CERTIFICATION TEST REPORT

Report Number. : 12720909-E4V3

Applicant	:	VeriFone, Inc. 1400 WEST STANFORD RANCH ROAD ROCKLIN, CA, 95765, U.S.A.
Model	:	M440
FCC ID	:	B32M440
IC	:	787C-M440
EUT Description	:	Point-of-Interaction Terminal
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date of Issue:
August 06, 2019

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
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NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	7/9/2019	Initial Issue	--
V2	7/22/2019	Updated Max output power and Test Methodology And company name	Tri Pham
V3	8/6/2019	Updated xyz statement	Tri Pham

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UL VERIFICATION SERVICES INC.
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: VeriFone, Inc.
1400 WEST STANFORD RANCH ROAD
ROCKLIN, CA, 95765, U.S.A.

EUT DESCRIPTION: Point-of-Interaction Terminal

MODEL: M440

SERIAL NUMBER: 346522674 (Radiated), 346522625 (Conducted)

DATE TESTED: May 21, 2019 – June 10, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Complies
ISED RSS-247 Issue 2	Complies
ISED RSS-GEN Issue 5	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:

Frank Ibrahim
Operations Leader
Consumer Technology Division
UL Verification Services Inc.

Reviewed By:

Tri Pham
Project Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v02r01, ANSI C63.10-2013, FCC 06-96, RSS-GEN Issue 5, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street	47658 Kato Road
☐ Chamber A	☐ Chamber D	☒ Chamber I
☐ Chamber B	☐ Chamber E	☐ Chamber J
☐ Chamber C	☐ Chamber F	☒ Chamber K
	☐ Chamber G	☐ Chamber L
	☐ Chamber H	☐ Chamber M

The above test sites and facilities are covered under FCC Test Firm Registration # 208313 and Industry Canada ISED #2324A.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

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4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.52 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.88 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.24 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.37 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.17 dB

Uncertainty figures are valid to a confidence level of 95%.

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The M440 is an integrated countertop Point-of-Interaction (POI) terminal designed to process online and offline transactions in an attended environment. The Multi-Lane (M440) product is part of the two-chip Carbon family (Android applications and Engage payment engine). It accepts all payment methods - MSR, PSCR, Contactless, and wallets. The radio communication mechanisms available in the system include WiFi dual band 802.11 a/b/g/n and Bluetooth 4.1 BLE (BT4.2 on Android 7.1 or later versions), and CTLS (NFC).

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX			
5180-5240	802.11a	10.88	12.25
5180-5240	802.11n HT20	12.09	16.18
5190-5230	802.11n HT40	11.12	12.94

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX			
5260 - 5320	802.11a	11.22	13.24
5260 - 5320	802.11n HT20	12.19	16.56
5270 - 5310	802.11n HT40	11.32	13.55

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX			
5500-5700	802.11a	10.32	10.76
5500-5700	802.11n HT20	12.02	15.92
5510-5670	802.11n HT40	9.78	9.51

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 1TX			
5745-5825	802.11a	10.06	10.14
5745-5825	802.11n HT20	9.96	9.91
5755-5795	802.11n HT40	10.03	10.07

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a dual band stamped metal antenna., with a maximum gain of 1.51 dBi.

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was Qualcomm Radio Control Tool, Version 4.0.00123.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated bandedge, harmonics, and spurious emissions from 1 GHz to 18GHz were performed. The EUT was set to transmit at the Low/Middle/High channels.

The fundamental of the EUT was investigated in two orthogonal orientations X and Z, it was determined that X-axis was the worst case orientation, therefore all final radiated testing was performed with the EUT in X(flatbed) position.

Radiated emission below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT was set to transmit at the channel with highest output power as worst-case scenario.

Worst-case data rates as provided by the client were:

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC
Laptop AC/DC Adapter	Dell	LA65NM130	CN-0JNKWD-72438-61M-0728-A03	DoC
Laptop	Dell	Latitude E7450	H24JN72	DoC
AC/DC Adapter	Verifone	2AAJ012F US	A1914000013	DoC
Base Plug	Verifone	M400 BAS	445-101-01-A REV:A00	DoC
Debug Board	Verifone	LBL445-003-01-A	445-113-01-A	DoC

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Unshielded	0.9	AC Mains to AC/DC Adapter
2	DC	1	DC	Unshielded	1.85	AC/DC Adapter to Laptop
3	USB	1	USB Type-C to Type-A	Shielded	1	Laptop to Debug Board
4	USB	1	USB Type-C	Shielded	1.5	Base Plug to EUT
5	DC	5	DC	Unshielded	1.8	AC/DC Adapter to Base Plug
6	Antenna	1	SMA	Unshielded	0.08	To spectrum analyzer

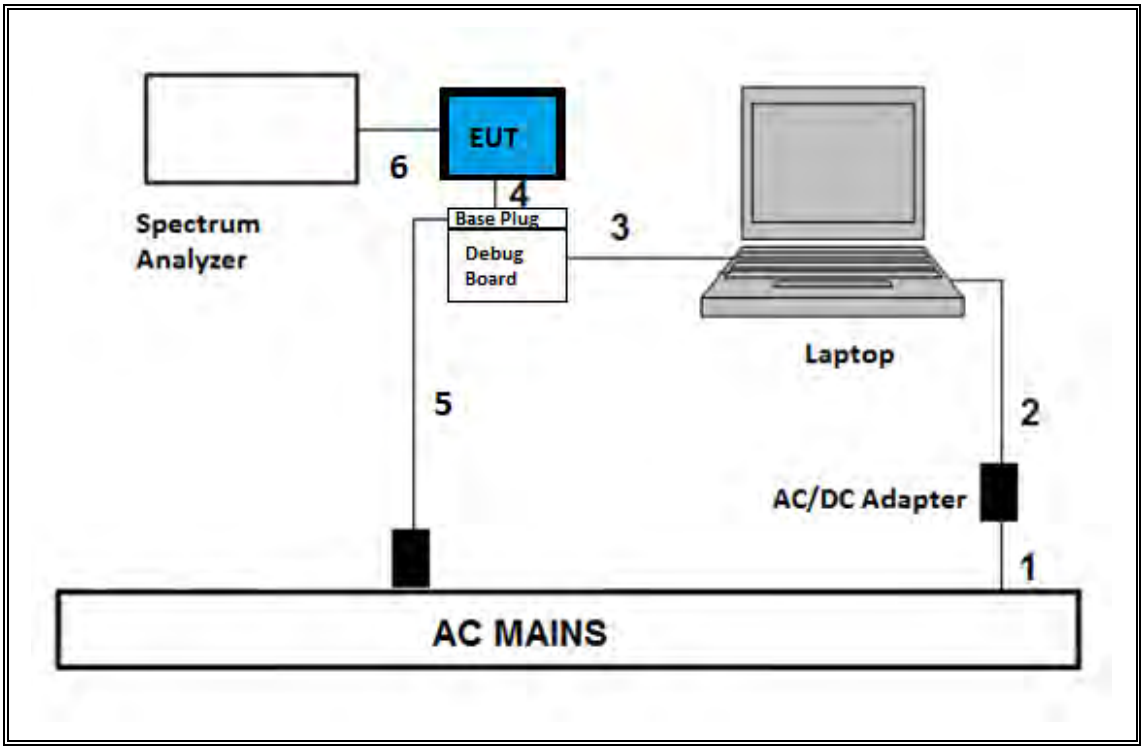
I/O CABLES (AC POWER CONDUCTED TEST AND RADIATED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	AC	Unshielded	0.9	AC Mains to AC/DC Adapter
2	DC	1	DC	Unshielded	1.85	AC/DC Adapter to Laptop
3	USB	1	USB Type-C to Type-A	Shielded	1	Laptop to Debug Board
4	USB	1	USB Type-C	Shielded	1.5	Base Plug to EUT
5	DC	5	DC	Unshielded	1.8	AC/DC Adapter to Base Plug

TEST SETUP-CONDUCTED TEST

The EUT was connected to a Base Plug and powered by the Base Plug. Test software exercised the EUT.

SETUP DIAGRAM



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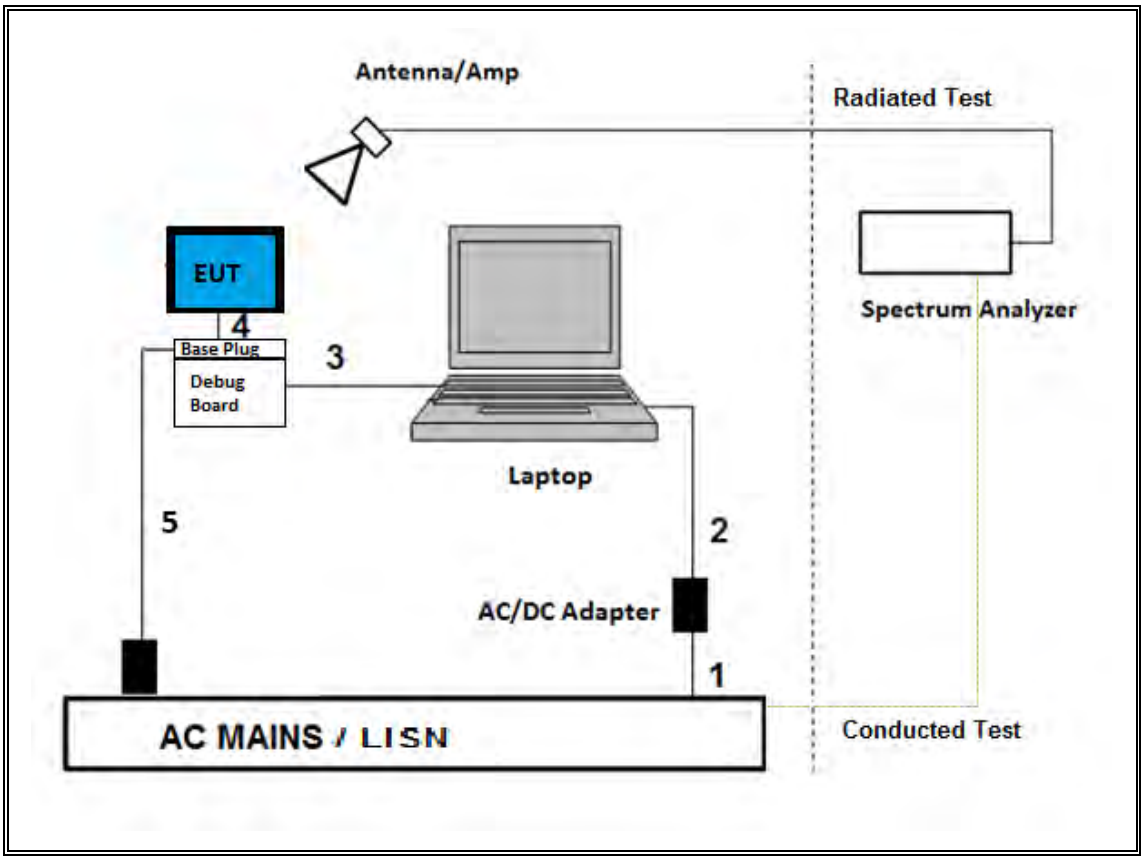
TEST SETUP- AC LINE CONDUCTED TEST AND RADIATED TEST

The EUT was connected to a Base Plug and powered by the Base Plug. Test software exercised the EUT.

SETUP DIAGRAM



6. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v02r01, Section B.

6 dB Emission BW: KDB 789033 D02 v02r01, Section C.2

26 dB Emission BW: KDB 789033 D02 v02r01, Section C.1

99% Occupied BW: KDB 789033 D02 v02r01, Section D.

Conducted Output Power: KDB 789033 D02 v02r01, Section E.3.b (Method PM-G) and KDB 789033 D02 v02r01, Section E.2.b (Method SA-1)

Power Spectral Density: KDB 789033 D02 v02r01, Section F

Unwanted emissions in restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v02r01, Sections G.3, G.4, and G.5.

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

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7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment were utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
6 port rf switch, 1-18GHz	Pasternack	PE7159	171455	08/01/2019	08/01/2018
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1271	07/26/2019	07/26/2018
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1224	10/09/2019	10/09/2018
Antenna, Passive Loop 30Hz – 1MHz	Electro-Metrics	EM-6871	PRE0179465	05/31/2020	05/31/2019
Antenna, Passive Loop 100kHz – 30MHz	Electro-Metrics	EM-6872	PRE0179467	05/31/2020	05/31/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	05/25/2019	05/25/2018
Antenna, Horn 700MHz-18GHz	AH Systems Inc.	SAS-571	PRE0190810	07/10/2019	07/10/2017
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179377	02/15/2020	02/15/2019
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179376	02/14/2020	02/14/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1450	01/24/2020	01/24/2019
Amplifier, 1-18GHz	MITIQ	AFS42-00101800-25-S-42	PRE0181078	08/01/2019	08/01/2018
Amplifier, 9kHz to 1GHz, 32 dB	Sonoma Instrument	310	PRE0186650	12/13/2019	12/13/2018
Hybrid Antenna, 30MHz to 3GHz	SunAR rf motion	JB3	PRE0184052	10/24/2019	10/24/2018
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	PRE0182188	08/29/2019	08/29/2018
Pre-Amp, 18-26.5GHz	AMPLICAL	AMP18G26.5-60	PRE0181238	05/01/2020	05/01/2019
Antenna, Horn 26.5 to 40GHz	A.R.A.	MWH-2640/B	PRE0182201	09/04/2019	09/04/2018
Amplifier, 26 - 40GHz	AMPLICAL	AMP26G40-60	PRE0181239	05/01/2020	05/01/2019
AC Line Conducted					
EMI Receiver	Rohde & Schwarz	ESR	T1436	02/14/2020	02/14/2019
LISN for Conducted Emissions CISPR-16	FCC INC.	FCC LISN 50/250	T1310	06/15/2019	06/15/2018
Test Software List					
Radiated Software	UL	UL EMC		Ver 9.5, June 22, 2018	
Antenna Port Software	UL	UL RF		Ver 9.6, April 18, 2019	
AC Line Conducted Software	UL	UL EMC		Ver 9.5, May 26, 2015	

NOTES:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a 1TX	1.360	1.560	0.872	87.18%	0.60	0.735
802.11n HT20 1TX	1.270	1.470	0.864	86.39%	0.64	0.787
802.11n HT40 1TX	0.636	0.836	0.761	76.06%	1.19	1.573

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DUTY CYCLE PLOTS

DUTY CYCLE 802.11a 1TX MODE

DUTY CYCLE 802.11n HT20 1TX MODE

DUTY CYCLE 802.11nHT40 1TX MODE

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8.2. 26 dB BANDWIDTH

LIMITS

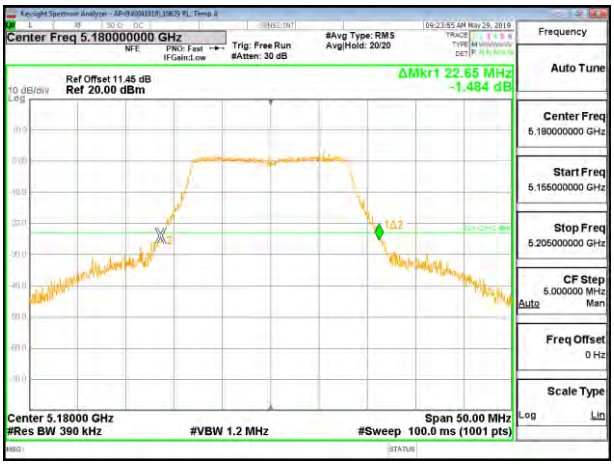
None; for reporting purposes only.

RESULTS

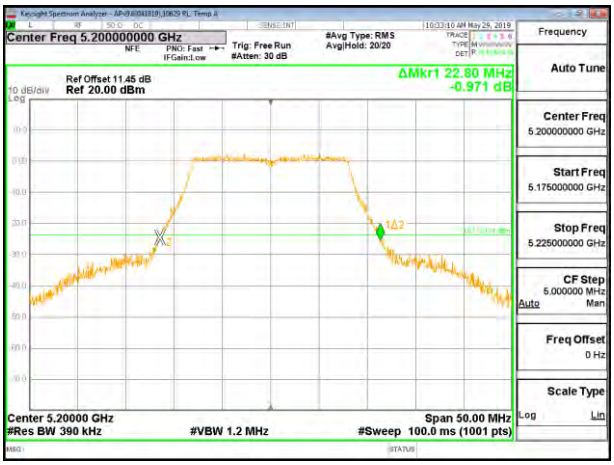
8.2.1. 802.11a MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

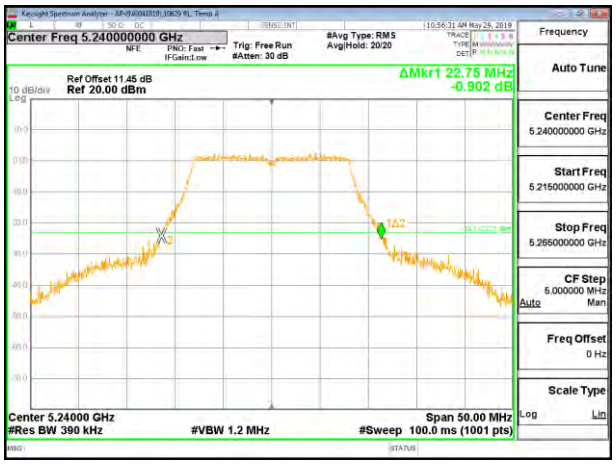
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.65
Mid	5200	22.80
High	5240	22.75



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	22.95
Mid	5200	22.95
High	5240	22.85

LOW CHANNEL

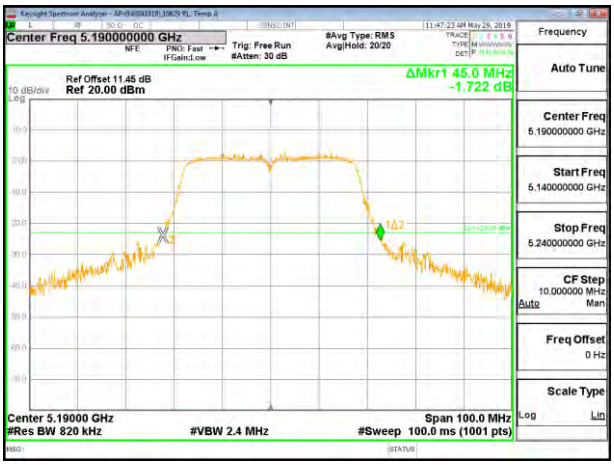
MID CHANNEL

HIGH CHANNEL

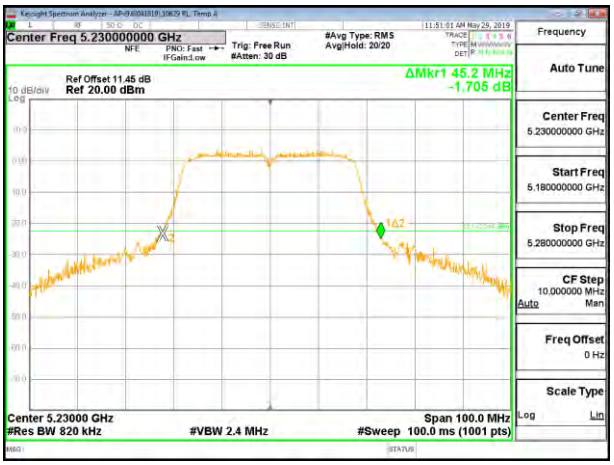
8.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	45.00
High	5230	45.20



LOW CHANNEL



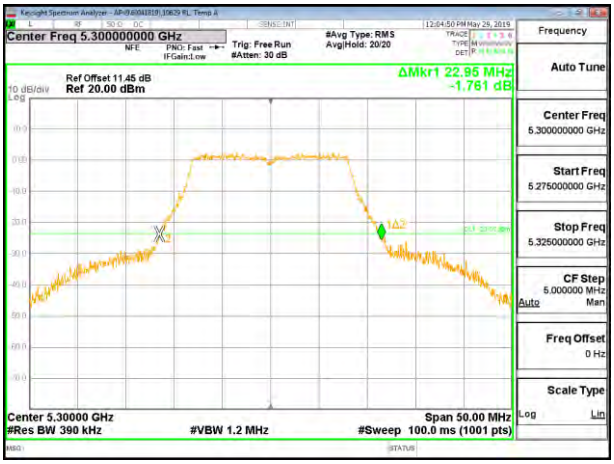
HIGH CHANNEL

8.2.4. 802.11a MODE IN THE 5.3 GHz BAND

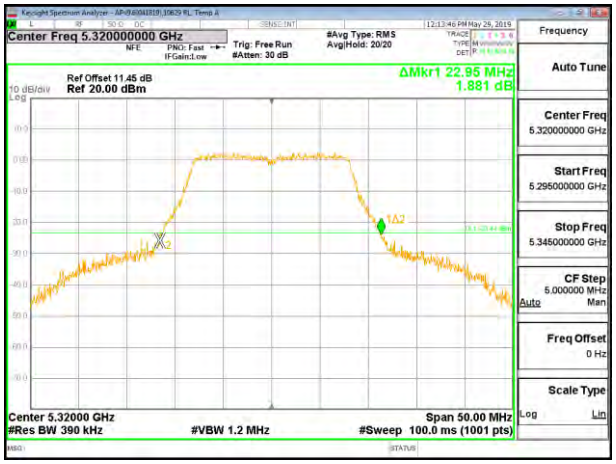
1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.70
Mid	5300	22.95
High	5320	22.95

LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.2.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	22.95
Mid	5300	22.85
High	5320	22.90

LOW CHANNEL

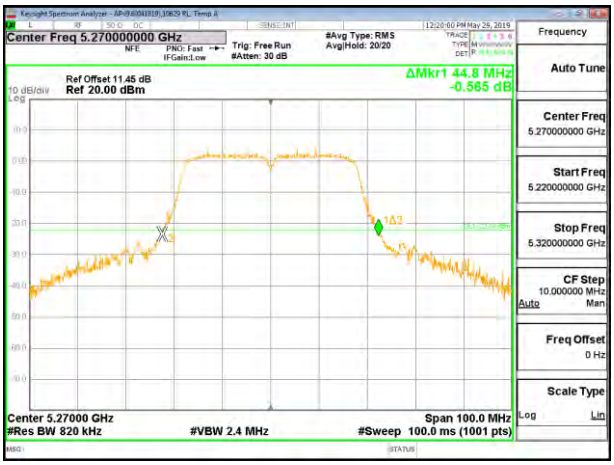
MID CHANNEL

HIGH CHANNEL

8.2.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	44.80
High	5310	44.10



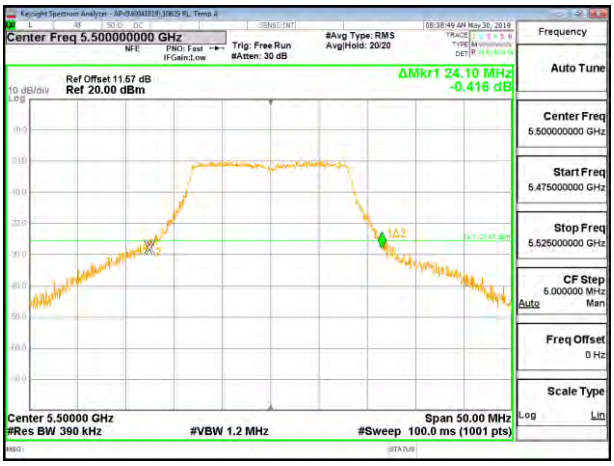
LOW CHANNEL

HIGH CHANNEL

8.2.7. 802.11a MODE IN THE 5.6 GHz BAND

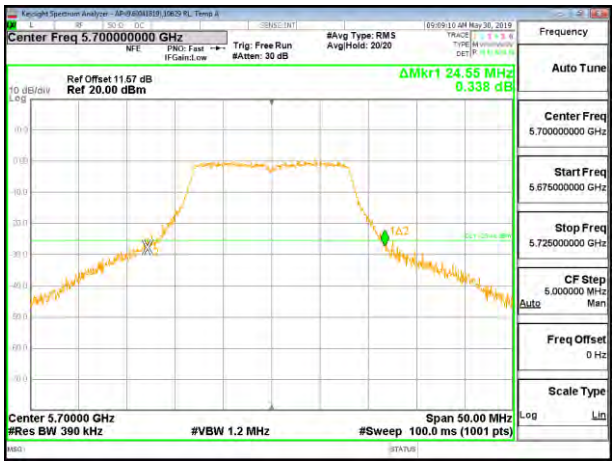
1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	24.10
Mid	5580	24.35
High	5700	24.55



LOW CHANNEL

MID CHANNEL



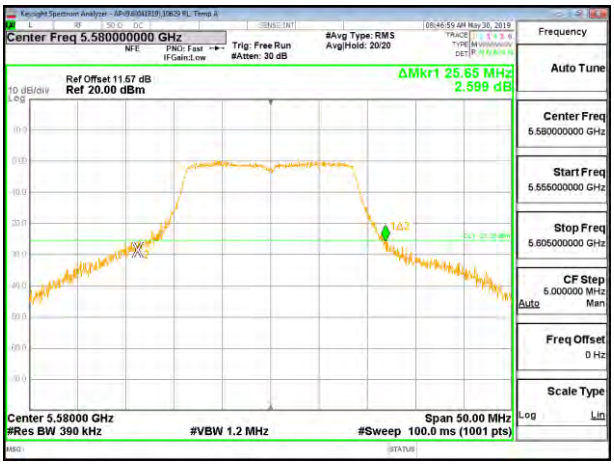
HIGH CHANNEL

8.2.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	25.05
Mid	5580	25.65
High	5700	25.10

LOW CHANNEL



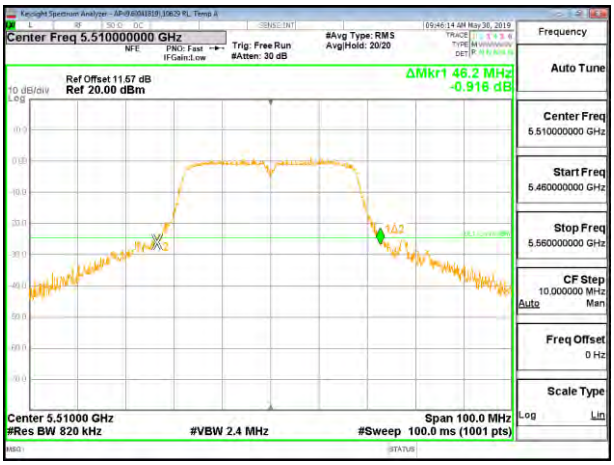
MID CHANNEL

HIGH CHANNEL

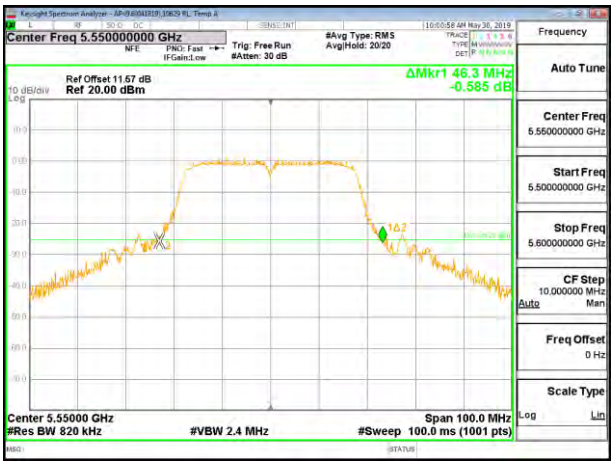
8.2.9. 802.11n HT40 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	46.20
Mid	5550	46.30
High	5670	46.40



