CERTIFICATION TEST REPORT

Report Number. : 12356844-E4V3

Applicant	:	GOOGLE LLC 1600 AMPHITHEATRE PARKWAY MOUNTAIN VIEW, CA 94043, U.S.A.
Model	:	H1A
FCC ID	:	A4RH1A
EUT Description	:	INTERACTIVE VIDEO STREAMING DEVICE
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART E

Date Of Issue:
August 30, 2018

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

REPORT REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	8/14/2018	Initial Issue	---
V2	8/27/2018	Updated Section 5.5, updated description about simultaneous transmission	
V3	8/30/2018	Updated Sections 8.5.9, 10, 11 and 12.	E.Yu

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UL VERIFICATION SERVICES INC.
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: GOOGLE LLC
1600 AMPHITHEATRE PARKWAY
MOUNTAIN VIEW, CA 94043, U.S.A.

EUT DESCRIPTION: INTERACTIVE VIDEO STREAMING DEVICE

MODEL: H1A

SERIAL NUMBER: G1424638 (CONDUCTED)
G1421457 (RADIATED)

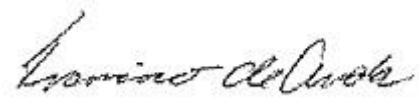
DATE TESTED: July 19, 2018 – August 14, 2018

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. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
UL Verification Services Inc. By:



Francisco de Anda
CONSUMER TECHNOLOGY DIVISION
Operations Leader
UL Verification Services Inc.

Prepared By:

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Test Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, FCC 14-30, FCC KDB 905462 D02 v02/D03 v01r02/D06 v02, FCC KDB 789033 D02 v02r01, FCC KDB 644545 D03 v01, ANSI C63.10-2013, FCC 06-96, FCC KDB 905462 D02 and D03.

3. FACILITIES AND ACCREDITATION

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

47173 Benicia Street	47266 Benicia Street	47658 Kato Rd
☒ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☒ Chamber K (ISED:2324A-1)
☒ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☒ Chamber L (ISED:2324A-3)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	
	☐ Chamber G (ISED:22541-4)	
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

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5. EQUIPMENT UNDER TEST

5.1. EUT DESCRIPTION

The EUT is an Interactive Video Streaming Device

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

5.2 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.2 GHz band, 1TX			
5180-5240	802.11a	17.32	53.95
5180-5240	802.11n HT20	17.02	50.35
5190-5230	802.11n HT40	15.66	36.81
5210	802.11ac VHT80	9.02	7.98

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.3 GHz band, 1TX			
5260 - 5320	802.11a	17.31	53.83
5260 - 5320	802.11n HT20	17.01	50.23
5270 - 5310	802.11n HT40	15.16	32.81
5290	802.11ac VHT80	11.64	14.59

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.6 GHz band, 1TX			
5500-5720	802.11a	17.06	50.82
5500-5720	802.11n HT20	16.87	48.64
5510-5710	802.11n HT40	15.78	37.84
5530-5690	802.11ac VHT80	16.33	42.95

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
5.8 GHz band, 1TX			
5745-5825	802.11a	17.10	51.29
5745-5825	802.11n HT20	17.02	50.35
5755-5795	802.11n HT40	15.59	36.22
5775	802.11ac VHT80	15.96	39.45

STRADDLE CHANNELS

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1Tx (Channels overlapping UNII-2C and UNII-3)			
5720 (Whole Fundamental	802.11a	17.02	50.35
5720 (Whole Fundamental	802.11n HT20	16.78	47.64
5710 (Whole Fundamental	802.11n HT40	15.62	36.48
5690 (Whole Fundamental	802.11ac VHT80	16.33	42.95

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, with a maximum gain of 5 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware and utility software during testing was version 127694.

5.5. WORST-CASE CONFIGURATION AND MODE

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

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

EUT can only be set up in desktop orientation; therefoe, all radiated testing was performed with the EUT in desktop orientation.

Simultaneous transmission for BT/BLE radios and 5GHz WLAN radio was investigated, no additional noticeable emissions were found.

802.11ac VHT20 and VHT40 modes are different from 802.11nHT20 and HT40 only in control messages and have the same power settings. 802.11ac-VHT20 is covered by 802.11n-HT20, and 802.11ac-VHT40 is covered by 802.11n-HT40

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

802.11a mode: 6 Mbps
802.11n HT20mode: MCS0
802.11n HT40mode: MCS0
802.11ac VHT80 mode: MCS0

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop AC/DC adapter	Lenovo	ADLX65NCT2A	11S36200293ZZ10049556E	NA
Laptop	Lenovo	X220	R9-P89W3	NA
AC adapter	Google	NA	W015R007q	NA

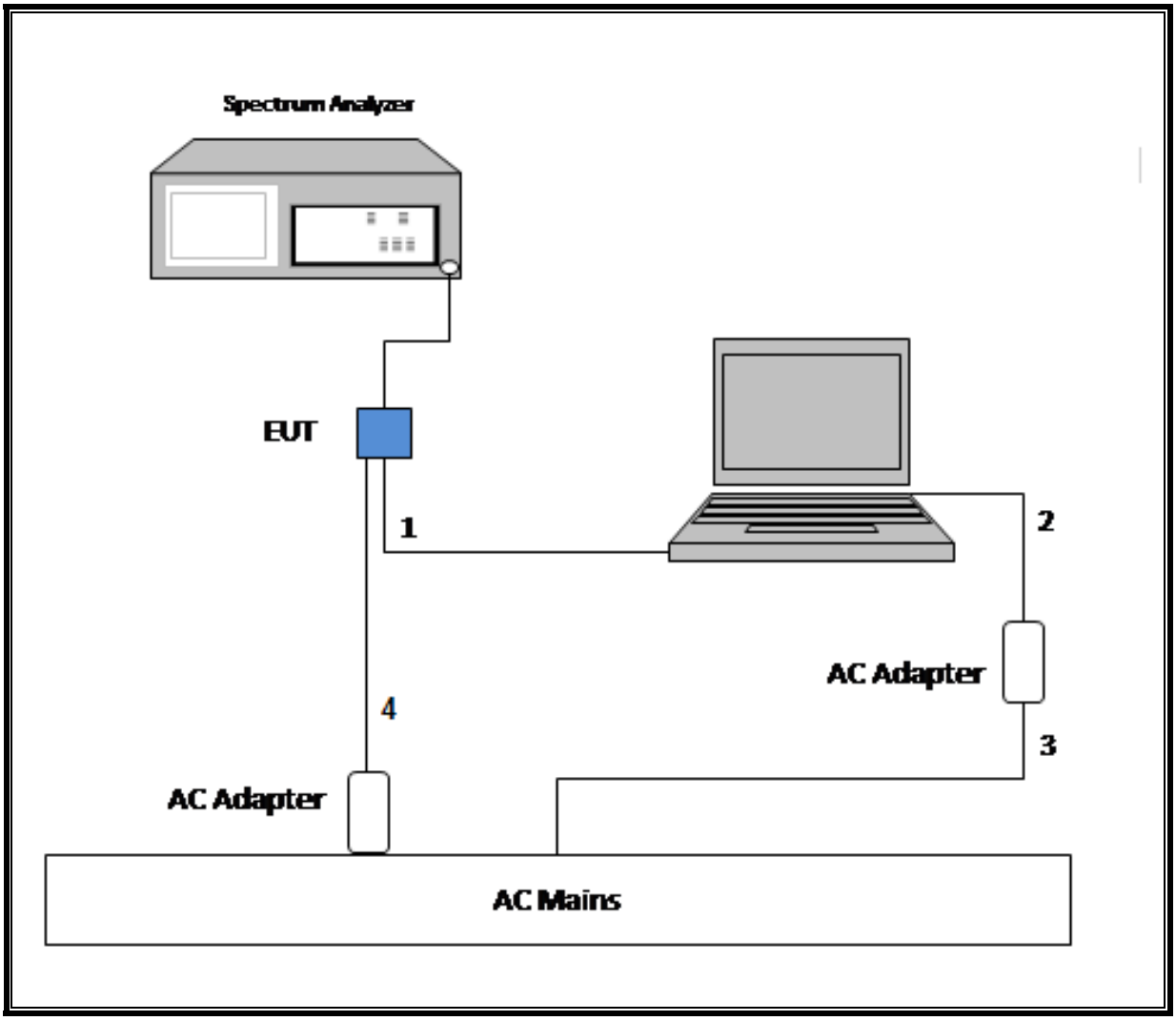
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	micro USB	Shielded	1	
2	DC	1	DC connector	Unshielded	1.75	
3	AC	1	2-Prong	Unshielded	1	
4	DC	1	DC connector	Unshielded	1.75	

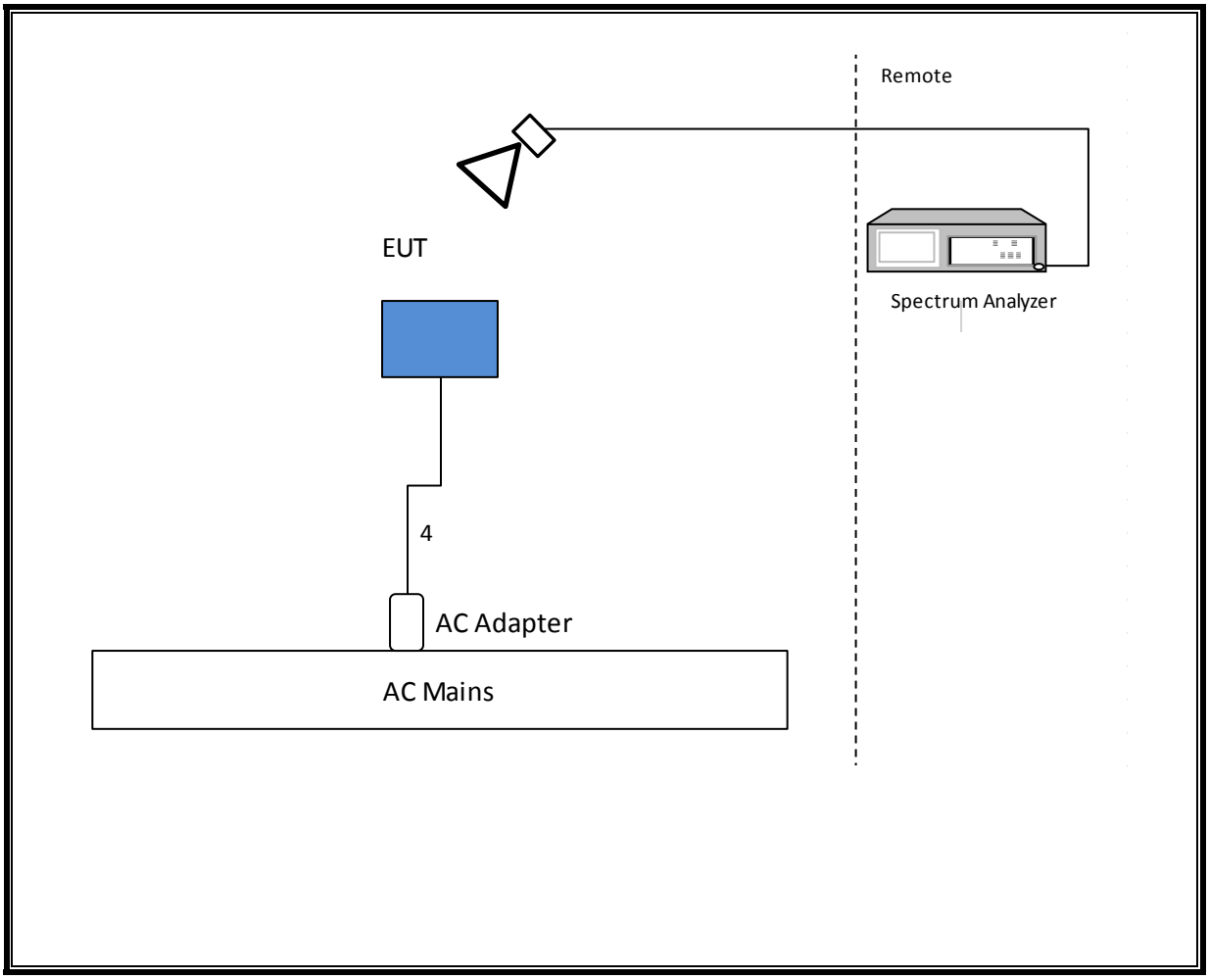
TEST SETUP

The EUT was connected to a host Laptop via USB cable. Test software exercised the EUT.

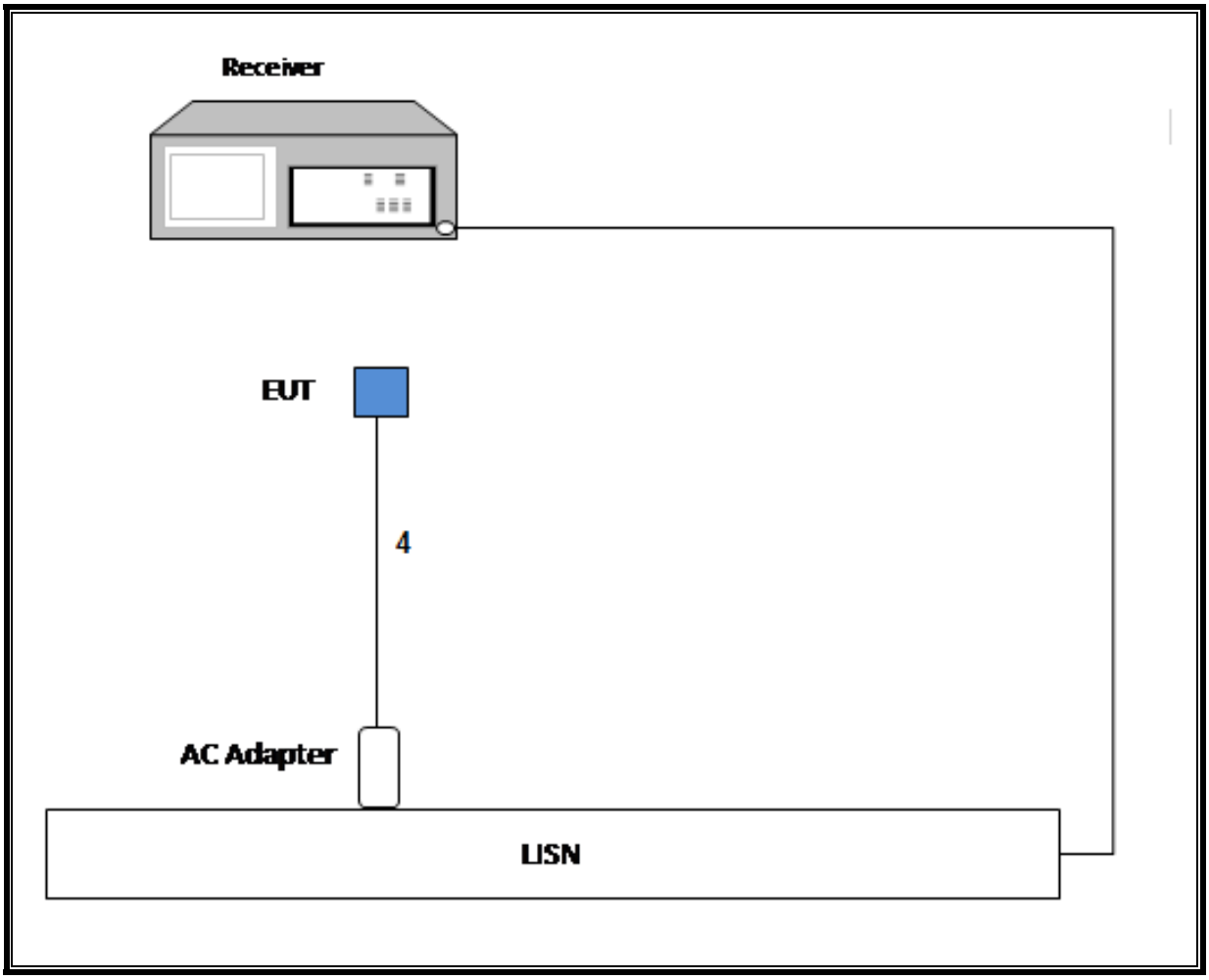
SETUP DIAGRAM FOR ANTENNA PORT CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR AC LINE CONDUCTED TESTS



6. MEASUREMENT METHOD

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

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

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

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

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

Power Spectral Density: KDB 789033 D02 v02r01, Section F

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

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

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

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7. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Amplifier	Hewlet Packard	8447D	T64	02/14/2019
Amplifier, 1 - 18GHz	MITEQ	AFS42-00101800-25-S-42	T1568	06/21/2019
Amplifier, 1 - 18GHz	Amplical	AMP1G18-35	T1569	06/03/2019
RF Preamplifier, 1 - 26GHz	Agilent	8449B	T404	03/09/2019
Pre-Amp, 26-40GHz	MITEQ	NSTTA2640-35-HG	T1864	03/09/2019
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB3	T407	05/10/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	EMC4294	04/30/2019
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T344	04/30/2019
Antenna Horn, 18 to 26GHz	ARA	MWH-1826/B	T488	10/04/2018
Antenna Horn, 26.5 to 40GHz	ARA	MWH-2640	T90	08/25/2018
Power Meter, P-series single channel	Keysight	N1912A	T1271	07/26/2019
Power Sensor	Keysight	N1921A	T1225	04/10/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1466	04/16/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1454	01/08/2019
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1113	12/21/2018
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179522	05/11/2019
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179367	04/28/2019
AC Line Conducted				
EMI Test Receiver 9Khz-7GHz	Rohde & Schwarz	ESCI7	T1124	11/07/2018
LISN for Conducted Emissions CISPR-16	Fischer	50/250-25-2	EMC4385	01/31/2019
Power Cable, Line Conducted Emissions	UL	PG1	T861	08/31/2018
UL AUTOMATION SOFTWARE				
Radiated Software	UL	UL EMC	Ver 9.5, Dec 01, 2016	
Antenna Port Software	UL	UL EMC	Ver 7.9, Jan 24, 2018	
AC Line Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015	

NOTES:

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

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8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
802.11a 1TX	2.062	2.083	0.990	98.99%	0.00	0.010
802.11n HT20 1TX	1.918	1.942	0.988	98.76%	0.00	0.010
802.11n HT40 1TX	0.944	0.966	0.977	97.72%	0.10	1.059
802.11ac VHT80 1TX	0.460	0.481	0.956	95.63%	0.19	2.174

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DUTY CYCLE PLOTS

DUTY CYCLE 802.11a 1TX MODE

DUTY CYCLE 802.11n HT20 1TX MODE

DUTY CYCLE 802.11n HT40 1TX MODE

DUTY CYCLE 802.11ac VHT80 1TX MODE

8.2. 26 dB BANDWIDTH

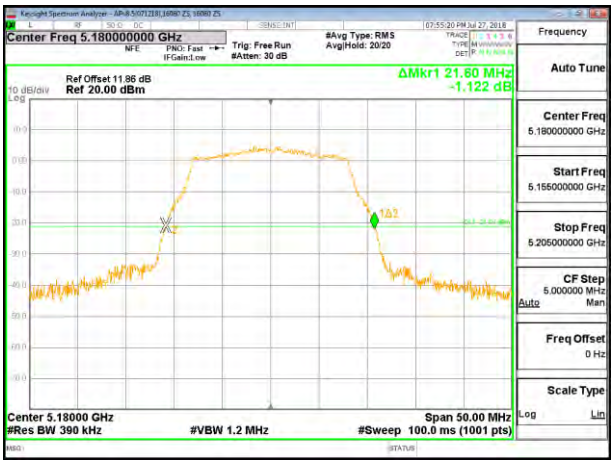
LIMITS

None; for reporting purposes only.

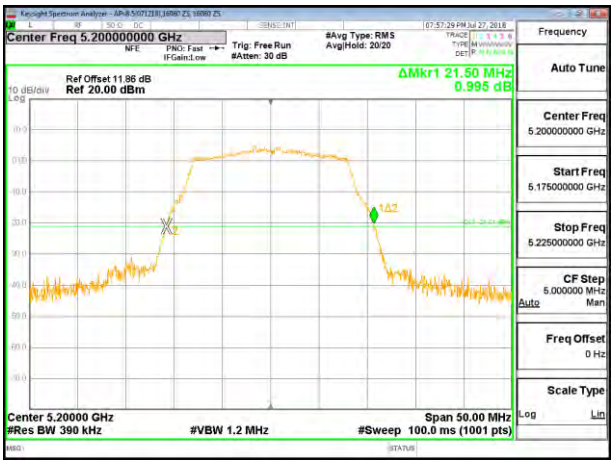
RESULTS

8.2.1. 802.11a MODE IN THE 5.2 GHz BAND

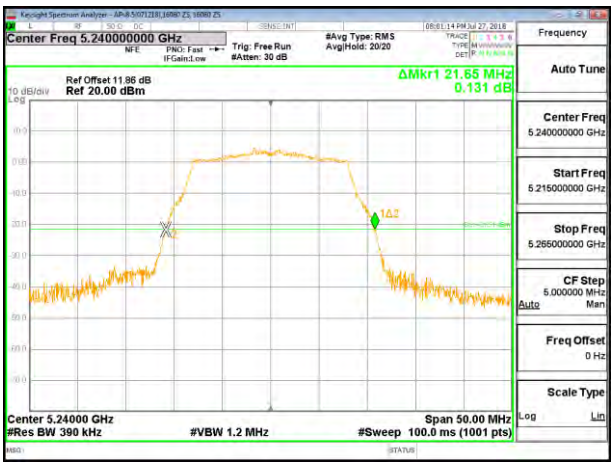
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.60
Mid	5200	21.50
High	5240	21.65



LOW CHANNEL



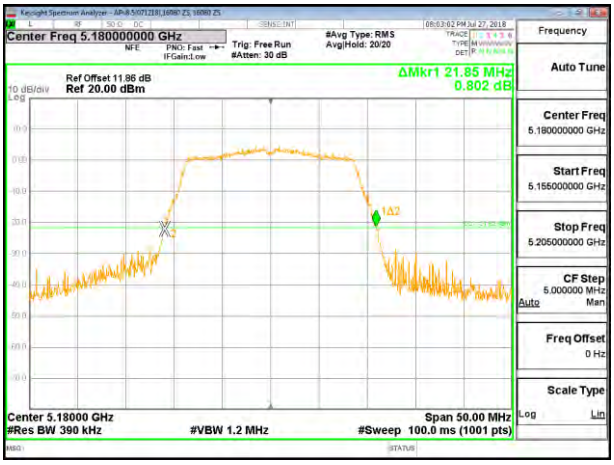
MID CHANNEL



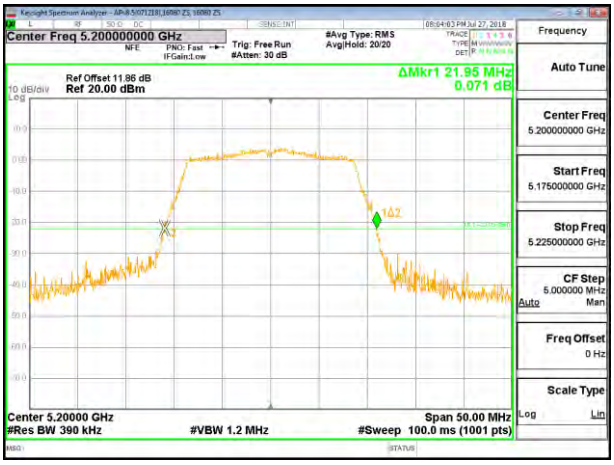
HIGH CHANNEL

8.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

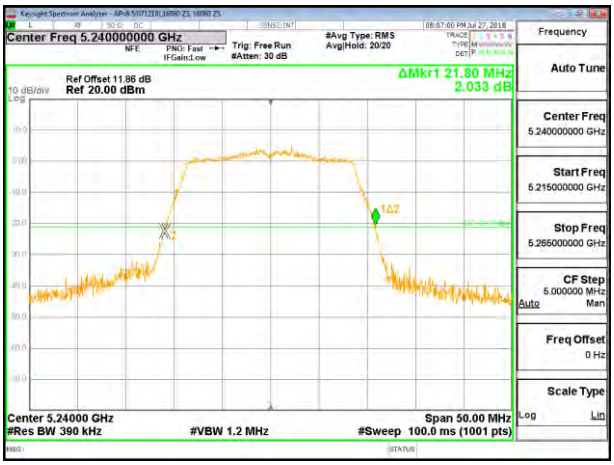
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	21.85
Mid	5200	21.95
High	5240	21.80



LOW CHANNEL



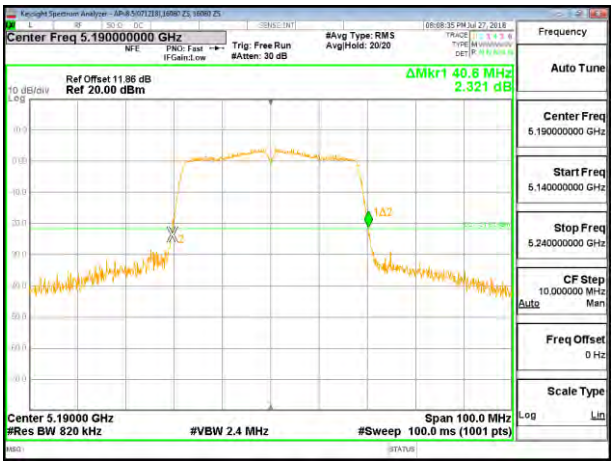
MID CHANNEL



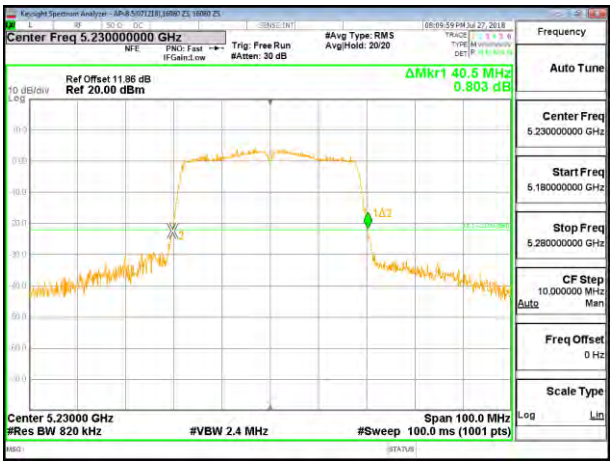
HIGH CHANNEL

8.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	40.60
High	5230	40.50



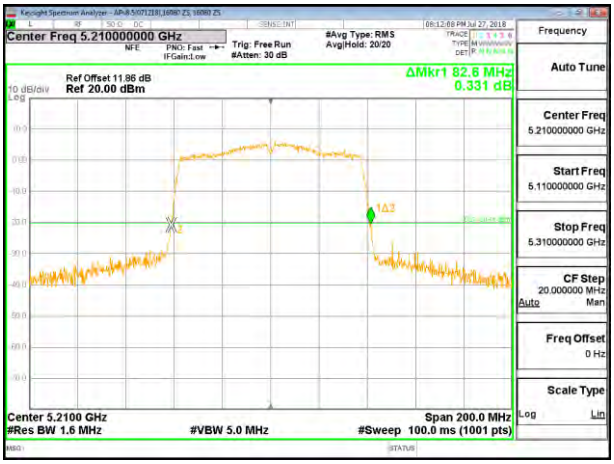
LOW CHANNEL



HIGH CHANNEL

8.2.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

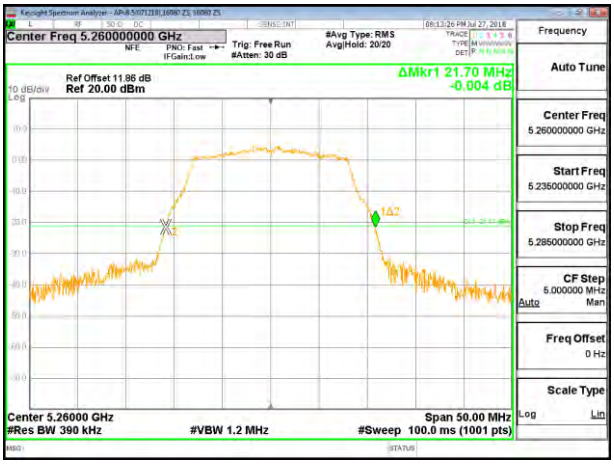
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5210	82.60



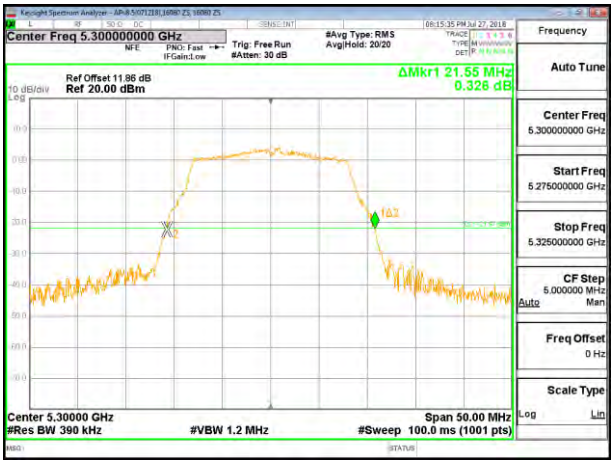
MID CHANNEL

8.2.5. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.70
Mid	5300	21.55
High	5320	21.65



LOW CHANNEL



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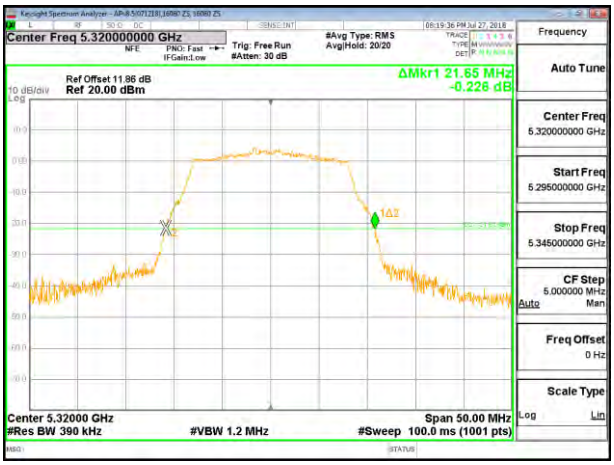
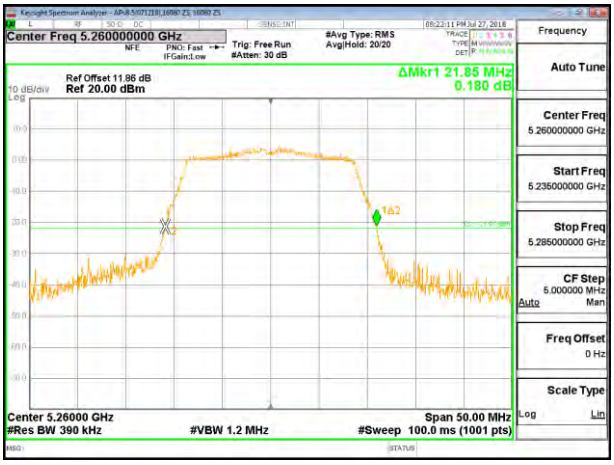


