FCC CFR47 PART 15 SUBPART E
INDUSTRY CANADA RSS-247 ISSUE 1

CERTIFICATION TEST REPORT

FOR

BLUETOOTH, BLE, and 802.11 a/b/g/n Measuring Device

MODEL NUMBER: IKE-IK04-L

FCC ID: 2ACBG4000

IC: 11952A-4000

REPORT NUMBER: 16U22614-E4V1

ISSUE DATE: 3/17/2016

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	03/17/16	Initial Issue	C. Vergonio

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	IkeGPS
EUT DESCRIPTION:	BLUETOOTH, BLE, and 802.11 a/b/g/n Measuring Device
MODEL:	IKE-IK04-L
SERIAL NUMBER:	DVT2 UNIT37 (Radiated), DVT2 UNIT46 (Conducted)
DATE TESTED:	February 23 – March 16, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart E	Pass
INDUSTRY CANADA RSS-247 Issue 1	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

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 any government.

Approved & Released For
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Tested By:

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WiSE LAB EMC TECHNICIAN
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, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 1.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, 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
☒ Chamber A	☐ Chamber D
☒ Chamber B	☐ Chamber E
☒ Chamber C	☐ Chamber F
	☐ Chamber G
	☐ Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

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

Chambers A through H are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-8, respectively.

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
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 9KHz to 30 MHz	2.14 dB
Radiated Disturbance, 30 to 1000 MHz	4.98 dB
Radiated Disturbance,1000 to 6000 MHz	3.86 dB
Radiated Disturbance,6000 to 18000 MHz	4.23 dB
Radiated Disturbance,18000 to 26000 MHz	5.30 dB
Radiated Disturbance,26000 to 40000 MHz	5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth, BLE, and 802.11a/b/g/n Measuring 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)
1TX			
5180 - 5240	802.11a	14.30	26.92
5180 - 5240	802.11n HT20	14.80	30.20
5190 - 5230	802.11n HT40	10.60	11.48

5.3 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1TX			
5260 - 5320	802.11a	14.40	27.54
5260 - 5320	802.11n HT20	14.70	29.51
5270 - 5310	802.11n HT40	10.40	10.96

5.6 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1TX			
5500 - 5700	802.11a	14.30	26.92
5500 - 5700	802.11n HT20	14.70	29.51
5510 - 5670	802.11n HT40	10.60	11.48

5.8 GHz BAND

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
1TX			
5745 - 5825	802.11a	14.20	26.30
5745 - 5825	802.11n HT20	14.70	29.51
5755 - 5795	802.11n HT40	10.60	11.48

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPC antenna, with a maximum gain of -0.15dBi.

5.4. SOFTWARE and HARDWARE

The test utility software and hardware used during testing was Software Version: 1.0 and Hardware Version: 1.0.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission and power line conducted emission were performed with the EUT set to transmit on the channel with higher output power as worst-case scenario.

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

Based on the baseline scan, the worst-case data rates were:

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

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	IkeGPS	ASSA41w2-050250	N/A	N/A

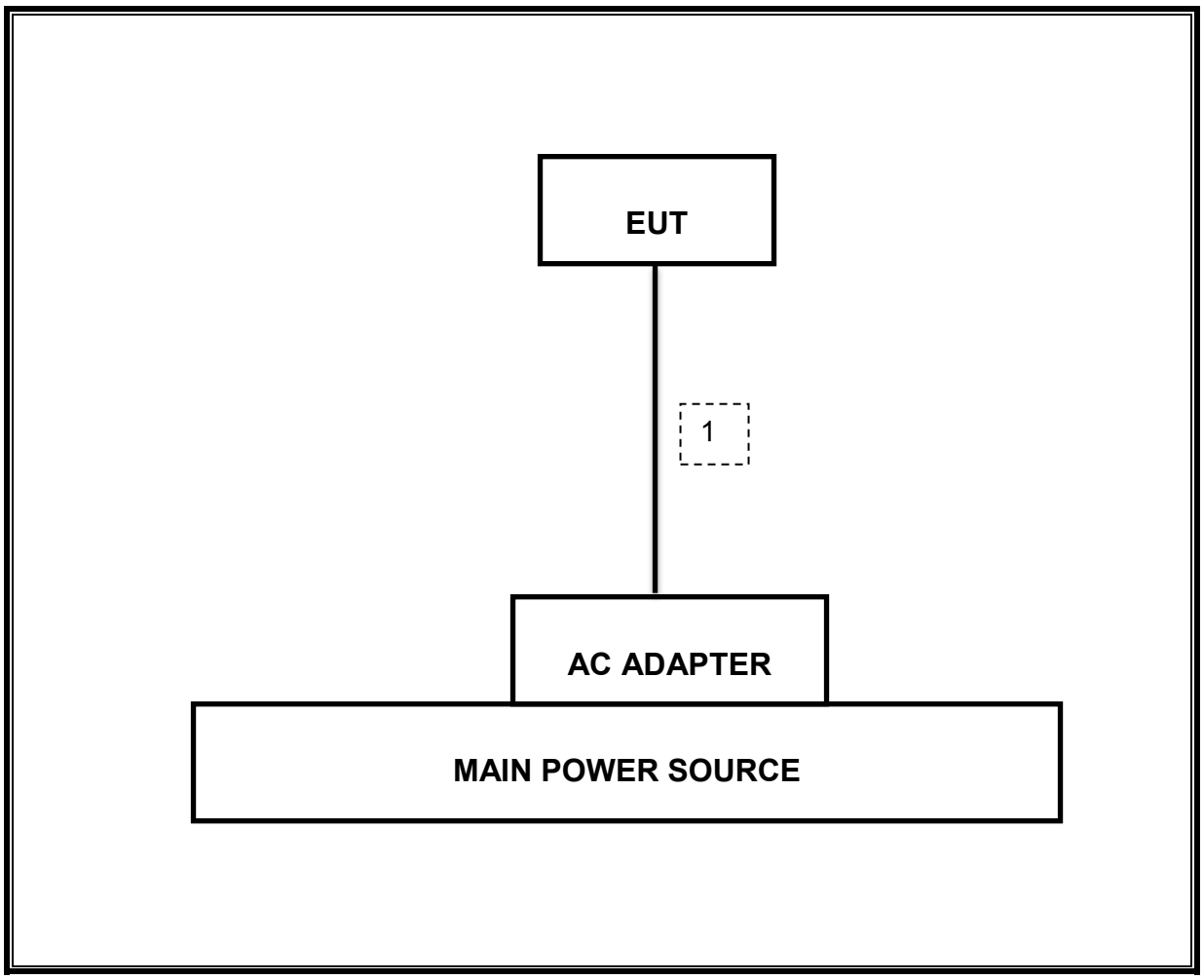
I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	USB	Unshielded	1.5	N/A

TEST SETUP

The EUT is a stand-alone unit during the tests. Test software exercised the radio card

SETUP DIAGRAM FOR RADIATED TESTS



6. 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**	**T Number**	**Cal Due**
Antenna, Biconolog, 30MHz-1 GHz	Sunol Sciences	JB1	130	09/01/16
Antenna, Horn, 18GHz	EMCO	3115	59	11/18/16
Antenna, Horn, 26.5 GHz	ARA	MWH-1826/B	447	05/12/16
RF Preamplifier, 1GHz - 18GHz	Miteq	NSP4000-SP2	88	04/07/16
RF Preamplifier, 1GHz - 26.5GHz	HP	8449B	404	06/29/16
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	123	10/22/16
Spectrum Analyzer, PXA, 3 Hz to 44 GHz	Keysight	N9030A	907	06/11/16
EMI Test Receiver, 9 KHz to 7 GHz	Rohde & Schwarz	ECSI7	284	09/10/16
Peak Power Meter	Agilent / HP	N1914A	254	06/08/16
Peak / Average Power Sensor	Keysight	E9323A	338	04/16/16
LISN, 30 MHz	Solar	8012-50-R-24-BNC	28	7/28/2016
Reject Filter, 2.4GHz	Micro-Tronics	BRM50702	160	CNR
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	417	05/04/16
High Pass Filter 6GHz	Micro-Tronics	HPS17542	893	04/25/16
High Pass Filter 3GHz	Micro-Tronics	HPS17543	898	04/25/16

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, June 24, 2015
Conducted Software	UL	UL EMC	Ver 9.5, May 26, 2015
Antenna Port Software	UL	UL RF	Ver 3.9.1, Dec 28, 2015

7. MEASUREMENT METHOD

On Time and Duty Cycle: KDB 789033 D02 v01r01, Section B.

6 dB Emission BW: KDB 789033 D02 v01r01, Section C.

26 dB Emission BW: KDB 789033 D02 v01r01, Section C.

99% Occupied BW: KDB 789033 D02 v01r01, Section D.

Conducted Output Power: KDB 789033 D02 v01r01, Section E.3.b (Method PM-G), and KDB 662911 D01 v02r01.

Power Spectral Density: KDB 789033 D02 v01r01, Section F, and KDB 662911 D01 v02r01.

Unwanted emissions in restricted bands: KDB 789033 D02 v01r01, Sections G.3, G.4, G.5, and G.6.

Unwanted emissions in non-restricted bands: KDB 789033 D02 v01r01, Sections G.3, G.4, and G.5.

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

8. SUMMARY TABLE

FCC Part Section	RSS Section	Test Description	Test Limit	Test Condition	Test Result
§15.407 (a)	RSS-247	Occupied Band width (26dB)	N/A	Conducted	Pass
§15.407	RSS-247 6.2.4	6dB Band width (5.8Ghz)	>500KHz		Pass
§15.407 (a)(1)	RSS-247 6.2	TX Cond. Power5.15-5.25	<24dBm (FCC) / <23 dBm or <10+10Log(99% BW) (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	TX Cond. Power 5.25-5.35 & 5.47-5.725	<24dBm or <11+10log (OBW) (FCC) / <24 dBm or <11+10Log(99% BW) (IC)		Pass
§15.407 (a)(3)	RSS-247 6.2.4	TX Cond. Power 5.725-5.825	<30dBm		Pass
§15.407 (a)(1)	RSS-247 6.2	PSD (5.15-5.25)	<11dBm/MHz (FCC) <10 dBm/MHz EIRP (IC)		Pass
§15.407 (a)(2)	RSS-247 6.2	PSD (5.3,5.5GHz)	<11dBm/MHz		Pass
§15.407 (a)(3)	RSS-247 6.2.4	PSD (5.8GHz)	<30dBm per 500kHz		Pass
§15.207 (a)	RSS-GEN 8.8	AC Power Line conducted emissions	Section 10		Pass
§15.407 (b) & 15.209	RSS-GEN 8.9/7	Radiated Spurious Emission	<54dBuV/m	Radiated	Pass
§15.407 (h)(2)	RSS-247 6.3	Dynamic Frequency Selection	N/A	Radiated / Condcuted	Pass

9. ANTENNA PORT TEST RESULTS

9.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

PROCEDURE

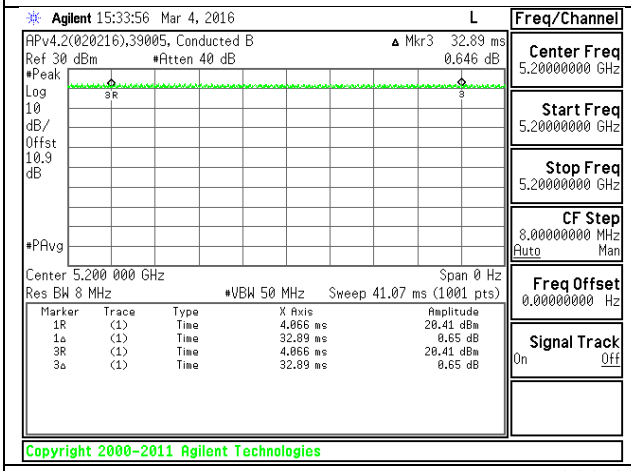
KDB 789033 Zero-Span Spectrum Analyzer Method.

ON TIME AND DUTY CYCLE RESULTS

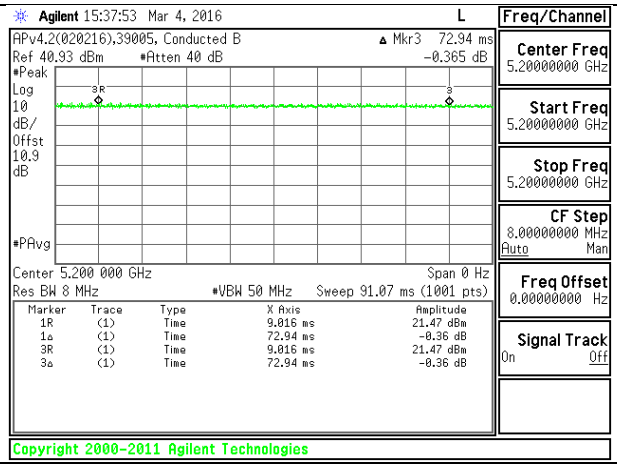
Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)	
802.11a	32.890	32.890	1.000	100.00%	0.00	0.010	
802.11n HT20	72.940	72.940	1.000	100.00%	0.00	0.010	
802.11n HT40	65.740	65.740	1.000	100.00%	0.00	0.010	

DUTY CYCLE PLOTS

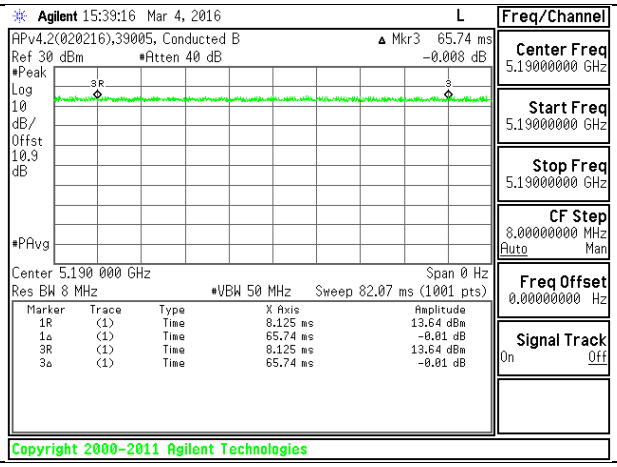
802.11a



802.11n HT20



802.11n HT40



9.2.26 dB BANDWIDTH

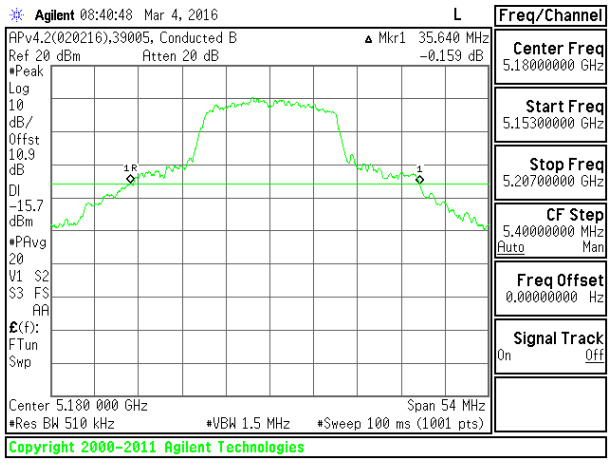
LIMITS

None; for reporting purposes only.

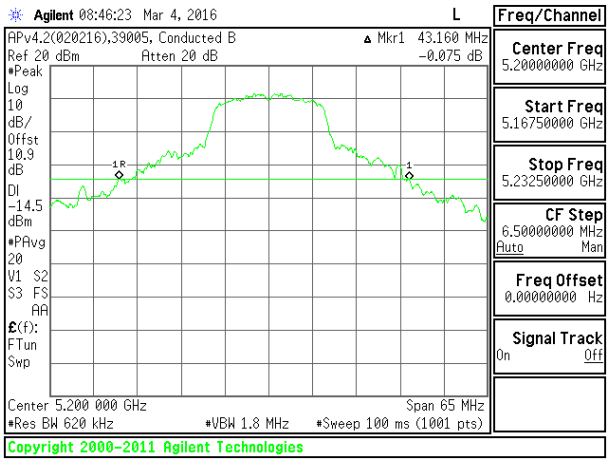
RESULTS

9.2.1. 802.11a MODE IN THE 5.2 GHz BAND

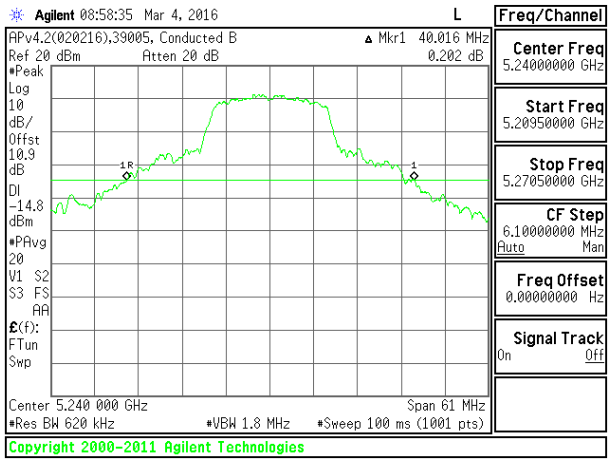
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	35.64
Mid	5200	43.16
High	5240	40.02



LOW CHANNEL



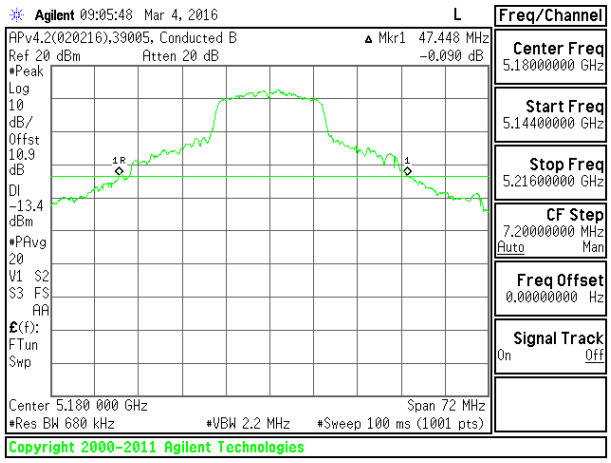
MID CHANNEL



HIGH CHANNEL

9.2.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5180	47.45
Mid	5200	47.88
High	5240	45.02



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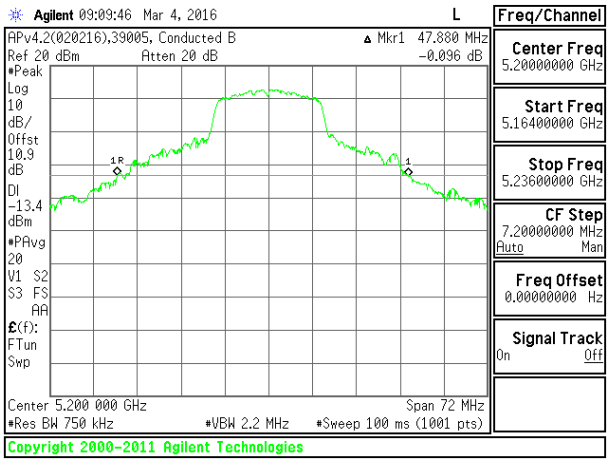

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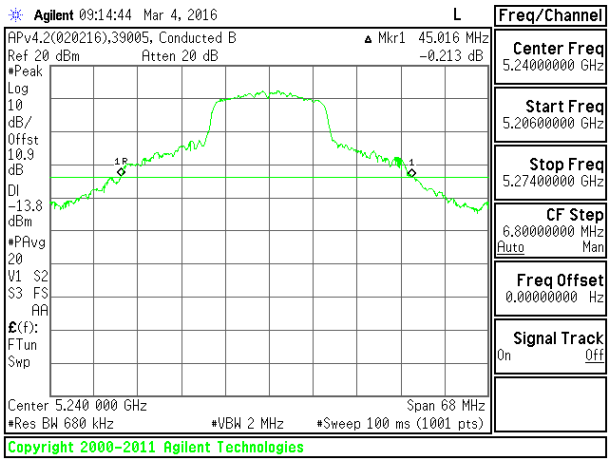
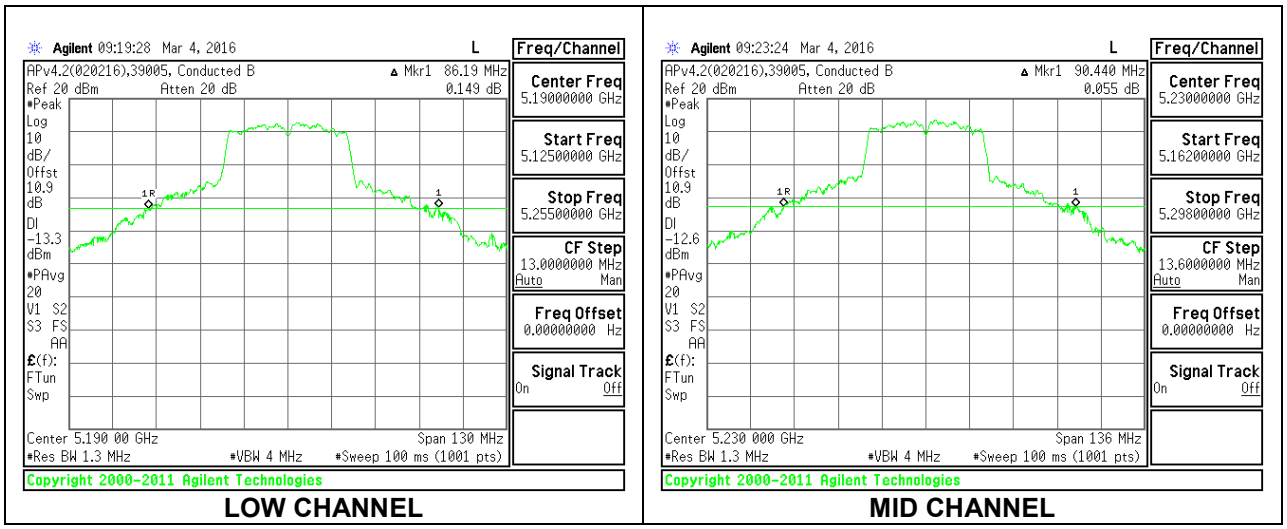