LOW CHANNEL



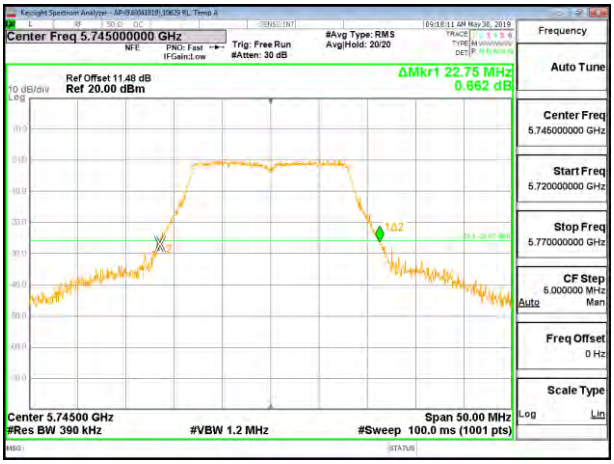
MID CHANNEL

HIGH CHANNEL

8.2.10. 802.11a MODE IN THE 5.8 GHz BAND

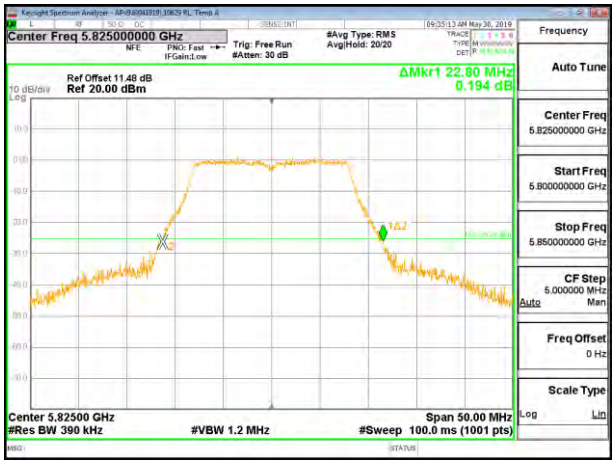
1TX Antenna 1 MODE

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	22.75
Mid	5785	22.80
High	5825	22.80



LOW CHANNEL

MID CHANNEL

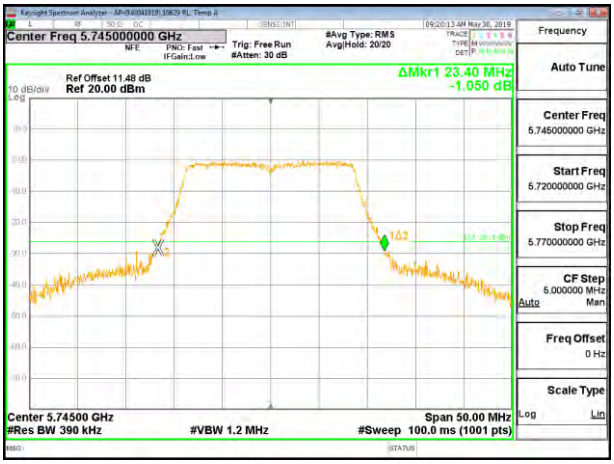


HIGH CHANNEL

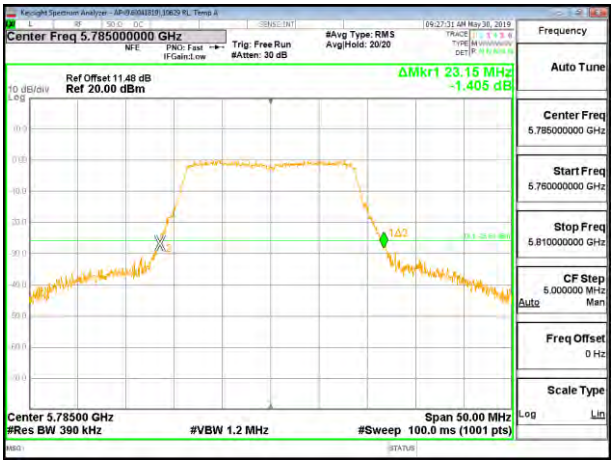
8.2.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

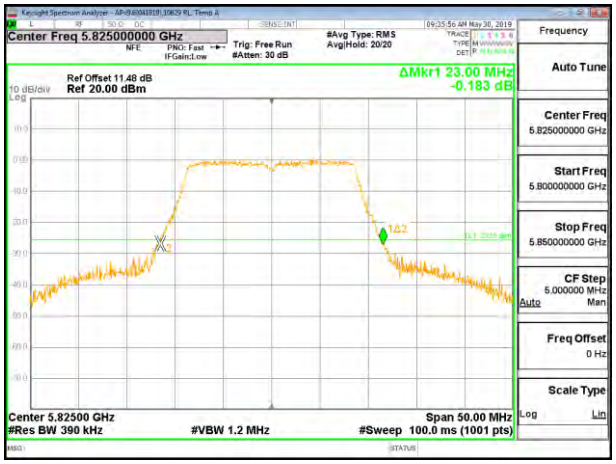
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	23.40
Mid	5785	23.15
High	5825	23.00



LOW CHANNEL



MID CHANNEL

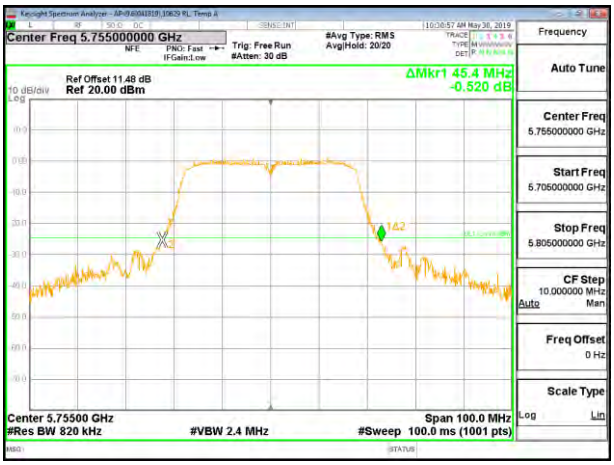


HIGH CHANNEL

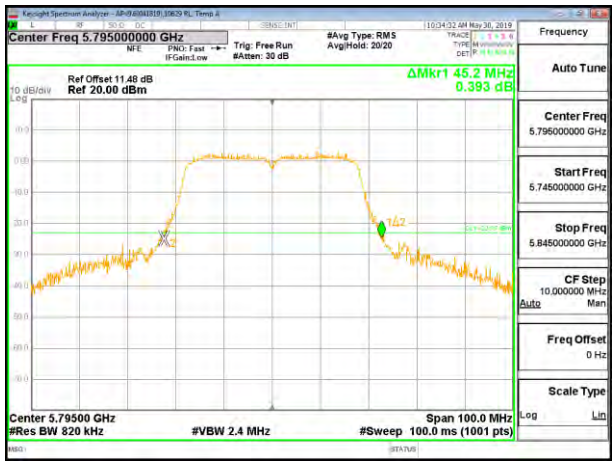
8.2.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	45.40
High	5795	45.20



LOW CHANNEL



HIGH CHANNEL

8.3. 99% BANDWIDTH

LIMITS

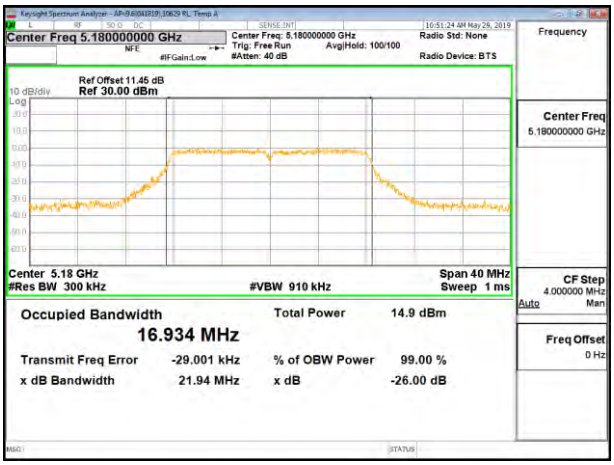
None; for reporting purposes only.

RESULTS

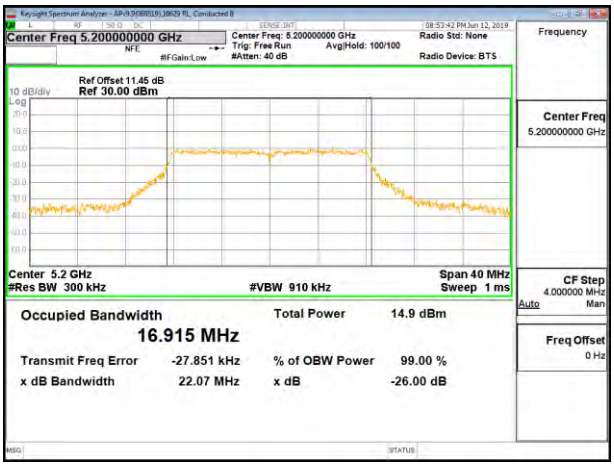
8.3.1. 802.11a MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

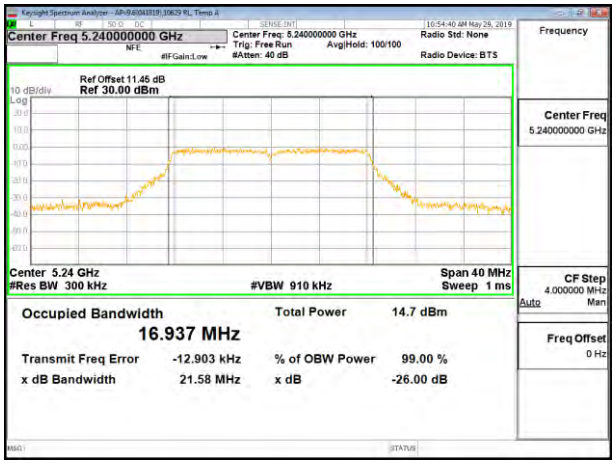
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.9340
Mid	5200	16.9150
High	5240	16.9370



LOW CHANNEL



MID CHANNEL

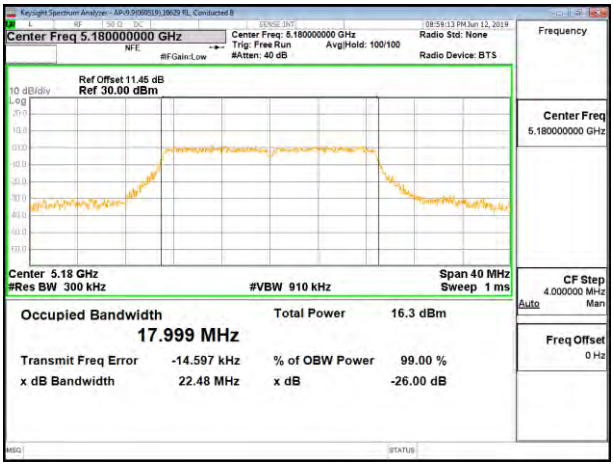


HIGH CHANNEL

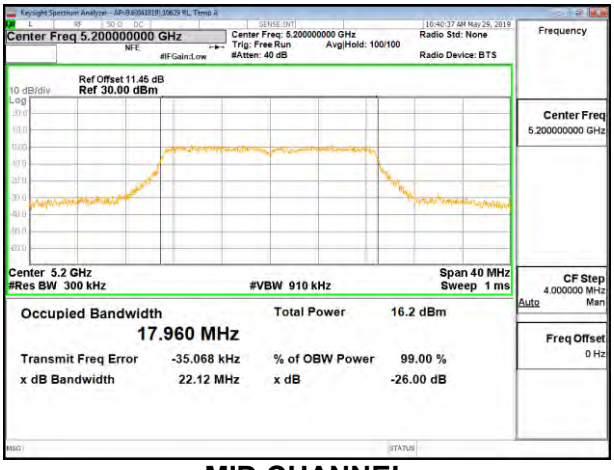
8.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

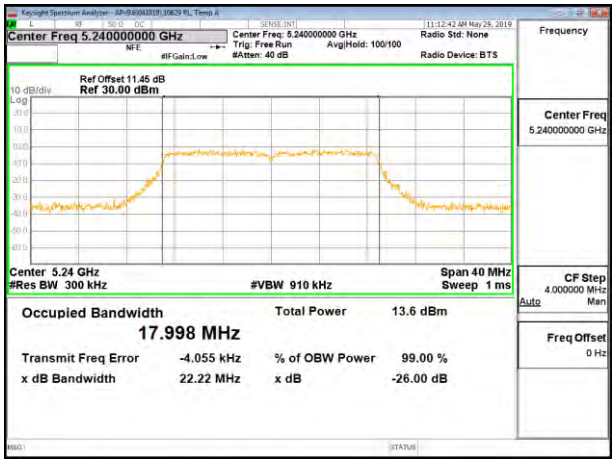
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.9990
Mid	5200	17.9600
High	5240	17.9980



LOW CHANNEL



MID CHANNEL

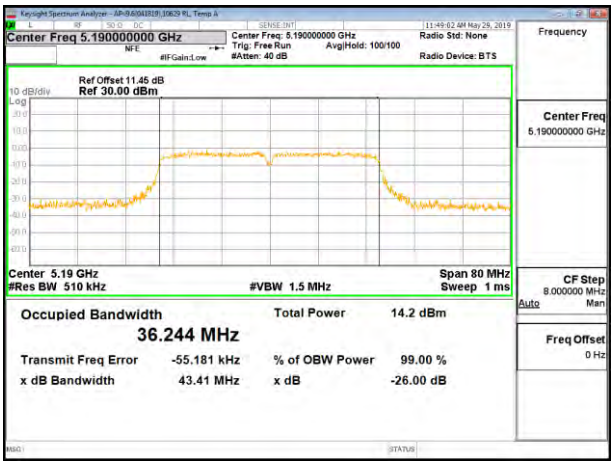


HIGH CHANNEL

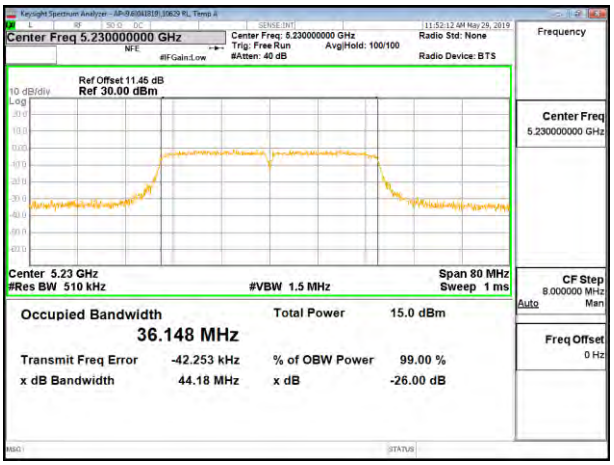
8.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.2440
High	5230	36.1480



LOW CHANNEL

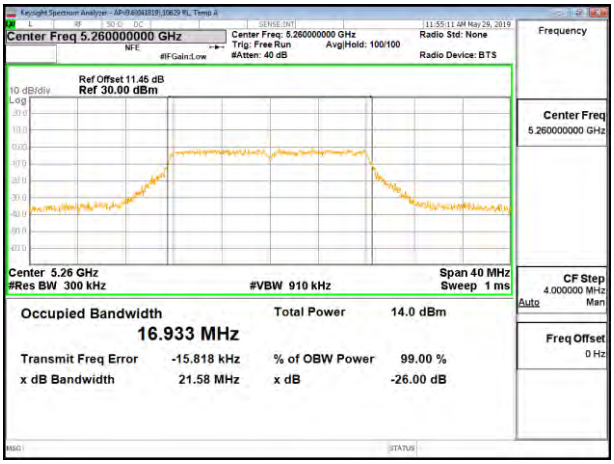


HIGH CHANNEL

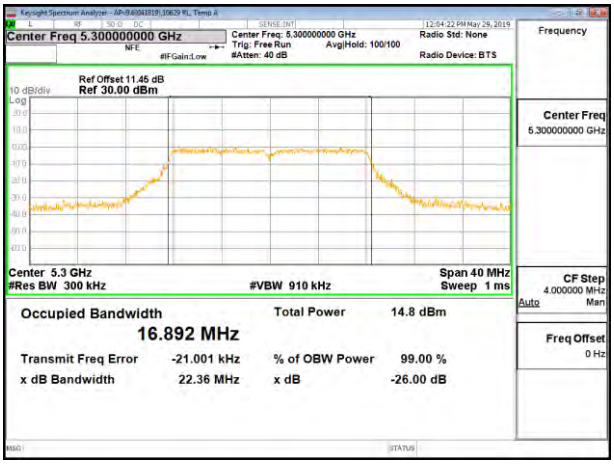
8.3.4. 802.11a MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

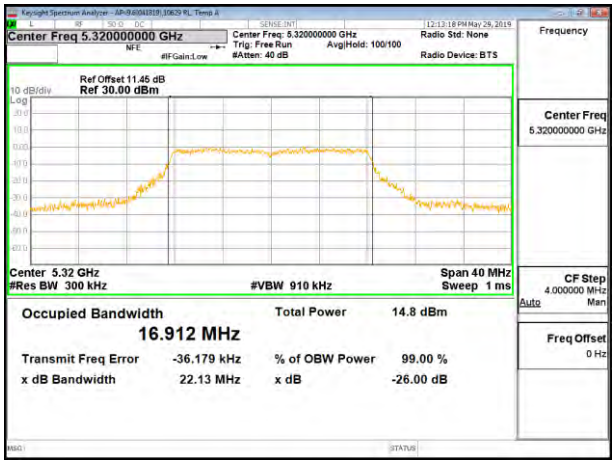
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.9330
Mid	5300	16.8920
High	5320	16.9120



LOW CHANNEL



MID CHANNEL

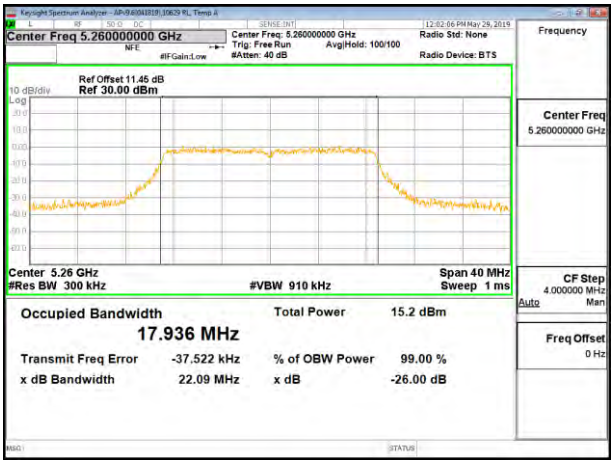


HIGH CHANNEL

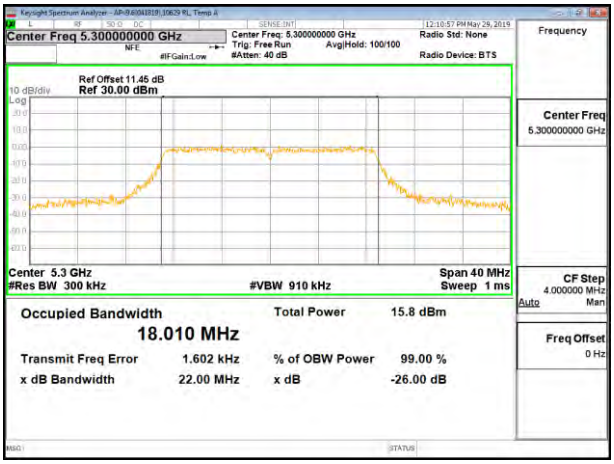
8.3.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

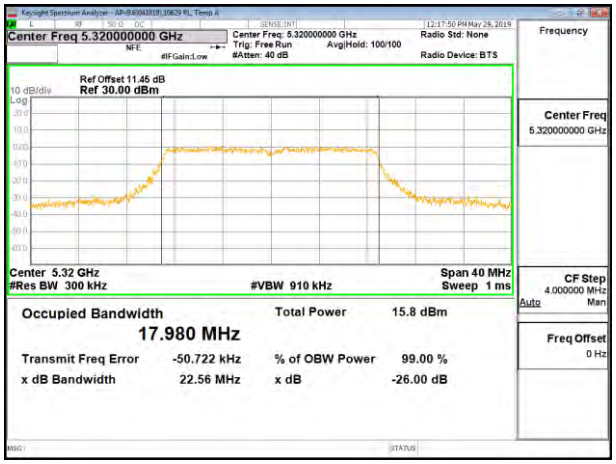
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.9360
Mid	5300	18.0100
High	5320	17.9800



LOW CHANNEL



MID CHANNEL

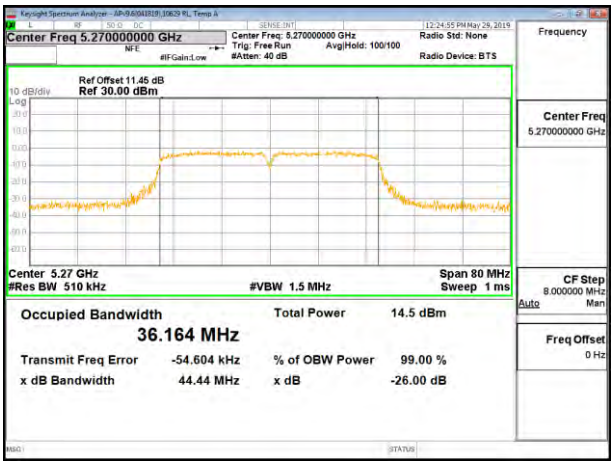


HIGH CHANNEL

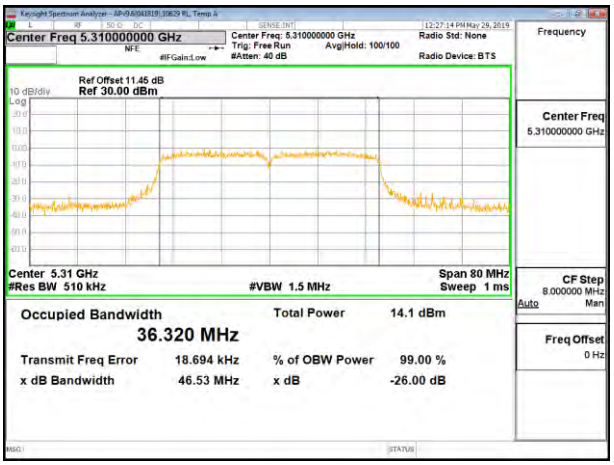
8.3.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.1640
High	5310	36.3200



LOW CHANNEL

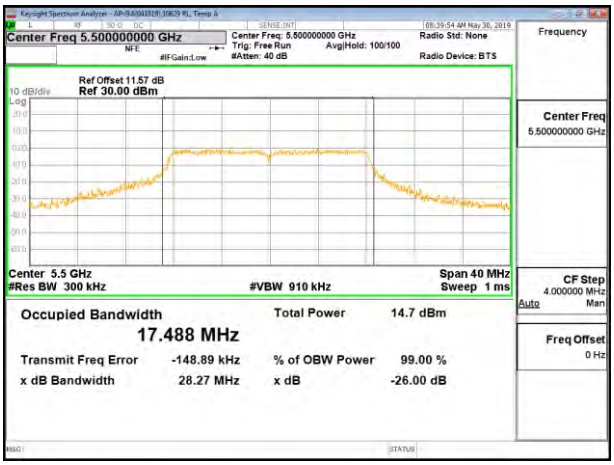


HIGH CHANNEL

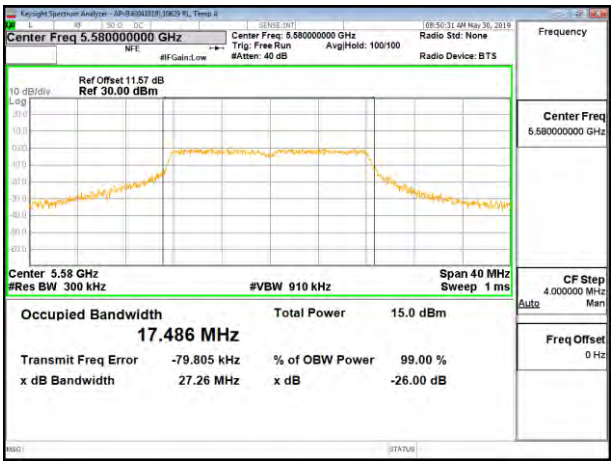
8.3.7. 802.11a MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE

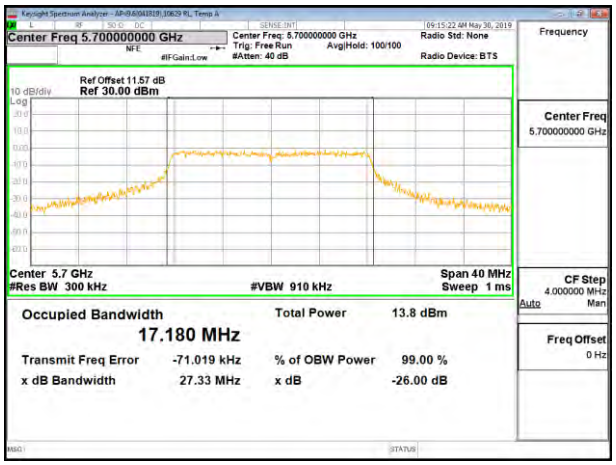
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.4880
Mid	5580	17.4860
High	5700	17.1800



LOW CHANNEL



MID CHANNEL

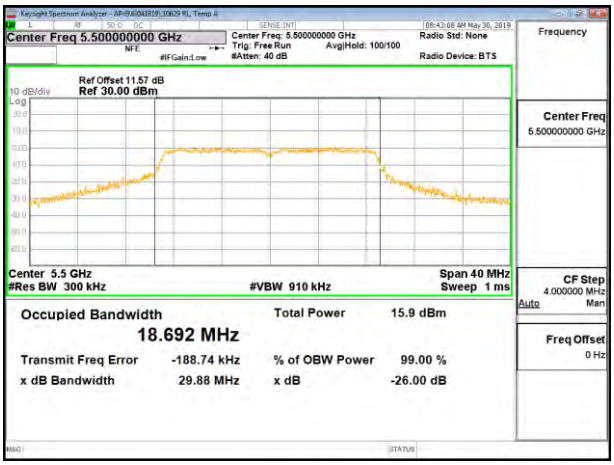


HIGH CHANNEL

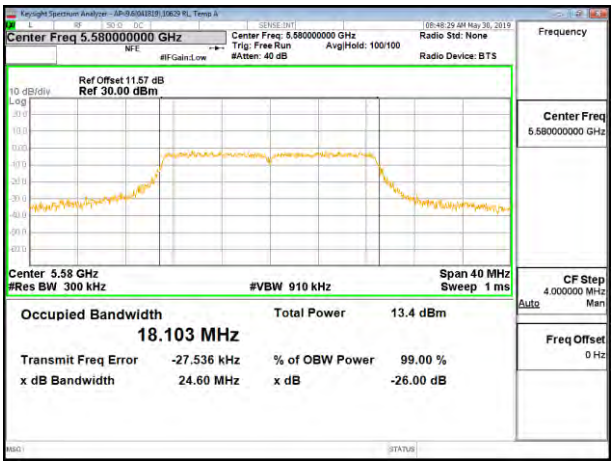
8.3.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE

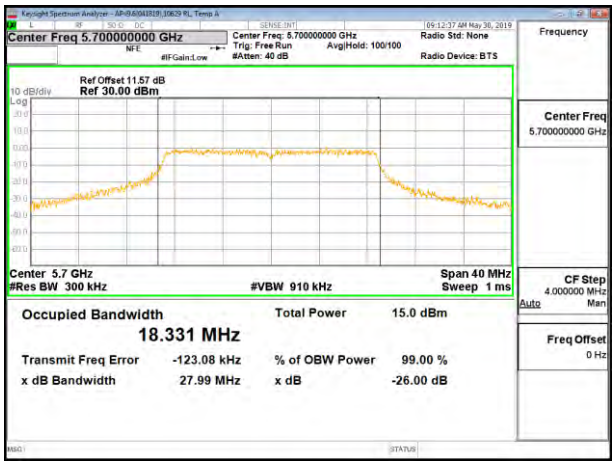
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	18.6920
Mid	5580	18.1030
High	5700	18.3310



