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United States of America
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CERTIFICATION TEST REPORT

Manufacturer: PCTEL, Inc
471 Brighton Drive
Bloomington, Illinois 60108-3102 USA

Applicant: Same as Above

Product Name: Industrial IoT Radio Module

Product Description: 2x2, 802.11ac, 5 GHz, mPCIe radio module

**Operating Voltage/Freq.
of EUT During Testing:** 120V/60 Hz; PoE 48VDC

Model: RM-WIFI-AC-2X2-HP-US

FCC ID: NYPRMWIFIAC2X2

Testing Commenced: 2022-07-26

Testing Ended: 2022-08-10

Summary of Test Results: In Compliance

The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

Rule(s):

- **FCC Part 15 Subpart E – Unlicensed National Information Infrastructure Devices, Section 15.407 General technical requirements**



Order Number: F2P19924D

Applicant: PCTEL, Inc
FCC ID: NYPRMWIFIAC2X2

A handwritten signature in black ink, appearing to read 'Julius Chiller'.

Evaluation Conducted by:

Julius Chiller, EMC/Wireless Engineer

A handwritten signature in black ink, appearing to read 'Ken Littell'.

Report Reviewed by:

Ken Littell, Vice President of EMC

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10:2013 and recommended FCC procedure of measurement of devices operating under Section 15.407 and in KDB789033 v02r01. A list of the measurement equipment can be found in Section 6.



1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used, and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data and are expressed with a 95% confidence factor using a coverage factor of $k=2$. The Uncertainty for a laboratory are referred to as U_{lab} . For Radiated and Conducted Emissions, the Expanded Uncertainty is compared to the U_{cispr} values to determine if a specific margin is required to deem compliance.

U_{lab}

Measurement Range	Combined Uncertainty	Expanded Uncertainty
Radiated Emissions <1 GHz @ 3m	2.54	5.07dB
Radiated Emissions <1 GHz @ 10m	2.55	5.09dB
Radiated Emissions 1 GHz to 2.7 GHz	1.81	3.62dB
Radiated Emissions 2.7 GHz to 18 GHz	1.55	3.10dB
AC Power Line Conducted Emissions, 150kHz to 30 MHz	1.38	2.76dB
AC Power Line Conducted Emissions, 9kHz to 150kHz	1.66	3.32dB

U_{cispr}

Measurement Range	Expanded Uncertainty
Radiated Emissions <1 GHz @ 3m	5.2dB
Radiated Emissions <1 GHz @ 10m	5.2dB
Radiated Emissions 1 GHz to 2.7 GHz	Under Consideration
Radiated Emissions 2.7 GHz to 18 GHz	Under Consideration
AC Power Line Conducted Emissions, 150kHz to 30 MHz	3.6dB
AC Power Line Conducted Emissions, 9kHz to 150kHz	4.0dB

If U_{lab} is less than or equal to U_{cispr} , then:

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} in table 1, then:

- compliance is deemed to occur if no measured disturbance, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance, increased by $(U_{lab} - U_{cispr})$, exceeds the disturbance limit.

Note: Only measurements listed in the tables above that relate to tests included in this Test Report are applicable.



Order Number: F2P19924D

Applicant: PCTEL, Inc
FCC ID: NYPRMWIFIAC2X2

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2P19924D-04E	First Issue	2022-08-12	K. Littell



2 SUMMARY OF TEST RESULTS/MODIFICATIONS

Note: Results below apply to UNII-1, UNII-2A, UNII-2C, and UNII-3.

Test Name	Standard(s)	Results
Radiated Spurious Emissions	CFR 47 Part 15.205 / KDB789033	Complies

Modifications Made to the Equipment
None



3 ENGINEERING STATEMENT

This report has been prepared on behalf of PCTEL, Inc to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.407 of the FCC Rules using ANSI C63.10 and KDB789033 standards. The test results found in this test report relate only to the items tested.



4 EUT INFORMATION AND DATA

4.1 Equipment Under Test:

Product: **Industrial IoT Radio Module**Model: **RM-WIFI-AC-2X2-HP-US**

Serial No.: 928504a24210004

Software Version: *Manufacturer documentation states there is no software for this device (refer to Section 7 of document titled "RM-WIFI-AC-2x2-HP FCC Theory of Operation.")*FCC ID: **NYPRMWIFIAC2X2**

4.2 Trade Name:

PCTEL, Inc

4.3 Power Supply:

PhiHong PSAC60W-120

4.4 Applicable Rules:

CFR 47, Part 15.407, subpart E

4.5 Equipment Category:

Radio Transmitter Module

4.6 Antenna:

Additional External Antennas		
Part No.	Description	Gain
AEMH51PT155UFL	Circuit-board-based 5 GHz horizontally polarized monopole with 155 mm U.FL pigtail cable	4.3dBi
AED2451PT155UFL	Circuit-board-based dual-band dipole with 155 mm U.FL pigtail cable	2.8dBi
AEMV2451PT155UFL	Bent-metal dual-band monopole with 155 mm U.FL pigtail cable	2.4dBi
AEPV2451PT155UFL	Bent metal dual-band PIFA with 155 mm U.FL pigtail cable	4.8dBi

4.7 Accessories:

Device	Manufacturer	Model Number	Serial Number
Access Point	Qualcomm	None Specified	None Specified
Laptop	Hewlett Packard	G42	None Specified
Power Supply	PhiHong	PSAC60W-120	P73102761A1
Accessory Software/ Version	Qualcomm	Procomm Plus v4.8, Qualcomm QRCT v4.0.00050	

4.8 Testing Algorithm:

EUT was controlled with client-supplied Qualcomm software to provide output in the 5 GHz UNII 1, 2A, 2C and 3 Wi-Fi bands at various modulations and data rates.

**5 LIST OF MEASUREMENT INSTRUMENTATION**

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	Albatross Projects	B83117-DF435-T261	US140023	2022-03-09
Temp/Hum. Recorder	CL233	Extech	445814	02	2022-03-04
Temp/Hum. Recorder	CL234	Extech	445814	03	2022-03-08
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2022-07-08
Antenna, Bilog	CL211	Sunol Sciences, Inc.	JB1	A021017	2022-09-28
Low Loss Cable Set	--	Pasternack	PE3C0666-252 / PE3C066-50CM	None Spec.	2023-10-12
Antenna, Horn 18-26 GHz	CL114	A. H. Systems, Inc.	SAS-572	237	2023-07-30
Antenna, Horn 26-40 GHz	CL188	Com-Power	AH-640 Horn	091065	2023-07-29
Amplifier w/Monopole & 18" Loop	CL163-Loop	A.H. Systems, Inc.	EHA-52B	100	2022-09-14
Pre-Amplifier	CL153	Keysight Tech.	83006A	MY39500791	2022-02-12
Pre-Amplifier	CL285	Com-Power	PAM-0207	322	2022-07-08
Horn Antenna 1-18GHz	CL098	Emco	3115	9809-5580	2022-01-08
Software:	Tile Version 3.4.B.3		Software Verified: 2021-09-07 to 2021-09-15		
Software:	EMC 32, Version 8.53.0		Software Verified: 2021-09-07 to 2021-09-15		



6 RADIATED SPURIOUS EMISSION

The EUT antenna port was fitted with each of the optional antennas. Radiated emissions were measured in a Semi-Anechoic Chamber. All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

6.1 Requirements:

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).

All other undesirable emission that do not fall under the provisions of Part 15.205, shall meet the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.*
- (2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.*
- (3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.*
- (4) For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.*



6.2 Radiated Spurious Emission Test Data

Test Date(s):	2022-08-05	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.407; Part 15.209 / KDB789033	Air Temperature:	20.7°C
		Relative Humidity:	48%

Notes: Plots are peak, max hold prescan data included only to determine what frequencies to investigate and measure. The EUT was initially placed in a semi-anechoic chamber, and rotated in all three orthogonal positions to maximize the emissions. The orthogonal position that showed the highest emissions was used. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned in a semi-anechoic chamber for maximum emissions. All antennas were mounted, and all transmitters were on and transmitting at the same time to set worst-case Radiated Emissions and Beamforming due to MIMO configuration. While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

Some of the frequencies did not change with the EUT on or off. At those frequencies, the test distance was shortened to 1 meter and still no emissions from the EUT were visible or over the ambient or limit.

In the following plots, emissions to be found by the EUT were measured and listed in tables. The black lines are active scans while the green lines are the max peak scan of the unit during rotations. The plots are for reference only and the limit lines are not actual limit lines but merely a guide.

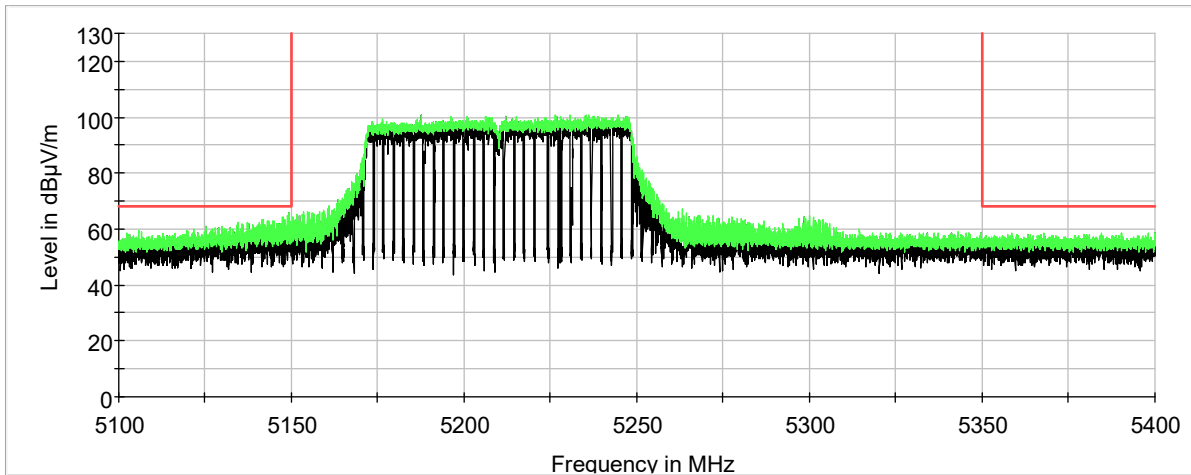
Limits are indicated as follows:

Solid Red = 15.407 Avg

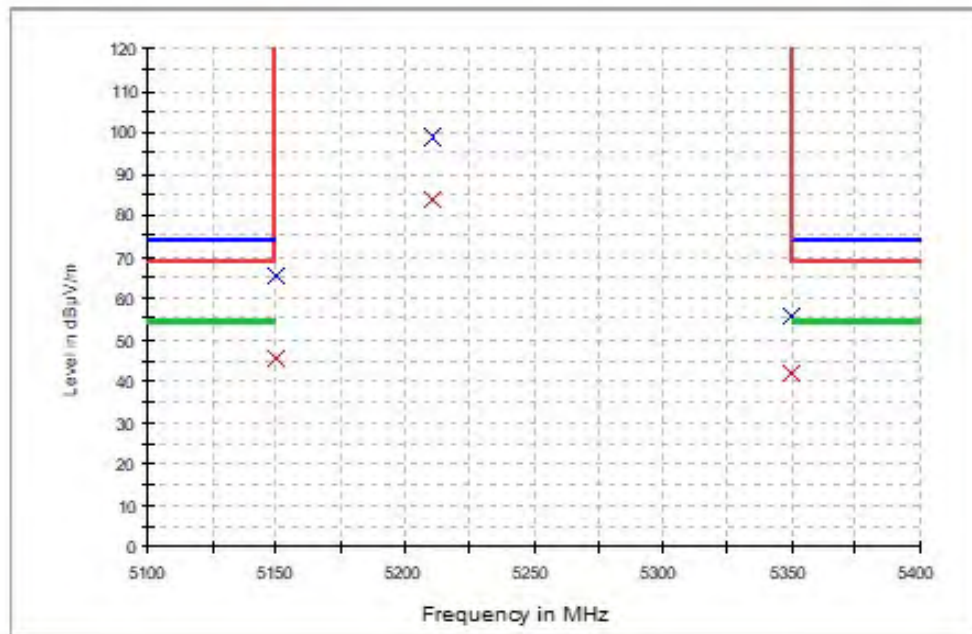
Green = Restricted Band Avg

Blue = Restricted Band Peak

In the UNII-1 (5.15-5.25 GHz) band, UNII-2A (5.25-5.35 GHz) band, and lower end of the UNII-2C (5.47-5.725 GHz) band, there are restricted bands that applies from 4.5-5.15 GHz, and from 5.35-5.46 GHz. In these restricted bands, the limits are 54 dBuV/m Avg and 74 dBuV/m Peak.

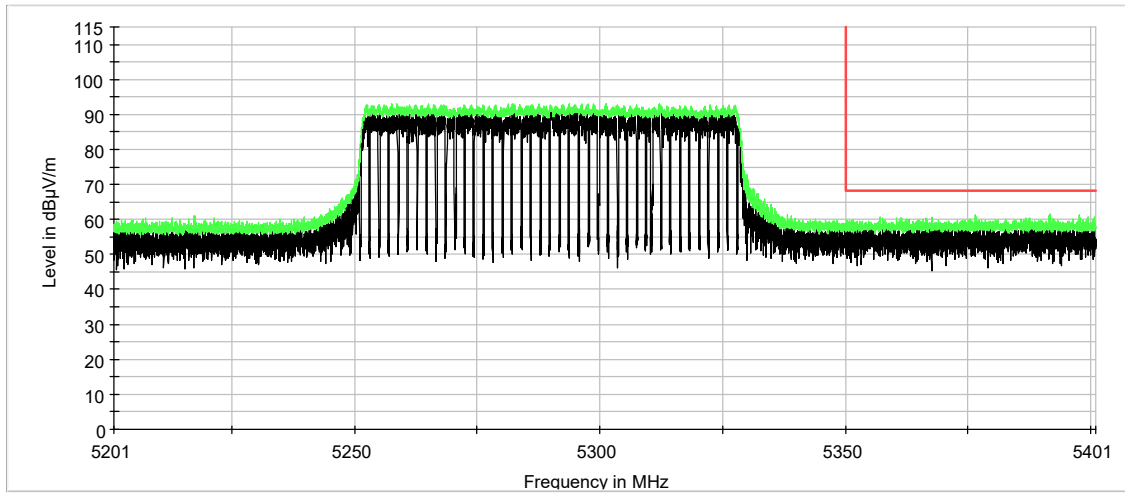
**Antenna #1 - AED2451PT155UFL****Radiated Band Edge: UNII 1, HT80**

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBµV/m)
5150.000000	65.3	45.6	1000.000	150.0	H	43.0	12.0	-8.4	54.0	-8.7	74.0
5210.000000	98.6	83.7	1000.000	150.0	H	43.0	12.0	-----	-----	-----	-----
5350.000000	56.0	42.0	1000.000	150.0	H	43.0	12.4	-12.0	54.0	-18.0	74.0



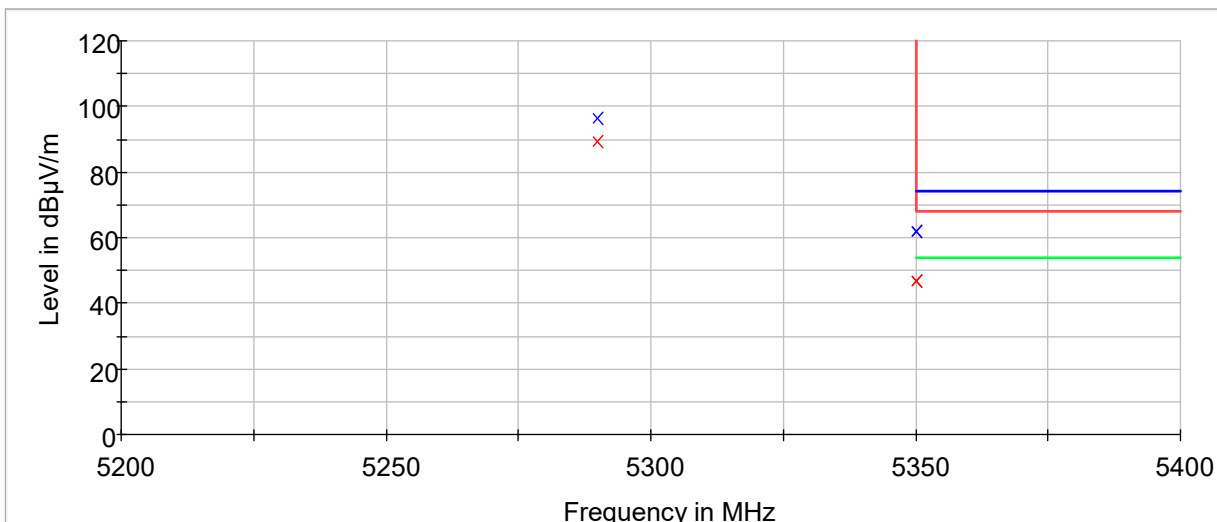


Radiated Band Edge: UNII 2A, HT80



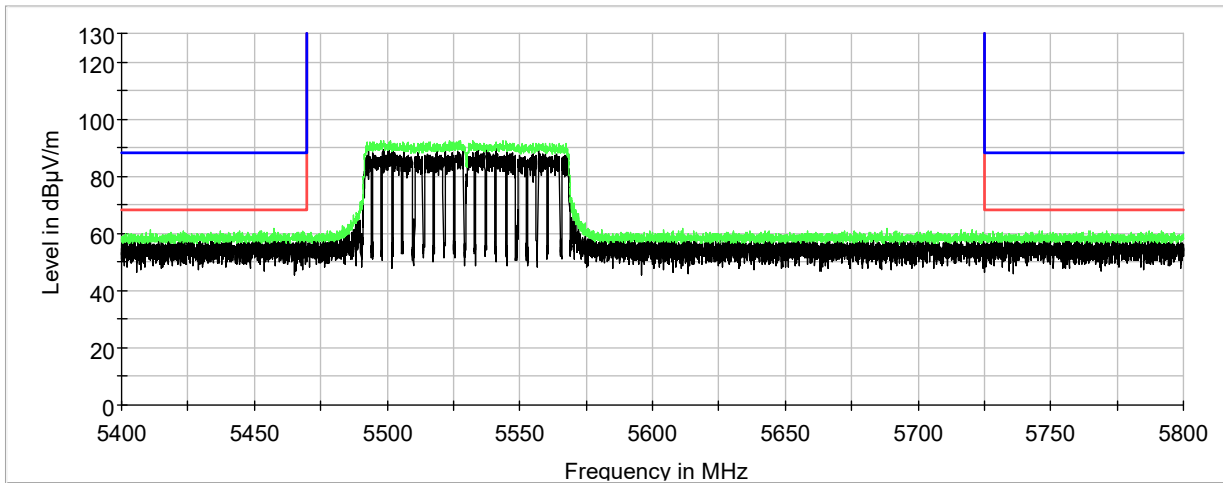
Measurements

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBµV/m)
5290.000000	89.3	77.7	1000	150.0	V	0.0	19.2	-----	-----	-----	-----
5350.000000	59.9	46.3	1000	150.0	V	0.0	19.6	7.7	54.0	-14.1	74.0



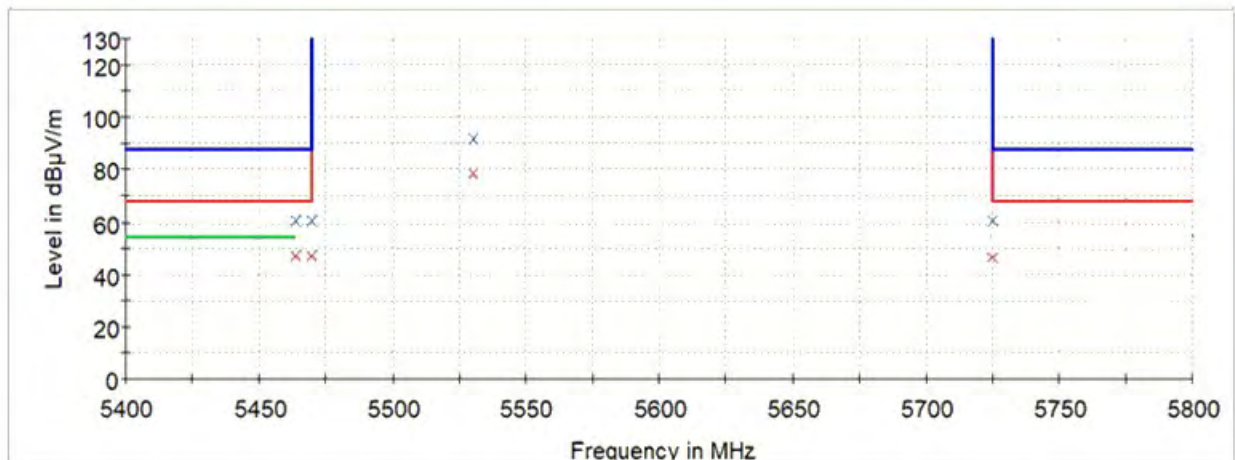


Radiated Band Edge: Lower Band Edge UNII 2C, HT80



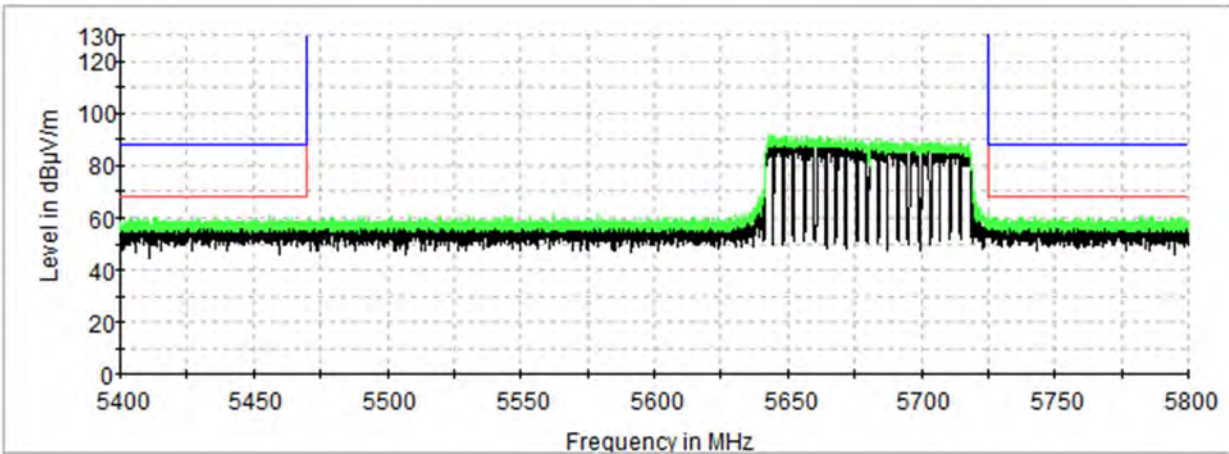
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5530.000000	91.7	78.4	1000.000	150.0	V	0.0	20.0	-----	-----	-----	-----
5470.000000	60.3	47.0	1000.000	150.0	V	0.0	19.9	-----	-----	-7.9	68.2
5725.000000	60.5	46.5	1000.000	150.0	V	0.0	19.9	-----	-----	-7.7	68.2
5460.000000	59.6	46.4	1000.000	150.0	V	0.0	19.9	-7.6	54.0	-14.4	74.0



