FCC 47 CFR PART 15 SUBPART E & INDUSTRY CANADA RSS-247 (Class II Permissive Change)

TEST REPORT

For

Data Collection Computer

Model: CV31A

Trade Name: Honeywell

Issued to

Honeywell International Inc
9680 Old Bailes Rd Fort Mill SC United States 29707

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com
Issued Date: December 8, 2015

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		May 24, 2014		Initial Issue	ALL	Kelly Cheng
01		December 8, 2015		Rev. (01)	ALL	Doris Chu

Rev. (01)
1. Applicant updates standard.
2. Other information, please refer to the T140430W01and this test report.

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1. TEST RESULT CERTIFICATION

Applicant: Honeywell International Inc
9680 Old Bailes Rd Fort Mill SC United States 29707

Manufacturer: Honeywell International Inc
9680 Old Bailes Rd Fort Mill SC United States 29707

Equipment Under Test: Data Collection Computer

Trade Name: Honeywell

Model: CV31A

Date of Test: May 7 ~ 27, 2014

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart E & Industry Canada RSS-247 Issue 1	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: 2013 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 and Industry Canada RSS-247 Issue 1.

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

<table>
<tr><td>Product</td><td>Data Collection Computer</td></tr>
<tr><td>Trade Name</td><td>Honeywell</td></tr>
<tr><td>Model Number</td><td>CV31A</td></tr>
<tr><td>Model Discrepancy</td><td>N/A</td></tr>
<tr><td>Received Date</td><td>October 19, 2015</td></tr>
<tr><td>Power Supply</td><td>VDC from Power Adapter
Intermec / 9006AE01
I/P: 100-240V, 50-60Hz, 1.5A
O/P: 12V, 8.3A 100W</td></tr>
<tr><td>Operating Frequency Range &
Number of Channels</td><td>
<table>
<tr><th></th><th>Mode</th><th>Frequency Range (MHz)</th><th>Number of Channels</th></tr>
<tr><td rowspan="2">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>4 Channels</td></tr>
<tr><td rowspan="2">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>4 Channels</td></tr>
<tr><td rowspan="2">UNII Band III</td><td>IEEE 802.11a</td><td>5500 - 5700</td><td>11 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 – 5700</td><td>11 Channels</td></tr>
</table>
</td></tr>
<tr><td>Transmit Power</td><td>
<table>
<tr><th></th><th>Mode</th><th>Frequency Range (MHz)</th><th>Output Power (dBm)</th><th>Output Power (mw)</th></tr>
<tr><td rowspan="2">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>13.45</td><td>22.1309</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>13.29</td><td>21.3304</td></tr>
<tr><td rowspan="2">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>13.55</td><td>22.6464</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>13.58</td><td>22.8034</td></tr>
<tr><td rowspan="2">UNII Band III</td><td>IEEE 802.11a</td><td>5500 - 5700</td><td>14.41</td><td>27.6058</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 – 5700</td><td>14.38</td><td>27.4157</td></tr>
</table>
</td></tr>
<tr><td>Modulation Technique</td><td>OFDM (QPSK, BPSK, 16-QAM, 64-QAM)</td></tr>
<tr><td>Transmit Data Rate</td><td>IEEE 802.11a mode: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
IEEE 802.11n HT 20 MHz: 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)</td></tr>
<tr><td>Antenna Specification</td><td>For Internal Antenna / VENTURE
PIFA Antenna / Gain: 4.08 dBi
For Square Antenna / Laird Technologies
Air-loaded patch Antenna / Gain: 3.0 dBi
For Round Antenna / Antenex(A Unit of Laird Technologies)
Omnidirectional Antenna / Gain: 5.0 dBi</td></tr>
</table>

Remark: *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 15.207, 15.209, 15.407 and KDB 789033 D02 General UNII Test Procedures New Rules v01.

The tests documented in this report were performed in accordance with IC RSS-247, IC RSS-Gen and ANSI C63.10:2013.

This submittal(s) (test report) is intended for IC Certification with Industry Canada RSS-247.

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

According to the requirements in ANSI C63.10: 2013, 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 ANSI C63.10: 2013.

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: CV31A) had been tested under operating condition.

Two PIFA antennas are supplied: Wieson and Jieng Tai, Wieson with the higher gain was selected for final test.

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

UNII Band I:

IEEE 802.11a for 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 MHz for 5180 ~ 5240MHz:
Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6.5Mbps data rate were chosen for full testing.

UNII Band II:

IEEE 802.11a for 5260 ~ 5320MHz:
Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5260 ~ 5320MHz:
Channel Low (5260MHz), Channel Mid (5280MHz) and Channel High (5320MHz) with 6.5Mbps data rate were chosen for full testing.

UNII Band III:

IEEE 802.11a for 5500 ~ 5700MHz:
Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5700MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5500 ~ 5700MHz:
Channel Low (5500MHz), Channel Mid (5580MHz) and Channel High (5700MHz) with 6.5Mbps data rate were chosen for full testing.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (Y axis) and the worst case was recorded.

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	MY43360131	03/14/2015
Power Meter	Anritsu	ML2495A	1012009	04/24/2015
Power Sensor	Anritsu	MA2411B	0917072	04/24/2015

Wugu 966 Chamber A				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510252	10/31/2014
EMI Test Receiver	R&S	ESCI	100064	02/14/2015
Pre-Amplifier	Mini-Circults	ZFL-1000LN	SF350700823	01/10/2015
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/17/2014
Bilog Antenna	Sunol Sciences	JB3	A030105	10/01/2014
Horn Antenna	EMCO	3117	00055165	01/09/2015
Horn Antenna	EMCO	3116	00026370	10/10/2014
Loop Antenna	EMCO	6502	8905/2356	06/09/2014
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
Site NSA	CCS	N/A	N/A	12/23/2014
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # B				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCI	101203	09/12/2014
LISN	R&S	ESH3-Z5	848773/014	12/09/2014
ISN	FCC	FCC-TLISN-T4-02	20395	05/29/2015
ISN	FCC	FCC-TLISN-T8-02-09	101131	09/04/2014
Coaxial Cable	Commate	CFD300-NL	NA	12/05/2014
Test S/W	CCS-3A1-CE			

Dynamic Frequency Selection				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Vector Signal Generator	R&S	SMU 200A	101480	12/04/2014
Spectrum Analyzer	R&S	FSU	100258	09/03/2014

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / 30M~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.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10: 2013 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 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 0824-01 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, IC 2324G-1 for 3M Semi Anechoic Chamber A, 2324G-2 for 3M Semi Anechoic Chamber B.

5.4 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	TAF Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada 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	Mouse	DELL	OXN867	J0206CRS	R41108	Shielded, 1.8m	N/A
2	Earphone	Lenovo	GS-4021M	57Y4488	N/A	Unshielded, 1.8m	N/A
3	HDD	WD	My Passport	WX31A41D9040	D33015	N/A	N/A

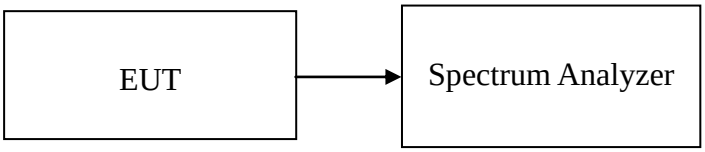
Remark:

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 & RSS 247 REQUIREMENTS

7.1 99% BANDWIDTH

TEST CONFIGURATION



TEST PROCEDURE

The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold.

TEST RESULTS

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.2957
Mid	5220	17.2531
High	5240	17.1437

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	18.1720
Mid	5220	18.1983
High	5240	18.2905

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.1477
Mid	5280	17.2408
High	5320	17.2674

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	18.4701
Mid	5280	18.2148
High	5320	18.2517

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.3577
Mid	5580	17.3125
High	5700	17.2078

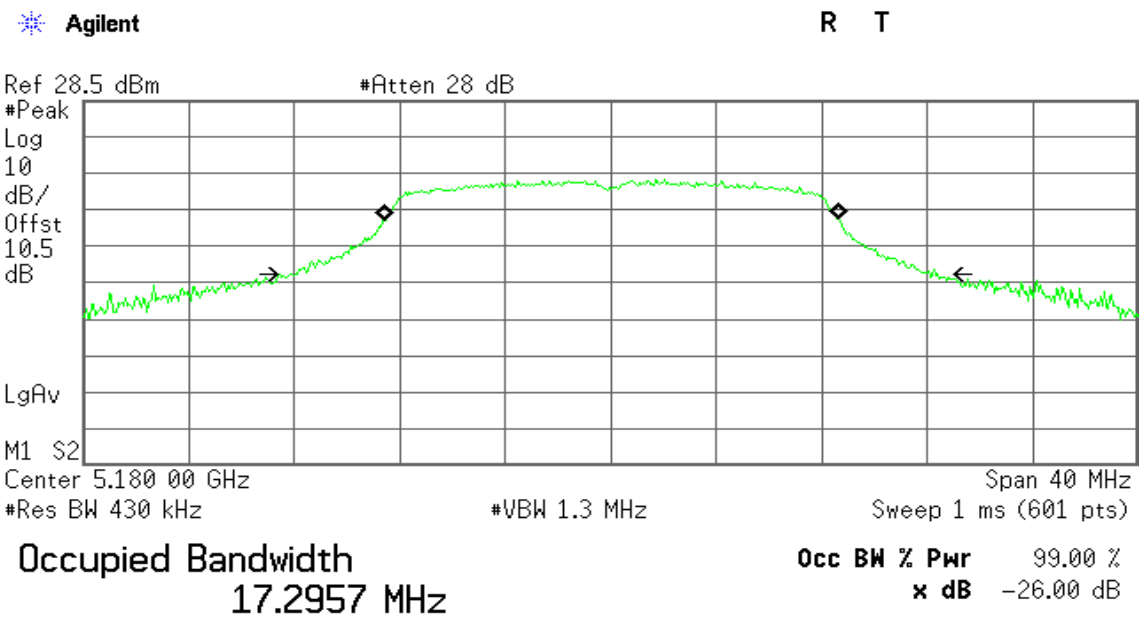
Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	18.3401
Mid	5580	18.3137
High	5700	18.2414

Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)

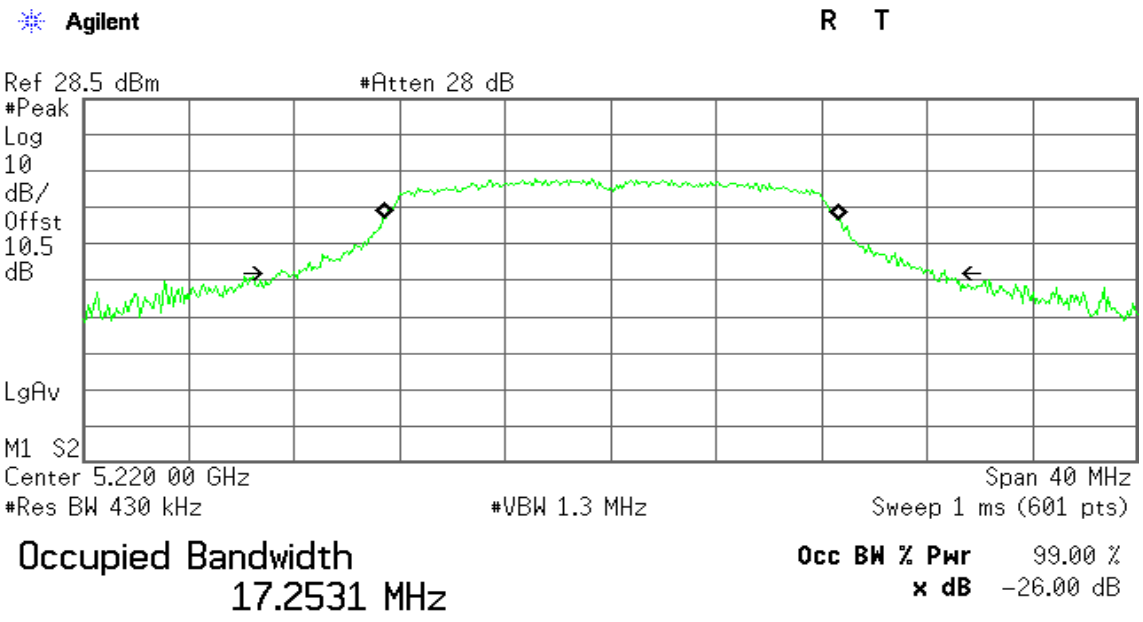


Occupied Bandwidth
17.2957 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 27.775 kHz
x dB Bandwidth 24.252 MHz

99% Bandwidth (CH Mid)

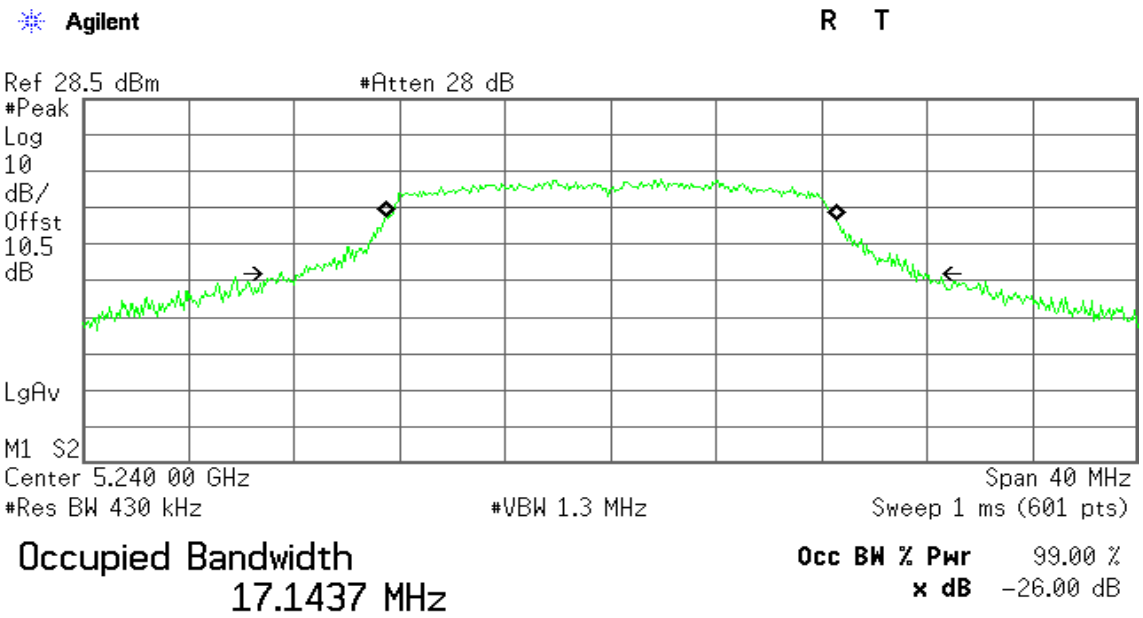


Occupied Bandwidth
17.2531 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 29.064 kHz
x dB Bandwidth 25.209 MHz

99% Bandwidth (CH High)



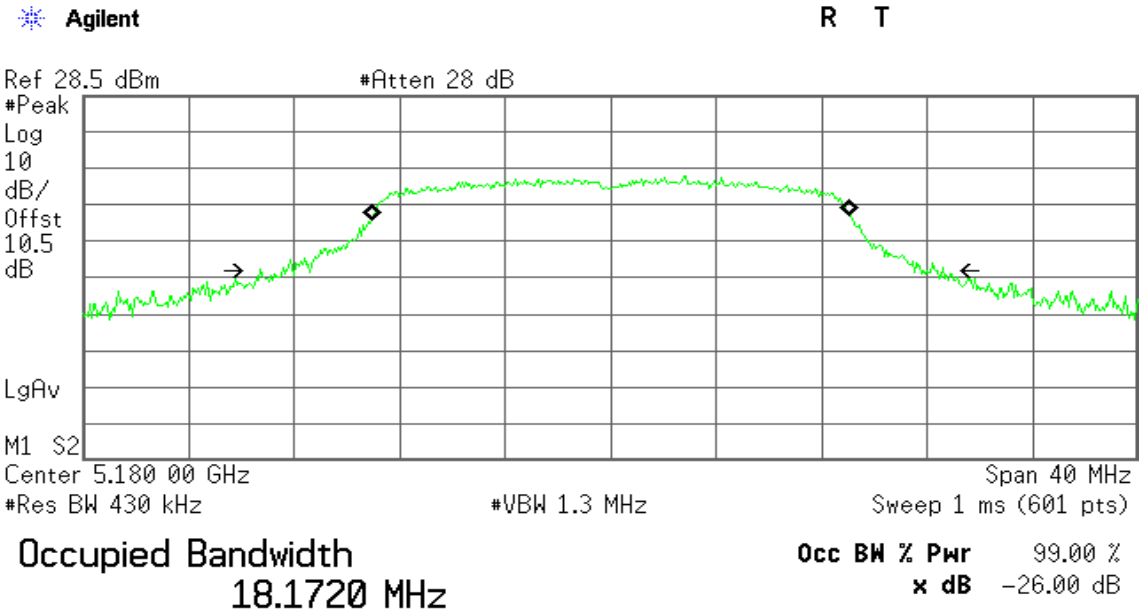
Occupied Bandwidth
17.1437 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 9.473 kHz
x dB Bandwidth 24.497 MHz

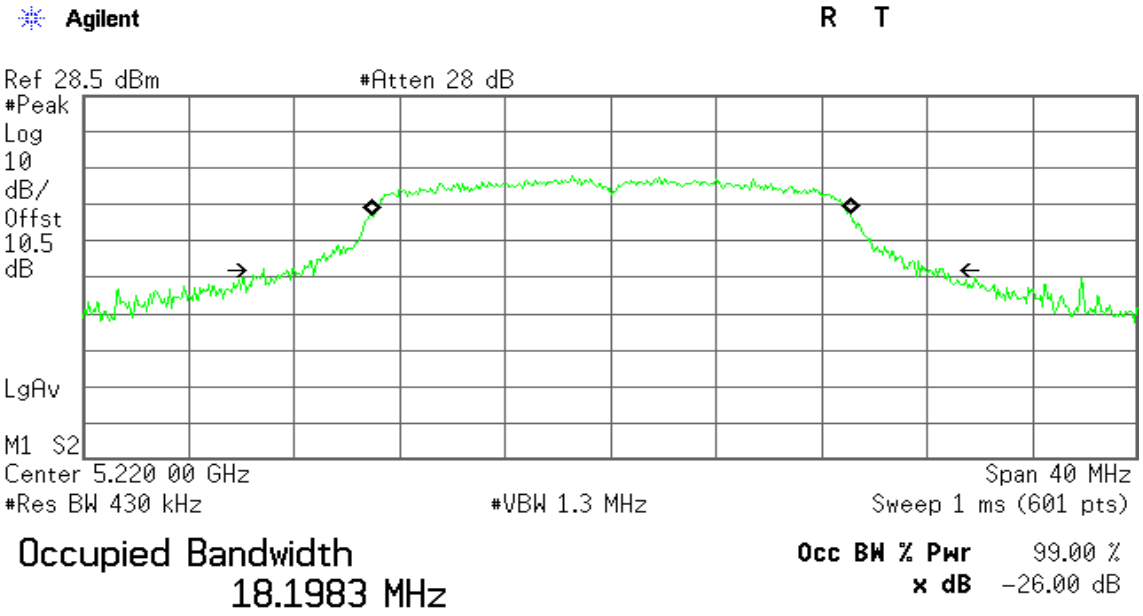
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)



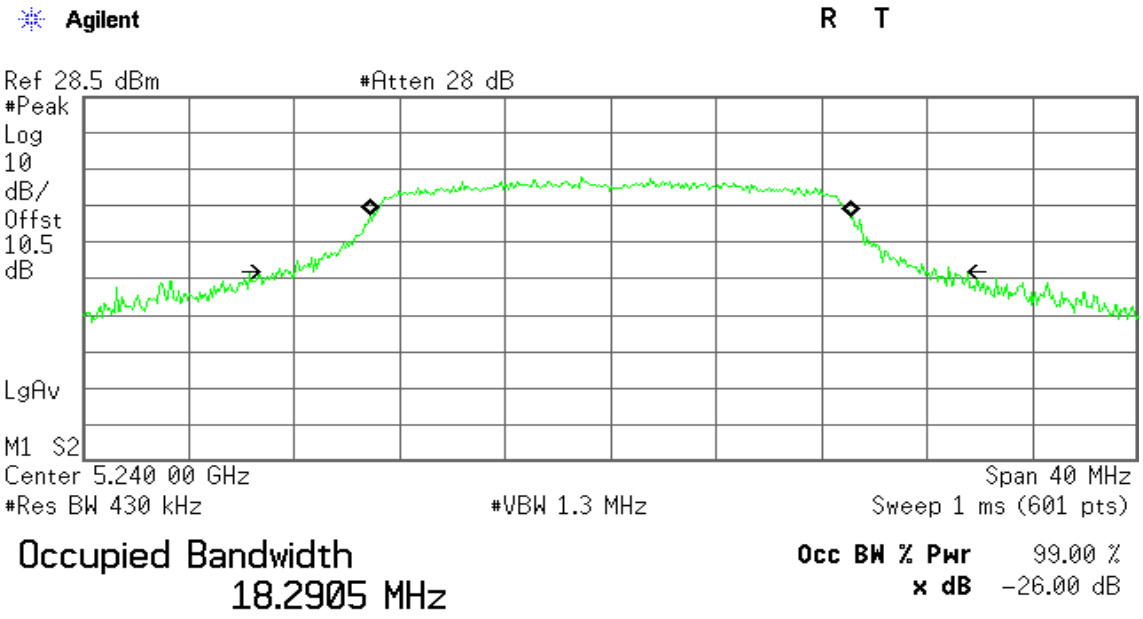
Transmit Freq Error	7.290 kHz
x dB Bandwidth	25.907 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error	14.893 kHz
x dB Bandwidth	25.750 MHz

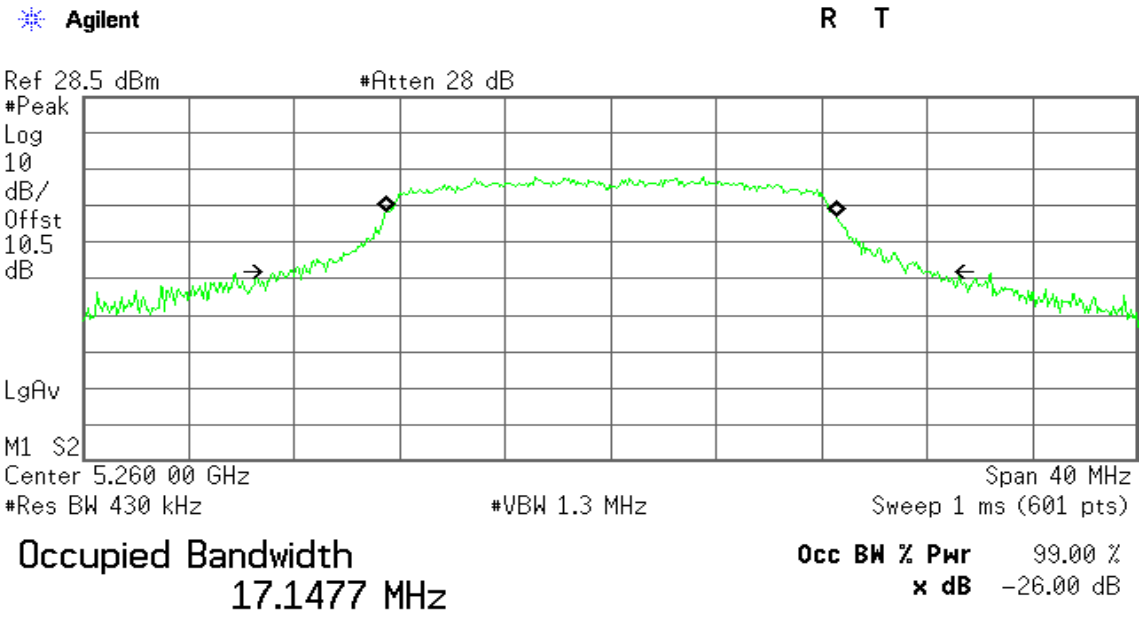
99% Bandwidth (CH High)



Transmit Freq Error	18.223 kHz
x dB Bandwidth	25.427 MHz

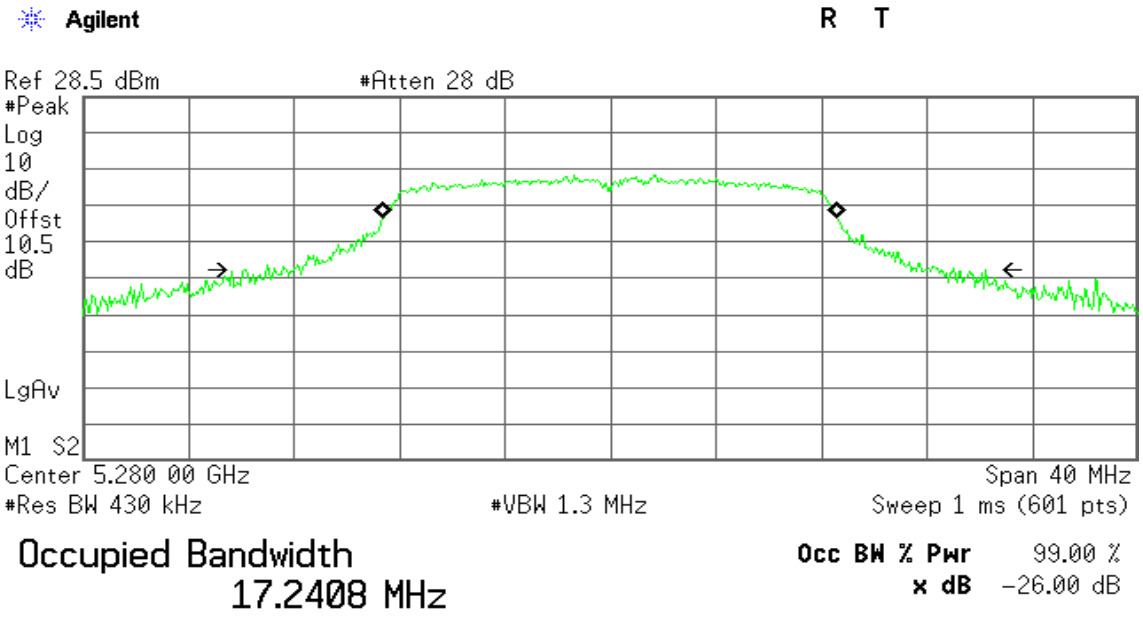
IEEE 802.11a mode / 5260 ~ 5320MHz

99% Bandwidth (CH Low)



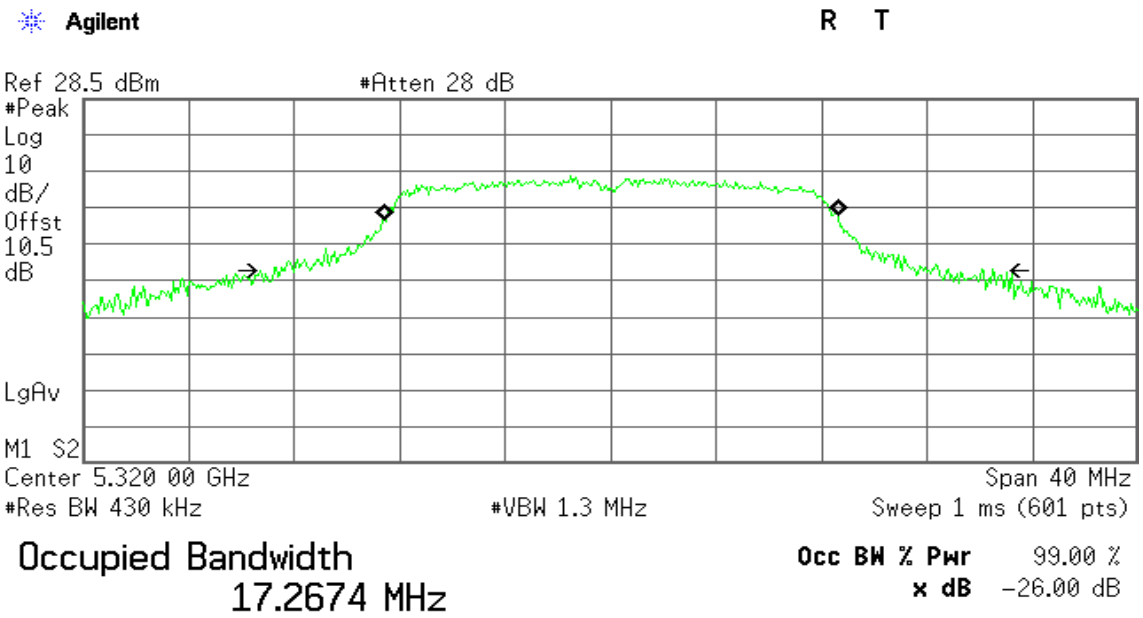
Transmit Freq Error	27.082 kHz
x dB Bandwidth	24.940 MHz

99% Bandwidth (CH Mid)



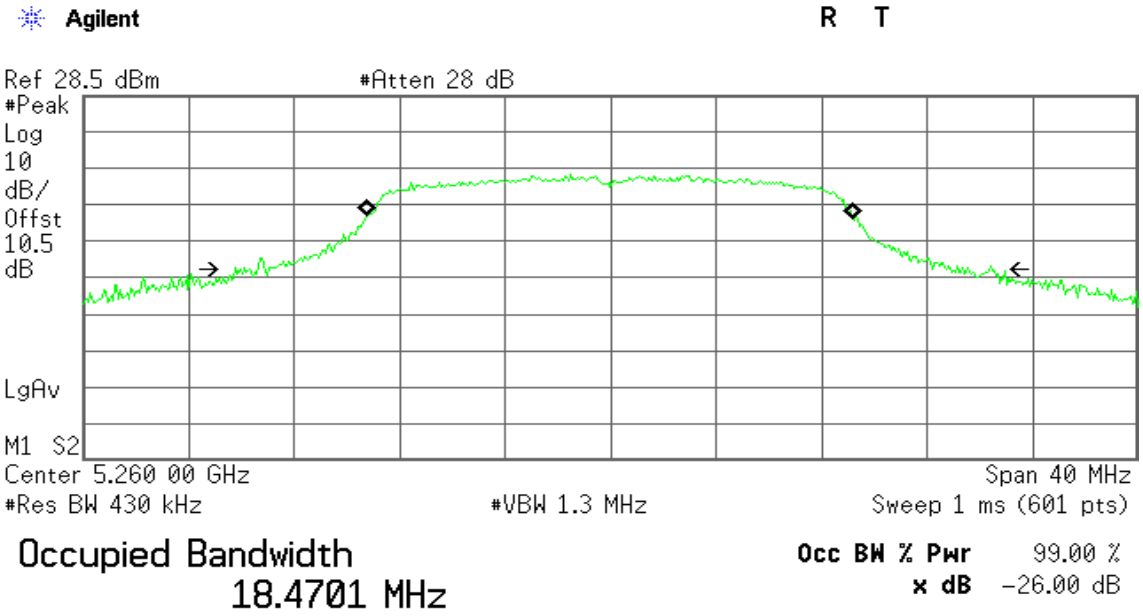
Transmit Freq Error	-21.914 kHz
x dB Bandwidth	28.078 MHz

99% Bandwidth (CH High)



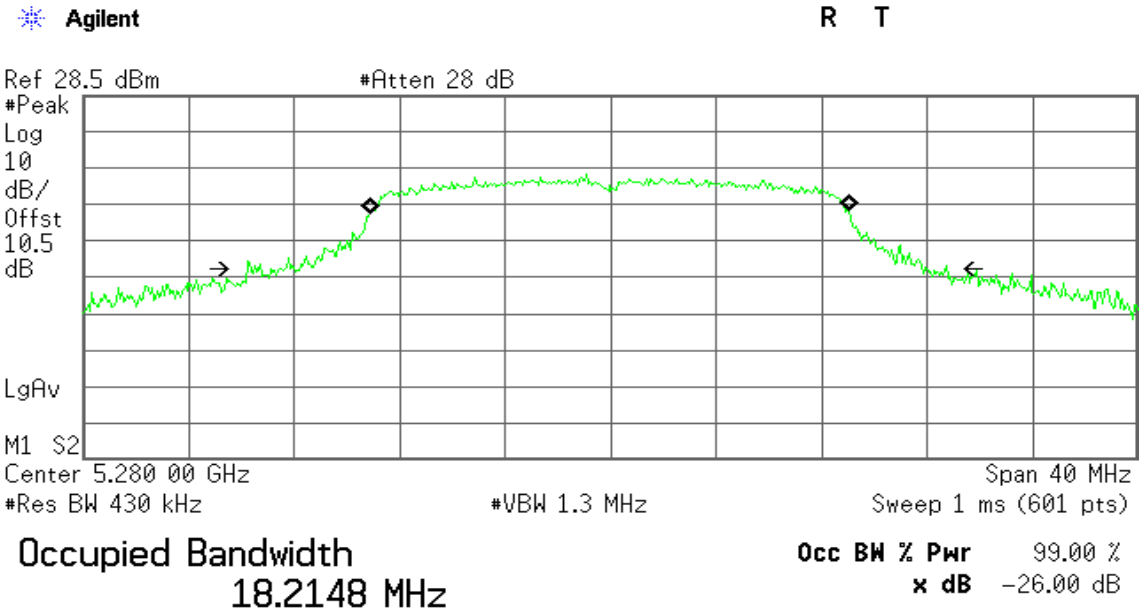
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

99% Bandwidth (CH Low)



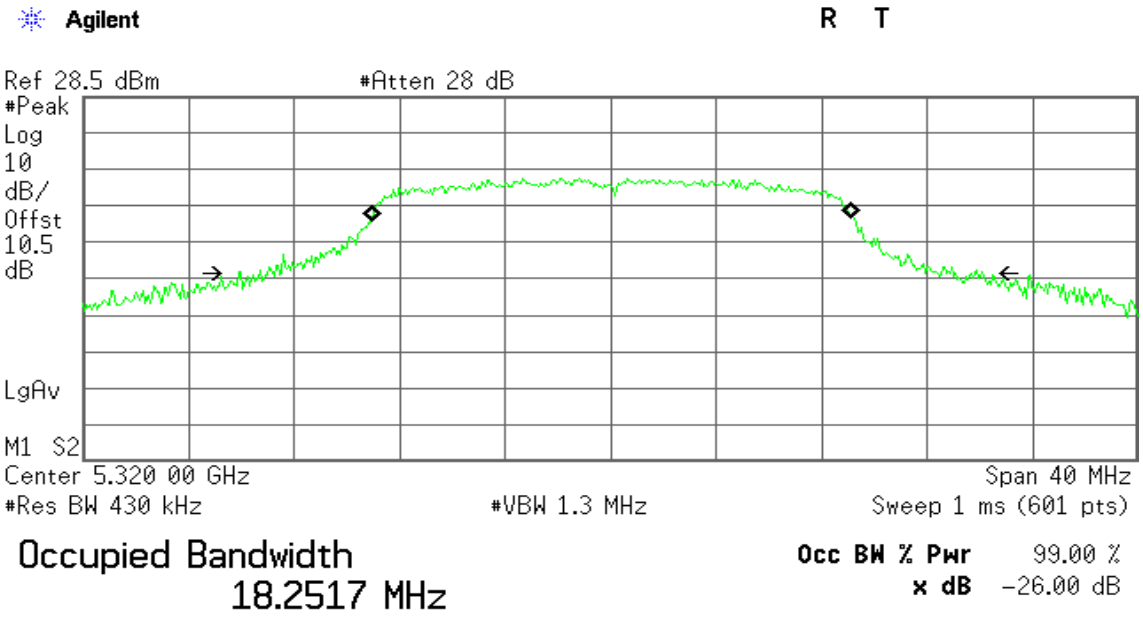
Transmit Freq Error -1.804 kHz
x dB Bandwidth 28.656 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -35.787 kHz
x dB Bandwidth 26.528 MHz

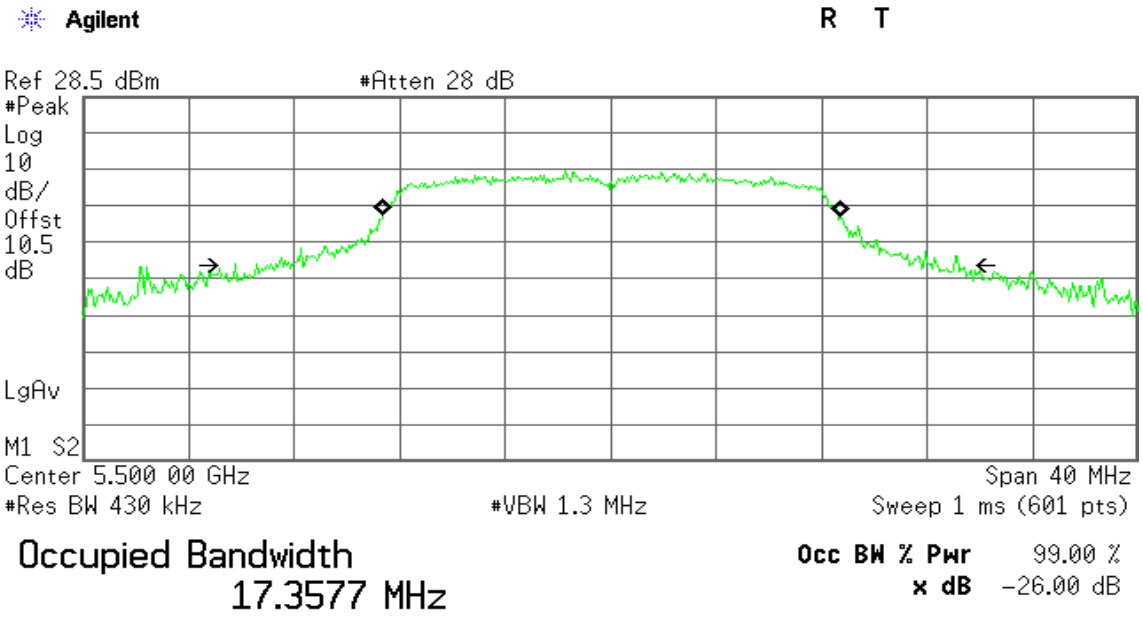
99% Bandwidth (CH High)



Transmit Freq Error	29.238 kHz
x dB Bandwidth	28.148 MHz

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)

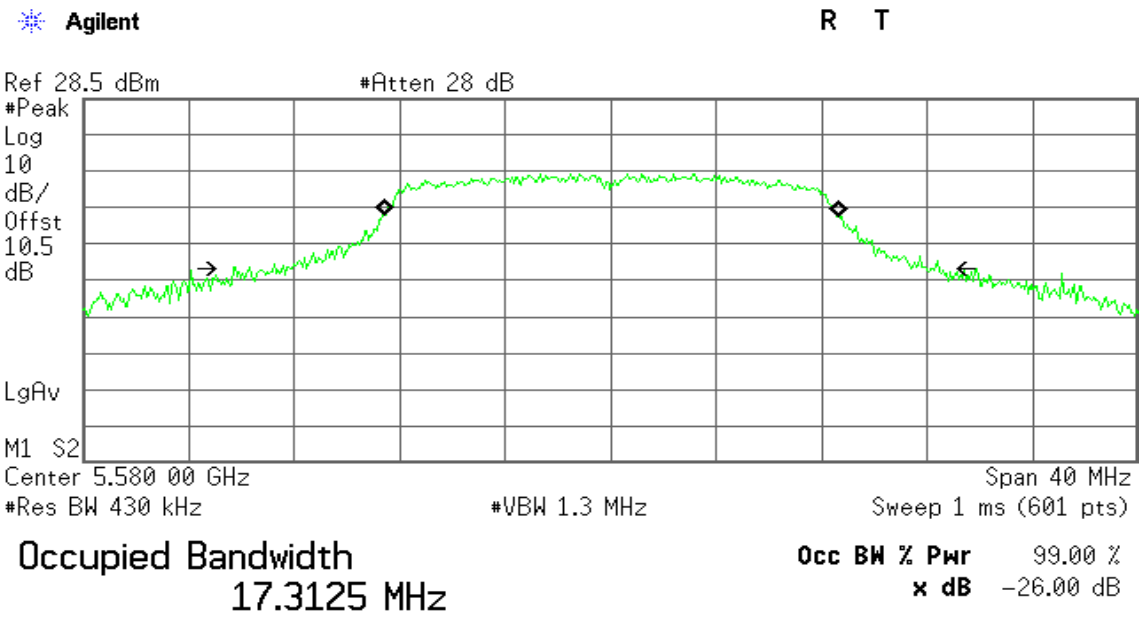


Occupied Bandwidth
17.3577 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 34.766 kHz
x dB Bandwidth 27.402 MHz

99% Bandwidth (CH Mid)

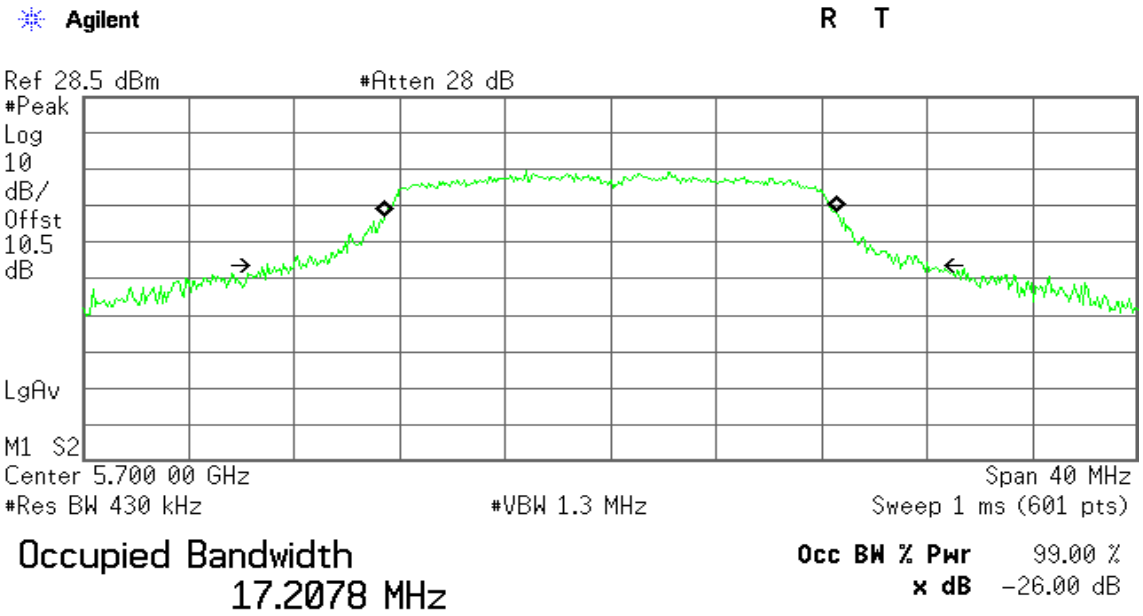


Occupied Bandwidth
17.3125 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

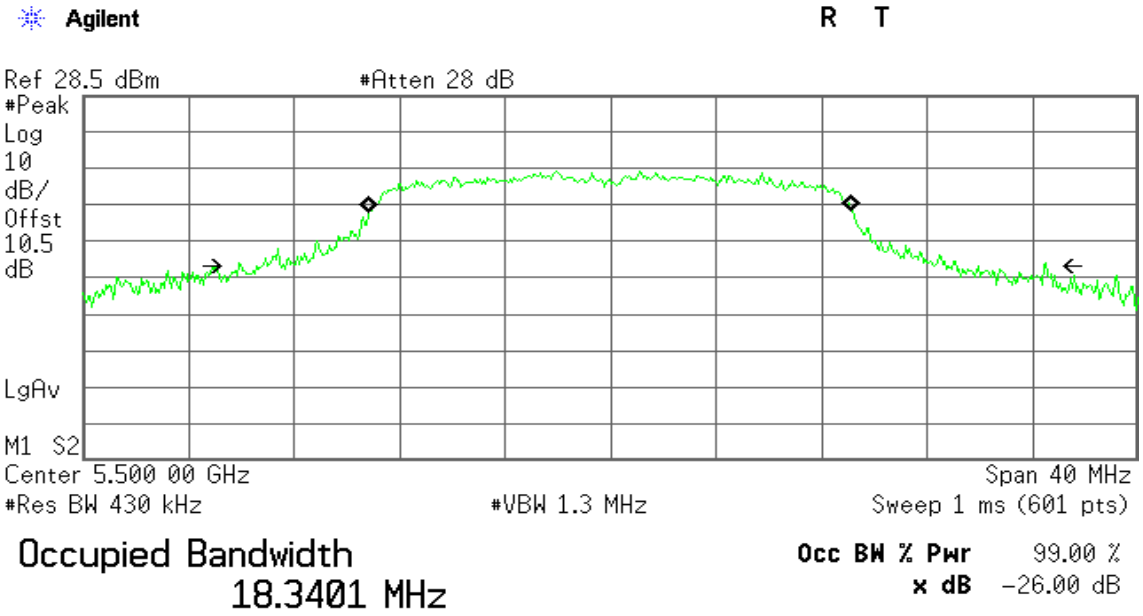
Transmit Freq Error 28.549 kHz
x dB Bandwidth 26.728 MHz

99% Bandwidth (CH High)



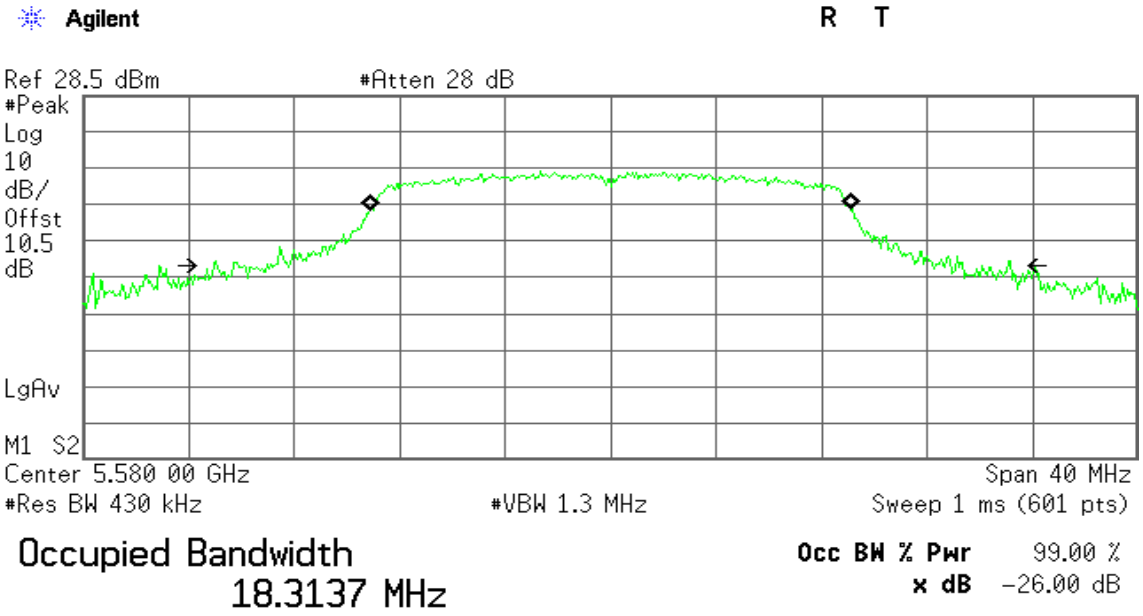
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)



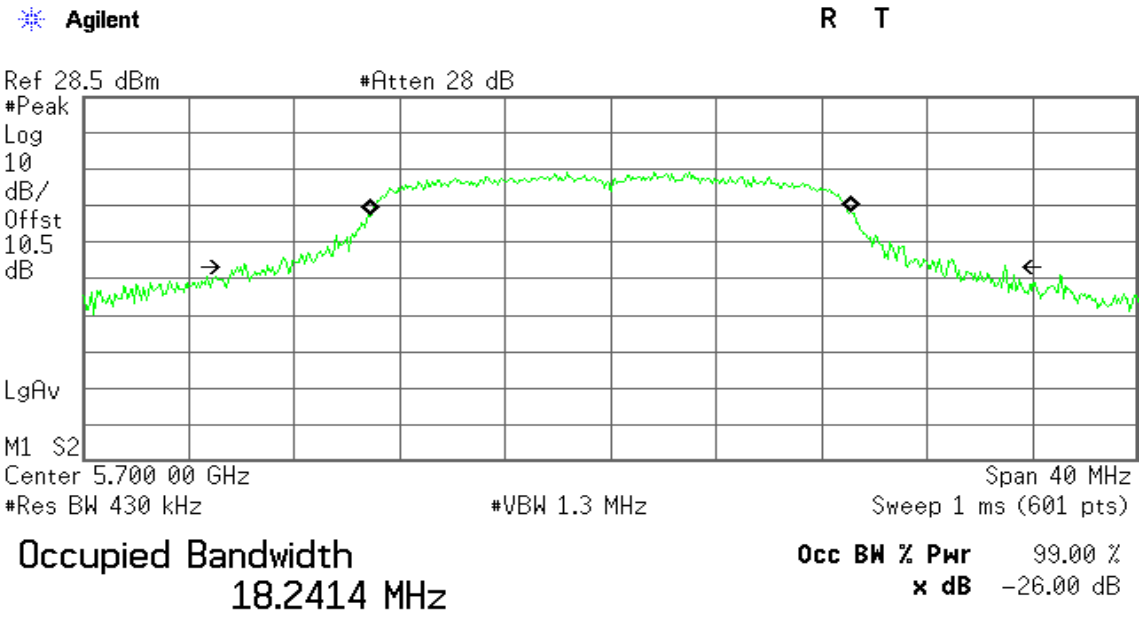
Transmit Freq Error -12.325 kHz
x dB Bandwidth 30.632 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -172.059 Hz
x dB Bandwidth 30.186 MHz

99% Bandwidth (CH High)

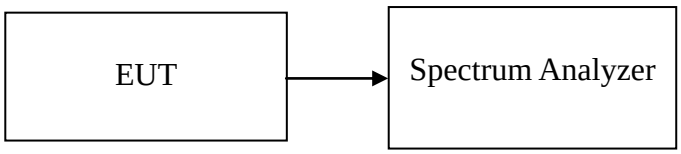


7.2 26 DB EMISSION BANDWIDTH

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)	26db Bandwidth (MHz)
Low	5180	24.252
Mid	5220	25.209
High	5240	24.497

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

Channel	Frequency (MHz)	26db Bandwidth (MHz)
Low	5180	25.907
Mid	5220	25.750
High	5240	25.427

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
Low	5260	24.940
Mid	5280	28.078
High	5320	27.230

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
Low	5180	28.656
Mid	5260	26.528
High	5320	28.148

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
Low	5500	27.402
Mid	5580	26.728
High	5700	25.044

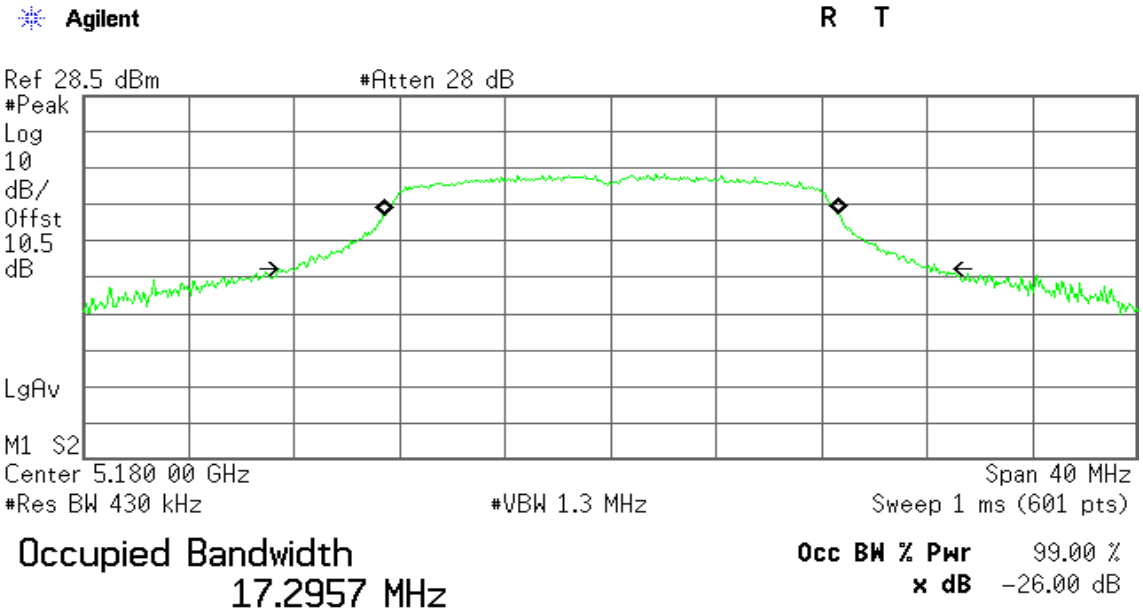
Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	26db Bandwidth (MHz)
Low	5500	30.632
Mid	5580	30.186
High	5700	29.082