LOW CHANNEL



MID CHANNEL

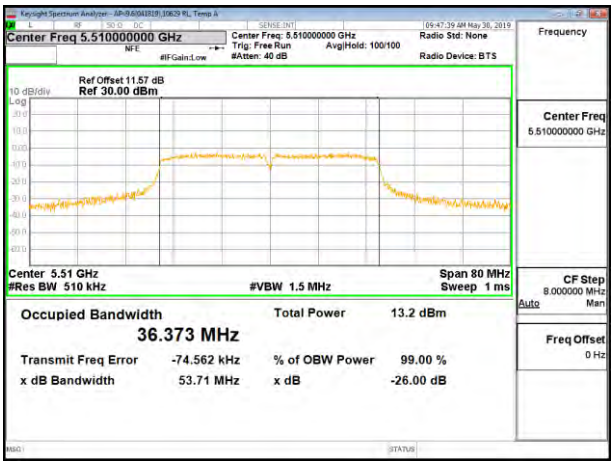


HIGH CHANNEL

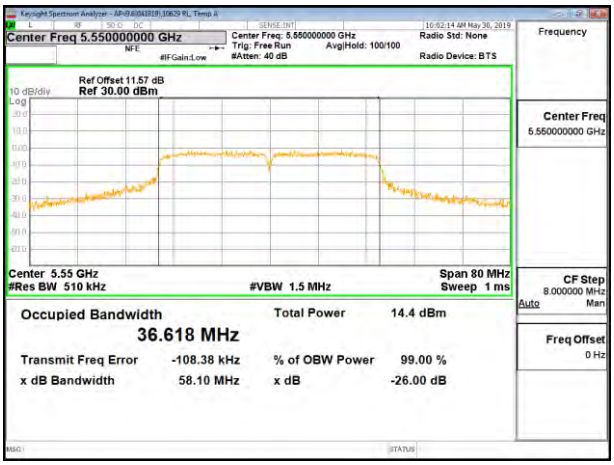
8.3.9. 802.11n HT40 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE

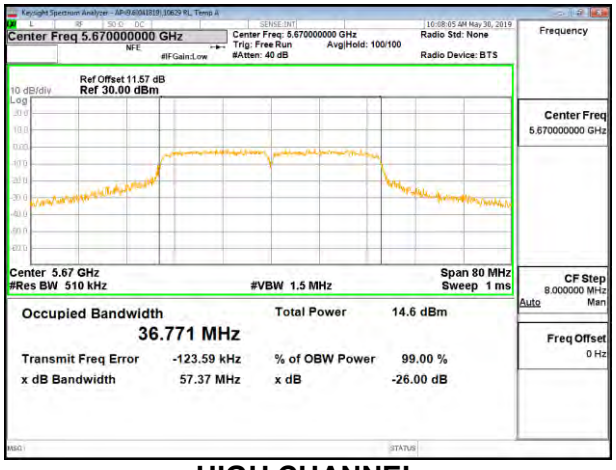
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.3730
Mid	5550	36.6180
High	5670	36.7710



LOW CHANNEL



MID CHANNEL

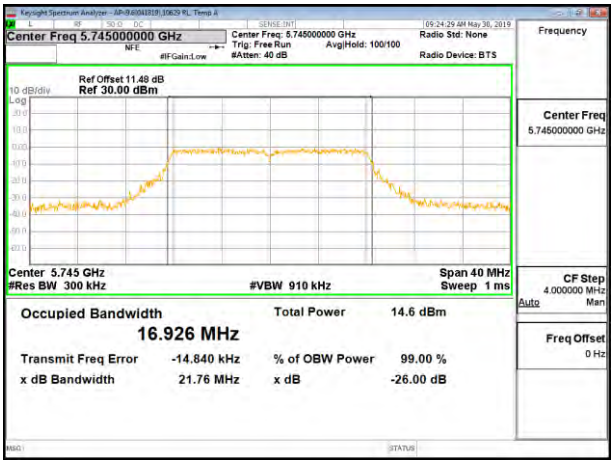


HIGH CHANNEL

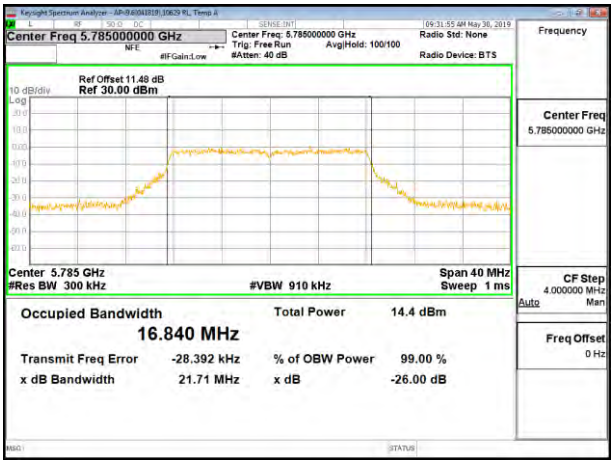
8.3.10. 802.11a MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

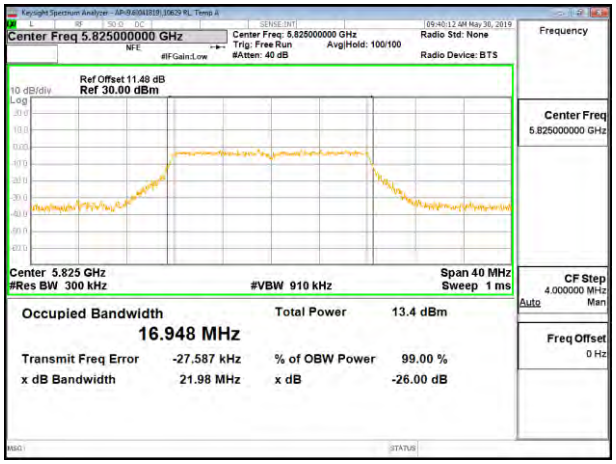
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.9260
Mid	5785	16.8400
High	5825	16.9480



LOW CHANNEL



MID CHANNEL

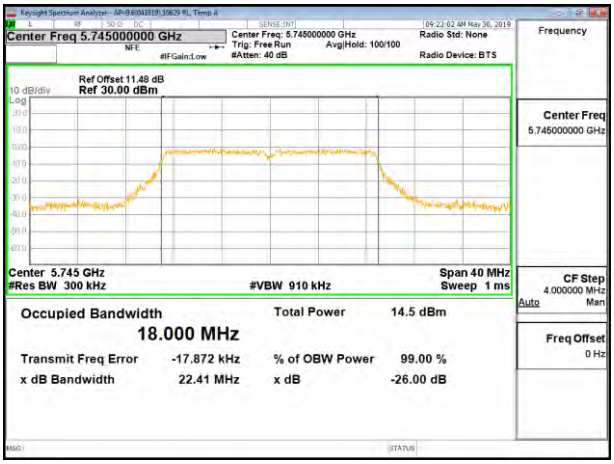


HIGH CHANNEL

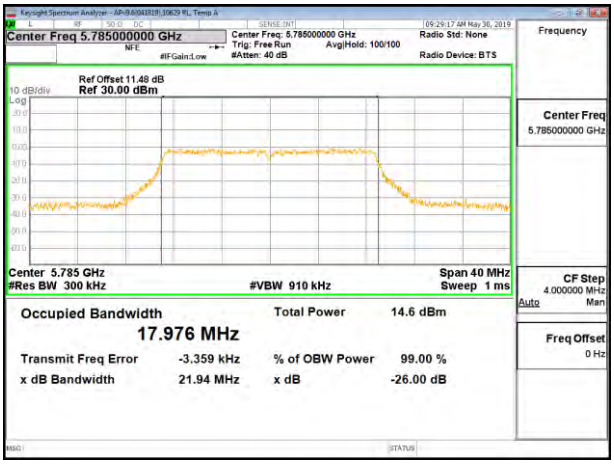
8.3.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

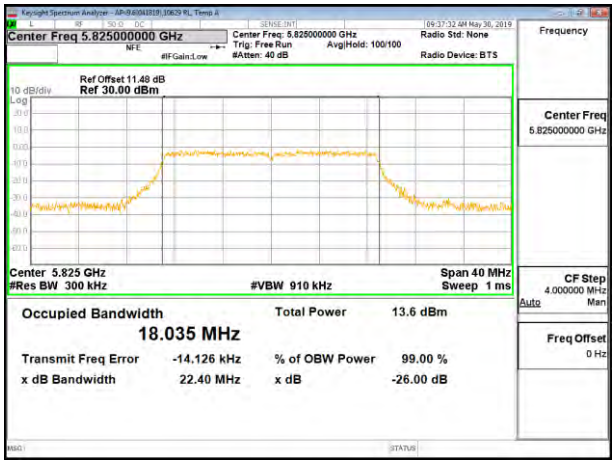
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	18.0000
Mid	5785	17.9760
High	5825	18.0350



LOW CHANNEL



MID CHANNEL

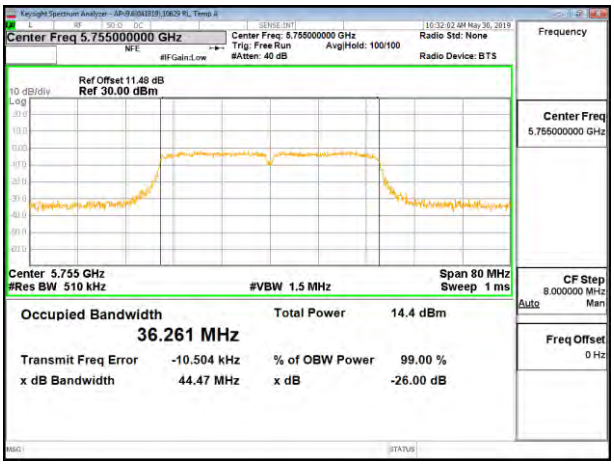


HIGH CHANNEL

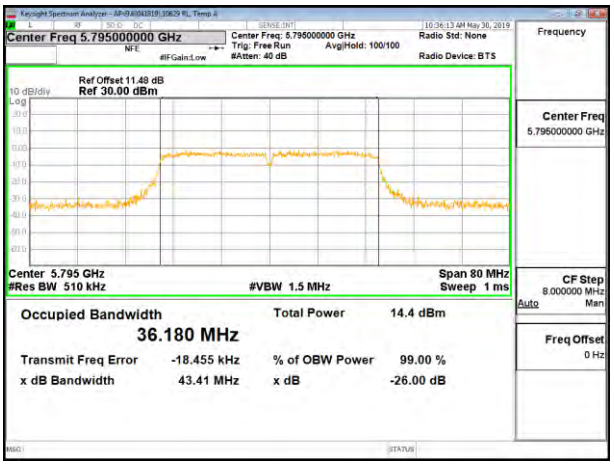
8.3.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.2610
High	5795	36.1800



LOW CHANNEL



HIGH CHANNEL

8.4. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

RSS-247 6.2.4.1

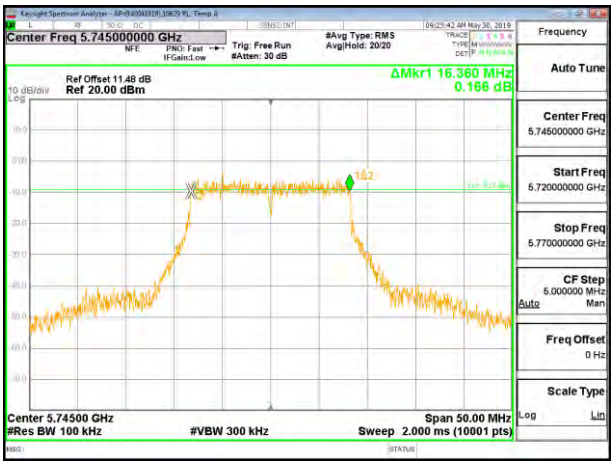
The minimum 6 dB bandwidth shall be at least 500 kHz.

RESULTS

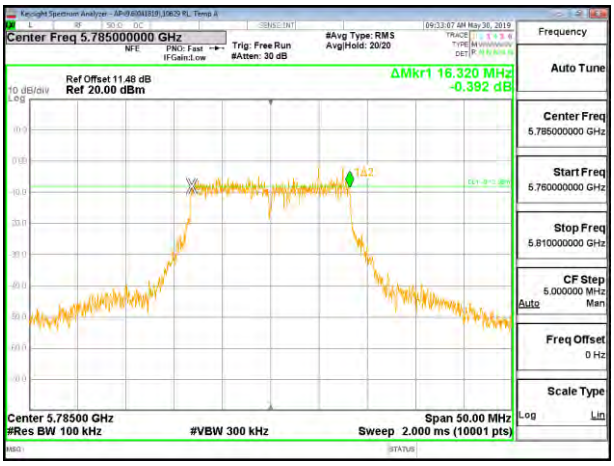
8.4.1. 802.11a MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

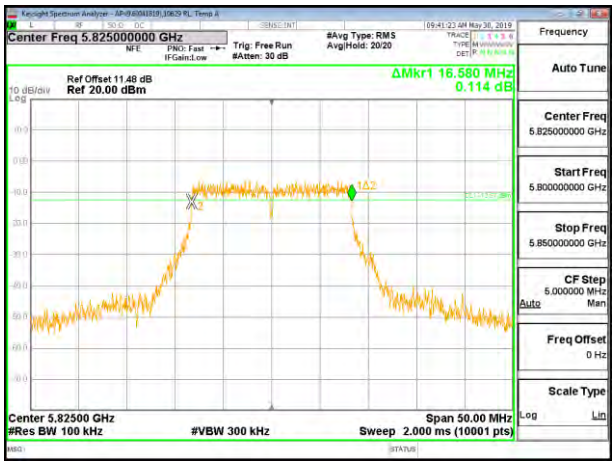
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.3600	0.5
Mid	5785	16.3200	0.5
High	5825	16.5800	0.5



LOW CHANNEL



MID CHANNEL

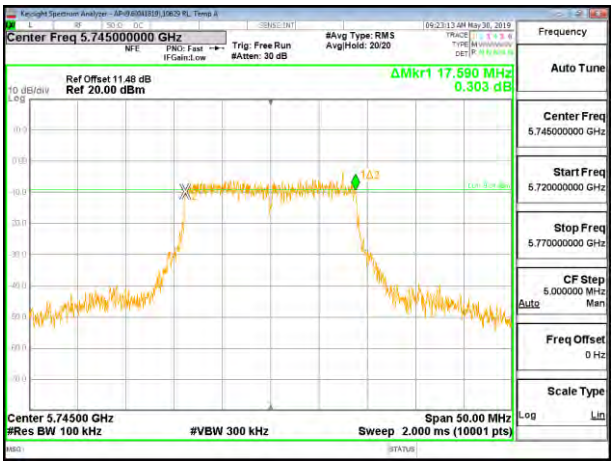


HIGH CHANNEL

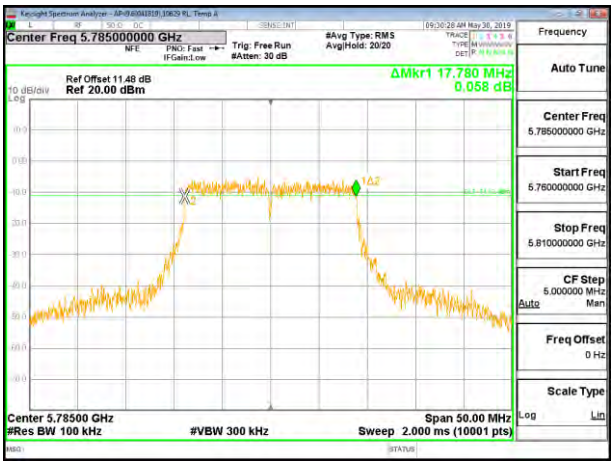
8.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

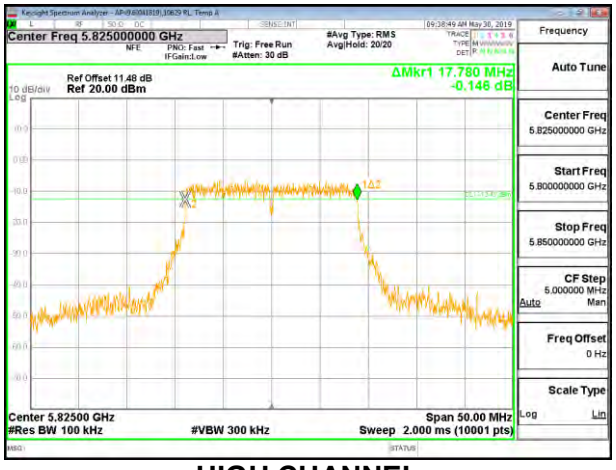
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.5900	0.5
Mid	5785	17.7800	0.5
High	5825	17.7800	0.5



LOW CHANNEL



MID CHANNEL

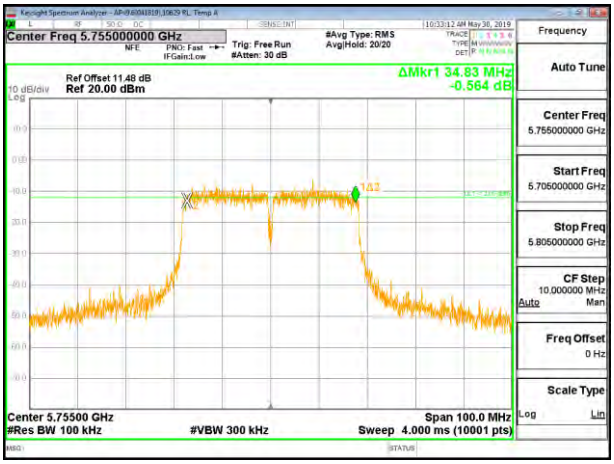


HIGH CHANNEL

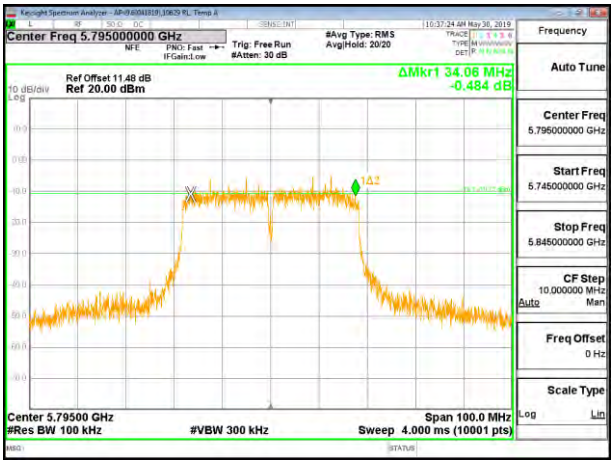
8.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	34.8300	0.5
High	5795	34.0600	0.5



LOW CHANNEL



HIGH CHANNEL

8.5. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz (pick the section that applies to your product)

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Bands 5.25-5.35 GHz and 5.47-5.725 GHz
The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Band 5.725-5.85 GHz

The maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

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Band 5.15-5.25 GHz
The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log10B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

Band 5.25-5.35 GHz
The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Bands 5.47-5.6 GHz and 5.65-5.725 GHz
The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Band 5.725-5.85 GHz
The maximum conducted output power shall not exceed 1 W. The power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G) and for straddles channels KDB 789033 D02 v02r01, Section E.2.b (Method SA-1) was used.

The measurement method used for power spectral density is KDB 789033 D02 v02r01, Section F

DIRECTIONAL ANTENNA GAIN

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

RESULTS

8.5.1. 802.11a MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE (FCC+IC) MOBILE

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	16.934	1.51
Mid	5200	16.915	1.51
High	5240	16.937	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED EIRP Limit (dBm)	Max ISED Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)	ISED eirp PSD Limit (dBm/1MHz)	PSD Limit (dBm/1MHz)
Low	5180	24.00	22.29	20.78	20.78	11.00	10.00	8.49
Mid	5200	24.00	22.28	20.77	20.77	11.00	10.00	8.49
High	5240	24.00	22.29	20.78	20.78	11.00	10.00	8.49

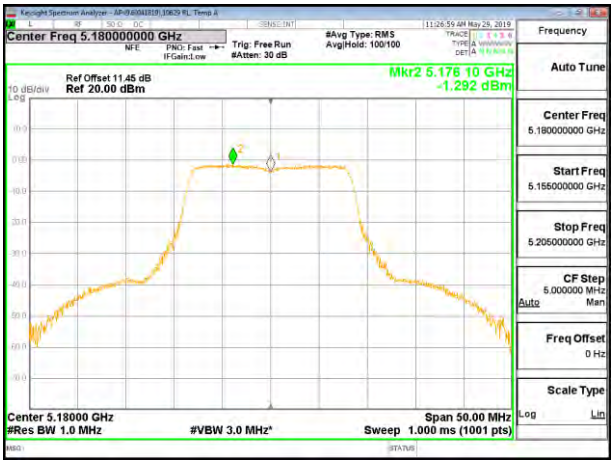
Duty Cycle CF (dB)	0.60	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	10.81	10.81	20.78	-9.97
Mid	5200	10.83	10.83	20.77	-9.94
High	5240	10.88	10.88	20.78	-9.90

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5180	-1.292	-0.69	8.49	-9.18
Mid	5200	-1.930	-1.33	8.49	-9.82
High	5240	-1.845	-1.25	8.49	-9.74



LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

8.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE (FCC+IC) MOBILE

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	17.999	1.51
Mid	5200	17.960	1.51
High	5240	17.998	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED EIRP Limit (dBm)	Max ISED Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)	ISED eirp PSD Limit (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)
Low	5180	24.00	22.55	21.04	21.04	11.00	10.00	8.49
Mid	5200	24.00	22.54	21.03	21.03	11.00	10.00	8.49
High	5240	24.00	22.55	21.04	21.04	11.00	10.00	8.49

Duty Cycle CF (dB)	0.64	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	11.94	11.94	21.04	-9.10
Mid	5200	12.08	12.08	21.03	-8.95
High	5240	12.09	12.09	21.04	-8.95

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	-0.642	0.00	8.49	-8.49
Mid	5200	-0.601	0.04	8.49	-8.45
High	5240	-3.234	-2.59	8.49	-11.08

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

8.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE (FCC+IC) MOBILE

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	36.244	1.51
High	5230	36.148	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED EIRP Limit (dBm)	Max ISED Power (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)	ISED eirp PSD Limit (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)
Low	5190	24.00	23.00	21.49	21.49	11.00	10.00	8.49
High	5230	24.00	23.00	21.49	21.49	11.00	10.00	8.49

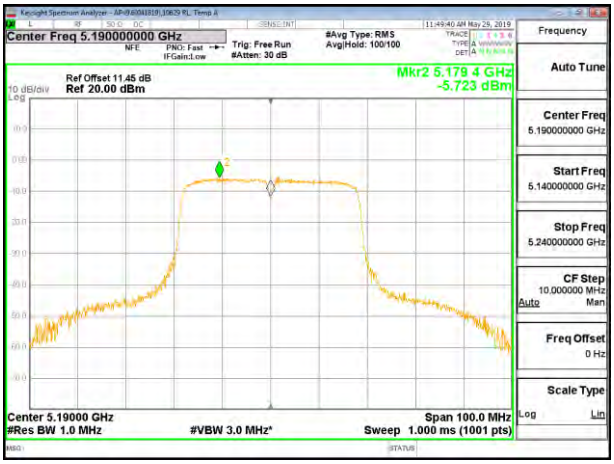
Duty Cycle CF (dB)	1.19	Included in Calculations of Corr'd Power & PSD

Output Power Results

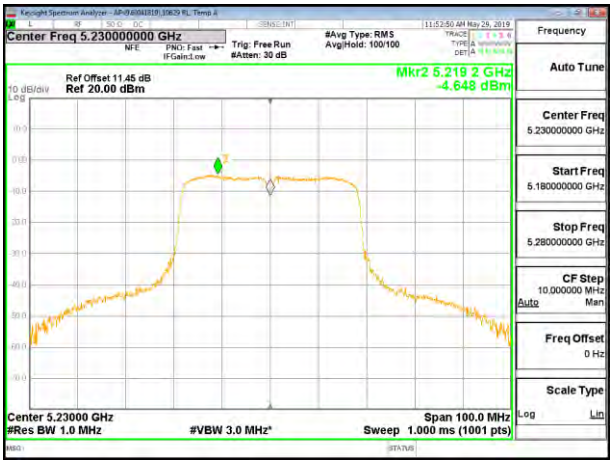
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.02	10.02	21.49	-11.47
High	5230	11.12	11.12	21.49	-10.37

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5190	-5.723	-4.53	8.49	-13.02
High	5230	-4.648	-3.46	8.49	-11.95



LOW CHANNEL



HIGH CHANNEL

8.5.4. 802.11a MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE (FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	22.70	1.51	24.00	11.00
Mid	5300	22.95	1.51	24.00	11.00
High	5320	22.95	1.51	24.00	11.00

Duty Cycle CF (dB)	0.60	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	11.01	11.01	24.00	-12.99
Mid	5300	11.13	11.13	24.00	-12.87
High	5320	11.22	11.22	24.00	-12.78

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	-2.089	-1.49	11.00	-12.49
Mid	5300	-1.972	-1.37	11.00	-12.37
High	5320	-1.642	-1.04	11.00	-12.04

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

1TX Antenna 1 MODE (IC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	16.933	1.51	23.29	11.00
Mid	5300	16.892	1.51	23.28	11.00
High	5320	16.912	1.51	23.28	11.00

Duty Cycle CF (dB)	0.60	Included in Calculations of Corr'd PSD

Output Power Results

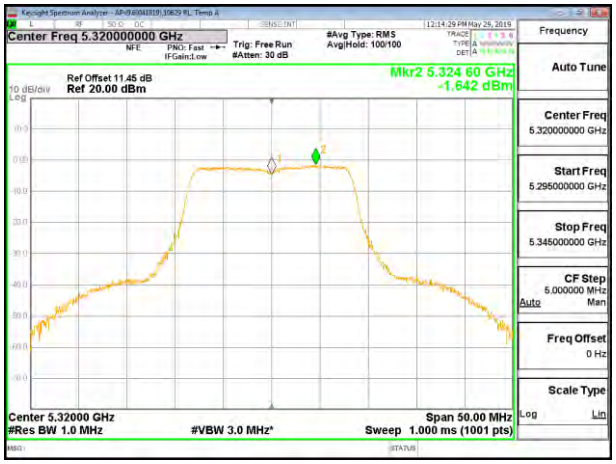
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	11.01	11.01	23.29	-12.28
Mid	5300	11.13	11.13	23.28	-12.15
High	5320	11.22	11.22	23.28	-12.06

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	-2.089	-1.49	11.00	-12.49
Mid	5300	-1.972	-1.37	11.00	-12.37
High	5320	-1.642	-1.04	11.00	-12.04

LOW CHANNEL

MID CHANNEL



HIGH CHANNEL

8.5.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE (FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	22.95	1.51	24.00	11.00
Mid	5300	22.85	1.51	24.00	11.00
High	5320	22.90	1.51	24.00	11.00

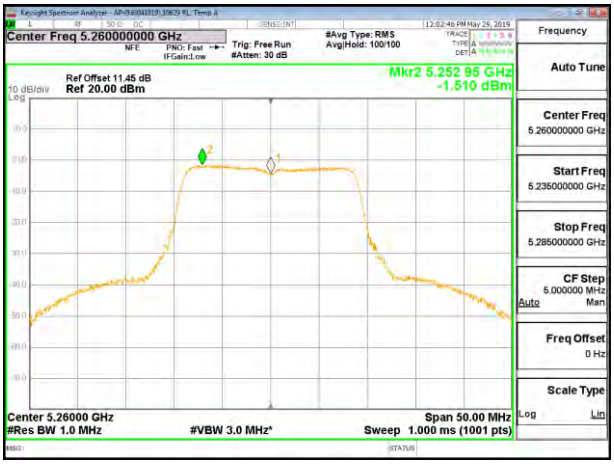
Duty Cycle CF (dB)	0.64	Included in Calculations of Corr'd PSD

Output Power Results

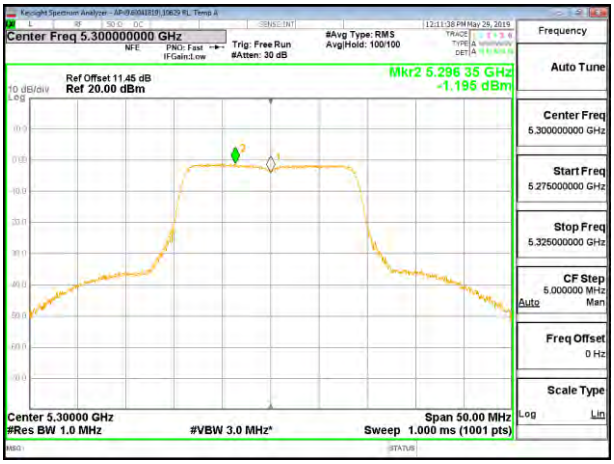
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	12.08	12.08	24.00	-11.92
Mid	5300	12.16	12.16	24.00	-11.84
High	5320	12.19	12.19	24.00	-11.81

