TEST REPORT

Report Number: 13583138-E5V2

Applicant	:	Samsung Electronics Co., Ltd. 129 Samsung-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 16677, Korea
Model	:	SM-A526B/DS, SM-A526B
FCC ID	:	A3LSMA526B
EUT Description	:	GSM/WCDMA/LTE/5G Phablet with BT/BLE, DTS/UNII a/b/g/n/ac and NFC
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E (Exclude DFS)

Date Of Issue:
February 04, 2021

Prepared by:
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REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	1/26/2021	Initial Issue	
V2	2/4/2021	Updated Section 1, 6.5, 9.4 and 9.5	Kiya Kedida

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Samsung Electronics Co., Ltd. 129 Samsung-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 16677, Korea
EUT DESCRIPTION:	GSM/WCDMA/LTE Phablet with BT/BLE, DTS/UNII a/b/g/n/ac and NFC
MODEL:	SM-A526B/DS, SM-A526B
SERIAL NUMBER:	R3CN90Q12KN(Conducted) 49a9c185151d7ece (Radiated)
DATE TESTED:	NOVEMBER 17, 2020 –FEBRUARY 2, 2020

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.

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2. TEST RESULT SUMMARY

FCC Clause	Requirement	Result	Comment
See Comment	Duty Cycle	Reporting purposes only	Per ANSI C63.10, Section 12.2.
See Comment	26dB BW/99% OBW	Reporting purposes only	Per ANSI C63.10 Sections 6.9.2 and 6.9.3
15.407 (e)	6 dB BW	Complies	None.
15.407 (a) (1-4), (h) (1)	Output Power	Complies	None.
15.407 (a) (1-3, 5)	PSD	Complies	None.
15.209, 15.205, 15.407 (b)	Radiated Emissions	Complies	None.
15.207	AC Mains Conducted Emissions	Complies	None.

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3. 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 789033 D02 v02r01, KDB 414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013, FCC 06-96.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, California 94538, USA	US0104	2324A	208313
☐	Building 2: 47266 Benicia Street, Fremont, California 94538, USA	US0104	22541	208313
☒	Building 4: 47658 Kato Rd, Fremont, California 94538, USA	US0104	2324B	208313

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	U_{Lab}
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.84 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	4.84 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB

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

5.4. 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

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6. EQUIPMENT UNDER TEST

6.1. EUT DESCRIPTION

The EUT is a GSM/WCDMA/LTE/5G Phablet with BT/BLE, DTS/UNII a/b/g/n/ac and NFC. The model SM-A526B/DS was used for final testing and is representative of the test results in this report.

6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX			
5180-5240	802.11a	16.70	46.77
5180-5240	802.11n HT20	16.64	46.13
5190-5230	802.11n HT40	14.94	31.19
5210	802.11ac VHT80	12.45	17.58

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX			
5260 - 5320	802.11a	16.82	48.08
5260 - 5320	802.11n HT20	16.80	47.86
5270 - 5310	802.11n HT40	14.63	29.04
5290	802.11ac VHT80	12.72	18.71

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX			
5500-5720	802.11a	16.79	47.75
5500-5720	802.11n HT20	16.60	45.71
5510-5710	802.11n HT40	14.86	30.62
5530-5690	802.11ac VHT80	12.68	18.54

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 1TX			
5745-5825	802.11a	16.98	49.89
5745-5825	802.11n HT20	16.82	48.08
5755-5795	802.11n HT40	14.72	29.65
5775	802.11ac VHT80	12.25	16.79

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6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FIPA antenna, with a maximum gain of:

Frequency (GHz)	Peak Antenna Gain (dBi)
5180-5240	-3.48
5260-5320	-3.31
5500-5720	-3.37
5745-5825	-3.81

6.4. SOFTWARE AND FIRMWARE

The test utility software used during testing was A526B.001.

6.5. 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 investigated in three orthogonal orientations X,Y,Z, it was determined that Y orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Y orientation.

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

802.11a mode : 6 Mbps
802.11n HT20 mode : MCS0
802.11n HT40 mode : MCS0
802.11ac VHT80 mode : MCS0

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6.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
AC Adapter	Samsung	EP-TA800	R37M8PH3JN2SE3	N/A
Earphone	Samsung	N/A	N/A	N/A

I/O CABLES (CONDUCTED TEST)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	Antenna	1	RF	Shielded	0.2	To spectrum Analyzer
2	USB	1	USB	Un-shielded	1	EUT to AC Mains

I/O CABLES (RADIATED AND CONDUCTED EMISSIONS)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	USB	1	USB	Shielded	1	N/A
2	Earphone	1	3.5mm	Un-shielded	1	N/A

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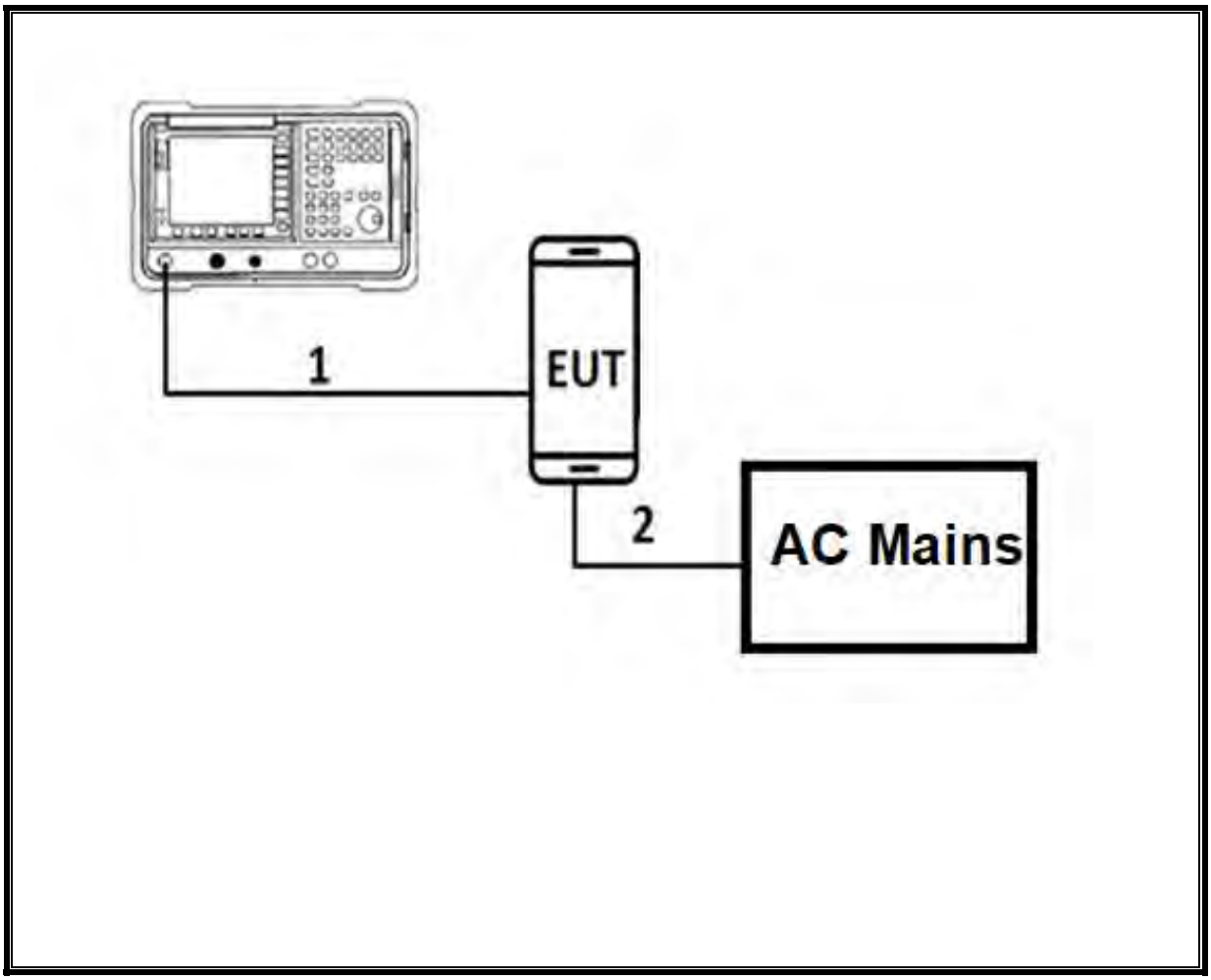
CONDUCTED TEST SETUP DIAGRAM



TEST SETUP

For conducted tests: the EUT was stand alone. The test software exercises the radio.

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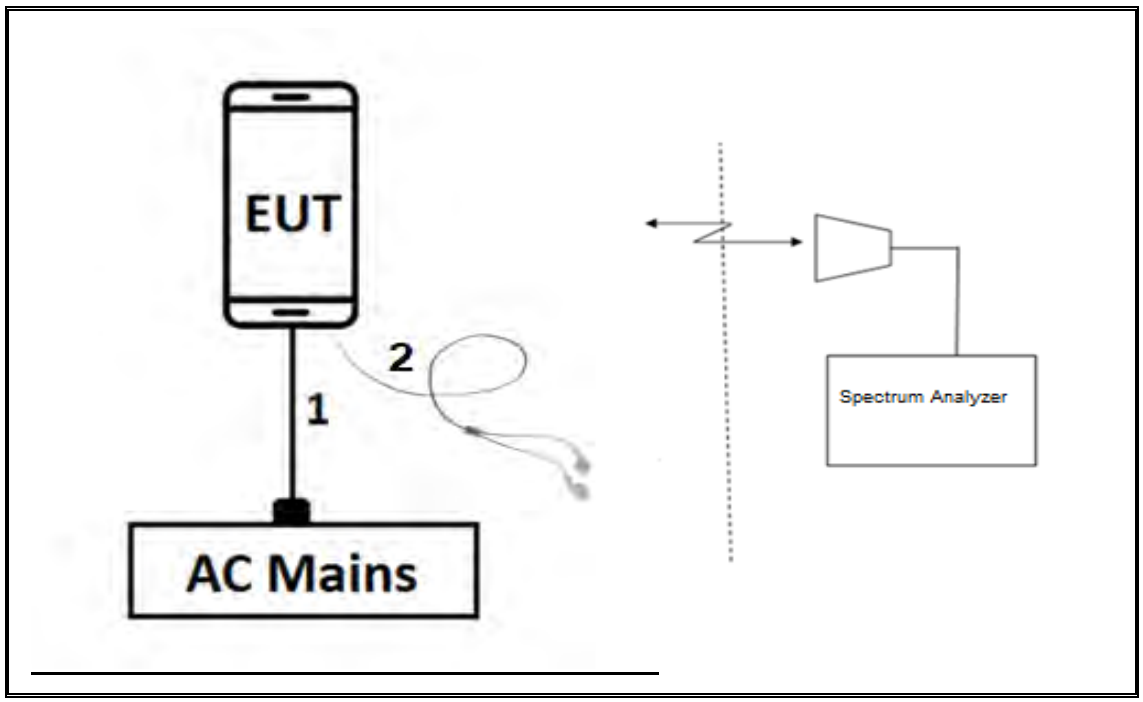
RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



TEST SETUP

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

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7. 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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8. 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**	**Asset**	**Cal Due**
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	PRE0179465	07/27/2021
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	PRE0179467	07/27/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T863	08/31/2021
Amplifier, 100MHz-18GHz	APLICAL	AMP0.1G-18-47-20	PRE0197319	05/04/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T345	05/19/2021
Amplifier, 100MHz-18GHz	APLICAL	AMP0.1G-18-47-20	190322	06/07/2021
Antenna, Horn Double Ridge Guide 700MHz-18GHz	A.H.System	SAS-571	T963	01/25/2021
Amplifier, 1000MHz-18GHz	APLICAL	AMP1G18-35	T1571	08/20/2021
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	05/26/2021
Amplifier, 1000MHz-18GHz	MITEQ	AFS42-00101800-25-S-42	T1568	04/14/2021
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp	JB3	PRE0184971	02/05/2021
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	T300	01/23/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179376	04/03/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179367	02/26/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179372	02/25/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	PRE0179375	02/25/2021
Antenna Horn, 18 to 26GHz	ARA	MWH-1826/B	T447	09/24/2021
Antenna Horn, 26 to 40GHz	ARA	MWH-2640/B	T446	09/24/2021
High Frequency Amplifier Switch Box	Agilent Technology	8449B	PRE0183142	04/08/2021
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	T1268	01/22/2021
Power Sensor, P-series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	T413	02/26/2021
AC Line Conducted				
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**
LISN	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	PRE0186446	01/21/2021
L.I.S.N	FCC INC.	FCC LISN 50/250	24	01/21/2021
EMI TEST RECEIVER	Rohde & Schwarz	ESR	T1436	02/20/2021
Transient Limiter	COM-POWER	LIT-930A	PRE0129246	01/23/2021
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Rev 9.5, 30 Apr, 2020	
Antenna Port Software	UL	UL RF	AP2020.9.1	
AC Line Conducted Software	UL	UL EMC	Rev 9.5, 07 Jul 2020	

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9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a	1.432	1.470	0.974	97.41%	0.11	0.698
802.11n HT20	1.340	1.377	0.973	97.31%	0.12	0.746
802.11n HT40	0.664	0.700	0.949	94.86%	0.23	1.506
802.11ac VHT80	0.332	0.368	0.902	90.22%	0.45	3.012

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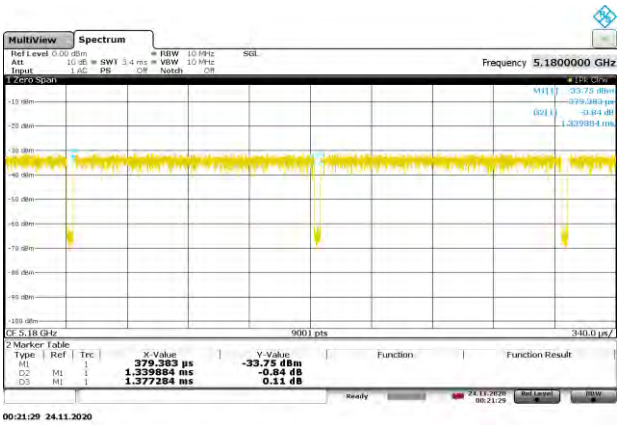
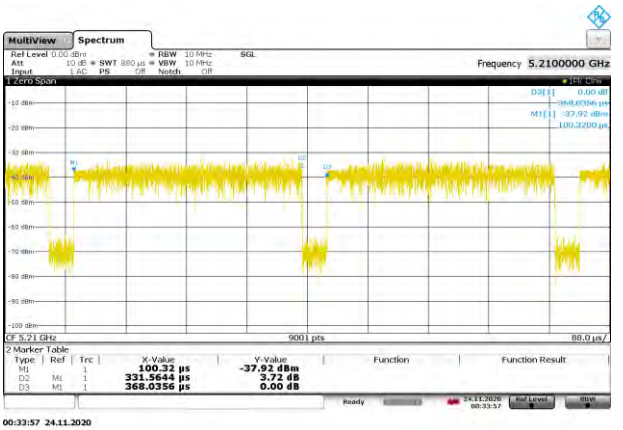
DUTY CYCLE PLOTS

DUTY CYCLE 802.11a



DUTY CYCLE 802.11n HT20

DUTY CYCLE 802.11n HT40



DUTY CYCLE 802.11ac VHT80

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9.2. 26 dB BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

UL VERIFICATION SERVICES INC.
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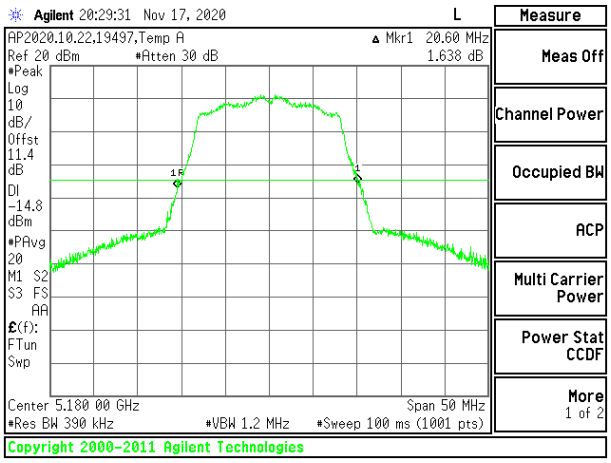
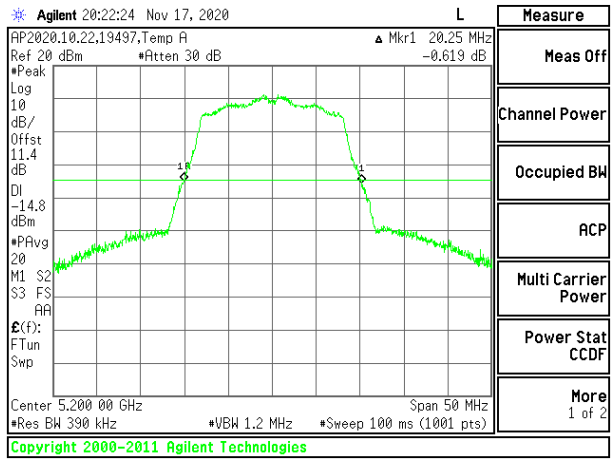
9.2.1. 802.11a MODE IN THE 5.2 GHz BAND

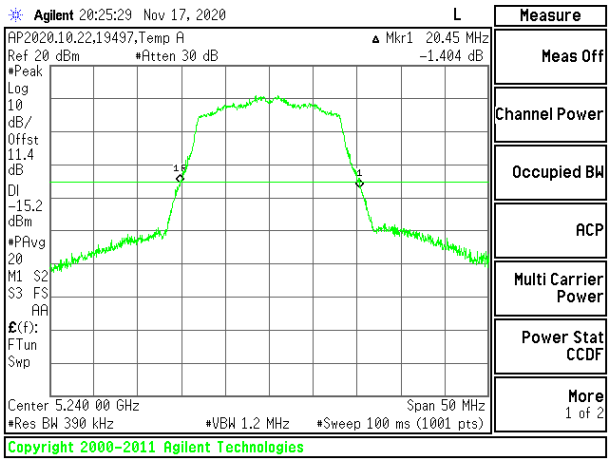
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	20.60
Mid	5200	20.25
High	5240	20.45



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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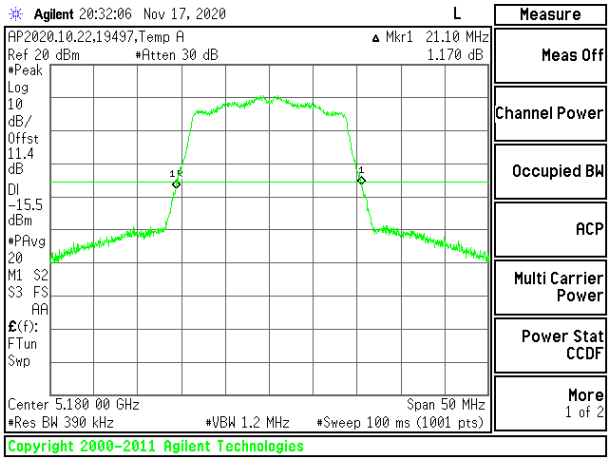
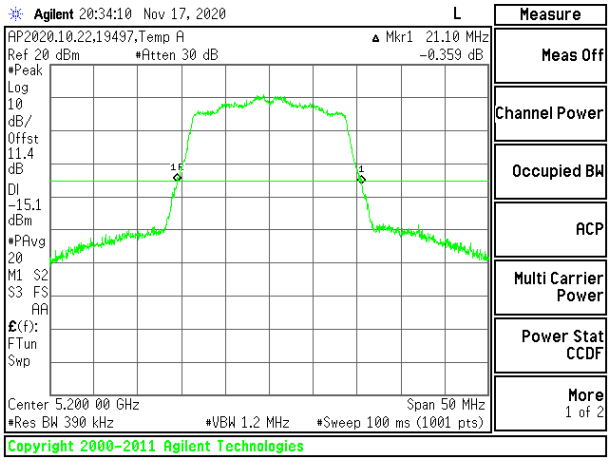
9.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

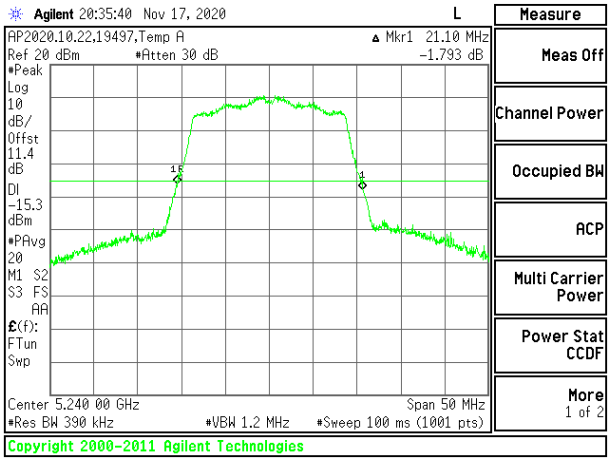
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.10
Mid	5200	21.10
High	5240	21.10



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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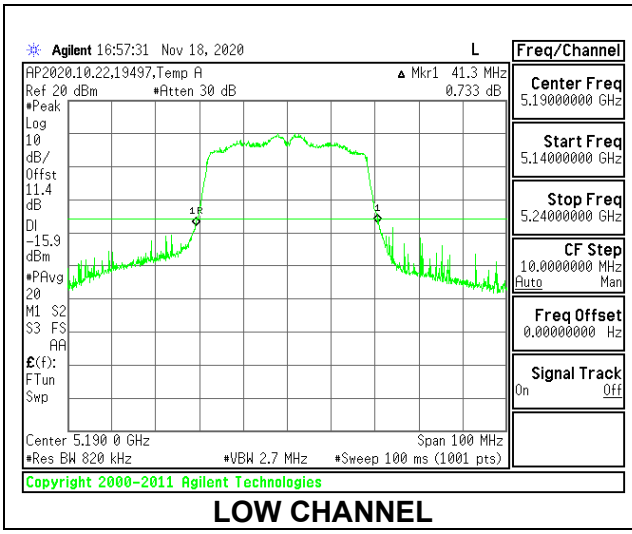
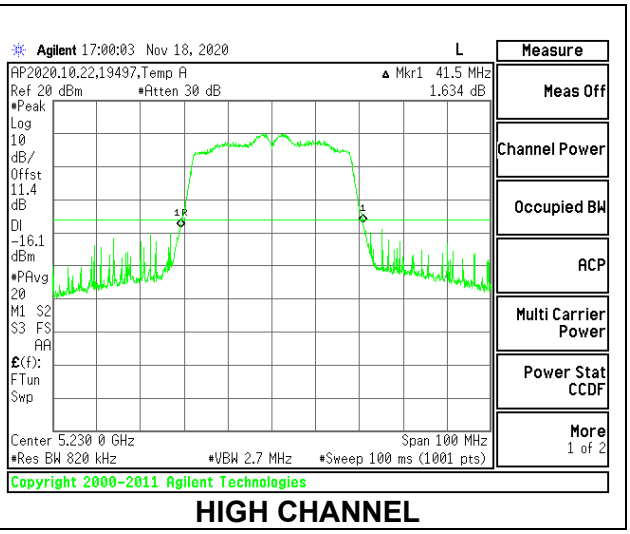
9.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	41.30
High	5230	41.50



LOW CHANNEL



HIGH CHANNEL

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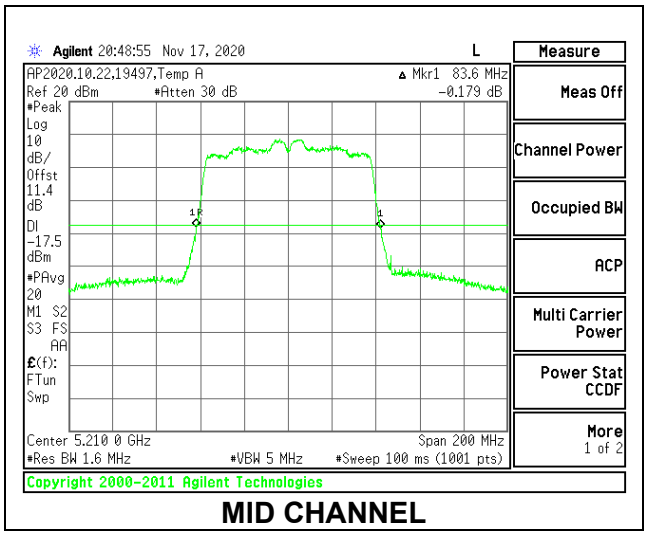
9.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	83.60



MID CHANNEL

UL VERIFICATION SERVICES INC.
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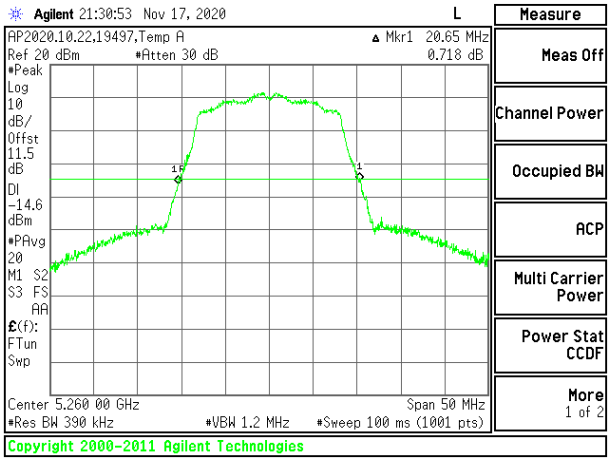
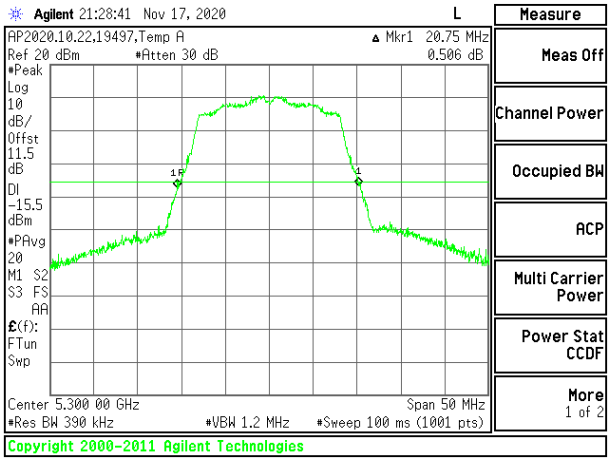
9.2.5. 802.11a MODE IN THE 5.3 GHz BAND

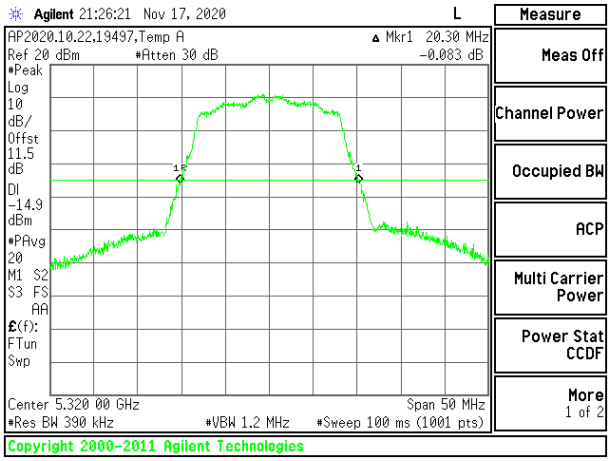
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.65
Mid	5300	20.75
High	5320	20.30



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
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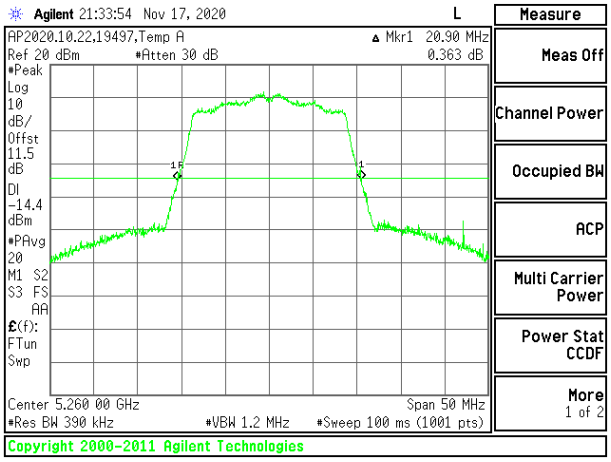
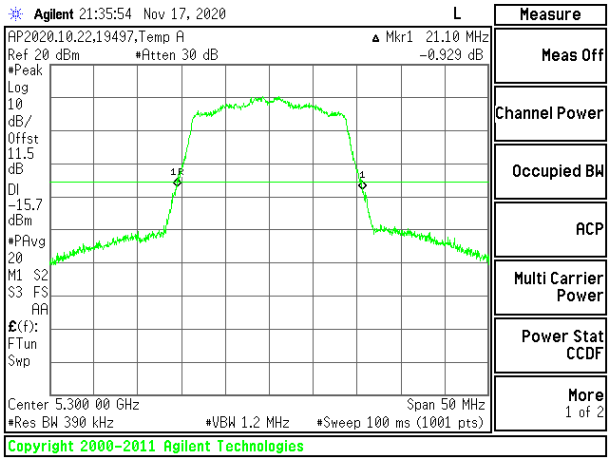
9.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

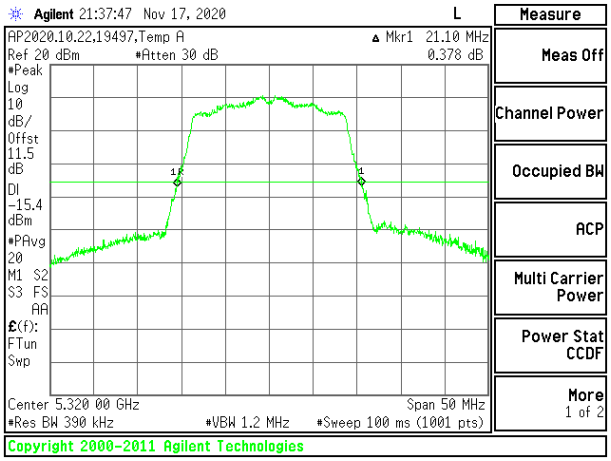
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	20.90
Mid	5300	21.10
High	5320	21.10



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
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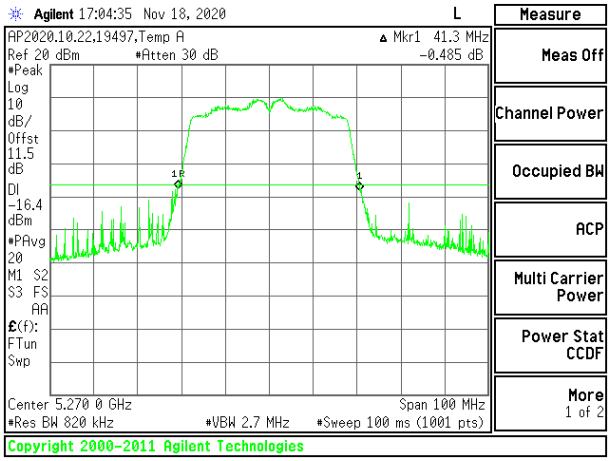
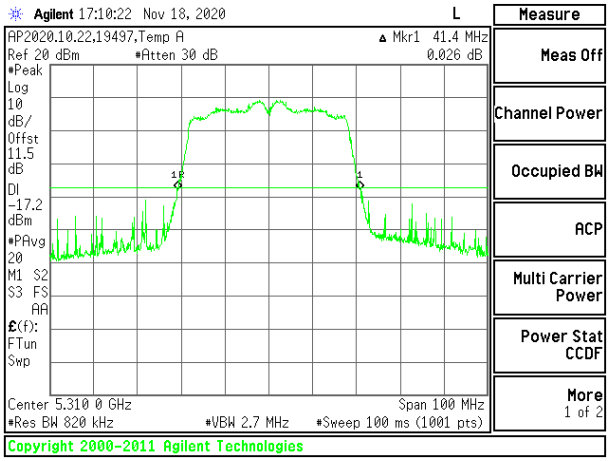
9.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	41.30
High	5310	41.40



LOW CHANNEL



HIGH CHANNEL

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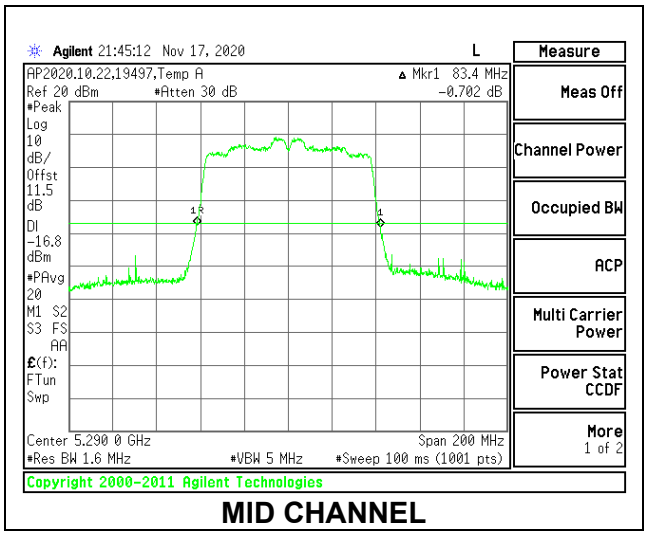
9.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5290	83.40



MID CHANNEL

UL VERIFICATION SERVICES INC.
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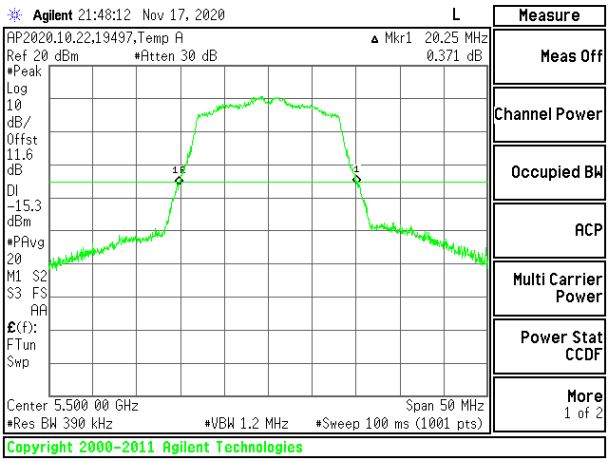
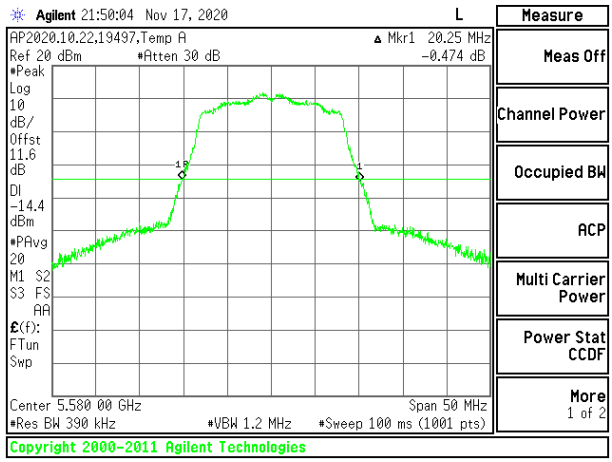
9.2.9. 802.11a MODE IN THE 5.6 GHz BAND

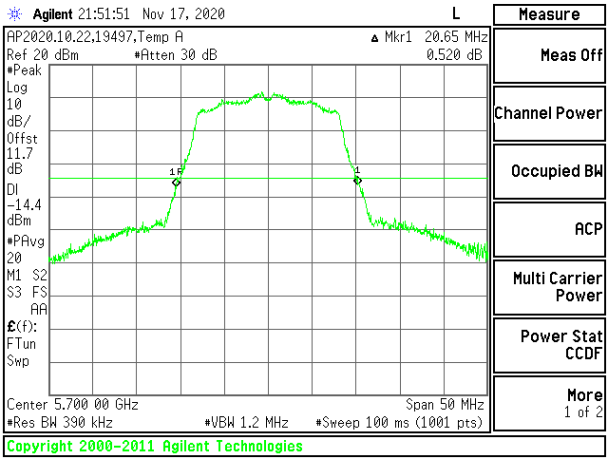
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	20.25
Mid	5580	20.25
High	5700	20.65
144	5720	20.35