HIGH CHANNEL

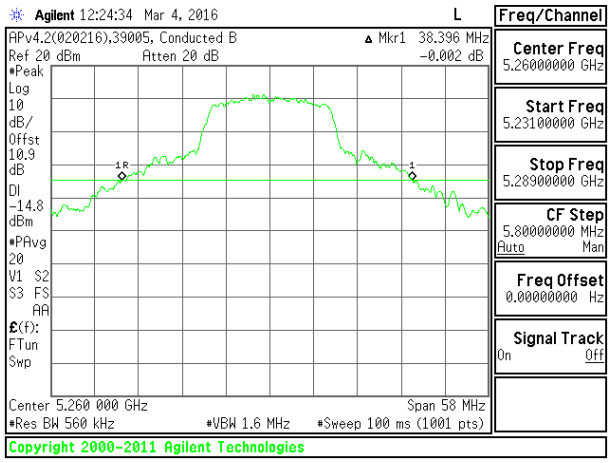
9.2.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	26dB Bandwidth (MHz)
Low	5190	86.19
Mid	5230	90.44



9.2.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	38.40
Mid	5300	33.86
High	5320	34.63



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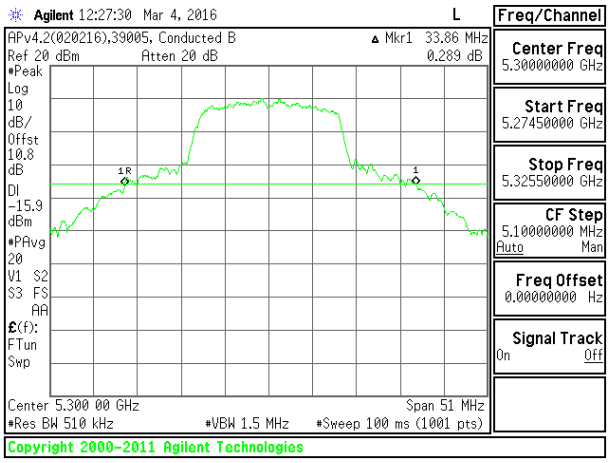

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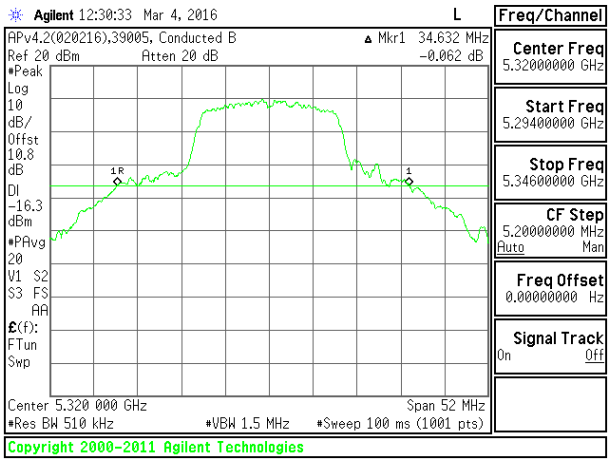
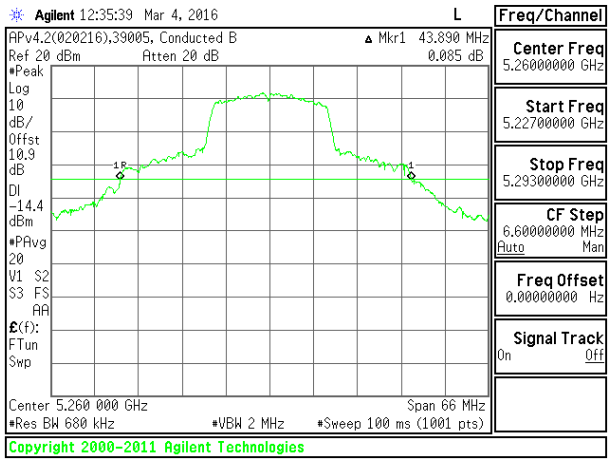


HIGH CHANNEL

9.2.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5260	43.89
Mid	5300	44.02
High	5320	43.63



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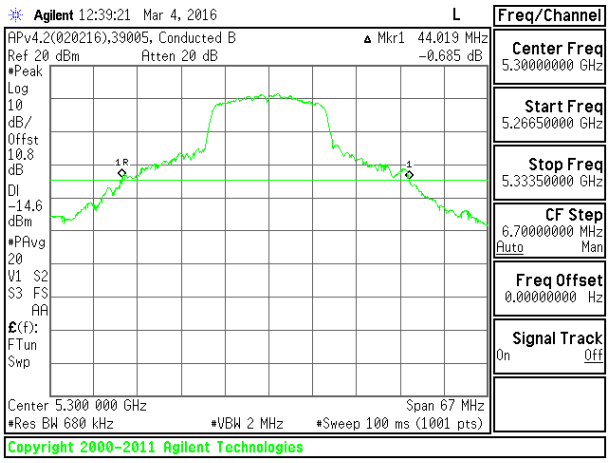

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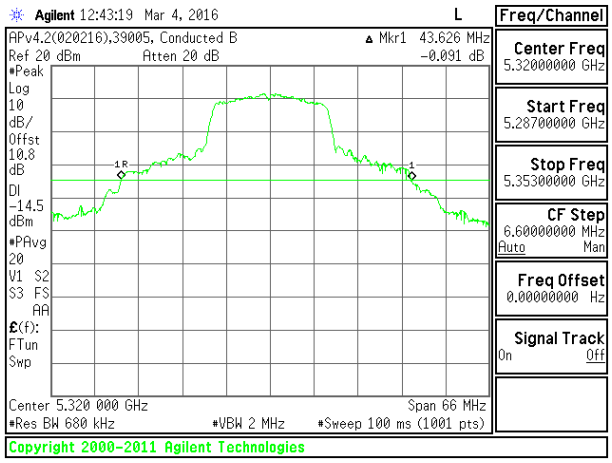
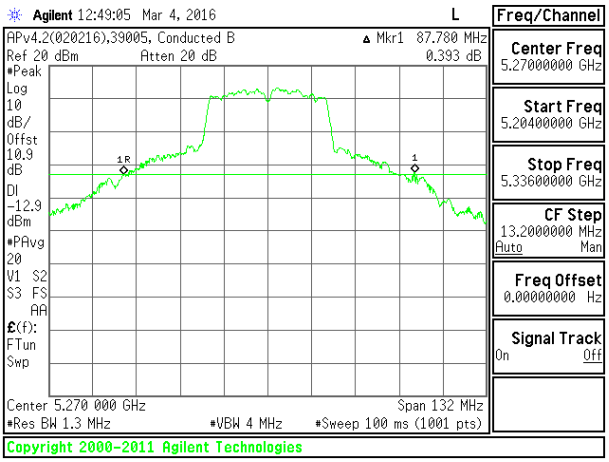


HIGH CHANNEL

9.2.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5270	87.78
High	5310	40.57



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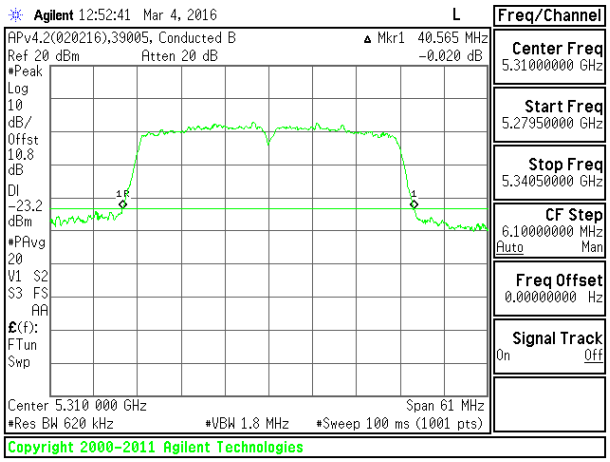
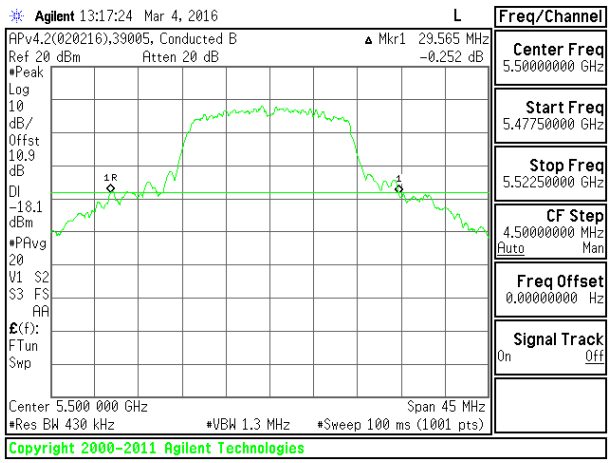


HIGH CHANNEL

9.2.7. 802.11a MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	29.57
Mid	5580	26.08
High	5700	25.62



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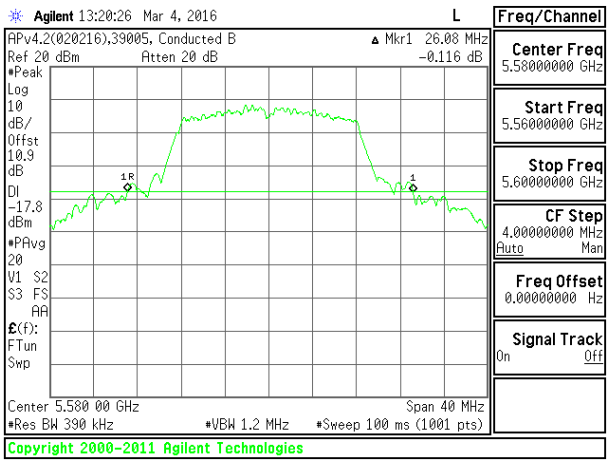

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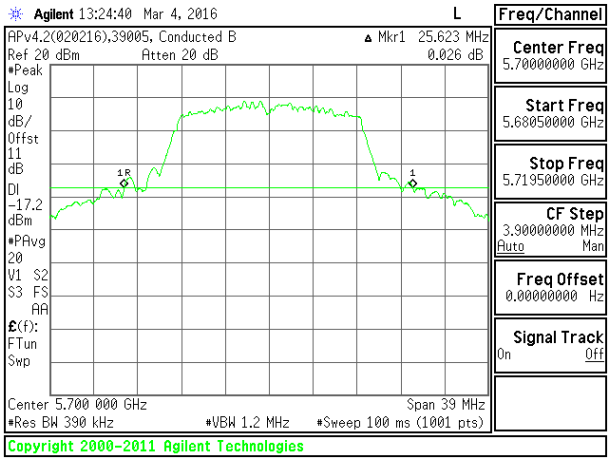
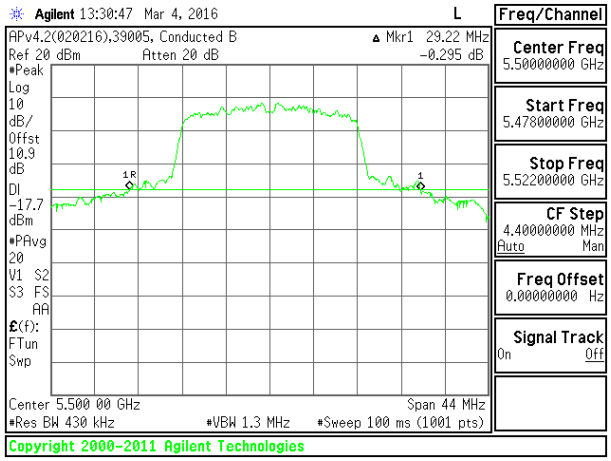


HIGH CHANNEL

9.2.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5500	29.22
Mid	5580	29.48
High	5700	31.26



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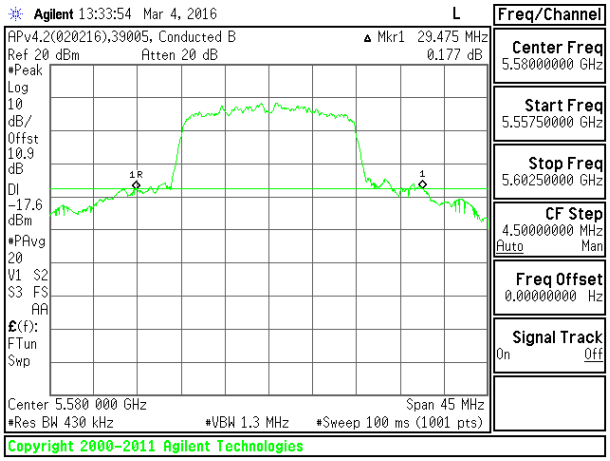

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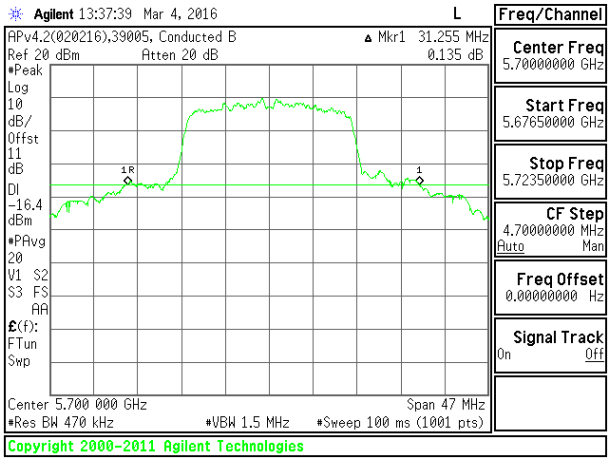
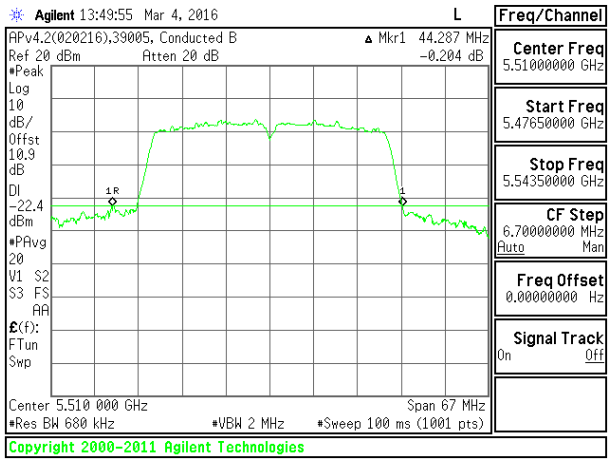


HIGH CHANNEL

9.2.9. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
Low	5510	44.29
Mid	5550	70.07
High	5670	69.93



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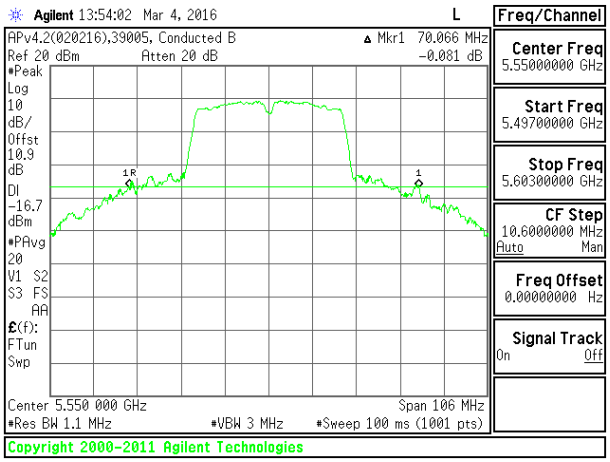
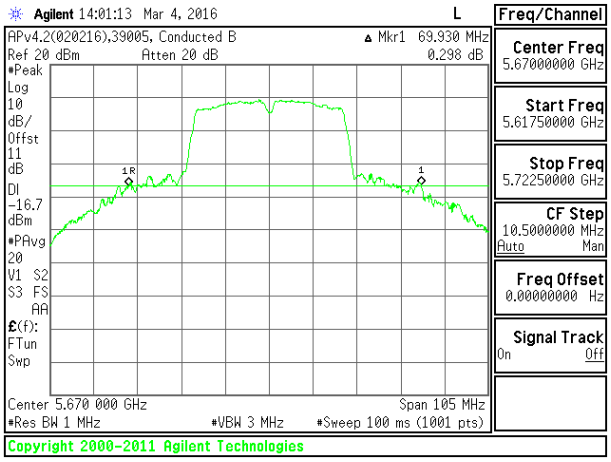


MID CHANNEL



HIGH CHANNEL

9.3.99% BANDWIDTH

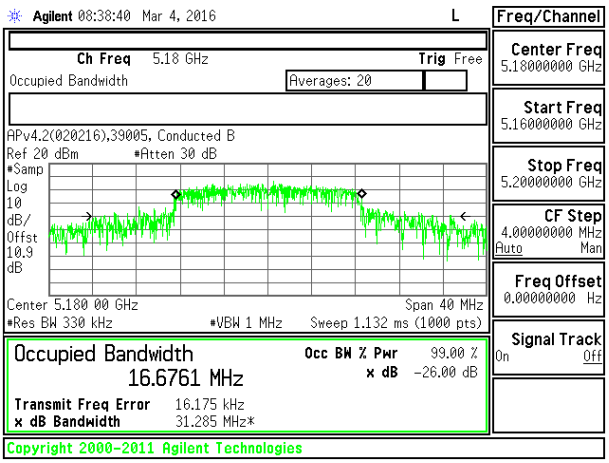
LIMITS

None; for reporting purposes only.

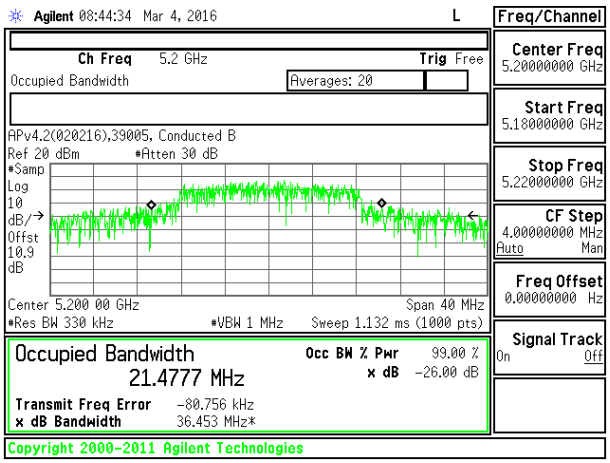
RESULTS

9.3.1. 802.11a MODE IN THE 5.2 GHz BAND

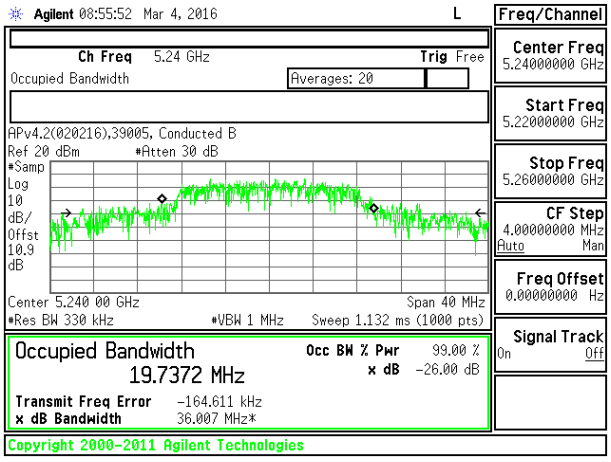
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	16.6761
Mid	5200	21.4777
High	5240	19.7372



LOW CHANNEL



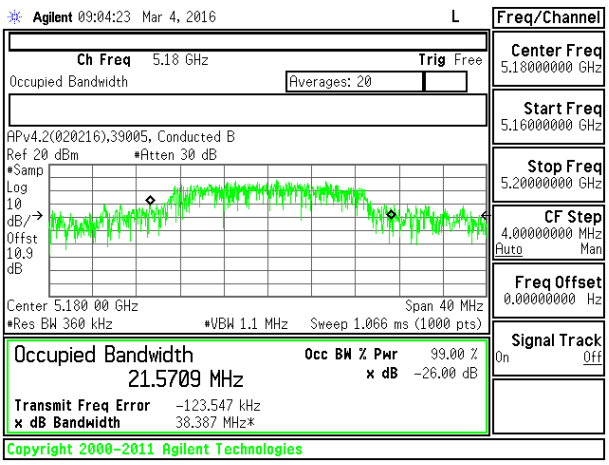
MID CHANNEL



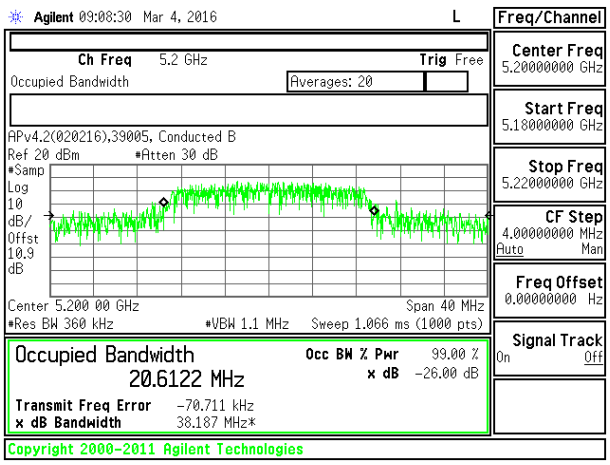
HIGH CHANNEL

9.3.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

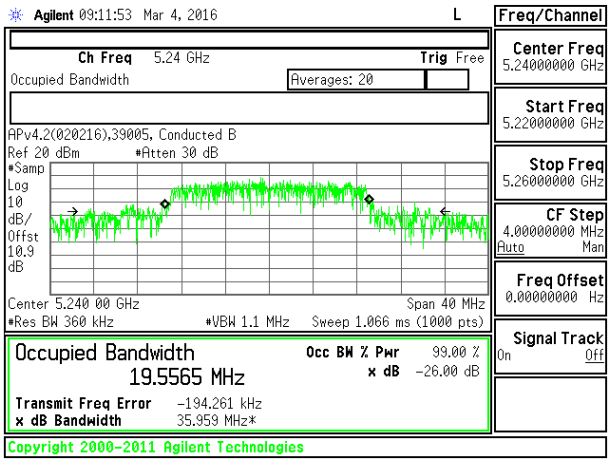
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5180	21.5709
Mid	5200	20.6122
High	5240	19.5565



