Venstar, Inc.

TEST REPORT FOR

WiFi Thermostat
Model: One Lite Thermostat

Tested to The Following Standards:

FCC Part 15 Subpart C Section(s)

15.207 & 15.247
(DTS 2400-2483.5MHz)

Report No.: 107533-7

Date of issue: January 26, 2023

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

Test Certificate # 803.01

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

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Chatsworth, CA 91311

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REPORT PREPARED BY:

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Mariposa, CA 95338

Project Number: 107533

DATE OF EQUIPMENT RECEIPT: September 28, 2022
DATE(S) OF TESTING: September 28 and 30, 2022
October 10 - 12, 2022

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the equipment provided by the client, tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.03.20

Site Registration & Accreditation Information

Location	*NIST CB #	FCC	Canada	Japan
Canyon Park, Bothell, WA	US0103	US1024	3082C	A-0136
Brea, CA	US0103	US1024	3082D	A-0136
Fremont, CA	US0103	US1024	3082B	A-0136
Mariposa, CA	US0103	US1024	3082A	A-0136

*CKC's list of NIST designated countries can be found at: https://standards.gov/cabs/designations.html

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C - 15.247 (DTS)

Test Procedure	Description	Modifications	Results
15.247(a)(2)	6dB Bandwidth	N/A	Pass
15.247(b)(3)	Output Power	N/A	Pass
15.247(d)	RF Conducted Emissions & Band Edge	N/A	Pass
15.247(d)	Radiated Emissions & Band Edge	N/A	Pass
15.247(e)	Power Spectral Density	N/A	Pass
15.207	AC Conducted Emissions	N/A	Pass

NA = Not Applicable

ISO/IEC 17025 Decision Rule
The declaration of pass or fail herein is based upon assessment to the specification(s) listed above, including where applicable, assessment of measurement uncertainties. For performance related tests, equipment was monitored for specified criteria identified in that section of testing.

Modifications During Testing

This list is a summary of the modifications made to the equipment during testing.

Summary of Conditions
No modifications were made during testing.

Modifications listed above must be incorporated into all production units.

Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

During testing, numerous configurations may have been utilized. The configurations listed below support compliance to the standard(s) listed in the Summary of Results section.

Configuration 1

Equipment Tested:

Device	Manufacturer	Model #	S/N
WiFi Thermostat	Venstar, Inc.	One Lite Thermostat	2220000024

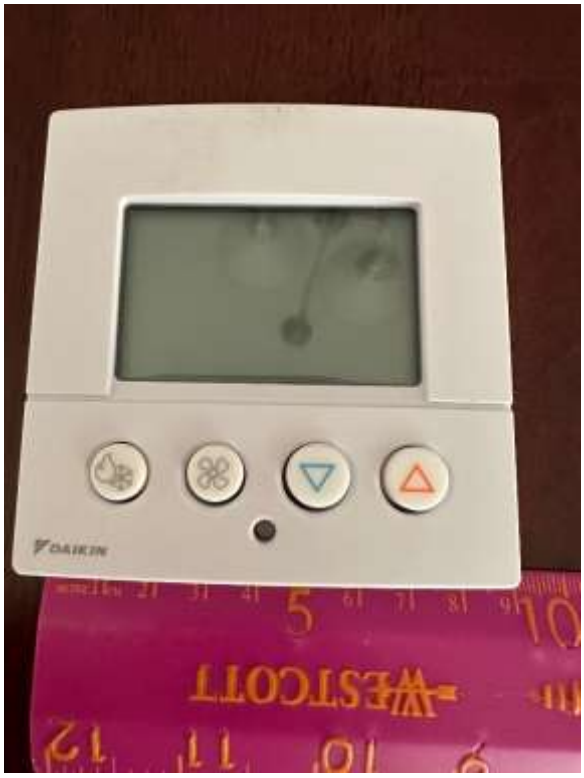
Support Equipment:

Device	Manufacturer	Model #	S/N
24Vac Power Supply	Generic	MKA-412400200	none
Laptop Computer	Lenovo	Thinkpad T500	L3B3906
USB to Serial Module	FTDI	FT2232H	none

General Product Information:

Product Information	Manufacturer-Provided Details
Equipment Type:	Stand-Alone Equipment
Type of Wideband System:	DTS
Operating Frequency Range:	2412MHz to 2462MHz
Modulation Type(s):	802.11g/n20
Maximum Duty Cycle:	98%
Number of TX Chains:	1
Antenna Type(s) and Gain:	Integral/1.6dBi
Beamforming Type:	N/A
Antenna Connection Type:	Integral
Nominal Input Voltage:	24VAC 60Hz
Firmware / Software used for Test:	EspRFTestTool
The validity of results is dependent on the stated product details, the accuracy of which the manufacturer assumes full responsibility.	

EUT Photo(s)



Front View

Back View

Left Side View

Right Side View

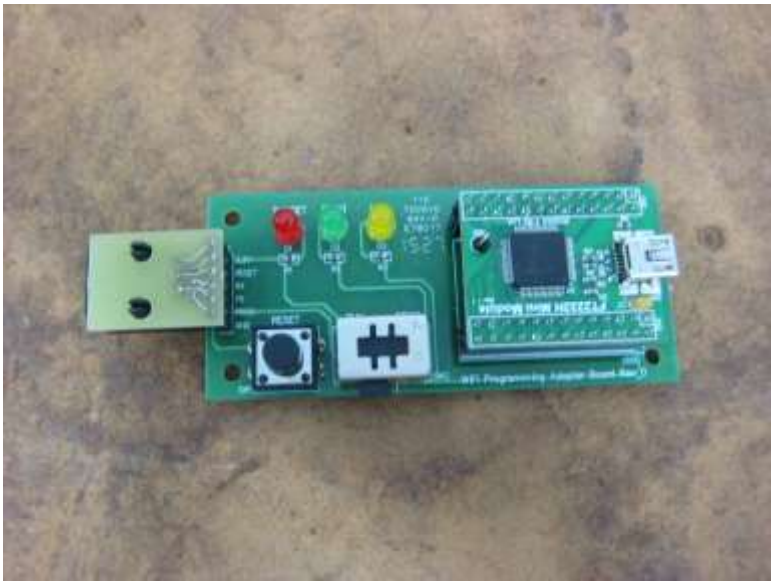
Top View

Bottom View

Support Equipment Photo(s)

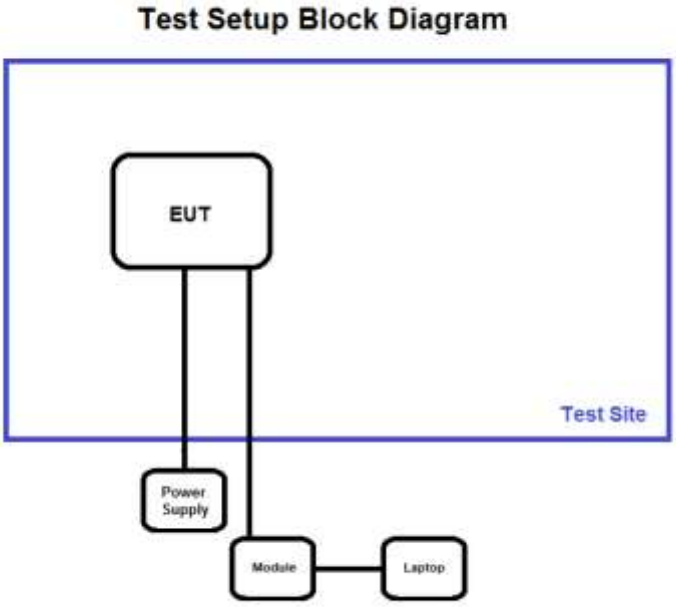
24Vac Power Supply

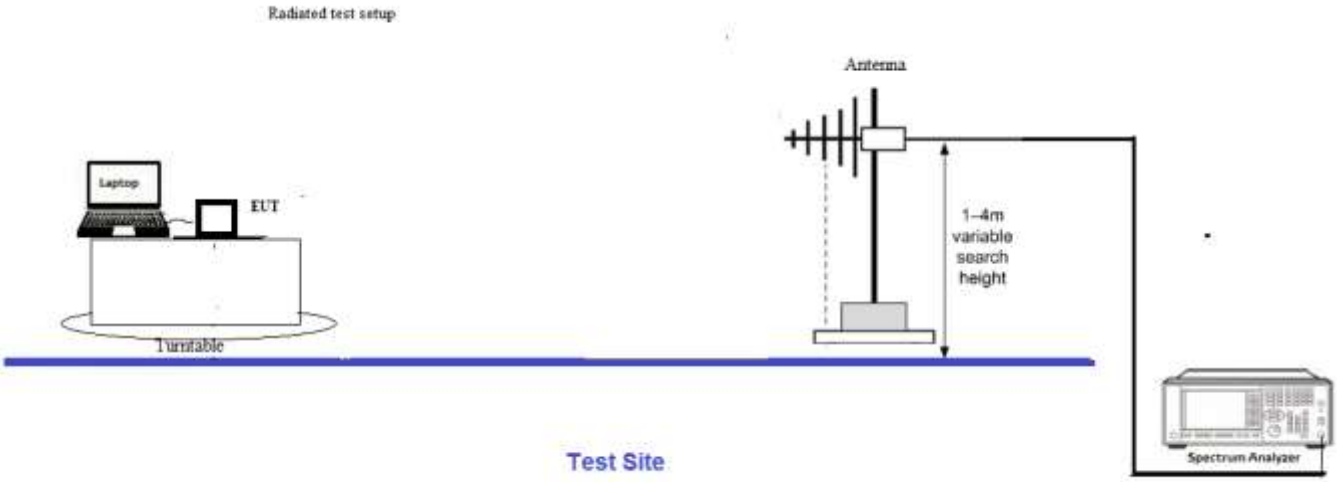
Laptop Computer



USB to Serial Module

Block Diagram of Test Setup(s)





FCC Part 15 Subpart C

15.247(a)(2) 6dB Bandwidth

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	S. Yamamoto
Test Method:	ANSI C63.10 (2013), KDB 558074	Test Date(s):	9/28/2022
Configuration:	1		
Test Setup:	The antenna port connector of the EUT is connected to the input of the spectrum analyzer using a coaxial cable and attenuator.		

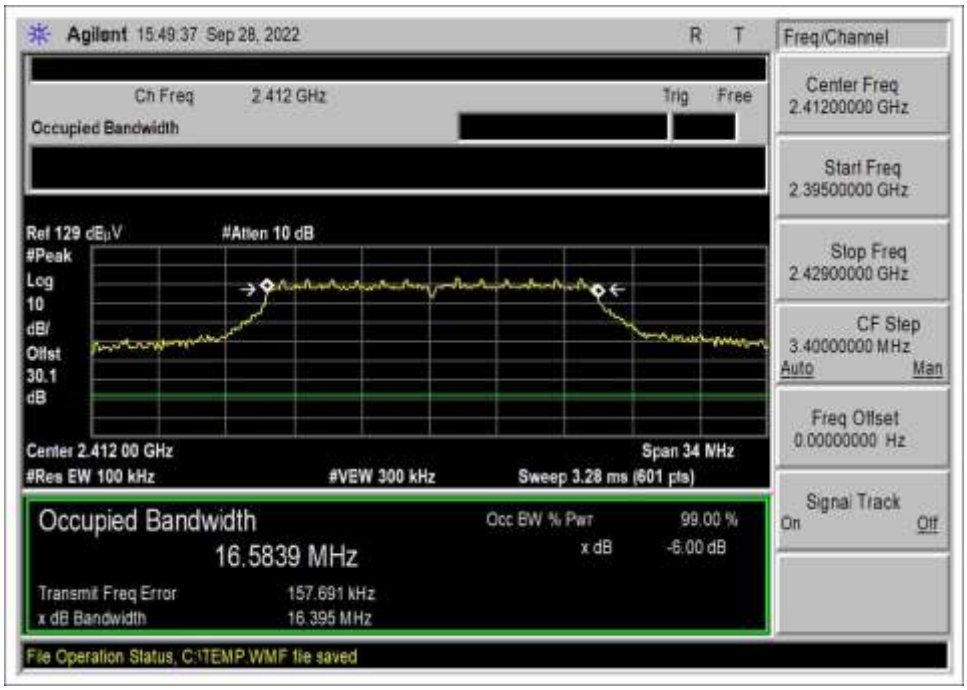
Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	42

Test Equipment					
Asset#	Description	Manufacturer	Model	Cal Date	Cal Due
02672	Spectrum Analyzer	Agilent	E4446A	5/9/2022	5/9/2024
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/28/2021	10/28/2023
P07658	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

Test Data Summary					
Frequency (MHz)	Antenna Port	Modulation	Measured (kHz)	Limit (kHz)	Results
2412	1	802.11g 6M	16395	≥500	Pass
2437	1	802.11g 6M	16407	≥500	Pass
2462	1	802.11g 6M	16401	≥500	Pass
2412	1	802.11g 54M	16532	≥500	Pass
2437	1	802.11g 54M	16526	≥500	Pass
2462	1	802.11g 54M	16523	≥500	Pass
2412	1	802.11n20 MCS0	17656	≥500	Pass
2437	1	802.11n20 MCS0	17653	≥500	Pass
2462	1	802.11n20 MCS0	17648	≥500	Pass
2412	1	802.11n20 MCS7	17800	≥500	Pass
2437	1	802.11n20 MCS7	17793	≥500	Pass
2462	1	802.11n20 MCS7	17795	≥500	Pass

Plot(s)

DTS BW 802.11g 6M



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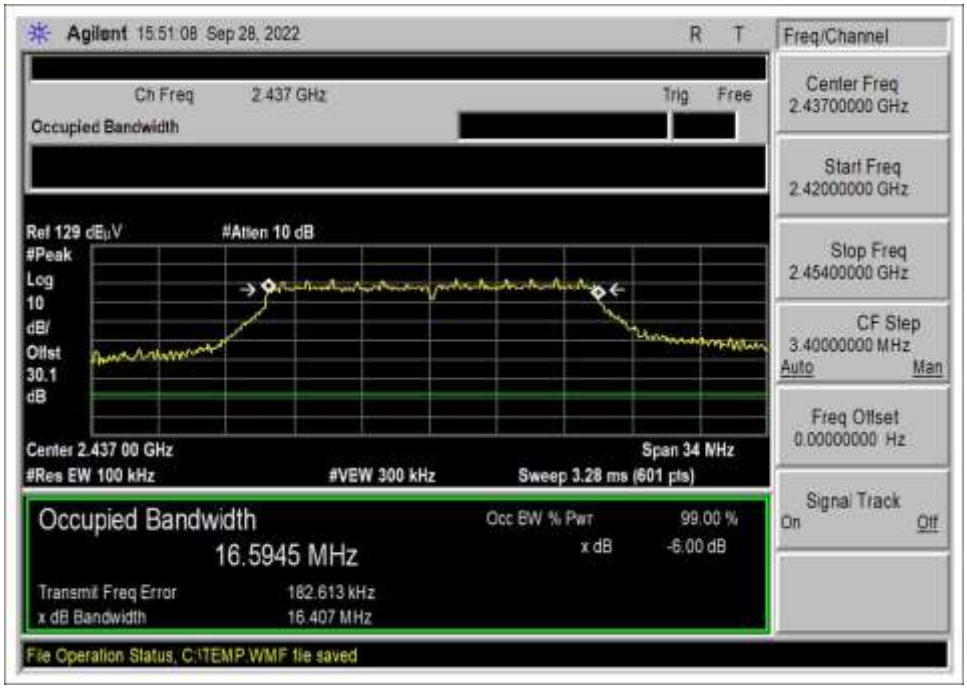

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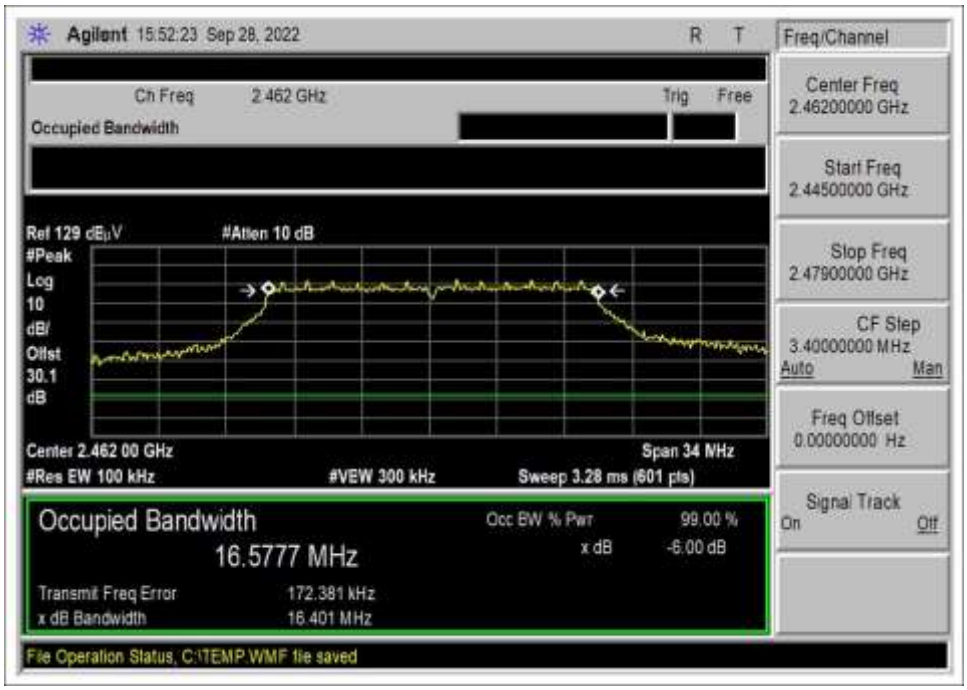

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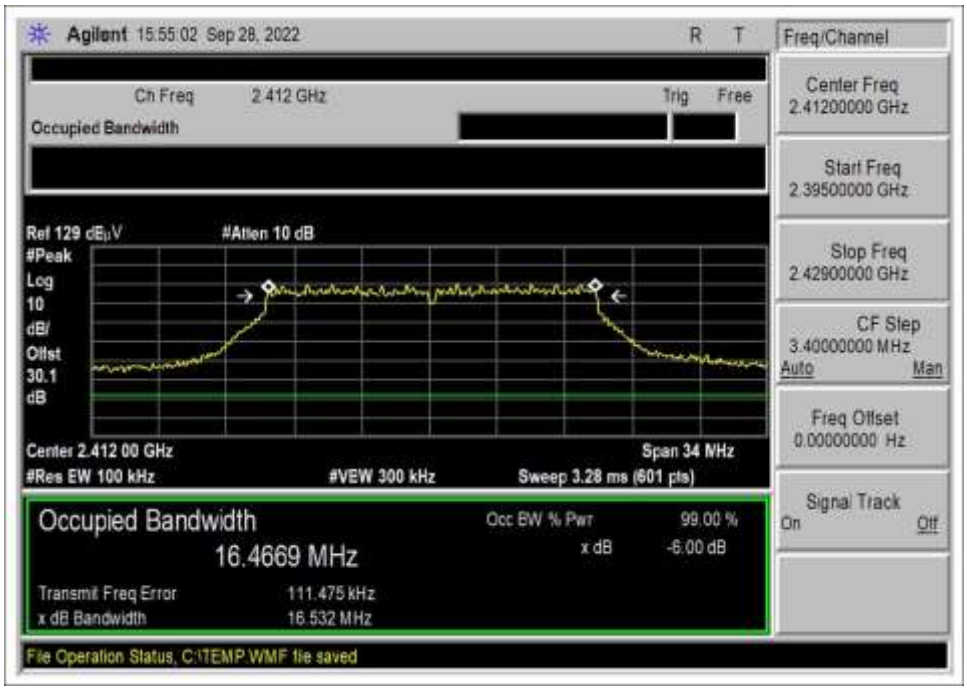
DTS BW 802.11g 54M



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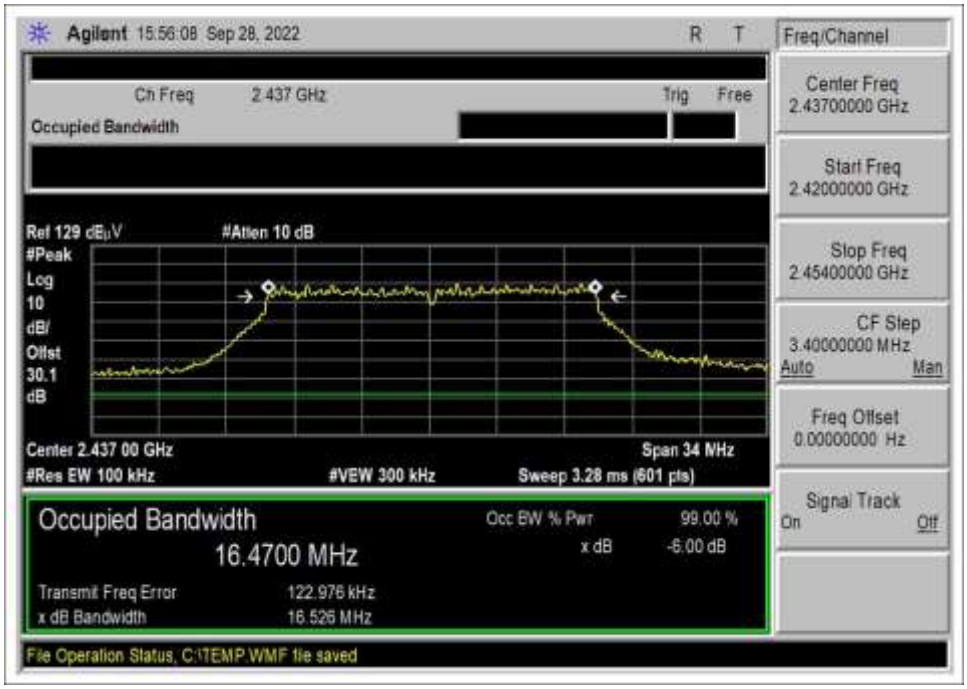

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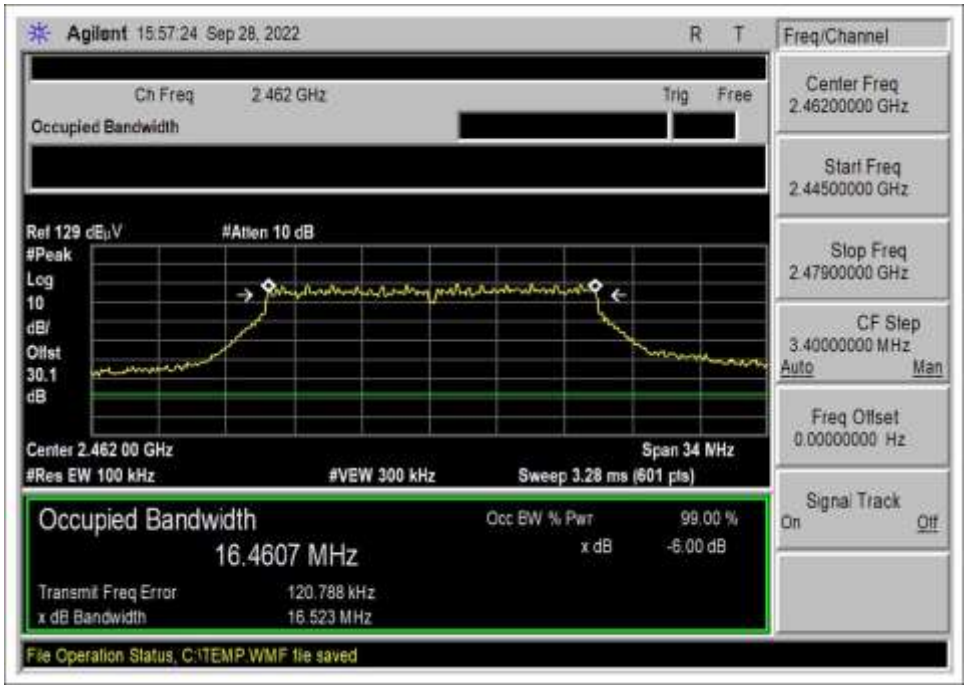

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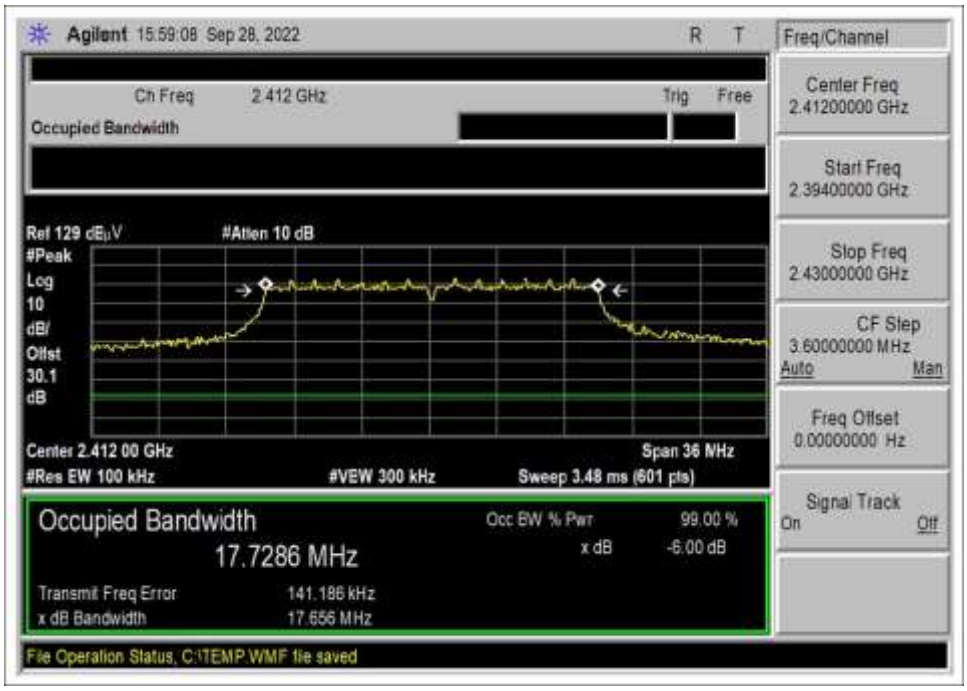
DTS BW 802.11n20 MCS0



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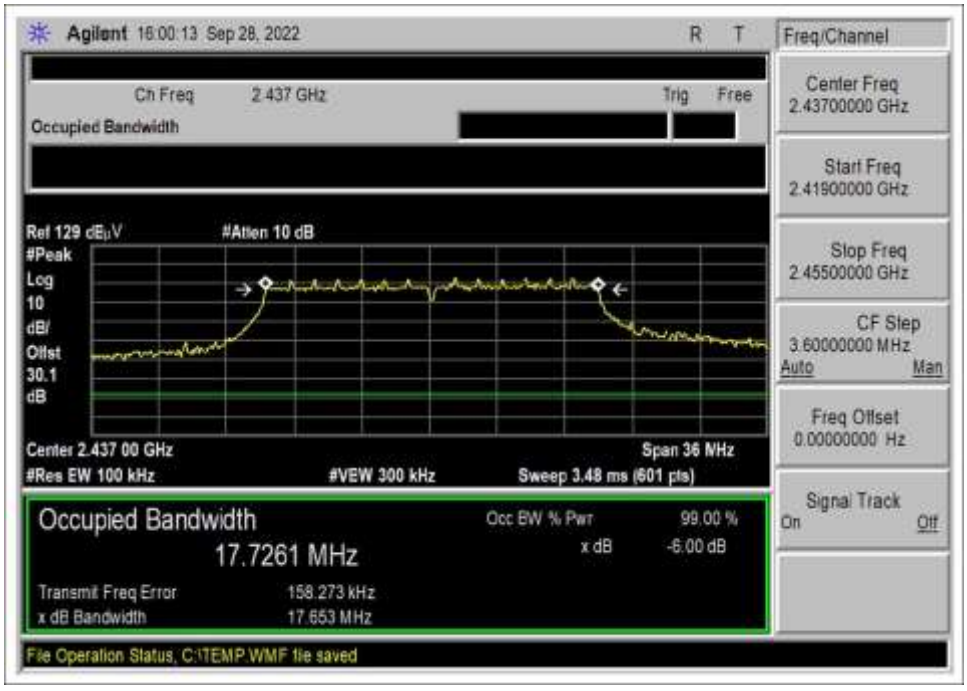

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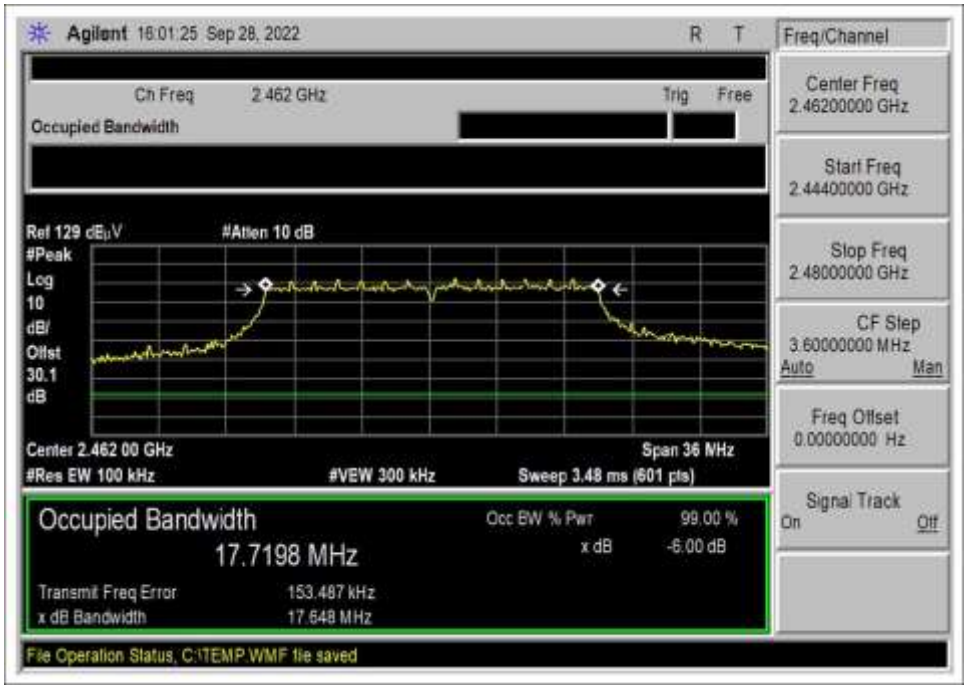

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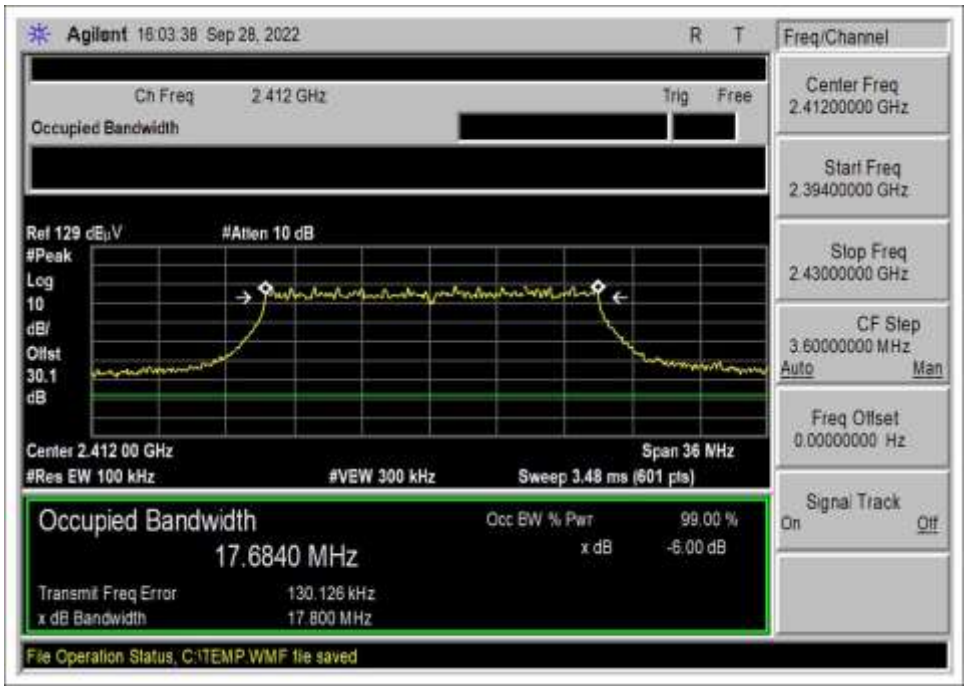

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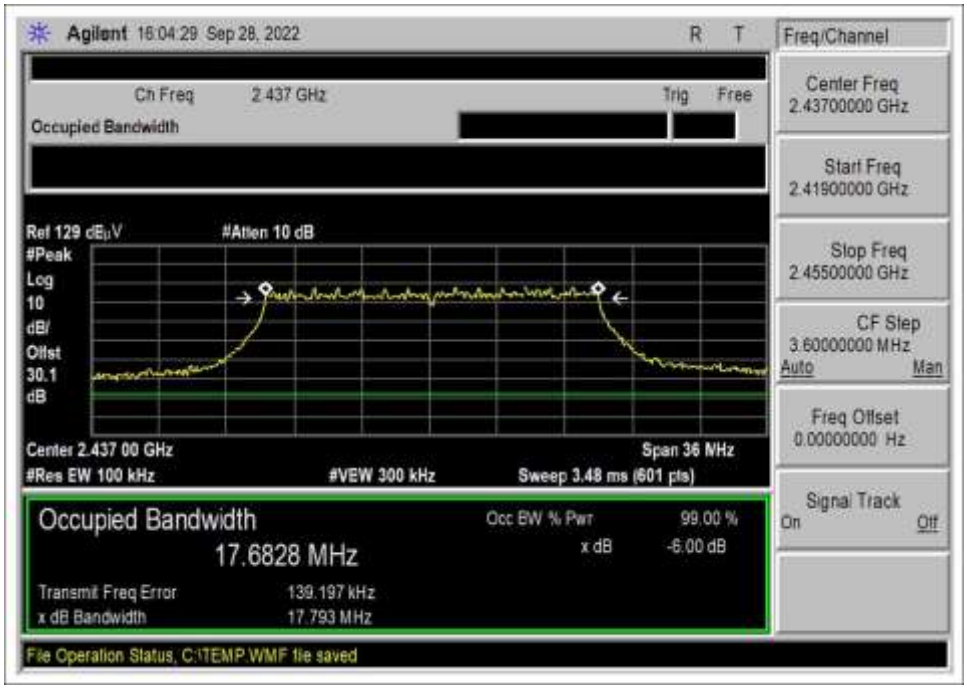

