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Alcohol Monitoring Systems, Inc. TEST REPORT

SCOPE OF WORK
EMC TESTING – RB200

REPORT NUMBER
104633944LEX-001.3

ISSUE DATE **REVISED DATE**
3/29/2022 9/13/2022

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45

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Non-Specific EMC Report Shell Rev. December 2017

EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 104633944LEX-001.3
Project Number: G104633944LEX-001

Report Issue Date: 3/29/2022
Report Revised Date: 9/13/2022

Standards: FCC Title 47 CFR Part 15 Subpart B
FCC Part 15 Subpart C
ICES-003 Issue 7
RSS-247 Issue 2

Tested by:
Intertek Testing Services NA, Inc.
731 Enterprise Dr.
Lexington, KY 40510
USA

Client:
Alcohol Monitoring Systems, Inc.
1241 W Mineral Ave
Suite 200
Littleton, CO 80120
USA

Report prepared by

Brian Lackey, Team Leader

Report reviewed by

James Sudduth, Senior Staff Engineer

Table of Contents

1 Introduction and Conclusion

The tests indicated below were performed on the product described in section 4 The remaining test sections are the verbatim text from the actual data sheets used during the investigation. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

FCC Rule	ISED Rule	Test Method	Test Description	Measured Value	Limit	Results
15.247(a)(2)	RSS-247 (5.2.a)	ANSI C63.10 (6.9.2)	6dB Bandwidth	802.11b: 9.135 MHz 802.11g: 15.26 MHz 802.11n: 15.26 MHz	6 dB Bandwidth ≥ 500 kHz	Pass
	RSS-Gen (6.6)	ANSI C63.10 (6.9.3)	99% Bandwidth	802.11b: 14.10 MHz 802.11g: 16.41 MHz 802.11n: 17.50 MHz	Must Be Measured	Pass
15.247(b)	RSS-247 (5.4.d)	ANSI C63.10 (11.9.2.3.1)	Maximum Conducted Output Power	802.11b: 20.60 dBm 802.11g: 17.87 dBm 802.11n: 17.37 dBm	1 Watt (30 dBm)	Pass
	RSS-247 (5.4.d)	ANSI C63.10	Effective Isotropic Radiated Power	802.11b: 22.48 dBm 802.11g: 19.75 dBm 802.11n: 19.25 dBm	4 W (36 dBm)	Pass
15.247(e)	RSS-247 (5.2.b)	ANSI C63.10 (11.10.2)	Power Spectral Density	802.11b: -3.76 dBm/3 kHz 802.11g: -10.09 dBm/3 kHz 802.11n: -11.38 dBm/3 kHz	8 dBm/3 kHz	Pass
15.247(d)	RSS-247 (5.5)	ANSI C63.10 (11.11.1)	Conducted Spurious Emissions	<-30dBc	<-30 dBc (average) <-20 dBc (peak)	Pass
15.247(d), 15.205(a) 15.209(a)	RSS-247 (5.5) RSS-247 (3.3)	ANSI C63.10 (11.12.1)	Radiated Spurious Emissions	802.11b: 47.96 dBuV/m 802.11g: 38.37 dBuV/m 802.11n: 41.30 dBuV/m	See 15.209(a) and 15.205(a)	Pass
15.207(a)	RSS-Gen (8.8)	ANSI C63.10	Conducted Emissions	40.174 dBuV	See 15.207(a)	Pass
15.203			Antenna Requirement	Internal with unique connector	Permanently attached or unique connector	Pass

3 Client Information

This product was tested at the request of the following:

Client Information	
Client Name:	Alcohol Monitoring Systems, Inc.
Address:	1241 W Mineral Ave Suite 200 Littleton, CO 80120 USA
Contact:	Gordon Murray
Telephone:	+1 (720) 879-3404
Email:	gmurray@scramsystems.com
Manufacturer Information	
Manufacturer Name:	Alcohol Monitoring Systems, Inc.
Manufacturer Address:	1241 W Mineral Ave Suite 200 Littleton, CO 80120 USA

4 Description of Equipment under Test and Variant Models

Equipment Under Test	
Product Name	RB200
Model Number	RB200
Serial Number	Test Sample 1
Receive Date	10/28/2021
Test Start Date	10/28/2021
Test End Date	11/24/2021
Transmit Bands Supported	2412 – 2462MHz
Test Channels Utilized	2412MHz Channel 1 2437MHz Channel 6 2462MHz Channel 11
Modulation Types Supported	802.11b, 802.11g, 802.11n
Antenna Information (provided by client)[1]	KYOCERA AVC 1001312-01: +1.88dBi gain
Device Received Condition	Good
Test Sample Type	Production

Description of Equipment Under Test (provided by client)

The SCRAM Remote Breath provides handheld, portable breath alcohol monitoring with options for scheduled, random, on-demand, and client-initiated testing for low-risk clients or those who have earned less intensive testing and monitoring. Government-grade facial verification software decreases manual photo review by up to 95%, allowing officers more time to spend on their caseloads and clients.

Built for community corrections, SCRAM Remote Breath can improve client outcomes in drunk and impaired driving, domestic and family, and alcohol and opioid caseloads. Remote breath testing is also an effective alcohol monitoring solution that can be integrated into prison and jail overcrowding and bail and sentencing reform programs to further increase community safety.

4.1 Variant Models:

There were no variant models covered by this evaluation.

[1] This information was provided by the client and not measured by Intertek Testing Services NA, Inc. Changes in this value may impact compliance.

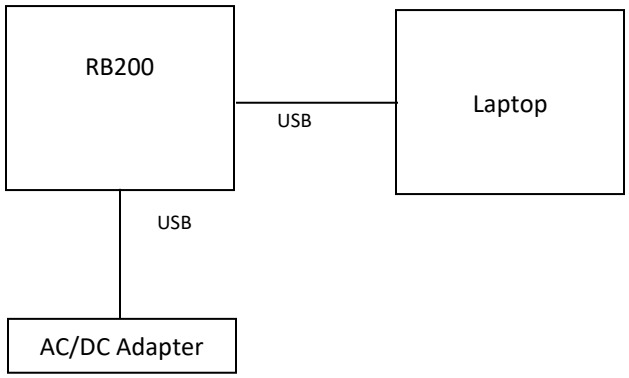
5 System Setup and Method

No.	Descriptions of EUT Exercising
1	The EUT was connected to a test laptop and configured to transmit on a low, middle, or high channel.
2	The EUT was powered with its radios idle.

Cables					
Qty	Description	Length	Shielding	Ferrites	Termination
2	USB-A to USB Micro-B	2m	Yes	None	USB

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Laptop	HP	-	-

5.1 EUT Block Diagram:



5.2 Test Equipment Used (Conducted Antenna Port Tests):

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
Wideband Power Sensor	4022	Rohde & Schwarz	NRP-Z81	9/22/2021	9/22/2022
Spectrum Analyzer	3720	Rohde & Schwarz	FSEK30	10/11/2021	10/11/2022

5.3 Test Equipment Used (Conducted AC Input Tests):

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8131	Rohde & Schwarz	ESW44	1/15/2020	1/15/2022
LISN	2509	Fischer Custom Communication	FCC-LISN-50-50-2M	7/13/2021	7/13/2022
Coaxial Cable	2593			12/21/2020	12/21/2021
Coaxial Cable	2592			12/21/2020	12/21/2021
Coaxial Cable	3339			12/21/2020	12/21/2021

5.4 Test Equipment Used (Radiated Tests):

Description	Asset	Manufacturer	Model	Cal Date	Cal Due
EMI Test Receiver	8131	Rohde & Schwarz	ESW44	1/15/2020	1/15/2022
Magnetic Loop Antenna	2366	ETS	6502	7/30/2021	7/30/2022
Bilog Antenna	3133	ETS	3142C	8/26/2021	8/26/2022
Horn Antenna (1-18GHz)	3780	ETS	3117	6/28/2021	6/28/2022
Horn Antenna (18-40GHz)	3779	ETS	3116c	7/30/2021	7/30/2022
Preamplifier (18-40GHz)	3921	Rohde & Schwarz	TS-PR40	12/21/2020	12/21/2021
Coaxial Cable (40GHz)	7020			12/21/2020	12/21/2021
Coaxial Cable (40GHz)	7021			12/21/2020	12/21/2021
System Controller	4096	ETS Lindgren	2090	Verify at Time of Use	Verify at Time of Use
System Controller	3957	Sunol Sciences	SC99V	Verify at Time of Use	Verify at Time of Use
Coaxial Cable	3074			12/21/2020	12/21/2021
3m Cable Preamplifier	3918	Rohde & Schwarz	TS-PR18	12/21/2020	12/21/2021
Coaxial Cable	2588			12/21/2020	12/21/2021
Coaxial Cable	2593			12/21/2020	12/21/2021
Coaxial Cable	2592			12/21/2020	12/21/2021
Coaxial Cable	3339			12/21/2020	12/21/2021

5.5 Software Utilized:

Name	Manufacturer	Version
EMC32	Rohde & Schwarz	Version 10.60.20
TILE7	ETS Lindgren	Version 7.0.6.545
GPIBShot	Rohde & Schwarz	Version 2.7.2
Power Viewer Plus	Rohde & Schwarz	Version 6.1

6 Measurement Procedures and Determination of Worst-Case Modes

The occupied bandwidth, conducted spurious emissions, and conducted output power measurements were all performed with the RB200 connected to a spectrum analyzer. Measurements were performed per the procedures outlined in ANSI C63.10: 2013. See the summary tables for specific references to the appropriate sections that were used.

The output power measurements were performed with the RB200 connected to a wideband power meter.

For radiated spurious emission measurements, testing was performed with the bandwidth setting and modulation that produced the highest output power. The frequency spectrum was investigated from 9kHz to at least 10 times the highest frequency used or generated in the device or 40GHz (whichever was lower). The device was tested in three orthogonal positions.

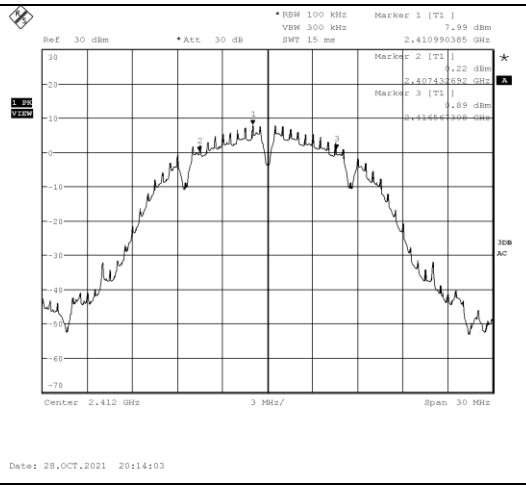
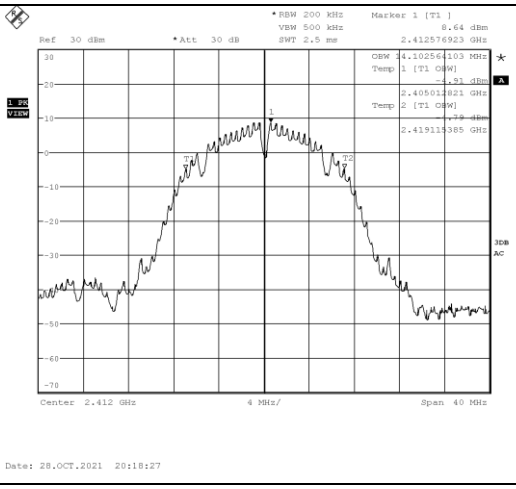
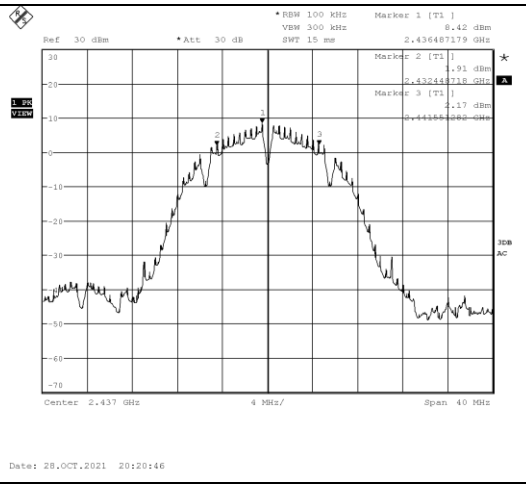
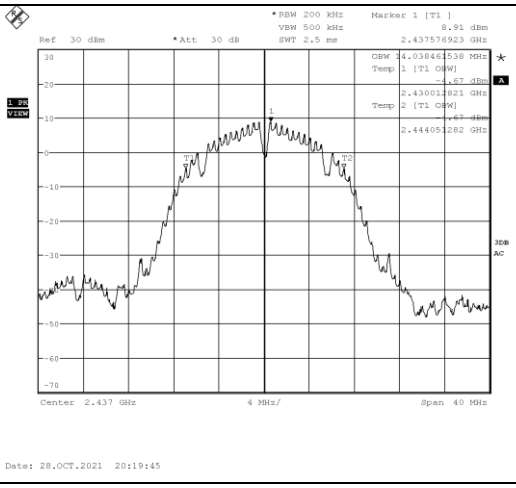
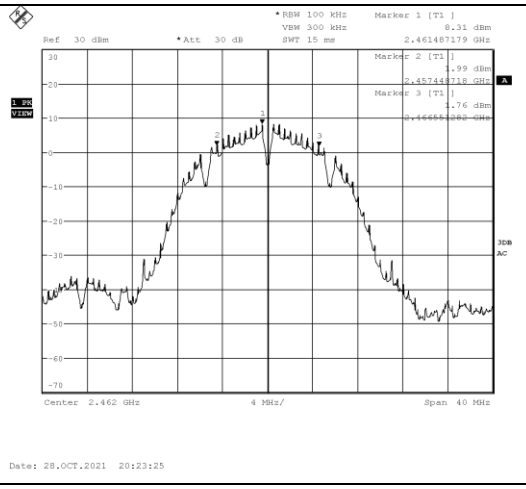
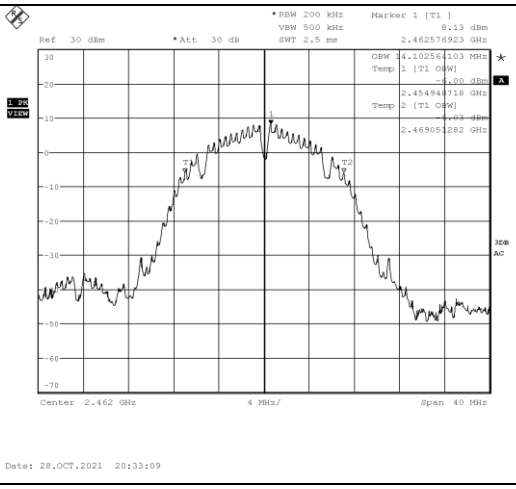
Testing was performed for the lowest order modulation for each transmit mode (DSSS or OFDM) as well as for each transmit bandwidth supported as these present the worst case in terms of spurious emissions and output power.