LOW CHANNEL



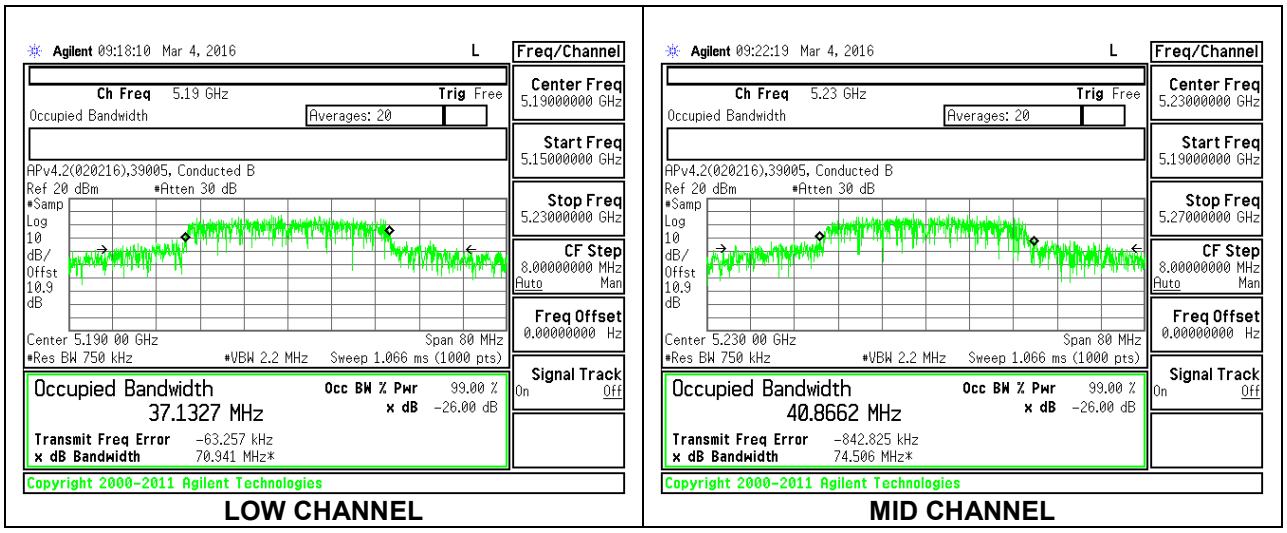
MID CHANNEL



HIGH CHANNEL

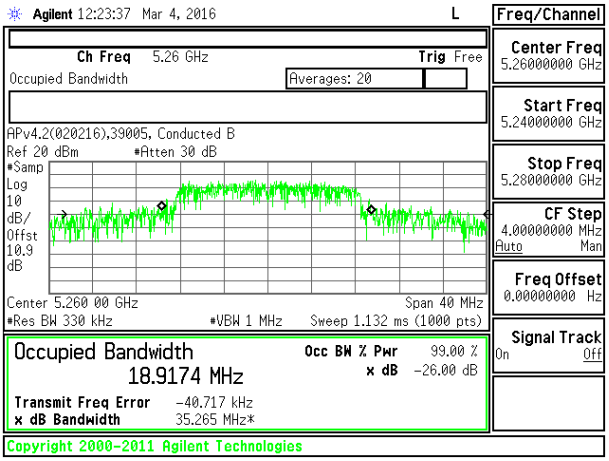
9.3.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5190	37.1327
Mid	5230	40.8662

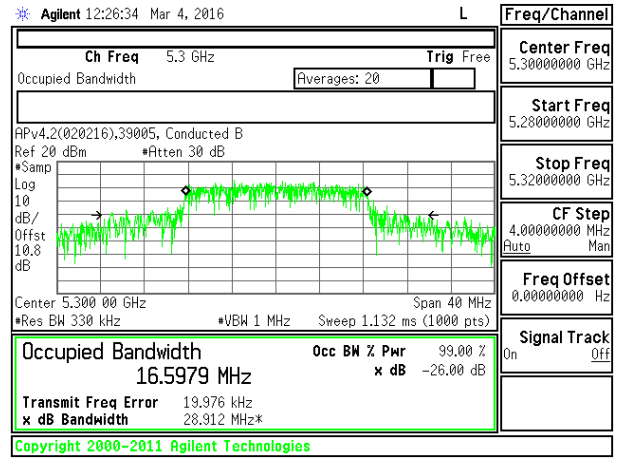


9.3.4. 802.11a MODE IN THE 5.3 GHz BAND

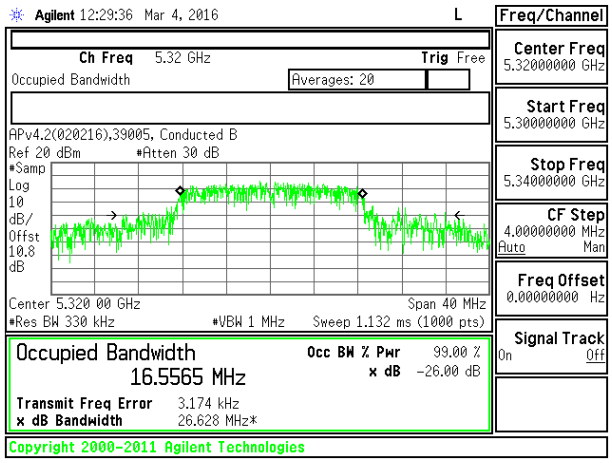
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	18.9174
Mid	5300	16.5979
High	5320	16.5565



LOW CHANNEL



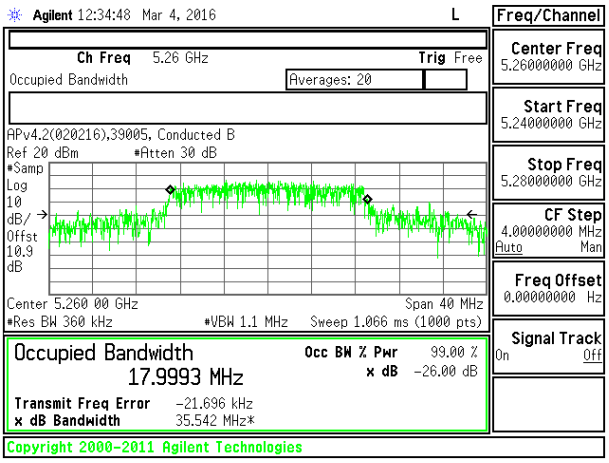
MID CHANNEL



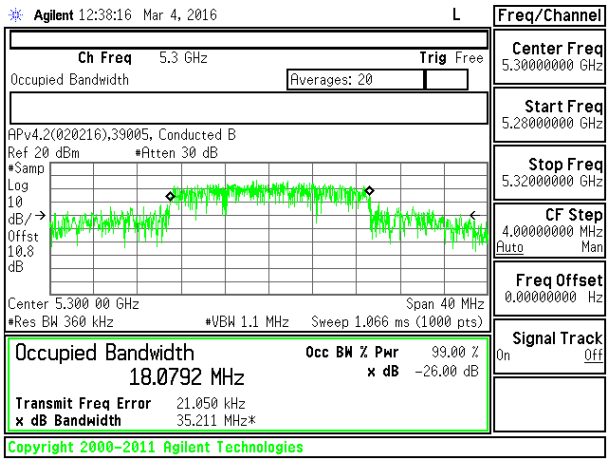
HIGH CHANNEL

9.3.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

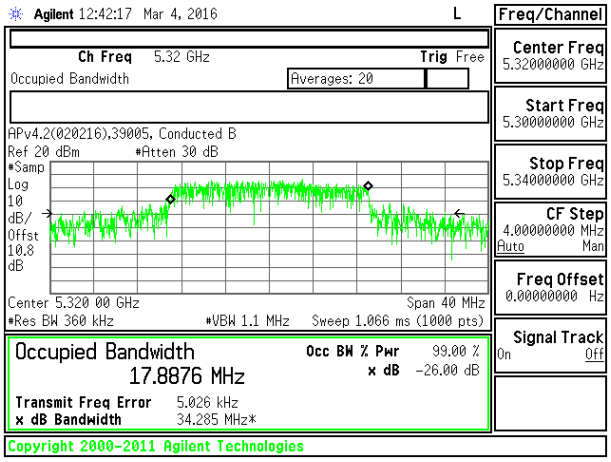
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5260	17.9993
Mid	5300	18.0792
High	5320	17.8876



LOW CHANNEL



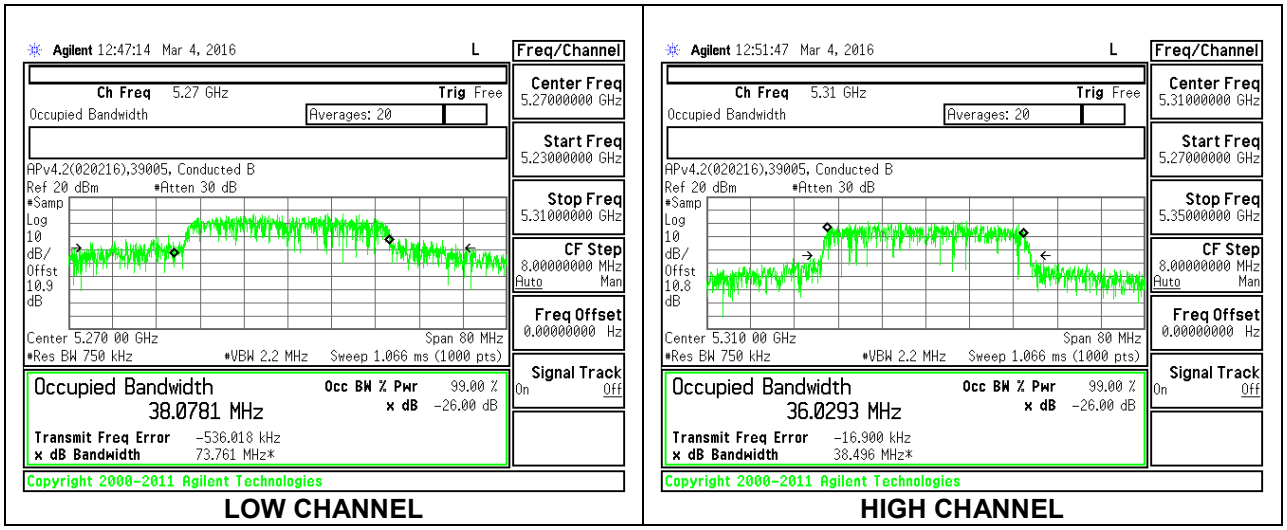
MID CHANNEL



HIGH CHANNEL

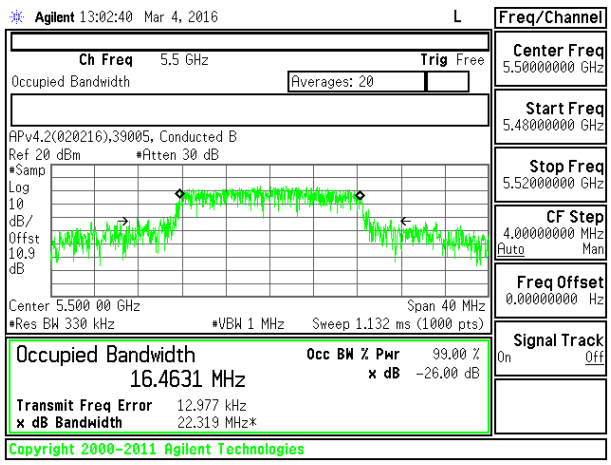
9.3.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5270	38.0781
High	5310	36.0293

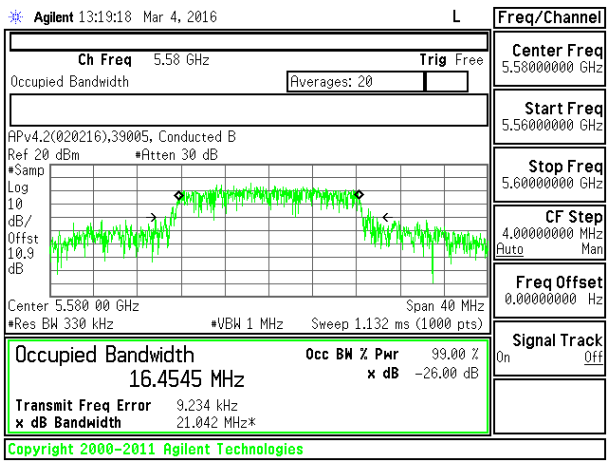


9.3.7. 802.11a MODE IN THE 5.6 GHz BAND

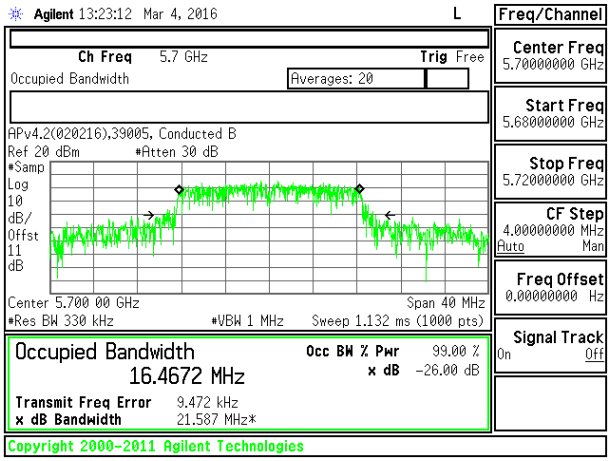
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	16.4631
Mid	5580	16.4545
High	5700	16.4672



LOW CHANNEL



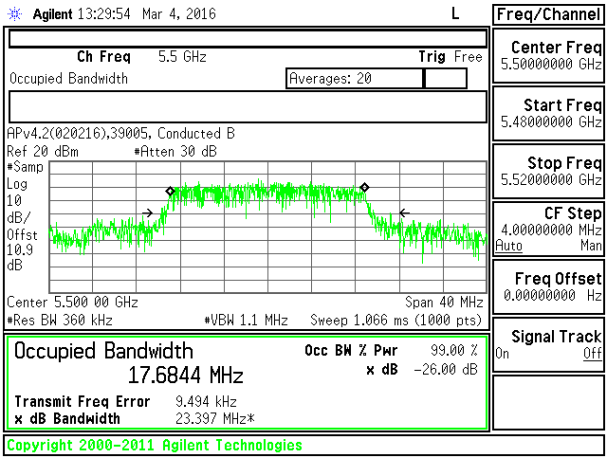
MID CHANNEL



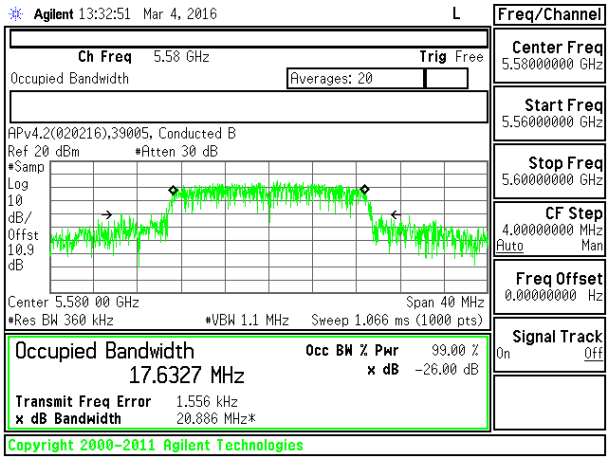
HIGH CHANNEL

9.3.8. 802.11n HT20 MODE IN THE 5.6 GHz BAND

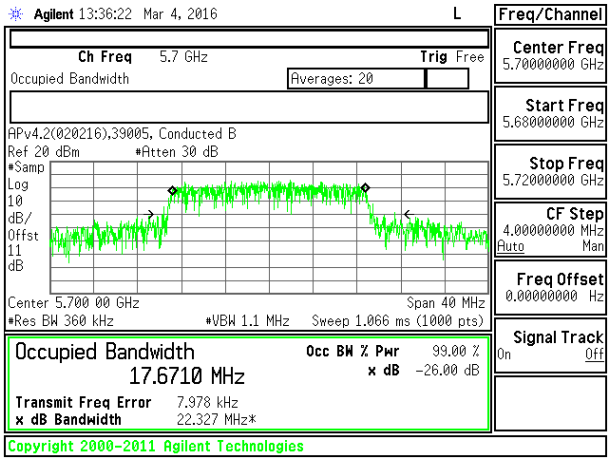
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5500	17.6844
Mid	5580	17.6327
High	5700	17.6710



LOW CHANNEL



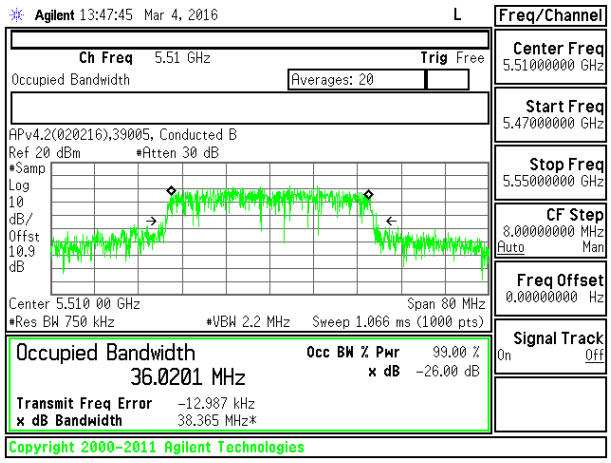
MID CHANNEL



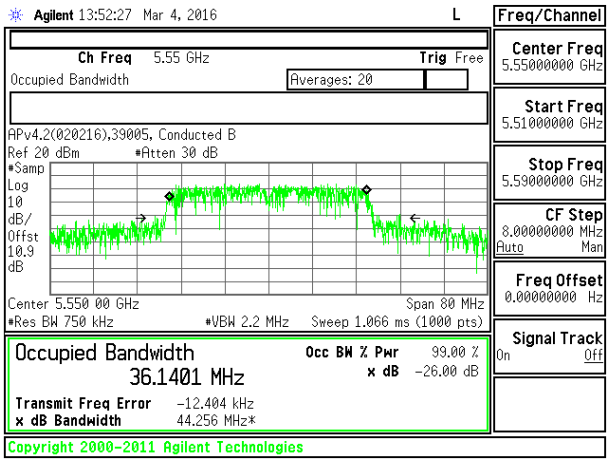
HIGH CHANNEL

9.3.9. 802.11n HT40 MODE IN THE 5.6 GHz BAND

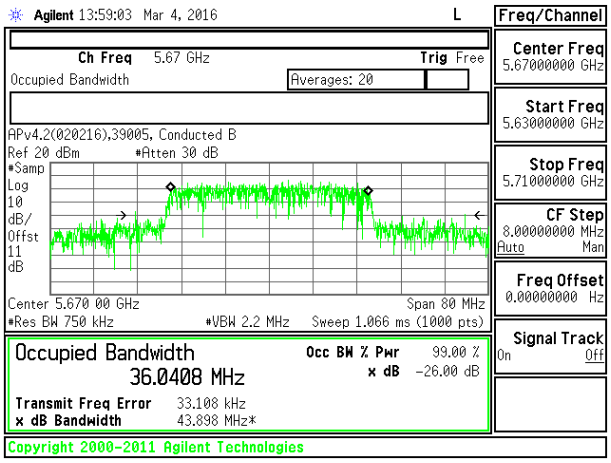
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5510	36.0201
Mid	5550	36.1401
High	5670	36.0408