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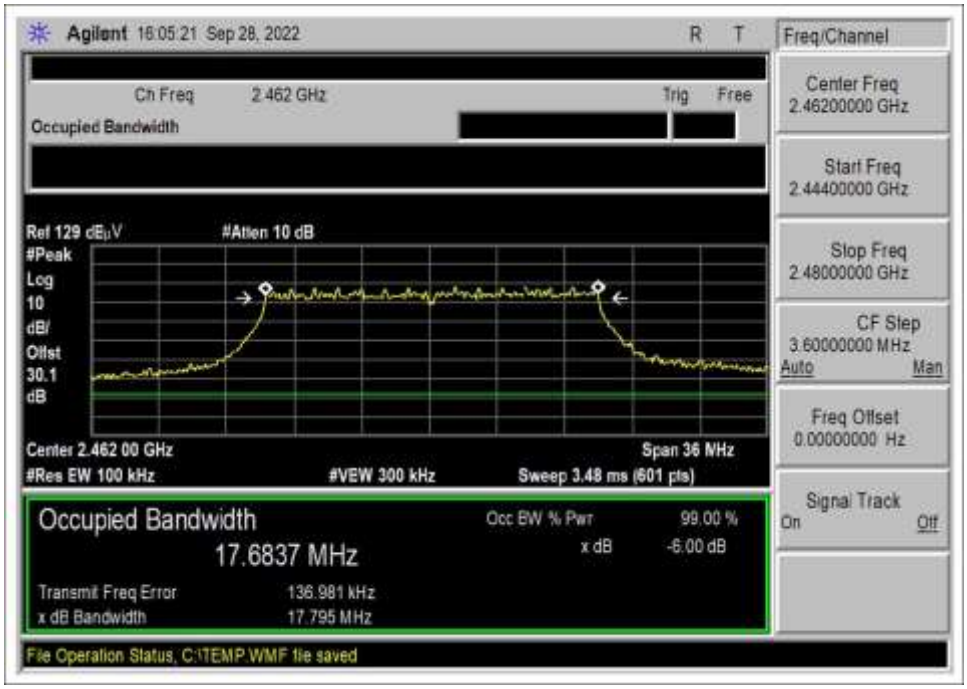
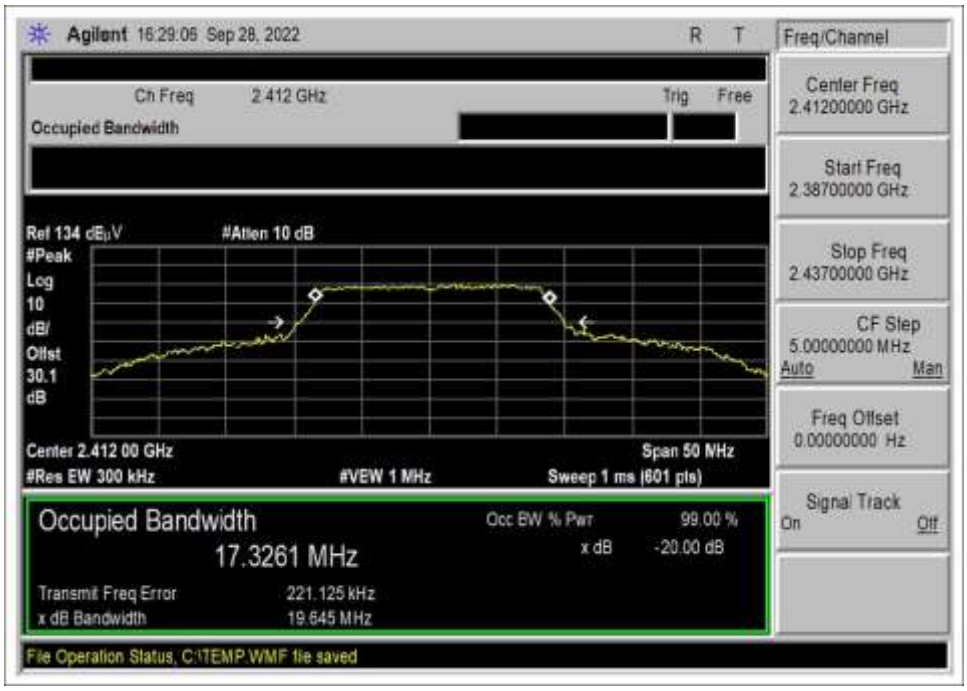


High Channel

OBW 802.11g 6M



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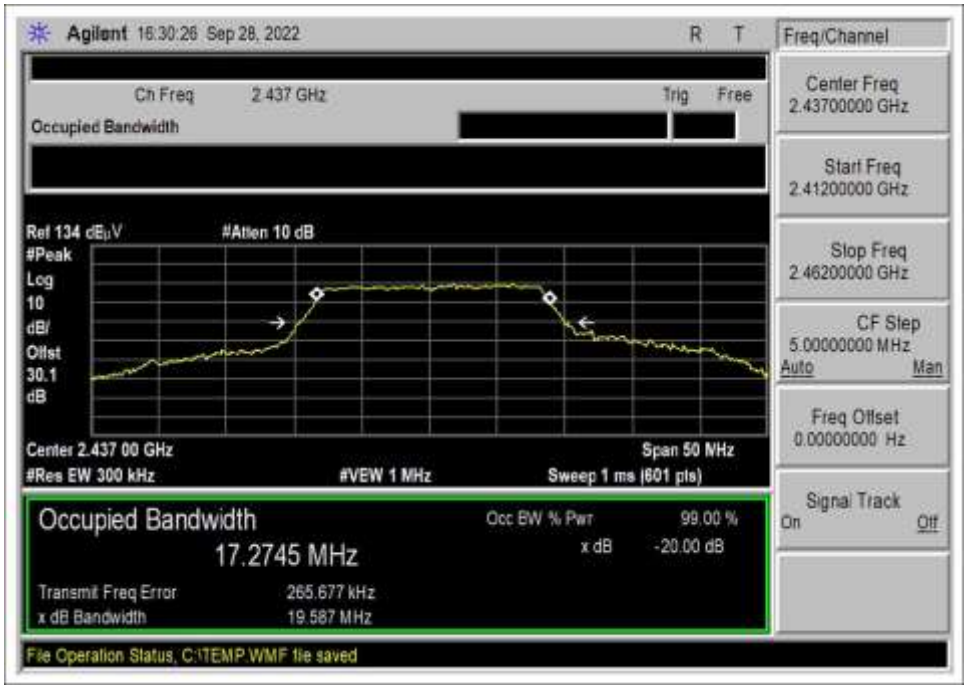

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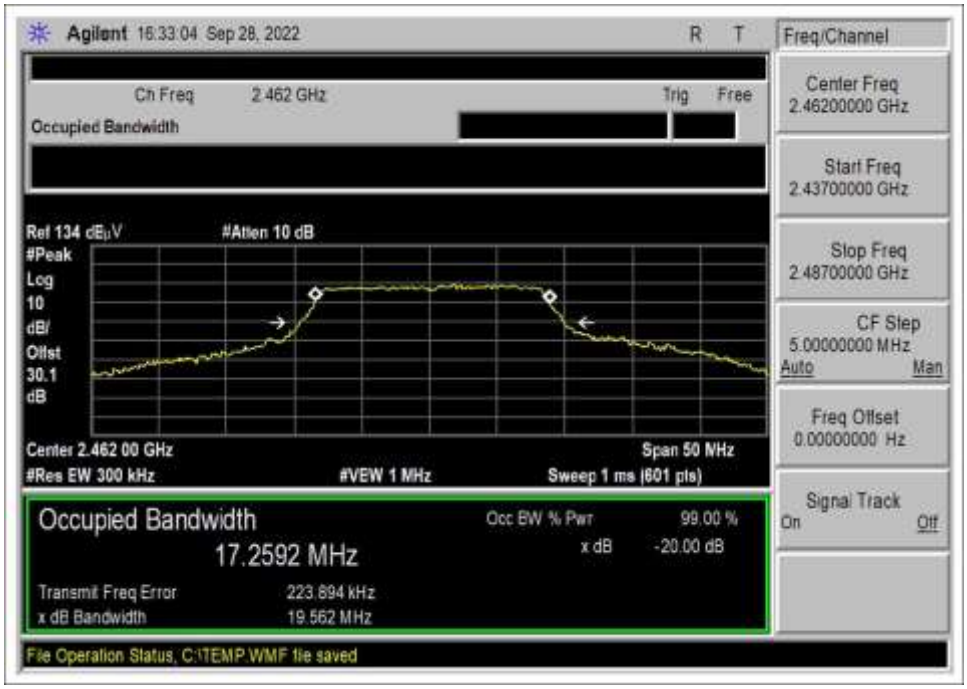
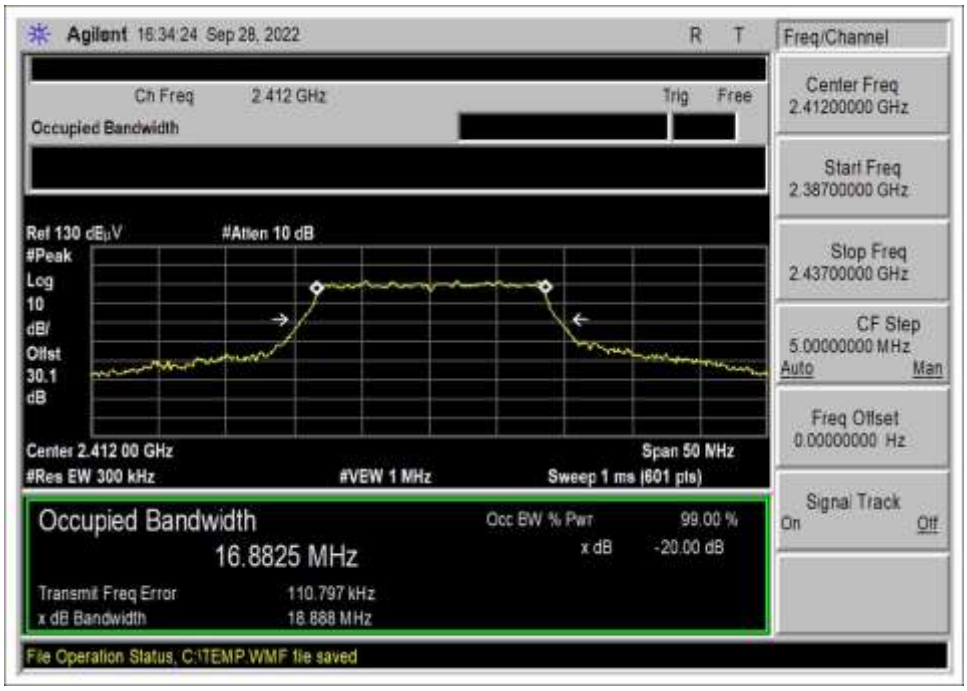


High Channel

OBW 802.11g 54M



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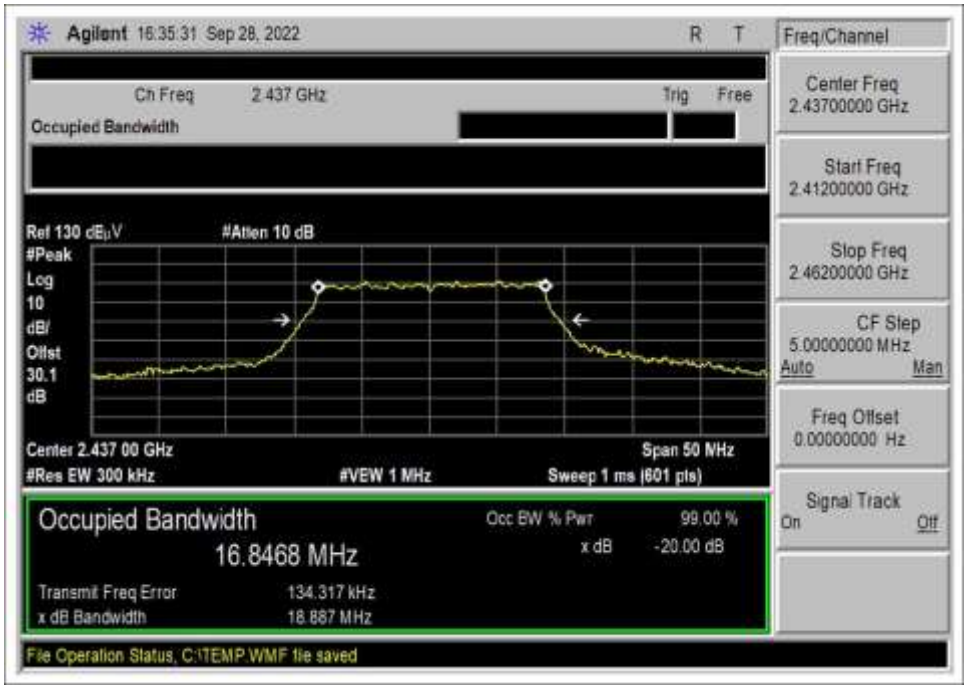

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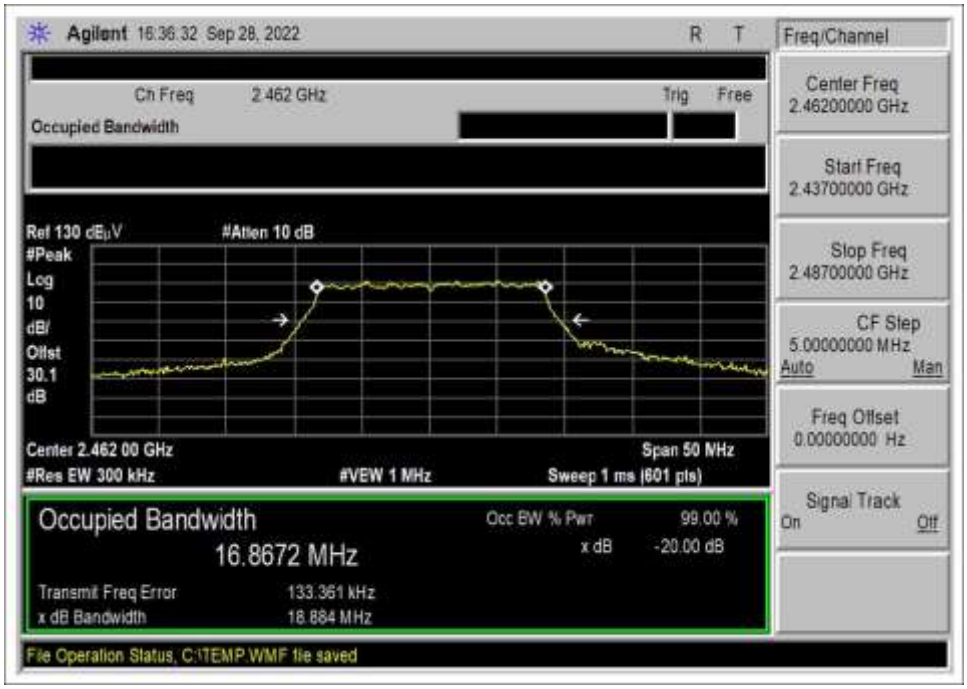

High Channel

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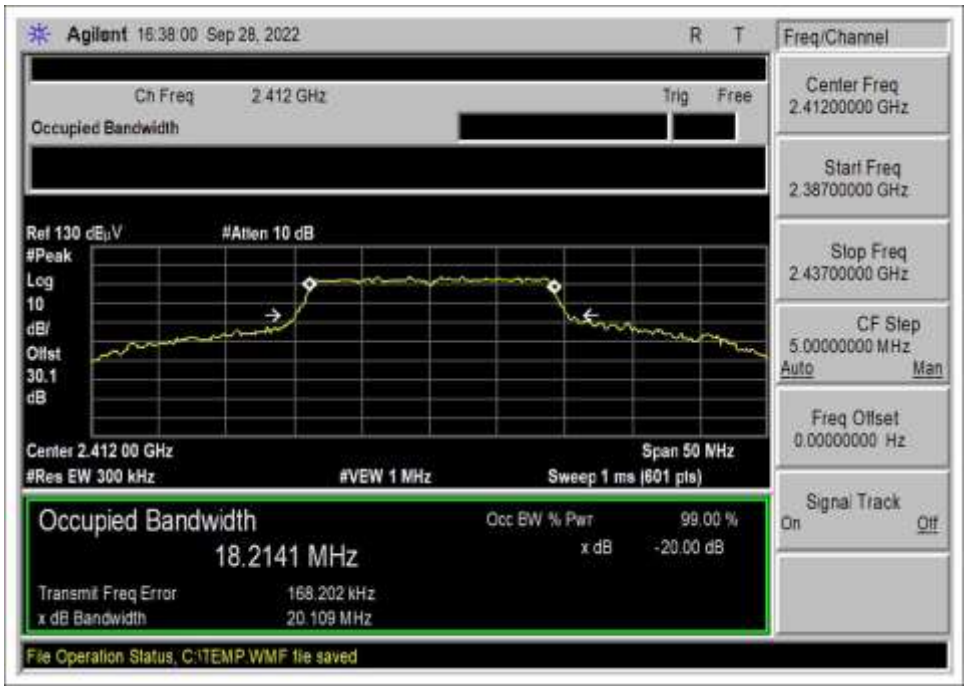

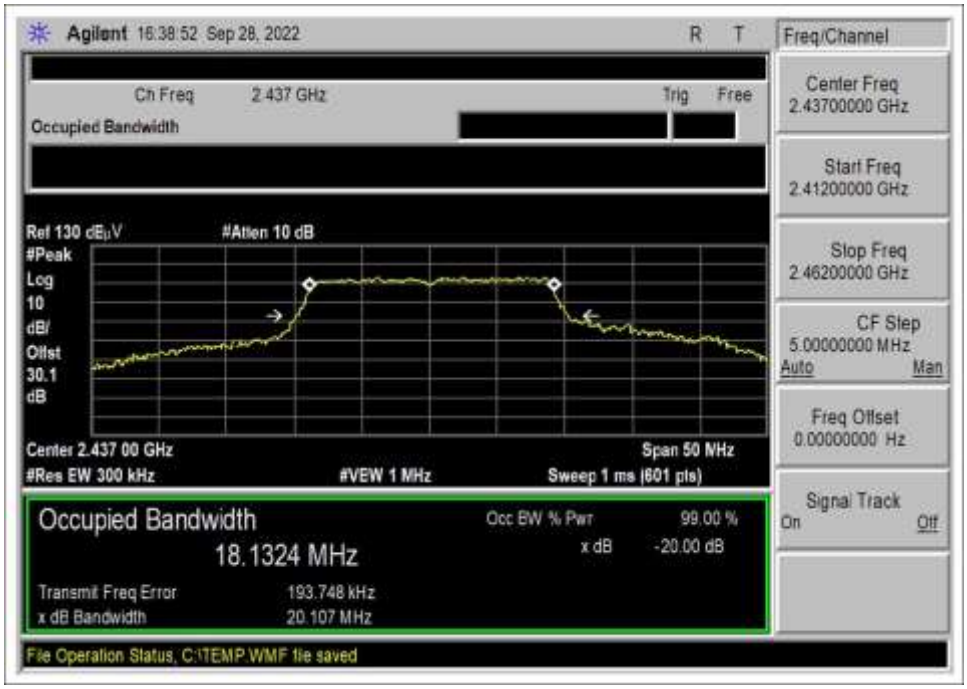

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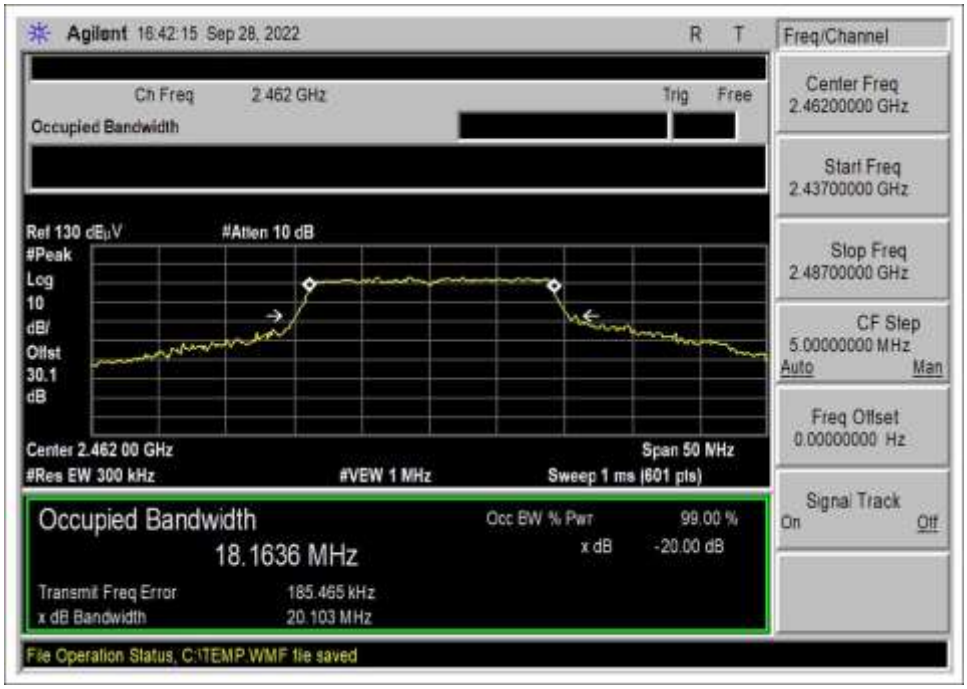

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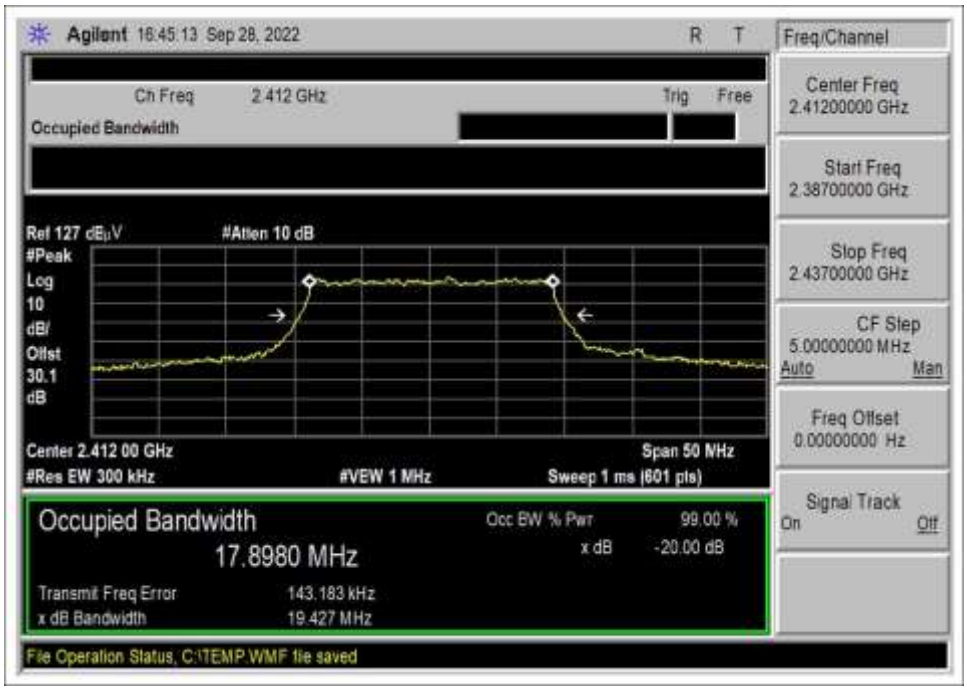
OBW 802.11n20 MCS7



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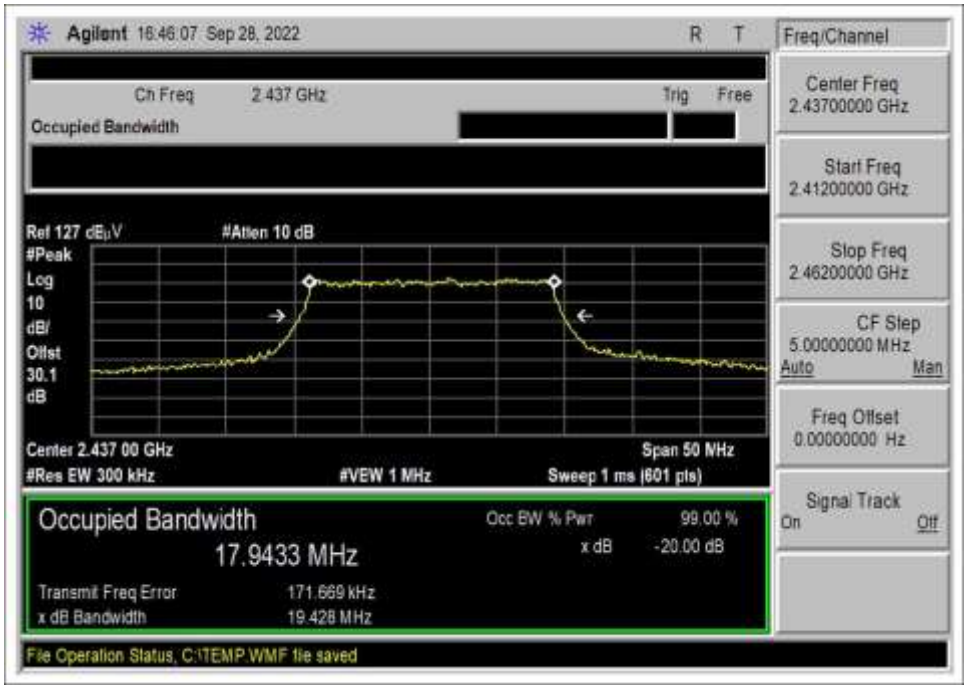

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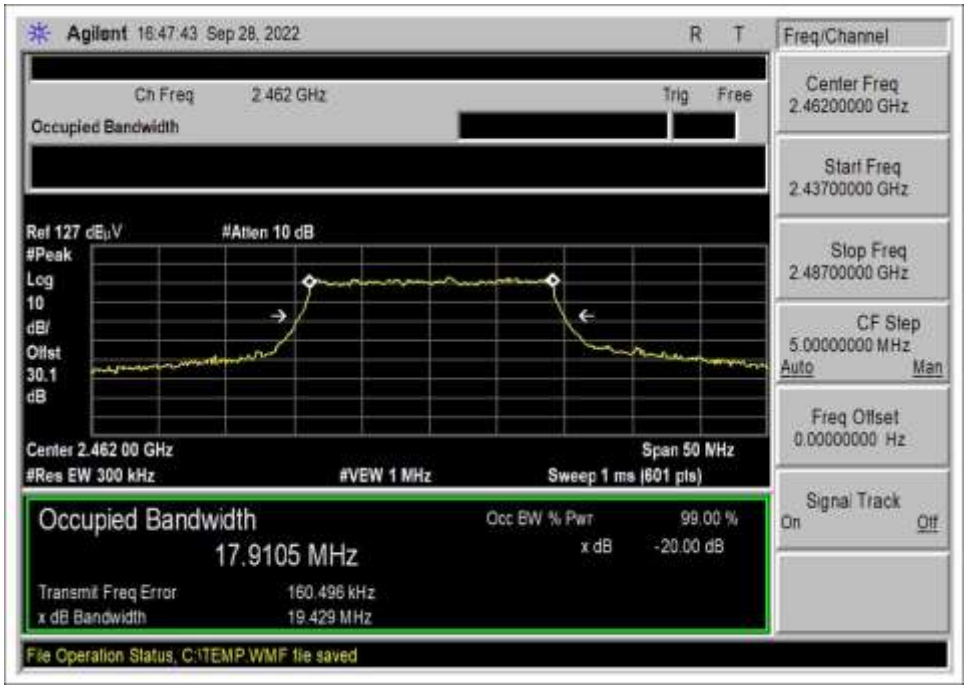
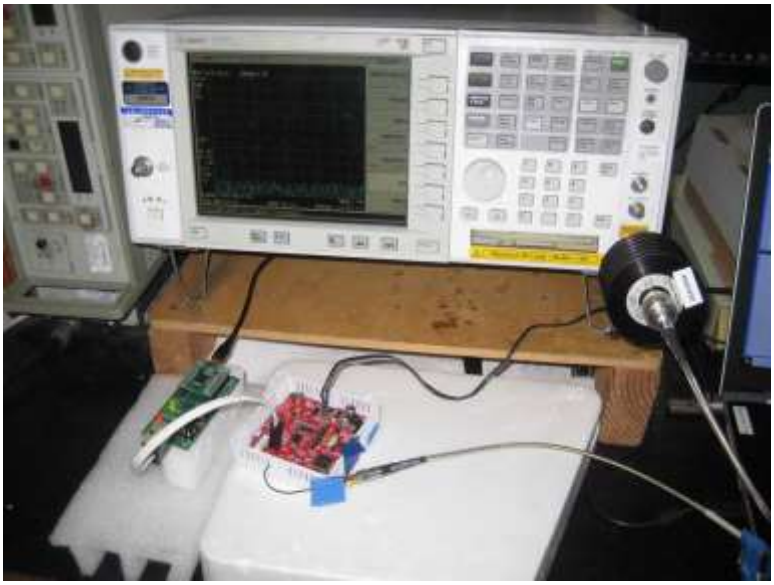


High Channel

Test Setup Photo(s)



15.247(b)(3) Output Power

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	S. Yamamoto
Test Method:	ANSI C63.10 (2013), KDB 558074	Test Date(s):	9/30/2022
Configuration:	1		
Test Setup:	The antenna port connector of the EUT is connected to the input of the spectrum analyzer using a coaxial cable and attenuator.		

Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	49

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02672	Spectrum Analyzer	Agilent	E4446A	5/9/2022	5/9/2024
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/28/2021	10/28/2023
P07658	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

Test Data Summary - Voltage Variations					
Frequency (MHz)	**Modulation / Ant Port**	**$V_{Minimum}$ (dBm)**	**$V_{Nominal}$ (dBm)**	**$V_{Maximum}$ (dBm)**	**Max Deviation from $V_{Nominal}$ (dB)**
2412	802.11g 6M	15.61	15.61	15.61	0.0
2437	802.11g 6M	15.25	15.25	15.25	0.0
2462	802.11g 6M	15.00	15.00	15.00	0.0
2412	802.11g 54M	12.60	12.60	12.60	0.0
2437	802.11g 54M	11.87	11.87	11.87	0.0
2462	802.11g 54M	11.65	11.65	11.65	0.0
2412	802.11n20 MCS0	15.70	15.70	15.70	0.0
2437	802.11n20 MCS0	15.10	15.10	15.10	0.0
2462	802.11n20 MCS0	15.01	15.01	15.01	0.0
2412	802.11n20 MCS7	11.40	11.40	11.40	0.0
2437	802.11n20 MCS7	10.70	10.70	10.70	0.0
2462	802.11n20 MCS7	10.45	10.45	10.45	0.0

Test performed using operational mode with the highest output power, representing worst case.

Parameter Definitions:

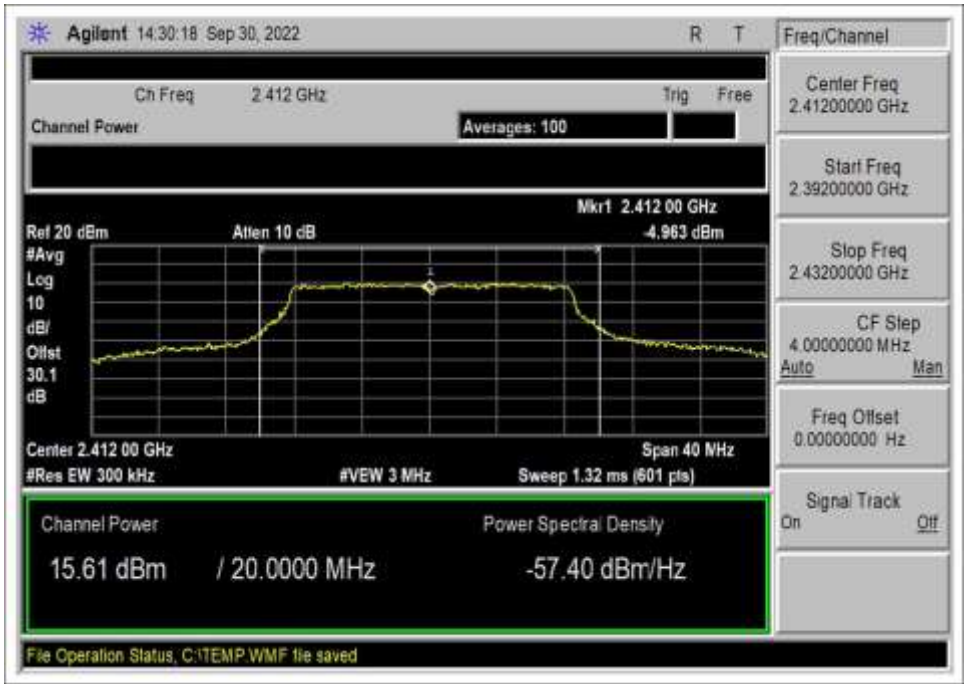
Measurements performed at input voltage Vnominal ± 15%.