Test Plot

IEEE 802.11a for 5180 ~ 5240MHz

CH Low

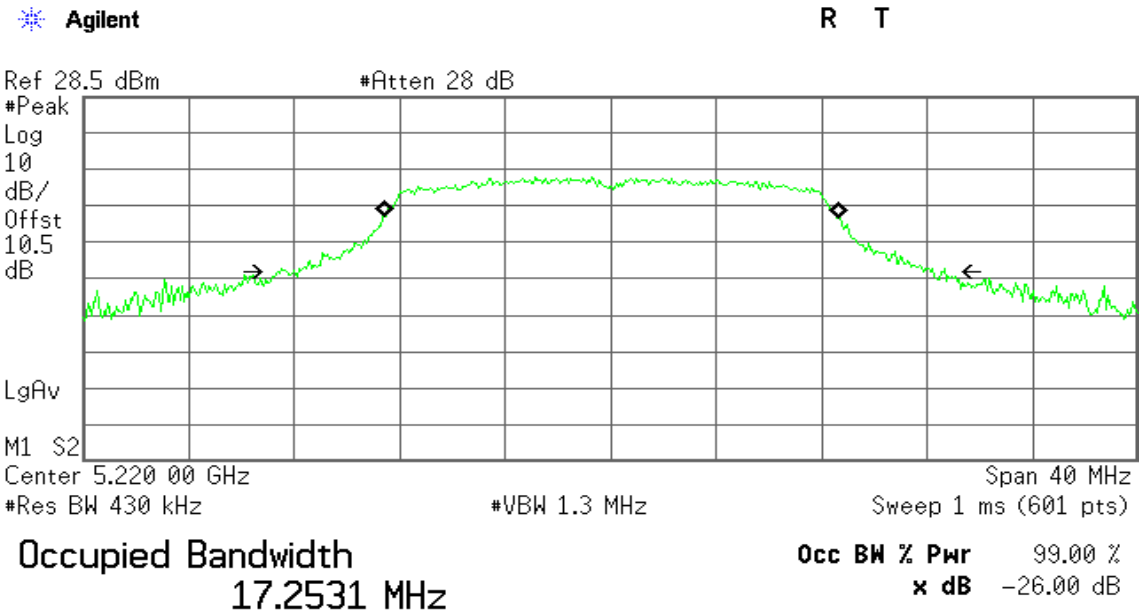


Occupied Bandwidth
17.2957 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 27.775 kHz
x dB Bandwidth 24.252 MHz

CH Mid

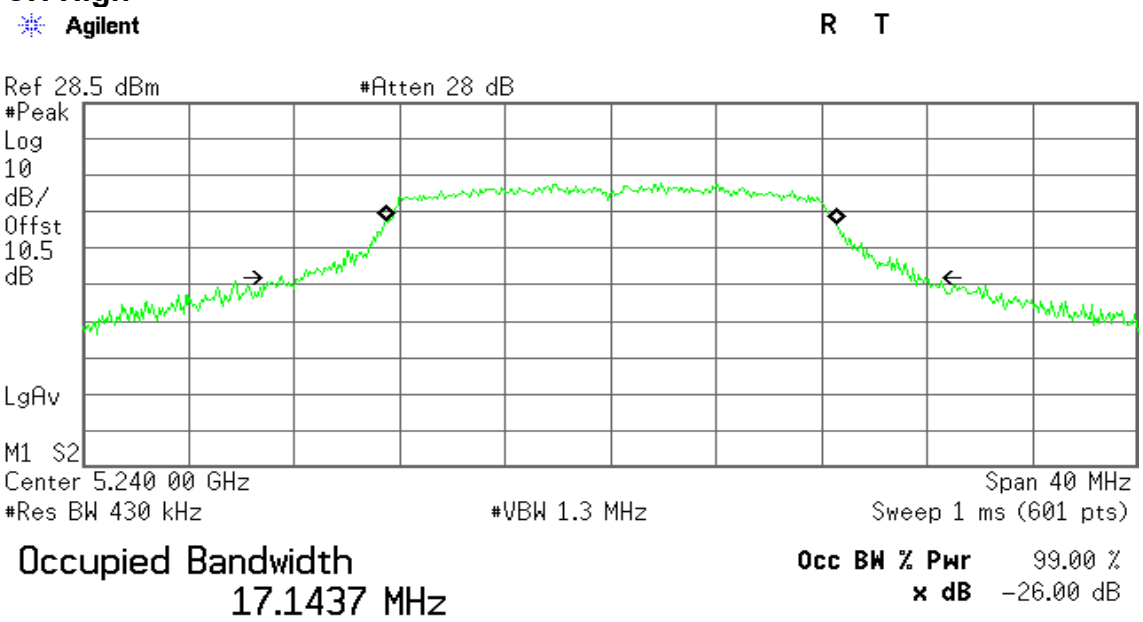


Occupied Bandwidth
17.2531 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 29.064 kHz
x dB Bandwidth 25.209 MHz

CH High



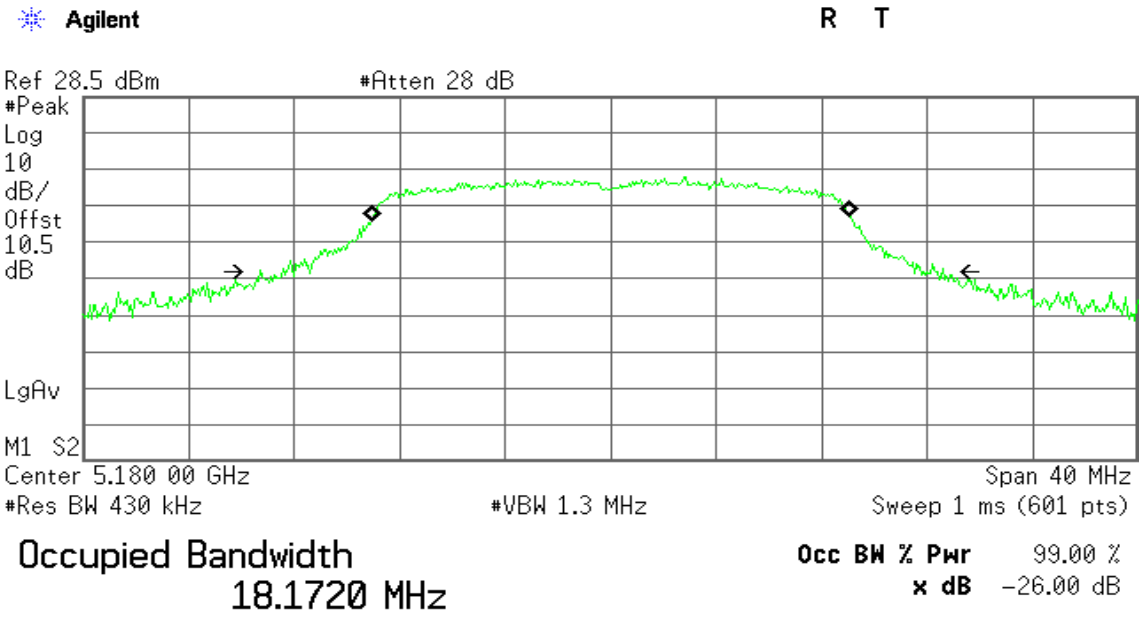
Occupied Bandwidth
17.1437 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 9.473 kHz
x dB Bandwidth 24.497 MHz

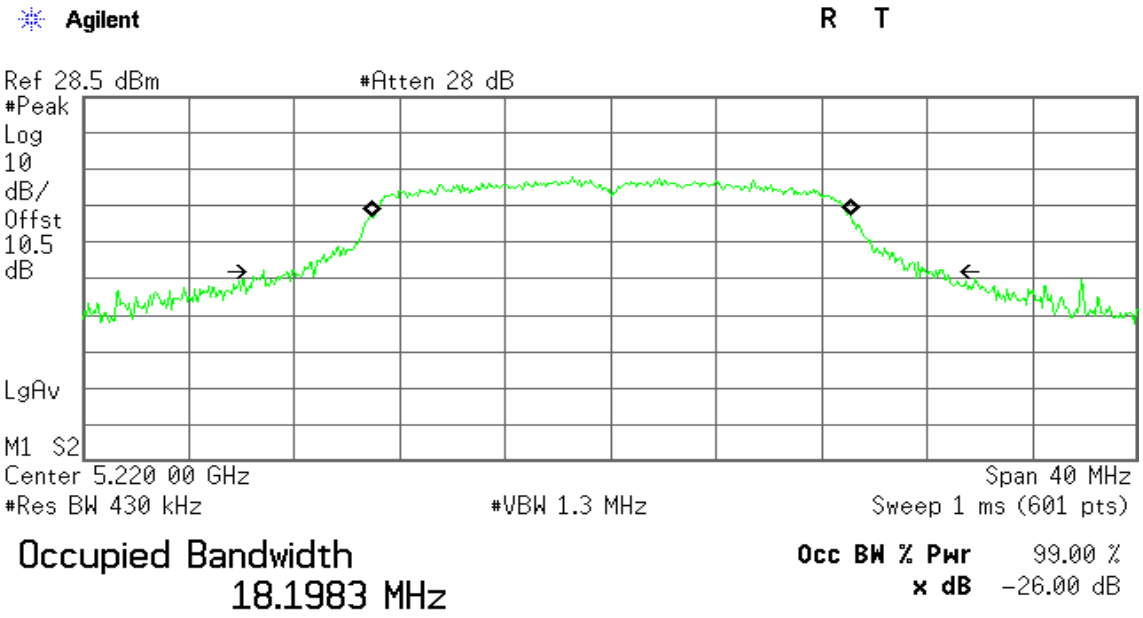
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz

CH Low



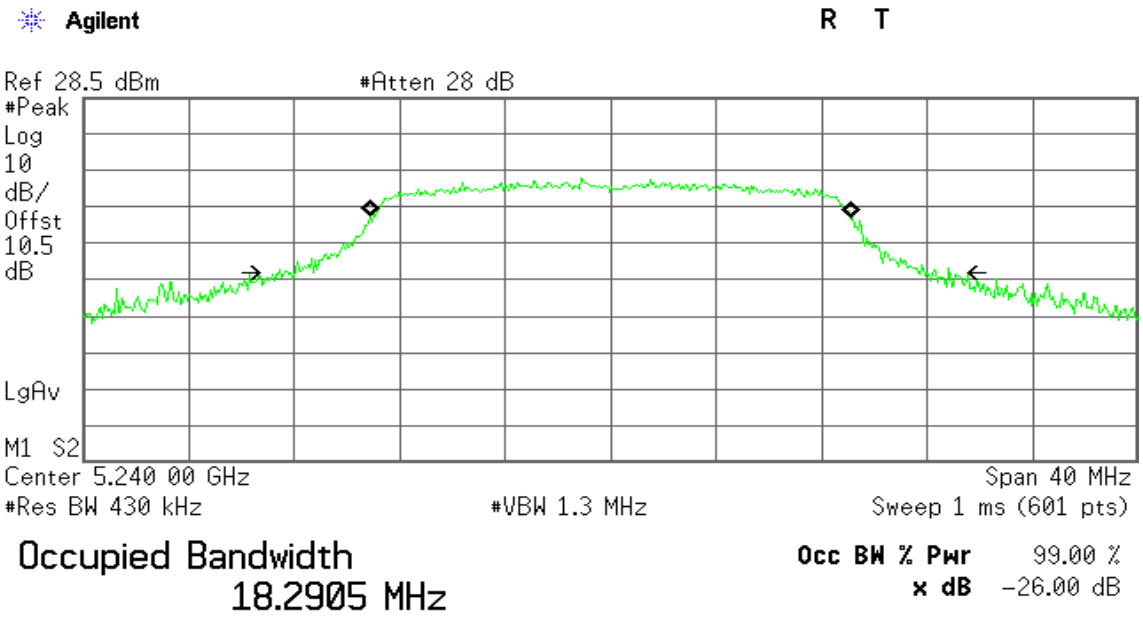
Transmit Freq Error	7.290 kHz
x dB Bandwidth	25.907 MHz

CH Mid



Transmit Freq Error	14.893 kHz
x dB Bandwidth	25.750 MHz

CH High



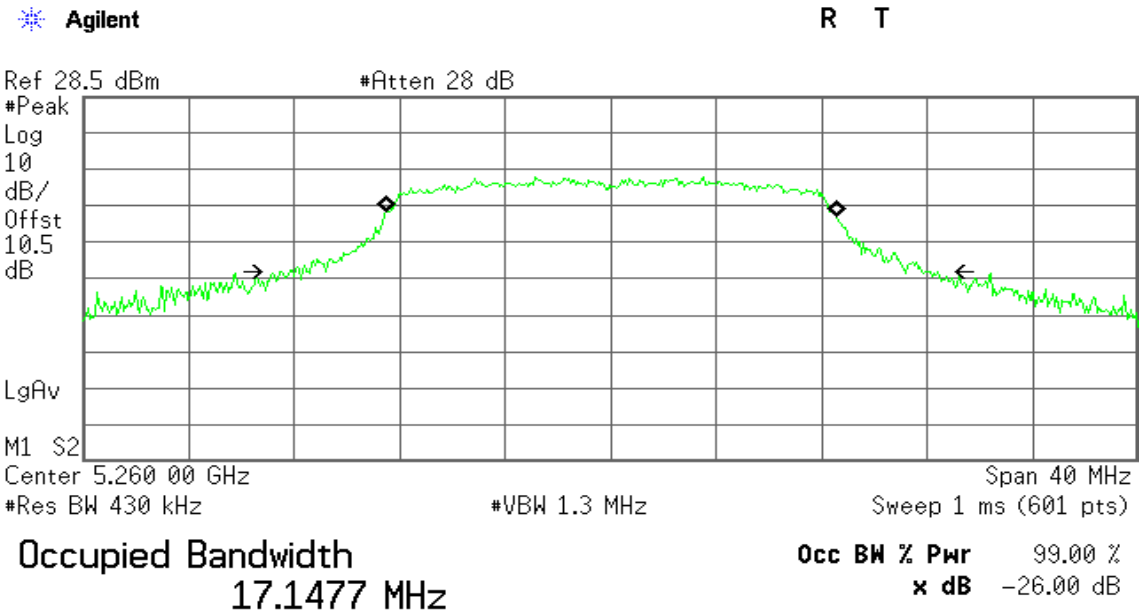
Occupied Bandwidth
18.2905 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 18.223 kHz
x dB Bandwidth 25.427 MHz

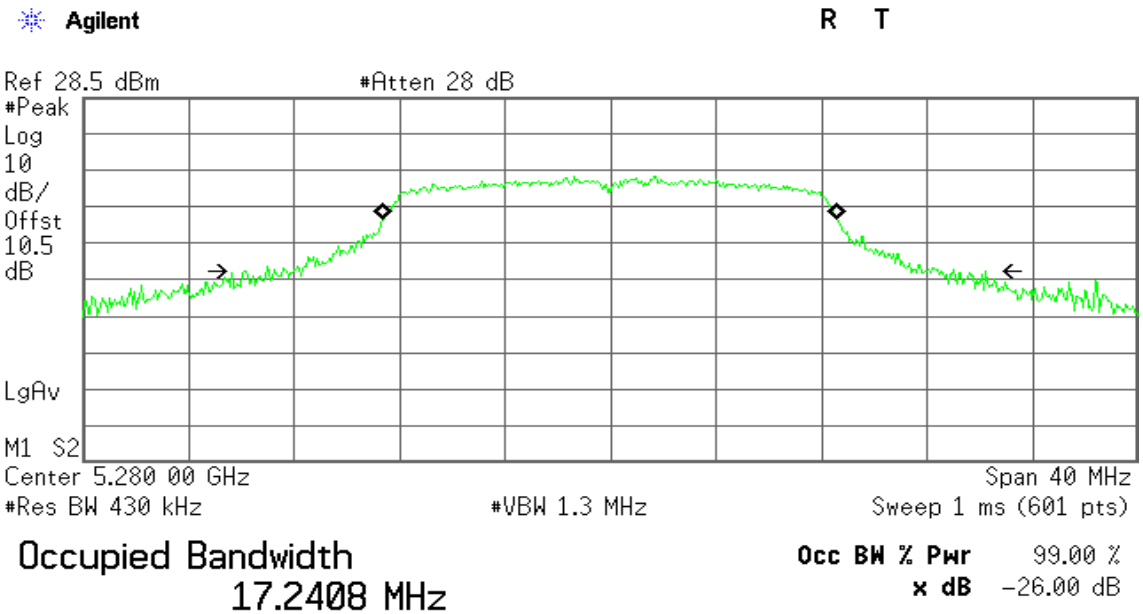
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low



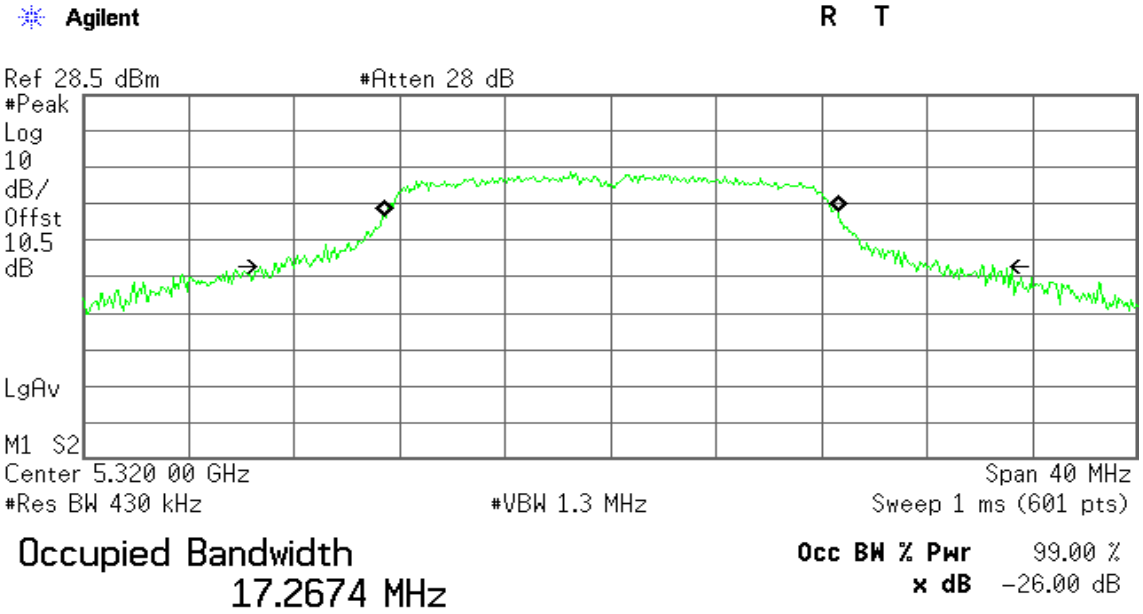
Transmit Freq Error	27.082 kHz
x dB Bandwidth	24.940 MHz

CH Mid



Transmit Freq Error	-21.914 kHz
x dB Bandwidth	28.078 MHz

CH High



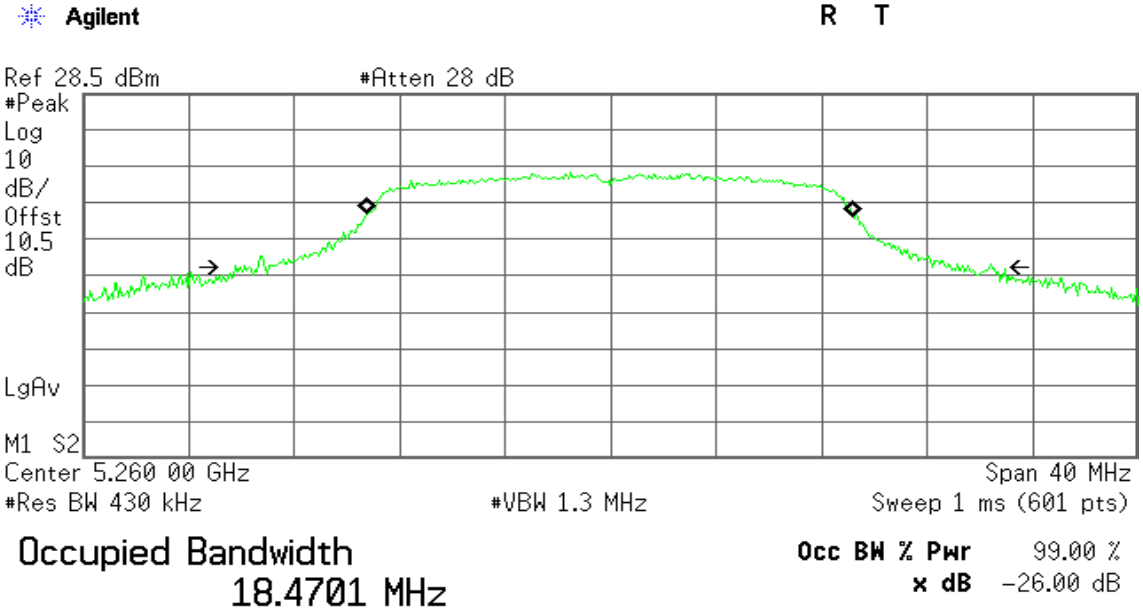
Occupied Bandwidth
17.2674 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 422.972 Hz
x dB Bandwidth 27.230 MHz

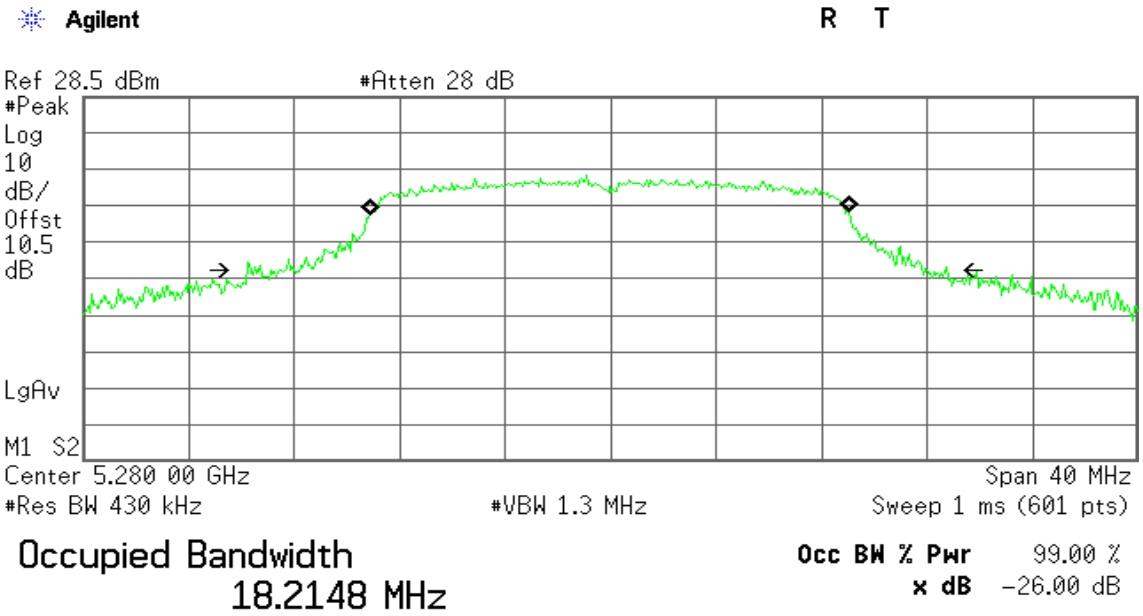
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

CH Low



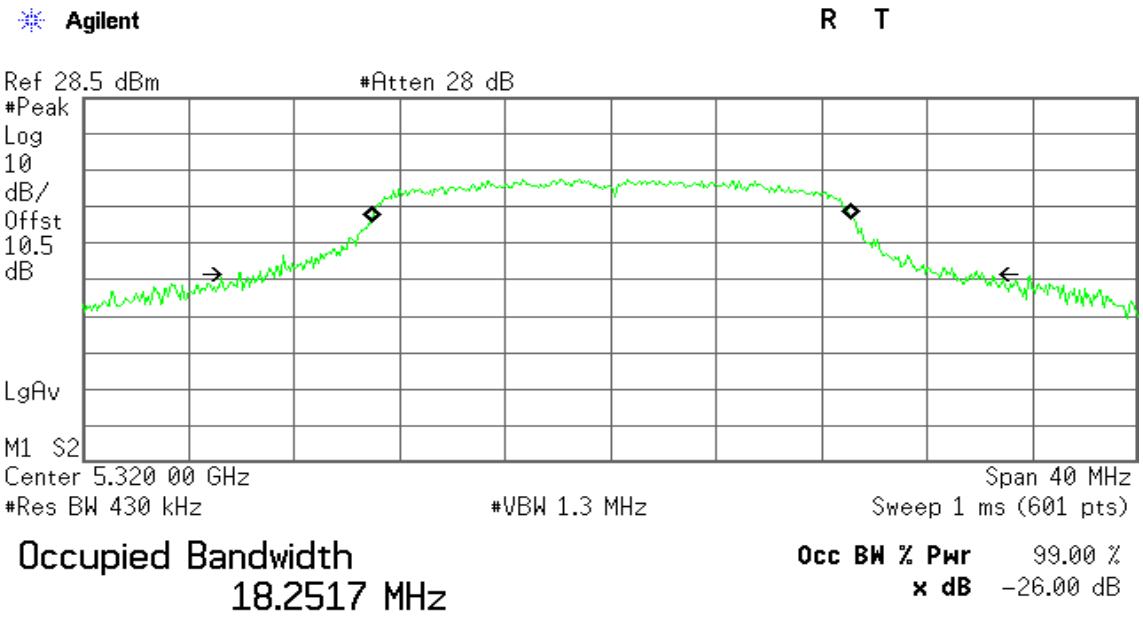
Transmit Freq Error −1.804 kHz
x dB Bandwidth 28.656 MHz

CH Mid



Transmit Freq Error −35.787 kHz
x dB Bandwidth 26.528 MHz

CH High



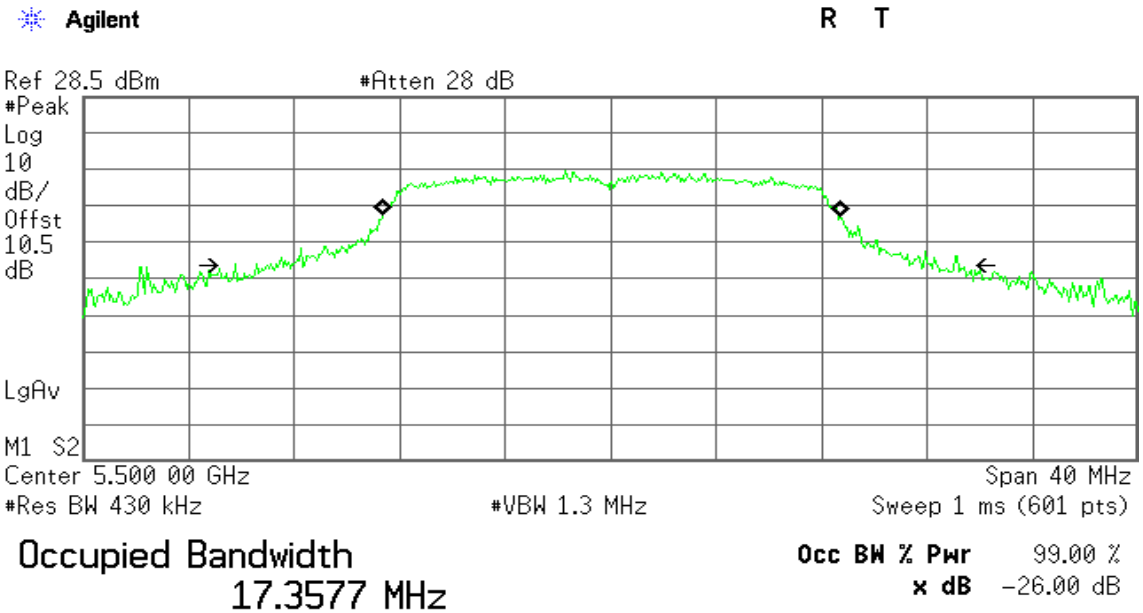
Occupied Bandwidth
18.2517 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 29.238 kHz
x dB Bandwidth 28.148 MHz

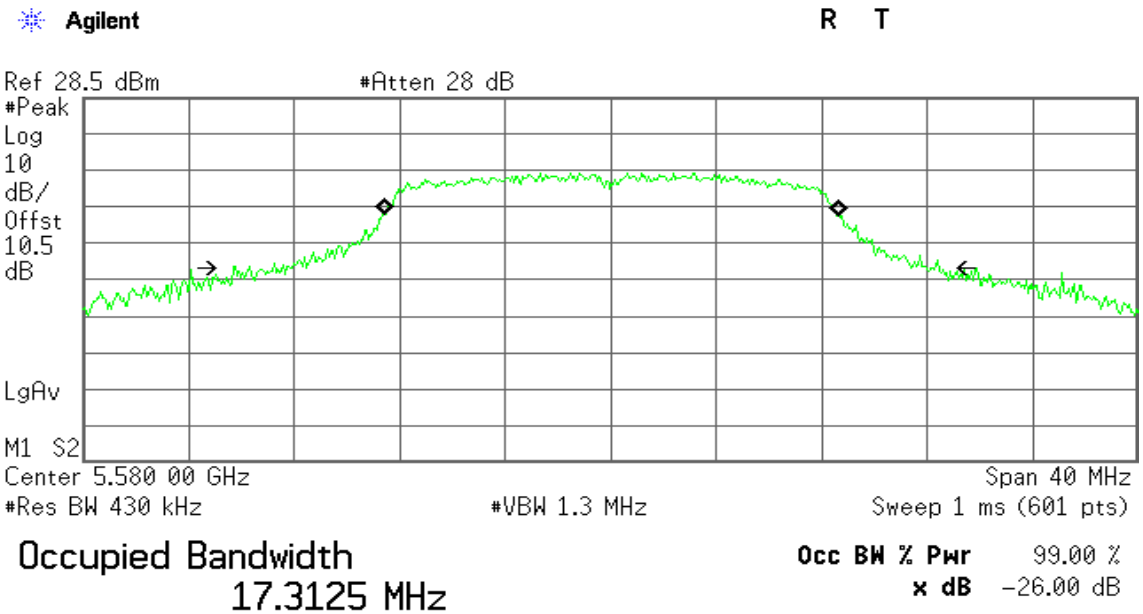
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low



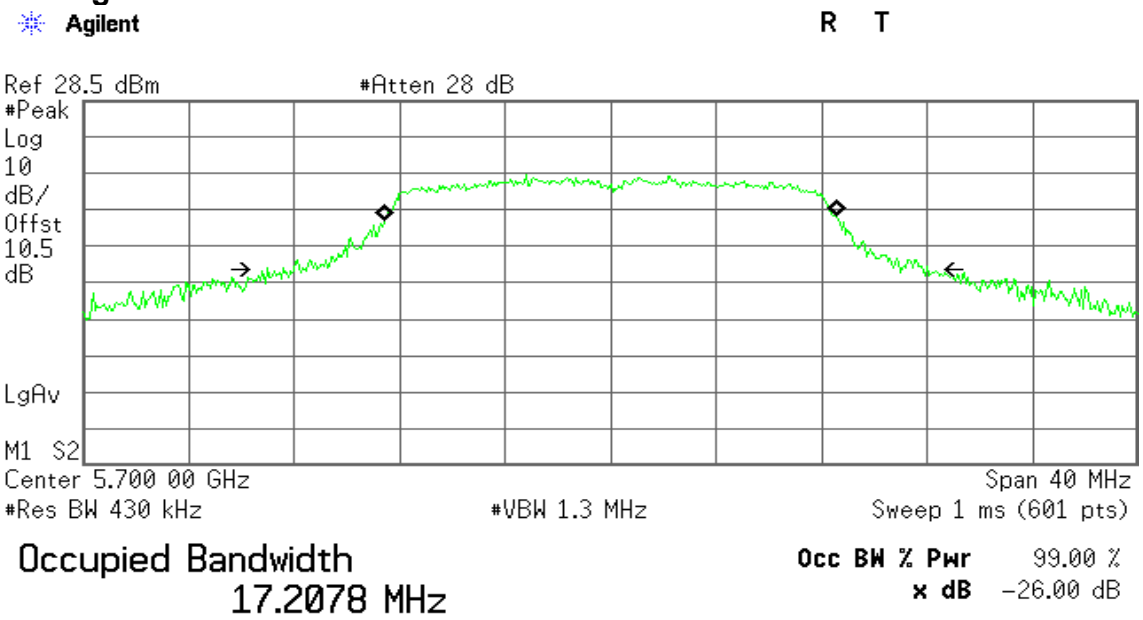
Transmit Freq Error	34.766 kHz
x dB Bandwidth	27.402 MHz

CH Mid



Transmit Freq Error	28.549 kHz
x dB Bandwidth	26.728 MHz

CH High



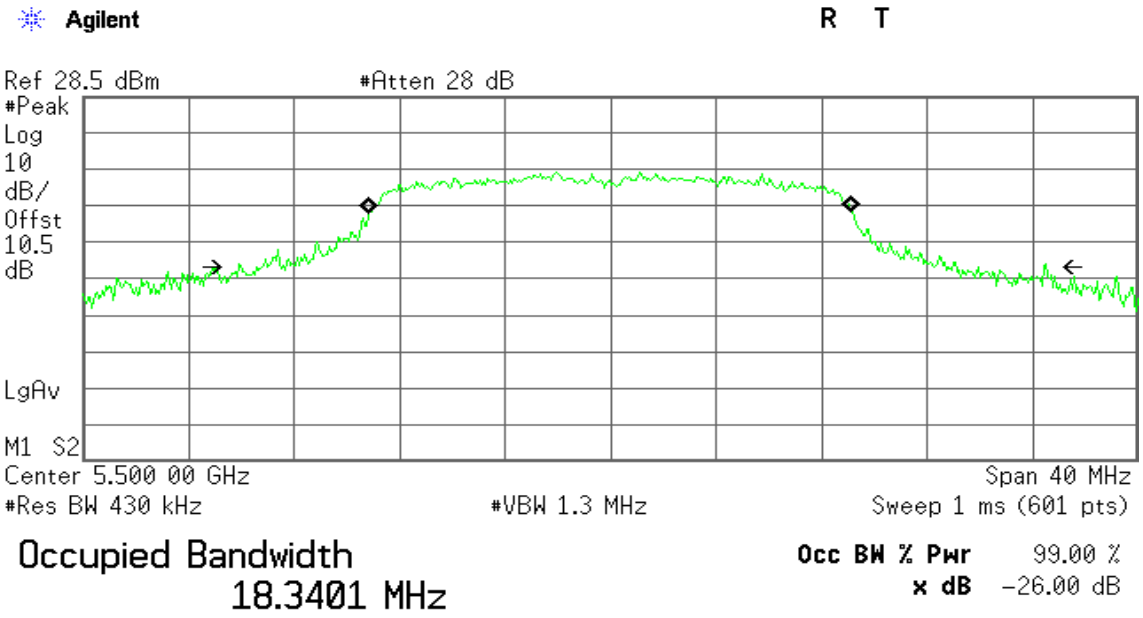
Occupied Bandwidth
17.2078 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -8.500 kHz
x dB Bandwidth 25.044 MHz

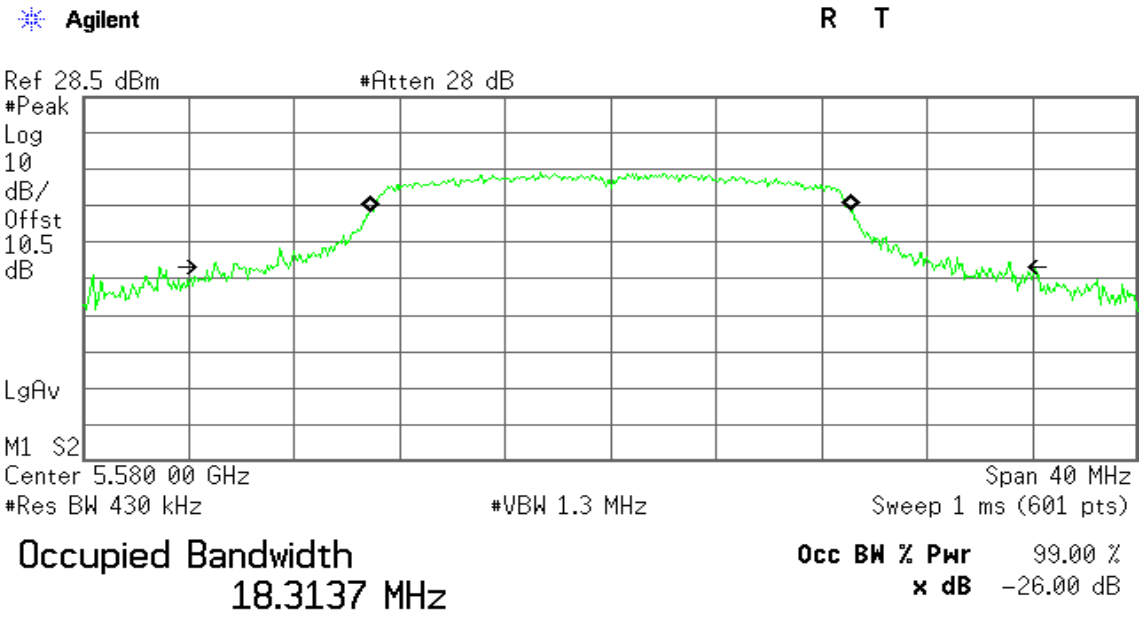
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz

CH Low



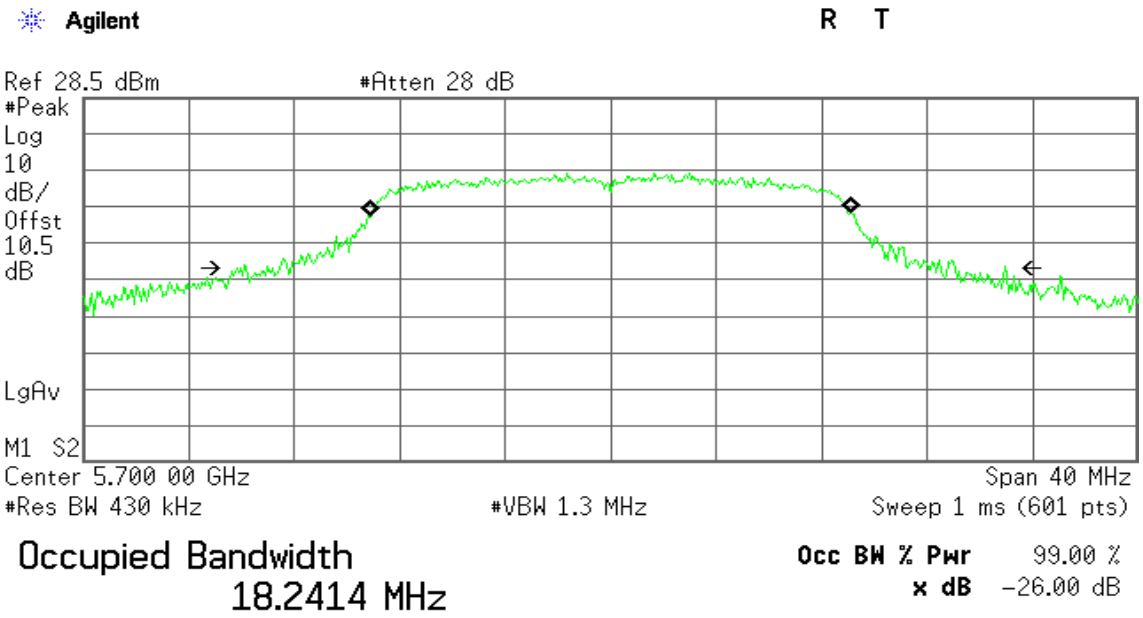
Transmit Freq Error -12.325 kHz
x dB Bandwidth 30.632 MHz

CH Mid



Transmit Freq Error -172.059 Hz
x dB Bandwidth 30.186 MHz

CH High



Occupied Bandwidth
18.2414 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 4.096 kHz
x dB Bandwidth 29.082 MHz

7.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

According to §15.407(a)

For the band 5.15-5.25 GHz, 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz.

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

According to RSS-247,

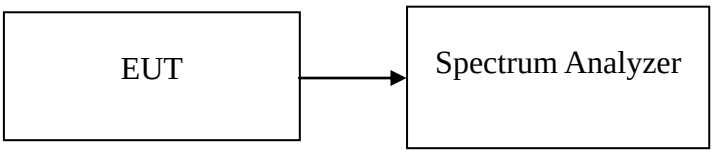
(1) For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 Log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(2) For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or 11 + 10 Log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 Log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.
The peak power shall not exceed the limit as follow:

Test Configuration

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

Specified Limit of the Peak Power

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5180	***13.45**	24.00
Mid	5220	13.16	24.00
High	5240	13.36	24.00

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5180	13.25	24.00
Mid	5220	13.12	24.00
High	5240	***13.29**	24.00

Test mode: IEEE 802.11a mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5260	13.54	24.00
Mid	5280	***13.55**	24.00
High	5320	13.52	24.00

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5260	***13.58**	24.00
Mid	5280	13.53	24.00
High	5320	13.45	24.00

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5500	14.28	24.00
Mid	5580	14.31	24.00
High	5700	***14.41**	24.00

Test mode: IEEE 802.11n HT 20 MHz Channel mode/ 5500 ~ 5700MHz

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Power Limit (dBm)
Low	5500	14.32	24.00
Mid	5580	14.36	24.00
High	5700	***14.38**	24.00

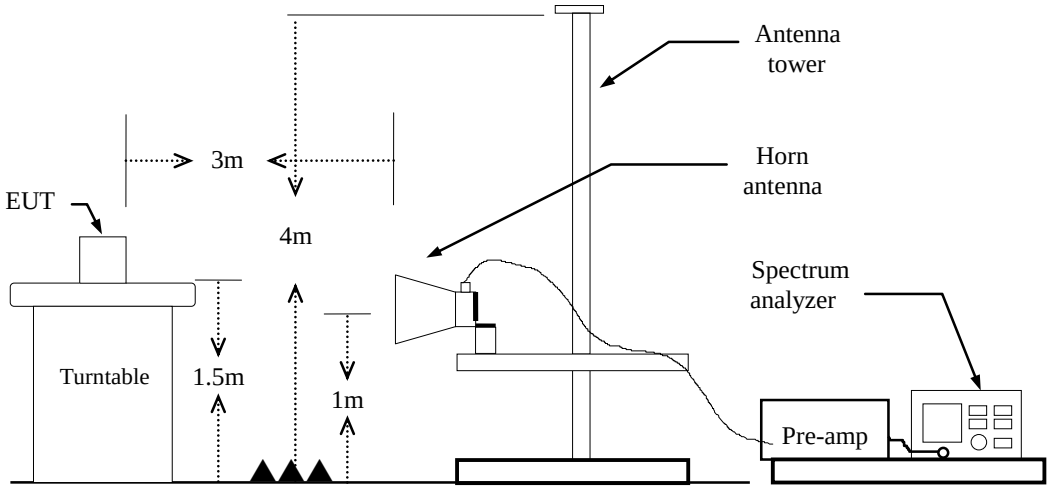
7.4 BAND EDGES MEASUREMENT

LIMIT

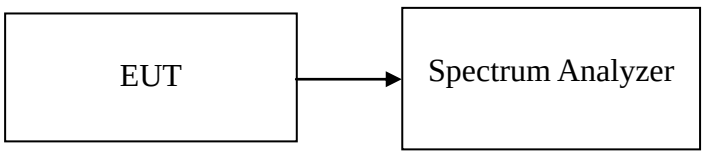
According to §15.407 & RSS-247 §, in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration

For Radiated Emission above 1GHz



For Conducted



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 : 1MHz / VBW : 3MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=300Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.
6. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant

For Conducted

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

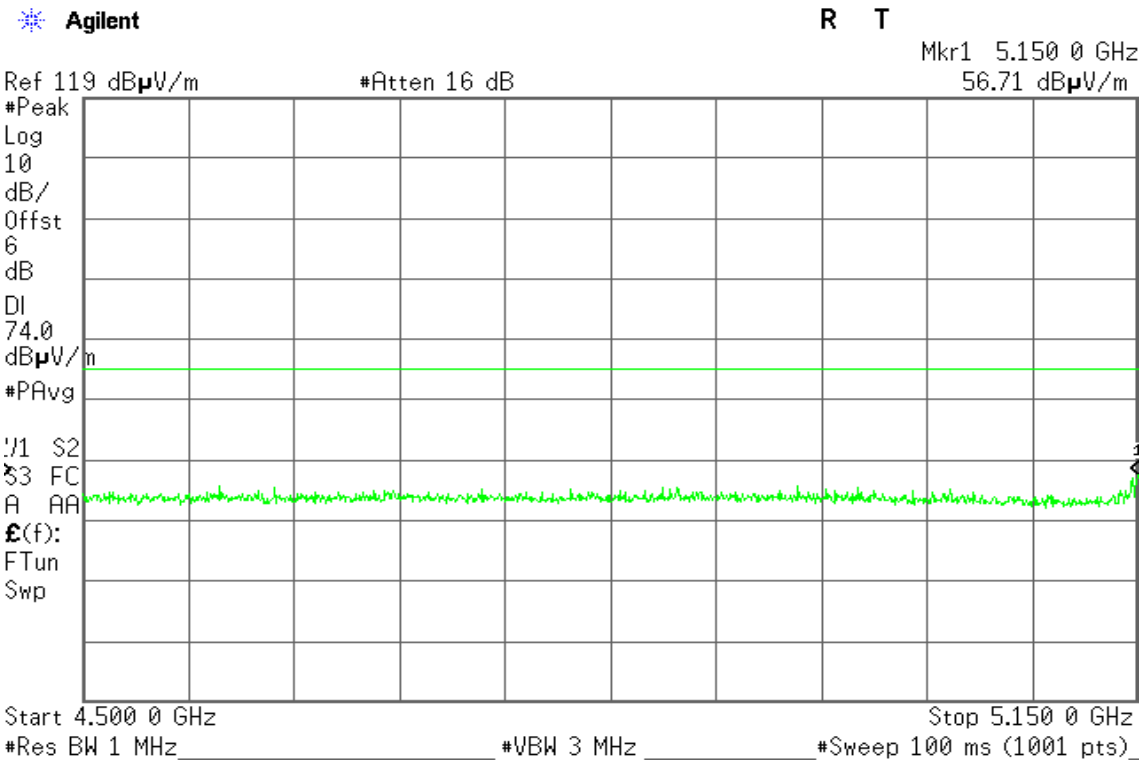
TEST RESULTS

Refer to attach spectrum analyzer data chart.