LOW CHANNEL



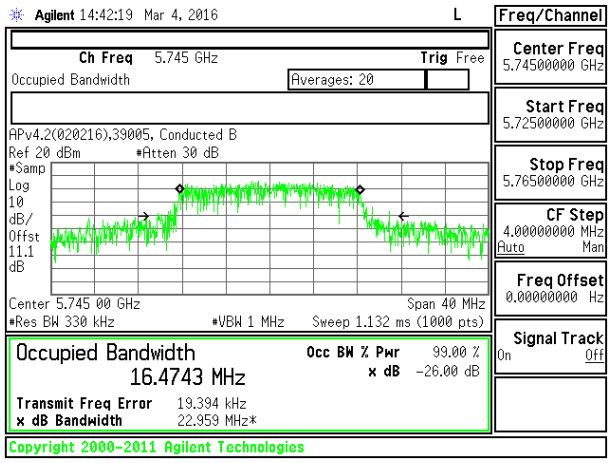
MID CHANNEL



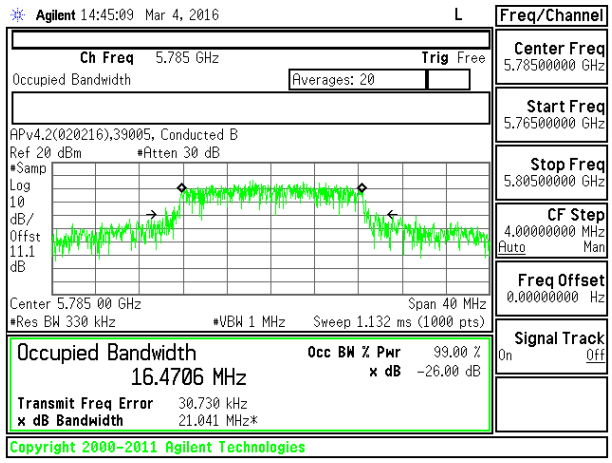
HIGH CHANNEL

9.3.10. 802.11a MODE IN THE 5.8 GHz BAND

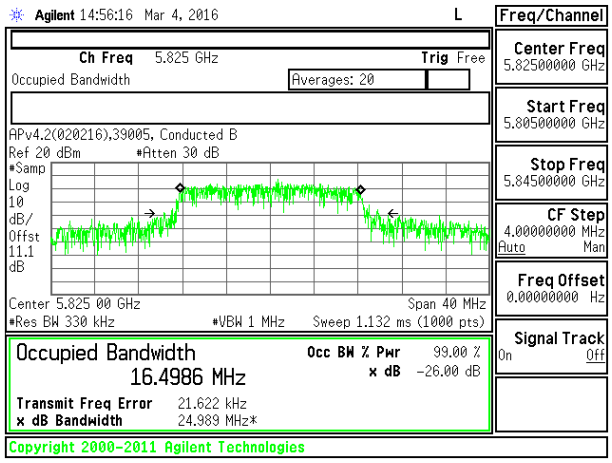
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	16.4743
Mid	5785	16.4706
High	5825	16.4986



LOW CHANNEL



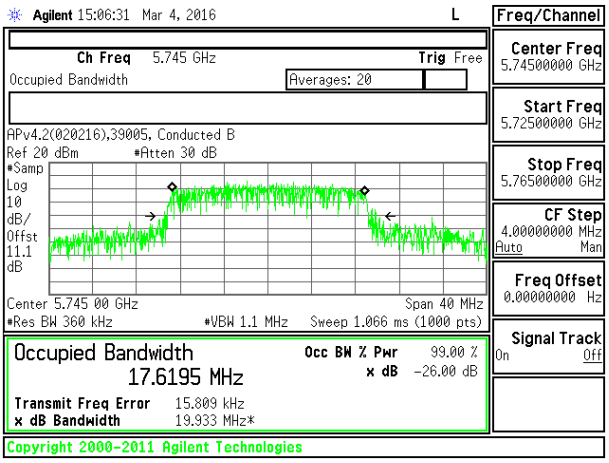
MID CHANNEL



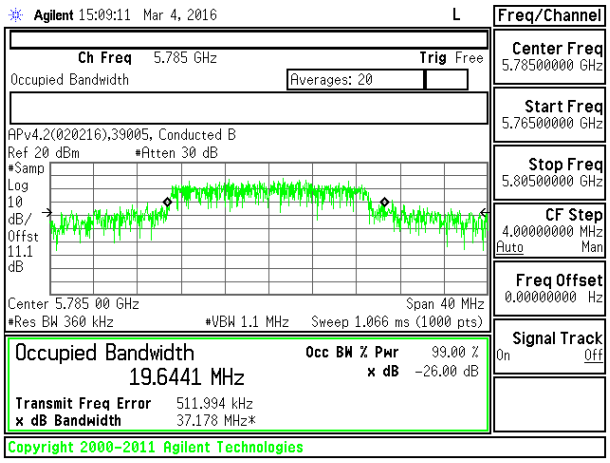
HIGH CHANNEL

9.3.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

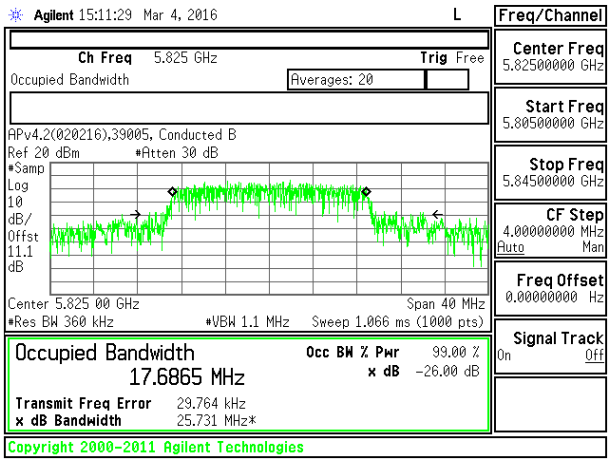
Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5745	17.6195
Mid	5785	19.6441
High	5825	17.6865



LOW CHANNEL



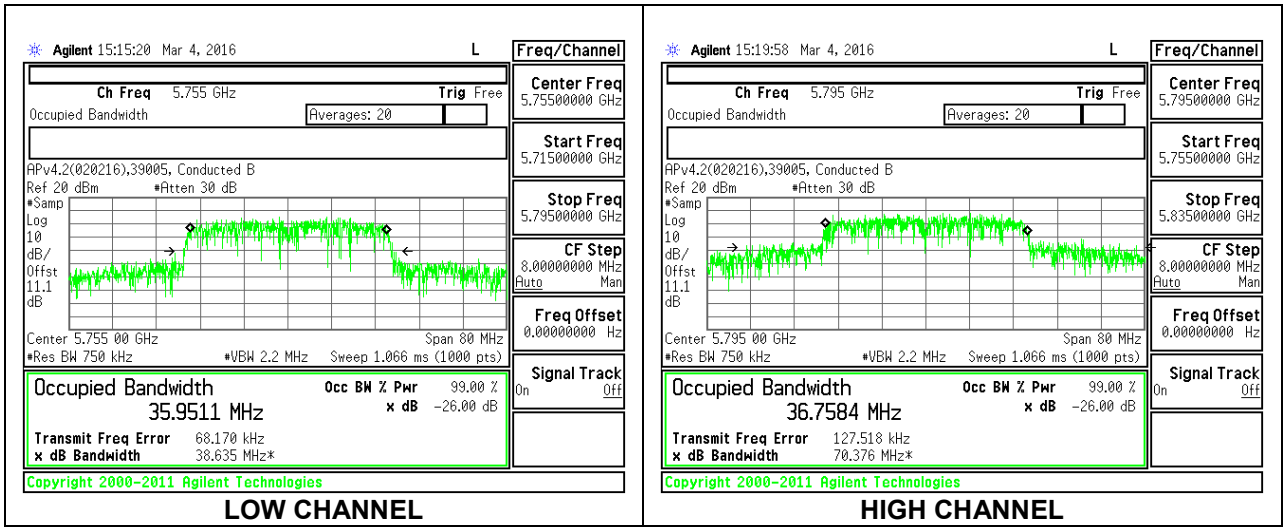
MID CHANNEL



HIGH CHANNEL

9.3.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	99% Bandwidth (MHz)
Low	5755	35.9511
High	5795	36.7584



9.4.6 dB BANDWIDTH

LIMITS

FCC §15.407

RSS-247 6.2.4

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

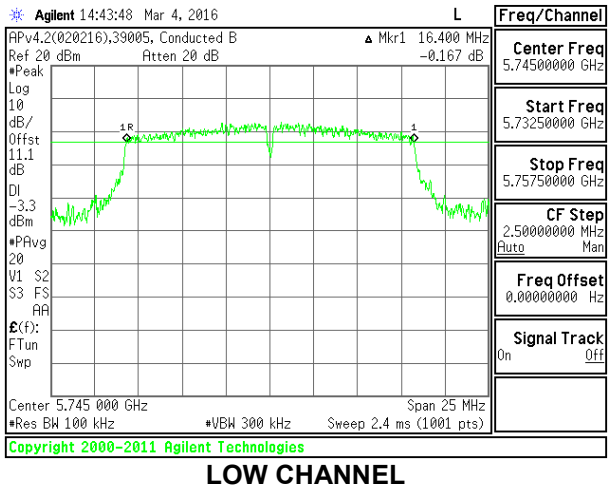
TEST PROCEDURE

Reference to 789033 D02 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to100KHz, the VBW >= 3 x RBW, peak detector and max hold.

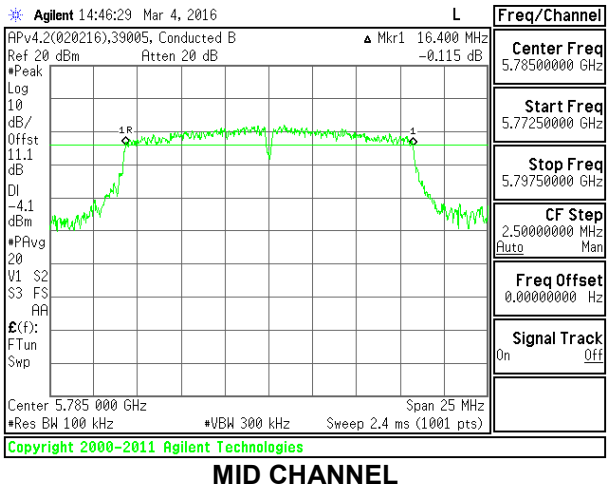
RESULTS

9.4.1. 802.11a MODE IN THE 5.8 GHz BAND

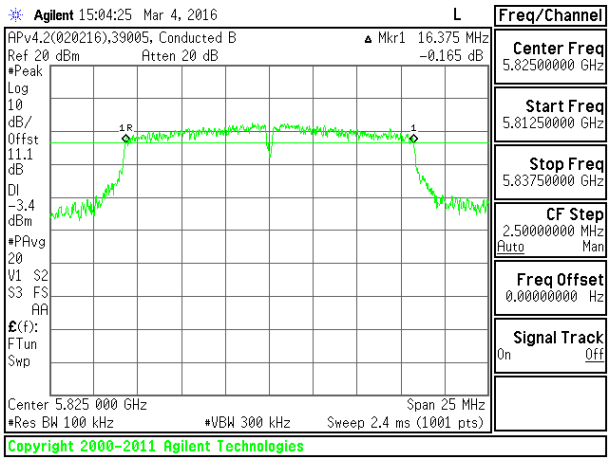
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	16.400	0.5
Mid	5785	16.400	0.5
High	5825	16.375	0.5



LOW CHANNEL



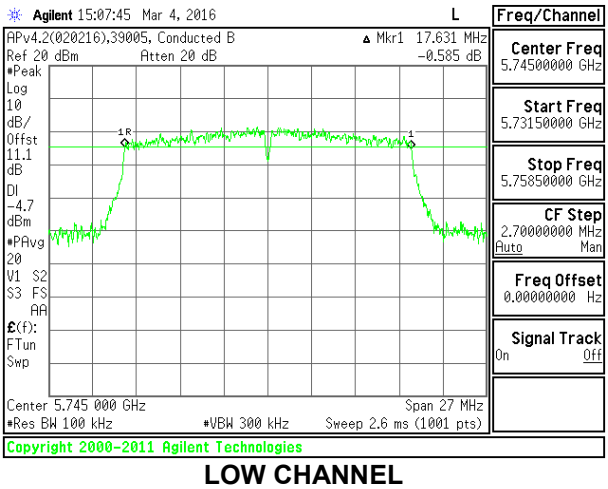
MID CHANNEL



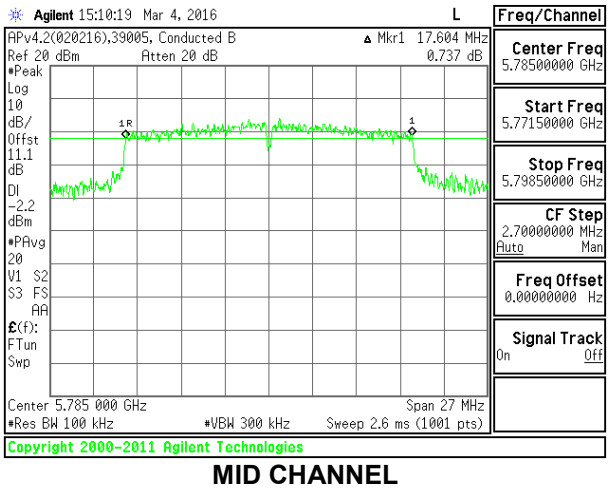
HIGH CHANNEL

9.4.2. 802.11n HT20 MODE IN THE 5.8 GHz BAND

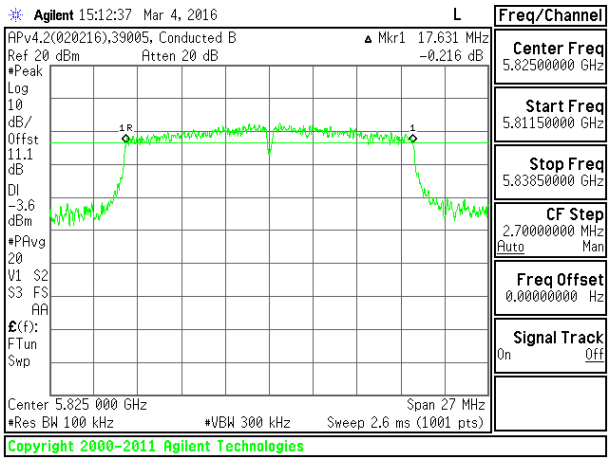
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5745	17.631	0.5
Mid	5785	17.604	0.5
High	5825	17.631	0.5



LOW CHANNEL



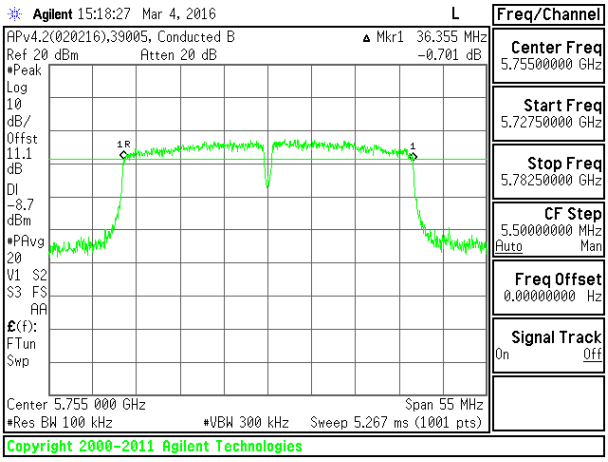
MID CHANNEL



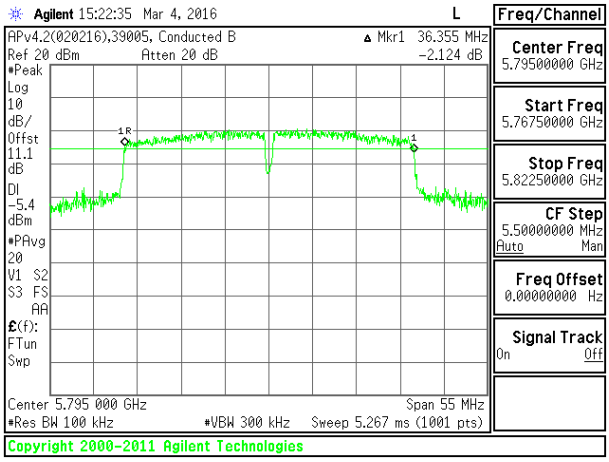
HIGH CHANNEL

9.4.3. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	5755	36.355	0.5
High	5795	36.355	0.5



LOW CHANNEL



HIGH CHANNEL

9.5. OUTPUT POWER AND PPSD

LIMITS

FCC §15.407

Band 5.15–5.25 GHz
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.

IC RSS-247

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

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

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

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

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

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

DIRECTIONAL ANTENNA GAIN

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

RESULTS

9.5.1. 802.11a MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	35.64	16.68	-0.75
Mid	5200	43.16	21.48	-0.75
High	5240	40.02	19.74	-0.75

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	22.22	22.97	22.97	11.00	10.00	10.75
Mid	5200	24.00	23.00	23.75	23.75	11.00	10.00	10.75
High	5240	24.00	22.95	23.70	23.70	11.00	10.00	10.75

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

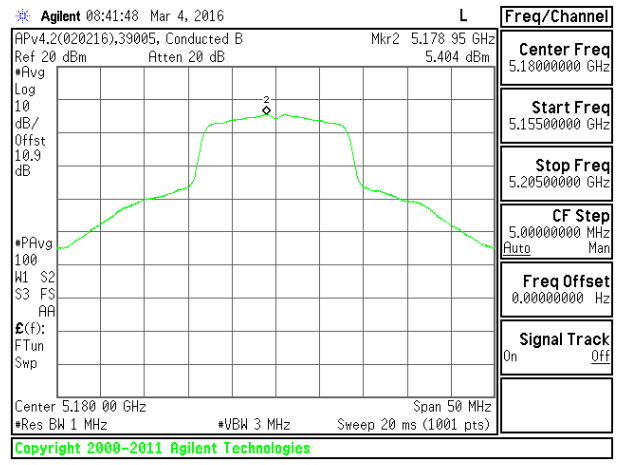
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.10	14.10	22.97	-8.87
Mid	5200	14.10	14.10	23.75	-9.65
High	5240	14.30	14.30	23.70	-9.40
Worst			14.30		

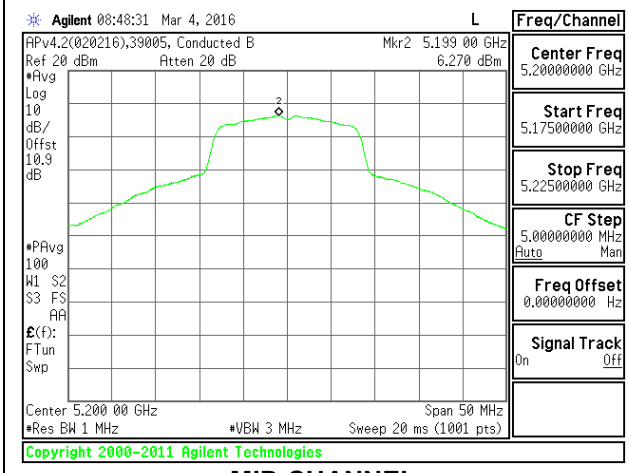
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	5.404	5.40	10.75	-5.35
Mid	5200	6.270	6.27	10.75	-4.48
High	5240	6.028	6.03	10.75	-4.72

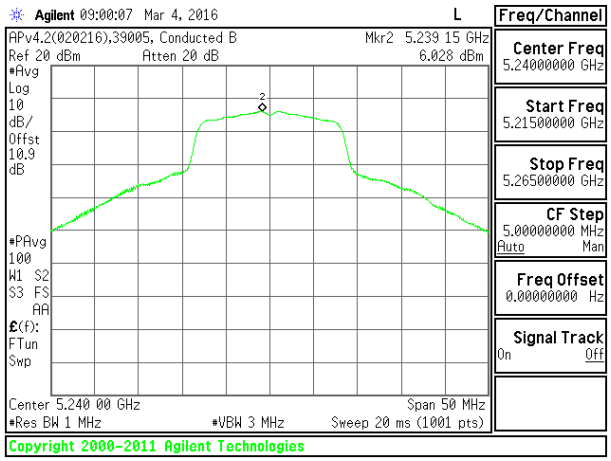
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.3. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5180	35.64	16.68	-0.75
Mid	5200	43.16	21.48	-0.75
High	5240	40.02	19.74	-0.75

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5180	24.00	22.22	22.97	22.97	11.00	10.00	10.75
Mid	5200	24.00	23.00	23.75	23.75	11.00	10.00	10.75
High	5240	24.00	22.95	23.70	23.70	11.00	10.00	10.75

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

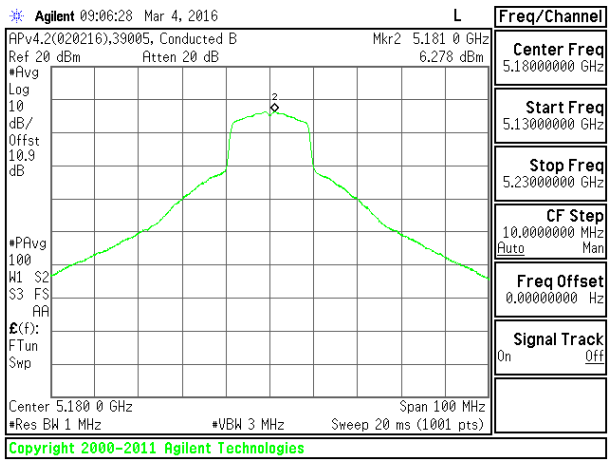
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5180	14.80	14.80	22.97	-8.17
Mid	5200	14.30	14.30	23.75	-9.45
High	5240	14.50	14.50	23.70	-9.20
Worst			14.80		

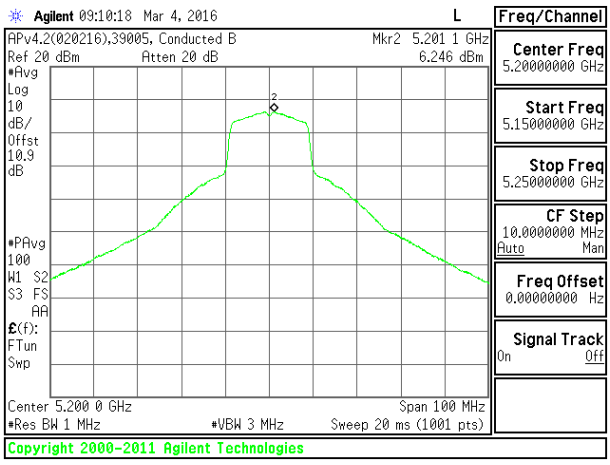
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5180	6.278	6.28	10.75	-4.47
Mid	5200	6.246	6.25	10.75	-4.50
High	5240	6.199	6.20	10.75	-4.55