Parameter	Value
$V_{Nominal}$:	24Vac
$V_{Minimum}$:	20.4Vac
$V_{Maximum}$:	27.6Vac

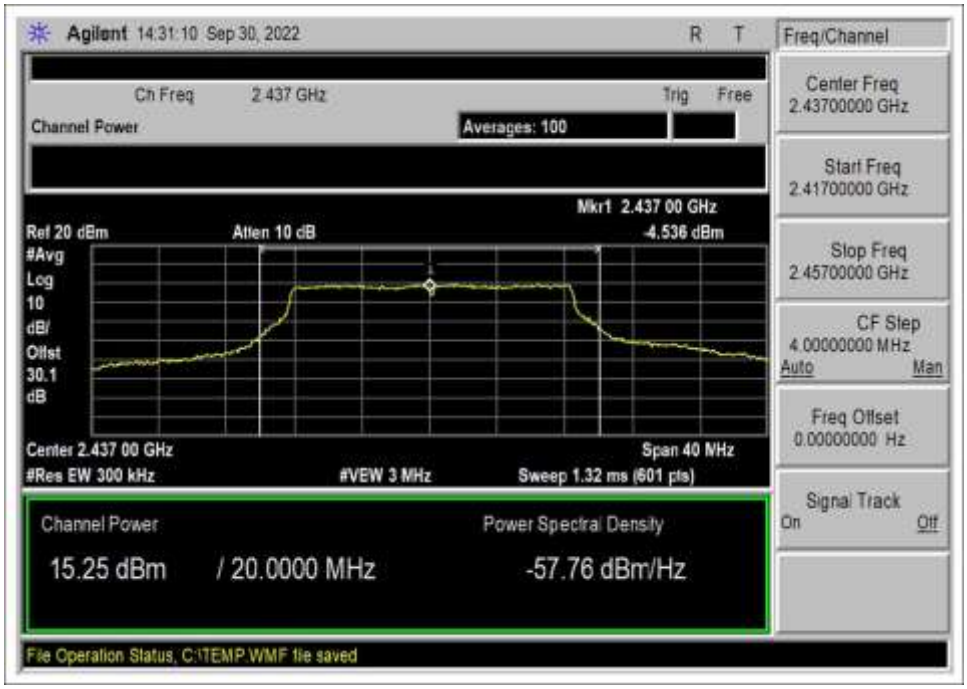
Test Data Summary - RF Conducted Measurement					
Measurement Option: AVGSA-1					
Frequency (MHz)	**Modulation**	**Ant. Type / Gain (dBi)**	**Measured (dBm)**	**Limit (dBm)**	**Results**
2412	802.11g 6M	Integral / 1.6	15.61	≤ 30	Pass
2437	802.11g 6M	Integral / 1.6	15.25	≤ 30	Pass
2462	802.11g 6M	Integral / 1.6	15.00	≤ 30	Pass
2412	802.11g 54M	Integral / 1.6	12.60	≤ 30	Pass
2437	802.11g 54M	Integral / 1.6	11.87	≤ 30	Pass
2462	802.11g 54M	Integral / 1.6	11.65	≤ 30	Pass
2412	802.11n20 MCS0	Integral / 1.6	15.70	≤ 30	Pass
2437	802.11n20 MCS0	Integral / 1.6	15.10	≤ 30	Pass
2462	802.11n20 MCS0	Integral / 1.6	15.01	≤ 30	Pass
2412	802.11n20 MCS7	Integral / 1.6	11.40	≤ 30	Pass
2437	802.11n20 MCS7	Integral / 1.6	10.70	≤ 30	Pass
2462	802.11n20 MCS7	Integral / 1.6	10.45	≤ 30	Pass

Plot Data

802.11g 6M



Low Channel



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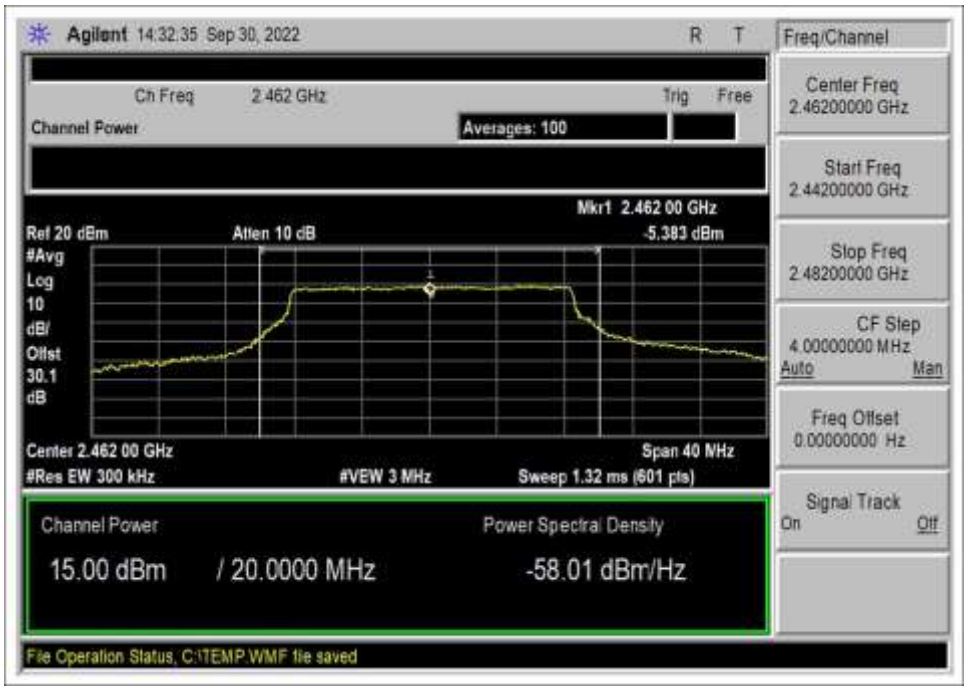
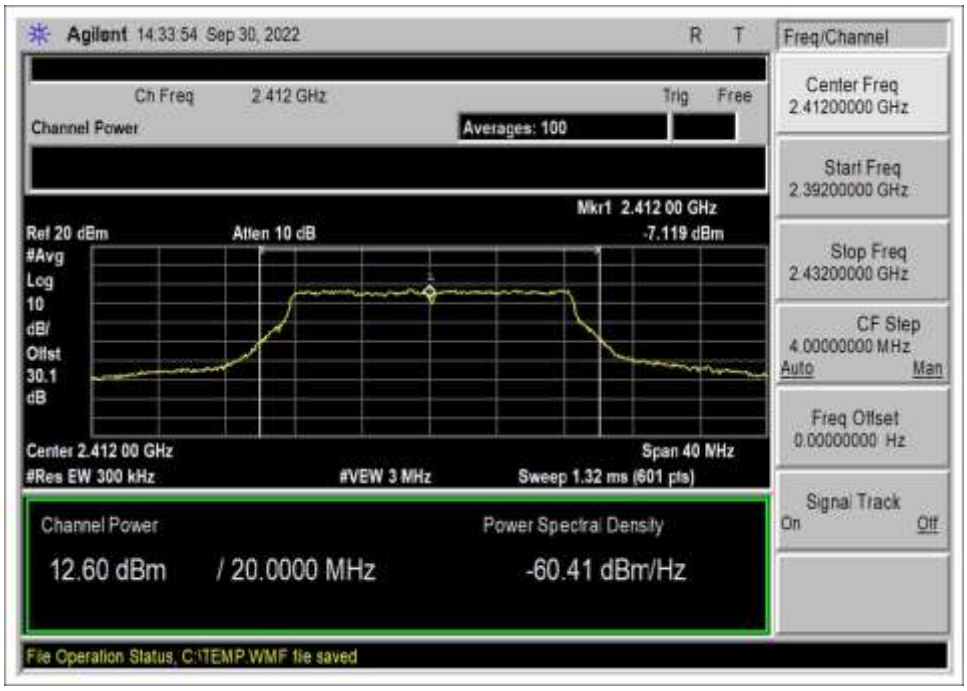


High Channel

802.11g 54M



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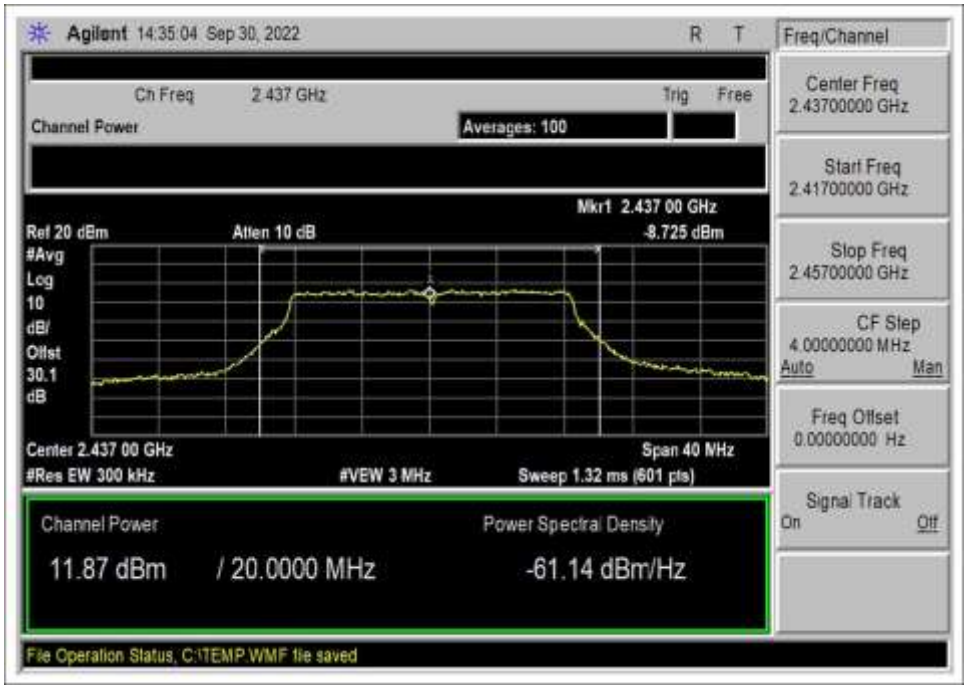

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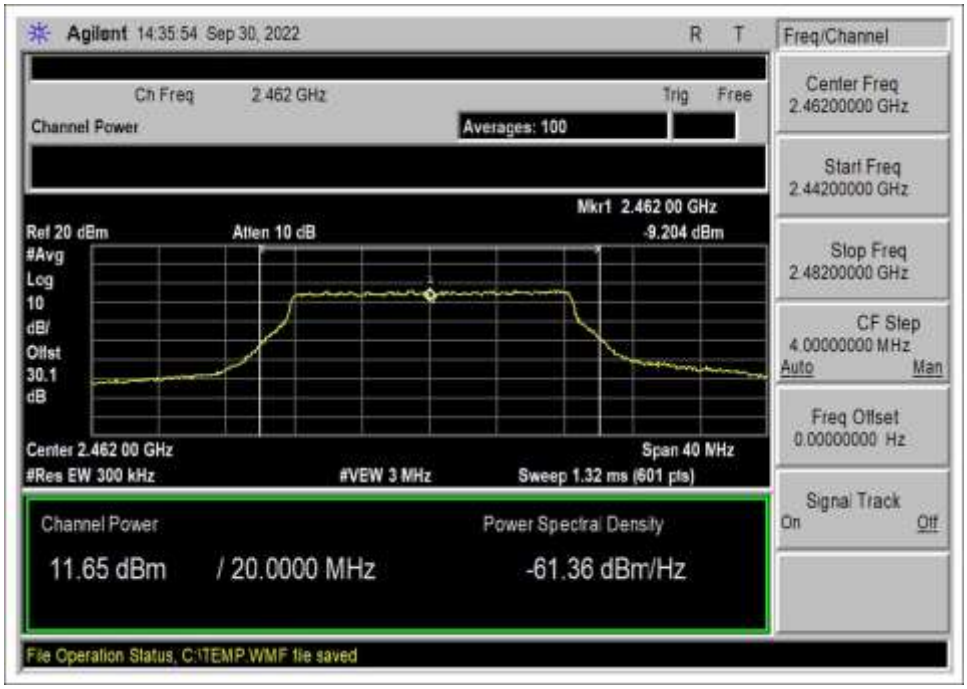
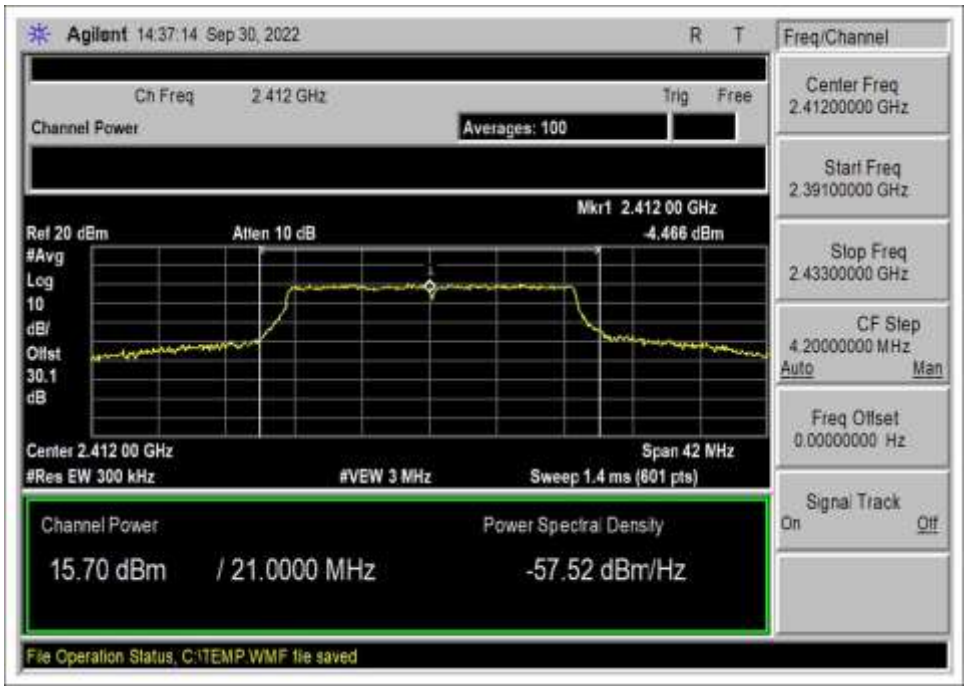
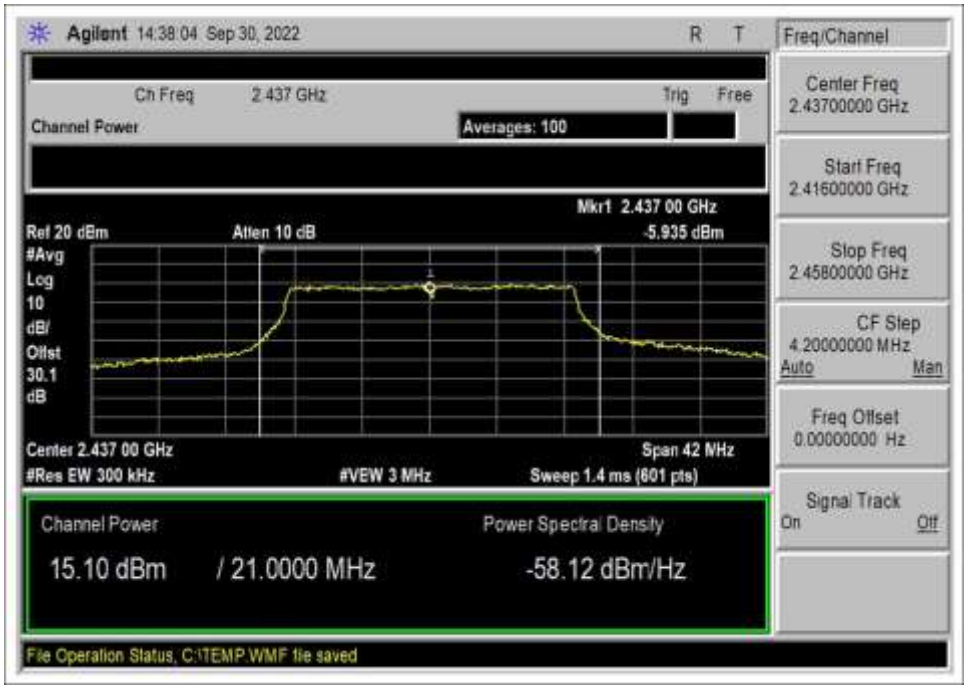


High Channel

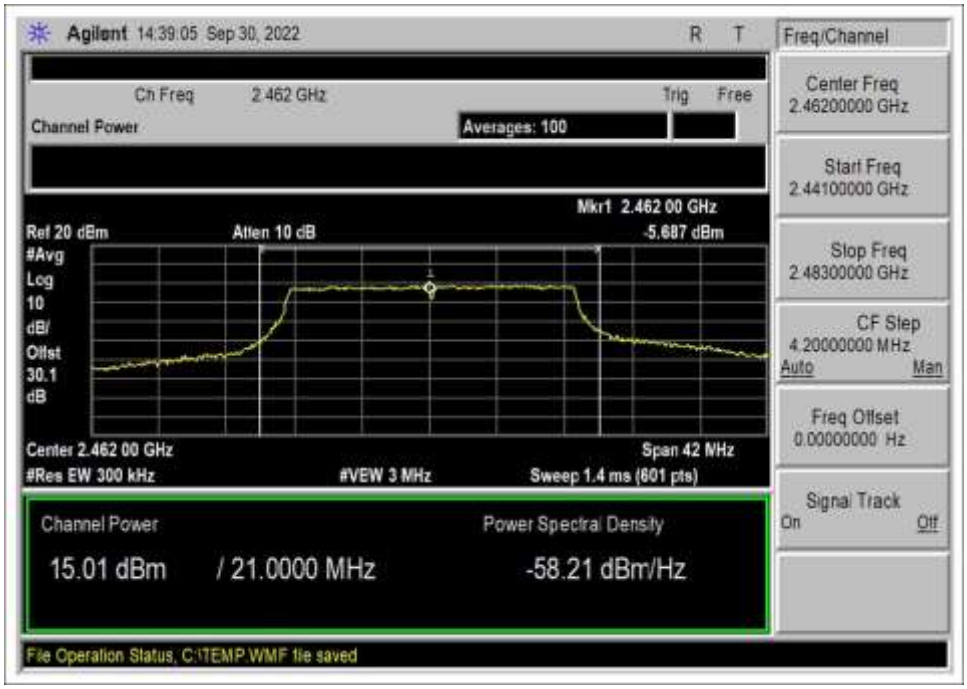
802.11n20 MCS0



Low Channel

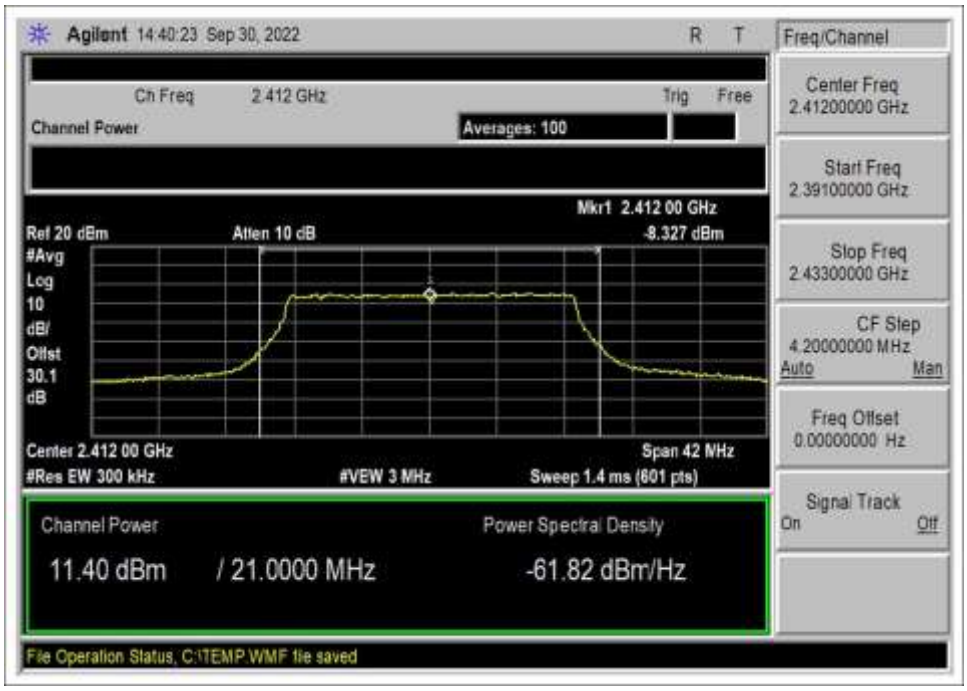


Middle Channel

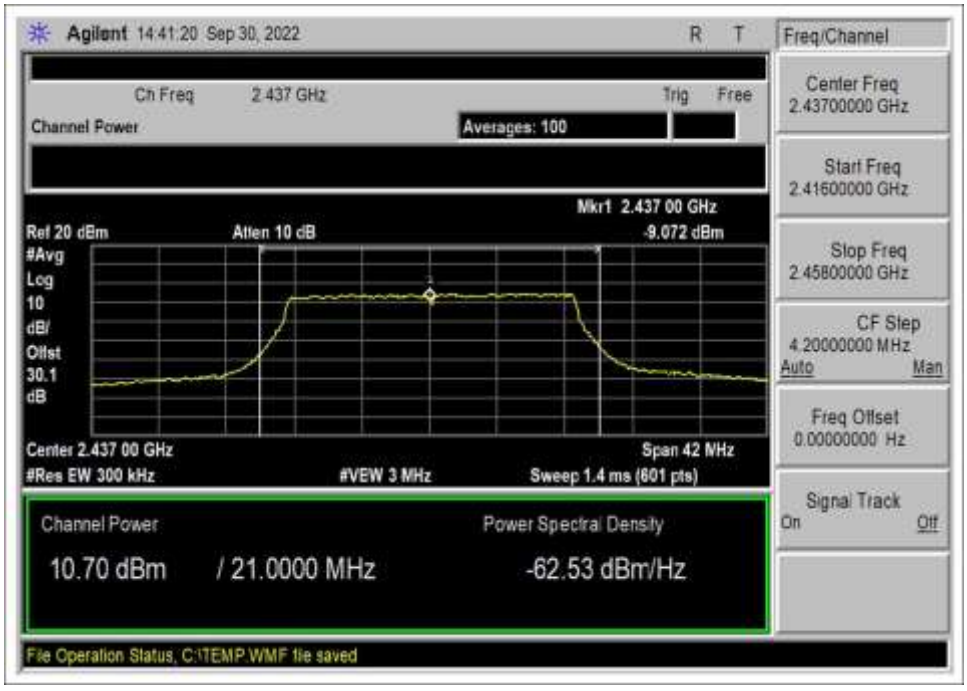


High Channel

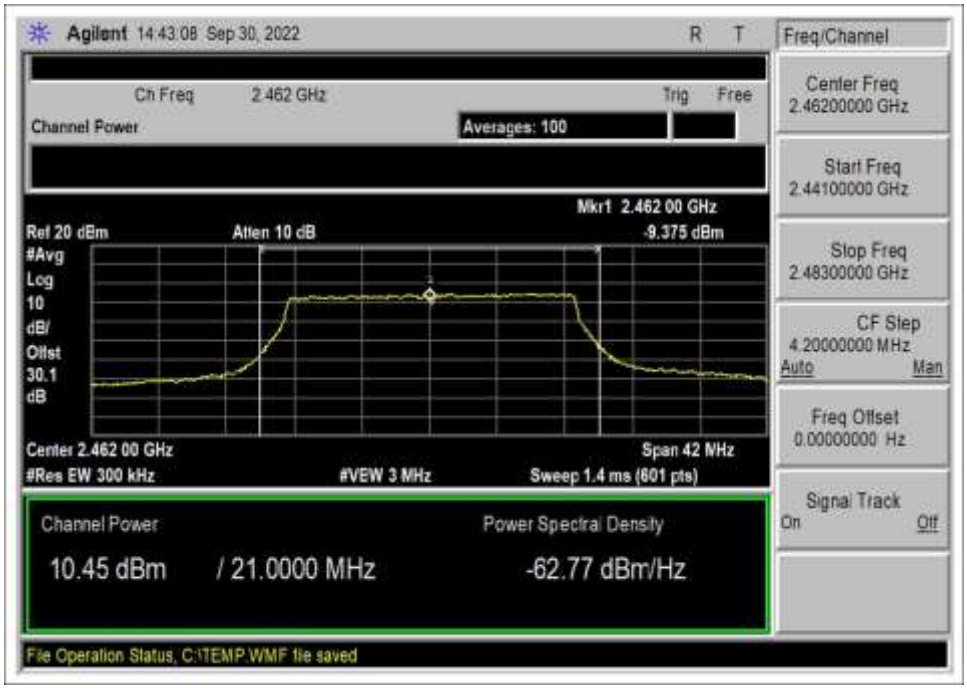
802.11n20 MCS7



Low Channel



Middle Channel



High Channel

Test Setup / Conditions / Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(b) Power Output (2400-2483.5 MHz DTS)**		
Work Order #:	**107533**	Date:	9/30/2022
Test Type:	**Conducted Emissions**	Time:	14:56:56
Tested By:	S. Yamamoto	Sequence#:	1
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via WiFi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

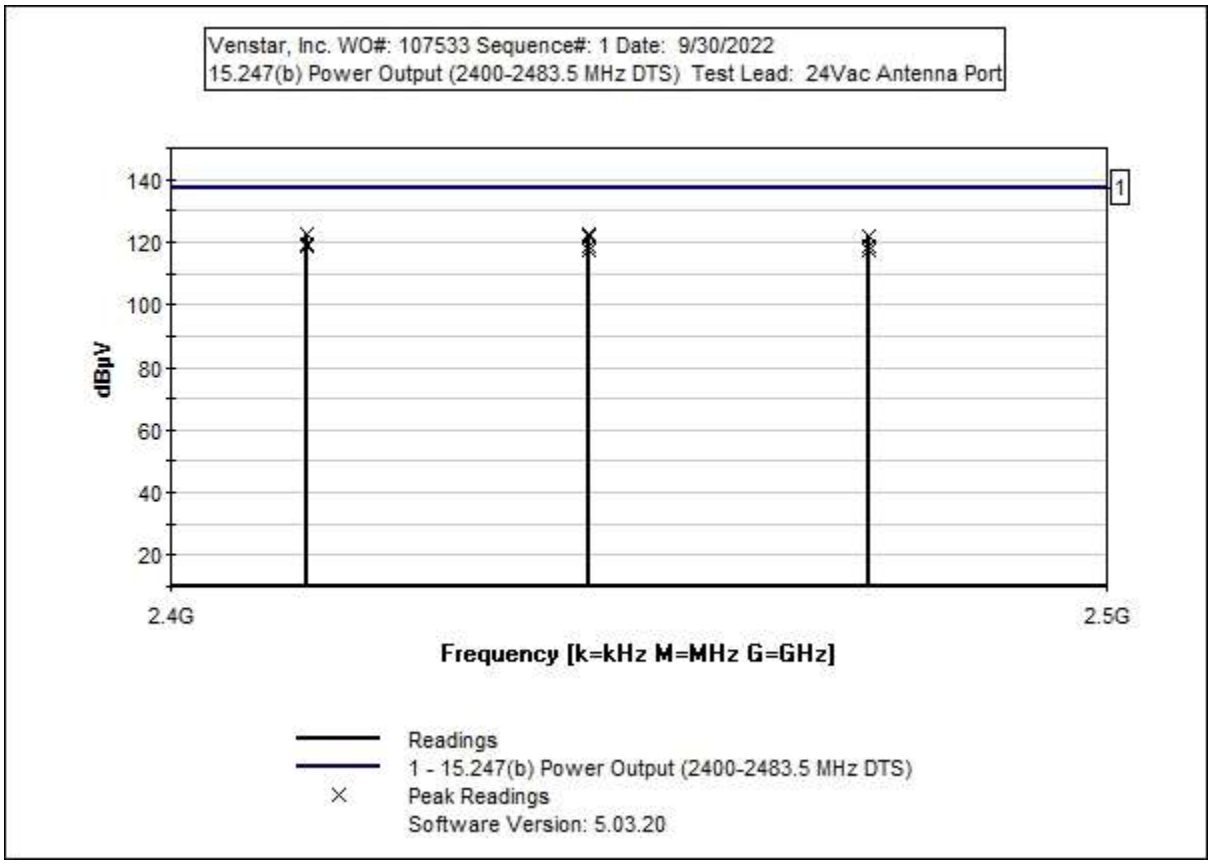
Testing Frequencies:
Low channel 2412MHz
Middle channel 2437MHz
High channel 2462MHz

Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

Modulation: OFDM, BPSK, 64-QAM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2412MHz to 2462MHz
RBW=300kHz, VBW=3MHz

ANSI C63.10-2013
558074 D01 15.247 Meas Guidance v05r02



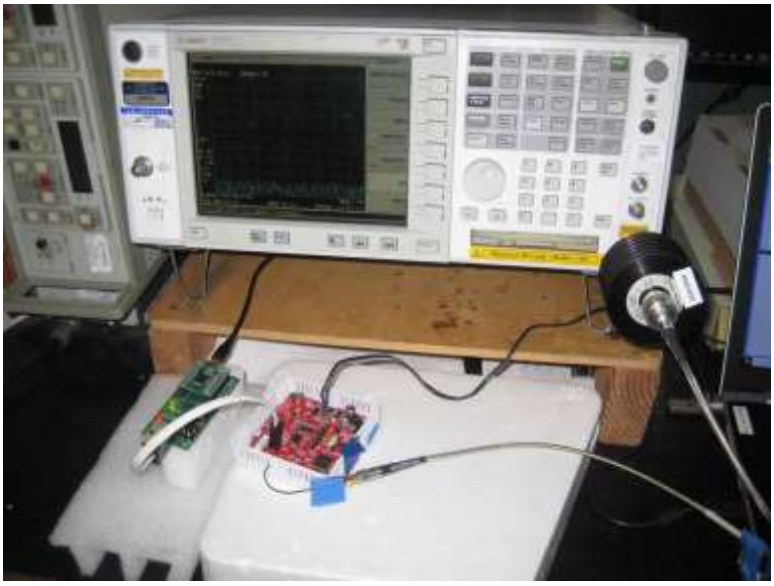
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T3	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2412.000M	92.6	+0.0	+0.5	+29.6		+0.0	122.7	137.0	-14.3	Anten
2	2412.000M	92.5	+0.0	+0.5	+29.6		+0.0	122.6	137.0	-14.4	Anten
3	2437.000M	92.2	+0.0	+0.5	+29.6		+0.0	122.3	137.0	-14.8	Anten
4	2437.000M	92.0	+0.0	+0.5	+29.6		+0.0	122.1	137.0	-14.9	Anten
5	2462.000M	91.9	+0.0	+0.4	+29.6		+0.0	121.9	137.0	-15.1	Anten
6	2462.000M	91.9	+0.0	+0.4	+29.6		+0.0	121.9	137.0	-15.1	Anten
7	2412.000M	89.5	+0.0	+0.5	+29.6		+0.0	119.6	137.0	-17.4	Anten
8	2437.000M	88.8	+0.0	+0.5	+29.6		+0.0	118.9	137.0	-18.1	Anten
9	2462.000M	88.6	+0.0	+0.4	+29.6		+0.0	118.6	137.0	-18.5	Anten
10	2412.000M	88.3	+0.0	+0.5	+29.6		+0.0	118.4	137.0	-18.6	Anten
11	2437.000M	87.6	+0.0	+0.5	+29.6		+0.0	117.7	137.0	-19.3	Anten
12	2462.000M	87.3	+0.0	+0.4	+29.6		+0.0	117.4	137.0	-19.7	Anten

Test Setup Photo(s)



15.247(d) RF Conducted Emissions & Band Edge

Test Setup / Conditions/ Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) Conducted Spurious Emissions**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	09:19:54
Tested By:	S. Yamamoto	Sequence#:	4
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequencies:
Low channel 2412MHz
Middle channel 2437MHz
High channel 2462MHz

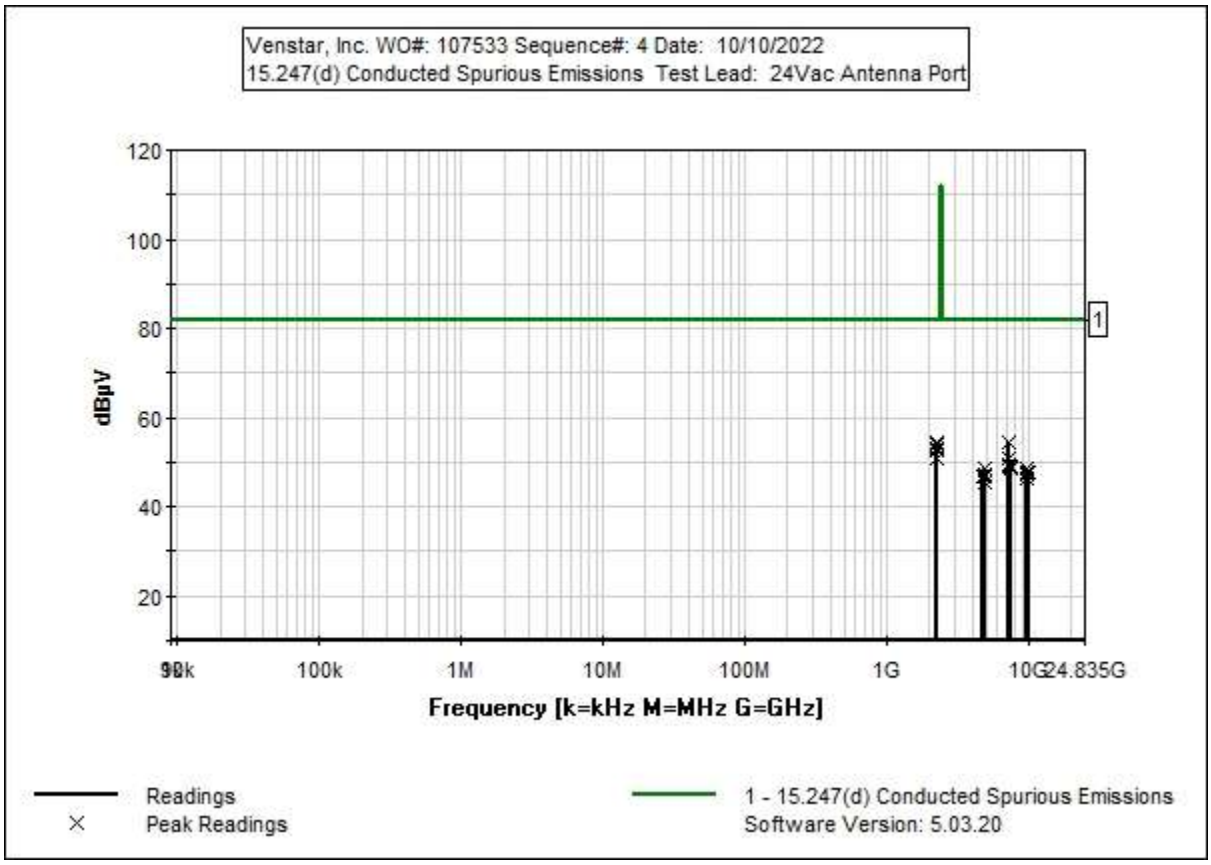
Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)

Modulation: OFDM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 9kHz to 25GHz
RBW=100kHz, VBW=300kHz
30dBc limit line

Test Environment Conditions:
Temperature: 23°C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10-2013, KDB 558074
558074 D01 15.247 Meas Guidance v05r02