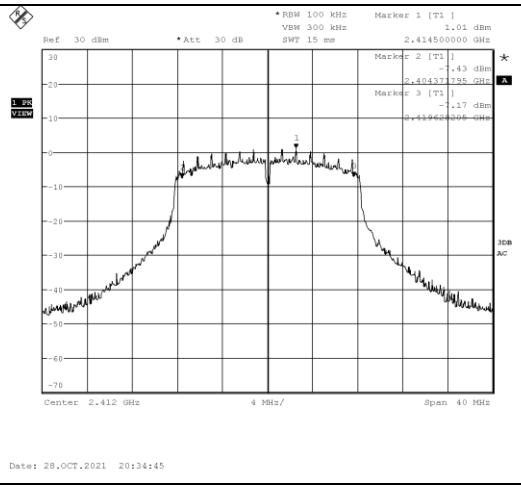
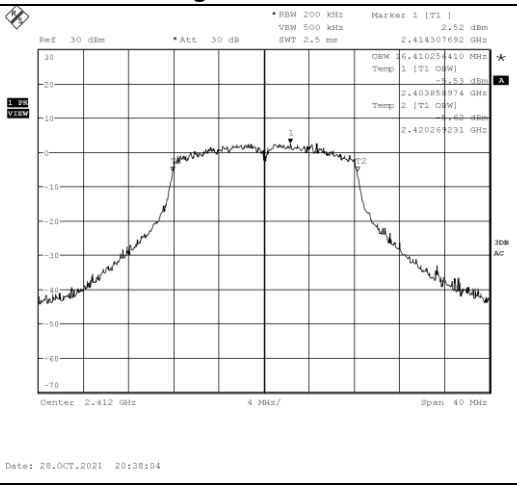
7 Occupied Bandwidth Data

Transmit Mode	Channel	Frequency (MHz)	DTS BW (MHz)	20dB BW (MHz)	99% BW (MHz)	Result
802.11b	1	2412	9.135	15.449	14.103	Pass
	6	2437	9.103	15.449	14.038	Pass
	11	2462	9.103	15.449	14.103	Pass
802.11g	1	2412	15.256	18.333	16.410	Pass
	6	2437	15.192	18.397	16.410	Pass
	11	2462	15.256	18.013	16.346	Pass
802.11n	1	2412	15.256	18.910	17.500	Pass
	6	2437	15.256	19.167	17.436	Pass
	11	2462	15.256	19.231	17.500	Pass

Test Personnel:	Brian Lackey	Test Date:	10/28/2021
Supervising/Reviewing Engineer (Where Applicable)	NA	Limit Applied:	6dB Bandwidth ≥ 500kHz
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	22.6C
Input Voltage:	Battery	Relative Humidity:	41.2%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	991.2mbar

Deviations, Additions, or Exclusions: None

DTS Bandwidth, 99% Bandwidth 802.11b	
	
DTS Bandwidth Channel 1	99% Bandwidth Channel 1
	
DTS Bandwidth Channel 6	99% Bandwidth Channel 6
	
DTS Bandwidth Channel 11	99% Bandwidth Channel 11

DTS Bandwidth, 99% Bandwidth 802.11g	
	
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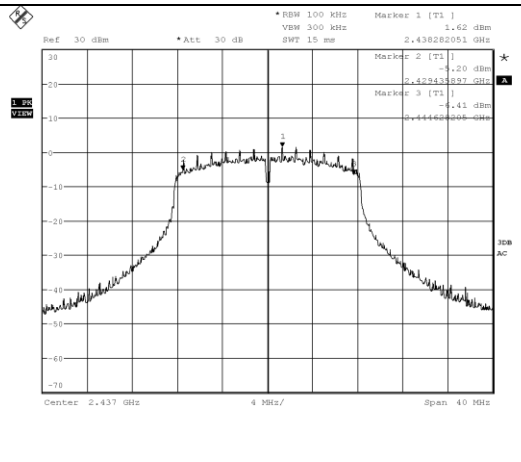	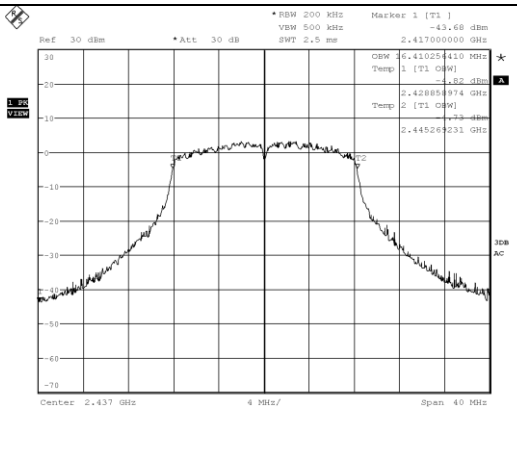
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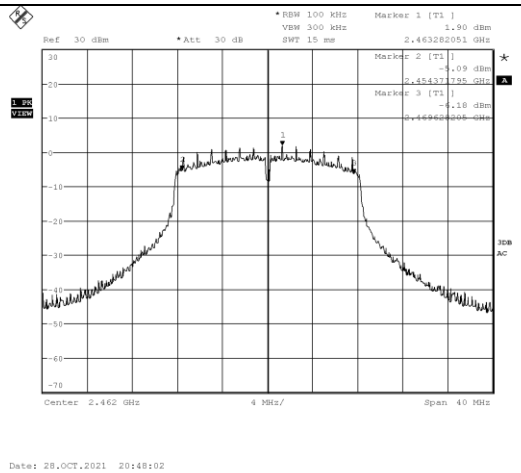
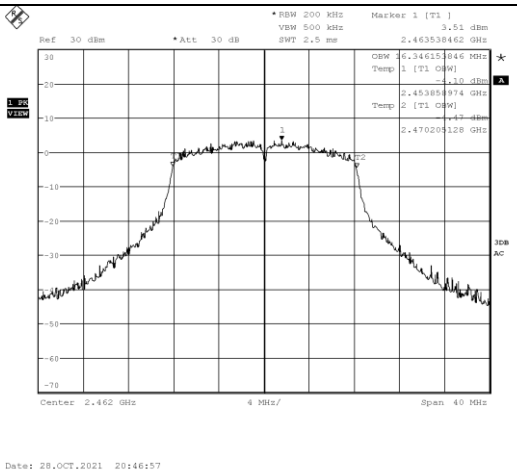
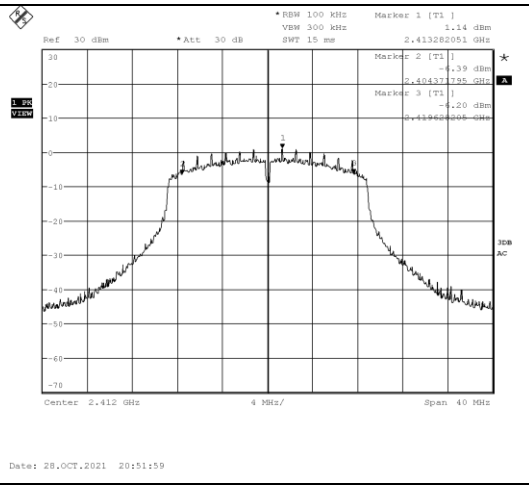
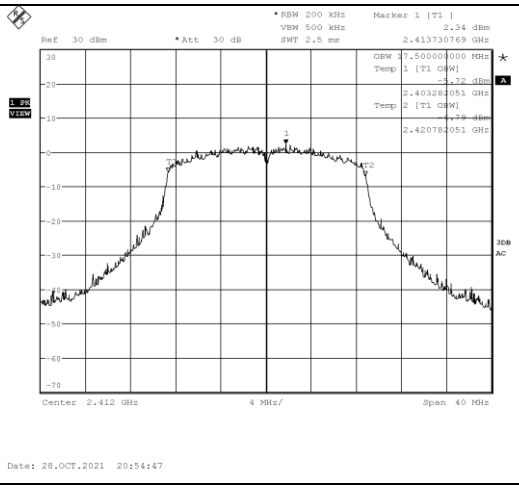
	
DTS Bandwidth Channel 11	99% Bandwidth Channel 11

DTS Bandwidth, 99% Bandwidth 802.11n	
	
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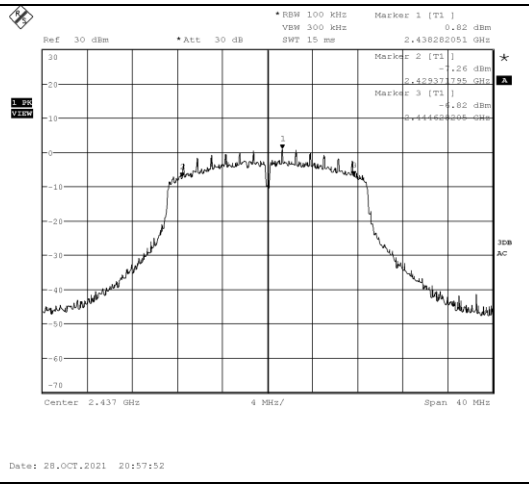
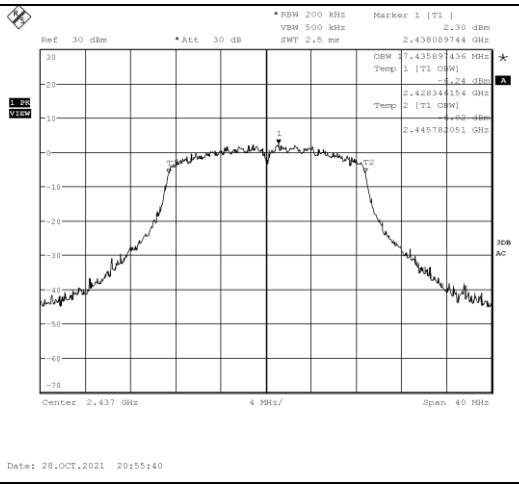
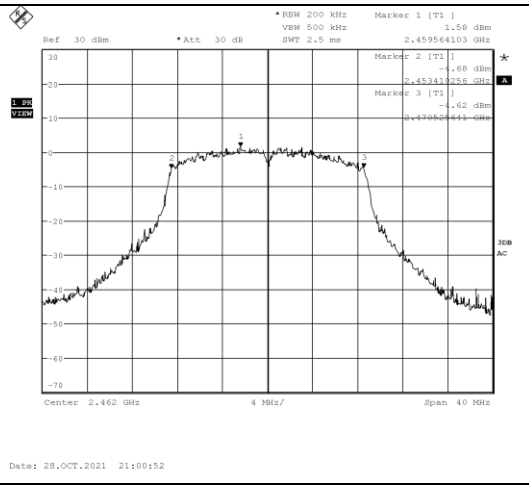
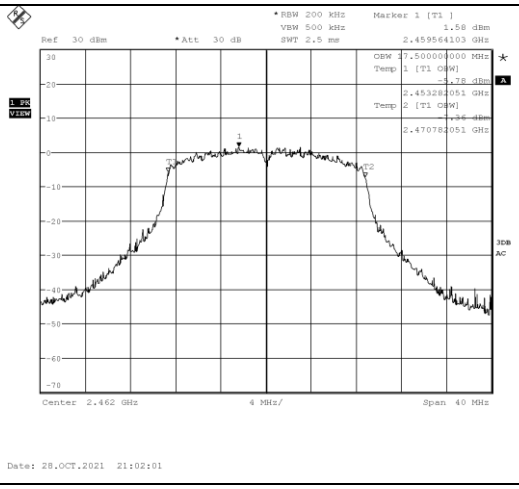
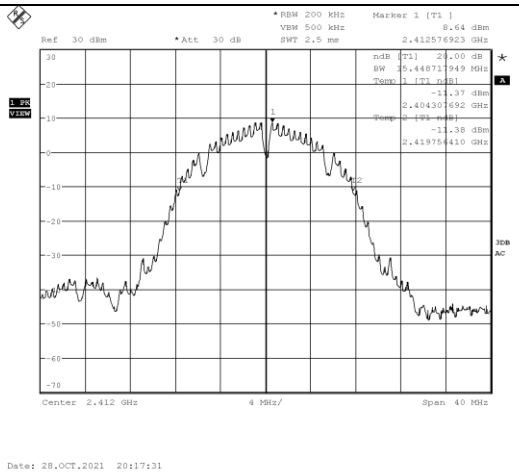
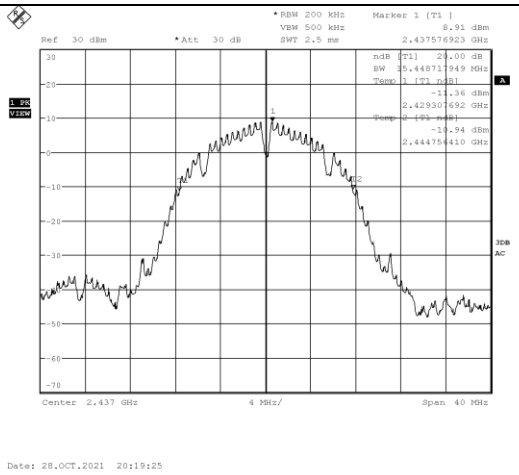
	
DTS Bandwidth Channel 6	99% Bandwidth Channel 6
	
DTS Bandwidth Channel 11	99% Bandwidth Channel 11

20dB Bandwidth 802.11b



20dB Bandwidth Channel 1



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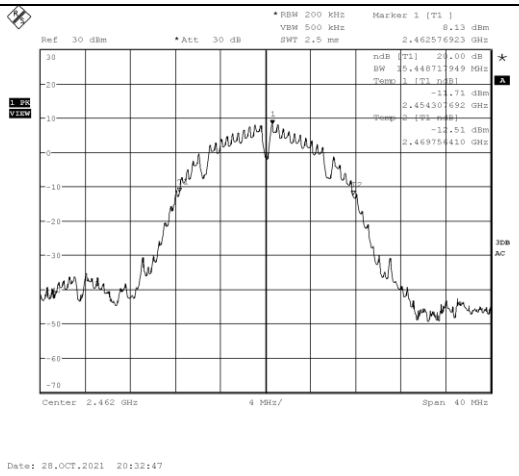
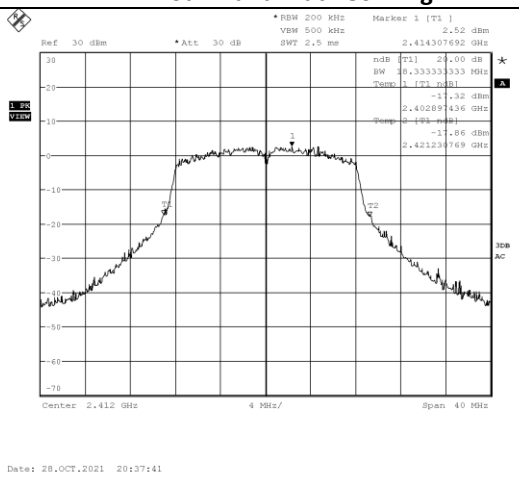