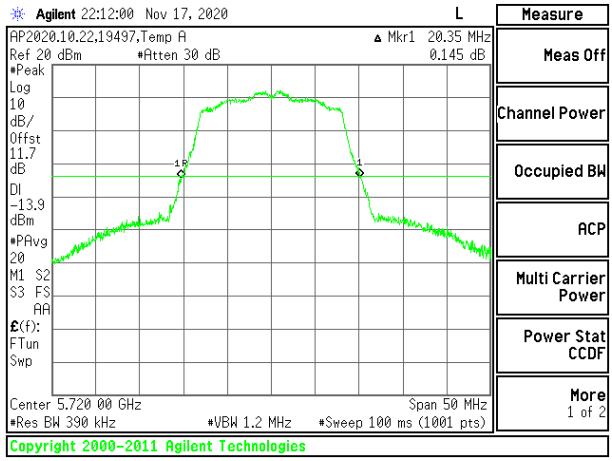
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144

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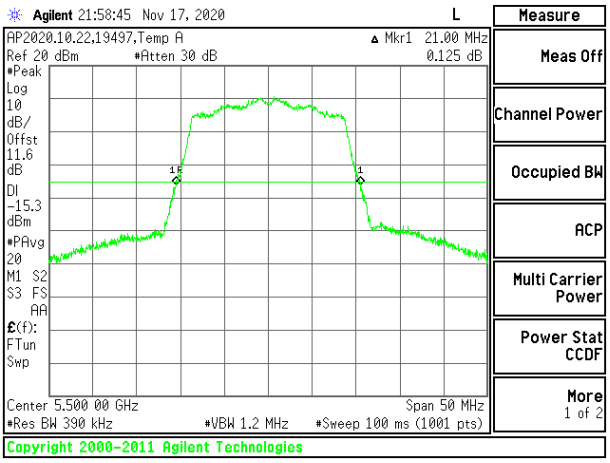
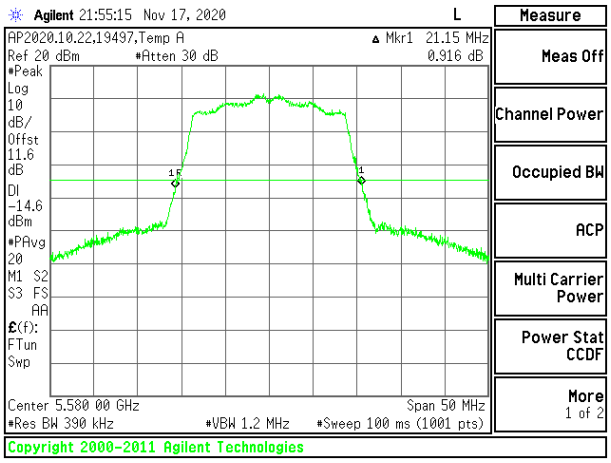
9.2.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

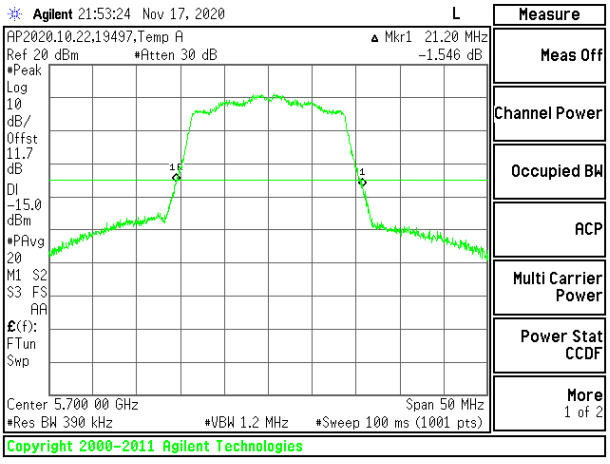
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.00
Mid	5580	21.15
High	5700	21.20
144	5720	21.15



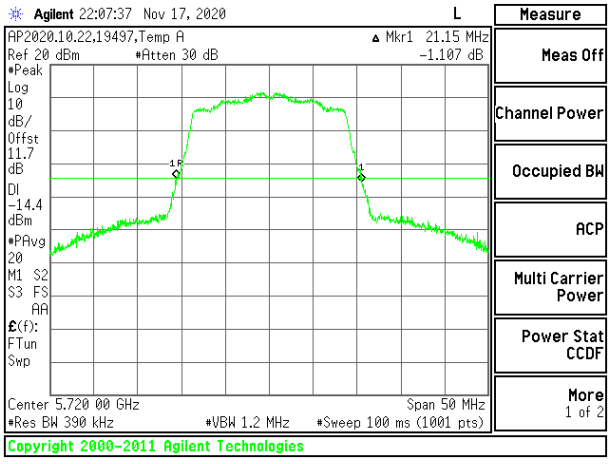
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144

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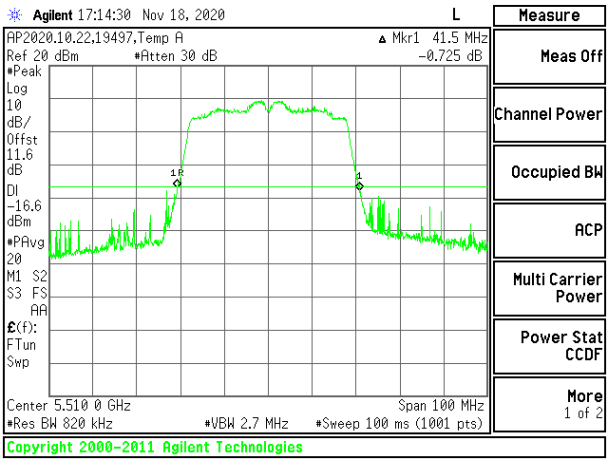
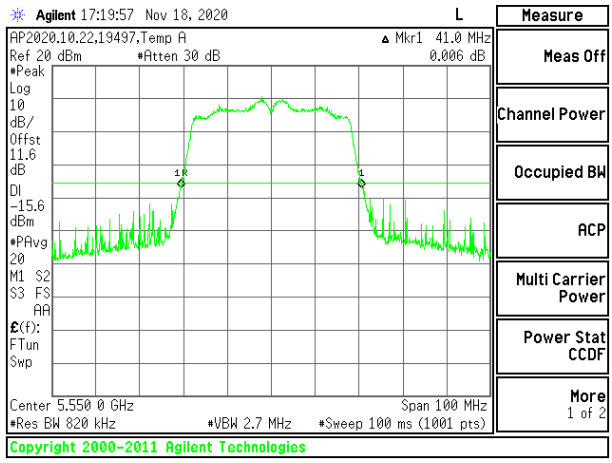
9.2.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

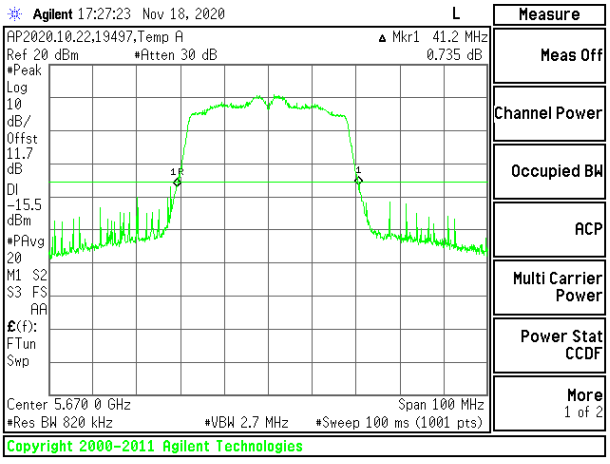
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	41.50
Mid	5550	41.00
High	5670	41.20
142	5710	41.20



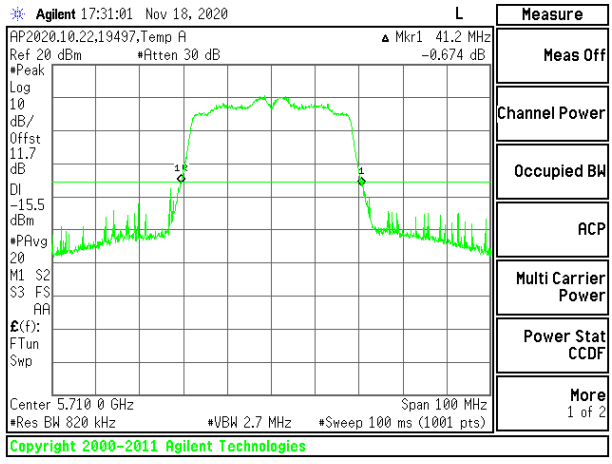
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 142

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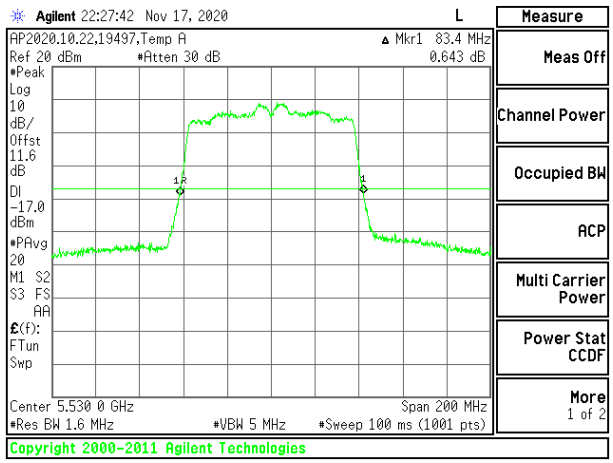
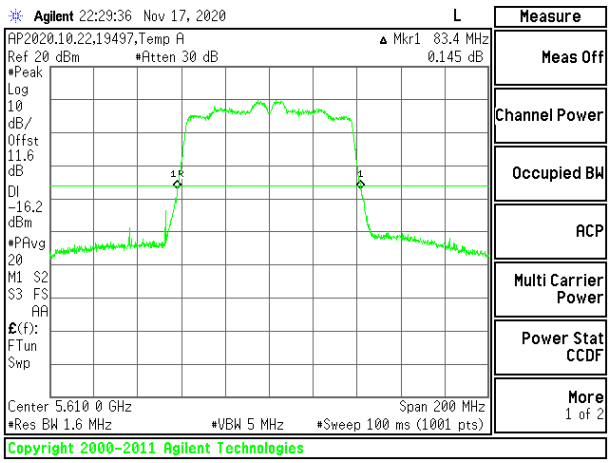
9.2.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

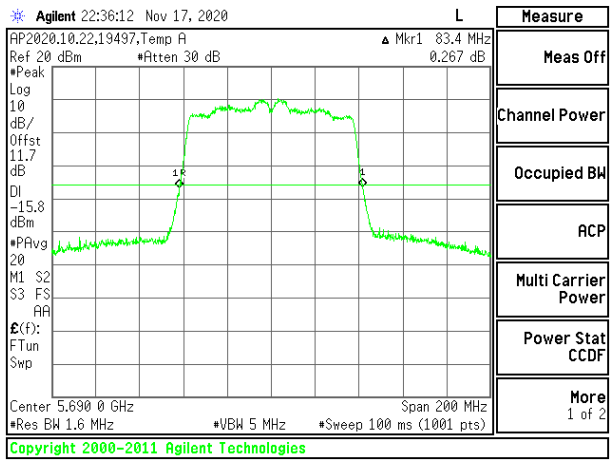
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5530	83.40
High	5610	83.40
138	5690	83.40



LOW CHANNEL



HIGH CHANNEL



CHANNEL 138

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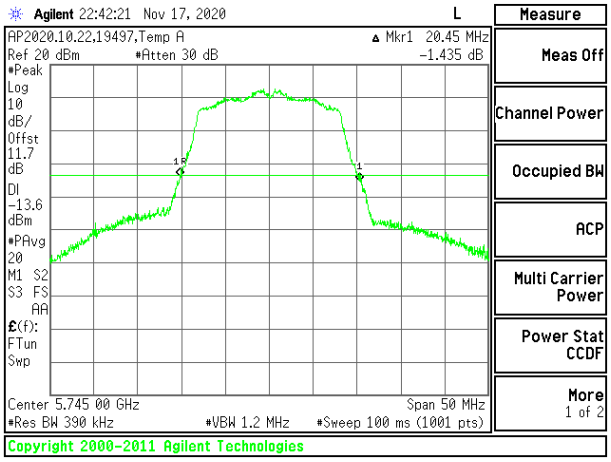
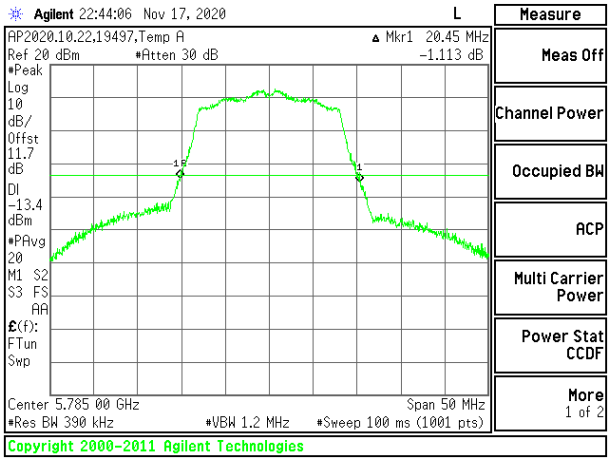
9.2.13. 802.11a MODE IN THE 5.8 GHz BAND

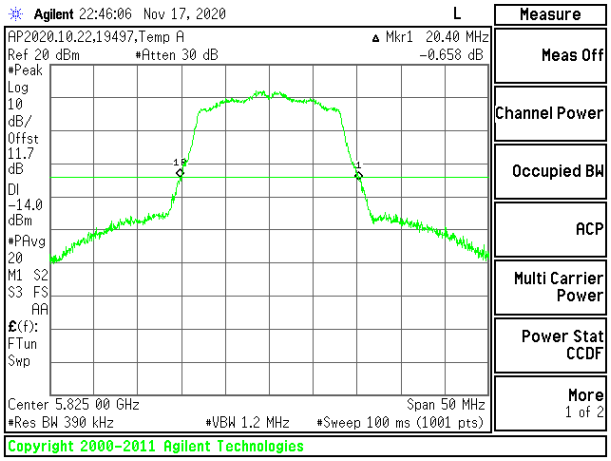
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.45
Mid	5785	20.45
High	5825	20.40



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
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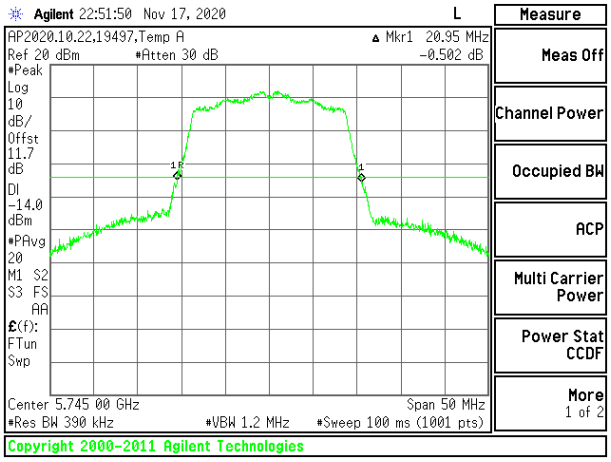
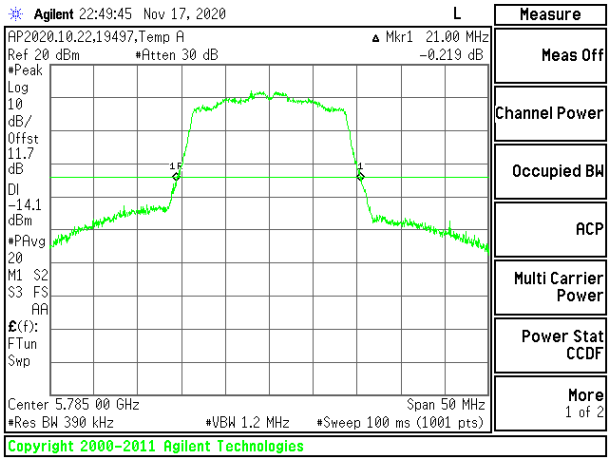
9.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

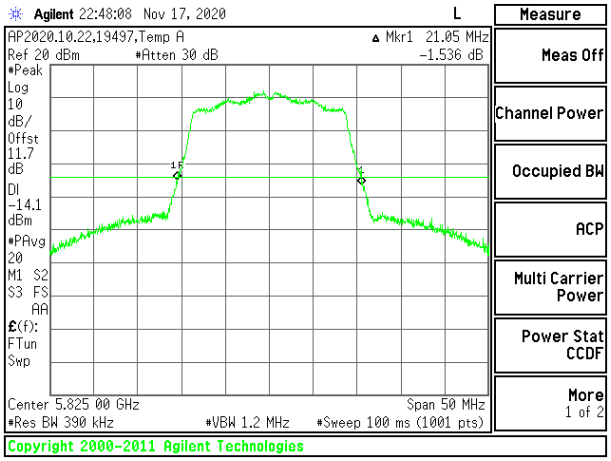
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	20.95
Mid	5785	21.00
High	5825	21.05



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

UL VERIFICATION SERVICES INC.
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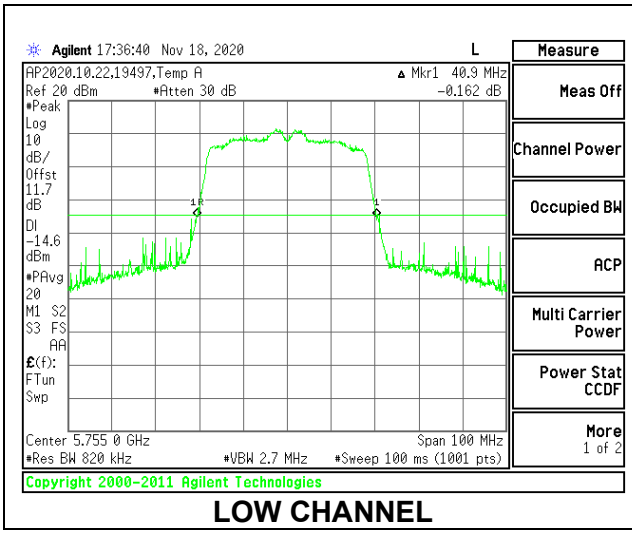
9.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	40.90
High	5795	41.30



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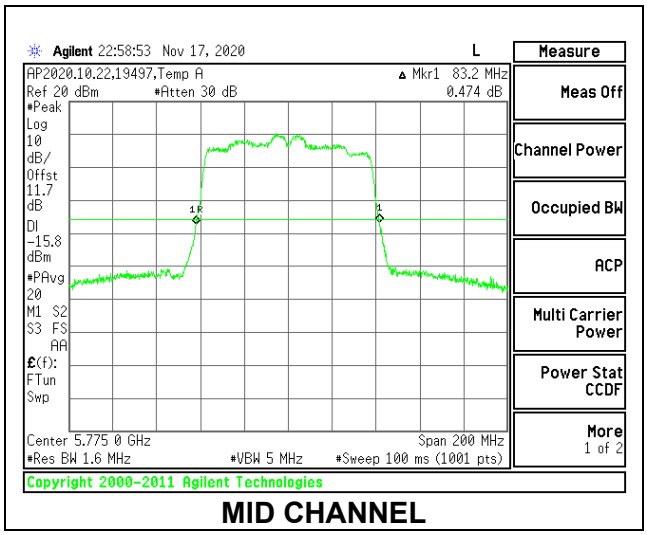
9.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5775	83.20



MID CHANNEL

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9.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

RESULTS

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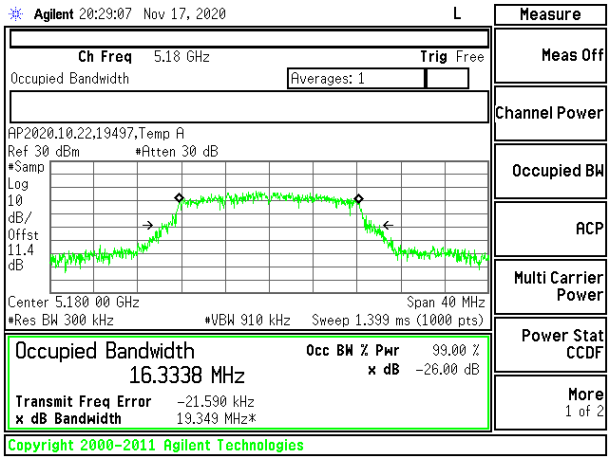
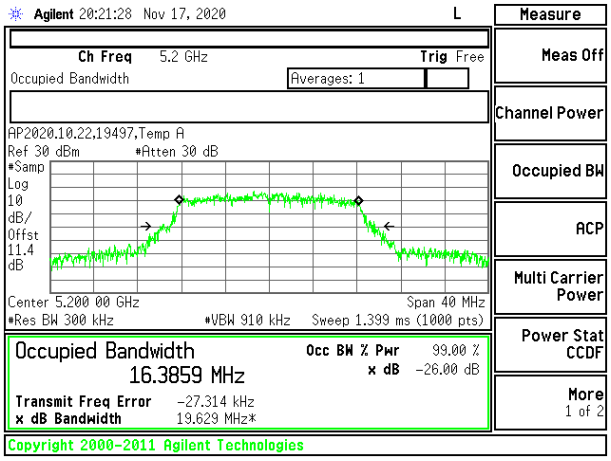
9.3.1. 802.11a MODE IN THE 5.2 GHz BAND

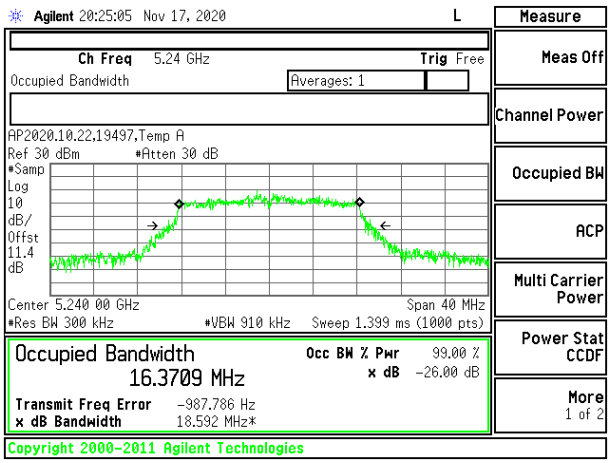
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.3338
Mid	5200	16.3859
High	5240	16.3709



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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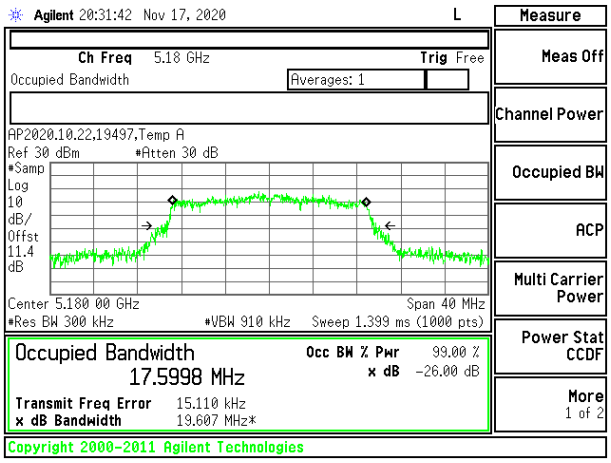
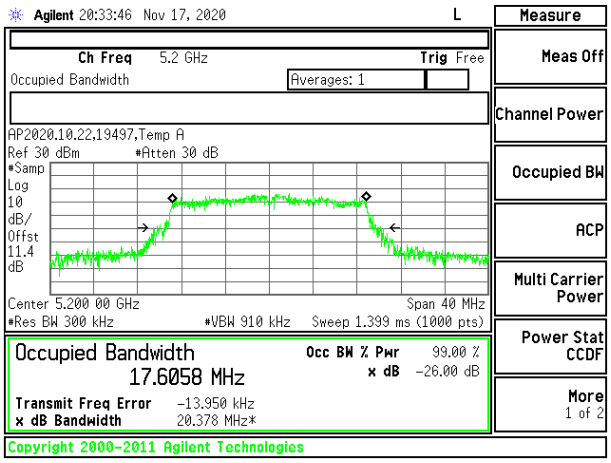
9.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

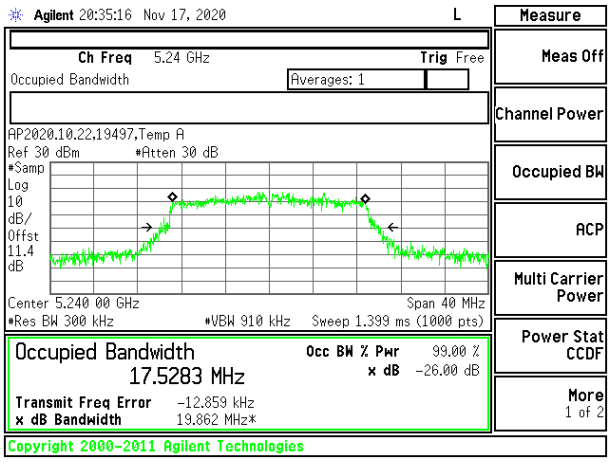
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.5998
Mid	5200	17.6058
High	5240	17.5283



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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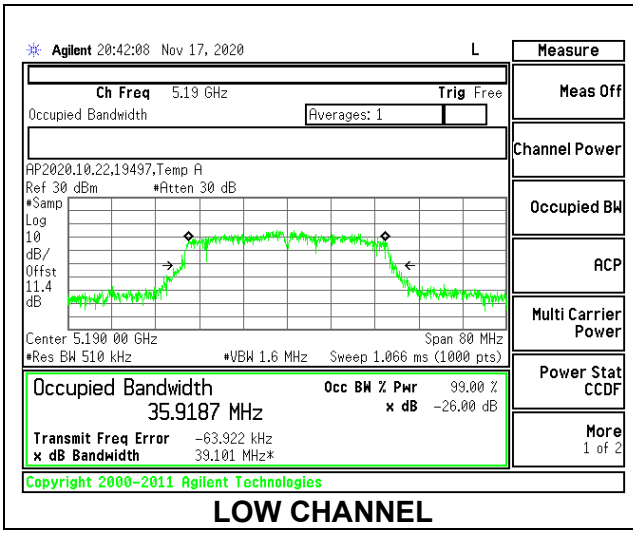
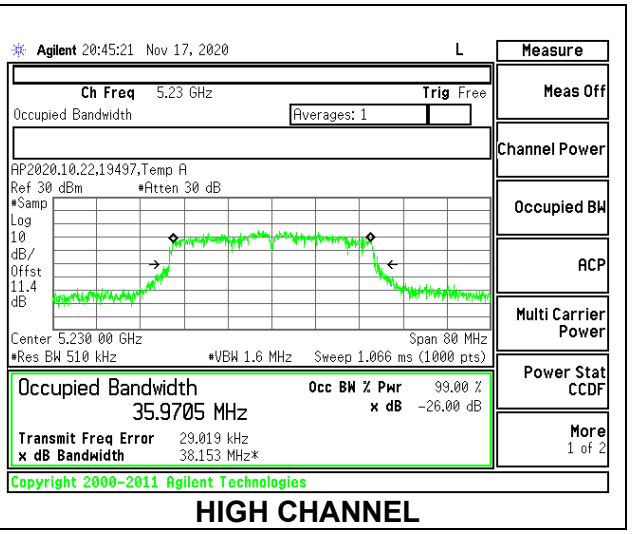
9.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	35.9187
High	5230	35.9705



LOW CHANNEL



HIGH CHANNEL

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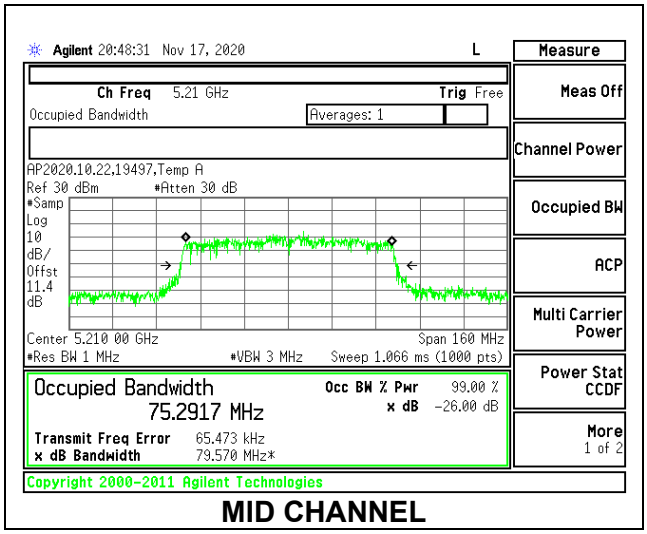
9.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	75.2917



MID CHANNEL

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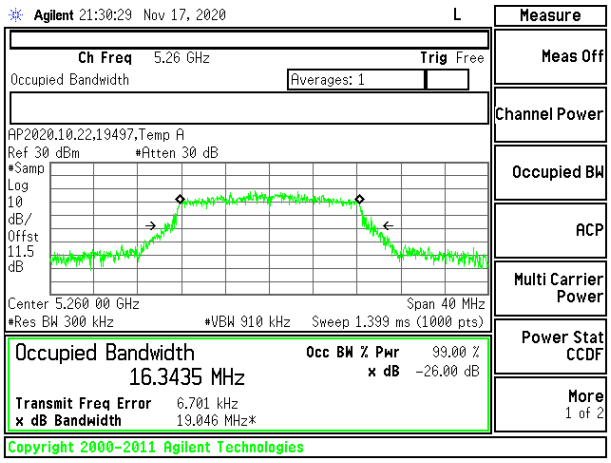
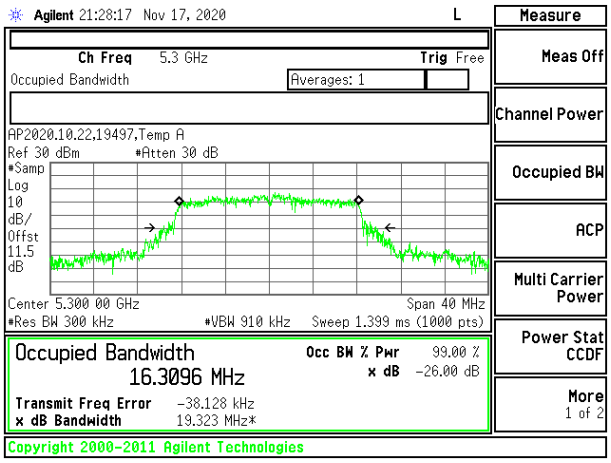
9.3.5. 802.11a MODE IN THE 5.3 GHz BAND

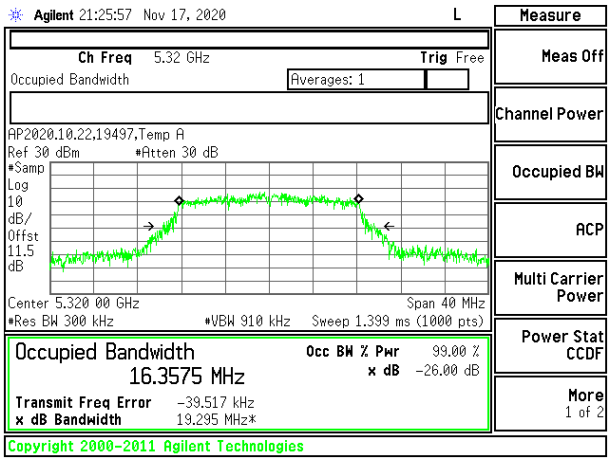
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.3435
Mid	5300	16.3096
High	5320	16.3575



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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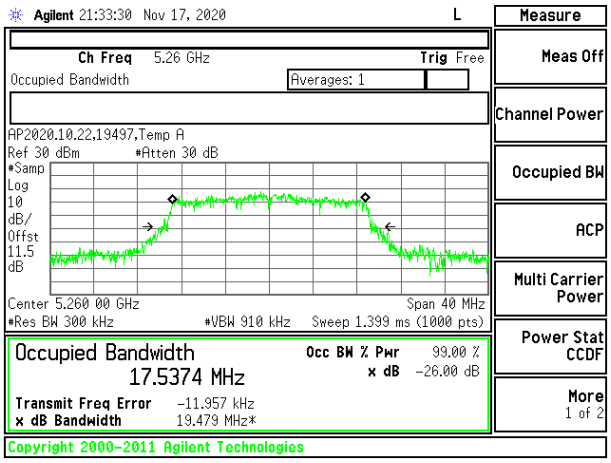
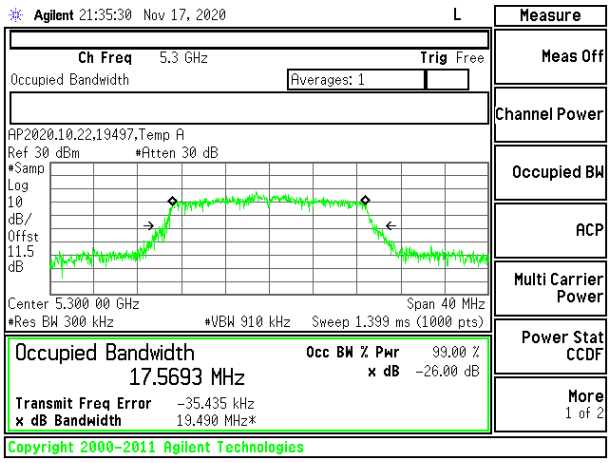
9.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

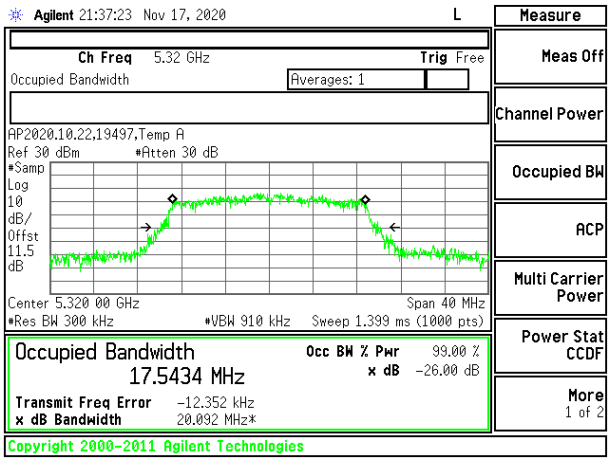
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.5374
Mid	5300	17.5693
High	5320	17.5434



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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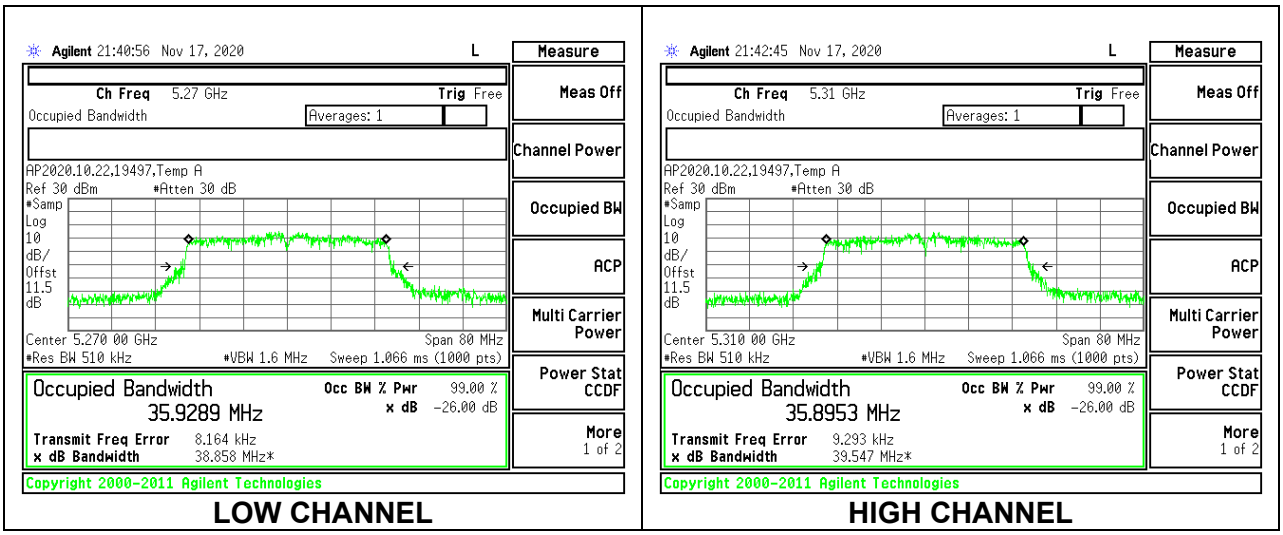
9.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	35.9289
High	5310	35.8953