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T2	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2240.083M	24.6	+0.4	+29.6			+0.0	54.6	81.9	-27.3	Anten
2	7238.230M	24.0	+0.9	+29.6			+0.0	54.5	81.9	-27.4	Anten
3	2240.117M	24.0	+0.4	+29.6			+0.0	54.0	81.9	-27.9	Anten
4	2240.106M	23.0	+0.4	+29.6			+0.0	53.0	81.9	-28.9	Anten
5	2240.109M	22.6	+0.4	+29.6			+0.0	52.6	81.9	-29.3	Anten
6	2240.083M	20.9	+0.4	+29.6			+0.0	50.9	81.9	-31.0	Anten
7	2240.120M	20.9	+0.4	+29.6			+0.0	50.9	81.9	-31.0	Anten
8	7306.030M	20.5	+0.9	+29.5			+0.0	50.9	81.9	-31.0	Anten
9	7233.230M	19.1	+0.9	+29.6			+0.0	49.6	81.9	-32.3	Anten
10	7316.570M	18.8	+0.9	+29.5			+0.0	49.2	81.9	-32.7	Anten
11	7386.330M	18.7	+0.8	+29.5			+0.0	49.0	81.9	-32.9	Anten
12	4881.370M	18.3	+0.7	+29.6			+0.0	48.6	81.9	-33.3	Anten
13	7387.670M	18.2	+0.8	+29.5			+0.0	48.5	81.9	-33.4	Anten
14	9752.830M	18.2	+1.0	+29.3			+0.0	48.5	81.9	-33.4	Anten
15	9743.470M	17.5	+1.0	+29.3			+0.0	47.8	81.9	-34.1	Anten
16	9650.530M	17.4	+0.9	+29.4			+0.0	47.7	81.9	-34.2	Anten
17	9852.230M	17.4	+1.0	+29.2			+0.0	47.6	81.9	-34.3	Anten
18	4926.430M	17.0	+0.7	+29.6			+0.0	47.3	81.9	-34.6	Anten
19	4828.330M	16.9	+0.7	+29.7			+0.0	47.3	81.9	-34.6	Anten
20	9654.370M	16.7	+0.9	+29.4			+0.0	47.0	81.9	-34.9	Anten
21	4874.200M	16.6	+0.7	+29.6			+0.0	46.9	81.9	-35.0	Anten
22	4820.770M	16.5	+0.7	+29.7			+0.0	46.9	81.9	-35.0	Anten
23	9845.900M	16.2	+1.0	+29.2			+0.0	46.4	81.9	-35.5	Anten
24	4916.800M	15.3	+0.7	+29.6			+0.0	45.6	81.9	-36.3	Anten

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 7149936112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) Conducted Spurious Emissions**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	09:30:18
Tested By:	S. Yamamoto	Sequence#:	5
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequencies:
Low channel 2412MHz
Middle channel 2437MHz
High channel 2462MHz

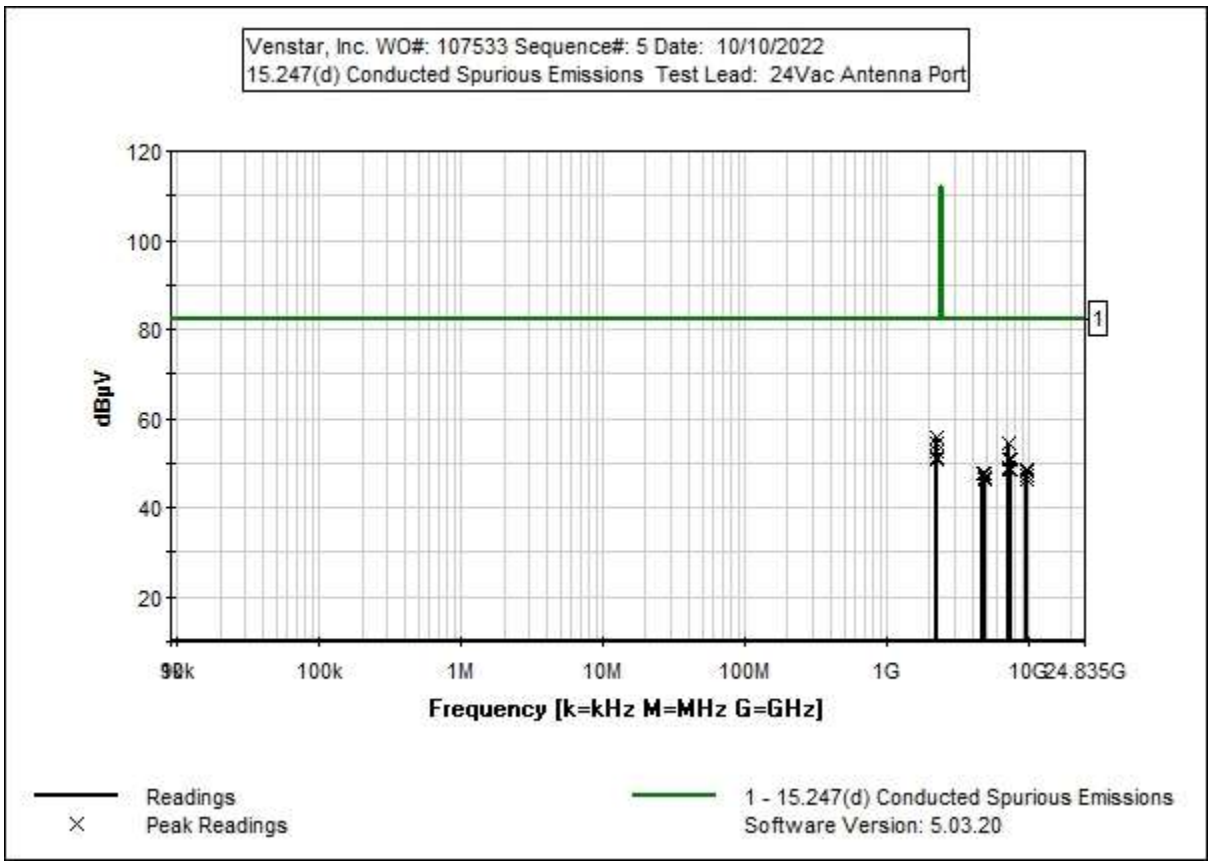
Rates:
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

Modulation: BPSK, 64-QAM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 9kHz to 25GHz
RBW=100kHz, VBW=300kHz
30dBc limit line

Test Environment Conditions:
Temperature: 23°C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10-2013, KDB 558074
558074 D01 15.247 Meas Guidance v05r02



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T2	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

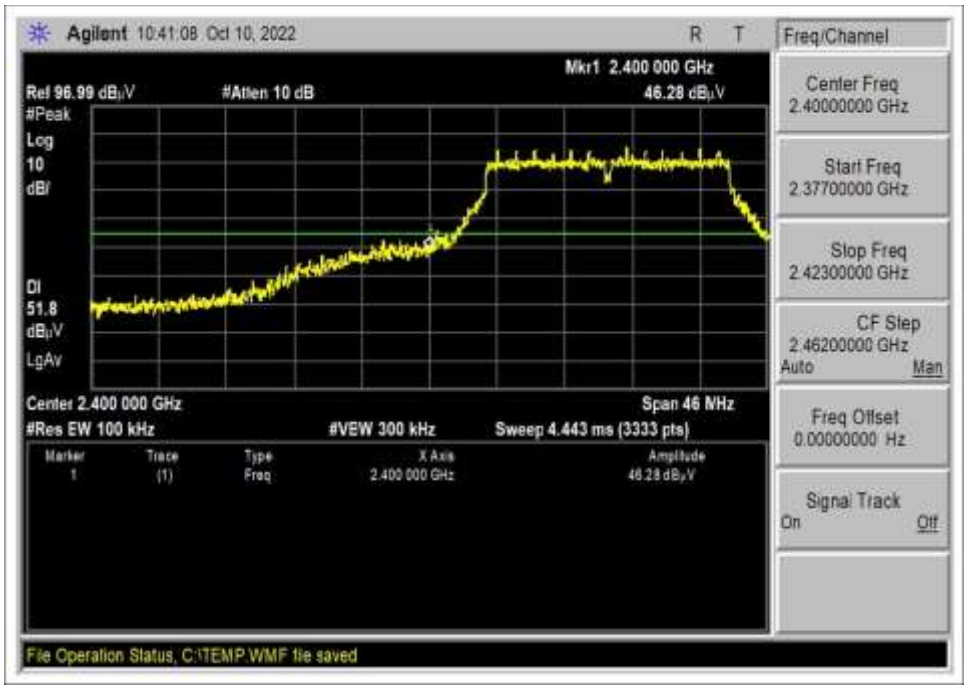
#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2240.115M	25.9	+0.4	+29.6			+0.0	55.9	82.1	-26.2	Anten
2	2240.101M	24.5	+0.4	+29.6			+0.0	54.5	82.1	-27.6	Anten
3	7240.070M	23.9	+0.9	+29.6			+0.0	54.4	82.1	-27.7	Anten
4	2240.123M	22.8	+0.4	+29.6			+0.0	52.8	82.1	-29.3	Anten
5	2240.114M	22.5	+0.4	+29.6			+0.0	52.5	82.1	-29.6	Anten
6	2240.089M	21.3	+0.4	+29.6			+0.0	51.3	82.1	-30.8	Anten
7	7385.770M	20.7	+0.8	+29.5			+0.0	51.0	82.1	-31.1	Anten
8	2240.104M	20.9	+0.4	+29.6			+0.0	50.9	82.1	-31.2	Anten
9	7316.900M	20.4	+0.9	+29.5			+0.0	50.8	82.1	-31.3	Anten
10	7240.770M	18.6	+0.9	+29.6			+0.0	49.1	82.1	-33.0	Anten
11	7395.830M	18.3	+0.8	+29.5			+0.0	48.6	82.1	-33.5	Anten
12	7318.730M	18.1	+0.9	+29.5			+0.0	48.5	82.1	-33.6	Anten
13	9738.770M	18.1	+1.0	+29.3			+0.0	48.4	82.1	-33.7	Anten
14	9846.200M	18.0	+1.0	+29.2			+0.0	48.2	82.1	-33.9	Anten
15	9639.730M	17.7	+0.9	+29.4			+0.0	48.0	82.1	-34.1	Anten
16	4818.330M	17.5	+0.7	+29.7			+0.0	47.9	82.1	-34.2	Anten
17	4925.870M	17.4	+0.7	+29.6			+0.0	47.7	82.1	-34.4	Anten
18	9647.270M	17.1	+0.9	+29.4			+0.0	47.4	82.1	-34.7	Anten
19	9839.700M	17.0	+1.0	+29.2			+0.0	47.2	82.1	-34.9	Anten
20	4825.300M	16.2	+0.7	+29.7			+0.0	46.6	82.1	-35.5	Anten
21	4881.770M	16.3	+0.7	+29.6			+0.0	46.6	82.1	-35.5	Anten
22	4931.800M	16.2	+0.7	+29.6			+0.0	46.5	82.1	-35.6	Anten
23	9745.970M	16.0	+1.0	+29.3			+0.0	46.3	82.1	-35.8	Anten
24	4881.970M	15.9	+0.7	+29.6			+0.0	46.2	82.1	-35.9	Anten

Band Edge

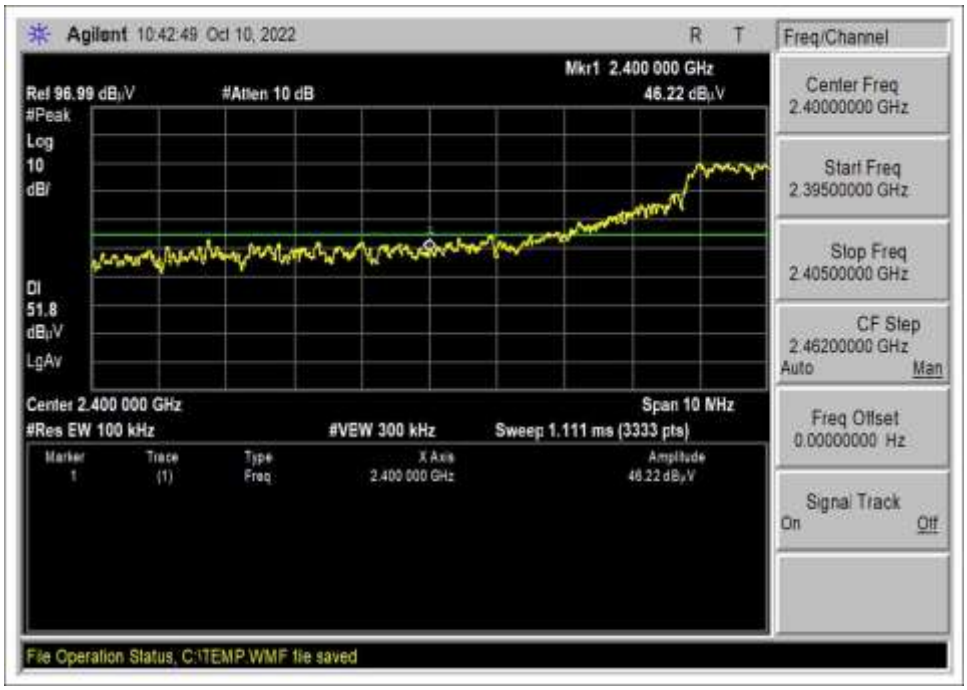
Band Edge Summary				
Limit applied: Max Power/100kHz - 30dB (When average power limit is applied).				
Frequency (MHz)	**Modulation**	**Measured (dBm)**	**Limit (dBm)**	**Results**
2400.0	802.11g 6M	-30.6	< -25.1	Pass
2483.5	802.11g 6M	-39.5	< -25.1	Pass
2400.0	802.11g 54M	-39.0	< -25.1	Pass
2483.5	802.11g 54M	-45.9	< -25.1	Pass
2400.0	802.11n20 MCS0	-29.7	< -24.9	Pass
2483.5	802.11n20 MCS0	-36.7	< -24.9	Pass
2400.0	802.11n20 MCS7	-38.8	< -24.9	Pass
2483.5	802.11n20 MCS7	-46.2	< -24.9	Pass

Band Edge Plots

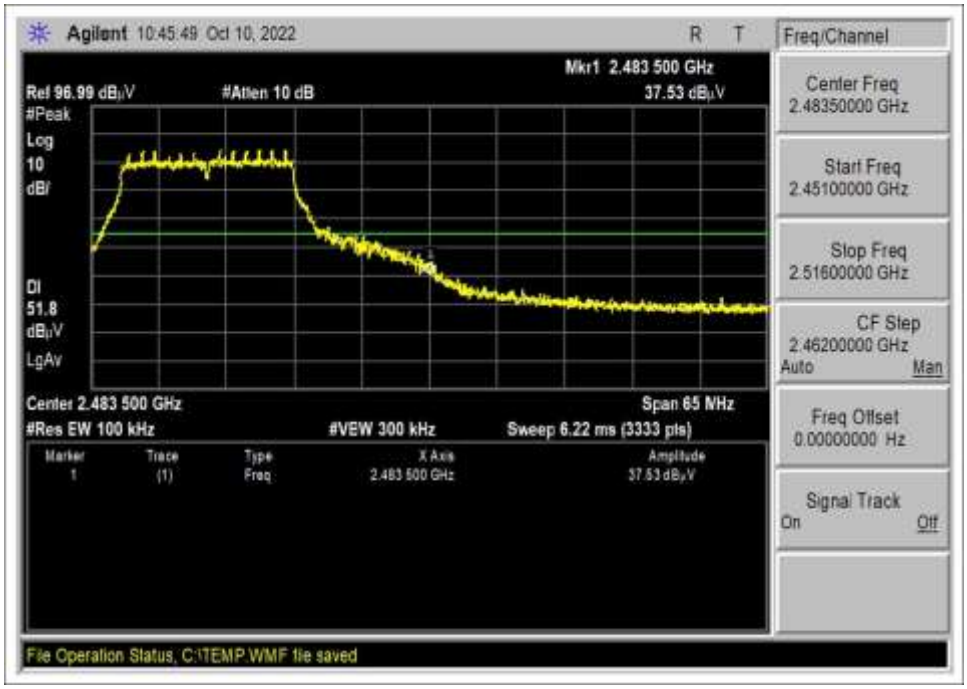
802.11g 6M



Low Channel

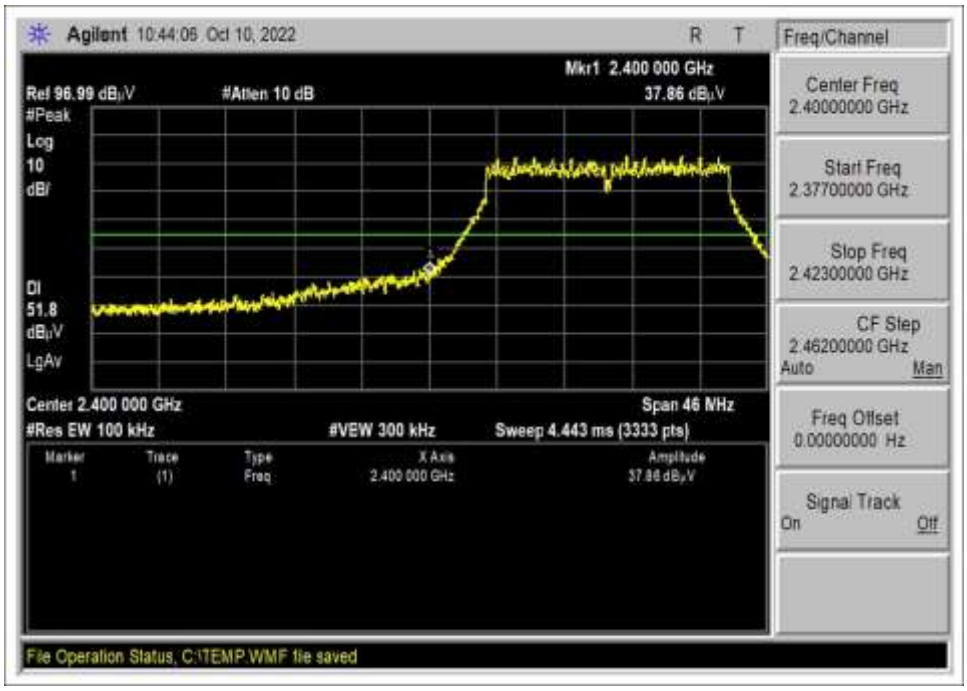


Low Channel (Zoom)

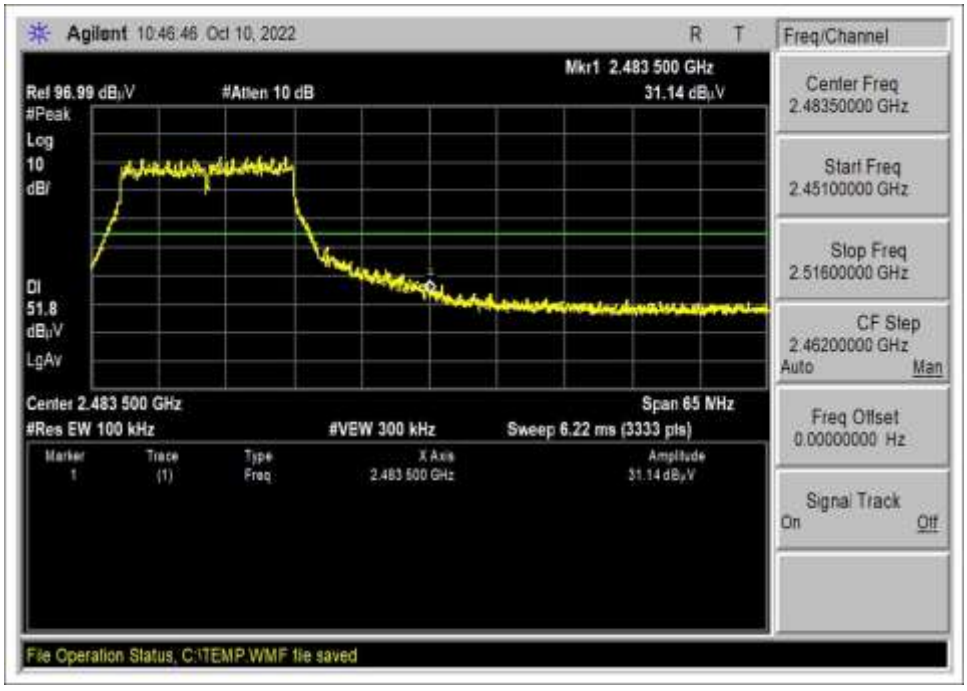


High Channel

802.11g 54M

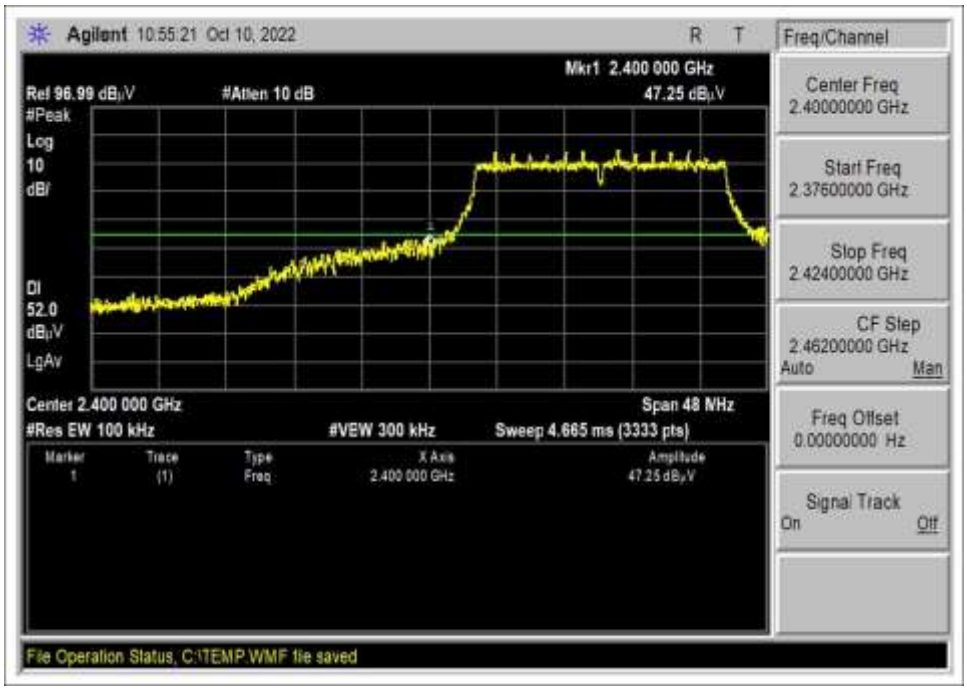


Low Channel

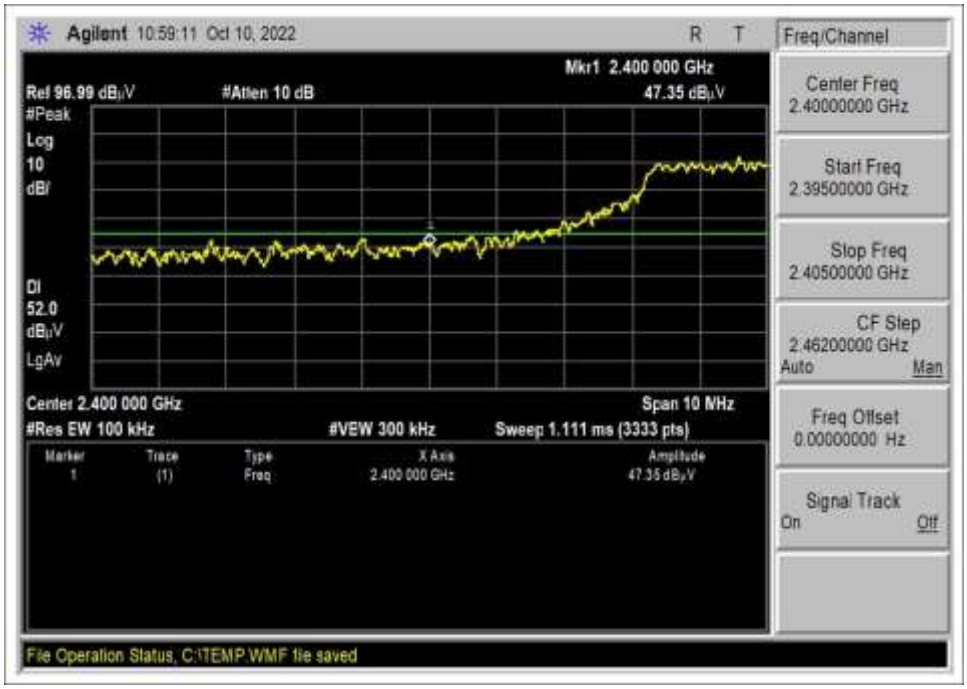


High Channel

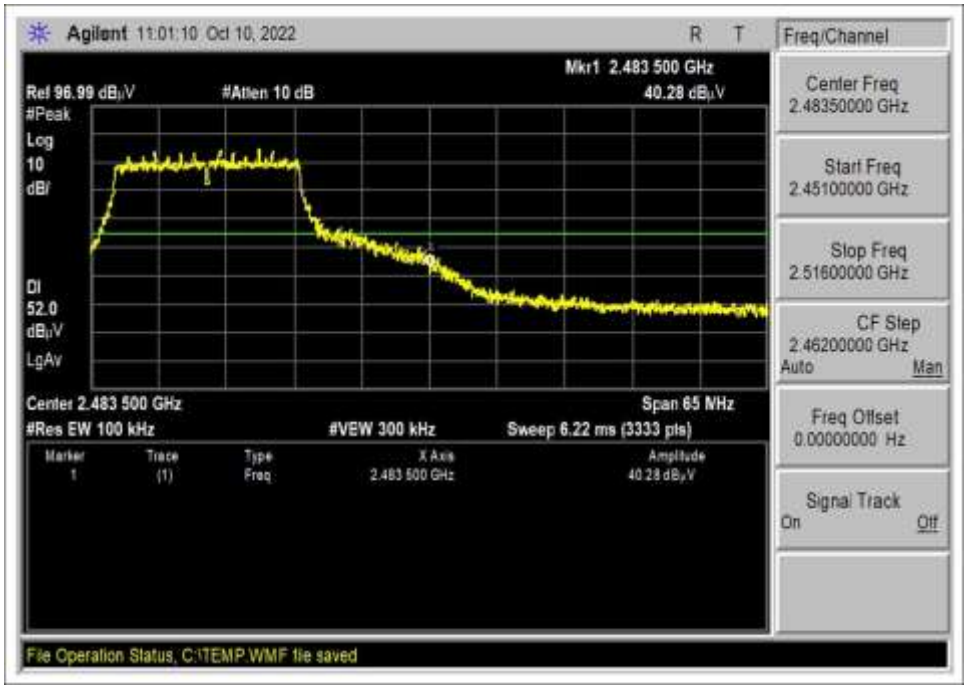
802.11n20 MCS0



Low Channel

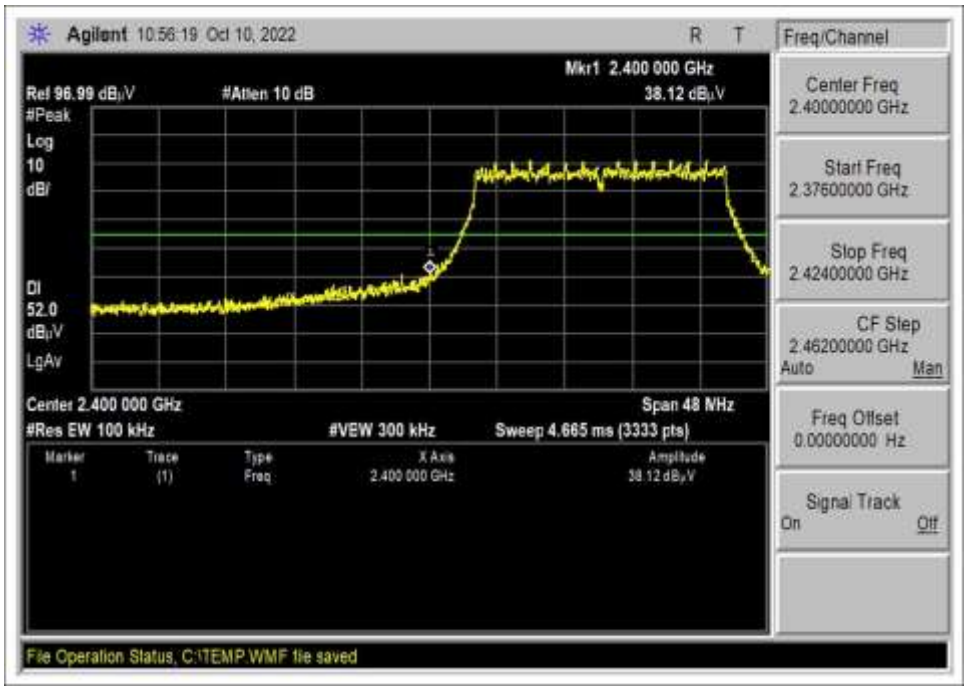


Low Channel (Zoom)

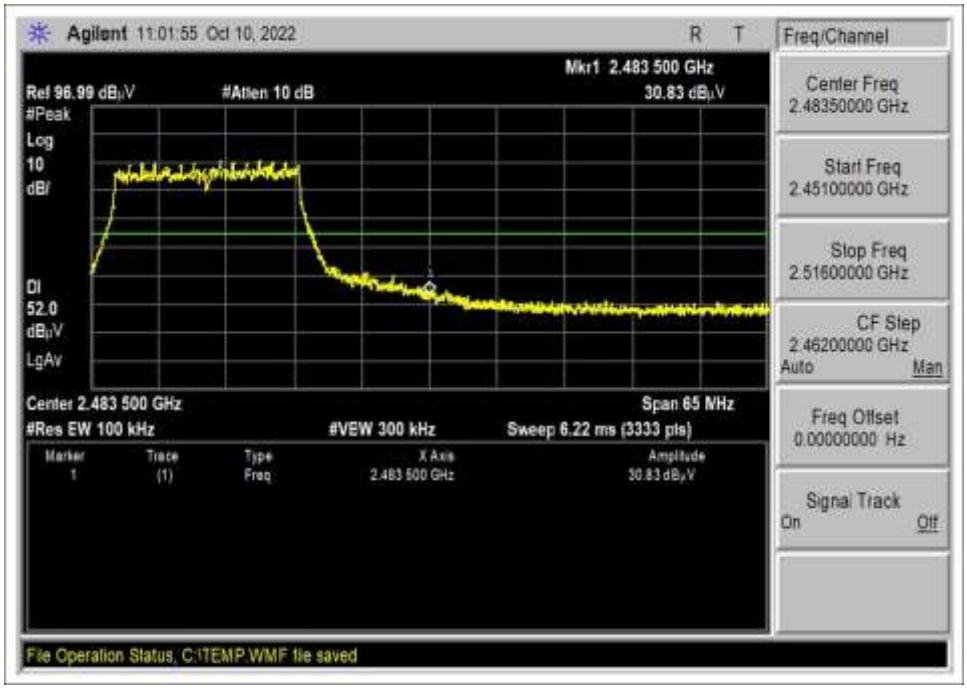


High Channel

802.11n20 MCS7



Low Channel



High Channel

Test Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) Conducted Band Edge**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	10:47:28
Tested By:	S. Yamamoto	Sequence#:	7
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequencies:
Low channel 2412MHz
High channel 2462MHz

Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)

Modulation: OFDM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2400MHz to 2483.5MHz
RBW=100kHz, VBW=300kHz
30dBc limit line

Test Environment Conditions:
Temperature: 23°C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10-2013; KDB 558074
558074 D01 15.247 Meas Guidance v05r02

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T2	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2400.000M	46.3	+0.5	+29.6			+0.0	76.4	81.9	-5.5	Anten
2	2400.000M	37.9	+0.5	+29.6			+0.0	68.0	81.9	-13.9	Anten
3	2483.500M	37.5	+0.4	+29.6			+0.0	67.5	81.9	-14.4	Anten
4	2483.500M	31.1	+0.4	+29.6			+0.0	61.1	81.9	-20.8	Anten

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) Conducted Band Edge**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	11:02:37
Tested By:	S. Yamamoto	Sequence#:	8
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequencies:
Low channel 2412MHz
High channel 2462MHz

Rates:
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

Modulation: BPSK, 64-QAM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2400MHz to 2483.5MHz
RBW=100kHz, VBW=300kHz
30dBc limit line

Test Environment Conditions:
Temperature: 23°C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10-2013; KDB 558074
558074 D01 15.247 Meas Guidance v05r02

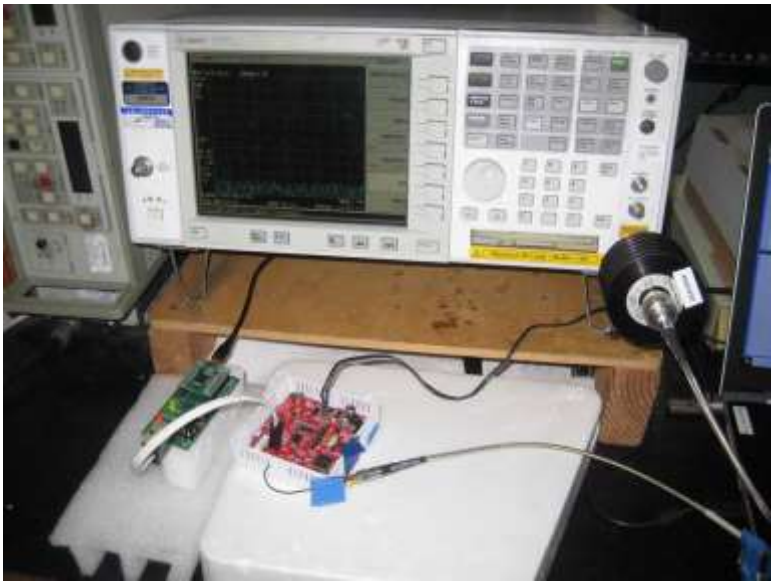
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T2	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2400.000M	47.2	+0.5	+29.6			+0.0	77.3	82.1	-4.8	Anten
2	2483.500M	40.3	+0.4	+29.6			+0.0	70.3	82.1	-11.8	Anten
3	2400.000M	38.1	+0.5	+29.6			+0.0	68.2	82.1	-13.9	Anten
4	2483.500M	30.8	+0.4	+29.6			+0.0	60.8	82.1	-21.3	Anten

Test Setup Photo(s)



15.247(d) Radiated Emissions & Band Edge

Test Setup / Conditions/ Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**107533**	Date:	10/12/2022
Test Type:	**Radiated Scan**	Time:	15:31:20
Tested By:	S. Yamamoto	Sequence#:	15
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.
The EUT is transmitting continuously at >=98%.

