CERTIFICATION TEST REPORT

Report Number. : 12795814-E3V1

Applicant	:	DISH TECHNOLOGIES LLC 9601 MERIDIAN BLVD ENGLEWOOD, CO, 80112
Model	:	AIRTV 2
FCC ID	:	DKN-ATV2
EUT Description	:	OVER THE AIR TV STREAMING DEVICE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
May 10, 2019

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
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NVLAP Lab code: 200065-0

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	5/10/2019	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: DISH TECHNOLOGIES LLC
9601 MERIDIAN BLVD
ENGLEWOOD, CO 80112

EUT DESCRIPTION: Over the Air TV Streaming Device

MODEL: AIRTV 2

SERIAL NUMBER: R5KWMF00396B (Radiated)
R5KWMF00367B (Conducted)

DATE TESTED: APRIL 11, 2019 –MAY 10, 2019

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	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
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UL Verification Services Inc.

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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 662911 D01 v02r01, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v02r01, FCC KDB 644545 D03 v01, ANSI C63.10-2013, FCC 06-96, FCC KDB 905462 D02 and D03.

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 Rd
☐ 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. Chambers above are covered under Industry Canada company address and respective code

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 EUT is a Over the Air TV streaming device.

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, 2TX			
5180-5240	802.11n HT20	6.29	4.26
5190-5230	802.11n HT40	7.07	5.09
5210	802.11ac VHT80	9.96	9.91

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 2TX			
5745-5825	802.11n HT20	14.78	30.06
5755-5795	802.11n HT40	14.70	29.51
5775	802.11ac VHT80	13.03	20.09

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an embedded antenna, with a maximum gain of 3.3 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was LPP-0.1

The test utility software used during testing was the Marvel Labtool.

5.5. WORST-CASE CONFIGURATION AND MODE

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

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The fundamental of the EUT was tested at normal operation on the Y-axis position.

11a mode is covered by 11n HT20 mode since it has the same power or lower than 11n HT20. Radiated harmonics spurious were performed with the EUT set at the 2TX CDD mode with power setting equal or higher than SISO modes as the worst-case scenario.

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

802.11n HT20mode: MCS8
802.11n HT40mode: MCS8
802.11ac VHT80 mode: MCS0

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5.6. DESCRIPTION OF TEST SETUP

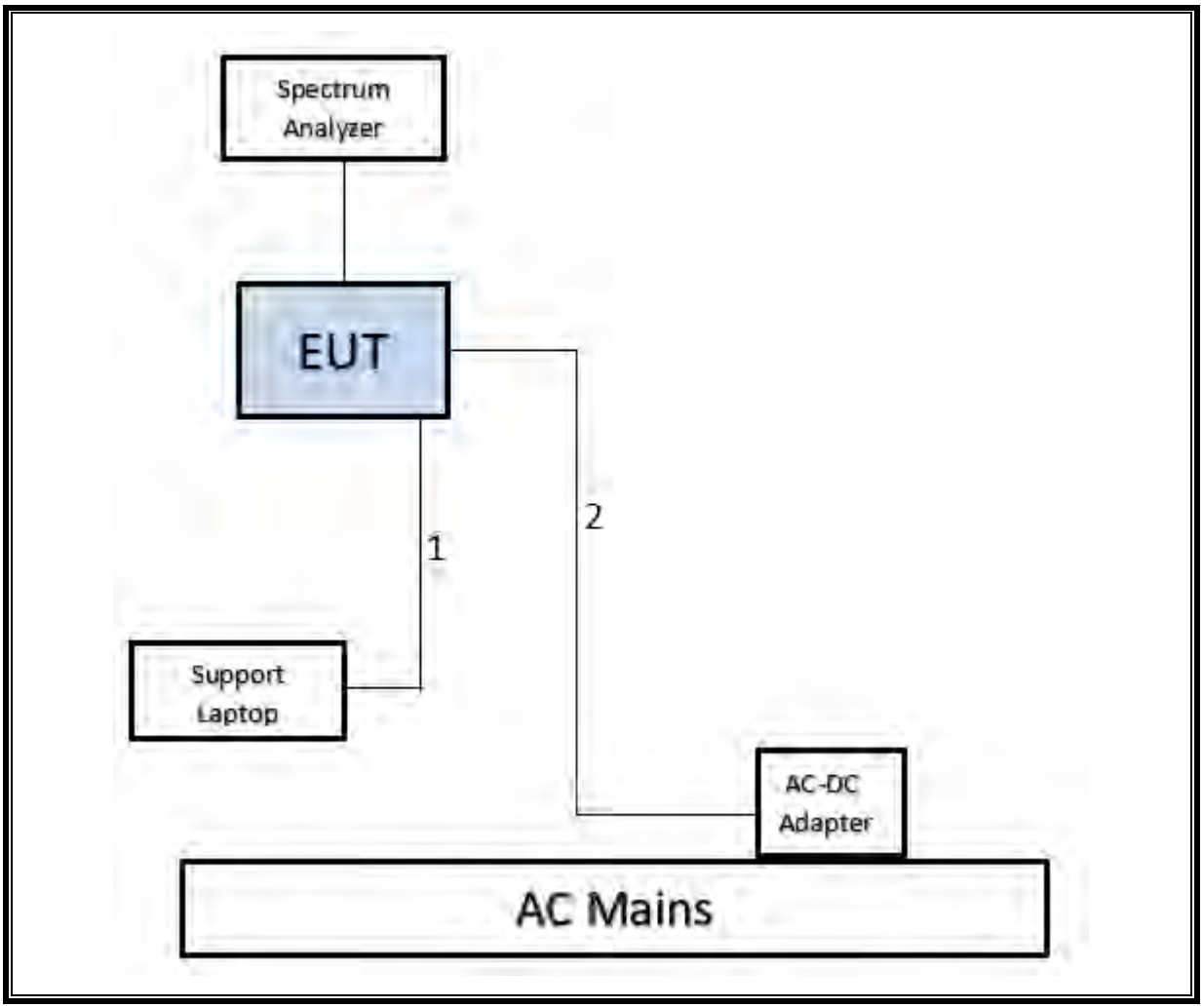
SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter to EUT	LITEON	PB-1190-6ES1	ETC1832001874	N/A
Laptop	HP	EliteBook 8470p	CNU342CP7Y	N/A
AC Adapter to Laptop	HP	PA-1650-32HJ	N/A	N/A

I/O CABLES (CONDUCTED, RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Ethernet	1	Ethernet	Un-shielded	2	Laptop to EUT
2	AC	1	AC	Un-shielded	1.5	Laptop to EUT

CONDCUTED TEST SETUP DIAGRAM



TEST SETUP

For conducted tests, the EUT was connected to a laptop. The test software exercises the radio.

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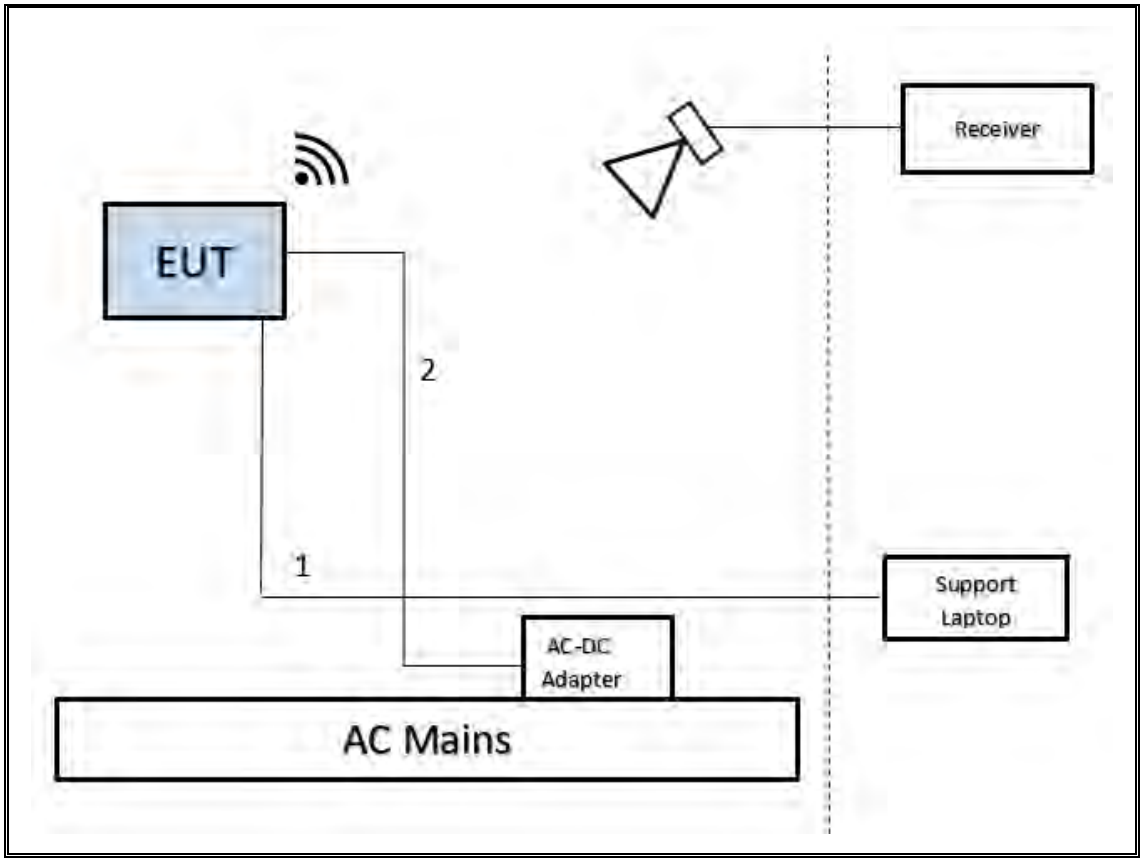
RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



TEST SETUP

For radiated tests: EUT is connected to a charger. The test software exercises the radio.

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 was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1265	01/29/2020	01/29/2019
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T1227	02/05/2020	02/05/2019
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179465	05/22/2019	05/22/2018
Antenna, Passive Loop 100kHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179467	05/22/2019	05/22/2018
Amplifier, 100kHz to 1GHz, 32 dB	Sonoma Instrument	310	PRE0180714	05/31/2019	05/31/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T862	05/25/2019	05/25/2018
Amplifier, 1 to18GHz	MITEQ	AFS42-00101800-25-S-42	PRE018078	08/01/2019	08/01/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	PRE0189055	04/20/2020	04/20/2018
Amplifier, 1 to18GHz	AMPLICAL	AMP1G18-35	T1571	07/30/2019	07/30/2018
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	04/30/2019	04/30/2018
Amplifier, 1 to18GHz, 35dB	AMOLICAL	AMP1G18-35	T1569	06/03/2019	06/03/2018
Hybrid Antenna, 30MHz to 3GHz	SunAR rf motion	JB3	PRE0184971	11/13/2019	11/13/2018
Amplifier, 100kHz to 1GHz, 32 dB	Sonoma Instrument	310	PRE0180175	07/09/2019	07/09/2018
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	PRE0182188	08/29/2019	08/29/2018
Pre-Amp, 1-26.5GHz	Amplical	AMP18G26.5-60	PRE0181238	05/01/2020	05/01/2019
Antenna, Horn 26 to 40GHz	ARA	MWH-2640	T90	09/11/2019	09/11/2018
Pre-Amp, 26-40GHz	Amplical	AMP26G40-60	PRE0181238	05/01/2020	05/01/2019
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179367	02/14/2020	02/14/2019
EMI Test Receiver	Rohde&Schwarz	ESW44	PRE0179372	02/16/2020	02/16/2019
EMI Test Receiver	Rohde&Schwarz	ESW44	PRE0179377	02/15/2020	02/15/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T908	01/23/2020	01/23/2019
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	01/24/2020	01/24/2019
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 789033 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)
802.11n HT20	3.083	3.184	0.968	96.83%	0.14	0.324
802.11n HT40	2.389	2.490	0.959	95.94%	0.18	0.419
802.11ac VHT80	1.171	1.272	0.921	92.06%	0.36	0.854

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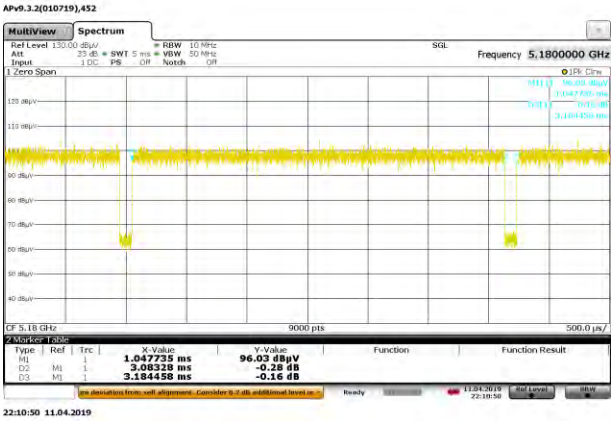
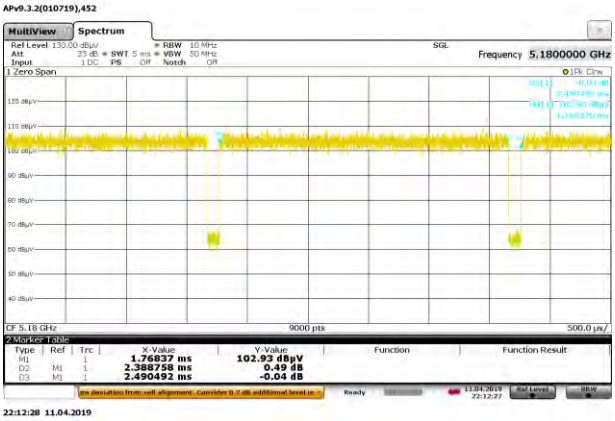
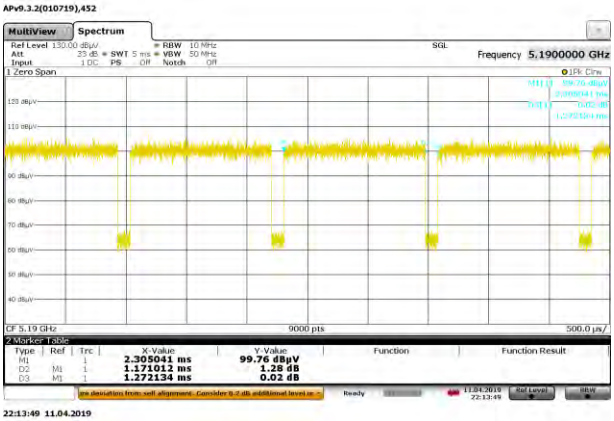
DUTY CYCLE PLOTS



DUTY CYCLE 802.11n HT20



DUTY CYCLE 802.11n HT40



DUTY CYCLE 802.11ac VHT80

8.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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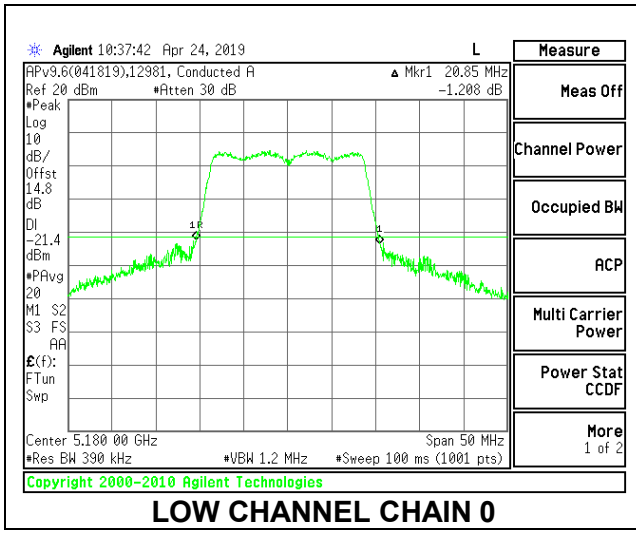
8.2.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

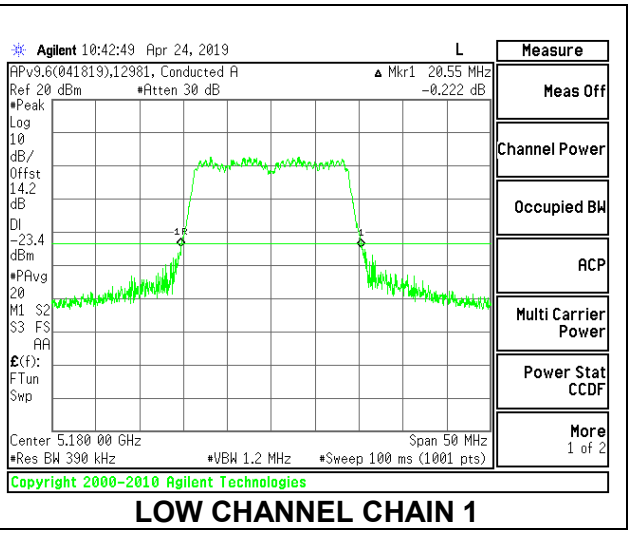
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Antenna 1 (MHz)	26 dB Bandwidth Antenna 2 (MHz)
Low	5180	20.85	20.55
Mid	5200	20.75	20.50
High	5240	20.60	20.55

LOW CHANNEL

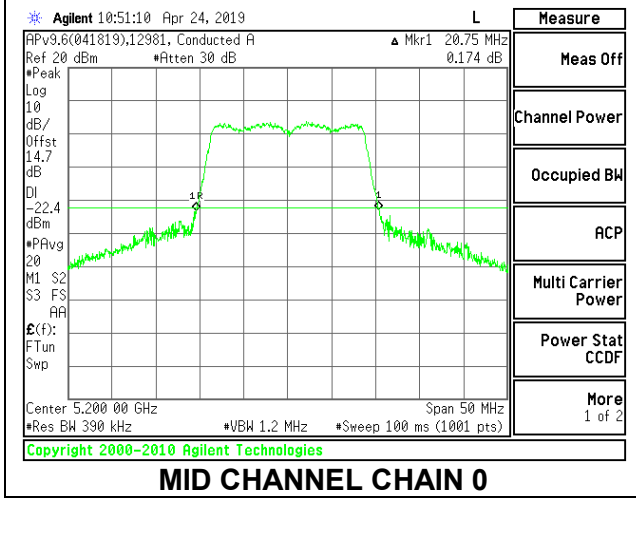


LOW CHANNEL CHAIN 0



LOW CHANNEL CHAIN 1

MID CHANNEL



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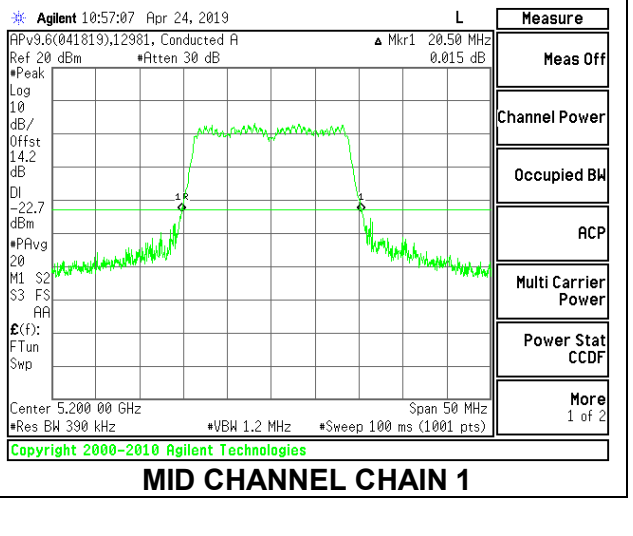
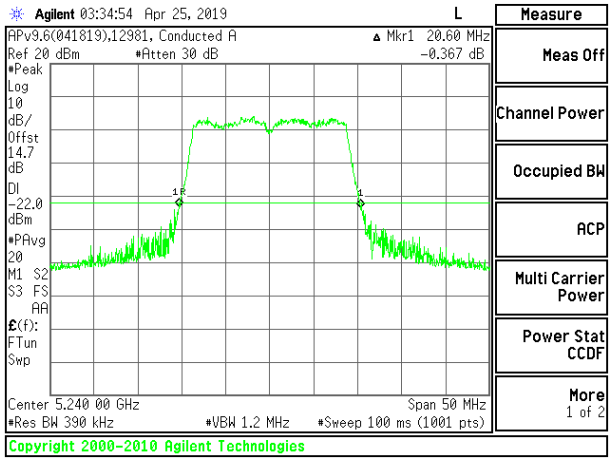
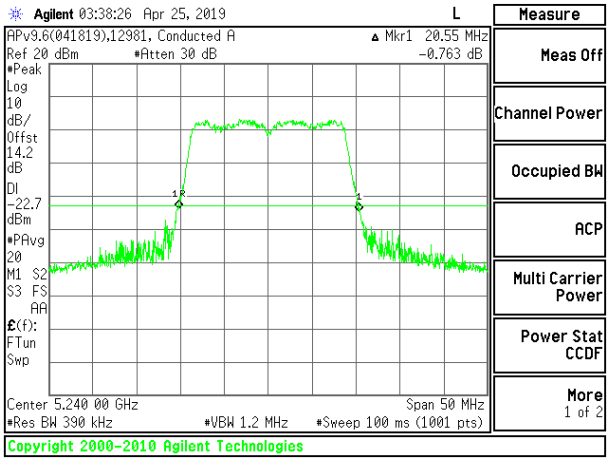


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



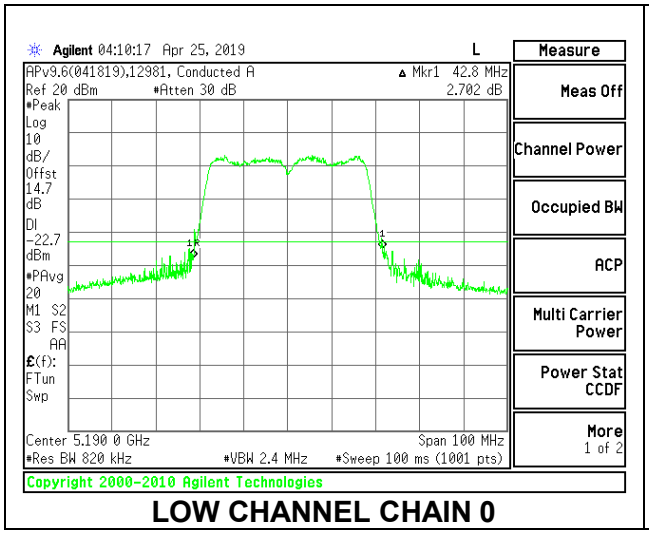
HIGH CHANNEL CHAIN 1

8.2.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

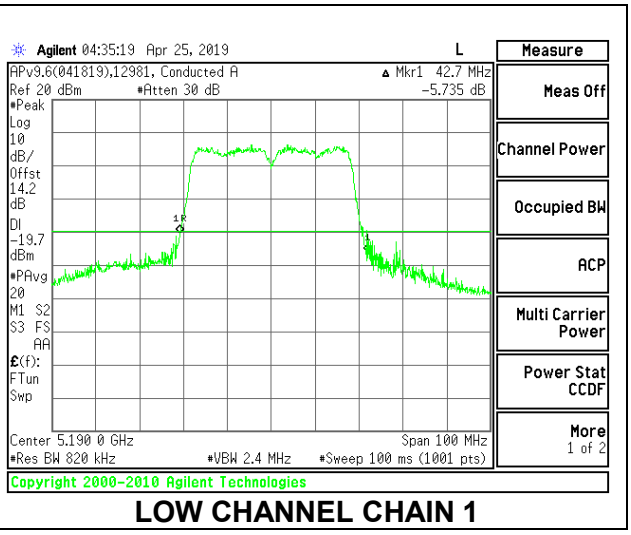
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5190	42.80	42.70
High	5230	42.90	42.20

LOW CHANNEL

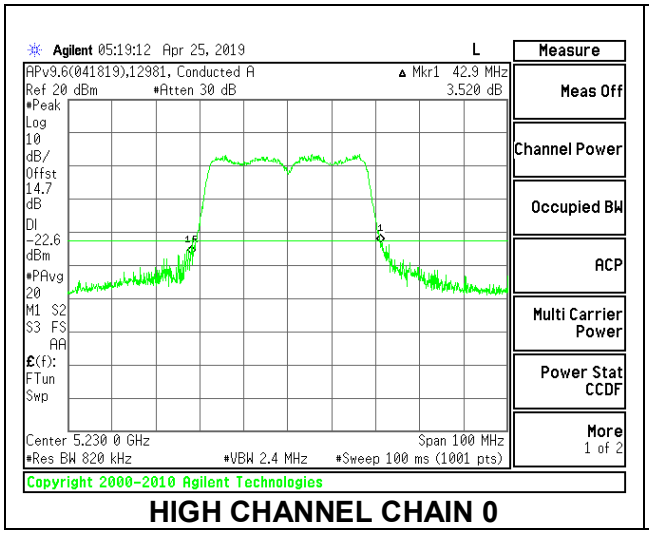


LOW CHANNEL CHAIN 0

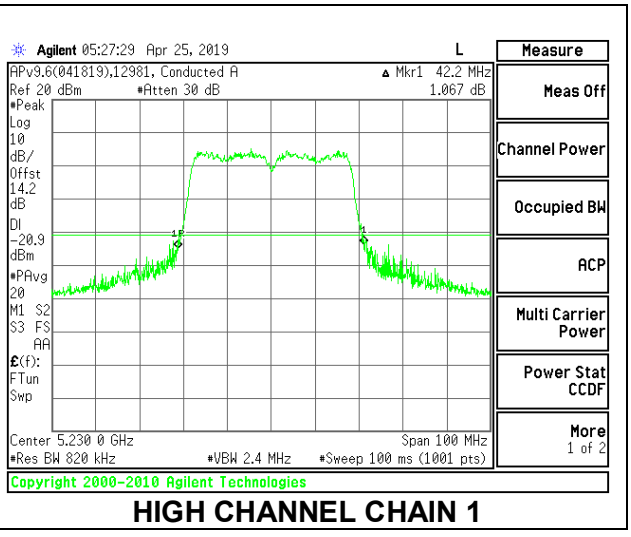


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



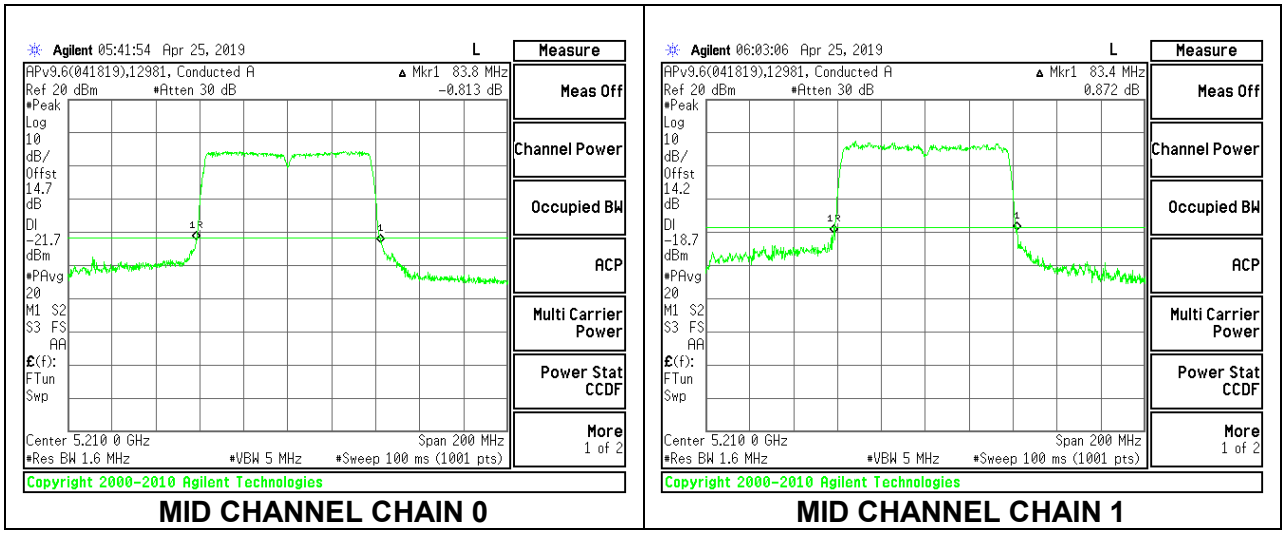
HIGH CHANNEL CHAIN 1

8.2.3. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5210	83.80	83.40

MID CHANNEL



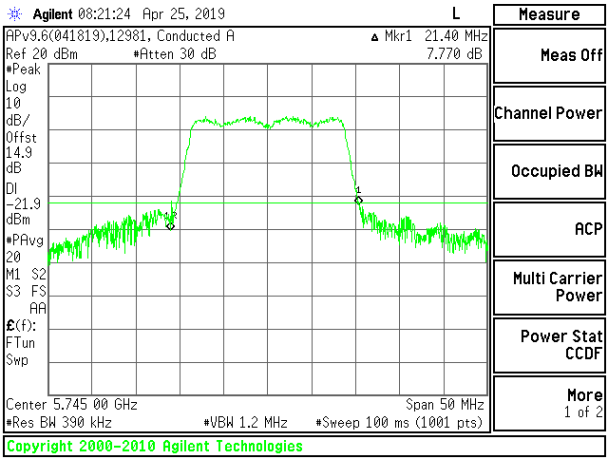
MID CHANNEL CHAIN 0 **MID CHANNEL CHAIN 1**

8.2.4. 802.11n HT20 MODE IN THE 5.8 GHz BAND

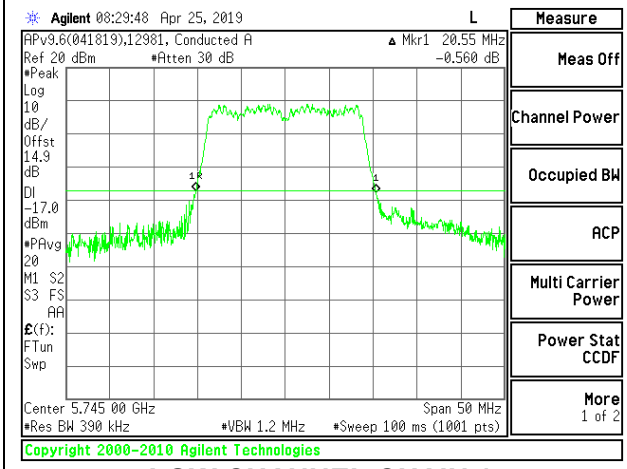
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5745	21.40	20.55
Mid	5785	20.80	20.45
High	5825	21.25	20.50

LOW CHANNEL

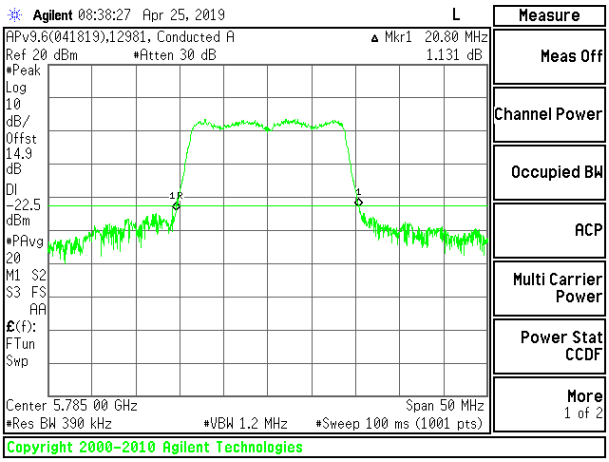


LOW CHANNEL CHAIN 0

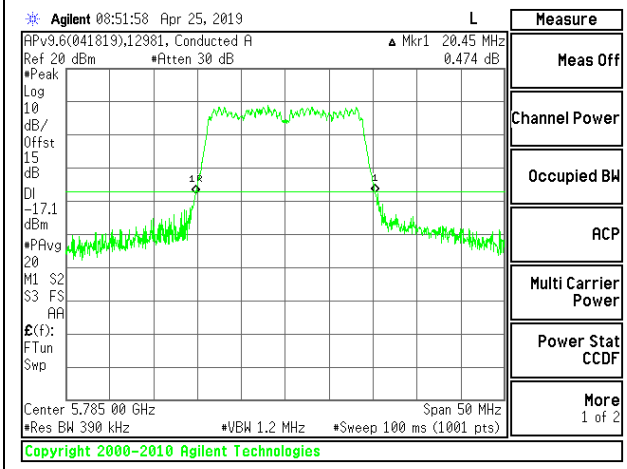


LOW CHANNEL CHAIN 1

MID CHANNEL

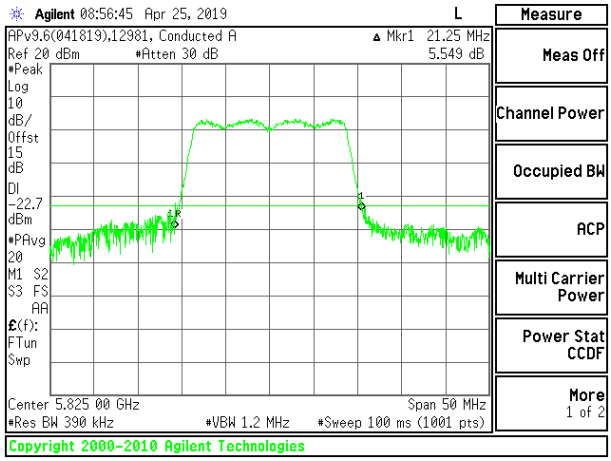


MID CHANNEL CHAIN 0

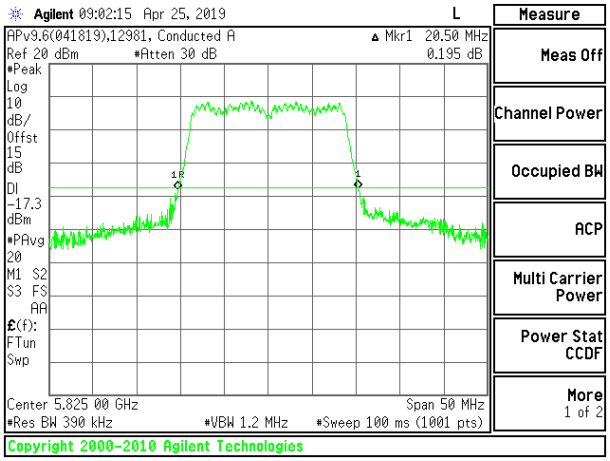


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



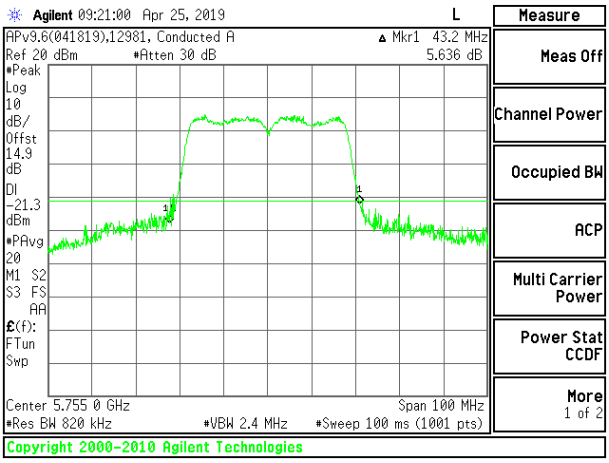
HIGH CHANNEL CHAIN 1

8.2.5. 802.11n HT40 MODE IN THE 5.8 GHz BAND

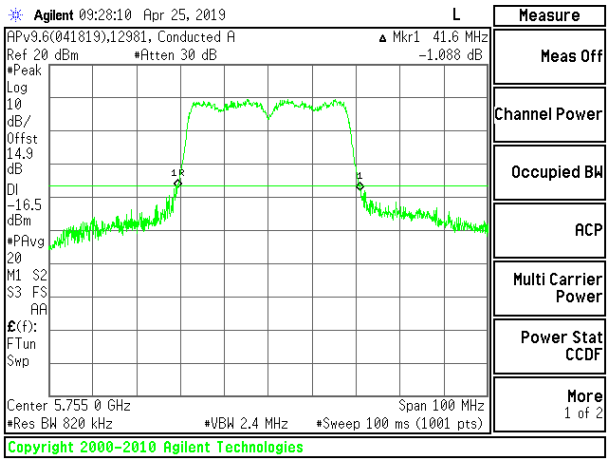
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Low	5755	43.20	41.60
High	5795	44.50	41.40