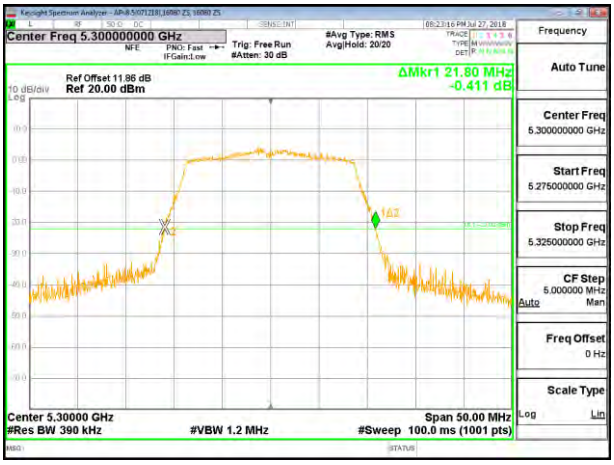
HIGH CHANNEL

8.2.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	21.85
Mid	5300	21.80
High	5320	21.95



LOW CHANNEL



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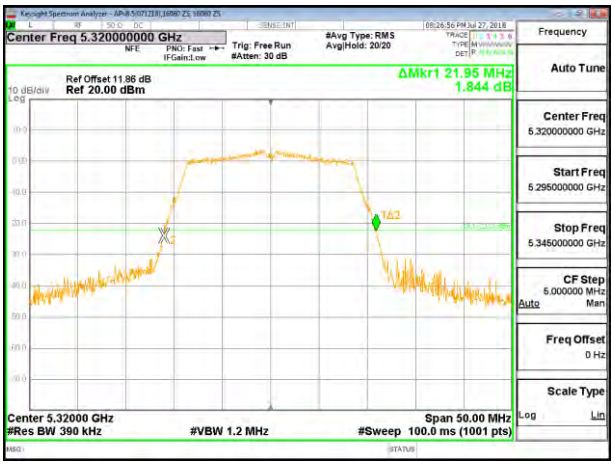
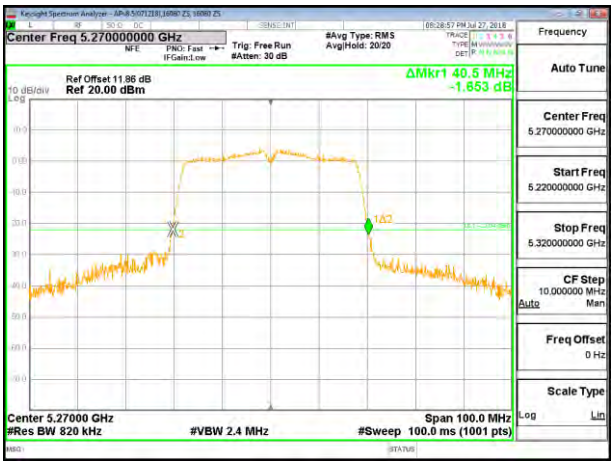


HIGH CHANNEL

8.2.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5270	40.50
High	5310	40.30

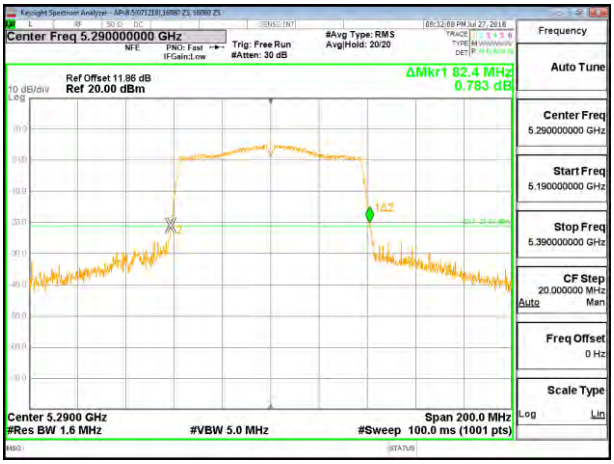


LOW CHANNEL

HIGH CHANNEL

8.2.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

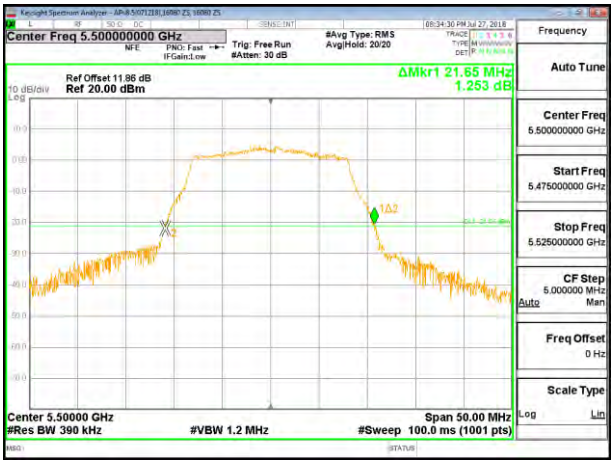
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5290	82.40



MID CHANNEL

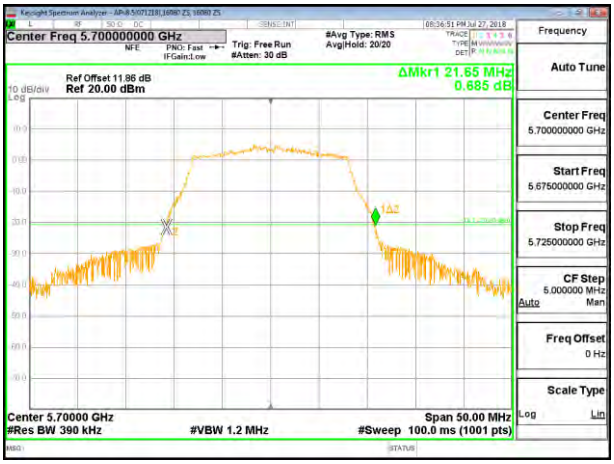
8.2.9. 802.11a MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	21.65
Mid	5580	21.60
High	5700	21.65
144	5720	21.60



LOW CHANNEL

MID CHANNEL

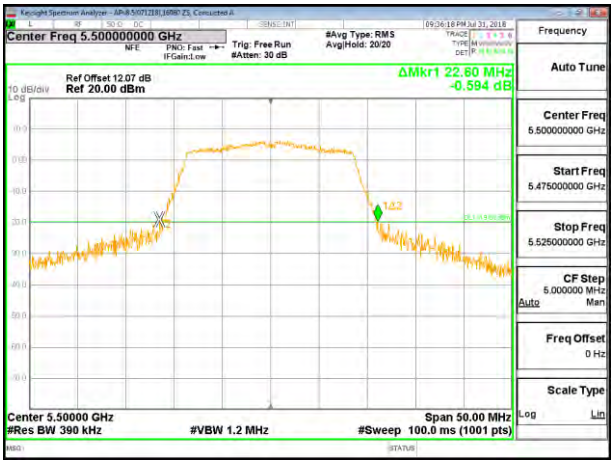


HIGH CHANNEL

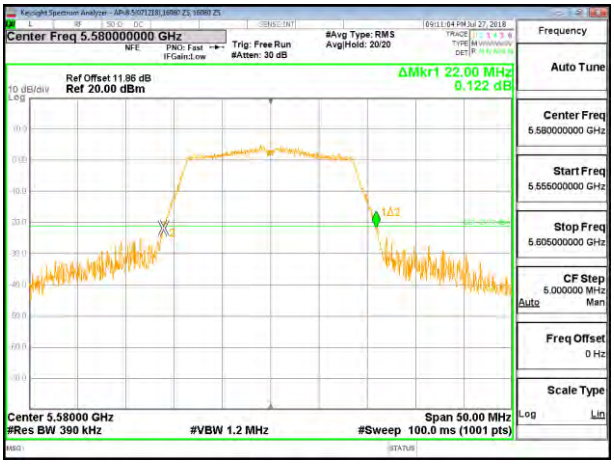
CHANNEL 144

8.2.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

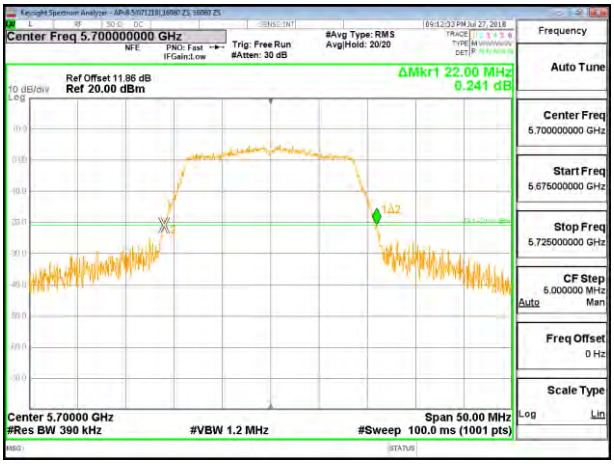
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	22.60
Mid	5580	22.00
High	5700	22.00
144	5720	21.95



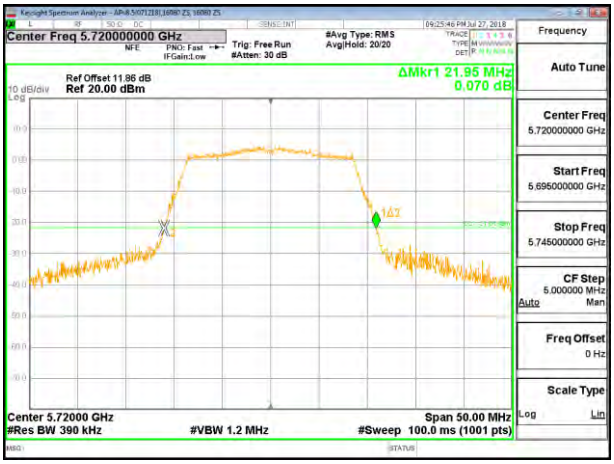
LOW CHANNEL



MID CHANNEL



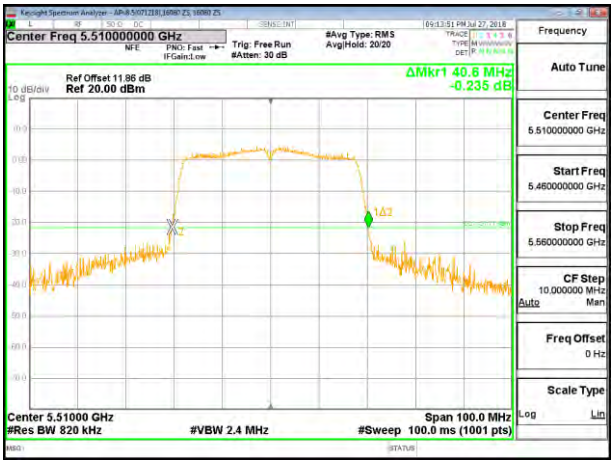
HIGH CHANNEL



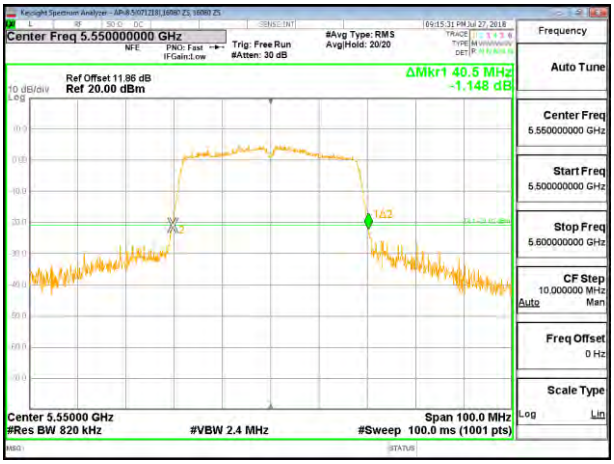
CHANNEL 144

8.2.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	40.60
Mid	5550	40.50
High	5670	40.60
142	5710	40.70

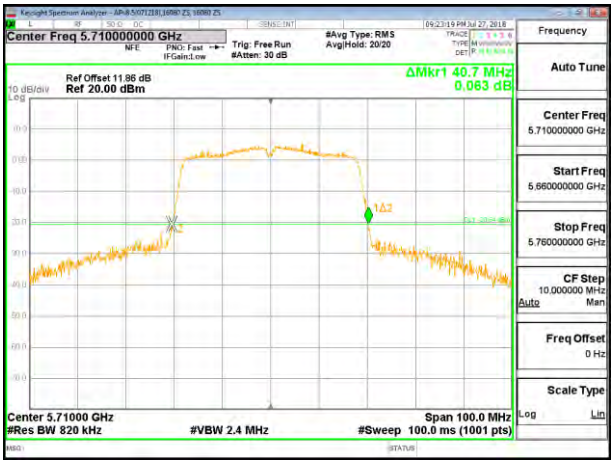


LOW CHANNEL



MID CHANNEL

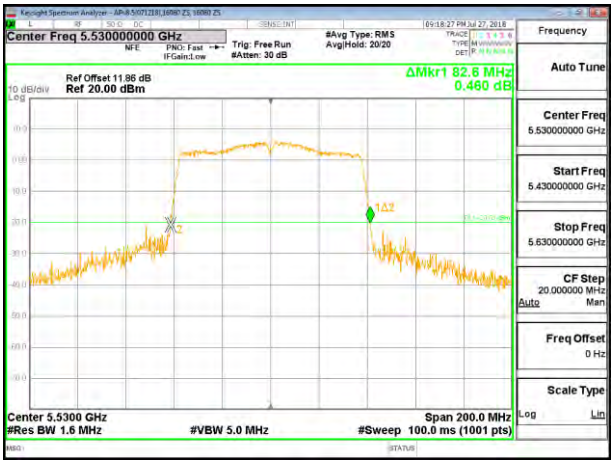
HIGH CHANNEL



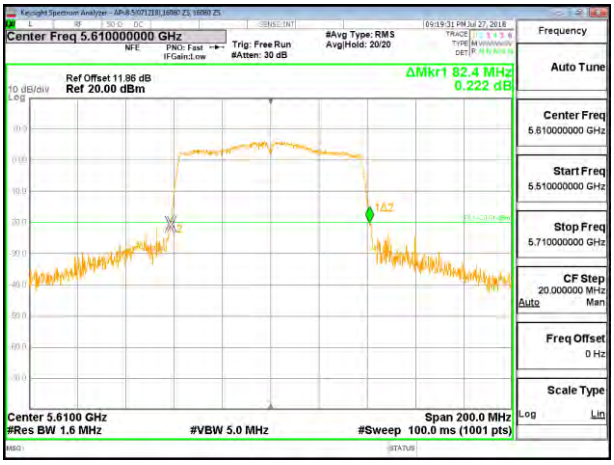
CHANNEL 142

8.2.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

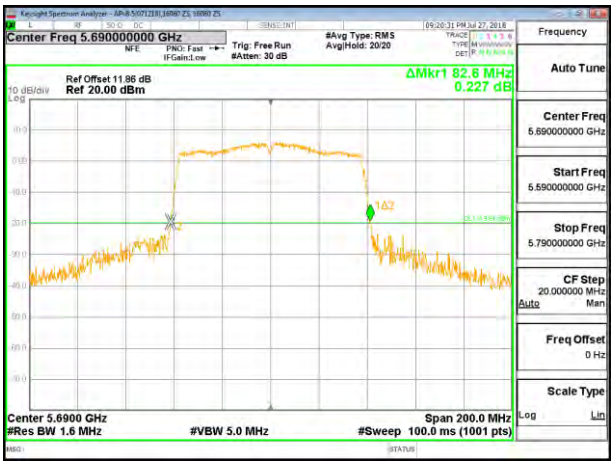
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5530	82.60
High	5610	82.40
138	5690	82.60



LOW CHANNEL



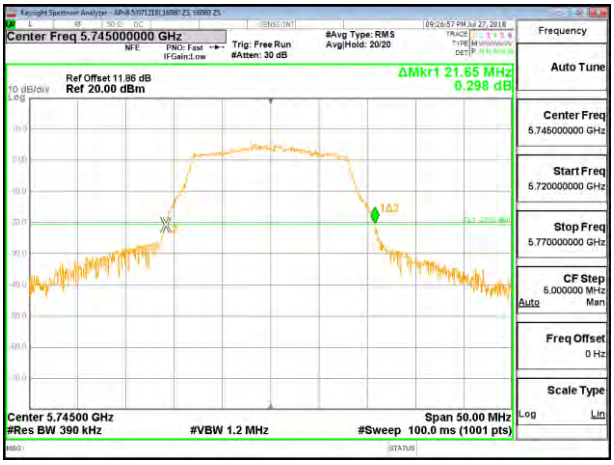
HIGH CHANNEL



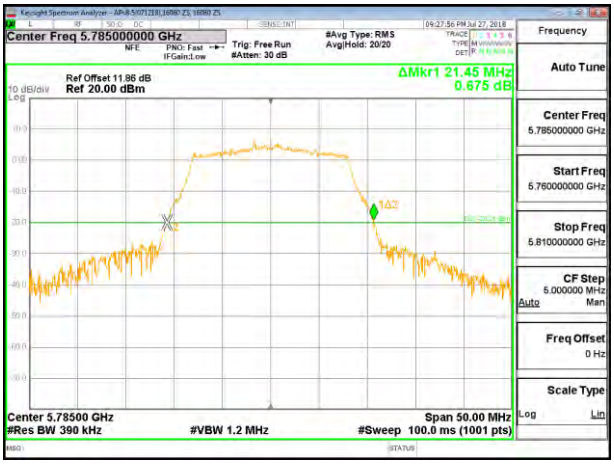
CHANNEL 138

8.2.13. 802.11a MODE IN THE 5.8 GHz BAND

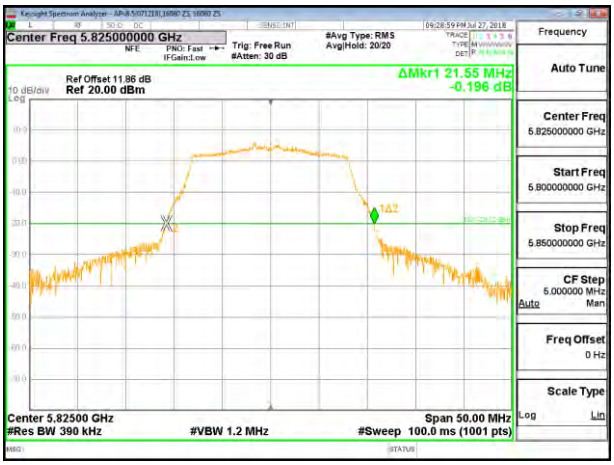
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	21.65
Mid	5785	21.45
High	5825	21.55



LOW CHANNEL



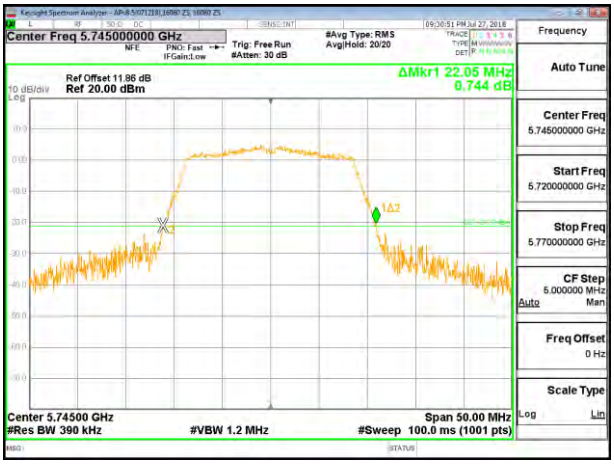
MID CHANNEL



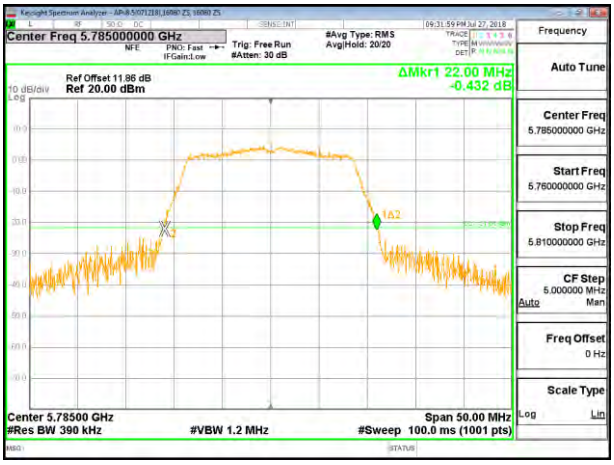
HIGH CHANNEL

8.2.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

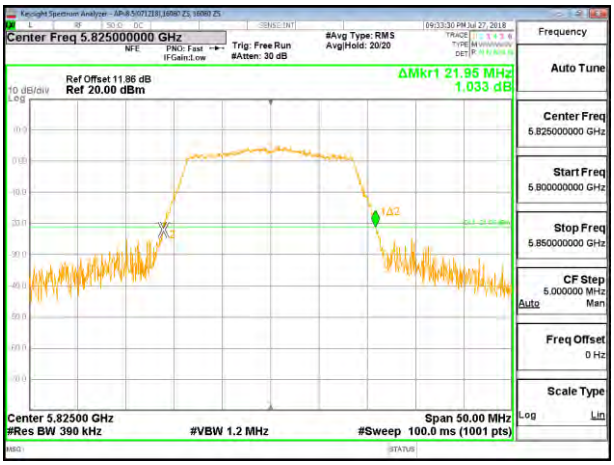
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5745	22.05
Mid	5785	22.00
High	5825	21.95



LOW CHANNEL



MID CHANNEL

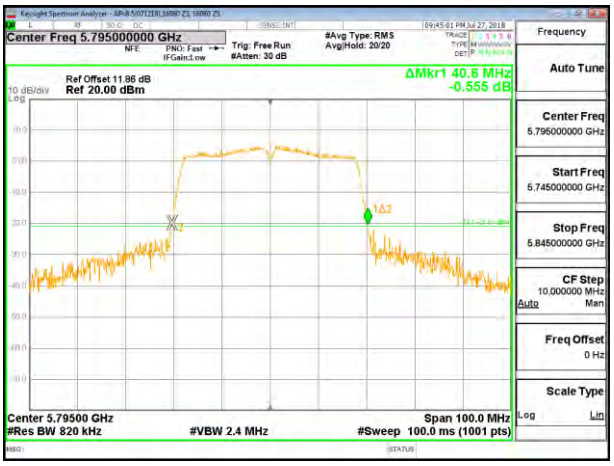


HIGH CHANNEL

8.2.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5755	40.50
High	5795	40.60

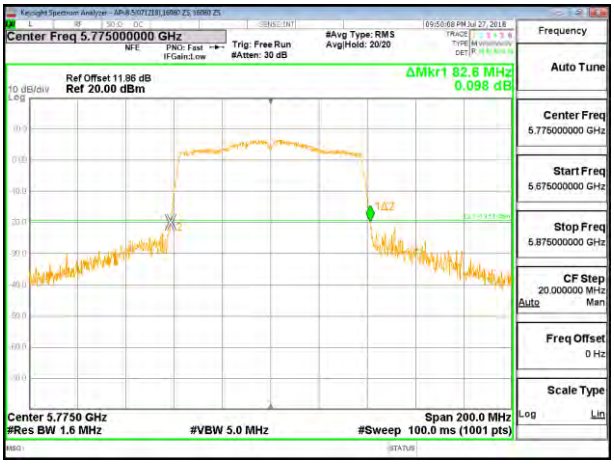
LOW CHANNEL



HIGH CHANNEL

8.2.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Mid	5775	82.60



MID CHANNEL

8.3. 99% BANDWIDTH

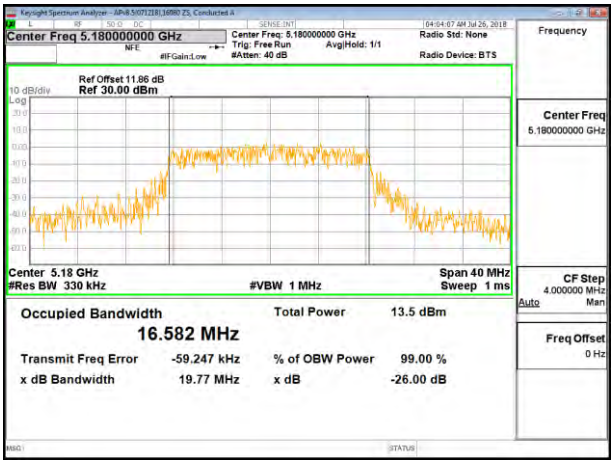
LIMITS

None; for reporting purposes only.

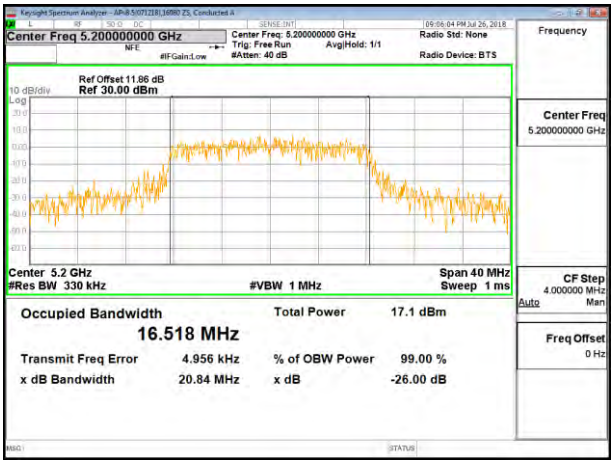
RESULTS

8.3.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.5820
Mid	5200	16.5180
High	5240	16.5780



LOW CHANNEL

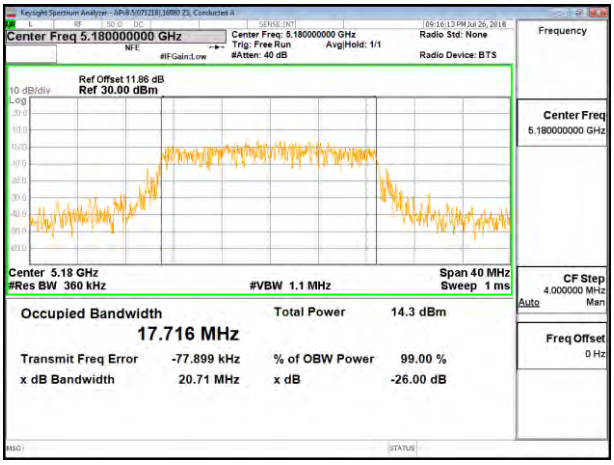


MID CHANNEL

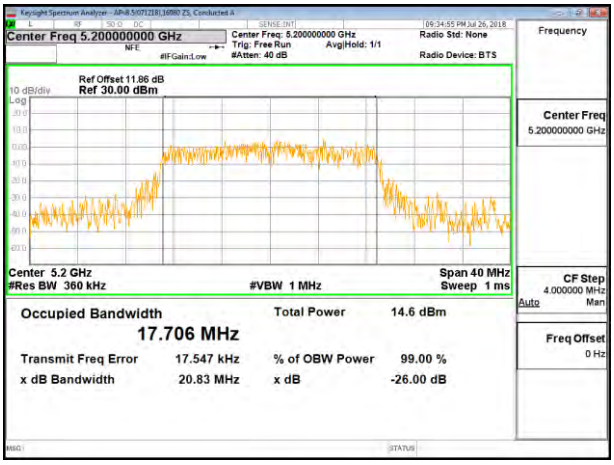
HIGH CHANNEL

8.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

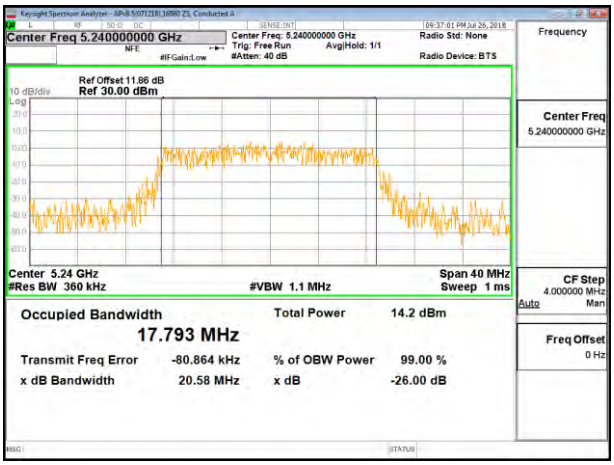
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	17.7160
Mid	5200	17.7060
High	5240	17.7930



LOW CHANNEL



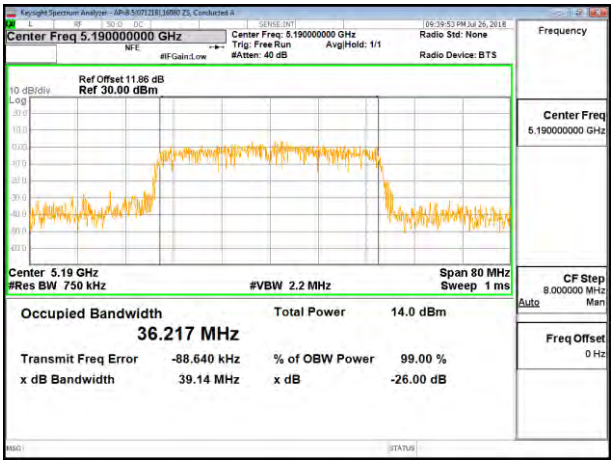
MID CHANNEL



HIGH CHANNEL

8.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	36.2170
High	5230	36.3470



LOW CHANNEL

HIGH CHANNEL

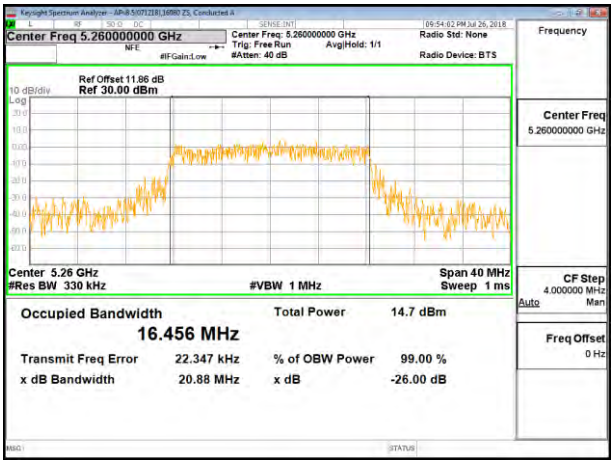
8.3.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5210	75.7130

