

FCC 47 CFR PART 15 SUBPART E

TEST REPORT

For

Wireless module

Model:

WG7833-B0, WG7833BEM2A, WG7833BEM2B

Trade Name: Jorjin

Issued to

Jorjin Technologies INC

17F, No. 239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 22161

Issued by

Compliance Certification Services Inc.

**No. 11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)**

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Issued Date: May 29, 2015



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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		May 29, 2015		Initial Issue	ALL	Becca Chen

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION.....	4
2. EUT DESCRIPTION	5
3. TEST METHODOLOGY	6
3.1 EUT CONFIGURATION	6
3.2 EUT EXERCISE	6
3.3 GENERAL TEST PROCEDURES	6
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS.....	7
3.5 DESCRIPTION OF TEST MODES	8
4. INSTRUMENT CALIBRATION.....	9
4.1 MEASURING INSTRUMENT CALIBRATION.....	9
4.2 MEASUREMENT EQUIPMENT USED	9
4.3 MEASUREMENT UNCERTAINTY	10
5. FACILITIES AND ACCREDITATIONS	11
5.1 FACILITIES.....	11
5.2 EQUIPMENT	11
5.3 TABLE OF ACCREDITATIONS AND LISTINGS	12
6. SETUP OF EQUIPMENT UNDER TEST	13
6.1 SETUP CONFIGURATION OF EUT	13
6.2 SUPPORT EQUIPMENT	13
7. FCC PART 15 REQUIREMENTS.....	14
7.1 26 DB EMISSION BANDWIDTH	14
7.2 MAXIMUM CONDUCTED OUTPUT POWER.....	27
7.3 BAND EDGES MEASUREMENT	30
7.4 PEAK POWER SPECTRAL DENSITY.....	67
7.5 RADIATED UNDESIRABLE EMISSION	80
7.6 POWERLINE CONDUCTED EMISSIONS	117
7.7 FREQUENCY STABILITY	118
APPENDIX I - PHOTOGRAPHS OF TEST SETUP	127
APPENDIX II - PHOTOGRAPHS OF EUT	

1. TEST RESULT CERTIFICATION

Applicant: Jorjin Technologies INC
17F, No. 239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 22161

Equipment Under Test: Wireless module

Trade Name: Jorjin

Model: WG7833-B0, WG7833BEM2A, WG7833BEM2B

Date of Test: April 28 ~ May 27, 2015

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart E	No non-compliance noted

We hereby certify that:

Compliance Certification Services Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Reviewed by:



Miller Lee
Manager
Compliance Certification Services Inc.



Angel Cheng
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	Wireless module				
Trade Name	Jorjin				
Model Number	WG7833-B0, WG7833BEM2A, WG7833BEM2B				
Model Discrepancy	Model	External PCB	Antenna connector		
	WG7833-B0	X	X		
	WG7833BEM2A	O	O		
	WG7833BEM2B	O	X		
Received Date	April 17, 2015				
Power Rating	Powered from host device via USB Cable				
Frequency Range	IEEE 802.11a, IEEE 802.11n HT20 : 5180MHz ~ 5240MHz; 5745 ~ 5825 MHz IEEE 802.11n HT40 : 5190MHz ~ 5230MHz; 5755 ~ 5795MHz				
Channel Number	IEEE 802.11a, IEEE 802.11n HT20 : 5180MHz ~ 5825MHz : 9 Channels IEEE 802.11n HT40 : 5190MHz ~ 5795MHz : 4 Channels				
Transmit Power		Mode	Frequency Range (MHz)	Transmit Power (dBm)	Transmit Power (W)
	UNII Band I	IEEE 802.11a	5180 – 5240	16.29	0.0426
		IEEE 802.11n HT 20 mode	5180 – 5240	15.98	0.0396
		IEEE 802.11n HT 40 mode	5190 ~ 5230	14.08	0.0256
	UNII Band VI	IEEE 802.11a	5745 ~ 5825	14.72	0.0296
		IEEE 802.11n HT 20 mode	5745 ~ 5825	14.48	0.0281
		IEEE 802.11n HT 40 mode	5755 ~ 5795	13.08	0.0203
Modulation Technique	OFDM (QPSK, BPSK, 16-QAM, 64-QAM, 256QAM)				
Transmit Data Rate	IEEE 802.11a mode: 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT 20 mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) IEEE 802.11n HT 40 mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)				
Antenna Specification	1. PCB Antenna / Unictron H2B1BB1A1Q0100: 4.59 dBi 2. Dipole Antenna / WIESON GPOT155-002: 2.08 dBi				

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: WS2-WG7833B0** filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.

3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10. Radiated testing was performed at an antenna to EUT distance 3 meters.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

3.2 EUT EXERCISE

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement.

According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10, the conducted emission from the EUT is measured in the frequency range between 0.15 MHz and 30MHz, using the CISPR Quasi-Peak detector mode.

Radiated Emissions

The EUT is placed on the turntable, which is 1.5 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT (model: WG7833-B0) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

Band I

IEEE 802.11a mode / 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz:

Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz:

Channel Low (5190MHz) and Channel High (5230MHz) with 13.5Mbps data rate were chosen for full testing.

Band IV

IEEE 802.11a mode / 5745 ~ 5825MHz

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 mode: / 5745 ~ 5825MHz

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel Low (5755MHz) and Channel High (5795MHz) with 13.5Mbps data rate were chosen for full testing.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/23/2015
Thermostatic/Hrgrosatic Chamber	TAICHY	MHG-150LF	930619	10/07/2015
AC Power Source	EXTECH	6205	1140845	N.C.R
DC Power Supply	ABM	8301HD	D011531	N.C.R
Power Meter	Anritsu	ML2495A	1012009	06/03/2015
Power Sensor	Anritsu	MA2411A	0917072	06/03/2015
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40	101073	07/09/2015
Test S/W	EZ-EMC (CCS-3A1RE)			

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	09/18/2015
EMI Test Receiver	R&S	ESCI	100064	05/30/2015
Bilog Antenna	Sunol Sciences	JB3	A030105	08/19/2015
Horn Antenna	EMCO	3117	00055165	01/26/2016
Horn Antenna	EMCO	3116	26370	12/25/2015
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Pre-Amplifier	MITEQ	1652-3000	1490939	08/09/2016
Pre-Amplifier	EMC	EMC 01265	4035	08/09/2016
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	12/25/2015
Coaxial Cable	Huber+Suhner	102	29212/2	12/25/2015
Coaxial Cable	Huber+Suhner	102	29406/2	12/25/2015
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
N/A				

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / <200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- ☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
- ☒ No.139, Wugong Rd., Wugu Dist., New Taipei City 24891, Taiwan (R.O.C.)
- ☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
- ☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1	Notebook PC	TOSHIBA	Satellite M840	N/A	PPD-AR5B225	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

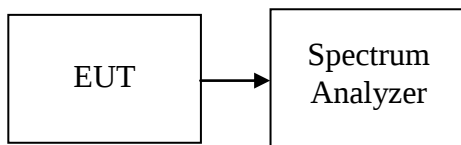
7. FCC PART 15 REQUIREMENTS

7.1 26 DB EMISSION BANDWIDTH

LIMIT

According to §15.303(c), for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW > 1%EBW, VBW > RBW, Span >26dB bandwidth, and Sweep = auto.
4. Mark the peak frequency and -26dB (upper and lower) frequency.
5. Repeat until all the rest channels were investigated.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	18.2682
Mid	5220	17.7961
High	5240	17.9256

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	18.2598
Mid	5220	18.2706
High	5240	18.8239

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.1218
High	5230	36.3461

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5745	17.1461
Mid	5785	17.8718
High	5825	17.6620

Test mode: IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5745	18.0882
Mid	5785	18.3816
High	5825	18.6682

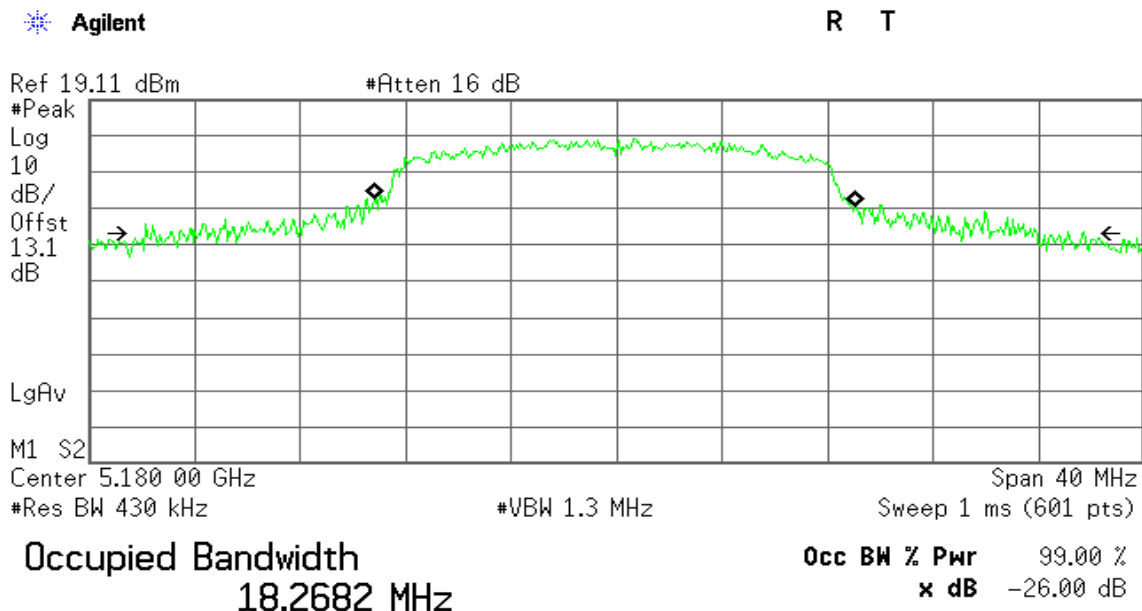
Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5755	35.8678
High	5795	36.1366

Test Plot

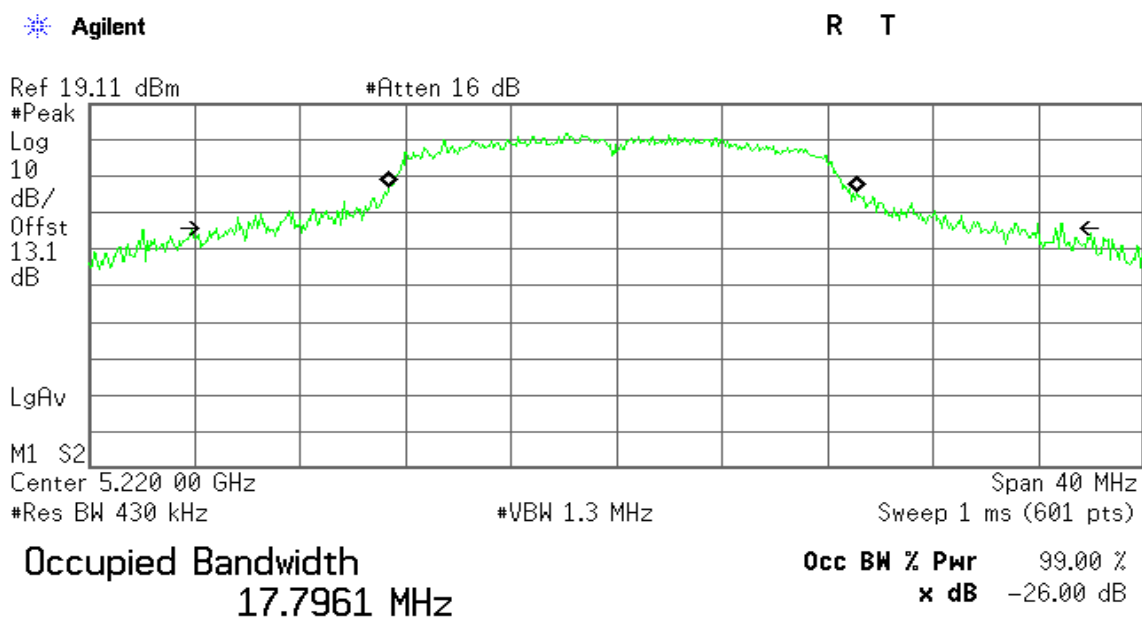
IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low



Transmit Freq Error -35.142 kHz
x dB Bandwidth 35.653 MHz

CH Mid

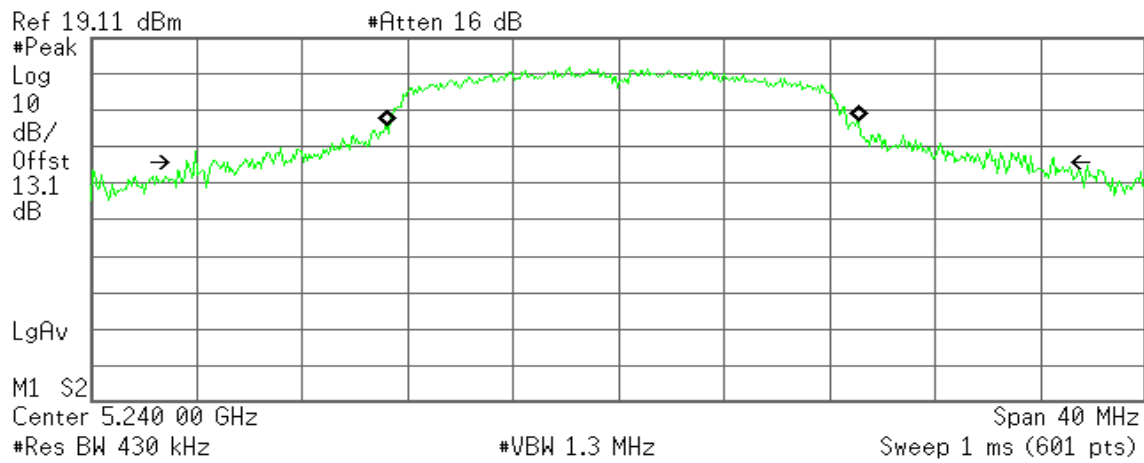


Transmit Freq Error 246.318 kHz
x dB Bandwidth 32.096 MHz

CH High

Agilent

R T



Occupied Bandwidth
17.9256 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

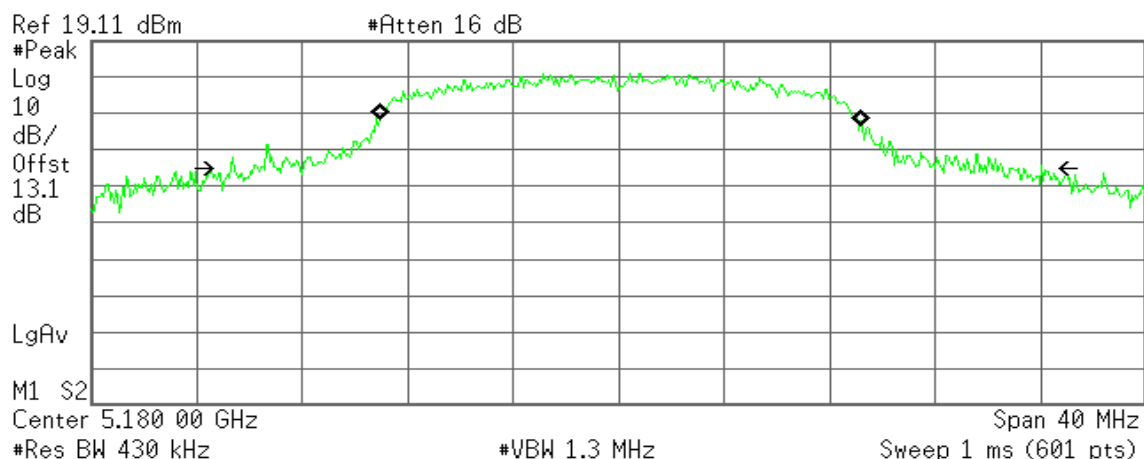
Transmit Freq Error 167.689 kHz
x dB Bandwidth 32.976 MHz

IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

CH Low

Agilent

R T



Occupied Bandwidth

18.2598 MHz

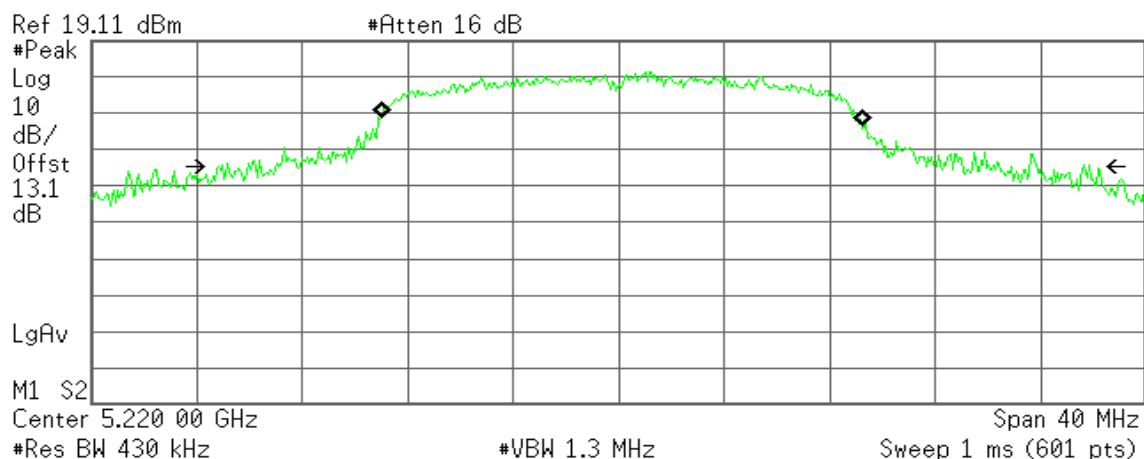
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 43.008 kHz
x dB Bandwidth 30.777 MHz

CH Mid

Agilent

R T



Occupied Bandwidth

18.2706 MHz

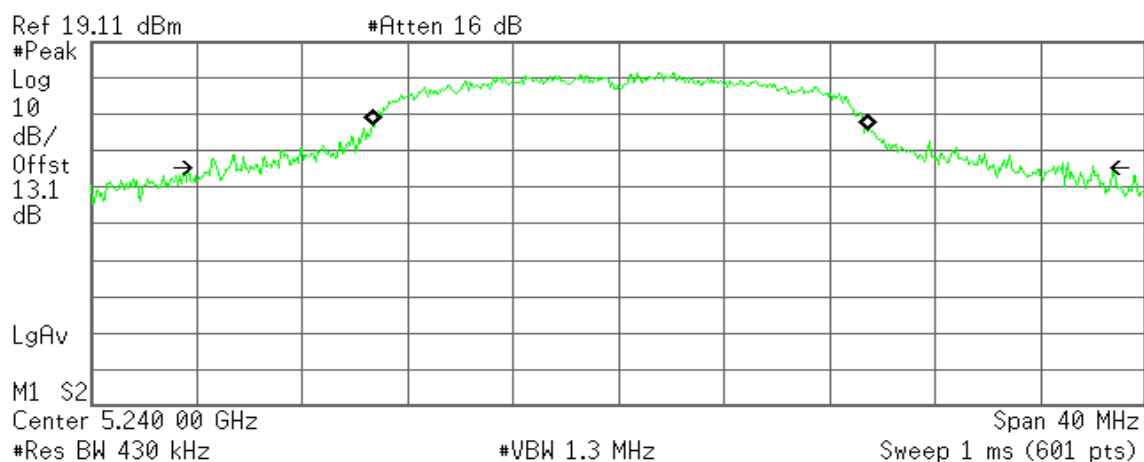
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 107.714 kHz
x dB Bandwidth 32.896 MHz

CH High

Agilent

R T



Occupied Bandwidth

18.8239 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

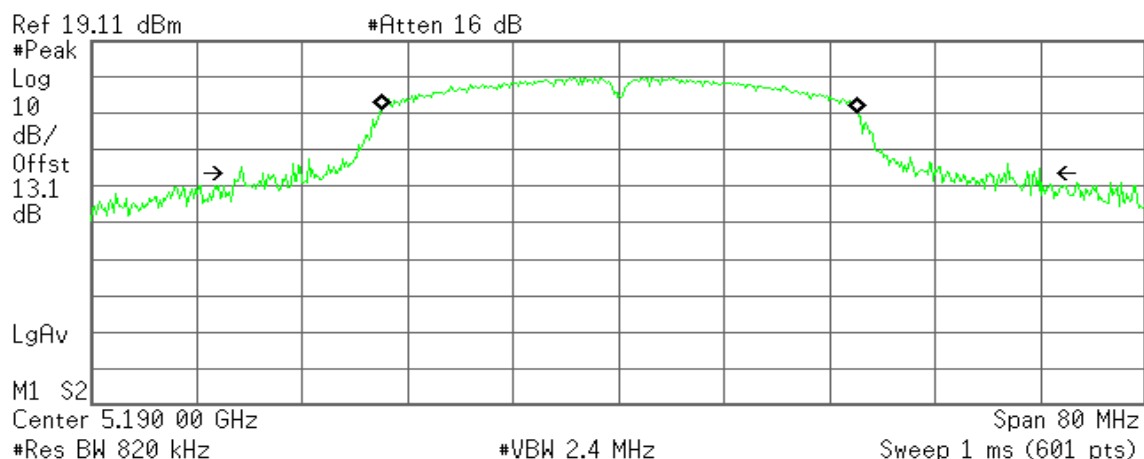
Transmit Freq Error 86.225 kHz
x dB Bandwidth 33.450 MHz

IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

CH Low

Agilent

R T

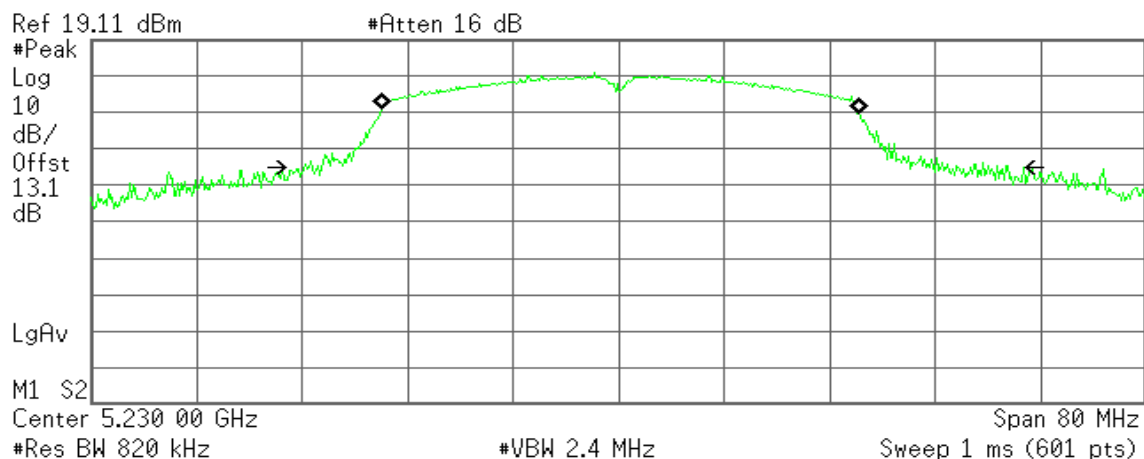


Transmit Freq Error 83.198 kHz
x dB Bandwidth 60.666 MHz

CH High

Agilent

R T



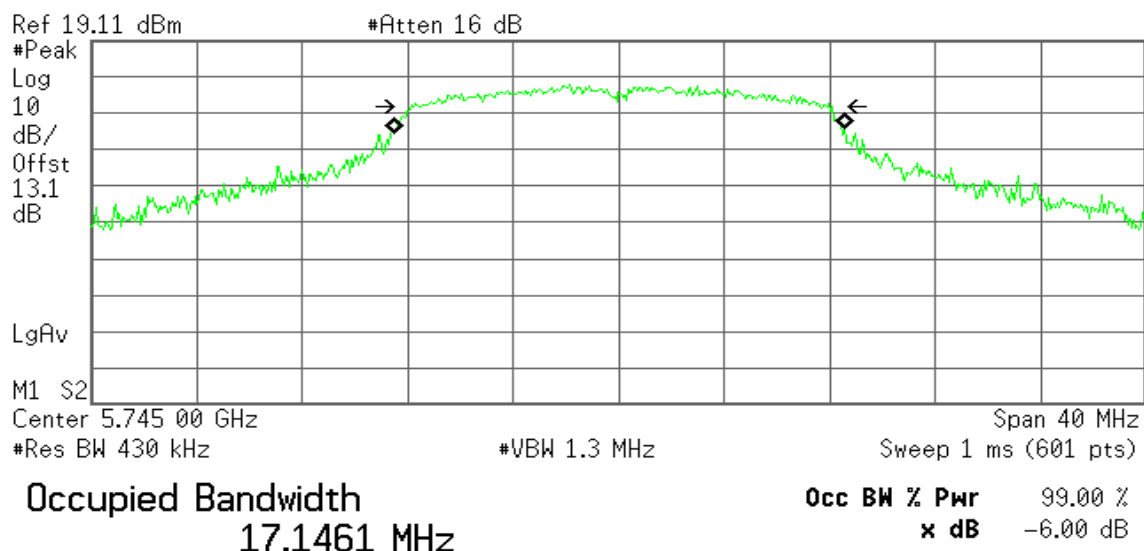
Transmit Freq Error 153.989 kHz
x dB Bandwidth 53.330 MHz

IEEE 802.11a mode / 5745 ~ 5825MHz

CH Low

Agilent

R T

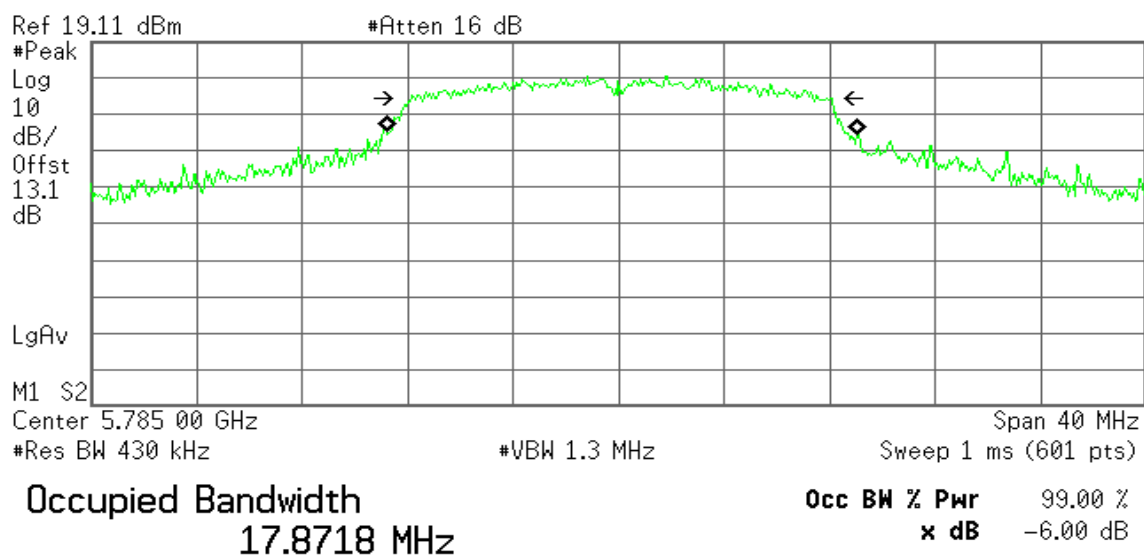


Transmit Freq Error 9.371 kHz
x dB Bandwidth 15.866 MHz

CH Mid

Agilent

R T

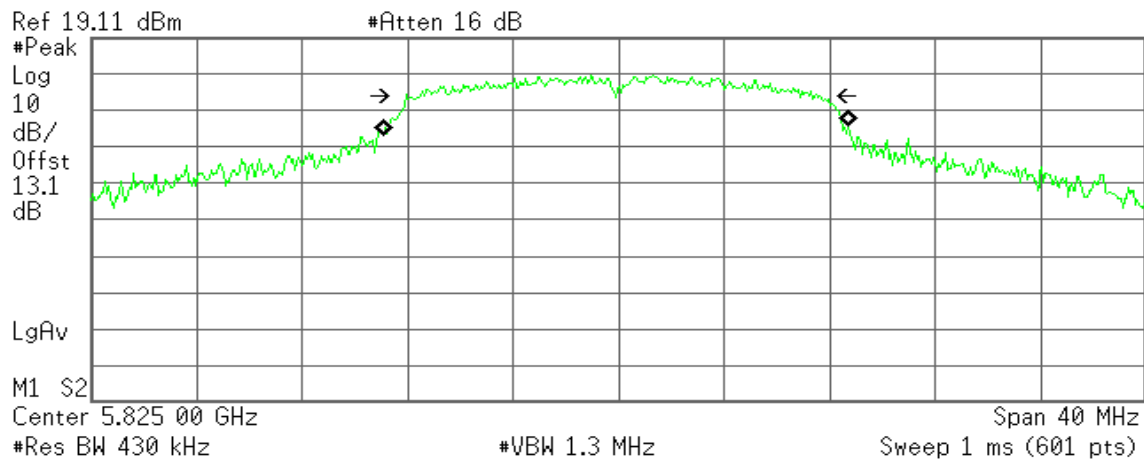


Transmit Freq Error 114.553 kHz
x dB Bandwidth 15.723 MHz

CH High

 Agilent

R T



Occupied Bandwidth
17.6620 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

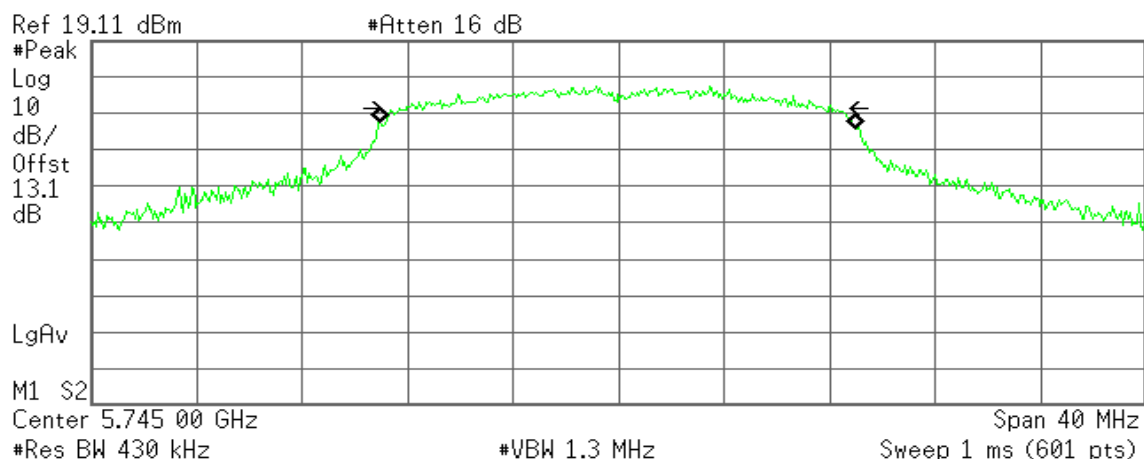
Transmit Freq Error -101.033 kHz
x dB Bandwidth 15.701 MHz

IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

CH Low

Agilent

R T



Occupied Bandwidth

18.0882 MHz

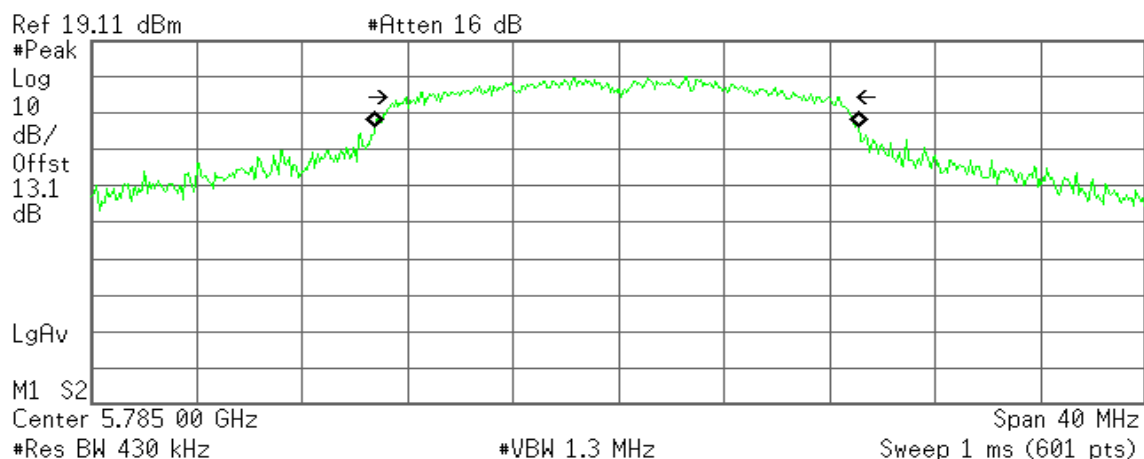
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -22.128 kHz
x dB Bandwidth 16.443 MHz

CH Mid

Agilent

R T



Occupied Bandwidth

18.3816 MHz

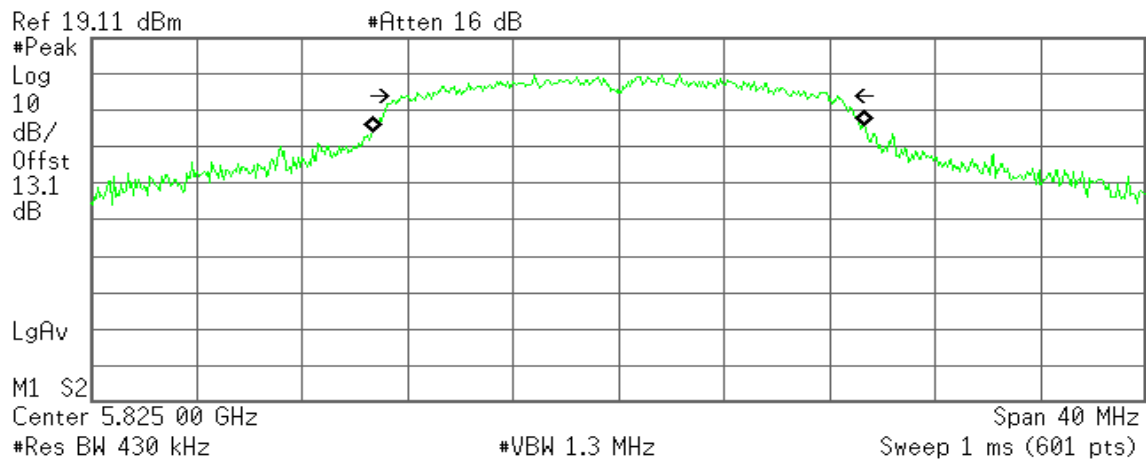
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -50.899 kHz
x dB Bandwidth 16.501 MHz

CH High

Agilent

R T



Occupied Bandwidth
18.6682 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

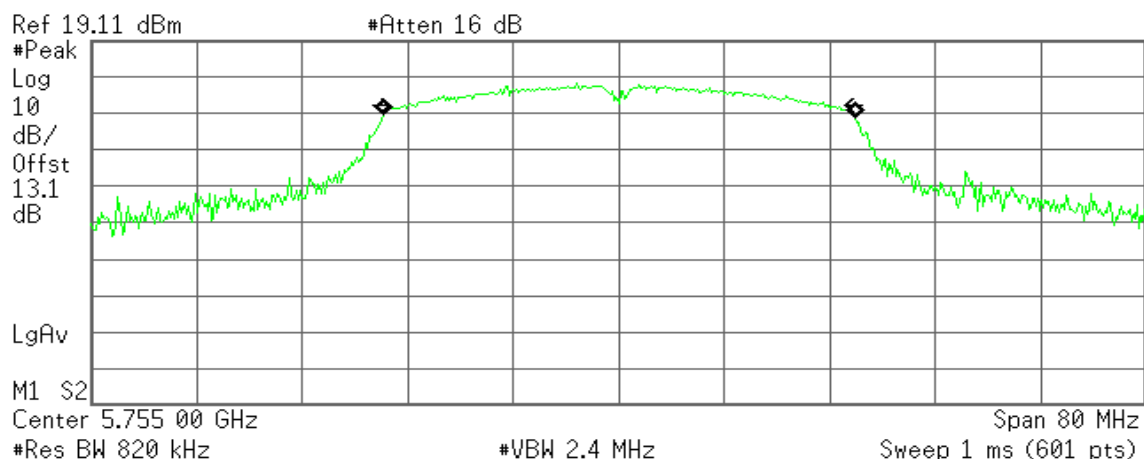
Transmit Freq Error 18.594 kHz
x dB Bandwidth 16.370 MHz

IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

CH Low

Agilent

R T



Occupied Bandwidth

35.8678 MHz

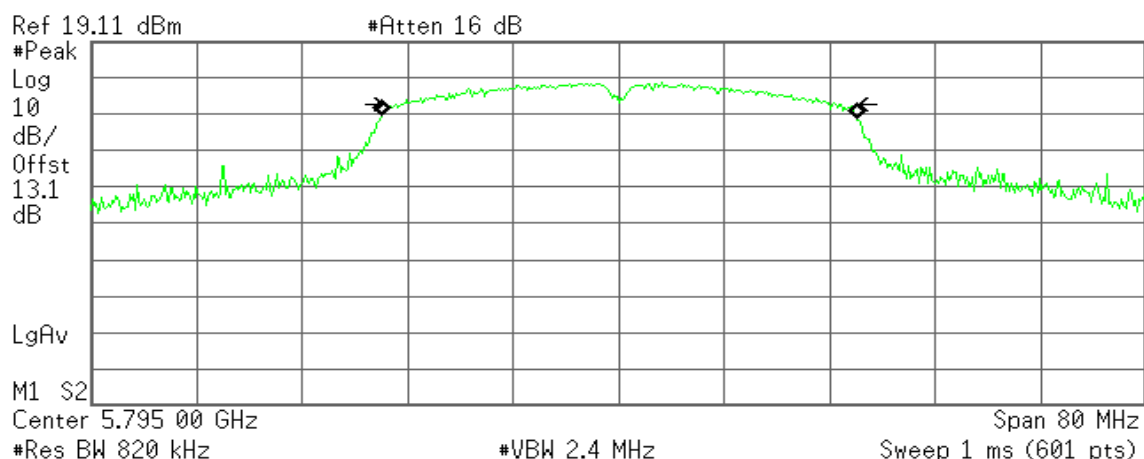
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 39.688 kHz
x dB Bandwidth 31.604 MHz

CH High

Agilent

R T



Occupied Bandwidth

36.1366 MHz

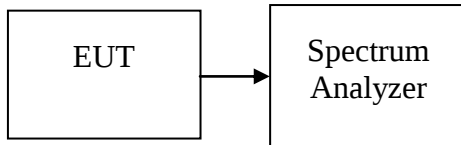
Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 43.053 kHz
x dB Bandwidth 33.454 MHz

7.2 MAXIMUM CONDUCTED OUTPUT POWER

Test Configuration

The EUT was connected to a spectrum analyzer through a 50 Ω RF cable.



TEST PROCEDURE

Set span to encompass the entire emission bandwidth (EBW) of the signal.

Set RBW = 1 MHz / Set VBW = 3 MHz.

Use sample detector mode if bin width (i.e., span/number of points in spectrum display) < 0.5 RBW. Otherwise use peak detector mode. Use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at full control power for entire sweep of every sweep. If the device transmits continuously, with no off intervals or reduced power intervals, the trigger may be set to “free run”. Trace average 100 traces in power averaging mode. Compute power by integrating the spectrum across the 26 dB EBW of the signal. The integration can be performed using the spectrum analyzer’s band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	16.18	24.00
Mid	5220	16.29	24.00
High	5240	16.23	24.00

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	15.98	24.00
Mid	5220	15.85	24.00
High	5240	15.97	24.00

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5190	14.08	24.00
High	5230	14.04	24.00

Test mode: IEEE 802.11a mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5745	11.74	30.00
Mid	5785	14.72	30.00
High	5825	14.50	30.00

Test mode: IEEE 802.11n HT 20 mode / 5745~5825MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5745	10.99	30.00
Mid	5785	14.48	30.00
High	5825	14.30	30.00

Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5755	11.51	30.00
High	5795	13.08	30.00

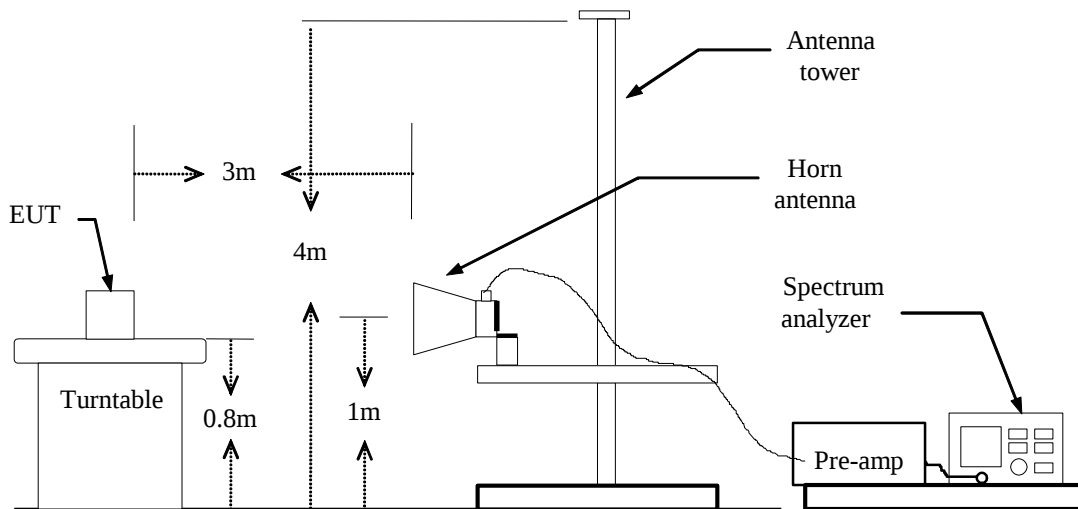
7.3 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b),

- (1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
 - (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz,
if duty cycle $\geq 98\%$, VBW=10Hz.
if duty cycle $< 98\%$ VBW=1/T.
IEEE 802.11a mode: = 95%, VBW=180Hz
IEEE 802.11 HT 20 MHz mode: = 93%, VBW=200Hz
IEEE 802.11n HT 40 MHz mode: = 87%, VBW=910Hz
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

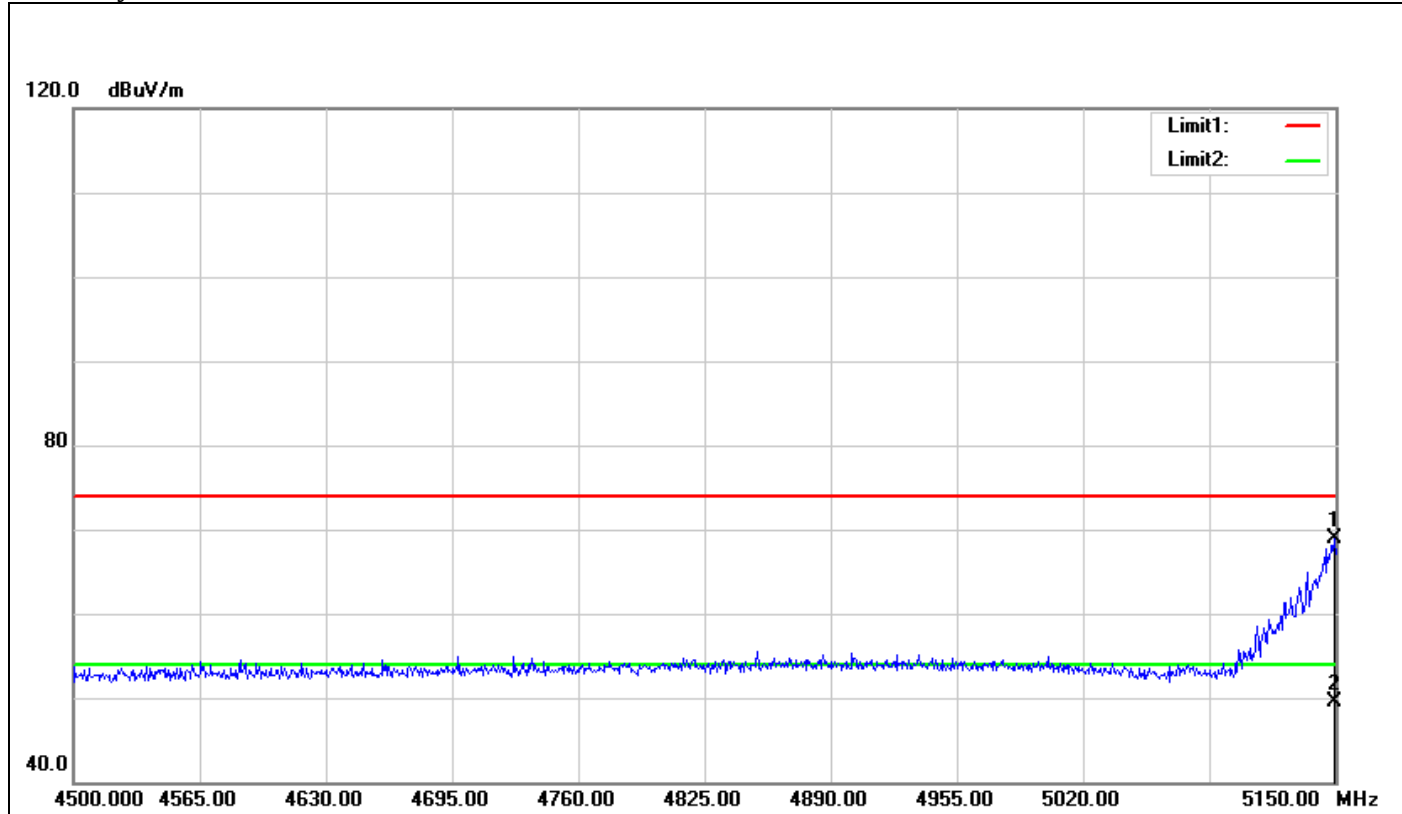
TEST RESULTS

Refer to attach spectrum analyzer data chart.

For PCB Antenna

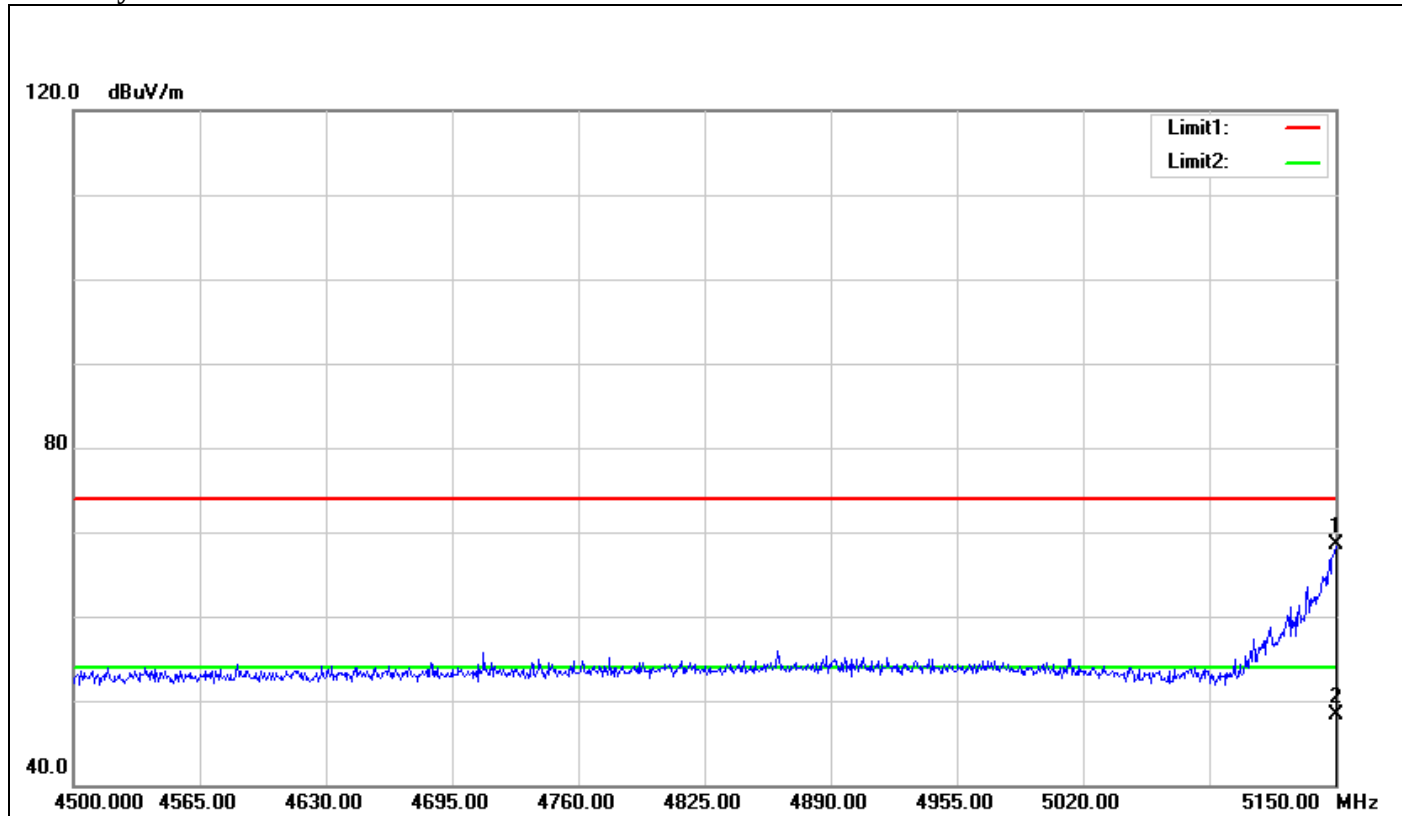
Band Edges (IEEE 802.11a mode / 5180 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5149.350	65.85	3.04	68.89	74.00	-5.11	100	145	peak
2	5149.350	46.54	3.04	49.58	54.00	-4.42	100	145	AVG

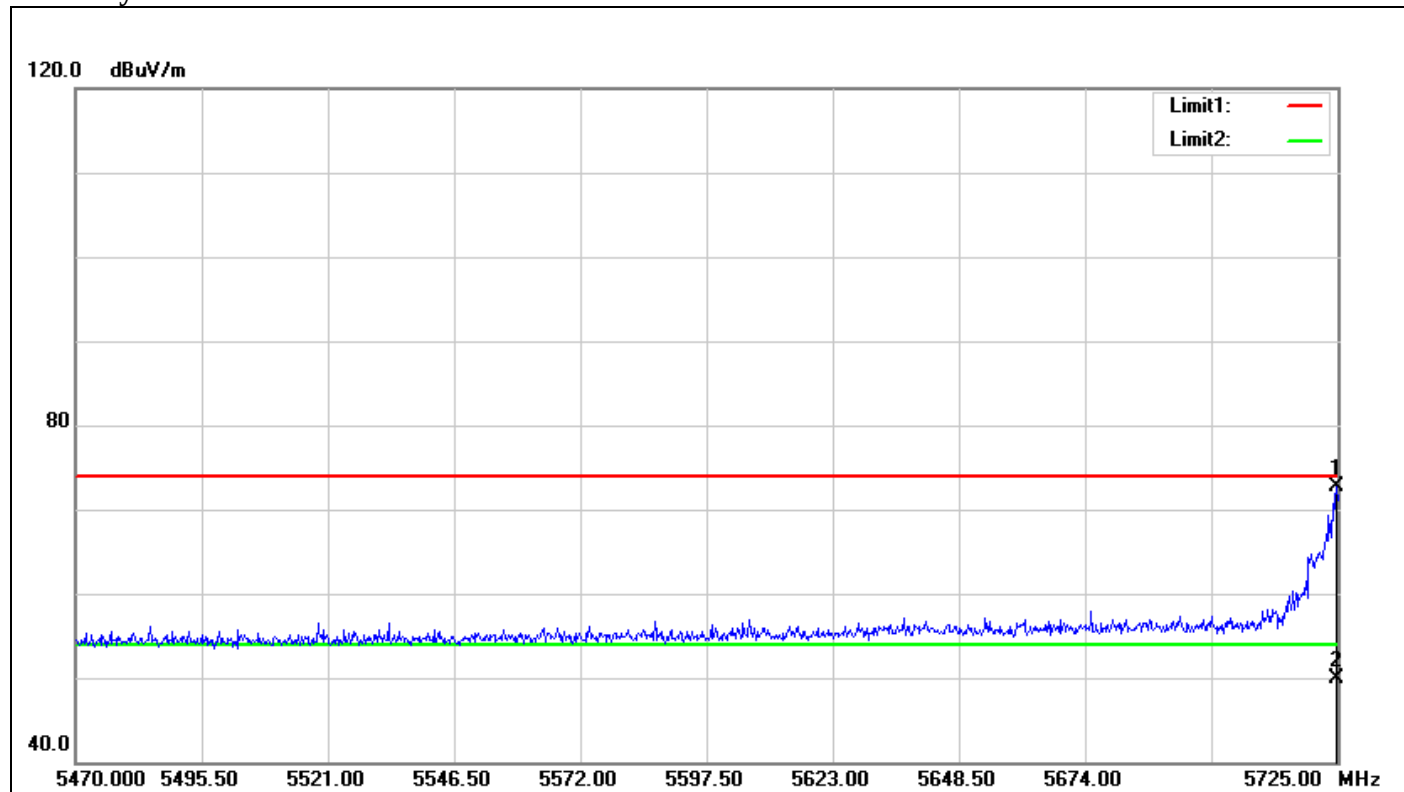
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	65.40	3.04	68.44	74.00	-5.56	100	350	peak
2	5150.000	45.26	3.04	48.30	54.00	-5.70	100	350	AVG

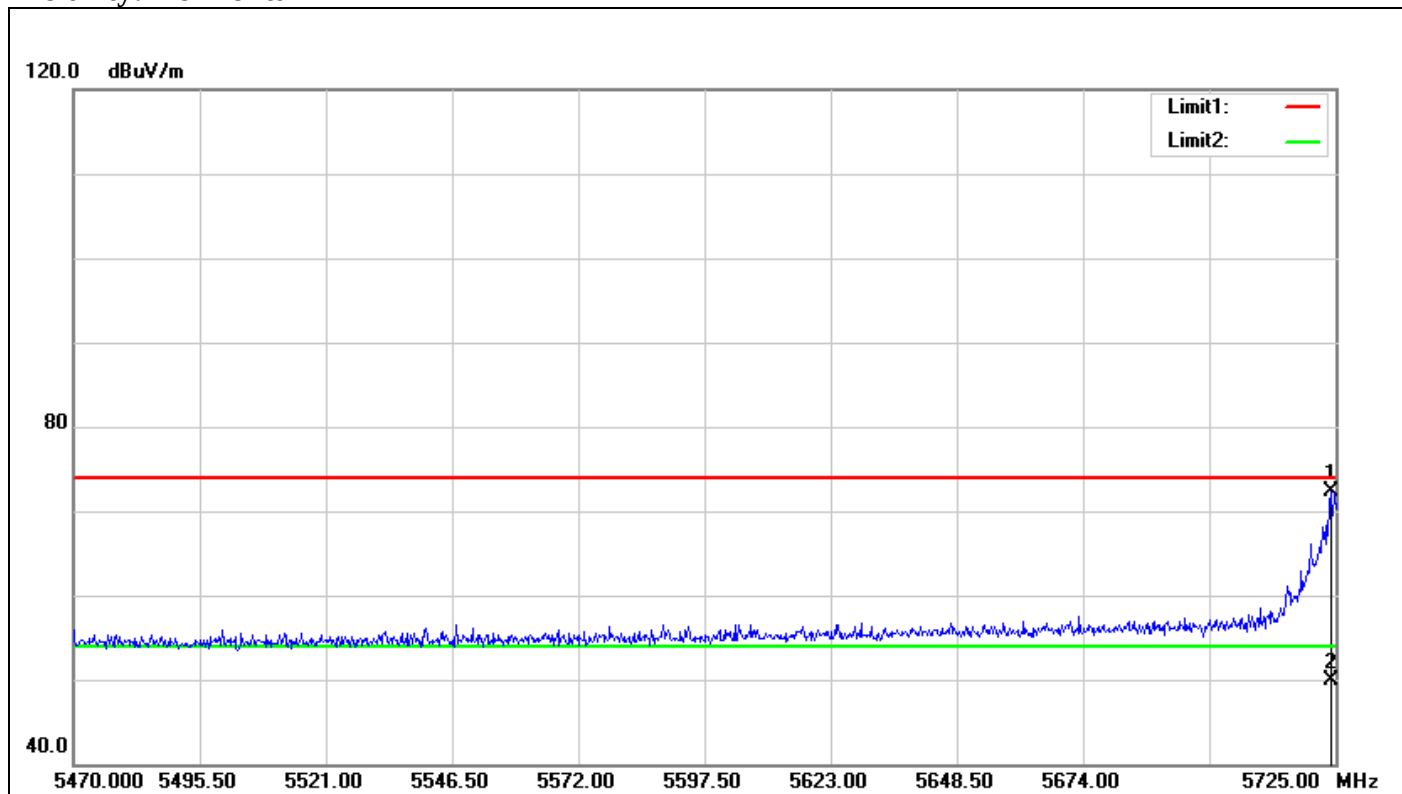
Band Edges (IEEE 802.11a mode / 5745 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5724.745	66.44	6.21	72.65	74.00	-1.35	100	152	peak
2	5724.745	43.69	6.21	49.90	54.00	-4.10	100	152	AVG

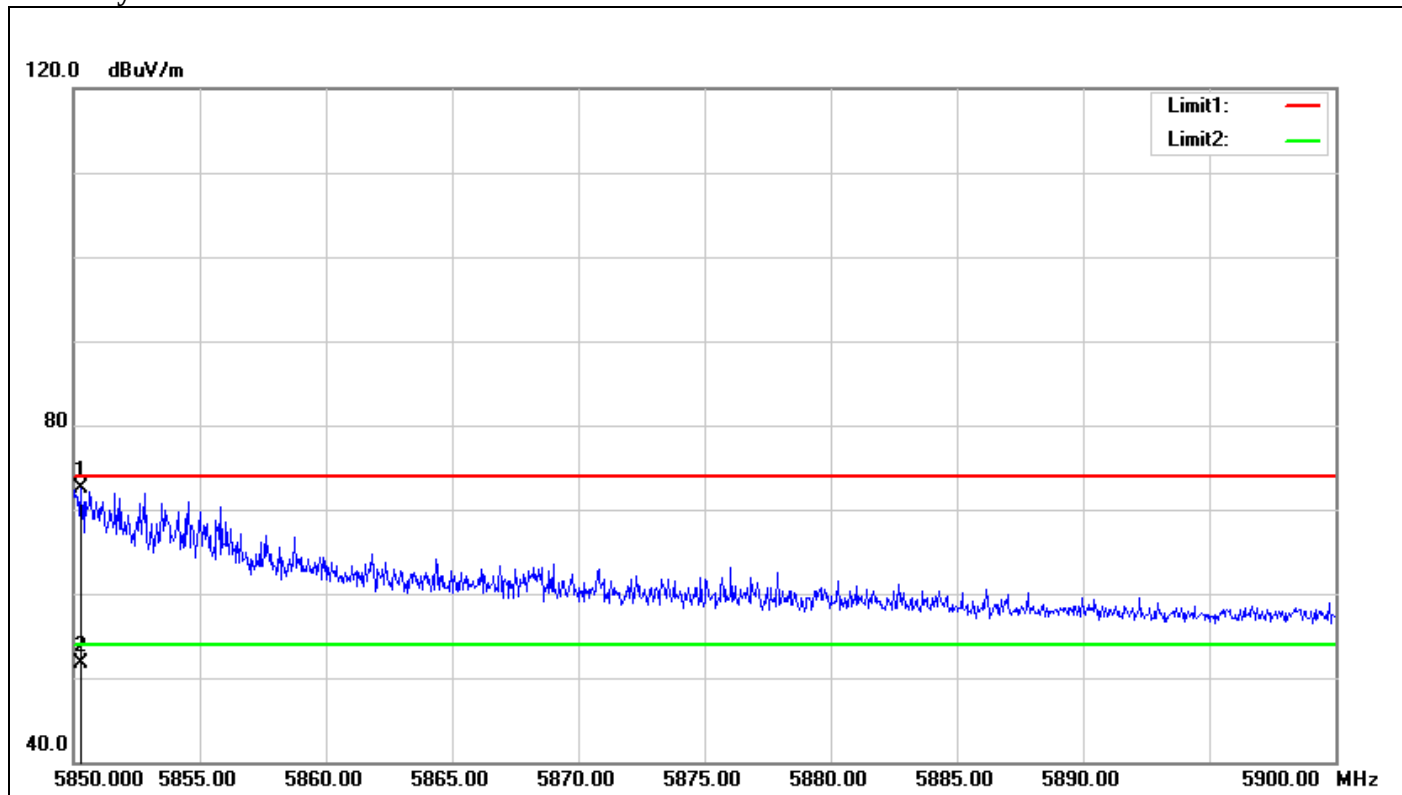
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5723.980	66.14	6.20	72.34	74.00	-1.66	100	298	peak
2	5723.980	43.76	6.20	49.96	54.00	-4.04	100	298	AVG