LOW CHANNEL

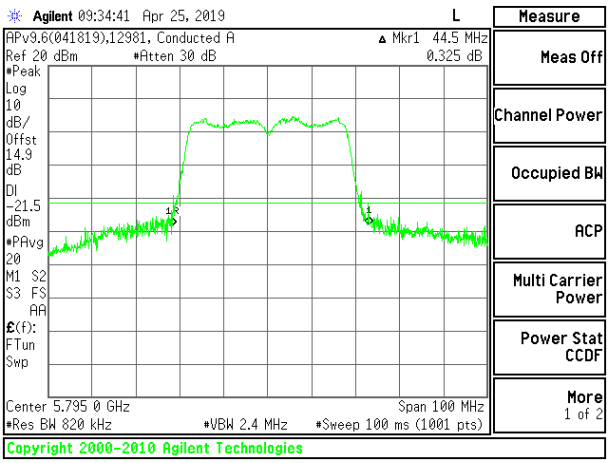


LOW CHANNEL CHAIN 0

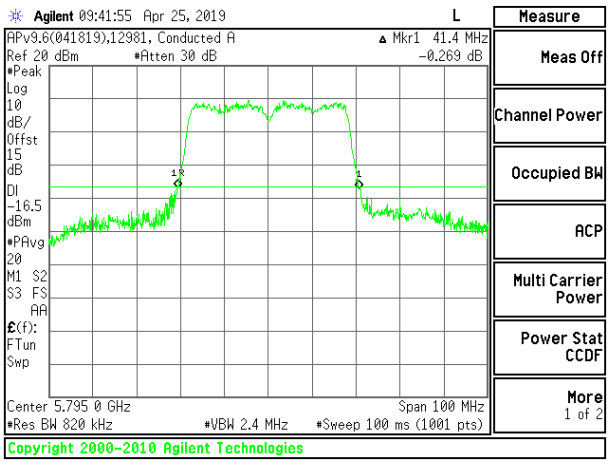


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



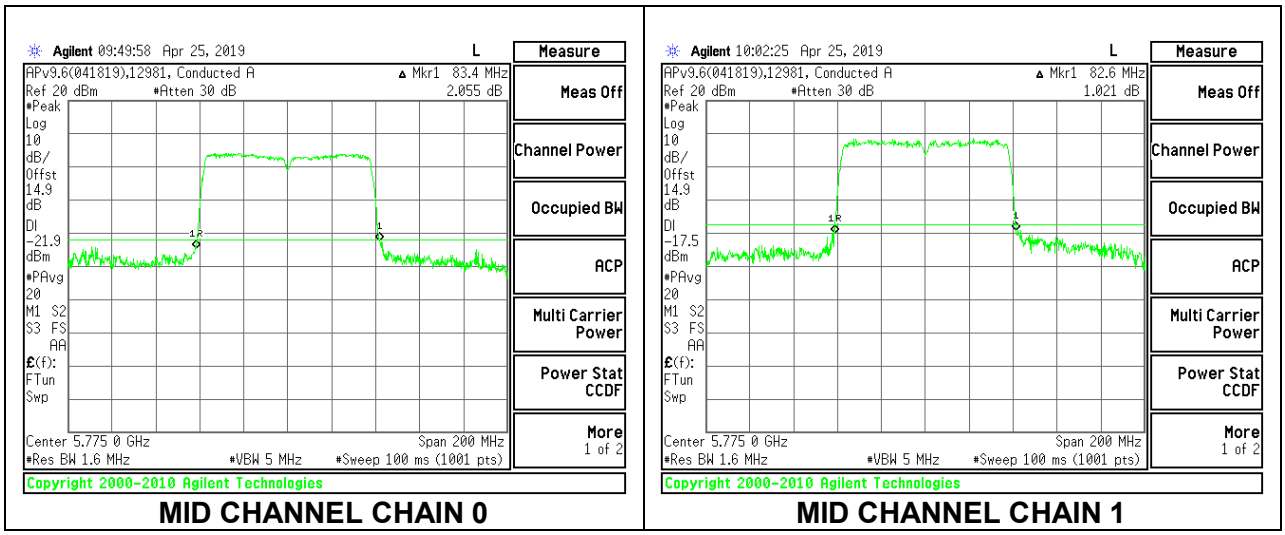
HIGH CHANNEL CHAIN 1

8.2.6. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	26 dB Bandwidth Chain 0 (MHz)	26 dB Bandwidth Chain 1 (MHz)
Mid	5775	83.40	82.60

MID CHANNEL



MID CHANNEL CHAIN 0 **MID CHANNEL CHAIN 1**

8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

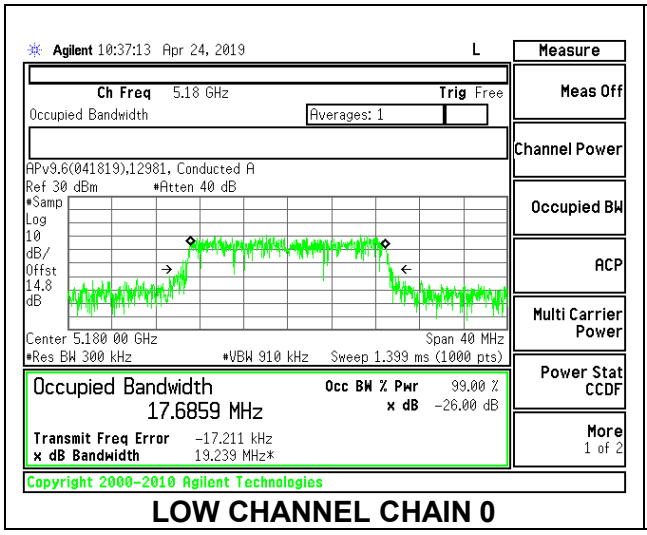
RESULTS

8.3.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

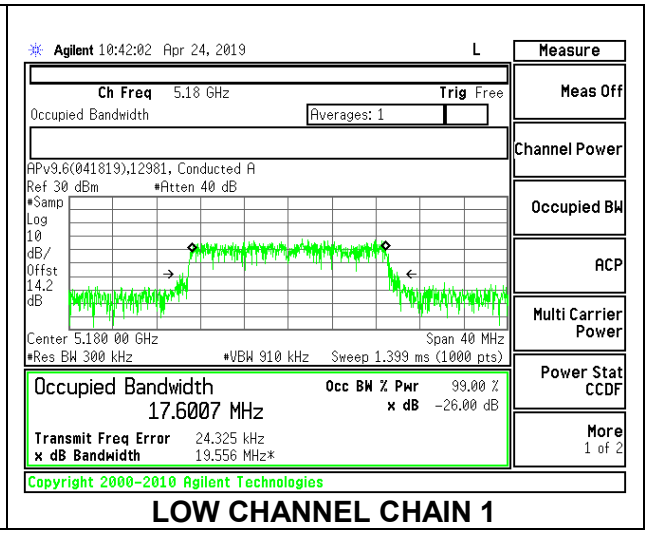
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5180	17.6860	17.6010
Mid	5200	17.6650	17.6900
High	5240	17.6590	17.7550

LOW CHANNEL

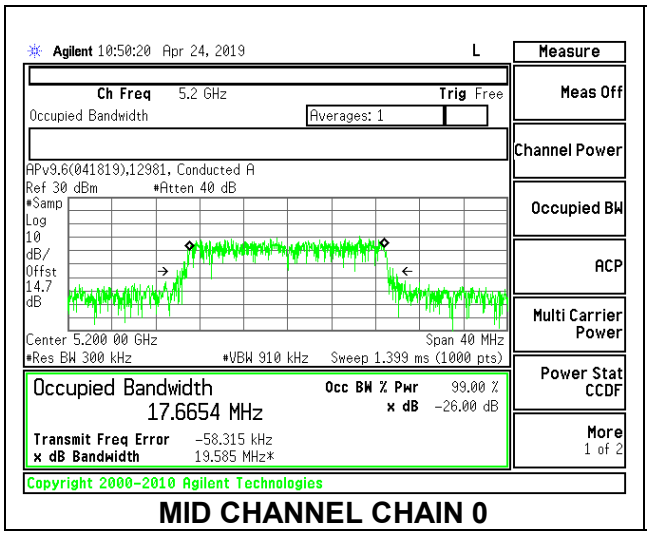


LOW CHANNEL CHAIN 0

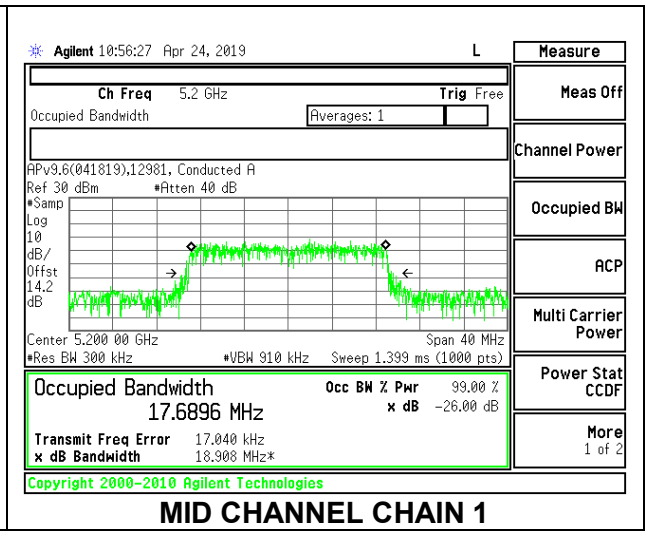


LOW CHANNEL CHAIN 1

MID CHANNEL

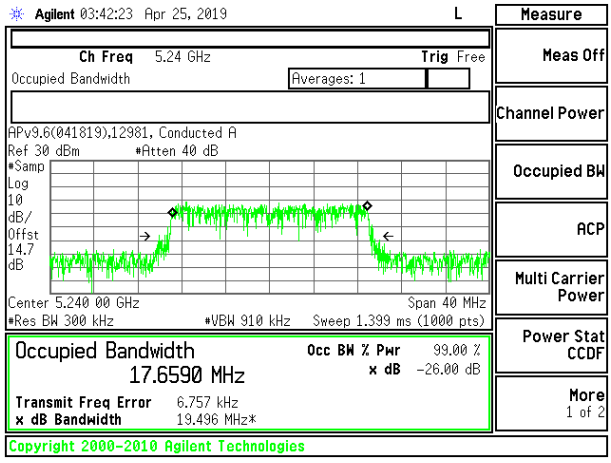


MID CHANNEL CHAIN 0

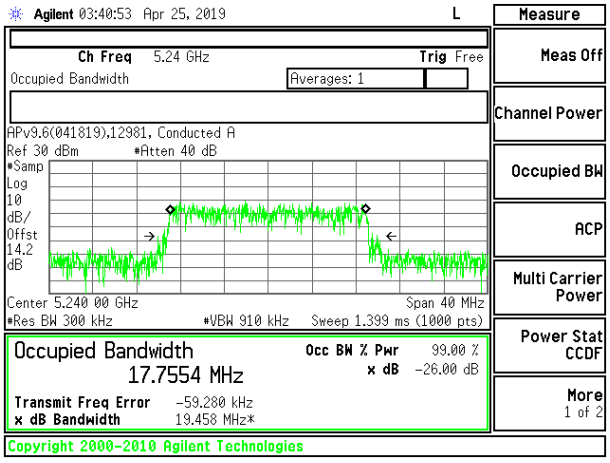


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



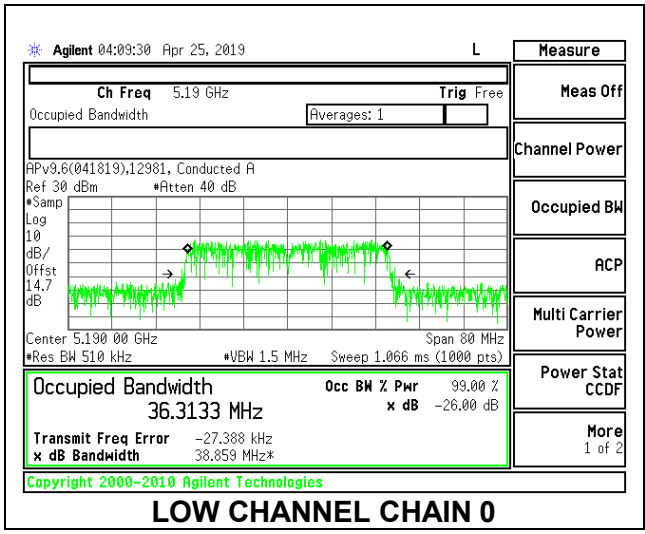
HIGH CHANNEL CHAIN 1

8.3.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

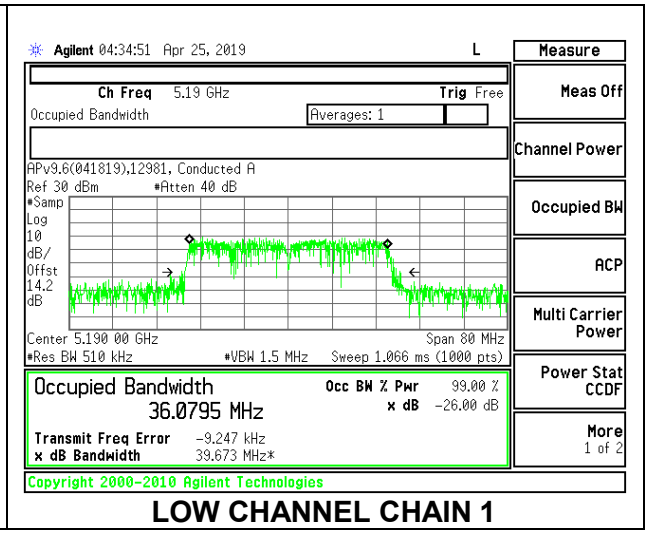
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5190	36.3130	36.0800
High	5230	36.1910	36.0930

LOW CHANNEL

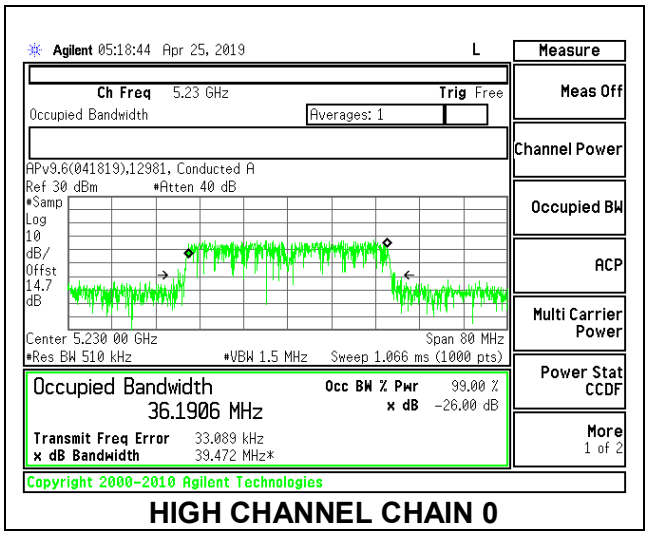


LOW CHANNEL CHAIN 0

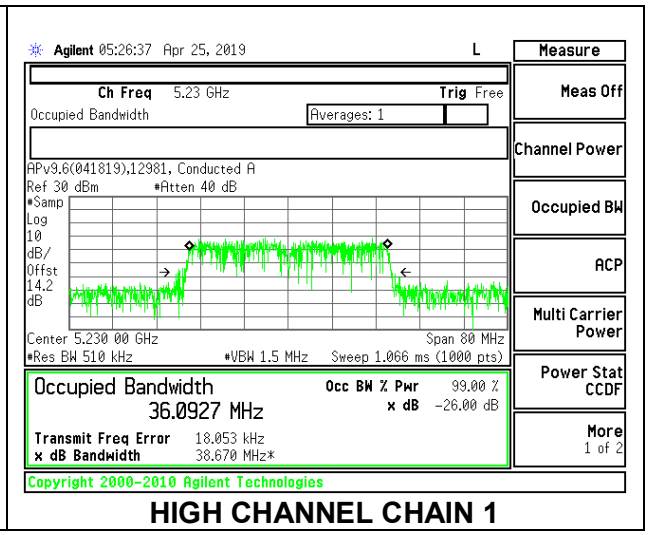


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



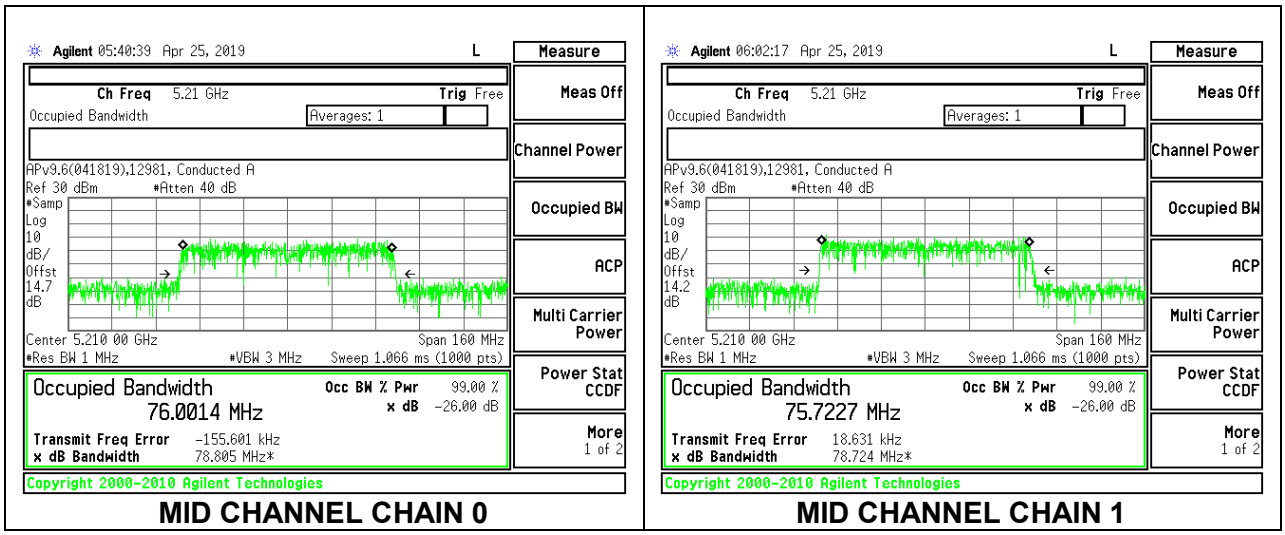
HIGH CHANNEL CHAIN 1

8.3.3. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5210	76.0010	75.7230

MID CHANNEL



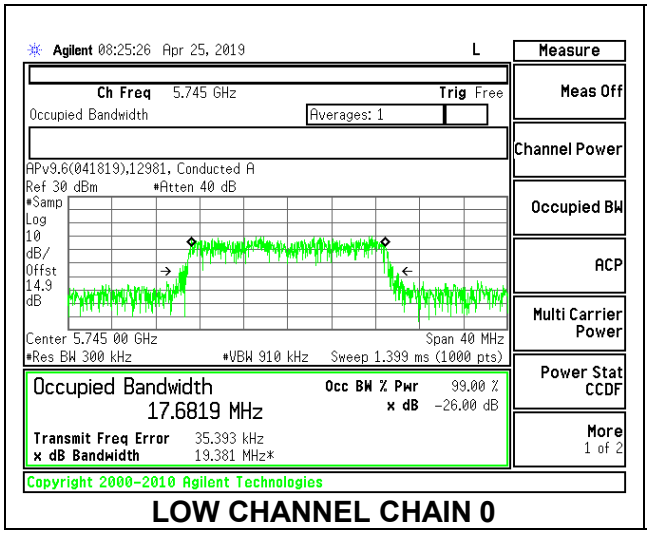
MID CHANNEL CHAIN 0 **MID CHANNEL CHAIN 1**

8.3.4. 802.11n HT20 MODE IN THE 5.8 GHz BAND

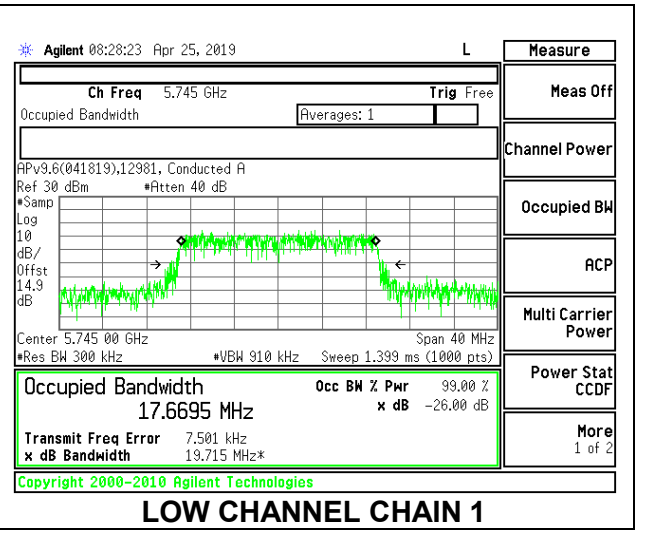
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5745	17.6820	17.6690
Mid	5785	17.6310	17.6760
High	5825	17.7290	17.7530

LOW CHANNEL

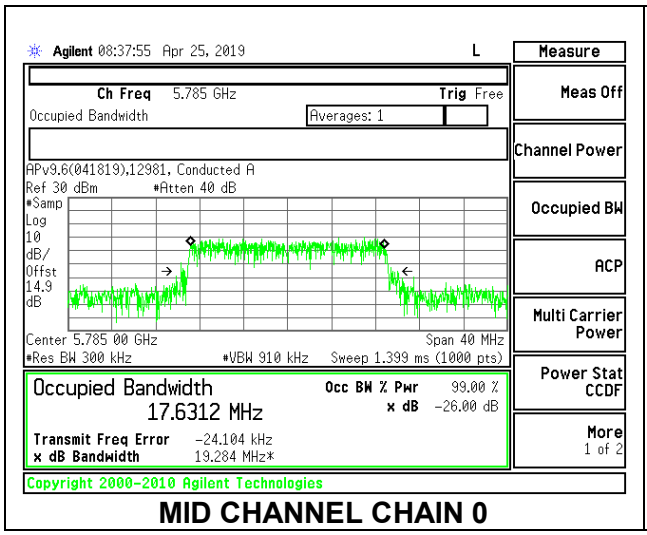


LOW CHANNEL CHAIN 0

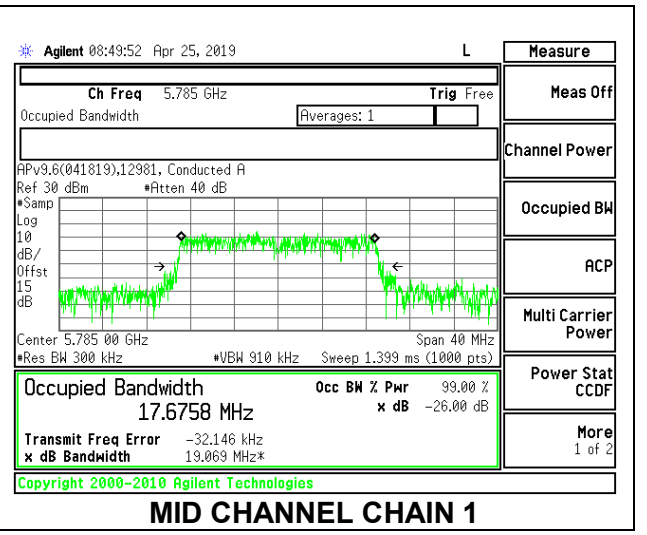


LOW CHANNEL CHAIN 1

MID CHANNEL

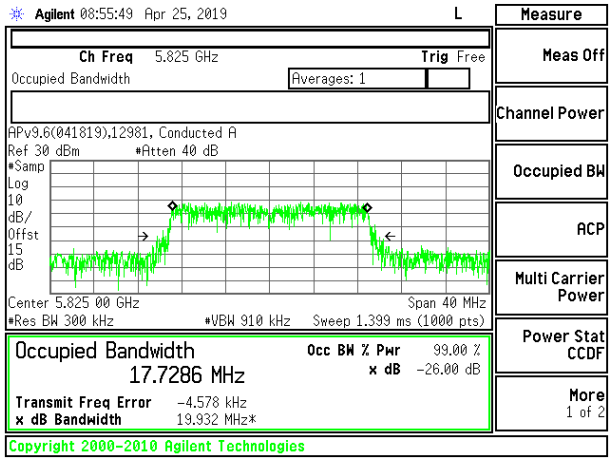


MID CHANNEL CHAIN 0

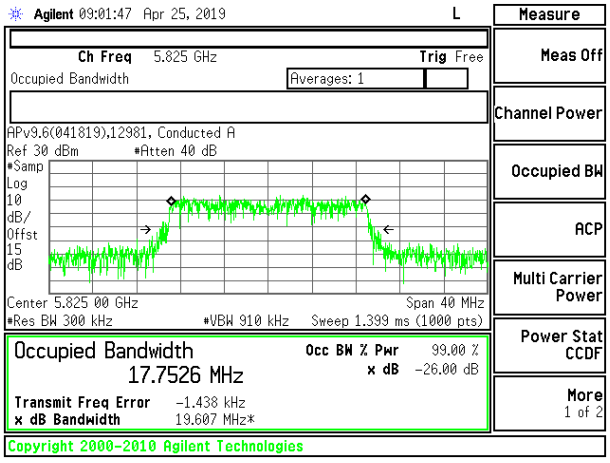


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



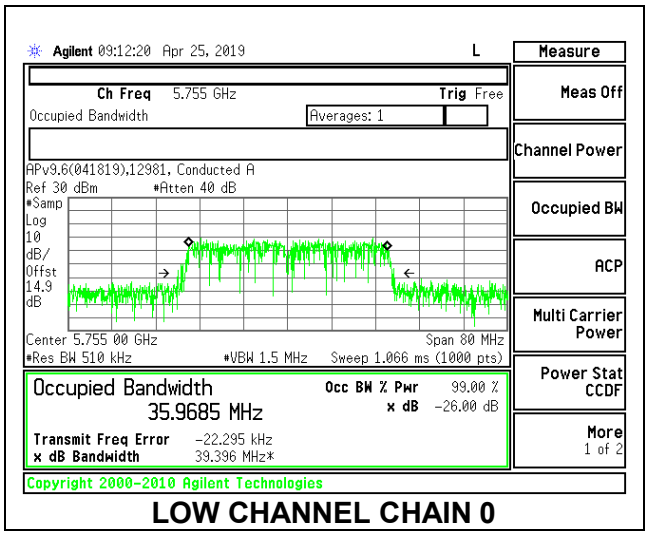
HIGH CHANNEL CHAIN 1

8.3.5. 802.11n HT40 MODE IN THE 5.8 GHz BAND

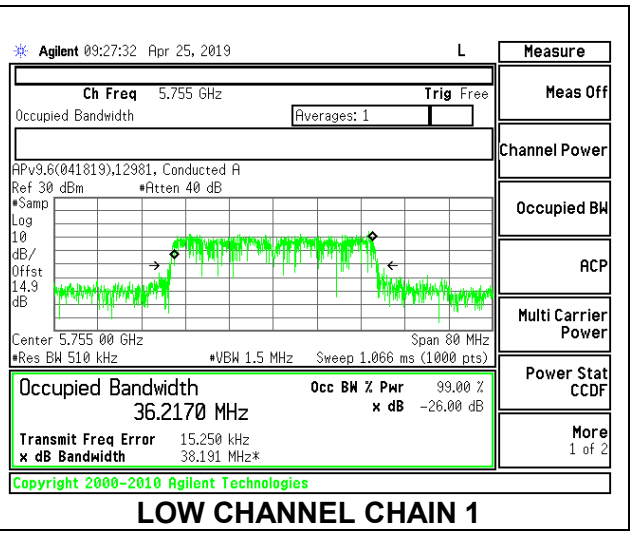
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Low	5755	35.9680	36.2170
High	5795	36.0820	36.2310

LOW CHANNEL

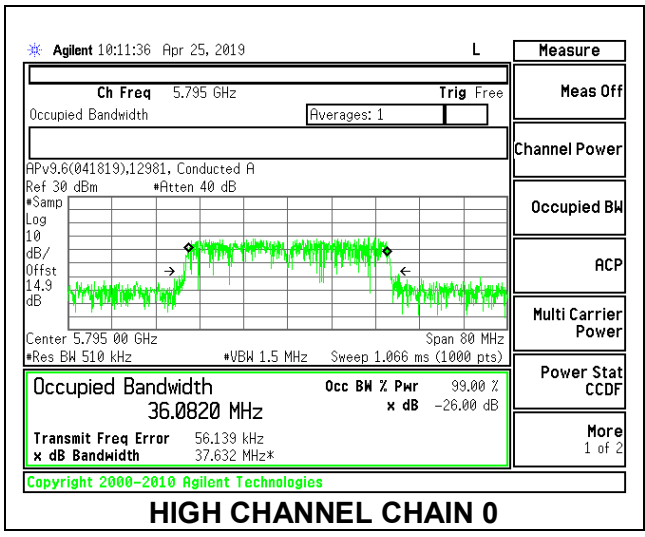


LOW CHANNEL CHAIN 0

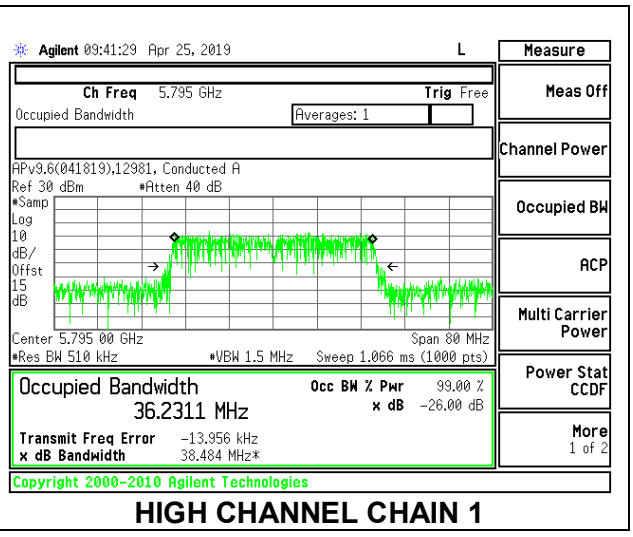


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



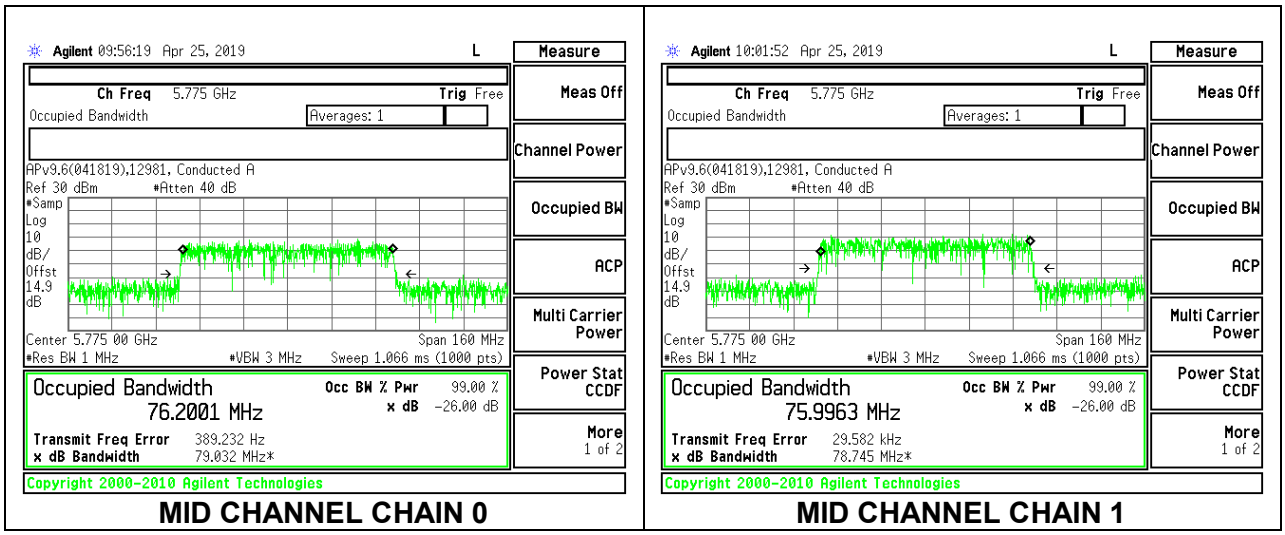
HIGH CHANNEL CHAIN 1

8.3.6. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	99% Bandwidth Chain 0 (MHz)	99% Bandwidth Chain 1 (MHz)
Mid	5775	76.2000	75.9960