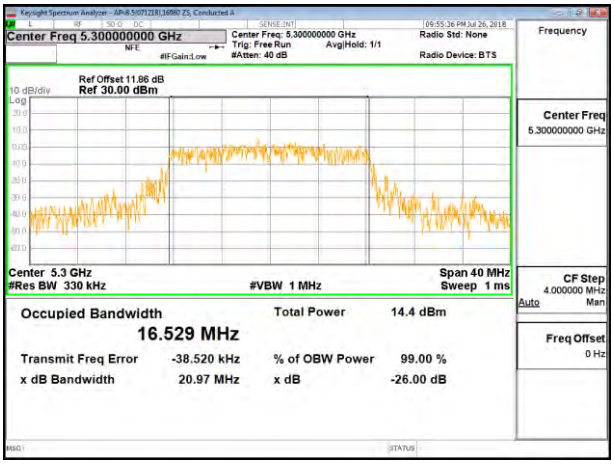
MID CHANNEL

8.3.5. 802.11a MODE IN THE 5.3 GHz BAND

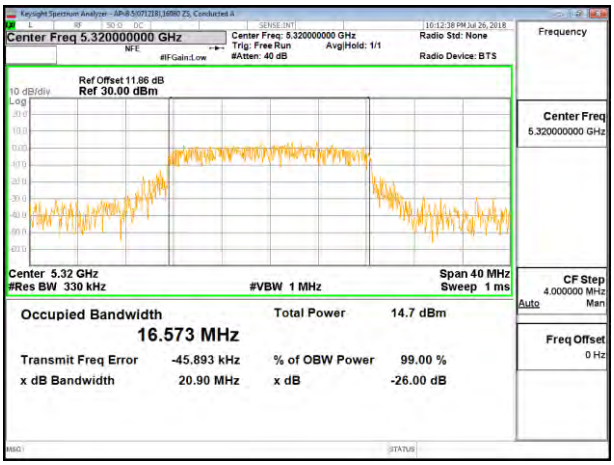
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	16.4560
Mid	5300	16.5290
High	5320	16.5730



LOW CHANNEL



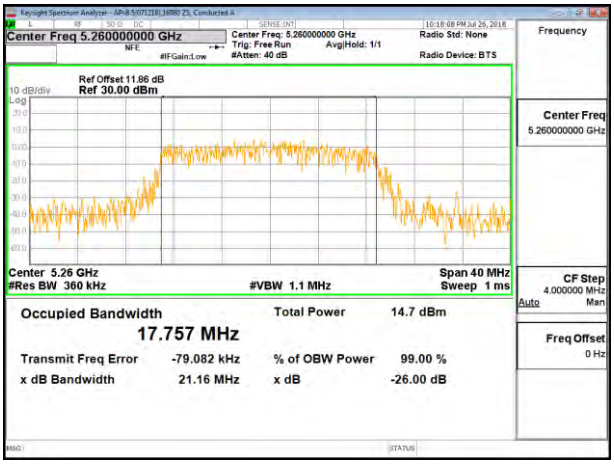
MID CHANNEL



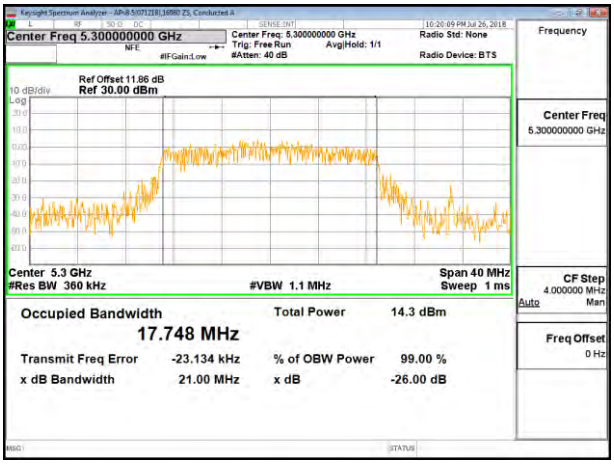
HIGH CHANNEL

8.3.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

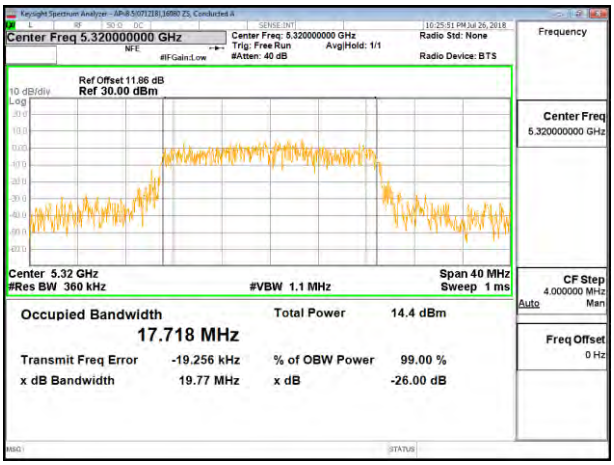
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.7570
Mid	5300	17.7480
High	5320	17.7180



LOW CHANNEL



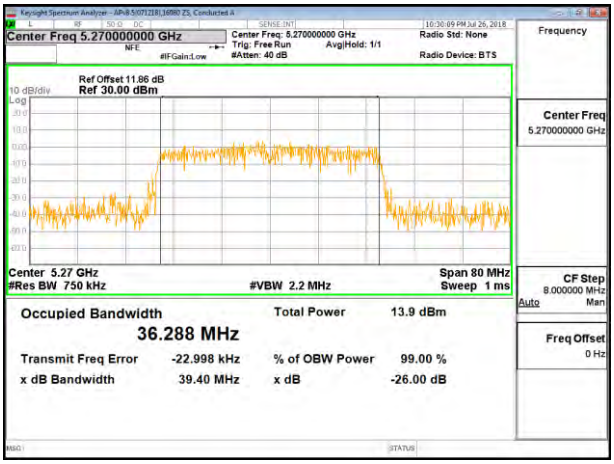
MID CHANNEL



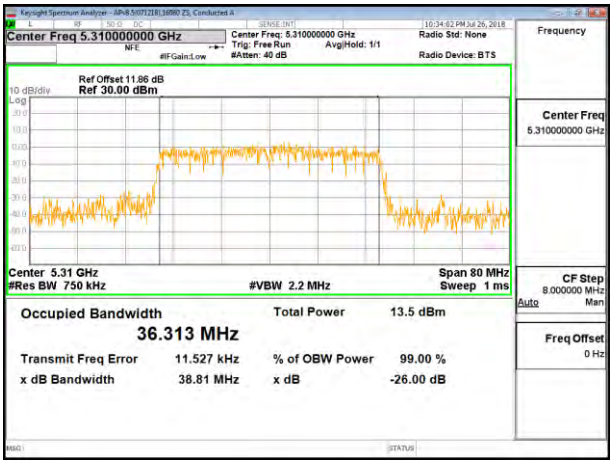
HIGH CHANNEL

8.3.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	36.2880
High	5310	36.3130



LOW CHANNEL



HIGH CHANNEL

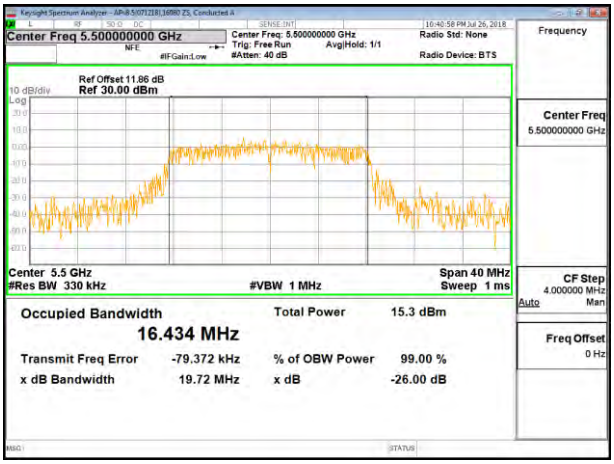
8.3.8. 802.11ac VHT80 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5290	75.6480

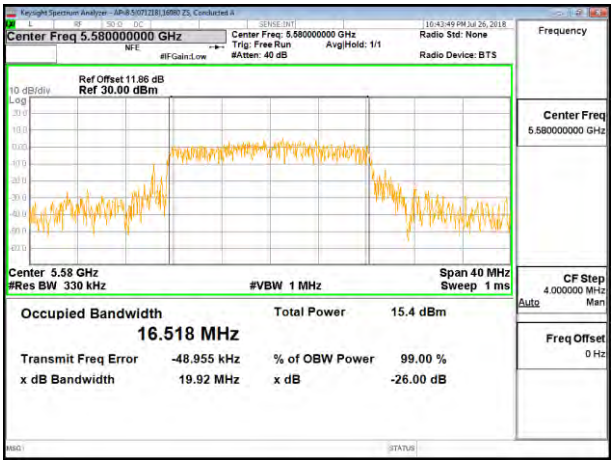
MID CHANNEL

8.3.9. 802.11a MODE IN THE 5.6 GHz BAND

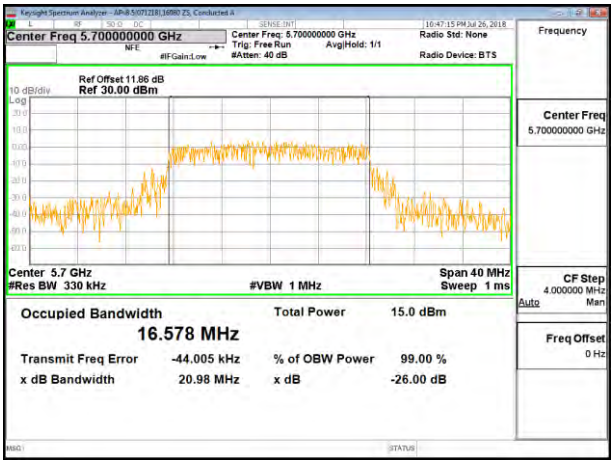
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.4340
Mid	5580	16.5180
High	5700	16.5780
144	5720	16.4550



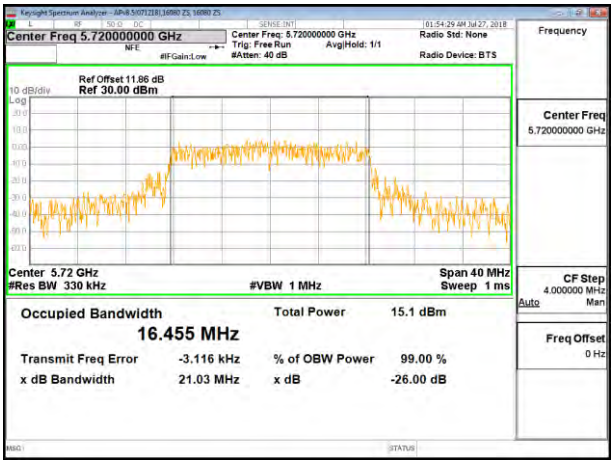
LOW CHANNEL



MID CHANNEL



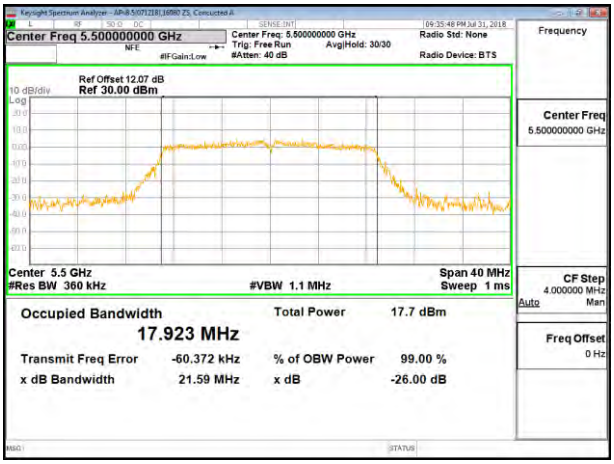
HIGH CHANNEL



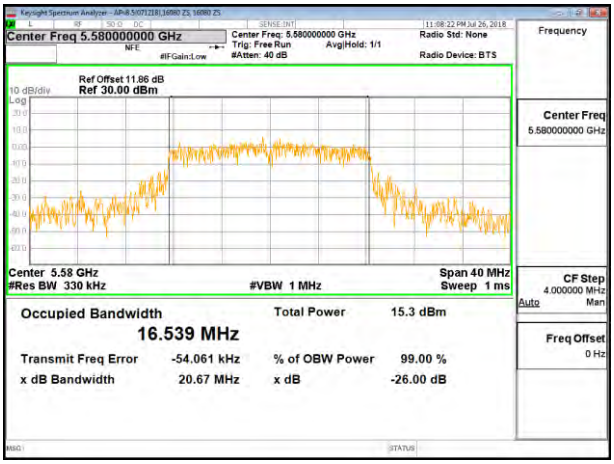
CHANNEL 144

8.3.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

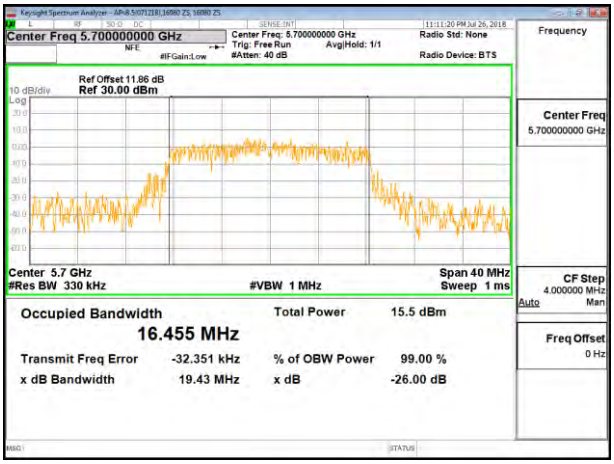
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.9230
Mid	5580	16.5390
High	5700	16.4550
144	5720	17.6970



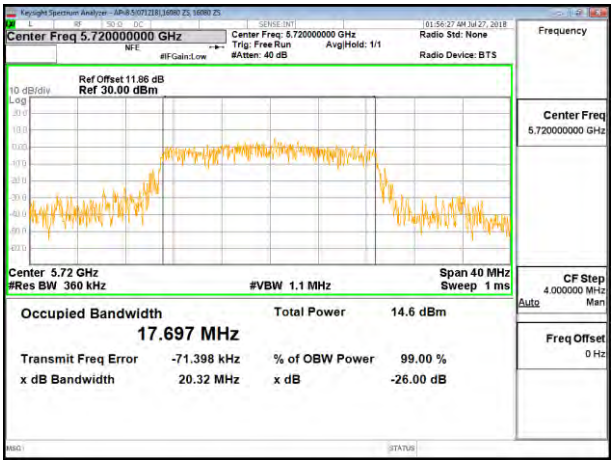
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

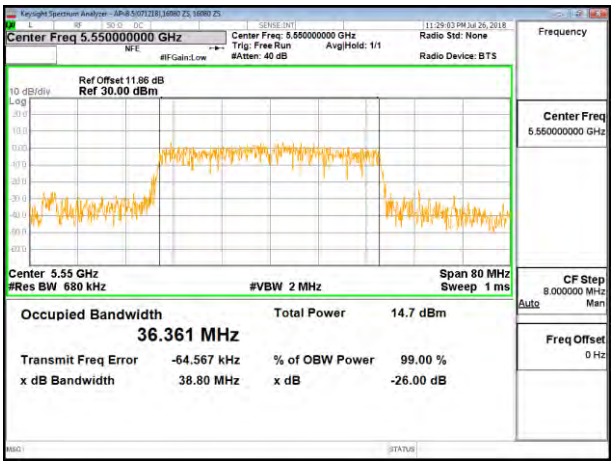


CHANNEL 144

8.3.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.0620
Mid	5550	36.3610
High	5670	36.1800
142	5710	36.2660

LOW CHANNEL



MID CHANNEL

HIGH CHANNEL

CHANNEL 142

8.3.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5530	75.7430
High	5610	75.6340
138	5690	75.7280

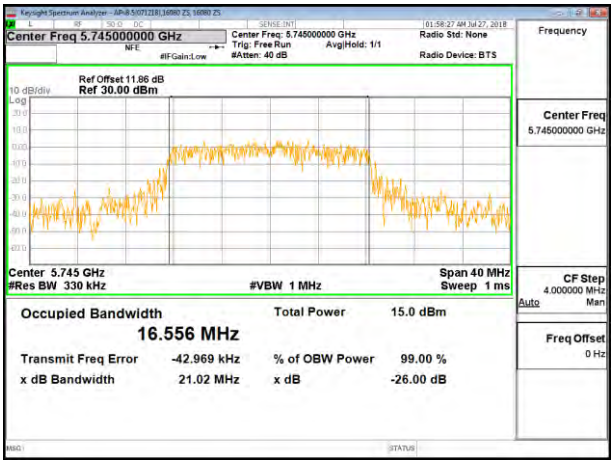
LOW CHANNEL

HIGH CHANNEL

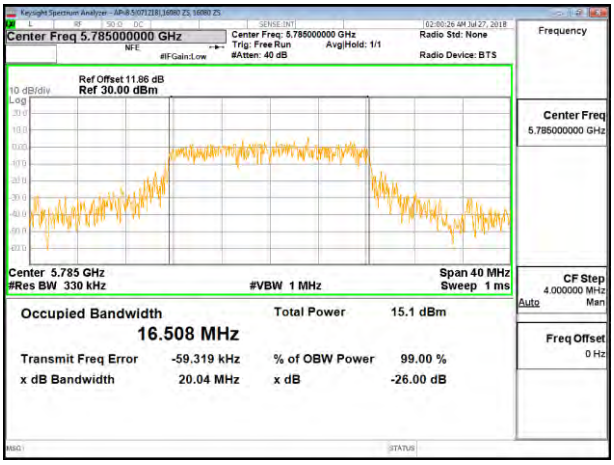
CHANNEL 138

8.3.13. 802.11a MODE IN THE 5.8 GHz BAND

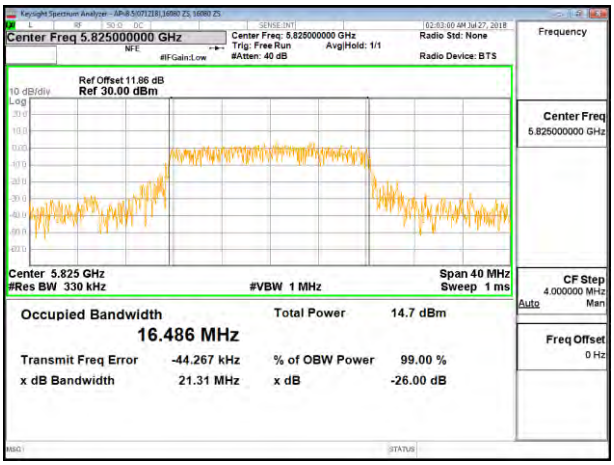
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.5560
Mid	5785	16.5080
High	5825	16.4860



LOW CHANNEL



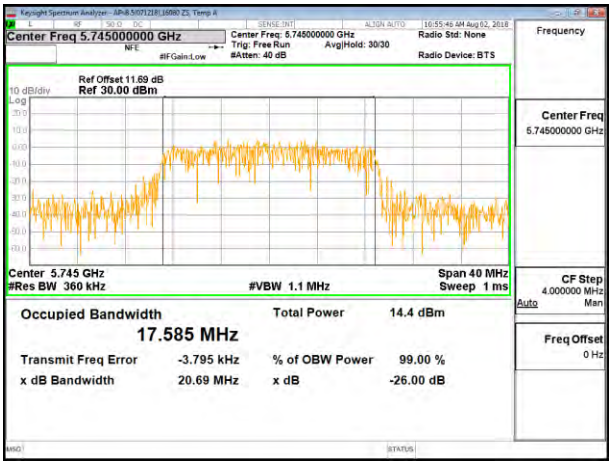
MID CHANNEL



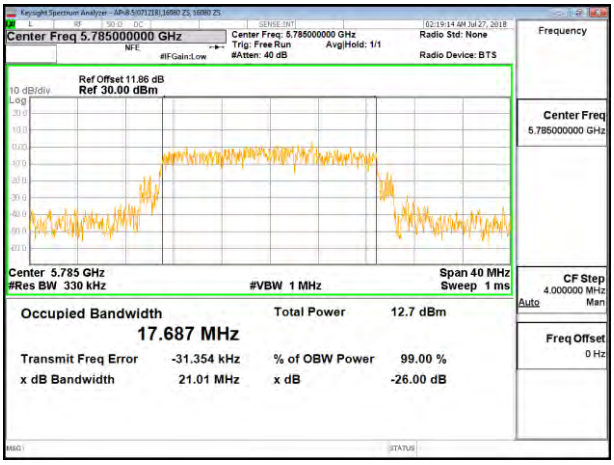
HIGH CHANNEL

8.3.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

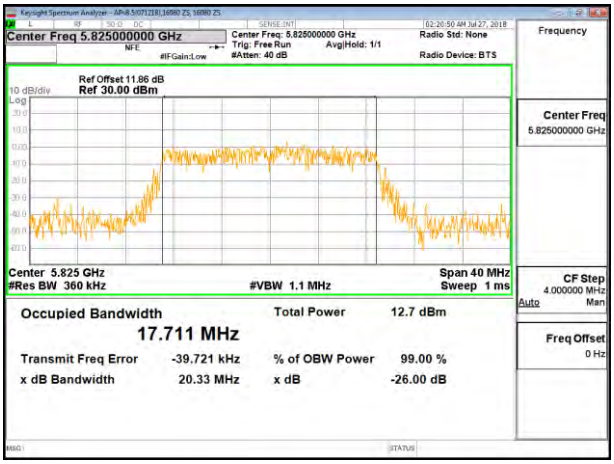
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.5850
Mid	5785	17.6870
High	5825	17.7110



LOW CHANNEL



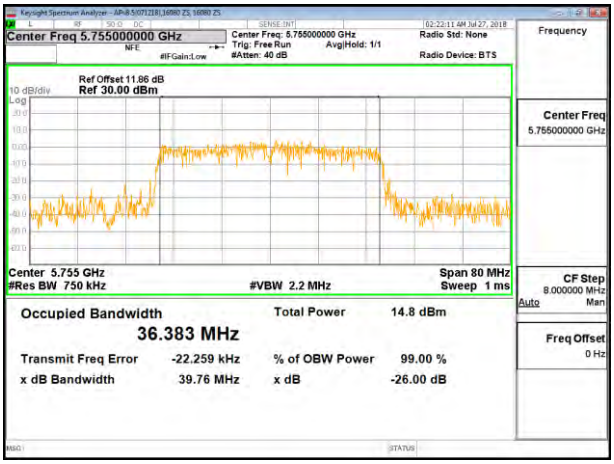
MID CHANNEL



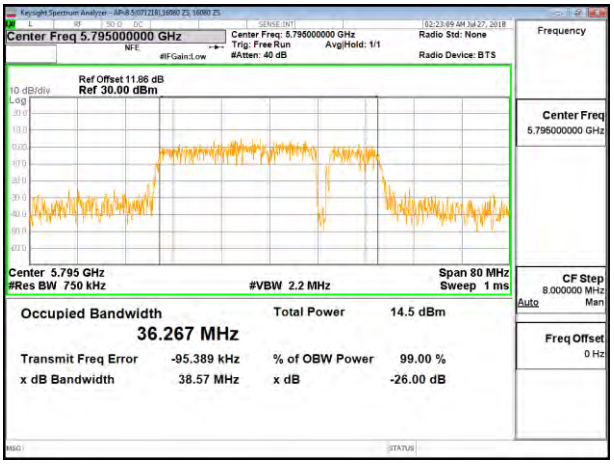
HIGH CHANNEL

8.3.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	36.3830
High	5795	36.2670



LOW CHANNEL



HIGH CHANNEL

8.3.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Mid	5775	75.7970

MID CHANNEL

8.4. 6 dB BANDWIDTH

LIMITS

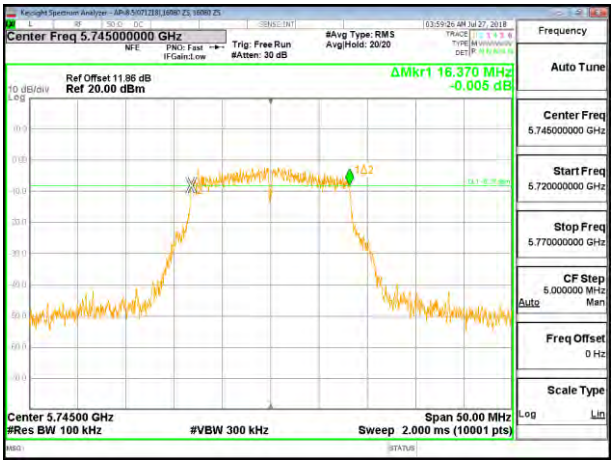
FCC §15.407 (e)

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

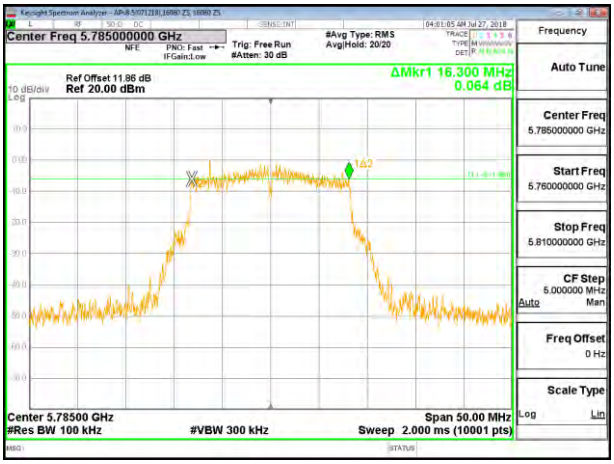
RESULTS

8.4.1. 802.11a MODE IN THE 5.8 GHz BAND

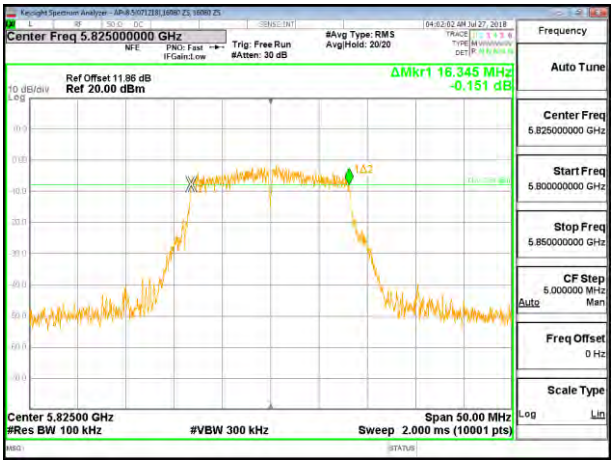
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.3700	0.5
Mid	5785	16.3000	0.5
High	5825	16.3450	0.5
144	5720	3.2200	0.5



LOW CHANNEL



MID CHANNEL

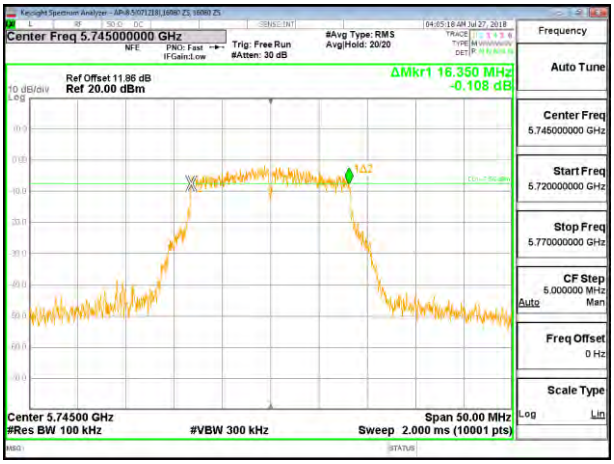


HIGH CHANNEL

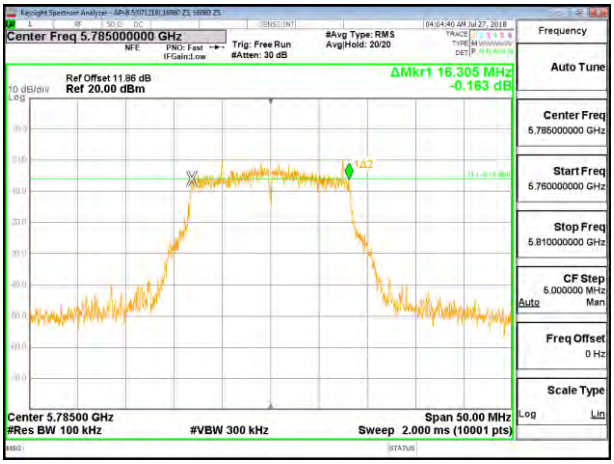
CHANNEL 144

8.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

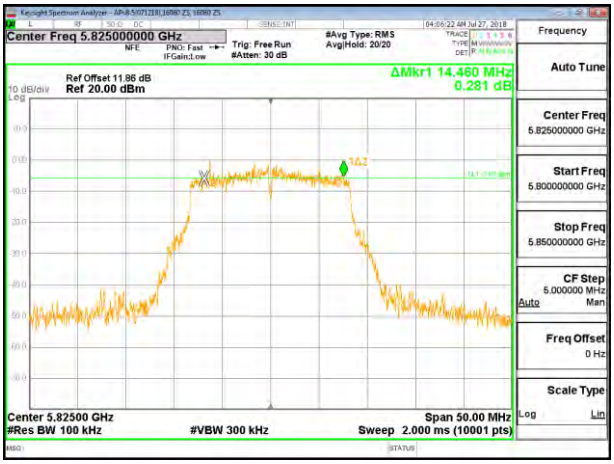
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.3500	0.5
Mid	5785	16.3050	0.5
High	5825	14.4600	0.5
144	5720	3.9200	0.5



LOW CHANNEL



MID CHANNEL

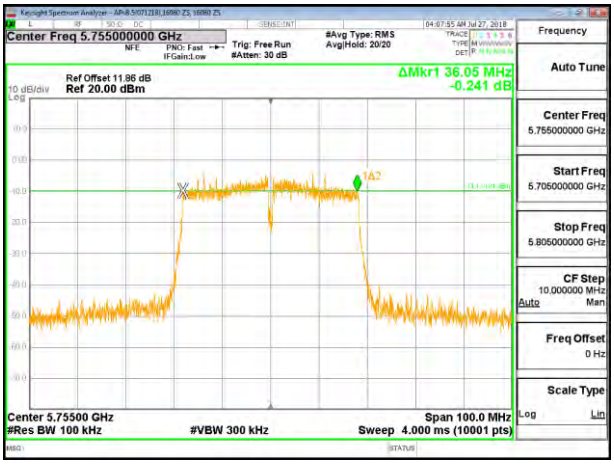


HIGH CHANNEL

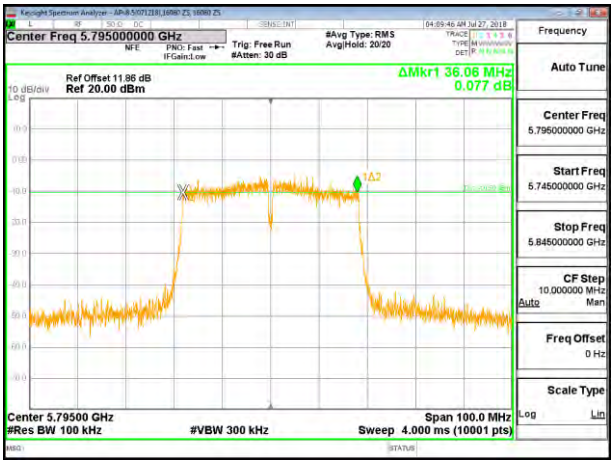
CHANNEL 144

8.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.0500	0.5
High	5795	36.0600	0.5
142	5710	3.0900	0.5