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	-1.510	-0.87	11.00	-11.87
Mid	5300	-1.195	-0.56	11.00	-11.56
High	5320	-1.156	-0.52	11.00	-11.52



LOW CHANNEL



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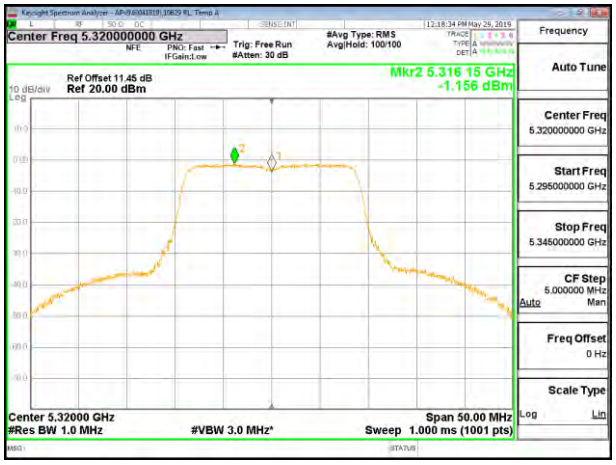


HIGH CHANNEL

1TX Antenna 1 MODE (IC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	17.936	1.51	23.54	11.00
Mid	5300	18.010	1.51	23.56	11.00
High	5320	17.980	1.51	23.55	11.00

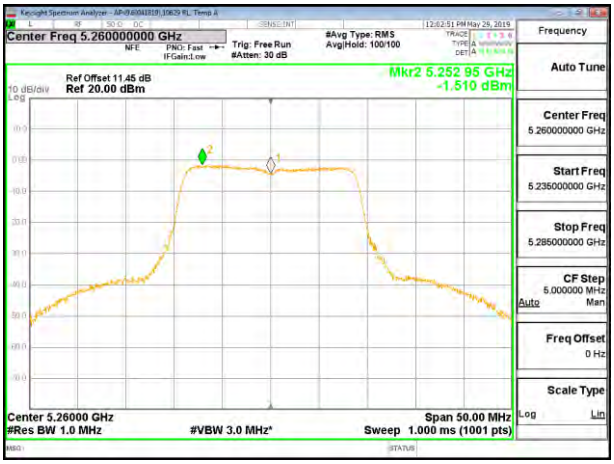
Duty Cycle CF (dB)	0.64	Included in Calculations of Corr'd PSD

Output Power Results

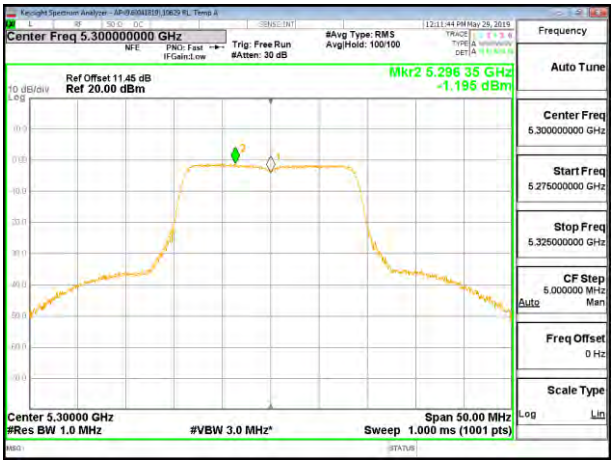
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	12.08	12.08	23.54	-11.46
Mid	5300	12.16	12.16	23.56	-11.40
High	5320	12.19	12.19	23.55	-11.36

PSD Results

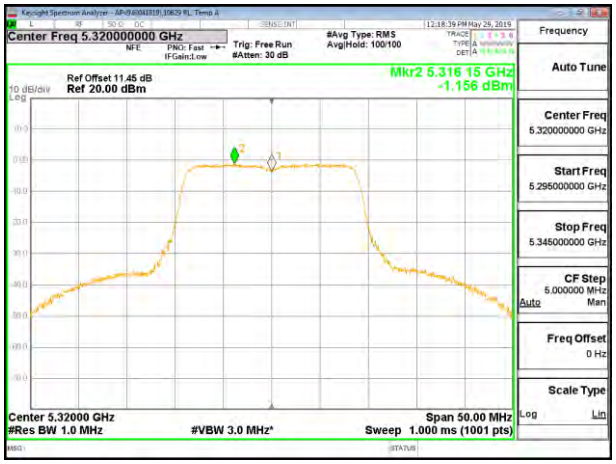
Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	-1.510	-0.87	11.00	-11.87
Mid	5300	-1.195	-0.56	11.00	-11.56
High	5320	-1.156	-0.52	11.00	-11.52



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE (FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5270	44.80	1.51	24.00	11.00
High	5310	44.10	1.51	24.00	11.00

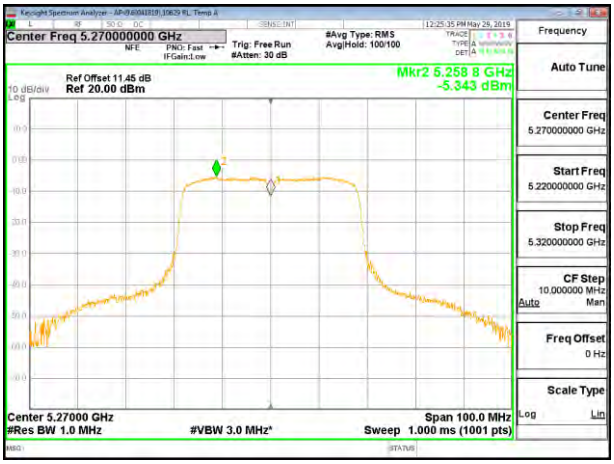
Duty Cycle CF (dB)	1.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	11.32	11.32	24.00	-12.68
High	5310	10.22	10.22	24.00	-13.78

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5270	-5.343	-4.15	11.00	-15.15
High	5310	-6.186	-5.00	11.00	-16.00



LOW CHANNEL

HIGH CHANNEL

1TX Antenna 1 MODE (IC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5270	36.164	1.51	24.00	11.00
High	5310	36.320	1.51	24.00	11.00

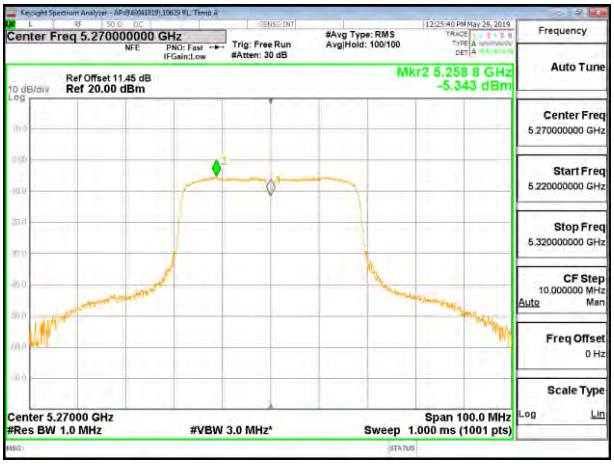
Duty Cycle CF (dB)	1.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	11.32	11.32	24.00	-12.68
High	5310	10.22	10.22	24.00	-13.78

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5270	-5.343	-4.15	11.00	-15.15
High	5310	-6.186	-5.00	11.00	-16.00



LOW CHANNEL

HIGH CHANNEL

8.5.7. 802.11a MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	24.10	17.4880	1.51
Mid	5580	24.35	17.4860	1.51
High	5700	24.55	17.1800	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)	ISED PSD Limit (dBm/1MHz)	PSD Limit (dBm/1MHz)
Low	5500	24.00	23.43	29.43	23.43	11.00	11.00	11.00
Mid	5580	24.00	23.43	29.43	23.43	11.00	11.00	11.00
High	5700	24.00	23.35	29.35	23.35	11.00	11.00	11.00

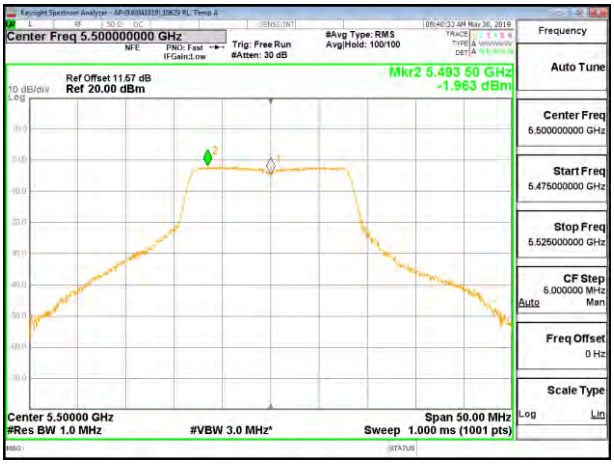
Duty Cycle CF (dB)	0.60	Included in Calculations of Corr'd PSD

Output Power Results

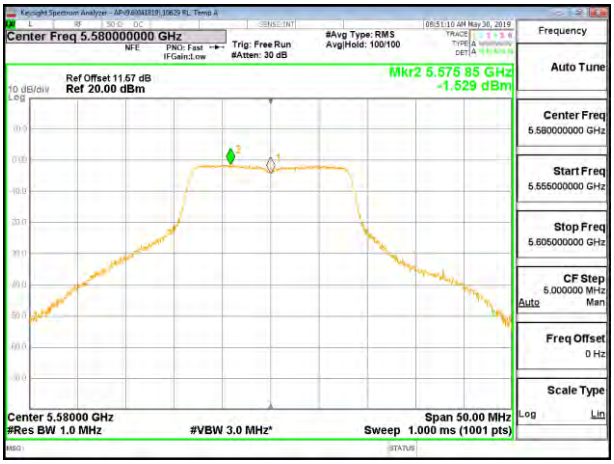
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	10.32	10.32	23.43	-13.11
Mid	5580	10.01	10.01	23.43	-13.42
High	5700	8.92	8.92	23.35	-14.43

PSD Results

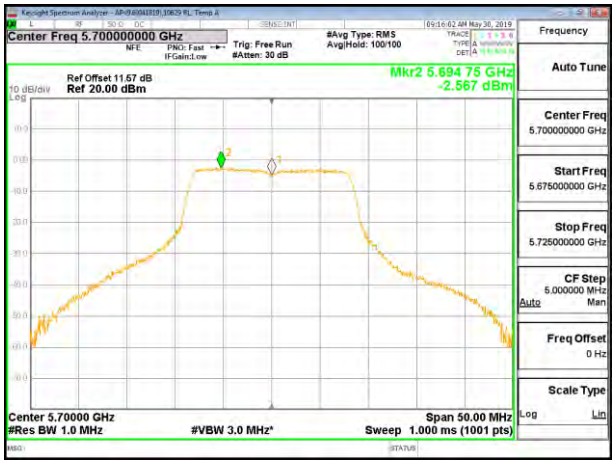
Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	-1.963	-1.363	11.00	-12.36
Mid	5580	-1.529	-0.929	11.00	-11.93
High	5700	-2.567	-1.967	11.00	-12.97



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	25.05	18.6920	1.51
Mid	5580	25.65	18.1030	1.51
High	5700	25.10	18.3310	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)	ISED PSD Limit (dBm/1MHz)	PSD Limit (dBm/1MHz)
Low	5500	24.00	23.72	29.72	23.72	11.00	11.00	11.00
Mid	5580	24.00	23.58	29.58	23.58	11.00	11.00	11.00
High	5700	24.00	23.63	29.63	23.63	11.00	11.00	11.00

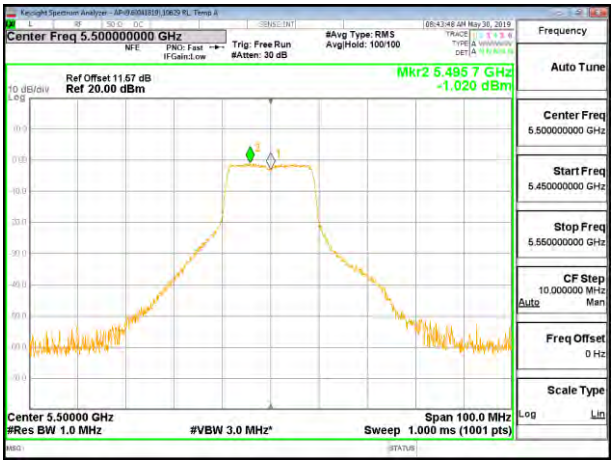
Duty Cycle CF (dB)	0.64	Included in Calculations of Corr'd PSD

Output Power Results

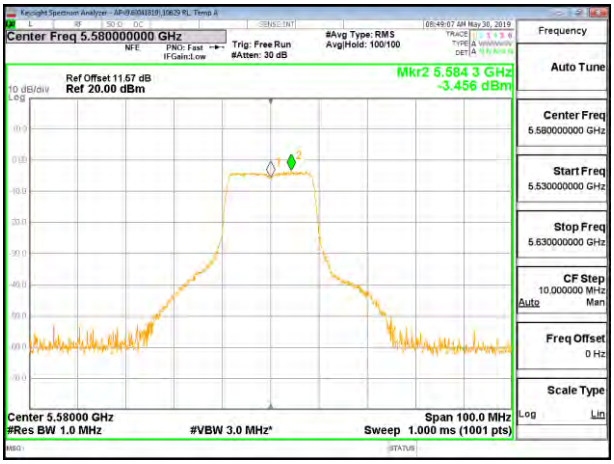
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	11.37	11.37	23.72	-12.35
Mid	5580	12.02	12.02	23.58	-11.56
High	5700	10.13	10.13	23.63	-13.50

PSD Results

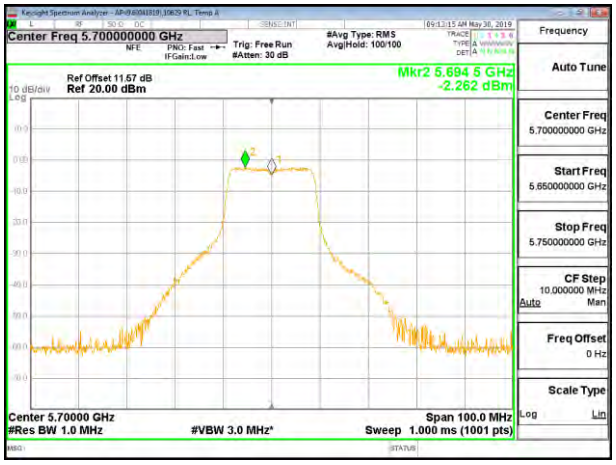
Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	-1.020	-0.380	11.00	-11.38
Mid	5580	-3.456	-2.816	11.00	-13.82
High	5700	-2.262	-1.622	11.00	-12.62



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.9. 802.11n HT40 MODE IN THE 5.6 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	46.20	36.3730	1.51
Mid	5550	46.30	36.6180	1.51
High	5670	46.40	36.7710	1.51

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	ISED Power Limit (dBm)	ISED EIRP Limit (dBm)	Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)	ISED PSD Limit (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)
Low	5510	24.00	24.00	30.00	24.00	11.00	11.00	11.00
Mid	5550	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5670	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	1.19	Included in Calculations of Corr'd PSD

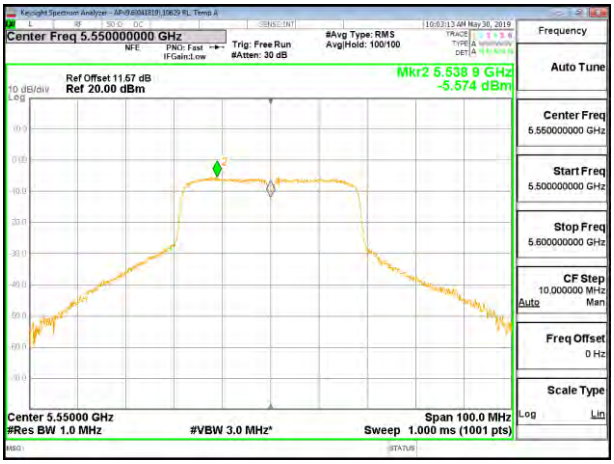
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	8.85	8.85	24.00	-15.15
Mid	5550	9.78	9.78	24.00	-14.22
High	5670	9.76	9.76	24.00	-14.24

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5510	-6.981	-5.79	11.00	-16.79
Mid	5550	-5.574	-4.38	11.00	-15.38
High	5670	-5.350	-4.16	11.00	-15.16

LOW CHANNEL



MID CHANNEL

HIGH CHANNEL

8.5.10. 802.11a MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	FCC/ISED PSD Limit (dBm/ 500KHz)
Low	5745	1.51	30.00	30.00
Mid	5785	1.51	30.00	30.00
High	5825	1.51	30.00	30.00

Duty Cycle CF (dB)	0.60	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	10.06	10.06	30.00	-19.94
Mid	5785	9.95	9.95	30.00	-20.05
High	5825	9.06	9.06	30.00	-20.94

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	-4.900	-4.300	30.00	-34.30
Mid	5785	-4.974	-4.374	30.00	-34.37
High	5825	-5.361	-4.761	30.00	-34.76

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

8.5.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	FCC/ISED PSD Limit (dBm/ 500KHz)
Low	5745	1.51	30.00	30.00
Mid	5785	1.51	30.00	30.00
High	5825	1.51	30.00	30.00

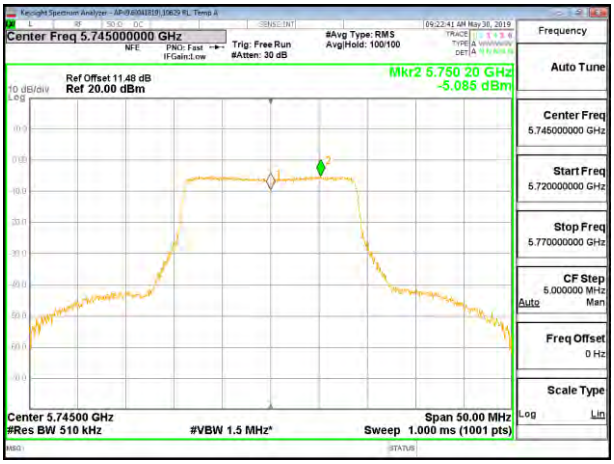
Duty Cycle CF (dB)	0.64	Included in Calculations of Corr'd PSD

Output Power Results

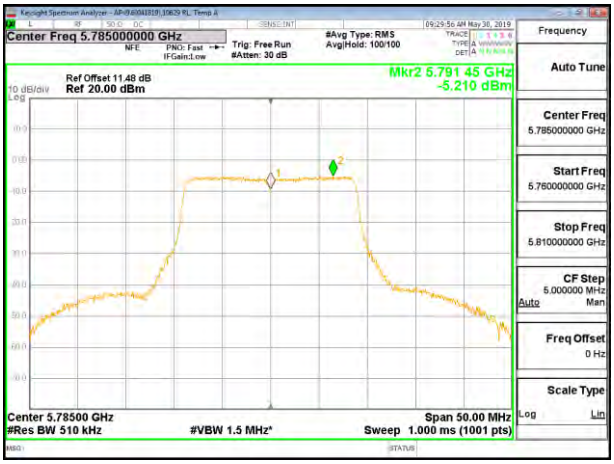
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	9.96	9.96	30.00	-20.04
Mid	5785	9.94	9.94	30.00	-20.06
High	5825	9.11	9.11	30.00	-20.89

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	-5.085	-4.445	30.00	-34.45
Mid	5785	-5.210	-4.570	30.00	-34.57
High	5825	-6.190	-5.550	30.00	-35.55



LOW CHANNEL



MID CHANNEL

HIGH CHANNEL

8.5.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

1TX Antenna 1 MODE (FCC+IC)

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/ISED Power Limit (dBm)	FCC/ISED PSD Limit (dBm/ 500KHz)
Low	5755	1.51	30.00	30.00
High	5795	1.51	30.00	30.00

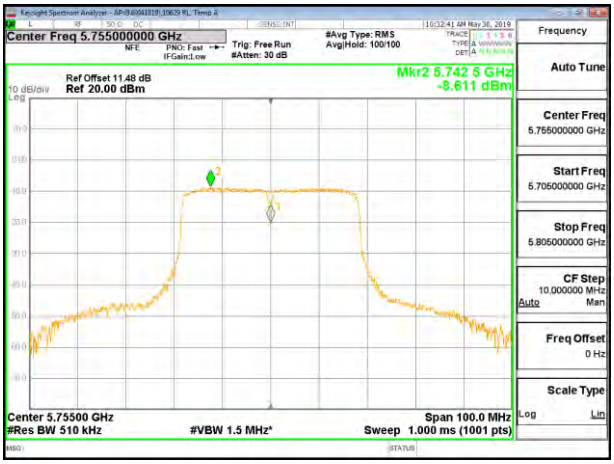
Duty Cycle CF (dB)	1.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	10.03	10.03	30.00	-19.97
High	5795	9.87	9.87	30.00	-20.13

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5755	-8.611	-7.421	30.00	-37.42
High	5795	-8.539	-7.349	30.00	-37.35



LOW CHANNEL

HIGH CHANNEL

9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 30 MHz to 1GHz and 18GHz to 40 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 5 GHz bands.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

KDB 414788 Open Field Site (OFS) and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

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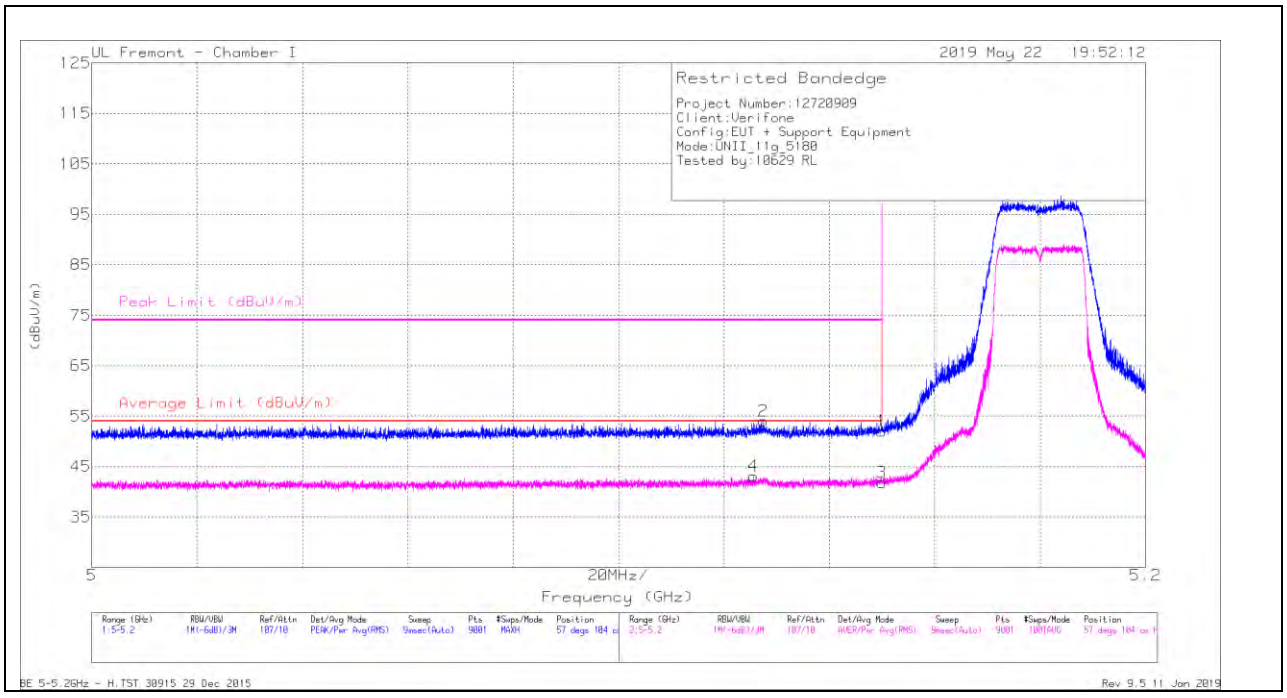
9.1. TRANSMITTER ABOVE 1 GHz

9.1.1. TX ABOVE 1 GHz 802.11a MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

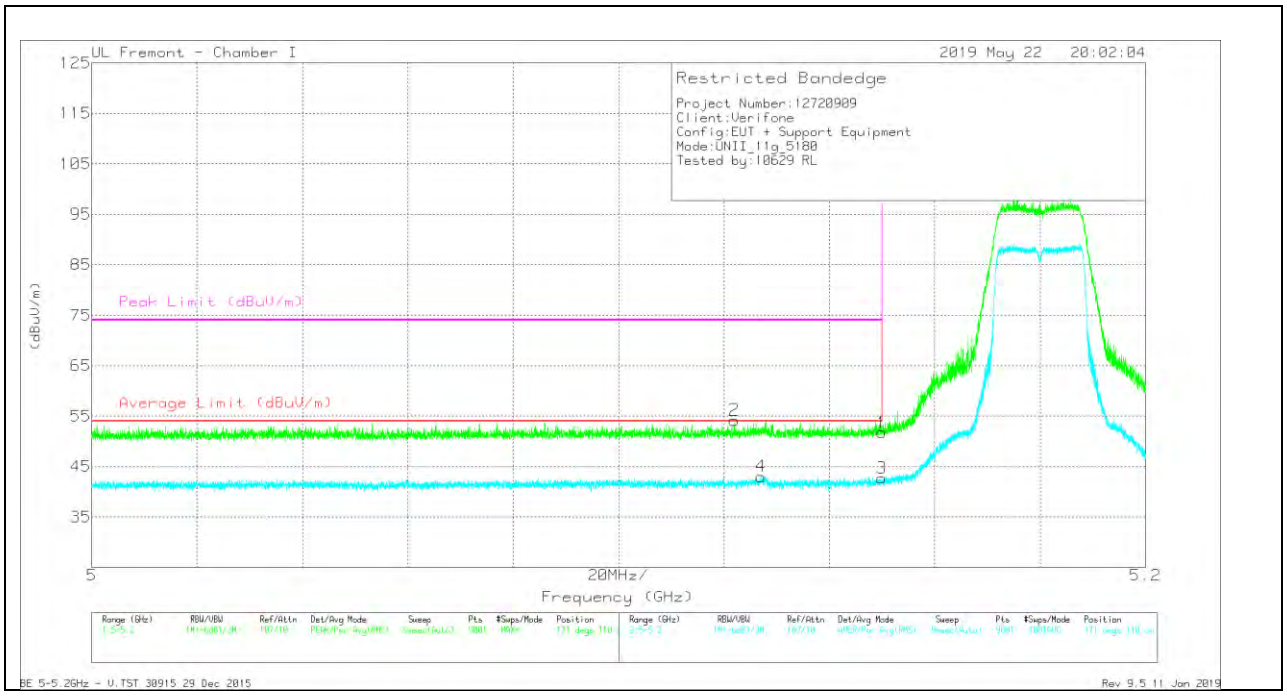


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	36.67	Pk	34.4	-19	0	52.07	-	-	74	-21.93	57	104	H
2	*5.127	38.65	Pk	34.3	-18.9	0	54.05	-	-	74	-19.95	57	104	H
3	*5.15	25.8	RMS	34.4	-19	.6	41.8	54	-12.2	-	-	57	104	H
4	*5.126	27.11	RMS	34.3	-18.9	.6	43.11	54	-10.89	-	-	57	104	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