20dB Bandwidth Channel 11

20dB Bandwidth 802.11g

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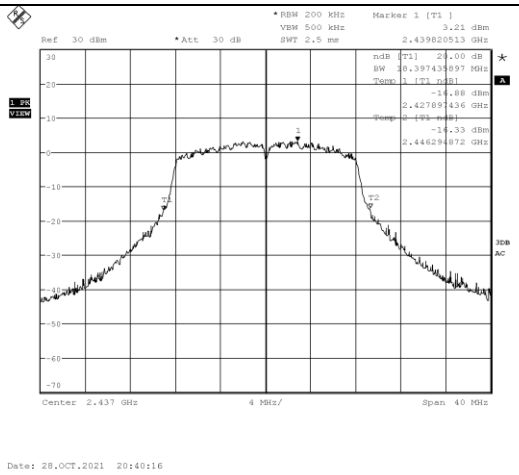
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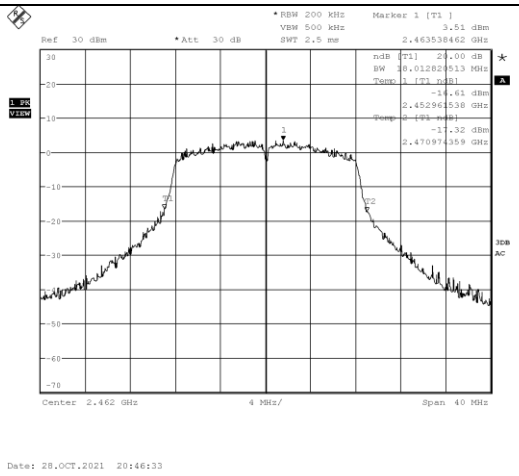
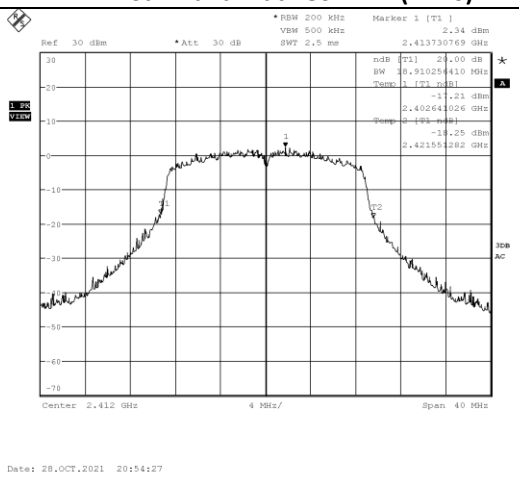

20dB Bandwidth Channel 11

20dB Bandwidth 802.11n (HT20)

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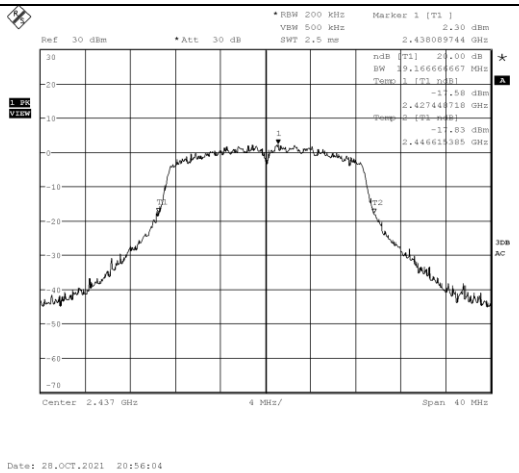
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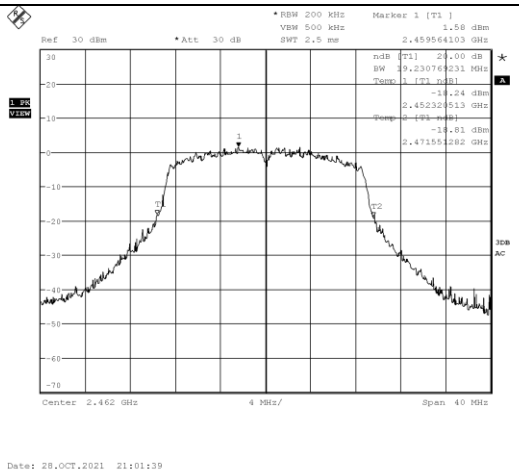

20dB Bandwidth Channel 11

8 Output Power Data

Mode	Channel / Frequency (MHz)		Peak Power (dBm)	15.247 / RSS-247 Limit (dBm)	Result
802.11b	1	2412	20.60	30	Pass
	6	2437	20.60	30	Pass
	11	2462	20.50	30	Pass
802.11g	1	2412	17.37	30	Pass
	6	2437	17.87	30	Pass
	11	2462	17.77	30	Pass
802.11n (HT20)	1	2412	17.37	30	Pass
	6	2437	17.07	30	Pass
	11	2462	17.07	30	Pass

Test Personnel:	Brian Lackey	Test Date:	10/28/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	30 dBm
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	22.6C
Input Voltage:	Battery	Relative Humidity:	41.2%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	991.2mbar

Deviations, Additions, or Exclusions: None

9 Effective Isotropic Radiated Power

Mode	Channel / Frequency (MHz)		Peak Power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	RSS-247 Limit (dBm)	Result
802.11b	1	2412	20.60	1.88	22.48	36	Pass
	6	2437	20.60	1.88	22.48	36	Pass
	11	2462	20.50	1.88	22.38	36	Pass
802.11g	1	2412	17.37	1.88	19.25	36	Pass
	6	2437	17.87	1.88	19.75	36	Pass
	11	2462	17.77	1.88	19.65	36	Pass
802.11n (HT20)	1	2412	17.37	1.88	19.25	36	Pass
	6	2437	17.07	1.88	18.95	36	Pass
	11	2462	17.07	1.88	18.95	36	Pass

Test Personnel:	Brian Lackey	Test Date:	10/28/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	36 dBm
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	22.6C
Input Voltage:	Battery	Relative Humidity:	41.2%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	991.2mbar

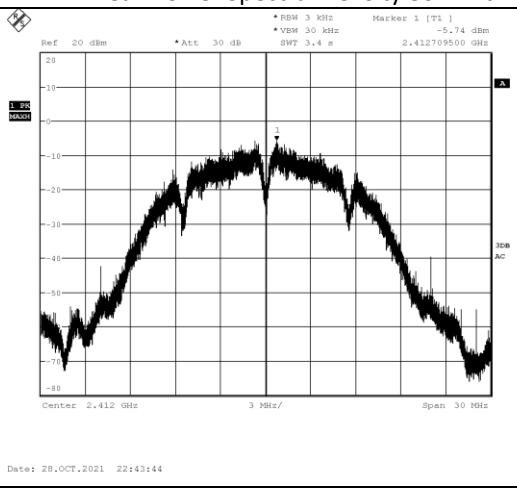
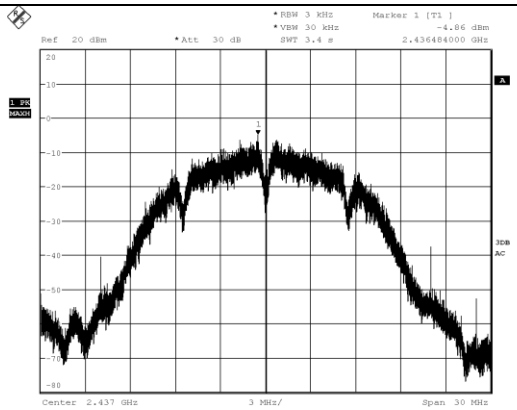
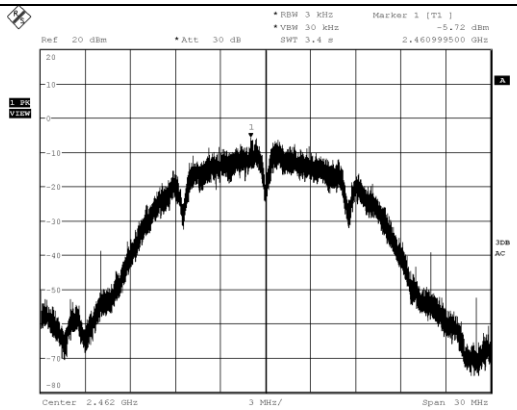
Deviations, Additions, or Exclusions: None

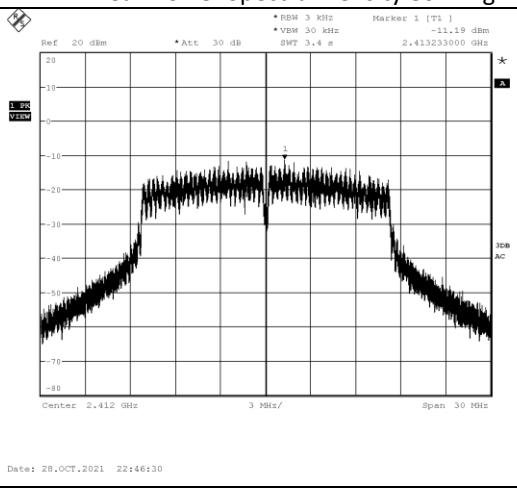
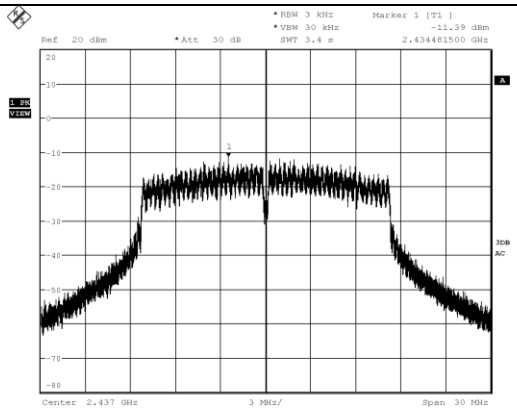
10 Power Spectral Density Data

Mode	Channel	Frequency (MHz)	Analyzer Reading (dBm)	Cable Loss (dB)	PPSD Single Port (dBm/3kHz)	PPSD Limit (dBm/3kHz)	Result
802.11b	1	2412	-5.74	1.1	-4.64	8	Pass
	6	2437	-4.86	1.1	-3.76	8	Pass
	11	2462	-5.72	1.2	-4.52	8	Pass
802.11g	1	2412	-11.19	1.1	-10.09	8	Pass
	6	2437	-11.39	1.1	-10.29	8	Pass
	11	2462	-12.36	1.2	-11.16	8	Pass
802.11n (HT20)	1	2412	-13.25	1.1	-12.15	8	Pass
	6	2437	-12.57	1.1	-11.47	8	Pass
	11	2462	-12.58	1.2	-11.38	8	Pass

Test Personnel:	Brian Lackey	Test Date:	10/28/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	8 dBm/3 kHz
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	22.6C
Input Voltage:	Battery	Relative Humidity:	41.2%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	991.2mbar

Deviations, Additions, or Exclusions: None

Peak Power Spectral Density 802.11b

Channel 1

Channel 6

Channel 11

Peak Power Spectral Density 802.11g

Channel 1

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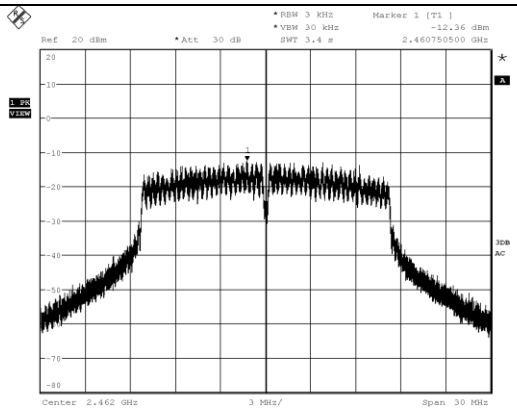
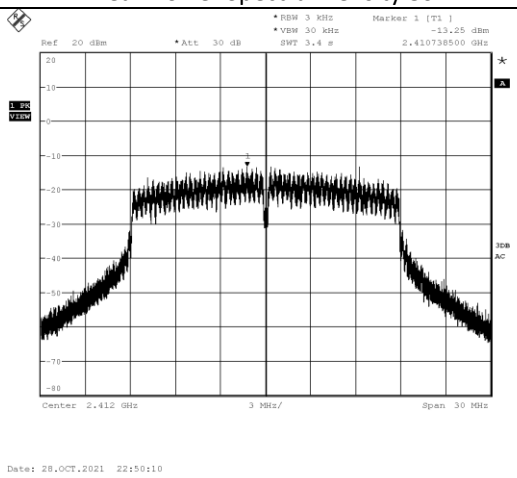
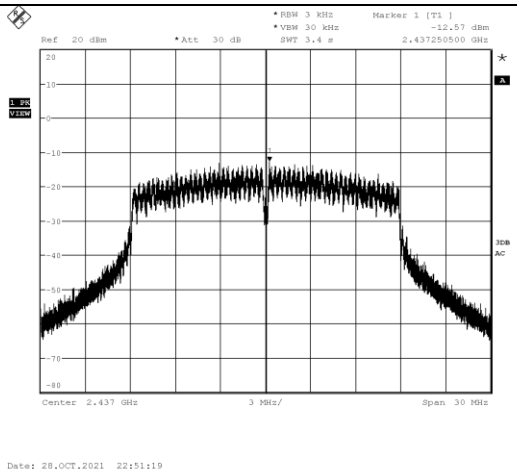
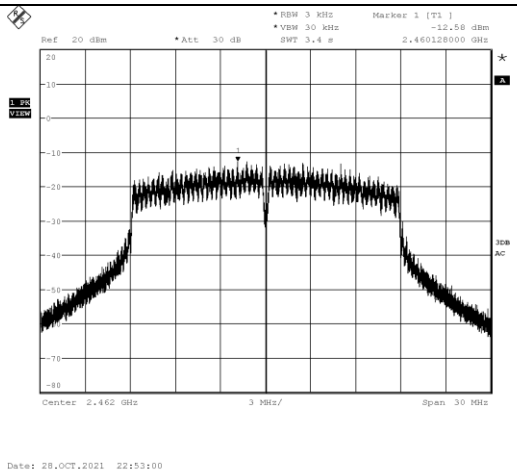
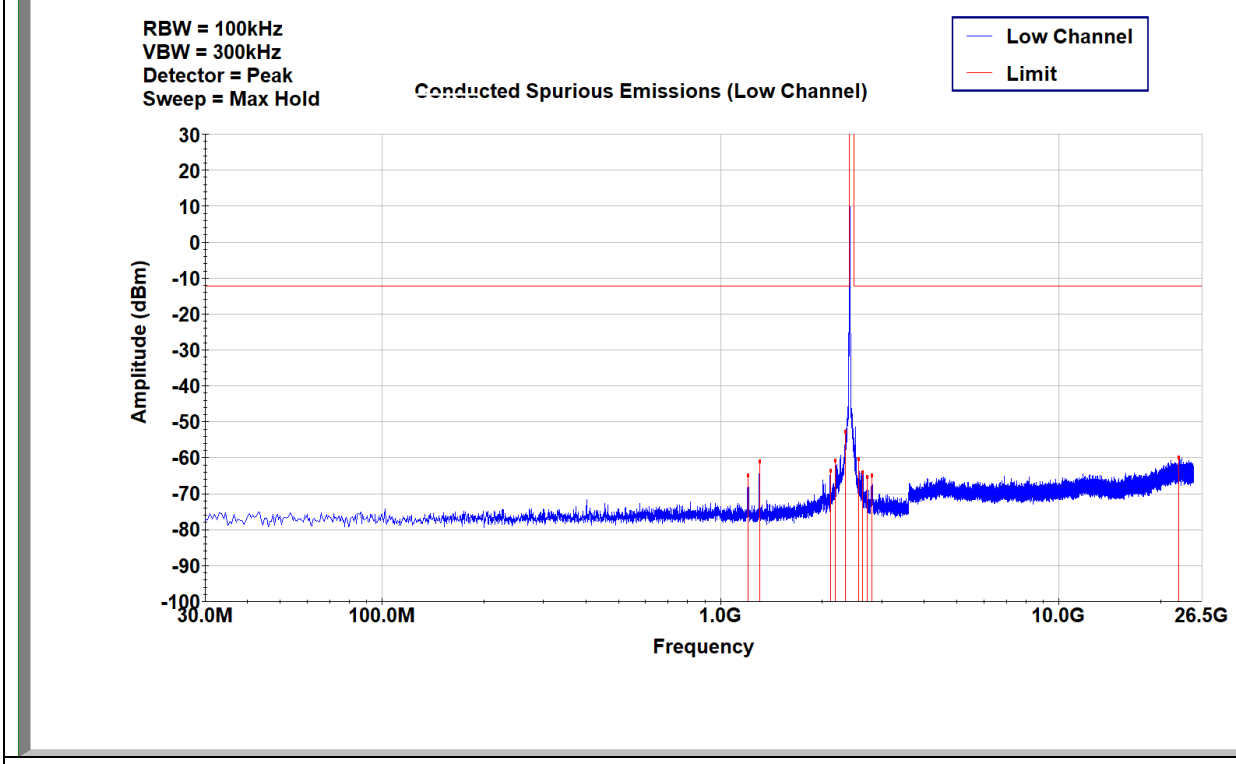