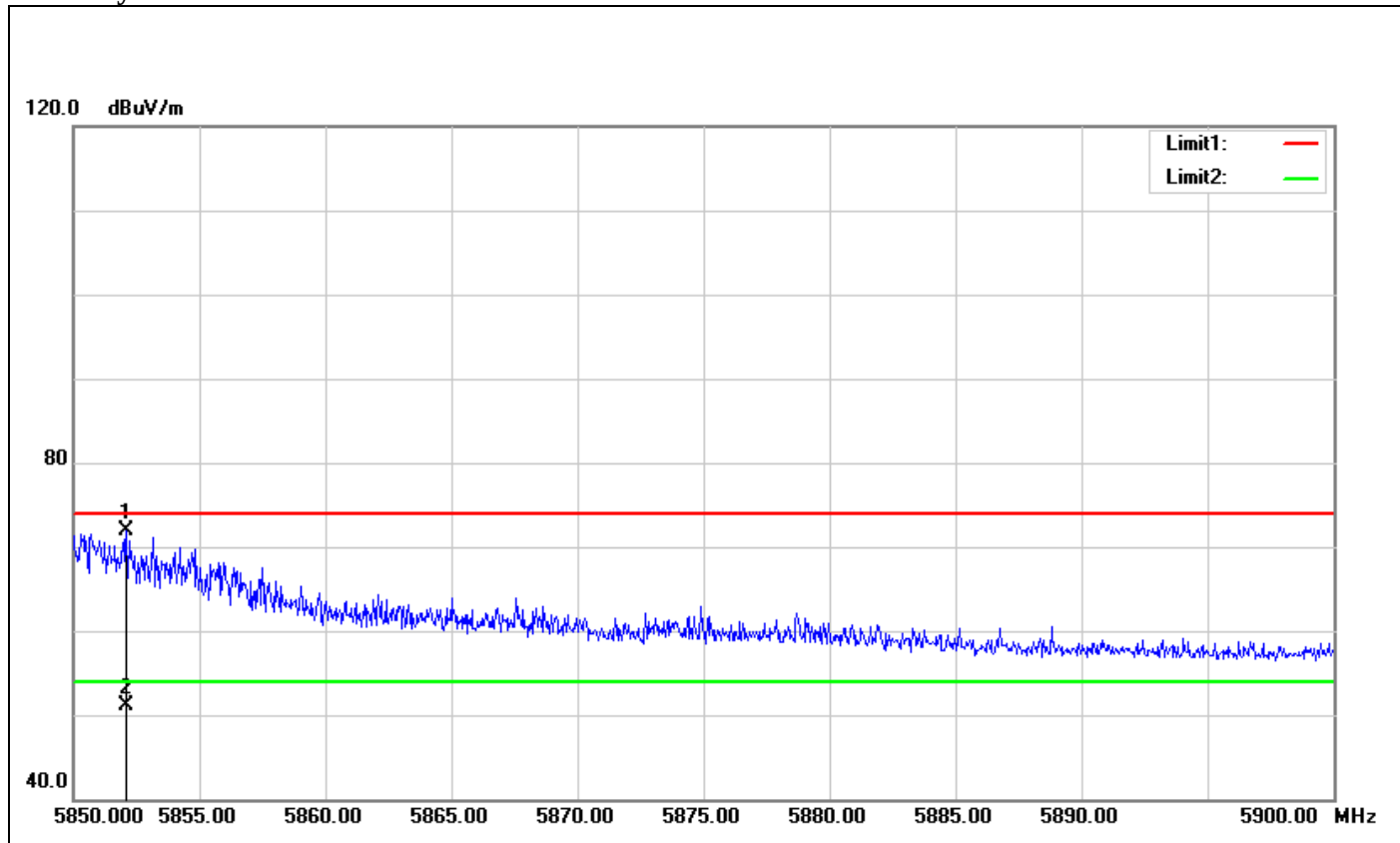
Band Edges (IEEE 802.11a mode / 5825MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5850.300	65.76	6.74	72.50	74.00	-1.50	100	318	peak
2	5850.300	44.92	6.74	51.66	54.00	-2.34	100	318	AVG

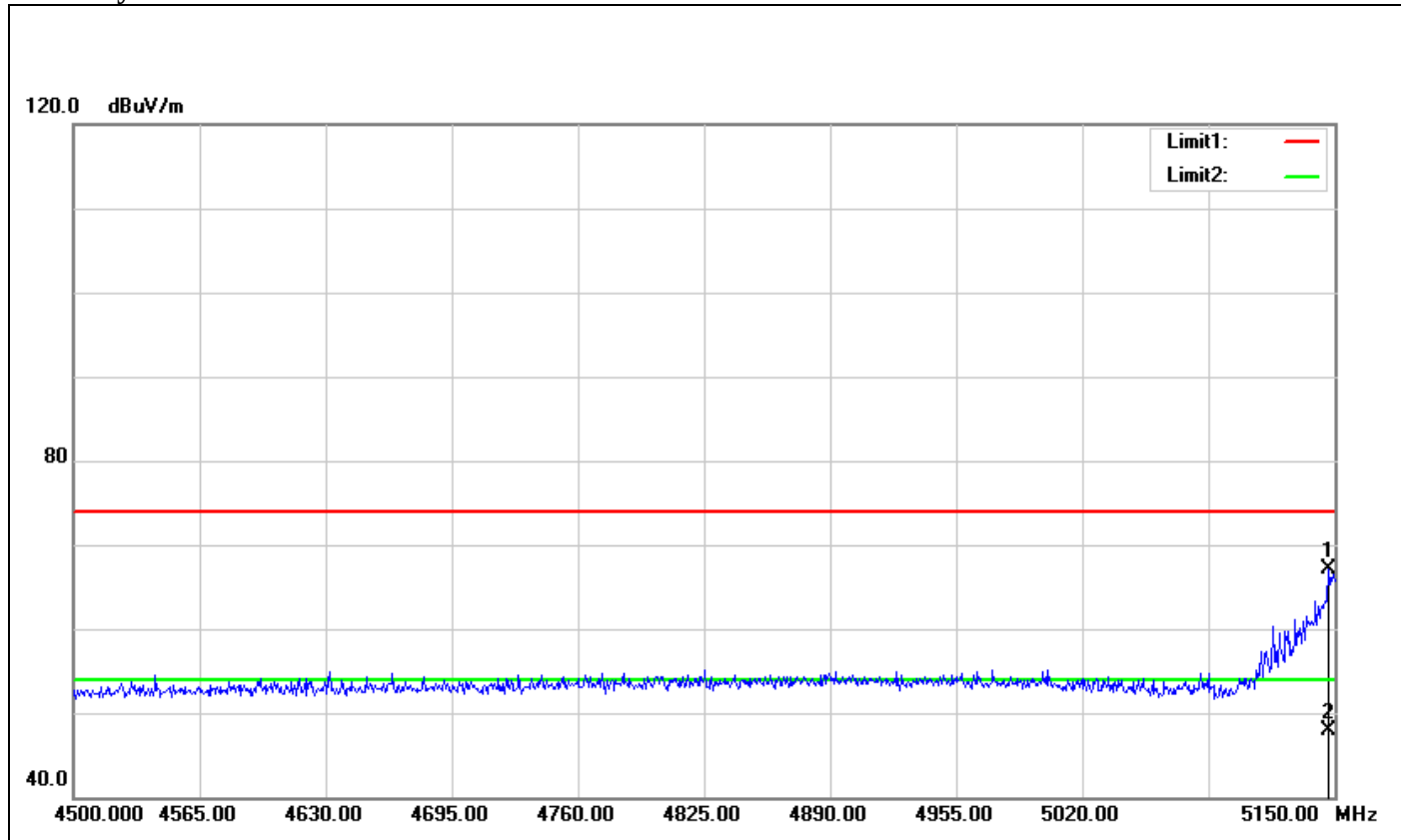
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5852.100	65.12	6.75	71.87	74.00	-2.13	100	16	peak
2	5852.100	44.29	6.75	51.04	54.00	-2.96	100	16	AVG

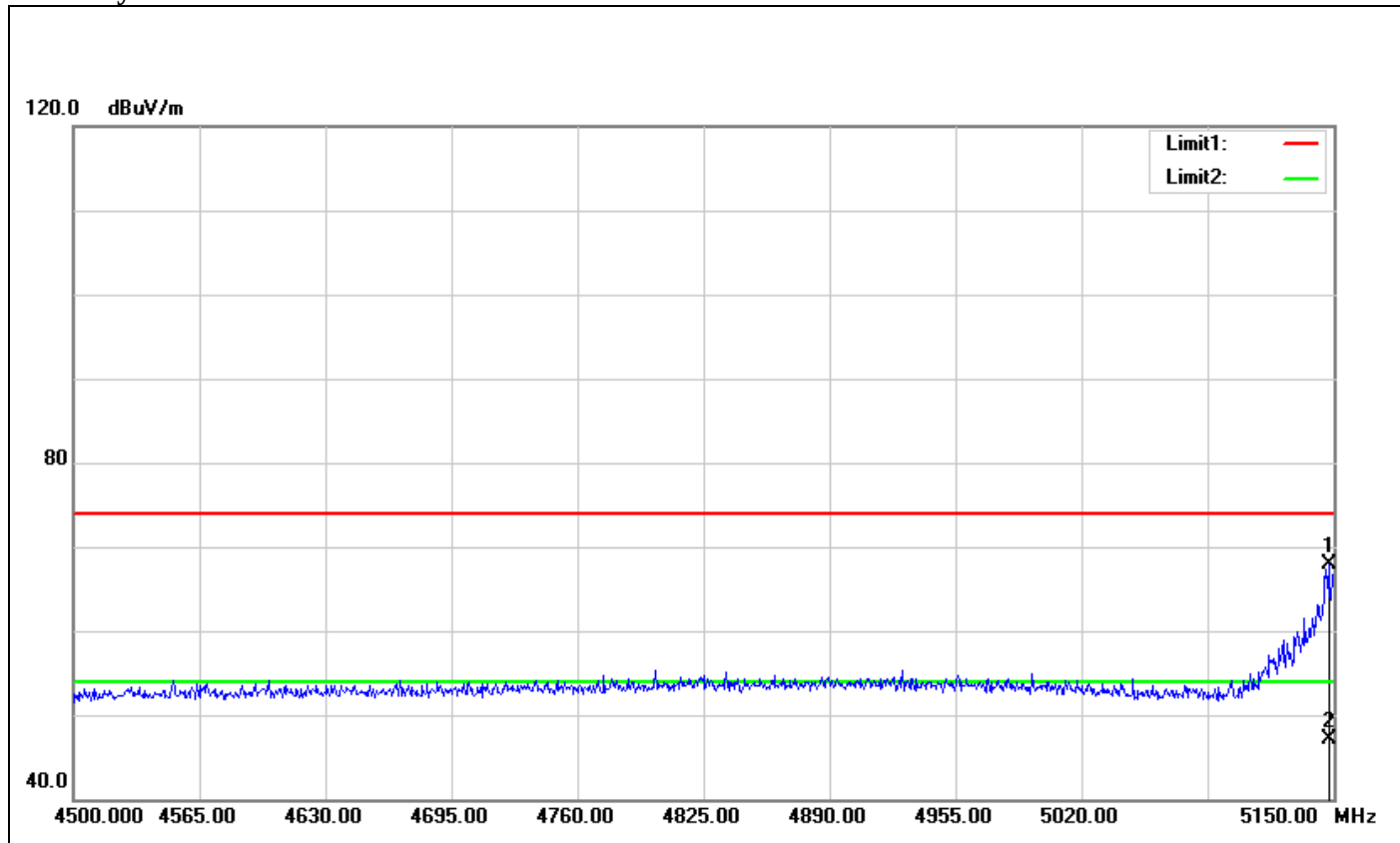
Band Edges (IEEE 802.11n HT 20 mode / 5180 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5146.750	64.11	3.02	67.13	74.00	-6.87	100	307	peak
2	5146.750	44.98	3.02	48.00	54.00	-6.00	100	307	AVG

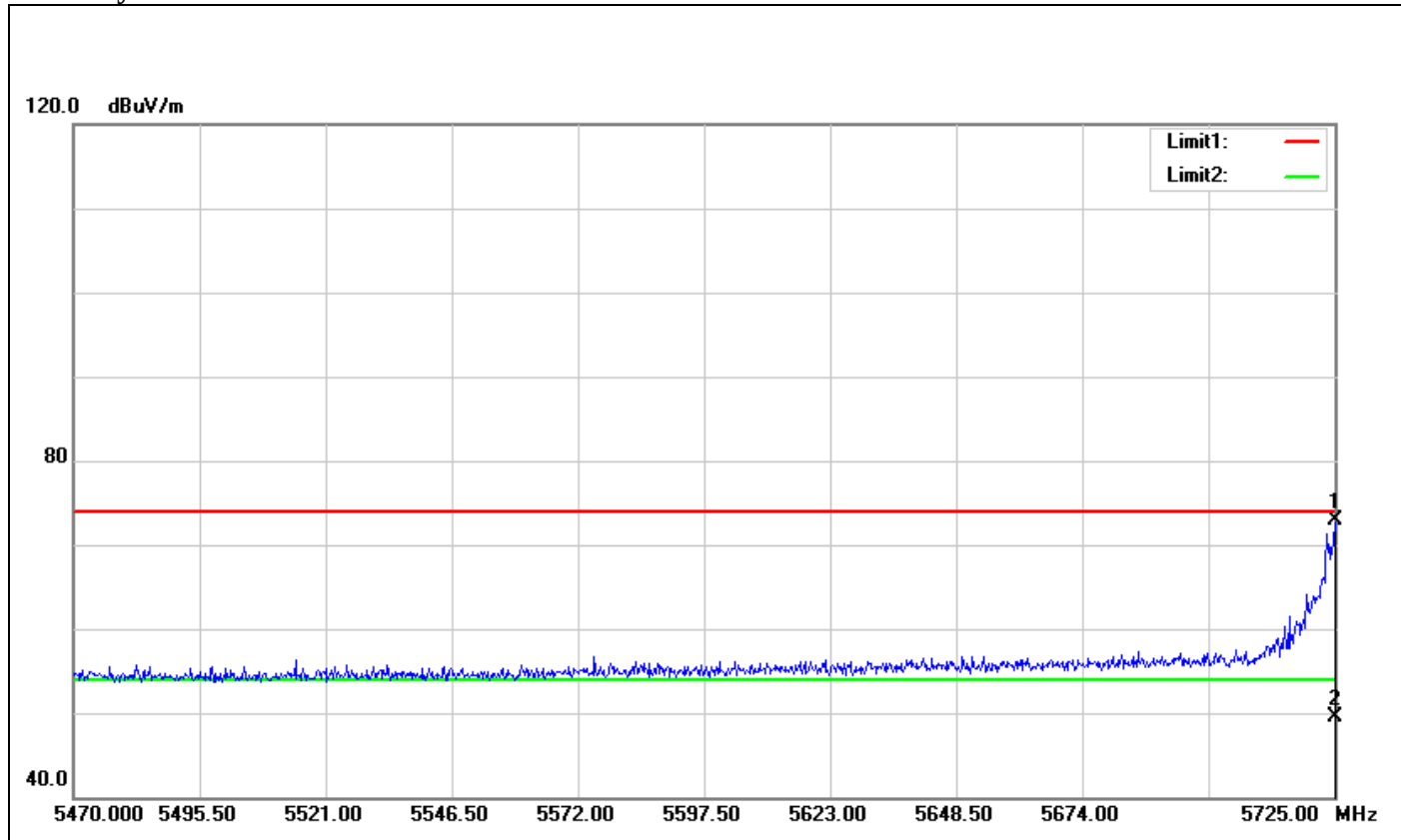
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5147.400	64.86	3.02	67.88	74.00	-6.12	100	273	peak
2	5147.400	44.16	3.02	47.18	54.00	-6.82	100	273	AVG

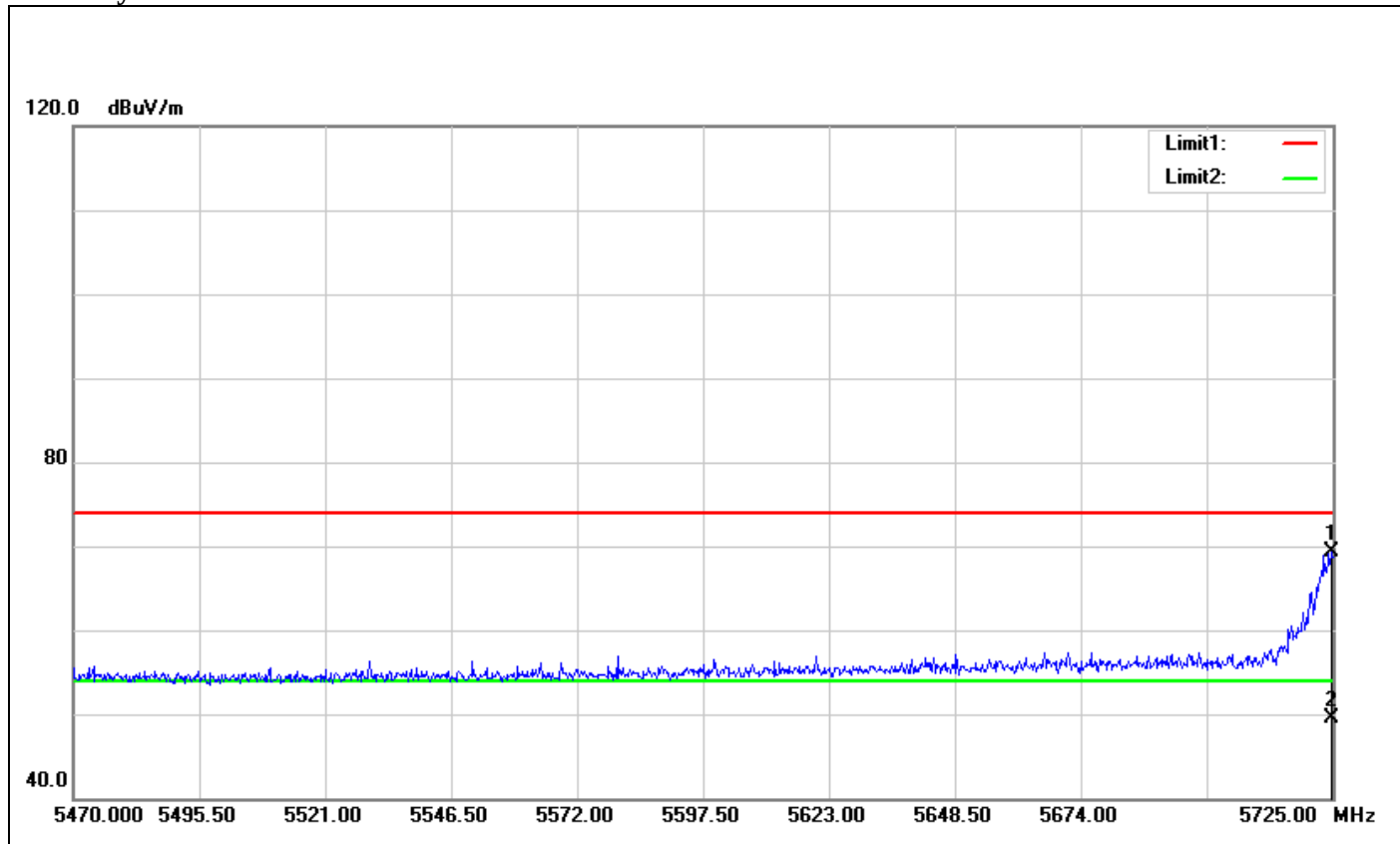
Band Edges (IEEE 802.11n HT 20 mode / 5745 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5725.000	66.77	6.21	72.98	74.00	-1.02	100	145	peak
2	5725.000	43.34	6.21	49.55	54.00	-4.45	100	145	AVG

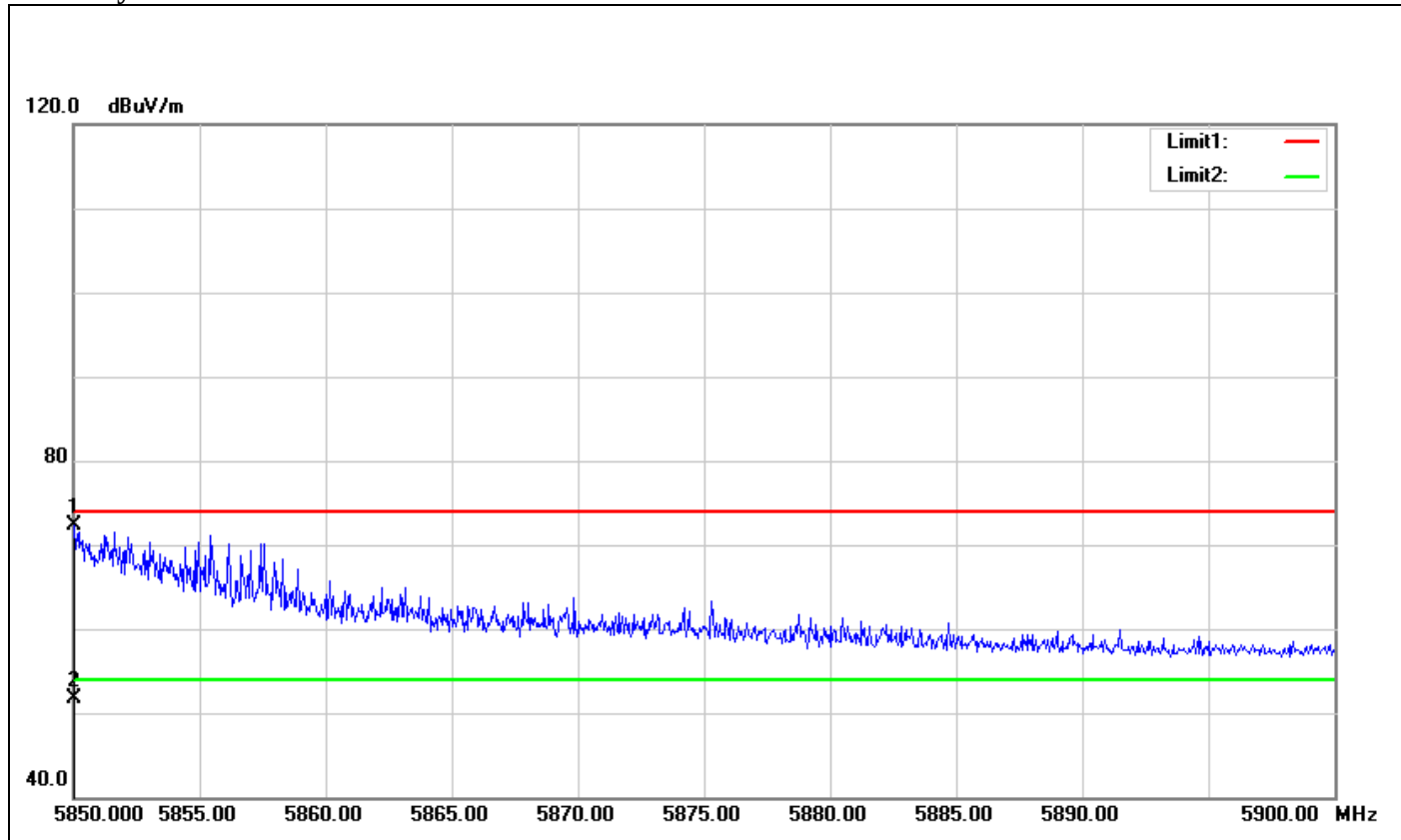
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5724.745	63.01	6.21	69.22	74.00	-4.78	100	353	peak
2	5724.745	43.33	6.21	49.54	54.00	-4.46	100	353	AVG

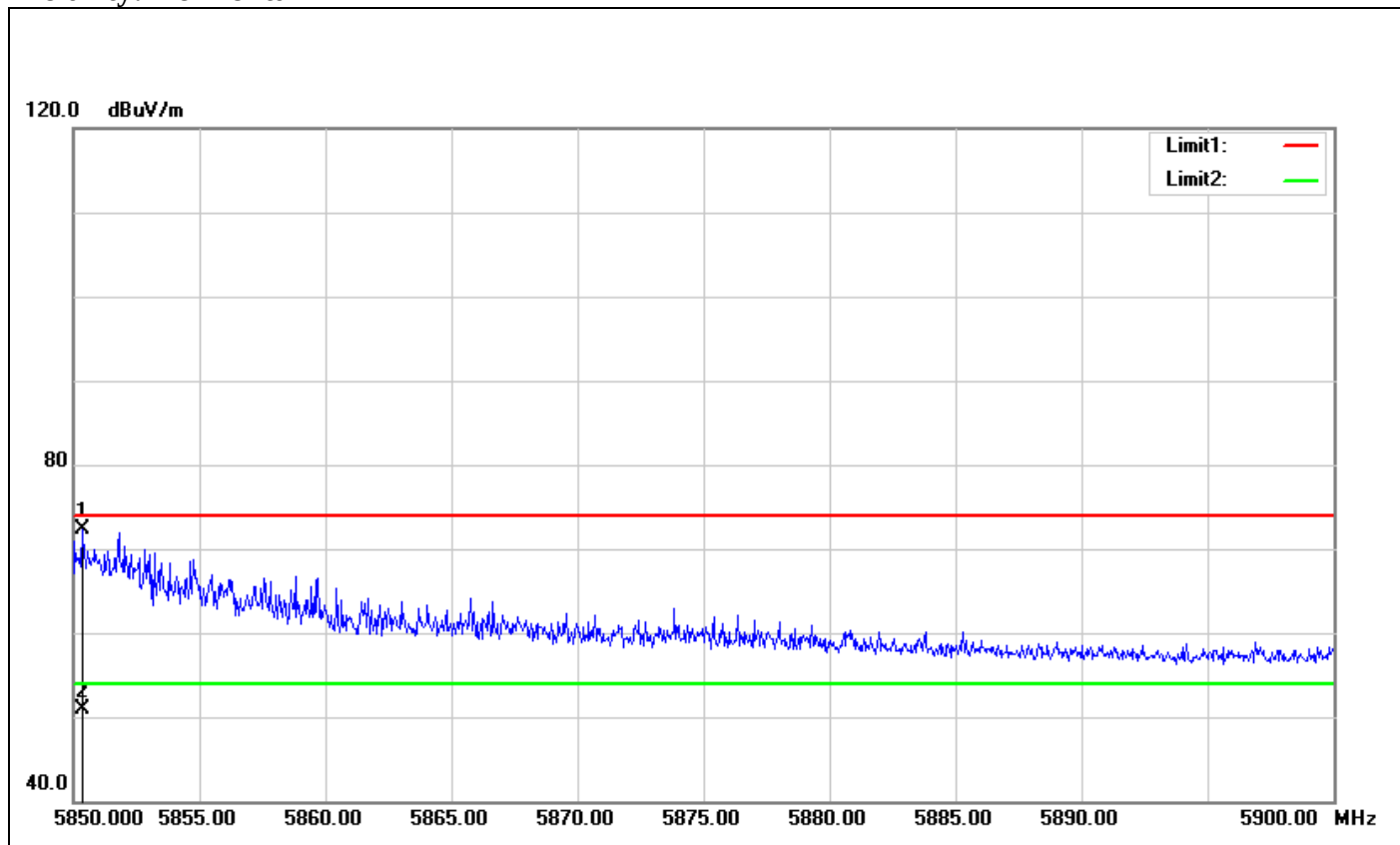
Band Edges (IEEE 802.11n HT 20 mode / 5825 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5850.050	65.62	6.74	72.36	74.00	-1.64	100	57	peak
2	5850.050	44.86	6.74	51.60	54.00	-2.40	100	57	AVG

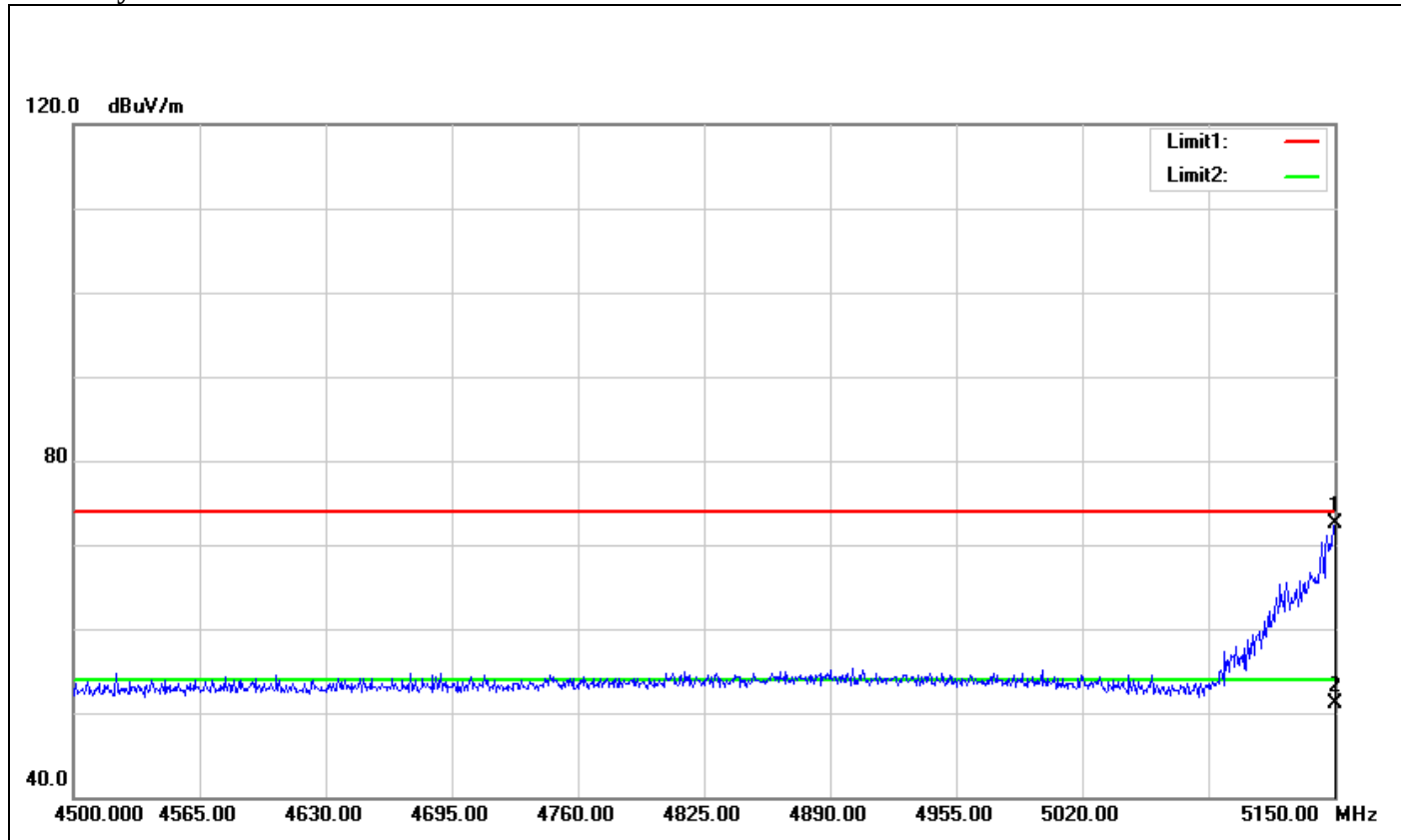
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5850.350	65.56	6.74	72.30	74.00	-1.70	100	357	peak
2	5850.350	44.24	6.74	50.98	54.00	-3.02	100	357	AVG