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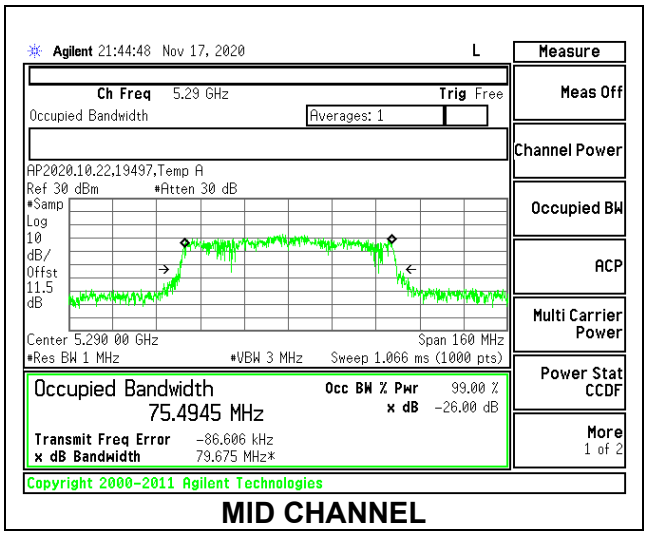
9.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5290	75.4945



MID CHANNEL

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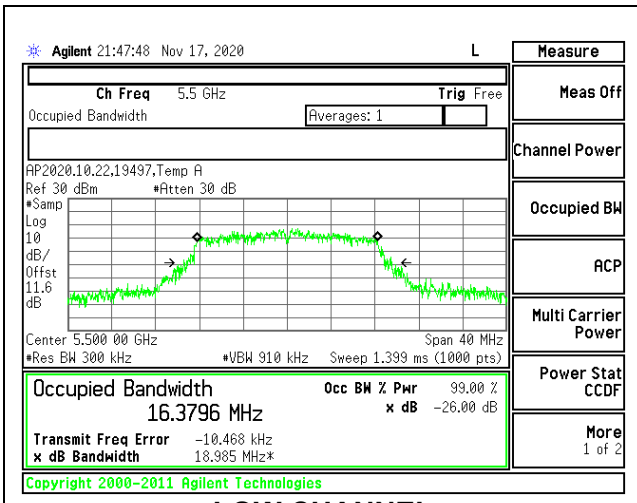
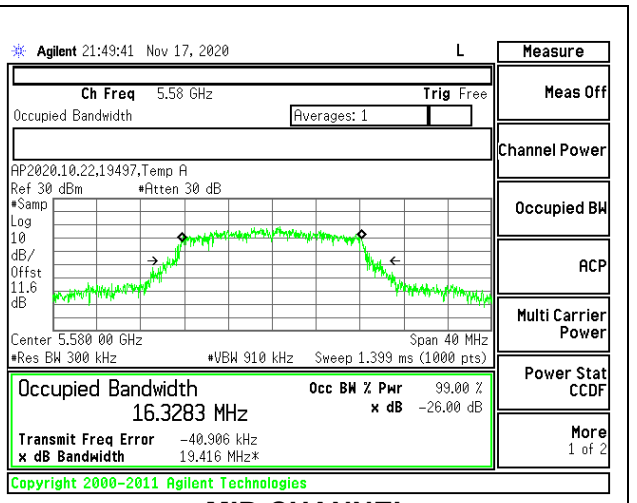
9.3.9. 802.11a MODE IN THE 5.6 GHz BAND

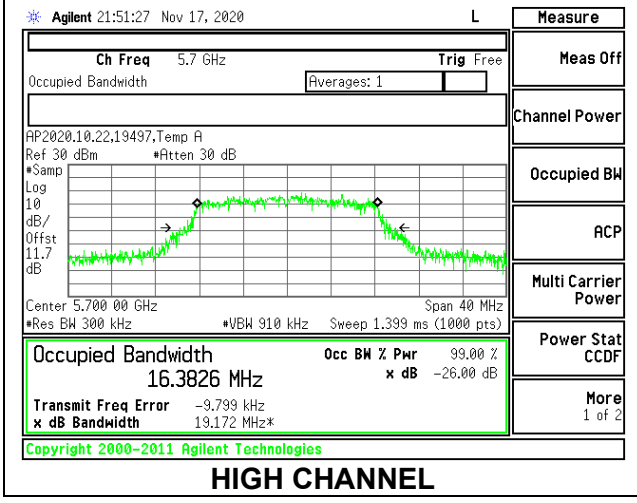
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.3796
Mid	5580	16.3283
High	5700	16.3826
144	5720	16.3271



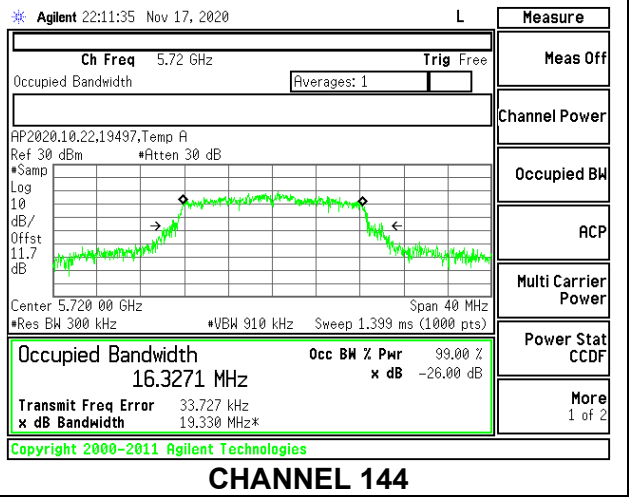
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



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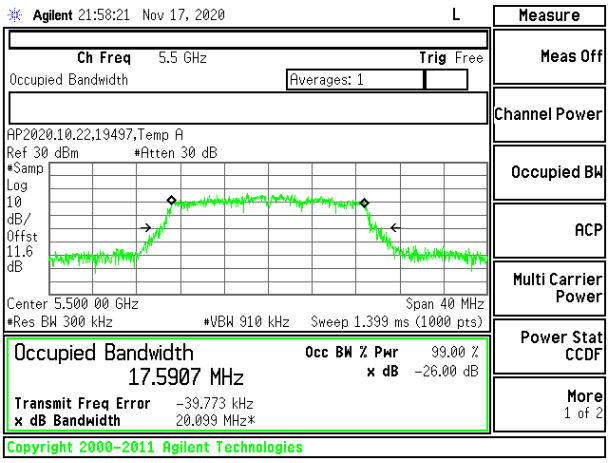
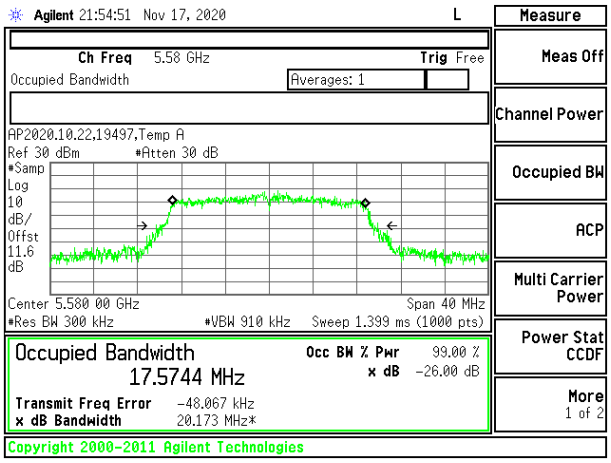
9.3.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

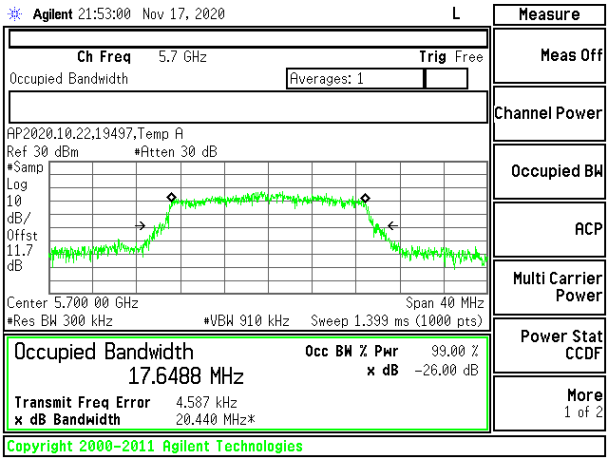
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.5907
Mid	5580	17.5744
High	5700	17.6488
144	5720	17.5237



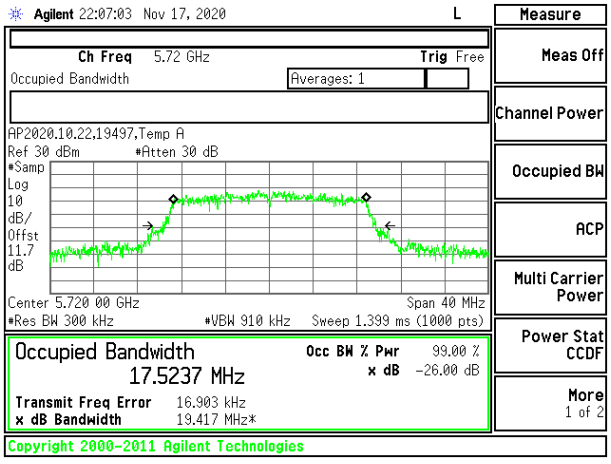
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



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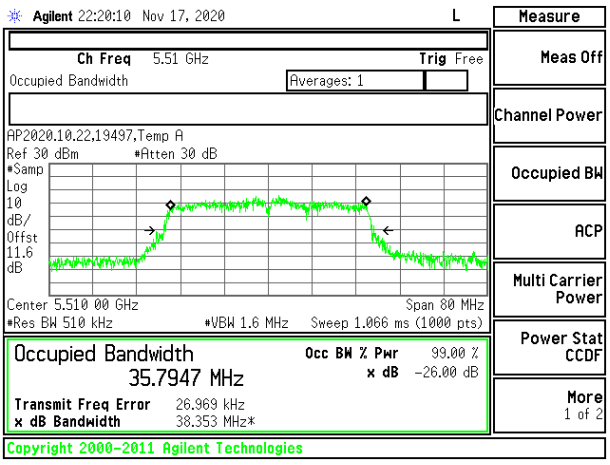
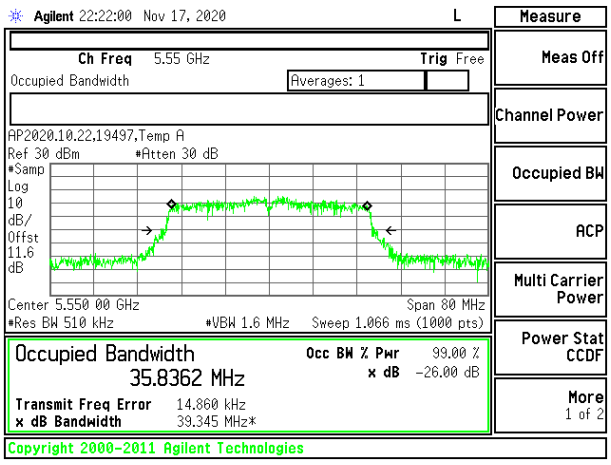
9.3.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

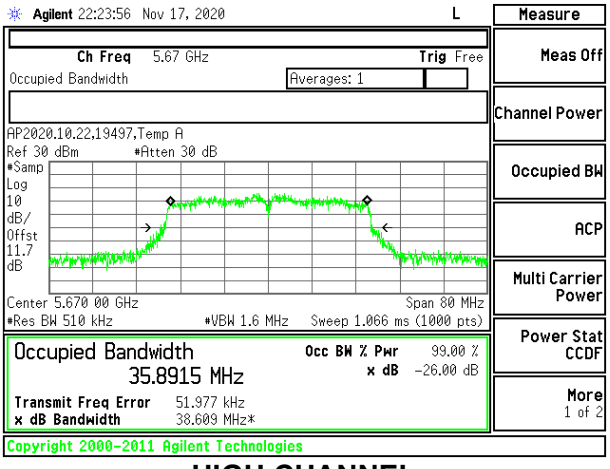
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	35.7947
Mid	5550	35.8362
High	5670	35.8915
142	5710	35.9061



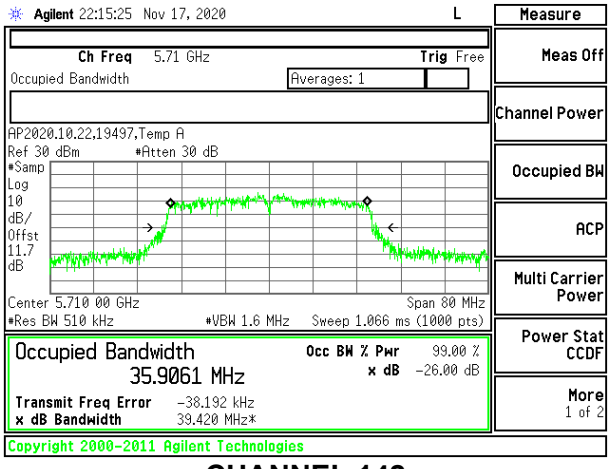
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



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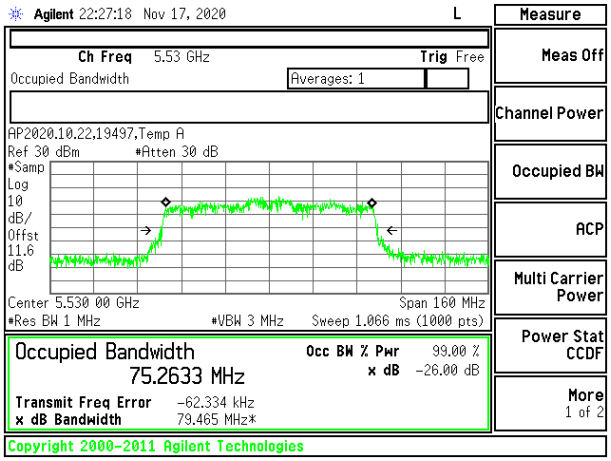
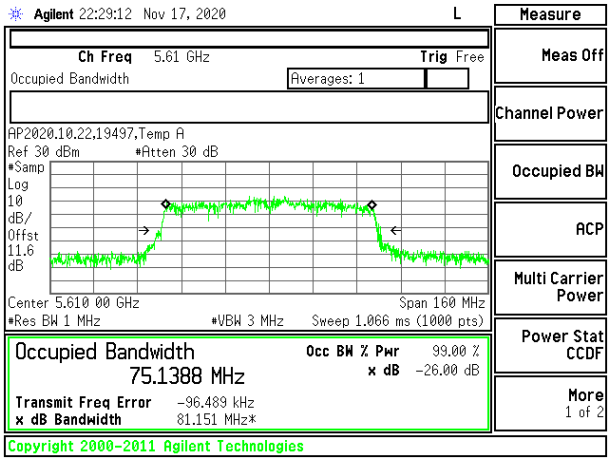
9.3.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

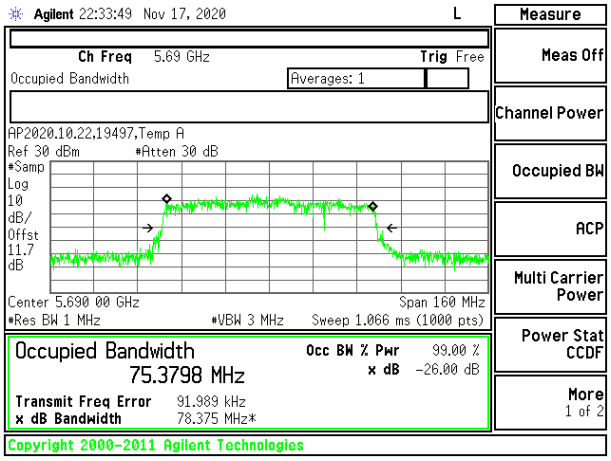
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5530	75.2633
High	5610	75.1388
138	5690	75.3798



LOW CHANNEL



HIGH CHANNEL



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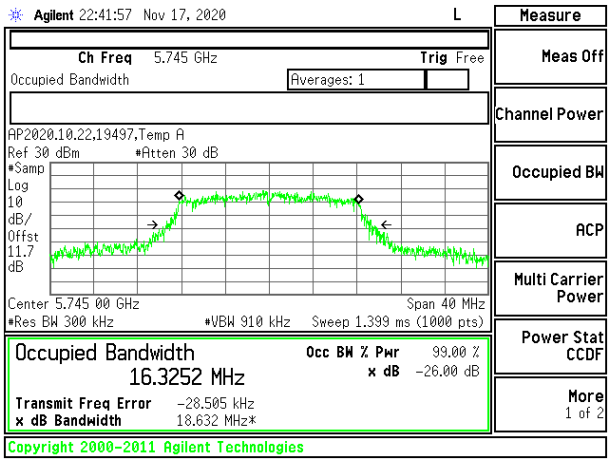
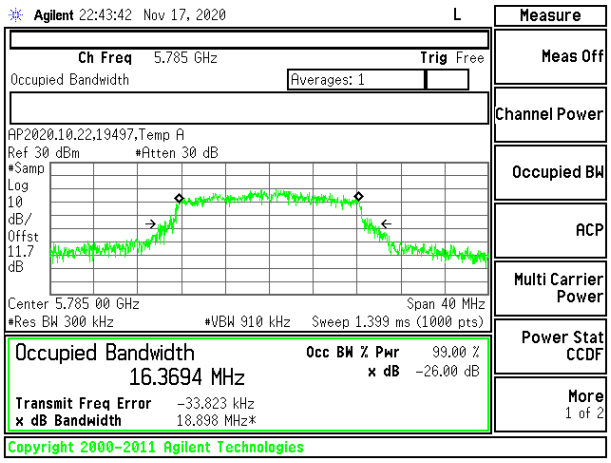
9.3.13. 802.11a MODE IN THE 5.8 GHz BAND

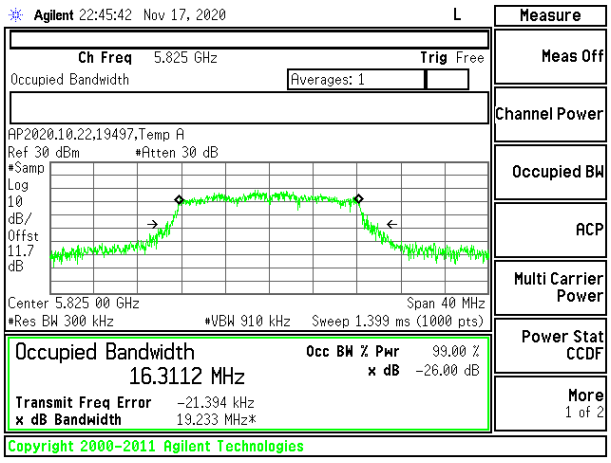
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.3252
Mid	5785	16.3694
High	5825	16.3112



LOW CHANNEL



MID CHANNEL



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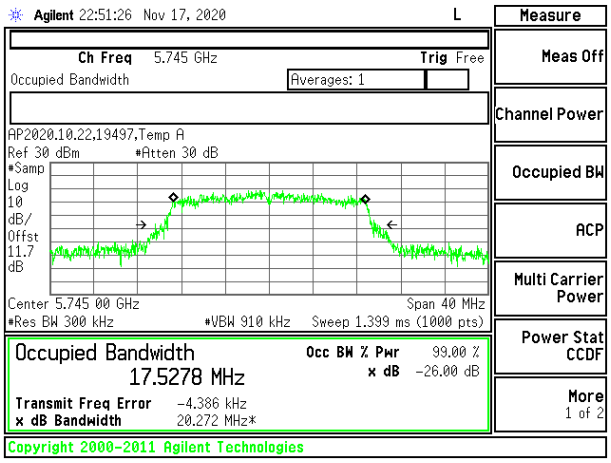
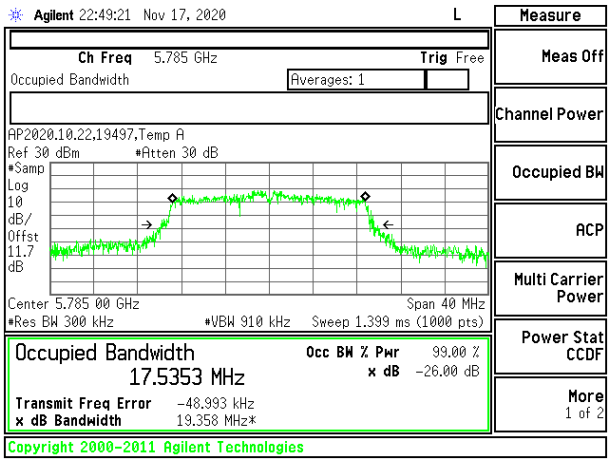
9.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

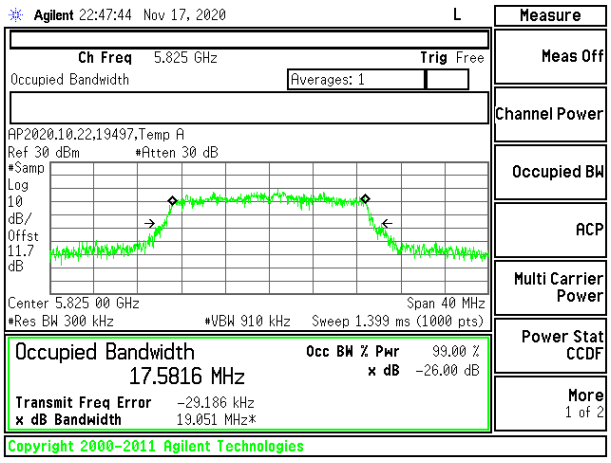
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.5278
Mid	5785	17.5353
High	5825	17.5816



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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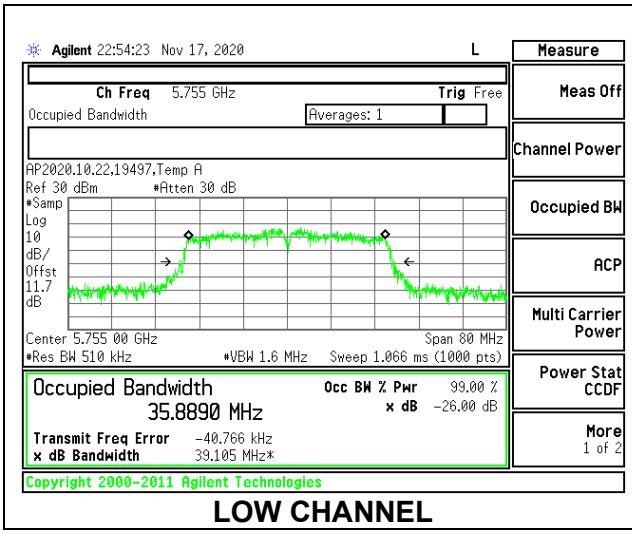
9.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	35.8890
High	5795	35.8734



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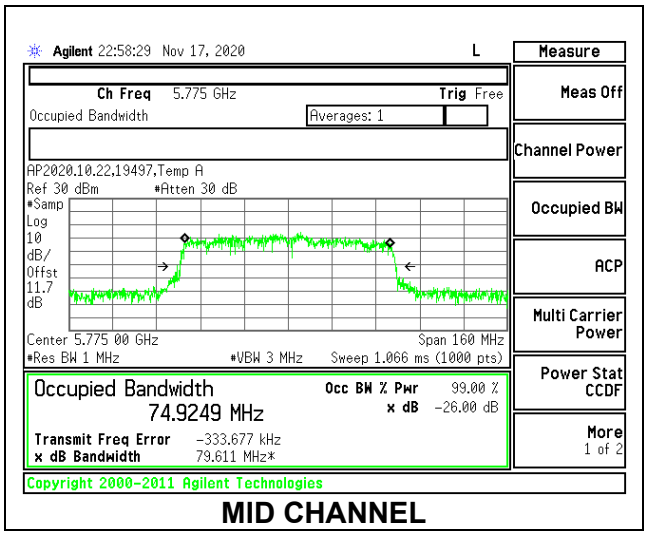
9.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5775	74.9249



MID CHANNEL

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9.4. 6 dB BANDWIDTH

LIMITS

FCC §15.407 (e)

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

RESULTS

UL VERIFICATION SERVICES INC.
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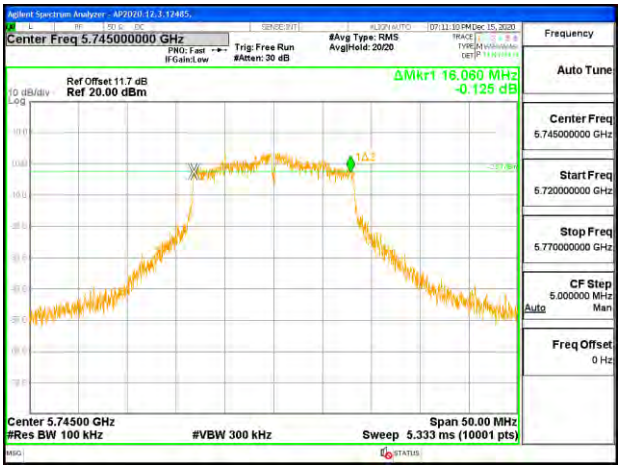
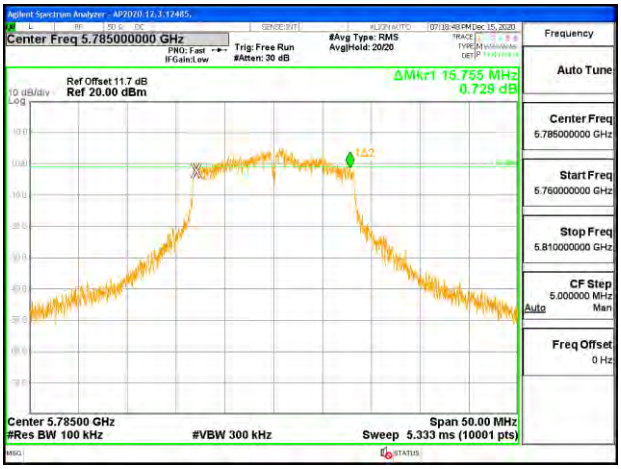
9.4.1. 802.11a MODE IN THE 5.8 GHz BAND

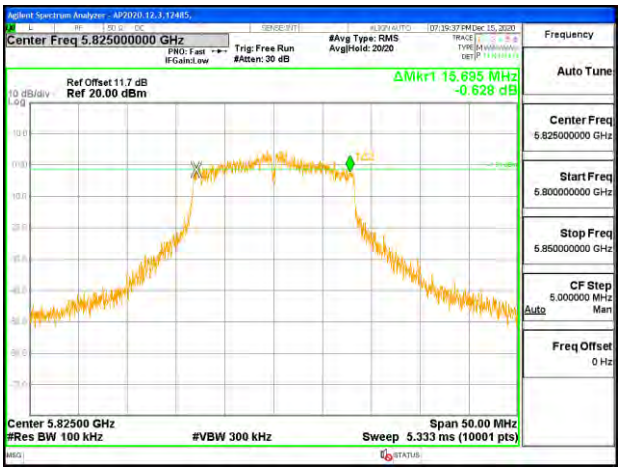
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.060	0.5
Mid	5785	15.755	0.5
High	5825	15.659	0.5
144	5720	3.1580	0.5



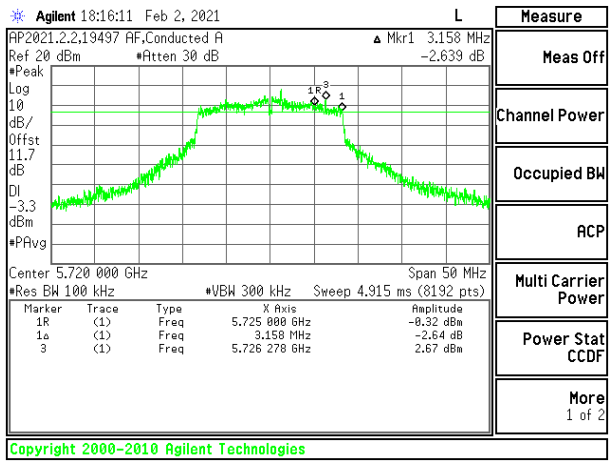
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



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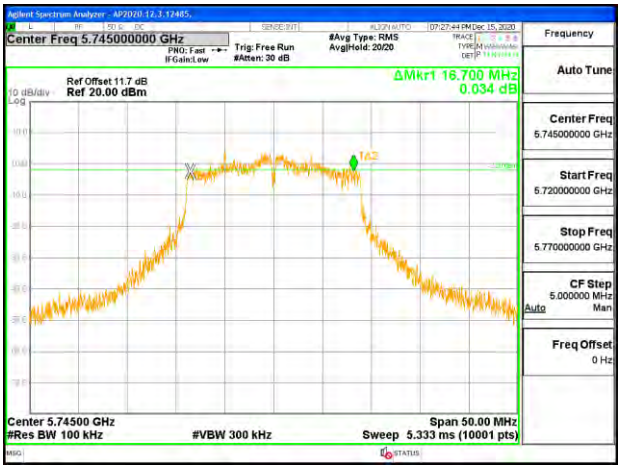
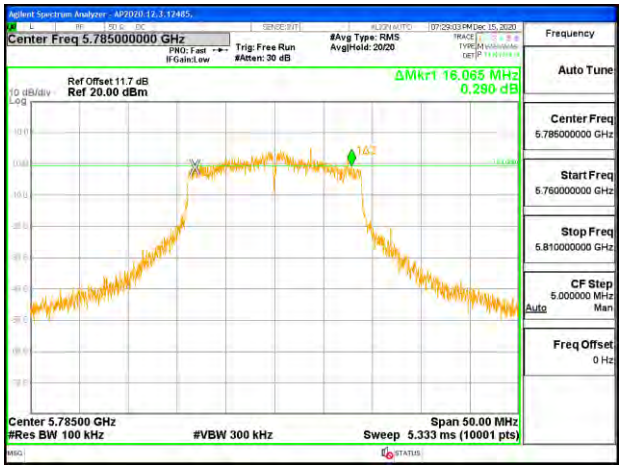
9.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

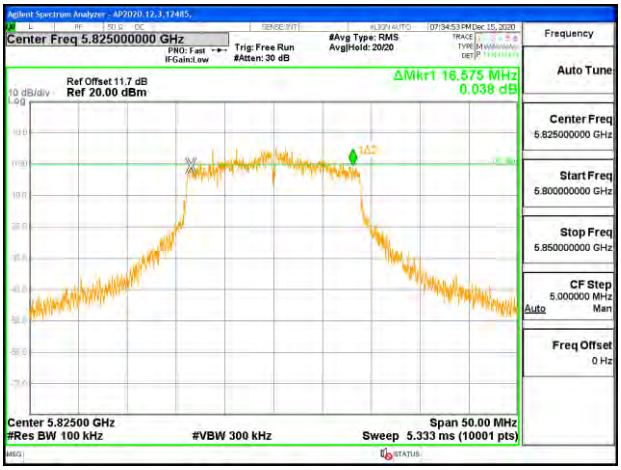
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.700	0.5
Mid	5785	16.065	0.5
High	5825	16.575	0.5
144	5720	3.7870	0.5



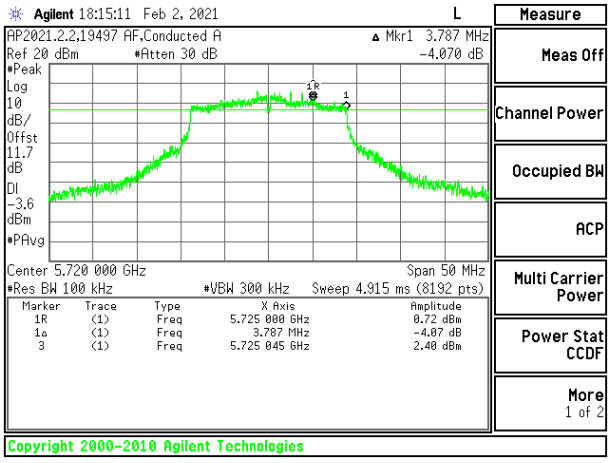
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144

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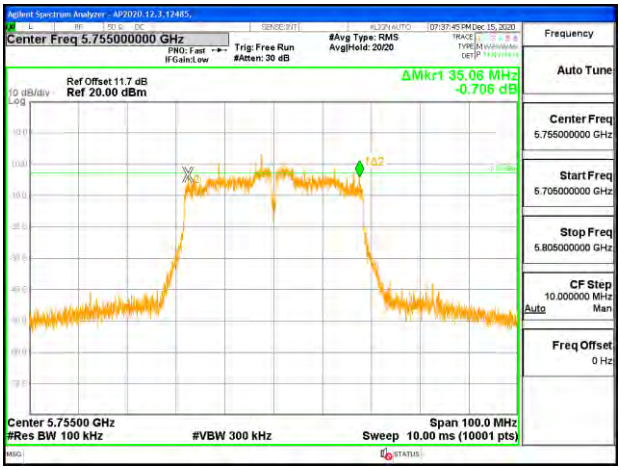
9.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	35.06	0.5
High	5795	35.08	0.5
142	5710	3.2210	0.5



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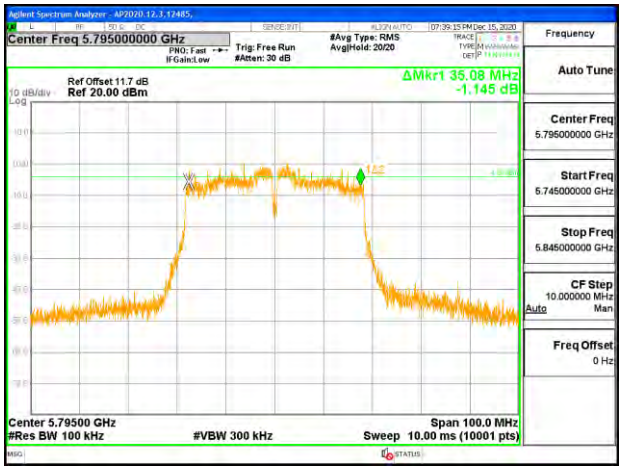

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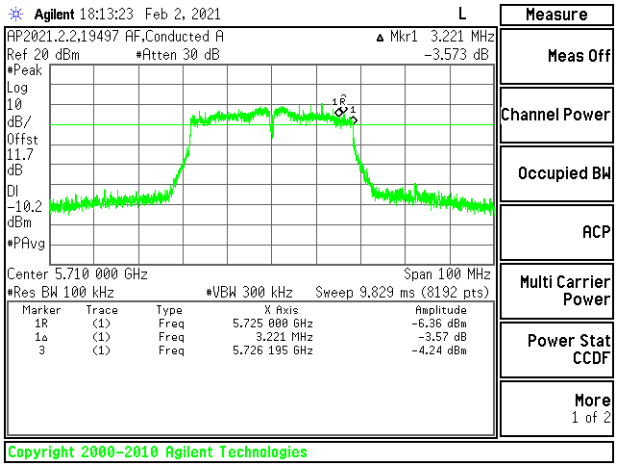

CHANNEL 142

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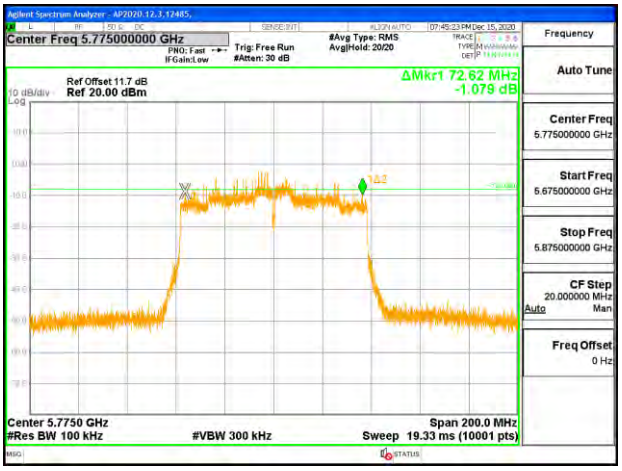
9.4.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	72.62	0.5
138	5690	3.1520	0.5



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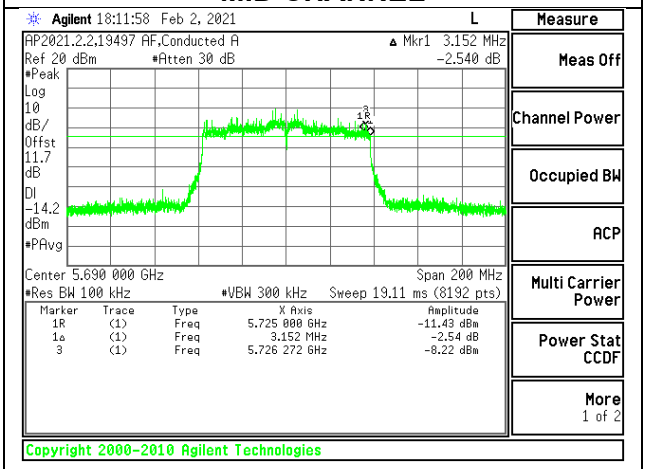

CHANNEL 138

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9.5. 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).

