FCC 47 CFR PART 15 SUBPART E & INDUSTRY CANADA RSS-210

TEST REPORT

For

802.11n, Dual Band 2T2R Wireless LAN USB Module

Model: WN4516R

Trade Name: LITE-ON

Issued to

Lite-On Technology Corp.
4F, 90, Chien 1 Road, Chung Ho,New Taipei City 23585, Taiwan, R.O.C.

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: February 11, 2015

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		February 11, 2015		Initial Issue	ALL	Doris Chu

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1. TEST RESULT CERTIFICATION

Applicant:	Lite-On Technology Corp. 4F, 90, Chien 1 Road, Chung Ho,New Taipei City 23585, Taiwan, R.O.C.
Manufacturer:	LITE-ON TECHNOLOGY (Changzhou) CO., LTD 9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City, Jiangsu Province 213100 China
Equipment Under Test:	802.11n, Dual Band 2T2R Wireless LAN USB Module
Trade Name:	LITE-ON
Model:	WN4516R
Date of Test:	January 19 ~ February 5, 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart E & Industry Canada RSS-210 Issue 8 December, 2010	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 C63.4: 2009** and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and Industry Canada RSS-210 Issue 8.

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

Approved by:

Miller Lee
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Angel Cheng
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

<table>
<tr><td>Product</td><td>802.11n, Dual Band 2T2R Wireless LAN USB Module</td></tr>
<tr><td>Trade Name</td><td>LITE-ON</td></tr>
<tr><td>Model Number</td><td>WN4516R</td></tr>
<tr><td>Model Discrepancy</td><td>N/A</td></tr>
<tr><td>Received Date</td><td>January 13, 2015</td></tr>
<tr><td>Power Supply</td><td>Power form host device</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="3">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>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>2 Channels</td></tr>
<tr><td rowspan="3">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>IEEE 802.11n HT 40 MHz</td><td>5270 - 5310</td><td>2 Channels</td></tr>
<tr><td rowspan="3">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>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 - 5670</td><td>5 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="3">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>14.92</td><td>31.0456</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>18.25</td><td>66.8344</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>17.97</td><td>62.6614</td></tr>
<tr><td rowspan="3">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>15.06</td><td>32.0627</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>18.18</td><td>65.7658</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 - 5310</td><td>18.09</td><td>64.4169</td></tr>
<tr><td rowspan="3">UNII Band III</td><td>IEEE 802.11a</td><td>5500 - 5700</td><td>15.27</td><td>33.6512</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 – 5700</td><td>18.02</td><td>63.3870</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 - 5670</td><td>18.19</td><td>65.9174</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)
IEEE 802.11n HT 40 MHz: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)</td></tr>
<tr><td>Antenna Specification</td><td>Gain: 4.6 dBi</td></tr>
<tr><td>Antenna Designation</td><td>PIFA Antenna</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

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2009 Radiated testing was performed at an antenna to EUT distance 3 meters.

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC CFR 47 Part 15.207, 15.209 and 15.407, RSS-GEN Issue 2, and RSS-210 Issue 8.

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

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

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

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4, 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 0.8 m above the ground plane. The turntable is then rotated for 360 degrees to determine the proper orientation for the maximum emission level. The EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission level. And, each emission is to be maximized by changing the horizontal and vertical polarization of the receiving antenna. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.

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: WN4516R) had been tested under operating condition.

The EUT is a 2x2 configuration spatial MIMO (2Tx & 2Rx) without beam forming function that operate in double TX chains and double RX chains. The 2x2 configuration is implemented with two outside TX & RX chains (Chain 0 and 1).

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

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

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.

IEEE 802.11n HT 40 MHz Channel for 5190 ~ 5230MHz:
Channel Low (5190MHz) and Channel High (5230MHz) with 13.5Mbps 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.

IEEE 802.11n HT 40 MHz for 5270 ~ 5310MHz:

Channel Low (5270MHz) and Channel High (5310MHz) with 13.5Mbps data rate were chosen for full testing.

UNII Band III:

IEEE 802.11a for 5500 ~ 5700MHz:
Channel Low (5500MHz), Channel Mid (MHz) 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.

IEEE 802.11n HT 40 MHz for 5510 ~ 5670MHz:
Channel Low (5510MHz), Channel Mid (5550MHz) and Channel High (5670MHz) with 13.5Mbps 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 (X 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	US42510252	11/23/2015
Thermostatic/Hrgrosatic Chamber	TAICHY	MHG-150LF	930619	10/07/2015
AC Power Source	EXTECH	6205	1140845	N.C.R
DC Power Supply	ABM	8301HD	D011531	N.C.R
Power Meter	Anritsu	ML2495A	1012009	06/03/2015
Power Sensor	Anritsu	MA2411A	0917072	06/03/2015
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40	101073	07/09/2015

Wugu 966 Chamber A				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510268	09/18/2015
EMI Test Receiver	R&S	ESCI	100064	05/30/2015
Bilog Antenna	Sunol Sciences	JB3	A030105	08/19/2015
Horn Antenna	EMCO	3117	00055165	02/04/2015
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Test S/W	EZ-EMC (CCS-3A1RE)			

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
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 C63.4 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	Notebook PC	TOSHIBA	Satellite M840	N/A	PPD-AR5B225	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2	Notebook PC	HP	dv6-1332TX	CNF9491GPS	PD9112BNHU	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3	Notebook PC	IBM	7663 (T61)	L3E9812	N/A	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

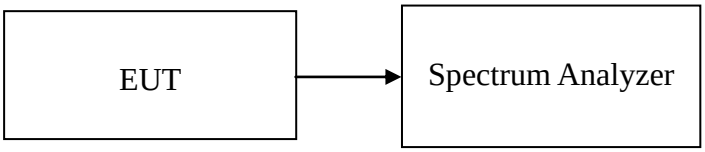
1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15 REQUIREMENTS & RSS 210 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	16.9607
Mid	5220	16.8869
High	5240	16.9622

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.8633
Mid	5220	17.8642
High	5240	17.9039

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.7532
Mid	5220	17.8170
High	5240	17.7991

Test mode: IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.5334
High	5230	36.4542

Test mode: IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.2243
High	5230	36.3526

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	16.9728
Mid	5280	16.9911
High	5320	16.9958

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.8591
Mid	5280	17.8701
High	5320	17.8947

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.7671
Mid	5280	17.7744
High	5320	17.7796

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.4078
High	5310	36.4663

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.1966
High	5310	36.2082

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	16.9135
Mid	5580	16.8458
High	5700	16.9705

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.9751
Mid	5580	17.9298
High	5700	17.9432

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.7825
Mid	5580	17.7834
High	5700	17.7827

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.4712
Mid	5550	36.3438
High	5670	36.5433

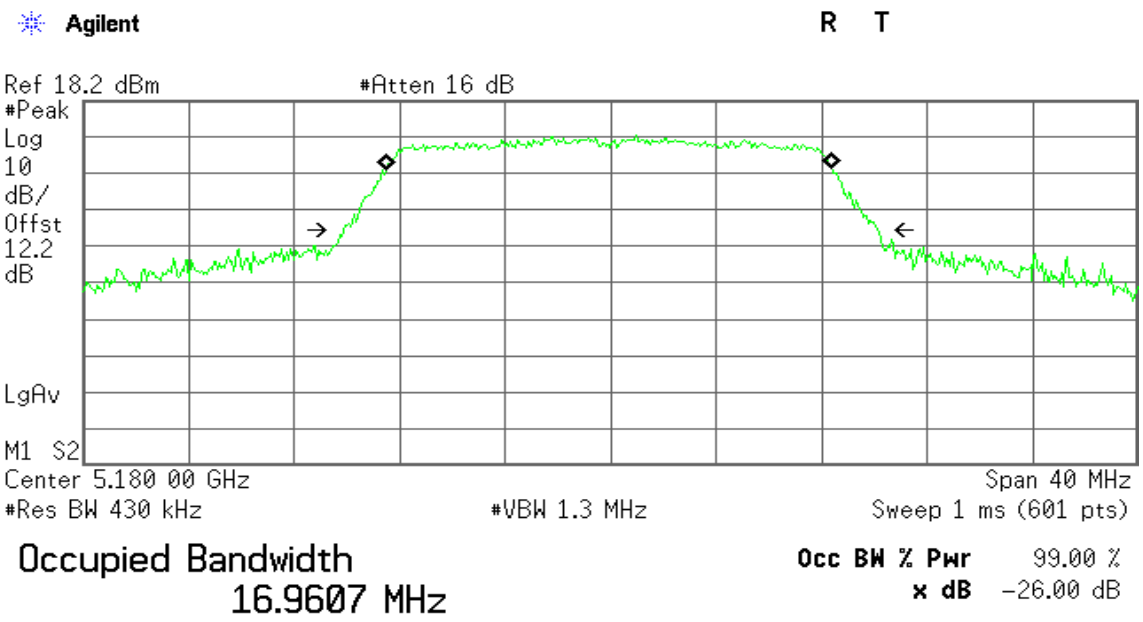
Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.1968
Mid	5550	36.3530
High	5670	36.3071

Test Plot

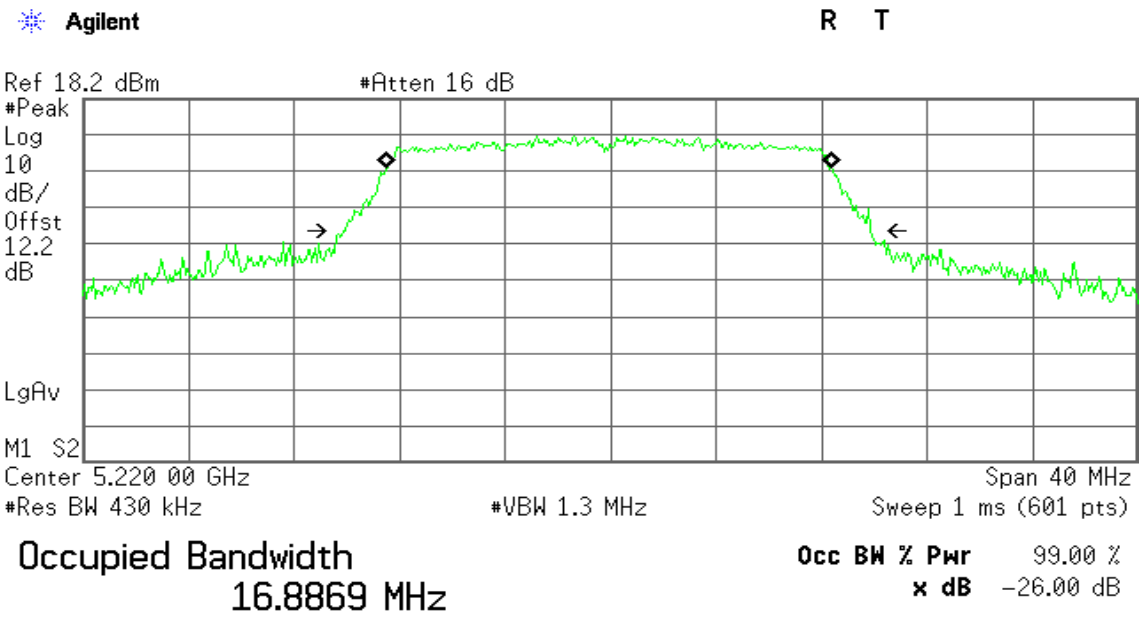
IEEE 802.11a mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)



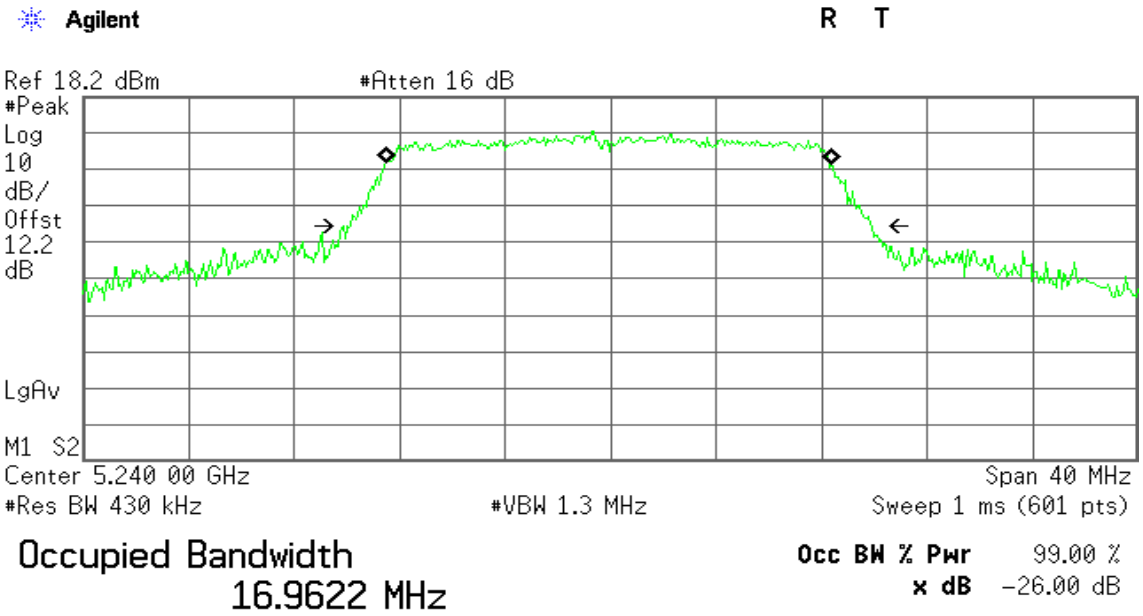
Transmit Freq Error -60.623 kHz
x dB Bandwidth 20.306 MHz

99% Bandwidth (CH Mid)



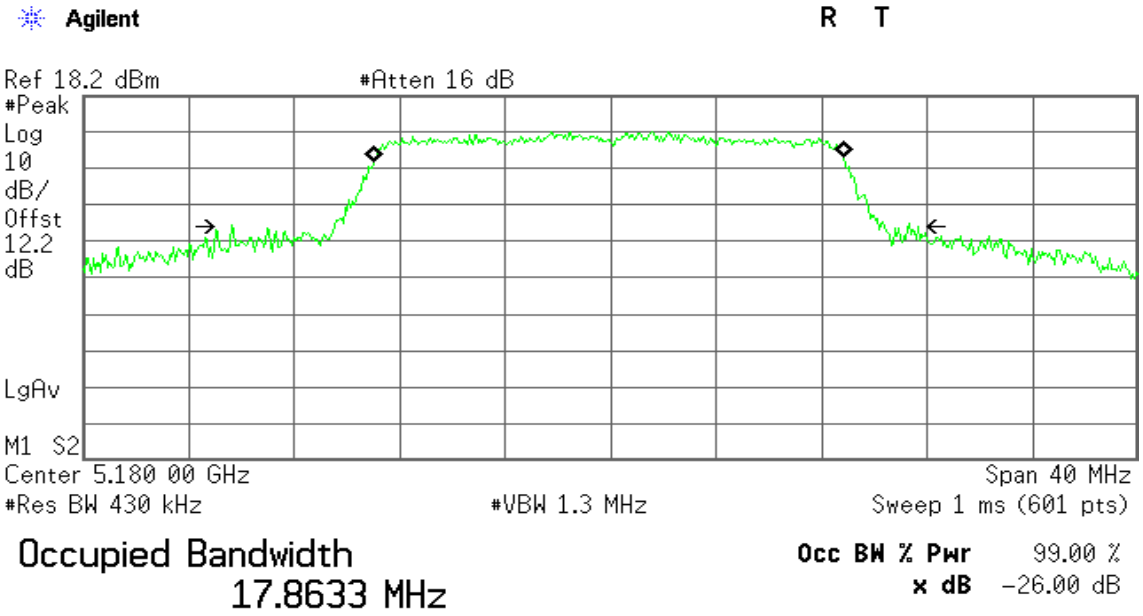
Transmit Freq Error -64.550 kHz
x dB Bandwidth 20.009 MHz

99% Bandwidth (CH High)



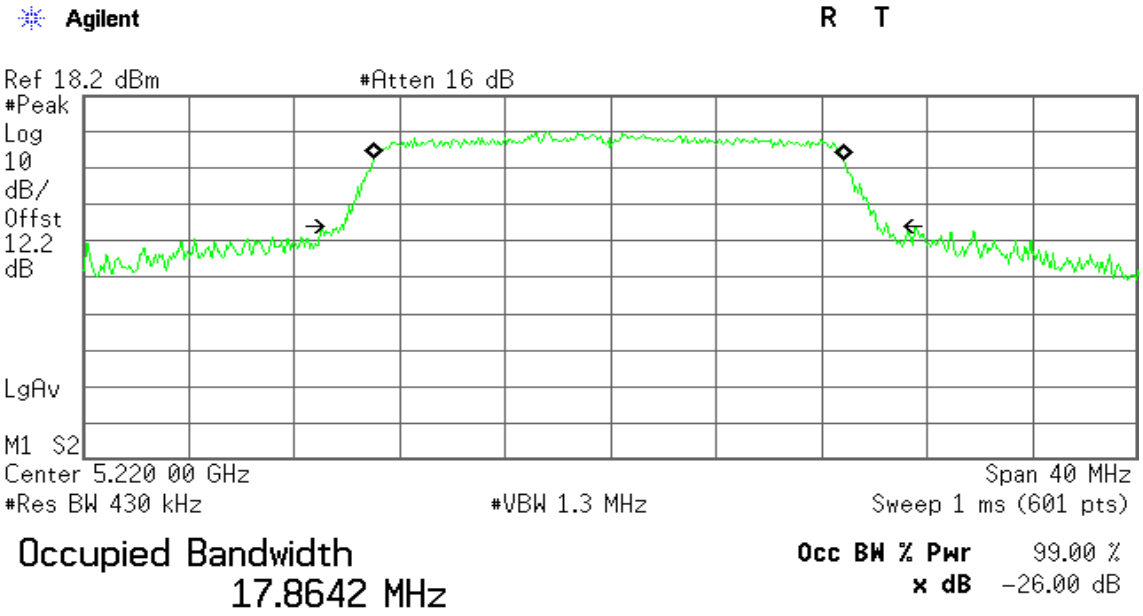
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

99% Bandwidth (CH Low)



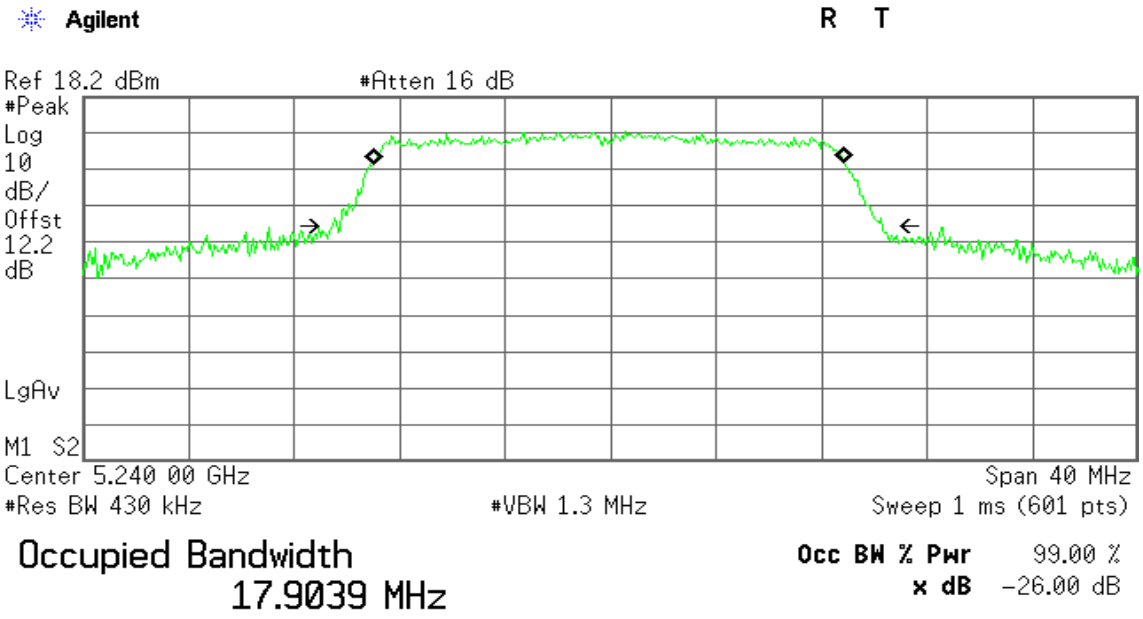
Transmit Freq Error -60.464 kHz
x dB Bandwidth 25.701 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -67.494 kHz
x dB Bandwidth 20.706 MHz

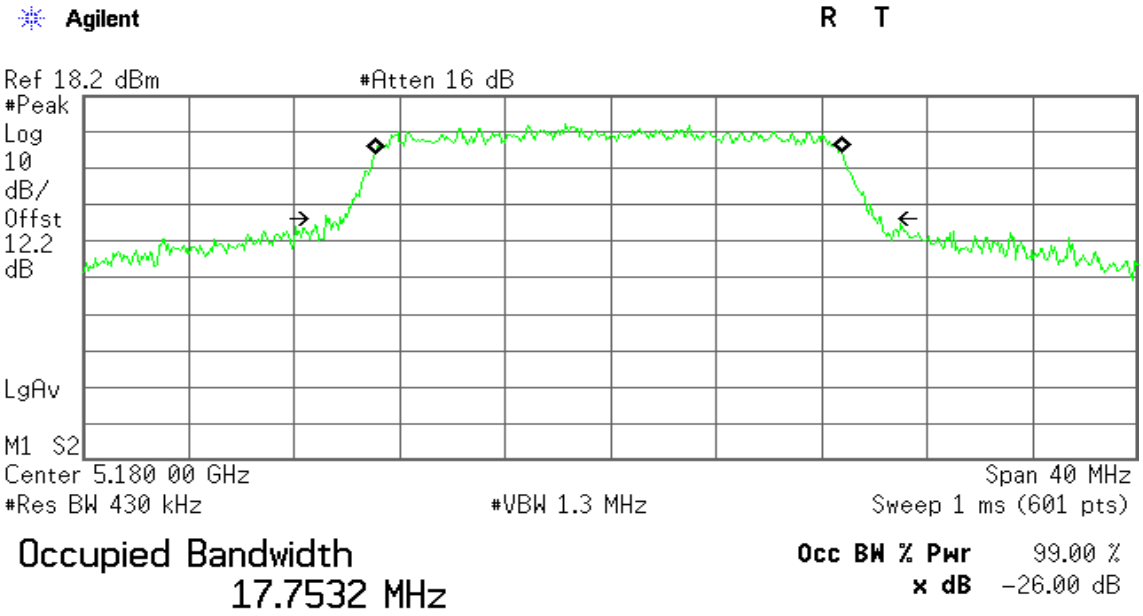
99% Bandwidth (CH High)



Transmit Freq Error	-68.845 kHz
x dB Bandwidth	20.747 MHz

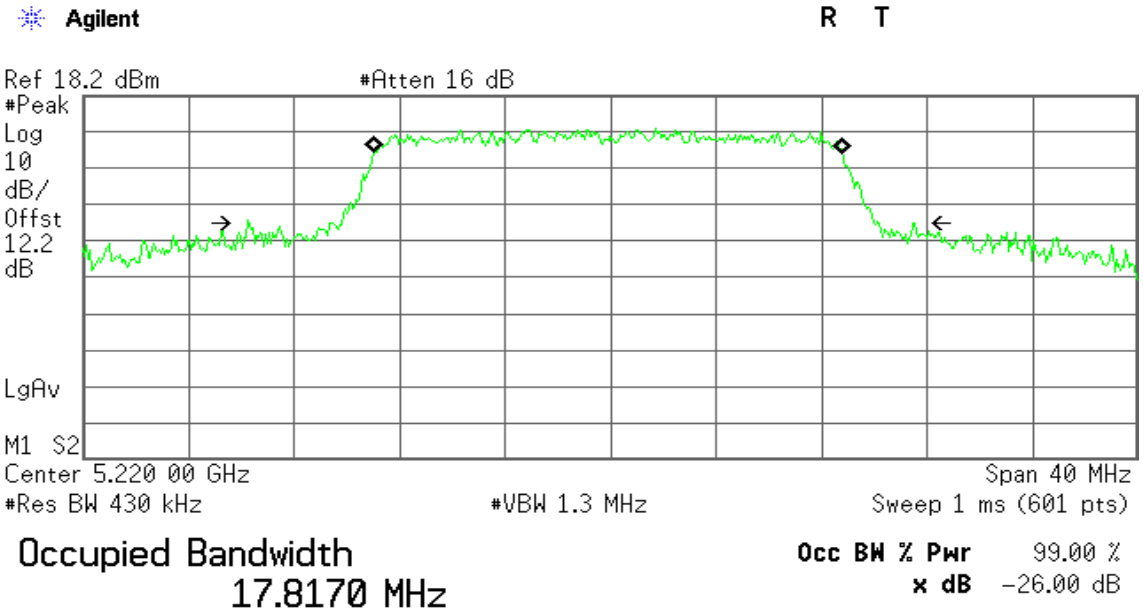
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

99% Bandwidth (CH Low)



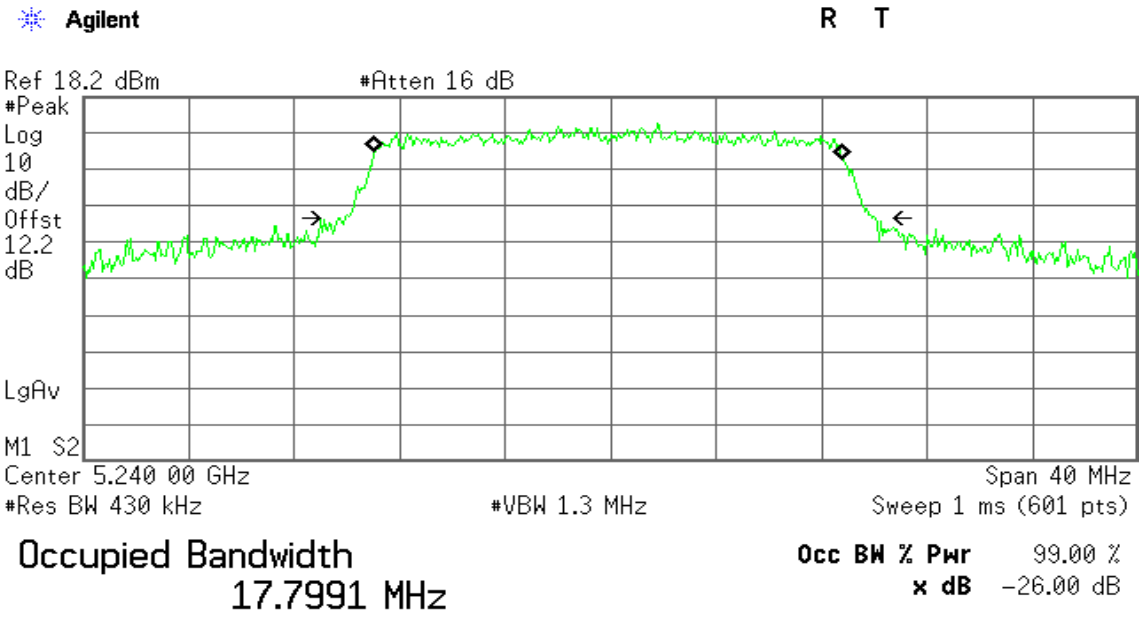
Transmit Freq Error −74.110 kHz
x dB Bandwidth 21.092 MHz

99% Bandwidth (CH Mid)



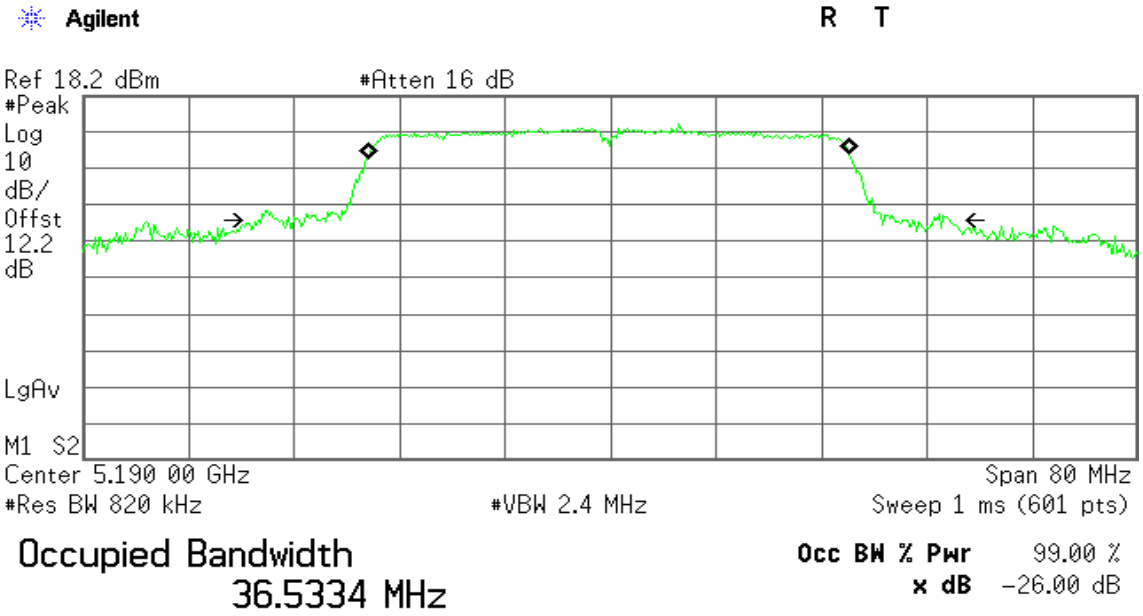
Transmit Freq Error −79.829 kHz
x dB Bandwidth 25.291 MHz

99% Bandwidth (CH High)



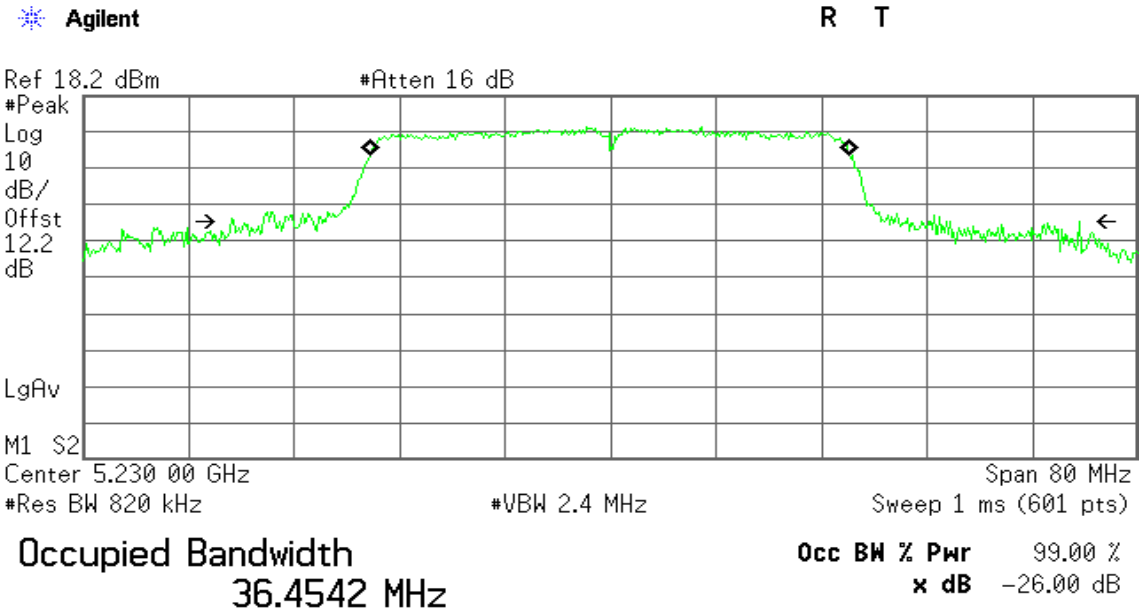
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

99% Bandwidth (CH Low)



Transmit Freq Error -115.296 kHz
x dB Bandwidth 52.109 MHz

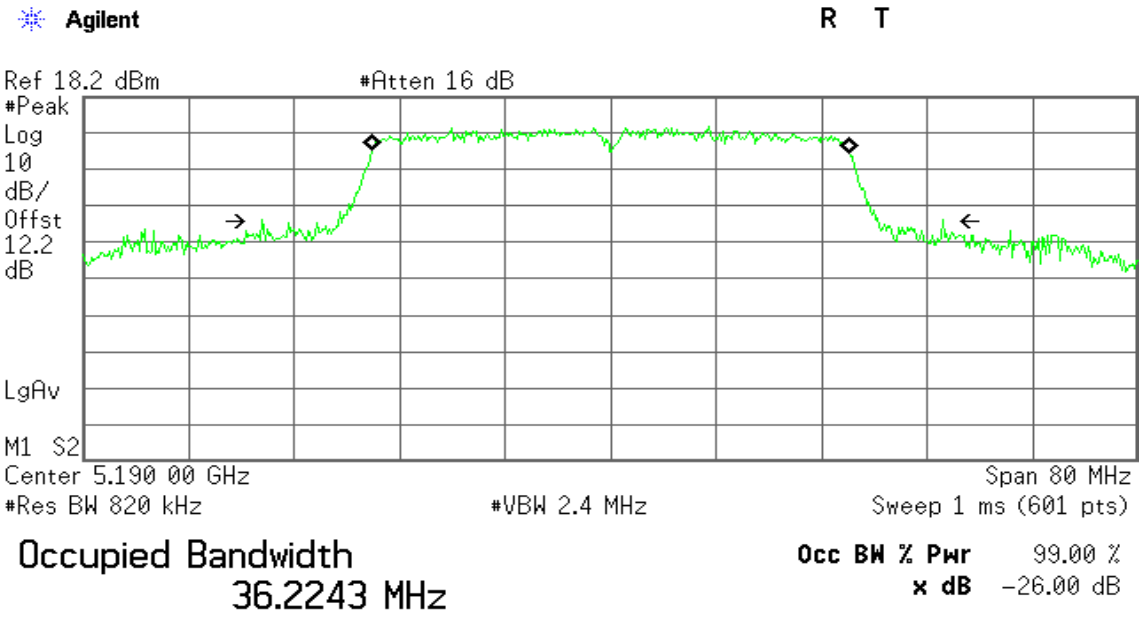
99% Bandwidth (CH High)



Transmit Freq Error -49.963 kHz
x dB Bandwidth 64.312 MHz

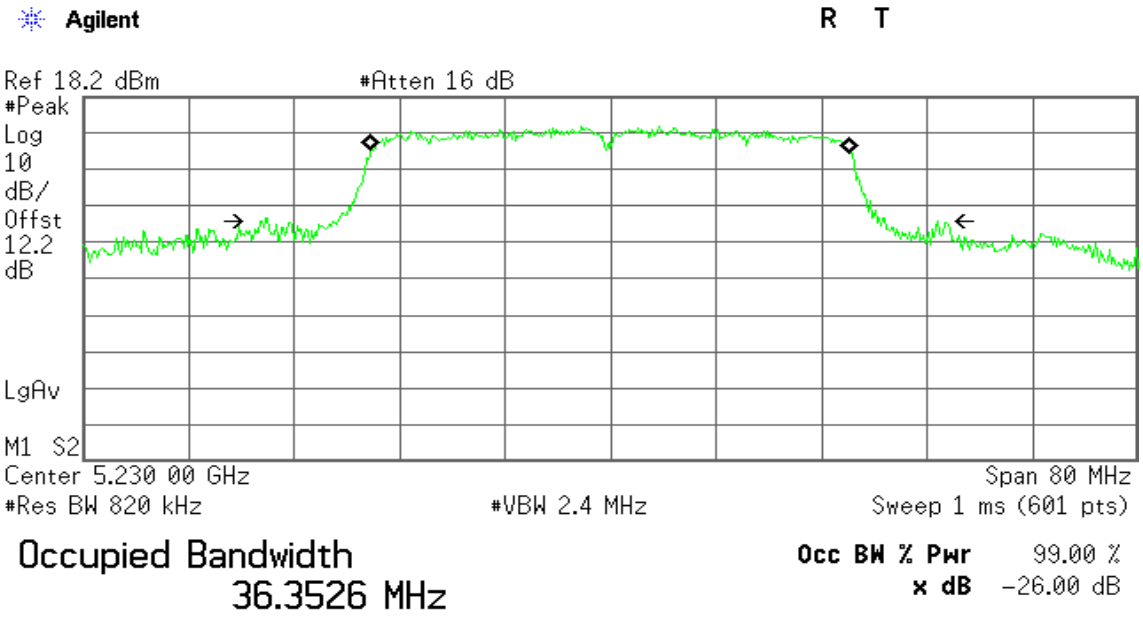
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

99% Bandwidth (CH Low)



Transmit Freq Error 5.396 kHz
x dB Bandwidth 51.647 MHz

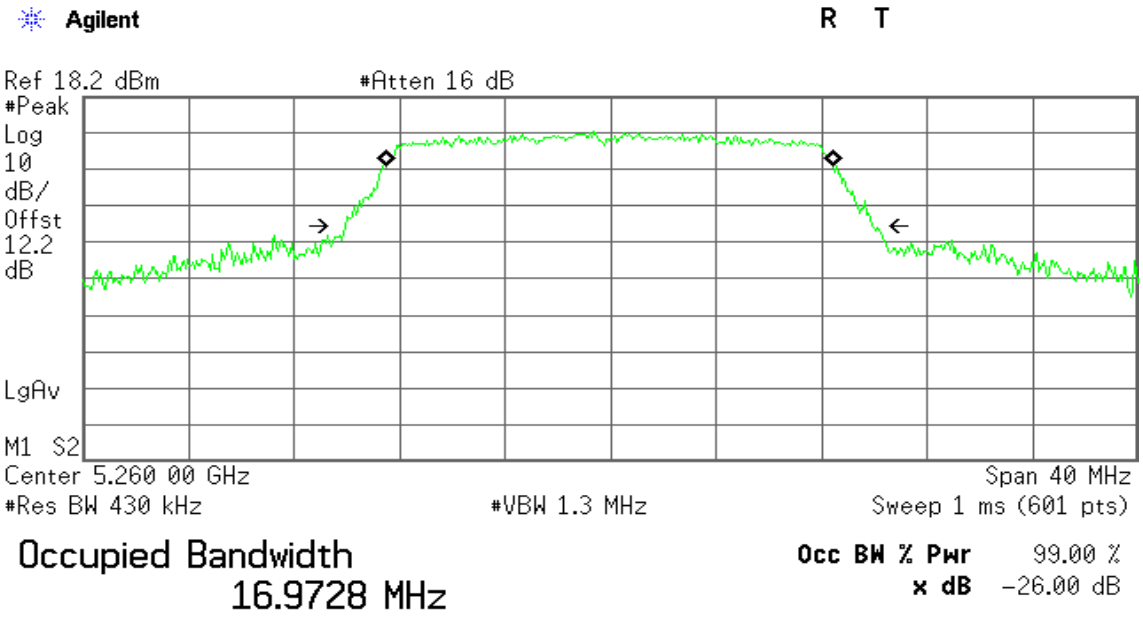
99% Bandwidth (CH High)



Transmit Freq Error -26.815 kHz
x dB Bandwidth 51.352 MHz

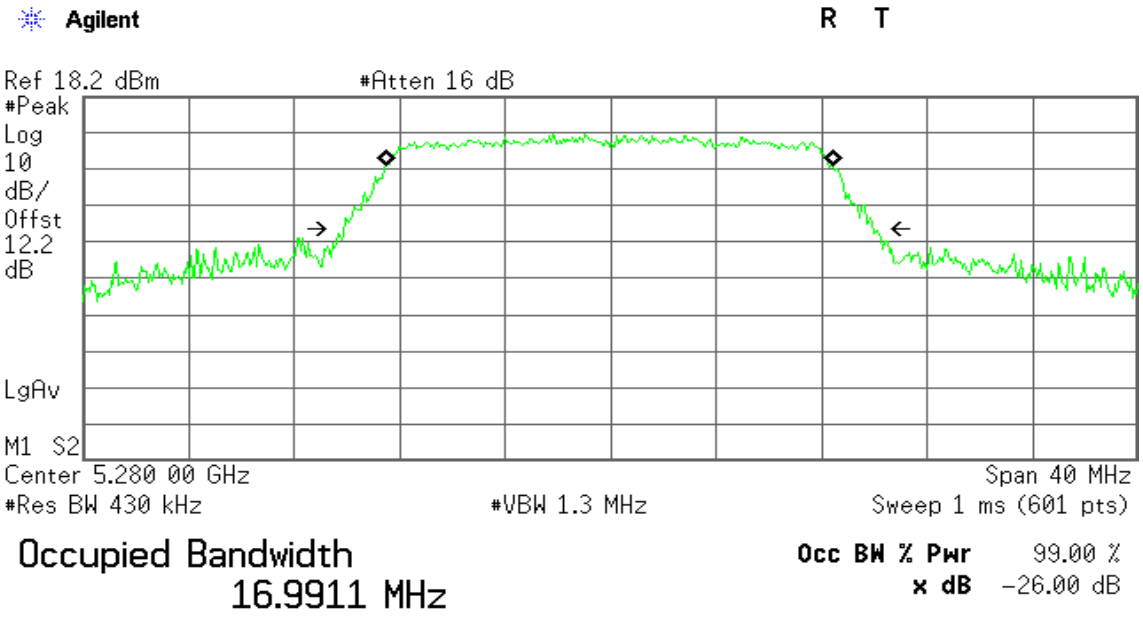
IEEE 802.11a mode / 5260 ~ 5320MHz

99% Bandwidth (CH Low)



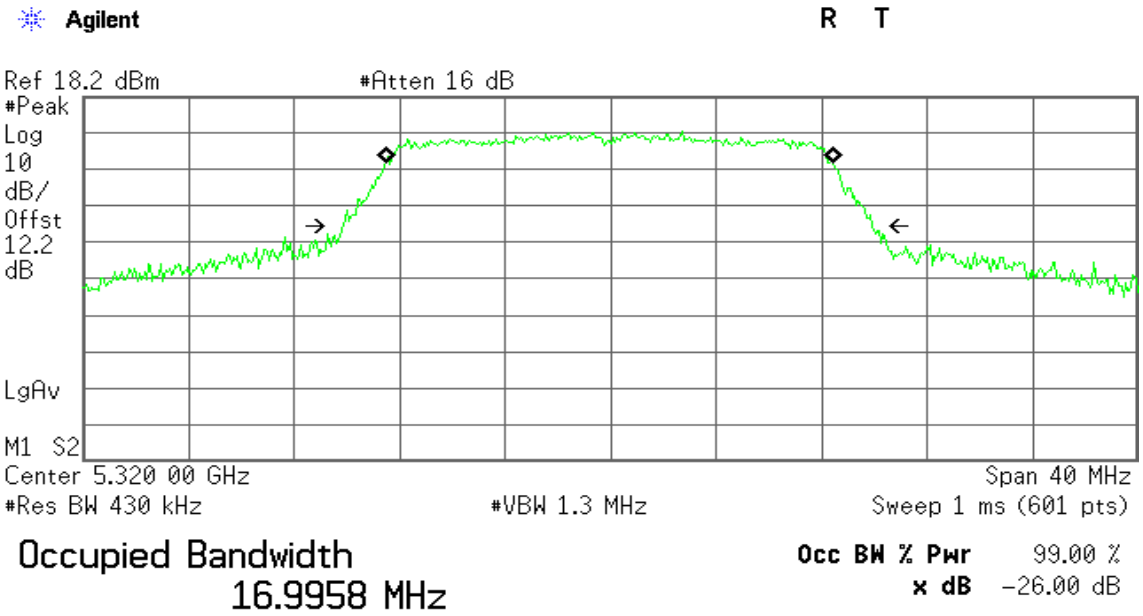
Transmit Freq Error -30.799 kHz
x dB Bandwidth 20.011 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -35.863 kHz
x dB Bandwidth 20.090 MHz

99% Bandwidth (CH High)



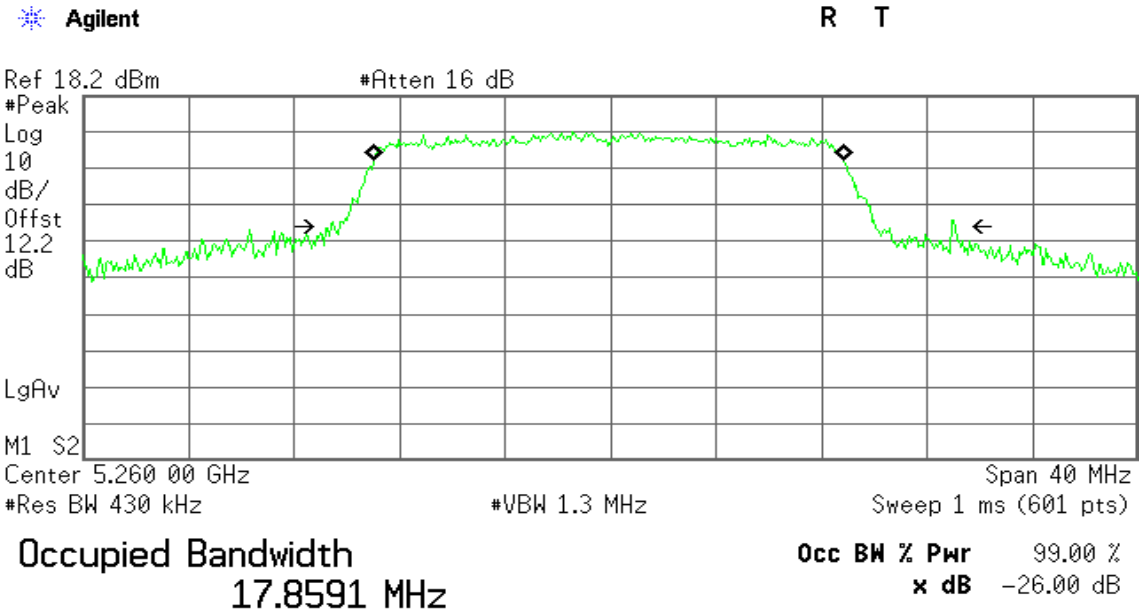
Occupied Bandwidth
16.9958 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -46.874 kHz
x dB Bandwidth 20.106 MHz

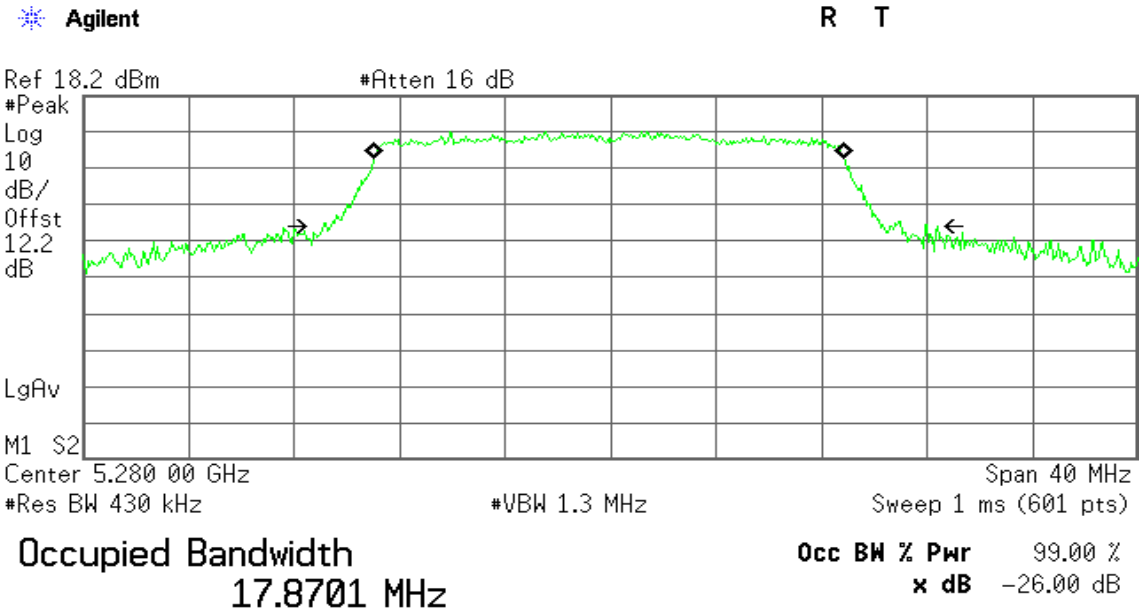
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

99% Bandwidth (CH Low)



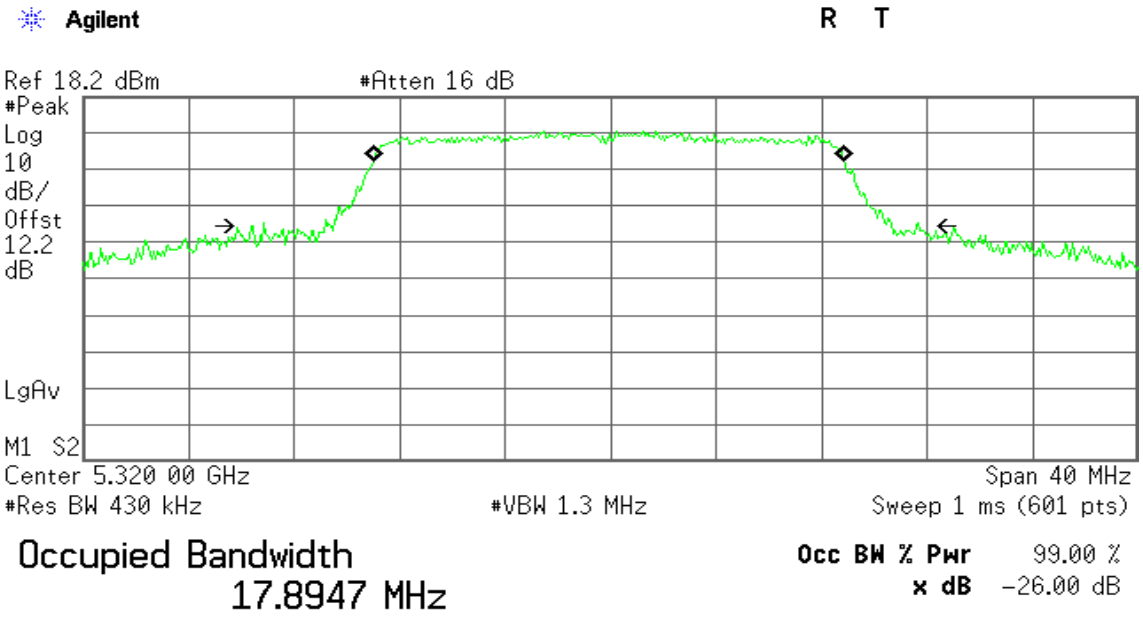
Transmit Freq Error -70.801 kHz
x dB Bandwidth 23.683 MHz

99% Bandwidth (CH Mid)



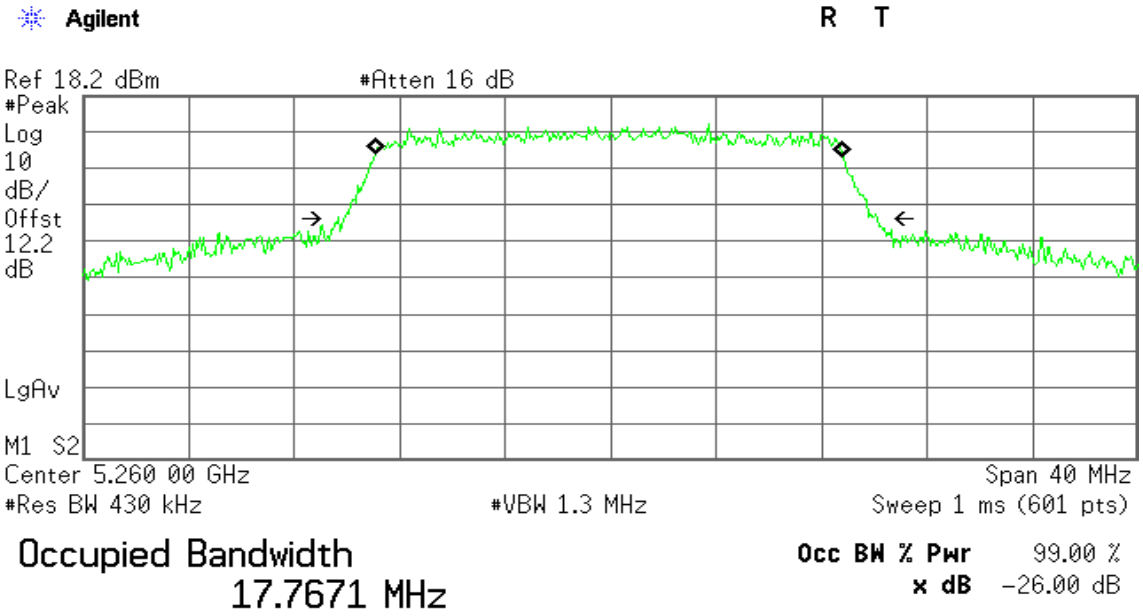
Transmit Freq Error -47.801 kHz
x dB Bandwidth 22.900 MHz

99% Bandwidth (CH High)



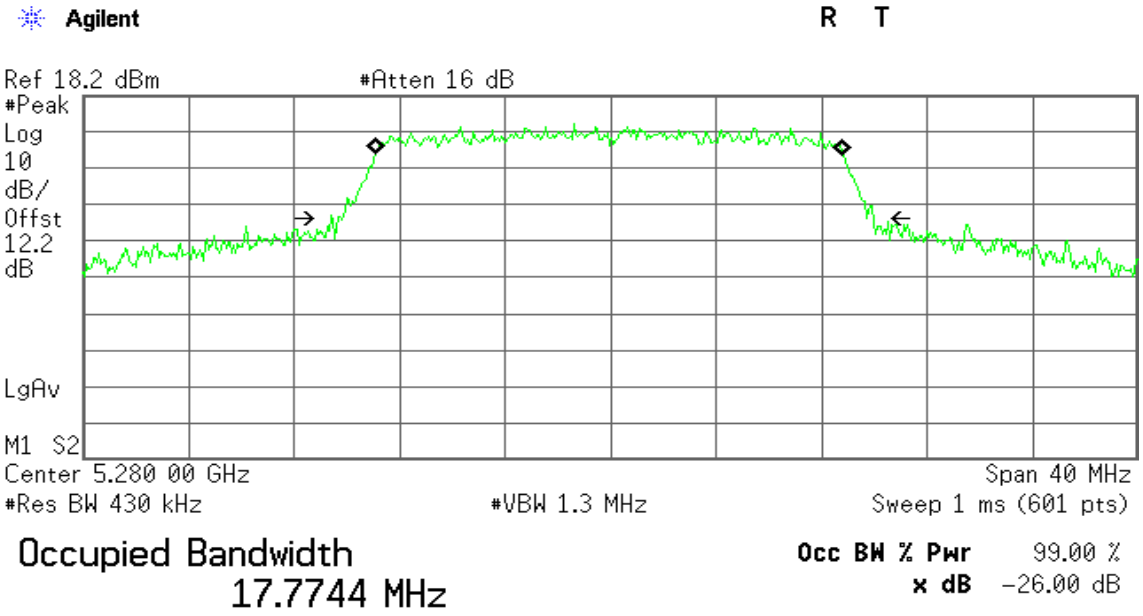
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

99% Bandwidth (CH Low)



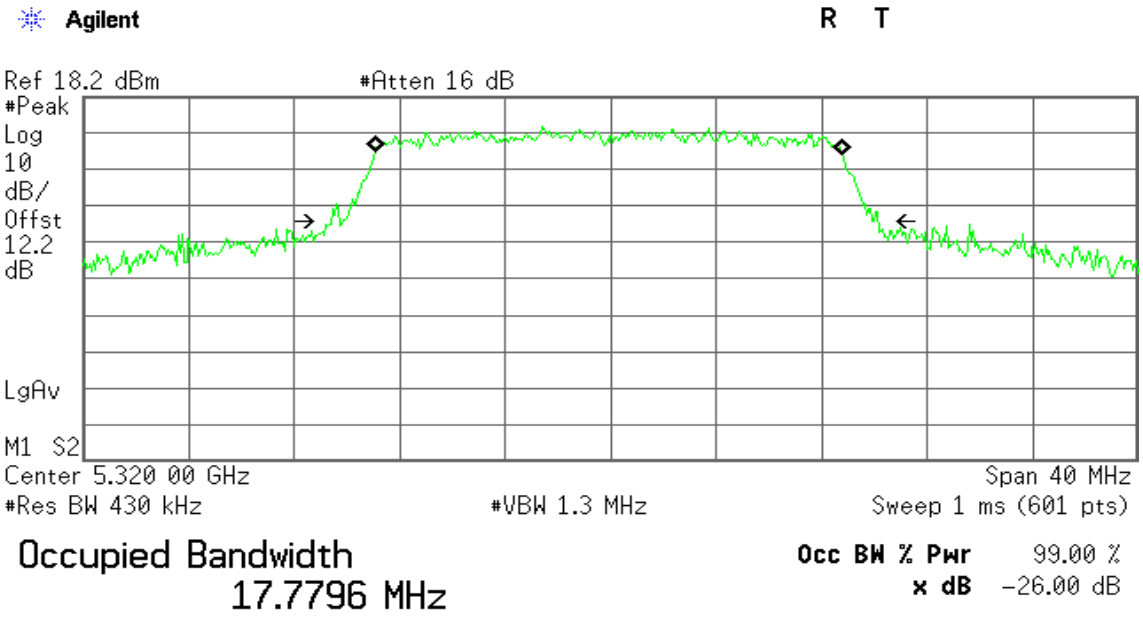
Transmit Freq Error -75.544 kHz
x dB Bandwidth 20.502 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -56.161 kHz
x dB Bandwidth 20.599 MHz

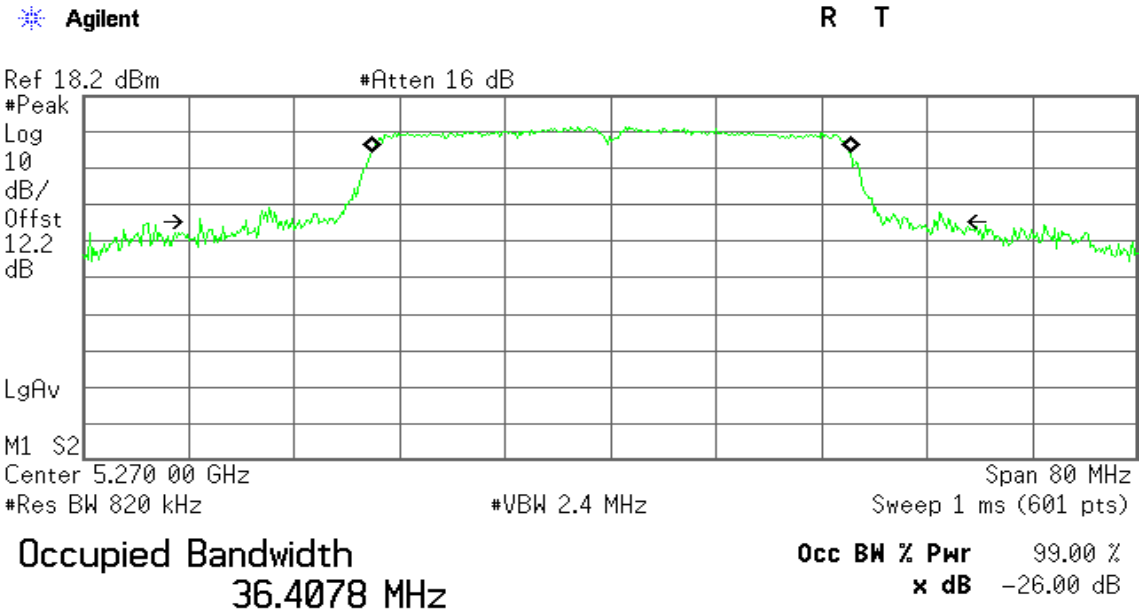
99% Bandwidth (CH High)



Transmit Freq Error	-69.204 kHz
x dB Bandwidth	20.769 MHz

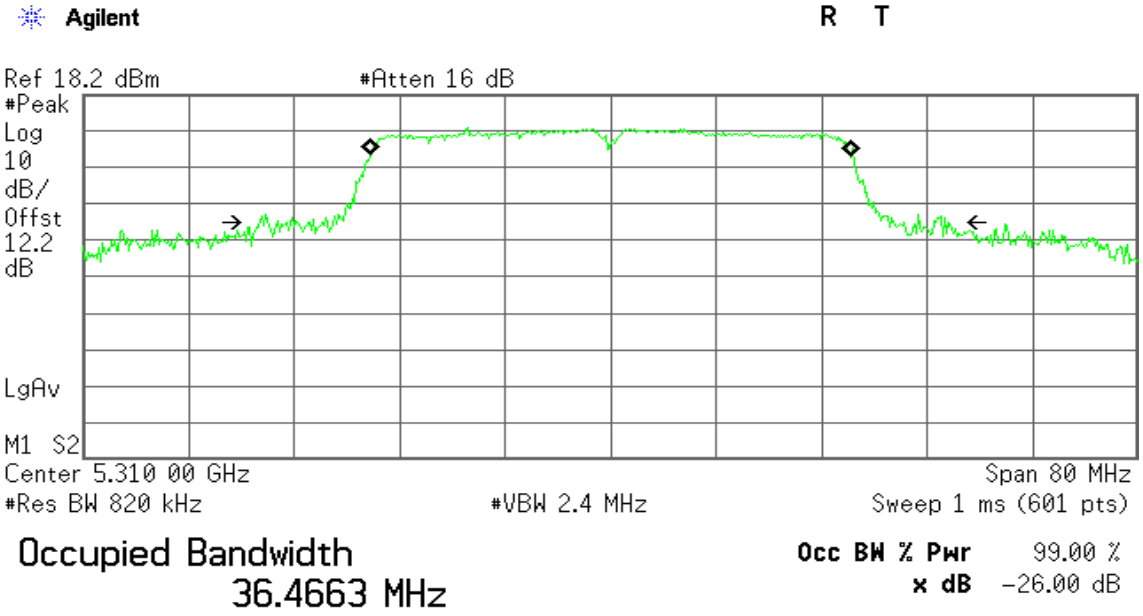
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

99% Bandwidth (CH Low)



Transmit Freq Error 11.068 kHz
x dB Bandwidth 56.826 MHz

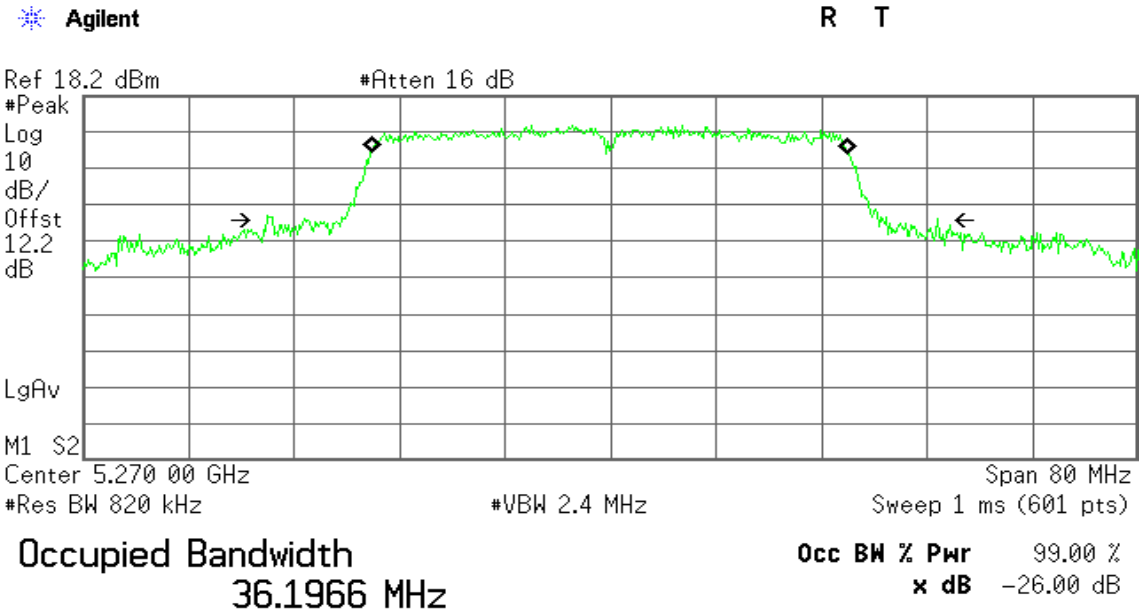
99% Bandwidth (CH High)



Transmit Freq Error 11.449 kHz
x dB Bandwidth 52.285 MHz

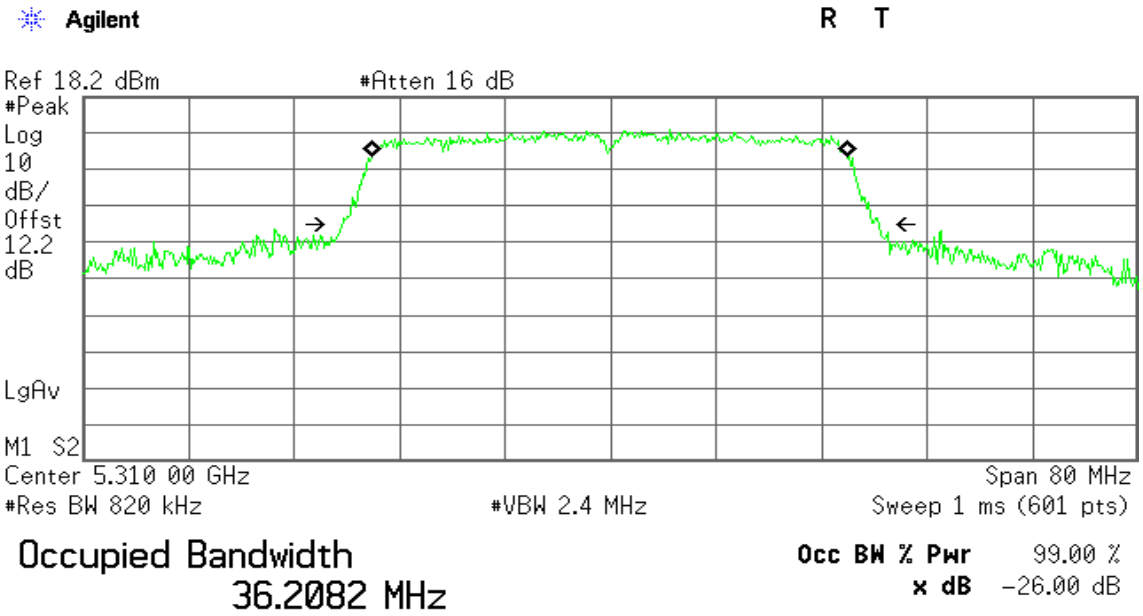
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

99% Bandwidth (CH Low)



Transmit Freq Error -47.859 kHz
x dB Bandwidth 50.870 MHz

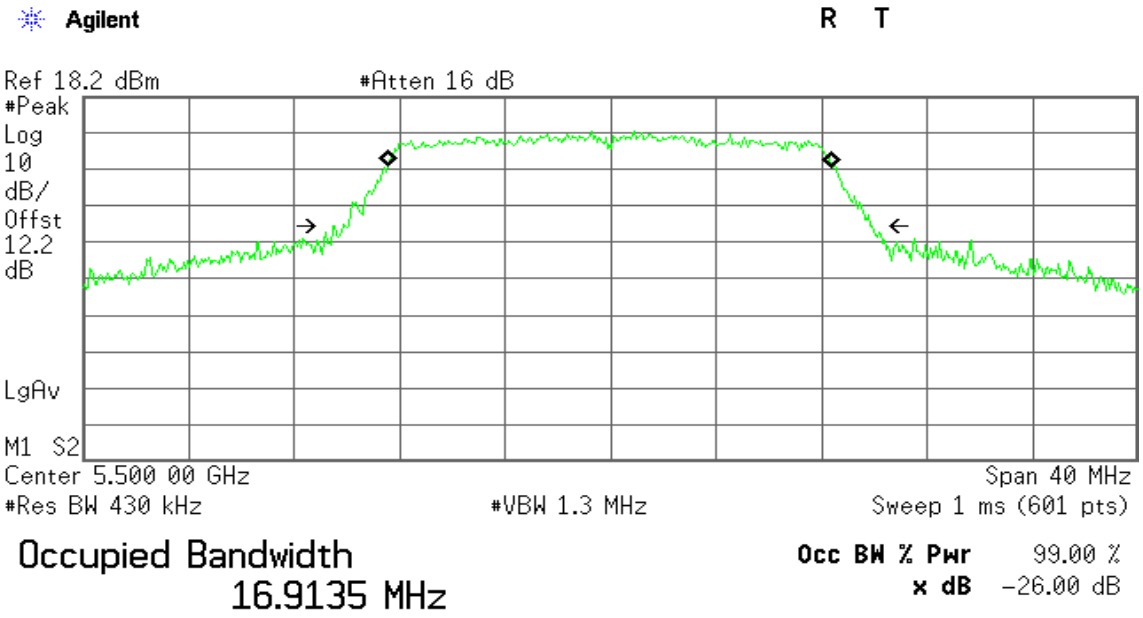
99% Bandwidth (CH High)