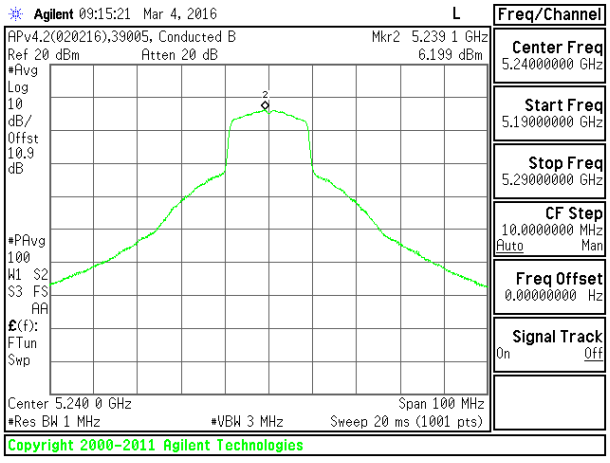
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.4. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5190	86.19	37.13	-0.75
Mid	5230	90.44	40.87	-0.75

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC EIRP Limit (dBm)	Max IC Power (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC eirp PSD Limit (dBm)	PPSD Limit (dBm)
Low	5190	24.00	23.00	23.75	23.75	11.00	10.00	10.75
Mid	5230	24.00	23.00	23.75	23.75	11.00	10.00	10.75
Duty Cycle CF (dB)		0.00	Included in Calculations of Corr'd Power & PPSD					

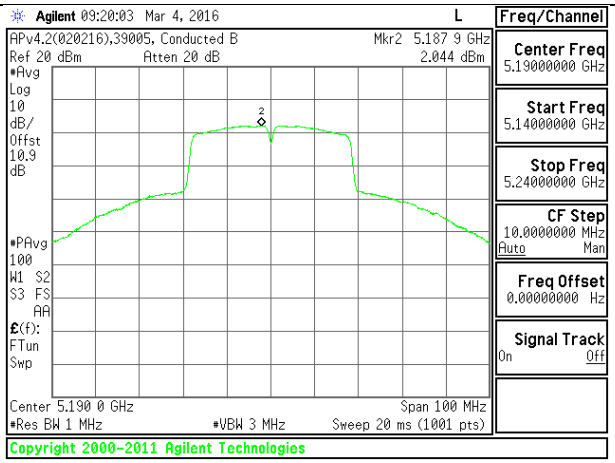
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5190	10.60	10.60	23.75	-13.15
Mid	5230	10.40	10.40	23.75	-13.35
Worst			10.60		

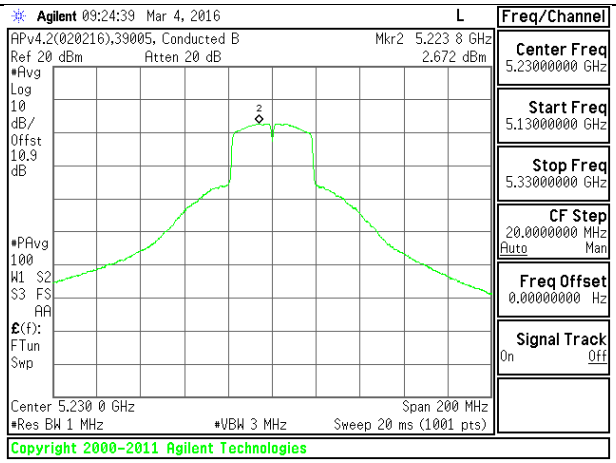
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5190	2.044	2.04	10.75	-8.71
Mid	5230	2.672	2.67	10.75	-8.08

PSD PLOTS



LOW CHANNEL



MID CHANNEL

9.5.5. 802.11a MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	38.40	18.92	-0.71
Mid	5300	33.86	16.60	-0.71
High	5320	34.63	16.56	-0.71

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.77	29.77	23.77	11.00	11.00	11.00
Mid	5300	24.00	23.20	29.20	23.20	11.00	11.00	11.00
High	5320	24.00	23.19	29.19	23.19	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

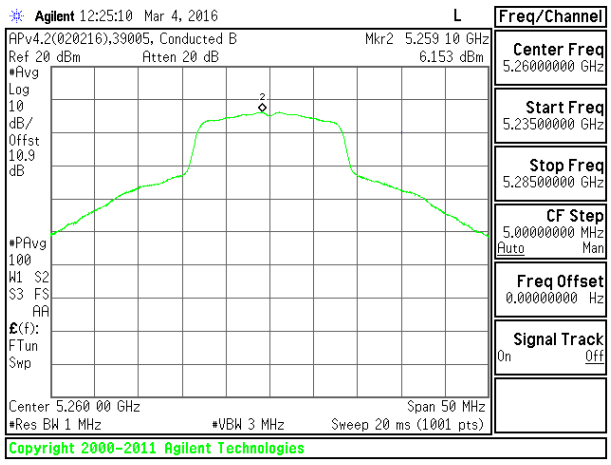
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.40	14.40	23.77	-9.37
Mid	5300	13.80	13.80	23.20	-9.40
High	5320	13.80	13.80	23.19	-9.39
Worst			14.40		

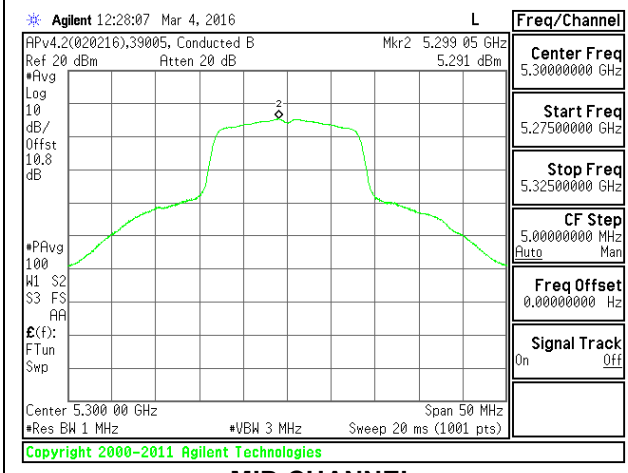
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	6.153	6.15	11.00	-4.85
Mid	5300	5.291	5.29	11.00	-5.71
High	5320	5.284	5.28	11.00	-5.72

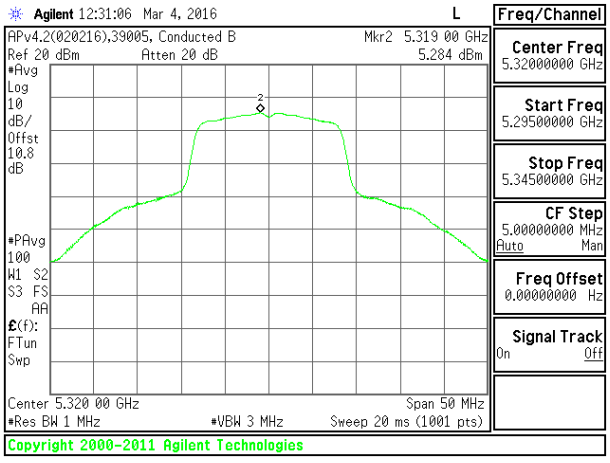
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.6. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5260	43.89	18.00	-0.71
Mid	5300	44.02	18.08	-0.71
High	5320	43.63	17.89	-0.71

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5260	24.00	23.55	29.55	23.55	11.00	11.00	11.00
Mid	5300	24.00	23.57	29.57	23.57	11.00	11.00	11.00
High	5320	24.00	23.53	29.53	23.53	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

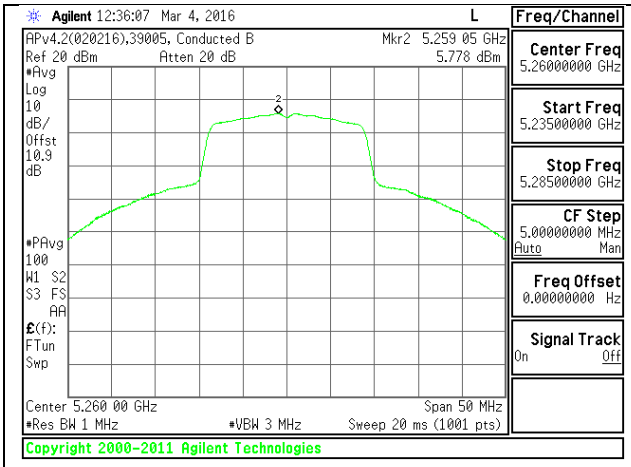
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5260	14.70	14.70	23.55	-8.85
Mid	5300	14.50	14.50	23.57	-9.07
High	5320	14.60	14.60	23.53	-8.93
Worst			14.70		

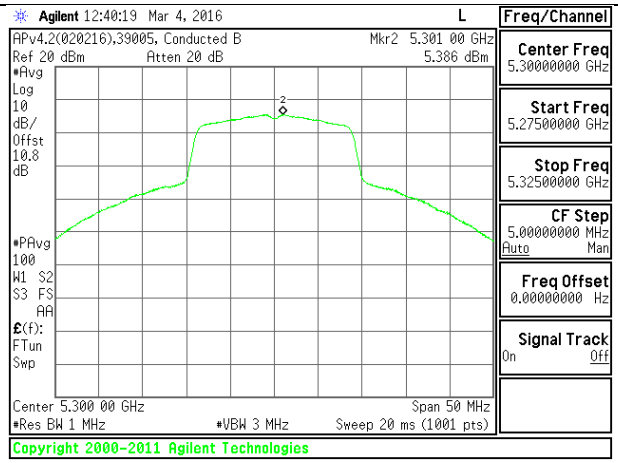
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5260	5.778	5.78	11.00	-5.22
Mid	5300	5.386	5.39	11.00	-5.61
High	5320	5.705	5.71	11.00	-5.30

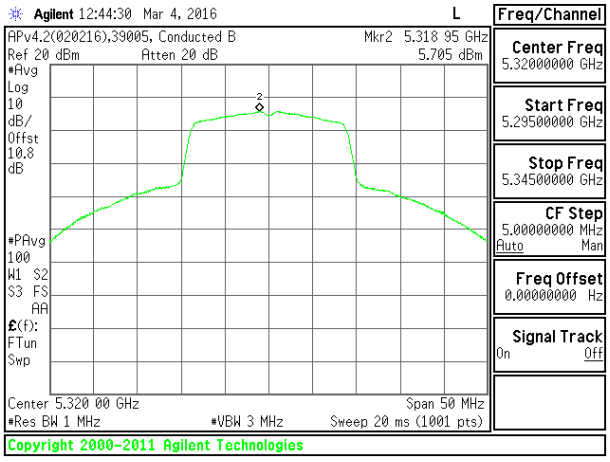
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.7. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5270	87.78	38.08	-0.71
High	5310	40.57	36.03	-0.71

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5270	24.00	24.00	30.00	24.00	11.00	11.00	11.00
High	5310	24.00	24.00	30.00	24.00	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

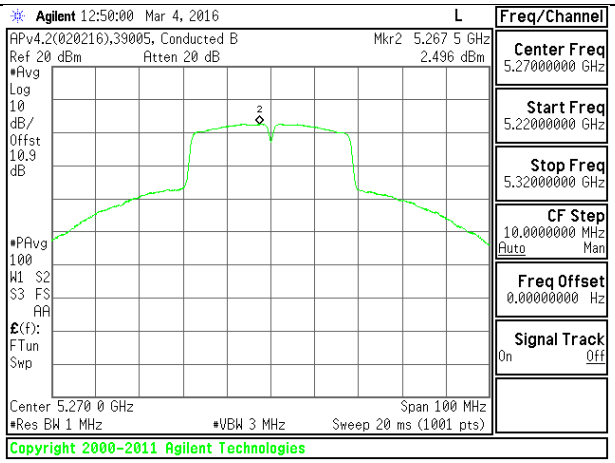
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5270	10.40	10.40	24.00	-13.60
High	5310	10.20	10.20	24.00	-13.80
Worst			10.40		

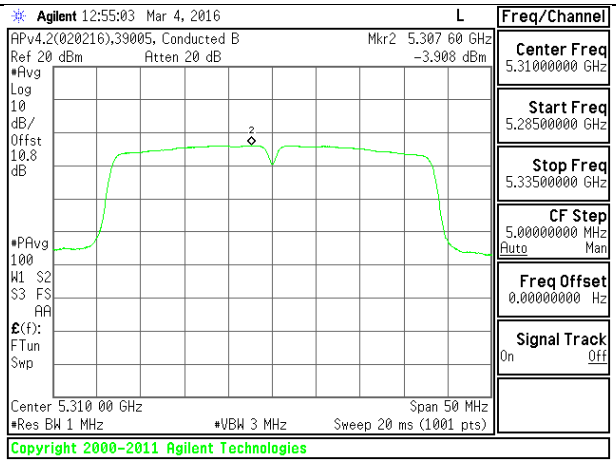
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5270	2.50	2.50	11.00	-8.50
High	5310	-3.91	-3.91	11.00	-14.91

PSD PLOTS



LOW CHANNEL



HIGH CHANNEL

9.5.8. 802.11a MODE IN THE 5.6 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	29.57	16.46	-0.36
Mid	5580	26.08	16.45	-0.36
High	5700	25.62	16.47	-0.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.17	29.17	23.17	11.00	11.00	11.00
Mid	5580	24.00	23.16	29.16	23.16	11.00	11.00	11.00
High	5700	24.00	23.17	29.17	23.17	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

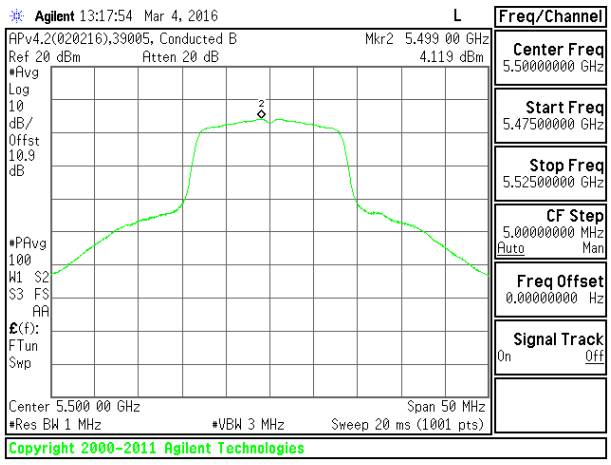
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.30	14.30	23.17	-8.87
Mid	5580	14.20	14.20	23.16	-8.96
High	5700	14.00	14.00	23.17	-9.17
Worst			14.30		

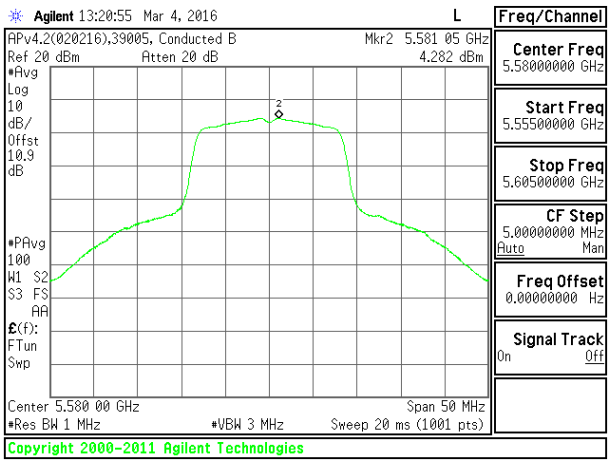
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	4.119	4.12	11.00	-6.88
Mid	5580	4.282	4.28	11.00	-6.72
High	5700	4.950	4.95	11.00	-6.05

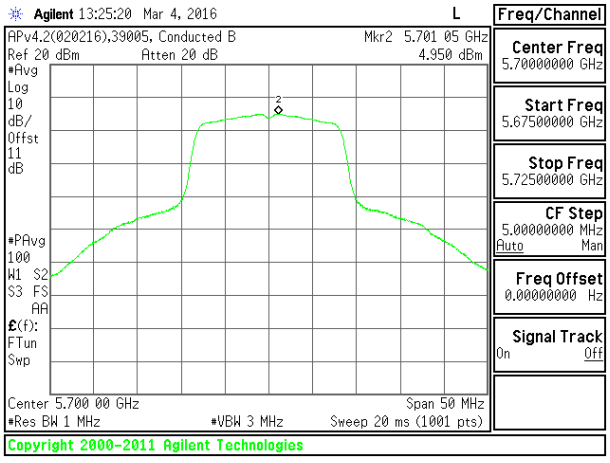
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.9. 802.11n HT20 MODE IN THE 5.6 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5500	29.22	17.68	-0.36
Mid	5580	29.48	17.63	-0.36
High	5700	31.26	17.67	-0.36

Limits

Channel	Frequency (MHz)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Power Limit (dBm)	FCC PPSD Limit (dBm)	IC PSD Limit (dBm)	PPSD Limit (dBm)
Low	5500	24.00	23.48	29.48	23.48	11.00	11.00	11.00
Mid	5580	24.00	23.46	29.46	23.46	11.00	11.00	11.00
High	5700	24.00	23.47	29.47	23.47	11.00	11.00	11.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

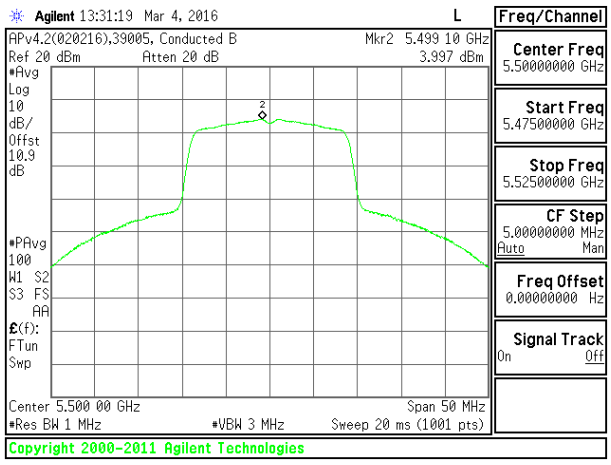
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5500	14.30	14.30	23.48	-9.18
Mid	5580	14.70	14.70	23.46	-8.76
High	5700	14.20	14.20	23.47	-9.27
Worst			14.70		

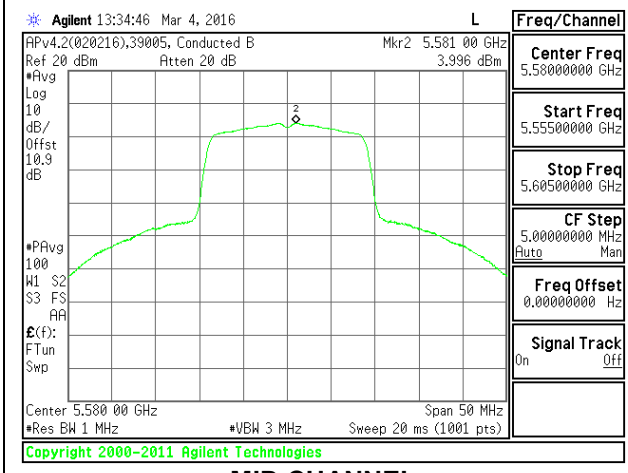
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5500	3.997	4.00	11.00	-7.00
Mid	5580	3.996	4.00	11.00	-7.00
High	5700	4.673	4.67	11.00	-6.33

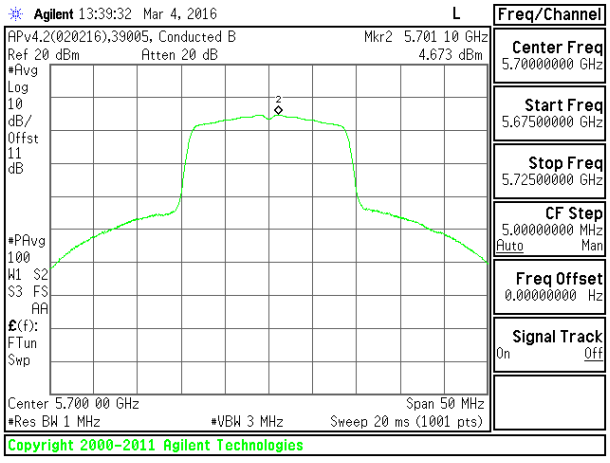
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.10. 802.11n HT40 MODE IN THE 5.6 GHz BAND

Bandwidth and Antenna Gain

Channel	Frequency (MHz)	Min 26 dB BW (MHz)	Min 99% BW (MHz)	Directional Gain (dBi)
Low	5510	44.29	36.02	-0.36
Mid	5550	70.07	36.14	-0.36
High	5670	69.93	36.04	-0.36

Limits

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

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power & PPSD

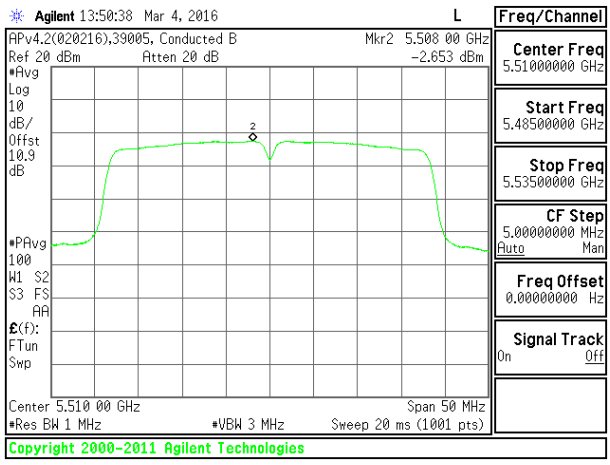
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5510	10.60	10.60	24.00	-13.40
Mid	5550	10.40	10.40	24.00	-13.60
High	5670	10.40	10.40	24.00	-13.60
Worst			10.60		