Bands 5.25-5.35 GHz and 5.47-5.725 GHz

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

Band 5.725-5.85 GHz

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

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TEST PROCEDURE

The measurement method used for output power is KDB 789033 D02 v02r01, Section E.3.b (Method PM-G).

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

For all straddle channels, full bandwidth power is reported in the 5.6GHz section. The combined 5.6GHz and 5.8GHz power already passed the worst case 5.6GHz 24dBm limit, therefore there is no need to provide the 5.8GHz power.

DIRECTIONAL ANTENNA GAIN

For 1 TX:
There is only one transmitter output therefore the directional gain is equal to the antenna gain.

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Test Engineer:	20792 KN
Test Date:	11/17/2020

RESULTS

9.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5180	-3.48	24.00	11.00
Mid	5200	-3.48	24.00	11.00
High	5240	-3.38	24.00	11.00

Duty Cycle CF (dB)	0.11	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	16.52	16.52	24.00	-7.48
Mid	5200	16.70	16.70	24.00	-7.30
High	5240	16.43	16.43	24.00	-7.57

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5180	7.32	7.43	11.00	-3.57
Mid	5200	7.08	7.19	11.00	-3.81
High	5240	7.06	7.17	11.00	-3.83

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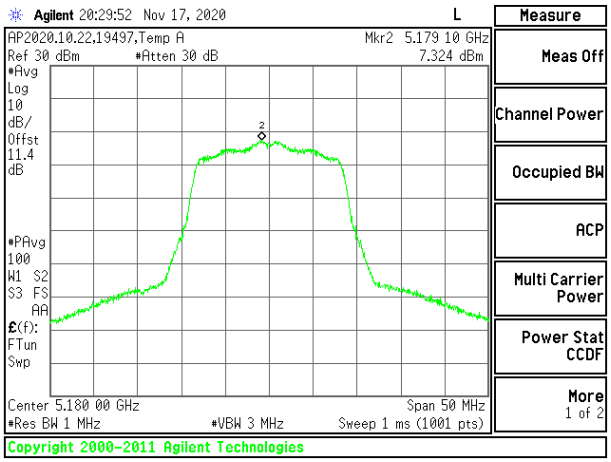
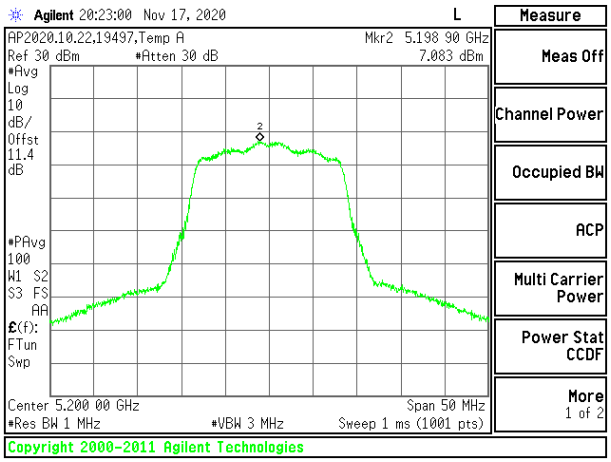


LOW CHANNEL



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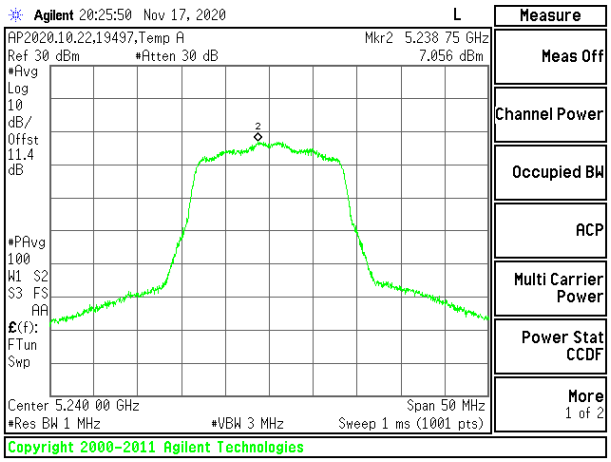

HIGH CHANNEL

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9.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5180	-3.48	24.00	11.00
Mid	5200	-3.48	24.00	11.00
High	5240	-3.48	24.00	11.00

Duty Cycle CF (dB)	0.12	**Included in Calculations of Corr'd PSD**

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	16.39	16.39	24.00	-7.61
Mid	5200	16.60	16.60	24.00	-7.40
High	5240	16.64	16.64	24.00	-7.36

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	6.96	7.08	11.00	-3.92
Mid	5200	6.82	6.94	11.00	-4.06
High	5240	6.87	6.99	11.00	-4.01

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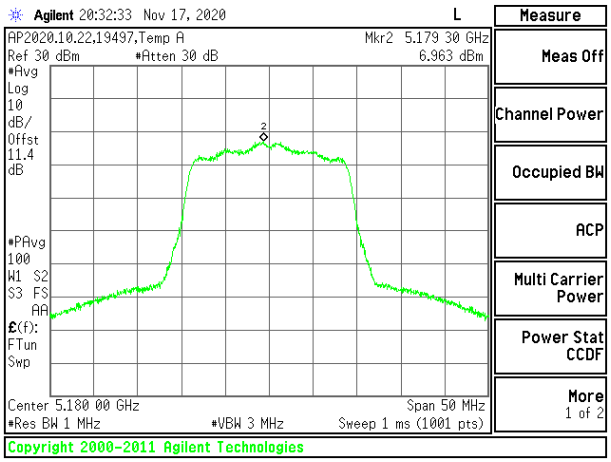
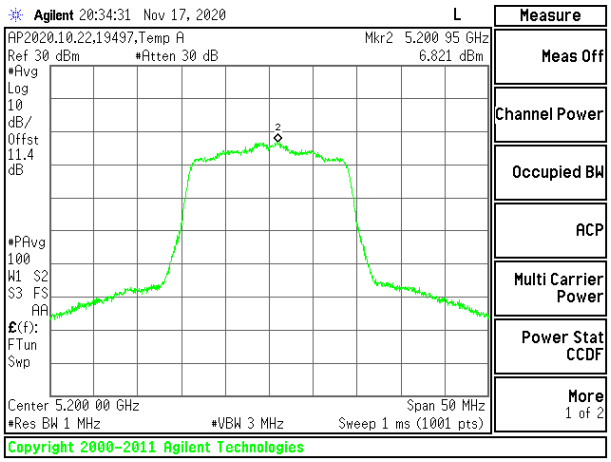


LOW CHANNEL



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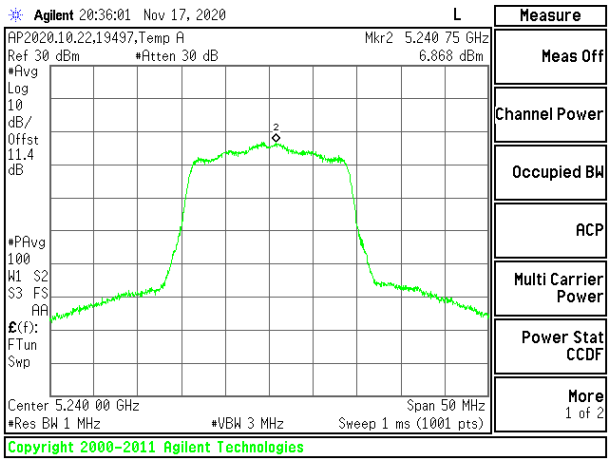

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9.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain for Power (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5190	-3.48	24.00	11.00
High	5230	-3.48	24.00	11.00

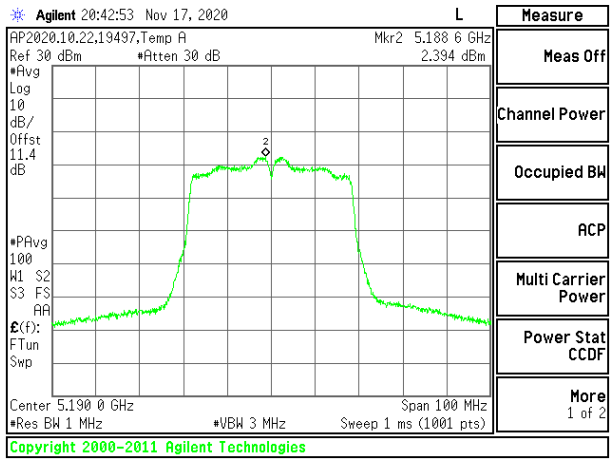
Duty Cycle CF (dB)	0.23	Included in Calculations of Corr'd Power & PSD

Output Power Results

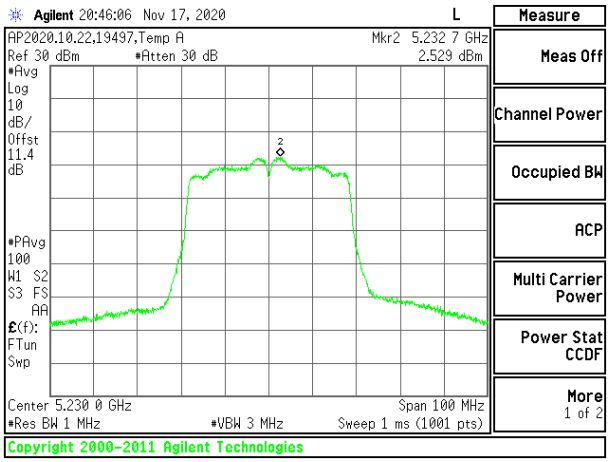
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	14.72	14.72	24.00	-9.28
High	5230	14.94	14.94	24.00	-9.06

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5190	2.39	2.62	11.00	-8.38
High	5230	2.53	2.76	11.00	-8.24



LOW CHANNEL



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9.5.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Mid	5210	-3.48	24.00	11.00

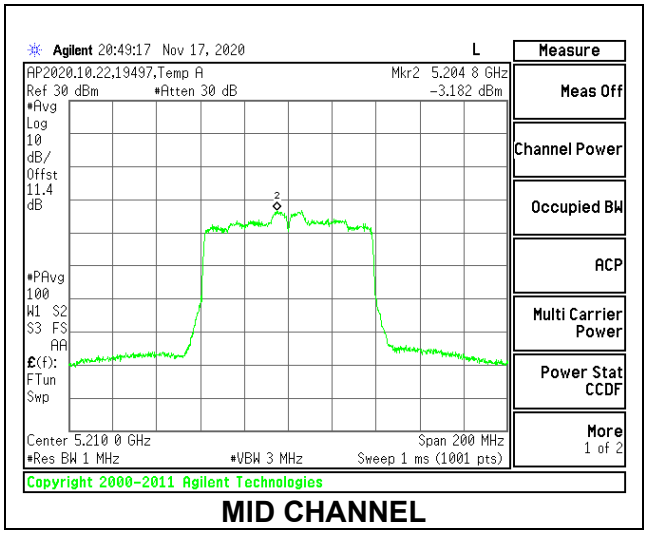
Duty Cycle CF (dB)	0.45	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	12.45	12.45	24.00	-11.55

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5210	-3.18	-2.73	11.00	-13.73



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9.5.5. 802.11a MODE IN THE 5.3 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	20.65	-3.31	24.00	11.00
Mid	5300	20.75	-3.31	24.00	11.00
High	5320	20.30	-3.31	24.00	11.00

Duty Cycle CF (dB)	0.11	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.82	16.82	24.00	-7.18
Mid	5300	16.63	16.63	24.00	-7.37
High	5320	16.79	16.79	24.00	-7.21

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	7.930	8.04	11.00	-2.96
Mid	5300	7.031	7.14	11.00	-3.86
High	5320	6.960	7.07	11.00	-3.93

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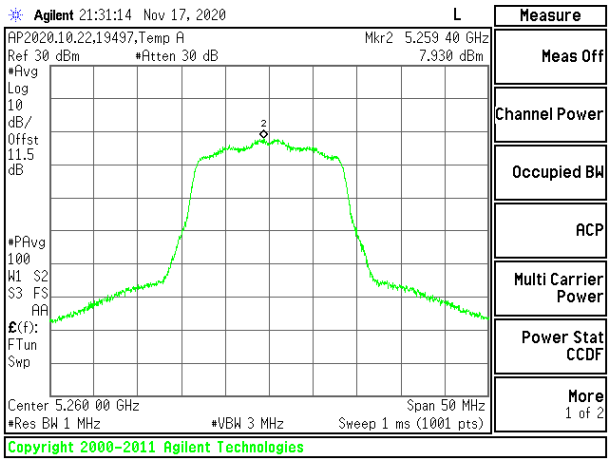

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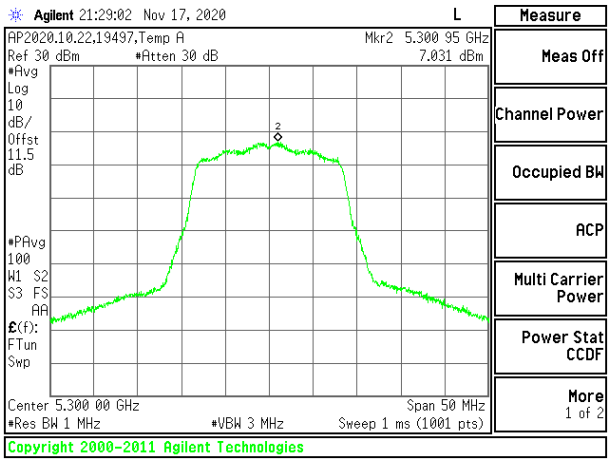

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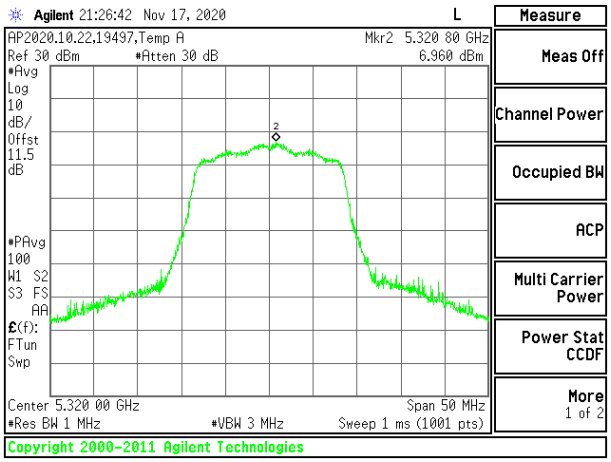

HIGH CHANNEL

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9.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	20.90	-3.31	24.00	11.00
Mid	5300	21.10	-3.31	24.00	11.00
High	5320	21.10	-3.31	24.00	11.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	16.68	16.68	24.00	-7.32
Mid	5300	16.59	16.59	24.00	-7.41
High	5320	16.80	16.80	24.00	-7.20

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	7.799	7.92	11.00	-3.08
Mid	5300	6.787	6.91	11.00	-4.09
High	5320	7.029	7.15	11.00	-3.85

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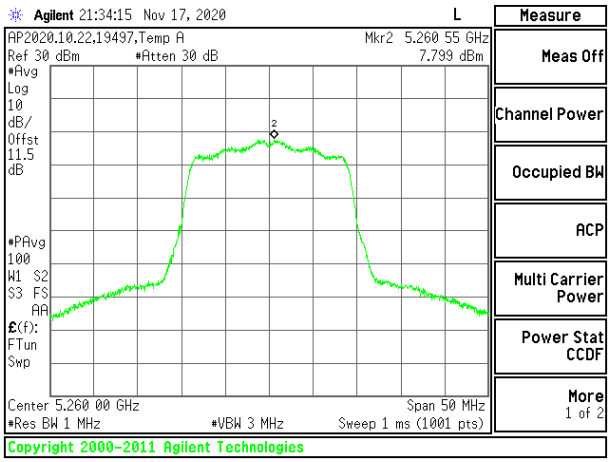

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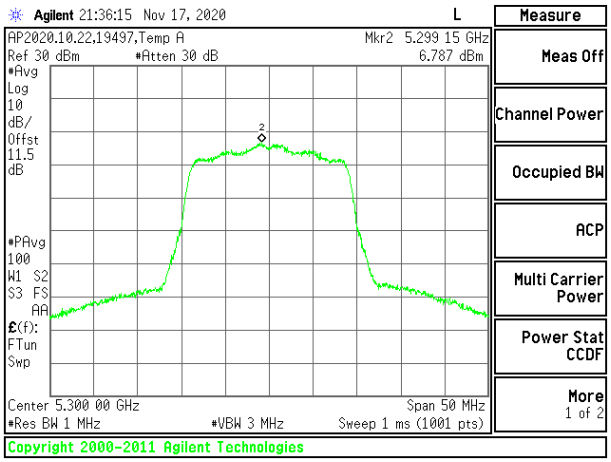

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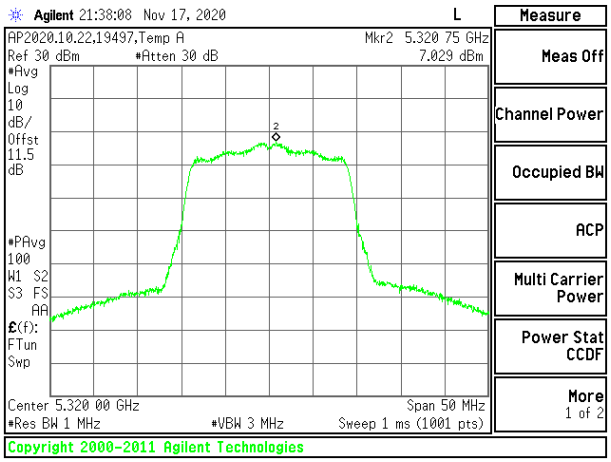

HIGH CHANNEL

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9.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Low	5260	41.30	-3.31	24.00	11.00
High	5320	41.40	-3.31	24.00	11.00

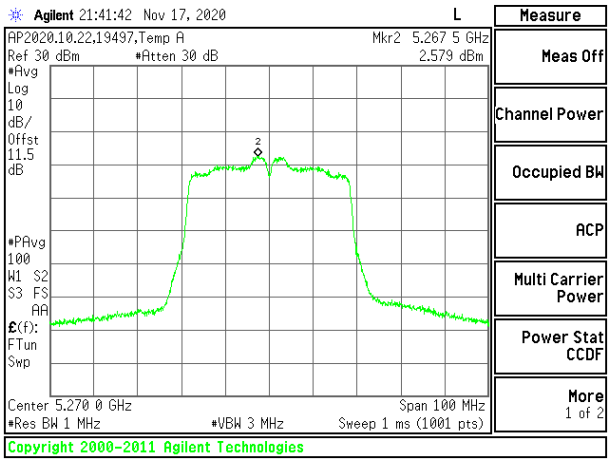
Duty Cycle CF (dB)	0.23	Included in Calculations of Corr'd PSD

Output Power Results

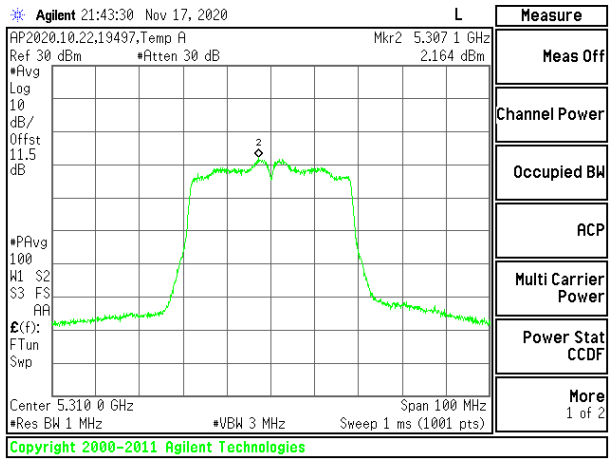
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.63	14.63	24.00	-9.37
High	5320	14.27	14.27	24.00	-9.73

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	2.579	2.81	11.00	-8.19
High	5320	2.164	2.39	11.00	-8.61



LOW CHANNEL



HIGH CHANNEL

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9.5.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/1MHz)
Mid	5290	83.40	-3.31	24.00	11.00

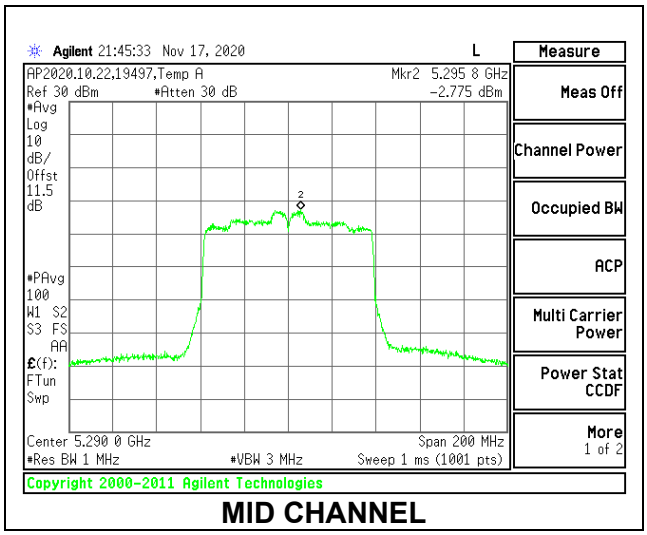
Duty Cycle CF (dB)	0.45	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	12.72	12.72	24.00	-11.28

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Mid	5290	-2.775	-2.33	11.00	-13.33



MID CHANNEL

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9.5.9. 802.11a MODE IN THE 5.6 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5500	20.25	-3.37	24.00	11.00
Mid	5580	20.25	-3.37	24.00	11.00
High	5700	20.65	-3.37	24.00	11.00
144	5720	20.35	-3.37	24.00	11.00

Duty Cycle CF (dB)	0.11	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	16.79	16.79	24.00	-7.21
Mid	5580	16.50	16.50	24.00	-7.50
High	5700	16.36	16.36	24.00	-7.64
144	5720	16.56	16.56	24.00	-7.44

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	6.73	6.84	11.00	-4.16
Mid	5580	7.64	7.75	11.00	-3.25
High	5700	7.99	8.10	11.00	-2.90
144	5720	8.61	8.72	11.00	-2.28

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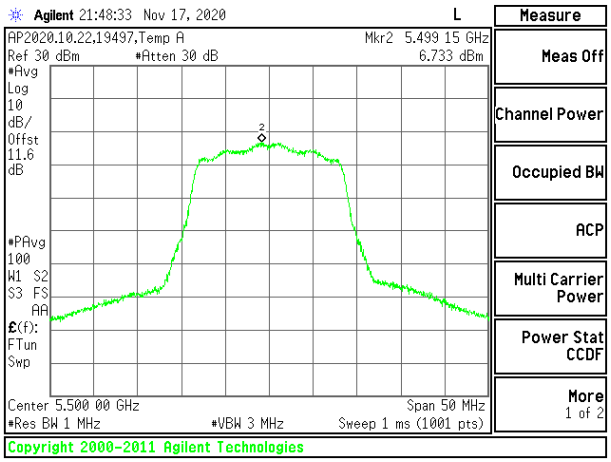

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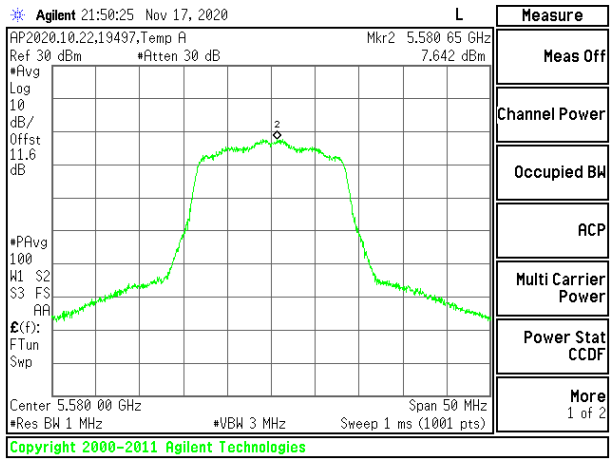

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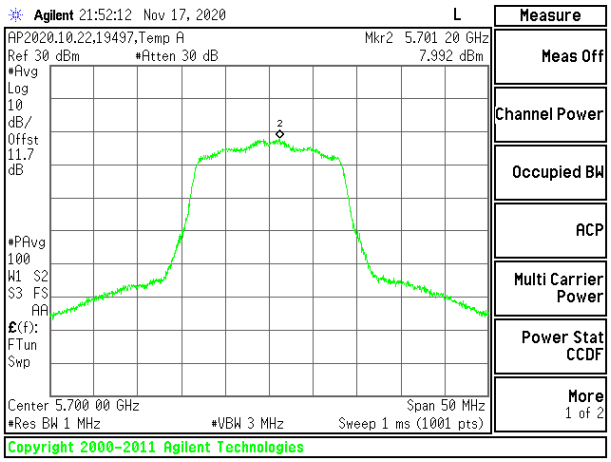

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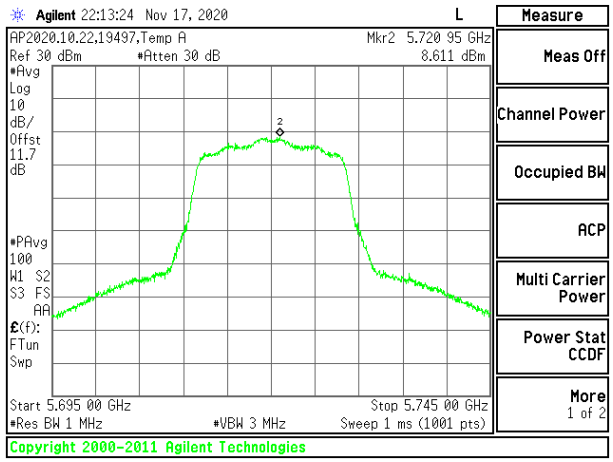

CHANNEL 144

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9.5.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5500	21.0	-3.37	24.00	11.00
Mid	5580	21.2	-3.37	24.00	11.00
High	5700	21.2	-3.37	24.00	11.00
144	5720	21.2	-3.37	24.00	11.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	16.60	16.60	24.00	-7.40
Mid	5580	16.59	16.59	24.00	-7.41
High	5700	16.20	16.20	24.00	-7.80
144	5720	16.43	16.43	24.00	-7.57

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	6.63	6.75	11.00	-4.25
Mid	5580	7.85	7.97	11.00	-3.04
High	5700	7.80	7.92	11.00	-3.08
144	5720	8.12	8.24	11.00	-2.76

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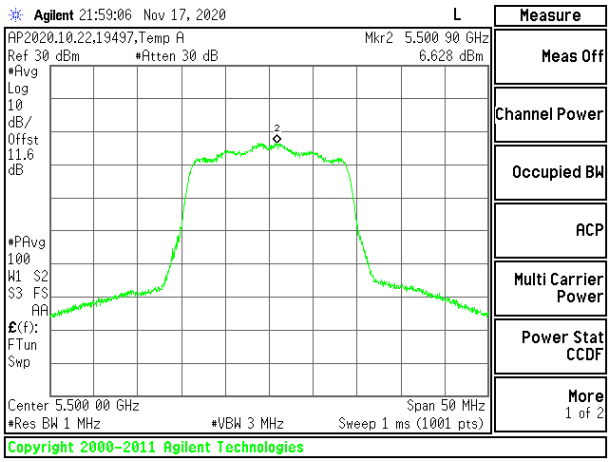

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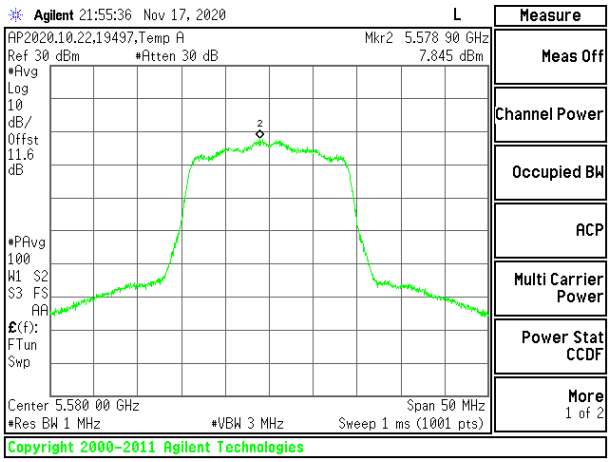

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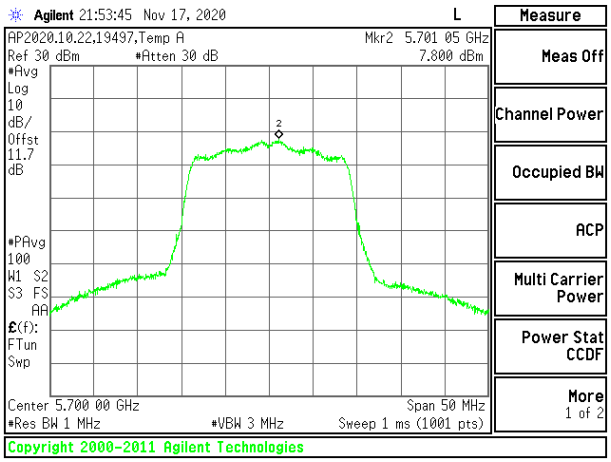

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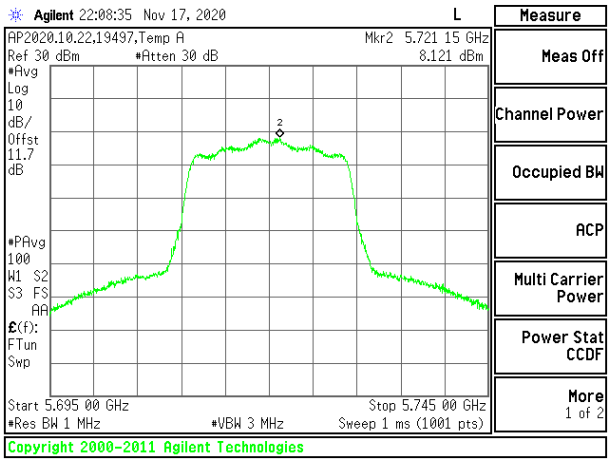

CHANNEL 144

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9.5.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5510	41.50	-3.37	24.00	11.00
Mid	5550	41.00	-3.37	24.00	11.00
High	5670	41.20	-3.37	24.00	11.00
142	5710	41.20	-3.37	24.00	11.00

Duty Cycle CF (dB)	0.23	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	14.86	14.86	24.00	-9.14
Mid	5550	14.47	14.47	24.00	-9.53
High	5670	14.74	14.74	24.00	-9.26
142	5710	14.39	14.39	24.00	-9.61

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5510	2.19	2.42	11.00	-8.58
Mid	5550	2.63	2.86	11.00	-8.14
High	5670	3.44	3.67	11.00	-7.33
142	5710	3.29	3.52	11.00	-7.49

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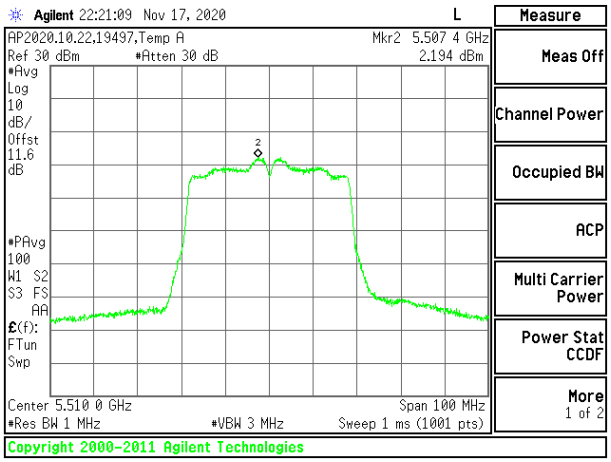
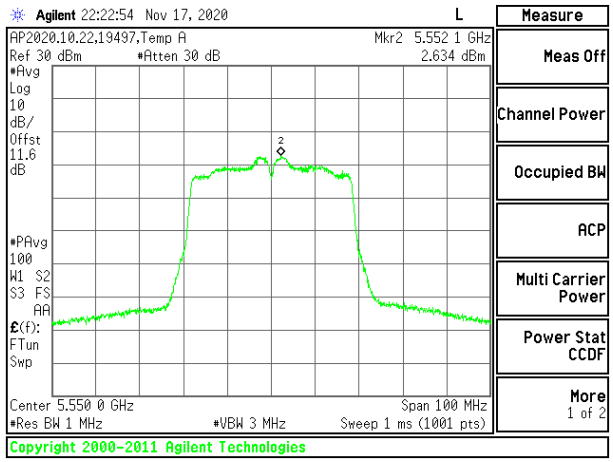


LOW CHANNEL



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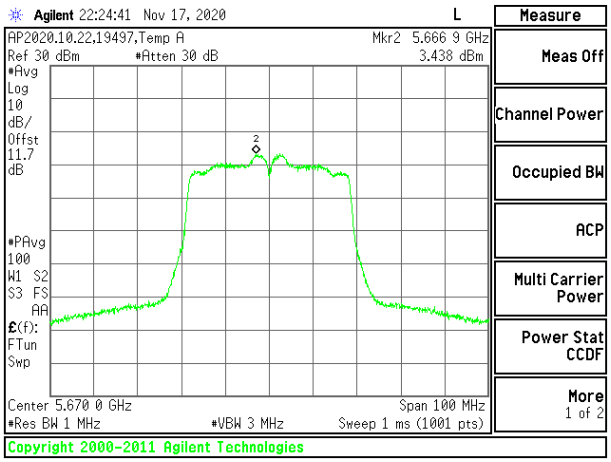

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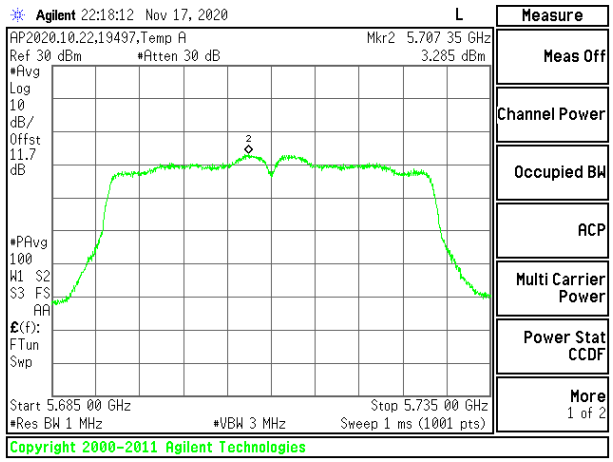