LOW CHANNEL

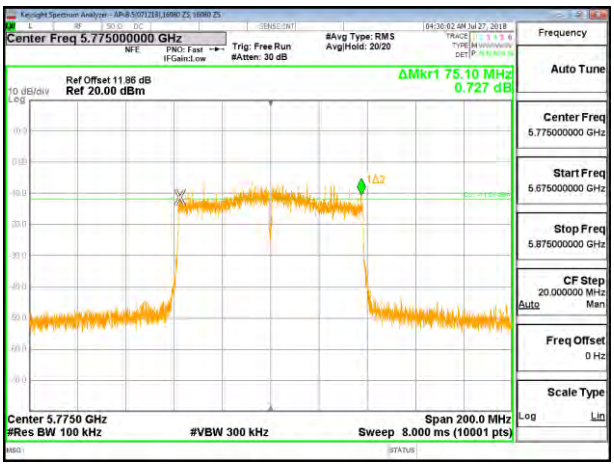


HIGH CHANNEL

CHANNEL 142

8.4.4. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Mid	5775	75.1000	0.5
138	5690	3.1600	0.5



MID CHANNEL

CHANNEL 138

8.5. OUTPUT POWER AND PSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz

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

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

Band 5.725-5.85 GHz

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

TEST PROCEDURE

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

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

DIRECTIONAL ANTENNA GAIN

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

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RESULTS

8.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)
Low	5180	5.00	24.00	11.00
Mid	5200	5.00	24.00	11.00
High	5240	5.00	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

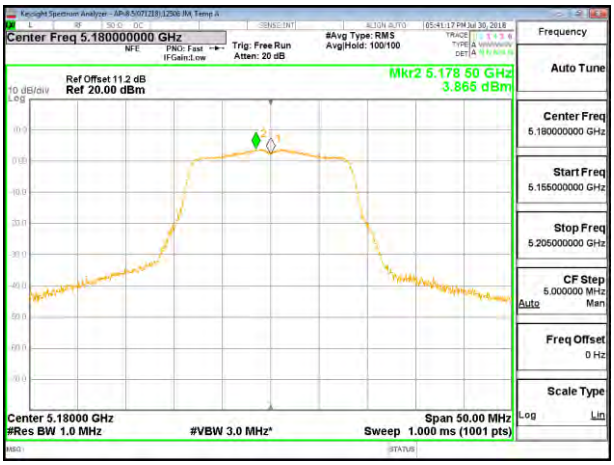
Output Power Results

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.360	14.36	24.00	-9.64
Mid	5200	17.250	17.25	24.00	-6.75
High	5240	17.320	17.32	24.00	-6.68

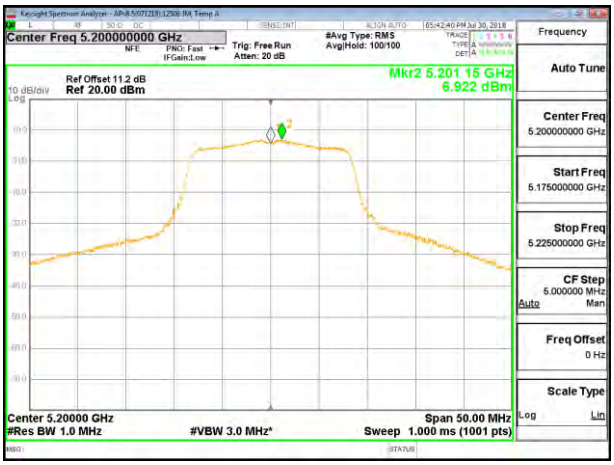
PSD Results

Channel	Frequency (MHz)	Measured PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5180	3.865	3.87	11.00	-7.14
Mid	5200	6.922	6.92	11.00	-4.08
High	5240	6.672	6.67	11.00	-4.33

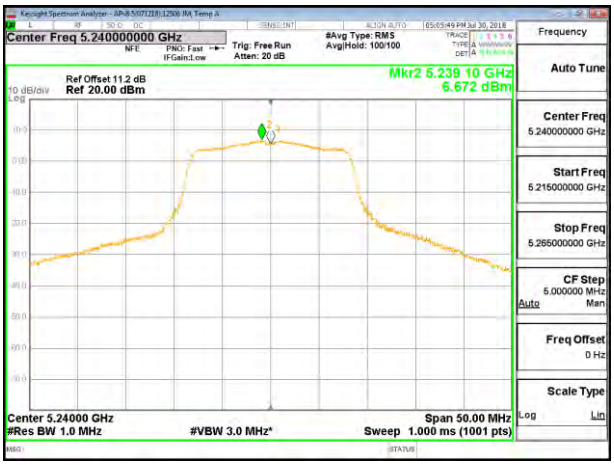
PSD



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)
Low	5180	5.00	24.00	11.00
Mid	5200	5.00	24.00	11.00
High	5240	5.00	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

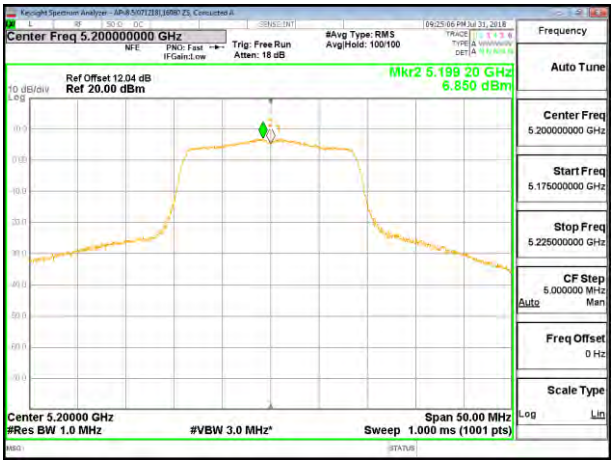
Output Power Results

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	13.83	13.83	24.00	-10.17
Mid	5200	17.01	17.01	24.00	-6.99
High	5240	17.02	17.02	24.00	-6.98

PSD Results

Channel	Frequency (MHz)	Measured PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5180	3.879	3.88	11.00	-7.12
Mid	5200	6.850	6.85	11.00	-4.15
High	5240	6.393	6.39	11.00	-4.61

LOW CHANNEL



MID CHANNEL

HIGH CHANNEL

8.5.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)
Low	5190	5.00	24.00	11.00
High	5230	5.00	24.00	11.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Measured Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	13.020	13.02	24.00	-10.98
High	5230	15.660	15.66	24.00	-8.34

PSD Results

Channel	Frequency (MHz)	Measured PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5190	0.084	0.18	11.00	-10.82
High	5230	2.468	2.57	11.00	-8.43

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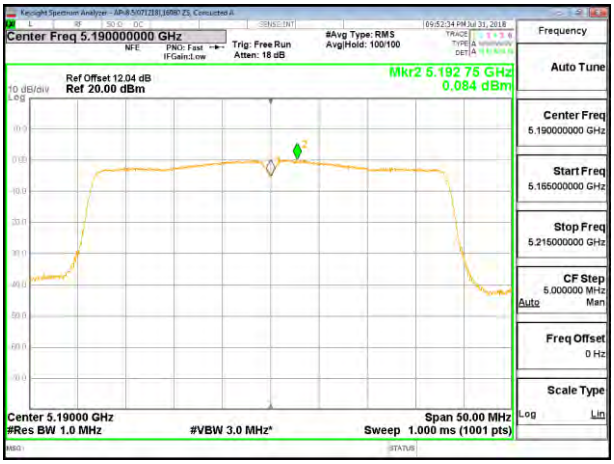

LOW CHANNEL

HIGH CHANNEL

8.5.4. 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)
Mid	5210	5.00	24.00	11.00

Duty Cycle CF (dB)	0.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Measuered Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5210	9.020	9.02	24.00	-14.98

PPSD Results

Channel	Frequency (MHz)	Measuered PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5210	-7.276	-7.09	11.00	-18.09

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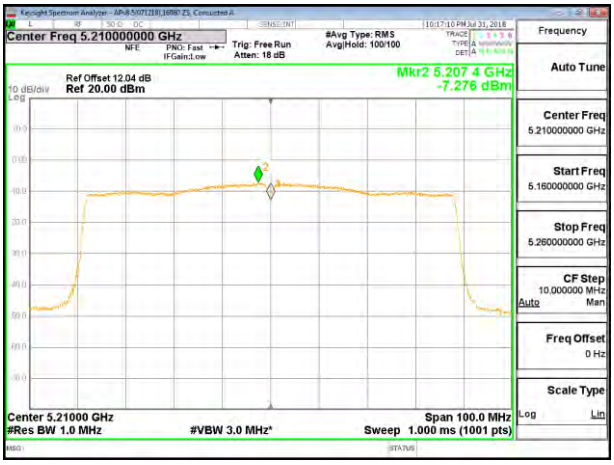


MID CHANNEL

8.5.5. 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	21.70	5.00	24.00	11.00
Mid	5300	21.55	5.00	24.00	11.00
High	5320	21.65	5.00	24.00	11.00

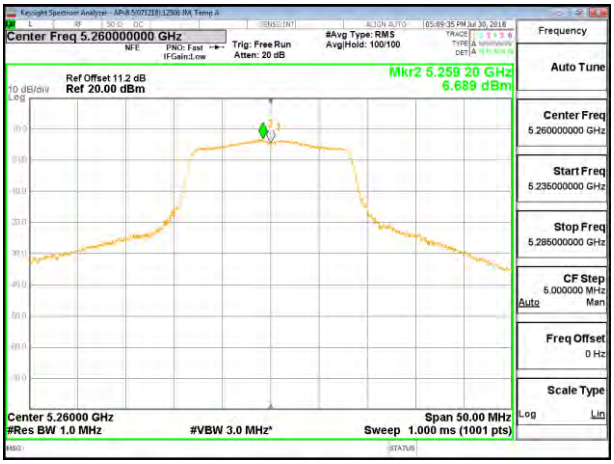
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

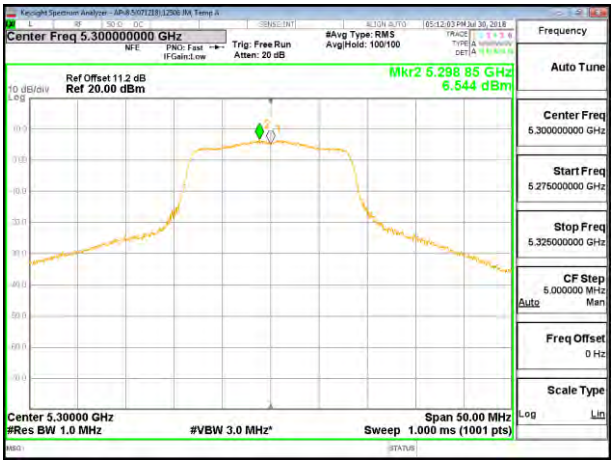
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	17.31	17.31	24.00	-6.69
Mid	5300	17.22	17.22	24.00	-6.78
High	5320	14.17	14.17	24.00	-9.83

PSD Results

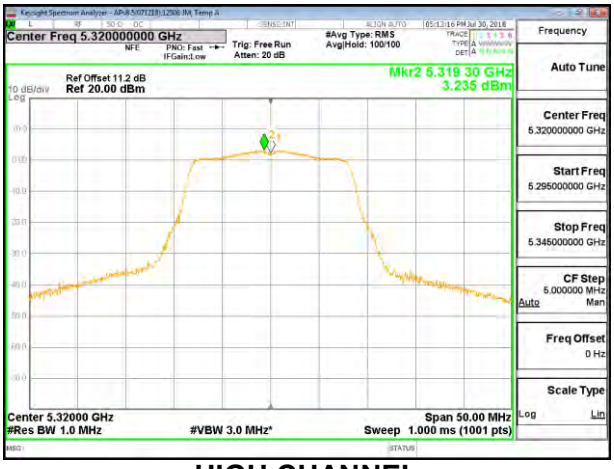
Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	6.689	6.69	11.00	-4.31
Mid	5300	6.544	6.54	11.00	-4.46
High	5320	3.235	3.24	11.00	-7.77



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.6. 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	21.85	5.00	24.00	11.00
Mid	5300	21.80	5.00	24.00	11.00
High	5320	21.95	5.00	24.00	11.00

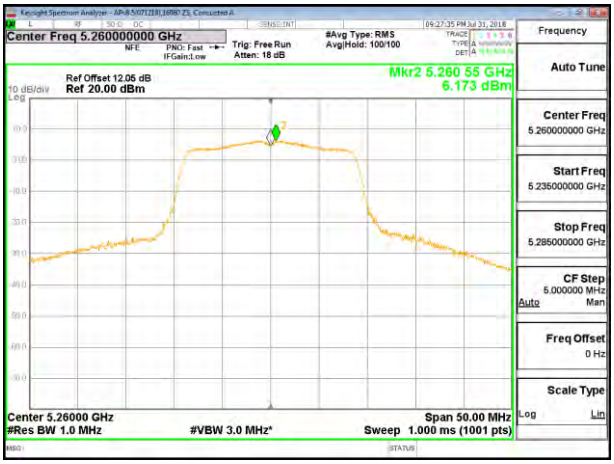
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

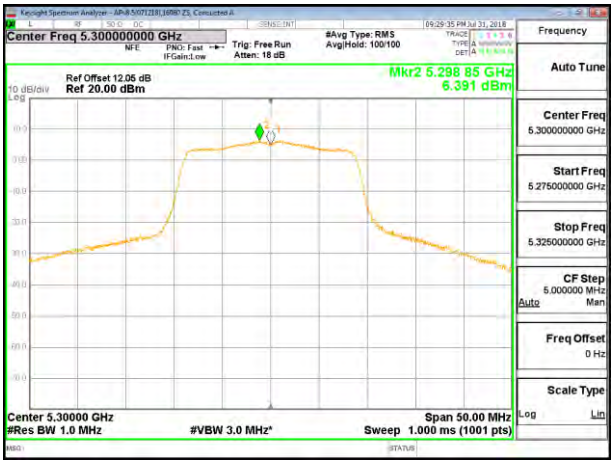
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	17.01	17.01	24.00	-6.99
Mid	5300	16.87	16.87	24.00	-7.13
High	5320	13.53	13.53	24.00	-10.47

PSD Results

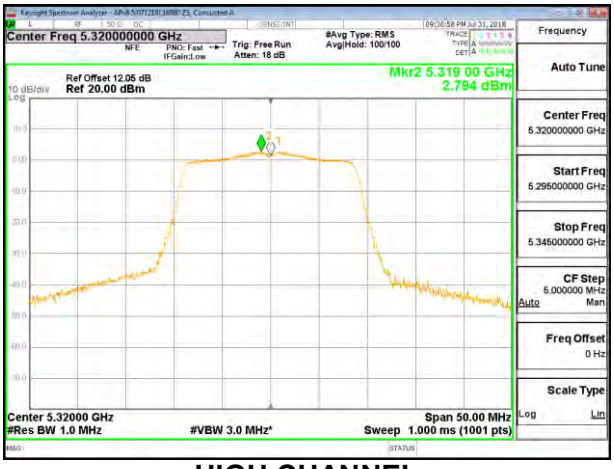
Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5260	6.173	6.17	11.00	-4.83
Mid	5300	6.391	6.39	11.00	-4.61
High	5320	2.794	2.79	11.00	-8.21



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

8.5.7. 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	5270	40.50	5.00	24.00	11.00
High	5310	40.30	5.00	24.00	11.00

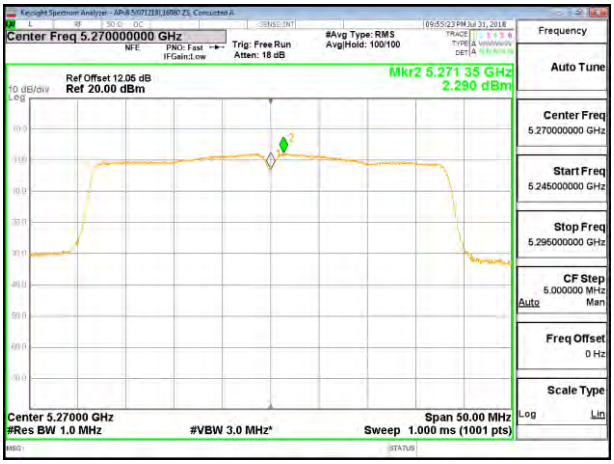
Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD

Output Power Results

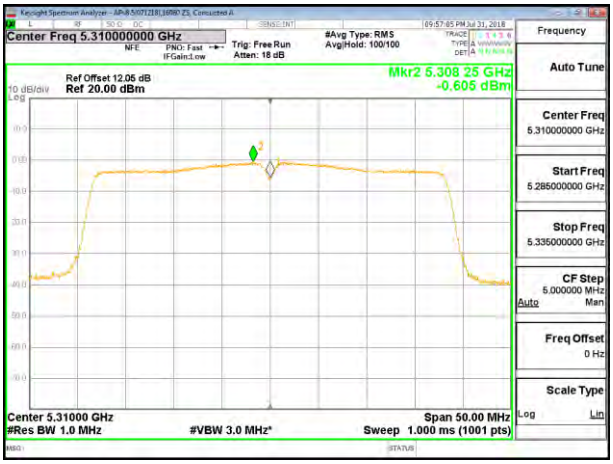
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	15.16	15.16	24.00	-8.84
High	5310	12.73	12.73	24.00	-11.27

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Low	5270	2.290	2.39	11.00	-8.61
High	5310	-0.605	-0.51	11.00	-11.51



LOW CHANNEL



HIGH CHANNEL

8.5.8. 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	82.40	5.00	24.00	11.00

Duty Cycle CF (dB)	0.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5290	11.64	11.64	24.00	-12.36

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/1MHz)	Total Corr'd PSD (dBm/1MHz)	PSD Limit (dBm/1MHz)	PSD Margin (dB)
Mid	5290	-4.692	-4.50	11.00	-15.50

MID CHANNEL

8.5.9. 802.11a MODE IN THE 5.6 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directiona Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/1 MHz)
Low	5500	21.65	5.00	24.00	11.00
Mid	5580	21.60	5.00	24.00	11.00
High	5700	21.65	5.00	24.00	11.00
*144	5720	21.60	5.00	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

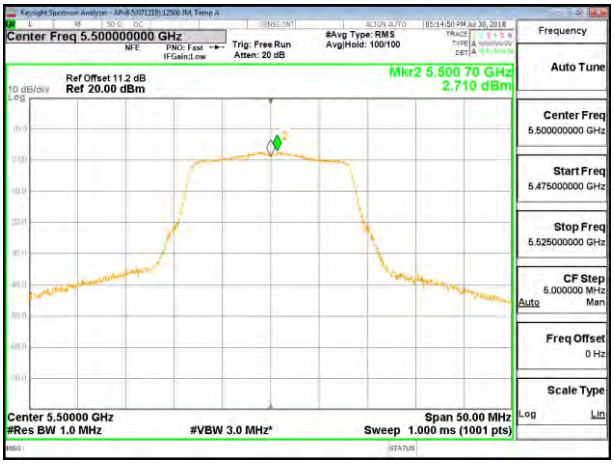
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.960	13.96	24.00	-10.04
Mid	5580	17.060	17.06	24.00	-6.94
High	5700	13.440	13.44	24.00	-10.56
*144	5720	17.020	17.02	24.00	-6.98

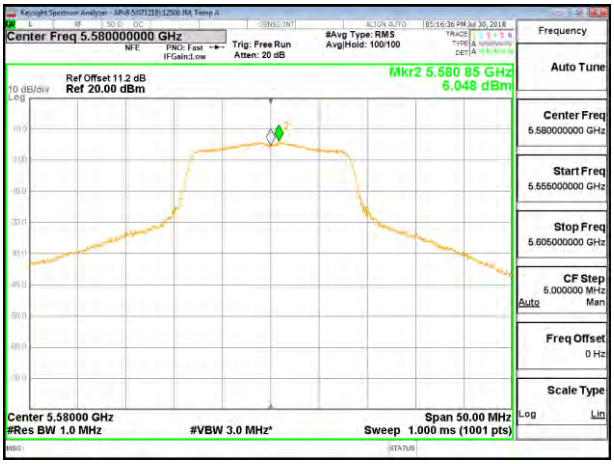
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	2.710	2.710	11.00	-8.29
Mid	5580	6.048	6.048	11.00	-4.95
High	5700	2.055	2.055	11.00	-8.95
*144	5720	6.211	6.211	11.00	-4.79

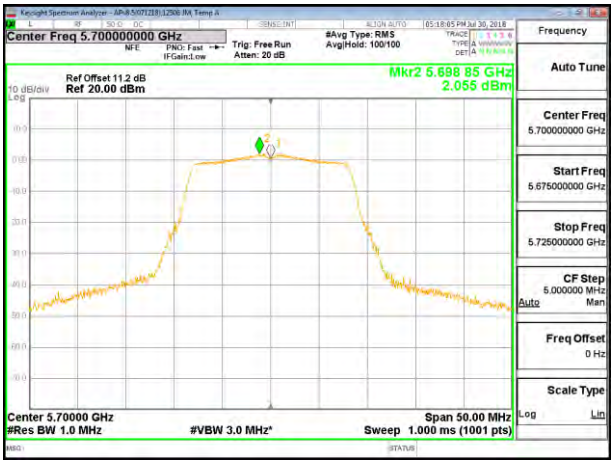
*Based on the 15.80MHz bandwidth for the portion that the straddle channel occupies in the UNII-2C band, the calculated power limit is 11+10*log (15.80) =22.99 dBm. The total signal power is 17.02 dBm which is less than the limit of 22.99dBm.



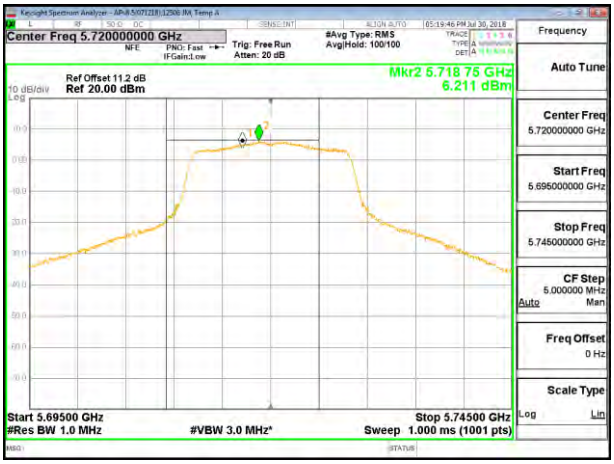
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144

8.5.10. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/1MHz)
Low	5500	22.60	5.00	24.00	11.00
Mid	5580	22.00	5.00	24.00	11.00
High	5700	22.00	5.00	24.00	11.00
*144	5720	21.95	5.00	24.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

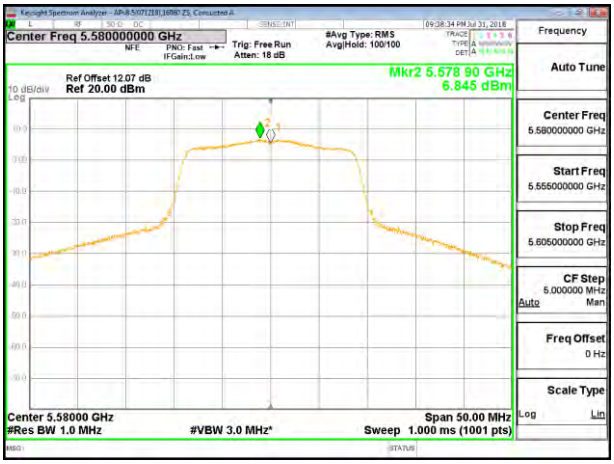
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	13.620	13.62	24.00	-10.38
Mid	5580	16.870	16.87	24.00	-7.13
High	5700	12.900	12.90	24.00	-11.10
*144	5720	16.780	16.78	24.00	-7.22

PSD Results

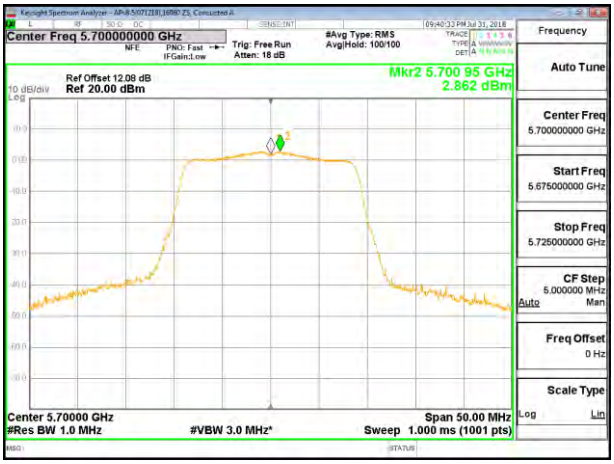
Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5500	3.156	11.00	-7.84
Mid	5580	6.845	11.00	-4.16
High	5700	2.862	11.00	-8.14
*144	5720	6.740	11.00	-4.26

*Based on the 15.98MHz bandwidth for the portion that the straddle channel occupies in the UNII-2C band, the calculated power limit is 11+10*log (15.98) =23.04 dBm. The total signal power is 16.78 dBm which is less than the limit of 23.04dBm.

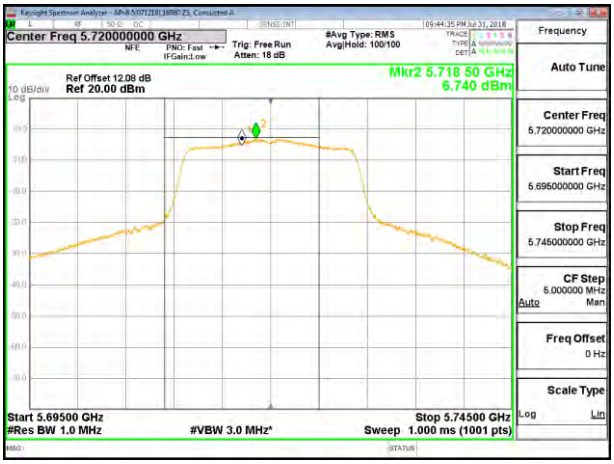
LOW CHANNEL



MID CHANNEL



HIGH CHANNEL



CHANNEL 144

8.5.11. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Direction Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/1 MHz)
Low	5510	40.60	5.00	24.00	11.00
Mid	5550	40.50	5.00	24.00	11.00
High	5670	40.60	5.00	24.00	11.00
*142	5710	40.70	5.00	24.00	11.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD

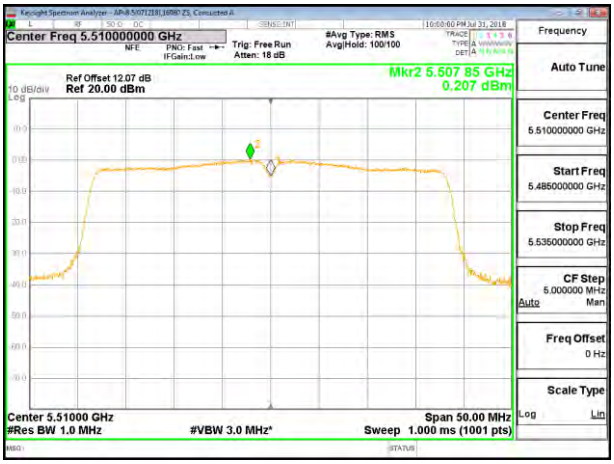
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	13.550	13.55	24.00	-10.45
Mid	5550	15.500	15.50	24.00	-8.50
High	5670	15.780	15.78	24.00	-8.22
*142	5710	15.620	15.62	24.00	-8.38

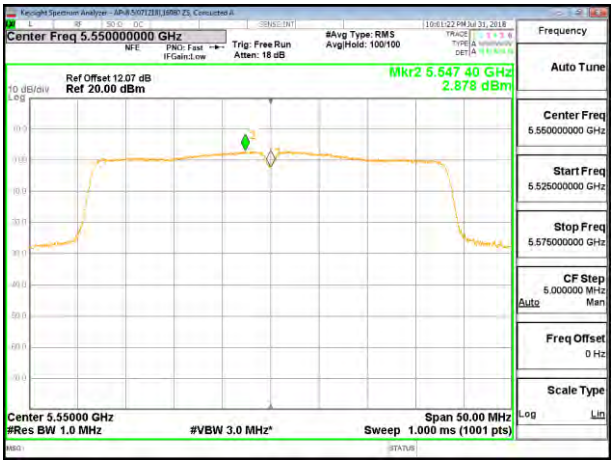
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5510	0.207	0.307	11.00	-10.69
Mid	5550	2.878	2.978	11.00	-8.02
High	5670	3.156	3.256	11.00	-7.74
*142	5710	3.855	3.955	11.00	-7.05

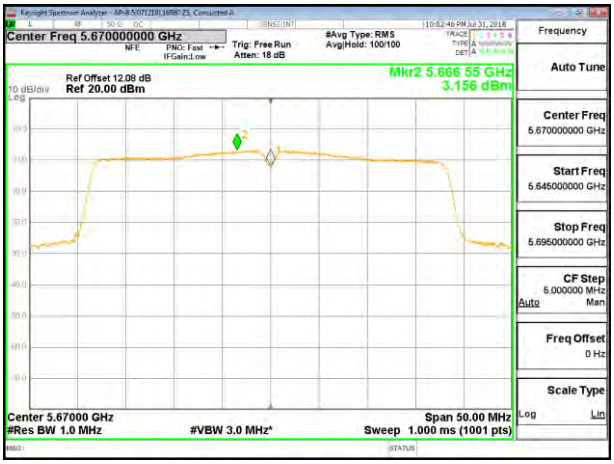
*The 26dB signal bandwidth wthin the 5470 -5725 MHz band clearly exceed 20MHz and so the limit for the power within the 5470-5725MHz band is 24dBm.