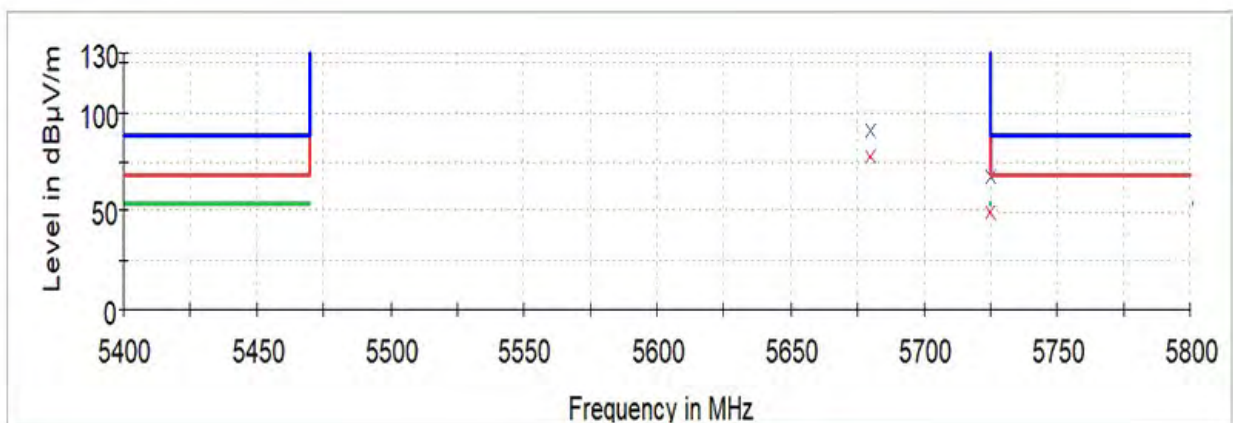


Radiated Band Edge: Upper Band Edge UNII 2C, HT80



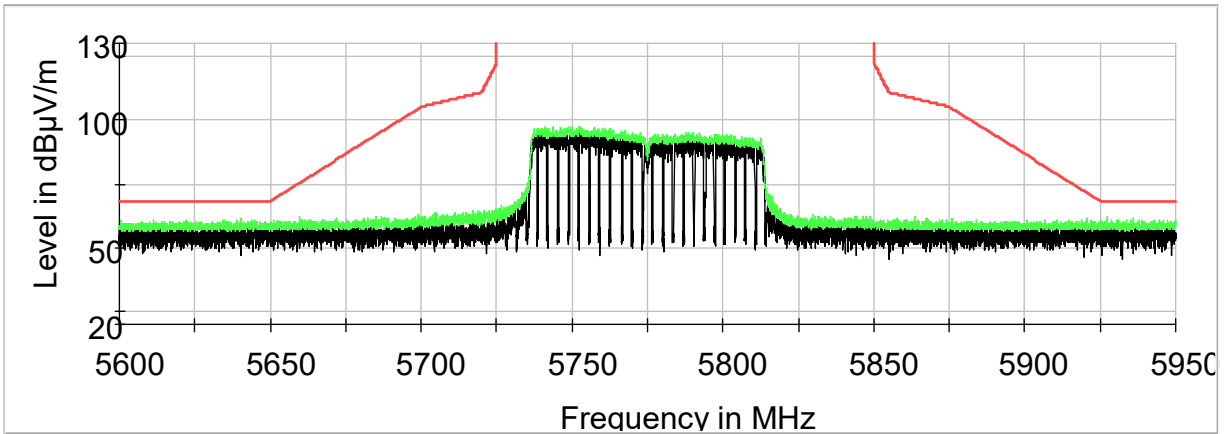
Measurements

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBµV/m)
5680.000000	90.7	77.5	1000.000	150.0	V	0.0	19.9	----	----	----	----
5725.000000	67.9	49.5	1000.000	150.0	V	0.0	19.9	-18.7	68.2	-0.3	68.2



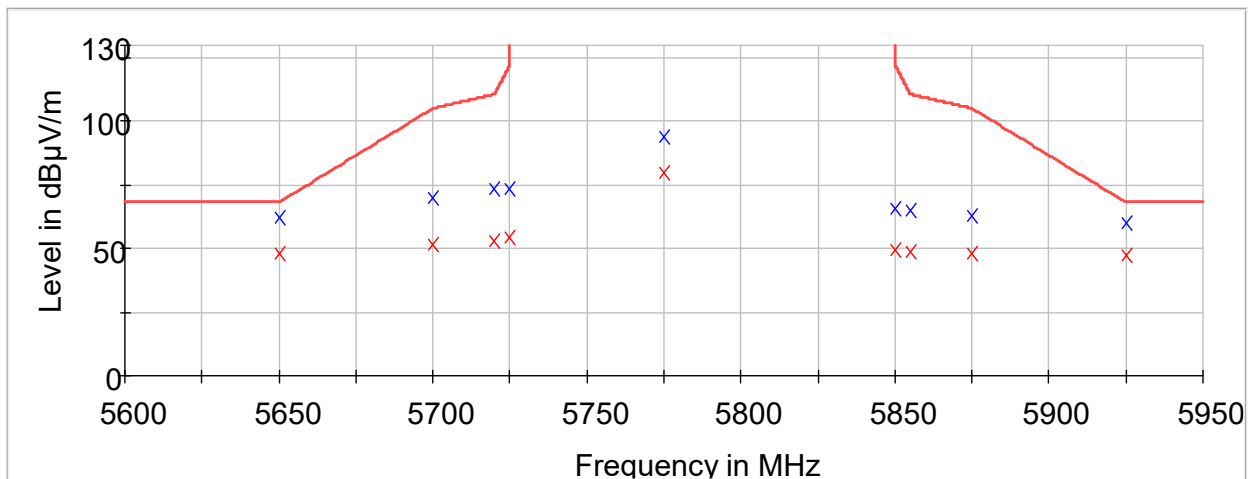


Radiated Band Edge: UNII 3, HT80



Measurements

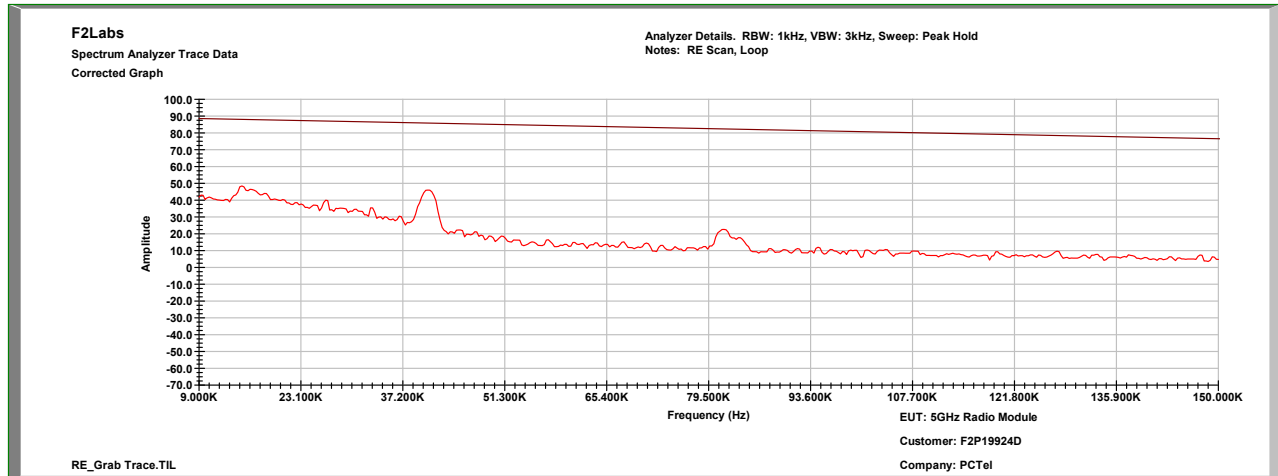
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Limit - MaxPeak (dBμV/m)	Margin - MaxPeak (dB)
5775.000000	93.8	80.1	1000.000	150.0	V	0.0	20.0	-----	-----
5925.000000	59.9	47.1	1000.000	150.0	V	0.0	20.3	68.2	-8.3
5650.000000	62.3	48.4	1000.000	150.0	V	0.0	19.9	68.2	-5.9
5700.000000	70.0	51.4	1000.000	150.0	V	0.0	19.9	105.1	-35.1
5875.000000	62.6	48.0	1000.000	150.0	V	0.0	20.1	105.1	-42.5
5855.000000	64.8	48.9	1000.000	150.0	V	0.0	20.0	110.8	-46.0
5720.000000	73.4	52.9	1000.000	150.0	V	0.0	19.9	110.8	-37.4
5725.000000	73.5	54.4	1000.000	150.0	V	0.0	19.9	122.2	-50.7
5850.000000	65.8	49.5	1000.000	150.0	V	0.0	20.0	122.2	-58.4



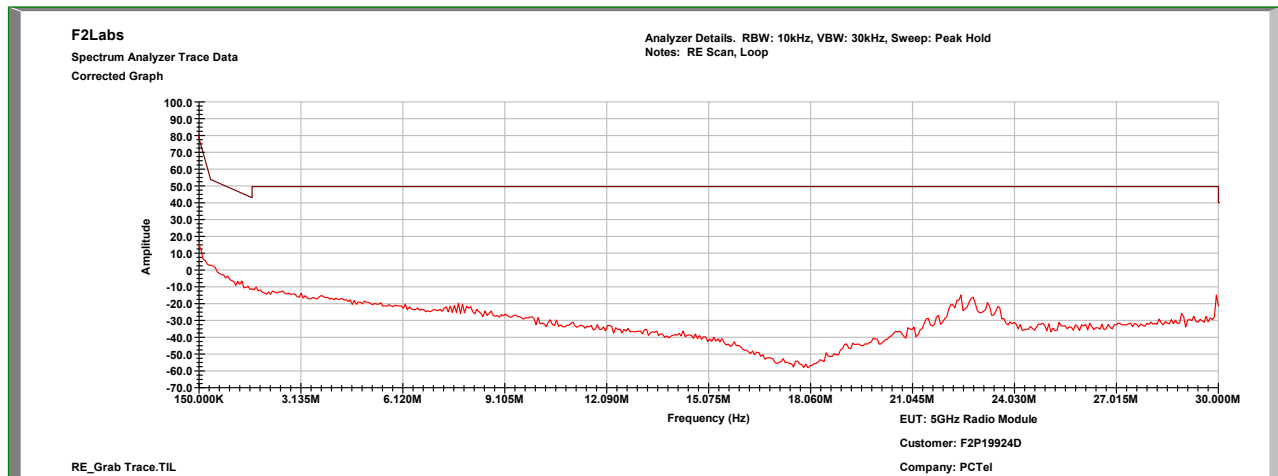


Scans were performed one at a time on each channel at each modulation and in each UNII band. Each channel at every modulation in all bands were scanned for Beamforming and again in Non-Beamforming. The following plots are worse case scans from all channels, all modulations, in all bands. The measurements in the tables are from all channels and modulations.

Radiated Spurious Emissions: 0.009 MHz to 0.15 MHz

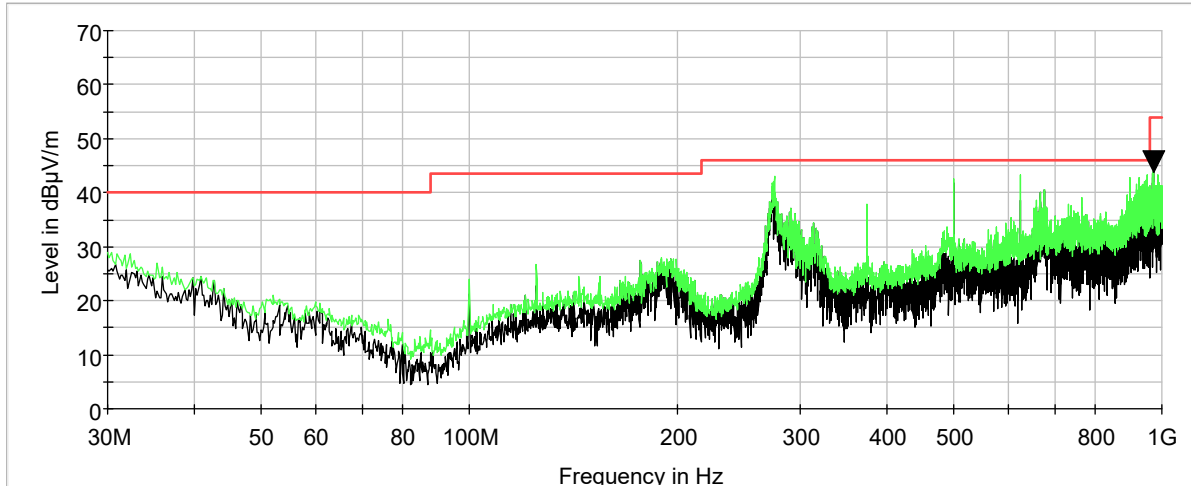


Radiated Spurious Emissions: 0.15 MHz to 30.0 MHz

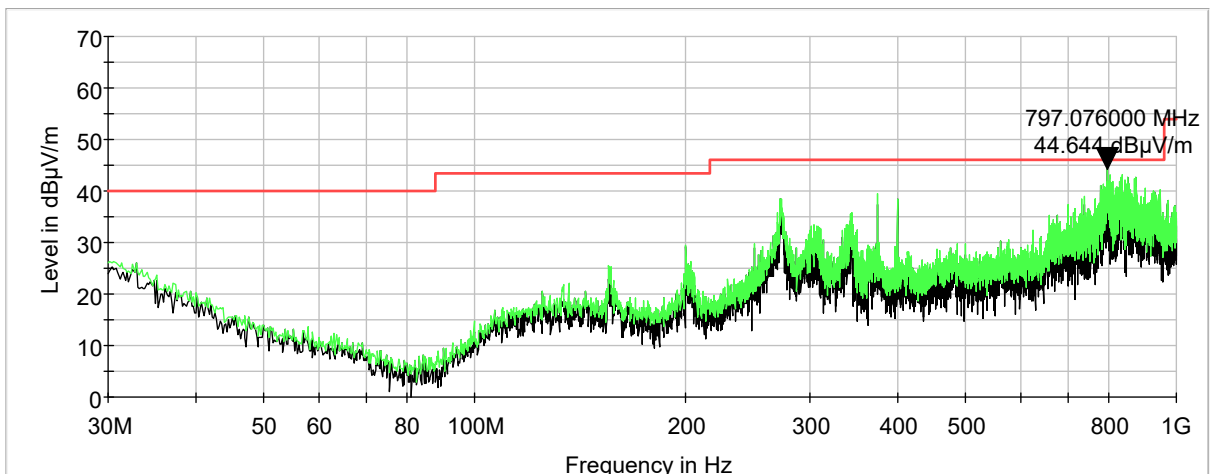




Radiated Spurious Emissions: 30 MHz to 1000 MHz, Vertical



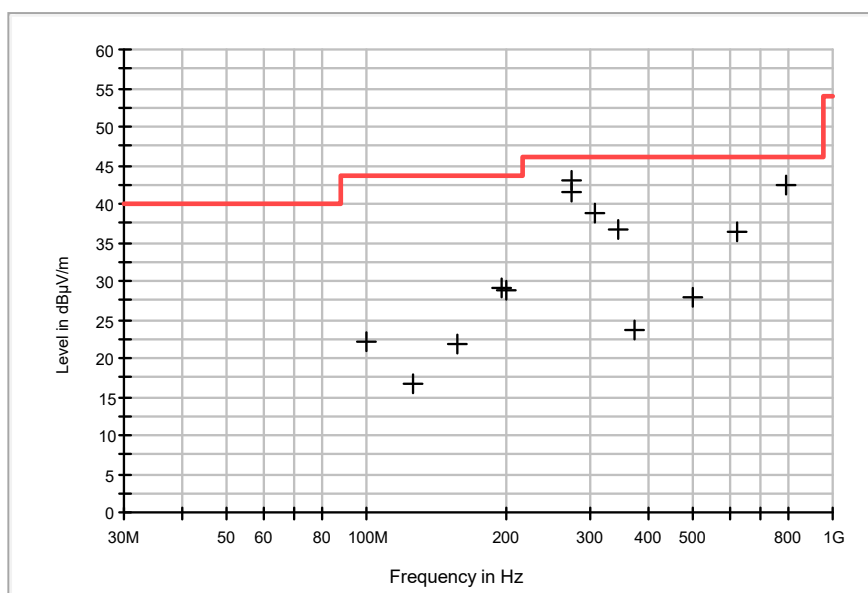
Radiated Spurious Emissions: 30 MHz to 1000 MHz, Horizontal





Measurements, 30 MHz to 1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
100.000000	22.1	120.000	100.0	V	223.0	-12.0	21.4	43.5
124.880000	16.7	120.000	100.0	V	303.0	-8.3	26.8	43.5
155.320000	21.9	120.000	100.0	H	186.0	-9.4	21.6	43.5
193.920000	29.1	120.000	100.0	V	26.0	-9.7	14.4	43.5
199.960000	28.7	120.000	100.0	H	329.0	-8.5	14.8	43.5
274.840000	42.9	120.000	100.0	H	8.0	-7.7	3.1	46.0
275.600000	41.4	120.000	100.0	V	49.0	-7.7	4.6	46.0
307.440000	38.7	120.000	100.0	H	133.0	-7.1	7.3	46.0
344.480000	36.8	120.000	100.0	H	298.0	-6.1	9.2	46.0
374.920000	23.7	120.000	100.0	V	6.0	-5.3	22.3	46.0
500.000000	28.0	120.000	100.0	V	111.0	-2.1	18.0	46.0
625.000000	36.3	120.000	100.0	V	336.0	0.4	9.7	46.0
796.880000	42.4	120.000	100.0	H	354.0	3.1	3.6	46.0





Measurements above 1GHz

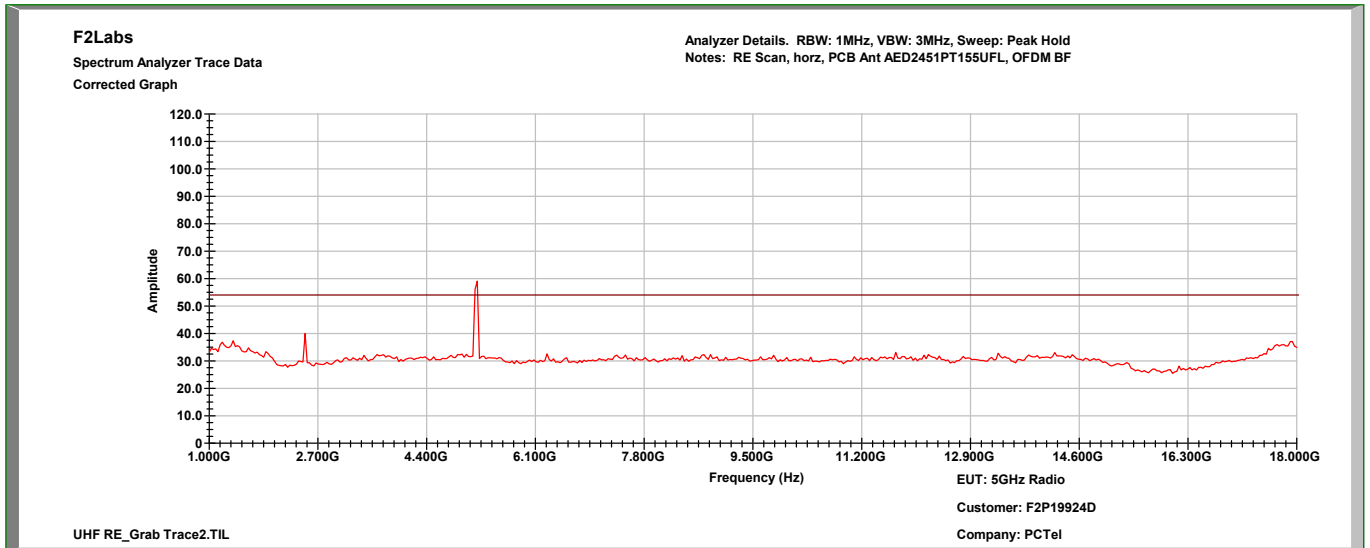
Antenna	Freq. (GHz)	Peak Reading (dBuv)	AVG Reading	Corr. Fact.	Corrected Peak Reading (dBuv/m)	Corrected AVG Reading (dBuv/m)	AVG Limit	Peak Limit	AVG Margin	Peak Margin
AED2451PT155UFL	2.499	46.76	42.5	-5.7	41.1	36.8	54	74	11.5	27.24
	10.36	55.1	--	-6.2	48.92	--	--	68.2	--	13.1
AEMH51PT155UFL	2.499	49.49	44.8	-5.7	55.19	39.1	54	74	9.2	24.51
	10.36	39.6	--	-6.2	45.8	--	--	68.2	--	28.6
AEMV2451PT155UFL	2.499	48.9	43.4	-5.7	54.6	37.7	54	74	10.6	25.1
	10.36	49.4	--	-6.2	55.6	--	--	68.2	--	18.8
AEPV2451PT155UFL	2.499	49.1	43.8	-5.7	54.8	38.1	54	74	10.2	24.9
	10.36	45.59	--	-6.2	51.79	--	--	68.2	--	22.61

2.499GHz is in the 2.4385 - 2.500 GHz restricted band.