Channel 11

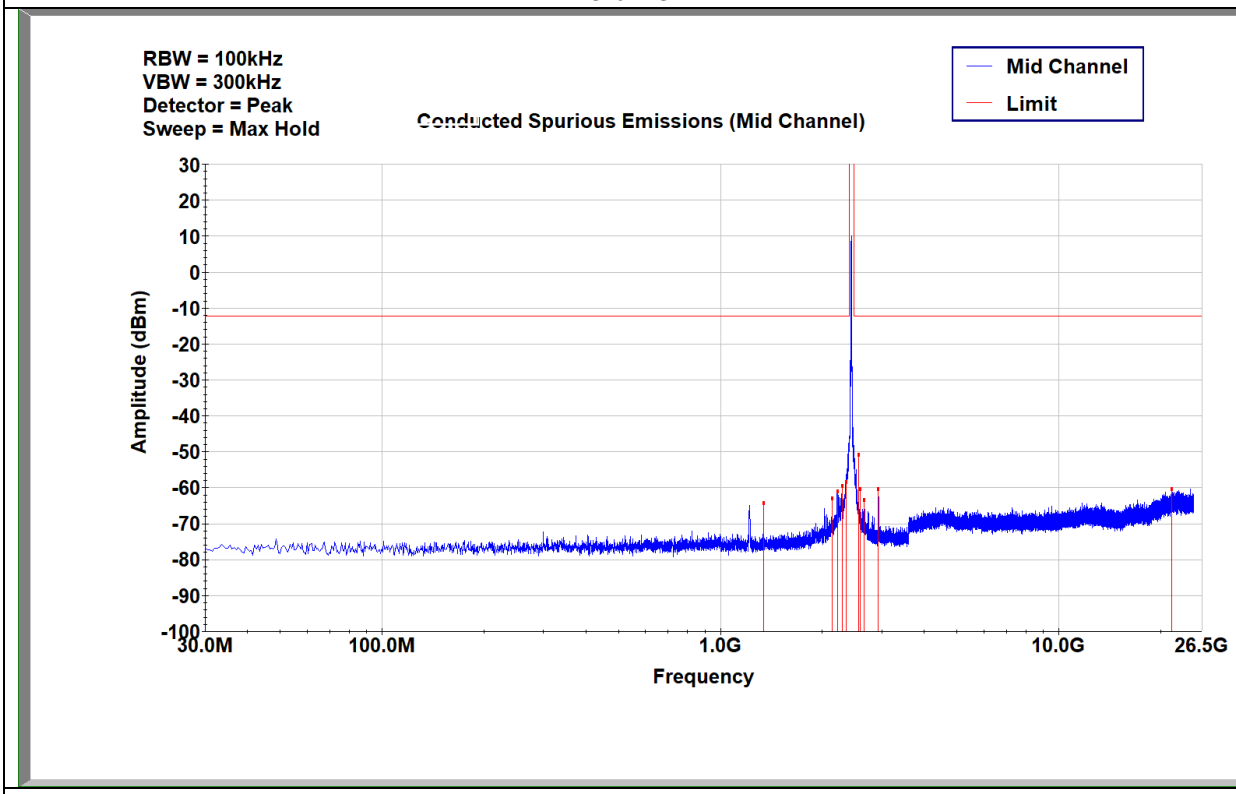
Peak Power Spectral Density 802.11n

Channel 1

Channel 6

Channel 11

11 Conducted Spurious Emission Data

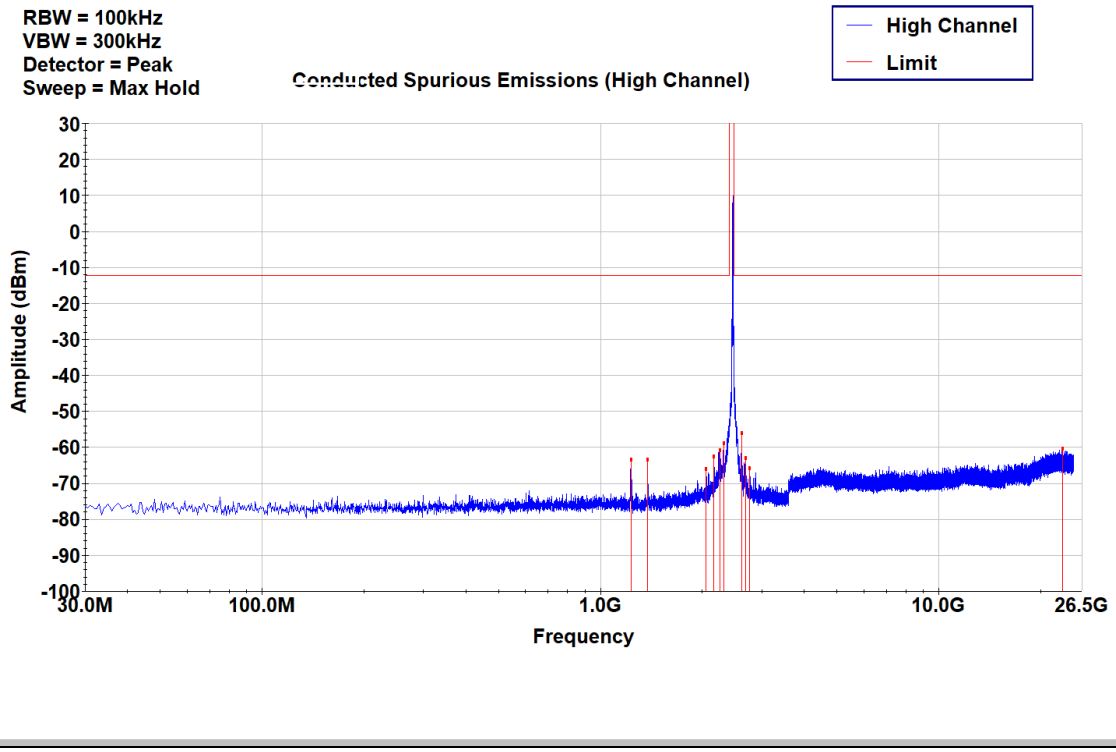
Conducted Spurious Emissions 802.11b



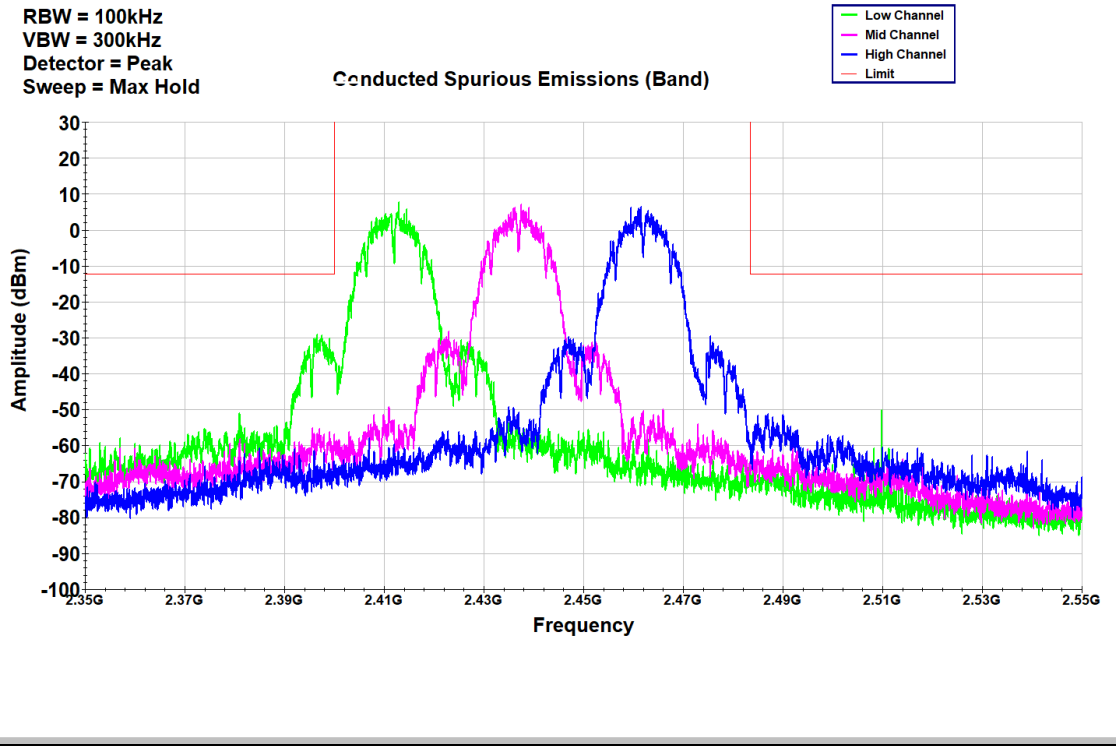
Channel 1



Channel 6

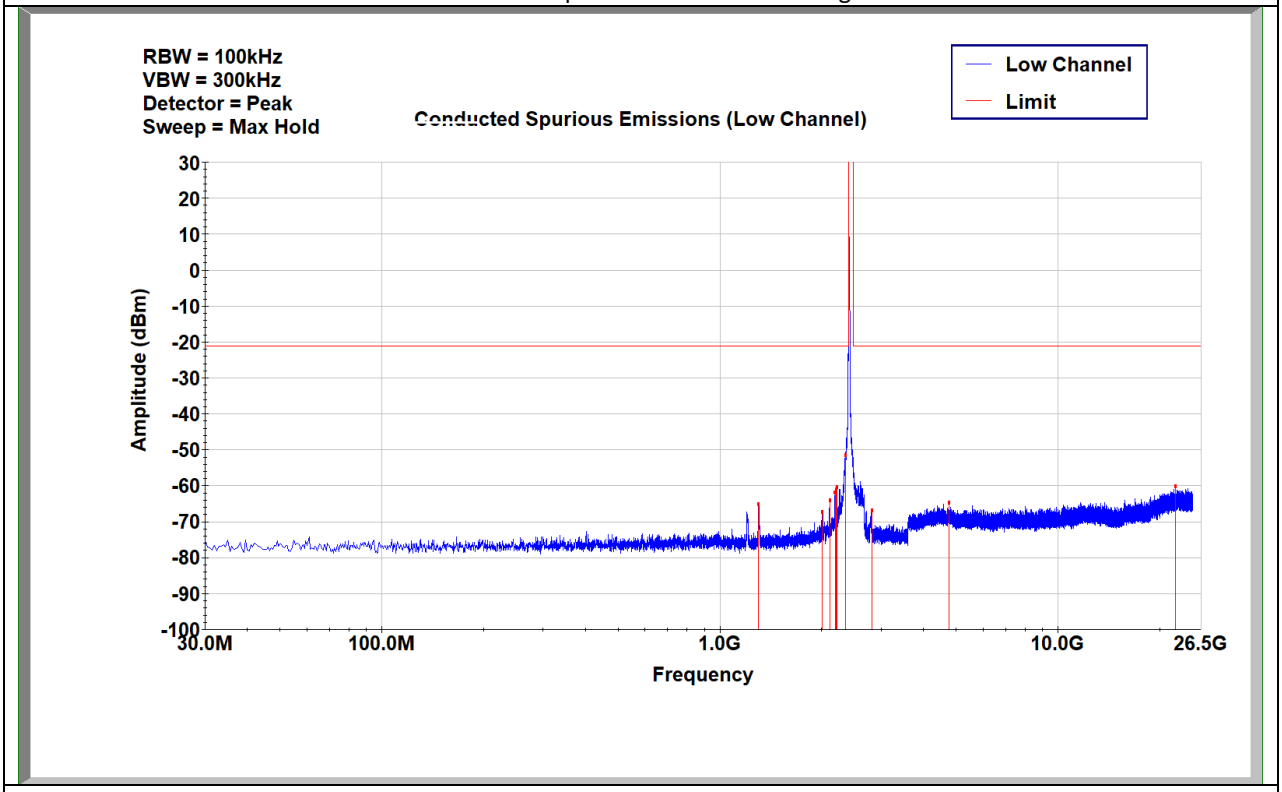


Channel 11

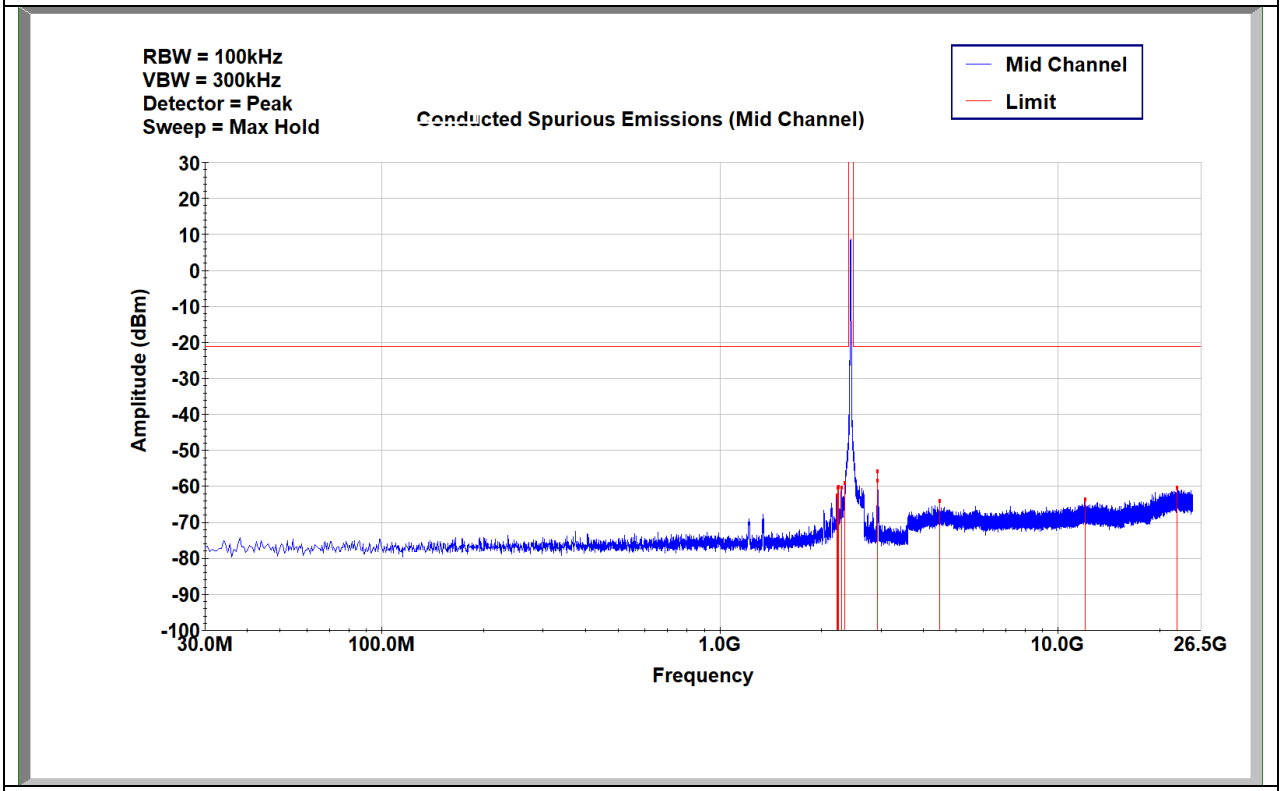


Band Edge

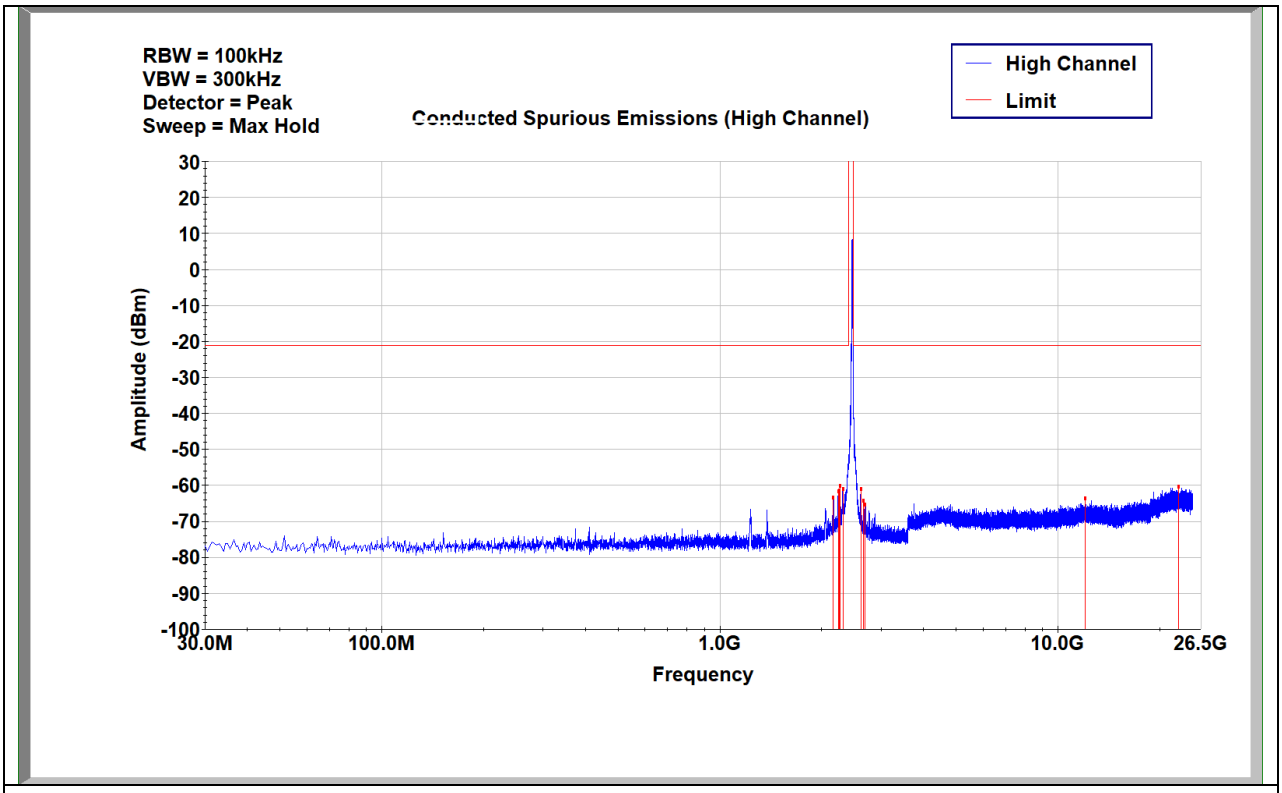
Conducted Spurious Emissions 802.11g



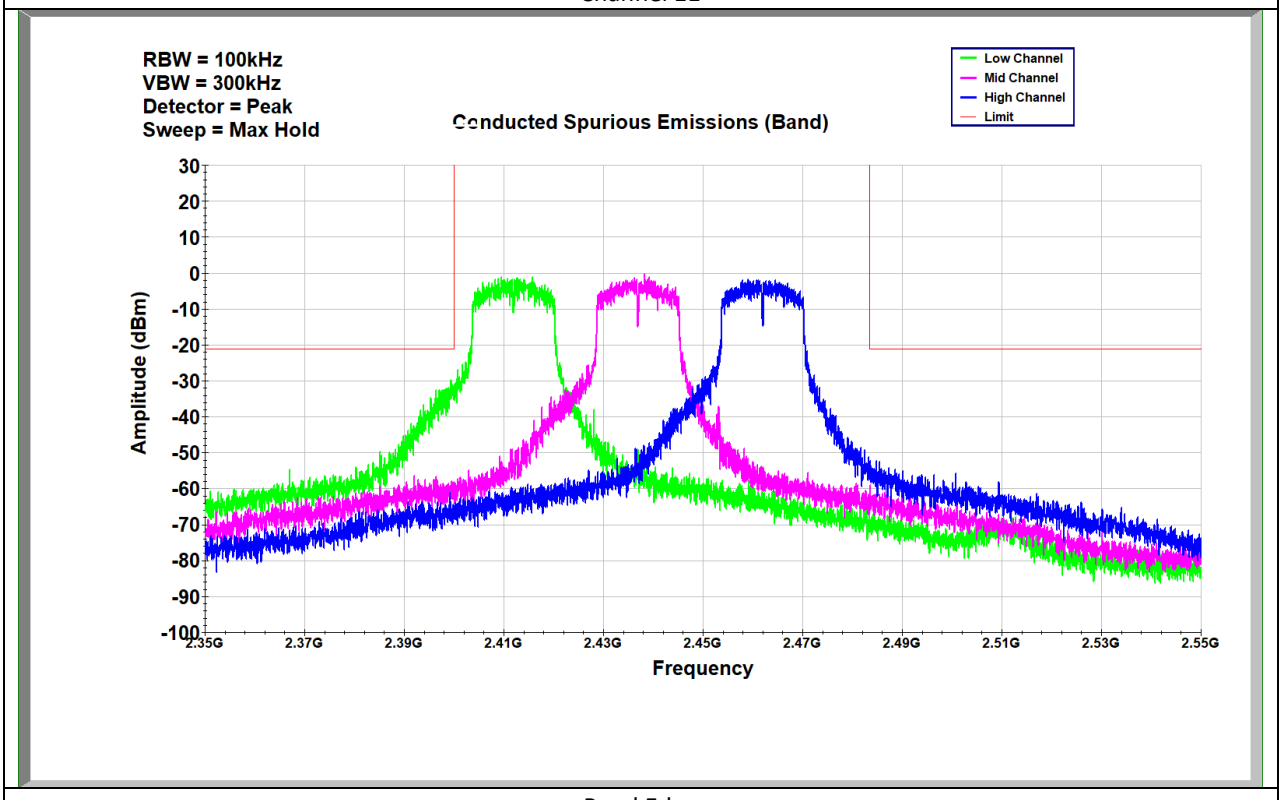
Channel 1



Channel 6

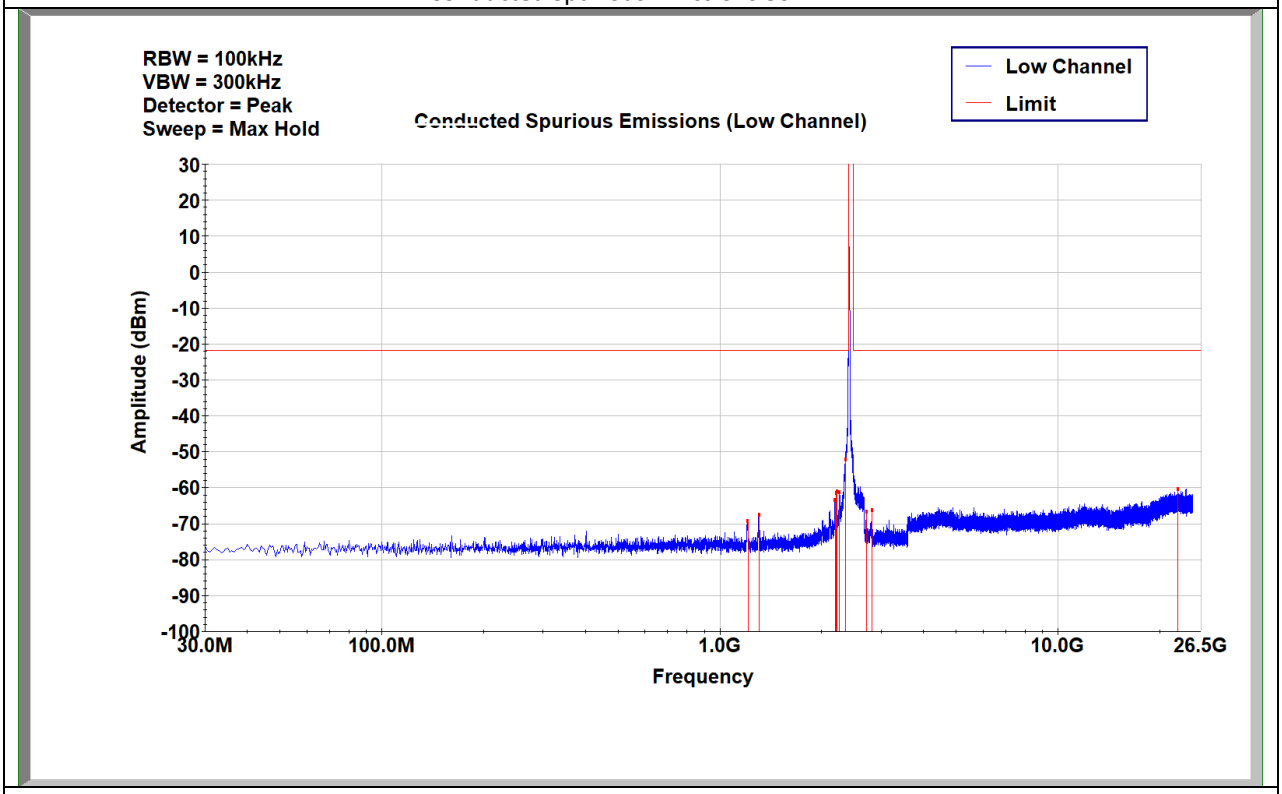


Channel 11

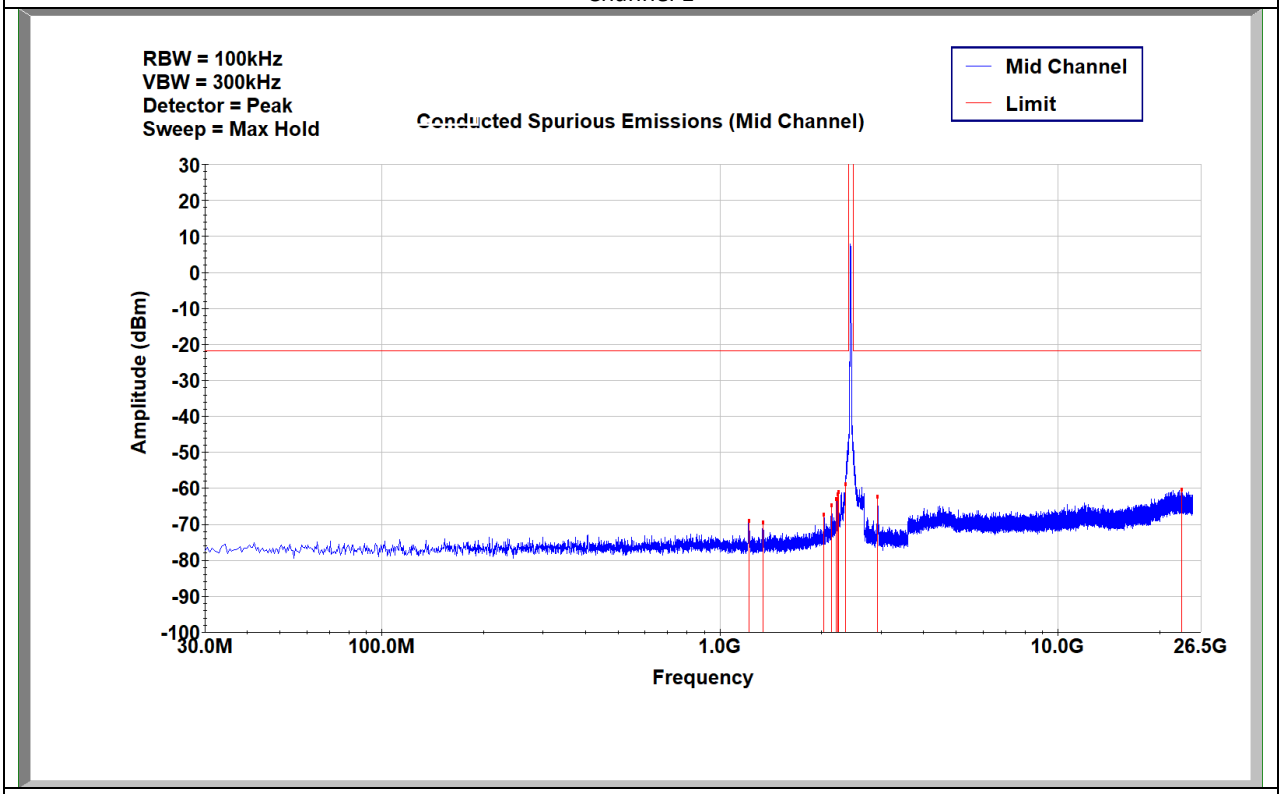


Band Edge

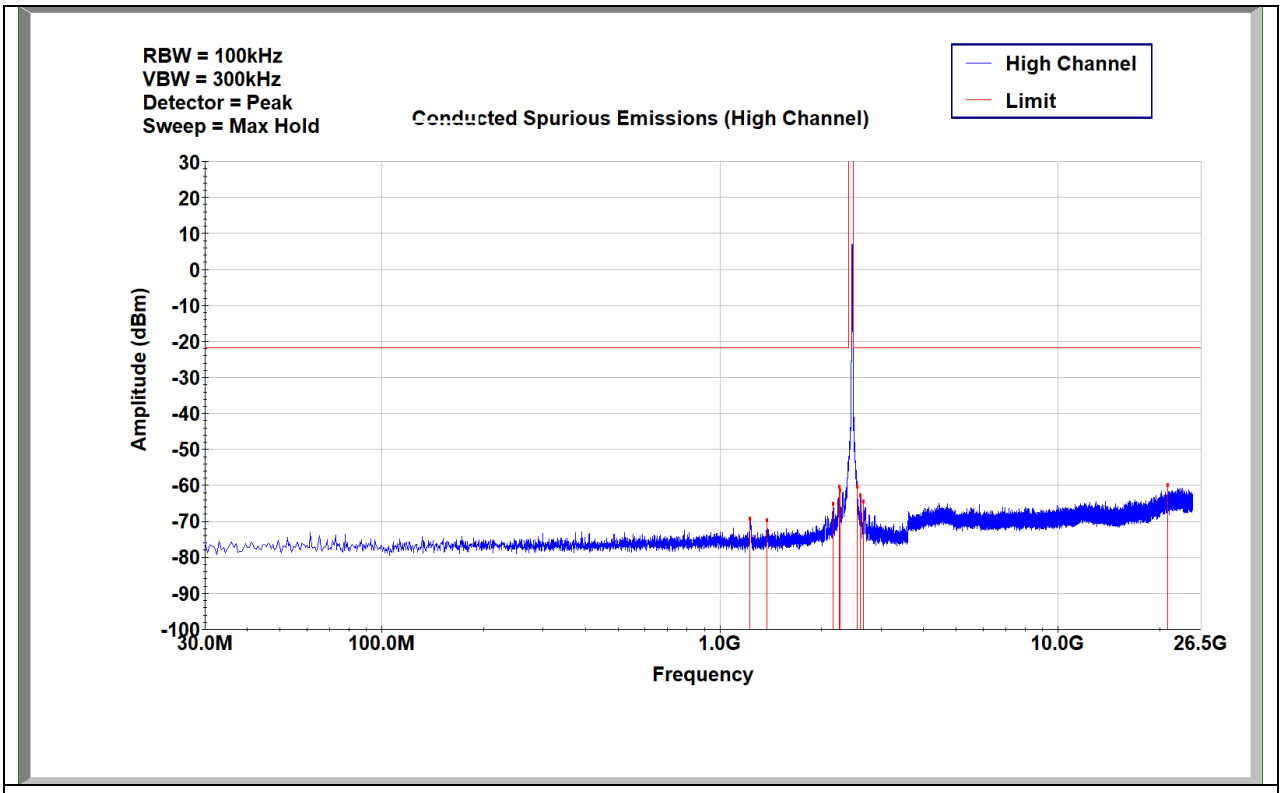
Conducted Spurious Emissions 802.11n



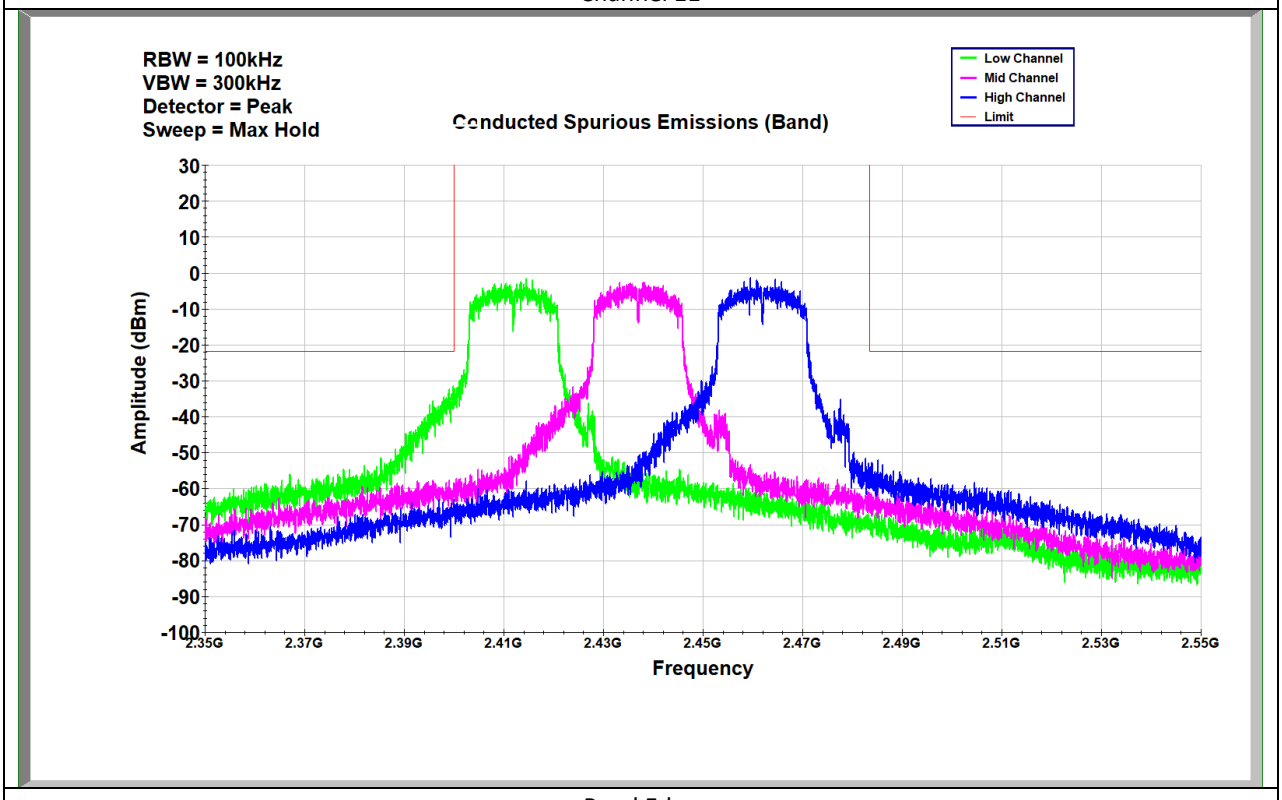
Channel 1



Channel 6



Channel 11



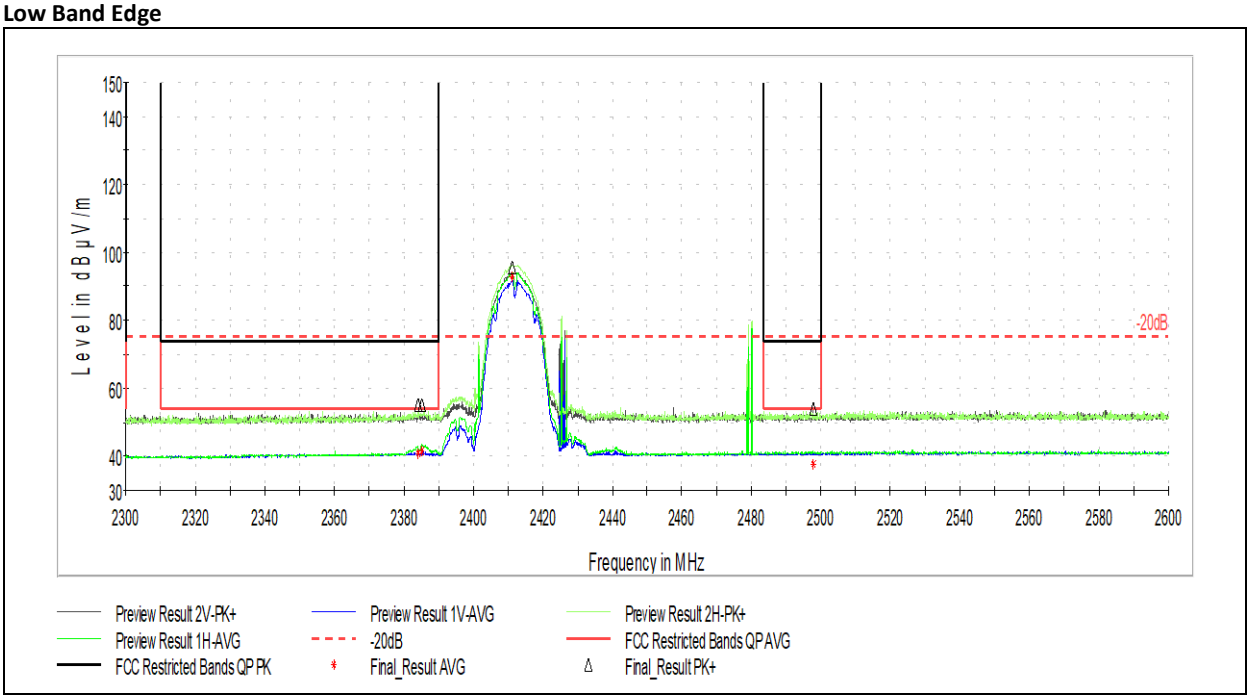
Band Edge

12 Worst Case Radiated Spurious Emissions Data

12.1 Worst Case Radiated Spurious Emissions Data (802.11b, Channel 1)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.000000	45.67	73.98	28.31	1000.000	264.0	V	59.0	10
12103.500000	51.46	73.98	22.52	1000.000	365.0	H	262.0	20
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4824.000000	35.92	53.98	18.06	1000.000	264.0	V	59.0	10
12103.500000	38.49	53.98	15.49	1000.000	365.0	H	262.0	20

Low Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2384.000000	55.08	73.98	18.90	1000.000	100.0	H	35.0	39