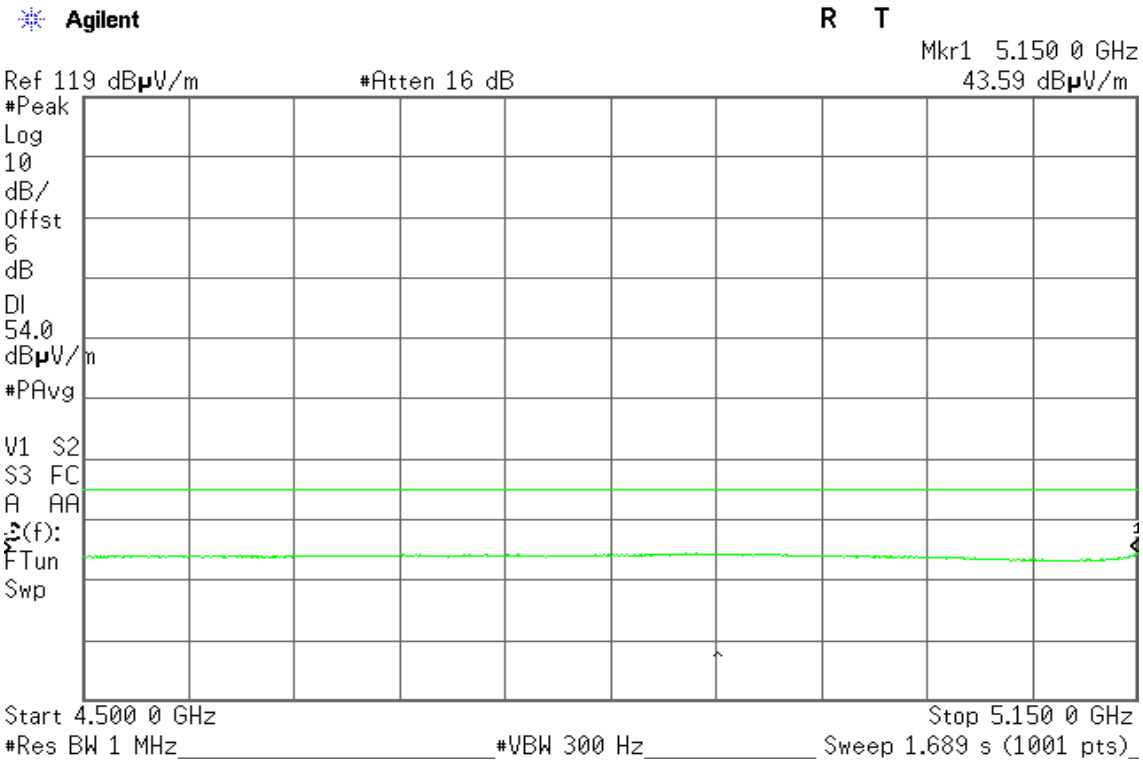
For Internal Antenna

Band Edges (IEEE 802.11a mode / 5180 MHz)

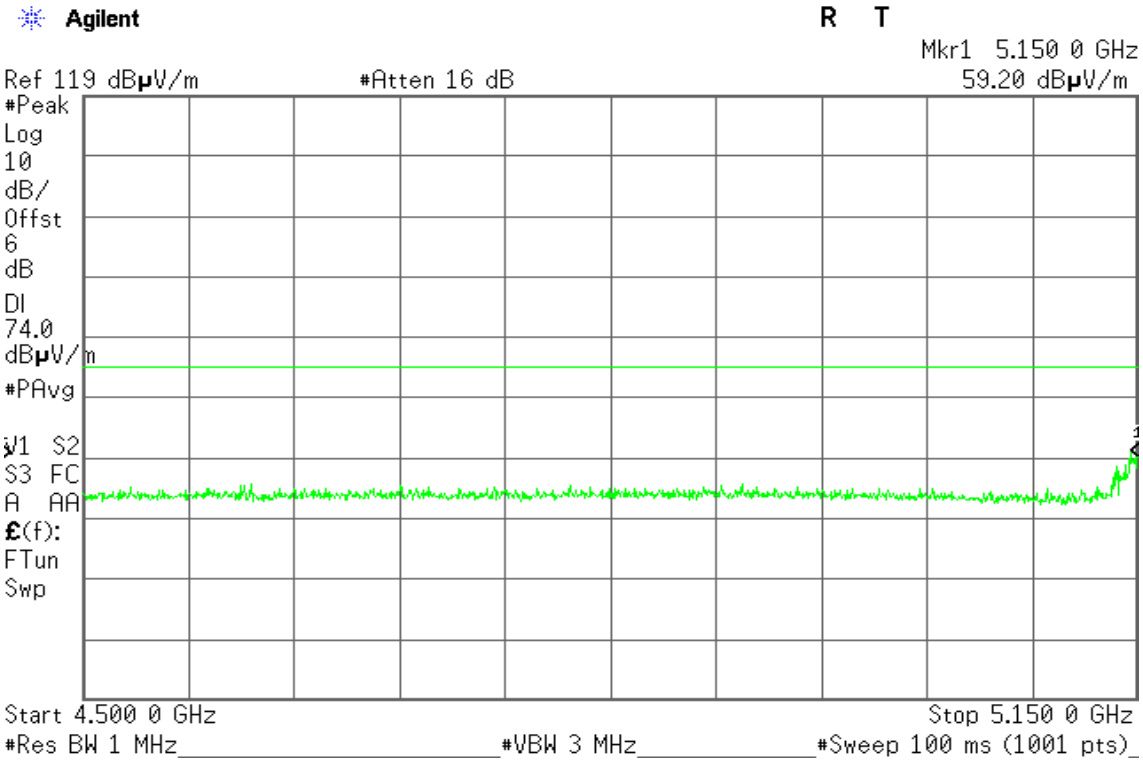
Detector mode: Peak Polarity: Vertical



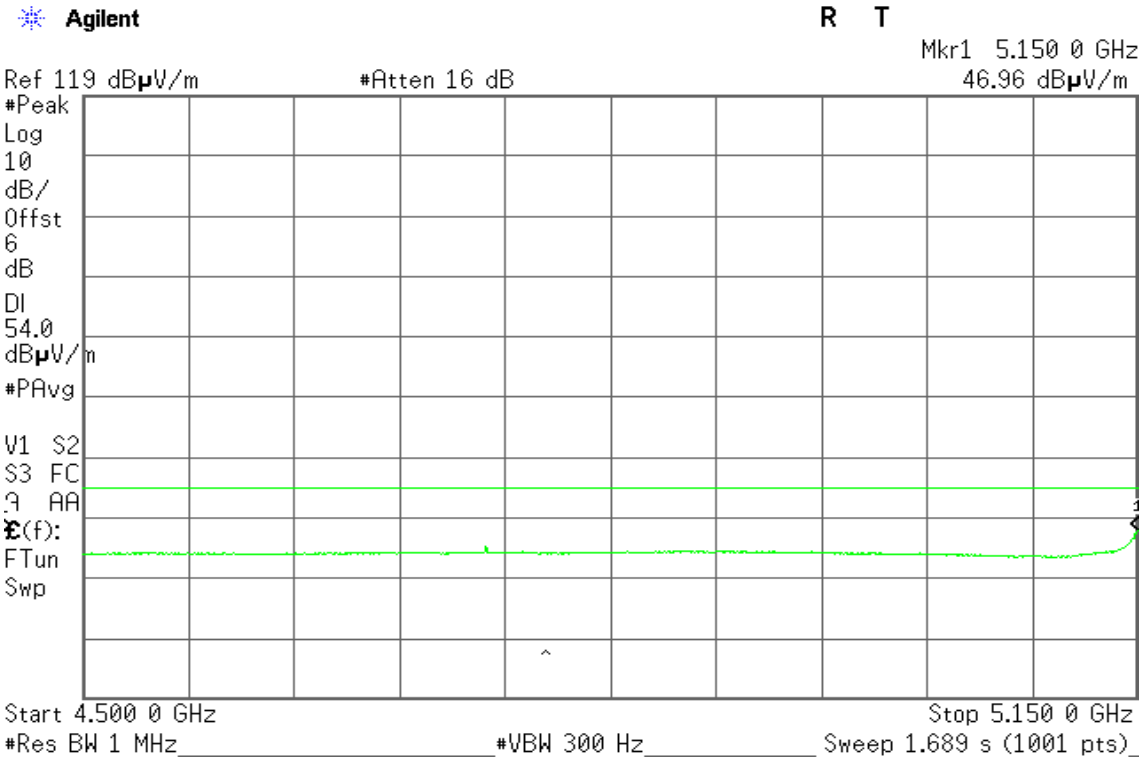
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

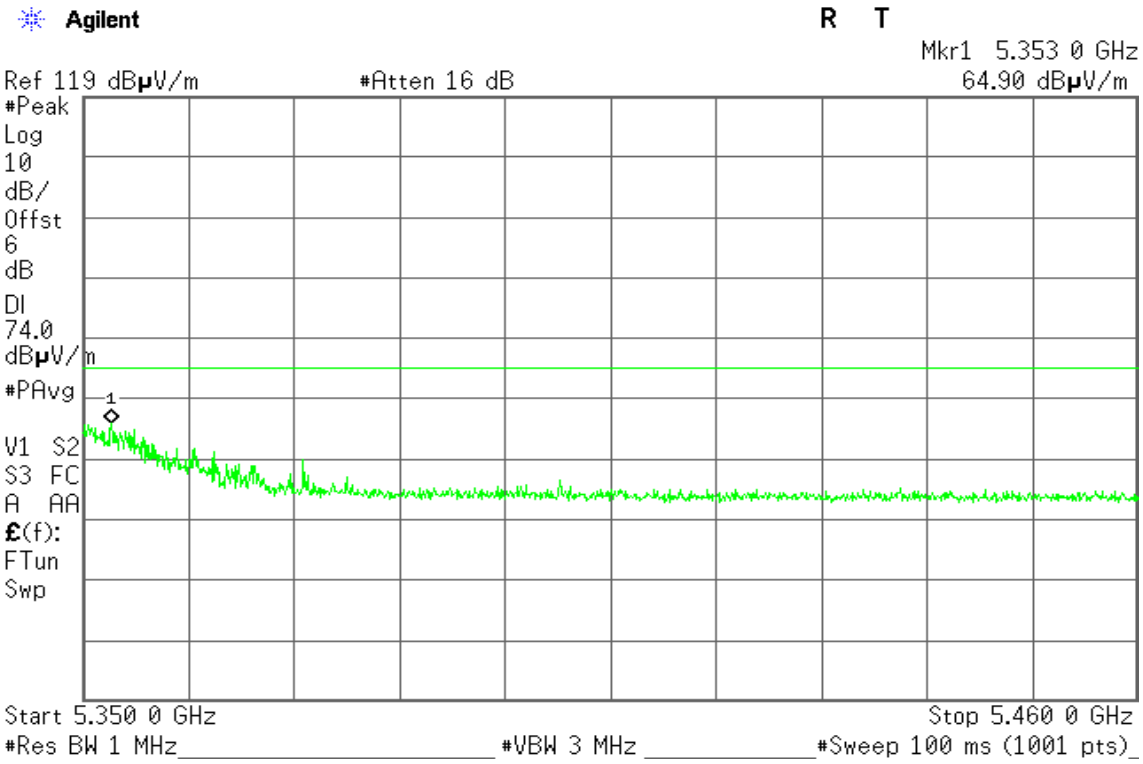


Detector mode: Average **Polarity: Horizontal**

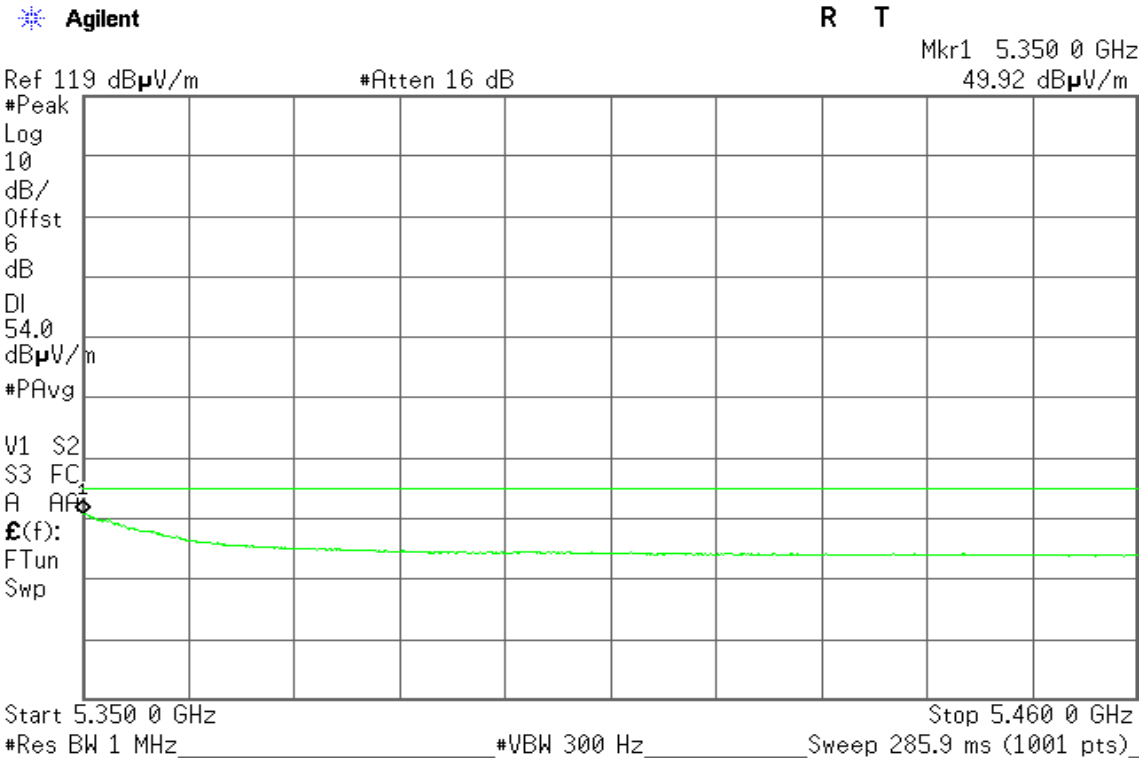


Band Edges (IEEE 802.11a mode / 5320 MHz)

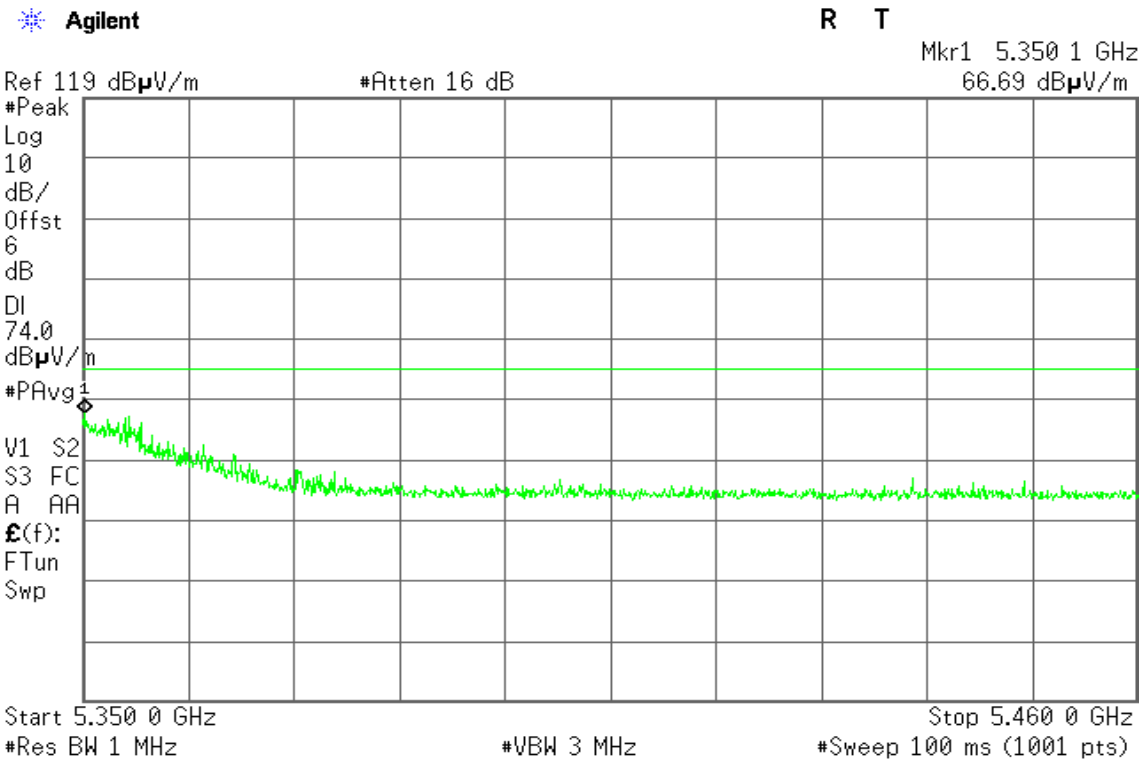
Detector mode: Peak Polarity: Vertical



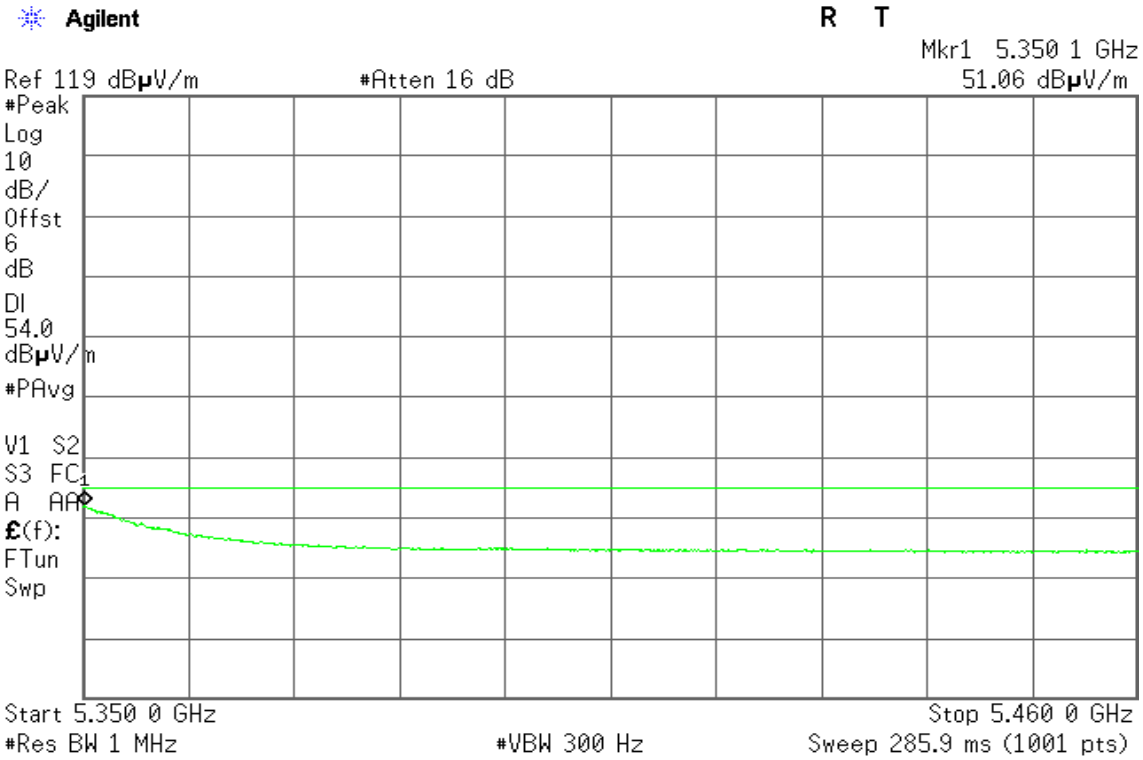
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

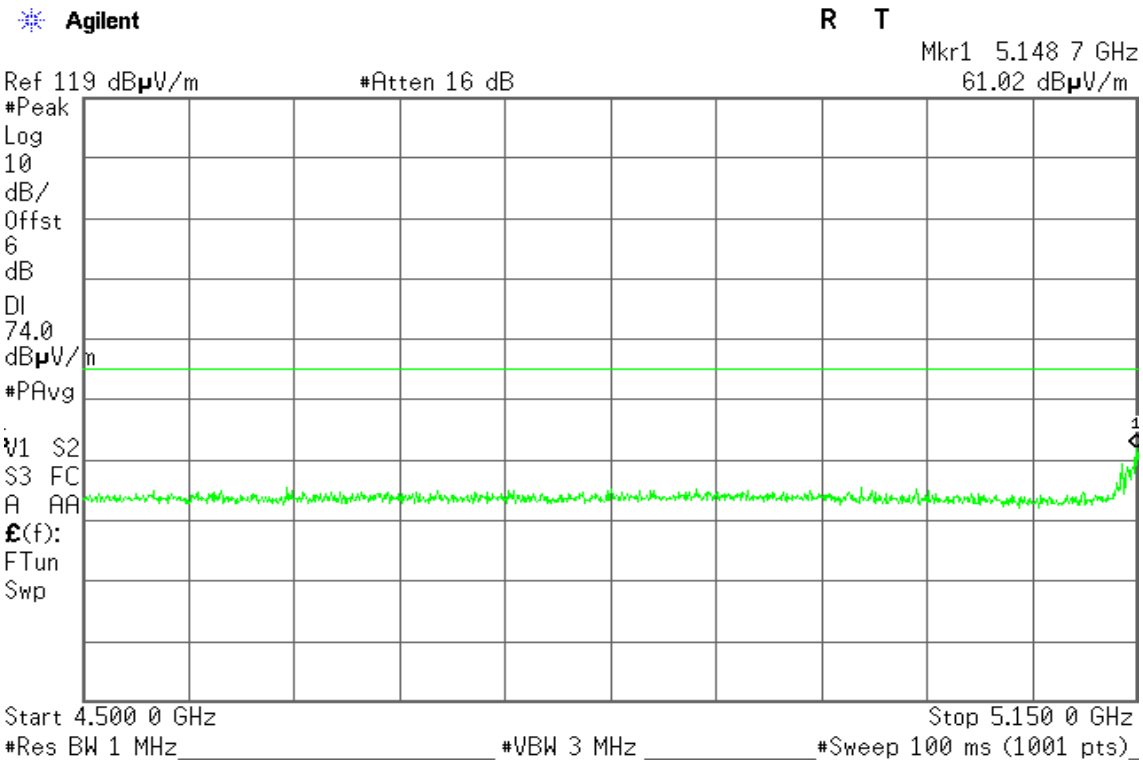


Detector mode: Average **Polarity: Horizontal**

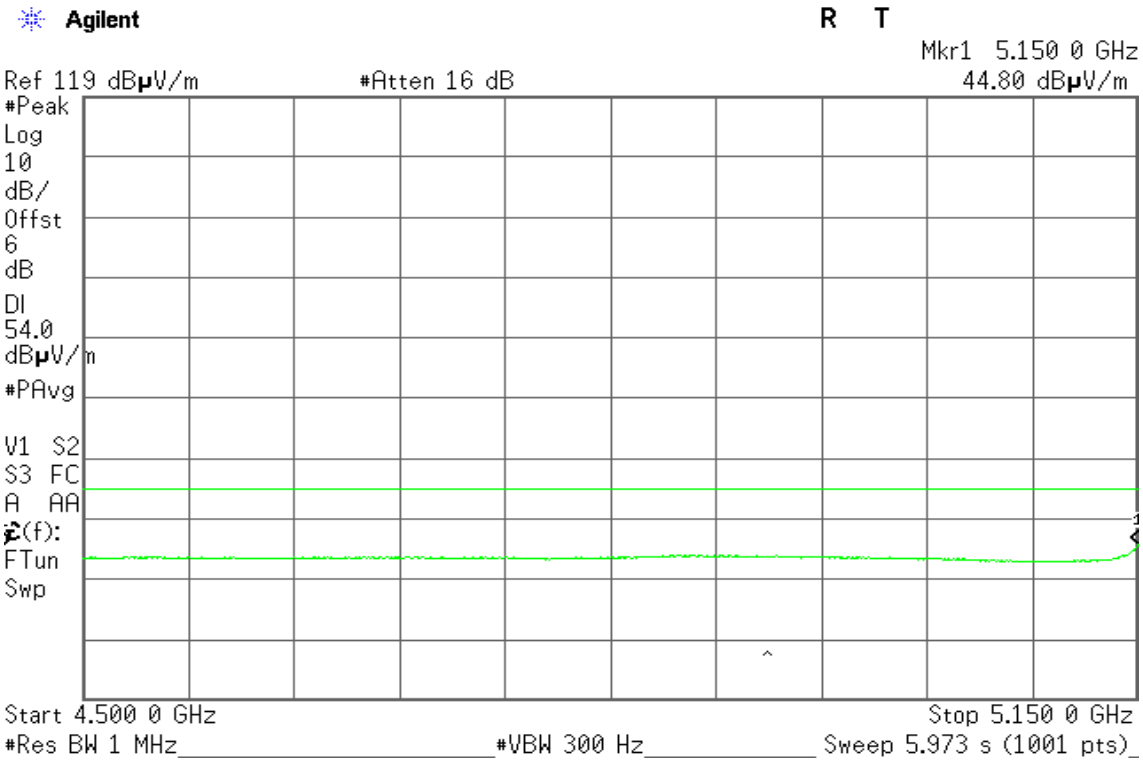


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5180 MHz)

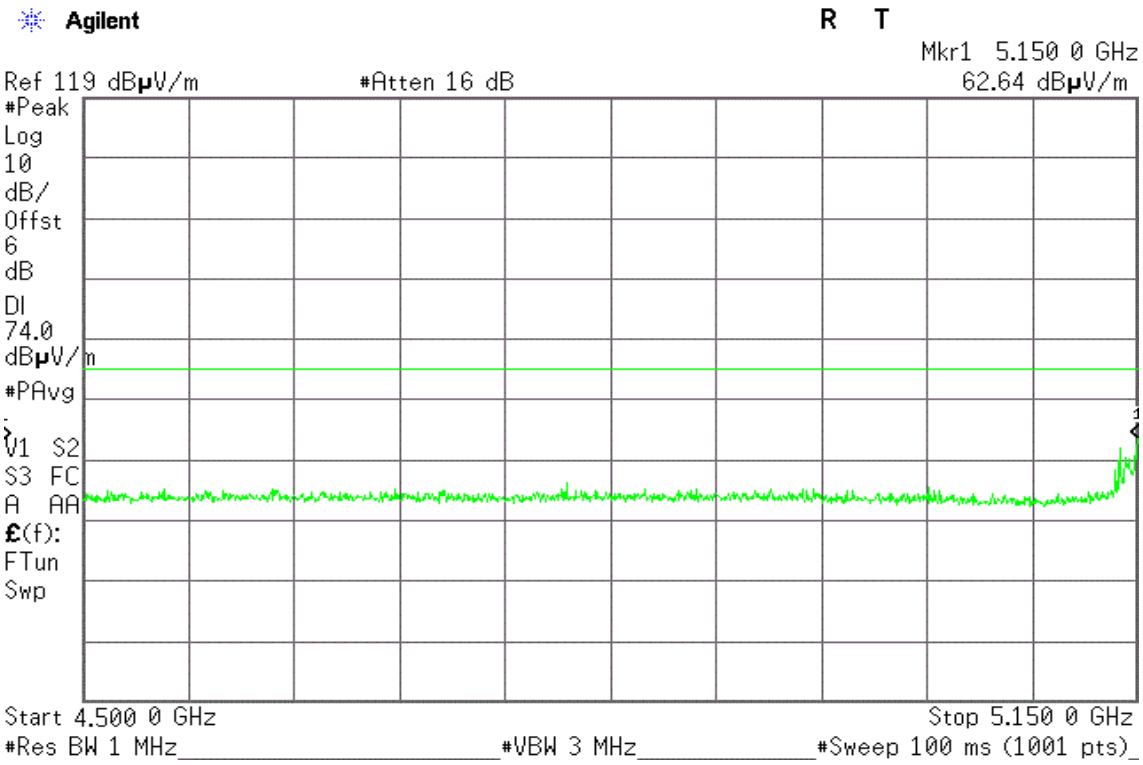
Detector mode: Peak Polarity: Vertical



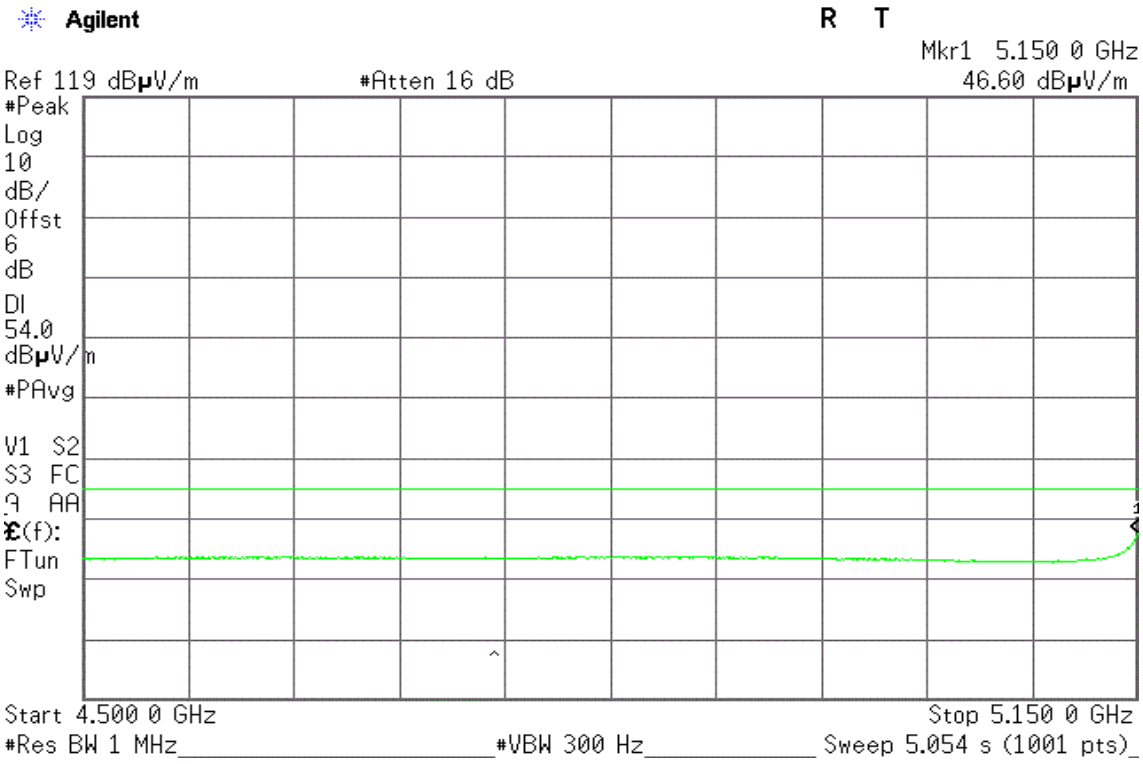
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal

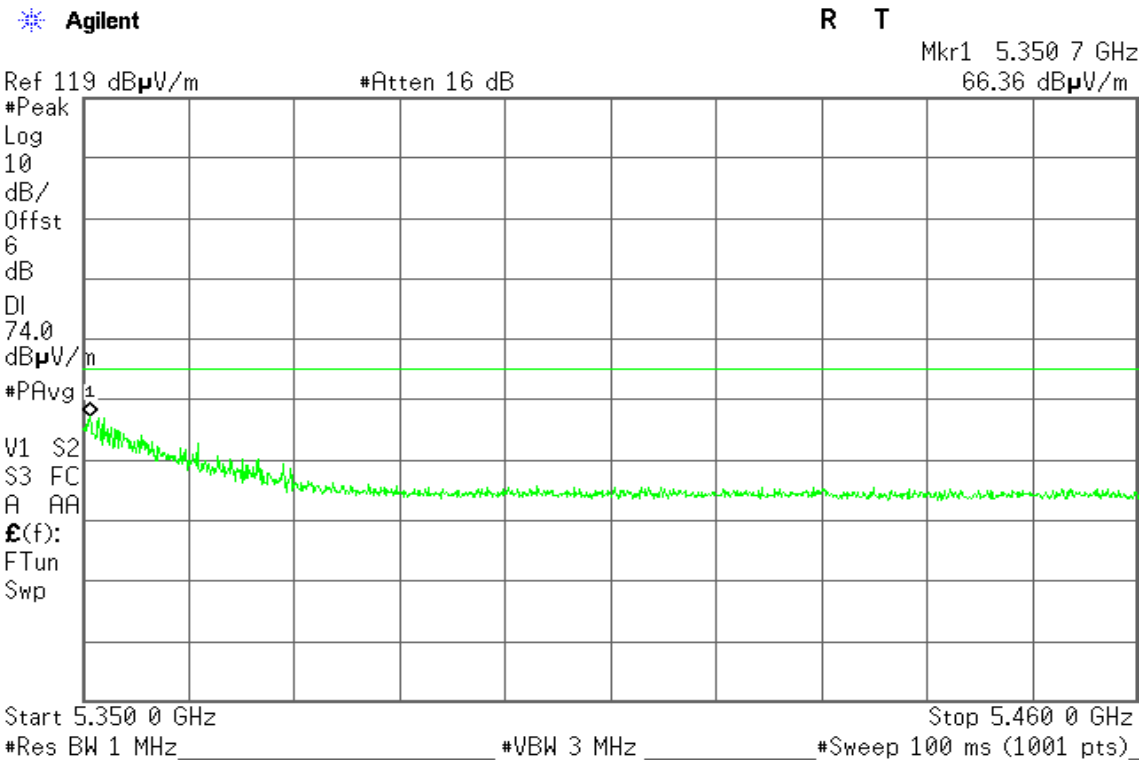


Detector mode: Average Polarity: Horizontal

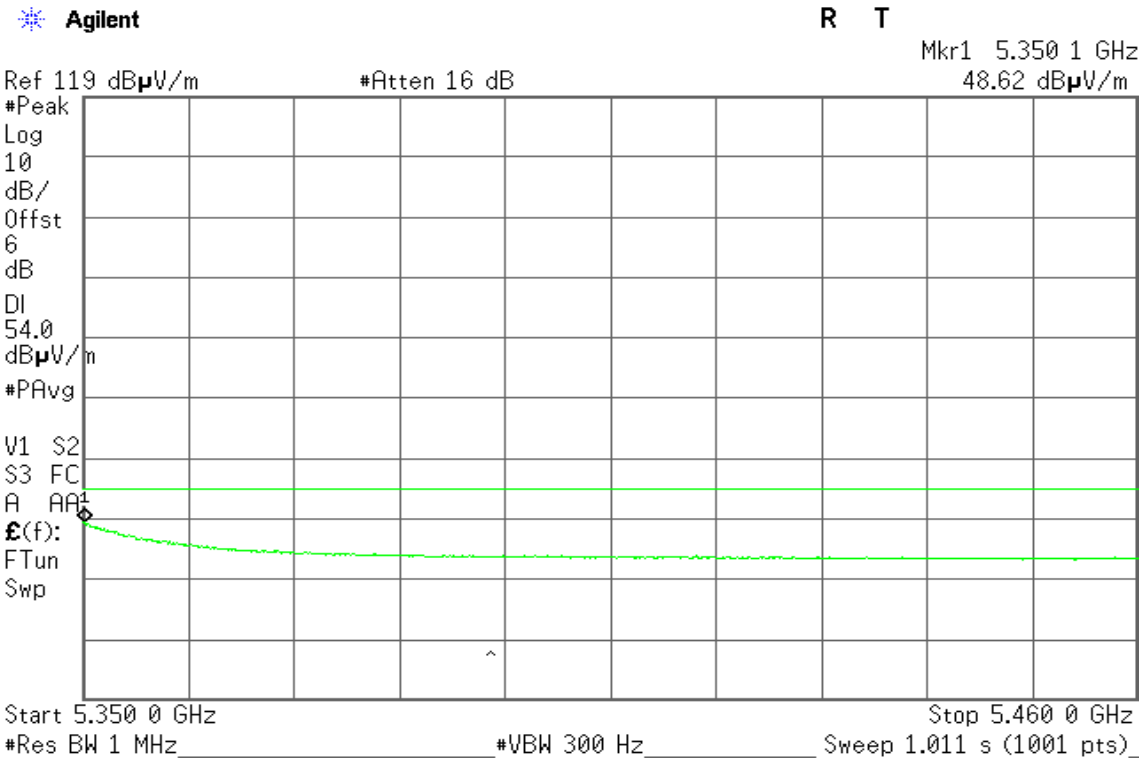


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5320 MHz)

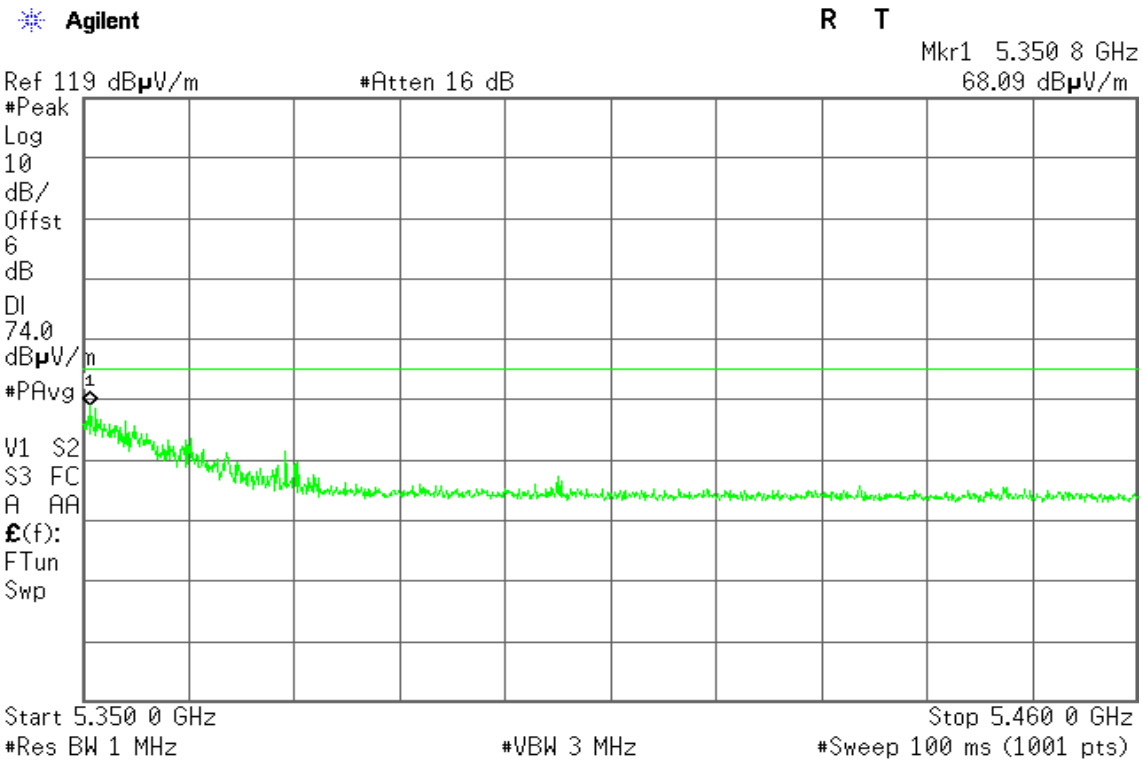
Detector mode: Peak Polarity: Vertical



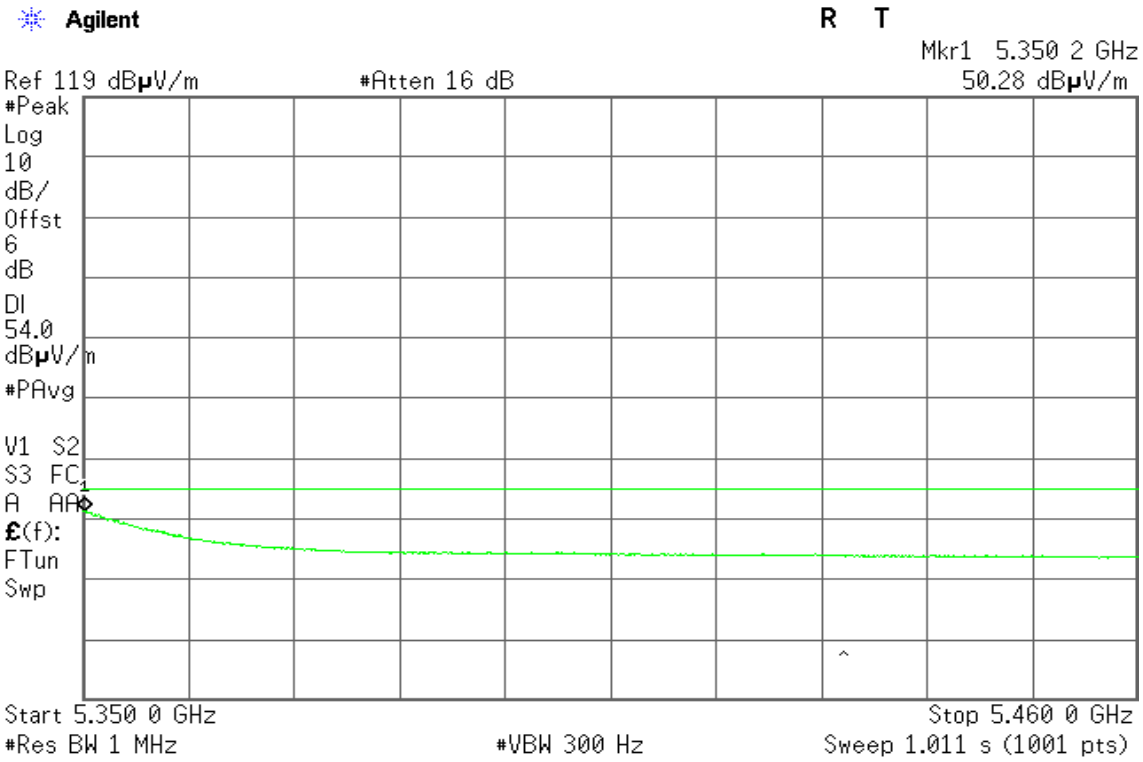
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal



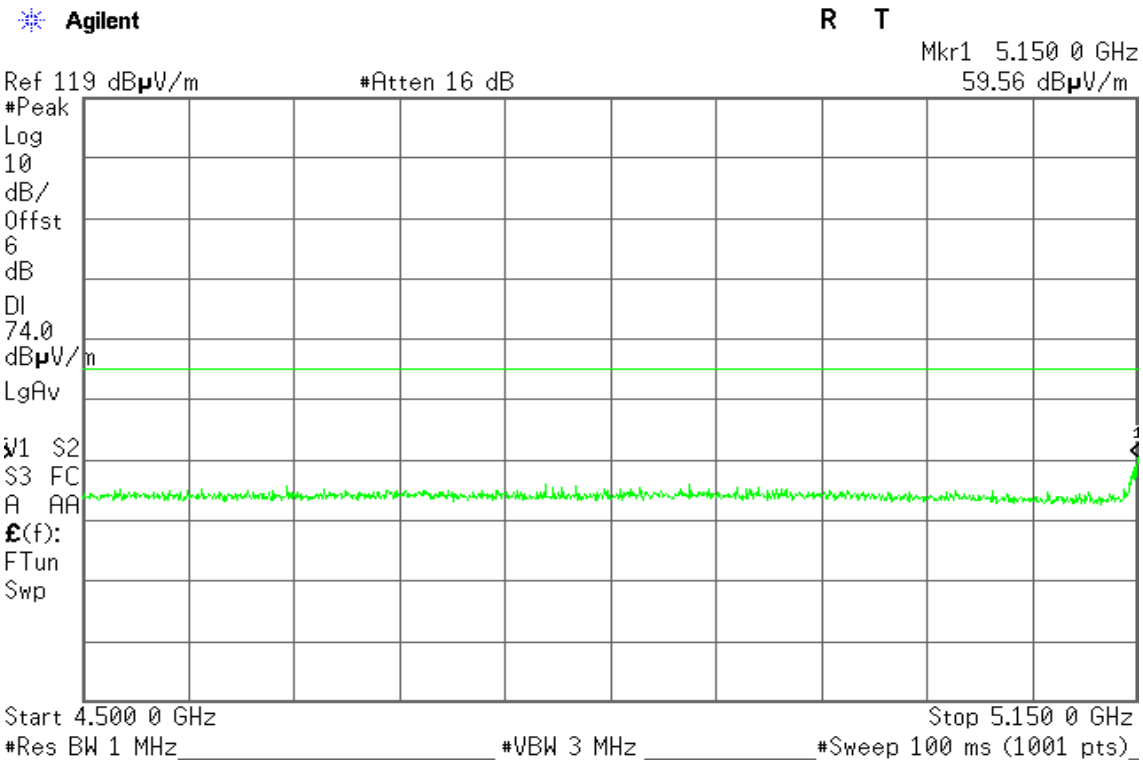
Detector mode: Average Polarity: Horizontal



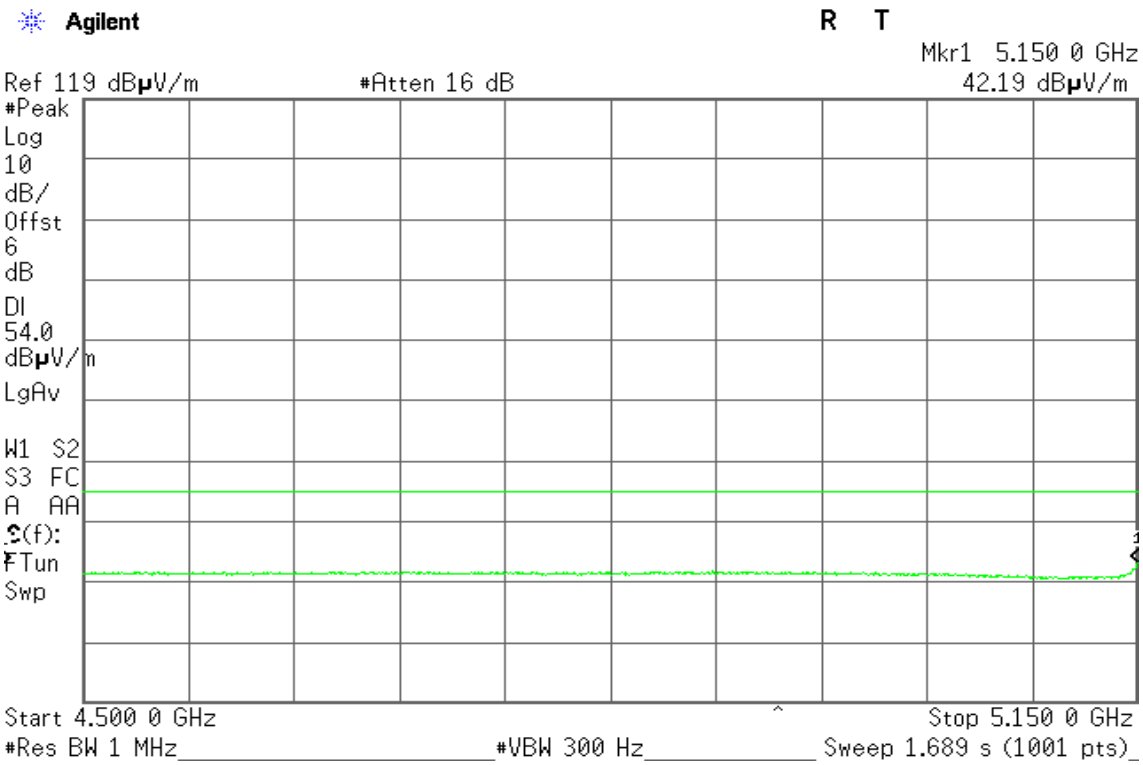
For Square Antenna

Band Edges (IEEE 802.11a mode / 5180 MHz)

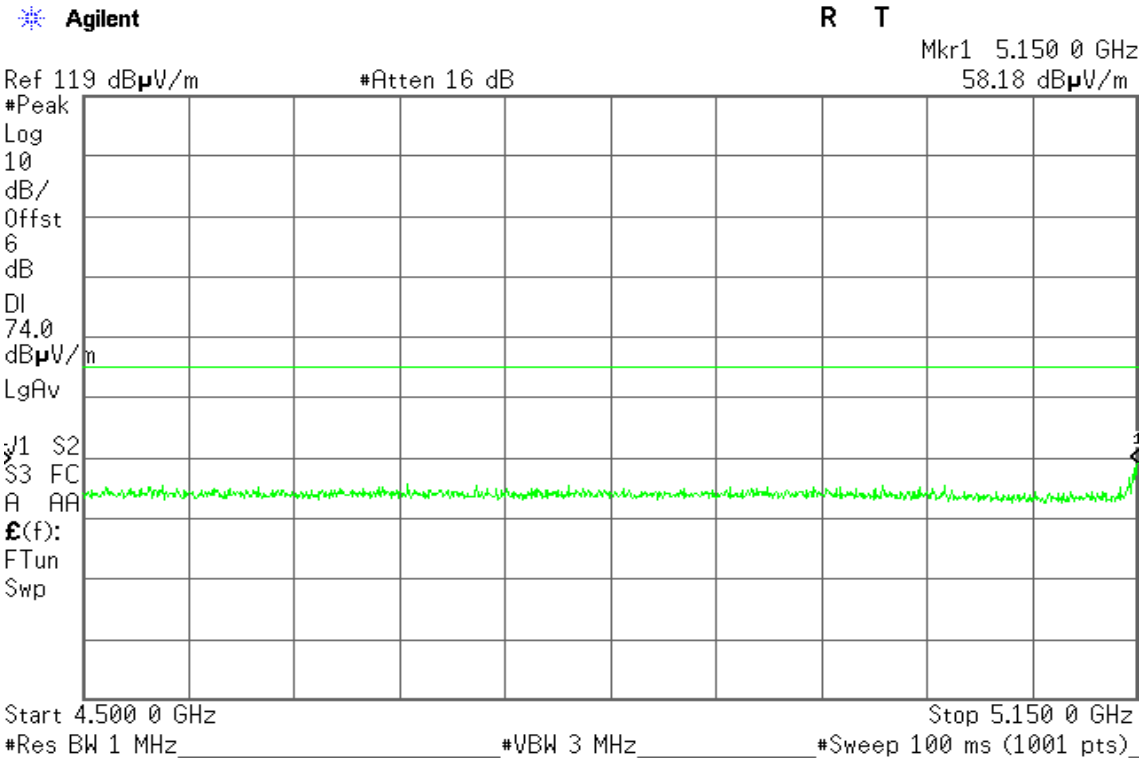
Detector mode: Peak Polarity: Vertical



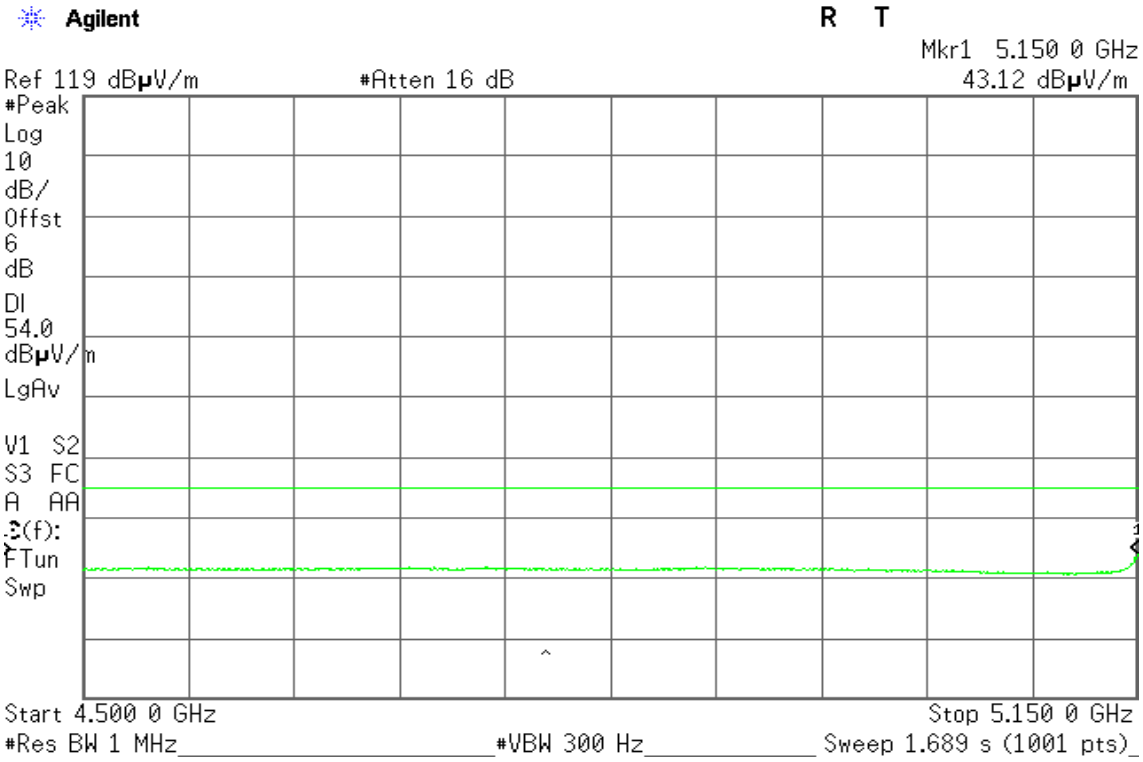
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

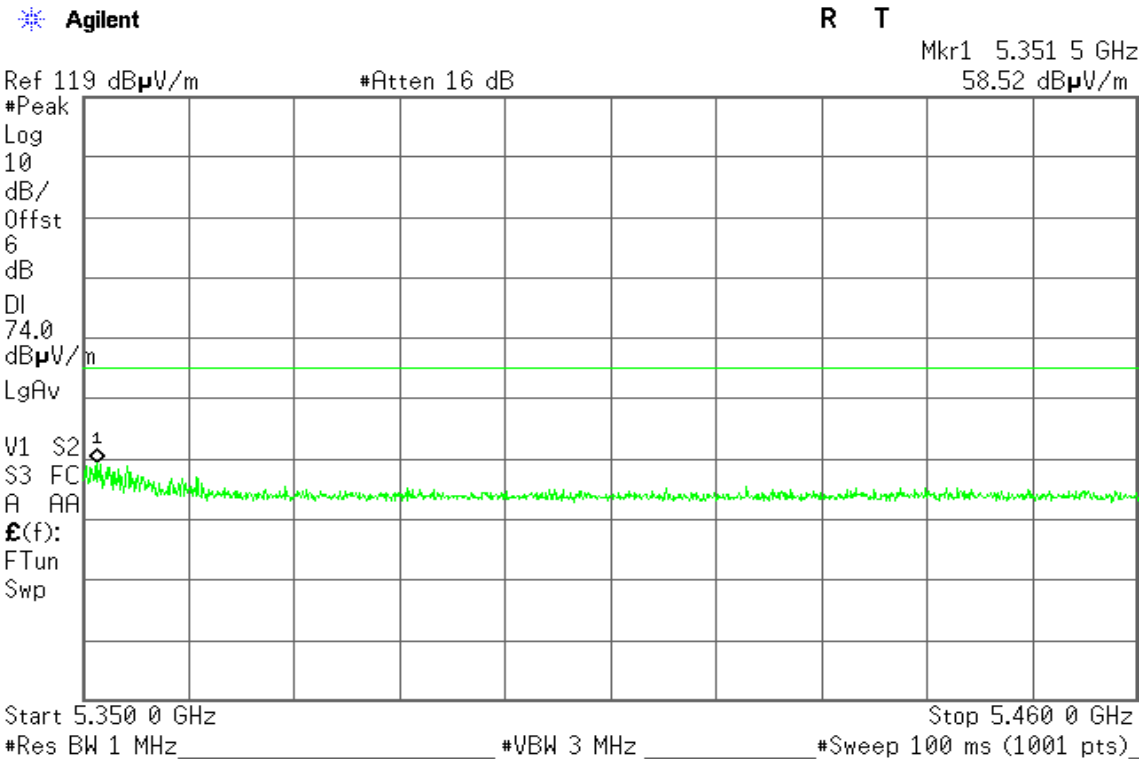


Detector mode: Average **Polarity: Horizontal**

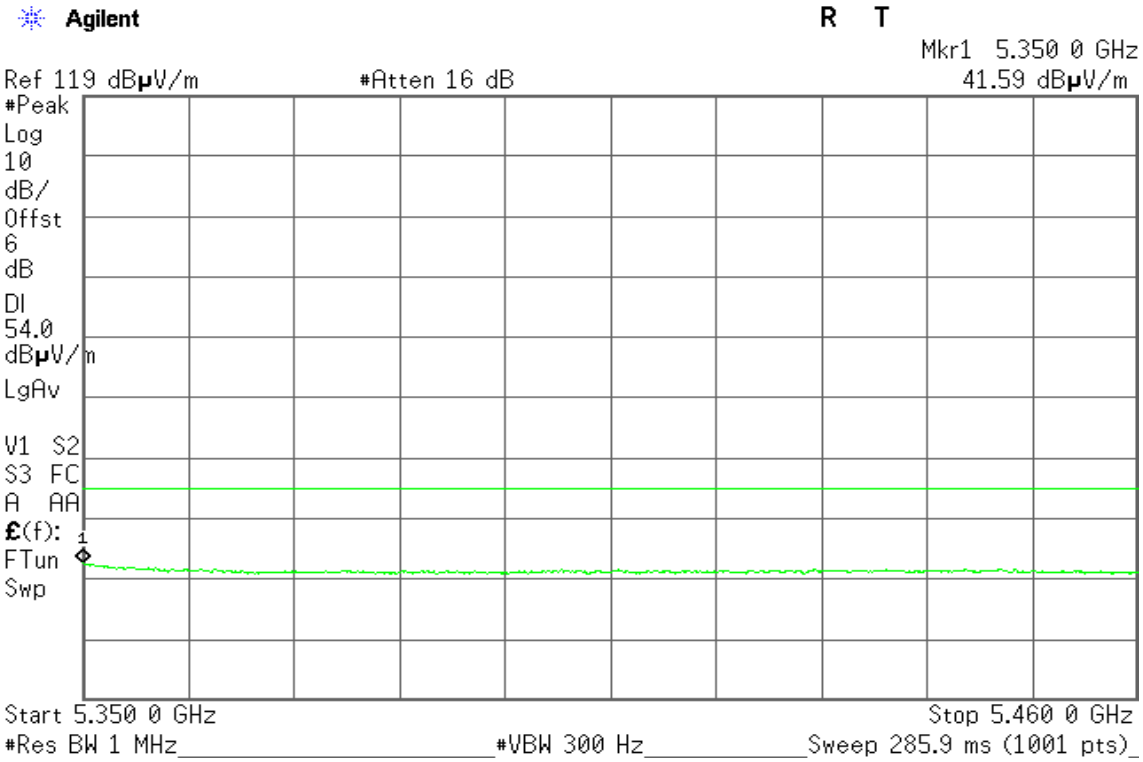


Band Edges (IEEE 802.11a mode / 5320 MHz)