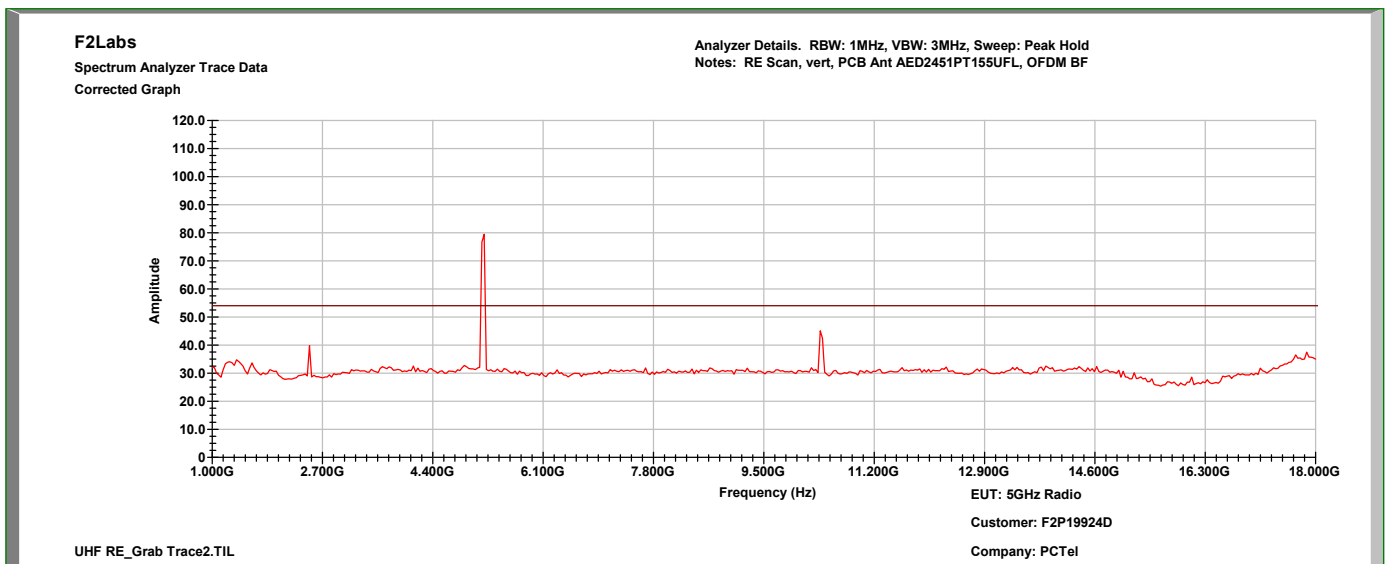
68.2 dBuv Limit = -27 dBm



Radiated Spurious Emissions: 1 GHz to 18 GHz, Horizontal

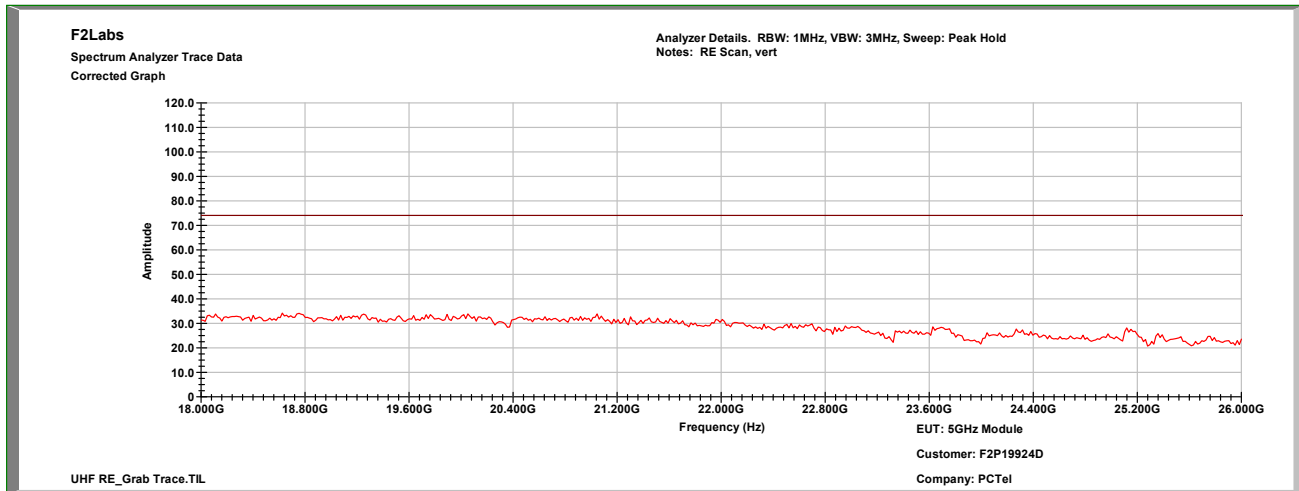


Radiated Spurious Emissions: 1 GHz to 18 GHz, Vertical

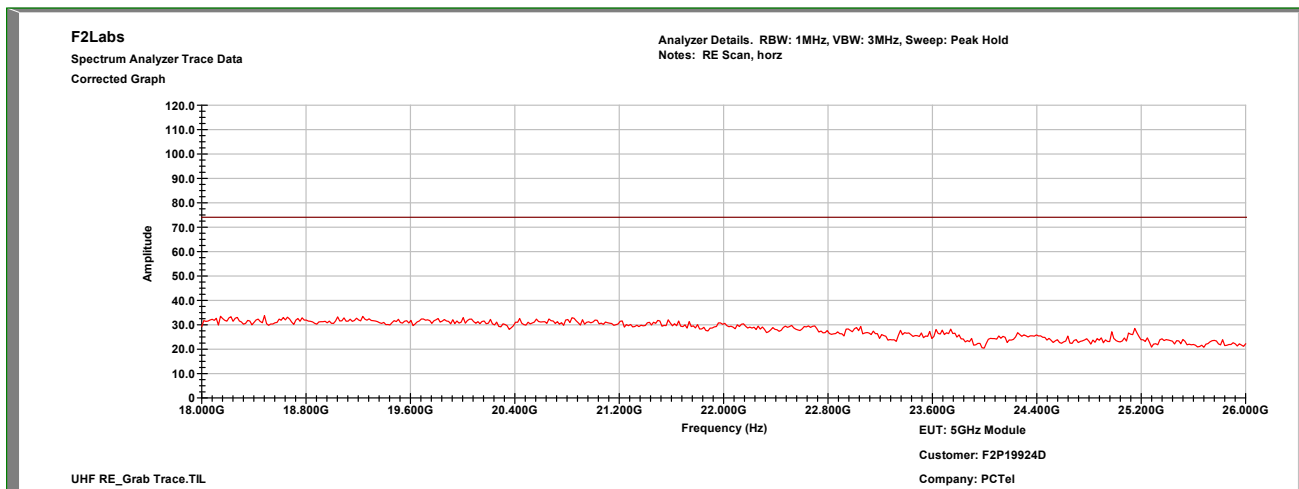




Radiated Spurious Emissions: 18 GHz to 26 GHz, Vertical

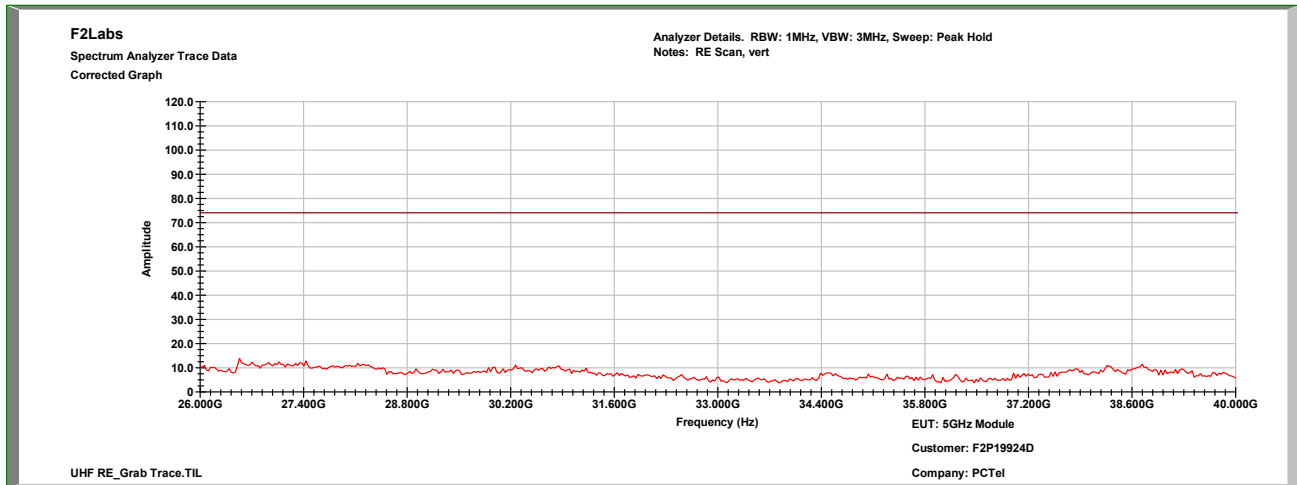


Radiated Spurious Emissions: 18 GHz to 26 GHz, Horizontal

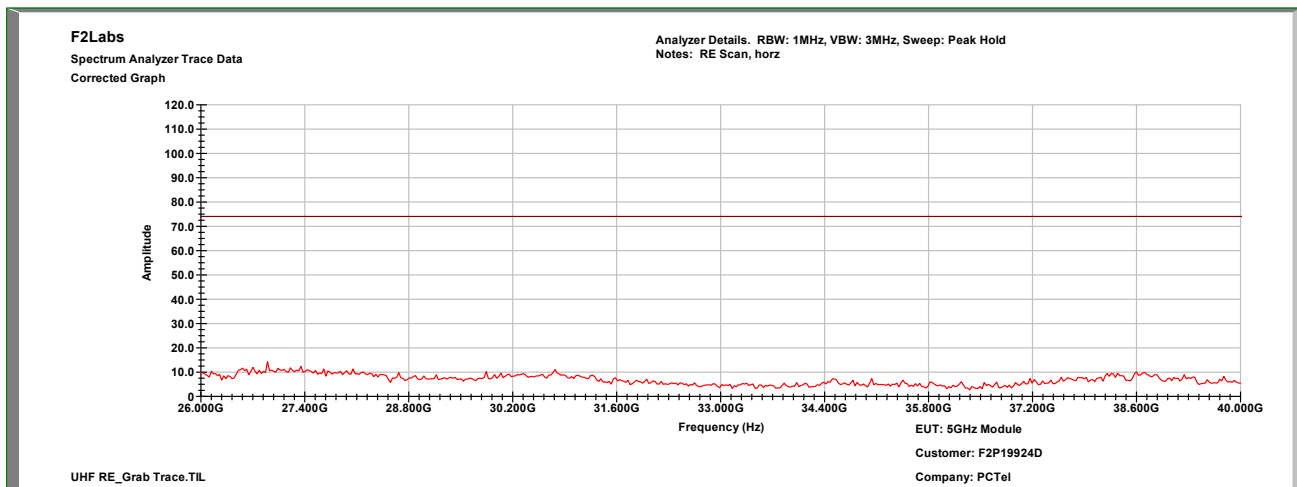




Radiated Spurious Emissions: 26 GHz to 40 GHz, Vertical



Radiated Spurious Emissions: 26 GHz to 40 GHz, Horizontal



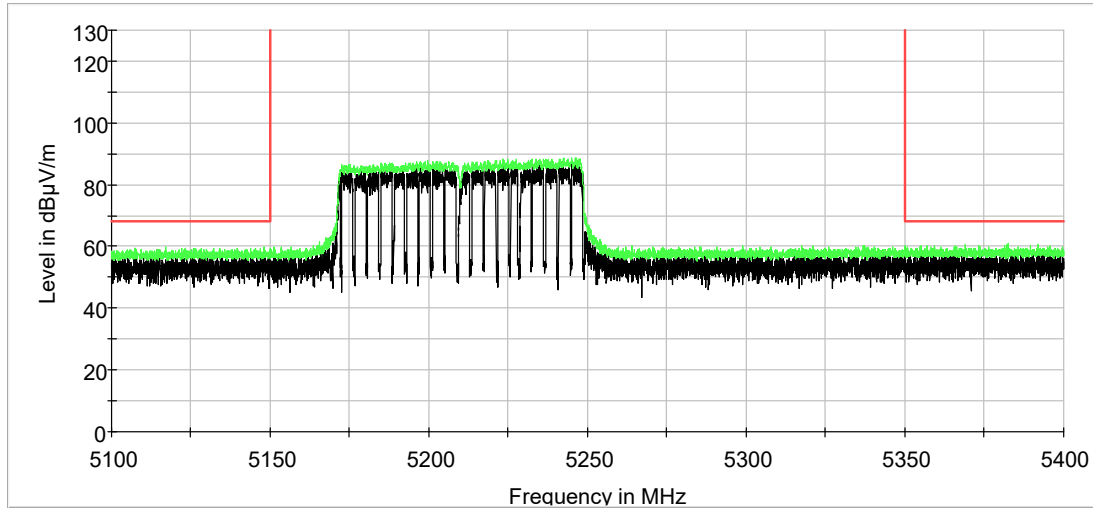


Radiated Spurious Emissions

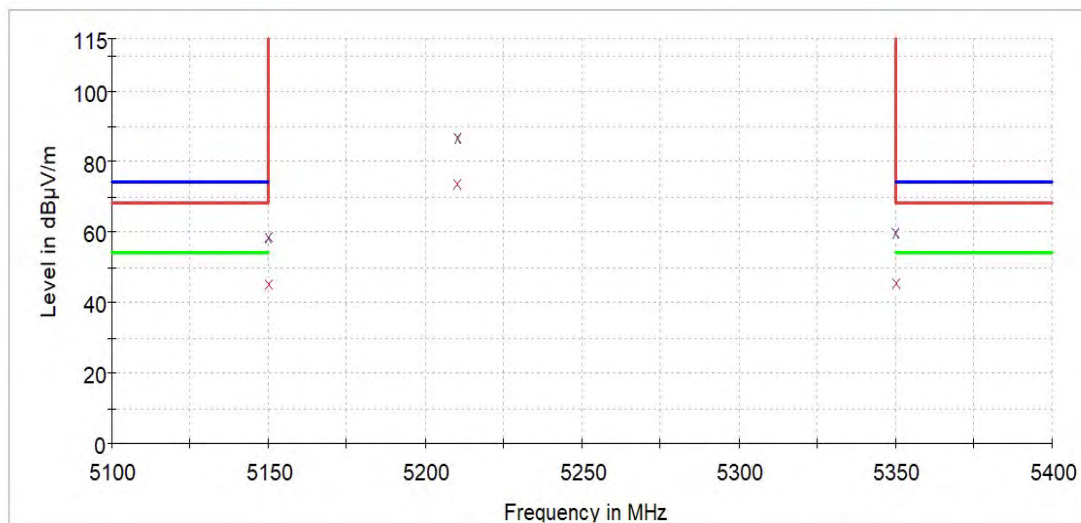


General Setup



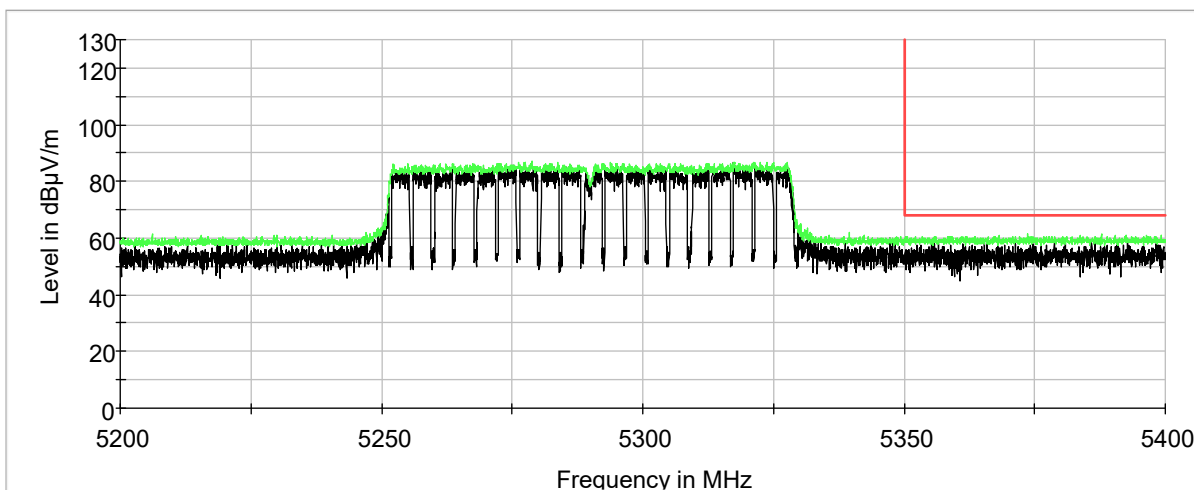
**Antenna #2 - AEMV2451PT155UFL****Radiated Band Edge: UNII 1, HT80**

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5210.000000	87.9	75.3	1000.000	150.0	V	0.0	19.1	-----	-----	----	----
5150.000000	58.8	45.6	1000.000	150.0	V	0.0	19.0	-8.4	54.0	-15.2	74.0
5350.000000	59.4	46.1	1000.000	150.0	V	0.0	19.6	-7.9	54.0	-14.6	74.0



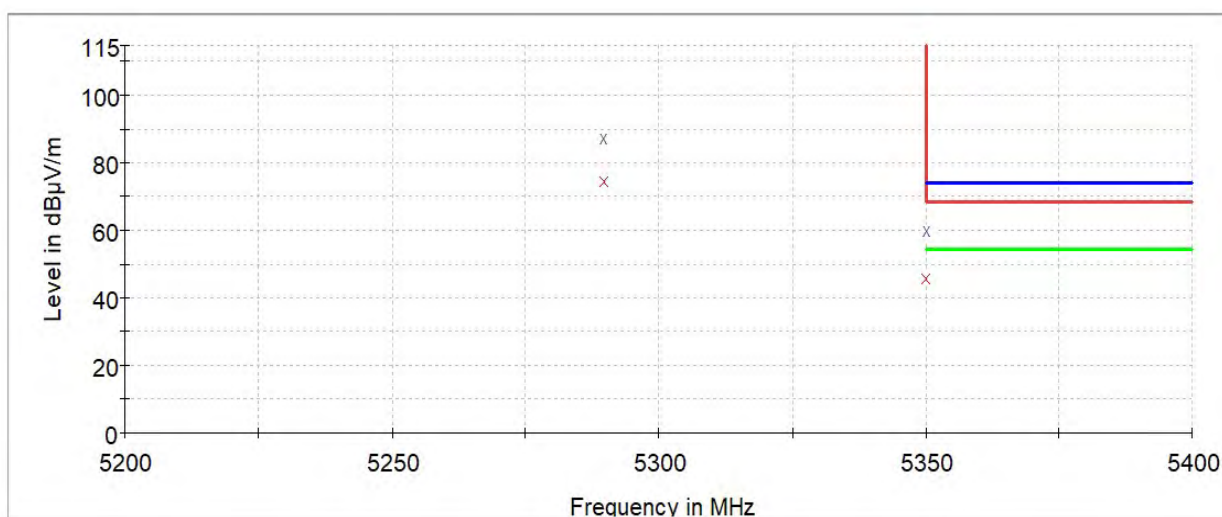


Radiated Band Edge: UNII 2A, HT80



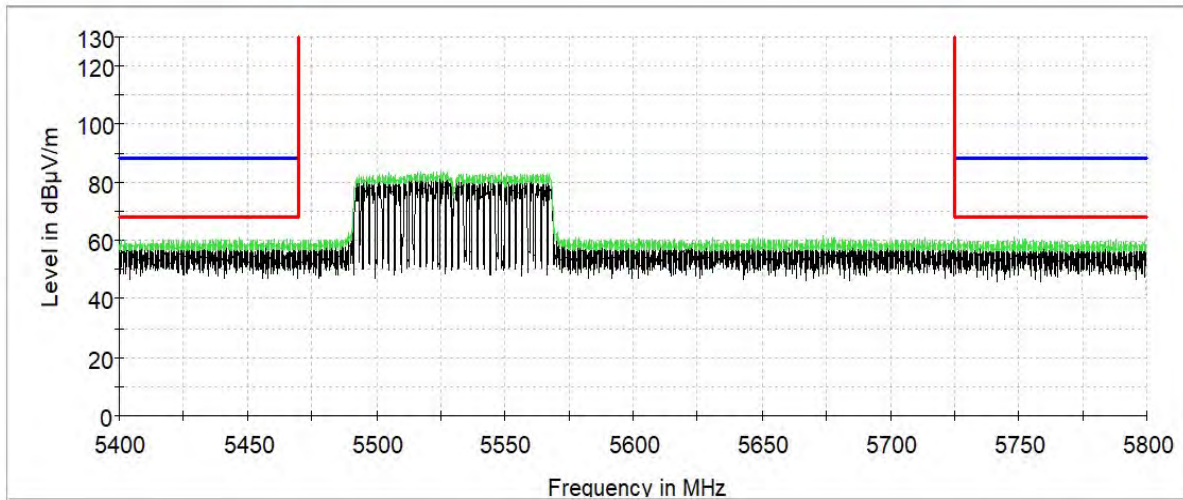
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5350.000000	59.5	46.1	1000.000	150.0	V	0.0	19.6	-7.9	54.0	-14.5	74.0
5290.000000	86.9	74.7	1000.000	150.0	V	0.0	19.2	-----	-----	-----	-----

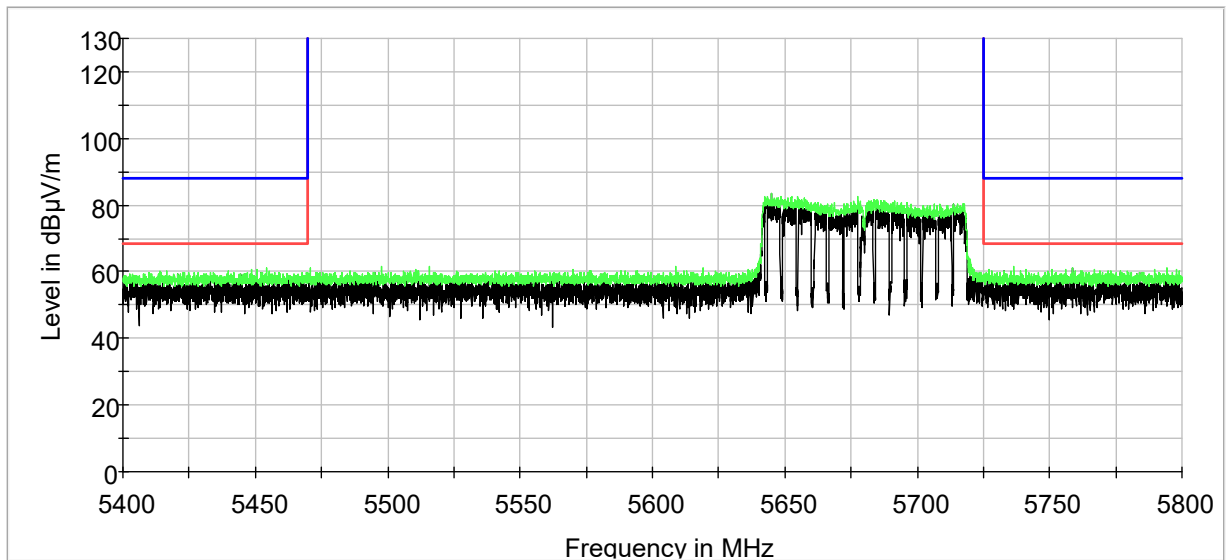




Radiated Lower Band Edge: UNII 2C, HT80



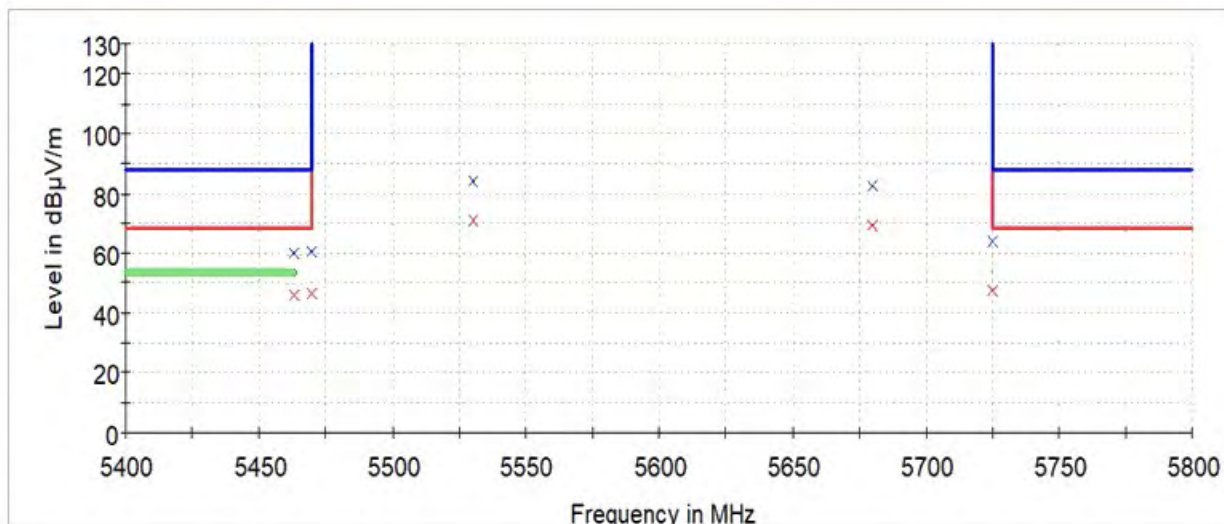
Radiated Upper Band Edge: UNII 2C, HT80





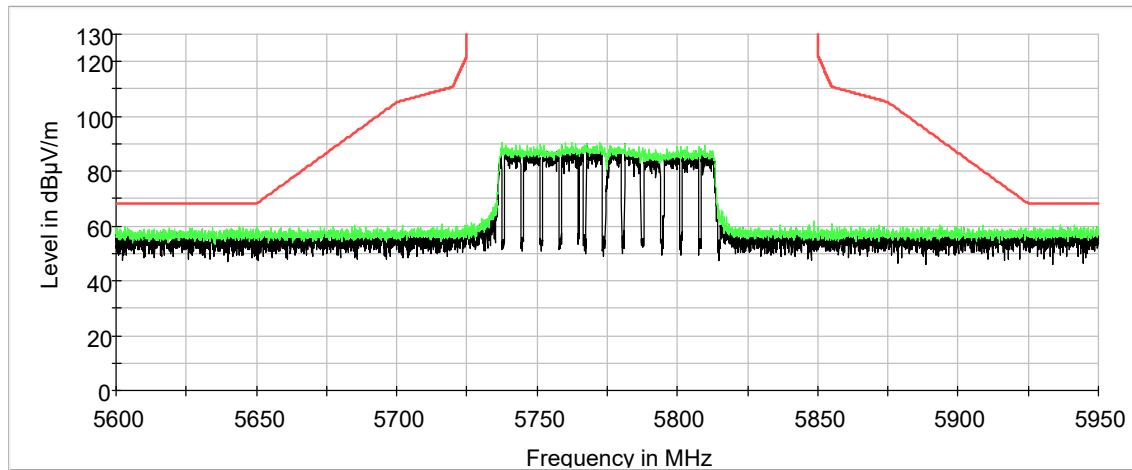
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5680.000000	82.7	69.6	1000.000	150.0	V	0.0	19.9	-----	-----	-----	-----
5725.000000	64.2	47.3	1000.000	150.0	V	0.0	19.9	-20.9	-----	-4.0	68.2
5530.000000	84.0	70.8	1000.000	150.0	V	0.0	20.0	-----	-----	-----	-----
5470.000000	60.7	46.4	1000.000	150.0	V	0.0	19.9	-21.8	-----	-7.5	68.2
5460.000000	60.1	45.9	1000.000	150.0	V	0.0	19.9	-8.1	54.0	-13.9	74.0



