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

TEST REPORT

For

802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module

Model: WN4510L

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: May 12, 2014

Testing Laboratory
1309

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		May 12, 2014		Initial Issue	ALL	Kelly Cheng

TABLE OF CONTENTS

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 A9 Building,No.88 Yanghu Road, Wujin Hi-Tech Industrial Development Zone ,Changzhou City, Jiangsu Province 213100 China
Equipment Under Test:	802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module
Trade Name:	LITE-ON
Model:	WN4510L
Date of Test:	April 22 ~ May 9, 2014

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>802.11a/b/g/n/ac, 2T2R Wireless LAN USB2.0 Module</td></tr>
<tr><td>Trade Name</td><td>LITE-ON</td></tr>
<tr><td>Model Number</td><td>WN4510L</td></tr>
<tr><td>Model Discrepancy</td><td>N/A</td></tr>
<tr><td>Received Date</td><td>April 16, 2014</td></tr>
<tr><td>Power Supply</td><td>Powered from 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="4">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>IEEE 802.11ac (VHT80)</td><td>5210</td><td>1 Channels</td></tr>
<tr><td rowspan="4">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>IEEE 802.11ac (VHT80)</td><td>5290</td><td>1 Channels</td></tr>
<tr><td rowspan="4">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>3 Channels</td></tr>
<tr><td>IEEE 802.11ac (VHT80)</td><td>5530 ~ 5690</td><td>2 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 (w)</th></tr>
<tr><td rowspan="4">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>16.40</td><td>0.0437</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>16.52</td><td>0.0449</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>16.47</td><td>0.0444</td></tr>
<tr><td>IEEE 802.11ac (VHT80)</td><td>5210</td><td>16.36</td><td>0.0433</td></tr>
<tr><td rowspan="4">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>19.60</td><td>0.0912</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>17.26</td><td>0.0532</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 ~ 5310</td><td>18.11</td><td>0.0647</td></tr>
<tr><td>IEEE 802.11ac (VHT80)</td><td>5290</td><td>16.94</td><td>0.0494</td></tr>
<tr><td rowspan="4">UNII Band III</td><td>IEEE 802.11a</td><td>5500 ~ 5700</td><td>19.10</td><td>0.0813</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 ~ 5700</td><td>18.15</td><td>0.0653</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 ~ 5670</td><td>18.14</td><td>0.0652</td></tr>
<tr><td>IEEE 802.11ac (VHT80)</td><td>5530 ~ 5690</td><td>17.80</td><td>0.0603</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 mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps)
IEEE 802.11n HT 40 mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
IEEE 802.11ac (VHT80) mode: OFDM (29.3, 58.5, 87.8, 117, 175.5, 234, 263.3, 292.5, 351, 390, 468, 526.5, 585, 702, 780 Mbps)</td></tr>
<tr><td>Antenna Specification</td><td>LITE-ON / 3010000271ID
Antenna Gain: 1.74 dBi</td></tr>
<tr><td>Antenna Designation</td><td>Integral Antenna</td></tr>
</table>

Operation Frequency:

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)					
CHANNEL	**MHz**	**CHANNEL**	**MHz**	**CHANNEL**	**MHz**
36	5.18	68	5.34	100	5.5
37	5.185	69	5.345	101	5.505
38	5.19	70	5.35	102	5.51
39	5.195	71	5.355	103	5.515
40	5.2	72	5.36	104	5.52
41	5.205	73	5.365	105	5.525
42	5.21	74	5.37	106	5.53
43	5.215	75	5.375	107	5.535
44	5.22	76	5.38	108	5.54
45	5.225	77	5.385	109	5.545
46	5.23	78	5.39	110	5.55
47	5.235	79	5.395	111	5.555
48	5.24	80	5.4	112	5.56
49	5.245	81	5.405	113	5.565
50	5.25	82	5.41	114	5.57
51	5.255	83	5.415	115	5.575
52	5.26	84	5.42	116	5.58
53	5.265	85	5.425	117	5.585
54	5.27	86	5.43	118	5.59
55	5.275	87	5.435	119	5.595
56	5.28	88	5.44	130	5.65
57	5.285	89	5.445	131	5.655
58	5.29	90	5.45	132	5.66
59	5.295	91	5.455	133	5.665
60	5.3	92	5.46	134	5.67
61	5.305	93	5.465	135	5.675
62	5.31	94	5.47	136	5.68
63	5.315	95	5.475	137	5.685
64	5.32	96	5.48	138	5.69
65	5.325	97	5.485	139	5.695
66	5.33	98	5.49	140	5.7
67	5.335	99	5.495		

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, 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: WN4510L) had been tested under operating condition.

The EUT is a 2x2 configuration spatial MIMO (2Tx & 2Rx) without beam forming function. The 2x2 configuration is implemented with three outside TX & RX chains (Chain 0, Chain 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.

IEEE 802.11ac (VHT80) for 5210MHz:
Channel Low(5210MHz) with 29.3Mbps 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.

IEEE 802.11ac (VHT80) for 5290MHz:

Channel Low(5290MHz) with 29.3Mbps data rate were chosen for full testing.

UNII Band III:

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

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

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.

IEEE 802.11ac (VHT80) for 5530 ~ 5690MHz:
Channel Low (5530MHz), Channel High (5690MHz) with 29.3Mbps data rate were chosen for full testing.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

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

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/19/2015
Power Meter	Anritsu	ML2495A	1012009	06/03/2015
Power Sensor	Anritsu	MA2411A	0917072	06/03/2015

3M Chamber Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510268	11/05/2014
EMI Test Receiver	R&S	ESCI	100064	02/27/2015
Pre-Amplifier	Mini-Circults	ZFL-1000LN	SF350700823	01/11/2015
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/18/2014
Bilog Antenna	Sunol Sciences	JB3	A030105	10/01/2014
Horn Antenna	EMCO	3117	00055165	02/12/2015
Horn Antenna	EMCO	3116	2487	10/09/2014
Loop Antenna	EMCO	6502	8905/2356	06/09/2014
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Site NSA	CCS	N/A	N/A	12/21/2014
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESI	101203	09/12/2014
LISN	R&S	ESH3-Z5	848773/014	12/05/2014
Coaxial Cable	Commate	CFD300-NL	NA	12/05/2014
Test S/W	CCS-3A1-CE			

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2159
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	IBM	7663 (T61)	L3E9812	N/A	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2	Notebook PC	DELL	PP19L	7B3ZP1S	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. APPLICABLE RULES

RSS-210 §2 General Certification Requirements and Specifications

RSS-210 §2.1 RSS-Gen Compliance

In addition to RSS-210, the requirements in RSS-Gen, *General Requirements and Information for the Certification of Radio Apparatus*, must be met.

RSS-210 §2.2 Emissions Falling Within Restricted Frequency Bands

Category I licence-exempt equipment is required to comply with the provisions in RSS-Gen with respect to emissions falling within restricted frequency bands. These restricted frequency bands are listed in RSS-Gen.

RSS-210 §2.3 Receivers

Category I equipment receivers for use with transmitters subject to RSS-210 must comply with the applicable requirements set out in RSS-Gen and be certified under RSS-210. Category II equipment receivers for use with transmitters subject to RSS-210 are exempt from certification, but are subject to compliance with RSS-Gen and RSS-310.

RSS-210 §2.5 General Field Strength Limits

RSS-Gen includes the general field strength limits of unwanted emissions, where applicable, for transmitters and receivers operating in accordance with the provisions specified in this standard. Unwanted emissions of transmitters and receivers are permitted to fall within the restricted bands listed in RSS-Gen, and including the TV bands, but fundamental emissions are prohibited in the restricted bands.

RSS-210 §2.5.1 Transmitters with Wanted Emissions that are Within the General Field Strength Limits

Whether or not their operation is addressed by published RSS standards, transmitters whose wanted and unwanted emissions are within the general field strength limits shown in RSS-Gen, they may operate in any of the frequency bands, other than the restricted bands listed in RSS-Gen and including the TV bands, and shall be certified under RSS-210. Under no conditions may the level of any unwanted emissions exceed the level of the fundamental emission.

Note: Devices operating below 490 kHz in which all emissions are at least 40 dB below the limit listed in RSS-Gen (*General Field Strength Limits for Transmitters at Frequencies below 30 MHz*) are Category II devices and are subject to RSS-310.

RSS-210 §2.7 Tables

RSS-210 §Annex 8: Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands

This section applies to systems that employ frequency hopping (FH) and digital modulation technology in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. Systems in these bands may employ frequency hopping, digital modulation and or a combination (hybrid) of both techniques.
A frequency hopping system that synchronizes with another or several other systems (to avoid frequency collision among them) via off-air sensing or via connecting cables is not hopping randomly and therefore is not in compliance with RSS-210.

RSS-210 §A8.1 Frequency Hopping Systems

Frequency hopping systems are spread spectrum systems in which the carrier is modulated with coded information in a conventional manner causing a conventional spreading of the RF energy about the carrier frequency. The frequency of the carrier is not fixed but changes at fixed intervals under the direction of a coded sequence.
Frequency hopping systems are not required to employ all available hopping frequencies during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream.
Incorporation of intelligence into a frequency hopping system that enables it to recognize other users of the band and to avoid occupied frequencies is permitted, provided that the frequency hopping system does it individually, and independently chooses or adapts its hopset. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.
The following applies to frequency hopping systems in each of the three bands.
(a) The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long term distribution appears evenly distributed.

(b) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125 W. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
(d) Frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that a minimum of 15 hopping channels are used.

RSS-210 §A8.2 Digital Modulation Systems

These include systems employing digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to all three bands.

RSS-210 §A8.4 Transmitter Output Power and e.i.r.p. Requirements

(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum peak conducted power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.
As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power (see RSS-Gen)
(5) Point-to-point systems in the bands 2400-2483.5 MHz and 5725-5850 MHz are permitted to have an e.i.r.p. higher than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be allowed to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to- point systems.
Note: “Fixed, point-to-point operation”, excludes point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information.

RSS-210 §A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

RSS-Gen §2 General Information

RSS-Gen §2.1.2 Category II Equipment

Category II equipment comprises radio devices where a standard has been prescribed but for which a TAC is not required, that is, equipment certification by Industry Canada or a Certification Body (CB) is not required (certification exempt), pursuant to subsection 4(3) of the Radiocommunication Act. The manufacturer or importer shall nevertheless ensure that the standards are complied with. A test report shall be available on request and the device shall be properly labelled.

RSS-Gen §2.2 Receivers

Receivers that are used for radiocommunication other than broadcasting are defined as Category I equipment or Category II equipment, subject to compliance with applicable Industry Canada standards.
Receivers shall be capable of operation only with transmitters for which RSSs are published.
Receivers are classified as described in sections 2.2.1 and 2.2.2.

RSS-Gen §2.2.1 Category I Equipment Receivers

A receiver is classified as Category I equipment if it meets one of the following conditions:
(a) a stand-alone receiver (see Note 1, below), which operates on any frequency in the band 30-960 MHz, and is used for the reception of signals in that frequency band from a transmitter classified as Category I equipment;
(b) a Citizen's Band (CB) receiver (26.96-27.410 MHz);
(c) a scanner receiver.
Note 1: A *stand-alone receiver* is defined as any receiver that is not permanently combined together with a transmitter in a single case (transceiver), in which it functions as the receiver component of the transceiver.
Receivers classified as Category I equipment shall comply with the limits for receiver spurious emissions set out in RSS-Gen; however, equipment certification is granted under the applicable RSS standard along with the associated transmitter classified as Category I equipment. Scanner receivers are covered under their own specific RSS.

RSS-Gen §2.2.2 Category II Equipment Receivers

A receiver is classified as Category II equipment if it does not meet any of the conditions of Section 2.2.1.
Category II receivers shall comply with the applicable testing, labelling and user manual requirements in RSS-310.

RSS-Gen §5.6 Exposure of Humans to RF Fields

Category I and Category II equipment shall comply with the applicable requirements of RSS-102.

RSS-Gen §6 Receiver Spurious Emission Standard

Receivers shall comply with the limits of spurious emissions set out in this section, measured over the frequency range determined in accordance with Section 4.10.

RSS-Gen §6.1 Radiated Limits

Radiated spurious emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals.

Spurious emissions from receivers shall not exceed the radiated limits shown in the table below:

RSS-Gen Table 2 - Spurious Emission Limits for Receivers

Frequency (MHz)	Field Strength microvolts/m at 3 metres
30-88	100
88-216	150
216-960	200
Above 960	500

*Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 7.2.7.

RSS- Gen Table 3: Restricted Frequency Bands (Note)

MHz	MHz	MHz	MHz	GHz
0.090-0.110	8.37625-8.38675	--	1718.8-1722.2	9.0-9.2
--	8.41425-8.41475	156.52475-156.52525	2200-2300	9.3-9.5
2.1735-2.1905	12.29-12.293	156.7-156.9	2310-2390	10.6-12.7
3.020-3.026	12.51975-12.52025	--	--	13.25-13.4
4.125-4.128	12.57675-12.57725	--	2655-2900	14.47-14.5
4.17725-4.17775	13.36-13.41	240-285	3260-3267	15.35-16.2
4.20725-4.20775	16.42-16.423	322-335.4	3332-3339	17.7-21.4
5.677-5.683	16.69475-16.69525	399.9-410	3345.8-3358	22.01-23.12
6.215-6.218	16.80425-16.80475	608-614	3500-4400	23.6-24.0
6.26775-6.26825	25.5-25.67	960-1427	4500-5150	31.2-31.8
6.31175-6.31225	37.5-38.25	1435-1626.5	5350-5460	36.43-36.5
8.291-8.294	73-74.6; 74.8-75.2	1645.5-1646.5	7250-7750	Above 38.6
8.362-8.366	108-138	1660-1710	8025-8500	

Note: *Certain frequency bands listed in Table 2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard as well as RSS-310.*

RSS- Gen Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz

Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

Note: *Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands(54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).*

RSS- Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in Hz)	300
490-1.705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Note: *The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.*

RSS-Gen §7.1.2 Transmitter Antenna

A transmitter can only be sold or operated with antennas with which it was approved. Transmitter may be approved with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest gain antenna of each combination of transmitter and antenna type for which approval is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type having equal or lesser gain as an antenna that had been successfully tested with the transmitter, will also be considered approved with the transmitter, and may be used and marketed with the transmitter. For Category I transmitters, the manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer.
For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power limits.User manuals for transmitters shall display the following notice in a conspicuous location:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

The above notice may be affixed to the device instead of displayed in the user manual.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi) and required impedance for each.

RSS-Gen §7.2.4 Transmitter and Receiver AC Power Lines Conducted Emission Limits

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The more stringent limit applies at the frequency range boundaries.

The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network (LISN).

RSS-Gen Table 4 – AC Power Line Conducted Emission Limits

Frequency Range (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

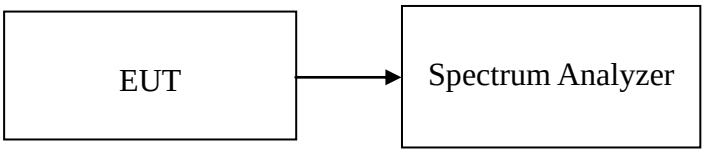
**Decreases with the logarithm of the frequency.*

8. FCC PART 15 REQUIREMENTS & RSS 210 REQUIREMENTS

8.1 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	16.9856
Mid	5220	16.9827
High	5240	16.9696

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.9888
Mid	5220	17.9066
High	5240	17.8829

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	17.8166
Mid	5220	17.8337
High	5240	17.7954

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.4972
High	5230	36.5769

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	36.3010
High	5230	36.3303

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5190 ~ 5230MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Mid	5210	75.8171

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5190 ~ 5230MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Mid	5210	75.7411

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	16.9222
Mid	5280	16.9699
High	5320	17.0151

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.8979
Mid	5280	17.9870
High	5320	17.9803

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	17.7950
Mid	5280	17.8347
High	5320	17.8197

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.5075
High	5310	36.7493

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	36.3306
High	5310	36.2487

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5270 ~ 5310MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Mid	5290	75.8292

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5270 ~ 5310MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Mid	5290	75.7399

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	16.9681
Mid	5580	16.9815
High	5700	16.9863

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.8963
Mid	5580	17.9216
High	5700	17.8759

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	17.8230
Mid	5580	17.8148
High	5700	17.8065

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.4408
Mid	5550	36.4701
High	5670	36.4416

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	36.3202
Mid	5550	36.3637
High	5670	36.2776

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5510 ~ 5670MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5530	75.8427
High	5690	75.8319

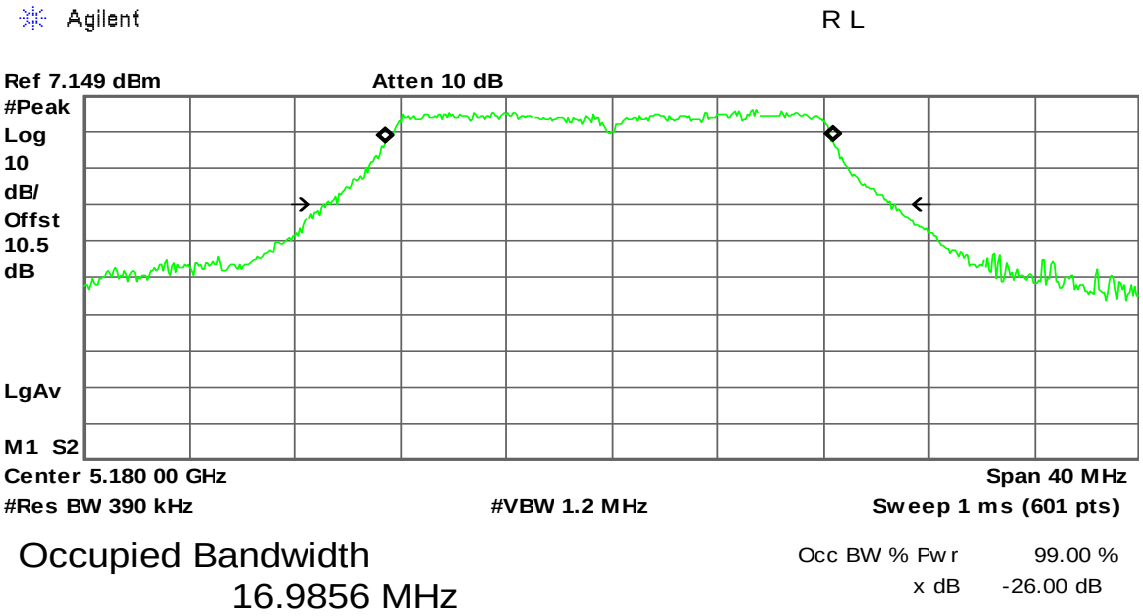
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5530	75.7777
High	5690	75.7315

Test Plot

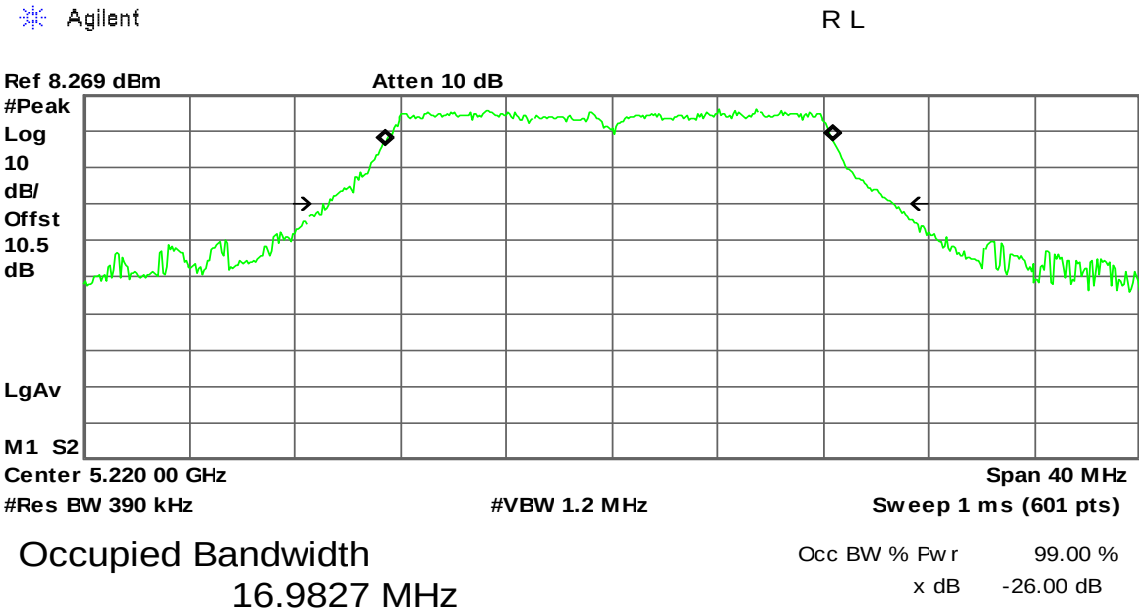
IEEE 802.11a mode / 5180 ~ 5240MHz

99% Bandwidth (CH Low)



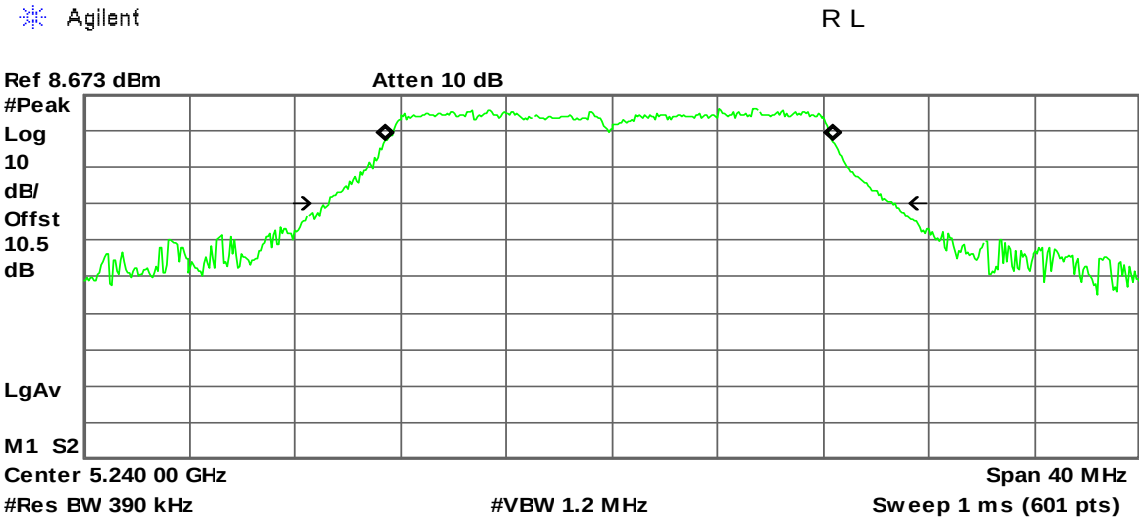
Transmit Freq Error	-107.246 kHz
x dB Bandwidth	21.562 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error	-106.297 kHz
x dB Bandwidth	21.378 MHz

99% Bandwidth (CH High)



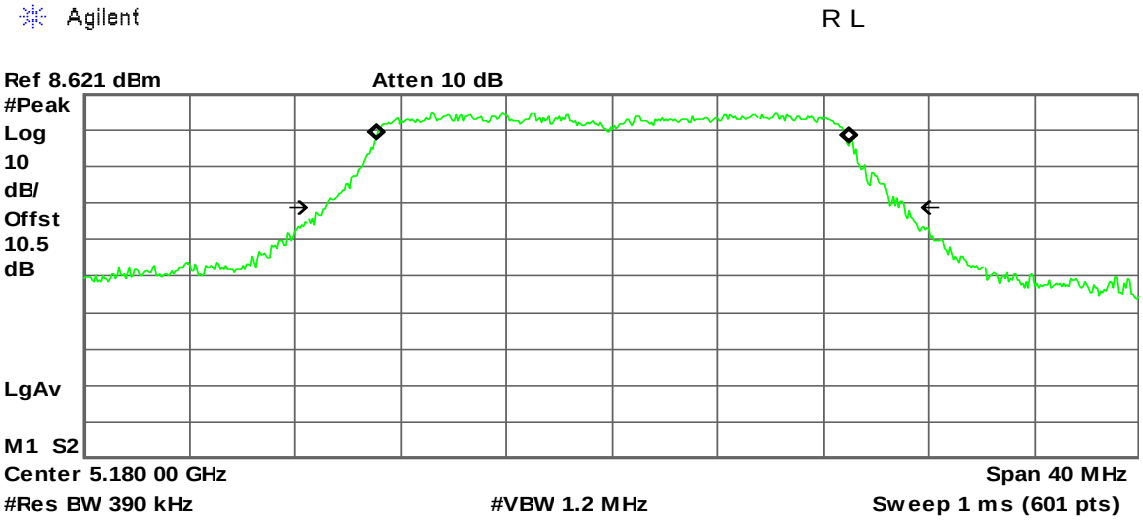
Occupied Bandwidth
16.9696 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -104.556 kHz
x dB Bandwidth 21.346 MHz

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

99% Bandwidth (CH Low)

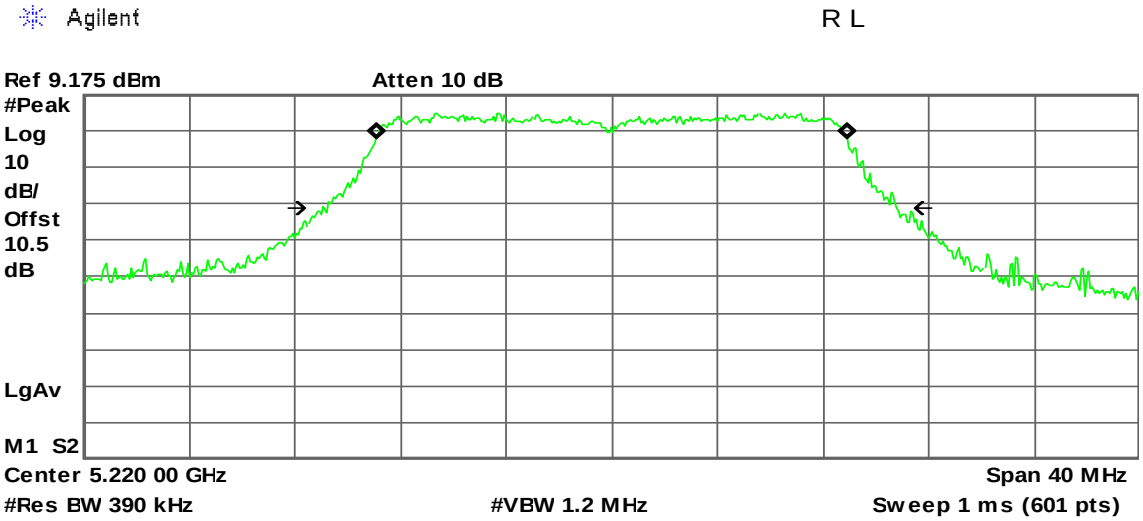


Occupied Bandwidth
17.9888 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 33.725 kHz
x dB Bandwidth 21.928 MHz

99% Bandwidth (CH Mid)

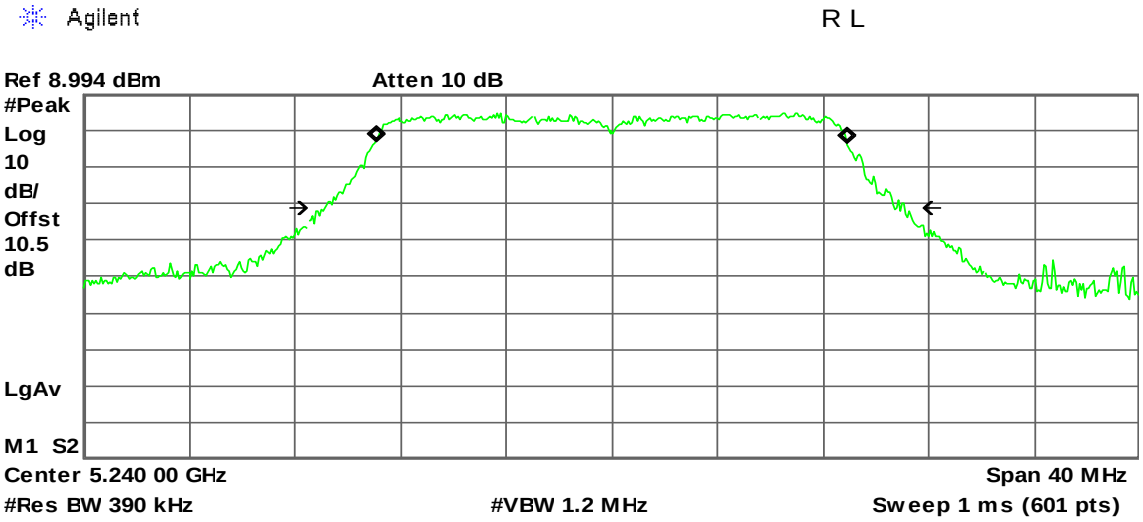


Occupied Bandwidth
17.9066 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error	-6.015 kHz
x dB Bandwidth	21.738 MHz

99% Bandwidth (CH High)



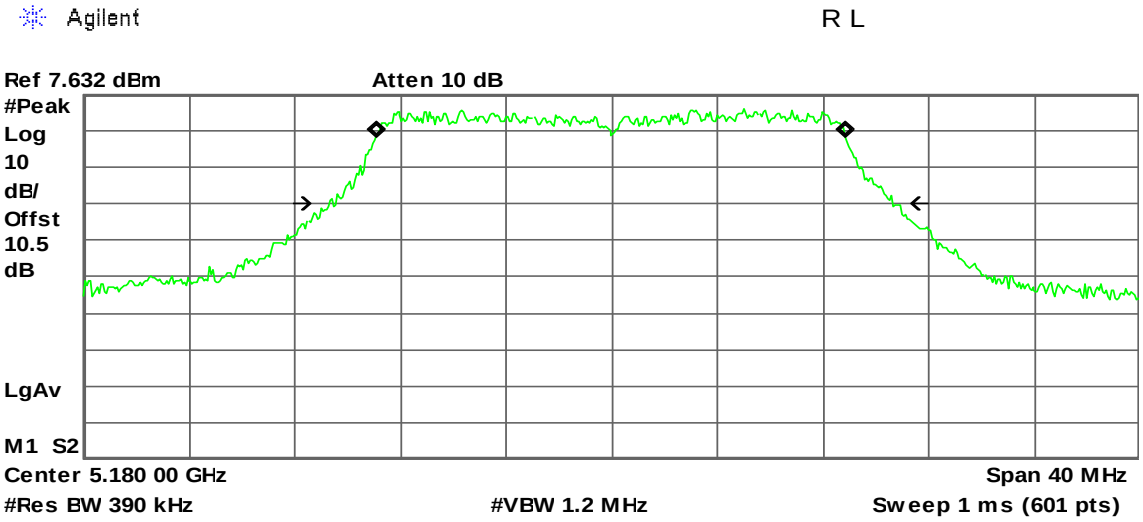
Occupied Bandwidth
17.8829 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error	-24.212 kHz
x dB Bandwidth	21.975 MHz

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

99% Bandwidth (CH Low)

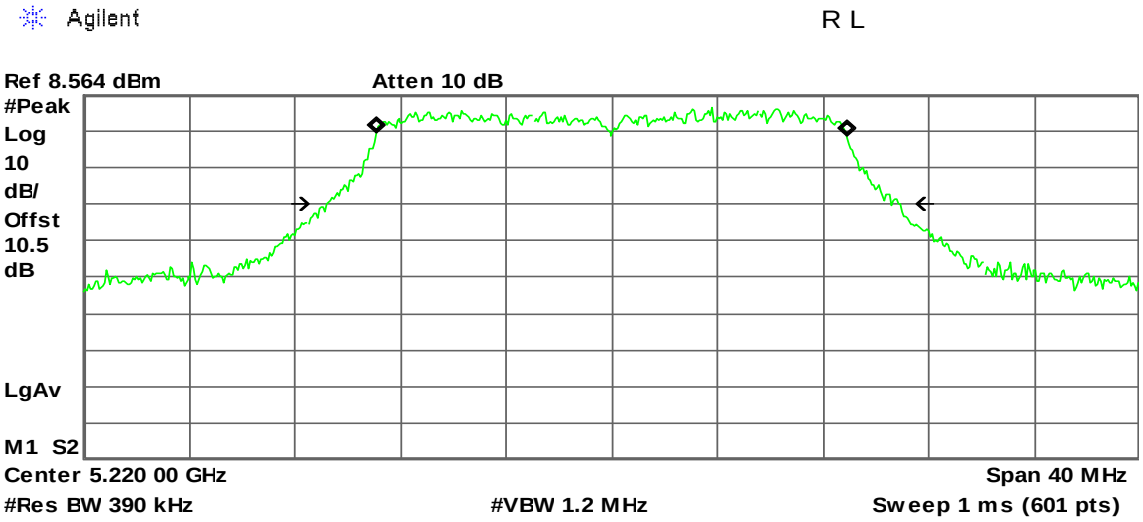


Occupied Bandwidth
17.8166 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -38.695 kHz
x dB Bandwidth 21.369 MHz

99% Bandwidth (CH Mid)

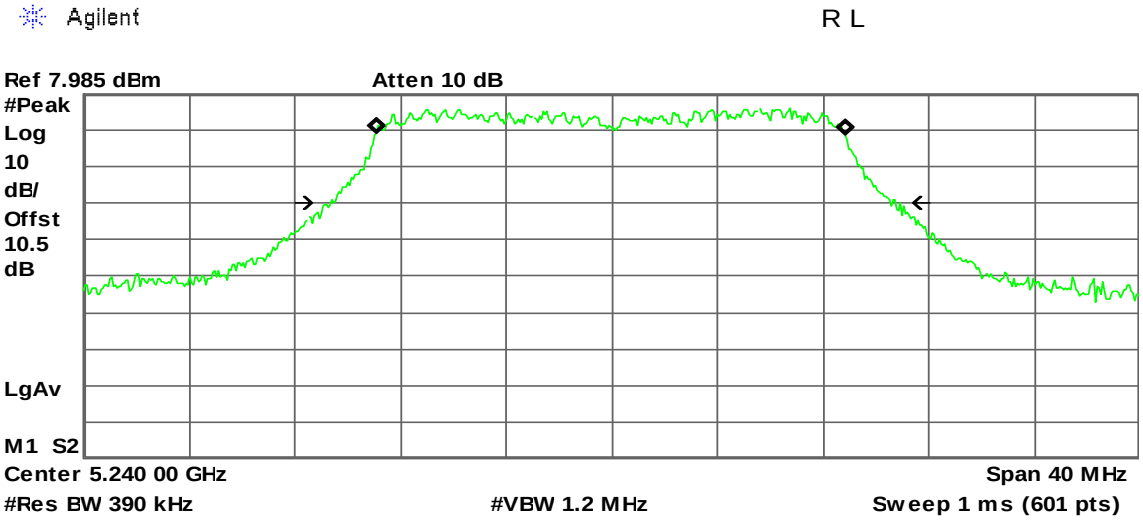


Occupied Bandwidth
17.8337 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -13.176 kHz
x dB Bandwidth 21.640 MHz

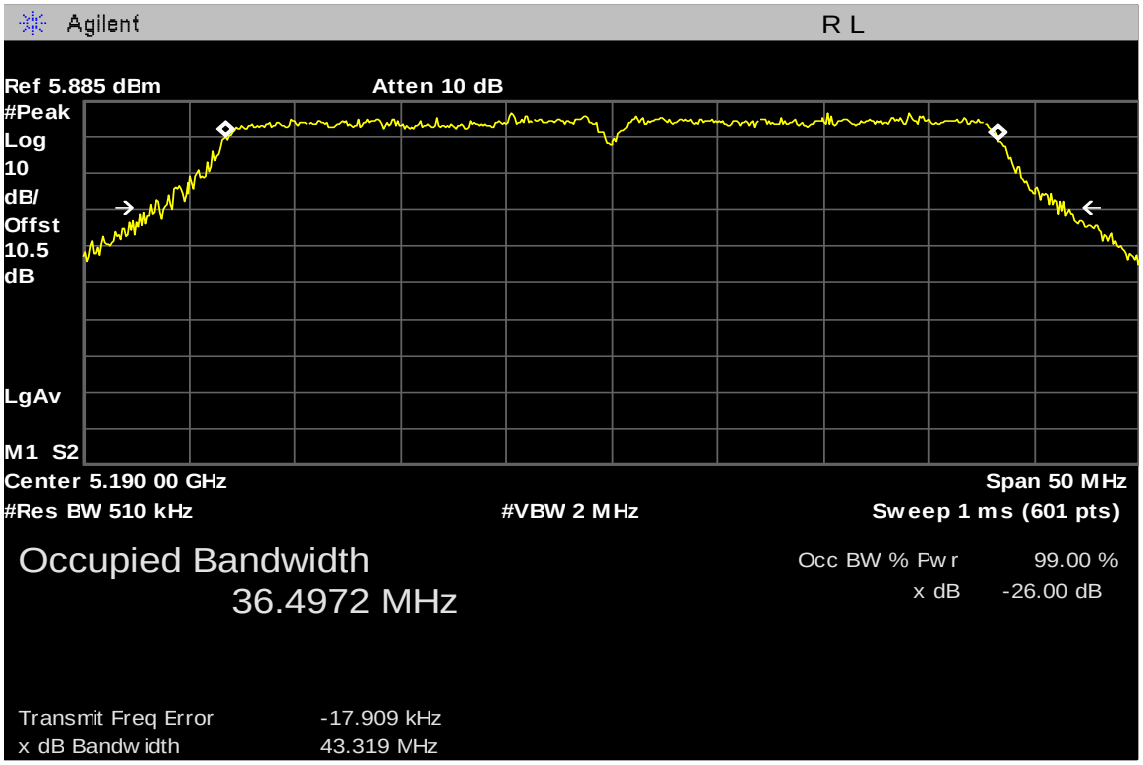
99% Bandwidth (CH High)



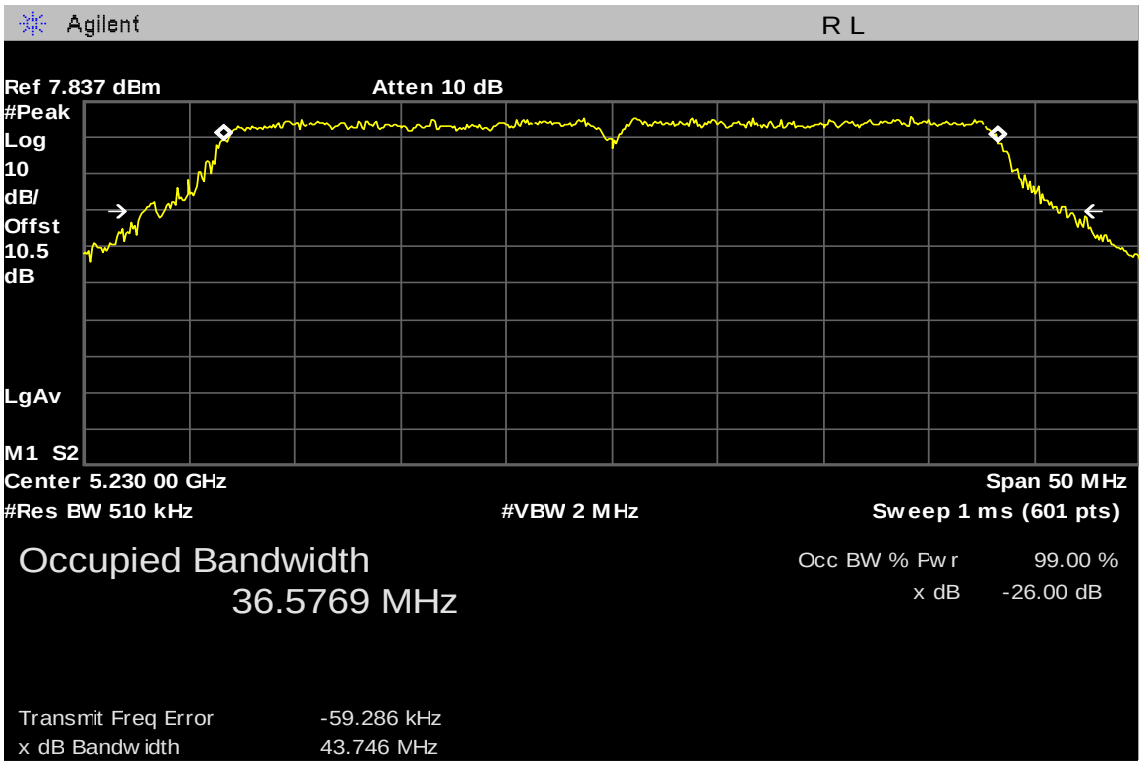
Transmit Freq Error	-37.105 kHz
x dB Bandwidth	21.395 MHz

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

99% Bandwidth (CH Low)

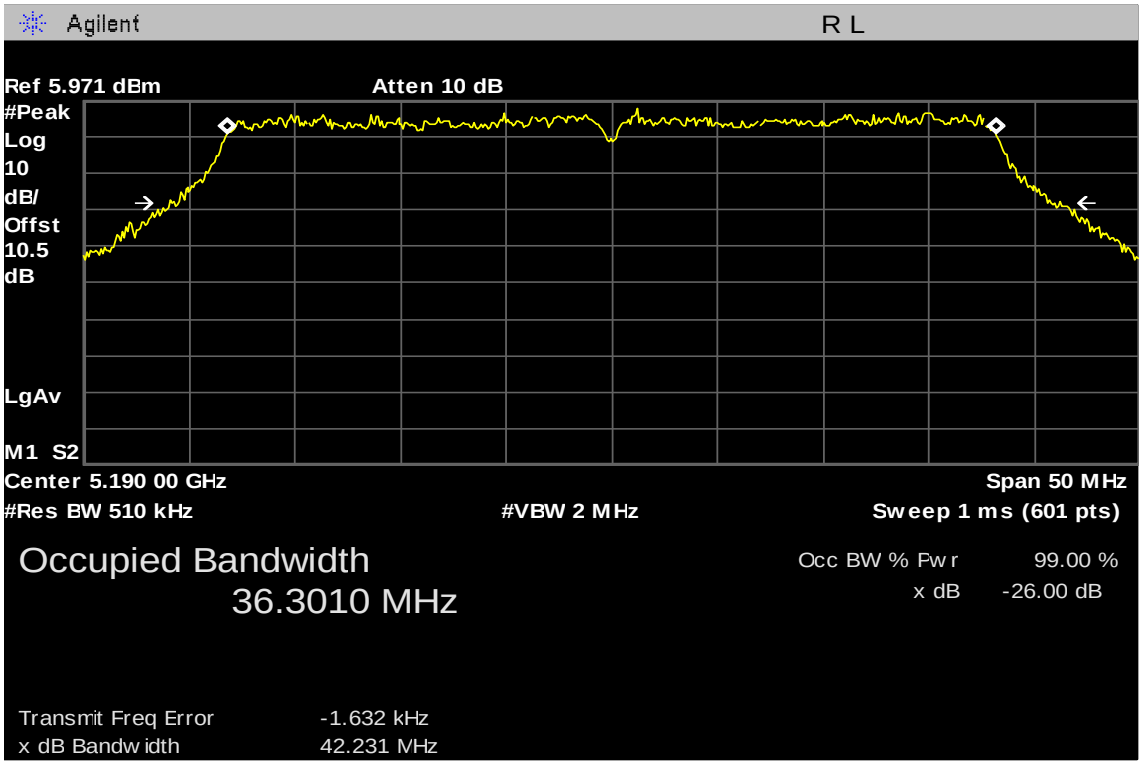


99% Bandwidth (CH High)

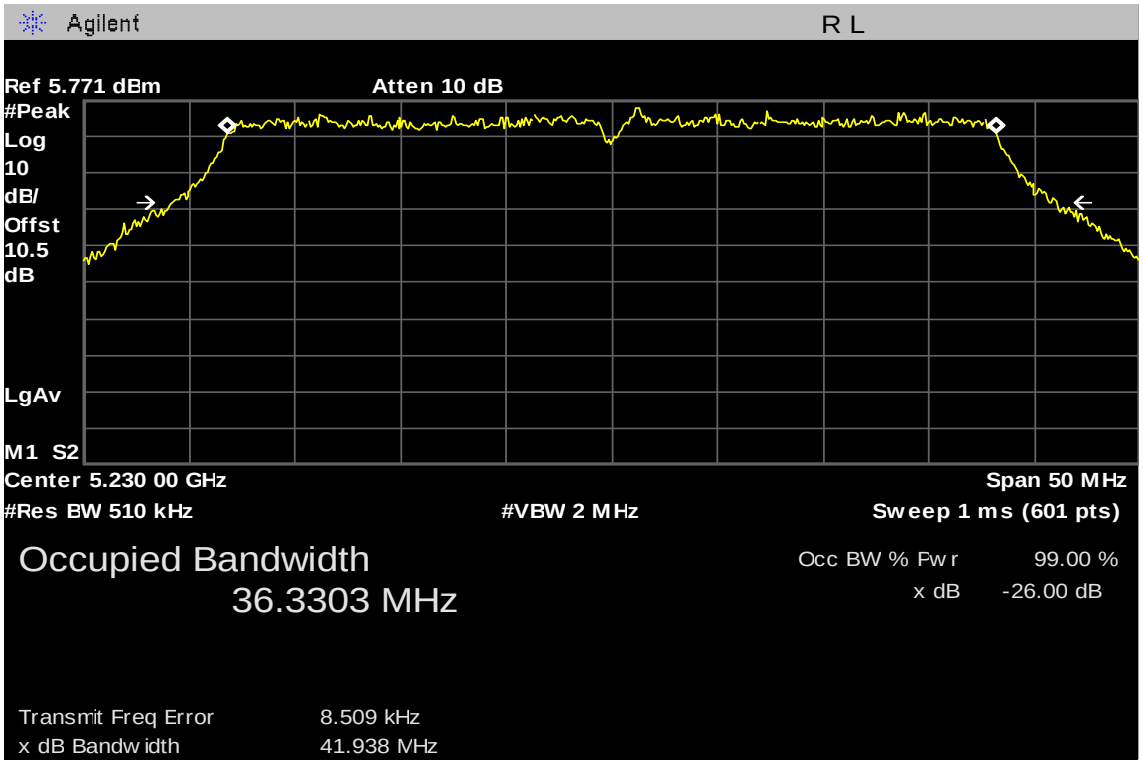


IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

99% Bandwidth (CH Low)