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

CHANNEL 142

8.5.12. 802.11ac VHT80 MODE IN THE 5.6 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ 1MHz)
Low	5530	82.60	5.00	24.00	11.00
High	5610	82.40	5.00	24.00	11.00
*138	5690	82.60	5.00	24.00	11.00

Duty Cycle CF (dB)	0.19	Included in Calculations of Corr'd PSD

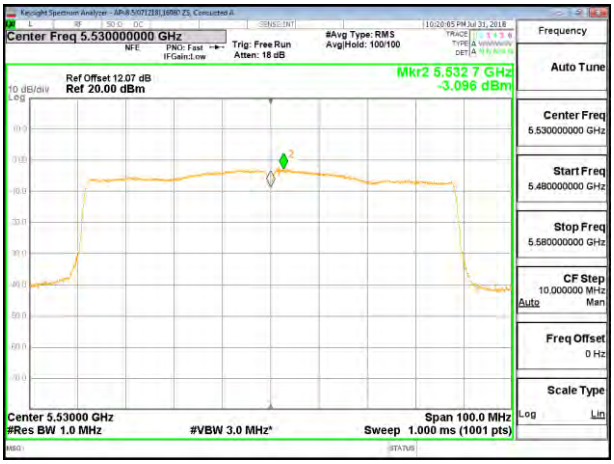
Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5530	13.010	13.01	24.00	-10.99
High	5610	15.990	15.99	24.00	-8.01
*138	5690	16.330	16.33	24.00	-7.67

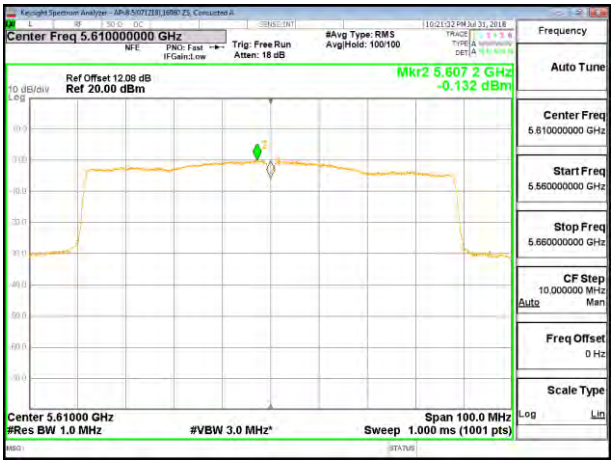
PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 1MHz)	Total Corr'd PSD (dBm/ 1MHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5530	-3.096	-2.906	11.00	-13.91
High	5610	-0.132	0.058	11.00	-10.94
*138	5690	1.040	1.230	11.00	-9.77

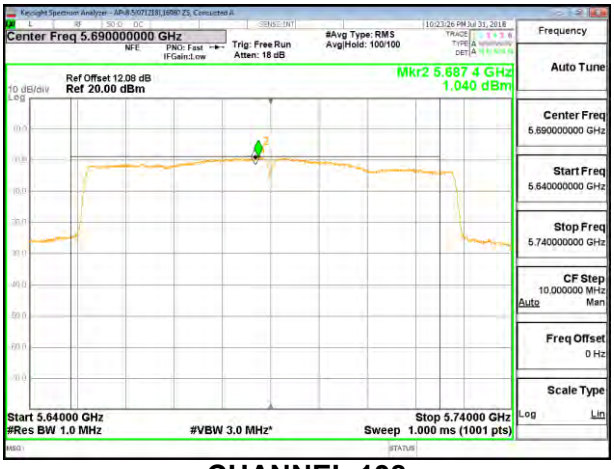
*The 26dB signal bandwidth wthin the 5470 -5725 MHz band clearly exceed 20MHz and so the limit for the power within the 5470-5725MHz band is 24dBm.



LOW CHANNEL



HIGH CHANNEL



CHANNEL 138

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8.5.13. 802.11a MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ /500KHz)
Low	5745	5.00	30.00	30.00
Mid	5785	5.00	30.00	30.00
High	5825	5.00	30.00	30.00

Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD

Output Power Results

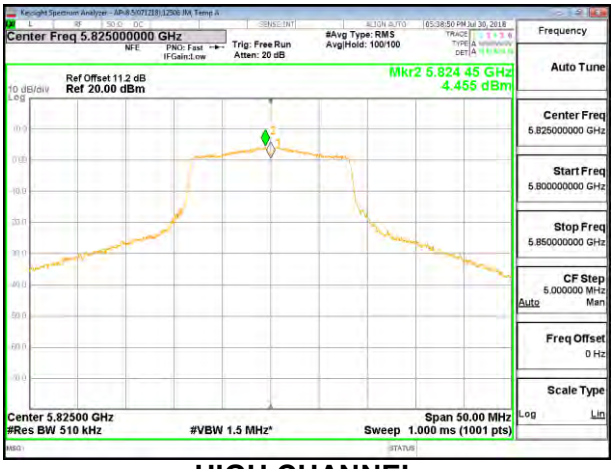
Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	17.10	17.10	30.00	-12.90
Mid	5785	17.10	17.10	30.00	-12.90
High	5825	17.02	17.02	30.00	-12.98

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 500KHz)	PSD Margin (dB)
Low	5745	3.406	3.506	30.00	-26.49
Mid	5785	3.737	3.837	30.00	-26.16
High	5825	4.455	4.555	30.00	-25.45

LOW CHANNEL

MID CHANNEL



HIGH CHANNEL

8.5.14. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ 500KHz)
Low	5745	5.00	30.00	30.00
Mid	5785	5.00	30.00	30.00
High	5825	5.00	30.00	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	17.02	17.02	30.00	-12.98
Mid	5785	16.84	16.84	30.00	-13.16
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	4.102	4.102	30.00	-25.90
Mid	5785	4.034	4.034	30.00	-25.97
High	5825	3.957	3.957	30.00	-26.04

LOW CHANNEL

MID CHANNEL

HIGH CHANNEL

8.5.15. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/ 500KHz)
Low	5755	5.00	30.00	30.00
High	5795	5.00	30.00	30.00

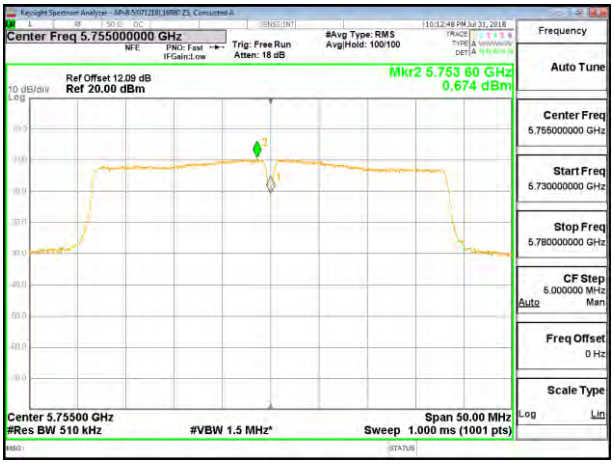
Duty Cycle CF (dB)	0.10	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	15.59	15.59	30.00	-14.41
High	5795	15.54	15.54	30.00	-14.46

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Low	5755	0.674	0.774	30.00	-29.23
High	5795	0.232	0.332	30.00	-29.67



LOW CHANNEL

HIGH CHANNEL

8.5.16. 802.11ac VHT80 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	FCC PSD Limit (dBm/500KHz)
Mid	5775	5.00	30.00	30.00

Duty Cycle CF (dB)	0.19	Included in Calculations of Corr'd PSD

Output Power Results

Channel	Frequency (MHz)	Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Mid	5775	15.96	15.96	30.00	-14.04

PSD Results

Channel	Frequency (MHz)	Meas PSD (dBm/ 500KHz)	Total Corr'd PSD (dBm/ 500KHz)	PSD Limit (dBm/ 1MHz)	PSD Margin (dB)
Mid	5775	-4.044	-3.854	30.00	-33.85

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MID CHANNEL

9. 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

6.2.1.2 (for 5150-5250 MHz band)
6.2.2.2 (for 5250-5350 MHz band)
6.2.3.2 (for 5470-5600 MHz and 5650-5725 MHz bands)
6.2.4.2 (for 5725-5850 MHz band)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

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

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

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

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

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

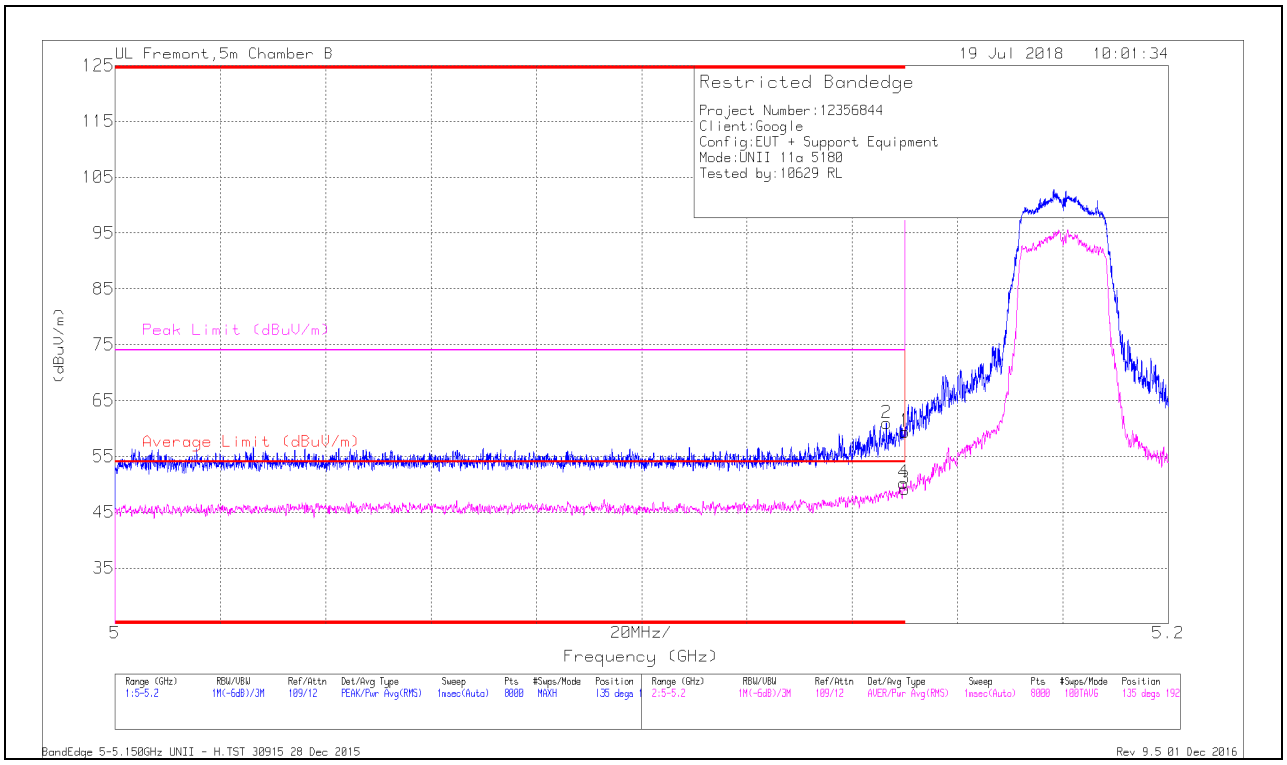
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

9.1. TRANSMITTER ABOVE 1 GHz

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

BANDEDGE (LOW CHANNEL)

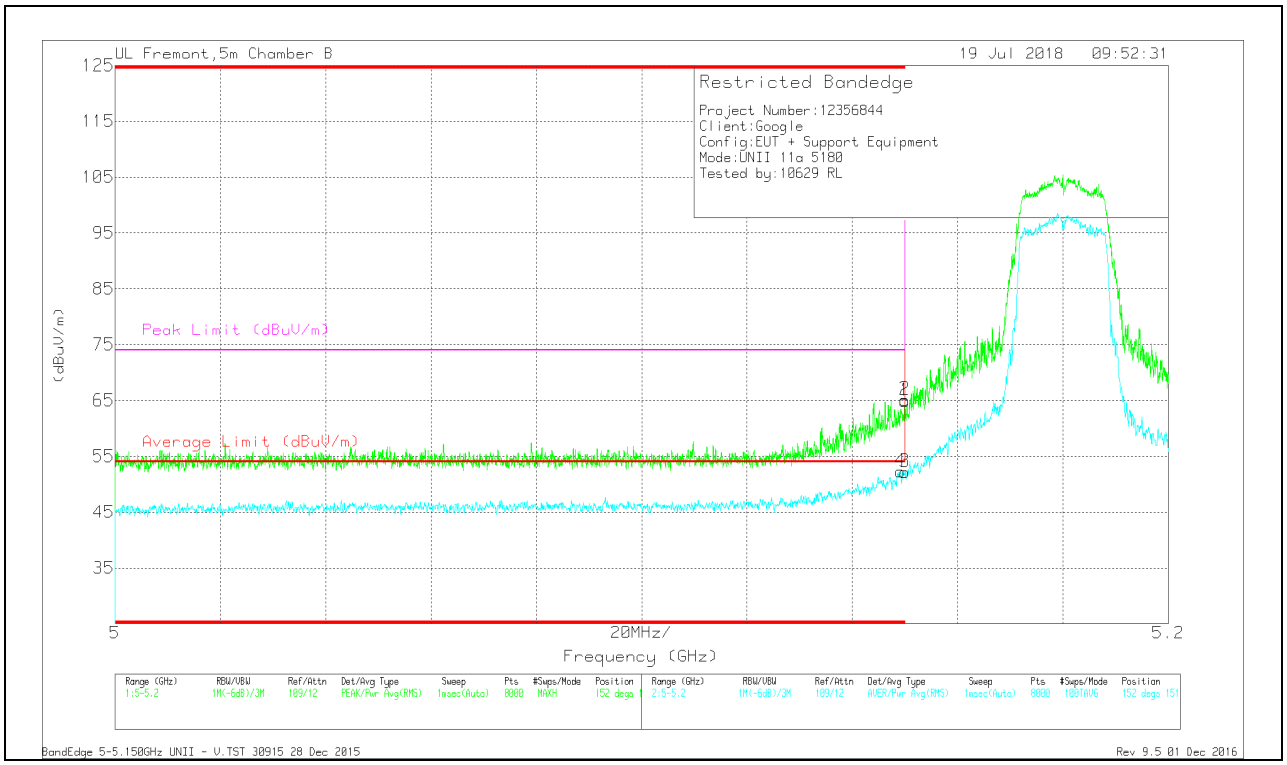
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.146	44.75	Pk	34.6	-18.4	60.95	-	-	74	-13.05	135	192	H
1	* 5.15	43.31	Pk	34.6	-18.5	59.41	-	-	74	-14.59	135	192	H
3	* 5.15	33.08	RMS	34.6	-18.5	49.18	54	-4.82	-	-	135	192	H
4	* 5.15	34.12	RMS	34.6	-18.5	50.22	54	-3.78	-	-	135	192	H

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

VERTICAL RESULT

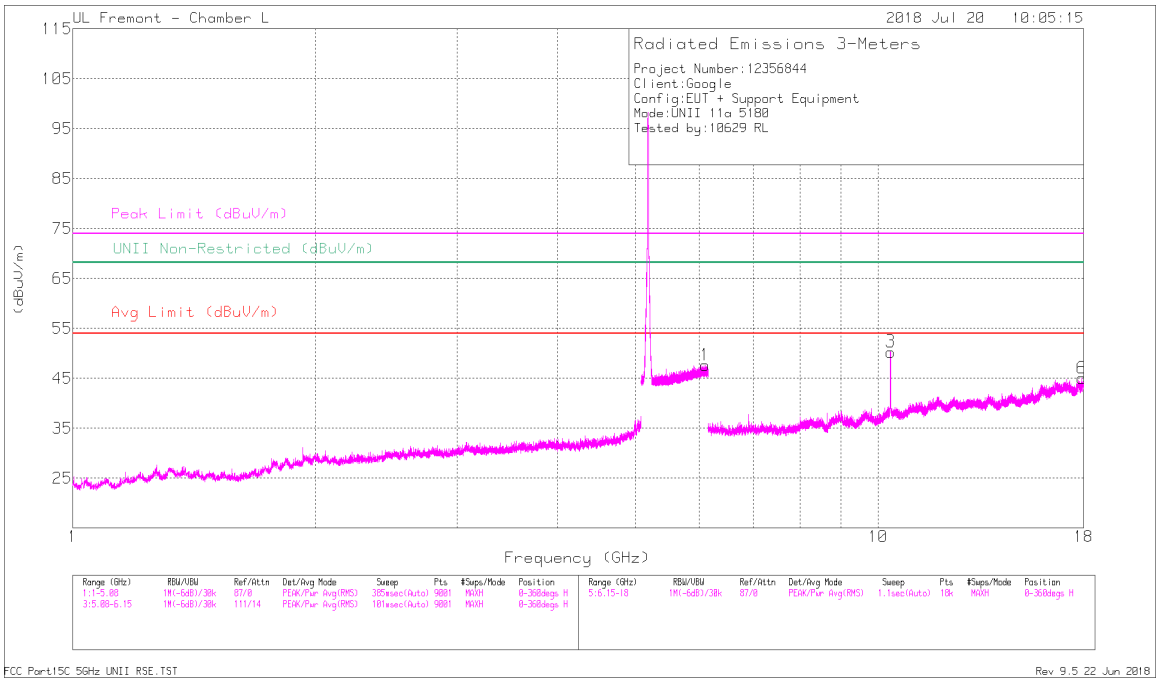


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 5.149	36.16	RMS	34.6	-18.5	52.26	54	-1.74	-	-	152	151	V
1	* 5.15	48.84	Pk	34.6	-18.5	64.94	-	-	74	-9.06	152	151	V
2	* 5.15	49.03	Pk	34.6	-18.5	65.13	-	-	74	-8.87	152	151	V
3	* 5.15	36.1	RMS	34.6	-18.5	52.2	54	-1.8	-	-	152	151	V

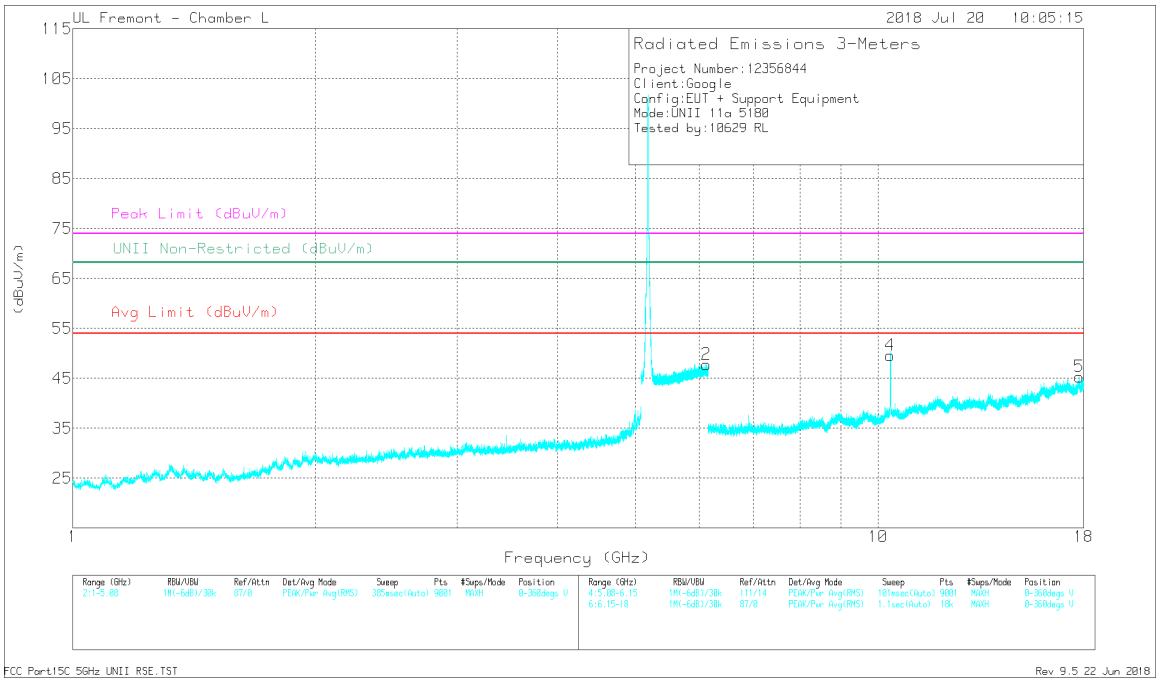
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency(GHz)	MeterReading(dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	CorrectedReading(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
6.098	34.15	PK-U	35.4	-17.6	51.95	-	-	-	-	68.2	-16.25	291	120	H
6.125	34.4	PK-U	35.4	-17.7	52.1	-	-	-	-	68.2	-16.1	2	268	V
10.359	44.4	PK-U	37.5	-21.1	60.8	-	-	-	-	68.2	-7.4	281	100	H
* 17.916	27.66	PK-U	40.6	-18.6	49.66	-	-	74	-24.34	-	-	219	116	H
* 17.913	19.89	ADR	40.6	-18.6	41.89	54	-12.11	-	-	-	-	219	116	H
10.359	45.27	PK-U	37.5	-21.1	61.67	-	-	-	-	68.2	-6.53	265	239	V
* 17.776	27.35	PK-U	40.5	-17.9	49.95	-	-	74	-24.05	-	-	337	159	V
* 17.778	19	ADR	40.5	-17.9	41.6	54	-12.4	-	-	-	-	337	159	V

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

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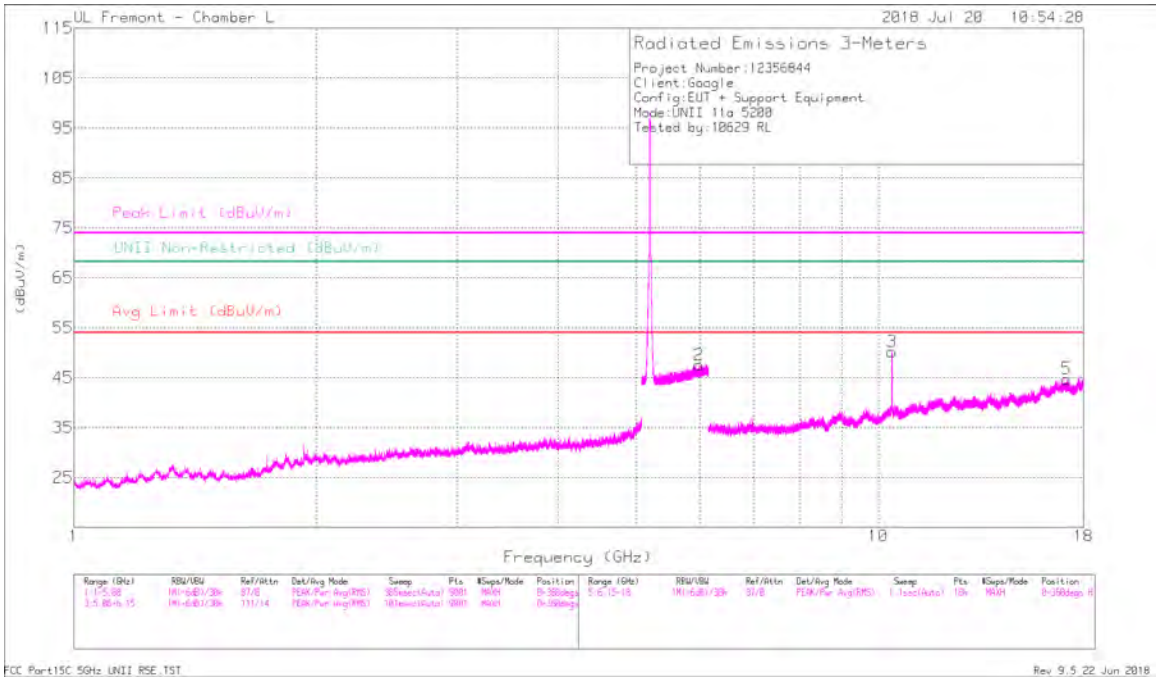
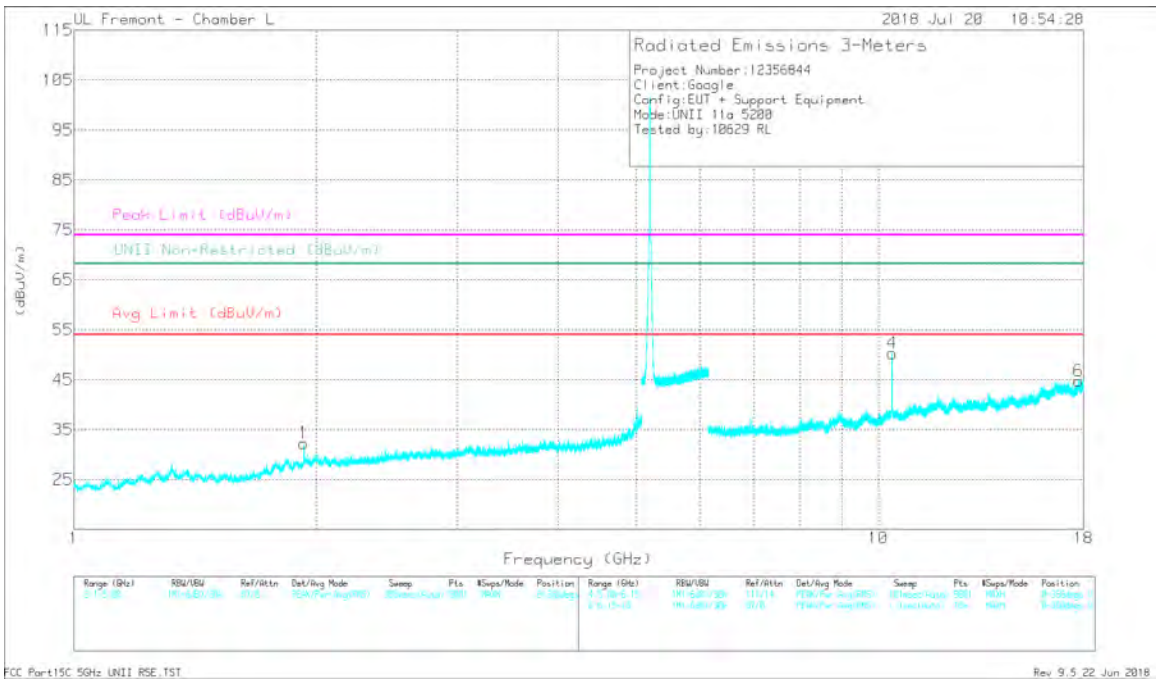
MID CHANNEL RESULTS



HORIZONTAL



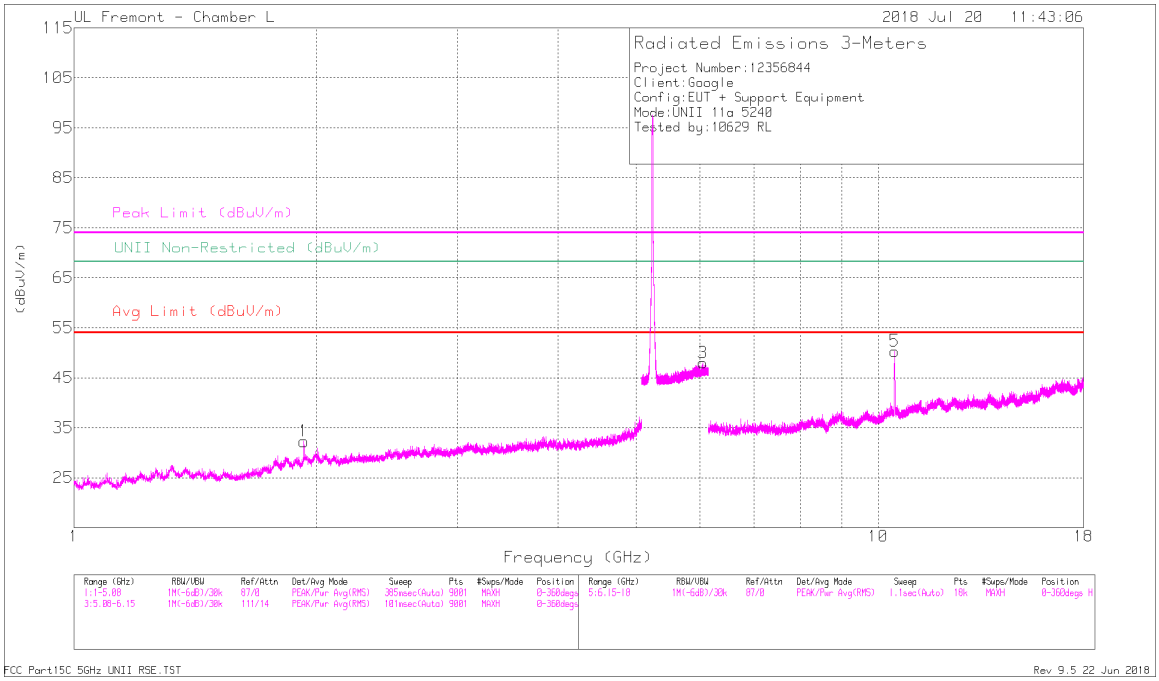
VERTICAL

RADIATED EMISSIONS

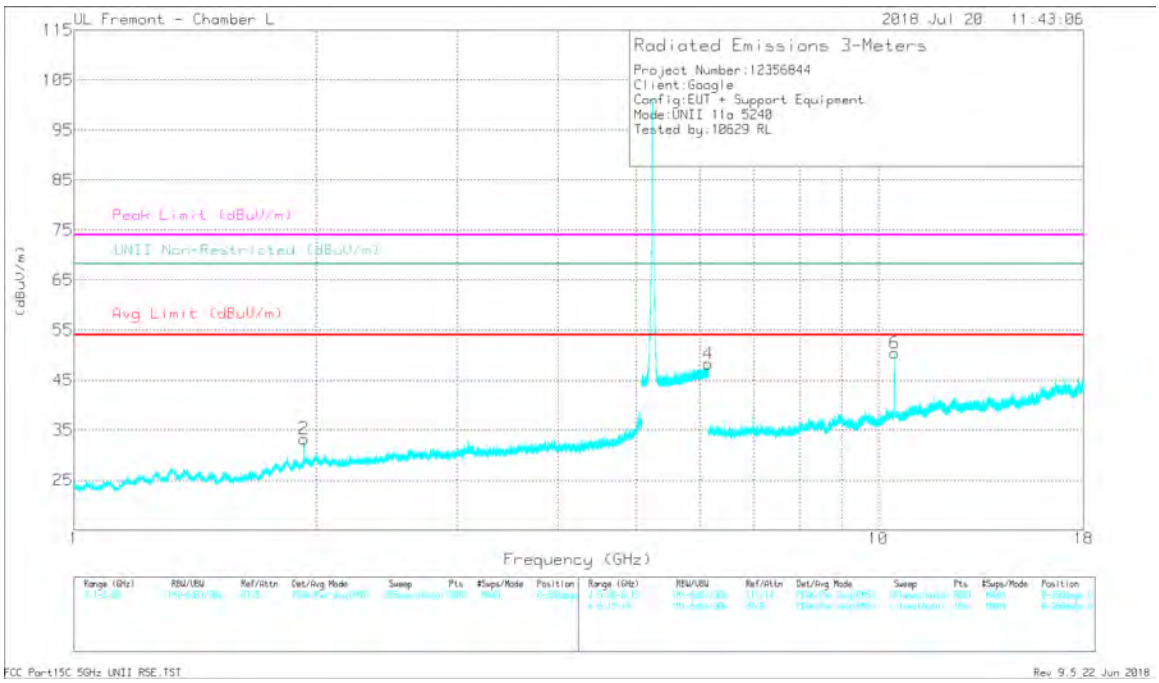
Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.932	41.68	PK-U	31.3	-33.5	39.48	-	-	-	-	68.2	-28.72	235	240	V
5.984	33.95	PK-U	35.1	-17.7	51.35	-	-	-	-	68.2	-16.85	205	236	H
5.988	25.97	ADR	35.1	-17.7	43.37	-	-	-	-	-	-	205	236	H
10.404	45.1	PK-U	37.5	-21.3	61.3	-	-	-	-	68.2	-6.9	283	101	H
17.145	28.09	PK-U	40.4	-19.1	49.39	-	-	-	-	68.2	-18.81	291	347	H
10.399	45.95	PK-U	37.5	-21.2	62.25	-	-	-	-	68.2	-5.95	266	234	V
* 17.744	28.56	PK-U	40.5	-18	51.06	-	-	74	-22.94	-	-	179	292	V
* 17.738	19.64	ADR	40.5	-17.9	42.24	54	-11.76	-	-	-	-	179	292	V