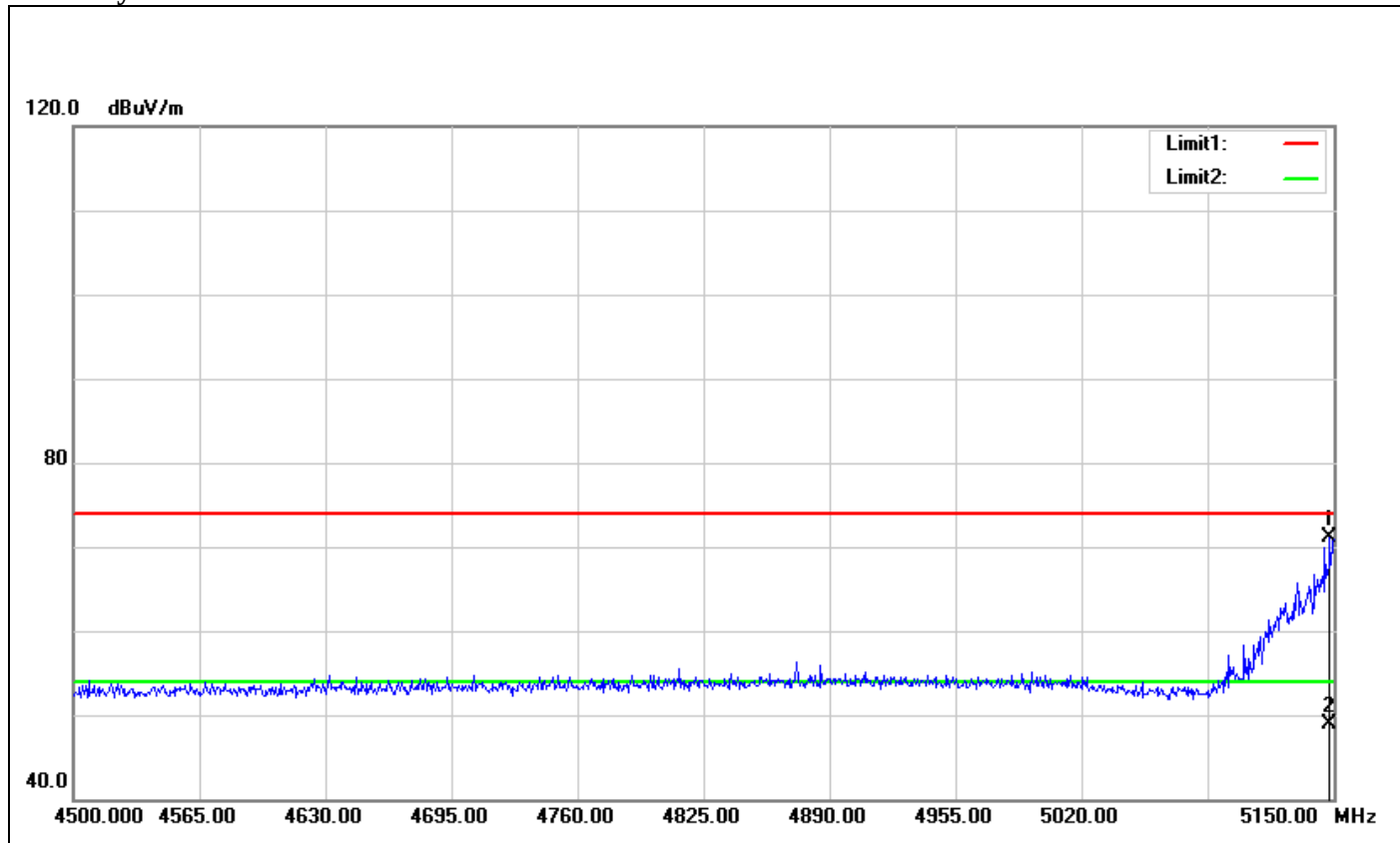
Band Edges (IEEE 802.11n HT 40 mode / 5190 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	69.49	3.04	72.53	74.00	-1.47	100	321	peak
2	5150.000	48.11	3.04	51.15	54.00	-2.85	100	321	AVG

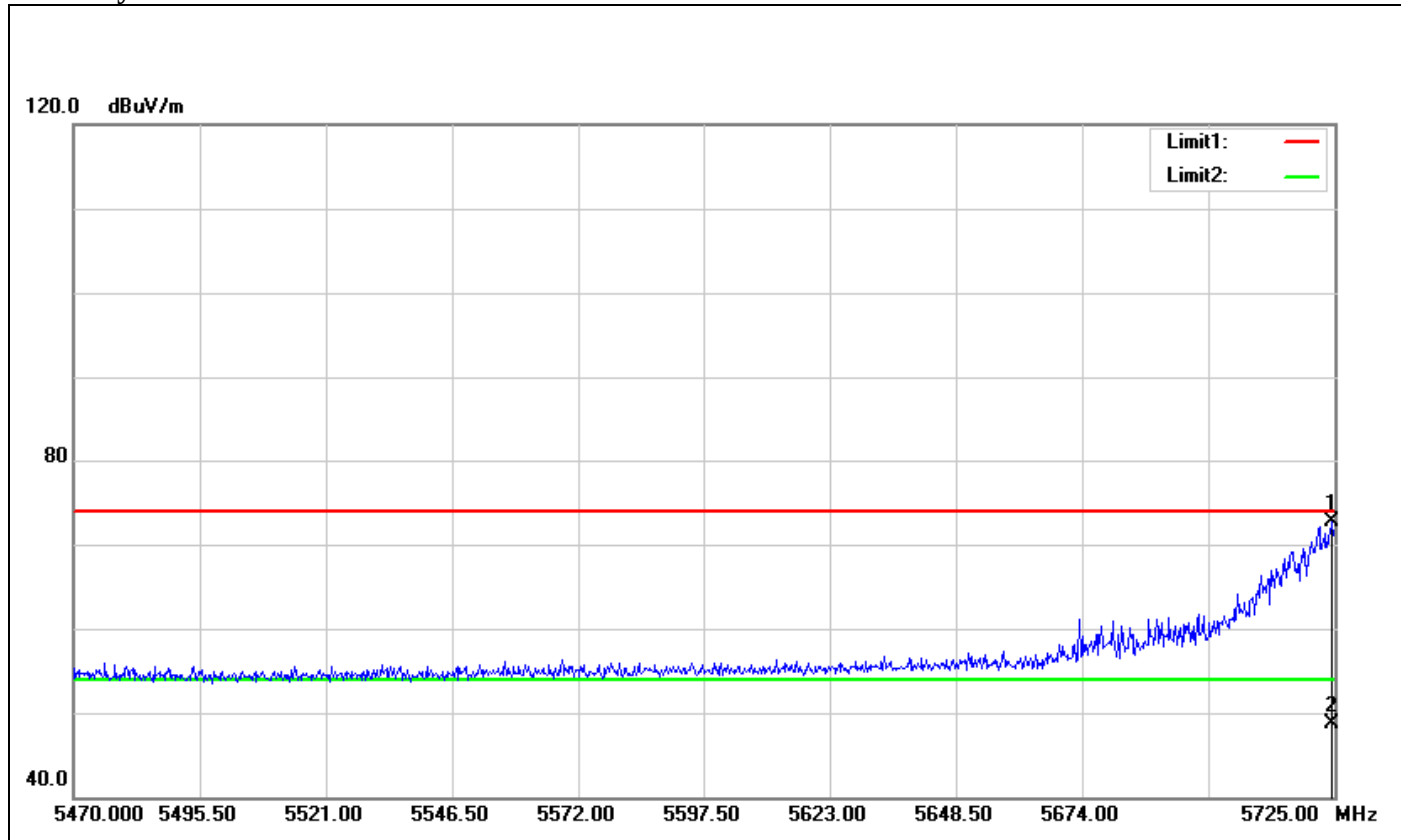
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5148.050	68.12	3.03	71.15	74.00	-2.85	100	196	peak
2	5148.050	45.94	3.03	48.97	54.00	-5.03	100	196	AVG

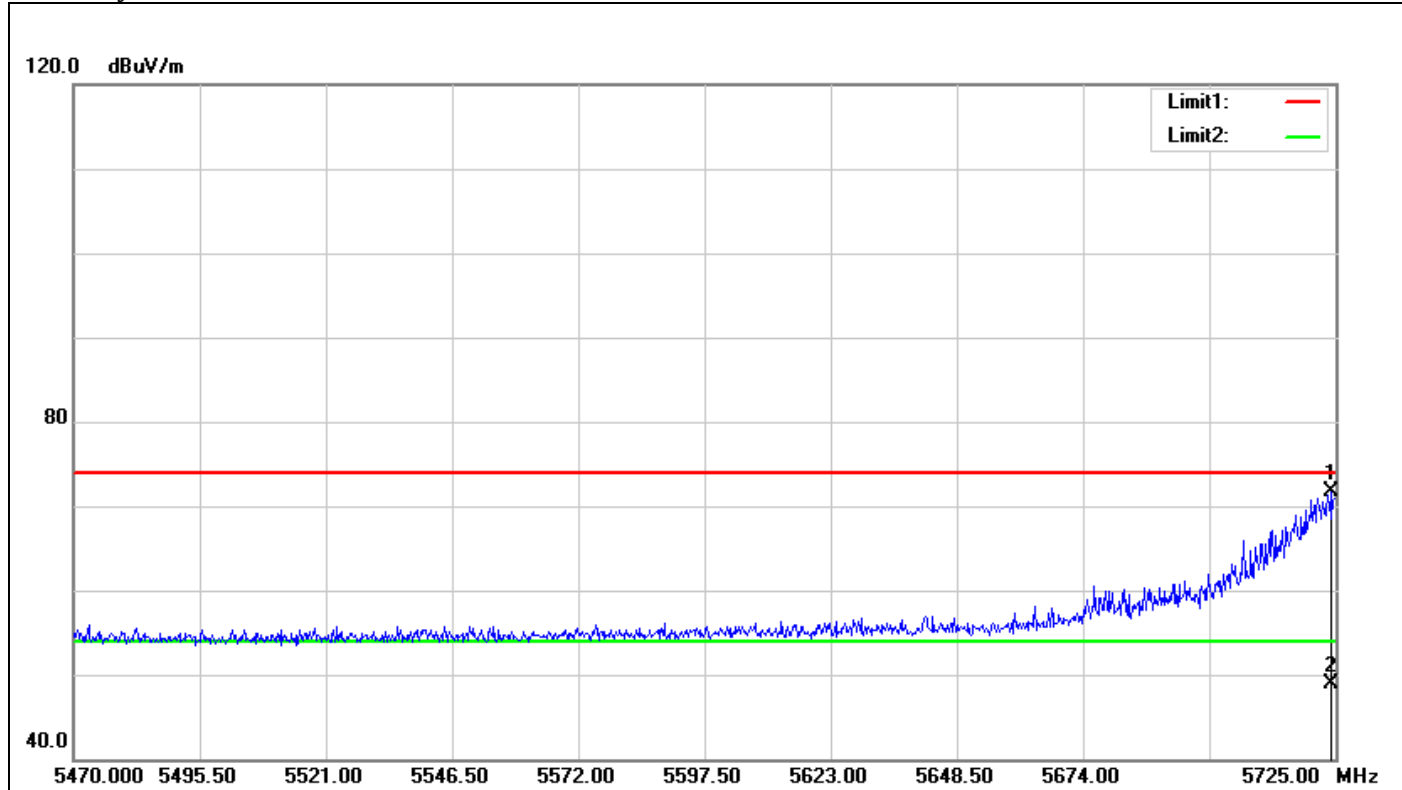
Band Edges (IEEE 802.11n HT 40 mode / 5755 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5724.490	66.40	6.21	72.61	74.00	-1.39	100	266	peak
2	5724.490	42.56	6.21	48.77	54.00	-5.23	100	266	AVG

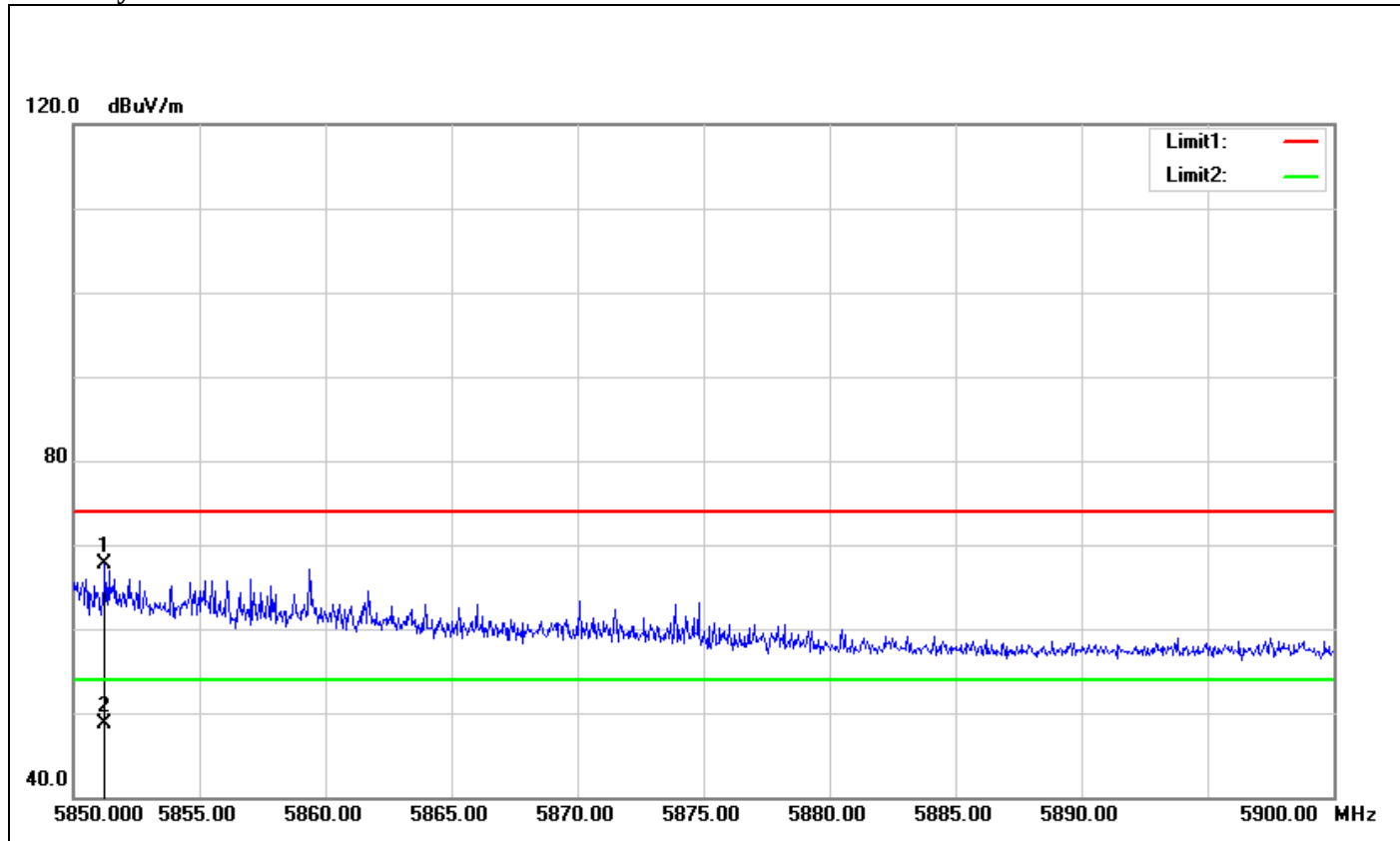
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5723.980	65.44	6.20	71.64	74.00	-2.36	100	27	peak
2	5723.980	42.70	6.20	48.90	54.00	-5.10	100	27	AVG

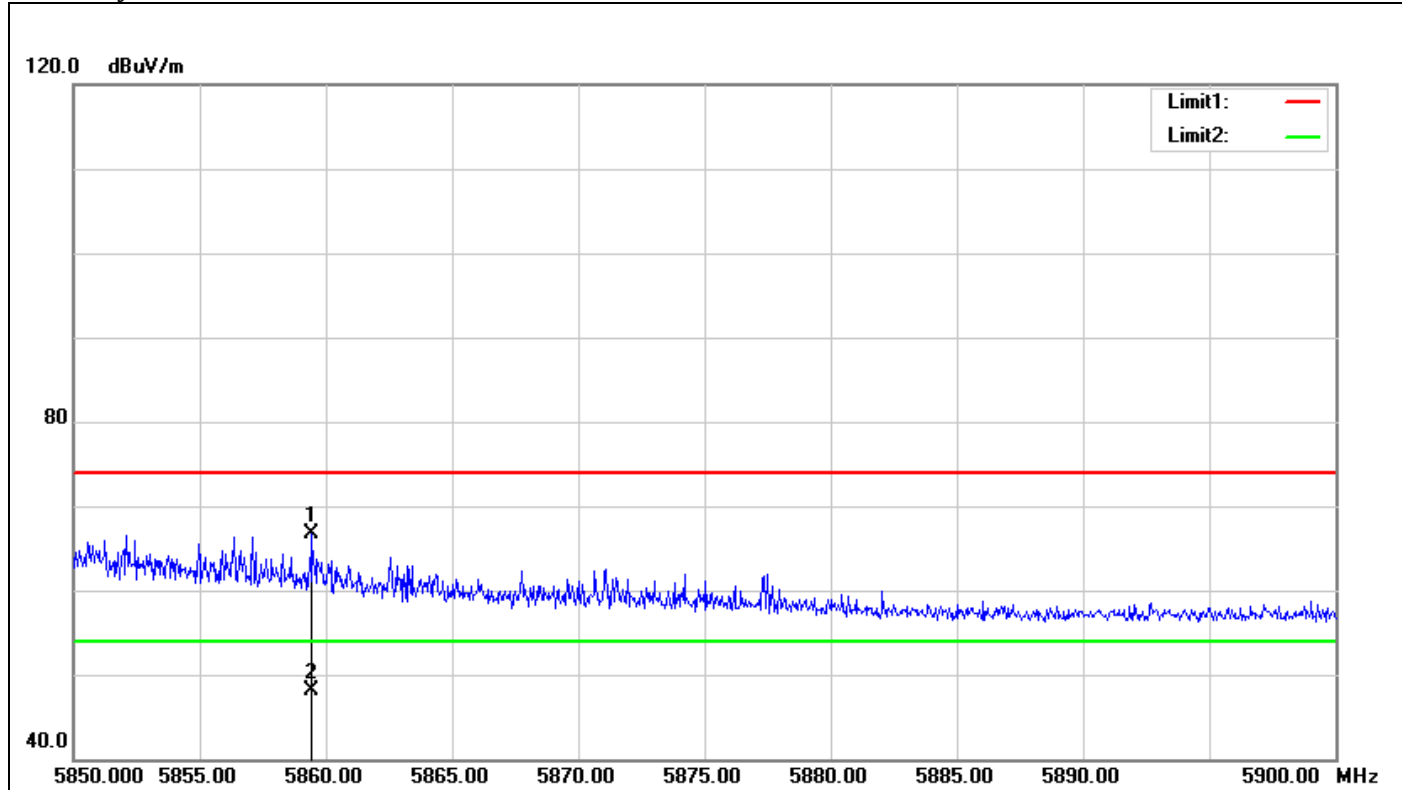
Band Edges (IEEE 802.11n HT 40 mode / 5795 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5851.250	60.92	6.75	67.67	74.00	-6.33	100	81	peak
2	5851.250	41.95	6.75	48.70	54.00	-5.30	100	81	AVG

Polarity: Horizontal

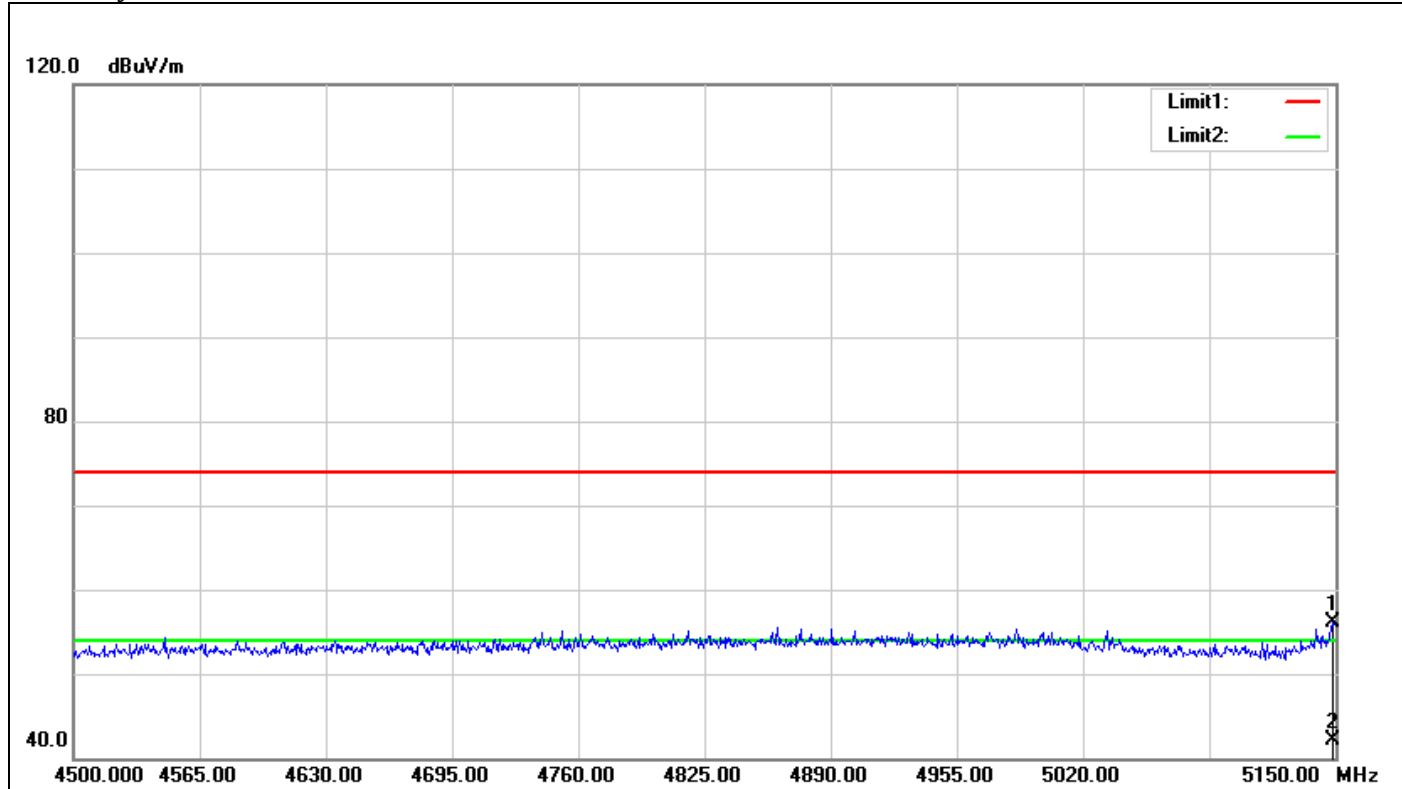


No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5859.450	59.93	6.78	66.71	74.00	-7.29	100	270	peak
2	5859.450	41.35	6.78	48.13	54.00	-5.87	100	270	AVG

For Dipole Antenna

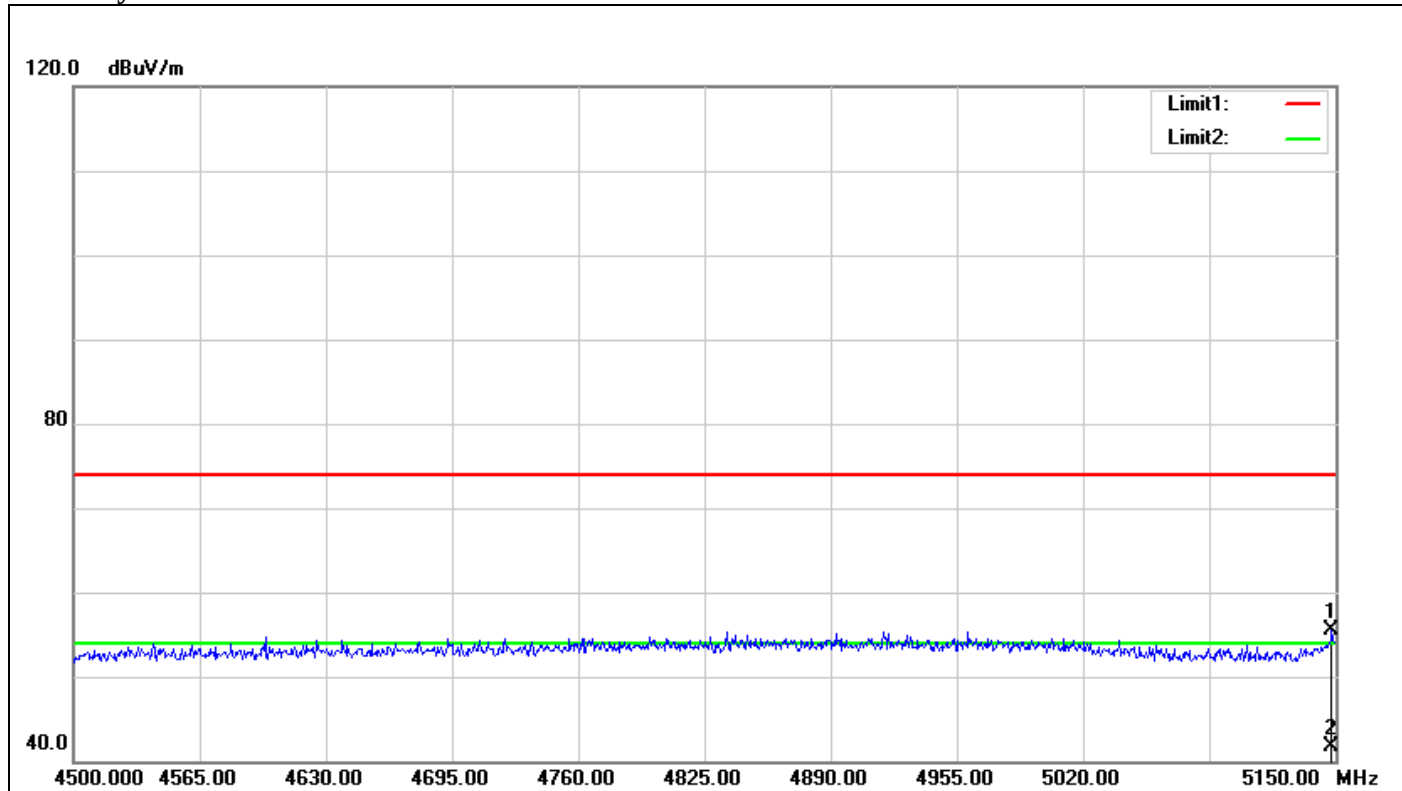
Band Edges (IEEE 802.11a mode / 5180 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5148.700	53.05	3.03	56.08	74.00	-17.92	100	13	peak
2	5148.700	39.10	3.03	42.13	54.00	-11.87	100	13	AVG

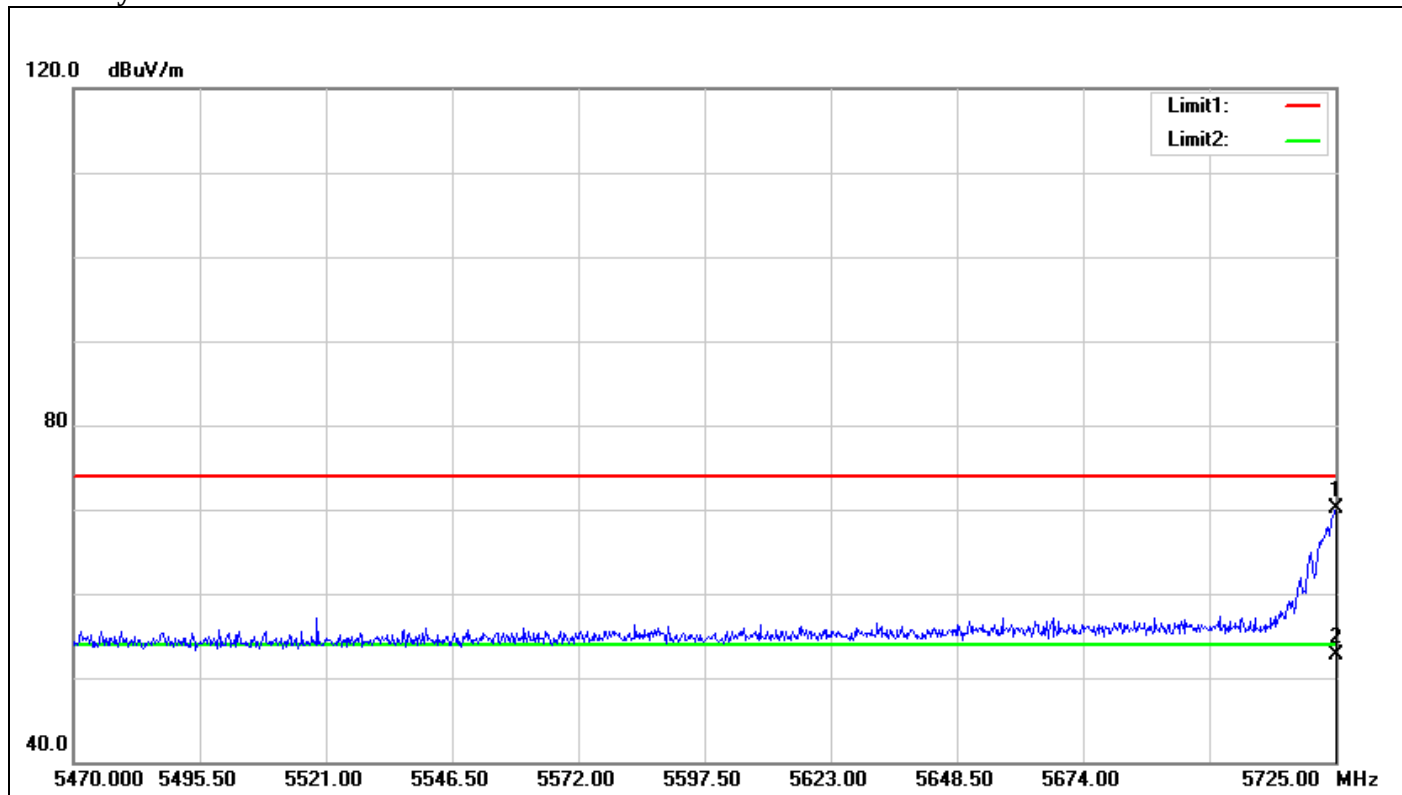
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5148.050	52.56	3.03	55.59	74.00	-18.41	100	42	peak
2	5148.050	38.63	3.03	41.66	54.00	-12.34	100	42	AVG