MID CHANNEL



MID CHANNEL CHAIN 0 **MID CHANNEL CHAIN 1**

8.4. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

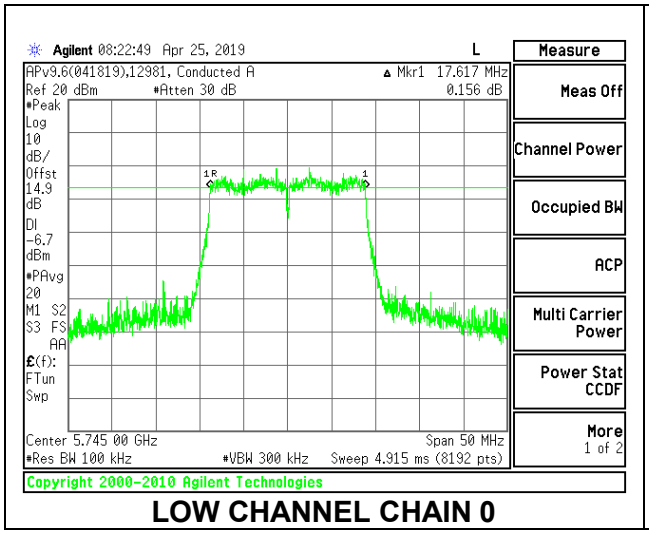
RESULTS

8.4.1. 802.11n HT20 MODE IN THE 5.8 GHz BAND

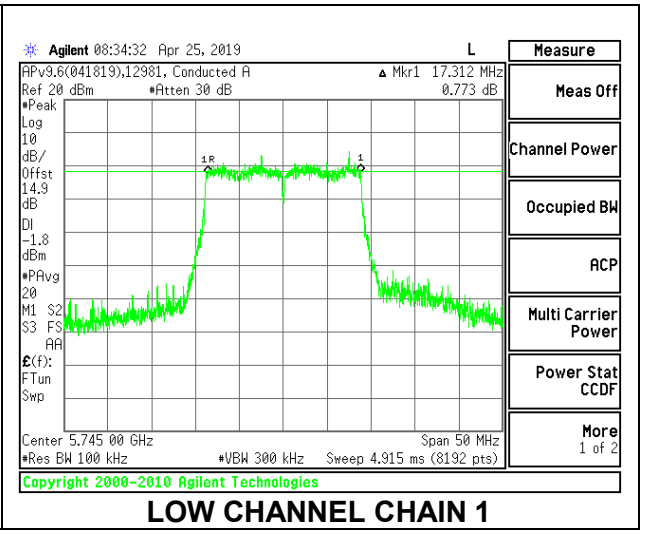
2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5745	17.6170	17.3120	0.5
Mid	5785	17.5860	17.6350	0.5
High	5825	17.5560	17.6840	0.5

LOW CHANNEL

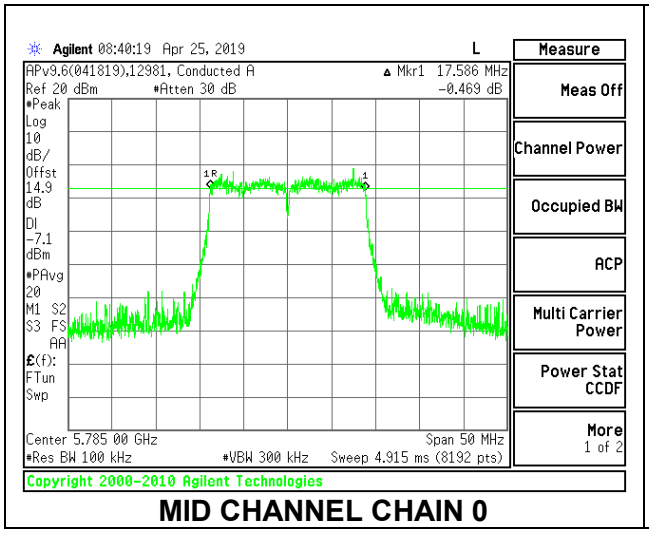


LOW CHANNEL CHAIN 0

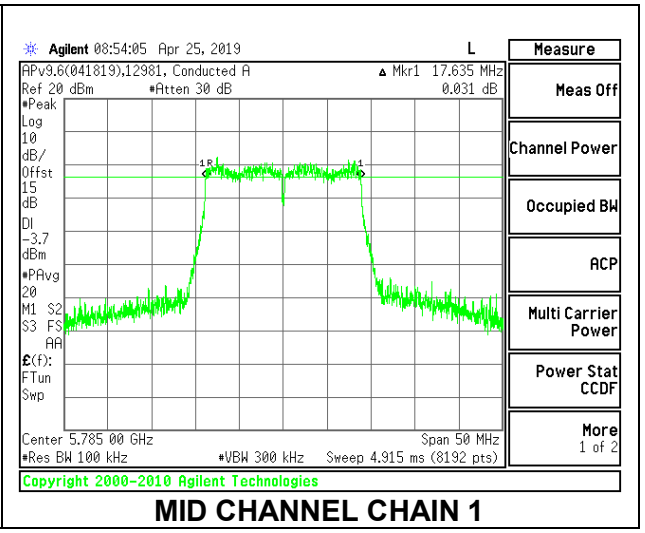


LOW CHANNEL CHAIN 1

MID CHANNEL

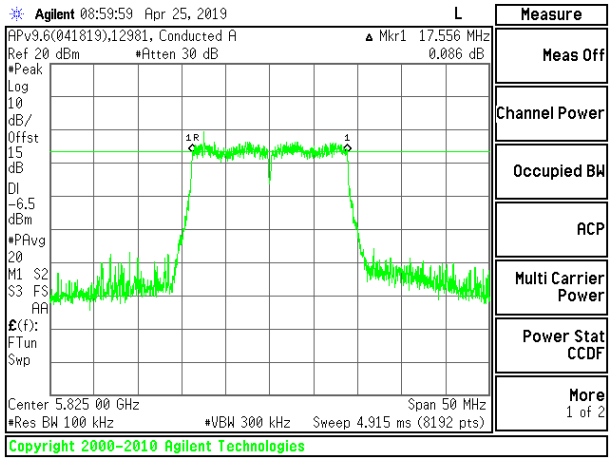


MID CHANNEL CHAIN 0

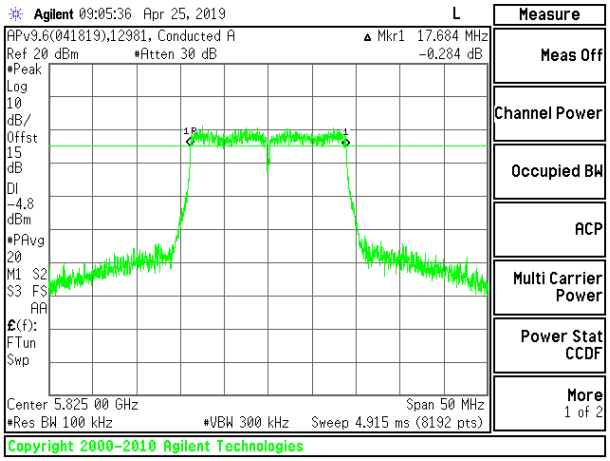


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



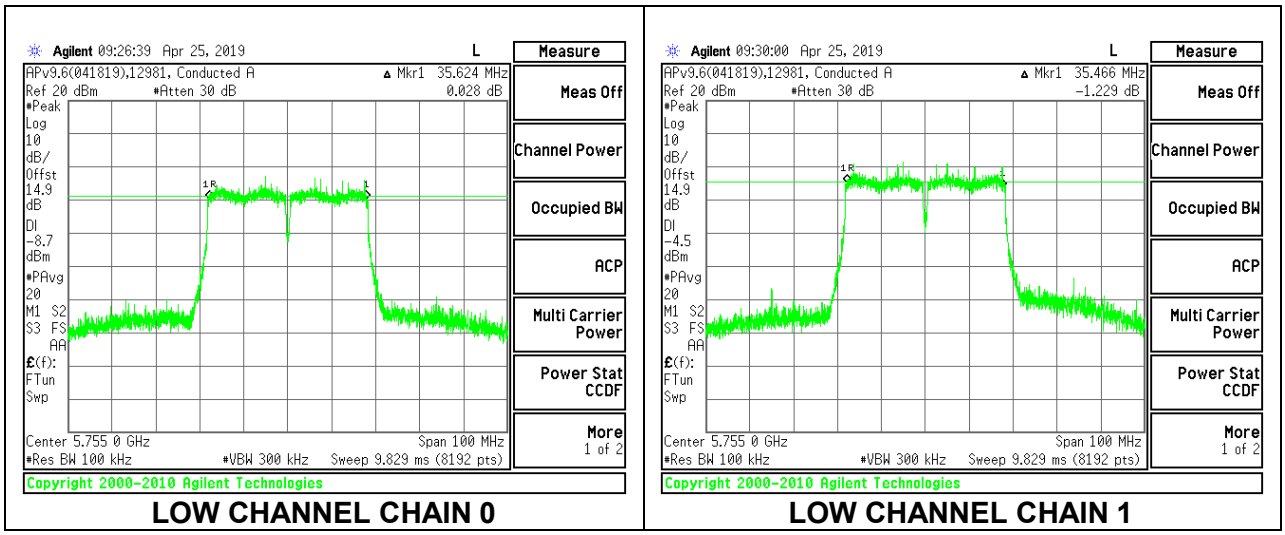
HIGH CHANNEL CHAIN 1

8.4.2. 802.11n HT40 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

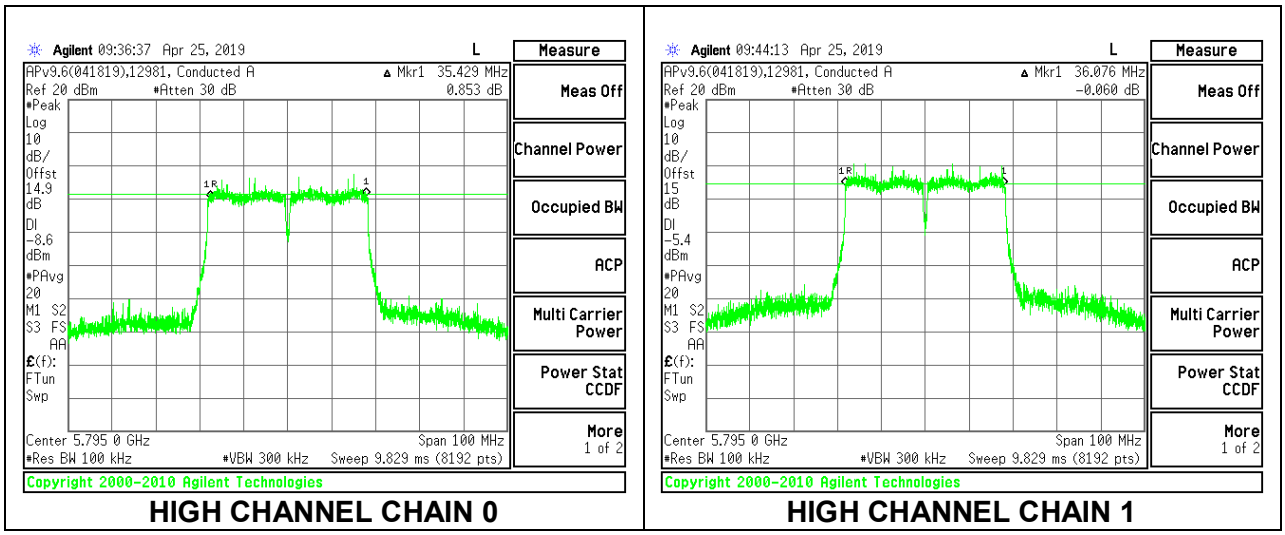
Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Low	5755	35.6240	35.4660	0.5
High	5795	35.4290	36.0760	0.5

LOW CHANNEL



LOW CHANNEL CHAIN 0 **LOW CHANNEL CHAIN 1**

HIGH CHANNEL



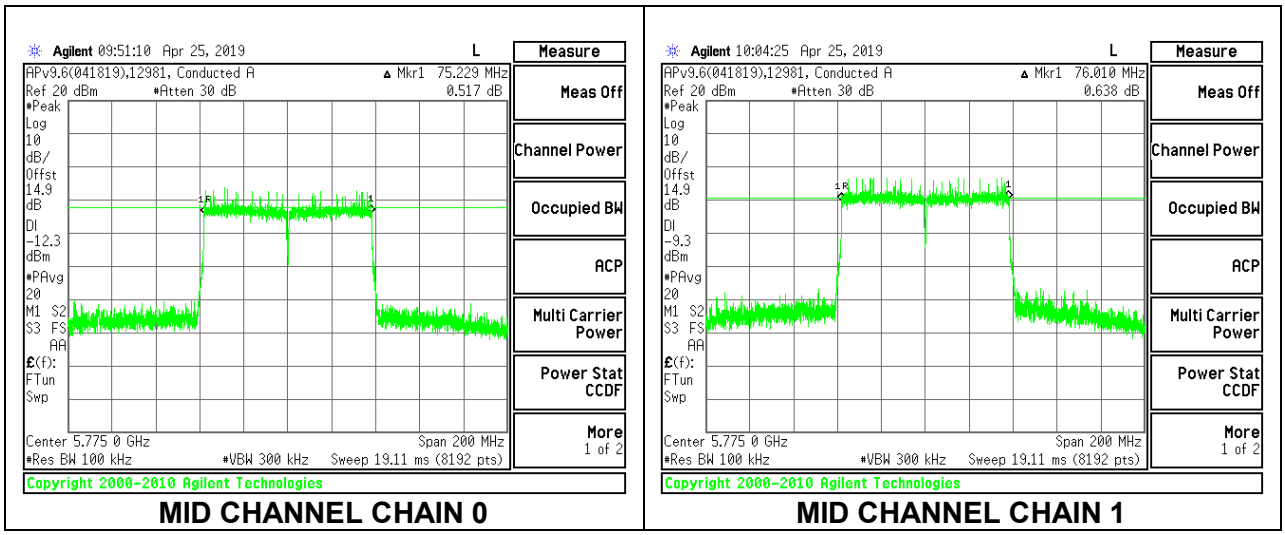
HIGH CHANNEL CHAIN 0 **HIGH CHANNEL CHAIN 1**

8.4.3. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

Channel	Frequency (MHz)	6 dB BW Chain 0 (MHz)	6 dB BW Chain 1 (MHz)	Minimum Limit (MHz)
Mid	5775	75.2290	76.0100	0.5

MID CHANNEL



MID CHANNEL CHAIN 0 **MID CHANNEL CHAIN 1**

8.5. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz

(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.

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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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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

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DIRECTIONAL ANTENNA GAIN

Tx chains are uncorrelated for power and correlated for PSD due to the device supporting CDD in all MIMO modes. The directional gains are as follows:

Band (GHz)	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Uncorrelated Chains Directional Gain (dBi)	Correlated Chains Directional Gain (dBi)
5.2	3.0	3.0	3.00	6.01
5.8	3.0	3.0	3.00	6.01

RESULTS

8.5.1. 802.11n HT20 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC) MOBILE

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	3.00	6.01	24.00	10.99
Mid	5200	3.00	6.01	24.00	10.99
High	5240	3.00	6.01	24.00	10.99

Duty Cycle CF (dB)	0.14	Included in Calculations of Corr'd PSD

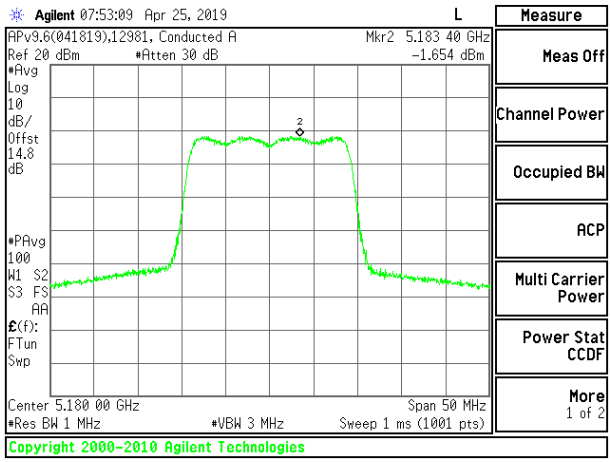
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	3.89	2.49	6.26	24.00	-17.74
Mid	5200	3.98	2.44	6.29	24.00	-17.71
High	5240	4.01	2.41	6.29	24.00	-17.71

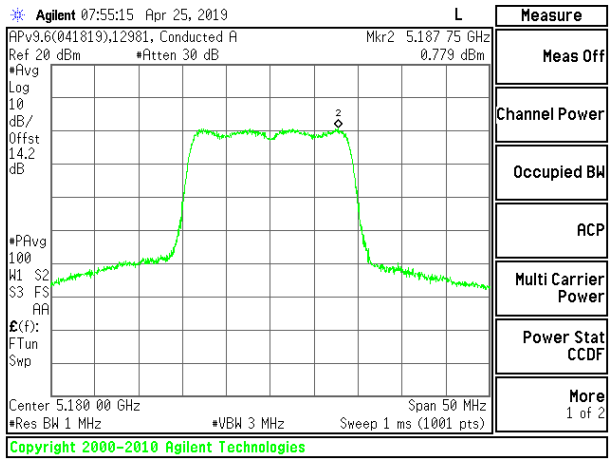
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/1MHz)	Chain 1 Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	-1.65	0.78	2.88	10.99	-8.11
Mid	5200	-1.93	-0.95	1.74	10.99	-9.25
High	5240	-1.17	-0.93	2.10	10.99	-8.89

LOW CHANNEL

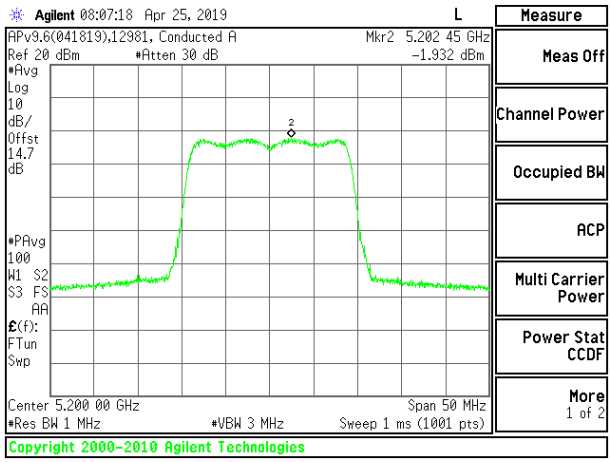


LOW CHANNEL CHAIN 0

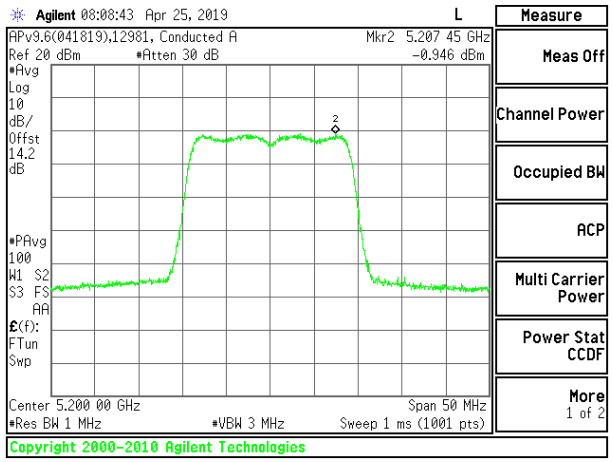


LOW CHANNEL CHAIN 1

MID CHANNEL

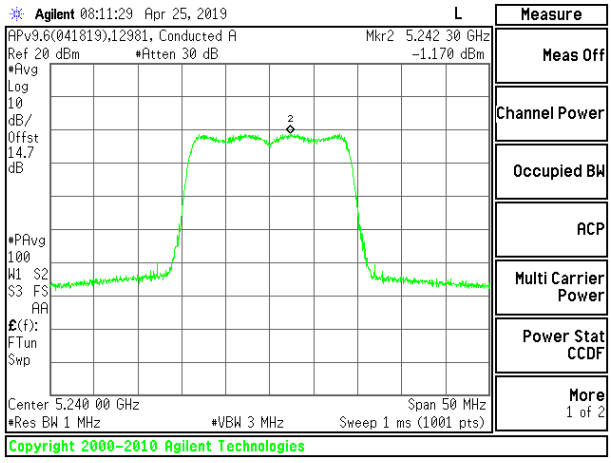


MID CHANNEL CHAIN 0

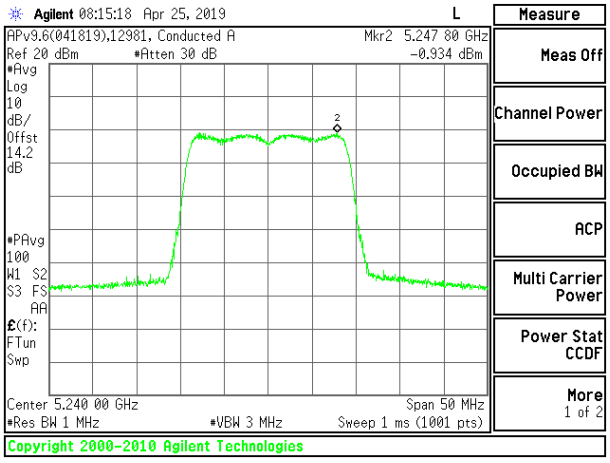


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.2. 802.11n HT40 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC) MOBILE

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5190	3.00	6.01	24.00	10.99
High	5230	3.00	6.01	24.00	10.99

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd PSD

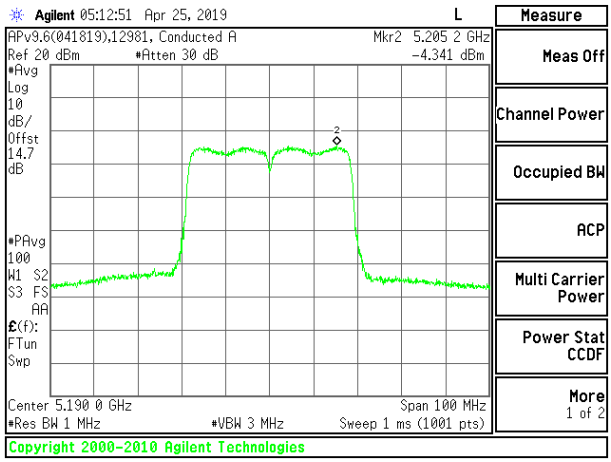
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	8.75	7.07	11.18	24.00	-12.82
High	5230	8.94	6.84	11.21	24.00	-12.79

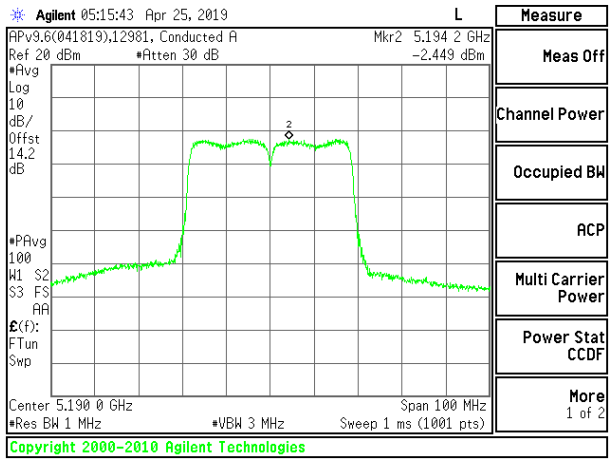
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5190	-4.34	-2.45	-0.10	10.99	-11.09
High	5230	-3.76	-3.77	-0.58	10.99	-11.57

LOW CHANNEL

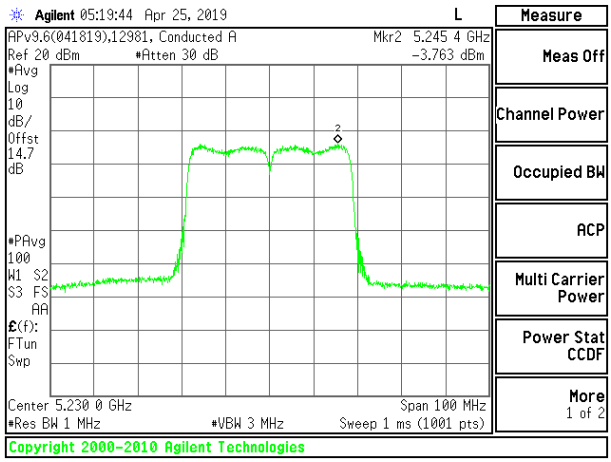


LOW CHANNEL CHAIN 0

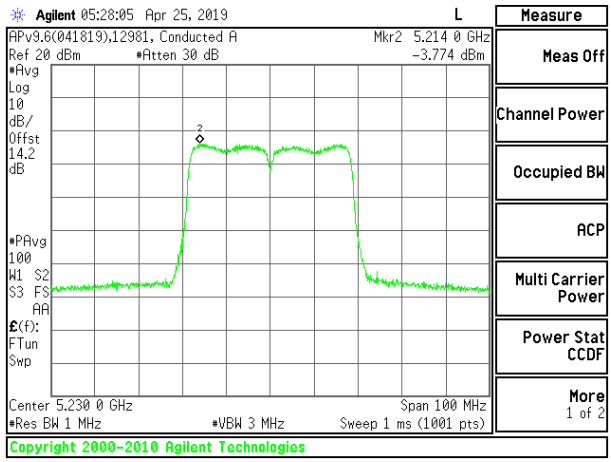


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.3. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC) MOBILE

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Directional Gain for PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Mid	5210	3.00	6.01	24.00	10.99

Duty Cycle CF (dB)	0.36	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	7.32	5.70	9.96	24.00	-14.04

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 1MHz)	Chain 1 Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5210	-9.82	-8.02	-5.46	10.99	-16.45

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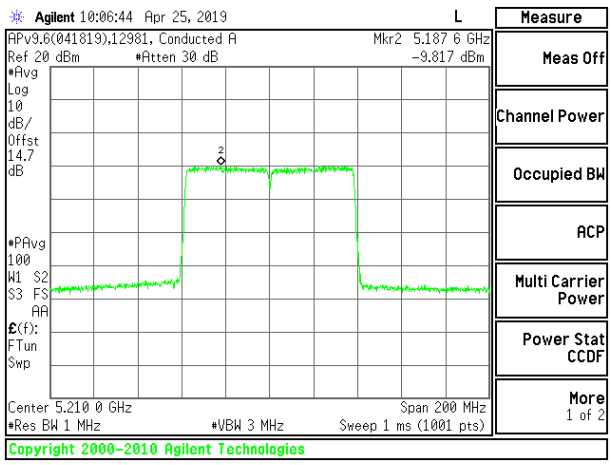
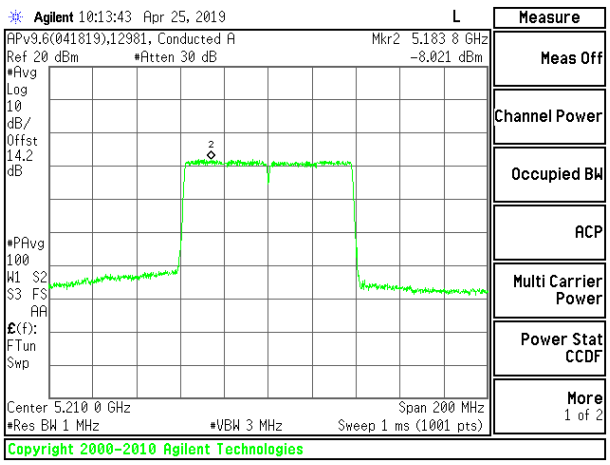
MID CHANNEL



MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

8.5.4. 802.11n HT20 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Low	5745	3.00	6.01	30.00	29.99
Mid	5785	3.00	6.01	30.00	29.99
High	5825	3.00	6.01	30.00	29.99

Duty Cycle CF (dB)	0.14	Included in Calculations of Corr'd PSD

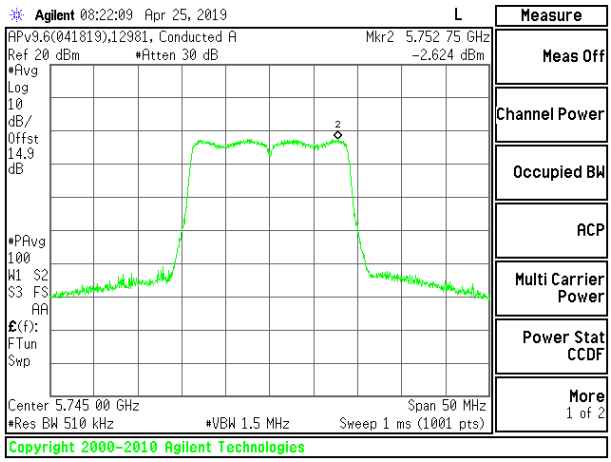
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	10.71	12.62	14.78	30.00	-15.22
Mid	5785	10.35	12.57	14.61	30.00	-15.39
High	5825	9.94	11.89	14.03	30.00	-15.97

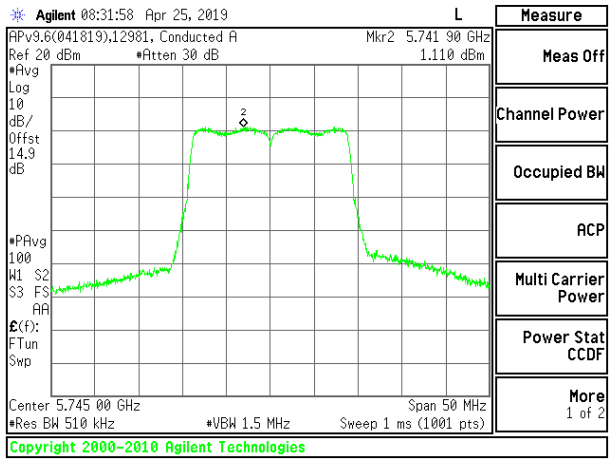
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 500KHz)	Chain 1 Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	-2.62	1.11	2.78	29.99	-27.21
Mid	5785	-3.02	0.84	2.47	29.99	-27.52
High	5825	-3.06	0.68	2.35	29.99	-27.64

LOW CHANNEL

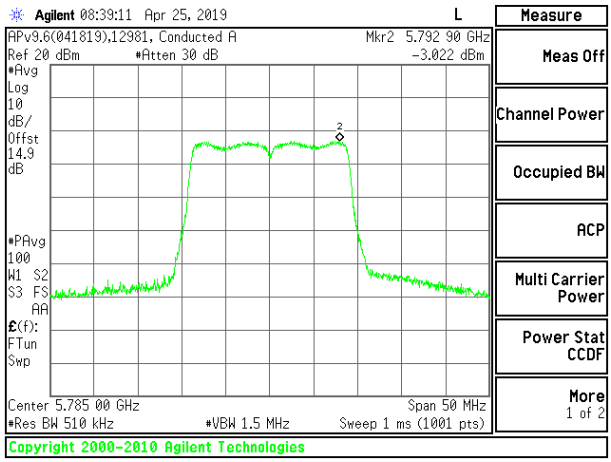


LOW CHANNEL CHAIN 0

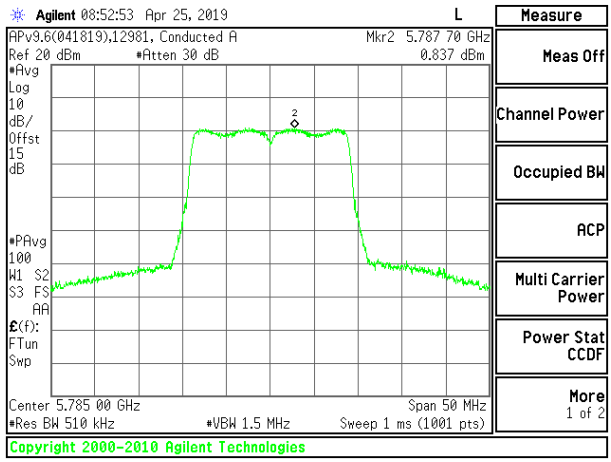


LOW CHANNEL CHAIN 1

MID CHANNEL

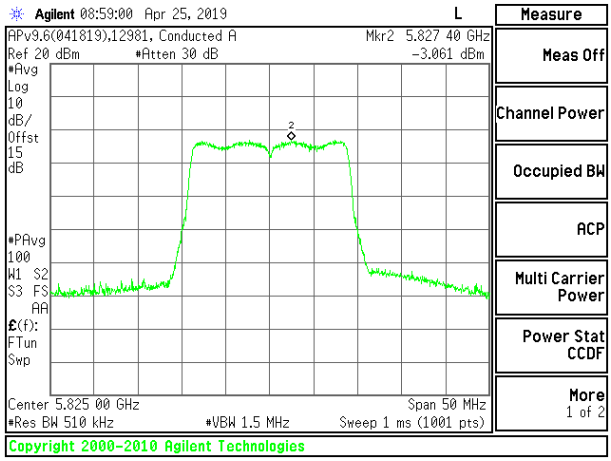


MID CHANNEL CHAIN 0

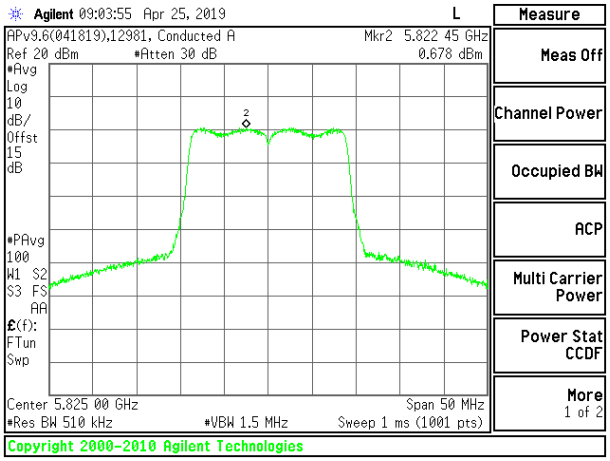


MID CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.5. 802.11n HT40 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Low	5755	3.00	6.01	30.00	29.99
High	5795	3.00	6.01	30.00	29.99