Transmit Freq Error -58.575 kHz
x dB Bandwidth 40.737 MHz

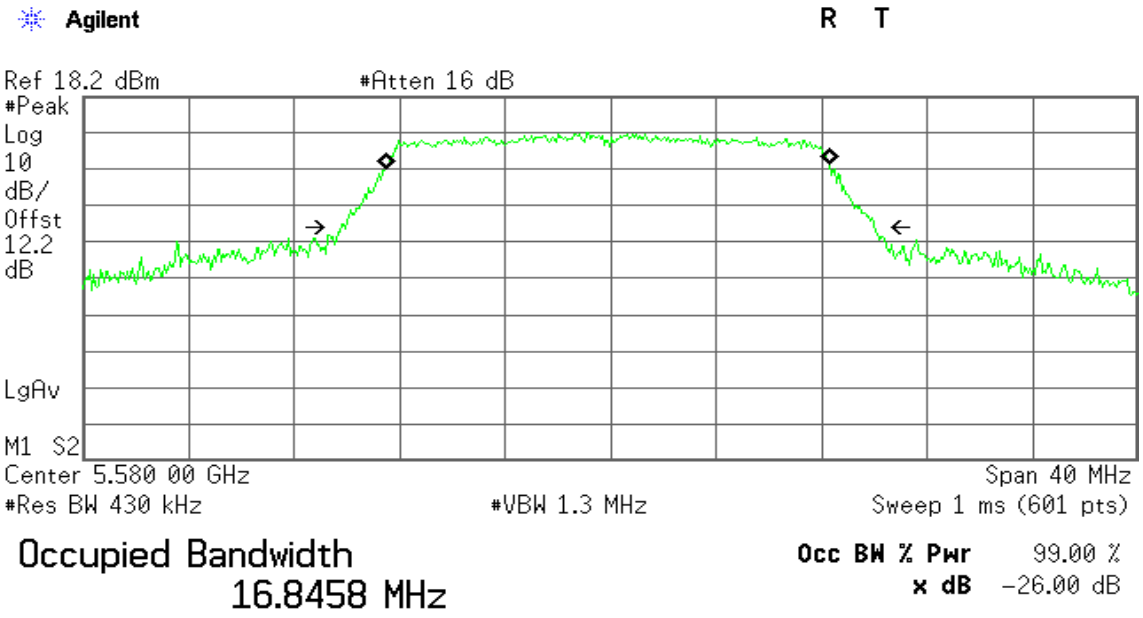
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

99% Bandwidth (CH Low)



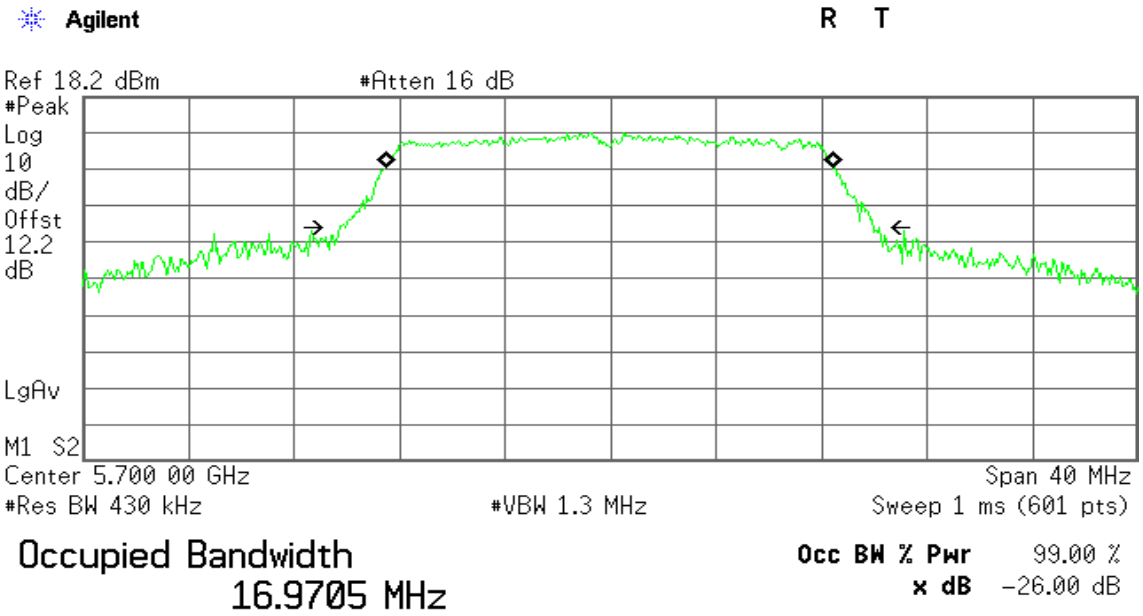
Transmit Freq Error -36.197 kHz
x dB Bandwidth 20.455 MHz

99% Bandwidth (CH Mid)



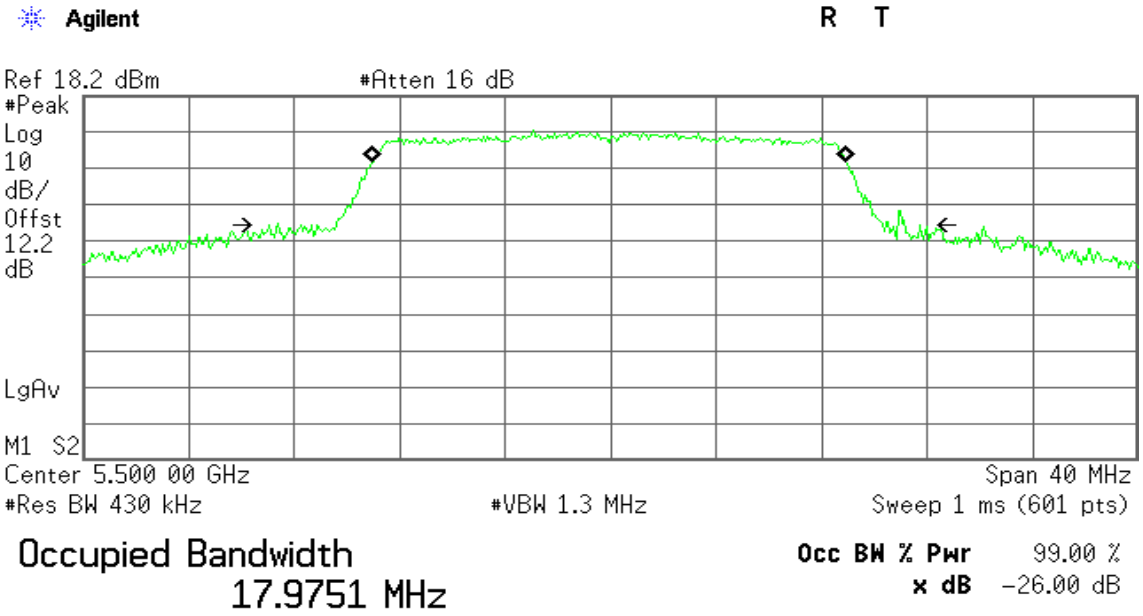
Transmit Freq Error -98.015 kHz
x dB Bandwidth 20.244 MHz

99% Bandwidth (CH High)



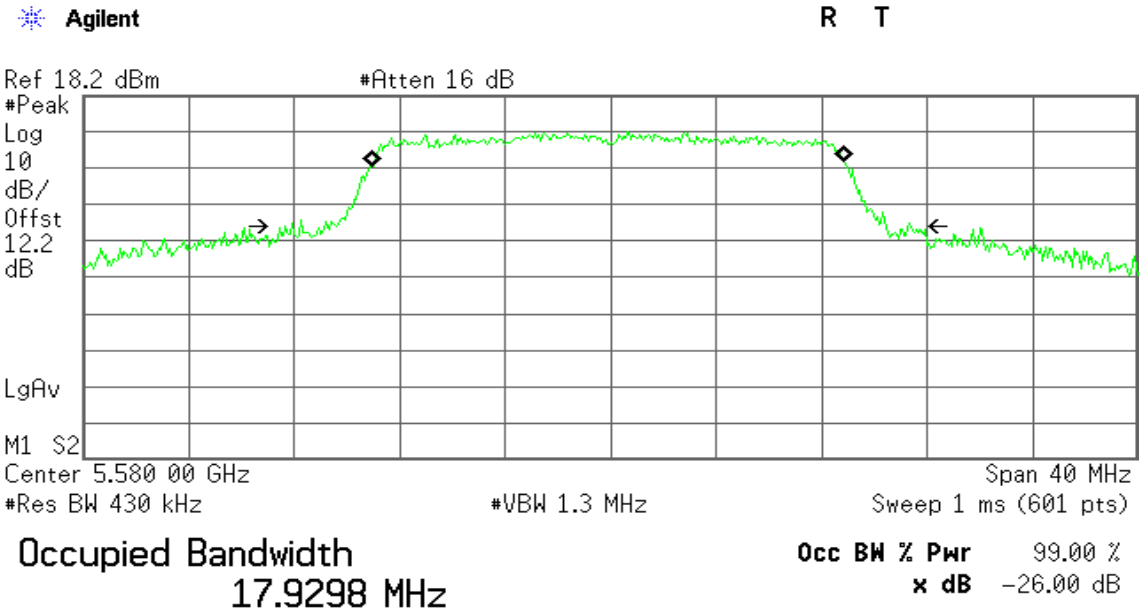
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

99% Bandwidth (CH Low)



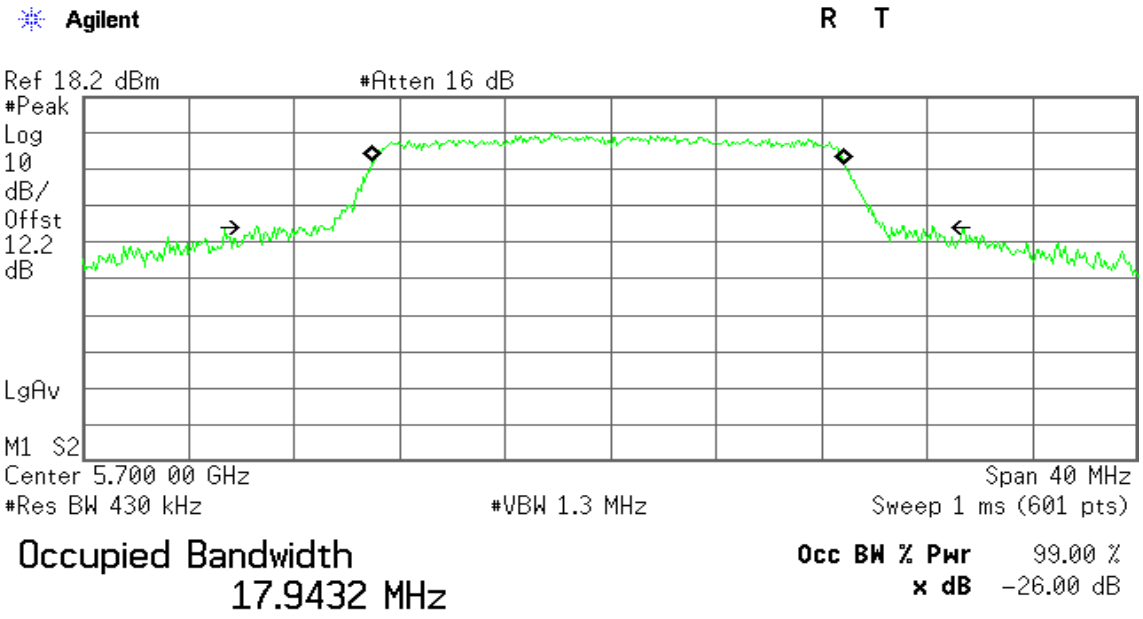
Transmit Freq Error -65.110 kHz
x dB Bandwidth 24.673 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -83.828 kHz
x dB Bandwidth 23.719 MHz

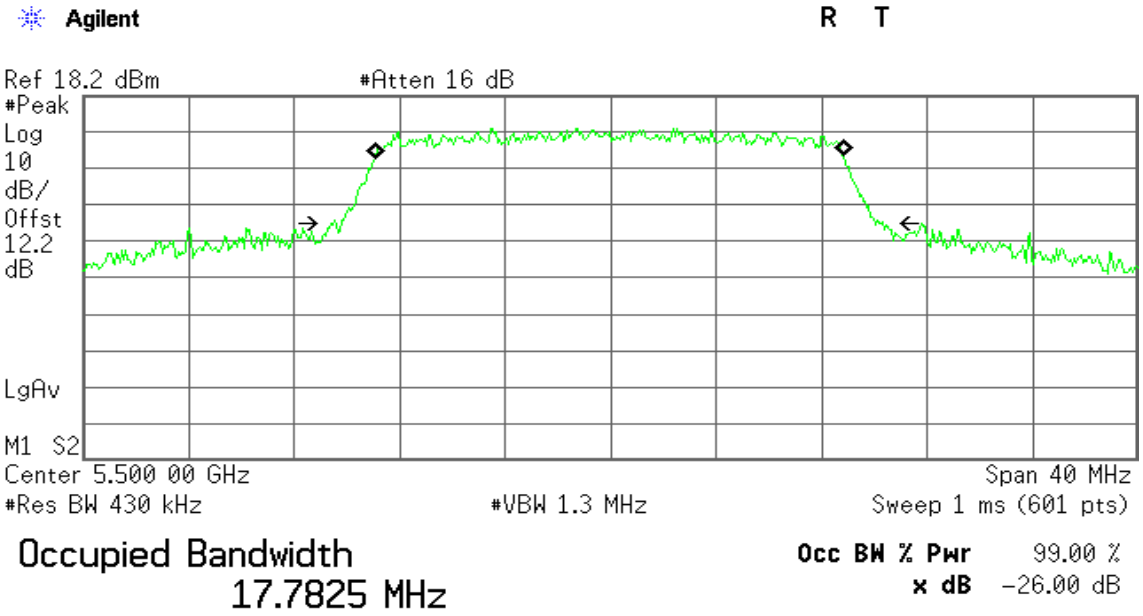
99% Bandwidth (CH High)



Transmit Freq Error	-92.088 kHz
x dB Bandwidth	25.647 MHz

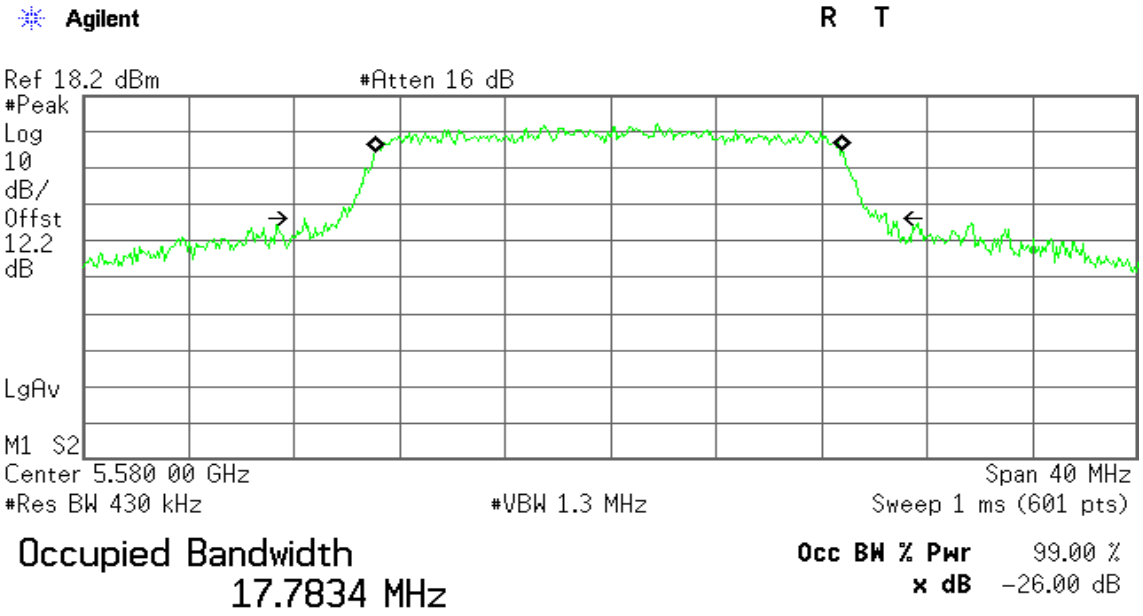
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

99% Bandwidth (CH Low)



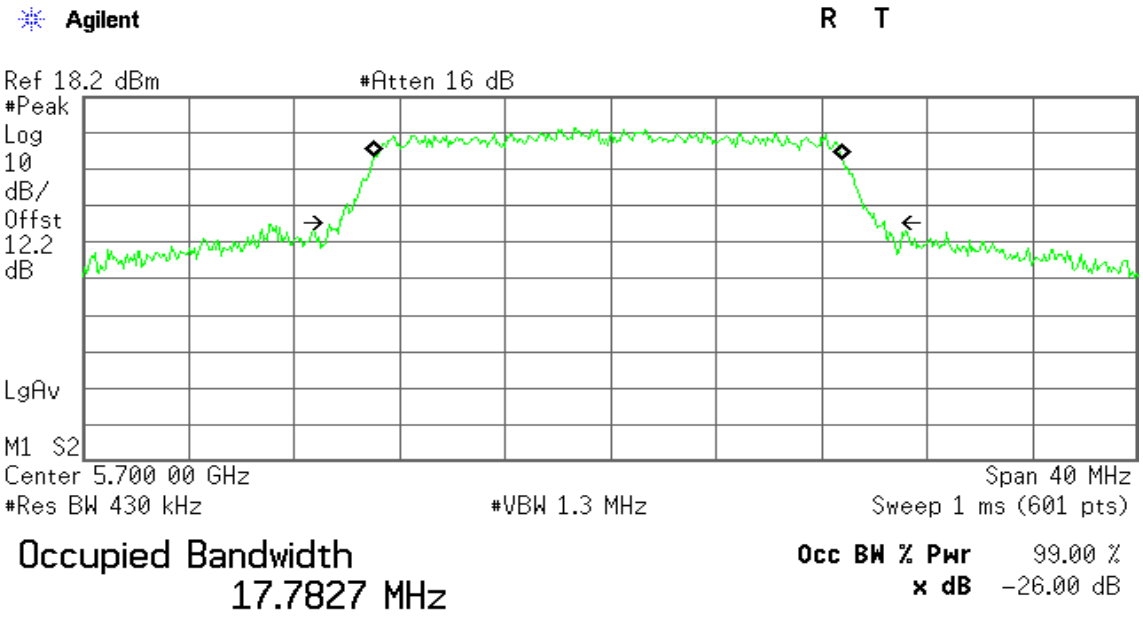
Transmit Freq Error -51.293 kHz
x dB Bandwidth 20.852 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -68.540 kHz
x dB Bandwidth 22.099 MHz

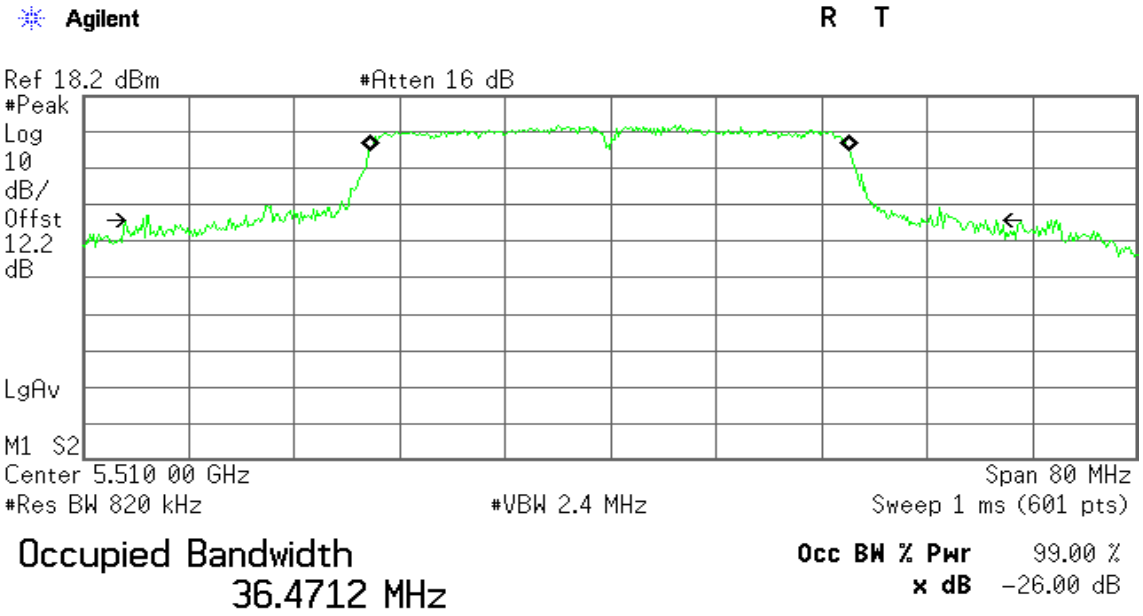
99% Bandwidth (CH High)



Transmit Freq Error −84.627 kHz
x dB Bandwidth 20.697 MHz

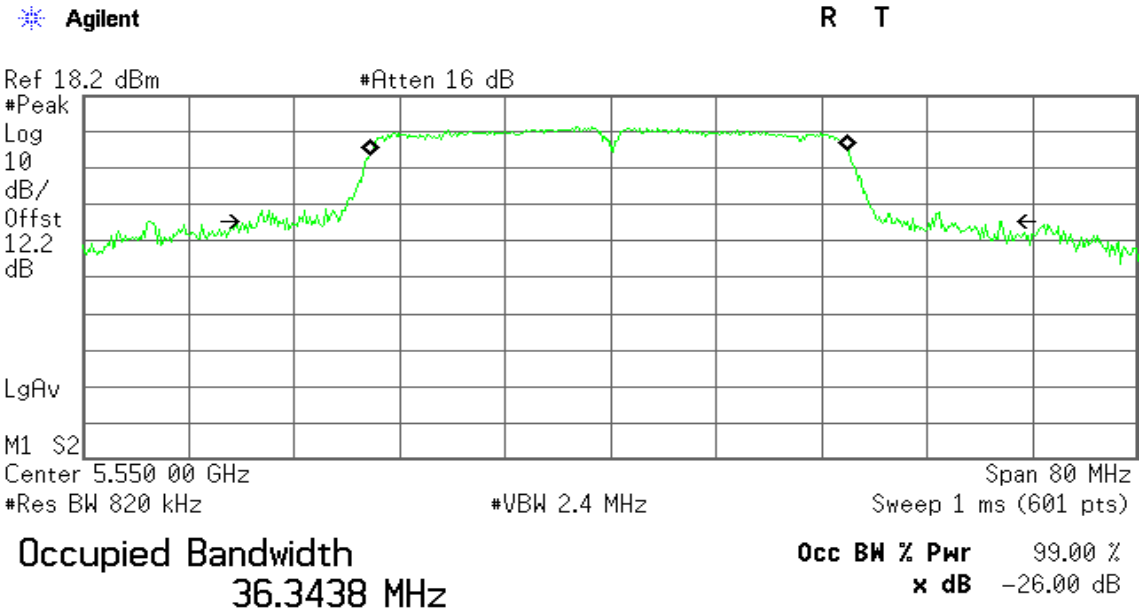
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

99% Bandwidth (CH Low)



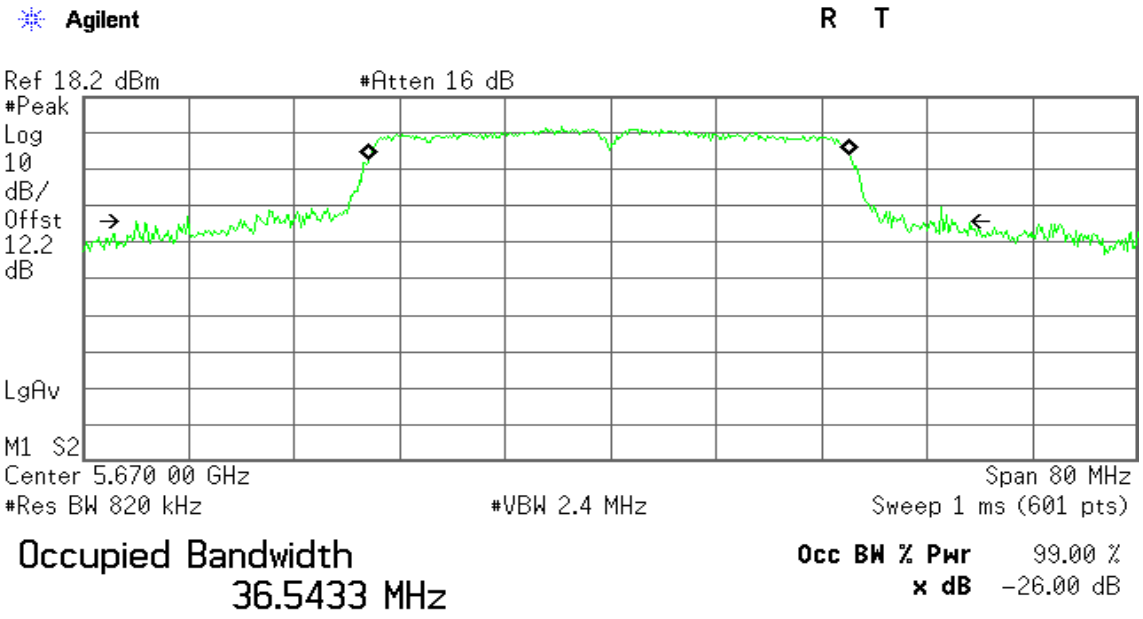
Transmit Freq Error -97.013 kHz
x dB Bandwidth 63.886 MHz

99% Bandwidth (CH Mid)



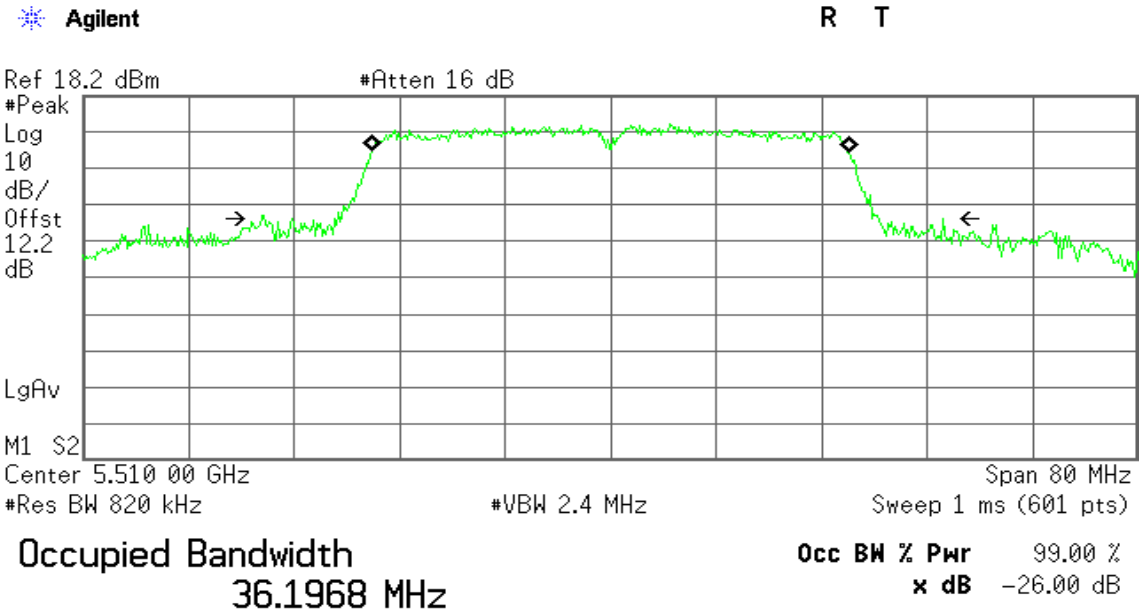
Transmit Freq Error -118.610 kHz
x dB Bandwidth 56.269 MHz

99% Bandwidth (CH High)



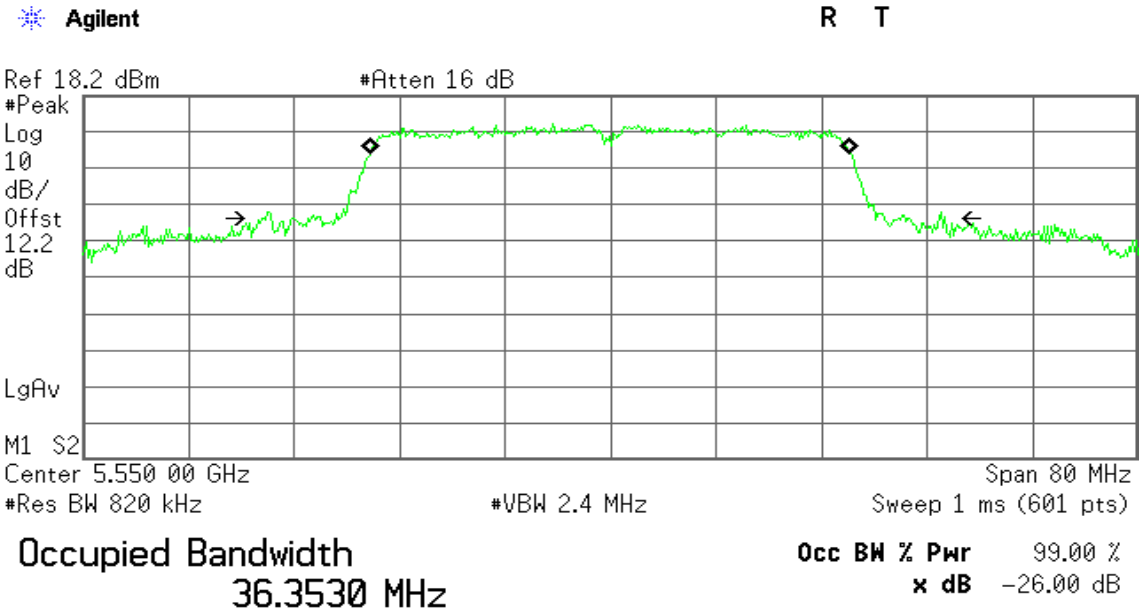
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

99% Bandwidth (CH Low)



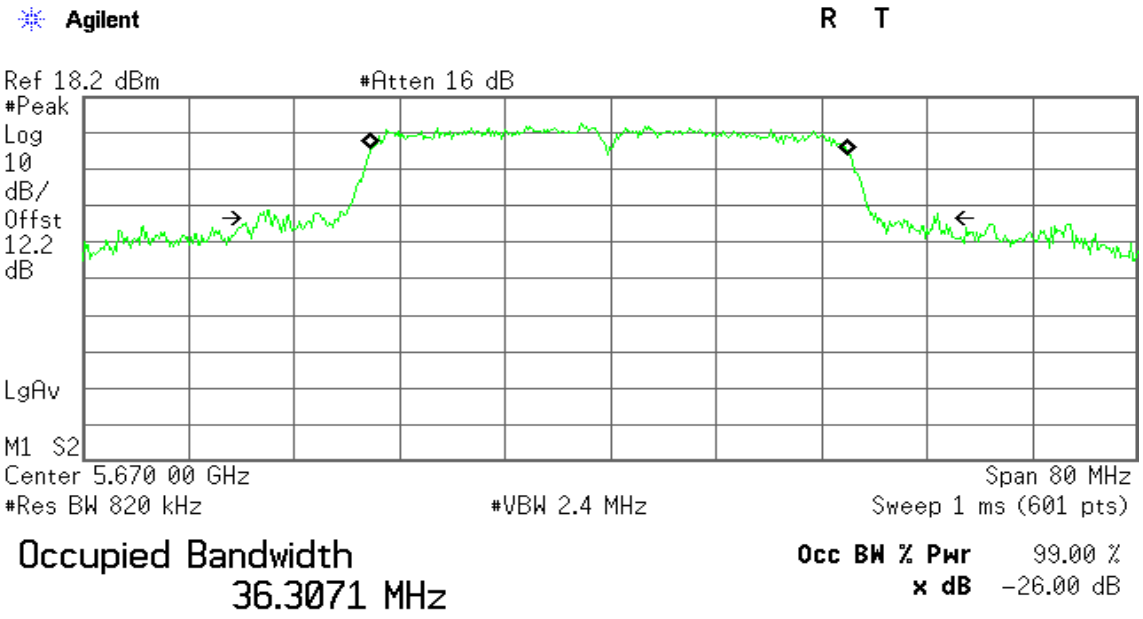
Transmit Freq Error -25.113 kHz
x dB Bandwidth 51.672 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error -45.341 kHz
x dB Bandwidth 51.784 MHz

99% Bandwidth (CH High)

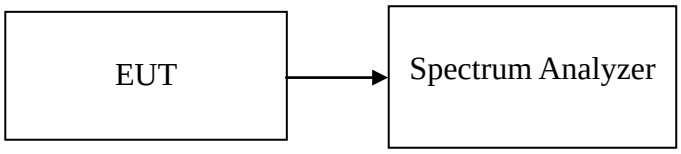


7.2 26 dB EMISSION BANDWIDTH

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)	Bandwidth (B) (MHz)
Low	5180	20.306
Mid	5220	20.009
High	5240	19.813

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	25.701
Mid	5220	20.706
High	5240	20.747

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	21.092
Mid	5220	25.291
High	5240	20.390

Test mode: IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	52.109
High	5230	64.312

Test mode: IEEE 802.11n HT 40 MHz mode/ 5190 ~ 5230MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	51.647
High	5230	51.352

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5260	20.011
Mid	5280	20.090
High	5320	20.106

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	23.683
Mid	5260	22.900
High	5320	25.304

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	20.502
Mid	5260	20.599
High	5320	20.769

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	56.826
High	5310	52.285

Test mode: IEEE 802.11n HT 40 MHz mode/ 5270 ~ 5310MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	50.870
High	5310	40.737

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	20.455
Mid	5580	20.244
High	5700	20.264

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	24.673
Mid	5580	23.719
High	5700	25.647

Test mode: IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	20.852
Mid	5580	22.099
High	5700	20.697

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	63.886
Mid	5550	56.269
High	5670	61.952

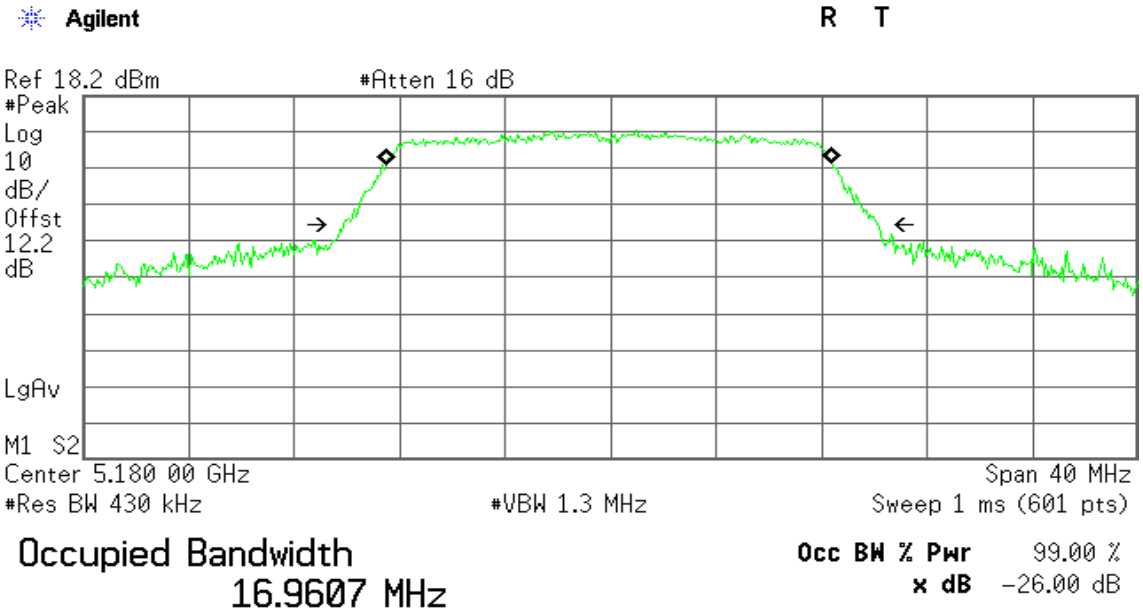
Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	51.672
Mid	5550	51.784
High	5670	51.545

Test Plot

IEEE 802.11a for 5180 ~ 5240MHz

CH Low

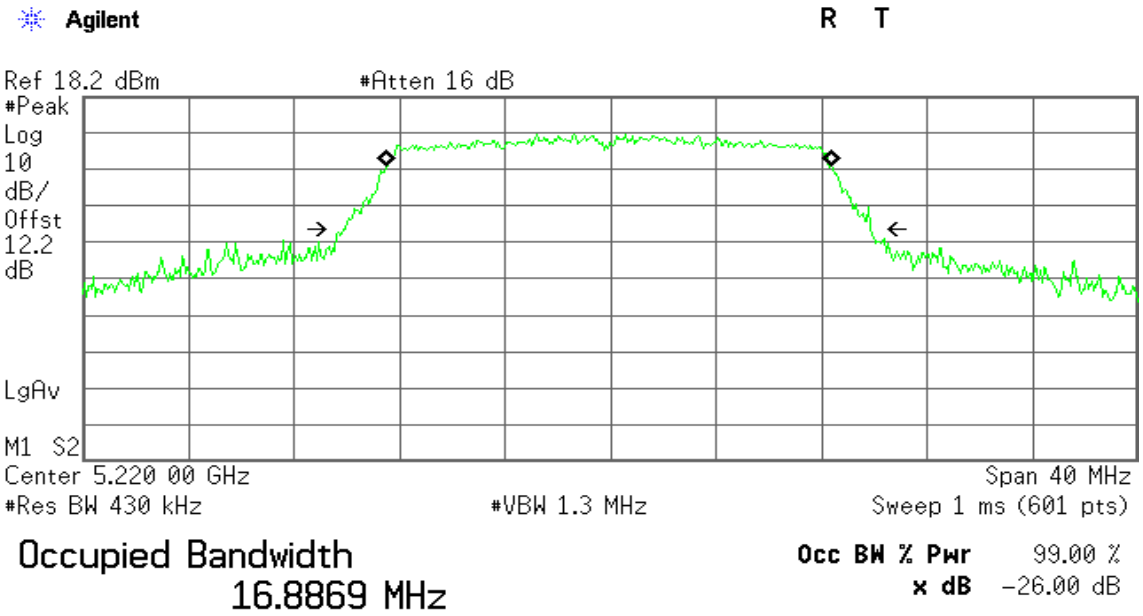


Occupied Bandwidth
16.9607 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -60.623 kHz
x dB Bandwidth 20.306 MHz

CH Mid

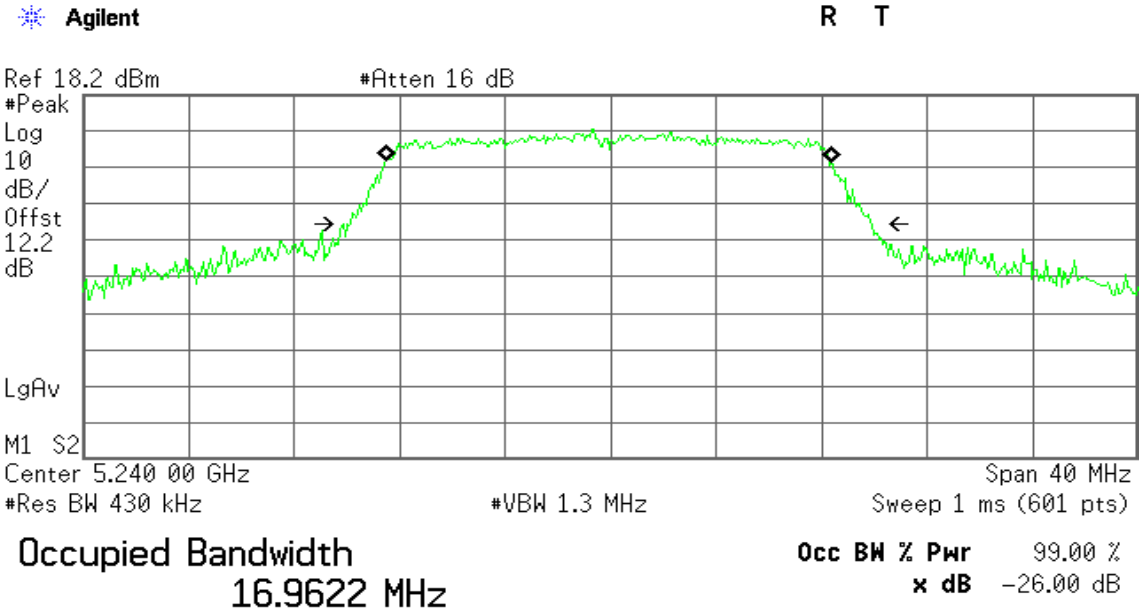


Occupied Bandwidth
16.8869 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -64.550 kHz
x dB Bandwidth 20.009 MHz

CH High



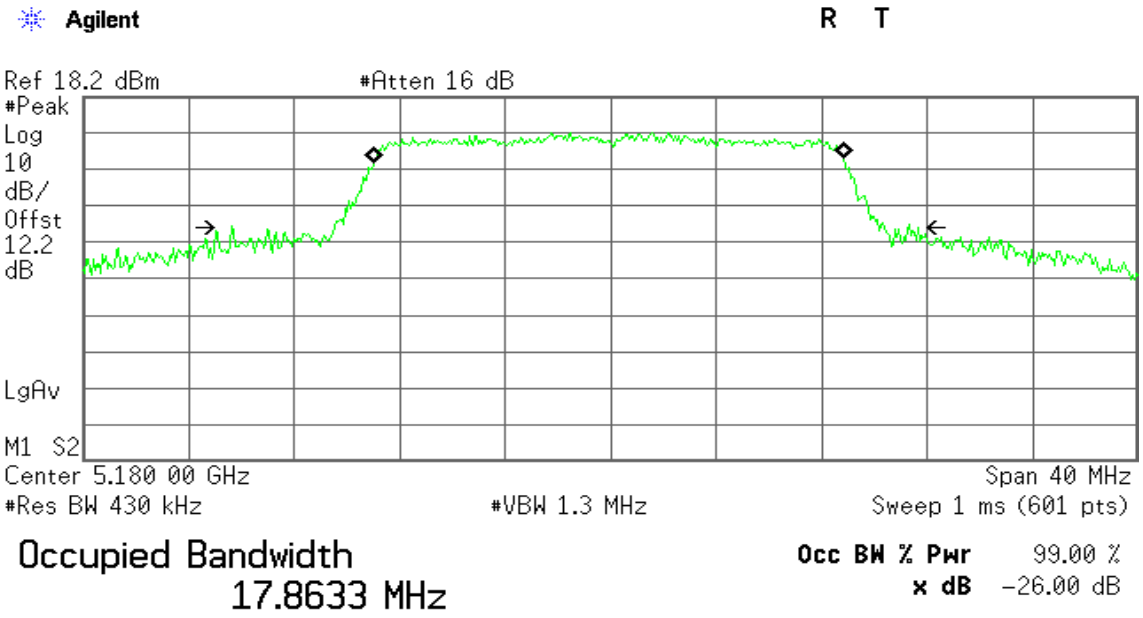
Occupied Bandwidth
16.9622 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -72.620 kHz
x dB Bandwidth 19.813 MHz

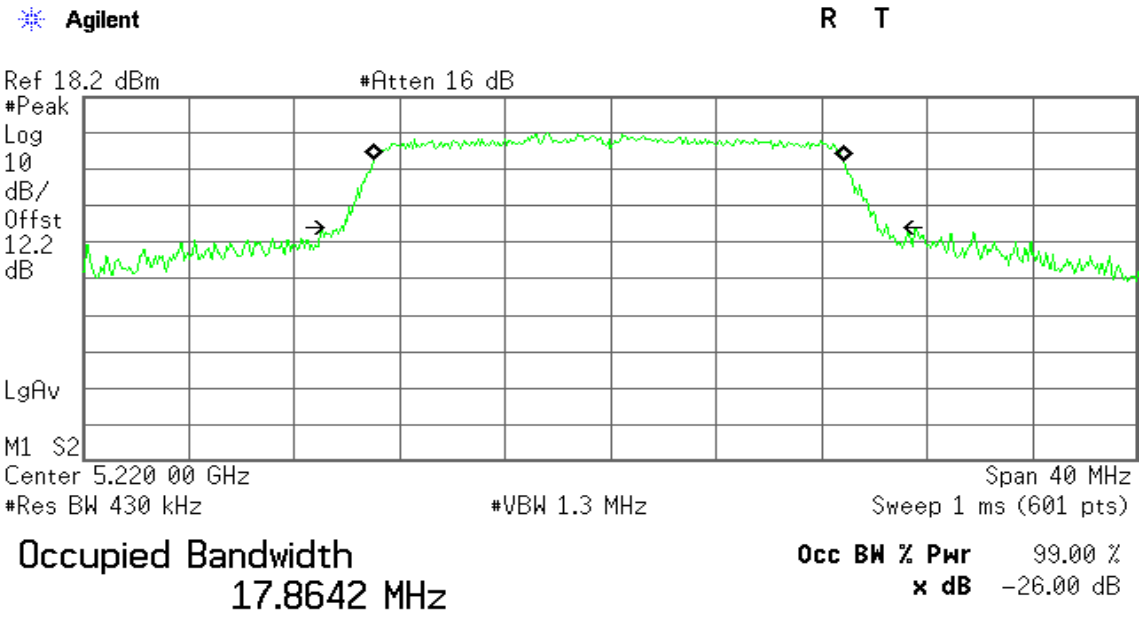
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

CH Low



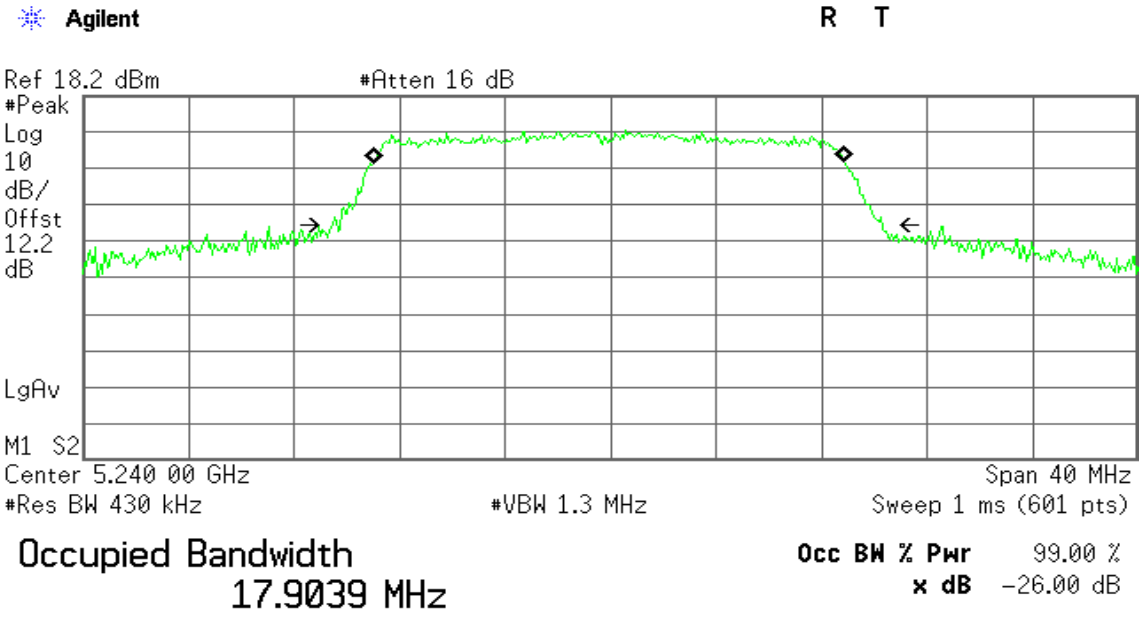
Transmit Freq Error -60.464 kHz
x dB Bandwidth 25.701 MHz

CH Mid



Transmit Freq Error -67.494 kHz
x dB Bandwidth 20.706 MHz

CH High



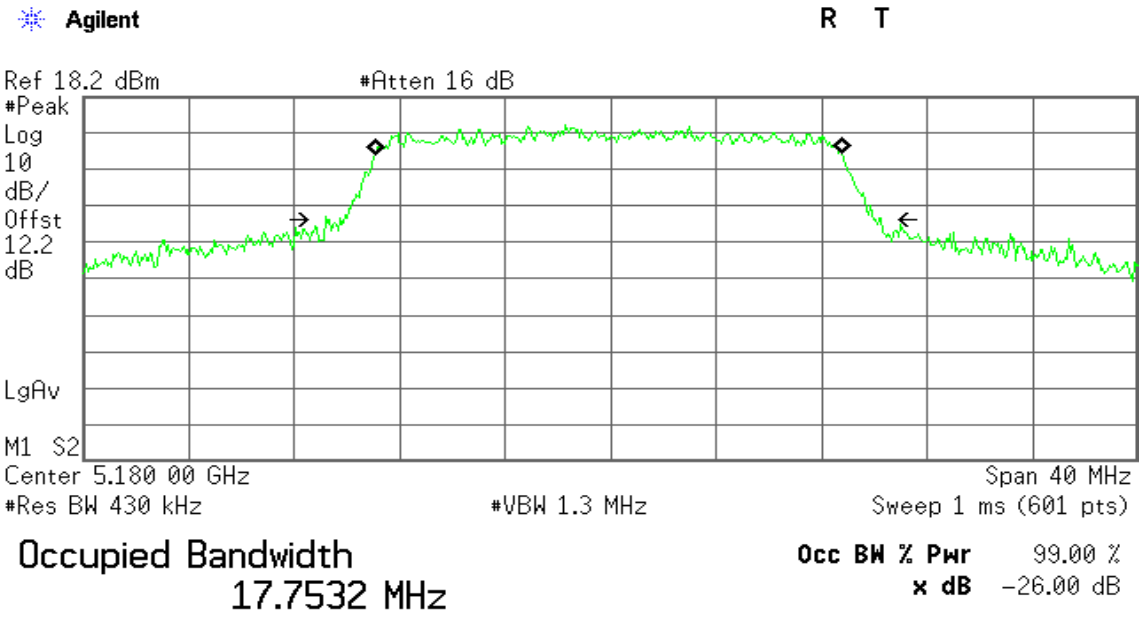
Occupied Bandwidth
17.9039 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -68.845 kHz
x dB Bandwidth 20.747 MHz

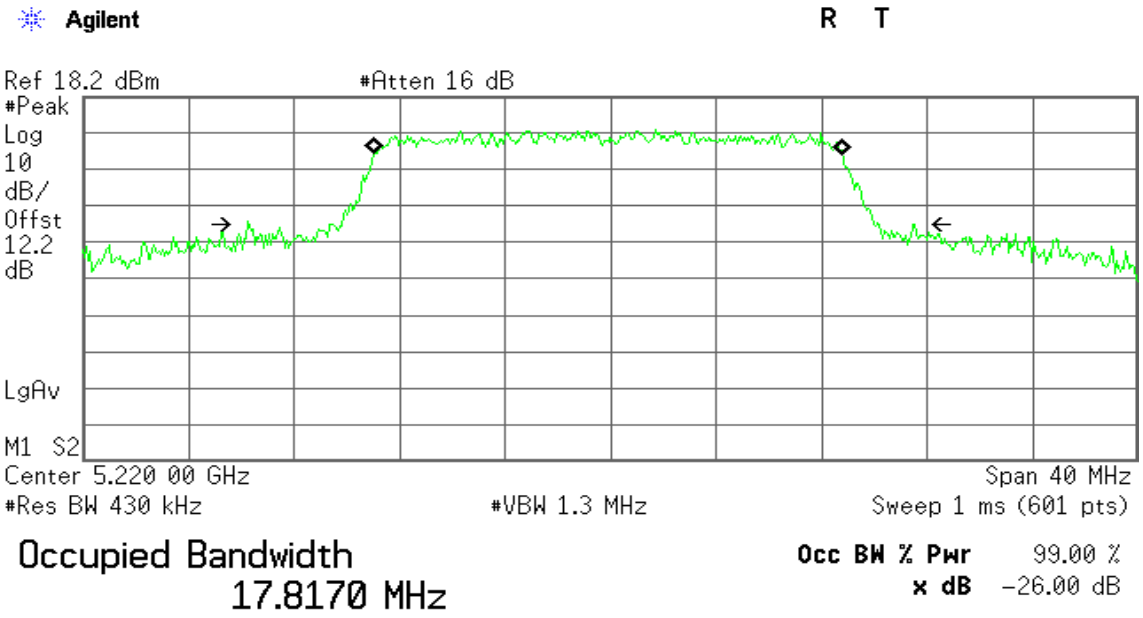
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low



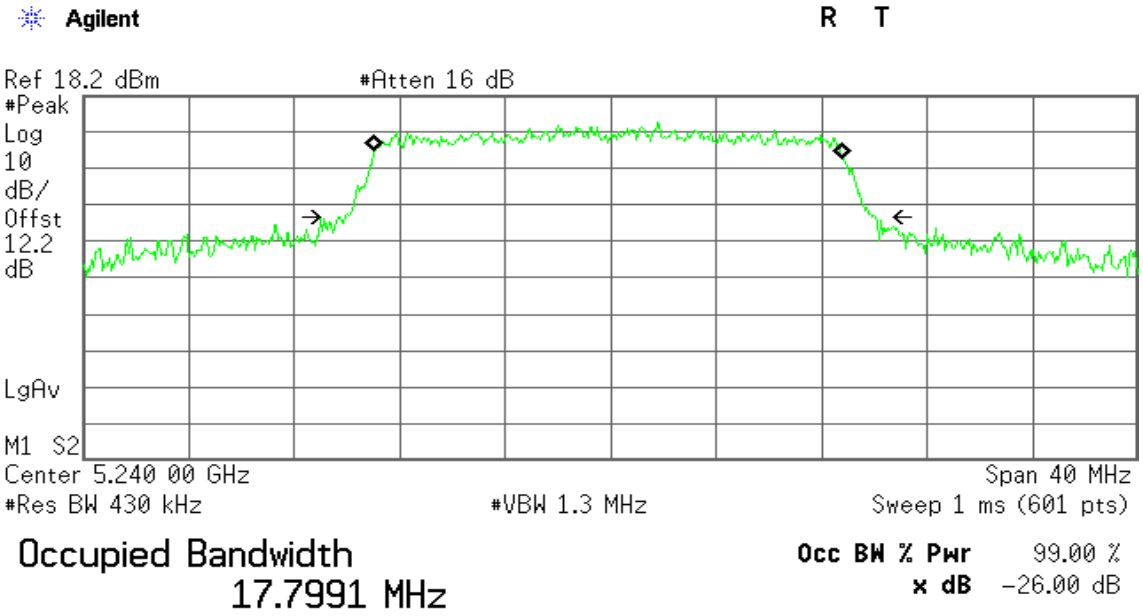
Transmit Freq Error −74.110 kHz
x dB Bandwidth 21.092 MHz

CH Mid



Transmit Freq Error −79.829 kHz
x dB Bandwidth 25.291 MHz

CH High



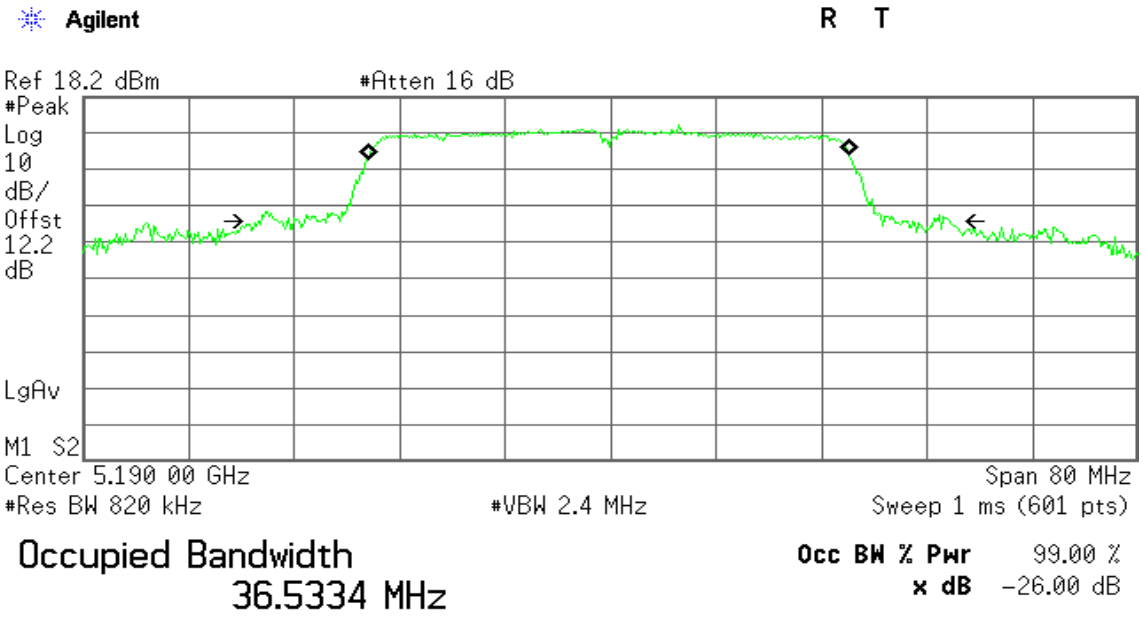
Occupied Bandwidth
17.7991 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -71.691 kHz
x dB Bandwidth 20.390 MHz

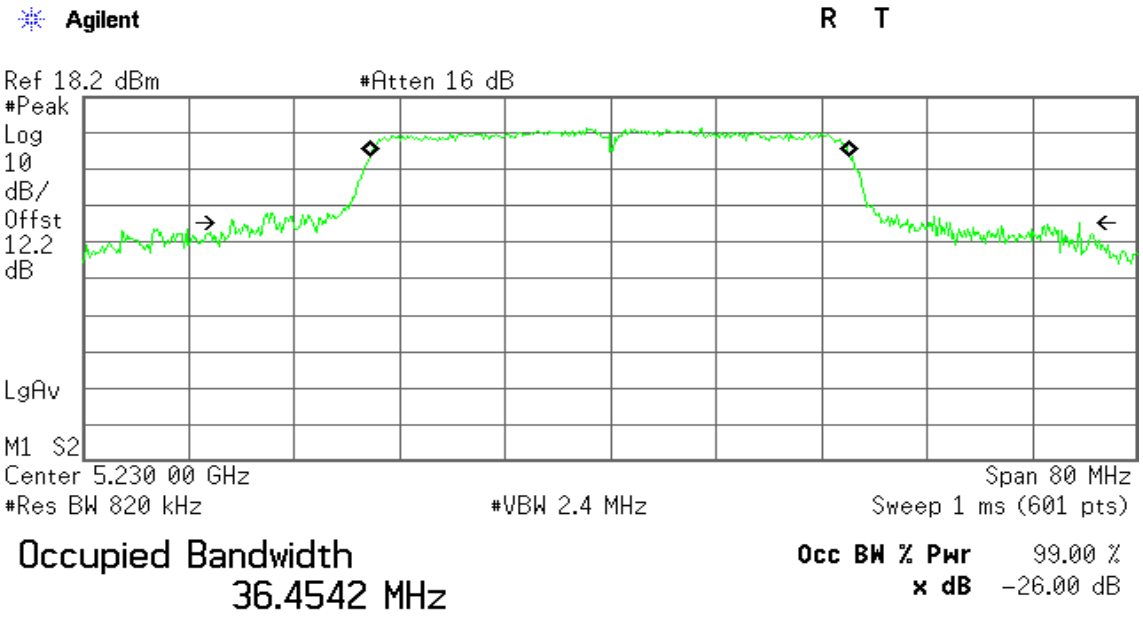
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

CH Low



Transmit Freq Error −115.296 kHz
x dB Bandwidth 52.109 MHz

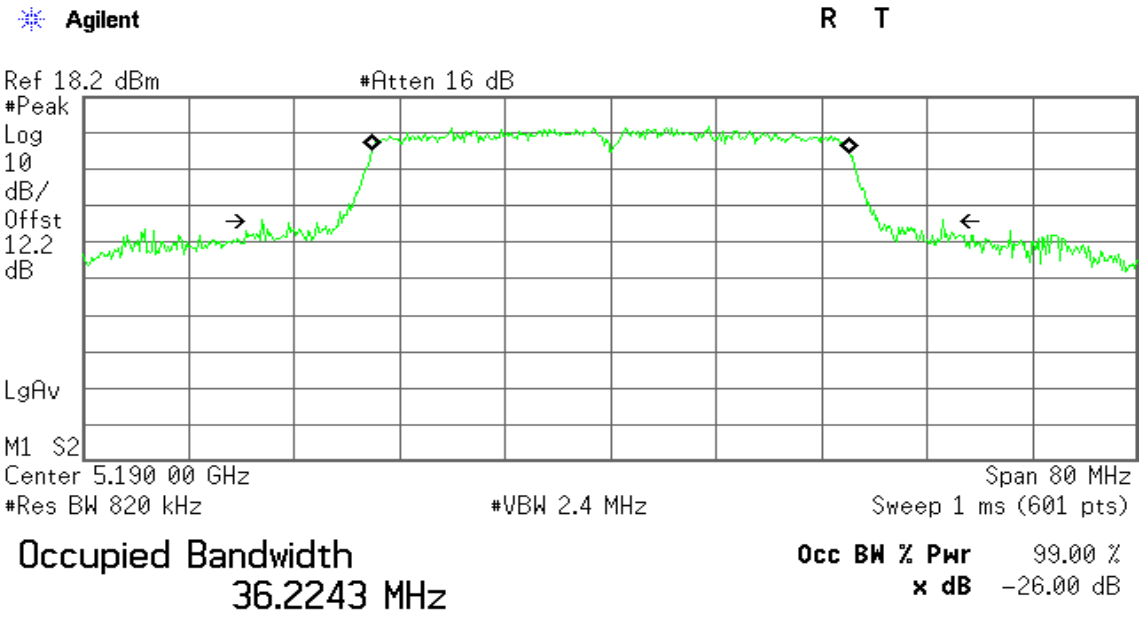
CH High



Transmit Freq Error −49.963 kHz
x dB Bandwidth 64.312 MHz

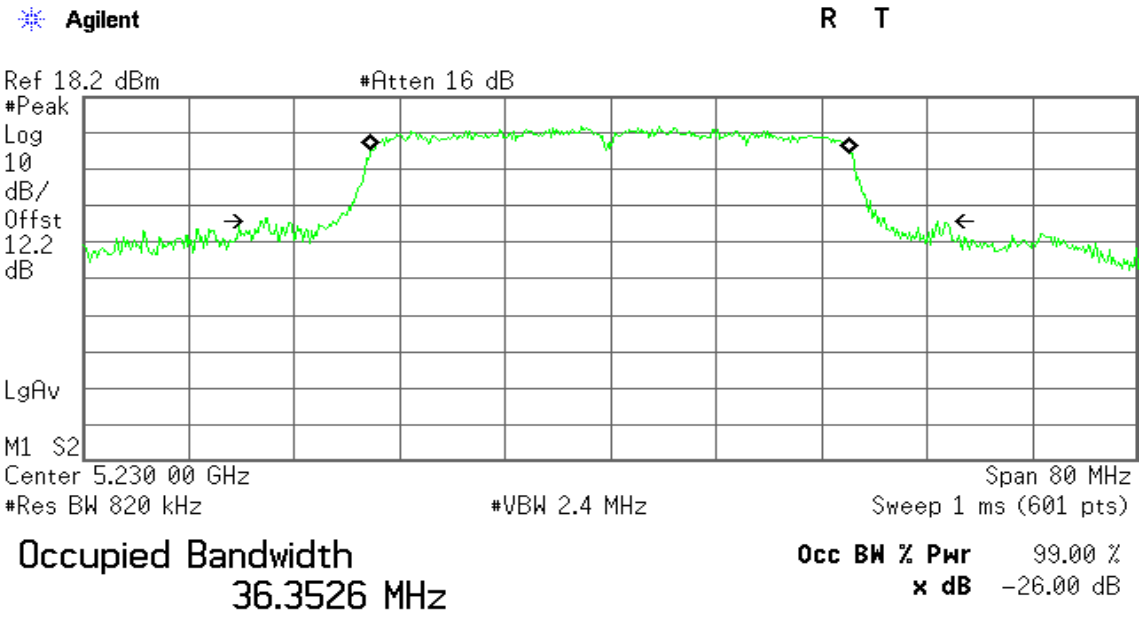
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

CH Low



Transmit Freq Error 5.396 kHz
x dB Bandwidth 51.647 MHz

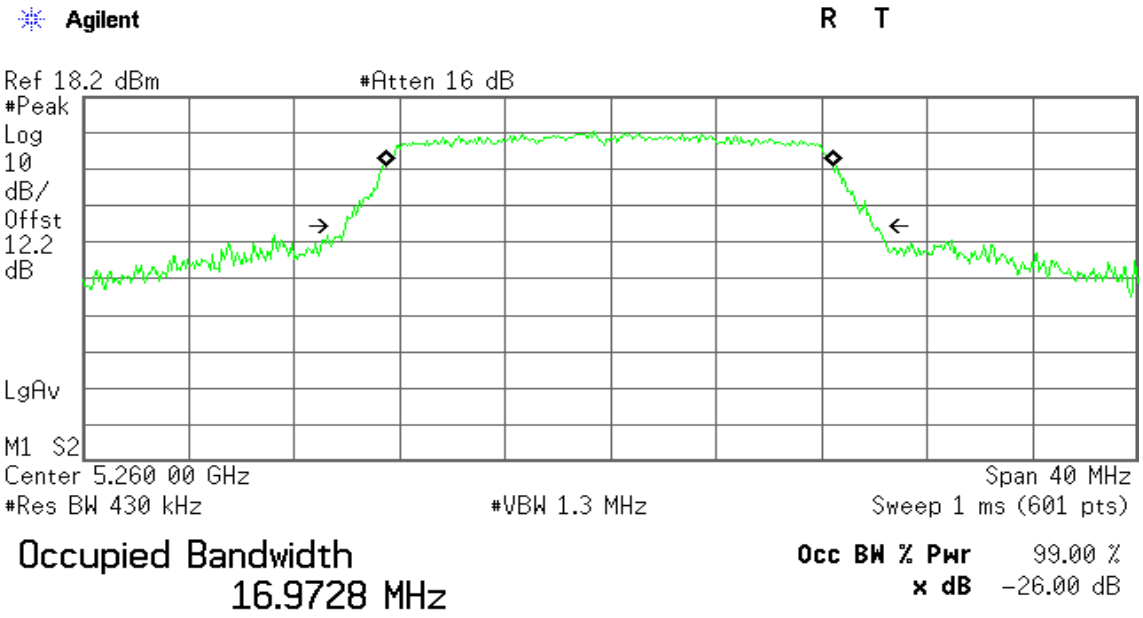
CH High



Transmit Freq Error -26.815 kHz
x dB Bandwidth 51.352 MHz

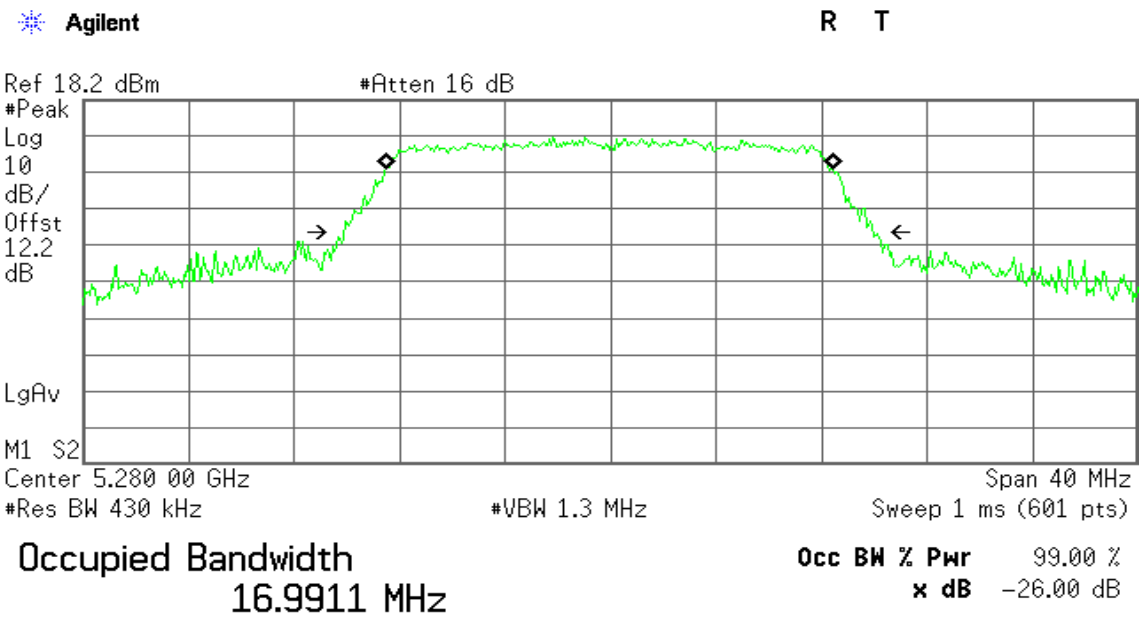
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low