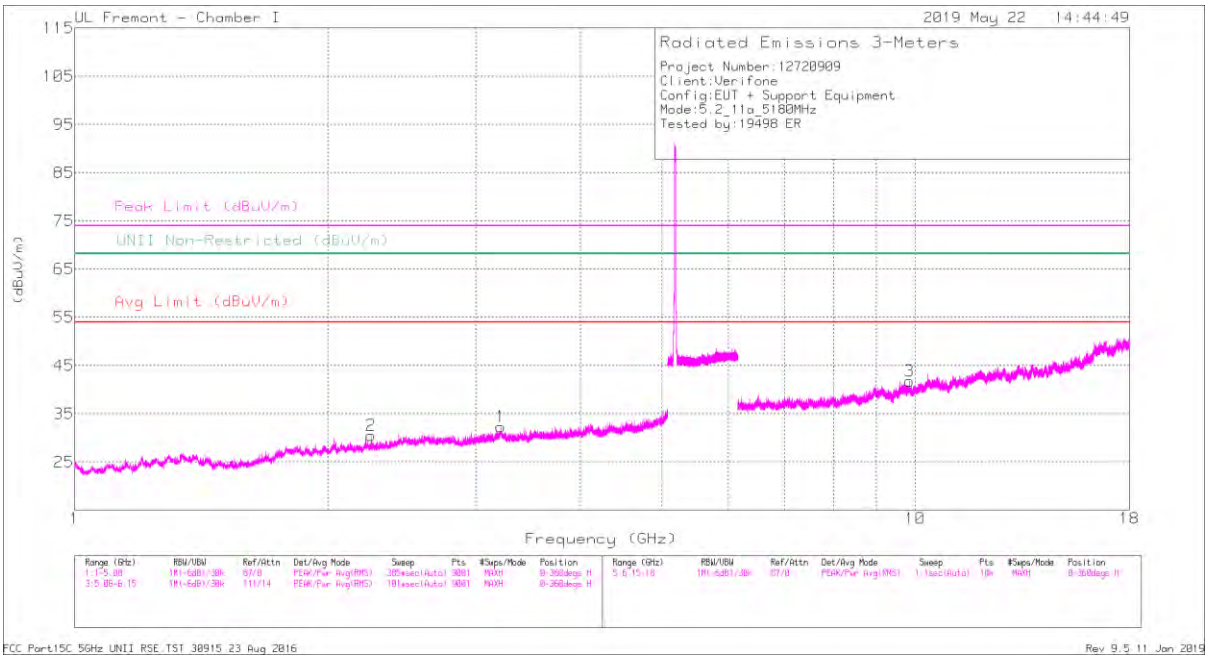
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	36.42	Pk	34.4	-19	0	51.82	-	-	74	-22.18	171	110	V
2	* 5.122	38.7	Pk	34.4	-18.9	0	54.2	-	-	74	-19.8	171	110	V
3	* 5.15	26.67	RMS	34.4	-19	.6	42.67	54	-11.33	-	-	171	110	V
4	* 5.127	27.03	RMS	34.3	-18.9	.6	43.03	54	-10.97	-	-	171	110	V

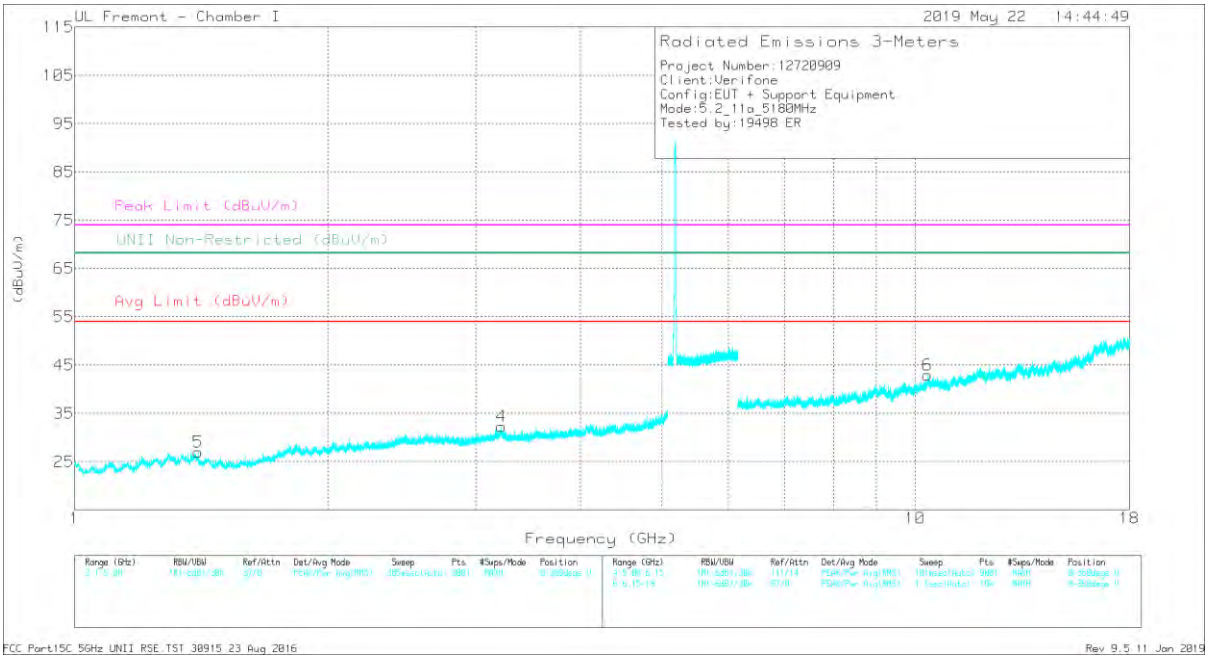
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)
1	3.216	33.77	PK-U	33.5	-29.8	0	37.47	-	-	-	-	68.2	-30.73	131	135
2	* 2.254	36.23	PK-U	31.5	-31.9	0	35.83	-	-	74	-38.17	-	-	126	147
	* 2.254	25.67	ADR	31.5	-31.9	0.6	25.87	54	-28.13	-	-	-	-	126	147
4	3.218	34.29	PK-U	33.3	-29.8	0	37.79	-	-	-	-	68.2	-30.41	228	215
5	* 1.403	38.18	PK-U	28.9	-33.5	0	33.58	-	-	74	-40.42	-	-	56	254
	* 1.403	27.38	ADR	28.9	-33.5	0.6	23.38	54	-30.62	-	-	-	-	56	254
3	9.846	27.82	PK-U	36.9	-16.7	0	48.02	-	-	-	-	68.2	-20.18	253	153
6	10.36	29.56	PK-U	37.4	-16.6	0	50.36	-	-	-	-	68.2	-17.84	291	107

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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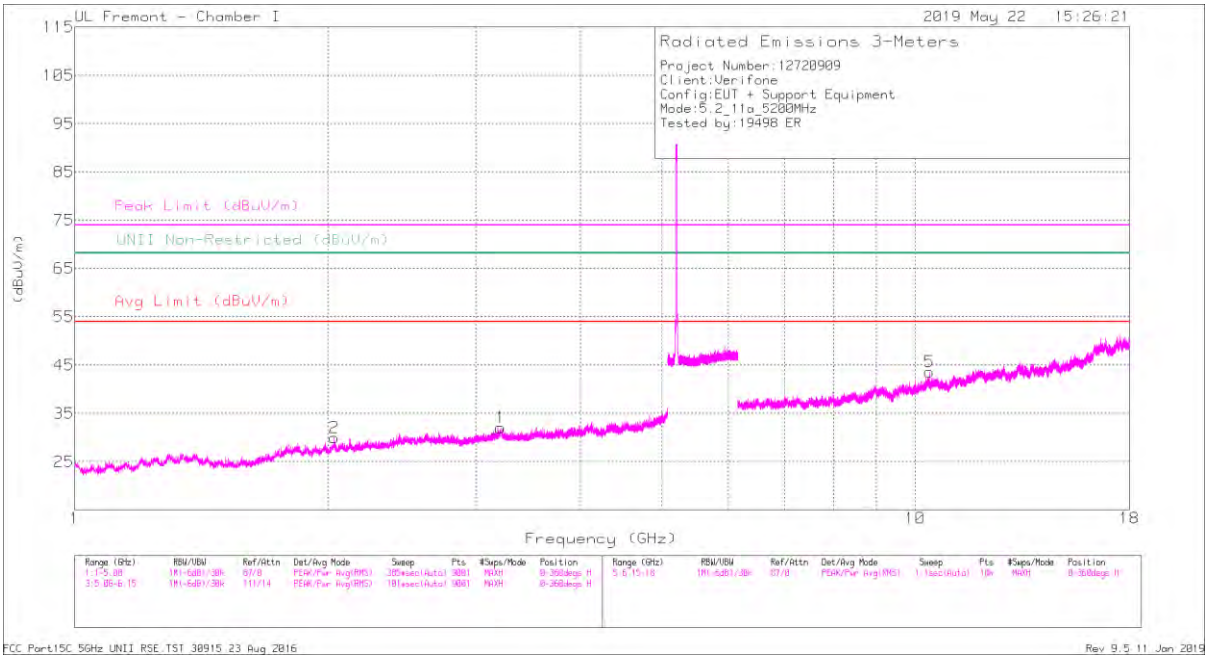
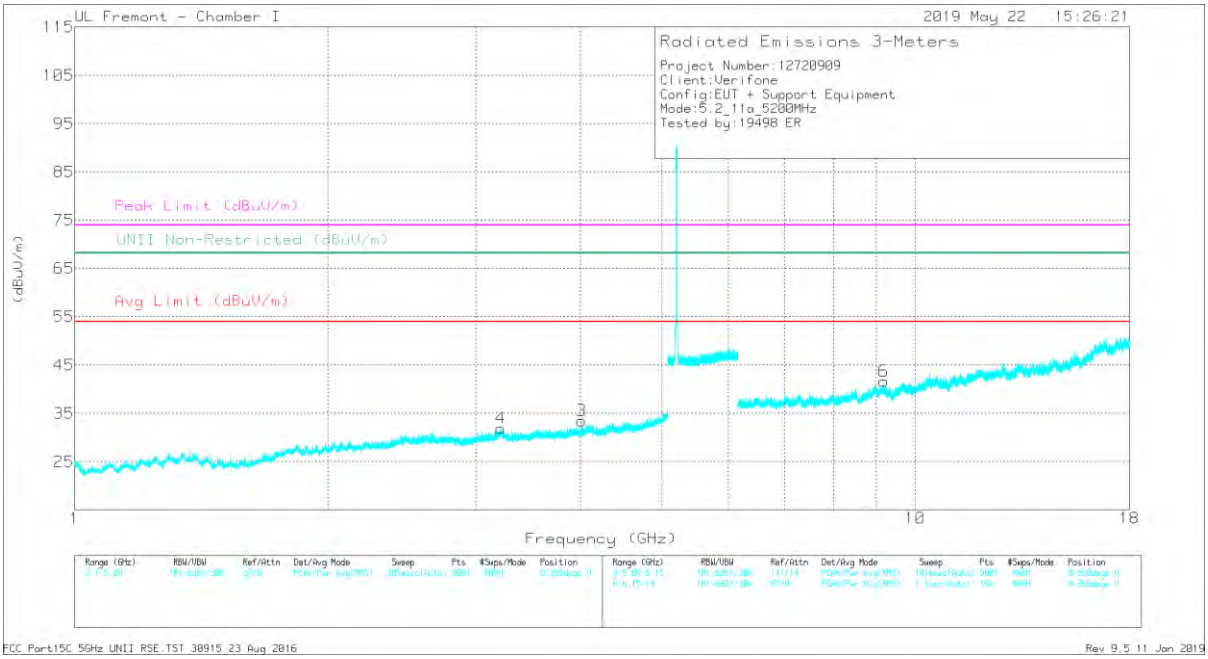
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	3.212	34.24	PK-U	33.6	-29.9	0	37.94	-	-	-	-	68.2	-30.26	108	148	H
2	2.035	40.52	PK-U	31.1	-32.1	0	39.52	-	-	-	-	68.2	-28.68	46	157	H
3	* 4.011	35.46	PK-U	33.3	-29.9	0	38.86	-	-	74	-35.14	-	-	186	228	V
	* 4.011	25.21	ADR	33.3	-29.9	0.6	29.21	54	-24.79	-	-	-	-	186	228	V
4	3.214	33.63	PK-U	33.6	-29.9	0	37.33	-	-	-	-	68.2	-30.87	152	131	V
5	10.4	28.85	PK-U	37.4	-16.8	0	49.45	-	-	-	-	68.2	-18.75	84	102	H
6	* 9.185	27.7	PK-U	36.4	-17.5	0	46.6	-	-	74	-27.4	-	-	143	283	V
	* 9.187	19.06	ADR	36.4	-17.5	0.6	38.56	54	-15.44	-	-	-	-	143	283	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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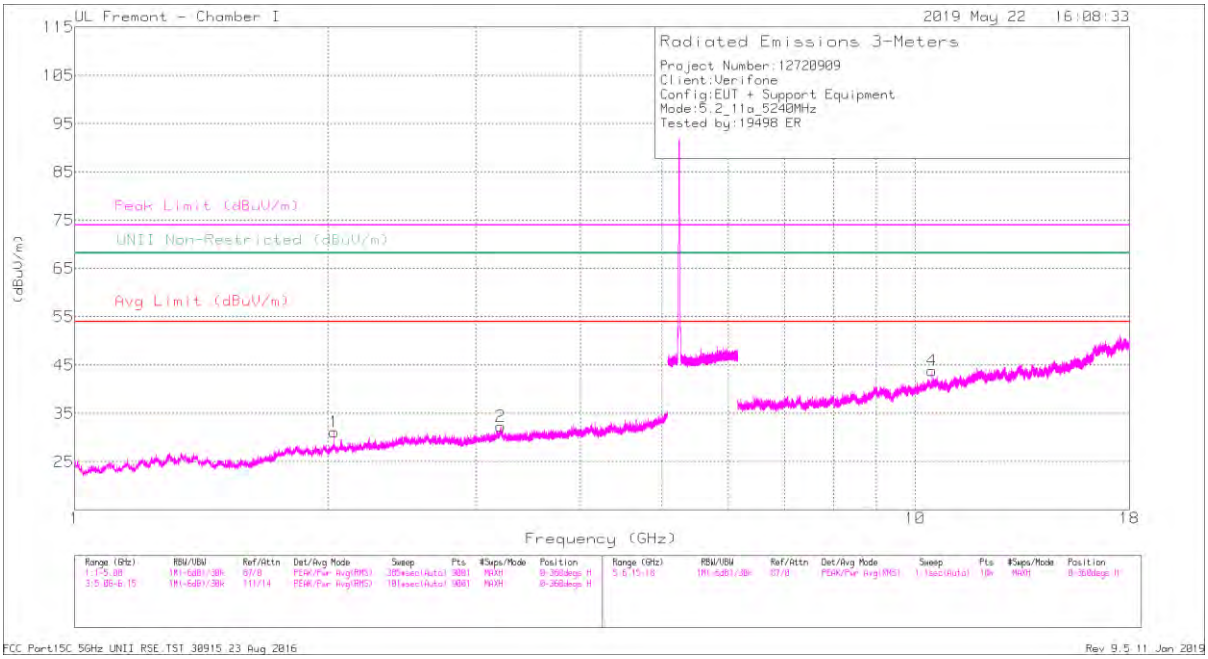
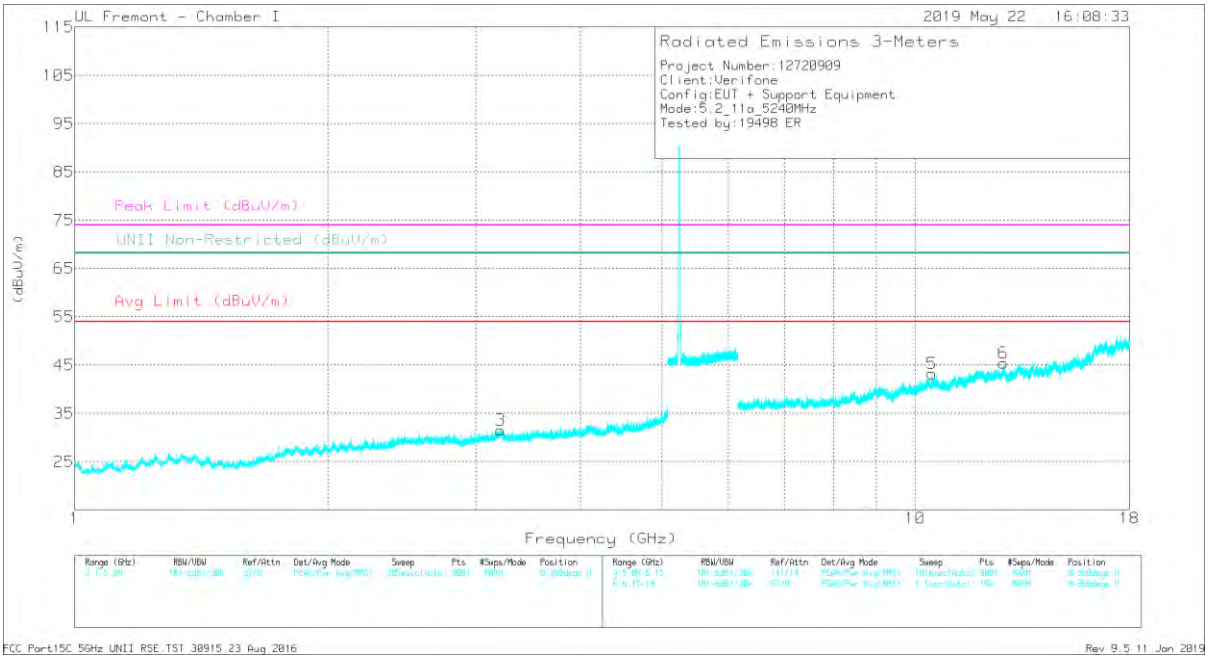
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.035	38.24	PK-U	31.1	-32.1	0	37.24	-	-	-	-	68.2	-30.96	44	160	H
2	3.212	34.33	PK-U	33.6	-29.9	0	38.03	-	-	-	-	68.2	-30.17	171	193	H
3	3.214	34.34	PK-U	33.6	-29.9	0	38.04	-	-	-	-	68.2	-30.16	306	248	V
4	10.48	29.34	PK-U	37.6	-17.4	0	49.54	-	-	-	-	68.2	-18.66	85	223	H
5	10.482	29.37	PK-U	37.6	-17.3	0	49.67	-	-	-	-	68.2	-18.53	191	116	V
6	12.746	26.89	PK-U	39.2	-15.8	0	50.29	-	-	-	-	68.2	-17.91	297	186	V

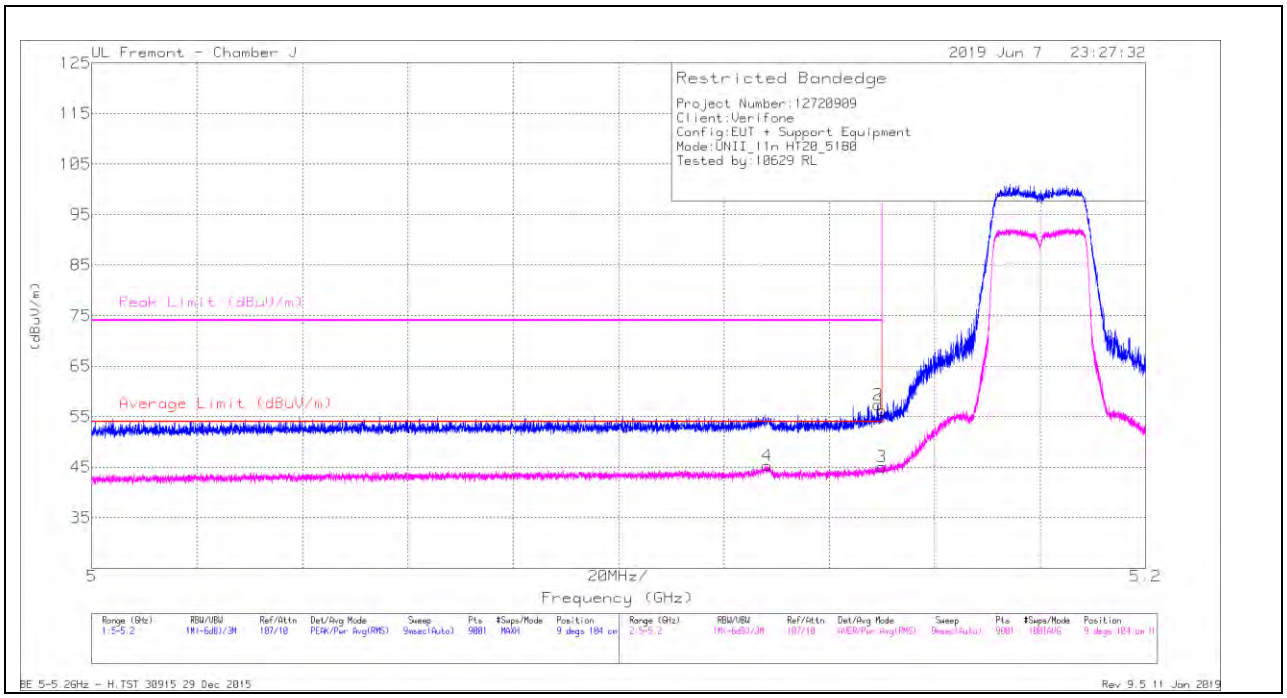
PK-U - U-NII: Maximum Peak

9.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

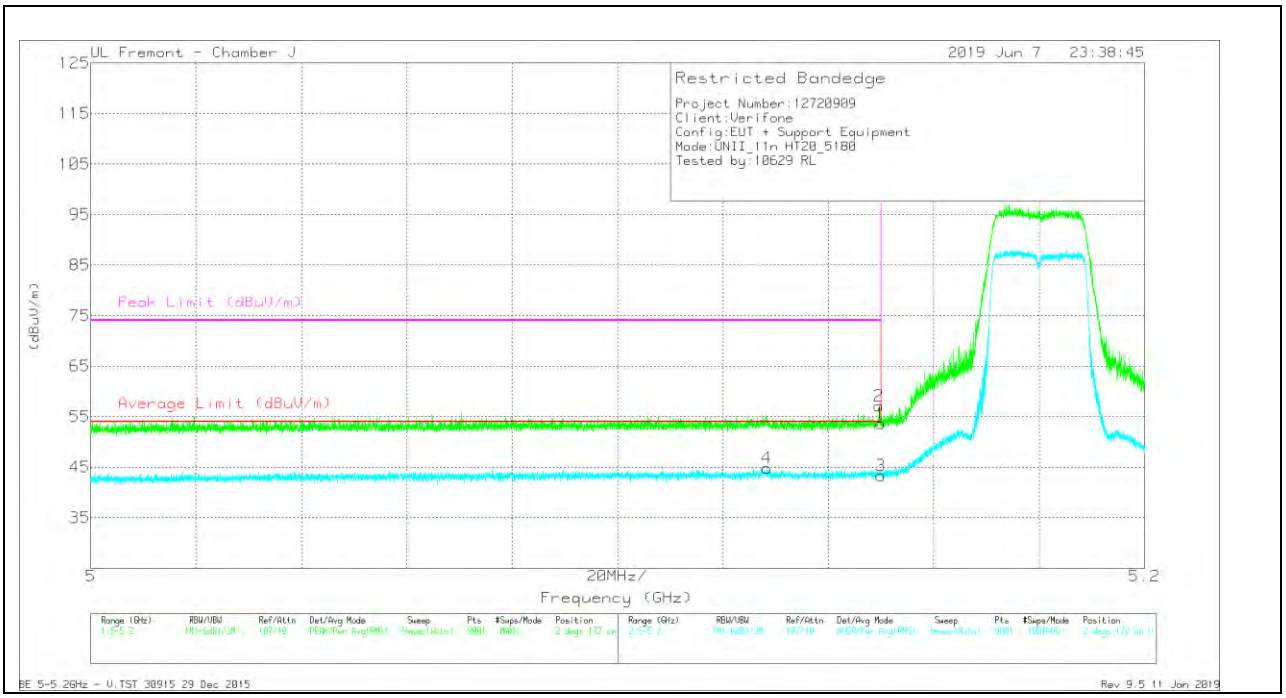


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	41.78	Pk	35.7	-21.2	0	56.28	-	-	74	-17.72	9	104	H
2	*5.149	42.86	Pk	35.7	-21.2	0	57.36	-	-	74	-16.64	9	104	H
3	*5.15	29.91	RMS	35.7	-21.2	.64	45.05	54	-8.95	-	-	9	104	H
4	*5.128	30.23	RMS	35.7	-21.2	.64	45.37	54	-8.63	-	-	9	104	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



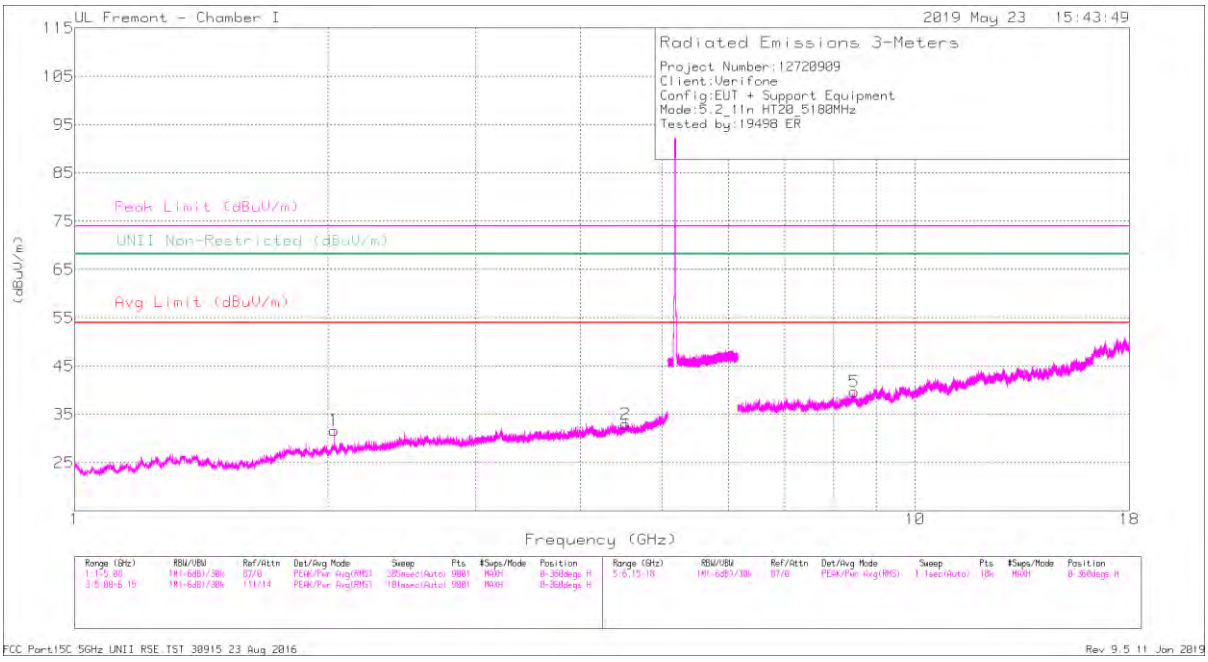
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	39.15	Pk	35.7	-21.2	0	53.65	-	-	74	-20.35	2	172	V
2	*5.15	42.59	Pk	35.7	-21.2	0	57.09	-	-	74	-16.91	2	172	V
3	*5.15	28.22	RMS	35.7	-21.2	.64	43.36	54	-10.64	-	-	2	172	V
4	*5.128	29.65	RMS	35.7	-21.2	.64	44.79	54	-9.21	-	-	2	172	V