2385.269231	55.24	73.98	18.74	1000.000	100.0	H	33.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2384.000000	40.98	53.98	13.00	1000.000	100.0	H	35.0	39
2385.269231	41.48	53.98	12.50	1000.000	100.0	H	33.0	39

Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.2 Worst Case Radiated Spurious Emissions Data (802.11b, Channel 6)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
124.952222	33.97	43.52	9.56	120.000	100.0	V	37.0	22
270.075000	40.14	46.02	5.88	120.000	104.0	V	162.0	23
401.779444	33.43	46.02	12.59	120.000	211.0	H	170.0	27
Frequency (MHz)	**MaxPeak (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4874.000000	47.30	73.98	26.68	1000.000	233.0	V	57.0	10
7312.000000	53.98	73.98	20.00	1000.000	410.0	V	198.0	13
22483.500000	57.46	73.98	16.52	1000.000	268.0	V	24.0	11
23797.500000	56.78	73.98	17.20	1000.000	390.0	V	-1.0	11
31502.000000	62.89	73.98	11.09	1000.000	392.0	H	226.0	17
36451.500000	63.76	73.98	10.22	1000.000	410.0	V	346.0	19
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4874.000000	40.36	53.98	13.62	1000.000	233.0	V	57.0	10
7312.000000	47.96	53.98	6.02	1000.000	410.0	V	198.0	13
22483.500000	44.04	53.98	9.94	1000.000	268.0	V	24.0	11
23797.500000	43.78	53.98	10.20	1000.000	390.0	V	-1.0	11
31502.000000	49.15	53.98	4.83	1000.000	392.0	H	226.0	17
36451.500000	50.49	53.98	3.49	1000.000	410.0	V	346.0	19

