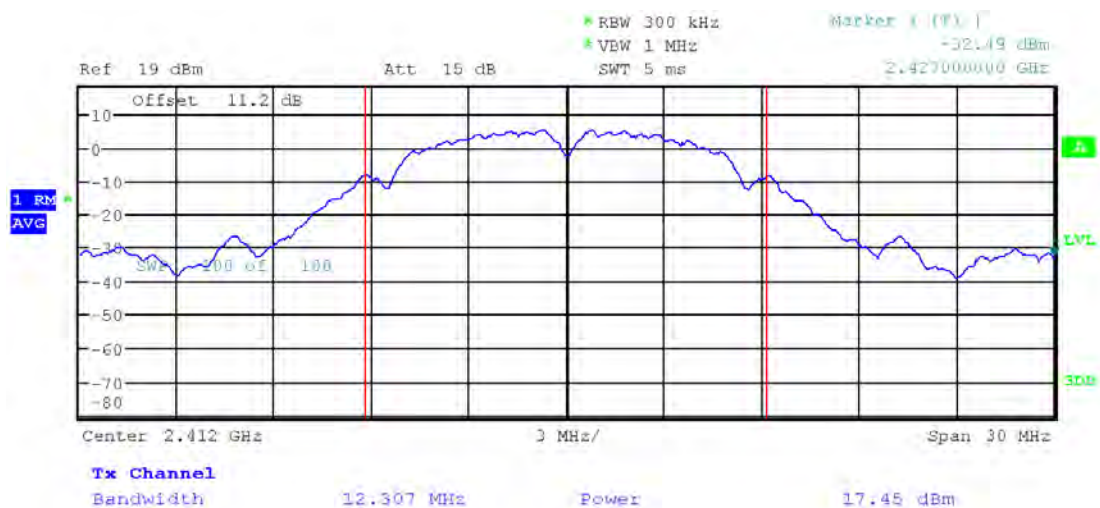
Tested By	Test Date
Minh Ly	October 14, 2021

4.2.3 Test Result

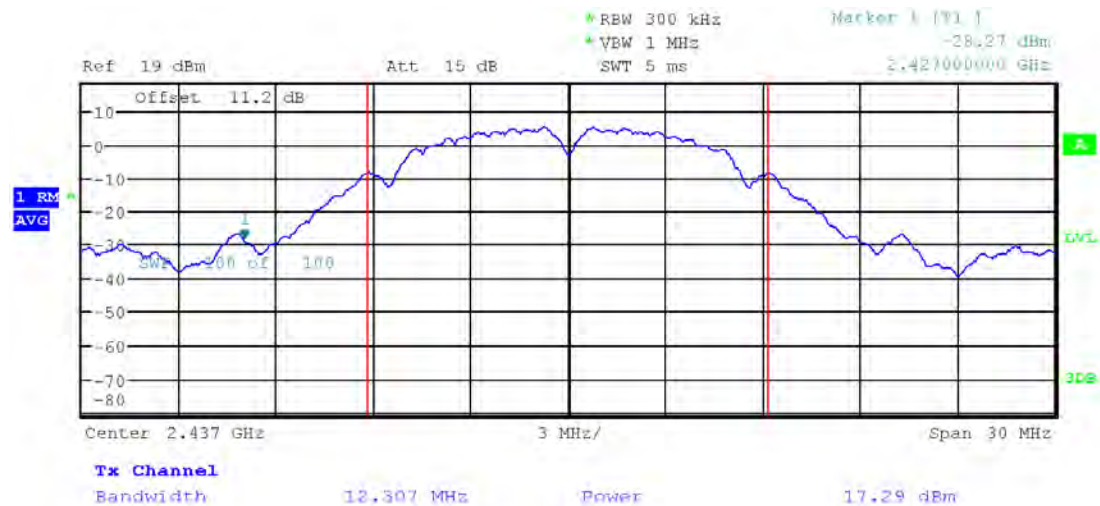
Refer to the following plots for the test result:

Standard	Data Rate	Channel	Frequency MHz	Conducted Average Power dBm	Conducted Average Power mW	Plot #
802.11b	1 Mbps	1	2412	17.45	55.590	2.1
		6	2437	17.29	53.579	2.2
		11	2462	17.15	51.880	2.3
802.11g	6 Mbps	1	2412	15.71	37.239	2.4
		6	2437	15.43	34.914	2.5
		11	2462	15.53	35.727	2.6
802.11n 20MHz	MCS0	1	2412	15.90	38.904	2.7
		6	2437	15.77	37.757	2.8
		11	2462	15.66	36.812	2.9

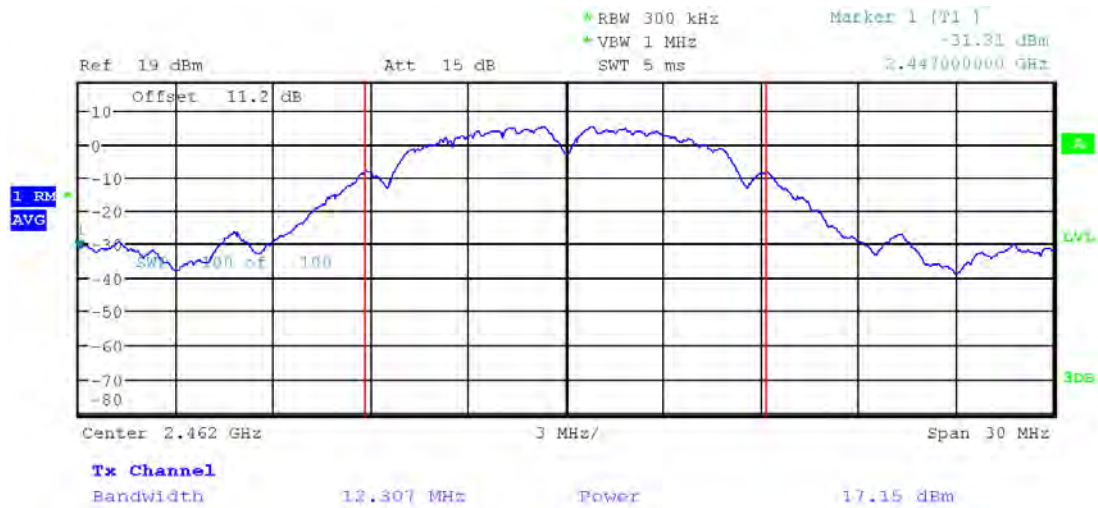
Plot 2. 1



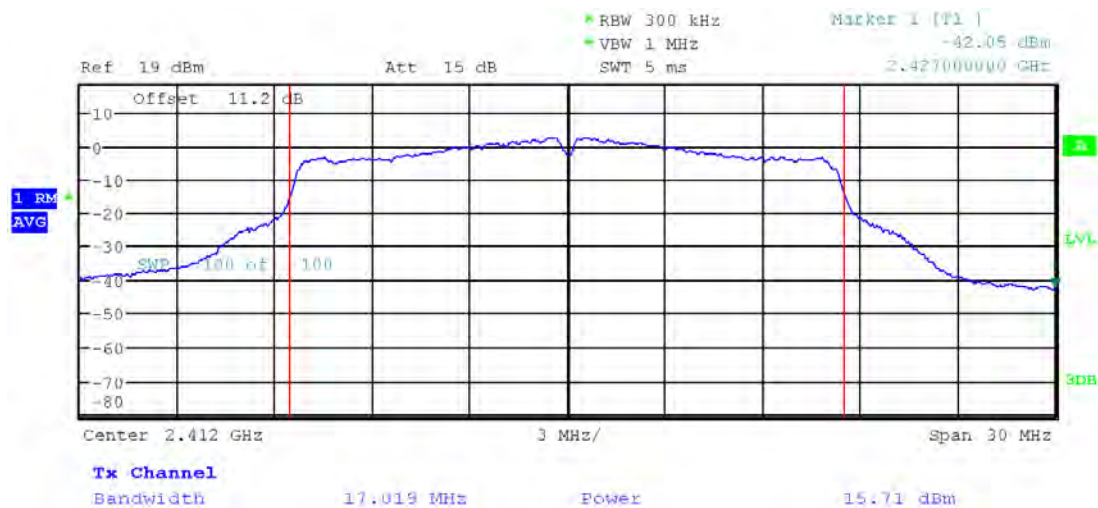
Plot 2. 2



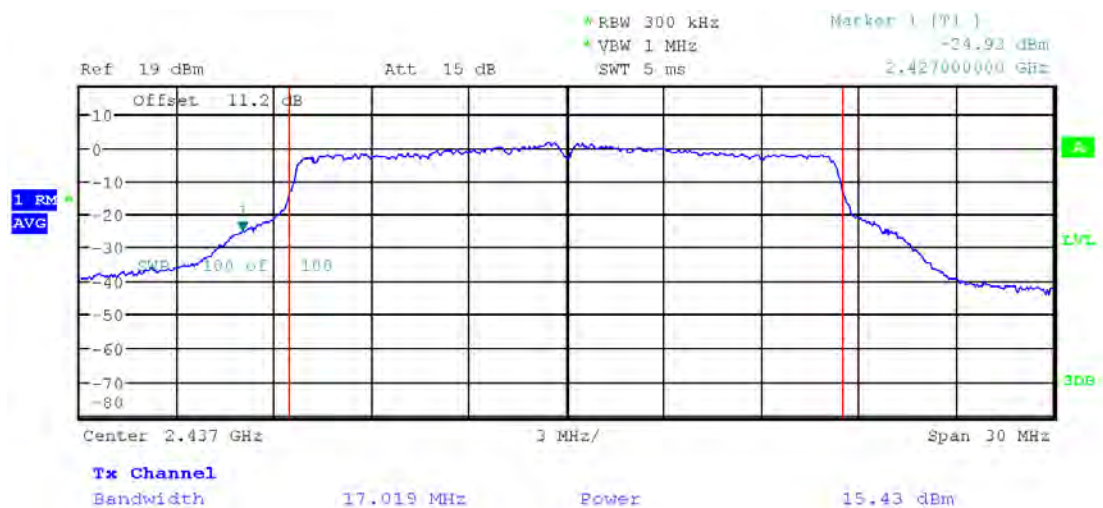
Plot 2.3



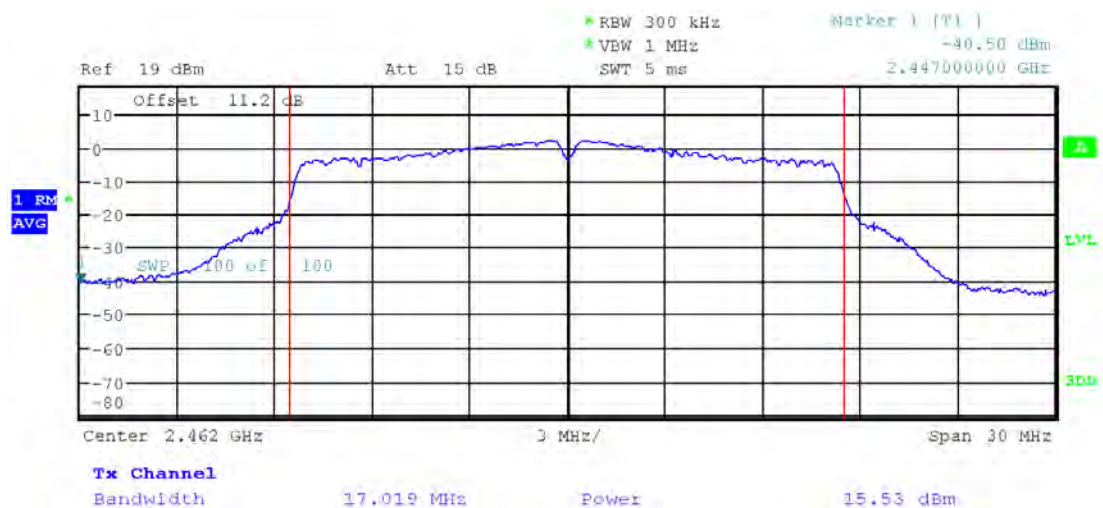
Plot 2.4



Plot 2.5



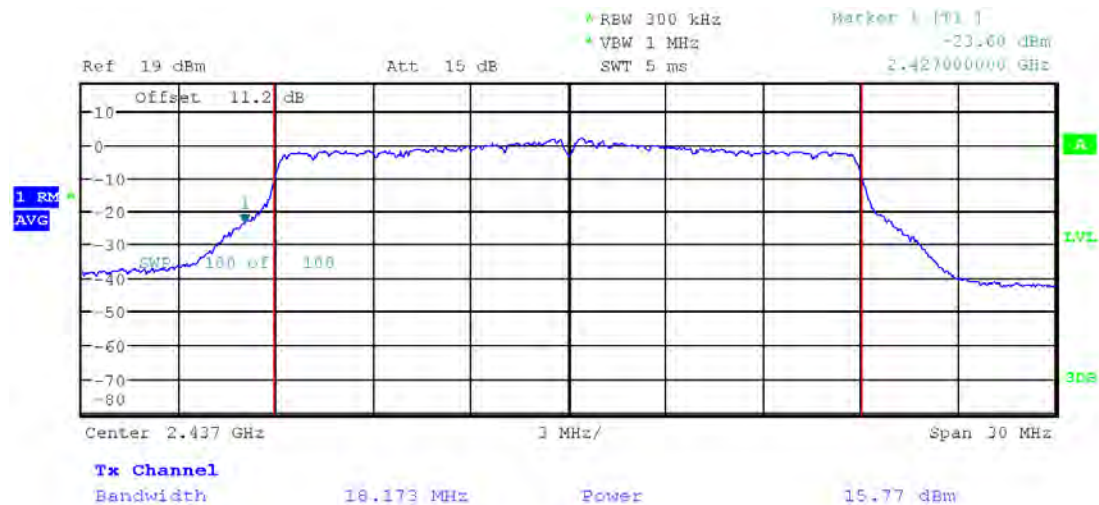
Plot 2.6



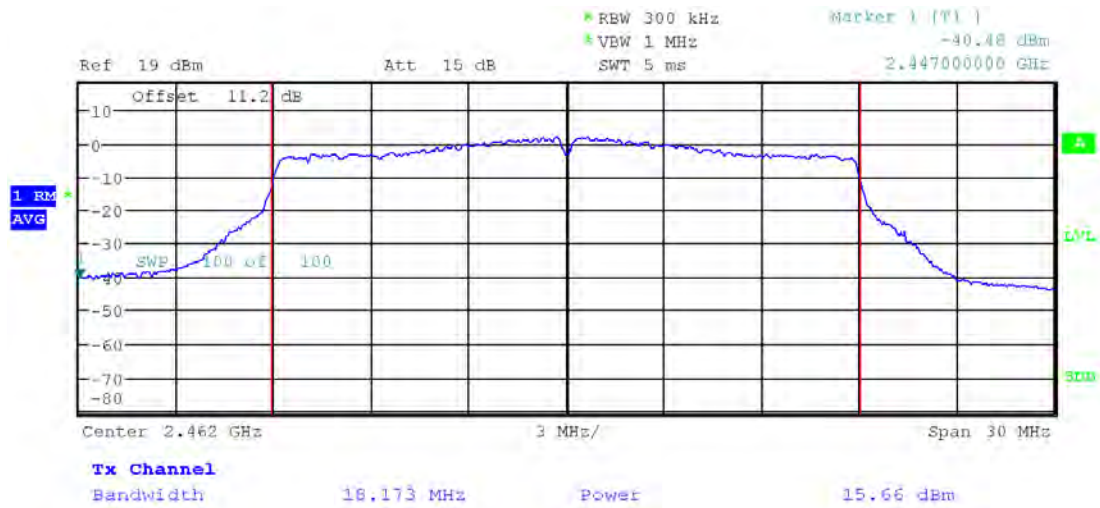
Plot 2.7



Plot 2.8



Plot 2. 9



4.3 Power Spectral Density FCC: 15.247 (e); RSS-247, 5.2.b);

4.3.1 Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna should not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2 Procedure

The antenna port of the EUT was connected to the input of a spectrum analyzer to measure the Transmitter Power Density (PSD). The offset programmed on the analyzer is corrected to include cable loss, attenuator.

The procedure described in FCC Publication FCC Publication KDB 558074 D01 Meas Guidance v05r02, specifically section 11.10.2 Method PKPSD (peak PSD) of ANSI 63.10.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the *DTS bandwidth*.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

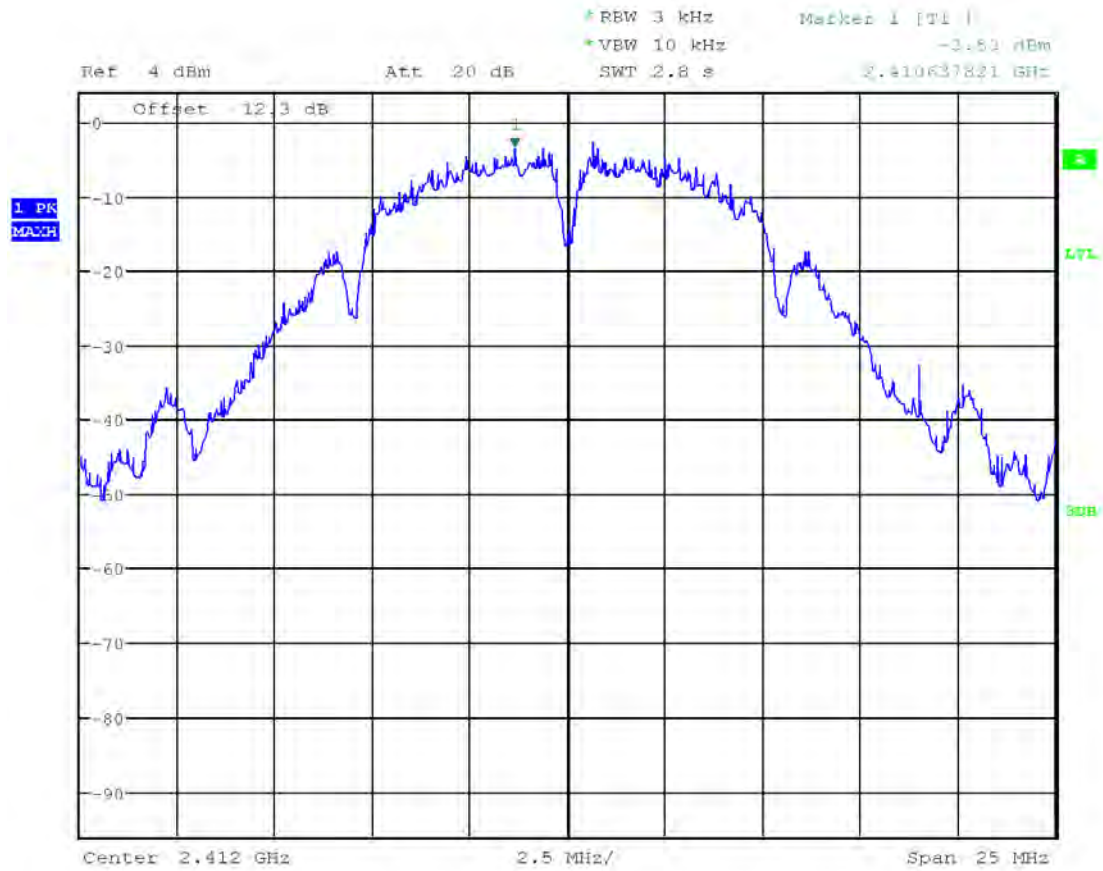
Tested By	Test Date
Minh Ly	October 12, 2021

4.3.3 Test Result

Refer to the following plots for the test result:

Standard	Channel	Frequency MHz	PSD (Peak) dBm	Margin to 8dBm Limit dB	Plot #
802.11b	1	2412	-3.53	-11.53	3.1
	6	2437	-3.75	-11.75	3.2
	11	2462	-3.21	-11.21	3.3
802.11g	1	2412	-5.03	-13.03	3.4
	6	2437	-6.11	-14.11	3.5
	11	2462	-6.49	-14.49	3.6
802.11n 20MHz	1	2412	-6.15	-14.15	3.7
	6	2437	-5.49	-13.49	3.8
	11	2462	-4.86	-12.86	3.9