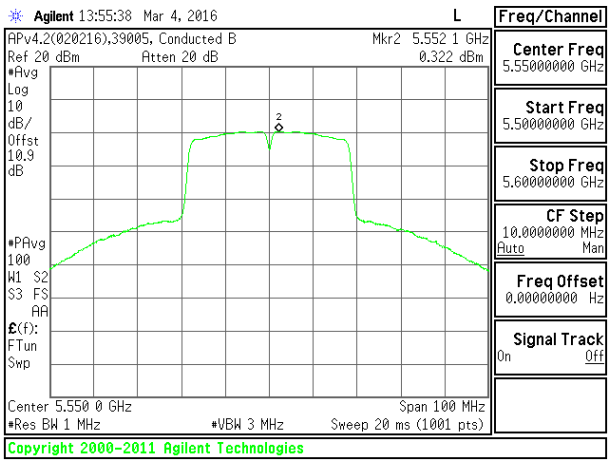
PPSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5510	-2.653	-2.65	11.00	-13.65
Mid	5550	0.322	0.32	11.00	-10.68
High	5670	1.032	1.03	11.00	-9.97

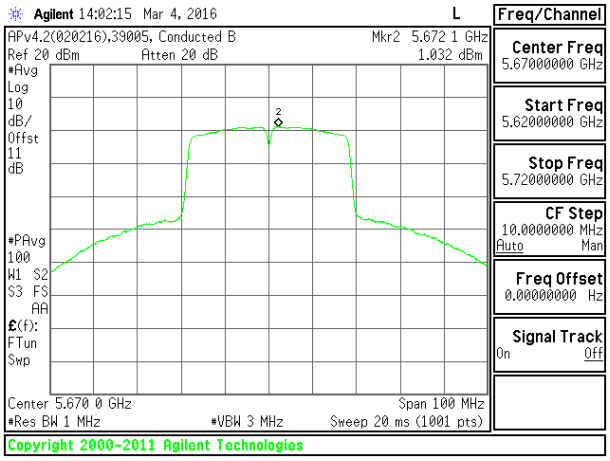
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.11. 802.11a MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5745	-0.15	30.00	30.00
Mid	5785	-0.15	30.00	30.00
High	5825	-0.15	30.00	30.00

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

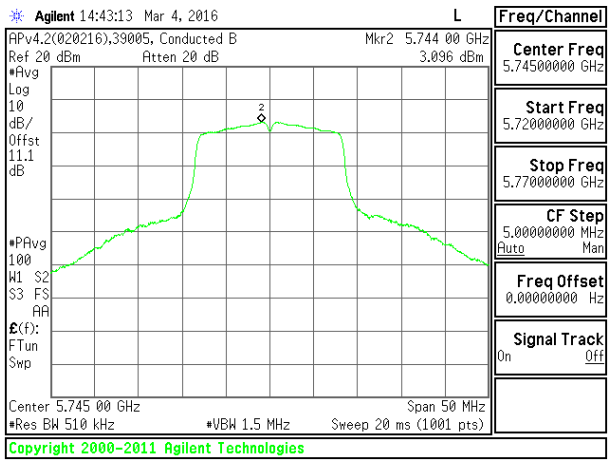
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	13.70	13.70	30.00	-16.30
Mid	5785	14.20	14.20	30.00	-15.80
High	5825	14.10	14.10	30.00	-15.90
Worst			14.20		

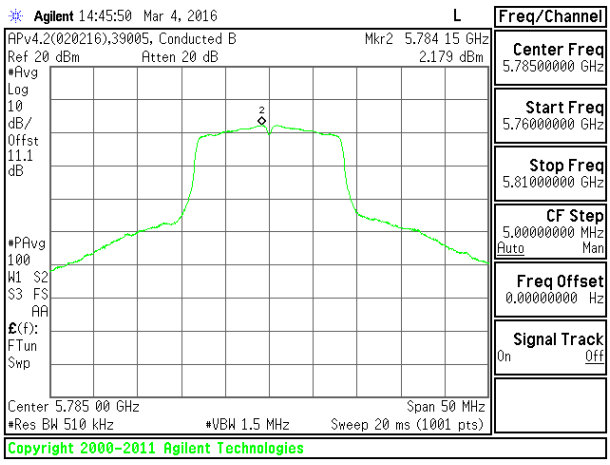
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	3.10	3.10	30.00	-26.90
Mid	5785	2.18	2.18	30.00	-27.82
High	5825	2.80	2.80	30.00	-27.20

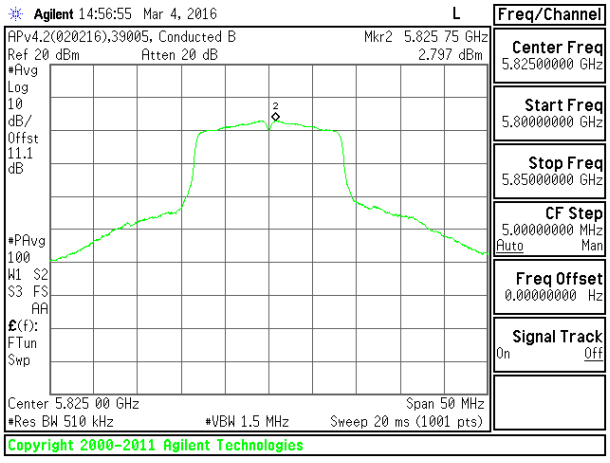
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.12. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5745	-0.15	30.00	30.00
Mid	5785	-0.15	30.00	30.00
High	5825	-0.15	30.00	30.00

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

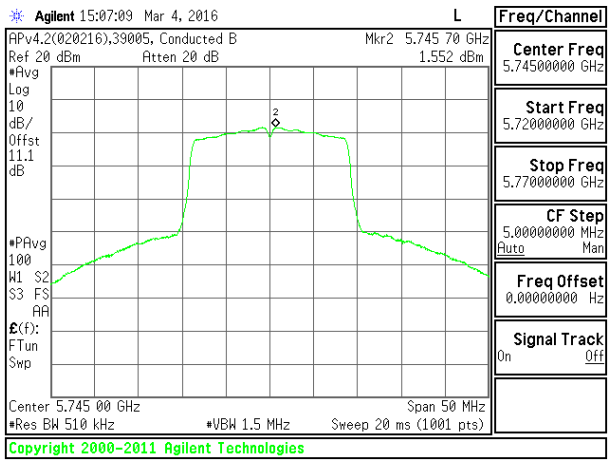
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5745	14.70	14.70	30.00	-15.30
Mid	5785	14.30	14.30	30.00	-15.70
High	5825	14.40	14.40	30.00	-15.60
Worst			14.70		

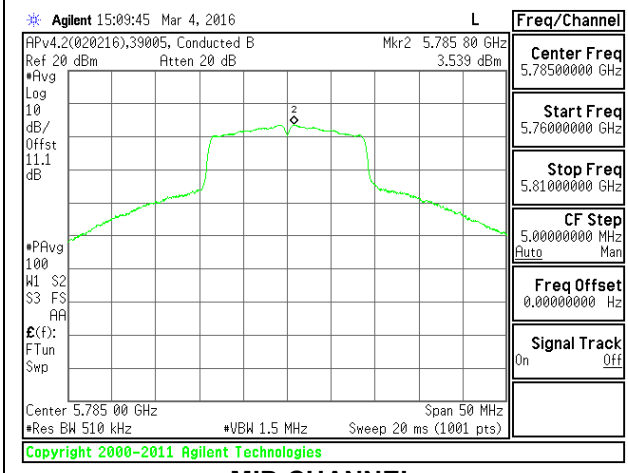
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5745	1.55	1.55	30.00	-28.45
Mid	5785	3.54	3.54	30.00	-26.46
High	5825	2.57	2.57	30.00	-27.43

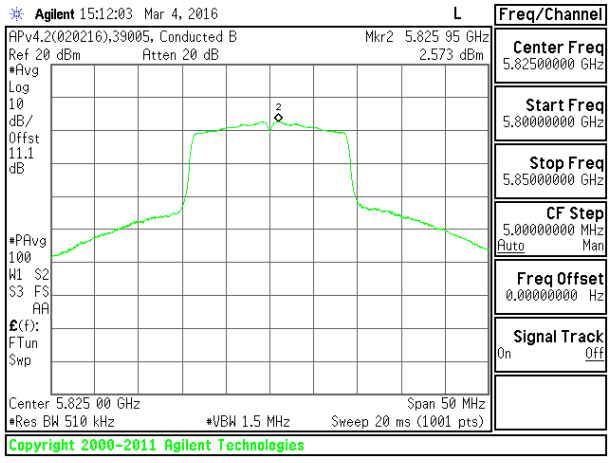
PSD PLOTS



LOW CHANNEL



MID CHANNEL



HIGH CHANNEL

9.5.13. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Antenna Gain and Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC/IC Power Limit (dBm)	FCC/IC PSD Limit (dBm)
Low	5755	-0.15	30.00	30.00
High	5795	-0.15	30.00	30.00

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

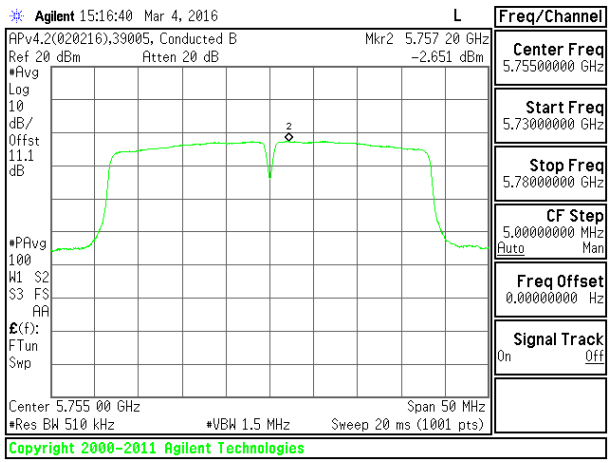
Output Power Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Power Margin (dB)
Low	5755	10.60	10.60	30.00	-19.40
High	5795	10.20	10.20	30.00	-19.80
Worst			10.60		

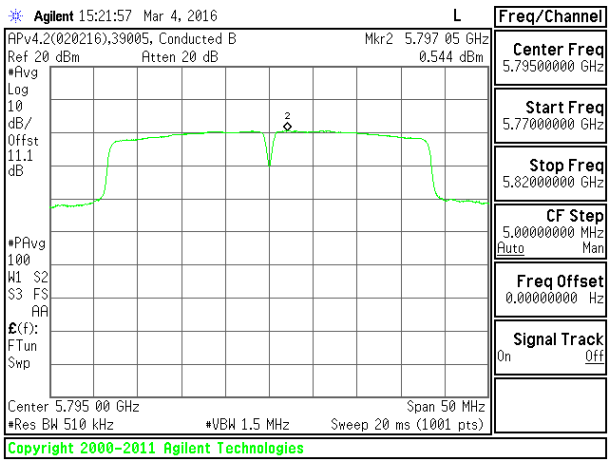
PSD Results

Channel	Frequency (MHz)	Chain 0 Meas PPSD (dBm)	Total Corr'd PPSD (dBm)	PPSD Limit (dBm)	PPSD Margin (dB)
Low	5755	-2.65	-2.65	30.00	-32.65
High	5795	0.54	0.54	30.00	-29.46

PSD PLOTS



LOW CHANNEL



HIGH CHANNEL

9.6. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11.1 dB (including 10 dB pad and 1.1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

RESULTS

9.6.1. 802.11a MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	14.10
Mid	5200	14.10
High	5240	14.30
Worst		14.30

9.6.2. 802.11n HT20 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5180	14.80
Mid	5200	14.30
High	5240	14.50
Worst		14.80

9.6.3. 802.11n HT40 MODE IN THE 5.2 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5190	10.60
Mid	5230	10.40
Worst		10.60

9.6.4. 802.11a MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	14.40
Mid	5300	13.80
High	5320	13.80
Worst		14.40

9.6.5. 802.11n HT20 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5260	14.70
Mid	5300	14.50
High	5320	14.60
Worst		14.70

9.6.6. 802.11n HT40 MODE IN THE 5.3 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5270	10.40
High	5310	10.20
Worst		10.40

9.6.7. 802.11a MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	14.30
Mid	5580	14.20
High	5700	14.00
Worst		14.30

9.6.8. 802.11n HT20 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5500	14.30
Mid	5580	14.70
High	5700	14.20
Worst		14.70

9.6.9. 802.11n HT40 MODE IN THE 5.5 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5510	10.60
Mid	5550	10.40
High	5670	10.40
Worst		10.60

9.6.10. 802.11a MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	13.70
Mid	5785	14.20
High	5825	14.10
Worst		14.20

9.6.11. 802.11n HT20 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5745	14.70
Mid	5785	14.30
High	5825	14.40
Worst		14.70

9.6.12. 802.11n HT40 MODE IN THE 5.8 GHz BAND

Channel	Frequency (MHz)	Avg Power (dBm)
Low	5755	10.60
High	5795	10.20
Worst		10.60

10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN Clause 8.9 (Transmitter)

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 below 1GHz and 150cm for above 1GHz. The antenna to EUT distance is 3 meters.

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.

Reference to KDB 789033 UNII part G) 6) d) Method AD:
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and add duty cycle factor to the reading offset for average measurements.

The spectrum from 1GHz to 40 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

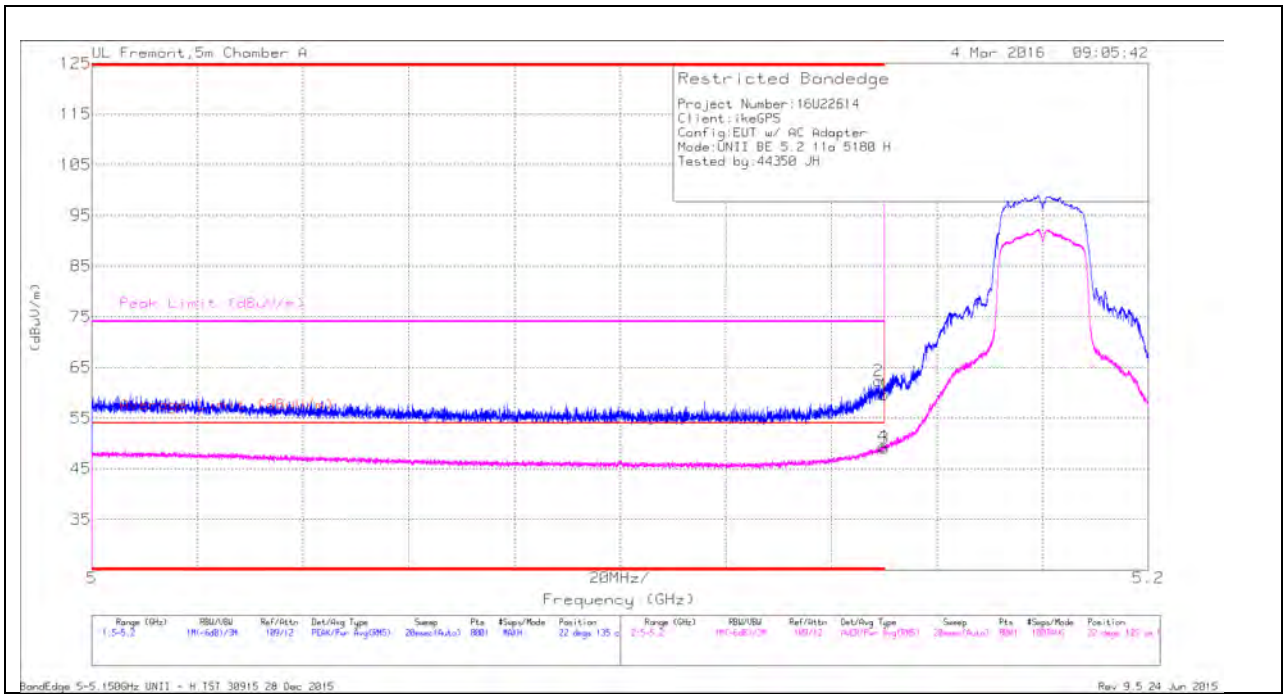
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

10.1. TRANSMITTER ABOVE 1 GHz

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULTS



Trace Markers

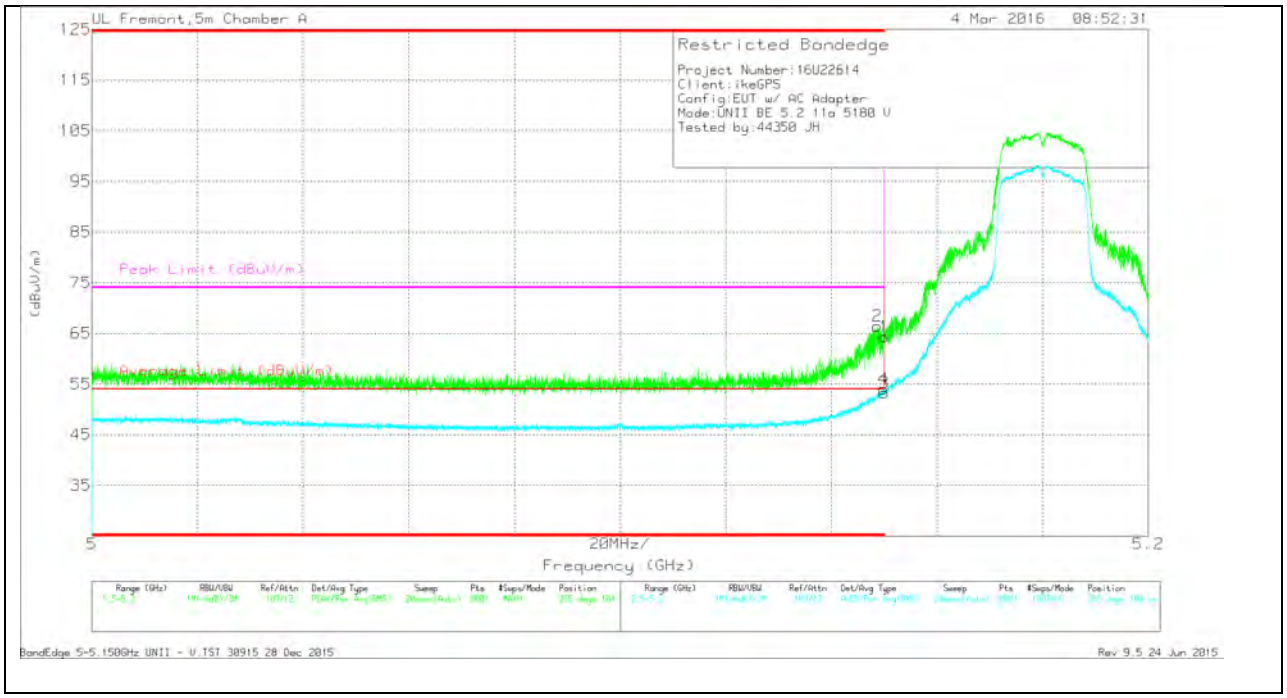
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Fltr/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	45.18	Pk	34.5	-20.1	0	59.58	-	-	74	-14.42	22	135	H
2	* 5.149	47.8	Pk	34.5	-20	0	62.3	-	-	74	-11.7	22	135	H
3	* 5.15	34.67	RMS	34.5	-20.1	0	49.07	54	-4.93	-	-	22	135	H
4	* 5.15	35.04	RMS	34.5	-20.1	0	49.44	54	-4.56	-	-	22	135	H

* - indicates frequency in CFR15.205/IC7.2.2 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Flt r/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	49.91	Pk	34.5	-20.1	0	64.31	-	-	74	-9.69	265	104	V
2	* 5.149	51.93	Pk	34.5	-20	0	66.43	-	-	74	-7.57	265	104	V
3	* 5.15	38.87	RMS	34.5	-20.1	0	53.27	54	-.73	-	-	265	104	V
4	* 5.15	39.58	RMS	34.5	-20.1	0	53.98	54	-.02	-	-	265	104	V