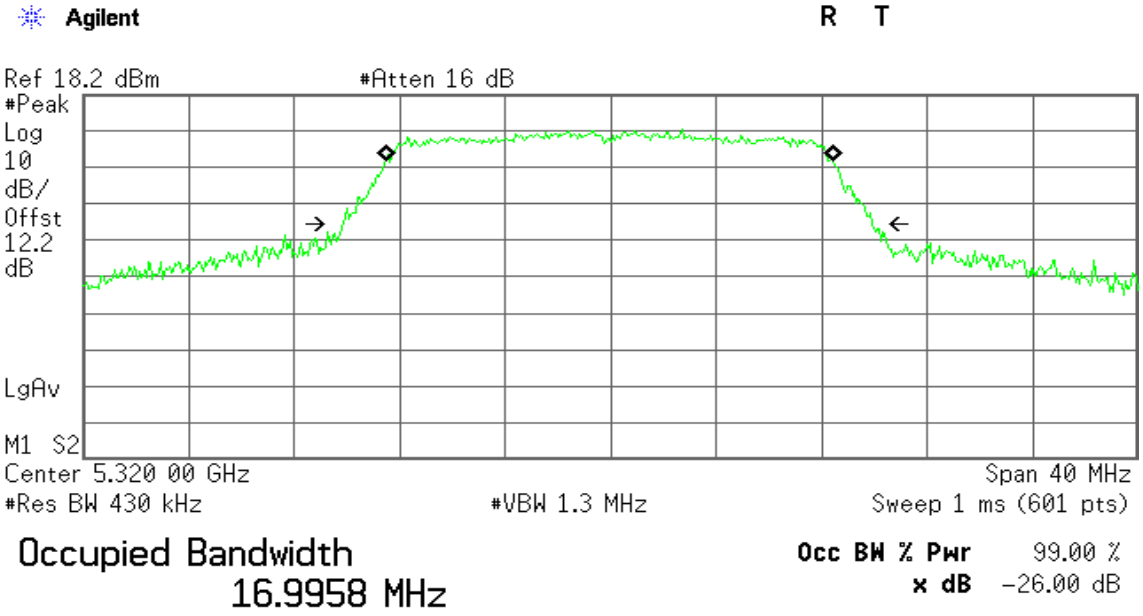
Transmit Freq Error −30.799 kHz
x dB Bandwidth 20.011 MHz

CH Mid



Transmit Freq Error −35.863 kHz
x dB Bandwidth 20.090 MHz

CH High



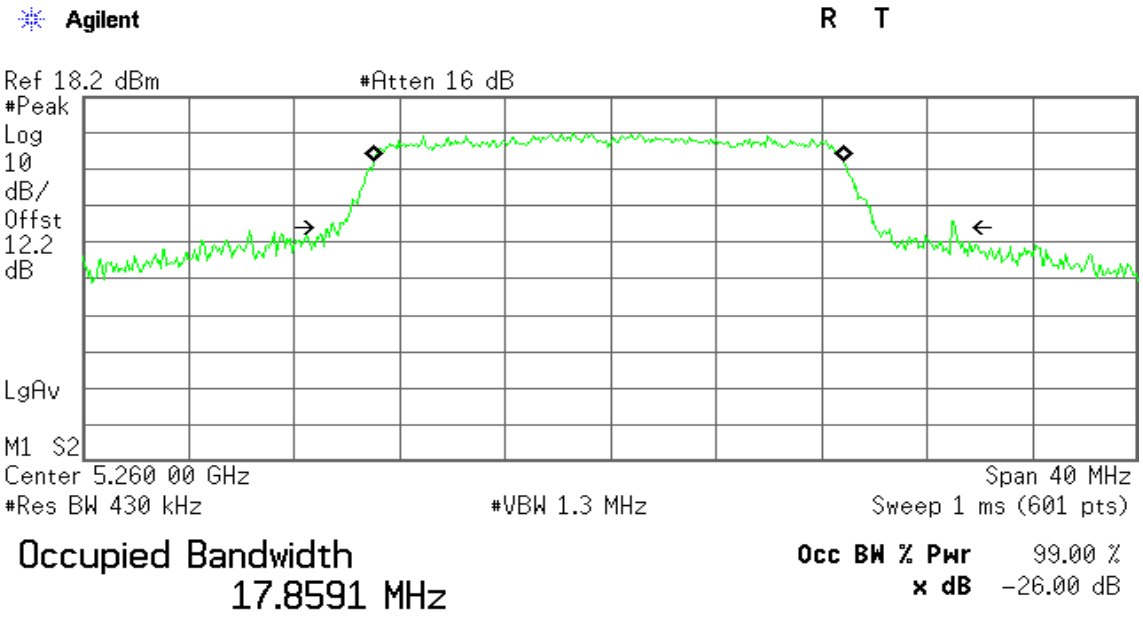
Occupied Bandwidth
16.9958 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -46.874 kHz
x dB Bandwidth 20.106 MHz

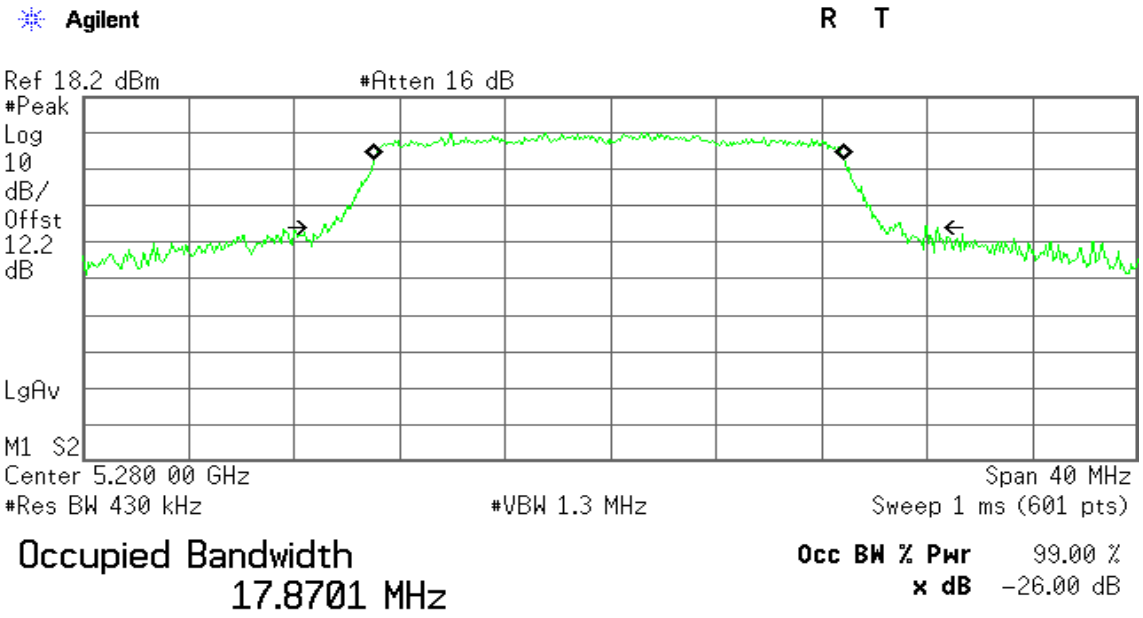
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low



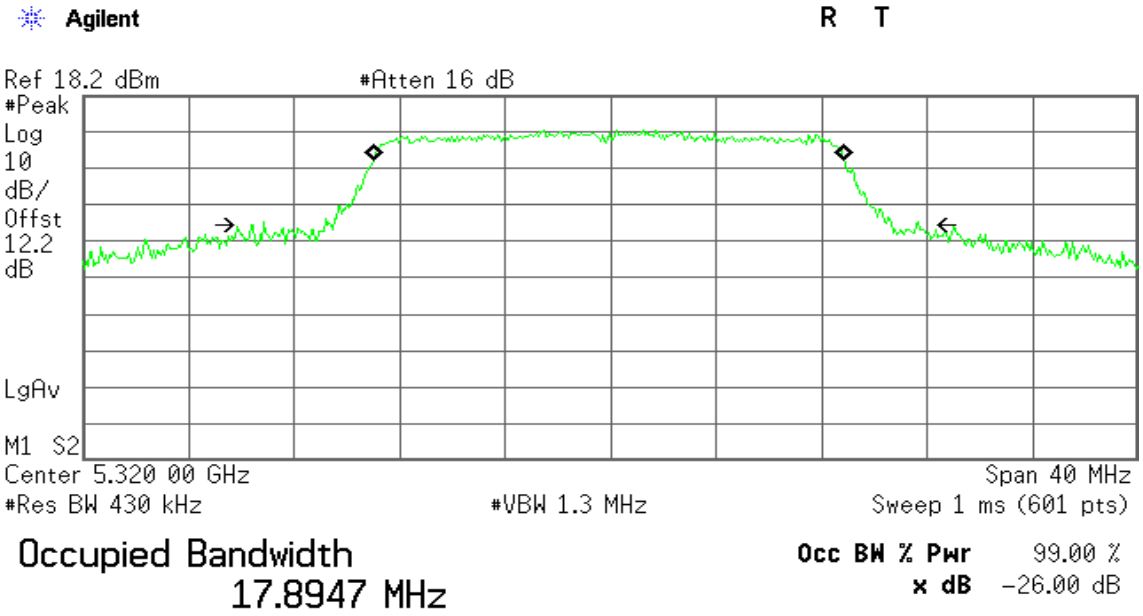
Transmit Freq Error -70.801 kHz
x dB Bandwidth 23.683 MHz

CH Mid



Transmit Freq Error -47.801 kHz
x dB Bandwidth 22.900 MHz

CH High



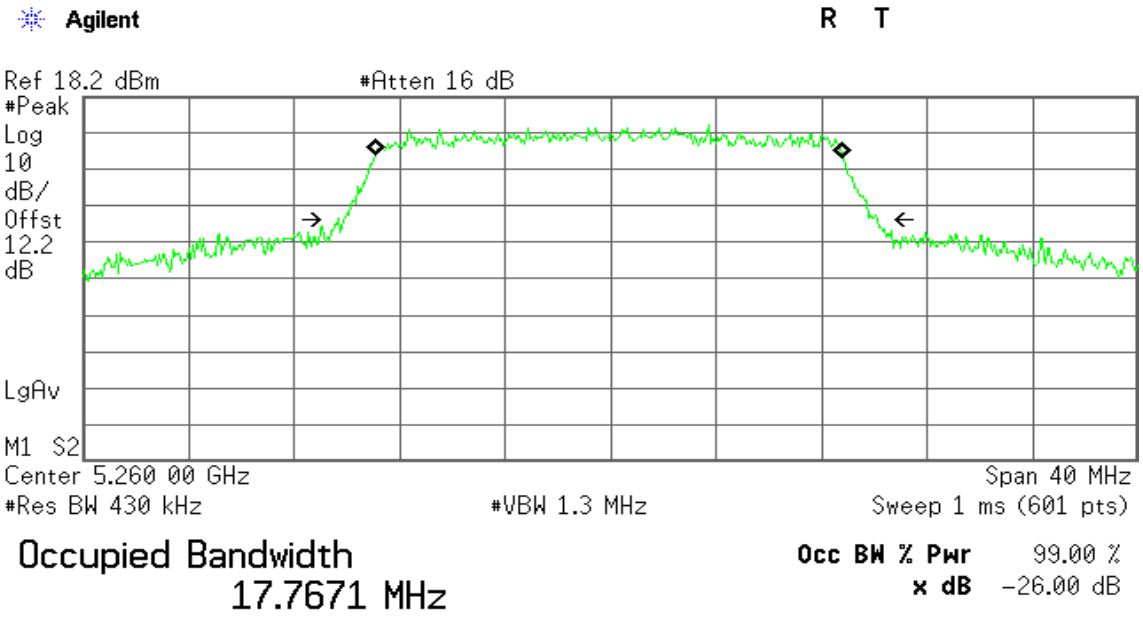
Occupied Bandwidth
17.8947 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -62.638 kHz
x dB Bandwidth 25.304 MHz

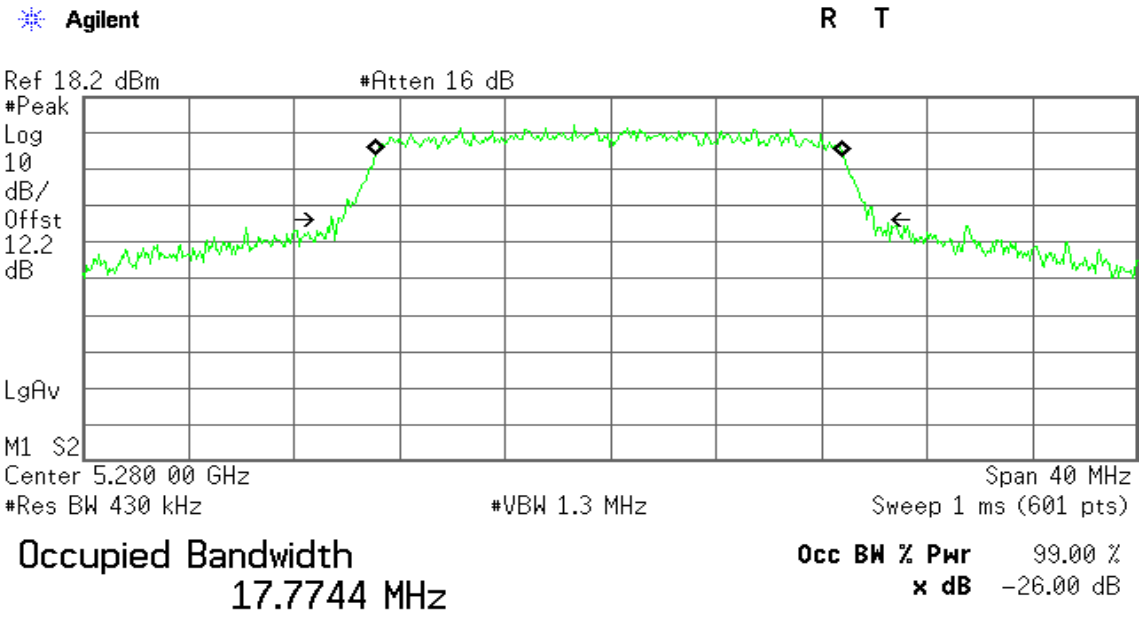
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

CH Low



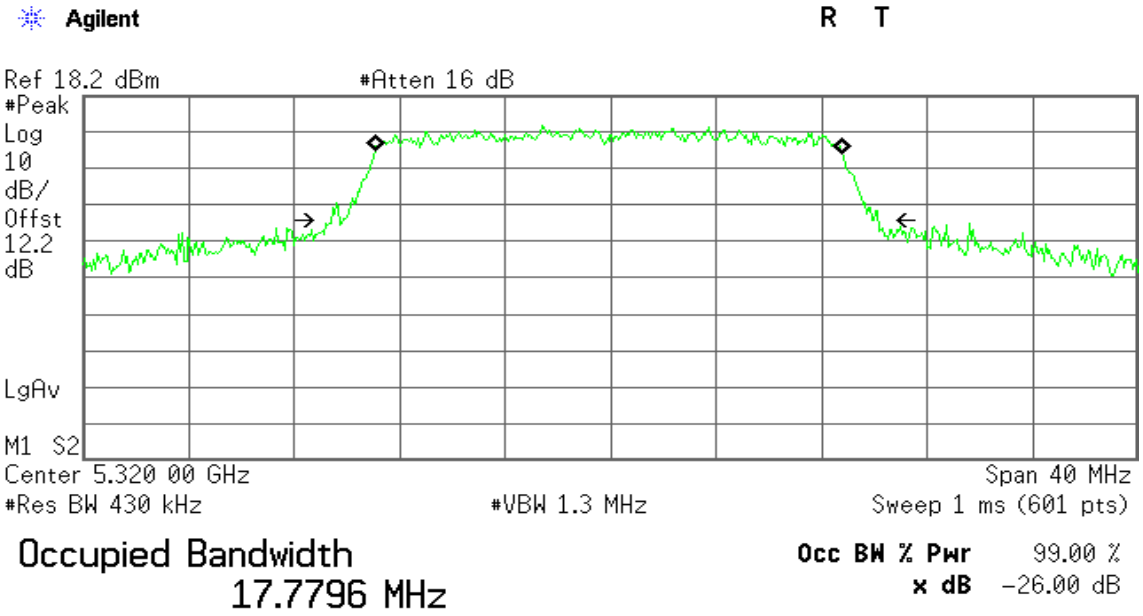
Transmit Freq Error -75.544 kHz
x dB Bandwidth 20.502 MHz

CH Mid



Transmit Freq Error -56.161 kHz
x dB Bandwidth 20.599 MHz

CH High



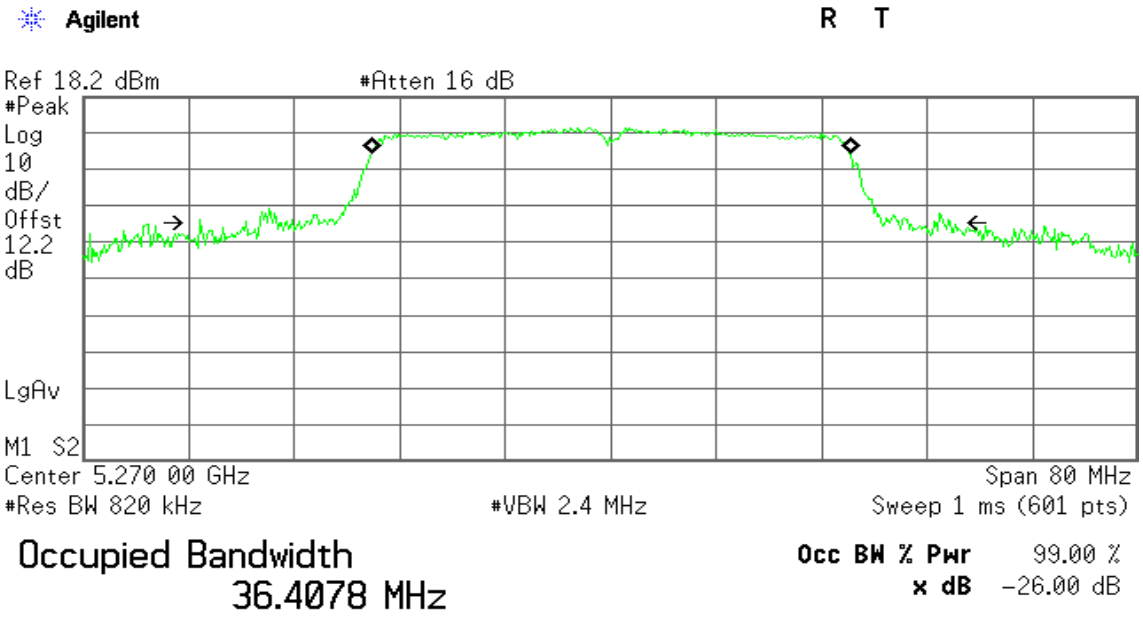
Occupied Bandwidth
17.7796 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -69.204 kHz
x dB Bandwidth 20.769 MHz

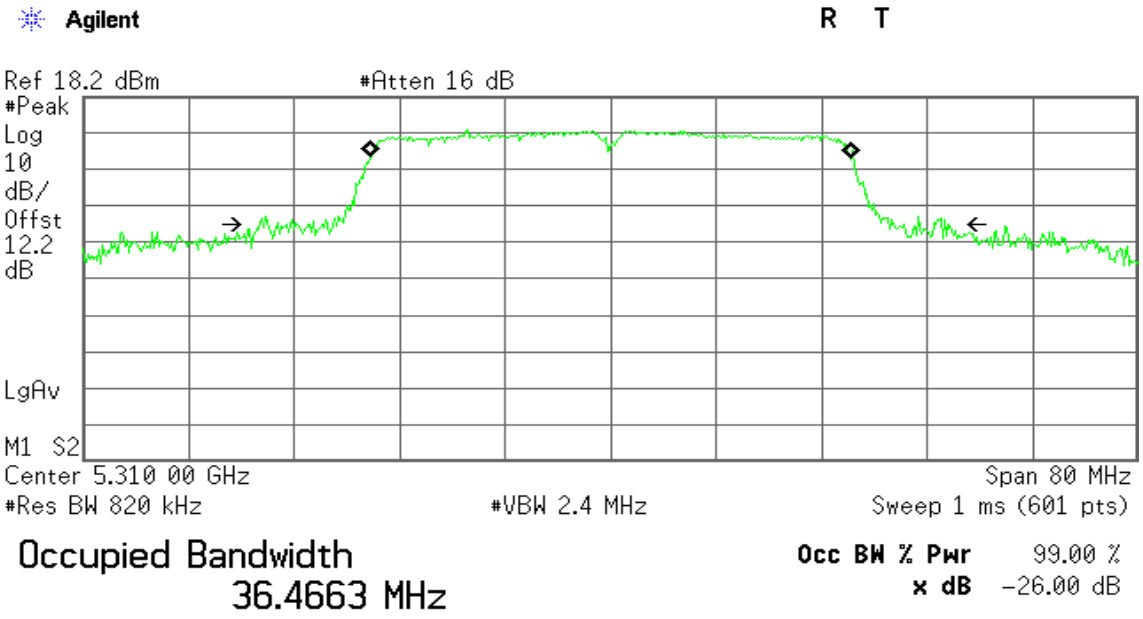
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low



Transmit Freq Error 11.068 kHz
x dB Bandwidth 56.826 MHz

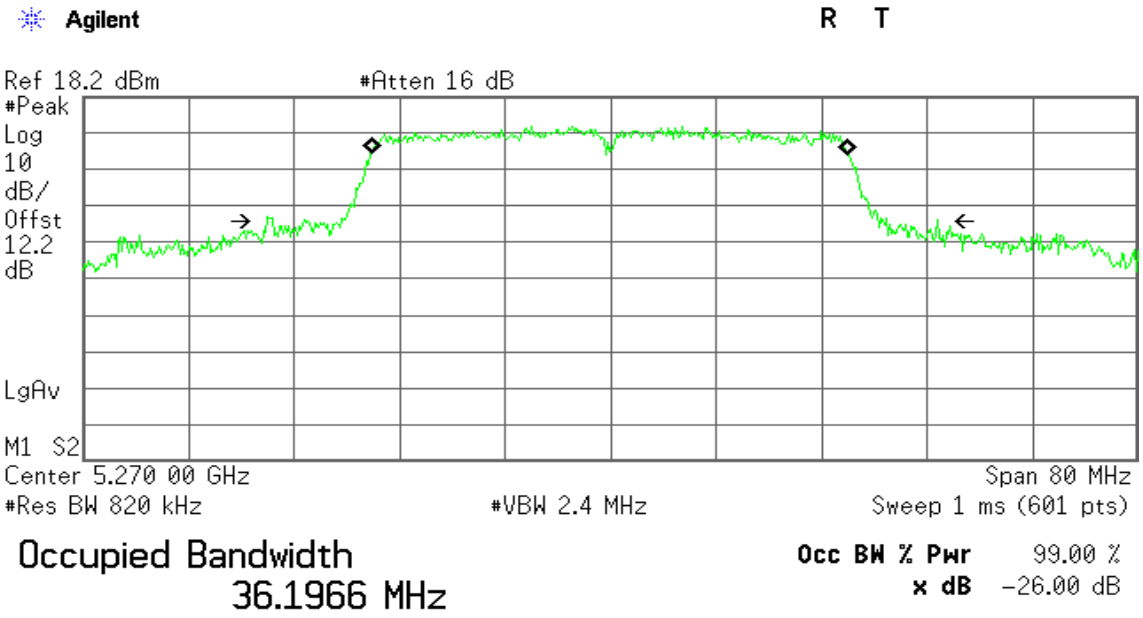
CH High



Transmit Freq Error 11.449 kHz
x dB Bandwidth 52.285 MHz

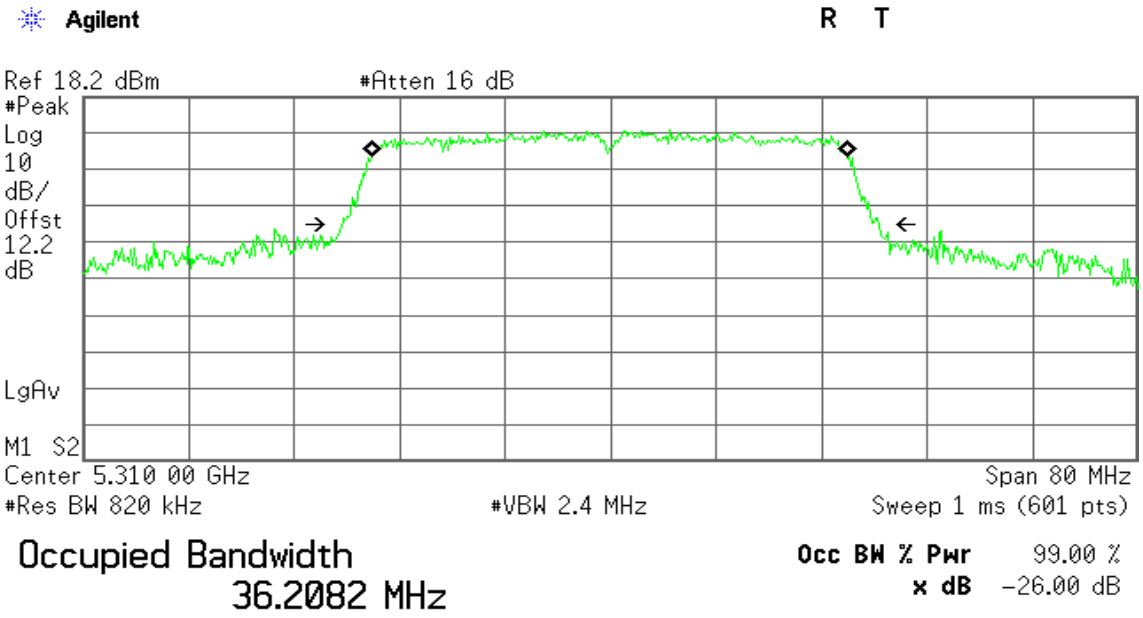
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low



Transmit Freq Error -47.859 kHz
x dB Bandwidth 50.870 MHz

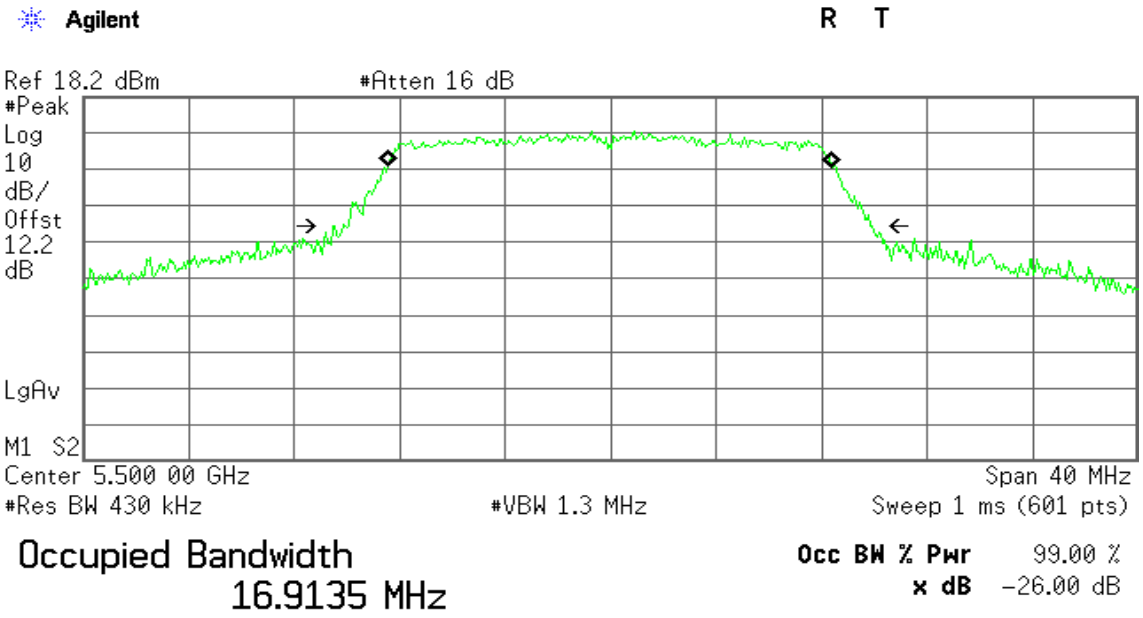
CH High



Transmit Freq Error -58.575 kHz
x dB Bandwidth 40.737 MHz

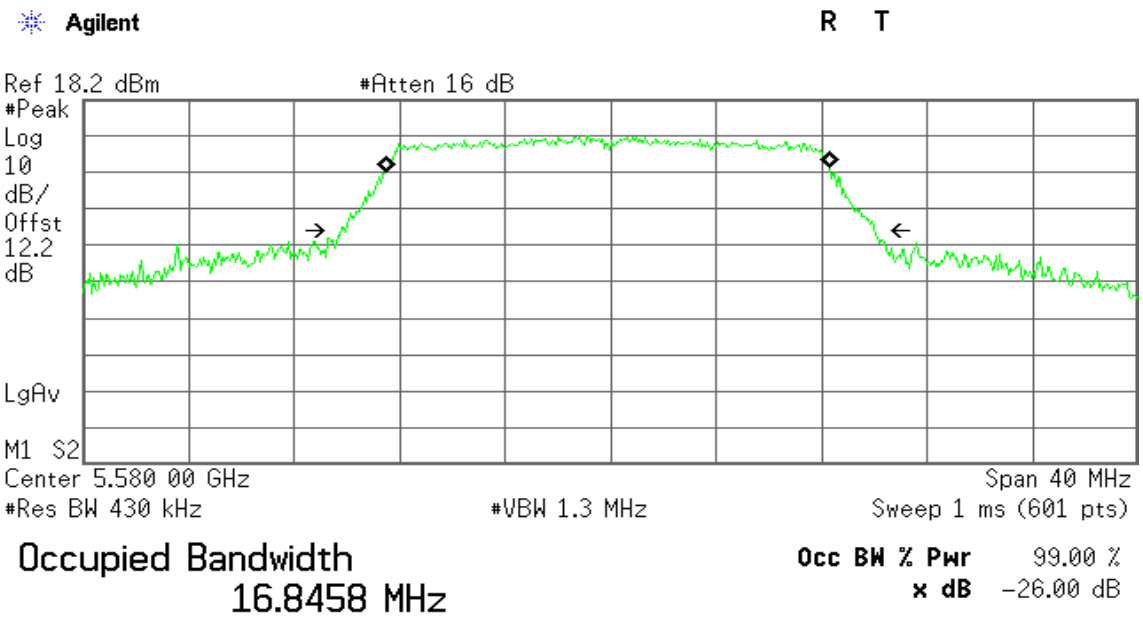
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low



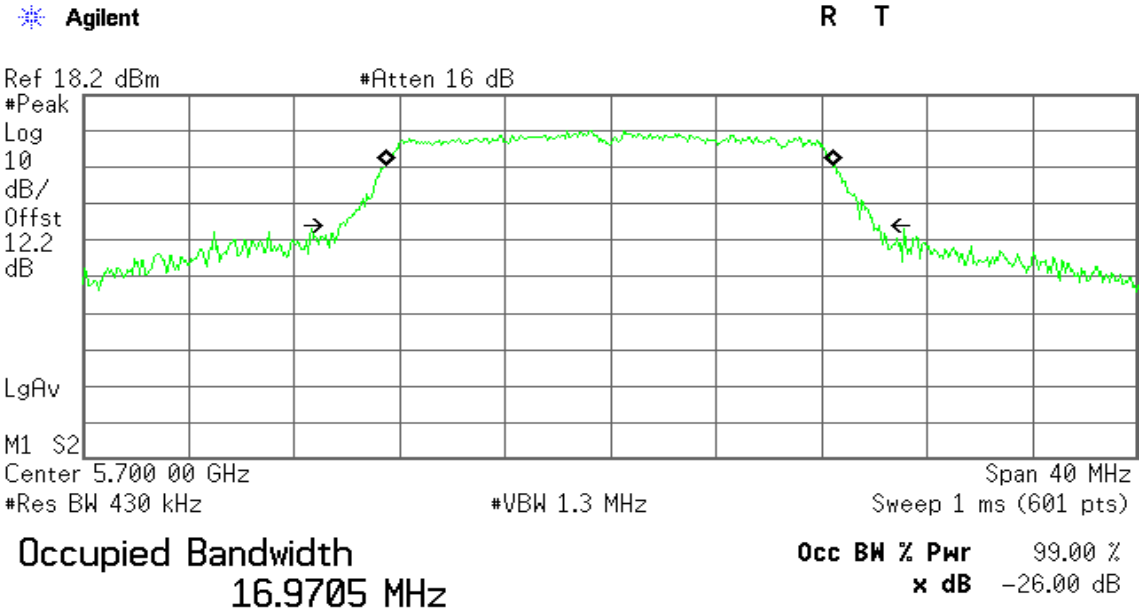
Transmit Freq Error −36.197 kHz
x dB Bandwidth 20.455 MHz

CH Mid



Transmit Freq Error −98.015 kHz
x dB Bandwidth 20.244 MHz

CH High



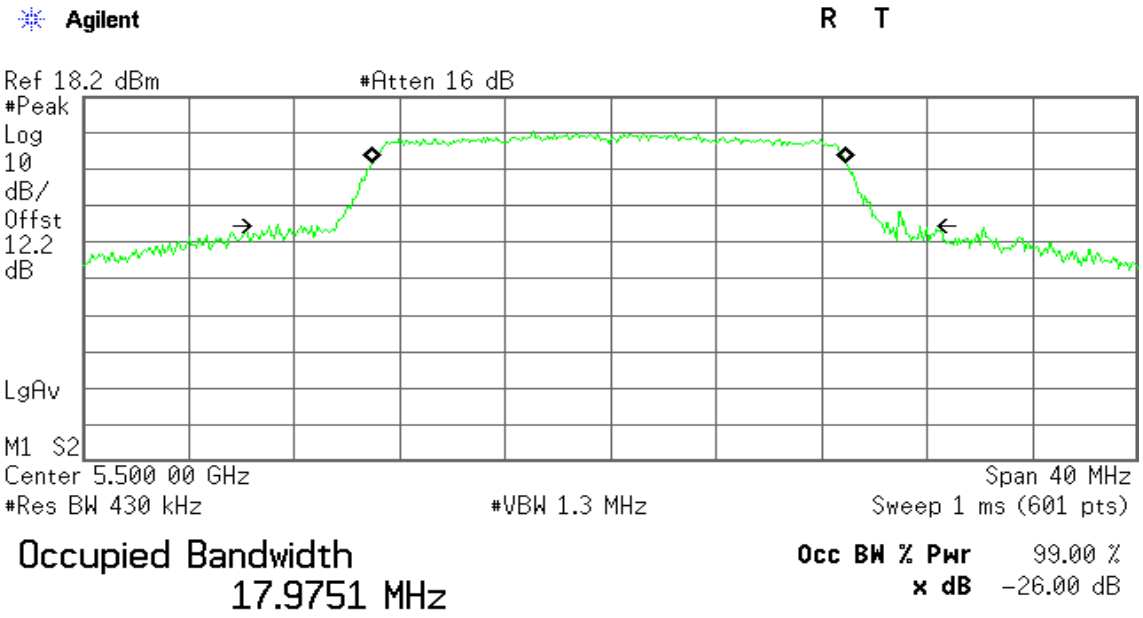
Occupied Bandwidth
16.9705 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -33.690 kHz
x dB Bandwidth 20.264 MHz

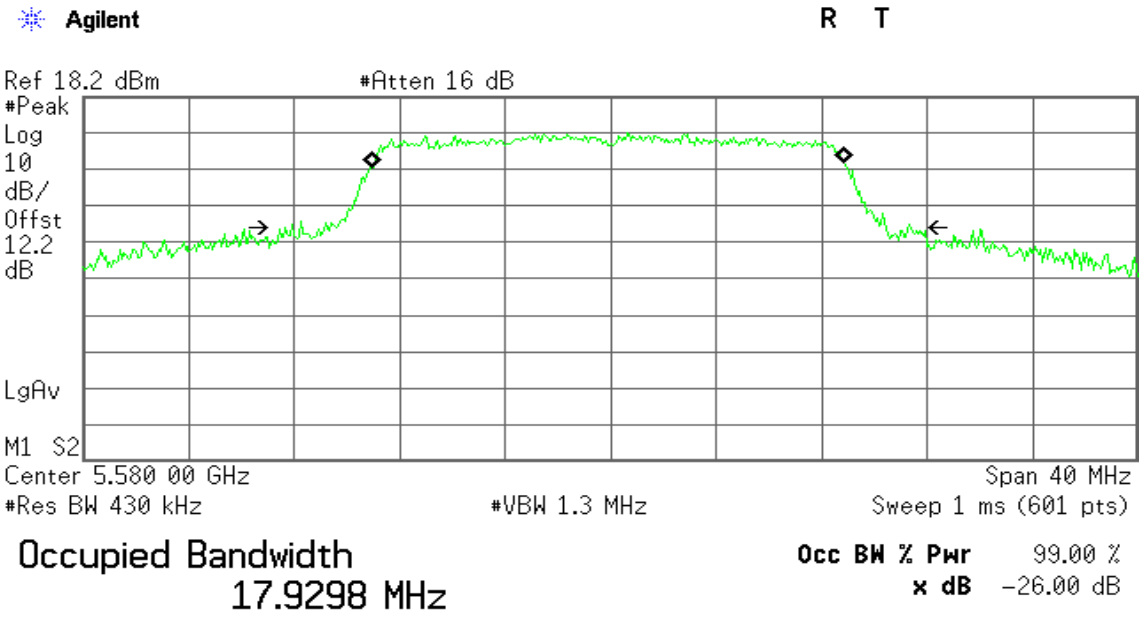
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

CH Low



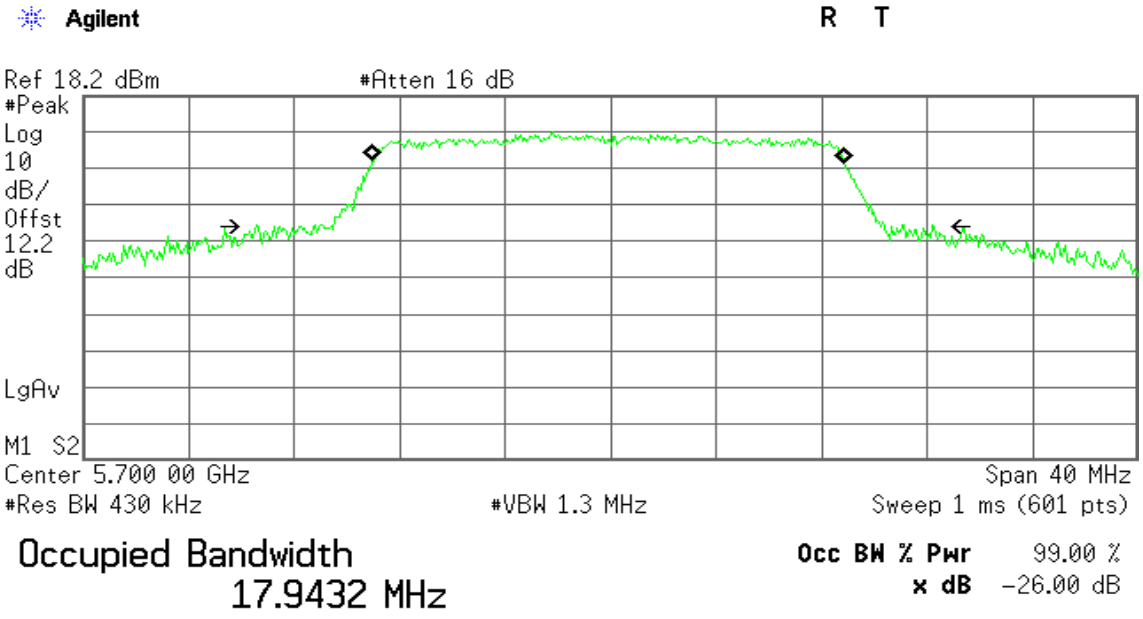
Transmit Freq Error -65.110 kHz
x dB Bandwidth 24.673 MHz

CH Mid



Transmit Freq Error -83.828 kHz
x dB Bandwidth 23.719 MHz

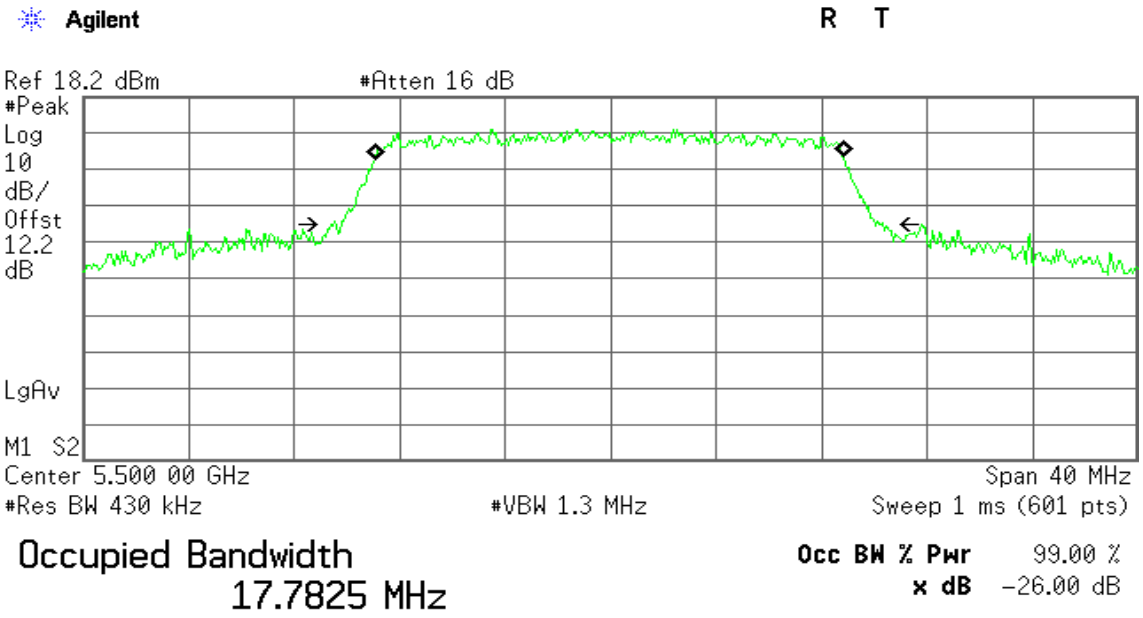
CH High



Transmit Freq Error	-92.088 kHz
x dB Bandwidth	25.647 MHz

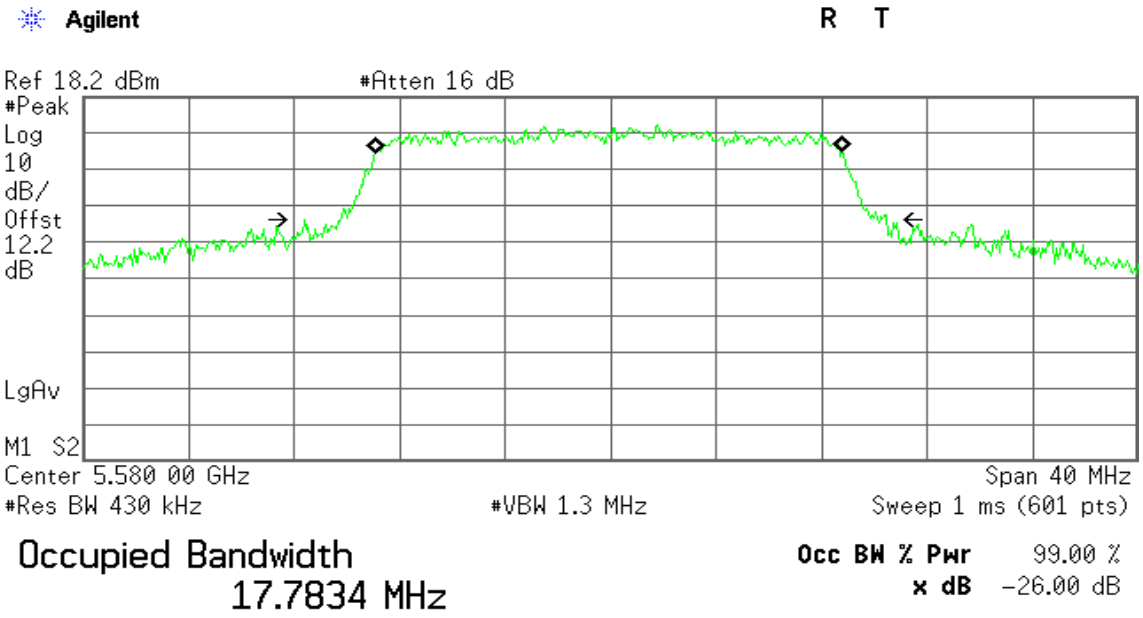
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low



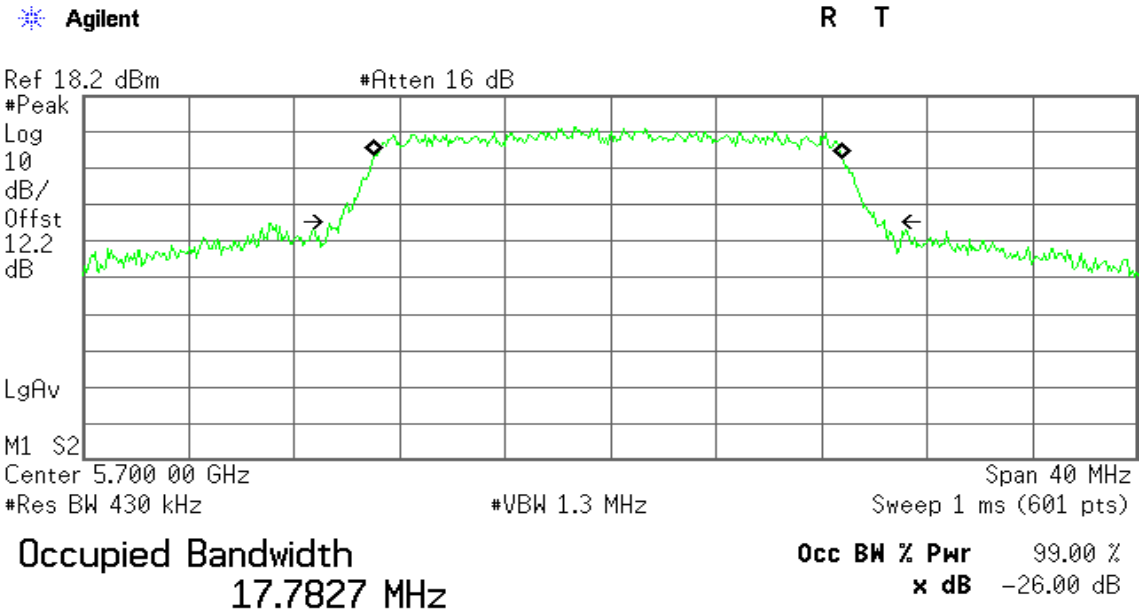
Transmit Freq Error -51.293 kHz
x dB Bandwidth 20.852 MHz

CH Mid



Transmit Freq Error -68.540 kHz
x dB Bandwidth 22.099 MHz

CH High



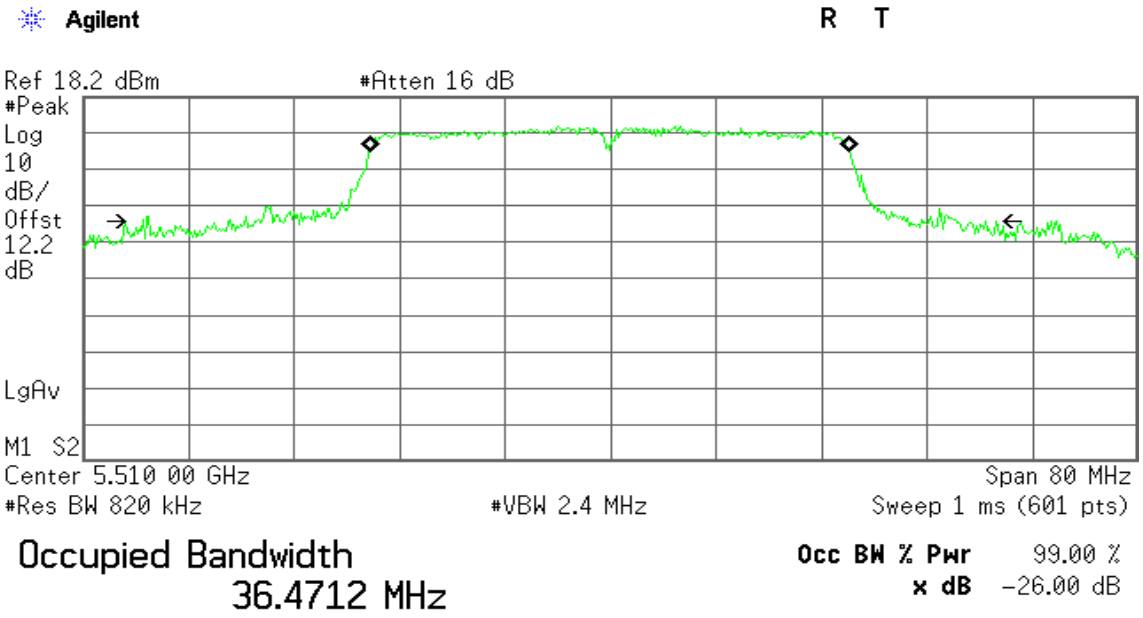
Occupied Bandwidth
17.7827 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -84.627 kHz
x dB Bandwidth 20.697 MHz

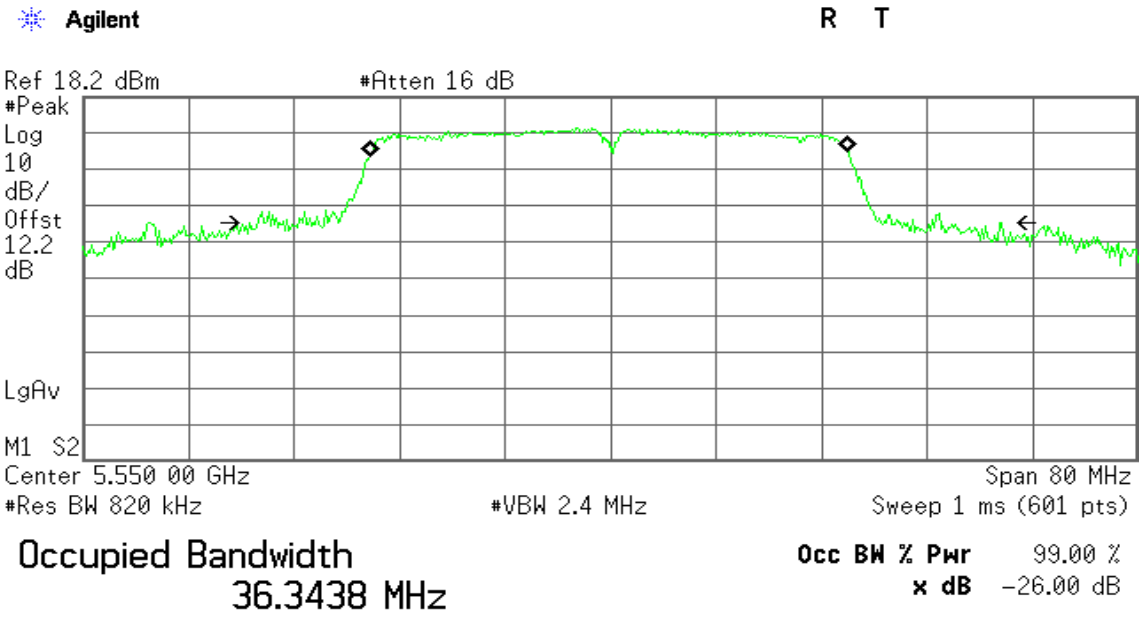
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

CH Low



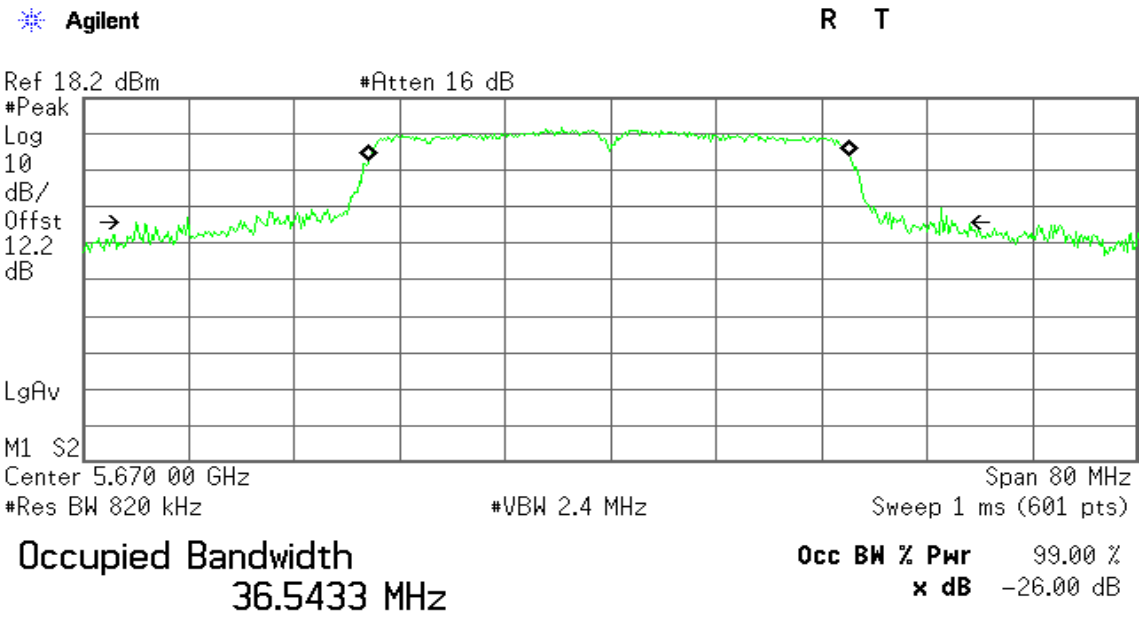
Transmit Freq Error -97.013 kHz
x dB Bandwidth 63.886 MHz

CH Mid



Transmit Freq Error -118.610 kHz
x dB Bandwidth 56.269 MHz

CH High



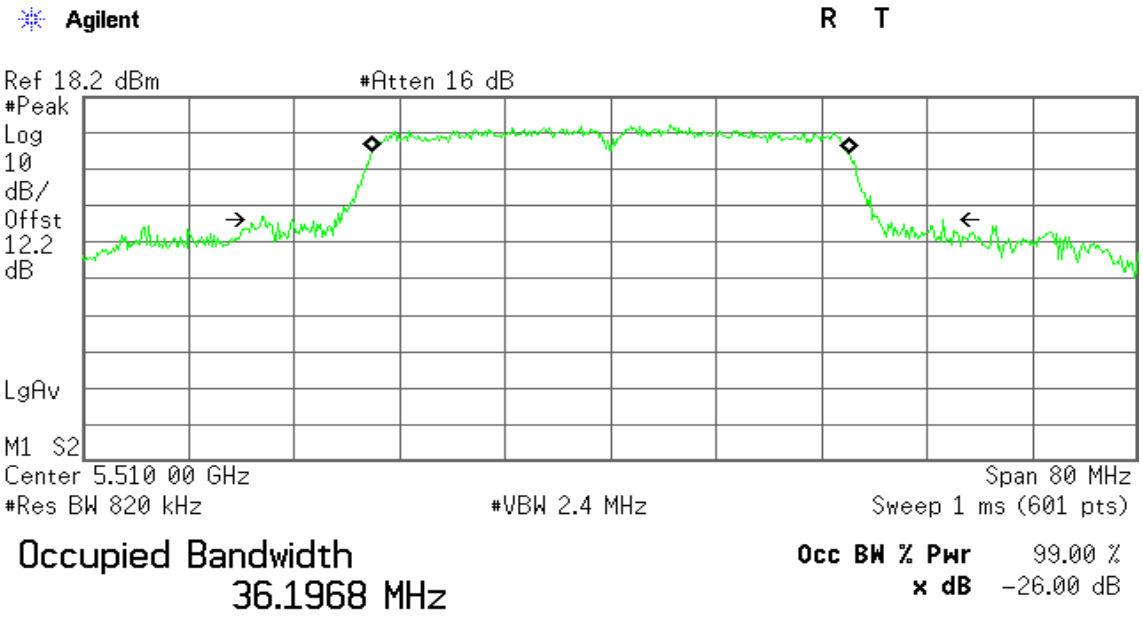
Occupied Bandwidth
36.5433 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -98.583 kHz
x dB Bandwidth 61.952 MHz

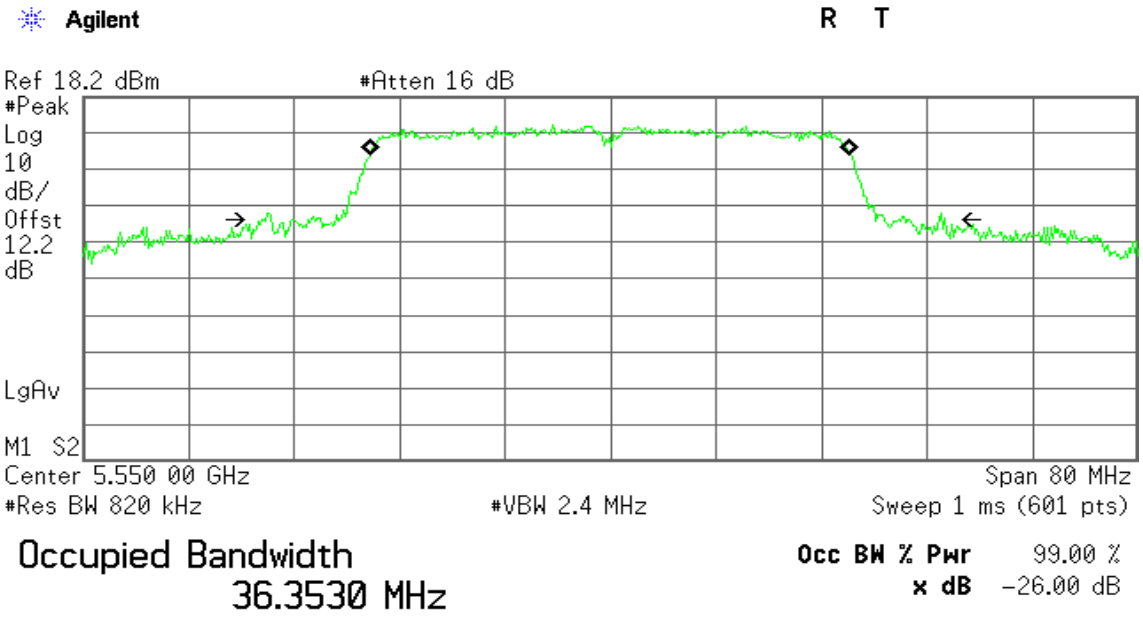
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

CH Low



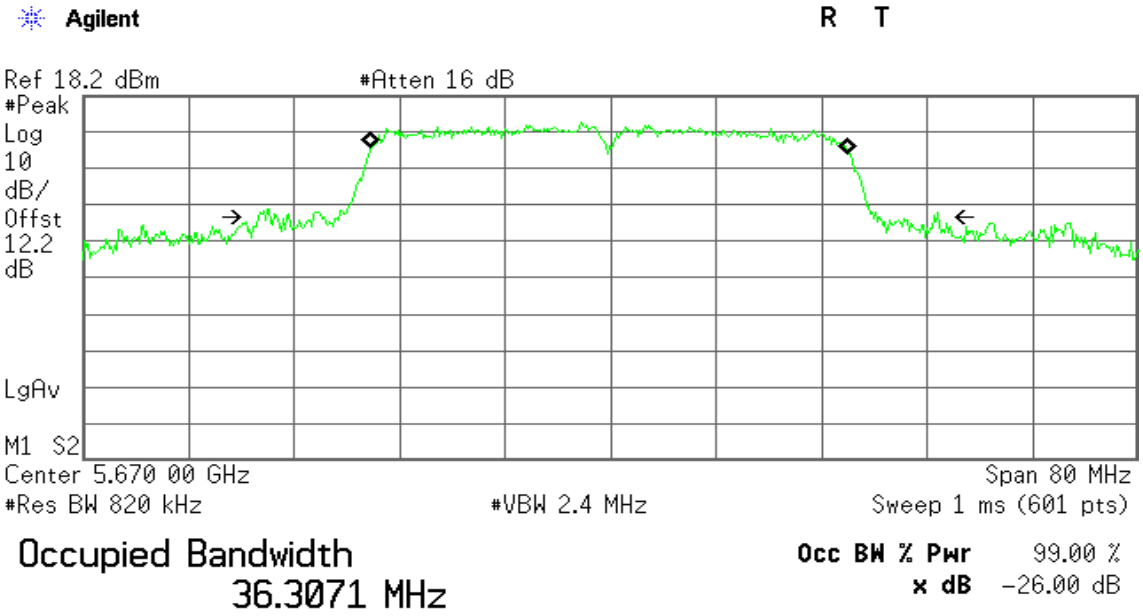
Transmit Freq Error -25.113 kHz
x dB Bandwidth 51.672 MHz

CH Mid



Transmit Freq Error -45.341 kHz
x dB Bandwidth 51.784 MHz

CH High



Occupied Bandwidth
36.3071 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -96.860 kHz
x dB Bandwidth 51.545 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-210 §A9.2,

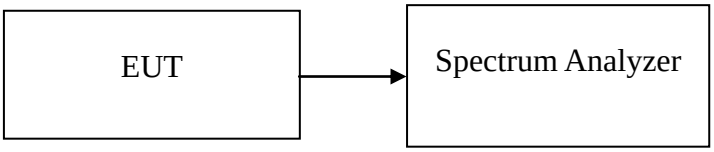
(1) For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 Log_{10} B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

(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.