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

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

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RADIATED EMISSIONS

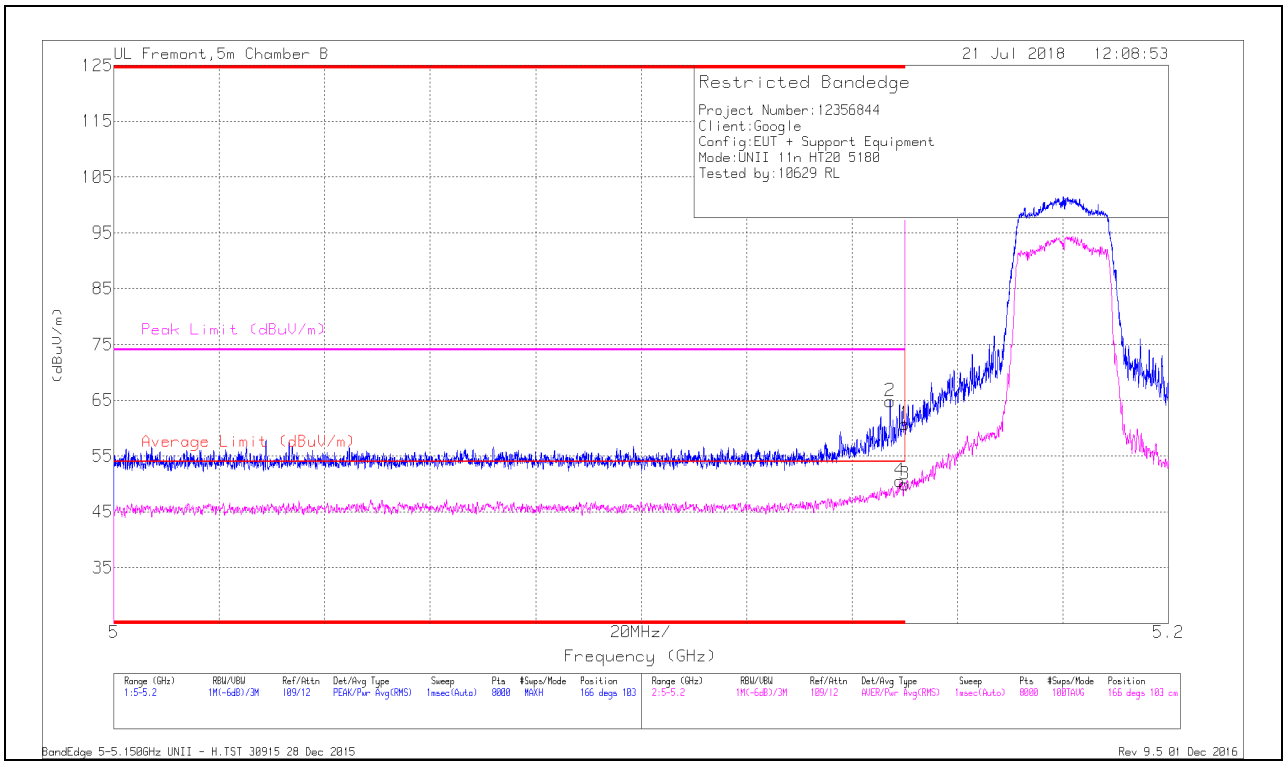
Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.932	39.72	PK-U	31.3	-33.5	37.52	-	-	-	-	68.2	-30.68	201	158	H
1.933	40.7	PK-U	31.3	-33.5	38.5	-	-	-	-	68.2	-29.7	51	239	V
6.05	35.45	PK-U	35.3	-17.7	53.05	-	-	-	-	68.2	-15.15	157	200	H
6.145	33.66	PK-U	35.5	-17.7	51.46	-	-	-	-	68.2	-16.74	124	269	V
10.479	44.94	PK-U	37.5	-21.1	61.34	-	-	-	-	68.2	-6.86	195	271	H
10.479	44.28	PK-U	37.5	-21.1	60.68	-	-	-	-	68.2	-7.52	265	237	V

PK-U - U-NII: Maximum Peak

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

BANDEDGE (LOW CHANNEL)

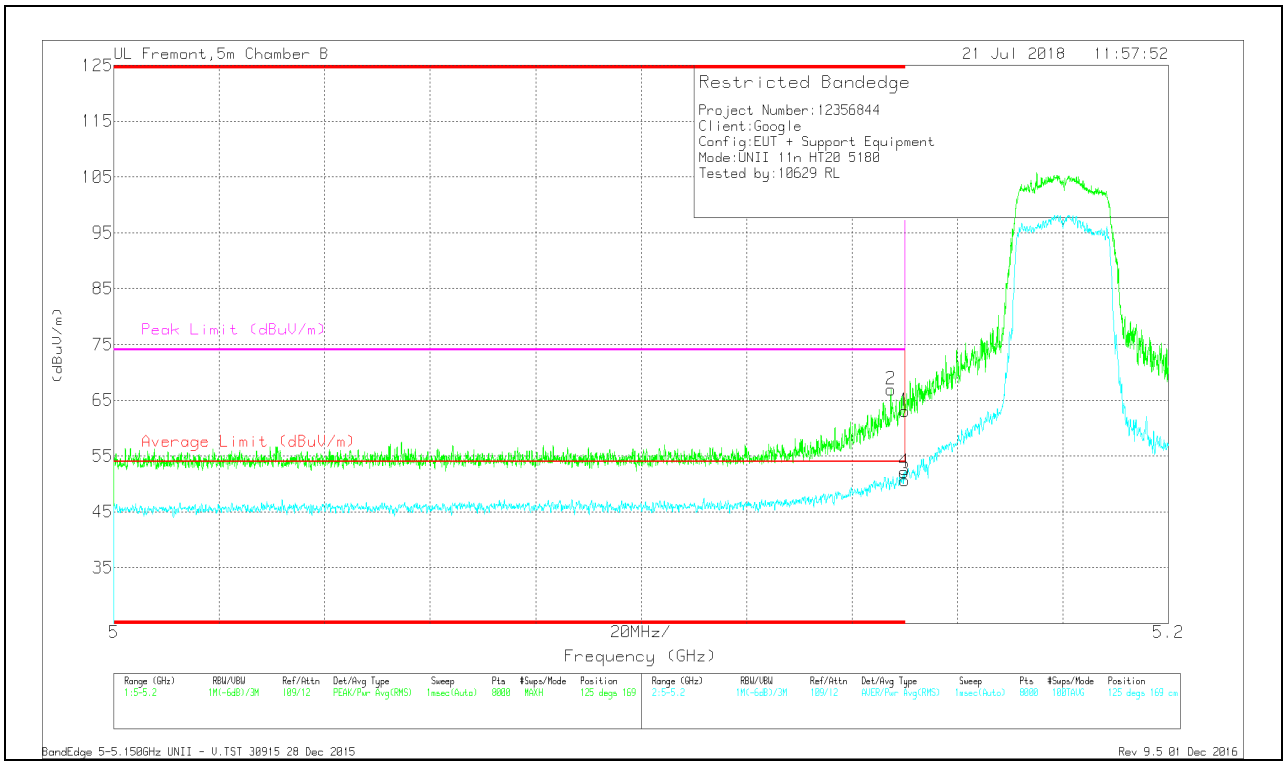
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.147	48.75	Pk	34.6	-18.5	64.85	-	-	74	-9.15	166	103	H
4	* 5.149	34.41	RMS	34.6	-18.5	50.51	54	-3.49	-	-	166	103	H
1	* 5.15	44.58	Pk	34.6	-18.5	60.68	-	-	74	-13.32	166	103	H
3	* 5.15	33.83	RMS	34.6	-18.5	49.93	54	-4.07	-	-	166	103	H

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

VERTICAL RESULT

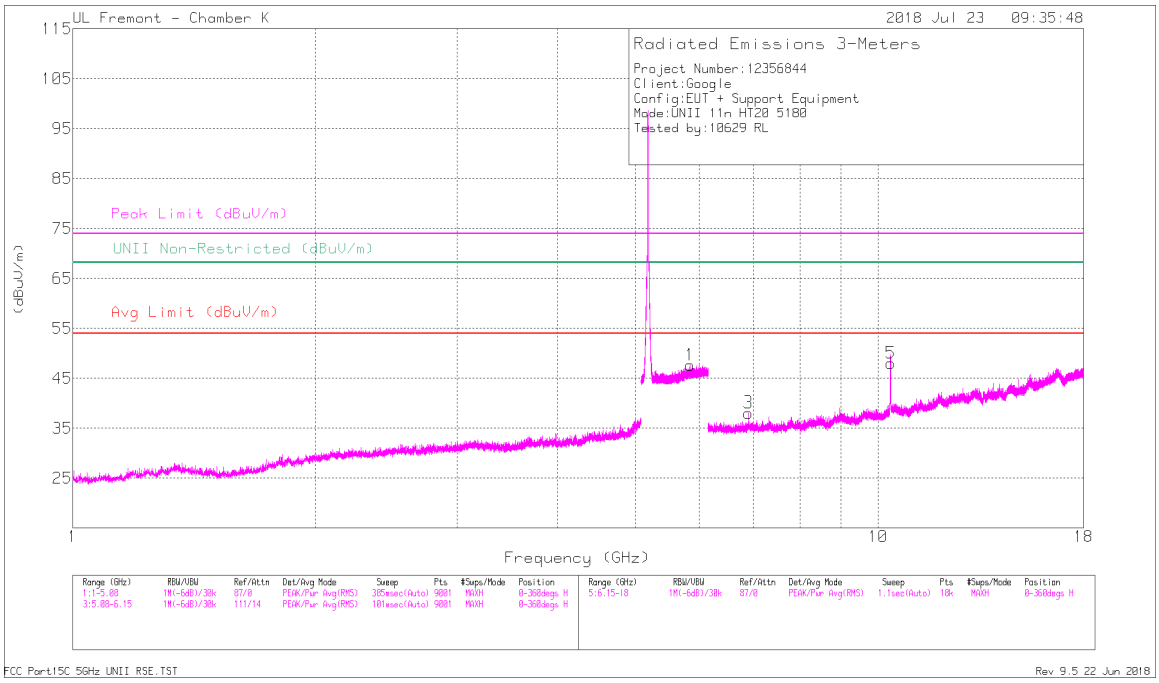


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	46.96	Pk	34.6	-18.5	63.06	-	-	74	-10.94	125	169	V
2	* 5.147	50.78	Pk	34.6	-18.5	66.88	-	-	74	-7.12	125	169	V
3	* 5.15	34.51	RMS	34.6	-18.5	50.61	54	-3.39	-	-	125	169	V
4	* 5.15	36	RMS	34.6	-18.5	52.1	54	-1.9	-	-	125	169	V

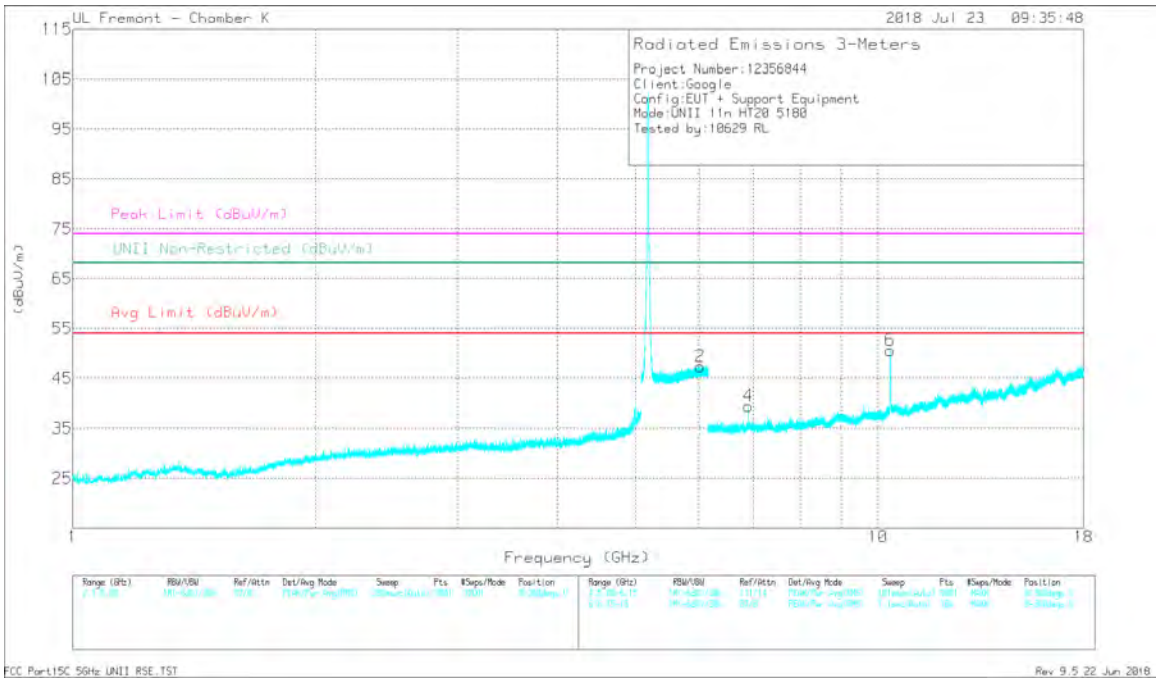
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency(GHz)	MeterReading(dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	CorrectedReading(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
5.845	36.21	PK-U	35	-18.8	52.41	-	-	-	-	68.2	-15.79	195	127	H
6.015	35.41	PK-U	35.2	-18.5	52.11	-	-	-	-	68.2	-16.09	286	261	V
6.906	36.01	PK-U	35.5	-26.6	44.91	-	-	-	-	68.2	-23.29	0	141	H
10.36	46.64	PK-U	37.4	-23	61.04	-	-	-	-	68.2	-7.16	18	217	H
6.907	35.74	PK-U	35.5	-26.6	44.64	-	-	-	-	68.2	-23.56	0	110	V
10.359	47.62	PK-U	37.4	-23	62.02	-	-	-	-	68.2	-6.18	84	217	V

PK-U - U-NII: Maximum Peak

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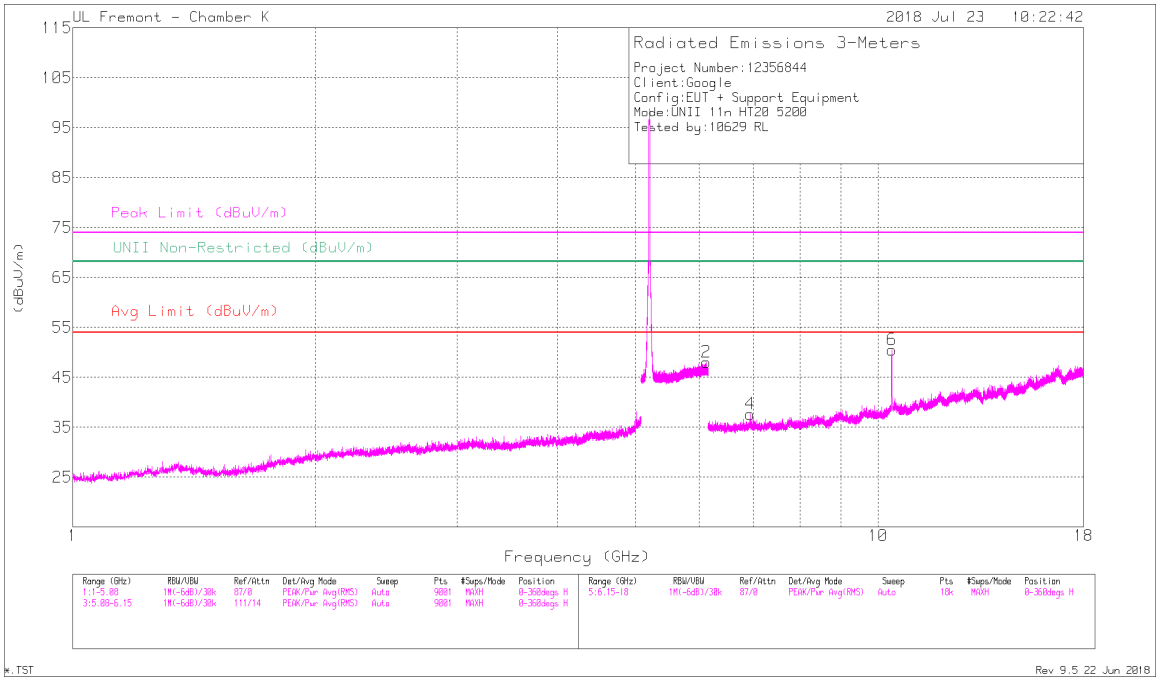
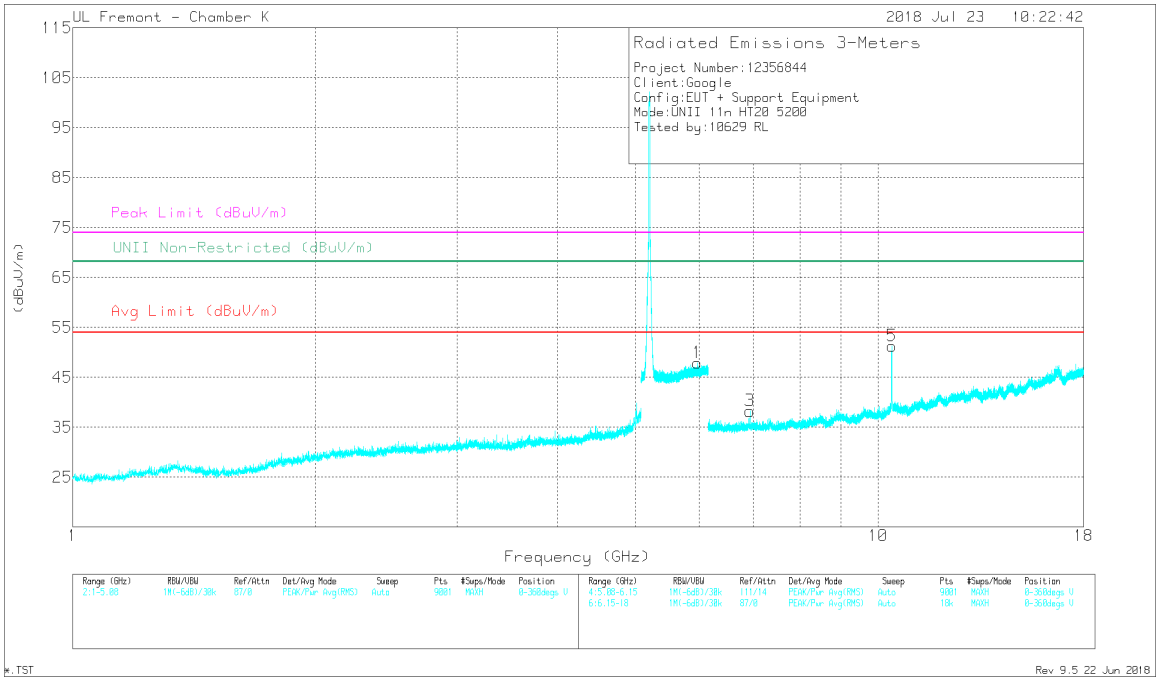
MID CHANNEL RESULTS



HORIZONTAL



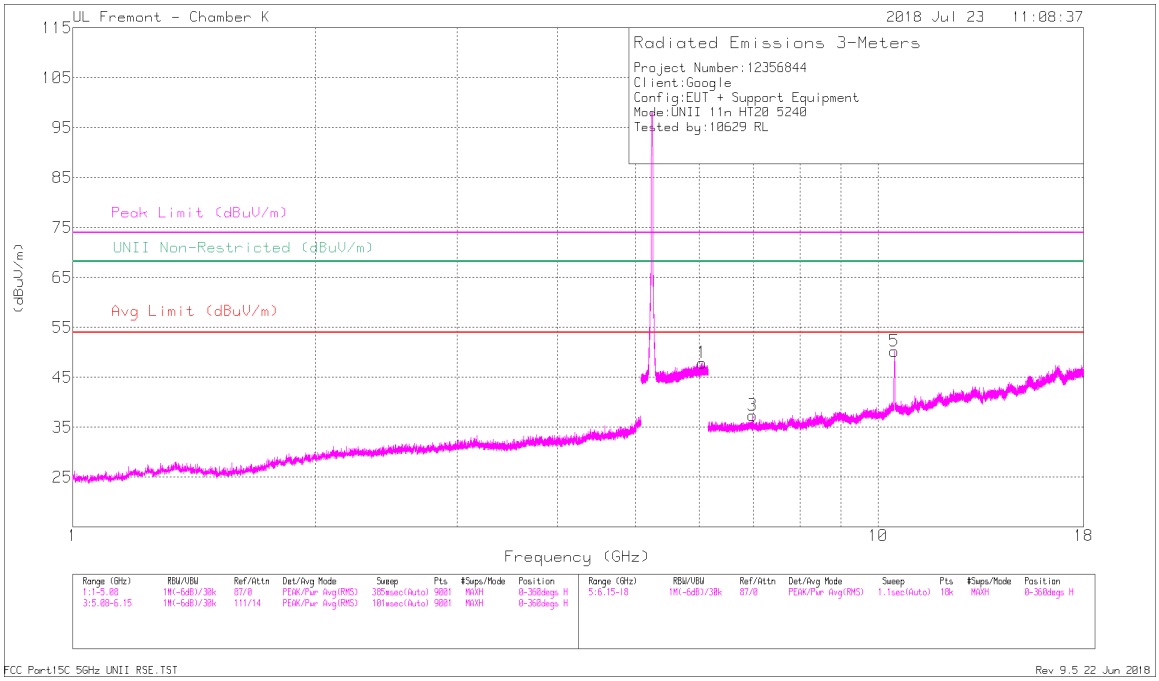
VERTICAL

RADIATED EMISSIONS

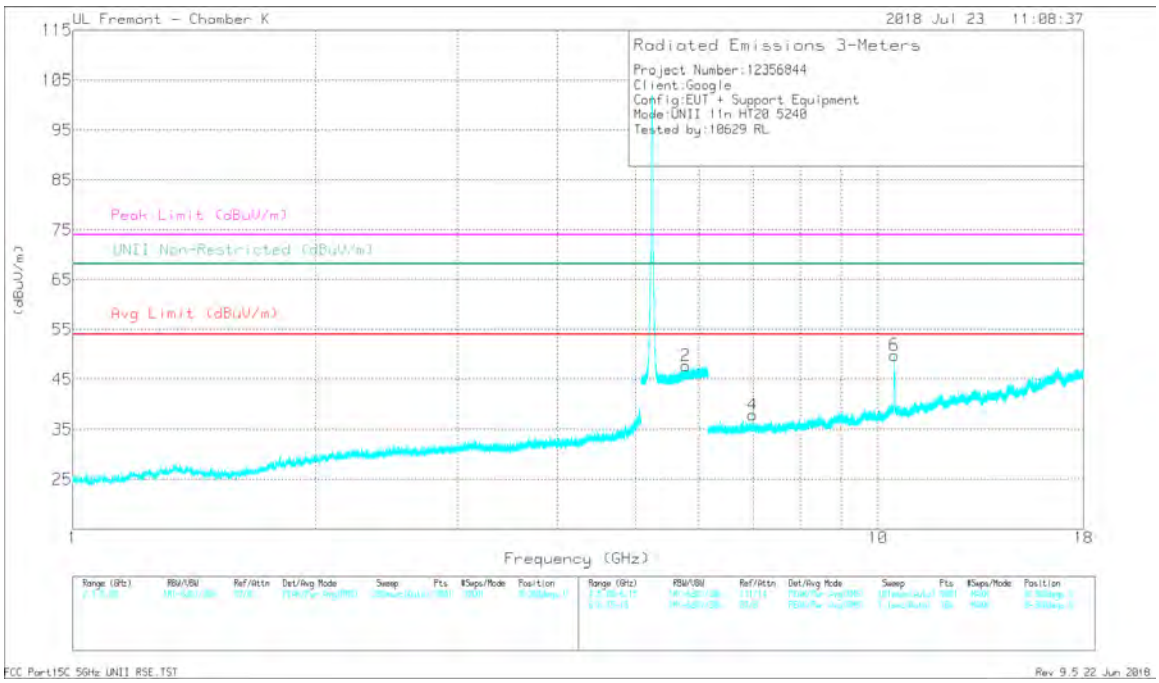
Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNii Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6.118	35.9	PK-U	35.3	-18.2	53	-	-	-	-	68.2	-15.2	318	146	H
5.966	34.34	PK-U	35.1	-18.7	50.74	-	-	-	-	68.2	-17.46	166	278	V
6.935	34.97	PK-U	35.5	-26.4	44.07	-	-	-	-	68.2	-24.13	0	116	H
10.4	45.4	PK-U	37.4	-22.9	59.9	-	-	-	-	68.2	-8.3	104	119	H
6.933	35.25	PK-U	35.5	-26.4	44.35	-	-	-	-	68.2	-23.85	4	142	V
10.398	42.55	PK-U	37.4	-22.9	57.05	-	-	-	-	68.2	-11.15	88	233	V

PK-U - U-NII: Maximum Peak

HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (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
6.05	35.31	PK-U	35.3	-18.4	52.21	-	-	-	-	68.2	-15.99	134	331	H
5.767	36.43	PK-U	34.9	-18.9	52.43	-	-	-	-	68.2	-15.77	214	248	V
6.987	35.97	PK-U	35.5	-26.6	44.87	-	-	-	-	68.2	-23.33	139	188	H
10.482	45.7	PK-U	37.6	-22.9	60.4	-	-	-	-	68.2	-7.8	109	116	H
6.987	36.07	PK-U	35.5	-26.6	44.97	-	-	-	-	68.2	-23.23	5	162	V
10.479	46.62	PK-U	37.6	-22.9	61.32	-	-	-	-	68.2	-6.88	88	216	V

PK-U - U-NII: Maximum Peak

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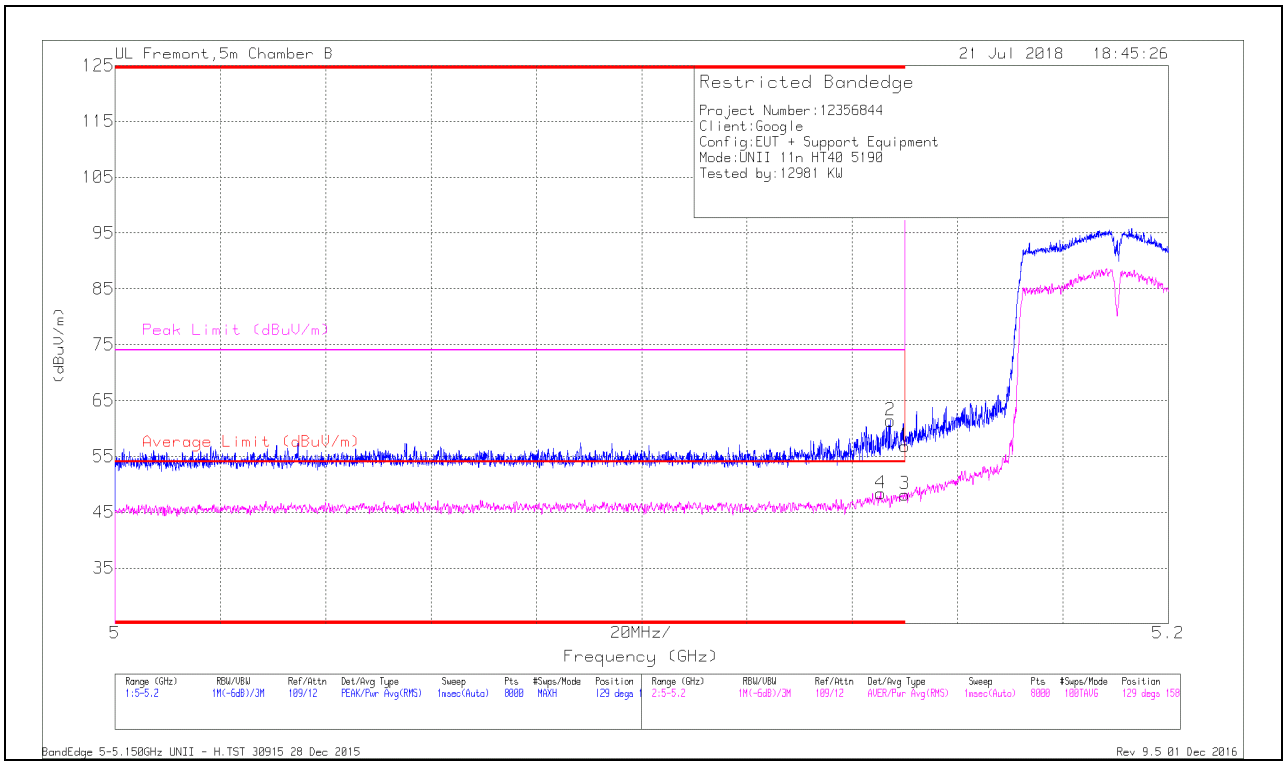
9.1.3. TX ABOVE 1 GHz 802.11n HT40 MODE IN THE 5.2 GHz BAND

BANDEDGE (LOW CHANNEL)