CHANNEL 142

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9.5.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

(FCC)

Bandwidth, Antenna Gain, and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 1MHz)
Low	5530	83.40	-3.37	24.00	11.00
High	5610	83.40	-3.37	24.00	11.00
138	5690	83.40	-3.37	24.00	11.00

Duty Cycle CF (dB)	0.45	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	12.51	12.51	24.00	-11.49
High	5610	12.68	12.68	24.00	-11.32
138	5690	12.60	12.60	24.00	-11.40

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5530	-2.85	-2.40	11.00	-13.40
High	5610	-2.27	-1.82	11.00	-12.82
138	5690	-1.44	-0.99	11.00	-11.99

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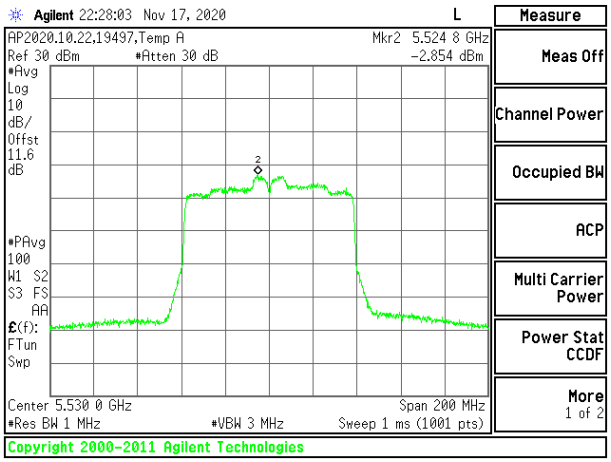

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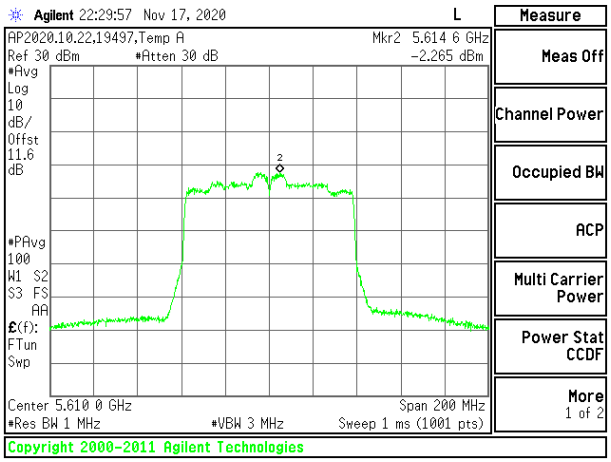

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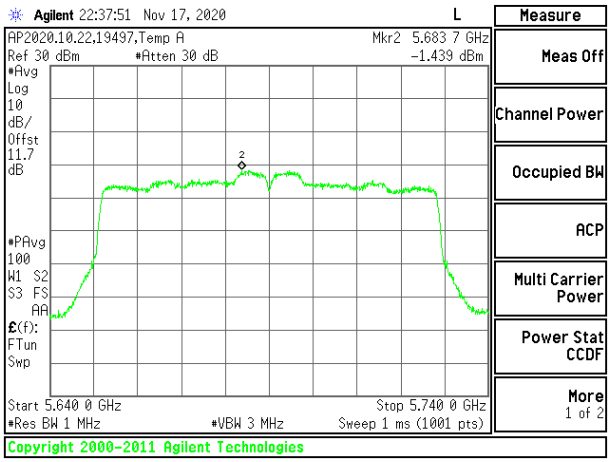

CHANNEL 138

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9.5.13. 802.11a MODE IN THE 5.8 GHz BAND

(FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Low	5745	-3.81	30.00	30.00
Mid	5785	-3.81	30.00	30.00
High	5825	-3.81	30.00	30.00

Duty Cycle CF (dB)	0.11	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	16.58	16.58	30.00	-13.42
Mid	5785	16.98	16.98	30.00	-13.02
High	5825	16.82	16.82	30.00	-13.18

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	5.712	5.822	30.00	-24.18
Mid	5785	5.901	6.011	30.00	-23.99
High	5825	5.810	5.920	30.00	-24.08

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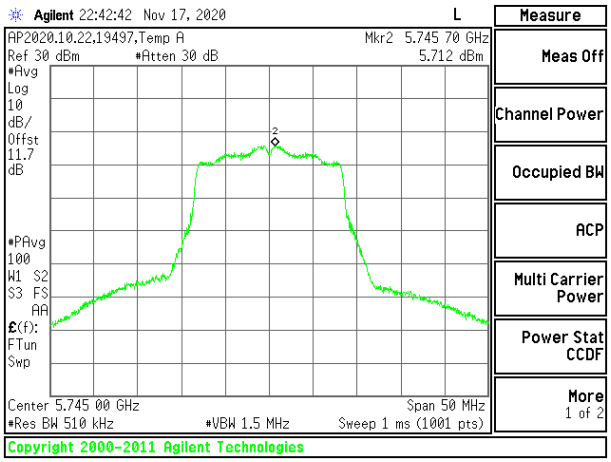
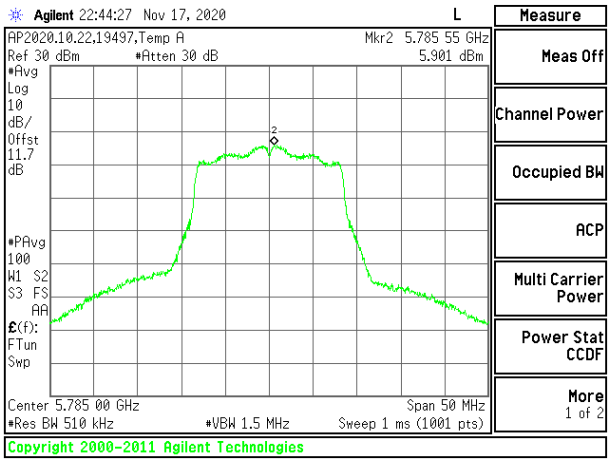
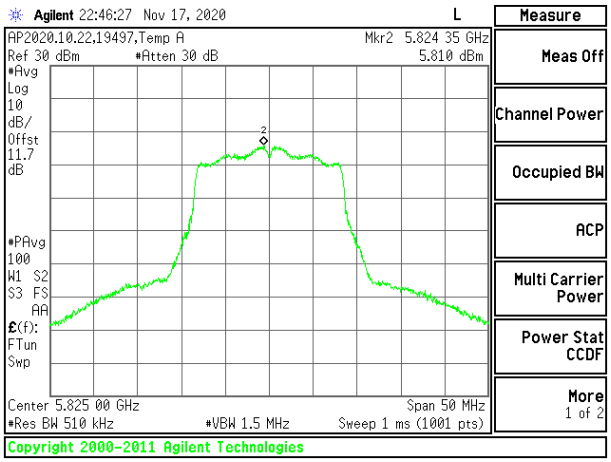


LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

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47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

9.5.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

(FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Low	5745	-3.81	30.00	30.00
Mid	5785	-3.81	30.00	30.00
High	5825	-3.81	30.00	30.00

Duty Cycle CF (dB)	0.12	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	16.61	16.61	30.00	-13.39
Mid	5785	16.82	16.82	30.00	-13.18
High	5825	16.72	16.72	30.00	-13.28

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	5.393	5.513	30.00	-24.49
Mid	5785	5.542	5.662	30.00	-24.34
High	5825	5.655	5.775	30.00	-24.23

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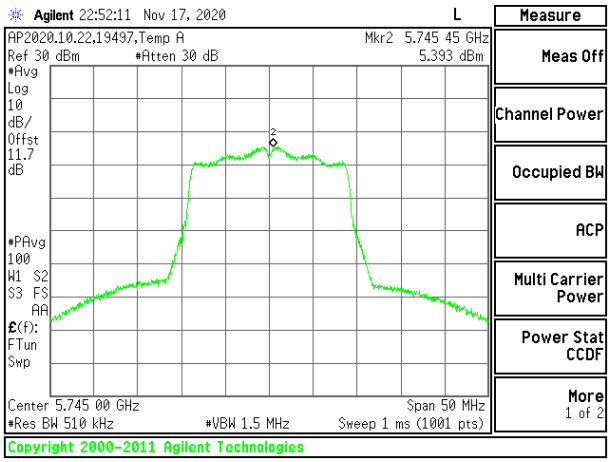
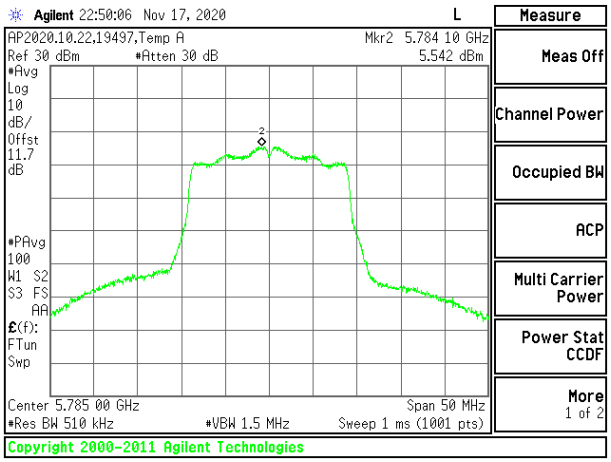


LOW CHANNEL



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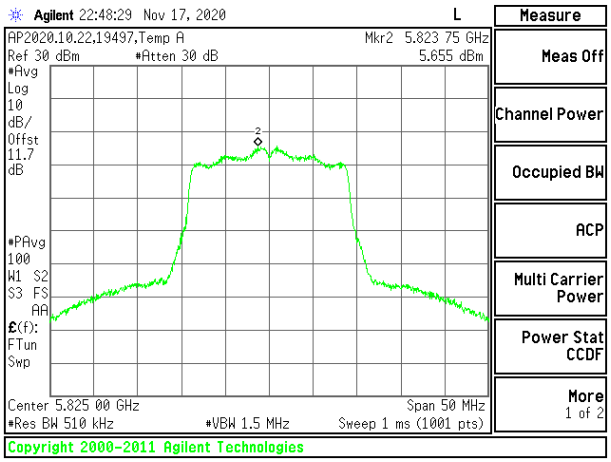

HIGH CHANNEL

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9.5.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

(FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Low	5755	-3.81	30.00	30.00
High	5795	-3.81	30.00	30.00

Duty Cycle CF (dB)	0.23	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	14.68	14.68	30.00	-15.32
High	5795	14.72	14.72	30.00	-15.28

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm)	Total Corr'd PSD (dBm)	PSD Limit (dBm)	PSD Margin (dB)
Low	5755	1.746	1.976	30.00	-28.02
High	5795	0.862	1.092	30.00	-28.91

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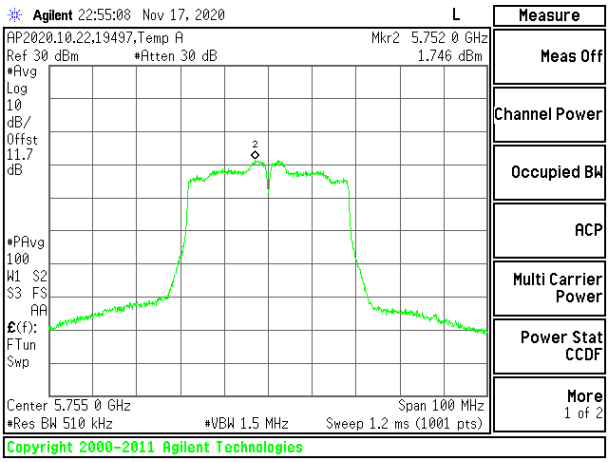
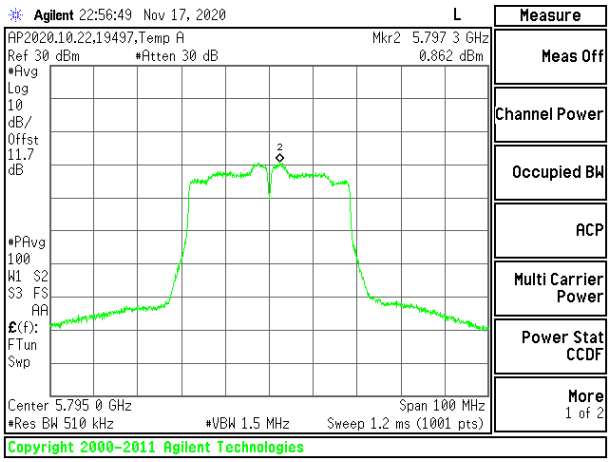


LOW CHANNEL



HIGH CHANNEL

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9.5.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

(FCC)

Antenna Gain and Limit

Channel	Frequency (MHz)	Directional Gain (dBi)	Power Limit (dBm)	PSD Limit (dBm/ 500KHz)
Mid	5775	-3.81	30.00	30.00

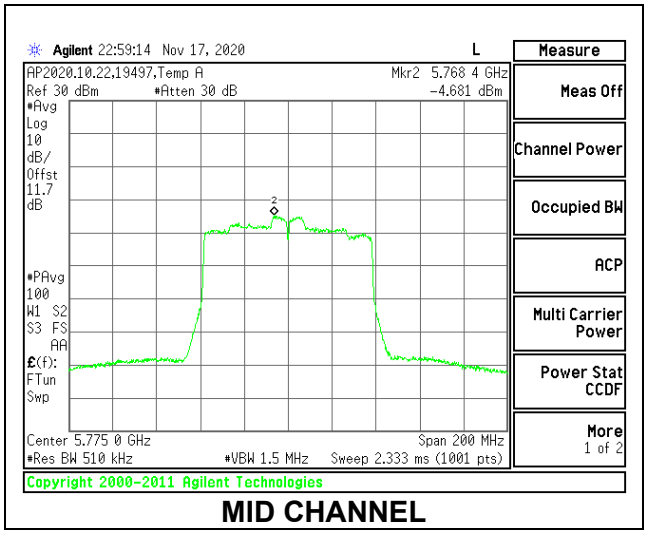
Duty Cycle CF (dB)	0.45	Included in Calculations of Corr'd Power & PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	12.25	12.25	30.00	-17.75

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Mid	5775	-4.681	-4.231	30.00	-34.23



MID CHANNEL

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10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209 -Restriced bands

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

After January 01, 2019 for Outside of the Restricted Bands Emissions

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.

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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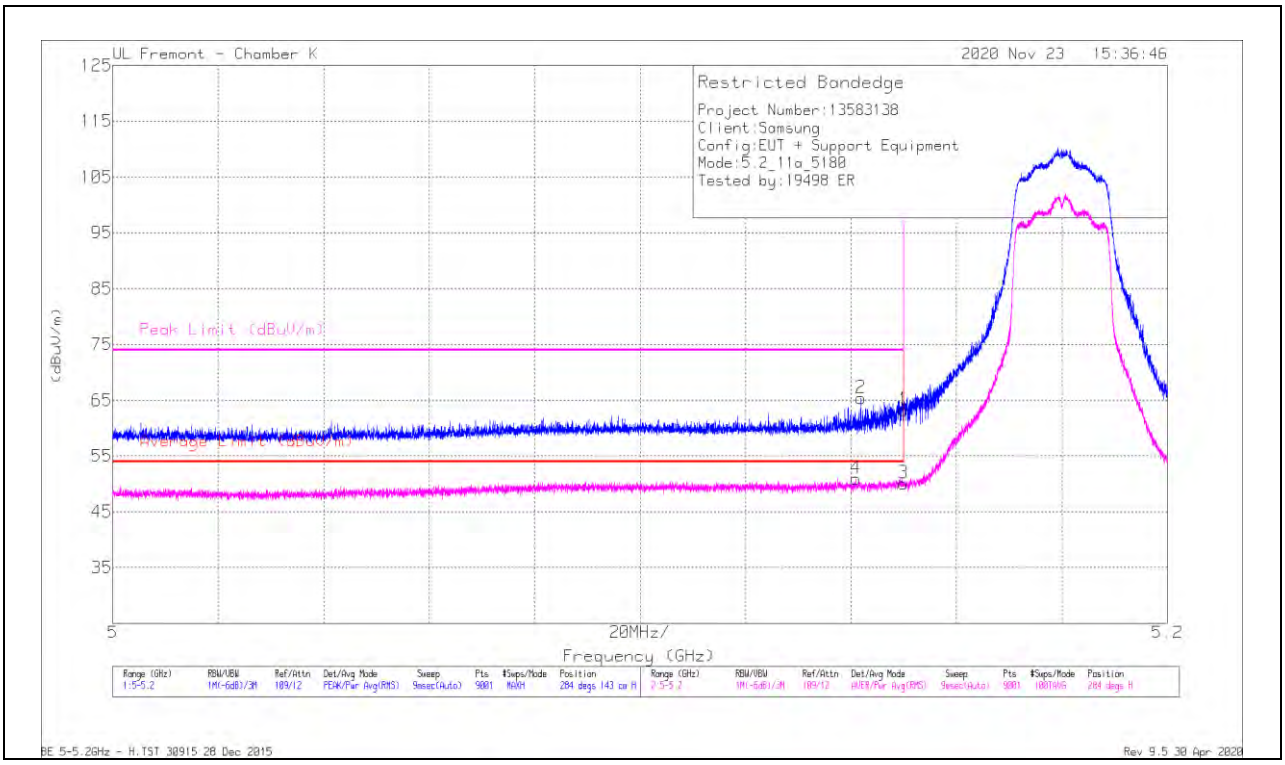
10.1. TRANSMITTER ABOVE 1 GHz

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

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.15	36.31	Pk	34.6	-7.6	0	63.31	-	-	74	-10.69	284	143	H
2	5.14187	38.49	Pk	34.5	-7.6	0	65.39	-	-	74	-8.61	284	143	H
3	5.15	22.99	RMS	34.6	-7.6	.11	50.1	54	-3.9	-	-	284	143	H
4	5.14098	23.92	RMS	34.6	-7.7	.11	50.93	54	-3.07	-	-	284	143	H

Pk - Peak detector
RMS - RMS detection

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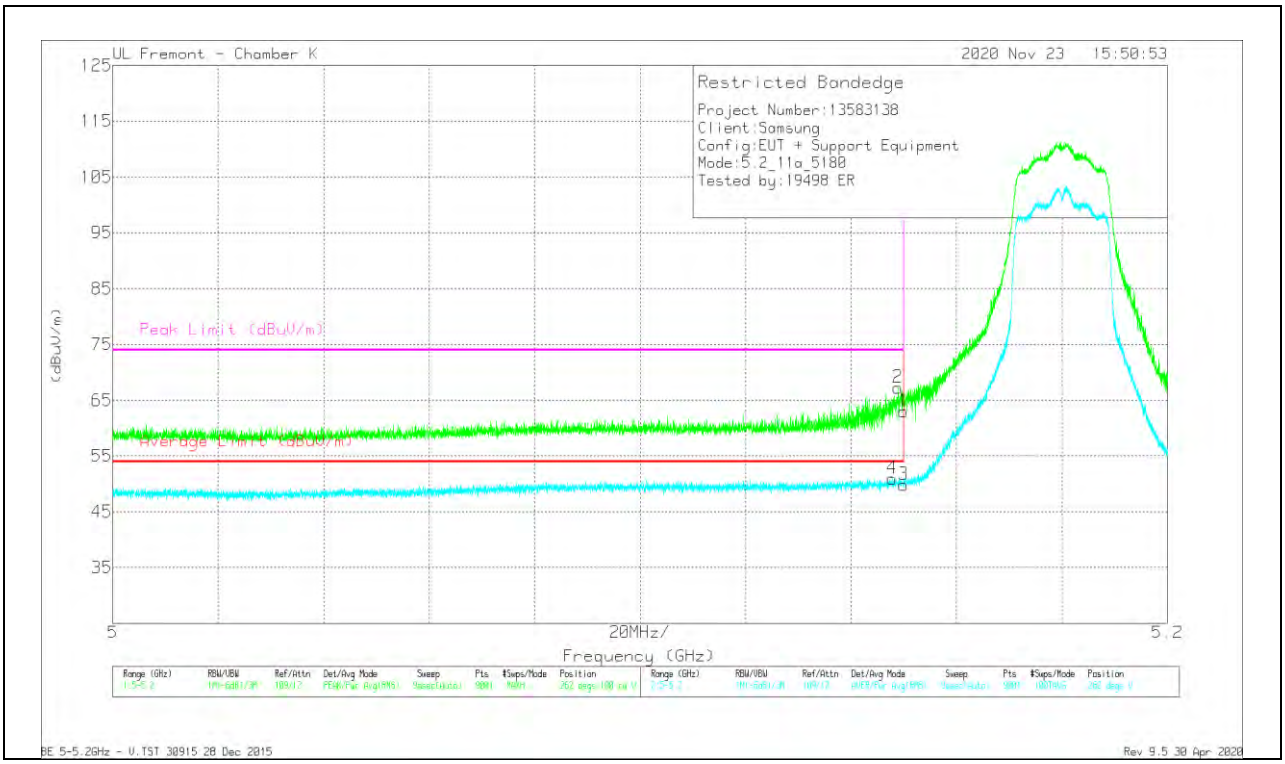
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	5.15	36.05	Pk	34.6	-7.6	0	63.05	-	-	74	-10.95	262	100	V
2	5.14889	40.31	Pk	34.5	-7.6	0	67.21	-	-	74	-6.79	262	100	V
3	5.15	22.78	RMS	34.6	-7.6	.11	49.89	54	-4.11	-	-	262	100	V
4	5.14787	23.93	RMS	34.5	-7.6	.11	50.94	54	-3.06	-	-	262	100	V

Pk - Peak detector
RMS - RMS detection

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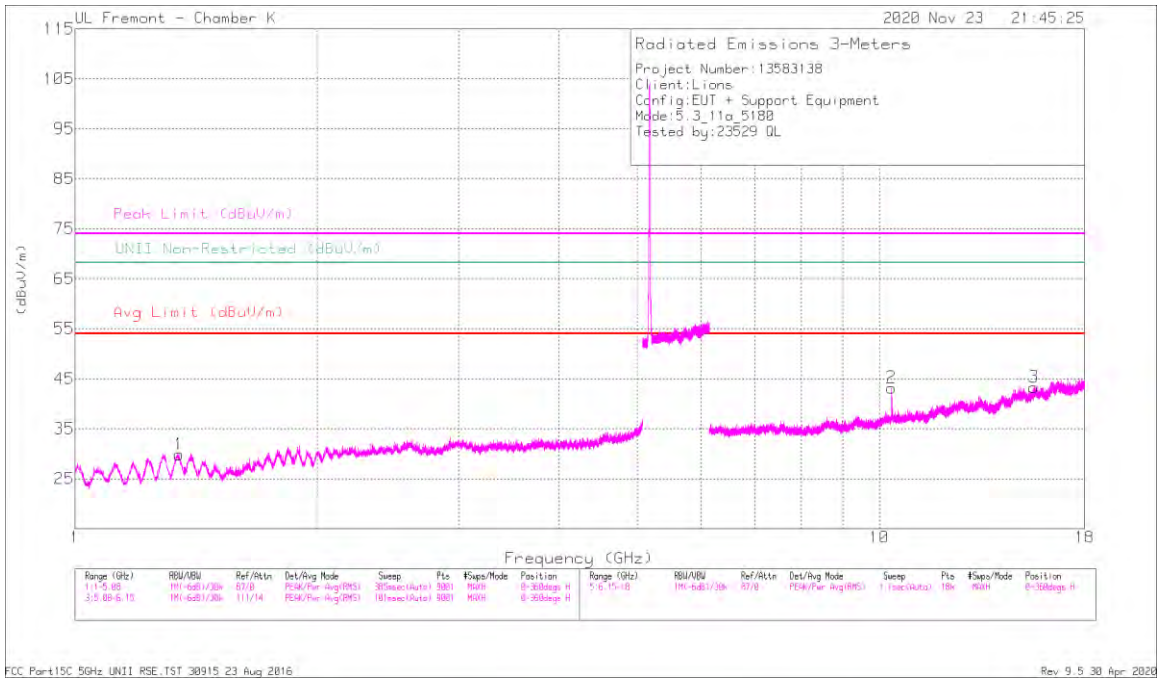
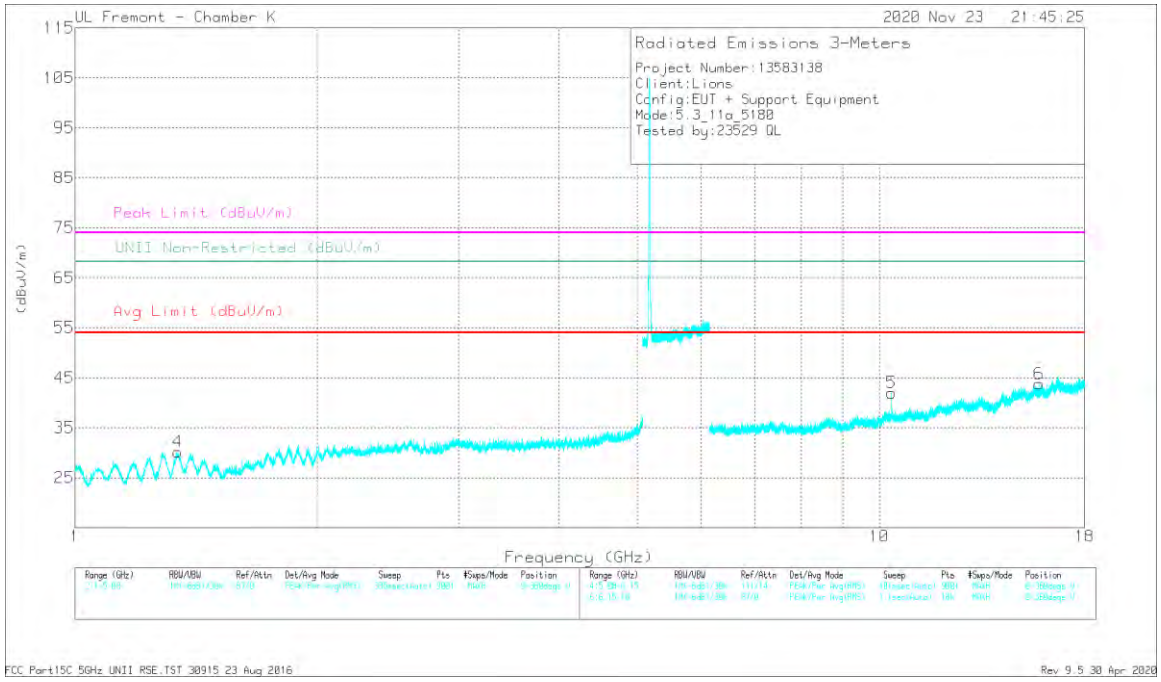
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.34564	54.98	PK-U	29.3	-46.5	0	37.78	-	-	74	-36.22	-	-	26	307	H
* 1.34535	43.74	ADR	29.3	-46.5	.11	26.65	54	-27.35	-	-	-	-	26	307	H
* 1.34063	55.7	PK-U	29.3	-46.6	0	38.4	-	-	74	-35.6	-	-	125	354	V
* 1.34069	44.06	ADR	29.3	-46.6	.11	26.87	54	-27.13	-	-	-	-	125	354	V
10.36105	53.71	PK-U	37.6	-37.2	0	54.11	-	-	-	-	68.2	-14.09	14	201	H
* 15.56118	43.69	PK-U	40.9	-33.8	0	50.79	-	-	74	-23.21	-	-	249	137	H
* 15.56345	32.01	ADR	40.9	-33.8	.11	39.22	54	-14.78	-	-	-	-	249	137	H
10.35738	50.57	PK-U	37.6	-37.2	0	50.97	-	-	-	-	68.2	-17.23	310	150	V
* 15.80218	43.62	PK-U	40.8	-34.1	0	50.32	-	-	74	-23.68	-	-	289	339	V
* 15.79882	32.53	ADR	40.8	-34.2	.11	39.24	54	-14.76	-	-	-	-	289	339	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

UL VERIFICATION SERVICES INC.
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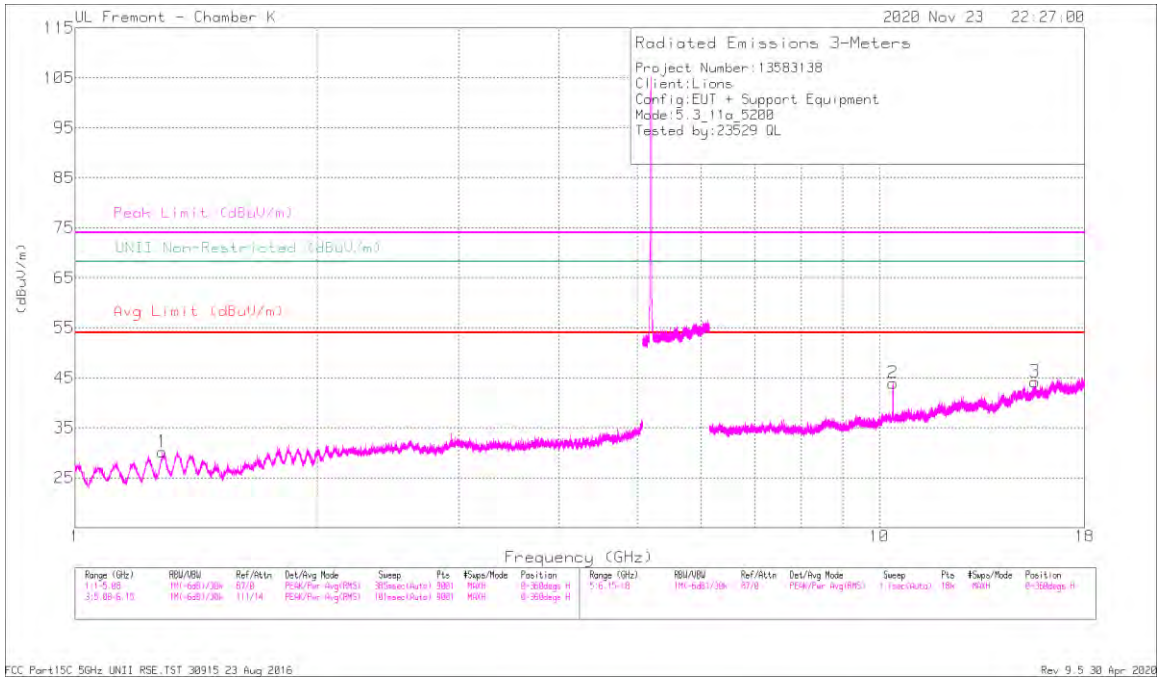
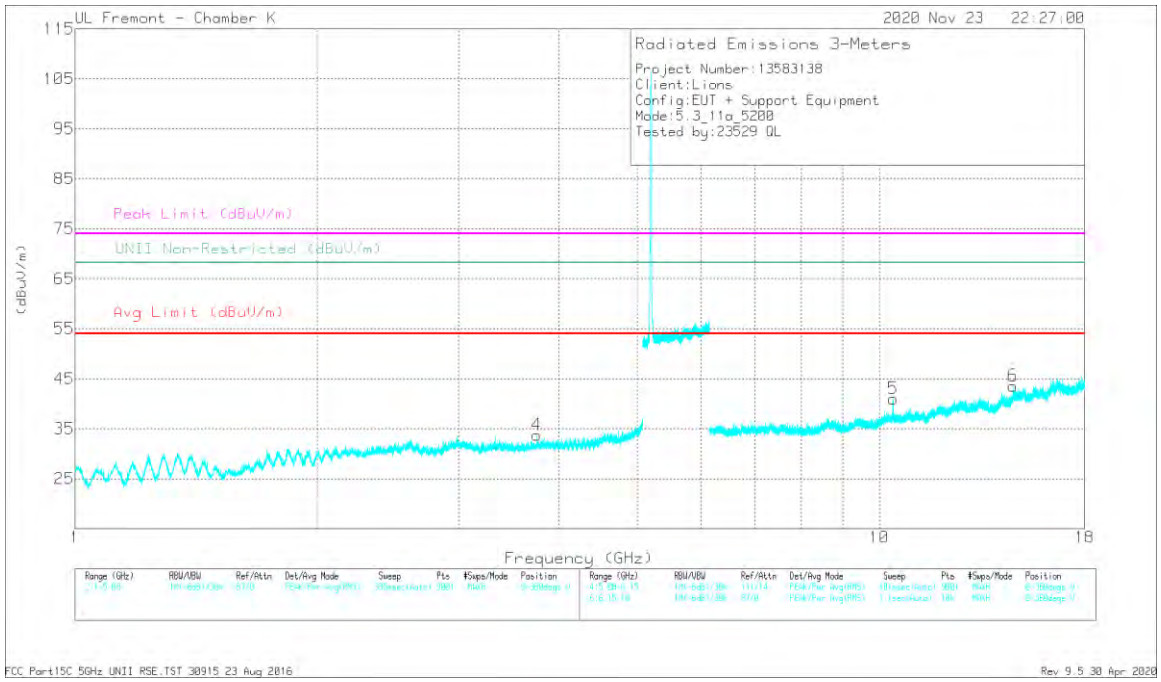
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.28347	54.58	PK-U	29.4	-46.6	0	37.38	-	-	74	-36.62	-	-	153	166	H
* 1.28567	44.01	ADR	29.4	-46.6	.11	26.92	54	-27.08	-	-	-	-	153	166	H
* 3.74971	48.87	PK-U	33.7	-42	0	40.57	-	-	74	-33.43	-	-	303	202	V
* 3.74887	37.09	ADR	33.7	-42	.11	28.9	54	-25.1	-	-	-	-	303	202	V
* 15.61633	43.79	PK-U	40.9	-33.6	0	51.09	-	-	74	-22.91	-	-	102	321	H
* 15.61454	31.66	ADR	40.8	-33.6	.11	38.97	54	-15.03	-	-	-	-	102	321	H
10.4002	55.08	PK-U	37.7	-37.2	0	55.58	-	-	-	-	68.2	-12.62	11	205	H
10.40164	50.76	PK-U	37.7	-37.2	0	51.26	-	-	-	-	68.2	-16.94	312	106	V
14.65665	43.26	PK-U	40.6	-35	0	48.86	-	-	-	-	68.2	-19.34	243	153	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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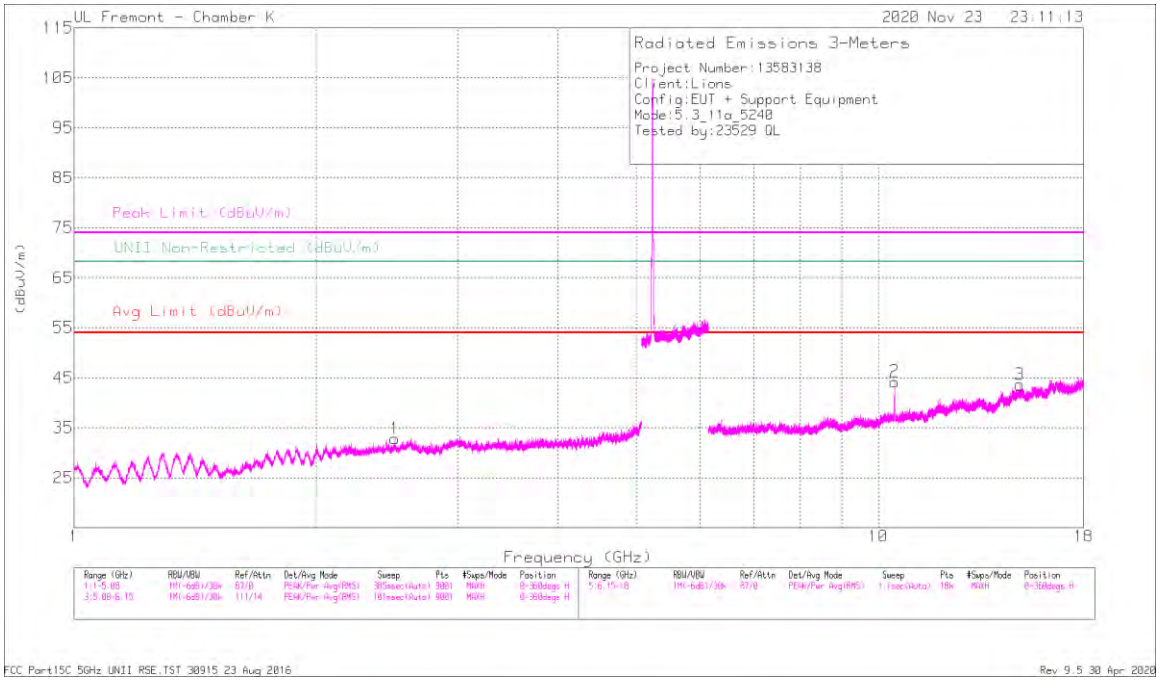
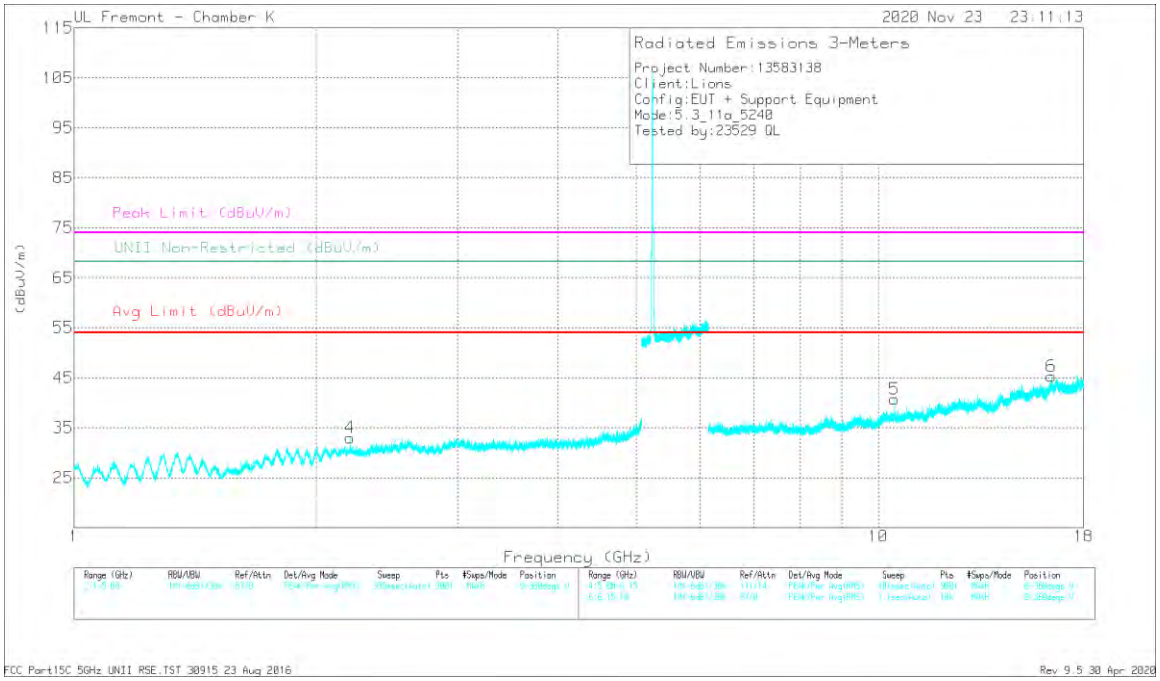
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
47173 Benicia Street, Fremont, CA 94538; USA TEL:(510) 319-4000 FAX:(510) 661-0888