TEST RESULTS

No non-compliance noted

Test Data

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	***14.92**	24.00
Mid	5220	14.84	24.00
High	5240	14.81	24.00

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5180	15.22	14.96	18.10	24.00
Mid	5220	15.15	15.13	18.15	24.00
High	5240	15.26	15.22	***18.25**	24.00

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5190	13.94	13.67	16.82	24.00
High	5230	14.86	15.05	***17.97**	24.00

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5260	***15.06**	24.00
Mid	5280	14.89	24.00
High	5320	14.92	24.00

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5260	15.08	15.12	18.11	24.00
Mid	5280	15.03	15.31	***18.18**	24.00
High	5320	14.88	14.94	17.92	24.00

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5270	15.20	14.96	***18.09**	24.00
High	5310	13.41	13.57	16.50	24.00

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5500	14.89	24.00
Mid	5580	***15.27**	24.00
High	5700	15.23	24.00

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

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5500	15.15	14.87	***18.02**	24.00
Mid	5580	14.77	15.24	18.02	24.00
High	5700	14.83	15.05	17.95	24.00

Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5510	15.11	15.01	18.07	24.00
Mid	5550	14.96	14.88	17.93	24.00
High	5670	15.13	15.22	***18.19**	24.00

Remark: *Total Output Power (w) = Chain 0 (10^(Output Power /10)/1000) + Chain 1 (10^(Output Power /10)/1000)*

7.4 BAND EDGES MEASUREMENT

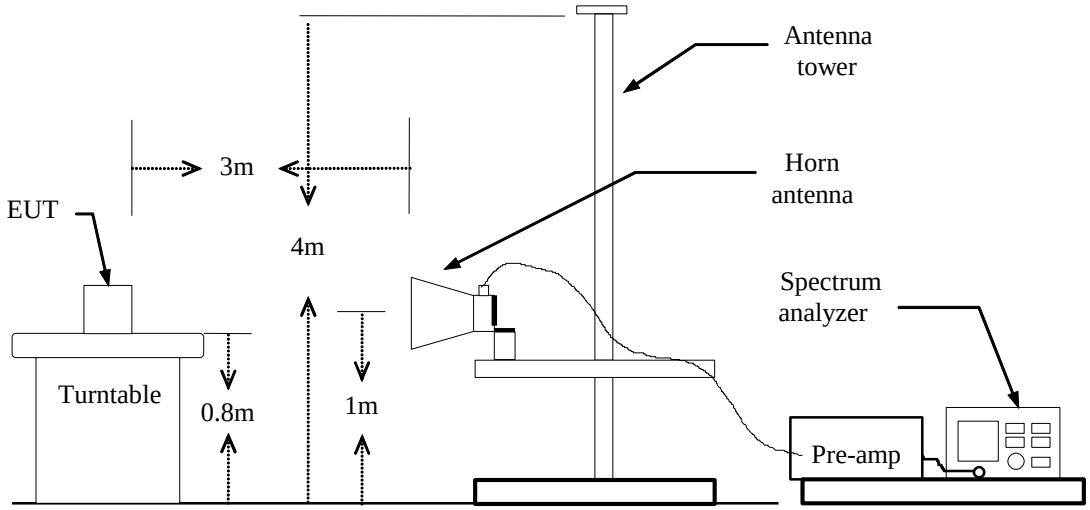
LIMIT

According to §15.407(b) & RSS-210 §A8.5,

(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TEST PROCEDURE

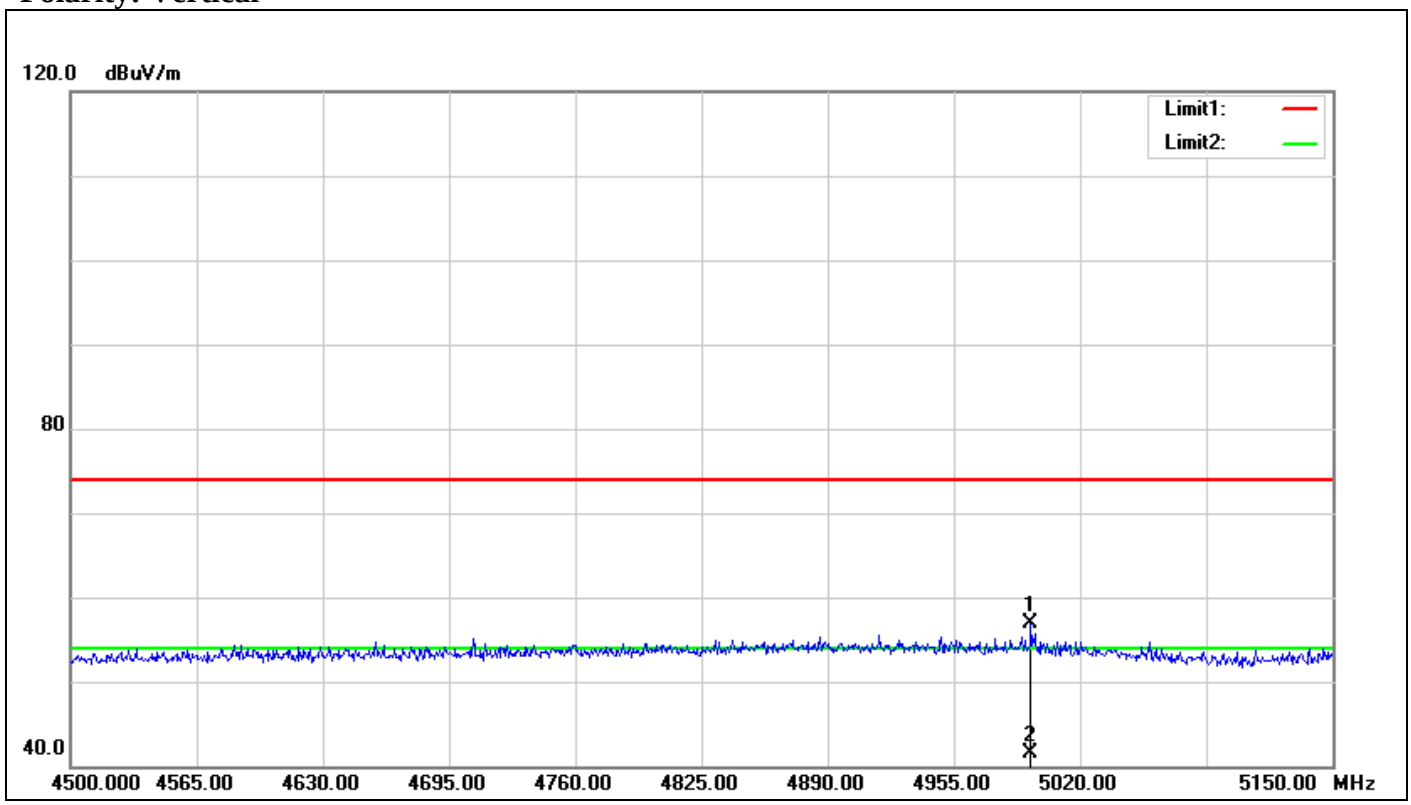
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=300Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

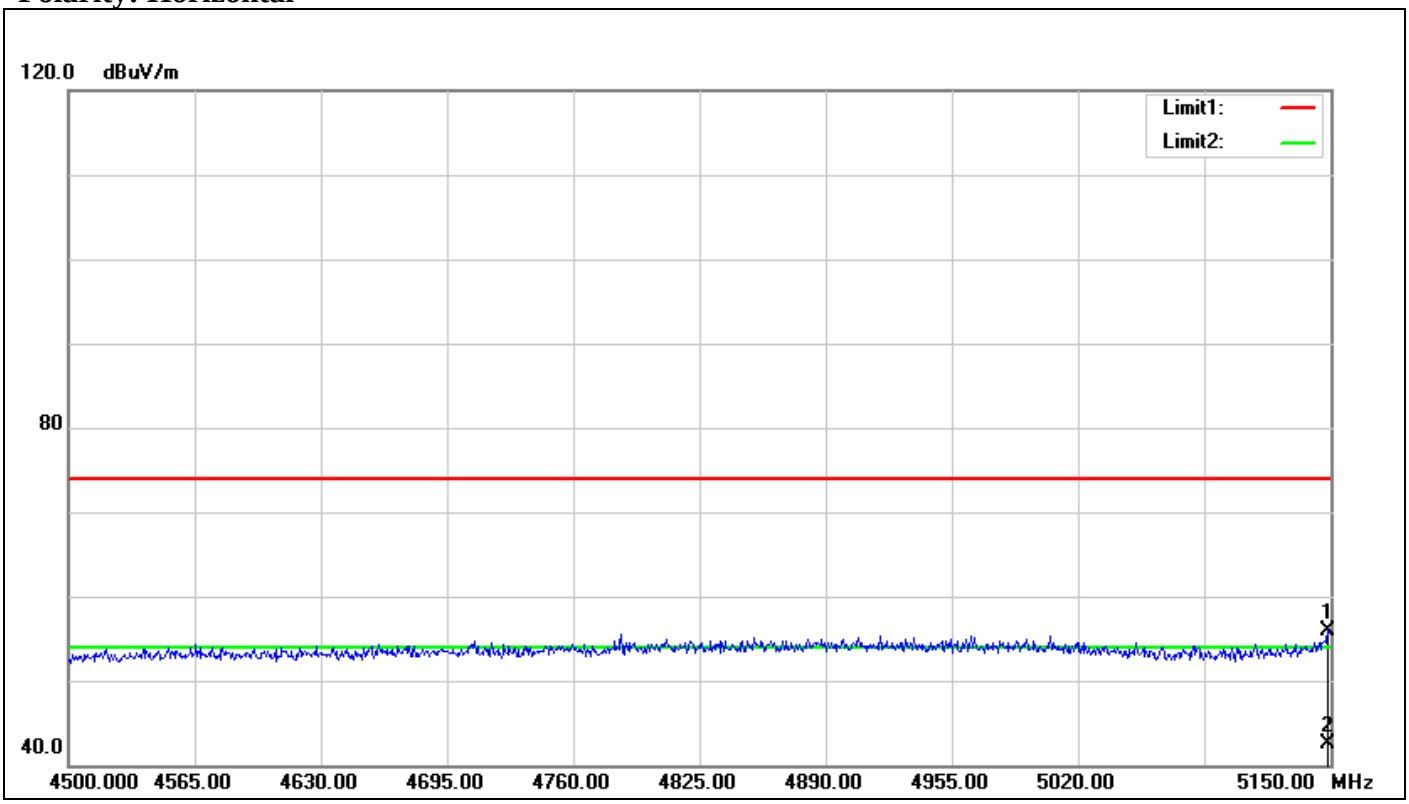
Band Edges (IEEE 802.11a mode / 5180 MHz)

Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	4994.650	52.95	3.96	56.91	74.00	-17.09	100	200	peak
2	4994.650	37.49	3.96	41.45	54.00	-12.55	100	200	AVG

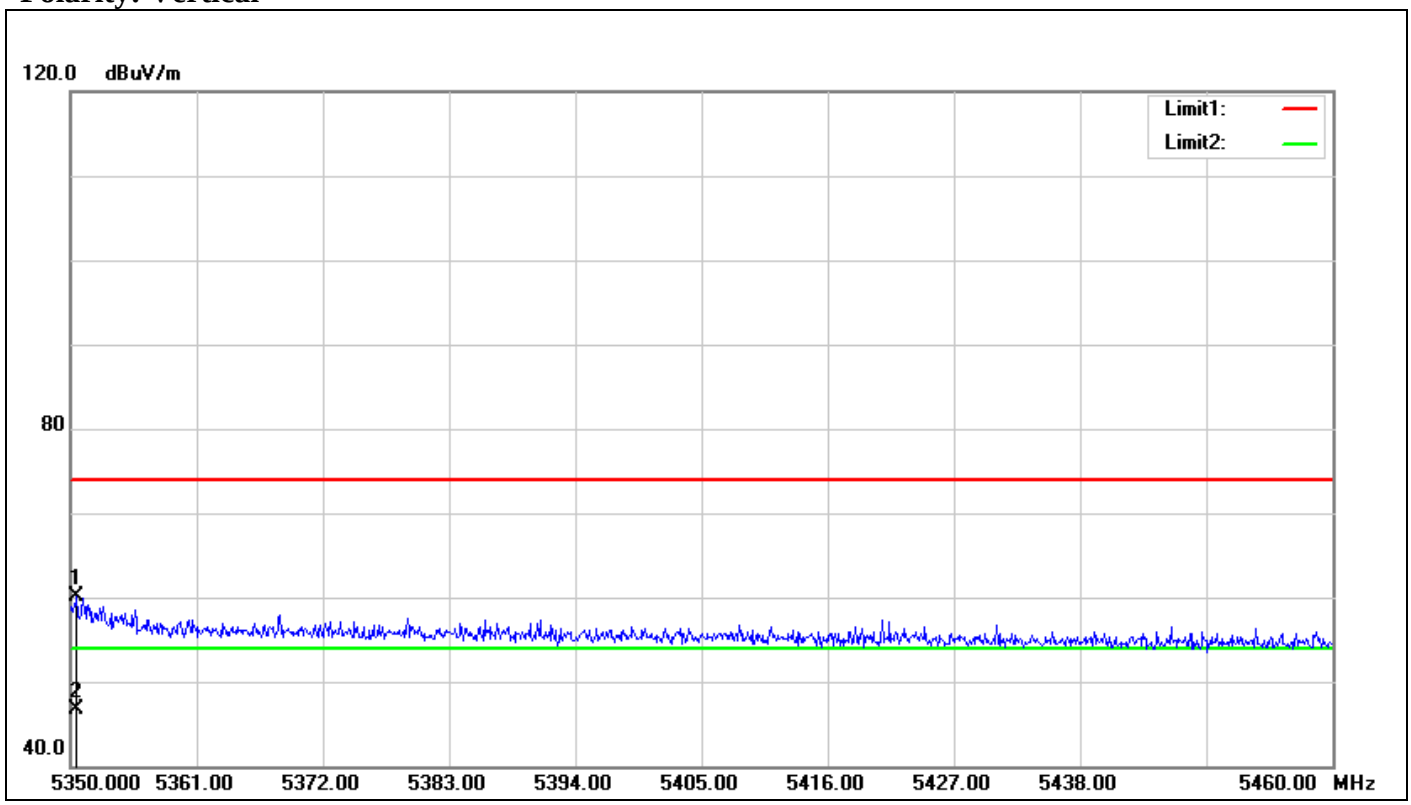
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5148.700	52.97	3.03	56.00	74.00	-18.00	100	229	peak
2	5148.700	39.52	3.03	42.55	54.00	-11.45	100	229	AVG

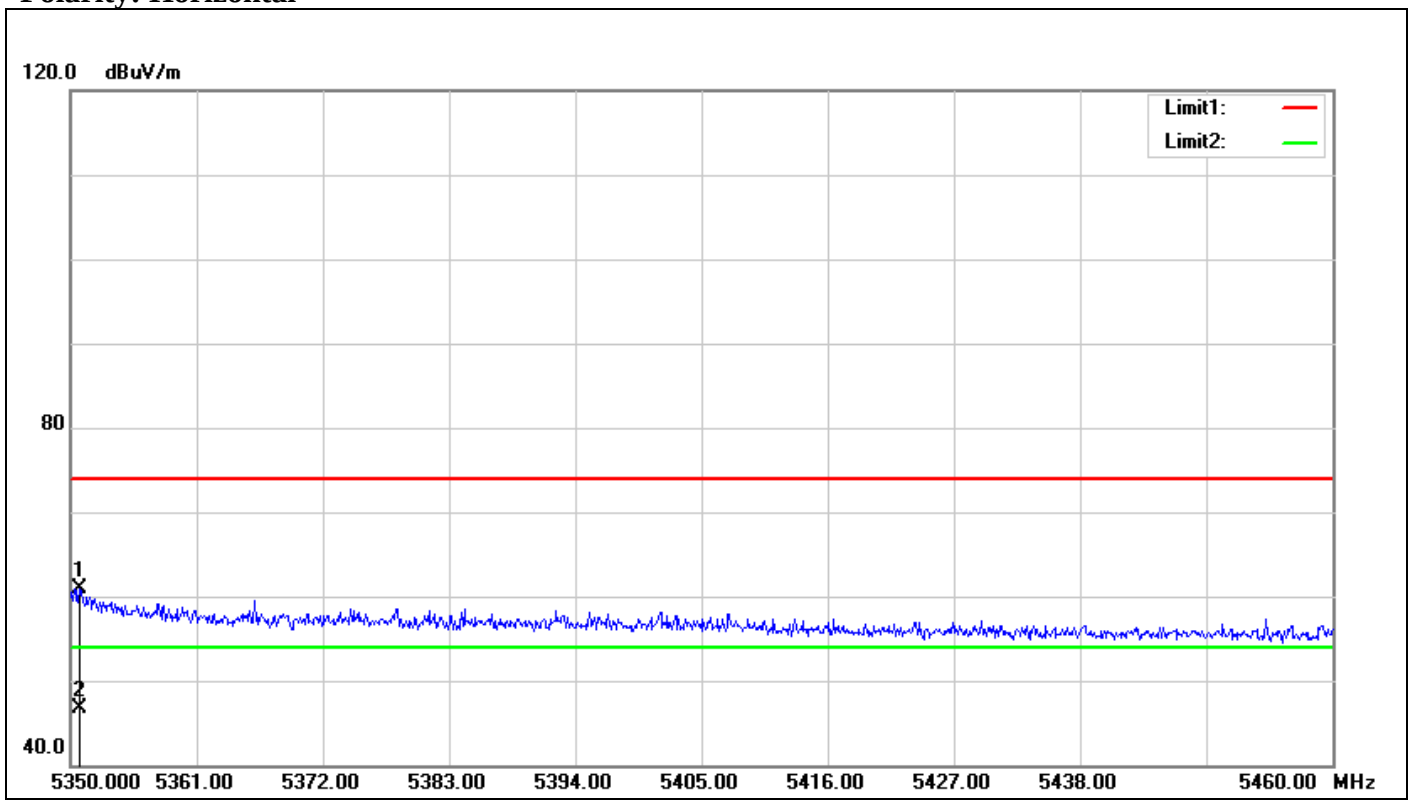
Band Edges (IEEE 802.11a mode / 5320 MHz

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.550	54.78	5.31	60.09	74.00	-13.91	100	4	peak
2	5350.550	41.32	5.31	46.63	54.00	-7.37	100	4	AVG

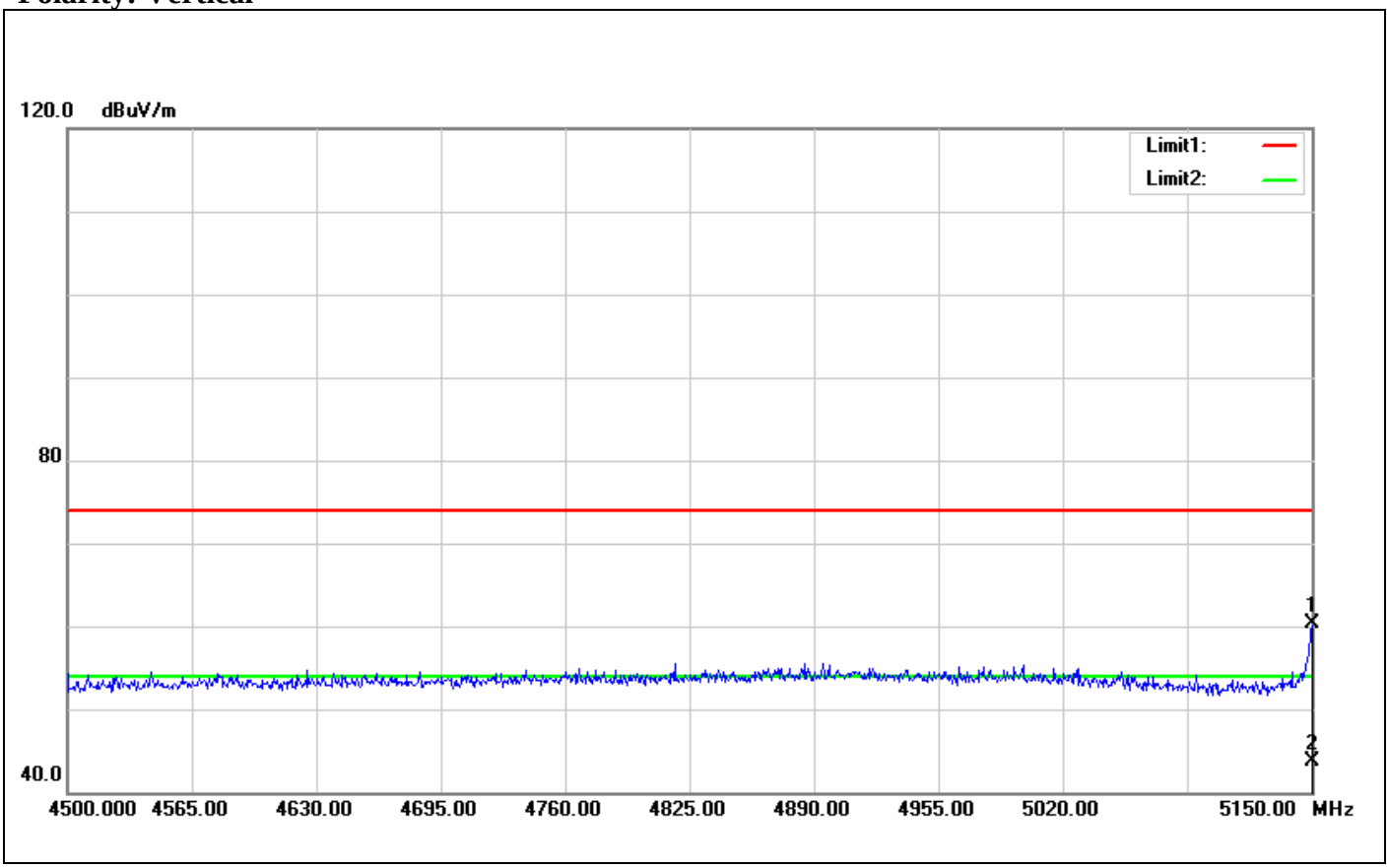
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	5350.770	55.65	5.32	60.97	74.00	-13.03	100	112	peak
2	5350.770	41.31	5.32	46.63	54.00	-7.37	100	112	AVG

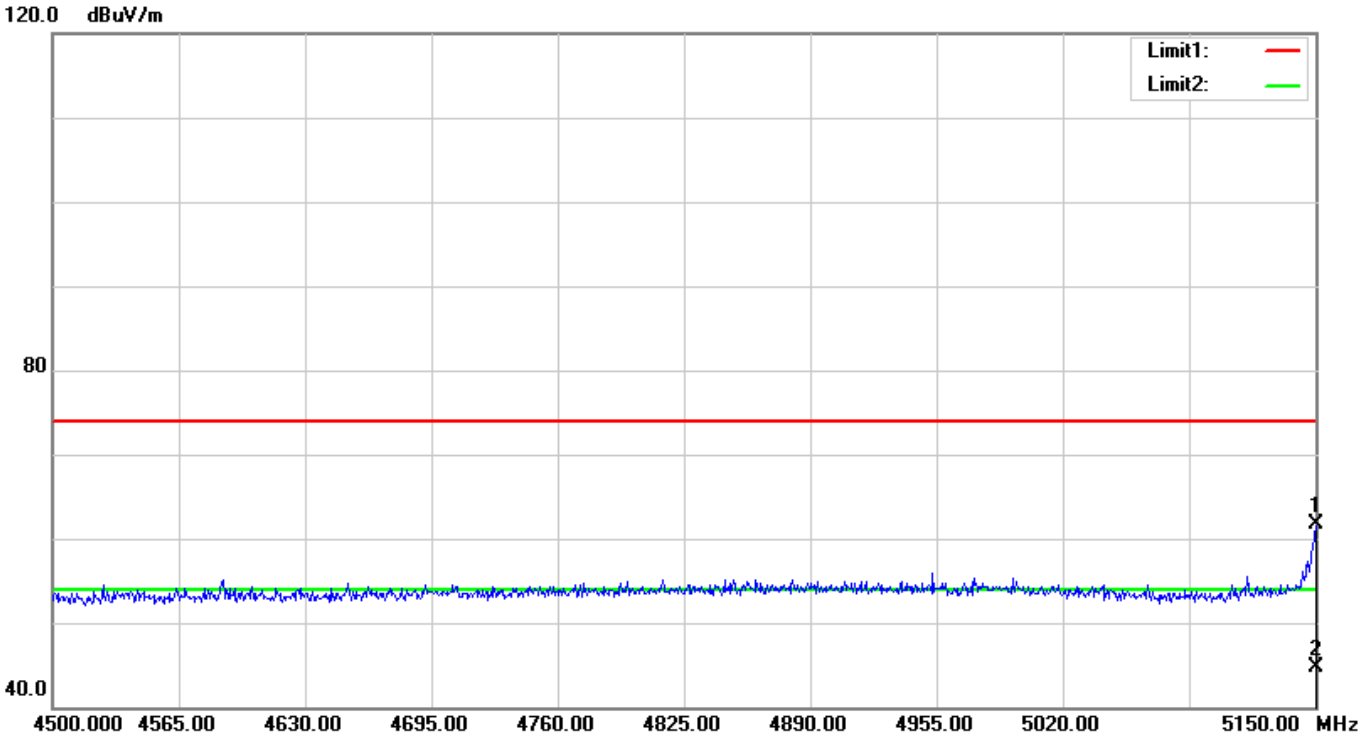
Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5180 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	57.29	3.04	60.33	74.00	-13.67	100	325	peak
2	5150.000	40.69	3.04	43.73	54.00	-10.27	100	325	AVG

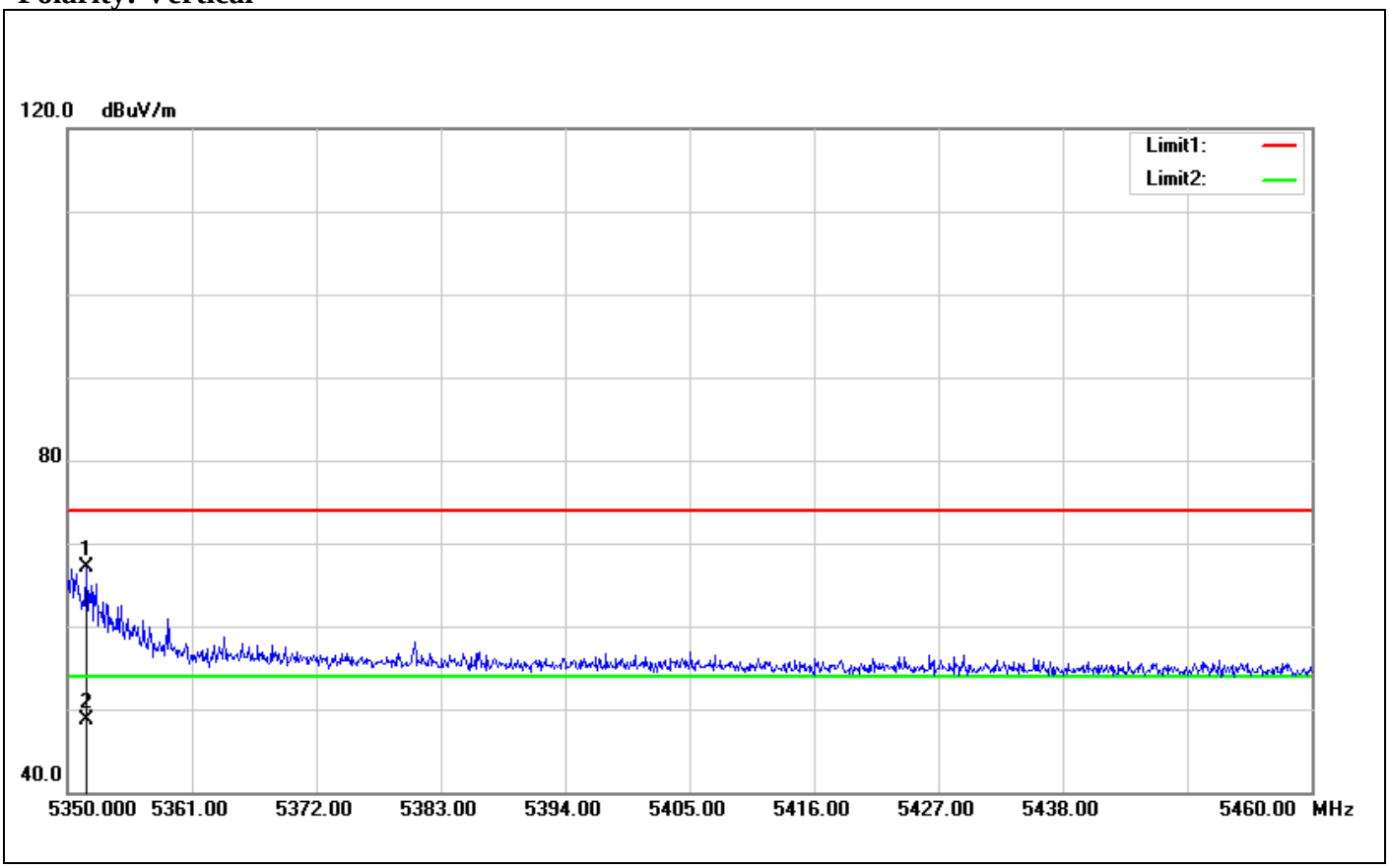
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	58.68	3.04	61.72	74.00	-12.28	100	336	peak
2	5150.000	41.62	3.04	44.66	54.00	-9.34	100	336	AVG

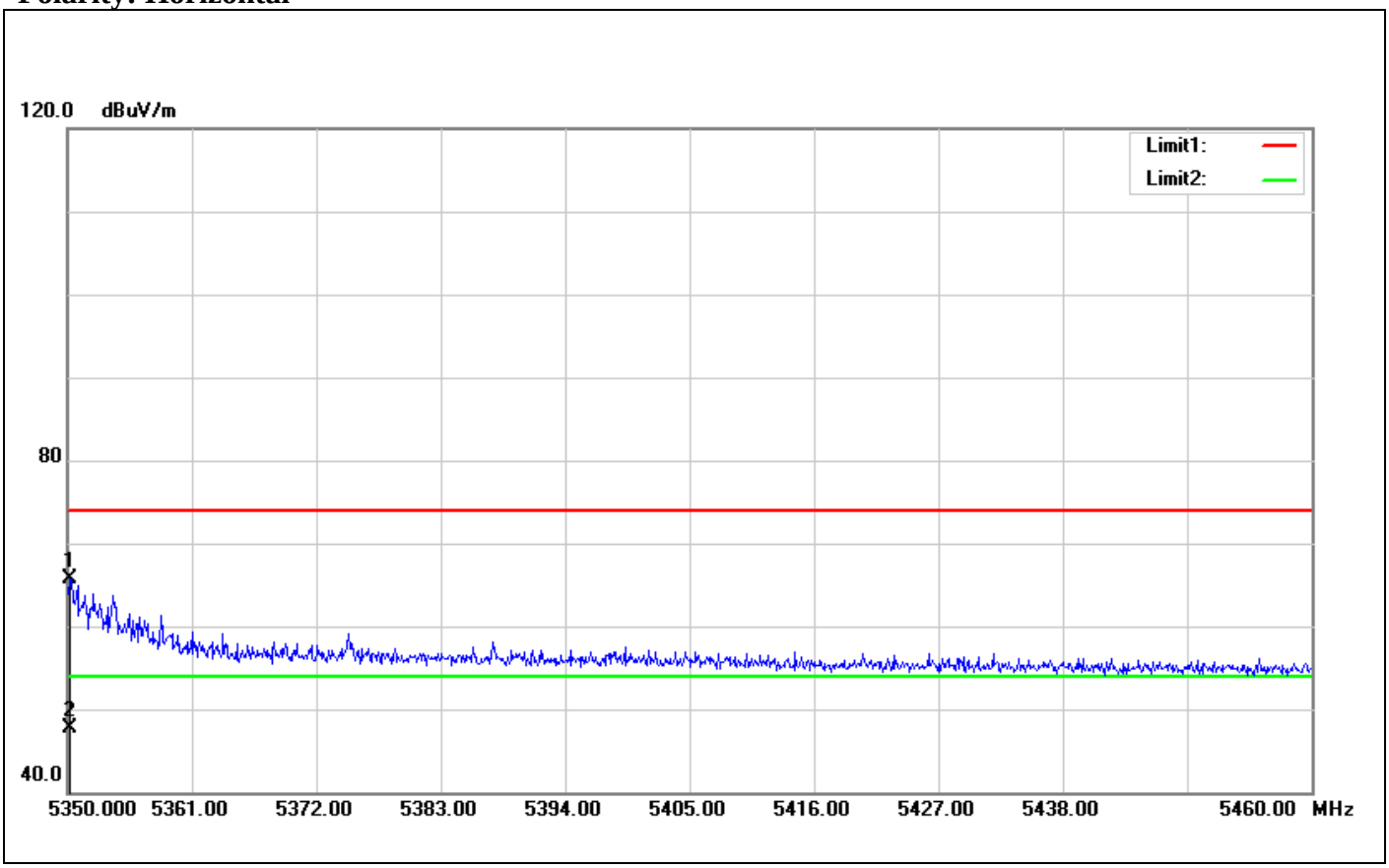
Band Edges (IEEE 802.11n HT 20 MHz Channel mode / 5320 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5351.650	61.72	5.32	67.04	74.00	-6.96	100	86	peak
2	5351.650	43.30	5.32	48.62	54.00	-5.38	100	86	AVG

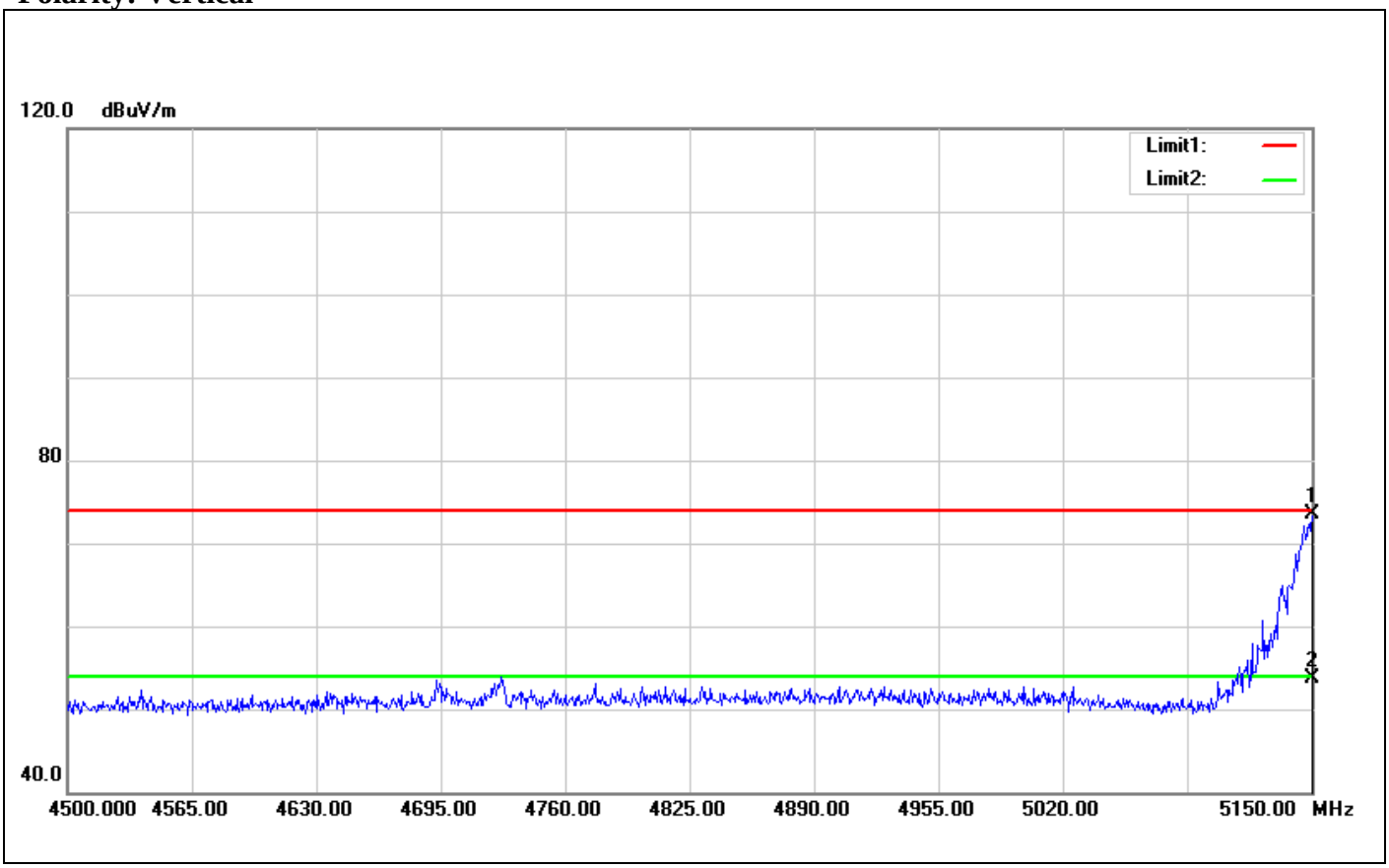
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.220	60.43	5.31	65.74	74.00	-8.26	100	214	peak
2	5350.220	42.33	5.31	47.64	54.00	-6.36	100	214	AVG

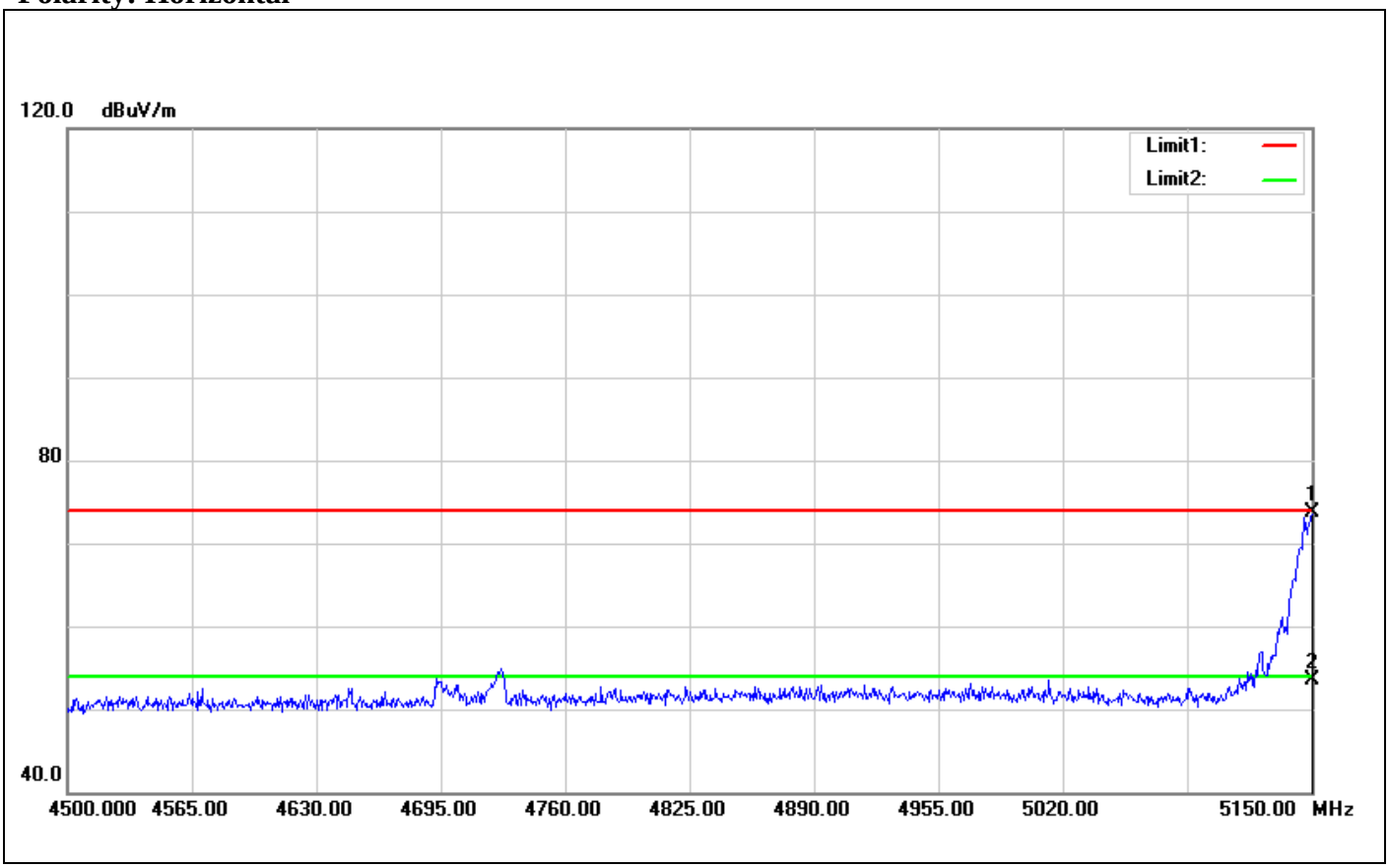
Band Edges (IEEE 802.11n HT 40 MHz mode / 5190 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	70.49	3.04	73.53	74.00	-0.47	100	17	peak
2	5150.000	50.65	3.04	53.69	54.00	-0.31	100	17	AVG

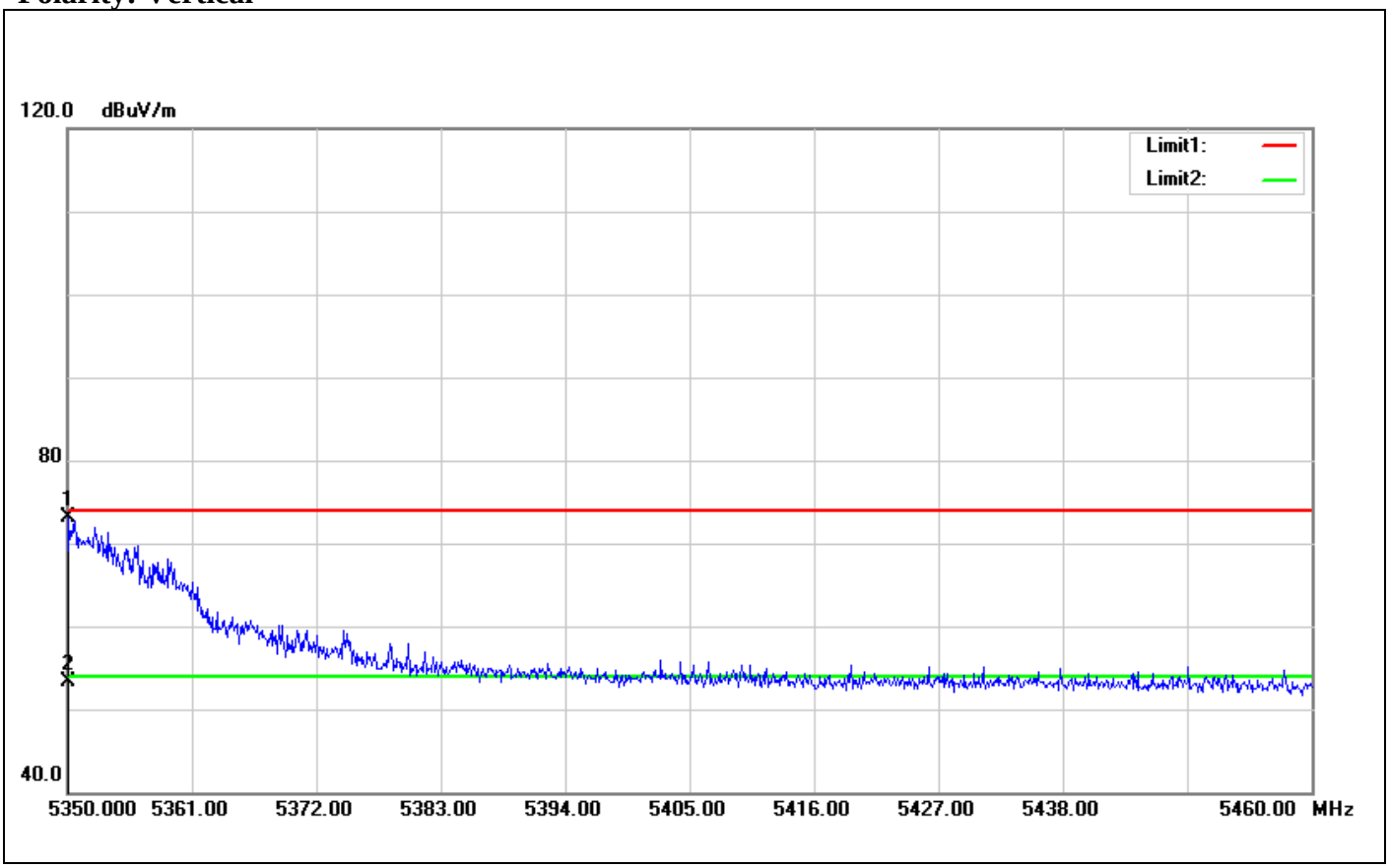
Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5150.000	70.62	3.04	73.66	74.00	-0.34	100	38	peak
2	5150.000	50.41	3.04	53.45	54.00	-0.55	100	38	AVG

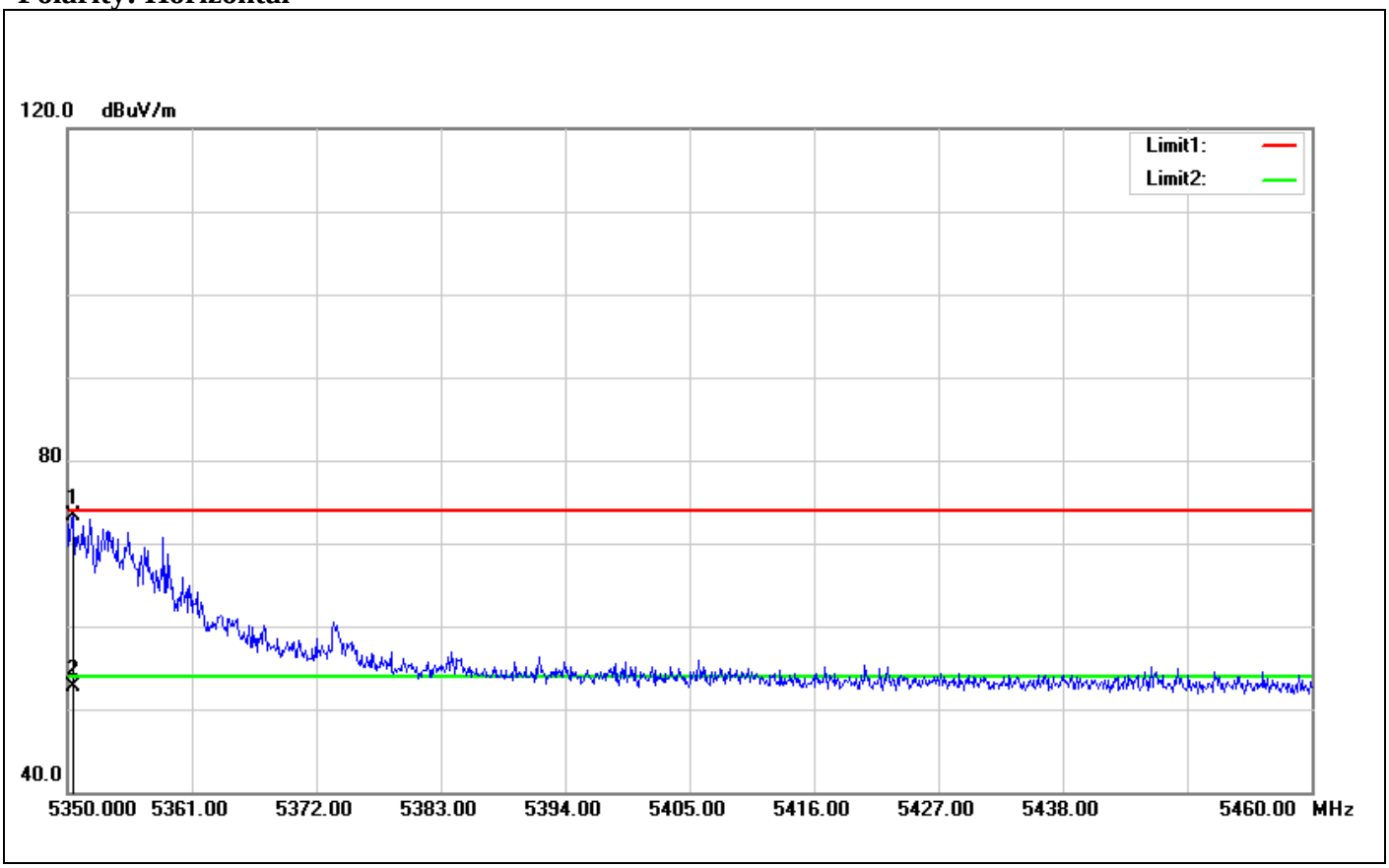
Band Edges (IEEE 802.11n HT 40 MHz mode / CH 5310 MHz)

Polarity: Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.000	67.87	5.31	73.18	74.00	-0.82	100	90	peak
2	5350.000	48.06	5.31	53.37	54.00	-0.63	100	90	AVG

Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)	
1	5350.440	67.99	5.31	73.30	74.00	-0.70	100	9	peak
2	5350.440	47.44	5.31	52.75	54.00	-1.25	100	9	AVG

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.

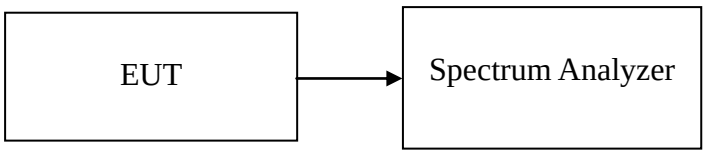
According to RSS-210 §A9.2,

(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)	Margin	Result
Low	5180	3.60	11.00	-13.4	PASS
Mid	5220	3.59	11.00	-13.41	PASS
High	5240	3.68	11.00	-13.32	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5180	3.39	3.88	6.65	11.00	-10.35	PASS
Mid	5220	3.87	3.82	6.86	11.00	-10.14	PASS
High	5240	3.90	3.85	6.89	11.00	-10.11	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5190	0.15	-0.01	3.08	11.00	-13.92	PASS
High	5230	0.46	0.27	3.38	11.00	-13.62	PASS

Remark: *Total PPSD (dBm) = 10*LOG(10^(Chain 0 PPSD / 10)+10^(Chain 1 PPSD /10)*

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5260	4.36	11.00	-6.64	PASS
Mid	5280	3.85	11.00	-7.15	PASS
High	5320	3.90	11.00	-7.1	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5260	3.99	3.95	6.98	11.00	-4.02	PASS
Mid	5280	3.73	4.05	6.90	11.00	-4.1	PASS
High	5320	3.98	3.60	6.80	11.00	-4.2	PASS

Test mode: IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5270	1.09	0.45	3.79	11.00	-7.21	PASS
High	5310	0.28	-0.68	2.84	11.00	-8.16	PASS

Remark: *Total PPSD (dBm) = 10*LOG(10^(Chain 0 PPSD / 10)+10^(Chain 1 PPSD /10)*

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5500	3.88	11.00	-7.12	PASS
Mid	5580	4.42	11.00	-6.58	PASS
High	5700	3.90	11.00	-7.1	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5500	3.41	3.71	6.57	11.00	-4.43	PASS
Mid	5580	3.34	3.74	6.55	11.00	-4.45	PASS
High	5700	3.86	3.92	6.90	11.00	-4.1	PASS

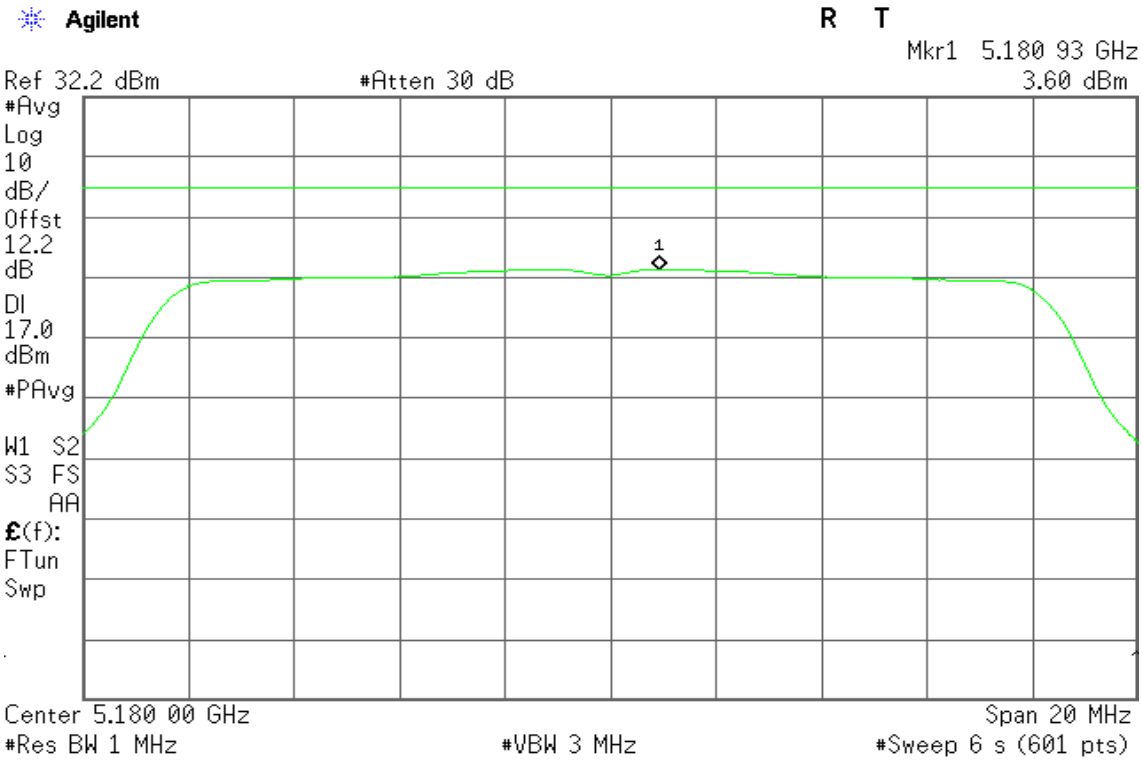
Test mode: IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5510	1.44	0.61	4.06	11.00	-6.94	PASS
Mid	5550	0.61	0.56	3.60	11.00	-7.4	PASS
High	5670	0.74	0.67	3.72	11.00	-7.28	PASS

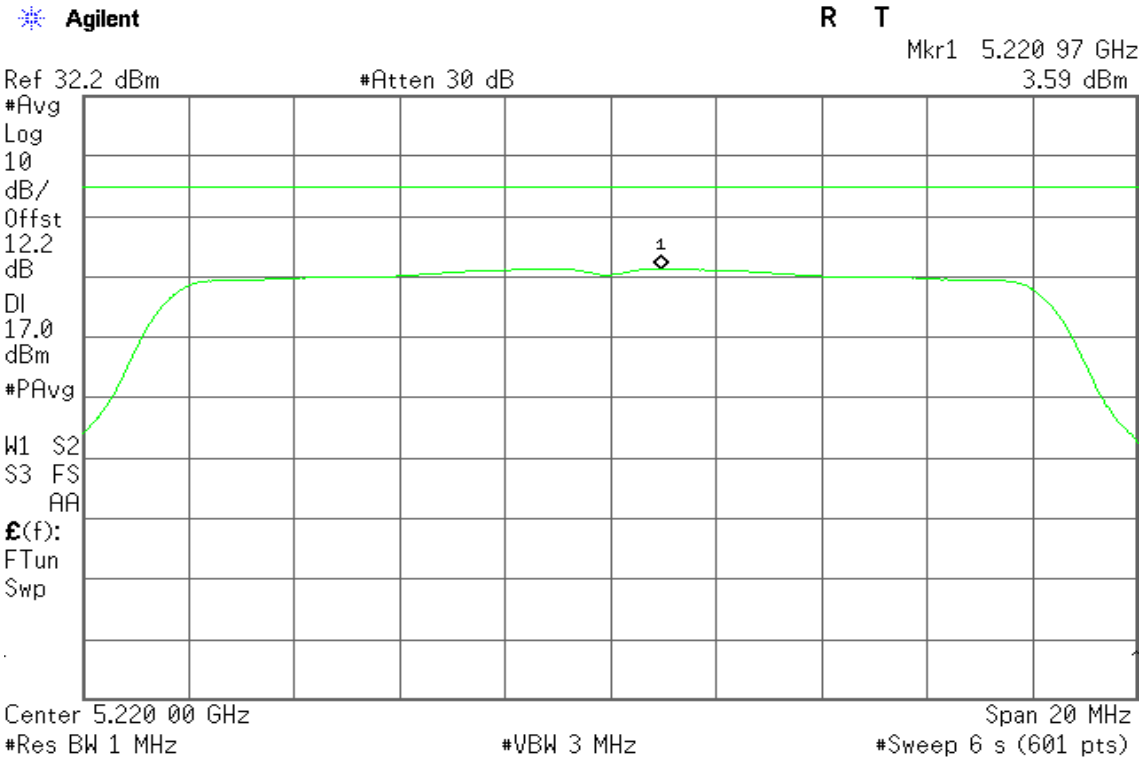
Remark: *Total PPSD (dBm) = 10*LOG(10^(Chain 0 PPSD / 10)+10^(Chain 1 PPSD /10)*

Test Plot
IEEE 802.11a mode / 5180 ~ 5240MHz

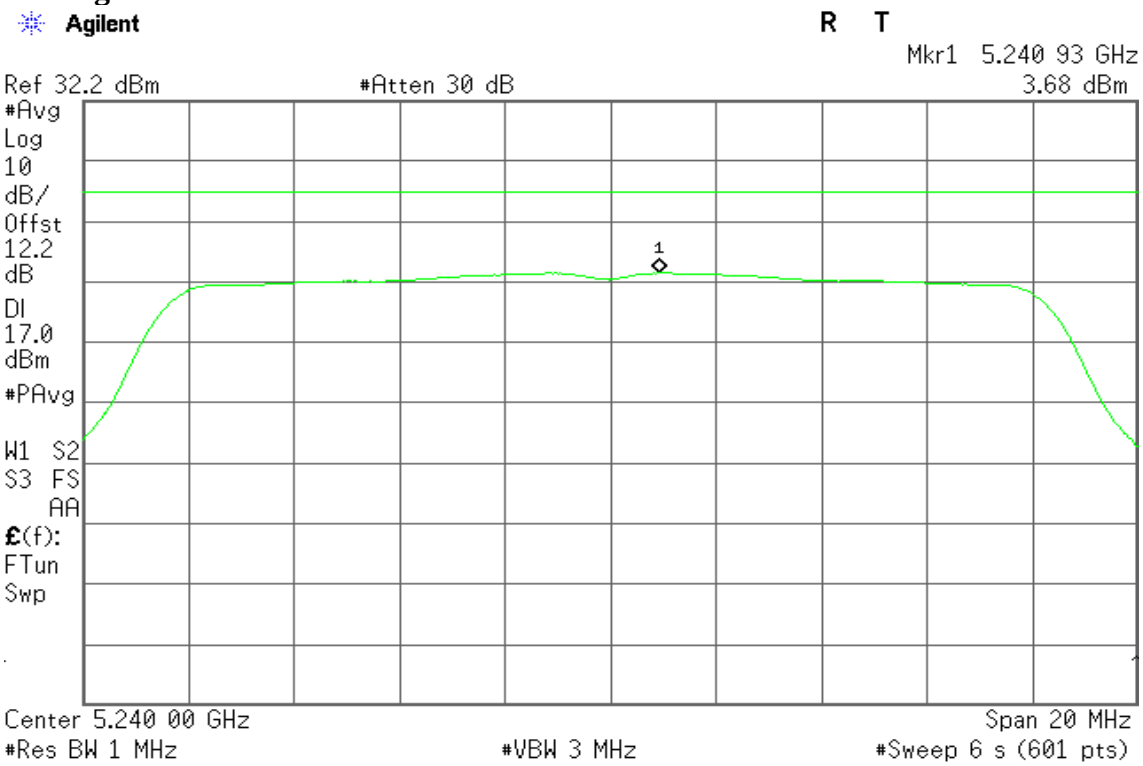
CH Low



CH Mid

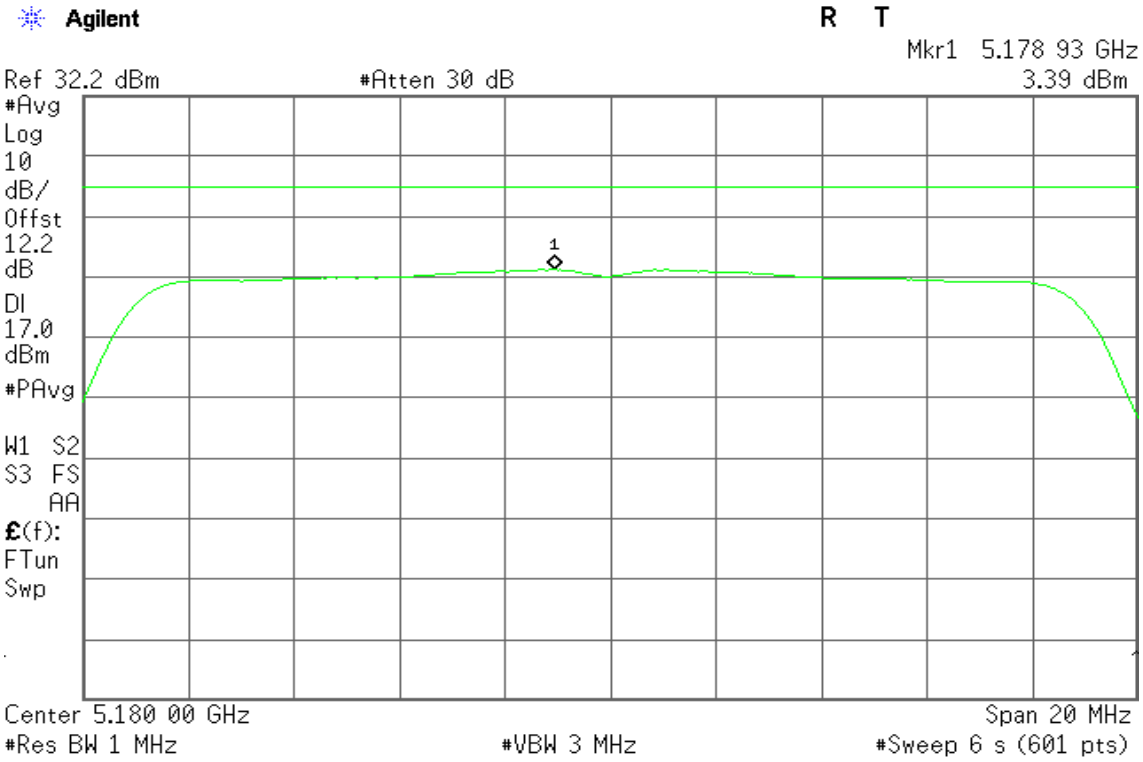


CH High

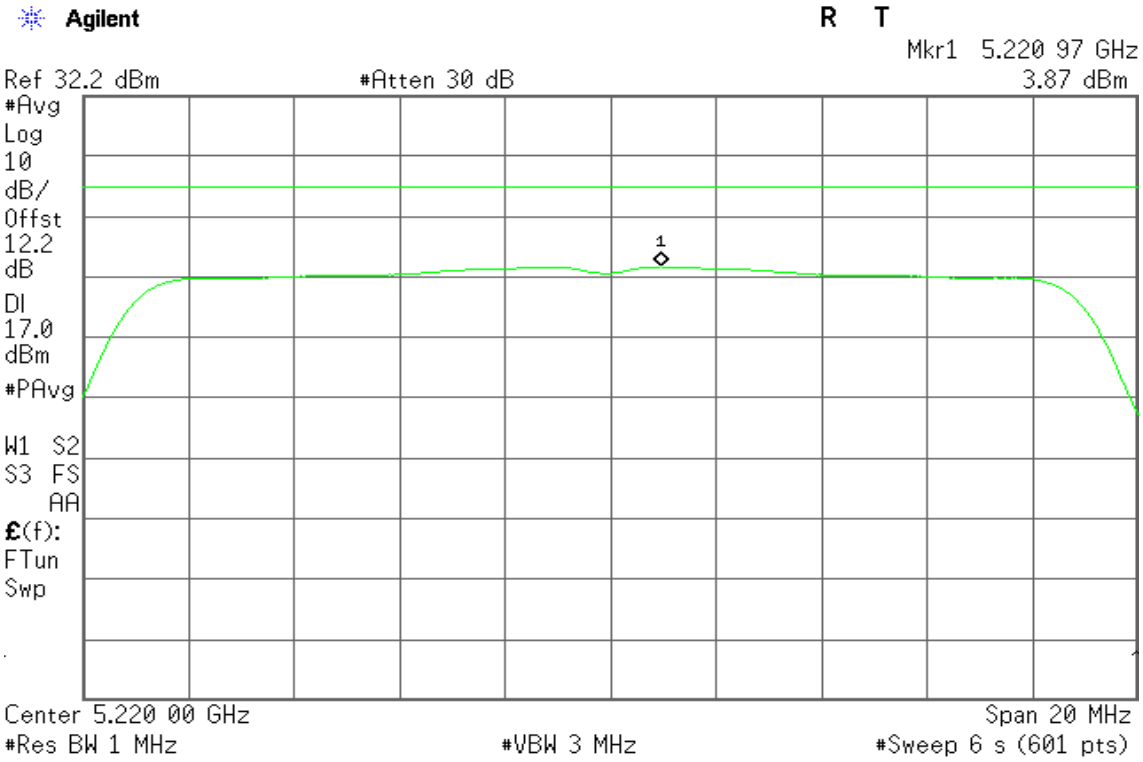

Agilent
R T
Mkr1 5.240 93 GHz
3.68 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
17.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.240 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

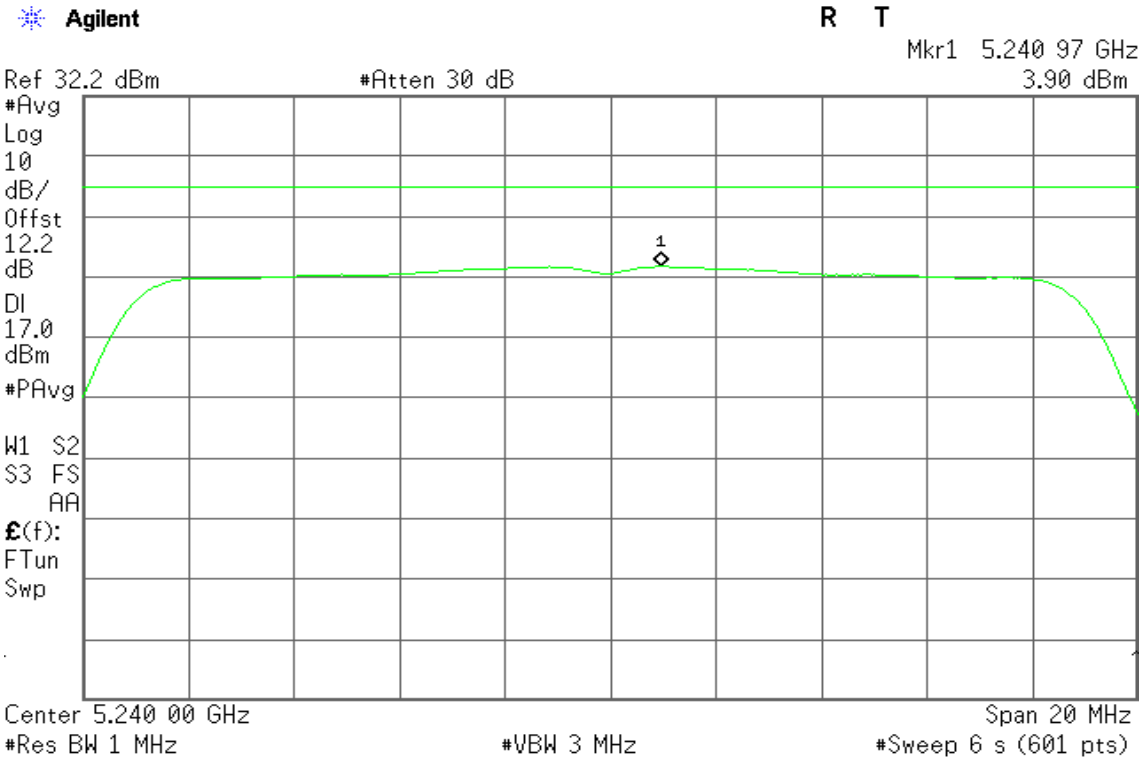
CH Low



CH Mid

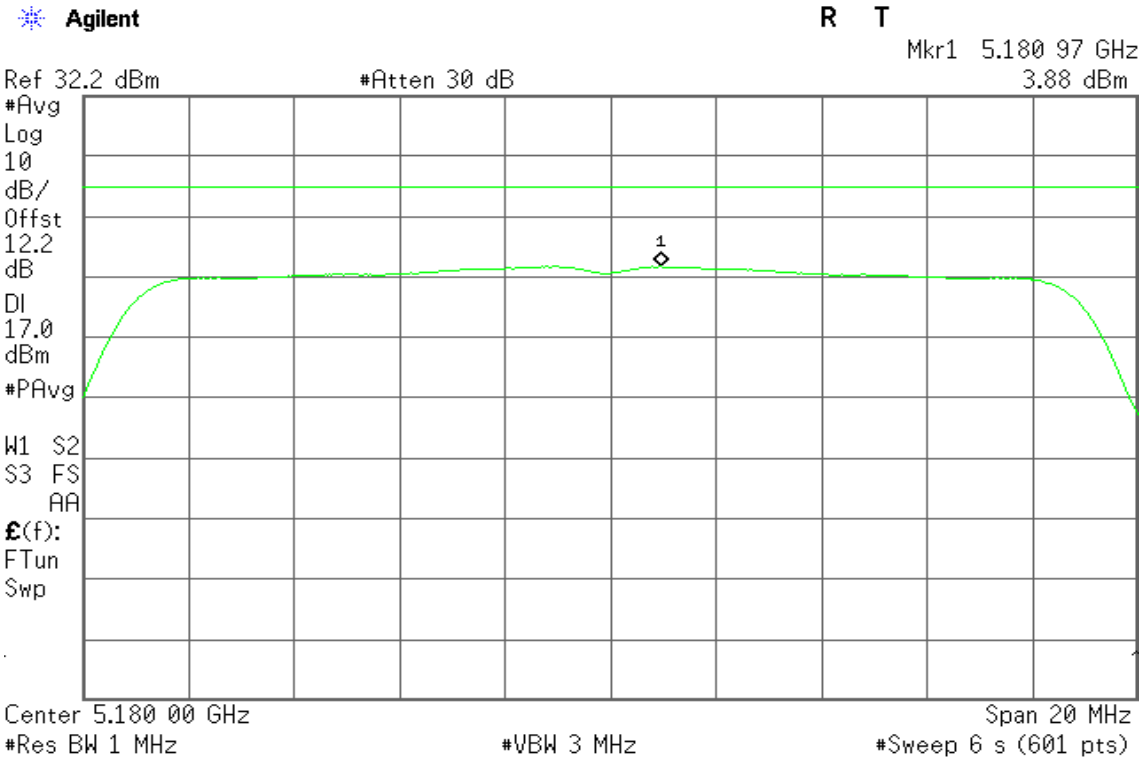


CH High

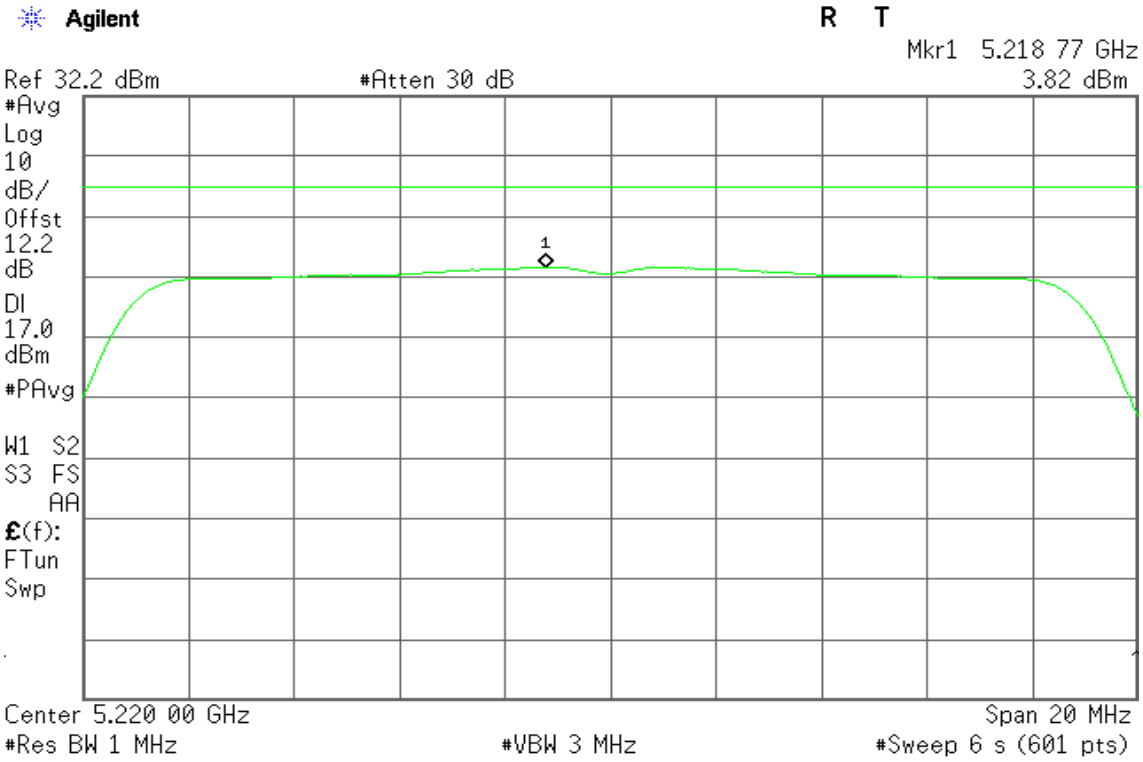

Agilent
R T
Mkr1 5.240 97 GHz
3.90 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
17.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.240 00 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 20 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