Plot 3.1



Date: 12.OCT.2021 22:04:31

Plot 3.2



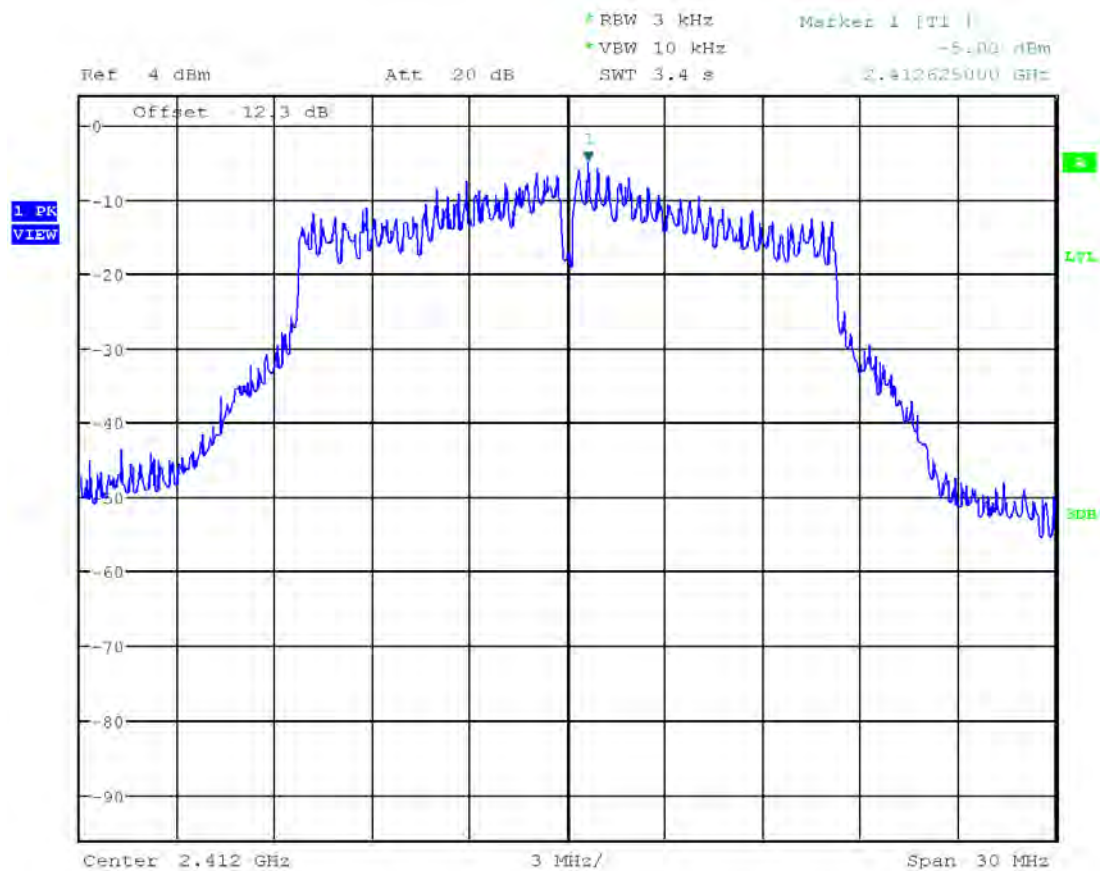
Date: 12.OCT.2021 22:05:46

Plot 3.3



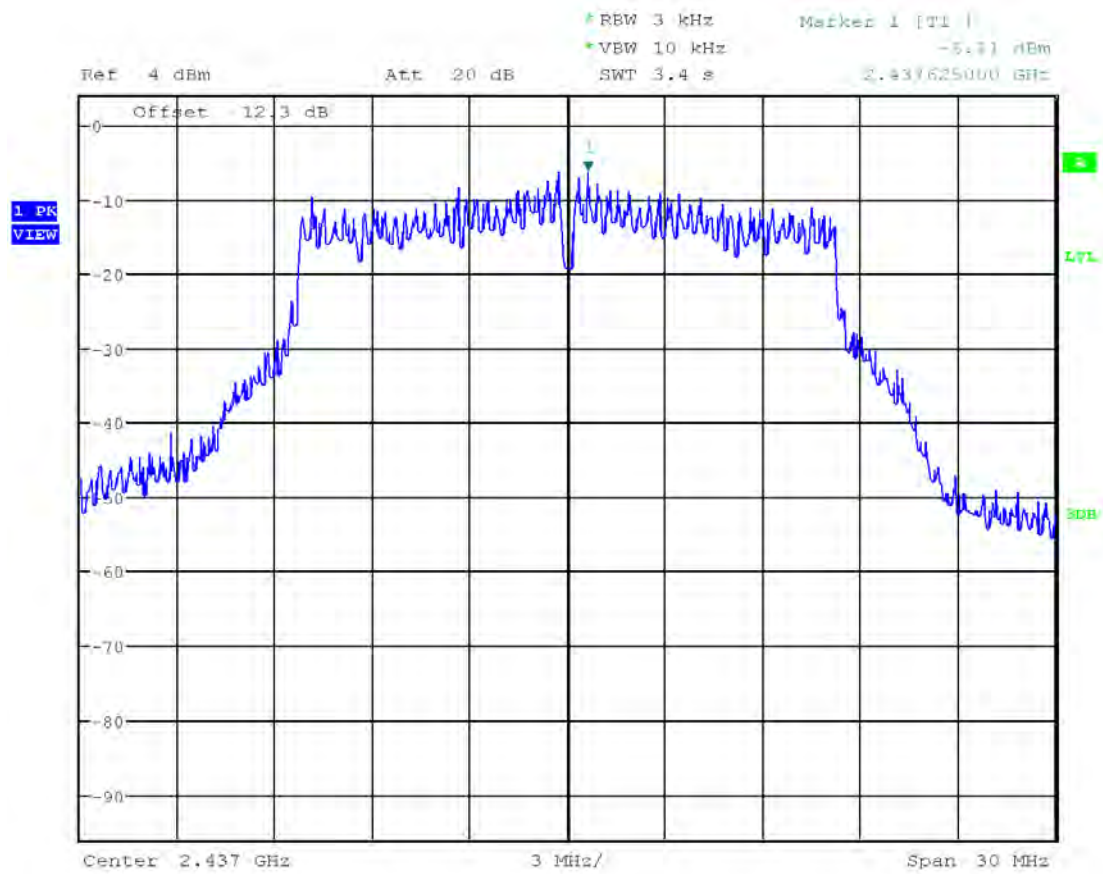
Date: 12.OCT.2021 22:06:44

Plot 3.4



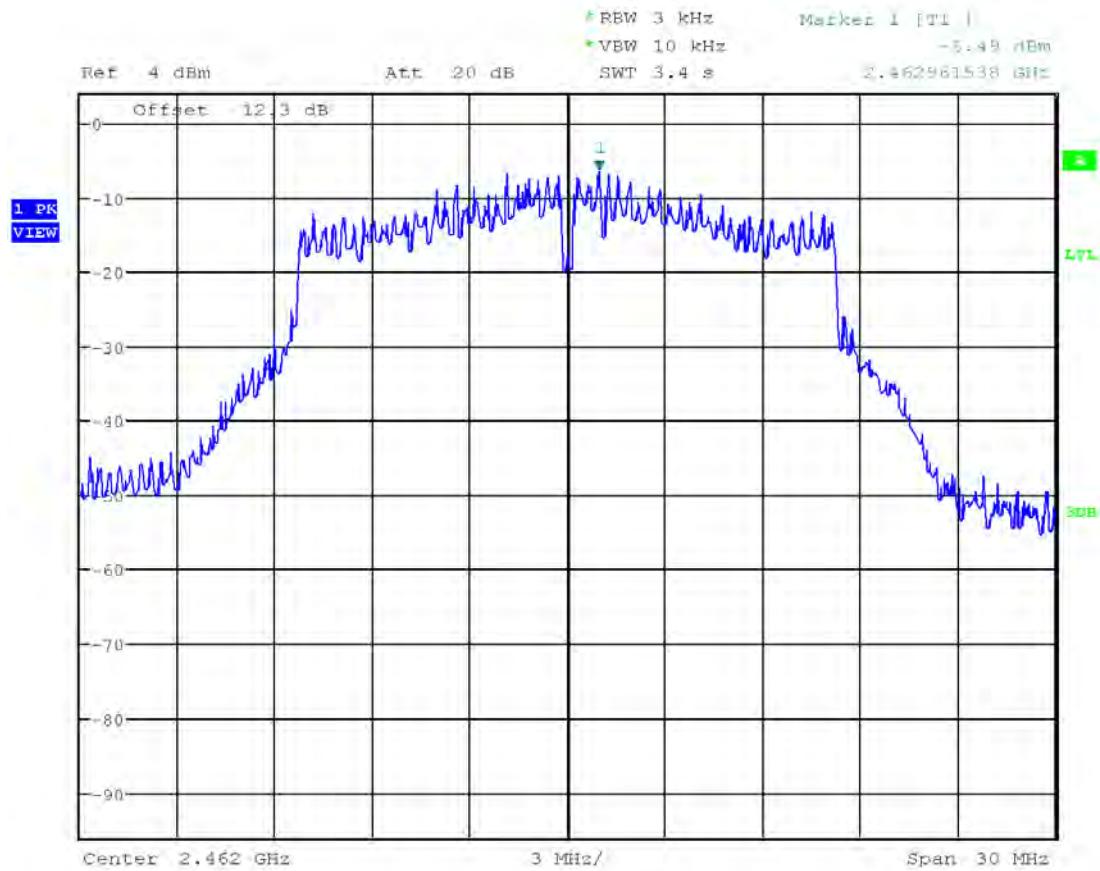
Date: 12.OCT.2021 22:07:59

Plot 3.5



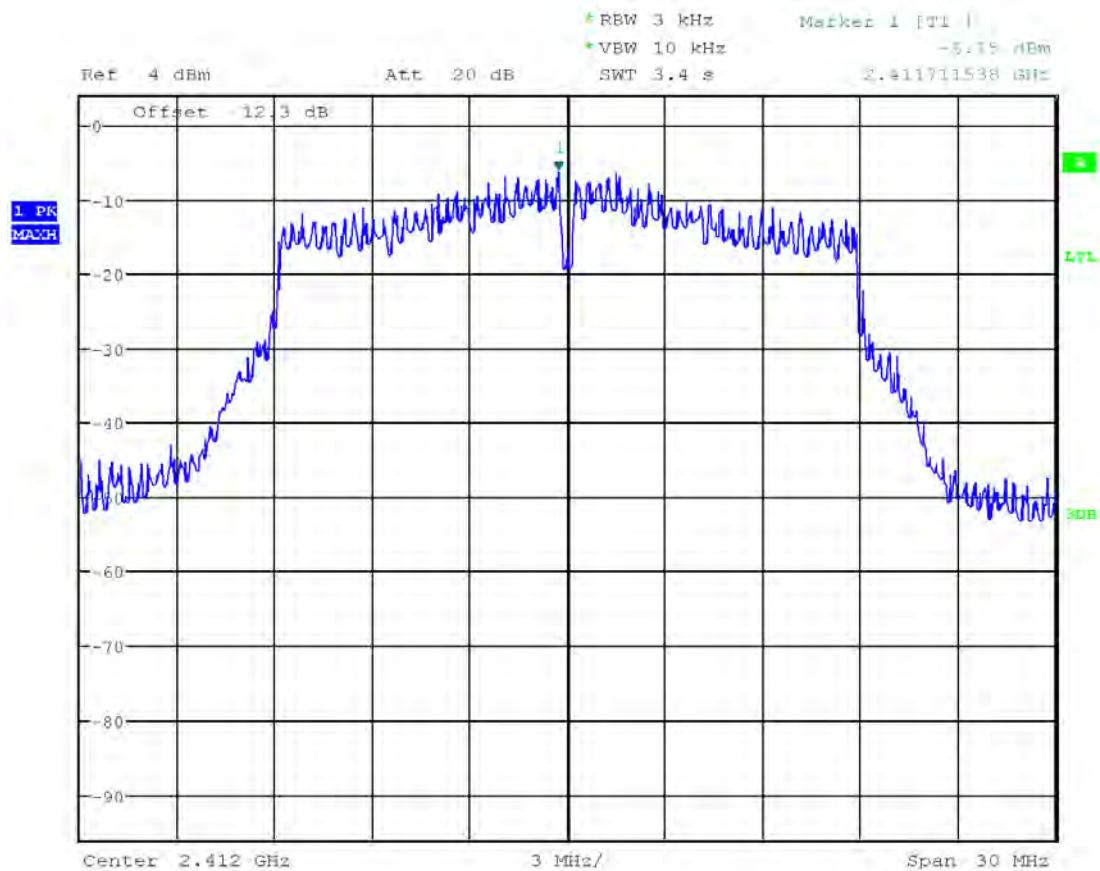
Date: 12.OCT.2021 22:09:34

Plot 3.6



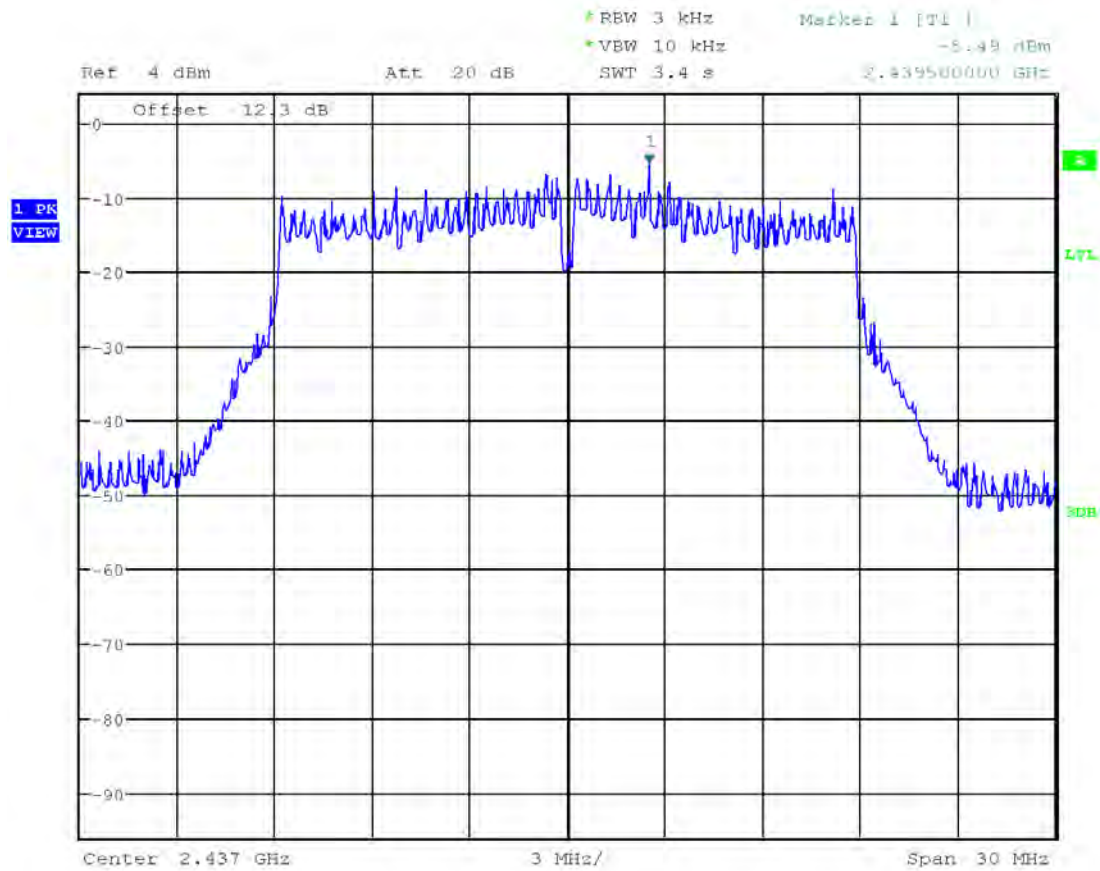
Date: 12.OCT.2021 22:10:25

Plot 3.7



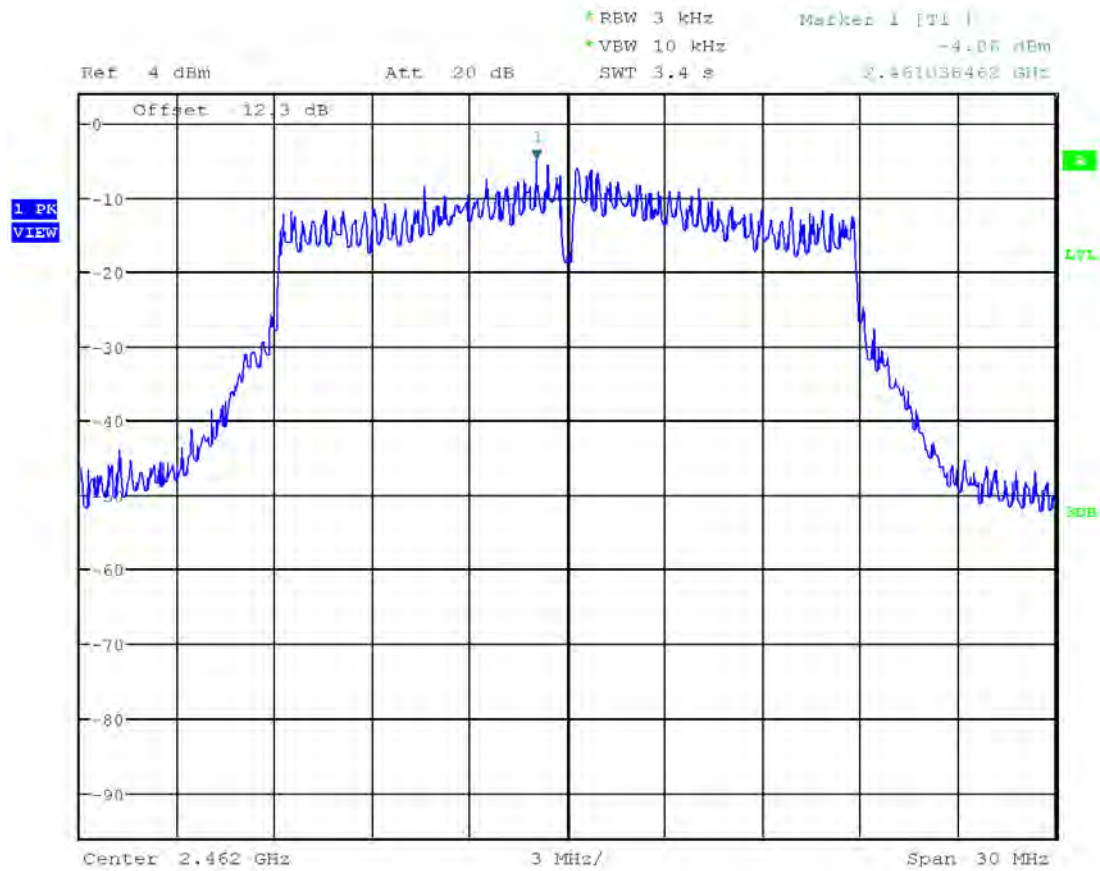
Date: 12.OCT.2021 22:11:40

Plot 3.8



Date: 12.OCT.2021 22:13:29

Plot 3.9



Date: 12.OCT.2021 22:15:17

4.4 Out-of-Band Conducted Emissions FCC: 15.247(d); RSS-247, 5.5;

4.4.1 Requirement

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be below the maximum in-band 100 kHz emissions by at least 20 dB (if peak power of in-band emission is measured) or 30 dB (if average power of in-band emission is measured).

In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)

4.4.2 Procedure

The procedure described in FCC Publication KDB 558074 D01 Meas Guidance v05r02, specifically section 11.11 DTS Emissions in non-restricted frequency bands of ANSI 63.10.

A spectrum analyzer was connected to the antenna port of the transmitter.

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq 3 \times$ RBW.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

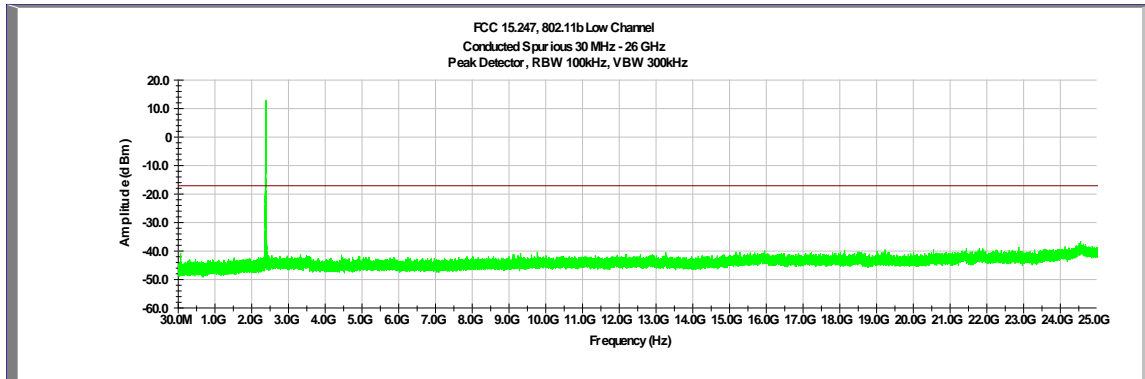
The unwanted emissions were measured from 30 MHz to 25 GHz. Plots below are corrected for cable loss and then compared to the limits.

4.4.3 Test Result

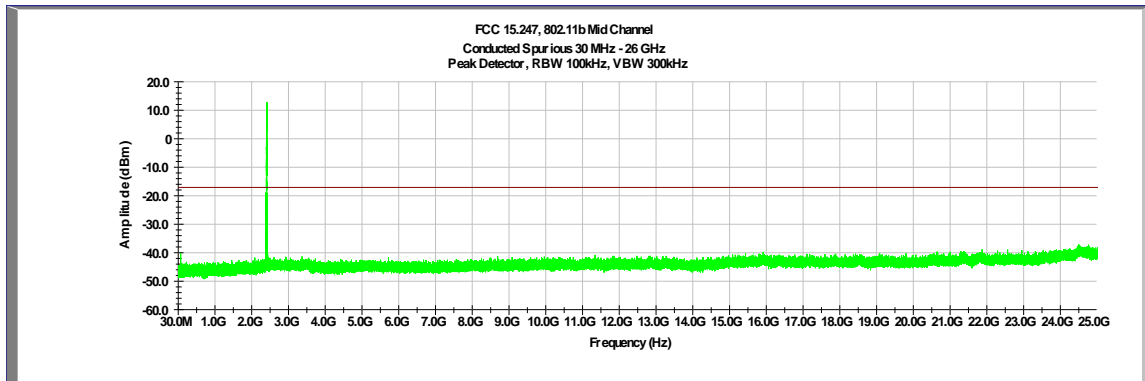
Refer to the following plots 4.1 – 4.9 for unwanted conducted emissions. The plot shows -30dB attenuation limit line.