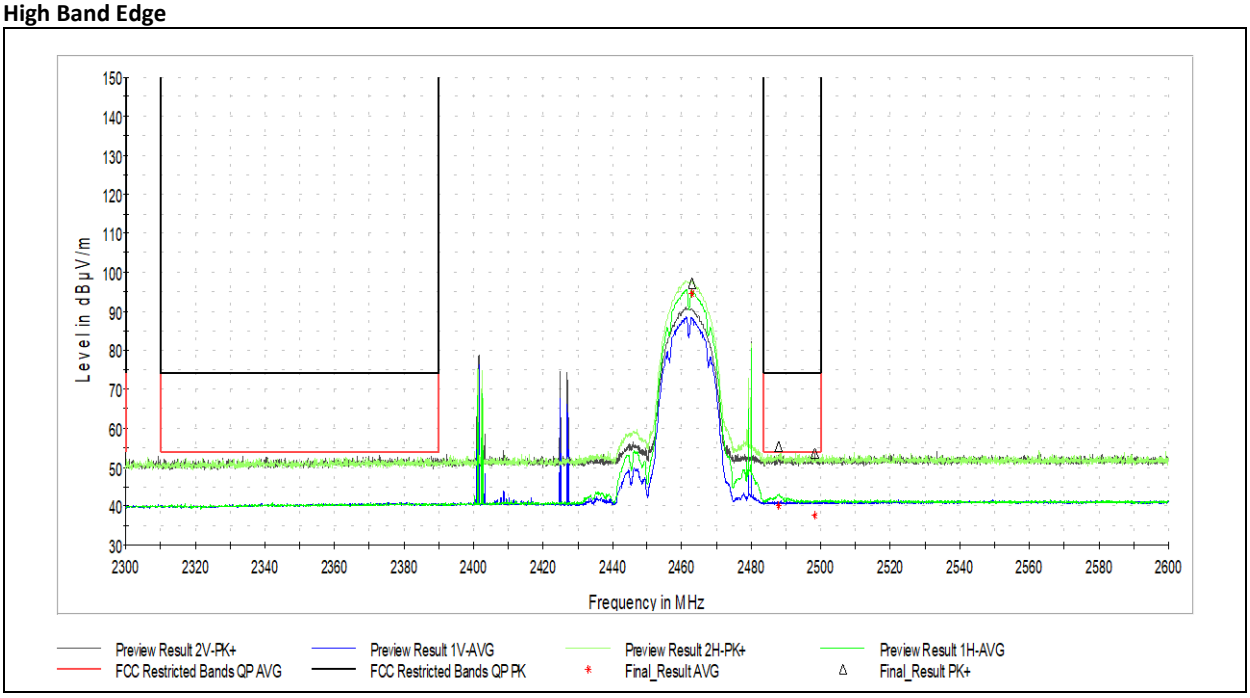
Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.3 Worst Case Radiated Spurious Emissions Data (802.11b, Channel 11)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4924.000000	52.01	73.98	21.97	1000.000	159.0	V	57.0	10
7387.000000	53.52	73.98	20.46	1000.000	397.0	V	147.0	13
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4924.000000	47.53	53.98	6.45	1000.000	159.0	V	57.0	10
7387.000000	47.29	53.98	6.69	1000.000	397.0	V	147.0	13

High Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2487.730769	55.35	73.98	18.63	1000.000	336.0	H	35.0	39
2498.230769	53.54	73.98	20.44	1000.000	313.0	V	33.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2487.730769	40.13	53.98	13.85	1000.000	336.0	H	35.0	39
2498.230769	37.74	53.98	16.24	1000.000	313.0	V	33.0	39

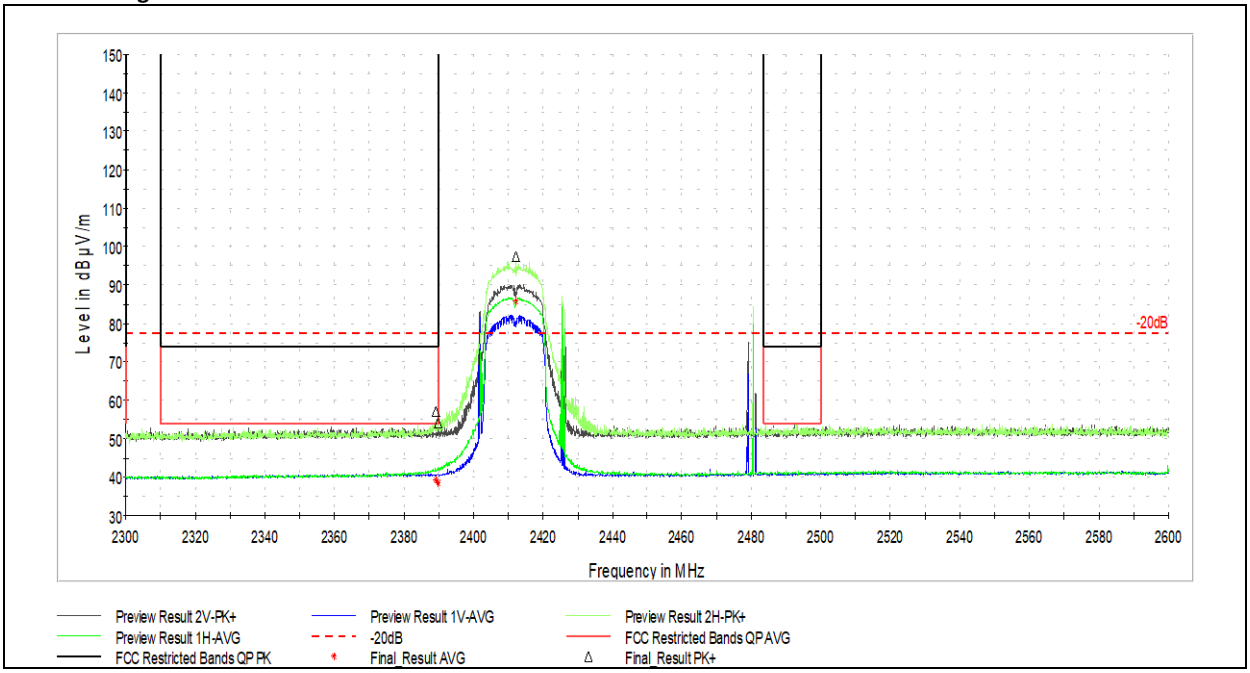
Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.4 Worst Case Radiated Spurious Emissions Data (802.11g, Channel 1)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4923.000000	43.46	73.98	30.52	1000.000	100.0	V	198.0	10
8259.000000	47.20	73.98	26.78	1000.000	100.0	V	334.0	15
12098.500000	51.66	73.98	22.32	1000.000	100.0	H	162.0	20
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4923.000000	30.13	53.98	23.85	1000.000	100.0	V	198.0	10
8259.000000	34.20	53.98	19.78	1000.000	100.0	V	334.0	15
12098.500000	38.37	53.98	15.61	1000.000	100.0	H	162.0	20