Testing Frequency:
Low channel 2412MHz
Middle Channel 2437MHz
High channel 2462MHz

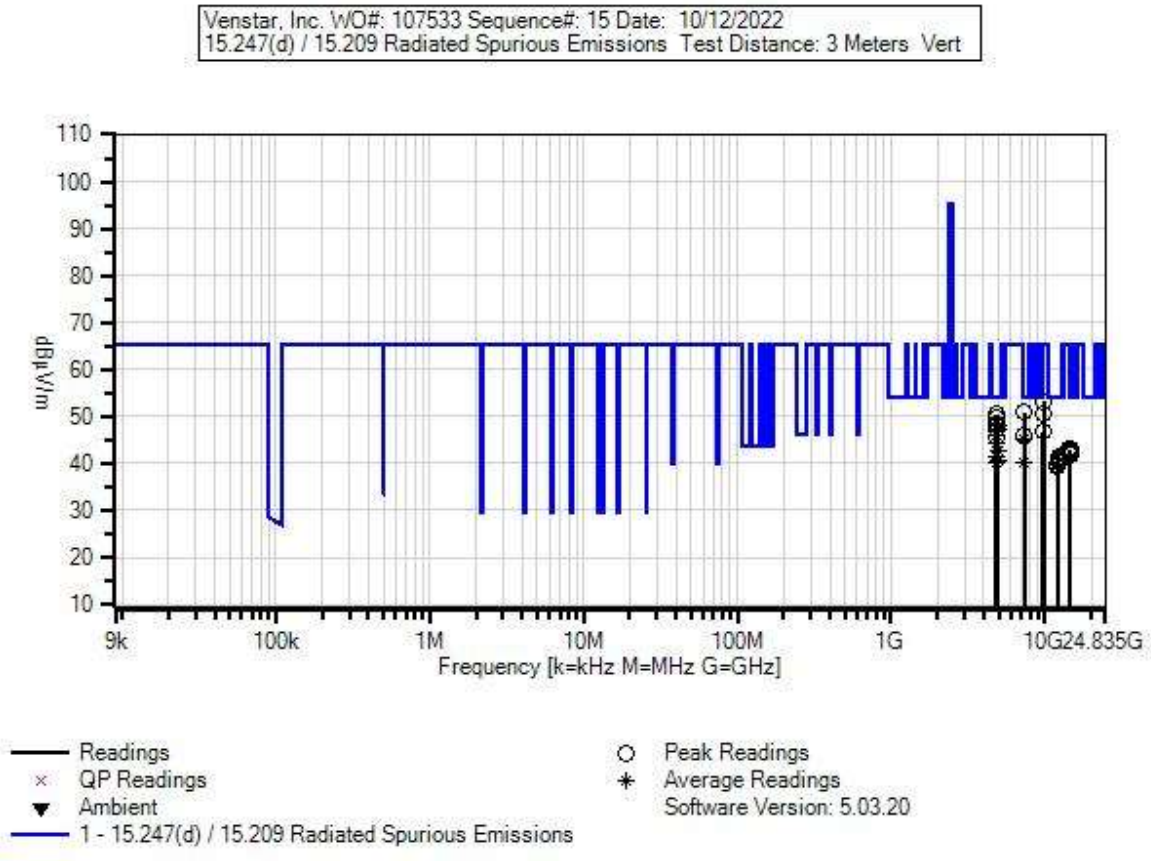
Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)

Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 9kHz to 25GHz
RBW=100kHz, VBW=300kHz NRB
RBW=1MHz, VBW=3MHz RB > 1GHz
RBW=120kHz, VBW=1.2MHz RB >30MHz, < 1GHz
RBW=9kHz, VBW=30kHz RB > 150kHz, < 30MHz
RBW=200Hz, VBW=1kHz RB > 9kHz, < 150kHz

In the frequency range <1000MHz, no EUT emissions were measurable within 20dB of the limit.

Test Environment Conditions:
Temperature: 23°C
Humidity: 59%
Pressure: 99kP
ANSI C63.10 (2013), KDB 558074



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06360	Cable	L1-PNMNM-48	9/30/2021	9/30/2023
T2	AN00849	Horn Antenna	3115	3/21/2022	3/21/2024
T3	AN00786	Preamp	83017A	5/23/2022	5/23/2024
T4	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T5	AN03385	High Pass Filter	11SH10-3000/T10000-O/O	5/17/2021	5/17/2023
T6	AN03367	Horn Antenna	62-GH-62-25.	8/3/2021	8/3/2023
	AN00309	Preamp	8447D	12/13/2021	12/13/2023
	AN00314	Loop Antenna	6502	3/29/2022	3/29/2024
	AN00851	Biconilog Antenna	CBL6111C	4/21/2022	4/21/2024
	AN01413	Horn Antenna	84125-80008	10/19/2020	10/19/2022
	ANP05050	Cable	RG223/U	12/24/2020	12/24/2022
	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/21/2020	12/21/2022

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	7309.570M	44.4	+6.1 +0.2	+36.3 +0.0	-36.9	+0.8	+0.0	50.9	54.0 802.11g 6M	-3.1	Horiz
2	4878.150M	48.9	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	50.5	54.0 802.11g 54M	-3.5	Horiz
3	4823.370M	48.5	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	49.9	54.0 802.11g 6M	-4.1	Vert
4	4820.030M	46.9	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	48.3	54.0 802.11g 54M	-5.7	Horiz
5	4923.967M Ave	46.4	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	48.0	54.0 802.11g 6M	-6.0	Horiz
^	4923.970M	59.0	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	60.6	54.0 802.11g 6M	+6.6	Horiz
7	4872.933M	45.8	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	47.4	54.0 802.11g 54M	-6.6	Vert
8	4921.800M Ave	45.7	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	47.3	54.0 802.11g 6M	-6.7	Vert
^	4921.800M	59.3	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	60.9	54.0 802.11g 6M	+6.9	Vert
10	7310.117M	39.5	+6.1 +0.2	+36.3 +0.0	-36.9	+0.8	+0.0	46.0	54.0 802.11g 54M	-8.0	Horiz
11	4824.942M	44.1	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	45.5	54.0 802.11g 54M	-8.5	Vert
12	7385.833M Ave	38.5	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	45.2	54.0 802.11g 6M	-8.8	Horiz
^	7385.833M	51.4	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	58.1	54.0 802.11g 6M	+4.1	Horiz
14	4874.017M Ave	42.7	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	44.3	54.0 802.11g 6M	-9.7	Vert
^	4874.017M	54.9	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	56.5	54.0 802.11g 6M	+2.5	Vert
16	14470.540 M	39.0	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.9	54.0 802.11g 6M	-11.1	Vert
17	14473.170 M	39.0	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.9	54.0 802.11g 54M	-11.1	Horiz
18	14473.500 M	38.6	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.5	54.0 802.11g 6M	-11.5	Horiz
19	4925.333M Ave	40.9	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	42.5	54.0 802.11g 54M	-11.5	Horiz
^	4925.330M	52.4	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	54.0	54.0 802.11g 54M	+0.0	Horiz
21	9850.320M	43.1	+7.0 +0.3	+37.9 +0.0	-36.1	+0.9	+0.0	53.1	65.3 802.11g 6M	-12.2	Horiz

22	14473.430 M	37.8	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	41.7	54.0 802.11g 54M	-12.3	Vert
23	12185.200 M	39.9	+8.2 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	41.6	54.0 802.11g 6M	-12.4	Horiz
24	4873.800M Ave	39.9	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	41.5	54.0 802.11g 6M	-12.5	Horiz
^	4873.800M	51.6	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	53.2	54.0 802.11g 6M	-0.8	Horiz
26	12189.030 M	39.4	+8.2 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	41.1	54.0 802.11g 54M	-12.9	Vert
27	12311.000 M	39.2	+8.3 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.8	54.0 802.11g 6M	-13.2	Vert
28	12184.400 M	39.2	+8.1 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	40.8	54.0 802.11g 6M	-13.2	Vert
29	12315.400 M	39.0	+8.3 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.6	54.0 802.11g 54M	-13.4	Vert
30	4919.900M Ave	39.0	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	40.6	54.0 802.11g 54M	-13.4	Vert
^	4919.900M	53.1	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	54.7	54.0 802.11g 54M	+0.7	Vert
32	7385.933M Ave	33.6	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	40.3	54.0 802.11g 6M	-13.7	Vert
^	7385.930M	45.3	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	52.0	54.0 802.11g 6M	-2.0	Vert
34	12311.970 M	38.6	+8.3 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.2	54.0 802.11g 54M	-13.8	Horiz
35	4818.167M Ave	38.6	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	40.0	54.0 802.11g 6M	-14.0	Horiz
^	4818.167M	52.2	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	53.6	54.0 802.11g 6M	-0.4	Horiz

37	12311.500 M	38.4	+8.3 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.0	54.0 802.11g 6M	-14.0	Horiz
38	12061.630 M	38.3	+8.1 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.6	54.0 802.11g 6M	-14.4	Vert
39	12060.020 M	38.4	+8.0 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.6	54.0 802.11g 54M	-14.4	Vert
40	12062.180 M	38.2	+8.1 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.5	54.0 802.11g 54M	-14.5	Horiz
41	9850.320M	40.7	+7.0 +0.3	+37.9 +0.0	-36.1	+0.9	+0.0	50.7	65.3 802.11g 6M	-14.6	Horiz
42	9750.330M	36.8	+7.0 +0.3	+37.7 +0.0	-36.0	+0.9	+0.0	46.7	65.3 802.11g 6M	-18.6	Horiz
43	14622.480 M	37.9	+8.9 +0.0	+0.0 +29.6	-35.5	+1.2	+0.0	42.1	65.3 802.11g 54M	-23.2	Horiz

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Spurious Emissions**		
Work Order #:	**107533**	Date:	10/12/2022
Test Type:	**Radiated Scan**	Time:	16:56:37
Tested By:	S. Yamamoto	Sequence#:	16
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.
The EUT is transmitting continuously at >=98%.

Testing Frequency:
Low channel 2412MHz
Middle Channel 2437MHz
High channel 2462MHz

Rates:
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

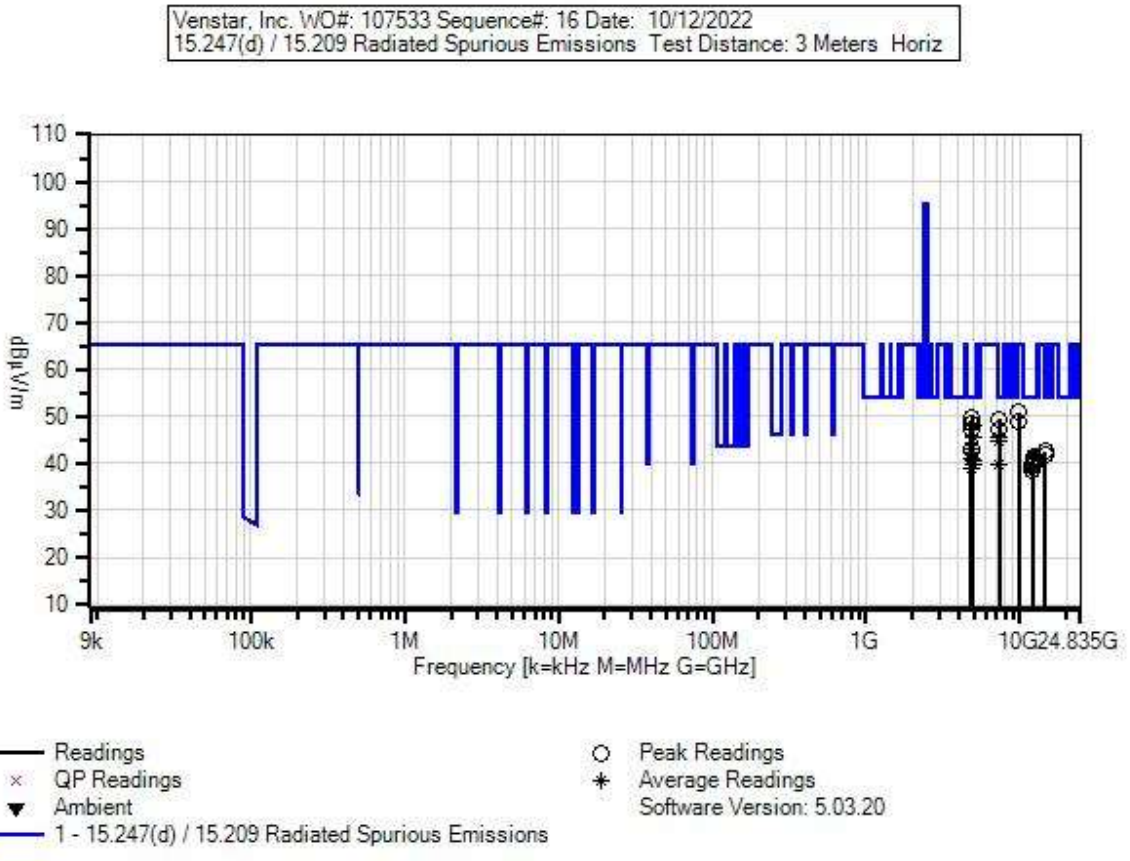
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 9kHz to 25GHz
RBW=100kHz, VBW=300kHz NRB
RBW=1MHz, VBW=3MHz RB > 1GHz
RBW=120kHz, VBW=1.2MHz RB >30MHz, < 1GHz
RBW=9kHz, VBW=30kHz RB > 150kHz, < 30MHz
RBW=200Hz, VBW=1kHz RB > 9kHz, < 150kHz

In the frequency range <1000MHz, no EUT emissions were measurable within 20dB of the limit.

Test Environment Conditions:
Temperature: 23°C
Humidity: 59%
Pressure: 99kPa

ANSI C63.10 (2013), KDB 558074



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06360	Cable	L1-PNMNM-48	9/30/2021	9/30/2023
T2	AN00849	Horn Antenna	3115	3/21/2022	3/21/2024
T3	AN00786	Preamp	83017A	5/23/2022	5/23/2024
T4	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T5	AN03385	High Pass Filter	11SH10-3000/T10000-O/O	5/17/2021	5/17/2023
T6	AN03367	Horn Antenna	62-GH-62-25.	8/3/2021	8/3/2023
	AN00309	Preamp	8447D	12/13/2021	12/13/2023
	AN00314	Loop Antenna	6502	3/29/2022	3/29/2024
	AN00851	Biconilog Antenna	CBL6111C	4/21/2022	4/21/2024
	AN01413	Horn Antenna	84125-80008	10/19/2020	10/19/2022
	ANP05050	Cable	RG223/U	12/24/2020	12/24/2022
	ANP05198	Cable-Amplitude +15C to +45C (dB)	8268	12/21/2020	12/21/2022

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	4876.800M	48.2	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	49.8	54.0 802.11n20 MCS7	-4.2	Horiz
2	7390.570M	42.7	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	49.4	54.0 802.11n20 MCS7	-4.6	Horiz
3	4824.200M	47.1	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	48.5	54.0 802.11n20 MCS7	-5.5	Horiz
4	4925.533M Ave	46.5	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	48.1	54.0 802.11n20 MCS0	-5.9	Horiz
^	4925.533M	61.5	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	63.1	54.0 802.11n20 MCS0	+9.1	Horiz
6	4872.930M	45.8	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	47.4	54.0 802.11n20 MCS7	-6.6	Vert
7	7388.770M	40.4	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	47.1	54.0 802.11n20 MCS7	-6.9	Vert
8	4922.983M Ave	44.0	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	45.6	54.0 802.11n20 MCS0	-8.4	Vert
^	4922.983M	59.1	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	60.7	54.0 802.11n20 MCS0	+6.7	Vert
10	7387.158M Ave	38.8	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	45.5	54.0 802.11n20 MCS0	-8.5	Vert
^	7387.160M	46.4	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	53.1	54.0 802.11n20 MCS0	-0.9	Vert
12	7387.067M Ave	38.0	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	44.7	54.0 802.11n20 MCS0	-9.3	Horiz
^	7387.067M	54.0	+6.1 +0.2	+36.5 +0.0	-36.9	+0.8	+0.0	60.7	54.0 802.11n20 MCS0	+6.7	Horiz
14	4872.685M Ave	41.4	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	43.0	54.0 802.11n20 MCS0	-11.0	Horiz
^	4872.685M	56.1	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	57.7	54.0 802.11n20 MCS0	+3.7	Horiz
16	4824.233M	41.5	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	42.9	54.0 802.11n20 MCS7	-11.1	Vert
17	14471.970 M	38.7	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.6	54.0 802.11n20 MCS0	-11.4	Vert
18	14474.270 M	38.7	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.6	54.0 802.11n20 MCS0	-11.4	Horiz
19	4873.467M Ave	40.7	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	42.3	54.0 802.11n20 MCS0	-11.7	Vert
^	4873.467M	55.0	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	56.6	54.0 802.11n20 MCS0	+2.6	Vert
21	14471.670 M	38.1	+8.9 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	42.0	54.0 802.11n20 MCS7	-12.0	Vert

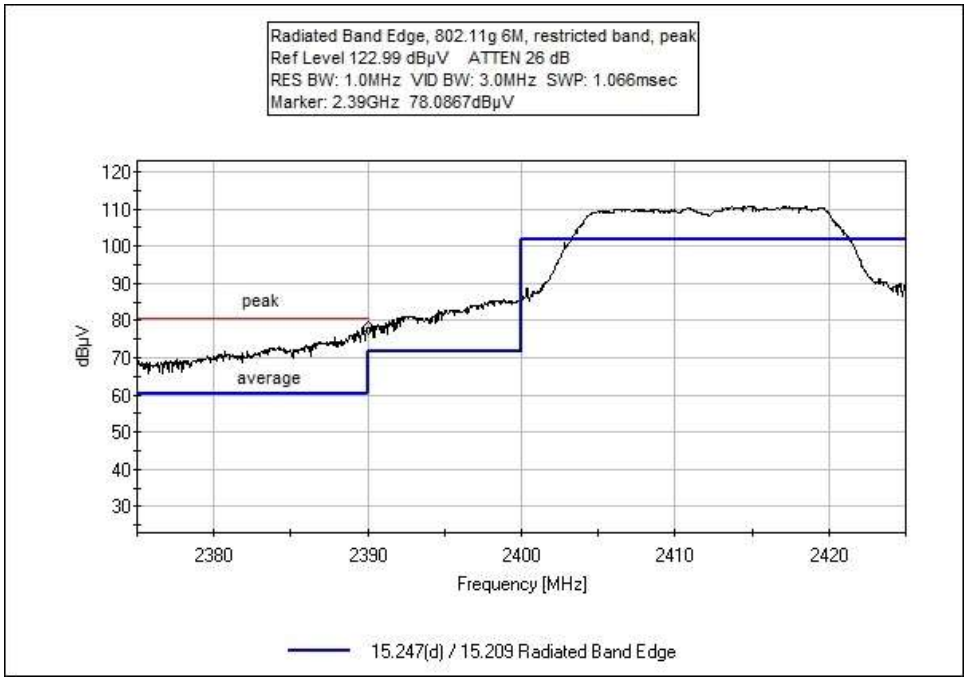
22	14474.900 M	38.0	+8.9 +0.0 +0.0	+0.0 +29.4	-35.6	+1.2	+0.0	41.9	54.0 802.11n20 MCS7	-12.1	Horiz
23	12185.830 M	39.6	+8.2 +0.0 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	41.3	54.0 802.11n20 MCS0	-12.7	Vert
24	12314.900 M	39.6	+8.3 +0.0 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	41.2	54.0 802.11n20 MCS7	-12.8	Horiz
25	4823.067M Ave	39.7	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	41.1	54.0 802.11n20 MCS0	-12.9	Horiz
^	4823.067M	53.4	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	54.8	54.0 802.11n20 MCS0	+0.8	Horiz
27	12308.370 M	39.3	+8.2 +0.0 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.8	54.0 802.11n20 MCS0	-13.2	Vert
28	12186.200 M	39.1	+8.2 +0.0 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	40.8	54.0 802.11n20 MCS7	-13.2	Vert
29	12187.260 M	38.7	+8.2 +0.0 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	40.4	54.0 802.11n20 MCS7	-13.6	Horiz
30	4923.567M Ave	38.8	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	40.4	54.0 802.11n20 MCS7	-13.6	Vert
^	4923.567M	52.9	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	54.5	54.0 802.11n20 MCS7	+0.5	Vert
32	12184.800 M	38.5	+8.1 +0.0 +0.0	+0.0 +28.6	-36.4	+1.3	+0.0	40.1	54.0 802.11n20 MCS0	-13.9	Horiz
33	12310.270 M	38.4	+8.3 +0.0 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	40.0	54.0 802.11n20 MCS0	-14.0	Horiz
34	4923.700M Ave	38.2	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	39.8	54.0 802.11n20 MCS7	-14.2	Horiz
^	4923.700M	51.6	+4.8 +0.3	+33.2 +0.0	-37.4	+0.7	+0.0	53.2	54.0 802.11n20 MCS7	-0.8	Horiz
36	12060.260 M	38.5	+8.0 +0.0 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.7	54.0 802.11n20 MCS0	-14.3	Horiz
37	12311.100 M	38.1	+8.3 +0.0 +0.0	+0.0 +28.4	-36.4	+1.3	+0.0	39.7	54.0 802.11n20 MCS7	-14.3	Vert
38	7312.318M Ave	33.1	+6.1 +0.2	+36.3 +0.0	-36.9	+0.8	+0.0	39.6	54.0 802.11n20 MCS0	-14.4	Horiz
^	7312.318M	47.1	+6.1 +0.2	+36.3 +0.0	-36.9	+0.8	+0.0	53.6	54.0 802.11n20 MCS0	-0.4	Horiz
40	9849.750M	40.8	+7.0 +0.3	+37.9 +0.0	-36.1	+0.9	+0.0	50.8	65.3 802.11n20 MCS0	-14.5	Vert
41	12060.930 M	38.2	+8.0 +0.0 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.4	54.0 802.11n20 MCS0	-14.6	Vert

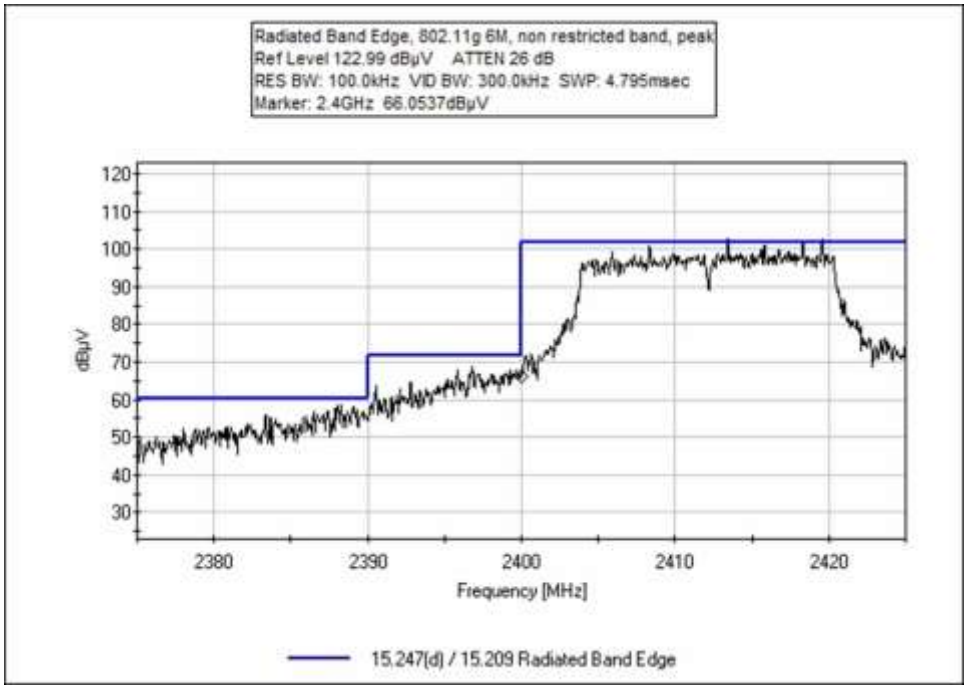
42	12062.790 M	38.1	+8.1 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	39.4	54.0	-14.6	Horiz
									802.11n20 MCS7		
43	4825.500M Ave	37.7	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	39.1	54.0	-14.9	Vert
									802.11n20 MCS0		
^	4825.500M	49.3	+4.8 +0.3	+33.0 +0.0	-37.4	+0.7	+0.0	50.7	54.0	-3.3	Vert
									802.11n20 MCS0		
45	12060.890 M	37.2	+8.0 +0.0	+0.0 +28.3	-36.4	+1.3	+0.0	38.4	54.0	-15.6	Vert
									802.11n20 MCS7		
46	9845.930M	39.0	+7.0 +0.3	+37.8 +0.0	-36.1	+0.9	+0.0	48.9	65.3	-16.4	Horiz
									802.11n20 MCS0		

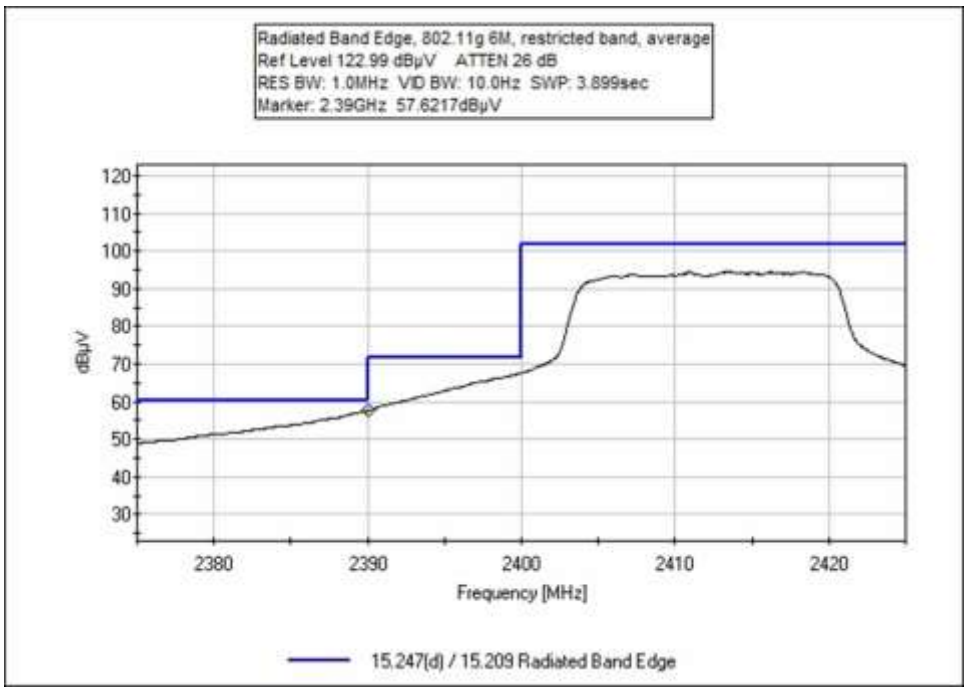
Band Edge

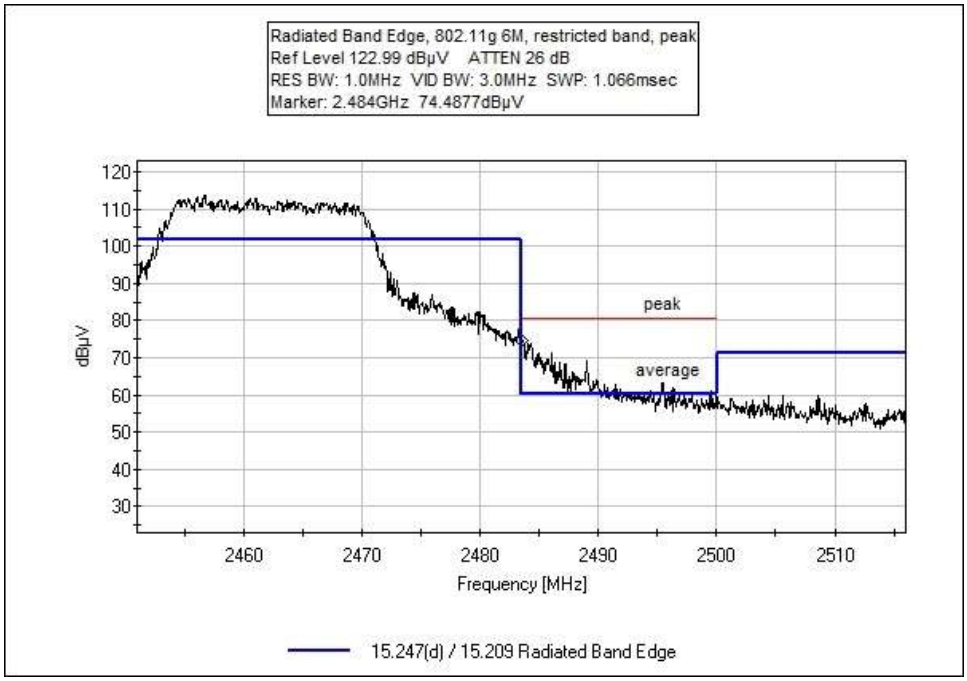
Band Edge Summary					
Frequency (MHz)	**Modulation**	**Ant. Type**	**Field Strength (dBuV/m @3m)**	**Limit (dBuV/m @3m)**	**Results**
2390.0	802.11g 6M	Integral	51.3	<54	Pass
2400.0	802.11g 6M	Integral	59.8	<65.3	Pass
2483.5	802.11g 6M	Integral	52.8	<54	Pass
2390.0	802.11g 54M	Integral	41.2	<54	Pass
2400.0	802.11g 54M	Integral	58.1	<65.3	Pass
2483.5	802.11g 54M	Integral	52.8	<54	Pass
2390.0	802.11n20 MCS0	Integral	52.4	<54	Pass
2400.0	802.11n20 MCS0	Integral	61.8	<65.3	Pass
2483.5	802.11n20 MCS0	Integral	53.2	<54	Pass
2390.0	802.11n20 MCS7	Integral	39.9	<54	Pass
2400.0	802.11n20 MCS7	Integral	52.1	<65.3	Pass
2483.5	802.11n20 MCS7	Integral	44.2	<54	Pass

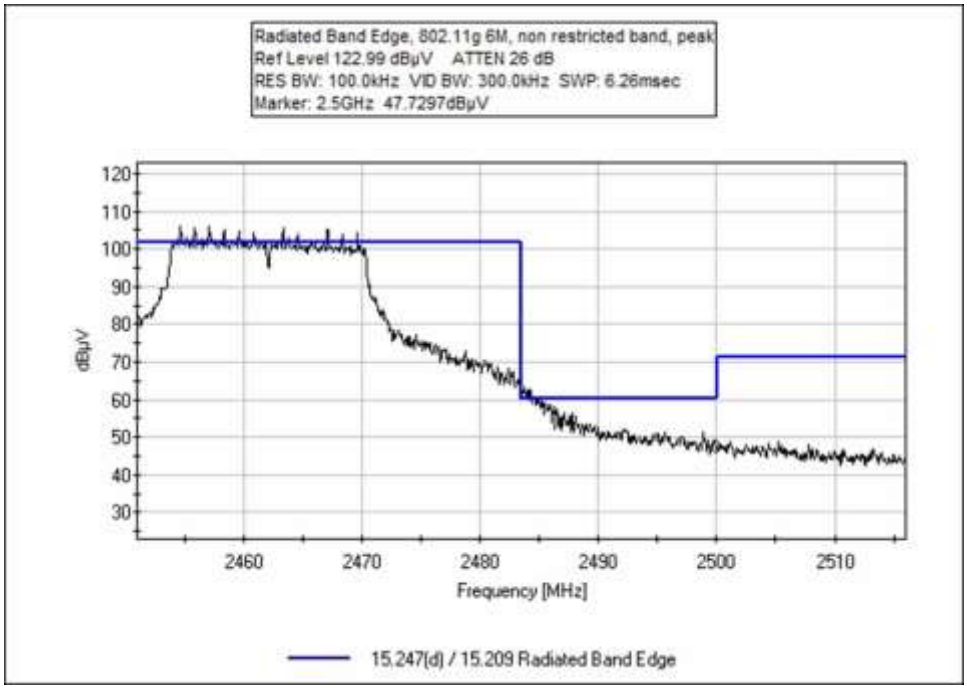
Band Edge Plots

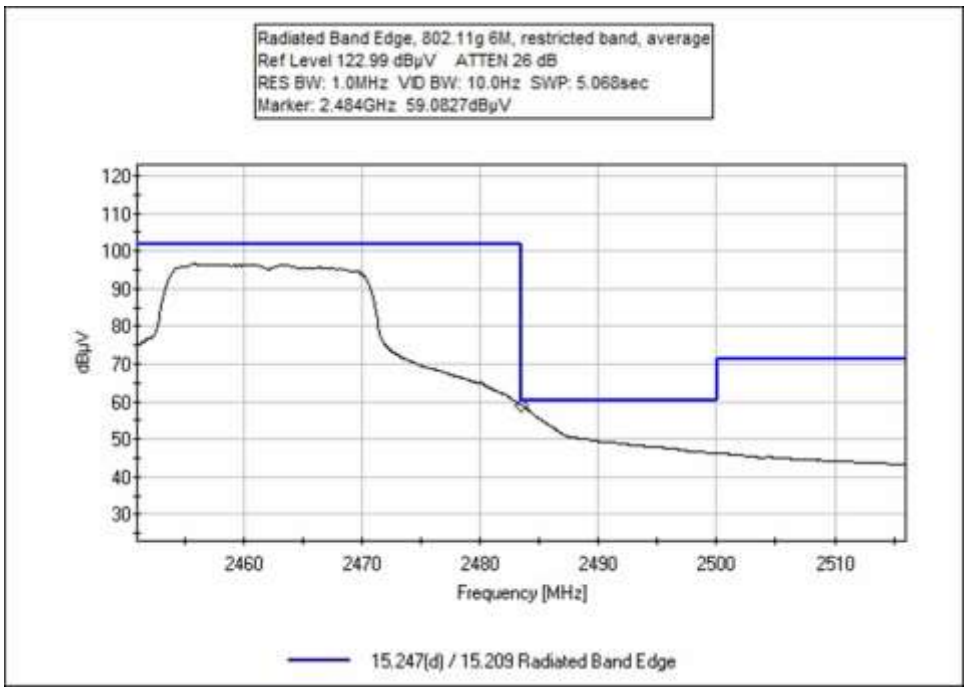


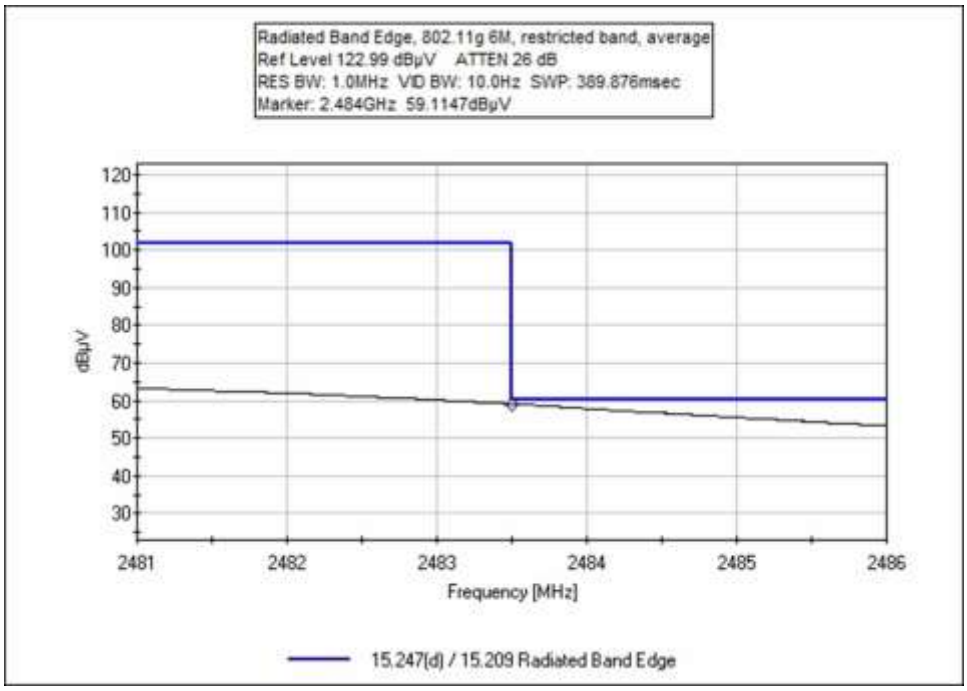


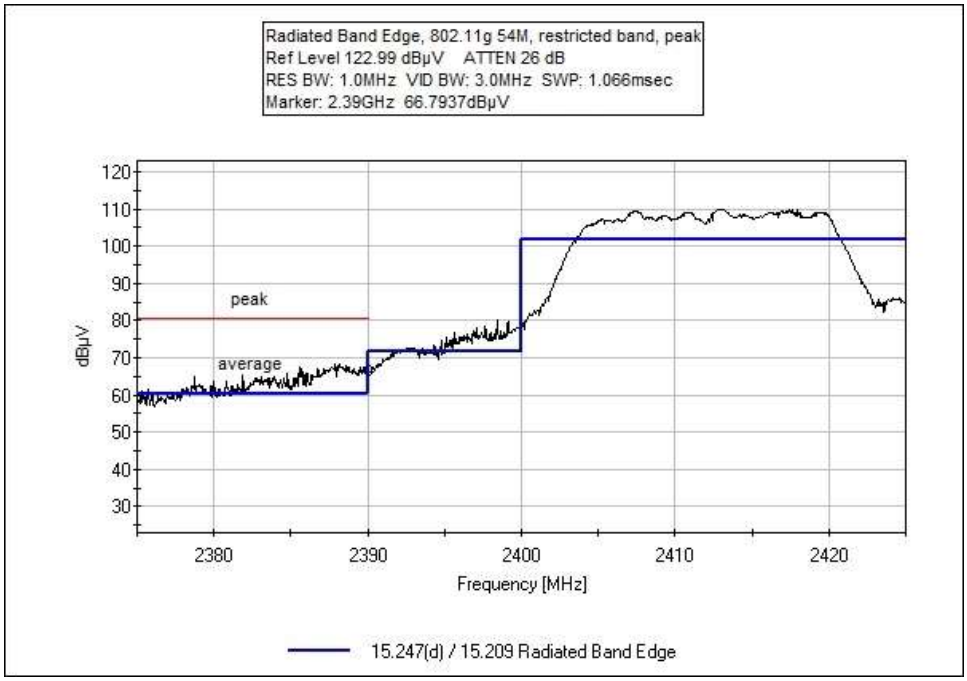

Radiated Band Edge, 802.11g 6M, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 3.899sec
Marker: 2.39GHz 57.6217dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