Tested By	Test Date
Minh Ly	October 12, 2021

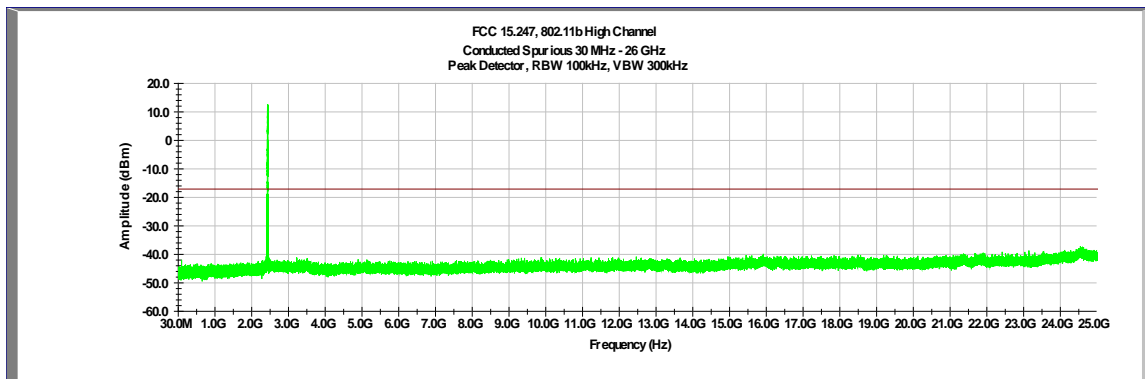
Plot 4.1
Tx @ 2412MHz 802.11b



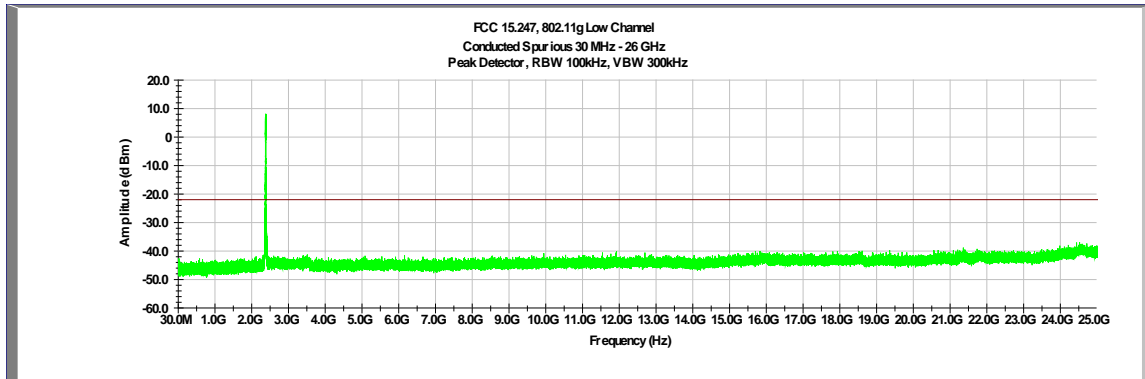
Plot 4.2
Tx @ 2437MHz 802.11b



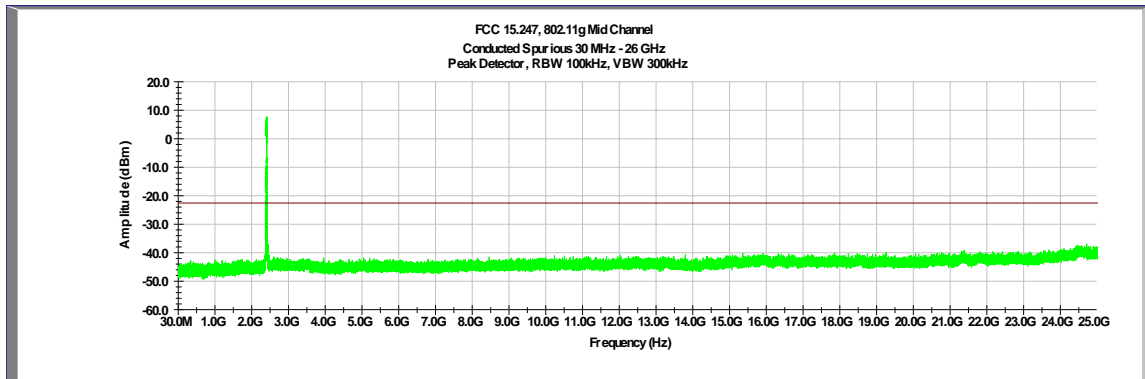
Plot 4.3
Tx @ 2462MHz 802.11b



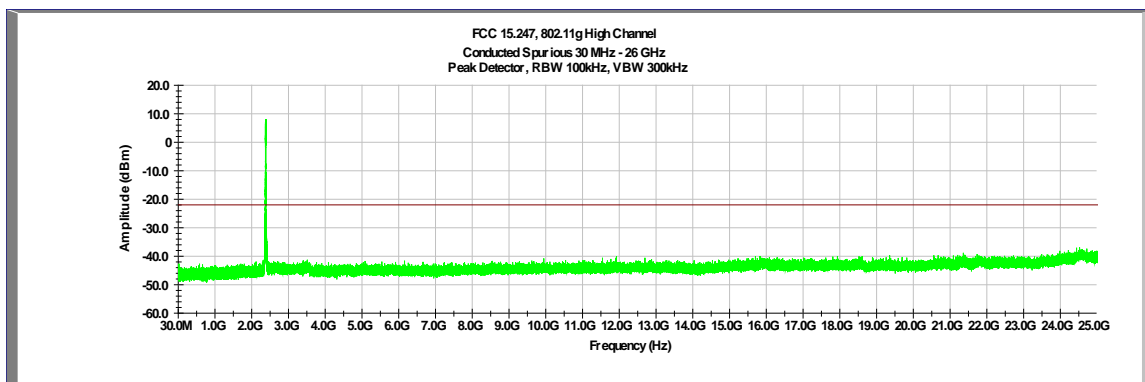
Plot 4.4
Tx @ 2412MHz 802.11g



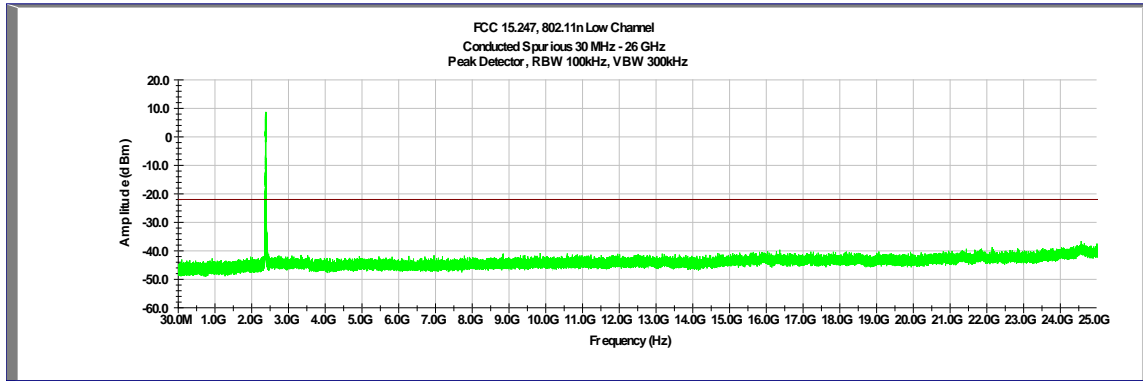
Plot 4.5
Tx @ 2437MHz 802.11g



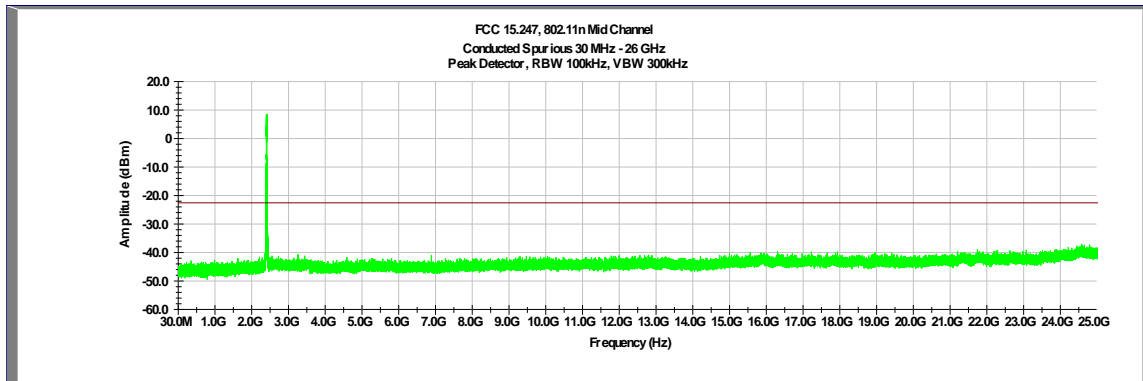
Plot 4.6
Tx @ 2462MHz 802.11g



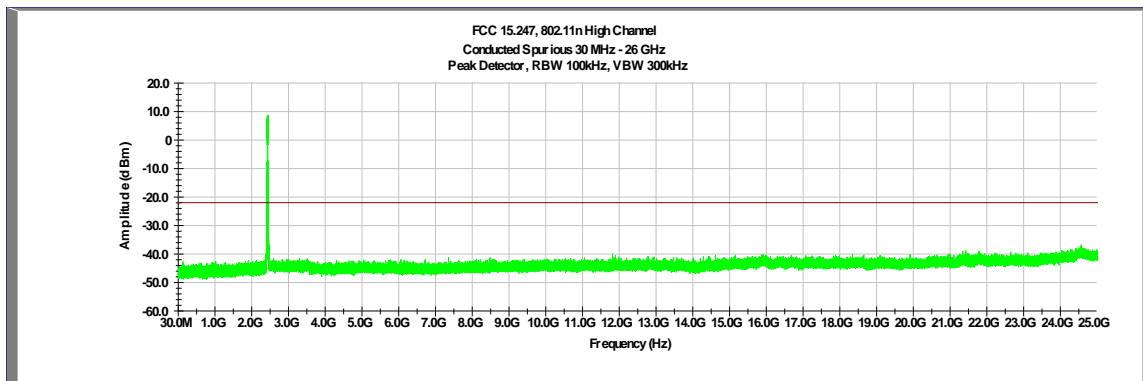
Plot 4.7
Tx @ 2412MHz 802.11n 20MHz



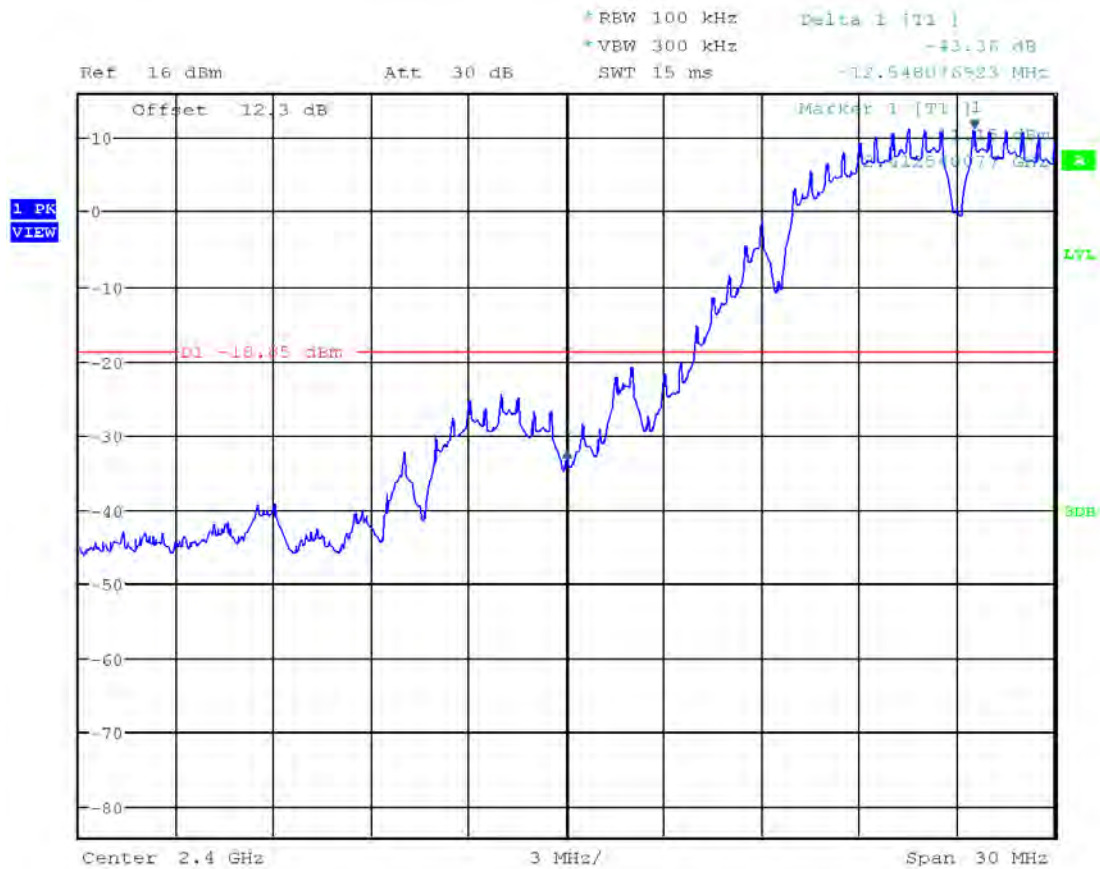
Plot 4.8
Tx @ 2437MHz 802.11n 20MHz



Plot 4.9
Tx @ 2462MHz 802.11n 20MHz

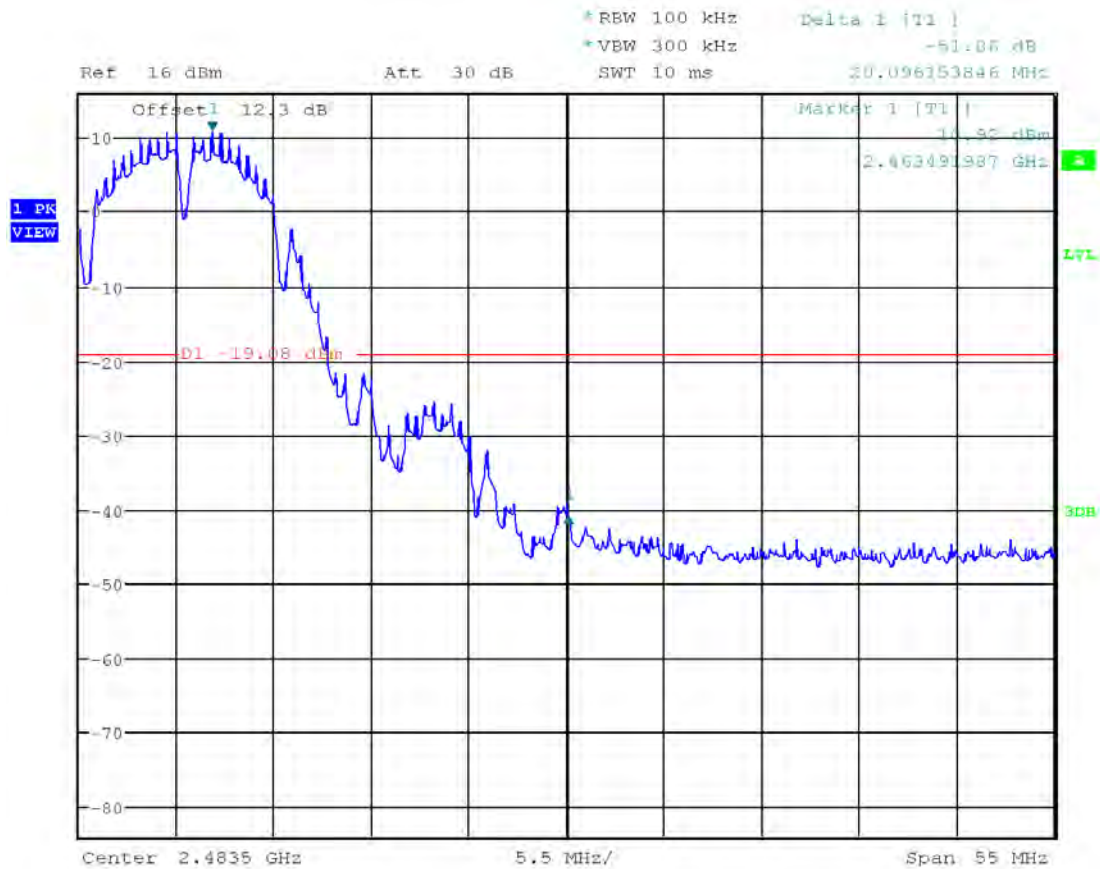


Plot 4.10
Conducted Band Edge, Tx @ 2412MHz 802.11b



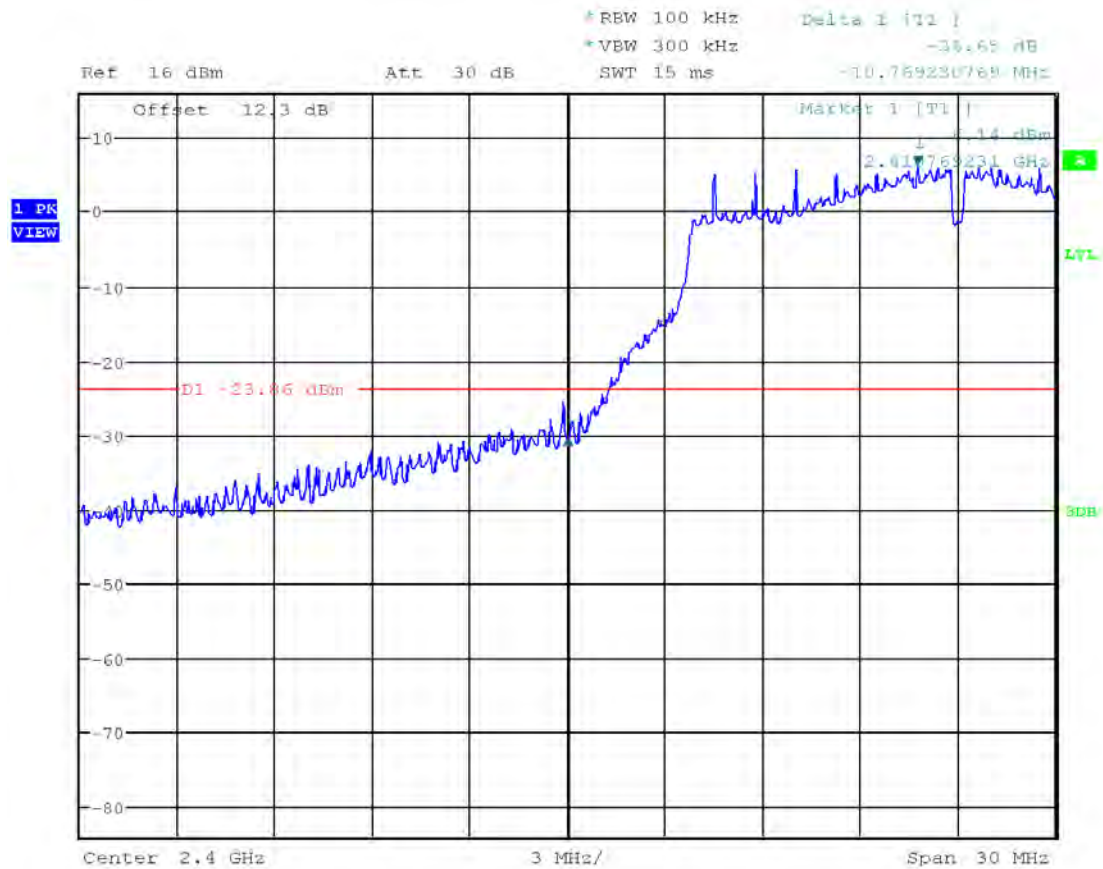
Date: 12.OCT.2021 22:20:51

Plot 4.11
Conducted Band Edge, Tx @ 2462MHz 802.11b



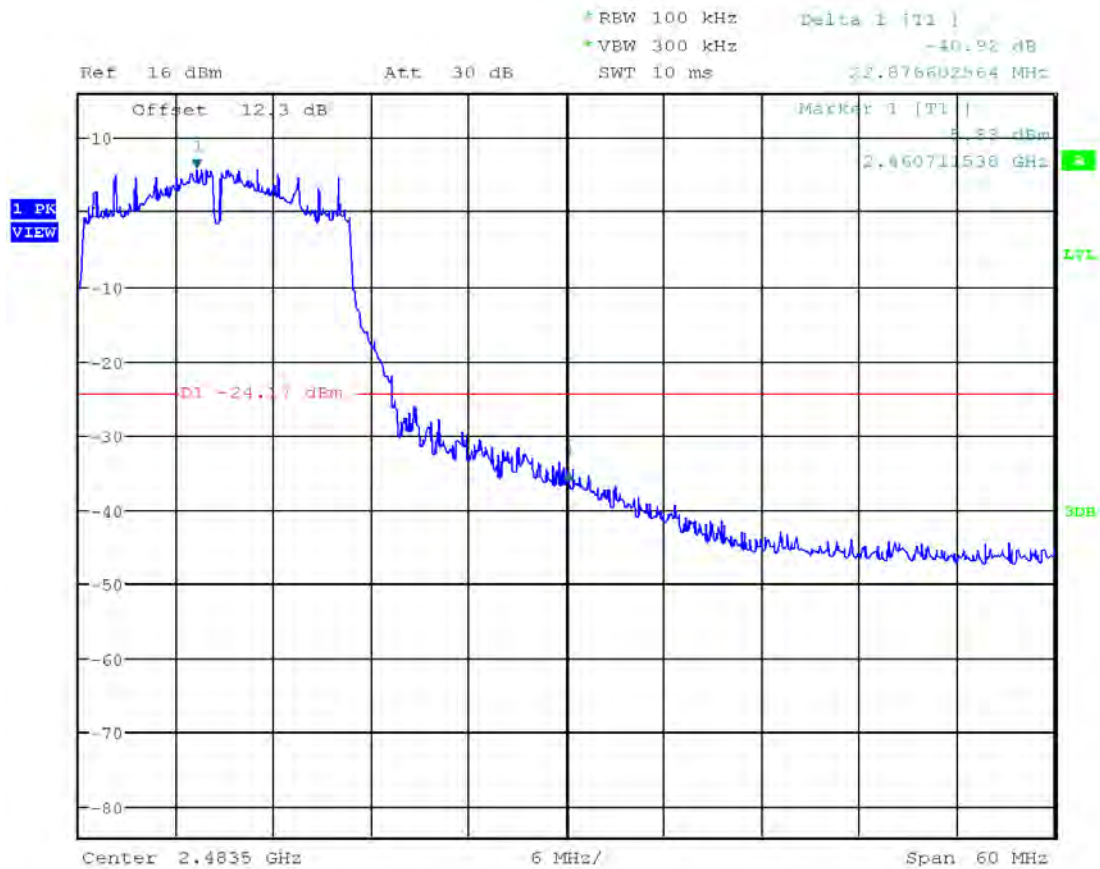
Date: 12.OCT.2021 22:25:48

Plot 4.12
Conducted Band Edge, Tx @ 2412MHz 802.11g



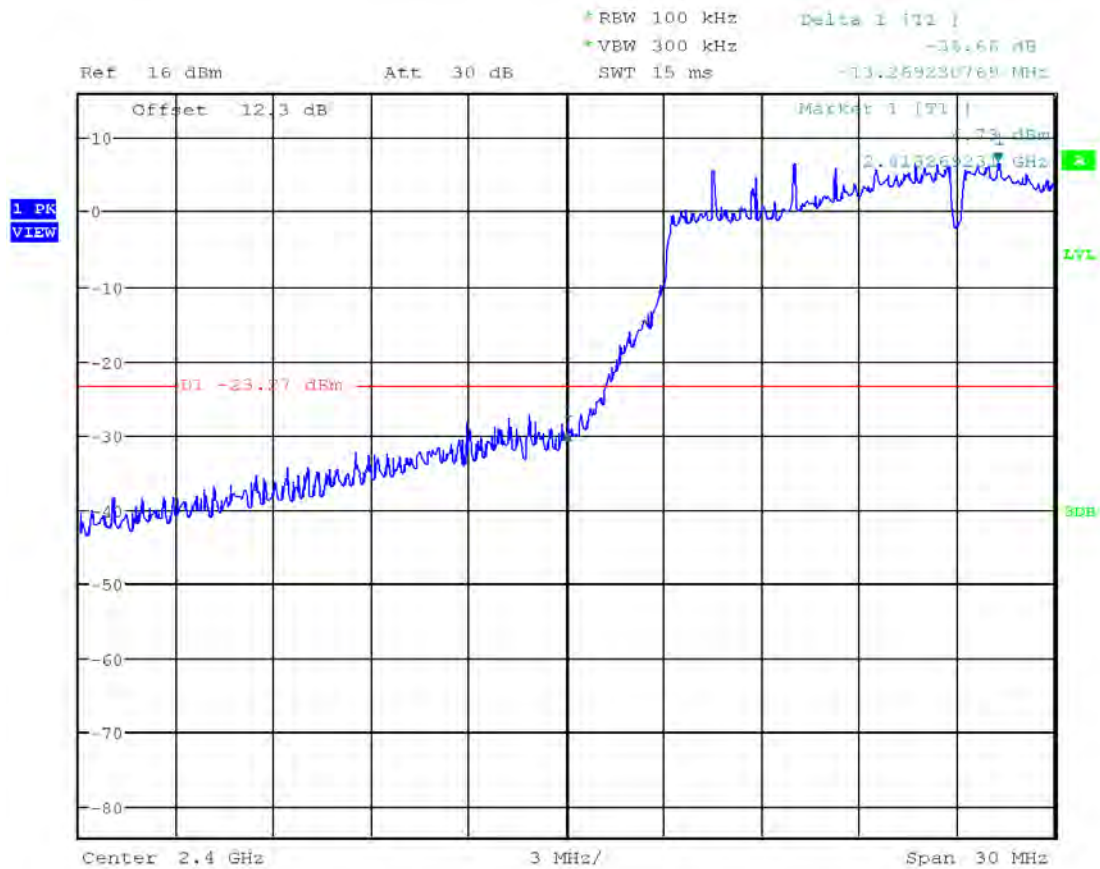
Date: 12.OCT.2021 22:22:21

Plot 4.13
Conducted Band Edge, Tx @ 2462MHz 802.11g



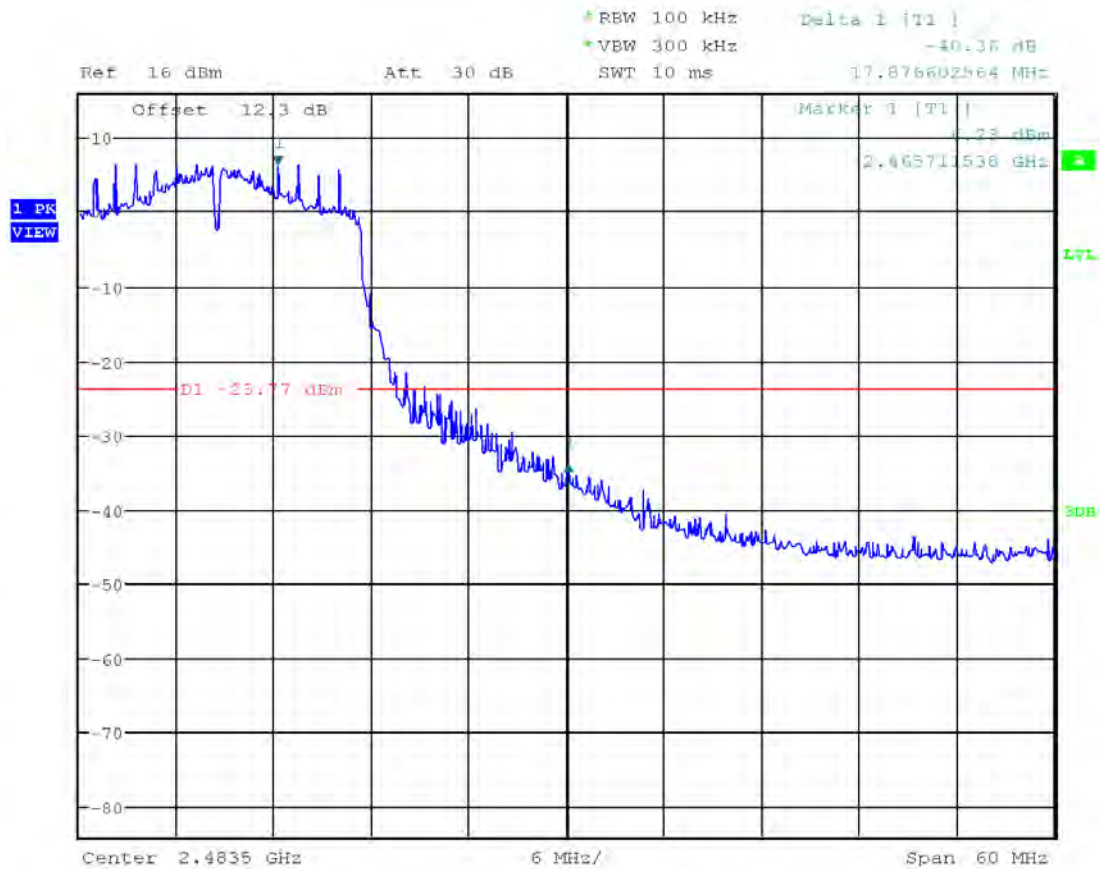
Date: 12.OCT.2021 22:28:40

Plot 4.14
Conducted Band Edge, Tx @ 2412MHz 802.11n 20MHz



Date: 12.OCT.2021 22:23:31

Plot 4.15
Conducted Band Edge, Tx @ 2462MHz 802.11n 20MHz



Date: 12.OCT.2021 22:29:50

4.5 Transmitter Radiated Emissions
FCC Rules: 15.247(d), 15.209, 15.205; RSS-247, 5.5;

4.5.1 Requirement

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

For out of band radiated emissions (except for frequencies in restricted bands), in any 100 kHz bandwidths outside the EUT pass-band, the RF power shall be at least 20dB (peak) or 30 dB (average) below that of the maximum in-band 100 kHz emissions.

4.5.2 Procedure – Radiated Emissions

Radiated emission measurements were performed from 9 kHz to 26.5 GHz according to the procedure described in ANSI C63.10: 2013. Spectrum Analyzer Resolution Bandwidth is 200Hz or greater for frequencies 9kHz to 30MHz, 100 kHz or greater for frequencies 30 MHz to 1000 MHz, 1 MHz for frequencies above 1000 MHz. Above 1000 MHz Peak and Average measurements were performed.

The EUT is placed on a plastic turntable that is 80 cm in height for below 1000MHz and 1.5m in height for above 1GHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters for frequencies above 1 GHz and at 10 meters for frequencies below 1 GHz.

Measurements made from 1 GHz to 18GHz had a 2.4-2.5GHz notch filter in place. A preamp was used from 30MHz to 26GHz.

All measurements were made with a Peak Detector and compared to QP limits for 30MHz – 1GHz and Average limits for 1GHz – 26GHz.

Correlation measurements were performed below 30MHz between 10m ALSE and Open Field site according to FCC KDB 414788 D01 Radiated Test Site v01r01 section 2. All readings were within the acceptable tolerance.

EUT was tested in both horizontal and upright position. Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels).

4.5.3 Field Strength Calculation

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$FS = RA + AF + CF - AG$; if measurement is performed at a distance other than specified in the rule, a Distance Correction Factor (DCF) shall be added.

Where FS = Field Strength in dB(μ V/m)

RA = Receiver Amplitude (including preamplifier) in dB(μ V); AF = Antenna Factor in dB(1/m)

CF = Cable Attenuation Factor in dB; AG = Amplifier Gain in dB

Assume a receiver reading of 52.0 dB(μ V) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μ V/m). This value in dB(μ V/m) was converted to its corresponding level in μ V/m.

RA = 52.0 dB(μ V)

AF = 7.4 dB(1/m)

CF = 1.6 dB

AG = 29.0 dB

$FS = 52.0 + 7.4 + 1.6 - 29.0 = 32$ dB(μ V/m).

Level in μ V/m = Com

mon Antilogarithm $[(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$.

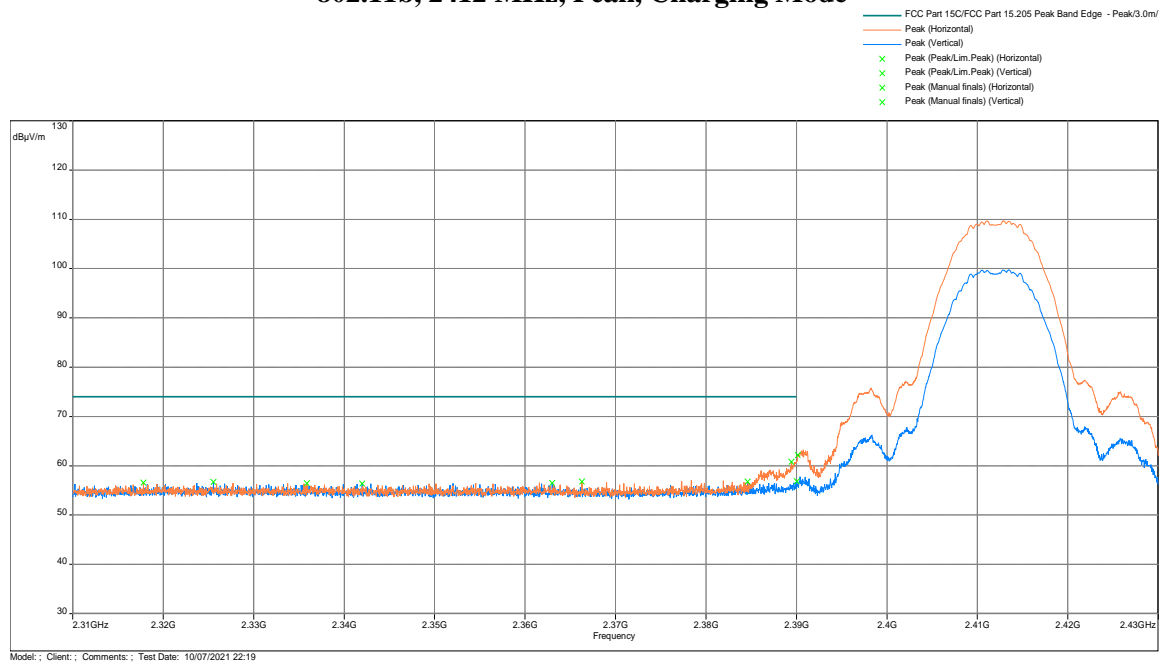
4.5.4 Test Results

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

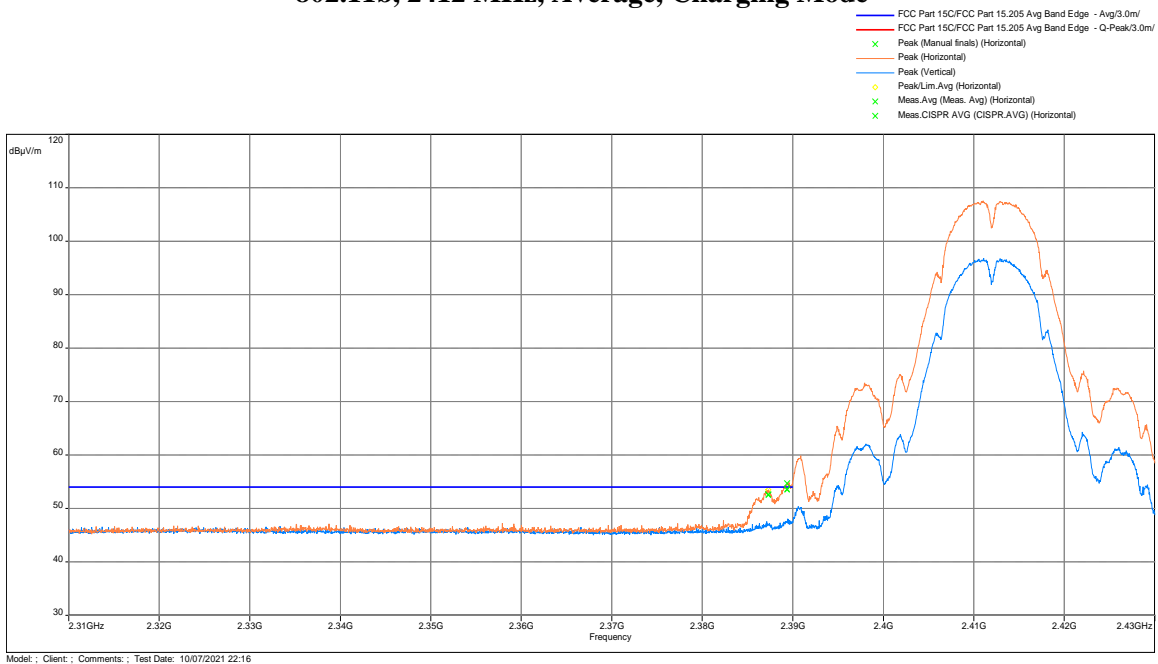
Tested By	Test Date
Minh Ly	October 08 - 11, 2021

Test Results: 15.209/15.205 Radiated Restricted Band Emissions

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11b, 2412 MHz, Peak, Charging Mode

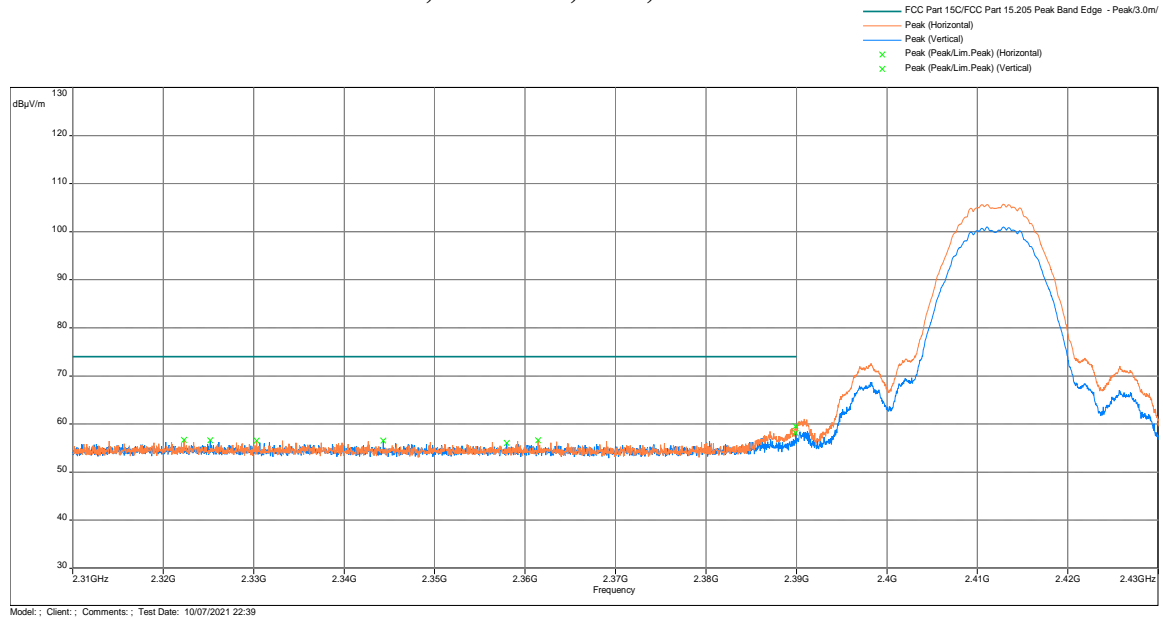


802.11b, 2412 MHz, Average, Charging Mode

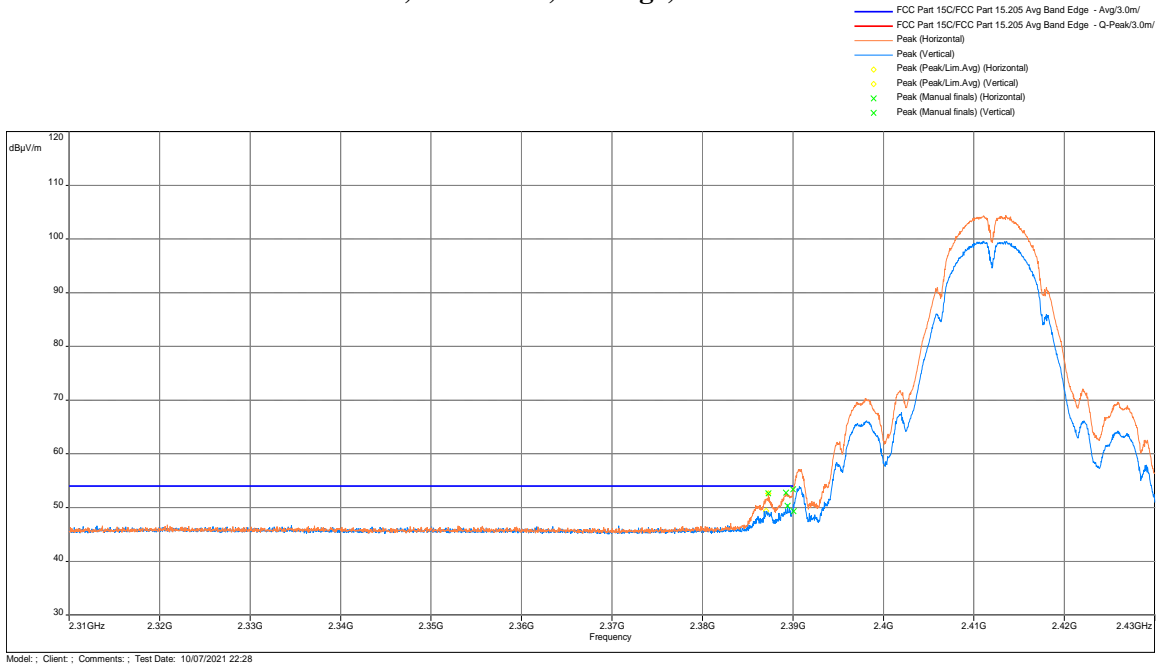


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2387.2	52.7	54.0	-1.4	150.0	198.0	Horizontal	21.6
2390.0	53.7	54.0	-0.4	150.0	190.0	Horizontal	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11b, 2412 MHz, Peak, Normal Mode