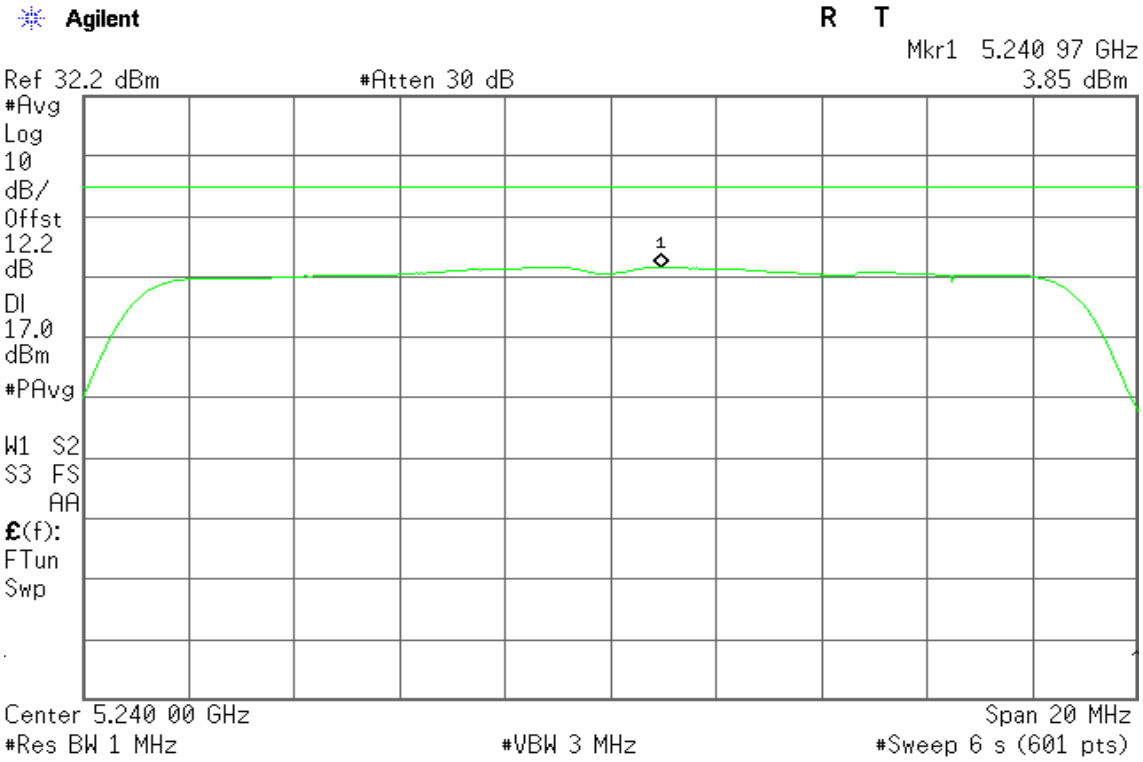
CH Low



CH Mid

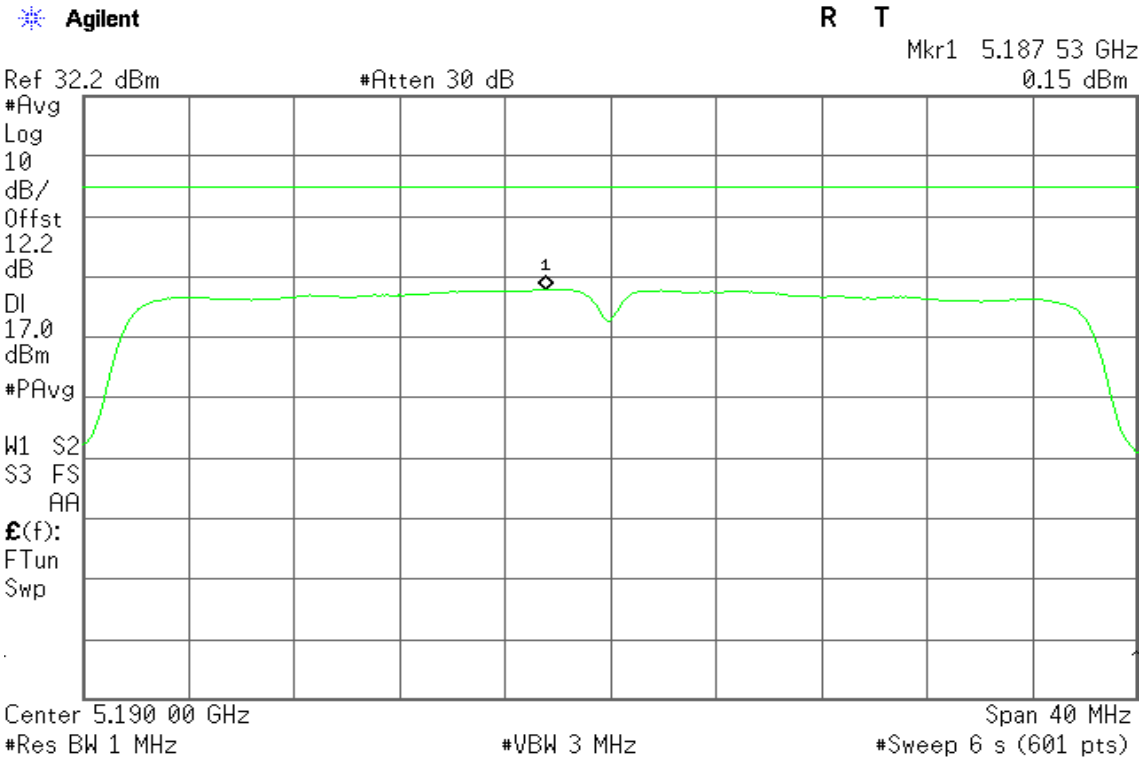


CH High

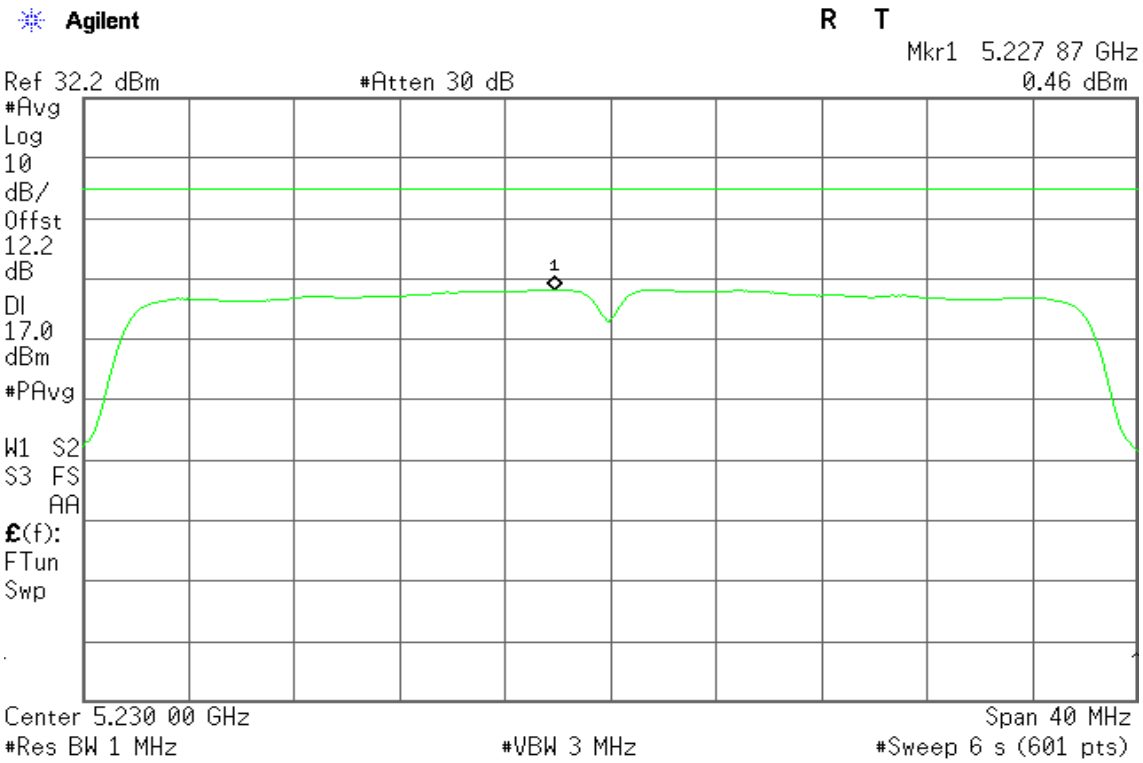

Agilent
R T
Mkr1 5.240 97 GHz
3.85 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
17.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.240 00 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 20 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

CH Low

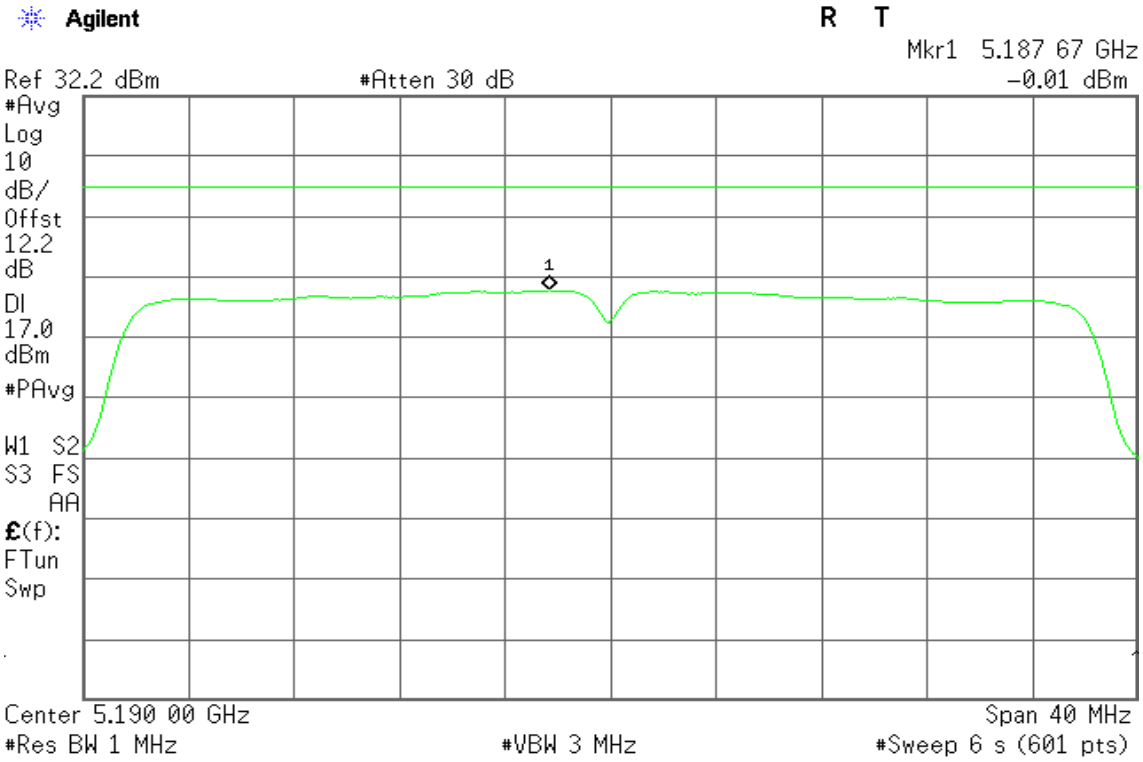


CH High

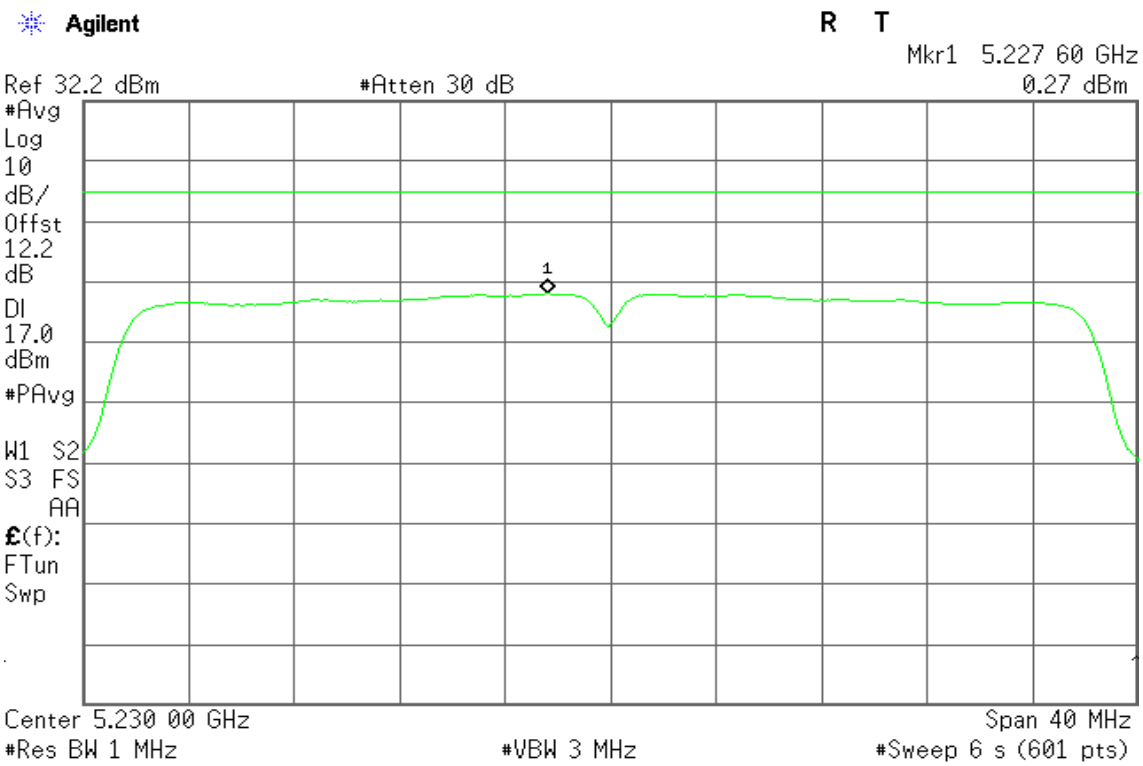


IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

CH Low

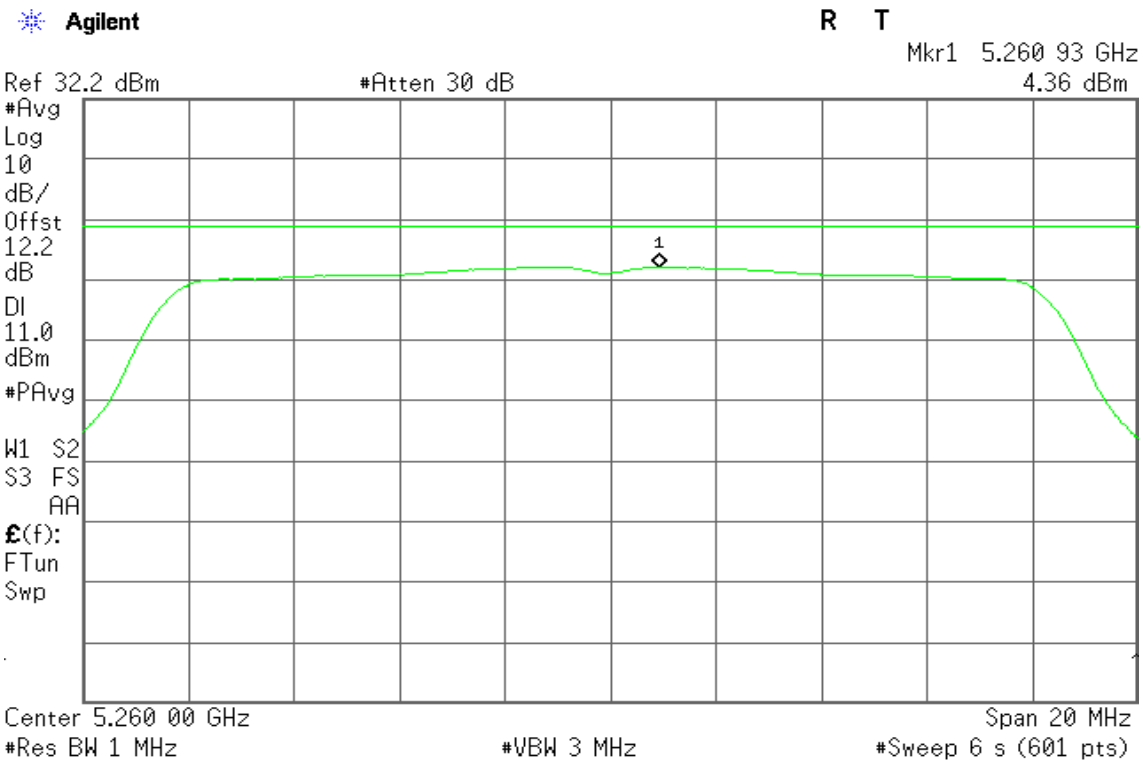


CH High

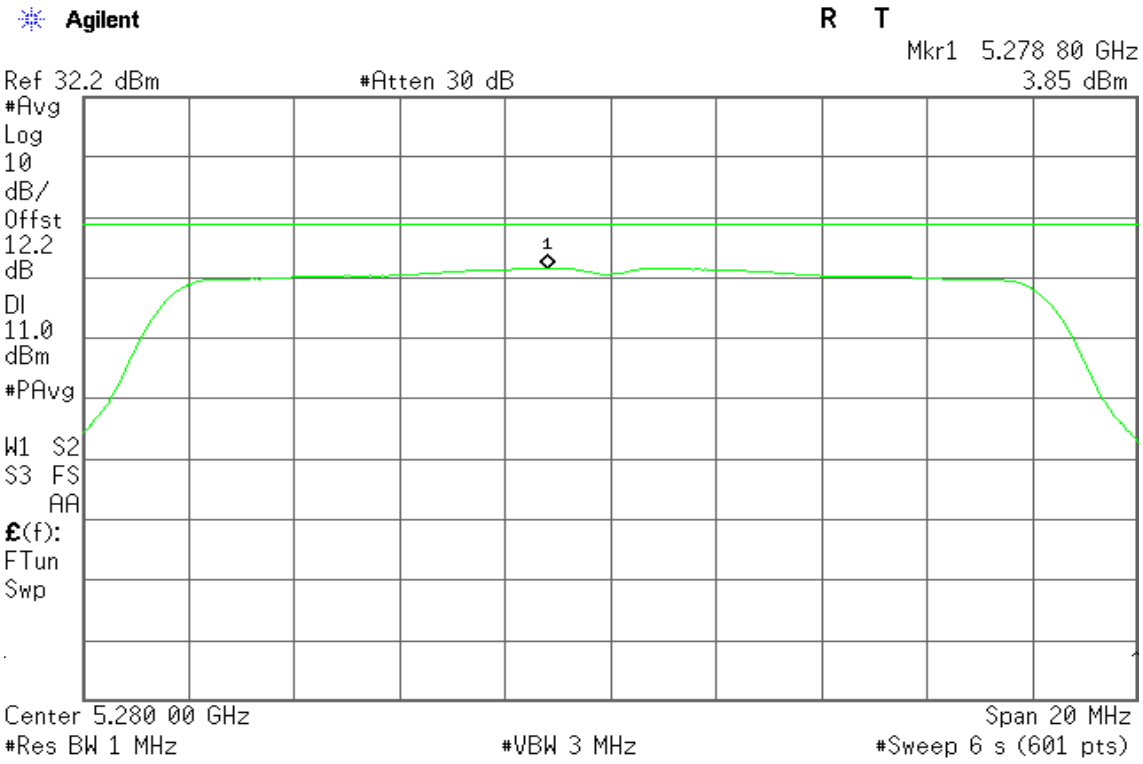


IEEE 802.11a mode / 5260 ~ 5320MHz

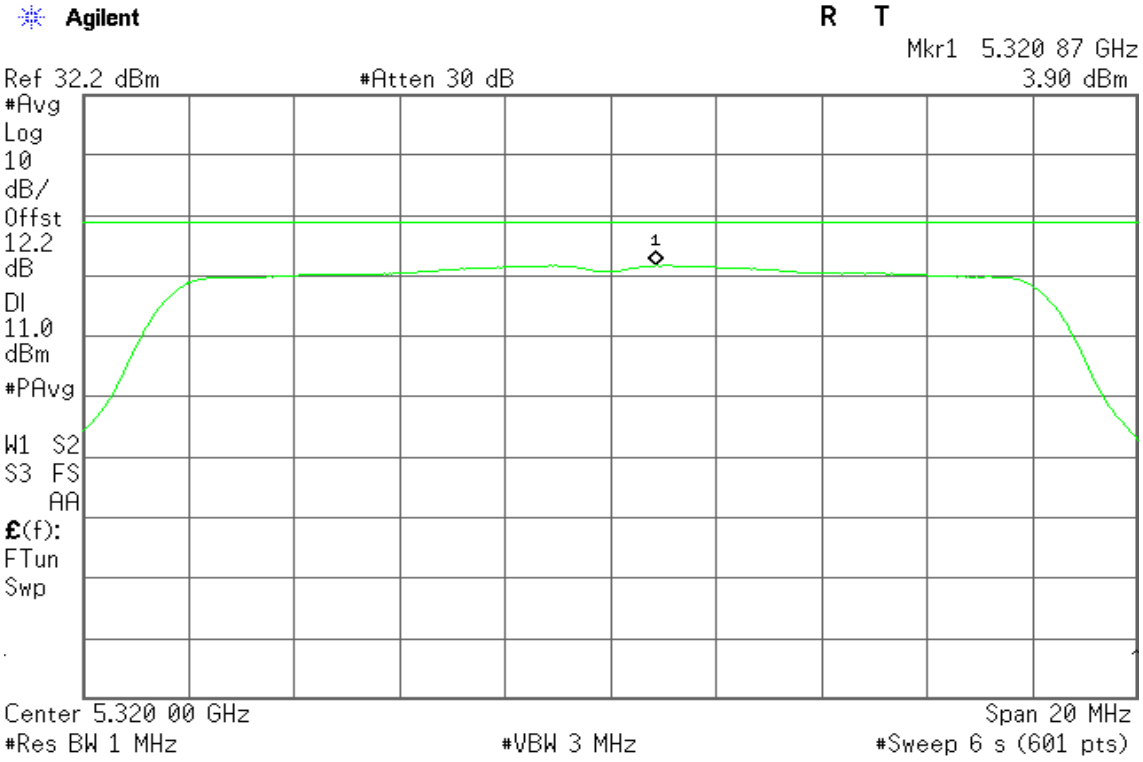
CH Low



CH Mid

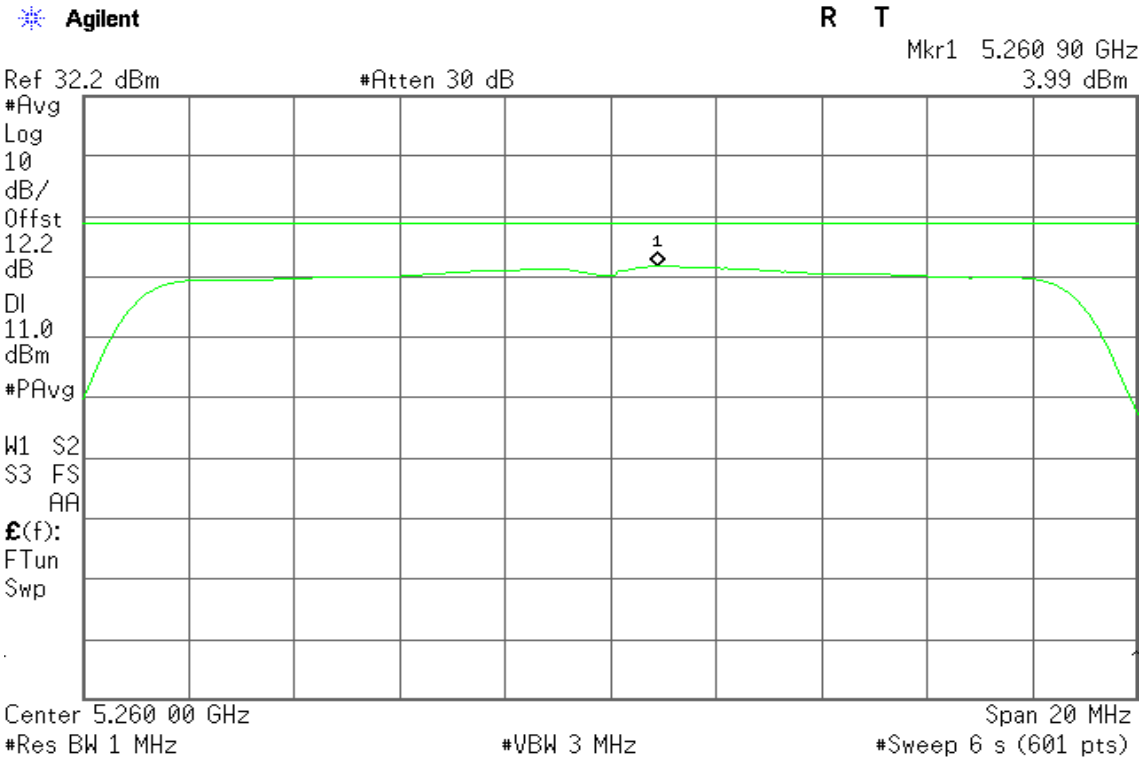


CH High

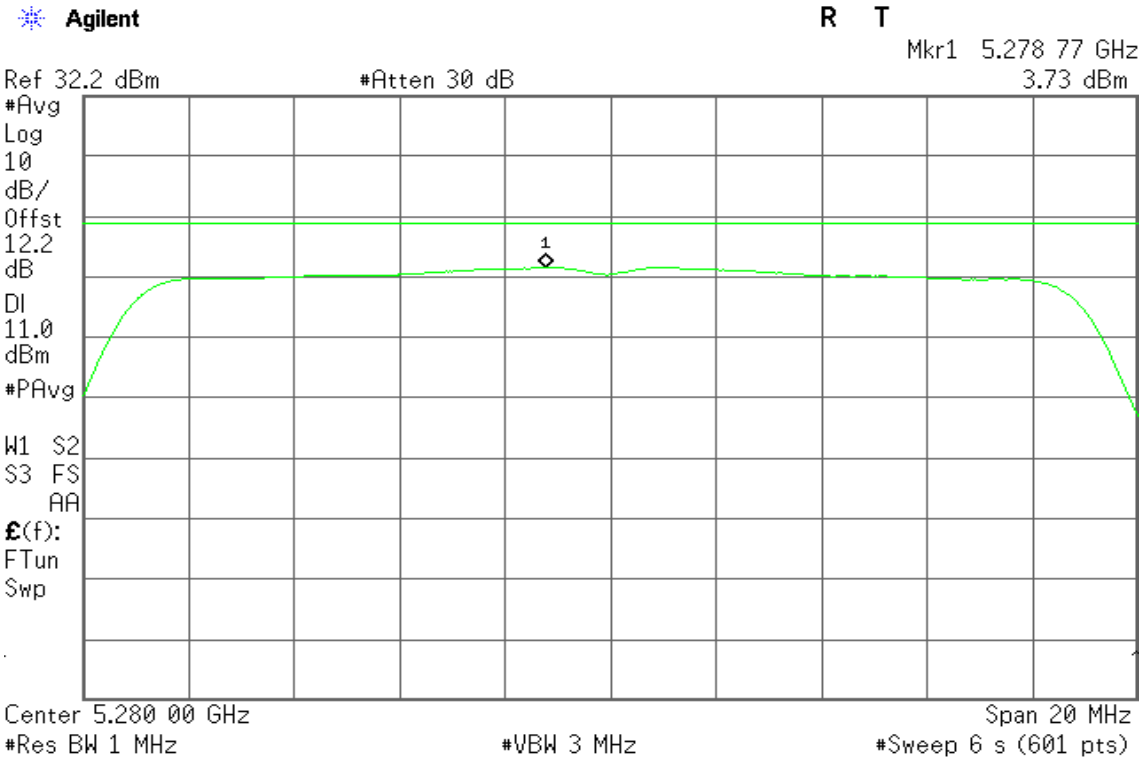

Agilent
R T
Mkr1 5.320 87 GHz
3.90 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.320 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

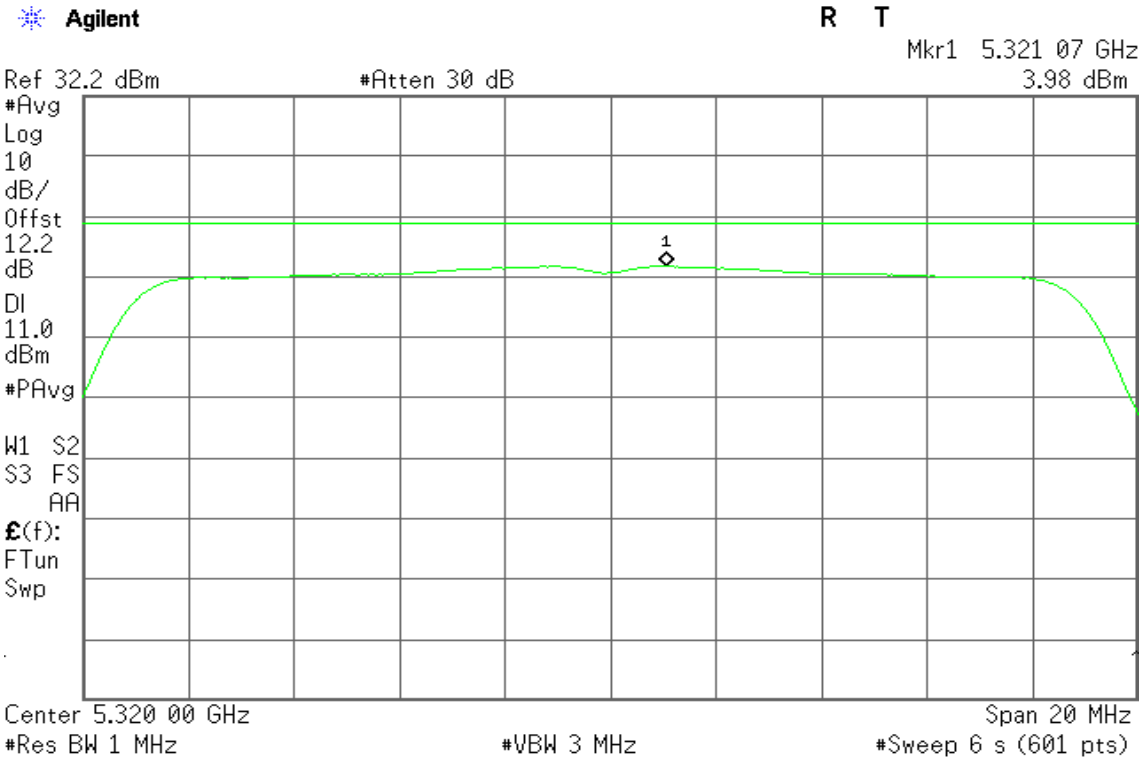
CH Low



CH Mid

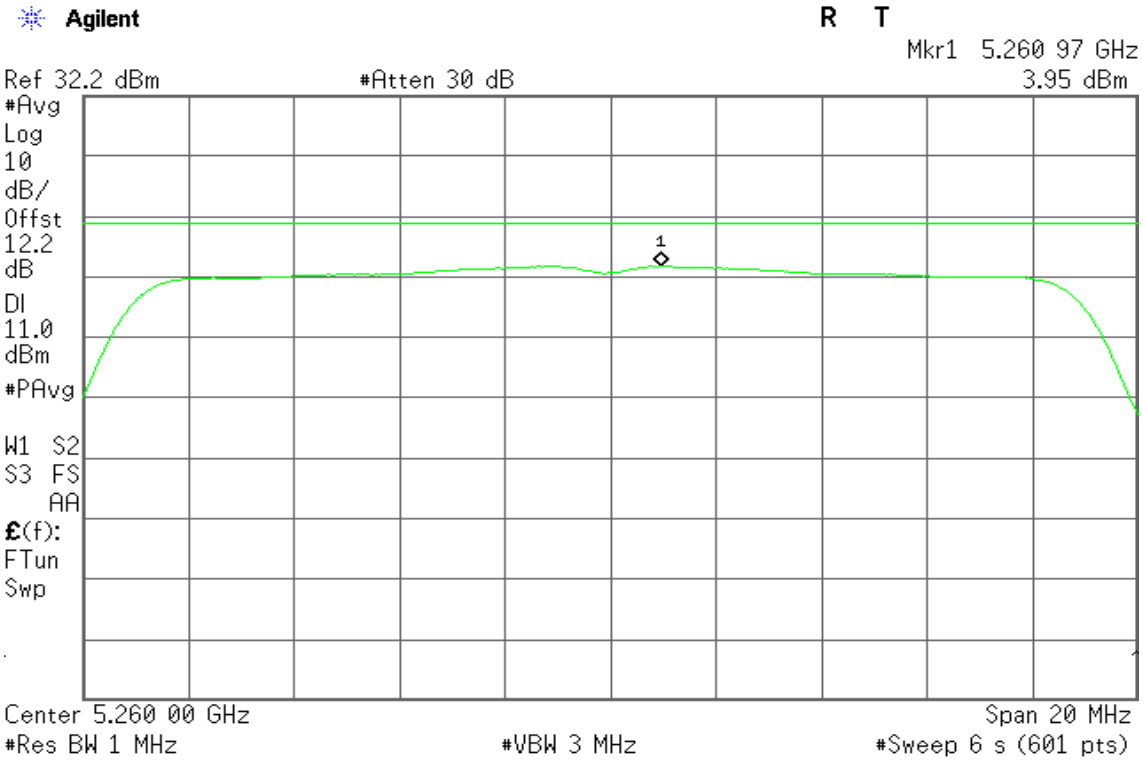


CH High

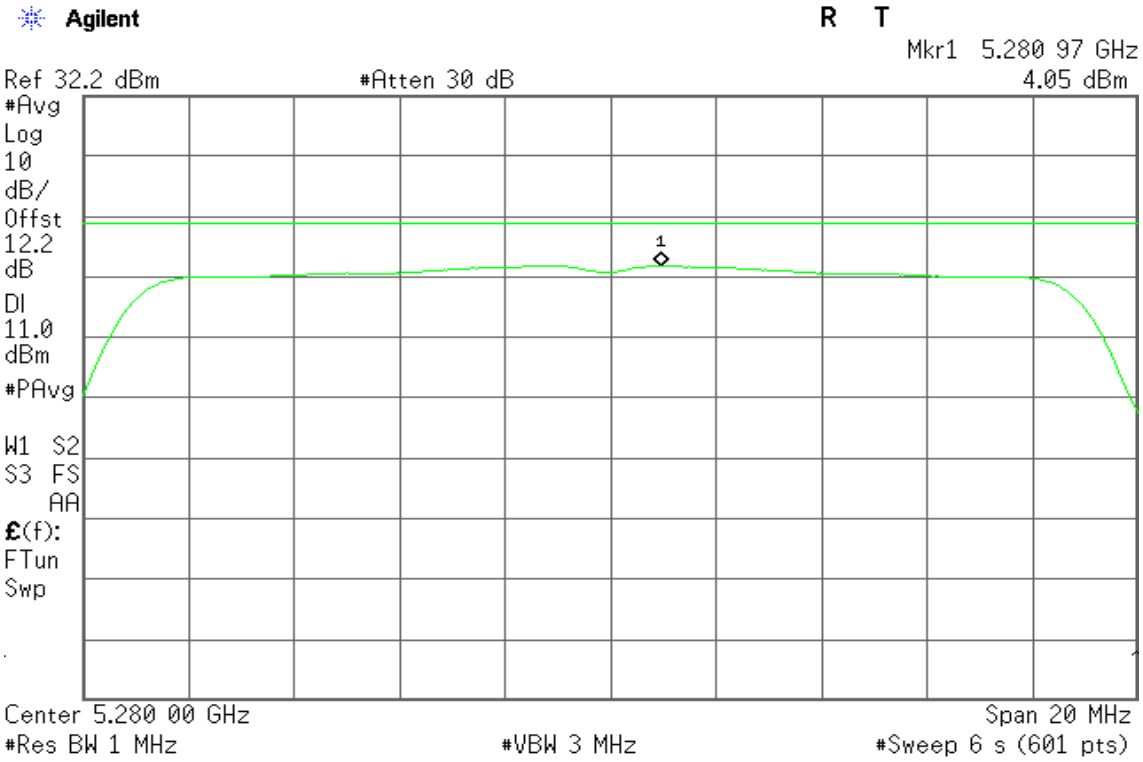

Agilent
R T
Mkr1 5.321 07 GHz
3.98 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.320 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

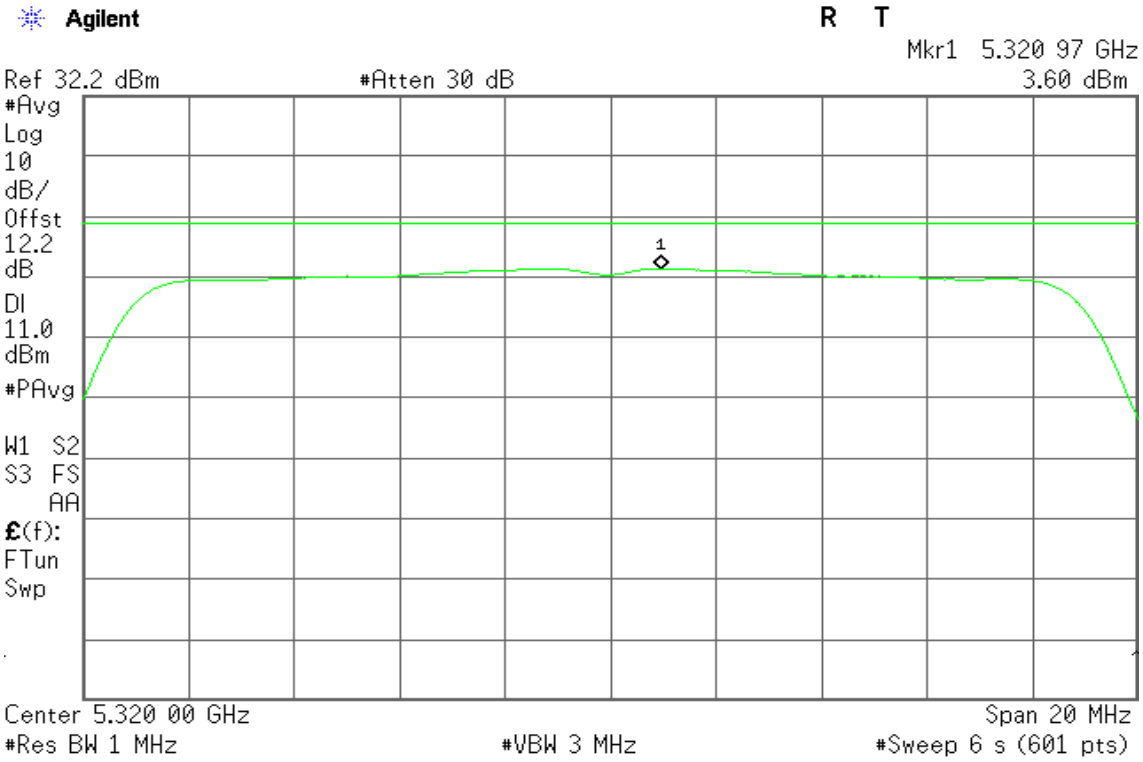
CH Low



CH Mid

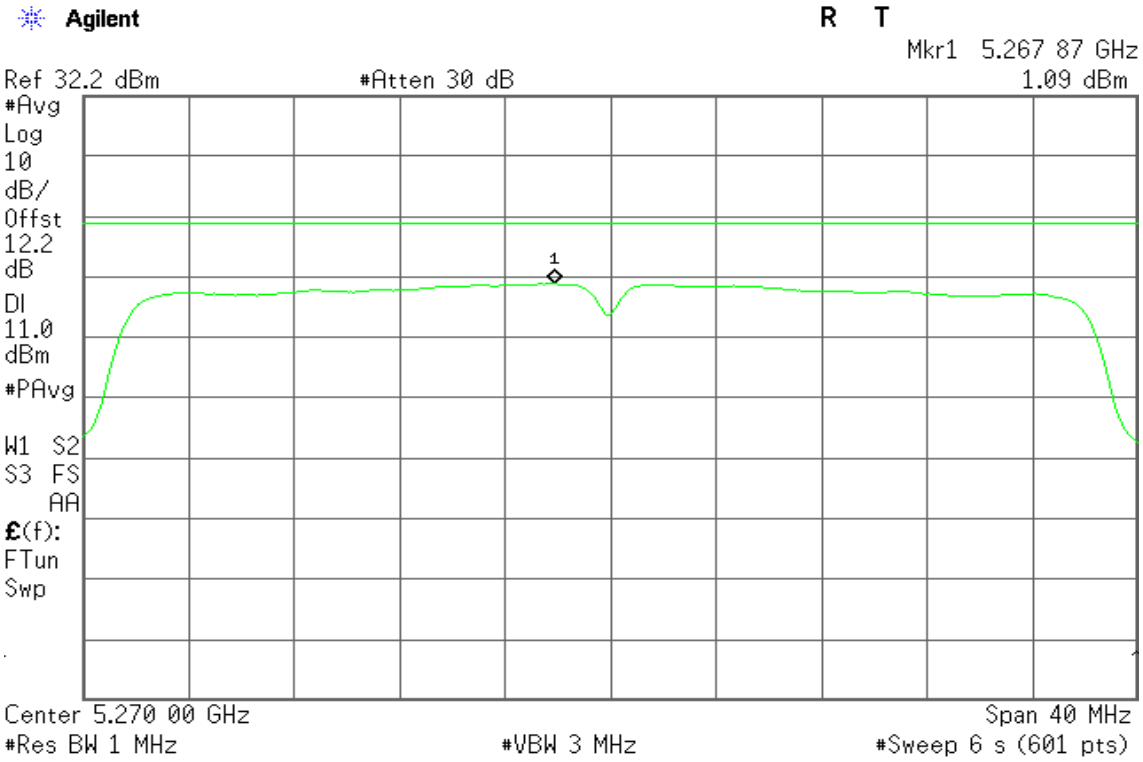


CH High

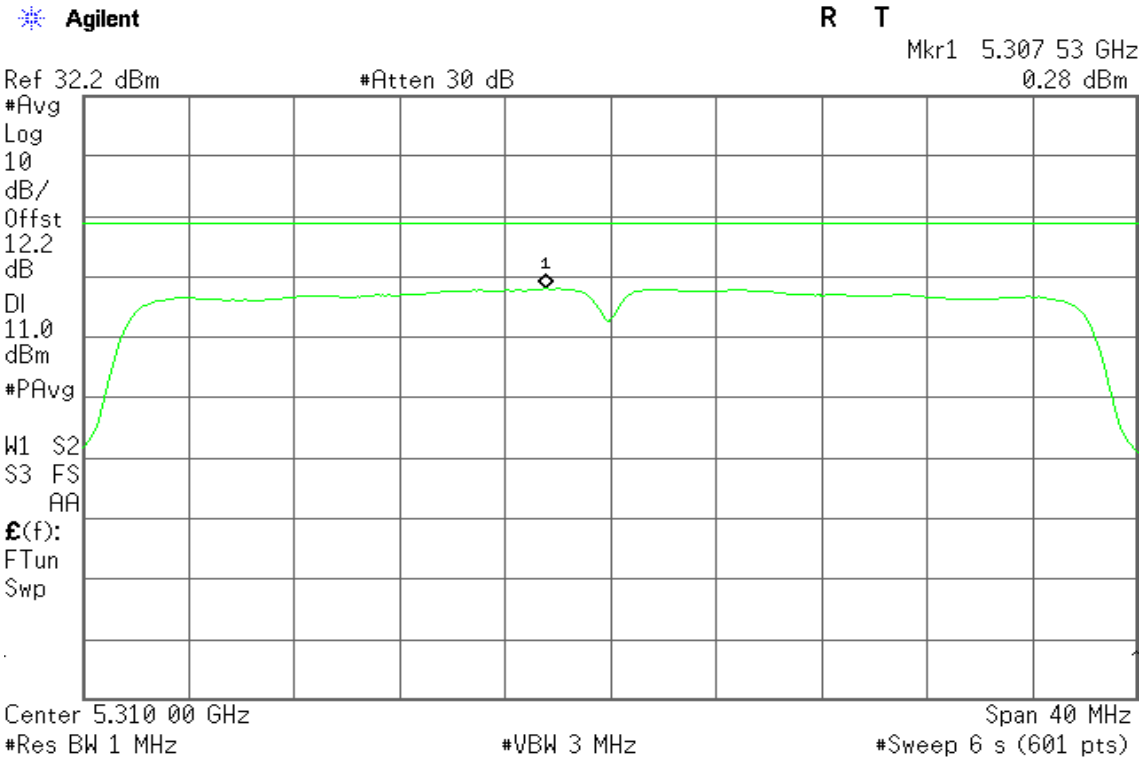

Agilent
R T
Mkr1 5.320 97 GHz
3.60 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.320 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low

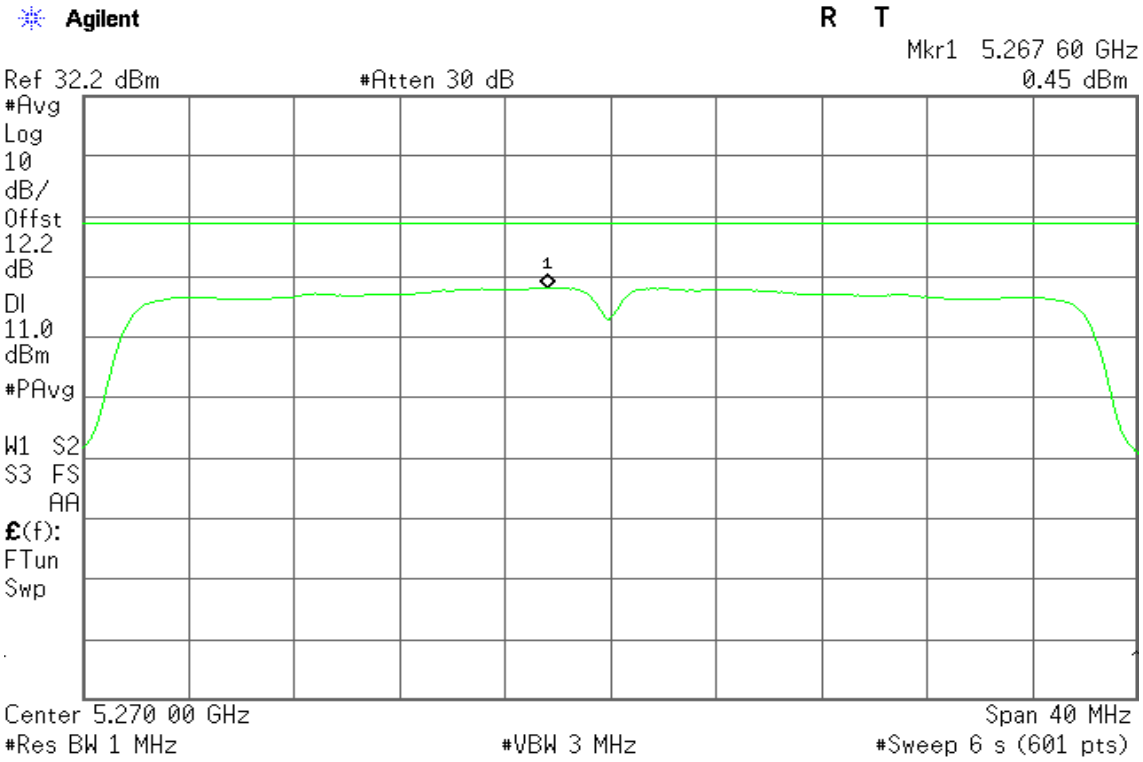


CH High

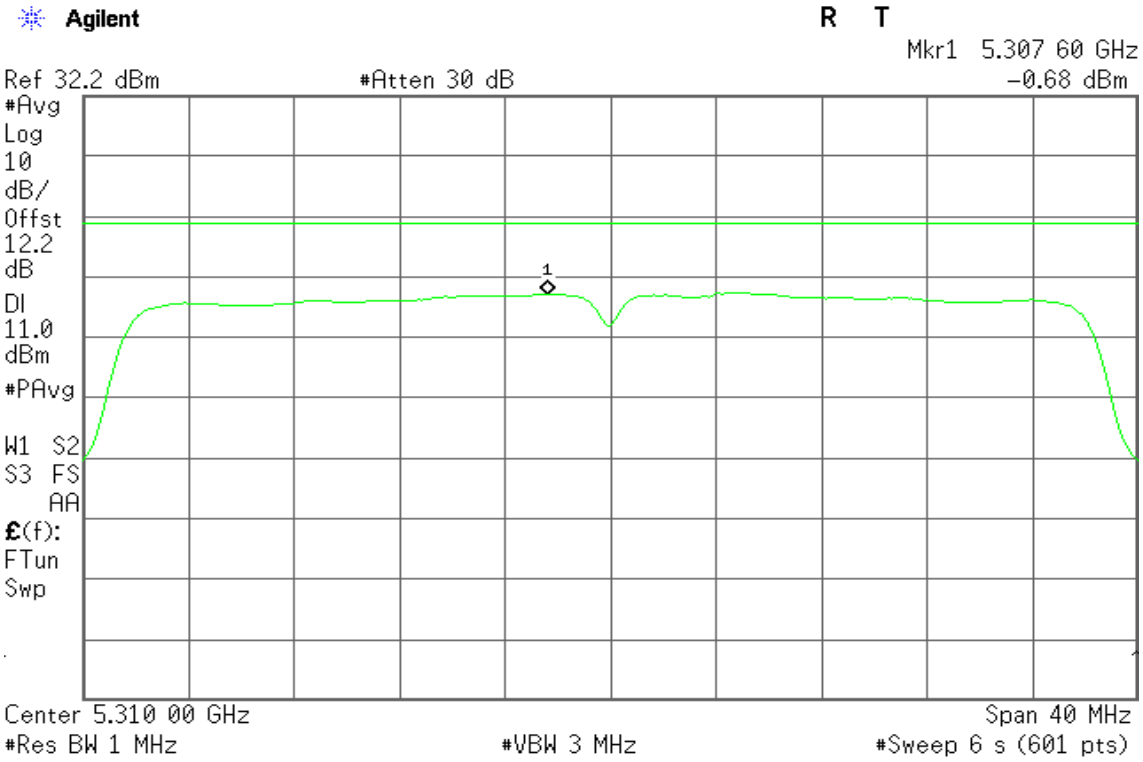


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low

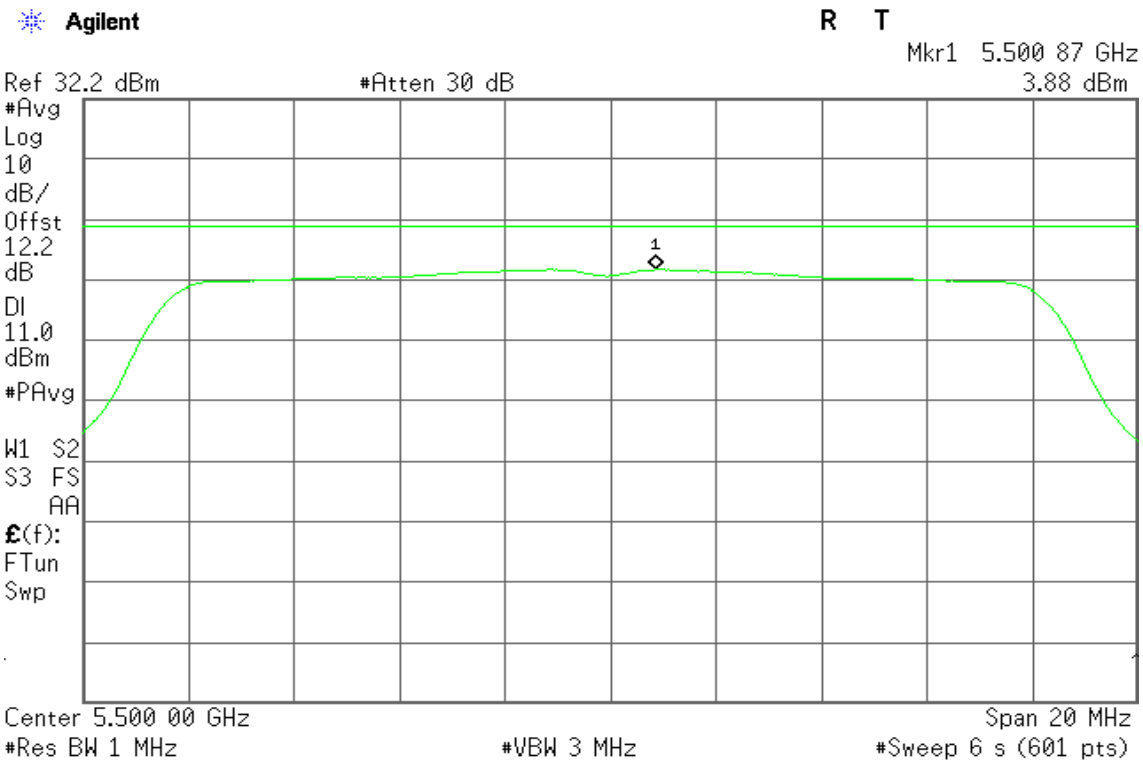


CH High

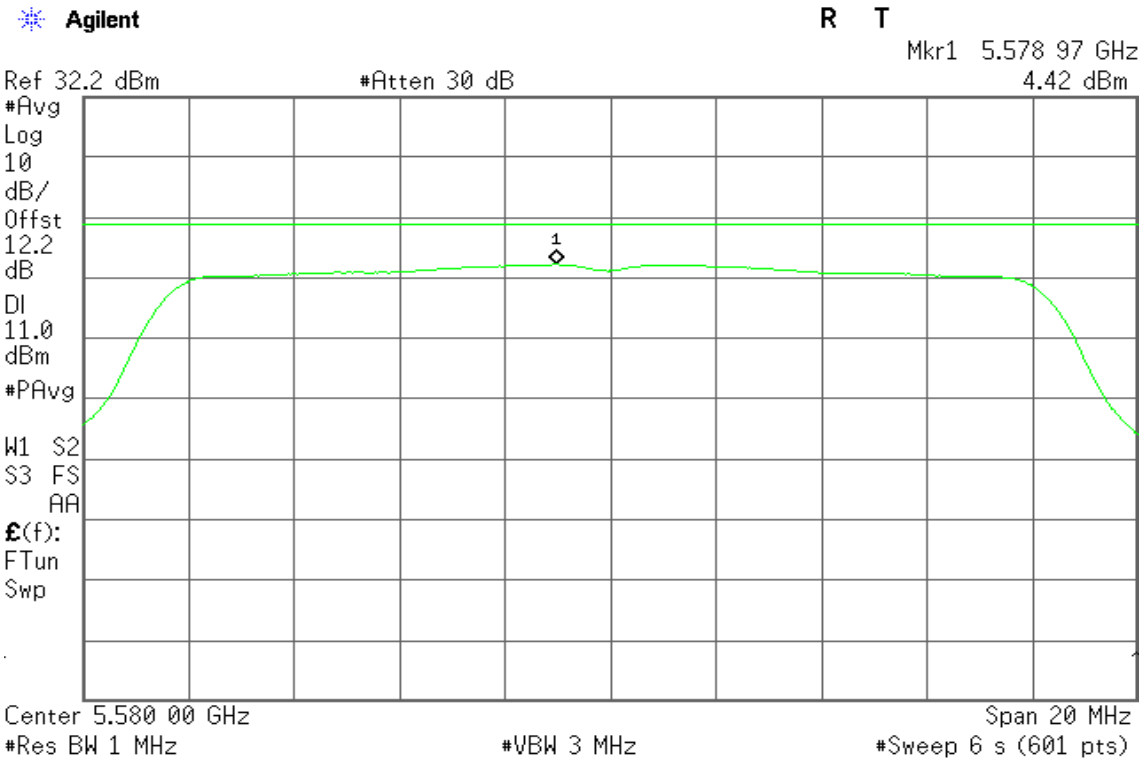


Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

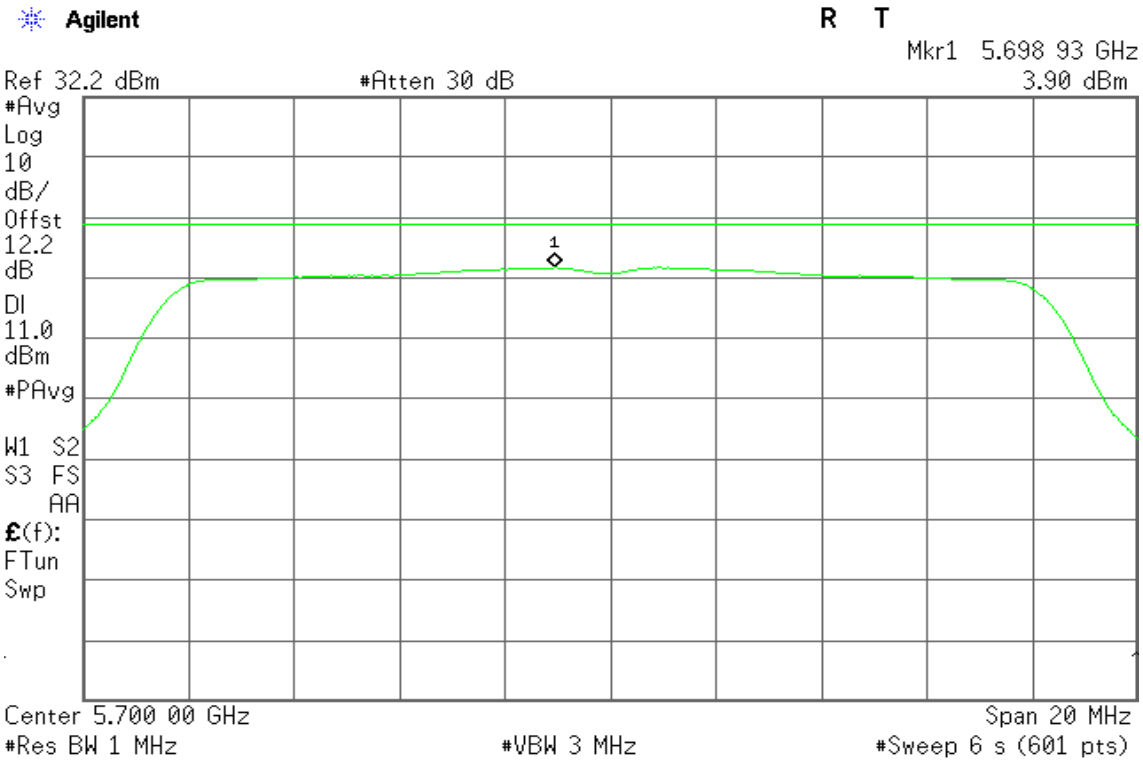
CH Low



CH Mid

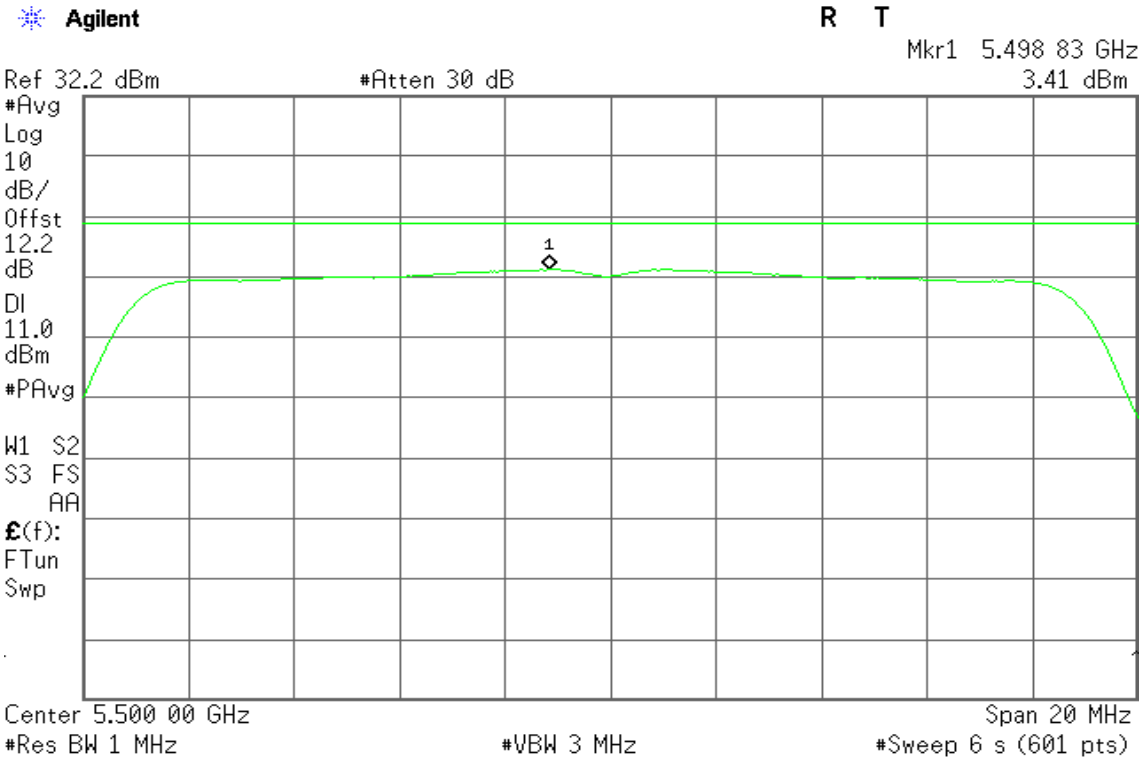


CH High

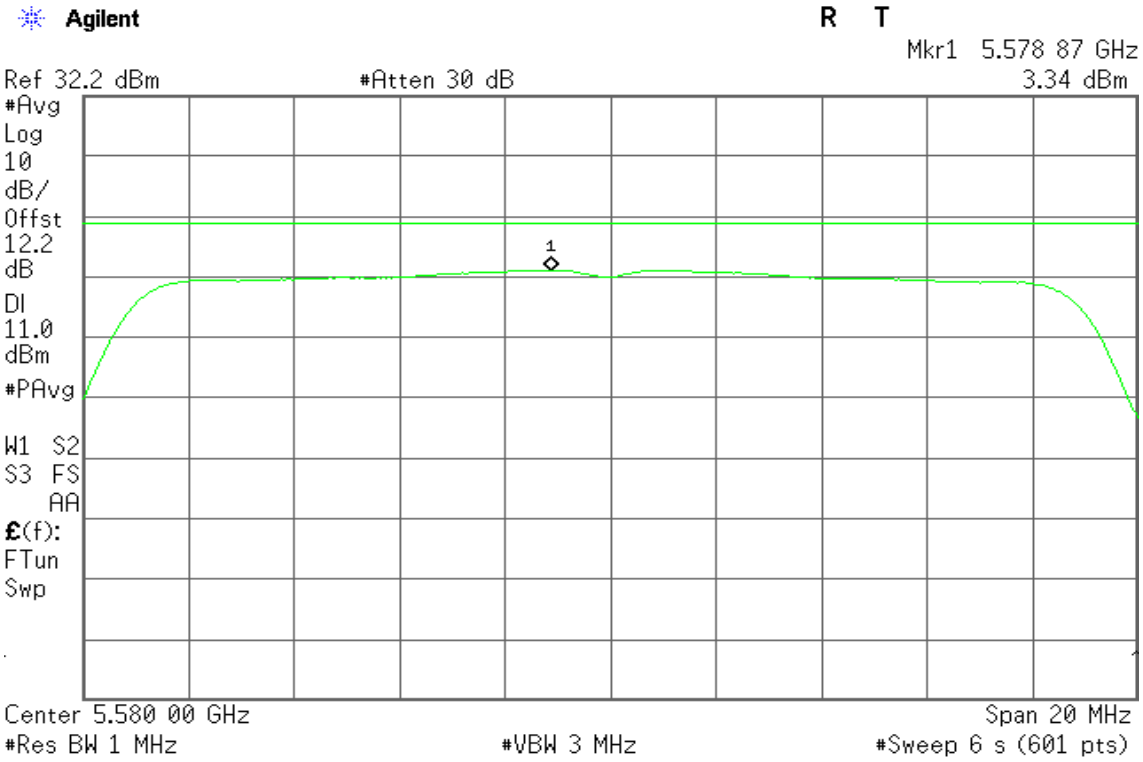

Agilent
R T
Mkr1 5.698 93 GHz
Ref 32.2 dBm
#Atten 30 dB
3.90 dBm
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.700 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

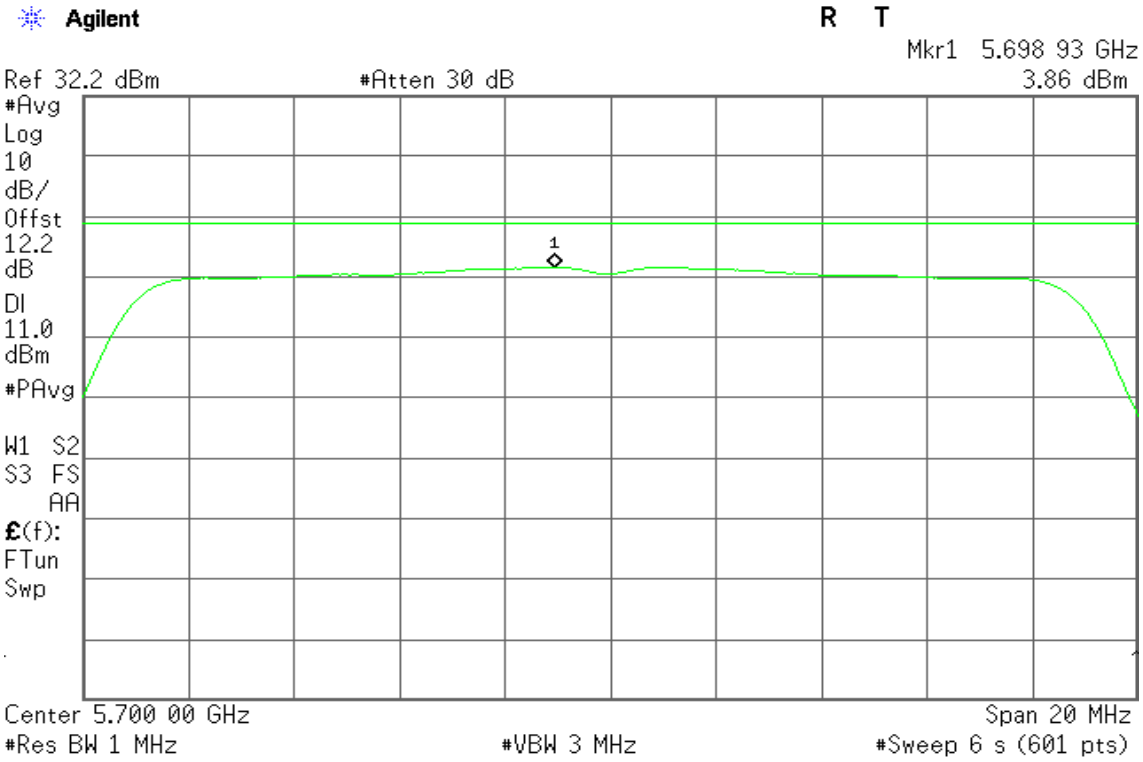
CH Low



CH Mid

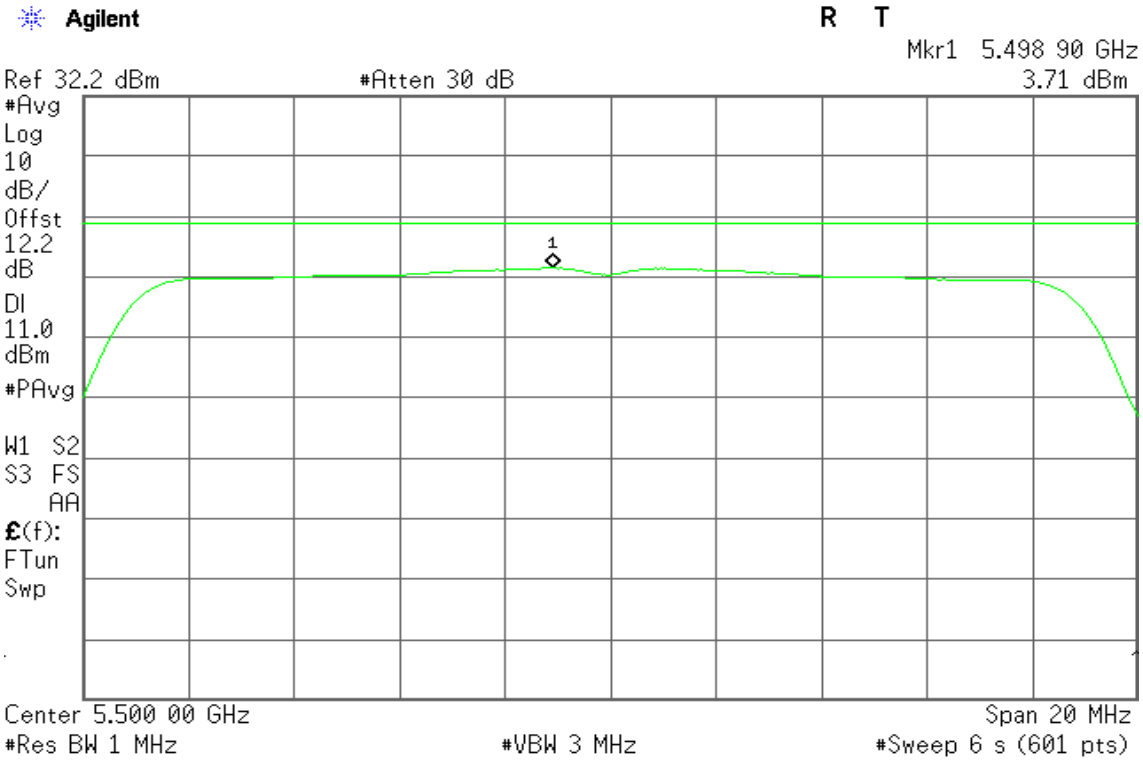


CH High

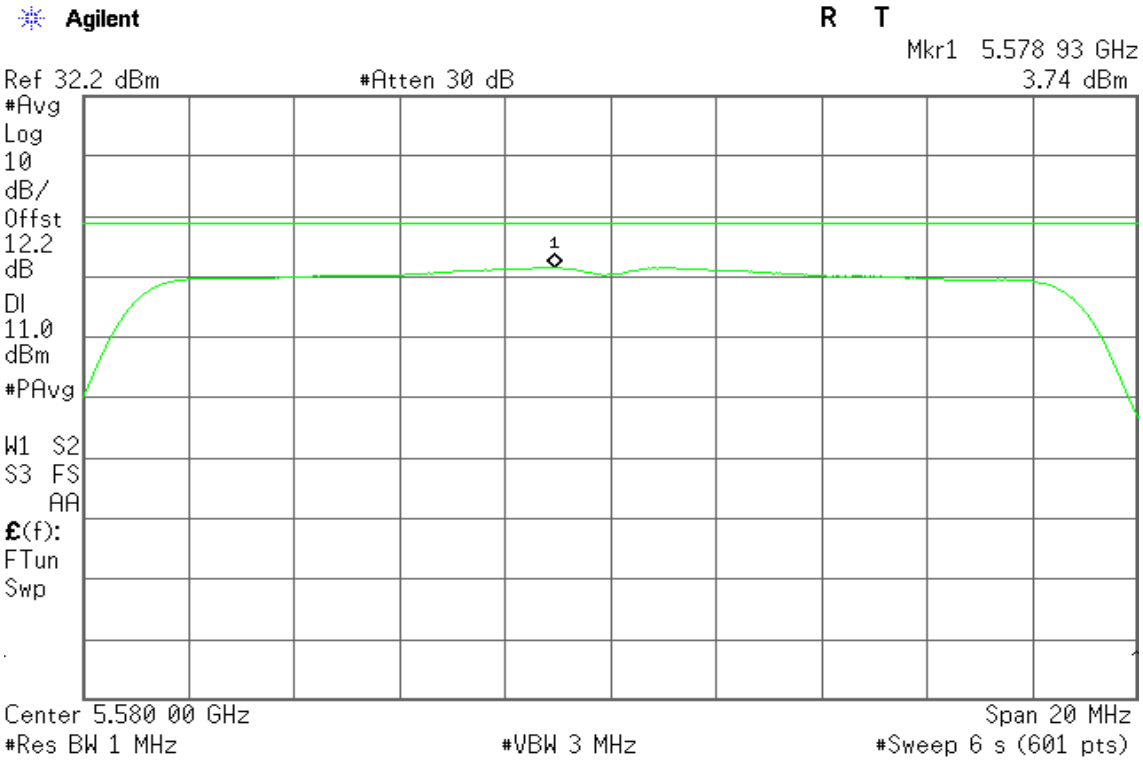

Agilent
R T
Mkr1 5.698 93 GHz
3.86 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
Center 5.700 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