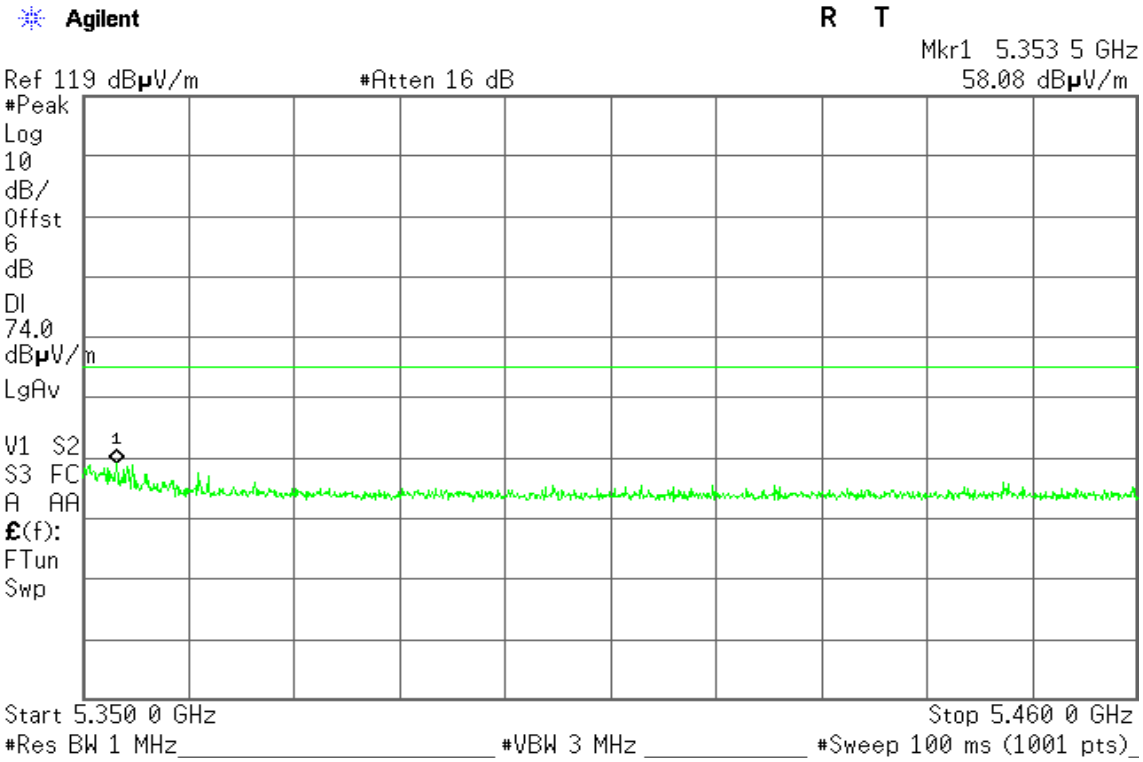
Detector mode: Peak Polarity: Vertical



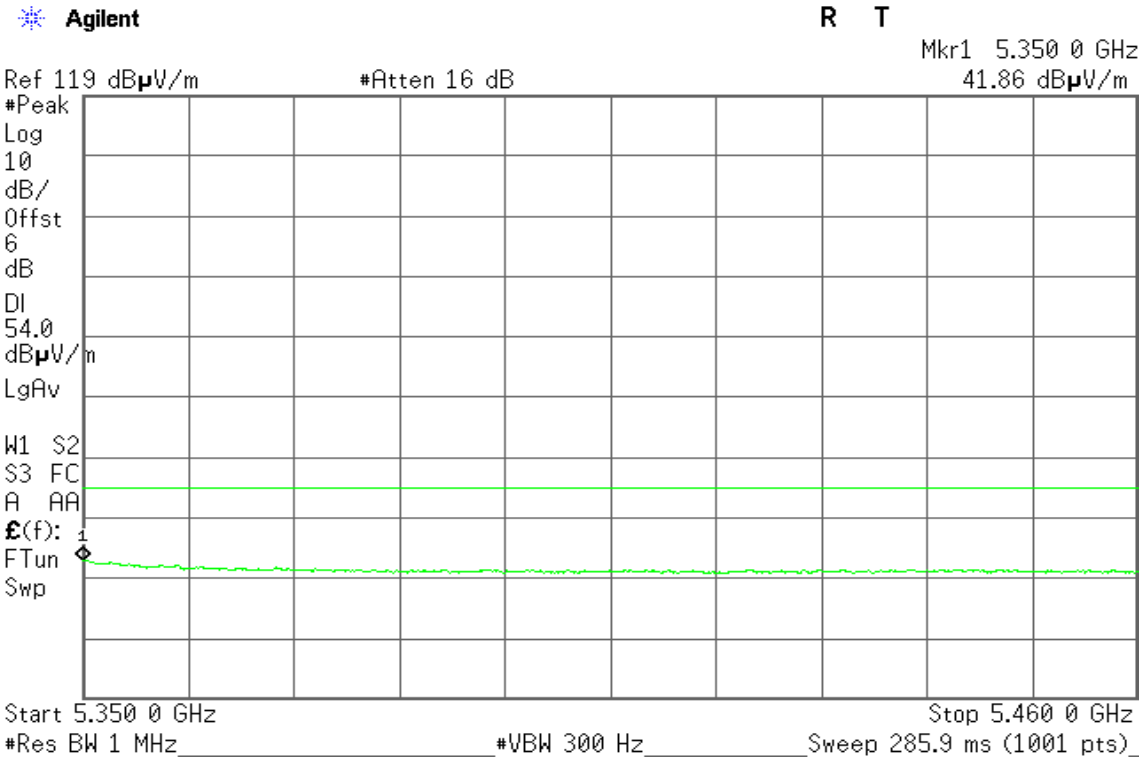
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

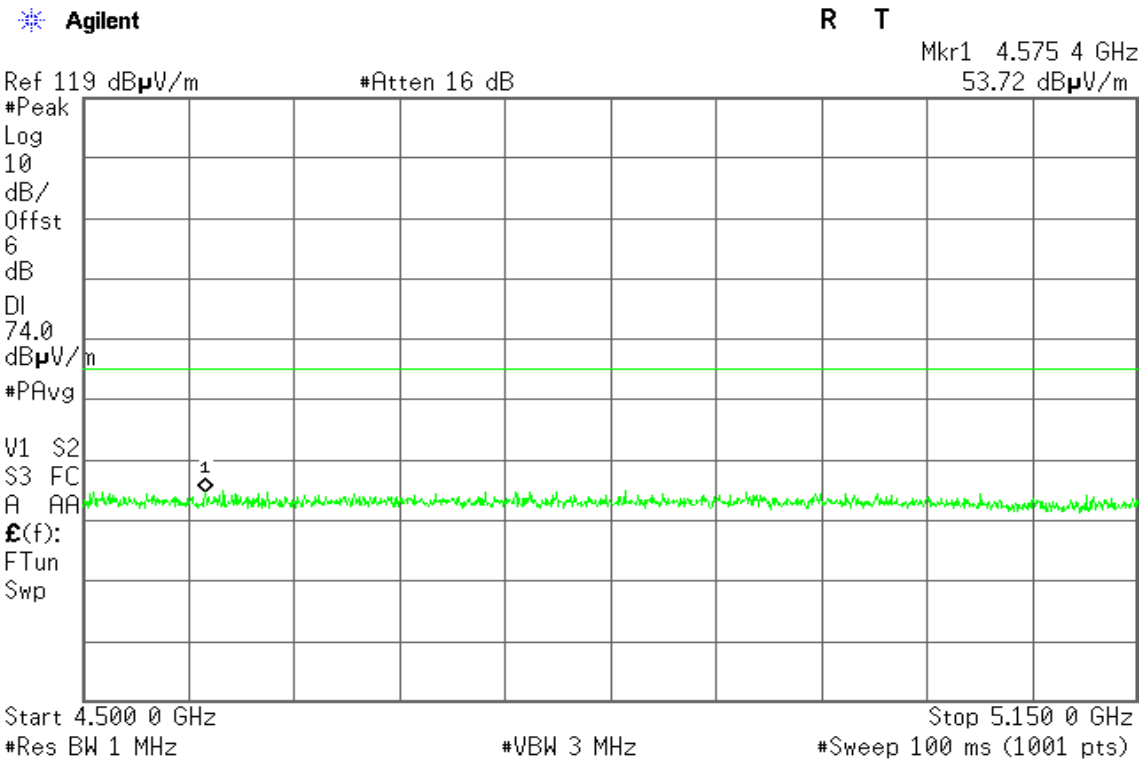


Detector mode: Average **Polarity: Horizontal**

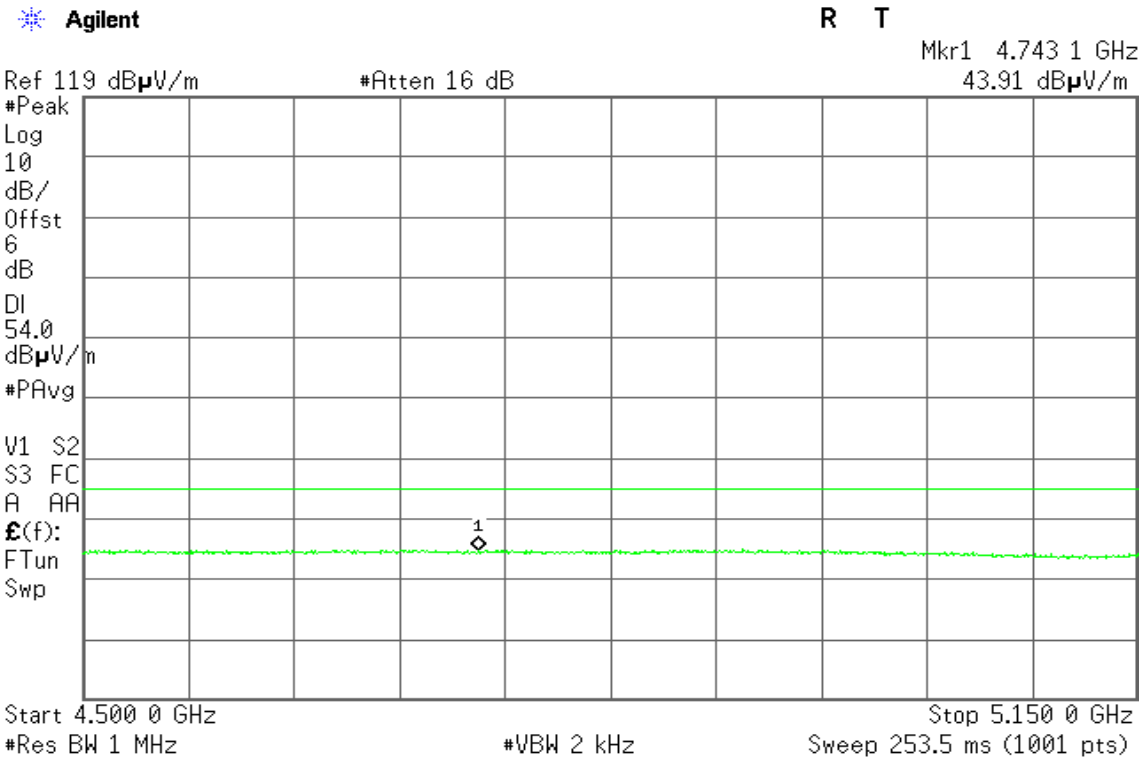


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5180 MHz)

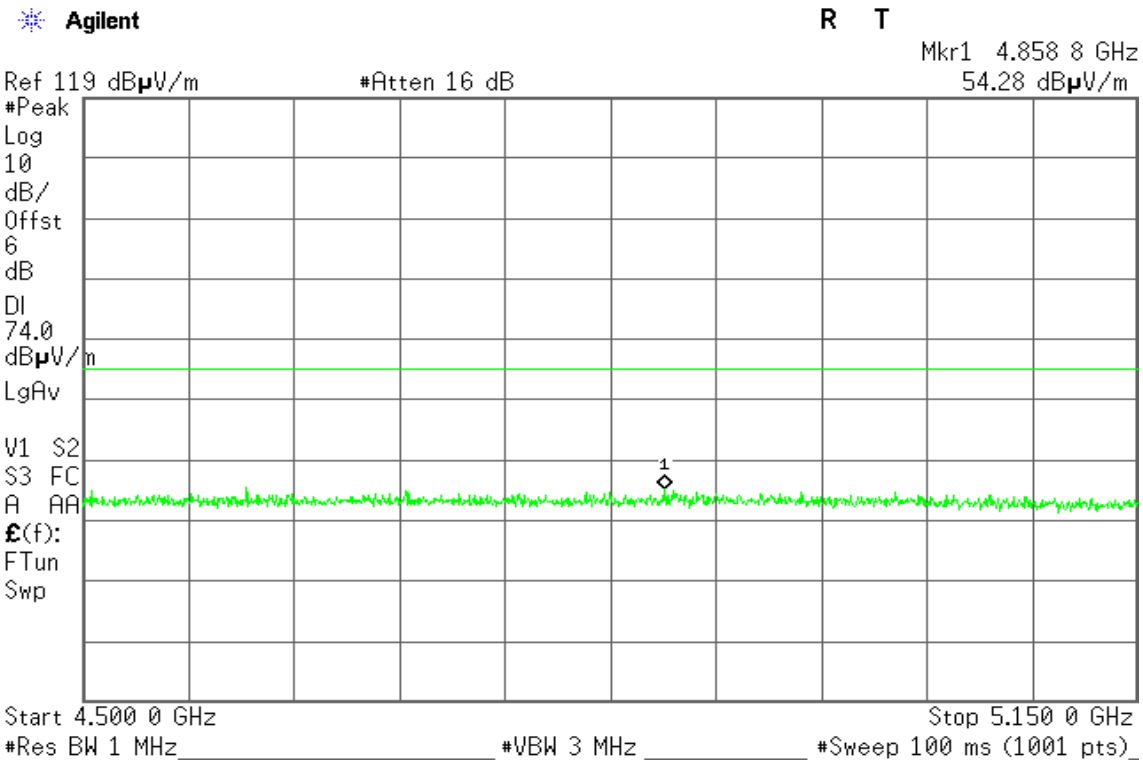
Detector mode: Peak Polarity: Vertical



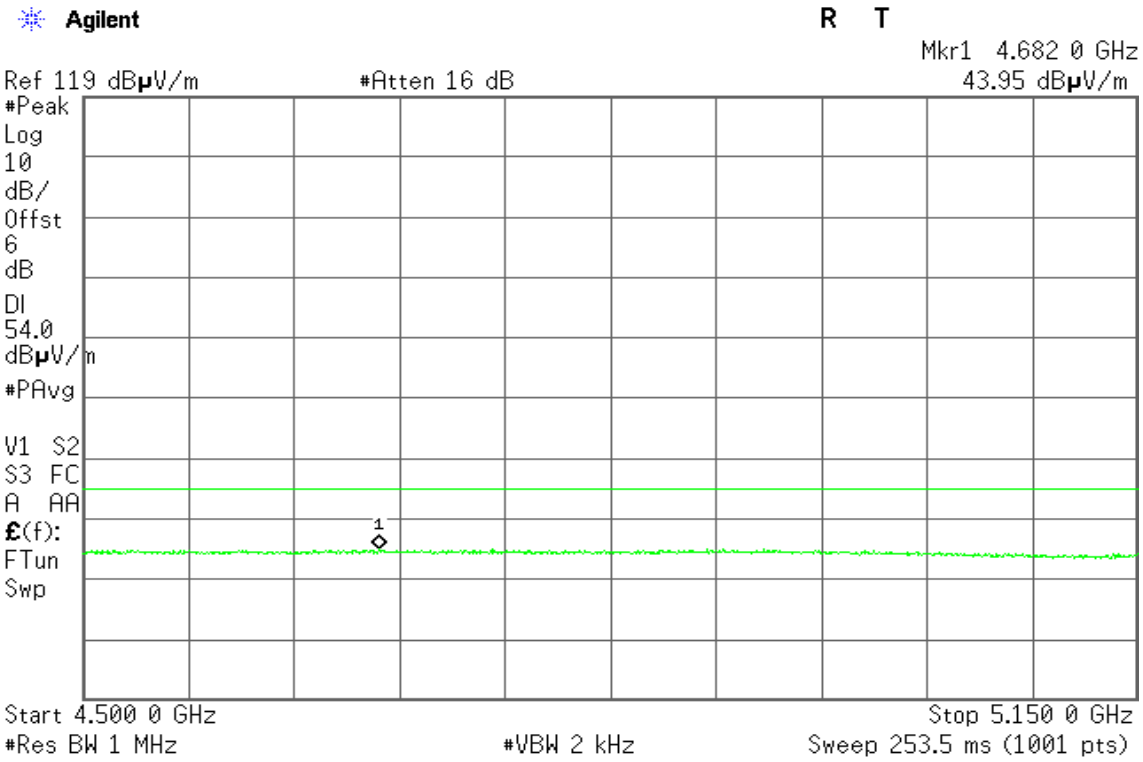
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal

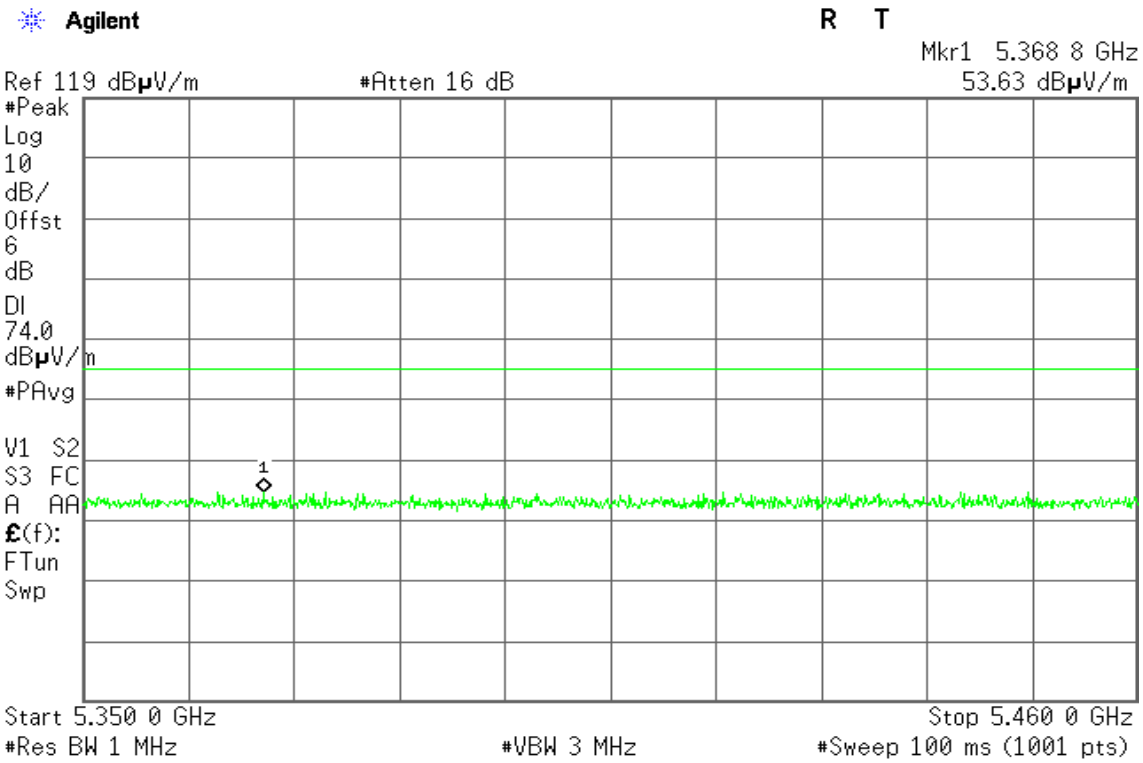


Detector mode: Average Polarity: Horizontal

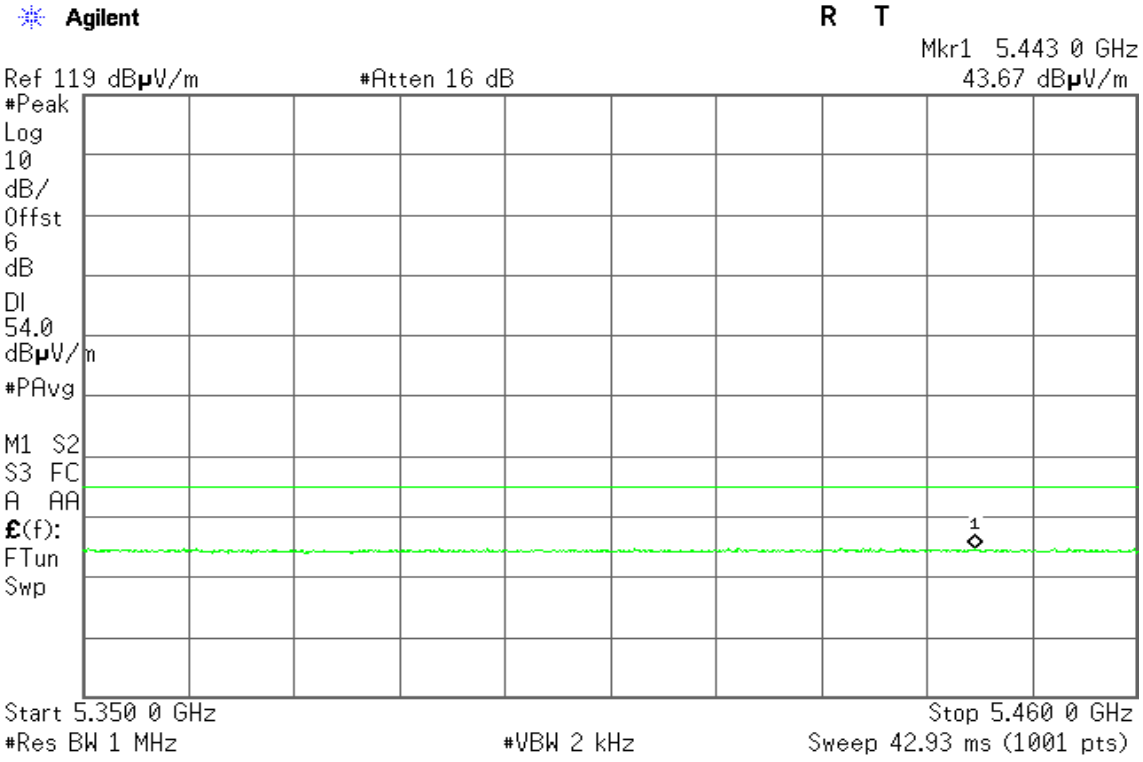


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5320 MHz)

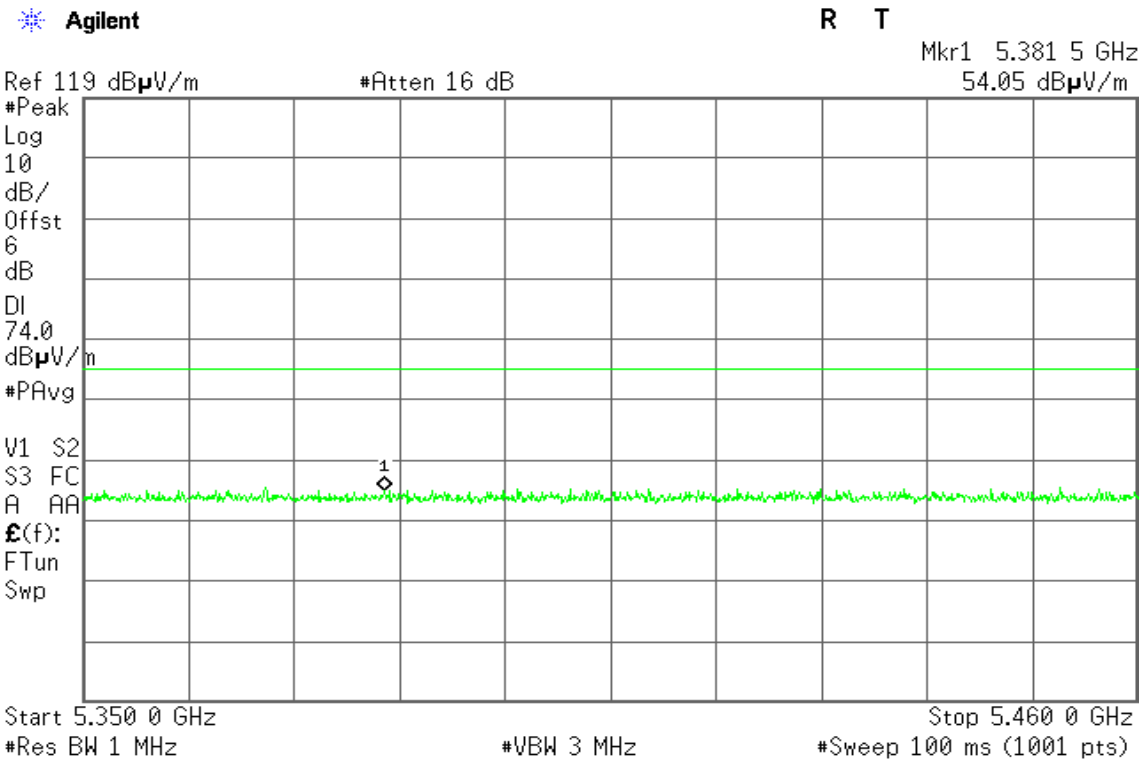
Detector mode: Peak Polarity: Vertical



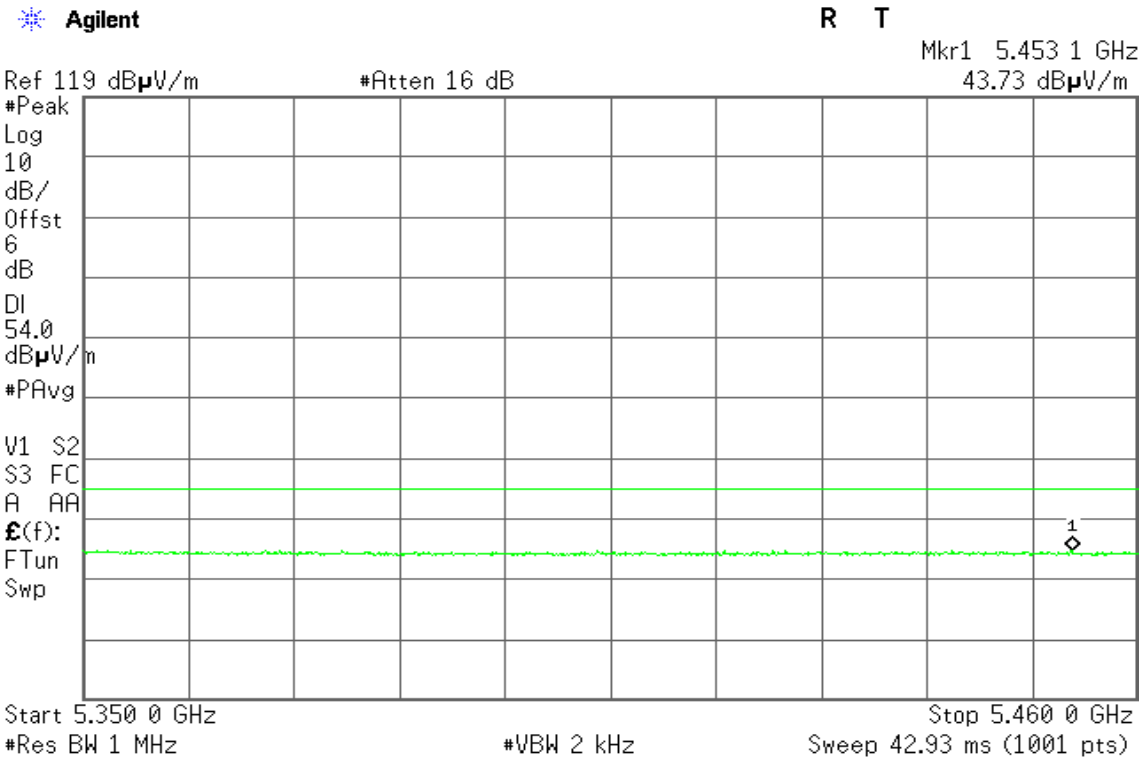
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal



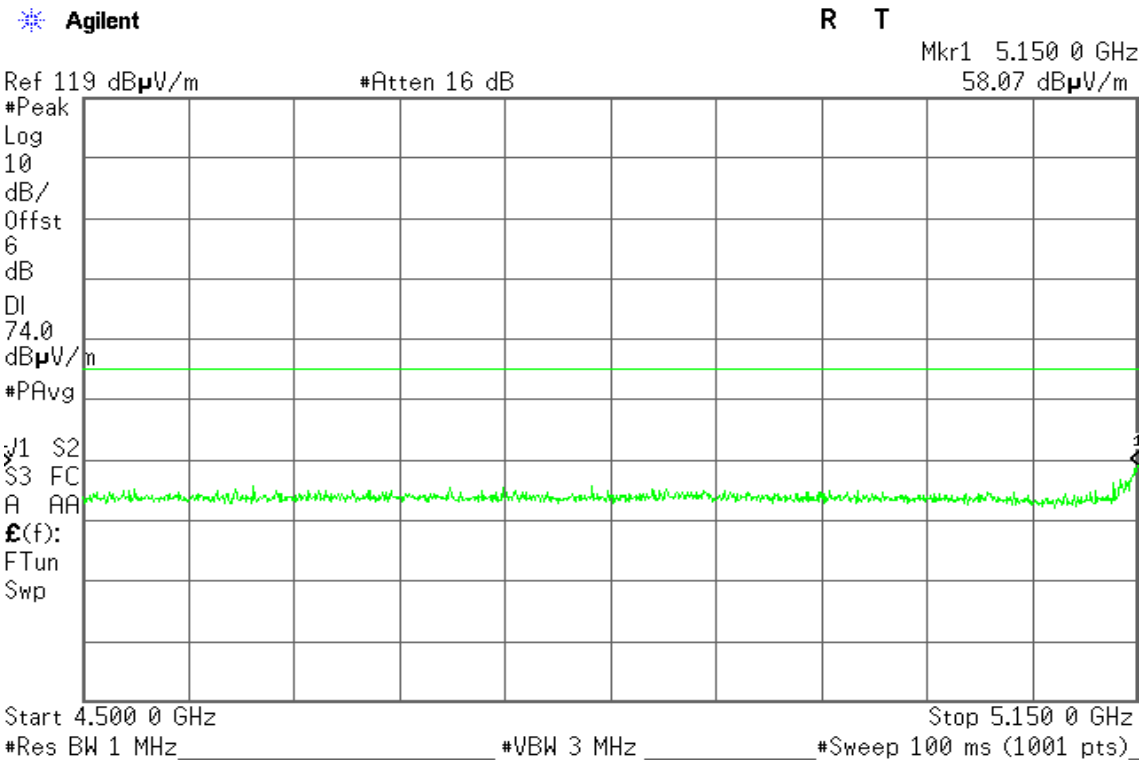
Detector mode: Average Polarity: Horizontal



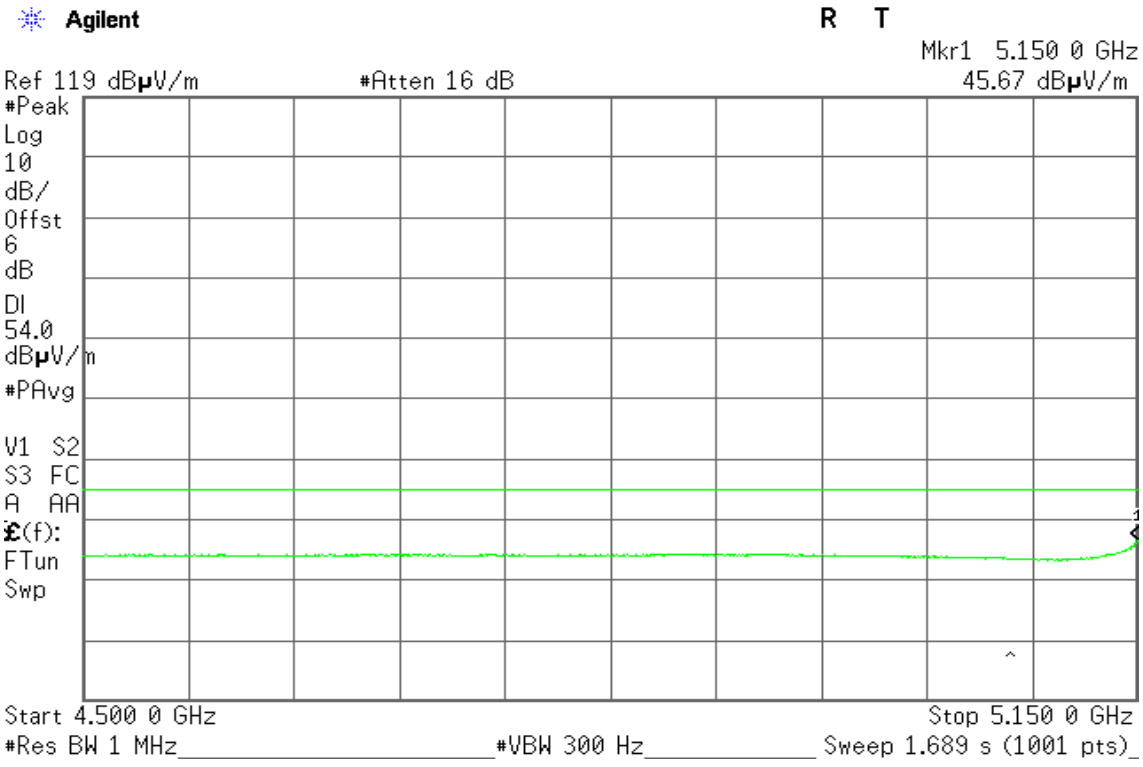
For Round Antenna

Band Edges (IEEE 802.11a mode / 5180 MHz)

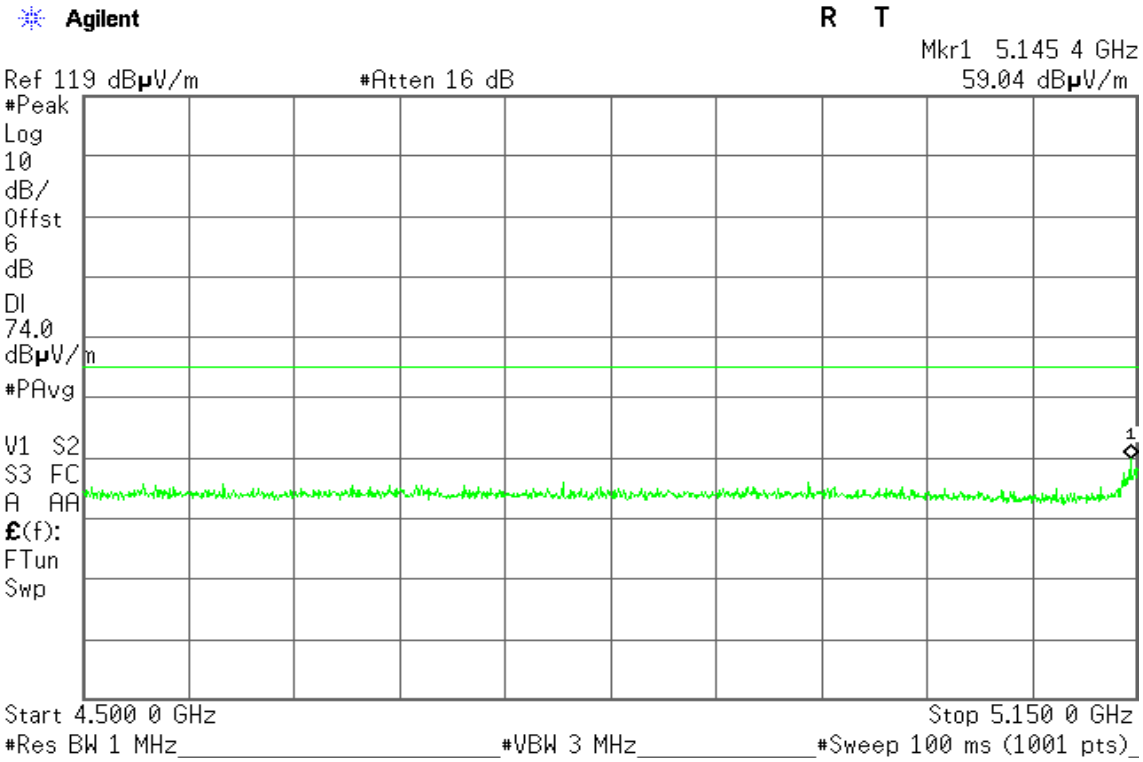
Detector mode: Peak Polarity: Vertical



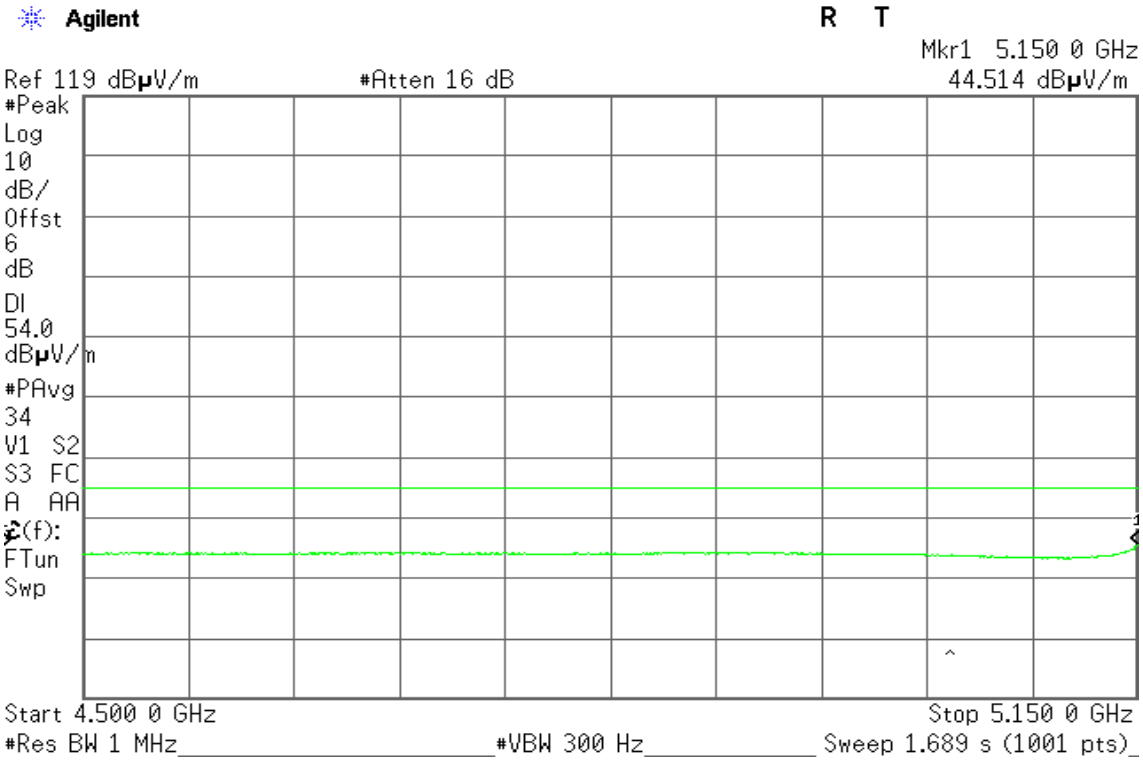
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

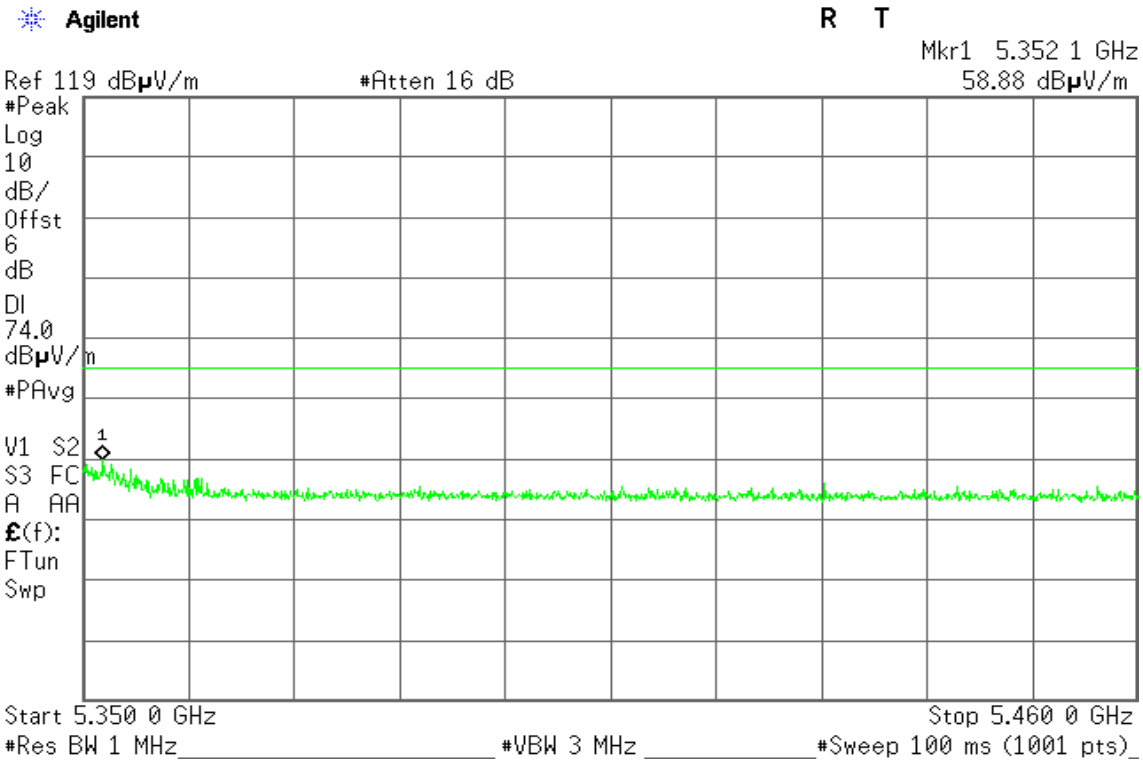


Detector mode: Average **Polarity: Horizontal**

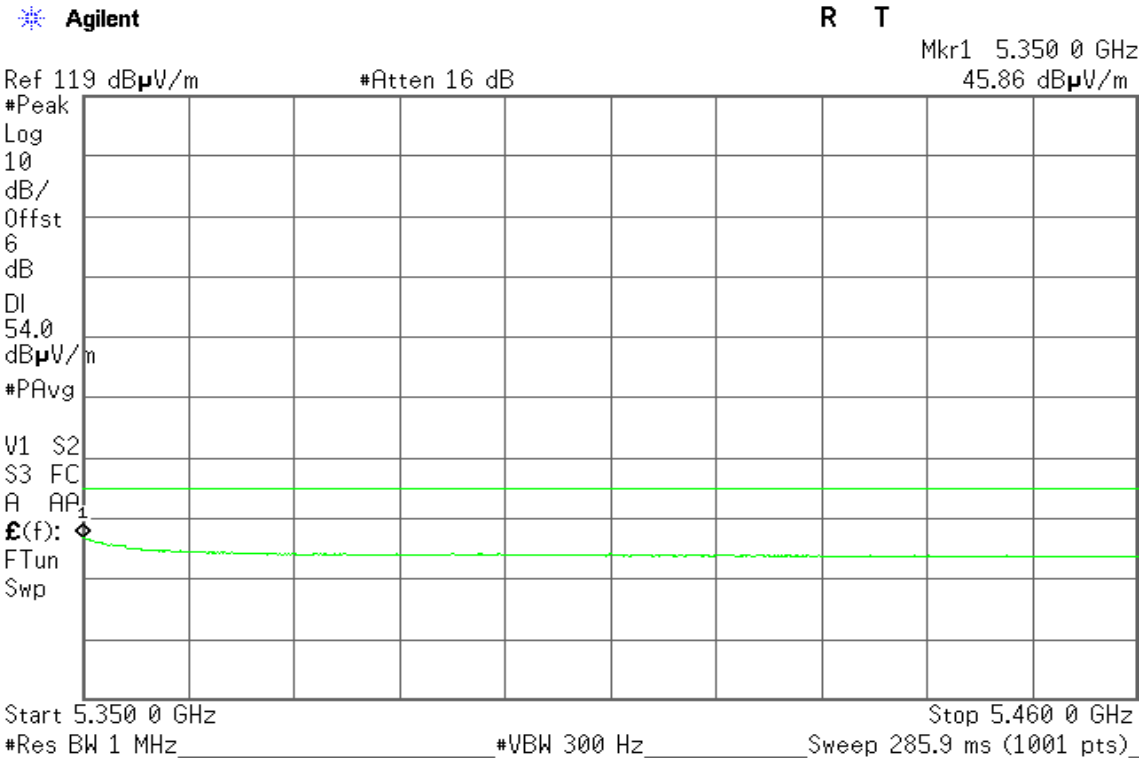


Band Edges (IEEE 802.11a mode / 5320 MHz)

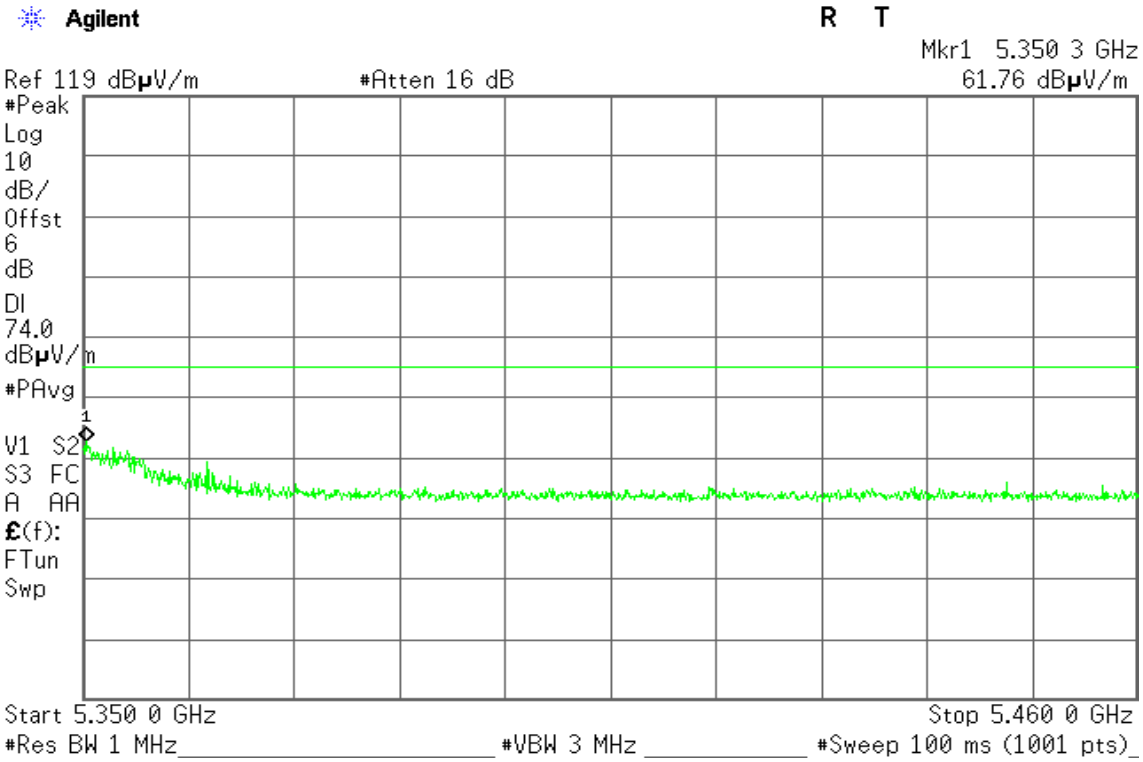
Detector mode: Peak Polarity: Vertical



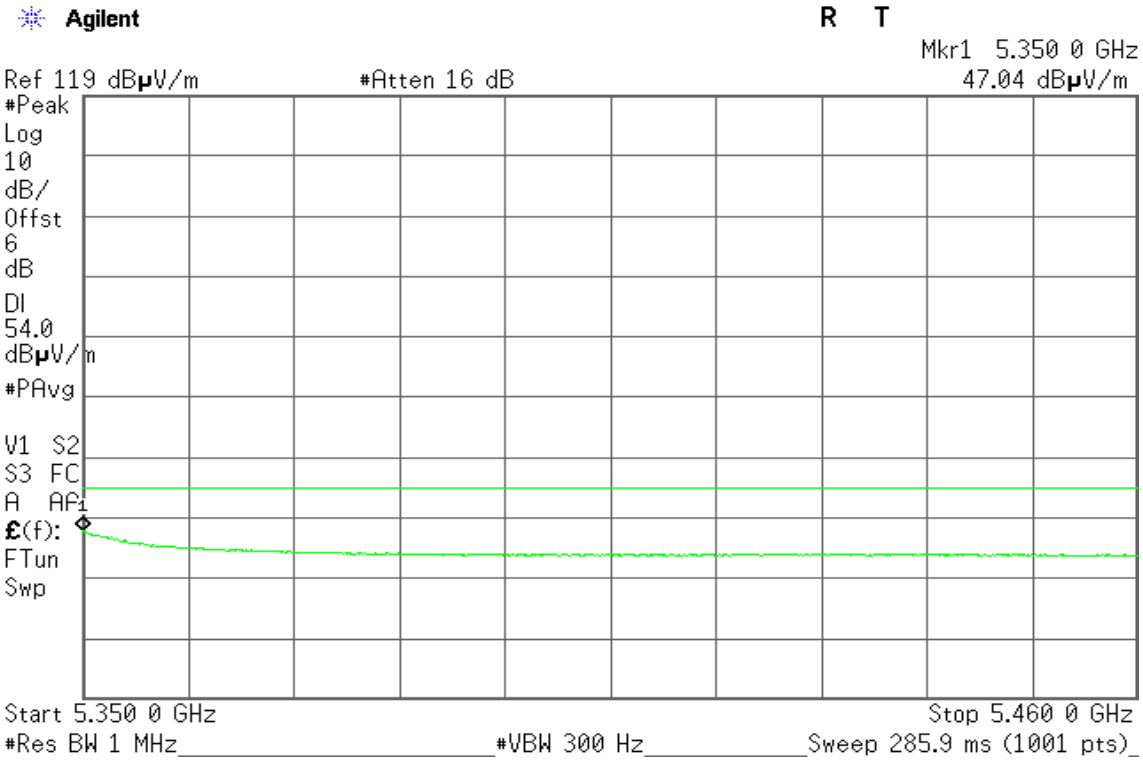
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