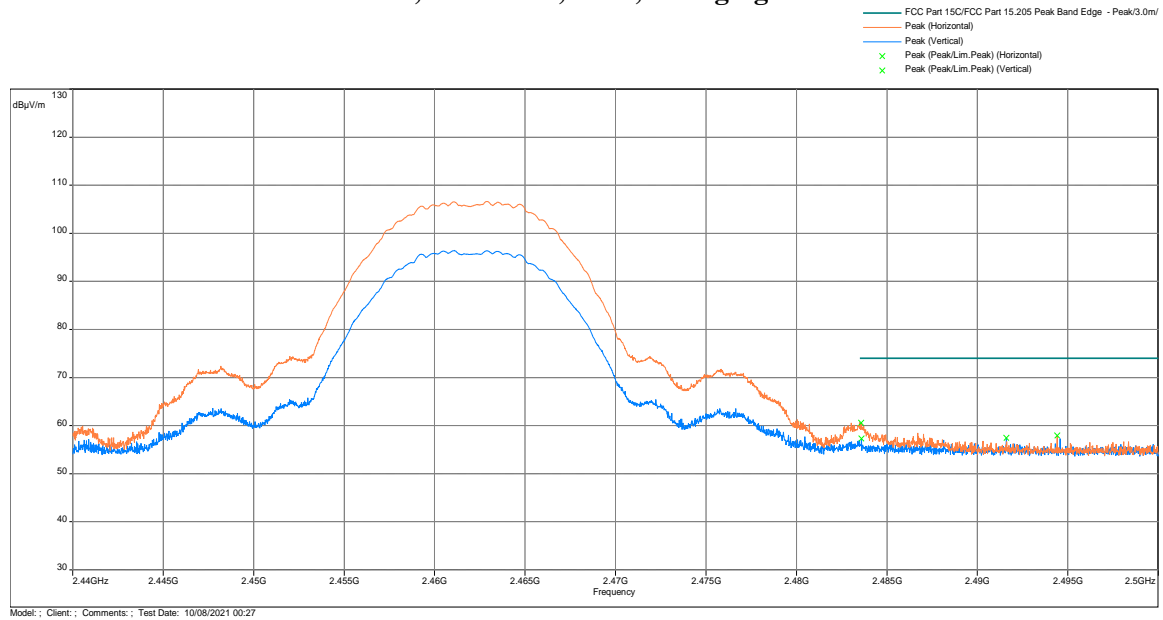


802.11b, 2412 MHz, Average, Normal Mode

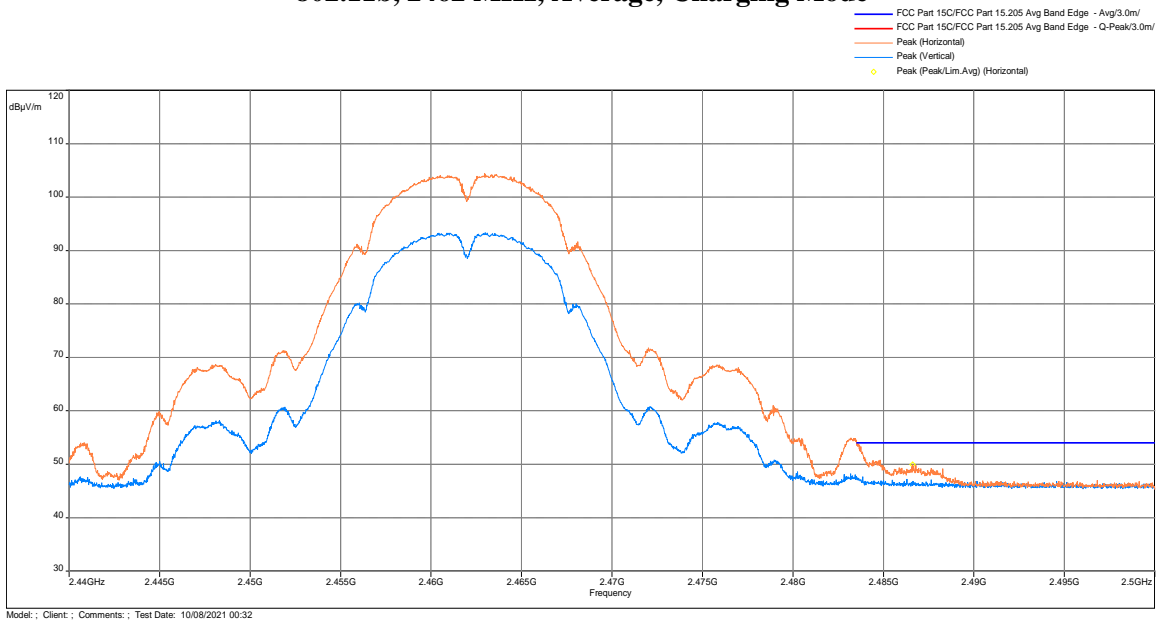


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2387.3	52.6	54.0	-1.4	1.5	181.5	Horizontal	21.6
2389.2	52.8	54.0	-1.2	1.5	181.5	Horizontal	21.6
2390.0	53.4	54.0	-0.6	1.5	181.5	Horizontal	21.6
2389.4	50.3	54.0	-3.7	1.5	286.3	Vertical	21.6
2390.0	49.3	54.0	-4.7	1.5	255.0	Vertical	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11b, 2462 MHz, Peak, Charging Mode

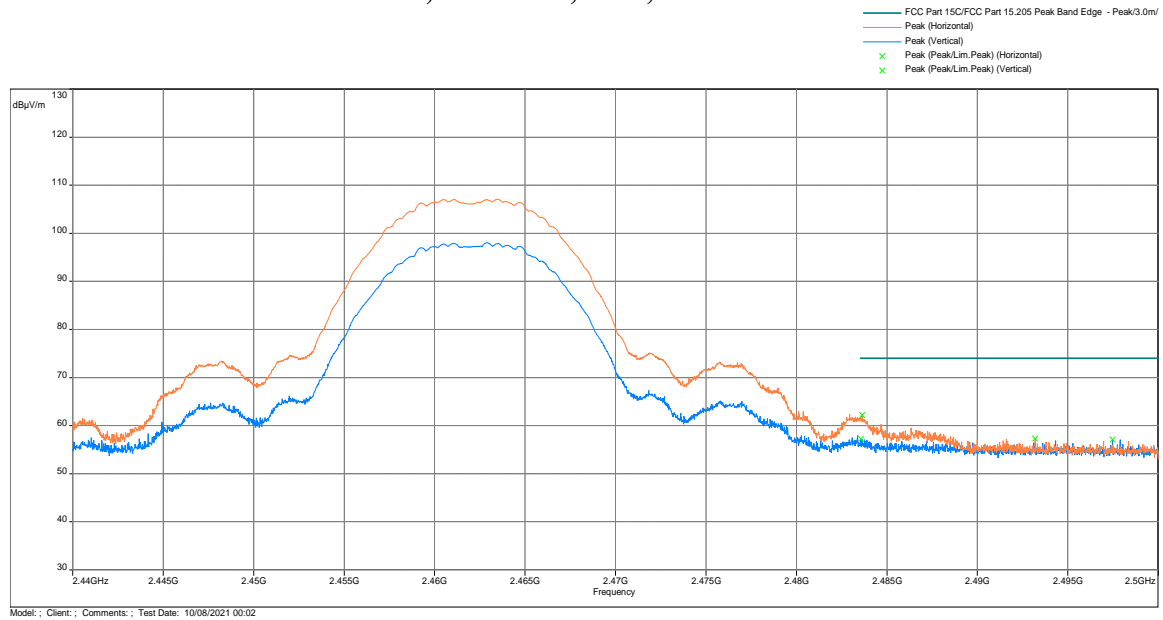


802.11b, 2462 MHz, Average, Charging Mode

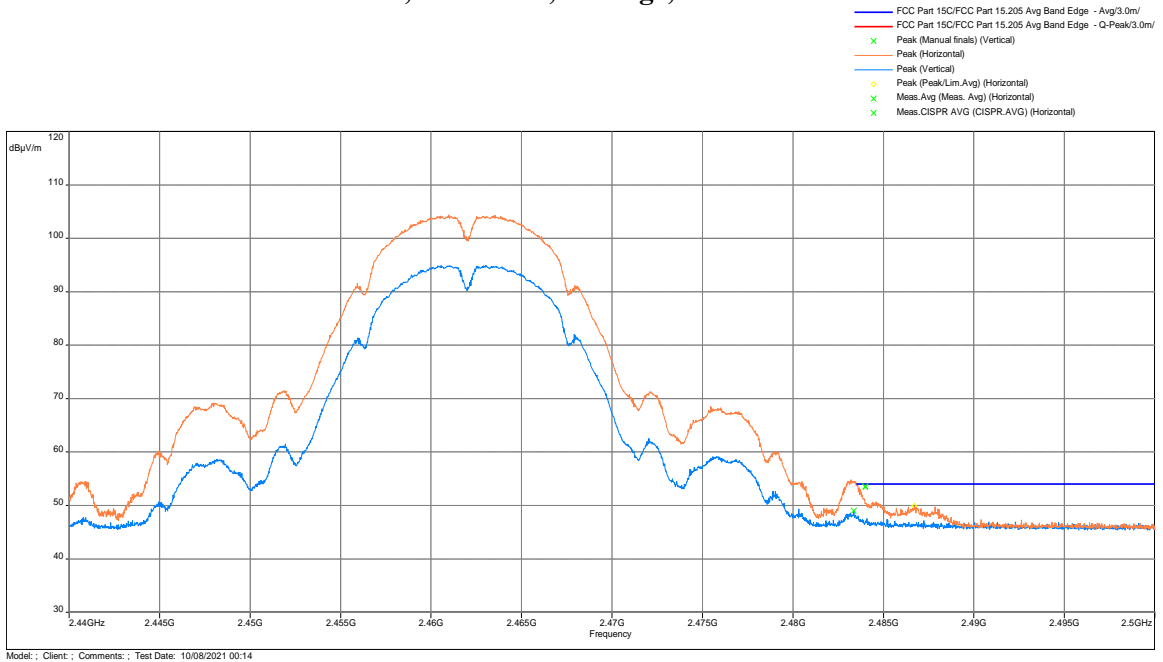


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	53.5	54.0	-0.5	1.5	58.0	Horizontal	22.0

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11b, 2462 MHz, Peak, Normal Mode

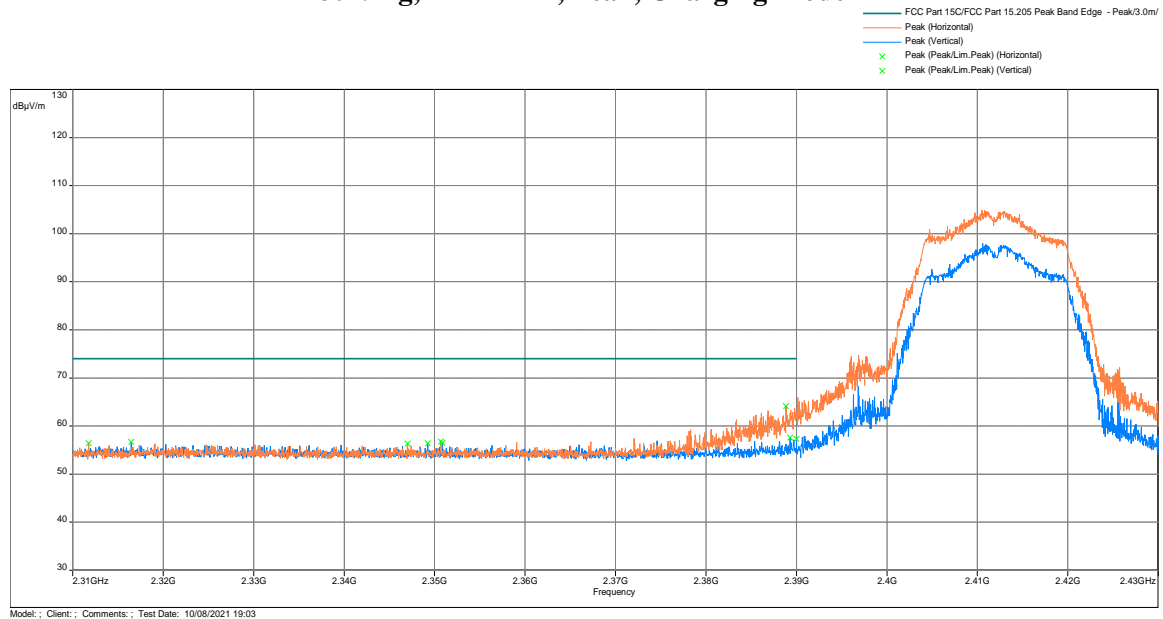


802.11b, 2462 MHz, Average, Normal Mode

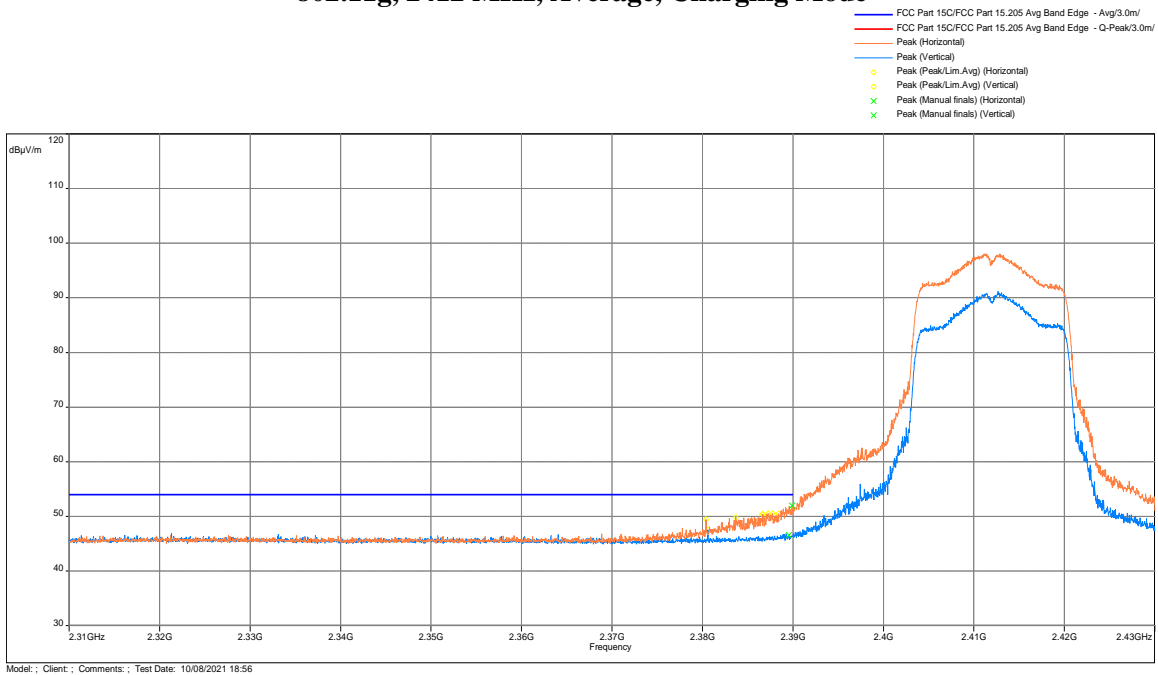


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	53.6	54.0	-0.5	1.4	193.0	Horizontal	22.0
2483.5	49.0	54.0	-5.0	1.5	0.0	Vertical	22.0

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11g, 2412 MHz, Peak, Charging Mode

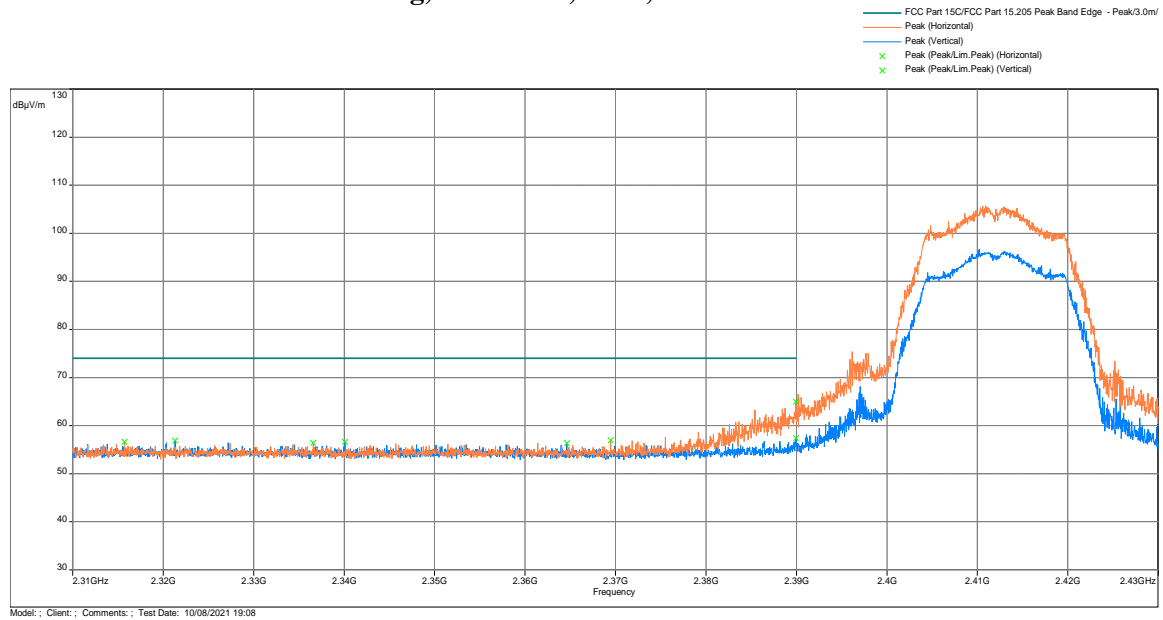


802.11g, 2412 MHz, Average, Charging Mode

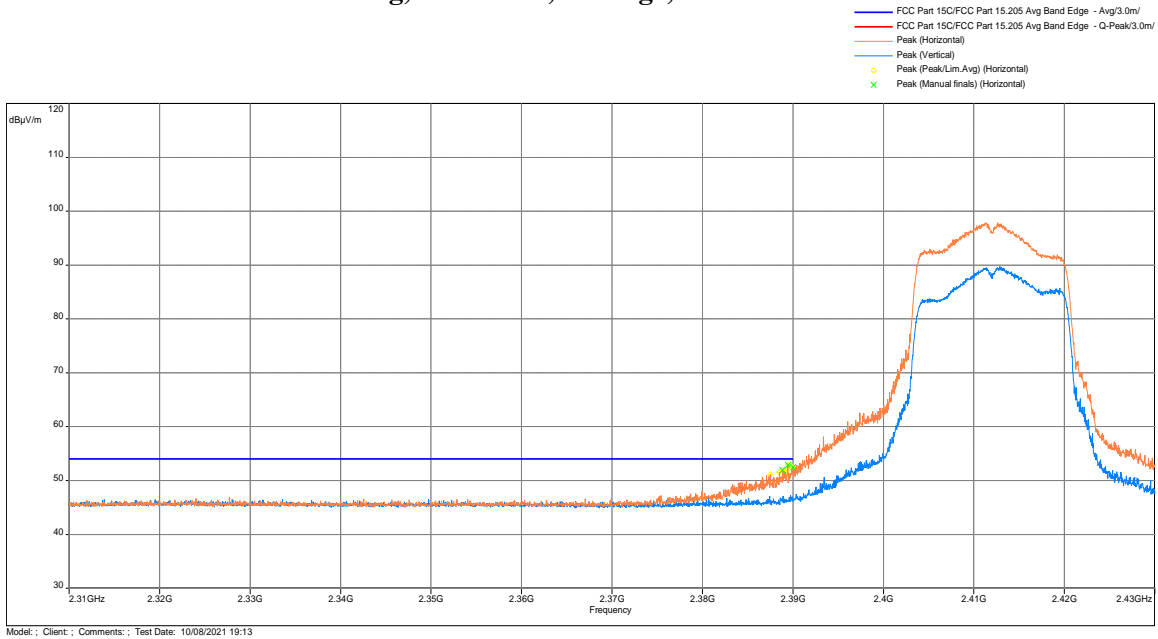


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2390.0	51.9	54.0	-2.1	1.5	123.0	Horizontal	21.6
2390.0	46.6	54.0	-7.5	1.5	162.3	Vertical	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11g, 2412 MHz, Peak, Normal Mode

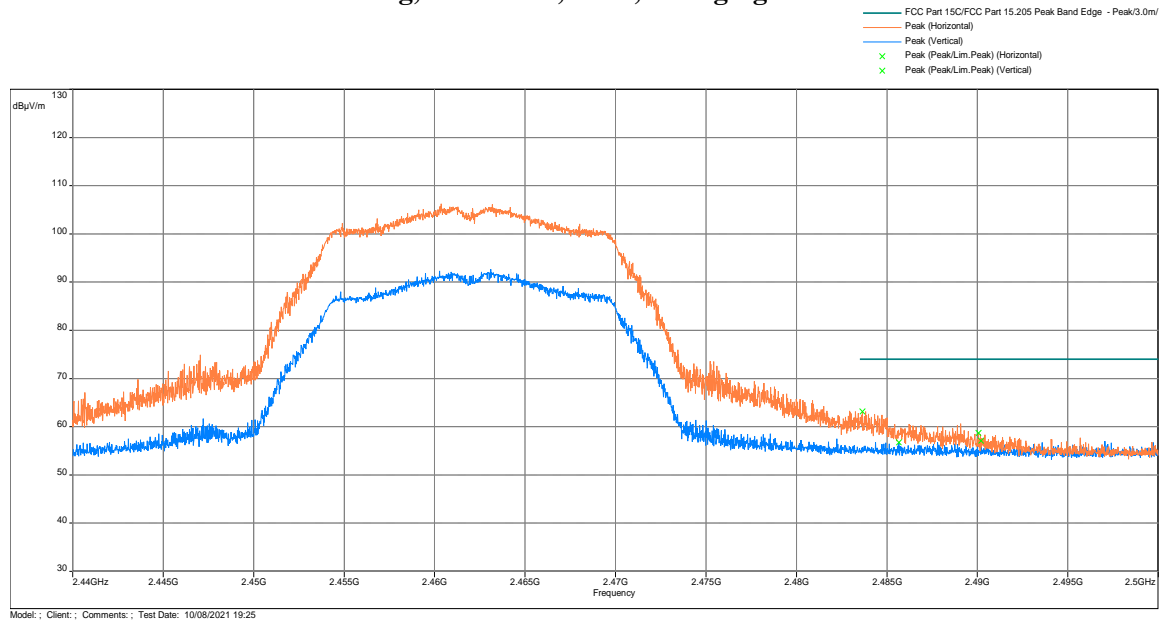


802.11g, 2412 MHz, Average, Normal Mode

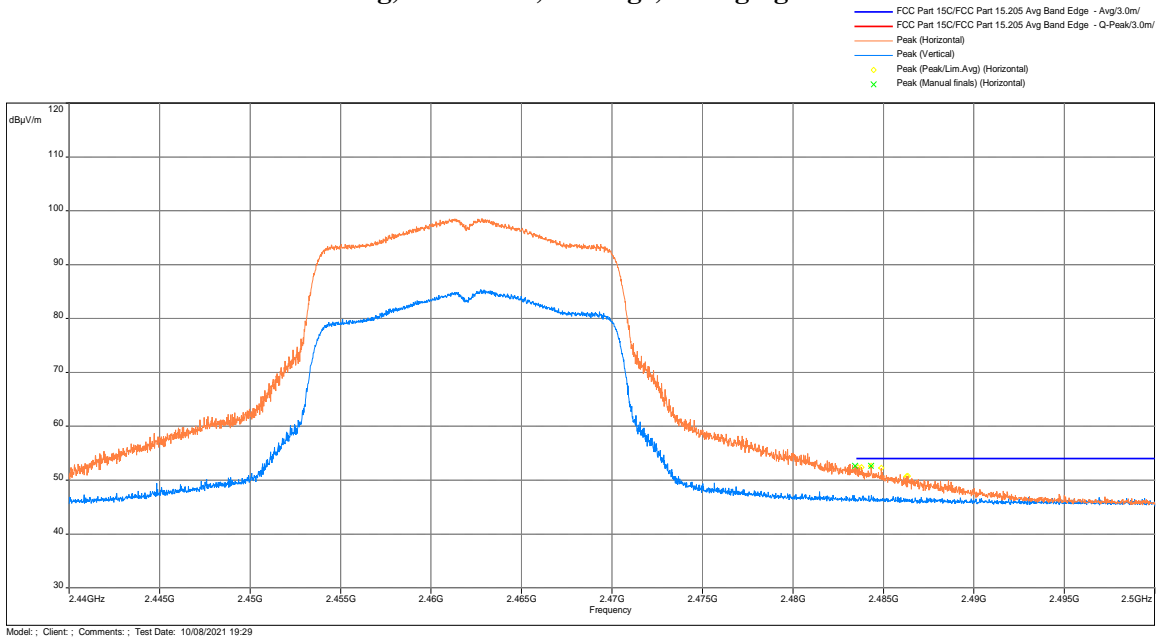


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2388.8	51.9	54.0	-2.1	1.5	63.3	Horizontal	21.6
2389.5	52.9	54.0	-1.1	1.5	63.3	Horizontal	21.6
2390.0	52.4	54.0	-1.6	1.5	63.3	Horizontal	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11g, 2462 MHz, Peak, Charging Mode

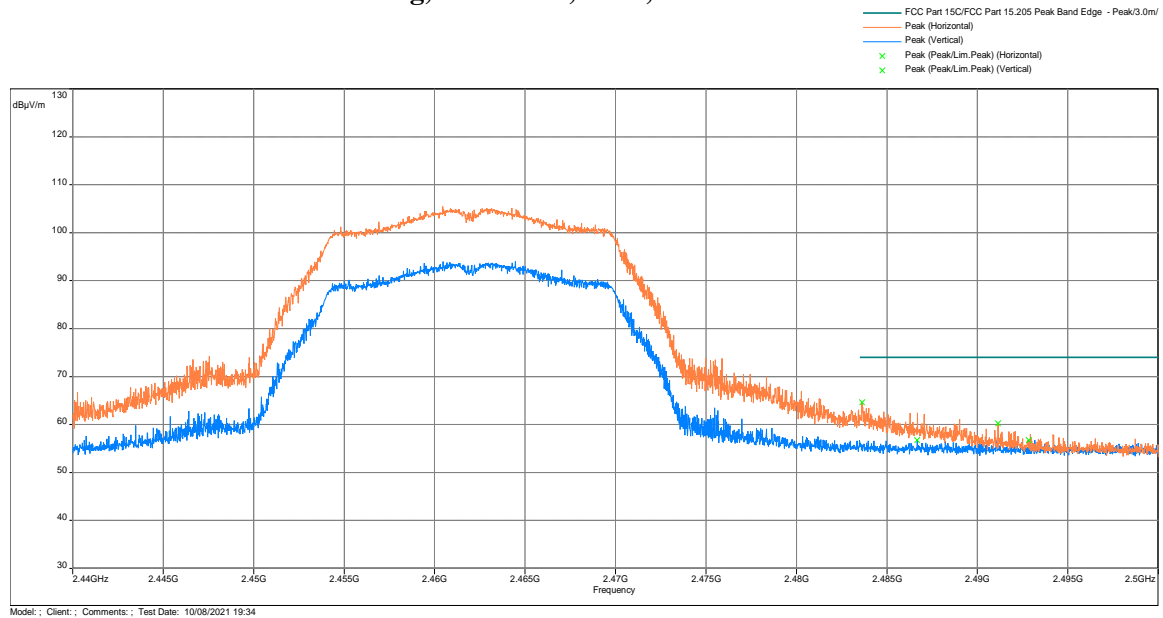


802.11g, 2462 MHz, Average, Charging Mode

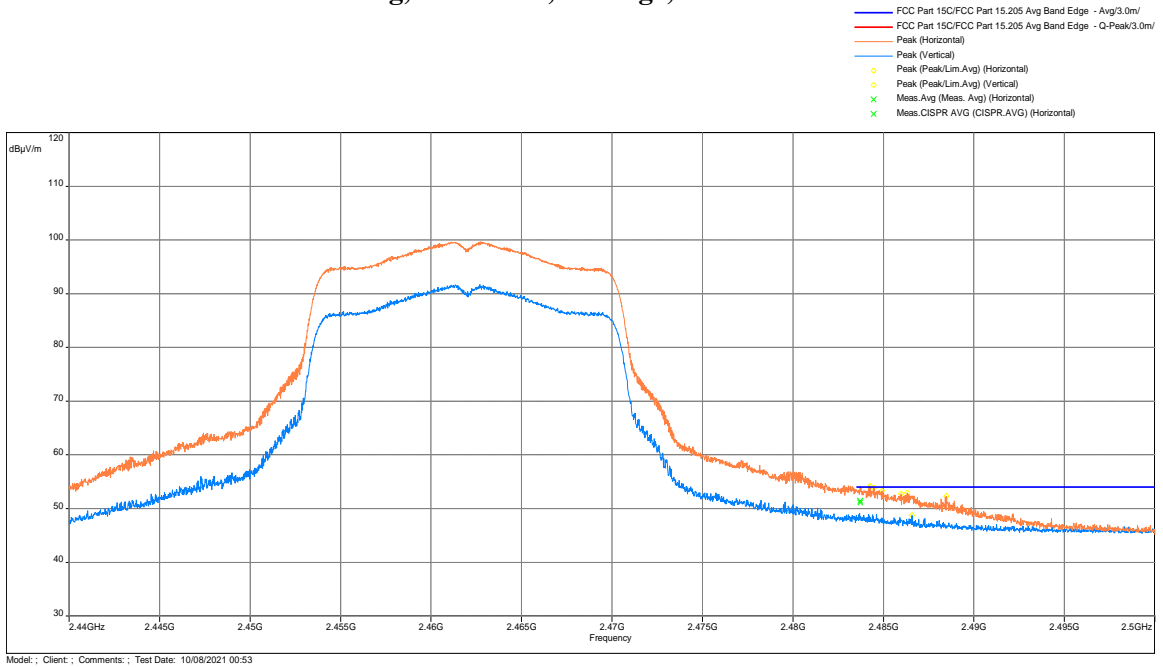


Freq. MHz	Ave@3m dB(uV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	52.6	54.0	-1.4	1.5	183.8	Horizontal	22.0
2484.3	52.6	54.0	-1.4	1.5	183.8	Horizontal	21.9

Out-of-Band Spurious Emissions at the Band Edge @ 1m distance 802.11g, 2462 MHz, Peak, Normal Mode