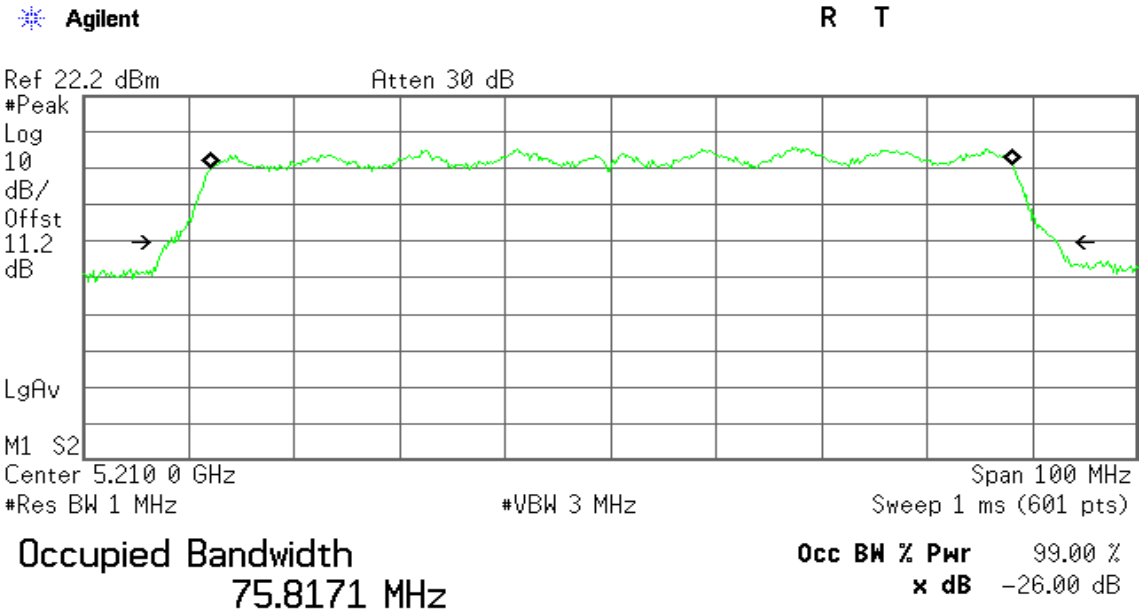


99% Bandwidth (CH High)



IEEE 802.11ac VHT 80 MHz mode / 5210MHz /

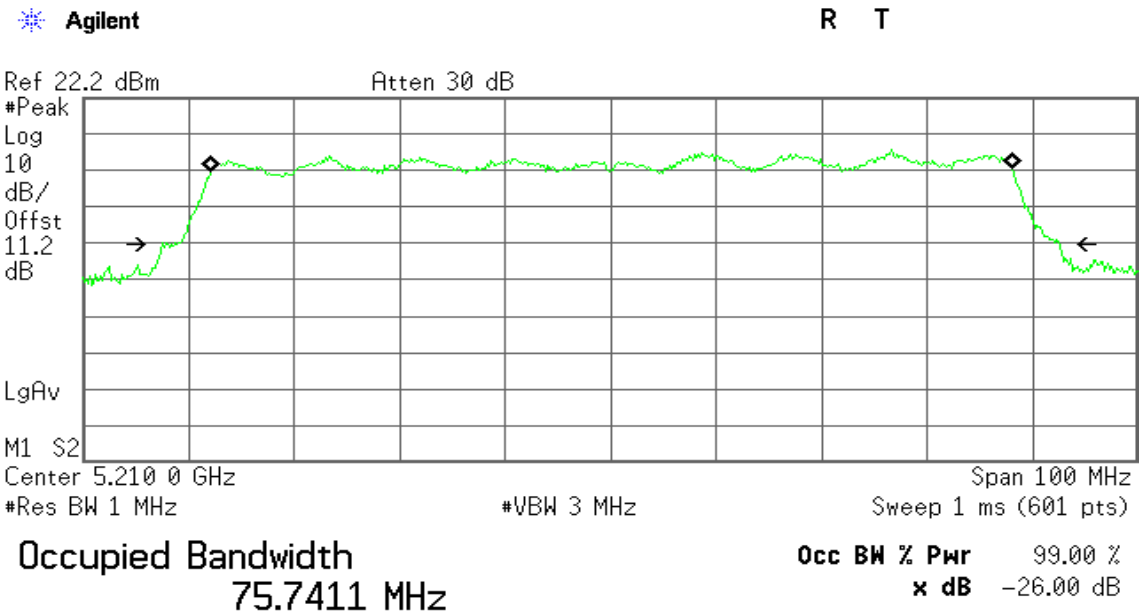
Chain 0 99% Bandwidth



Transmit Freq Error 146.693 kHz
x dB Bandwidth 84.422 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz /

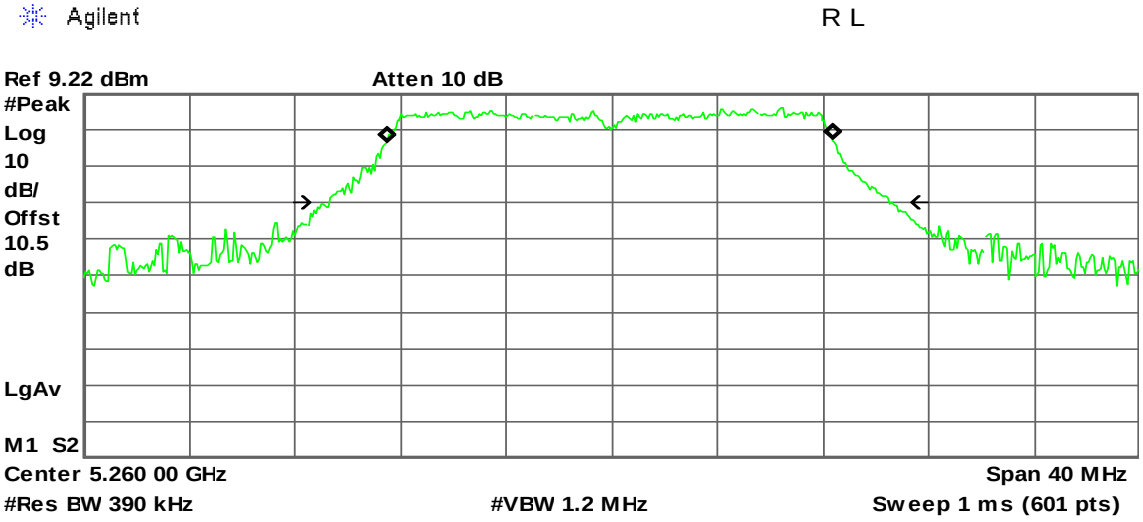
Chain 1 99% Bandwidth



Transmit Freq Error 120.224 kHz
x dB Bandwidth 85.158 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz

99% Bandwidth (CH Low)

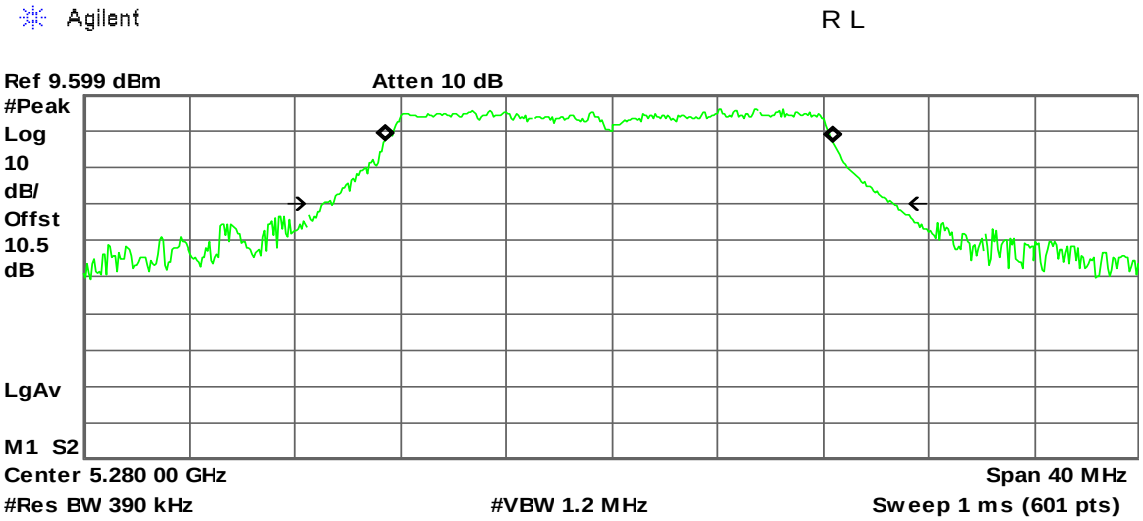


Occupied Bandwidth
16.9222 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -80.981 kHz
x dB Bandwidth 21.351 MHz

99% Bandwidth (CH Mid)

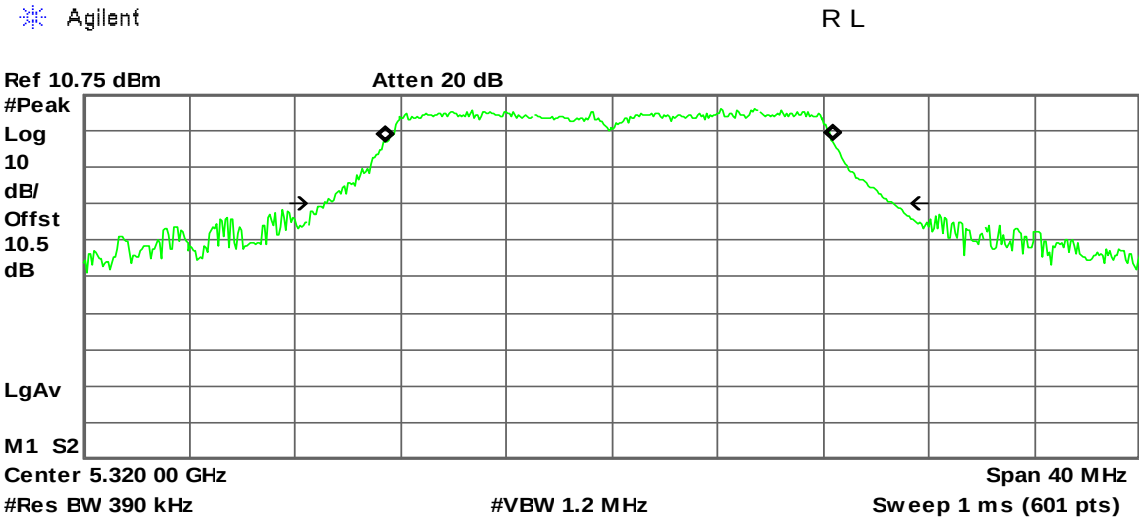


Occupied Bandwidth
16.9699 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -112.175 kHz
x dB Bandwidth 21.554 MHz

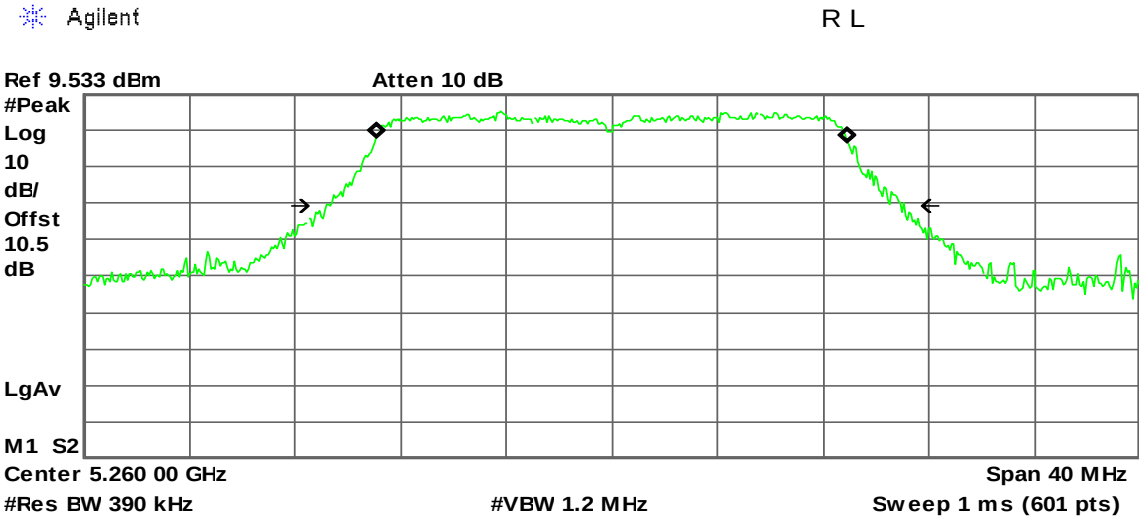
99% Bandwidth (CH High)



Transmit Freq Error	-116.968 kHz
x dB Bandwidth	21.540 MHz

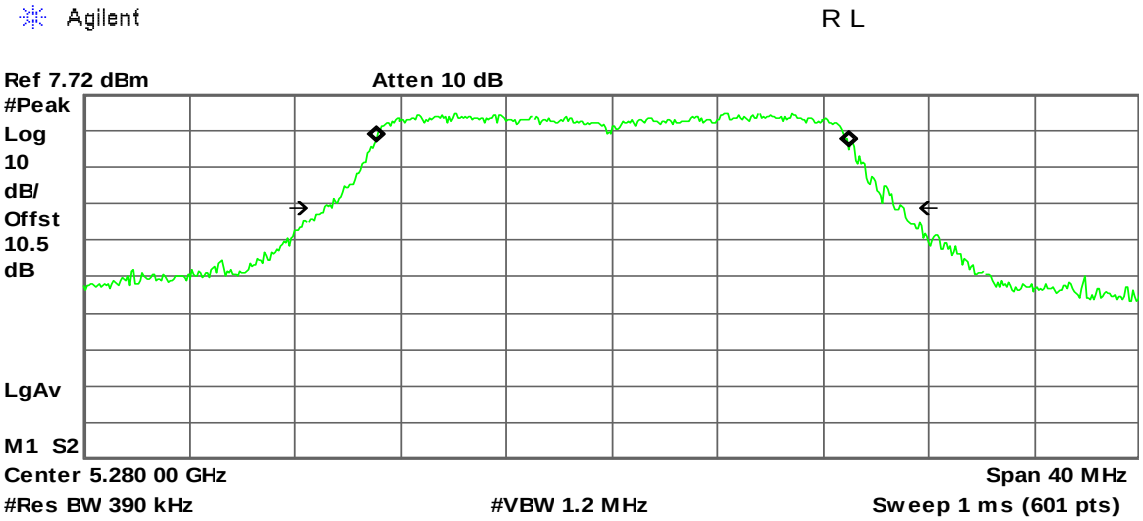
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

99% Bandwidth (CH Low)



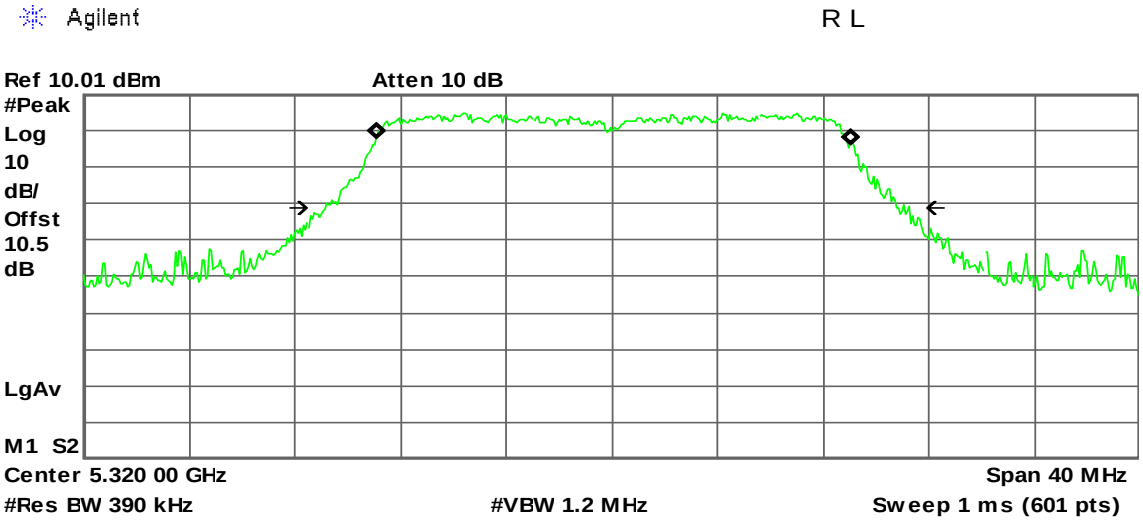
Transmit Freq Error	5.640 kHz
x dB Bandwidth	21.917 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error	36.214 kHz
x dB Bandwidth	21.911 MHz

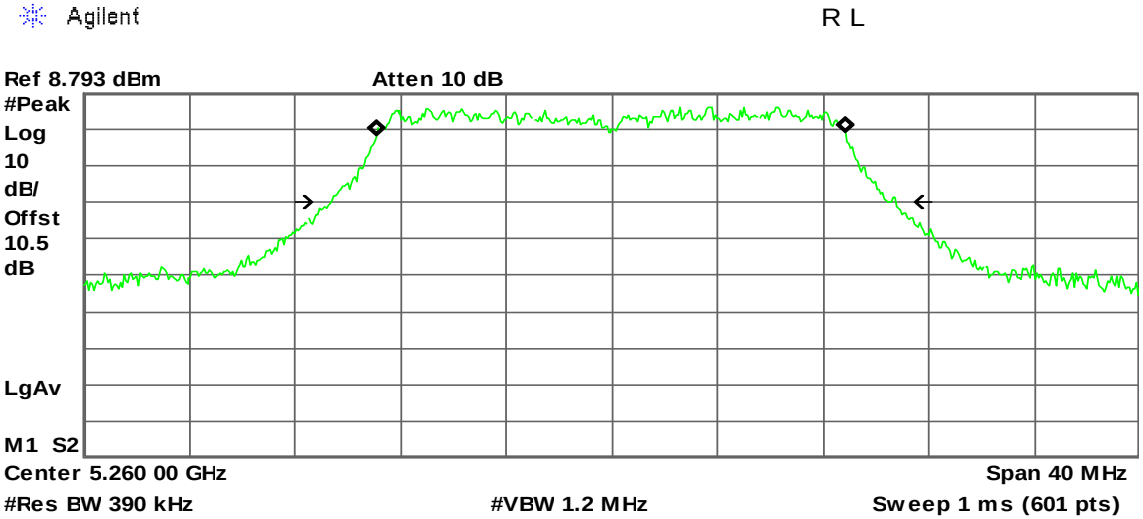
99% Bandwidth (CH High)



Transmit Freq Error	43.584 kHz
x dB Bandwidth	22.139 MHz

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

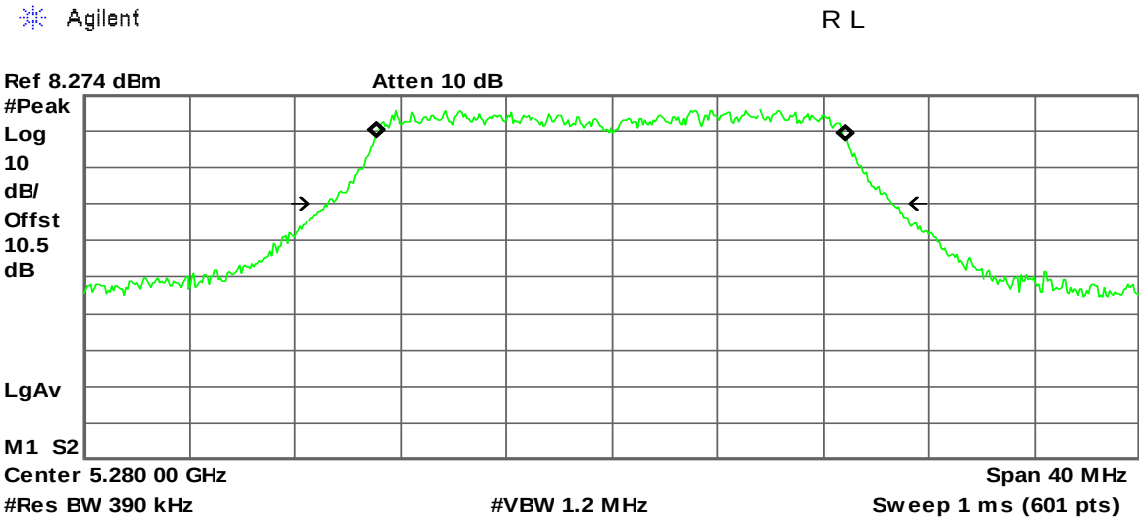
99% Bandwidth (CH Low)



Transmit Freq Error -19.005 kHz
x dB Bandwidth 21.407 MHz

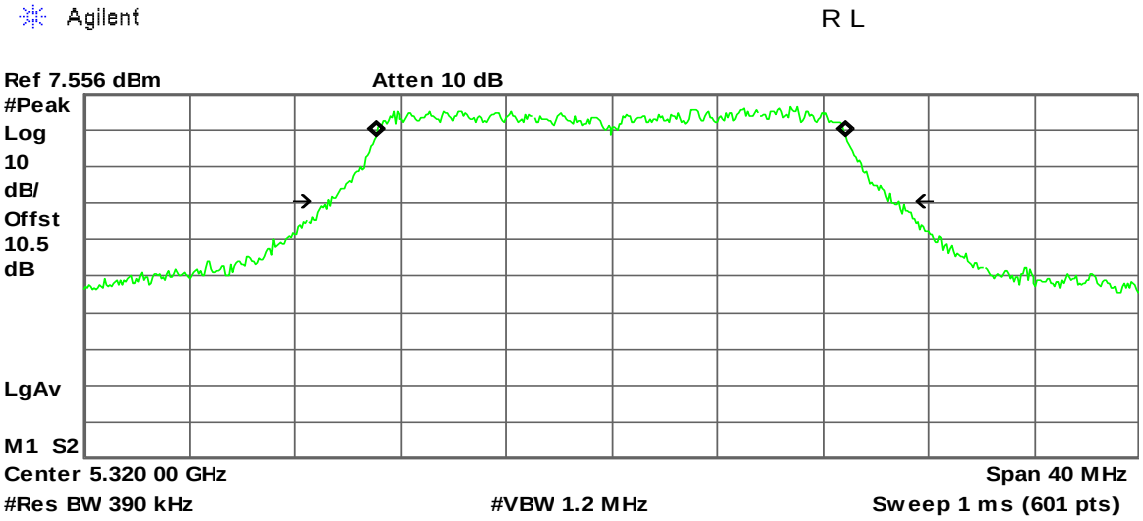
99%

Bandwidth (CH Mid)



Transmit Freq Error -39.581 kHz
x dB Bandwidth 21.384 MHz

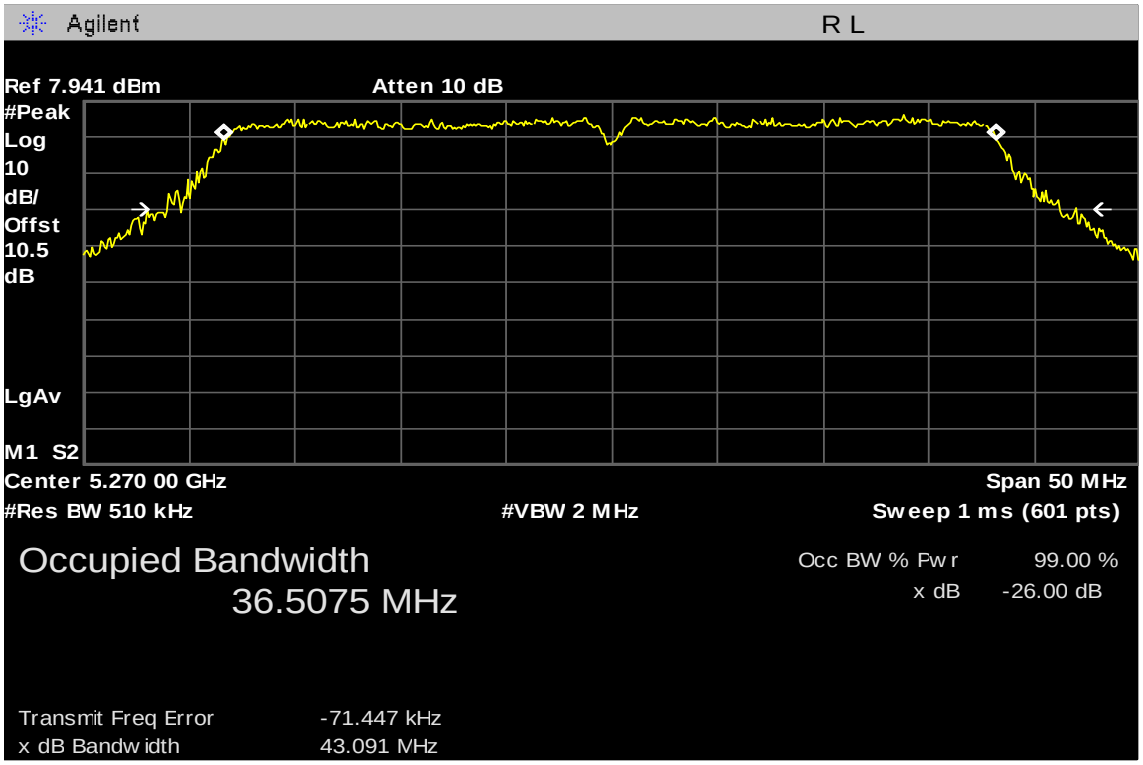
99% Bandwidth (CH High)



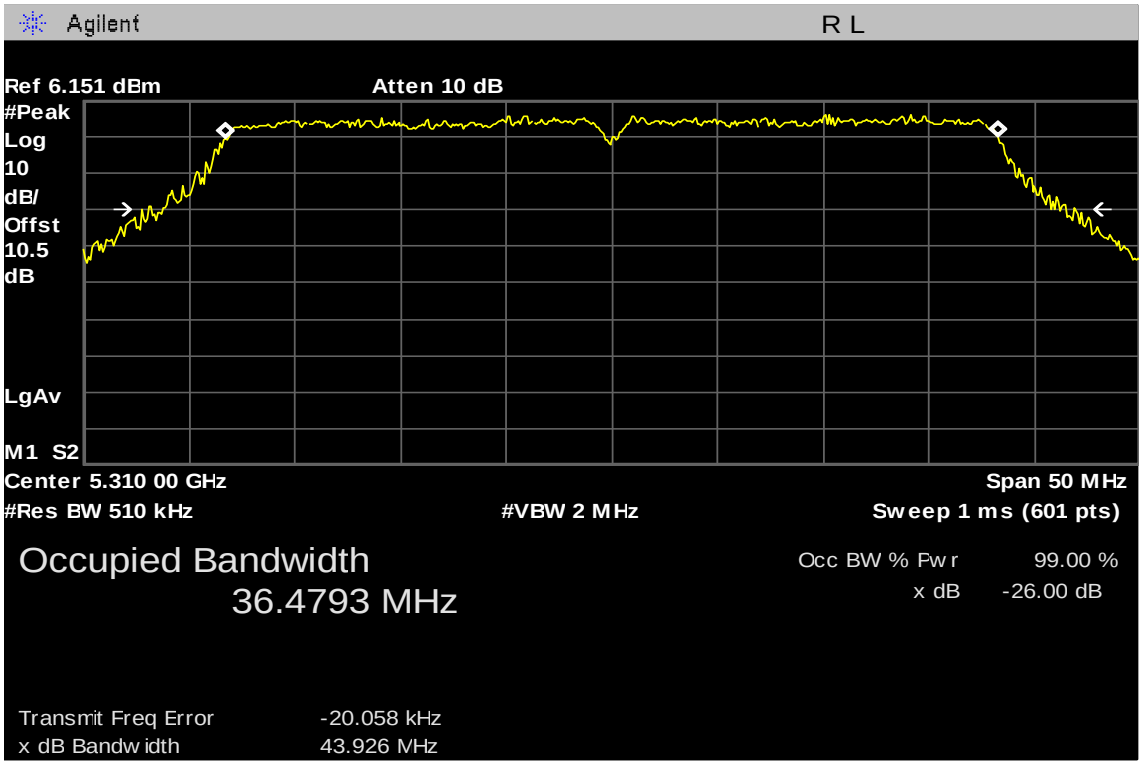
Transmit Freq Error	-27.767 kHz
x dB Bandwidth	21.616 MHz

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

99% Bandwidth (CH Low)

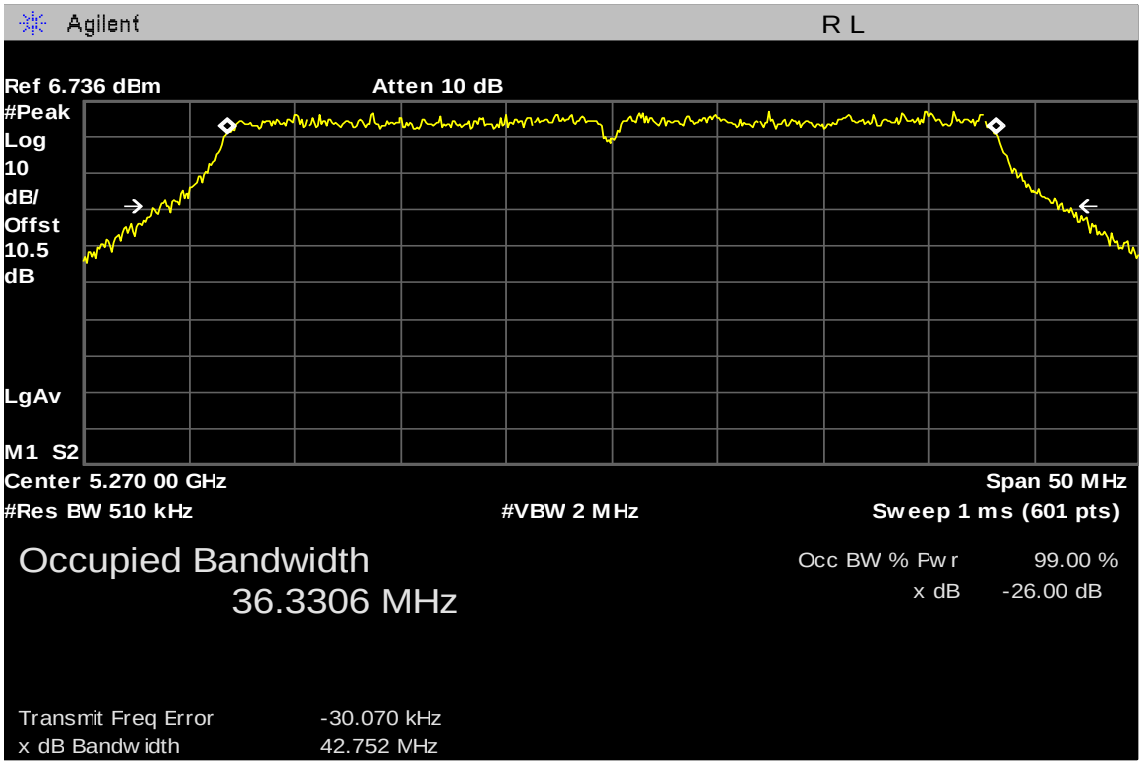


99% Bandwidth (CH High)

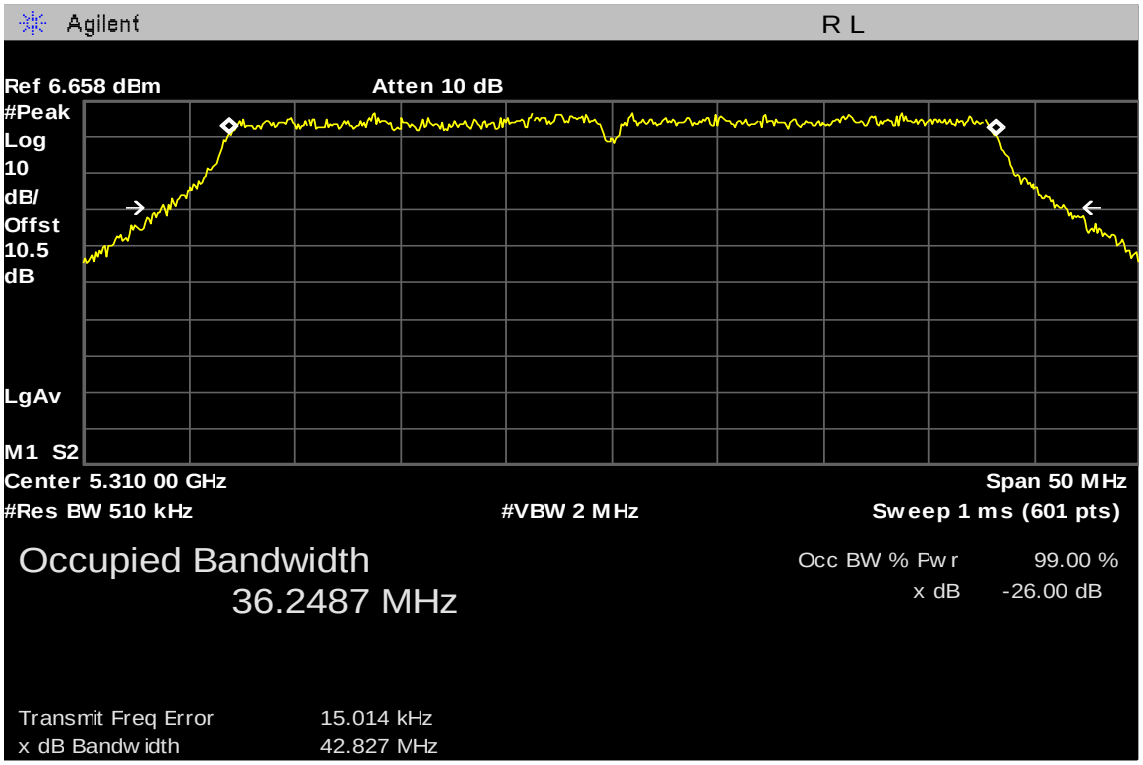


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

99% Bandwidth (CH Low)

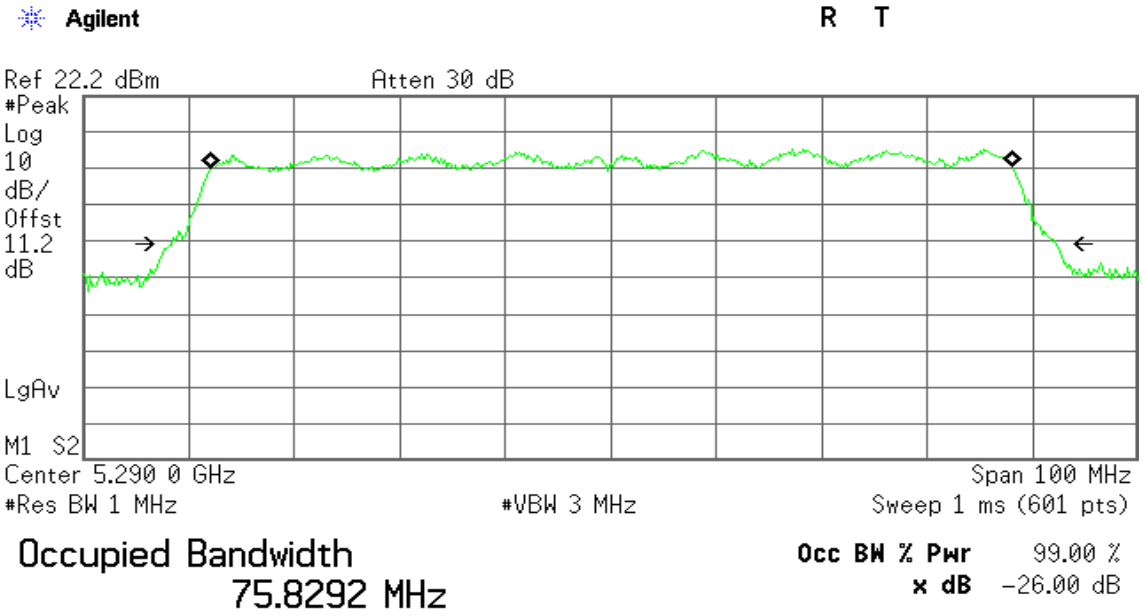


99% Bandwidth (CH High)



IEEE 802.11ac VHT 80 MHz mode / 5290MHz /

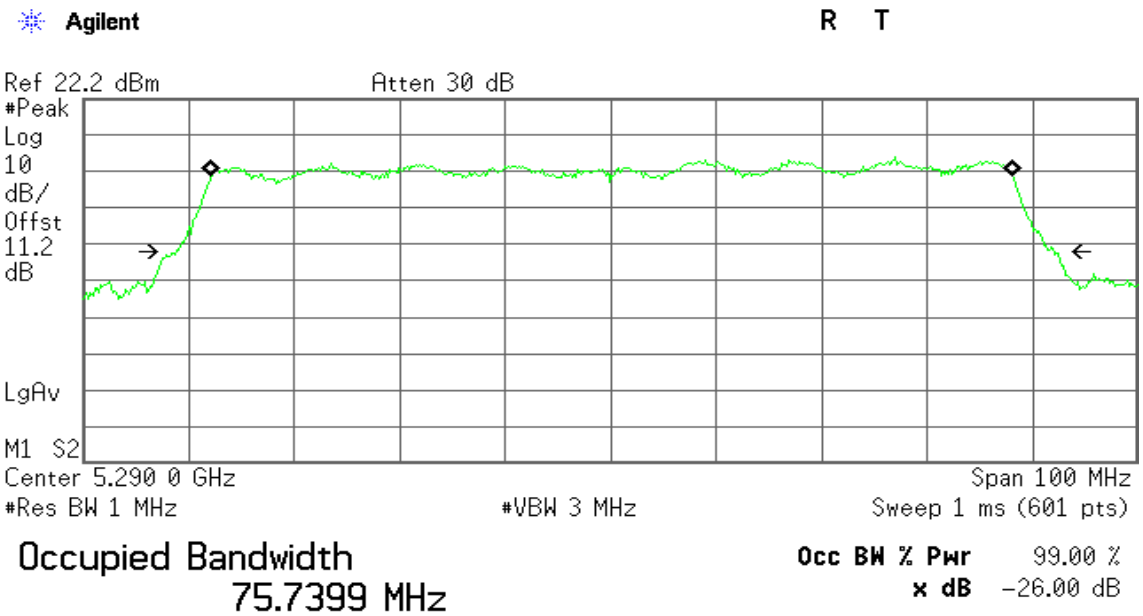
Chain 0 99% Bandwidth



Transmit Freq Error 130.657 kHz
x dB Bandwidth 83.895 MHz

IEEE 802.11ac VHT 80 MHz mode / 5290MHz /

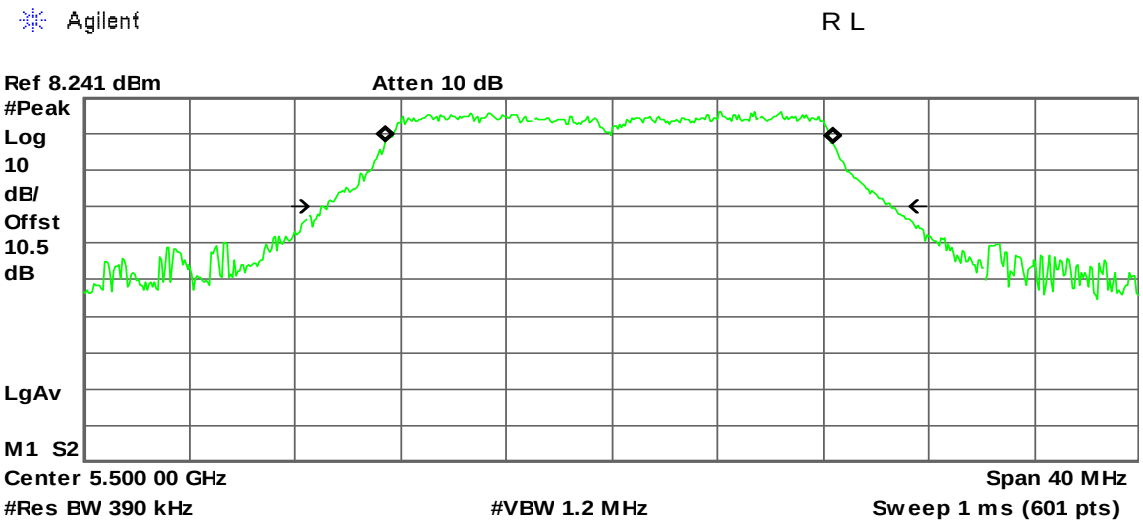
Chain 1 99% Bandwidth



Transmit Freq Error 119.231 kHz
x dB Bandwidth 83.363 MHz

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

99% Bandwidth (CH Low)

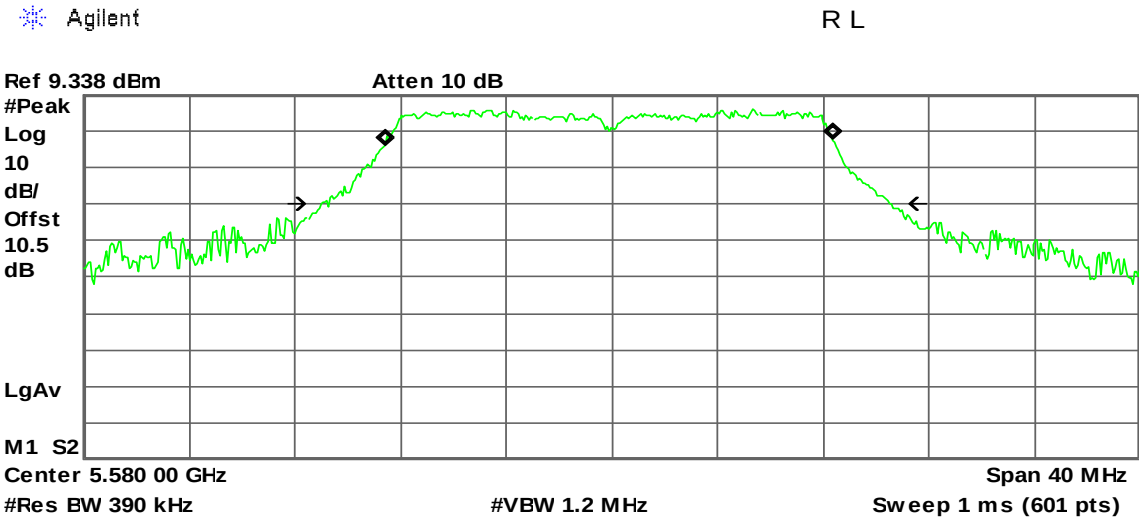


Occupied Bandwidth
16.9681 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -105.484 kHz
x dB Bandwidth 21.344 MHz

99% Bandwidth (CH Mid)

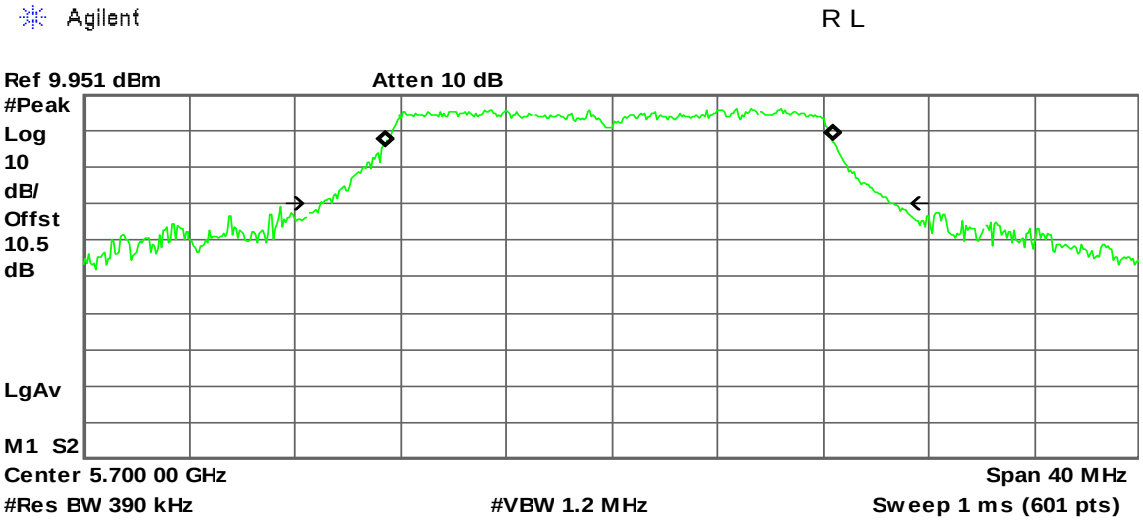


Occupied Bandwidth
16.9815 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -112.876 kHz
x dB Bandwidth 21.569 MHz

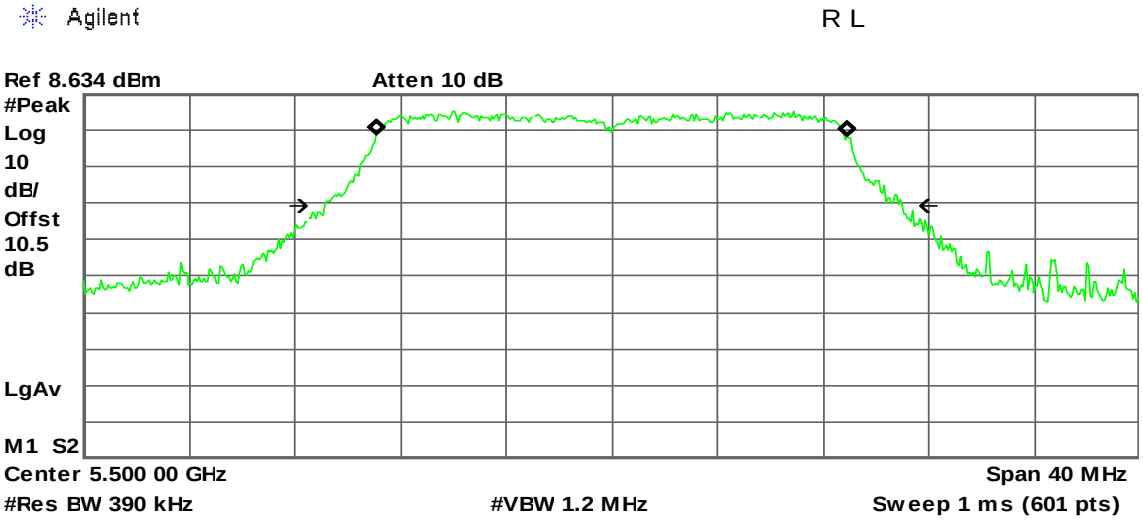
99% Bandwidth (CH High)



Transmit Freq Error	-116.665 kHz
x dB Bandwidth	21.712 MHz

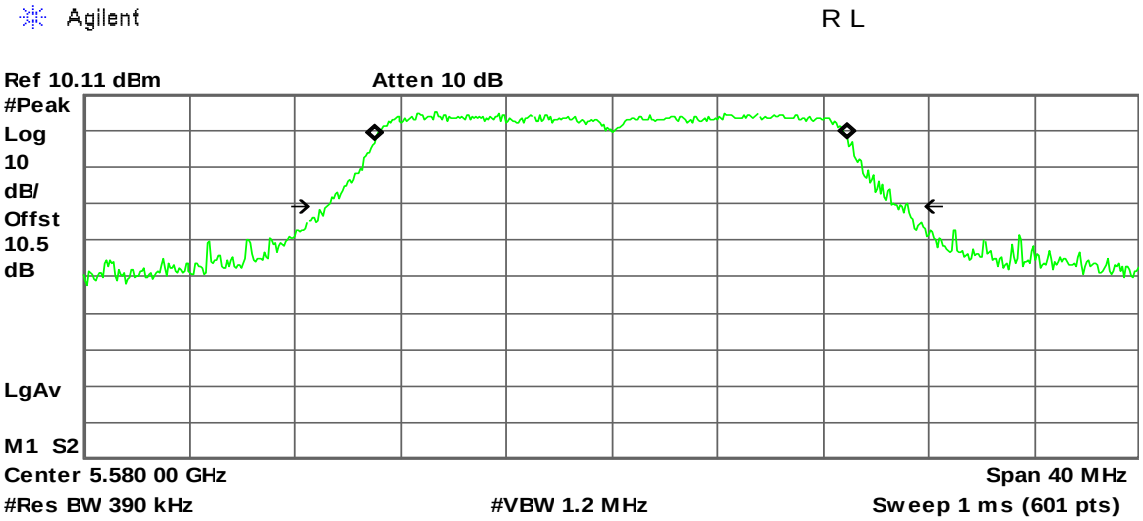
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