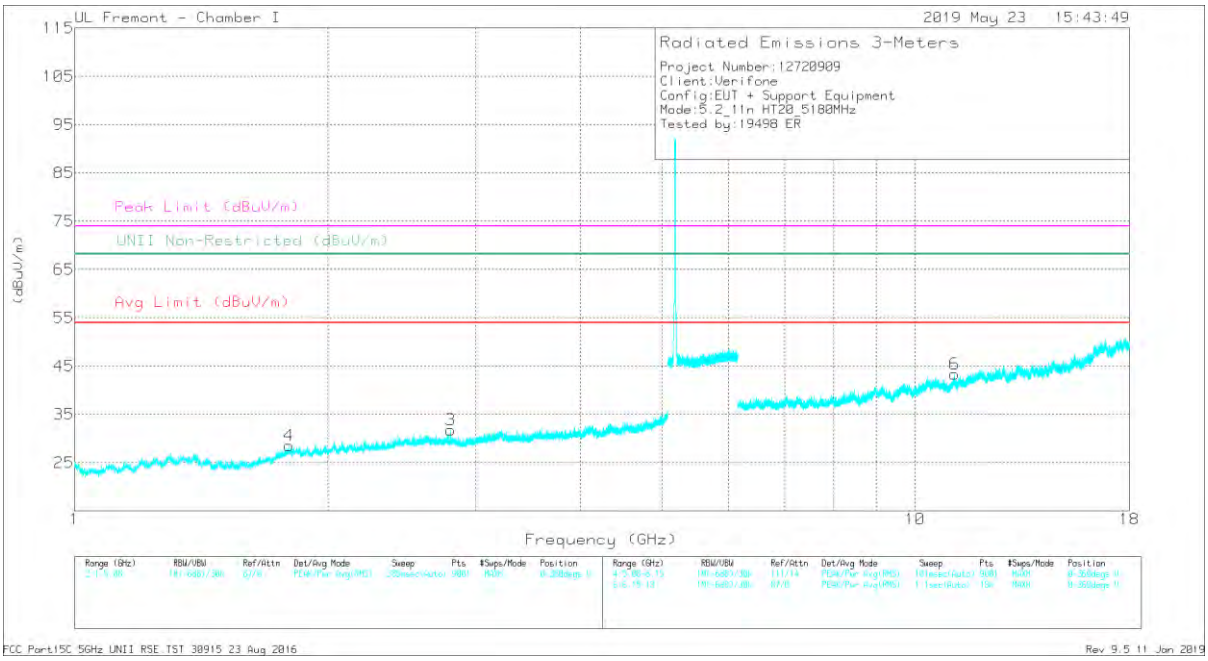
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)
1	2.035	40.13	PK-U	31.1	-32.1	0	39.13	-	-	-	-	68.2	-29.07	42	155
2	* 4.517	33.1	PK-U	33.7	-28.1	0	38.7	-	-	74	-35.3	-	-	267	270
	* 4.522	24.99	ADR	33.8	-28	.64	31.43	54	-22.57	-	-	-	-	267	270
4	1.799	35.95	PK-U	30.6	-32.6	0	33.95	-	-	-	-	68.2	-34.25	158	188
3	* 2.803	35.2	PK-U	32.3	-30.9	0	36.6	-	-	74	-37.4	-	-	148	163
	* 2.801	26.32	ADR	32.3	-30.8	.64	28.46	54	-25.54	-	-	-	-	148	163
5	* 8.474	27.89	PK-U	35.8	-18.9	0	44.79	-	-	74	-29.21	-	-	261	136
	* 8.471	19.43	ADR	35.8	-18.8	.64	37.07	54	-16.93	-	-	-	-	261	136
6	* 11.154	27.84	PK-U	37.8	-16.5	0	49.14	-	-	74	-24.86	-	-	127	254
	* 11.156	18.93	ADR	37.8	-16.5	.64	40.87	54	-13.13	-	-	-	-	127	254

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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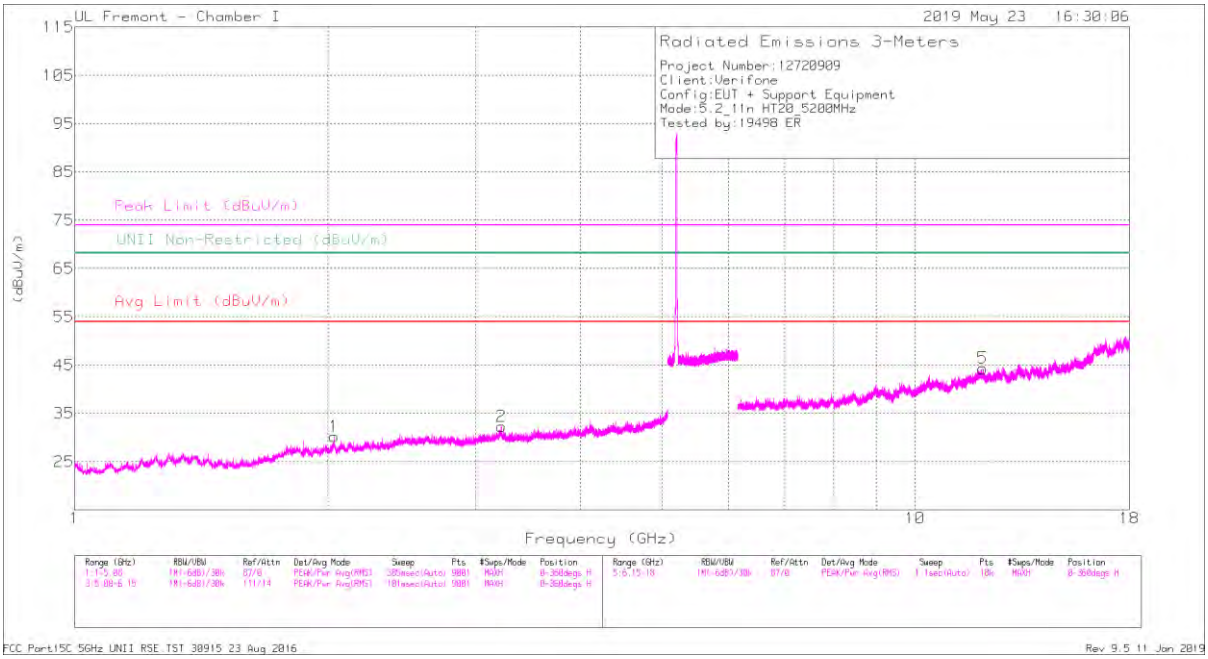
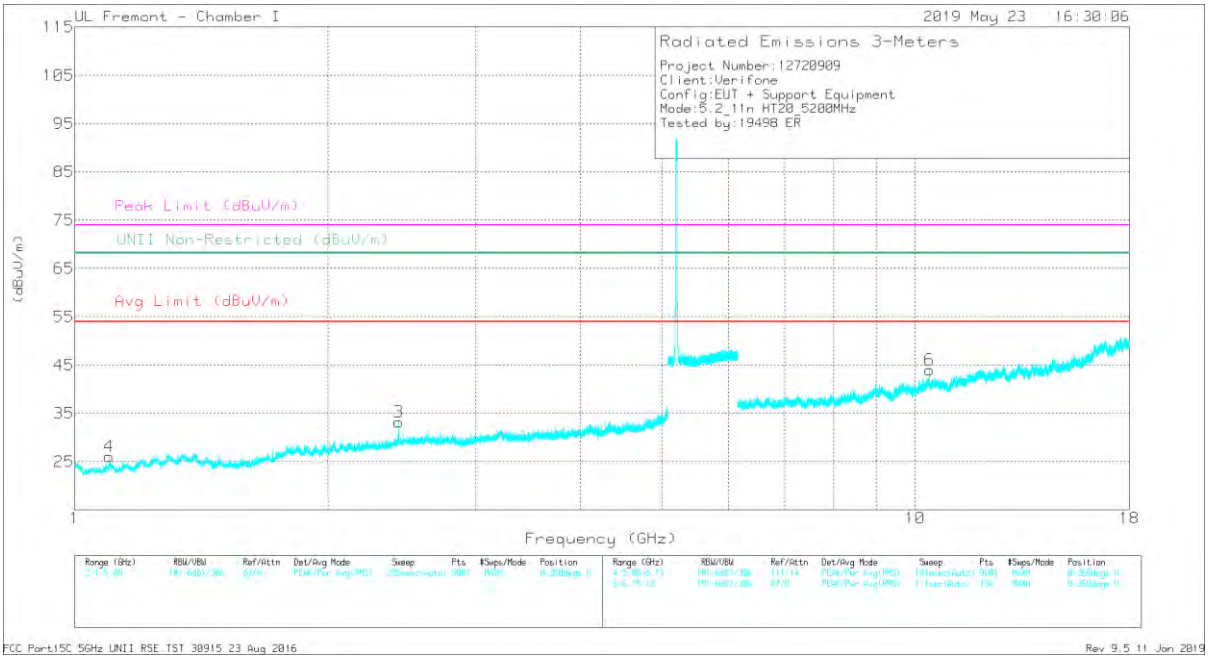
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)
1	2.035	39.6	PK-U	31.1	-32.1	0	38.6	-	-	-	-	68.2	-29.6	39	137
2	3.214	35.01	PK-U	33.6	-29.8	0	38.81	-	-	-	-	68.2	-29.39	136	122
3	2.431	36.12	PK-U	32.2	-31.7	0	36.62	-	-	-	-	68.2	-31.58	60	178
4	* 1.098	38	PK-U	27.6	-34.2	0	31.4	-	-	74	-42.6	-	-	203	177
	* 1.098	28.9	ADR	27.6	-34.2	.64	22.94	54	-31.06	-	-	-	-	203	177
5	* 12.037	26.56	PK-U	38.9	-16.4	0	49.06	-	-	74	-24.94	-	-	313	223
	* 12.038	18.72	ADR	38.9	-16.3	.64	41.96	54	-12.04	-	-	-	-	313	223
6	10.4	28.36	PK-U	37.4	-16.8	0	48.96	-	-	-	-	68.2	-19.24	293	135

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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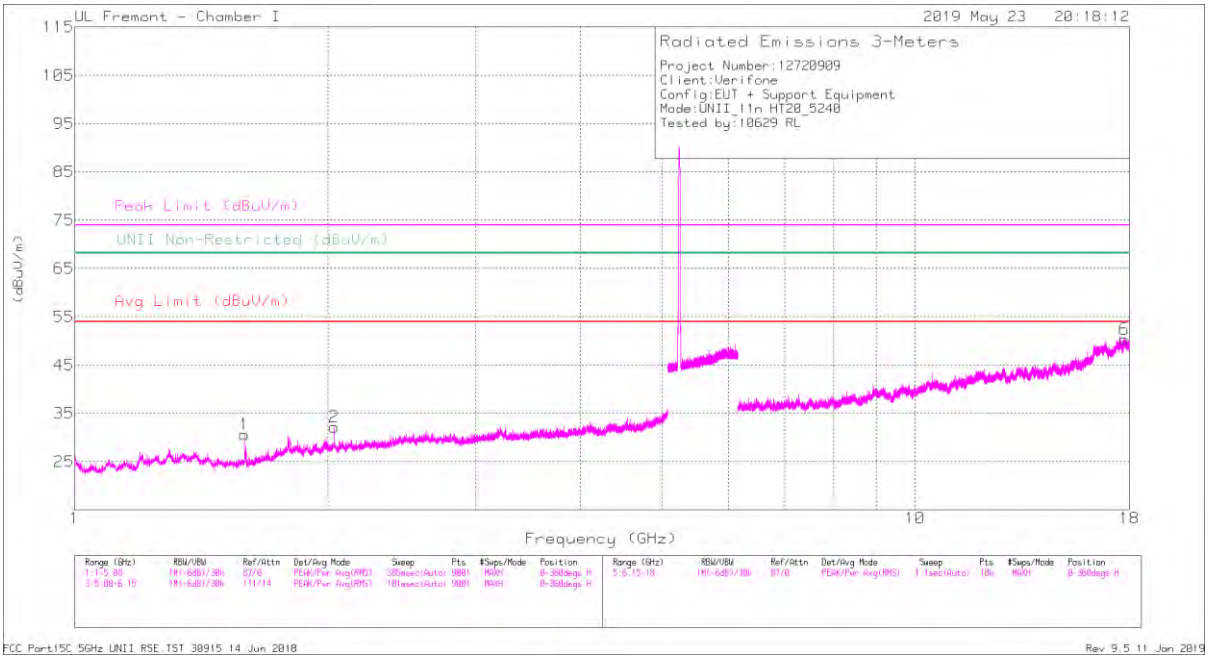
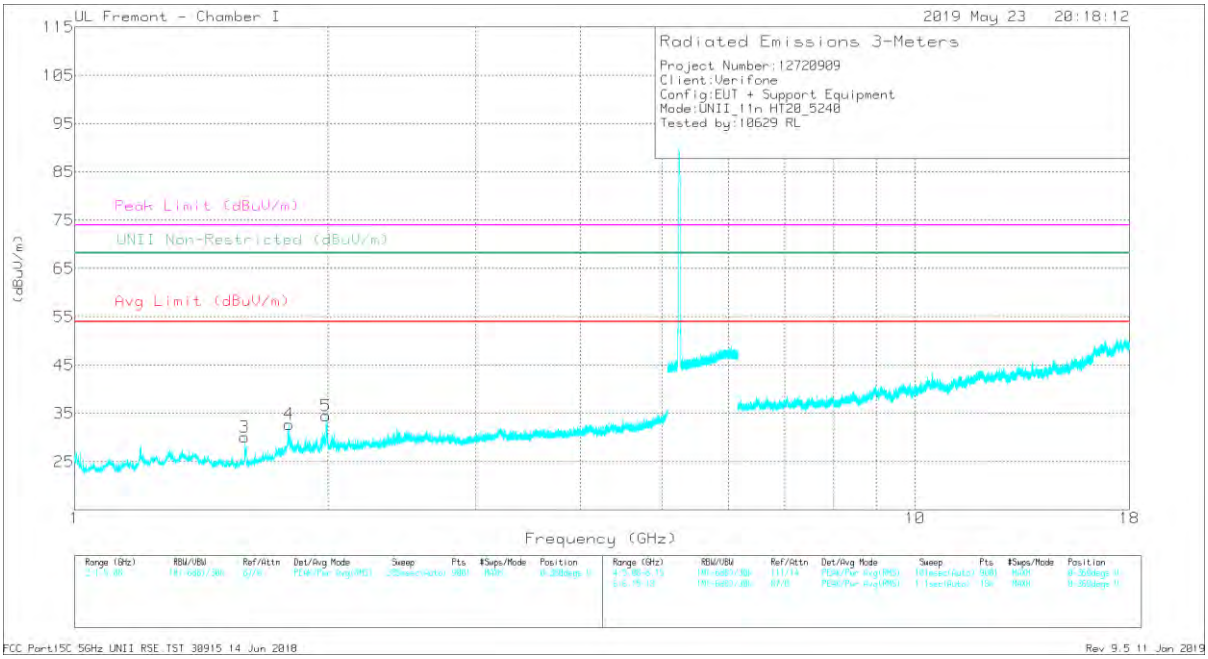
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.595	45.21	PK-U	28	-33	0	40.21	-	-	74	-33.79	-	-	297	169	H
	* 1.595	28.52	ADR	28	-33	.64	24.16	54	-29.84	-	-	-	-	297	169	H
2	2.035	39.24	PK-U	31.1	-32.1	0	38.24	-	-	-	-	68.2	-29.96	44	184	H
3	* 1.599	47.02	PK-U	28	-33	0	42.02	-	-	74	-31.98	-	-	169	199	V
	* 1.597	28.96	ADR	28	-33.1	.64	24.5	54	-29.5	-	-	-	-	169	199	V
4	1.794	47.54	PK-U	30.5	-32.7	0	45.34	-	-	-	-	68.2	-22.86	360	317	V
5	1.99	39.89	PK-U	30.9	-32.4	0	38.39	-	-	-	-	68.2	-29.81	348	175	V
5	* 17.756	26.11	PK-U	41.7	-10.2	0	57.61	-	-	74	-16.39	-	-	208	110	H
	* 17.755	16.22	ADR	41.6	-10.2	.64	48.26	54	-5.74	-	-	-	-	208	110	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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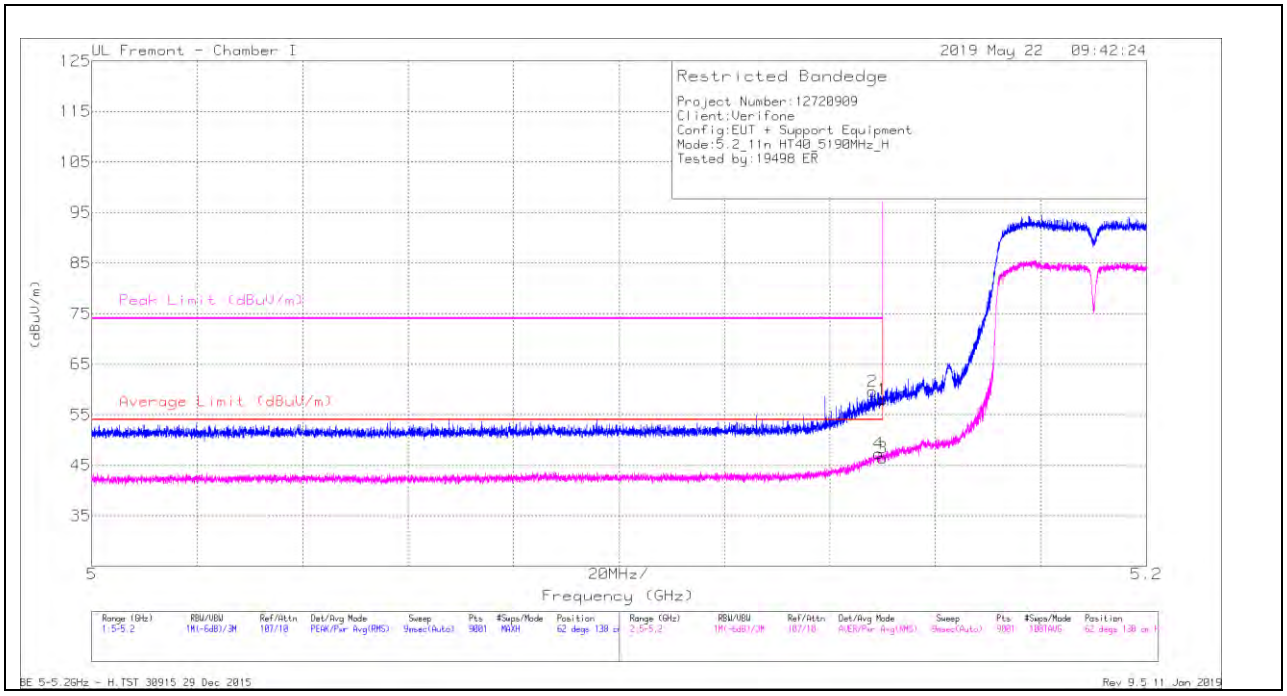
9.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT

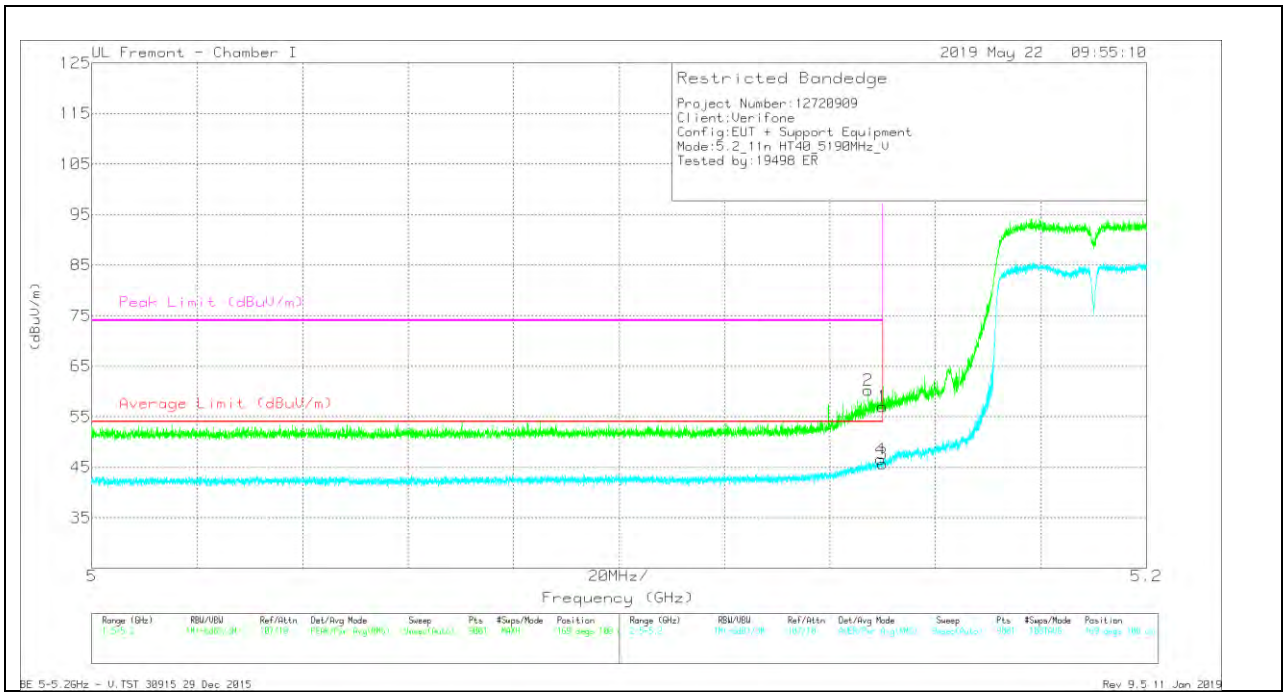


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.15	42.58	Pk	34.4	-19	0	57.98	-	-	74	-16.02	62	138	H
2	5.148	44.21	Pk	34.4	-19	0	59.61	-	-	74	-14.39	62	138	H
3	5.15	29.61	RMS	34.4	-19	1.19	46.20	54	-7.80	-	-	62	138	H
4	5.149	30.5	RMS	34.4	-19	1.19	47.09	54	-6.91	-	-	62	138	H

Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



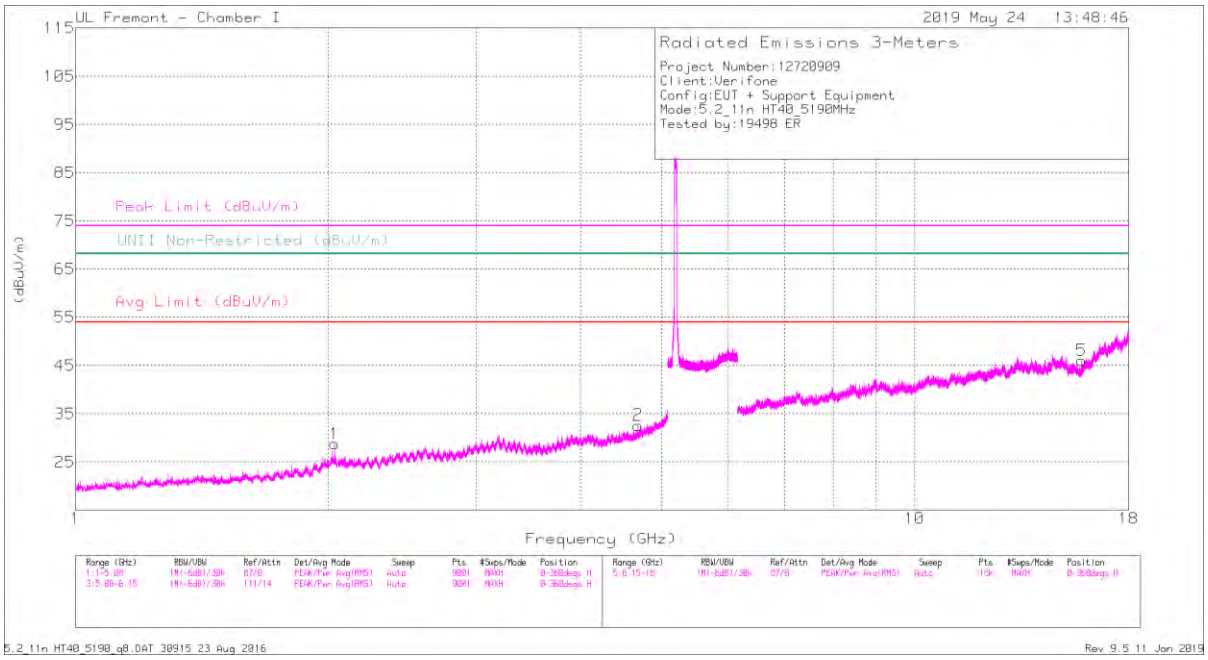
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.15	41.63	Pk	34.4	-19	0	57.03	-	-	74	-16.97	169	100	V
2	5.147	44.81	Pk	34.4	-19	0	60.21	-	-	74	-13.79	169	100	V
3	5.15	28.85	RMS	34.4	-19	1.19	45.25	54	-8.75	-	-	169	100	V
4	5.15	29.7	RMS	34.4	-19	1.19	46.10	54	-8.90	-	-	169	100	V

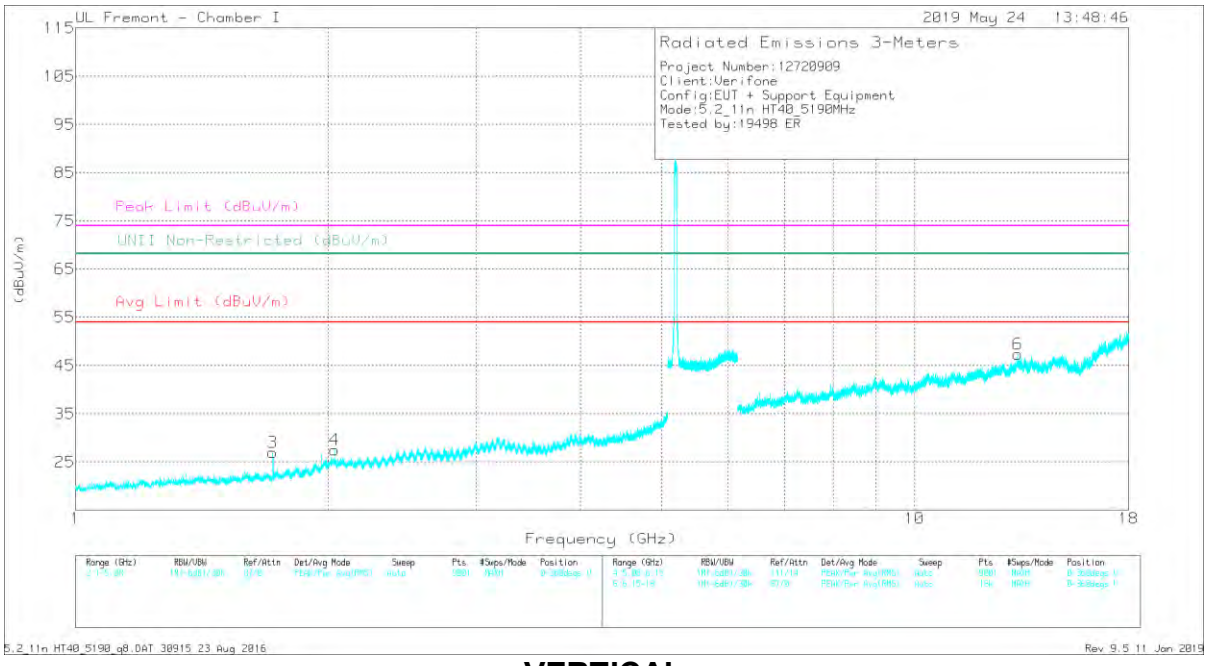
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