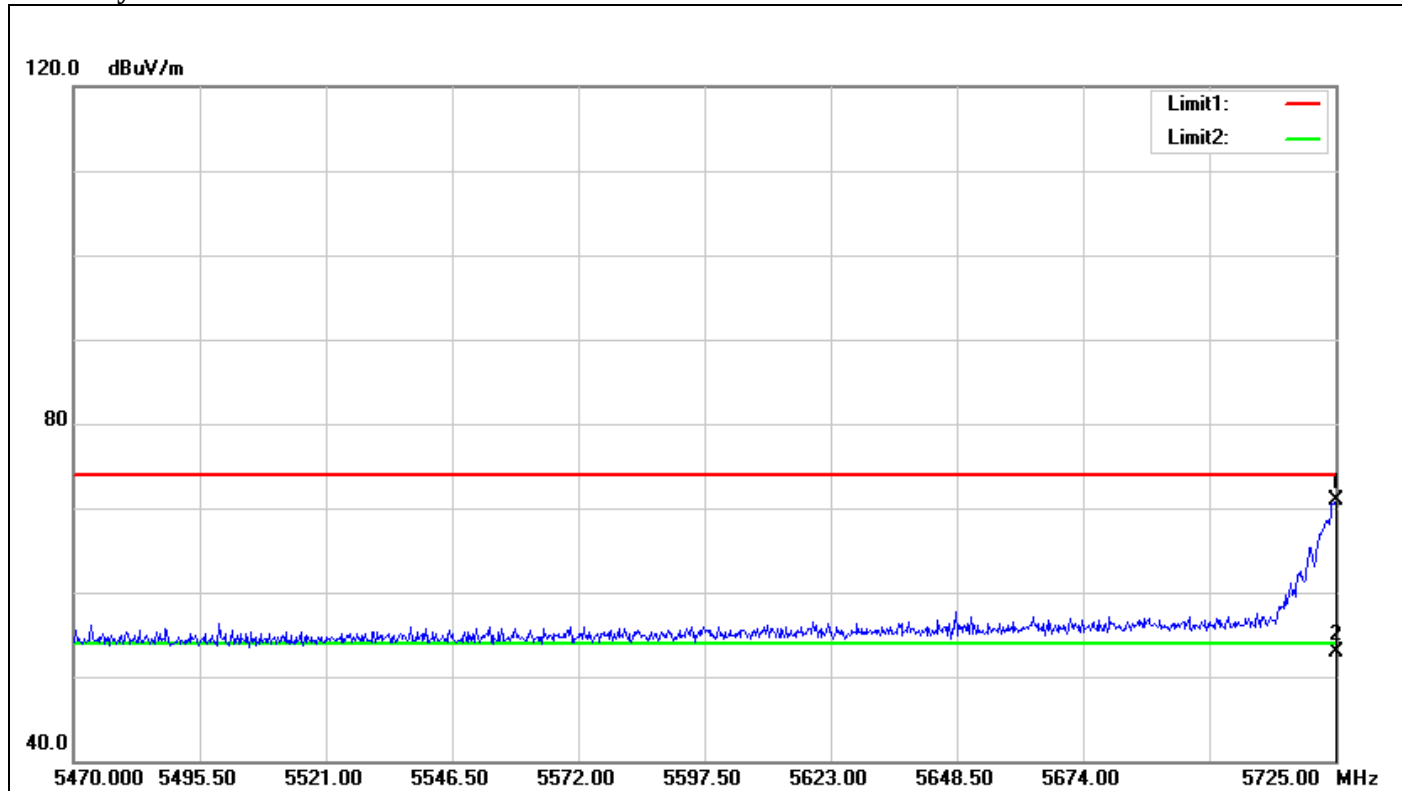
Band Edges (IEEE 802.11a mode / 5745 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5725.000	63.83	6.21	70.04	74.00	-3.96	100	71	peak
2	5725.000	46.40	6.21	52.61	54.00	-1.39	100	71	AVG

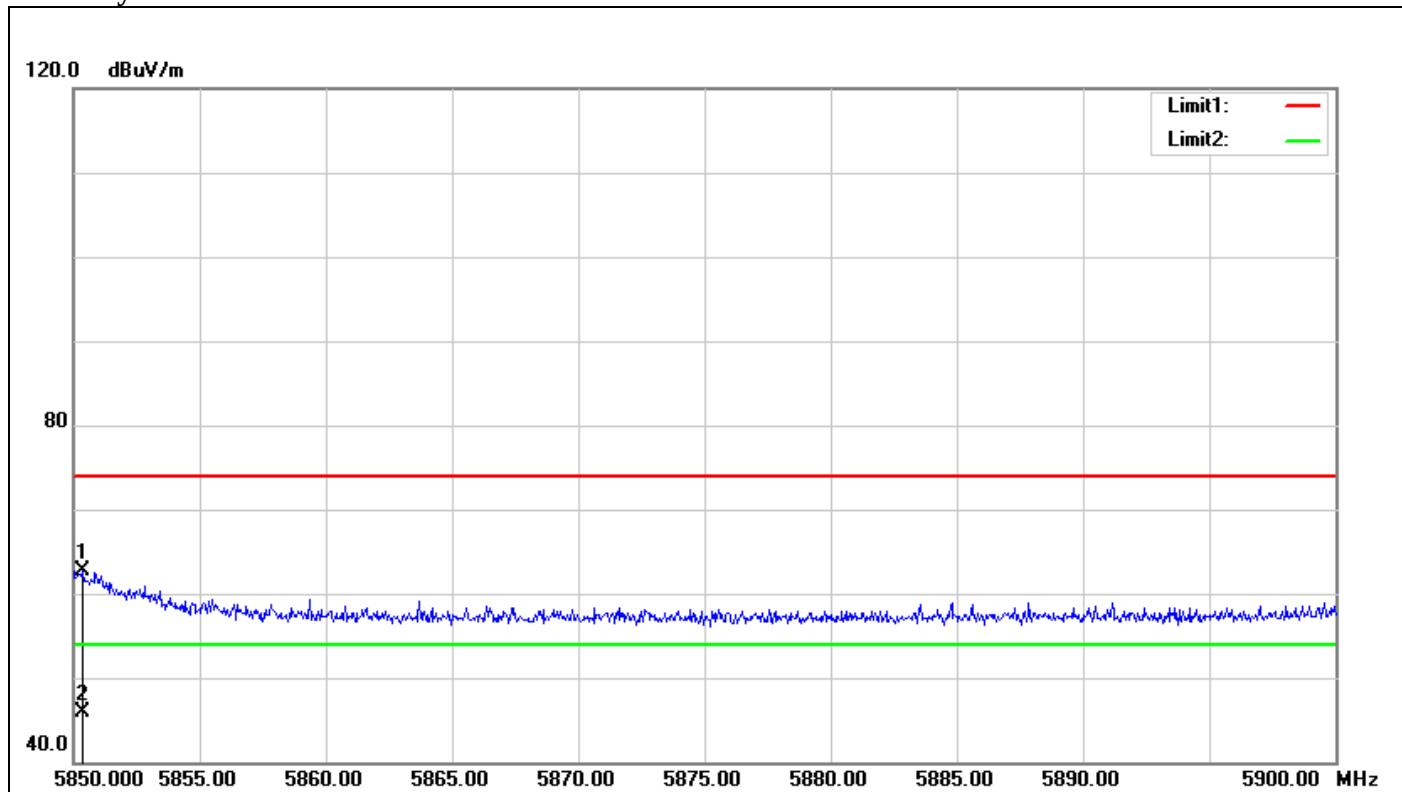
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5725.000	64.71	6.21	70.92	74.00	-3.08	100	244	peak
2	5725.000	46.65	6.21	52.86	54.00	-1.14	100	244	AVG

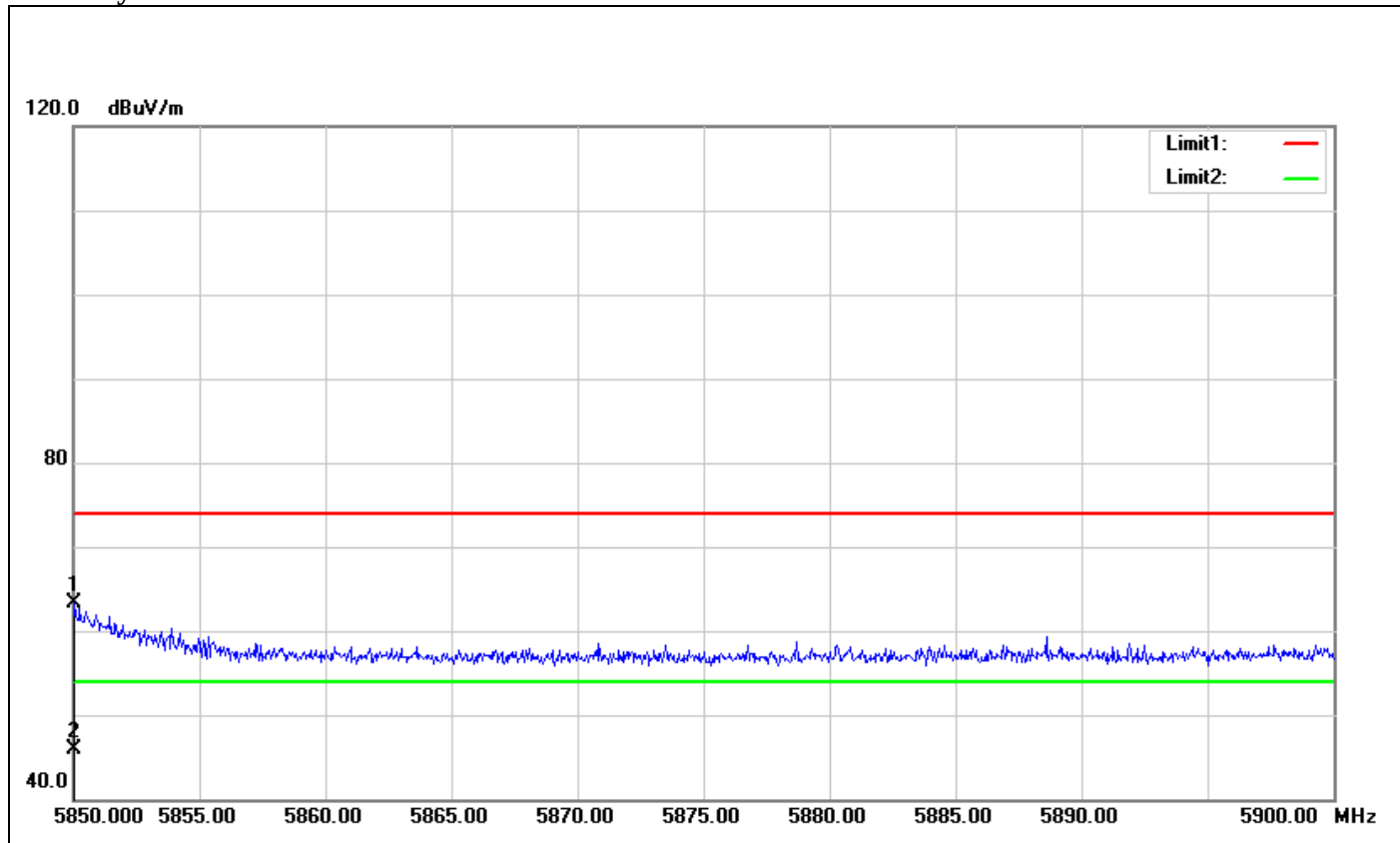
Band Edges (IEEE 802.11a mode / 5825MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5850.350	56.04	6.74	62.78	74.00	-11.22	100	12	peak
2	5850.350	39.11	6.74	45.85	54.00	-8.15	100	12	AVG

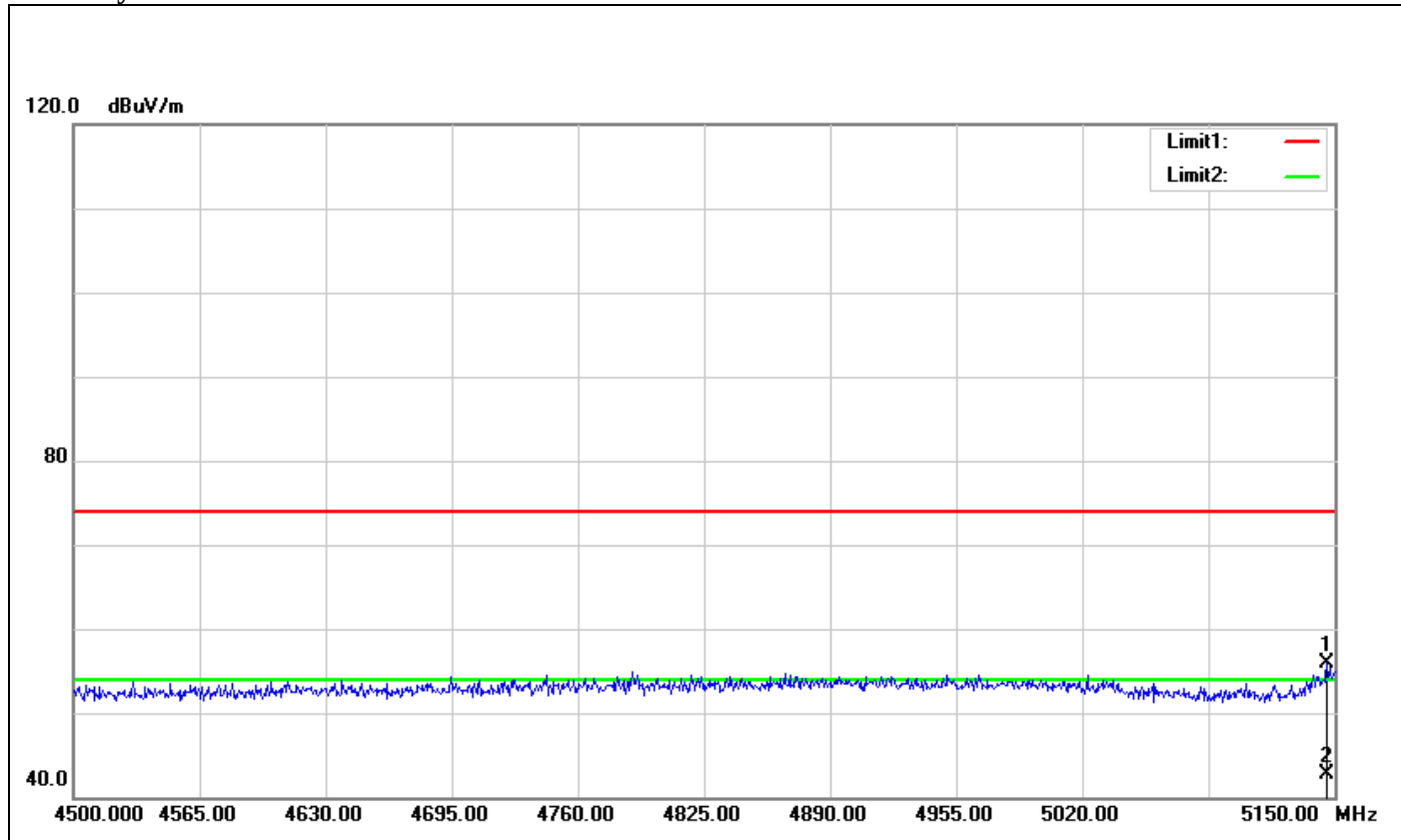
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5850.050	56.54	6.74	63.28	74.00	-10.72	100	259	peak
2	5850.050	39.10	6.74	45.84	54.00	-8.16	100	259	AVG

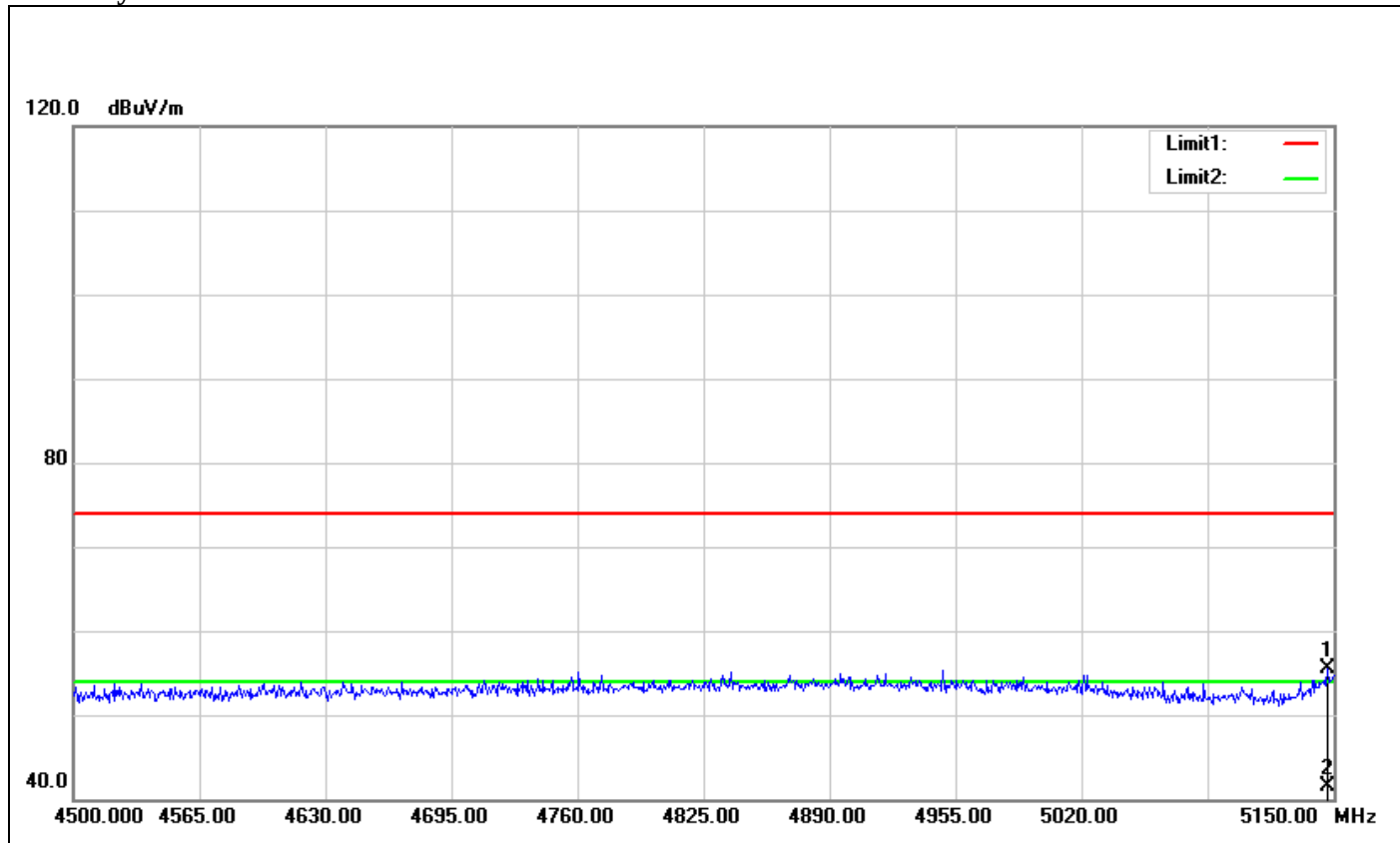
Band Edges (IEEE 802.11n HT 20 mode / 5180 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5146.100	52.92	3.01	55.93	74.00	-18.07	100	256	peak
2	5146.100	39.60	3.01	42.61	54.00	-11.39	100	256	AVG

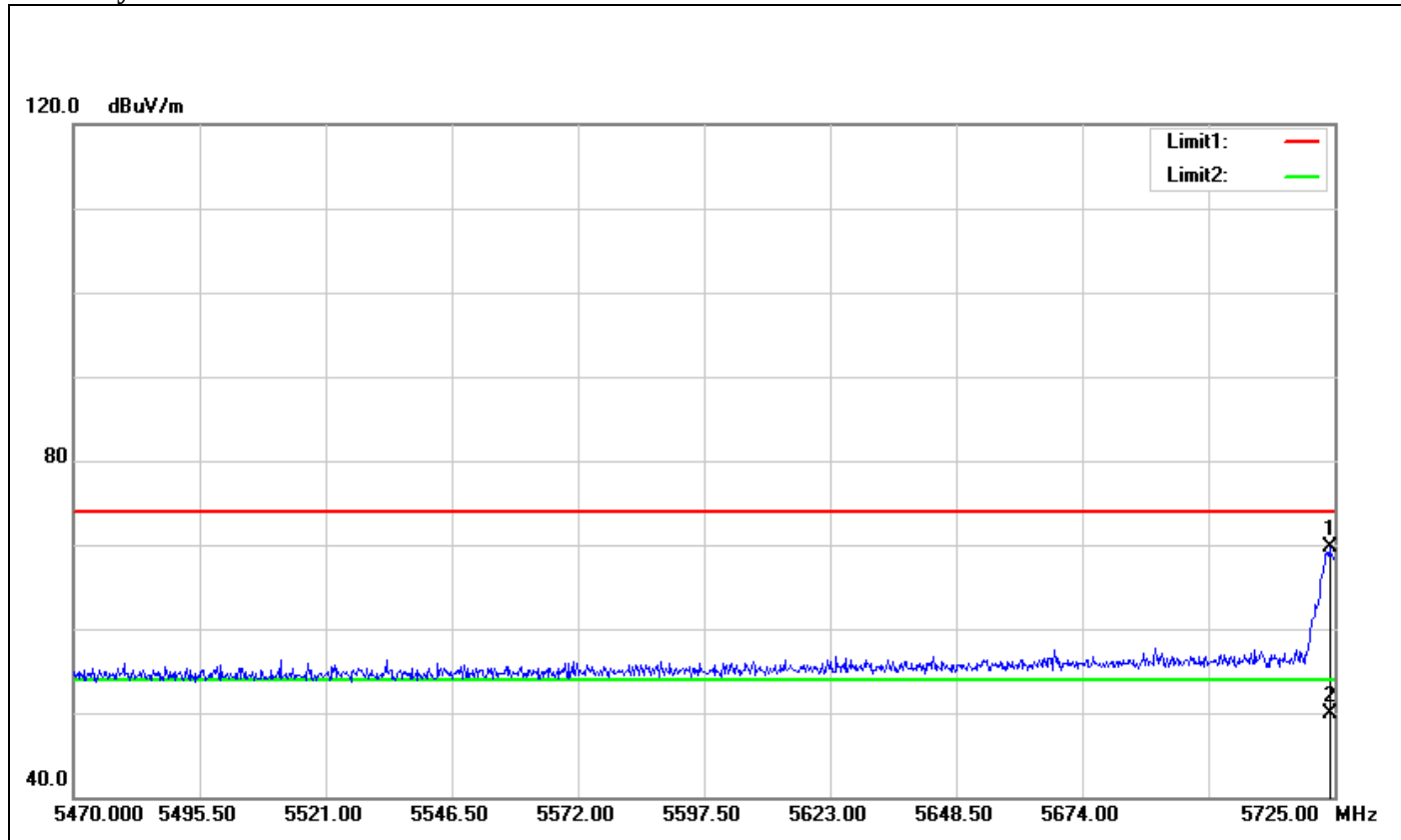
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5146.750	52.54	3.02	55.56	74.00	-18.44	100	126	peak
2	5146.750	38.43	3.02	41.45	54.00	-12.55	100	126	AVG

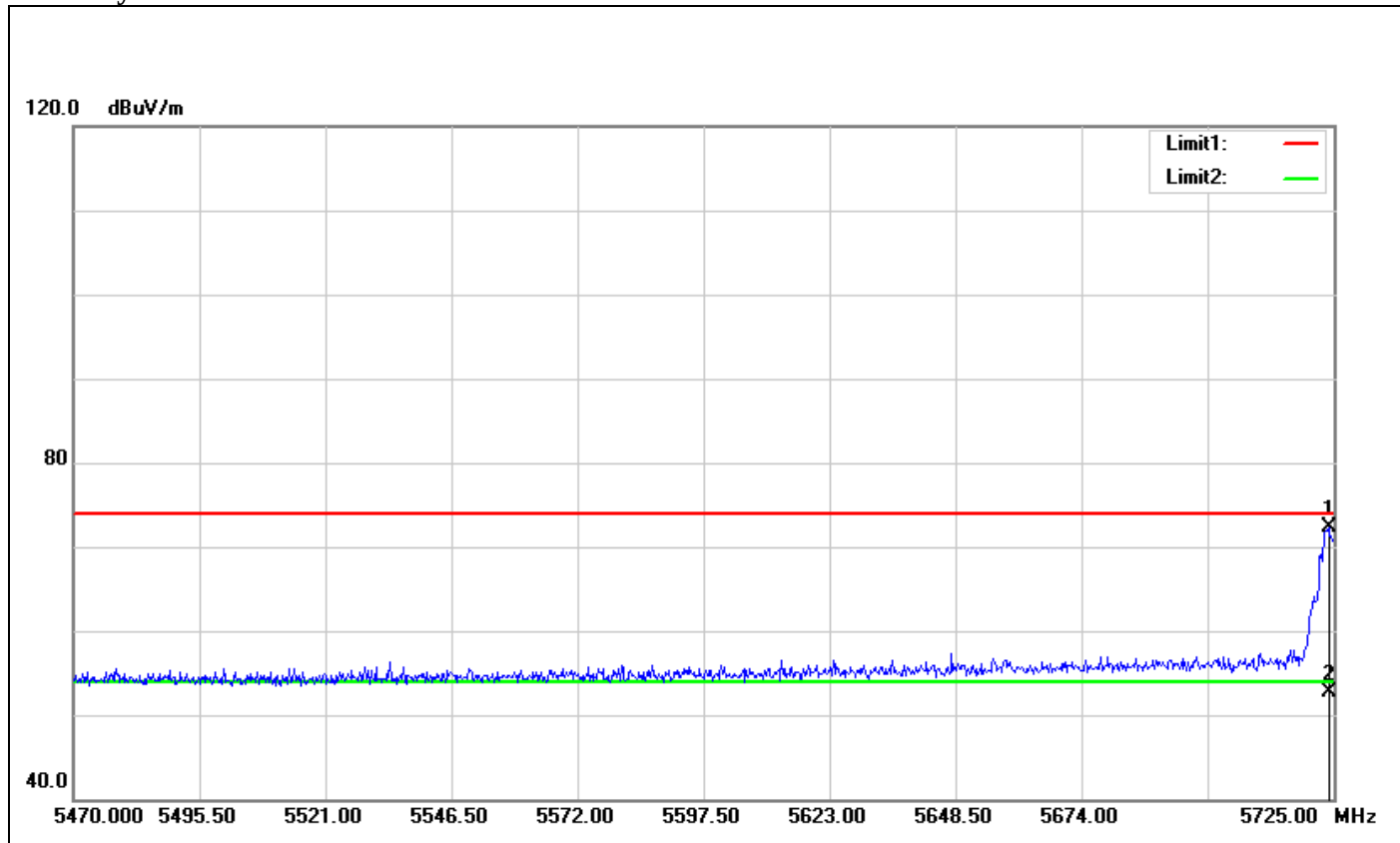
Band Edges (IEEE 802.11n HT 20 mode / 5745 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5723.980	63.50	6.20	69.70	74.00	-4.30	100	0	peak
2	5723.980	43.66	6.20	49.86	54.00	-4.14	100	0	AVG

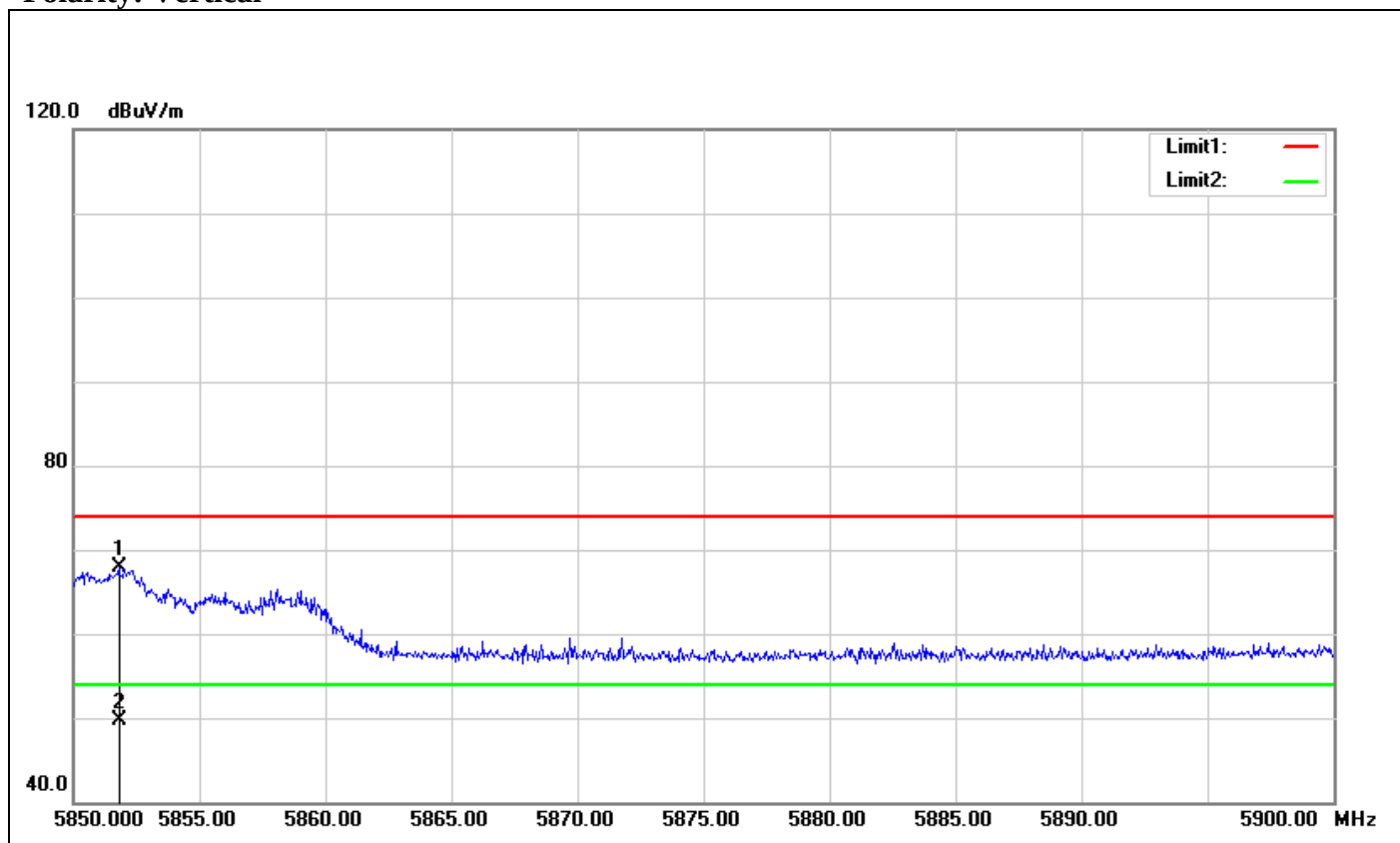
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5723.980	66.08	6.20	72.28	74.00	-1.72	100	233	peak
2	5723.980	46.44	6.20	52.64	54.00	-1.36	100	233	AVG