Duty Cycle CF (dB)	0.18	Included in Calculations of Corr'd PSD

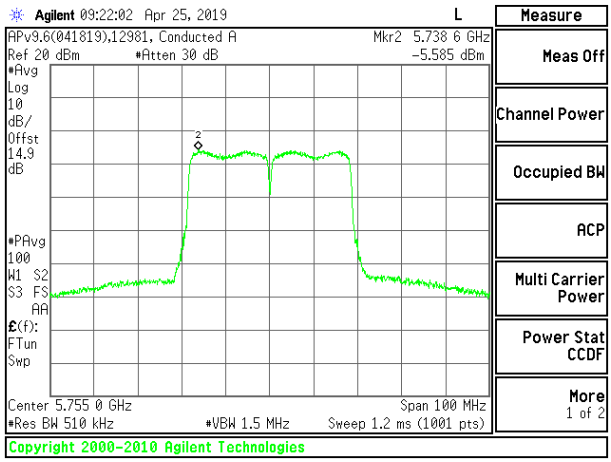
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	10.48	12.64	14.70	30.00	-15.30
High	5795	9.60	12.23	14.12	30.00	-15.88

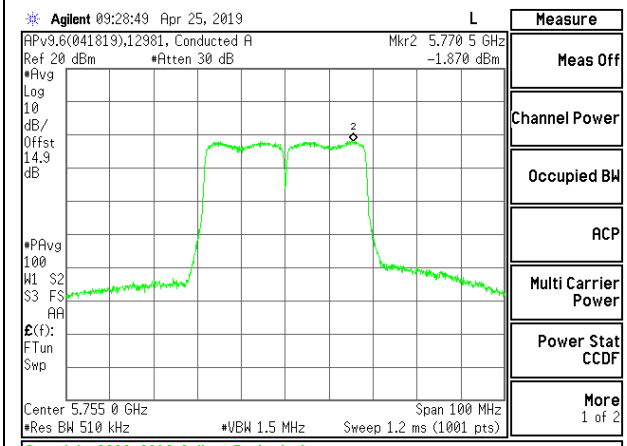
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 500KHz)	Chain 1 Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5755	-5.59	-1.87	-0.15	29.99	-30.14
High	5795	-6.12	-2.18	-0.53	29.99	-30.52

LOW CHANNEL

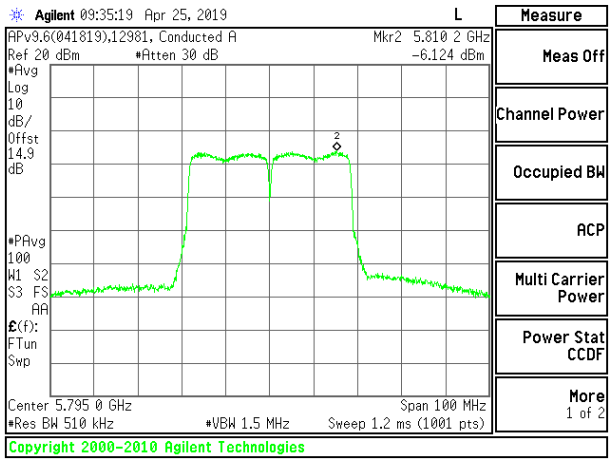


LOW CHANNEL CHAIN 0

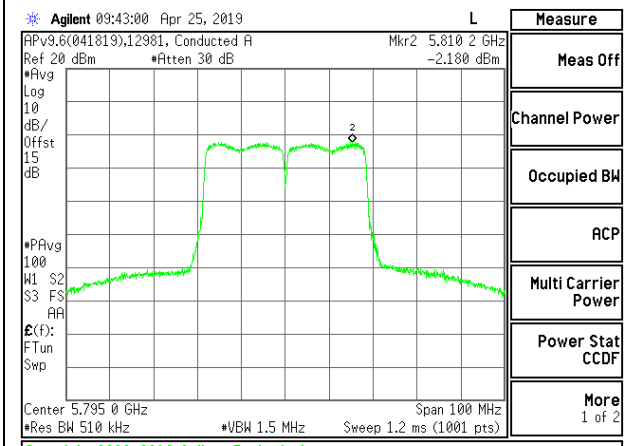


LOW CHANNEL CHAIN 1

HIGH CHANNEL



HIGH CHANNEL CHAIN 0



HIGH CHANNEL CHAIN 1

8.5.6. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE (FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain For Power (dBi)	Directional Gain For PSD (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Mid	5755	3.00	6.01	30.00	29.99

Duty Cycle CF (dB)	0.36	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Chain 1 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5755	8.91	10.91	13.03	30.00	-16.97

PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PSD (dBm/ 500KHz)	Chain 1 Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Mid	5775	-11.11	-7.69	-5.70	29.99	-35.69

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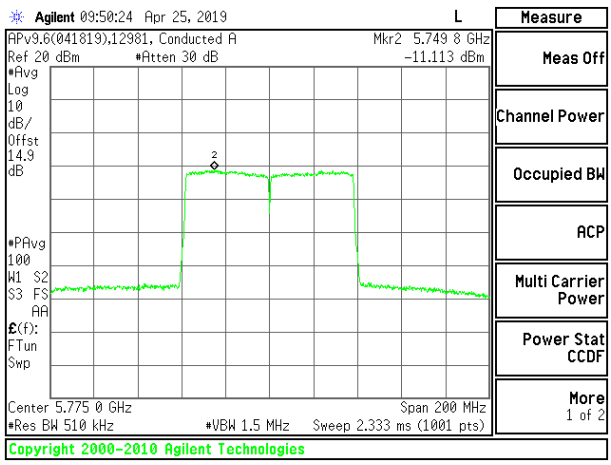
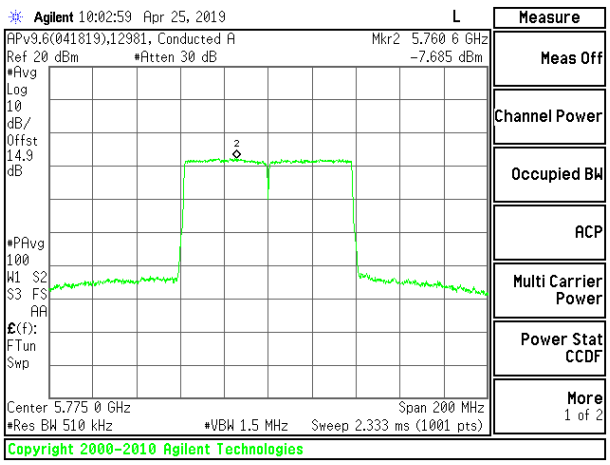
MID CHANNEL



MID CHANNEL CHAIN 0



MID CHANNEL CHAIN 1

9. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209 -Restriced bands

FCC §15.407(b)(1-3) -Un-Restriced bands

NCC LP0002 §2.7 and §2.8

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
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.

2D antenna use - 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.

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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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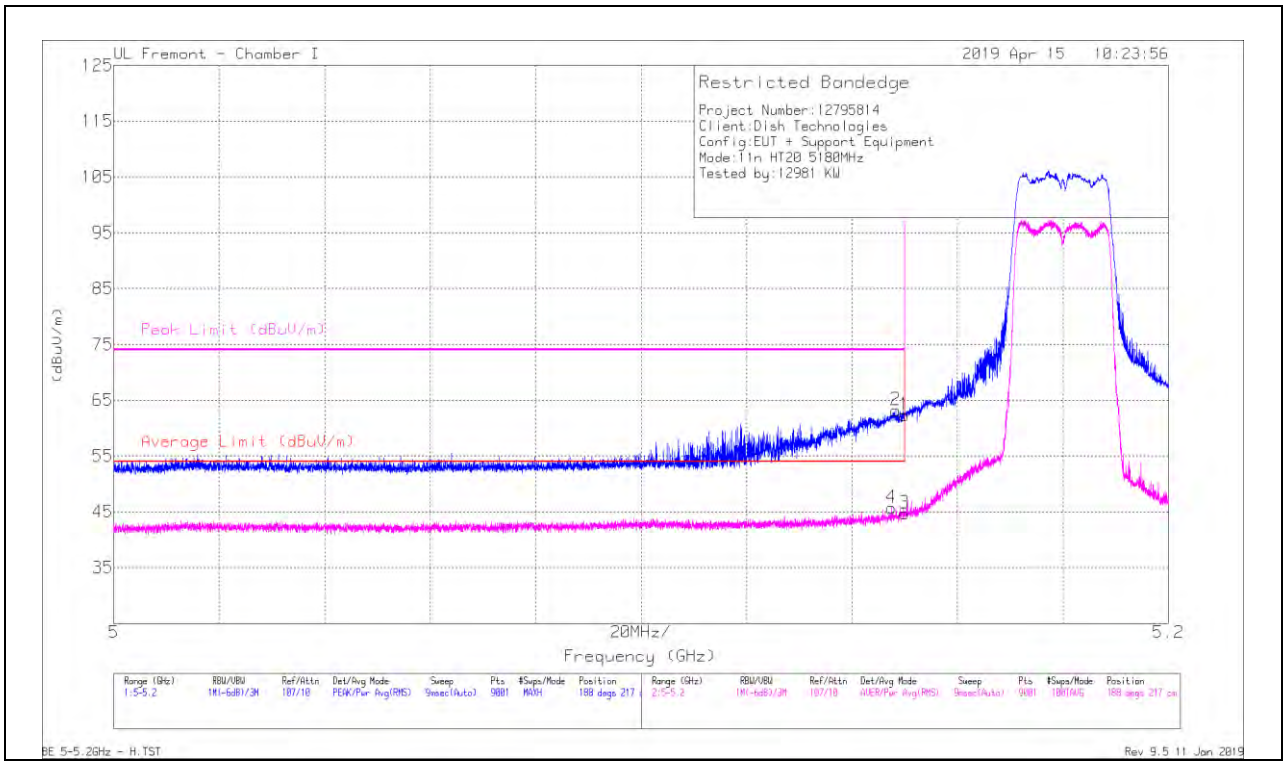
9.1. TRANSMITTER ABOVE 1 GHz

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

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (LOW CHANNEL)

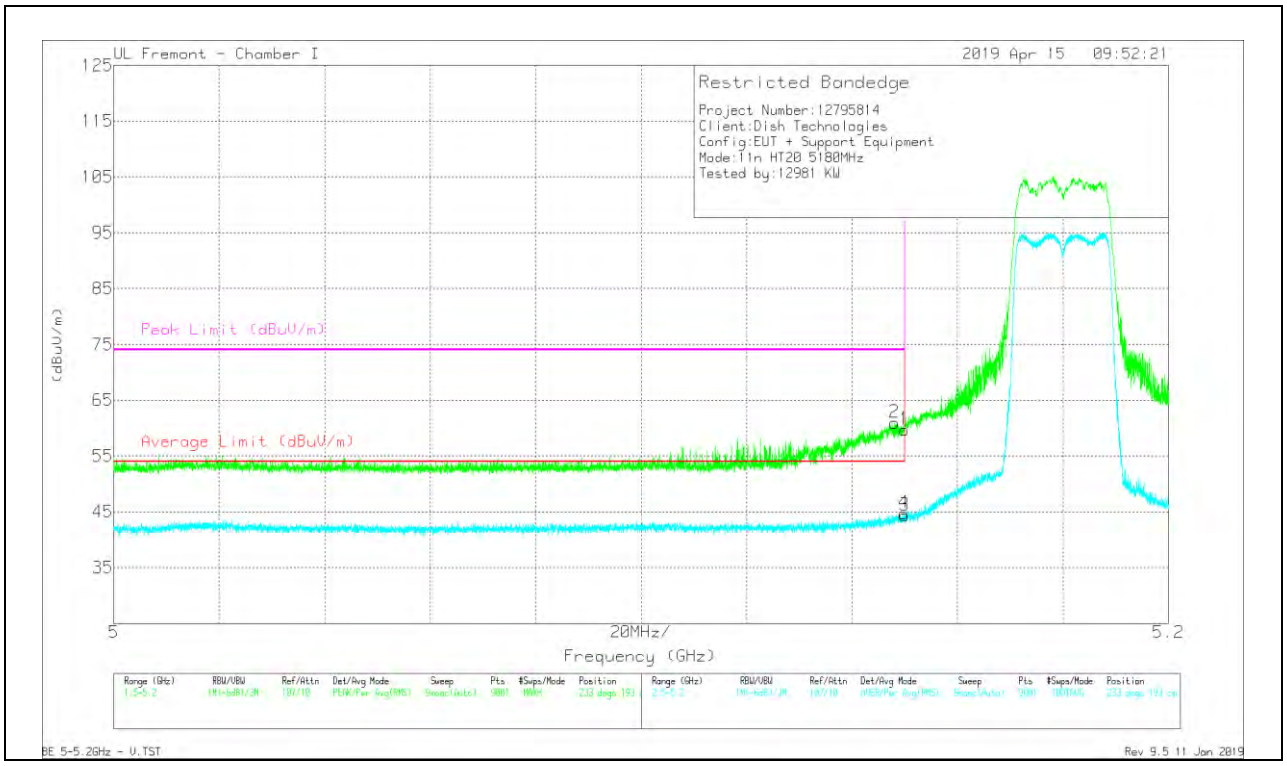
HORIZONTAL RESULT



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	46.94	Pk	34.4	-19	0	62.34	-	-	74	-11.66	188	217	H
2	*5.148	47.83	Pk	34.4	-19	0	63.23	-	-	74	-10.77	188	217	H
3	*5.15	29.27	RMS	34.4	-19	.14	44.81	54	-9.19	-	-	188	217	H
4	*5.147	30.31	RMS	34.4	-19	.14	45.85	54	-8.15	-	-	188	217	H

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

VERTICAL RESULT

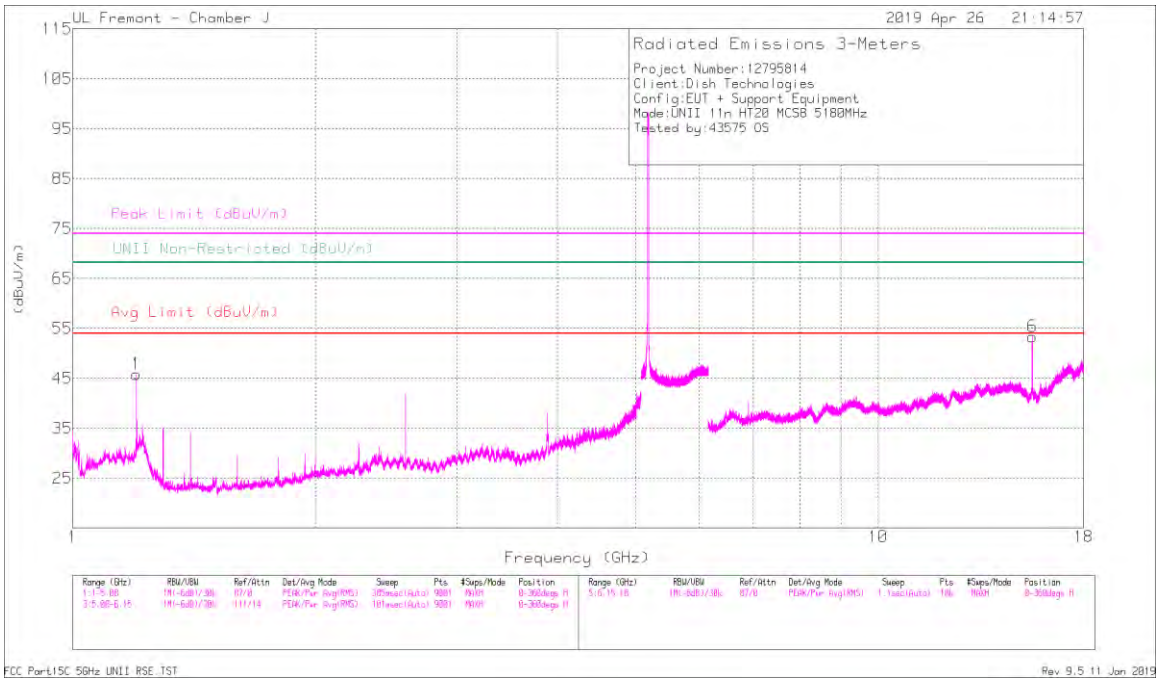


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	44.29	Pk	34.4	-19	0	59.69	-	-	74	-14.31	233	193	V
2	*5.148	45.59	Pk	34.4	-19	0	60.99	-	-	74	-13.01	233	193	V
3	*5.15	28.74	RMS	34.4	-19	.14	44.28	54	-9.72	-	-	233	193	V
4	*5.15	29.12	RMS	34.4	-19	.14	44.66	54	-9.34	-	-	233	193	V

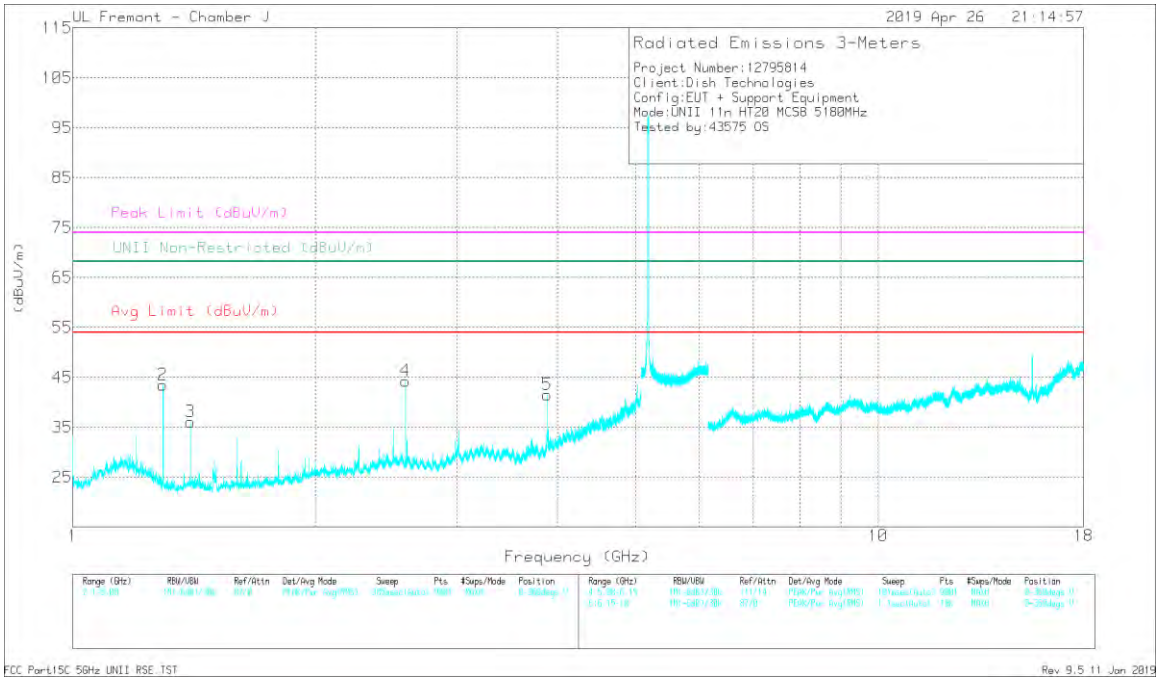
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	60.33	PK-U	24.1	-35.8	0	48.63	-	-	74	-25.37	-	-	214	178	H
* 1.2	55.89	ADR	24.1	-35.8	.14	44.33	54	-9.67	-	-	-	-	214	178	H
* 1.295	56.46	PK-U	24.5	-35.8	0	45.16	-	-	74	-28.84	-	-	299	233	V
* 1.295	54.31	ADR	24.5	-35.8	.14	43.15	54	-10.85	-	-	-	-	299	233	V
* 1.4	48.94	PK-U	25.2	-35.9	0	38.24	-	-	74	-35.76	-	-	351	125	V
* 1.4	45.61	ADR	25.2	-35.9	.14	35.05	54	-18.95	-	-	-	-	351	125	V
2.59	50.51	PK-U	30.2	-35.1	0	45.61	-	-	-	-	68.2	-22.59	246	106	V
2.59	47.11	ADR	30.2	-35.1	.14	42.35	-	-	-	-	-	-	246	106	V
* 3.885	45.82	PK-U	31.9	-32.7	0	45.02	-	-	74	-28.98	-	-	243	103	V
* 3.885	40.5	ADR	31.9	-32.7	.14	39.84	54	-14.16	-	-	-	-	243	103	V
* 15.543	46.3	PK-U	38.7	-20.4	0	64.6	-	-	74	-9.4	-	-	295	224	H
* 15.545	35.53	ADR	38.7	-20.4	.14	53.97	54	-.03	-	-	-	-	295	224	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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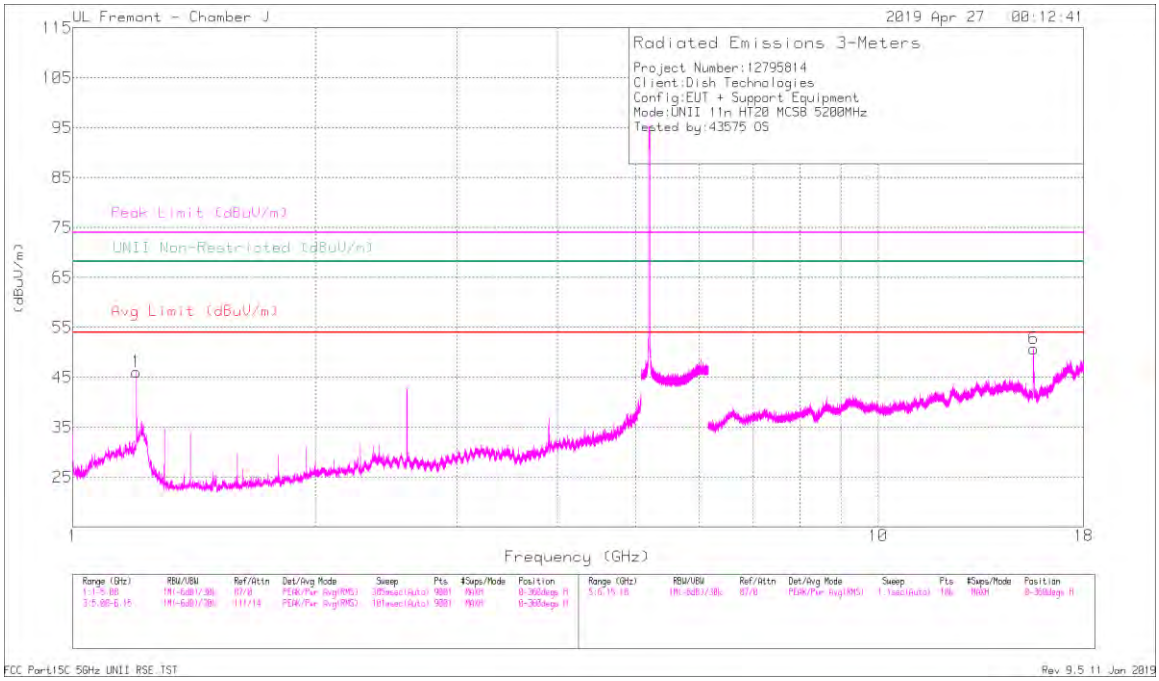
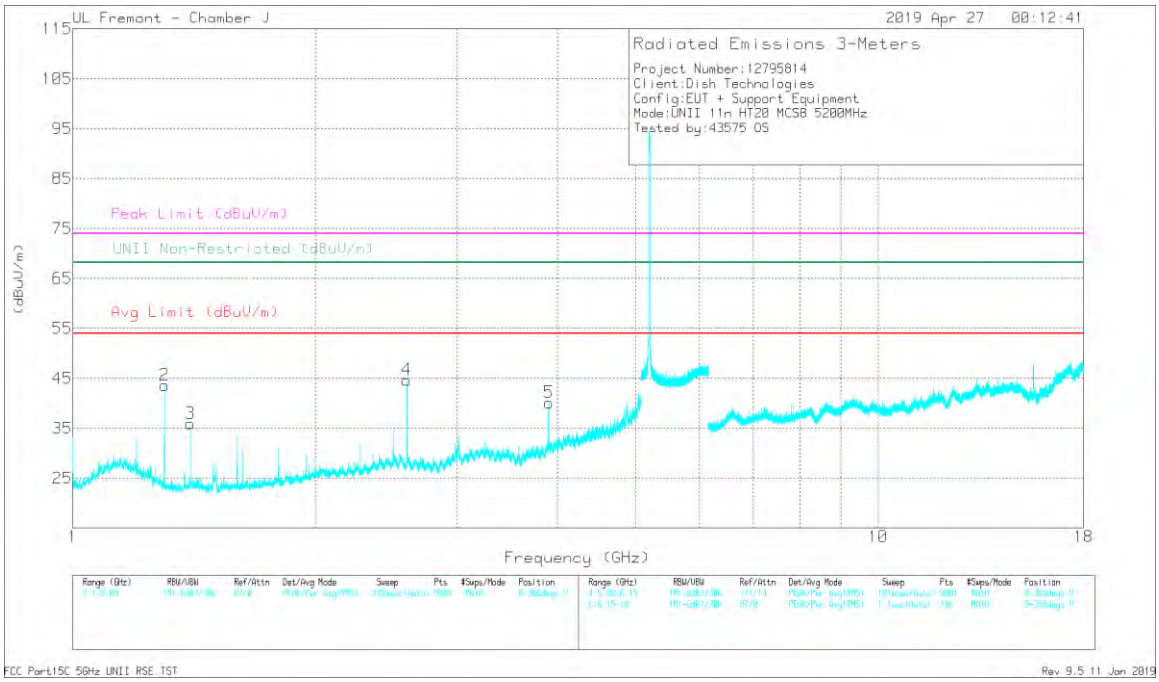
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	58.31	PK-U	24.1	-35.8	0	46.61	-	-	74	-27.39	-	-	189	151	H
* 1.2	55.11	ADR	24.1	-35.8	.14	43.55	54	-10.45	-	-	-	-	189	151	H
* 1.3	56.71	PK-U	24.5	-35.9	0	45.31	-	-	74	-28.69	-	-	296	226	V
* 1.3	54.62	ADR	24.5	-35.9	.14	43.36	54	-10.64	-	-	-	-	296	226	V
* 1.4	48.88	PK-U	25.2	-35.9	0	38.18	-	-	74	-35.82	-	-	350	127	V
* 1.4	45.51	ADR	25.2	-35.9	.14	34.95	54	-19.05	-	-	-	-	350	127	V
2.6	50.85	PK-U	30.2	-35.1	0	45.95	-	-	-	-	68.2	-22.25	262	118	V
* 3.9	44.55	PK-U	32	-32.7	0	43.85	-	-	74	-30.15	-	-	257	103	V
* 3.9	39.28	ADR	32	-32.7	.14	38.72	54	-15.28	-	-	-	-	257	103	V
* 15.601	45.7	PK-U	38.8	-20.5	0	64	-	-	74	-10	-	-	294	233	H
* 15.6	35.54	ADR	38.8	-20.5	.14	53.98	54	-.02	-	-	-	-	294	233	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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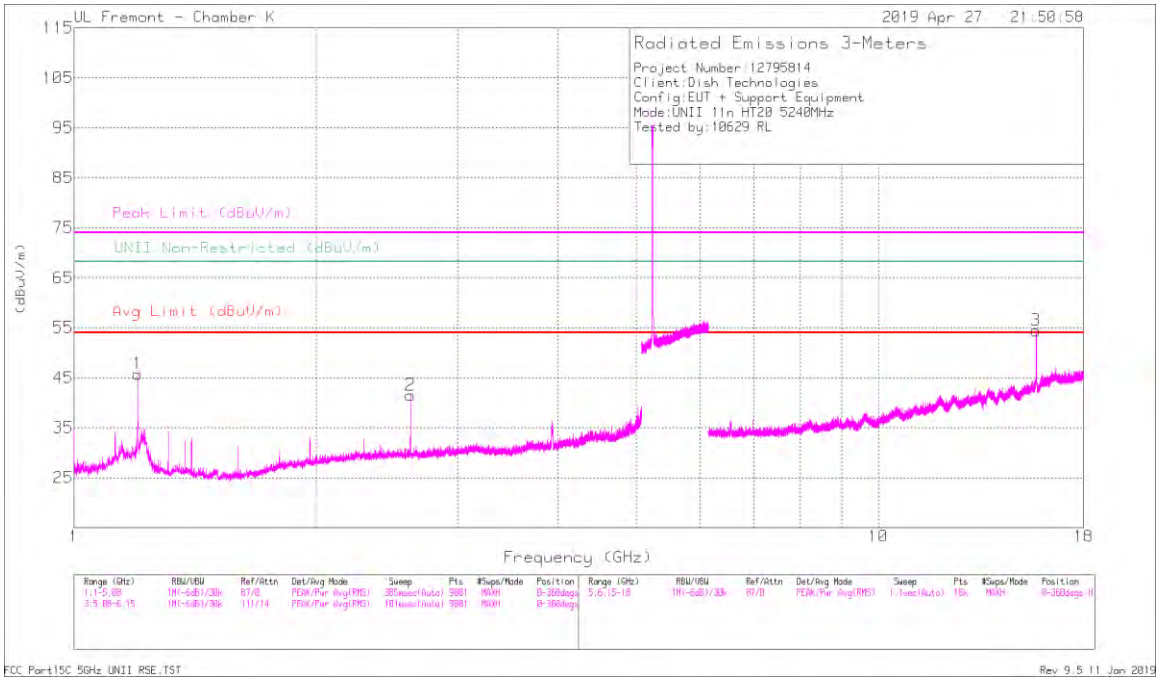
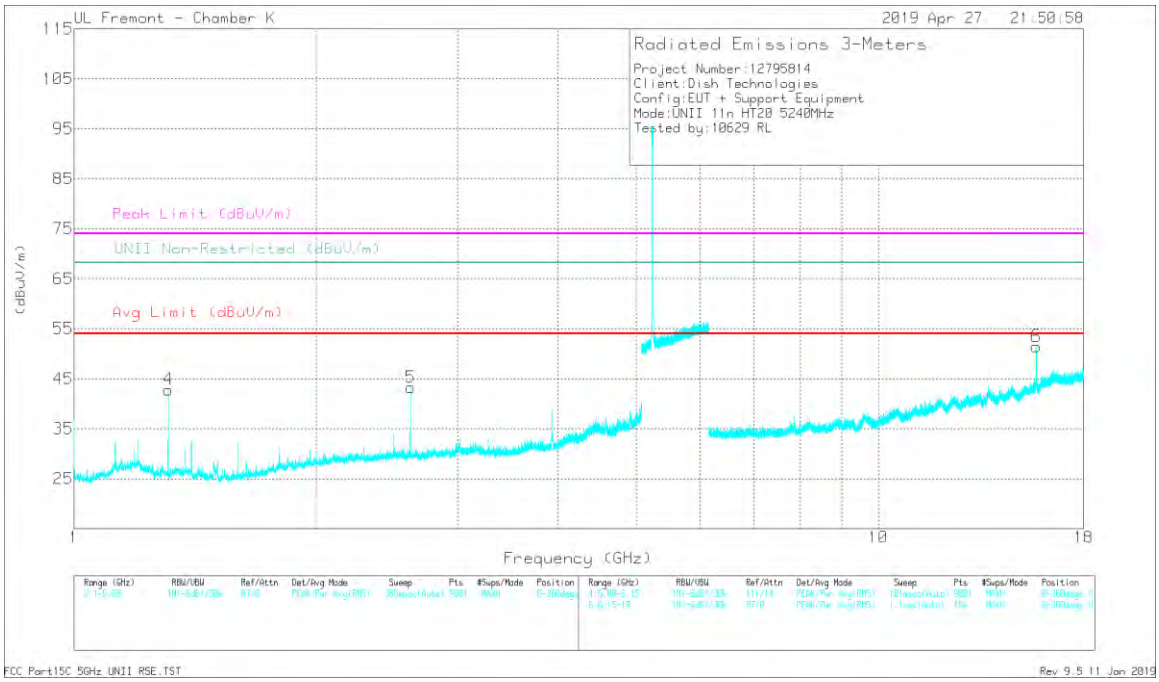
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	55.14	PK-U	28.2	-35.2	0	48.14	-	-	74	-25.86	-	-	279	143	H
* 1.2	51.64	ADR	28.2	-35.2	.14	44.78	54	-9.22	-	-	-	-	279	143	H
2.62	45.25	PK-U	32.3	-34.8	0	42.75	-	-	-	-	68.2	-25.45	223	112	H
* 1.31	50.26	PK-U	28.9	-35.3	0	43.86	-	-	74	-30.14	-	-	320	231	V
* 1.31	47.72	ADR	28.9	-35.3	.14	41.46	54	-12.54	-	-	-	-	320	231	V
2.62	47.46	PK-U	32.3	-34.8	0	44.96	-	-	-	-	68.2	-23.24	298	121	V
* 15.729	43.07	PK-U	40.8	-17.8	0	66.07	-	-	74	-7.93	-	-	20	200	H
* 15.72	30.53	ADR	40.8	-17.8	.14	53.67	54	-.33	-	-	-	-	20	200	H
* 15.729	39.1	PK-U	40.8	-17.8	0	62.1	-	-	74	-11.9	-	-	305	101	V
* 15.72	26.95	ADR	40.8	-17.8	.14	50.09	54	-3.91	-	-	-	-	305	101	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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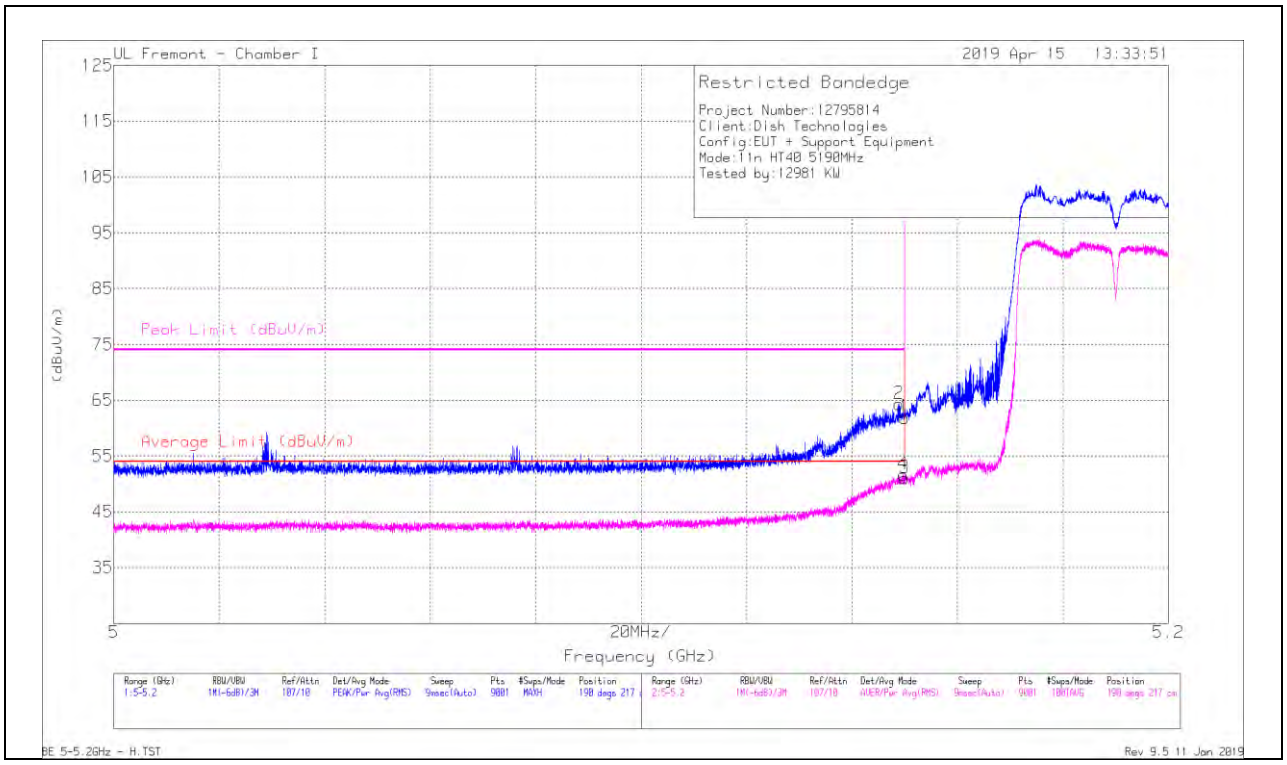
9.1.2. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (LOW CHANNEL)