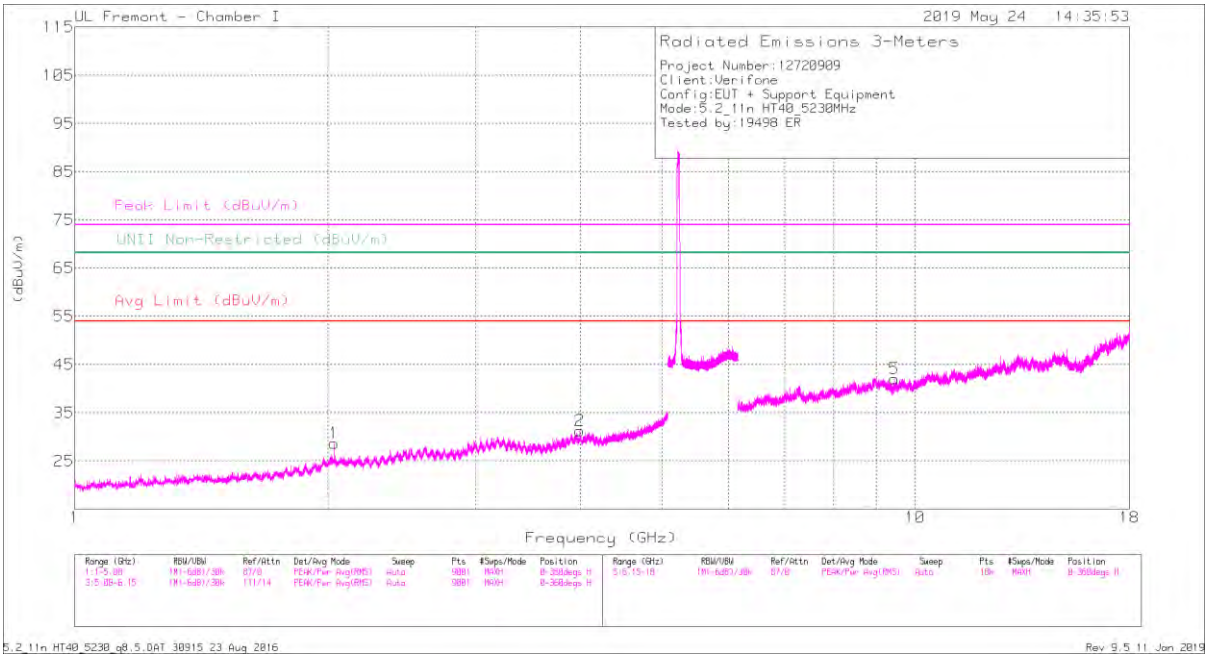
VERTICAL

RADIATED EMISSIONS

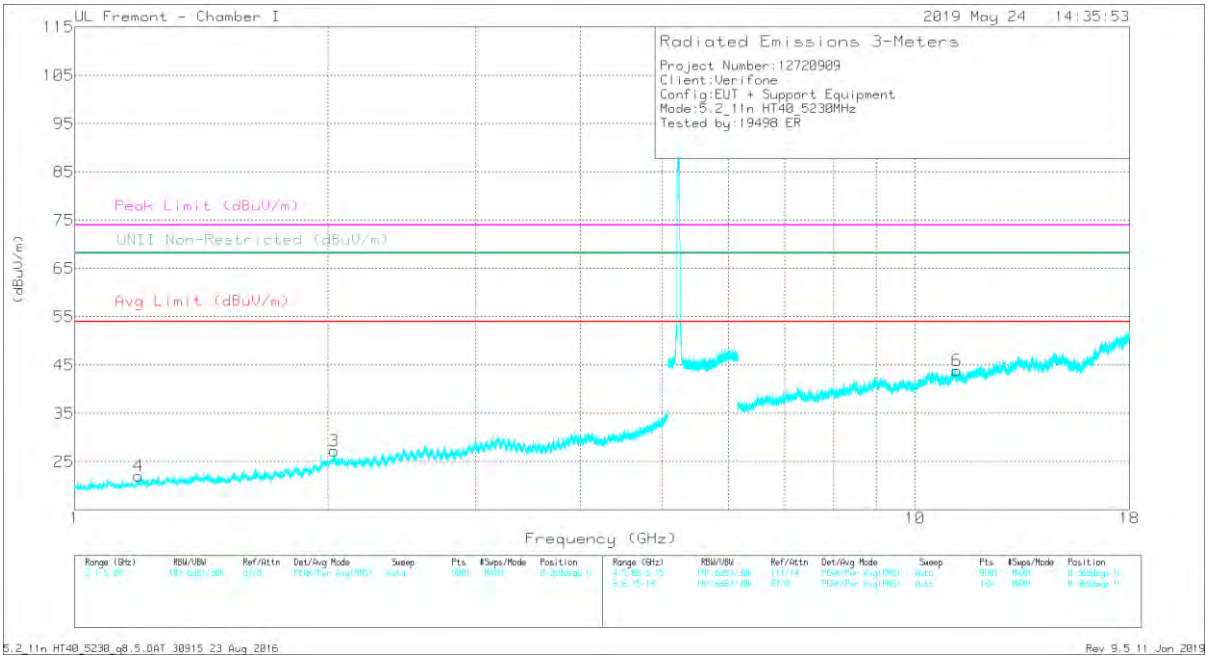
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0190810 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.035	39.11	PK-U	28.2	-32.1	0	35.21	-	-	-	-	68.2	-32.99	310	160	H
2	*4.674	32.84	PK-U	32.6	-28.4	0	37.04	-	-	74	-36.96	-	-	271	170	H
	*4.674	24.64	ADR	32.6	-28.4	1.19	30.03	54	-23.97	-	-	-	-	271	170	H
3	1.718	37.5	PK-U	25.7	-33.1	0	30.1	-	-	-	-	68.2	-38.1	31	196	V
4	2.034	38.45	PK-U	28.2	-32.1	0	34.55	-	-	-	-	68.2	-33.65	209	259	V
5	*15.828	24.56	PK-U	39.2	-13.7	0	50.06	-	-	74	-23.94	-	-	330	111	H
	*15.829	17.18	ADR	39.2	-13.7	1.19	43.87	54	-10.13	-	-	-	-	330	111	H
6	*13.285	29.41	PK-U	41.1	-15.9	0	54.61	-	-	74	-19.39	-	-	291	198	V
	*13.287	18.69	ADR	41.1	-15.9	1.19	45.08	54	-8.92	-	-	-	-	291	198	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0190810 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.035	39.22	PK-U	28.2	-32.1	0	35.32	-	-	-	-	68.2	-32.88	309	131	H
2	*3.995	34.02	PK-U	31.7	-29.6	0	36.12	-	-	74	-37.88	-	-	203	163	H
	*3.997	26.29	ADR	31.7	-29.7	1.19	29.48	54	-24.52	-	-	-	-	203	163	H
3	2.035	38.36	PK-U	28.2	-32.1	0	34.46	-	-	-	-	68.2	-33.74	85	102	V
4	*1.193	37.84	PK-U	24.1	-33.9	0	28.04	-	-	74	-45.96	-	-	78	221	V
	*1.189	28.81	ADR	24.1	-34	1.19	20.1	54	-33.9	-	-	-	-	78	221	V
5	*9.452	27.82	PK-U	37.8	-17.7	0	47.92	-	-	74	-26.08	-	-	75	230	H
	*9.45	18.12	ADR	37.8	-17.7	1.19	39.41	54	-14.59	-	-	-	-	75	230	H
6	*11.229	27.62	PK-U	39	-16.9	0	49.72	-	-	74	-24.28	-	-	135	173	V
	*11.23	18.14	ADR	39	-16.9	1.19	41.43	54	-12.57	-	-	-	-	135	173	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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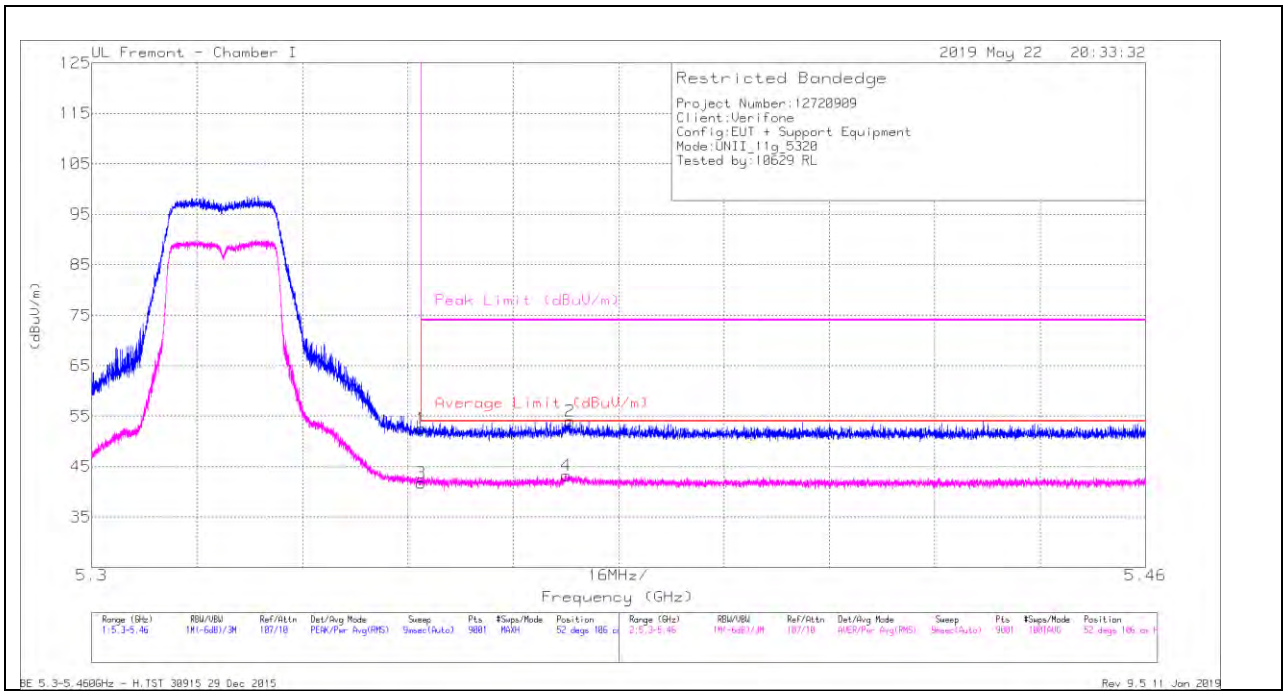
9.1.4. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

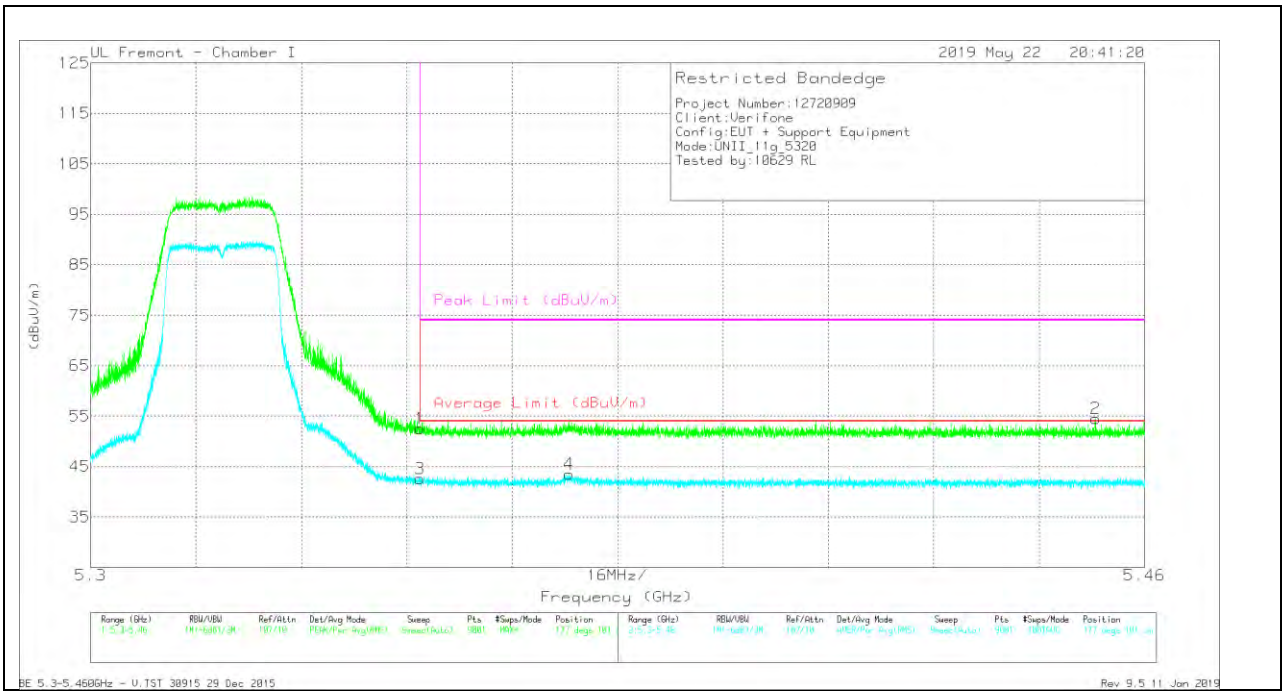


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.35	36.29	Pk	34.5	-18.3	0	52.49	-	-	74	-21.51	52	106	H
2	*5.373	37.76	Pk	34.4	-18.1	0	54.06	-	-	74	-19.94	52	106	H
3	*5.35	24.98	RMS	34.5	-18.3	.6	41.78	54	-12.22	-	-	52	106	H
4	*5.372	26.34	RMS	34.4	-18.1	.6	43.24	54	-10.76	-	-	52	106	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



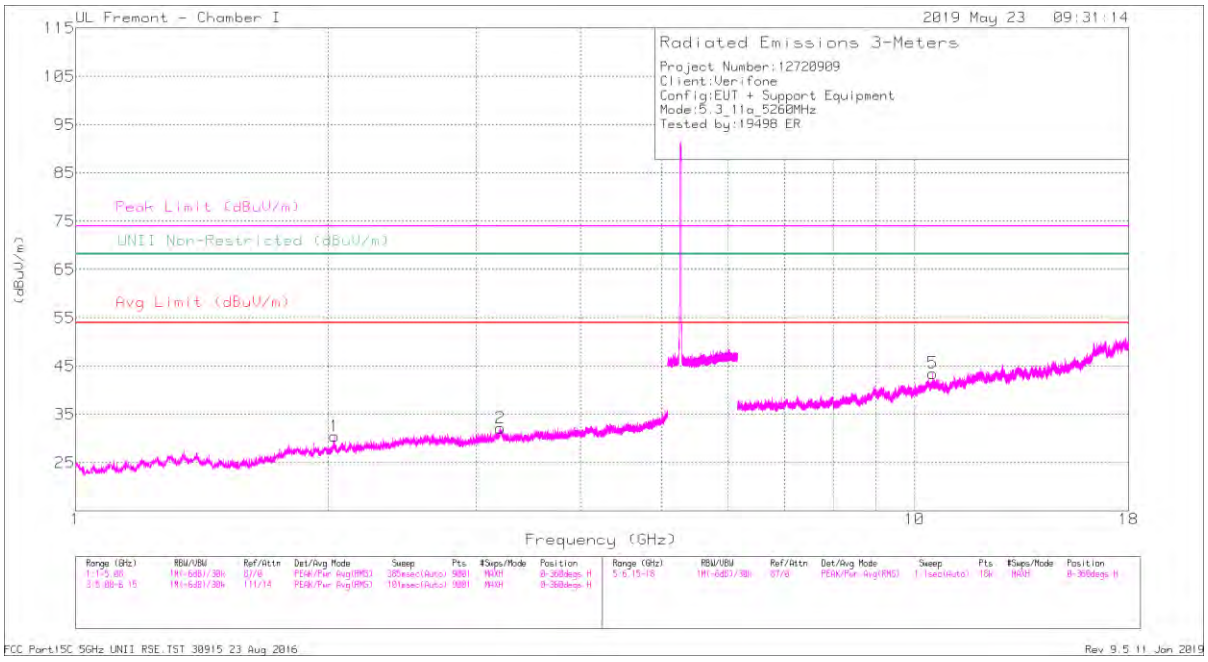
Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	36.37	Pk	34.5	-18.3	0	52.57	-	-	74	-21.43	177	101	V
2	* 5.453	37.79	Pk	34.6	-17.9	0	54.49	-	-	74	-19.51	177	101	V
3	* 5.35	25.77	RMS	34.5	-18.3	.6	42.57	54	-11.43	-	-	177	101	V
4	* 5.373	26.62	RMS	34.4	-18.1	.6	43.52	54	-10.48	-	-	177	101	V

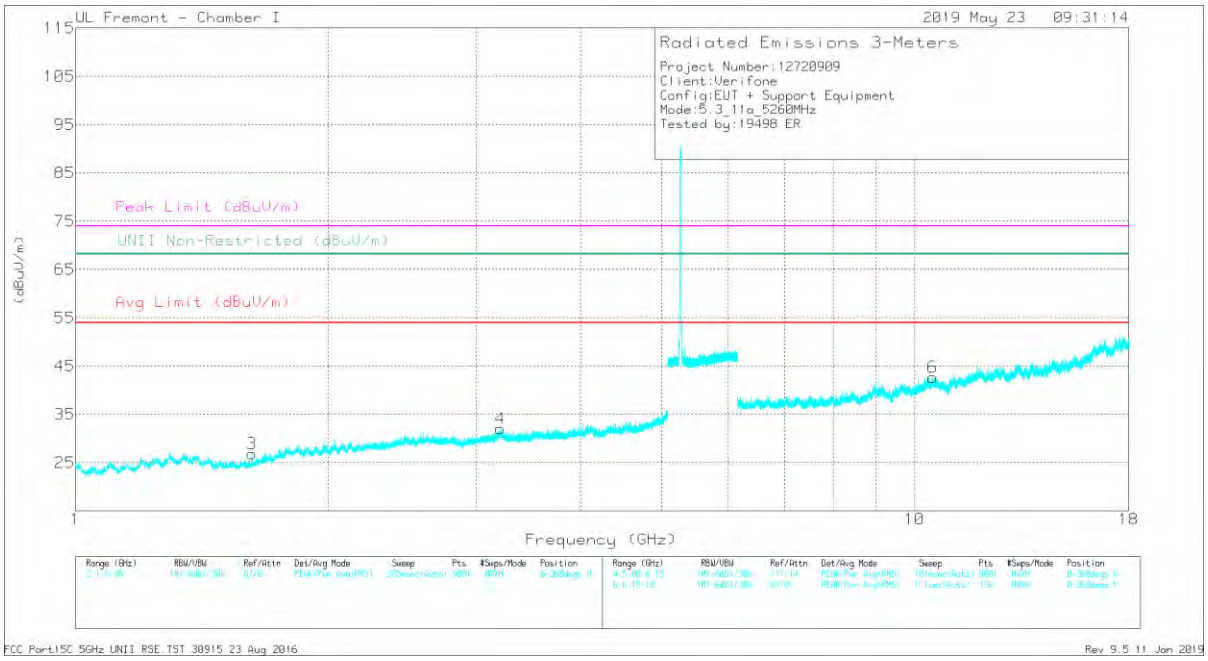
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	2.035	38.48	PK-U	31.1	-32.1	0	37.48	-	-	-	-	68.2	-30.72	39	127	H
2	3.208	36.48	PK-U	33.5	-29.8	0	40.18	-	-	-	-	68.2	-28.02	251	145	H
4	3.209	34.21	PK-U	33.6	-29.8	0	38.01	-	-	-	-	68.2	-30.19	166	194	V
3	* 1.622	37.52	PK-U	28	-32.9	0	32.62	-	-	74	-41.38	-	-	360	133	V
	* 1.622	27.6	ADR	28	-32.9	0.6	23.3	54	-30.7	-	-	-	-	360	133	V
5	10.52	29.68	PK-U	37.6	-17	0	50.28	-	-	-	-	68.2	-17.92	81	107	H
6	10.52	29.42	PK-U	37.6	-17	0	50.02	-	-	-	-	68.2	-18.18	192	105	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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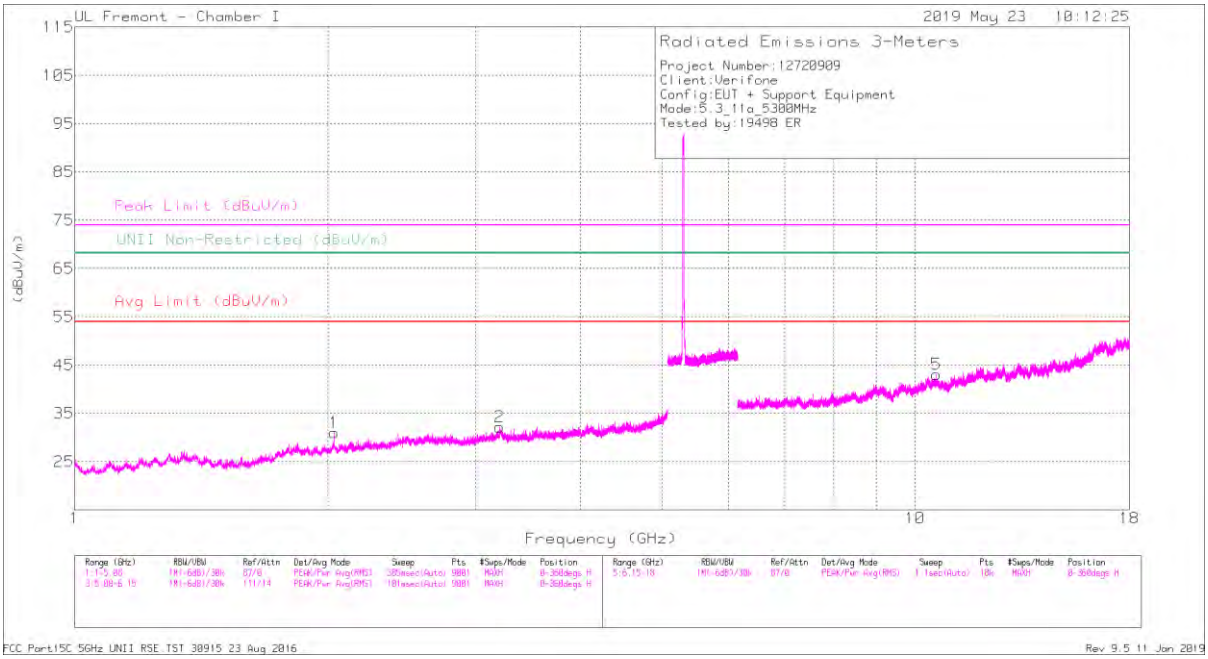
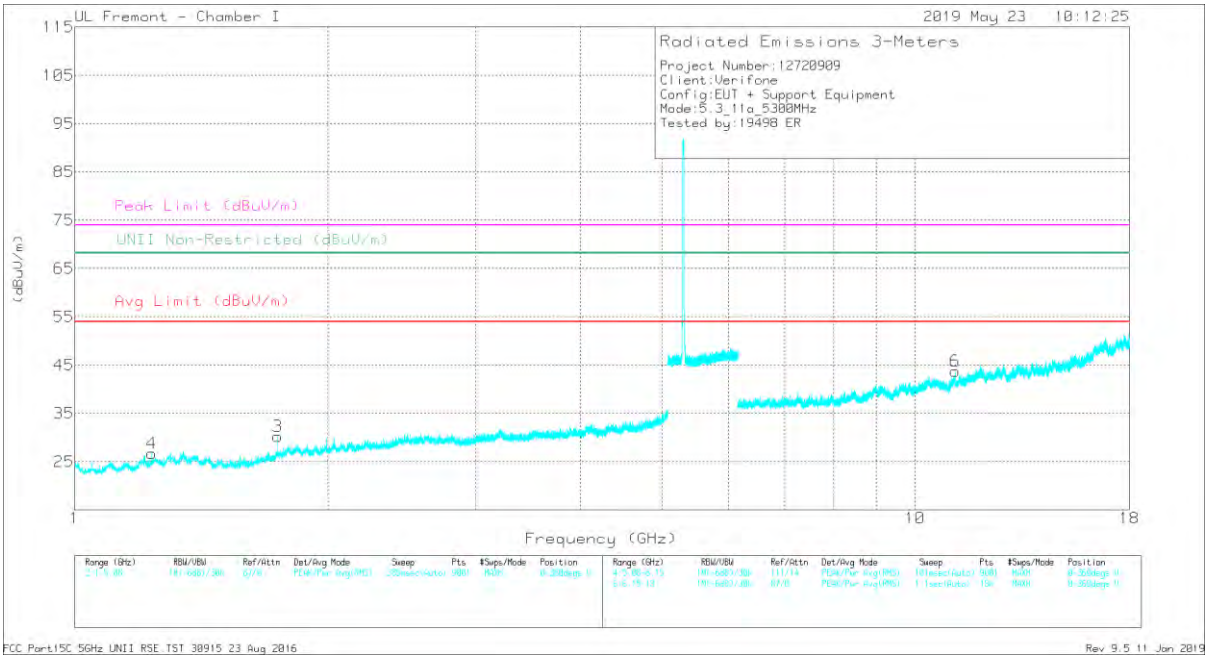
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)
1	2.035	37.92	PK-U	31.1	-32.1	0	36.92	-	-	-	-	68.2	-31.28	36	103
2	3.206	33.75	PK-U	33.4	-29.9	0	37.25	-	-	-	-	68.2	-30.95	199	143
3	1.743	37.84	PK-U	29.9	-33.2	0	34.54	-	-	-	-	68.2	-33.66	274	245
4	* 1.239	36.24	PK-U	28.9	-34.1	0	31.04	-	-	74	-42.96	-	-	81	183
	* 1.237	28.59	ADR	29	-34.1	0.6	24.09	54	-29.91	-	-	-	-	81	183
5	* 10.6	28.82	PK-U	37.8	-16.7	0	49.92	-	-	74	-24.08	-	-	296	132
	* 10.6	18.21	ADR	37.8	-16.7	0.6	39.91	54	-14.09	-	-	-	-	296	132
6	* 11.16	25.85	PK-U	37.9	-16.6	0	47.15	-	-	74	-26.85	-	-	192	110
	* 11.16	18.65	ADR	37.9	-16.6	0.6	40.55	54	-13.45	-	-	-	-	192	110

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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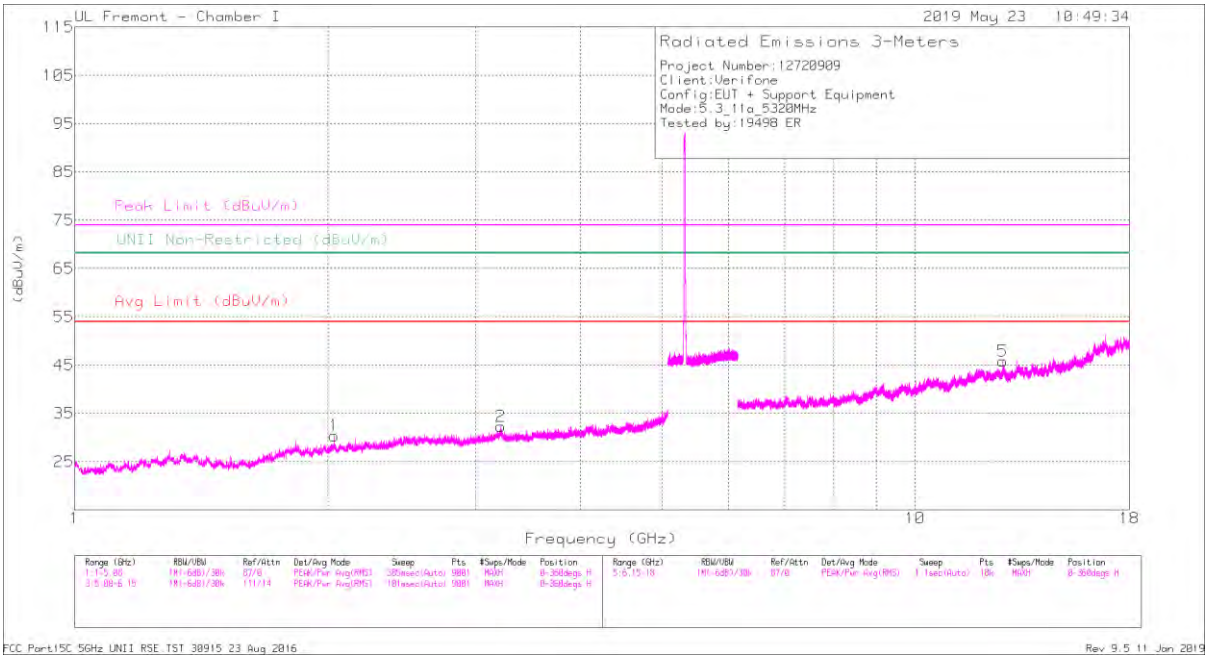
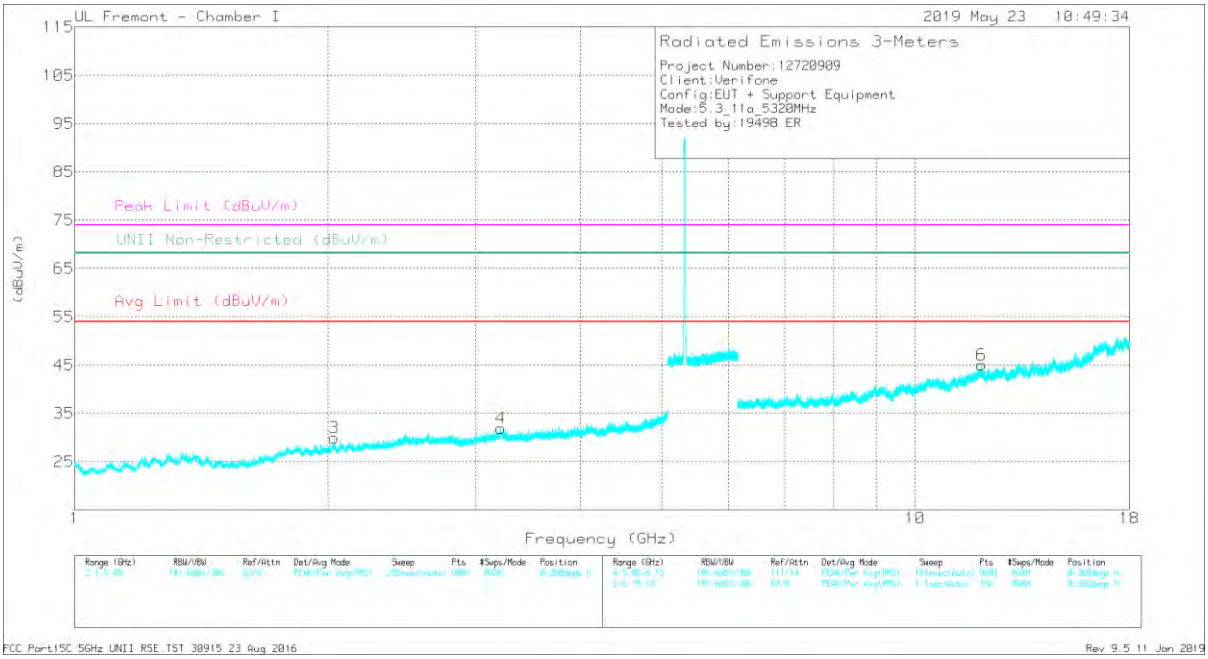
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)
1	2.035	38.48	PK-U	31.1	-32.1	0	37.48	-	-	-	-	68.2	-30.72	33	104
2	3.217	35.28	PK-U	33.4	-29.8	0	38.88	-	-	-	-	68.2	-29.32	151	132
3	2.035	37.4	PK-U	31.1	-32.1	0	36.4	-	-	-	-	68.2	-31.8	185	104
4	3.214	34.06	PK-U	33.6	-29.9	0	37.76	-	-	-	-	68.2	-30.44	78	130
5	12.717	27.17	PK-U	39.1	-16.1	0	50.17	-	-	-	-	68.2	-18.03	183	107
6	* 11.998	26.74	PK-U	38.8	-16.2	0	49.34	-	-	74	-24.66	-	-	79	178
	* 12.001	19.23	ADR	38.8	-16.2	0.6	42.43	54	-11.57	-	-	-	-	79	178