99% Bandwidth (CH Low)



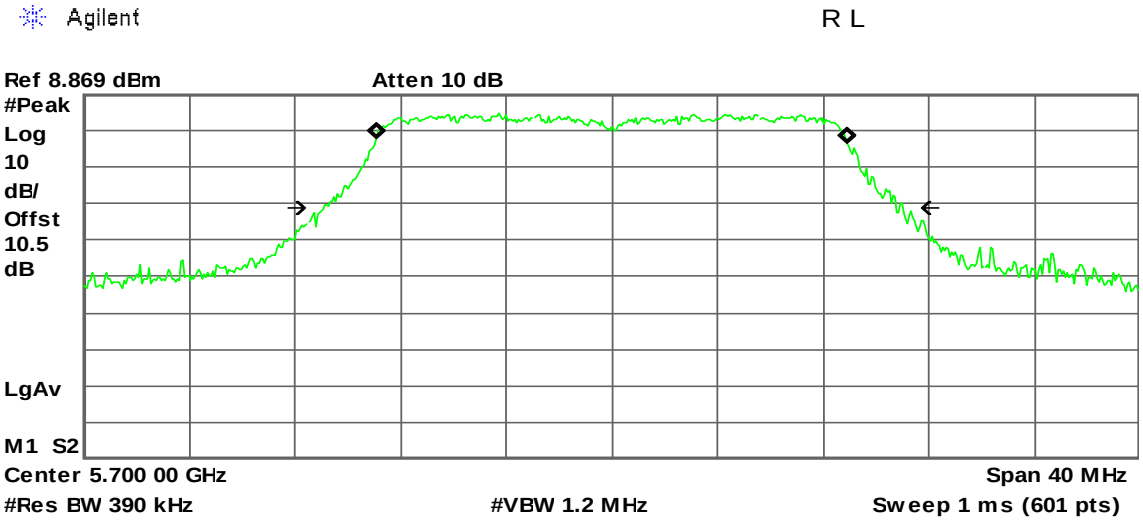
Transmit Freq Error	171.768 Hz
x dB Bandwidth	21.901 MHz

99% Bandwidth (CH Mid)



Transmit Freq Error	-6.078 kHz
x dB Bandwidth	22.035 MHz

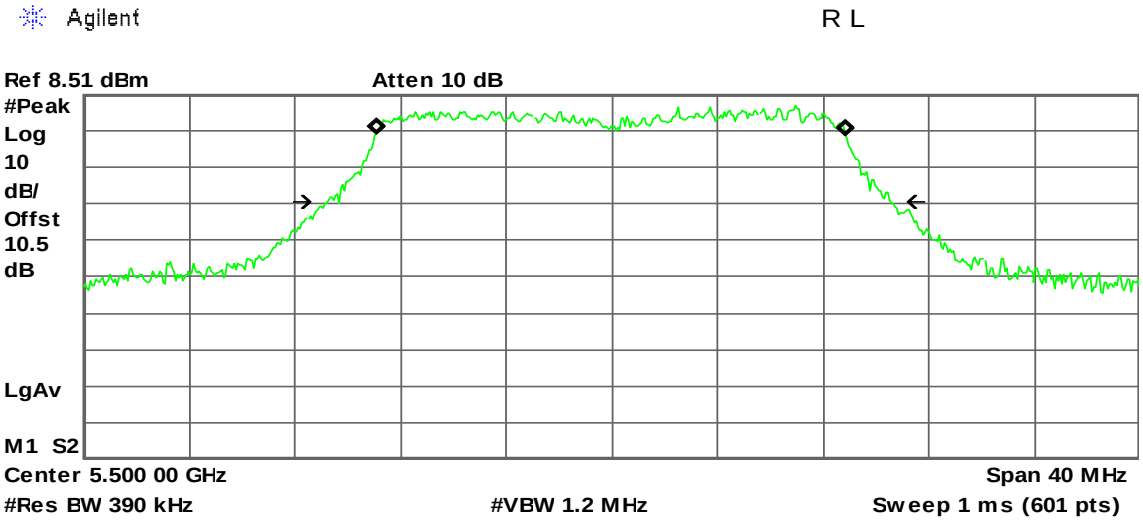
99% Bandwidth (CH High)



Transmit Freq Error	-427.853 Hz
x dB Bandwidth	21.949 MHz

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

99% Bandwidth (CH Low)

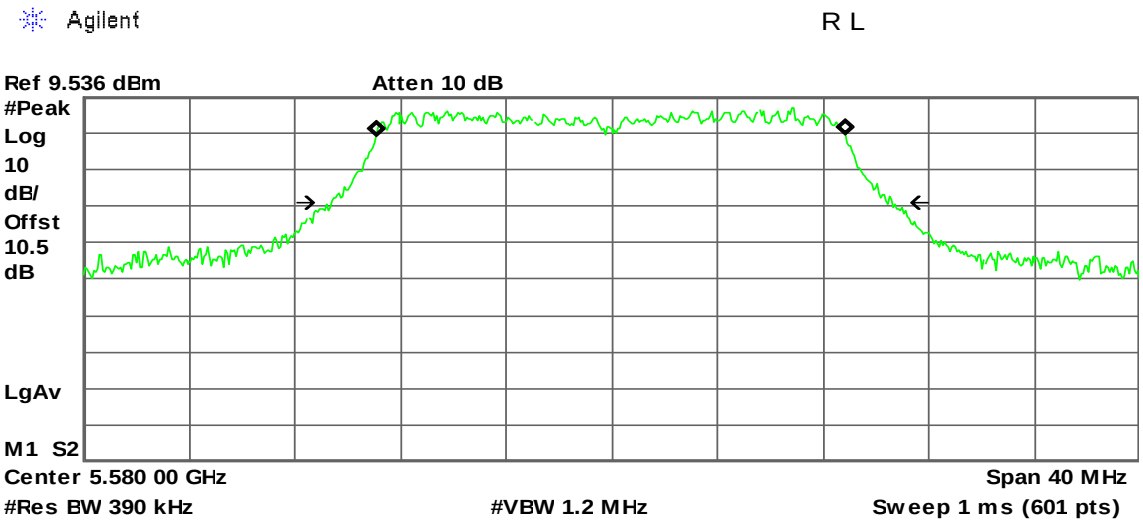


Occupied Bandwidth
17.8230 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -40.690 kHz
x dB Bandwidth 21.319 MHz

99% Bandwidth (CH Mid)

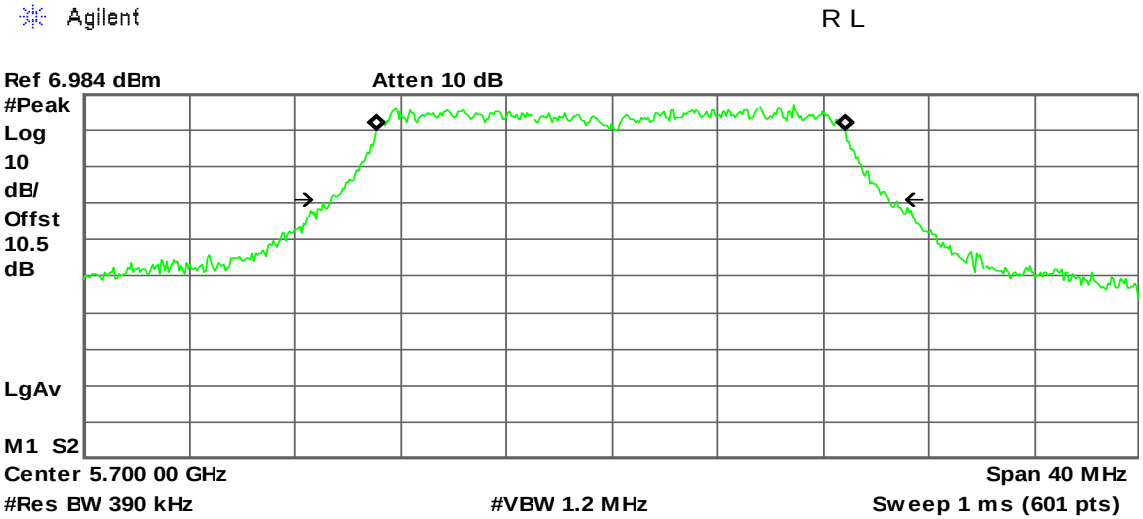


Occupied Bandwidth
17.8148 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -28.829 kHz
x dB Bandwidth 21.253 MHz

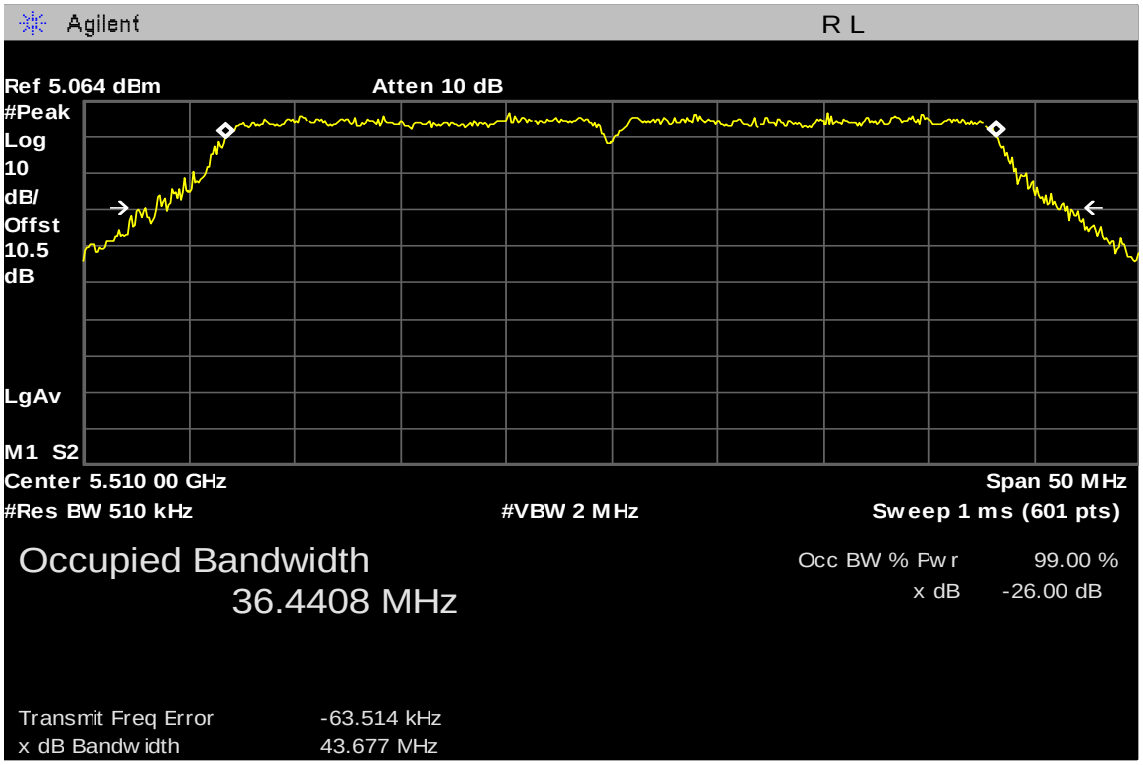
99% Bandwidth (CH High)



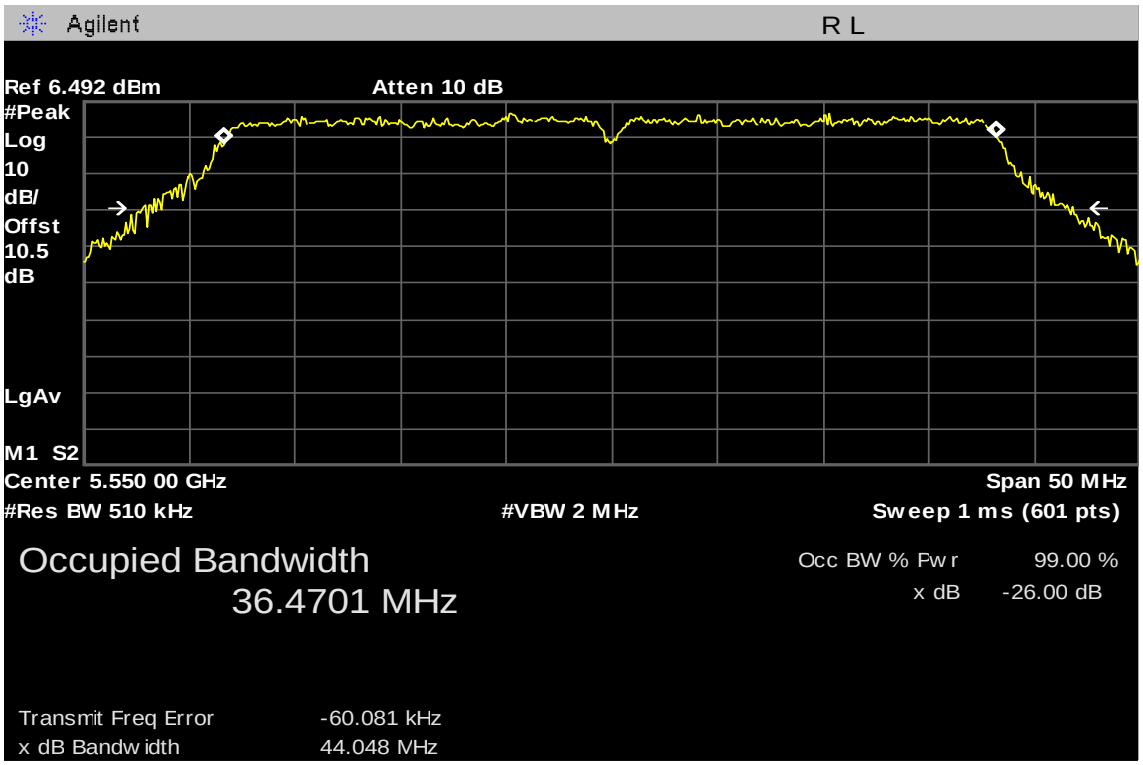
Transmit Freq Error	-32.866 kHz
x dB Bandwidth	21.134 MHz

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

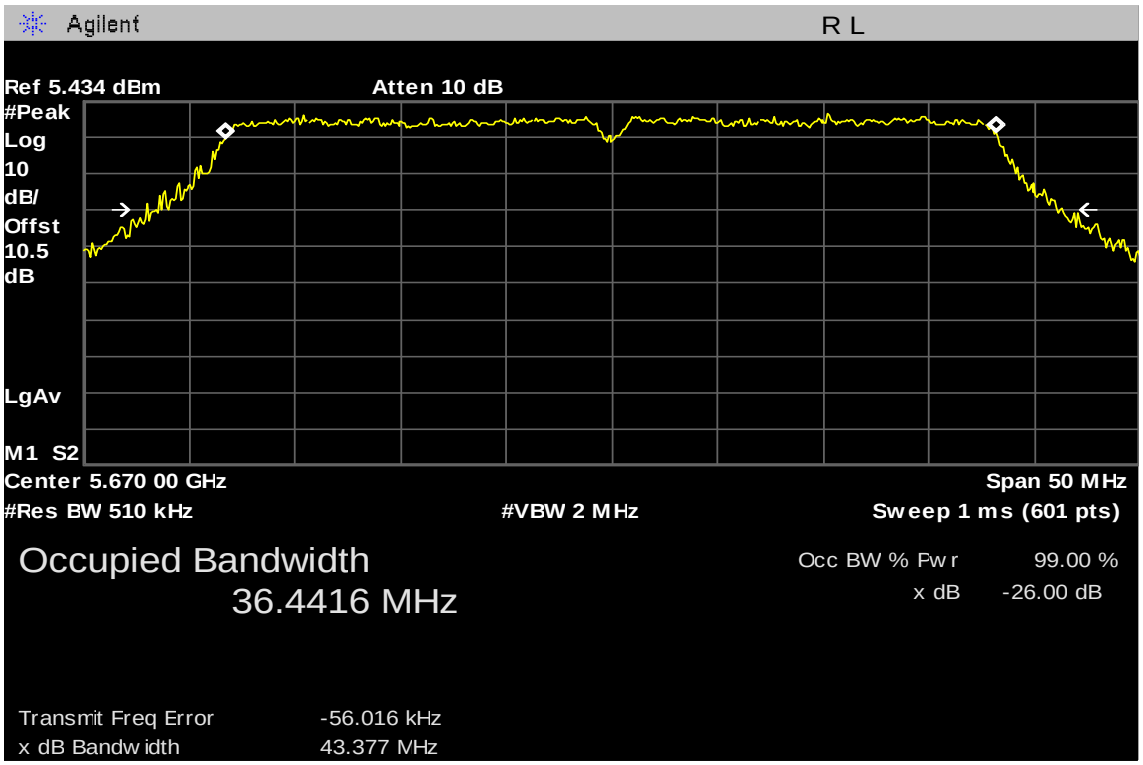
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

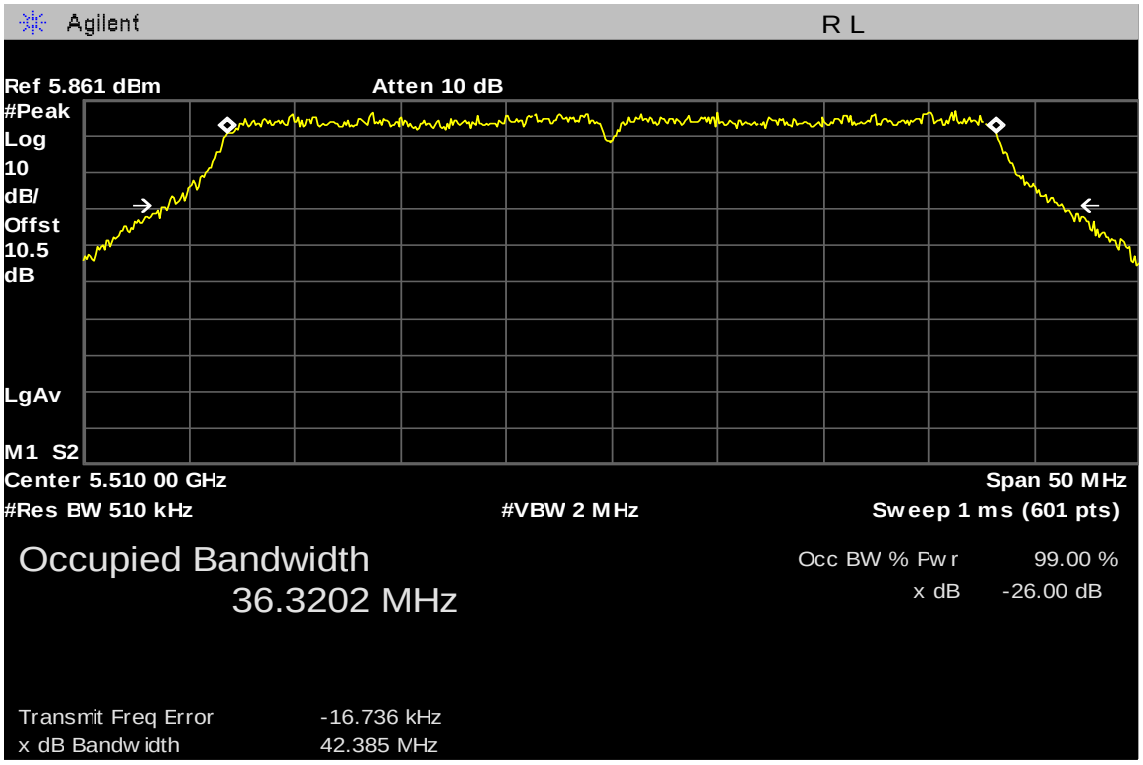


99% Bandwidth (CH High)

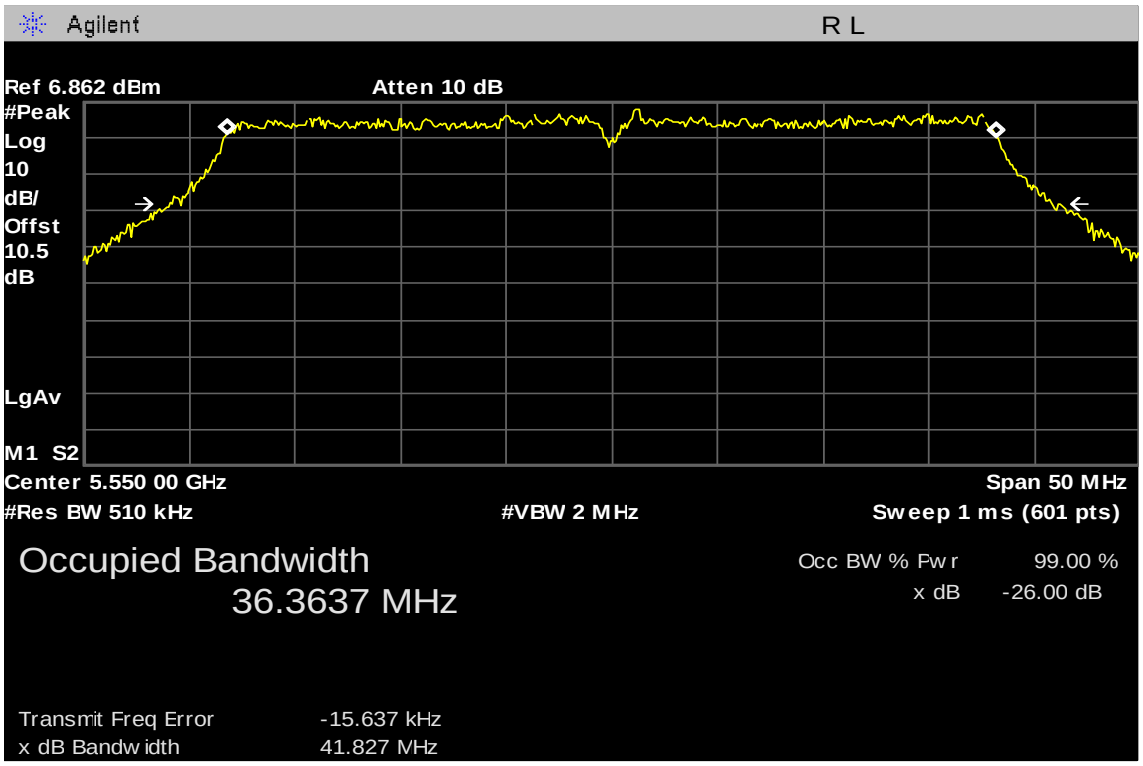


IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

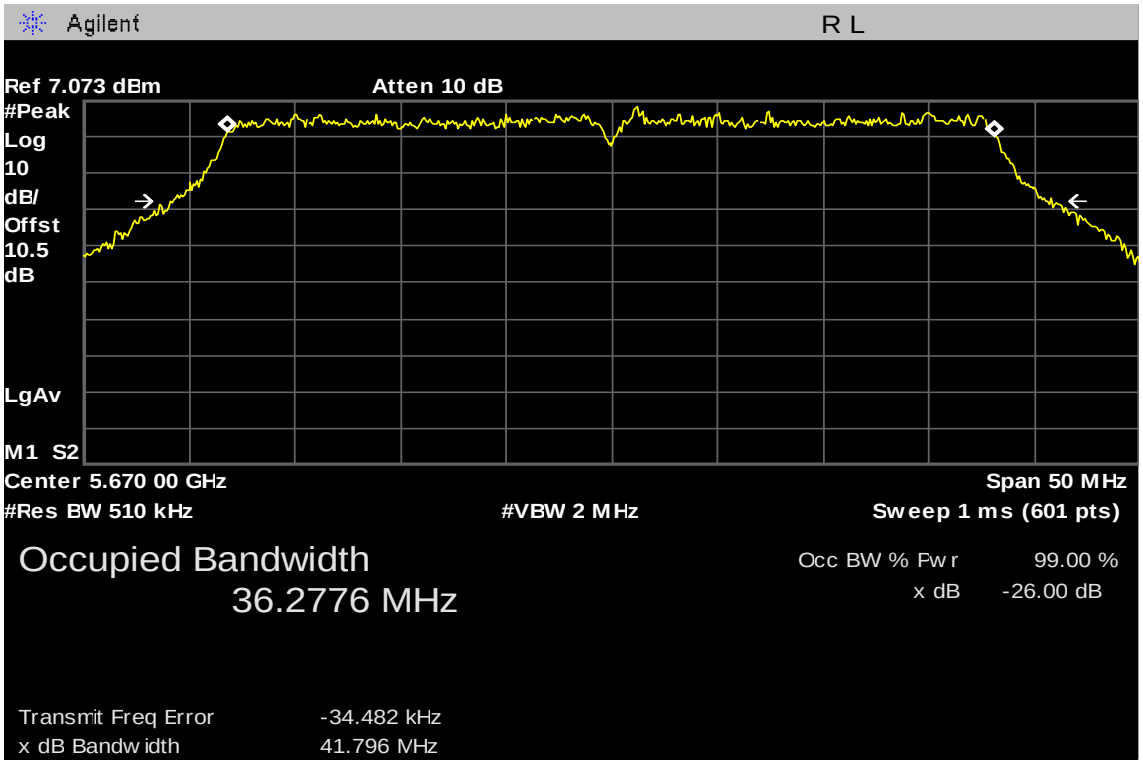
99% Bandwidth (CH Low)



99% Bandwidth (CH Mid)

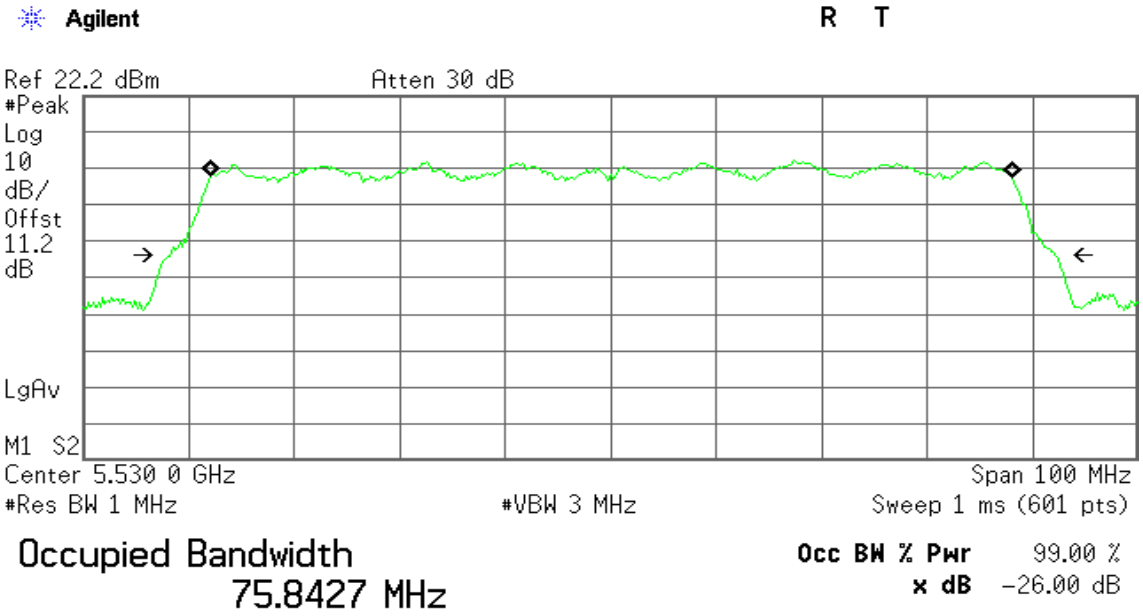


99% Bandwidth (CH High)



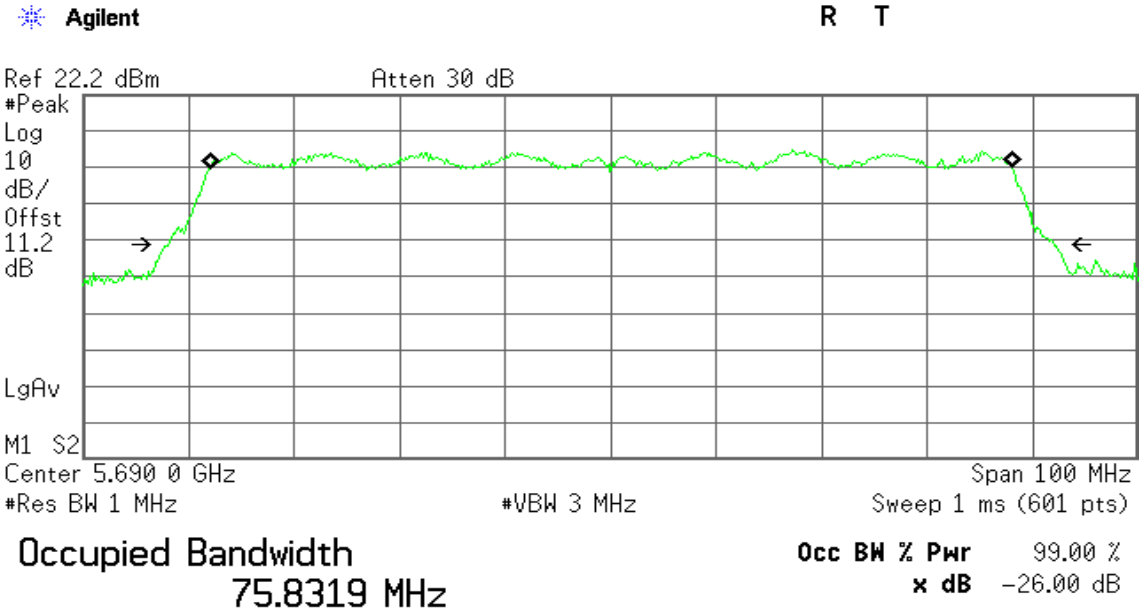
IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz /

Chain 0 99% Bandwidth (CH Low)



Transmit Freq Error 69.801 kHz
x dB Bandwidth 84.115 MHz

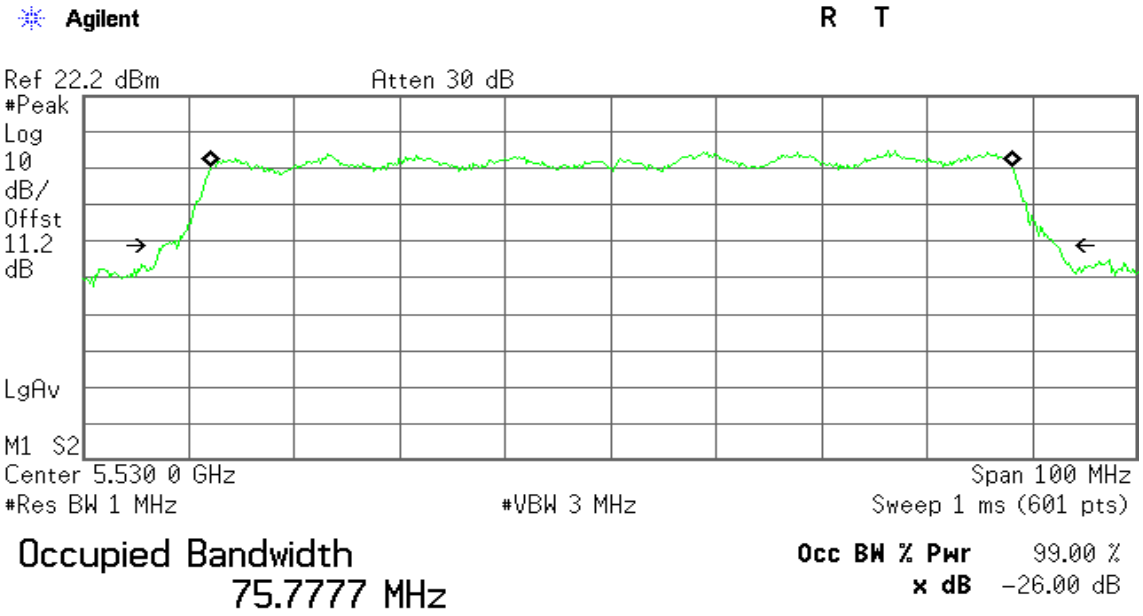
99% Bandwidth (CH High)



Transmit Freq Error 10.927 kHz
x dB Bandwidth 84.146 MHz

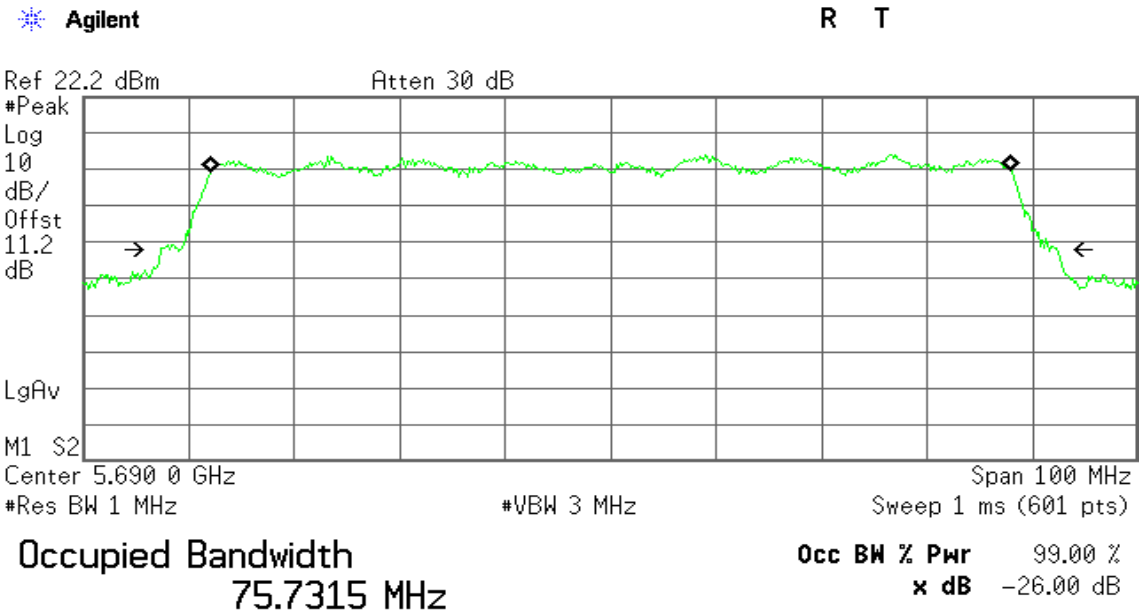
IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz /

Chain 1 99% Bandwidth (CH Low)



Transmit Freq Error 81.371 kHz
x dB Bandwidth 84.992 MHz

99% Bandwidth (CH High)



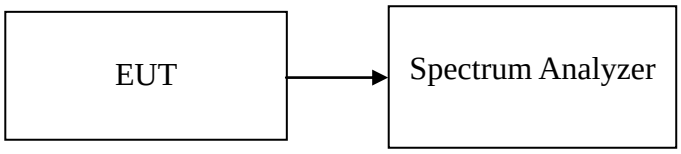
Transmit Freq Error 24.319 kHz
x dB Bandwidth 85.046 MHz

8.2 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	21.2666
Mid	5220	21.2666
High	5240	21.2667

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	21.9334
Mid	5220	21.9334
High	5240	21.9334

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	21.5333
Mid	5220	21.5334
High	5240	21.5333

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	43.9
High	5230	44

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	42.4
High	5230	42.5

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Mid	5210	75.8171

Test mode: IEEE 802.11ac VHT 80 MHz mode/ 5210MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Mid	5210	75.7411

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5260	21.3333
Mid	5280	21.3333
High	5320	21.2

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	22
Mid	5260	21.9334
High	5320	21.9333

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	21.5333
Mid	5260	21.5333
High	5320	21.5334

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	44.1
High	5310	44

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	42.6
High	5310	42.4

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Mid	5290	75.8292

Test mode: IEEE 802.11ac VHT 80 MHz mode/ 5290MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Mid	5290	75.7399

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	21.2667
Mid	5580	21.3334
High	5700	21.3333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	21.9334
Mid	5580	21.9333
High	5700	21.8667

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	21.5333
Mid	5580	21.4666
High	5700	21.5333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	44.2
Mid	5550	43.9
High	5670	44.1

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	42.6
Mid	5550	42.5
High	5670	42.6

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 0

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5530	75.8427
High	5690	75.8319

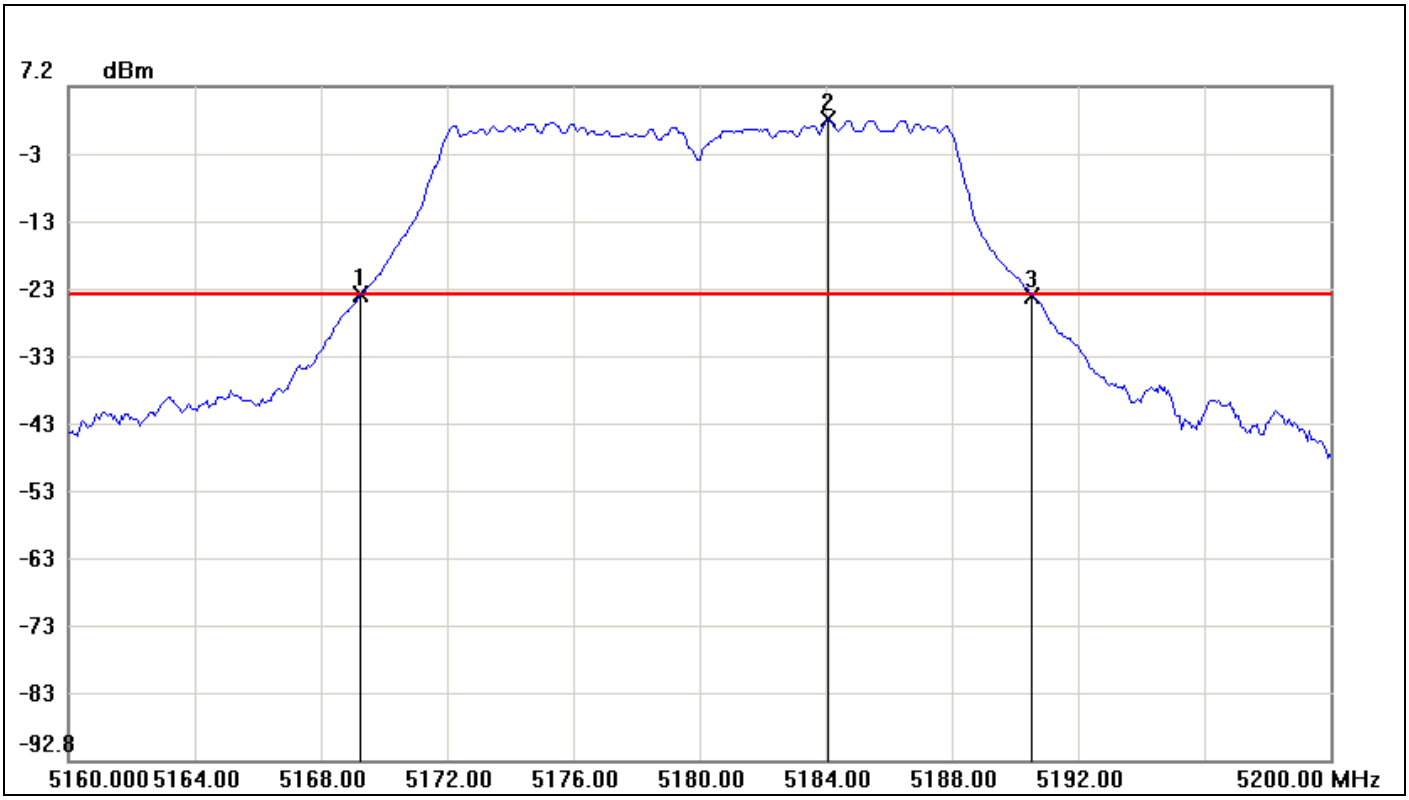
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5530	75.7777
High	5690	75.7315

Test Plot

IEEE 802.11a for 5180 ~ 5240MHz

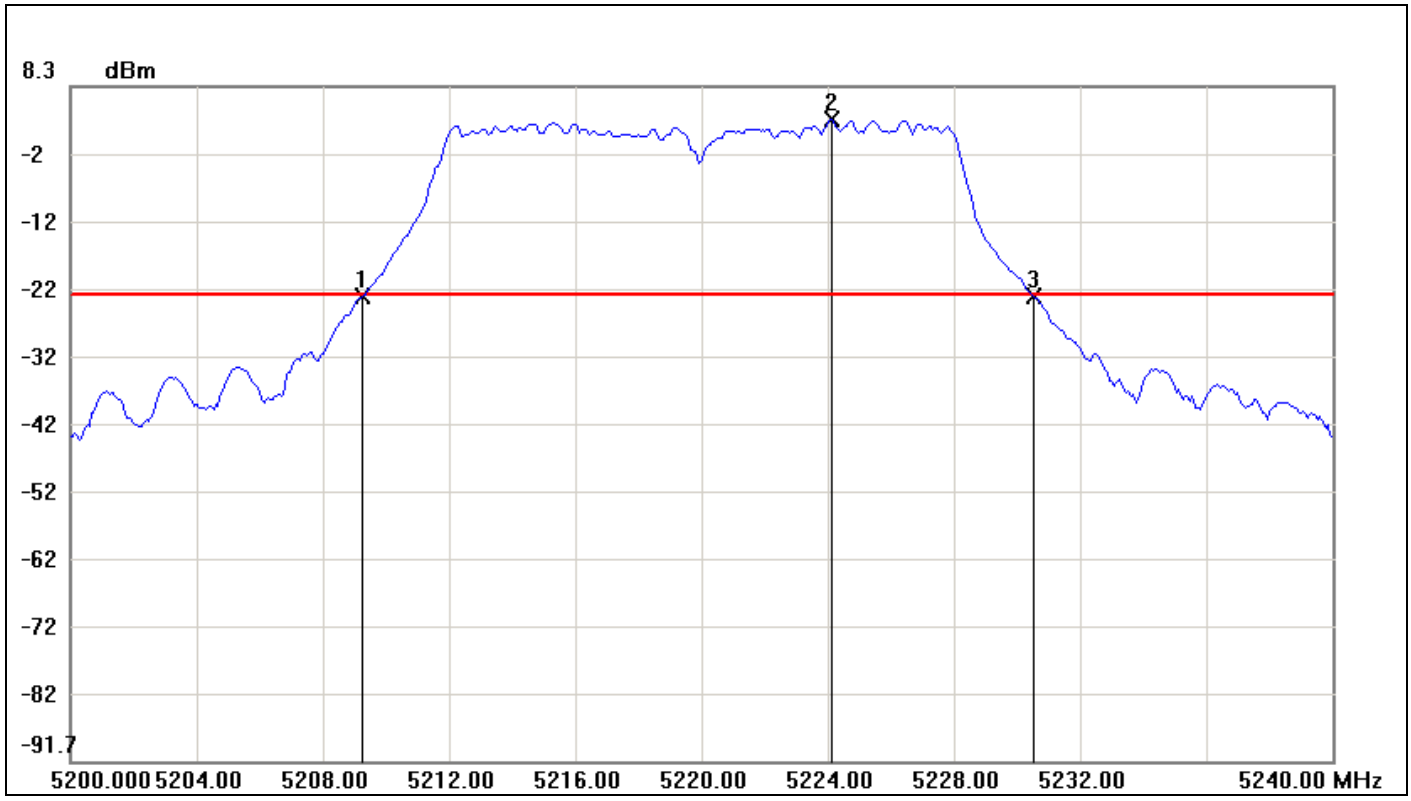
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5169.2667	-23.73	-23.68	-0.05
2	5184.0667	2.32	-23.68	26.00
3	5190.5333	-23.85	-23.68	-0.17

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.2666	-0.12

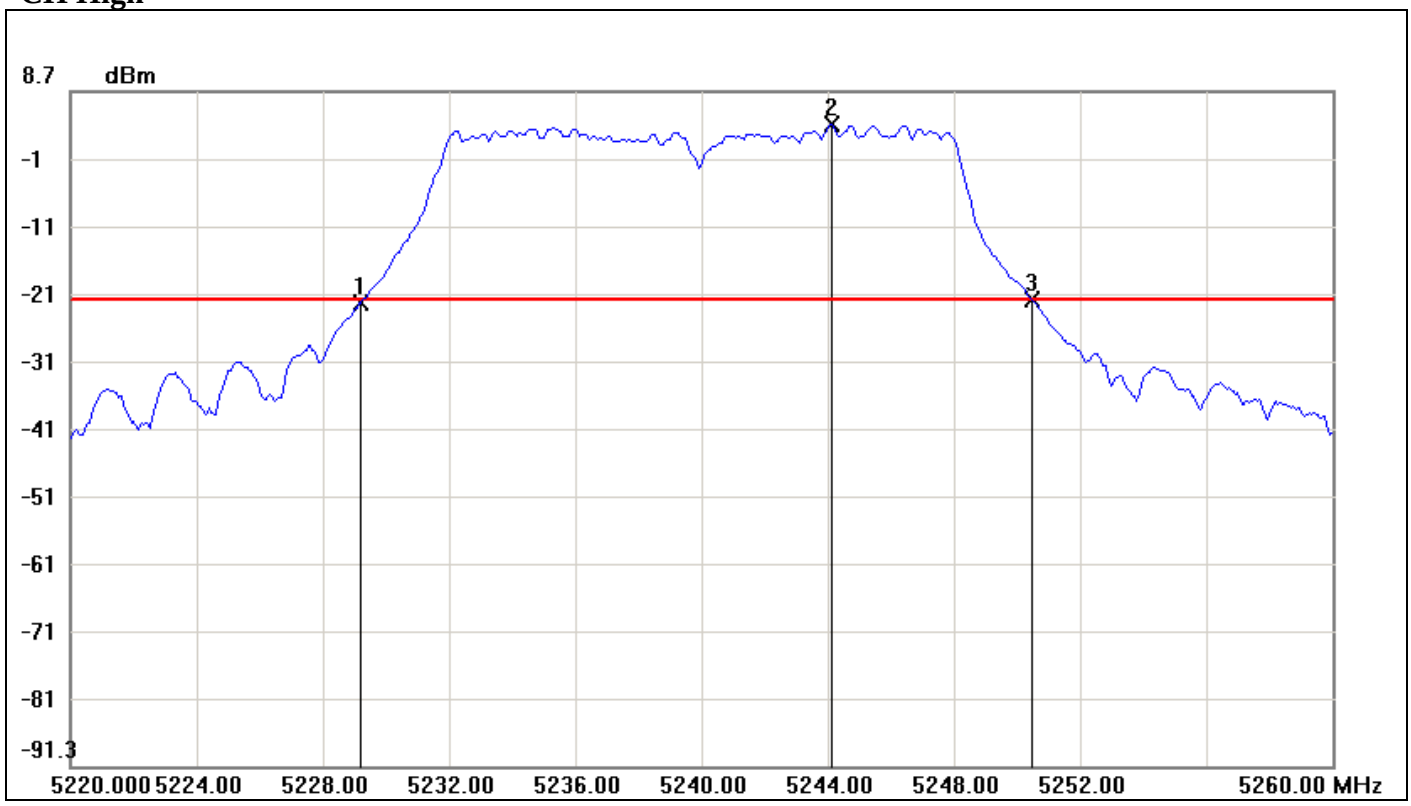
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5209.2667	-22.73	-22.60	-0.13
2	5224.1333	3.40	-22.60	26.00
3	5230.5333	-22.75	-22.60	-0.15