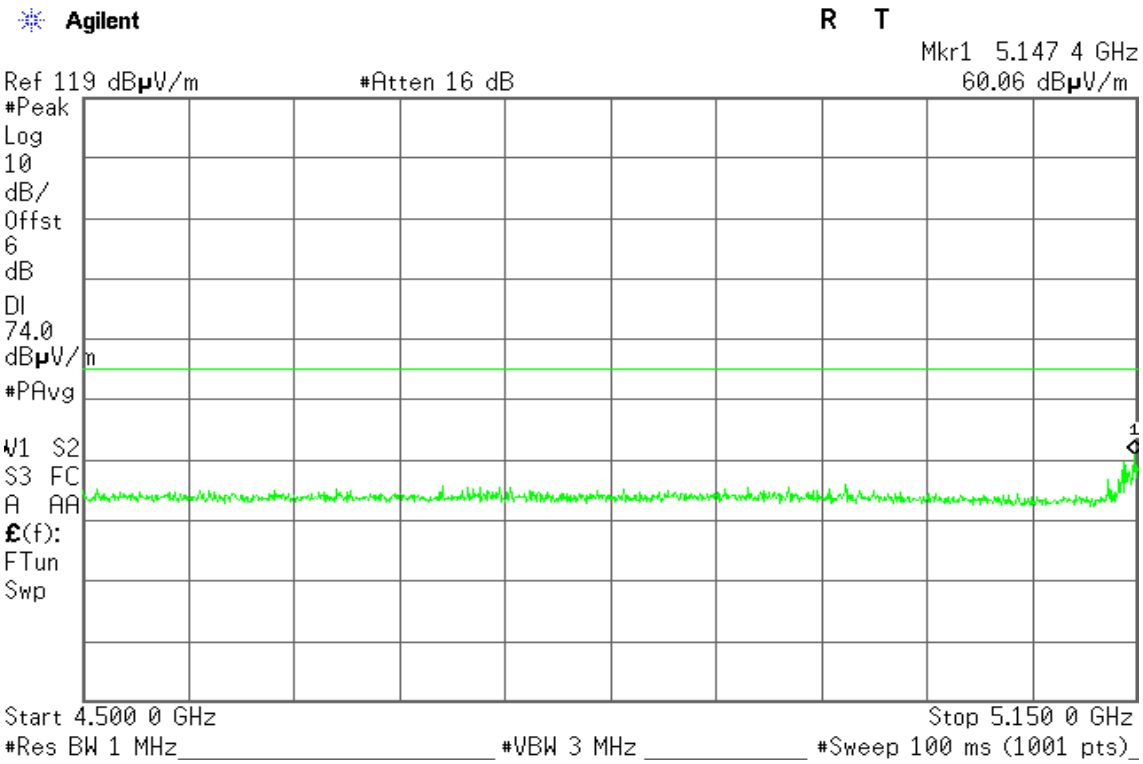


Detector mode: Average **Polarity: Horizontal**

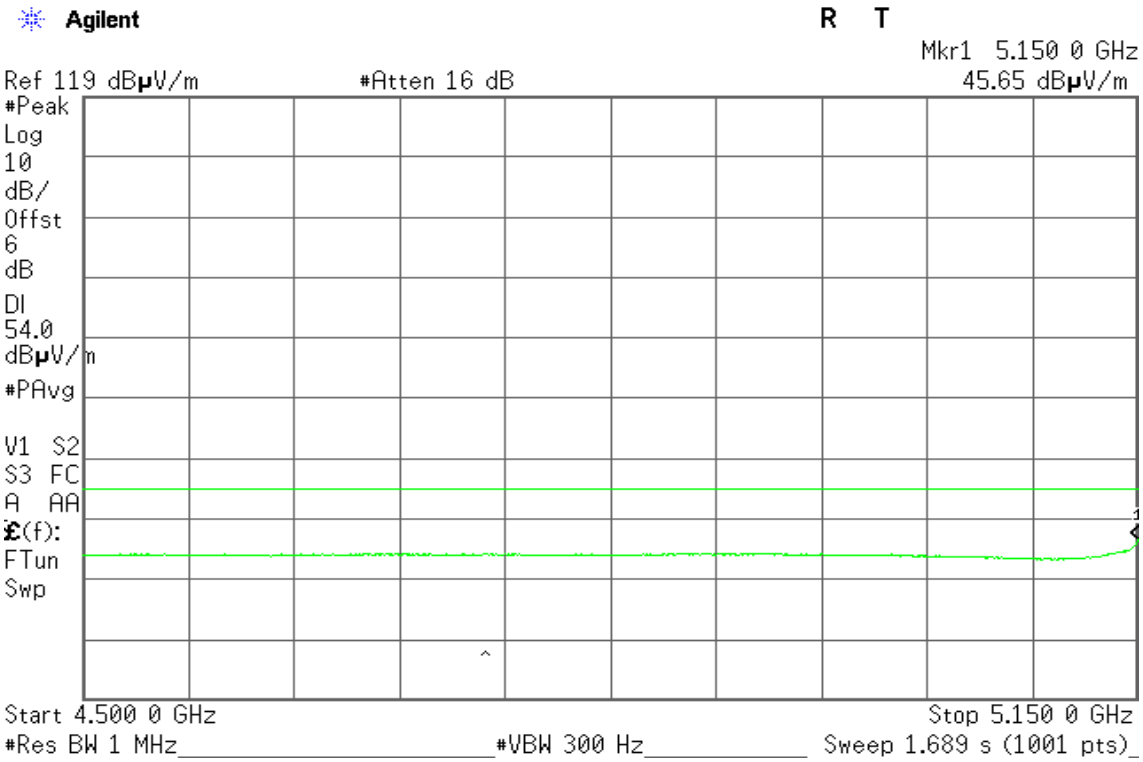


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5180 MHz)

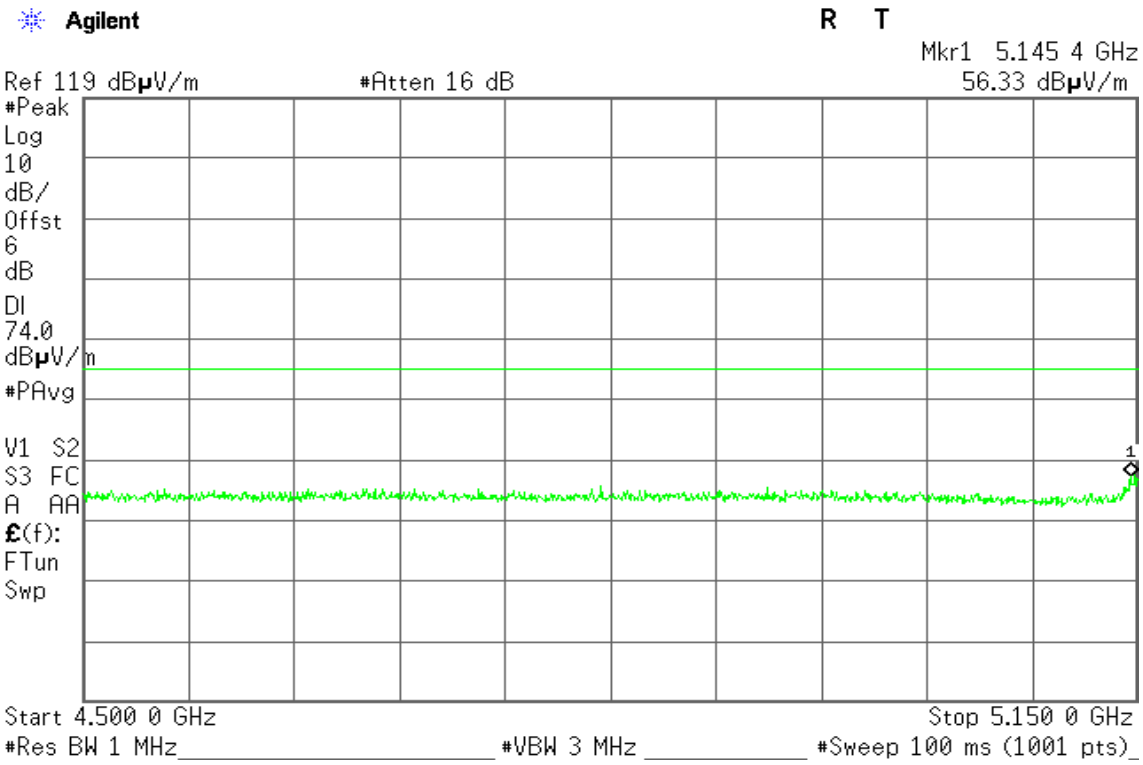
Detector mode: Peak Polarity: Vertical



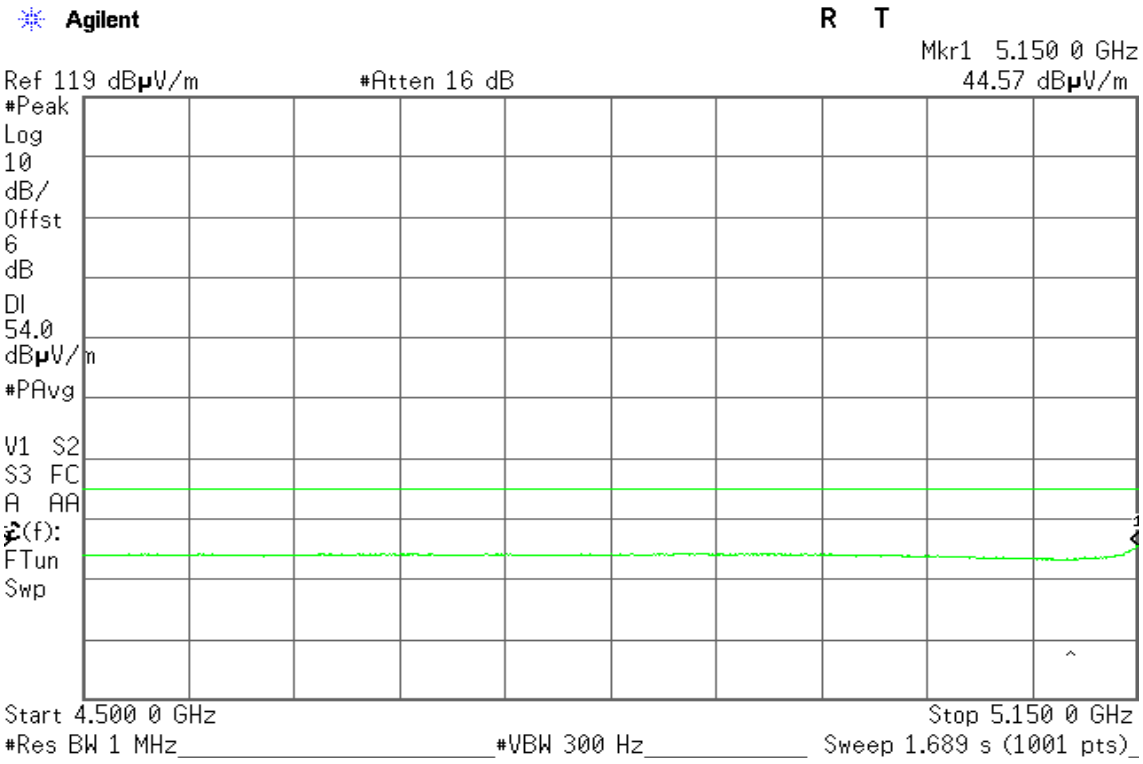
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal

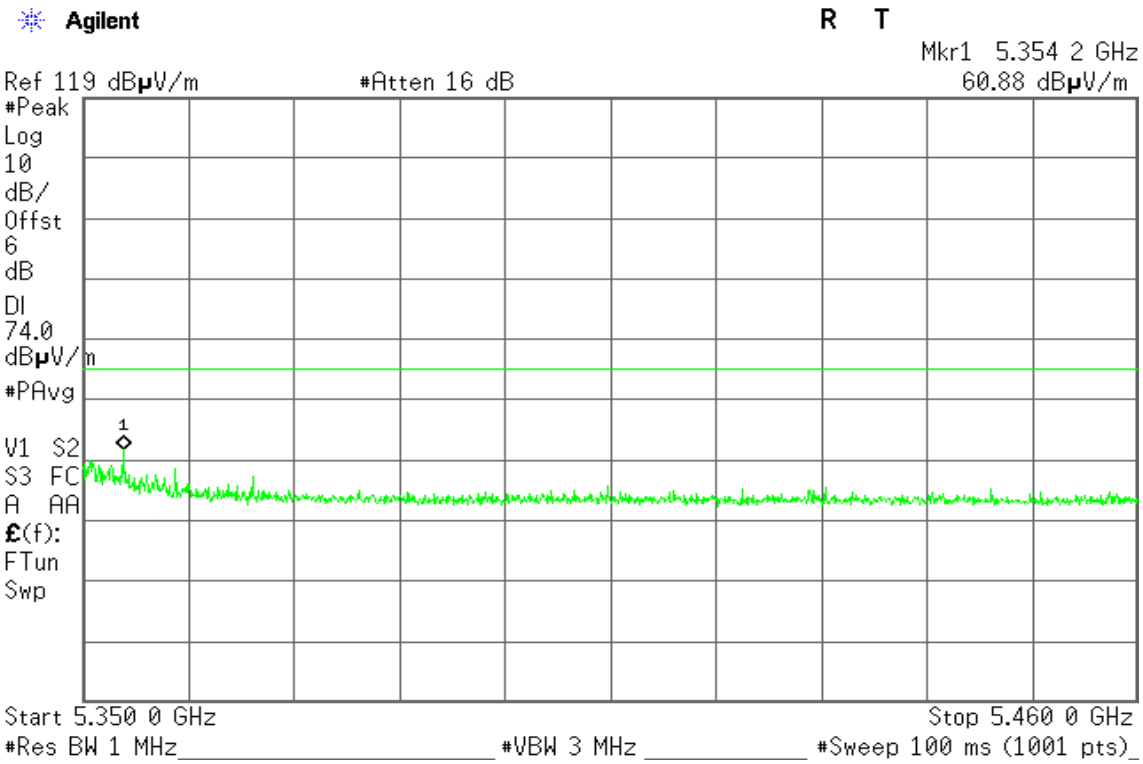


Detector mode: Average Polarity: Horizontal

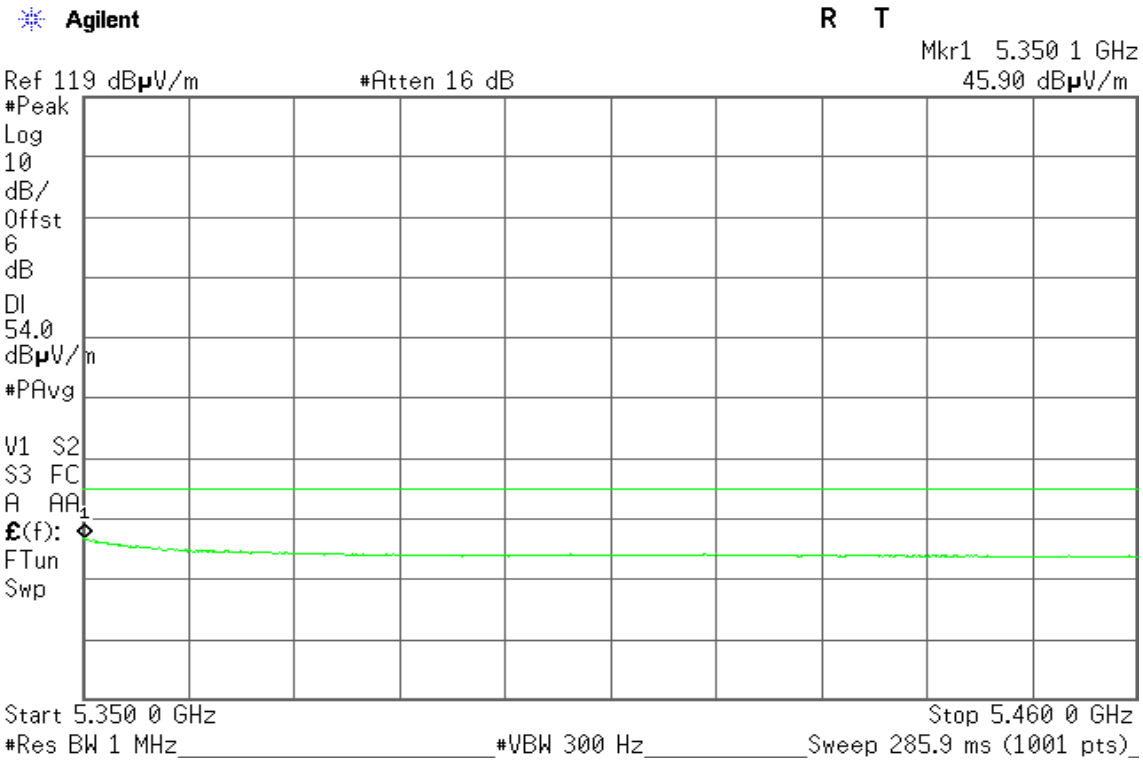


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5320 MHz)

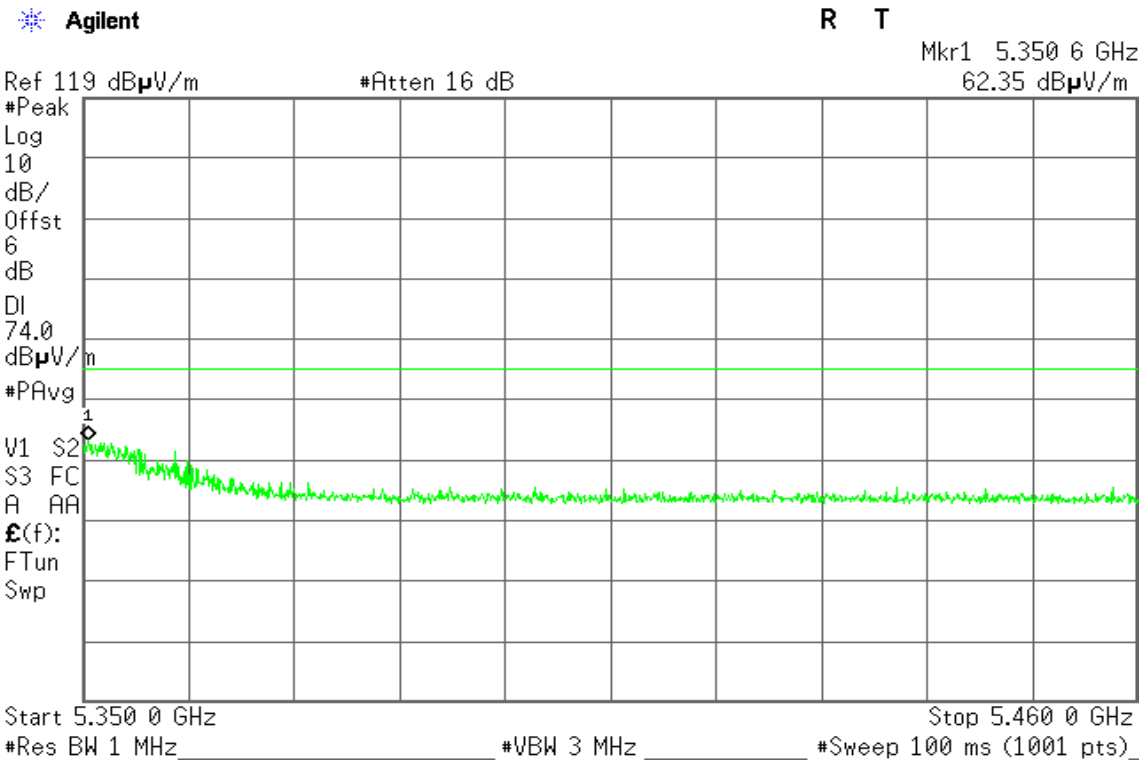
Detector mode: Peak Polarity: Vertical



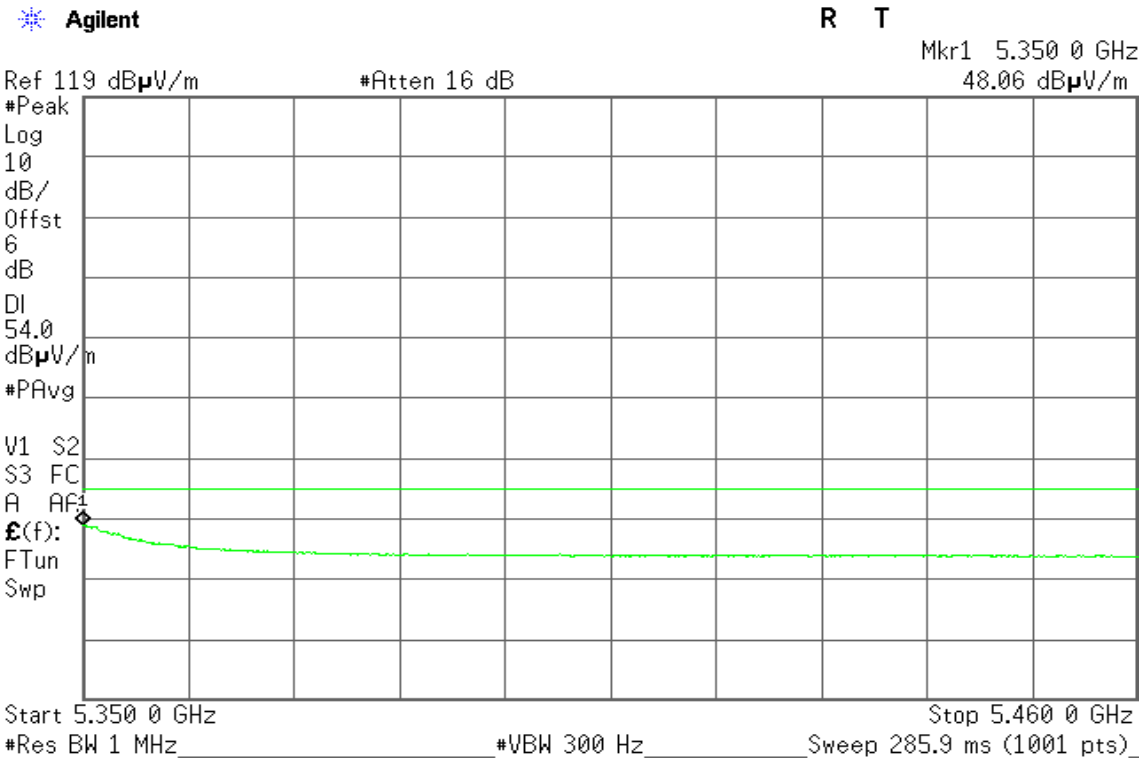
Detector mode: Average Polarity: Vertical



Detector mode: Peak Polarity: Horizontal



Detector mode: Average Polarity: Horizontal



7.5 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 11dBm in any 1MHz band.

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

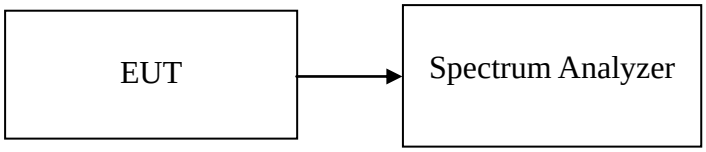
According to RSS-247,

(1) The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(2) The power spectral density shall not exceed 11 dBm in any 1.0 MHz 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	2.32	11.00	PASS
Mid	5220	2.30	11.00	PASS
High	5240	2.33	11.00	PASS

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5180	1.99	11.00	PASS
Mid	5220	2.12	11.00	PASS
High	5240	2.14	11.00	PASS

Test mode: IEEE 802.11a mode/ 5260 ~ 5320MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5260	2.52	11.00	PASS
Mid	5280	2.45	11.00	PASS
High	5320	2.85	11.00	PASS

Test mode: IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5260	2.26	11.00	PASS
Mid	5280	2.86	11.00	PASS
High	5320	2.70	11.00	PASS

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5500	3.76	11.00	PASS
Mid	5580	3.92	11.00	PASS
High	5700	3.78	11.00	PASS

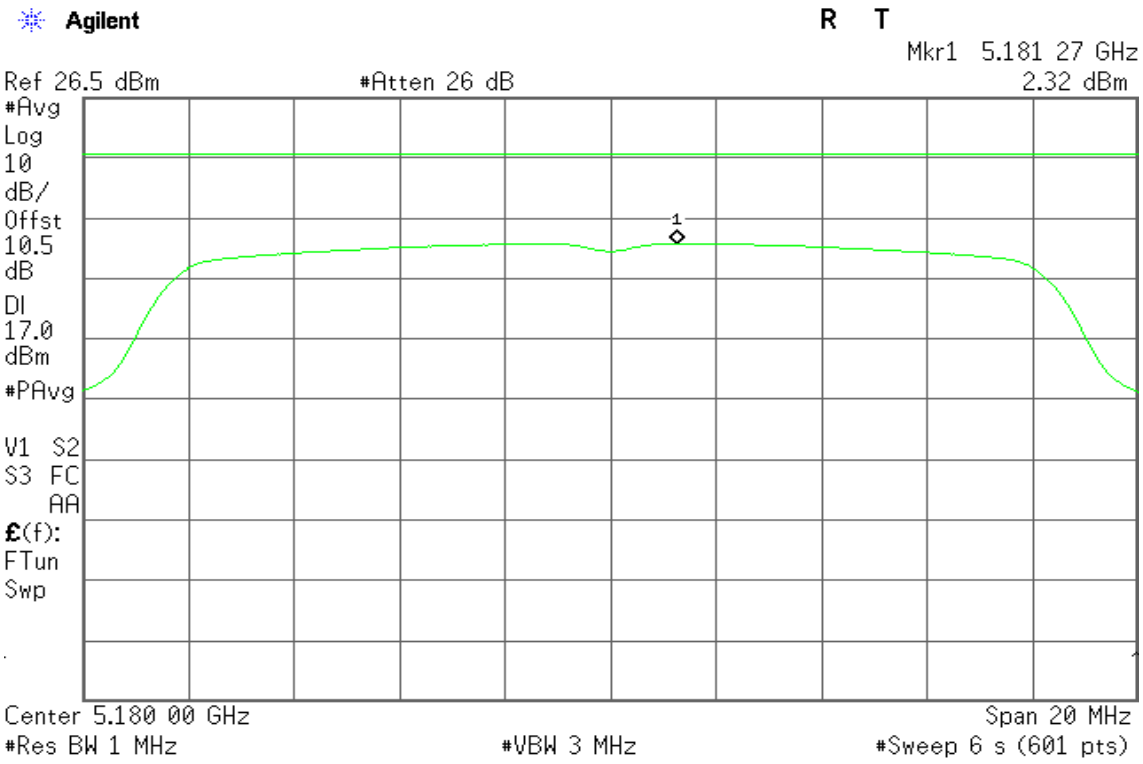
Test mode: IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5500	3.54	11.00	PASS
Mid	5580	3.77	11.00	PASS
High	5700	3.58	11.00	PASS

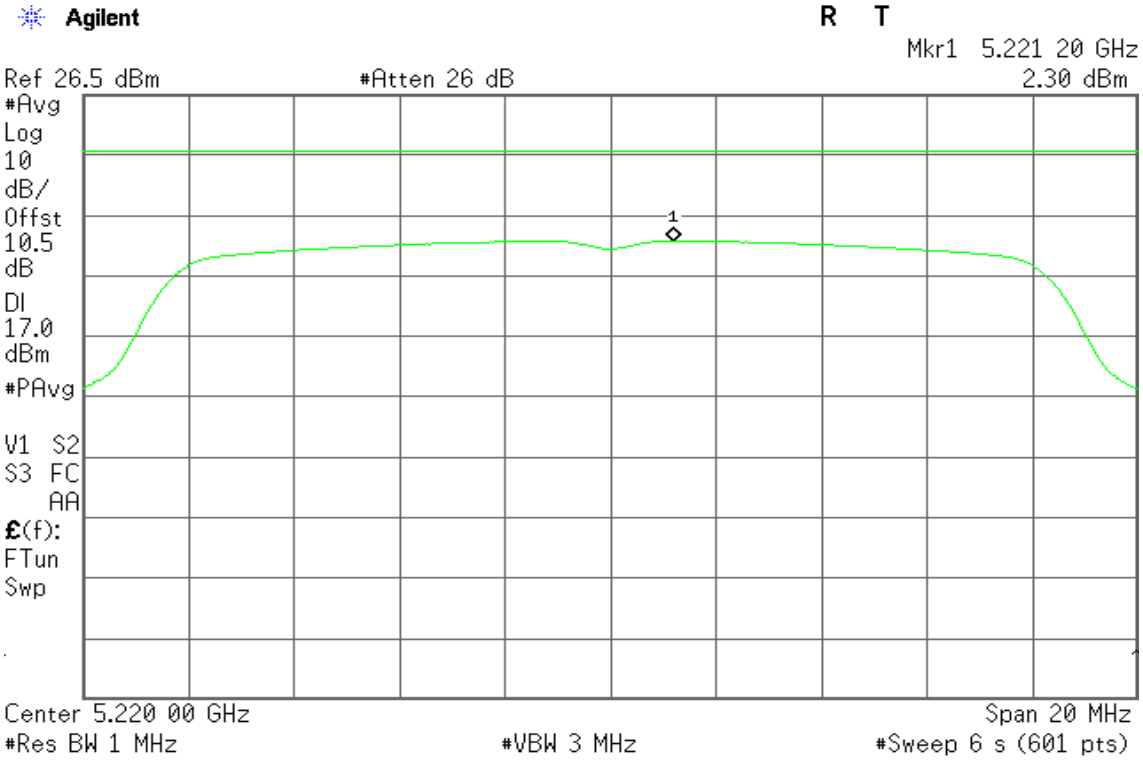
Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

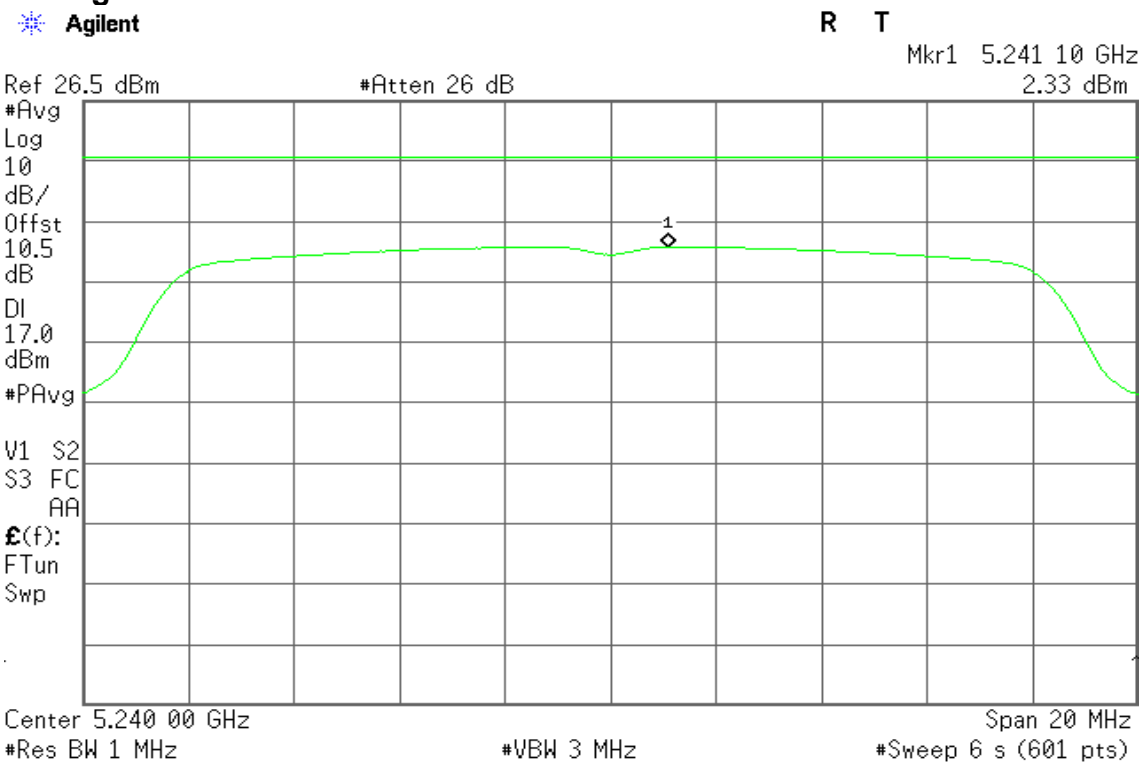
CH Low



CH Mid

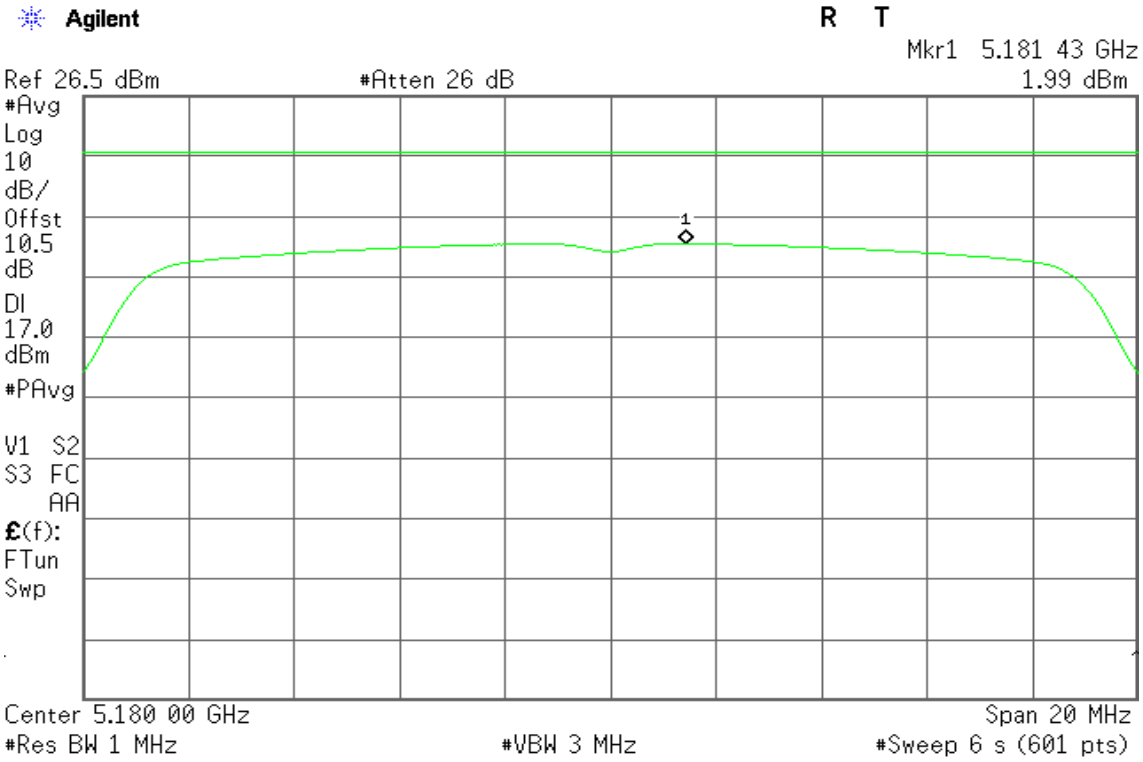


CH High

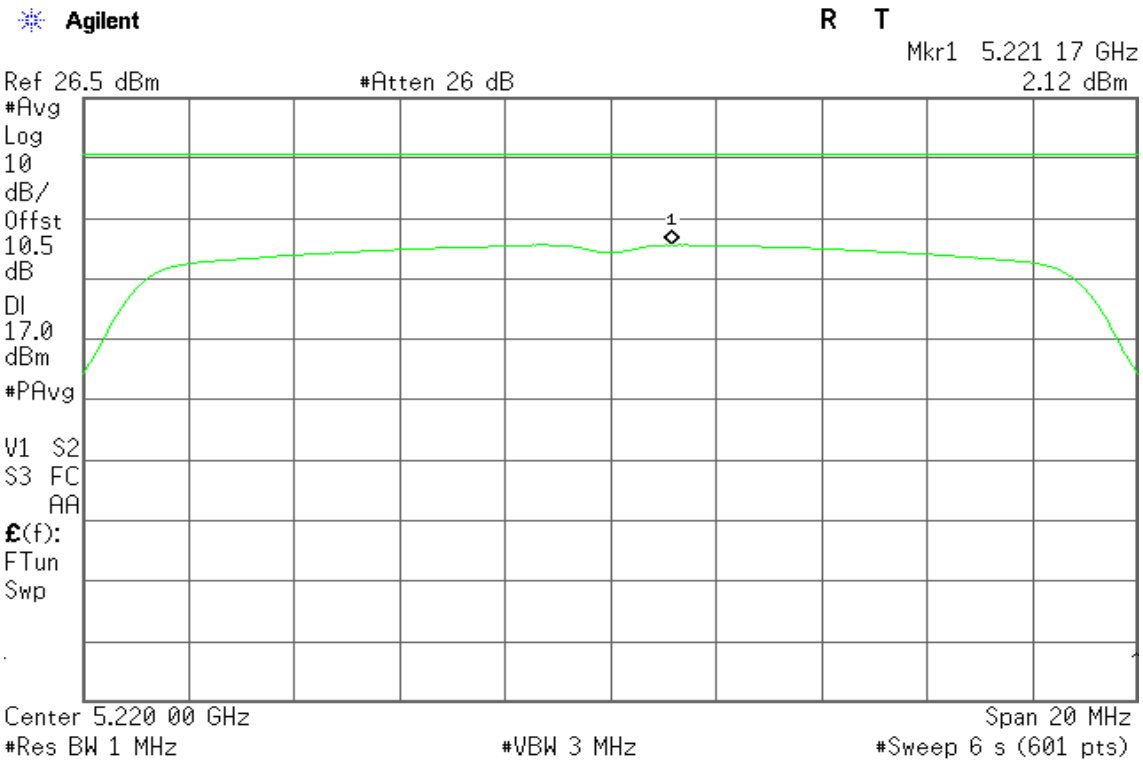

Agilent
R T
Mkr1 5.241 10 GHz
2.33 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
17.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
1
Center 5.240 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

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

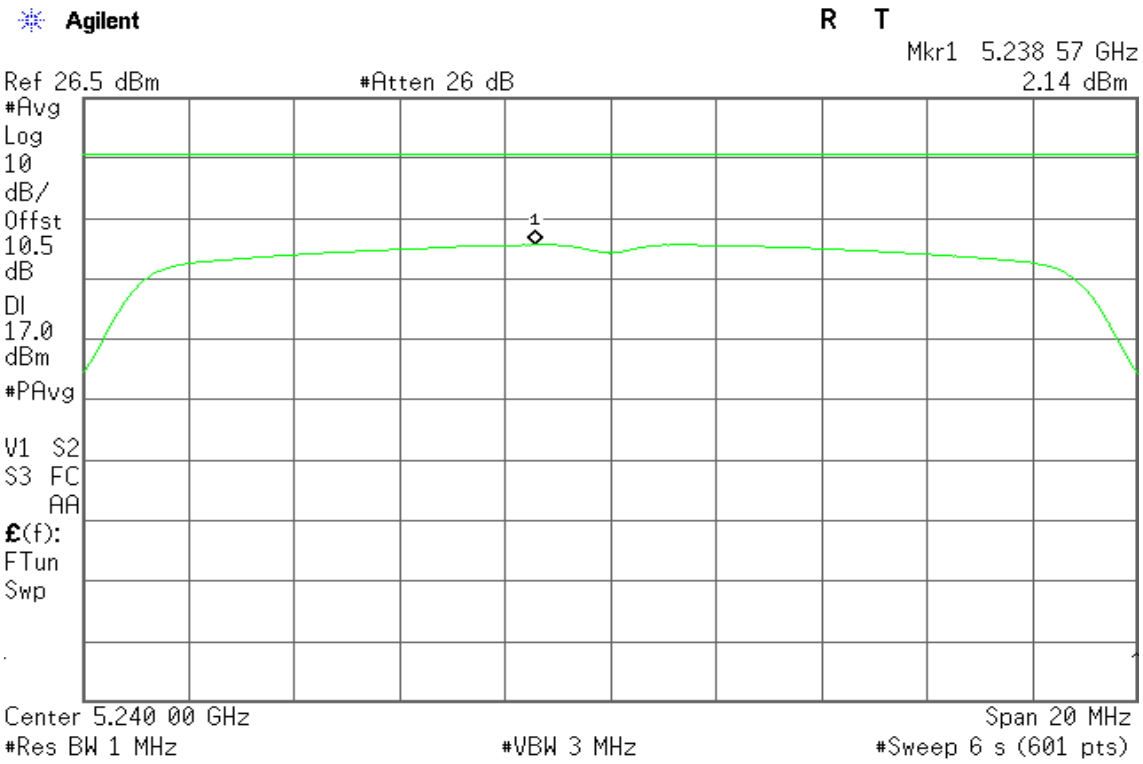
CH Low



CH Mid

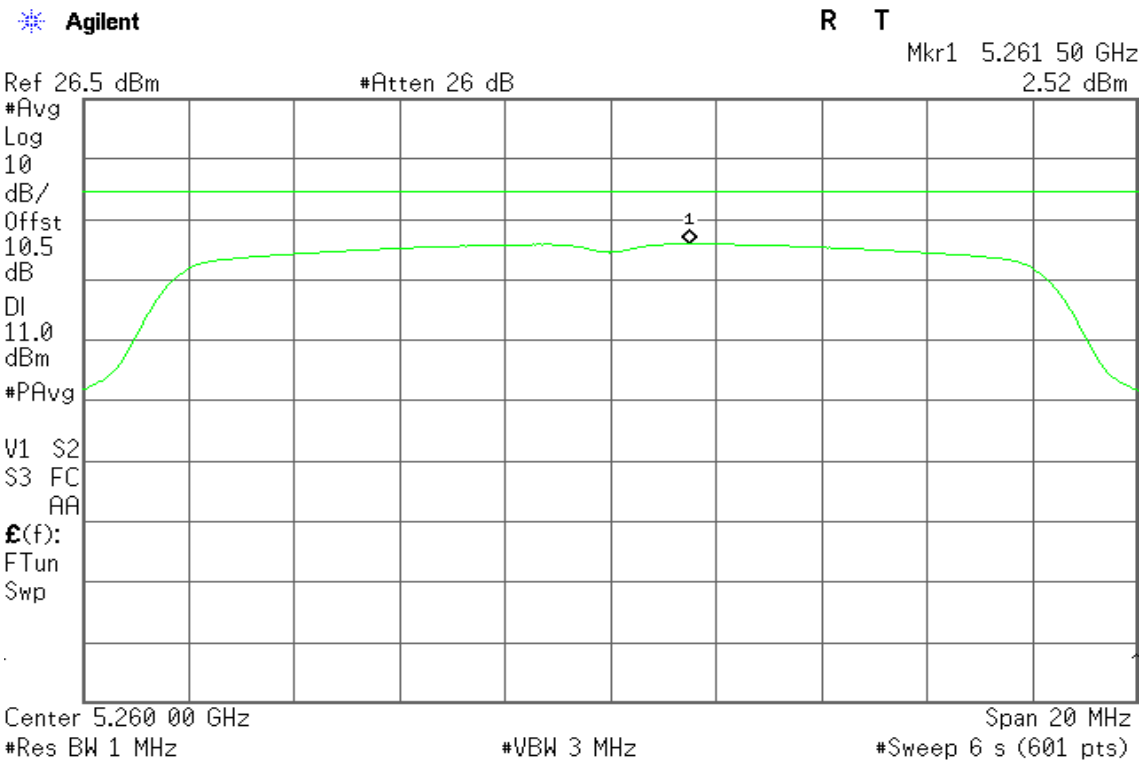


CH High

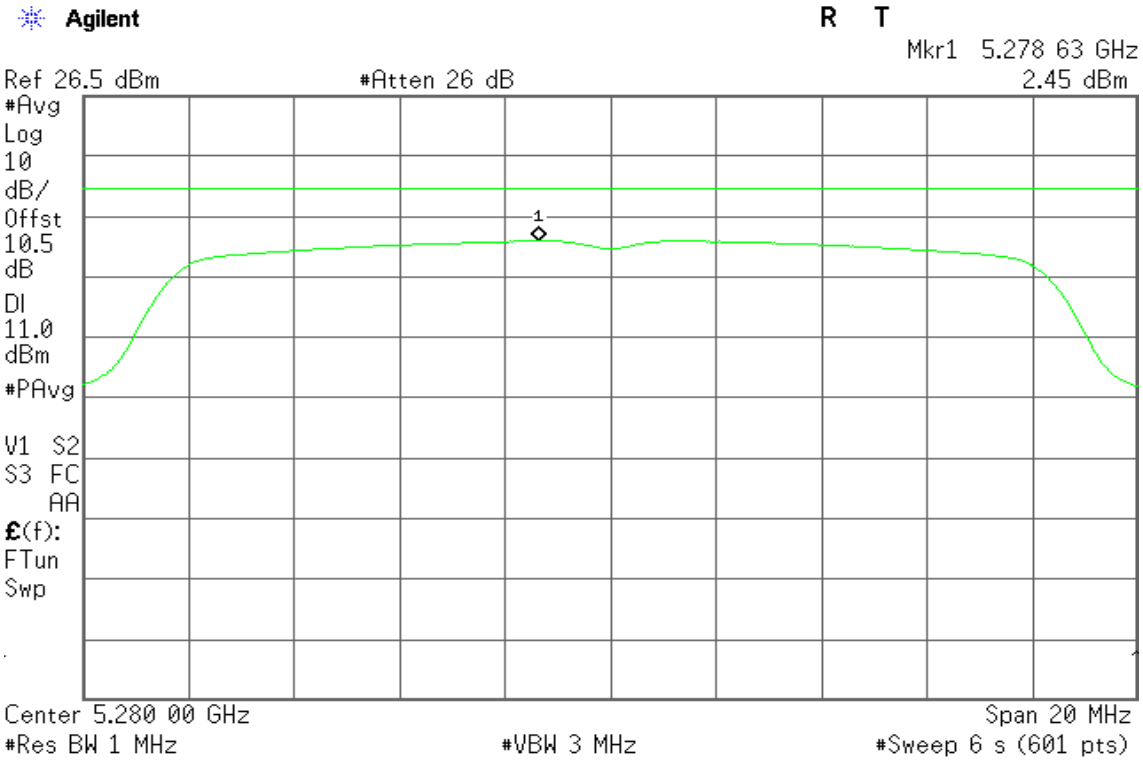

Agilent
R T
Mkr1 5.238 57 GHz
2.14 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
17.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 5.240 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11a mode / 5260 ~ 5320MHz

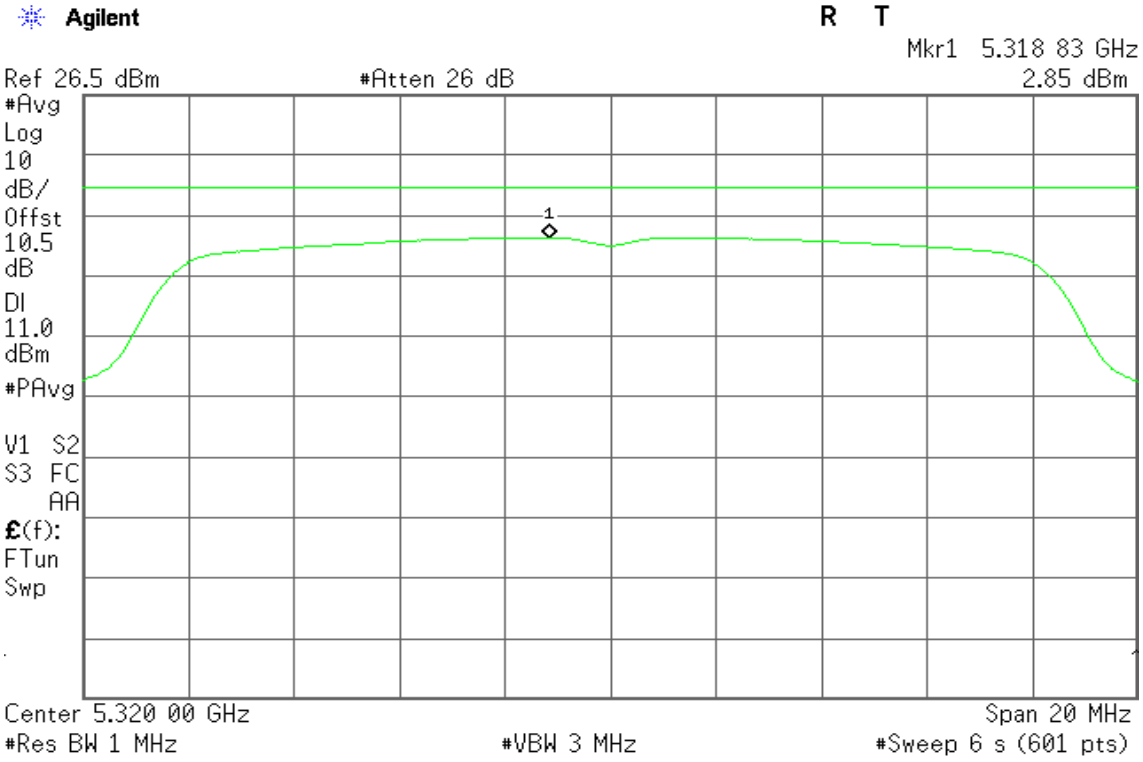
CH Low



CH Mid

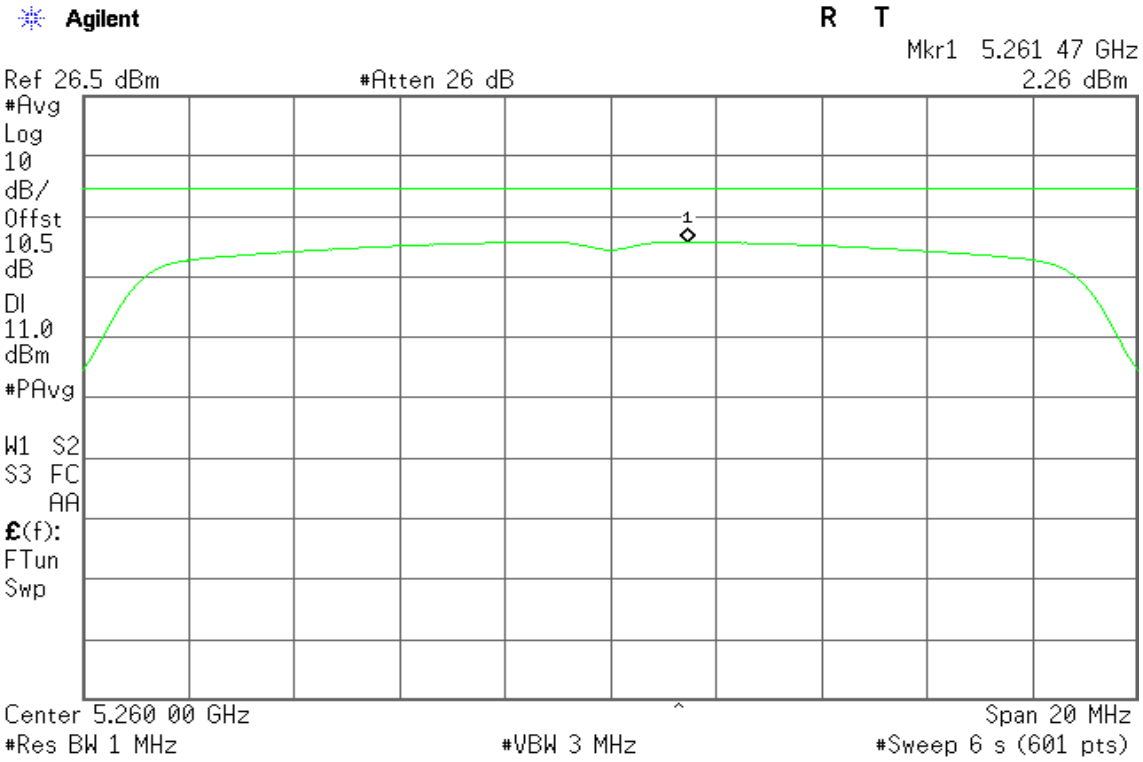


CH High

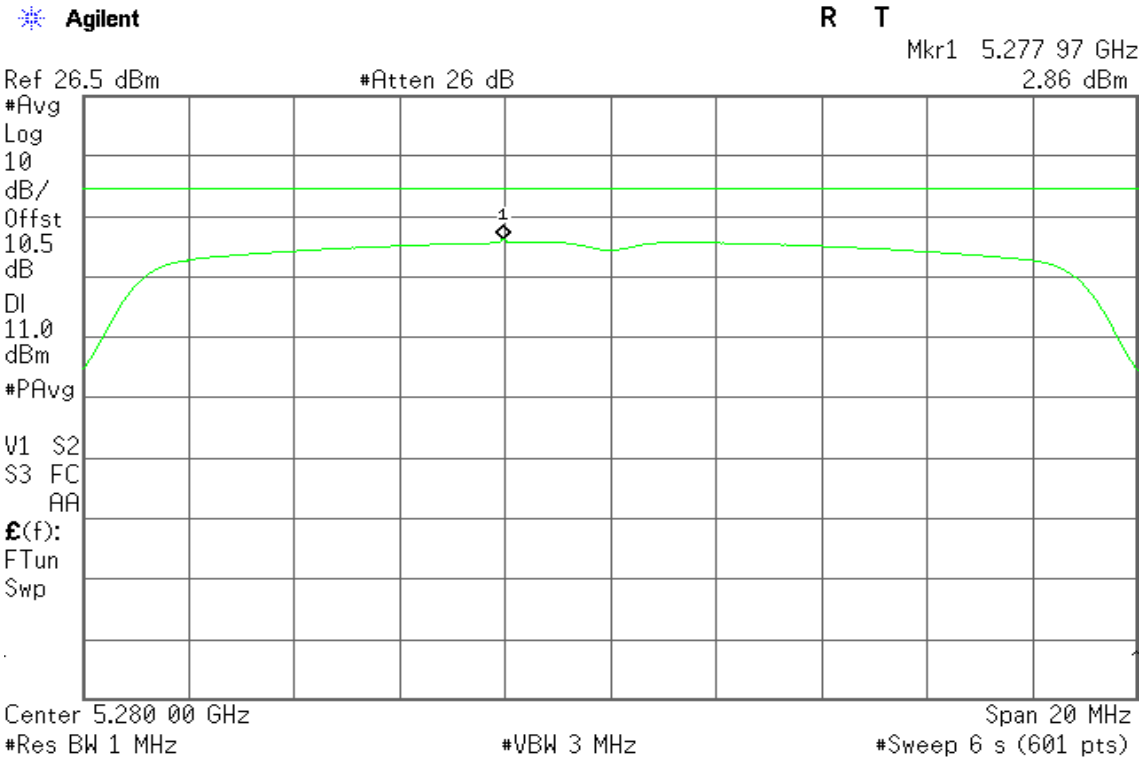

Agilent
R T
Mkr1 5.318 83 GHz
2.85 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
11.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 5.320 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz

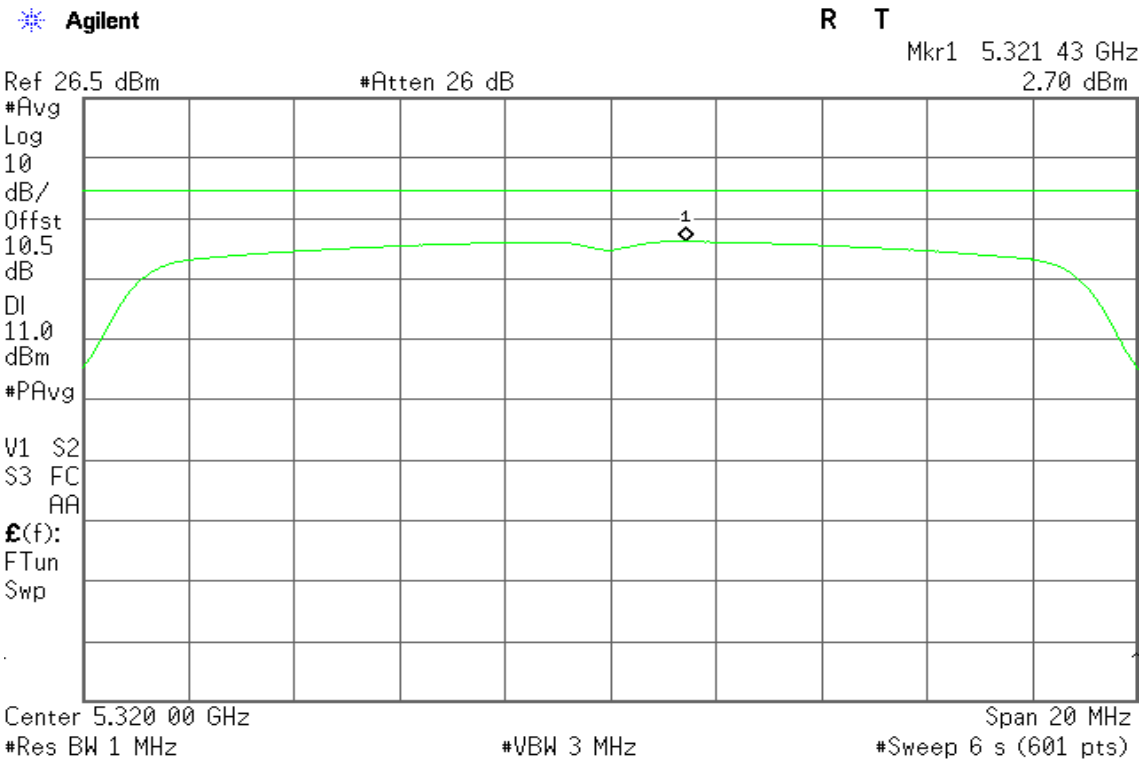
CH Low



CH Mid

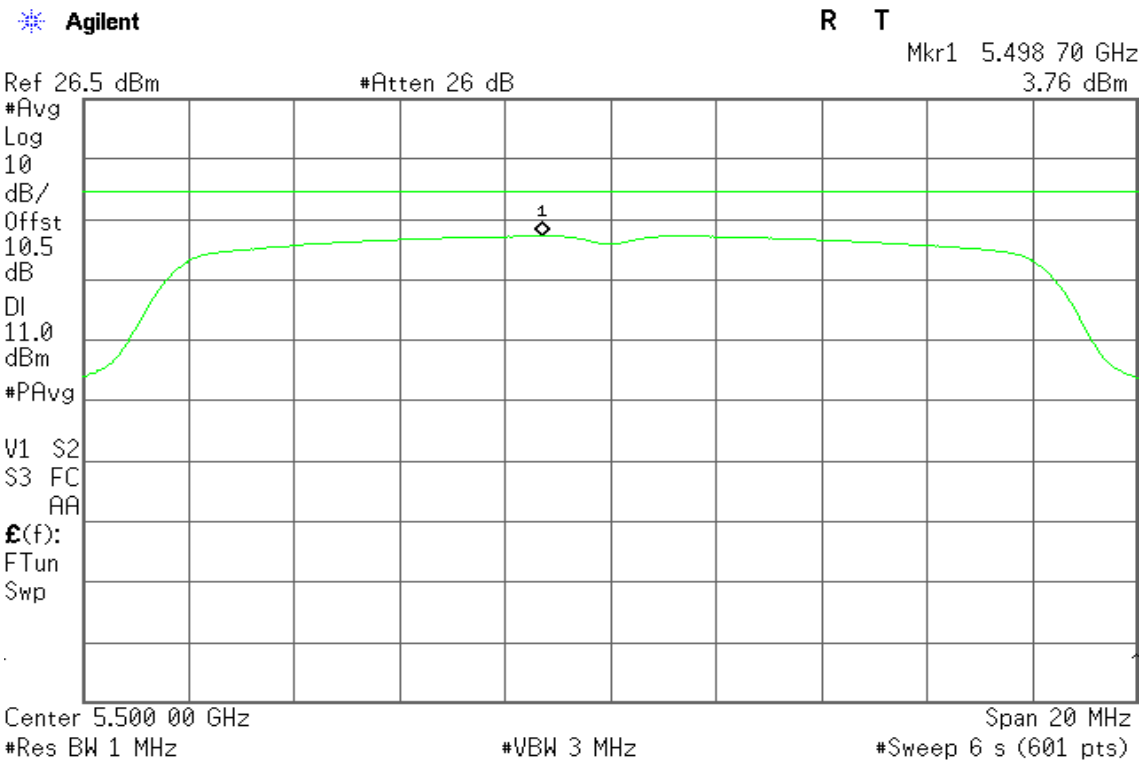


CH High

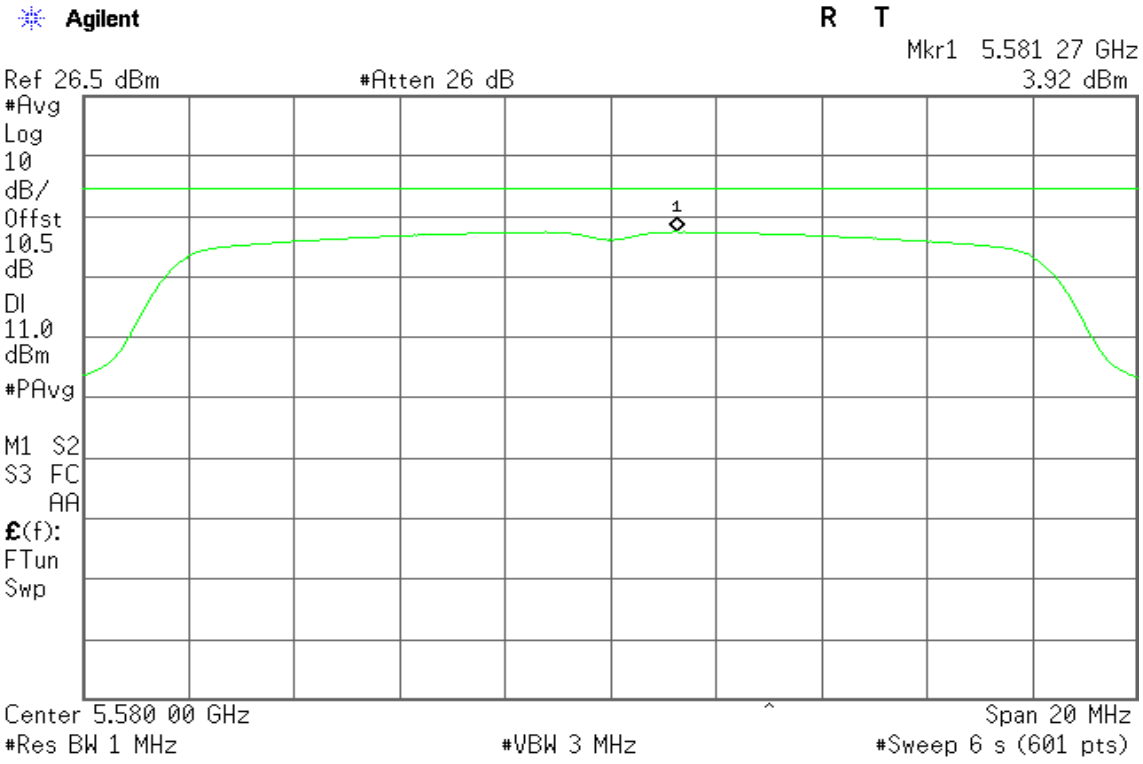

Agilent
R T
Mkr1 5.321 43 GHz
2.70 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
11.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
1
Center 5.320 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

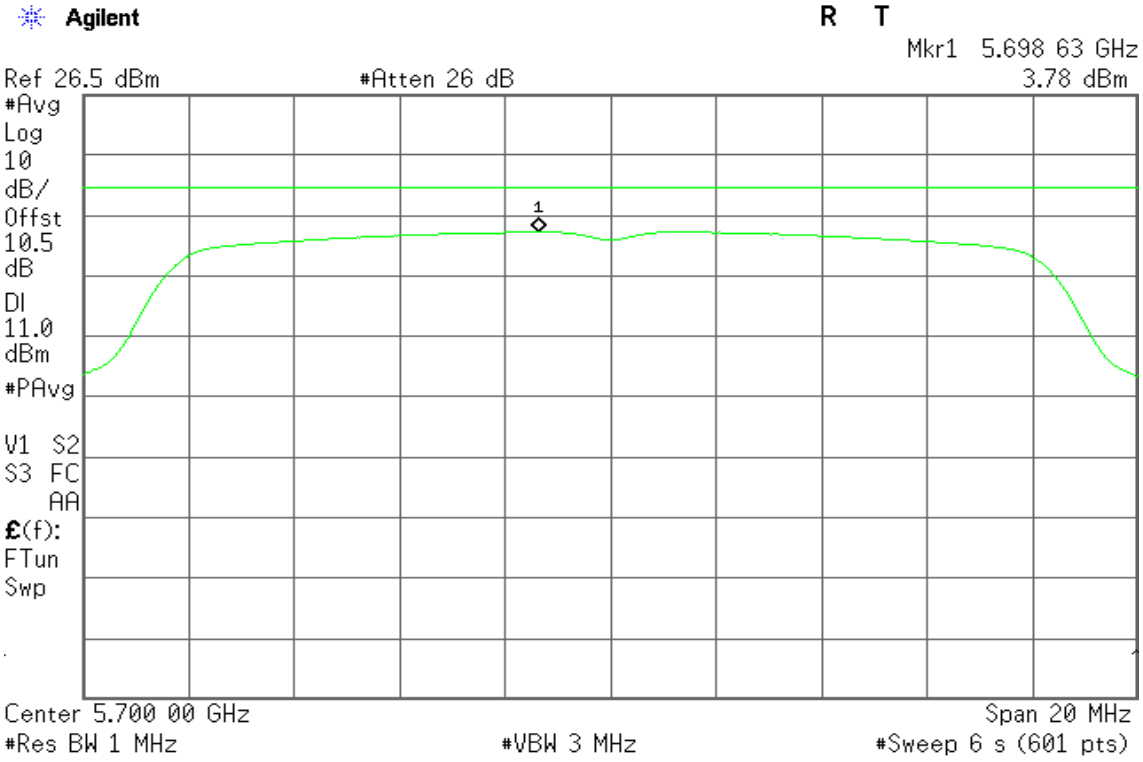
CH Low



CH Mid

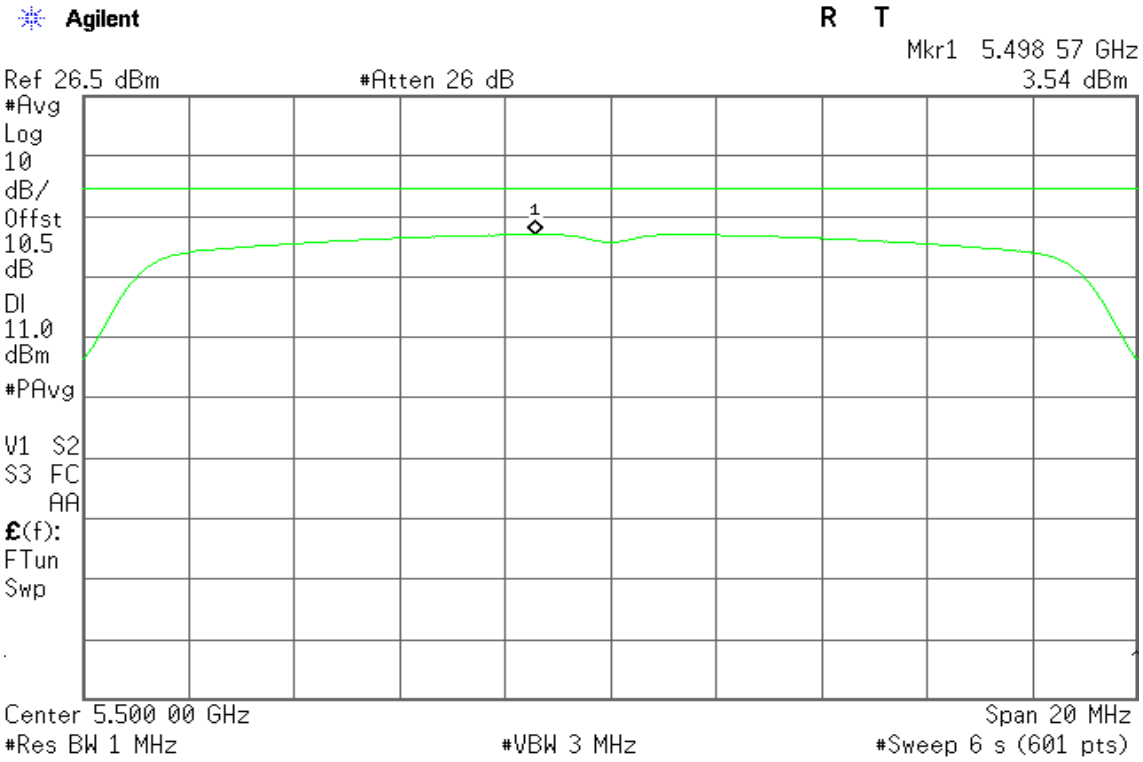


CH High

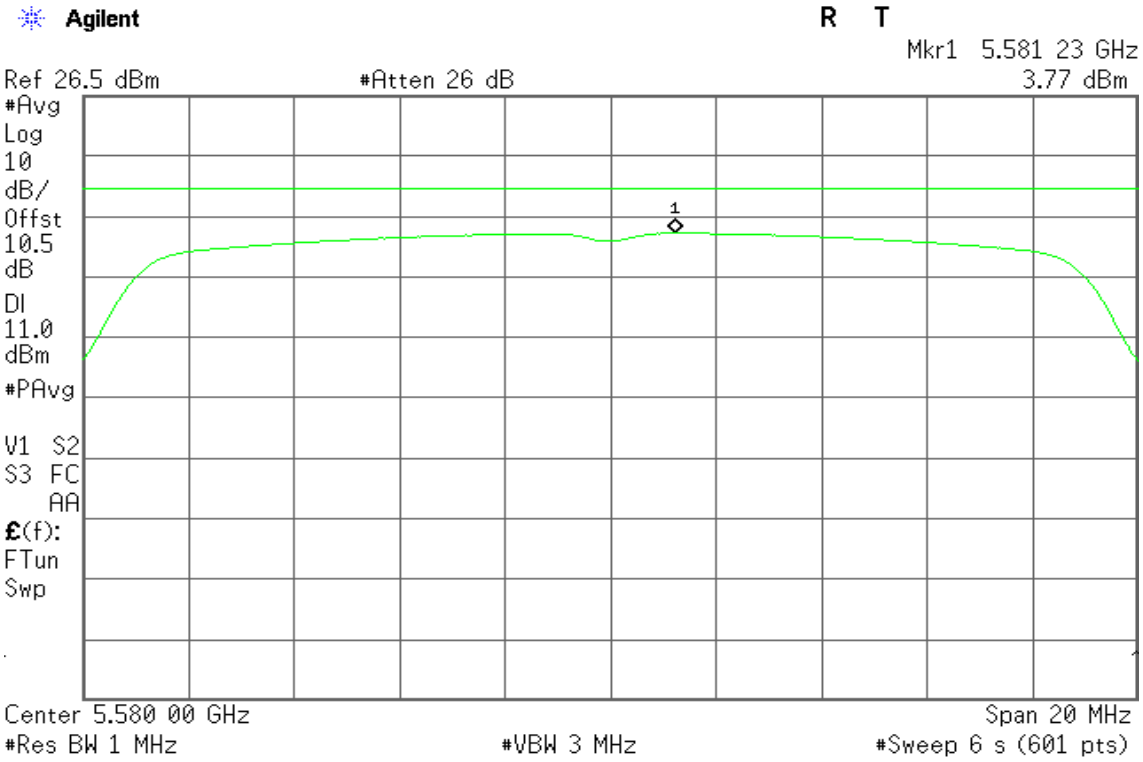

Agilent
R T
Mkr1 5.698 63 GHz
3.78 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
11.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 5.700 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz

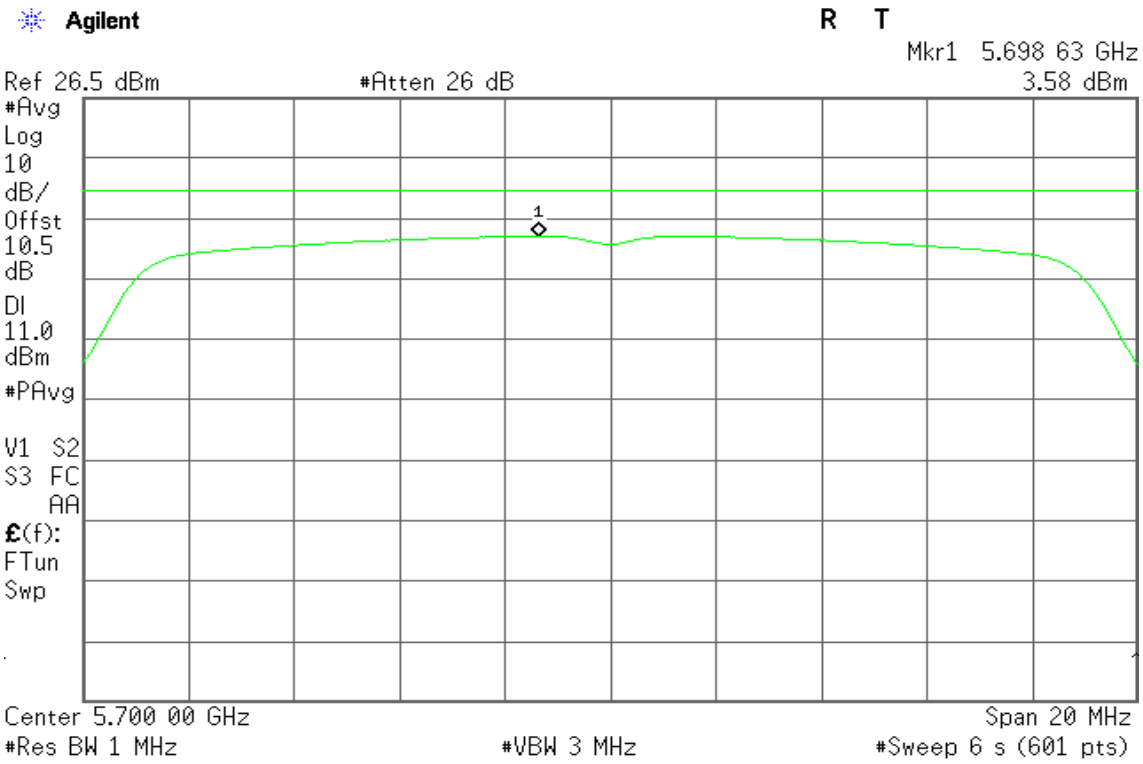
CH Low



CH Mid



CH High


Agilent
R T
Mkr1 5.698 63 GHz
3.58 dBm
Ref 26.5 dBm
#Atten 26 dB
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
11.0
dBm
#PAvg
V1 S2
S3 FC
AA
£(f):
FTun
Swp
Center 5.700 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

7.6 RADIATED UNDESIRABLE EMISSION

1. According to §15.209(a) & RSS-247, 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 (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

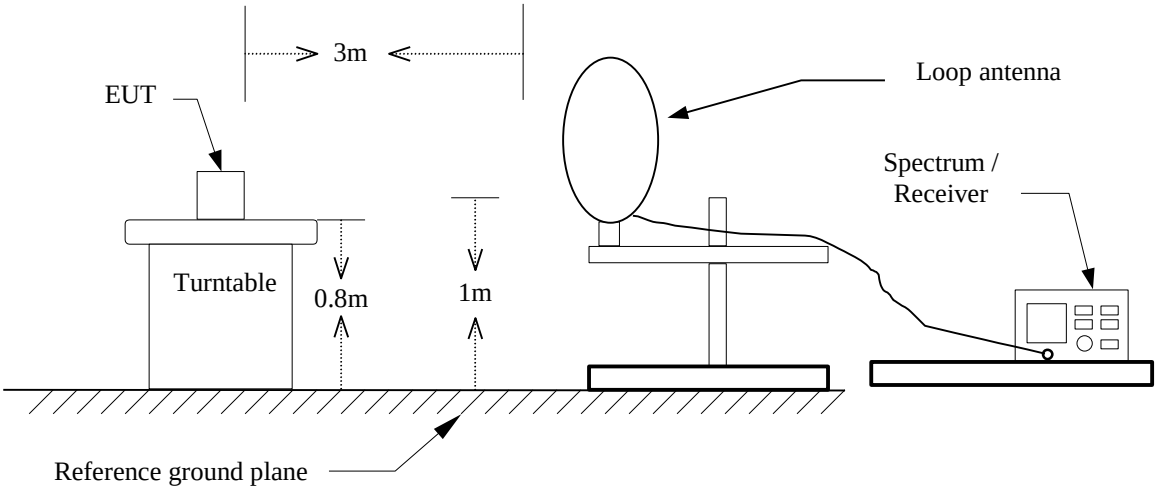
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

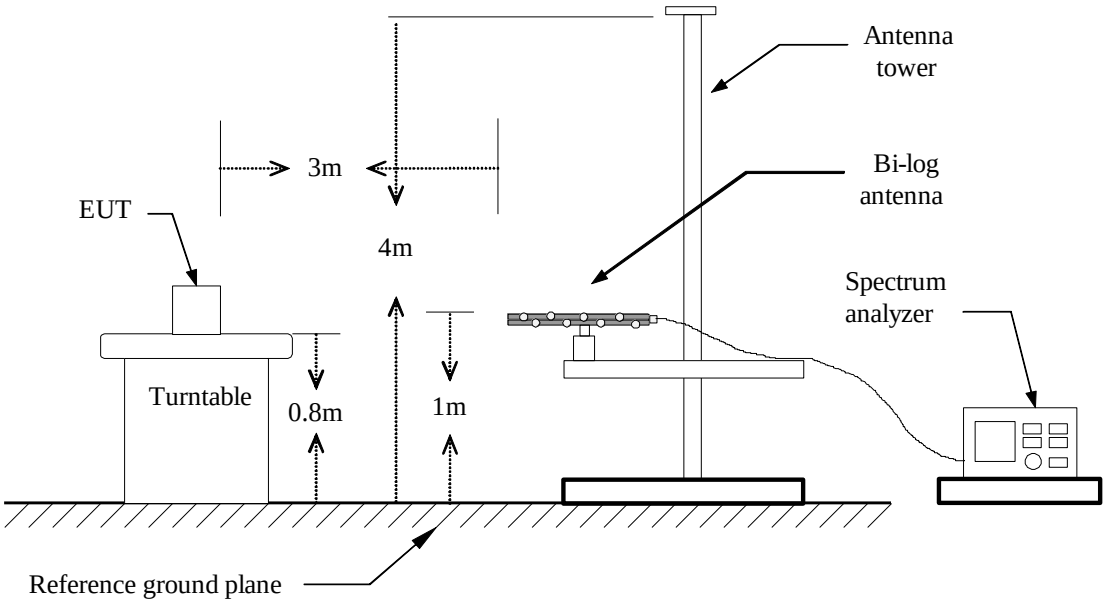
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

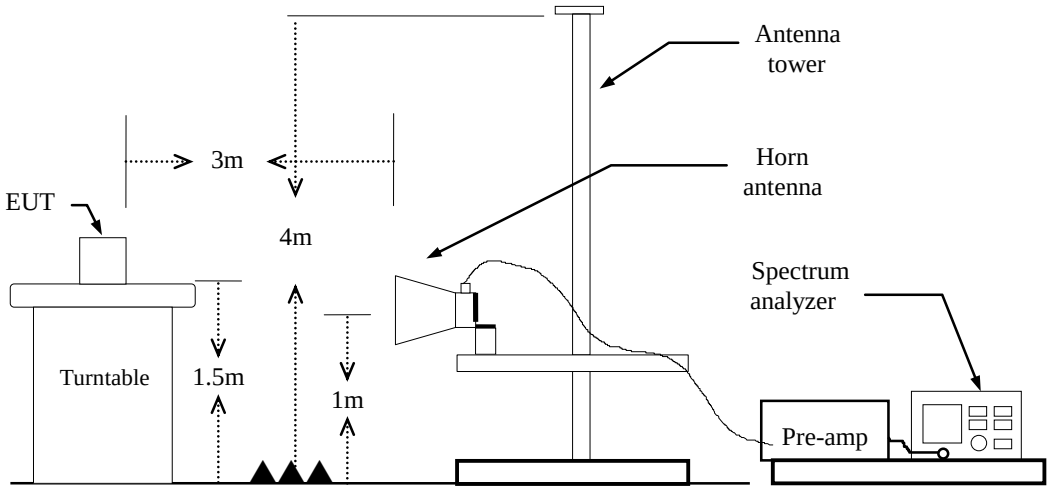
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz


Antenna
tower
3m
Horn
antenna
EUT
4m
Spectrum
analyzer
Turntable
1.5m
1m
Pre-amp

TEST PROCEDURE

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m high and below 1 GHz is 0.8m high 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 : 1MHz / VBW : 3MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=300Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.
8. Result = Spectrum Reading + cable loss(spectrum to Amp) - Amp Gain + Cable loss(Amp to receive Ant)+ Receive Ant

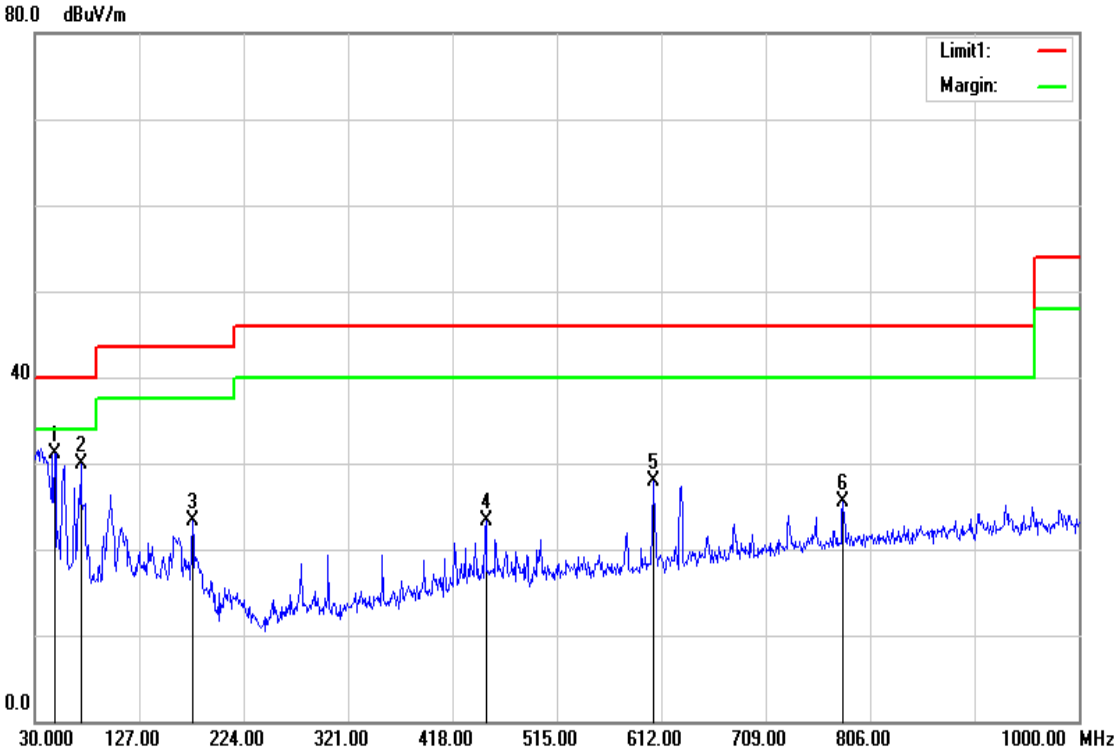
   Note: We checked every harmonics frequencies from Fundamental frequencies with reduced VBW, and we mark a point to prove pass or not if we find any emission. For this case, there are no emissions hidden in the noise floor.

For Internal Antenna
Below 1 GHz

Operation Mode: Normal Link **Test Date:** May 13, 2014

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

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



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
48.4300	53.18	-22.01	31.17	40.00	-8.83	Peak	V
72.6800	52.62	-22.69	29.93	40.00	-10.07	Peak	V
176.4700	42.40	-19.16	23.24	43.50	-20.26	Peak	V
449.0400	36.07	-12.69	23.38	46.00	-22.62	Peak	V
604.2400	38.30	-10.41	27.89	46.00	-18.11	Peak	V
780.7800	33.01	-7.57	25.44	46.00	-20.56	Peak	V

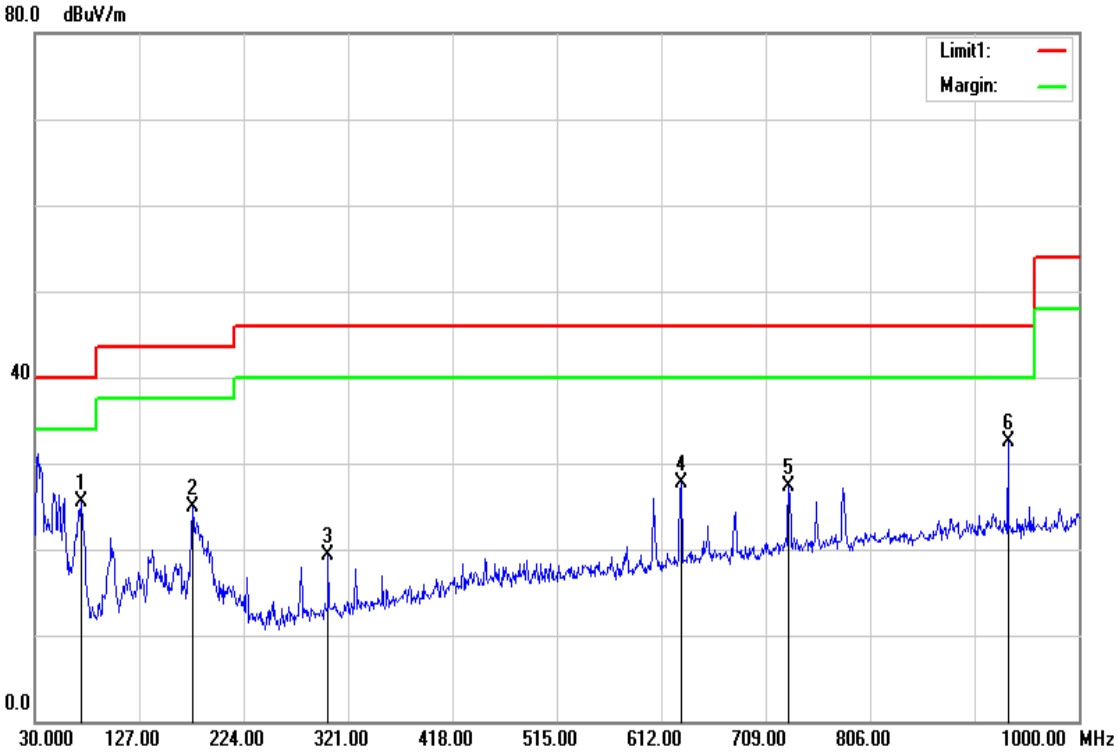
Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).*
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).*

Operation Mode: Normal Link **Test Date:** May 13, 2014

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

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



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
72.6800	48.18	-22.69	25.49	40.00	-14.51	peak	H
176.4700	44.13	-19.16	24.97	43.50	-18.53	peak	H
302.5700	35.60	-16.35	19.25	46.00	-26.75	peak	H
630.4300	37.54	-9.78	27.76	46.00	-18.24	peak	H
730.3400	35.49	-8.24	27.25	46.00	-18.75	peak	H
934.0400	38.25	-5.70	32.55	46.00	-13.45	peak	H

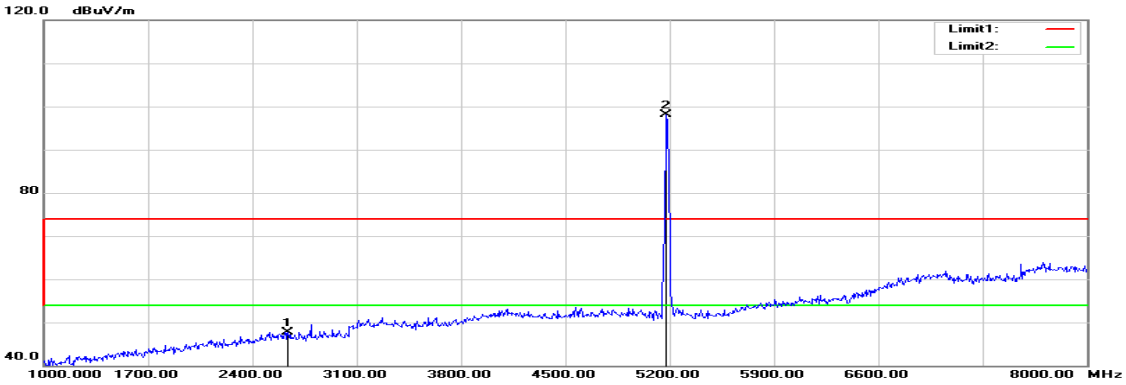
Remark:

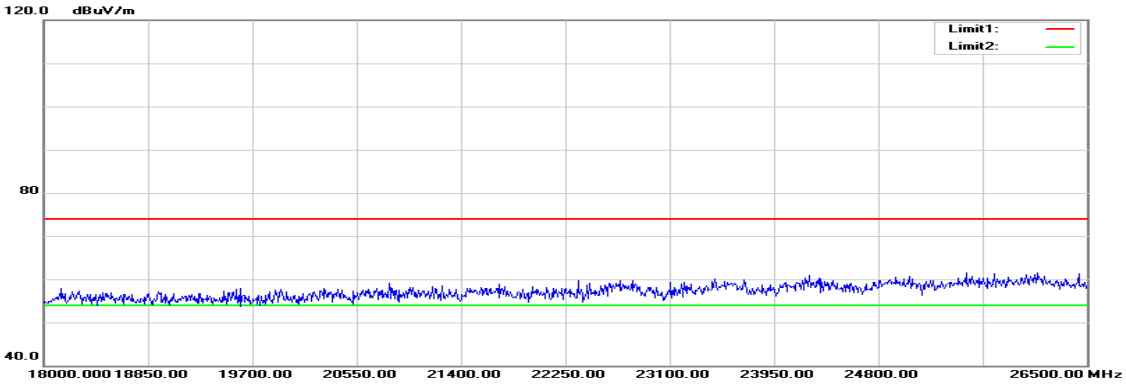
1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater 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).*

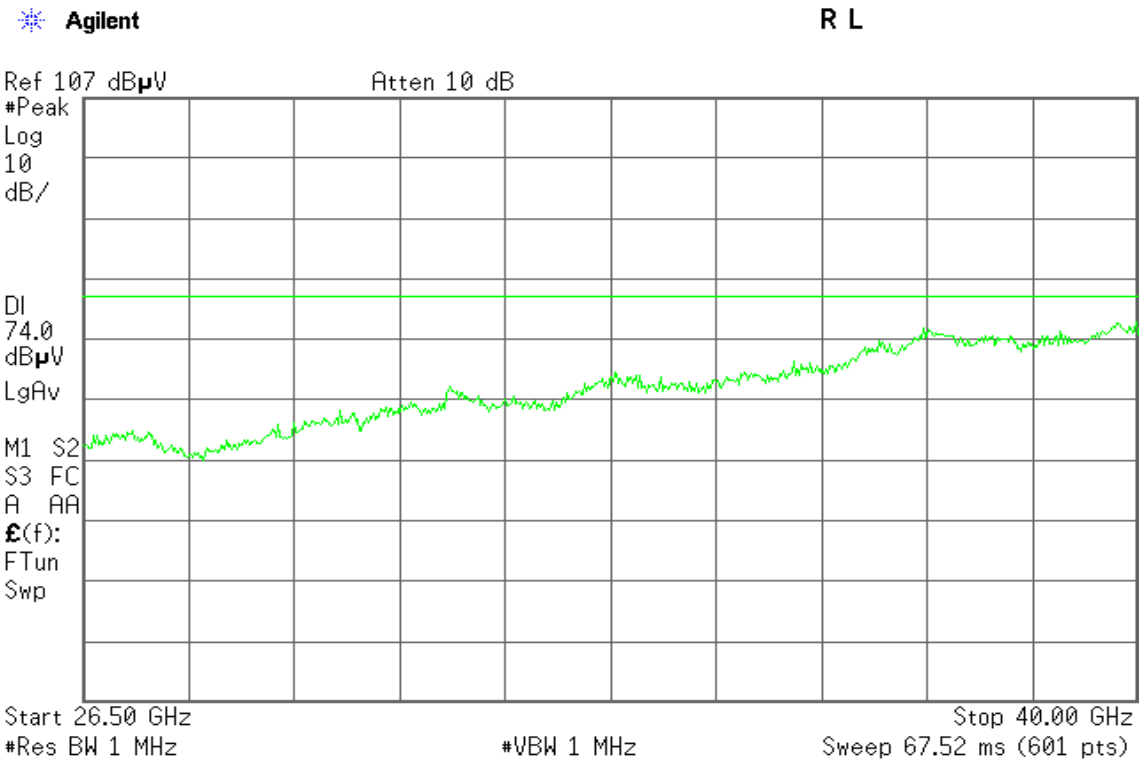
Above 1 GHz

Tx / IEEE 802.11a mode / Low

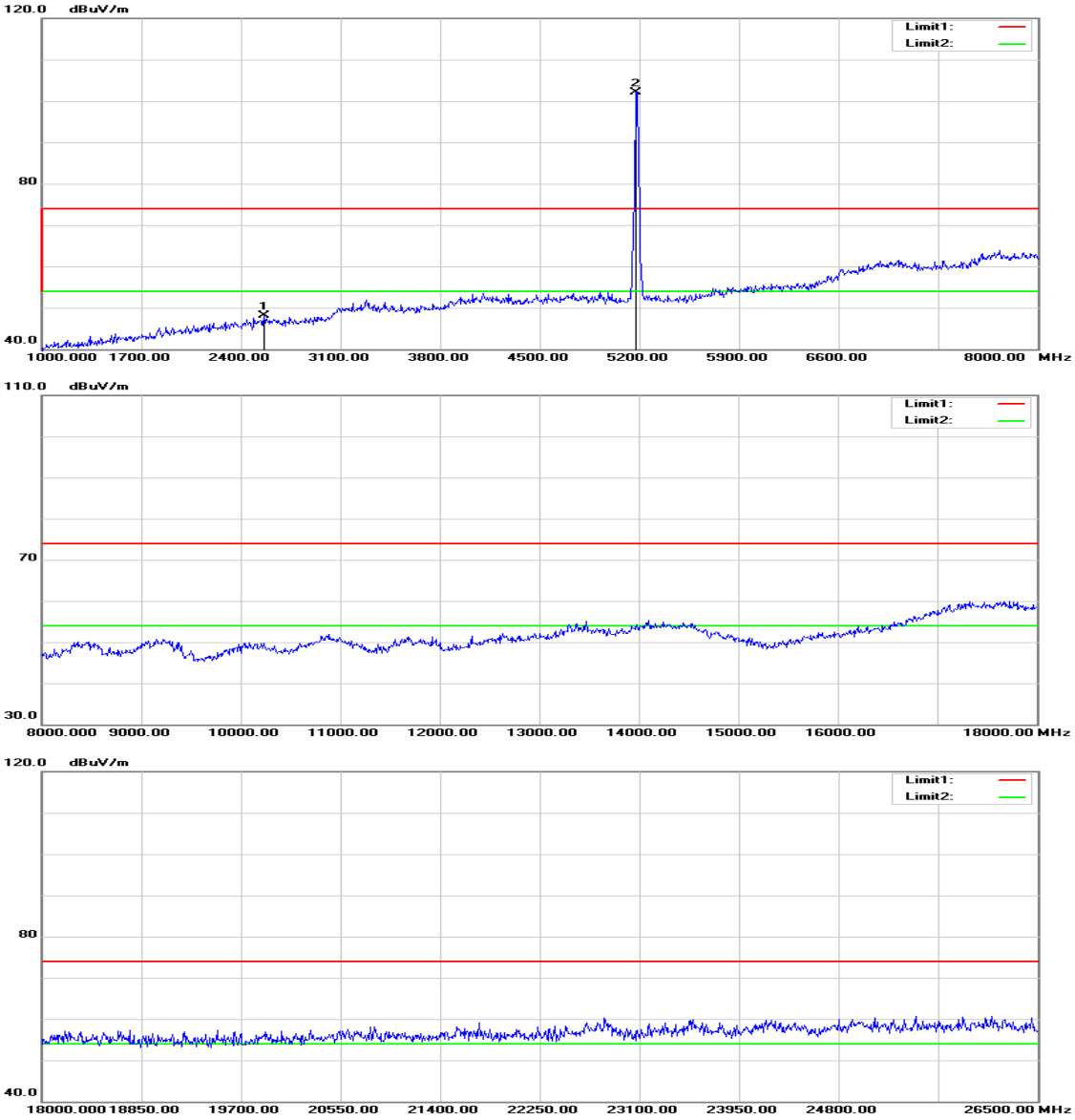
Polarity: Vertical

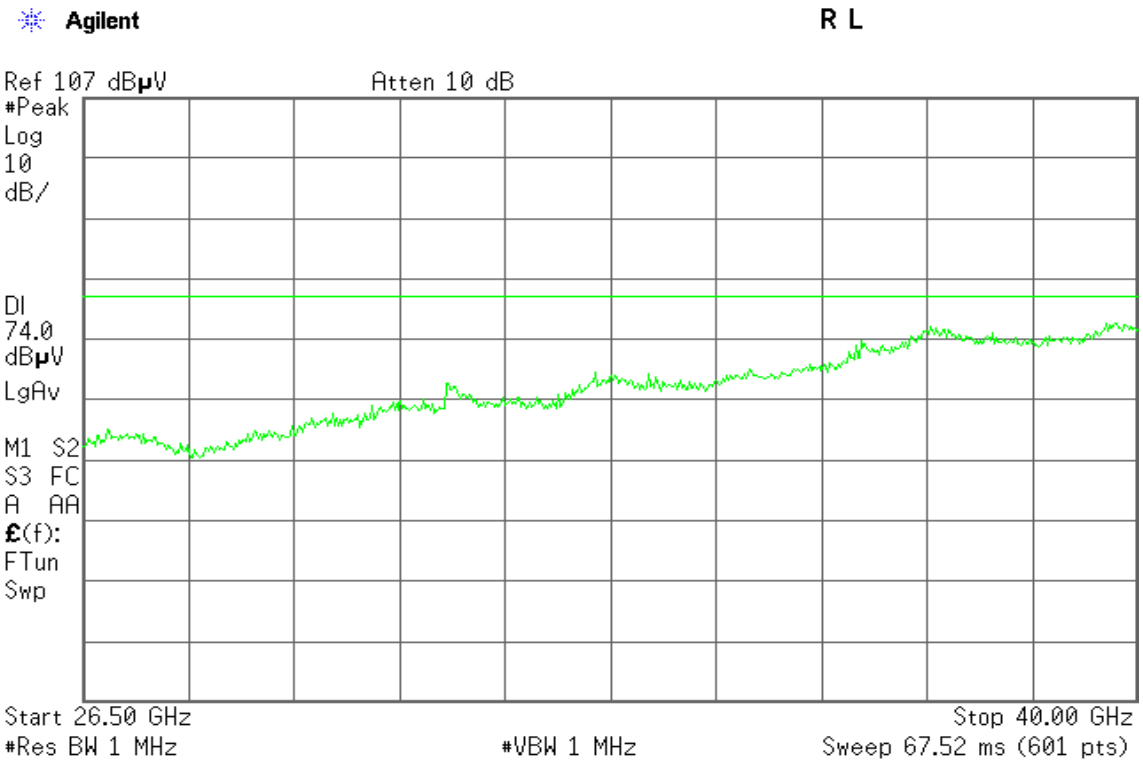





Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Above 1 GHz

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	May 13, 2014
Temperature:	27℃	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

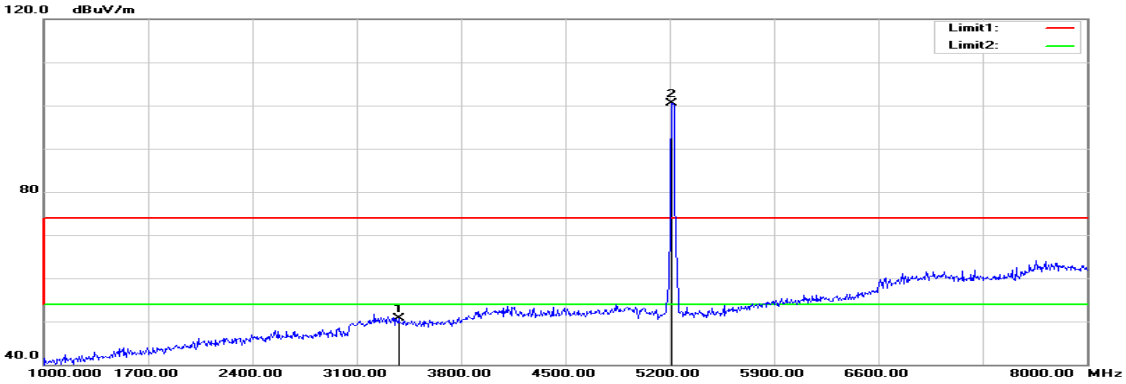
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2638.000	50.74	-2.96	47.78	74.00	-26.22	peak	V
N/A							
2561.000	51.24	-3.12	48.12	74.00	-25.88	peak	H
N/A							

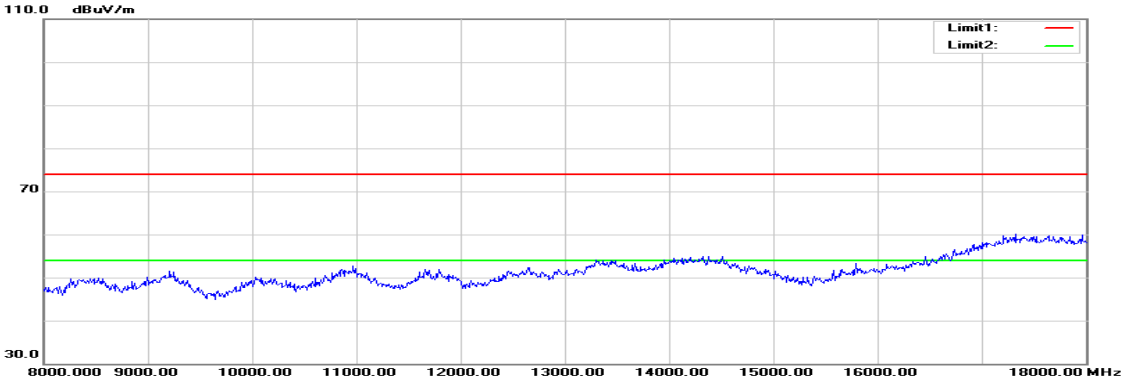
Remark:

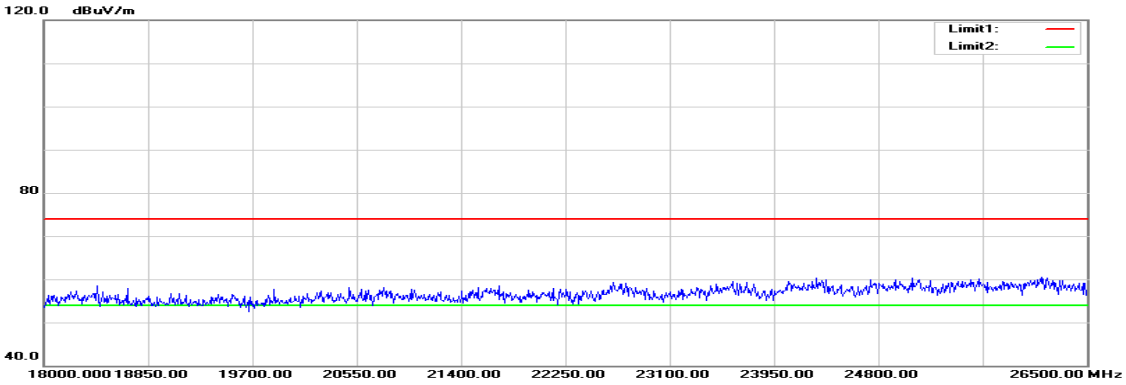
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average 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).*