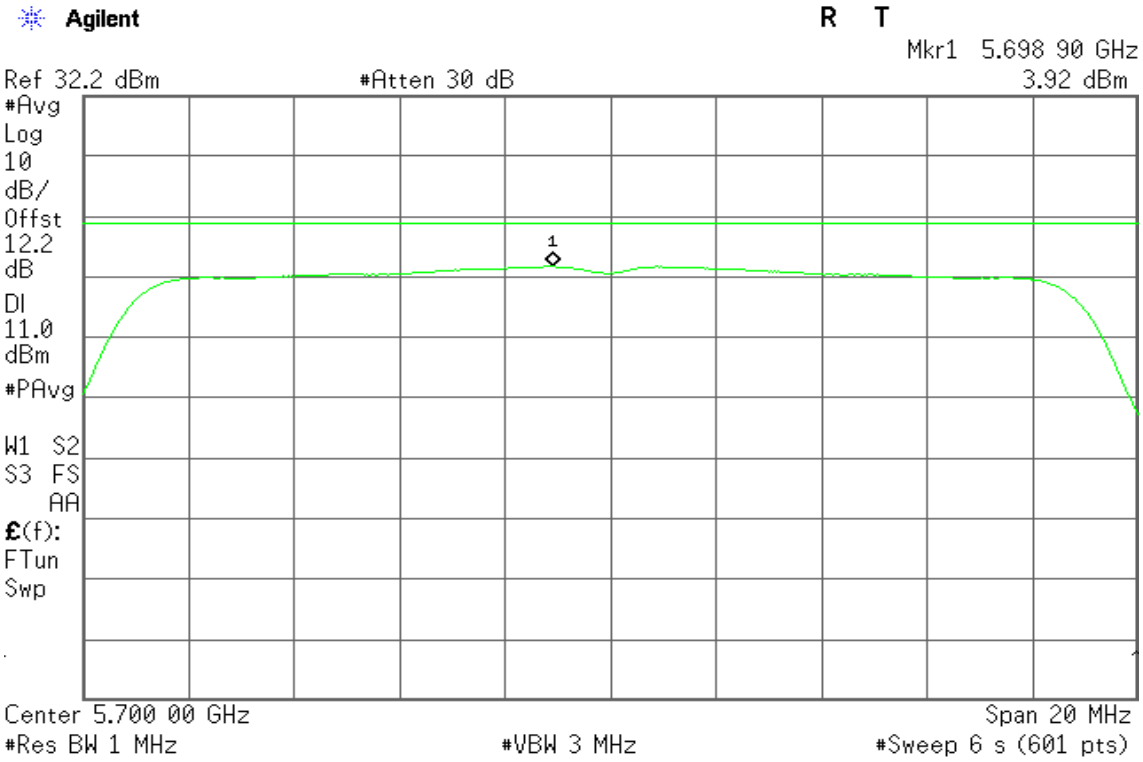
CH Low



CH Mid

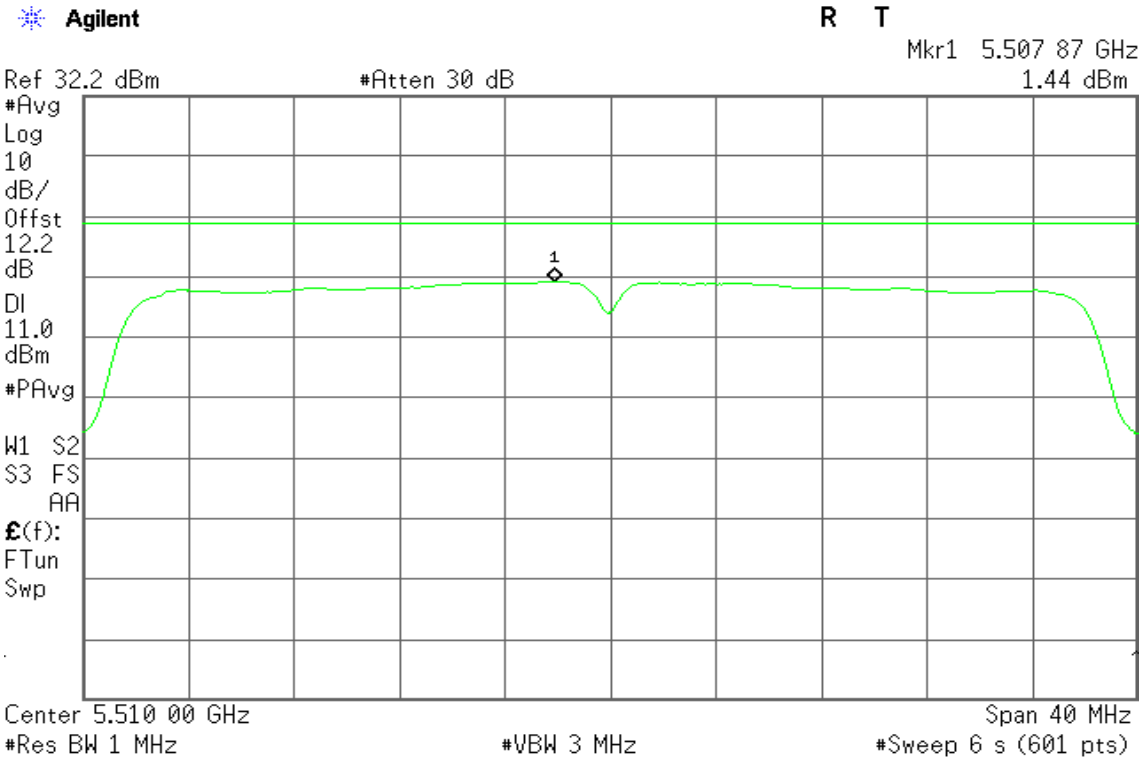


CH High

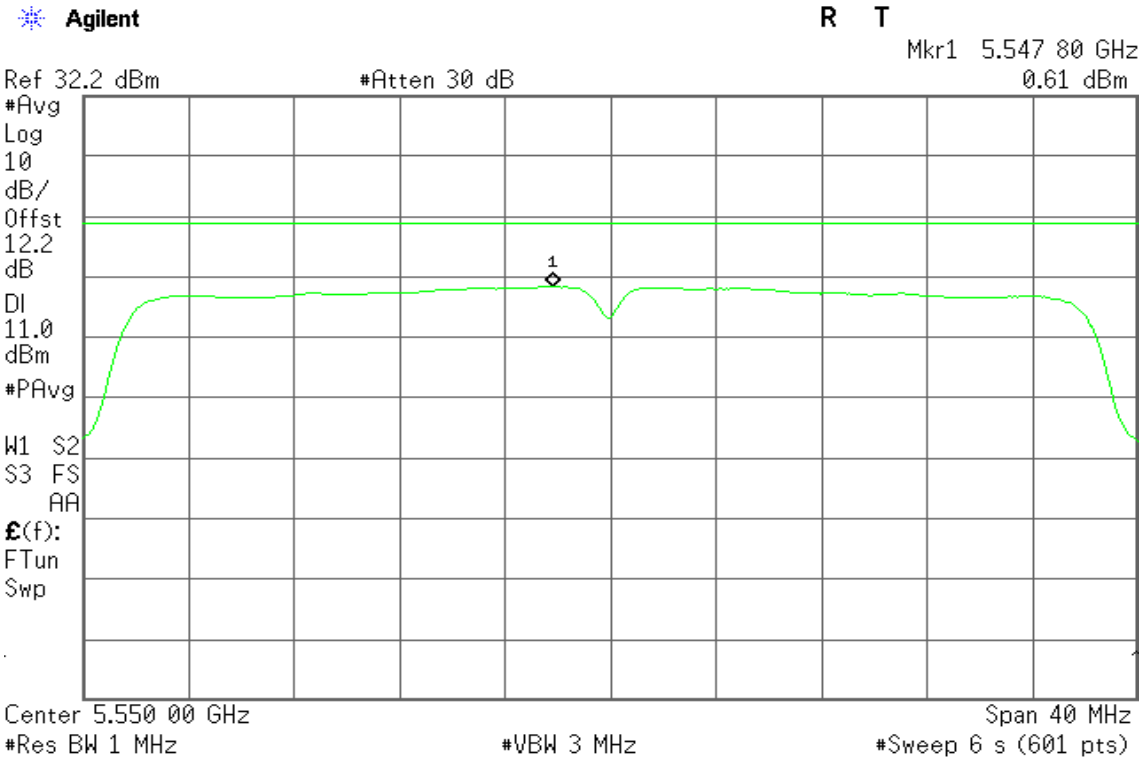

Agilent
R T
Mkr1 5.698 90 GHz
3.92 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
Center 5.700 00 GHz
Span 20 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

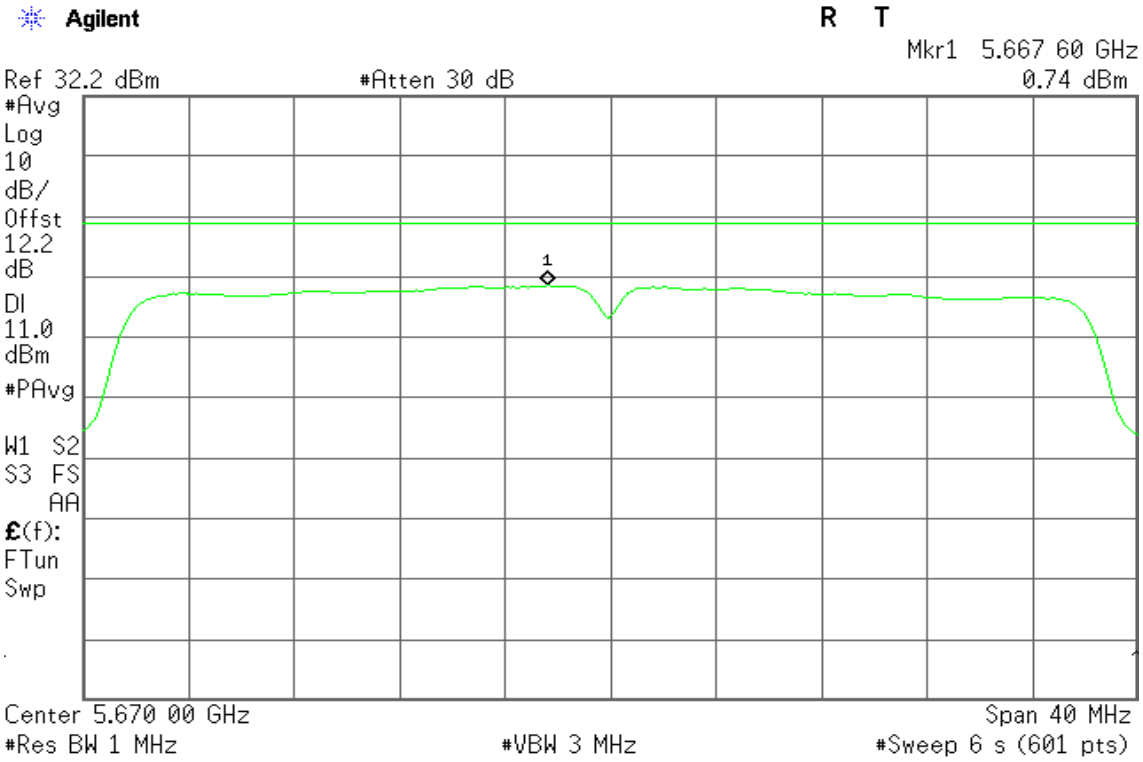
CH Low



CH Mid

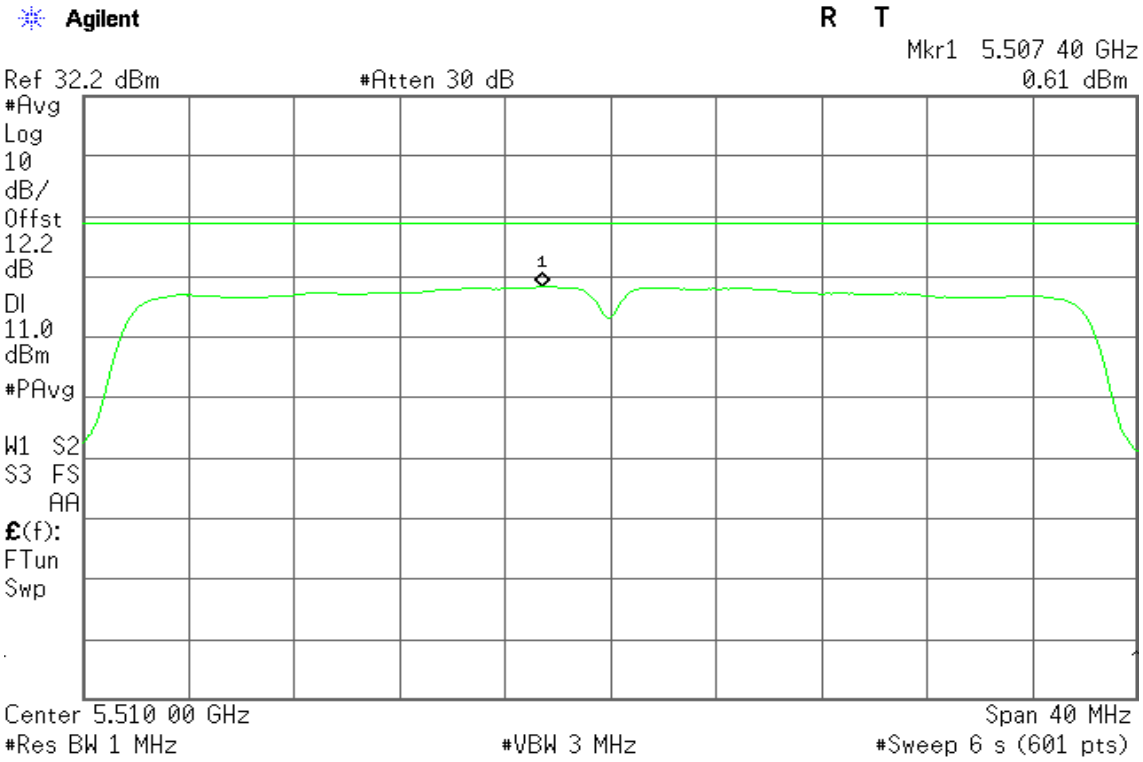


CH High

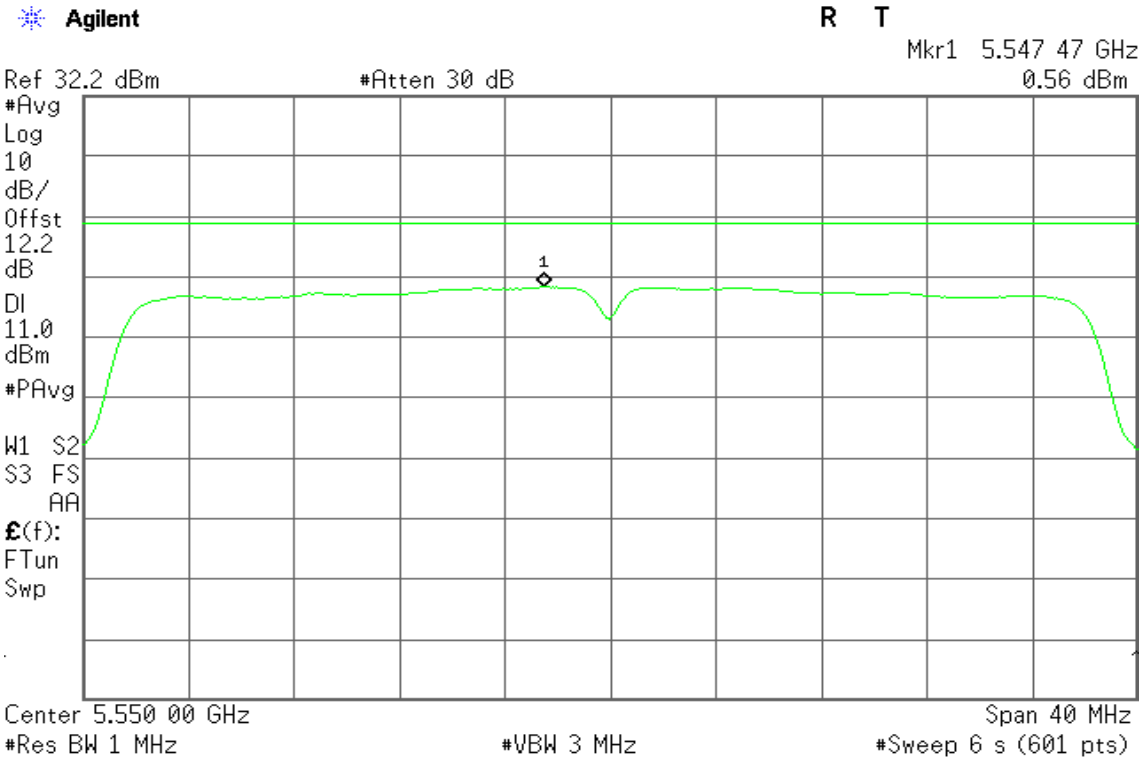

Agilent
R T
Mkr1 5.667 60 GHz
0.74 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.670 00 GHz
Span 40 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

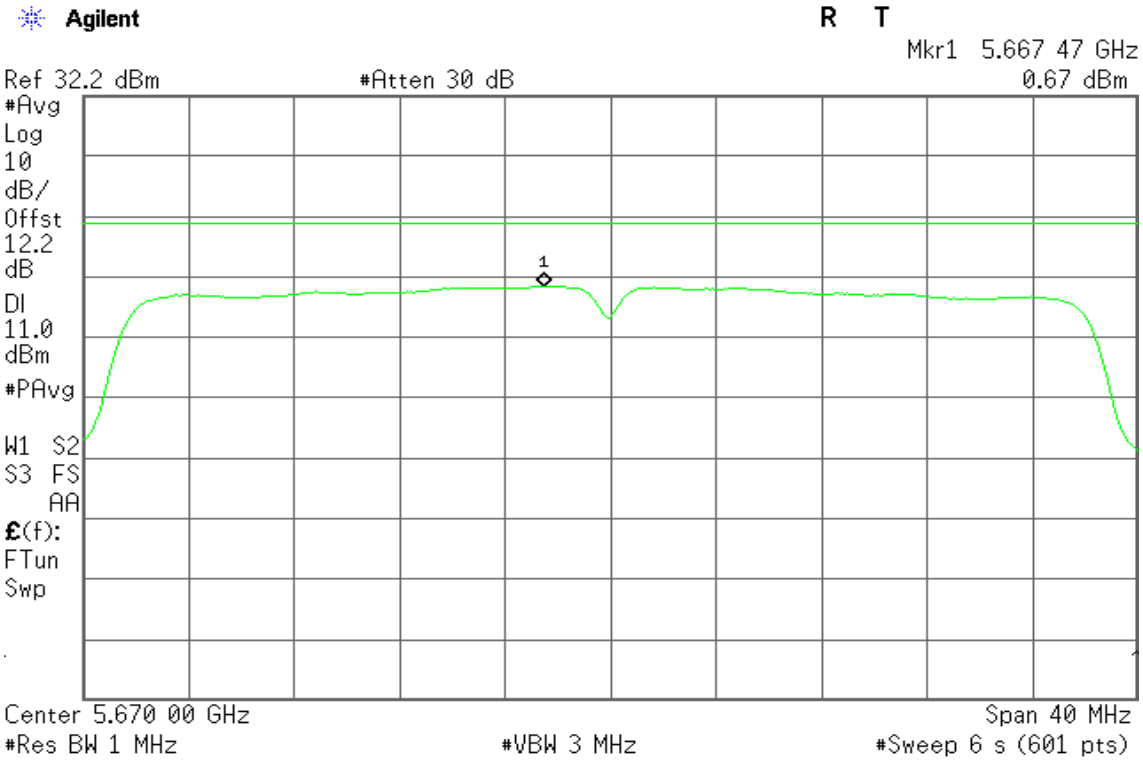
CH Low



CH Mid



CH High


Agilent
R T
Mkr1 5.667 47 GHz
0.67 dBm
Ref 32.2 dBm
#Atten 30 dB
#Avg
Log
10
dB/
Offst
12.2
dB
Dl
11.0
dBm
#PAvg
W1 S2
S3 FS
AA
£(f):
FTun
Swp
1
Center 5.670 00 GHz
Span 40 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-210 §A9.3, 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

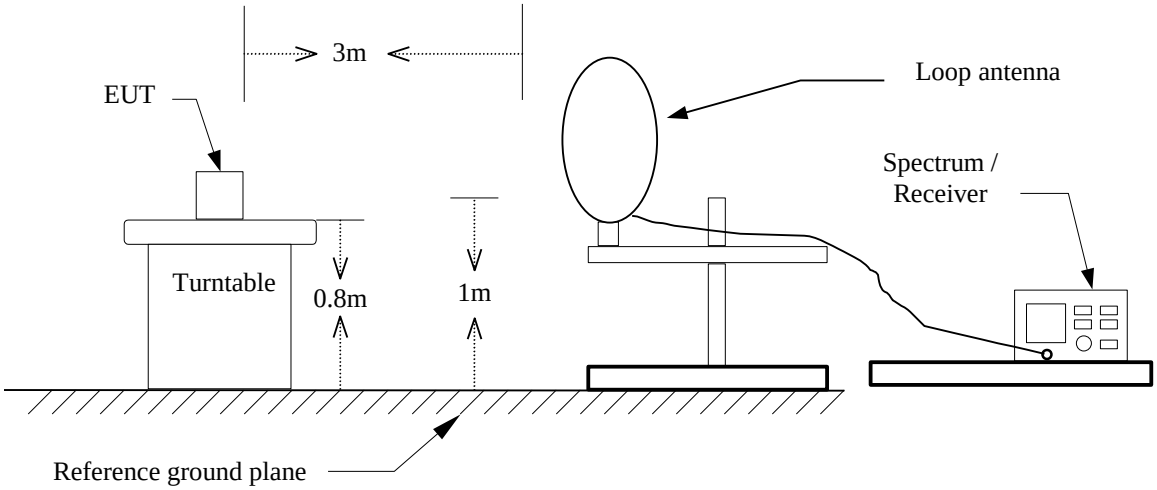
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

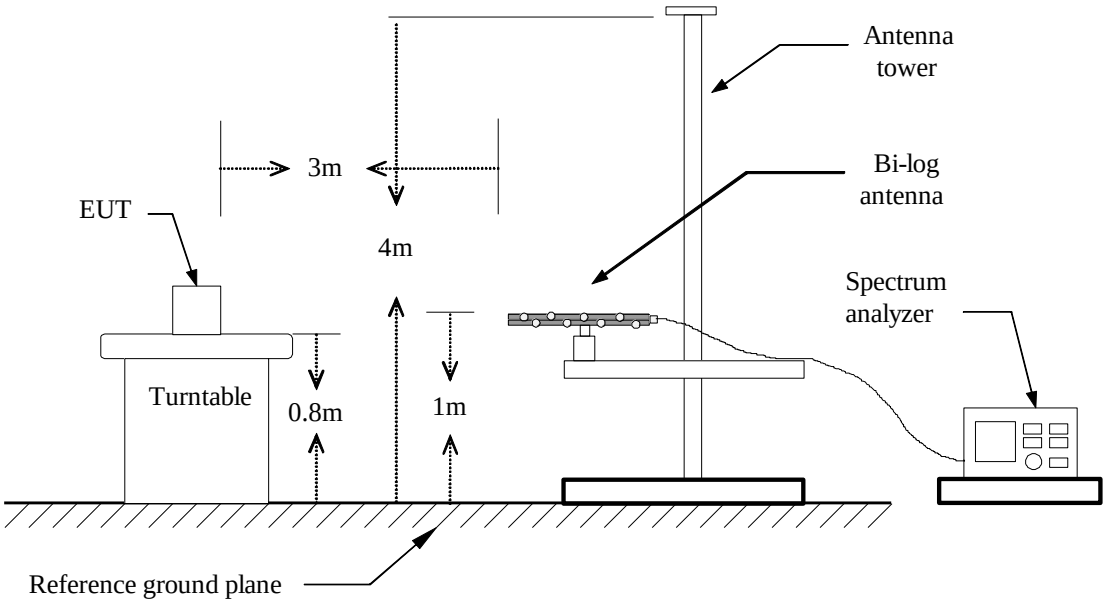
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

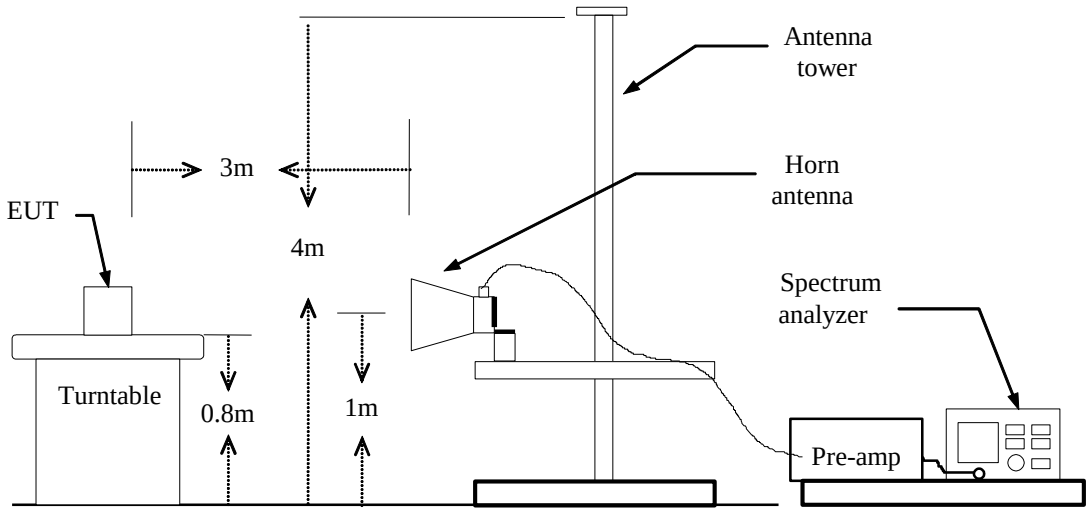
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz


Antenna
tower
3m
Horn
antenna
EUT
4m
Spectrum
analyzer
Turntable
0.8m
1m
Pre-amp

TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

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

   Above 1GHz:

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

   (b) AVERAGE: RBW=1MHz / VBW=300Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

Below 1 GHz

Operation Mode: Normal Link **Test Date:** January 20, 2015

Temperature: 27°C **Tested by:** Owen Wu

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

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
94.0200	47.26	-22.37	24.89	43.50	-18.61	Peak	V
253.1000	43.53	-18.18	25.35	46.00	-20.65	Peak	V
376.2900	43.53	-14.57	28.96	46.00	-17.04	Peak	V
478.1400	44.05	-12.19	31.86	46.00	-14.14	Peak	V
600.3600	44.44	-10.50	33.94	46.00	-12.06	Peak	V
900.0900	34.92	-6.16	28.76	46.00	-17.24	Peak	V
30.0000	47.82	-9.87	37.95	40.00	-2.05	Peak	H
40.6700	53.90	-17.58	36.32	40.00	-3.68	Peak	H
376.2900	54.43	-14.57	39.86	46.00	-6.14	Peak	H
478.1400	53.41	-12.19	41.22	46.00	-4.78	Peak	H
749.7400	34.02	-7.88	26.14	46.00	-19.86	Peak	H
900.0900	42.01	-6.16	35.85	46.00	-10.15	Peak	H

Remark:

1 *Measuring frequencies from 30 MHz to the 1GHz.*

2 *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*

3 *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*

4 *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

5 *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	January 19, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3800.000	50.19	0.37	50.56	74.00	-23.44	peak	V
10180.000	32.60	15.71	48.31	74.00	-25.69	peak	V
11920.000	33.58	17.15	50.73	74.00	-23.27	peak	V
N/A							
4542.000	49.27	3.31	52.58	74.00	-21.42	peak	H
10060.000	34.01	15.16	49.17	74.00	-24.83	peak	H
13360.000	33.64	19.55	53.19	74.00	-20.81	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
1721.000	56.24	-6.36	49.88	74.00	-24.12	peak	V
N/A							
2701.000	50.15	-2.71	47.44	74.00	-26.56	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).*

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3303.000	52.29	-1.38	50.91	74.00	-23.09	peak	V
N/A							
3975.000	49.64	1.12	50.76	74.00	-23.24	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
2498.000	54.67	-3.14	51.53	74.00	-22.47	peak	V
10360.000	33.96	16.52	50.48	74.00	-23.52	peak	V
15550.000	33.97	19.05	53.02	74.00	-20.98	peak	V
N/A							
4332.000	49.16	2.48	51.64	74.00	-22.36	peak	H
10310.000	32.31	16.30	48.61	74.00	-25.39	peak	H
16120.000	32.55	19.90	52.45	74.00	-21.55	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3191.000	52.74	-1.65	51.09	74.00	-22.91	peak	V
N/A							
1735.000	57.39	-6.28	51.11	74.00	-22.89	peak	H
N/A							

Remark:

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

Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH High **Test Date:** February 5, 2015

Temperature: 27℃ **Tested by:** Owen Wu

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)
2491.000	54.97	-3.20	51.77	74.00	-22.23	peak	V
10490.000	36.19	17.11	53.30	74.00	-20.70	peak	V
15720.000	34.78	19.19	53.97	74.00	-20.03	peak	V
N/A							
4087.000	51.02	1.56	52.58	74.00	-21.42	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
1924.000	55.10	-5.28	49.82	74.00	-24.18	peak	V
10050.000	34.27	15.12	49.39	74.00	-24.61	peak	V
15580.000	34.60	19.08	53.68	74.00	-20.32	peak	V
N/A							
4066.000	50.23	1.48	51.71	74.00	-22.29	peak	H
10810.000	32.23	16.89	49.12	74.00	-24.88	peak	H
15570.000	34.36	19.07	53.43	74.00	-20.57	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3198.000	53.85	-1.63	52.22	74.00	-21.78	peak	V
N/A							
3240.000	52.04	-1.53	50.51	74.00	-23.49	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
1679.000	53.14	-6.58	46.56	74.00	-27.44	peak	V
10030.000	33.88	15.03	48.91	74.00	-25.09	peak	V
15780.000	38.91	19.25	58.16	74.00	-15.84	peak	V
15780.000	24.89	19.25	44.14	54.00	-9.86	AVG	V
N/A							
4318.000	49.70	2.43	52.13	74.00	-21.87	peak	H
10010.000	33.55	14.94	48.49	74.00	-25.51	peak	H
15770.000	36.51	19.24	55.75	74.00	-18.25	peak	H
15770.000	23.50	19.24	42.74	54.00	-11.26	AVG	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3149.000	52.34	-1.75	50.59	74.00	-23.41	peak	V
N/A							
4262.000	49.63	2.22	51.85	74.00	-22.15	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27°C	**Tested by:**	Owen Wu
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)
1924.000	55.27	-5.28	49.99	74.00	-24.01	peak	V
N/A							
4682.000	49.44	3.64	53.08	74.00	-20.92	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
1924.000	53.81	-5.28	48.53	74.00	-25.47	peak	V
10030.000	34.32	15.03	49.35	74.00	-24.65	peak	V
15770.000	34.43	19.24	53.67	74.00	-20.33	peak	V
N/A							
3422.000	51.97	-1.10	50.87	74.00	-23.13	peak	H
10310.000	32.26	16.30	48.56	74.00	-25.44	peak	H
15780.000	34.12	19.25	53.37	74.00	-20.63	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
2498.000	54.55	-3.14	51.41	74.00	-22.59	peak	V
N/A							
4521.000	49.20	3.21	52.41	74.00	-21.59	peak	H
N/A							

Remark:

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

Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / CH High **Test Date:** February 5, 2015

Temperature: 27°C **Tested by:** Owen Wu

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)
1924.000	54.90	-5.28	49.62	74.00	-24.38	peak	V
N/A							
4269.000	49.25	2.25	51.50	74.00	-22.50	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3800.000	50.08	0.37	50.45	74.00	-23.55	peak	V
10540.000	33.15	17.13	50.28	74.00	-23.72	peak	V
15830.000	33.96	19.29	53.25	74.00	-20.75	peak	V
N/A							
3408.000	51.42	-1.13	50.29	74.00	-23.71	peak	H
10830.000	32.20	16.88	49.08	74.00	-24.92	peak	H
15810.000	34.60	19.27	53.87	74.00	-20.13	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
2526.000	54.02	-3.07	50.95	74.00	-23.05	peak	V
N/A							
4136.000	49.91	1.74	51.65	74.00	-22.35	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
4094.000	51.42	1.59	53.01	74.00	-20.99	peak	V
11000.000	32.61	16.73	49.34	74.00	-24.66	peak	V
15770.000	33.47	19.24	52.71	74.00	-21.29	peak	V
N/A							
1749.000	57.04	-6.21	50.83	74.00	-23.17	peak	H
10150.000	33.79	15.57	49.36	74.00	-24.64	peak	H
15830.000	33.71	19.29	53.00	74.00	-21.00	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz /CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3912.000	50.77	0.85	51.62	74.00	-22.38	peak	V
N/A							
3289.000	52.09	-1.42	50.67	74.00	-23.33	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3121.000	52.54	-1.82	50.72	74.00	-23.28	peak	V
N/A							
1735.000	53.99	-6.28	47.71	74.00	-26.29	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
1735.000	56.91	-6.28	50.63	74.00	-23.37	peak	V
9250.000	35.31	13.90	49.21	74.00	-24.79	peak	V
15830.000	32.91	19.29	52.20	74.00	-21.80	peak	V
N/A							
4129.000	50.61	1.72	52.33	74.00	-21.67	peak	H
10050.000	33.61	15.12	48.73	74.00	-25.27	peak	H
15900.000	33.37	19.35	52.72	74.00	-21.28	peak	H
N/A							

Remark:

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

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3205.000	52.21	-1.62	50.59	74.00	-23.41	peak	V
N/A							
3450.000	52.71	-1.03	51.68	74.00	-22.32	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3548.000	50.81	-0.70	50.11	74.00	-23.89	peak	V
N/A							
3366.000	51.81	-1.23	50.58	74.00	-23.42	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH Low	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3261.000	52.10	-1.48	50.62	74.00	-23.38	peak	V
11030.000	32.85	16.73	49.58	74.00	-24.42	peak	V
15800.000	33.48	19.26	52.74	74.00	-21.26	peak	V
N/A							
3730.000	50.82	0.07	50.89	74.00	-23.11	peak	H
10880.000	31.95	16.83	48.78	74.00	-25.22	peak	H
16210.000	32.82	20.25	53.07	74.00	-20.93	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH Mid	**Test Date:**	February 5, 2015
Temperature:	27°C	**Tested by:**	Owen Wu
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)
3373.000	51.58	-1.21	50.37	74.00	-23.63	peak	V
N/A							
3072.000	52.06	-1.94	50.12	74.00	-23.88	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH High	**Test Date:**	February 5, 2015
Temperature:	27℃	**Tested by:**	Owen Wu
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)
3471.000	51.20	-0.98	50.22	74.00	-23.78	peak	V
N/A							
3296.000	52.39	-1.40	50.99	74.00	-23.01	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 or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a) & RSS-Gen §7.2.4, except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

** Decreases with the logarithm of the frequency.*

Test Configuration

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

TEST PROCEDURE

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

TEST RESULTS

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

Test Data

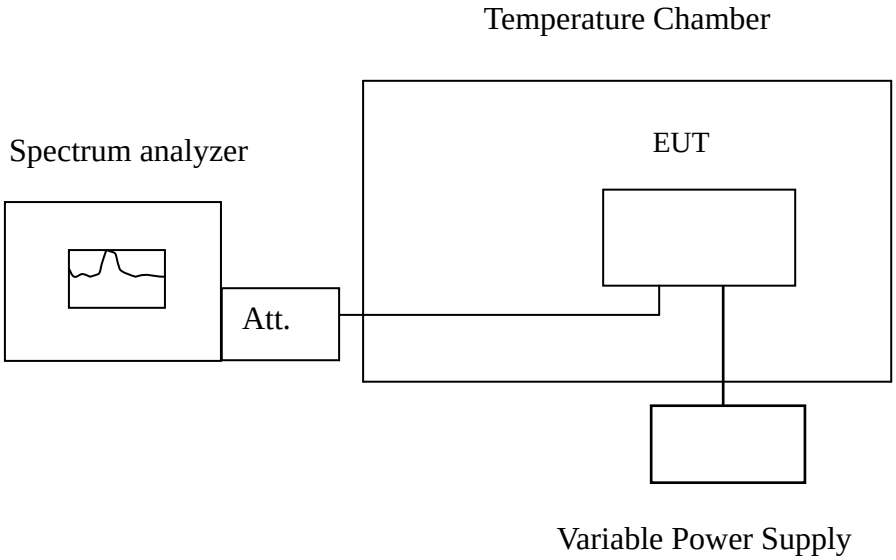
Not applicable, because EUT not connect to AC Main Source direct.

7.8 FREQUENCY STABILITY

LIMIT

According to §15.407(g) & RSS-210 §A9.5(5), manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the operational description.

Test Configuration



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted.

IEEE 802.11a mode / 5180 ~ 5240 MHz:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5179.996024	5150~5250	Pass
40	5	5179.995322	5150~5250	Pass
30	5	5179.994522	5150~5250	Pass
20	5	5179.994491	5150~5250	Pass
10	5	5179.993027	5150~5250	Pass
0	5	5180.006430	5150~5250	Pass
-10	5	5180.009418	5150~5250	Pass
-20	5	5179.996935	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5180.009687	5150~5250	Pass
	5	5180.00621	5150~5250	Pass
	5.75	5180.008635	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5240.002138	5150~5250	Pass
40	5	5239.993719	5150~5250	Pass
30	5	5240.008835	5150~5250	Pass
20	5	5240.005332	5150~5250	Pass
10	5	5240.002828	5150~5250	Pass
0	5	5239.996848	5150~5250	Pass
-10	5	5240.009443	5150~5250	Pass
-20	5	5240.002858	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5240.000476	5150~5250	Pass
	5	5240.001947	5150~5250	Pass
	5.75	5240.005556	5150~5250	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240 MHz / Chain 0:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5179.999530	5150~5250	Pass
40	5	5179.993338	5150~5250	Pass
30	5	5180.008267	5150~5250	Pass
20	5	5179.997325	5150~5250	Pass
10	5	5179.995099	5150~5250	Pass
0	5	5180.005885	5150~5250	Pass
-10	5	5179.993866	5150~5250	Pass
-20	5	5179.996982	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5179.992354	5150~5250	Pass
	5	5179.993985	5150~5250	Pass
	5.75	5179.996545	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5239.991577	5150~5250	Pass
40	5	5239.996815	5150~5250	Pass
30	5	5240.000409	5150~5250	Pass
20	5	5240.006348	5150~5250	Pass
10	5	5239.999149	5150~5250	Pass
0	5	5239.997759	5150~5250	Pass
-10	5	5240.010715	5150~5250	Pass
-20	5	5240.001272	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5240.007956	5150~5250	Pass
	5	5239.997929	5150~5250	Pass
	5.75	5240.008902	5150~5250	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240 MHz / Chain 1:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5179.994596	5150~5250	Pass
40	5	5180.010378	5150~5250	Pass
30	5	5179.997195	5150~5250	Pass
20	5	5180.002884	5150~5250	Pass
10	5	5179.993527	5150~5250	Pass
0	5	5180.001645	5150~5250	Pass
-10	5	5179.995758	5150~5250	Pass
-20	5	5180.010374	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5179.994732	5150~5250	Pass
	5	5180.002955	5150~5250	Pass
	5.75	5180.000986	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5240.000115	5150~5250	Pass
40	5	5240.003800	5150~5250	Pass
30	5	5239.998189	5150~5250	Pass
20	5	5239.994294	5150~5250	Pass
10	5	5240.002791	5150~5250	Pass
0	5	5240.001208	5150~5250	Pass
-10	5	5239.995173	5150~5250	Pass
-20	5	5239.990483	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5240.001486	5150~5250	Pass
	5	5239.996091	5150~5250	Pass
	5.75	5240.000803	5150~5250	Pass

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230 MHz / Chain 0:

CH Low

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5189.994988	5150~5250	Pass
40	5	5189.997119	5150~5250	Pass
30	5	5190.008260	5150~5250	Pass
20	5	5189.998872	5150~5250	Pass
10	5	5189.992378	5150~5250	Pass
0	5	5190.007590	5150~5250	Pass
-10	5	5189.997070	5150~5250	Pass
-20	5	5190.002476	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5189.999453	5150~5250	Pass
	5	5190.007264	5150~5250	Pass
	5.75	5190.010458	5150~5250	Pass

CH High

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5230.005840	5150~5250	Pass
40	5	5230.004376	5150~5250	Pass
30	5	5230.005036	5150~5250	Pass
20	5	5230.010683	5150~5250	Pass
10	5	5230.000675	5150~5250	Pass
0	5	5230.009796	5150~5250	Pass
-10	5	5230.010244	5150~5250	Pass
-20	5	5229.999528	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5229.998875	5150~5250	Pass
	5	5230.003445	5150~5250	Pass
	5.75	5229.998939	5150~5250	Pass

IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230 MHz / Chain 1:

CH Low

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5190.006362	5150~5250	Pass
40	5	5189.997452	5150~5250	Pass
30	5	5189.994051	5150~5250	Pass
20	5	5189.999345	5150~5250	Pass
10	5	5189.992909	5150~5250	Pass
0	5	5190.002890	5150~5250	Pass
-10	5	5189.993734	5150~5250	Pass
-20	5	5189.992234	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5189.992378	5150~5250	Pass
	5	5189.995564	5150~5250	Pass
	5.75	5189.997379	5150~5250	Pass

CH High

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5230.003210	5150~5250	Pass
40	5	5230.004460	5150~5250	Pass
30	5	5229.999457	5150~5250	Pass
20	5	5230.009028	5150~5250	Pass
10	5	5230.000432	5150~5250	Pass
0	5	5229.995551	5150~5250	Pass
-10	5	5229.997625	5150~5250	Pass
-20	5	5230.000262	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5229.993724	5150~5250	Pass
	5	5230.009782	5150~5250	Pass
	5.75	5229.993865	5150~5250	Pass

IEEE 802.11a mode / 5260 ~ 5320 MHz:

CH Low

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5259.992089	5250~5350	Pass
40	5	5260.002028	5250~5350	Pass
30	5	5260.005117	5250~5350	Pass
20	5	5259.999155	5250~5350	Pass
10	5	5260.006889	5250~5350	Pass
0	5	5260.002466	5250~5350	Pass
-10	5	5259.995581	5250~5350	Pass
-20	5	5260.010099	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5260.006595	5250~5350	Pass
	5	5260.008119	5250~5350	Pass
	5.75	5259.99861	5250~5350	Pass

CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5319.995228	5250~5350	Pass
40	5	5319.996407	5250~5350	Pass
30	5	5320.002505	5250~5350	Pass
20	5	5320.004673	5250~5350	Pass
10	5	5320.009999	5250~5350	Pass
0	5	5320.002555	5250~5350	Pass
-10	5	5319.999161	5250~5350	Pass
-20	5	5319.992609	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5320.000829	5250~5350	Pass
	5	5320.006902	5250~5350	Pass
	5.75	5319.992391	5250~5350	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320 MHz / Chain 0:

CH Low

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5259.996893	5250~5350	Pass
40	5	5260.001435	5250~5350	Pass
30	5	5260.008615	5250~5350	Pass
20	5	5259.999776	5250~5350	Pass
10	5	5260.004265	5250~5350	Pass
0	5	5260.000535	5250~5350	Pass
-10	5	5259.991484	5250~5350	Pass
-20	5	5260.003610	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5260.00255	5250~5350	Pass
	5	5260.00014	5250~5350	Pass
	5.75	5260.001673	5250~5350	Pass

CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5320.008989	5250~5350	Pass
40	5	5319.994363	5250~5350	Pass
30	5	5320.001034	5250~5350	Pass
20	5	5319.999118	5250~5350	Pass
10	5	5319.994584	5250~5350	Pass
0	5	5320.003710	5250~5350	Pass
-10	5	5320.010015	5250~5350	Pass
-20	5	5319.999859	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5319.9936	5250~5350	Pass
	5	5320.008656	5250~5350	Pass
	5.75	5319.99196	5250~5350	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320 MHz / Chain 1:

CH Low

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5260.010461	5250~5350	Pass
40	5	5259.995005	5250~5350	Pass
30	5	5259.998414	5250~5350	Pass
20	5	5259.999048	5250~5350	Pass
10	5	5260.005826	5250~5350	Pass
0	5	5260.000733	5250~5350	Pass
-10	5	5260.001512	5250~5350	Pass
-20	5	5259.995631	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5259.996523	5250~5350	Pass
	5	5259.9968	5250~5350	Pass
	5.75	5260.009289	5250~5350	Pass

CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5320.007189	5250~5350	Pass
40	5	5320.009703	5250~5350	Pass
30	5	5319.998268	5250~5350	Pass
20	5	5320.005535	5250~5350	Pass
10	5	5320.007358	5250~5350	Pass
0	5	5320.001016	5250~5350	Pass
-10	5	5319.990402	5250~5350	Pass
-20	5	5320.002053	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5320.009826	5250~5350	Pass
	5	5320.004926	5250~5350	Pass
	5.75	5319.997609	5250~5350	Pass

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310 MHz / Chain 0:

CH Low

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5269.991318	5250~5350	Pass
40	5	5270.006441	5250~5350	Pass
30	5	5269.993903	5250~5350	Pass
20	5	5270.004938	5250~5350	Pass
10	5	5269.999622	5250~5350	Pass
0	5	5269.995432	5250~5350	Pass
-10	5	5270.006854	5250~5350	Pass
-20	5	5269.994674	5250~5350	Pass

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5270.000617	5250~5350	Pass
	5	5270.008878	5250~5350	Pass
	5.75	5269.998444	5250~5350	Pass

CH High

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5309.995695	5250~5350	Pass
40	5	5309.994440	5250~5350	Pass
30	5	5309.995386	5250~5350	Pass
20	5	5310.010898	5250~5350	Pass
10	5	5309.993284	5250~5350	Pass
0	5	5309.997551	5250~5350	Pass
-10	5	5309.993613	5250~5350	Pass
-20	5	5310.005600	5250~5350	Pass

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5310.003334	5250~5350	Pass
	5	5310.004083	5250~5350	Pass
	5.75	5309.999589	5250~5350	Pass

IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310 MHz / Chain 1:

CH Low

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5270.008362	5250~5350	Pass
40	5	5270.002630	5250~5350	Pass
30	5	5269.994714	5250~5350	Pass
20	5	5269.997654	5250~5350	Pass
10	5	5270.002475	5250~5350	Pass
0	5	5270.005699	5250~5350	Pass
-10	5	5269.998155	5250~5350	Pass
-20	5	5269.995931	5250~5350	Pass

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5270.002402	5250~5350	Pass
	5	5269.999853	5250~5350	Pass
	5.75	5270.010878	5250~5350	Pass

CH High

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5309.999869	5250~5350	Pass
40	5	5310.004736	5250~5350	Pass
30	5	5310.003145	5250~5350	Pass
20	5	5309.996263	5250~5350	Pass
10	5	5310.004773	5250~5350	Pass
0	5	5310.009607	5250~5350	Pass
-10	5	5310.005084	5250~5350	Pass
-20	5	5310.001786	5250~5350	Pass

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5310.008354	5250~5350	Pass
	5	5310.005626	5250~5350	Pass
	5.75	5310.008619	5250~5350	Pass

IEEE 802.11a mode / 5500 ~ 5700 MHz:

CH Low

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5500.004970	5470~5725	Pass
40	5	5499.997987	5470~5725	Pass
30	5	5500.009408	5470~5725	Pass
20	5	5500.005945	5470~5725	Pass
10	5	5500.002286	5470~5725	Pass
0	5	5499.998019	5470~5725	Pass
-10	5	5499.990934	5470~5725	Pass
-20	5	5500.007560	5470~5725	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5499.995981	5470~5725	Pass
	5	5499.995654	5470~5725	Pass
	5.75	5500.003	5470~5725	Pass

CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5699.997123	5470~5725	Pass
40	5	5700.000366	5470~5725	Pass
30	5	5700.008219	5470~5725	Pass
20	5	5699.996786	5470~5725	Pass
10	5	5700.006721	5470~5725	Pass
0	5	5700.002999	5470~5725	Pass
-10	5	5699.999432	5470~5725	Pass
-20	5	5700.007314	5470~5725	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5699.998724	5470~5725	Pass
	5	5700.009027	5470~5725	Pass
	5.75	5700.001111	5470~5725	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700 MHz / Chain 0:

CH Low

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	5	5499.992053	5470~5725	Pass
40	5	5500.002982	5470~5725	Pass
30	5	5499.996116	5470~5725	Pass
20	5	5499.993078	5470~5725	Pass
10	5	5499.997630	5470~5725	Pass
0	5	5499.994297	5470~5725	Pass
-10	5	5500.009504	5470~5725	Pass
-20	5	5500.009662	5470~5725	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	4.25	5500.008073	5470~5725	Pass
	5	5499.993242	5470~5725	Pass
	5.75	5499.999878	5470~5725	Pass

CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5699.992358	5470~5725	Pass
40	5	5699.996410	5470~5725	Pass
30	5	5699.997443	5470~5725	Pass
20	5	5699.994837	5470~5725	Pass
10	5	5699.999941	5470~5725	Pass
0	5	5700.005565	5470~5725	Pass
-10	5	5700.007849	5470~5725	Pass
-20	5	5700.005474	5470~5725	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.5	5699.999515	5470~5725	Pass
	5	5699.997289	5470~5725	Pass
	5.5	5700.00885	5470~5725	Pass

IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700 MHz / Chain 1:

CH Low

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5500.009910	5470~5725	Pass
40	5	5500.001347	5470~5725	Pass
30	5	5500.008339	5470~5725	Pass
20	5	5500.003651	5470~5725	Pass
10	5	5499.995458	5470~5725	Pass
0	5	5500.004172	5470~5725	Pass
-10	5	5499.992905	5470~5725	Pass
-20	5	5499.996982	5470~5725	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5500.000186	5470~5725	Pass
	5	5499.99774	5470~5725	Pass
	5.75	5499.991329	5470~5725	Pass

CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5699.996042	5470~5725	Pass
40	5	5699.997096	5470~5725	Pass
30	5	5699.993344	5470~5725	Pass
20	5	5700.000430	5470~5725	Pass
10	5	5699.991196	5470~5725	Pass
0	5	5699.998317	5470~5725	Pass
-10	5	5699.996903	5470~5725	Pass
-20	5	5700.007143	5470~5725	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.5	5700.004881	5470~5725	Pass
	5	5699.997571	5470~5725	Pass
	5.5	5699.998511	5470~5725	Pass

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670 MHz / Chain 0:

CH Low

Operating Frequency: 5510 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5510.009098	5470~5725	Pass
40	5	5509.993681	5470~5725	Pass
30	5	5509.997484	5470~5725	Pass
20	5	5509.993150	5470~5725	Pass
10	5	5510.004948	5470~5725	Pass
0	5	5510.005445	5470~5725	Pass
-10	5	5510.008462	5470~5725	Pass
-20	5	5509.996989	5470~5725	Pass

Operating Frequency: 5510 MHz				
Environment Temperature (oC)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5510.000629	5470~5725	Pass
	5	5509.99761	5470~5725	Pass
	5.75	5509.991132	5470~5725	Pass

CH High

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5669.992129	5470~5725	Pass
40	5	5670.004515	5470~5725	Pass
30	5	5669.997002	5470~5725	Pass
20	5	5670.008376	5470~5725	Pass
10	5	5670.001173	5470~5725	Pass
0	5	5669.994172	5470~5725	Pass
-10	5	5670.000354	5470~5725	Pass
-20	5	5669.991404	5470~5725	Pass

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5670.00359	5470~5725	Pass
	5	5669.996935	5470~5725	Pass
	5.75	5670.000014	5470~5725	Pass

IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670 MHz / Chain 1:

CH Low

Operating Frequency: 5510 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5509.995200	5470~5725	Pass
40	5	5510.000482	5470~5725	Pass
30	5	5510.002767	5470~5725	Pass
20	5	5510.005142	5470~5725	Pass
10	5	5510.005935	5470~5725	Pass
0	5	5510.002704	5470~5725	Pass
-10	5	5510.009063	5470~5725	Pass
-20	5	5510.001542	5470~5725	Pass

Operating Frequency: 5510 MHz				
Environment Temperature (oC)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5509.995319	5470~5725	Pass
	5	5510.004964	5470~5725	Pass
	5.75	5509.995499	5470~5725	Pass

CH High

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	5	5670.008293	5470~5725	Pass
40	5	5670.004782	5470~5725	Pass
30	5	5669.995395	5470~5725	Pass
20	5	5669.991610	5470~5725	Pass
10	5	5669.997897	5470~5725	Pass
0	5	5669.999159	5470~5725	Pass
-10	5	5669.998437	5470~5725	Pass
-20	5	5670.009461	5470~5725	Pass

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	4.25	5670.005348	5470~5725	Pass
	5	5670.000601	5470~5725	Pass
	5.75	5670.008914	5470~5725	Pass

7.9 DYNAMIC FREQUENCY SELECTION

LIMIT

According to §15.407 (h) and FCC 06-96 appendix "compliance measurement procedures for unlicensed-national information infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection".

***Remark**: IC RSS-210* §A9.5 *is closely harmonized with FCC Part 15 DFS rules.*

Table 1: Applicability of DFS requirements prior to use of a channel

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client(with radar detection)
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (without radar detection)	Client(with radar detection)
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service

Maximum Transmit Power	Value (see note)
>=200 Milliwatt	-64 dBm
< 200 Milliwatt	-62 dBm

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.
Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period

The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the Burst.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar burst generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate channel changes (an aggregate of approximately 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Table 6 – Long Pulse Radar Test Signal

Radar Waveform	Bursts	Pulses per Burst	Pulse Width (µsec)	Chirp Width (µsec)	PRI (µsec)	Minimum Percentage of Successful Detection	Minimum Trials
5	8-20	1-3	50-100	5-20	1000-2000	80%	30

Table 7 – Frequency Hopping Radar Test Signal

Radar Waveform	Pulse Width (µsec)	PRI (µsec)	Burst Length (ms)	Pulses Per Hop	Hopping Rate (kHz)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	300	9	0.33	70%	30

DESCRIPTION OF EUT

Overview Of EUT With Respect To §15.407 (H) Requirements

The firmware installed in the EUT during testing was:
Firmware Rev: 5.1.19.0

The EUT operates over the 5250-5350 MHz range as a Client Device that does not have radar detection capability.

The antenna assembly utilized with the EUT has a gain of 7.3dBi.

The EUT uses one transmitter connected to two 50-ohm coaxial antenna ports via a diversity switch. Only one antenna port is connected to the test system since the EUT has one antenna only.

The Slave device associated with the EUT during these tests does not have radar detection capability.

WLAN traffic is generated by streaming the video file TestFile.mp2 "6 ½ Magic Hours" from the Master to the Slave in full motion video mode using the media player with the V2.61 Codec package.

The EUT utilizes the 802.11a architecture, with a nominal channel bandwidth of 20 MHz.

The Master Device is a Cisco Aironet 802.11a/b/g Access Point, FCC ID: LDK102073.

The rated output power of the Master unit is < 23dBm (EIRP). Therefore the required interference threshold level is -62 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is –62 + 5 = -57dBm.

The calibrated conducted DFS Detection Threshold level is set to -57 dBm. The tested level is lower than the required level hence it provides margin to the limit.

Manufacturer's Statement Regarding Uniform Channel Spreading

The end product implements an automatic channel selection feature at startup such that operation commences on channels distributed across the entire set of allowed 5GHz channels. This feature will ensure uniform spreading is achieved while avoiding non-allowed channels due to prior radar events.

TEST AND MEASUREMENT SYSTEM

System Overview

The measurement system is based on a conducted test method.

The short pulse and long pulse signal generating system utilizes the NTIA software. The Vector Signal Generator has been validated by the NTIA. The hopping signal generating system utilizes the CCS simulated hopping method and system, which has been validated by the DoD, FCC and NTIA. The software selects waveform parameters from within the bounds of the signal type on a random basis using uniform distribution.

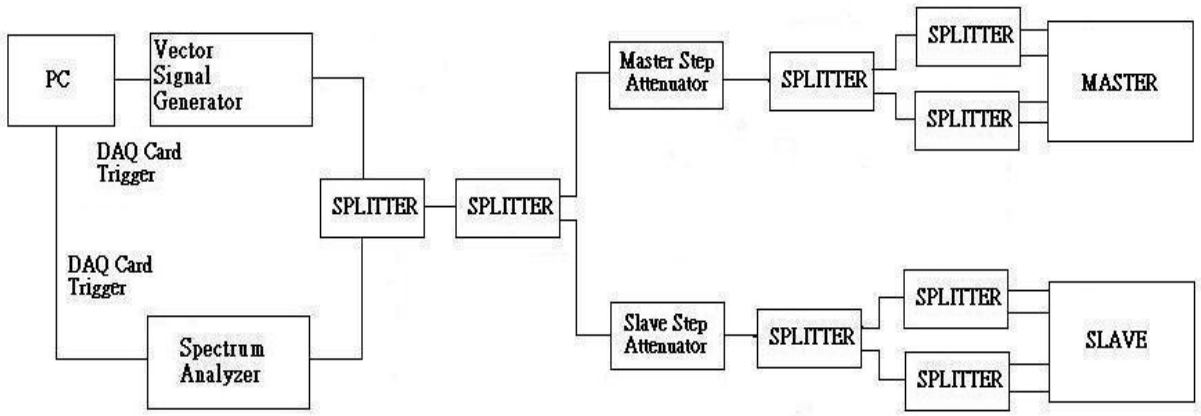
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

The hopping type 6 pulse parameters are fixed while the hopping sequence is based on the August 2005 NTIA Hopping Frequency List. The initial starting point randomized at run-time and each subsequent starting point is incremented by 475. Each frequency in the 100-length segment is compared to the boundaries of the EUT Detection Bandwidth and the software creates a hopping burst pattern in accordance with Section 7.4.1.3 Method #2 Simulated Frequency Hopping Radar Waveform Generating Subsystem of FCC 06-96 APPENDIX. The frequency of the signal generator is incremented in 1 MHz steps from FL to FH for each successive trial. This incremental sequence is repeated as required to generate a minimum of 30 total trials and to maintain a uniform frequency distribution over the entire Detection Bandwidth.

The signal monitoring equipment consists of a spectrum analyzer set to display 8001 bins on the horizontal axis. The time-domain resolution is 2 msec / bin with a 16 second sweep time, meeting the 10 second short pulse reporting criteria. The aggregate ON time is calculated by multiplying the number of bins above a threshold during a particular observation period by the dwell time per bin, with the analyzer set to peak detection and max hold. The time-domain resolution is 3 msec / bin with a 24 second sweep time, meeting the 22 second long pulse reporting criteria and allowing a minimum of 10 seconds after the end of the long pulse waveform.

Should multiple RF ports be utilized for the Master and/or Slave devices (for example, for diversity or MIMO implementations), 50 ohm termination would be removed from the splitter so that connection can be established between splitter and the Master and/or Slave devices.

Conducted Method System Block Diagram



System Calibration

Connect the spectrum analyzer to the test system in place of the master device. Set the signal generator to CW mode. Adjust the amplitude of the signal generator to yield a measured level of –62 dBm on the spectrum analyzer.

Without changing any of the instrument settings, reconnect the spectrum analyzer to the Common port of the Spectrum Analyzer Combiner/Divider and connect a 50 ohm load to the Master Device port of the test system.

Measure the amplitude and calculate the difference from –62 dBm. Adjust the Reference Level Offset of the spectrum analyzer to this difference. Confirm that the signal is displayed at –62 dBm. Readjust the RBW and VBW to 3 MHz, set the span to 10 MHz, and confirm that the signal is still displayed at –62 dBm.

The spectrum analyzer displays the level of the signal generator as received at the antenna ports of the Master Device. The interference detection threshold may be varied from the calibrated value of –62 dBm and the spectrum analyzer will still indicate the level as received by the Master Device.

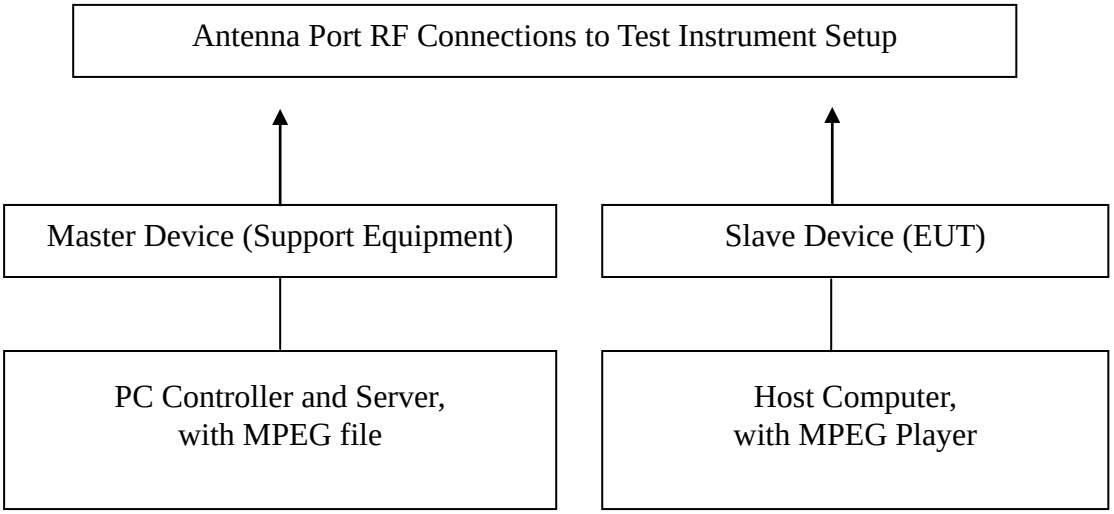
Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection threshold. Separate signal generator amplitude settings are determined as required for each radar type.

Adjustment Of Displayed Traffic Level

Establish a link between the Master and Slave, adjusting the Link Step Attenuator as needed to provide a suitable received level at the Master and Slave devices. Stream the video test file to generate WLAN traffic. Confirm that the WLAN traffic level, as displayed on the spectrum analyzer, is at lower amplitude than the radar detection threshold. Confirm that the displayed traffic is from the Master Device. For Master Device testing confirm that the displayed traffic does not include Slave Device traffic. For Slave Device testing confirm that the displayed traffic does not include Master Device traffic.

If a different setting of the Master Step Attenuator is required to meet the above conditions, perform a new System Calibration for the new Master Step Attenuator setting.