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.2666	-0.02

CH High

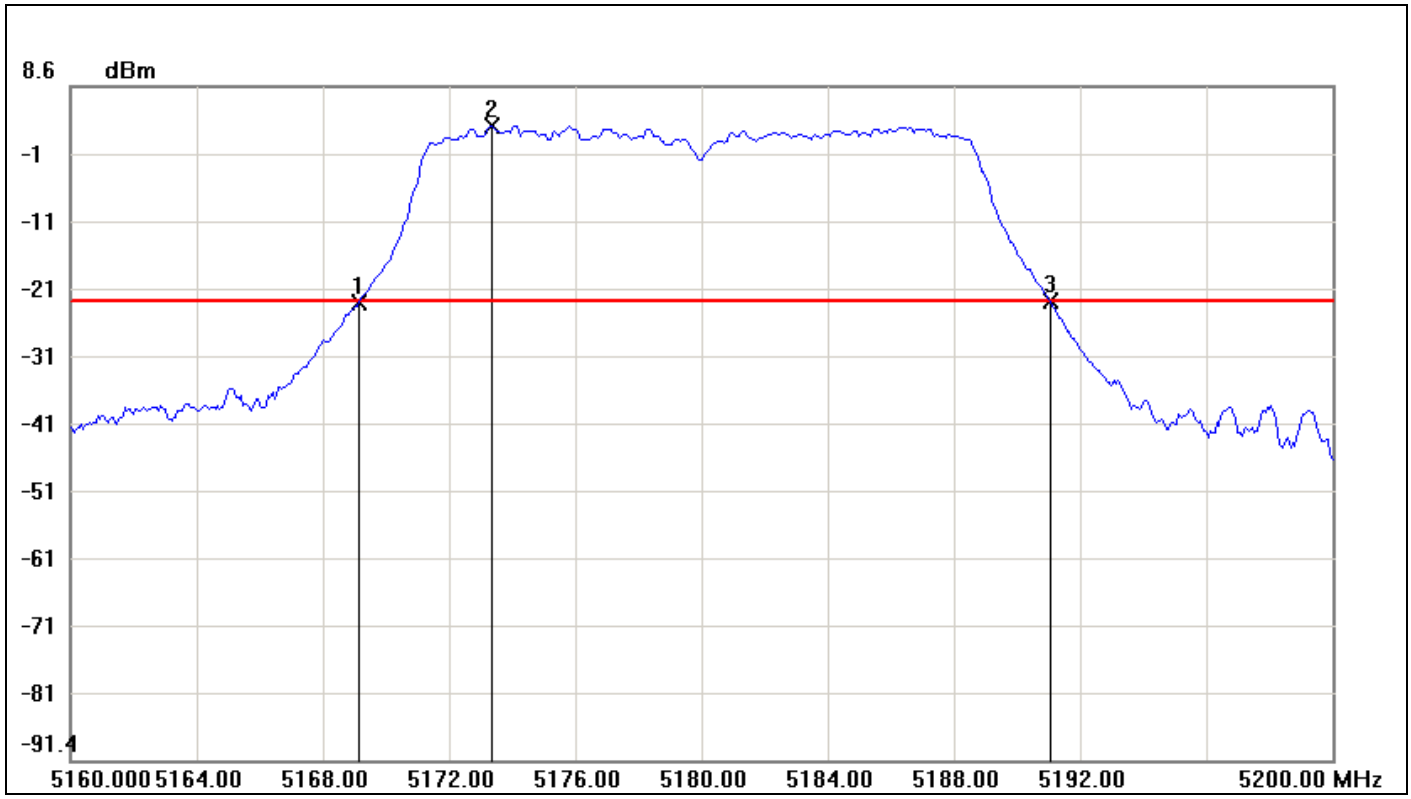


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5229.2000	-22.60	-22.20	-0.40
2	5244.1333	3.80	-22.20	26.00
3	5250.4667	-22.26	-22.20	-0.06

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.2667	0.34

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

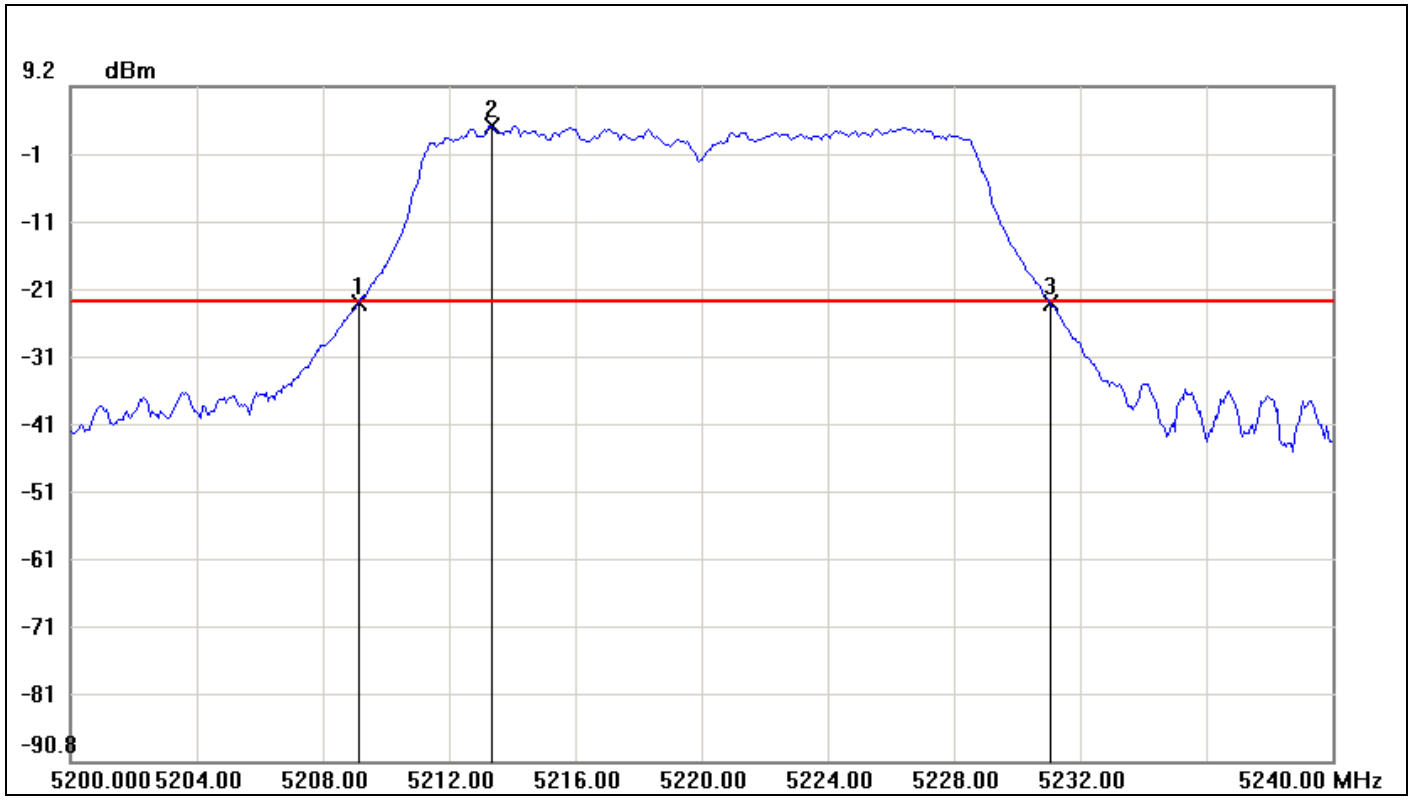
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5169.1333	-23.54	-23.23	-0.31
2	5173.3333	2.77	-23.23	26.00
3	5191.0667	-23.29	-23.23	-0.06

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9334	0.25

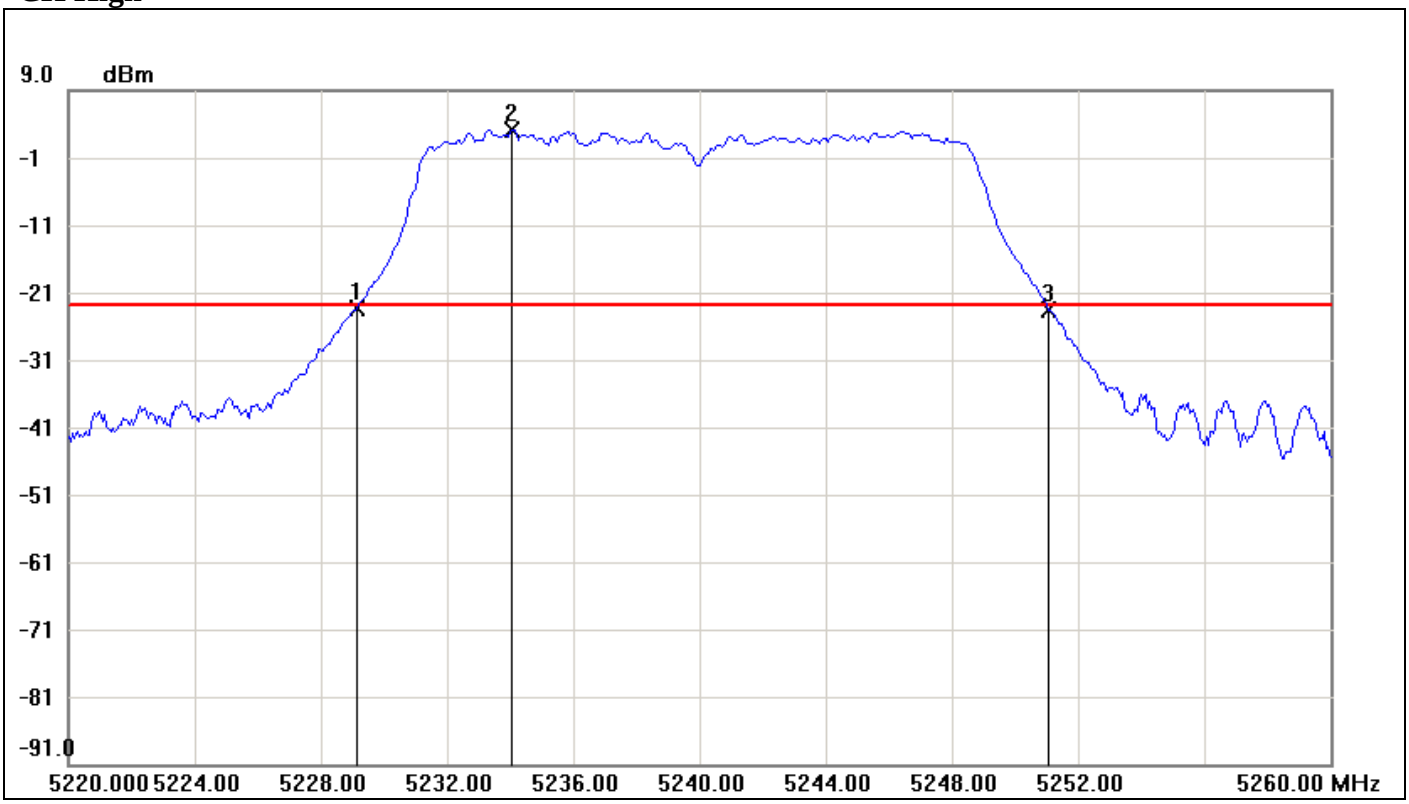
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5209.1333	-23.04	-22.77	-0.27
2	5213.3333	3.23	-22.77	26.00
3	5231.0667	-22.90	-22.77	-0.13

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9334	0.14

CH High

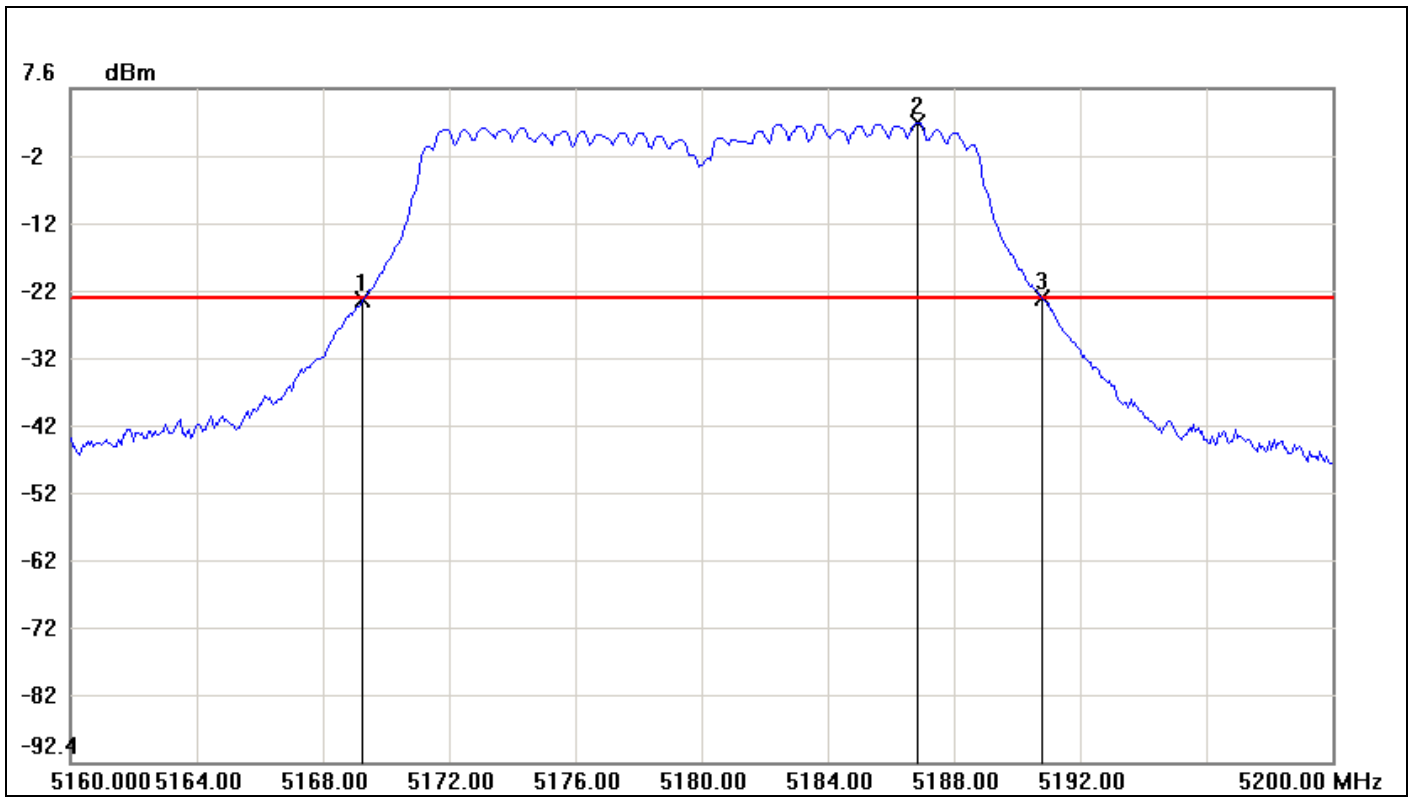


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5229.1333	-23.37	-22.97	-0.40
2	5234.0667	3.03	-22.97	26.00
3	5251.0667	-23.58	-22.97	-0.61

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9334	-0.21

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

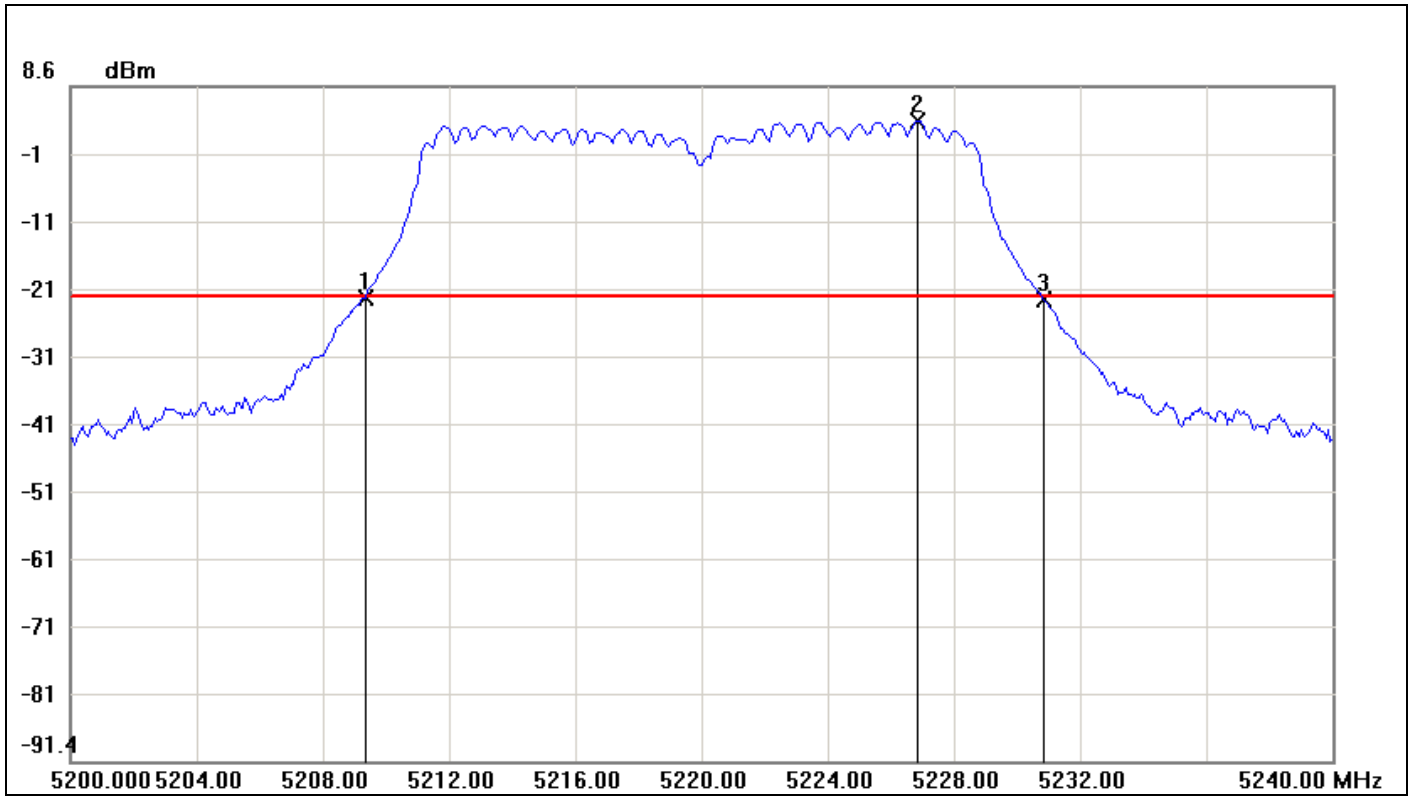
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5169.2667	-23.84	-23.40	-0.44
2	5186.8667	2.60	-23.40	26.00
3	5190.8000	-23.50	-23.40	-0.10

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	0.34

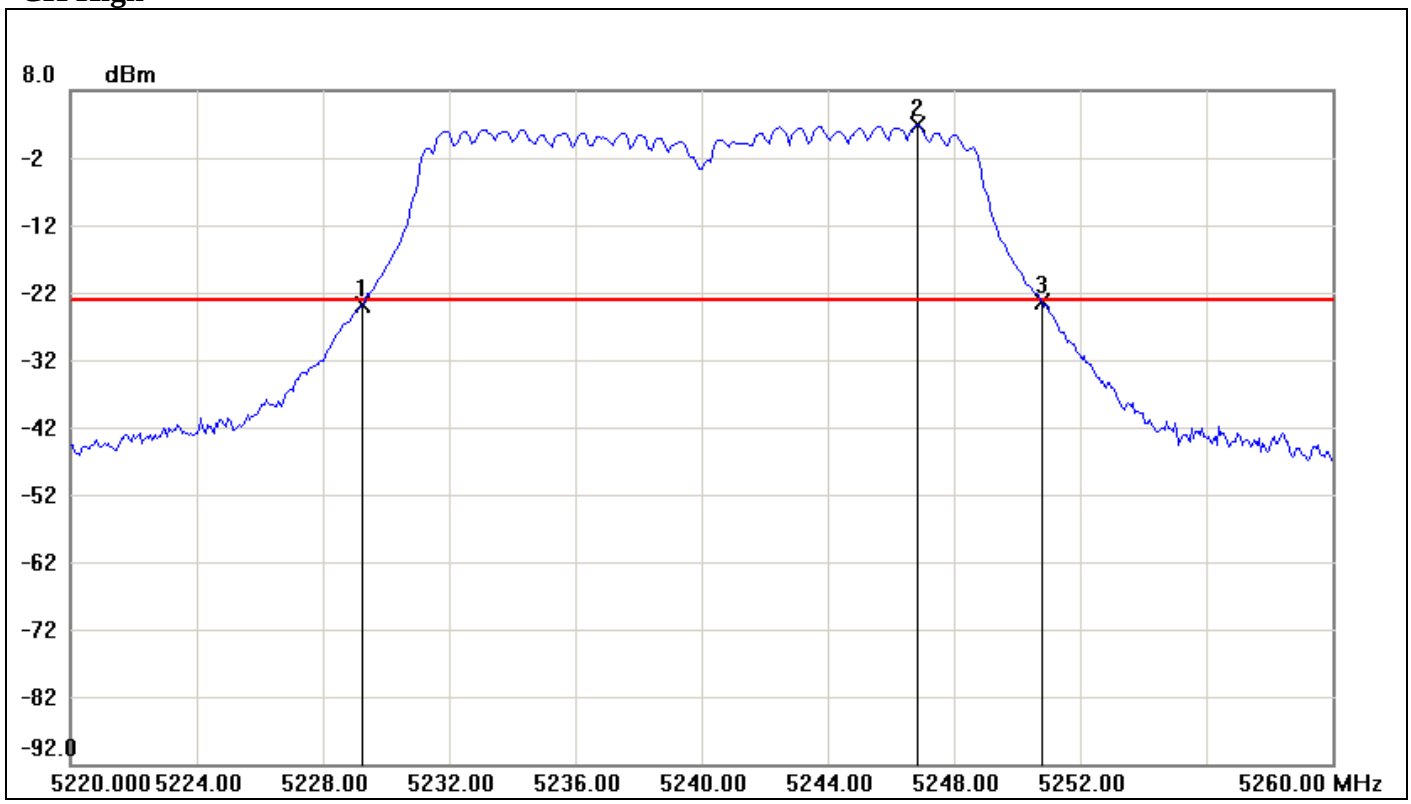
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5209.3333	-22.69	-22.47	-0.22
2	5226.8667	3.53	-22.47	26.00
3	5230.8667	-22.98	-22.47	-0.51

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5334	-0.29

CH High

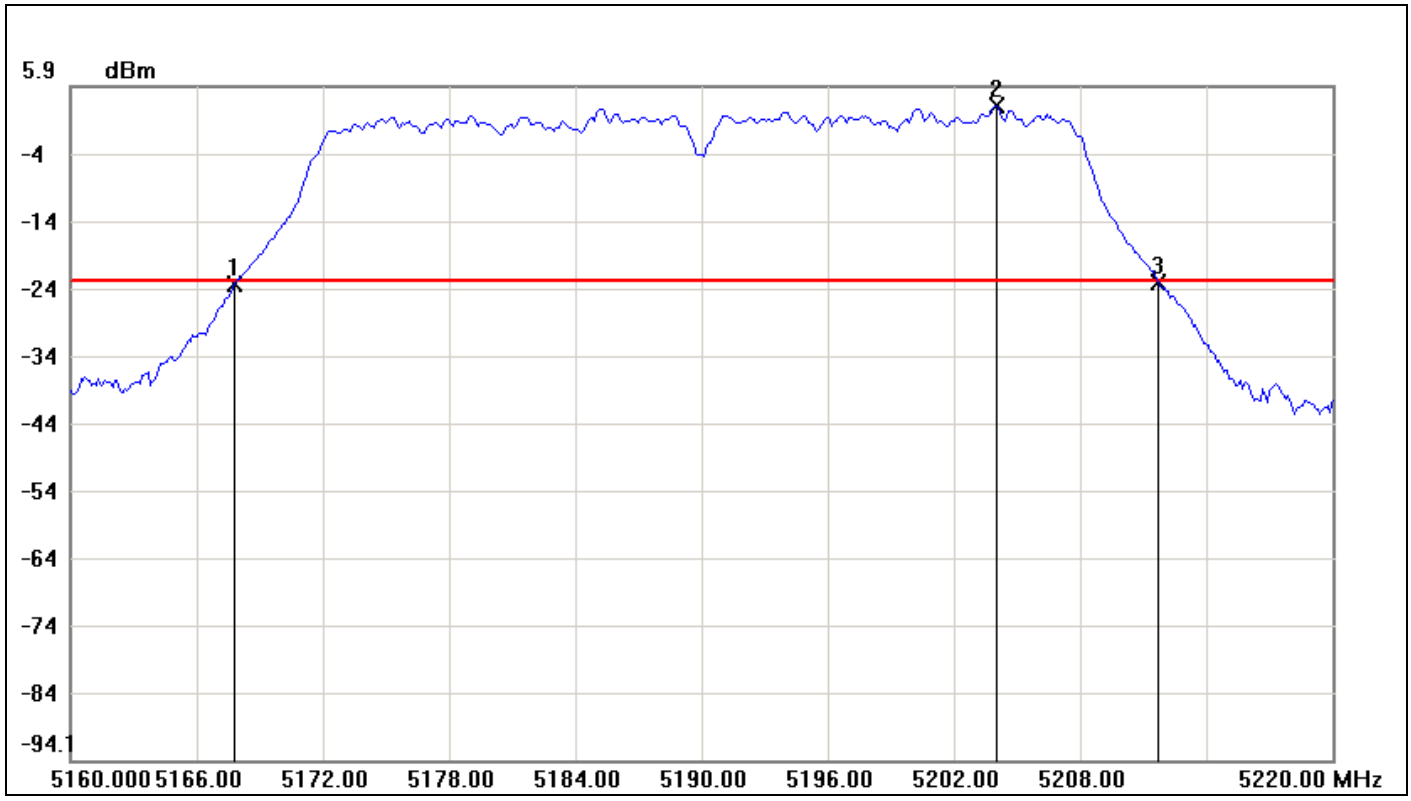


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5229.2667	-23.85	-23.12	-0.73
2	5246.8667	2.88	-23.12	26.00
3	5250.8000	-23.36	-23.12	-0.24

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	0.49

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

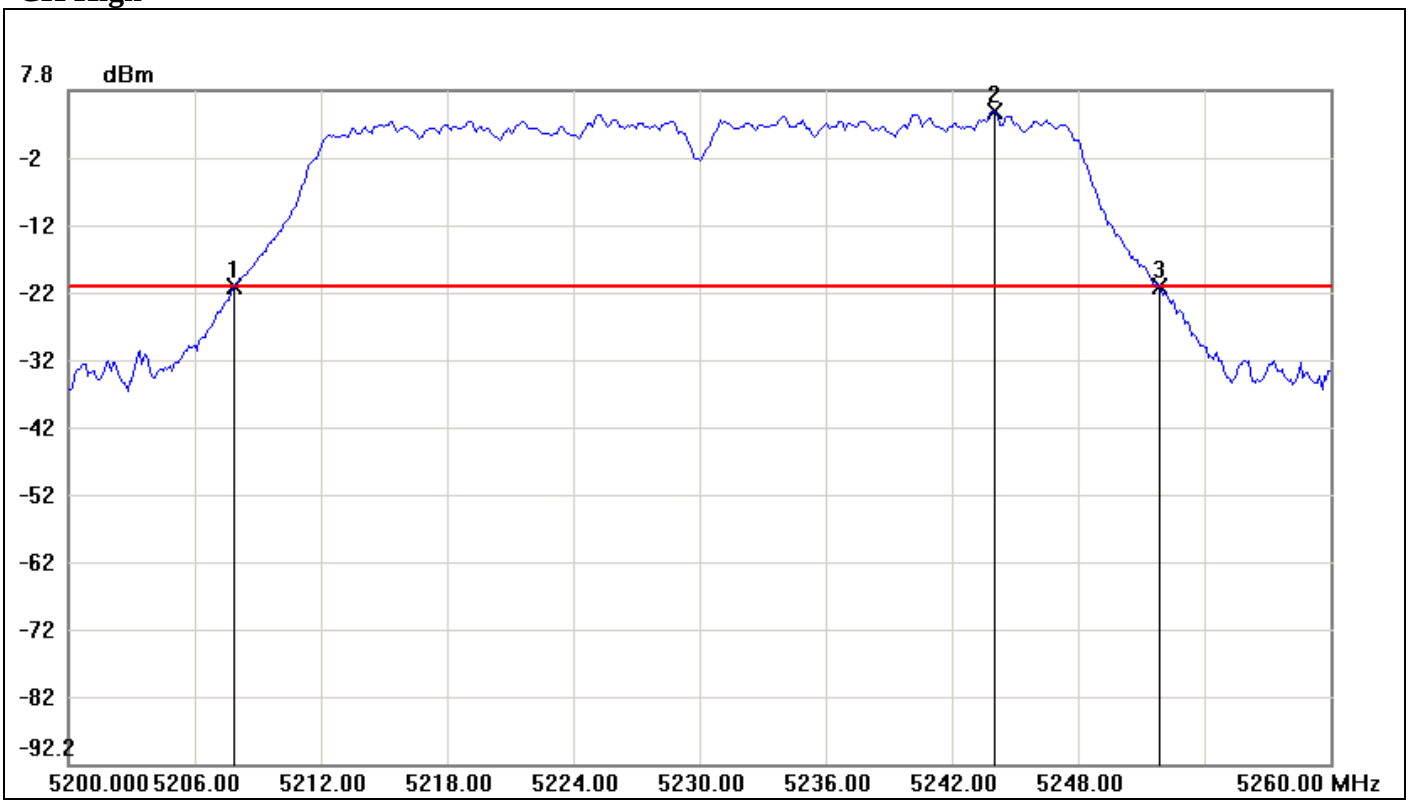
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5167.8000	-23.53	-23.03	-0.50
2	5204.0000	2.97	-23.03	26.00
3	5211.7000	-23.13	-23.03	-0.10

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	43.9	0.4

CH High

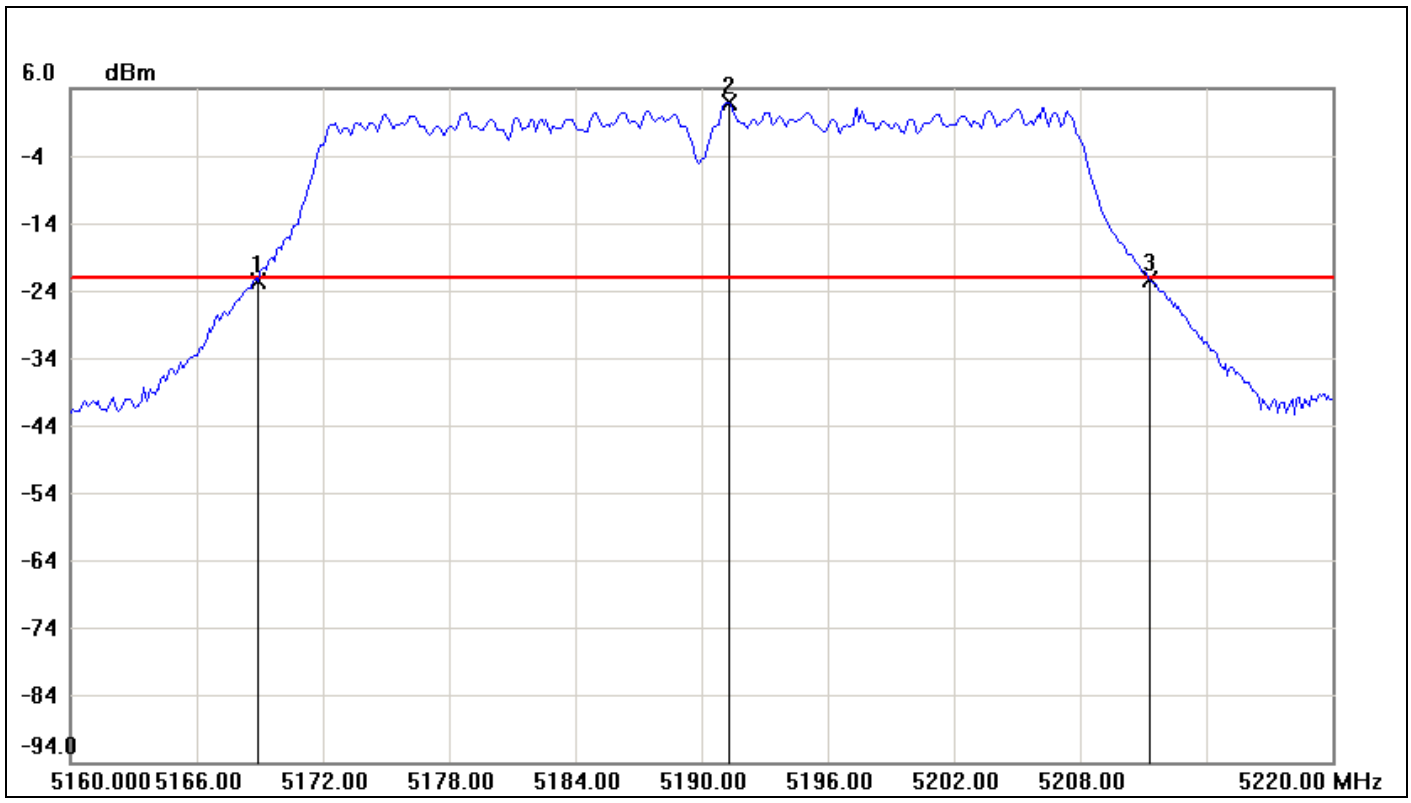


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5207.9000	-21.38	-21.28	-0.10
2	5244.0000	4.72	-21.28	26.00
3	5251.9000	-21.40	-21.28	-0.12

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44	-0.02

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

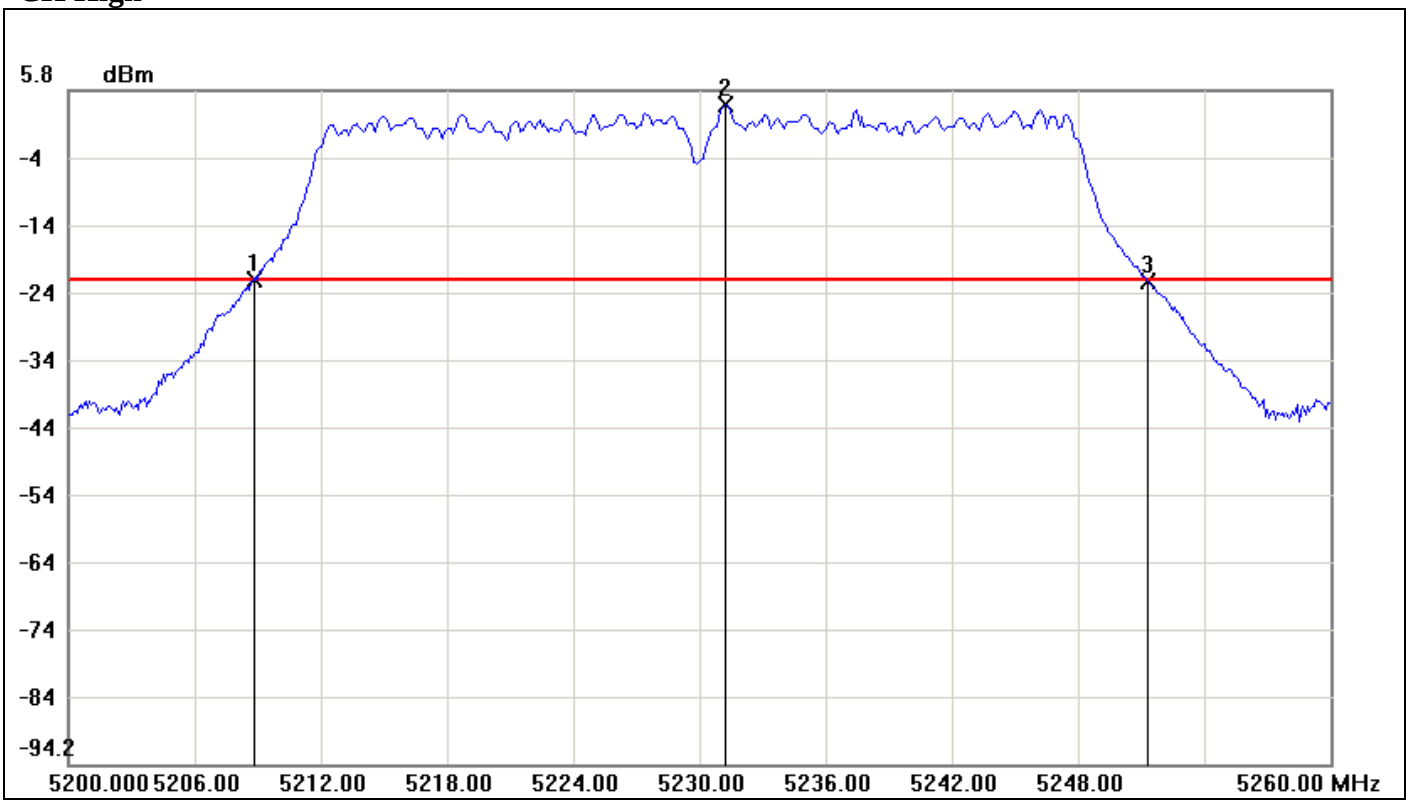
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5168.9000	-22.67	-22.04	-0.63
2	5191.3000	3.96	-22.04	26.00
3	5211.3000	-22.45	-22.04	-0.41

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.4	0.22

CH High

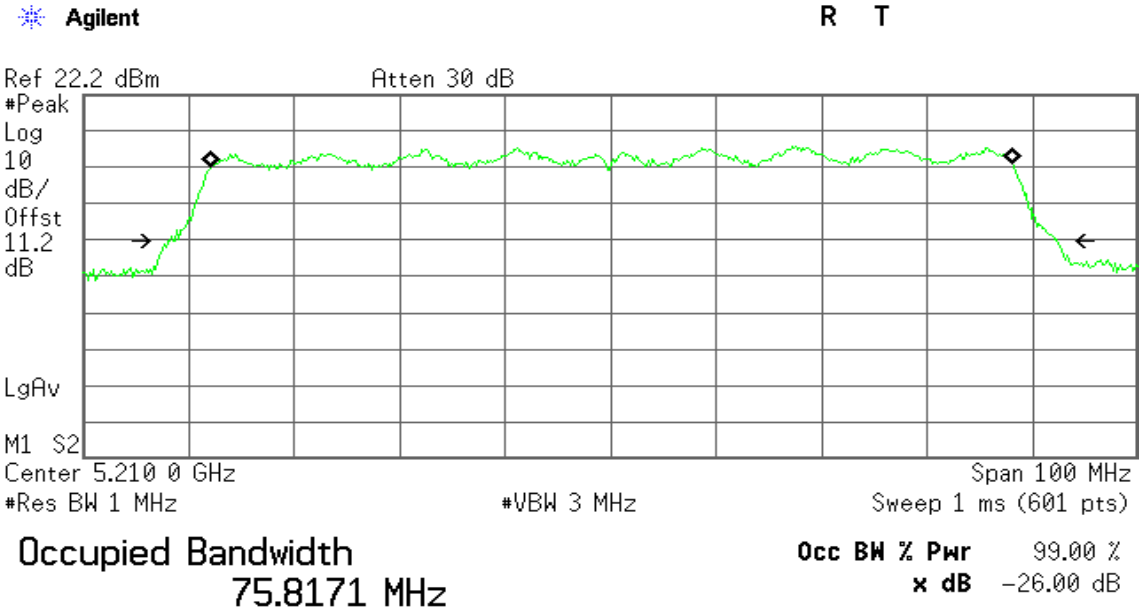


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5208.8000	-22.29	-22.28	-0.01
2	5231.2000	3.72	-22.28	26.00
3	5251.3000	-22.63	-22.28	-0.35

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.5	-0.34

IEEE 802.11ac VHT 80 MHz mode / 5210MHz /

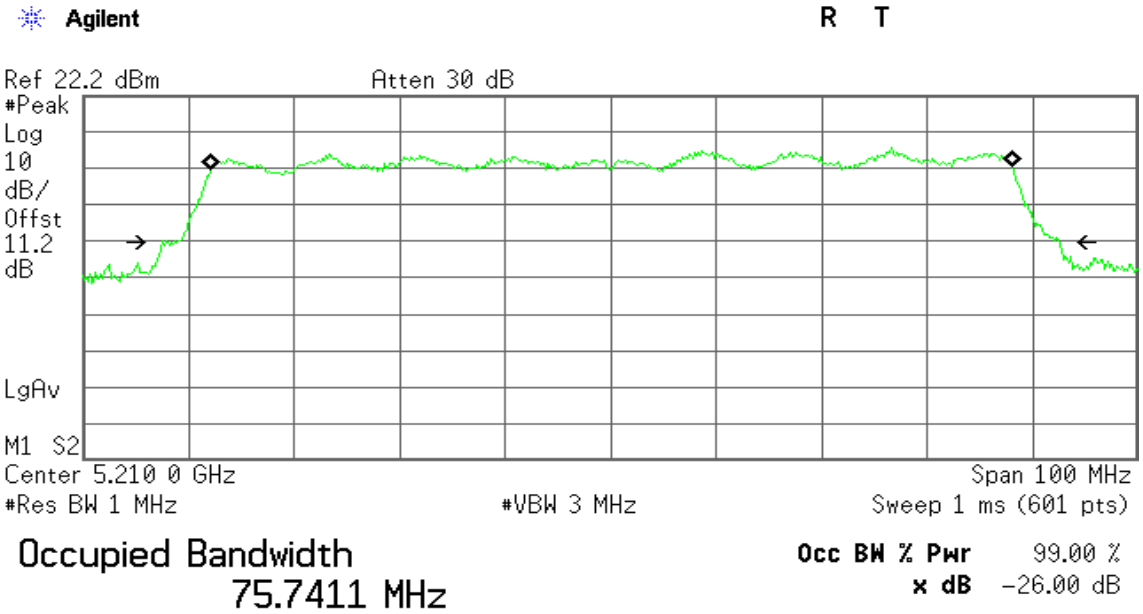
Chain 0 CH Mid



Transmit Freq Error 146.693 kHz
x dB Bandwidth 84.422 MHz

IEEE 802.11ac VHT 80 MHz mode / 5210MHz / Chain 1

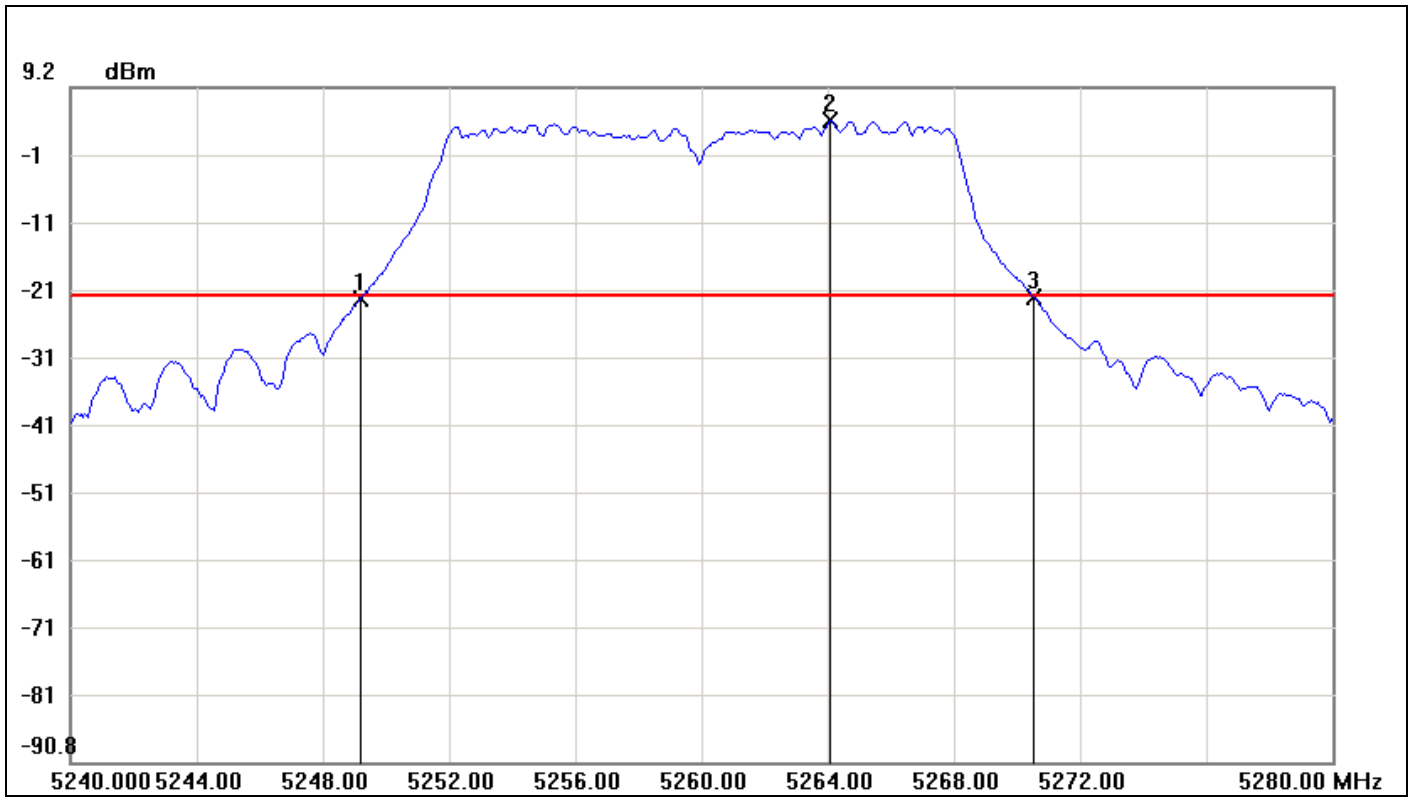
CH Mid



Transmit Freq Error 120.224 kHz
x dB Bandwidth 85.158 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz