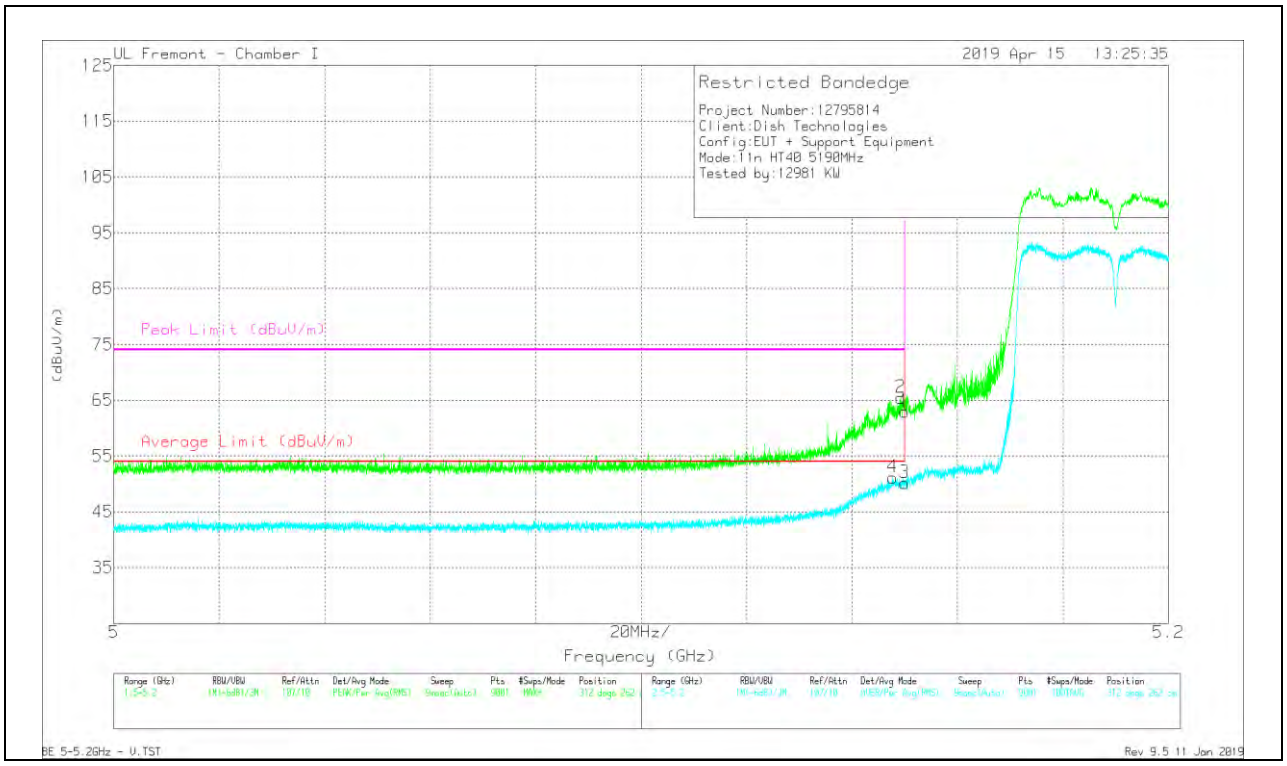
HORIZONTAL RESULT



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	46.5	Pk	34.4	-19	0	61.9	-	-	74	-12.1	190	217	H
2	* 5.149	48.92	Pk	34.4	-19	0	64.32	-	-	74	-9.68	190	217	H
3	* 5.15	35.43	RMS	34.4	-19	.18	51.01	54	-2.99	-	-	190	217	H
4	* 5.15	36.09	RMS	34.4	-19	.18	51.67	54	-2.33	-	-	190	217	H

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

VERTICAL RESULT

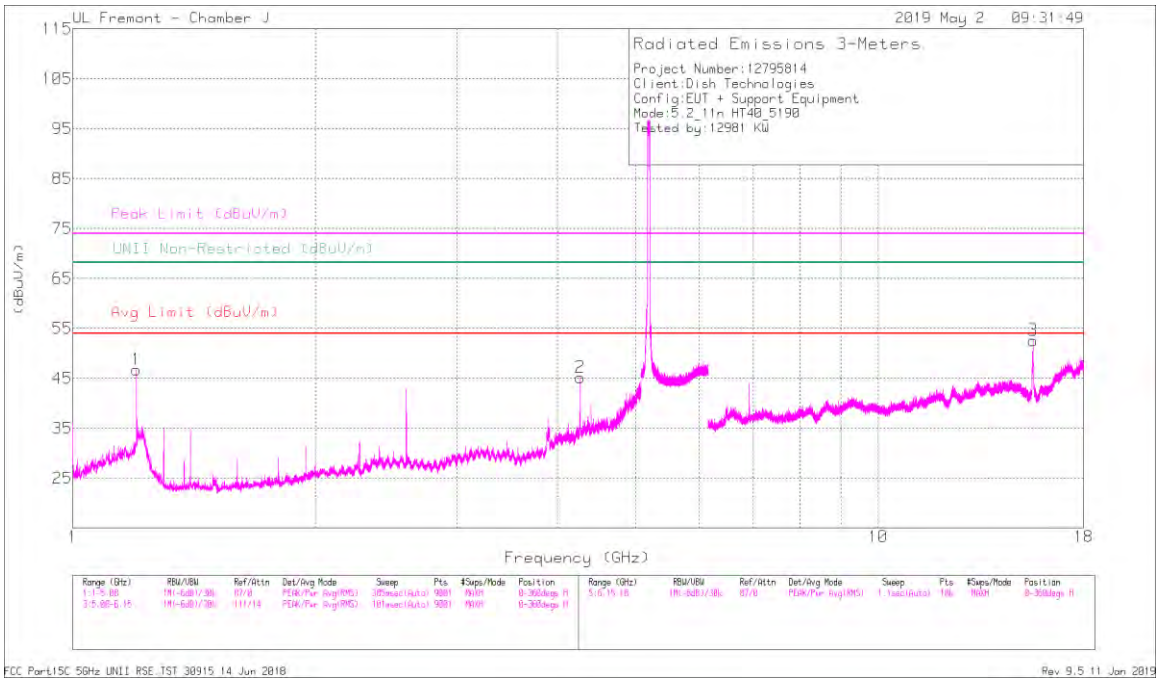


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	47.53	Pk	34.4	-19	0	62.93	-	-	74	-11.07	312	262	V
2	*5.149	50.03	Pk	34.4	-19	0	65.43	-	-	74	-8.57	312	262	V
3	*5.15	34.61	RMS	34.4	-19	.18	50.19	54	-3.81	-	-	312	262	V
4	*5.148	35.58	RMS	34.4	-19	.18	51.16	54	-2.84	-	-	312	262	V

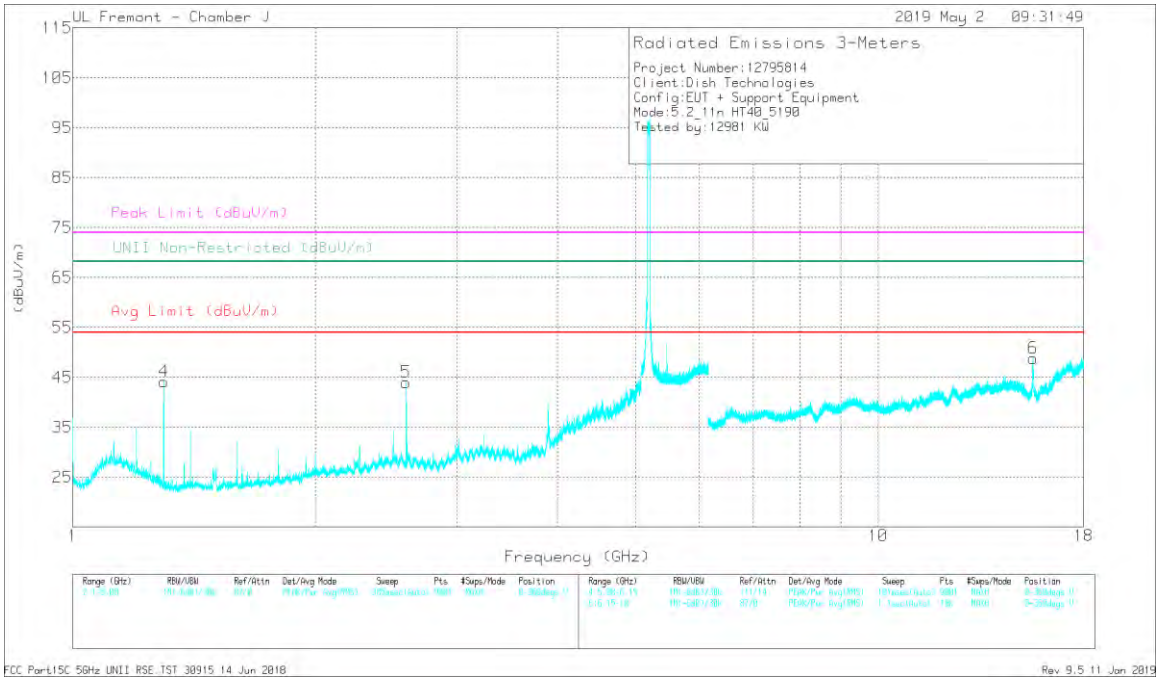
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	59.61	PK-U	24.1	-35.8	0	47.91	-	-	74	-26.09	-	-	212	102	H
* 1.2	56.91	ADR	24.1	-35.8	.18	45.39	54	-8.61	-	-	-	-	212	102	H
* 4.265	40.92	PK-U	31.9	-31.9	0	40.92	-	-	74	-33.08	-	-	77	117	H
* 4.266	30.42	ADR	31.9	-31.9	.18	30.6	54	-23.4	-	-	-	-	77	117	H
* 1.297	56.48	PK-U	24.5	-35.9	0	45.08	-	-	74	-28.92	-	-	292	220	V
* 1.297	53.33	ADR	24.5	-35.9	.18	42.11	54	-11.89	-	-	-	-	292	220	V
2.595	50.99	PK-U	30.2	-35.1	0	46.09	-	-	-	-	68.2	-22.11	256	118	V
* 15.58	41.29	PK-U	38.8	-20.6	0	59.49	-	-	74	-14.51	-	-	211	194	H
* 15.578	30.59	ADR	38.8	-20.6	.18	48.97	54	-5.03	-	-	-	-	211	194	H
* 15.581	38.28	PK-U	38.8	-20.6	0	56.48	-	-	74	-17.52	-	-	349	102	V
* 15.581	27.32	ADR	38.8	-20.6	.18	45.7	54	-8.3	-	-	-	-	349	102	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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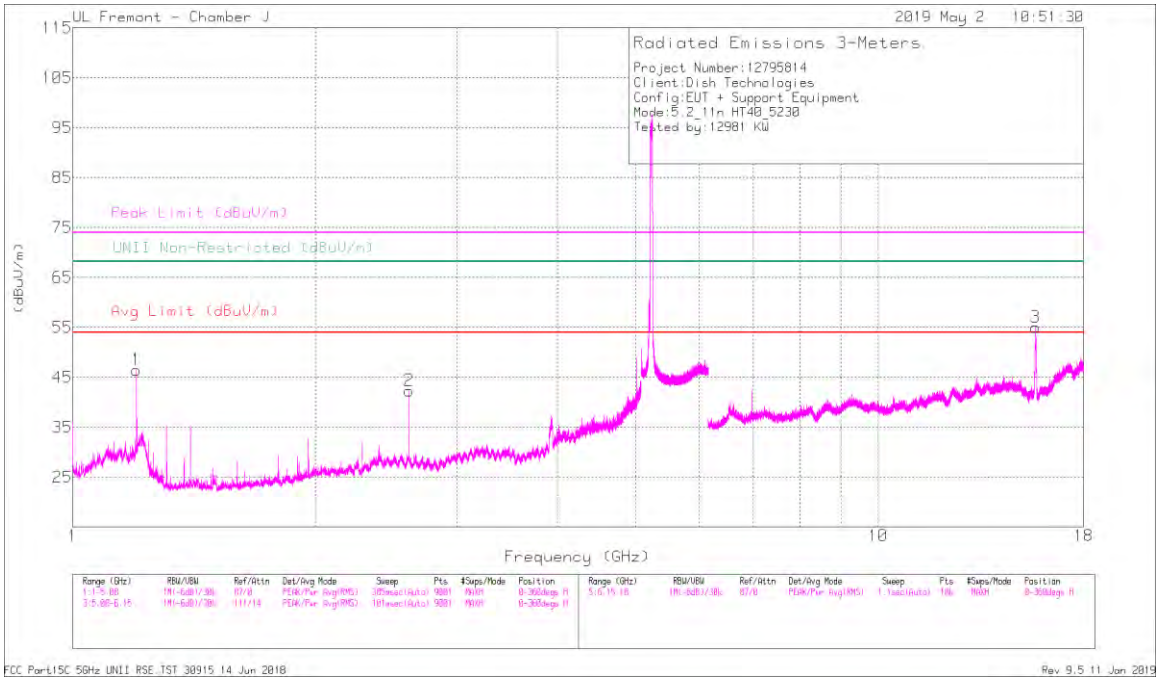
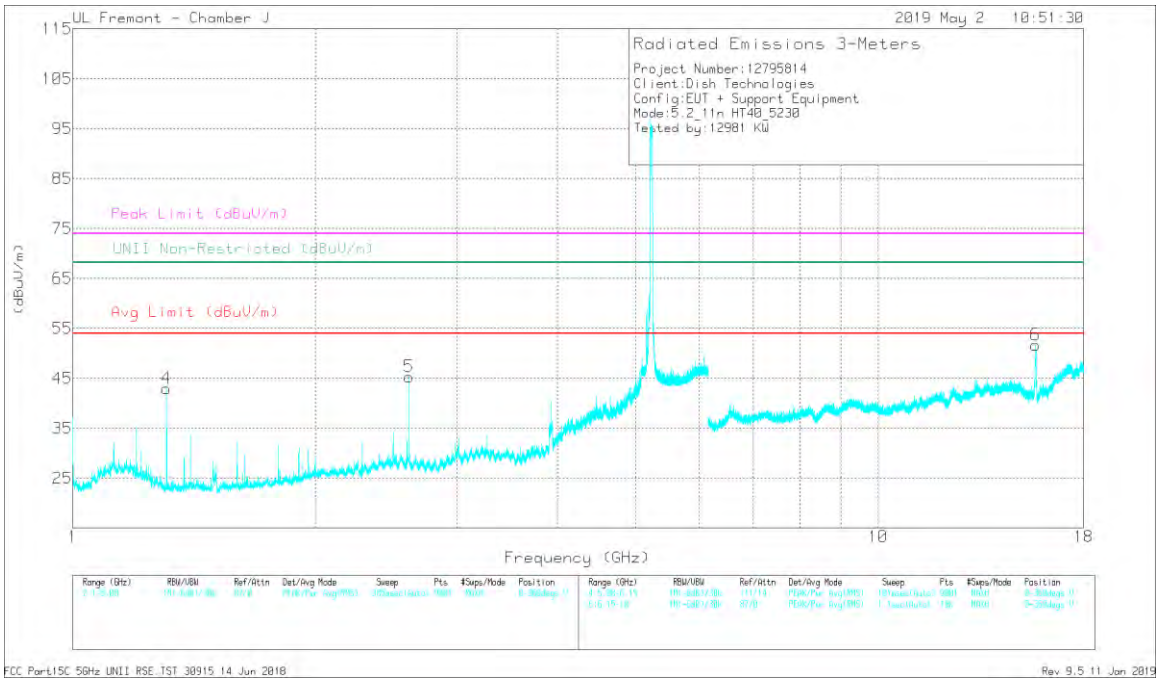
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	59.73	PK-U	24.1	-35.8	0	48.03	-	-	74	-25.97	-	-	212	187	H
* 1.2	56.6	ADR	24.1	-35.8	.18	45.08	54	-8.92	-	-	-	-	212	187	H
2.615	49.18	PK-U	30.1	-35.2	0	44.08	-	-	-	-	68.2	-24.12	175	108	H
* 1.307	56.35	PK-U	24.5	-35.8	0	45.05	-	-	74	-28.95	-	-	298	250	V
* 1.307	53.42	ADR	24.5	-35.8	.18	42.3	54	-11.7	-	-	-	-	298	250	V
2.615	51.9	PK-U	30.1	-35.2	0	46.8	-	-	-	-	68.2	-21.4	252	106	V
* 15.694	44.69	PK-U	38.9	-20.3	0	63.29	-	-	74	-10.71	-	-	327	200	H
* 15.693	34.61	ADR	38.9	-20.3	.18	53.39	54	-.61	-	-	-	-	327	200	H
* 15.698	40.65	PK-U	38.9	-20.3	0	59.25	-	-	74	-14.75	-	-	351	103	V
* 15.699	30.54	ADR	38.9	-20.3	.18	49.32	54	-4.68	-	-	-	-	351	103	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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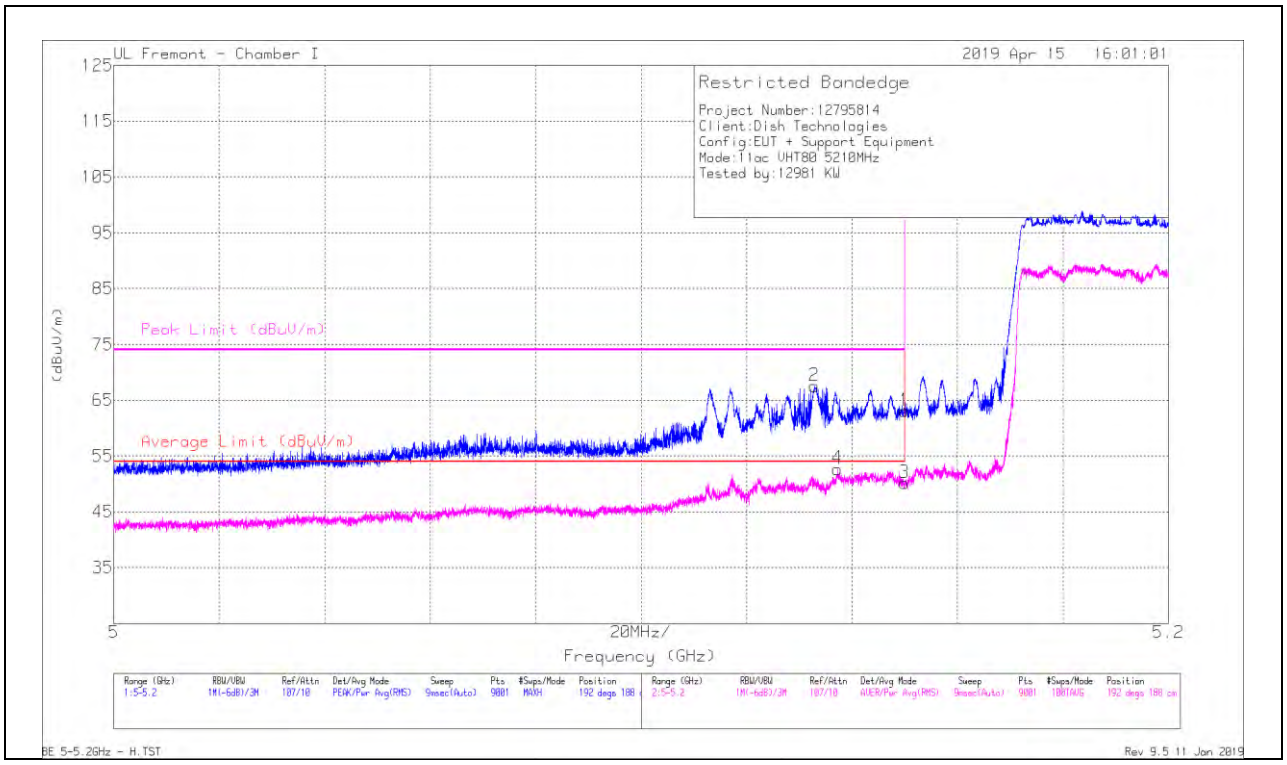
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.1.3. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (MID CHANNEL)

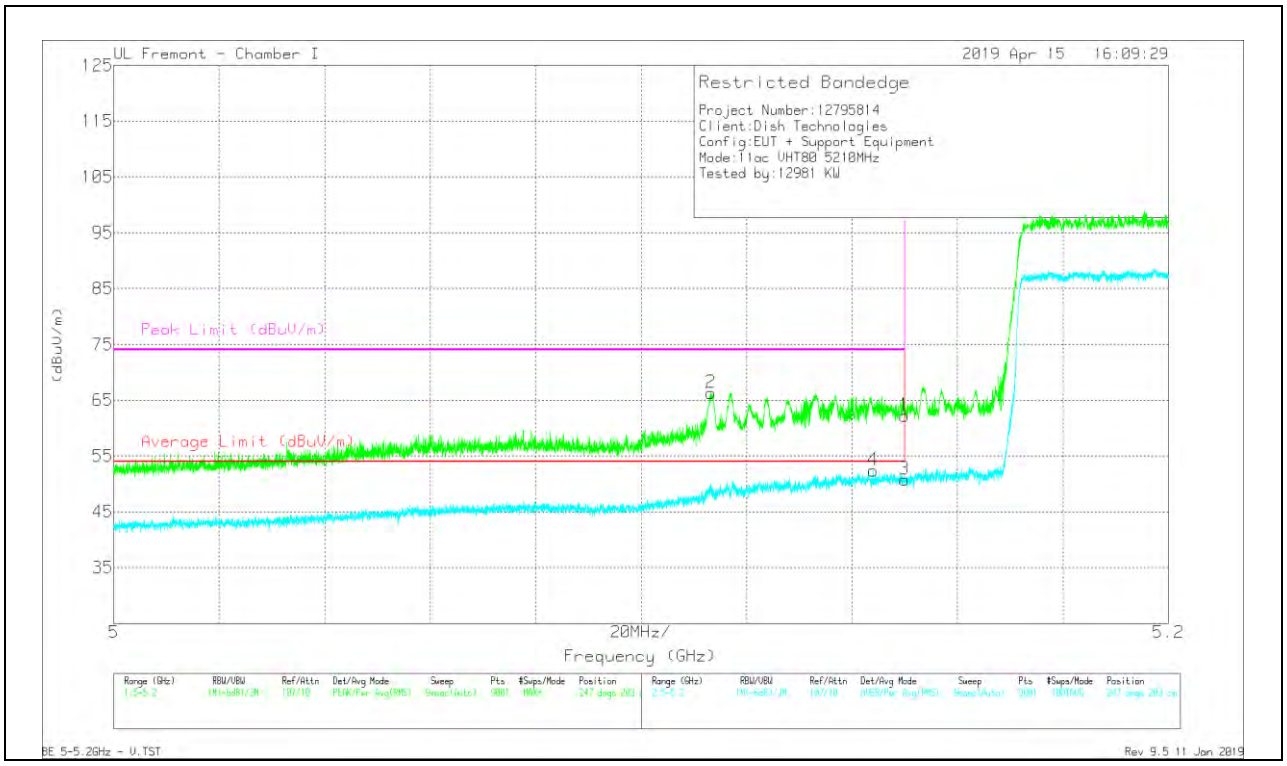
HORIZONTAL RESULT



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	47.64	Pk	34.4	-19	0	63.04	-	-	74	-10.96	192	188	H
2	* 5.133	52.23	Pk	34.3	-19	0	67.53	-	-	74	-6.47	192	188	H
3	* 5.15	34.39	RMS	34.4	-19	.36	50.15	54	-3.85	-	-	192	188	H
4	* 5.137	36.95	RMS	34.4	-19	.36	52.71	54	-1.29	-	-	192	188	H

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

VERTICAL RESULT

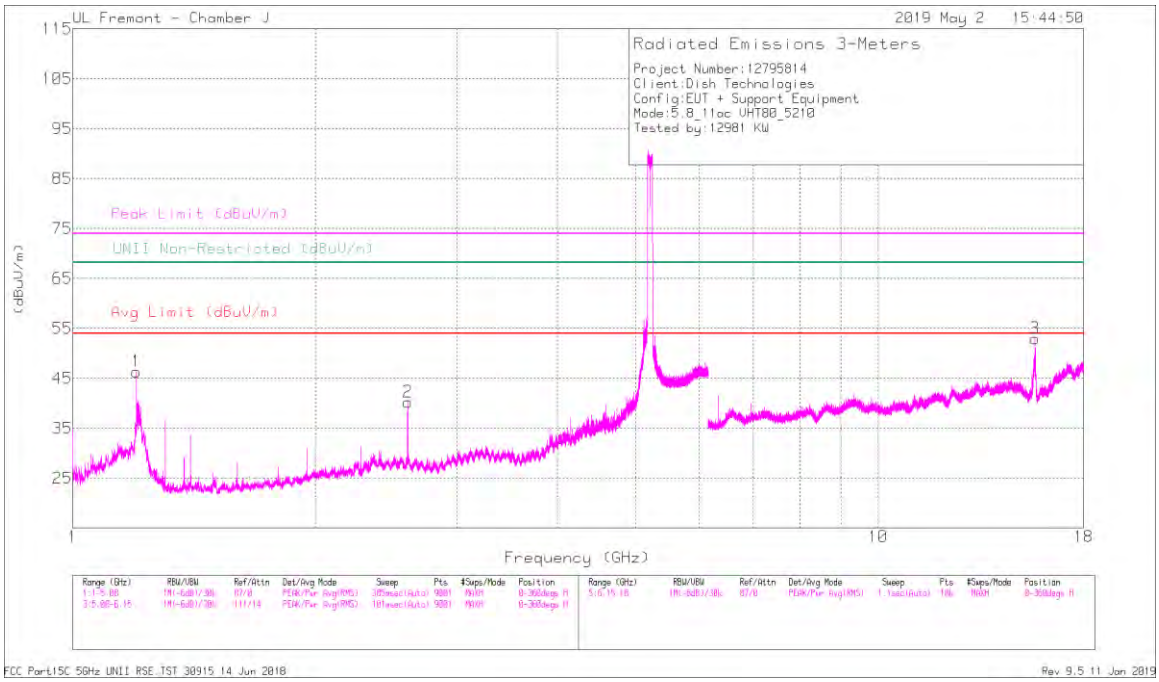


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	*5.15	46.85	Pk	34.4	-19	0	62.25	-	-	74	-11.75	247	203	V
2	*5.113	51.06	Pk	34.3	-19	0	66.36	-	-	74	-7.64	247	203	V
3	*5.15	34.99	RMS	34.4	-19	.36	50.75	54	-3.25	-	-	247	203	V
4	*5.144	36.72	RMS	34.4	-19.1	.36	52.38	54	-1.62	-	-	247	203	V

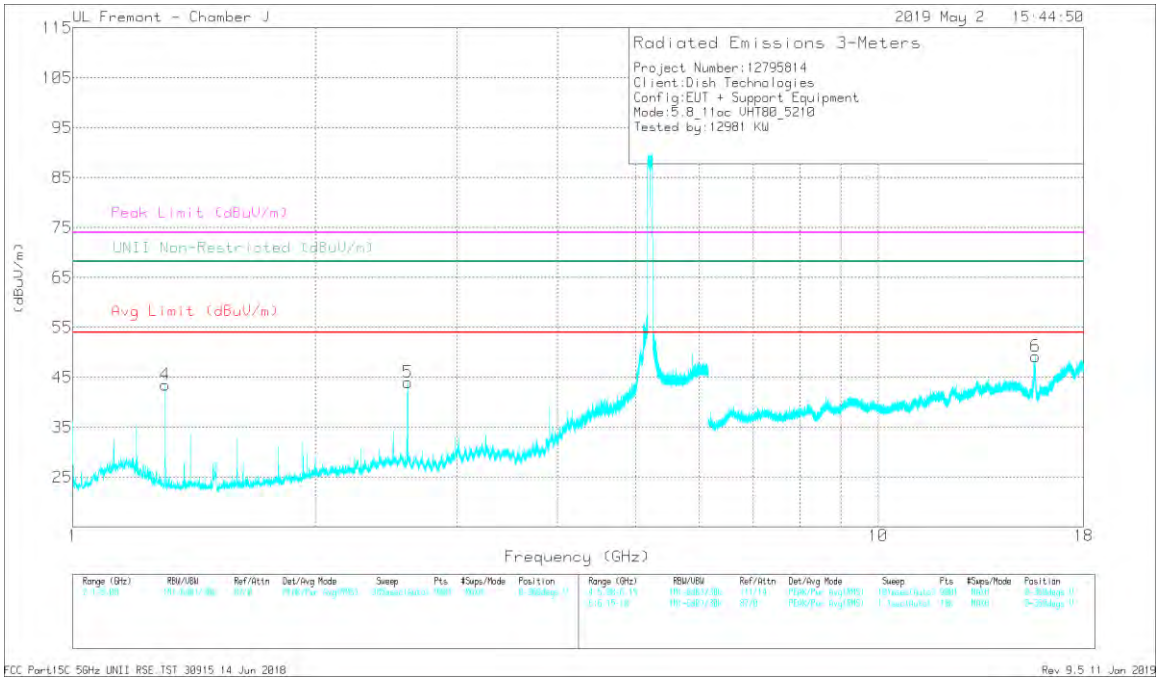
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	59.86	PK-U	24.1	-35.8	0	48.16	-	-	74	-25.84	-	-	213	183	H
* 1.2	56.56	ADR	24.1	-35.8	.36	45.22	54	-8.78	-	-	-	-	213	183	H
2.605	48.11	PK-U	30.1	-35.2	0	43.01	-	-	-	-	68.2	-25.19	252	149	H
* 1.302	56.47	PK-U	24.5	-35.9	0	45.07	-	-	74	-28.93	-	-	292	267	V
* 1.302	52.74	ADR	24.5	-35.9	.36	41.7	54	-12.3	-	-	-	-	292	267	V
2.605	51.53	PK-U	30.1	-35.2	0	46.43	-	-	-	-	68.2	-21.77	252	118	V
* 15.658	41.25	PK-U	38.9	-20.2	0	59.95	-	-	74	-14.05	-	-	324	193	H
* 15.663	29.24	ADR	38.9	-20.3	.36	48.2	54	-5.8	-	-	-	-	324	193	H
* 15.682	37.21	PK-U	38.9	-20.5	0	55.61	-	-	74	-18.39	-	-	352	103	V
* 15.682	24.91	ADR	38.9	-20.5	.36	43.67	54	-10.33	-	-	-	-	352	103	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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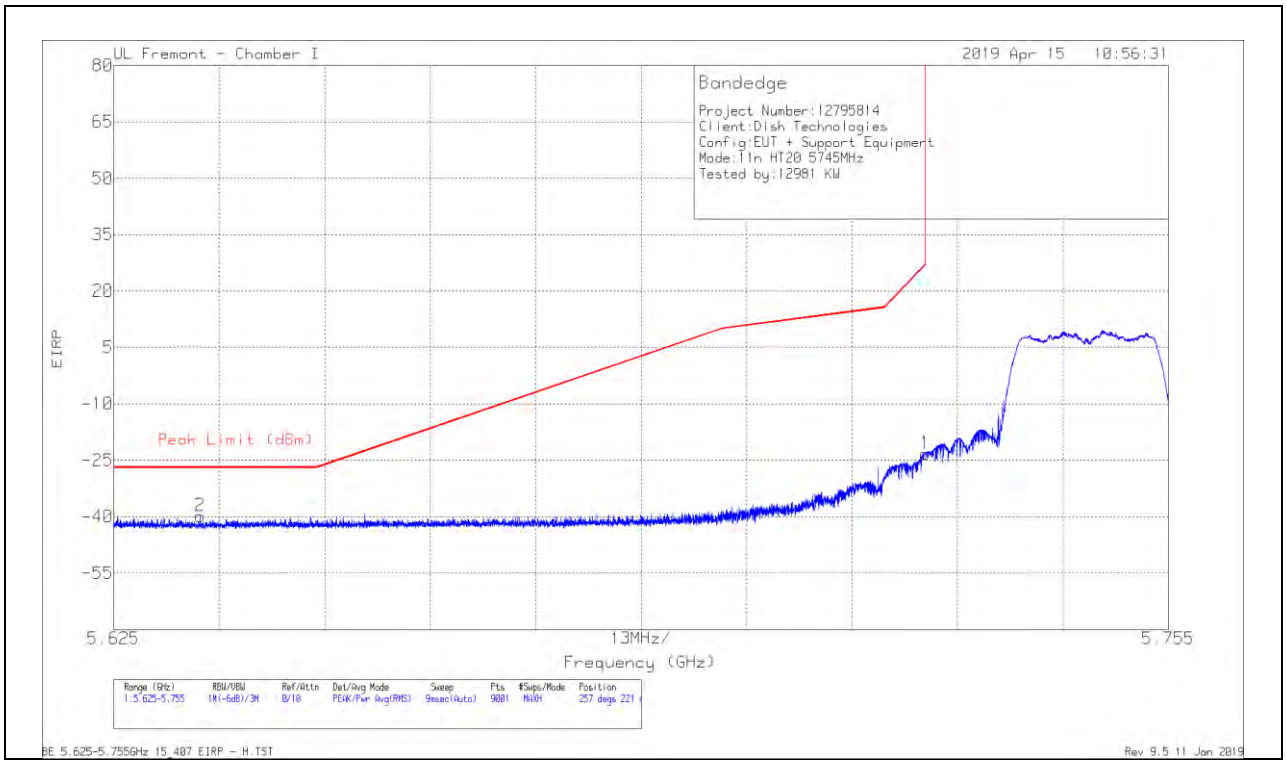
9.1.4. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (LOW CHANNEL)