Test Setup



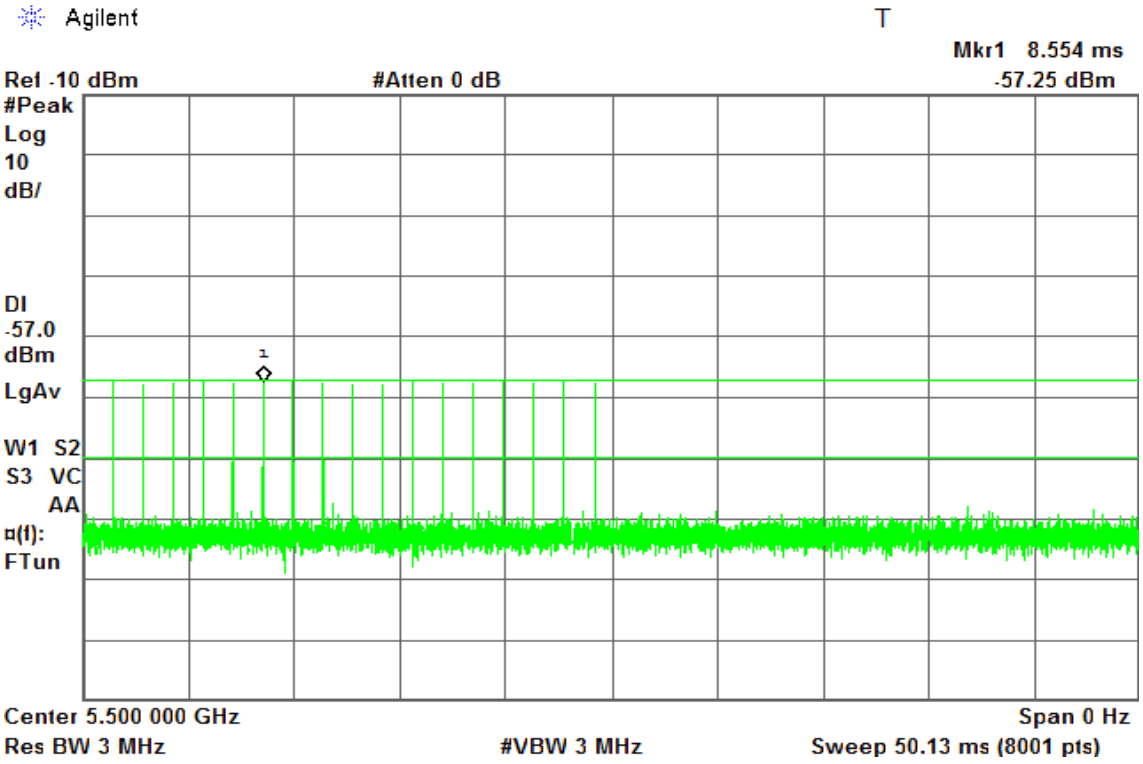
TEST RESULTS

No non-compliance noted

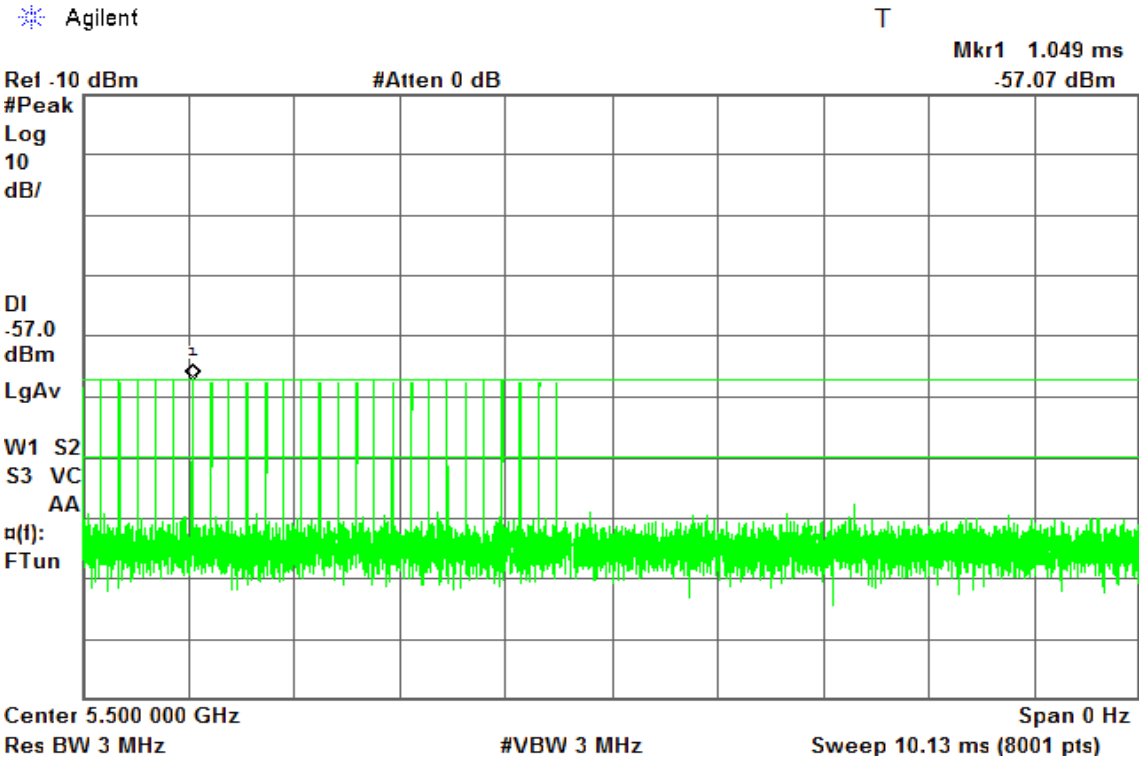
Test Plot

PLOTS OF RADAR WAVEFORMS

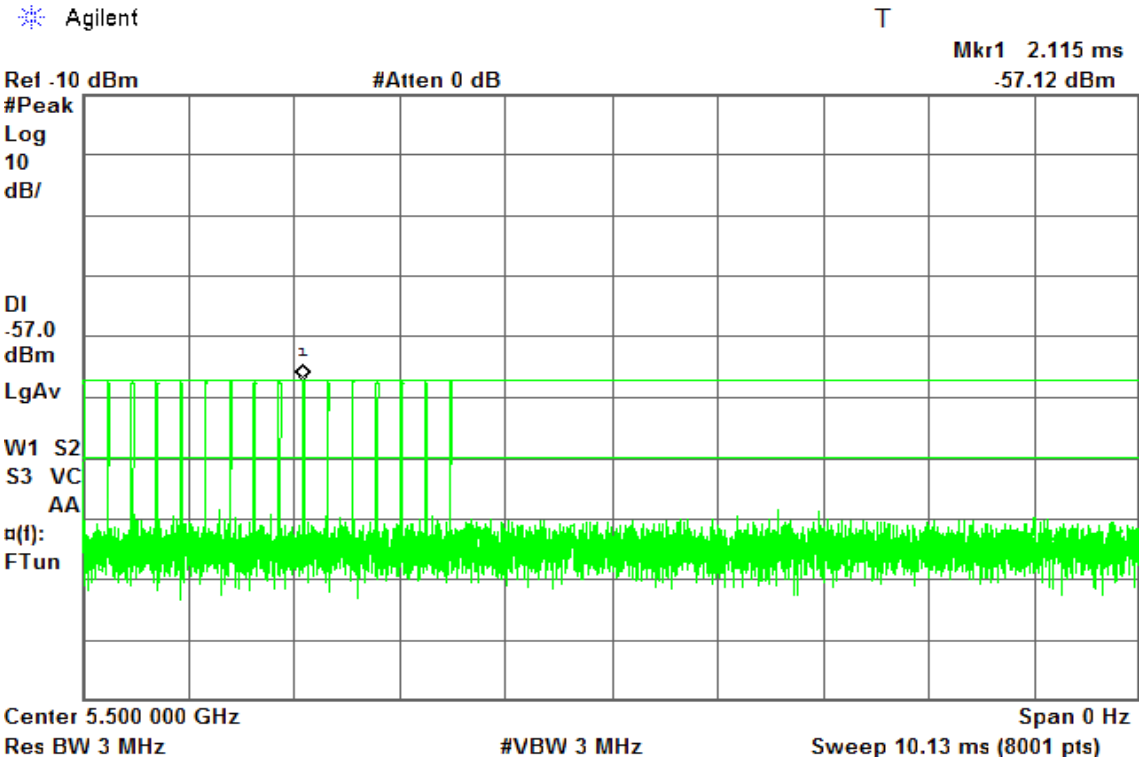
Sample of Short Pulse Radar Type 1



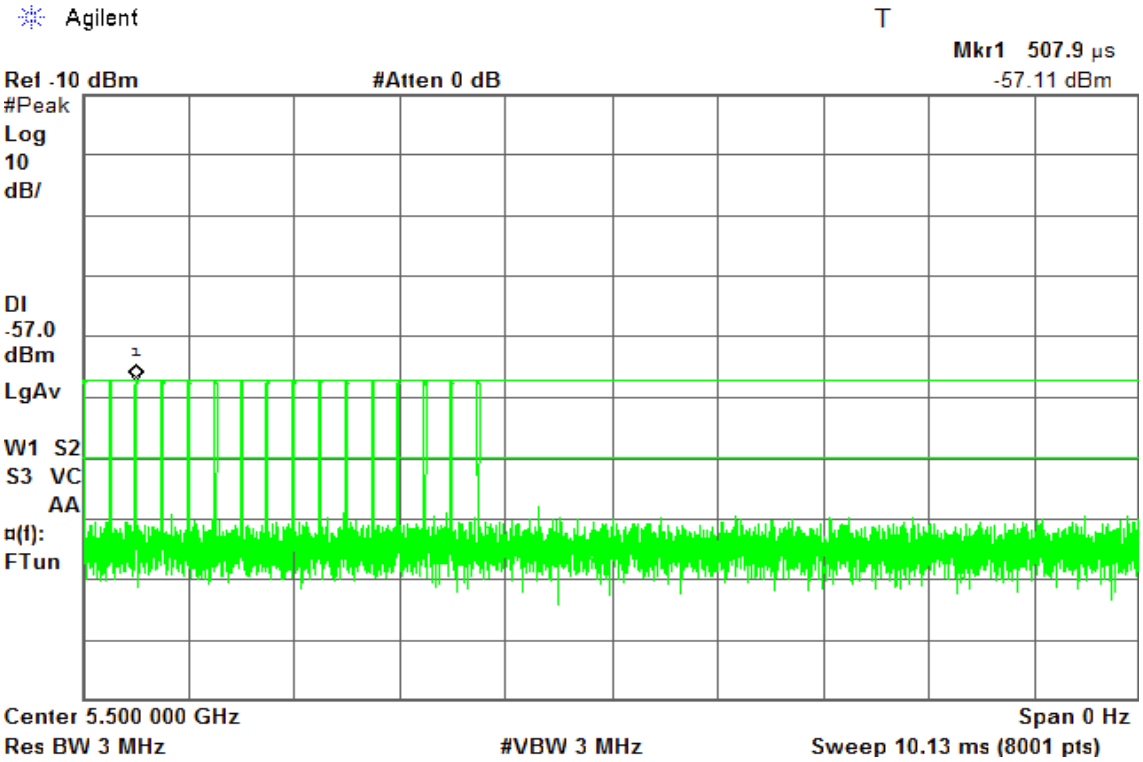
Sample of Short Pulse Radar Type 2



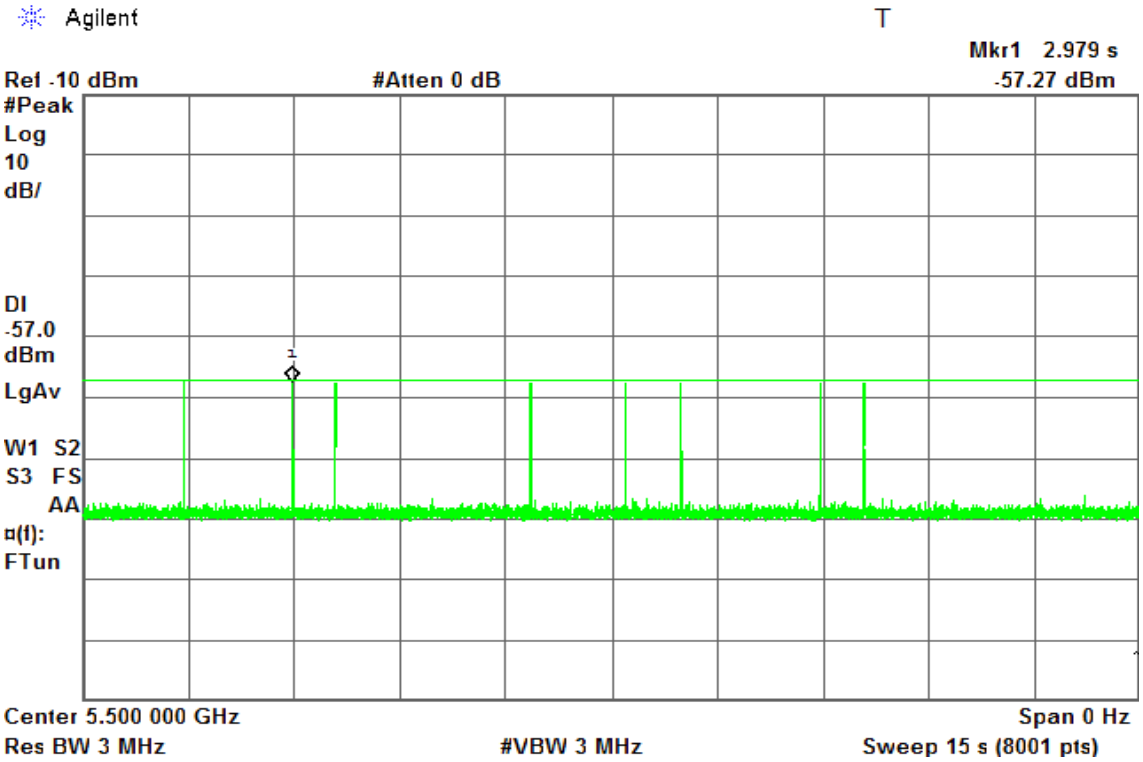
Sample of Short Pulse Radar Type 3



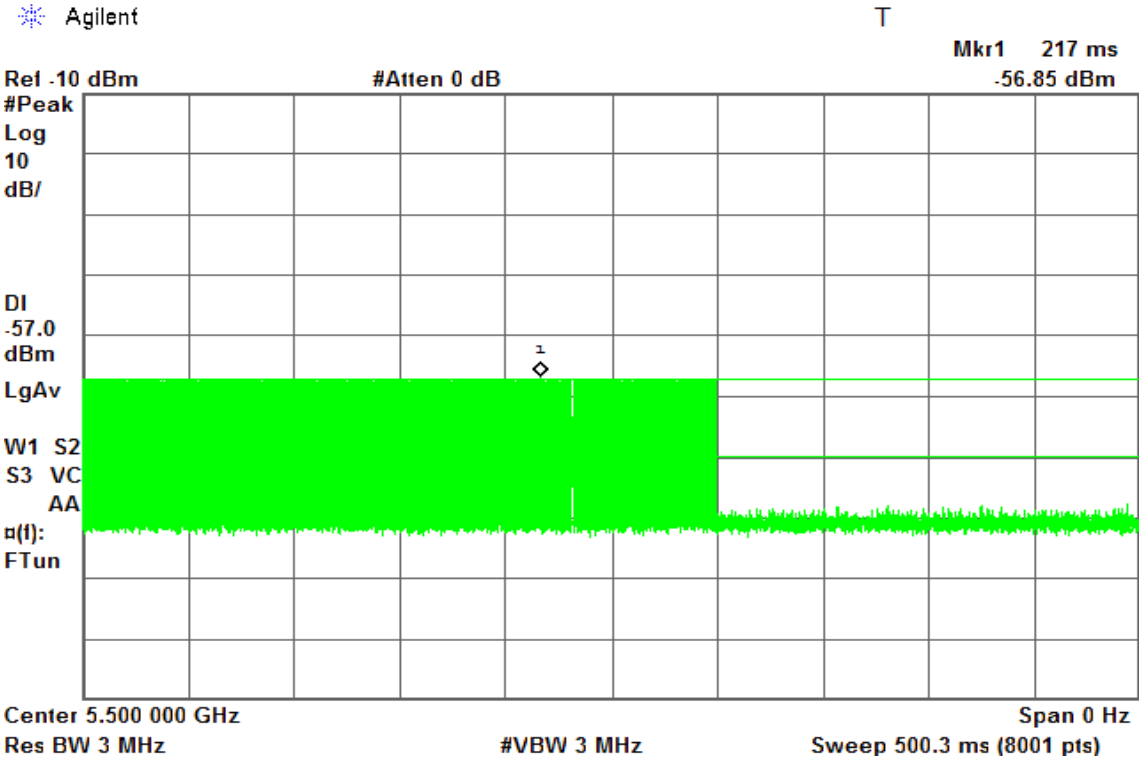
Sample of Short Pulse Radar Type 4

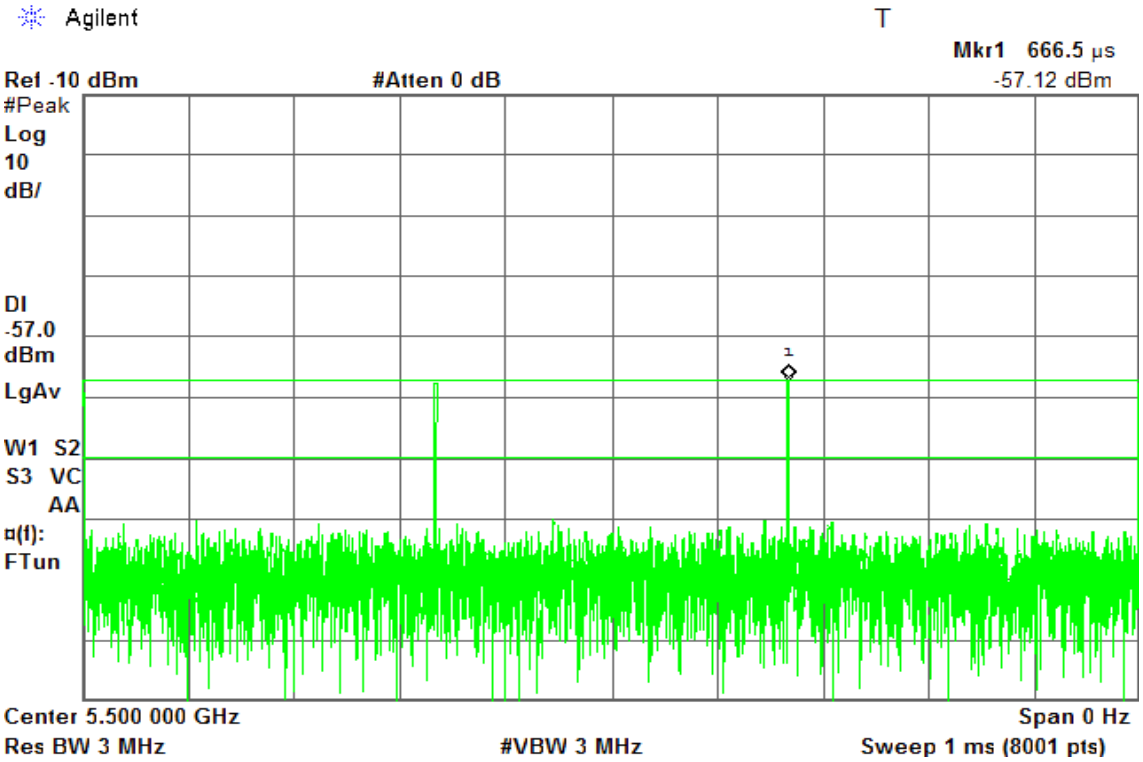


Sample of Long Pulse Radar Type 5



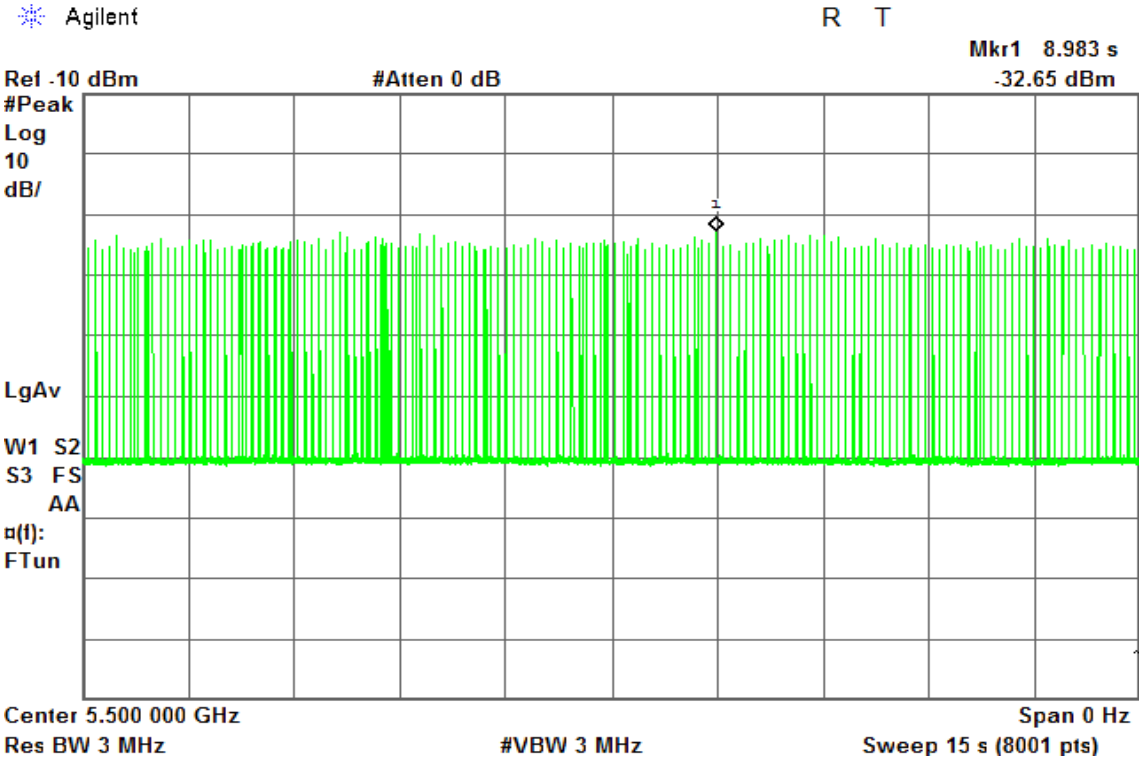
Sample of Frequency Hopping Radar Type 6



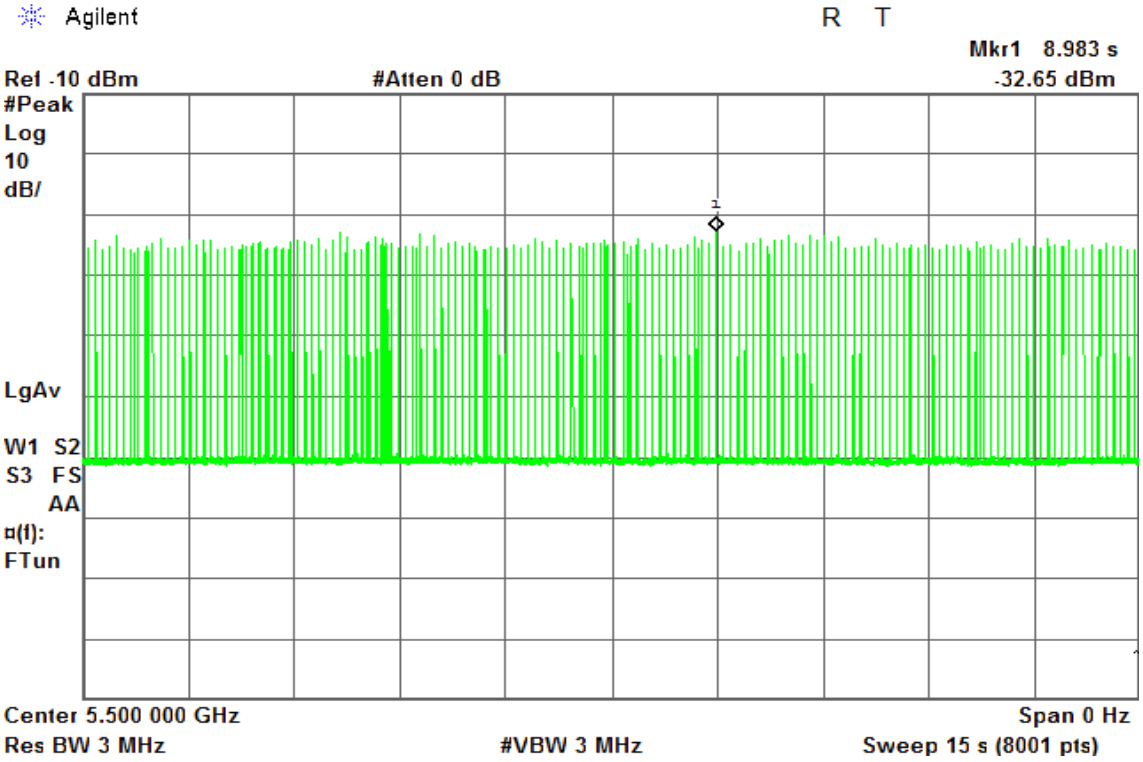


Plot of WLAN Traffic from Slave

IEEE 802.11n HT 20 MHz mode



IEEE 802.11n HT 40 MHz mode



TEST CHANNEL AND METHOD

All tests were performed at a channel center frequency of 5300 MHz utilizing a conducted test method.

CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

GENERAL REPORTING NOTES

The reference marker is set at the end of last radar pulse.

The delta marker is set at the end of the last WLAN transmission following the radar pulse. This delta is the channel move time.

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

(Number of analyzer bins showing transmission) * (dwell time per bin)

The observation period over which the aggregate time is calculated

Begins at (Reference Marker + 200 msec) and

Ends no earlier than (Reference Marker + 10 sec).

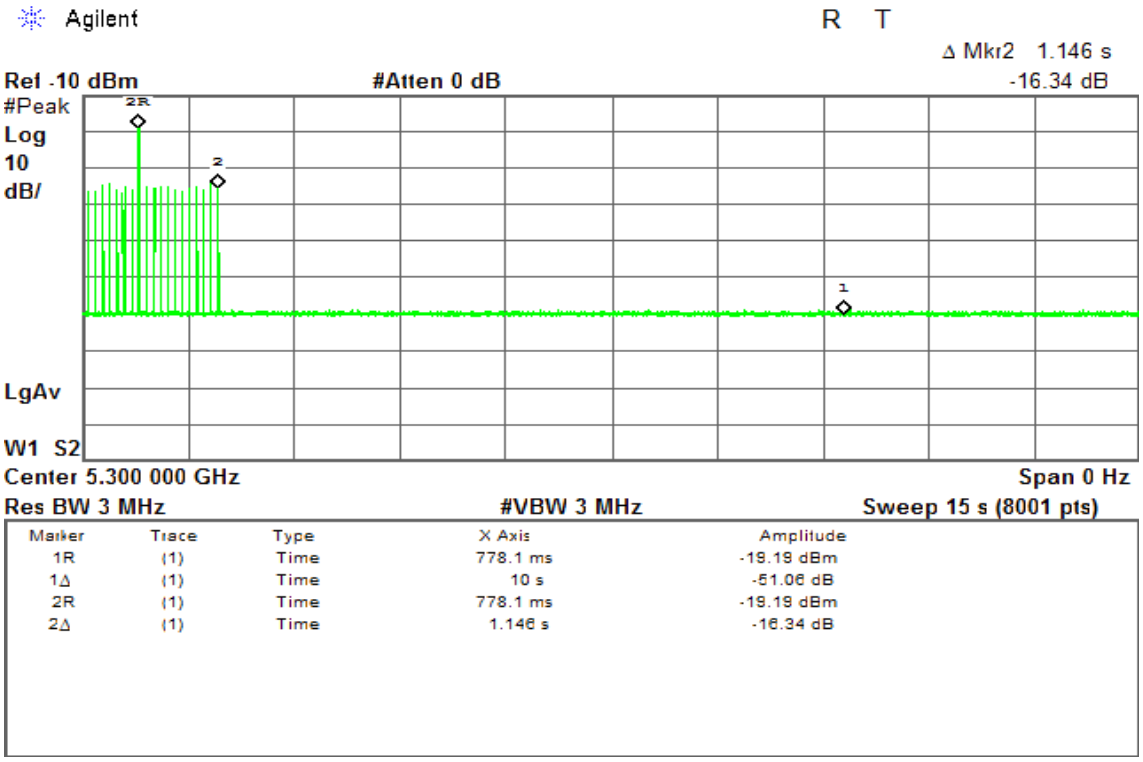
LOW BAND RESULTS

IEEE 802.11n HT 20 MHz Channel mode

Type 1 Channel Move Time Results

No non-compliance noted.

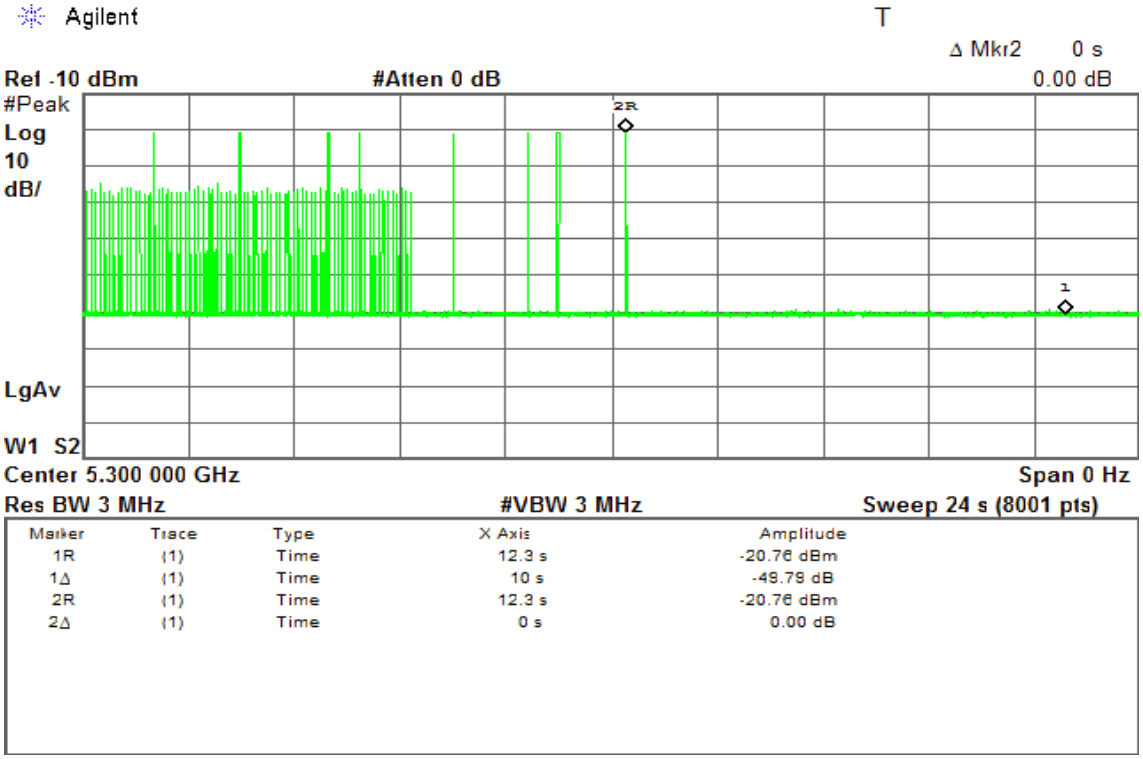
Channel Move Time (s)	Limit (s)
1.146	10



Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0	10



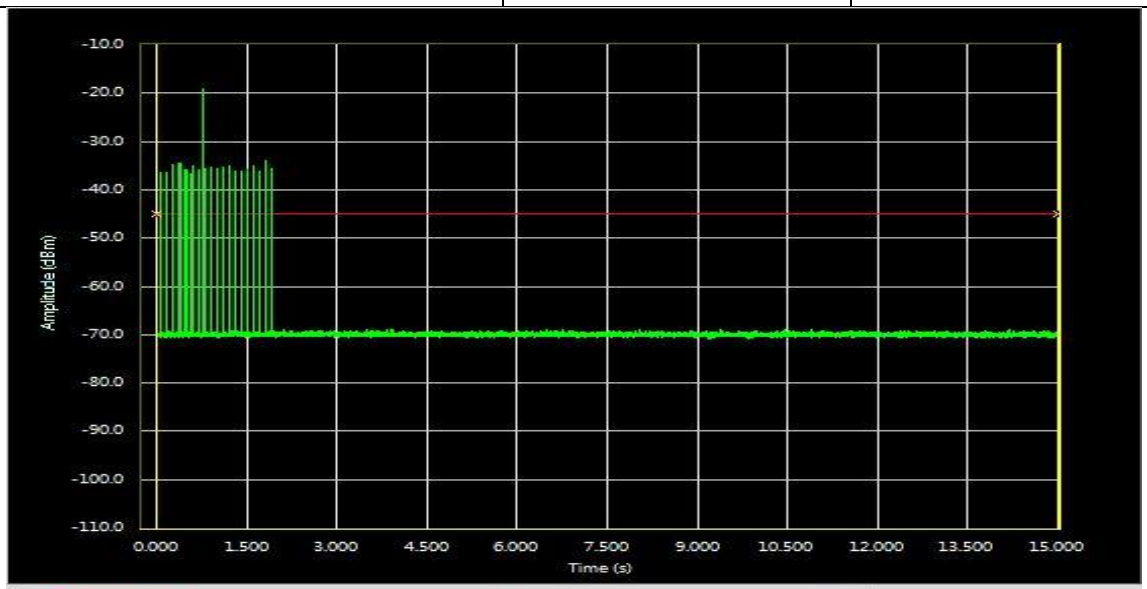
IEEE 802.11n HT 20 MHz Channel mode

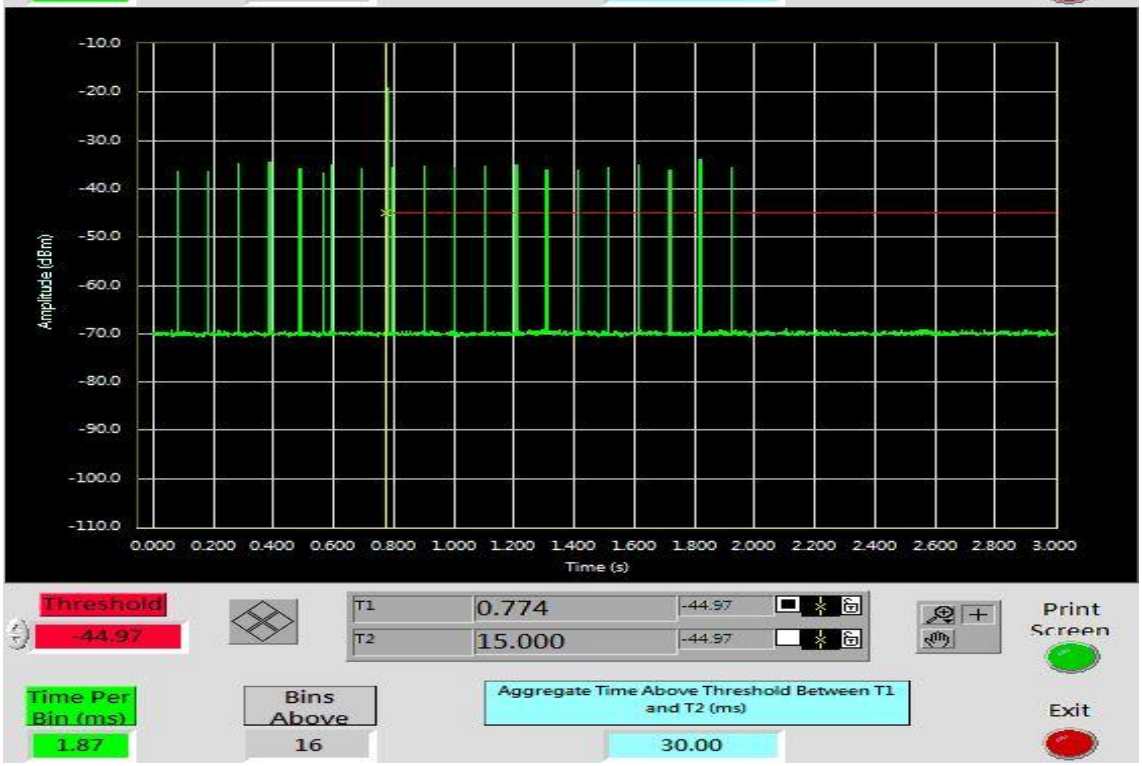
Type 1 Channel Closing Transmission Time Results

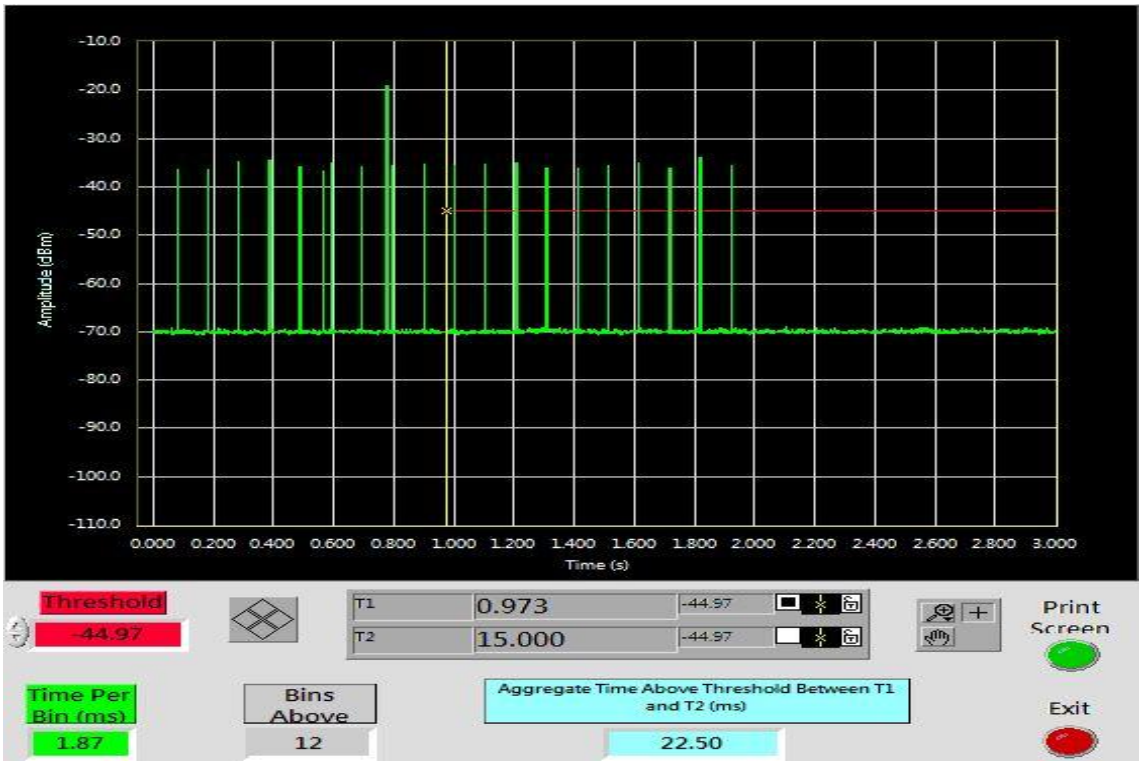
No non-compliance noted.

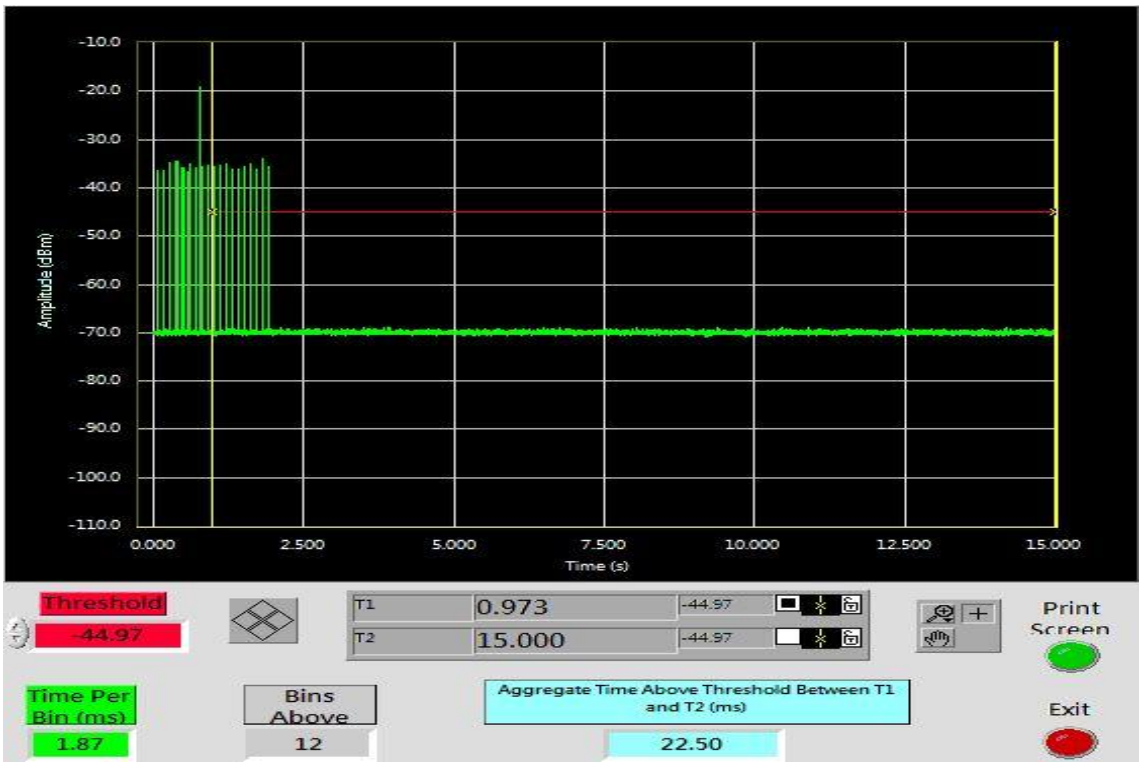
For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
22.50	60	-37.50



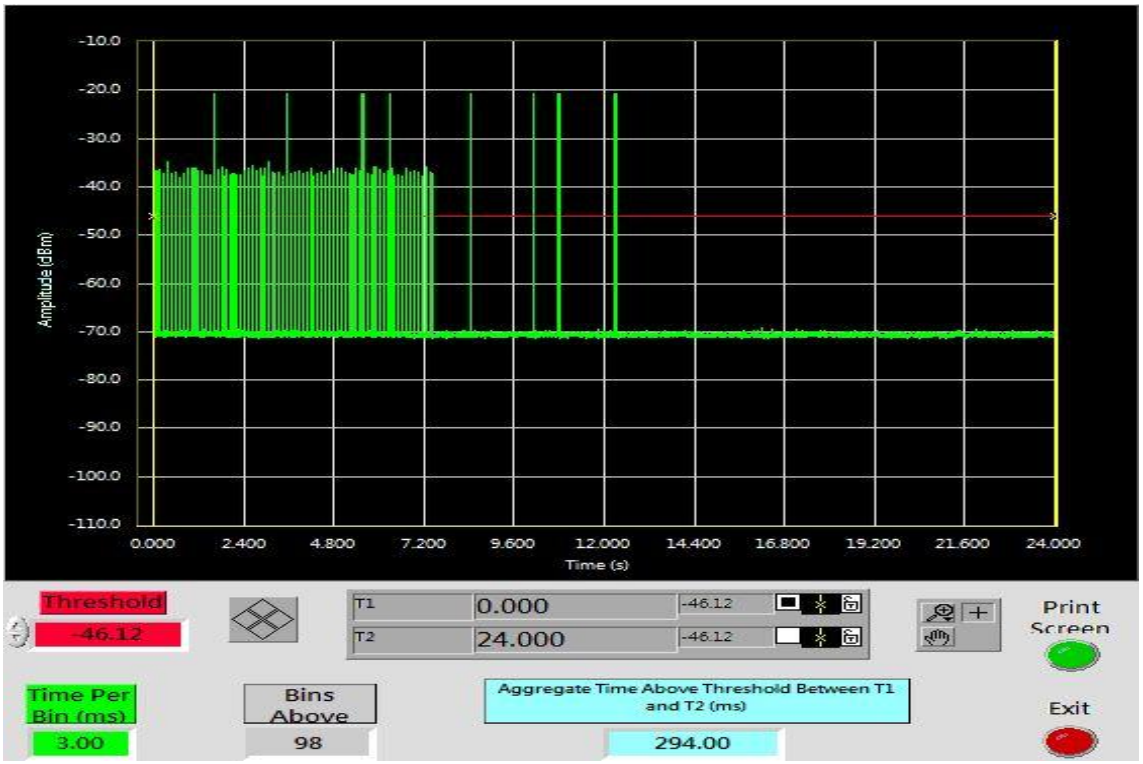


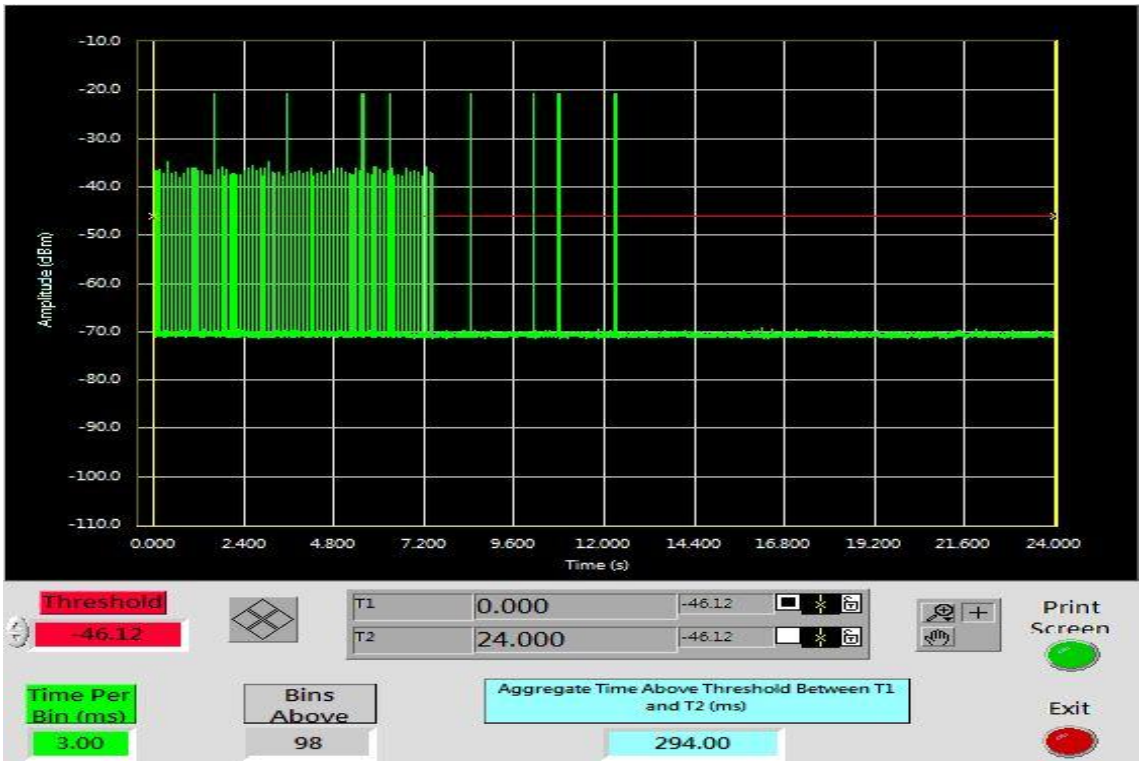

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-44.97
T1
0.973
-44.97
T2
15.000
-44.97
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
12
Aggregate Time Above Threshold Between T1 and T2 (ms)
22.50

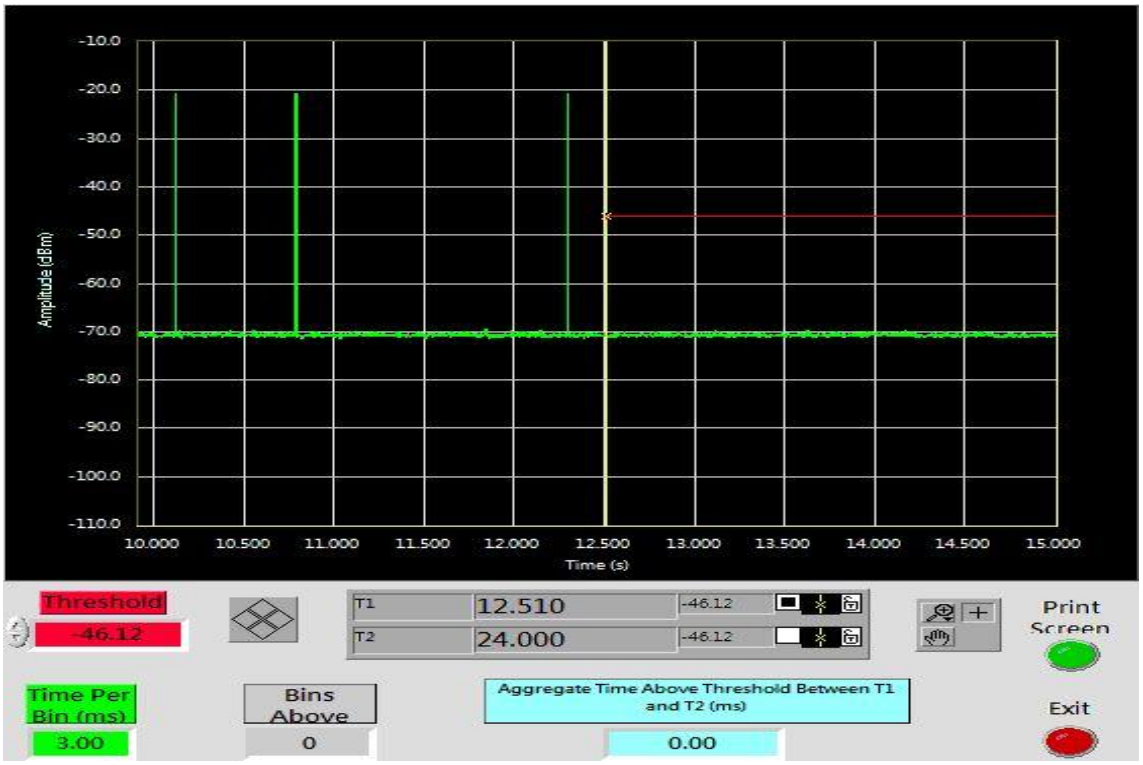

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-44.97
T1
0.973
-44.97
T2
15.000
-44.97
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
12
Aggregate Time Above Threshold Between T1 and T2 (ms)
22.50

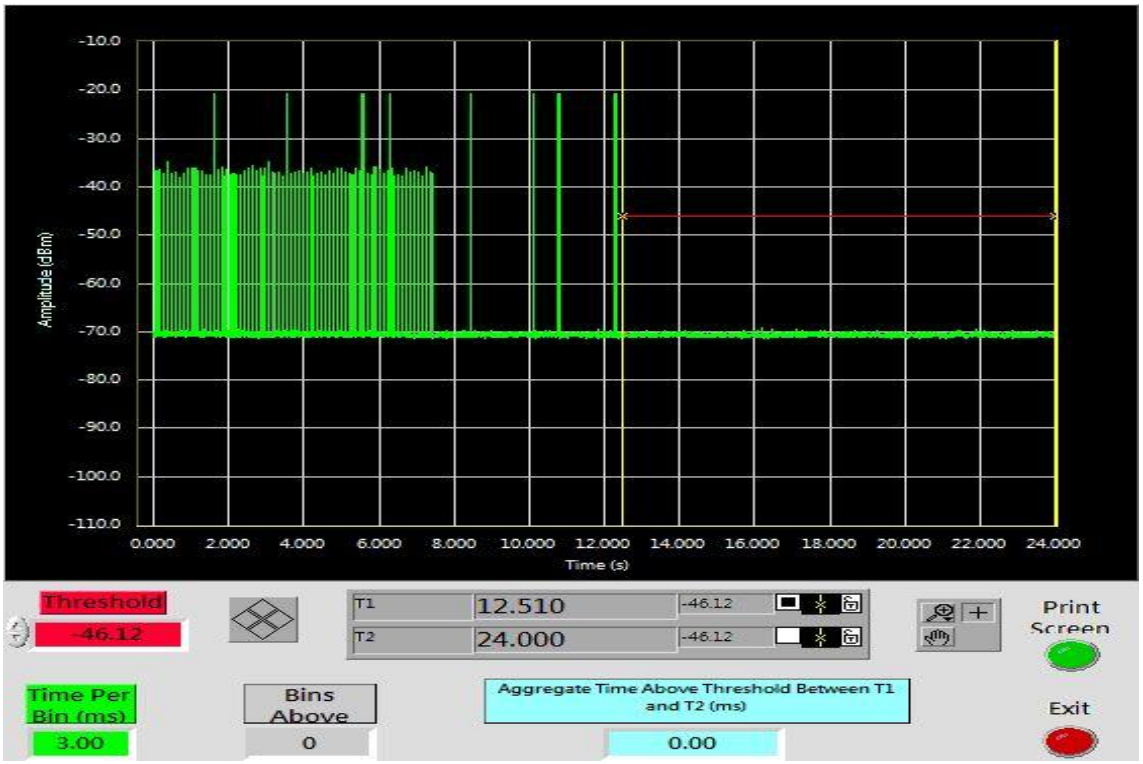
For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0	60	-60






-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
Time (s)
Threshold
-46.12
T1
12.510
-46.12
T2
24.000
-46.12
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

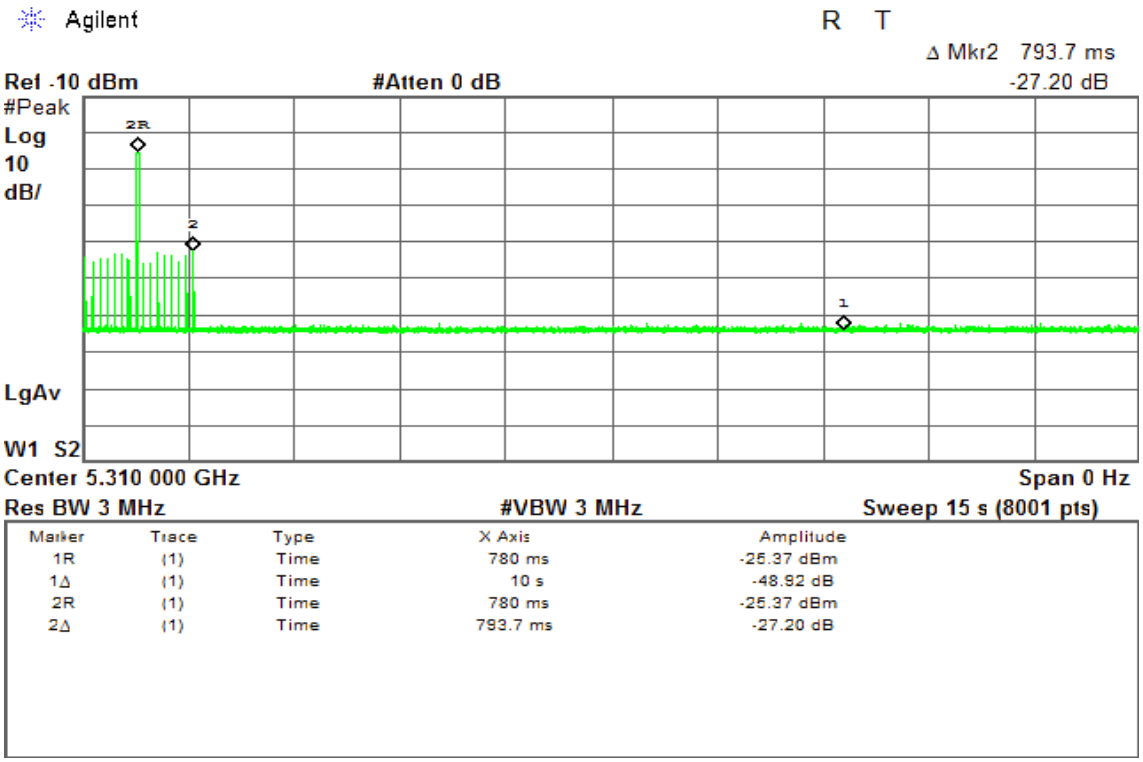

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-46.12
T1
12.510
-46.12
T2
24.000
-46.12
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

IEEE 802.11n HT 40 MHz mode

Type 1 Channel Move Time Results

No non-compliance noted.

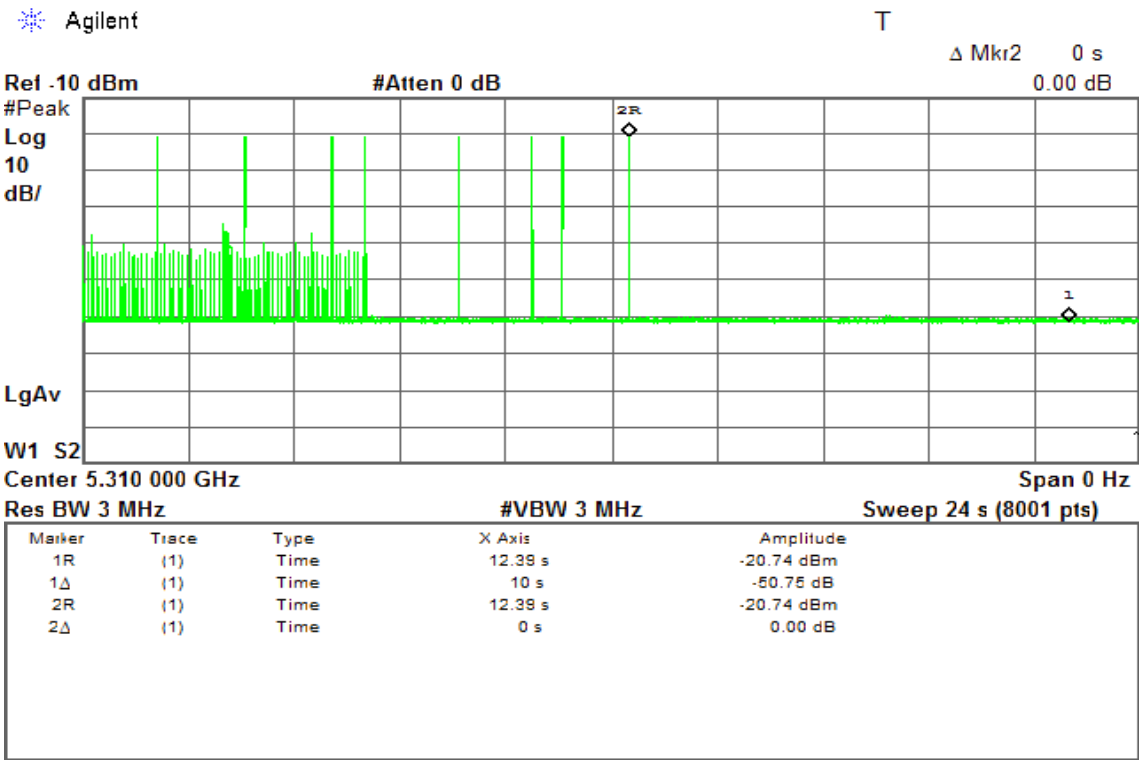
Channel Move Time (ms)	Limit (s)
793.7	10



Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0	10



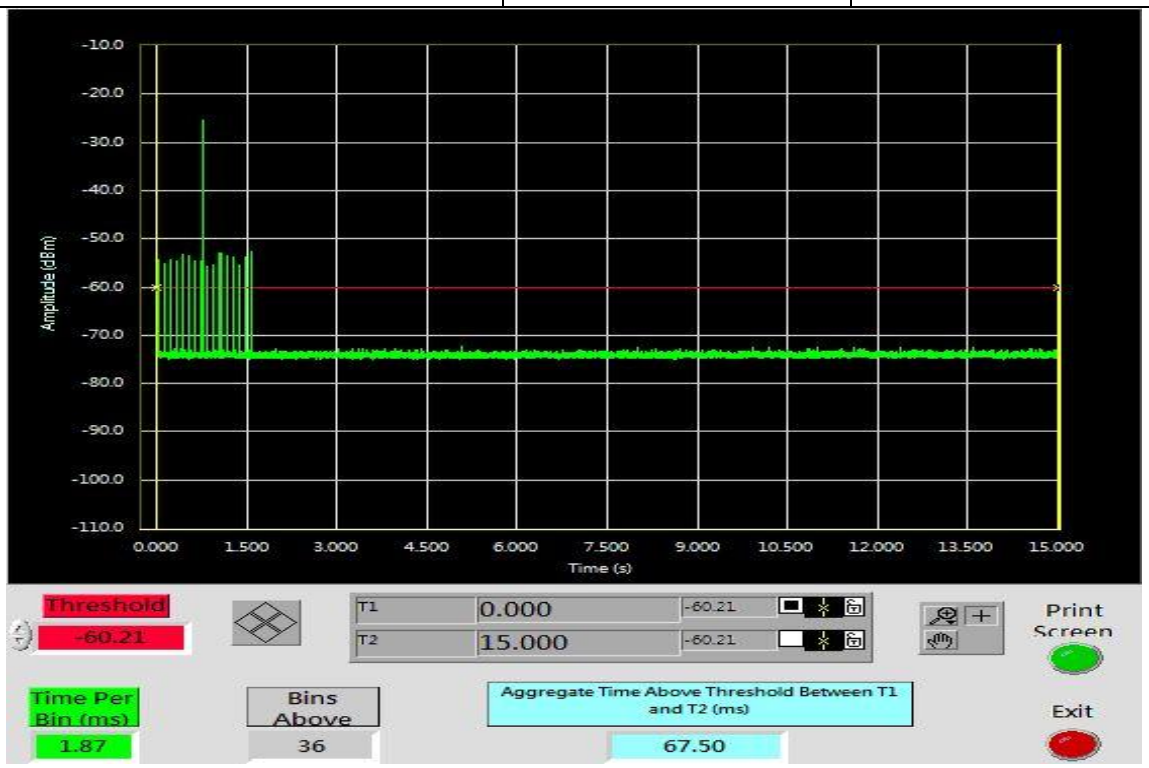
IEEE 802.11n HT 40 MHz mode

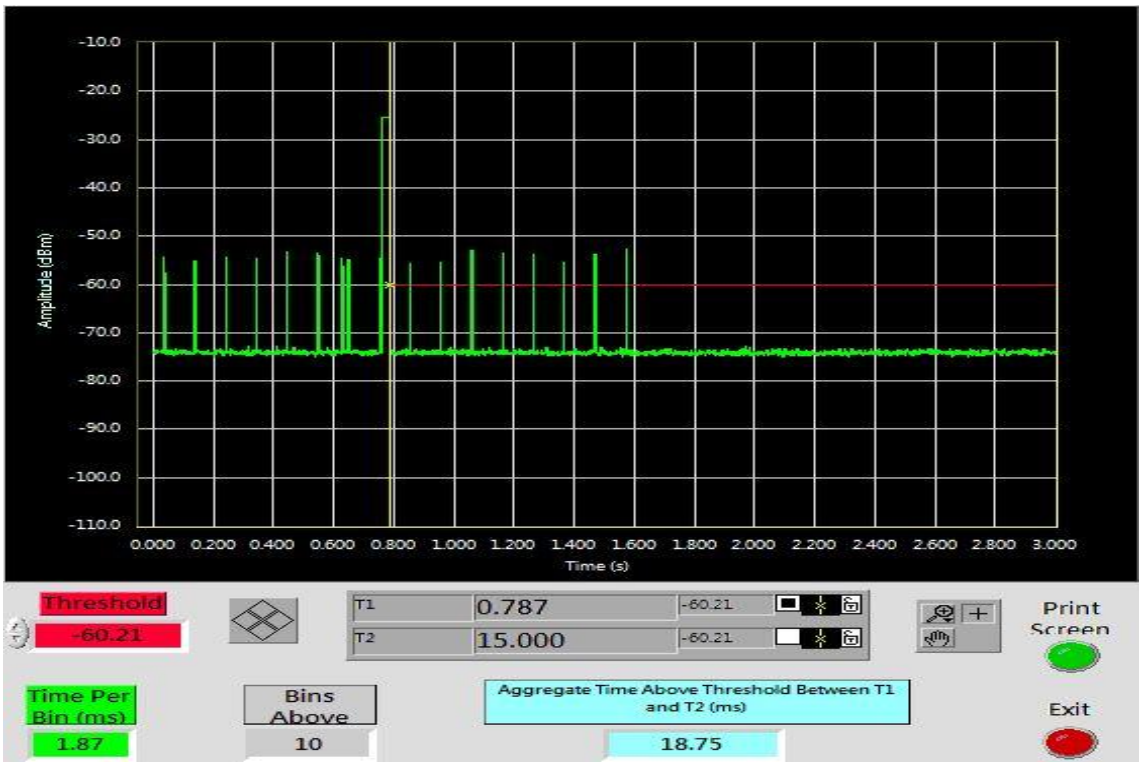
Type 1 Channel Closing Transmission Time Results

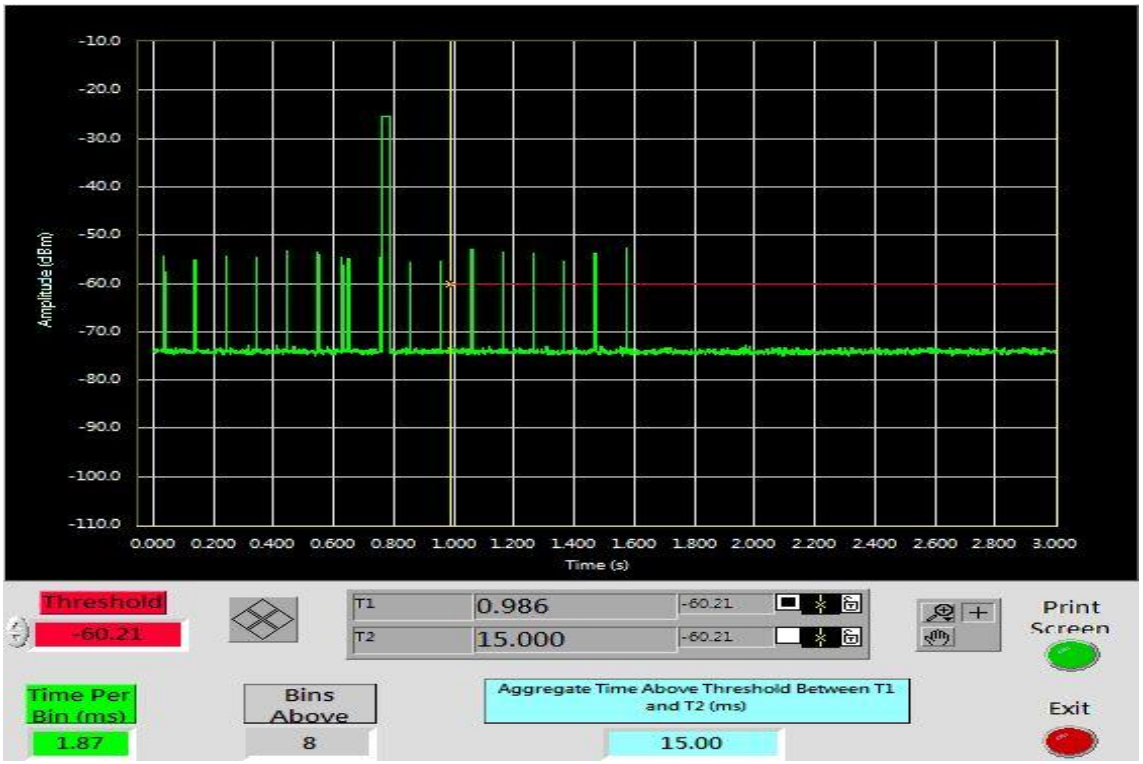
No non-compliance noted.