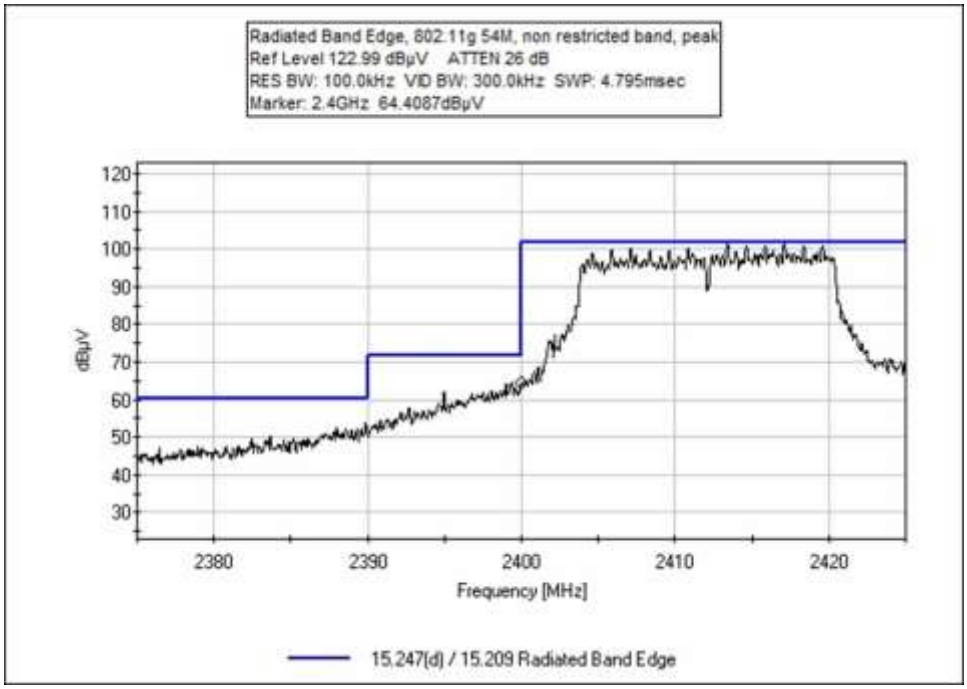

Radiated Band Edge, 802.11g 6M, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.484GHz 74.4877dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

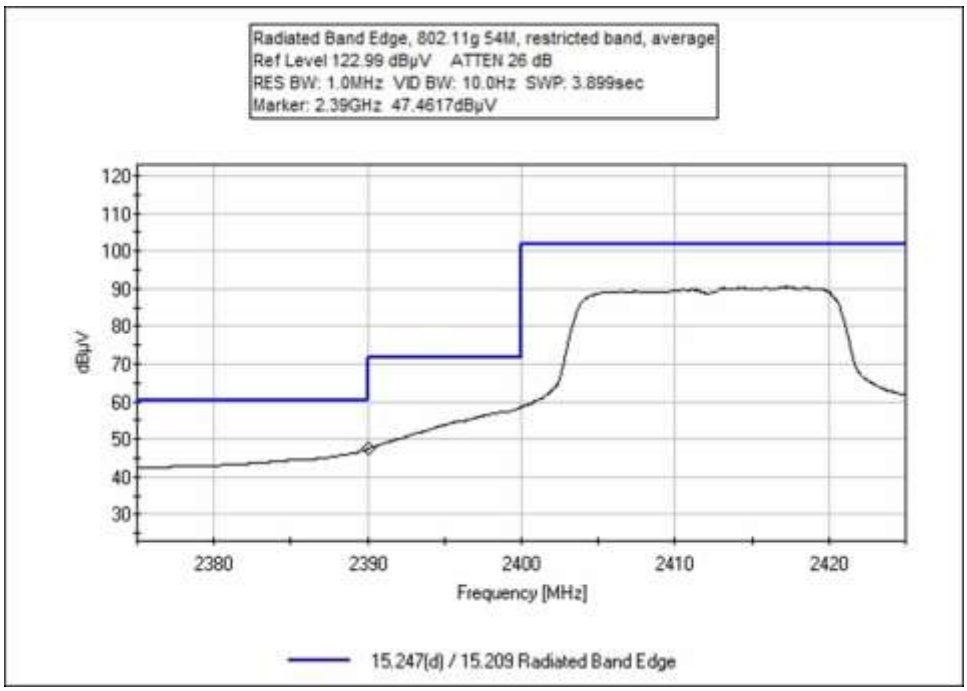

Radiated Band Edge, 802.11g 6M, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 6.26msec
Marker: 2.5GHz 47.7297dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

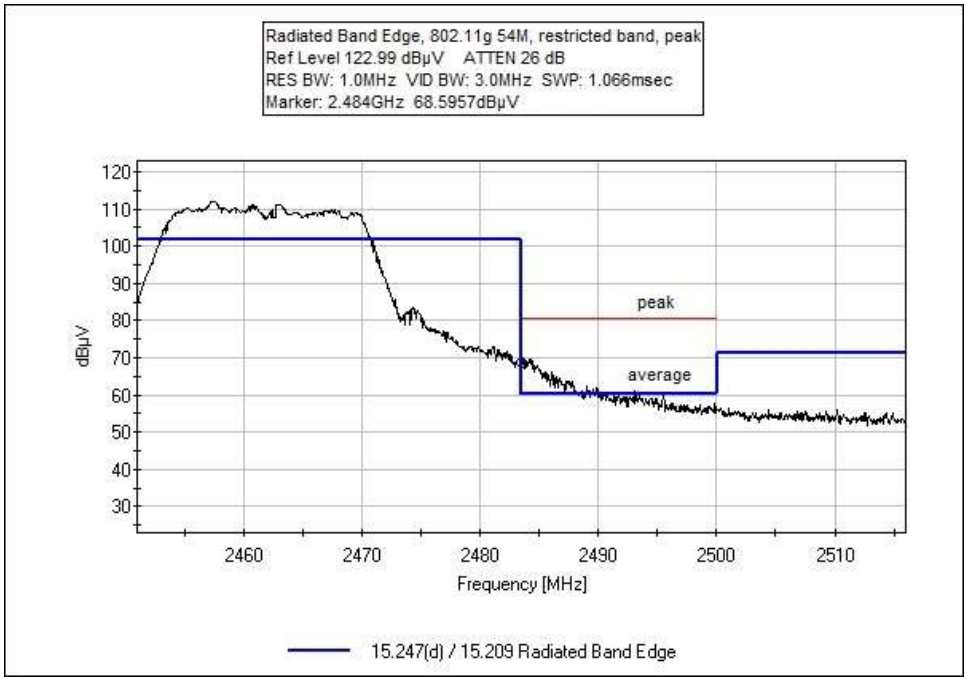

Radiated Band Edge, 802.11g 6M, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 5.068sec
Marker: 2.484GHz 59.0827dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

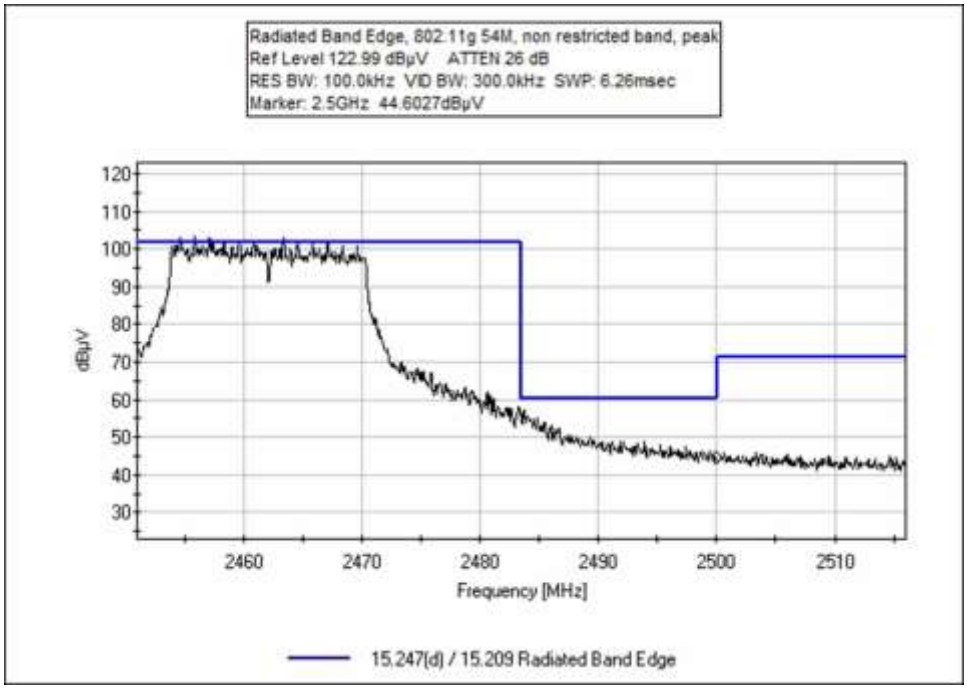

Radiated Band Edge, 802.11g 6M, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 389.876msec
Marker: 2.484GHz 59.1147dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2481
2482
2483
2484
2485
2486
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

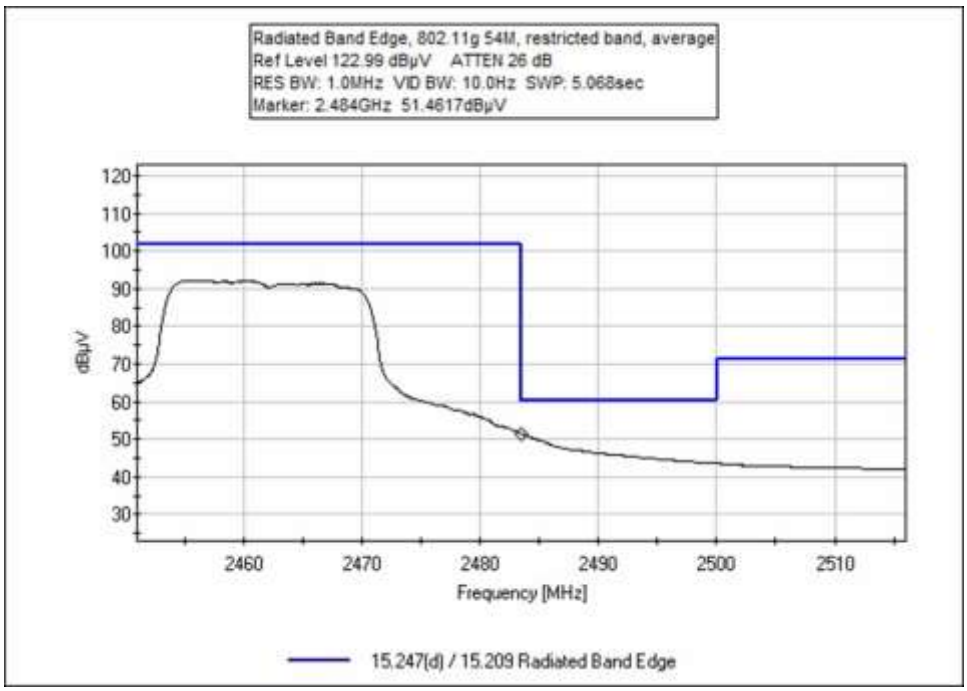

Radiated Band Edge, 802.11g 54M, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.39GHz 66.7937dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

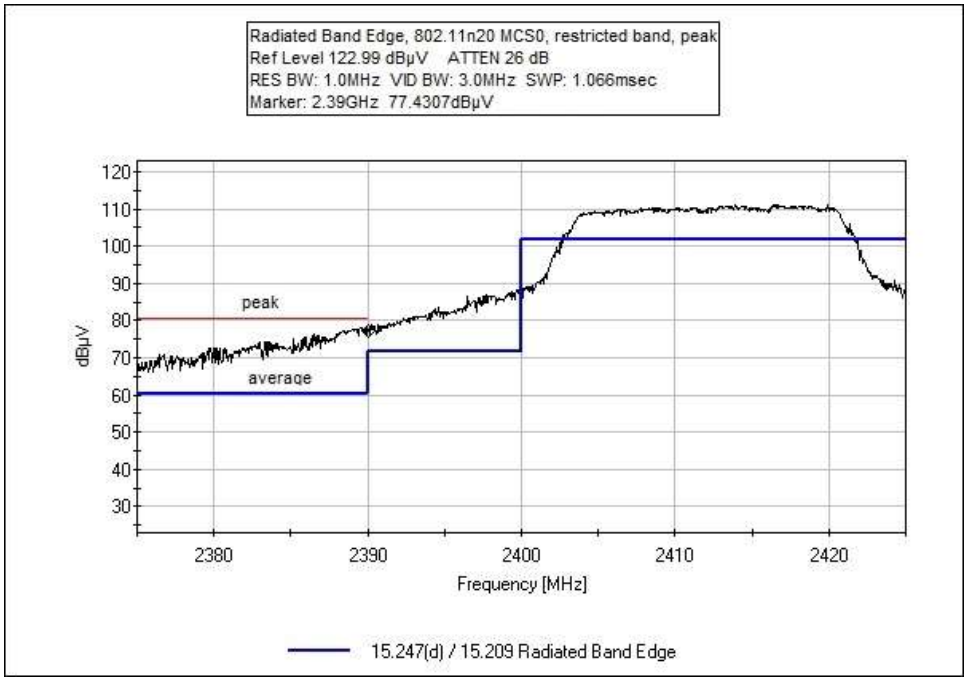

Radiated Band Edge, 802.11g 54M, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 4.795msec
Marker: 2.4GHz 64.4087dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

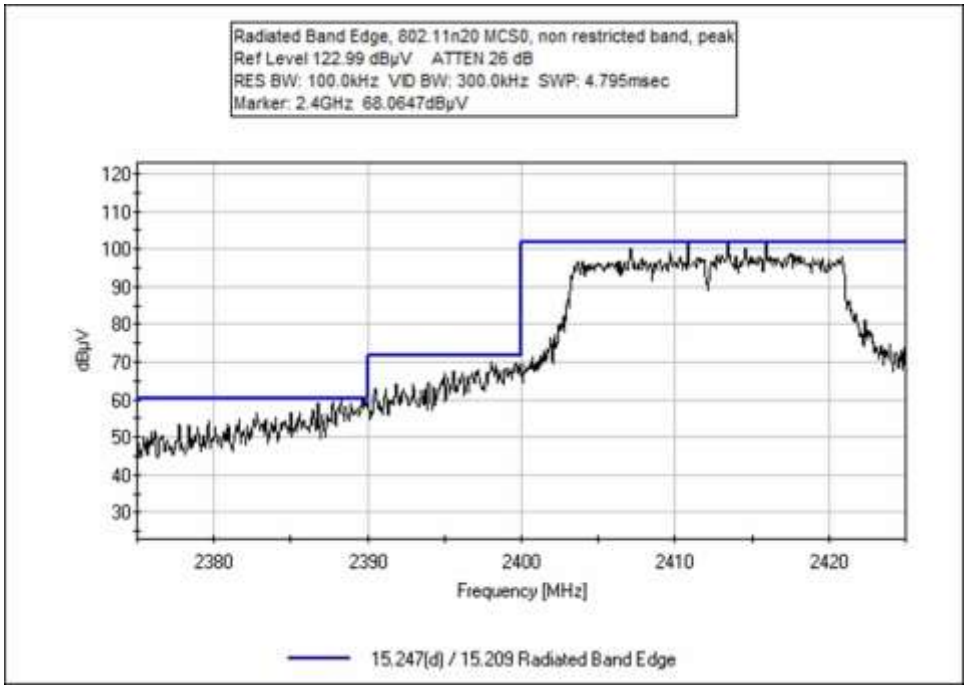

Radiated Band Edge, 802.11g 54M, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 3.899sec
Marker: 2.39GHz 47.4617dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

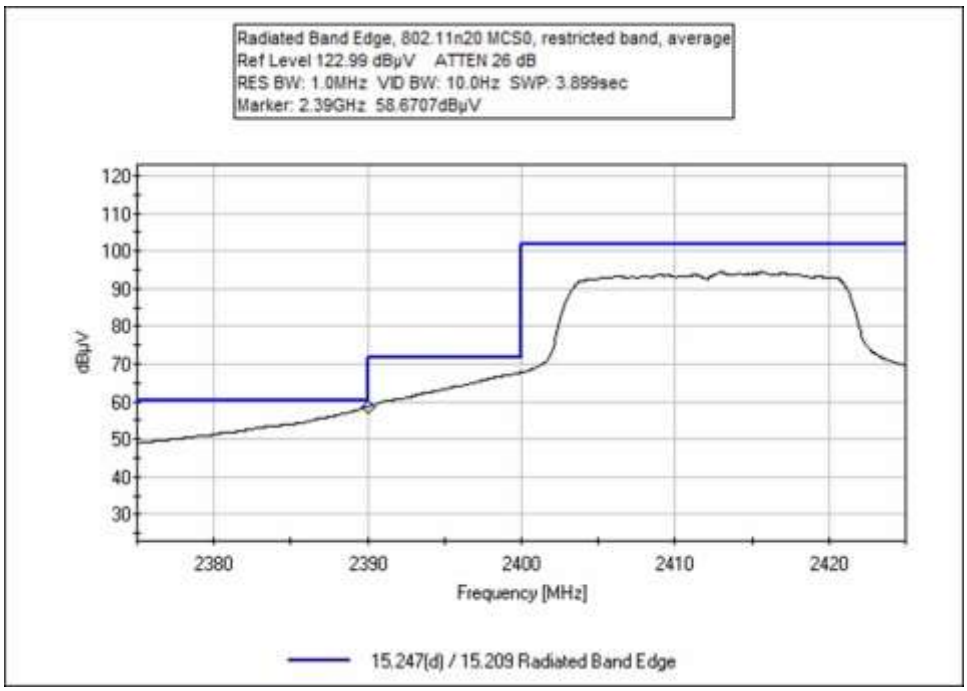

Radiated Band Edge, 802.11g 54M, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.484GHz 68.5957dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

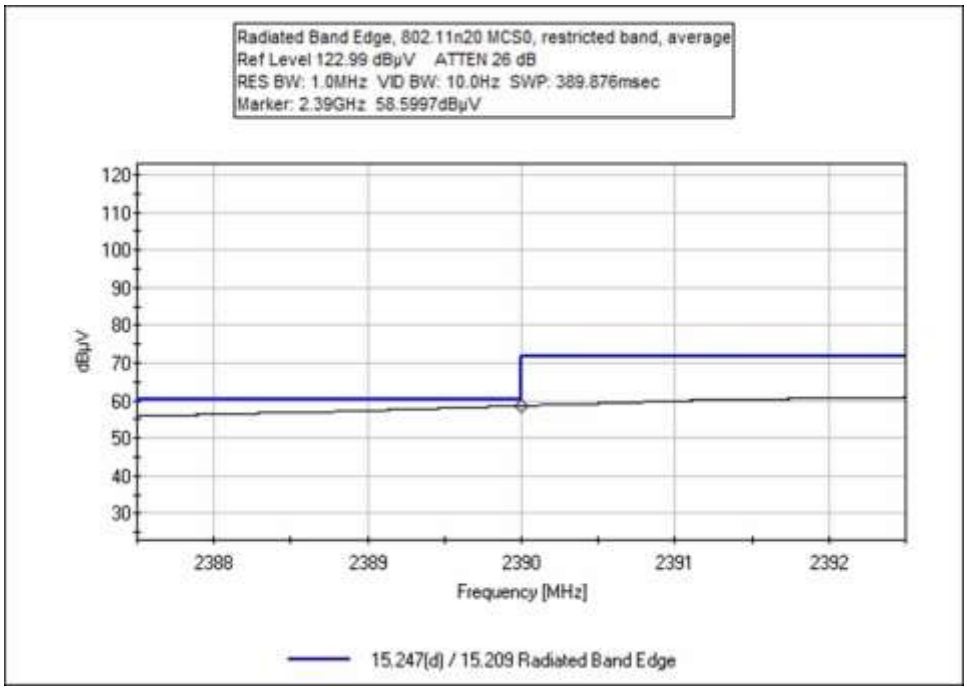

Radiated Band Edge, 802.11g 54M, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 6.26msec
Marker: 2.5GHz 44.6027dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

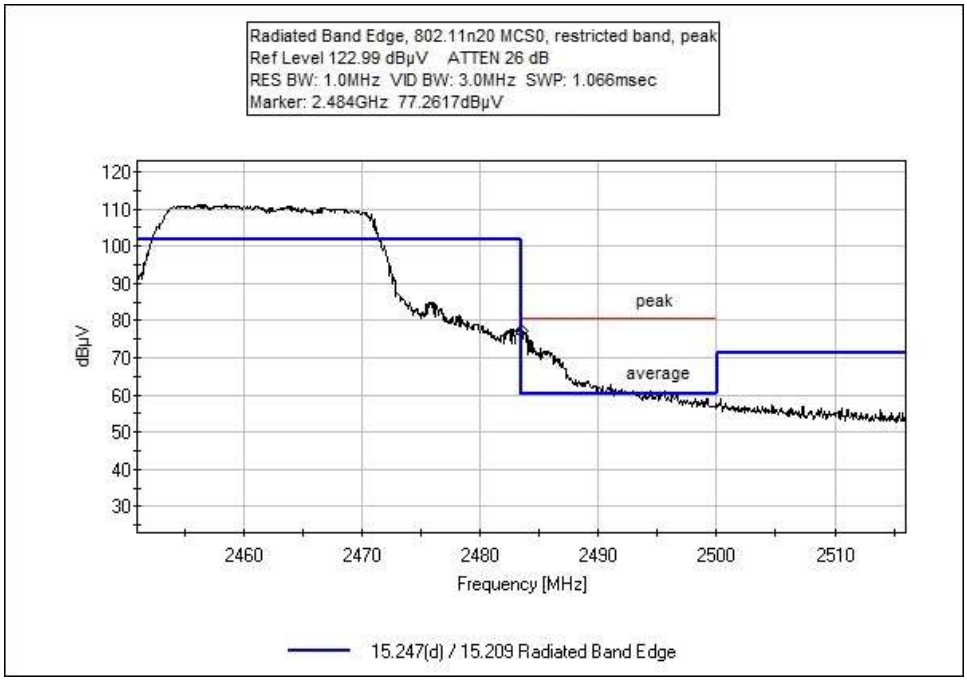

Radiated Band Edge, 802.11g 54M, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 5.068sec
Marker: 2.484GHz 51.4617dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

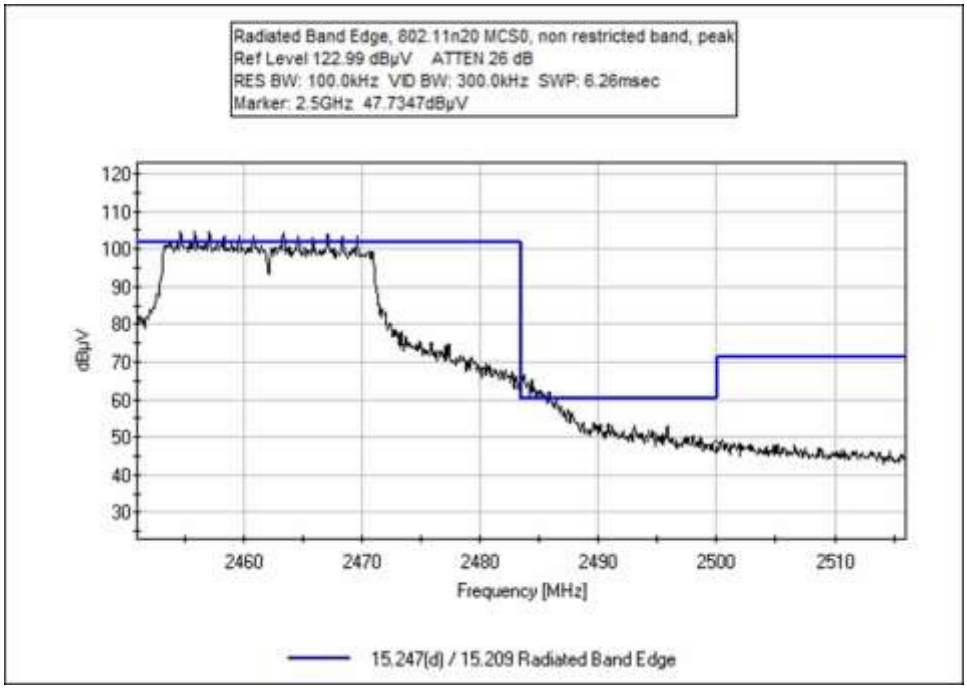

Radiated Band Edge, 802.11n20 MCS0, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.39GHz 77.4307dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

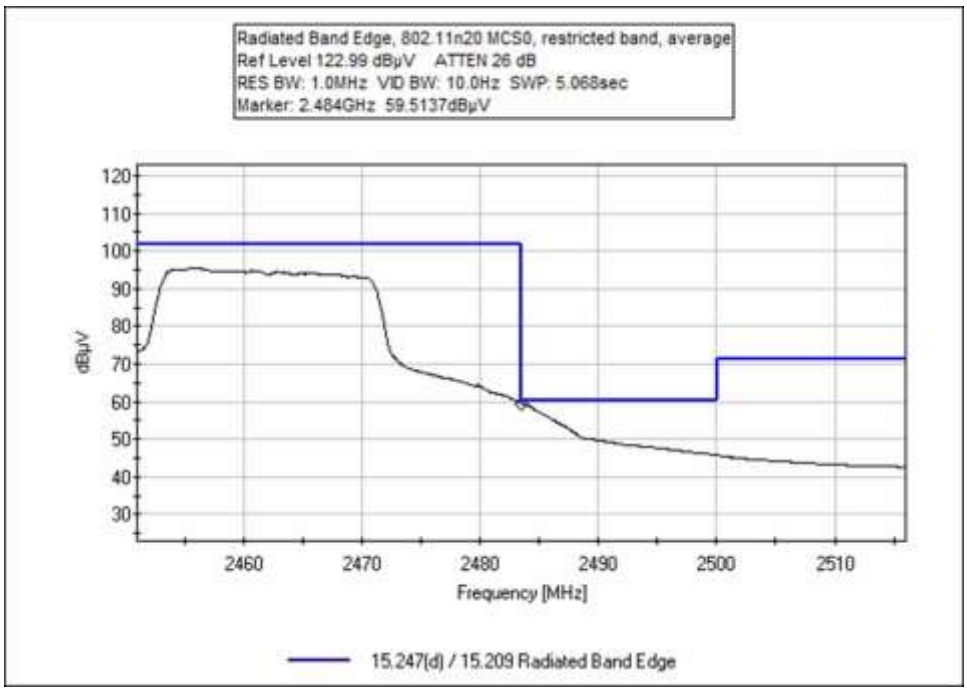

Radiated Band Edge, 802.11n20 MCS0, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 4.795msec
Marker: 2.4GHz 68.0647dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

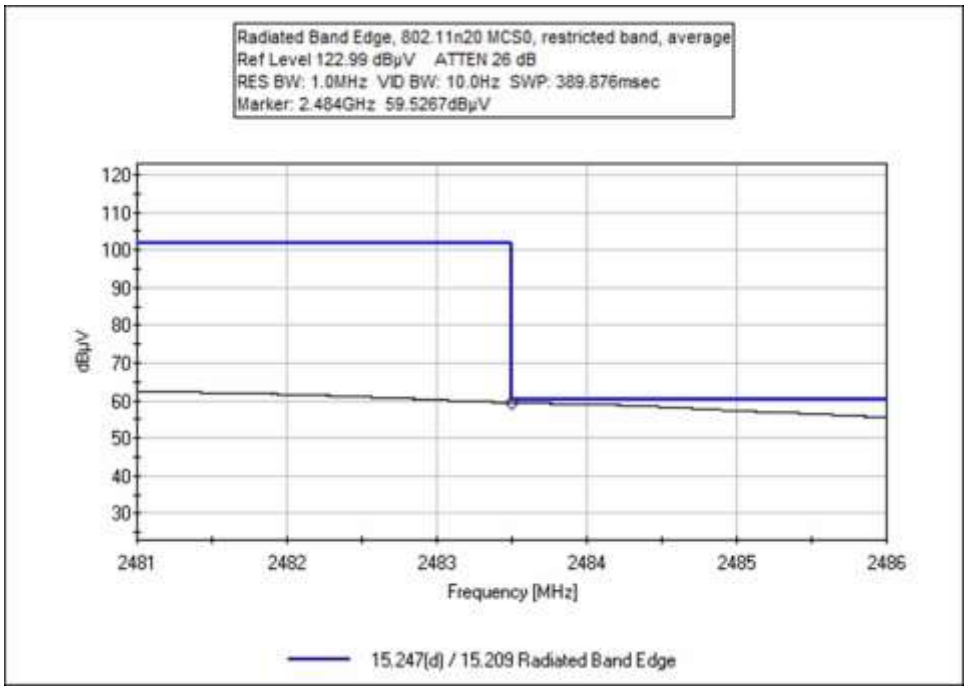

Radiated Band Edge, 802.11n20 MCS0, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 3.899sec
Marker: 2.39GHz 58.6707dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

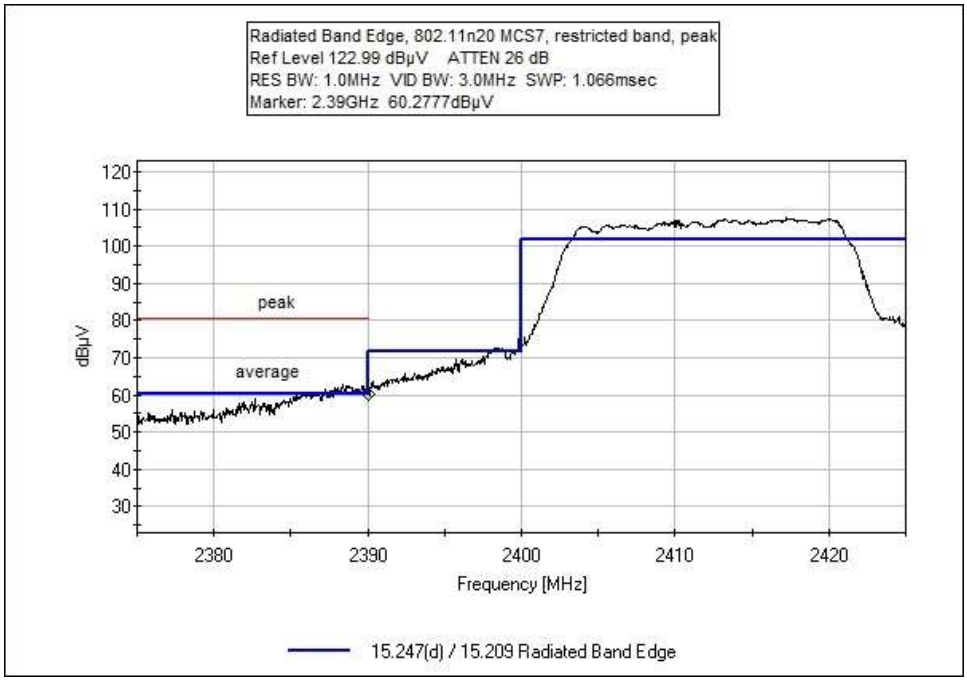

Radiated Band Edge, 802.11n20 MCS0, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 389.876msec
Marker: 2.39GHz 58.5997dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2388
2389
2390
2391
2392
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

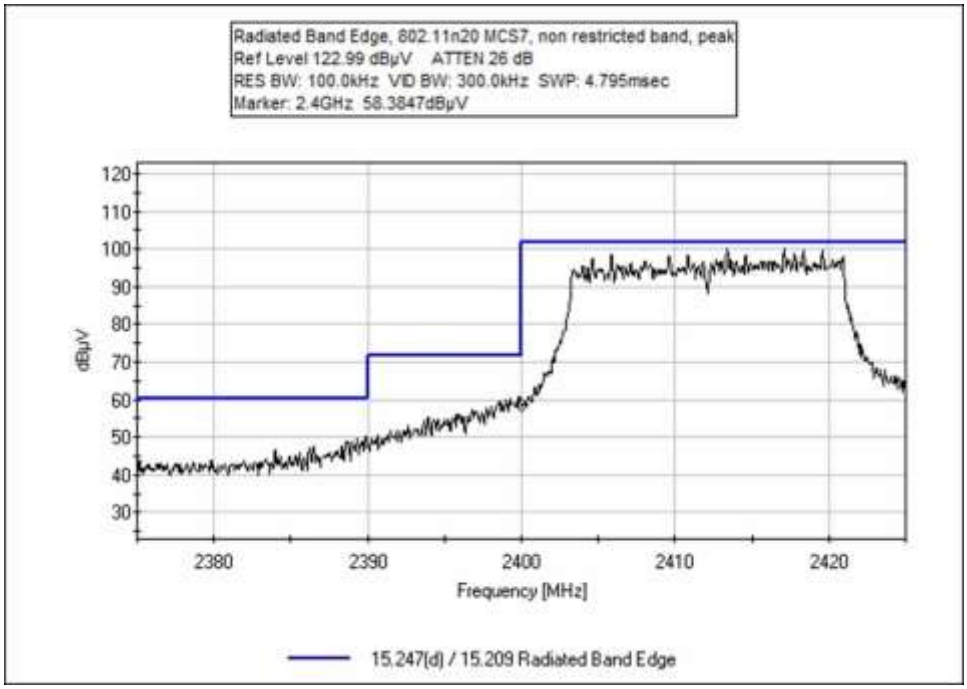

Radiated Band Edge, 802.11n20 MCS0, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.484GHz 77.2617dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
peak
average
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