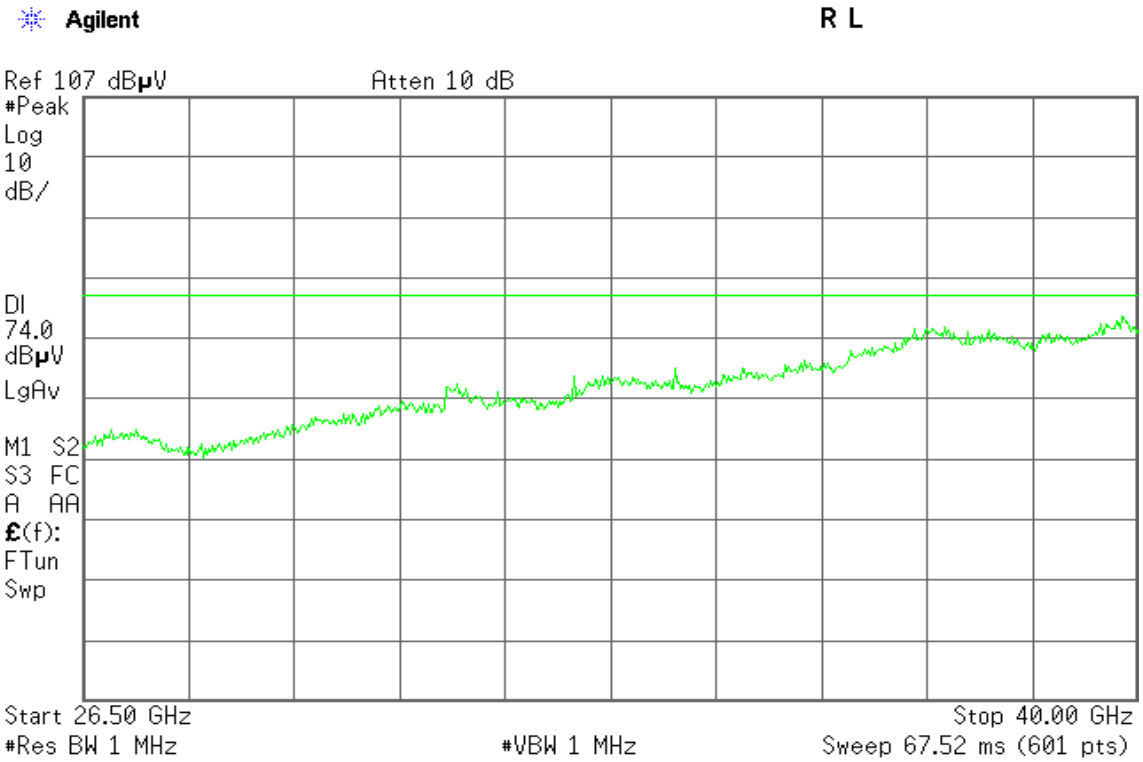
Tx / IEEE 802.11a mode / Mid

Polarity: Vertical

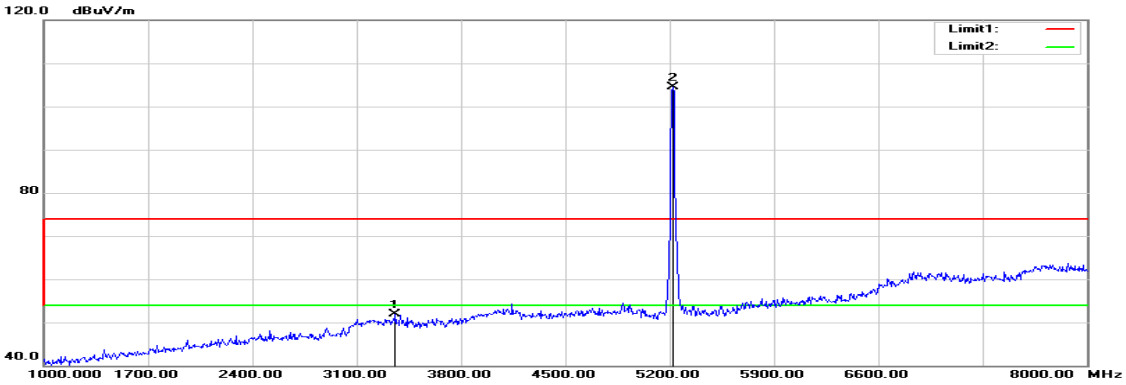


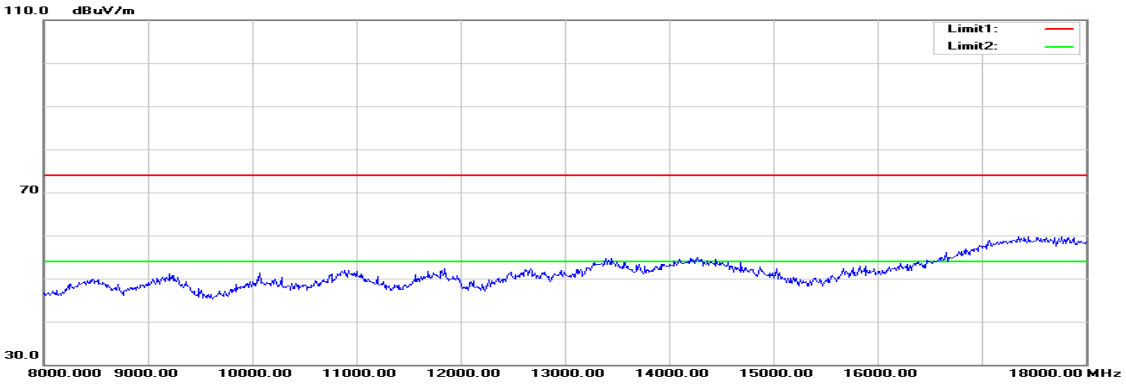


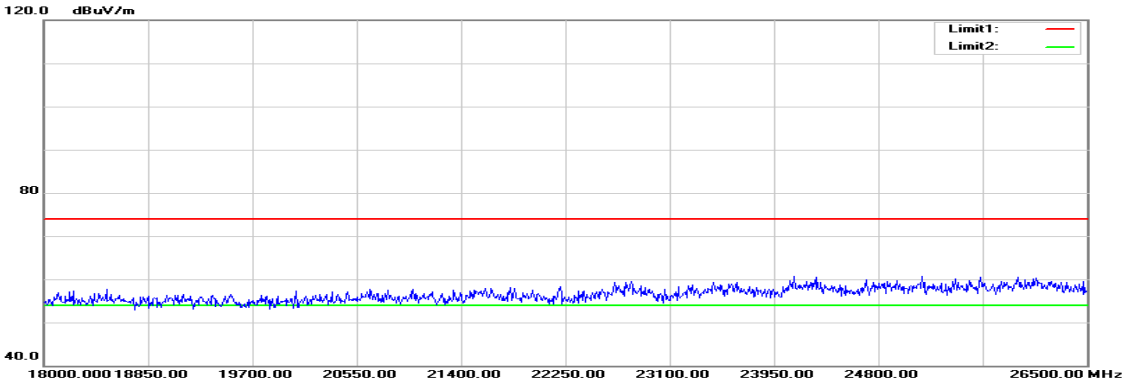


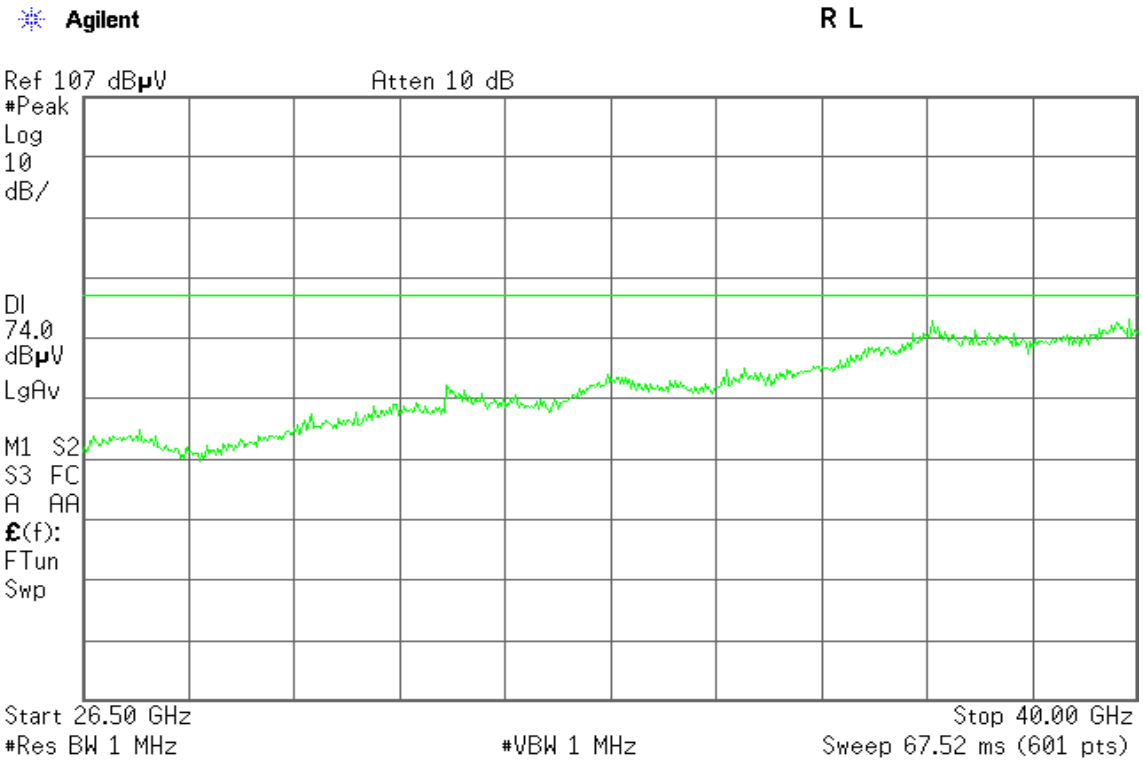

Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal








Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

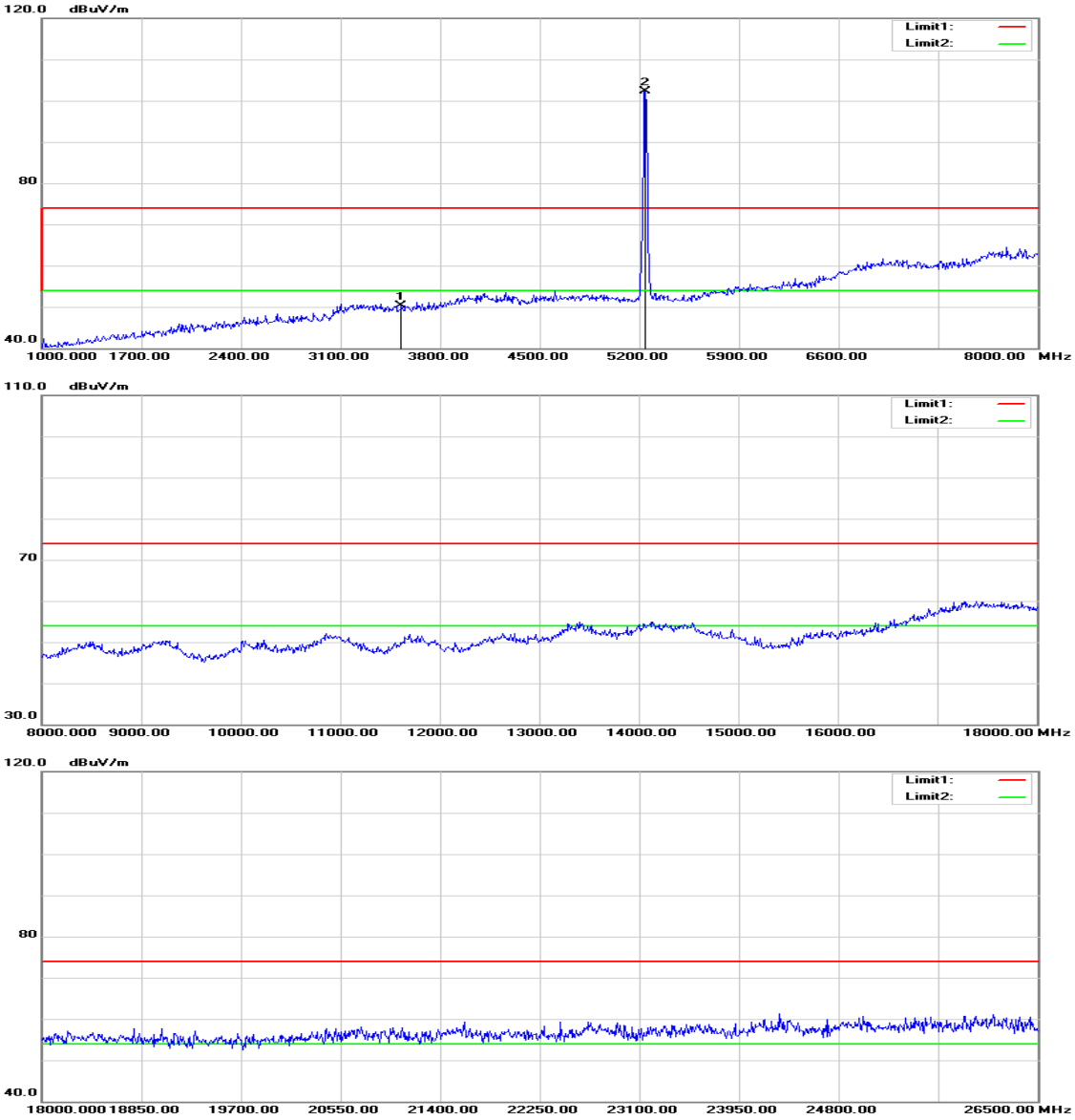
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3380.000	51.60	-0.98	50.62	74.00	-23.38	peak	V
N/A							
3359.000	52.87	-1.05	51.82	74.00	-22.18	peak	H
N/A							

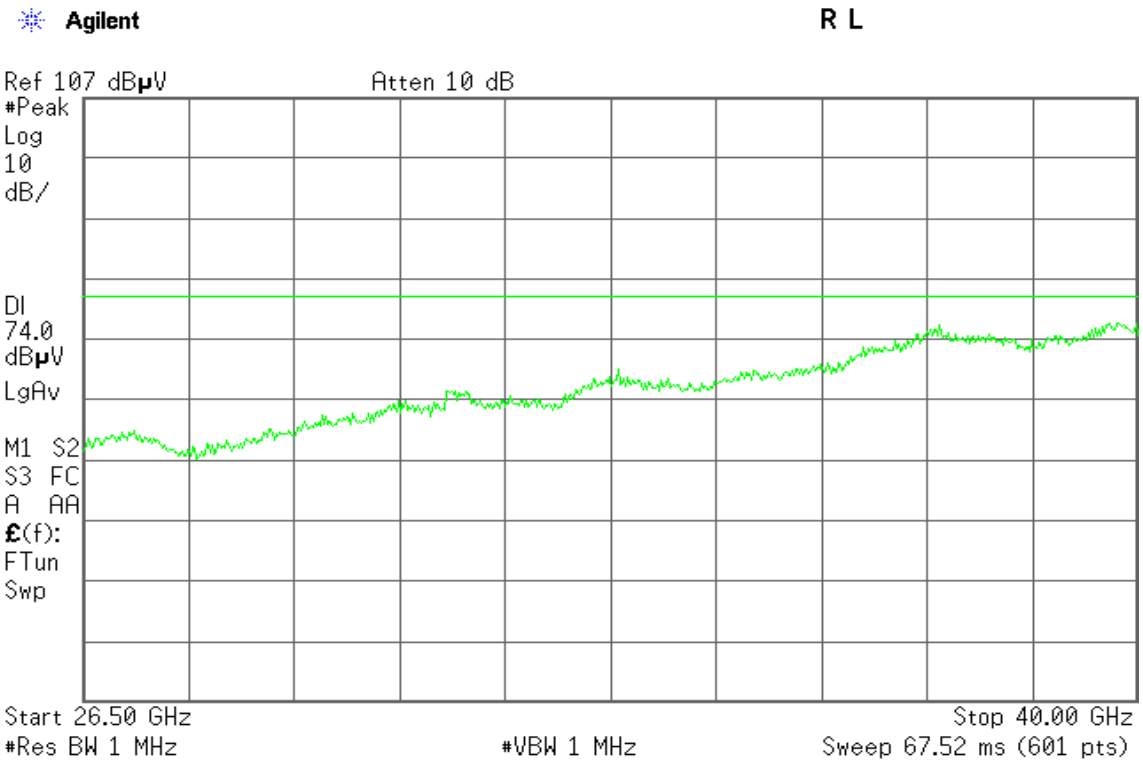
Remark:

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).*

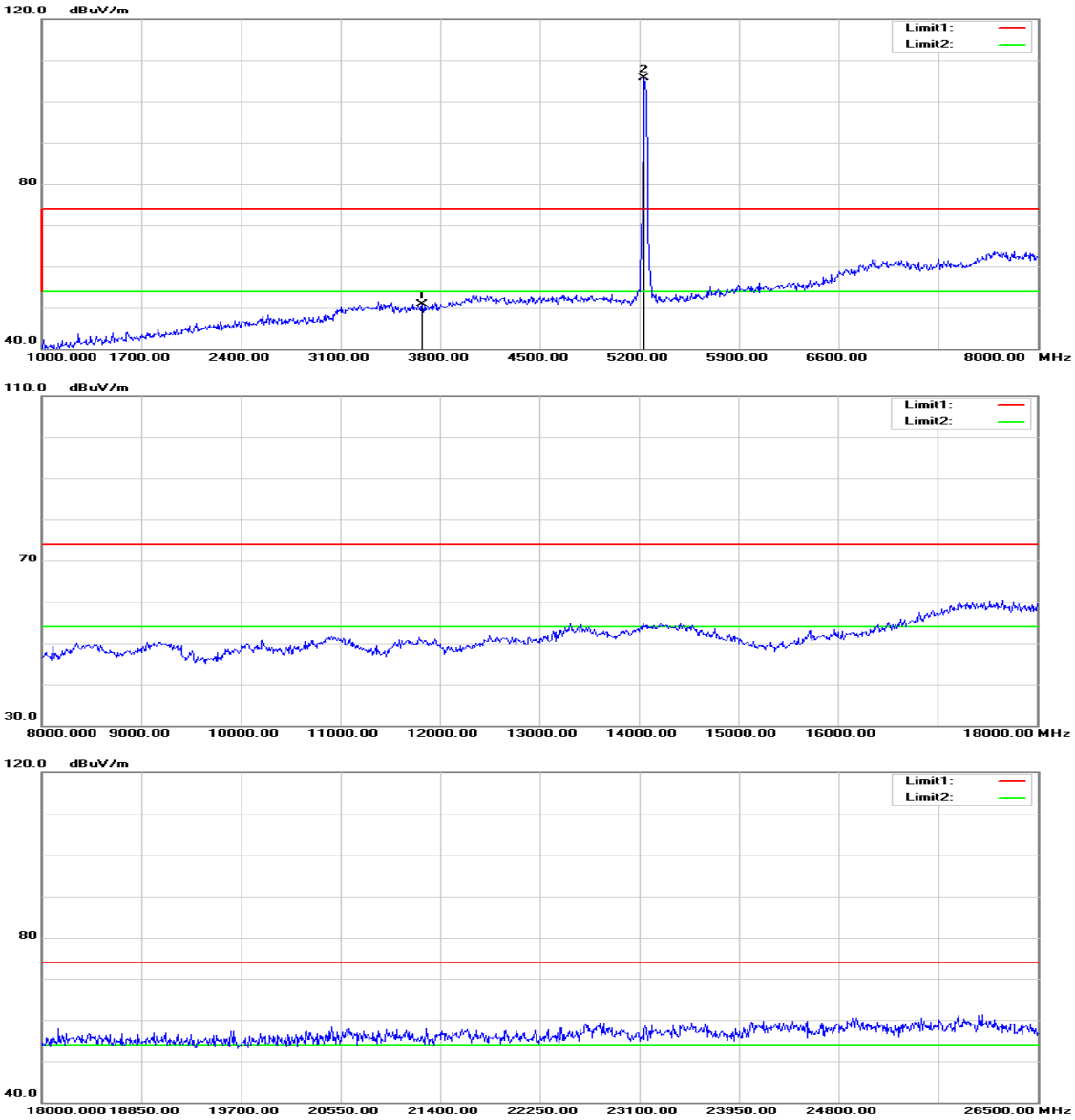
Tx / IEEE 802.11a mode / High

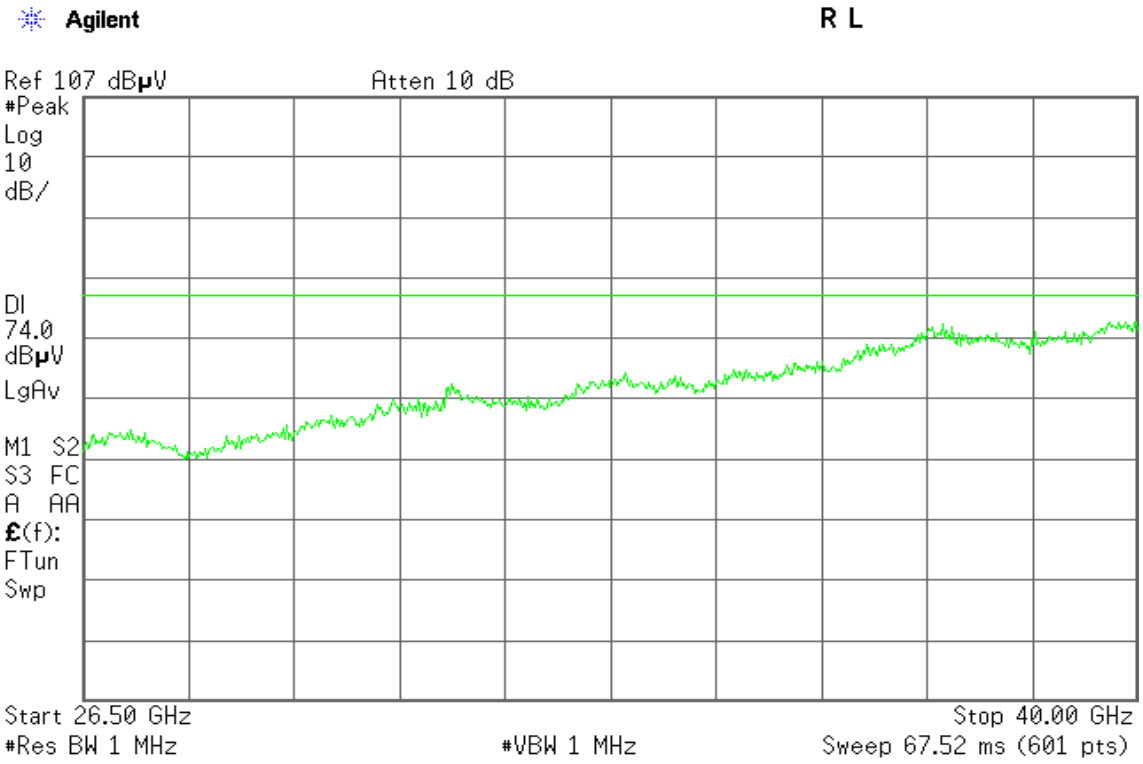
Polarity: Vertical




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH High	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

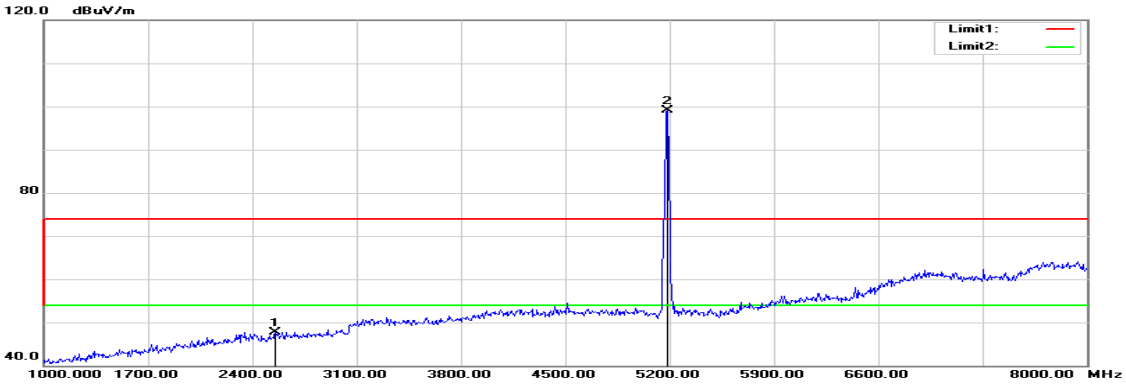
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3527.000	50.82	-0.42	50.40	74.00	-23.60	peak	V
N/A							
3674.000	50.48	0.48	50.96	74.00	-23.04	peak	H
N/A							

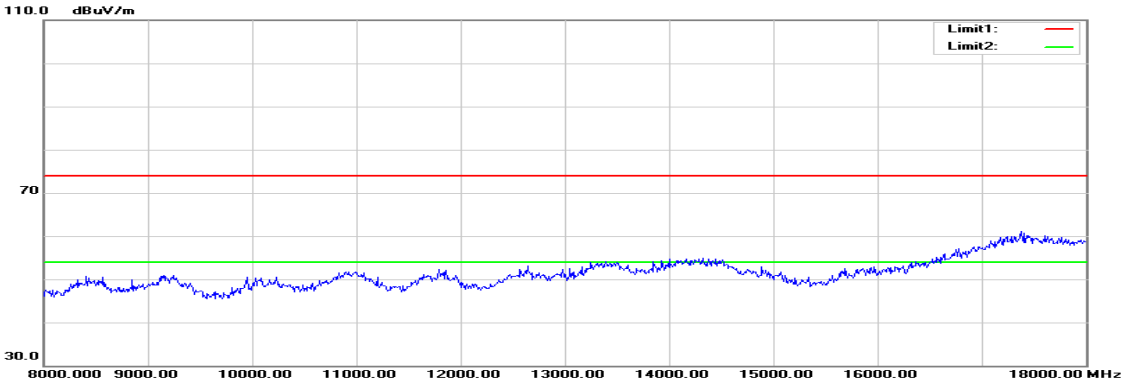
Remark:

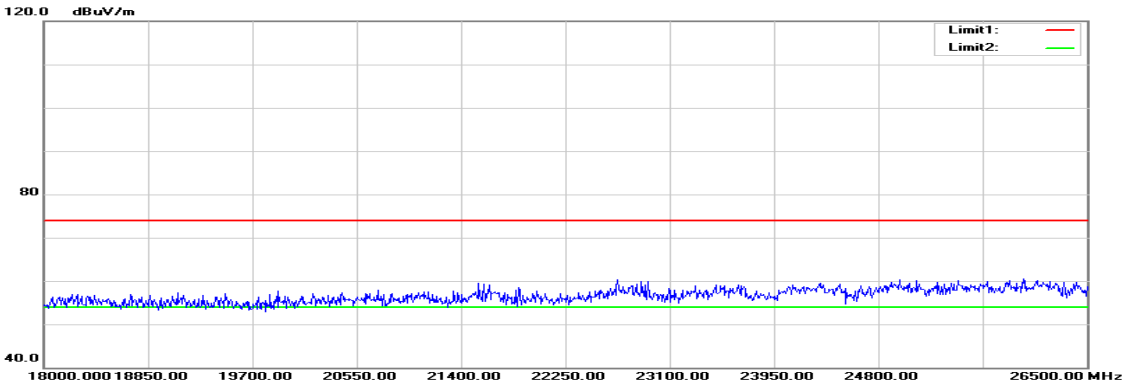
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average 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).*

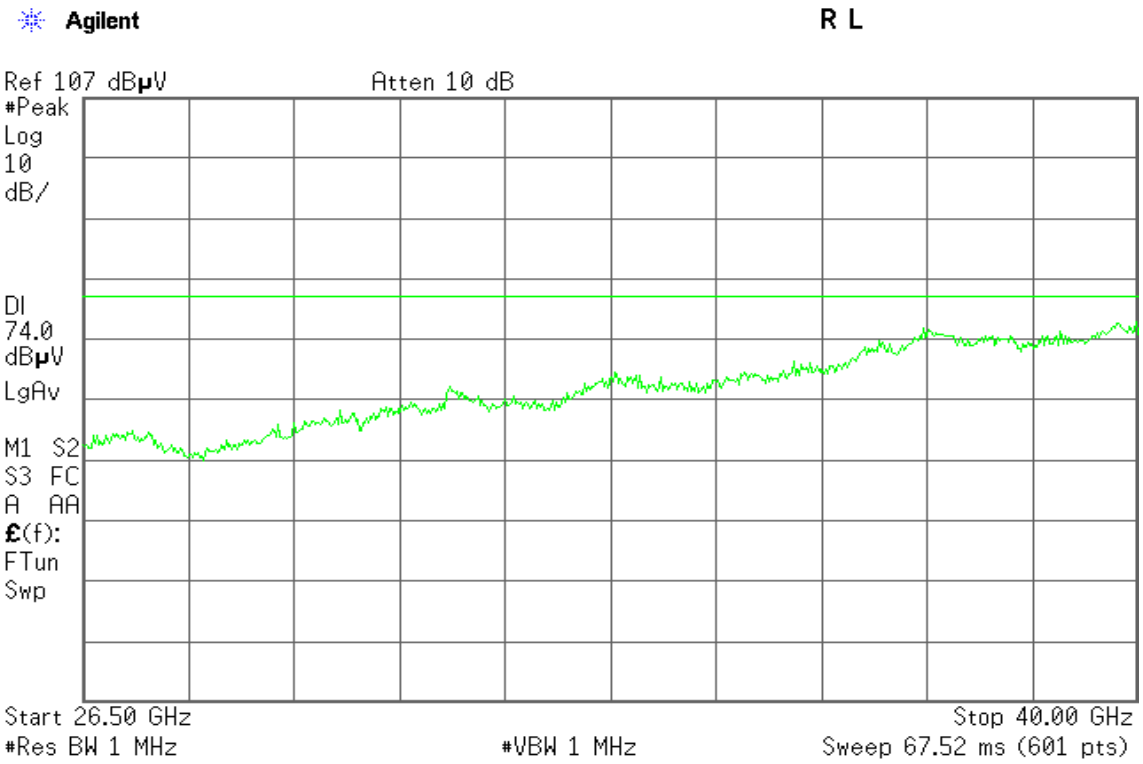
Tx / IEEE 802.11n HT 20 MHz / Low

Polarity: Vertical

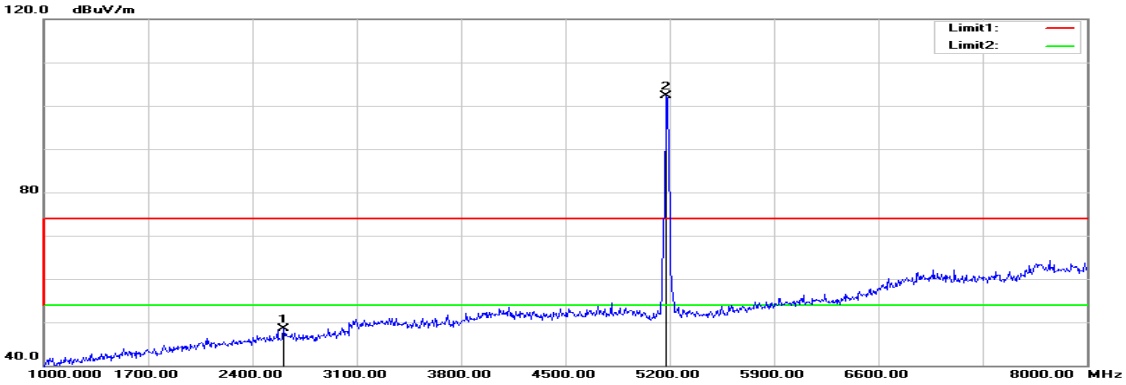


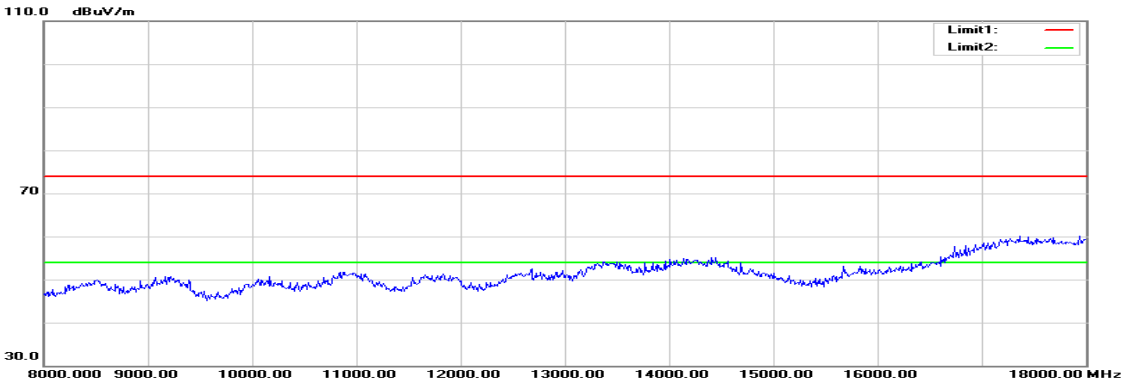


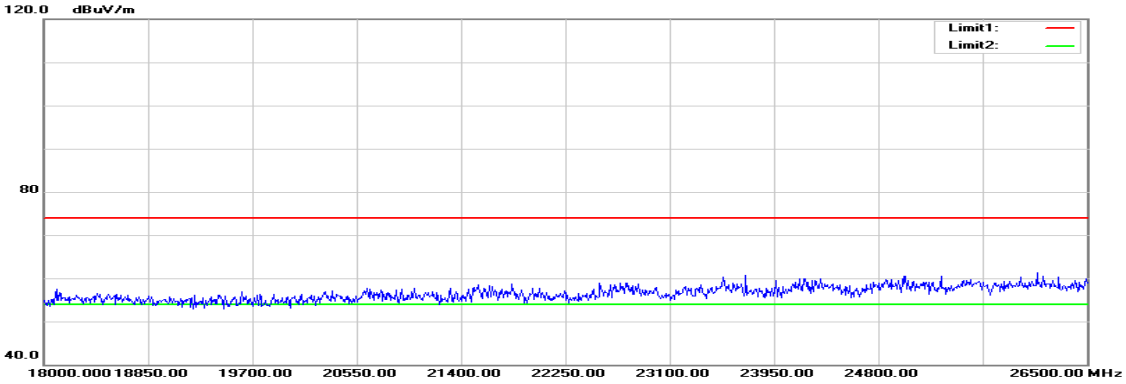


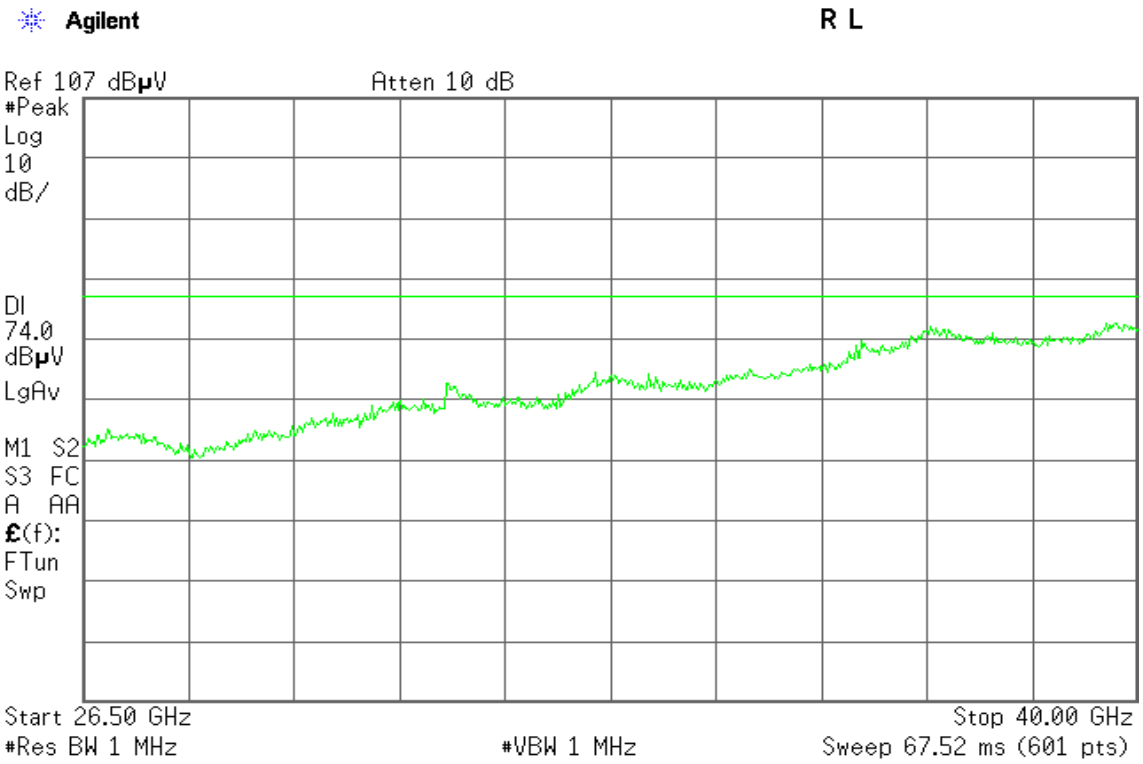

Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal








Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

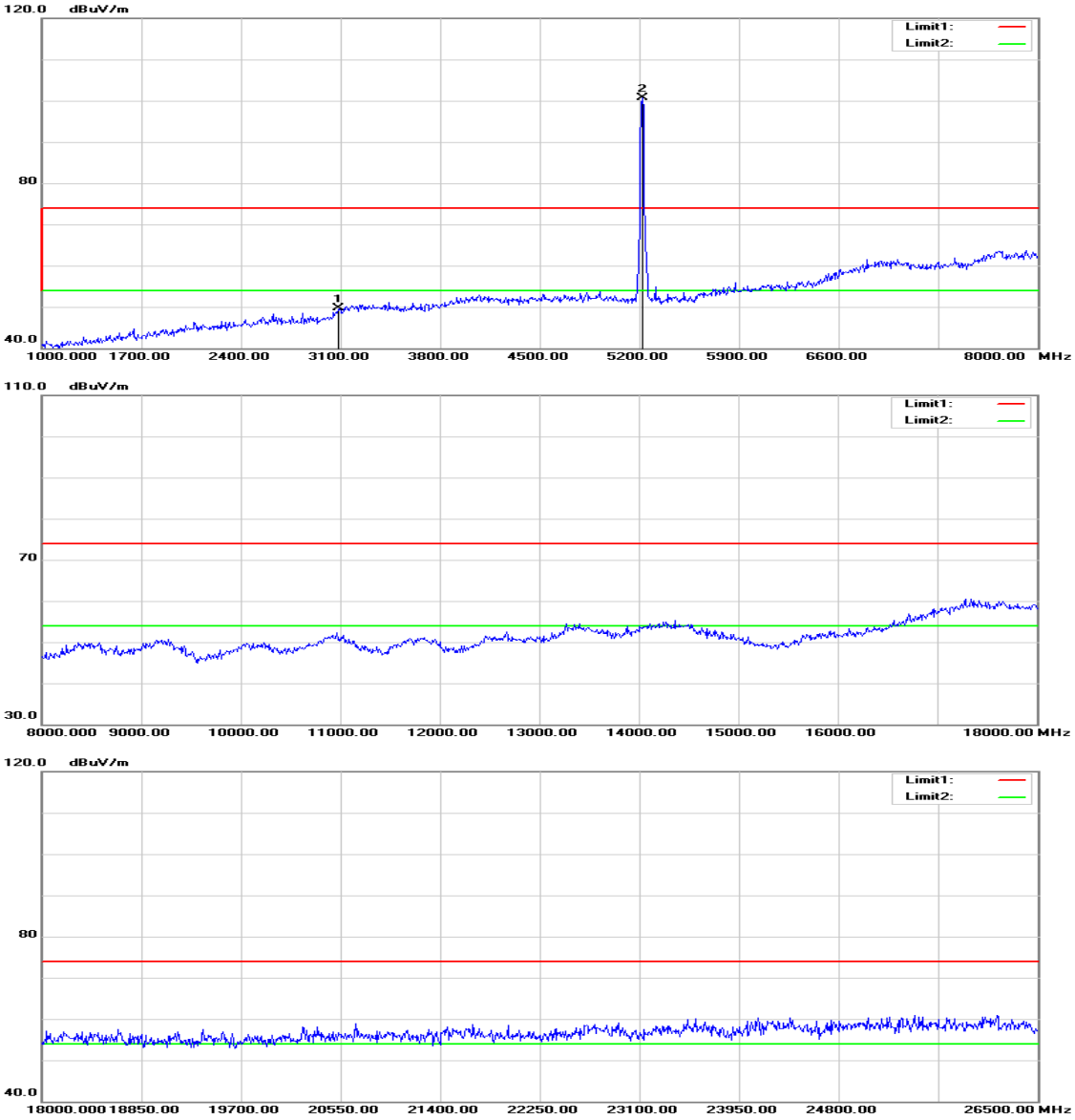
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2554.000	50.94	-3.14	47.80	74.00	-26.20	peak	V
N/A							
2610.000	51.46	-3.02	48.44	74.00	-25.56	peak	H
N/A							

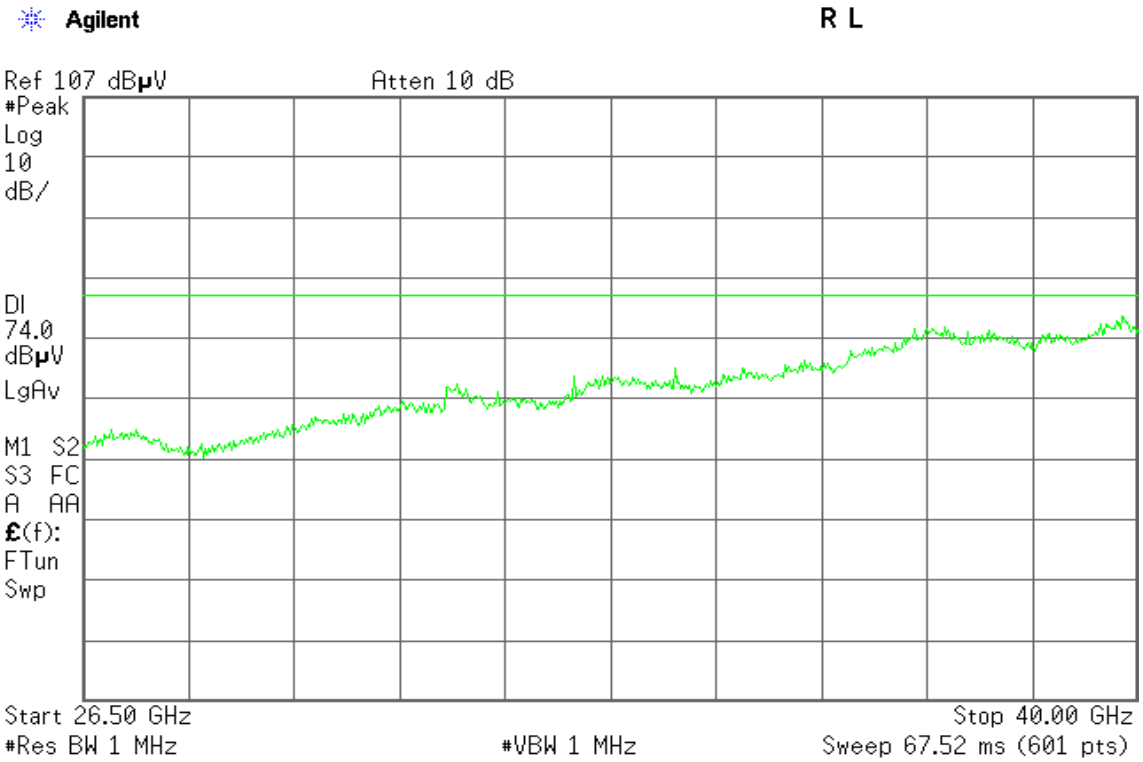
Remark:

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).*

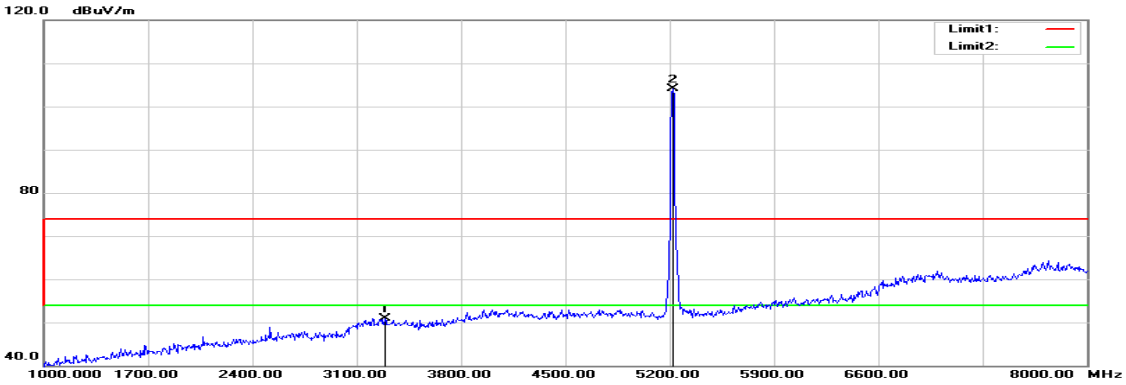
Tx / IEEE 802.11n HT 20 MHz / Mid

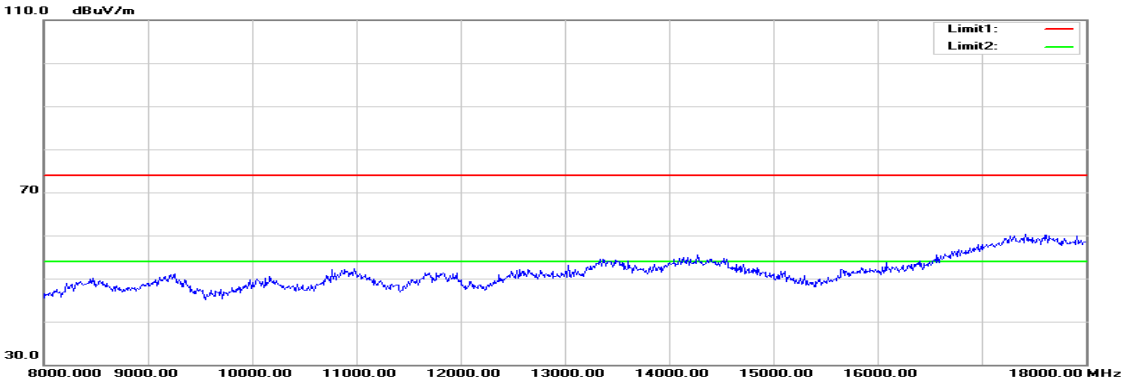
Polarity: Vertical

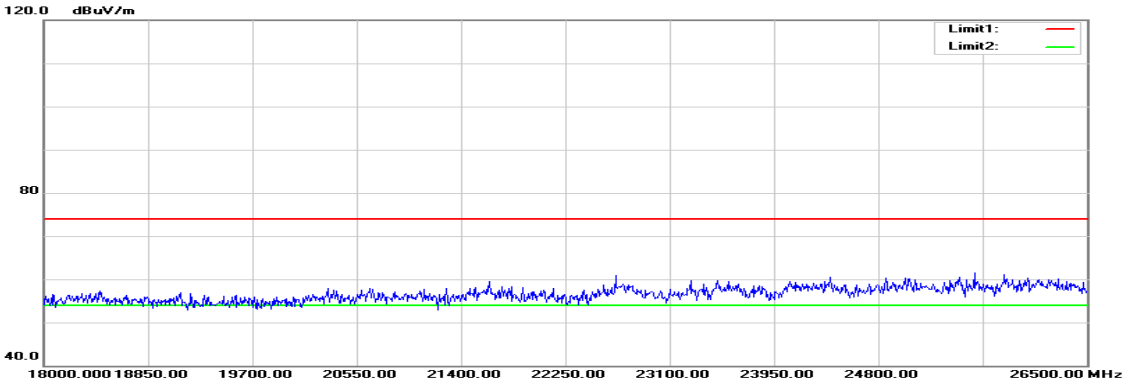


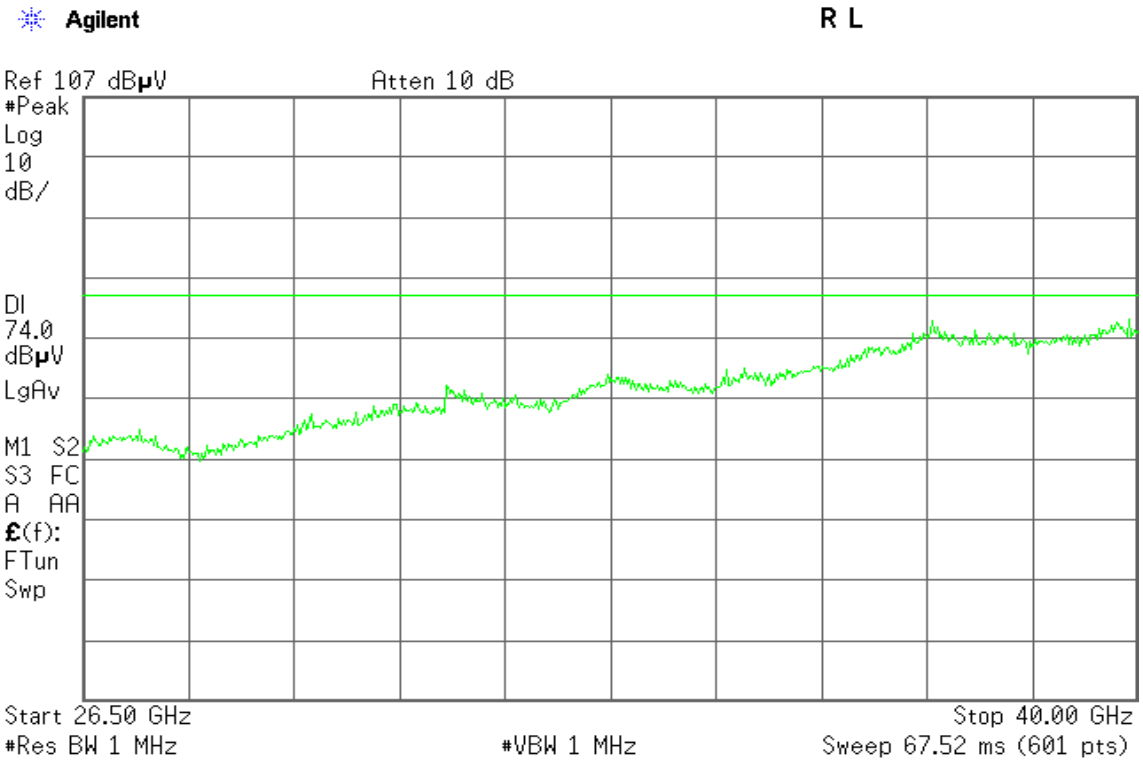

Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal








Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

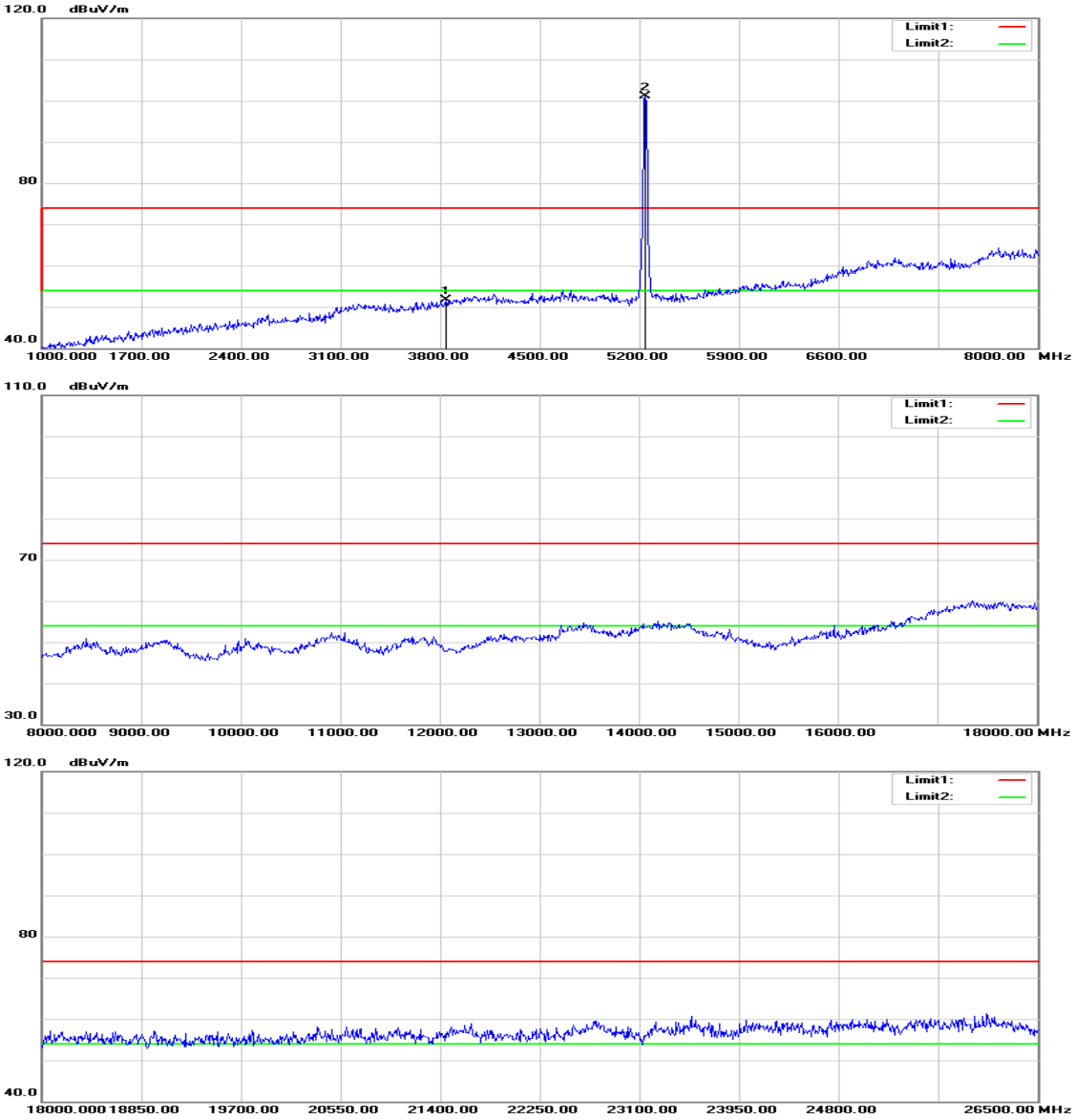
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3086.000	51.53	-1.93	49.60	74.00	-24.40	peak	V
N/A							
3289.000	52.19	-1.27	50.92	74.00	-23.08	peak	H
N/A							