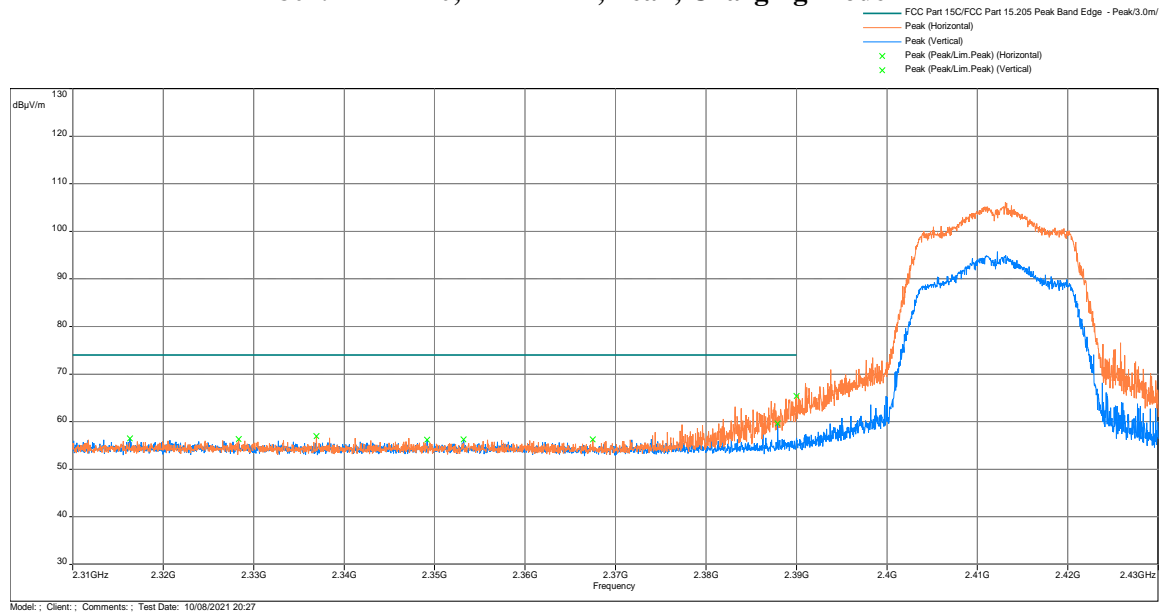


802.11g, 2462 MHz, Average, Normal Mode

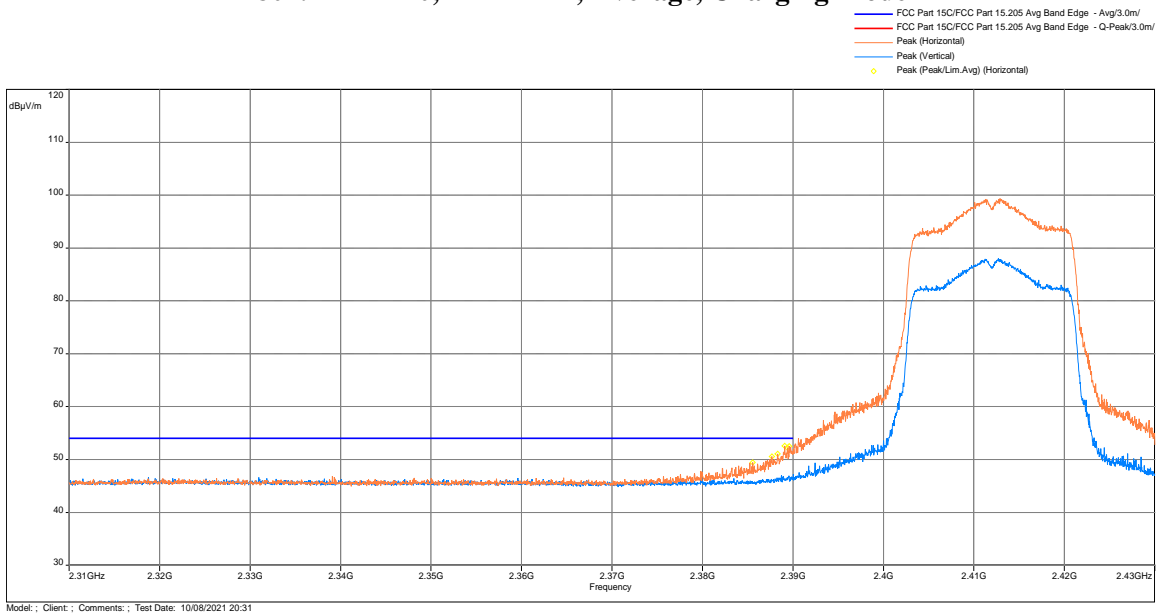


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	51.4	54.0	-2.6	1.5	196.0	Horizontal	22.0
2483.5	51.1	54.0	-2.9	1.5	122.0	Vertical	22.0

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11n HT20, 2412 MHz, Peak, Charging Mode

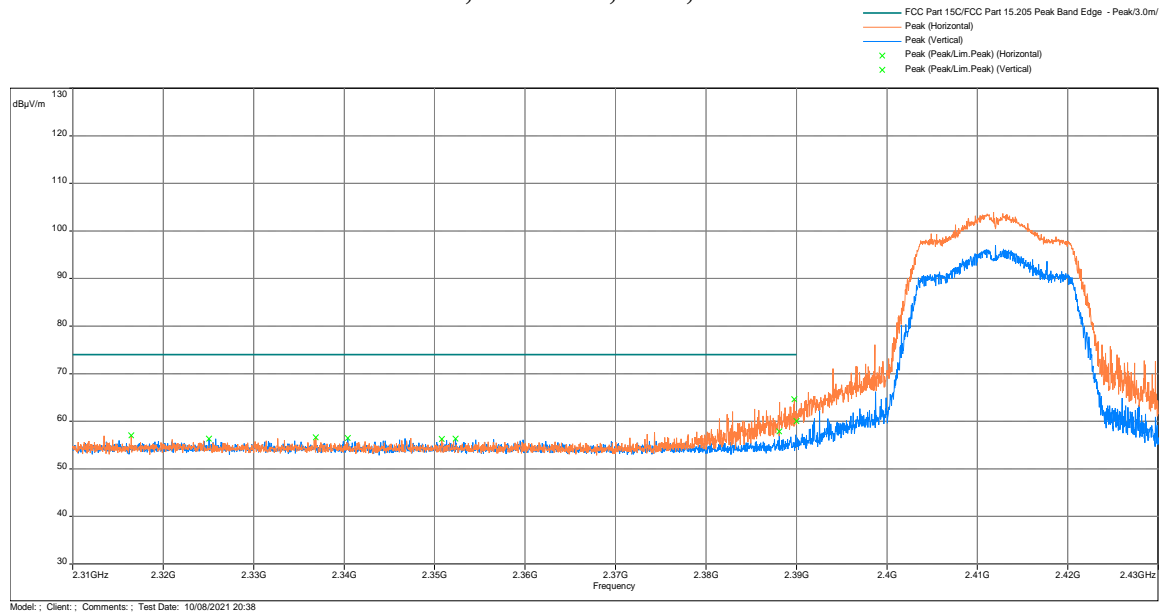


802.11n HT20, 2412 MHz, Average, Charging Mode

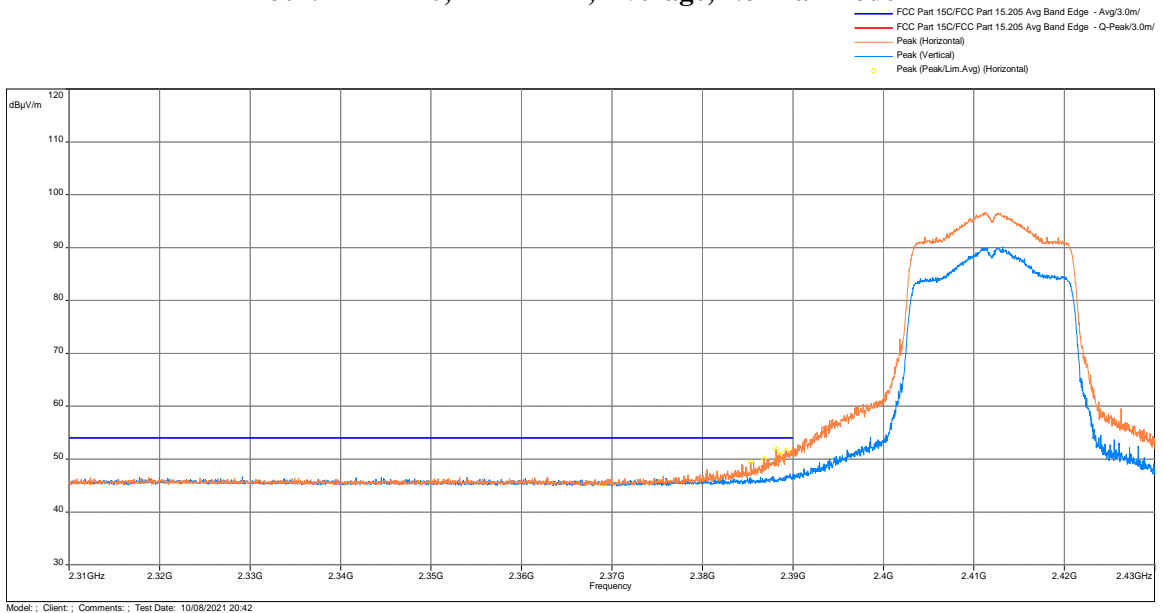


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2389.6	52.2	54.0	-1.8	1.5	183.0	Horizontal	21.6
2390.0	52.5	54.0	-1.5	1.5	242.5	Horizontal	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11n HT20, 2412 MHz, Peak, Normal Mode

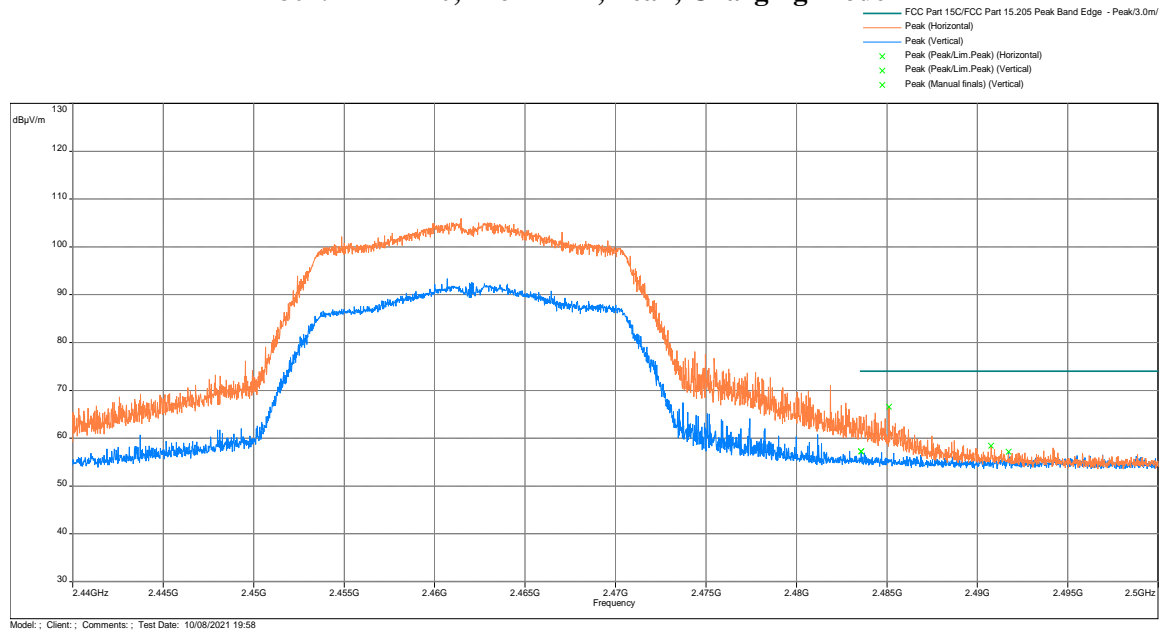


802.11n HT20, 2412 MHz, Average, Normal Mode

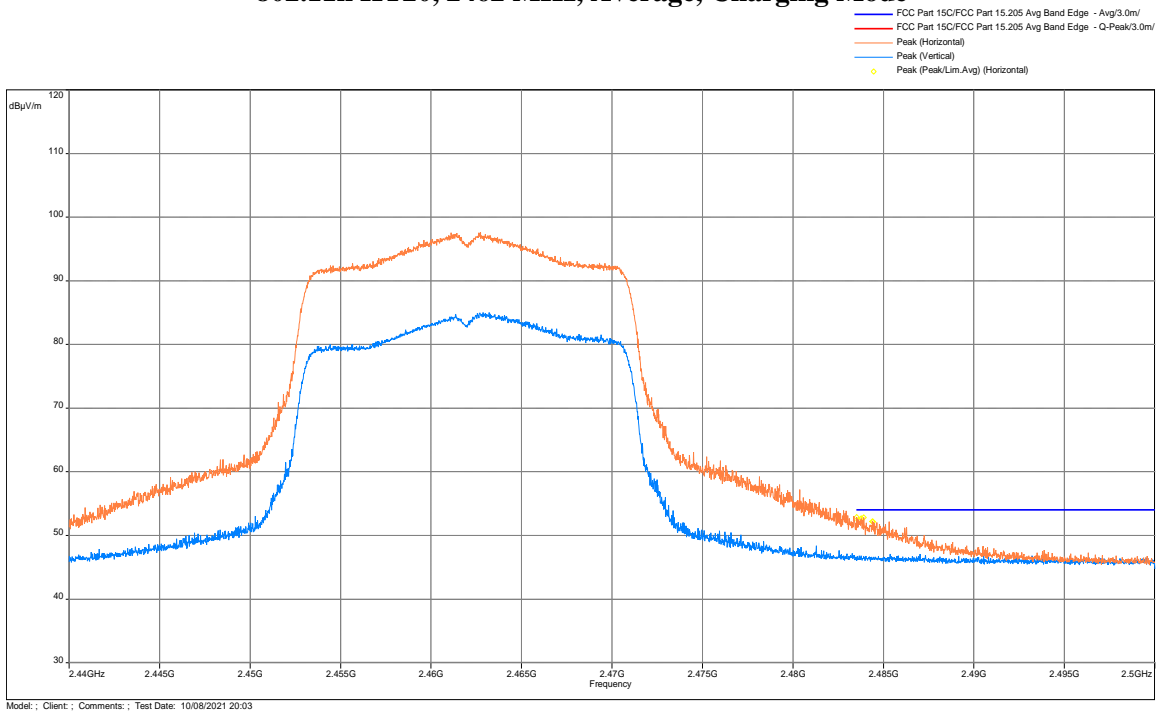


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2389.2	51.6	54.0	-2.4	1.5	242.8	Horizontal	21.6
2390.0	52.3	54.0	-1.7	1.5	242.8	Horizontal	21.6

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11n HT20, 2462 MHz, Peak, Charging Mode

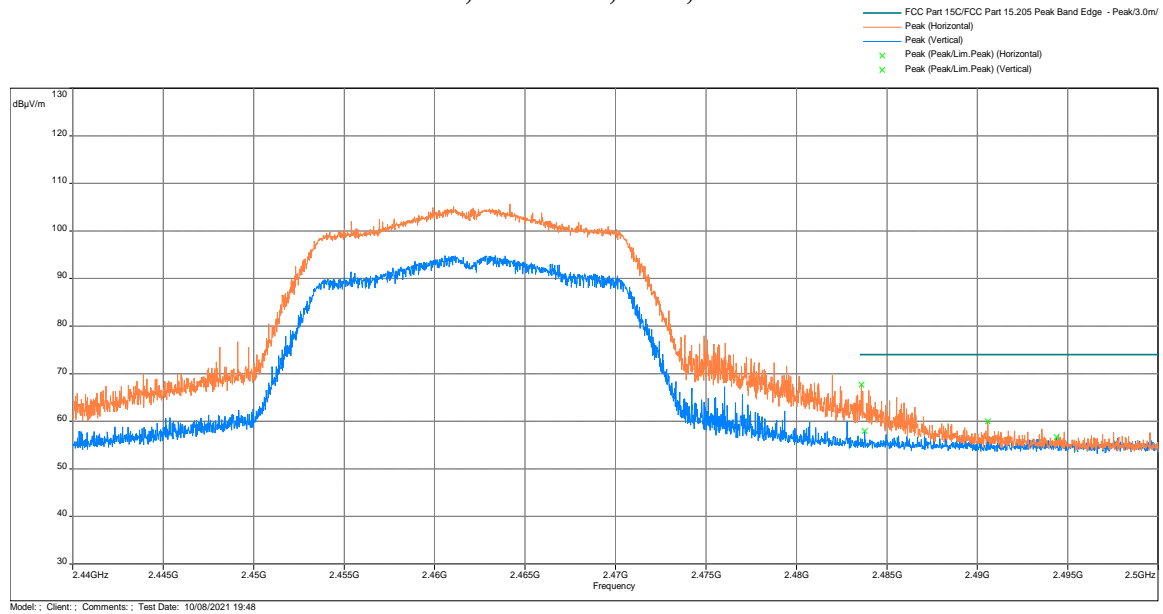


802.11n HT20, 2462 MHz, Average, Charging Mode

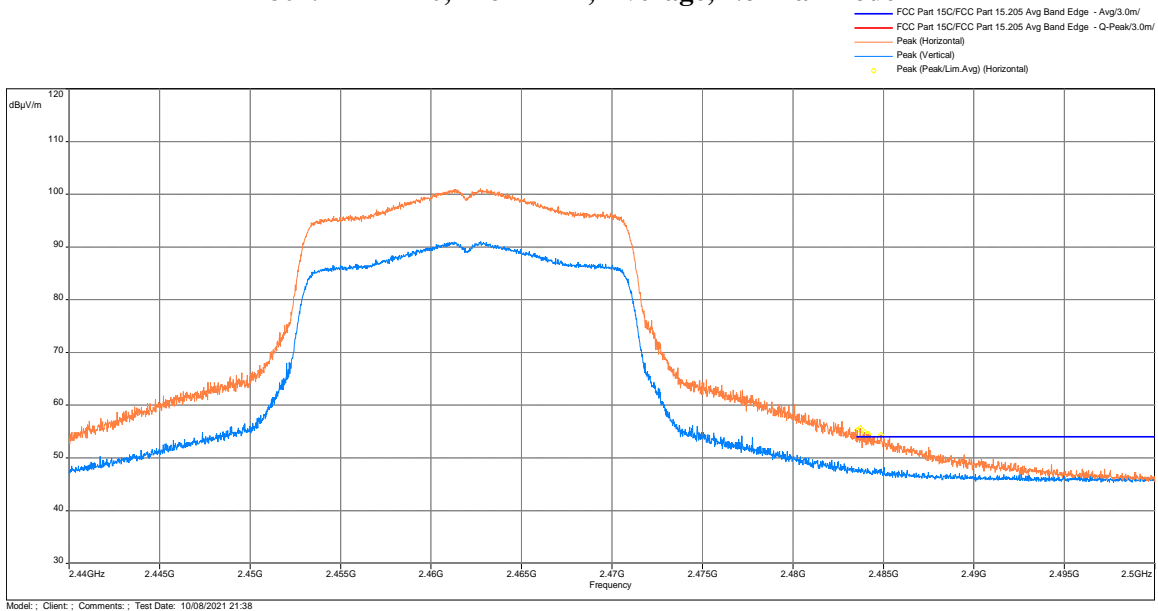


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	1.0	52.9	54.0	-1.2	1.5	184.3	Horizontal
2483.6	1.0	52.4	54.0	-1.6	1.5	184.3	Horizontal
2483.8	1.0	52.6	54.0	-1.4	1.5	184.3	Horizontal

Out-of-Band Spurious Emissions at the Band Edge @1m distance 802.11n HT20, 2462 MHz, Peak, Normal Mode



802.11n HT20, 2462 MHz, Average, Normal Mode

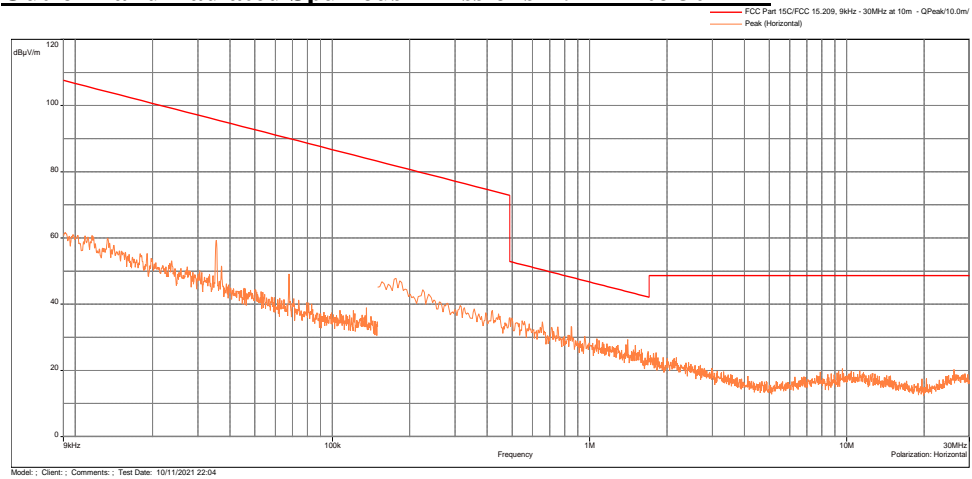


Freq. MHz	Ave@3m dB(μV/m)	Ave Limit dB(μV/m)	Margin dB	Height m	Azimuth deg	Polarity	Correction dB
2483.5	52.9	54.0	-1.1	1.5	0.0	Horizontal	22.0
2483.7	53.2	54.0	-0.8	1.4	199.0	Horizontal	22.0
2483.8	52.6	54.0	-1.4	1.5	4.0	Horizontal	22.0
2484.0	52.6	54.0	-1.4	1.5	180.0	Horizontal	22.0

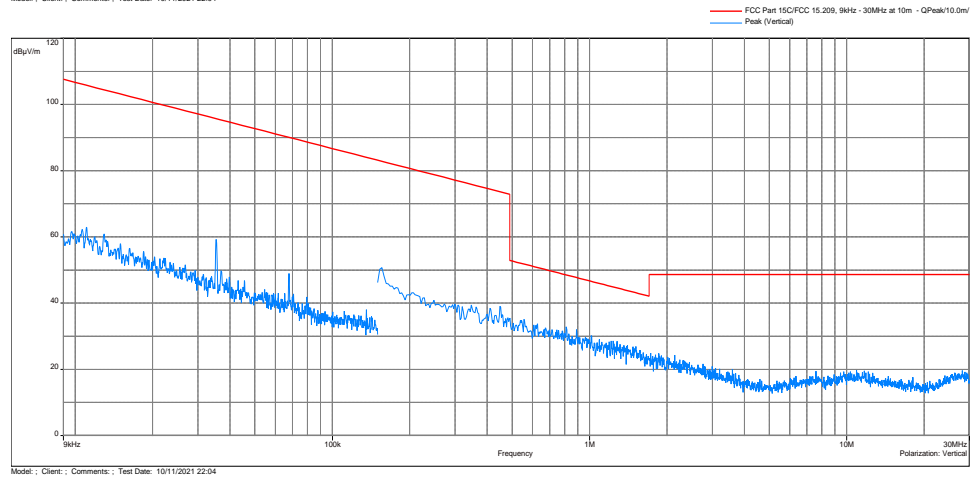
Results Complies

Out-of-Band Radiated Spurious Emissions – 9 kHz to 30MHz

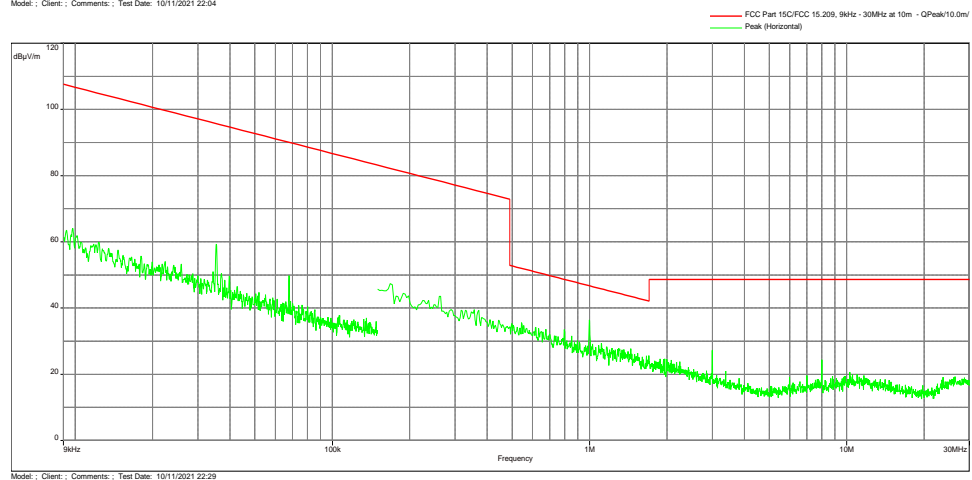
Antenna Position -
Coaxial



Antenna Position -
Coplanar

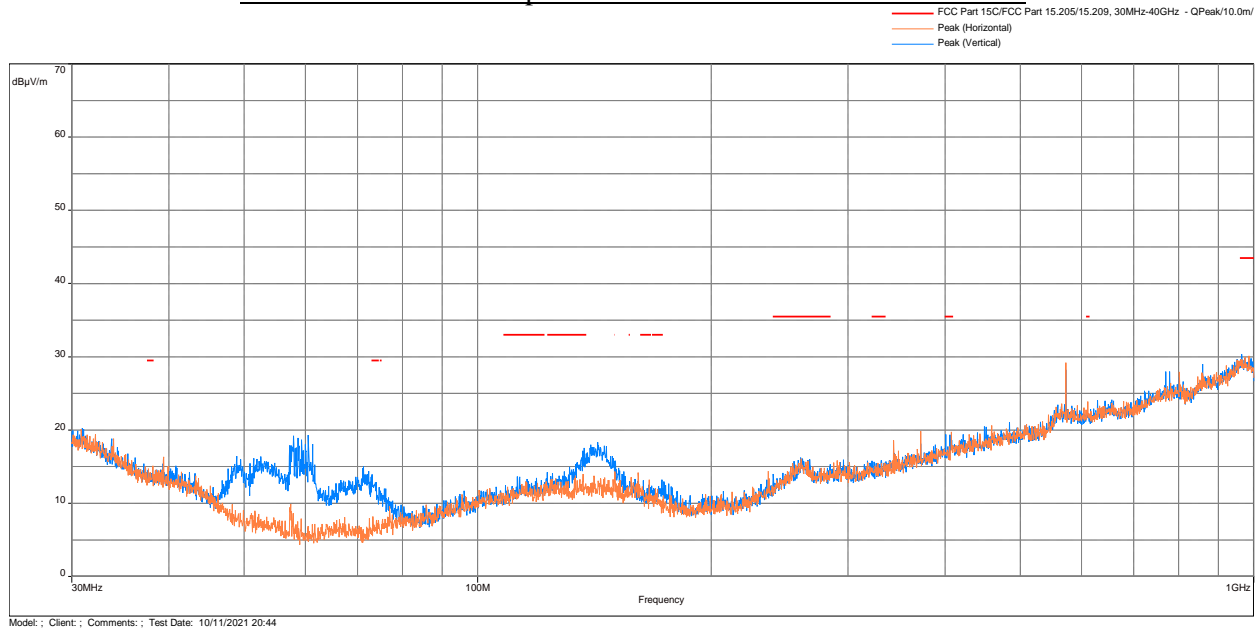


Antenna Position -
Horizontal

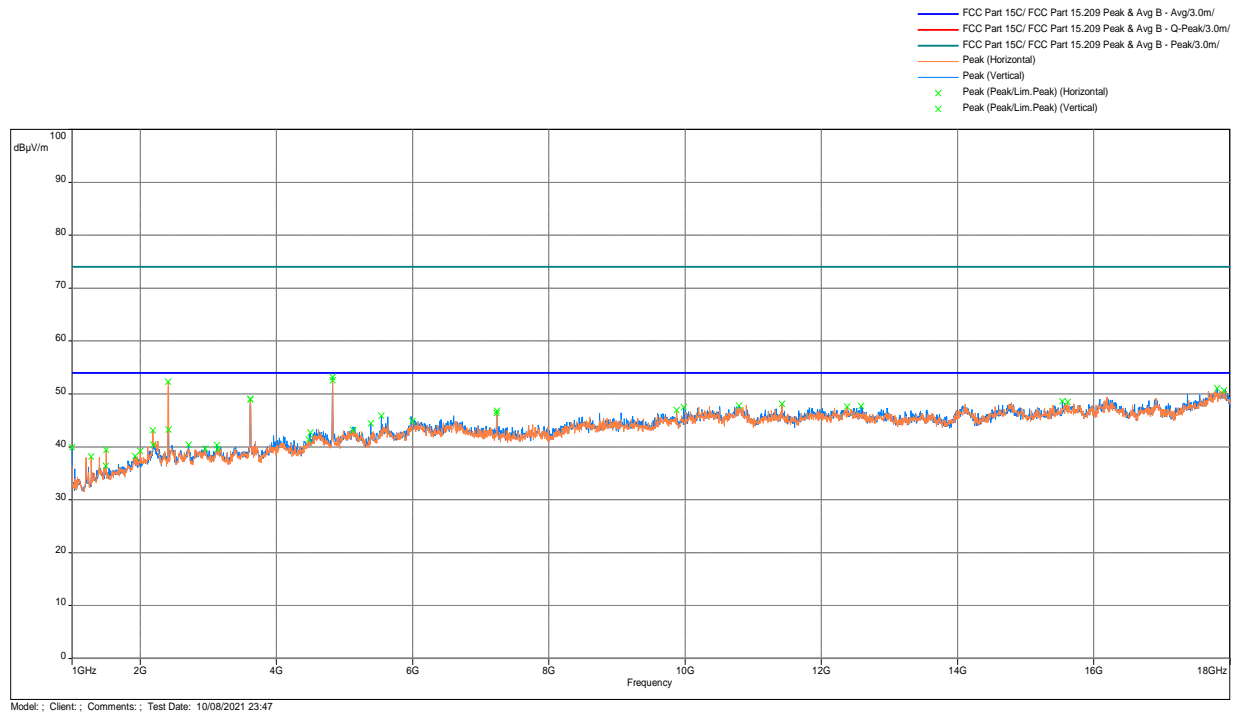


Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2412MHz

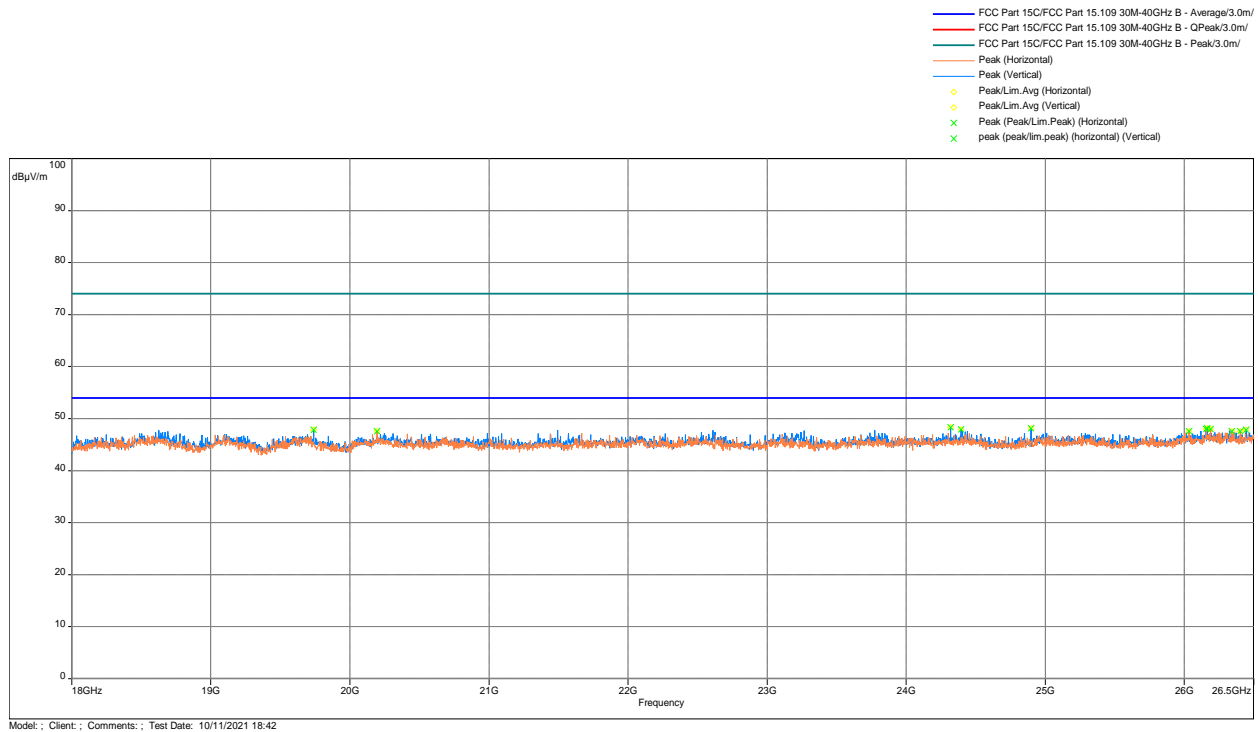
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