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
2.50326	51.16	PK-U	32.6	-44.5	0	39.26	-	-	-	-	68.2	-28.94	109	112	H
* 2.2043	51.58	PK-U	32	-45.4	0	38.18	-	-	74	-35.82	-	-	250	341	V
* 2.20216	41.18	ADR	31.9	-45.4	.11	27.79	54	-26.21	-	-	-	-	250	341	V
10.4804	53.04	PK-U	37.8	-37.2	0	53.64	-	-	-	-	68.2	-14.56	5	200	H
14.99484	43.85	PK-U	40.5	-34.4	0	49.95	-	-	-	-	68.2	-18.25	231	176	H
10.47828	51.7	PK-U	37.8	-37.1	0	52.4	-	-	-	-	68.2	-15.8	324	99	V
16.41761	43.74	PK-U	41.7	-32.6	0	52.84	-	-	-	-	68.2	-15.36	160	380	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

UL VERIFICATION SERVICES INC.
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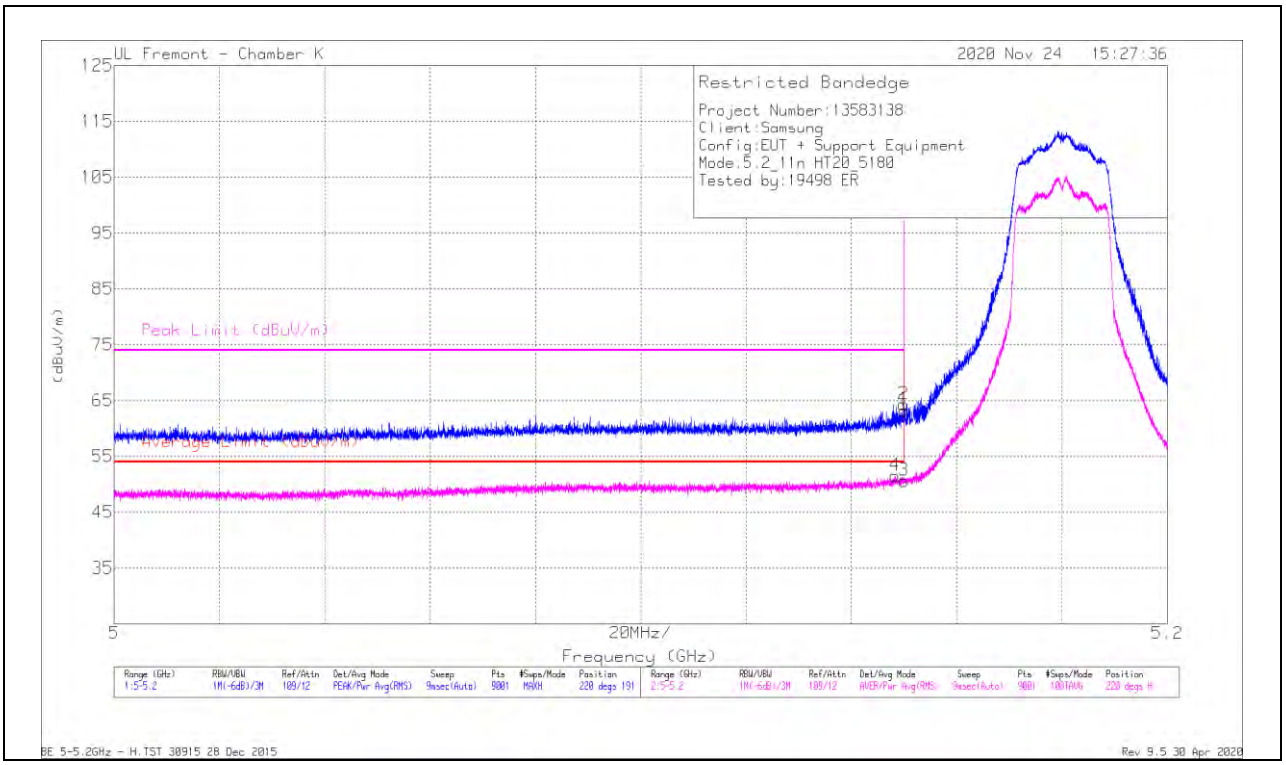
10.1.2. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.2 GHz BAND

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	36.27	Pk	34.6	-7.6	0	63.27	-	-	74	-10.73	220	191	H
2	* 5.14989	37.32	Pk	34.6	-7.6	0	64.32	-	-	74	-9.68	220	191	H
3	* 5.15	23.51	RMS	34.6	-7.6	.12	50.63	54	-3.37	-	-	220	191	H
4	* 5.14833	24.52	RMS	34.5	-7.6	.12	51.54	54	-2.46	-	-	220	191	H

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

UL VERIFICATION SERVICES INC.
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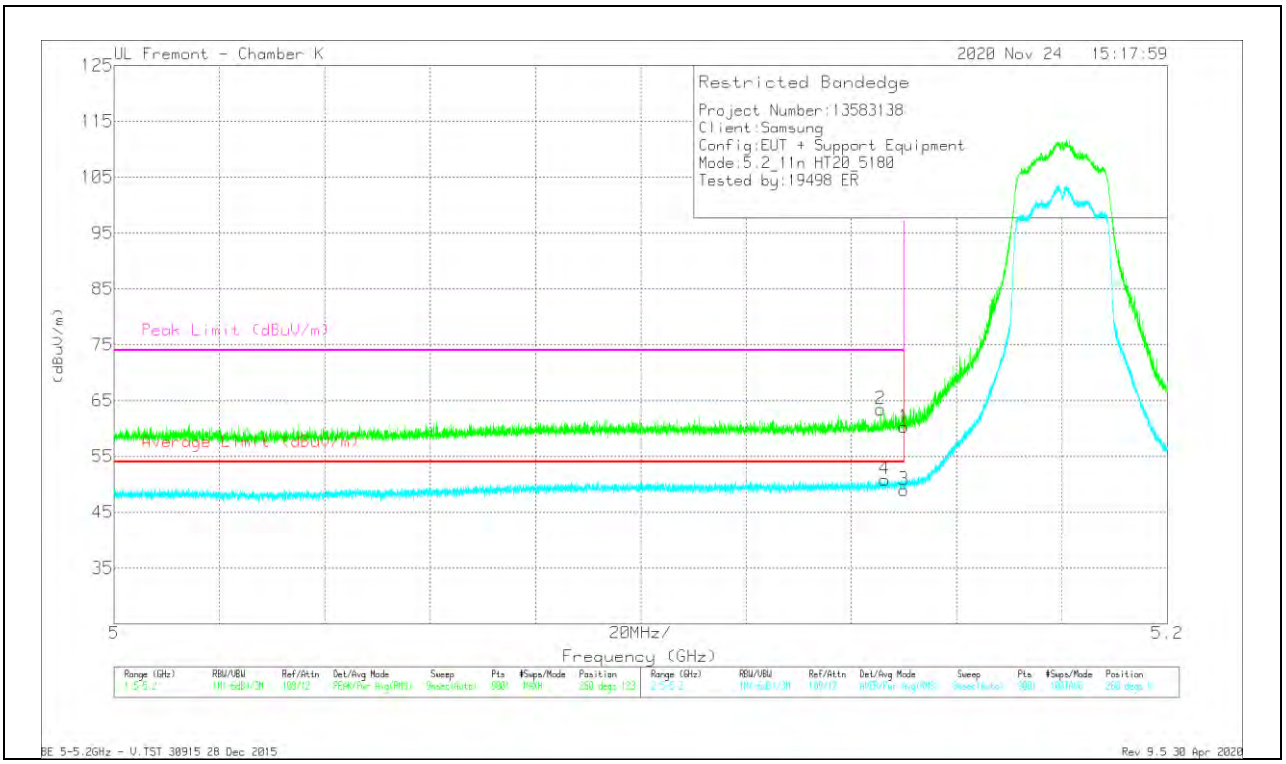
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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	33.28	Pk	34.6	-7.6	0	60.28	-	-	74	-13.72	260	123	V
2	* 5.14551	36.54	Pk	34.5	-7.6	0	63.44	-	-	74	-10.56	260	123	V
3	* 5.15	21.88	RMS	34.6	-7.6	.12	49	54	-5	-	-	260	123	V
4	* 5.14631	23.84	RMS	34.5	-7.6	.12	50.86	54	-3.14	-	-	260	123	V

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

UL VERIFICATION SERVICES INC.
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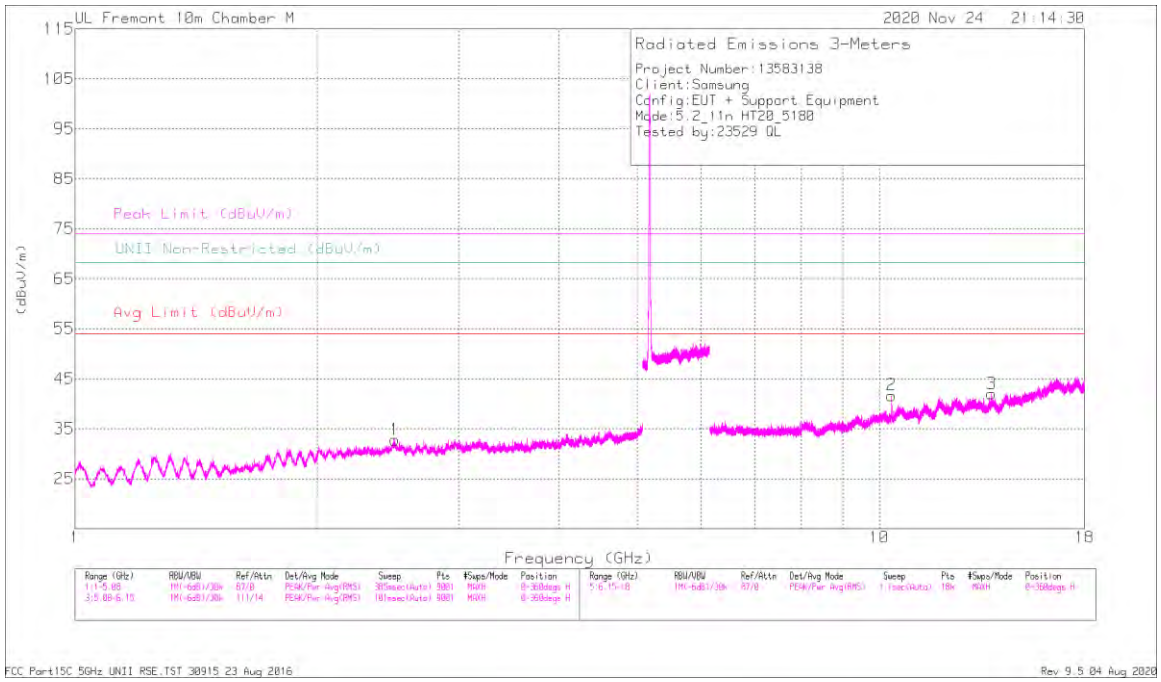
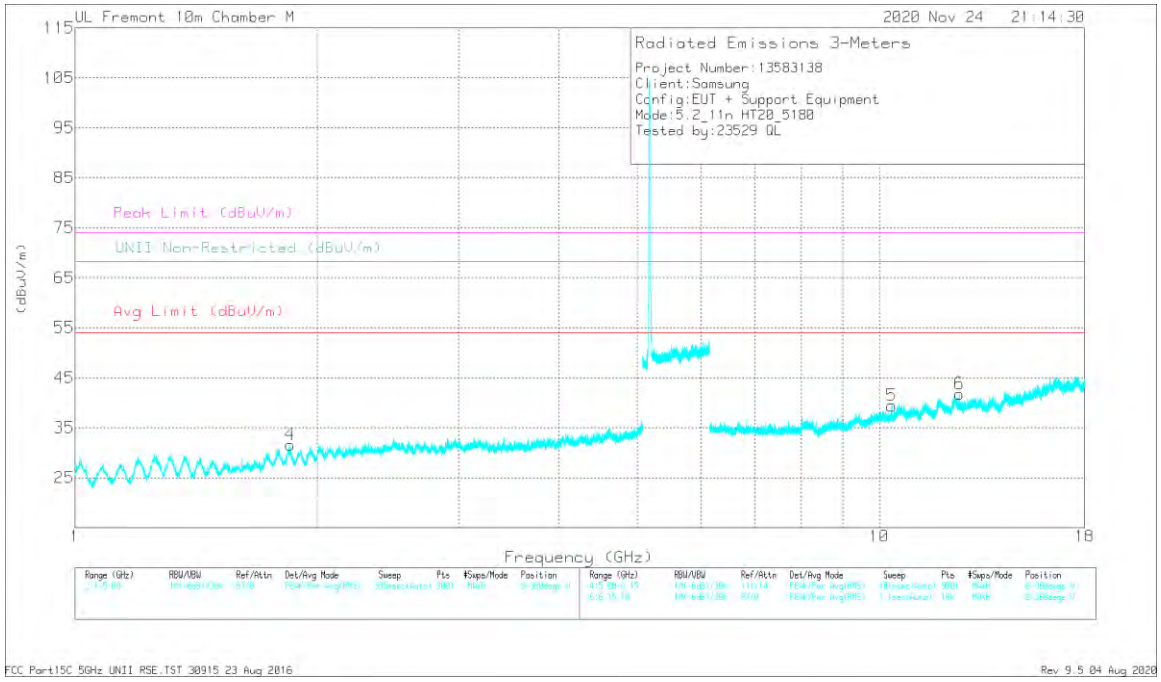
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
1.85382	53.09	PK-U	30.7	-45.6	0	38.19	-	-	-	-	68.2	-30.01	148	245	V
2.4977	51.87	PK-U	32.7	-44.2	0	40.37	-	-	74	-33.63	-	-	300	185	H
2.49868	40.35	ADR	32.7	-44.2	.12	28.97	54	-25.03	-	-	-	-	300	185	H
10.3601	49.6	PK-U	37.6	-36.8	0	50.4	-	-	-	-	68.2	-17.8	301	224	V
10.36467	51.18	PK-U	37.6	-36.9	0	51.88	-	-	-	-	68.2	-16.32	303	223	H
12.5843	41.71	PK-U	39.2	-34.2	0	46.71	-	-	74	-27.29	-	-	262	214	V
12.58552	31.24	ADR	39.2	-34.2	.12	36.36	54	-17.64	-	-	-	-	262	214	V
13.79354	44.2	PK-U	38.6	-34.5	0	48.3	-	-	-	-	68.2	-19.9	212	336	H

PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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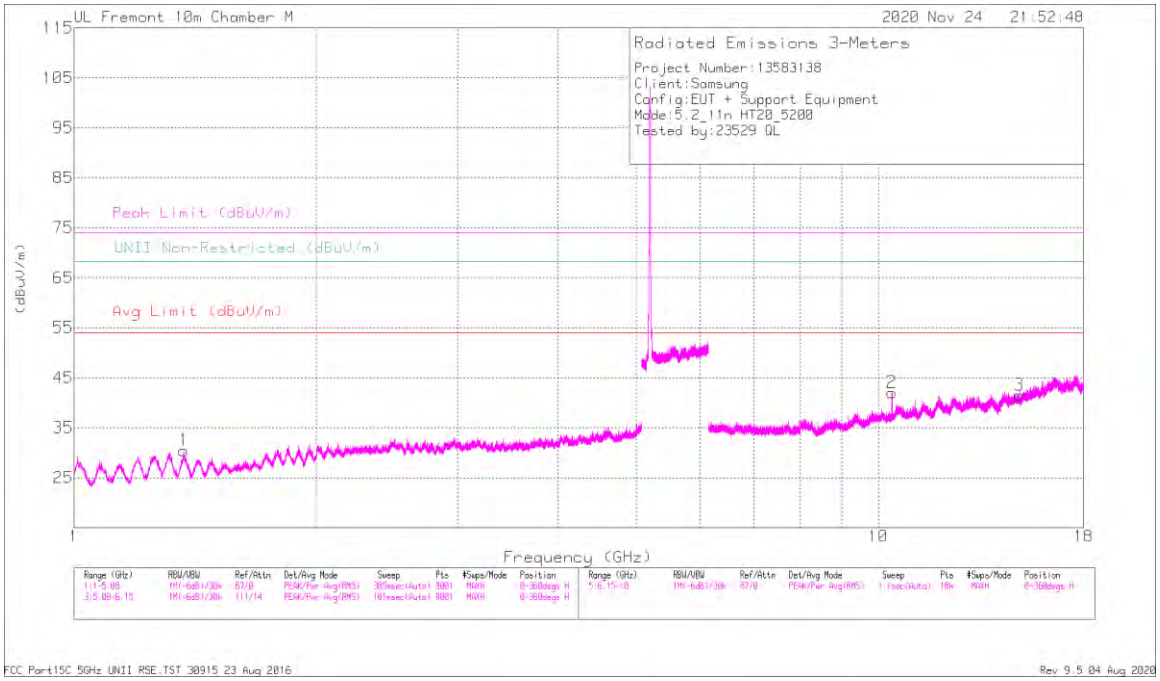
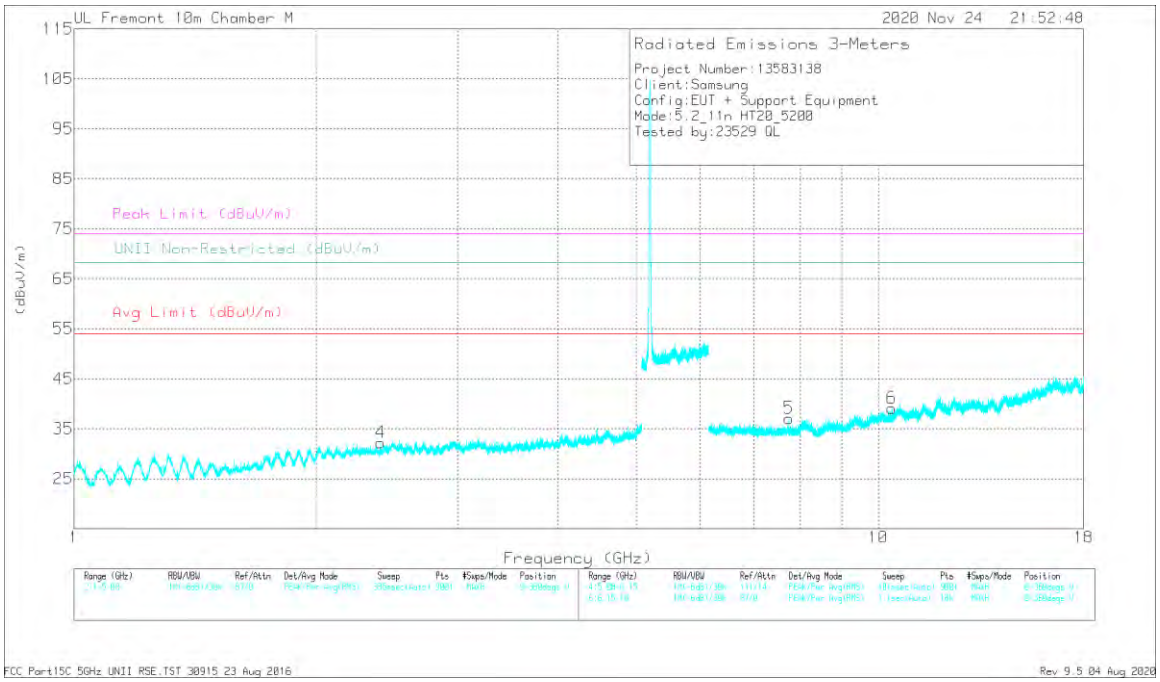
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
2.40461	39.75	ADR	32.1	-44.4	.12	27.57	-	-	-	-	-	-	127	138	V
2.40552	51.19	PK-U	32.1	-44.4	0	38.89	-	-	-	-	68.2	-29.31	224	112	V
2.40554	50.64	PK-U	32.1	-44.4	0	38.34	-	-	-	-	68.2	-29.86	127	138	V
7.742	33.66	ADR	35.7	-37.6	.12	31.88	54	-22.12	-	-	-	-	49	178	V
7.74352	44.77	PK-U	35.7	-37.7	0	42.77	-	-	74	-31.23	-	-	49	178	V
10.40045	49.43	PK-U	37.6	-36.8	0	50.23	-	-	-	-	68.2	-17.97	223	97	V
10.40139	50.92	PK-U	37.7	-36.8	0	51.82	-	-	-	-	68.2	-16.38	277	203	H
14.97589	41.96	PK-U	39.7	-33.5	0	48.16	-	-	-	-	68.2	-20.04	348	231	H

PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

UL VERIFICATION SERVICES INC.
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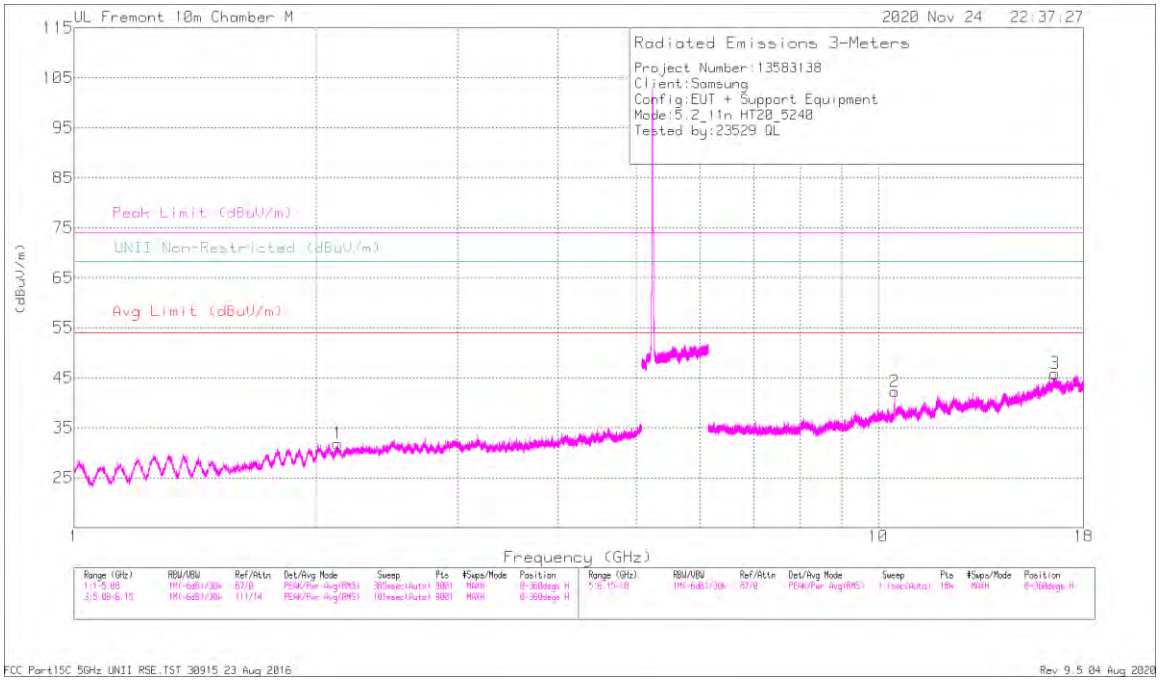
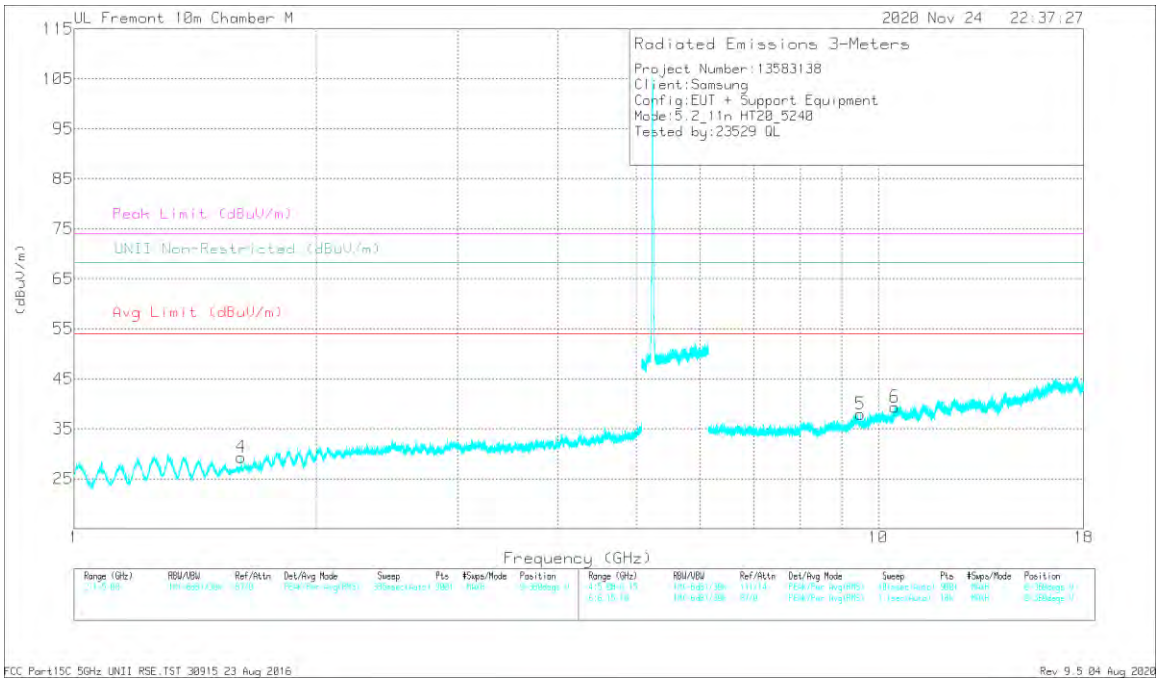
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

UL VERIFICATION SERVICES INC.
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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
1.61277	52.94	PK-U	28.5	-45.8	0	35.64	-	-	74	-38.36	-	-	231	266	V
1.61281	42.84	ADR	28.5	-45.8	.12	25.66	54	-28.34	-	-	-	-	231	266	V
2.12499	51.83	PK-U	31.4	-44.9	0	38.33	-	-	-	-	68.2	-29.87	317	120	H
9.50734	43.81	PK-U	36.5	-36.4	0	43.91	-	-	-	-	68.2	-24.29	253	146	V
10.47984	49.66	PK-U	37.8	-36.7	0	50.76	-	-	-	-	68.2	-17.44	237	100	H
10.48108	47.44	PK-U	37.8	-36.7	0	48.54	-	-	-	-	68.2	-19.66	206	188	V
16.5834	42.68	PK-U	41.7	-32.3	0	52.08	-	-	-	-	68.2	-16.12	173	119	H

PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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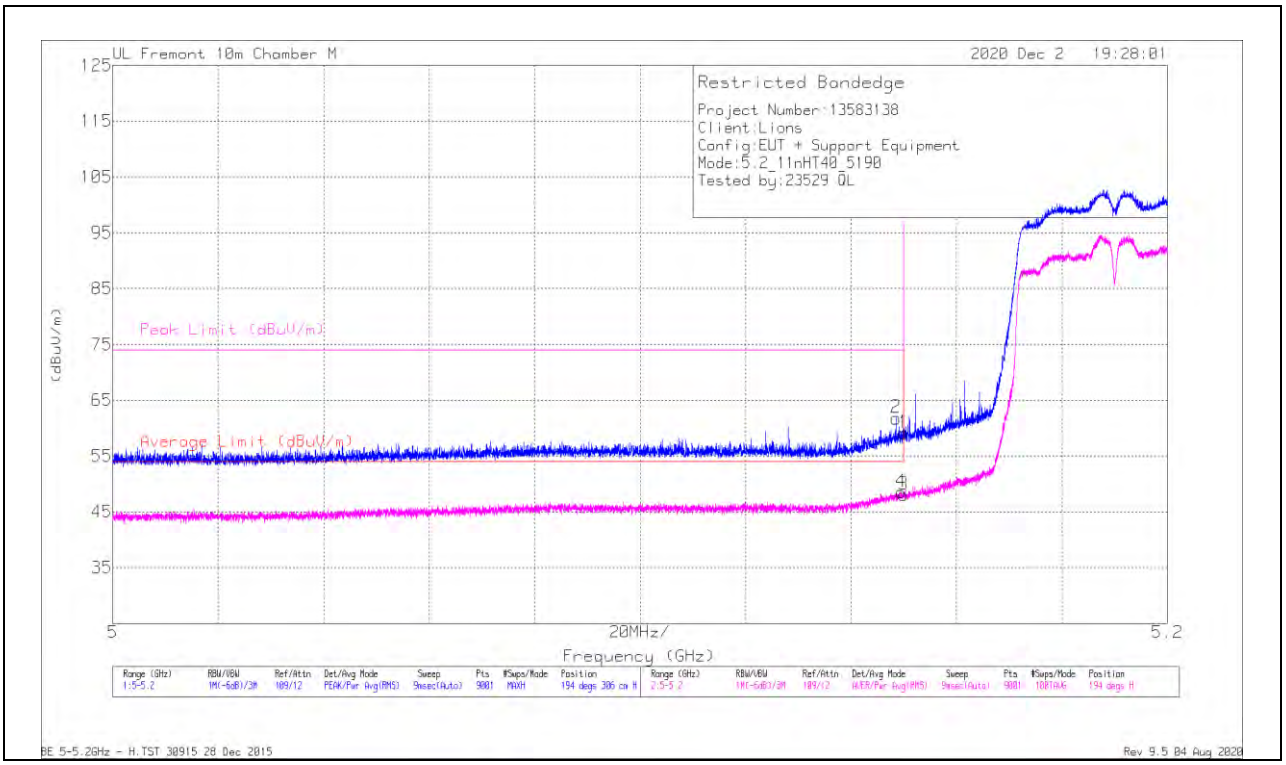
10.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
2	5.14853	38.68	Pk	34.1	-11	0	61.78	-	-	74	-12.22	194	306	H
4	5.14947	25.07	RMS	34.2	-11	.23	48.5	54	-5.5	-	-	194	306	H
1	5.15	35.95	Pk	34.2	-11	0	59.15	-	-	74	-14.85	194	306	H
3	5.15	24.66	RMS	34.2	-11	.23	48.09	54	-5.91	-	-	194	306	H

Pk - Peak detector
RMS - RMS detection

UL VERIFICATION SERVICES INC.
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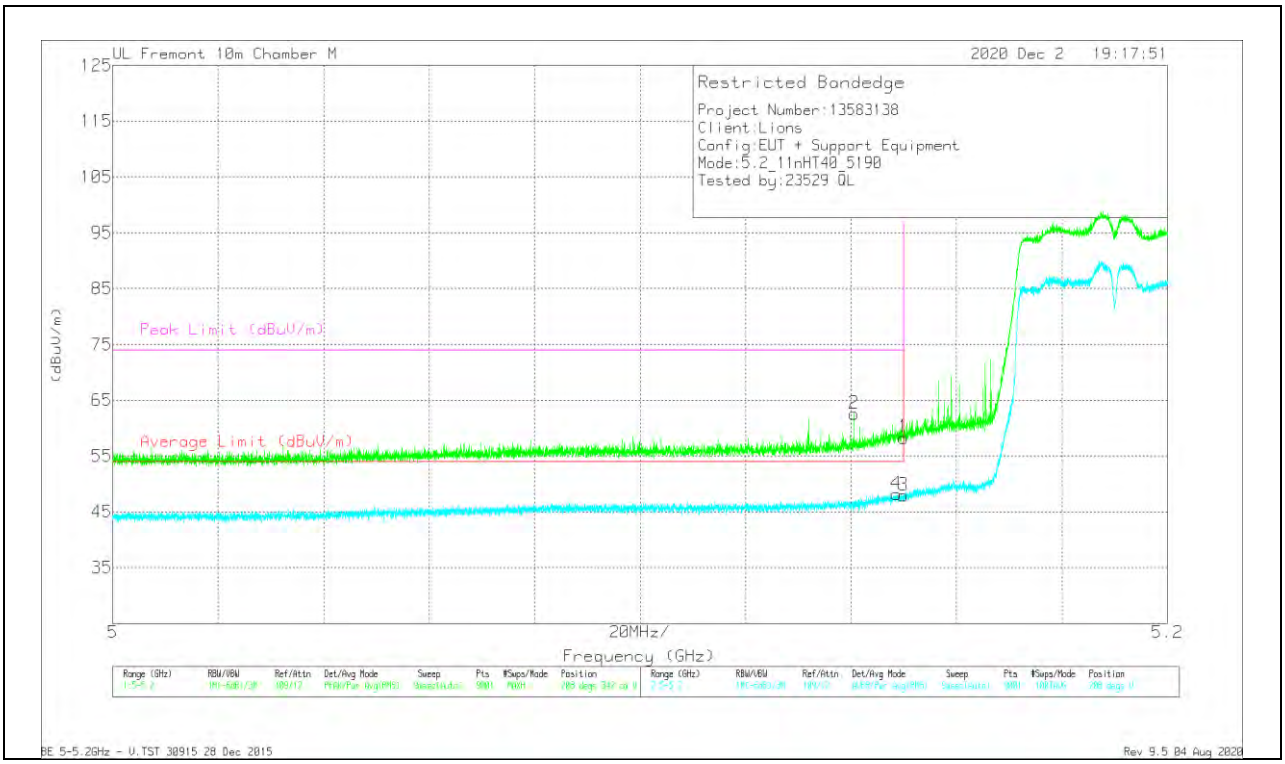
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
2	5.14058	39.39	Pk	34.2	-11	0	62.59	-	-	74	-11.41	208	342	V
4	5.1486	24.87	RMS	34.1	-11	.23	48.2	54	-5.8	-	-	208	342	V
1	5.15	35.1	Pk	34.2	-11	0	58.3	-	-	74	-15.7	208	342	V
3	5.15	24.5	RMS	34.2	-11	.23	47.93	54	-6.07	-	-	208	342	V