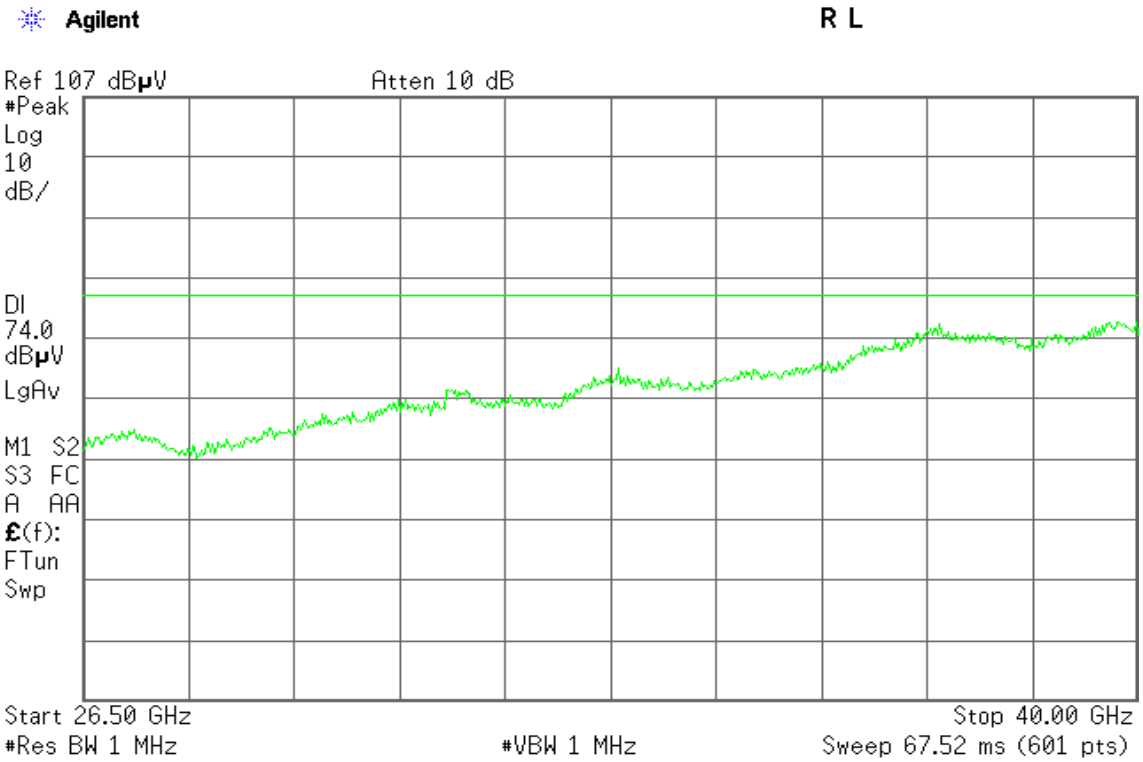
Remark:

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).*

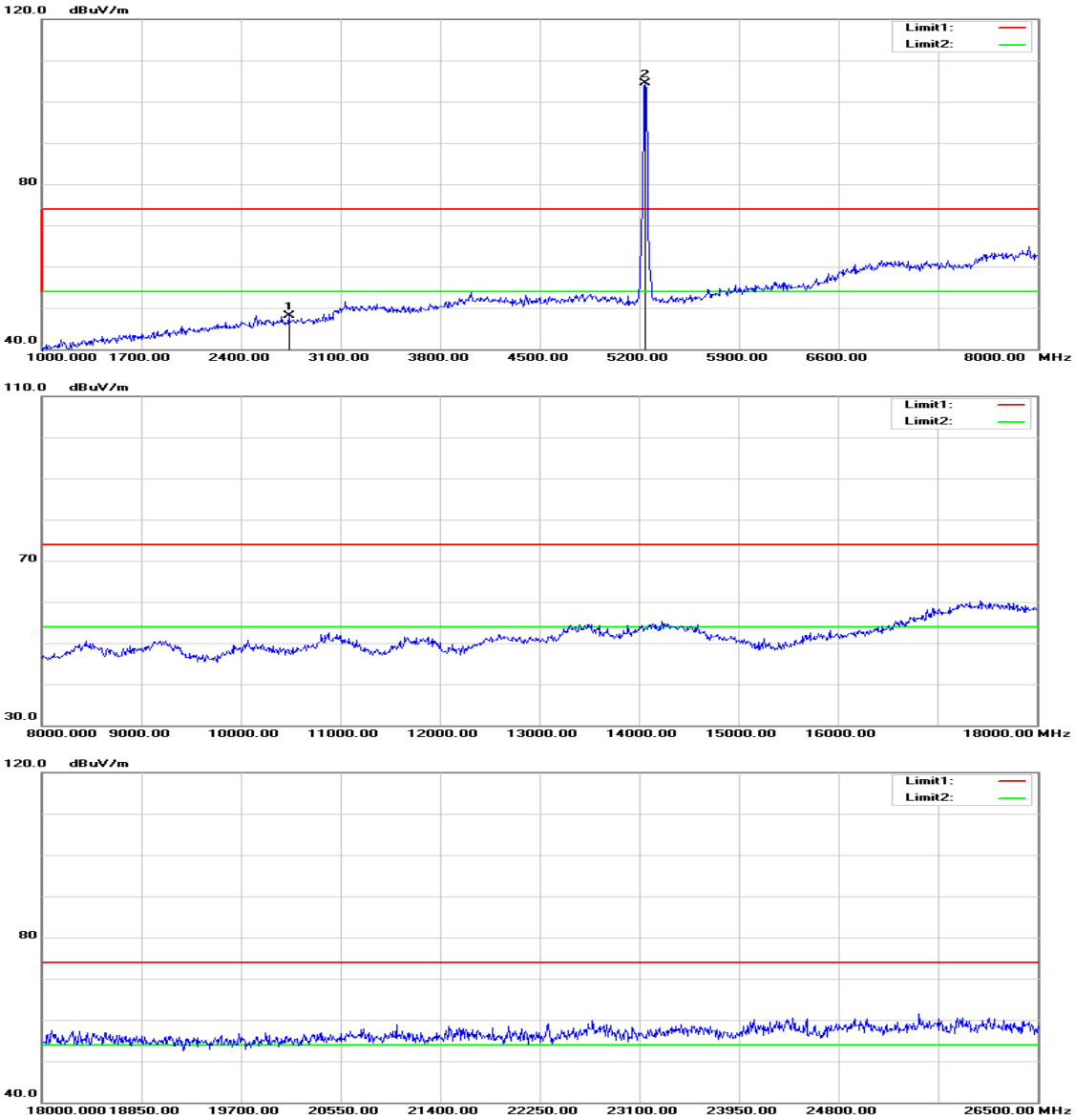
Tx / IEEE 802.11n HT 20 MHz / High

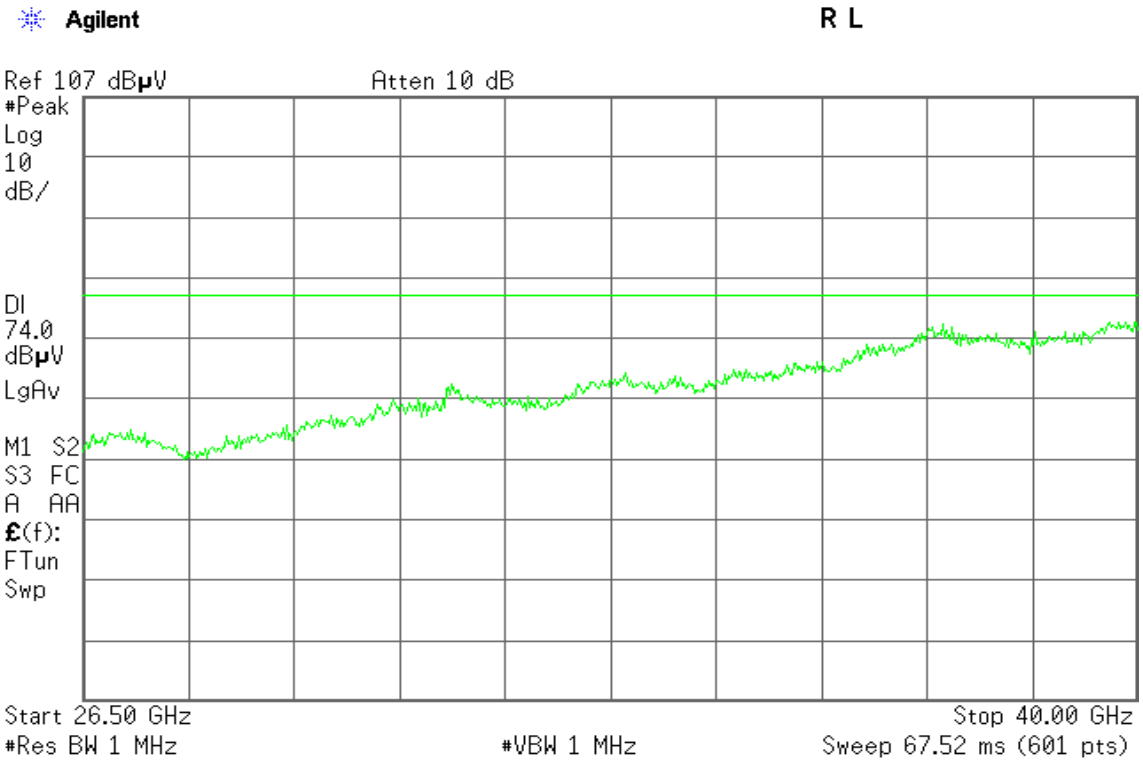
Polarity: Vertical




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH High	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

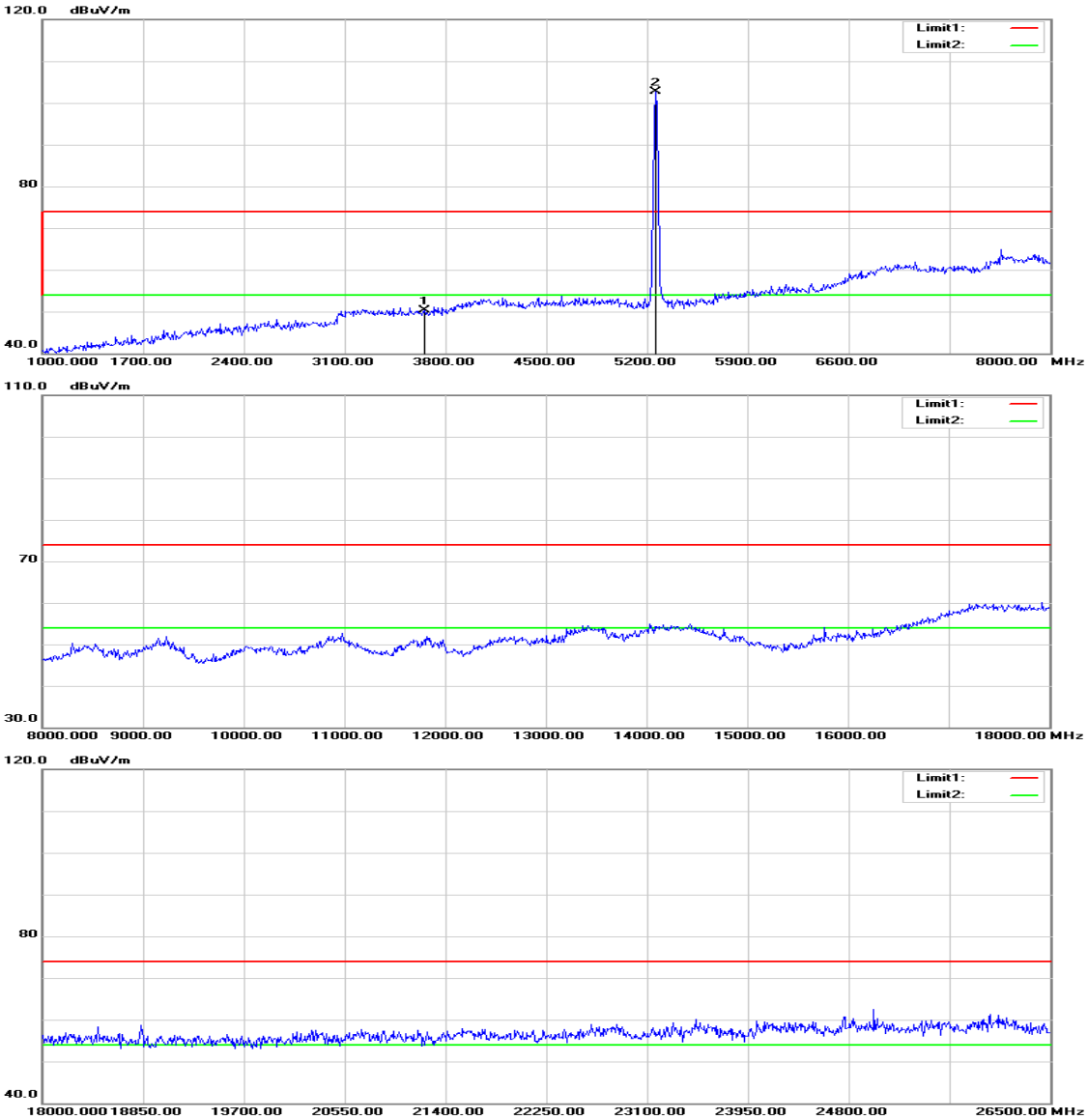
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3842.000	50.20	1.52	51.72	74.00	-22.28	peak	V
N/A							
2736.000	50.86	-2.76	48.10	74.00	-25.90	peak	H
N/A							

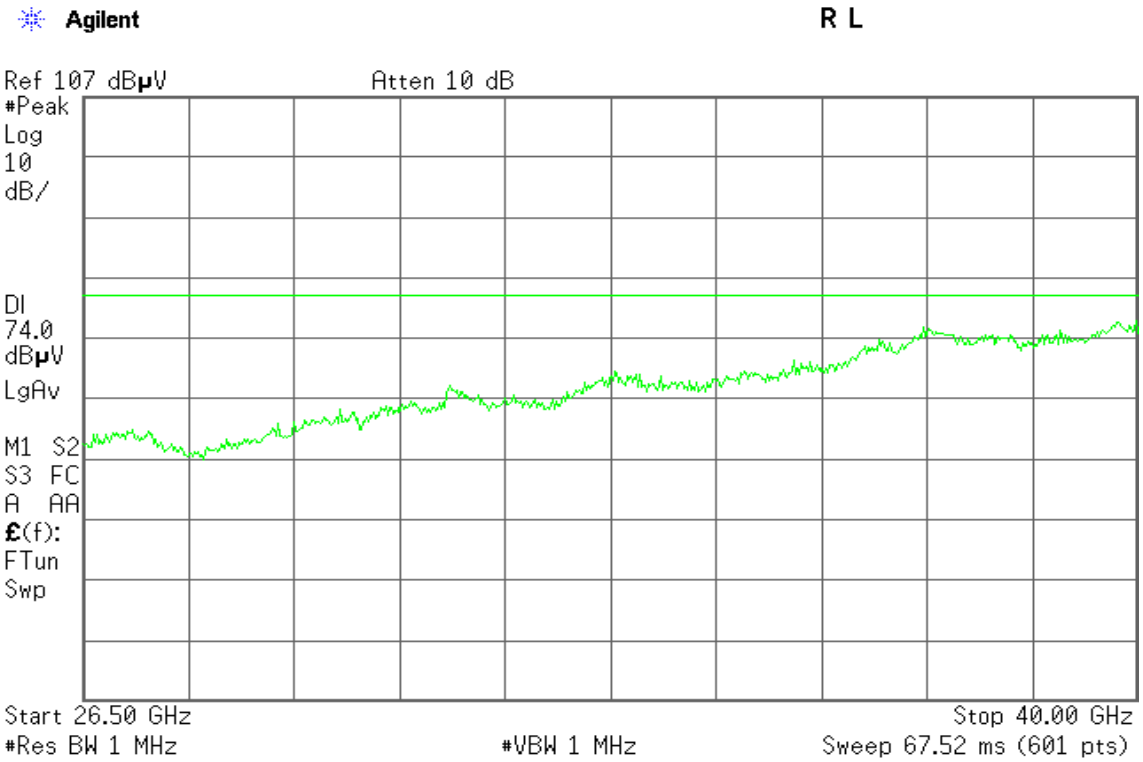
Remark:

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).*

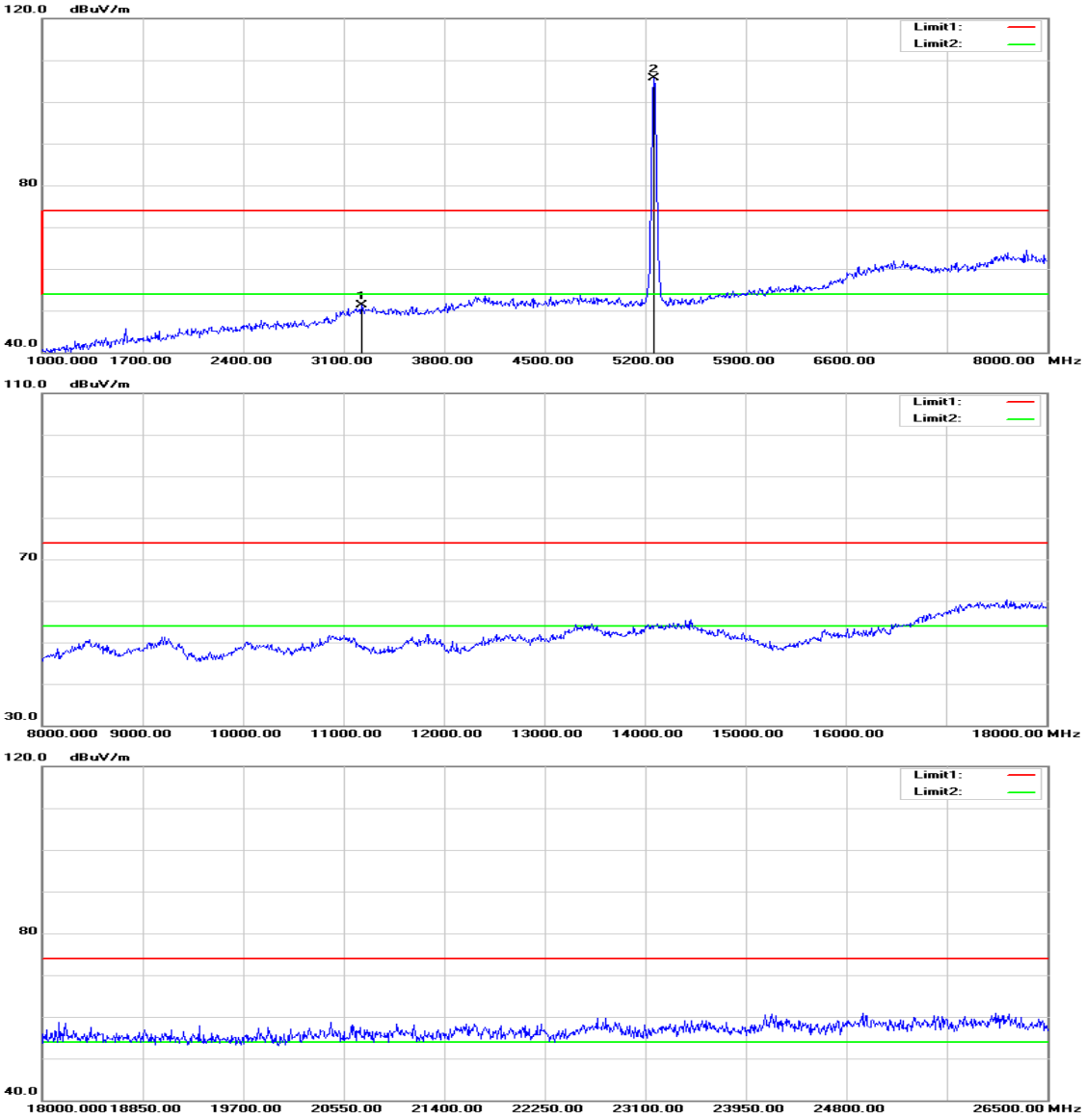
Tx / IEEE 802.11a mode / Low

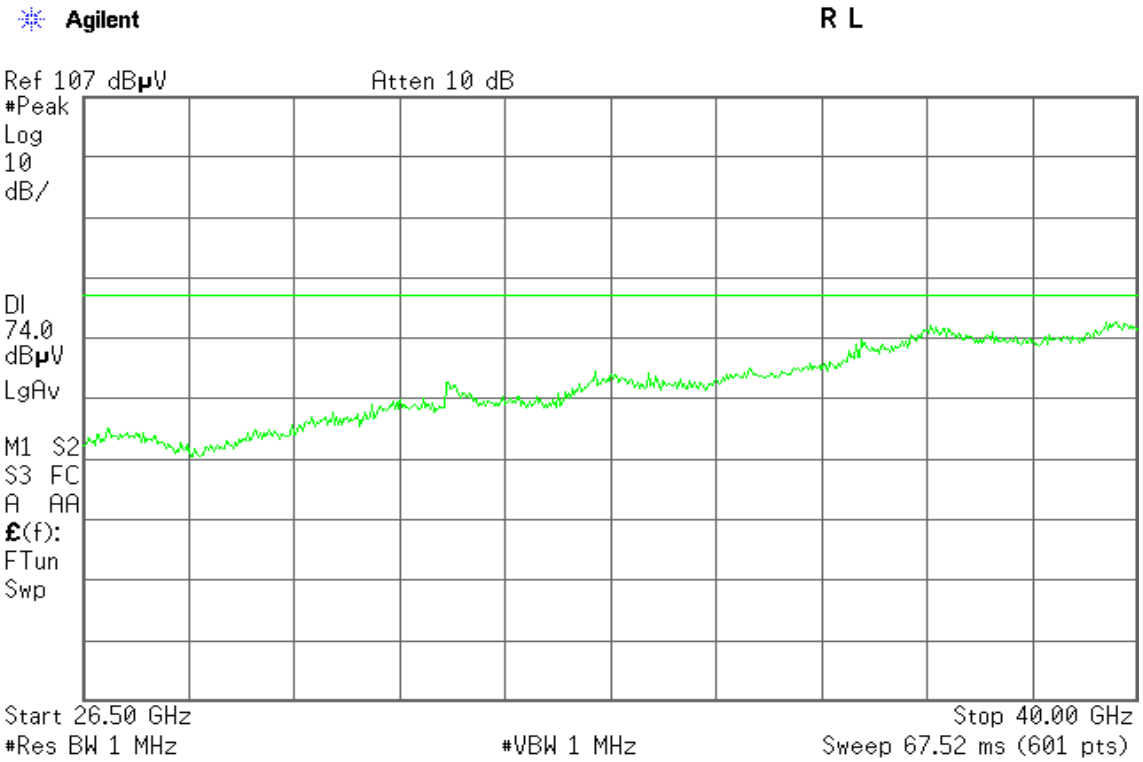
Polarity: Vertical




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal




Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Low	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

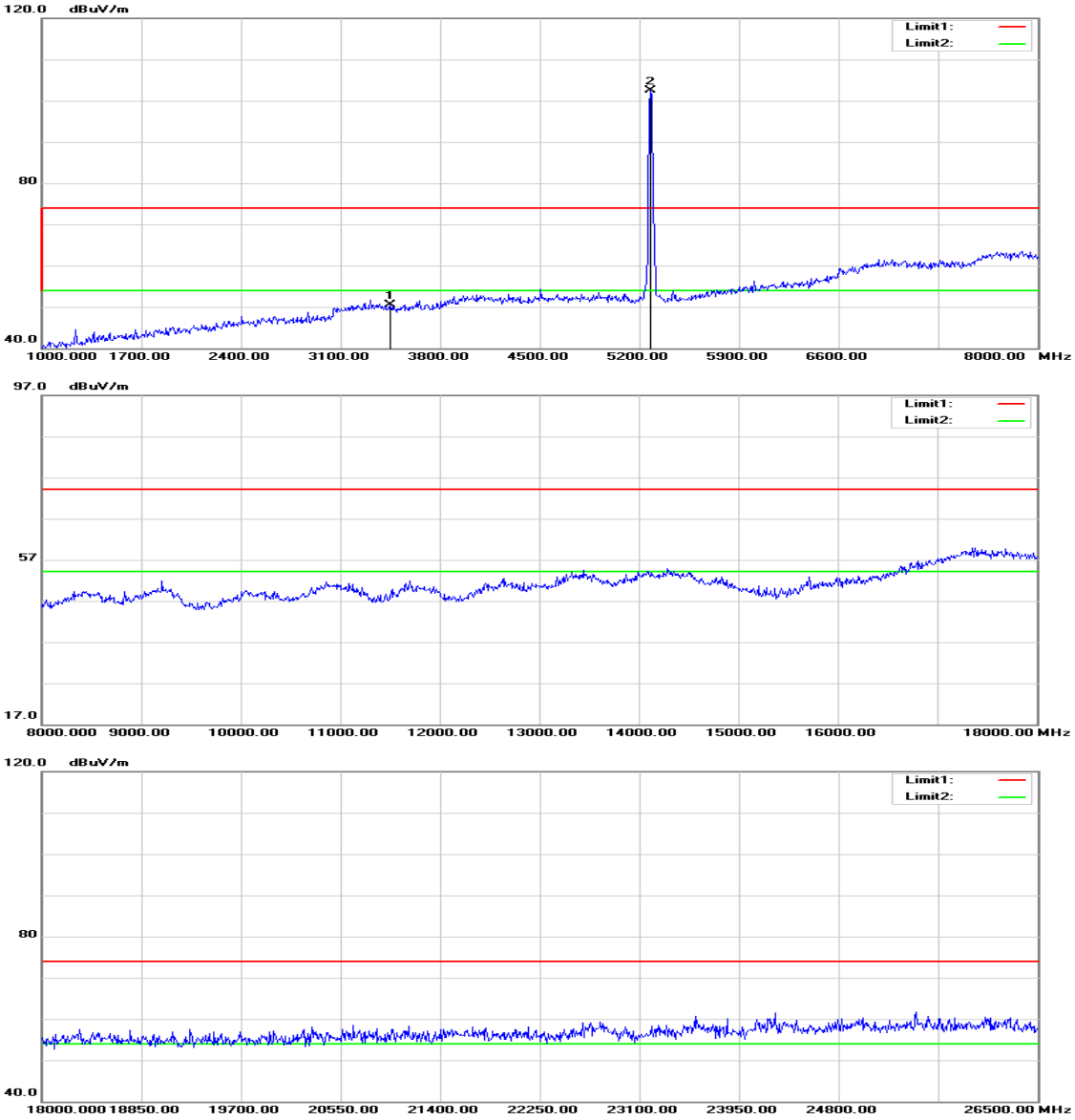
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3653.000	49.95	0.35	50.30	74.00	-23.70	peak	V
N/A							
3226.000	52.88	-1.48	51.40	74.00	-22.60	peak	H
N/A							

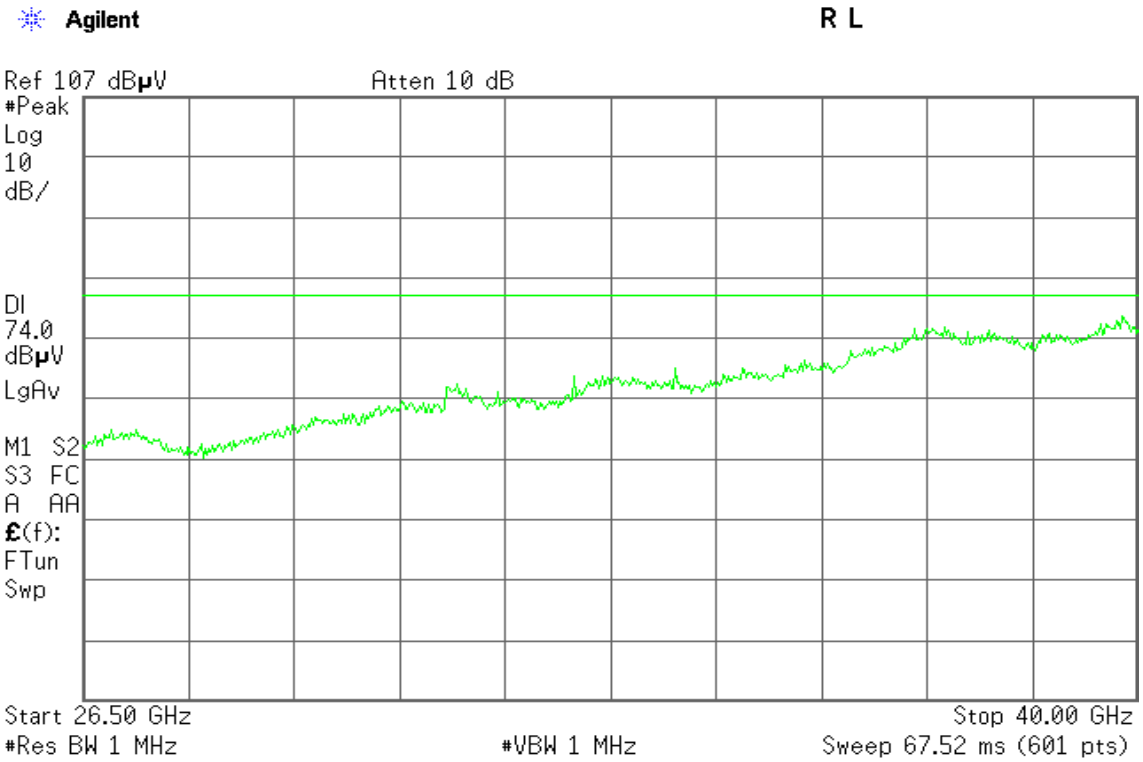
Remark:

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).*

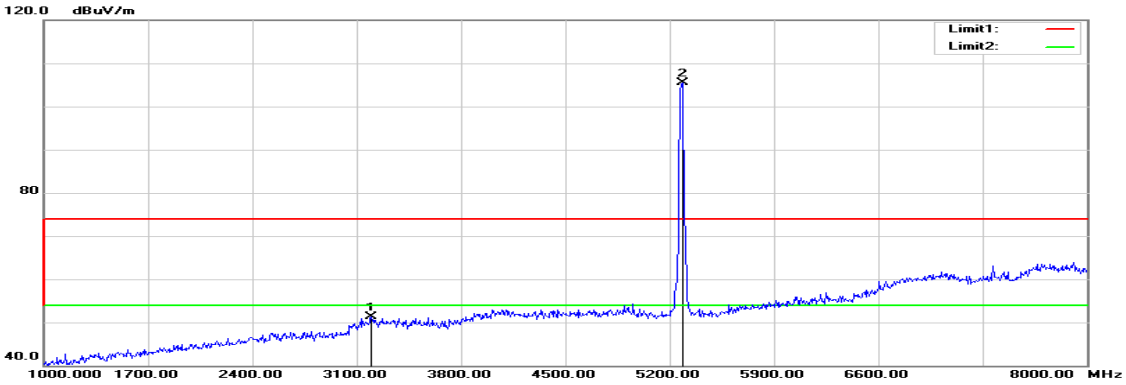
Tx / IEEE 802.11a mode / Mid

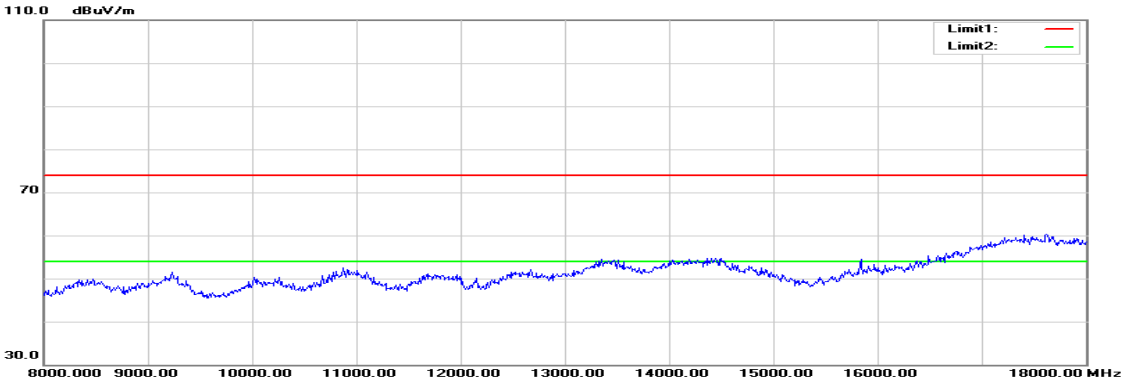
Polarity: Vertical

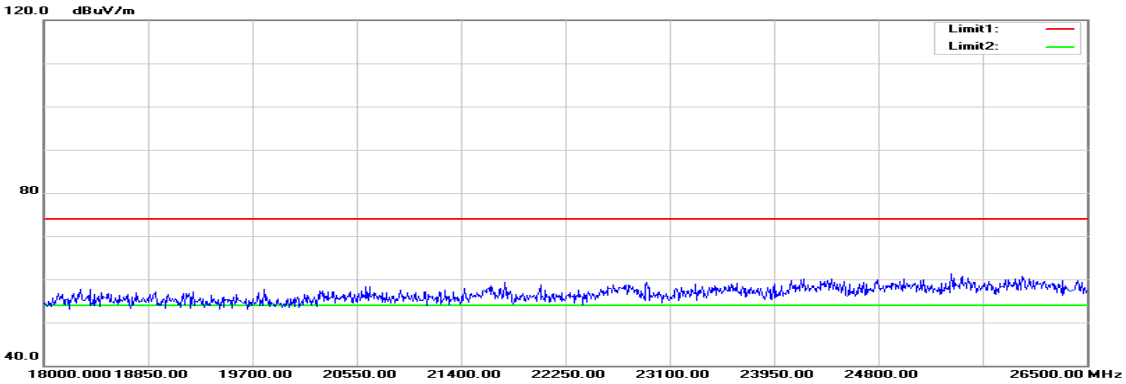


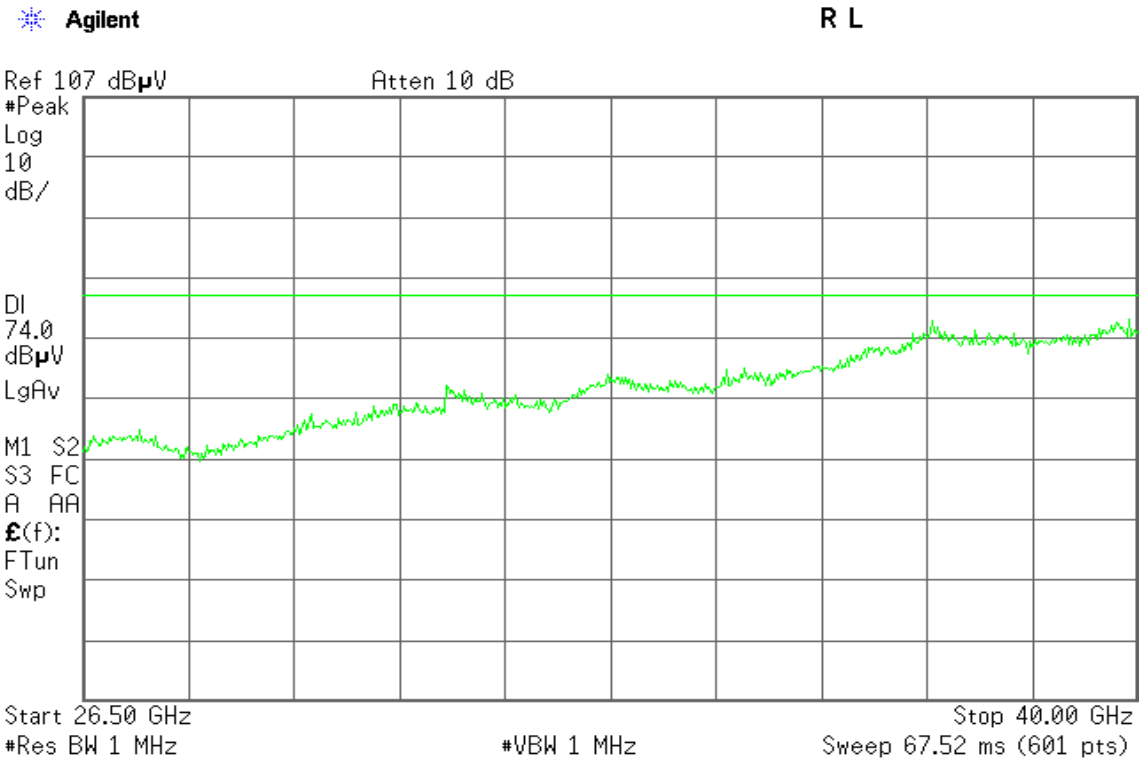

Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal








Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Mid	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

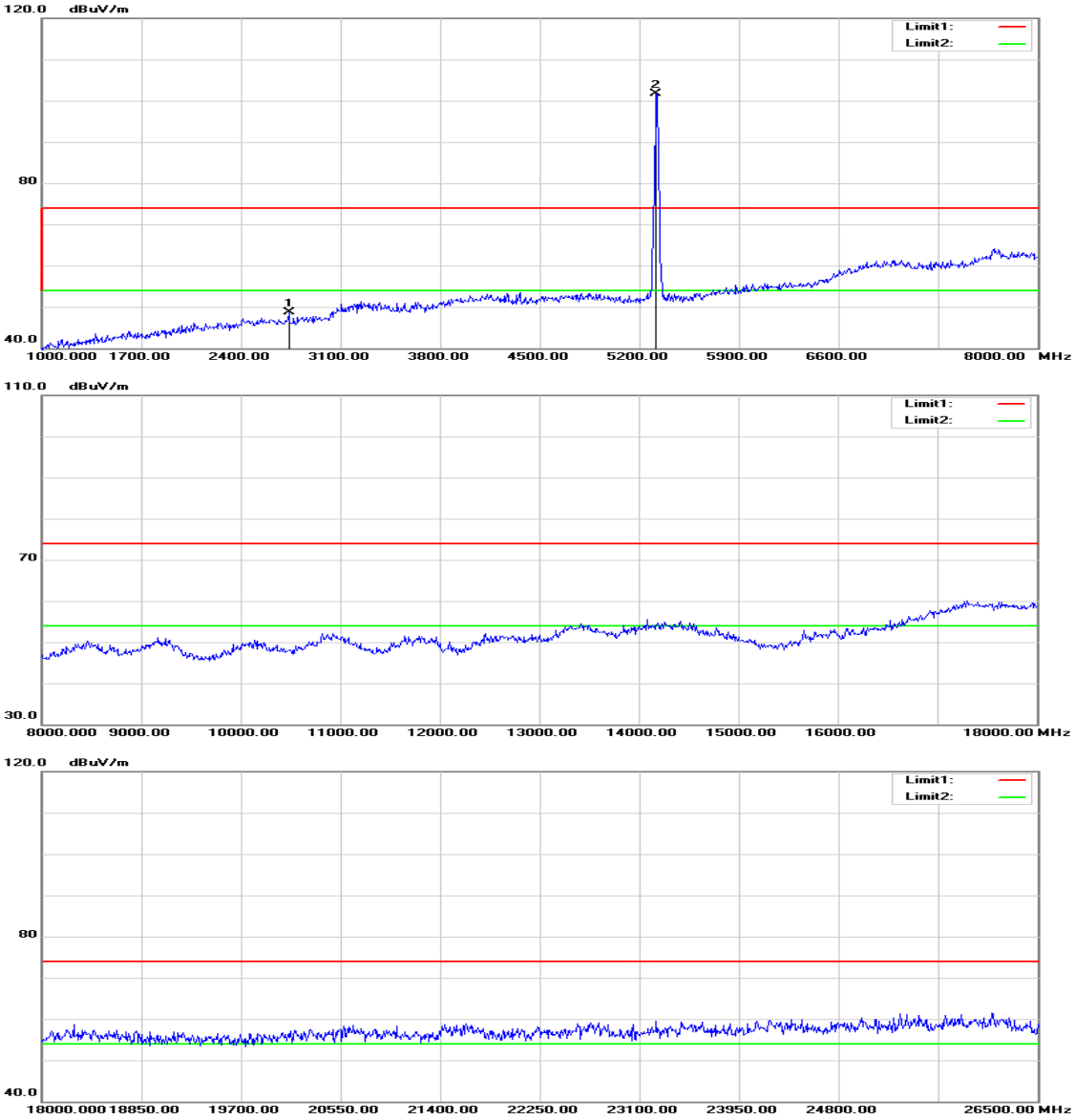
Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
3450.000	51.26	-0.75	50.51	74.00	-23.49	peak	V
N/A							
3198.000	52.79	-1.57	51.22	74.00	-22.78	peak	H
N/A							

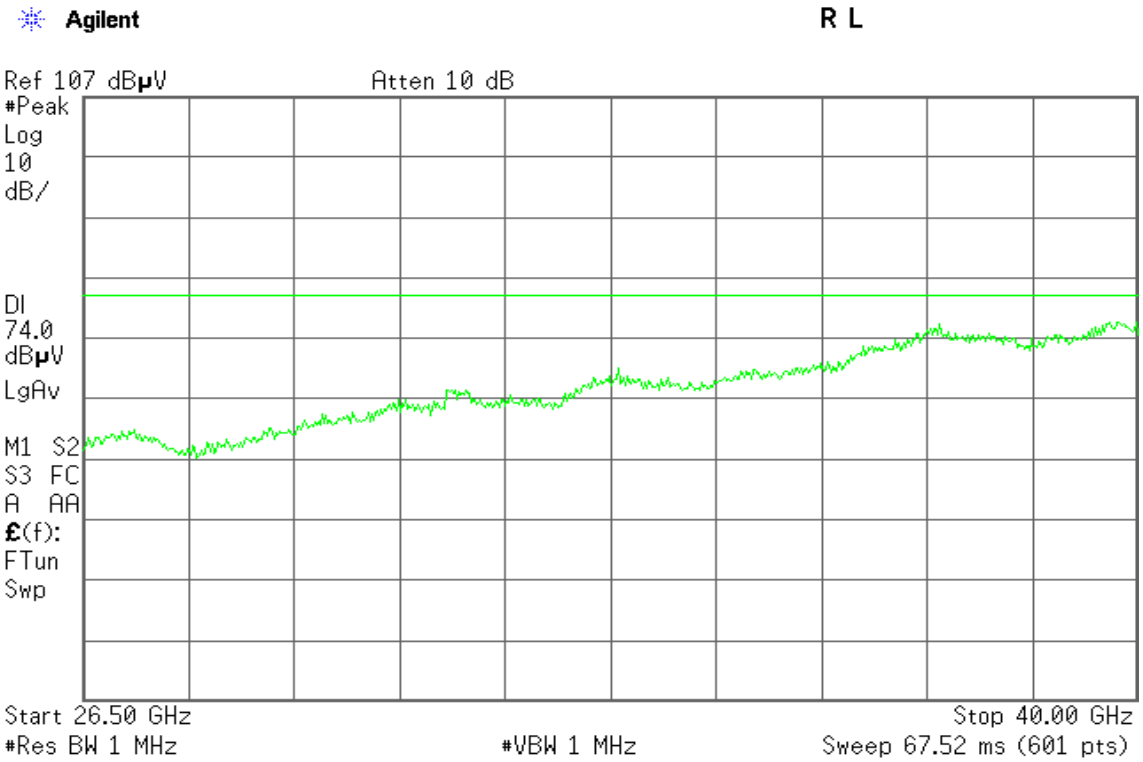
Remark:

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).*

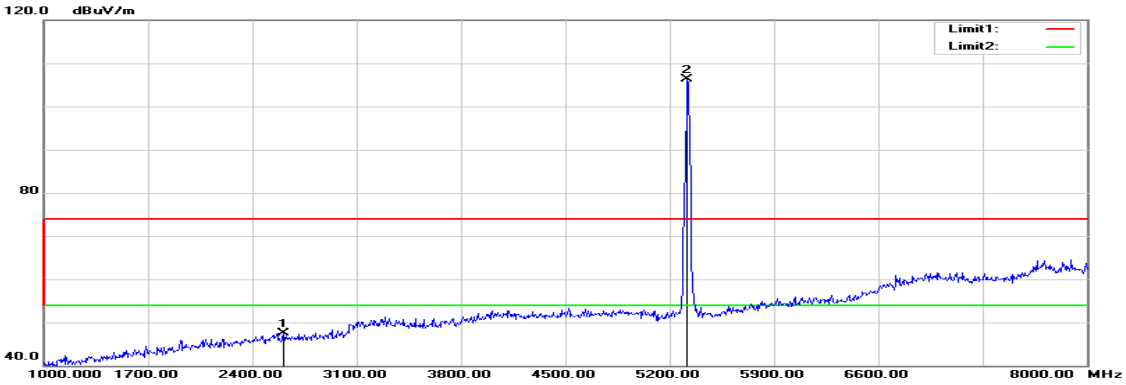
Tx / IEEE 802.11a mode / High

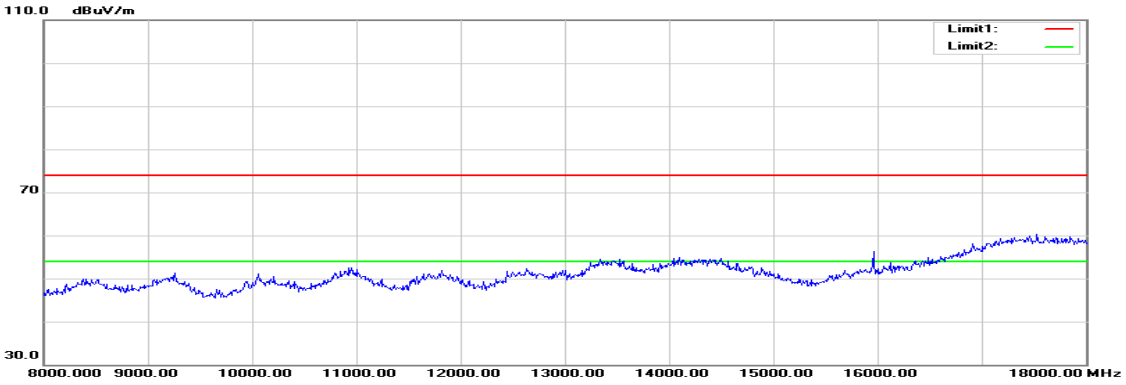
Polarity: Vertical

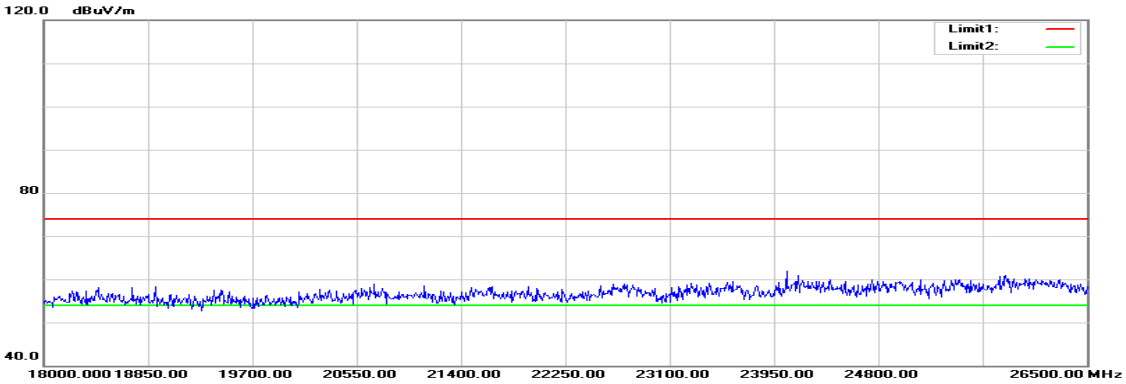


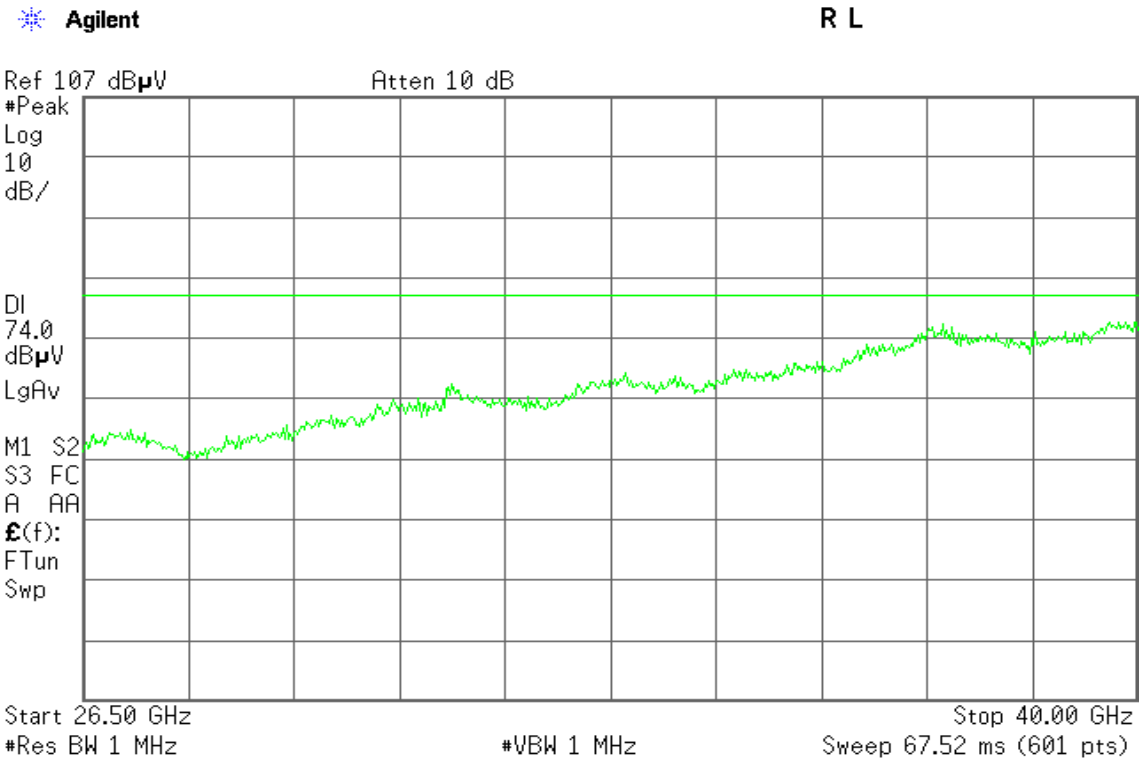

Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Polarity: Horizontal








Agilent
R L
Ref 107 dBµV
Atten 10 dB
#Peak
Log
10
dB/
Dl
74.0
dBµV
LgAv
M1 S2
S3 FC
A AA
£(f):
FTun
Swp
Start 26.50 GHz
Stop 40.00 GHz
#Res BW 1 MHz
#VBW 1 MHz
Sweep 67.52 ms (601 pts)

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH High	**Test Date:**	May 13, 2014
Temperature:	27°C	**Tested by:**	David Shu
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)
2736.000	51.43	-2.76	48.67	74.00	-25.33	peak	V
N/A							
2610.000	50.51	-3.02	47.49	74.00	-26.51	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).*

Tx / IEEE 802.11n HT 20 MHz / Low

Polarity: Vertical