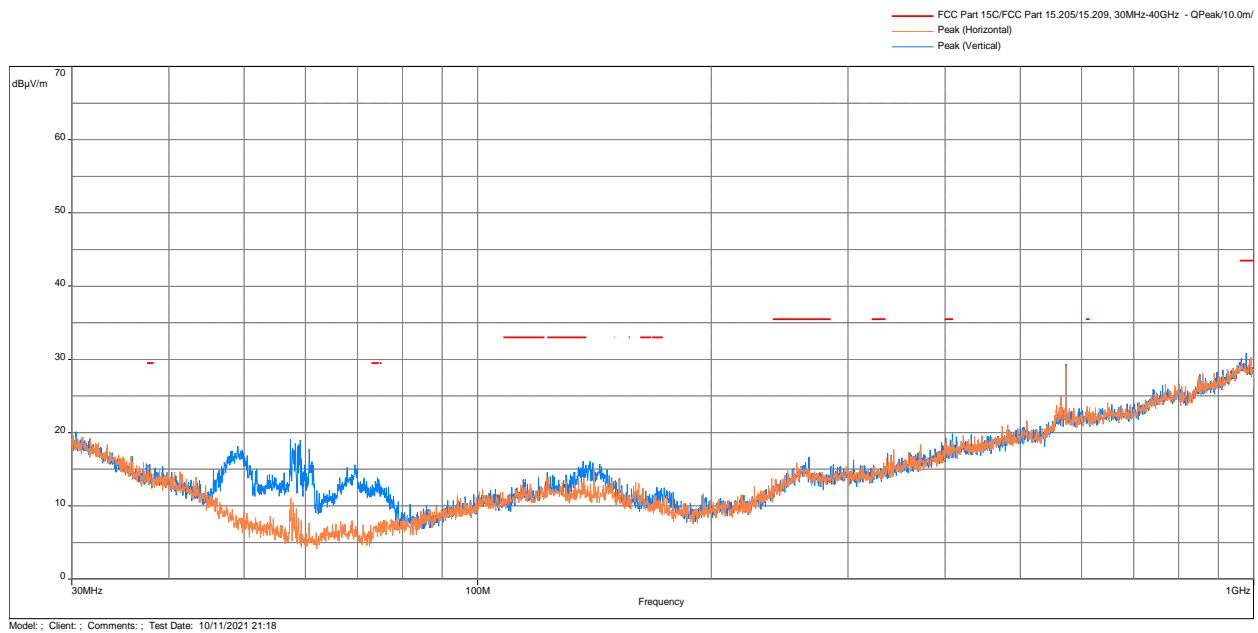
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3616.9	49.0	54.0	-5.0	1.5	57.8	Vertical	-6.9
3618.6	49.0	54.0	-5.0	1.5	57.5	Horizontal	-6.9
4823.9	53.2	54.0	-0.8	1.5	92.0	Vertical	-4.7
4823.9	52.6	54.0	-1.4	1.5	57.5	Horizontal	-4.7
15539.5	48.6	54.0	-5.4	1.5	337.0	Vertical	5.1
15616.6	48.5	54.0	-5.6	1.5	0.0	Horizontal	5.7
17907.6	50.6	54.0	-3.4	2.5	91.3	Horizontal	10.1

Note: Correction = AF + CF - Preamp

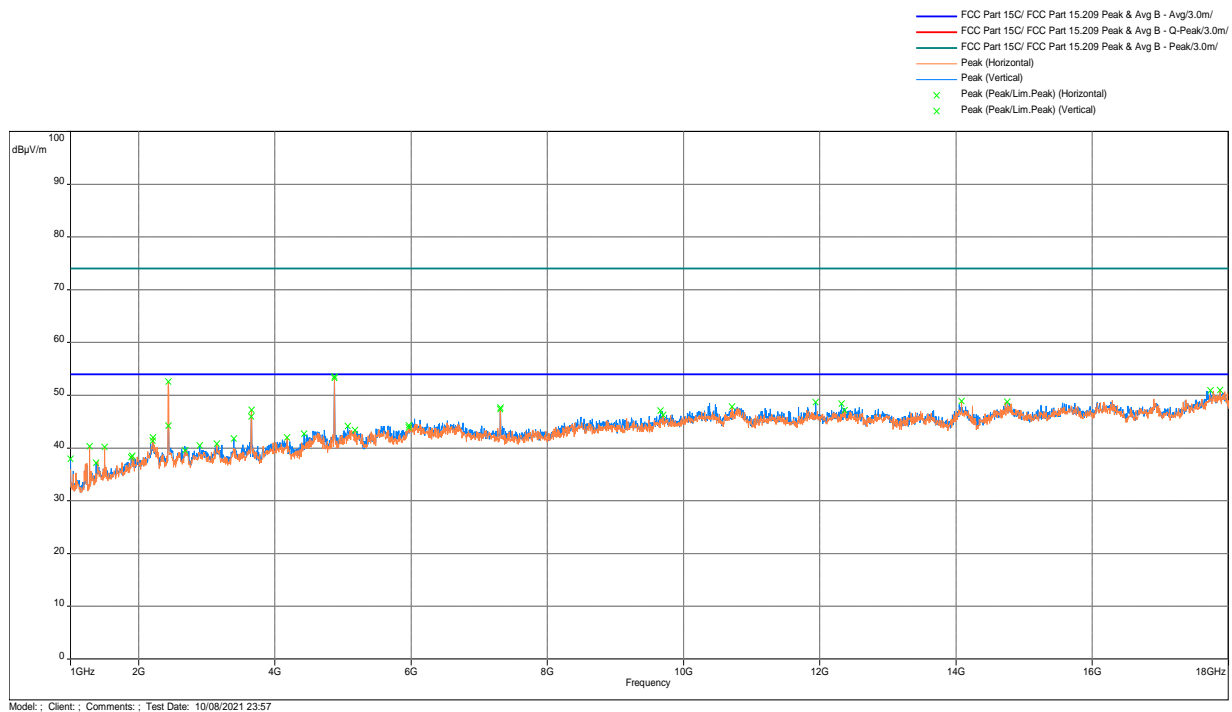
Results	Complies
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Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2437MHz

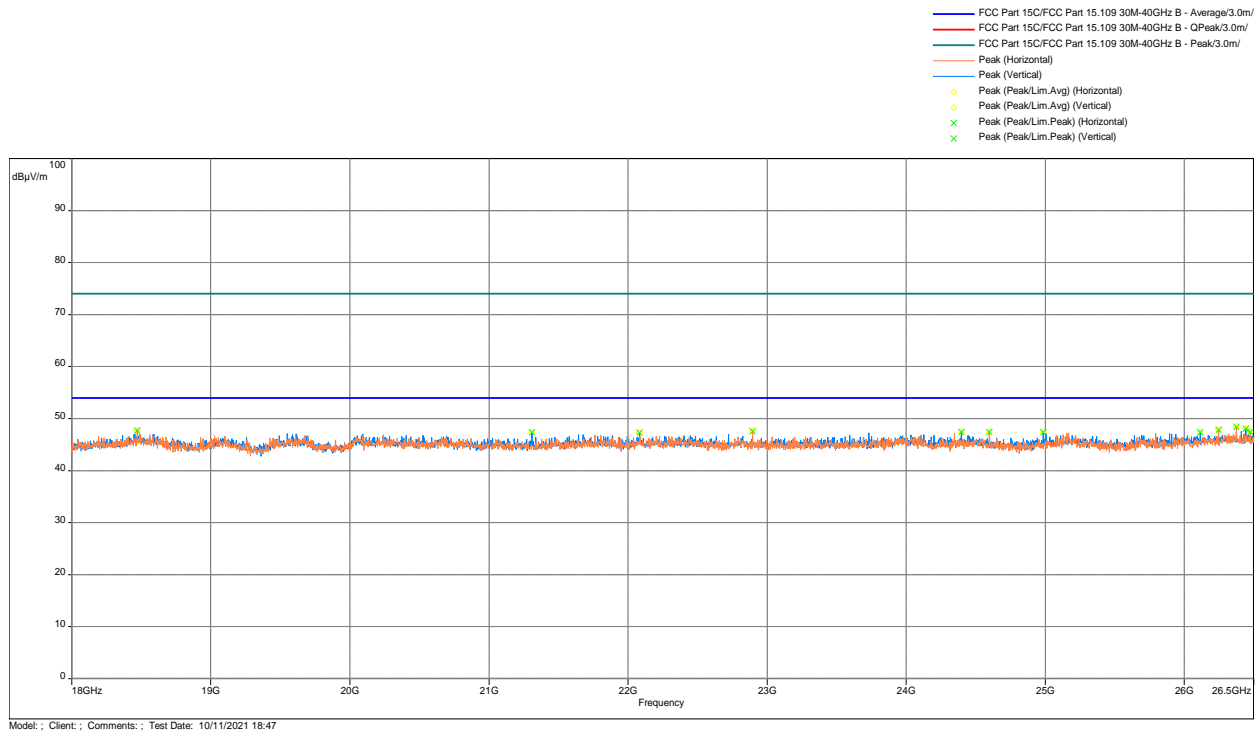
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



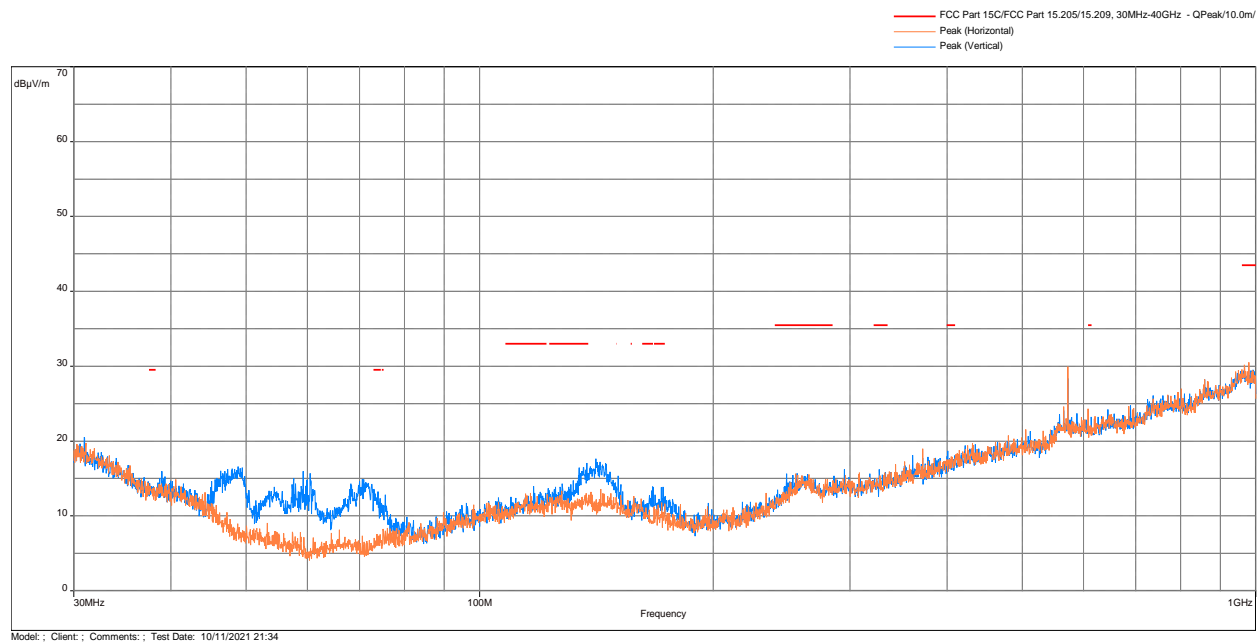
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3656.0	47.2	54.0	-6.8	1.5	57.5	Horizontal	-6.9
4873.7	53.5	54.0	-0.5	1.5	320.0	Vertical	-4.4
4873.7	53.3	54.0	-0.7	1.5	5.8	Horizontal	-4.4
7311.0	47.7	54.0	-6.4	1.5	0.0	Vertical	-2.2
17736.5	50.9	54.0	-3.1	1.5	353.8	Vertical	9.7
17873.6	51.0	54.0	-3.0	1.5	57.5	Horizontal	10.3

Note: Correction = AF + CF - Preamp

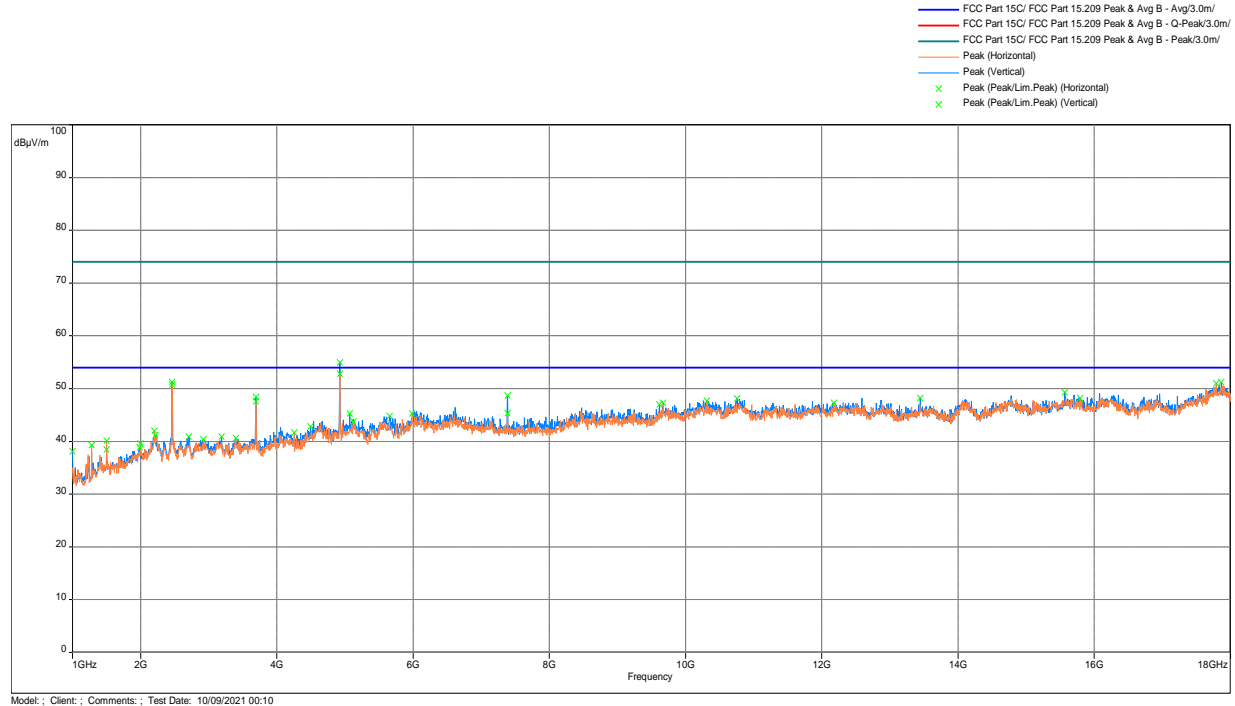
Results	Complies
----------------	-----------------

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11b 2462MHz

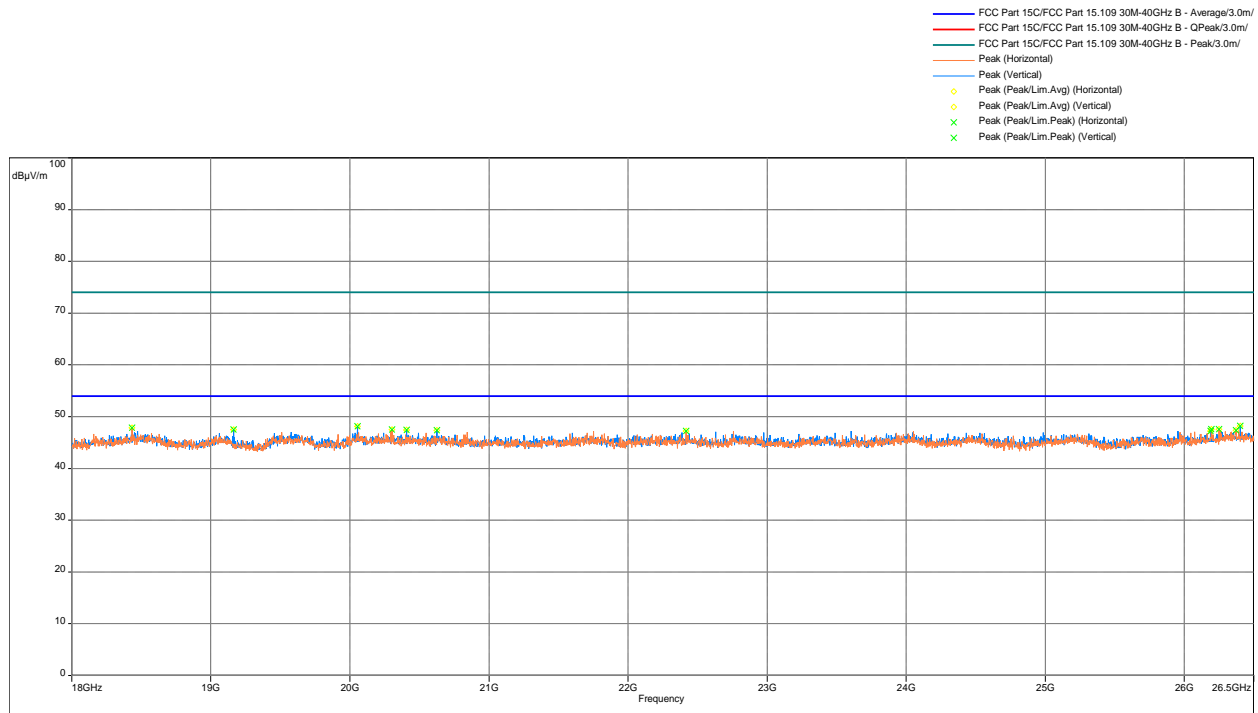
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz. Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3691.1	48.4	54.0	-5.6	1.5	23.0	Vertical	-7.0
7385.2	48.7	54.0	-5.3	1.5	0.0	Vertical	-2.2
15568.4	49.3	54.0	-4.7	1.5	0.0	Vertical	5.4
17788.1	51.0	54.0	-3.0	2.5	286.0	Horizontal	10.2
17864.6	51.2	54.0	-2.8	1.5	0.0	Vertical	10.3

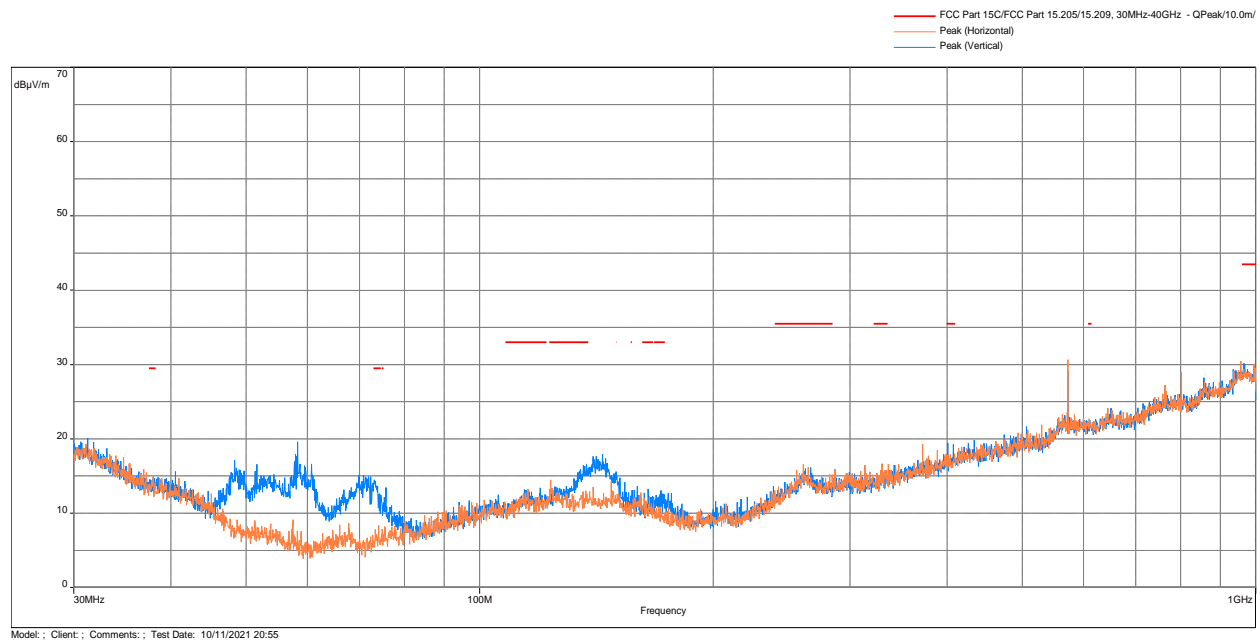
Frequency (MHz)	Ave FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
4923.6	52.8	54.0	-1.2	1.5	41.0	Horizontal	-4.3
4924.0	50.5	54.0	-3.5	242.0	317.0	Vertical	-4.3

Note: Correction = AF + CF - Preamp

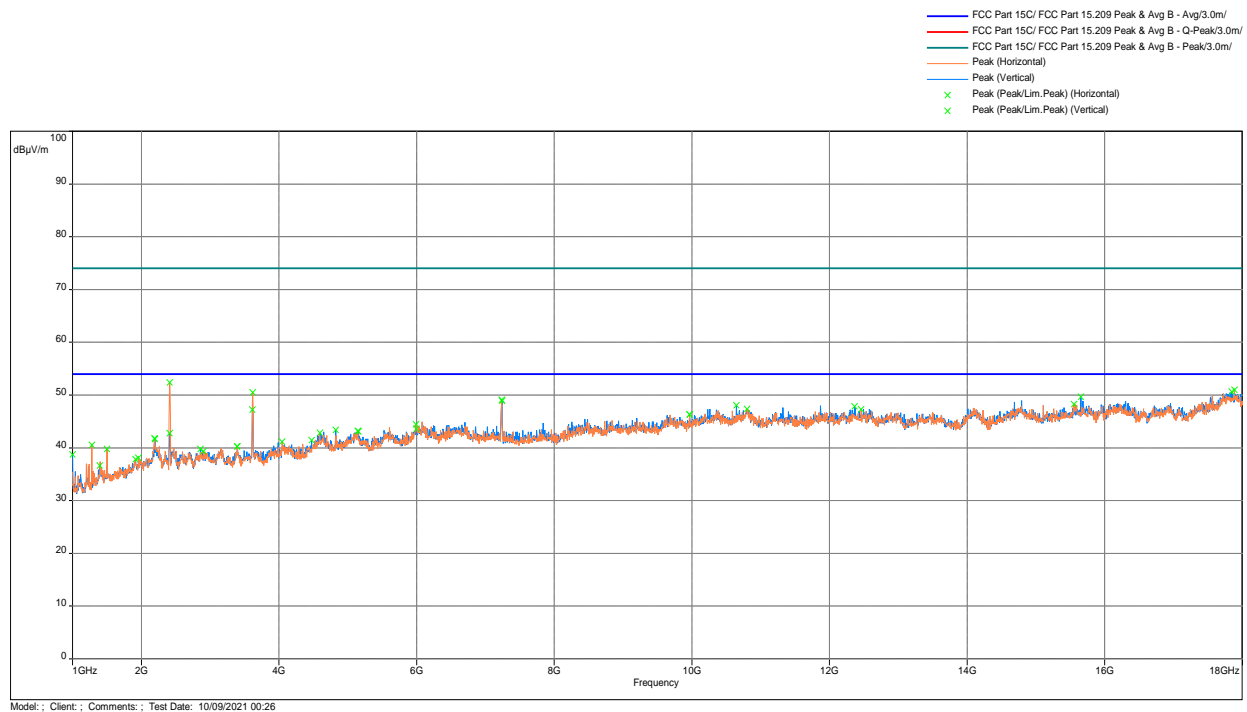
Results	Complies
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Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2412MHz