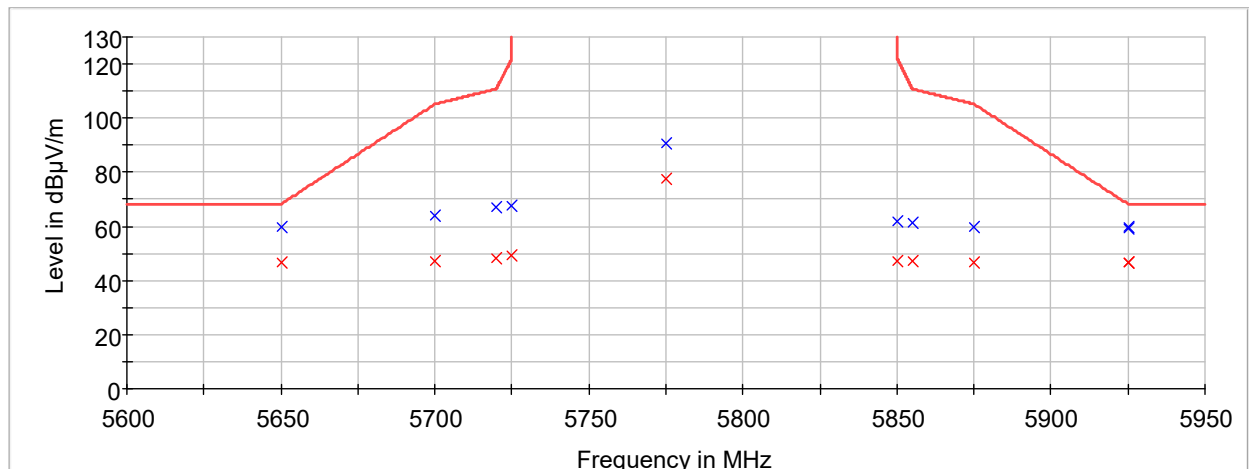


Radiated Band Edge: UNII 3, HT80



Measurements

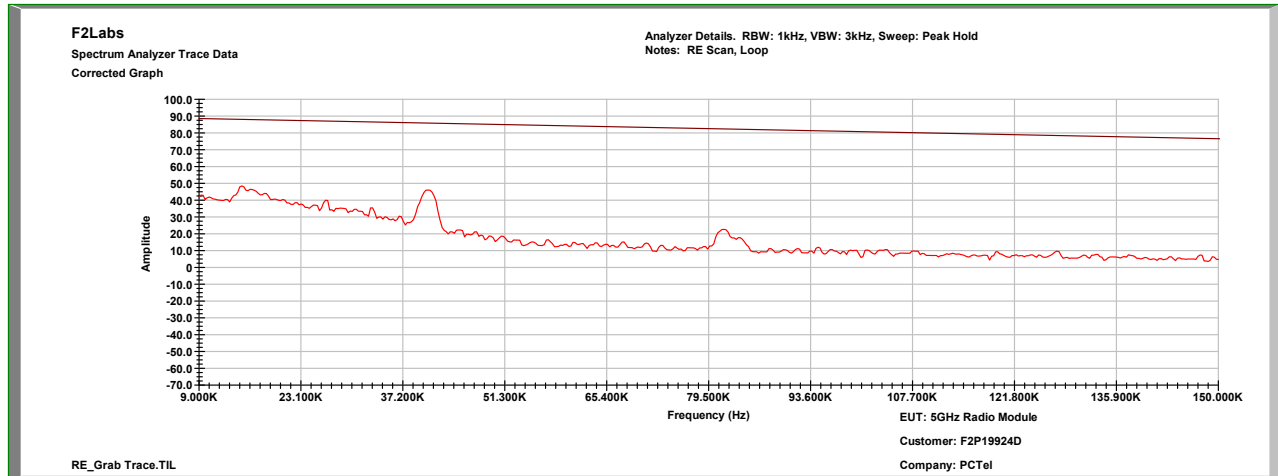
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Limit - MaxPeak (dBµV/m)	Margin - MaxPeak (dB)
5775.000000	90.9	77.4	1000.000	150.0	V	0.0	20.0	-----	-----
5650.000000	59.6	46.5	1000.000	150.0	V	0.0	19.9	68.2	-8.6
5700.000000	63.8	47.4	1000.000	150.0	V	0.0	19.9	105.2	-41.4
5720.000000	66.9	48.4	1000.000	150.0	V	0.0	19.9	110.8	-43.9
5725.000000	67.5	49.5	1000.000	150.0	V	0.0	19.9	122.2	-56.7
5850.000000	62.0	47.2	1000.000	150.0	V	0.0	20.0	122.2	-62.2
5855.000000	61.2	47.2	1000.000	150.0	V	0.0	20.0	110.8	-49.6
5875.000000	59.6	46.7	1000.000	150.0	V	0.0	20.1	105.2	-45.6
5925.000000	59.2	46.7	1000.000	150.0	V	0.0	20.3	68.2	-9.0



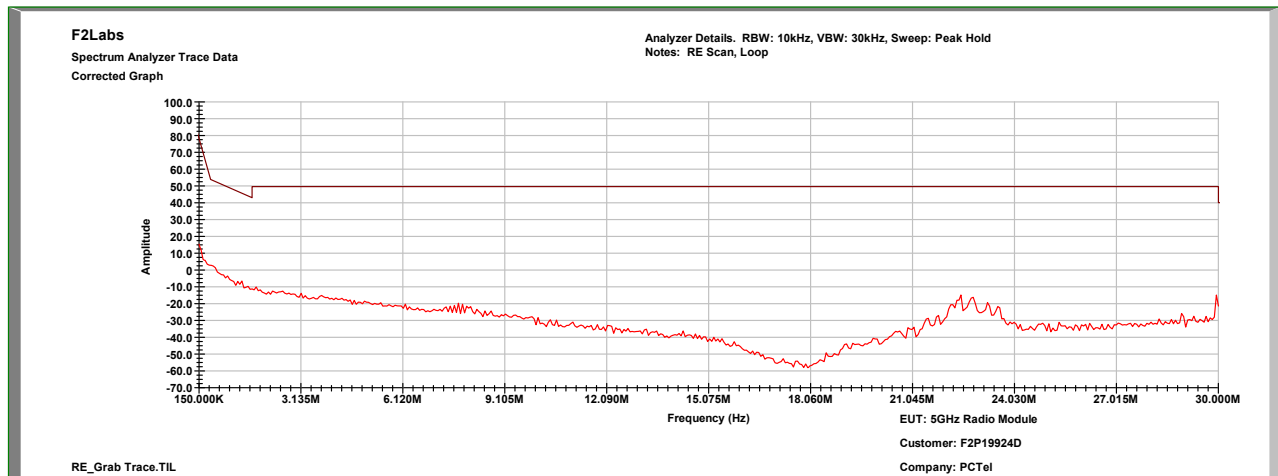


Scans were performed one at a time on each channel at each modulation and in each UNII band. Each channel at every modulation in all bands were scanned for Beamforming and again in Non-Beamforming. The following plots are worse case scans from all channels, all modulations, in all bands. The measurements in the tables are from all channels and modulations.

Radiated Spurious Emissions: 0.009 MHz to 0.15 MHz

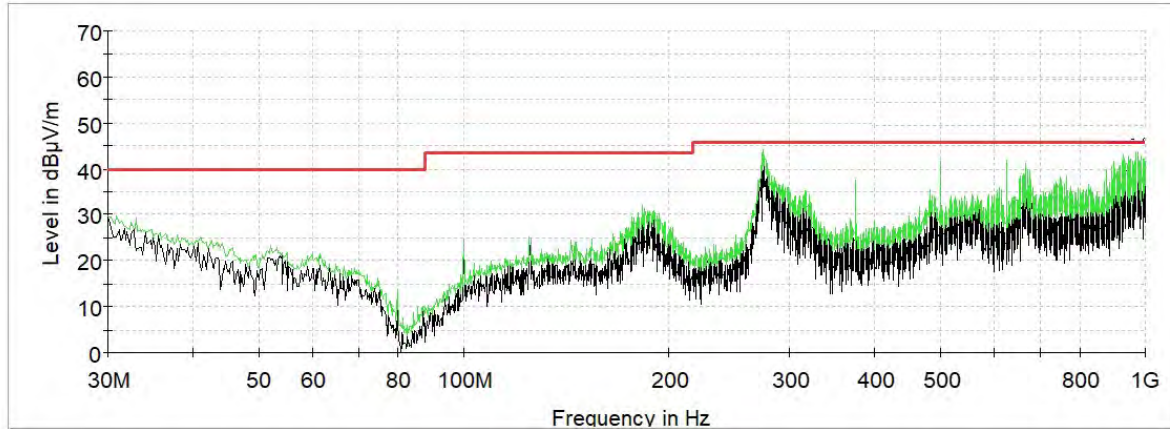


Radiated Spurious Emissions: 0.15 MHz to 30.0 MHz

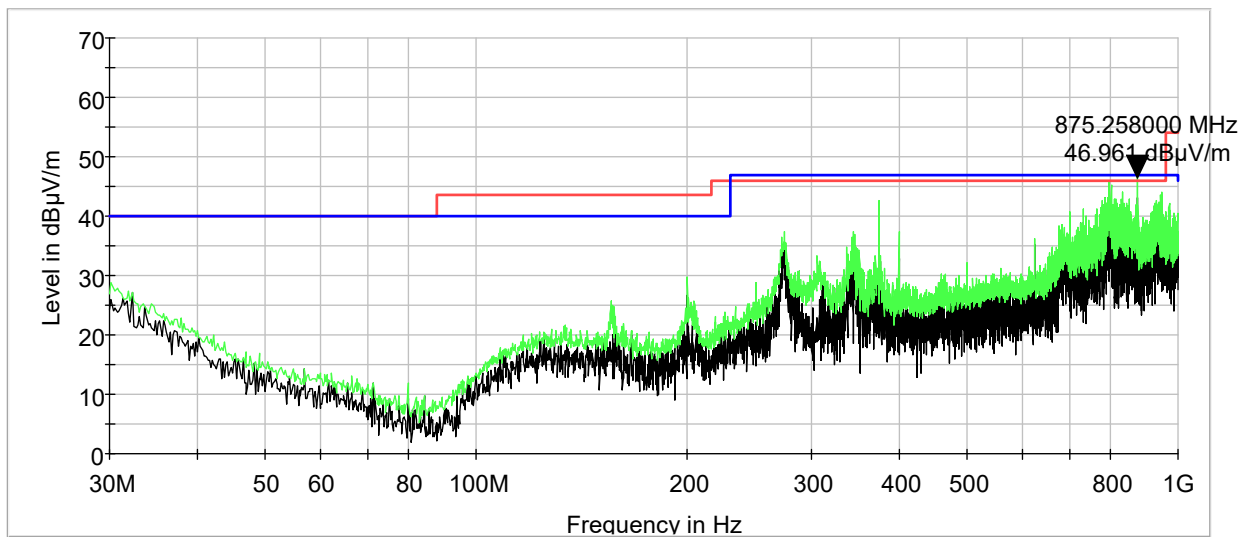




Radiated Spurious Emissions: 30 MHz to 1000 MHz, Vertical



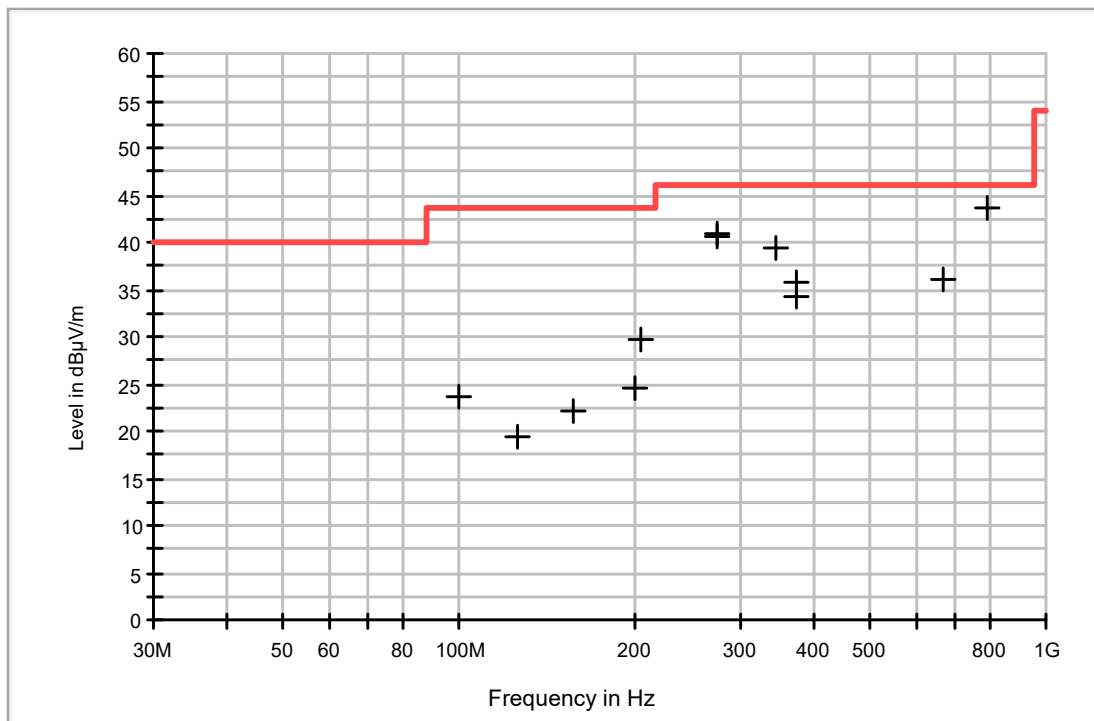
Radiated Spurious Emissions: 30 MHz to 1000 MHz, Horizontal





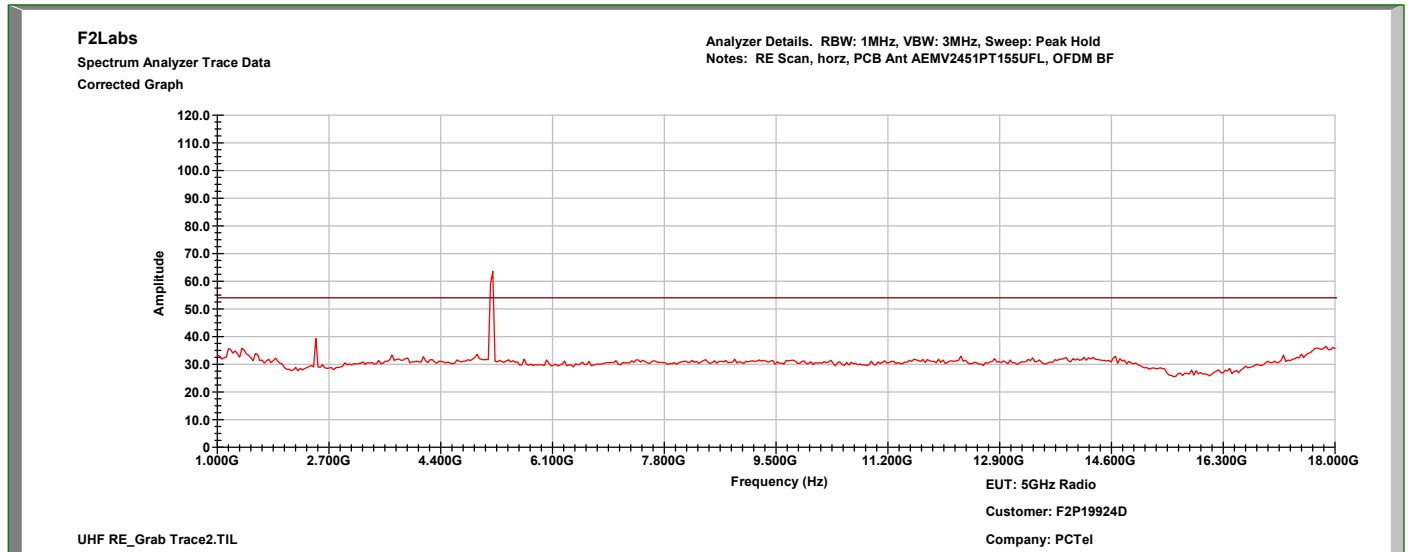
Measurements, 30 MHz to 1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
100.021055	23.5	120.000	100.0	V	113.0	-12.0	20.0	43.5
124.941212	19.3	120.000	100.0	V	73.0	-8.3	24.2	43.5
155.712000	22.0	120.000	100.0	H	358.0	-9.5	21.5	43.5
199.944000	24.6	120.000	100.0	H	207.0	-8.5	18.9	43.5
202.912256	29.7	120.000	100.0	V	302.0	-9.3	13.8	43.5
273.850000	40.7	120.000	100.0	V	271.0	-7.7	5.3	46.0
274.634000	41.0	120.000	100.0	H	2.0	-7.7	5.0	46.0
344.474000	39.4	120.000	100.0	H	40.0	-6.1	6.6	46.0
375.060091	35.8	120.000	100.0	V	41.0	-5.3	10.2	46.0
375.126000	34.2	120.000	100.0	H	126.0	-5.3	11.8	46.0
666.304873	36.1	120.000	100.0	V	305.0	1.1	9.9	46.0
796.882000	43.7	120.000	100.0	H	234.0	3.1	2.3	46.0