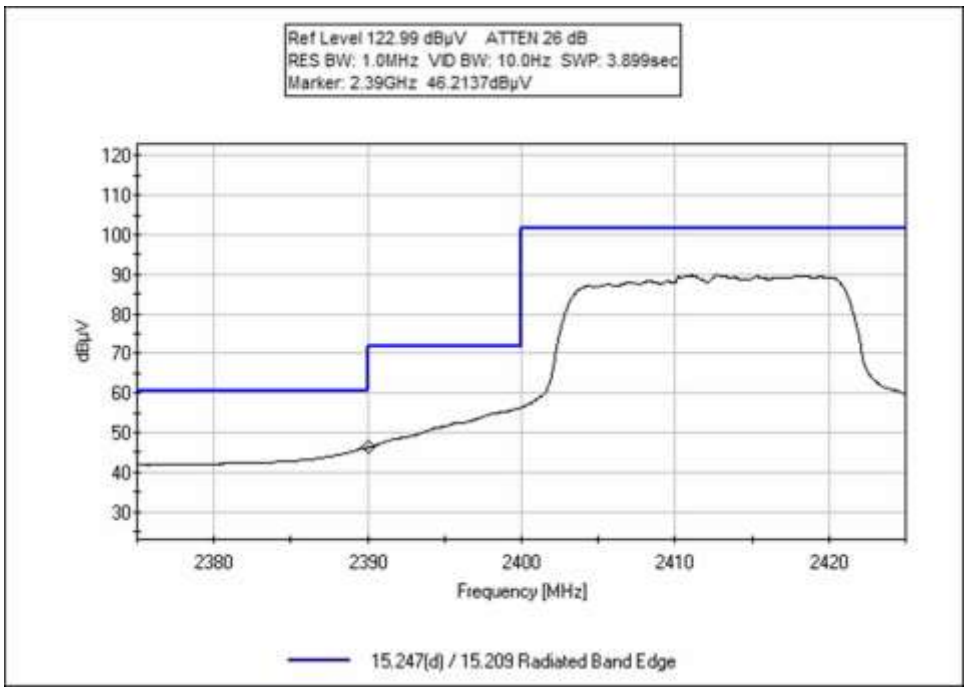

Radiated Band Edge, 802.11n20 MCS0, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 6.26msec
Marker: 2.5GHz 47.7347dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

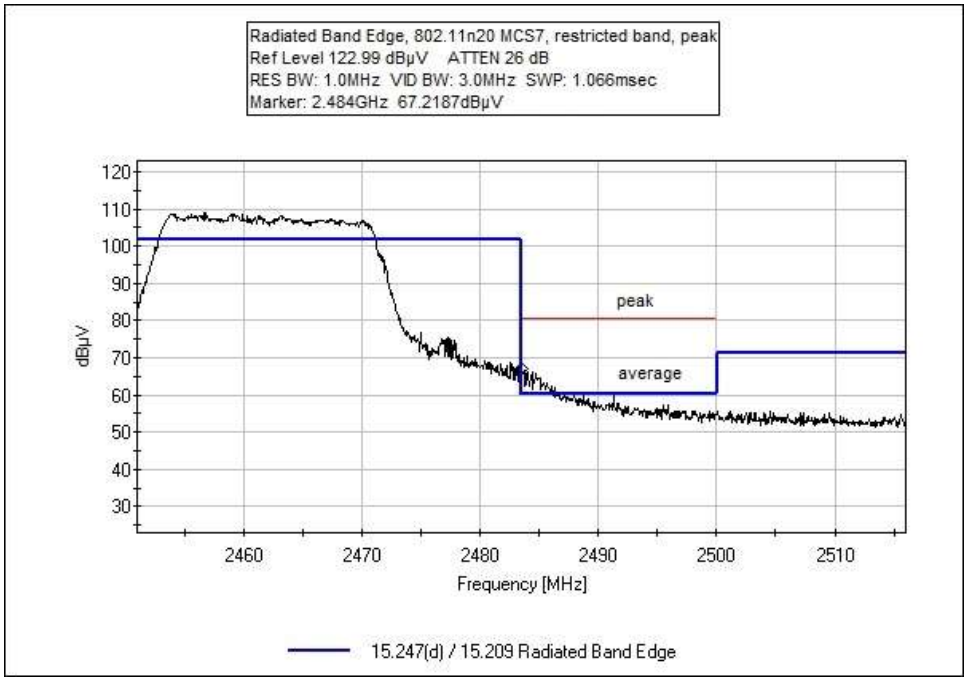

Radiated Band Edge, 802.11n20 MCS0, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 5.068sec
Marker: 2.484GHz 59.5137dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

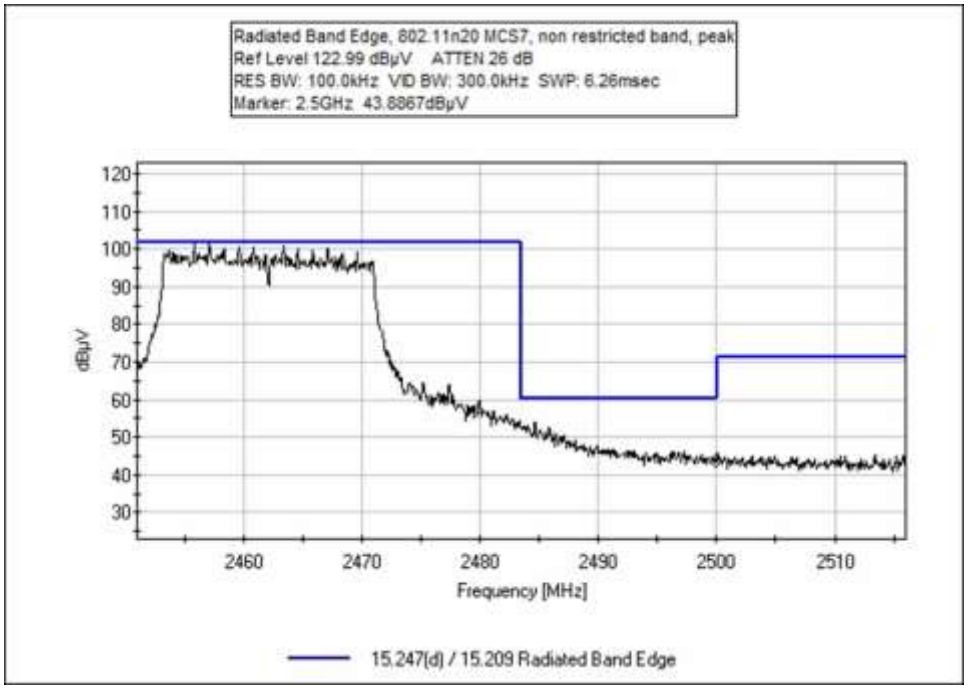

Radiated Band Edge, 802.11n20 MCS0, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 389.876msec
Marker: 2.484GHz 59.5267dBµV
dBµV
120
110
100
90
80
70
60
50
40
30
2481
2482
2483
2484
2485
2486
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

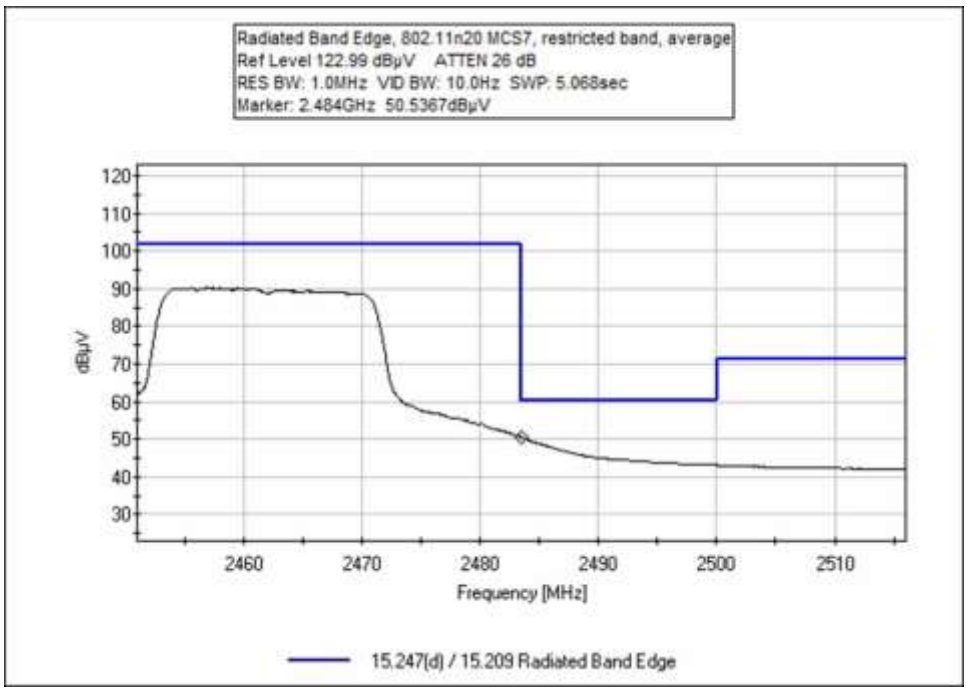

Radiated Band Edge, 802.11n20 MCS7, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.39GHz 60.2777dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 802.11n20 MCS7, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 4.795msec
Marker: 2.4GHz 58.3847dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 3.899sec
Marker: 2.39GHz 46.2137dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2380
2390
2400
2410
2420
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 802.11n20 MCS7, restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 3.0MHz SWP: 1.066msec
Marker: 2.484GHz 67.2187dBµV
peak
average
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 802.11n20 MCS7, non restricted band, peak
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 100.0kHz VID BW: 300.0kHz SWP: 6.26msec
Marker: 2.5GHz 43.8867dBµV
dBµV
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge


Radiated Band Edge, 802.11n20 MCS7, restricted band, average
Ref Level 122.99 dBµV ATTEN 26 dB
RES BW: 1.0MHz VID BW: 10.0Hz SWP: 5.068sec
Marker: 2.484GHz 50.5367dBµV
120
110
100
90
80
70
60
50
40
30
dBµV
2460
2470
2480
2490
2500
2510
Frequency [MHz]
15.247(d) / 15.209 Radiated Band Edge

Test Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Band Edge**		
Work Order #:	**107533**	Date:	10/11/2022
Test Type:	**Radiated Scan**	Time:	12:11:53
Tested By:	S. Yamamoto	Sequence#:	12
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.
The EUT is transmitting continuously at >=98%.

Testing Frequency:
Low channel 2412MHz
High channel 2462MHz

Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)

Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2412MHz to 2462MHz
RBW=100kHz, VBW=300kHz
RBW=1MHz, VBW=3MHz

Test Environment Conditions:
Temperature: 23°C
Humidity: 59%
Pressure: 99kPa

ANSI C63.10 (2013), KDB 558074

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06360	Cable	L1-PNMNM-48	9/30/2021	9/30/2023
T2	AN00849	Horn Antenna	3115	3/21/2022	3/21/2024
T3	AN00786	Preamp	83017A	5/23/2022	5/23/2024
T4	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2483.500M Ave	59.1	+3.3	+28.4	-38.5	+0.5	+0.0	52.8	54.0	-1.2	Vert
2	2390.000M Ave	57.6	+3.2	+28.5	-38.5	+0.5	+0.0	51.3	54.0	-2.7	Vert
3	2400.000M	66.1	+3.2	+28.5	-38.5	+0.5	+0.0	59.8	65.3	-5.5	Vert
4	2400.000M	64.4	+3.2	+28.5	-38.5	+0.5	+0.0	58.1	65.3	-7.2	Vert
5	2483.500M Ave	51.5	+3.3	+28.4	-38.5	+0.5	+0.0	45.2	54.0	-8.8	Vert
^	2483.500M	74.5	+3.3	+28.4	-38.5	+0.5	+0.0	68.2	54.0	+14.2	Vert
^	2483.500M	68.6	+3.3	+28.4	-38.5	+0.5	+0.0	62.3	54.0	+8.3	Vert
8	2500.000M	47.7	+3.3	+28.5	-38.5	+0.5	+0.0	41.5	54.0	-12.5	Vert
9	2390.000M Ave	47.5	+3.2	+28.5	-38.5	+0.5	+0.0	41.2	54.0	-12.8	Vert
^	2390.000M	78.1	+3.2	+28.5	-38.5	+0.5	+0.0	71.8	54.0	+17.8	Vert
^	2390.000M	66.8	+3.2	+28.5	-38.5	+0.5	+0.0	60.5	54.0	+6.5	Vert
12	2500.000M	44.6	+3.3	+28.5	-38.5	+0.5	+0.0	38.4	54.0	-15.6	Vert

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(d) / 15.209 Radiated Band Edge**		
Work Order #:	**107533**	Date:	10/11/2022
Test Type:	**Radiated Scan**	Time:	12:36:12
Tested By:	S. Yamamoto	Sequence#:	13
Software:	EMITest 5.03.20		

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.
The EUT is transmitting continuously at >=98%.

Testing Frequency:
Low channel 2412MHz
High channel 2462MHz

Rates:
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2412MHz to 2462MHz
RBW=100kHz, VBW=300kHz
RBW=1MHz, VBW=3MHz

Test Environment Conditions:
Temperature: 23°C
Humidity: 59%
Pressure: 99kPa

ANSI C63.10 (2013), KDB 558074

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	ANP06360	Cable	L1-PNMNM-48	9/30/2021	9/30/2023
T2	AN00849	Horn Antenna	3115	3/21/2022	3/21/2024
T3	AN00786	Preamp	83017A	5/23/2022	5/23/2024
T4	ANP07655	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

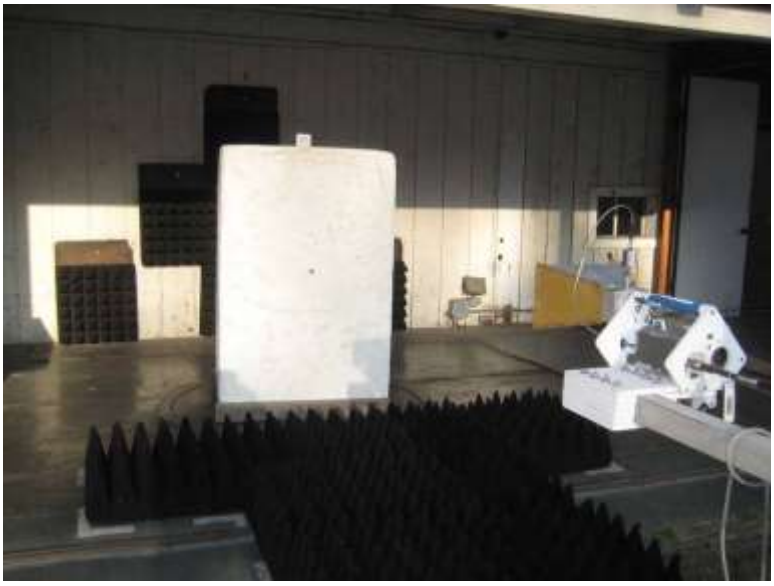
Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	2483.500M Ave	59.5	+3.3	+28.4	-38.5	+0.5	+0.0	53.2	54.0	-0.8	Vert
2	2390.000M Ave	58.7	+3.2	+28.5	-38.5	+0.5	+0.0	52.4	54.0	-1.6	Vert
3	2400.000M	68.1	+3.2	+28.5	-38.5	+0.5	+0.0	61.8	65.3	-3.5	Vert
4	2483.500M Ave	50.5	+3.3	+28.4	-38.5	+0.5	+0.0	44.2	54.0	-9.8	Vert
^	2483.500M	77.3	+3.3	+28.4	-38.5	+0.5	+0.0	71.0	54.0	+17.0	Vert
^	2483.500M	67.2	+3.3	+28.4	-38.5	+0.5	+0.0	60.9	54.0	+6.9	Vert
7	2500.000M	47.7	+3.3	+28.5	-38.5	+0.5	+0.0	41.5	54.0	-12.5	Vert
8	2400.000M	58.4	+3.2	+28.5	-38.5	+0.5	+0.0	52.1	65.3	-13.2	Vert
9	2390.000M Ave	46.2	+3.2	+28.5	-38.5	+0.5	+0.0	39.9	54.0	-14.1	Vert
^	2390.000M	77.4	+3.2	+28.5	-38.5	+0.5	+0.0	71.1	54.0	+17.1	Vert
^	2390.000M	60.3	+3.2	+28.5	-38.5	+0.5	+0.0	54.0	54.0	+0.0	Vert
12	2500.000M	43.9	+3.3	+28.5	-38.5	+0.5	+0.0	37.7	54.0	-16.3	Vert

Test Setup Photo(s)

Front View

Back View



Above 1GHz

15.247(e) Power Spectral Density

Test Setup/Conditions			
Test Location:	Brea Lab A	Test Engineer:	S. Yamamoto
Test Method:	ANSI C63.10 (2013), KDB 558074	Test Date(s):	9/30/2022
Configuration:	1		
Test Setup:	The antenna port connector of the EUT is connected to the input of the spectrum analyzer using a coaxial cable and attenuator.		

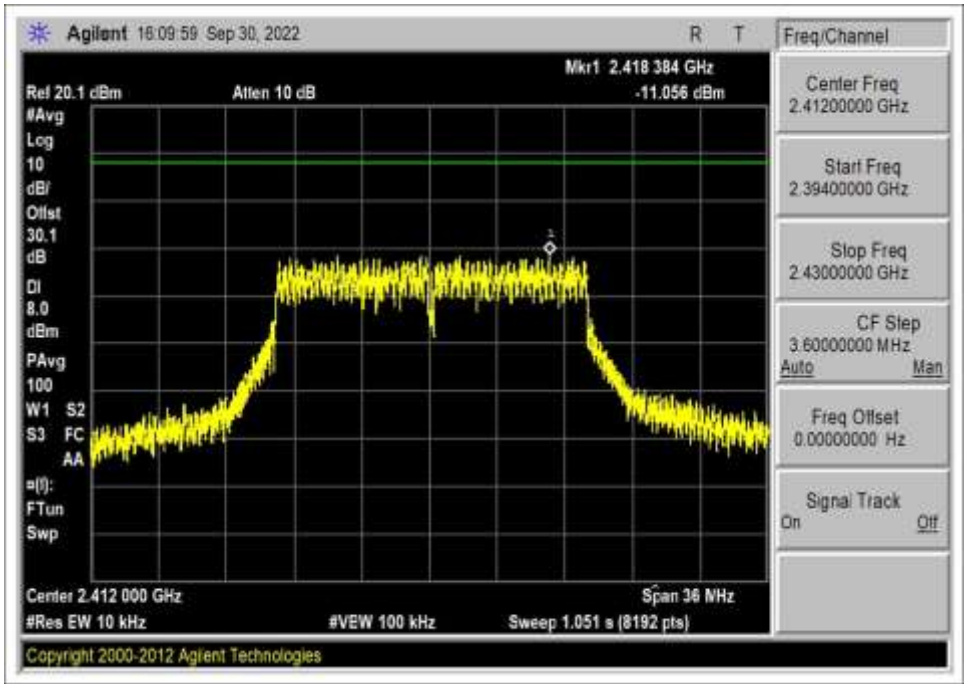
Environmental Conditions			
Temperature (ºC)	23	Relative Humidity (%):	49

Test Equipment					
Asset#	**Description**	**Manufacturer**	**Model**	**Cal Date**	**Cal Due**
02672	Spectrum Analyzer	Agilent	E4446A	5/9/2022	5/9/2024
03432	Attenuator	Aeroflex/Weinschel	90-30-34	10/28/2021	10/28/2023
P07658	Cable	Astrolab, Inc.	32022-29094K-29094K-24TC	6/22/2022	6/22/2024

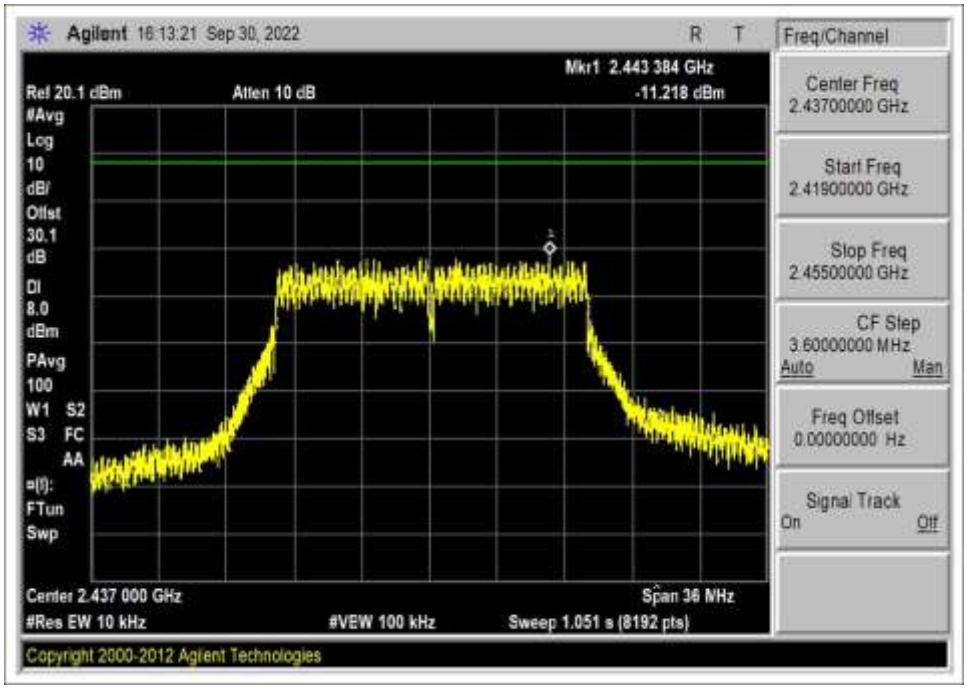
Test Data Summary - RF Conducted Measurement				
Measurement Method: PKPSD				
Frequency (MHz)	**Modulation**	**Measured (dBm/10kHz)**	**Limit (dBm/3kHz)**	**Results**
2412	802.11g 6M	-11.056	≤8	Pass
2437	802.11g 6M	-11.218	≤8	Pass
2462	802.11g 6M	-11.958	≤8	Pass
2412	802.11g 54M	-12.700	≤8	Pass
2437	802.11g 54M	-13.676	≤8	Pass
2462	802.11g 54M	-13.577	≤8	Pass
2412	802.11n20 MCS0	-10.791	≤8	Pass
2437	802.11n20 MCS0	-11.460	≤8	Pass
2462	802.11n20 MCS0	-11.292	≤8	Pass
2412	802.11n20 MCS7	-14.216	≤8	Pass
2437	802.11n20 MCS7	-15.094	≤8	Pass
2462	802.11n20 MCS7	-15.346	≤8	Pass