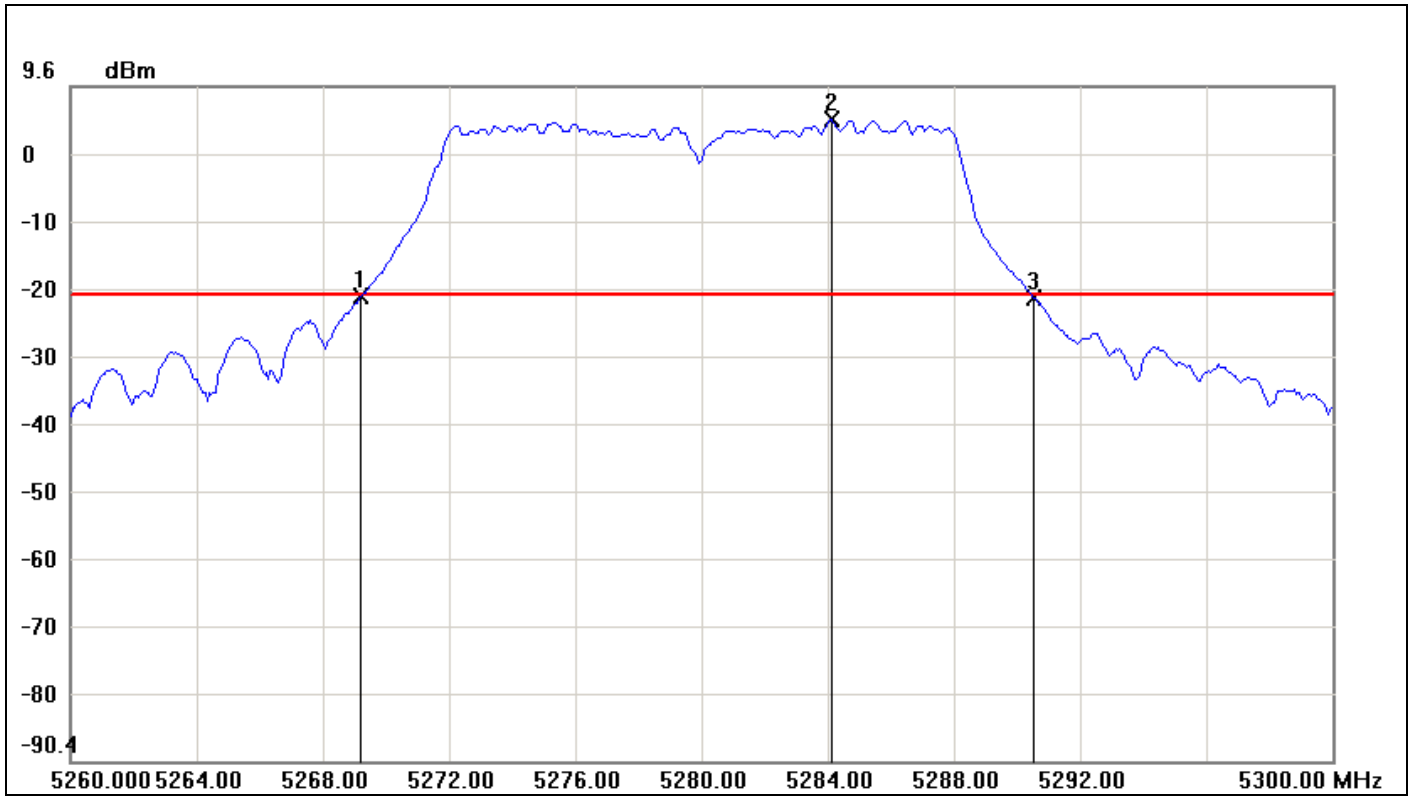
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5249.2000	-22.05	-21.69	-0.36
2	5264.0667	4.31	-21.69	26.00
3	5270.5333	-21.84	-21.69	-0.15

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.3333	0.21

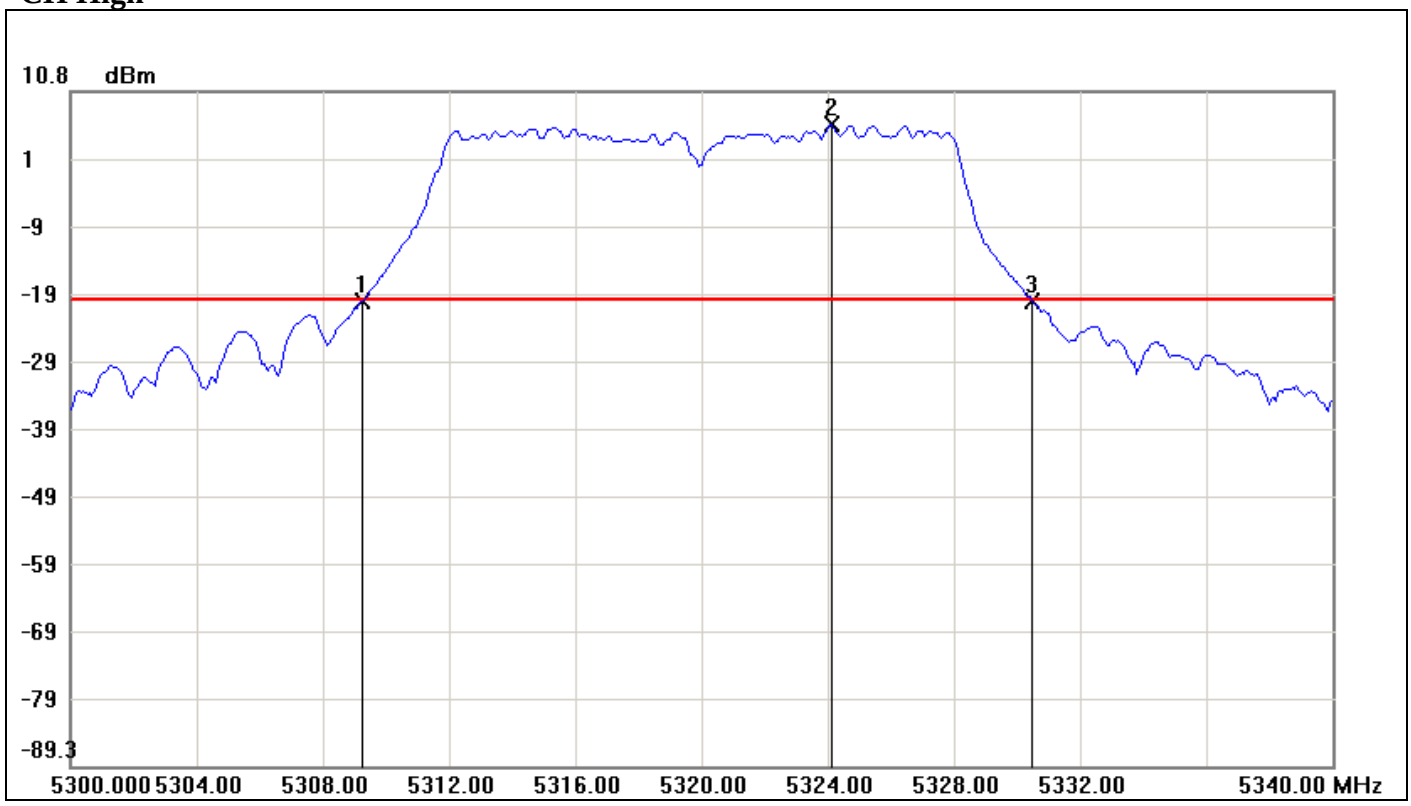
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5269.2000	-21.56	-21.29	-0.27
2	5284.1333	4.71	-21.29	26.00
3	5290.5333	-21.65	-21.29	-0.36

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.3333	-0.09

CH High

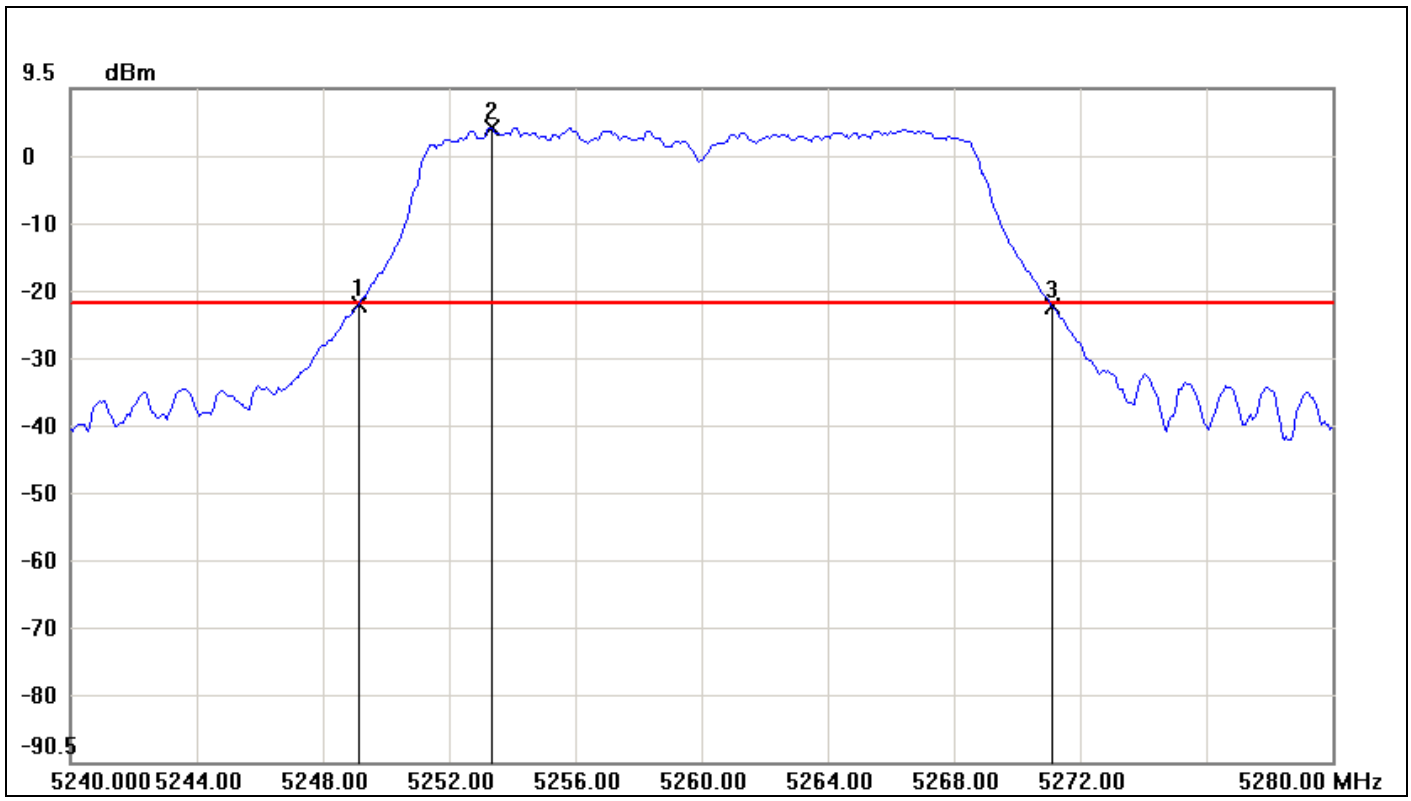


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5309.2667	-20.28	-20.17	-0.11
2	5324.1333	5.83	-20.17	26.00
3	5330.4667	-20.27	-20.17	-0.10

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.2	0.01

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

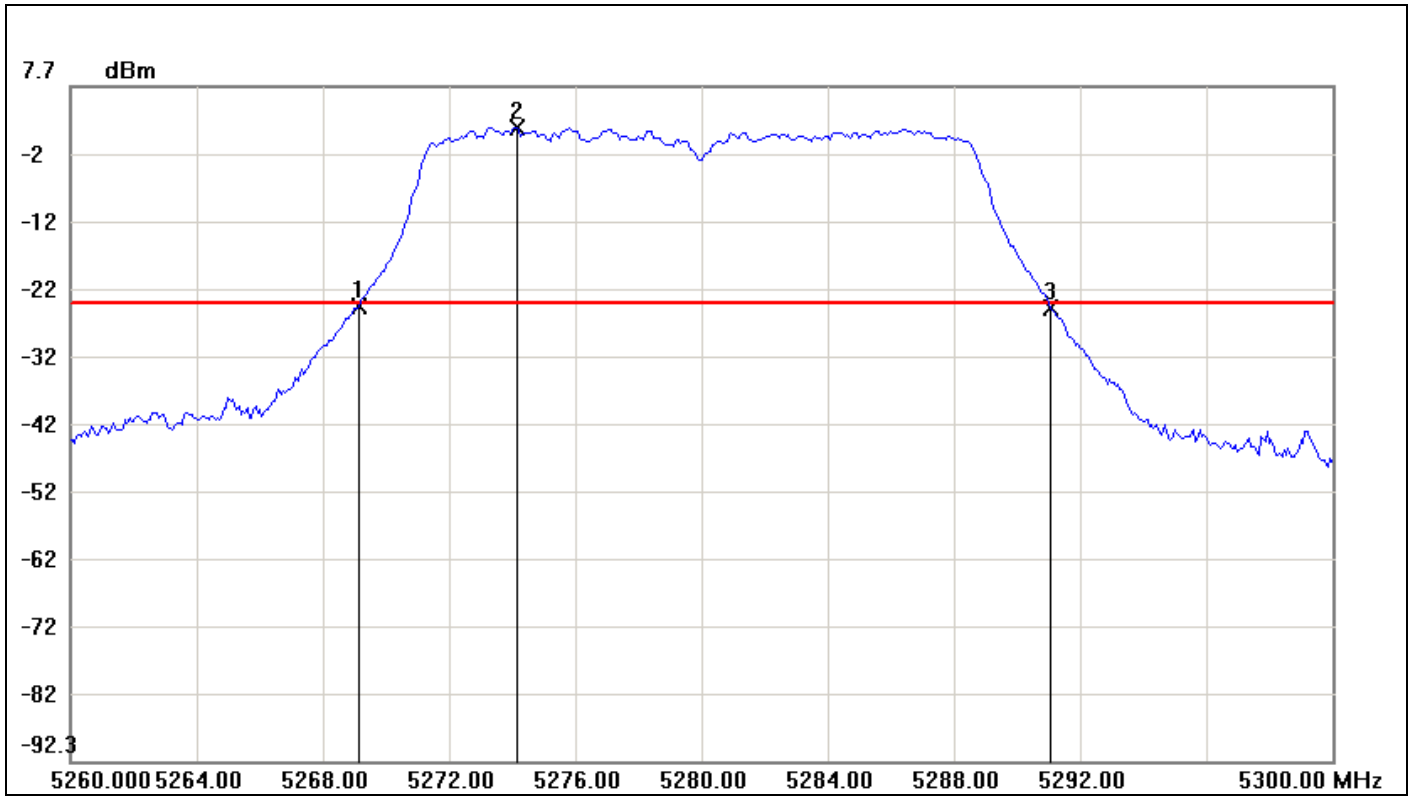
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5249.1333	-22.64	-22.37	-0.27
2	5253.3333	3.63	-22.37	26.00
3	5271.1333	-22.77	-22.37	-0.40

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	22	-0.13

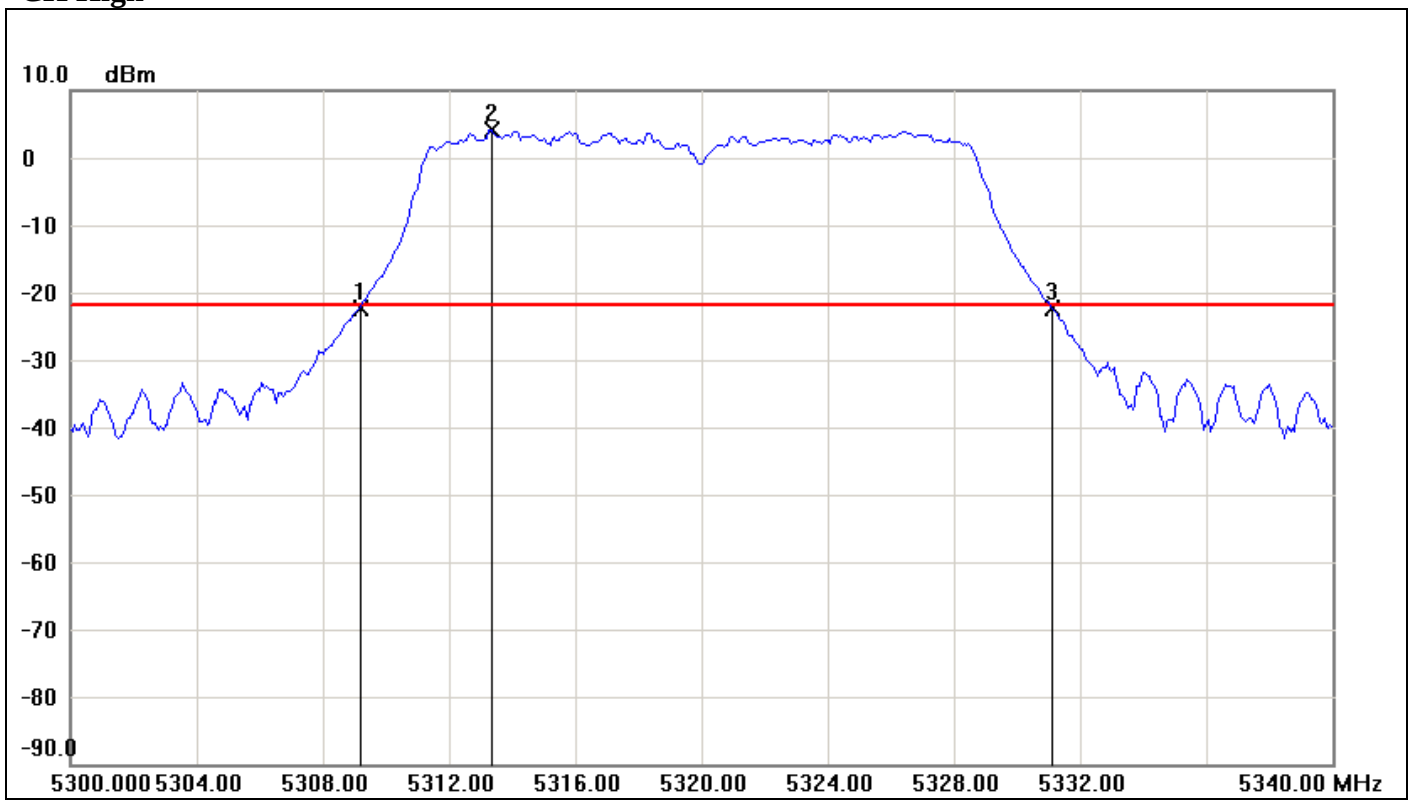
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5269.1333	-24.79	-24.28	-0.51
2	5274.1333	1.72	-24.28	26.00
3	5291.0667	-25.07	-24.28	-0.79

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9334	-0.28

CH High

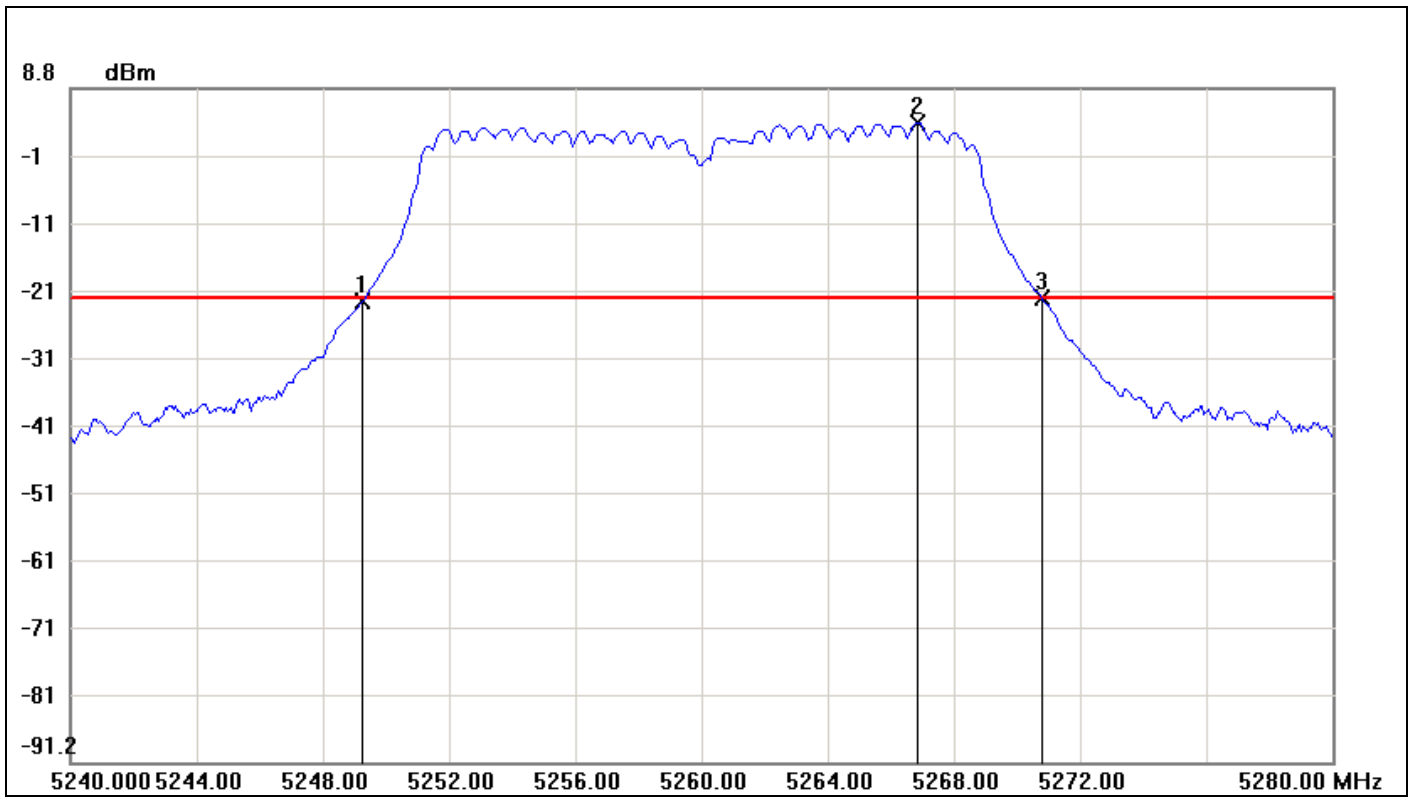


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5309.2000	-22.24	-21.96	-0.28
2	5313.3333	4.04	-21.96	26.00
3	5331.1333	-22.26	-21.96	-0.30

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9333	-0.02

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

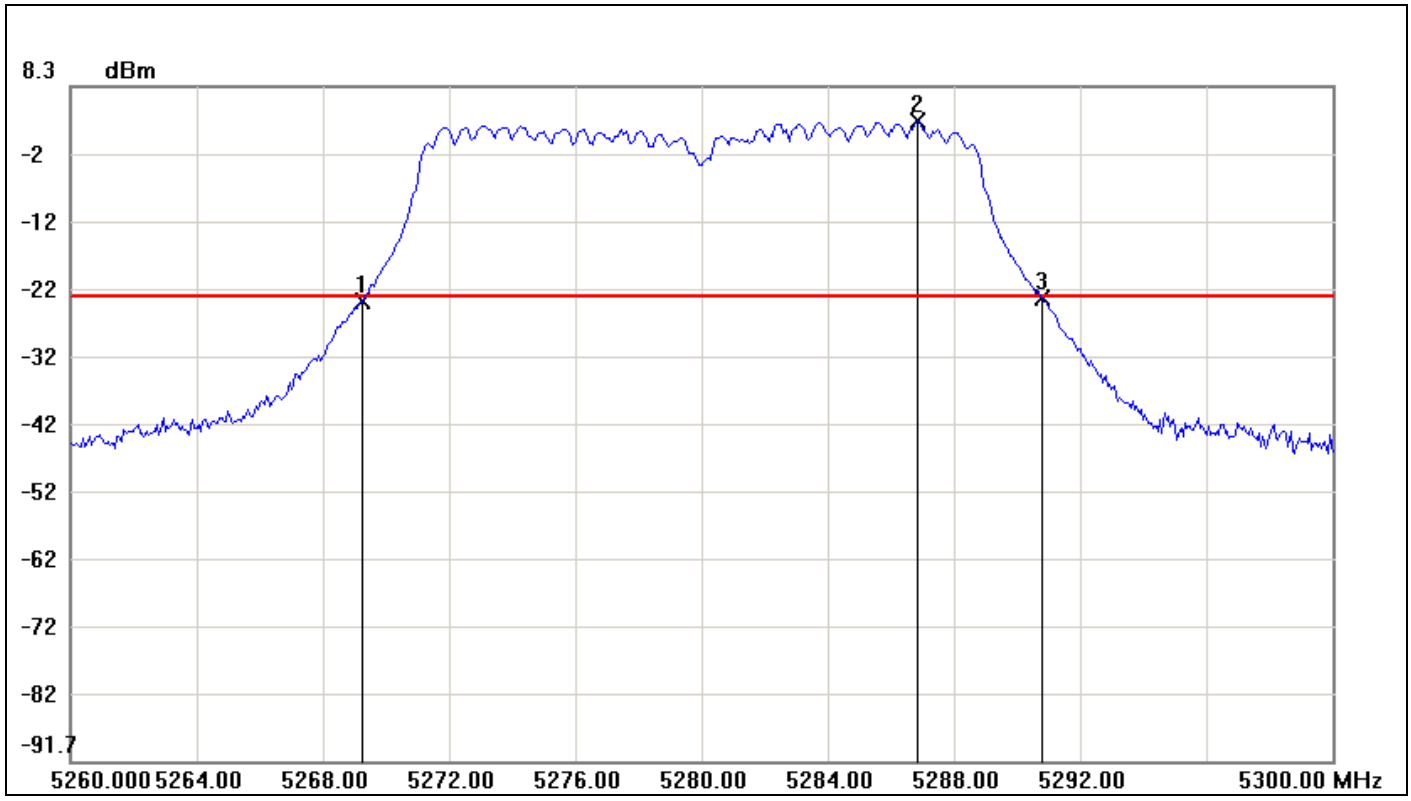
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5249.2667	-22.79	-22.29	-0.50
2	5266.8667	3.71	-22.29	26.00
3	5270.8000	-22.39	-22.29	-0.10

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	0.4

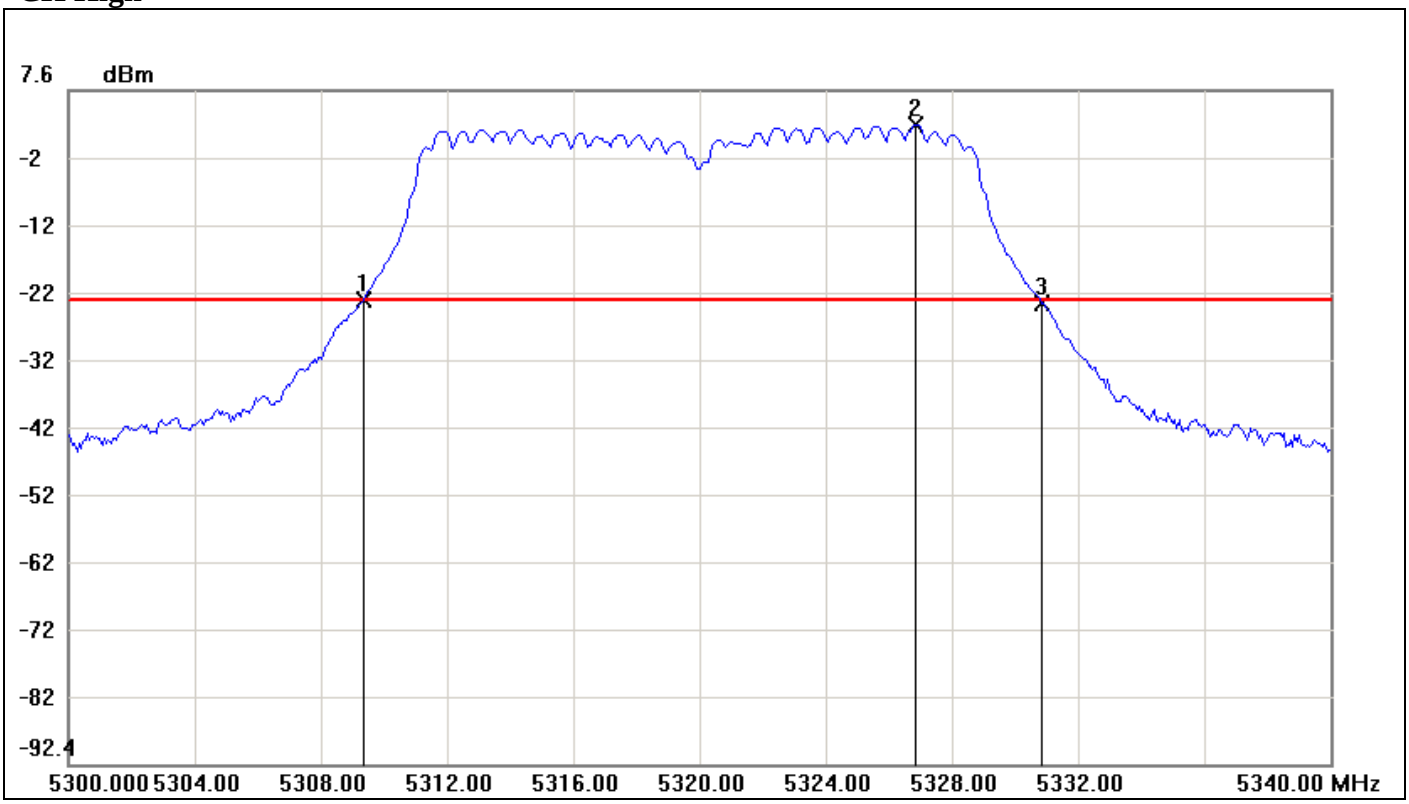
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5269.2667	-23.56	-22.95	-0.61
2	5286.8667	3.05	-22.95	26.00
3	5290.8000	-23.11	-22.95	-0.16

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	0.45

CH High

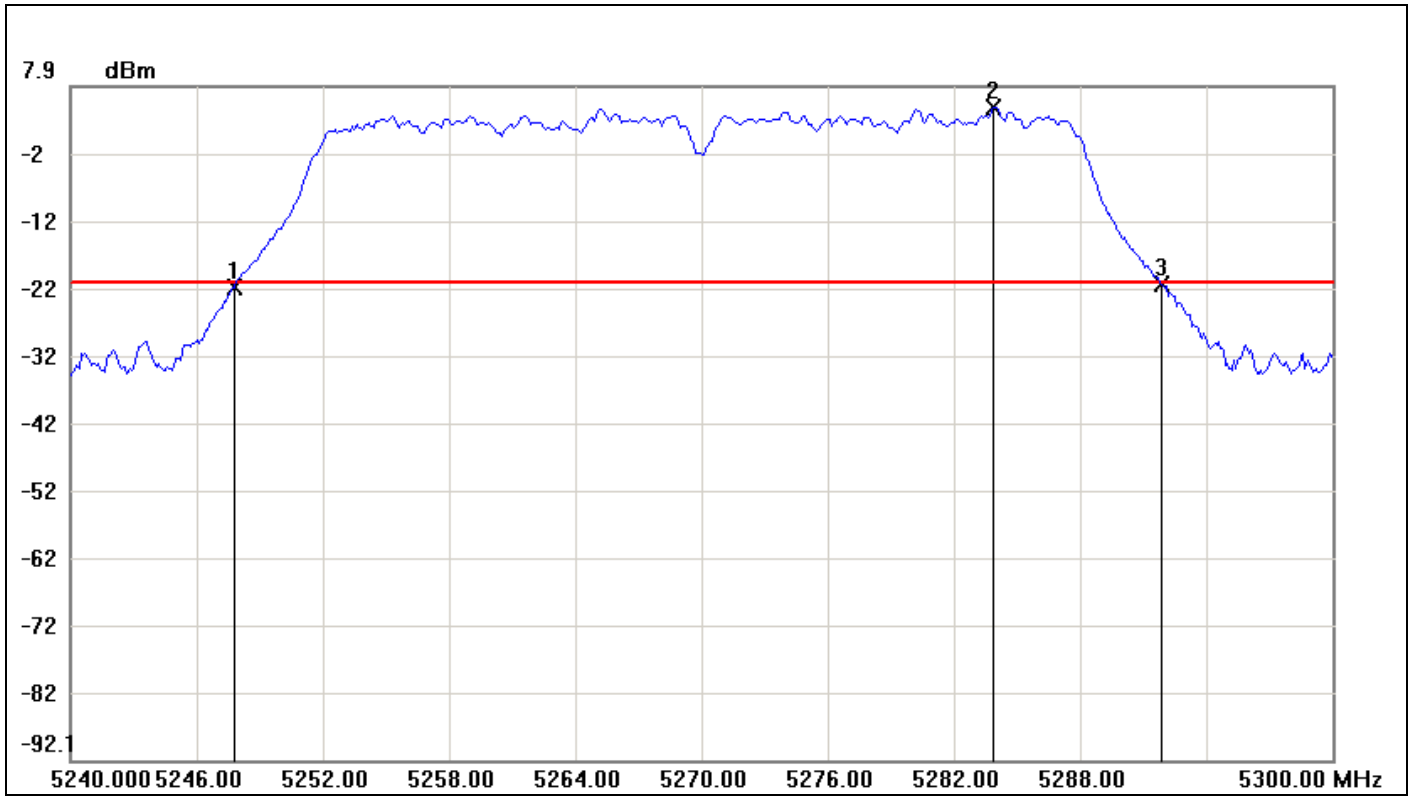


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5309.3333	-23.54	-23.51	-0.03
2	5326.8667	2.49	-23.51	26.00
3	5330.8667	-23.98	-23.51	-0.47

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5334	-0.44

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

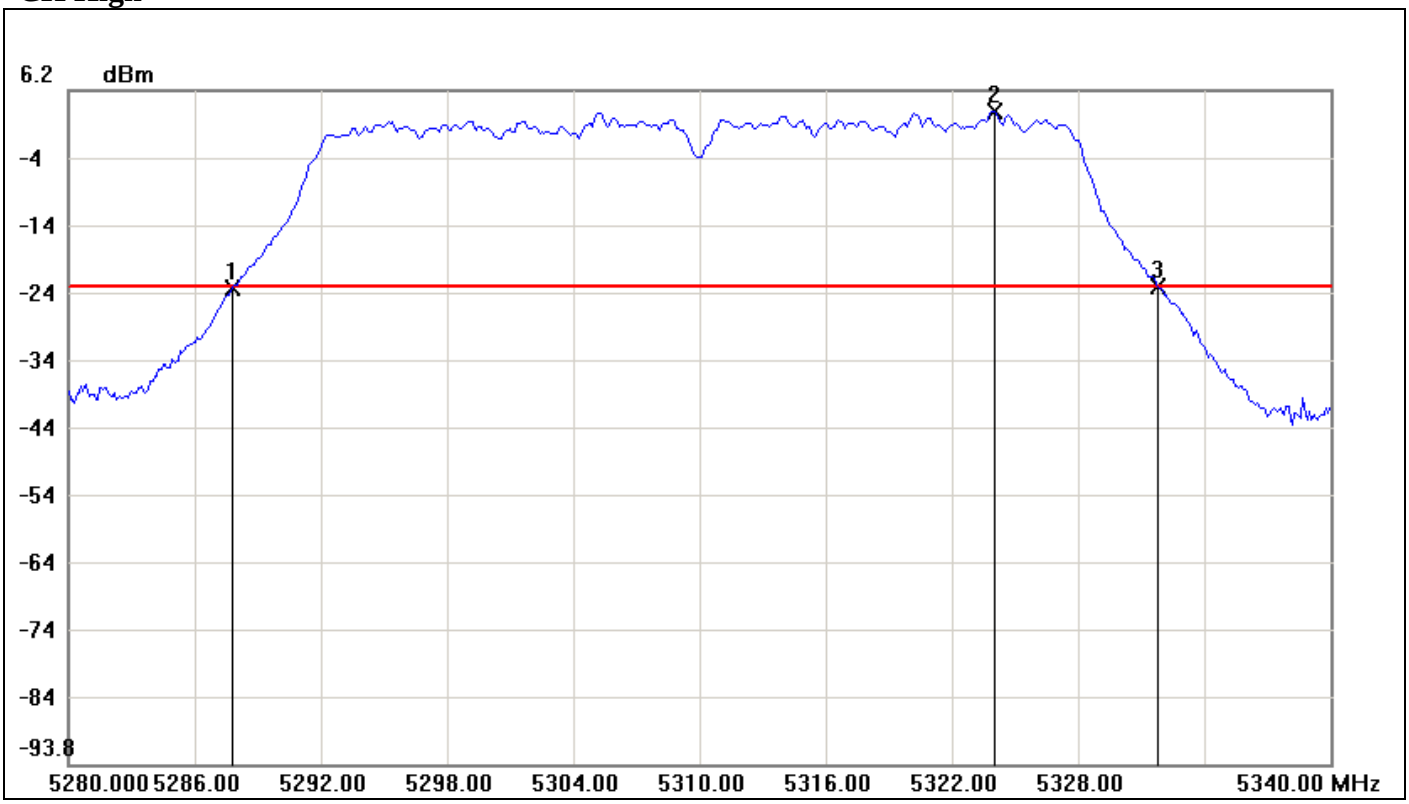
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5247.8000	-21.84	-21.22	-0.62
2	5283.9000	4.78	-21.22	26.00
3	5291.9000	-21.46	-21.22	-0.24

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44.1	0.38

CH High

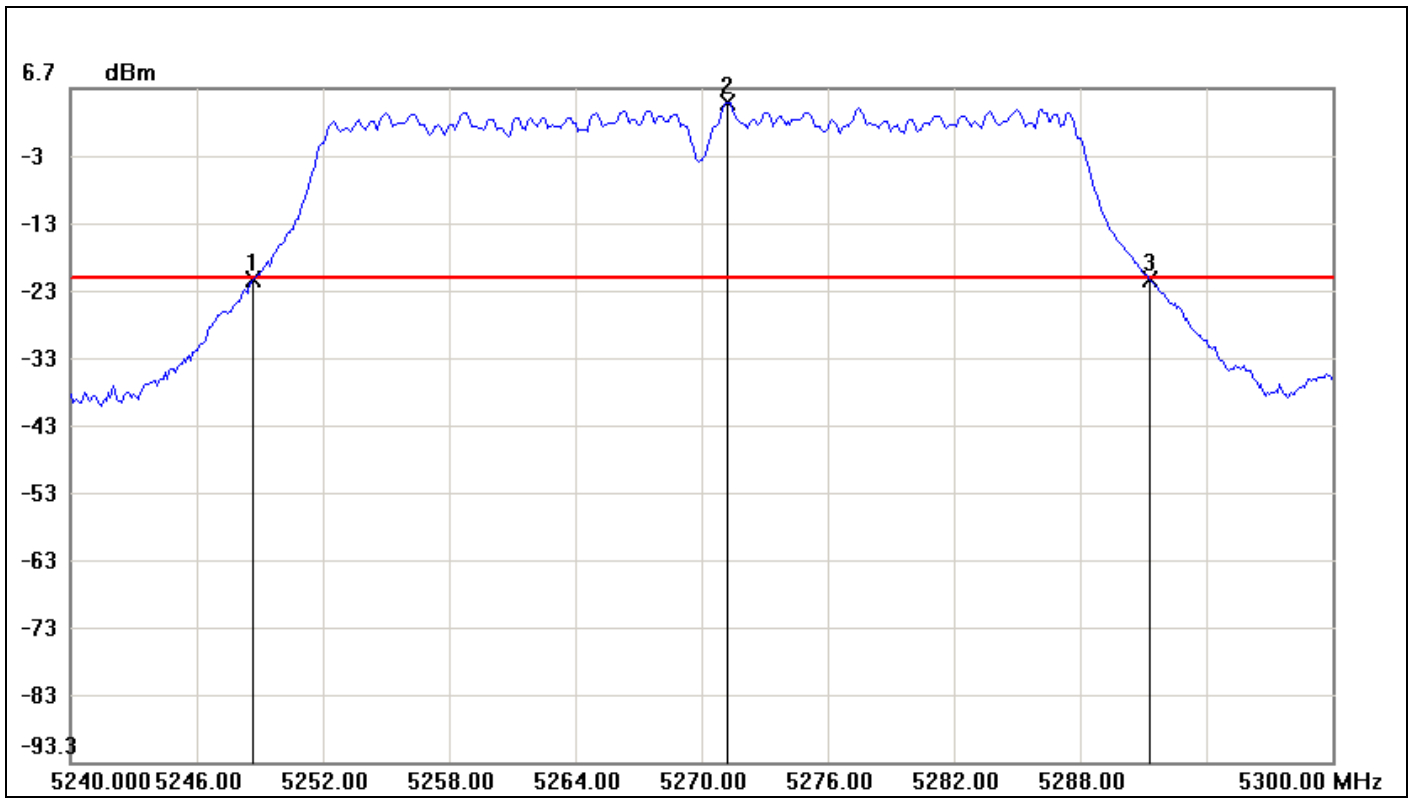


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5287.8000	-23.26	-22.92	-0.34
2	5324.0000	3.08	-22.92	26.00
3	5331.8000	-23.00	-22.92	-0.08

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44	0.26

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

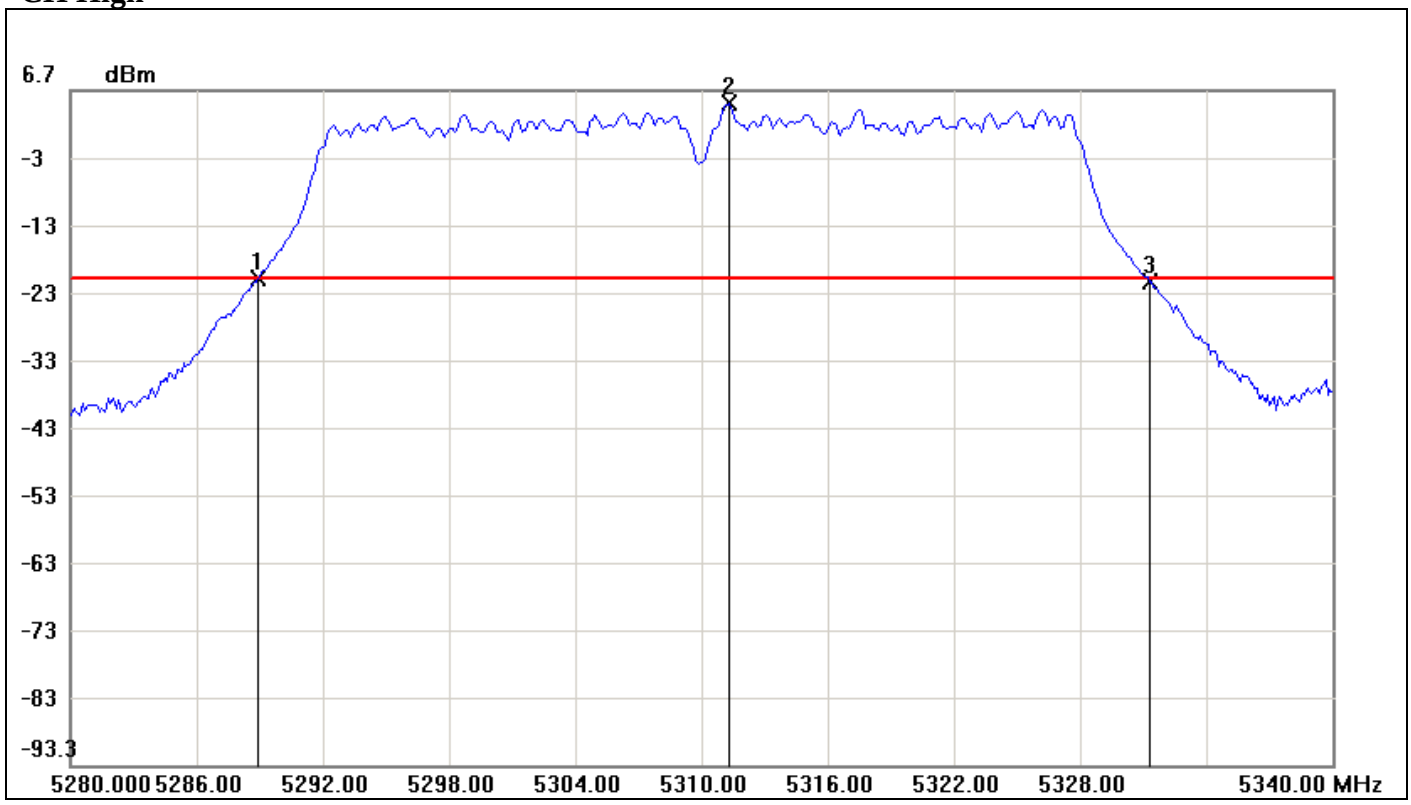
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5248.7000	-21.70	-21.27	-0.43
2	5271.2000	4.73	-21.27	26.00
3	5291.3000	-21.56	-21.27	-0.29

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.6	0.14

CH High

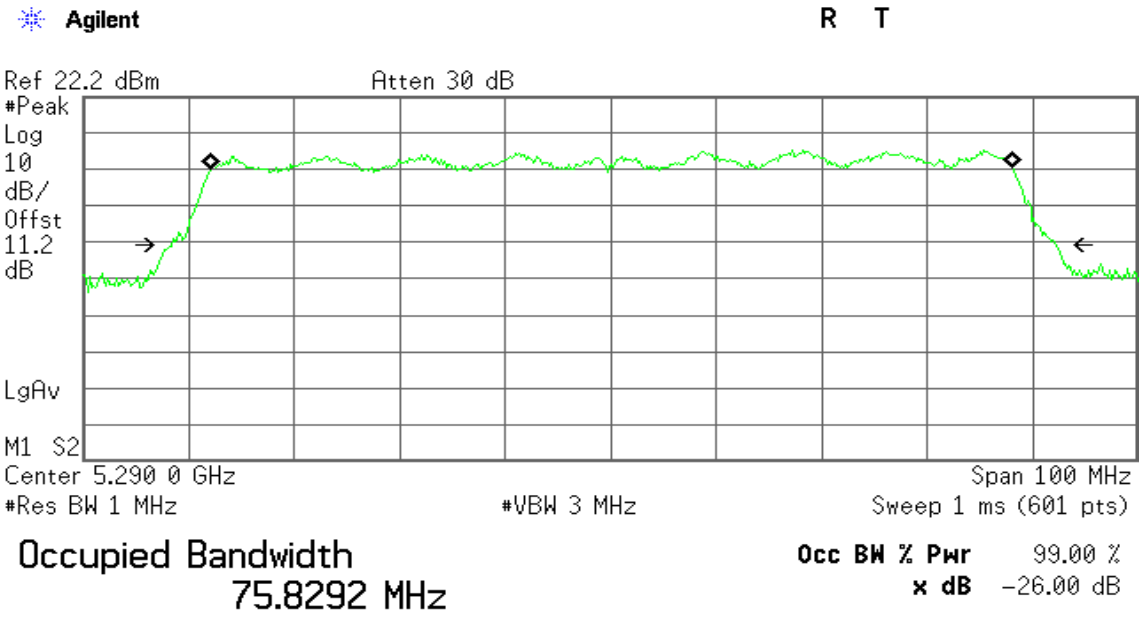


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5288.9000	-21.33	-21.32	-0.01
2	5311.3000	4.68	-21.32	26.00
3	5331.3000	-21.60	-21.32	-0.28