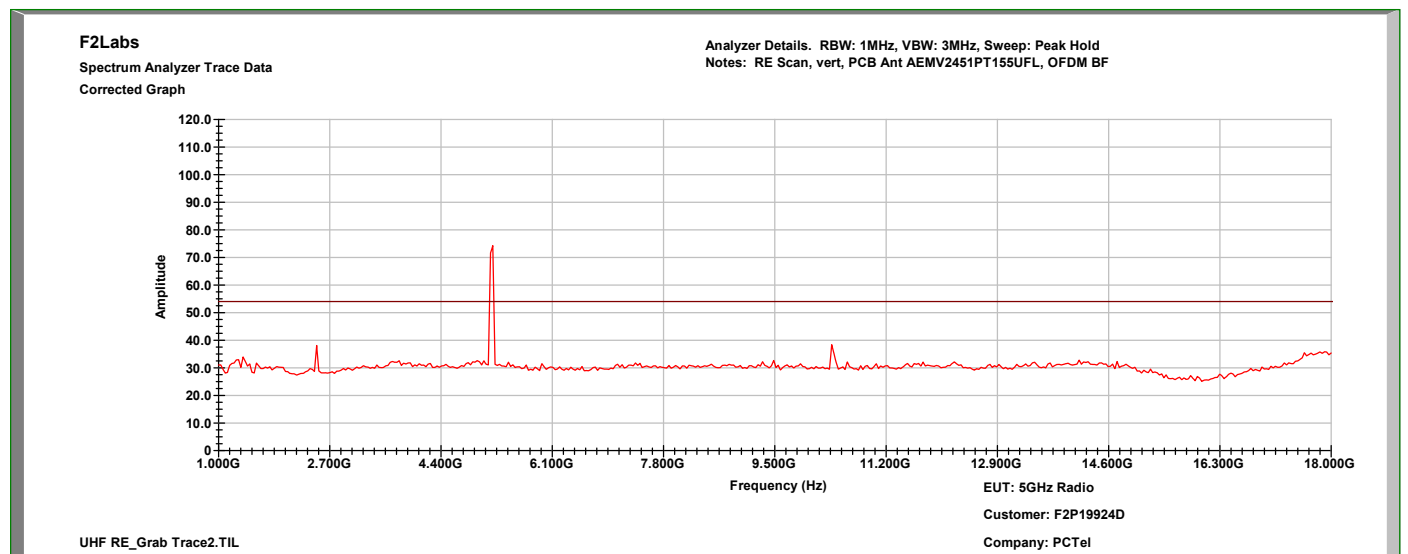




Radiated Spurious Emissions: 1 GHz to 18 GHz, Horizontal

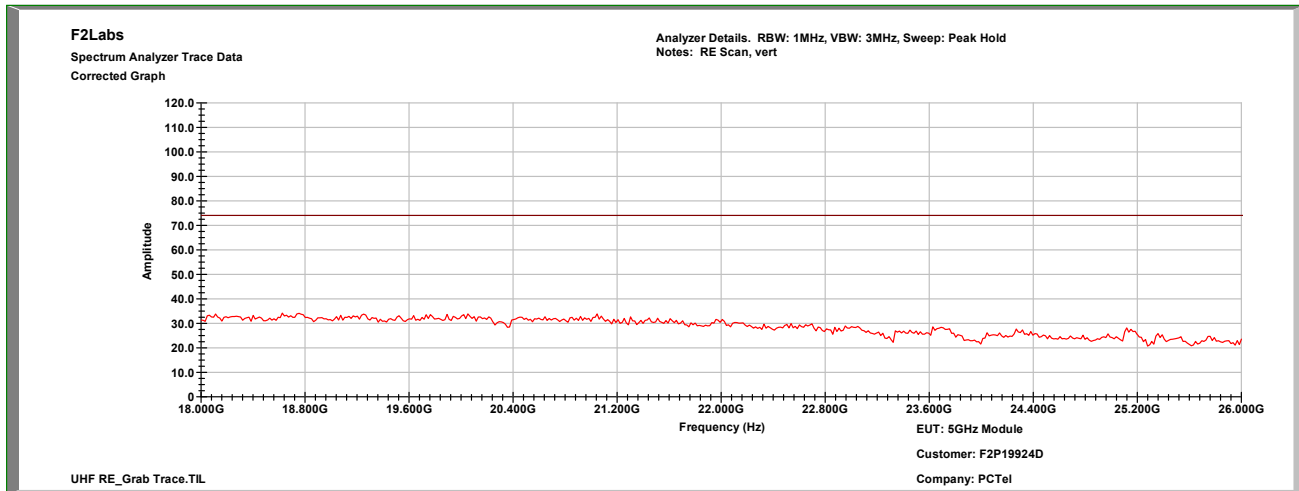


Radiated Spurious Emissions: 1 GHz to 18 GHz, Vertical

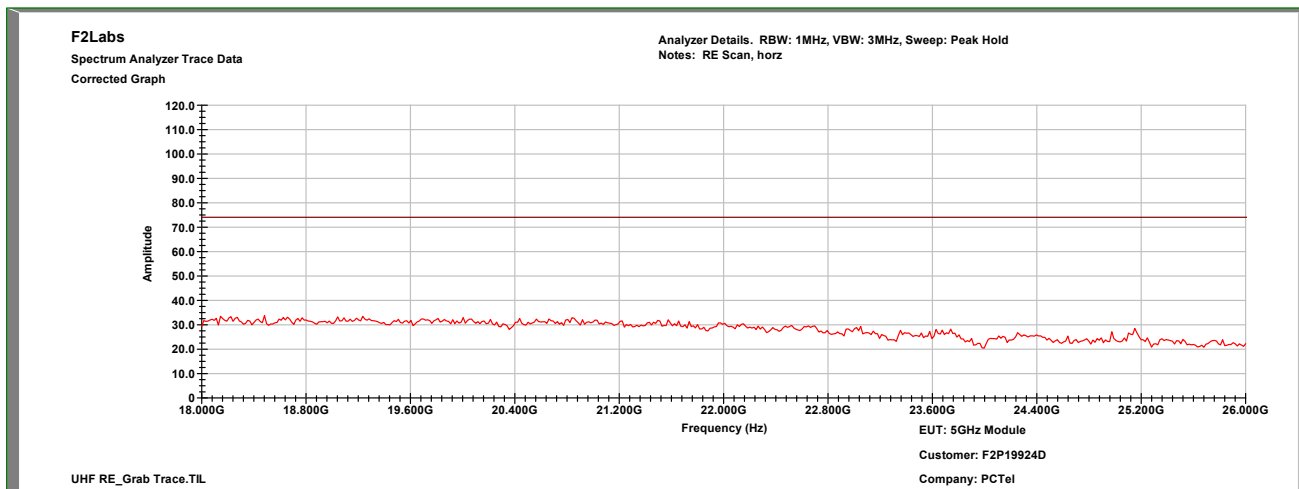




Radiated Spurious Emissions: 18 GHz to 26 GHz, Vertical

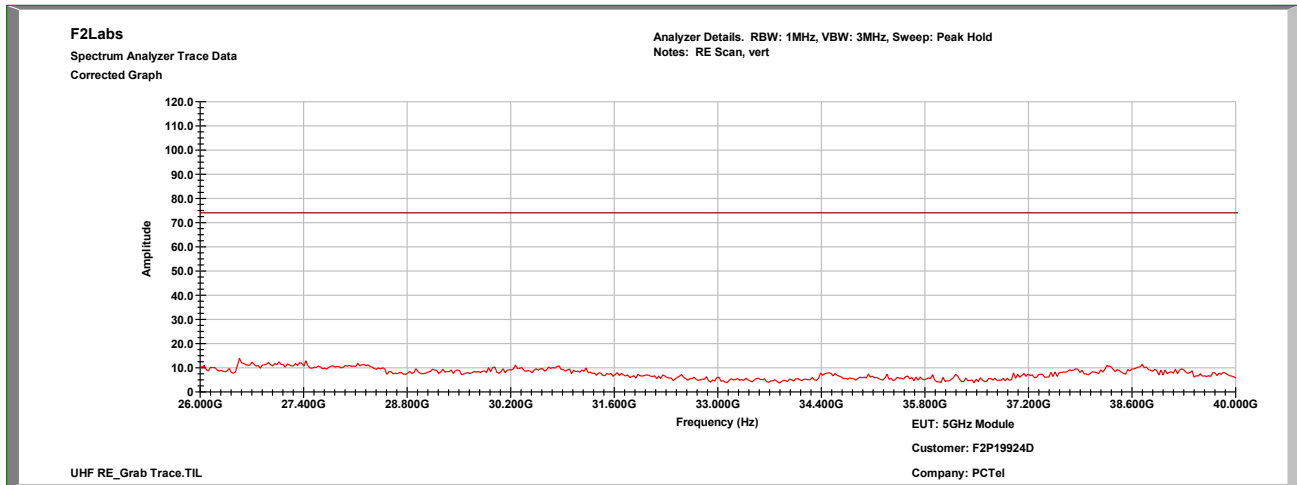


Radiated Spurious Emissions: 18 GHz to 26 GHz, Horizontal

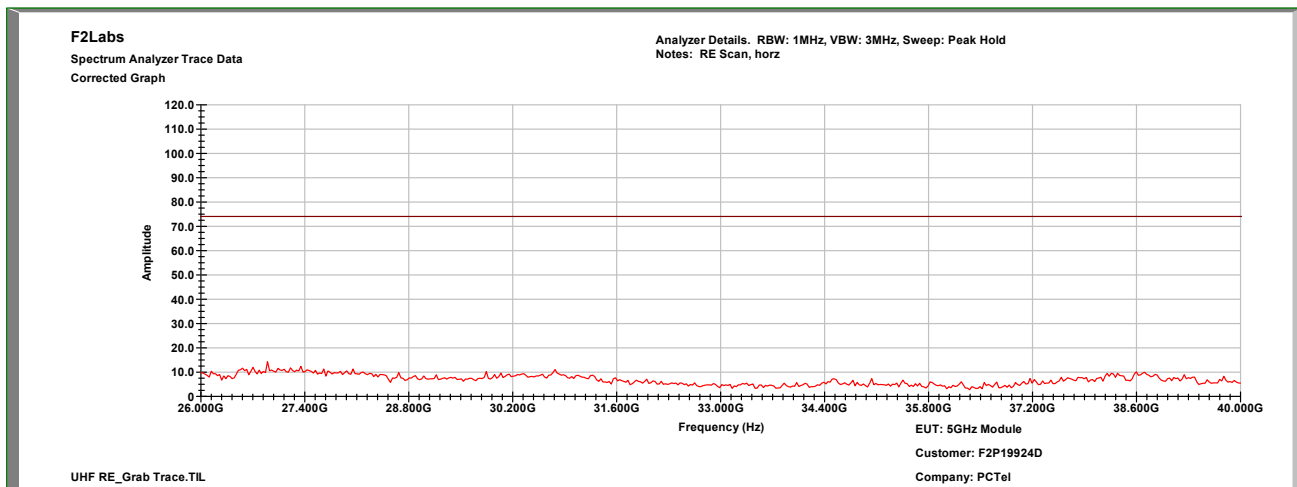




Radiated Spurious Emissions: 26 GHz to 40 GHz, Vertical



Radiated Spurious Emissions: 26 GHz to 40 GHz, Horizontal





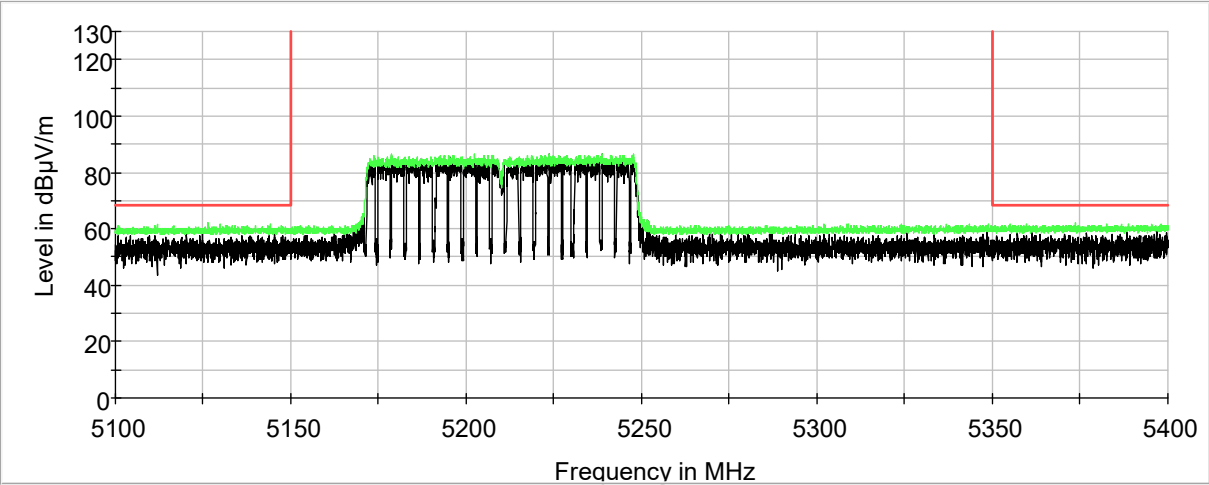
Radiated Spurious Emissions General Setup



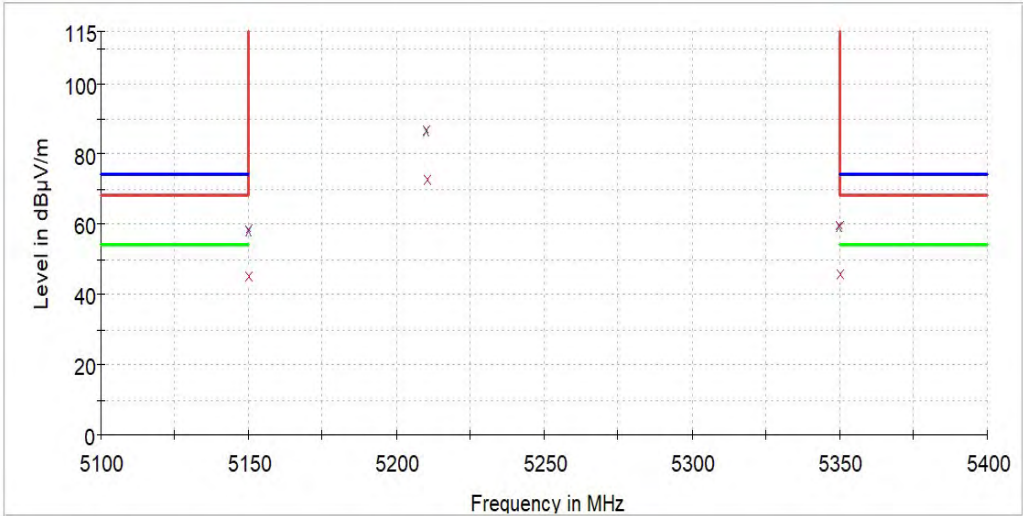


Antenna # 3 - AEMH51PT155UFL

Radiated Band Edge: UNII 1, HT80

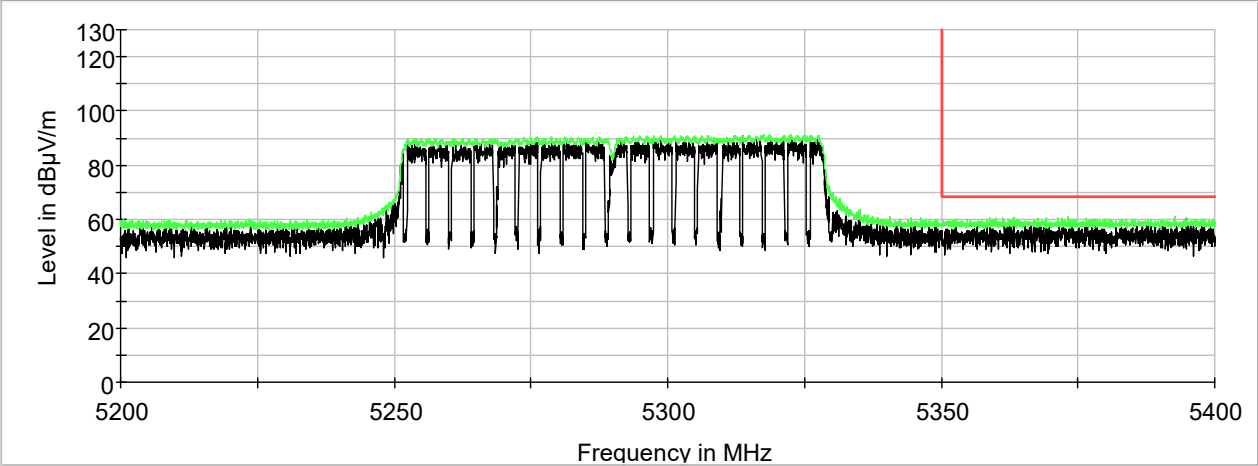


Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBµV/m)
5210.000000	86.6	73.4	1000.000	150.0	H	0.0	19.1	----	----	----	----
5150.000000	58.4	45.6	1000.000	150.0	H	0.0	19.0	-8.4	54.0	-15.6	74.0
5350.000000	59.8	46.0	1000.000	150.0	H	0.0	19.6	-8.0	54.0	-14.2	74.0



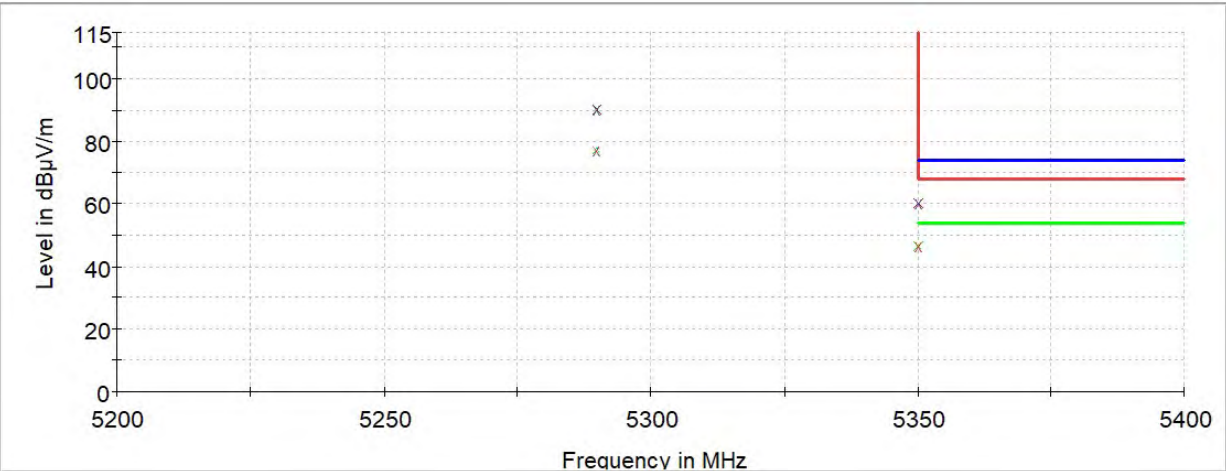


Radiated Band Edge: UNII 2A, HT80



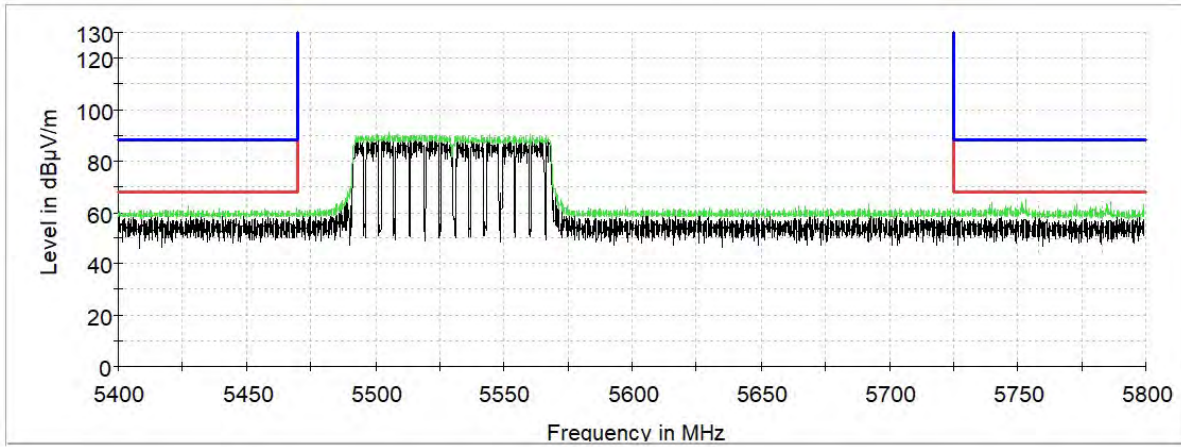
Measurements

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBµV/m)
5290.000000	90.1	77.3	1000.000	150.0	H	0.0	19.2	-----	-----	-----	-----
5350.000000	60.1	46.5	1000.000	150.0	H	0.0	19.6	-7.5	54.0	-14.2	74.0

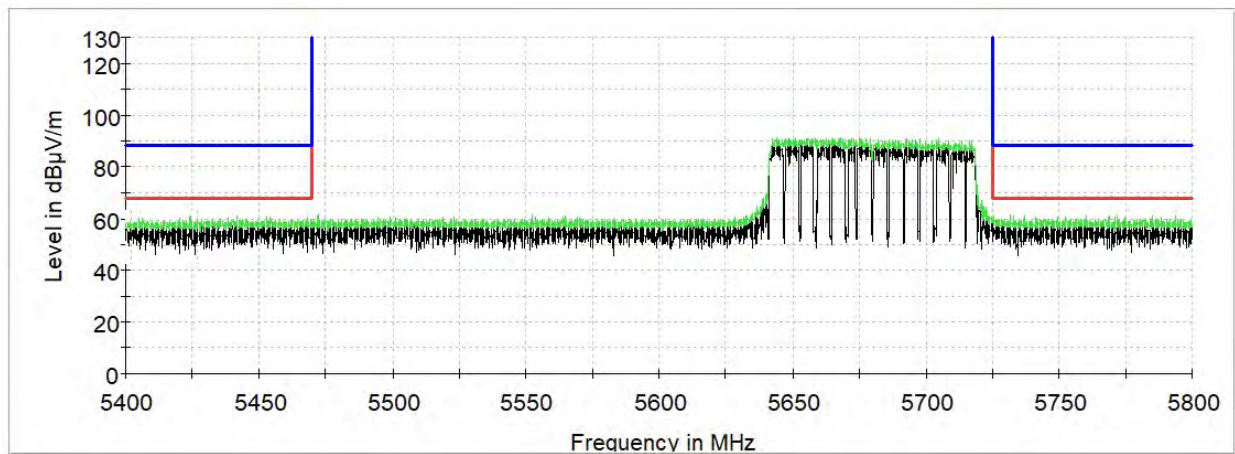




Radiated Lower Band Edge: UNII 2C, HT80



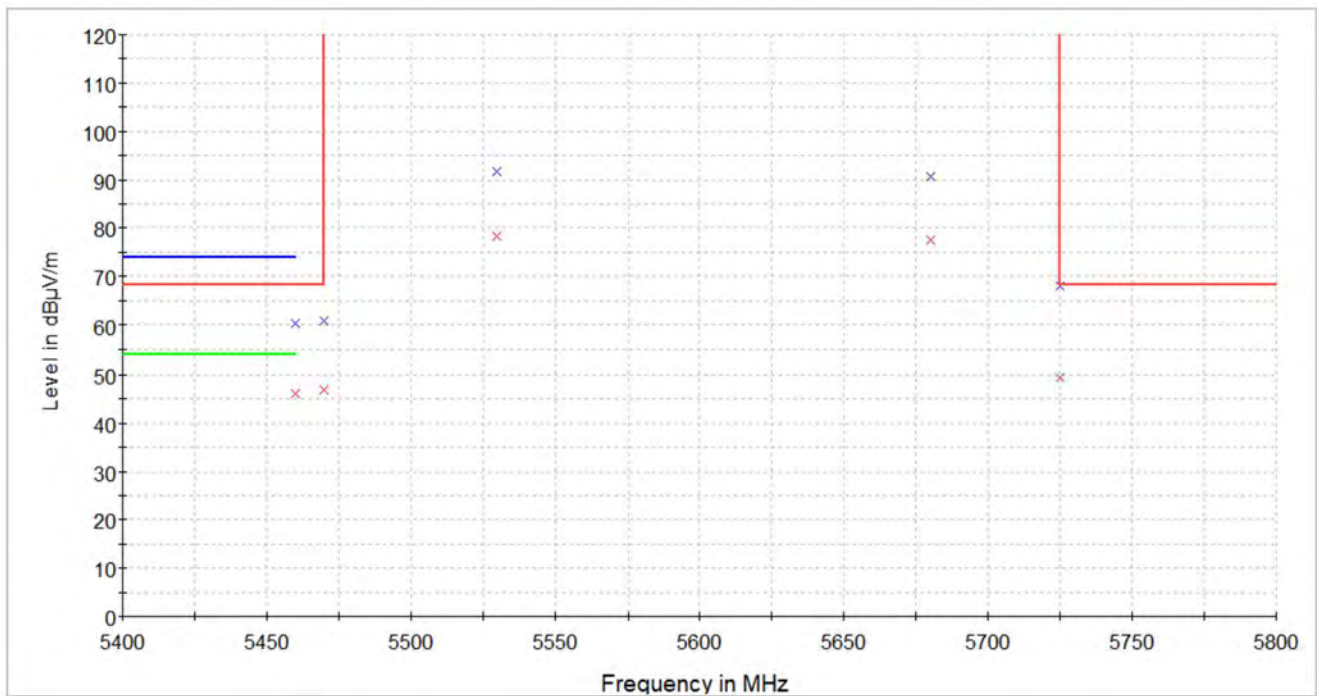
Radiated Upper Band Edge: UNII 2C, HT80





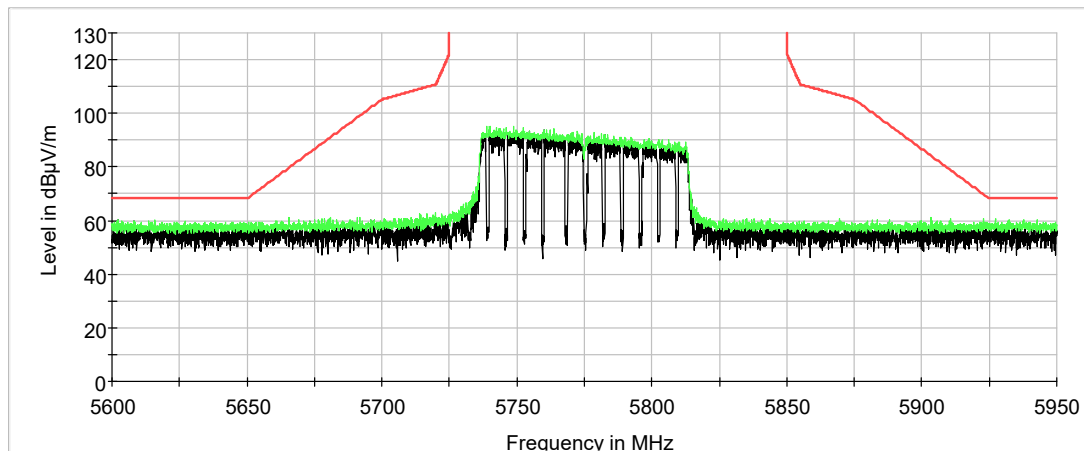
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5470.000000	60.8	46.8	1000.000	150.0	H	0.0	19.9	-----	-----	-7.4	68.2
5530.000000	91.7	78.4	1000.000	150.0	H	0.0	20.0	-----	-----	-----	-----
5680.000000	90.7	77.5	1000.000	150.0	H	0.0	19.9	-----	-----	-----	-----
5725.000000	67.9	49.5	1000.000	150.0	H	0.0	19.9	-----	-----	-0.3	68.2
5460.000000	60.3	46.2	1000.000	150.0	H	0.0	19.9	-7.8	54.0	-13.7	74.0