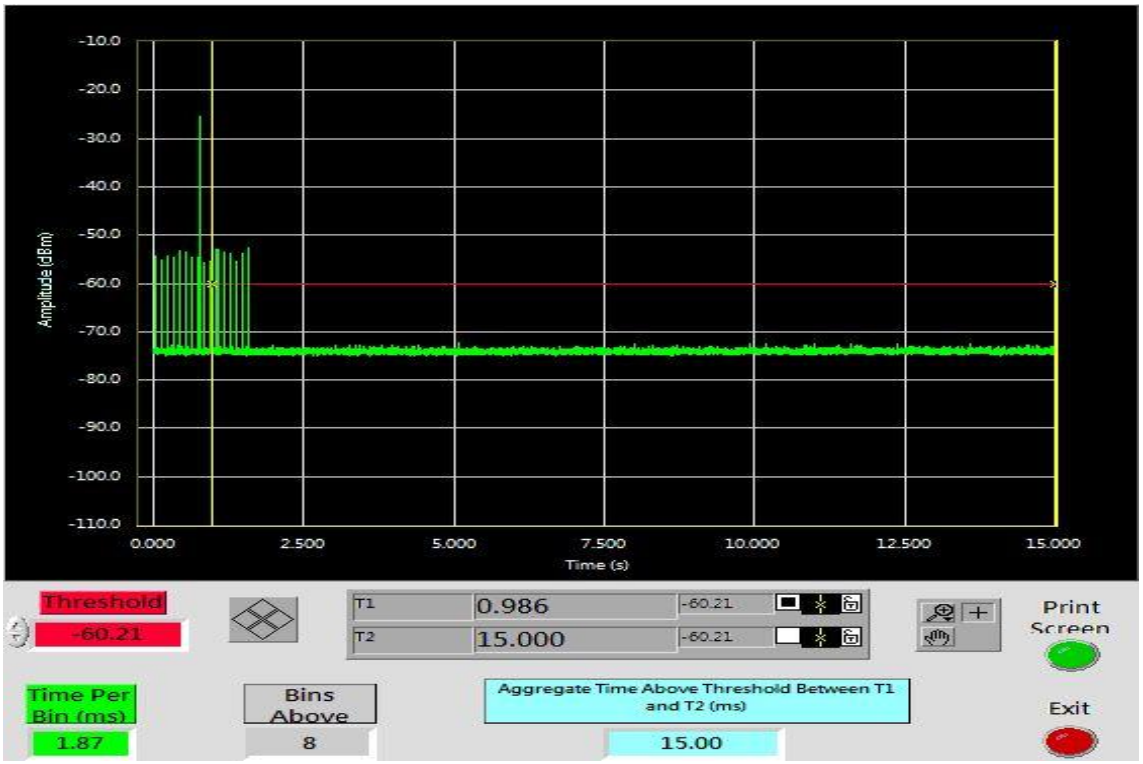
For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
15	60	-45



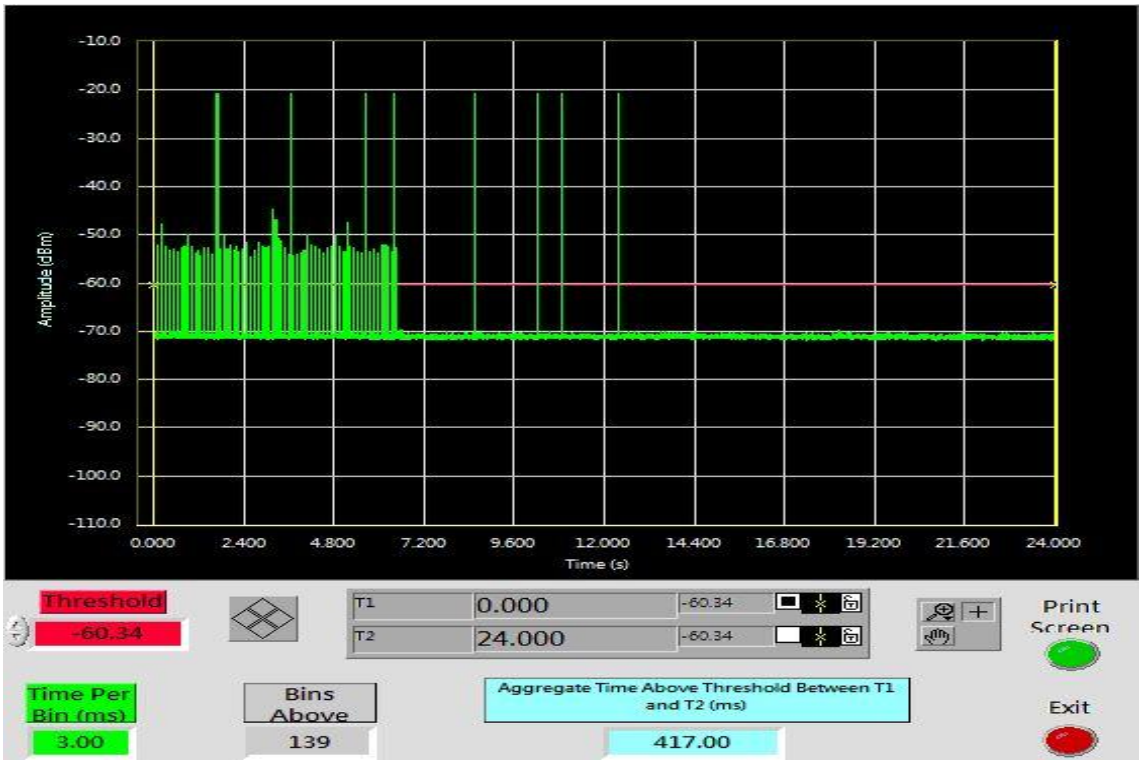


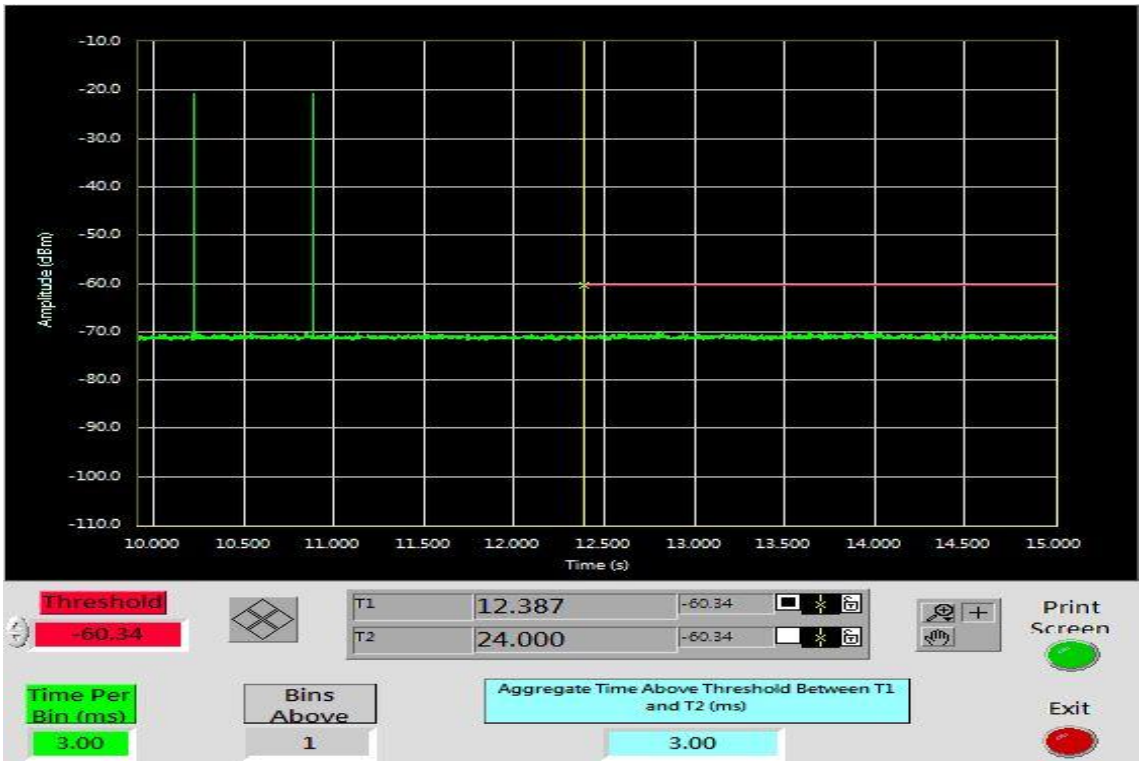

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-60.21
T1
0.986
-60.21
T2
15.000
-60.21
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
8
Aggregate Time Above Threshold Between T1 and T2 (ms)
15.00

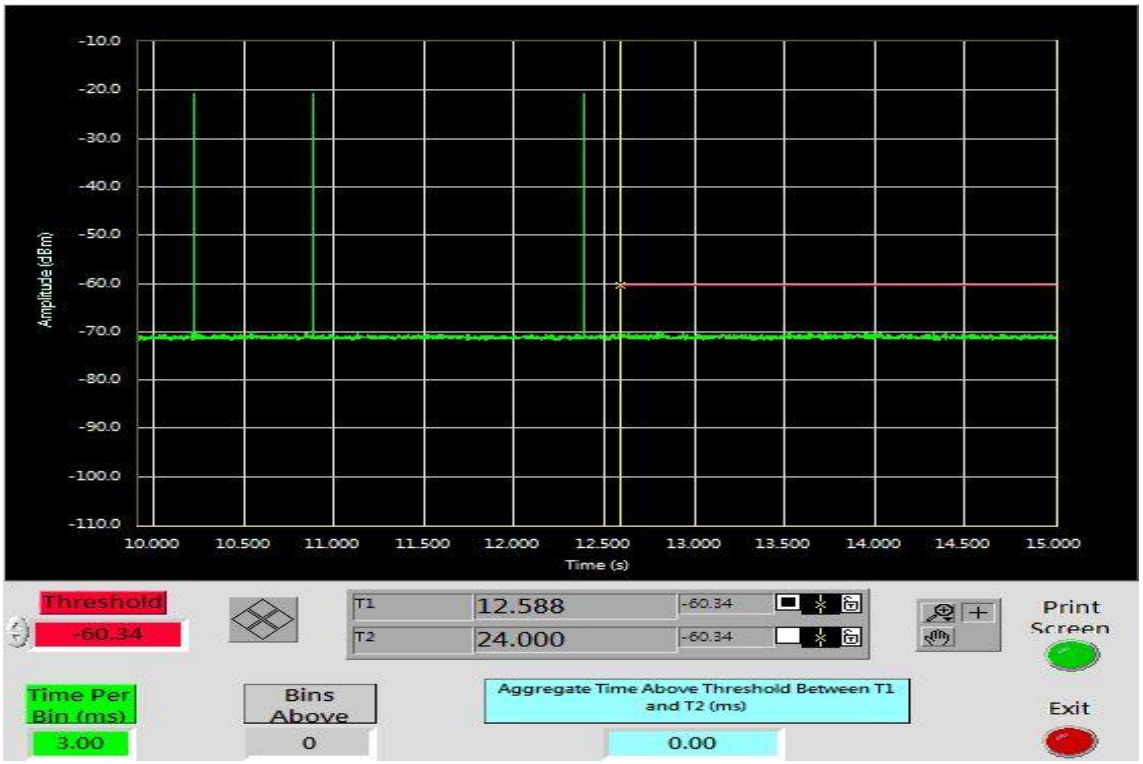

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-60.21
T1
0.986
-60.21
T2
15.000
-60.21
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
8
Aggregate Time Above Threshold Between T1 and T2 (ms)
15.00

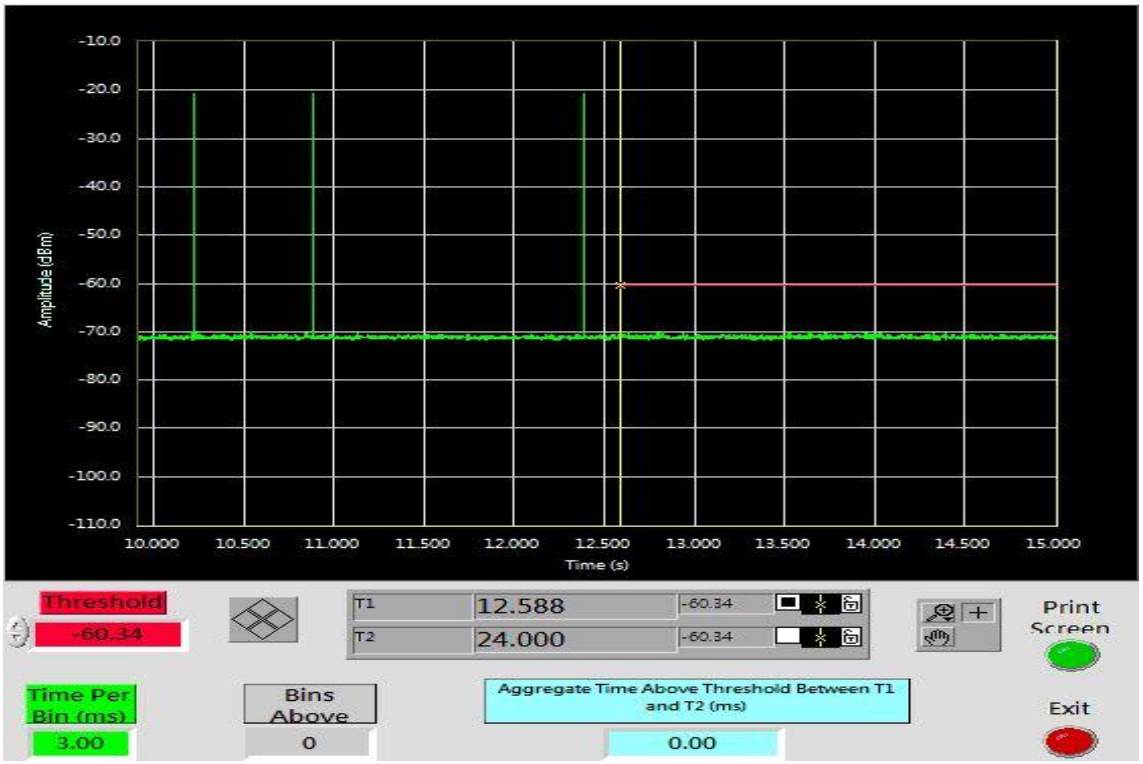
For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0	60	-60






-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
Time (s)
Threshold
-60.34
T1
12.588
-60.34
T2
24.000
-60.34
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit


-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
Time (s)
Threshold
-60.34
T1
12.588
-60.34
T2
24.000
-60.34
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

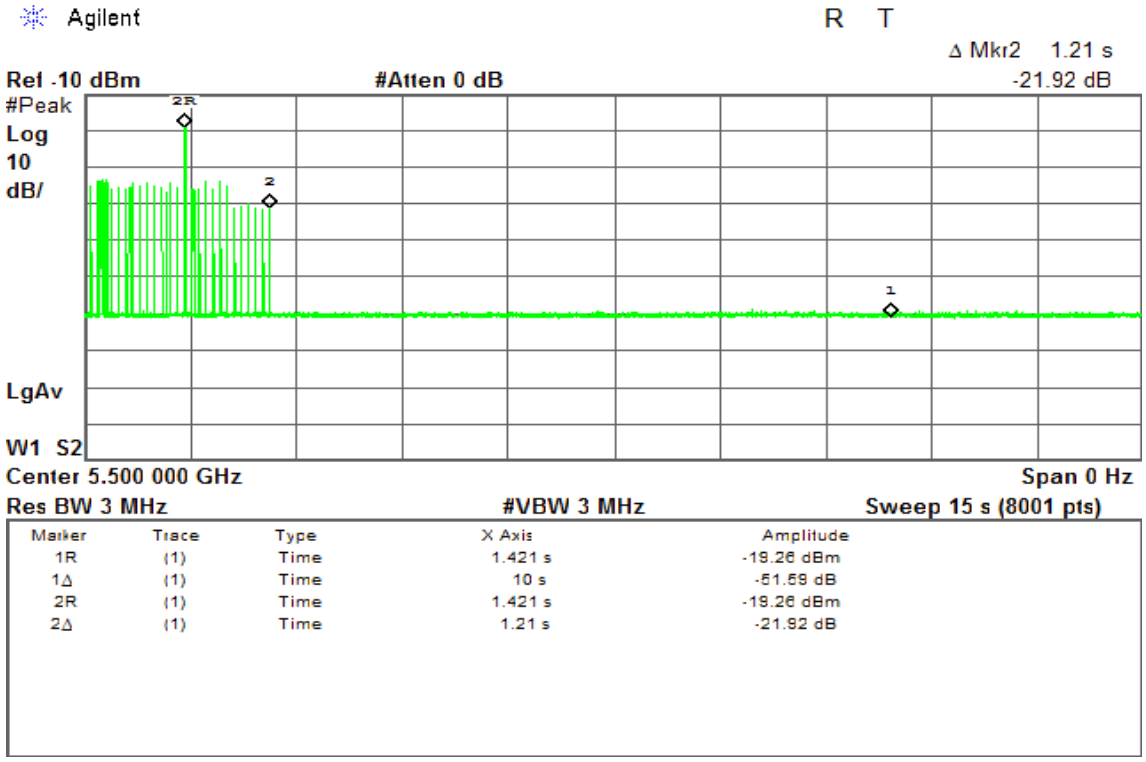
HIGH BAND RESULTS

IEEE 802.11n HT 20 MHz Channel mode

Type 1 Channel Move Time Results

No non-compliance noted.

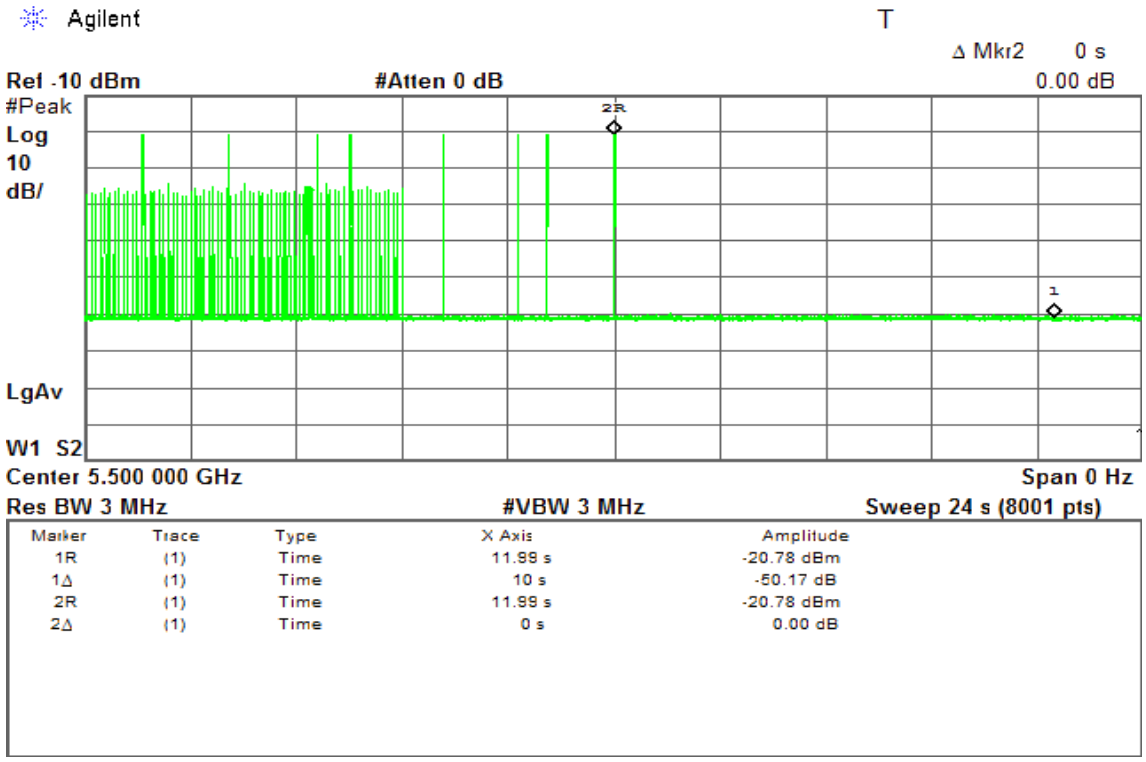
Channel Move Time (s)	Limit (s)
1.21	10



Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0	10



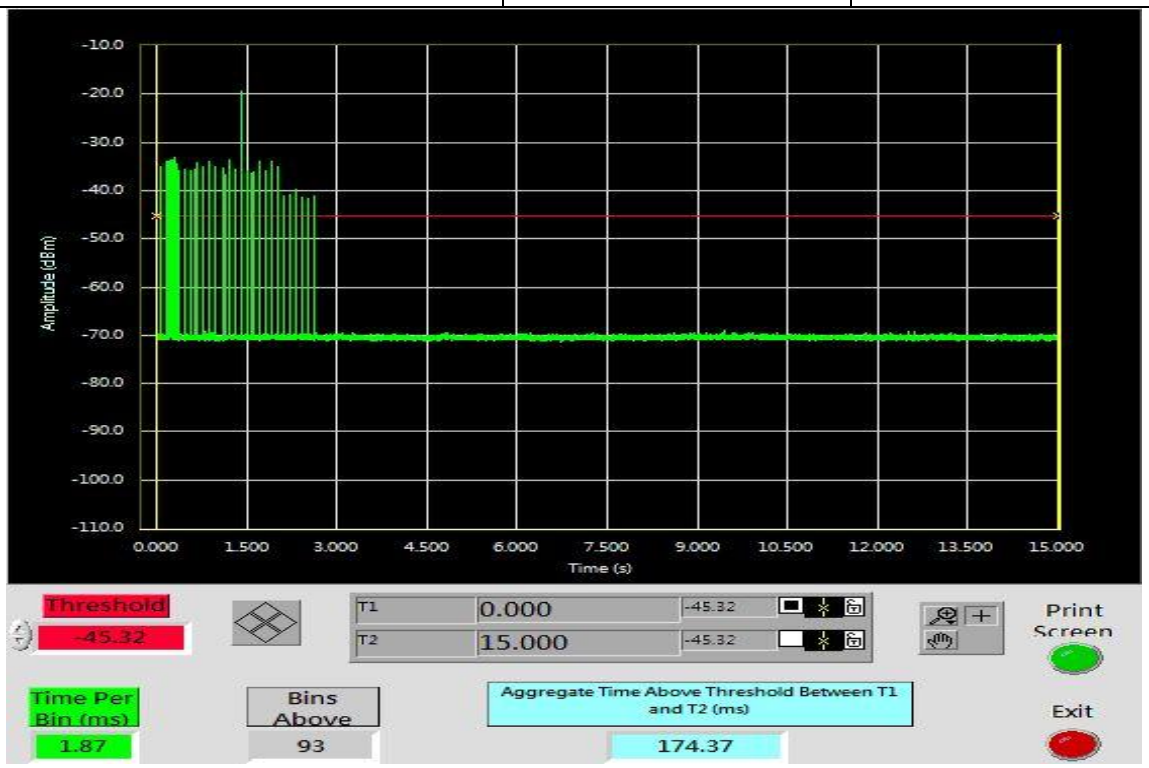
IEEE 802.11n HT 20 MHz Channel mode

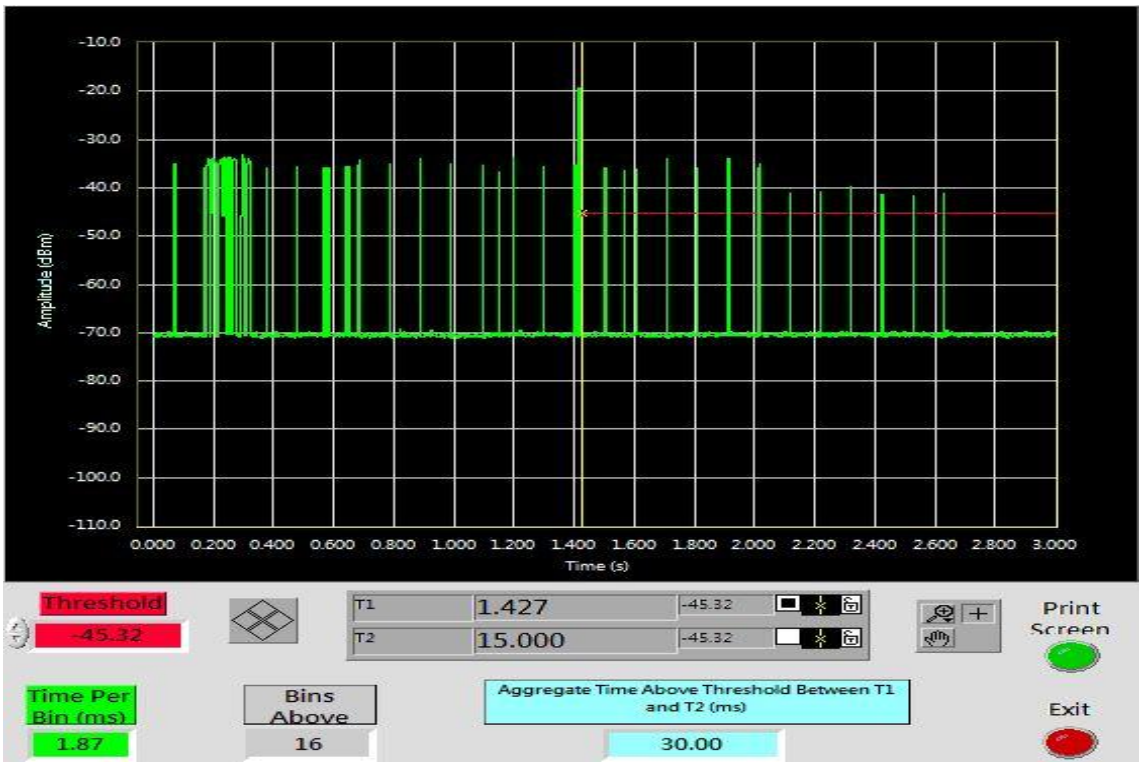
Type 1 Channel Closing Transmission Time Results

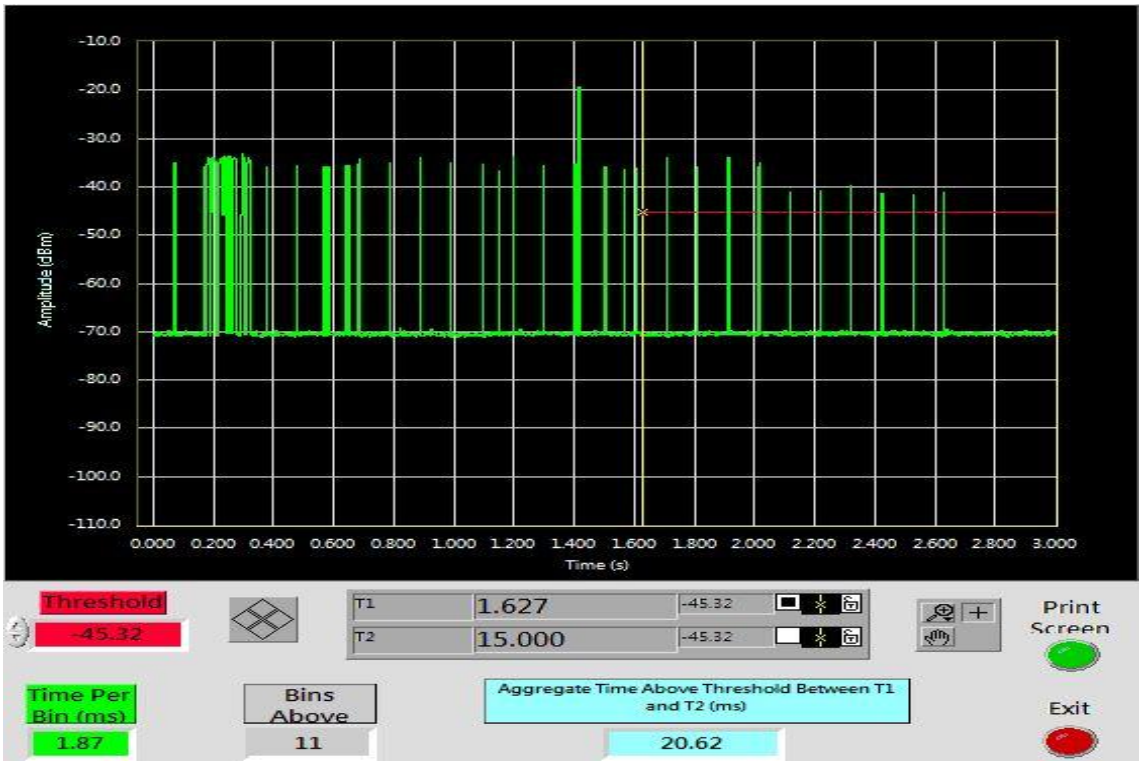
No non-compliance noted.

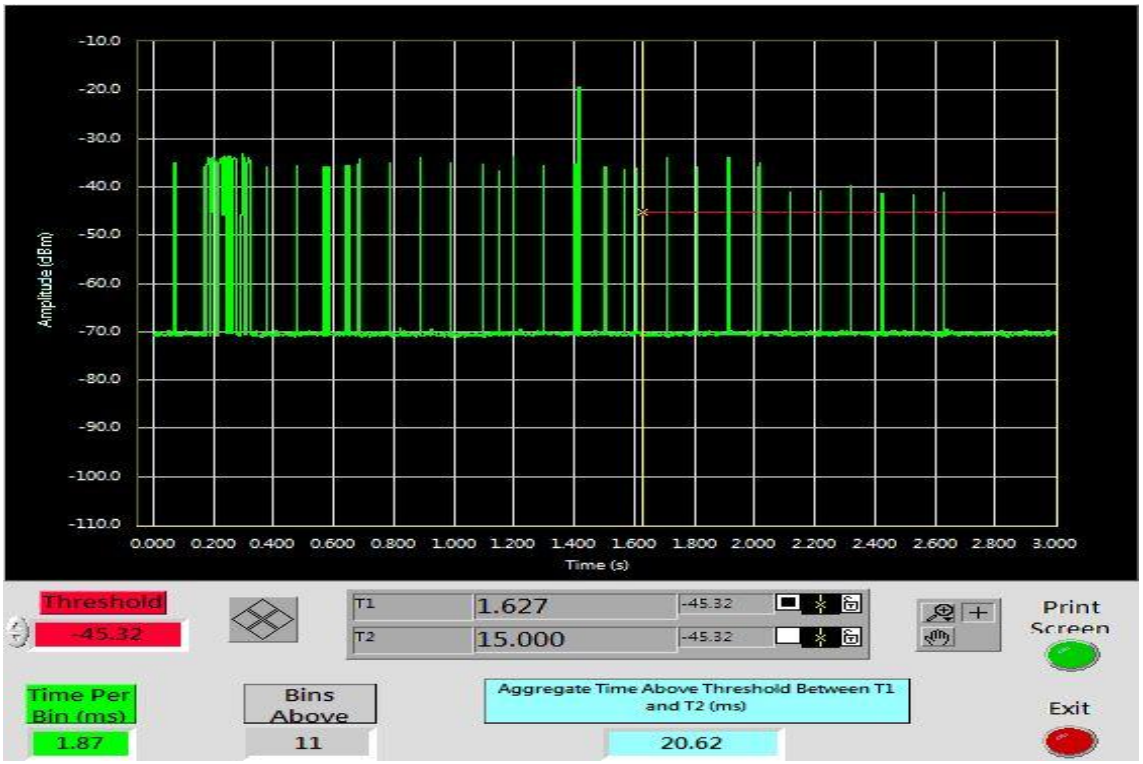
For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
20.62	60	-39.38



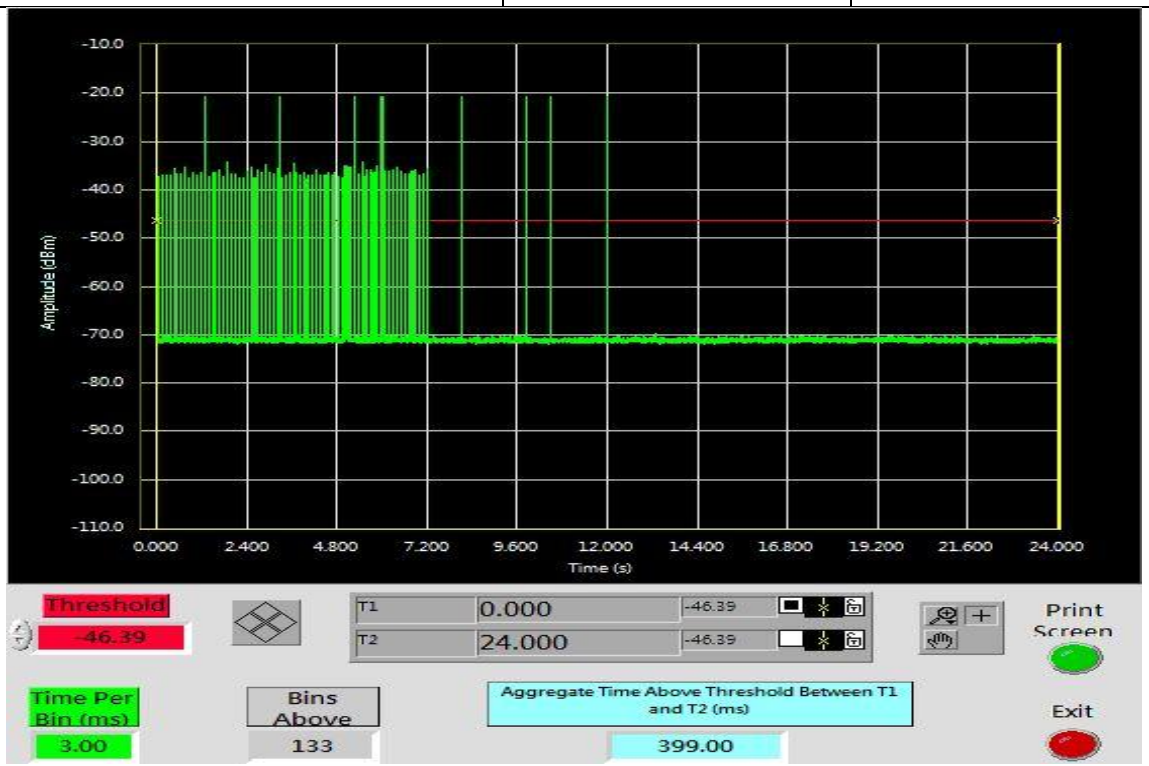


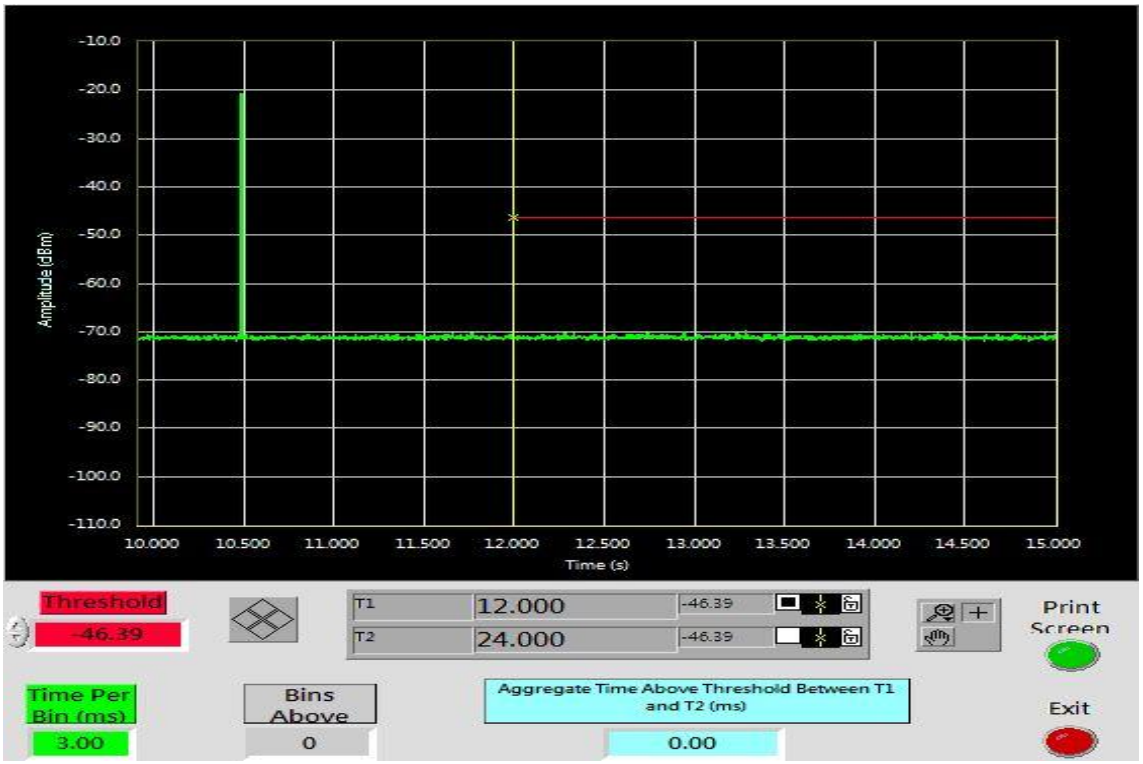

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-45.32
T1
1.627
-45.32
T2
15.000
-45.32
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
11
Aggregate Time Above Threshold Between T1 and T2 (ms)
20.62

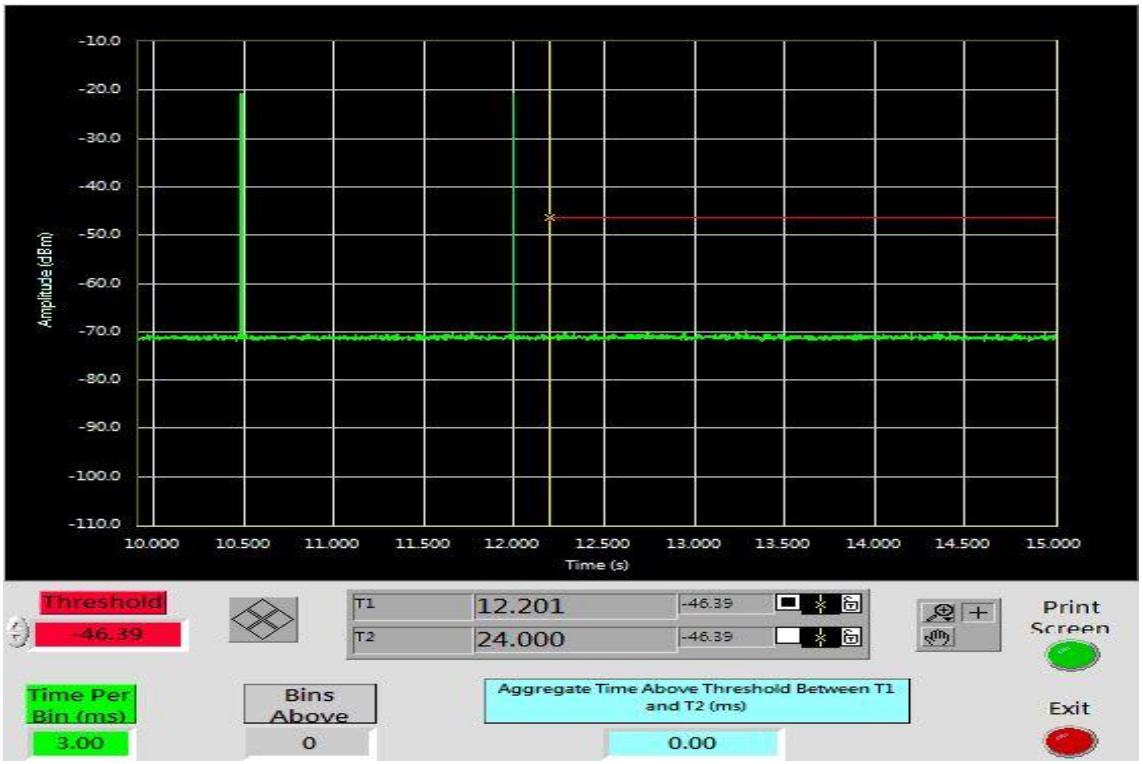

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-45.32
T1
1.627
-45.32
T2
15.000
-45.32
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
11
Aggregate Time Above Threshold Between T1 and T2 (ms)
20.62

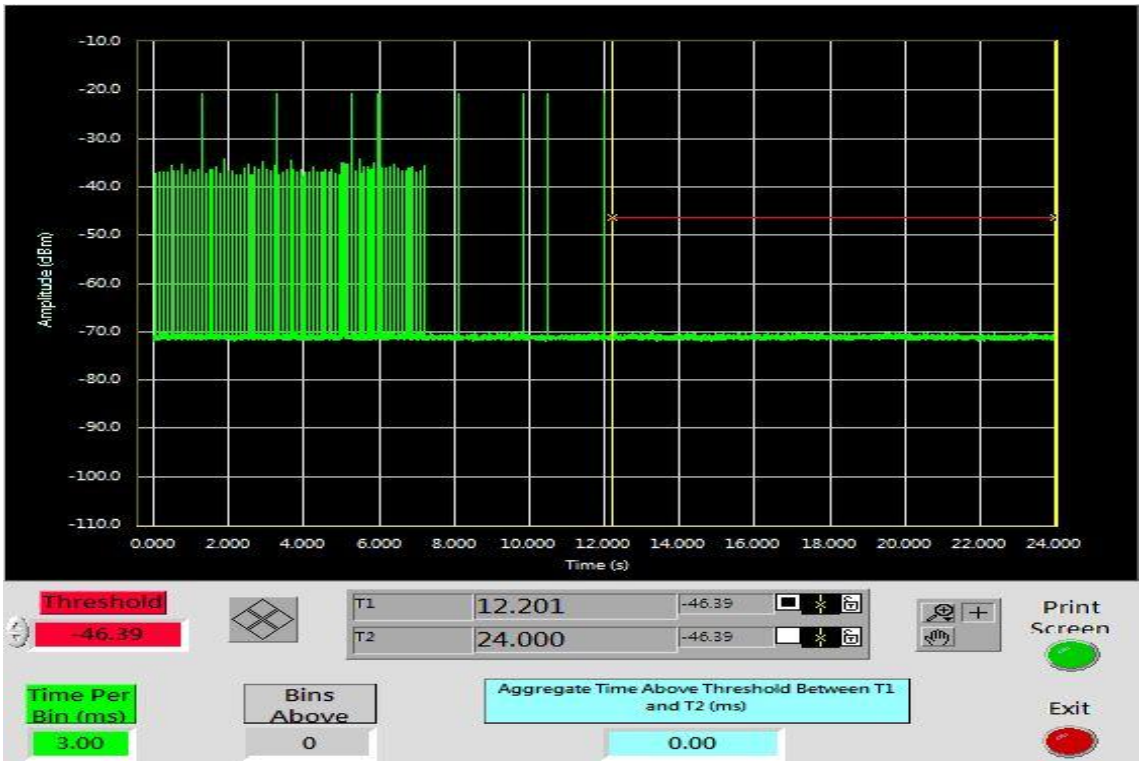
For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0	60	-60






-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
Time (s)
Threshold
-46.39
T1
12.201
-46.39
T2
24.000
-46.39
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

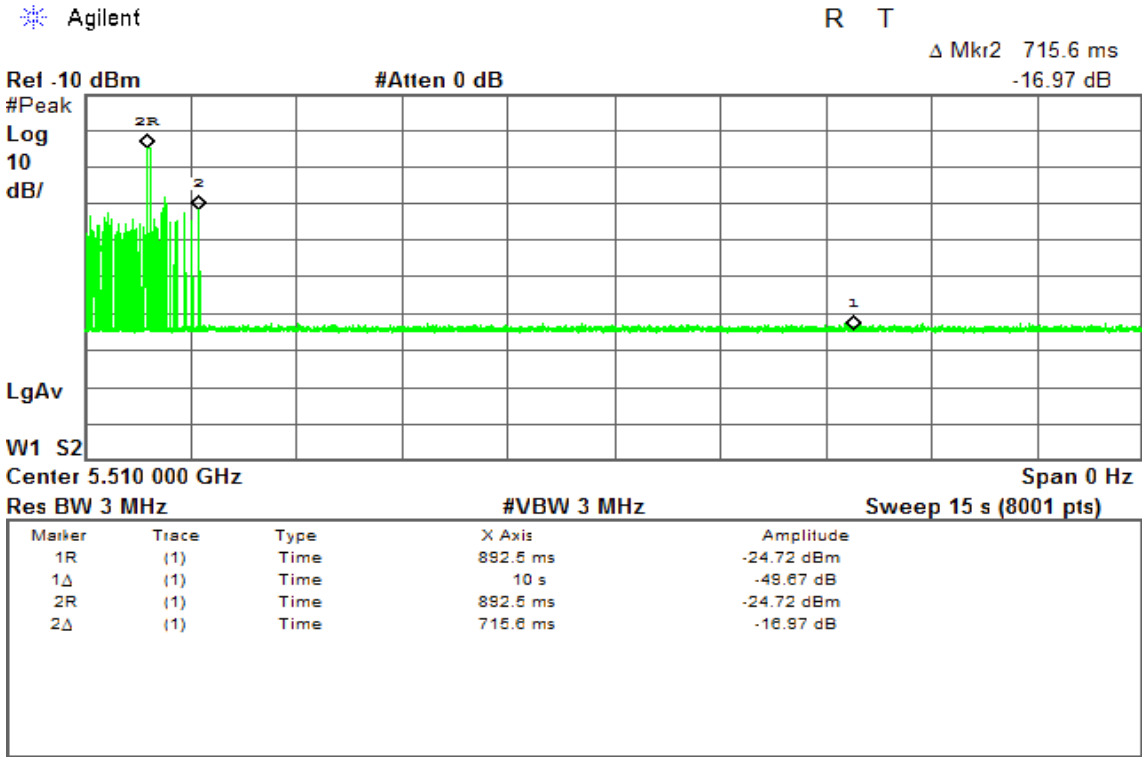

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-46.39
T1
12.201
-46.39
T2
24.000
-46.39
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

IEEE 802.11n HT 40 MHz mode

Type 1 Channel Move Time Results

No non-compliance noted.

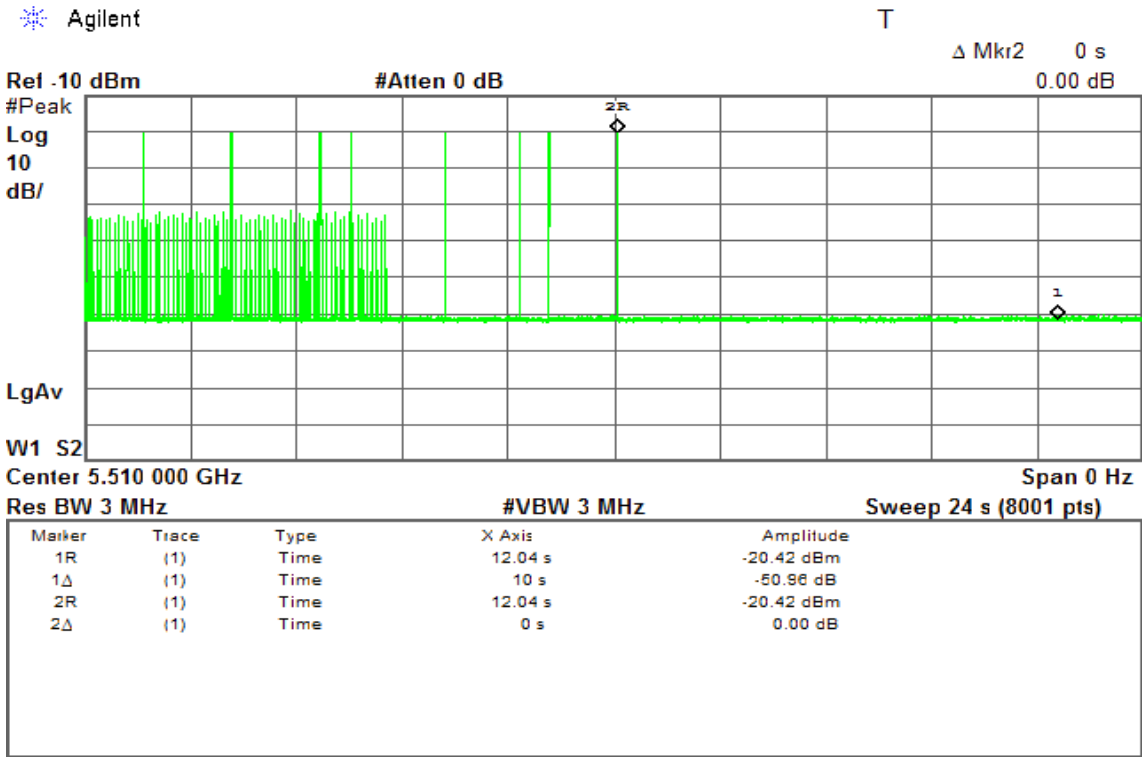
Channel Move Time (ms)	Limit (s)
715.6	10



Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0	10



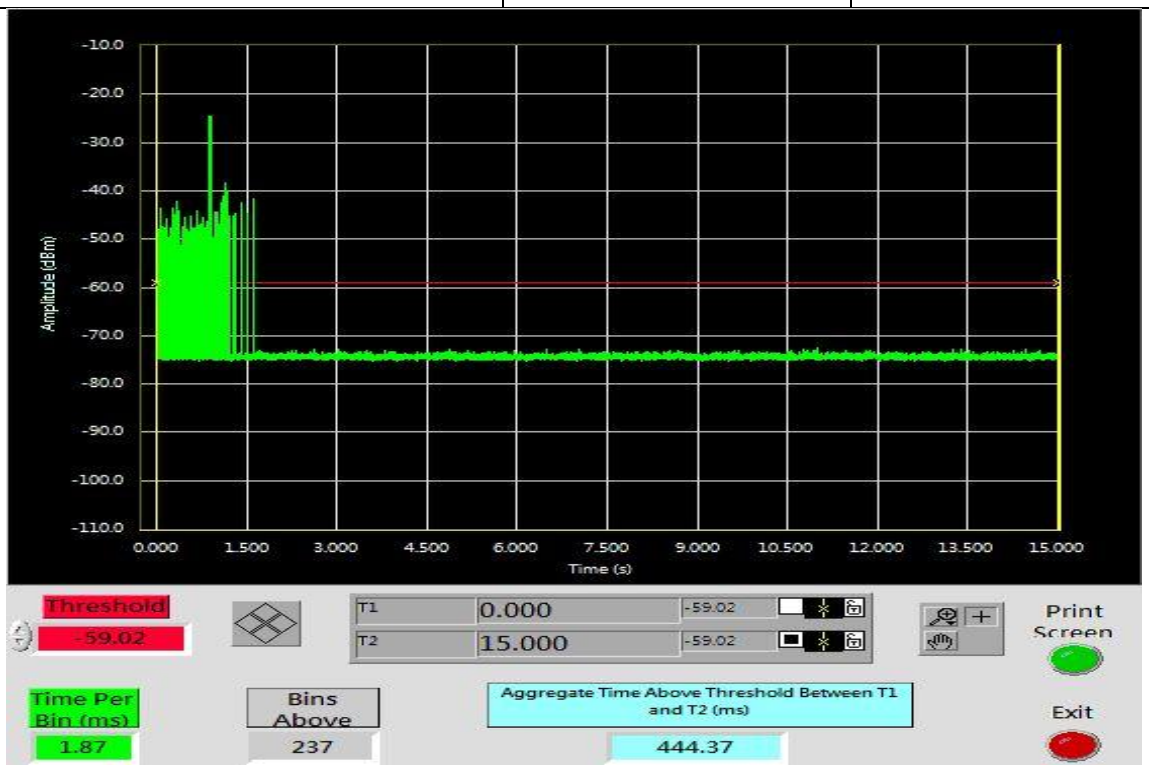
IEEE 802.11n HT 40 MHz mode

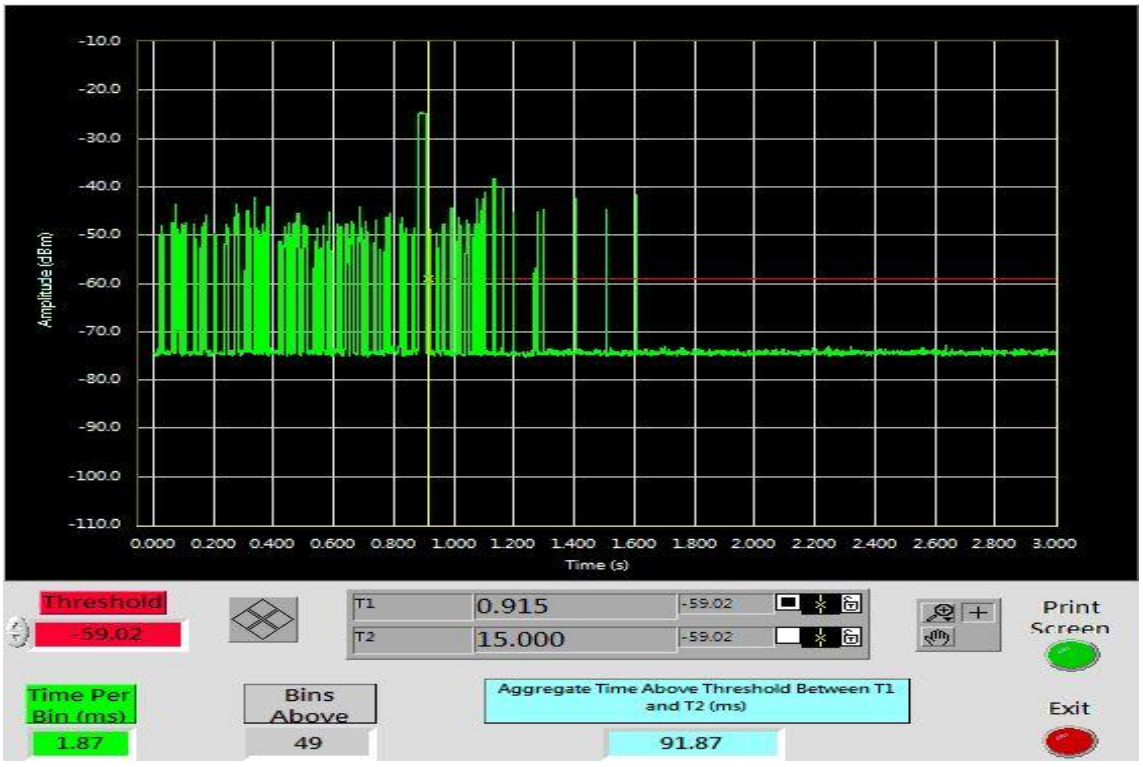
Type 1 Channel Closing Transmission Time Results

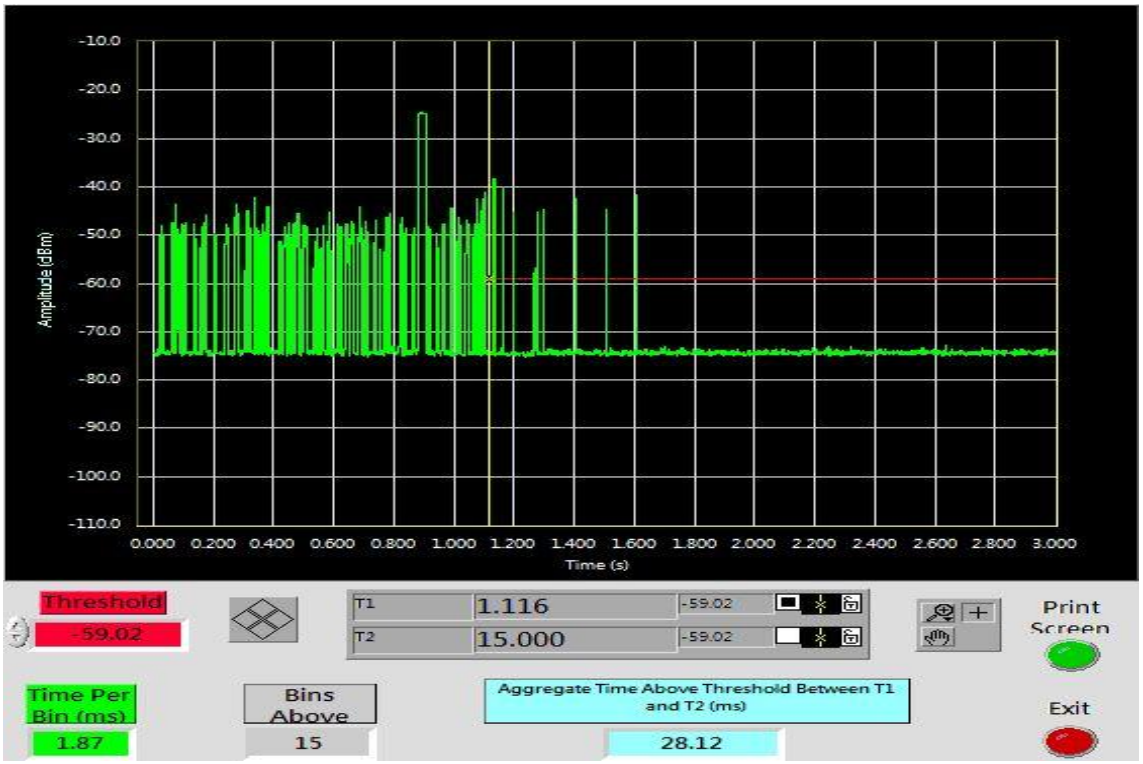
No non-compliance noted.

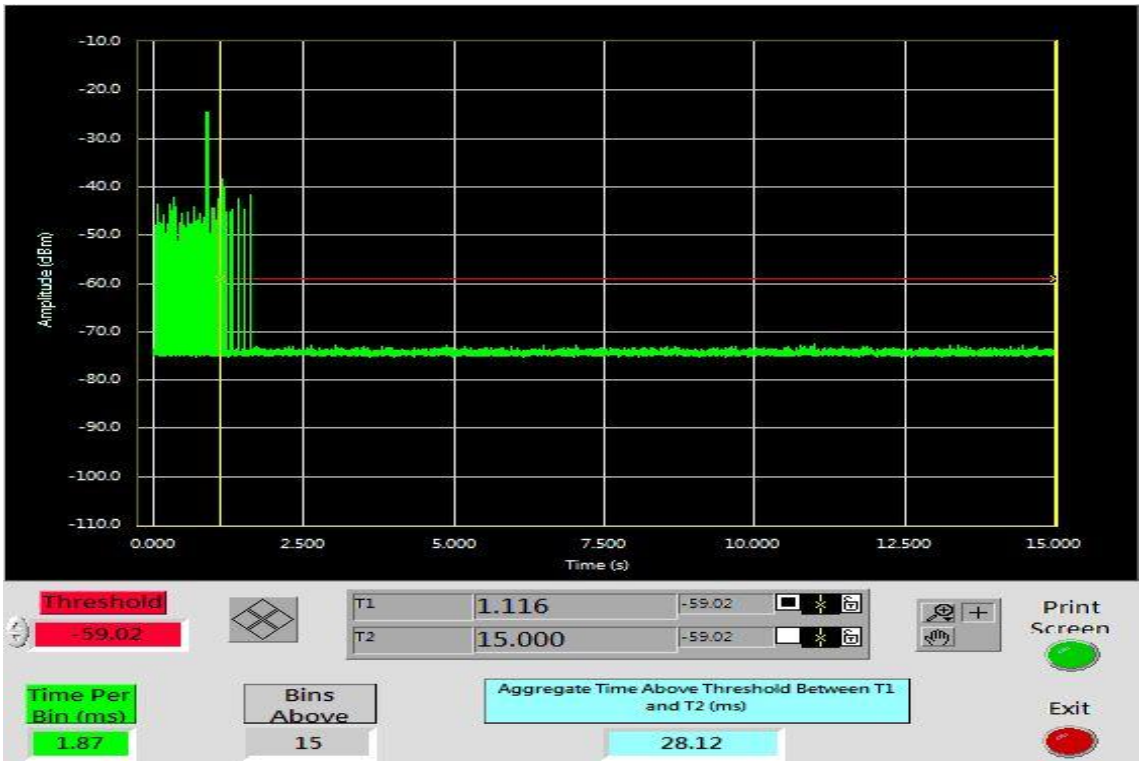
For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
28.12	60	-31.88



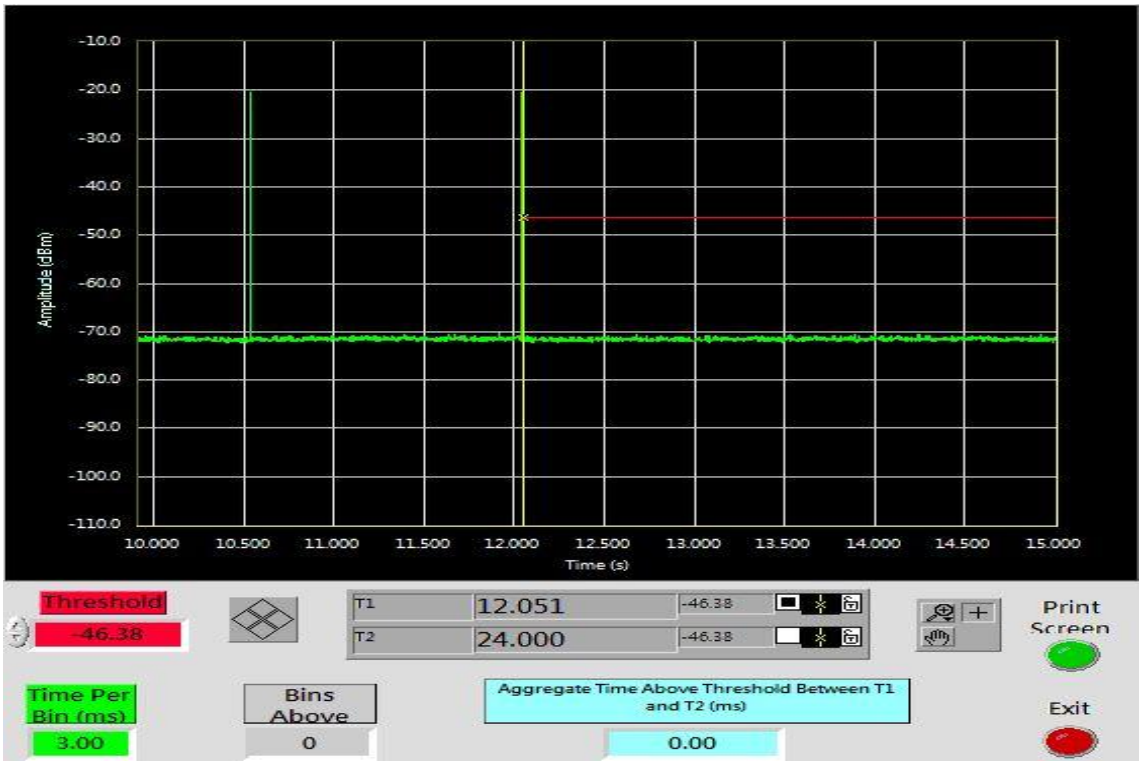


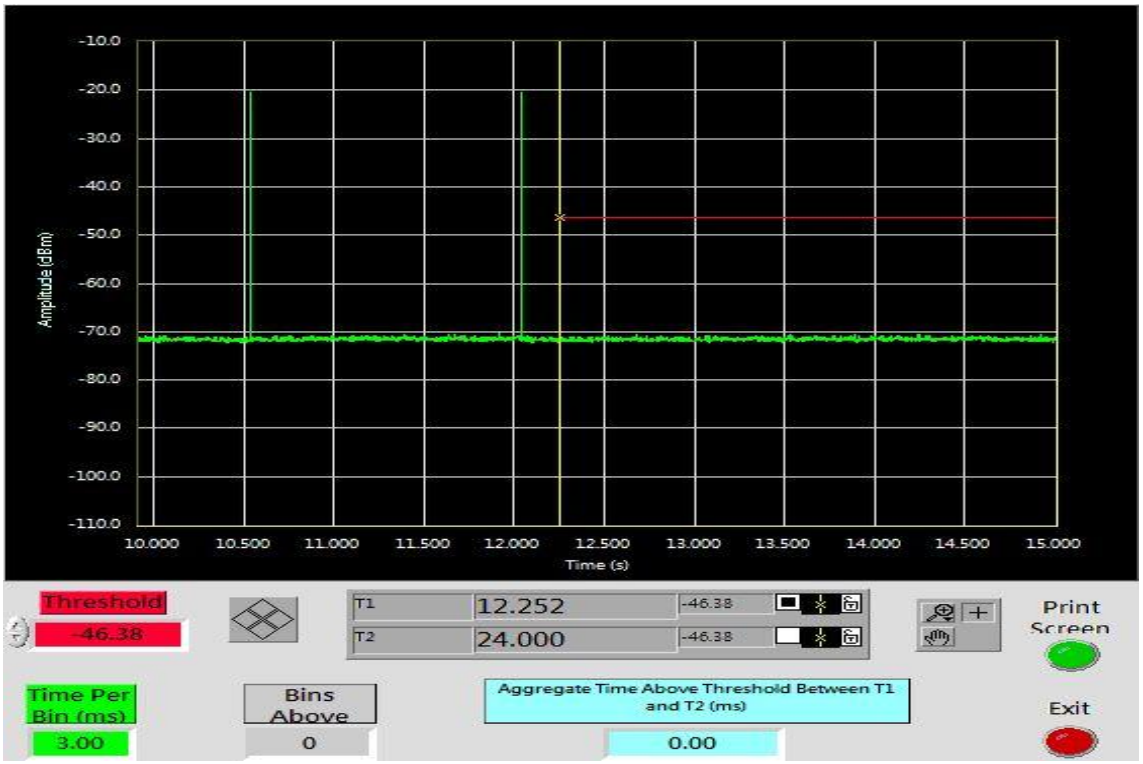

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-59.02
T1
1.116
-59.02
T2
15.000
-59.02
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
15
Aggregate Time Above Threshold Between T1 and T2 (ms)
28.12

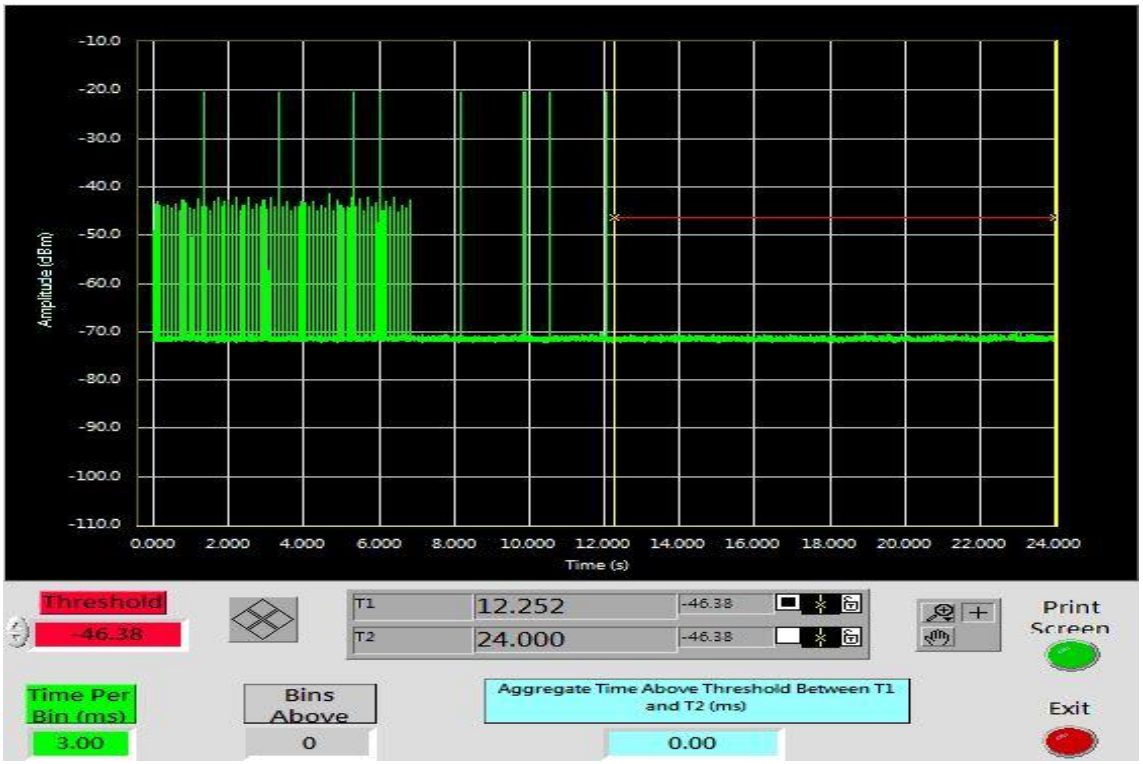

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-59.02
T1
1.116
-59.02
T2
15.000
-59.02
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
15
Aggregate Time Above Threshold Between T1 and T2 (ms)
28.12

For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
0	60	-60




-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
Time (s)
Threshold
-46.38
T1
12.252
-46.38
T2
24.000
-46.38
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00


-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
-110.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-46.38
T1
12.252
-46.38
T2
24.000
-46.38
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00

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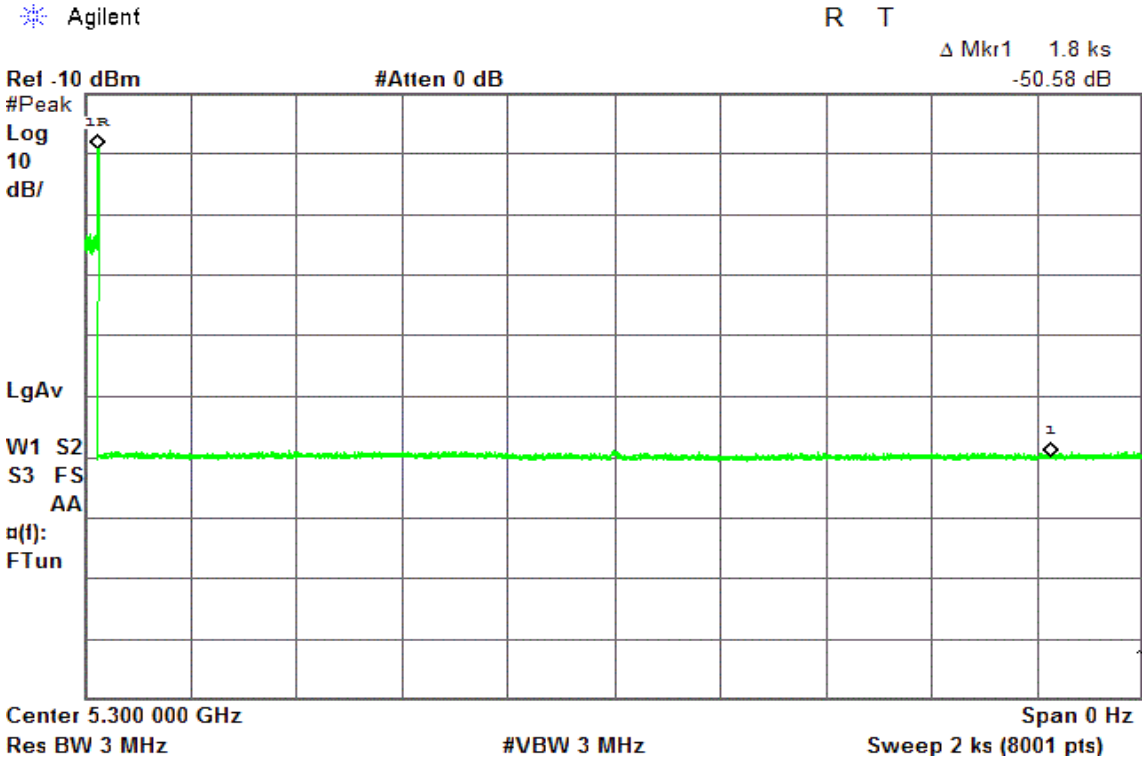
NON-OCCUPANCY PERIOD

LOW BAND RESULTS / IEEE 802.11n HT 20 MHz Channel mode

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

No EUT transmissions were observed on the test channel during the 30 minute observation time.

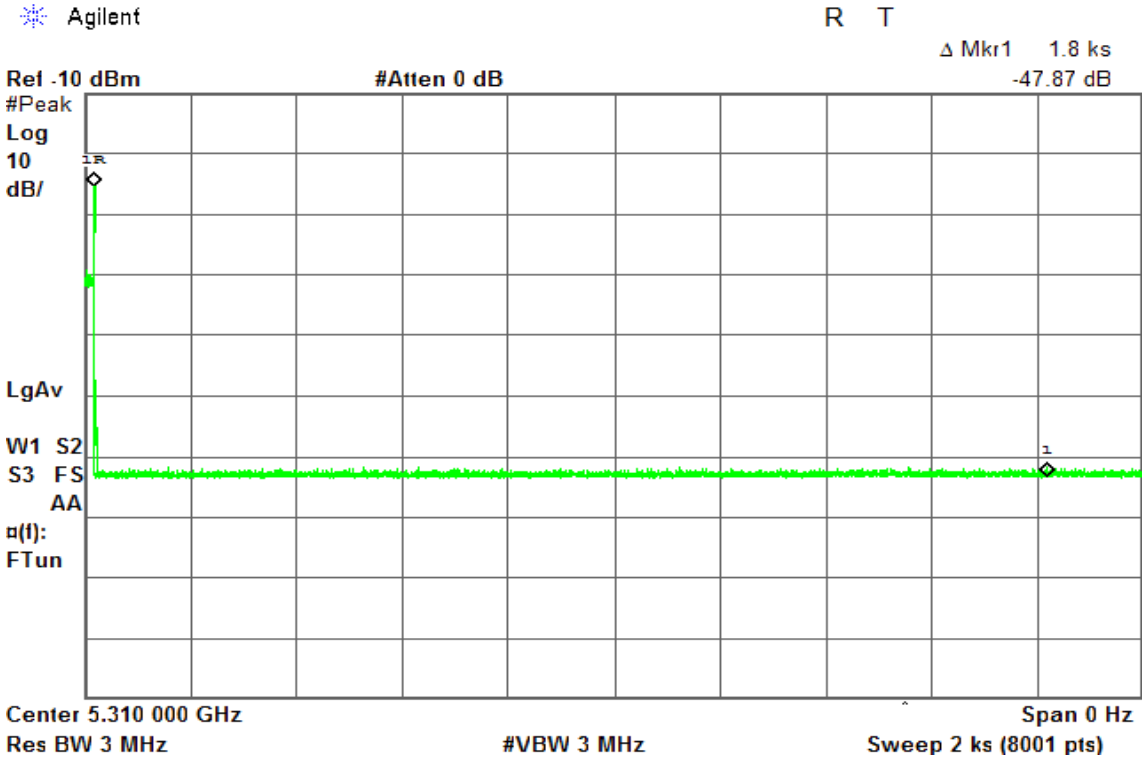


LOW BAND RESULTS / IEEE 802.11n HT 40 MHz mode

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

No EUT transmissions were observed on the test channel during the 30 minute observation time.

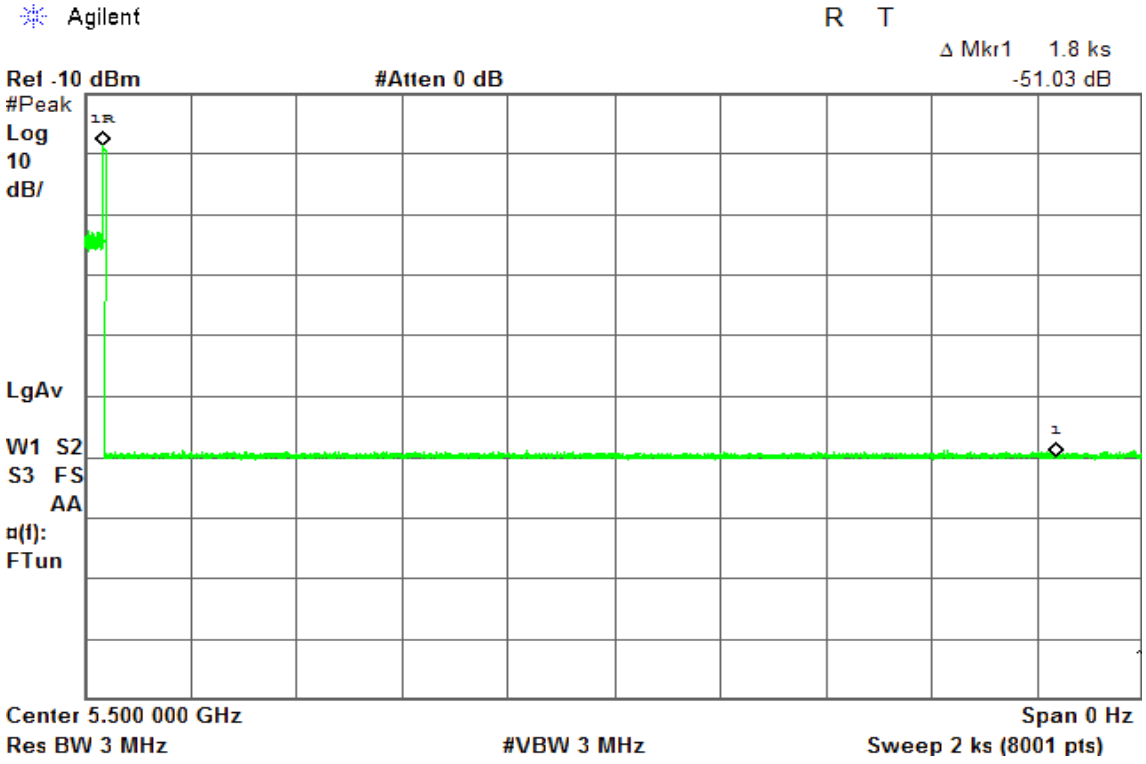


HIGH BAND RESULTS / IEEE 802.11n HT 20 MHz Channel mode

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

No EUT transmissions were observed on the test channel during the 30 minute observation time.



HIGH BAND RESULTS / IEEE 802.11n HT 40 MHz mode

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

No EUT transmissions were observed on the test channel during the 30 minute observation time.