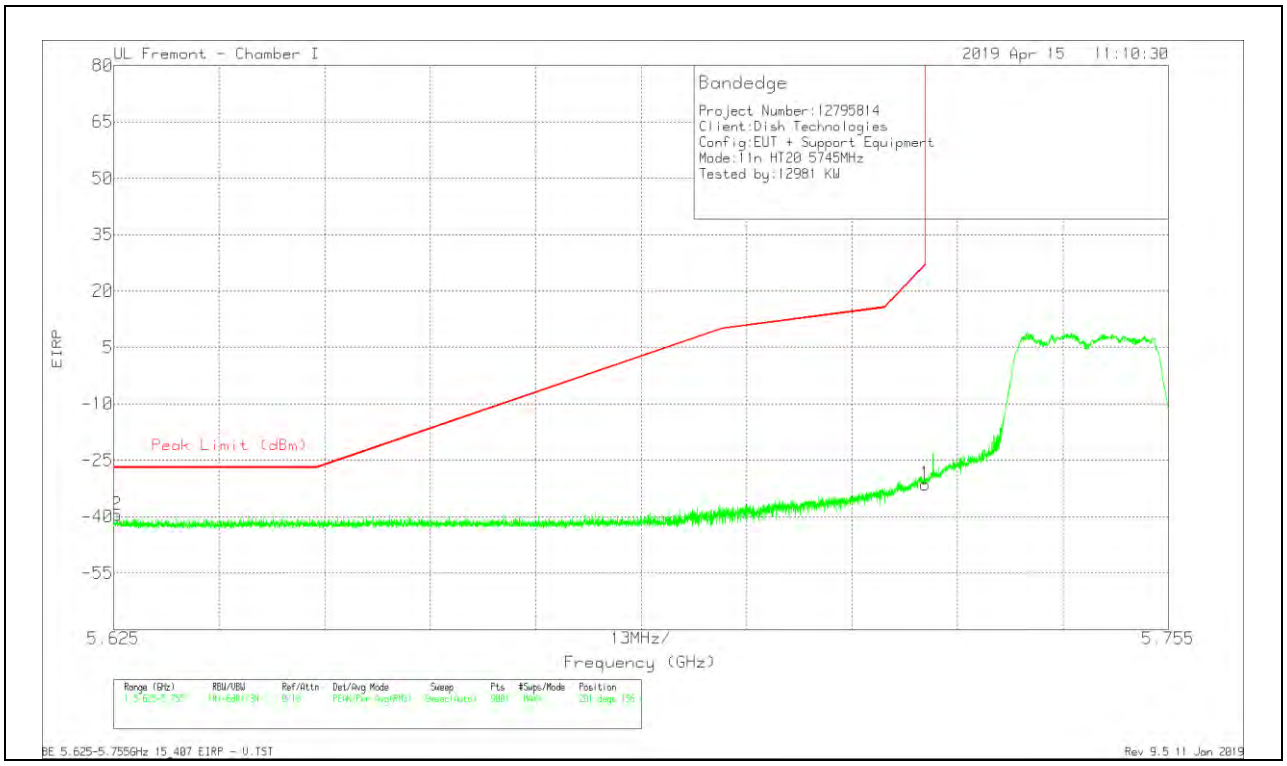
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-51.57	Pk	35	-18.5	11.8	-23.27	26.99	-50.26	257	221	H
2	5.636	-68.04	Pk	34.9	-18.6	11.8	-39.94	-27	-12.94	257	221	H

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

VERTICAL RESULT

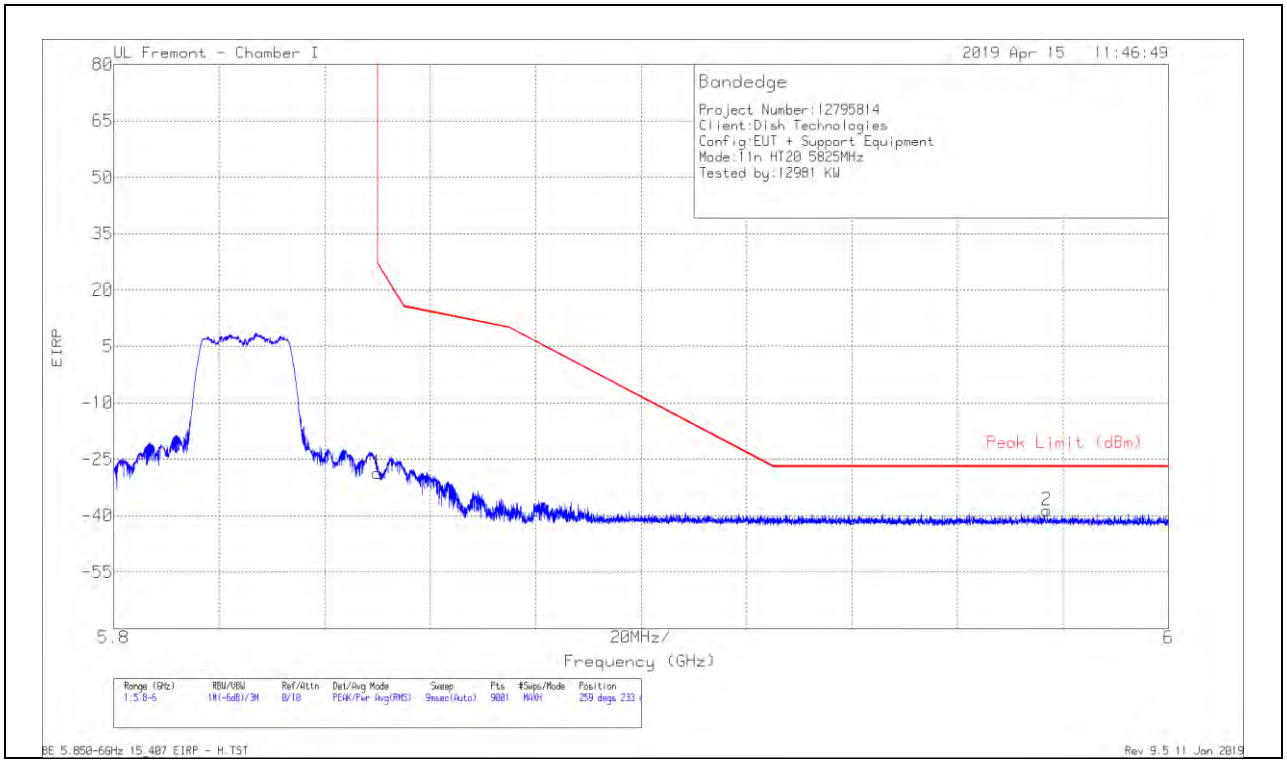


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-59.67	Pk	35	-18.5	11.8	-31.37	26.99	-58.36	201	156	V
2	5.625	-67.77	Pk	35.1	-18.6	11.8	-39.47	-27	-12.47	201	156	V

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

BANDEDGE (HIGH CHANNEL)

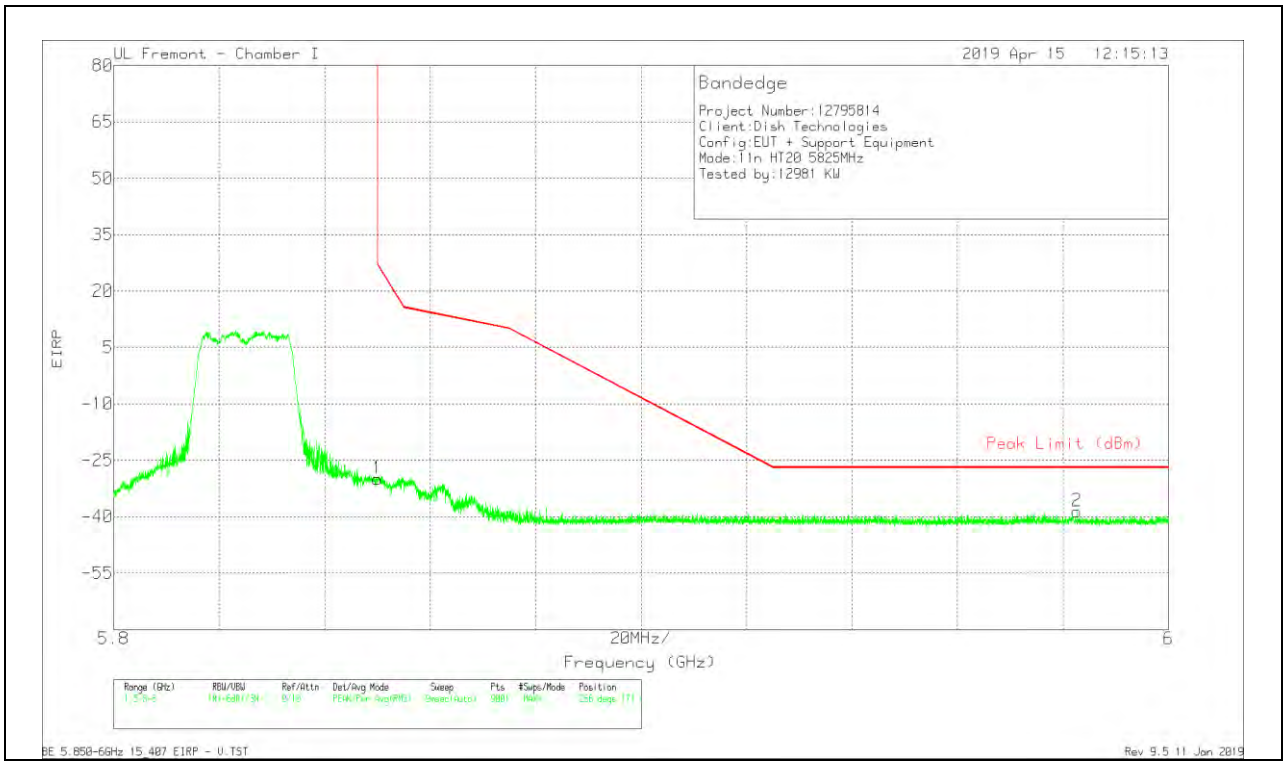
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-58.07	Pk	35.1	-17.4	11.8	-28.57	26.95	-55.52	259	233	H
2	5.977	-68.02	Pk	35.2	-17.5	11.8	-38.52	-27	-11.52	259	233	H

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

VERTICAL RESULT

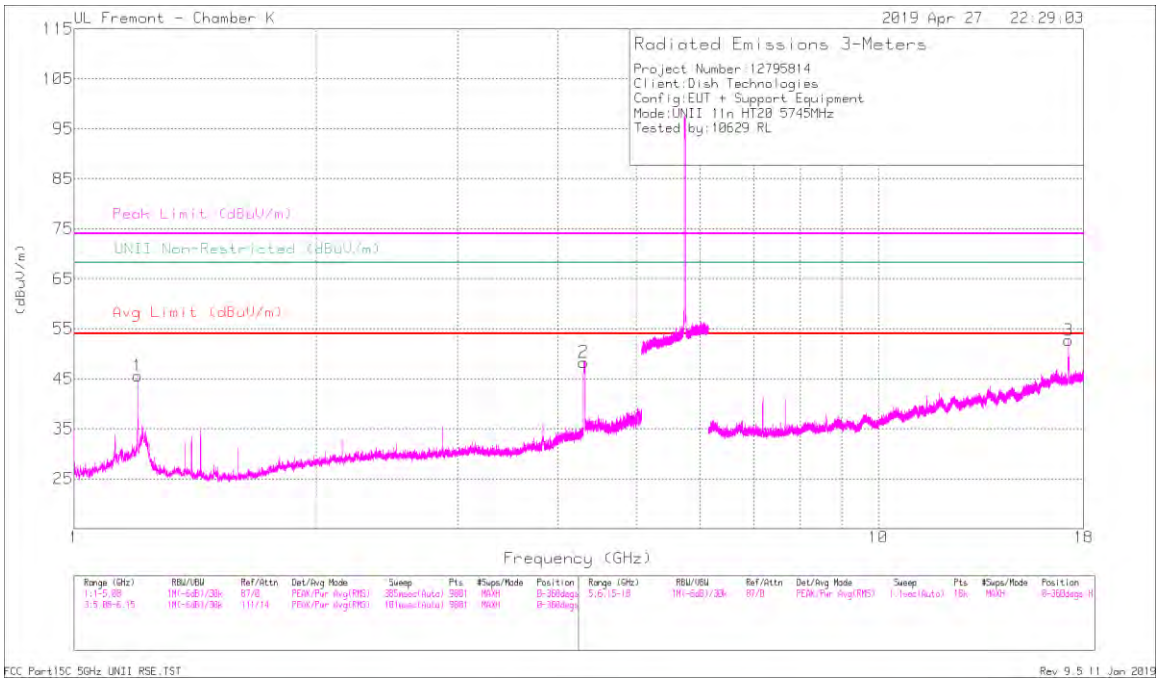


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-59.36	Pk	35.1	-17.4	11.8	-29.86	26.95	-56.81	266	171	V
2	5.983	-68.09	Pk	35.2	-17.5	11.8	-38.59	-27	-11.59	266	171	V

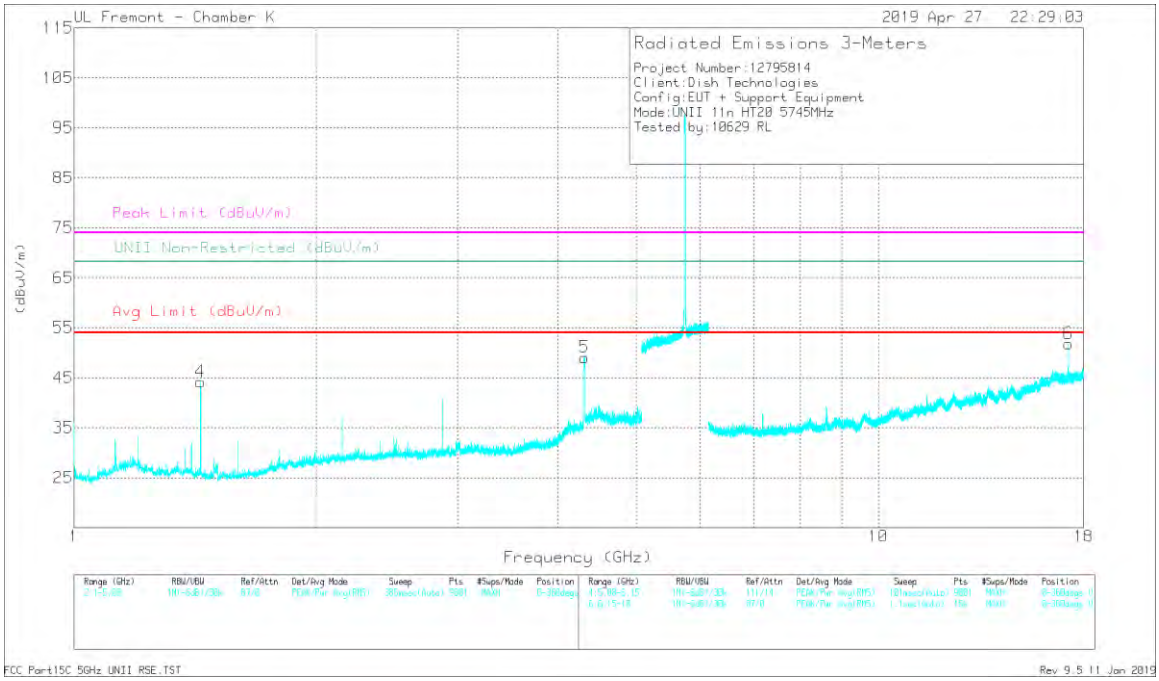
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	55	PK-U	28.2	-35.2	0	48	-	-	74	-26	-	-	274	147	H
* 1.2	51.55	ADR	28.2	-35.2	.14	44.69	54	-9.31	-	-	-	-	274	147	H
* 4.31	55.76	PK-U	33.6	-31.2	0	58.16	-	-	74	-15.84	-	-	232	304	H
* 4.311	46.04	ADR	33.6	-31.2	.14	48.58	54	-5.42	-	-	-	-	232	304	H
* 1.436	52.11	PK-U	28.6	-35.2	0	45.51	-	-	74	-28.49	-	-	354	223	V
* 1.436	49.09	ADR	28.6	-35.2	.14	42.63	54	-11.37	-	-	-	-	354	223	V
* 4.312	57	PK-U	33.6	-31.2	0	59.4	-	-	74	-14.6	-	-	352	208	V
* 4.311	44.06	ADR	33.6	-31.2	.14	46.6	54	-7.4	-	-	-	-	352	208	V
17.236	37.19	PK-U	41.3	-17.1	0	61.39	-	-	-	-	68.2	-6.81	285	102	H
17.232	34.38	PK-U	41.3	-17.1	0	58.58	-	-	-	-	68.2	-9.62	230	135	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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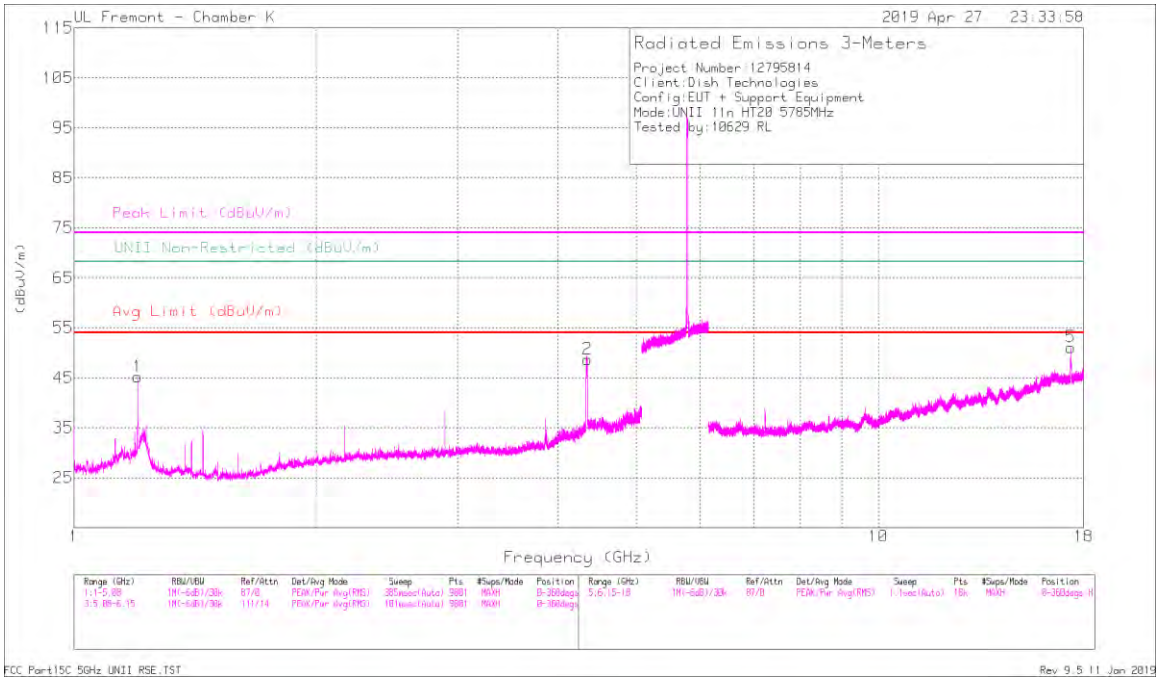
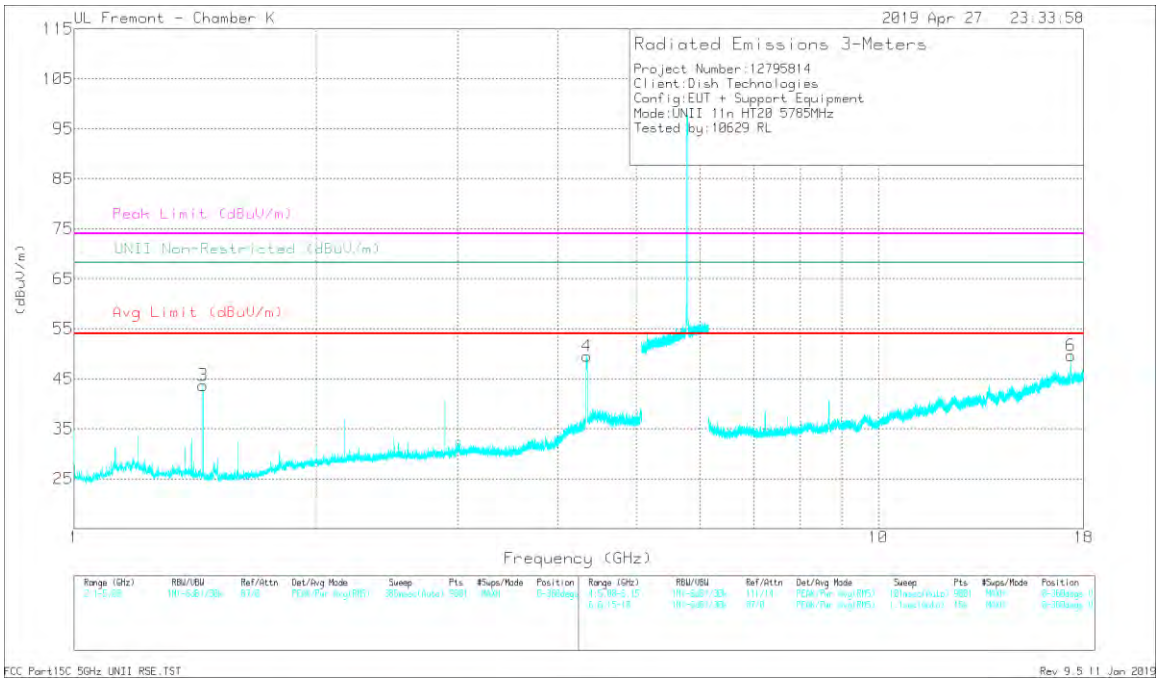
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	54.46	PK-U	28.2	-35.2	0	47.46	-	-	74	-26.54	-	-	277	146	H
* 1.2	51.53	ADR	28.2	-35.2	.14	44.67	54	-9.33	-	-	-	-	277	146	H
* 4.341	56.06	PK-U	33.7	-31.3	0	58.46	-	-	74	-15.54	-	-	237	309	H
* 4.341	46.4	ADR	33.7	-31.3	.14	48.94	54	-5.06	-	-	-	-	237	309	H
* 1.446	51.37	PK-U	28.5	-35.2	0	44.67	-	-	74	-29.33	-	-	14	190	V
* 1.446	49.09	ADR	28.5	-35.2	.14	42.53	54	-11.47	-	-	-	-	14	190	V
* 4.341	56.79	PK-U	33.7	-31.3	0	59.19	-	-	74	-14.81	-	-	353	215	V
* 4.346	45.19	ADR	33.7	-31.3	.14	47.73	54	-6.27	-	-	-	-	353	215	V
17.351	39.25	PK-U	41.3	-16.8	0	63.75	-	-	-	-	68.2	-4.45	347	288	H
17.352	34.34	PK-U	41.3	-16.8	0	58.84	-	-	-	-	68.2	-9.36	260	102	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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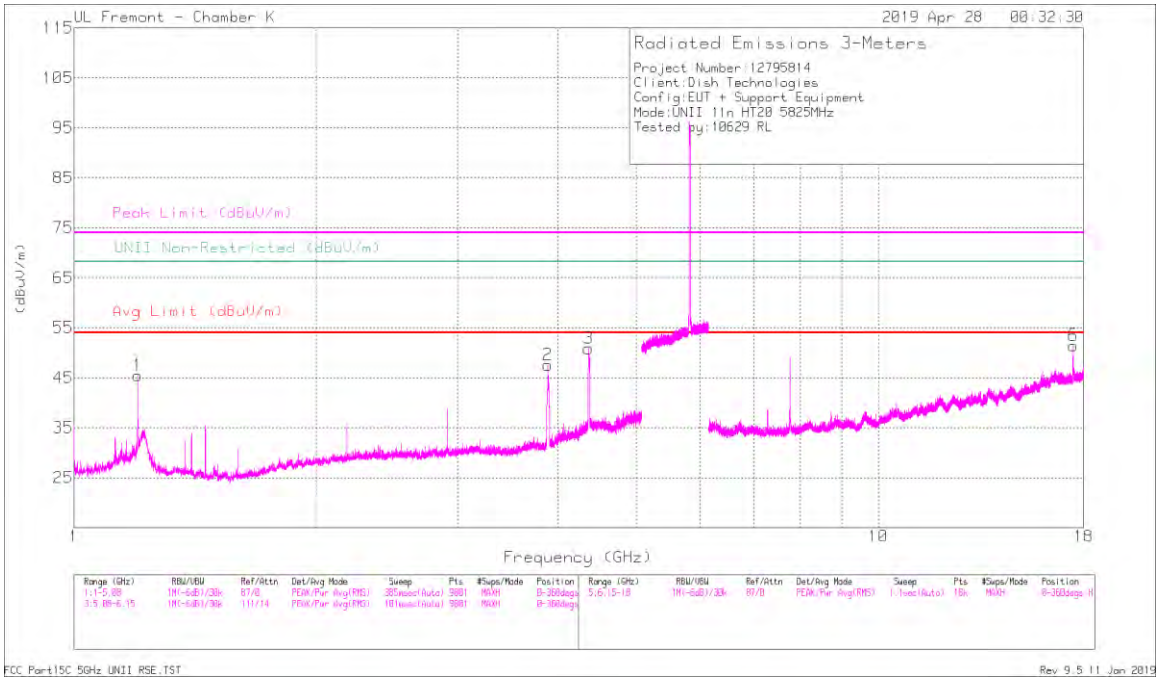
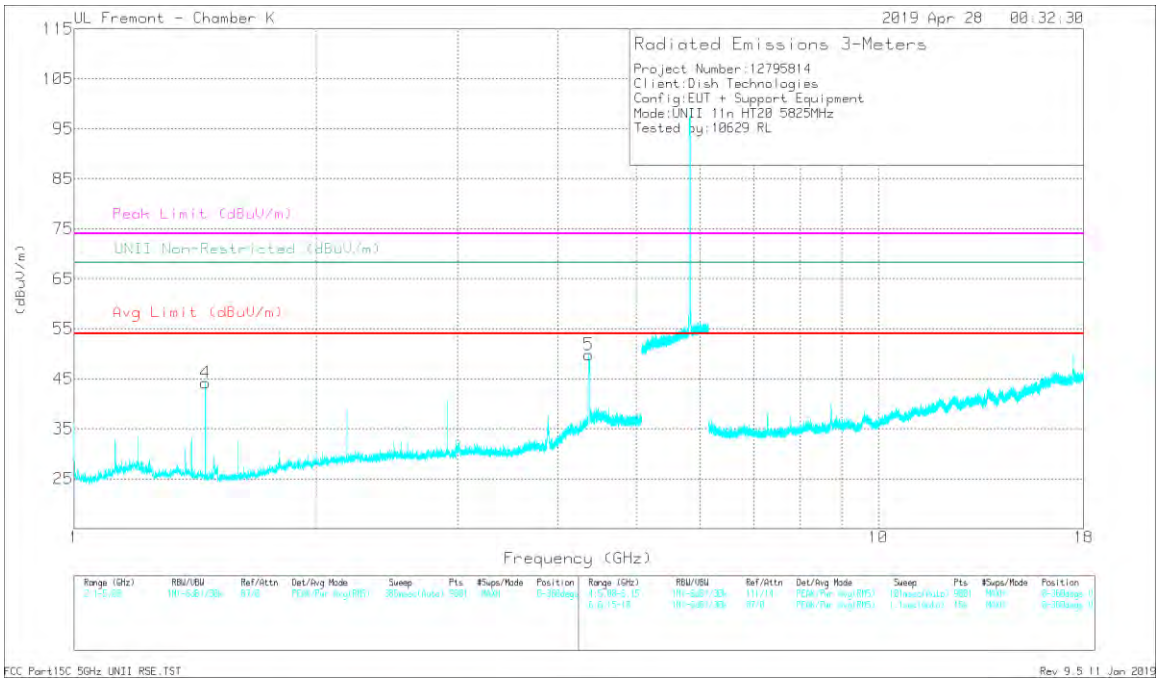
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (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	54.18	PK-U	28.2	-35.2	0	47.18	-	-	74	-26.82	-	-	274	146	H
* 1.2	51.18	ADR	28.2	-35.2	.14	44.32	54	-9.68	-	-	-	-	274	146	H
* 3.883	58.44	PK-U	33.4	-31.7	0	60.14	-	-	74	-13.86	-	-	255	184	H
* 3.883	43.47	ADR	33.4	-31.7	.14	45.31	54	-8.69	-	-	-	-	255	184	H
* 4.377	57.12	PK-U	33.8	-31.1	0	59.82	-	-	74	-14.18	-	-	237	344	H
* 4.366	47.59	ADR	33.8	-31.2	.14	50.33	54	-3.67	-	-	-	-	237	344	H
* 1.456	52.67	PK-U	28.4	-35.3	0	45.77	-	-	74	-28.23	-	-	350	149	V
* 1.456	50.49	ADR	28.4	-35.3	.14	43.73	54	-10.27	-	-	-	-	350	149	V
* 4.366	56.82	PK-U	33.8	-31.2	0	59.42	-	-	74	-14.58	-	-	352	194	V
* 4.371	44.85	ADR	33.8	-31.2	.14	47.59	54	-6.41	-	-	-	-	352	194	V
17.472	34.3	PK-U	41.3	-16.5	0	59.1	-	-	-	-	68.2	-9.1	28	105	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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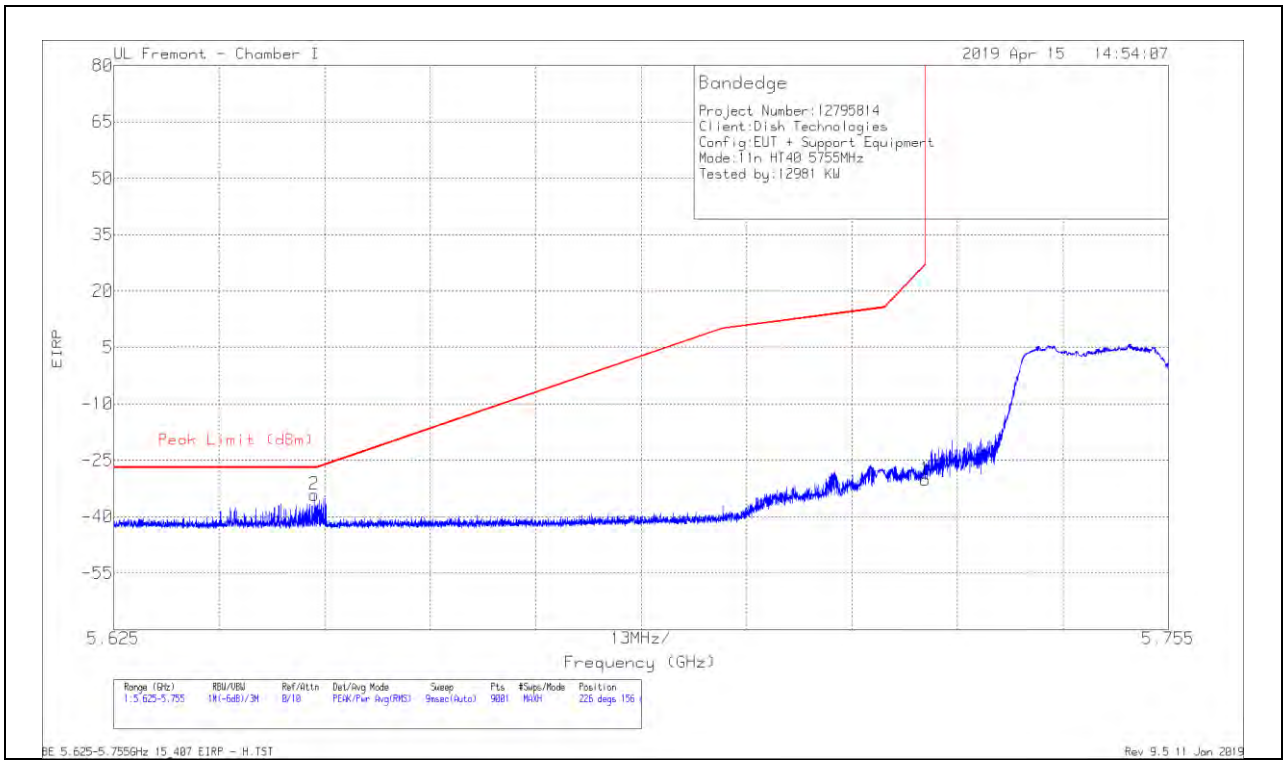
9.1.5. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (LOW CHANNEL)