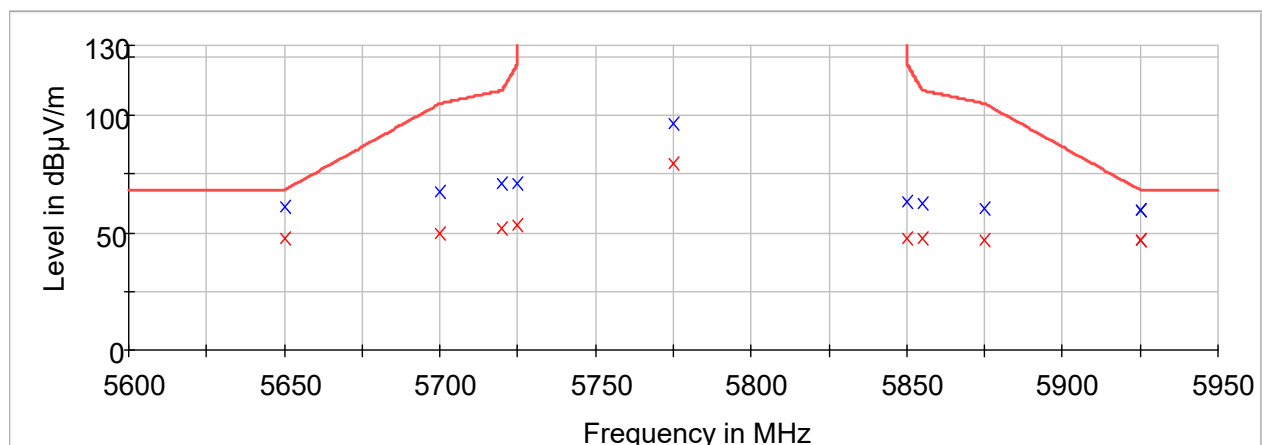


Radiated Band Edge: UNII 3, HT80



Measurements

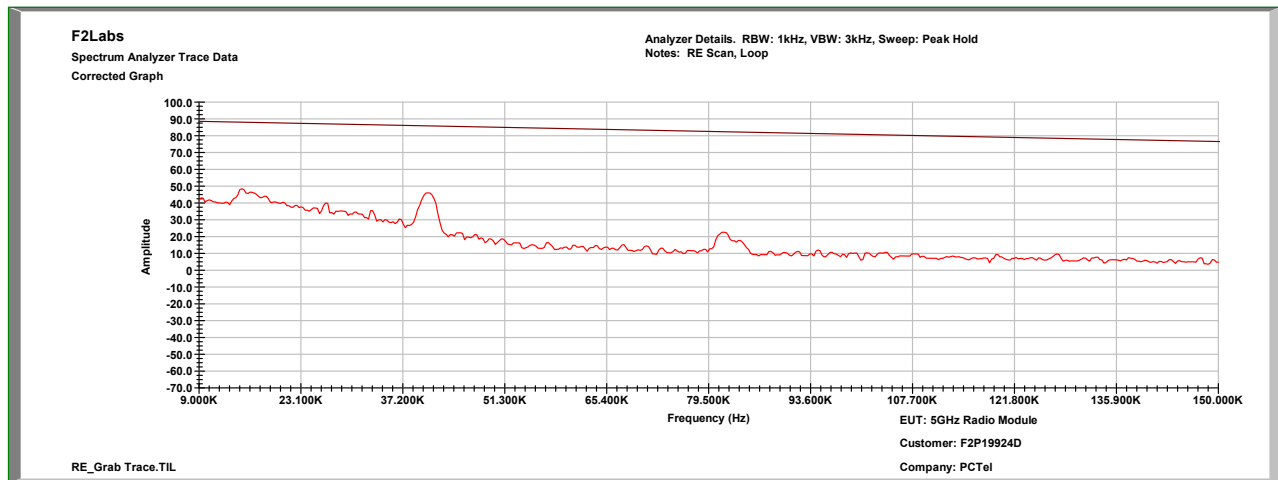
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Limit (dBμV/m)	Margin - MaxPeak (dB)
5775.000000	96.8	79.5	1000.000	150.0	H	0.0	20.0	-----	-----
5650.000000	61.4	47.5	1000.000	150.0	H	0.0	19.9	68.2	-6.8
5700.000000	67.2	50.0	1000.000	150.0	H	0.0	19.9	105.2	-38.0
5720.000000	70.7	51.8	1000.000	150.0	H	0.0	19.9	110.8	-40.1
5725.000000	71.3	53.4	1000.000	150.0	H	0.0	19.9	122.2	-50.9
5850.000000	62.9	47.8	1000.000	150.0	H	0.0	20.0	122.2	-59.3
5855.000000	62.2	47.6	1000.000	150.0	H	0.0	20.0	110.8	-48.6
5875.000000	60.4	47.0	1000.000	150.0	H	0.0	20.1	105.2	-44.8
5925.000000	59.4	46.7	1000.000	150.0	H	0.0	20.3	68.2	-8.8



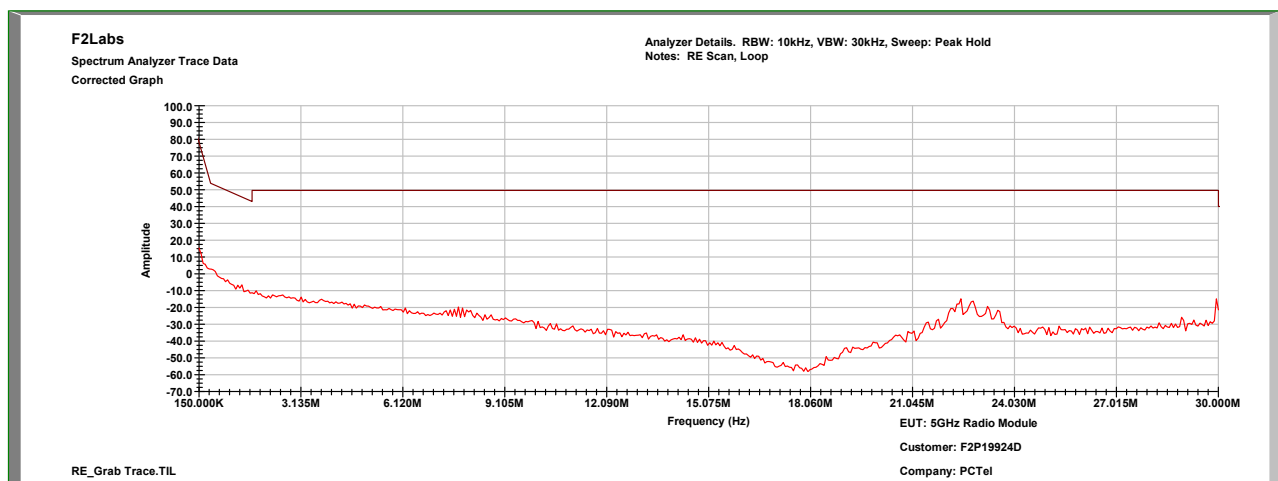


Scans were performed one at a time on each channel at each modulation and in each UNII band. Each channel at every modulation in all bands were scanned for Beamforming and again in Non-Beamforming. The following plots are worse case scans from all channels, all modulations, in all bands. The measurements in the tables are from all channels and modulations.

Radiated Spurious Emissions: 0.009 MHz to 0.15 MHz

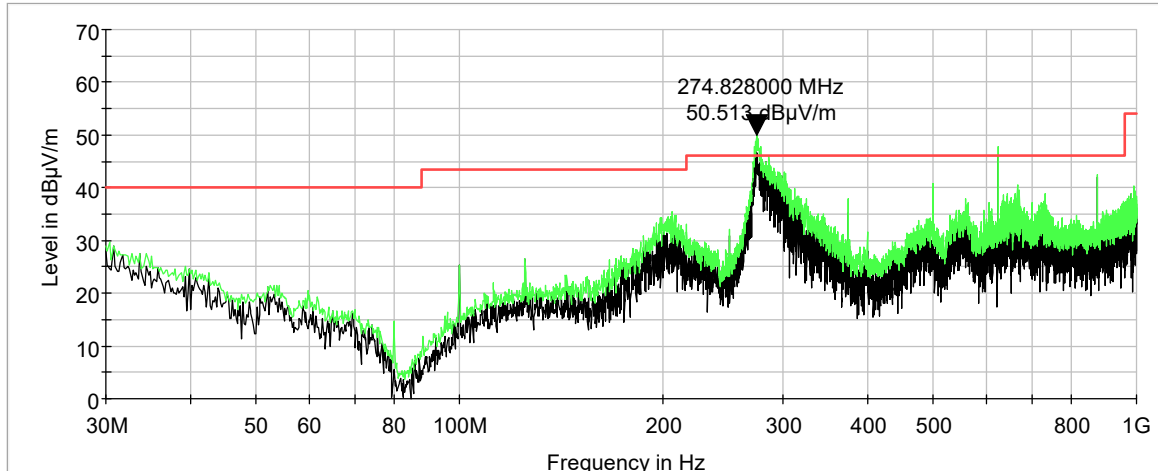


Radiated Spurious Emissions: 0.15 MHz to 30.0 MHz

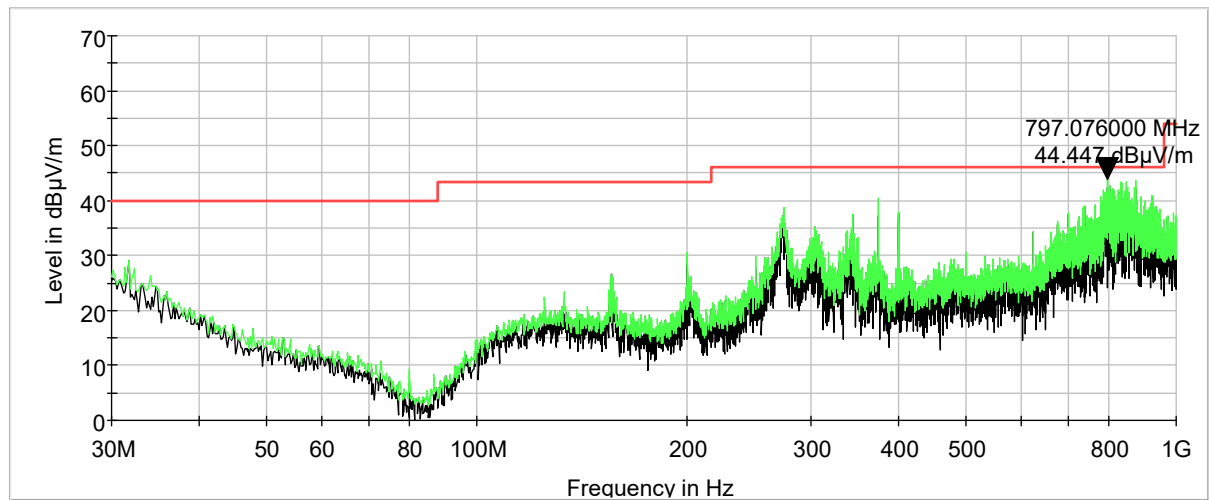




Radiated Spurious Emissions: 30 MHz to 1000 MHz, Vertical



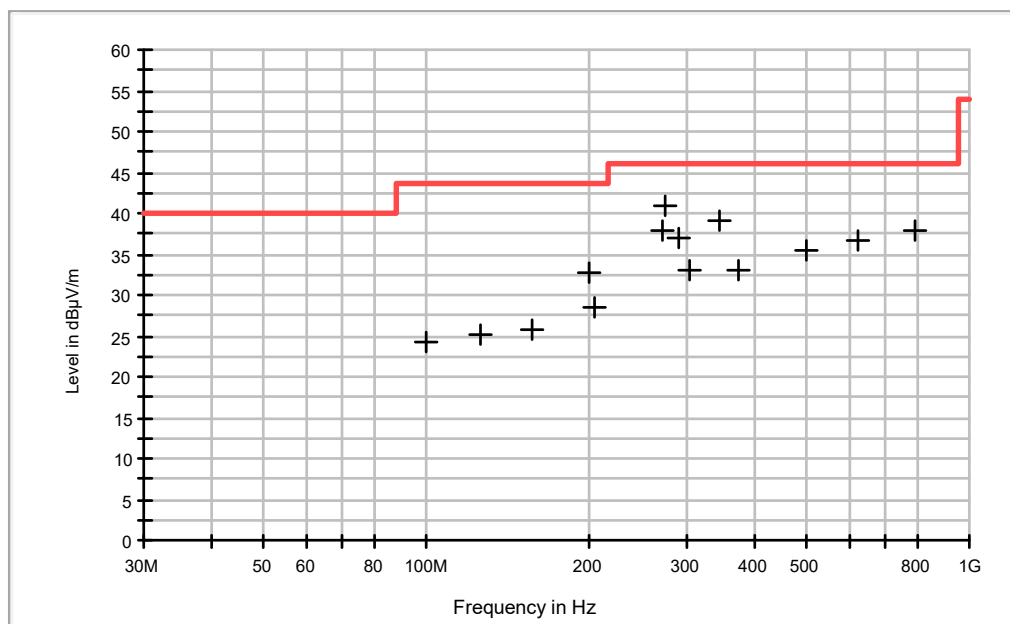
Radiated Spurious Emissions: 30 MHz to 1000 MHz, Horizontal





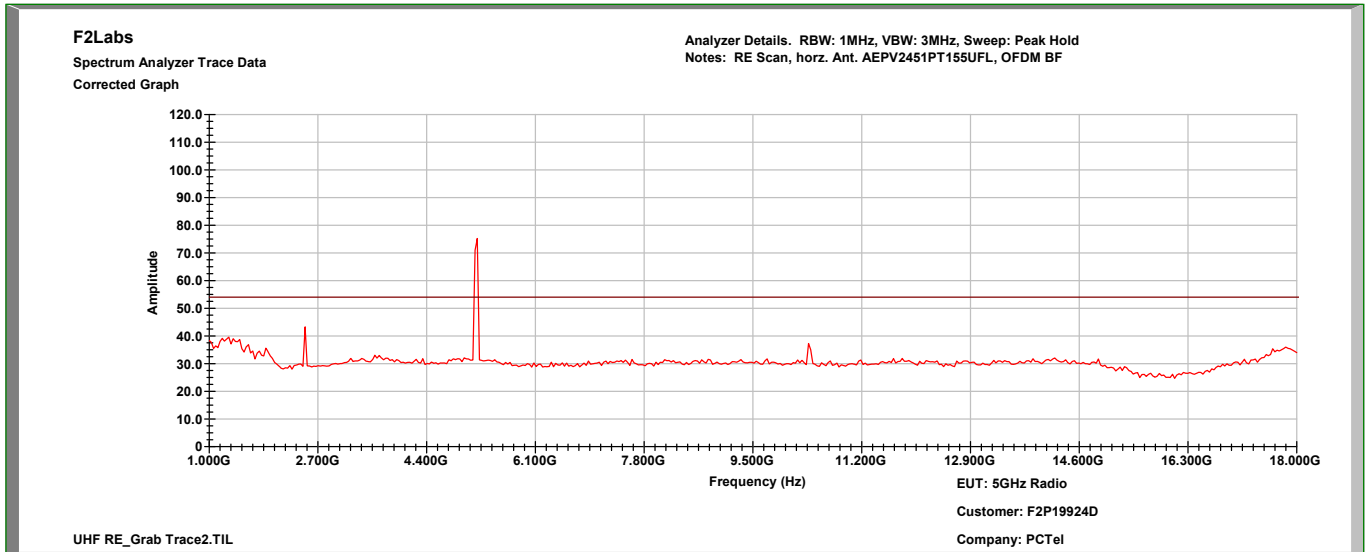
Measurements, 30 MHz to 1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
100.000000	24.3	120.000	100.0	V	332.0	-12.0	19.2	43.5
125.000000	25.2	120.000	100.0	V	217.0	-8.3	18.3	43.5
155.520000	25.8	120.000	100.0	H	46.0	-9.5	17.7	43.5
200.000000	32.8	120.000	100.0	H	96.0	-8.5	10.7	43.5
202.840000	28.4	120.000	100.0	V	344.0	-9.2	15.1	43.5
273.080000	37.7	120.000	100.0	H	0.0	-7.7	8.3	46.0
274.840000	41.0	120.000	100.0	V	274.0	-7.7	5.0	46.0
290.560000	37.0	120.000	100.0	V	303.0	-7.6	9.0	46.0
305.680000	32.9	120.000	100.0	H	231.0	-7.2	13.1	46.0
344.680000	38.9	120.000	100.0	H	68.0	-6.1	7.1	46.0
375.000000	33.1	120.000	100.0	V	354.0	-5.3	12.9	46.0
500.000000	35.3	120.000	100.0	V	66.0	-2.1	10.7	46.0
625.000000	36.6	120.000	100.0	V	256.0	0.4	9.4	46.0
797.080000	37.9	120.000	100.0	H	239.0	3.1	8.1	46.0