Pk - Peak detector
RMS - RMS detection

UL VERIFICATION SERVICES INC.
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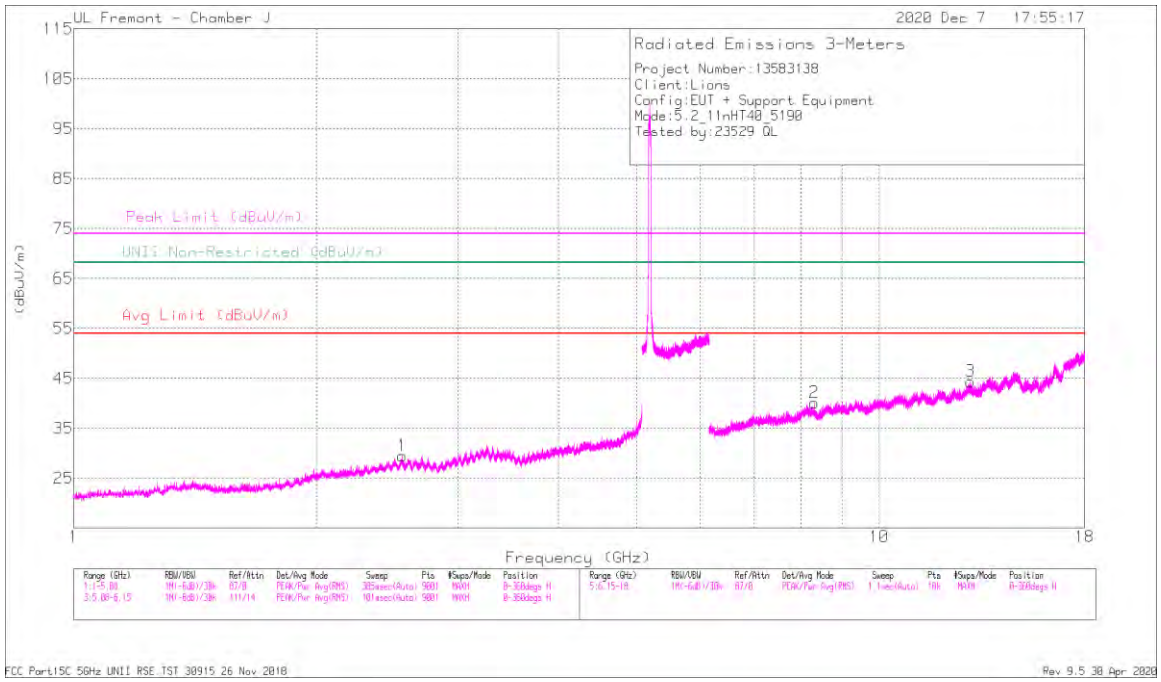
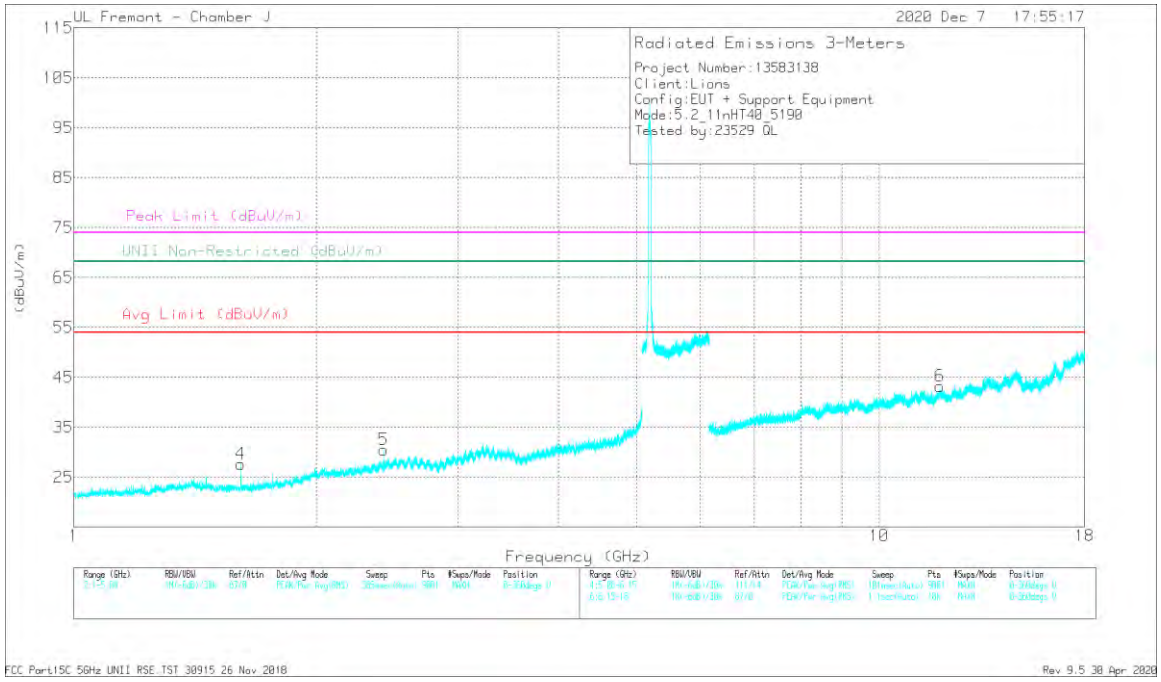
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (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
2.55589	41.55	PK-U	29.8	-34.7	0	36.65	-	-	-	-	68.2	-31.55	69	387	H
* 1.61297	42.4	PK-U	25.1	-35.4	0	32.1	-	-	74	-41.9	-	-	82	109	V
* 1.61281	34.38	ADR	25.1	-35.4	23	24.31	54	-29.69	-	-	-	-	82	109	V
2.42574	42.31	PK-U	29.3	-35	0	36.61	-	-	-	-	68.2	-31.59	268	212	V
* 8.3105	34.38	PK-U	37.8	-25.2	0	46.98	-	-	74	-27.02	-	-	118	244	H
* 8.31187	23.14	ADR	37.8	-25.2	23	35.97	54	-18.03	-	-	-	-	118	244	H
12.98787	31.65	PK-U	40.8	-21.4	0	51.05	-	-	-	-	68.2	-17.15	266	178	H
* 11.89633	32.24	PK-U	39.4	-22.2	0	49.44	-	-	74	-24.56	-	-	266	150	V
* 11.89557	21.62	ADR	39.3	-22.2	23	38.95	54	-15.05	-	-	-	-	266	150	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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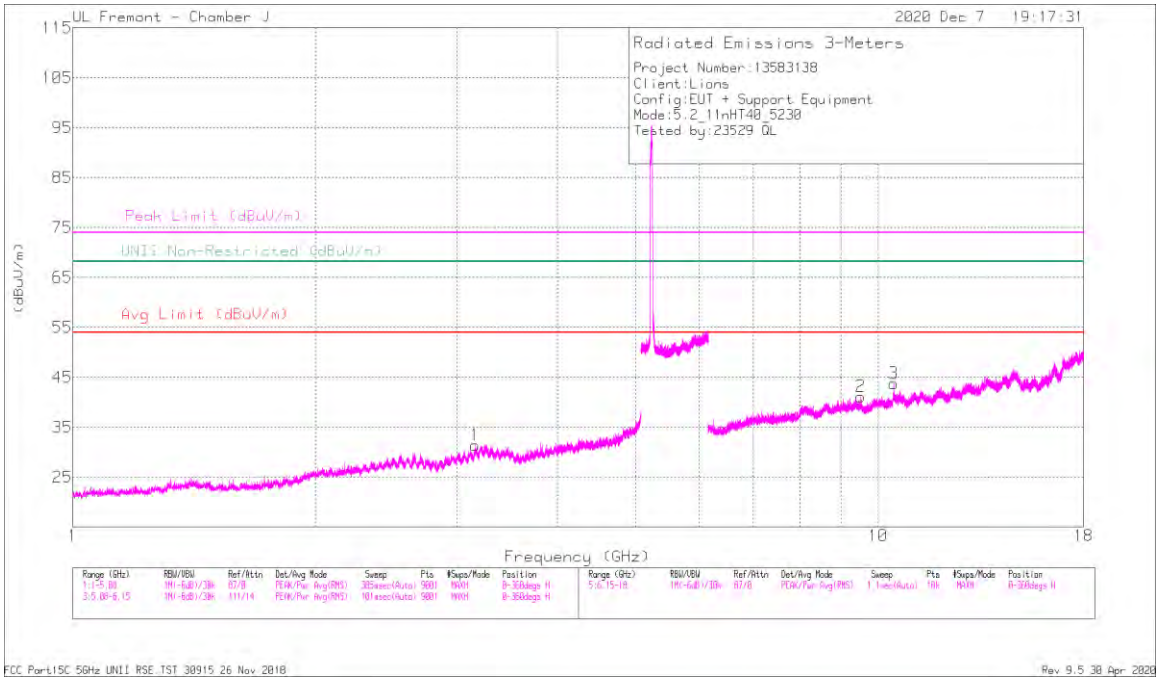
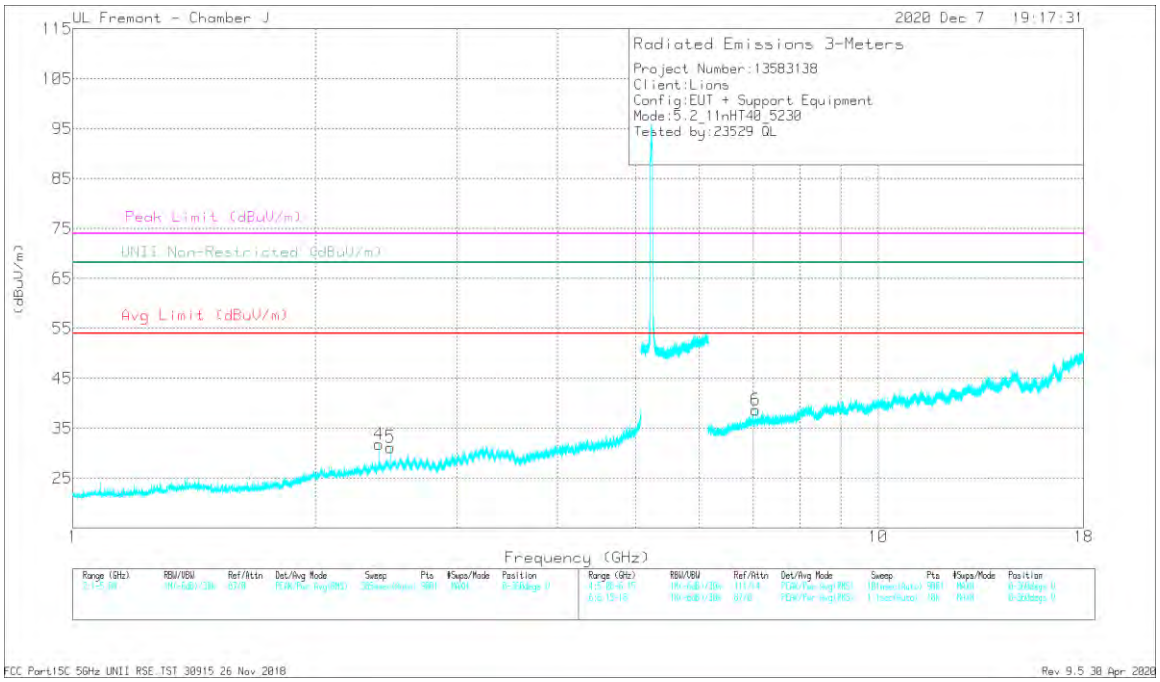
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AFT963 (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
3.16188	41.22	PK-U	31.3	-34.1	0	38.42	-	-	-	-	68.2	-29.78	288	195	H
2.40214	43.03	PK-U	29.1	-35	0	37.13	-	-	-	-	68.2	-31.07	213	140	V
2.48018	43.46	PK-U	29.5	-35	0	37.96	-	-	-	-	68.2	-30.24	171	188	V
9.5257	33.4	PK-U	38.6	-24	0	48	-	-	-	-	68.2	-20.2	346	221	H
10.45994	34.56	PK-U	39.5	-24.1	0	49.96	-	-	-	-	68.2	-18.24	163	139	H
7.03983	34.99	PK-U	36.8	-26.7	0	45.09	-	-	-	-	68.2	-23.11	181	322	V

PK-U - U-NII: Maximum Peak

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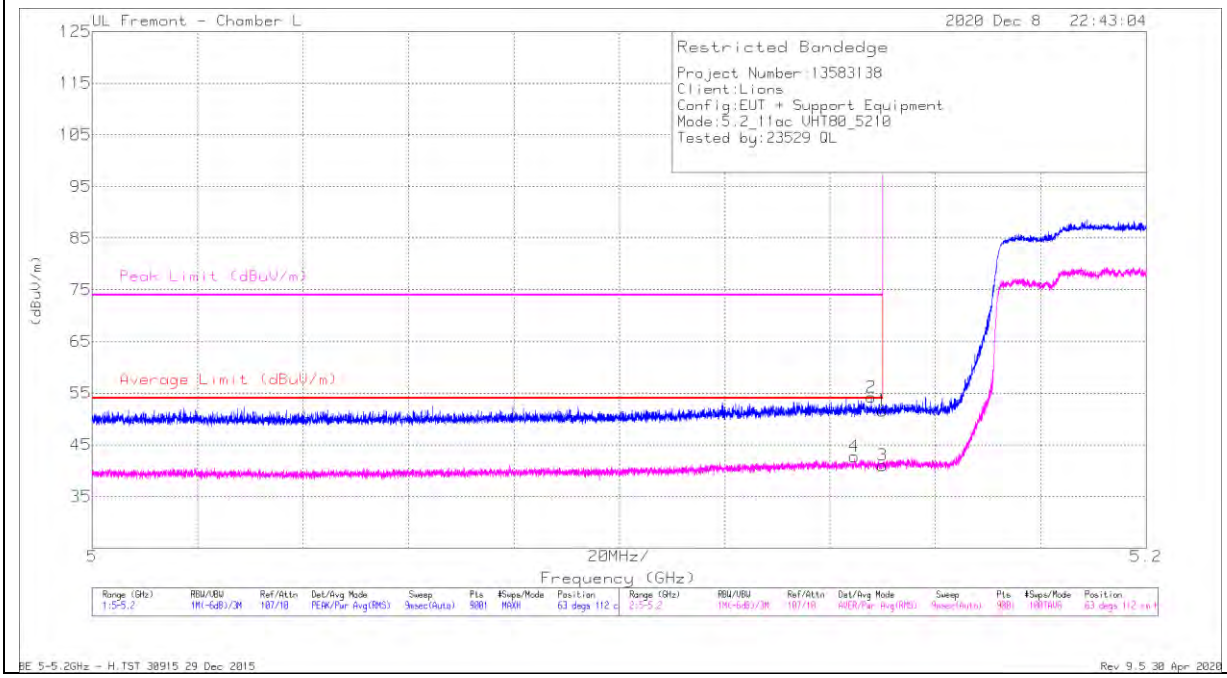
10.1.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

BANDEDGE (MID CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (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	34.77	Pk	34.3	-17.5	0	51.57	-	-	74	-22.43	63	112	H
2	* 5.14782	37.39	Pk	34.3	-17.5	0	54.19	-	-	74	-19.81	63	112	H
3	* 5.15	23.76	RMS	34.3	-17.5	.45	41.01	54	-12.99	-	-	63	112	H
4	* 5.14462	25.47	RMS	34.3	-17.5	.45	42.72	54	-11.28	-	-	63	112	H

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

UL VERIFICATION SERVICES INC.
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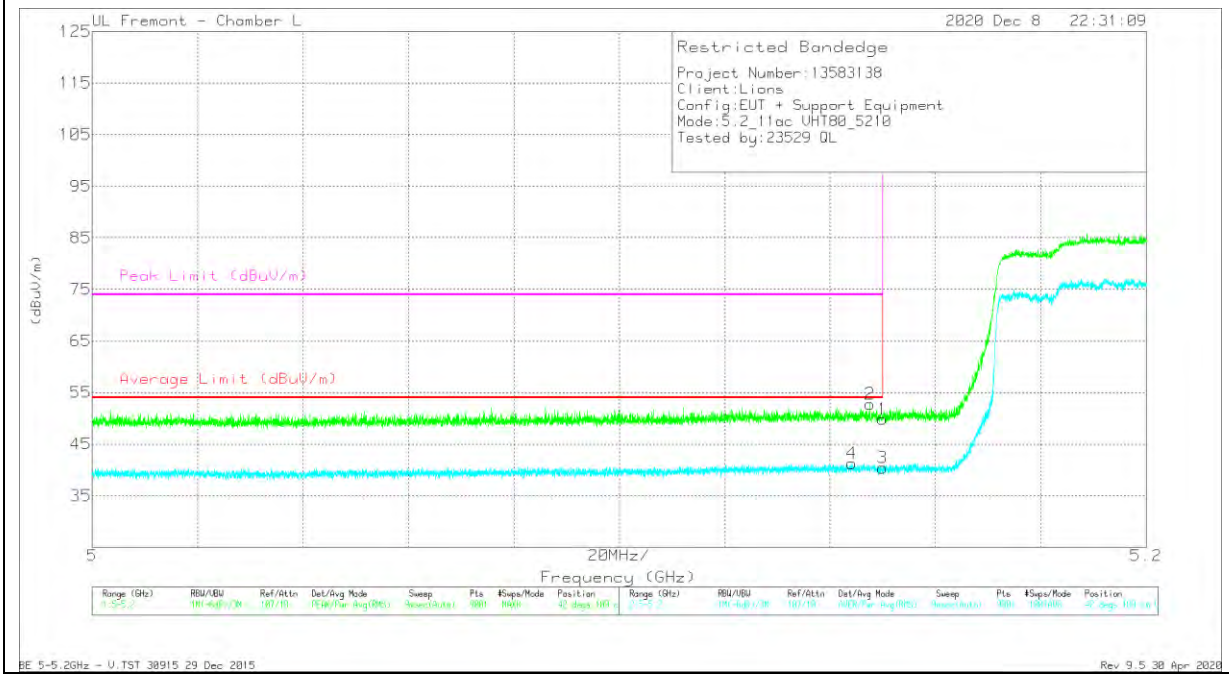
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 344 (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	33	Pk	34.3	-17.5	0	49.8	-	-	74	-24.2	42	109	V
2	* 5.14755	35.96	Pk	34.3	-17.5	0	52.76	-	-	74	-21.24	42	109	V
3	* 5.15	23.15	RMS	34.3	-17.5	.45	40.4	54	-13.6	-	-	42	109	V
4	* 5.14411	24.02	RMS	34.3	-17.5	.45	41.27	54	-12.73	-	-	42	109	V

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

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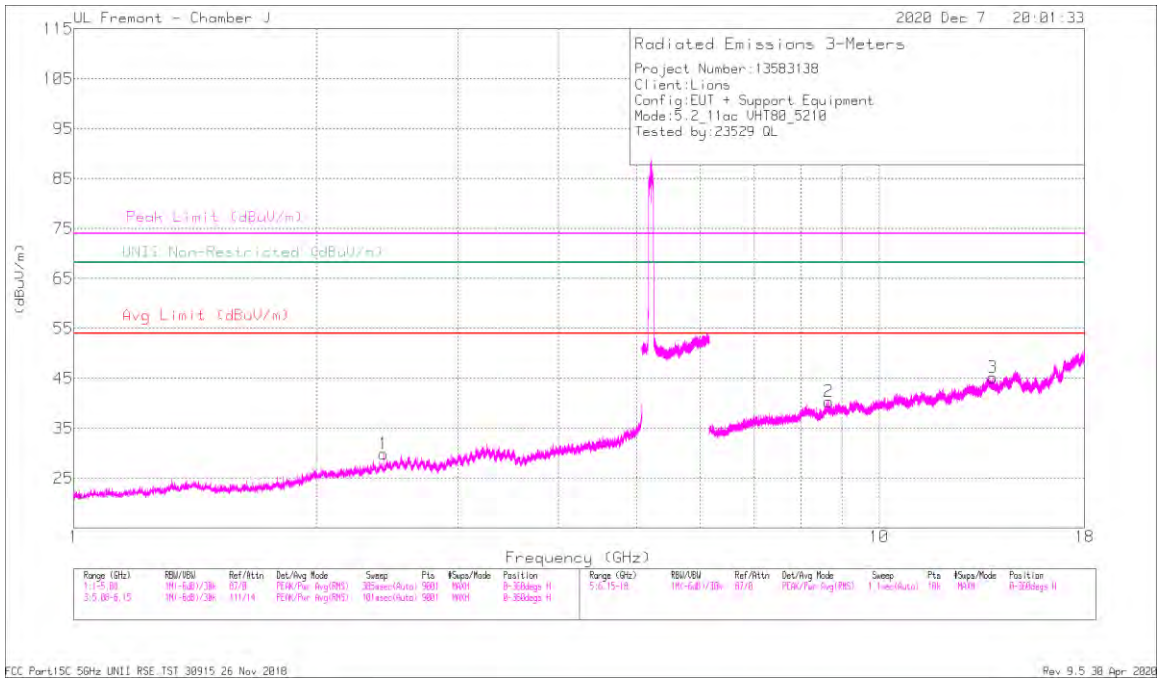
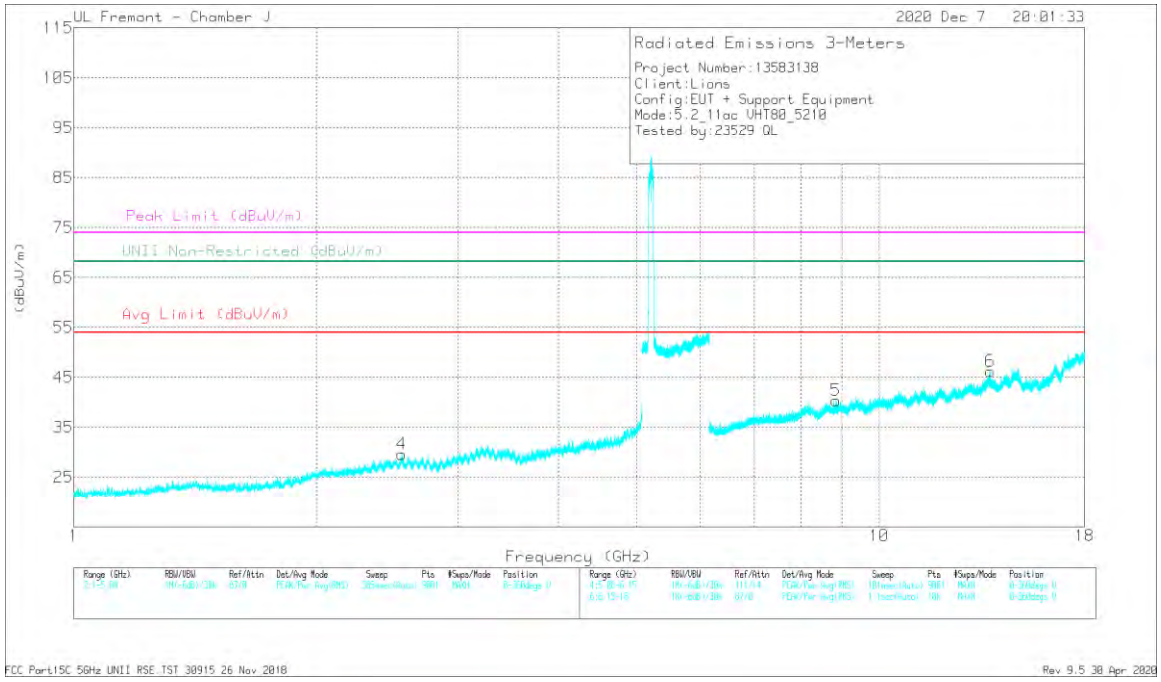
HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AFT963 (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
2.42503	41.2	PK-U	29.3	-35	0	35.5	-	-	-	-	68.2	-32.7	314	118	H
2.55194	42.75	PK-U	29.9	-34.7	0	37.95	-	-	-	-	68.2	-30.25	0	227	V
8.65647	33.66	PK-U	37.5	-24.8	0	46.36	-	-	-	-	68.2	-21.84	77	246	H
13.83165	30.6	PK-U	40.9	-20.4	0	51.1	-	-	-	-	68.2	-17.1	245	142	H
8.84416	34.13	PK-U	38.6	-24.7	0	48.03	-	-	-	-	68.2	-20.17	118	312	V
13.73272	30.96	PK-U	41.1	-20.6	0	51.46	-	-	-	-	68.2	-16.74	118	312	V

PK-U - U-NII: Maximum Peak

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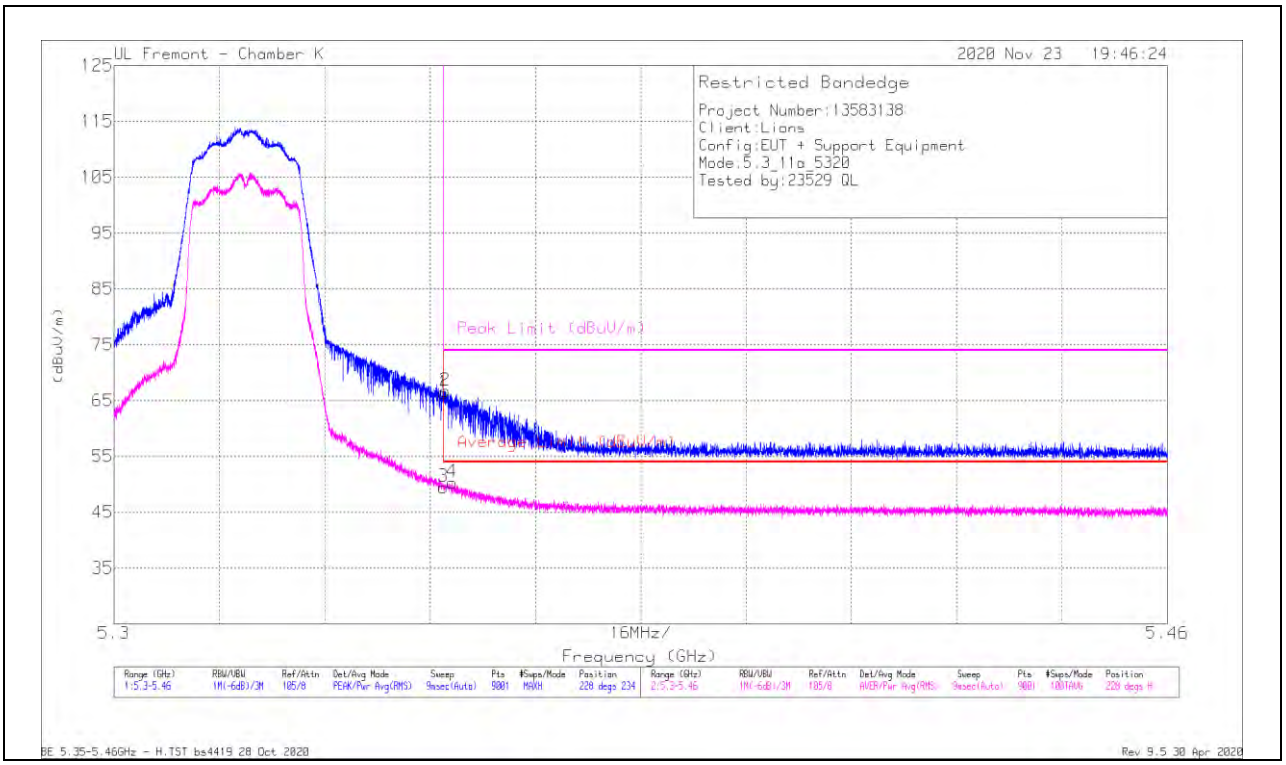
10.1.5. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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	* 5.35001	38.36	Pk	35.2	-7.2	0	66.36	-	-	74	-7.64	228	234	H
2	* 5.35028	38.71	Pk	35.2	-7.2	0	66.71	-	-	74	-7.29	228	234	H
3	* 5.35001	21.41	RMS	35.2	-7.2	.11	49.52	54	-4.48	-	-	228	234	H
4	* 5.35138	22.24	RMS	35.2	-7.2	.11	50.35	54	-3.65	-	-	228	234	H

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

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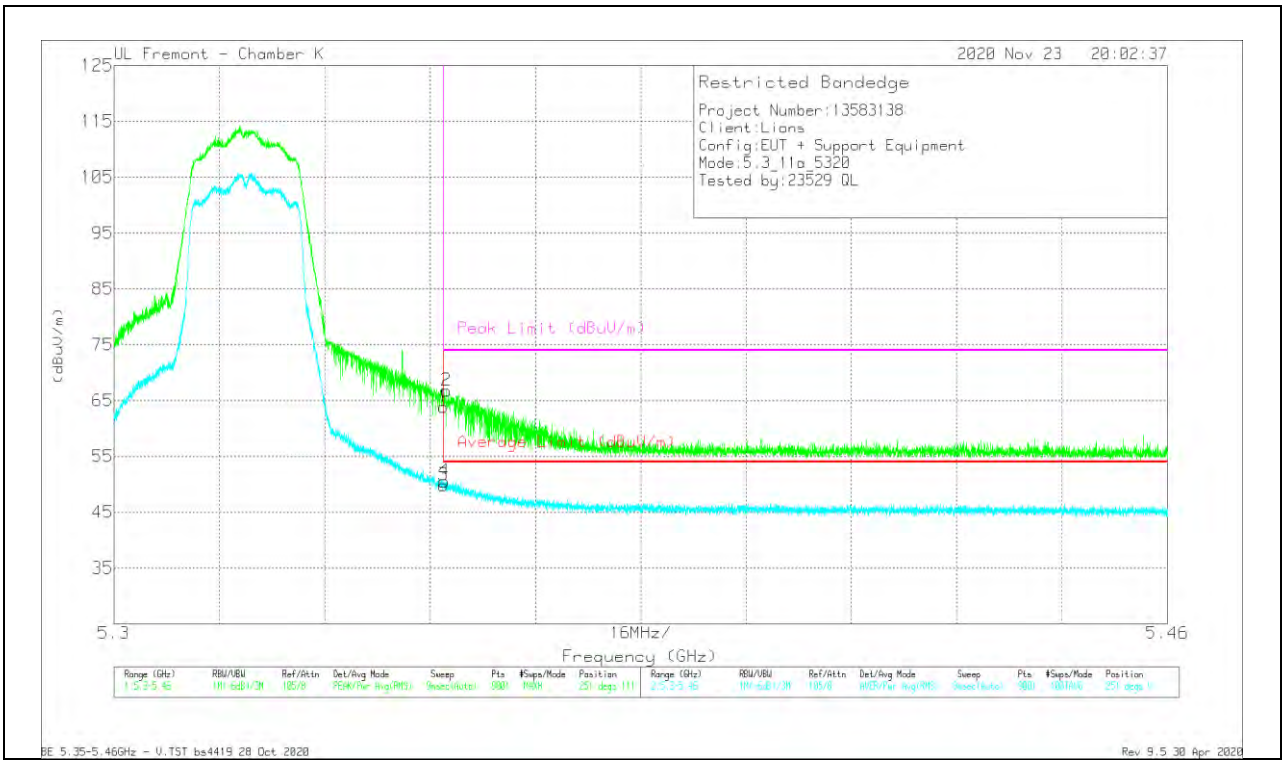
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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	* 5.35001	35.87	Pk	35.2	-7.2	0	63.87	-	-	74	-10.13	251	111	V
2	* 5.35047	38.75	Pk	35.2	-7.2	0	66.75	-	-	74	-7.25	251	111	V
3	* 5.35001	21.69	RMS	35.2	-7.2	.11	49.8	54	-4.2	-	-	251	111	V
4	* 5.35015	22.41	RMS	35.2	-7.2	.11	50.52	54	-3.48	-	-	251	111	V