* - indicates frequency in CFR15.205/IC8.10Restricted Band

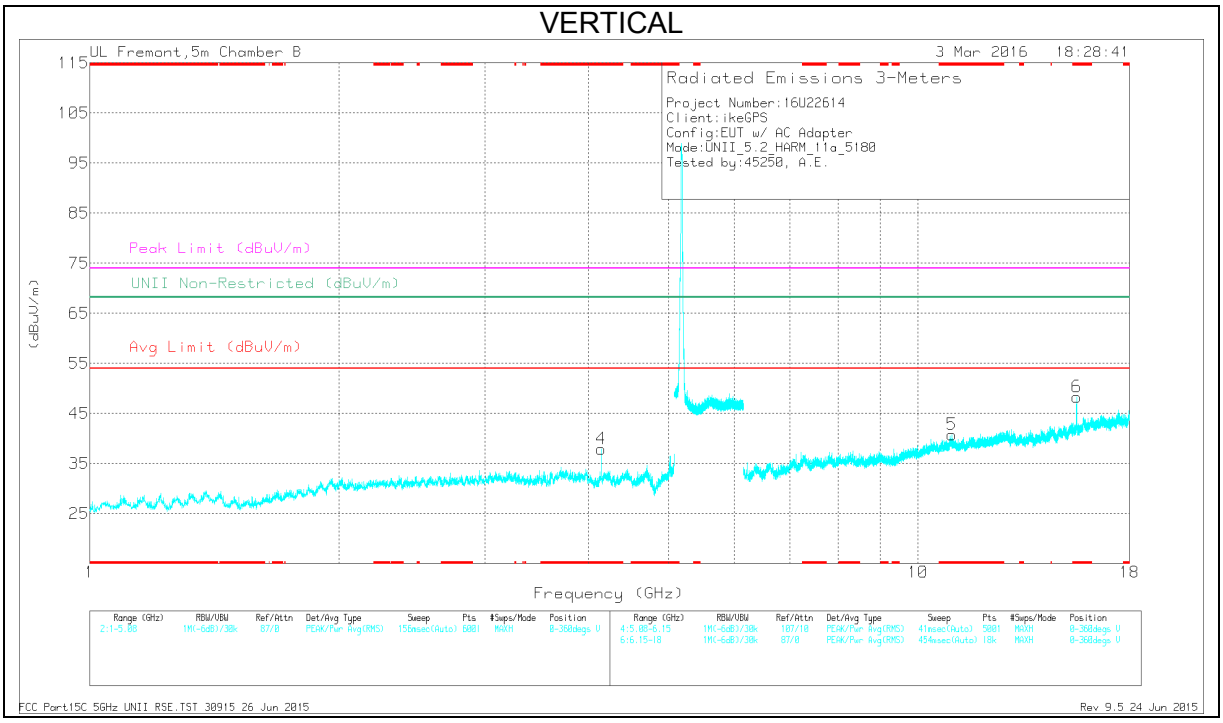
Pk - Peak detector

RMS - RMS detection

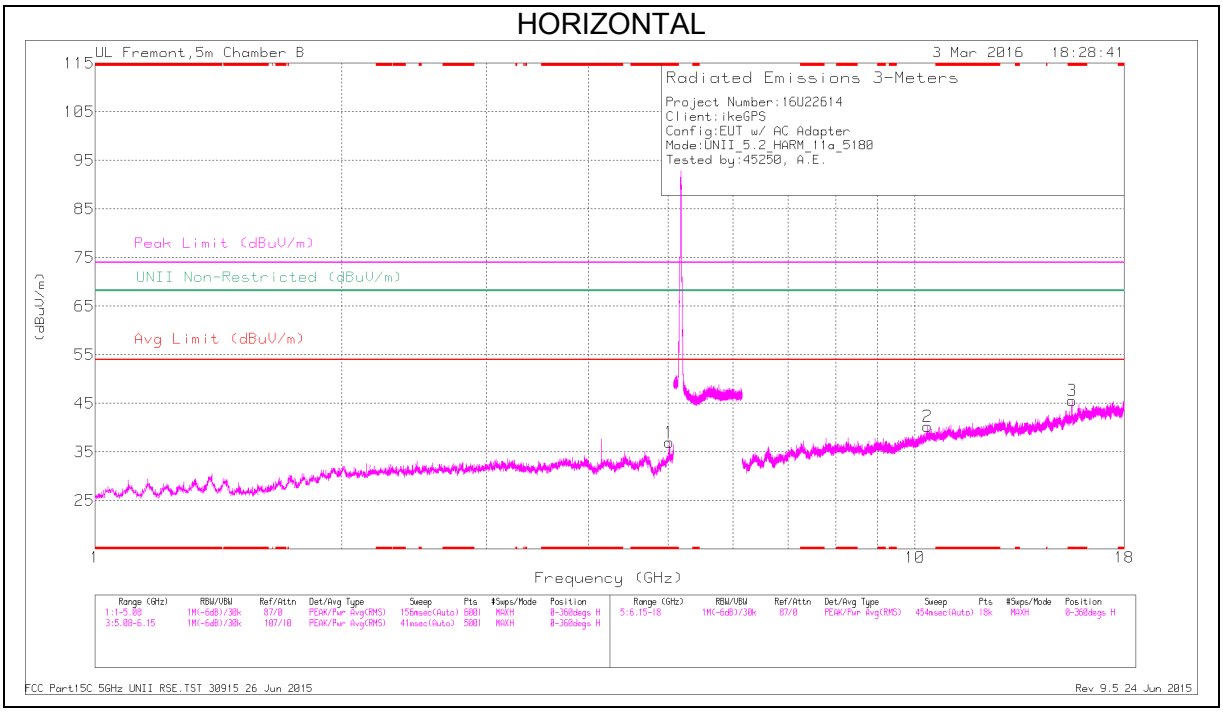
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS

VERTICAL



HORIZONTAL



LOW CHANNEL DATA

TRACE MARKERS

Marker	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	* 5.013	32.76	Pk	34.2	-30	0	36.96	-	-	74	-37.04	-	-	0-360	101	H
4	* 4.144	36.12	Pk	33.7	-31.9	0	37.92	-	-	74	-36.08	-	-	0-360	101	V
3	* 15.547	27.97	Pk	40.5	-22.9	0	45.57	-	-	74	-28.43	-	-	0-360	101	H
5	* 10.988	27.43	Pk	37.9	-24.6	0	40.73	-	-	74	-33.27	-	-	0-360	101	V
6	* 15.542	30.72	Pk	40.5	-22.9	0	48.32	-	-	74	-25.68	-	-	0-360	101	V
2	10.363	28.6	Pk	37.3	-25.6	0	40.3	-	-	-	-	68.2	-27.9	0-360	200	H

PK - Peak detector

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
* 5.013	39.68	PK-U	34.2	-30	0	43.88	-	-	74	-30.12	-	-	326	118	H
* 5.013	28.06	ADR	34.2	-30	0	32.26	54	-21.74	-	-	-	-	326	118	H
* 4.144	41.66	PK-U	33.7	-31.9	0	43.46	-	-	74	-30.54	-	-	227	113	V
* 4.144	33.15	ADR	33.7	-31.9	0	34.95	54	-19.05	-	-	-	-	227	113	V
* 15.546	32.66	PK-U	40.5	-22.9	0	50.26	-	-	74	-23.74	-	-	93	127	H
* 15.546	22.05	ADR	40.5	-22.9	0	39.65	54	-14.35	-	-	-	-	93	127	H
* 10.988	34.36	PK-U	37.9	-24.6	0	47.66	-	-	74	-26.34	-	-	345	397	V
* 10.988	22.88	ADR	37.9	-24.6	0	36.18	54	-17.82	-	-	-	-	345	397	V
* 15.542	39.37	PK-U	40.5	-22.9	0	56.97	-	-	74	-17.03	-	-	229	101	V
* 15.542	27.26	ADR	40.5	-22.9	0	44.86	54	-9.14	-	-	-	-	229	101	V
10.365	34.79	PK-U	37.3	-25.6	0	46.49	-	-	-	-	68.2	-21.71	151	212	H

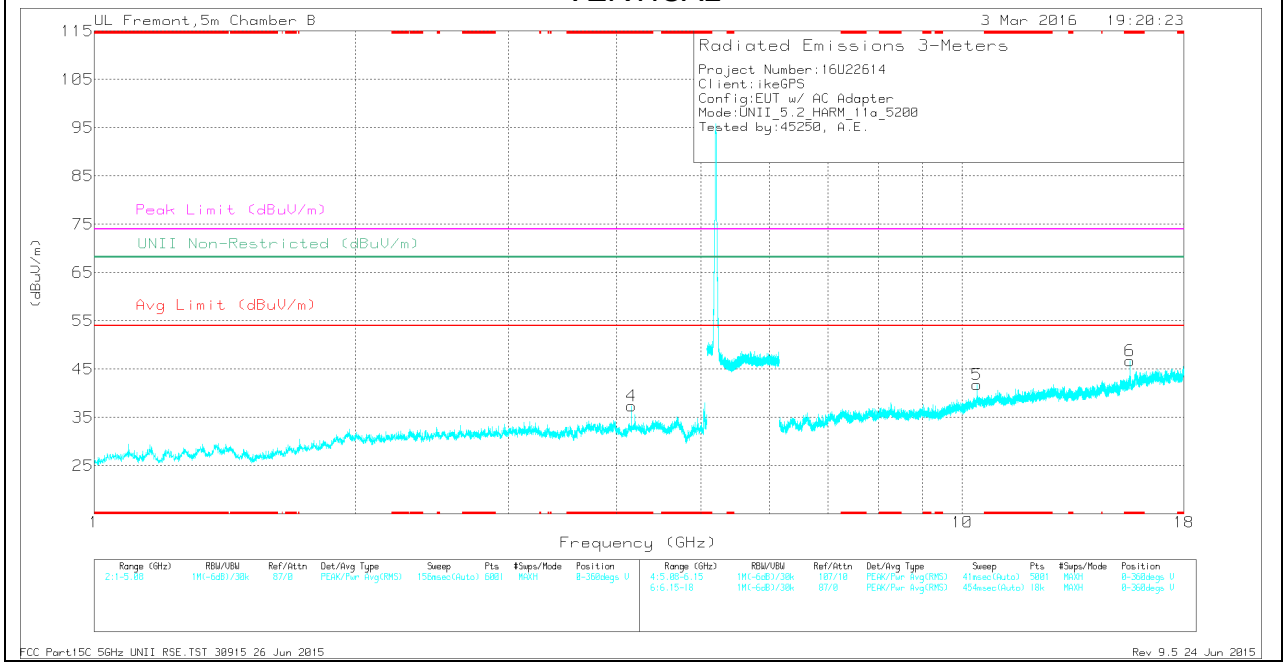
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

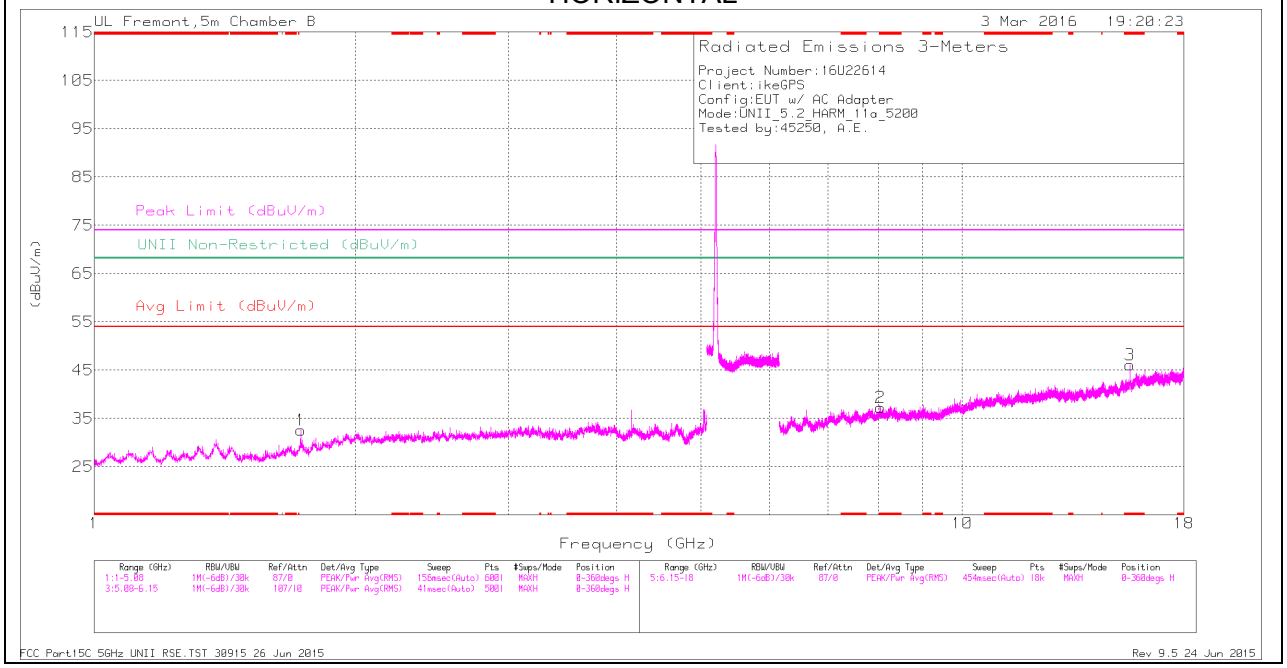
ADR - U-NII AD primary method, RMS average

MID CHANNEL RESULTS

VERTICAL



HORIZONTAL



MID CHANNEL DATA

TRACE MARKERS

Marker	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
4	* 4.16	35.39	Pk	33.7	-31.7	0	37.39	-	-	74	-36.61	-	-	0-360	101	V
2	* 8.051	30.05	Pk	35.7	-28.5	0	37.25	-	-	74	-36.75	-	-	0-360	101	H
3	* 15.6	28.66	Pk	40.7	-23.3	0	46.06	-	-	74	-27.94	-	-	0-360	101	H
6	* 15.599	29.38	Pk	40.7	-23.4	0	46.68	-	-	74	-27.32	-	-	0-360	200	V
1	1.729	37.71	Pk	29.3	-34.4	0	32.61	-	-	-	-	68.2	-35.59	0-360	101	H
5	10.398	29.64	Pk	37.3	-25.1	0	41.84	-	-	-	-	68.2	-26.36	0-360	101	V

PK - Peak detector

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
* 4.16	41.49	PK-U	33.7	-31.7	0	43.49	-	-	74	-30.51	-	-	230	120	V
* 4.16	32.35	ADR	33.7	-31.7	0	34.35	54	-19.65	-	-	-	-	230	120	V
* 8.05	37.79	PK-U	35.7	-28.5	0	44.99	-	-	74	-29.01	-	-	128	157	H
* 8.05	26.63	ADR	35.7	-28.5	0	33.83	54	-20.17	-	-	-	-	128	157	H
* 15.601	35	PK-U	40.7	-23.3	0	52.4	-	-	74	-21.6	-	-	229	102	H
* 15.599	23.86	ADR	40.7	-23.4	0	41.16	54	-12.84	-	-	-	-	229	102	H
* 15.599	38.19	PK-U	40.7	-23.4	0	55.49	-	-	74	-18.51	-	-	231	111	V
* 15.599	26.54	ADR	40.7	-23.4	0	43.84	54	-10.16	-	-	-	-	231	111	V
1.73	43.07	PK-U	29.4	-34.4	0	38.07	-	-	-	-	68.2	-30.13	163	228	H
10.399	34.6	PK-U	37.3	-25.2	0	46.7	-	-	-	-	68.2	-21.5	150	209	V

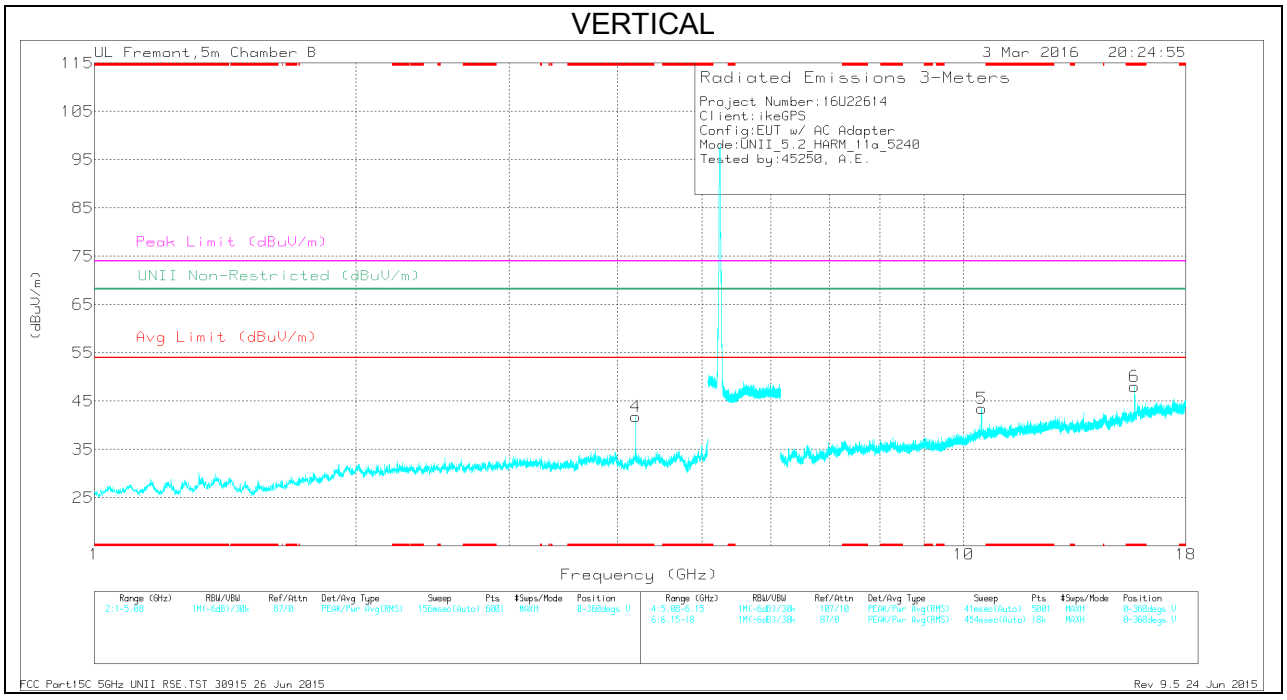
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

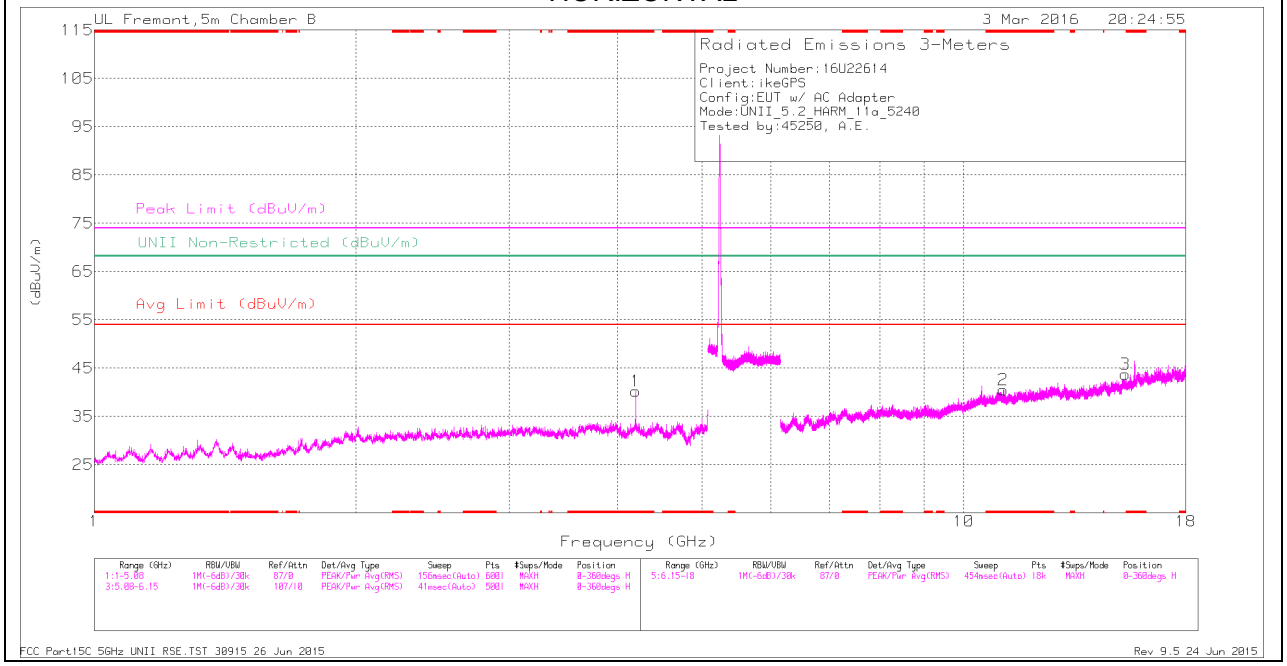
ADR - U-NII AD primary method, RMS average

HIGH CHANNEL RESULTS

VERTICAL



HORIZONTAL



HIGH CHANNEL DATA

TRACE MARKERS

Marker	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	* 4.192	38.11	Pk	33.7	-31.6	0	40.21	-	-	74	-33.79	-	-	0-360	200	H
4	* 4.192	39.7	Pk	33.7	-31.6	0	41.8	-	-	74	-32.2	-	-	0-360	200	V
2	* 11.092	28.13	Pk	37.9	-25.5	0	40.53	-	-	74	-33.47	-	-	0-360	200	H
6	* 15.712	30.68	Pk	40.7	-23.4	0	47.98	-	-	74	-26.02	-	-	0-360	200	V
5	10.483	31.47	Pk	37.4	-25.4	0	43.47	-	-	-	-	68.2	-24.73	0-360	101	V
3	15.347	26.38	Pk	40.2	-22.8	0	43.78	-	-	-	-	68.2	-24.42	0-360	101	H

PK - Peak detector

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
* 4.192	40.39	PK-U	33.7	-31.6	0	42.49	-	-	74	-31.51	-	-	43	217	H
* 4.192	33.55	ADR	33.7	-31.6	0	35.65	54	-18.35	-	-	-	-	43	217	H
* 4.192	45.63	PK-U	33.7	-31.6	0	47.73	-	-	74	-26.27	-	-	270	219	V
* 4.192	38.87	ADR	33.7	-31.6	0	40.97	54	-13.03	-	-	-	-	270	219	V
* 11.093	35.02	PK-U	37.9	-25.5	0	47.42	-	-	74	-26.58	-	-	282	193	H
* 11.094	23.91	ADR	37.9	-25.5	0	36.31	54	-17.69	-	-	-	-	282	193	H
* 15.714	38.02	PK-U	40.7	-23.5	0	55.22	-	-	74	-18.78	-	-	229	111	V
* 15.714	26.72	ADR	40.7	-23.5	0	43.92	54	-10.08	-	-	-	-	229	111	V
10.483	35.23	PK-U	37.4	-25.4	0	47.23	-	-	-	-	68.2	-20.97	208	151	V
15.347	32.79	PK-U	40.2	-22.8	0	50.19	-	-	-	-	68.2	-18.01	97	128	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