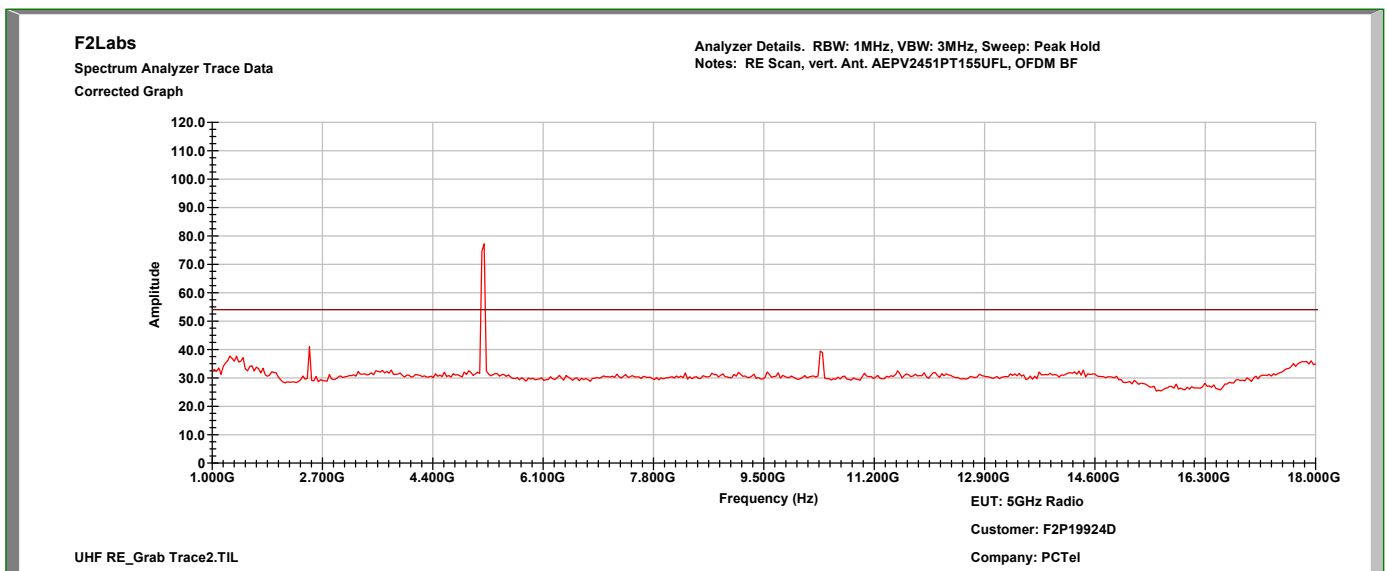




Radiated Spurious Emissions: 1 GHz to 18 GHz, Horizontal

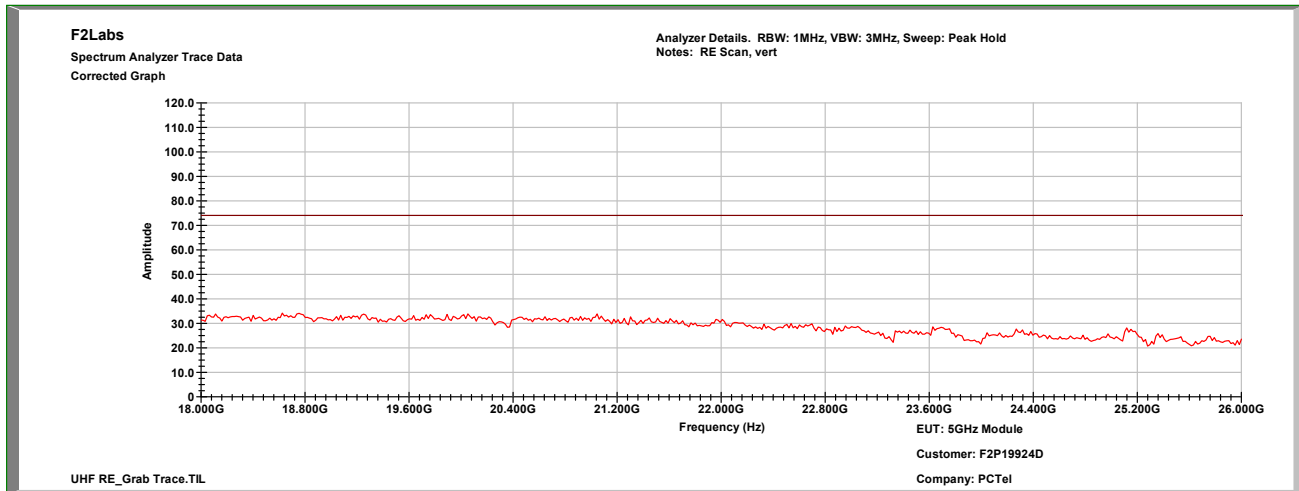


Radiated Spurious Emissions: 1 GHz to 18 GHz, Vertical

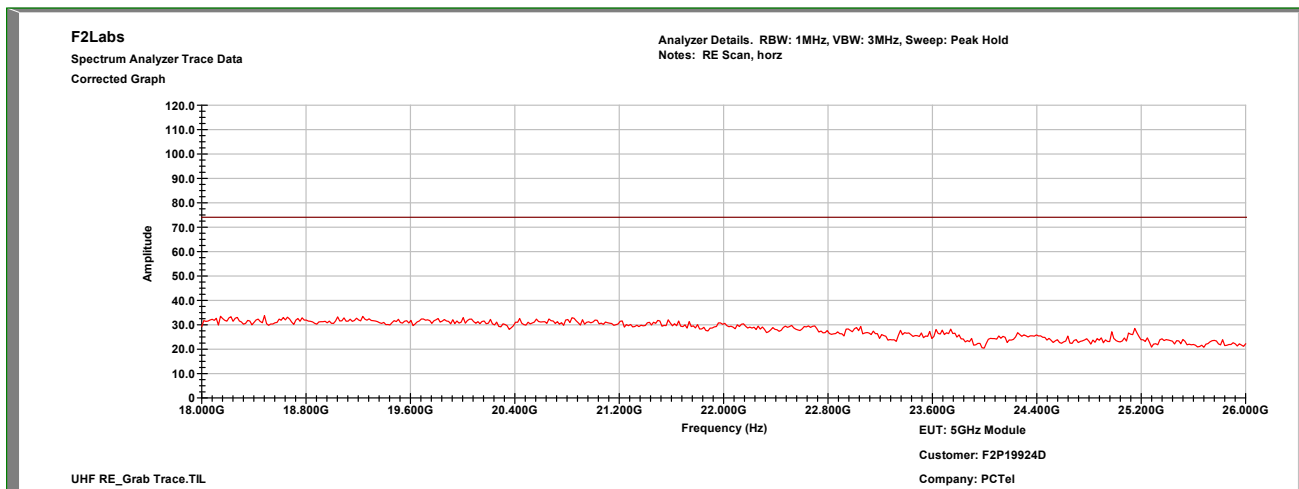




Radiated Spurious Emissions: 18 GHz to 26 GHz, Vertical

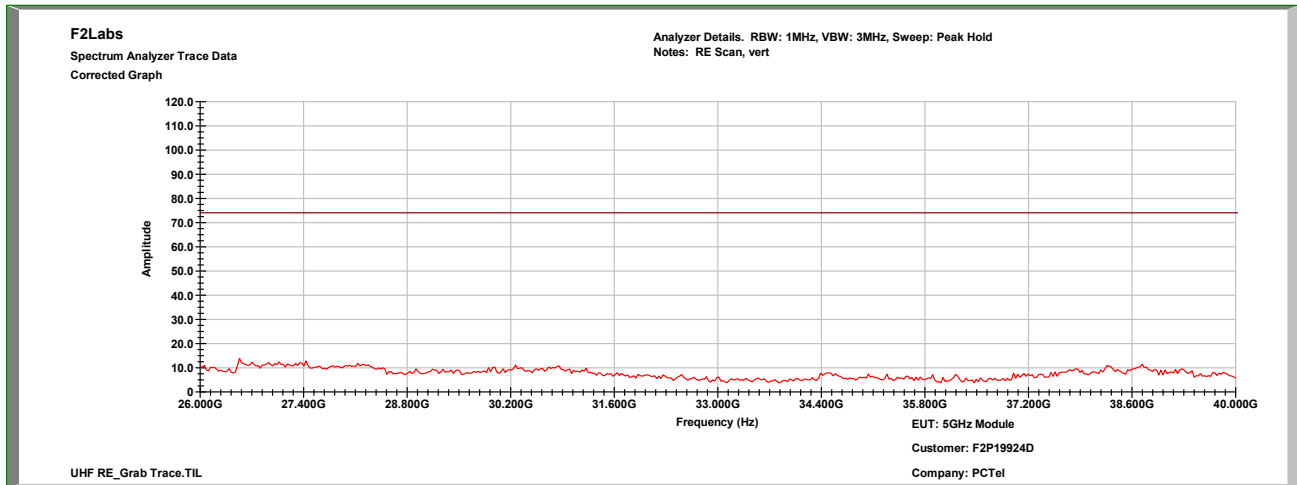


Radiated Spurious Emissions: 18 GHz to 26 GHz, Horizontal

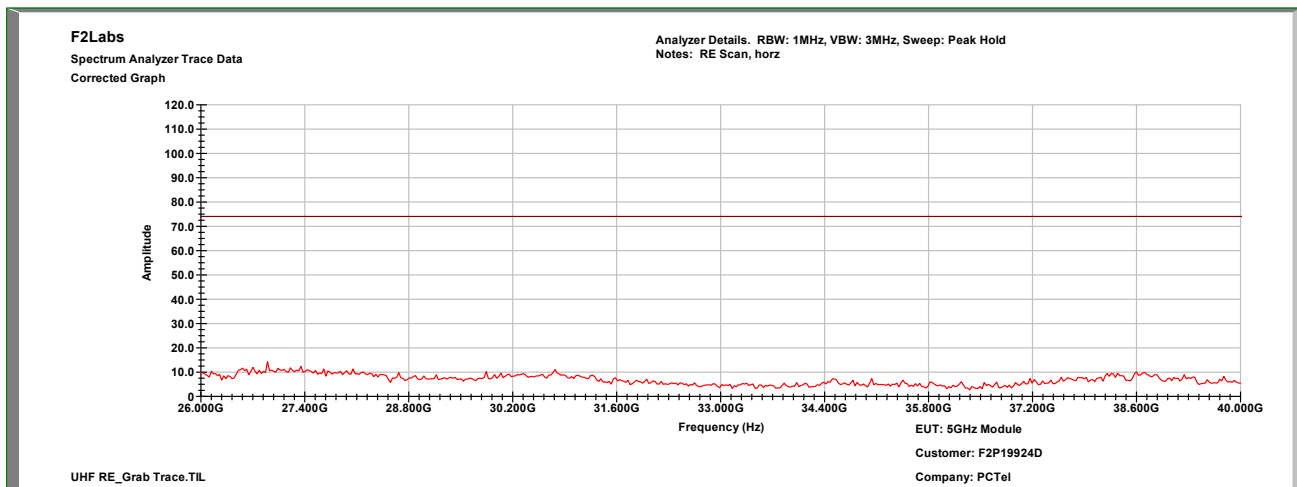




Radiated Spurious Emissions: 26 GHz to 40 GHz, Vertical



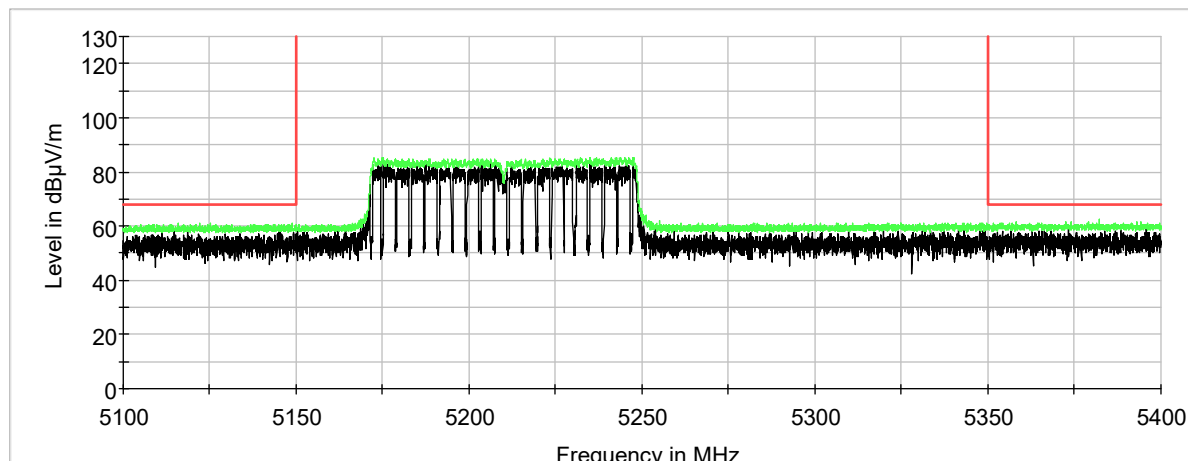
Radiated Spurious Emissions: 26 GHz to 40 GHz, Horizontal



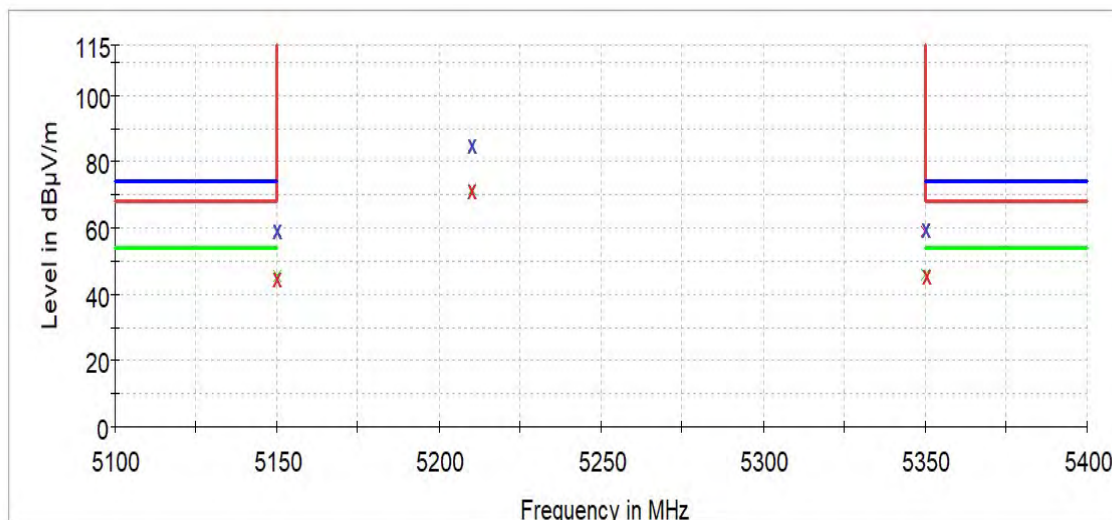


Radiated Spurious Emissions



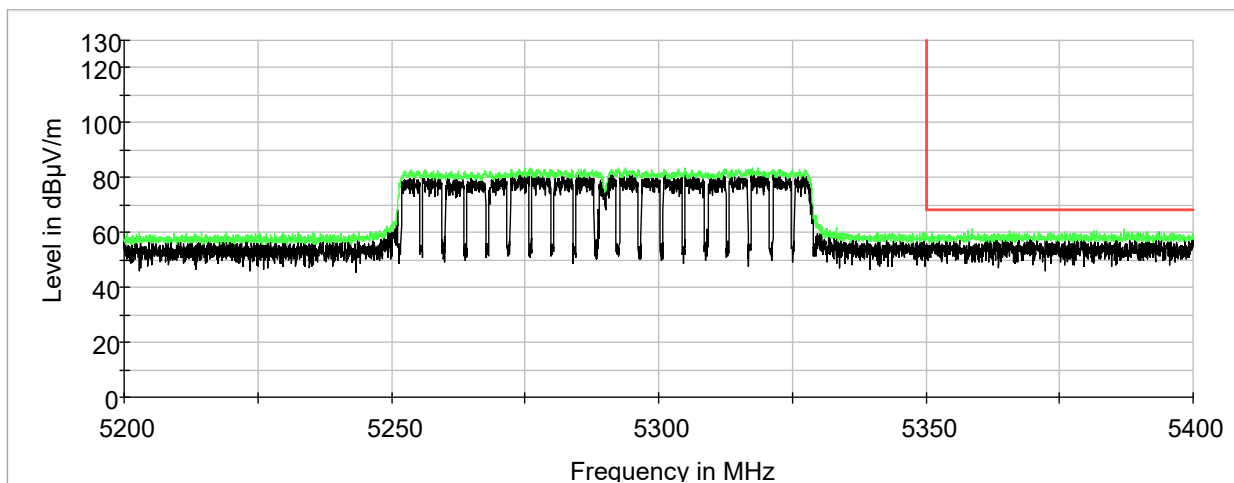
**Antenna #4 - AEPV2451PT155UFL****Radiated Band Edge: UNII 1, HT80**

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5210.000000	84.5	71.7	1000.000	150.0	V	0.0	19.1	-----	-----	-----	-----
5150.000000	59.2	45.6	1000.000	150.0	V	0.0	19.0	-8.4	54.0	-14.8	74.0
5350.000000	59.3	46.0	1000.000	150.0	V	0.0	19.6	-8.0	54.0	-14.7	74.0



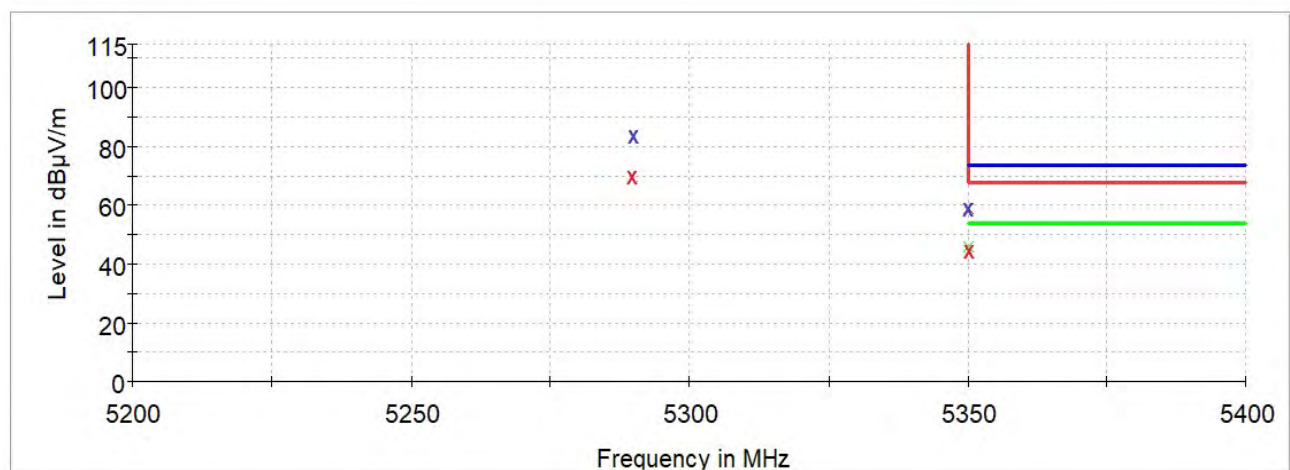


Radiated Band Edge: UNII 2A, HT80



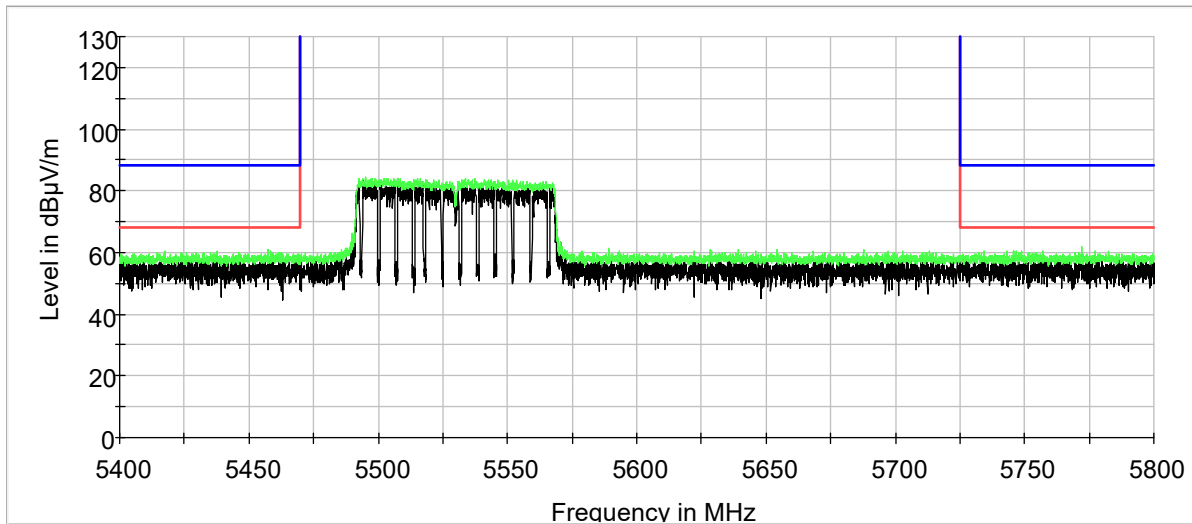
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5290.000000	83.3	70.3	1000.000	150.0	V	0.0	19.2	-----	-----	-----	-----
5350.000000	58.9	45.9	1000.000	150.0	V	0.0	19.6	-8.1	54.0	-15.1	74.0

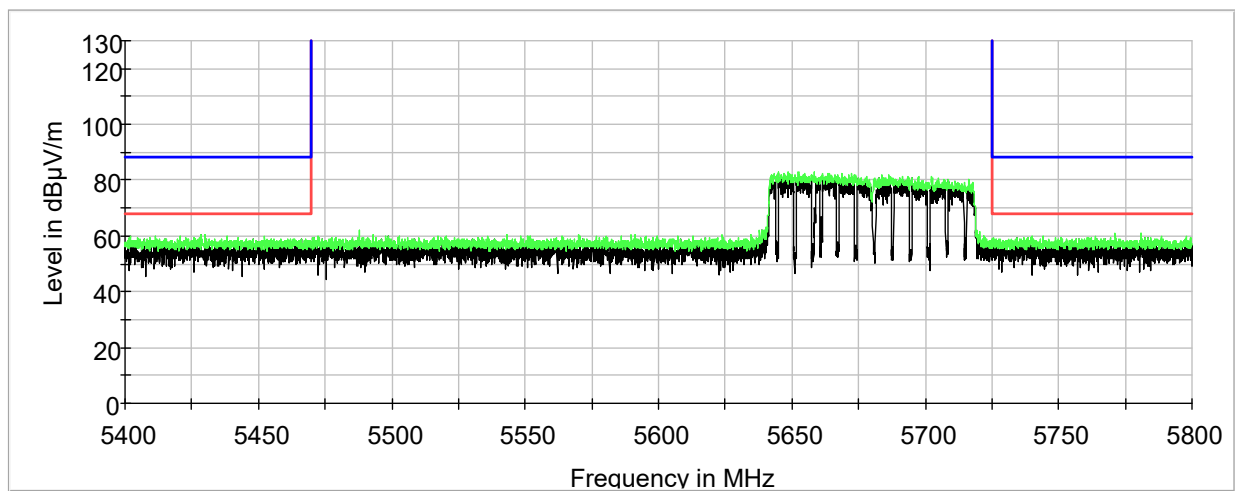




Radiated Lower Band Edge: UNII 2C, HT80



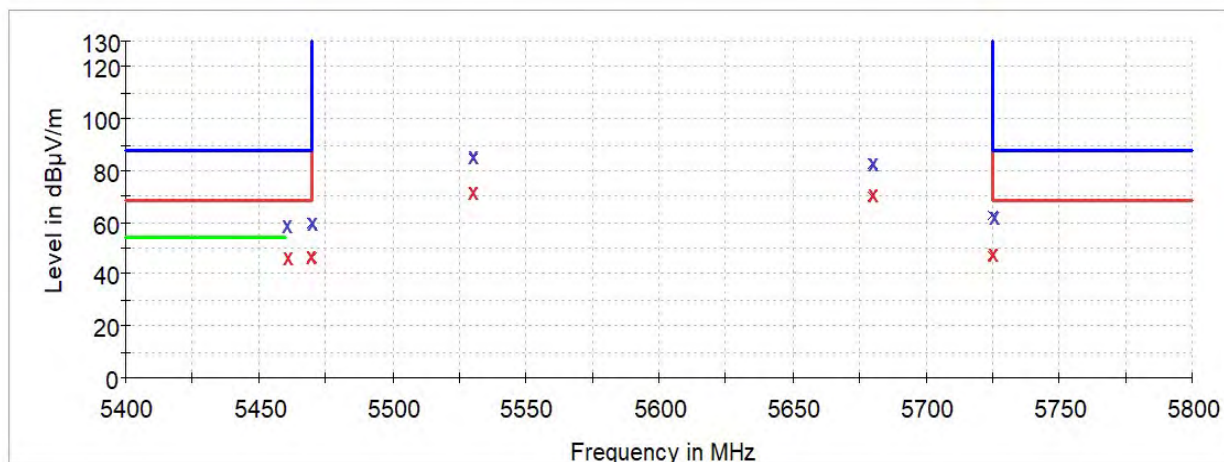
Radiated Upper Band Edge: UNII 2C, HT80





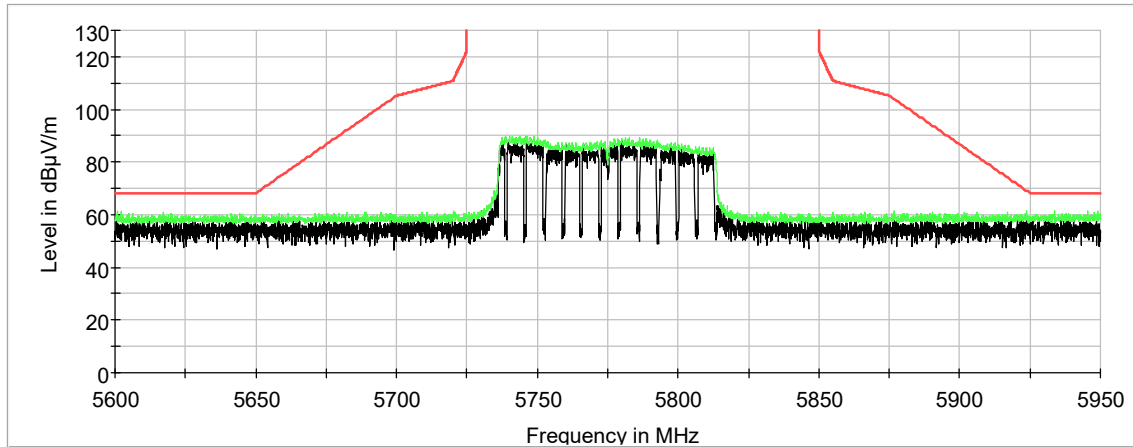
Measurements

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - AVG (dB)	Limit - AVG (dBμV/m)	Margin - MaxPeak (dB)	Limit - MaxPeak (dBμV/m)
5725.000000	62.8	47.0	1000.000	150.0	V	0.0	19.9	-----	-----	-25.4	68.2
5680.000000	83.1	70.3	1000.000	150.0	V	0.0	19.9	-----	-----	-----	-----
5530.000000	84.3	71.5	1000.000	150.0	V	0.0	20.0	-----	-----	-----	-----
5470.000000	59.9	46.4	1000.000	150.0	V	0.0	19.9	-----	-----	-28.3	68.2
5460.000000	59.4	46.4	1000.000	150.0	V	0.0	19.9	-7.6	54.0	-14.6	74.0



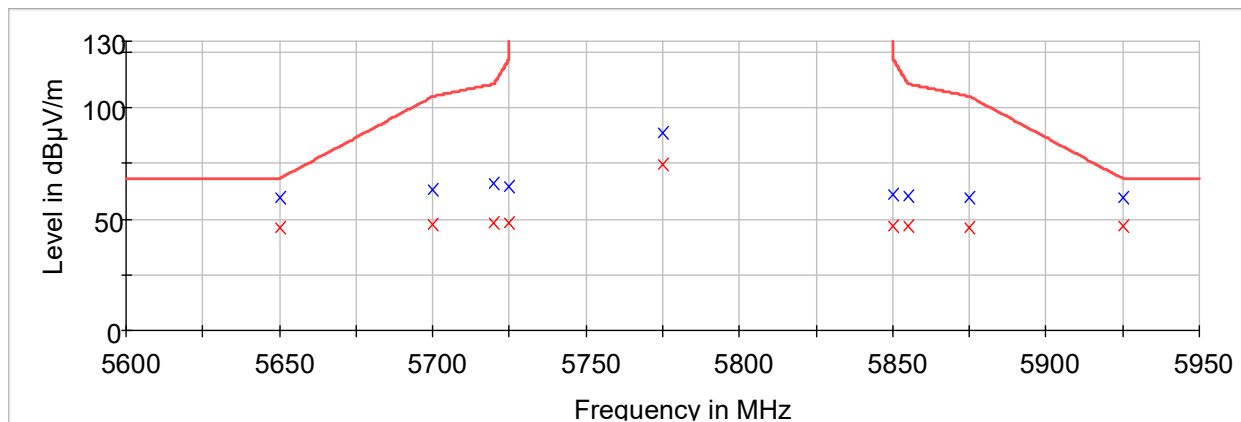


Radiated Band Edge: UNII 3, HT80



Measurements

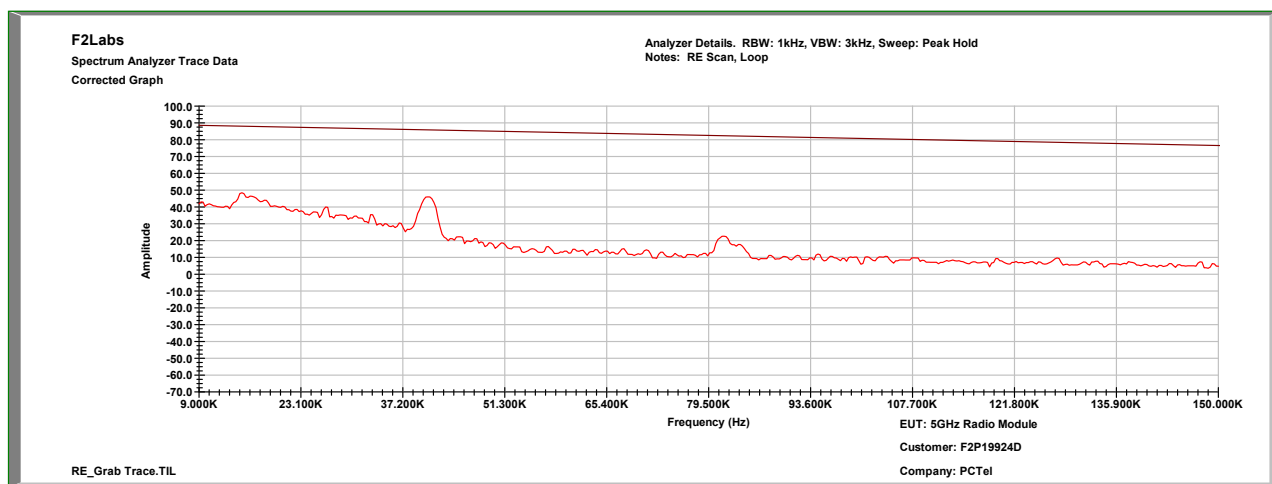
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Limit - MaxPeak (dBμV/m)	Margin - MaxPeak (dB)
5775.000000	88.5	74.5	1000.000	150.0	V	0.0	20.0	-----	-----
5650.000000	59.5	46.5	1000.000	150.0	V	0.0	19.9	68.2	-8.7
5700.000000	63.2	47.4	1000.000	150.0	V	0.0	19.9	105.2	-42.0
5720.000000	65.9	48.1	1000.000	150.0	V	0.0	19.9	110.8	-44.9
5725.000000	64.8	48.6	1000.000	150.0	V	0.0	19.9	122.2	-57.4
5850.000000	61.0	46.7	1000.000	150.0	V	0.0	20.0	122.2	-61.2
5855.000000	60.4	46.6	1000.000	150.0	V	0.0	20.0	110.8	-50.4
5875.000000	59.9	46.5	1000.000	150.0	V	0.0	20.1	105.2	-45.3
5925.000000	59.9	46.7	1000.000	150.0	V	0.0	20.3	68.2	-8.3



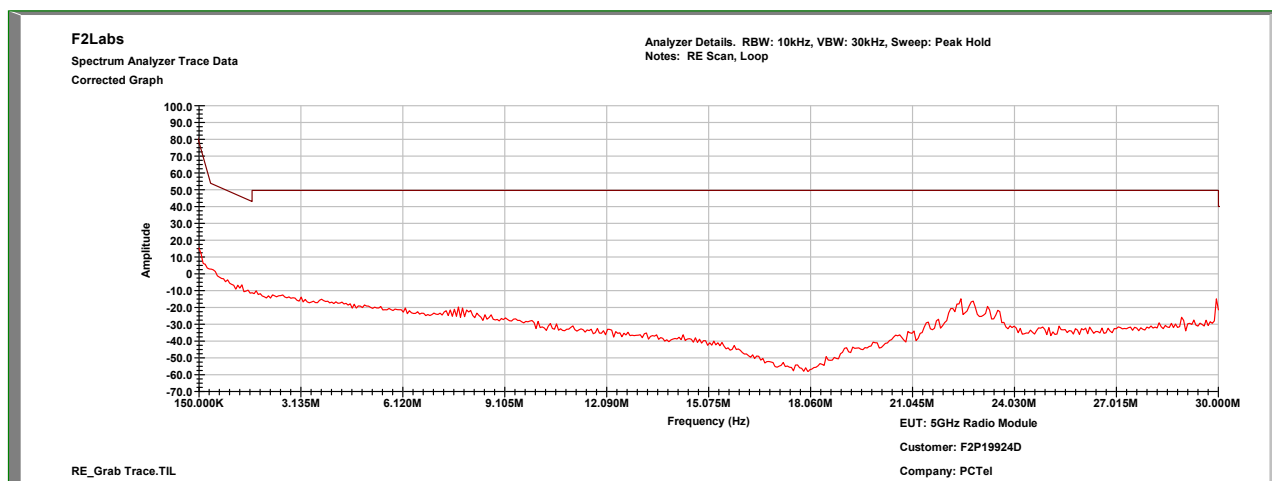


Scans were performed one at a time on each channel at each modulation and in each UNII band. Each channel at every modulation in all bands were scanned for Beamforming and again in Non-Beamforming. The following plots are worse case scans from all channels, all modulations, in all bands. The measurements in the tables are from all channels and modulations.