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

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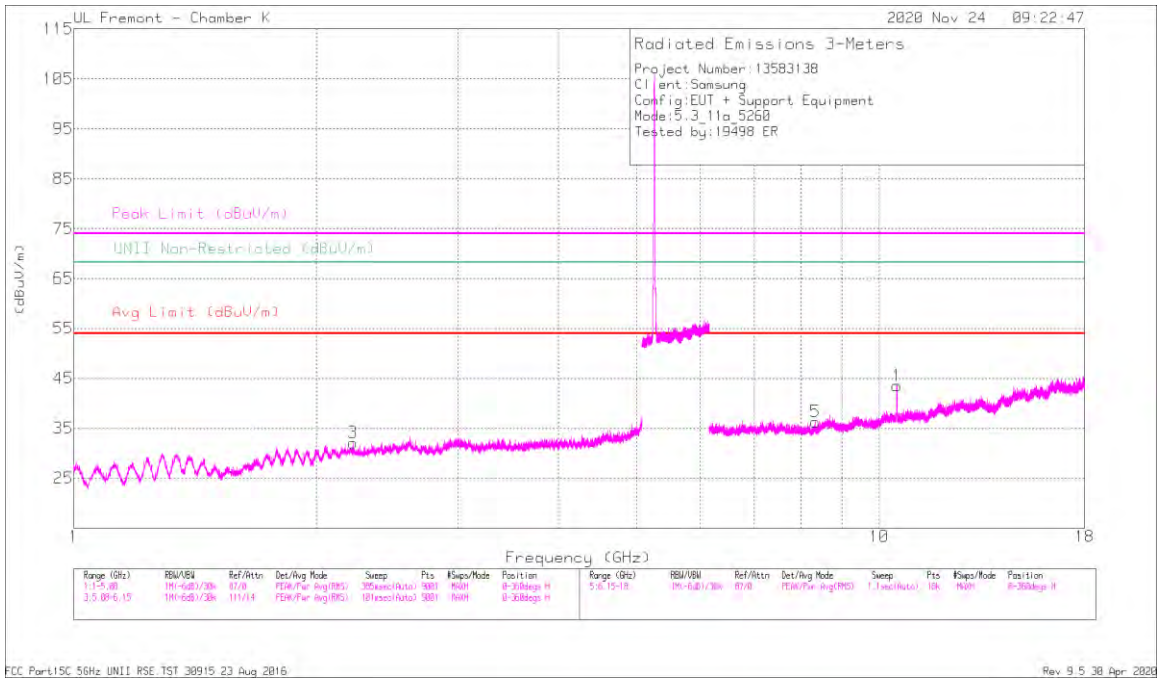
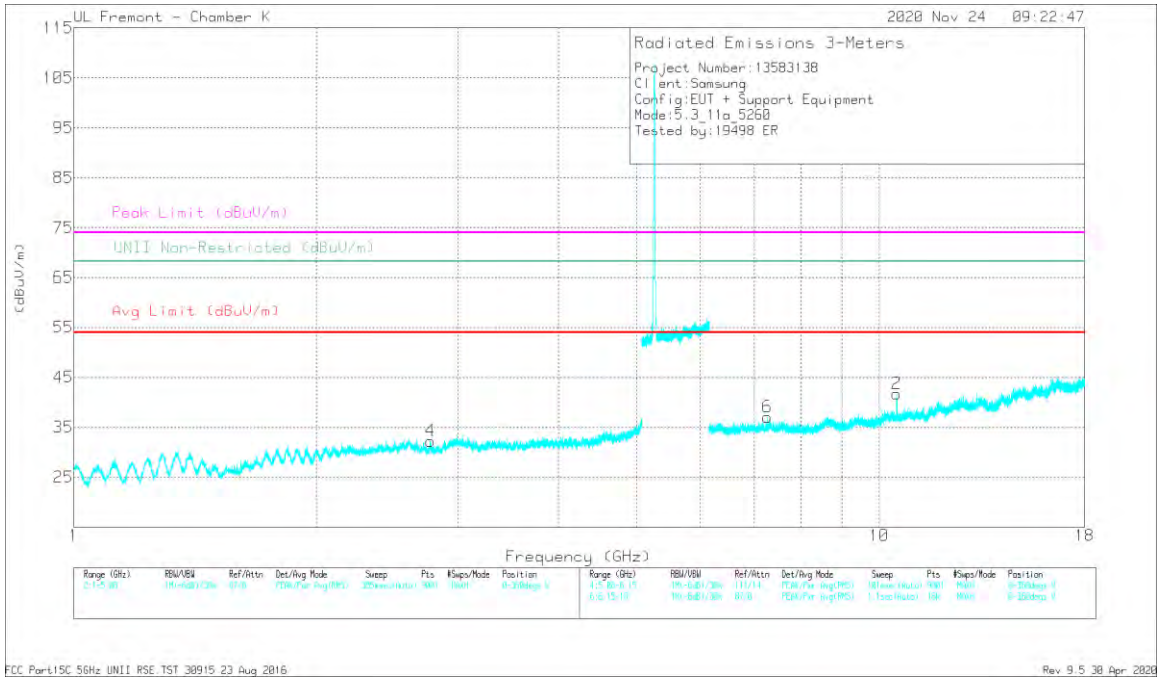
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 2.222	52.24	PK-U	31.9	-45.5	0	38.64	-	-	74	-35.36	-	-	89	287	H
* 2.22378	41.4	ADR	31.9	-45.5	.11	27.91	54	-26.09	-	-	-	-	89	287	H
* 2.77137	50.25	PK-U	32.5	-43.6	0	39.15	-	-	74	-34.85	-	-	280	385	V
* 2.77306	39.48	ADR	32.5	-43.6	.11	28.49	54	-25.51	-	-	-	-	280	385	V
* 8.33639	45.02	PK-U	36.1	-38	0	43.12	-	-	74	-30.88	-	-	292	133	H
* 8.33692	33.45	ADR	36.1	-38	.11	31.66	54	-22.34	-	-	-	-	292	133	H
10.52047	52.71	PK-U	37.8	-37.4	0	53.11	-	-	-	-	68.2	-15.09	42	97	H
* 7.27112	45.34	PK-U	36.1	-38	0	43.44	-	-	74	-30.56	-	-	11	253	V
* 7.26847	34.13	ADR	36.1	-38	.11	32.34	54	-21.66	-	-	-	-	11	253	V
10.51842	51.87	PK-U	37.8	-37.4	0	52.27	-	-	-	-	68.2	-15.93	314	107	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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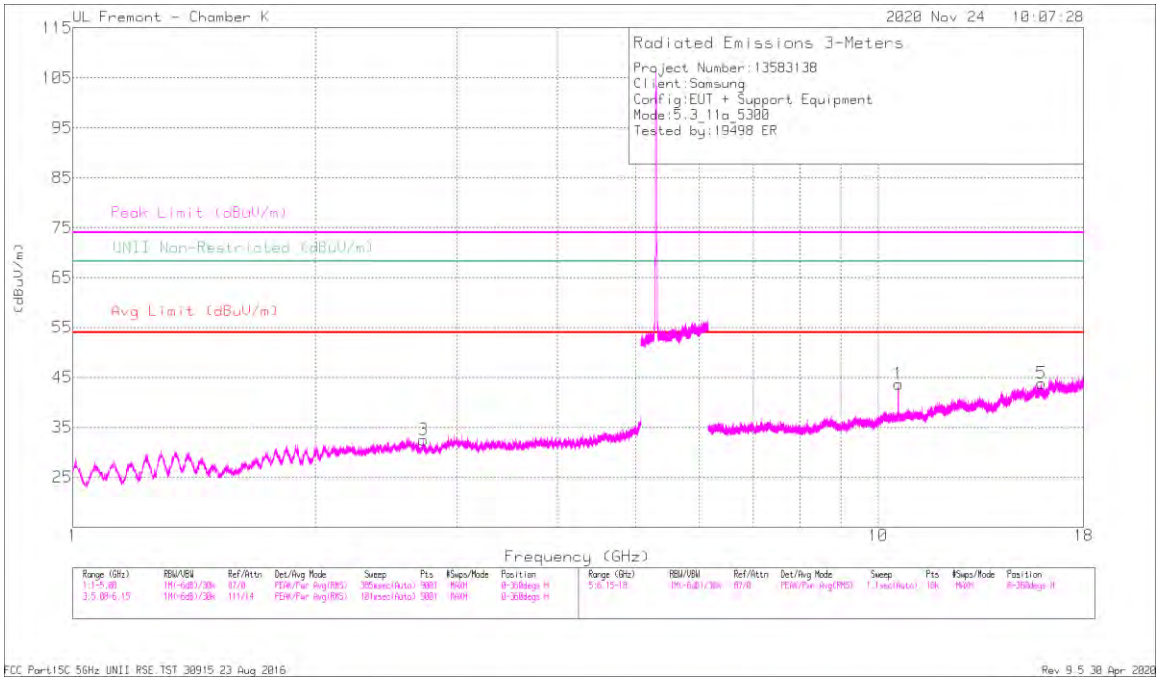
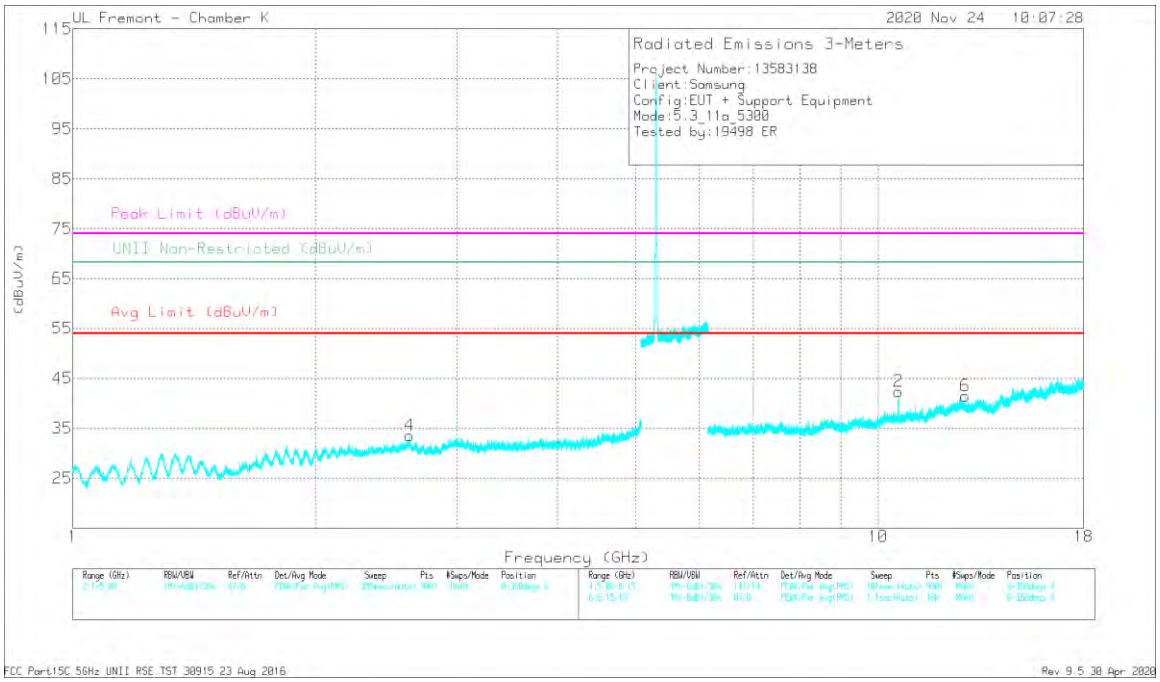
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 2.72243	50.53	PK-U	32.5	-43.7	0	39.33	-	-	74	-34.67	-	-	87	175	H
* 2.72557	38.92	ADR	32.5	-43.7	.11	27.83	54	-26.17	-	-	-	-	87	175	H
2.62234	51.94	PK-U	32.7	-43.9	0	40.74	-	-	-	-	68.2	-27.46	345	332	V
* 15.96082	44.62	PK-U	41	-33.3	0	52.32	-	-	74	-21.68	-	-	236	134	H
* 15.95233	33.18	ADR	41	-33.2	.11	41.09	54	-12.91	-	-	-	-	236	134	H
* 10.60049	54.28	PK-U	37.9	-37.4	0	54.78	-	-	74	-19.22	-	-	43	96	H
* 10.60136	42.03	ADR	37.9	-37.4	.11	42.64	54	-11.36	-	-	-	-	43	96	H
* 11.647	45.01	PK-U	38.4	-35.7	0	47.71	-	-	74	-26.29	-	-	311	101	V
* 11.57657	34.05	ADR	38.3	-36.1	.11	36.36	54	-17.64	-	-	-	-	311	101	V
12.84404	43.87	PK-U	39.5	-35	0	48.37	-	-	-	-	68.2	-19.83	247	145	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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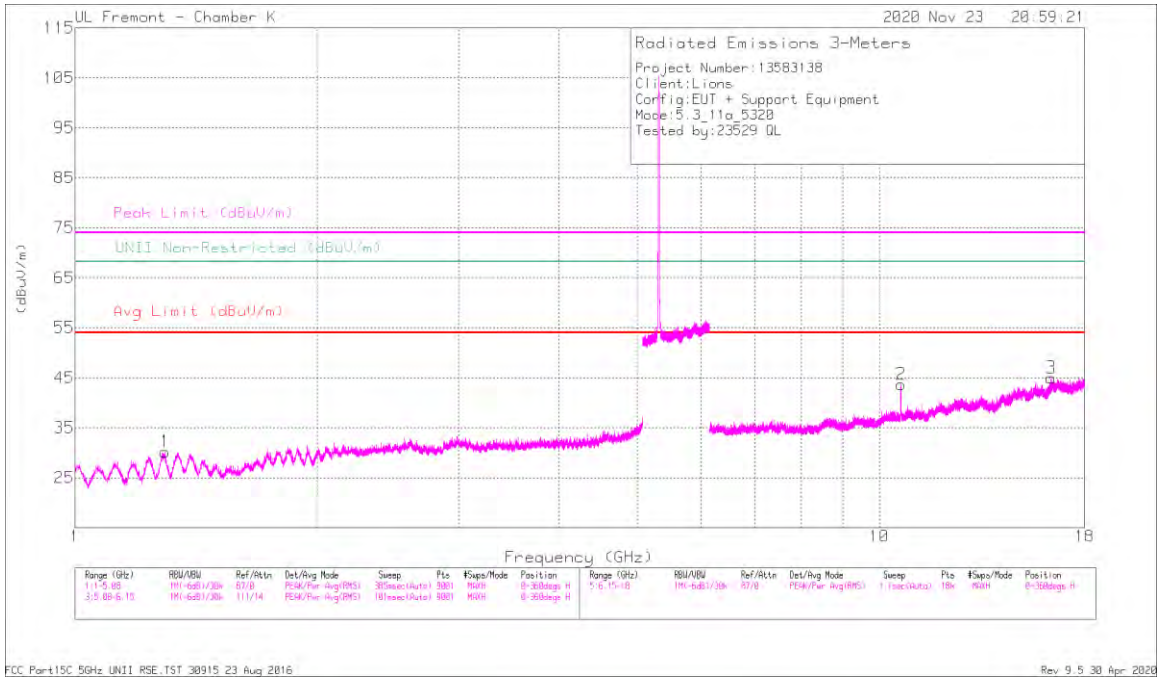
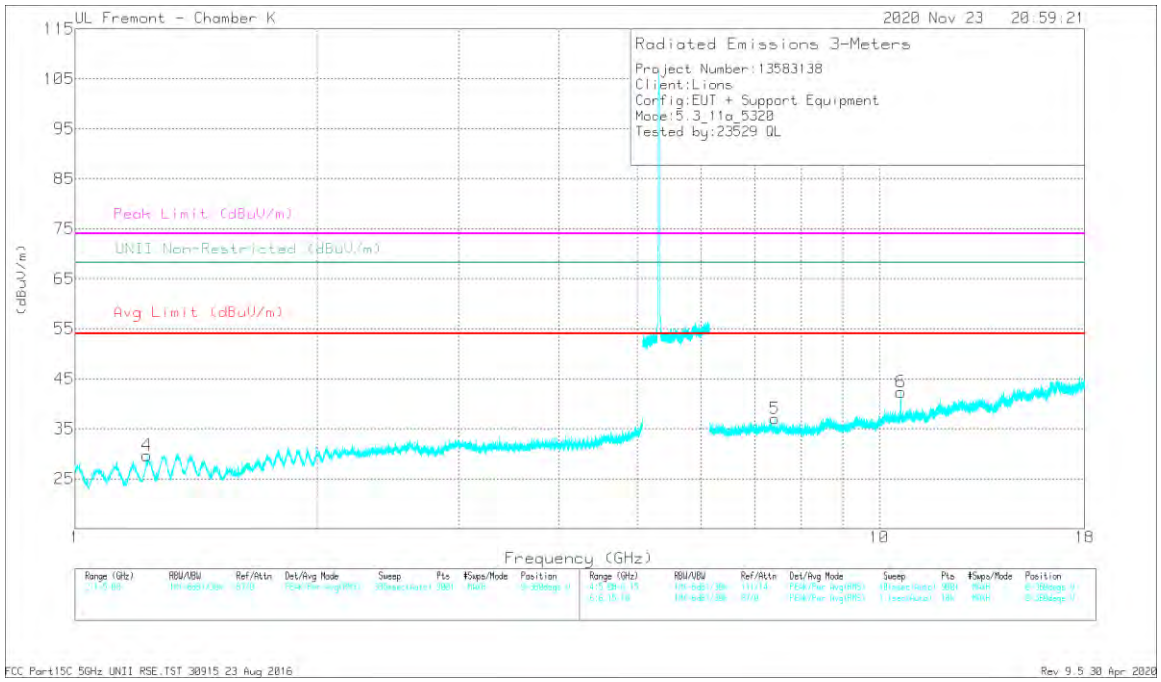
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (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
* 1.29262	55.01	PK-U	29.5	-46.6	0	37.91	-	-	74	-36.09	-	-	283	277	H
* 1.29185	43.77	ADR	29.5	-46.6	.11	26.78	54	-27.22	-	-	-	-	283	277	H
* 1.22835	54.34	PK-U	28.7	-46.7	0	36.34	-	-	74	-37.66	-	-	106	236	V
* 1.22884	43.59	ADR	28.7	-46.7	.11	25.7	54	-28.3	-	-	-	-	106	236	V
* 10.63947	53.11	PK-U	38	-37.2	0	53.91	-	-	74	-20.09	-	-	16	241	H
* 10.64079	41.36	ADR	38	-37.2	.11	42.27	54	-11.73	-	-	-	-	16	241	H
16.35989	42.42	PK-U	41.6	-32.4	0	51.62	-	-	-	-	68.2	-16.58	7	220	H
16.35723	31.75	ADR	41.6	-32.4	.11	41.06	-	-	-	-	-	-	7	220	H
* 7.41532	45.36	PK-U	36.1	-38.4	0	43.06	-	-	74	-30.94	-	-	34	341	V
* 7.41691	33.82	ADR	36.1	-38.4	.11	31.63	54	-22.37	-	-	-	-	34	341	V
* 10.64037	52.29	PK-U	38	-37.2	0	53.09	-	-	74	-20.91	-	-	308	106	V
* 10.63719	39.72	ADR	38	-37.2	.11	40.63	54	-13.37	-	-	-	-	308	106	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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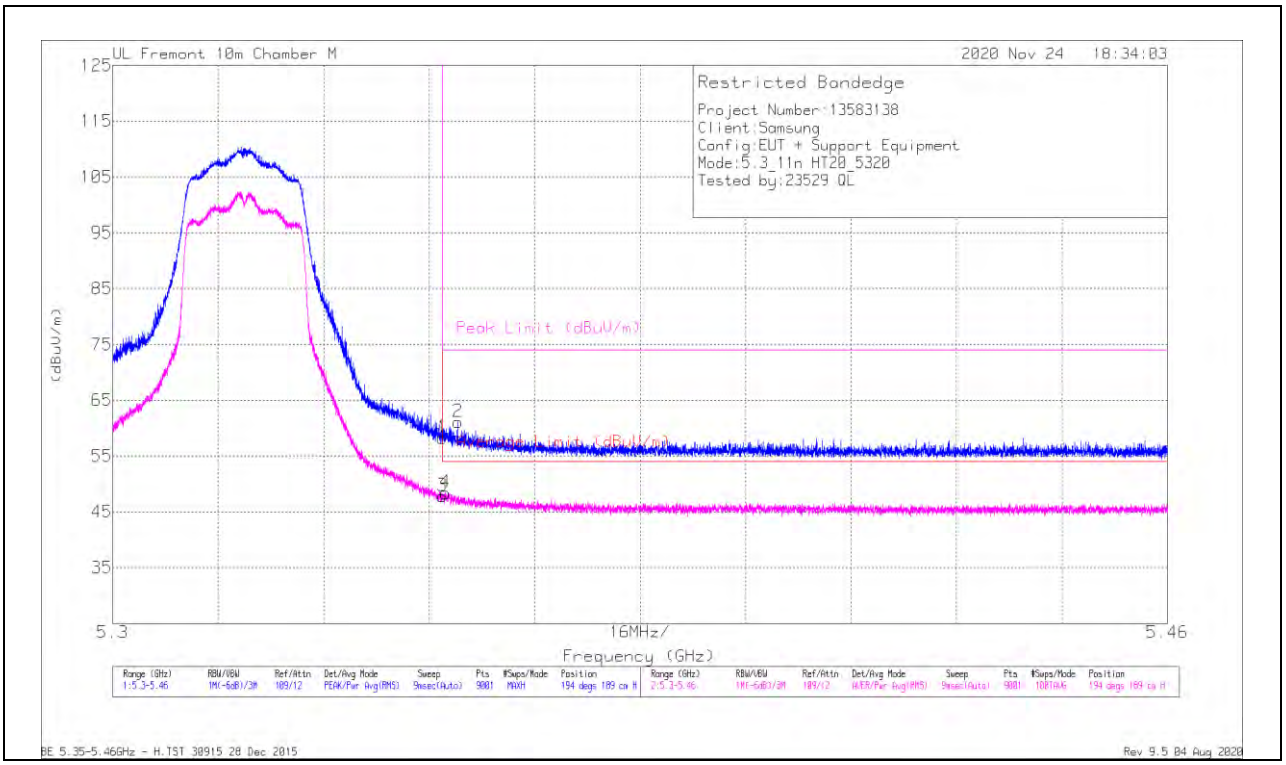
10.1.6. TX ABOVE 1 GHz 802.11n HT20 MODE IN THE 5.3 GHz BAND

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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	5.35001	34.89	Pk	34.5	-11.2	0	58.19	-	-	74	-15.81	194	189	H
3	5.35001	24.35	RMS	34.5	-11.2	.12	47.77	54	-6.23	-	-	194	189	H
4	5.35044	24.85	RMS	34.5	-11.1	.12	48.37	54	-5.63	-	-	194	189	H
2	5.35236	37.67	Pk	34.5	-11.1	0	61.07	-	-	74	-12.93	194	189	H

Pk - Peak detector
RMS - RMS detection

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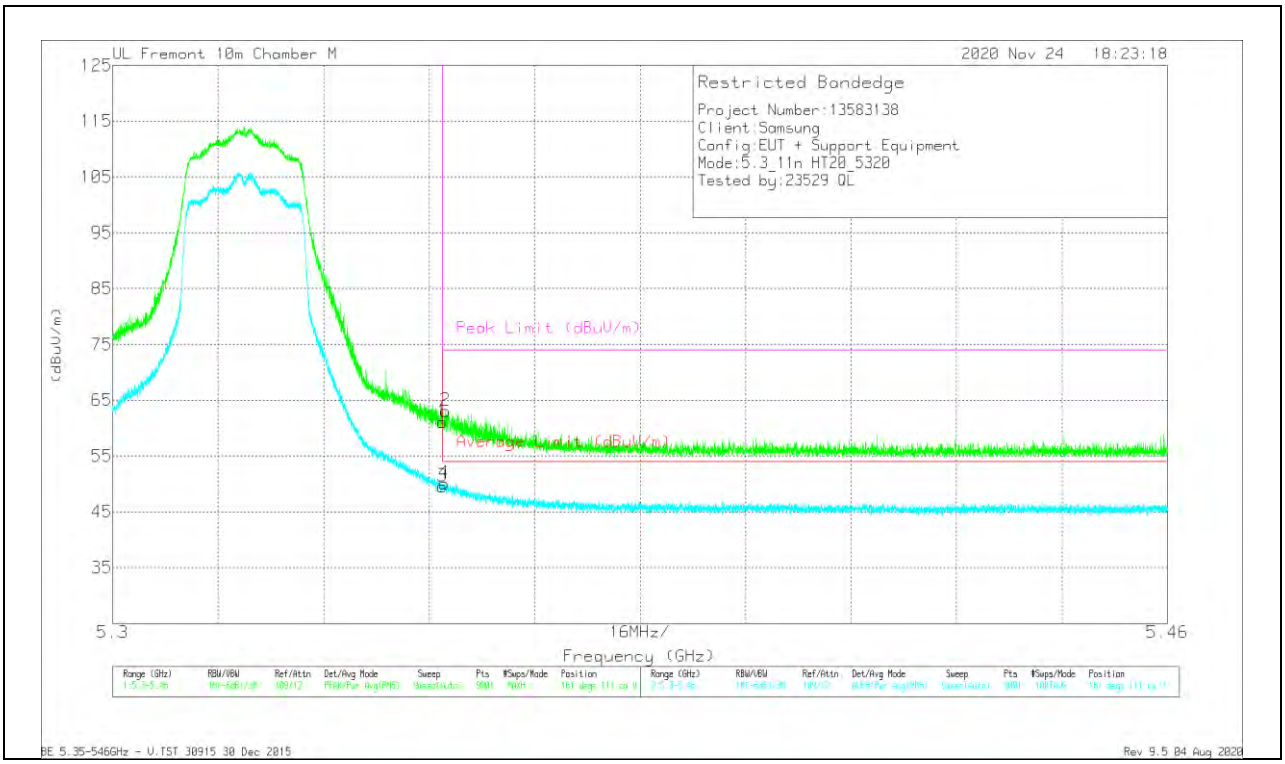
VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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	5.35001	37.75	Pk	34.5	-11.2	0	61.05	-	-	74	-12.95	161	111	V
3	5.35001	26.07	RMS	34.5	-11.2	.12	49.49	54	-4.51	-	-	161	111	V
4	5.35028	26.53	RMS	34.5	-11.1	.12	50.05	54	-3.95	-	-	161	111	V
2	5.35044	39.66	Pk	34.5	-11.1	0	63.06	-	-	74	-10.94	161	111	V

Pk - Peak detector
RMS - RMS detection

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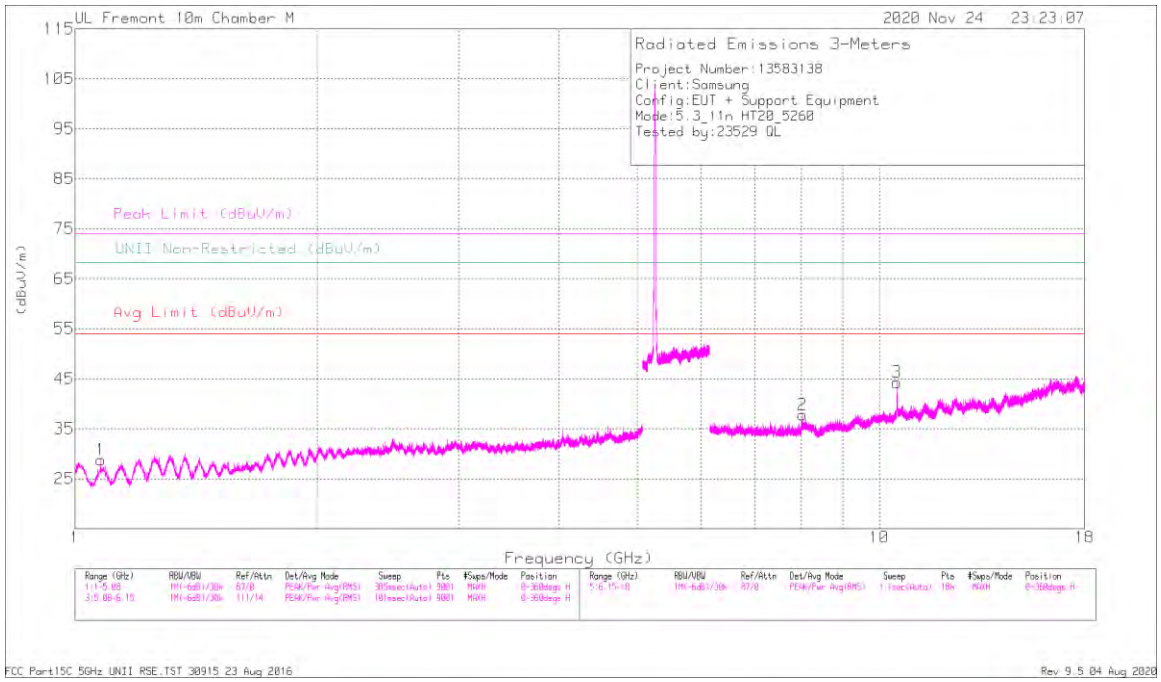
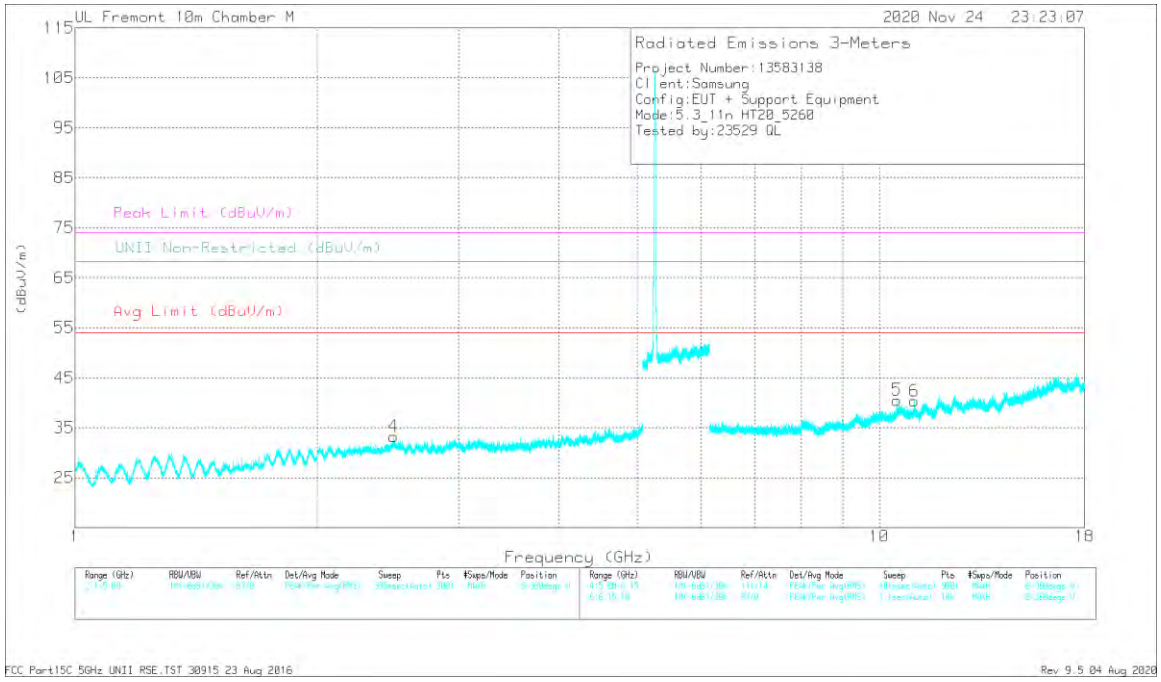
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
1.07506	43.46	ADR	27.1	-46.6	.12	24.08	54	-29.92	-	-	-	-	203	243	H
1.07525	54.46	PK-U	27.1	-46.6	0	34.96	-	-	74	-39.04	-	-	204	243	H
2.49143	40.5	ADR	32.7	-44.1	.12	29.22	54	-24.78	-	-	-	-	268	211	V
2.49199	52.74	PK-U	32.7	-44.1	0	41.34	-	-	74	-32.66	-	-	268	211	V
8.02481	47.04	PK-U	35.8	-37.2	0	45.64	-	-	-	-	68.2	-22.56	89	116	H
10.51834	48.1	PK-U	37.8	-36.6	0	49.3	-	-	-	-	68.2	-18.9	296	223	V
10.51842	51.02	PK-U	37.8	-36.6	0	52.22	-	-	-	-	68.2	-15.98	278	198	H
11.04968	33.83	ADR	37.9	-36.2	.12	35.65	54	-18.35	-	-	-	-	125	225	V
11.04974	45.78	PK-U	37.9	-36.2	0	47.48	-	-	74	-26.52	-	-	125	225	V

PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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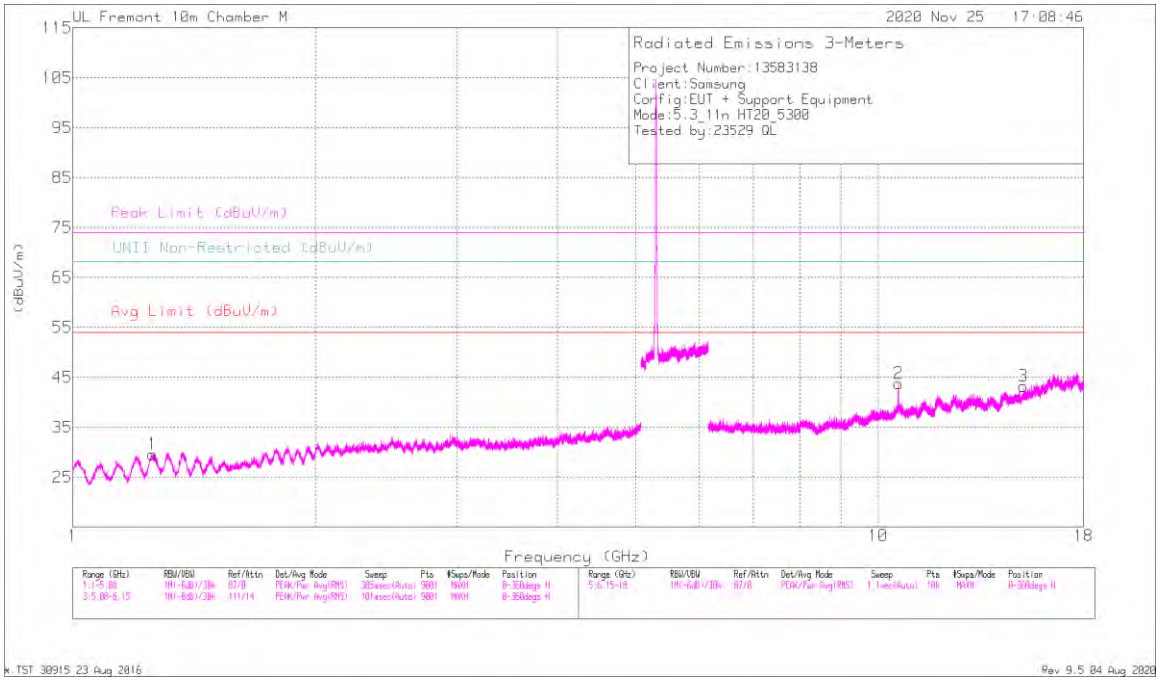
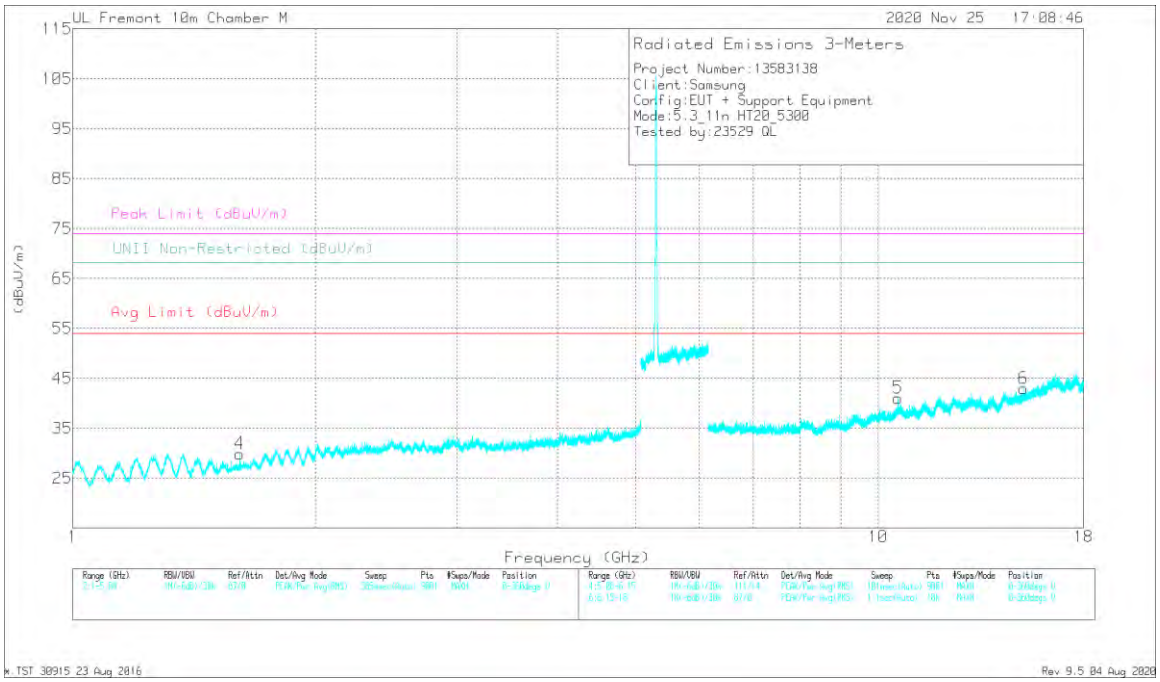
MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T345 (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
1.25471	44.39	ADR	28.6	-46.2	.12	26.91	54	-27.09	-	-	-	-	115	161	H
1.25608	56.14	PK-U	28.6	-46.2	0	38.54	-	-	74	-35.46	-	-	115	161	H
1.61281	42.71	ADR	28.5	-45.8	.12	25.53	54	-28.47	-	-	-	-	203	208	V
1.61326	53.92	PK-U	28.5	-45.8	0	36.62	-	-	74	-37.38	-	-	203	208	V
10.59193	45.55	PK-U	37.9	-36.8	0	46.65	-	-	-	-	68.2	-21.55	309	359	V
10.59793	49.67	PK-U	37.9	-36.7	0	50.87	-	-	-	-	68.2	-17.33	292	247	H
15.14861	43.59	PK-U	39.8	-33.5	0	49.89	-	-	-	-	68.2	-18.31	159	309	V
15.16096	42.17	PK-U	39.9	-33.4	0	48.67	-	-	-	-	68.2	-19.53	144	277	H

PK-U - U-NII: Maximum Peak
ADR - U-NII AD primary method, RMS average

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