Low Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.192308	57.18	73.98	16.80	1000.000	100.0	H	33.0	39
2389.942308	54.13	73.98	19.85	1000.000	179.0	H	0.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2389.192308	39.42	53.98	14.56	1000.000	100.0	H	33.0	39
2389.942308	38.41	53.98	15.57	1000.000	179.0	H	0.0	39

Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.5 Worst Case Radiated Spurious Emissions Data (802.11g, Channel 6)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
73.811667	25.19	40.00	14.81	120.000	101.0	V	195.0	15
124.952222	33.89	43.52	9.63	120.000	100.0	V	38.0	22
270.721667	40.12	46.02	5.90	120.000	99.0	V	174.0	23
403.557778	32.04	46.02	13.98	120.000	173.0	H	178.0	27

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3782.500000	42.23	73.98	31.75	1000.000	100.0	V	36.0	8
4875.000000	43.43	73.98	30.55	1000.000	172.0	H	48.0	10
8217.500000	48.04	73.98	25.94	1000.000	100.0	H	0.0	15
12095.500000	52.18	73.98	21.80	1000.000	100.0	H	55.0	20

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3782.500000	28.54	53.98	25.44	1000.000	100.0	V	36.0	8
4875.000000	29.62	53.98	24.36	1000.000	172.0	H	48.0	10
8217.500000	34.56	53.98	19.42	1000.000	100.0	H	0.0	15
12095.500000	38.26	53.98	15.72	1000.000	100.0	H	55.0	20

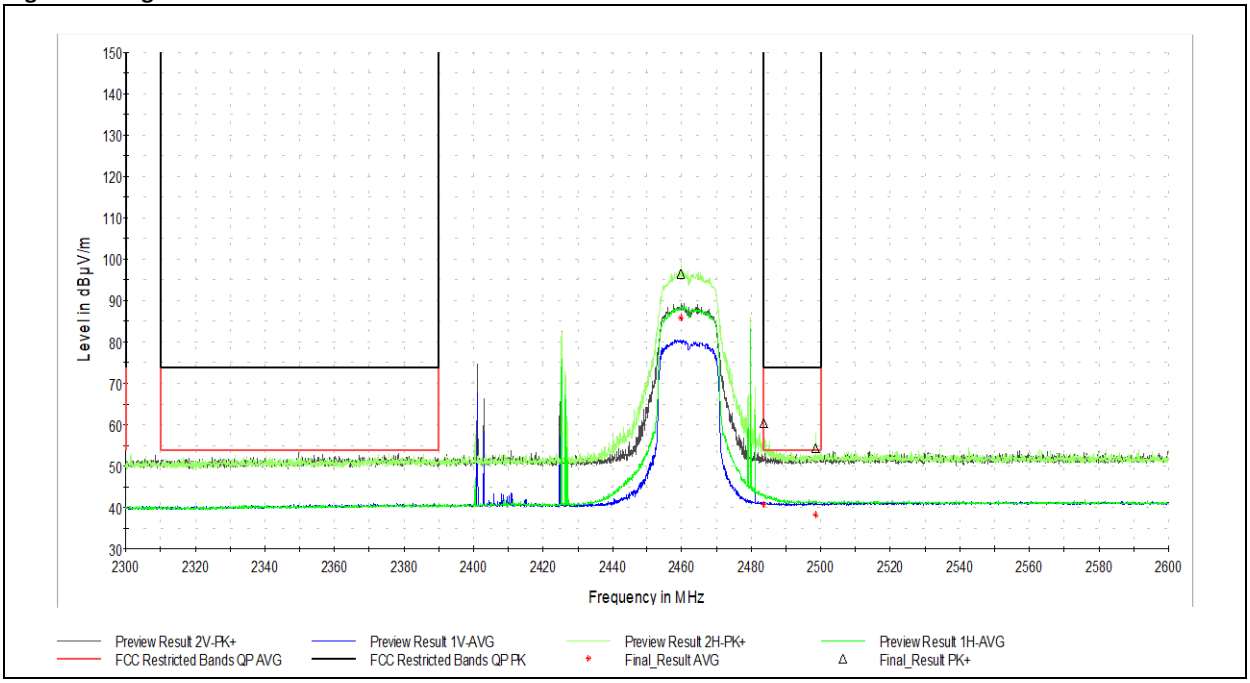
Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.6 Worst Case Radiated Spurious Emissions Data (802.11g, Channel 11)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2831.000000	41.68	73.98	32.30	1000.000	100.0	H	-1.0	6
4883.500000	44.19	73.98	29.79	1000.000	100.0	H	0.0	10
8235.000000	48.19	73.98	25.79	1000.000	100.0	H	334.0	15
12105.000000	51.99	73.98	21.99	1000.000	100.0	V	73.0	20
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2831.000000	27.75	53.98	26.23	1000.000	100.0	H	-1.0	6
4883.500000	29.80	53.98	24.18	1000.000	100.0	H	0.0	10
8235.000000	34.64	53.98	19.34	1000.000	100.0	H	334.0	15
12105.000000	38.34	53.98	15.64	1000.000	100.0	V	73.0	20

High Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.634615	60.40	73.98	13.58	1000.000	196.0	H	0.0	39
2498.519231	54.27	73.98	19.71	1000.000	335.0	H	35.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2483.634615	40.69	53.98	13.29	1000.000	196.0	H	0.0	39
2498.519231	38.34	53.98	15.64	1000.000	335.0	H	35.0	39

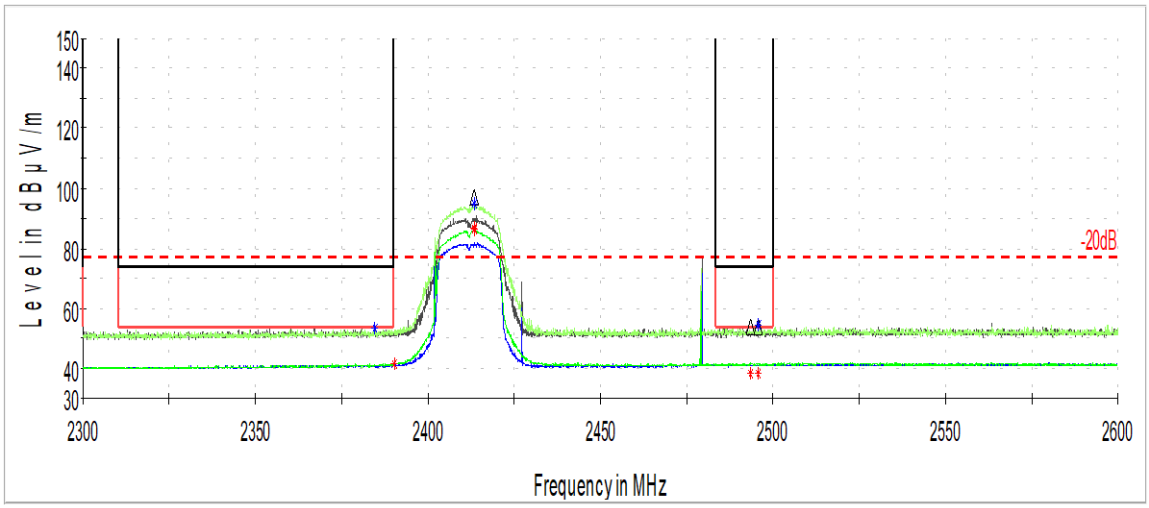
Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.7 Worst Case Radiated Spurious Emissions Data (802.11n, Channel 1)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3957.500000	42.06	73.98	31.92	1000.000	100.0	V	98.0	9
4913.000000	43.38	73.98	30.60	1000.000	100.0	H	0.0	10
8236.000000	48.03	73.98	25.95	1000.000	100.0	V	272.0	15
12099.500000	51.89	73.98	22.09	1000.000	100.0	H	346.0	20
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
3957.500000	28.49	53.98	25.49	1000.000	100.0	V	98.0	9
4913.000000	29.84	53.98	24.14	1000.000	100.0	H	0.0	10
8236.000000	34.49	53.98	19.49	1000.000	100.0	V	272.0	15
12099.500000	38.26	53.98	15.72	1000.000	100.0	H	346.0	20

Low Band Edge



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2493.615385	53.64	73.98	20.34	1000.000	201.0	H	0.0	39
2495.692308	53.89	73.98	20.09	1000.000	297.0	H	82.0	39
2384.634615	53.37	73.98	20.61	1000.000	100.0	V	210.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2493.615385	38.00	53.98	15.98	1000.000	201.0	H	0.0	39
2495.692308	38.03	53.98	15.95	1000.000	297.0	H	82.0	39
2389.873077	43.37	53.98	10.61	1000.000	100.0	H	0.0	39

Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.8 Worst Case Radiated Spurious Emissions Data (802.11n, Channel 6)

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
38.029444	26.85	40.00	13.15	120.000	99.0	V	-1.0	22
124.952222	34.02	43.52	9.50	120.000	101.0	V	38.0	22
256.333333	38.06	46.02	7.97	120.000	100.0	H	100.0	22
270.182778	41.24	46.02	4.78	120.000	100.0	H	225.0	23
Frequency (MHz)	**MaxPeak (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4947.500000	44.68	73.98	29.30	1000.000	100.0	V	171.0	10
7309.000000	46.17	73.98	27.81	1000.000	100.0	V	160.0	13
8200.000000	47.82	73.98	26.16	1000.000	100.0	V	84.0	15
12122.000000	51.47	73.98	22.51	1000.000	100.0	H	218.0	20
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4947.500000	30.39	53.98	23.59	1000.000	100.0	V	171.0	10
7309.000000	32.45	53.98	21.53	1000.000	100.0	V	160.0	13
8200.000000	34.13	53.98	19.85	1000.000	100.0	V	84.0	15
12122.000000	38.29	53.98	15.69	1000.000	100.0	H	218.0	20

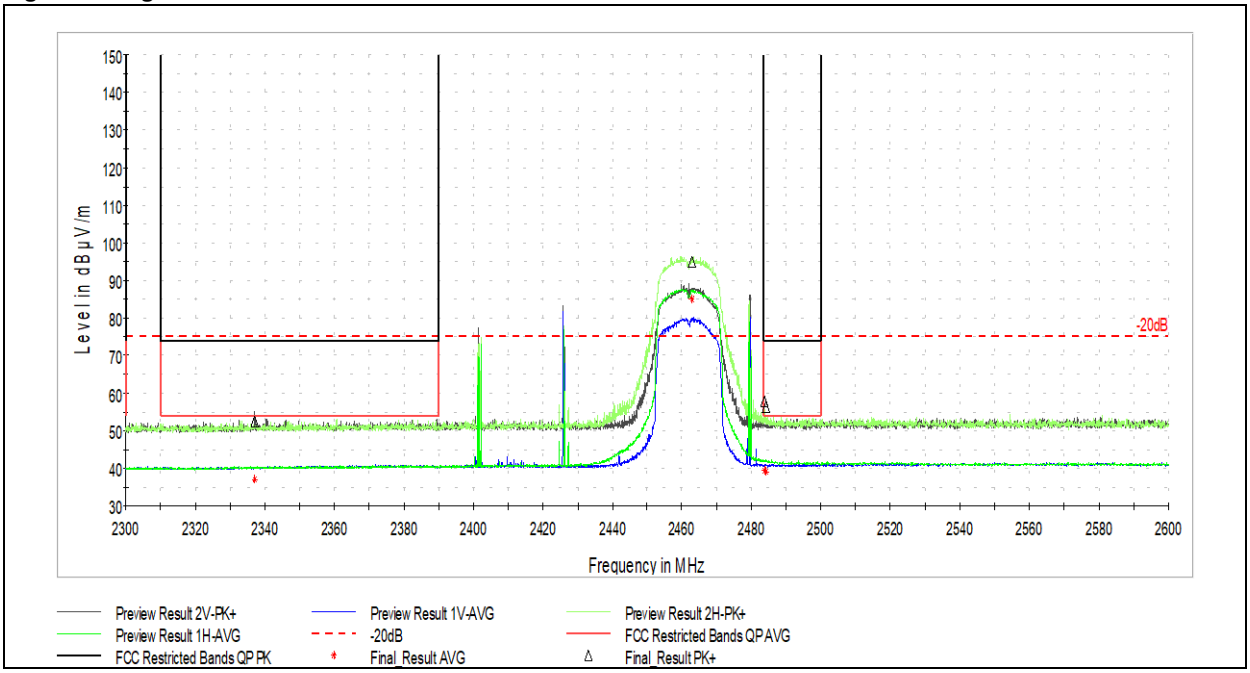
Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

12.9 Worst Case Radiated Spurious Emissions Data (802.11n, Channel 11)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.500000	43.52	73.98	30.46	1000.000	100.0	H	332.0	10
8230.500000	48.41	73.98	25.57	1000.000	100.0	H	297.0	15
12100.500000	52.14	73.98	21.84	1000.000	100.0	H	197.0	20
16118.000000	54.83	73.98	19.15	1000.000	100.0	H	24.0	25
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
4882.500000	30.03	53.98	23.95	1000.000	100.0	H	332.0	10
8230.500000	34.63	53.98	19.35	1000.000	100.0	H	297.0	15
12100.500000	38.45	53.98	15.53	1000.000	100.0	H	197.0	20
16118.000000	41.30	53.98	12.68	1000.000	100.0	H	24.0	25