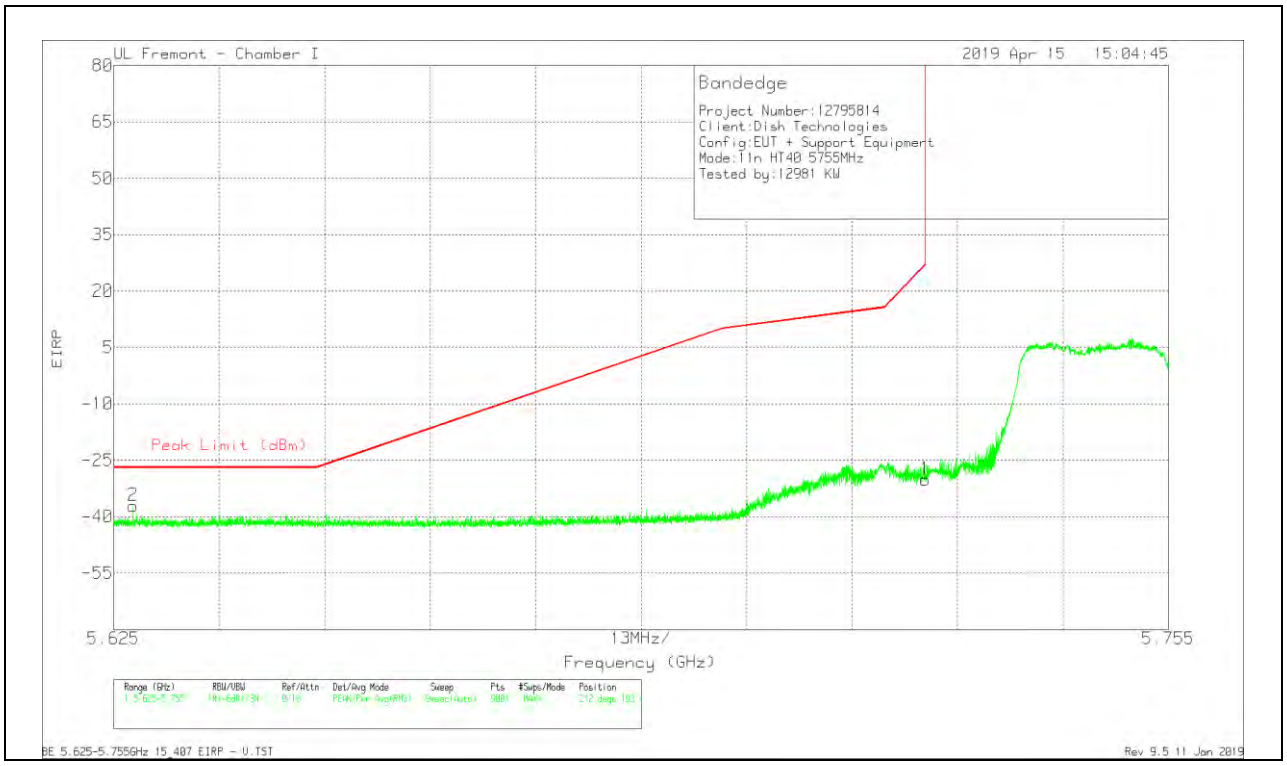
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-58.37	Pk	35	-18.5	11.8	-30.07	26.99	-57.06	226	156	H
2	5.65	-62.38	Pk	35	-18.6	11.8	-34.18	-27	-7.18	226	156	H

Pk - Peak detector

VERTICAL RESULT

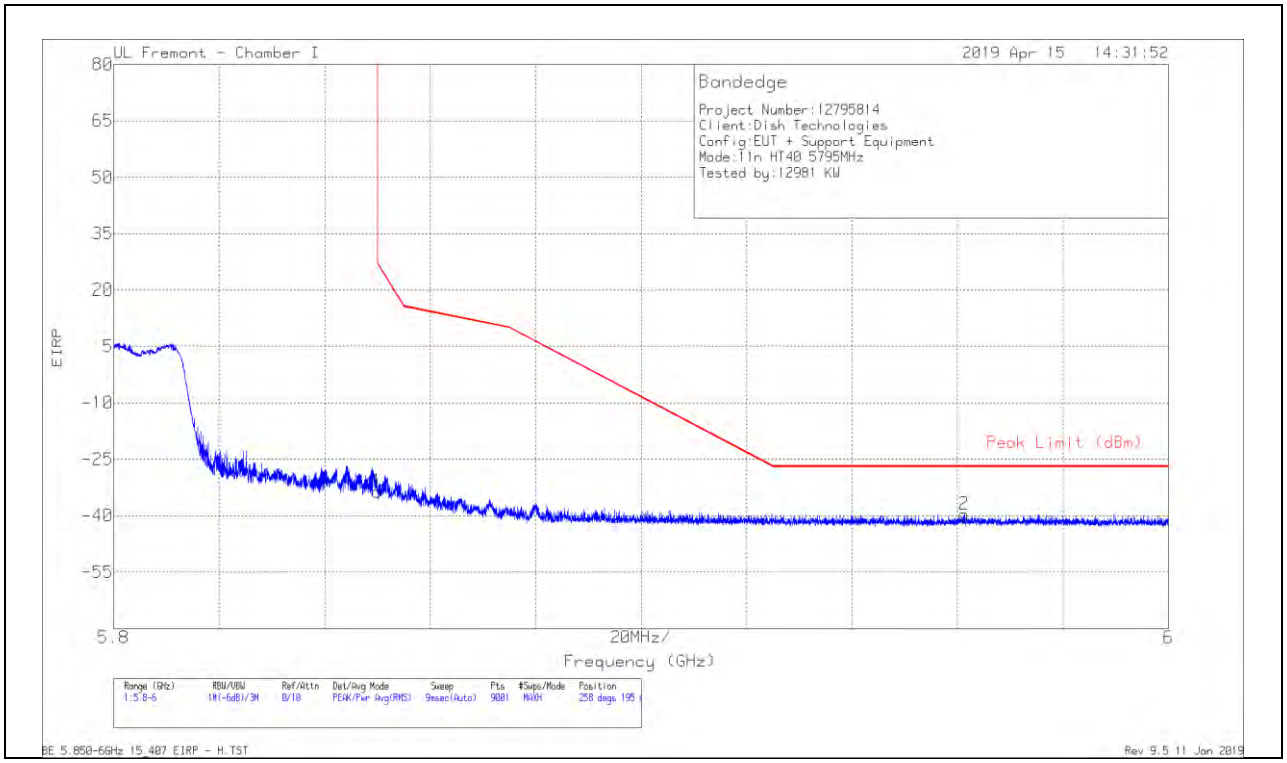


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-58.43	Pk	35	-18.5	11.8	-30.13	26.99	-57.12	212	183	V
2	5.627	-65.37	Pk	35.1	-18.6	11.8	-37.07	-27	-10.07	212	183	V

Pk - Peak detector

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-63.11	Pk	35.1	-17.4	11.8	-33.61	26.95	-60.56	258	195	H
2	5.961	-69.24	Pk	35.3	-17.5	11.8	-39.64	-27	-12.64	258	195	H

Pk - Peak detector

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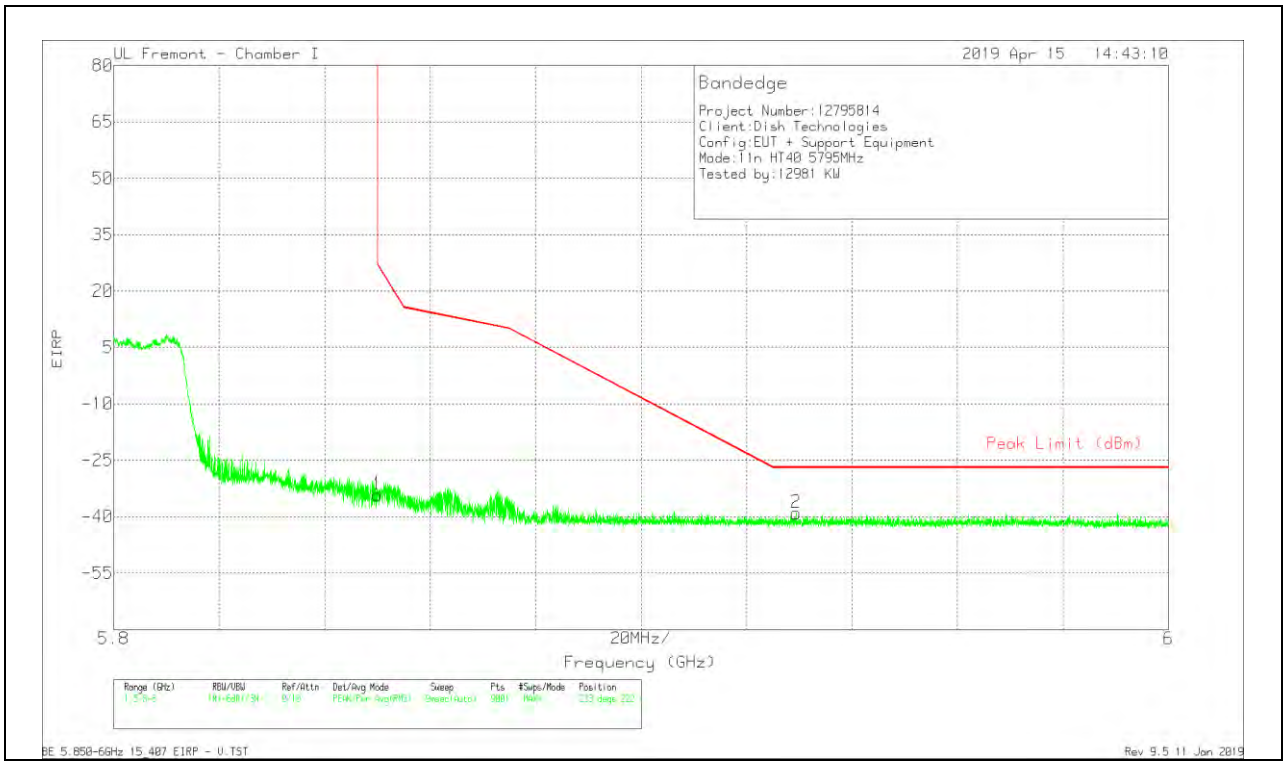
VERTICAL RESULT

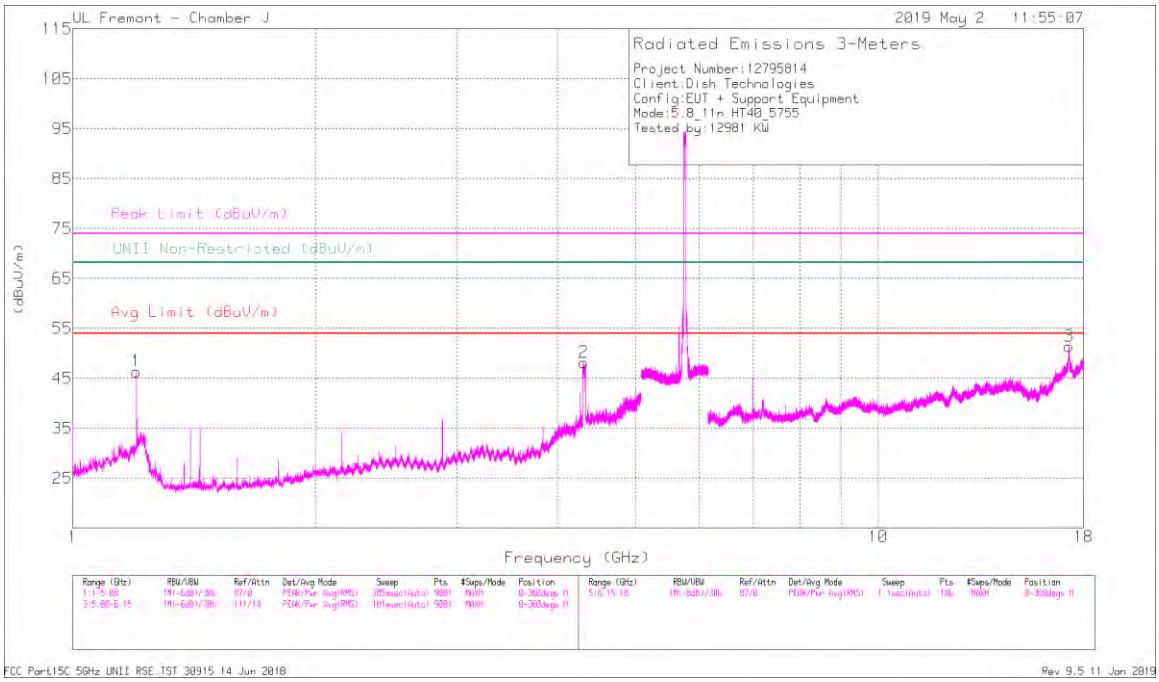


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Filter/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-63.58	Pk	35.1	-17.4	11.8	-34.08	26.95	-61.03	233	222	V
2	5.929	-68.64	Pk	35.2	-17.4	11.8	-39.04	-27	-12.04	233	222	V

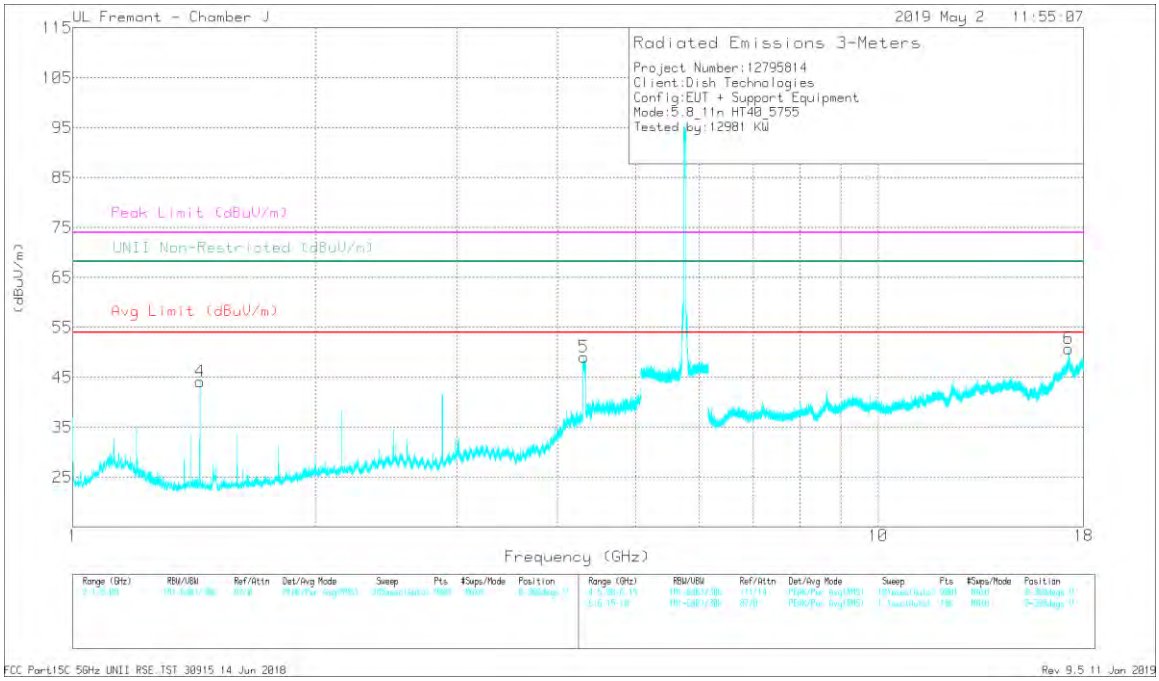
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	59.77	PK-U	24.1	-35.8	0	48.07	-	-	74	-25.93	-	-	211	102	H
* 1.2	56.51	ADR	24.1	-35.8	.18	44.99	54	-9.01	-	-	-	-	211	102	H
* 4.31	55.61	PK-U	31.9	-31.6	0	55.91	-	-	74	-18.09	-	-	198	303	H
* 4.312	47.19	ADR	31.9	-31.6	.18	47.67	54	-6.33	-	-	-	-	198	303	H
* 1.439	56.92	PK-U	25.1	-35.9	0	46.12	-	-	74	-27.88	-	-	292	166	V
* 1.439	53.25	ADR	25.1	-35.9	.18	42.63	54	-11.37	-	-	-	-	292	166	V
* 4.312	57.02	PK-U	31.9	-31.6	0	57.32	-	-	74	-16.68	-	-	301	200	V
* 4.312	47.22	ADR	31.9	-31.6	.18	47.7	54	-6.3	-	-	-	-	301	200	V
17.259	35.11	PK-U	43.8	-19.6	0	59.31	-	-	-	-	68.2	-8.89	147	103	H
17.25	36	PK-U	43.8	-19.6	0	60.2	-	-	-	-	68.2	-8	183	194	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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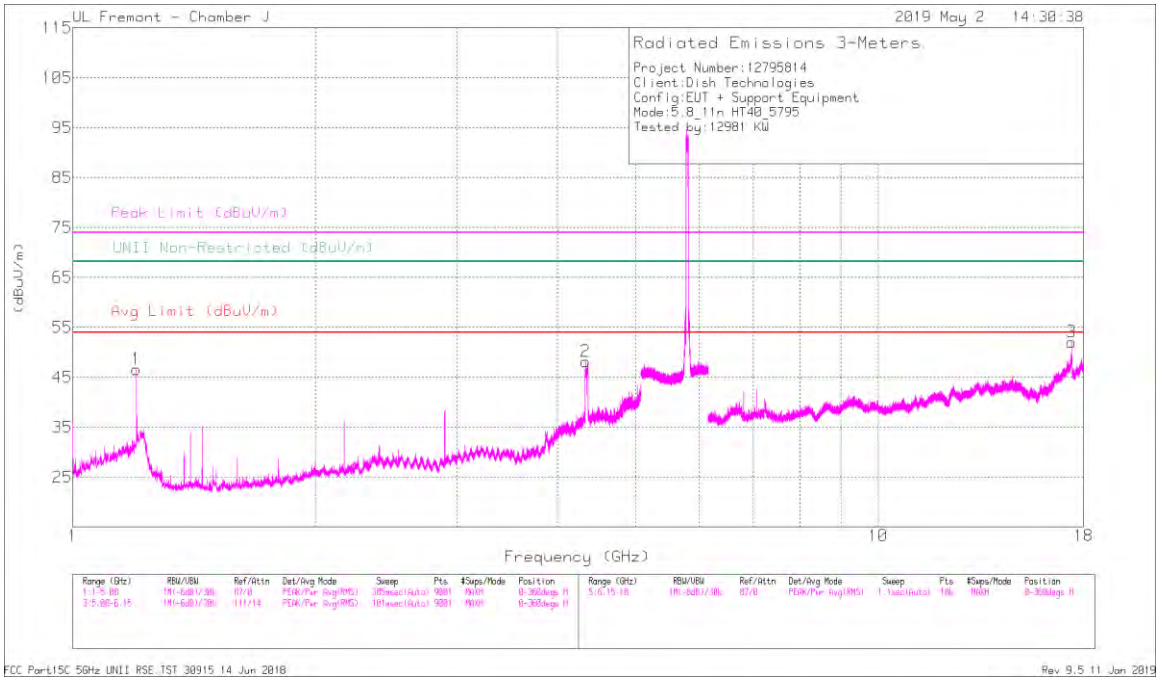
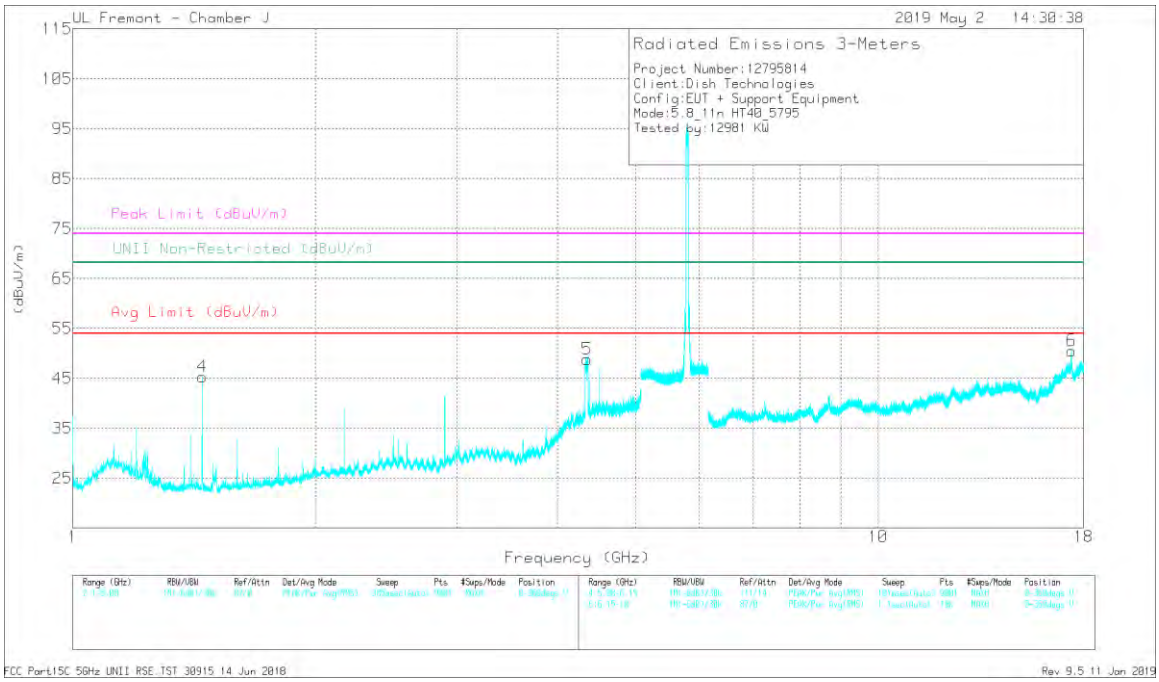
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	60.03	PK-U	24.1	-35.8	0	48.33	-	-	74	-25.67	-	-	212	182	H
* 1.2	56.57	ADR	24.1	-35.8	.18	45.05	54	-8.95	-	-	-	-	212	182	H
* 4.332	55.09	PK-U	31.9	-31.3	0	55.69	-	-	74	-18.31	-	-	188	295	H
* 4.33	46.28	ADR	31.9	-31.3	.18	47.06	54	-6.94	-	-	-	-	188	295	H
* 1.449	56.96	PK-U	25	-35.8	0	46.16	-	-	74	-27.84	-	-	301	154	V
* 1.449	54.41	ADR	25	-35.8	.18	43.79	54	-10.21	-	-	-	-	301	154	V
* 4.351	56.77	PK-U	32	-31	0	57.77	-	-	74	-16.23	-	-	285	195	V
* 4.353	45.16	ADR	32	-31	.18	46.34	54	-7.66	-	-	-	-	285	195	V
17.377	35.79	PK-U	43.2	-19.3	0	59.69	-	-	-	-	68.2	-8.51	237	184	H
17.391	33.74	PK-U	43.1	-19.2	0	57.64	-	-	-	-	68.2	-10.56	216	133	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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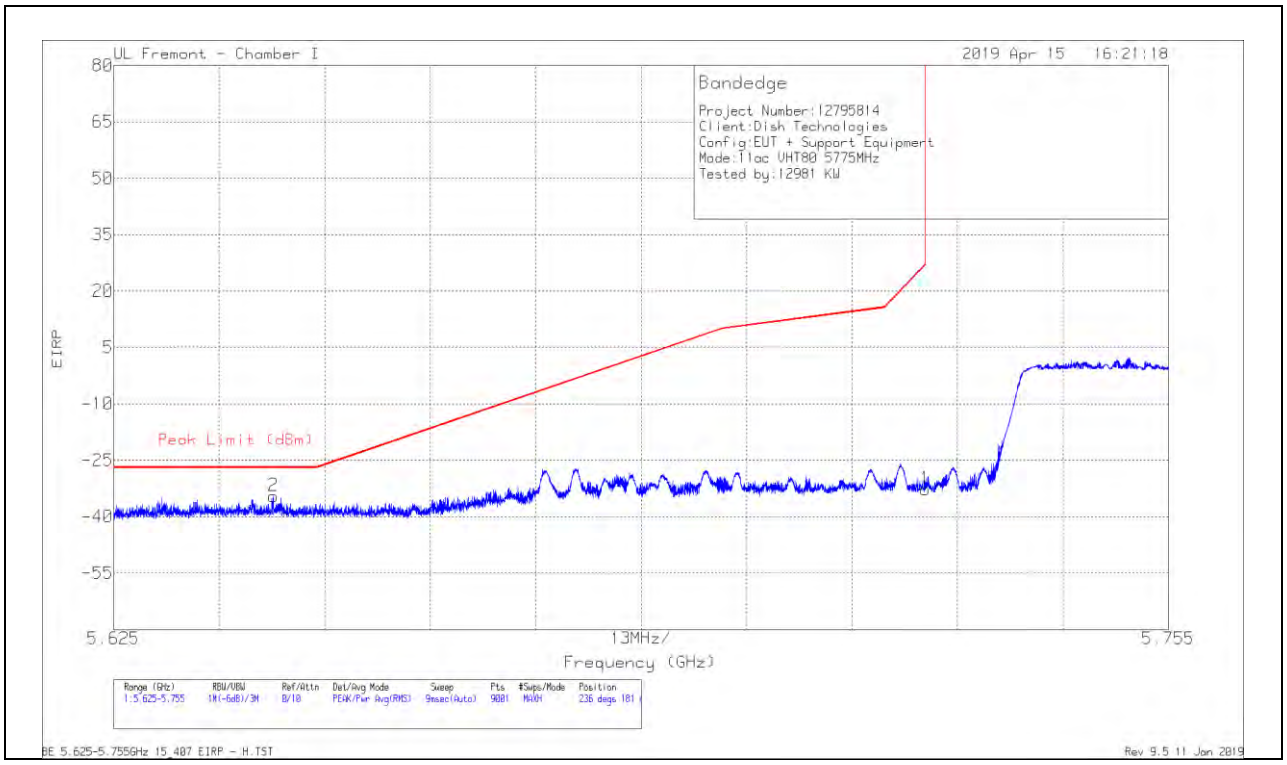
9.1.6. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

2TX Antenna 1 + Antenna 2 CDD MODE

BANDEDGE (CHANNEL 155 LOW EDGE)

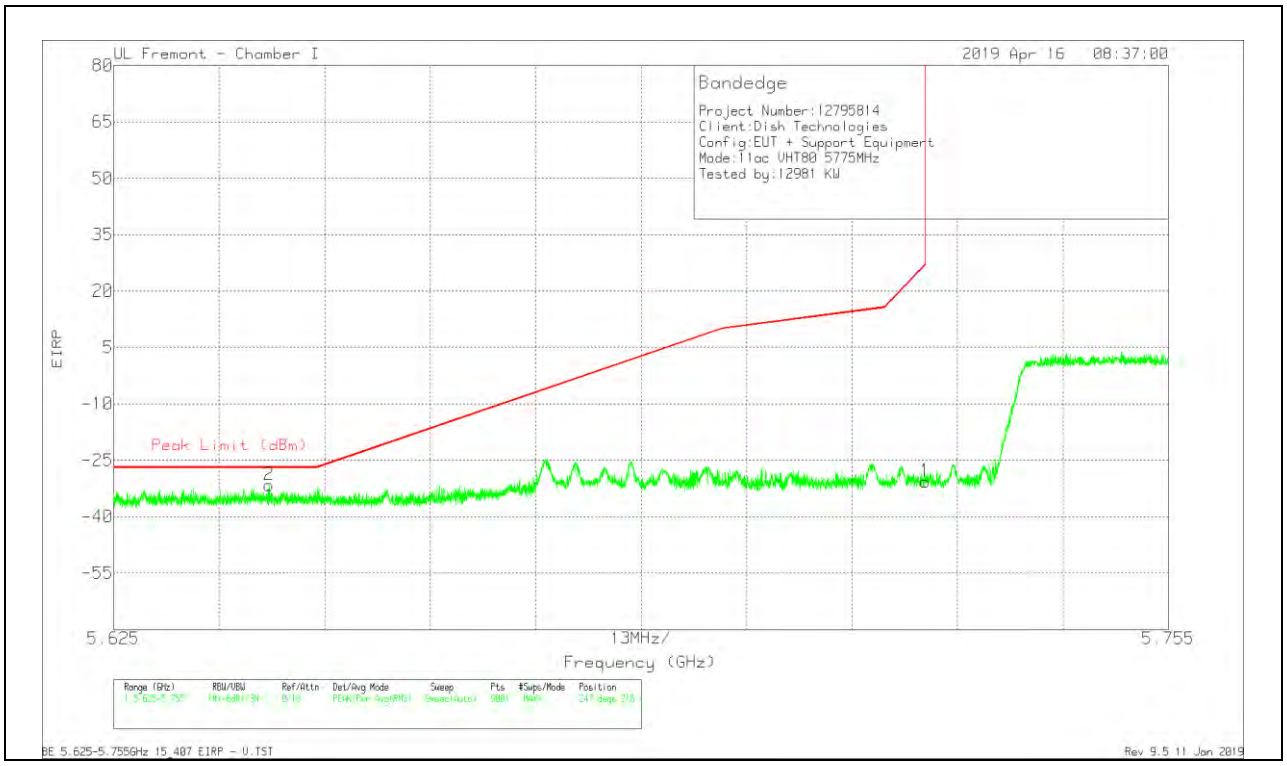
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-60.99	Pk	35	-18.5	11.8	-32.69	26.99	-59.68	236	181	H
2	5.645	-62.81	Pk	35.1	-18.6	11.8	-34.51	-27	-7.51	236	181	H

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

VERTICAL RESULT

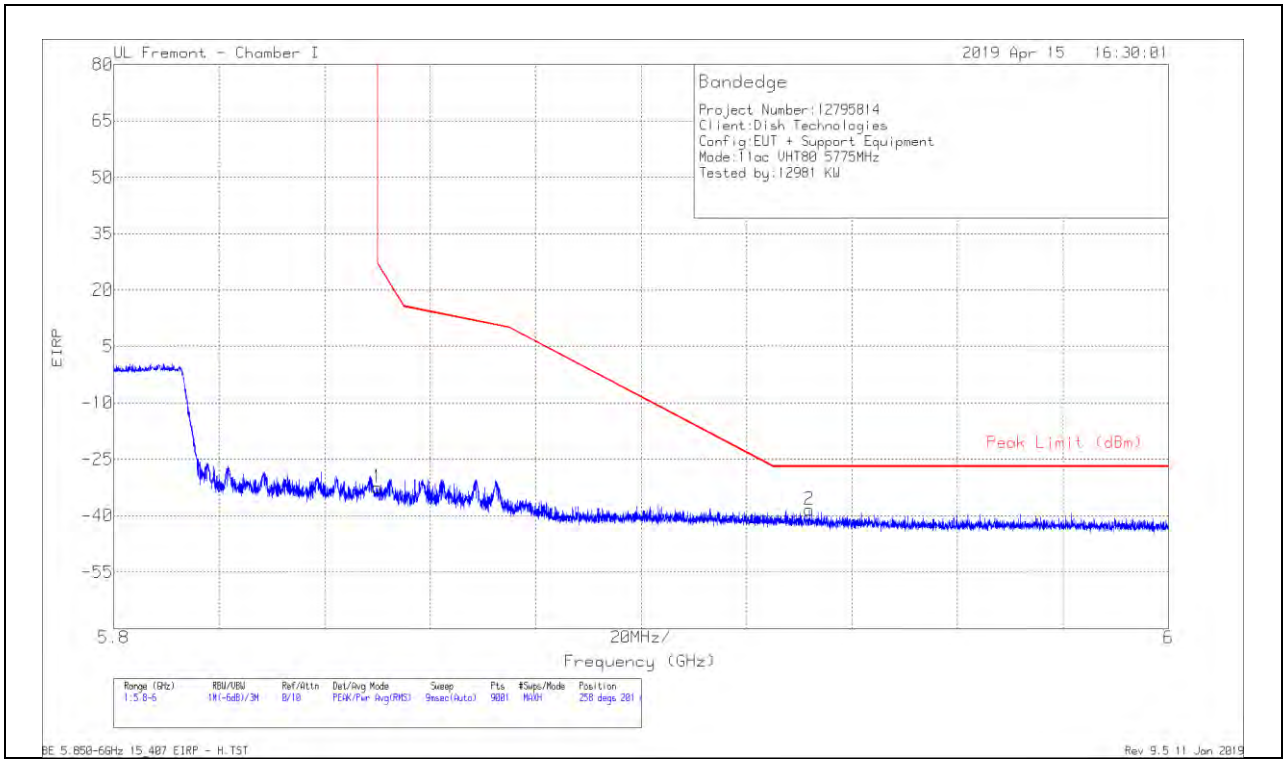


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.725	-58.91	Pk	35	-18.5	11.8	-30.61	26.99	-57.6	247	218	V
2	5.644	-59.88	Pk	35.1	-18.6	11.8	-31.58	-27	-4.58	247	218	V

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

BANDEDGE (CHANNEL 155 HIGH EDGE)

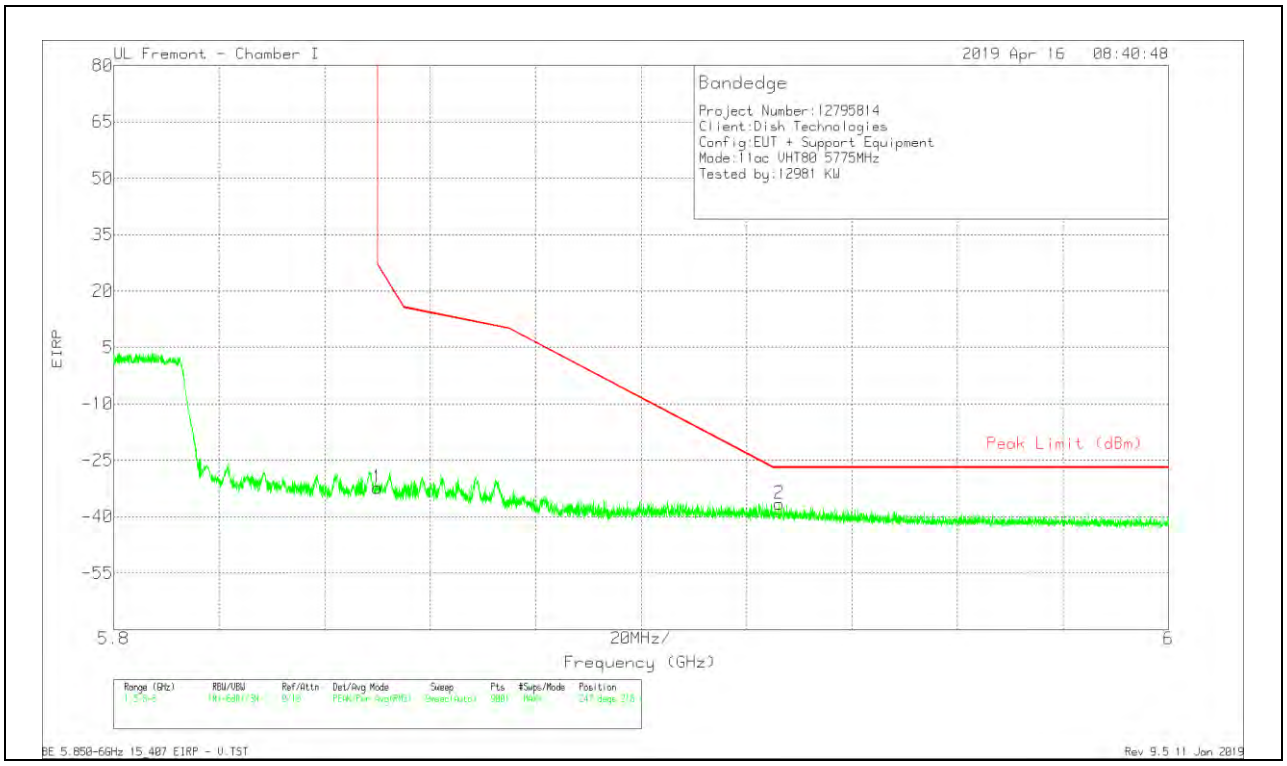
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-62	Pk	35.1	-17.4	11.8	-32.5	26.95	-59.45	258	201	H
2	5.932	-68.08	Pk	35.2	-17.3	11.8	-38.38	-27	-11.38	258	201	H