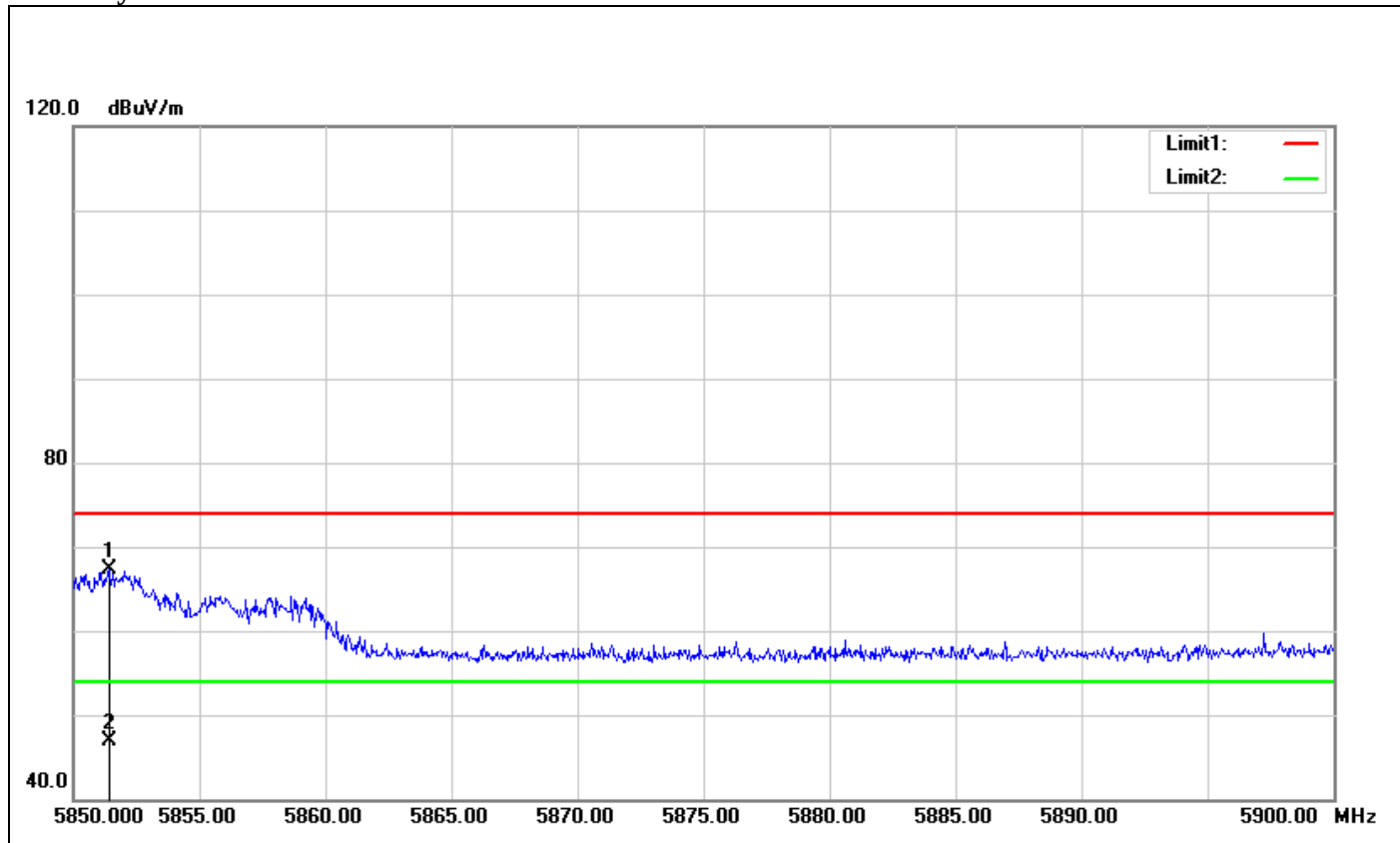
Band Edges (IEEE 802.11n HT 20 mode / 5825 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5851.800	61.19	6.75	67.94	74.00	-6.06	100	20	peak
2	5851.800	42.86	6.75	49.61	54.00	-4.39	100	20	AVG

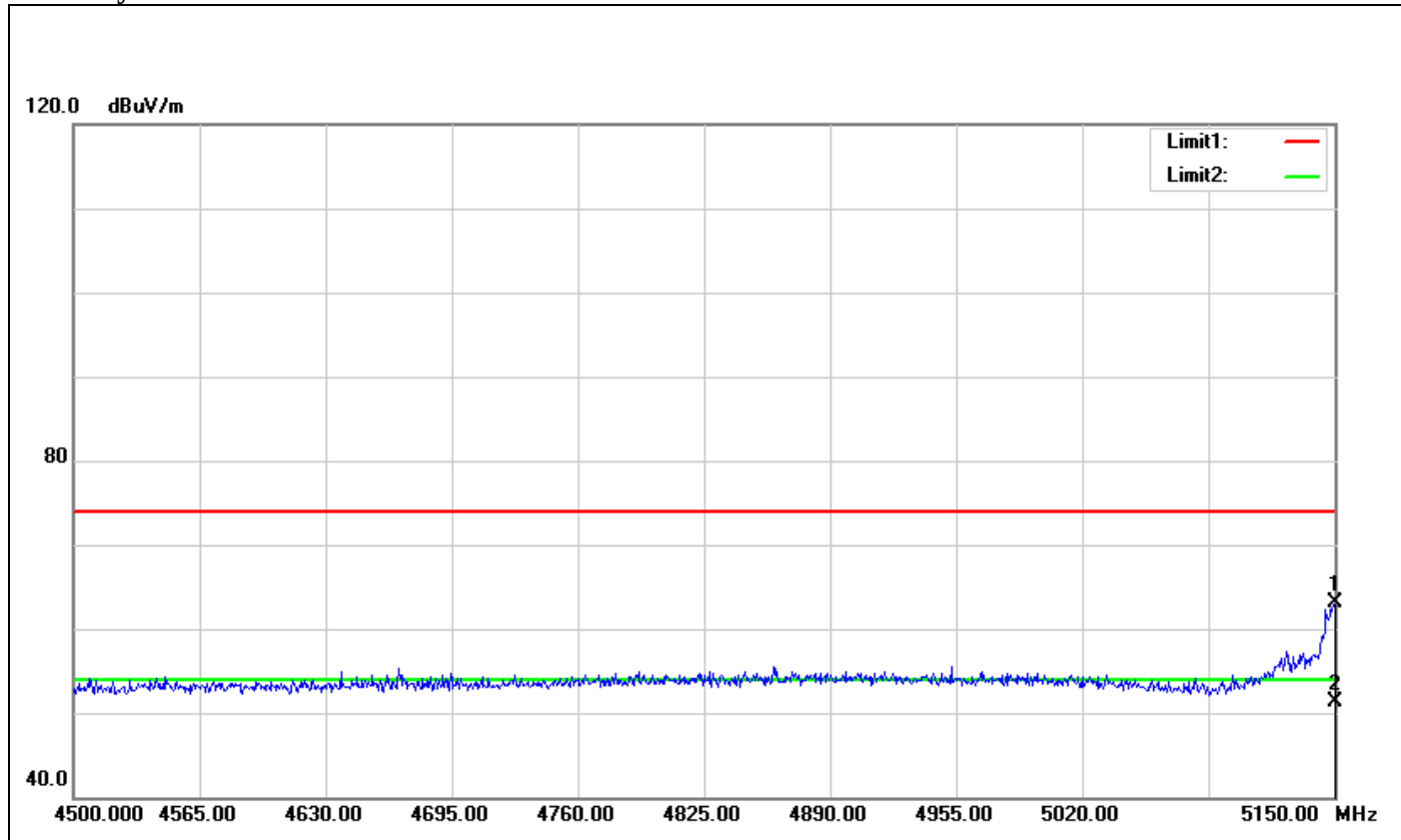
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5851.400	60.50	6.75	67.25	74.00	-6.75	100	189	peak
2	5851.400	40.16	6.75	46.91	54.00	-7.09	100	189	AVG

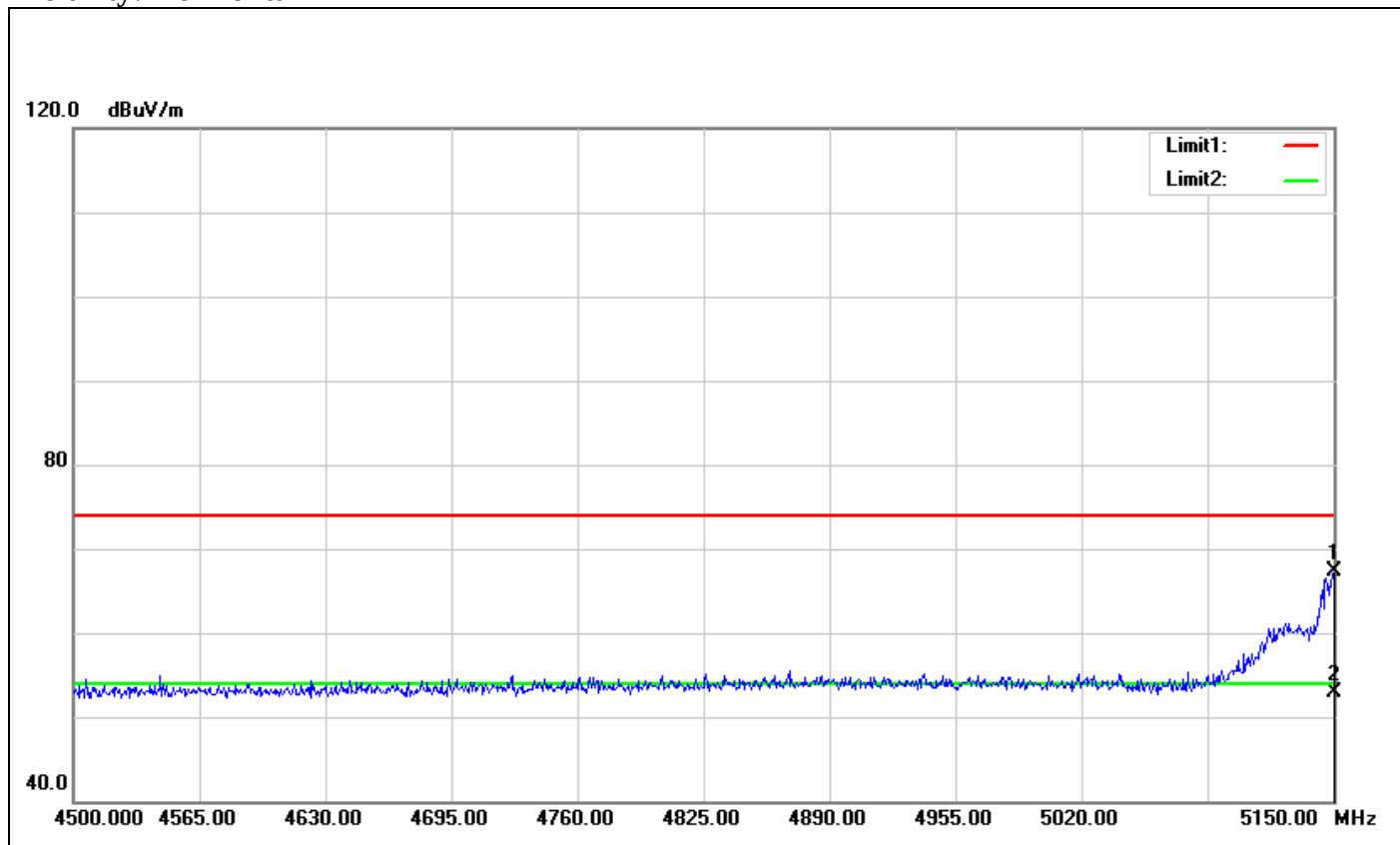
Band Edges (IEEE 802.11n HT 40 mode / 5190 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	60.10	3.04	63.14	74.00	-10.86	100	196	peak
2	5150.000	48.36	3.04	51.40	54.00	-2.60	100	196	AVG

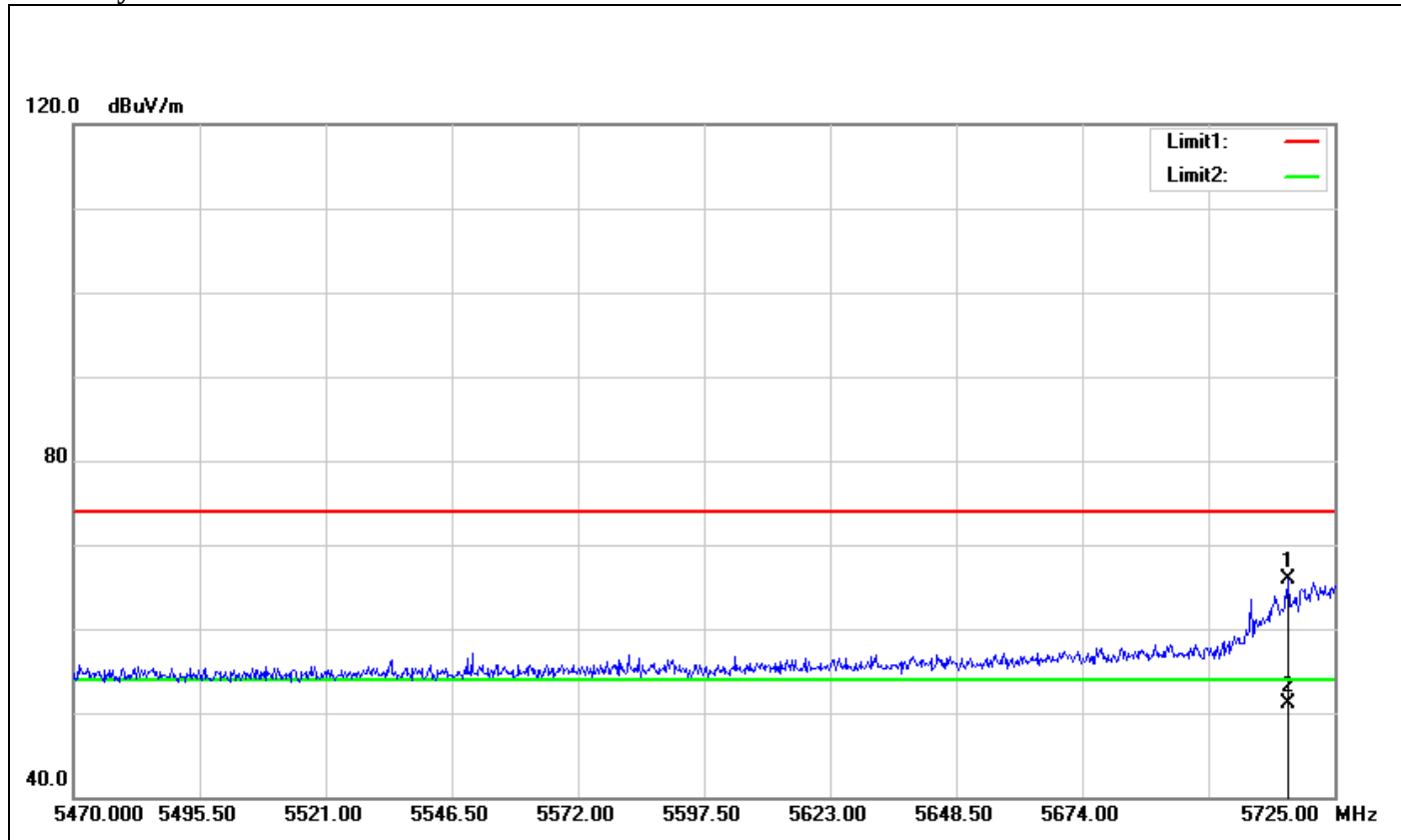
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5150.000	64.27	3.04	67.31	74.00	-6.69	100	161	peak
2	5150.000	49.84	3.04	52.88	54.00	-1.12	100	161	AVG

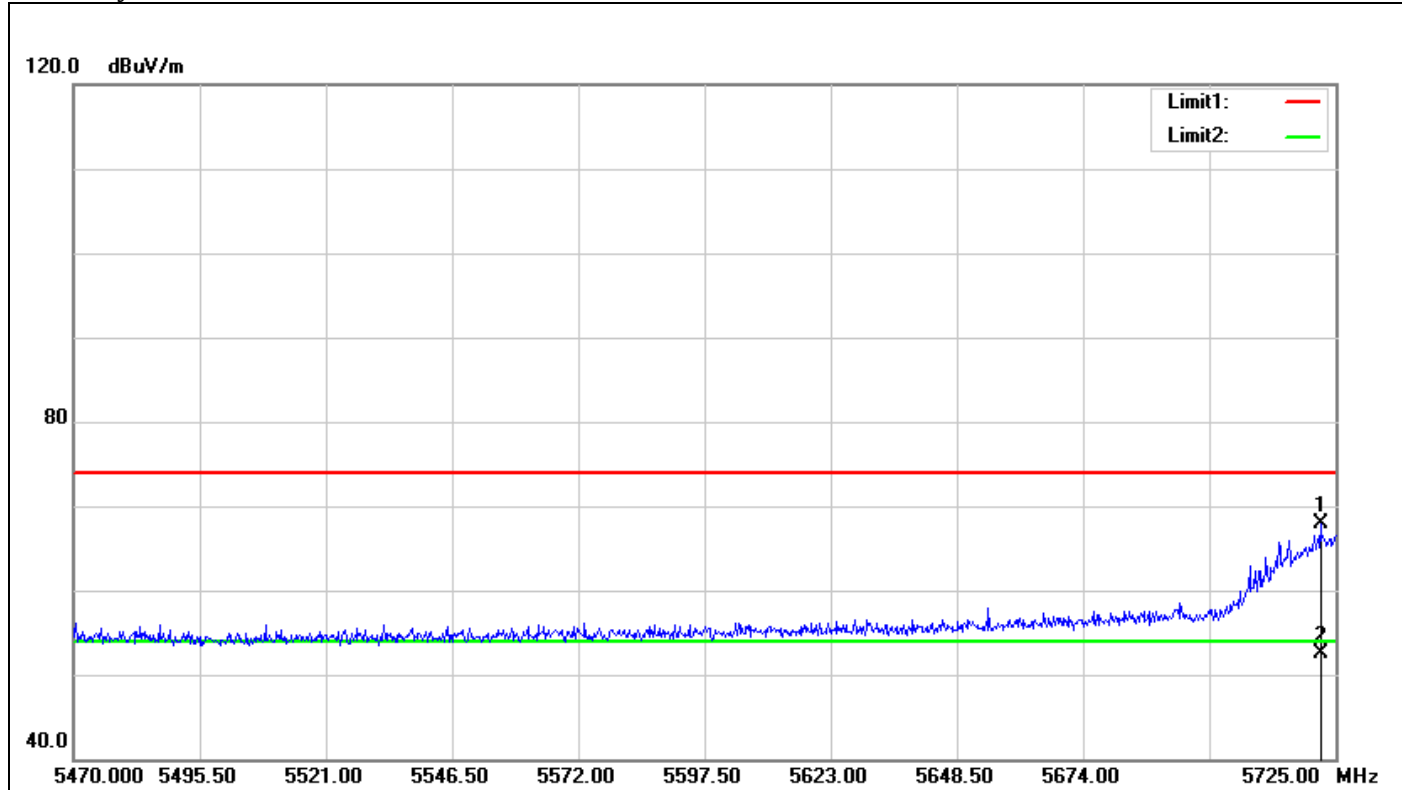
Band Edges (IEEE 802.11n HT 40 mode / 5755 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5715.565	59.68	6.17	65.85	74.00	-8.15	100	328	peak
2	5715.565	44.97	6.17	51.14	54.00	-2.86	100	328	AVG

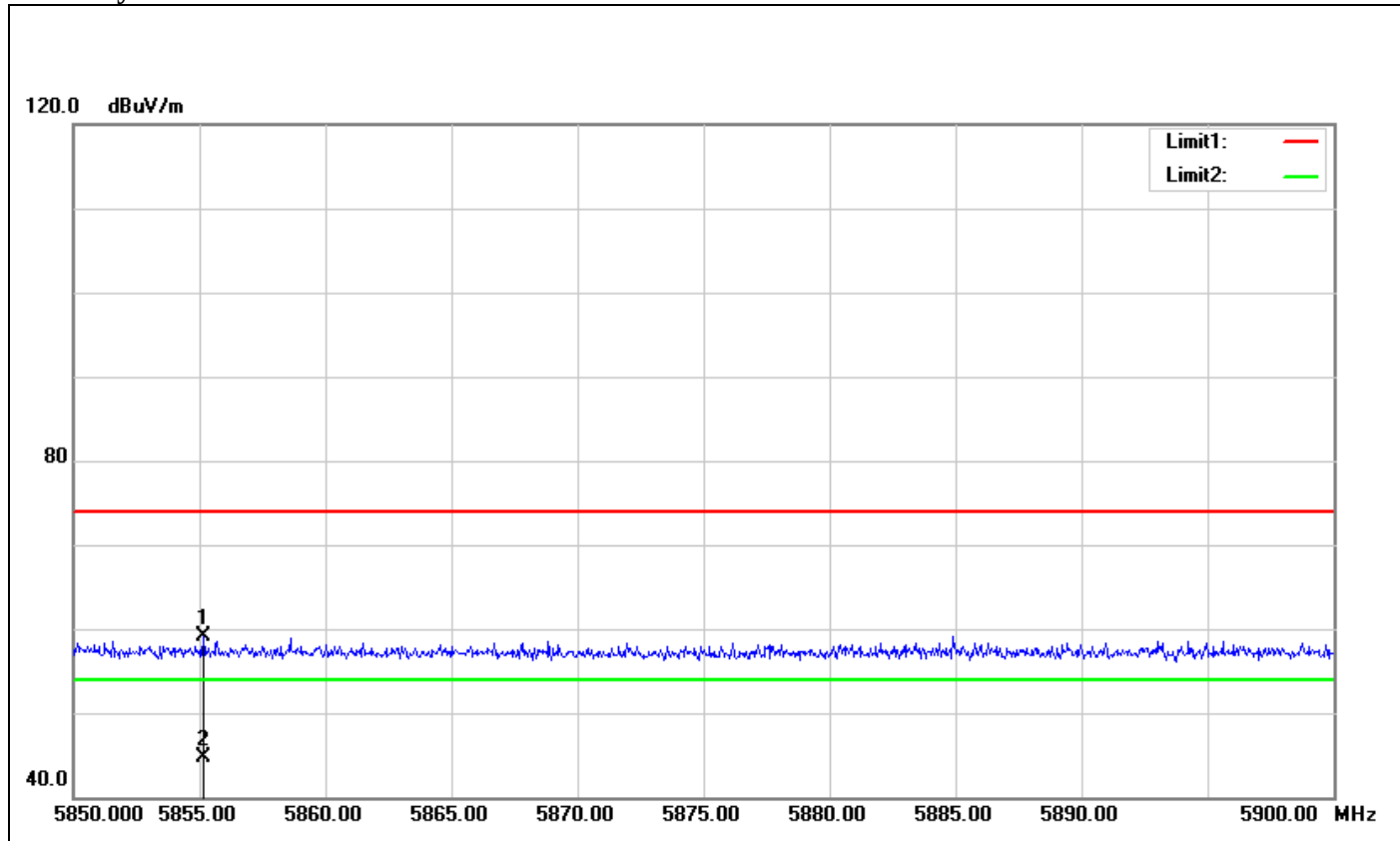
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5721.940	61.69	6.20	67.89	74.00	-6.11	100	162	peak
2	5721.940	46.38	6.20	52.58	54.00	-1.42	100	162	AVG

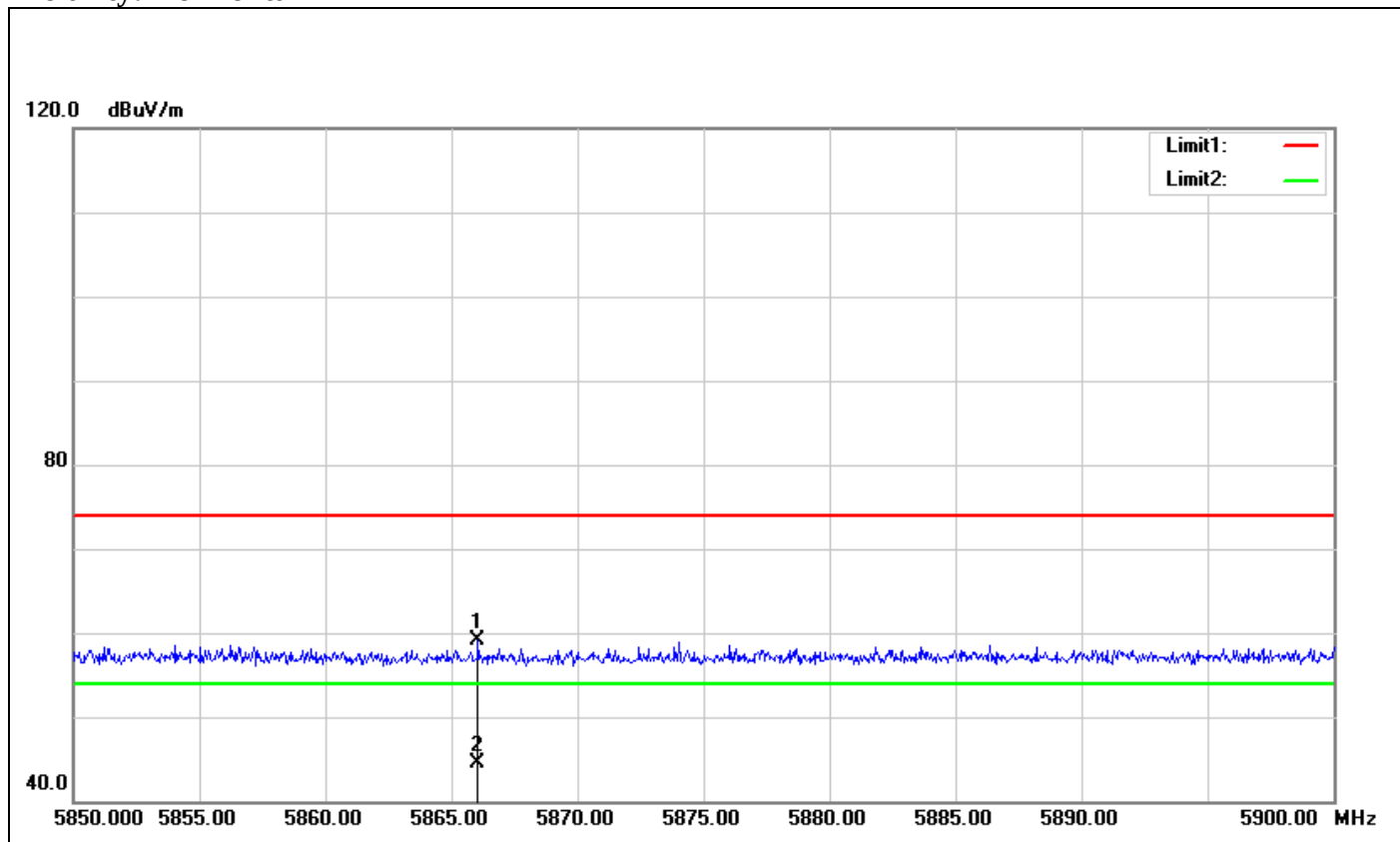
Band Edges (IEEE 802.11n HT 40 mode / 5795 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5855.150	52.30	6.76	59.06	74.00	-14.94	100	9	peak
2	5855.150	37.86	6.76	44.62	54.00	-9.38	100	9	AVG

Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5866.050	52.31	6.81	59.12	74.00	-14.88	100	288	peak
2	5866.050	37.77	6.81	44.58	54.00	-9.42	100	288	AVG

7.4 PEAK POWER SPECTRAL DENSITY

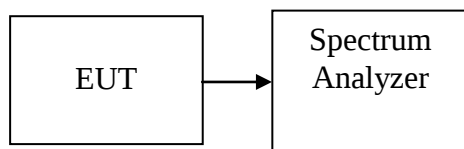
LIMIT

According to §15.407(a),

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.
- (2) For the band 5.25-5.35 GHz and 5.47-5.725 GHz bands, the peak power spectral density shall not exceed 11dBm in any 1MHz band.

If transmitting antennas of directional gain greater than 6dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz, Span = Sweep= AUTO
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed

TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11a mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5180	7.08	11.00	PASS
Mid	5220	7.12	11.00	PASS
High	5240	7.06	11.00	PASS

Test mode: IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5180	6.62	11.00	PASS
Mid	5220	6.62	11.00	PASS
High	5240	6.65	11.00	PASS

Test mode: IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5190	1.71	11.00	PASS
High	5230	1.68	11.00	PASS

Test mode: IEEE 802.11a mode/ 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	0.42	30.00	PASS
Mid	5785	2.98	30.00	PASS
High	5825	2.75	30.00	PASS

Test mode: IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	-0.21	30.00	PASS
Mid	5785	2.57	30.00	PASS
High	5825	2.29	30.00	PASS

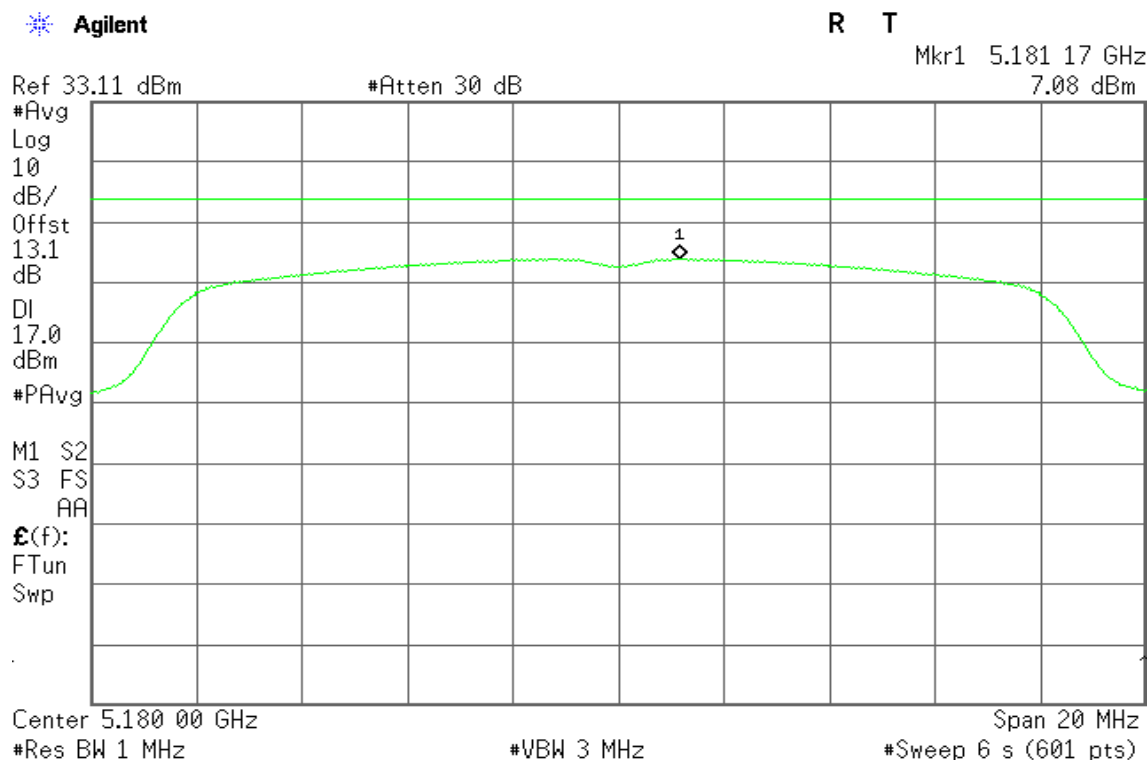
Test mode: IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5755	-3.22	30.00	PASS
High	5795	-2.58	30.00	PASS