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.4	-0.27

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 0

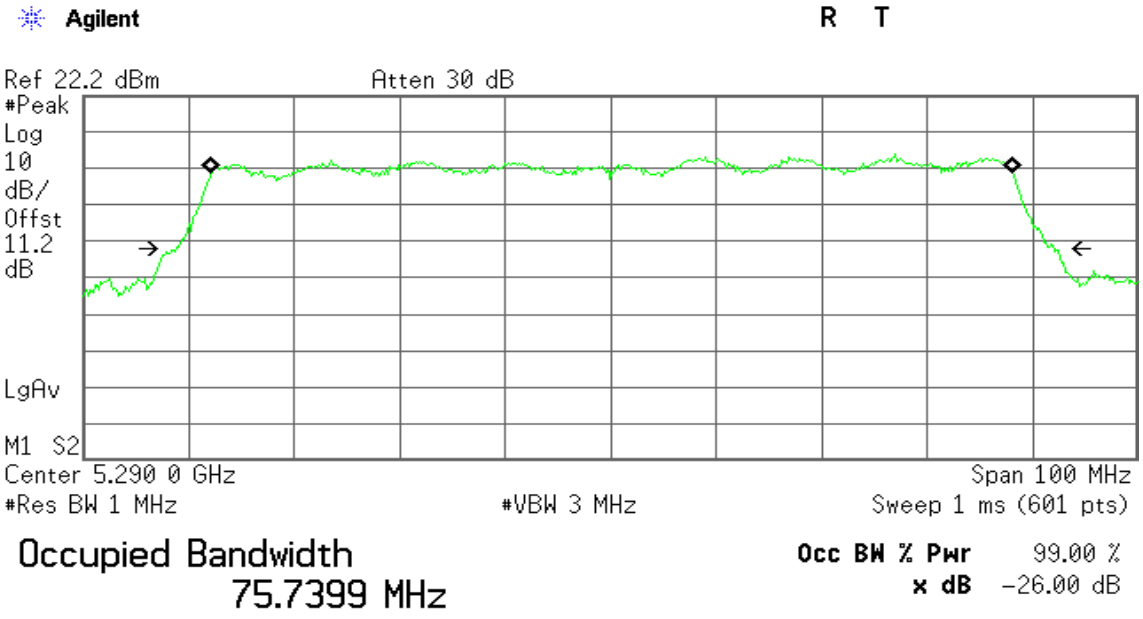
CH Mid



Transmit Freq Error	130.657 kHz
x dB Bandwidth	83.895 MHz

IEEE 802.11ac VHT 80 MHz mode / 5290MHz / Chain 1

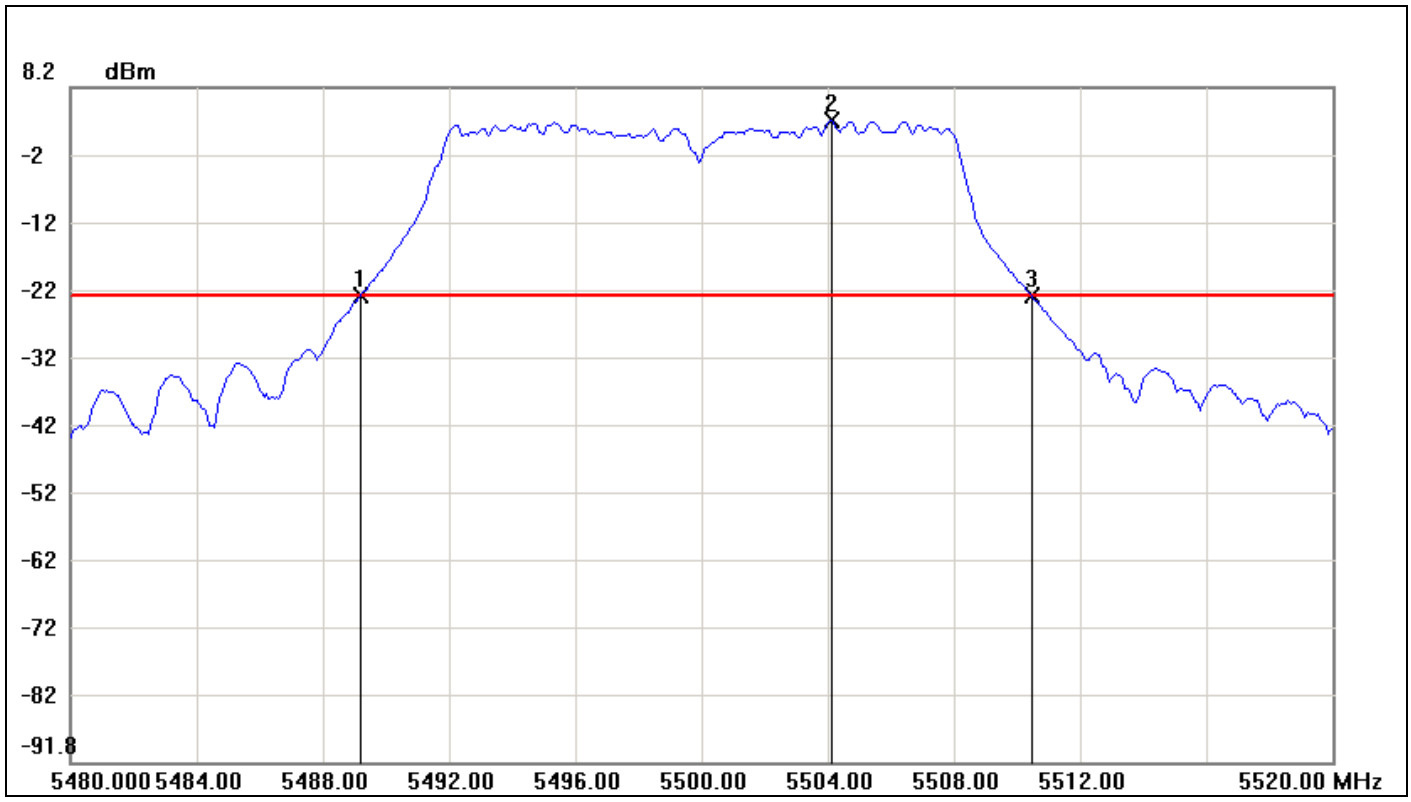
CH Mid



Transmit Freq Error	119.231 kHz
x dB Bandwidth	83.363 MHz

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

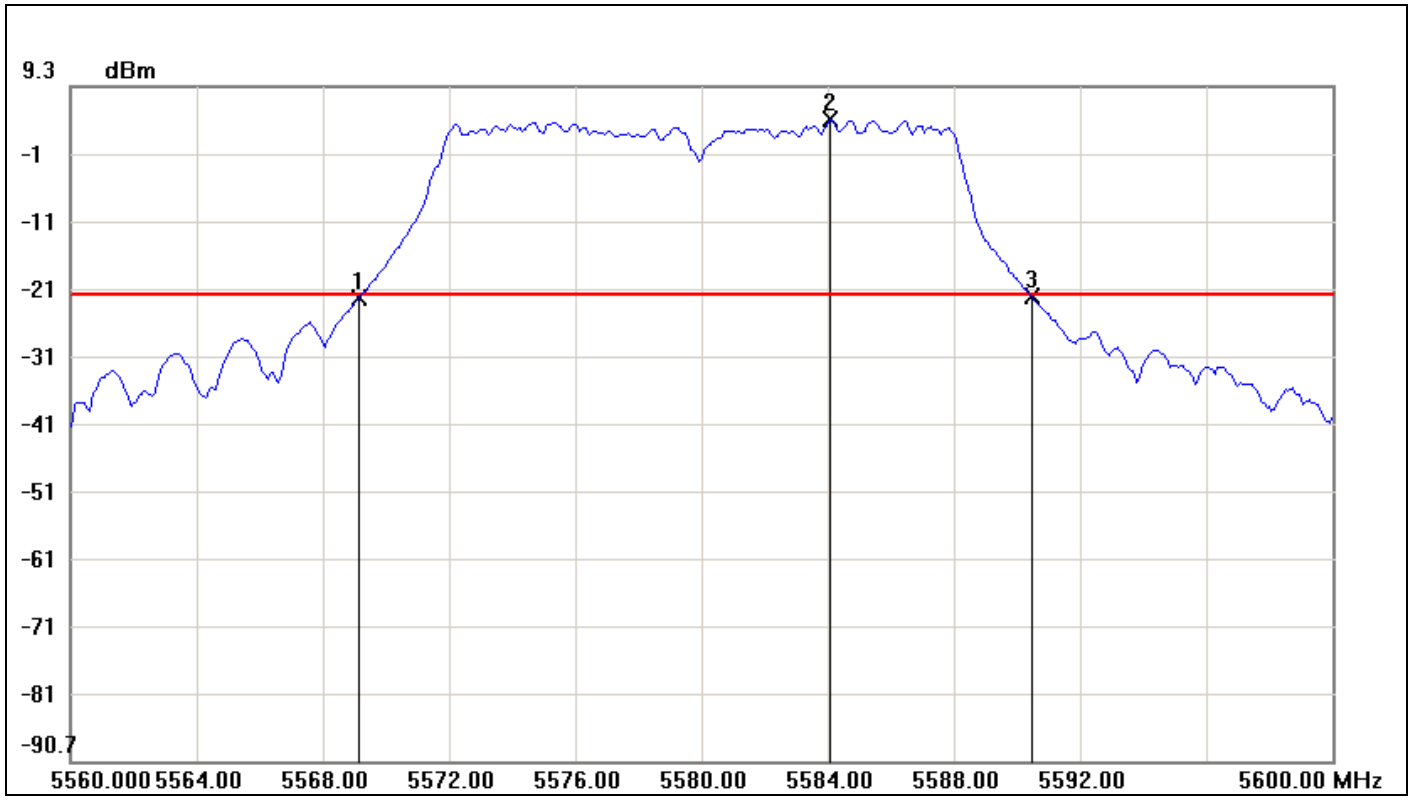
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5489.2000	-22.61	-22.60	-0.01
2	5504.1333	3.40	-22.60	26.00
3	5510.4667	-22.70	-22.60	-0.10

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.2667	-0.09

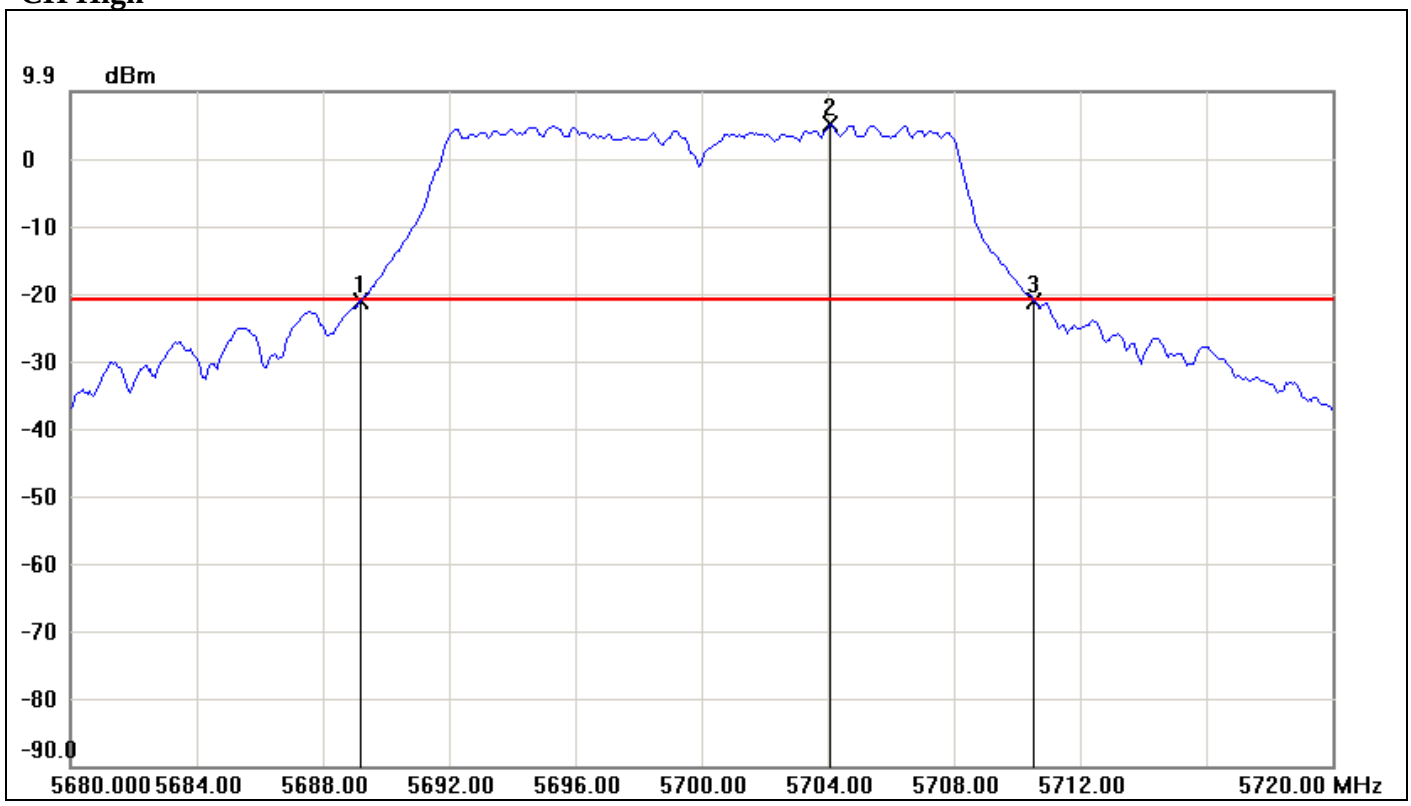
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5569.1333	-22.11	-21.61	-0.50
2	5584.0667	4.39	-21.61	26.00
3	5590.4667	-21.78	-21.61	-0.17

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.3334	0.33

CH High

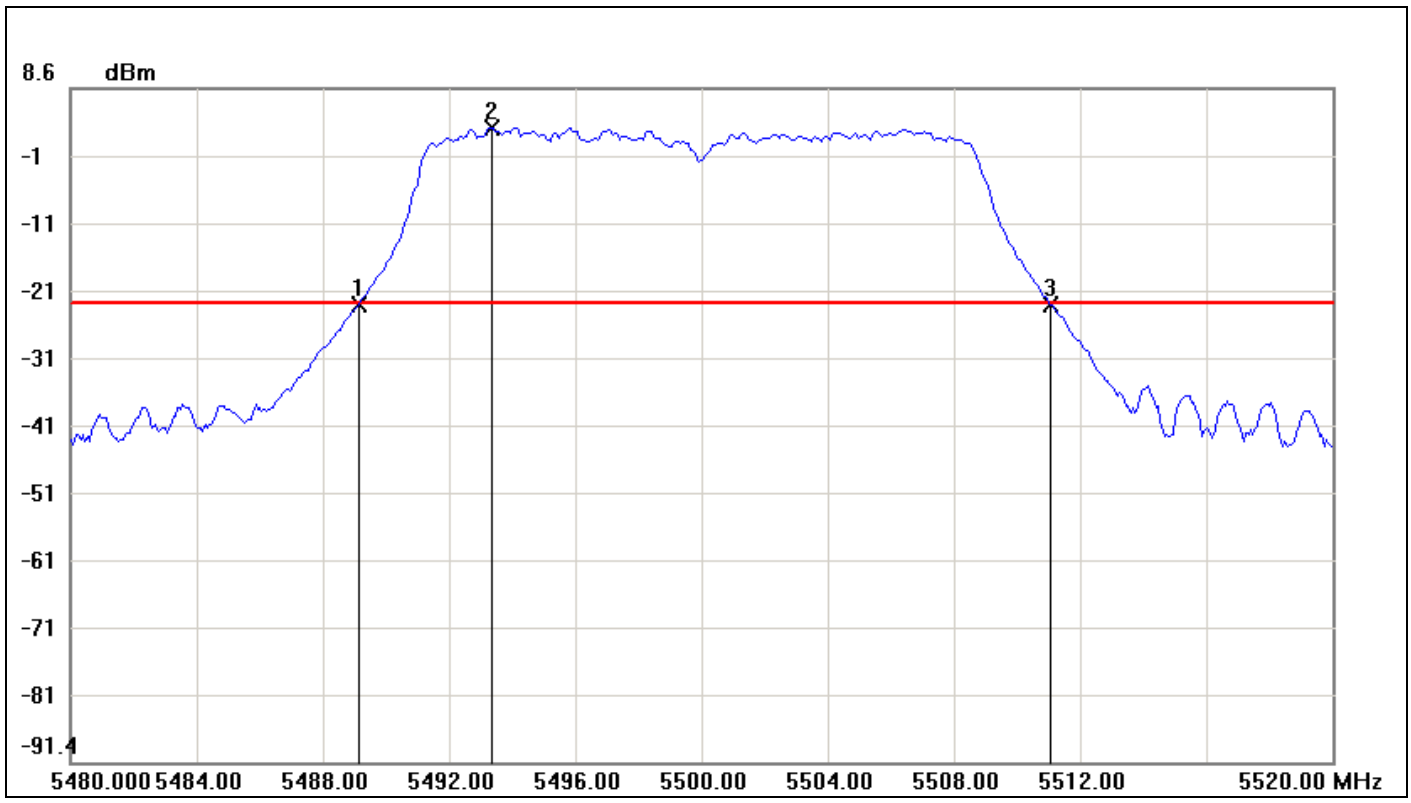


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5689.2000	-21.07	-20.96	-0.11
2	5704.0667	5.04	-20.96	26.00
3	5710.5333	-21.11	-20.96	-0.15

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.3333	-0.04

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

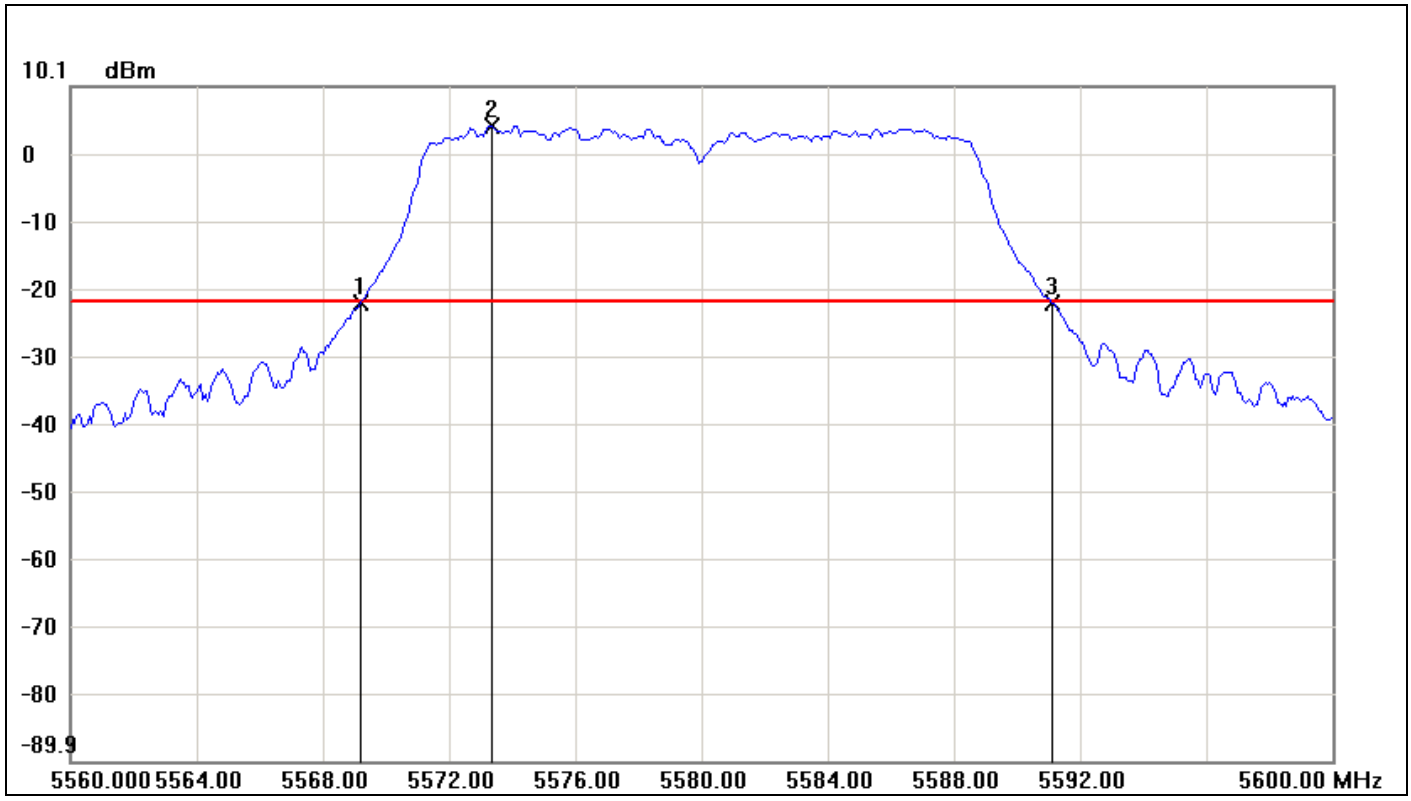
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5489.1333	-23.60	-23.16	-0.44
2	5493.3333	2.84	-23.16	26.00
3	5511.0667	-23.50	-23.16	-0.34

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9334	0.1

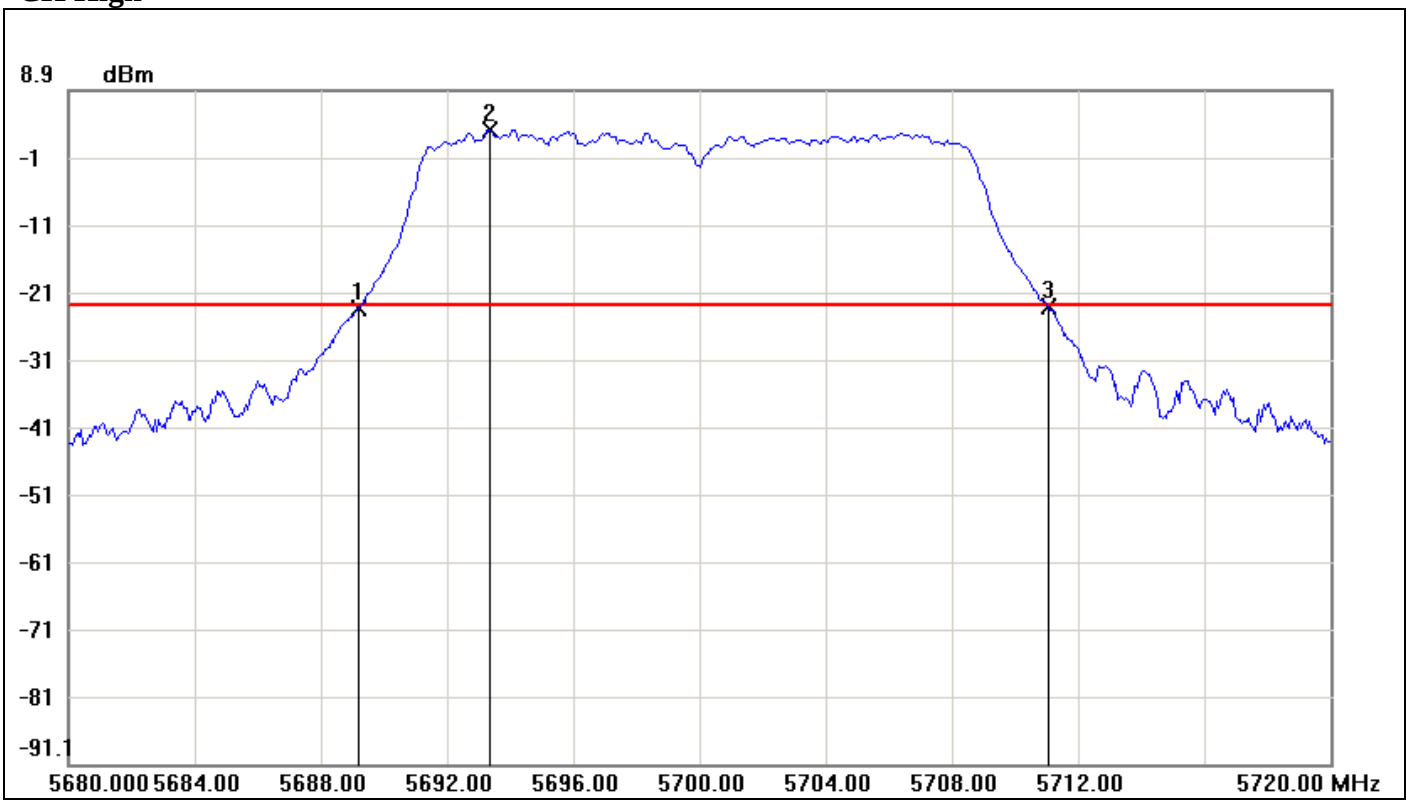
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5569.2000	-21.92	-21.69	-0.23
2	5573.3333	4.31	-21.69	26.00
3	5591.1333	-21.89	-21.69	-0.20

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.9333	0.03

CH High

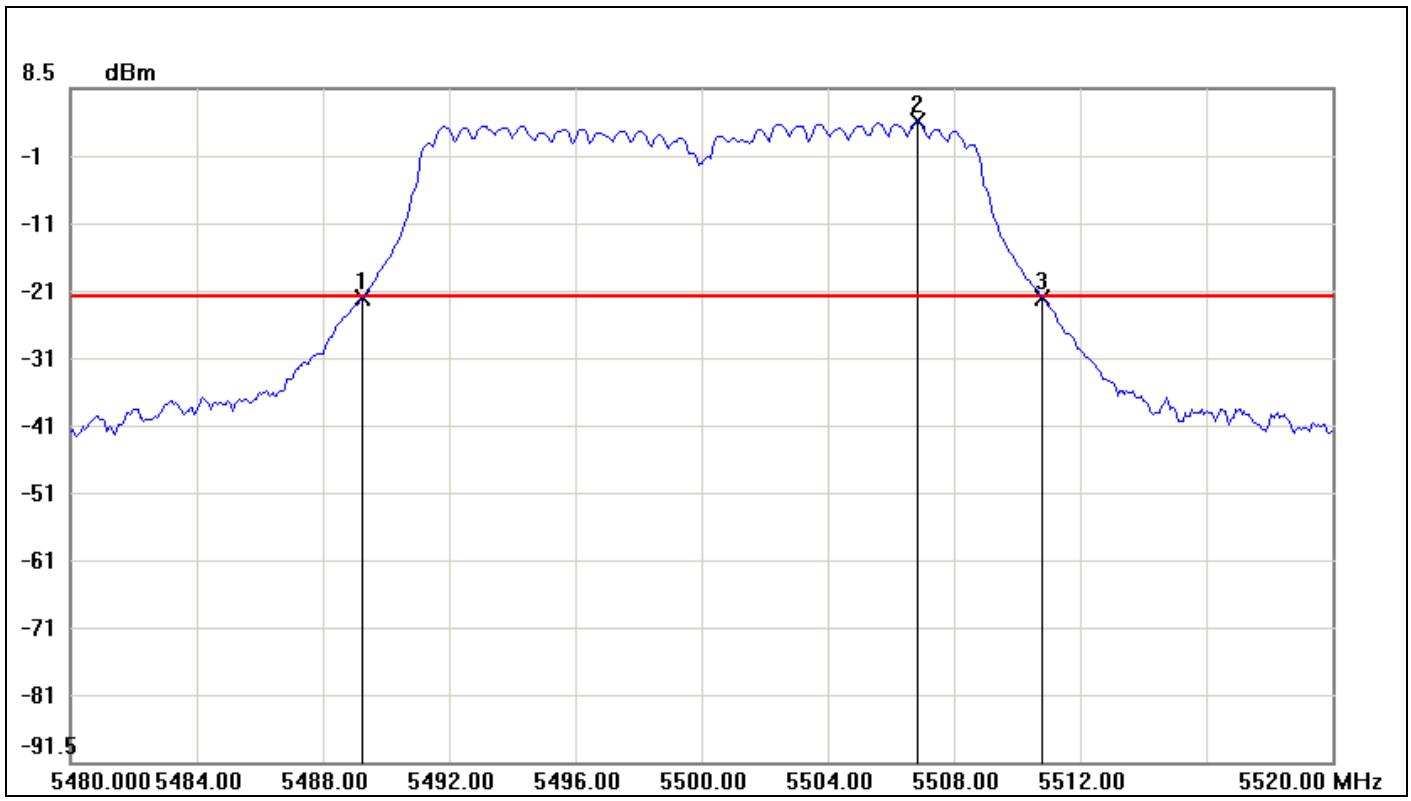


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5689.2000	-23.49	-23.08	-0.41
2	5693.3333	2.92	-23.08	26.00
3	5711.0667	-23.26	-23.08	-0.18

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.8667	0.23

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

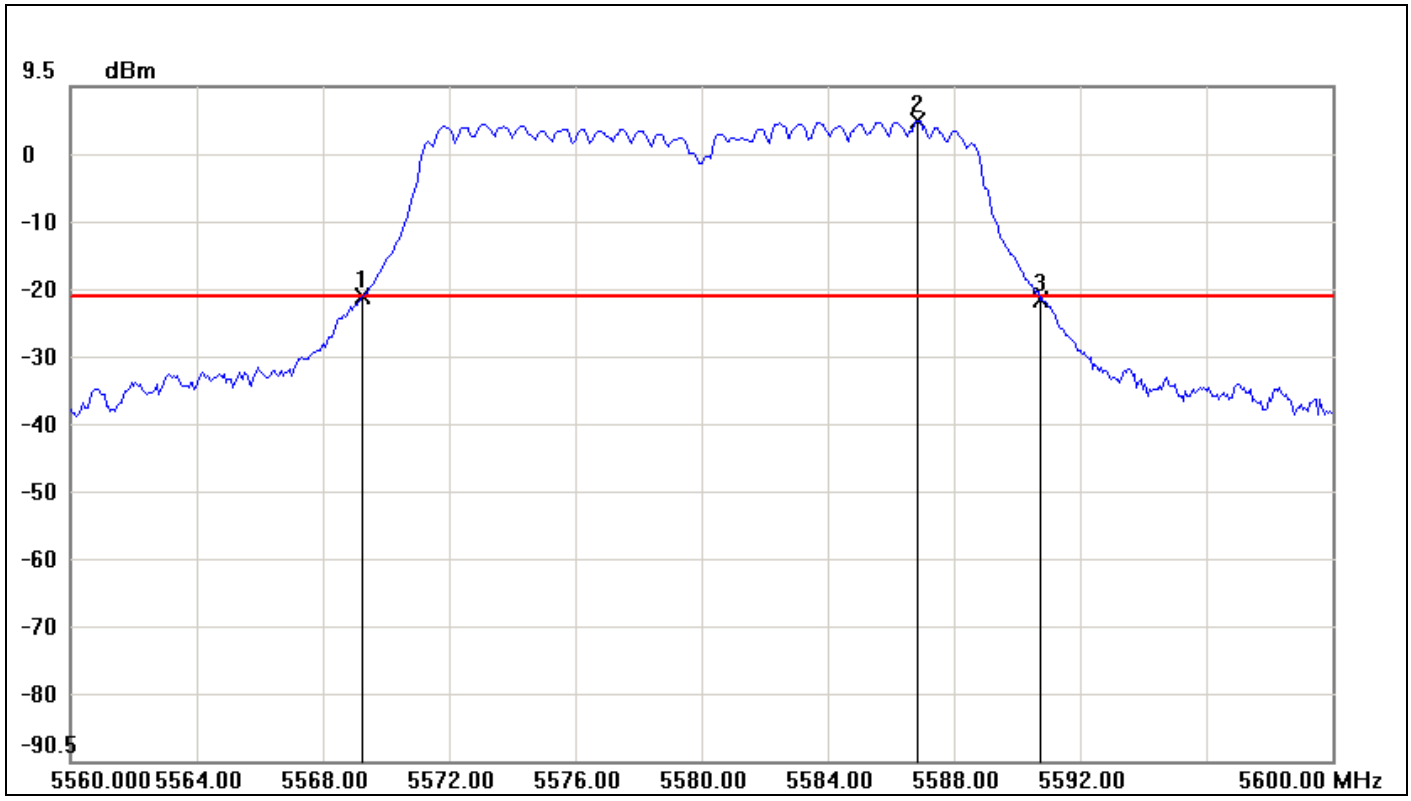
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5489.2667	-22.50	-22.45	-0.05
2	5506.8667	3.55	-22.45	26.00
3	5510.8000	-22.52	-22.45	-0.07

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	-0.02

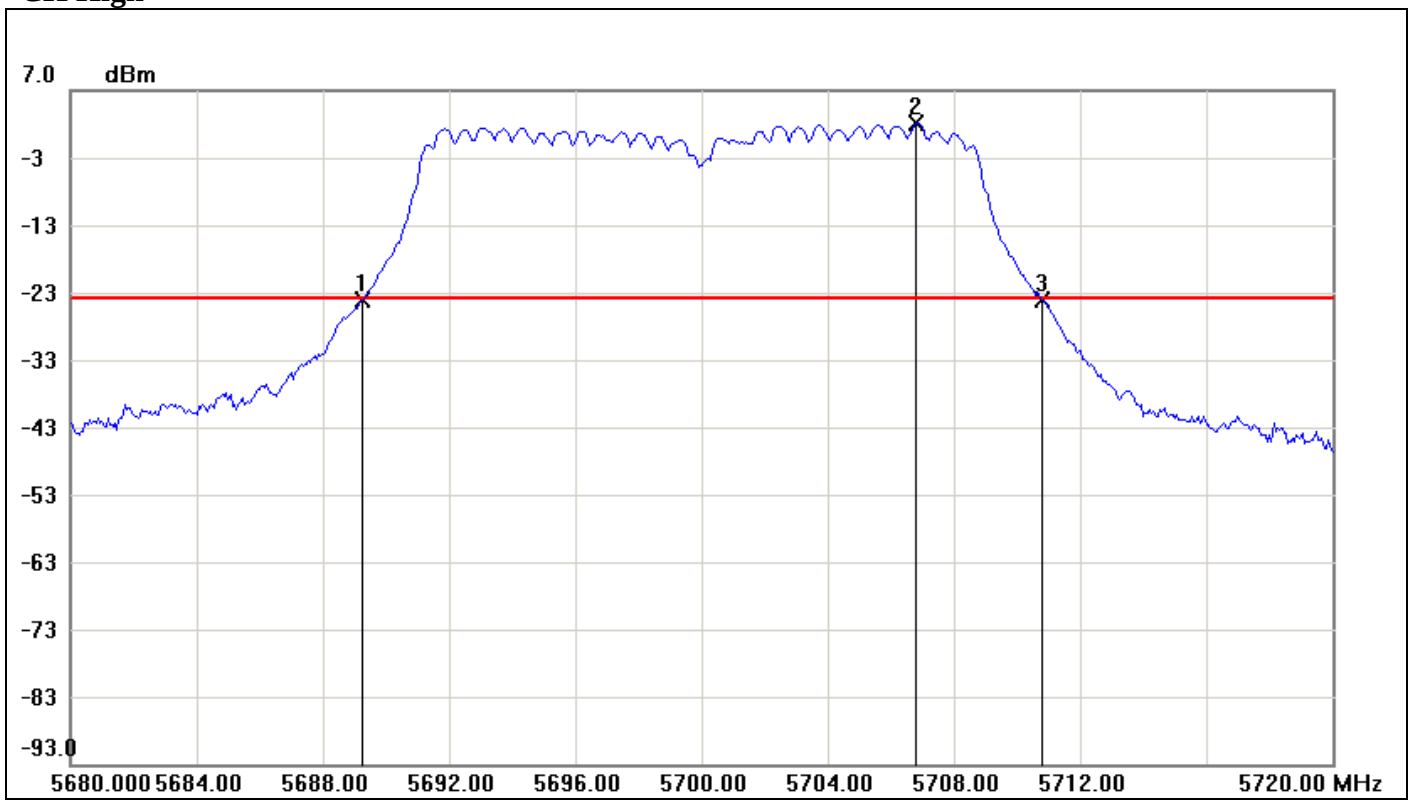
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5569.2667	-21.56	-21.52	-0.04
2	5586.8667	4.48	-21.52	26.00
3	5590.7333	-22.08	-21.52	-0.56

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.4666	-0.52

CH High

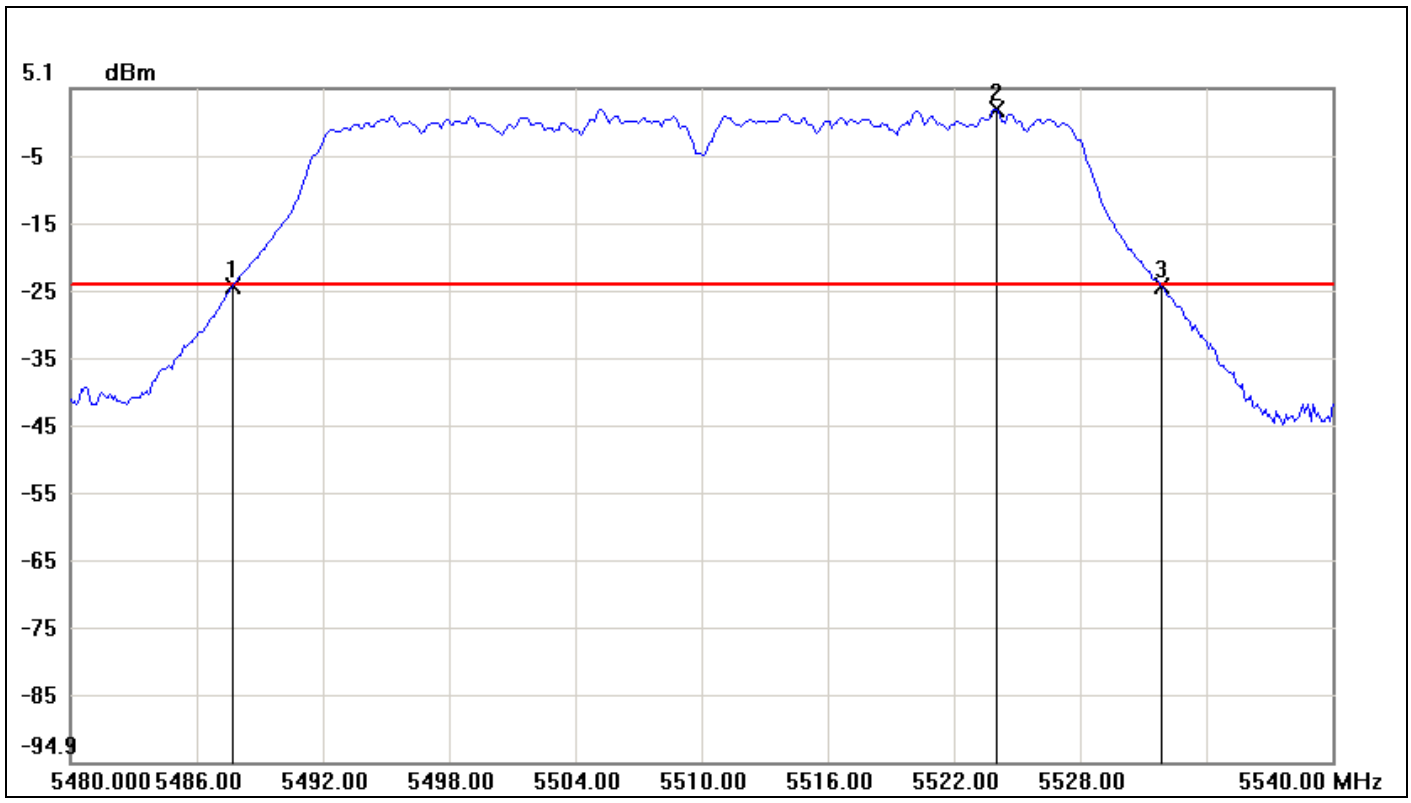


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5689.2667	-24.12	-23.95	-0.17
2	5706.8000	2.05	-23.95	26.00
3	5710.8000	-24.09	-23.95	-0.14

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	21.5333	0.03

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

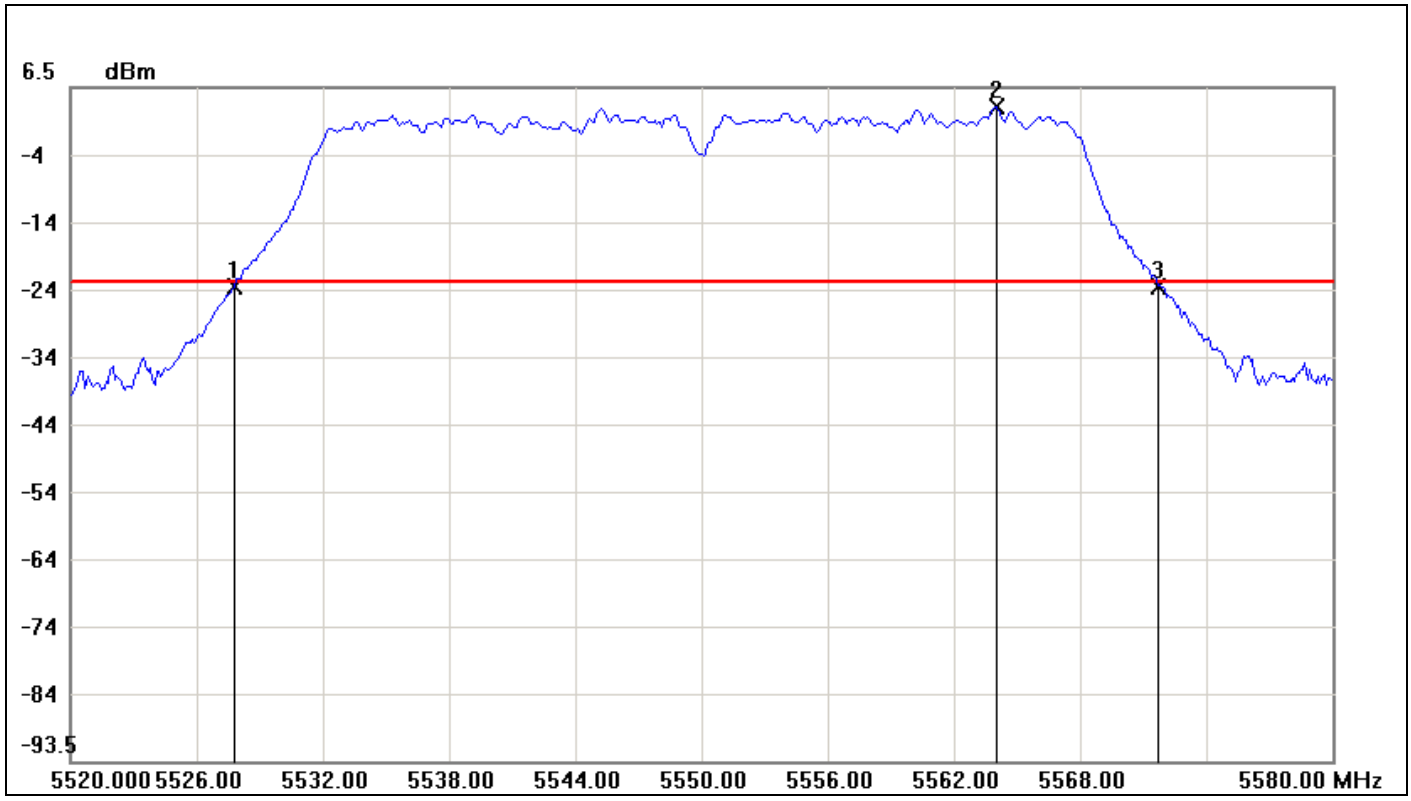
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5487.7000	-24.26	-24.12	-0.14
2	5524.0000	1.88	-24.12	26.00
3	5531.9000	-24.43	-24.12	-0.31

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44.2	-0.17

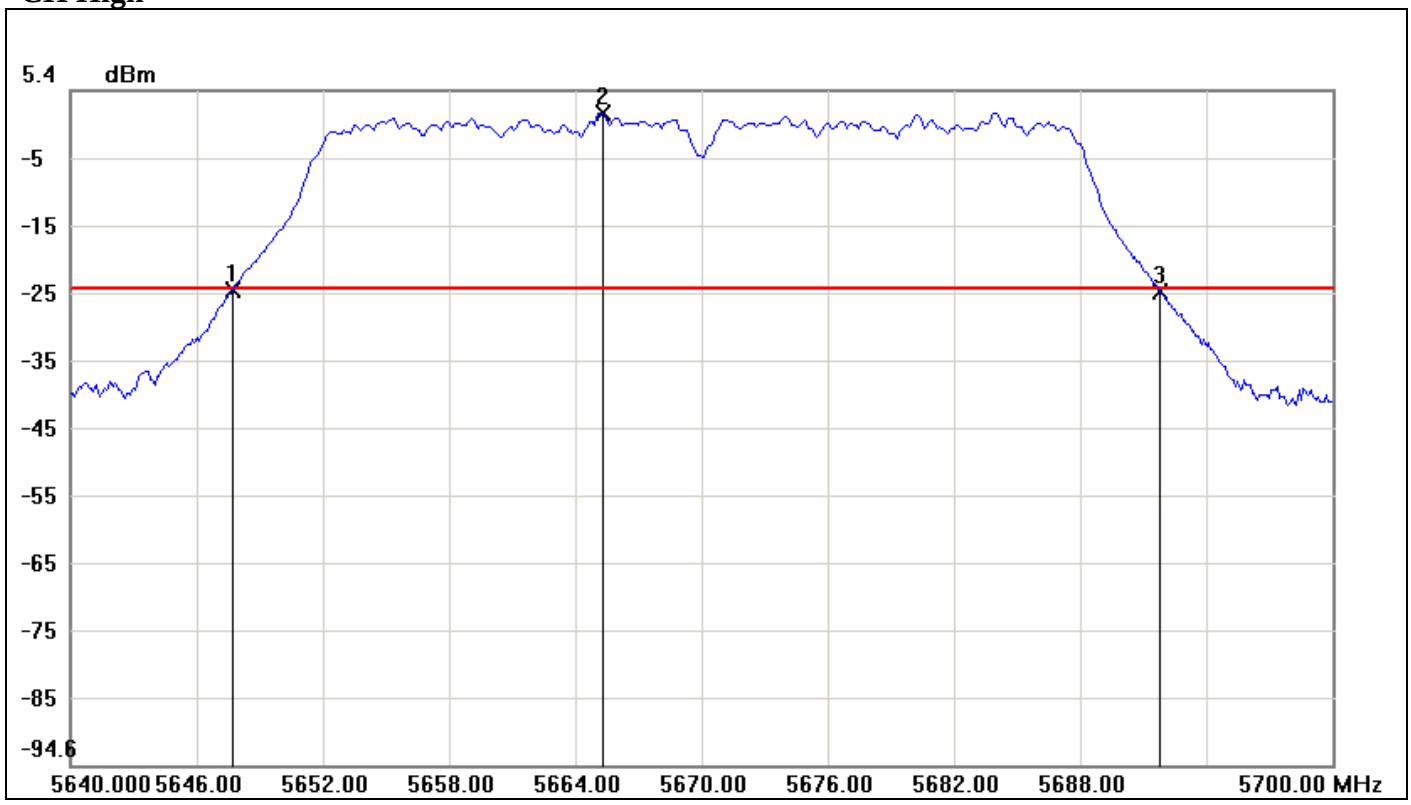
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5527.8000	-23.08	-22.49	-0.59
2	5564.0000	3.51	-22.49	26.00
3	5571.7000	-23.01	-22.49	-0.52