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

VERTICAL RESULT

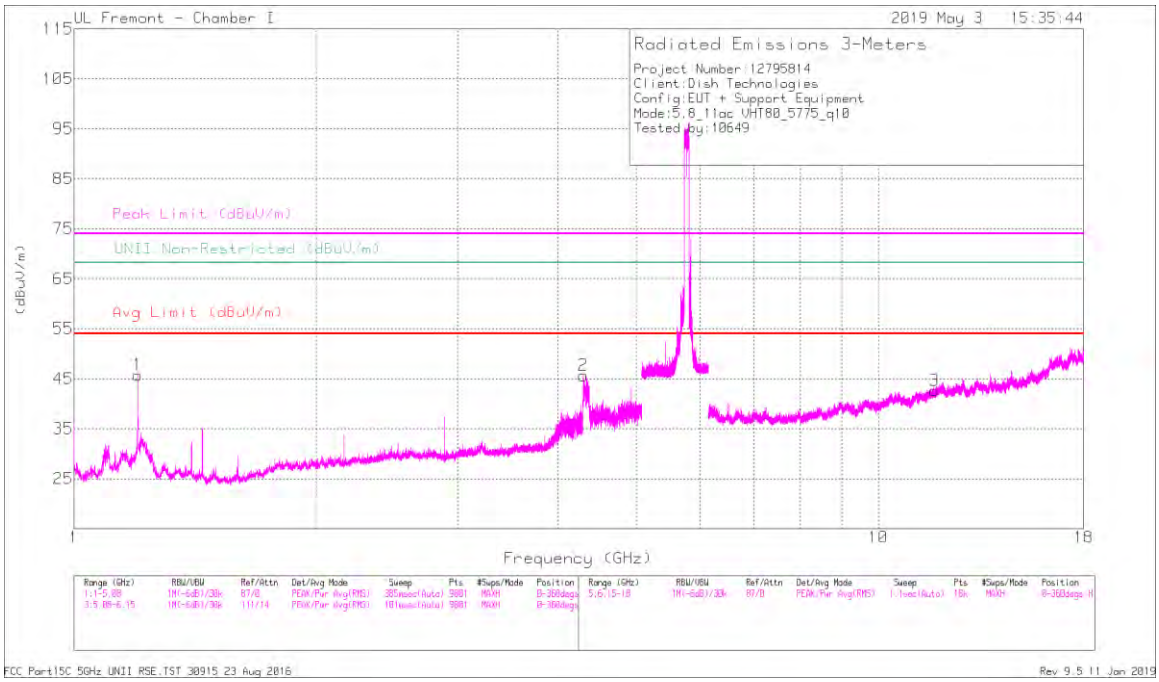


Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T862 (dB/m)	Amp/Cbl/Filt r/Pad (dB)	Conversion Factor (dB)	Corrected Reading EIRP	Peak Limit (dBm)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.85	-61.85	Pk	35.1	-17.4	11.8	-32.35	26.95	-59.3	247	218	V
2	5.926	-66.17	Pk	35.2	-17.4	11.8	-36.57	-27	-9.57	247	218	V

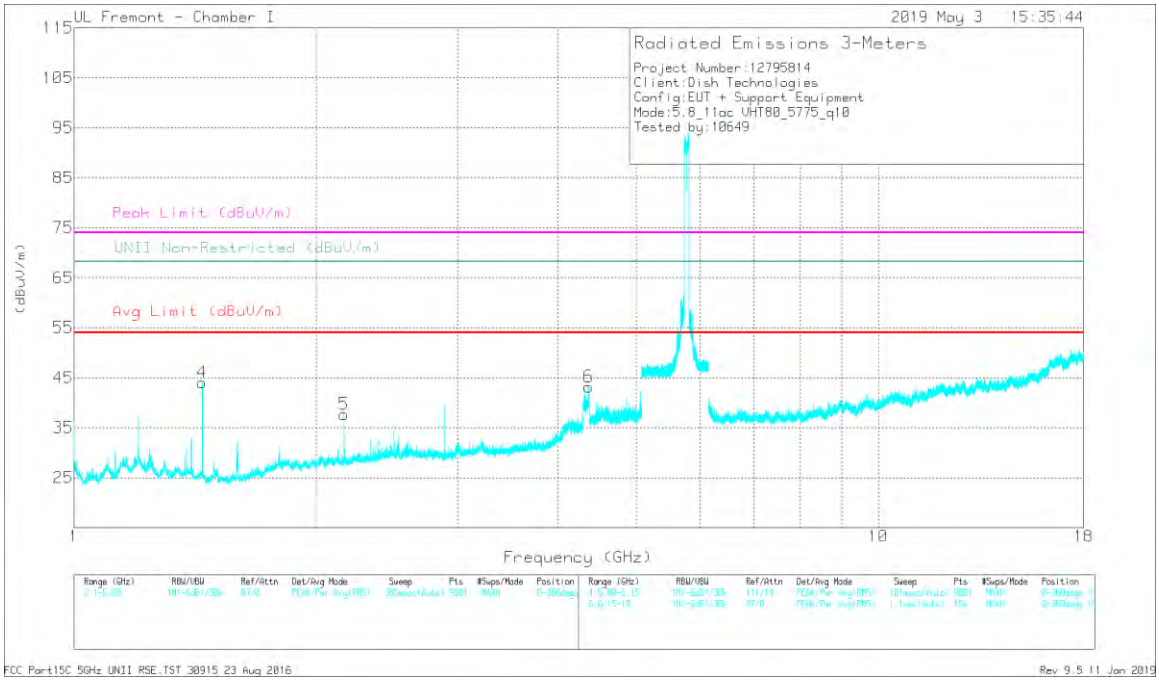
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE0189055 (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	53.4	PK-U	28.4	-34	0	47.8	-	-	74	-26.2	-	-	247	139	H
* 1.2	50.72	ADR	28.4	-34	.36	45.48	54	-8.52	-	-	-	-	247	139	H
* 4.296	44.45	PK-U	33.5	-28.6	0	49.35	-	-	74	-24.65	-	-	233	202	H
* 4.295	33.81	ADR	33.5	-28.6	.36	39.07	54	-14.93	-	-	-	-	233	202	H
* 1.444	49.86	PK-U	28.4	-33.4	0	44.86	-	-	74	-29.14	-	-	319	246	V
* 1.444	46.05	ADR	28.4	-33.4	.36	41.41	54	-12.59	-	-	-	-	319	246	V
2.166	40.81	PK-U	31.2	-32.2	0	39.81	-	-	-	-	68.2	-28.39	2	100	V
* 4.361	43.41	PK-U	33.7	-28	0	49.11	-	-	74	-24.89	-	-	273	162	V
* 4.361	35.05	ADR	33.7	-28	.36	41.11	54	-12.89	-	-	-	-	273	162	V
* 11.748	26.44	PK-U	38.5	-16.3	0	48.64	-	-	74	-25.36	-	-	240	261	H
* 11.747	18.14	ADR	38.5	-16.3	.36	40.7	54	-13.3	-	-	-	-	240	261	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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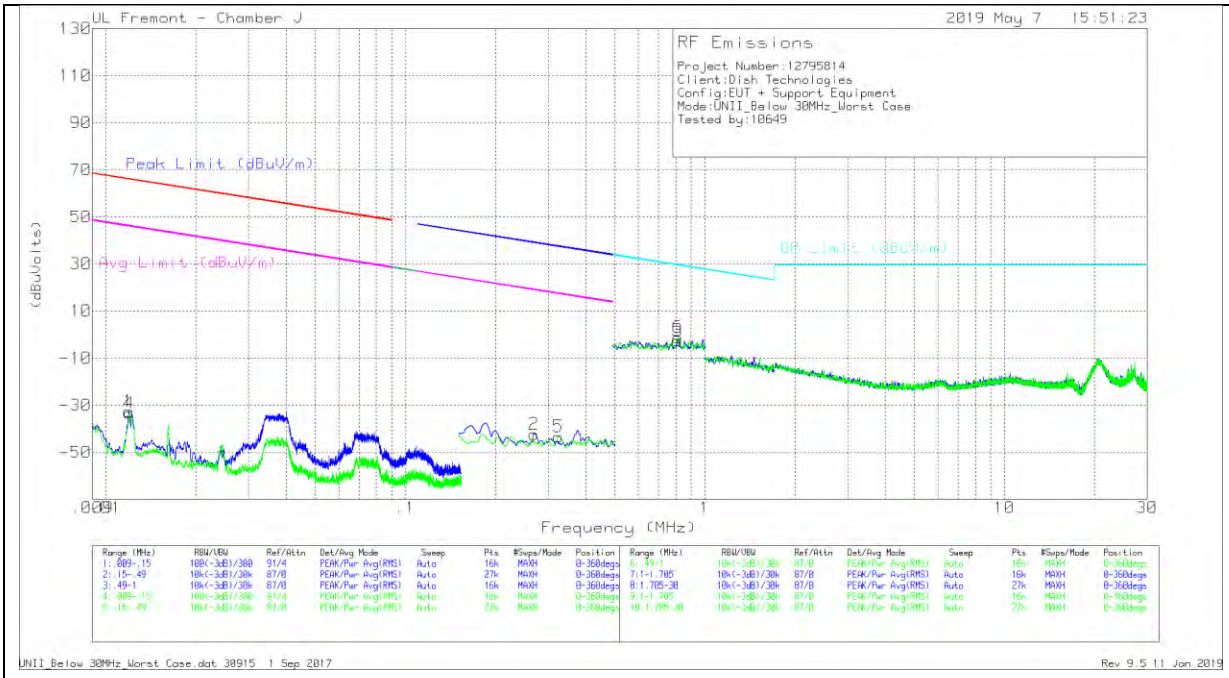
9.2. WORST CASE BELOW 30MHZ

SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)



ANTENNA- TWO ORIENTATIONS FACE ON/FACE OFF

Below 30MHz Data

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0180175 (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.01193	19.79	Pk	60	-32.4	-80	-32.61	66.06	-98.67	46.06	-78.67	-	-	-	-	0-360
2	.26829	13.29	Pk	56.3	-31.9	-80	-42.31	-	-	-	-	39.04	-81.35	19.04	-61.35	0-360
4	.01195	19.04	Pk	60	-32.4	-80	-33.36	66.04	-99.4	46.04	-79.4	-	-	-	-	0-360
5	.32414	12.23	Pk	56.3	-31.9	-80	-43.37	-	-	-	-	37.4	-80.77	17.4	-60.77	0-360

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0180175 (dB)	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
3	.80998	12.93	Pk	56.3	-31.8	-40	-2.57	29.45	-32.02	0-360
6	.81251	14.3	Pk	56.3	-31.8	-40	-1.2	29.42	-30.62	0-360

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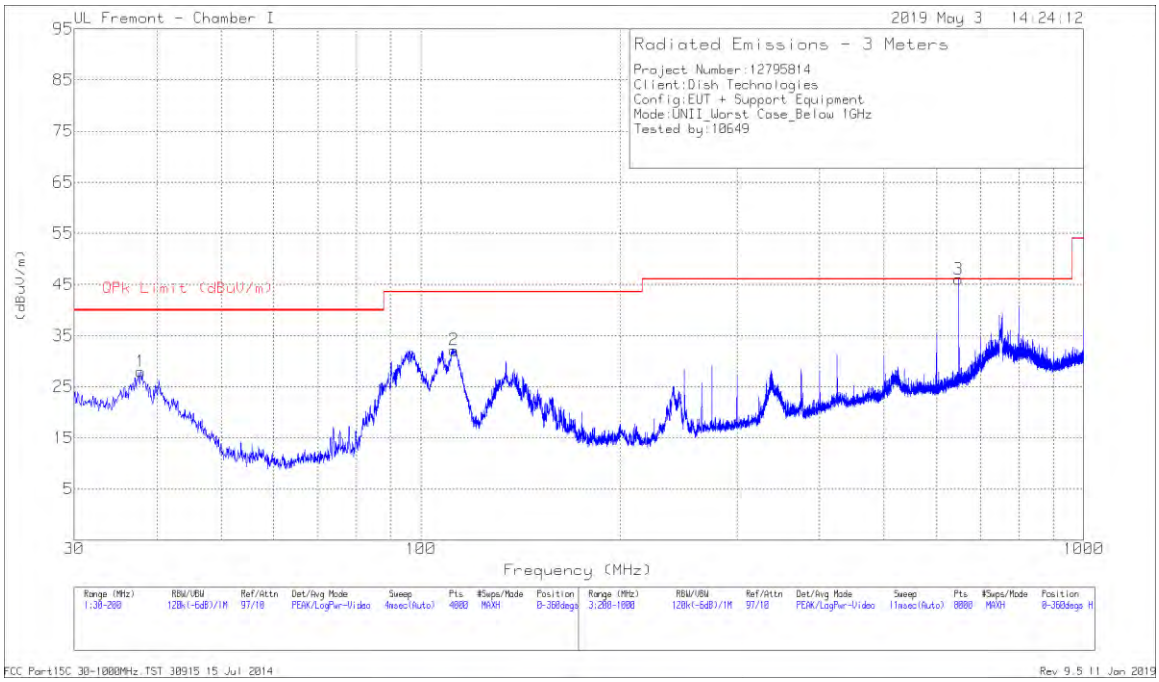
9.3. WORST CASE BELOW 1 GHZ



HORIZONTAL

VERTICAL

Below 1GHz DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	37.8008	37.96	Pk	21.3	-31.3	27.96	40	-12.04	0-360	300	H
2	112.2375	44.06	Pk	18.8	-30.7	32.16	43.52	-11.36	0-360	400	H
4	37.2694	44.64	Pk	21.6	-31.3	34.94	40	-5.06	0-360	102	V
3	647.4582	49.32	Pk	25.6	-28.9	46.02	46.02	0	0-360	102	H
5	599.952	37.56	Pk	24.2	-29.1	32.66	46.02	-13.36	0-360	101	V
6	647.4582	47.28	Pk	25.6	-28.9	43.98	46.02	-2.04	0-360	101	V

Pk - Peak detector

Radiated Emissions

Frequency (MHz)	Meter Reading (dBuV)	Det	AF PRE0184971 (dB/m)	Amp Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
37.3715	41.12	Qp	21.5	-31.3	31.32	40	-8.68	347	119	V
647.4966	48.2	Qp	25.6	-28.9	44.9	46.02	-1.12	177	114	H
647.4899	47.21	Qp	25.6	-28.9	43.91	46.02	-2.11	104	102	V

Qp - Quasi-Peak detector

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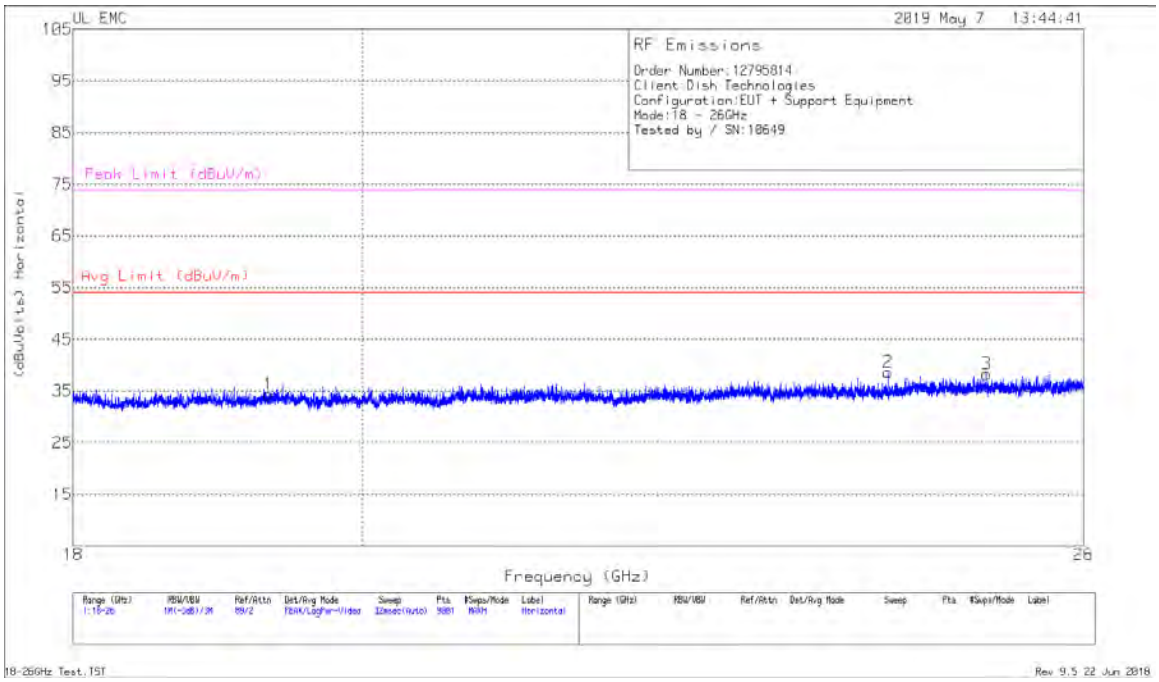
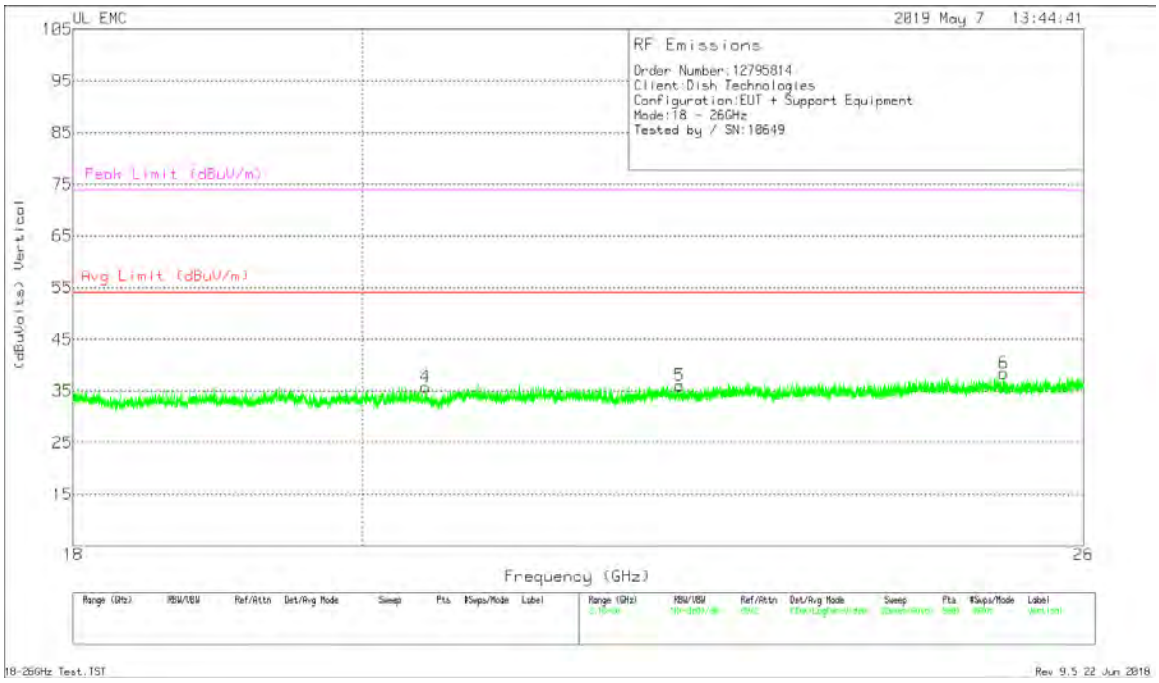
9.4. WORST CASE 18-26 GHZ



HORIZONTAL



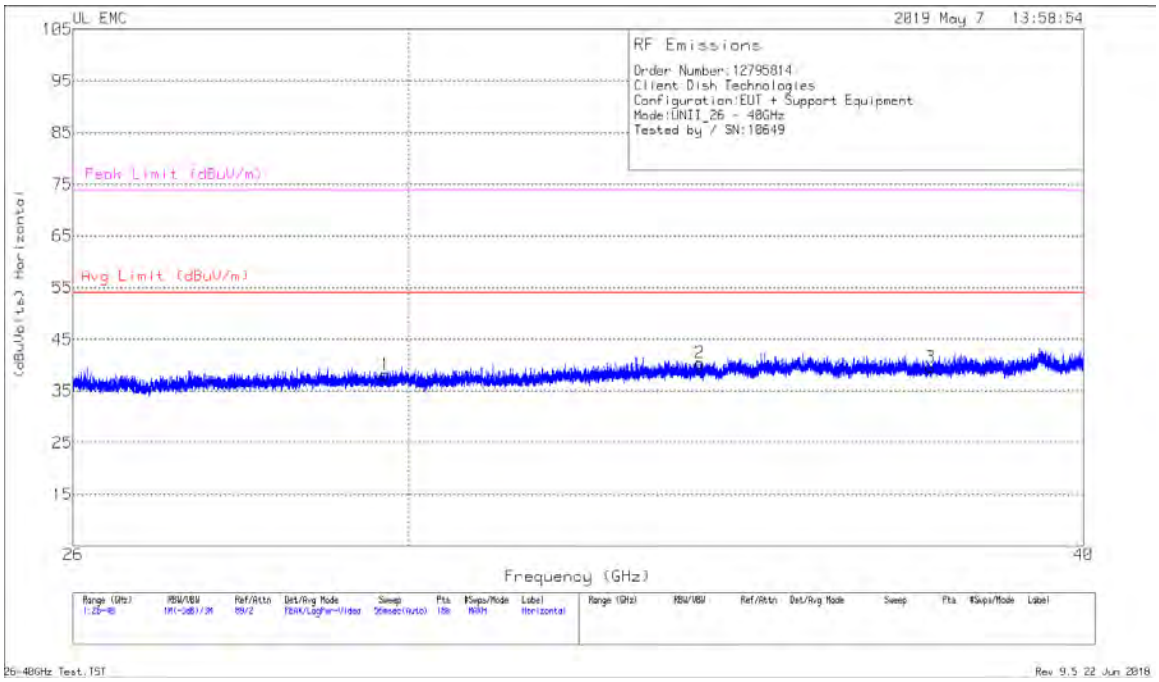
VERTICAL

18 – 26GHz DATA

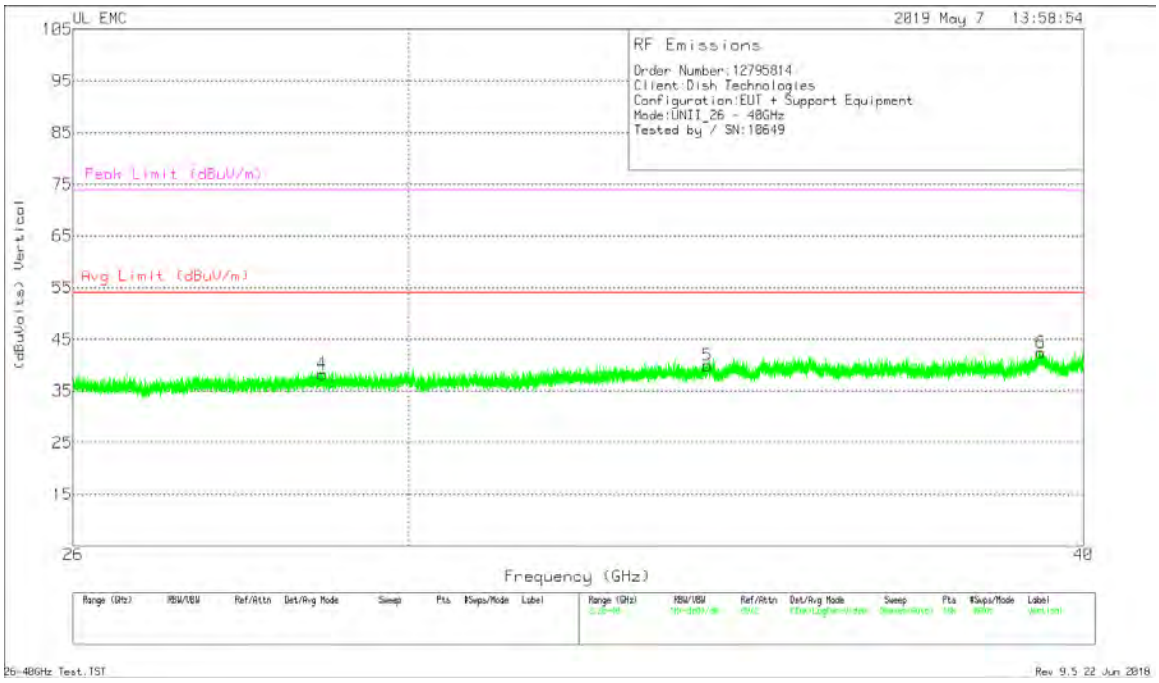
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF PRE018218 8 (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	19.328	67.66	Pk	33.2	-57	-9.5	34.36	54	-19.64	74	-39.64
2	24.215	70.64	Pk	34.5	-57	-9.5	38.64	54	-15.36	74	-35.36
3	25.096	67.98	Pk	35	-55.2	-9.5	38.28	54	-15.72	74	-35.72
4	20.464	68.16	Pk	33.8	-56.7	-9.5	35.76	54	-18.24	74	-38.24
5	22.446	69.17	Pk	34.1	-57.7	-9.5	36.07	54	-17.93	74	-37.93
6	25.256	68.64	Pk	34.8	-55.5	-9.5	38.44	54	-15.56	74	-35.56

Pk - Peak detector

9.5. WORST CASE 26-40 GHZ



HORIZONTAL



VERTICAL

26 – 40GHz DATA

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T90 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	29.705	64.64	Pk	36	-53	-9.5	38.14	54	-15.86	74	-35.86
2	33.966	67.16	Pk	36.9	-54.2	-9.5	40.36	54	-13.64	74	-33.64
3	37.476	67.06	Pk	37.3	-55.3	-9.5	39.56	54	-14.44	74	-34.44
4	28.909	64.84	Pk	35.8	-52.9	-9.5	38.24	54	-15.76	74	-35.76
5	34.073	66.23	Pk	36.9	-53.7	-9.5	39.93	54	-14.07	74	-34.07
6	39.279	68.02	Pk	38.5	-54.6	-9.5	42.42	54	-11.58	74	-31.58

Pk - Peak detector

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10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

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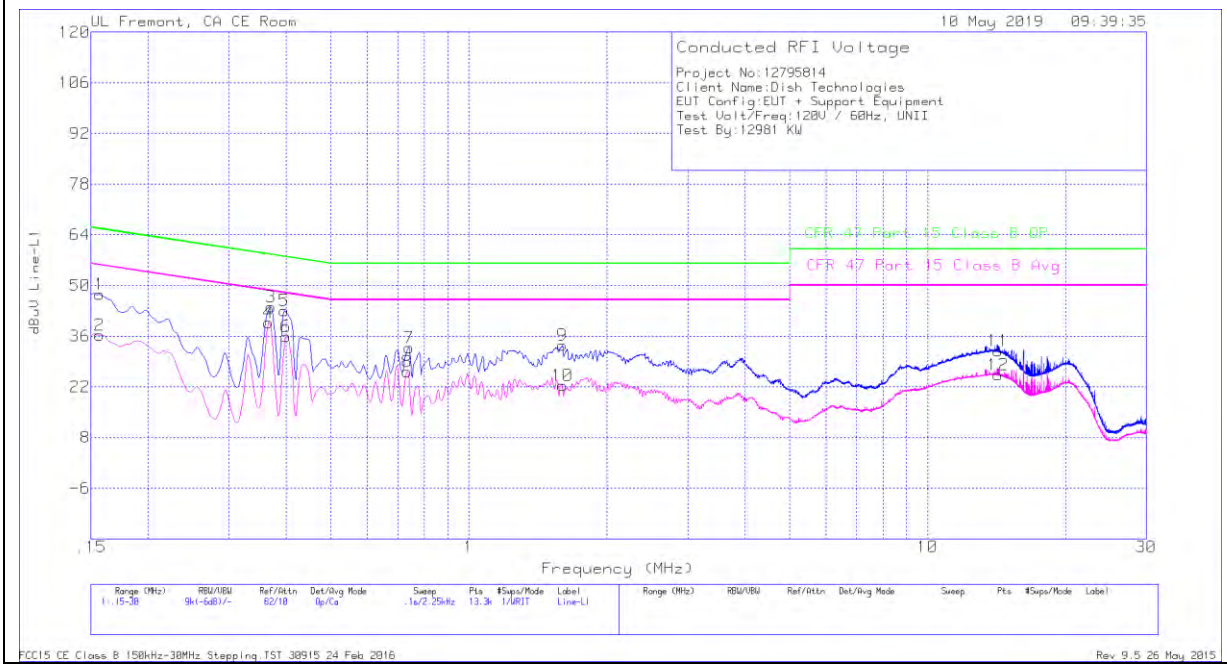
10.1.1. AC Power Line Norm

LINE 1 RESULTS

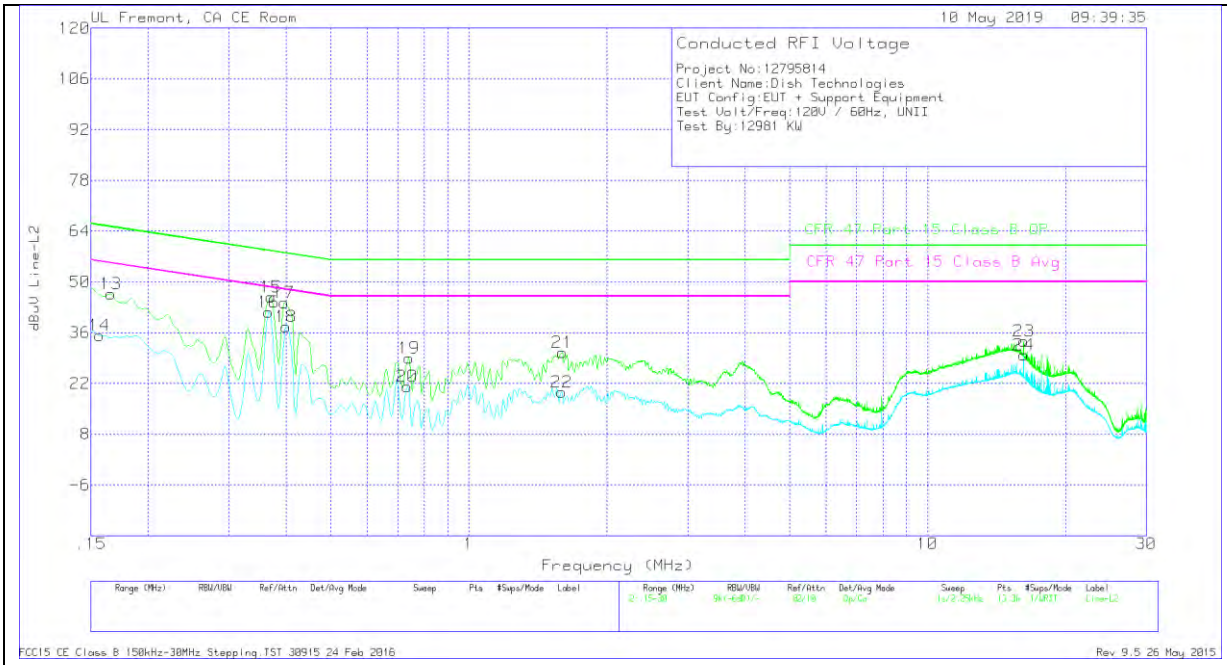


Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.15675	37.29	Qp	.1	0	10.1	47.49	65.63	-18.14	-	-
2	.15675	26.12	Ca	.1	0	10.1	36.32	-	-	55.63	-19.31
3	.3705	33.96	Qp	0	0	10.1	44.06	58.49	-14.43	-	-
4	.366	29.58	Ca	0	0	10.1	39.68	-	-	48.59	-8.91
5	.39525	33.02	Qp	0	0	10.1	43.12	57.95	-14.83	-	-
6	.39975	25.89	Ca	0	0	10.1	35.99	-	-	47.86	-11.87
7	.74175	22.76	Qp	0	0	10.1	32.86	56	-23.14	-	-
8	.735	16.01	Ca	0	0	10.1	26.11	-	-	46	-19.89
9	1.60125	23.31	Qp	0	.1	10.1	33.51	56	-22.49	-	-
10	1.599	12.13	Ca	0	.1	10.1	22.33	-	-	46	-23.67
11	14.244	21.27	Qp	.1	.3	10.2	31.87	60	-28.13	-	-
12	14.25075	14.71	Ca	.1	.3	10.2	25.31	-	-	50	-24.69

Qp - Quasi-Peak detector

Ca - CISPR average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.16575	36.48	Qp	.1	0	10.1	46.68	65.17	-18.49	-	-
14	.15675	25.08	Ca	.1	0	10.1	35.28	-	-	55.63	-20.35
15	.3705	35.72	Qp	0	0	10.1	45.82	58.49	-12.67	-	-
16	.366	31.56	Ca	0	0	10.1	41.66	-	-	48.59	-6.93
17	.39525	34.17	Qp	0	0	10.1	44.27	57.95	-13.68	-	-
18	.39975	27.56	Ca	0	0	10.1	37.66	-	-	47.86	-10.2
19	.74175	18.87	Qp	0	0	10.1	28.97	56	-27.03	-	-
20	.735	11.09	Ca	0	0	10.1	21.19	-	-	46	-24.81
21	1.60125	20.33	Qp	0	.1	10.1	30.53	56	-25.47	-	-
22	1.59225	9.32	Ca	0	.1	10.1	19.52	-	-	46	-26.48
23	16.2285	22.94	Qp	.1	.3	10.3	33.64	60	-26.36	-	-
24	16.2285	19.11	Ca	.1	.3	10.3	29.81	-	-	50	-20.19

Qp - Quasi-Peak detector

Ca - CISPR average detection