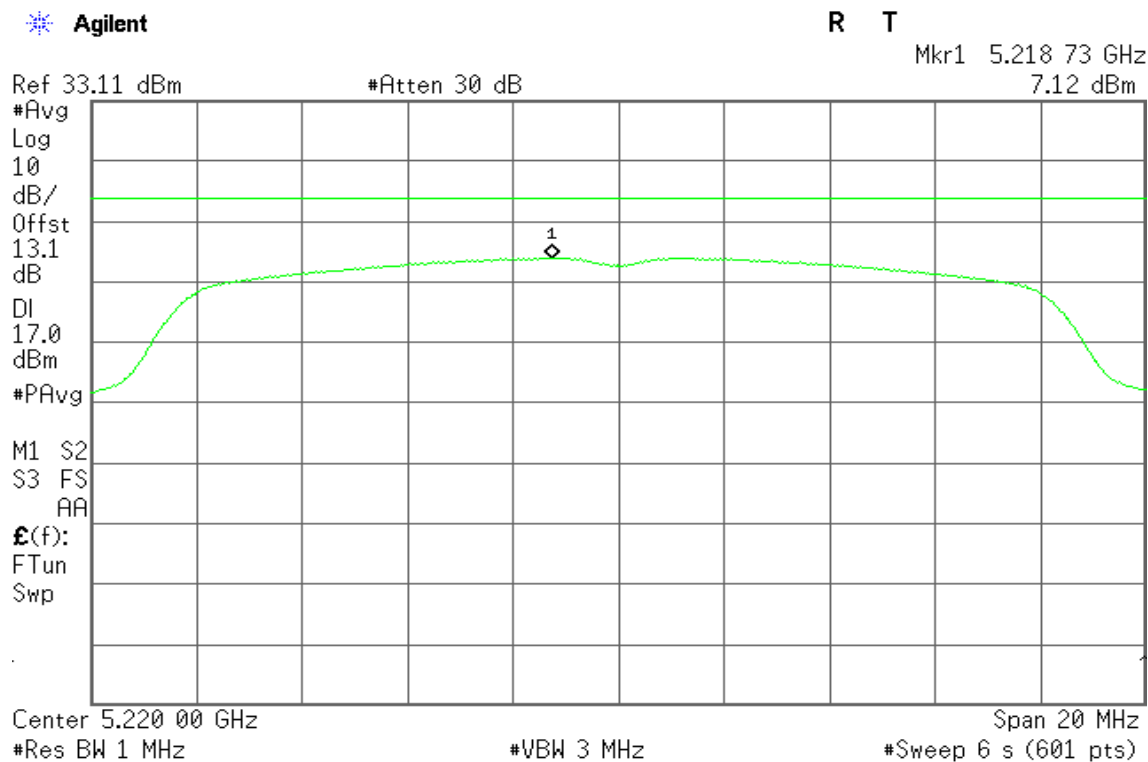
Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low



CH Mid



CH High

 Agilent

R T

Mkr1 5.238 87 GHz
7.06 dBm

Ref 33.11 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

17.0

dBm

#PAvg

M1 S2

S3 FS

AA

£(f):

FTun

Swp

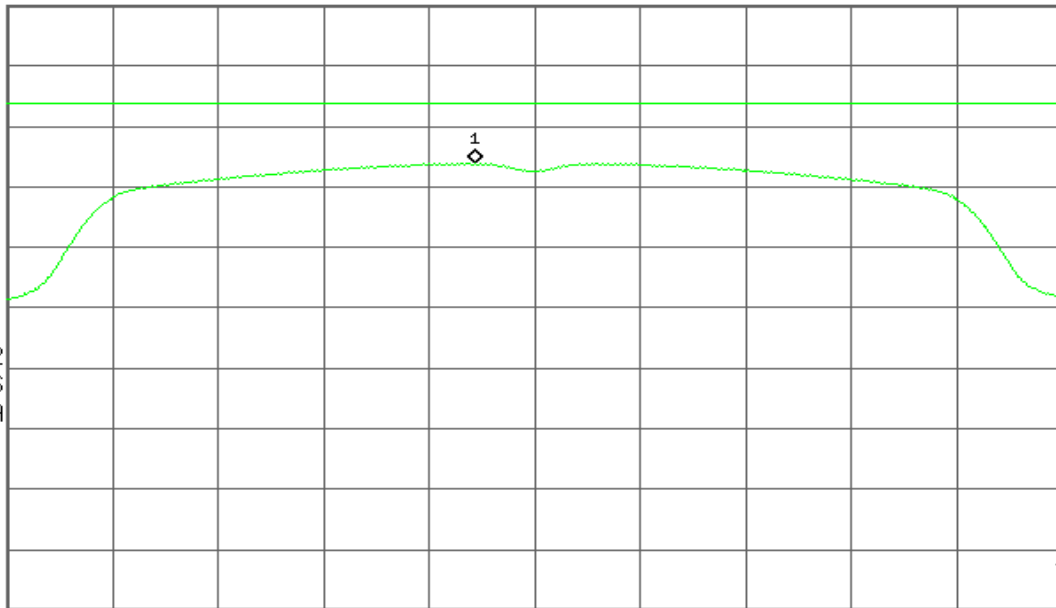
Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

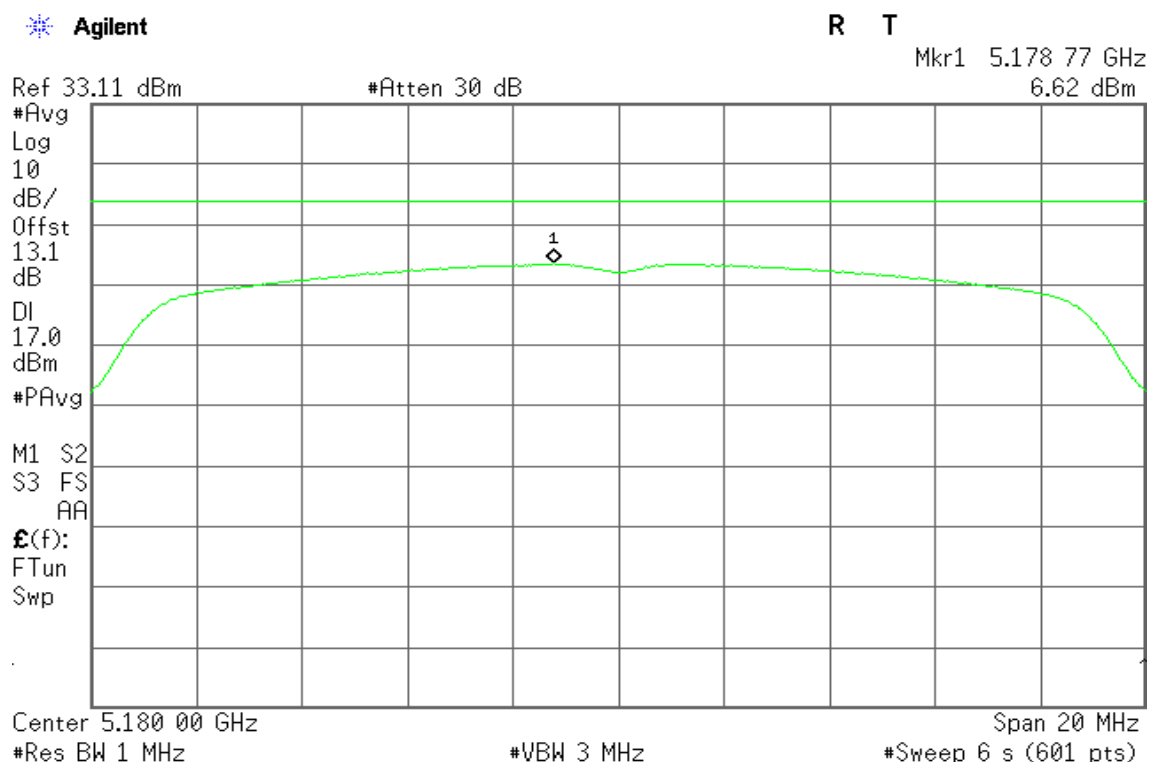
Span 20 MHz

#Sweep 6 s (601 pts)

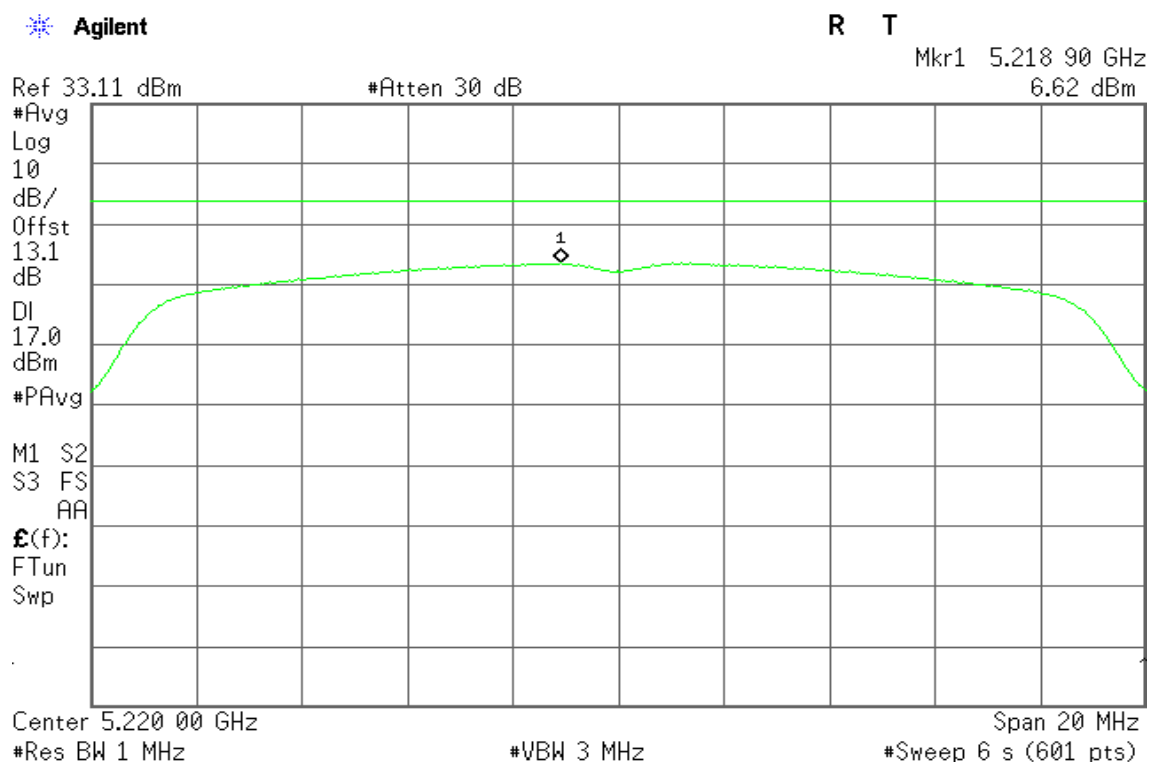


IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz

CH Low



CH Mid



CH High

 **Agilent**

R T

Mkr1 5.241 17 GHz
6.65 dBm

Ref 33.11 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

17.0

dBm

#PAvg

M1 S2

S3 FS

AA

£(f):

FTun

Swp

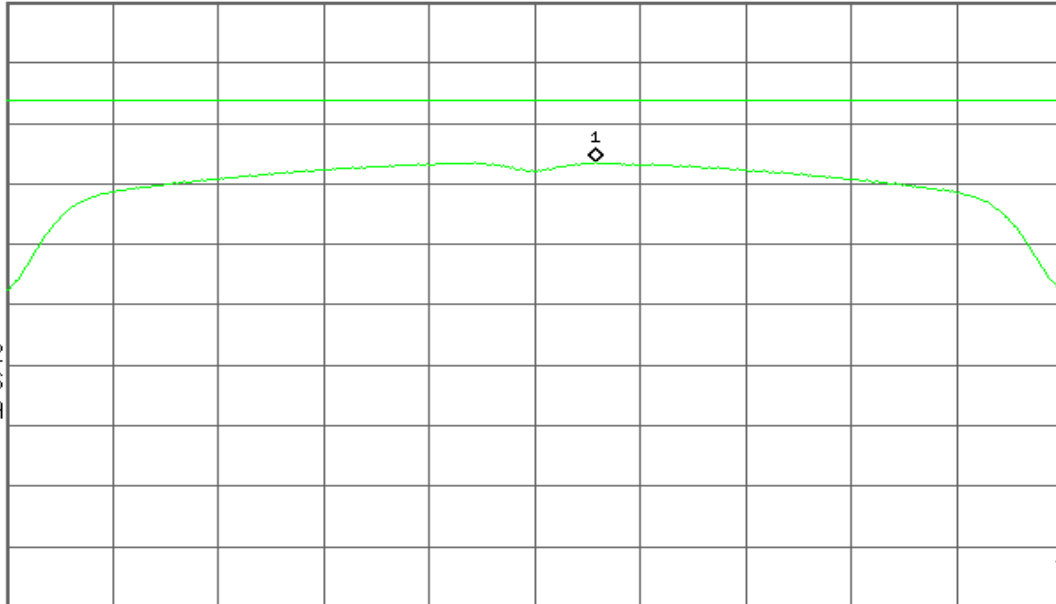
Center 5.240 00 GHz

#Res BW 1 MHz

#VBW 3 MHz

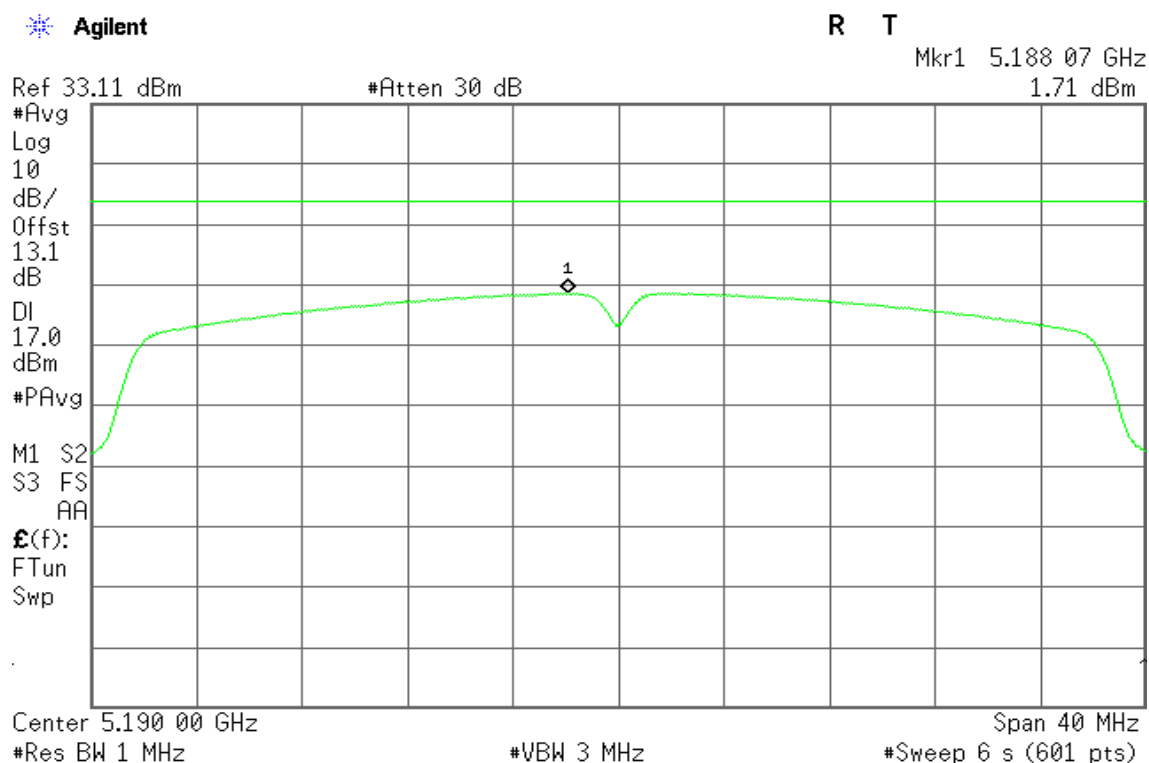
Span 20 MHz

#Sweep 6 s (601 pts)

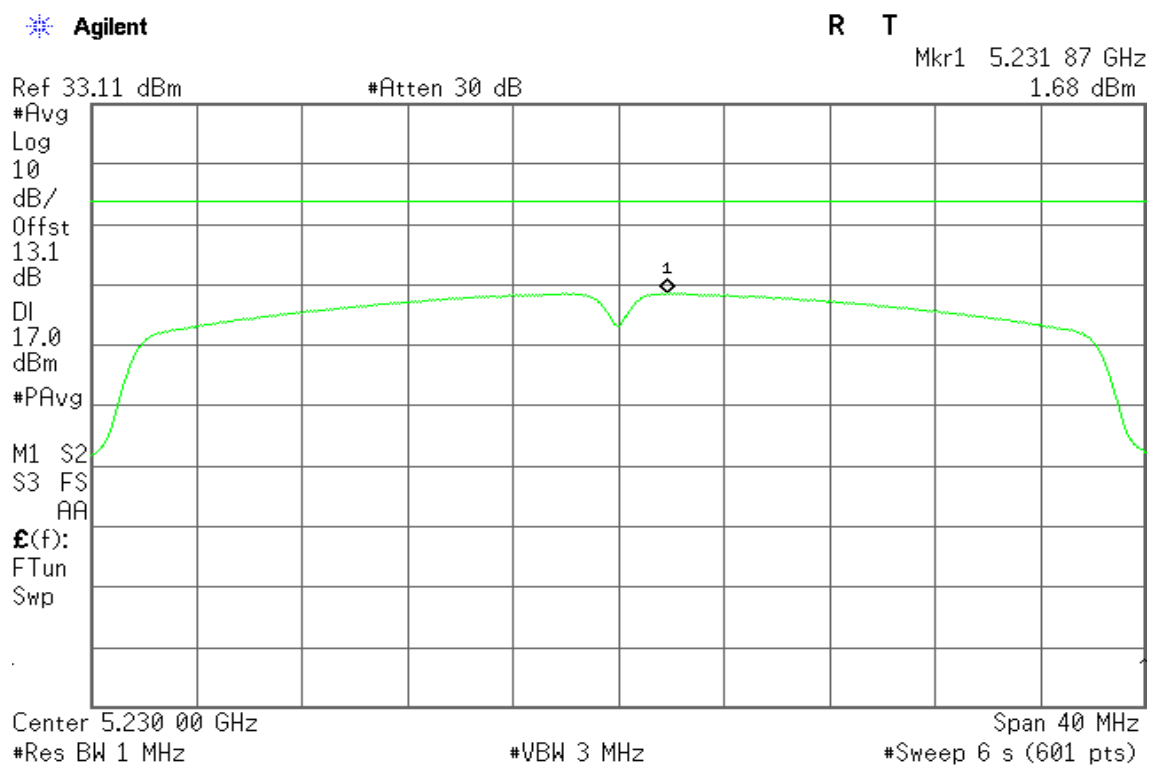


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz

CH Low

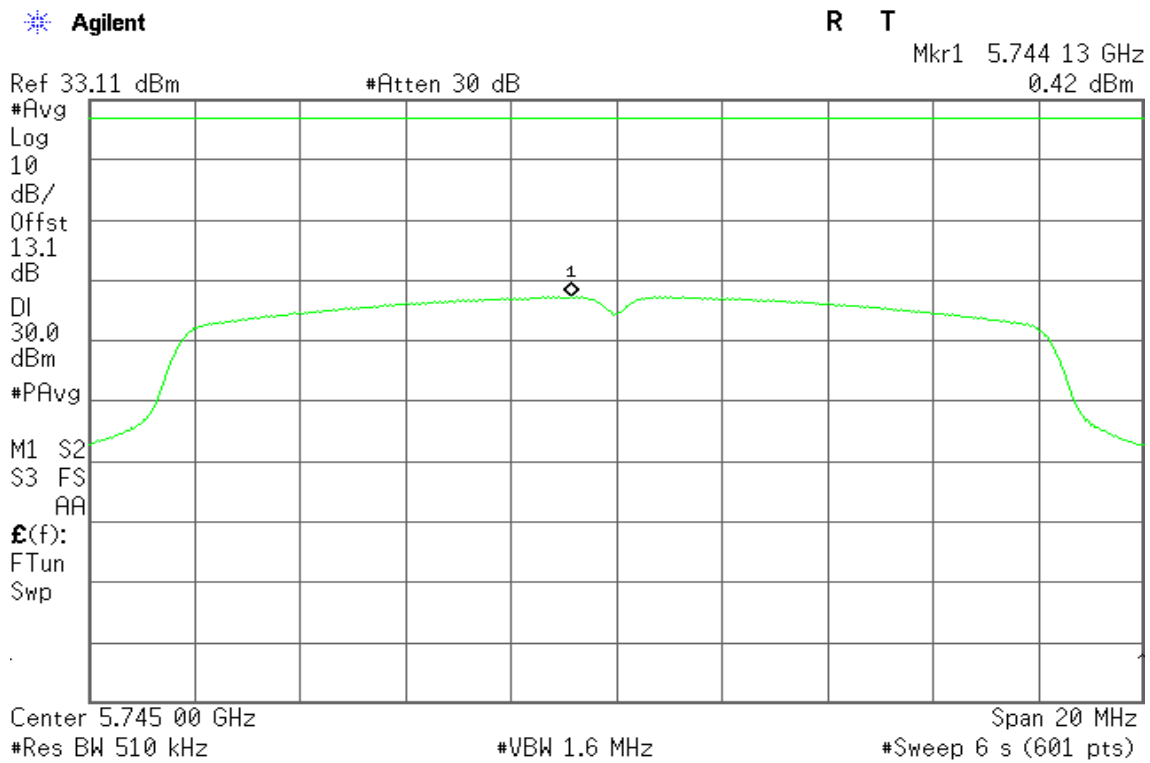


CH High

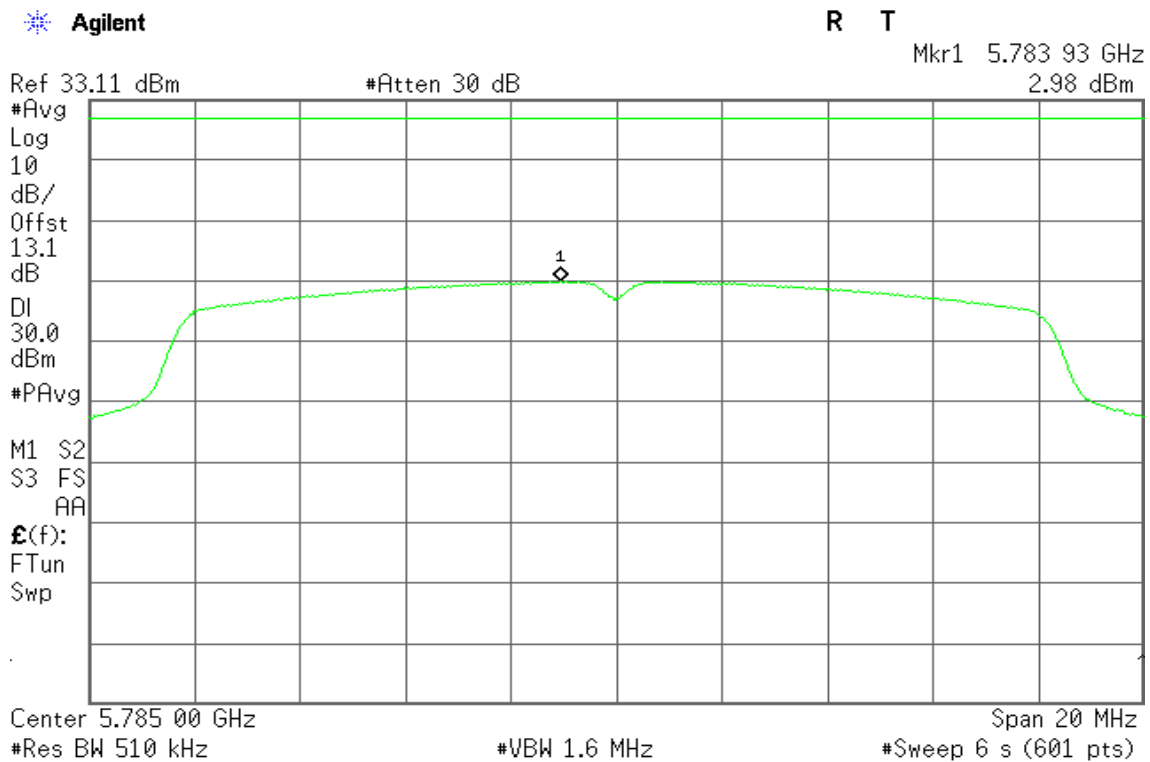


IEEE 802.11a mode / 5745 ~ 5825MHz

CH Low



CH Mid



CH High

 Agilent

R T

Mkr1 5.823 97 GHz
2.75 dBm

Ref 33.11 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

30.0

dBm

#PAvg

M1 S2

S3 FS

AA

£(f):

FTun

Swp

.

.

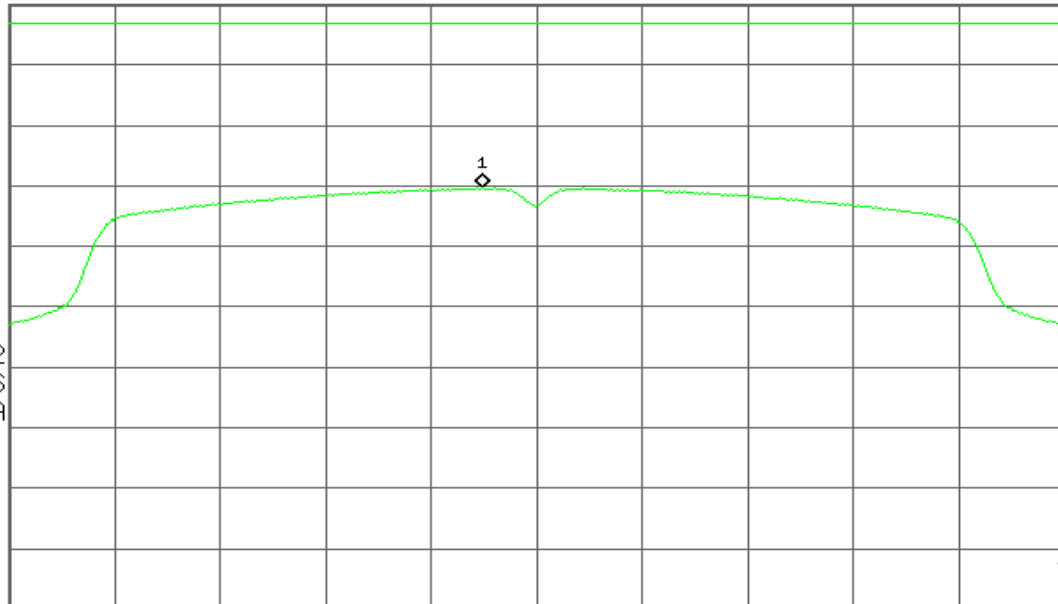
Center 5.825 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

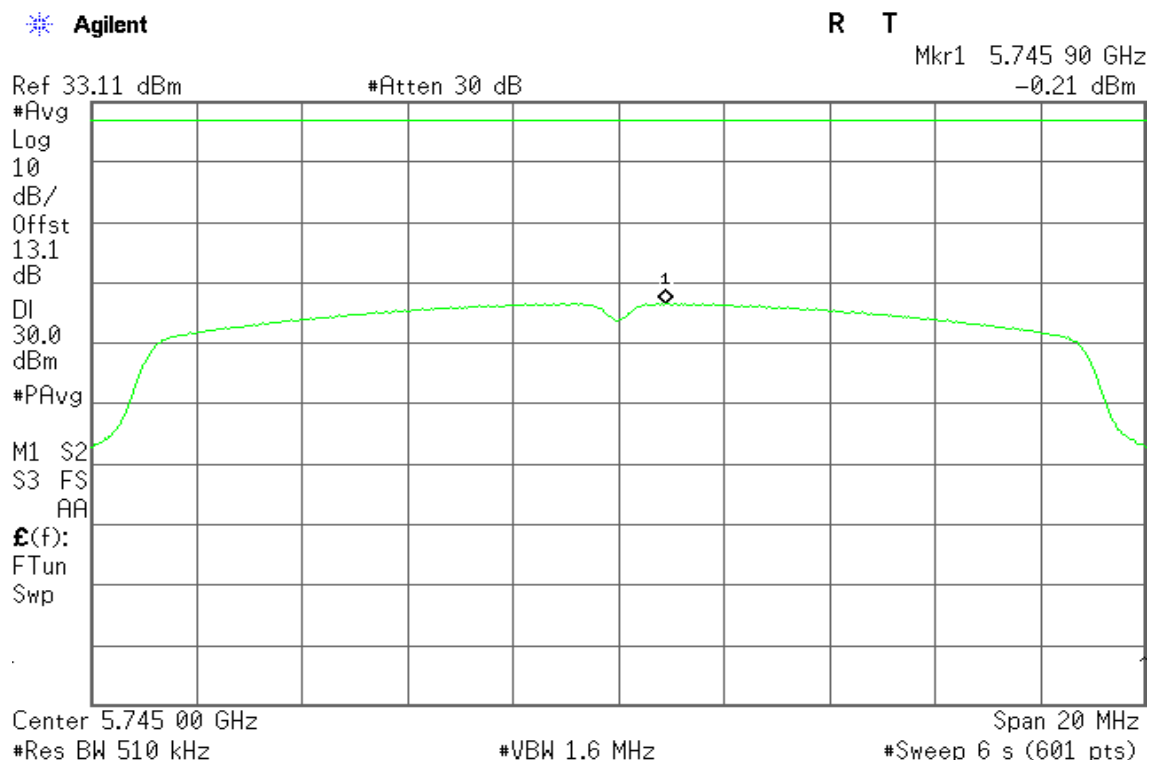
Span 20 MHz

#Sweep 6 s (601 pts)

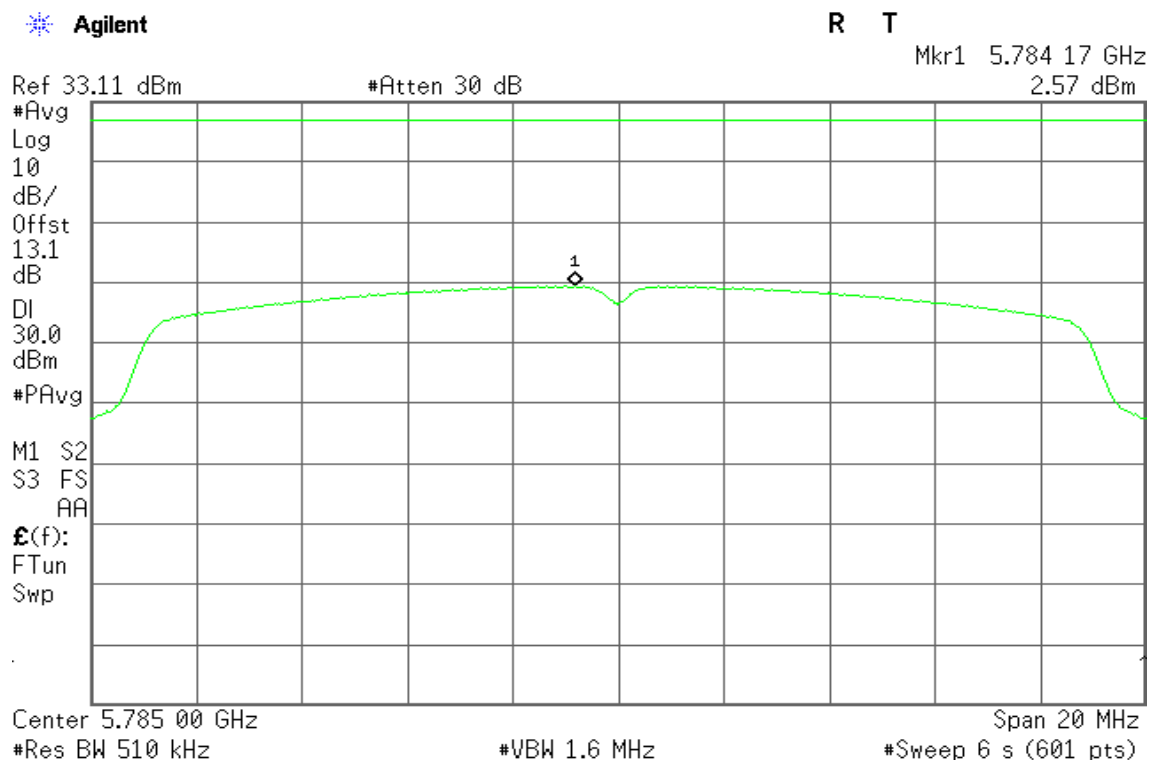


IEEE 802.11n HT 20 mode / 5745 ~ 5825MHz

CH Low



CH Mid



CH High

Agilent

R T

Mkr1 5.823 90 GHz
2.29 dBm

Ref 33.11 dBm

#Atten 30 dB

#Avg

Log

10

dB/

Offst

13.1

dB

DI

30.0

dBm

#PAvg

M1 S2

S3 FS

AA

£(f):