High Band Edge



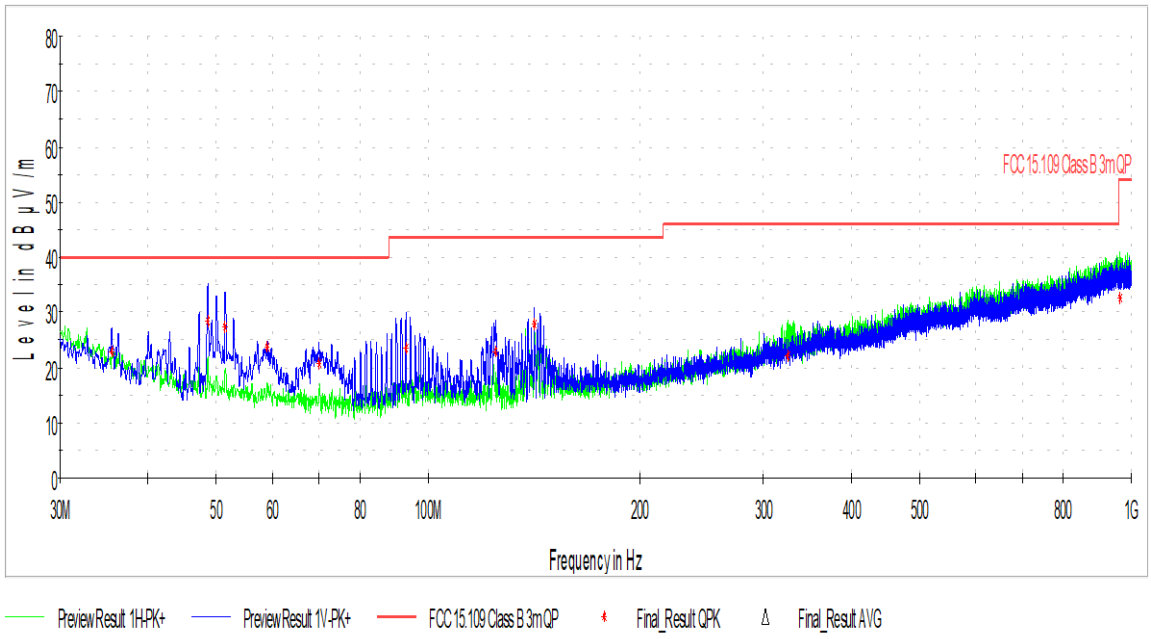
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.692308	57.72	73.98	16.26	1000.000	194.0	H	348.0	39
2484.211539	56.41	73.98	17.57	1000.000	188.0	H	345.0	39
Frequency (MHz)	**Average (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Bandwidth (kHz)**	**Height (cm)**	**Pol**	**Azimuth (deg)**	**Corr. (dB/m)**
2483.692308	39.30	53.98	14.68	1000.000	194.0	H	348.0	39
2484.211539	39.00	53.98	14.98	1000.000	188.0	H	345.0	39

Test Personnel:	Brian Lackey	Test Date:	11/30/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	15.205 Restricted Bands, 15.209
Product Standard:	FCC Part 15.247 RSS-247 Issue 2	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

13 Unintentional Radiated Emissions

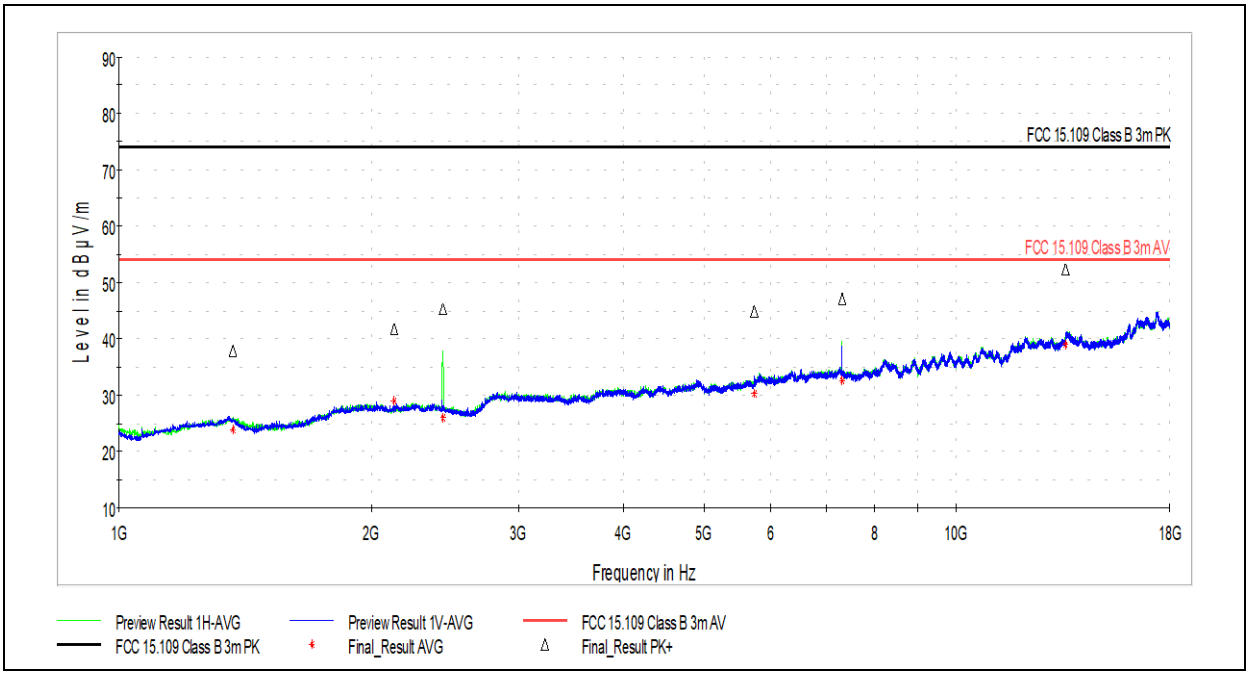
13.1 Unintentional Radiated Emissions, 30 MHz – 1 GHz



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.496667	22.93	40.00	17.07	120.000	100.0	V	314.0	20
48.591667	28.54	40.00	11.46	120.000	100.0	V	301.0	16
51.447778	27.35	40.00	12.65	120.000	100.0	V	314.0	15
59.046111	23.63	40.00	16.37	120.000	100.0	V	313.0	15
69.931667	20.79	40.00	19.21	120.000	100.0	V	312.0	14
93.103889	23.35	43.52	20.17	120.000	100.0	V	333.0	17
124.682778	22.91	43.52	20.61	120.000	100.0	V	113.0	16
141.603889	27.95	43.52	15.57	120.000	100.0	V	301.0	17
324.880000	22.01	46.02	24.01	120.000	95.0	H	120.0	25
963.840556	32.61	53.98	21.37	120.000	316.0	H	172.0	38

Test Personnel:	Brian Lackey	Test Date:	11/11/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	FCC Part 15.109
Product Standard:	FCC Part 15B ICES-003 Issue 7	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

13.2 Unintentional Radiated Emissions, 1GHz – 18 GHz

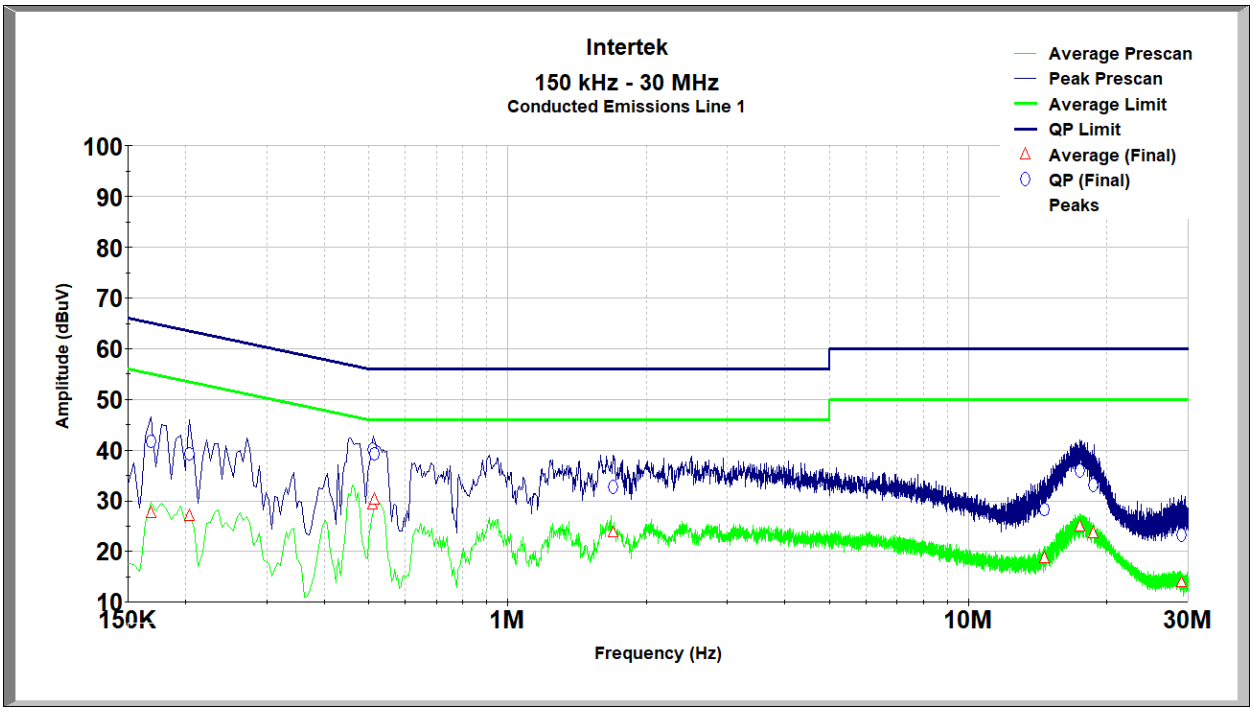


Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1367.000000	37.84	73.98	36.14	1000.000	136.0	H	0.0	1
2131.500000	41.68	73.98	32.30	1000.000	219.0	V	95.0	4
2436.000000	45.33	73.98	28.65	1000.000	191.0	H	346.0	6
5743.500000	44.88	73.98	29.10	1000.000	100.0	V	0.0	11
7310.000000	47.05	73.98	26.93	1000.000	100.0	H	128.0	13
13500.000000	52.25	73.98	21.73	1000.000	100.0	H	101.0	21

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1367.000000	23.79	53.98	30.19	1000.000	136.0	H	0.0	1
2131.500000	28.89	53.98	25.09	1000.000	219.0	V	95.0	4
2436.000000	26.05	53.98	27.93	1000.000	191.0	H	346.0	6
5743.500000	30.17	53.98	23.81	1000.000	100.0	V	0.0	11
7310.000000	32.45	53.98	21.53	1000.000	100.0	H	128.0	13
13500.000000	39.04	53.98	14.94	1000.000	100.0	H	101.0	21

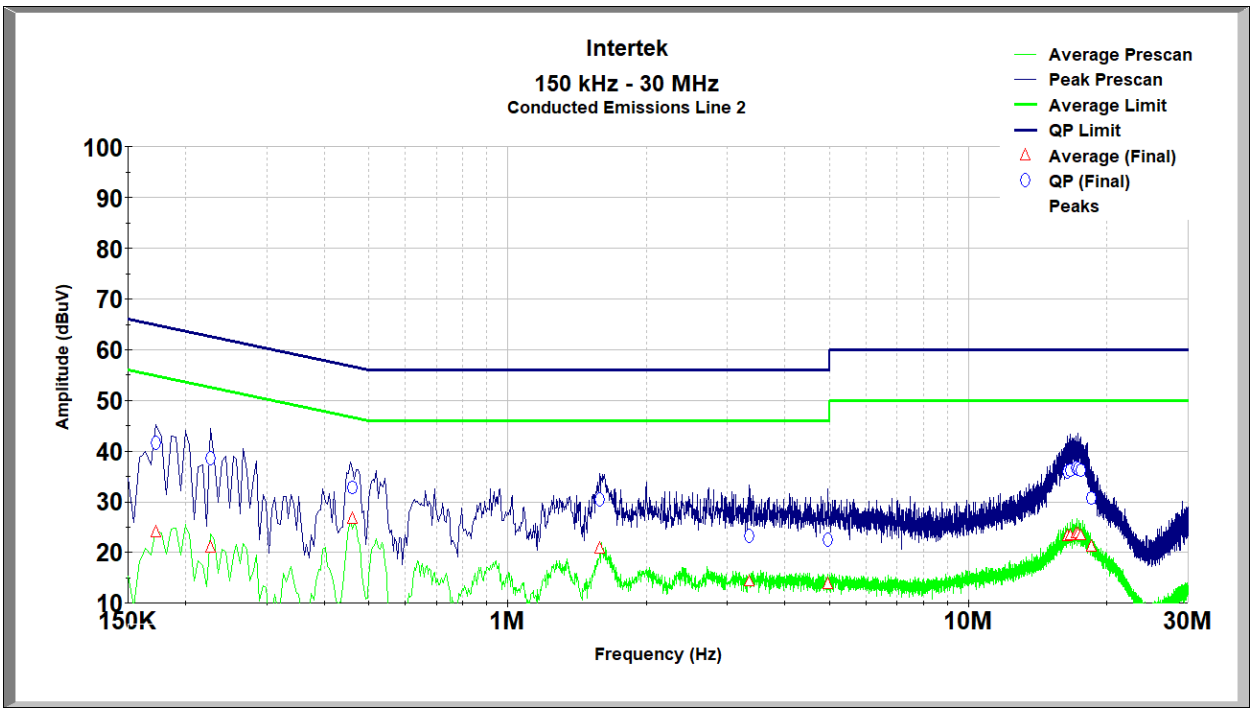
Test Personnel:	Brian Lackey	Test Date:	11/11/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	FCC Part 15.109
Product Standard:	FCC Part 15B ICES-003 Issue 7	Ambient Temperature:	19.2C
Input Voltage:	Battery	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

14 Conducted Emissions on AC Power Ports



Line

Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Margin (dB)	Average (dBuV)	Average Limit (dBuV)	Average Margin (dB)
0.168	41.800	65.486	23.686	27.572	55.486	27.914
0.204	39.302	64.457	25.156	26.999	54.457	27.458
0.510	40.174	56.000	15.826	29.284	46.000	16.716
0.514	39.275	56.000	16.725	30.308	46.000	15.692
1.694	32.642	56.000	23.358	23.883	46.000	22.117
14.619	28.363	60.000	31.637	18.664	50.000	31.336
17.433	35.879	60.000	24.121	25.049	50.000	24.951
18.724	33.137	60.000	26.863	23.619	50.000	26.381
29.054	23.251	60.000	36.749	13.987	50.000	36.013



Neutral

Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Margin (dB)	Average (dBuV)	Average Limit (dBuV)	Average Margin (dB)
0.172	41.540	65.357	23.817	24.027	55.357	31.330
0.227	38.589	63.814	25.226	21.068	53.814	32.747
0.461	32.982	57.129	24.147	26.680	47.129	20.448
1.585	30.449	56.000	25.551	20.731	46.000	25.269
3.345	23.202	56.000	32.798	14.337	46.000	31.663
4.965	22.574	56.000	33.426	13.801	46.000	32.199
16.443	35.869	60.000	24.131	23.266	50.000	26.734
16.663	36.261	60.000	23.739	23.390	50.000	26.610
17.154	36.769	60.000	23.231	23.810	50.000	26.190

Test Personnel:	Brian Lackey	Test Date:	11/11/2021
Supervising/Reviewing Engineer: (Where Applicable)	NA	Limit Applied:	FCC Part 15.107, 15.207
Product Standard:	FCC Part 15B ICES-003 Issue 7	Ambient Temperature:	19.2C
Input Voltage:	120V/60Hz	Relative Humidity:	48.5%
Pretest Verification w / Ambient Signals or BB Source:	Yes	Atmospheric Pressure:	981.1mbar

Deviations, Additions, or Exclusions: None

15 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	3/29/2022	104633944LEX-001	BL	JTS	Original Issue
1	5/9/2022	104633944LEX-001,1	BL	JTS	Updated antenna model number.
2	8/22/2022	104633944LEX-001.2	BL	JTS	Updated per TCB feedback.
3	9/13/2022	104633944LEX-001.3	BL	JTS	Updated per TCB feedback.