Radiated Spurious Emissions: 0.009 MHz to 0.15 MHz

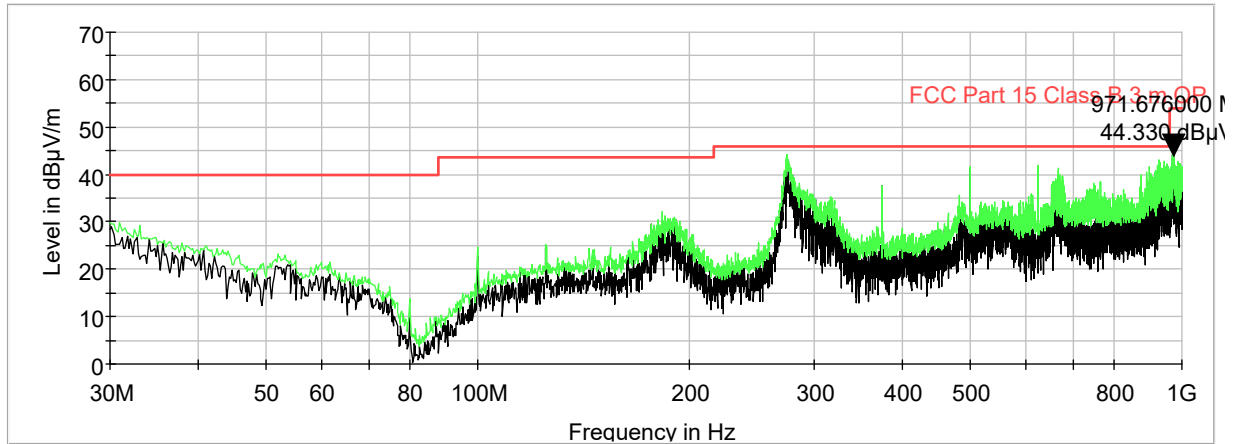


Radiated Spurious Emissions: 0.15 MHz to 30.0 MHz

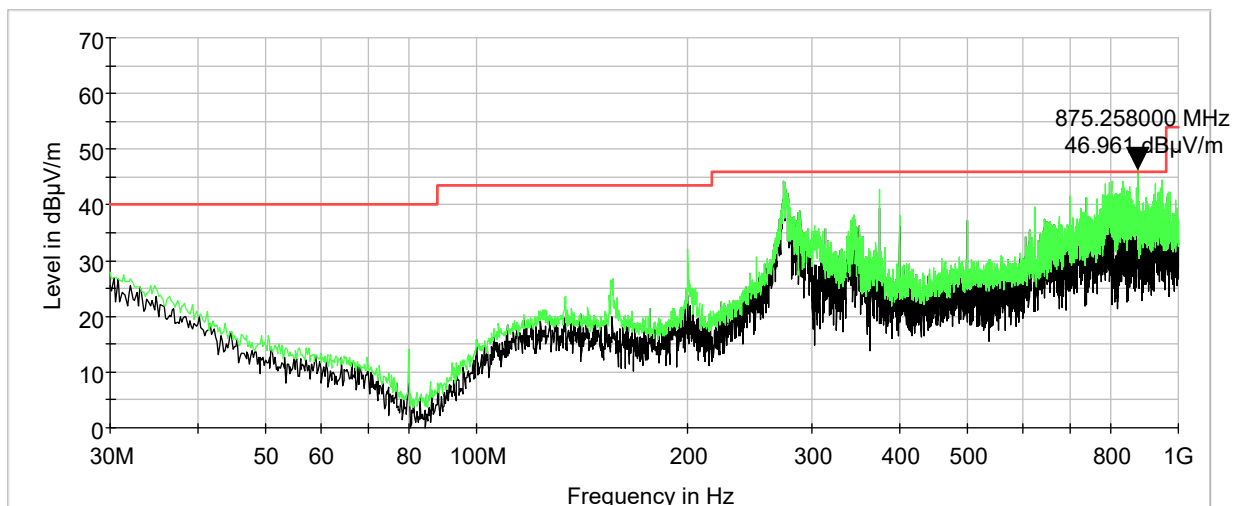




Radiated Spurious Emissions: 30 MHz to 1000 MHz, Vertical



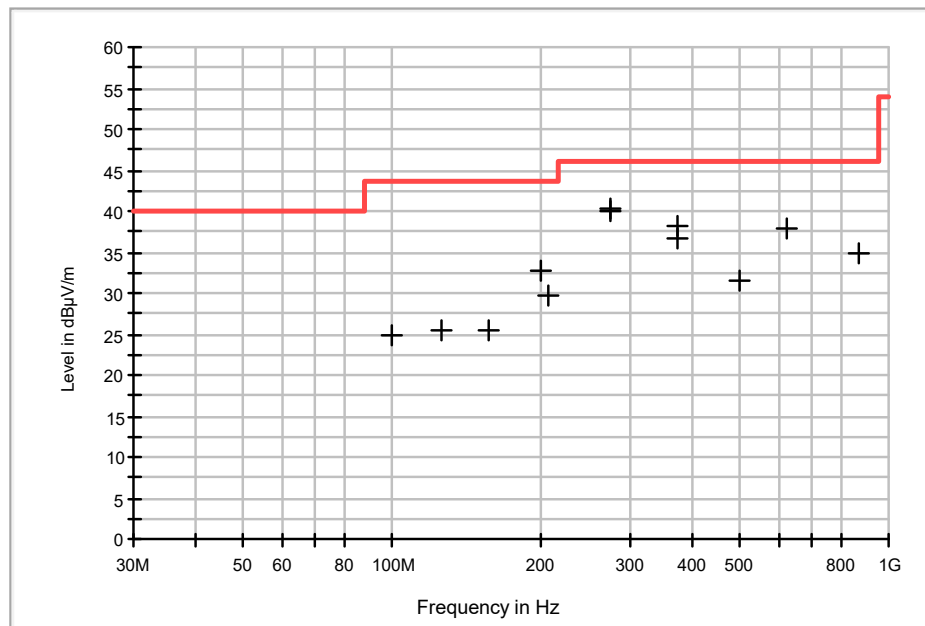
Radiated Spurious Emissions: 30 MHz to 1000 MHz, Horizontal





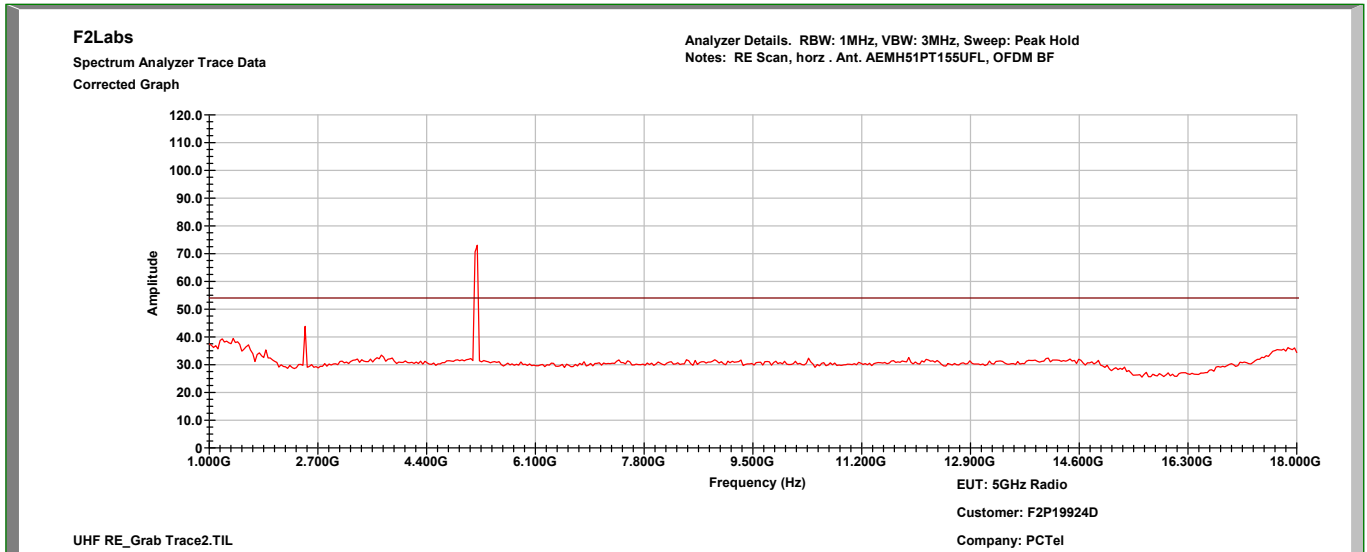
Measurements, 30 MHz to 1000 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBμV/m)
100.000000	24.9	120.000	100.0	V	316.0	-12.0	18.6	43.5
125.000000	25.4	120.000	100.0	V	232.0	-8.3	18.1	43.5
156.480000	25.4	120.000	100.0	H	7.0	-9.5	18.1	43.5
200.000000	32.8	120.000	100.0	H	348.0	-8.5	10.7	43.5
204.800000	29.7	120.000	100.0	V	12.0	-10.1	13.8	43.5
275.000000	40.0	120.000	100.0	H	307.0	-7.7	6.0	46.0
275.400000	40.3	120.000	100.0	V	293.0	-7.7	5.7	46.0
375.000000	38.3	120.000	100.0	H	278.0	-5.3	7.7	46.0
375.000000	36.7	120.000	100.0	V	243.0	-5.3	9.3	46.0
500.000000	31.6	120.000	100.0	H	344.0	-2.1	14.4	46.0
625.000000	37.8	120.000	100.0	V	341.0	0.4	8.2	46.0
875.000000	34.7	120.000	100.0	H	226.0	4.0	11.3	46.0

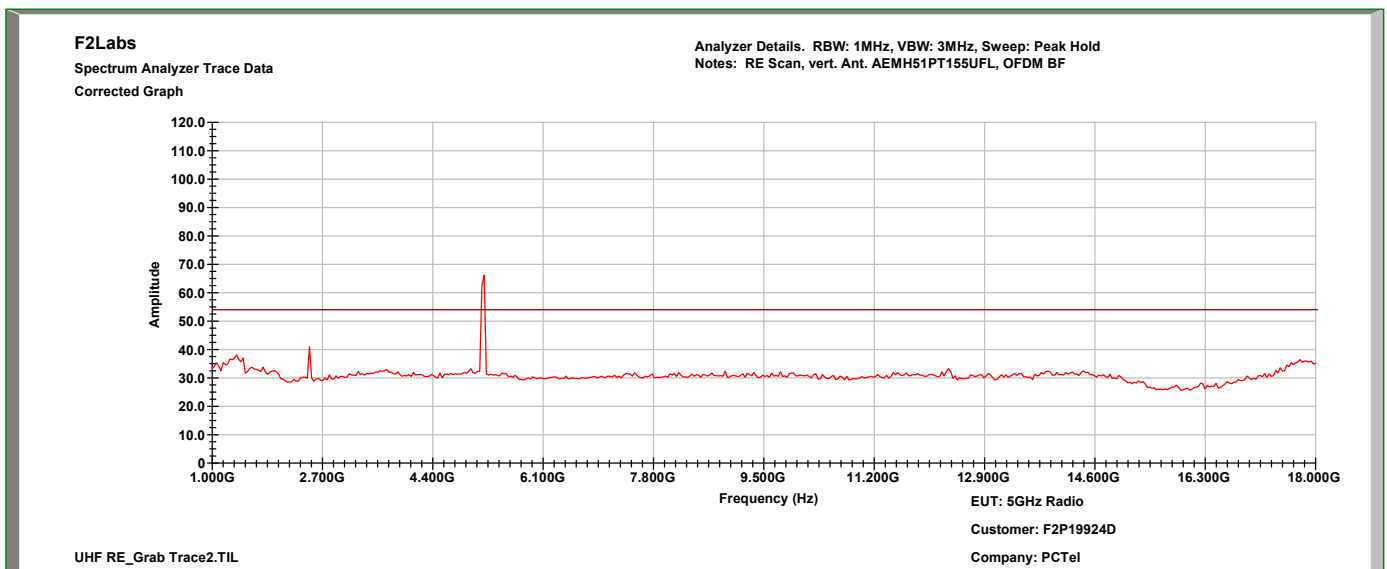




Radiated Spurious Emissions: 1 GHz to 18 GHz, Horizontal

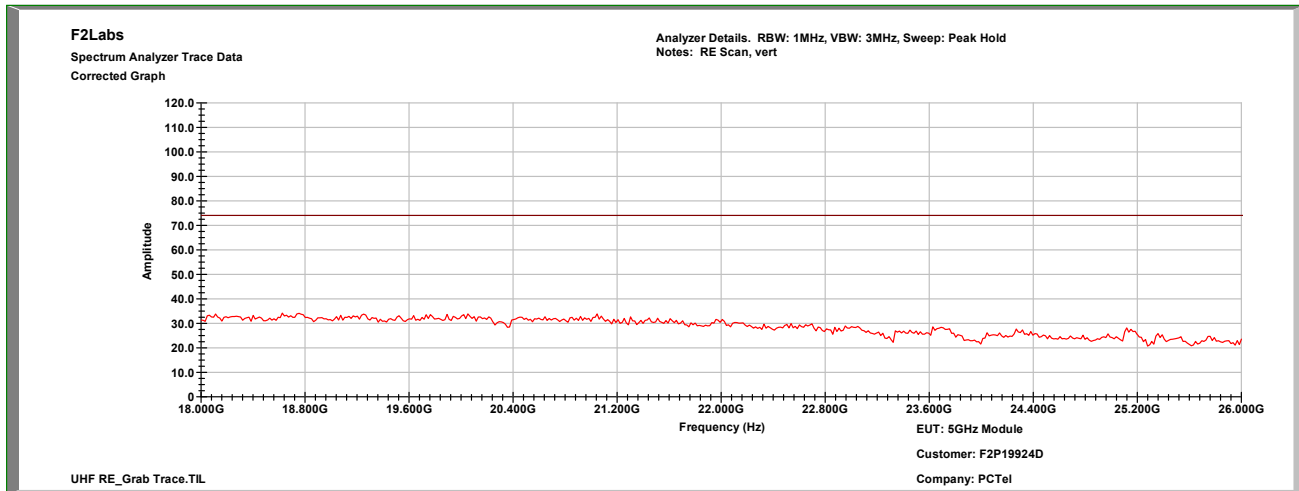


Radiated Spurious Emissions: 1 GHz to 18 GHz, Vertical

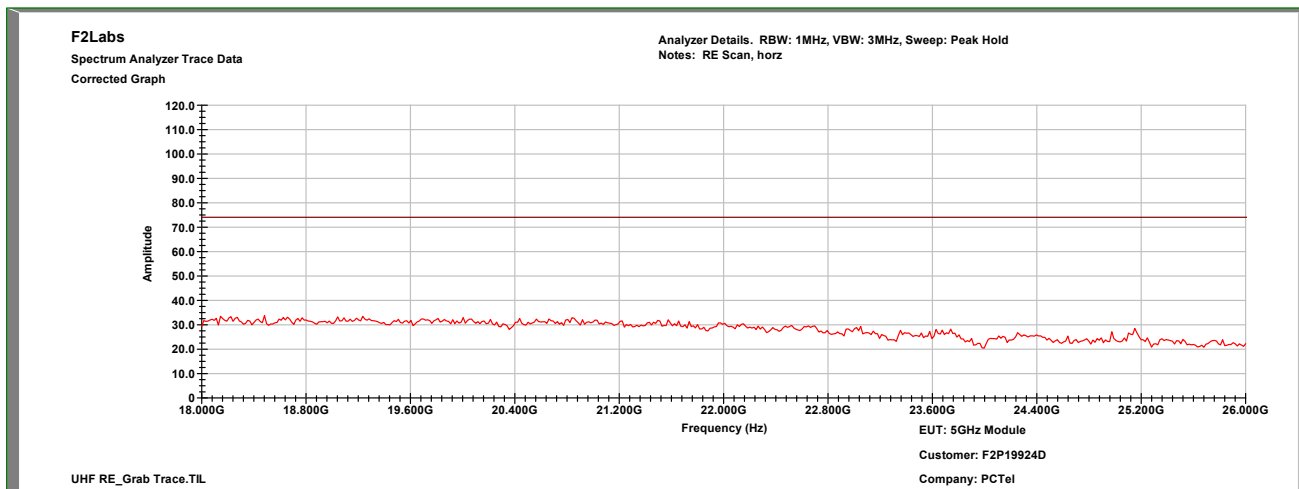




Radiated Spurious Emissions: 18 GHz to 26 GHz, Vertical

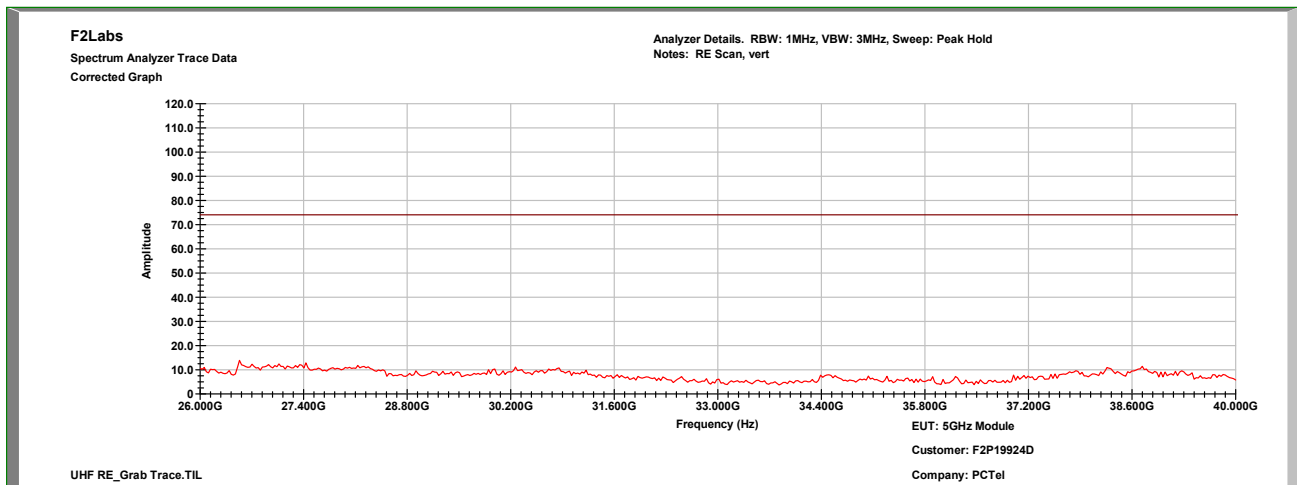


Radiated Spurious Emissions: 18 GHz to 26 GHz, Horizontal

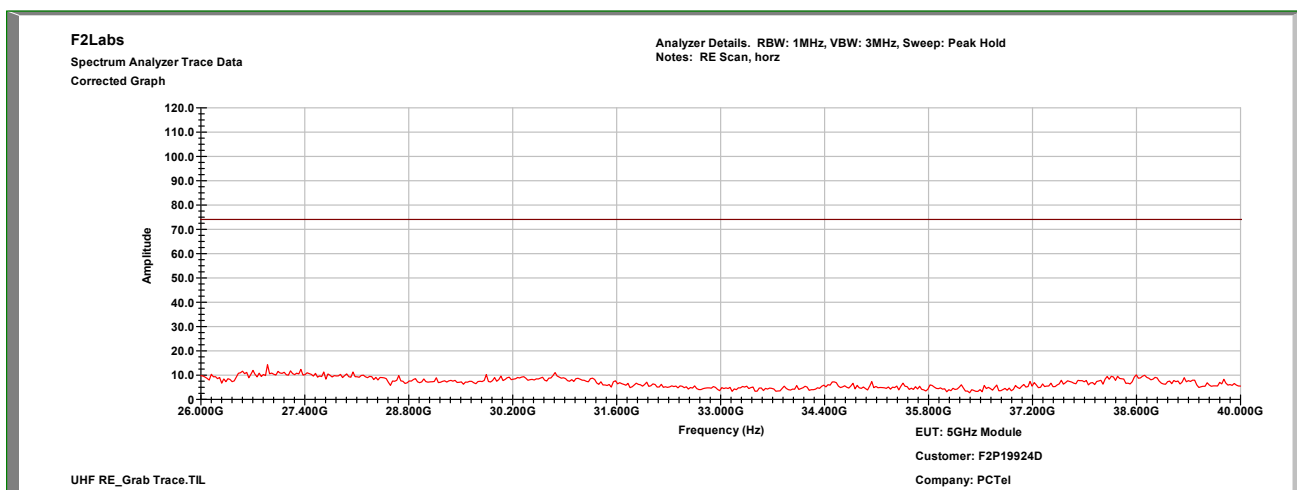




Radiated Spurious Emissions: 26 GHz to 40 GHz, Vertical



Radiated Spurious Emissions: 26 GHz to 40 GHz, Horizontal





Radiated Spurious Emissions