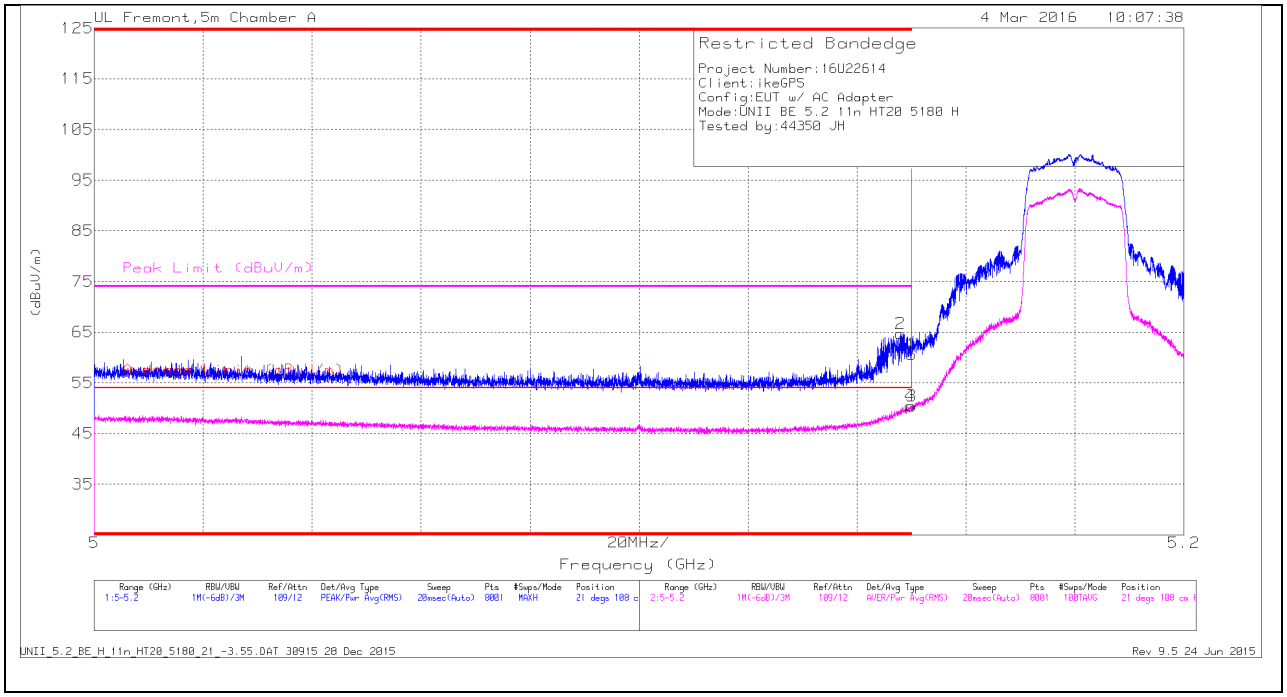
PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average

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

RESTRICTED BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULTS



Trace Markers

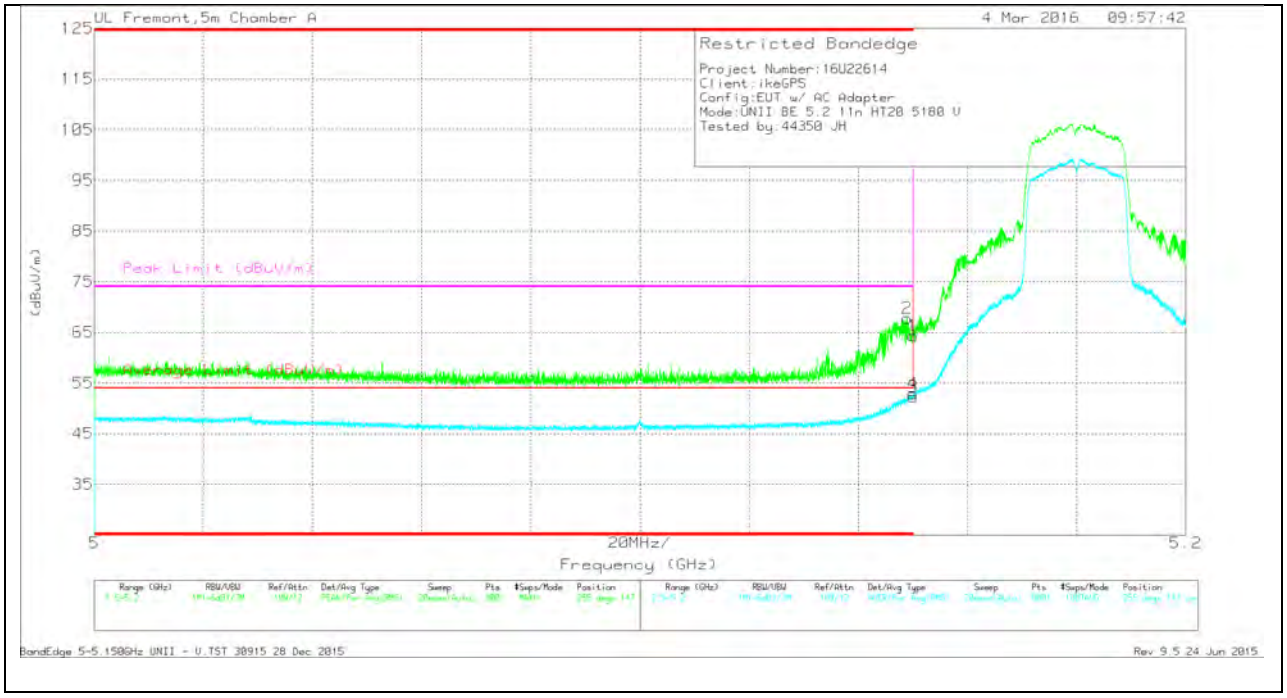
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (db/m)	Amp/Cbl/Flt r/Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 5.15	46.21	Pk	34.5	-20.1	0	60.61	-	-	74	-13.39	21	108	H
2	* 5.148	50.22	Pk	34.5	-20	0	64.72	-	-	74	-9.28	21	108	H
3	* 5.15	36.02	RMS	34.5	-20.1	0	50.42	54	-3.58	-	-	21	108	H
4	* 5.15	36.05	RMS	34.5	-20.1	0	50.45	54	-3.55	-	-	21	108	H

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

Pk - Peak detector

RMS - RMS detection

VERTICAL RESULTS



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (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	49.94	Pk	34.5	-20.1	0	64.34	-	-	74	-9.66	255	147	V
2	* 5.149	53.29	Pk	34.5	-20	0	67.79	-	-	74	-6.21	255	147	V
3	* 5.15	37.92	RMS	34.5	-20.1	0	52.32	54	-1.68	-	-	255	147	V
4	* 5.15	38.45	RMS	34.5	-20.1	0	52.85	54	-1.15	-	-	255	147	V

* - indicates frequency in CFR15.205/IC8.10 Restricted Band

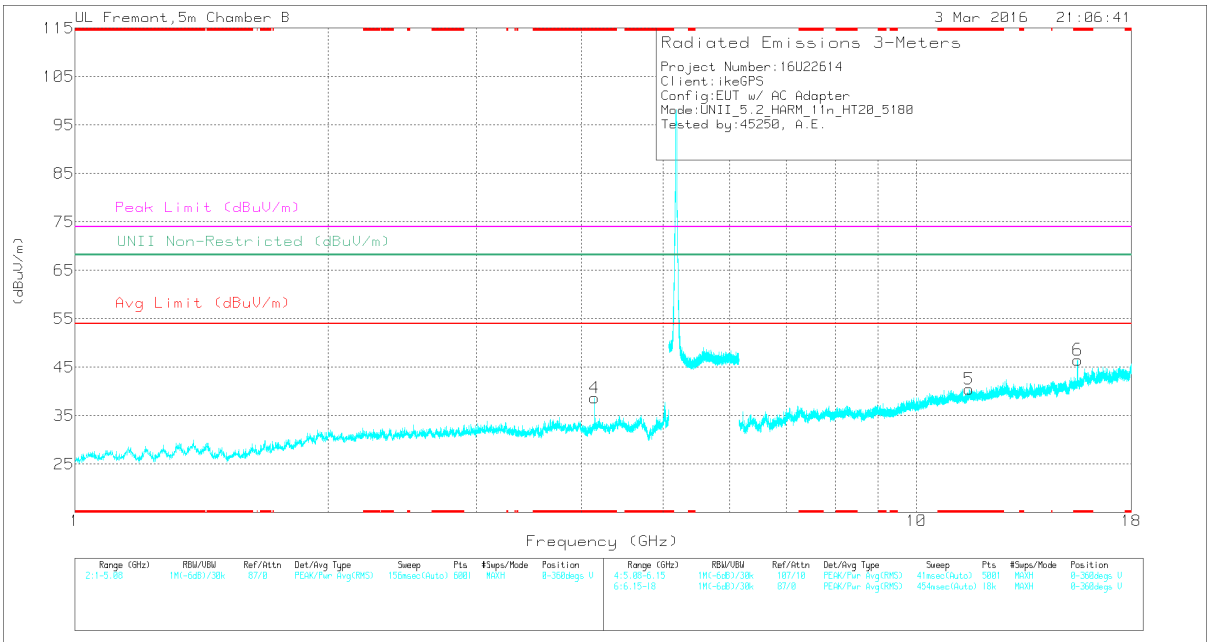
Pk - Peak detector

RMS - RMS detection

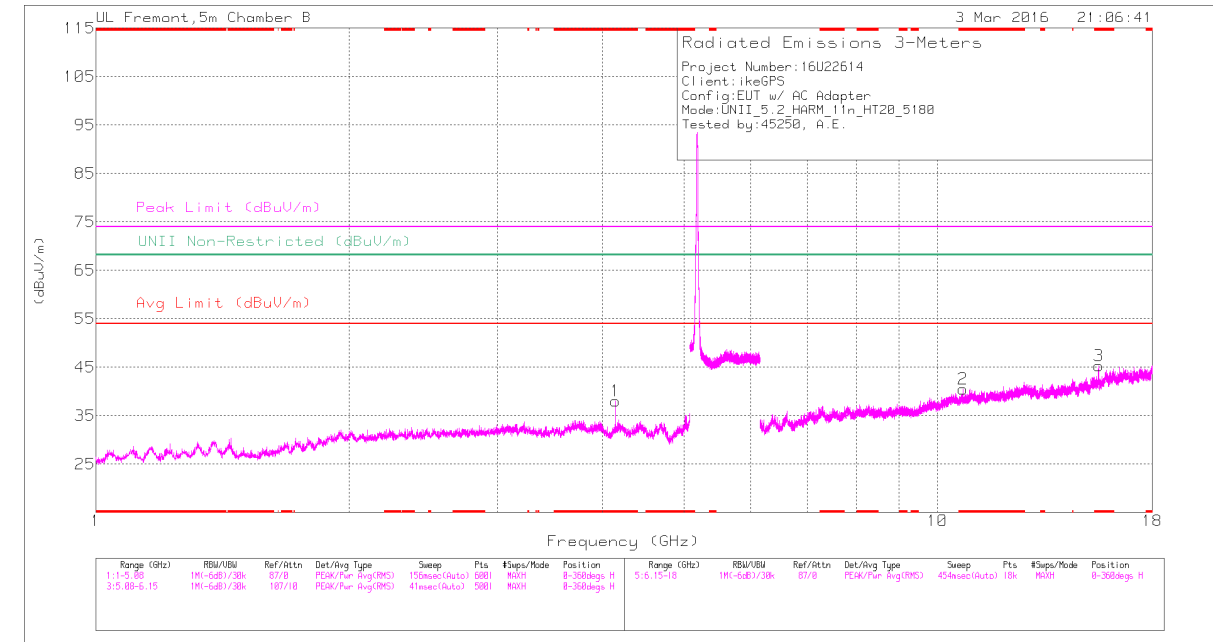
HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL RESULTS

VERTICAL



HORIZONTAL



LOW CHANNEL DATA

TRACE MARKERS

Marker	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	* 4.144	36.26	Pk	33.7	-31.9	0	38.06	-	-	74	-35.94	-	-	0-360	102	H
4	* 4.144	36.84	Pk	33.7	-31.9	0	38.64	-	-	74	-35.36	-	-	0-360	101	V
2	* 10.73	28.17	Pk	37.7	-25.4	0	40.47	-	-	74	-33.53	-	-	0-360	199	H
3	* 15.539	27.84	Pk	40.5	-23	0	45.34	-	-	74	-28.66	-	-	0-360	101	H
5	* 11.553	27.07	Pk	38.1	-24.7	0	40.47	-	-	74	-33.53	-	-	0-360	199	V
6	* 15.537	29.04	Pk	40.5	-23	0	46.54	-	-	74	-27.46	-	-	0-360	101	V

PK - Peak detector

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
* 4.144	42.7	PK-U	33.7	-31.9	0	44.5	-	-	74	-29.5	-	-	45	219	H
* 4.144	34.85	ADR	33.7	-31.9	0	36.65	54	-17.35	-	-	-	-	45	219	H
* 4.144	43.86	PK-U	33.7	-31.9	0	45.66	-	-	74	-28.34	-	-	272	169	V
* 4.144	36.43	ADR	33.7	-31.9	0	38.23	54	-15.77	-	-	-	-	272	169	V
* 10.73	34.53	PK-U	37.7	-25.4	0	46.83	-	-	74	-27.17	-	-	307	236	H
* 10.73	23.38	ADR	37.7	-25.4	0	35.68	54	-18.32	-	-	-	-	307	236	H
* 15.539	33.17	PK-U	40.5	-23	0	50.67	-	-	74	-23.33	-	-	95	123	H
* 15.54	21.99	ADR	40.5	-22.9	0	39.59	54	-14.41	-	-	-	-	95	123	H
* 11.552	34.42	PK-U	38.1	-24.7	0	47.82	-	-	74	-26.18	-	-	126	171	V
* 11.552	23.56	ADR	38.1	-24.7	0	36.96	54	-17.04	-	-	-	-	126	171	V
* 15.538	39.1	PK-U	40.5	-23	0	56.6	-	-	74	-17.4	-	-	229	115	V
* 15.539	27.01	ADR	40.5	-23	0	44.51	54	-9.49	-	-	-	-	229	115	V

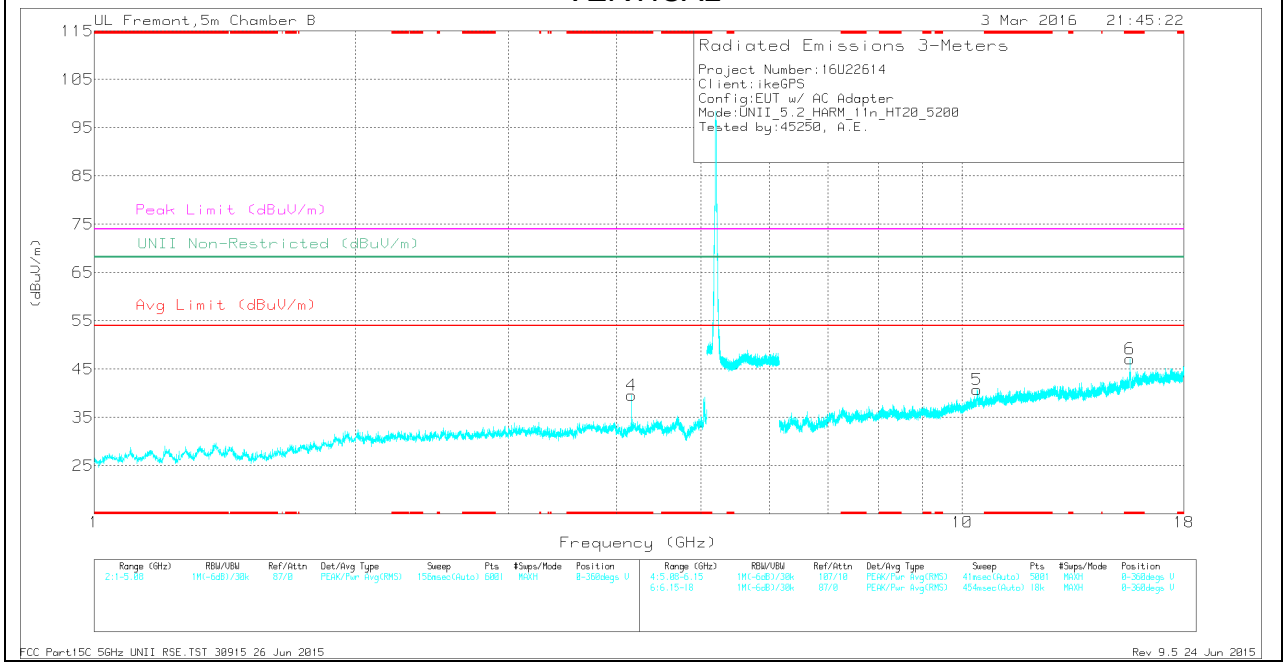
* - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

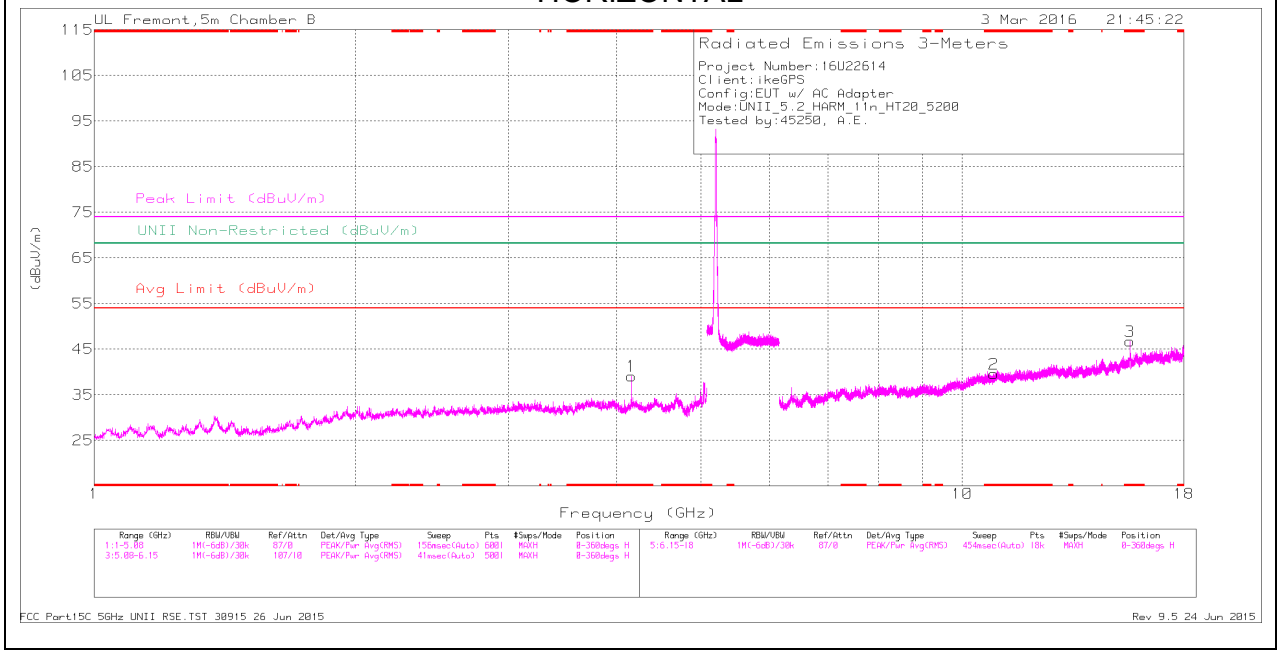
ADR - U-NII AD primary method, RMS average

MID CHANNEL RESULTS

VERTICAL



HORIZONTAL



MID CHANNEL DATA

TRACE MARKERS

Marker	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	* 4.16	37.14	Pk	33.7	-31.7	0	39.14	-	-	74	-34.86	-	-	0-360	101	H
4	* 4.16	37.58	Pk	33.7	-31.7	0	39.58	-	-	74	-34.42	-	-	0-360	101	V
2	* 10.869	27.63	Pk	37.8	-25.8	0	39.63	-	-	74	-34.37	-	-	0-360	199	H
3	* 15.6	29.37	Pk	40.7	-23.3	0	46.77	-	-	74	-27.23	-	-	0-360	199	H
6	* 15.599	29.8	Pk	40.7	-23.4	0	47.1	-	-	74	-26.9	-	-	0-360	101	V
5	10.401	28.68	Pk	37.3	-25.2	0	40.78	-	-	-	-	68.2	-27.42	0-360	101	V

PK - Peak detector

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
* 4.16	42.73	PK-U	33.7	-31.7	0	44.73	-	-	74	-29.27	-	-	44	215	H
* 4.16	35.6	ADR	33.7	-31.7	0	37.6	54	-16.4	-	-	-	-	44	215	H
* 4.16	44.16	PK-U	33.7	-31.7	0	46.16	-	-	74	-27.84	-	-	275	164	V
* 4.16	37.19	ADR	33.7	-31.7	0	39.19	54	-14.81	-	-	-	-	275	164	V
* 10.867	34.65	PK-U	37.8	-25.8	0	46.65	-	-	74	-27.35	-	-	311	231	H
* 10.87	23.83	ADR	37.8	-25.8	0	35.83	54	-18.17	-	-	-	-	311	231	H
* 15.601	35.49	PK-U	40.7	-23.3	0	52.89	-	-	74	-21.11	-	-	300	161	H
* 15.601	24.28	ADR	40.7	-23.3	0	41.68	54	-12.32	-	-	-	-	300	161	H
* 15.6	39.12	PK-U	40.7	-23.3	0	56.52	-	-	74	-17.48	-	-	234	107	V
* 15.598	27.92	ADR	40.7	-23.4	0	45.22	54	-8.78	-	-	-	-	234	107	V
10.401	36.4	PK-U	37.3	-25.2	0	48.5	-	-	-	-	68.2	-19.7	43	123	V

***** - indicates frequency in CFR15.205/IC8.10 Restricted Band

PK-U - U-NII: Maximum Peak

ADR - U-NII AD primary method, RMS average