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	43.9	0.07

CH High

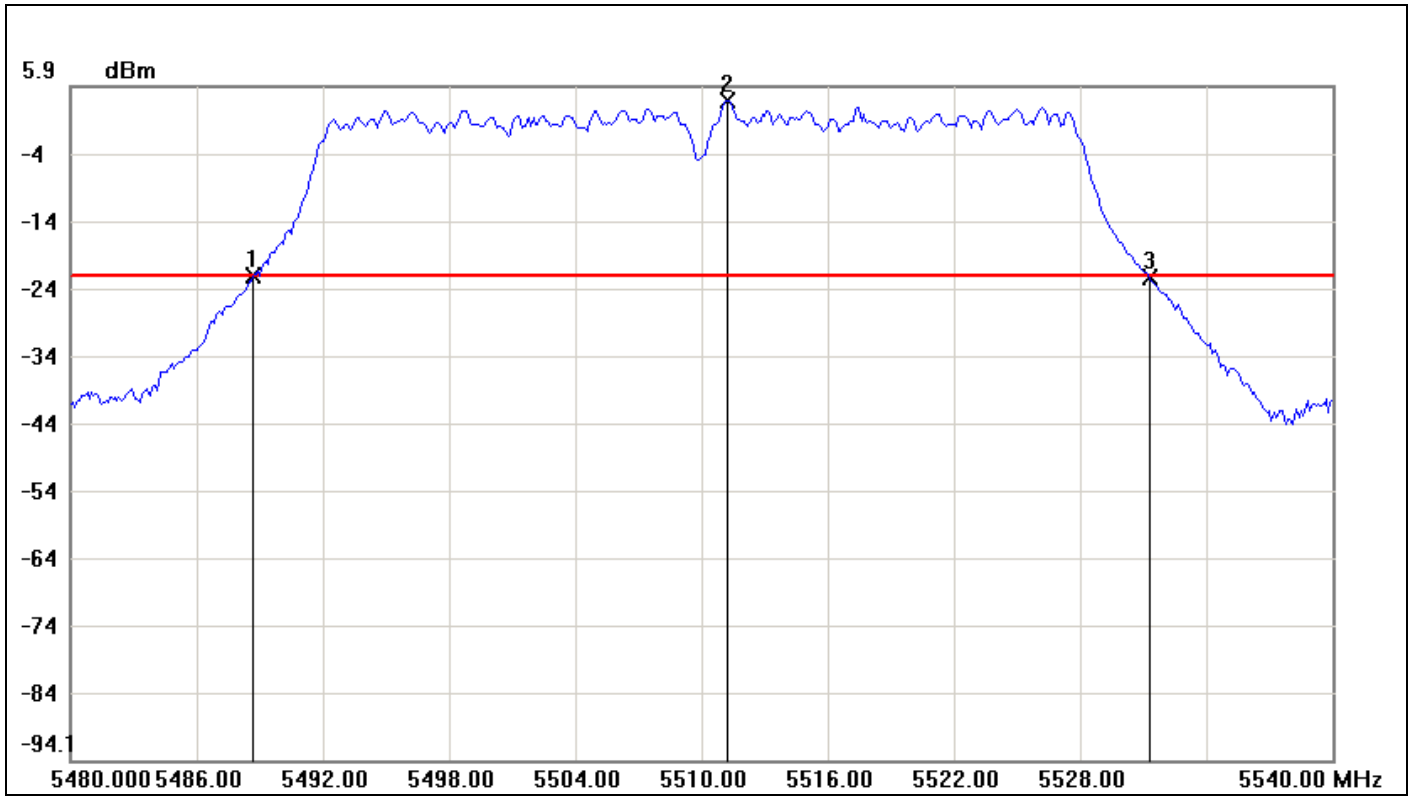


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5647.7000	-24.26	-23.82	-0.44
2	5665.3000	2.18	-23.82	26.00
3	5691.8000	-24.33	-23.82	-0.51

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44.1	-0.07

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

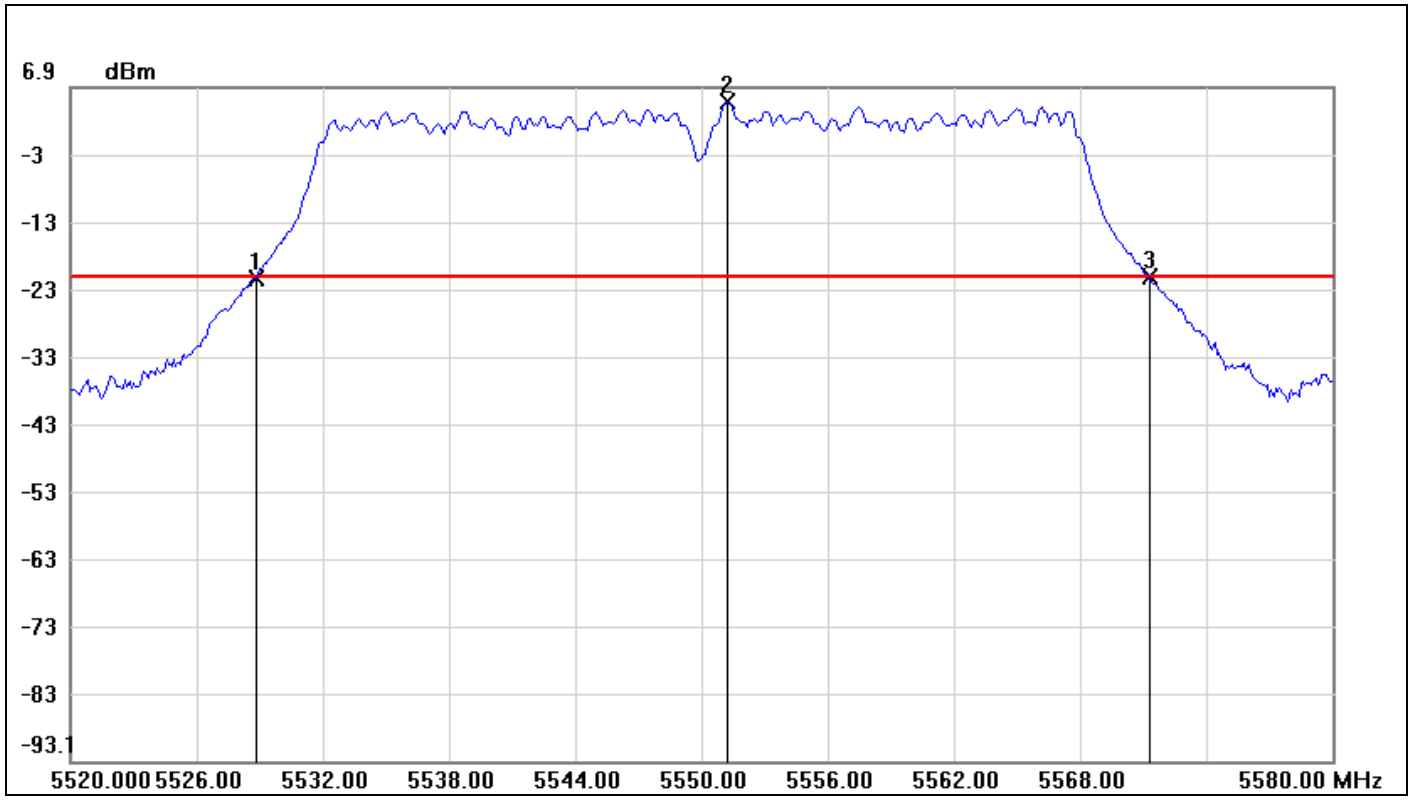
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5488.7000	-22.35	-22.19	-0.16
2	5511.2000	3.81	-22.19	26.00
3	5531.3000	-22.46	-22.19	-0.27

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.6	-0.11

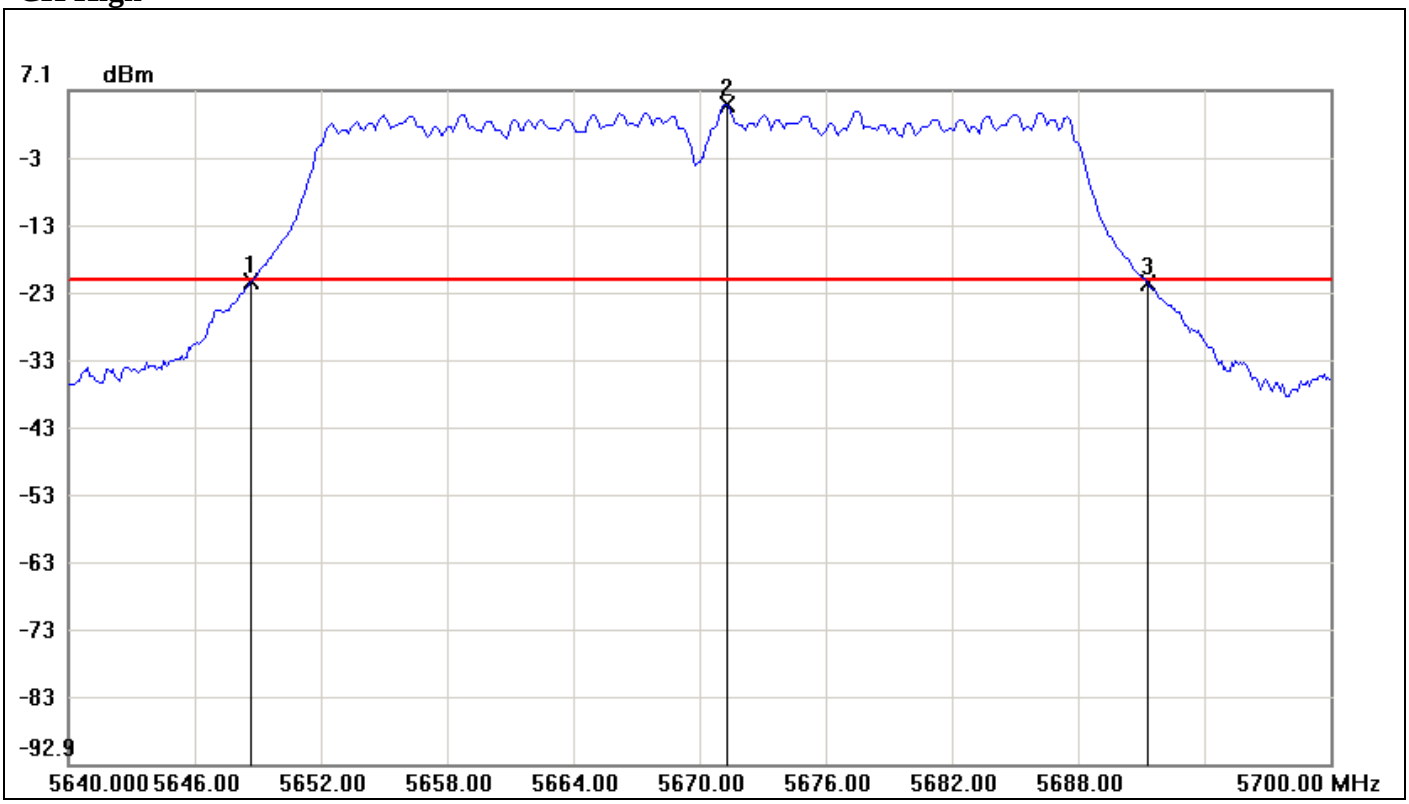
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5528.8000	-21.47	-21.14	-0.33
2	5551.2000	4.86	-21.14	26.00
3	5571.3000	-21.37	-21.14	-0.23

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.5	0.1

CH High

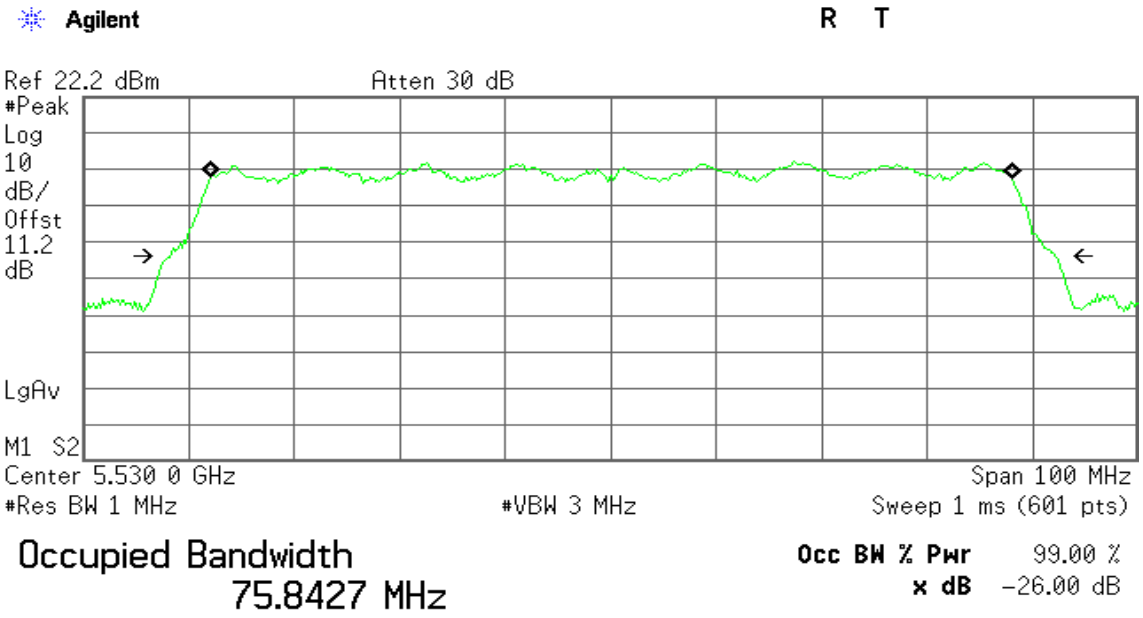


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5648.7000	-21.32	-21.03	-0.29
2	5671.3000	4.97	-21.03	26.00
3	5691.3000	-21.53	-21.03	-0.50

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	42.6	-0.21

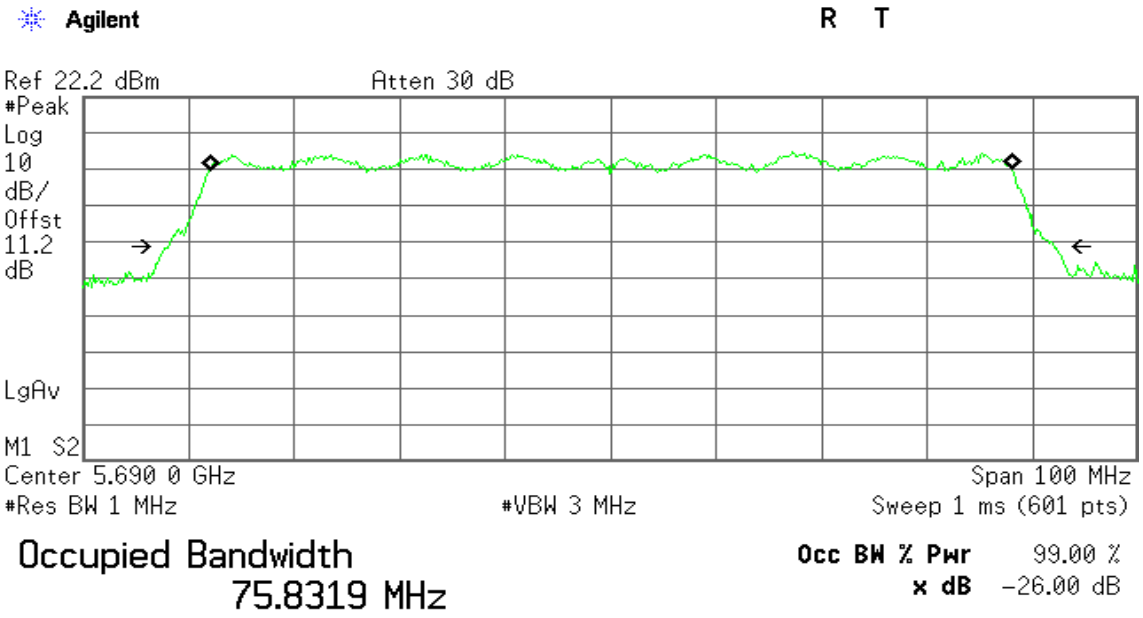
IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 0

CH Low



Transmit Freq Error	69.801 kHz
x dB Bandwidth	84.115 MHz

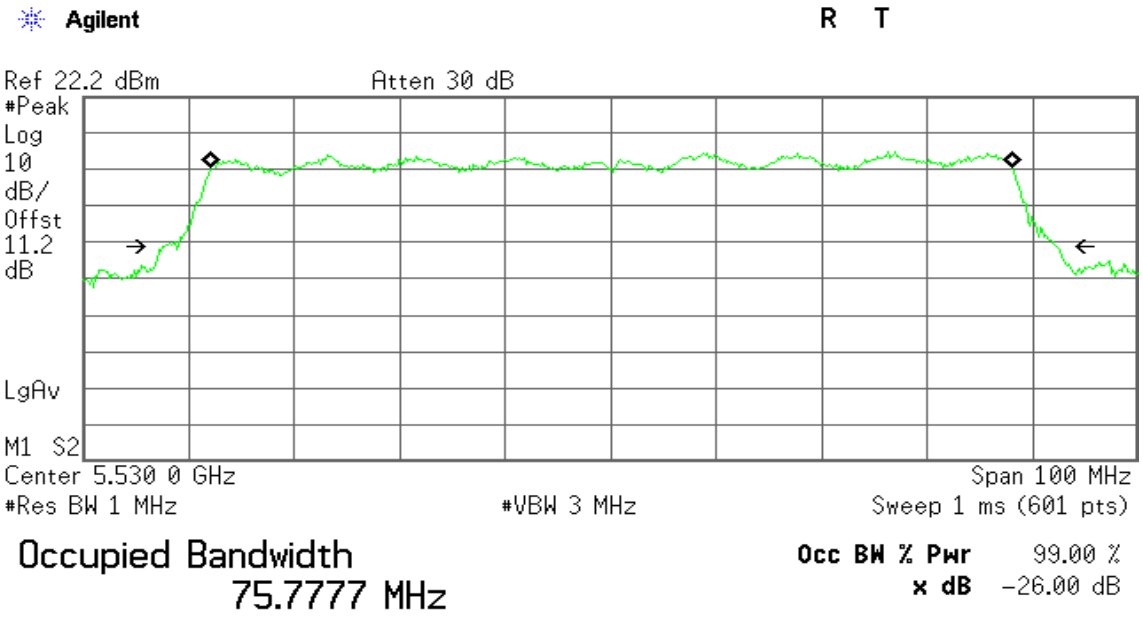
CH High



Transmit Freq Error	10.927 kHz
x dB Bandwidth	84.146 MHz

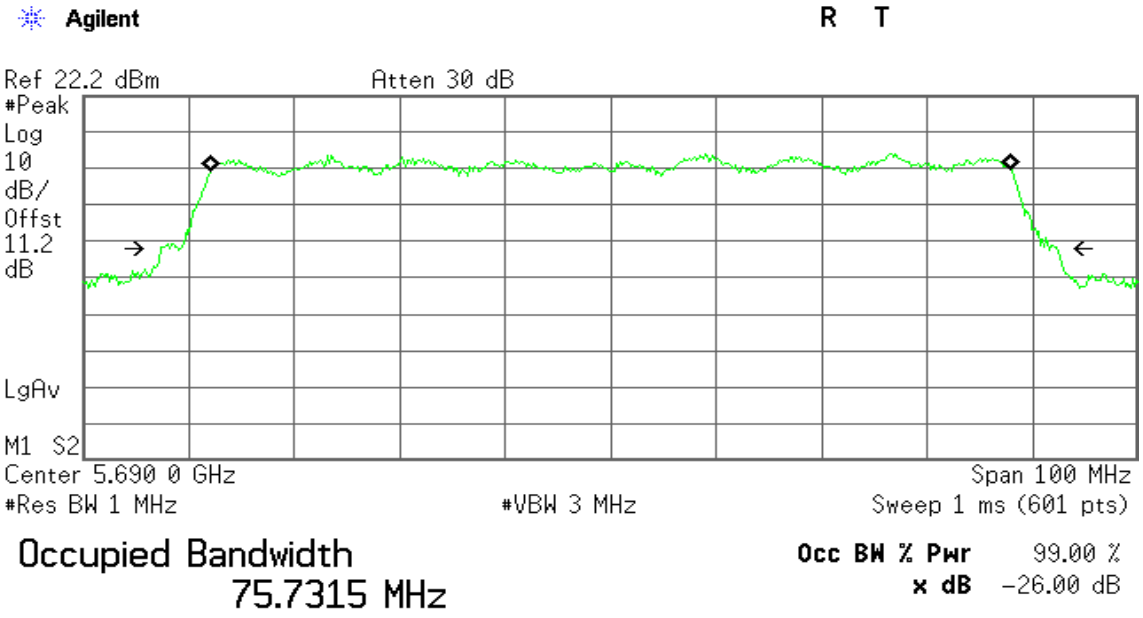
IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz / Chain 1

CH Low



Transmit Freq Error	81.371 kHz
x dB Bandwidth	84.992 MHz

CH High



Transmit Freq Error	24.319 kHz
x dB Bandwidth	85.046 MHz

8.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

According to §15.407(a),

(1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26 dB emission bandwidth in MHz.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands 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:

Specified Limit of the Peak Power

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5180	21.2666	13.27698	17.2770	17.00
Mid	5220	21.2666	13.27698	17.2770	17.00
High	5240	21.2667	13.27700	17.2770	17.00

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

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5180	21.9334	21.5333	13.4111	17.4111	17.00
Mid	5220	21.9334	21.5334	13.4111	17.4111	17.00
High	5240	21.9334	21.5333	13.4111	17.4111	17.00

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

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5190	43.9	42.4	16.4246	20.4246	17.00
High	5230	44	42.5	16.4345	20.4345	17.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Mid	5210	75.8171	75.7411	18.7977	22.7977	17.00

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5260	21.3333	13.29058	24.2906	24.00
Mid	5280	21.3333	13.29058	24.2906	24.00
High	5320	21.2	13.26336	24.2634	24.00

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

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5260	22	21.5333	13.4242	24.4242	24.00
Mid	5280	21.9334	21.5333	13.4111	24.4111	24.00
High	5320	21.9333	21.5334	13.4110	24.4110	24.00

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

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5270	44.1	42.6	16.4444	27.4444	24.00
High	5310	44	42.4	16.4345	27.4345	24.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Mid	5290	75.8292	75.7399	18.7984	29.7984	24.00

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

Channel	Frequency (MHz)	26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5500	21.2667	13.27700	24.2770	24.00
Mid	5580	21.3334	13.29060	24.2906	24.00
High	5700	21.3333	13.29058	24.2906	24.00

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

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5500	21.9334	21.5333	13.4111	24.4111	24.00
Mid	5580	21.9333	21.4666	13.4110	24.4110	24.00
High	5700	21.8667	21.5333	13.3978	24.3978	24.00

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

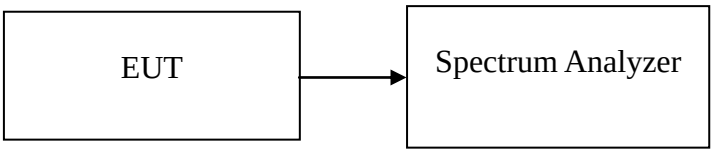
Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5510	44.2	42.6	16.4542	27.4542	24.00
Mid	5550	43.9	42.5	16.4246	27.4246	24.00
High	5670	44.1	42.6	16.4444	27.4444	24.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz

Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5530	75.8427	75.7777	18.7991	29.7991	24.00
High	5690	75.8319	75.7315	18.7985	29.7985	24.00

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	16.40	17.00
Mid	5220	16.40	17.00
High	5240	16.30	17.00

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	13.10	13.80	16.47	17.00
Mid	5220	13.20	13.70	16.47	17.00
High	5240	13.80	13.20	16.52	17.00

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	13.20	13.70	16.47	17.00
High	5230	13.50	13.40	16.46	17.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Mid	5210	13.30	13.40	16.36	17.00

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5260	18.00	24.00
Mid	5280	18.50	24.00
High	5320	19.60	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	14.40	14.10	17.26	24.00
Mid	5280	13.10	13.70	16.42	24.00
High	5320	14.30	14.20	17.26	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	15.10	15.10	18.11	24.00
High	5310	13.50	15.00	17.32	24.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Mid	5290	13.40	14.40	16.94	24.00

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5500	16.70	24.00
Mid	5580	17.60	24.00
High	5700	19.10	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	13.30	13.40	16.36	24.00
Mid	5580	14.50	15.70	18.15	24.00
High	5700	13.30	13.40	16.36	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	13.80	14.30	17.07	24.00
Mid	5550	15.90	14.20	**18.14**	24.00
High	5670	14.60	14.00	17.32	24.00

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5530	14.20	15.30	17.80	24.00
High	5690	14.00	14.70	17.37	24.00

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

8.4 BAND EDGES MEASUREMENT

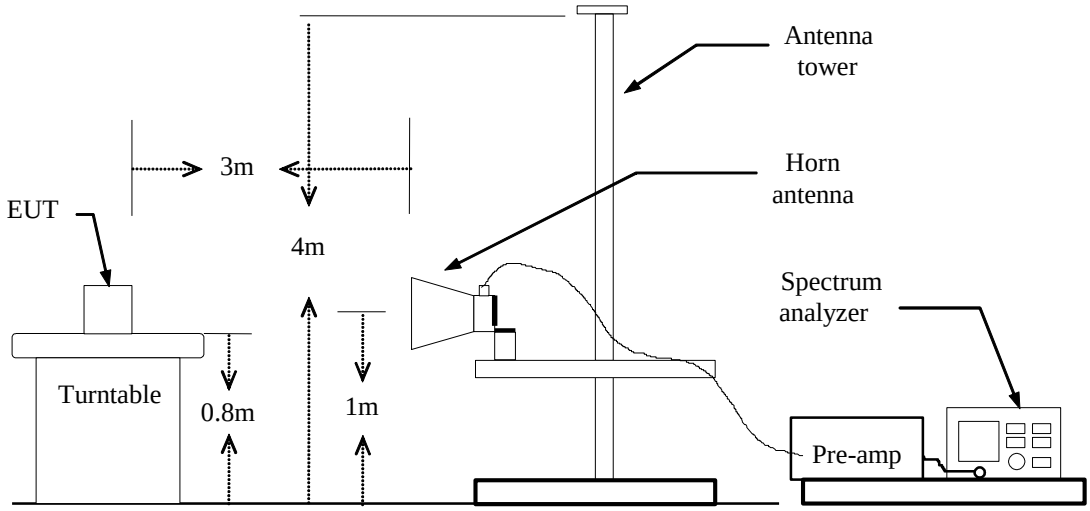
LIMIT

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

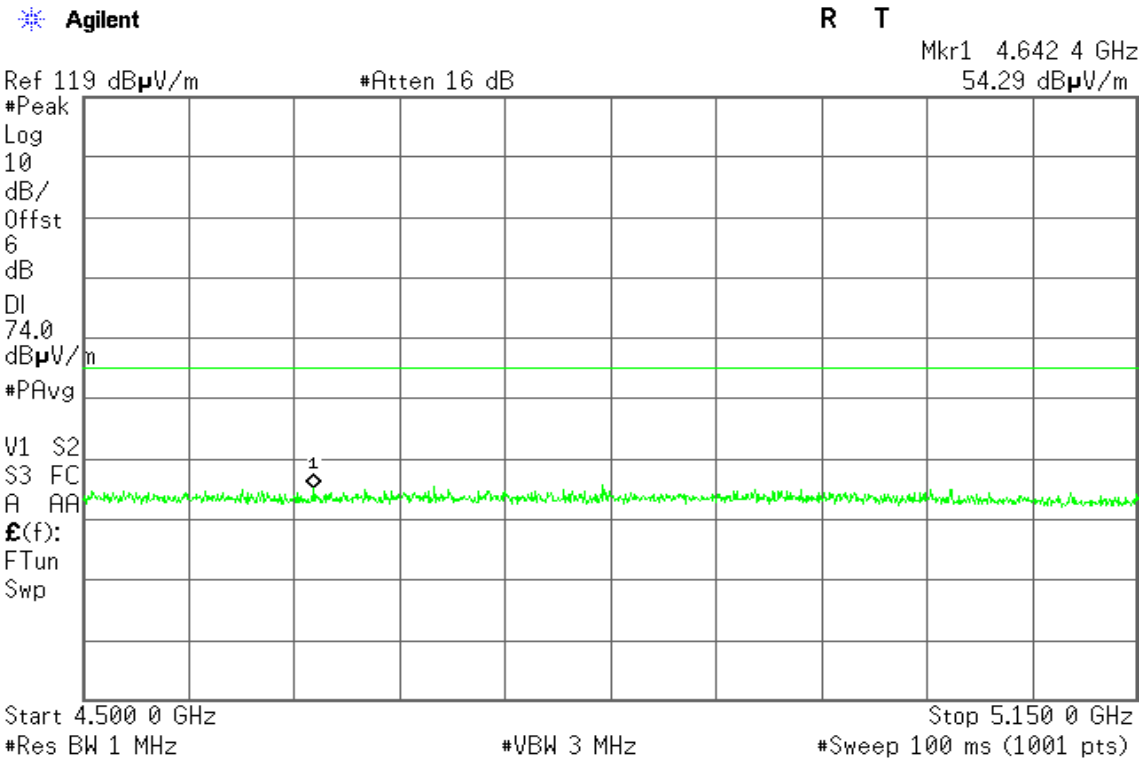
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the 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

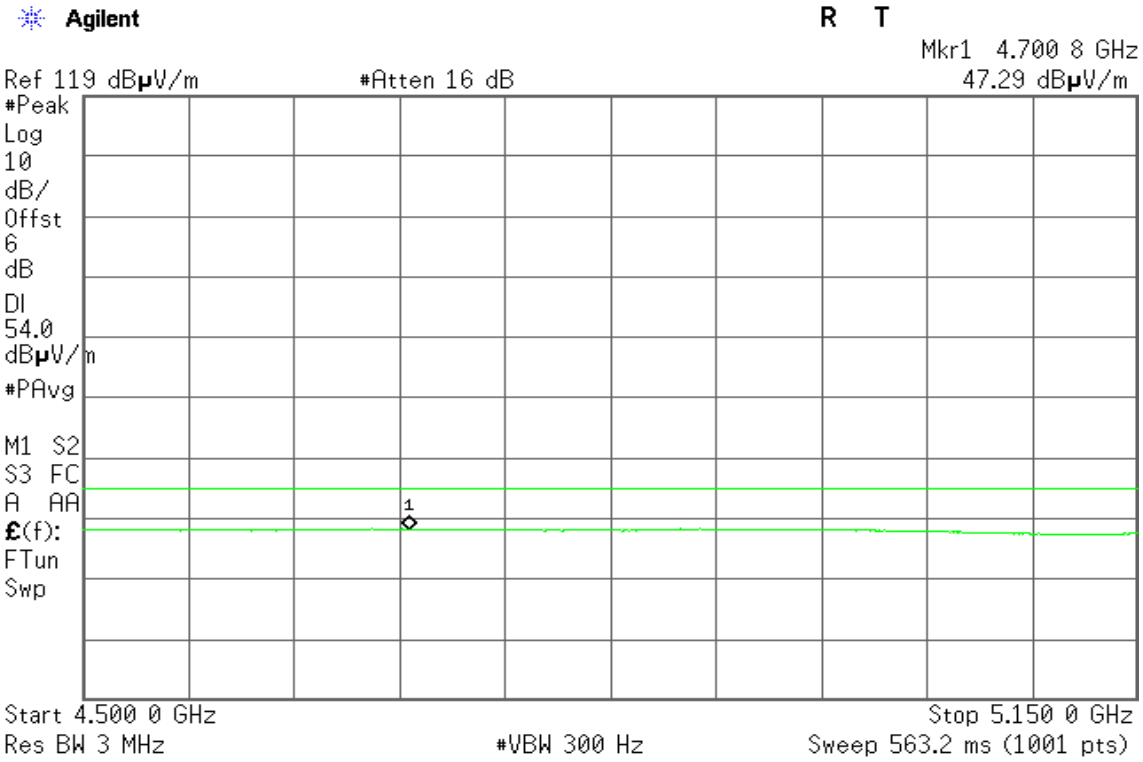
Refer to attach spectrum analyzer data chart.

Band Edges (IEEE 802.11a mode / CH 5180 MHz)

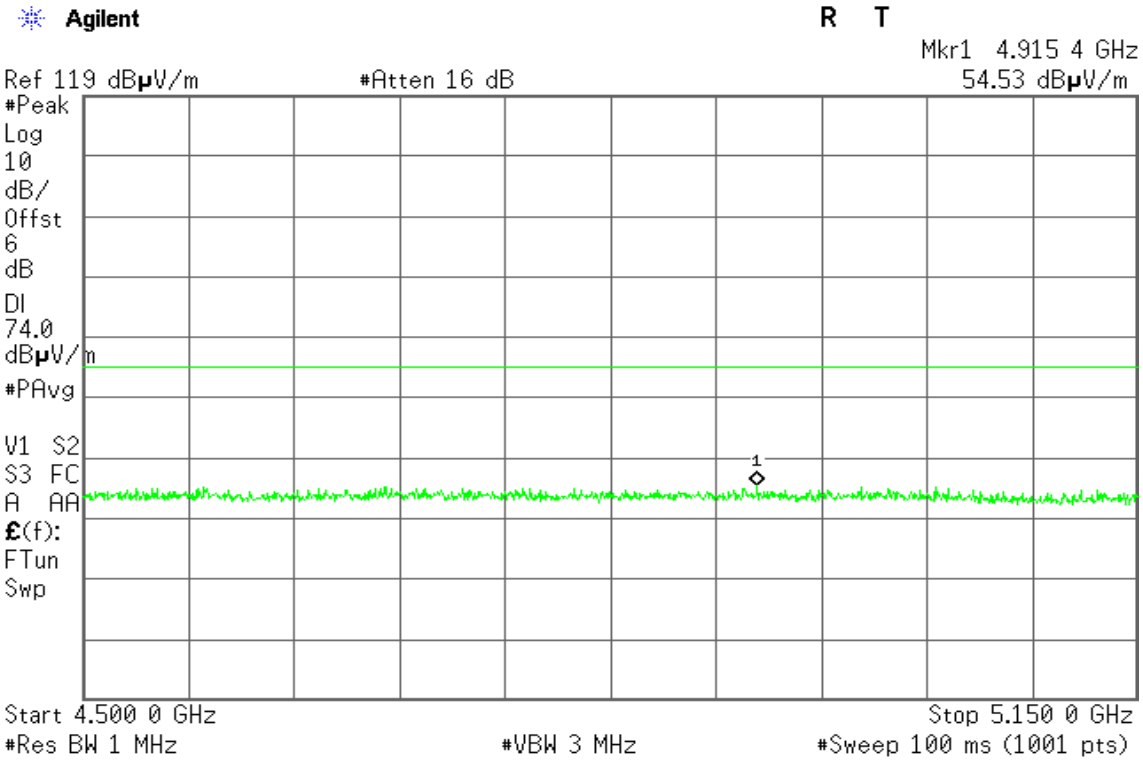
Detector mode: Peak **Polarity: Vertical**



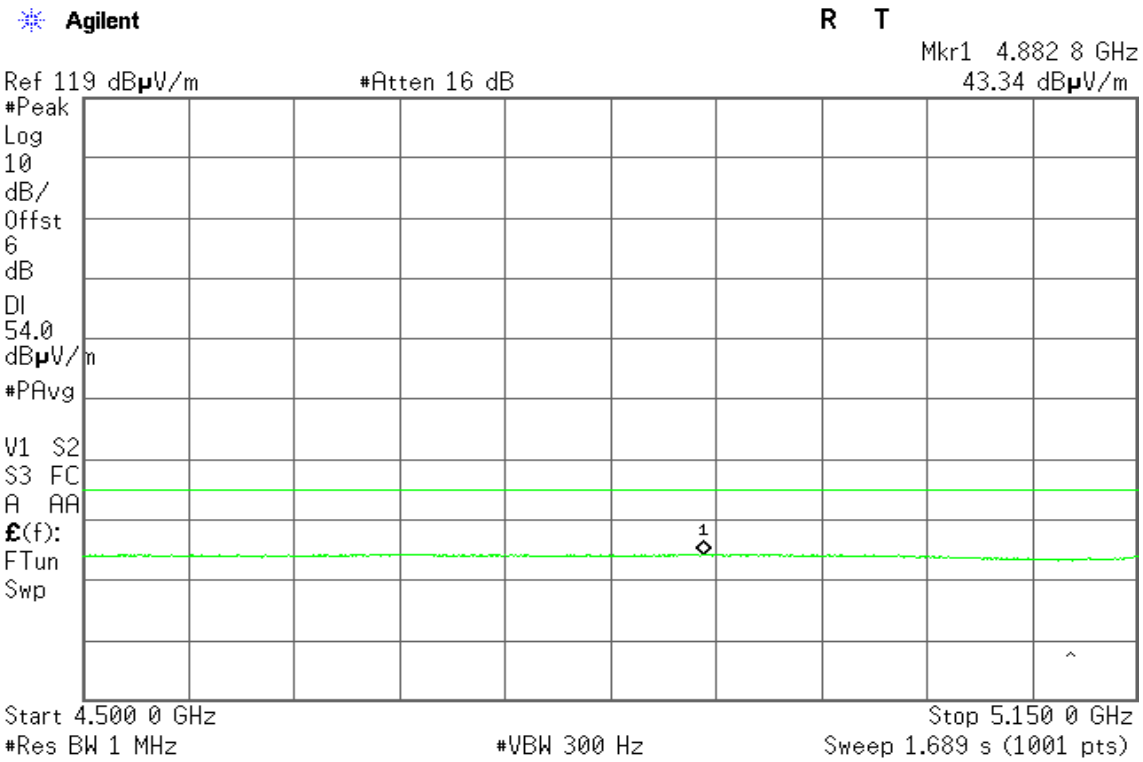
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

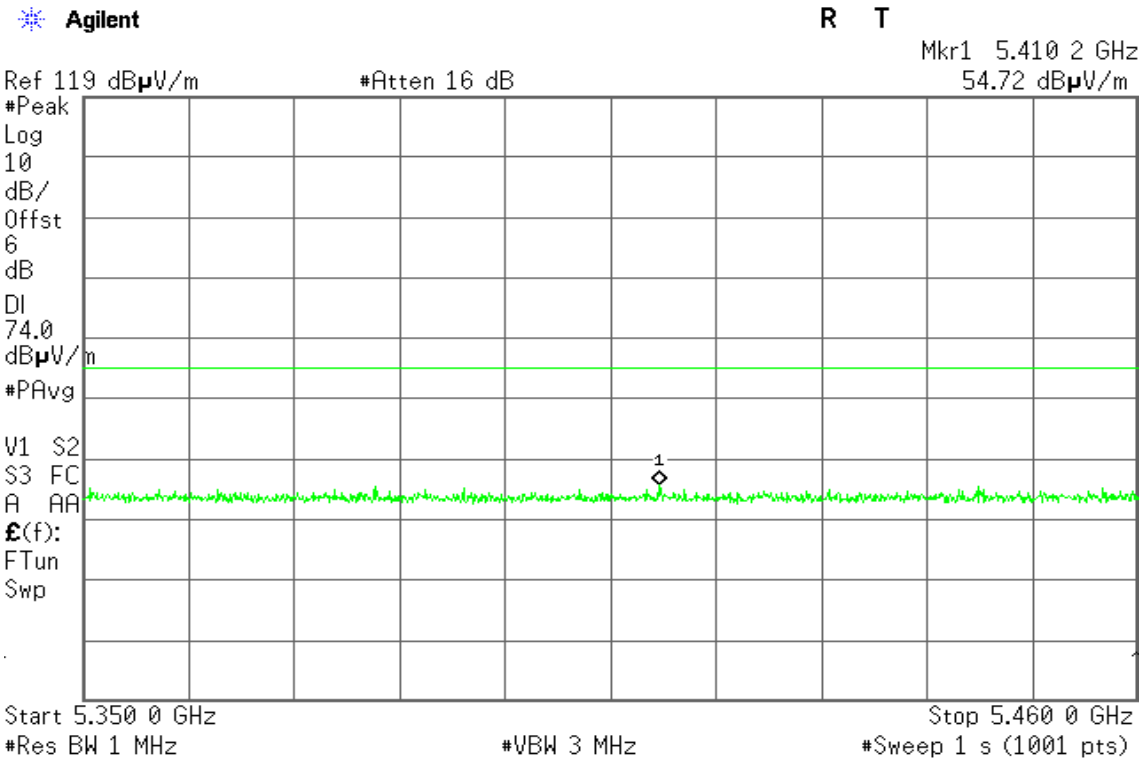


Detector mode: Average **Polarity: Horizontal**

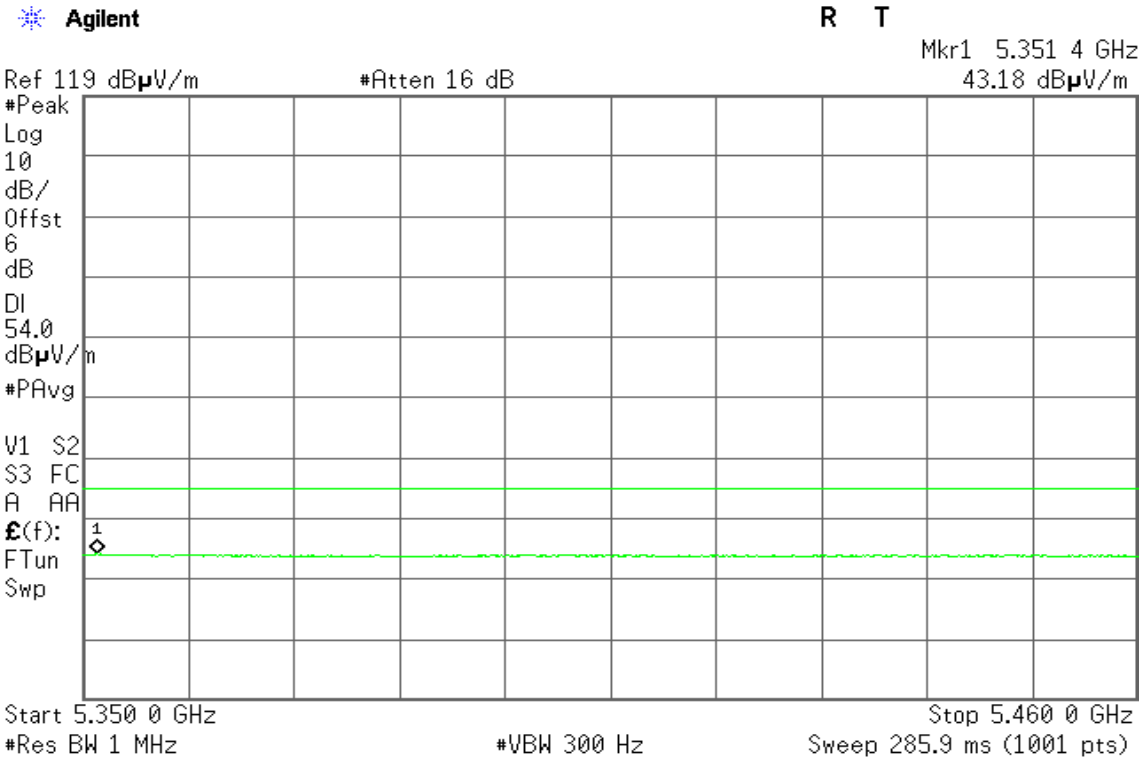


Band Edges (IEEE 802.11a mode / CH 5320 MHz)

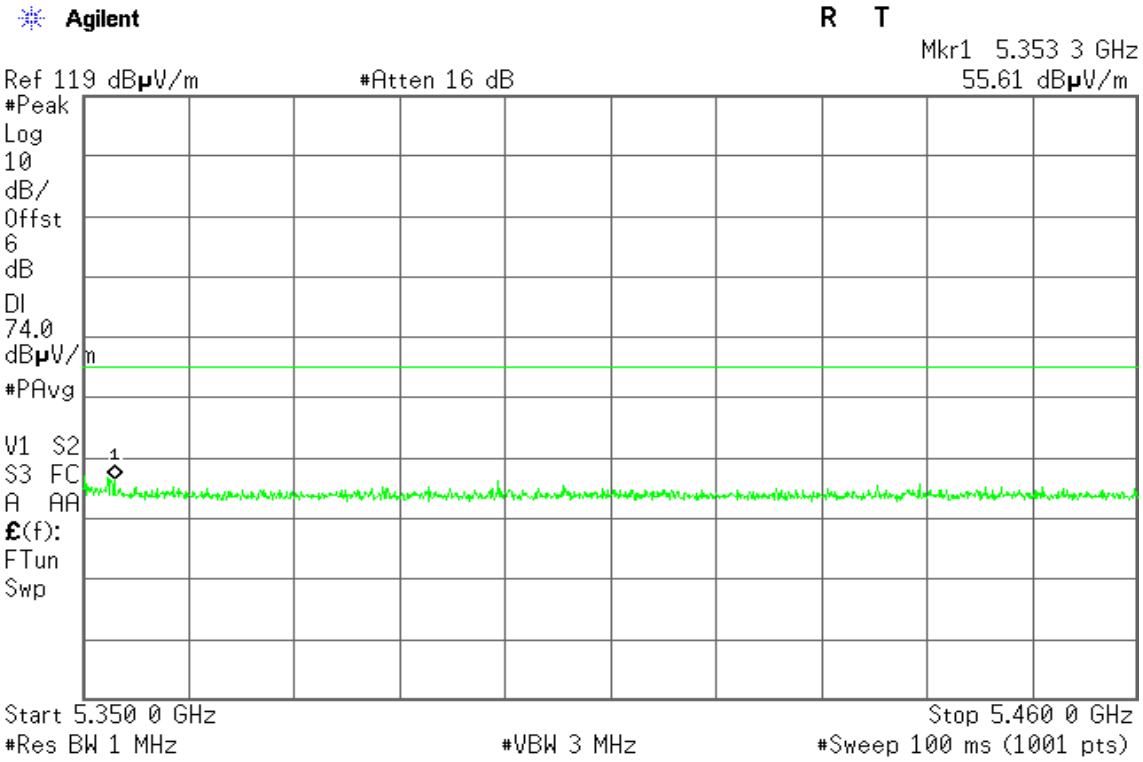
Detector mode: Peak **Polarity: Vertical**