FTun

Swp

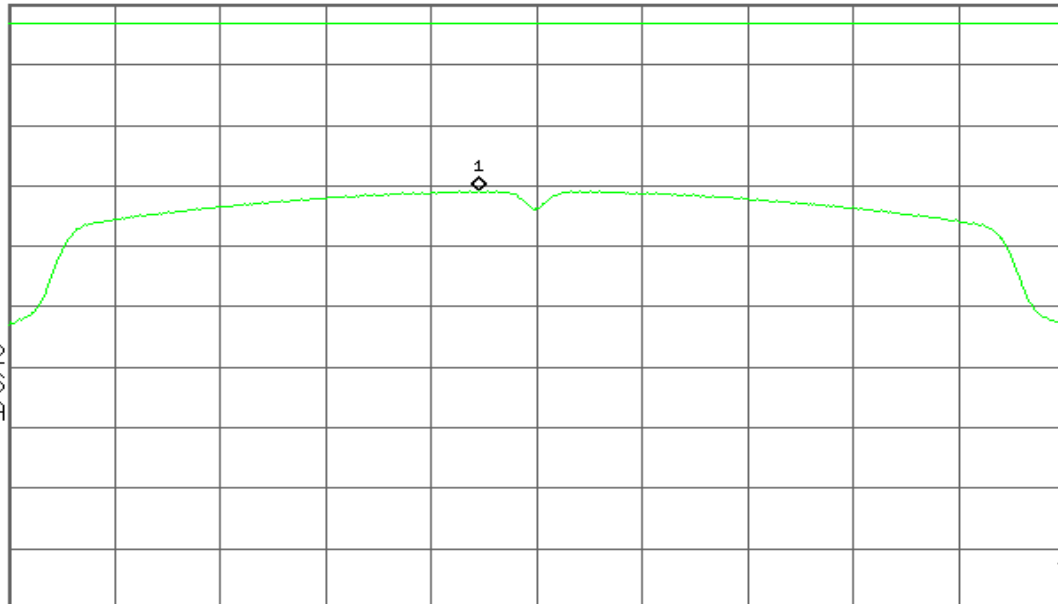
Center 5.825 00 GHz

#Res BW 510 kHz

#VBW 1.6 MHz

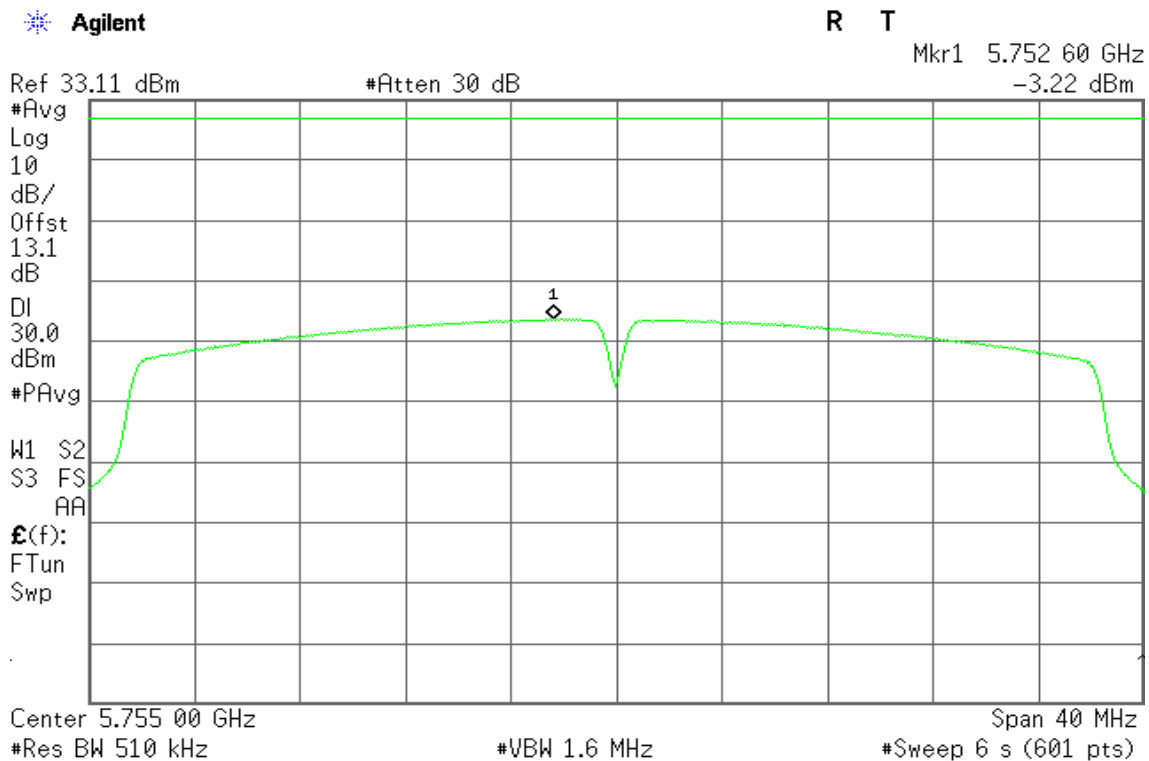
Span 20 MHz

#Sweep 6 s (601 pts)

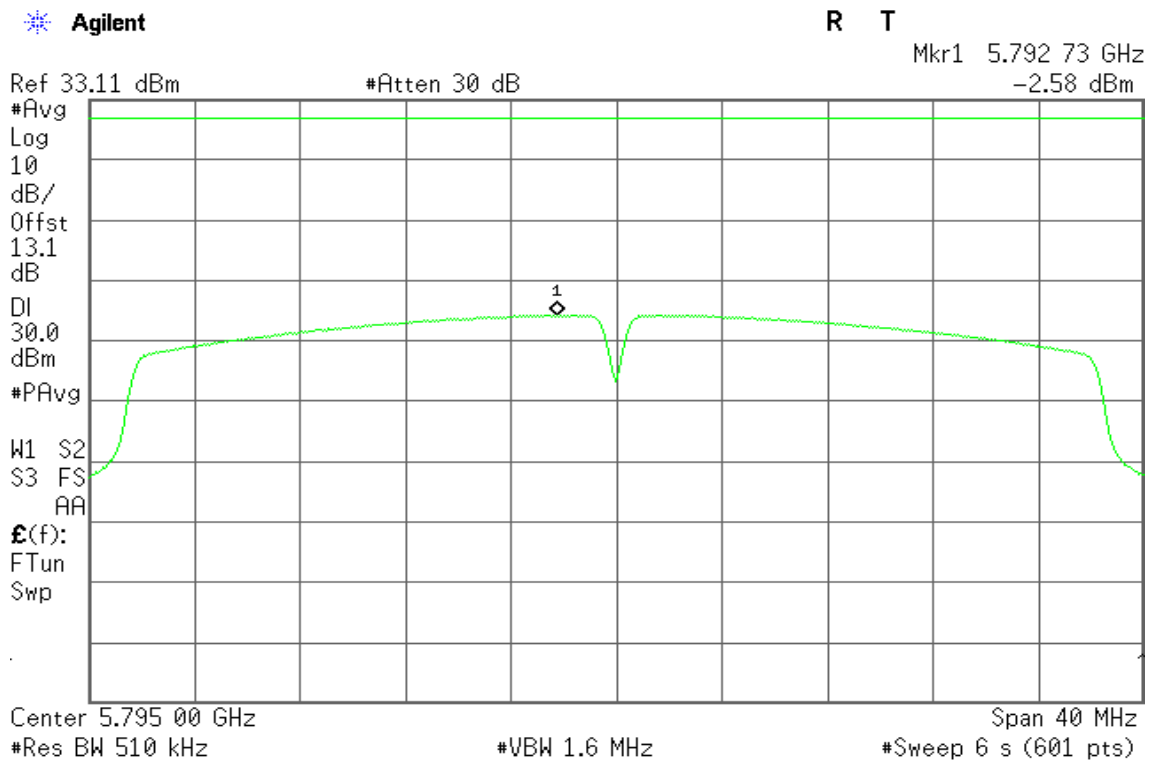


IEEE 802.11n HT 40 mode / 5755 ~ 5795MHz

CH Low



CH High



7.5 RADIATED UNDESIRABLE EMISSION

1. According to §15.209(a), except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

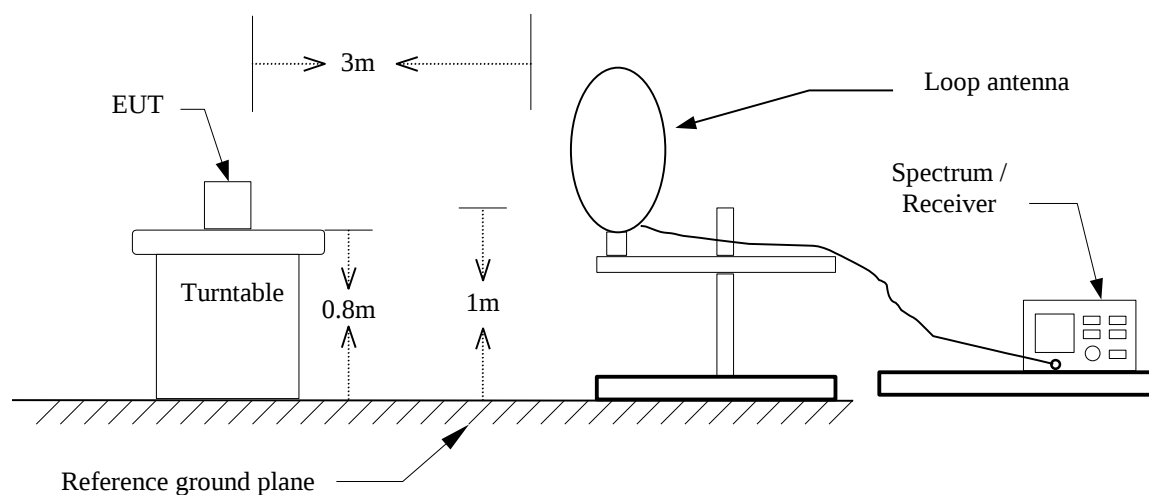
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the emission table above, the tighter limit applies at the band edges.

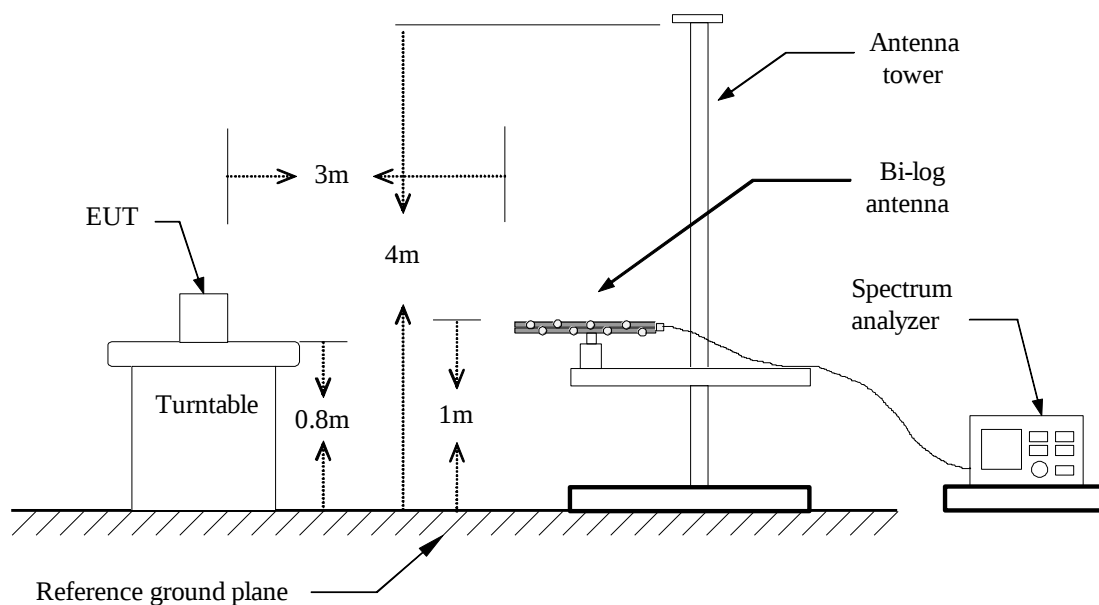
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
0.009 - 0.490	2400/F(kHz) +80	20LOG((2400/F(kHz))+80)
0.490 - 1.705	24000/F(kHz) +40	20LOG((24000/F(kHz))+40)
1.705 – 30.0	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

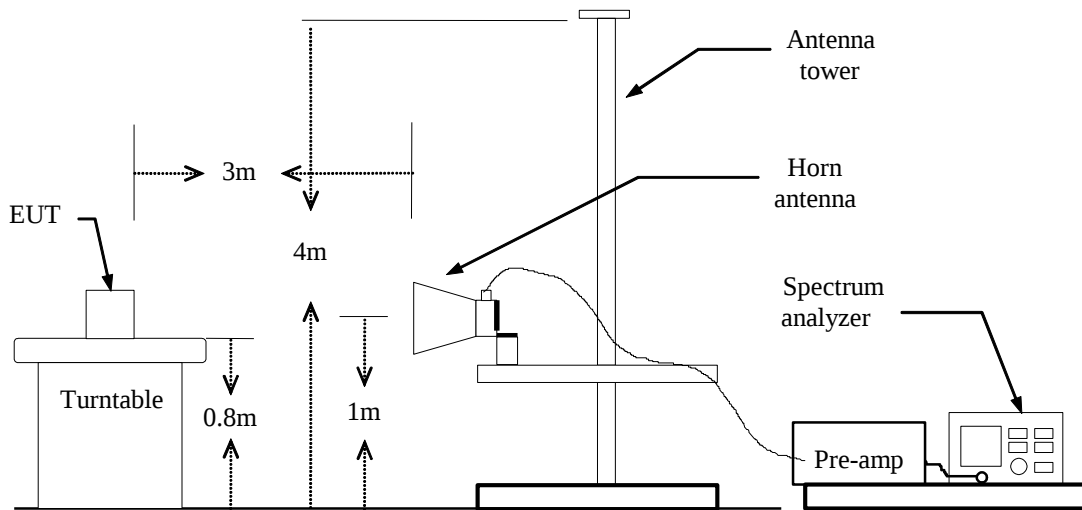
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

Below 1GHz:

RBW=100kHz / VBW=300kHz / Sweep=AUTO

Above 1GHz:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz,
if duty cycle $\geq 98\%$, VBW=10Hz.
if duty cycle $< 98\%$ VBW=1/T.

IEEE 802.11a mode: = 95%, VBW=180Hz

IEEE 802.11 HT 20 MHz mode: = 93%, VBW=200Hz

IEEE 802.11n HT 40 MHz mode: = 87%, VBW=910Hz

7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link

Test Date: April 29, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)	Ant.Pol. (H/V)
57.1600	54.62	-23.64	30.98	40.00	-9.02	Peak	V
84.3200	54.50	-23.20	31.30	40.00	-8.70	Peak	V
123.1200	46.91	-17.42	29.49	43.50	-14.01	Peak	V
246.3100	40.11	-18.48	21.63	46.00	-24.37	Peak	V
448.0700	40.07	-12.71	27.36	46.00	-18.64	Peak	V
625.5800	35.09	-9.90	25.19	46.00	-20.81	Peak	V
57.1600	53.91	-23.64	30.27	40.00	-9.73	Peak	H
95.9600	53.34	-21.90	31.44	43.50	-12.06	Peak	H
150.2800	50.12	-17.99	32.13	43.50	-11.37	Peak	H
342.3400	47.91	-15.38	32.53	46.00	-13.47	Peak	H
448.0700	39.25	-12.71	26.54	46.00	-19.46	Peak	H
757.5000	39.27	-7.80	31.47	46.00	-14.53	Peak	H

Remark:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

For PCB Antenna

Above 1 GHz

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH Low **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	51.88	-3.69	48.19	74.00	-25.81	peak	V
10360.000	34.67	16.52	51.19	74.00	-22.81	peak	V
N/A							
1959.000	52.28	-5.10	47.18	74.00	-26.82	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH Mid**Test Date:** April 28, 2015**Temperature:** 27°C**Tested by:** Andy Shi**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3100.000	50.79	-1.87	48.92	74.00	-25.08	peak	V
N/A							
2631.000	49.72	-2.86	46.86	74.00	-27.14	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH High **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1952.000	52.21	-5.13	47.08	74.00	-26.92	peak	V
N/A							
2519.000	49.43	-3.08	46.35	74.00	-27.65	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH Low **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2722.000	49.38	-2.67	46.71	74.00	-27.29	peak	V
10360.000	35.40	16.52	51.92	74.00	-22.08	peak	V
N/A							
2477.000	49.33	-3.32	46.01	74.00	-27.99	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH Mid **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	51.52	-3.69	47.83	74.00	-26.17	peak	V
N/A							
2505.000	50.84	-3.11	47.73	74.00	-26.27	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH High **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2589.000	49.92	-2.94	46.98	74.00	-27.02	peak	V
N/A							
2820.000	49.52	-2.47	47.05	74.00	-26.95	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5190 ~ 5230MHz/CH Low **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	51.51	-3.69	47.82	74.00	-26.18	peak	V
N/A							
N/A							
1945.000	50.98	-5.17	45.81	74.00	-28.19	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5190 ~ 5230MHz/CH High **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1952.000	52.18	-5.13	47.05	74.00	-26.95	peak	V
N/A							
2407.000	50.78	-3.70	47.08	74.00	-26.92	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745 ~ 5825MHz/CH Low **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	50.21	-3.69	46.52	74.00	-27.48	peak	V
N/A							
2547.000	50.42	-3.03	47.39	74.00	-26.61	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745 ~ 5825MHz/CH Mid **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2659.000	51.14	-2.80	48.34	74.00	-25.66	peak	V
N/A							
2701.000	49.65	-2.71	46.94	74.00	-27.06	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745~5825MHz/CH High **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2519.000	50.41	-3.08	47.33	74.00	-26.67	peak	V
N/A							
2834.000	49.97	-2.45	47.52	74.00	-26.48	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745~5825MHz/CH Low **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	50.07	-3.69	46.38	74.00	-27.62	peak	V
11490.000	33.94	16.78	50.72	74.00	-23.28	peak	V
N/A							
2680.000	49.69	-2.76	46.93	74.00	-27.07	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745~5825MHz/CH Mid **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2505.000	50.11	-3.11	47.00	74.00	-27.00	peak	V
N/A							
2645.000	49.77	-2.83	46.94	74.00	-27.06	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745 ~ 5825MHz/CH High **Test Date:** April 28, 2015

Temperature: 27°C

Tested by: Andy Shi

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	52.23	-3.69	48.54	74.00	-25.46	peak	V
N/A							
2400.000	51.19	-3.69	47.50	74.00	-26.50	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5755~5795MHz/CH Low **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2533.000	49.63	-3.05	46.58	74.00	-27.42	peak	V
N/A							
2743.000	49.78	-2.63	47.15	74.00	-26.85	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5755~5795MHz/CH High **Test Date:** April 28, 2015
Temperature: 27°C **Tested by:** Andy Shi
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2400.000	50.62	-3.69	46.93	74.00	-27.07	peak	V
N/A							
2568.000	50.78	-2.98	47.80	74.00	-26.20	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

For Dipole Antenna

Above 1 GHz

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH Low **Test Date:** May 27, 2015

Temperature: 27°C **Tested by:** David Hsu

Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2761.667	50.49	1.38	51.87	74.00	-22.13	peak	V
10366.667	42.72	13.80	56.52	74.00	-17.48	peak	V
10366.667	37.30	13.80	51.10	54.00	-2.90	AVG	V
N/A							
2656.667	50.60	1.10	51.70	74.00	-22.30	peak	H
10366.667	42.72	13.80	56.52	74.00	-17.48	peak	H
10366.667	37.30	13.80	51.10	54.00	-2.90	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH Mid**Test Date:** May 27, 2015**Temperature:** 27°C**Tested by:** David Hsu**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2493.333	51.96	-0.13	51.83	74.00	-22.17	peak	V
10450.000	40.26	14.01	54.27	74.00	-19.73	peak	V
10450.000	34.36	14.01	48.37	54.00	-5.63	AVG	V
N/A							
2750.000	51.21	0.60	51.81	74.00	-22.19	peak	H
10450.000	42.44	14.01	56.45	74.00	-17.55	peak	H
10450.000	36.06	14.01	50.07	54.00	-3.93	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5180 ~ 5240MHz/CH High **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2586.667	51.71	0.14	51.85	74.00	-22.15	peak	V
N/A							
2750.000	51.22	0.60	51.82	74.00	-22.18	peak	H
10483.333	42.30	14.10	56.40	74.00	-17.60	peak	H
10483.333	34.10	14.10	48.20	54.00	-5.80	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH Low **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2458.333	51.25	0.38	51.63	74.00	-22.37	peak	V
10366.667	41.08	13.80	54.88	74.00	-19.12	peak	V
10366.667	34.85	13.80	48.65	54.00	-5.35	AVG	V
N/A							
2551.667	50.63	0.82	51.45	74.00	-22.55	peak	H
10366.667	41.42	13.80	55.22	74.00	-18.78	peak	H
10366.667	35.16	13.80	48.96	54.00	-5.04	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH Mid **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2656.667	51.39	0.34	51.73	74.00	-22.27	peak	V
N/A							
2808.333	51.16	0.76	51.92	74.00	-22.08	peak	H
10433.333	41.30	13.97	55.27	74.00	-18.73	peak	H
10433.333	34.29	13.97	48.26	54.00	-5.74	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5180 ~ 5240MHz/CH High **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2773.333	51.00	0.67	51.67	74.00	-22.33	peak	V
10483.333	40.21	14.10	54.31	74.00	-19.69	peak	V
10483.333	33.31	14.10	47.41	54.00	-6.59	AVG	V
N/A							
2691.667	51.28	0.44	51.72	74.00	-22.28	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5190 ~ 5230MHz/CH Low **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2656.667	50.62	1.10	51.72	74.00	-22.28	peak	V
N/A							
N/A							
2446.667	51.48	0.29	51.77	74.00	-22.23	peak	H
10400.000	40.57	13.89	54.46	74.00	-19.54	peak	H
10400.000	32.01	13.89	45.90	54.00	-8.10	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5190 ~ 5230MHz/CH High **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2470.000	51.87	-0.22	51.65	74.00	-22.35	peak	V
10466.667	40.11	14.06	54.17	74.00	-19.83	peak	V
10466.667	33.01	14.06	47.07	54.00	-6.93	AVG	V
N/A							
2773.333	51.08	0.67	51.75	74.00	-22.25	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745 ~ 5825MHz/CH Low **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2878.333	50.89	0.96	51.85	74.00	-22.15	peak	V
N/A							
2738.333	50.95	0.57	51.52	74.00	-22.48	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745 ~ 5825MHz/CH Mid **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2750.000	50.75	0.60	51.35	74.00	-22.65	peak	V
N/A							
2761.667	51.31	0.63	51.94	74.00	-22.06	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11a mode/5745~5825MHz/CH High **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2691.667	51.22	0.44	51.66	74.00	-22.34	peak	V
N/A							
2936.667	50.66	1.12	51.78	74.00	-22.22	peak	H
11650.000	39.95	15.14	55.09	74.00	-18.91	peak	H
11650.000	33.44	15.14	48.58	54.00	-5.42	AVG	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745~5825MHz/CH Low **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2738.333	51.32	0.57	51.89	74.00	-22.11	peak	V
N/A							
2656.667	51.09	0.34	51.43	74.00	-22.57	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745~5825MHz/CH Mid **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2680.000	51.27	0.40	51.67	74.00	-22.33	peak	V
N/A							
2691.667	51.37	0.44	51.81	74.00	-22.19	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 20 mode/5745 ~ 5825MHz/CH High **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2715.000	51.25	0.50	51.75	74.00	-22.25	peak	V
N/A							
2890.000	50.72	0.99	51.71	74.00	-22.29	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5755~5795MHz/CH Low **Test Date:** May 27, 2015
Temperature: 27°C **Tested by:** David Hsu
Humidity: 53% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2831.667	50.82	0.83	51.65	74.00	-22.35	peak	V
N/A							
2656.667	51.50	0.34	51.84	74.00	-22.16	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

Operation Mode: TX/IEEE 802.11n HT 40 mode/5755~5795MHz/CH High **Test Date:** May 27, 2015

Temperature: 27°C

Tested by: David Hsu

Humidity: 53% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2925.000	50.72	1.09	51.81	74.00	-22.19	peak	V
N/A							
2691.667	51.18	0.44	51.62	74.00	-22.38	peak	H
N/A							

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit.
4. Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
6. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

7.6 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

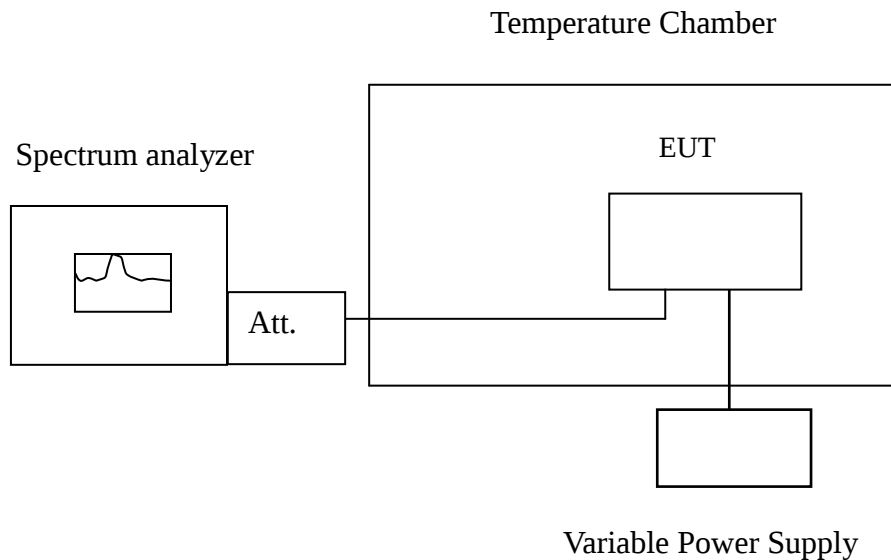
Not applicable, because EUT does not connect to AC Main Source direct.

7.7 FREQUENCY STABILITY

LIMIT

According to §15.407(g), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

Test Configuration



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST RESULTS

No non-compliance noted.

IEEE 802.11a mode / 5180 ~ 5240 MHz:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5180.001026	5150~5250	Pass
40	5	5180.008229	5150~5250	Pass
30	5	5180.001909	5150~5250	Pass
20	5	5180.003031	5150~5250	Pass
10	5	5180.006397	5150~5250	Pass
0	5	5179.991357	5150~5250	Pass
-10	5	5179.998519	5150~5250	Pass
-20	5	5179.998395	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5180.007429	5150~5250	Pass
	5	5179.995831	5150~5250	Pass
	5.75	5179.998119	5150~5250	Pass

CH Mid

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5220.003601	5150~5250	Pass
40	5	5219.995763	5150~5250	Pass
30	5	5220.001602	5150~5250	Pass
20	5	5219.991674	5150~5250	Pass
10	5	5219.996772	5150~5250	Pass
0	5	5220.001224	5150~5250	Pass
-10	5	5220.008351	5150~5250	Pass
-20	5	5220.006065	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5220.007155	5150~5250	Pass
	5	5219.993472	5150~5250	Pass
	5.75	5220.008813	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5240.008555	5150~5250	Pass
40	5	5239.994693	5150~5250	Pass
30	5	5239.993986	5150~5250	Pass
20	5	5240.003851	5150~5250	Pass
10	5	5240.006220	5150~5250	Pass
0	5	5240.008176	5150~5250	Pass
-10	5	5240.005081	5150~5250	Pass
-20	5	5239.996599	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5240.009632	5150~5250	Pass
	5	5239.995673	5150~5250	Pass
	5.75	5239.99218	5150~5250	Pass

IEEE 802.11n HT 20 mode / 5180 ~ 5240 MHz:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5180.006950	5150~5250	Pass
40	5	5180.006915	5150~5250	Pass
30	5	5180.001178	5150~5250	Pass
20	5	5179.995063	5150~5250	Pass
10	5	5179.996980	5150~5250	Pass
0	5	5179.998903	5150~5250	Pass
-10	5	5179.996152	5150~5250	Pass
-20	5	5180.004625	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5179.992234	5150~5250	Pass
	5	5180.001147	5150~5250	Pass
	5.75	5179.999095	5150~5250	Pass

CH Mid

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5219.996975	5150~5250	Pass
40	5	5219.997277	5150~5250	Pass
30	5	5219.993036	5150~5250	Pass
20	5	5219.998930	5150~5250	Pass
10	5	5219.995638	5150~5250	Pass
0	5	5220.009783	5150~5250	Pass
-10	5	5219.991889	5150~5250	Pass
-20	5	5219.995292	5150~5250	Pass

Operating Frequency: 5220 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5219.990485	5150~5250	Pass
	5	5220.009445	5150~5250	Pass
	5.75	5220.010564	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5240.005020	5150~5250	Pass
40	5	5239.995129	5150~5250	Pass
30	5	5240.000400	5150~5250	Pass
20	5	5240.003331	5150~5250	Pass
10	5	5240.000239	5150~5250	Pass
0	5	5239.990073	5150~5250	Pass
-10	5	5239.999474	5150~5250	Pass
-20	5	5239.993041	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5239.99467	5150~5250	Pass
	5	5240.005882	5150~5250	Pass
	5.75	5239.995315	5150~5250	Pass

IEEE 802.11n HT 40 mode / 5190 ~ 5230 MHz:

CH Low

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5190.000810	5150~5250	Pass
40	5	5190.009195	5150~5250	Pass
30	5	5190.006620	5150~5250	Pass
20	5	5190.002485	5150~5250	Pass
10	5	5189.992070	5150~5250	Pass
0	5	5190.006897	5150~5250	Pass
-10	5	5190.006923	5150~5250	Pass
-20	5	5189.997242	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5189.997943	5150~5250	Pass
	5	5189.991187	5150~5250	Pass
	5.75	5189.991852	5150~5250	Pass

CH High

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5230.004962	5150~5250	Pass
40	5	5229.993816	5150~5250	Pass
30	5	5229.994775	5150~5250	Pass
20	5	5230.007208	5150~5250	Pass
10	5	5229.998826	5150~5250	Pass
0	5	5230.001925	5150~5250	Pass
-10	5	5229.998397	5150~5250	Pass
-20	5	5230.009859	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5229.997897	5150~5250	Pass
	5	5229.996343	5150~5250	Pass
	5.75	5230.010685	5150~5250	Pass