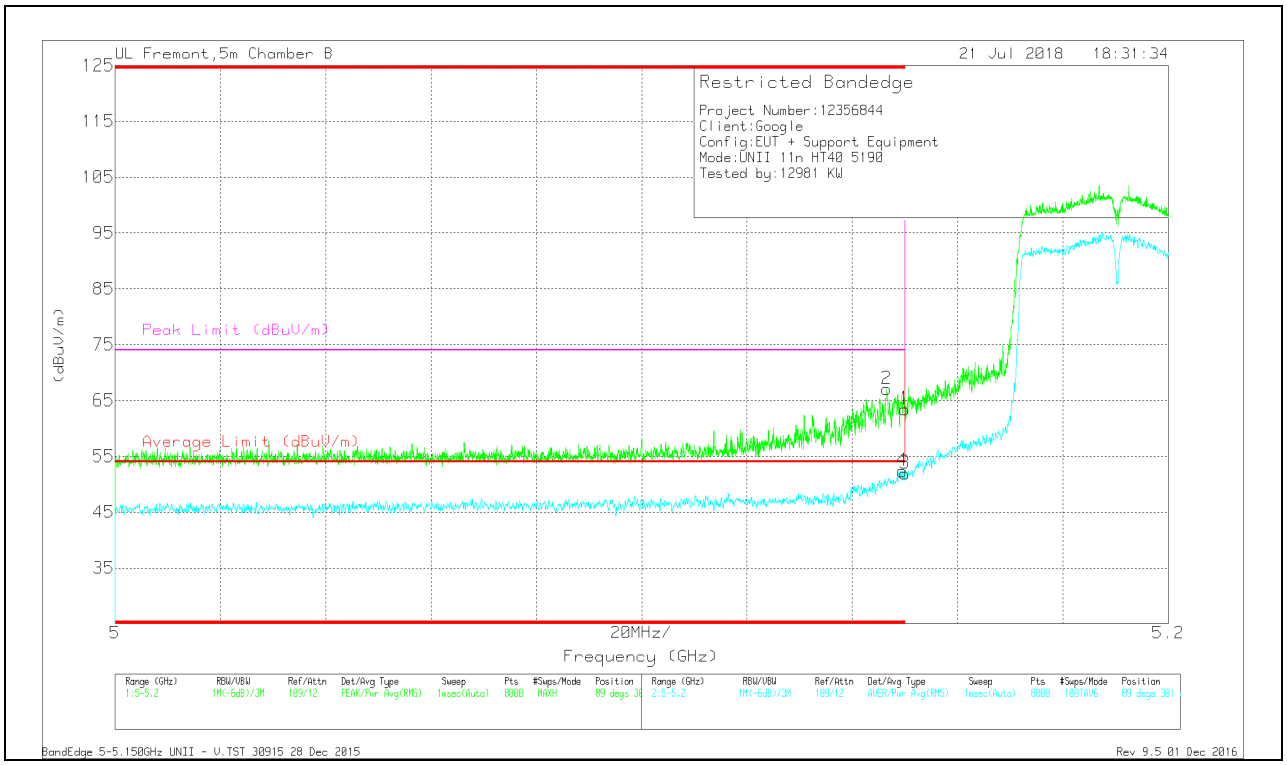
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF 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
4	* 5.145	32.08	RMS	34.6	-18.3	.1	48.48	54	-5.52	-	-	129	158	H
2	* 5.147	45.3	Pk	34.6	-18.5	0	61.4	-	-	74	-12.6	129	158	H
1	* 5.15	40.75	Pk	34.6	-18.5	0	56.85	-	-	74	-17.15	129	158	H
3	* 5.15	32.09	RMS	34.6	-18.5	.1	48.29	54	-5.71	-	-	129	158	H

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

VERTICAL RESULT

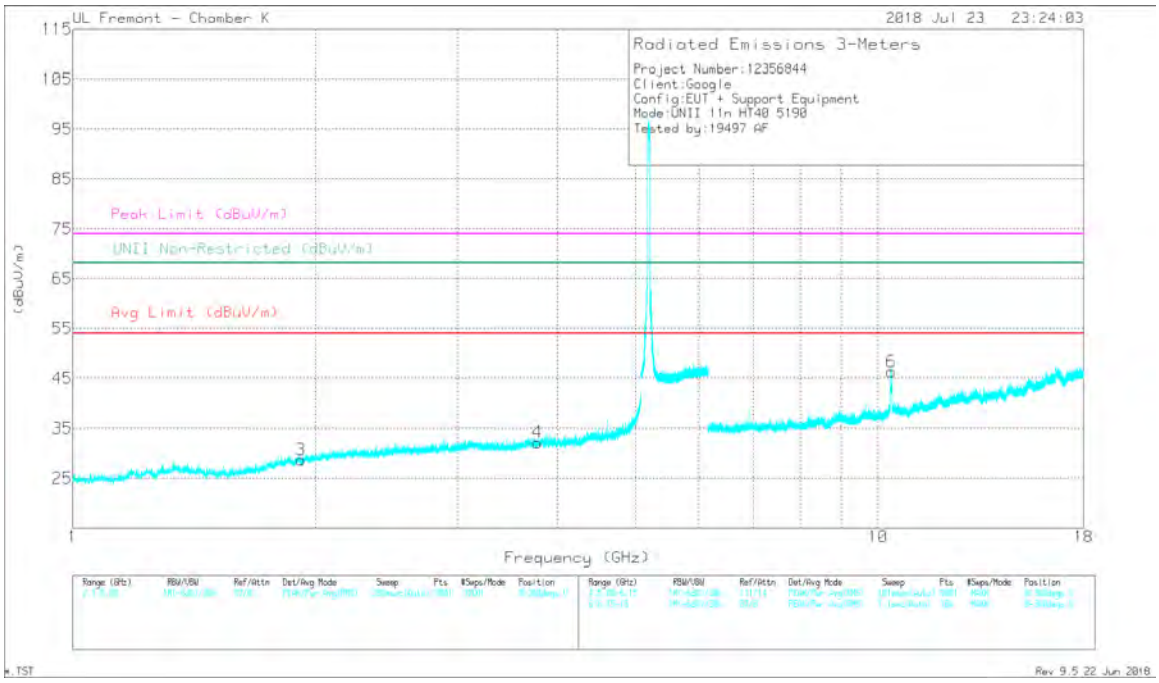


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.147	50.86	Pk	34.6	-18.4	0	67.06	-	-	74	-6.94	89	301	V
4	* 5.149	36.15	RMS	34.6	-18.5	.1	52.35	54	-1.65	-	-	89	301	V
1	* 5.15	47.35	Pk	34.6	-18.5	0	63.45	-	-	74	-10.55	89	301	V
3	* 5.15	35.74	RMS	34.6	-18.5	.1	51.94	54	-2.06	-	-	89	301	V

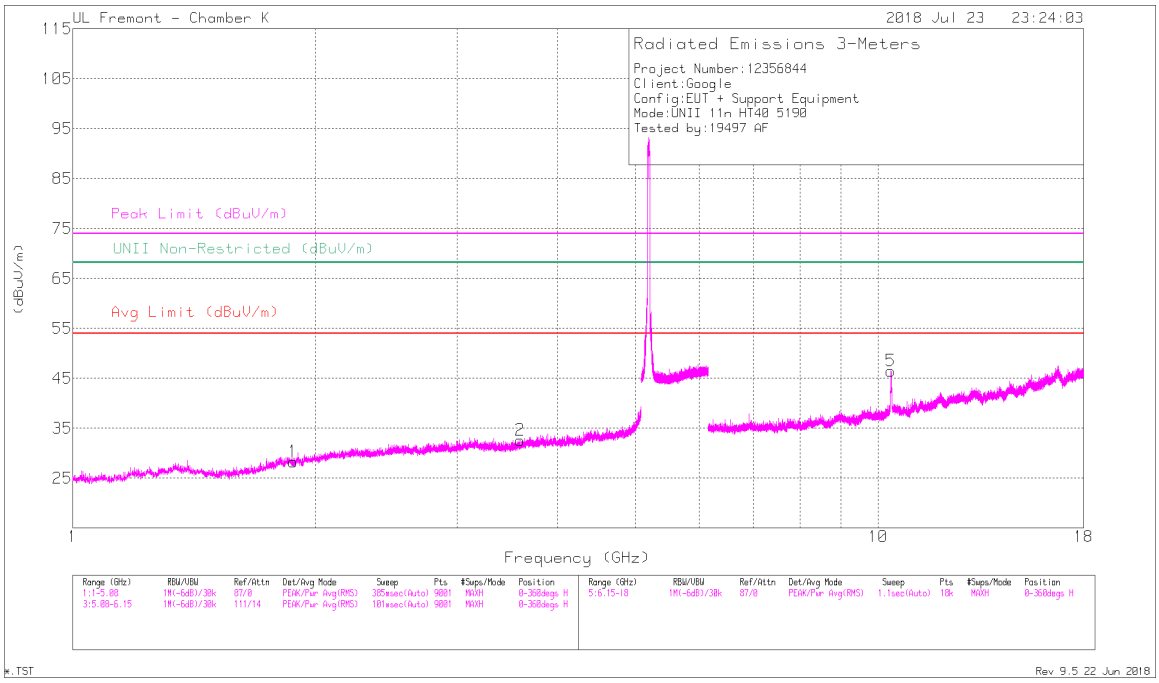
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.876	41.18	PK-U	30.4	-35.2	0	36.38	-	-	-	-	68.2	-31.82	263	309	H
1.878	30.87	ADR	30.4	-35.2	.1	26.17	-	-	-	-	-	-	263	309	H
* 3.594	38.03	PK-U	33	-32.4	0	38.63	-	-	74	-35.37	-	-	339	222	H
* 3.593	29.62	ADR	33	-32.4	.1	30.32	54	-23.68	-	-	-	-	339	222	H
1.921	41.22	PK-U	30.6	-35.2	0	36.62	-	-	-	-	68.2	-31.58	162	169	V
1.924	31.19	ADR	30.6	-35.2	.1	26.69	-	-	-	-	-	-	162	169	V
* 3.776	38.23	PK-U	33.4	-31.9	0	39.73	-	-	74	-34.27	-	-	226	167	V
* 3.776	29.07	ADR	33.4	-31.9	.1	30.67	54	-23.33	-	-	-	-	226	167	V
10.379	40.79	PK-U	37.4	-23	0	55.19	-	-	-	-	68.2	-13.01	190	235	H
10.38	30.51	ADR	37.4	-23	.1	45.01	-	-	-	-	-	-	190	235	H
10.394	40.71	PK-U	37.4	-23	0	55.11	-	-	-	-	68.2	-13.09	268	198	V
10.39	30.16	ADR	37.4	-23	.1	44.66	-	-	-	-	-	-	268	198	V

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

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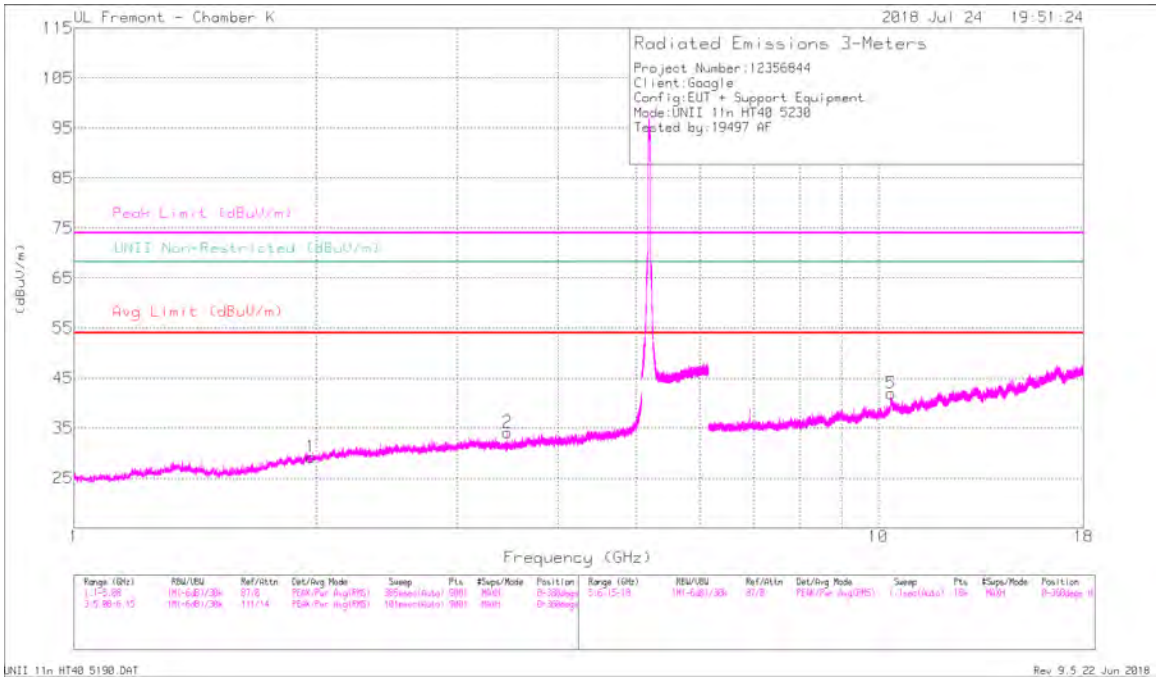
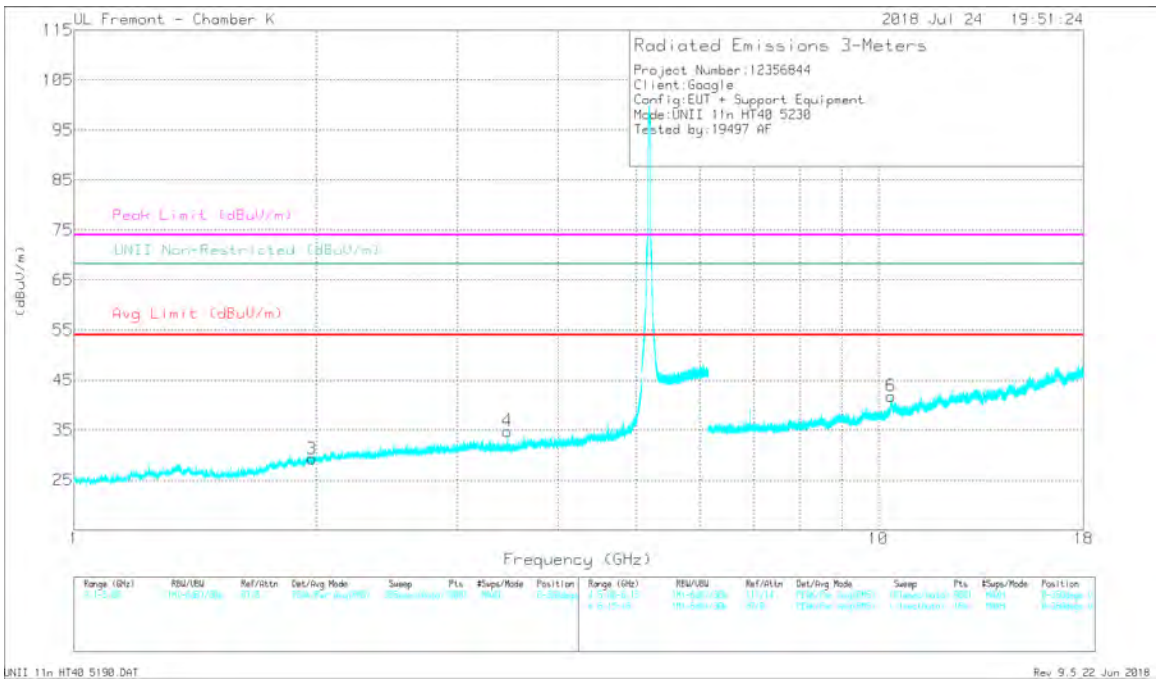
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.971	40.93	PK-U	30.9	-35.2	0	36.63	-	-	-	-	68.2	-31.57	54	167	H
1.971	31.32	ADR	30.9	-35.2	.1	27.12	-	-	-	-	-	-	54	167	H
3.459	40.04	PK-U	32.6	-32.8	0	39.84	-	-	-	-	68.2	-28.36	279	259	H
3.46	32.88	ADR	32.6	-32.8	.1	32.78	-	-	-	-	-	-	279	259	H
1.977	41.45	PK-U	30.9	-35.2	0	37.15	-	-	-	-	68.2	-31.05	23	266	V
1.975	31.59	ADR	30.9	-35.2	.1	27.39	-	-	-	-	-	-	23	266	V
3.46	40.98	PK-U	32.6	-32.8	0	40.78	-	-	-	-	68.2	-27.42	234	106	V
3.46	34.26	ADR	32.6	-32.8	.1	34.16	-	-	-	-	-	-	234	106	V
10.381	35.61	PK-U	37.4	-23	0	50.01	-	-	-	-	68.2	-18.19	164	229	H
10.379	25.37	ADR	37.4	-23	.1	39.87	-	-	-	-	-	-	164	229	H
10.373	35.42	PK-U	37.4	-23.1	0	49.72	-	-	-	-	68.2	-18.48	63	108	V
10.373	25.19	ADR	37.4	-23.1	.1	39.59	-	-	-	-	-	-	63	108	V

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

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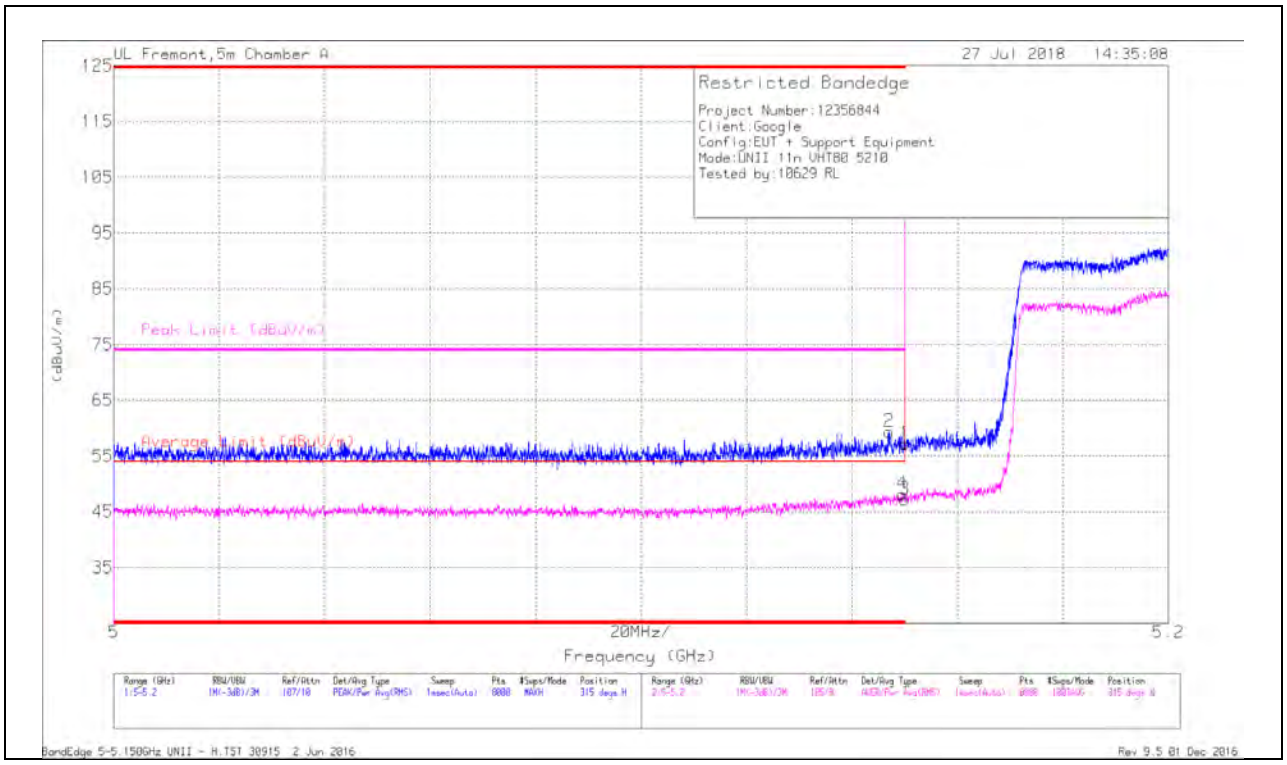
9.1.4. TX ABOVE 1 GHz 802.11ac VHT80 MODE IN THE 5.2 GHz BAND

BANDEDGE (MID CHANNEL)

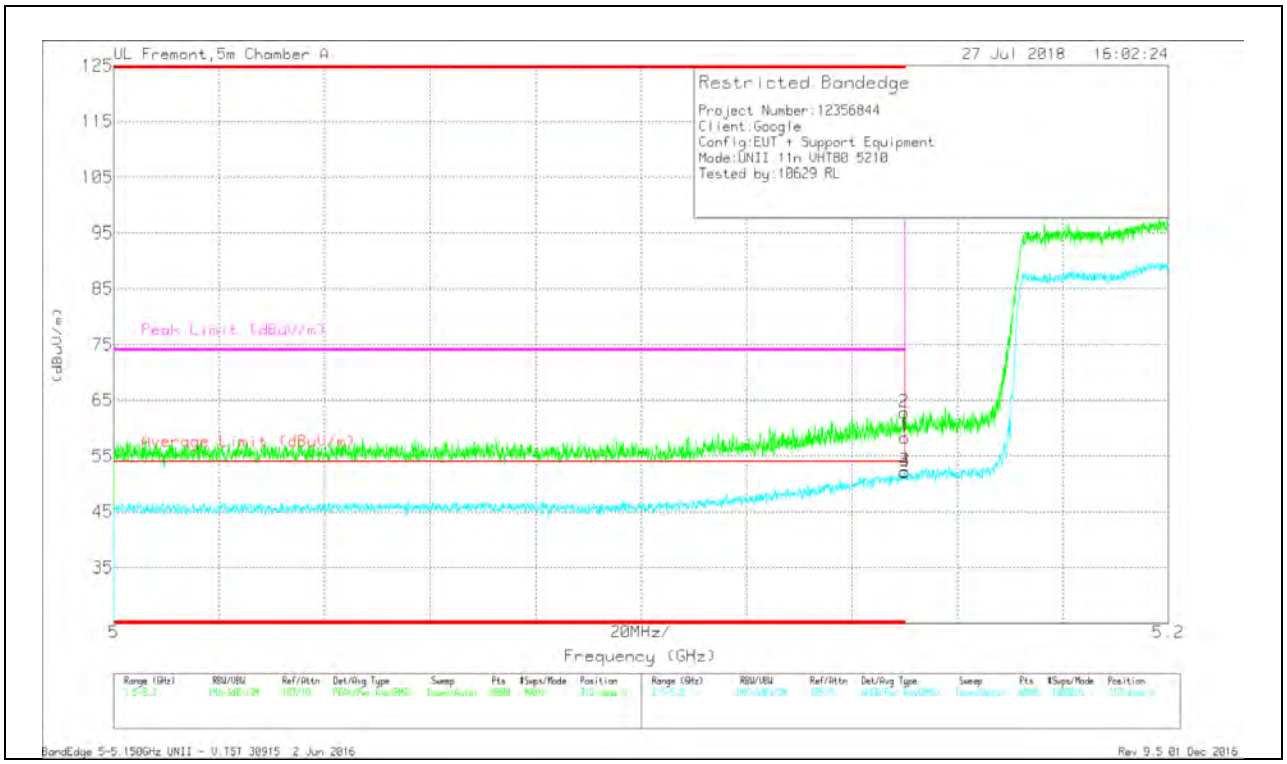
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 5.147	42.59	Pk	34.4	-17.6	0	59.39	-	-	74	-14.61	315	157	H
1	* 5.15	40.53	Pk	34.4	-17.7	0	57.23	-	-	74	-16.77	315	157	H
3	* 5.15	30.44	RMS	34.4	-17.7	.19	47.33	54	-6.67	-	-	315	157	H
4	* 5.15	31.35	RMS	34.4	-17.6	.19	48.34	54	-5.66	-	-	315	157	H

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

VERTICAL RESULT

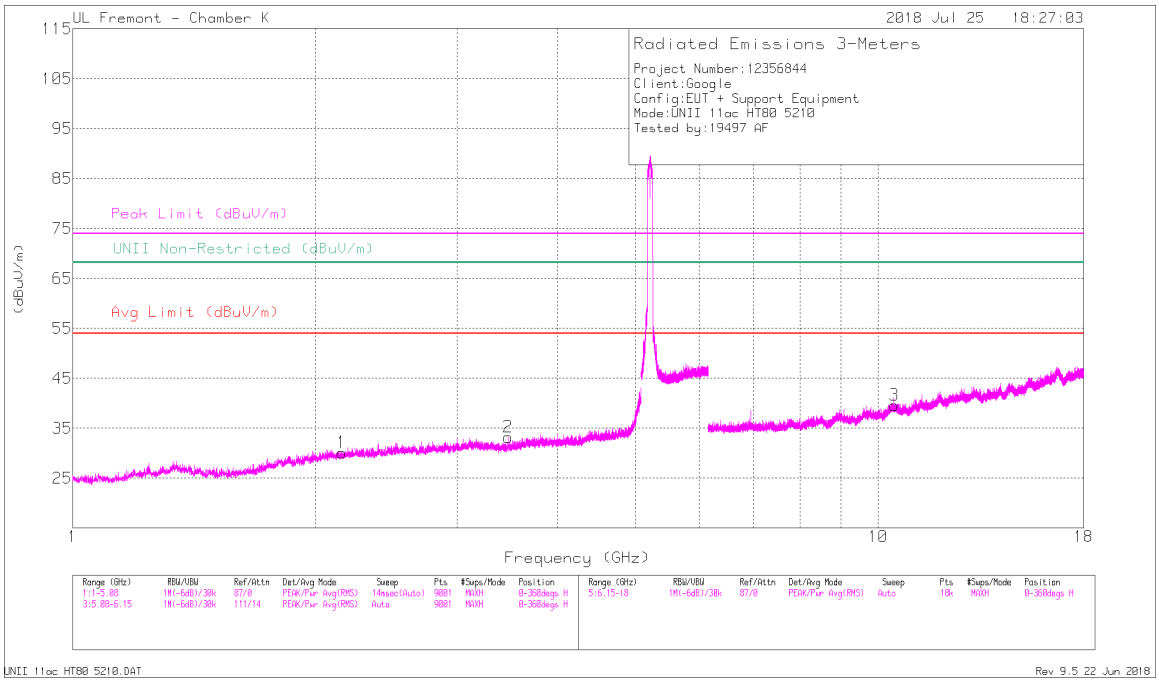


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	41.7	Pk	34.4	-17.7	0	58.4	-	-	74	-15.6	312	161	V
2	* 5.15	45.99	Pk	34.4	-17.6	0	62.79	-	-	74	-11.21	312	161	V
3	* 5.15	35.4	RMS	34.4	-17.7	.19	52.29	54	-1.71	-	-	312	161	V
4	* 5.15	35.23	RMS	34.4	-17.7	.19	52.12	54	-1.88	-	-	312	161	V

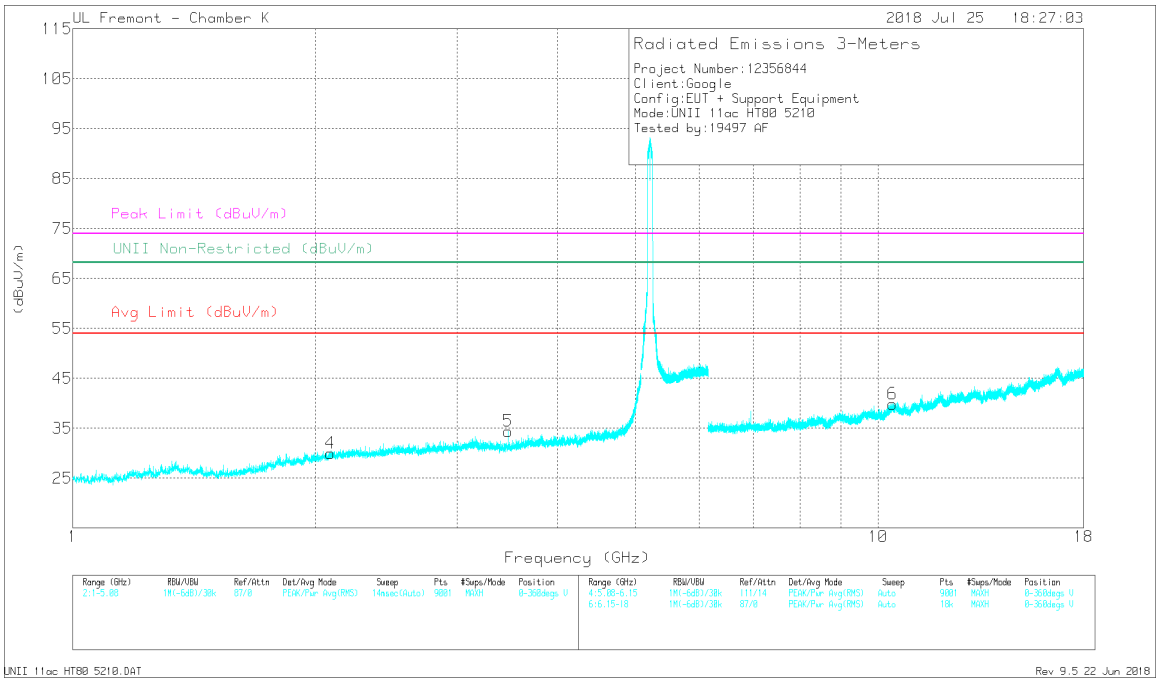
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T344 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2.16	41.4	PK-U	31.6	-35.1	0	37.9	-	-	-	-	68.2	-30.3	301	334	H
2.16	31.47	ADR	31.6	-35.2	.19	28.06	-	-	-	-	-	-	301	334	H
3.473	39.08	PK-U	32.6	-32.8	0	38.88	-	-	-	-	68.2	-29.32	38	230	H
3.473	31.11	ADR	32.6	-32.8	.19	31.1	-	-	-	-	-	-	38	230	H
2.09	41.77	PK-U	31.5	-35.1	0	38.17	-	-	-	-	68.2	-30.03	98	381	V
2.091	31.7	ADR	31.5	-35.1	.19	28.29	-	-	-	-	-	-	98	381	V
3.473	41.69	PK-U	32.6	-32.8	0	41.49	-	-	-	-	68.2	-26.71	230	117	V
3.473	33.8	ADR	32.6	-32.8	.19	33.79	-	-	-	-	-	-	230	117	V
10.478	32.26	PK-U	37.6	-22.9	0	46.96	-	-	-	-	68.2	-21.24	89	241	H
10.477	23.21	ADR	37.5	-22.9	.19	38	-	-	-	-	-	-	89	241	H
10.42	32.37	PK-U	37.5	-22.9	0	46.97	-	-	-	-	68.2	-21.23	207	158	V
10.423	23.11	ADR	37.5	-23	.19	37.8	-	-	-	-	-	-	207	158	V

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

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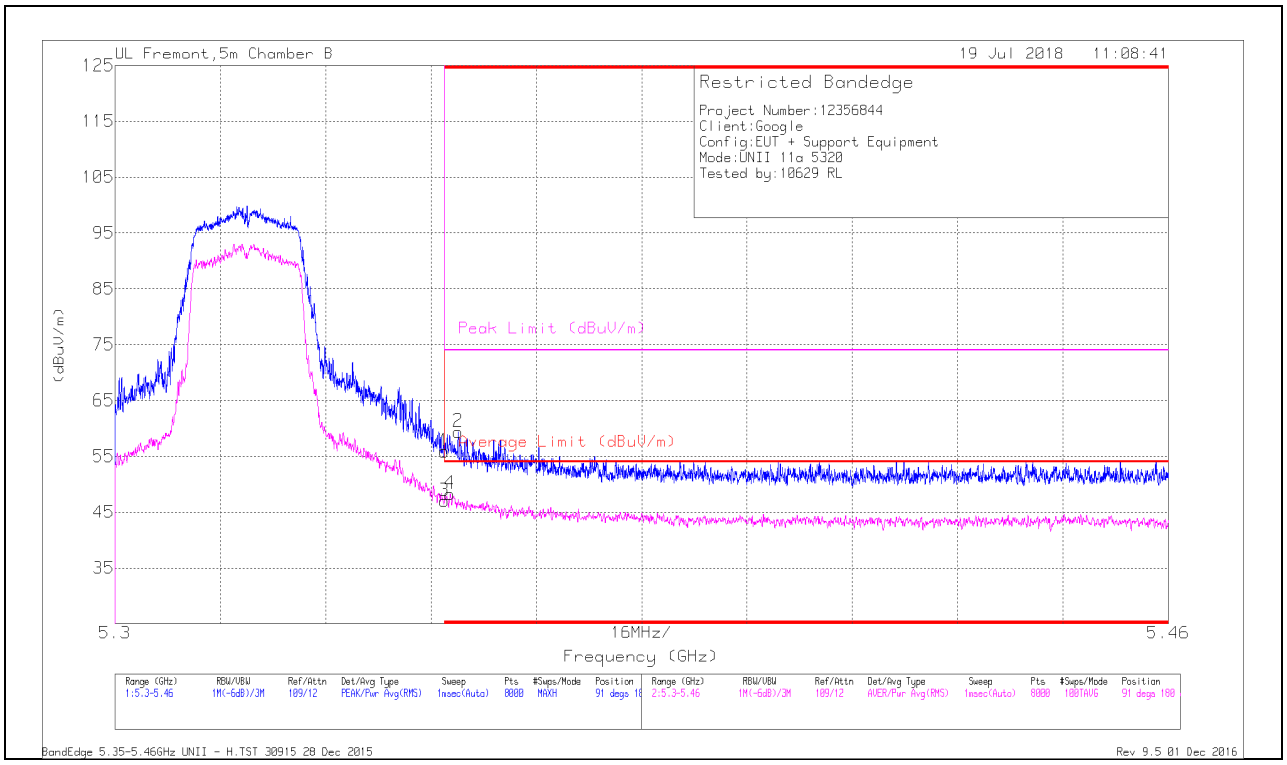
9.1.5. TX ABOVE 1 GHz 802.11a MODE IN THE 5.3 GHz BAND