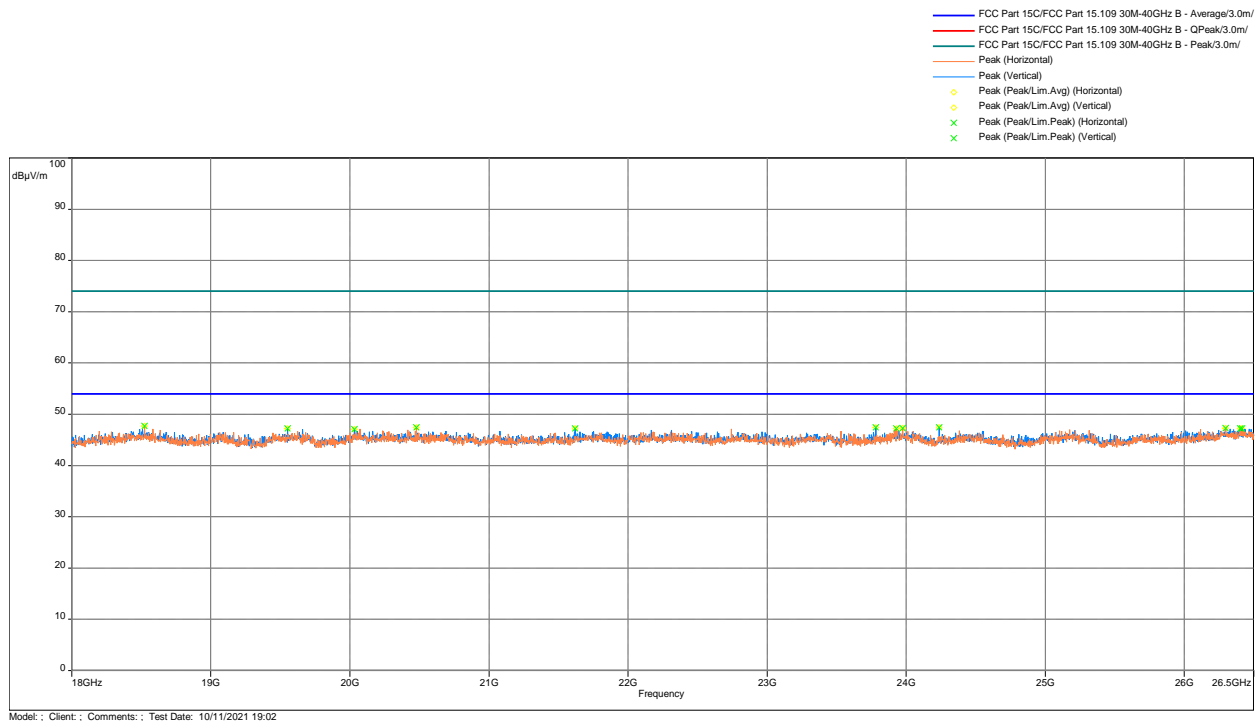
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



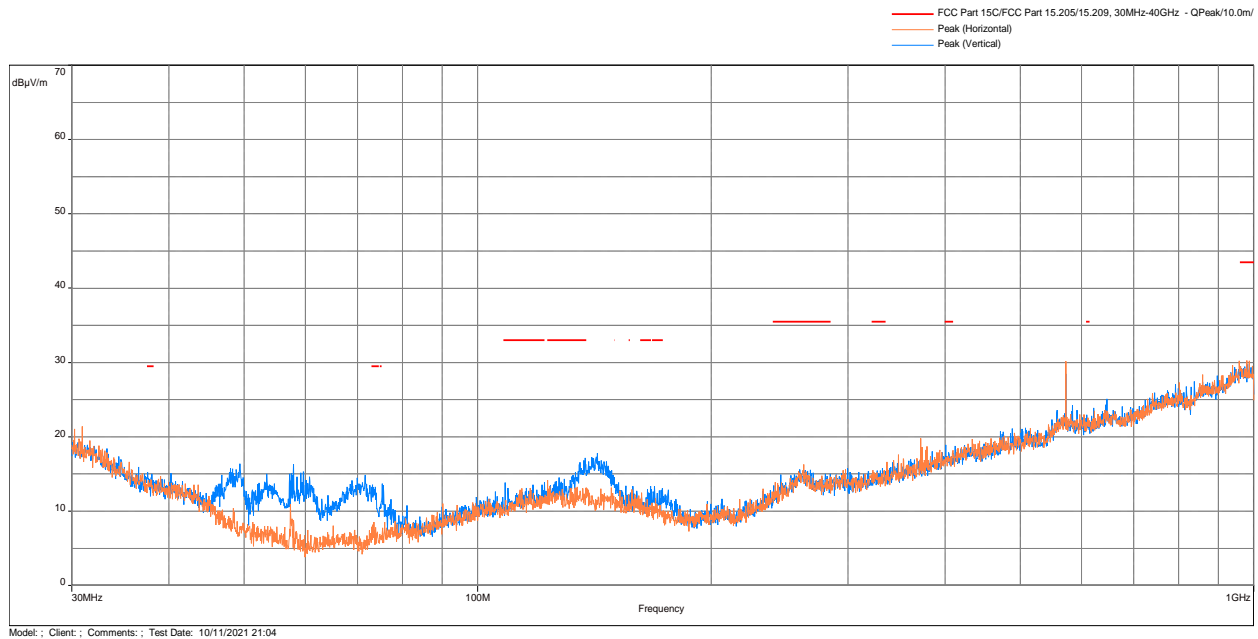
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3619.1	50.5	54.0	-3.5	1.5	23.0	Horizontal	-6.9
7235.6	49.1	54.0	-4.9	2.5	57.0	Horizontal	-2.4
7240.1	48.9	54.0	-5.1	1.5	301.5	Vertical	-2.4
15650.0	49.6	54.0	-4.4	1.5	28.5	Vertical	5.8
17844.2	50.6	54.0	-3.4	2.5	180.8	Vertical	10.1
17886.7	51.0	54.0	-3.0	2.5	319.8	Horizontal	10.2

Note: Correction = AF + CF - Preamp

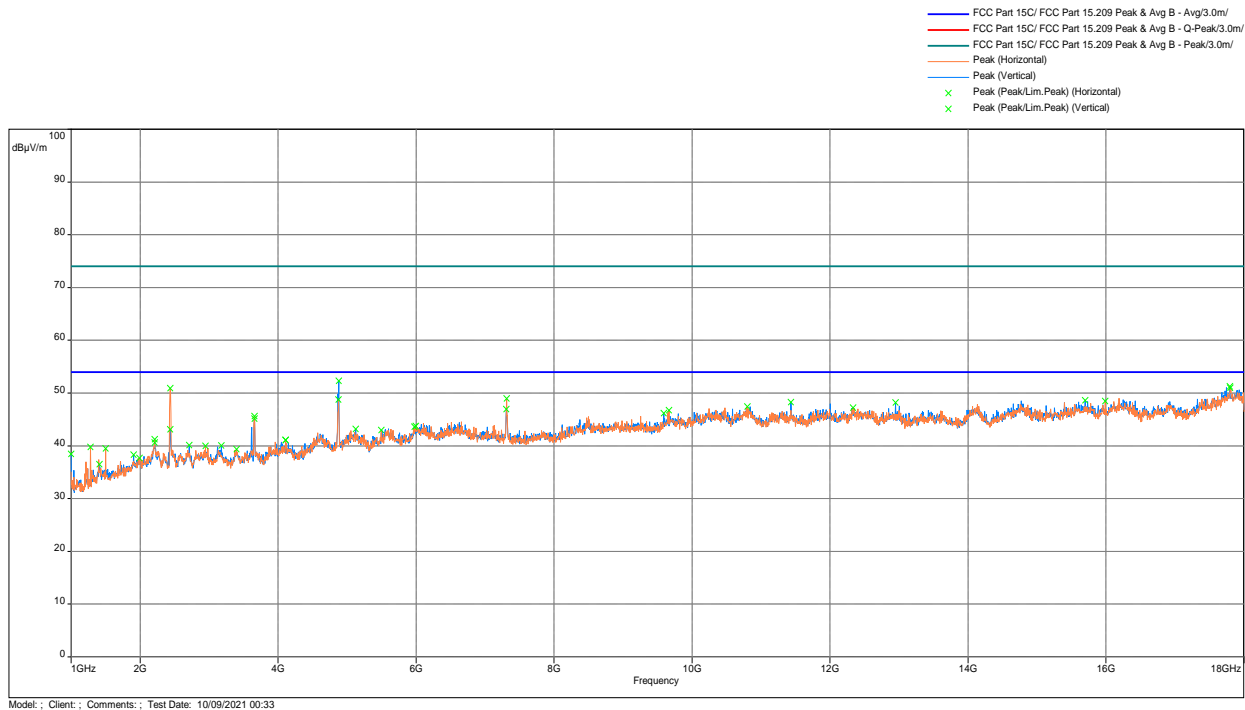
Results	Complies
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Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2437MHz

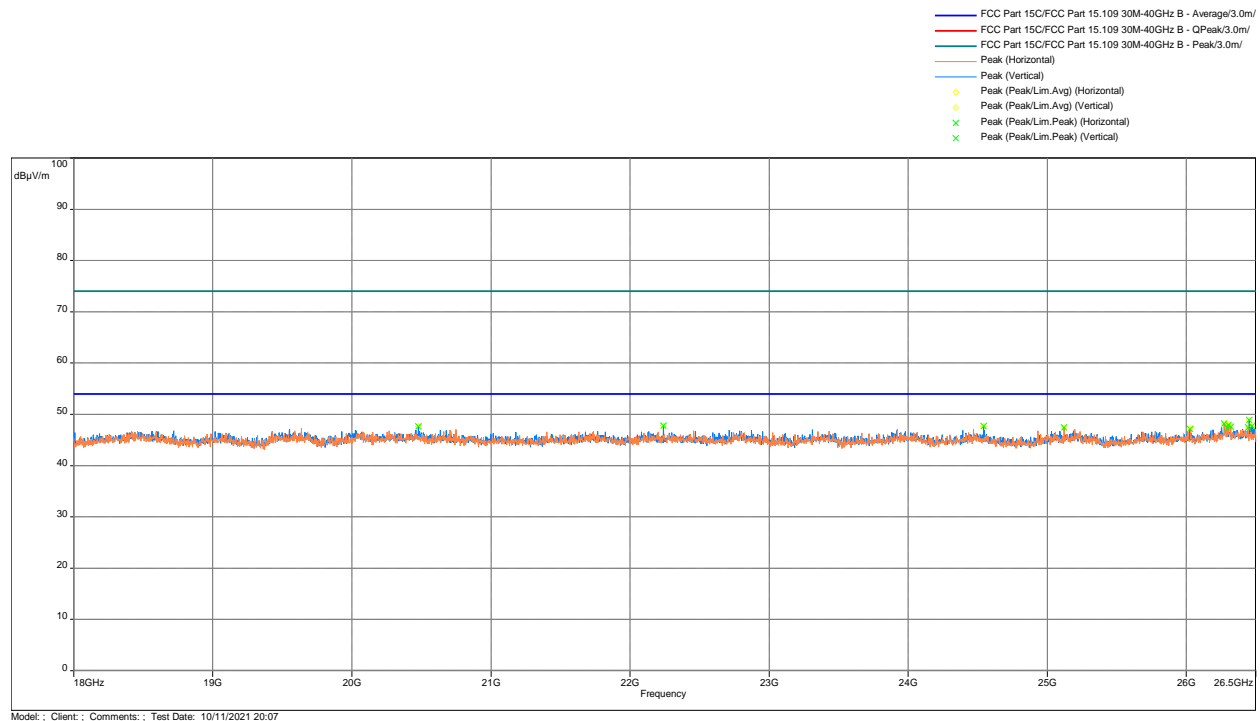
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



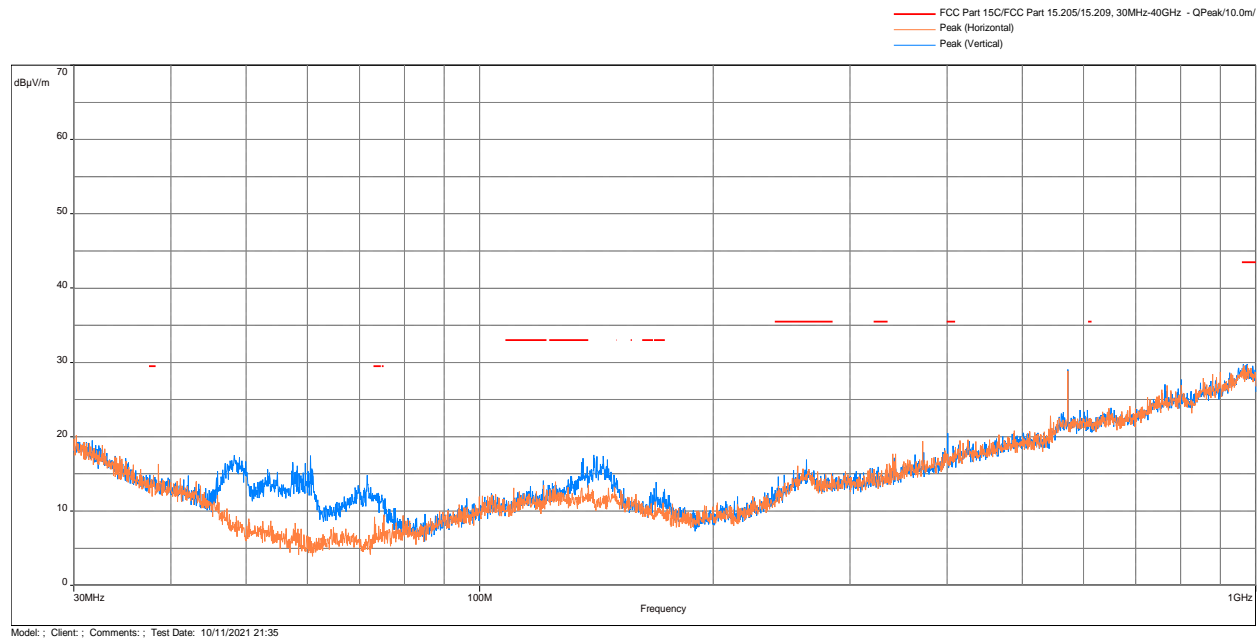
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
4875.4	48.7	54.0	-5.3	1.5	75.3	Horizontal	-4.4
4877.7	52.3	54.0	-1.7	1.5	57.5	Vertical	-4.4
7308.1	46.9	54.0	-7.1	1.5	353.8	Vertical	-2.2
7310.4	49.0	54.0	-5.1	2.5	91.5	Horizontal	-2.2
17797.1	51.2	54.0	-2.8	2.5	5.8	Vertical	10.2
17801.1	51.0	54.0	-3.0	1.5	318.0	Horizontal	10.2

Note: Correction = AF + CF - Preamp

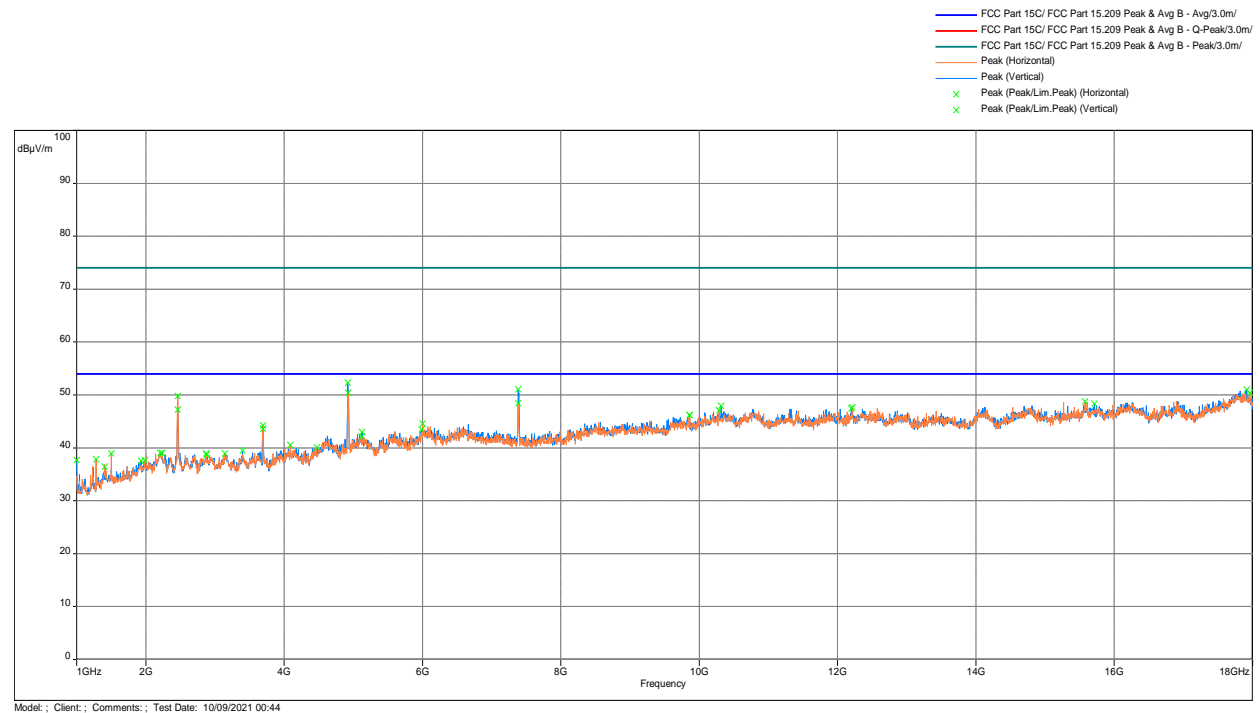
Results	Complies
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Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11g 2462MHz

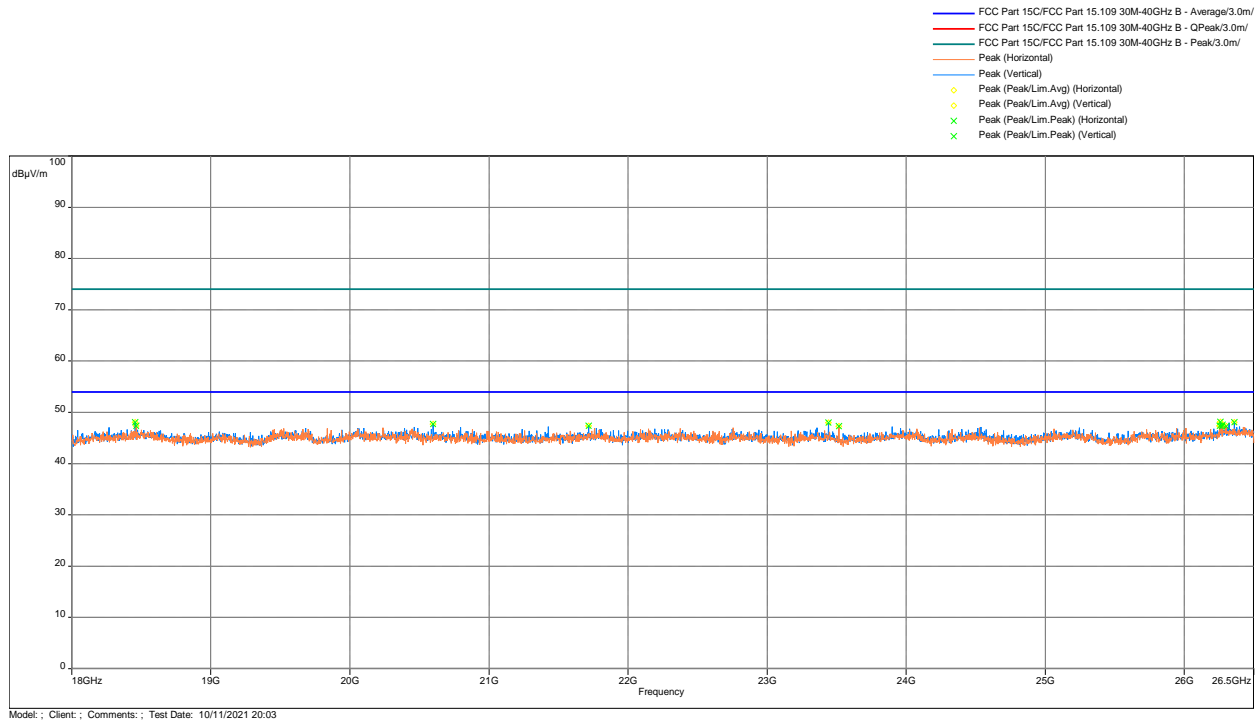
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



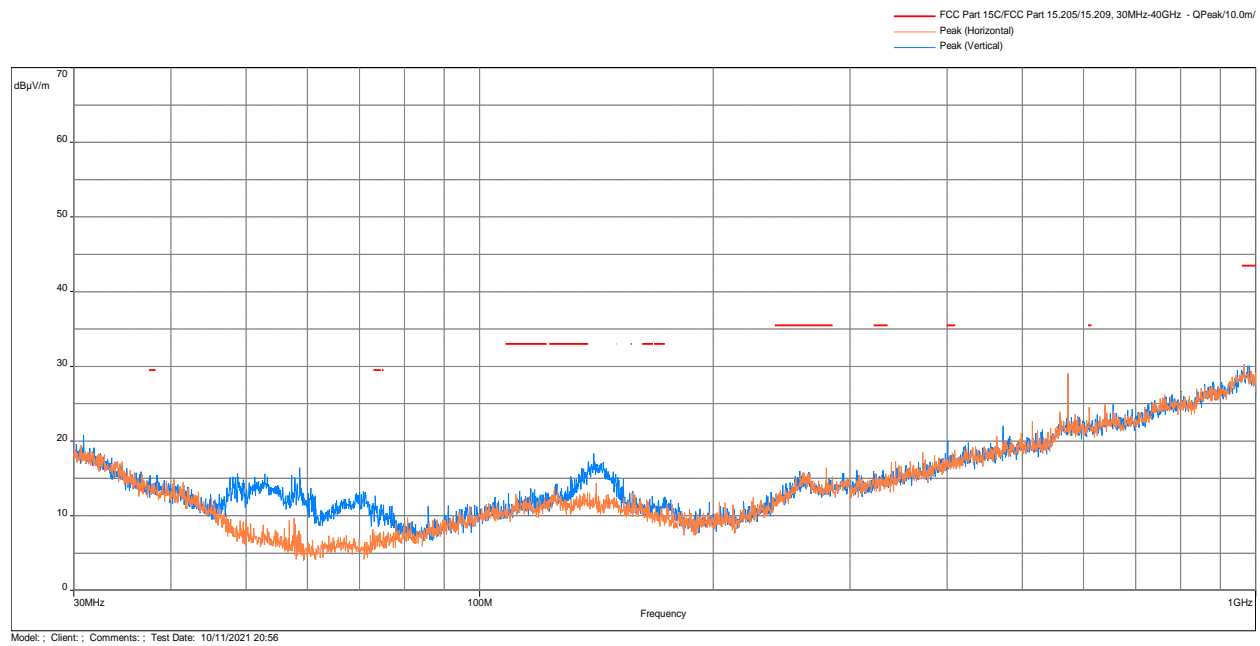
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
4920.8	52.3	54.0	-1.7	1.5	108.0	Vertical	-4.3
4923.0	50.5	54.0	-3.6	1.5	268.0	Horizontal	-4.3
7382.4	48.4	54.0	-5.6	2.5	213.5	Horizontal	-2.2
7383.5	51.1	54.0	-2.9	1.5	13.5	Vertical	-2.2
15579.8	48.8	54.0	-5.2	2.5	57.0	Horizontal	5.5
17913.9	51.0	54.0	-3.0	2.5	0.0	Vertical	10.1
17962.0	50.4	54.0	-3.6	2.5	353.5	Horizontal	9.5

Note: Correction = AF + CF - Preamp

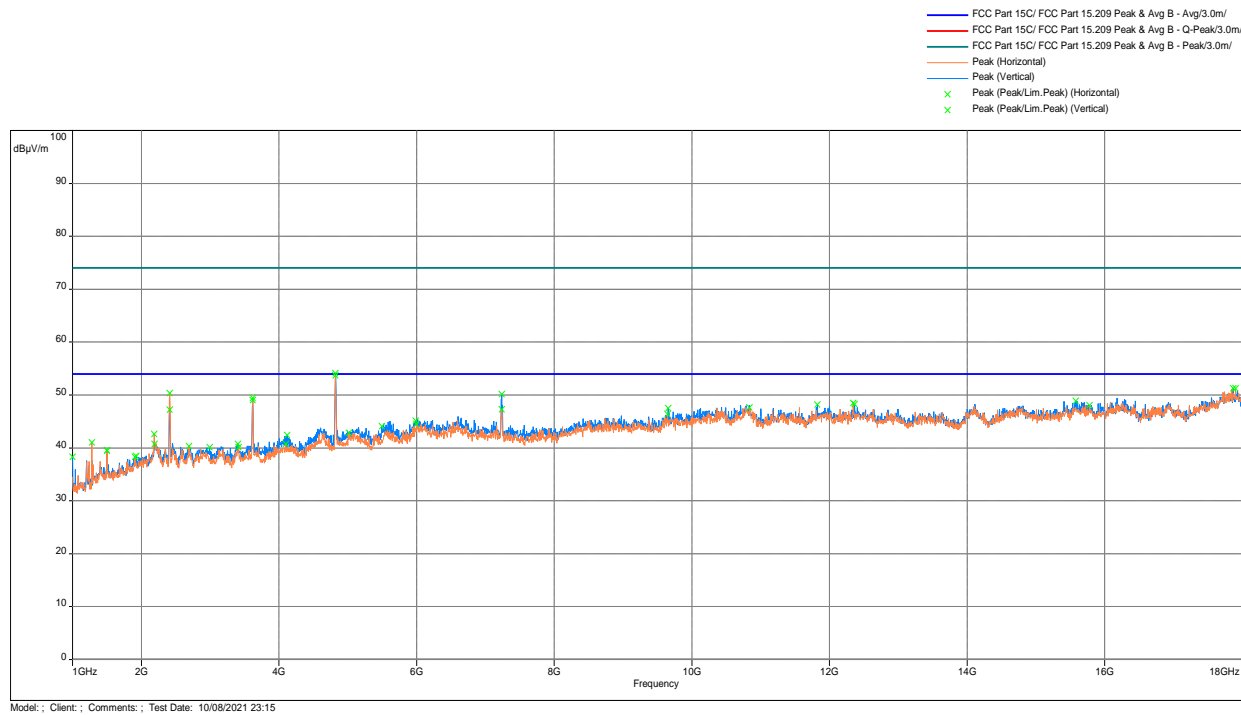
Results	Complies
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Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 20MHz, 2412MHz

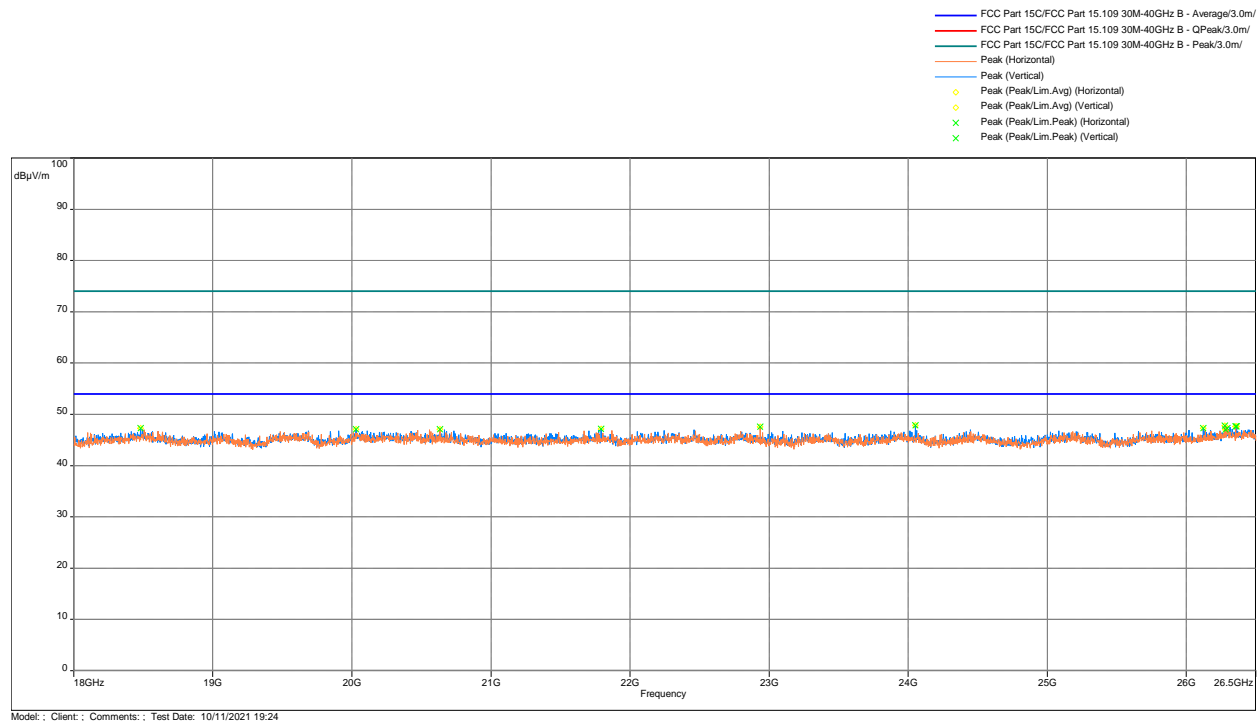
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3617.4	49.1	54.0	-4.9	1.5	14.0	Vertical	-6.9
3618.6	49.4	54.0	-4.6	1.5	83.0	Horizontal	-6.9
7239.6	50.2	54.0	-3.8	1.5	348.0	Vertical	-2.4
17867.4	51.2	54.0	-2.8	1.5	1.8	Vertical	10.3
17900.8	51.2	54.0	-2.8	1.5	288.0	Horizontal	10.2