Plots

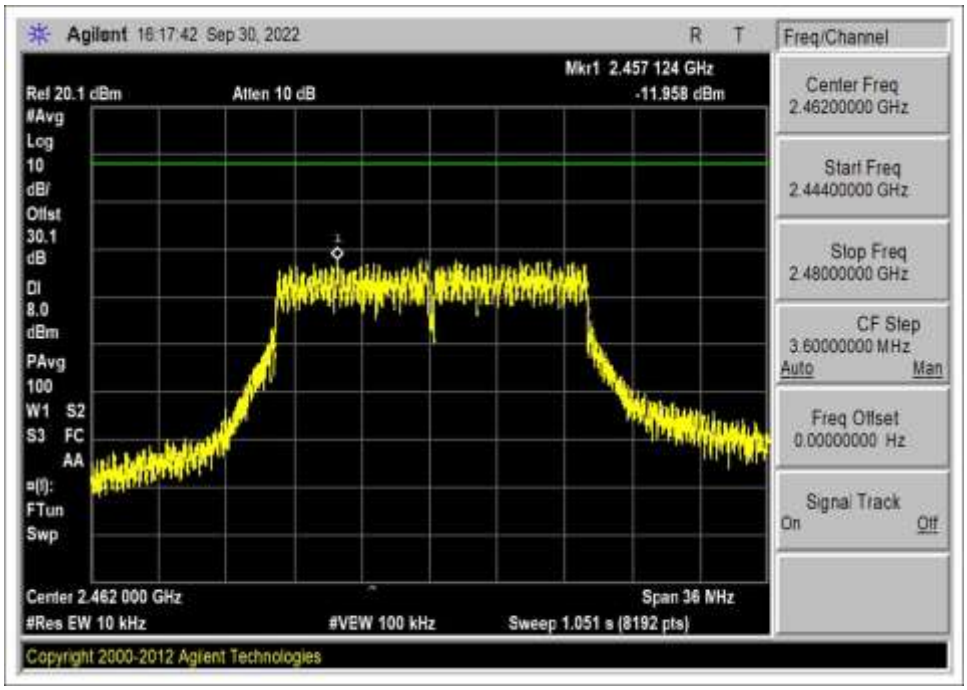
802.11g 6M



Low Channel

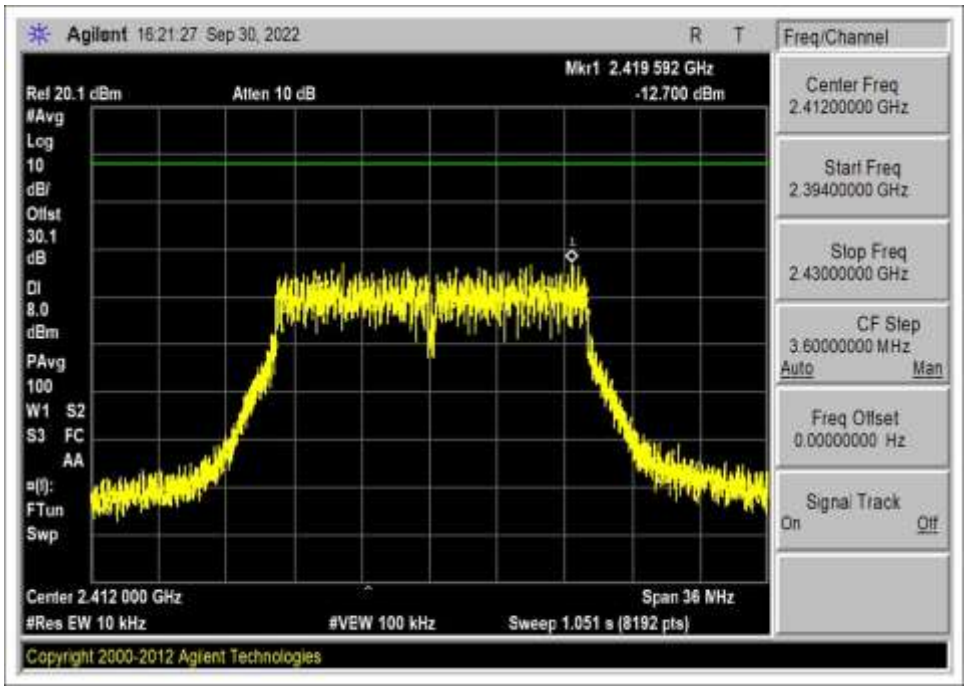


Middle Channel

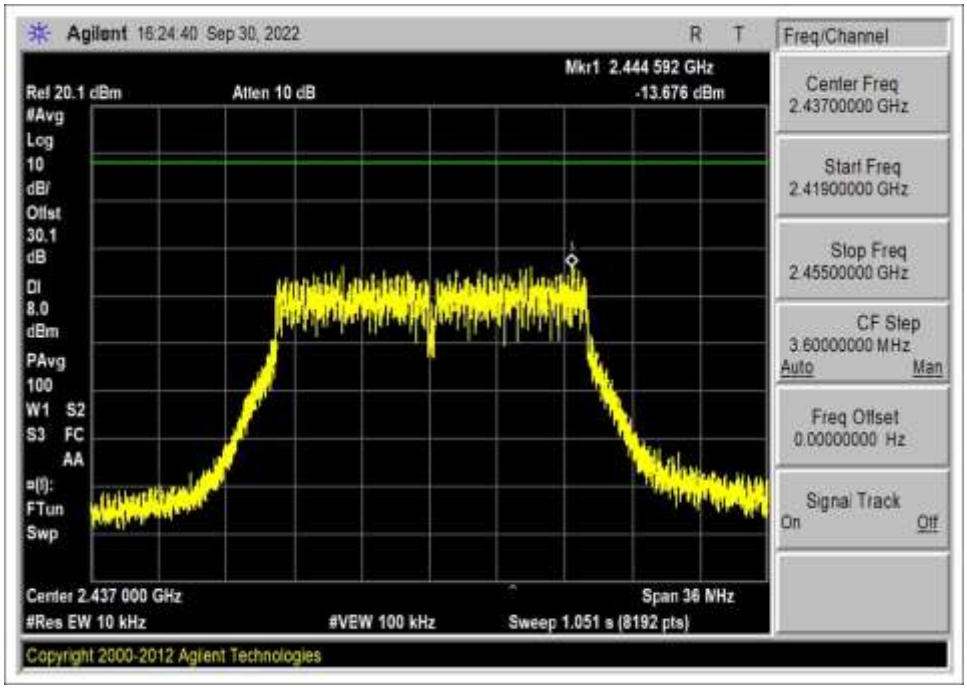


High Channel

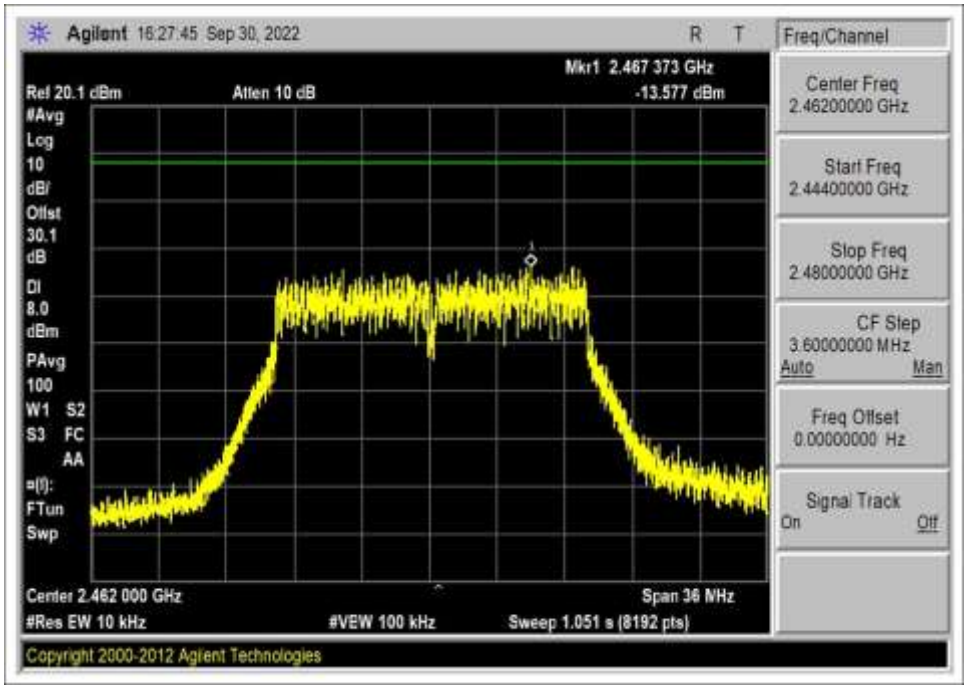
802.11g 54M



Low Channel

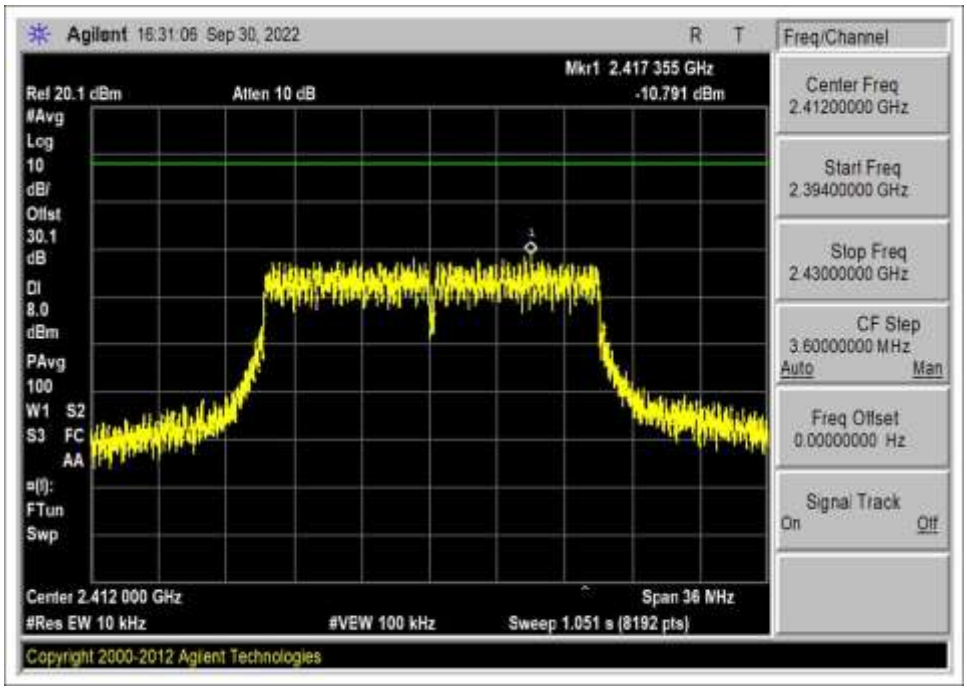


Middle Channel

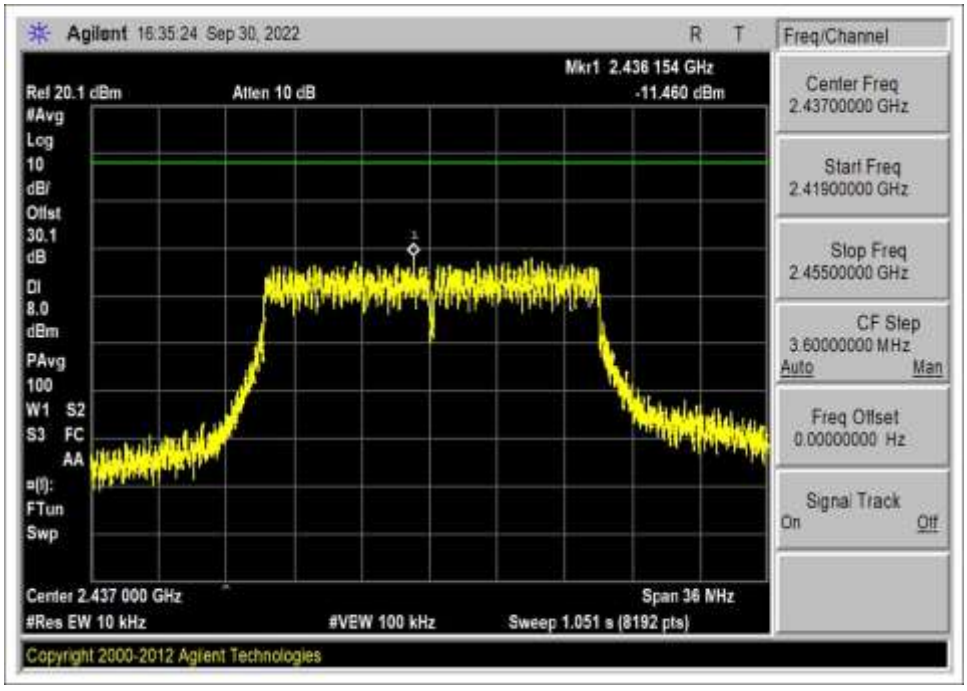


High Channel

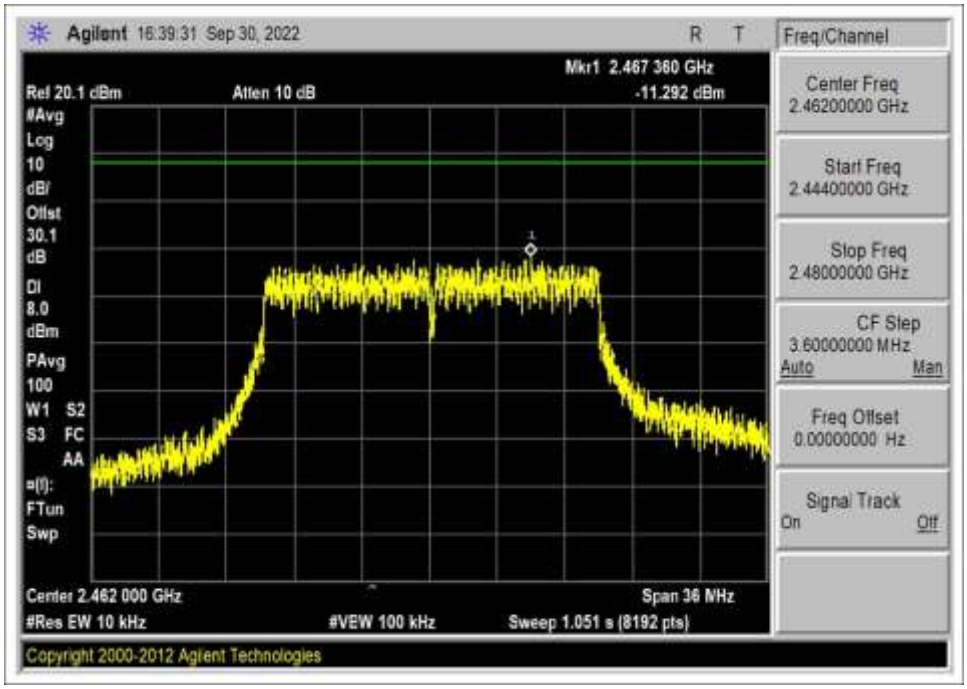
802.11n20 MCS0



Low Channel

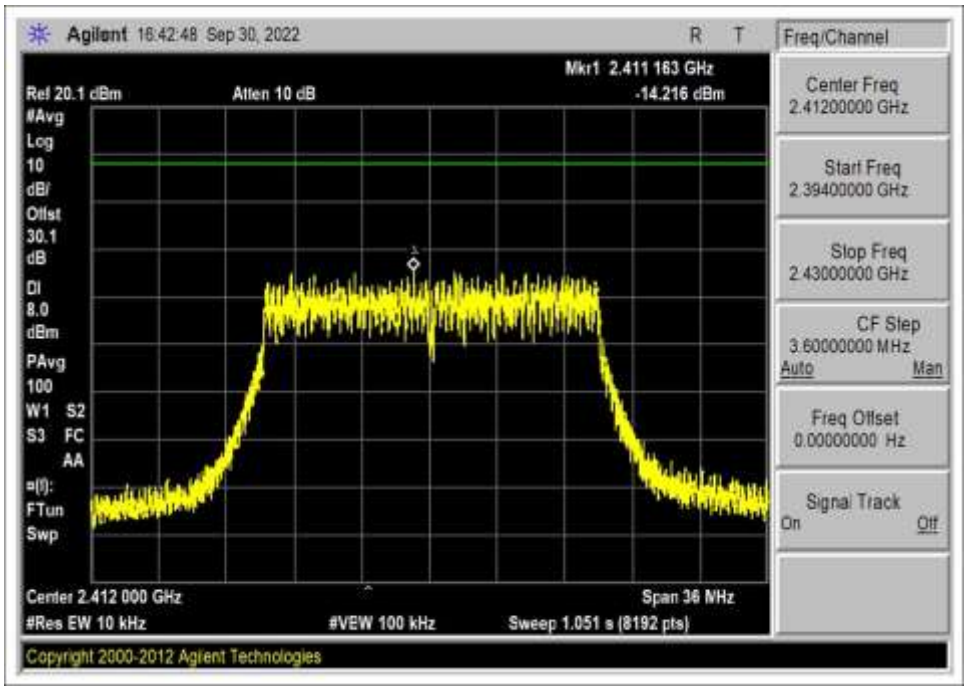


Middle Channel

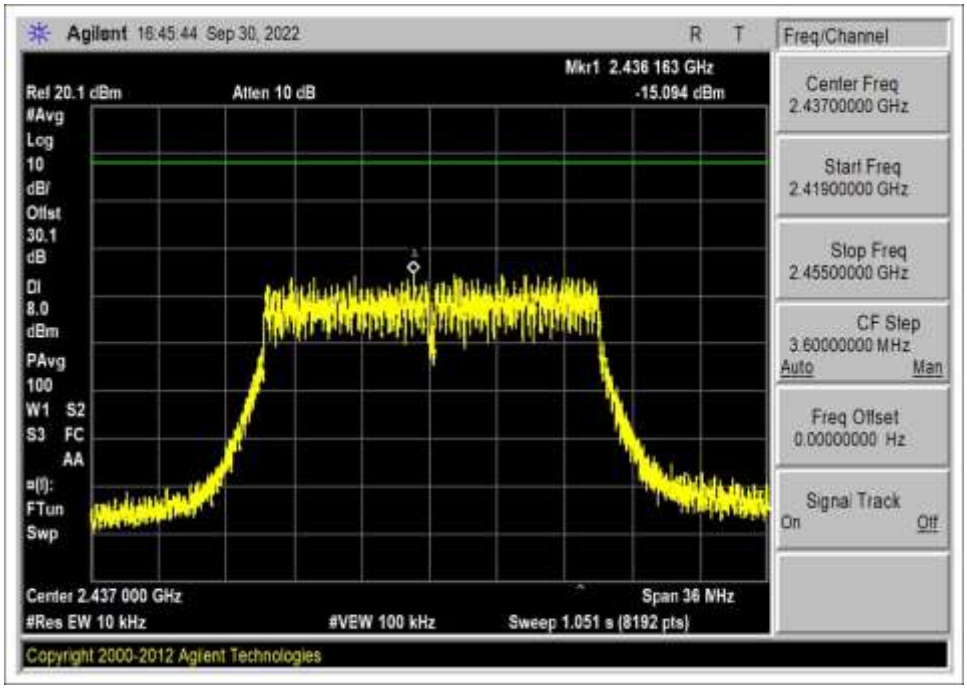


High Channel

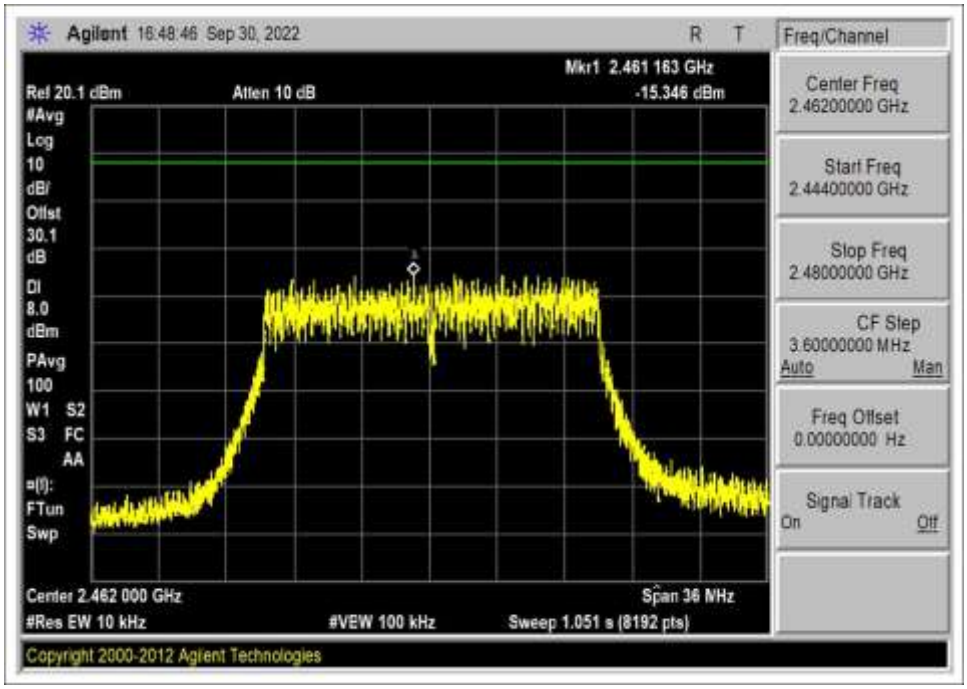
802.11n20 MCS7



Low Channel



Middle Channel



High Channel

Test Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.247(e) Peak Power Spectral Density (2400-2483.5 MHz DTS)**		
Work Order #:	**107533**	Date:	9/30/2022
Test Type:	**Conducted Emissions**	Time:	17:32:30
Tested By:	S. Yamamoto	Sequence#:	2
Software:	EMITest 5.03.20		24Vac

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

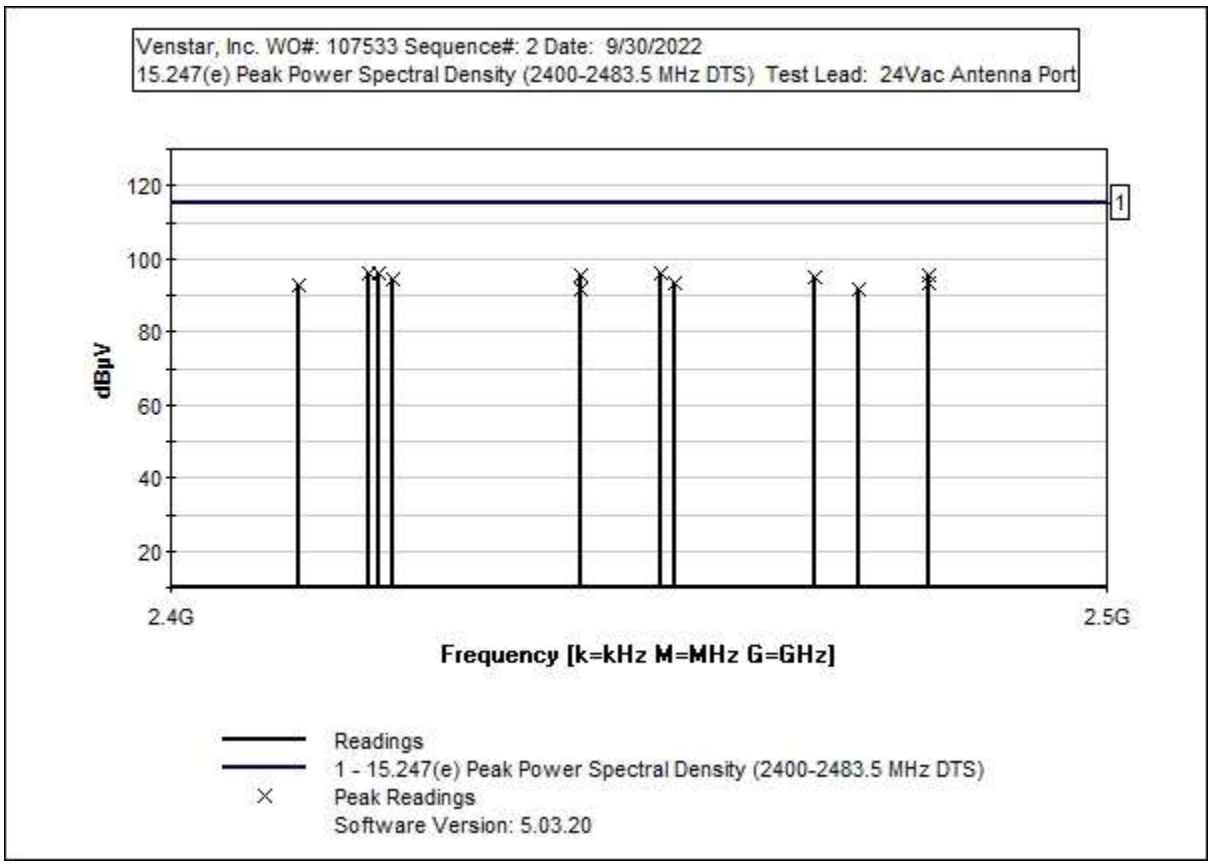
Testing Frequencies:
Low channel 2412MHz
Middle channel 2437MHz
High channel 2462MHz

Rates:
802.11g: 6Mbps (OFDM), 54Mbps (OFDM)
802.11n20: MCS0 (BPSK), MCS7 (64-QAM)

Modulation: OFDM, BPSK, 64-QAM
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 2412MHz to 2462MHz
RBW=10kHz, VBW=100kHz

ANSI C63.10-2013
558074 D01 15.247 Meas Guidance v05r02



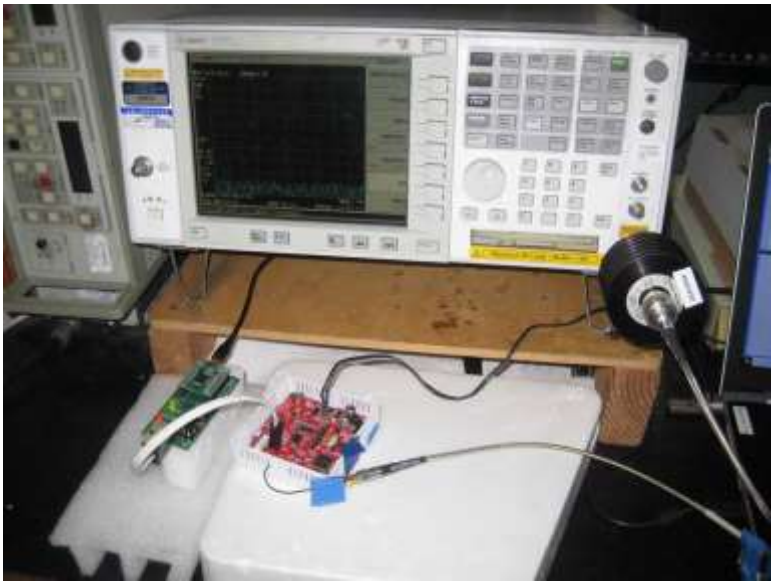
Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T2	ANP07658	Cable	32022-29094K-29094K-24TC	6/22/2022	6/22/2024
T3	AN03432	Attenuator	90-30-34	10/28/2021	10/28/2023

Measurement Data: Reading listed by margin. Test Lead: Antenna Port

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2417.355M	66.1	+0.0	+0.5	+29.6		+0.0	96.2	115.0	-18.8	Anten
2	2418.384M	65.8	+0.0	+0.5	+29.6		+0.0	95.9	115.0	-19.1	Anten
3	2443.384M	65.7	+0.0	+0.5	+29.6		+0.0	95.8	115.0	-19.2	Anten
4	2467.360M	65.6	+0.0	+0.4	+29.6		+0.0	95.6	115.0	-19.4	Anten
5	2436.154M	65.4	+0.0	+0.5	+29.6		+0.0	95.5	115.0	-19.5	Anten
6	2457.124M	64.9	+0.0	+0.5	+29.6		+0.0	95.0	115.0	-20.0	Anten
7	2419.592M	64.2	+0.0	+0.5	+29.6		+0.0	94.3	115.0	-20.7	Anten
8	2444.592M	63.2	+0.0	+0.5	+29.6		+0.0	93.3	115.0	-21.7	Anten
9	2467.373M	63.3	+0.0	+0.4	+29.6		+0.0	93.3	115.0	-21.7	Anten
10	2411.163M	62.7	+0.0	+0.5	+29.6		+0.0	92.8	115.0	-22.2	Anten
11	2436.163M	61.8	+0.0	+0.5	+29.6		+0.0	91.9	115.0	-23.1	Anten
12	2461.163M	61.6	+0.0	+0.4	+29.6		+0.0	91.6	115.0	-23.4	Anten

Test Setup Photo(s)



15.207 AC Conducted Emissions

Test Setup/ Conditions/ Data

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	12:15:59
Tested By:	S. Yamamoto	Sequence#:	9
Software:	EMITest 5.03.20		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a Styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via Wi-Fi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequency:
Low channel 2412MHz

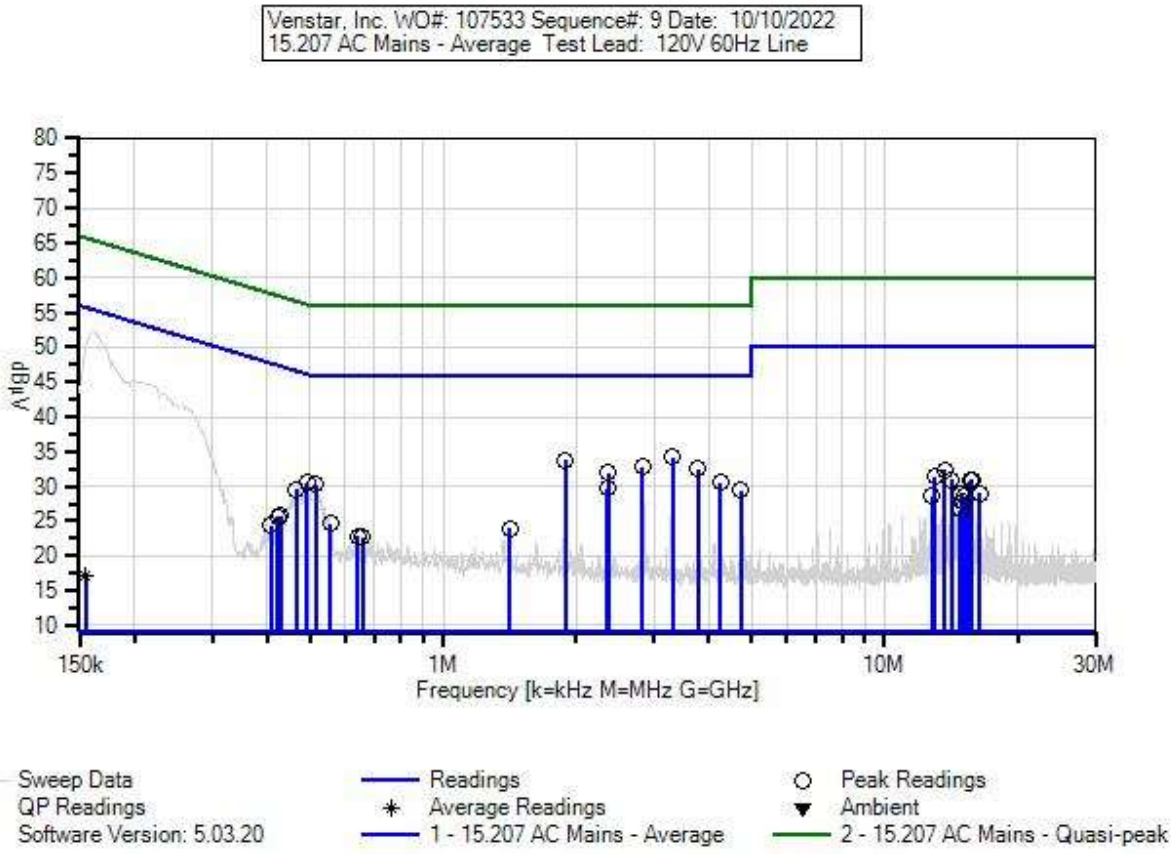
Rates:
802.11n20 MCS0

Modulation: BPSK
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 150kHz to 30MHz
RBW=9kHz, VBW=30kHz

Test Environment Conditions:
Temperature: 23C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02672	Spectrum Analyzer	E4446A	5/9/2022	5/9/2024
T1	AN02610	High Pass Filter	HE9615-150K-50-720B	9/8/2021	9/8/2023
T2	ANP07338	Cable	2249-Y-240	1/3/2022	1/3/2024
T3	ANP07545	Attenuator	SA18N10W-06	1/4/2021	1/4/2023
T4	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	3/18/2022	3/18/2023
	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	3/18/2022	3/18/2023
T5	ANP07738	Cable-Line L1(dB)	90cm-extcord	12/9/2020	12/9/2022
	ANP07738	Cable-Neutral L2(dB)	90cm-extcord	12/9/2020	12/9/2022

Measurement Data: Reading listed by margin. Test Lead: Line

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	3.310M	28.1	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	34.2	46.0	-11.8	Line
2	1.889M	27.8	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	33.8	46.0	-12.2	Line
3	2.829M	26.7	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	32.8	46.0	-13.2	Line
4	3.782M	26.4	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	32.5	46.0	-13.5	Line
5	2.366M	25.9	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	31.9	46.0	-14.1	Line
6	4.254M	24.3	+0.1 +0.2	+0.2	+5.7	+0.0	+0.0	30.5	46.0	-15.5	Line
7	491.059k	24.4	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	30.5	46.1	-15.6	Line
8	514.330k	24.1	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	30.2	46.0	-15.8	Line
9	2.353M	23.7	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	29.7	46.0	-16.3	Line
10	4.726M	23.2	+0.1 +0.2	+0.2	+5.7	+0.0	+0.0	29.4	46.0	-16.6	Line
11	464.152k	23.4	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	29.5	46.6	-17.1	Line
12	13.688M	25.5	+0.2 +0.6	+0.3	+5.8	+0.0	+0.0	32.4	50.0	-17.6	Line
13	13.013M	24.5	+0.2 +0.6	+0.3	+5.8	+0.0	+0.0	31.4	50.0	-18.6	Line
14	14.184M	24.1	+0.2 +0.6	+0.3	+5.8	+0.0	+0.0	31.0	50.0	-19.0	Line
15	15.743M	23.9	+0.2 +0.7	+0.3	+5.8	+0.0	+0.0	30.9	50.0	-19.1	Line
16	15.607M	23.8	+0.2 +0.7	+0.3	+5.8	+0.0	+0.0	30.8	50.0	-19.2	Line
17	16.427M	22.0	+0.2 +0.7	+0.3	+5.8	+0.0	+0.0	29.0	50.0	-21.0	Line
18	14.896M	21.9	+0.2 +0.6	+0.3	+5.8	+0.0	+0.0	28.8	50.0	-21.2	Line
19	555.780k	18.4	+0.3 +0.1	+0.0	+5.8	+0.0	+0.0	24.6	46.0	-21.4	Line
20	12.770M	21.8	+0.2 +0.5	+0.3	+5.8	+0.0	+0.0	28.6	50.0	-21.4	Line
21	15.247M	21.6	+0.2 +0.7	+0.3	+5.8	+0.0	+0.0	28.6	50.0	-21.4	Line
22	429.247k	19.8	+0.2 +0.1	+0.0	+5.7	+0.0	+0.0	25.8	47.3	-21.5	Line
23	421.975k	19.6	+0.2 +0.1	+0.0	+5.7	+0.0	+0.0	25.6	47.4	-21.8	Line

24	1.417M	17.9	+0.2 +0.1	+0.1	+5.7	+0.0	+0.0	24.0	46.0	-22.0	Line
25	15.067M	20.7	+0.2 +0.7	+0.3	+5.8	+0.0	+0.0	27.7	50.0	-22.3	Line
26	639.409k	16.6	+0.3 +0.1	+0.0	+5.8	+0.0	+0.0	22.8	46.0	-23.2	Line
27	407.430k	18.4	+0.2 +0.1	+0.0	+5.7	+0.0	+0.0	24.4	47.7	-23.3	Line
28	656.135k	16.6	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	22.7	46.0	-23.3	Line
29	14.806M	19.7	+0.2 +0.6	+0.3	+5.8	+0.0	+0.0	26.6	50.0	-23.4	Line
30	154.952k Ave	10.6	+0.7 +0.0	+0.0	+5.7	+0.0	+0.0	17.0	55.7	-38.7	Line
^	154.952k	46.0	+0.7 +0.0	+0.0	+5.7	+0.0	+0.0	52.4	55.7	-3.3	Line

Test Location:	CKC Laboratories, Inc. • 110 North Olinda Place • Brea, CA 92823 • 714-993-6112		
Customer:	**Venstar, Inc.**		
Specification:	**15.207 AC Mains - Average**		
Work Order #:	**107533**	Date:	10/10/2022
Test Type:	**Conducted Emissions**	Time:	12:27:06
Tested By:	S. Yamamoto	Sequence#:	10
Software:	EMITest 5.03.20		120V 60Hz

Equipment Tested:

Device	Manufacturer	Model #	S/N
Configuration 1			

Support Equipment:

Device	Manufacturer	Model #	S/N
Configuration 1			

Test Conditions / Notes:

The equipment under test (EUT) is placed on a styrofoam block. The EUT antenna port is connected to the spectrum analyzer via coaxial cable and attenuator. Voltage to the EUT is 24Vac. The EUT is also connected to a support laptop computer via WiFi programming adapter board. The laptop is running EspRFTestTool which is used to set frequency, rate, and channel.

Testing Frequency:
Low channel 2412MHz

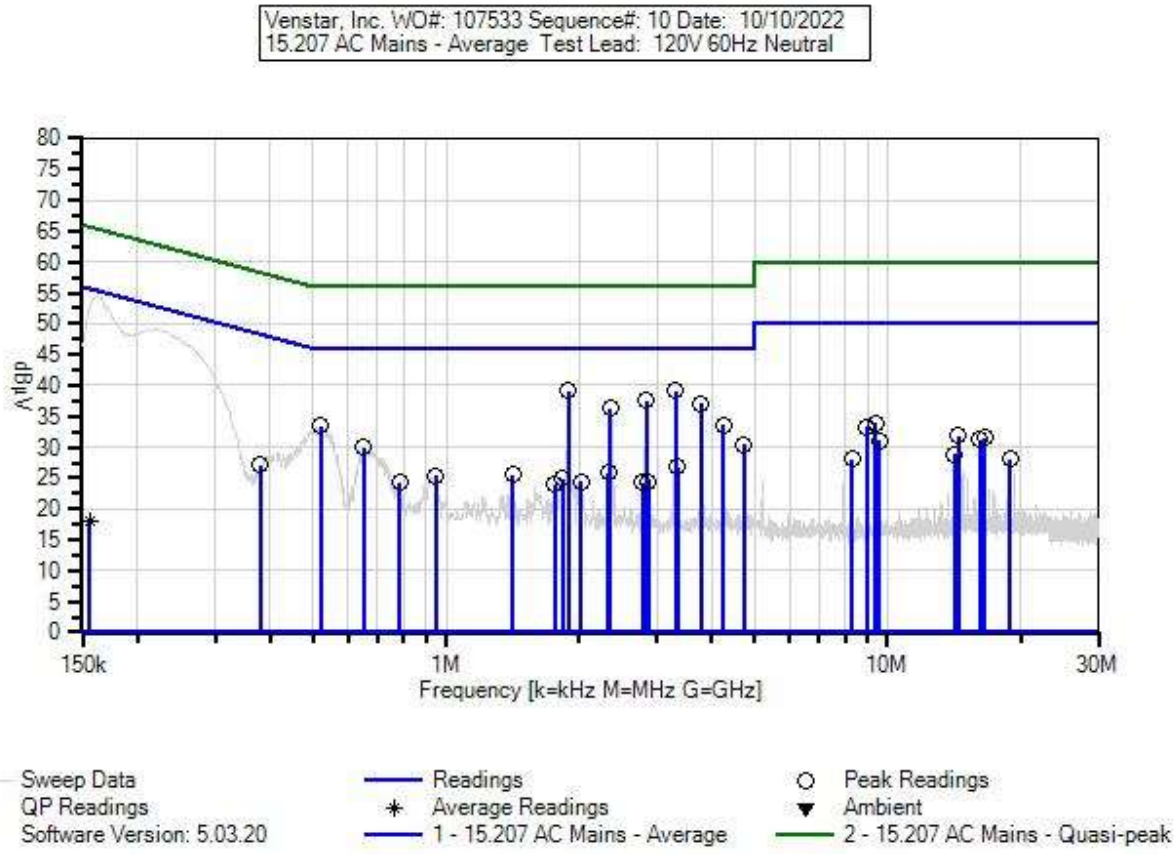
Rates:
802.11n20 MCS0

Modulation: BPSK
Mode: Continuous Modulated
TX Power Level Setting: 0

Frequency of measurement: 150kHz to 30MHz
RBW=9kHz, VBW=30kHz

Test Environment Conditions:
Temperature: 23°C
Humidity: 54%
Pressure: 99kPa

ANSI C63.10 (2013)



Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
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T2	ANP07338	Cable	2249-Y-240	1/3/2022	1/3/2024
T3	ANP07545	Attenuator	SA18N10W-06	1/4/2021	1/4/2023
	AN00847.1	50uH LISN-(L) Line 1	3816/2NM	3/18/2022	3/18/2023
T4	AN00847.1	50uH LISN-(N) Line 2	3816/2NM	3/18/2022	3/18/2023
	ANP07738	Cable-Line L1(dB)	90cm-extcord	12/9/2020	12/9/2022
T5	ANP07738	Cable-Neutral L2(dB)	90cm-extcord	12/9/2020	12/9/2022

Measurement Data: Reading listed by margin. Test Lead: Neutral

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV	dBµV	dB	Ant
1	1.889M	33.1	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	39.1	46.0	-6.9	Neutr
2	3.310M	33.0	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	39.1	46.0	-6.9	Neutr
3	2.838M	31.5	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	37.5	46.0	-8.5	Neutr
4	3.778M	31.0	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	37.1	46.0	-8.9	Neutr
5	2.357M	30.3	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	36.3	46.0	-9.7	Neutr
6	4.250M	27.4	+0.1 +0.2	+0.2	+5.7	+0.0	+0.0	33.6	46.0	-12.4	Neutr
7	520.875k	27.4	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	33.5	46.0	-12.5	Neutr
8	4.726M	24.3	+0.1 +0.2	+0.2	+5.7	+0.0	+0.0	30.5	46.0	-15.5	Neutr
9	650.317k	23.8	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	29.9	46.0	-16.1	Neutr
10	9.382M	27.4	+0.1 +0.4	+0.2	+5.7	+0.1	+0.0	33.9	50.0	-16.1	Neutr
11	8.959M	26.8	+0.1 +0.4	+0.2	+5.7	+0.1	+0.0	33.3	50.0	-16.7	Neutr
12	14.481M	25.0	+0.2 +0.5	+0.3	+5.8	+0.1	+0.0	31.9	50.0	-18.1	Neutr
13	16.562M	24.6	+0.2 +0.6	+0.3	+5.8	+0.1	+0.0	31.6	50.0	-18.4	Neutr
14	16.175M	24.2	+0.2 +0.6	+0.3	+5.8	+0.1	+0.0	31.2	50.0	-18.8	Neutr
15	9.589M	24.6	+0.1 +0.4	+0.2	+5.7	+0.1	+0.0	31.1	50.0	-18.9	Neutr
16	3.340M	20.7	+0.1 +0.2	+0.1	+5.7	+0.0	+0.0	26.8	46.0	-19.2	Neutr
17	2.336M	19.9	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	25.9	46.0	-20.1	Neutr
18	1.417M	19.4	+0.2 +0.1	+0.1	+5.7	+0.0	+0.0	25.5	46.0	-20.5	Neutr
19	949.501k	19.2	+0.2 +0.1	+0.1	+5.7	+0.0	+0.0	25.3	46.0	-20.7	Neutr
20	1.834M	18.8	+0.2 +0.1	+0.1	+5.7	+0.0	+0.0	24.9	46.0	-21.1	Neutr
21	14.139M	22.0	+0.2 +0.5	+0.3	+5.8	+0.1	+0.0	28.9	50.0	-21.1	Neutr
22	379.797k	21.1	+0.2 +0.1	+0.0	+5.7	+0.0	+0.0	27.1	48.3	-21.2	Neutr
23	2.017M	18.5	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	24.5	46.0	-21.5	Neutr

24	2.872M	18.5	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	24.5	46.0	-21.5	Neutr
25	784.850k	18.2	+0.3 +0.1	+0.0	+5.7	+0.0	+0.0	24.3	46.0	-21.7	Neutr
26	2.791M	18.2	+0.1 +0.1	+0.1	+5.7	+0.0	+0.0	24.2	46.0	-21.8	Neutr
27	18.932M	21.1	+0.2 +0.6	+0.3	+5.8	+0.1	+0.0	28.1	50.0	-21.9	Neutr
28	1.766M	17.9	+0.2 +0.1	+0.1	+5.7	+0.0	+0.0	24.0	46.0	-22.0	Neutr
29	8.319M	21.6	+0.1 +0.3	+0.2	+5.7	+0.1	+0.0	28.0	50.0	-22.0	Neutr
30 Ave	155.553k	11.5	+0.7 +0.0	+0.0	+5.7	+0.0	+0.0	17.9	55.7	-37.8	Neutr
^	155.553k	48.3	+0.7 +0.0	+0.0	+5.7	+0.0	+0.0	54.7	55.7	-1.0	Neutr

Test Setup Photo(s)

Front View

Back View

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Uncertainties reported are worst case for all CKC Laboratories' sites and represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit. Individual measurements were compared with the displayed limit value in the margin column. The margin was calculated based on subtracting the limit value from the corrected measurement value; a positive margin represents a measurement exceeding the limit, while a negative margin represents a measurement less than the limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB/m)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or caret ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point, the measuring device is set into the linear mode and the scan time is reduced.