BANDEDGE (HIGH CHANNEL)

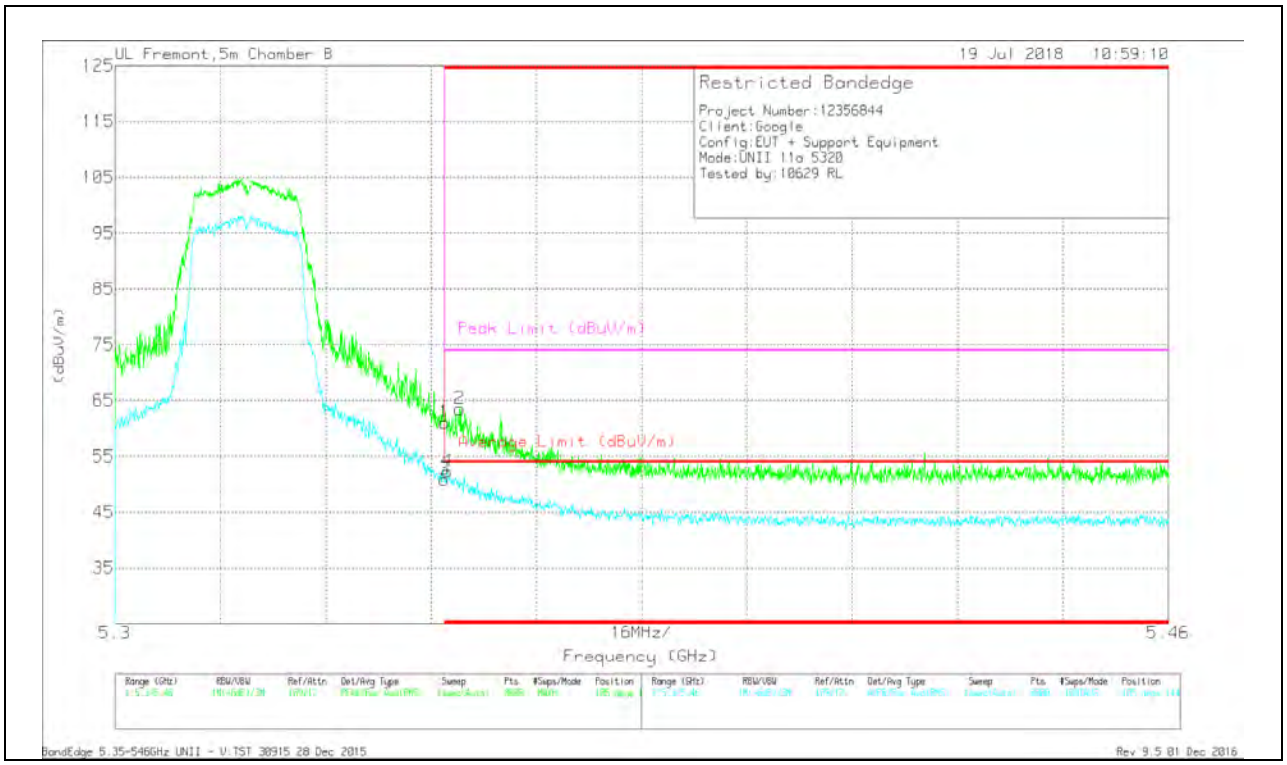
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	40.01	Pk	35	-19.1	55.91	-	-	74	-18.09	91	180	H
3	* 5.35	31.1	RMS	35	-19.1	47	54	-7	-	-	91	180	H
4	* 5.351	32.3	RMS	35	-19	48.3	54	-5.7	-	-	91	180	H
2	* 5.352	43.5	Pk	35	-19.1	59.4	-	-	74	-14.6	91	180	H

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

VERTICAL RESULT

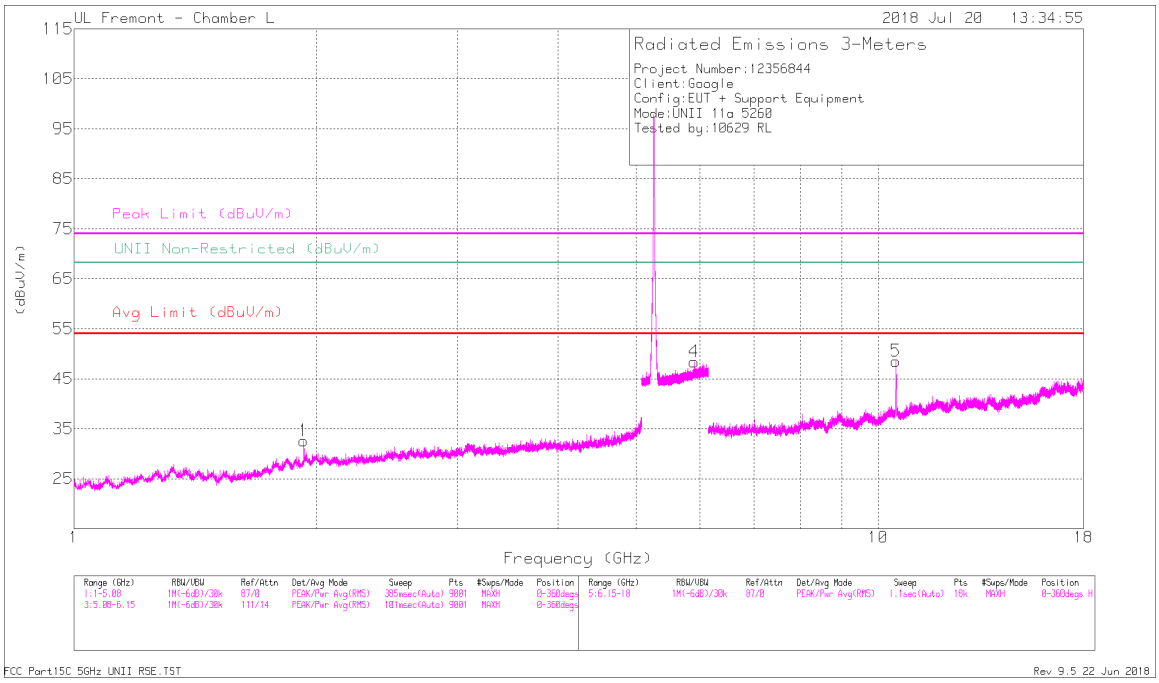


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	45.14	Pk	35	-19.1	61.04	-	-	74	-12.96	105	144	V
3	* 5.35	34.94	RMS	35	-19.1	50.84	54	-3.16	-	-	105	144	V
4	* 5.35	36.26	RMS	35	-19	52.26	54	-1.74	-	-	105	144	V
2	* 5.352	47.58	Pk	35	-19.1	63.48	-	-	74	-10.52	105	144	V

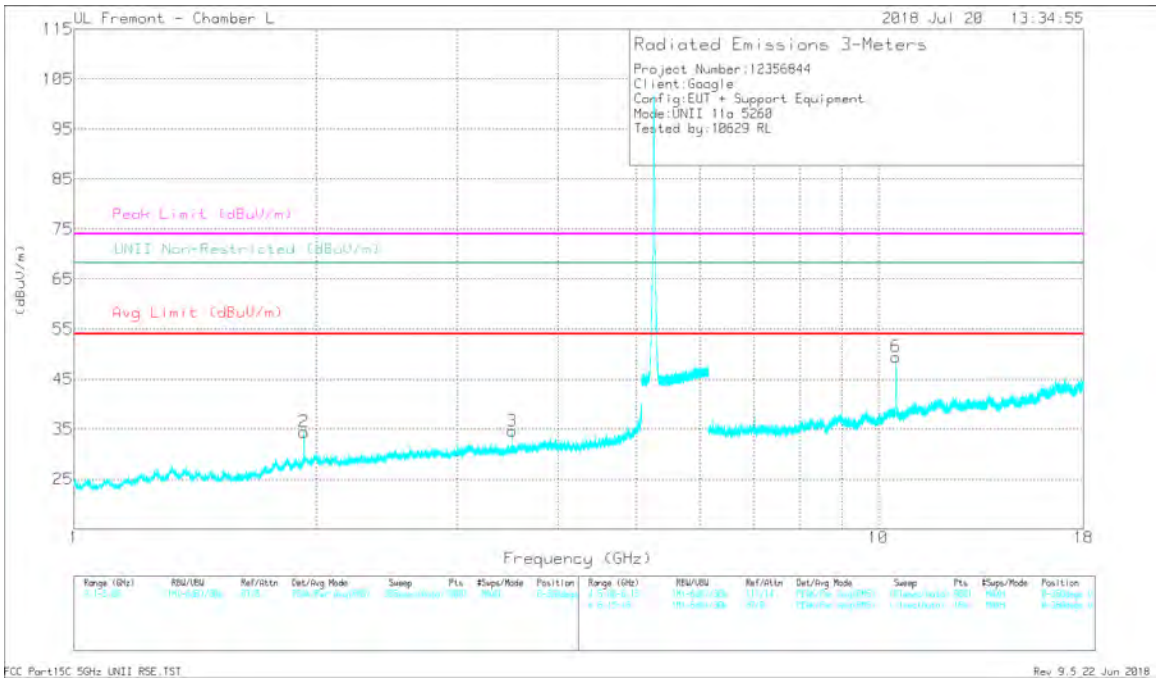
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection

HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS



HORIZONTAL



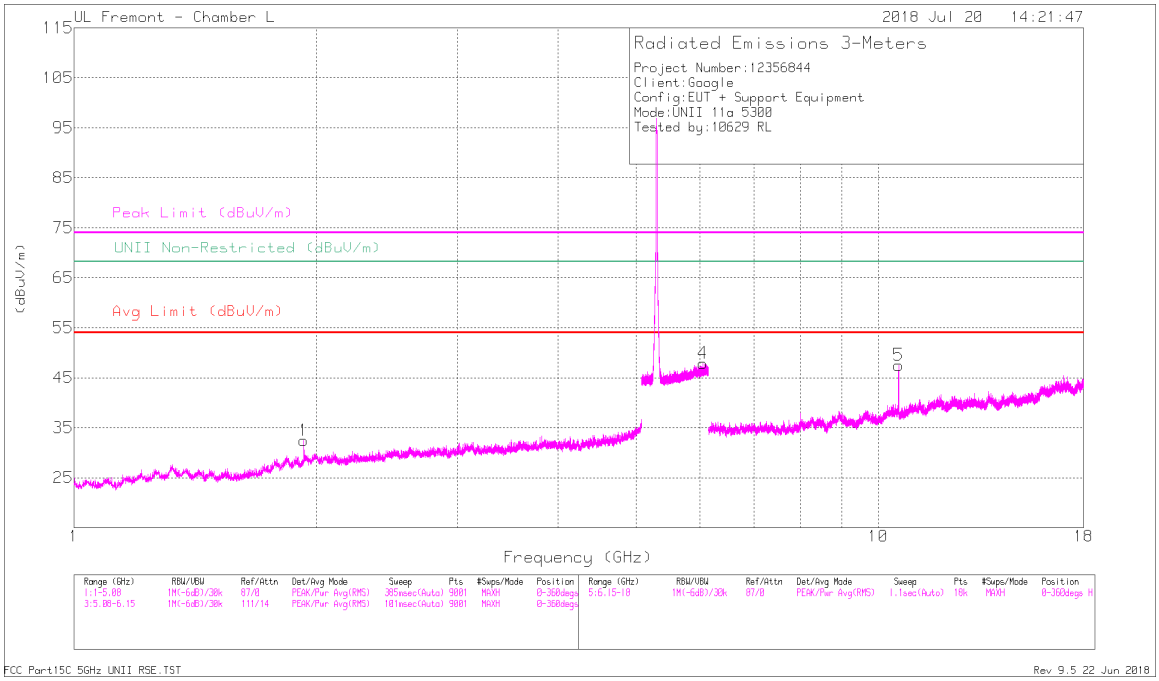
VERTICAL

RADIATED EMISSIONS

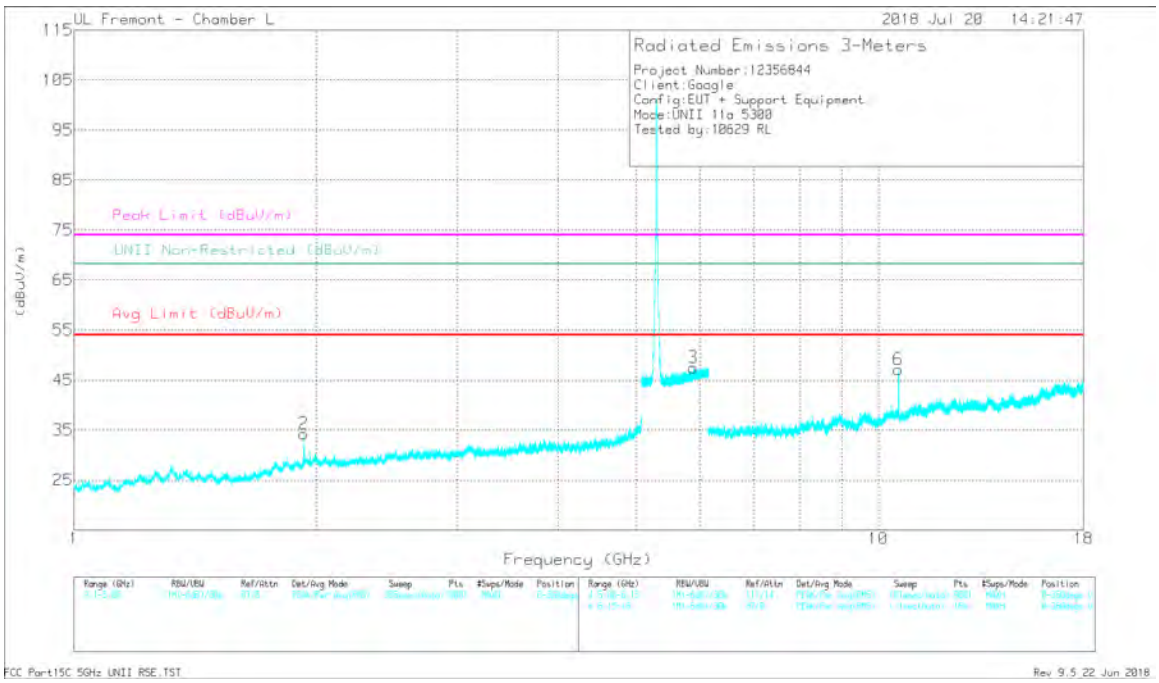
Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.931	39.56	PK-U	31.3	-33.5	37.36	-	-	-	-	68.2	-30.84	216	153	H
1.931	39.87	PK-U	31.3	-33.5	37.67	-	-	-	-	68.2	-30.53	107	199	V
* 3.507	37.71	PK-U	33	-31	39.71	-	-	74	-34.29	-	-	112	102	V
* 3.507	29.01	ADR	33	-31	31.01	54	-22.99	-	-	-	-	112	102	V
5.905	34.66	PK-U	35.2	-18	51.86	-	-	-	-	68.2	-16.34	331	280	H
10.519	42.89	PK-U	37.5	-20.8	59.59	-	-	-	-	68.2	-8.61	190	292	H
10.519	42.31	PK-U	37.5	-20.8	59.01	-	-	-	-	68.2	-9.19	262	238	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

MID CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (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
1.931	41	PK-U	31.3	-33.5	38.8	-	-	-	-	68.2	-29.4	164	140	H
1.931	40.99	PK-U	31.3	-33.5	38.79	-	-	-	-	68.2	-29.41	263	200	V
6.05	34.13	PK-U	35.3	-17.7	51.73	-	-	-	-	68.2	-16.47	197	310	H
5.89	34.82	PK-U	35.2	-18.1	51.92	-	-	-	-	68.2	-16.28	270	243	V
10.598	38.86	PK-U	37.6	-21.4	55.06	-	-	-	-	68.2	-13.14	190	238	H
10.6	29.66	ADR	37.6	-21.4	45.86	-	-	-	-	-	-	190	238	H
10.599	39.76	PK-U	37.6	-21.4	55.96	-	-	-	-	68.2	-12.24	262	235	V

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

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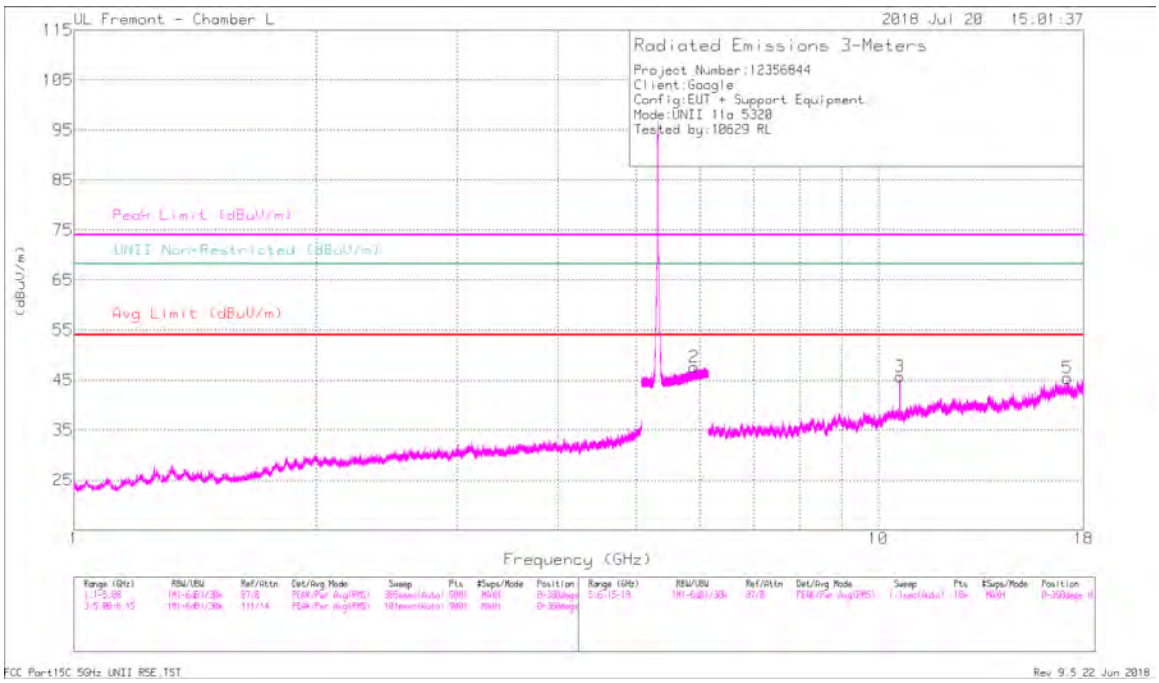
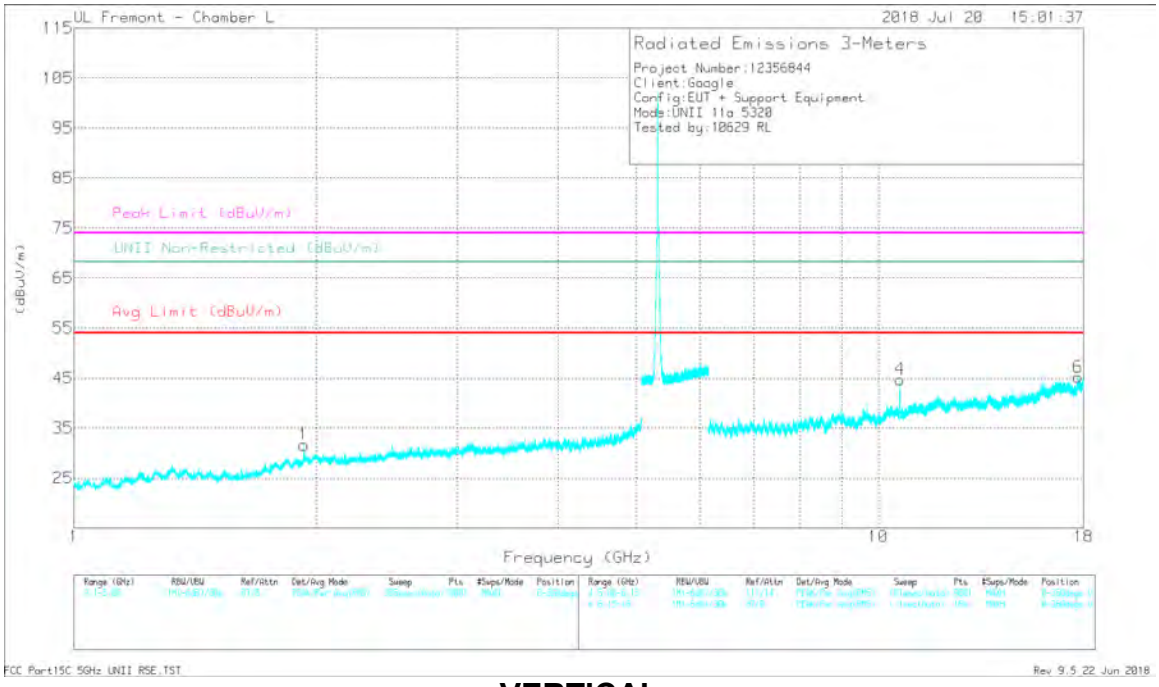
HIGH CHANNEL RESULTS



HORIZONTAL



VERTICAL

RADIATED EMISSIONS

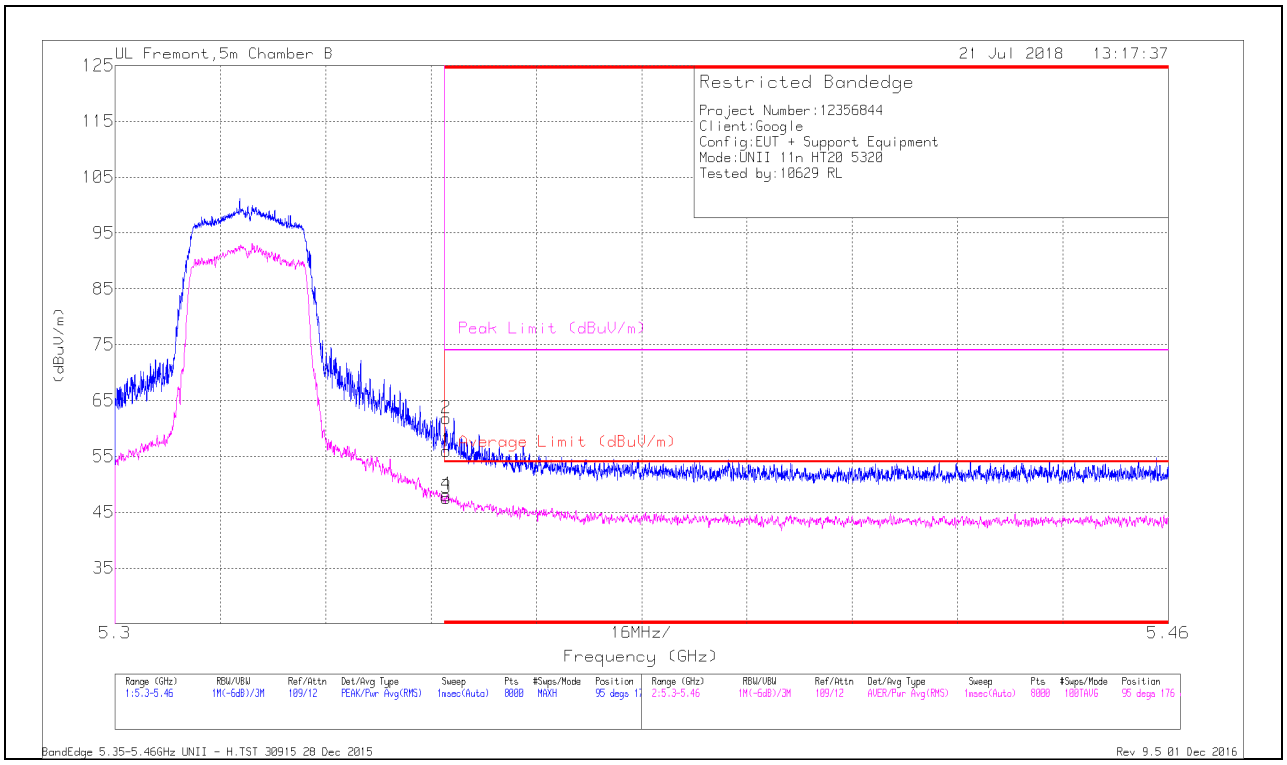
Frequency (GHz)	Meter Reading (dBuV)	Det	AF EMC4294 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	UNII Non-Restricted (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1.929	38.32	PK-U	31.3	-33.5	36.12	-	-	-	-	68.2	-32.08	124	161	V
5.905	36.36	PK-U	35.2	-18	53.56	-	-	-	-	68.2	-14.64	48	268	H
* 10.639	41.58	PK-U	37.6	-21.4	57.78	-	-	74	-16.22	-	-	194	240	H
* 10.64	29.51	ADR	37.6	-21.3	45.81	54	-8.19	-	-	-	-	194	240	H
17.193	27.55	PK-U	40.4	-18.2	49.75	-	-	-	-	68.2	-18.45	222	341	H
* 10.639	38.74	PK-U	37.6	-21.4	54.94	-	-	74	-19.06	-	-	44	109	V
* 10.641	27.52	ADR	37.6	-21.3	43.82	54	-10.18	-	-	-	-	44	109	V
* 17.729	29.1	PK-U	40.5	-17.8	51.8	-	-	74	-22.2	-	-	77	255	V
* 17.731	19.8	ADR	40.5	-17.8	42.5	54	-11.5	-	-	-	-	77	255	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

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

BANDEDGE (HIGH CHANNEL)

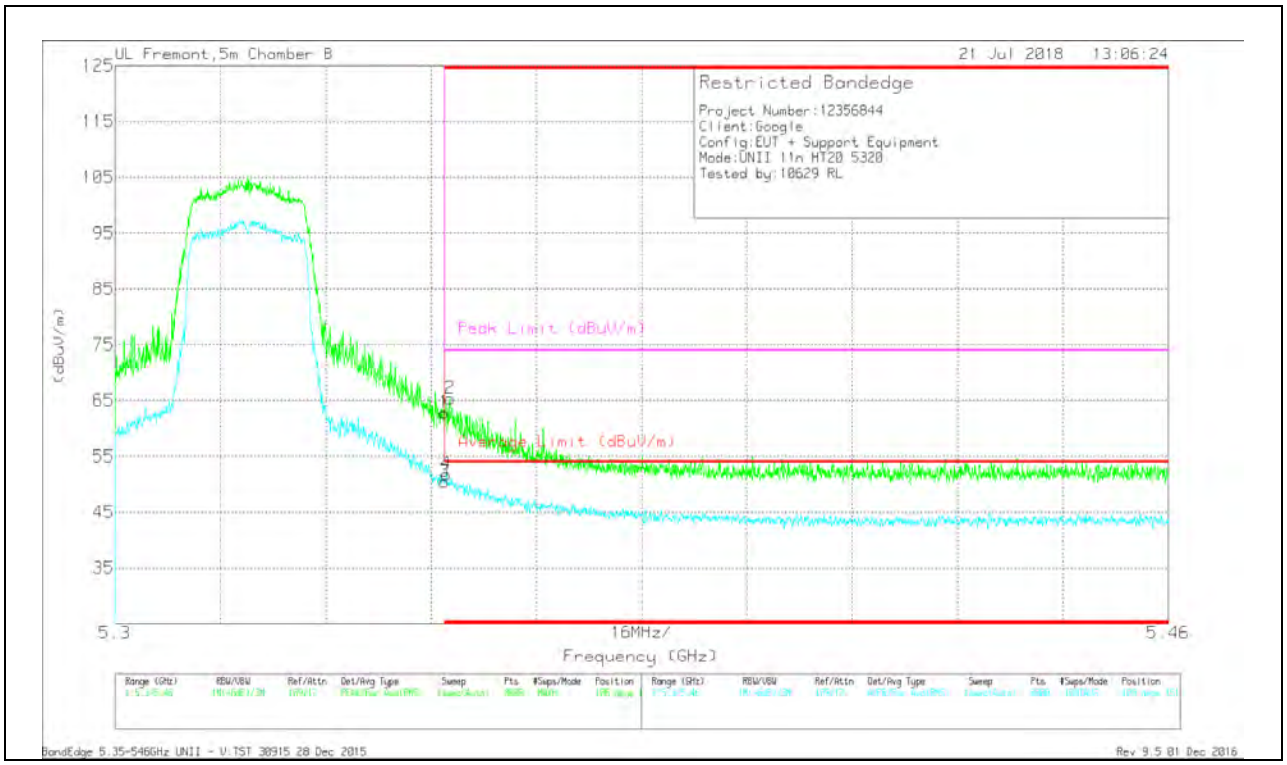
HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	40.05	Pk	35	-19.1	55.95	-	-	74	-18.05	95	176	H
2	* 5.35	45.88	Pk	35	-19.1	61.78	-	-	74	-12.22	95	176	H
3	* 5.35	31.66	RMS	35	-19.1	47.56	54	-6.44	-	-	95	176	H
4	* 5.35	32.18	RMS	35	-19.1	48.08	54	-5.92	-	-	95	176	H

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

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T863 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.35	46.89	Pk	35	-19.1	62.79	-	-	74	-11.21	108	151	V
2	* 5.351	49.34	Pk	35	-19	65.34	-	-	74	-8.66	108	151	V
3	* 5.35	34.54	RMS	35	-19.1	50.44	54	-3.56	-	-	108	151	V
4	* 5.35	35.91	RMS	35	-19.1	51.81	54	-2.19	-	-	108	151	V

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