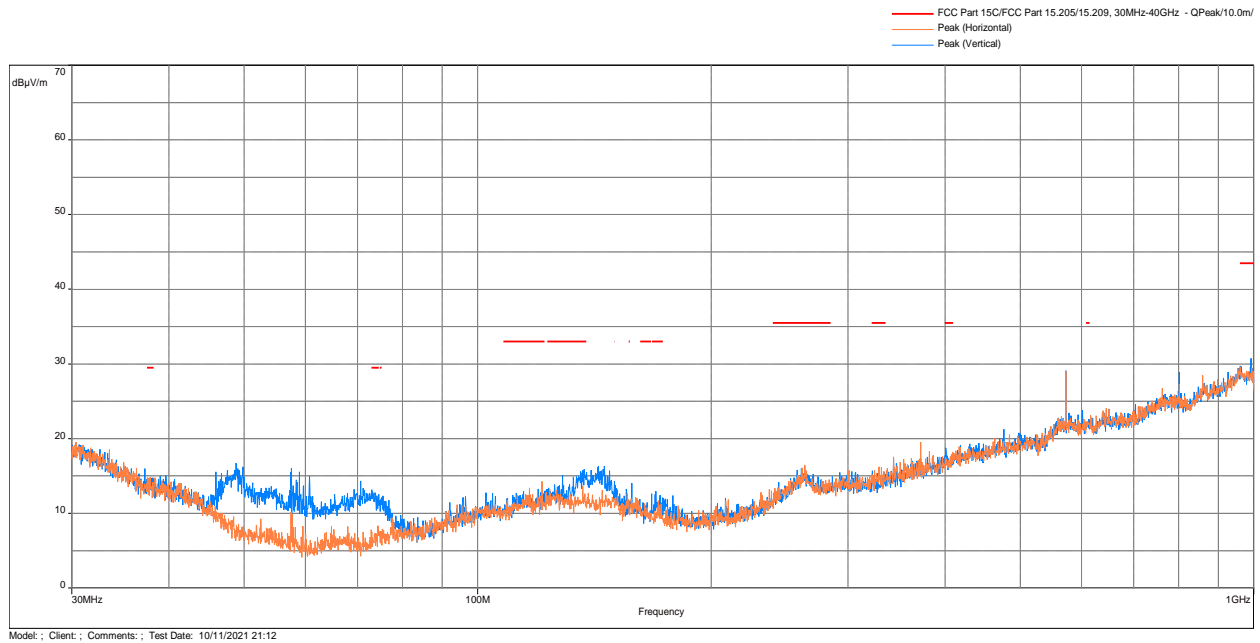
Frequency (MHz)	Ave FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
4817.3	35.9	54.0	-18.1	1.5	322.0	Horizontal	-4.7
4821.8	39.1	54.0	-14.9	125.0	266.0	Vertical	-4.7

Note: Correction = AF + CF - Preamp

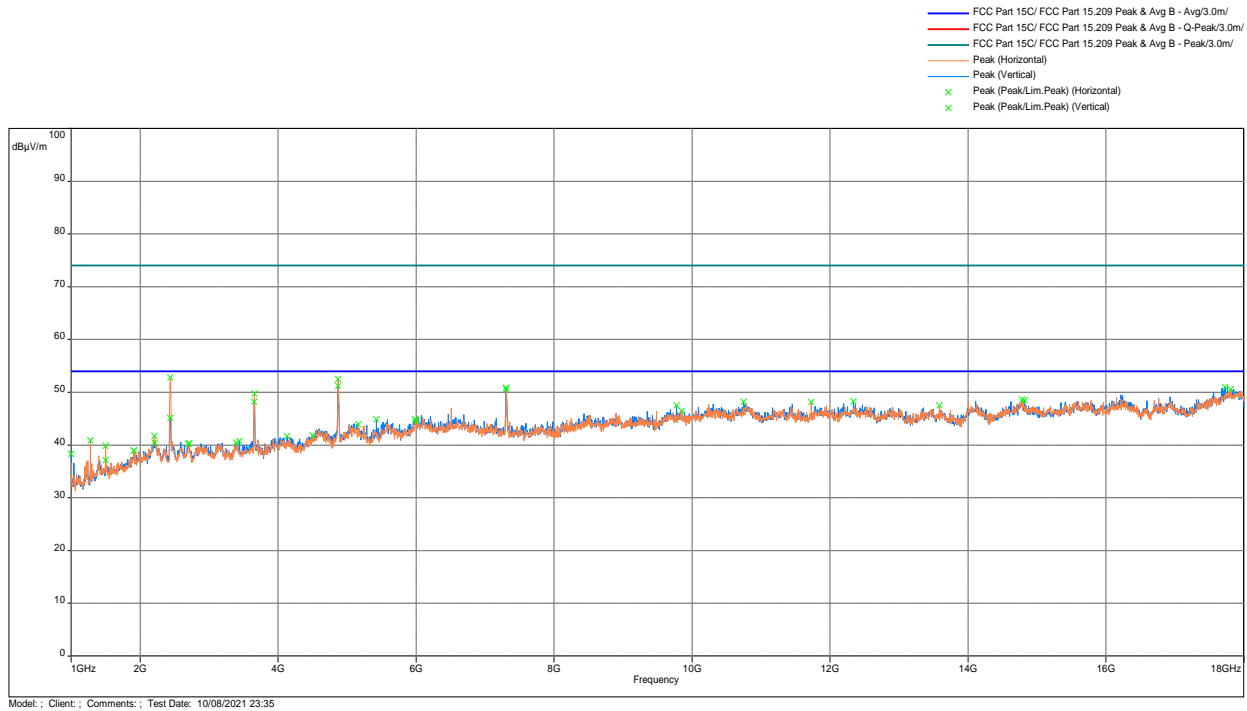
Results	Complies
----------------	-----------------

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 20MHz, 2437MHz

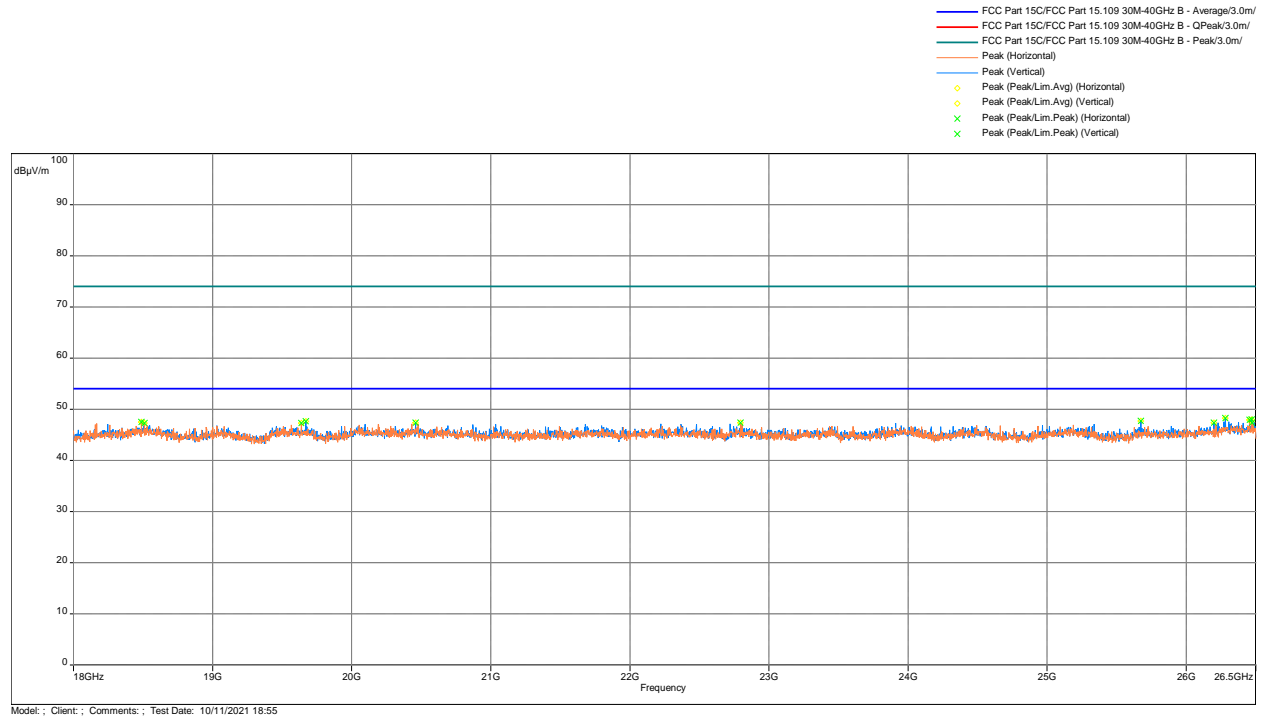
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



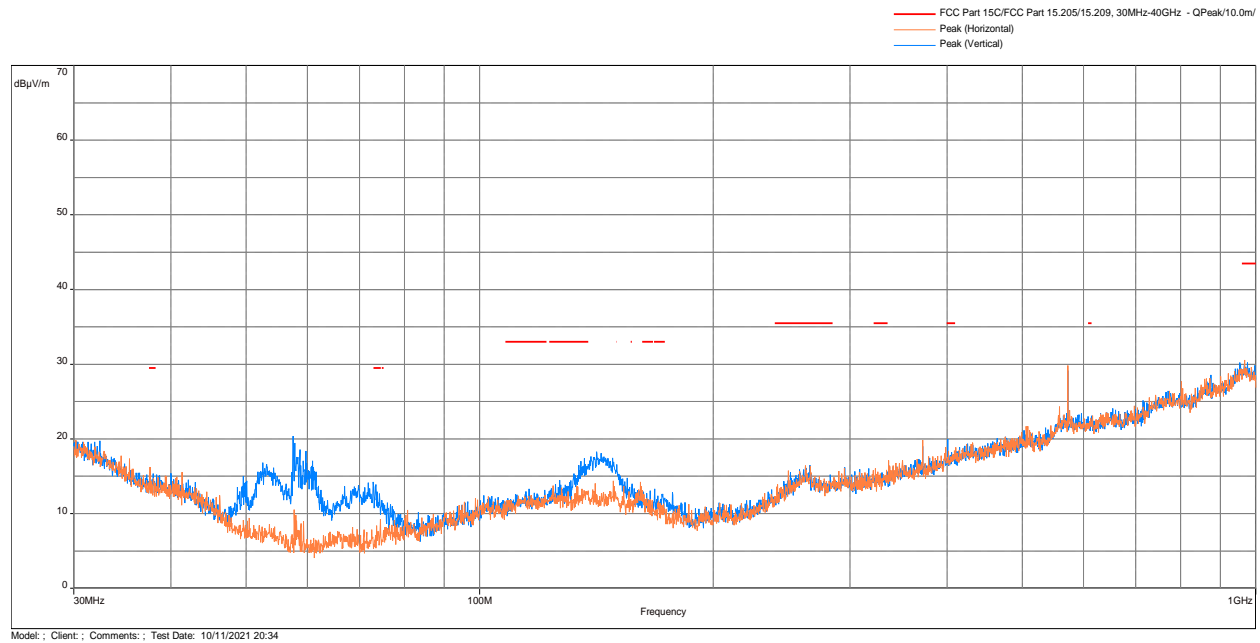
Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
3657.1	49.7	54.0	-4.3	1.5	23.0	Horizontal	-6.9
4869.2	52.5	54.0	-1.5	1.5	268.0	Horizontal	-4.4
4870.9	51.2	54.0	-2.8	1.5	1.0	Vertical	-4.4
7303.6	50.9	54.0	-3.2	1.5	336.5	Vertical	-2.2
7307.6	50.6	54.0	-3.4	2.5	284.0	Horizontal	-2.2
17725.2	51.0	54.0	-3.0	2.5	0.5	Vertical	9.5
17805.1	50.6	54.0	-3.4	1.5	318.0	Horizontal	10.2

Note: Correction = AF + CF - Preamp

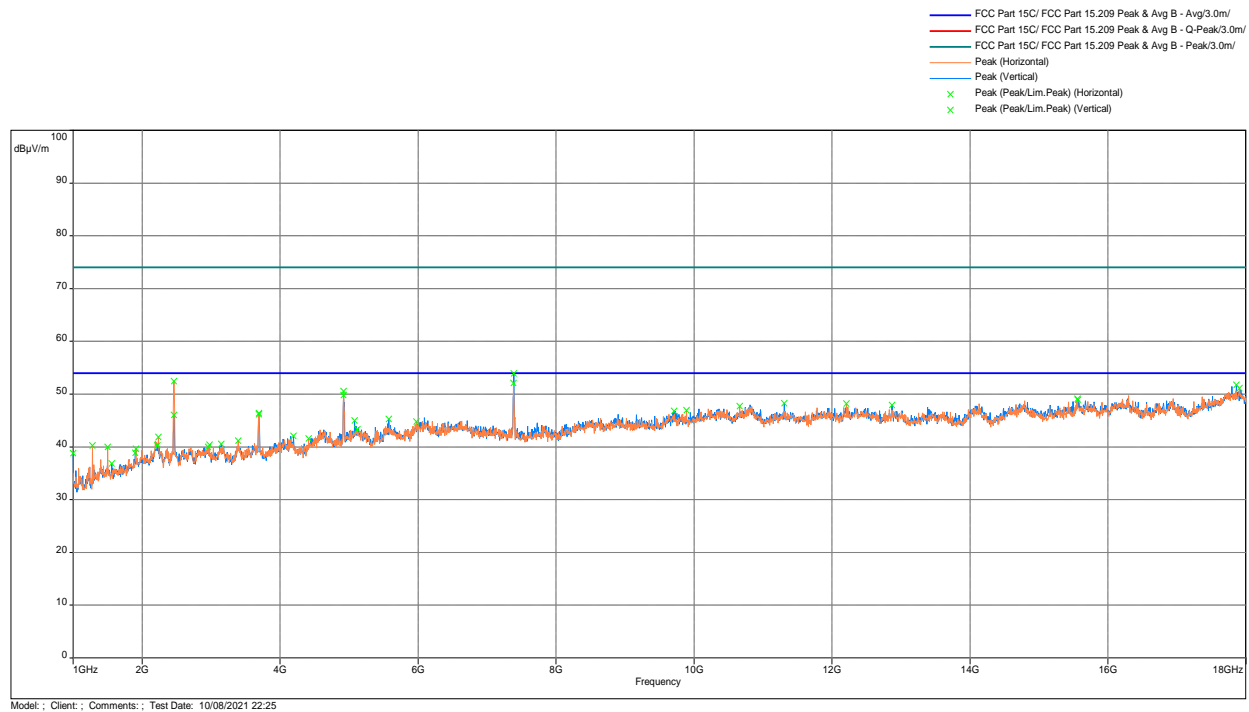
Results	Complies
----------------	-----------------

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 802.11n 20MHz, 2462MHz

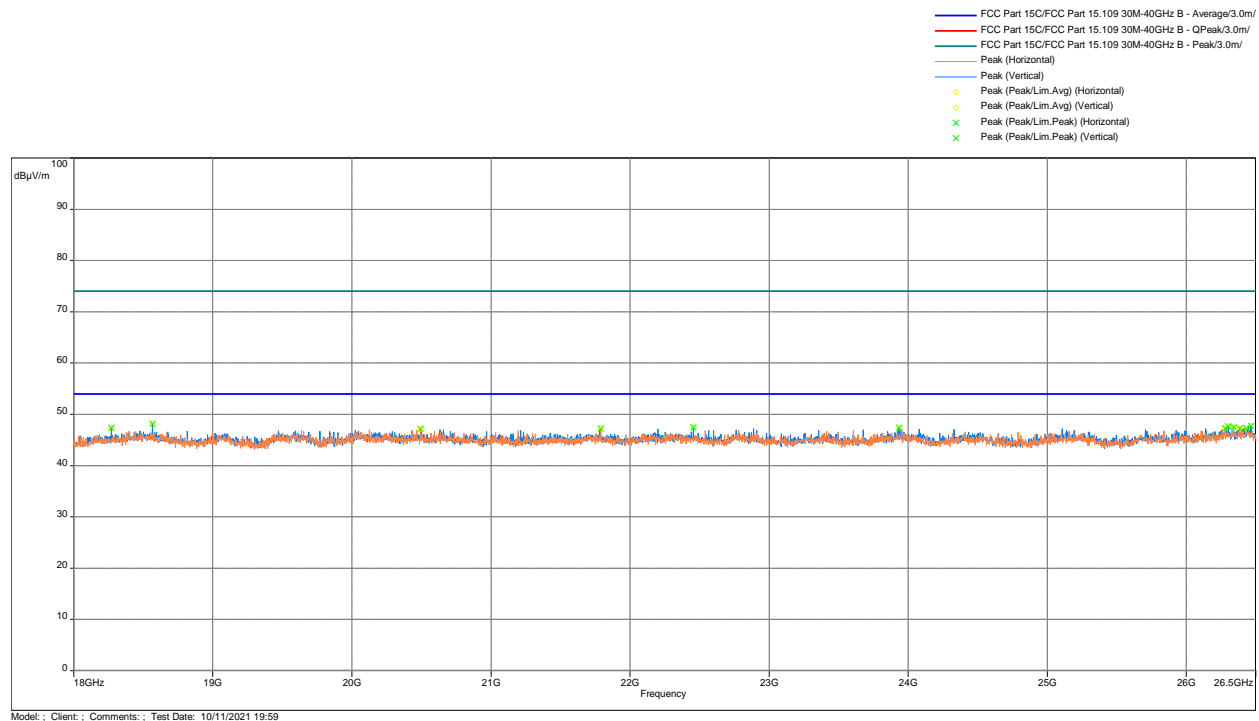
Out-of-Band Radiated Spurious Emissions - 30 MHz to 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan vs Peak & Avg Limit



Radiated Spurious Emissions 18000 - 26000 MHz, Peak Scan vs Peak & Avg Limit



Frequency (MHz)	Peak FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
4919.1	49.8	54.0	-4.2	1.5	319.0	Vertical	-4.3
4920.8	50.6	54.0	-3.4	1.5	0.0	Horizontal	-4.3
17857.8	51.8	54.0	-2.3	2.5	220.5	Vertical	10.2
17904.8	51.1	54.0	-2.9	2.5	266.0	Horizontal	10.2

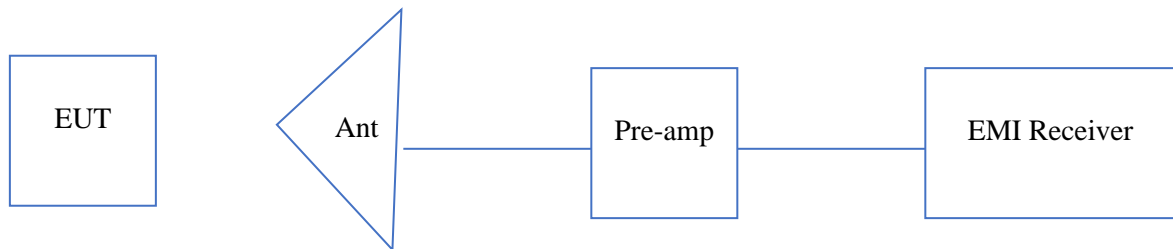
Frequency (MHz)	Ave FS@3m (dBμV/m)	Avg Limit@3m (dB(uV/m))	Margin (dB)	Height (m)	Azimuth (deg)	Polarity	Correction (dB)
7381.2	52.1	54.0	-1.9	3.5	324.5	Horizontal	-2.2
7386.7	38.1	54.0	-15.9	1.3	22.0	Vertical	-2.2

Note: Correction = AF + CF - Preamp

Results	Complies
----------------	-----------------

4.5.5 Test Setup Photographs

The following photographs show the testing configurations used.



4.6 AC Line Conducted Emission FCC: 15.207; RSS-GEN

4.6.1 Requirement

Frequency Band MHz	FCC Part 15.207 Limits	
	Quasi-Peak	Average
0.15-0.50	66 to 56 *	56 to 46 *
0.50-5.00	56	46
5.00-30.00	60	50

*Note: *Decreases linearly with the logarithm of the frequency
At the transition frequency the lower limit applies.*

4.6.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.10: 2013.

Tested By	Test Date
Minh Ly	October 12, 2021

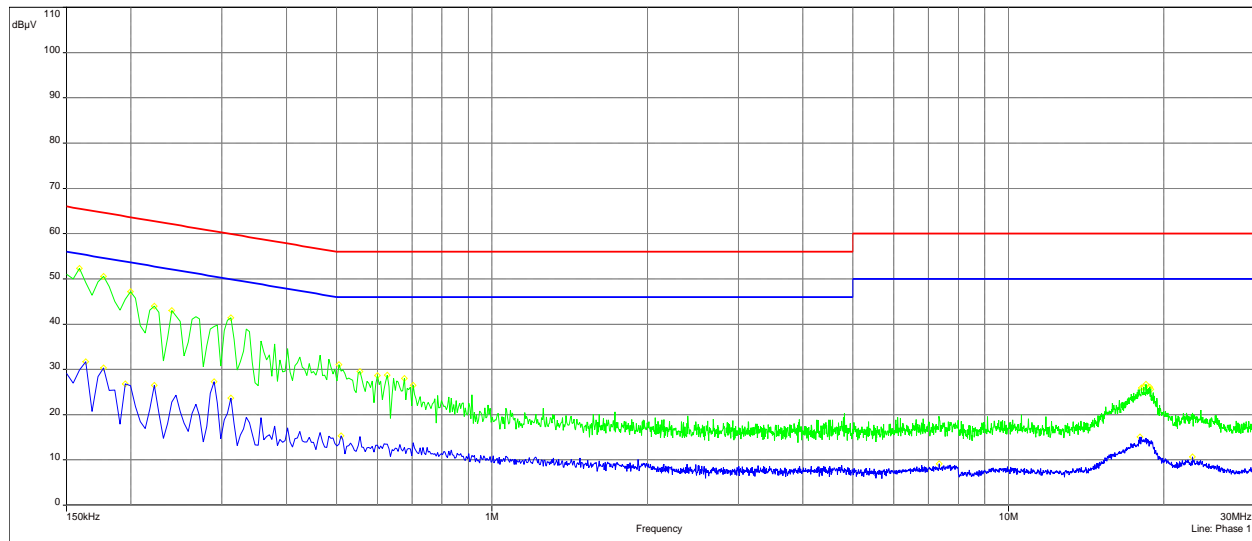
4.6.3 Test Results

15.207: Conducted Emissions 120VAC 60Hz

Phase 1

Sub-range 1
Frequencies: 150 kHz - 30 MHz (Mode: Lin - Step: 4.5 kHz)
Settings: RBW: 9kHz, VBW: 30kHz, Sweep time: 2e+03 ms/MHz, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: On
Line: Phase 1

— FCC Part 15C/FCC Part 15.207 - Average/
— FCC Part 15C/FCC Part 15.207 - QPeak/
— Peak (Phase 1)
— CISPR.AVG (Phase 1)
◊ Peak (Peak/Lim.Q-Peak) (Phase 1)
◊ CISPR.AVG (CISPR.AVG/Lim.Avg) (Phase 1)

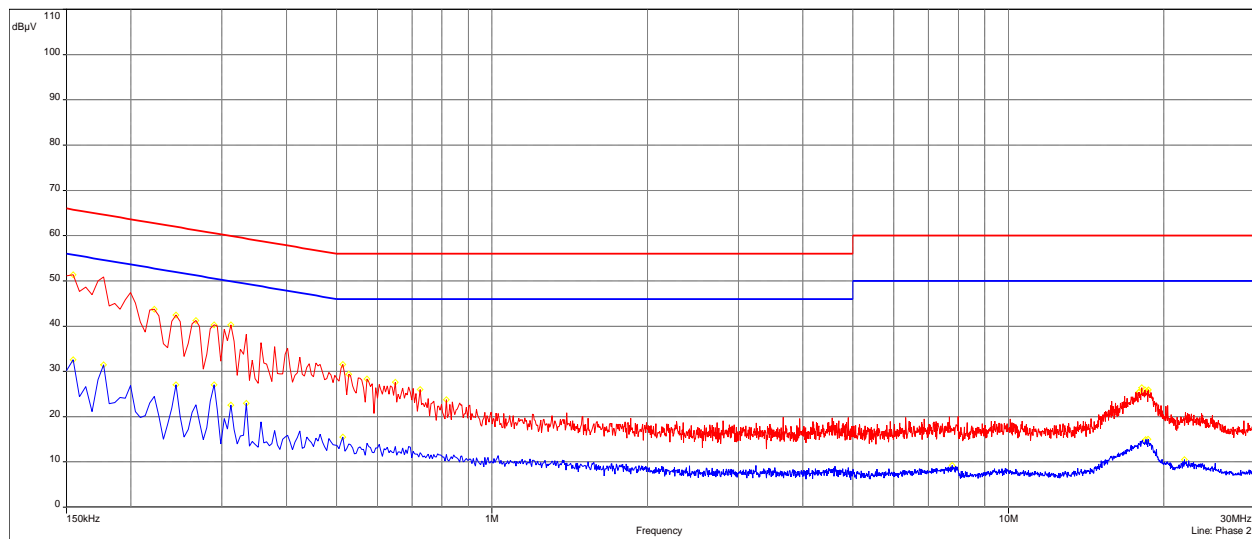


Model: ; Client: ; Comments: ; Test Date: 10/12/2021 23:52

Phase 2

Sub-range 2
Frequencies: 150 kHz - 30 MHz (Mode: Lin - Step: 4.5 kHz)
Settings: RBW: 9kHz, VBW: 30kHz, Sweep time: 2e+03 ms/MHz, Attenuation: 10 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: On
Line: Phase 2

— FCC Part 15C/FCC Part 15.207 - Average/
— FCC Part 15C/FCC Part 15.207 - QPeak/
— Peak (Phase 2)
— CISPR.AVG (Phase 2)
◊ Peak (Peak/Lim.Q-Peak) (Phase 2)
◊ cispr.avg (cispr.avg/lim.avg) (phase 1) (Phase 2)



Model: ; Client: ; Comments: ; Test Date: 10/12/2021 23:52

4.6.3 Test Results (Continued)

Frequency (MHz)	Q-Peak (dBμV)	Limit Q-Peak (dBμV)	Margin Q-Peak (dB)	Line	Correction (dB)
0.155	51.4	65.8	-14.4	Phase 2	11.0
0.159	52.4	65.5	-13.2	Phase 1	11.0
0.177	50.5	64.6	-14.1	Phase 1	11.0
0.200	47.2	63.6	-16.5	Phase 1	11.0
0.222	43.9	62.7	-18.8	Phase 1	11.0
0.312	41.4	59.9	-18.5	Phase 1	11.0

Frequency (MHz)	CISPR AVG (dBμV)	Limit Avg (dBμV)	Margin Avg (dB)	Line	Correction (dB)
0.155	32.6	55.8	-23.2	Phase 2	11.0
0.164	31.7	55.3	-23.6	Phase 1	11.0
0.177	31.5	54.6	-23.2	Phase 2	11.0
0.177	30.3	54.6	-24.3	Phase 1	11.0
0.290	27.3	50.5	-23.3	Phase 1	11.0
0.290	27.1	50.5	-23.5	Phase 2	11.0

Results: Complies by 13.2 dB

5.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
EMI Receiver	Rohde and Schwarz	ESU40	ITS 00961	12	03/09/22
LISN	FCC	FCC-LISN-50-50	ITS 00551	12	11/16/21
Horn Antenna	ETS Lindgren	3117PA	ITS 01636	12	12/17/21
18-40GHz Preamp	uComp Nordic	MCNS-50-18004000335P	ITS 01799	12	03/19/22
Pyramidal Horn Antenna	EMCO	3160-09	ITS 00571	#	#
Loop Antenna	EMCO	6512	ITS 01598	12	11/03/21
BI-Log Antenna	Teseq	CBL 6111D	ITS 01505	12	03/22/22
Pre-Amplifier	Sonoma Instrument	310N	ITS 00942	12	04/19/22
RF Cable	Mega Phase	TM40-K1K1-59	ITS 01655	12	10/05/21
RF Cable	Mega Phase	TM40-K1K1-19	ITS 01155	12	04/28/22
Notch Filter	MICRO-TRONICS	BRM50702	ITS 01166	12	06/29/22
RF Cable	Mega Phase	EMC1-K1K1-236	ITS 01484	12	06/29/22
10m Semi-anechoic chamber	Panashield	10m Chamber	ITS 00984	36	07/29/23

Calibration not required.

Software used for emission compliance testing utilized the following:

Name	Manufacturer	Version	Template/Profile
BAT-EMC	Nexio	3.20.0.14	ESU and ESR Intertek Emissions Template
Tile	Quantum Change	3.4.K.22	Conducted Spurious_30M-26GHz
RS Commander	Rohde Schwarz	1.6.4	Not Applicable (Screen grabber)

6.0 Document History

Revision/ Job Number	Writer Initials	Reviewers Initials	Date	Change
1.0 / G104799910	ML	KV	November 12, 2021	Original document
1.1 / G104799910	AS	KV	February 7, 2022	Updated Block Diagram

END OF REPORT