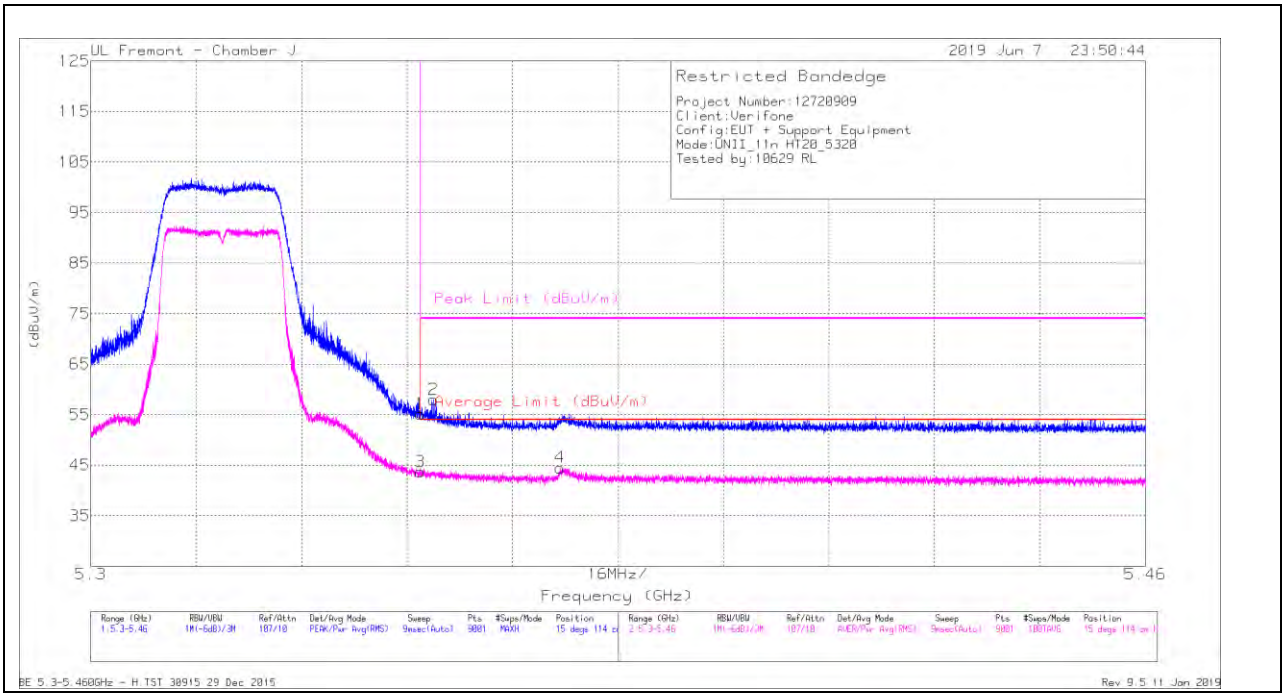
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

9.1.5. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

1TX Antenna 1 MODE

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT

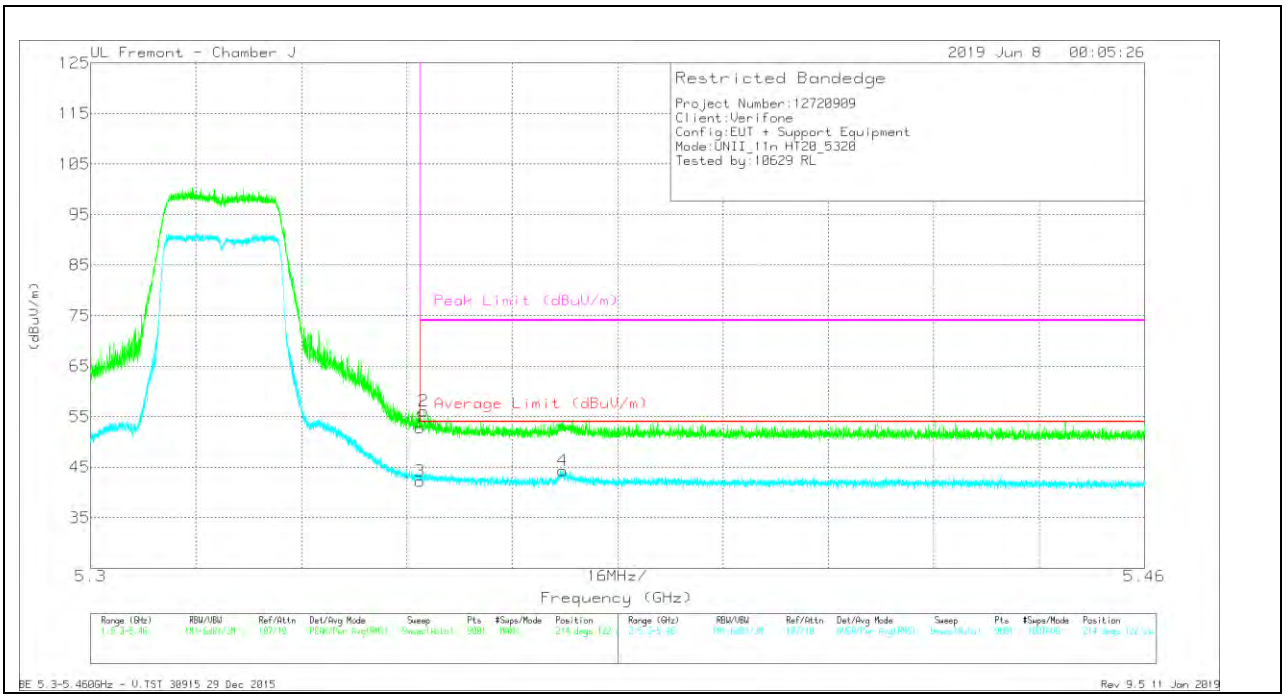


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	41.38	Pk	34.6	-20.8	0	55.18	-	-	74	-18.82	15	114	H
2	* 5.352	44.19	Pk	34.6	-20.8	0	57.99	-	-	74	-16.01	15	114	H
3	* 5.35	29.27	RMS	34.6	-20.8	.64	43.71	54	-10.29	-	-	15	114	H
4	* 5.371	30.18	RMS	34.5	-20.8	.64	44.52	54	-9.48	-	-	15	114	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

VERTICAL RESULT



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	39.01	Pk	34.6	-20.8	0	52.81	-	-	74	-21.19	214	122	V
2	* 5.351	42.33	Pk	34.6	-20.8	0	56.13	-	-	74	-17.87	214	122	V
3	* 5.35	27.76	RMS	34.6	-20.8	.64	42.2	54	-11.8	-	-	214	122	V
4	* 5.372	29.97	RMS	34.5	-20.8	.64	44.31	54	-9.69	-	-	214	122	V

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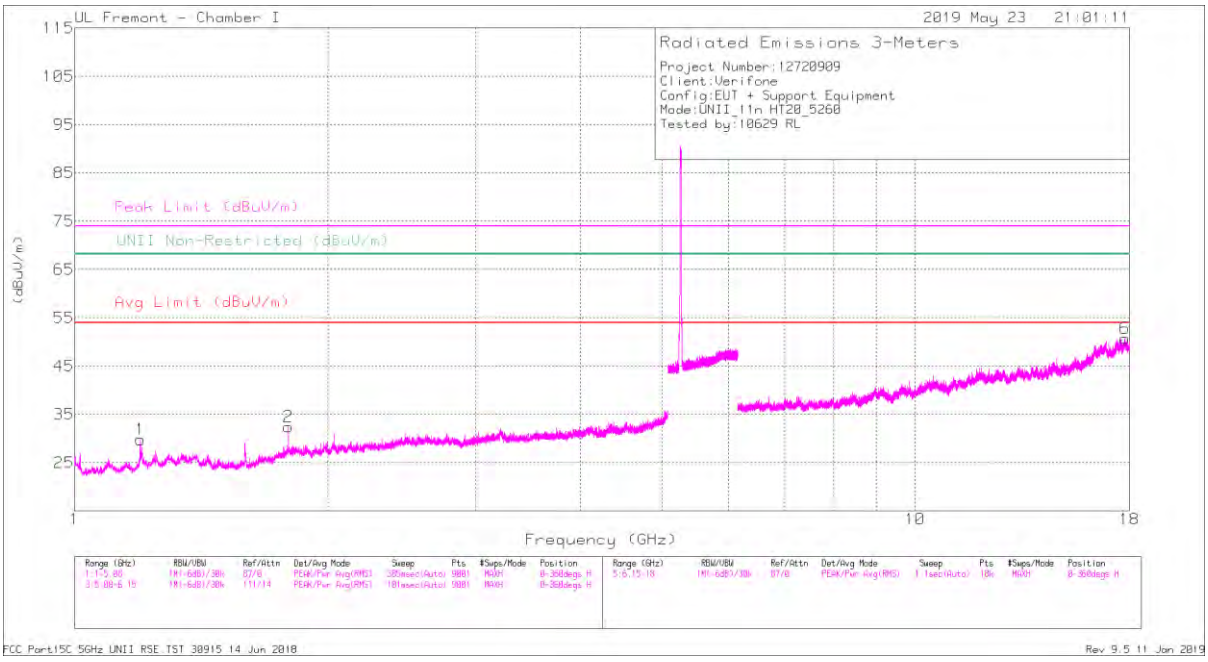
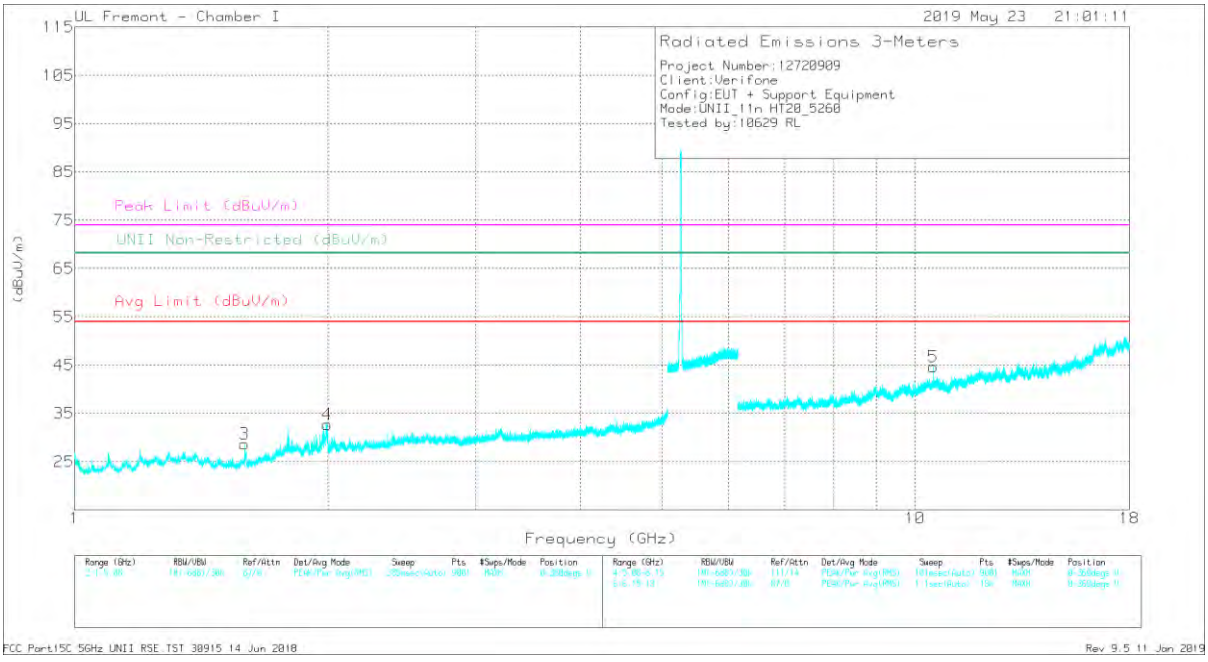
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.2	51.21	PK-U	28.4	-34	0	45.61	-	-	74	-28.39	-	-	0	228	H
	* 1.2	30.02	ADR	28.4	-34	.64	25.06	54	-28.94	-	-	-	-	0	228	H
2	1.801	39.04	PK-U	30.6	-32.7	0	36.94	-	-	-	-	68.2	-31.26	34	125	H
3	* 1.584	39.6	PK-U	28	-33.1	0	34.5	-	-	74	-39.5	-	-	77	199	V
	* 1.591	28.42	ADR	28.1	-33	.64	24.16	54	-29.84	-	-	-	-	77	199	V
4	1.983	38.87	PK-U	30.8	-32.4	0	37.27	-	-	-	-	68.2	-30.93	360	222	V
6	* 17.801	28.35	PK-U	41.8	-10.3	0	59.85	-	-	74	-14.15	-	-	35	375	H
	* 17.781	17.03	ADR	41.7	-10	.64	49.37	54	-4.63	-	-	-	-	35	375	H
5	10.52	31.31	PK-U	37.6	-17	0	51.91	-	-	-	-	68.2	-16.29	179	112	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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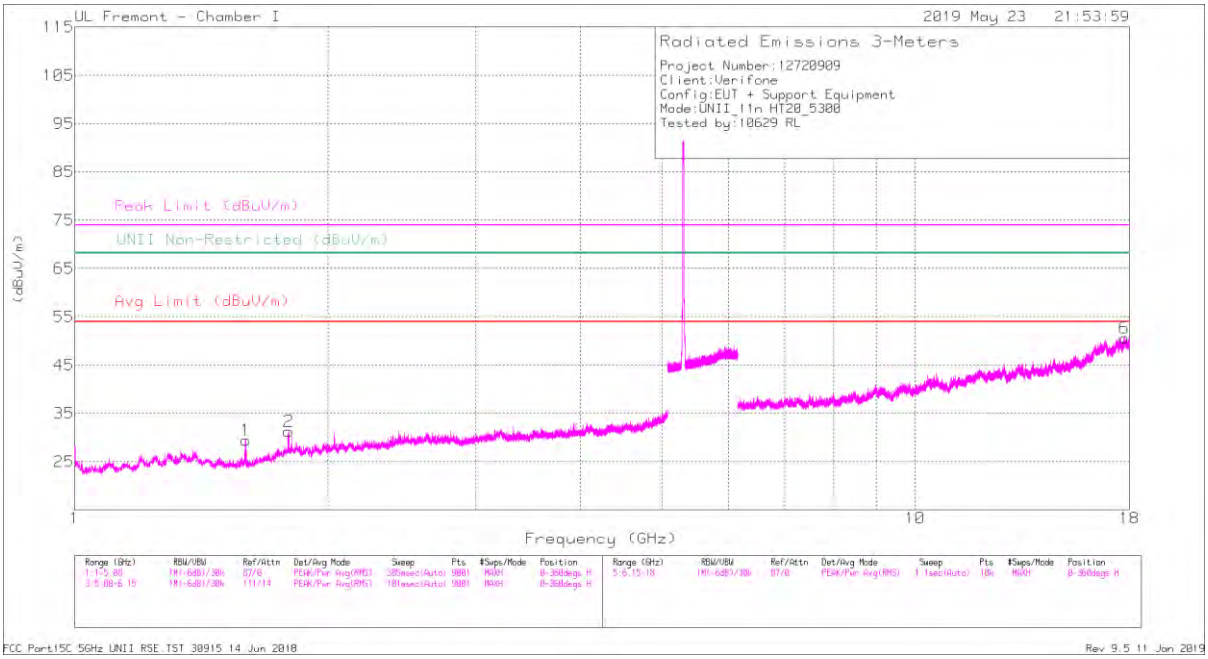
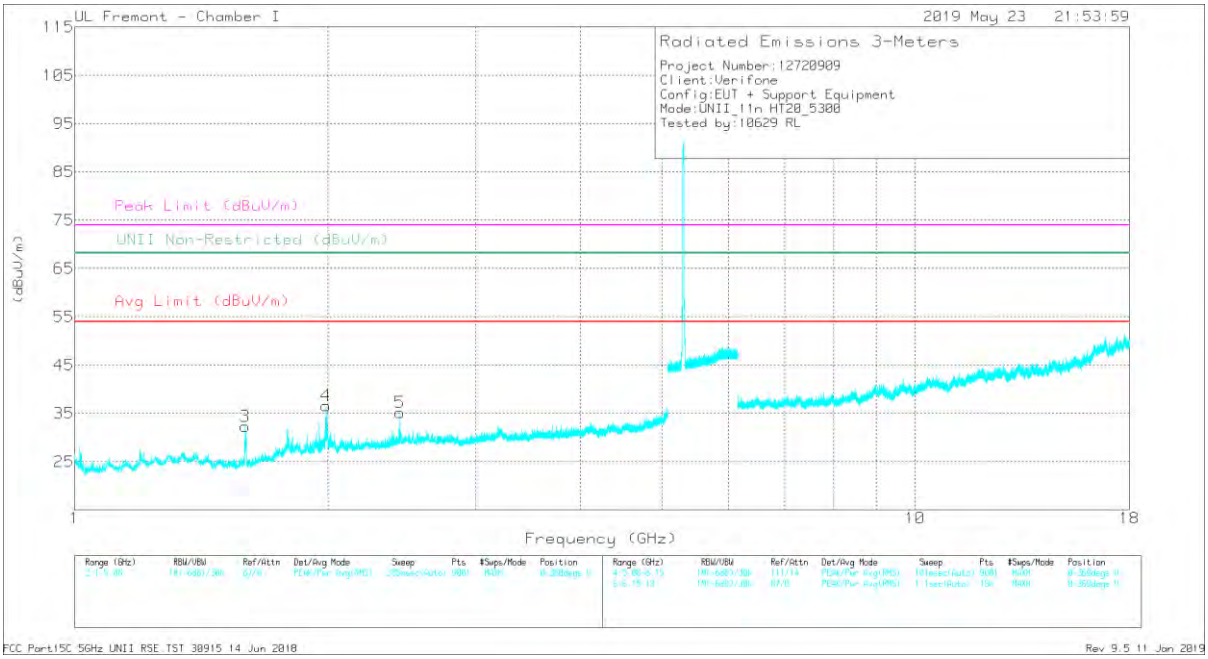
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.598	47.97	PK-U	28	-33.1	0	42.87	-	-	74	-31.13	-	-	305	190	H
	* 1.593	28.85	ADR	28	-33	.64	24.49	54	-29.51	-	-	-	-	305	190	H
2	1.798	48.68	PK-U	30.6	-32.6	0	46.68	-	-	-	-	68.2	-21.52	78	192	H
3	* 1.598	48.7	PK-U	28	-33.1	0	43.6	-	-	74	-30.4	-	-	170	197	V
	* 1.593	30.78	ADR	28.1	-33	.64	26.52	54	-27.48	-	-	-	-	170	197	V
4	1.991	48.41	PK-U	30.9	-32.4	0	46.91	-	-	-	-	68.2	-21.29	338	190	V
5	2.436	42.81	PK-U	32.2	-31.7	0	43.31	-	-	-	-	68.2	-24.89	266	397	V
6	* 17.742	25.75	PK-U	41.7	-10	0	57.45	-	-	74	-16.55	-	-	81	158	H
	* 17.744	15.95	ADR	41.7	-10	.64	48.29	54	-5.71	-	-	-	-	81	158	H

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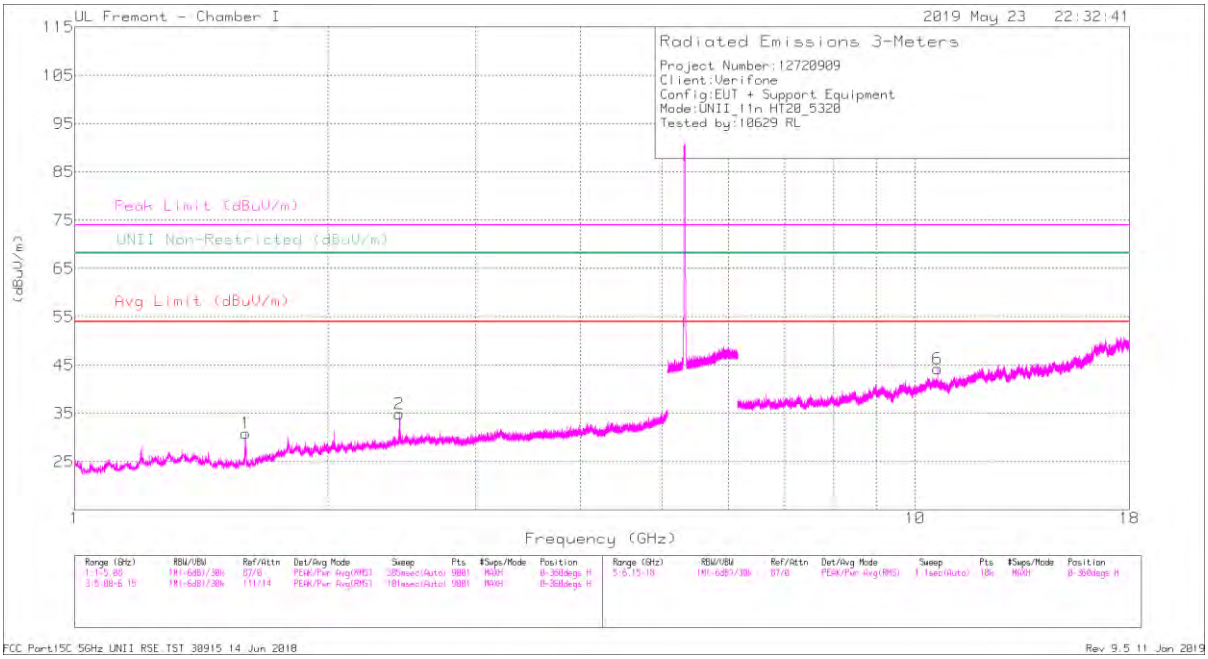
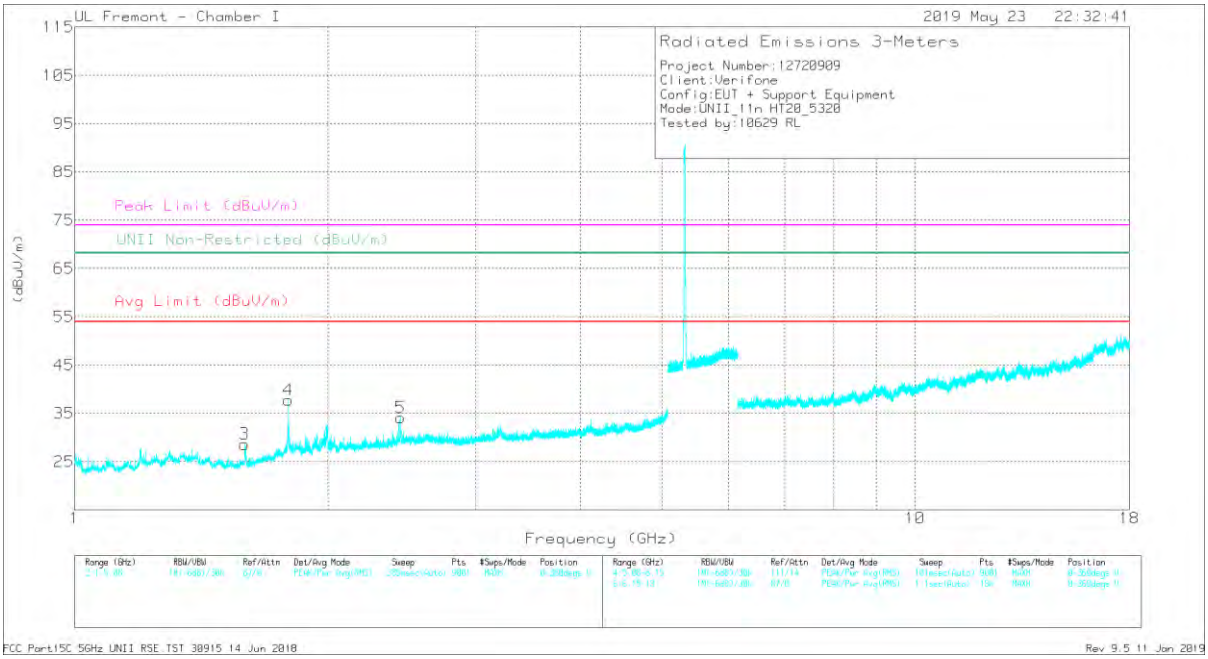
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.594	47.3	PK-U	28	-33	0	42.3	-	-	74	-31.7	-	-	308	177	H
	* 1.597	29.74	ADR	28	-33.1	.64	25.28	54	-28.72	-	-	-	-	308	177	H
2	2.445	42.17	PK-U	32.2	-31.7	0	42.67	-	-	-	-	68.2	-25.53	234	238	H
3	* 1.6	47.91	PK-U	28	-33	0	42.91	-	-	74	-31.09	-	-	165	116	V
	* 1.594	29.06	ADR	28	-33	.64	24.7	54	-29.3	-	-	-	-	165	116	V
4	1.783	40.04	PK-U	30.4	-32.6	0	37.84	-	-	-	-	68.2	-30.36	28	205	V
5	2.432	45.11	PK-U	32.2	-31.7	0	45.61	-	-	-	-	68.2	-22.59	189	127	V
6	* 10.64	29.7	PK-U	37.8	-16.3	0	51.2	-	-	74	-22.8	-	-	289	109	H
	* 10.64	19.17	ADR	37.8	-16.3	.64	41.31	54	-12.69	-	-	-	-	289	109	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
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