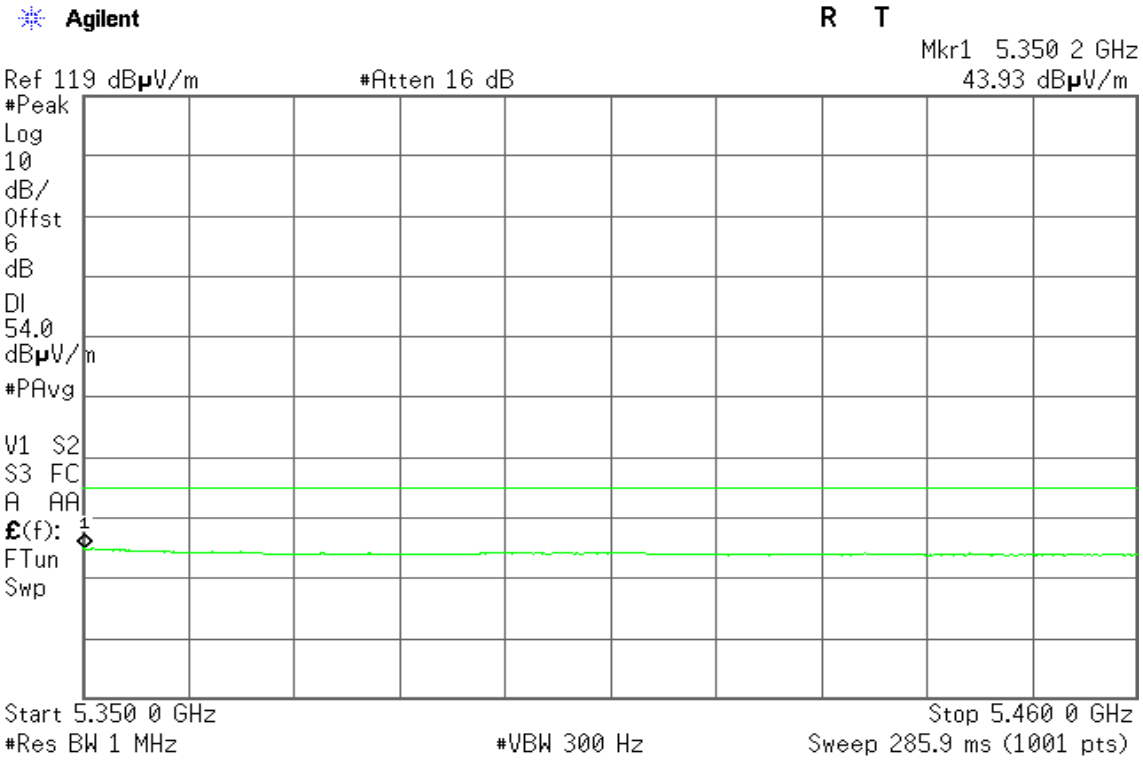
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

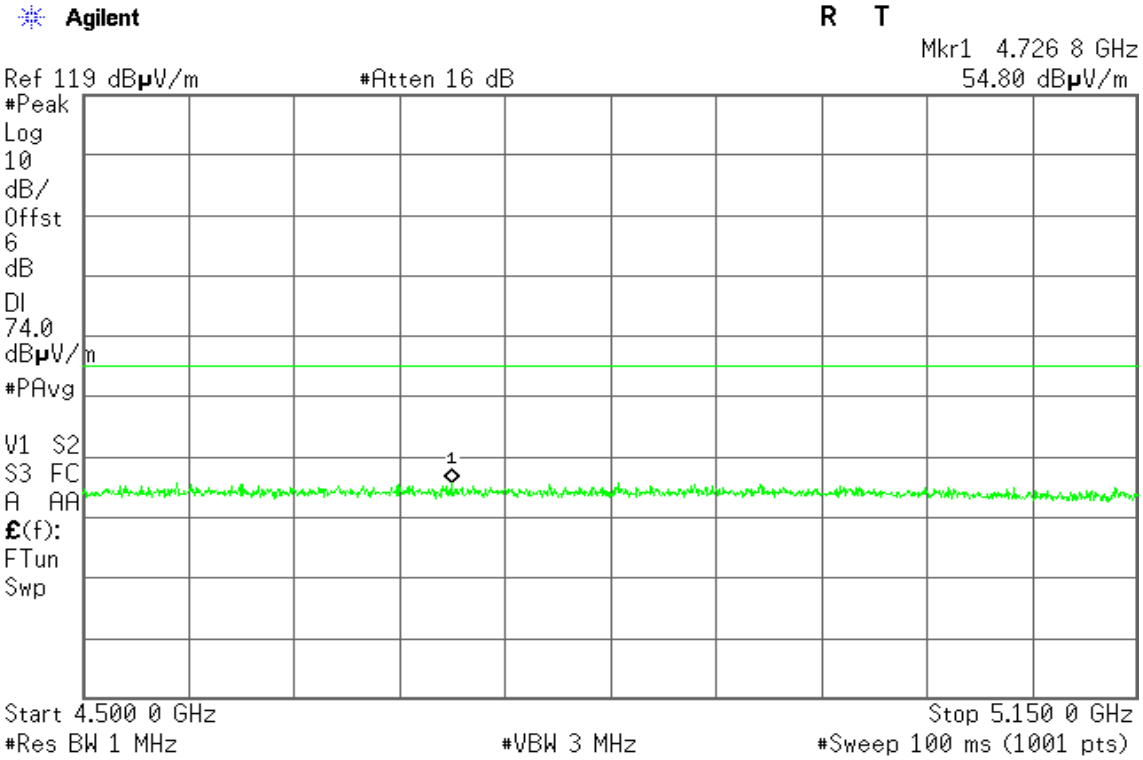


Detector mode: Average **Polarity: Horizontal**

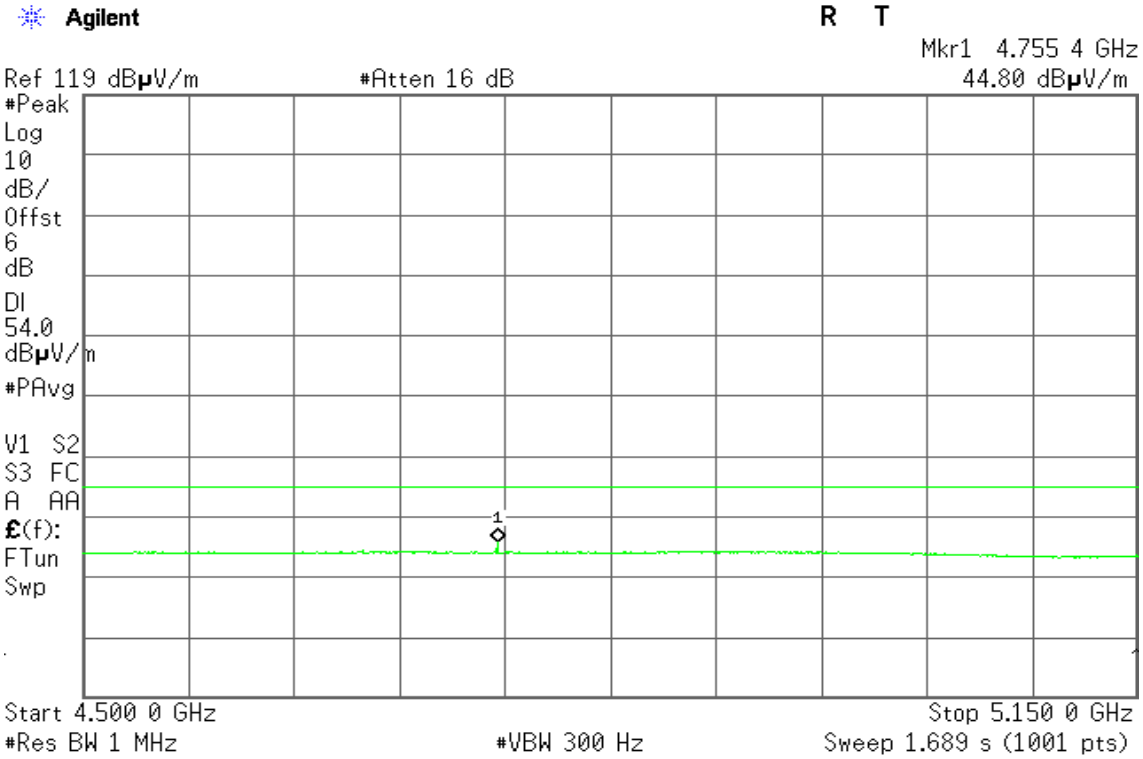


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / CH 5180 MHz)

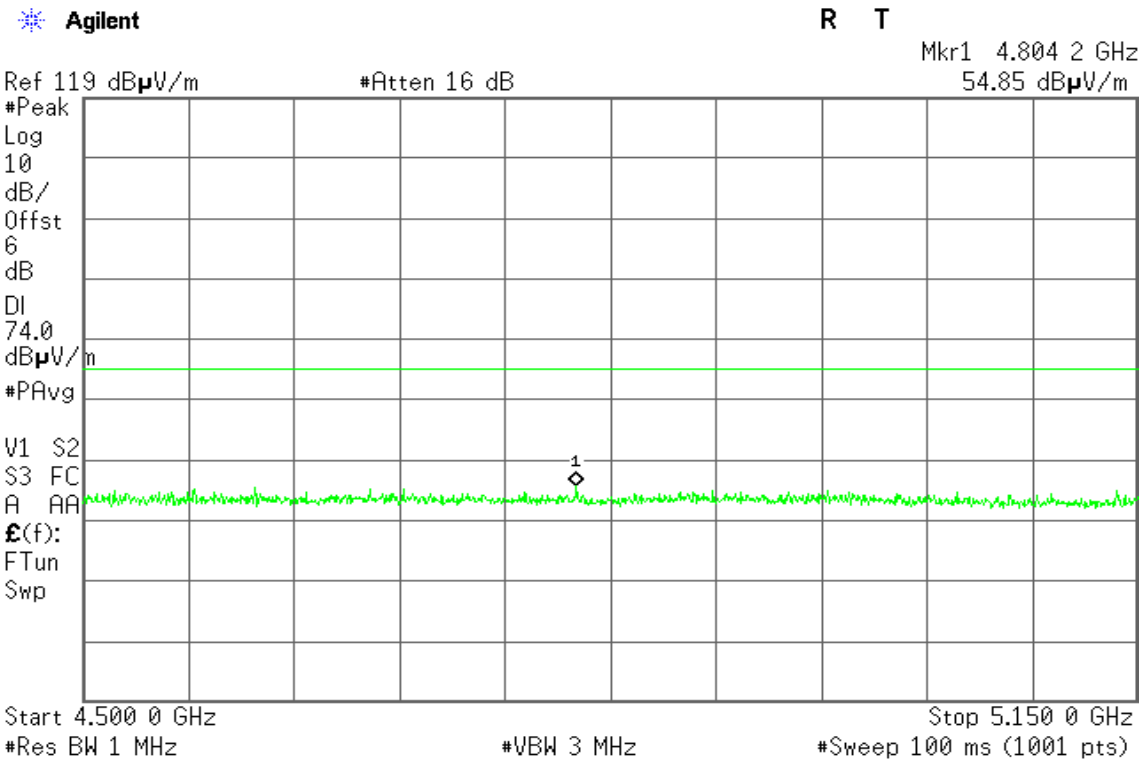
Detector mode: Peak **Polarity: Vertical**



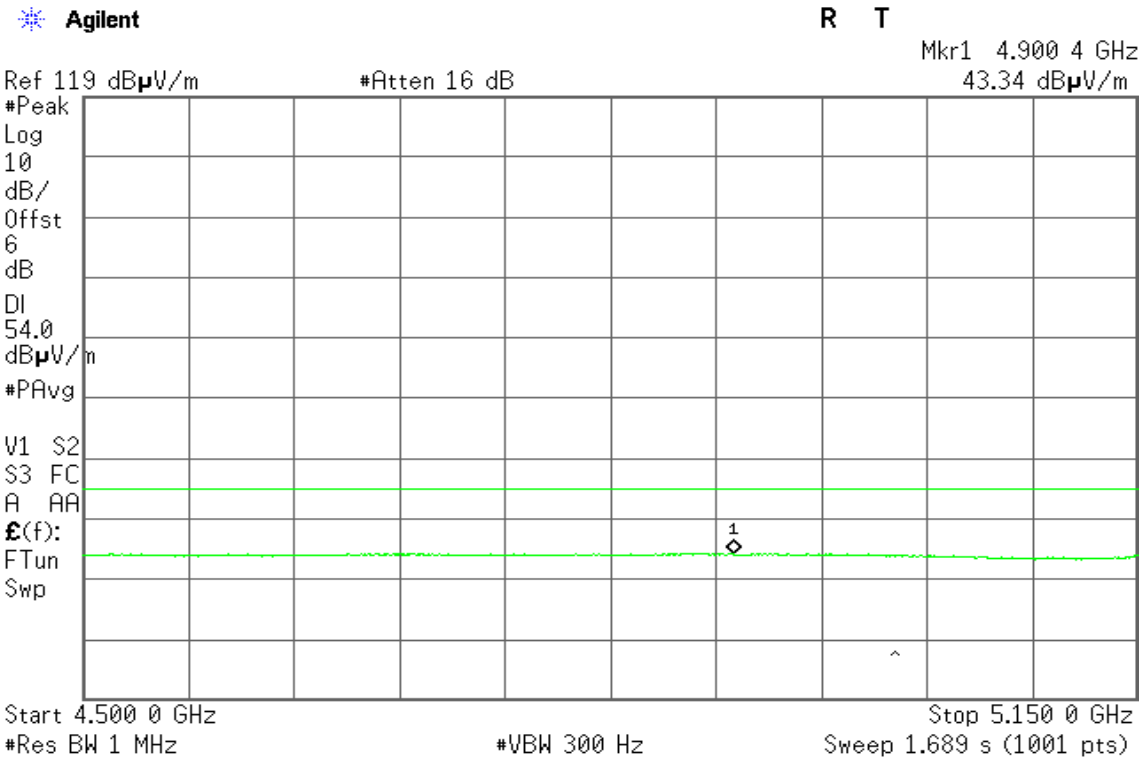
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

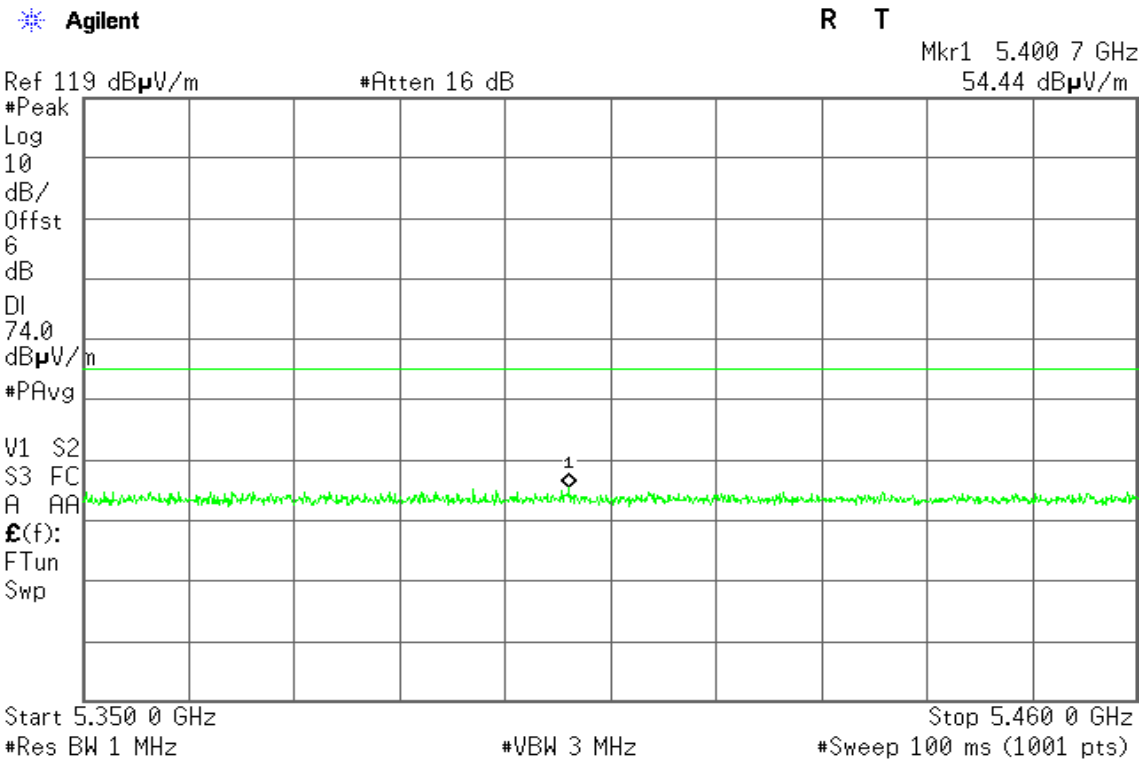


Detector mode: Average **Polarity: Horizontal**

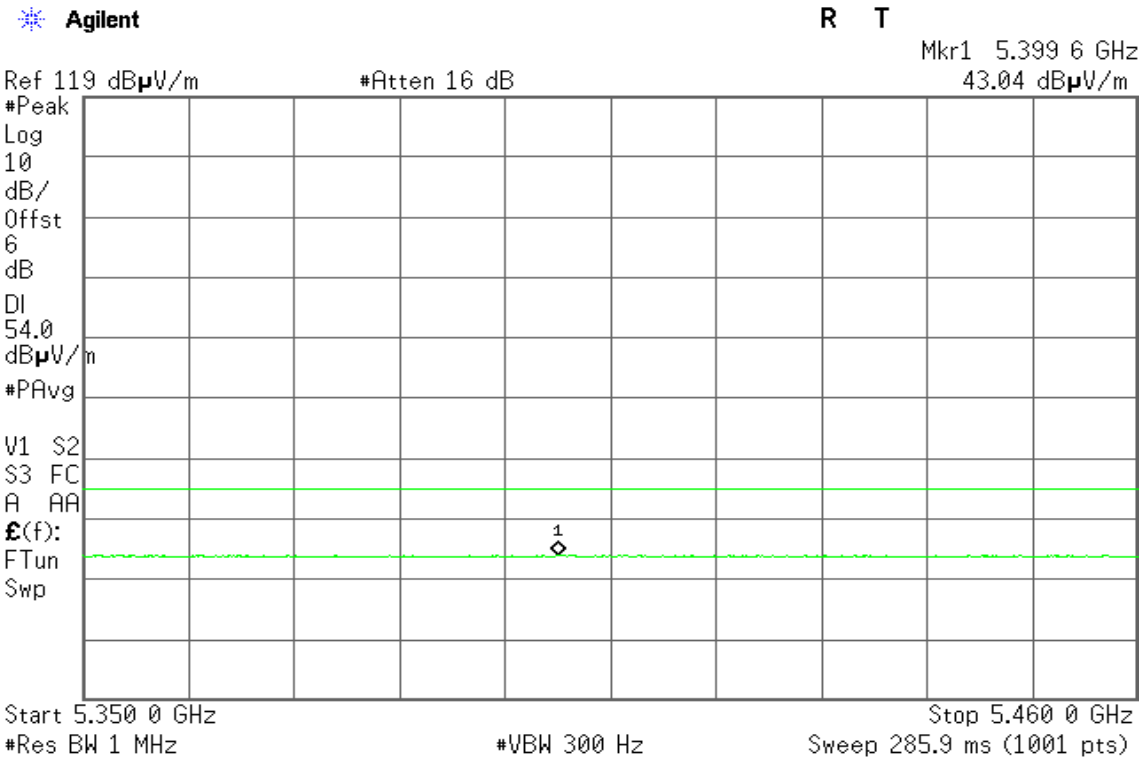


Band Edges (IEEE 802.11n HT 20 MHz Channel mode / CH 5320 MHz)

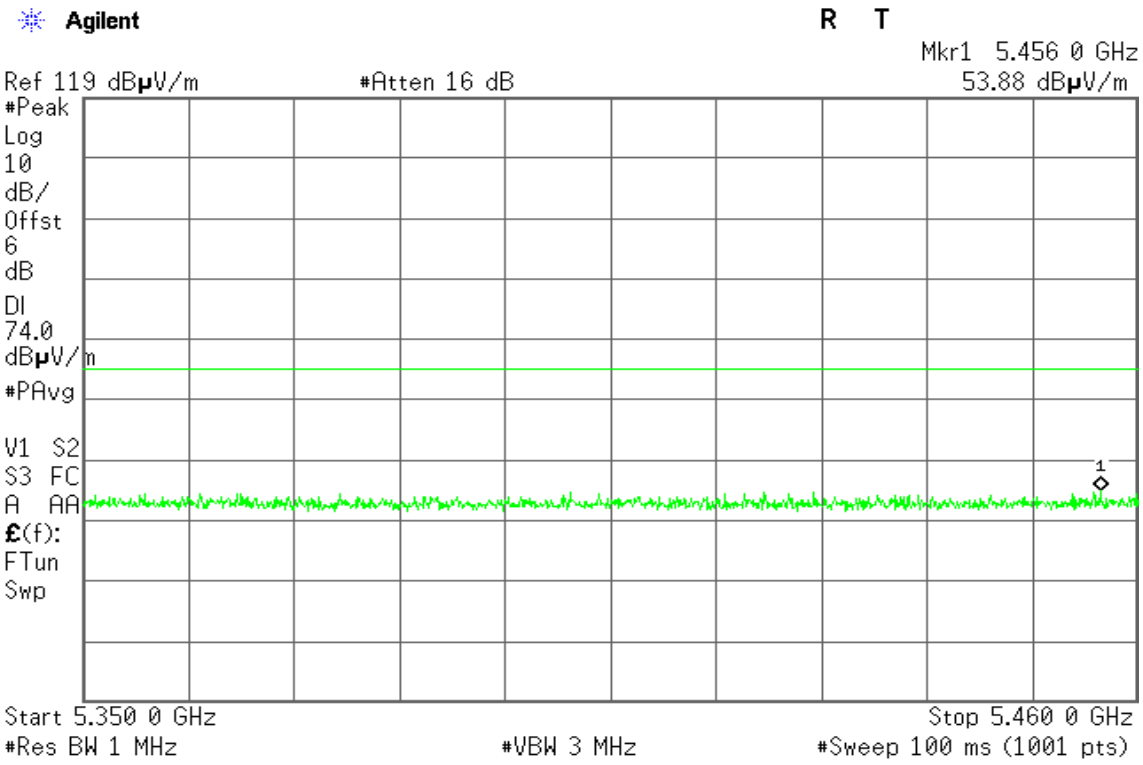
Detector mode: Peak **Polarity: Vertical**



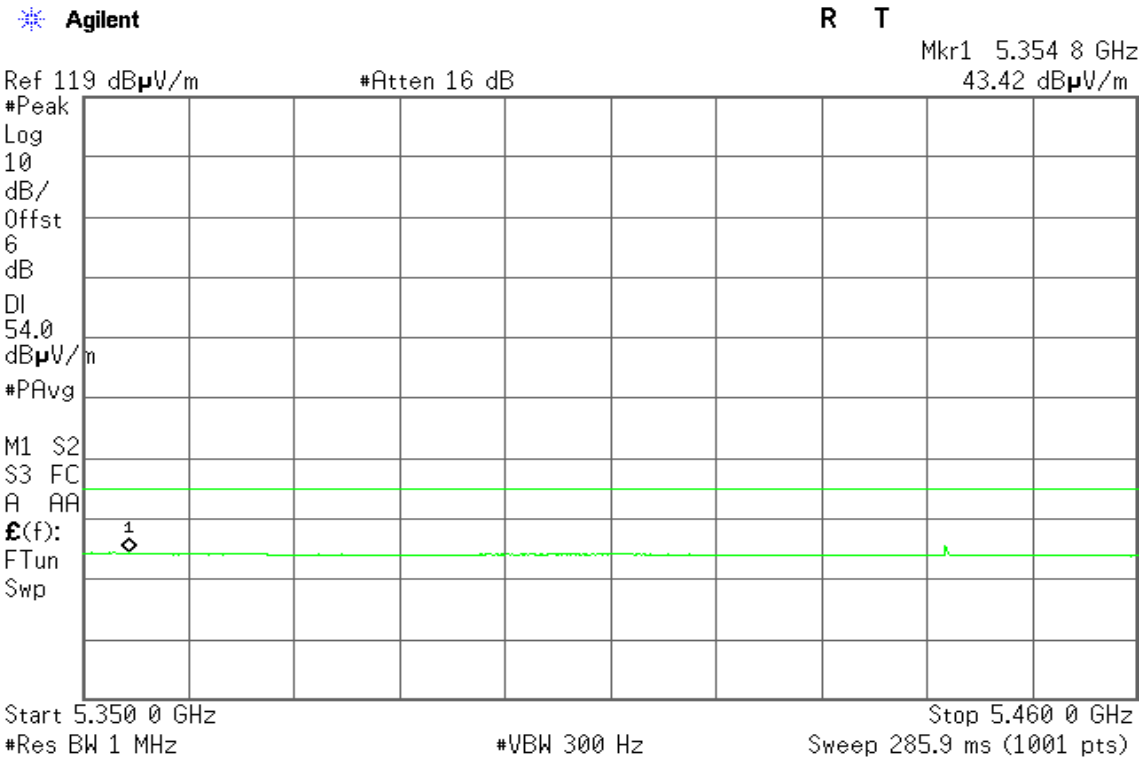
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

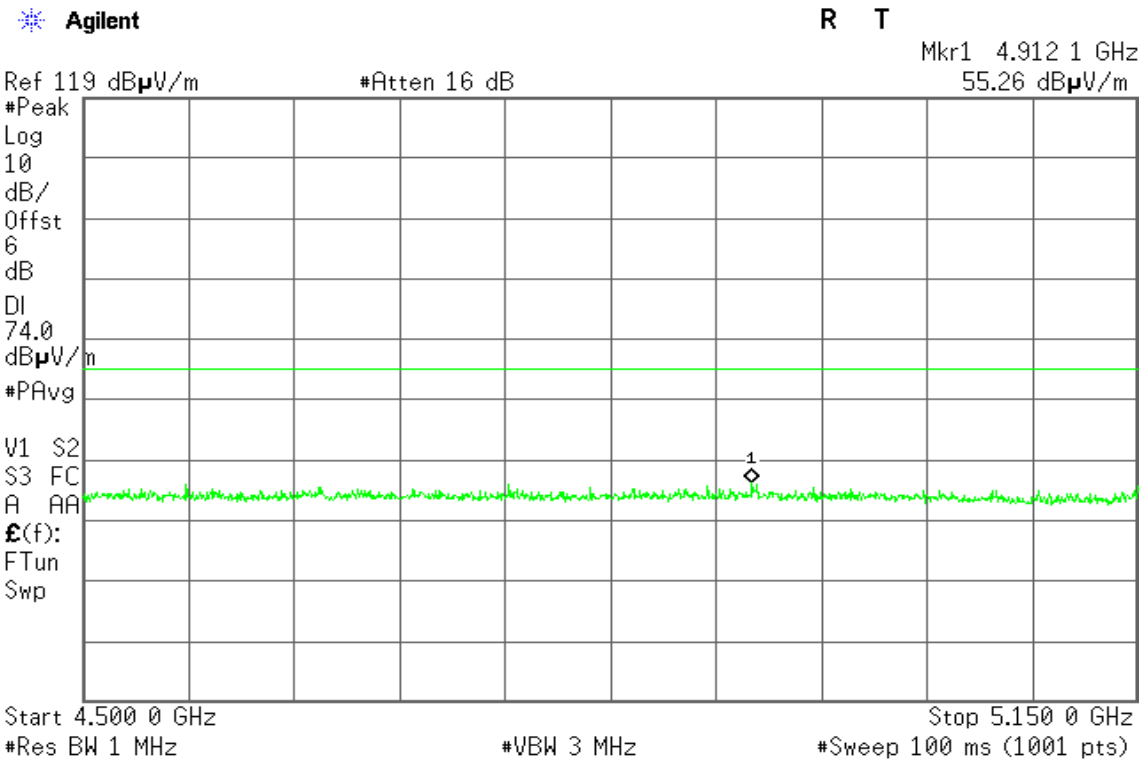


Detector mode: Average **Polarity: Horizontal**

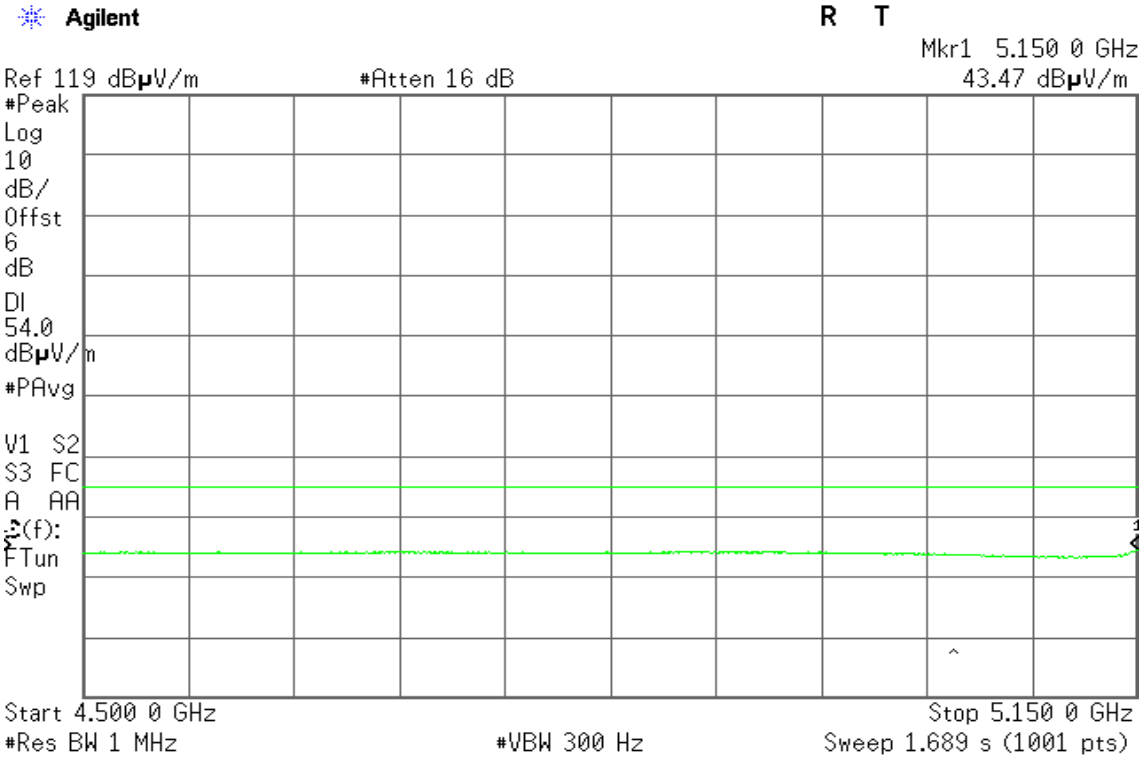


Band Edges (IEEE 802.11n HT 40 MHz mode / CH 5190 MHz)

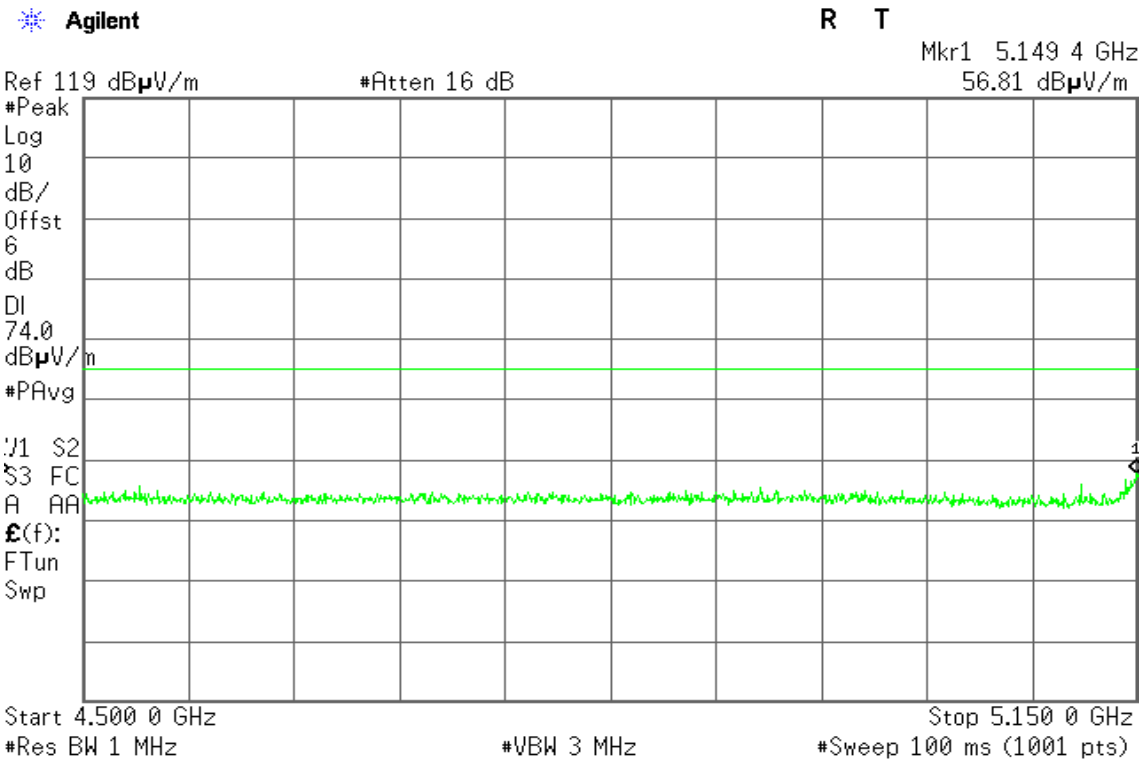
Detector mode: Peak **Polarity: Vertical**



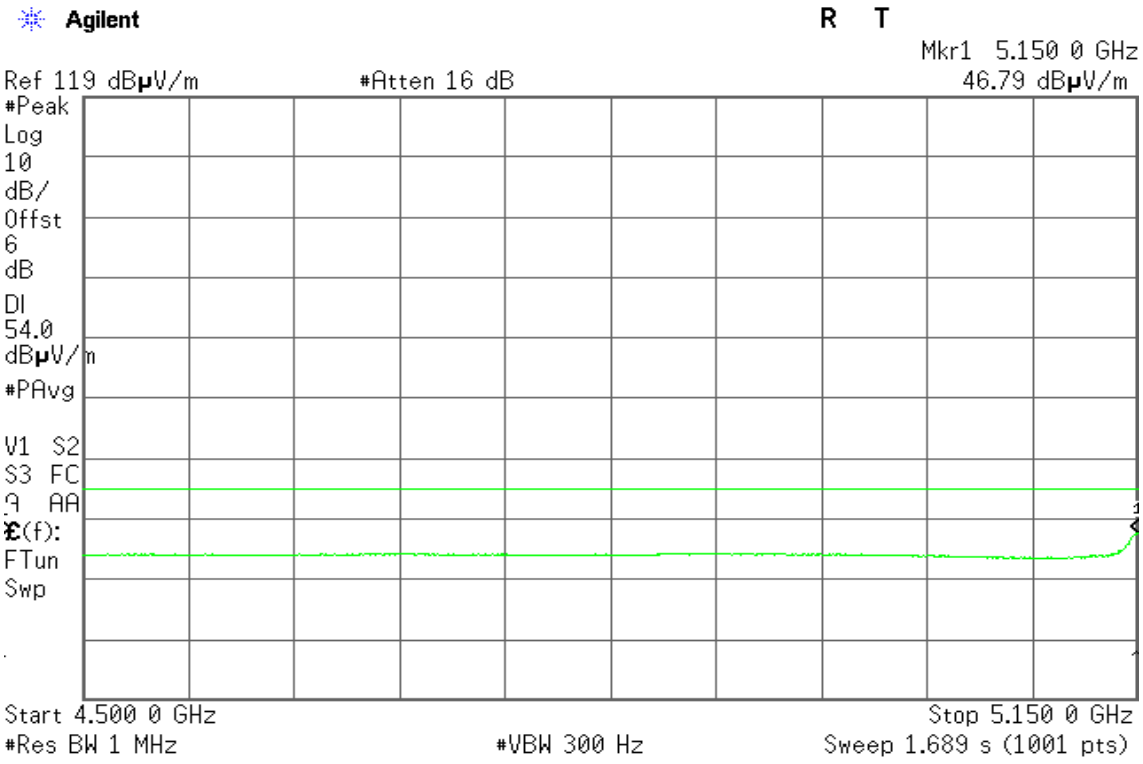
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

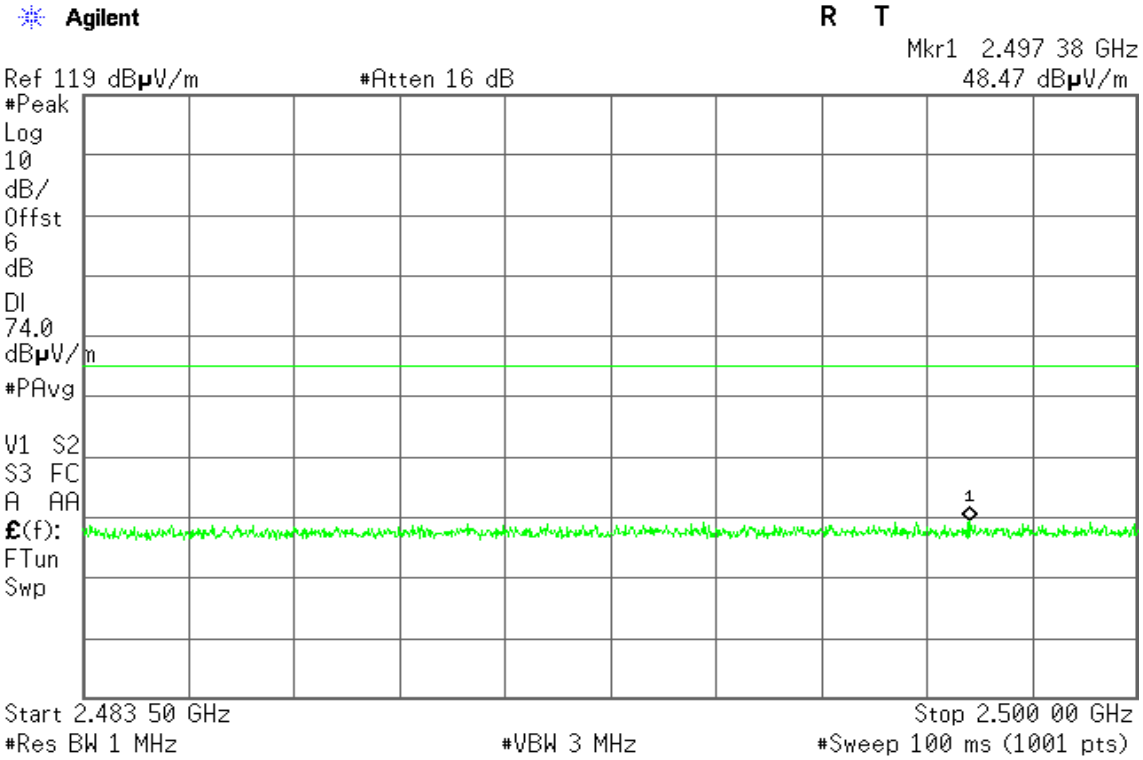


Detector mode: Average **Polarity: Horizontal**

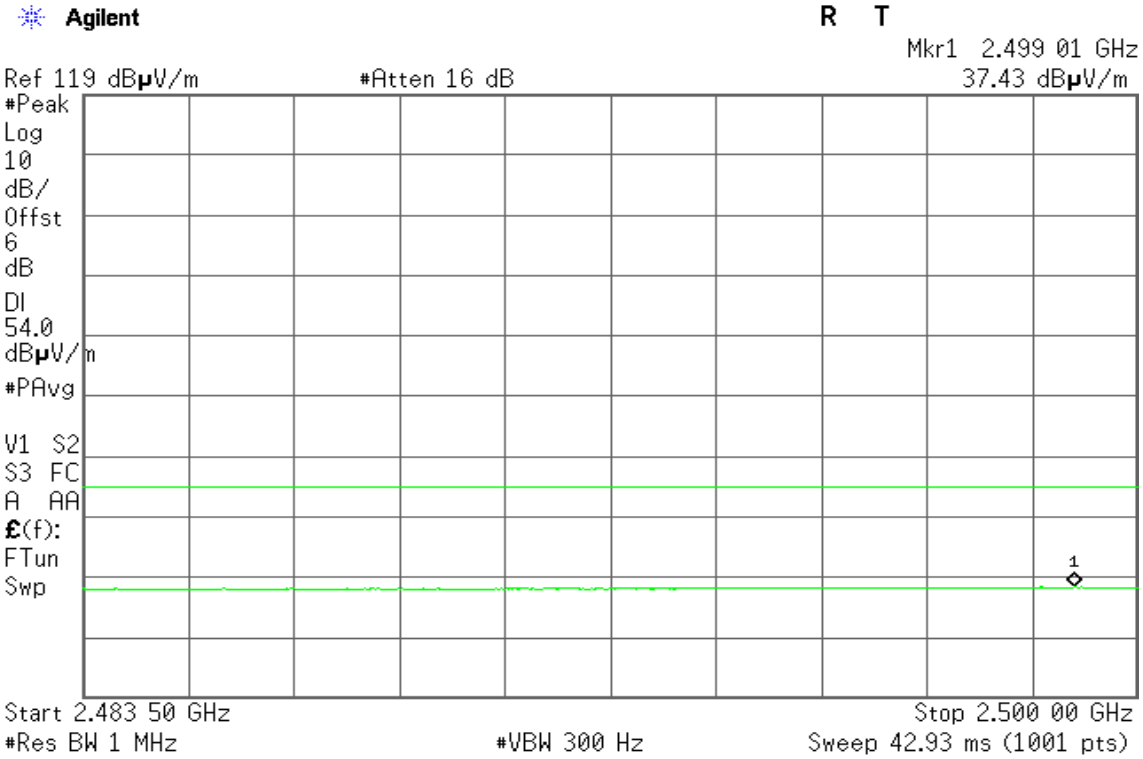


Band Edges (IEEE 802.11n HT 40 MHz mode / CH 5310 MHz)

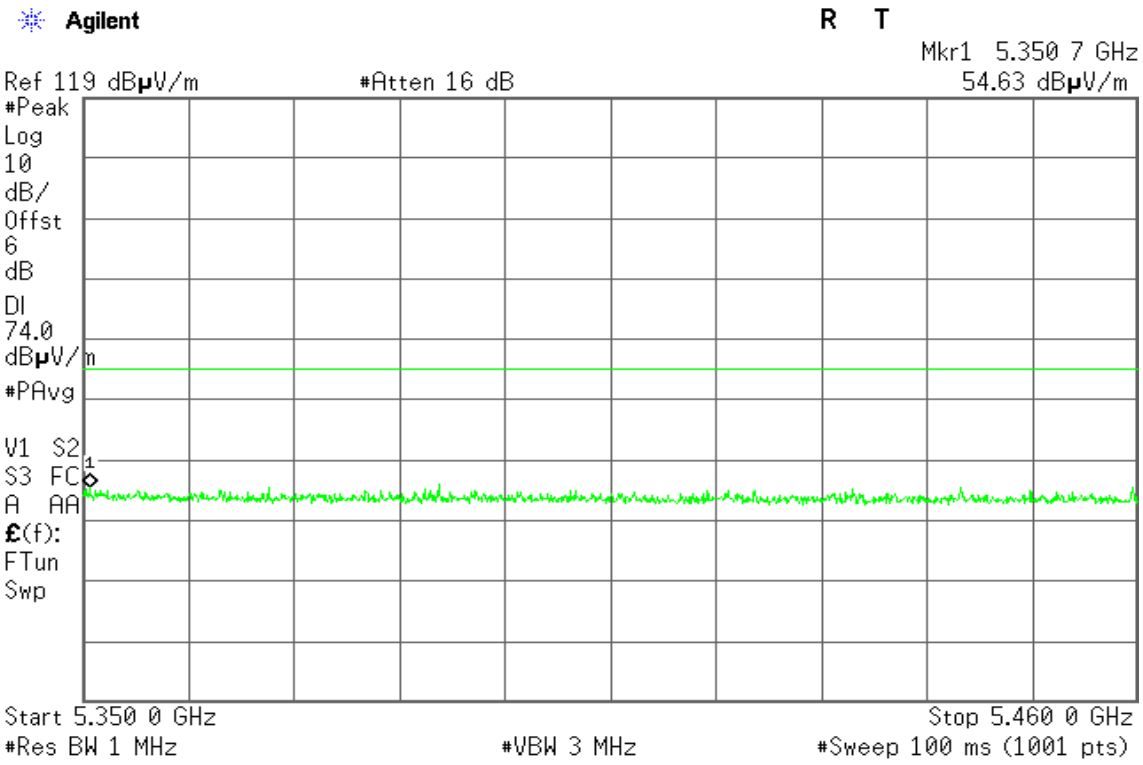
Detector mode: Peak **Polarity: Vertical**



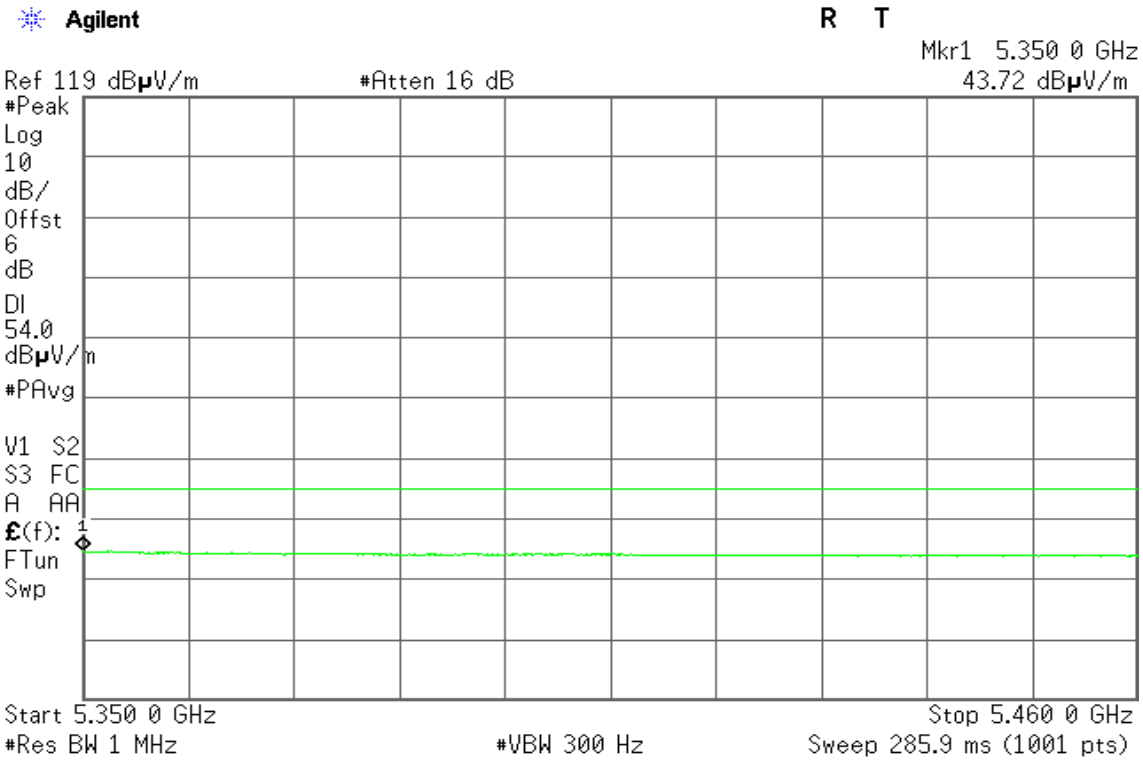
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

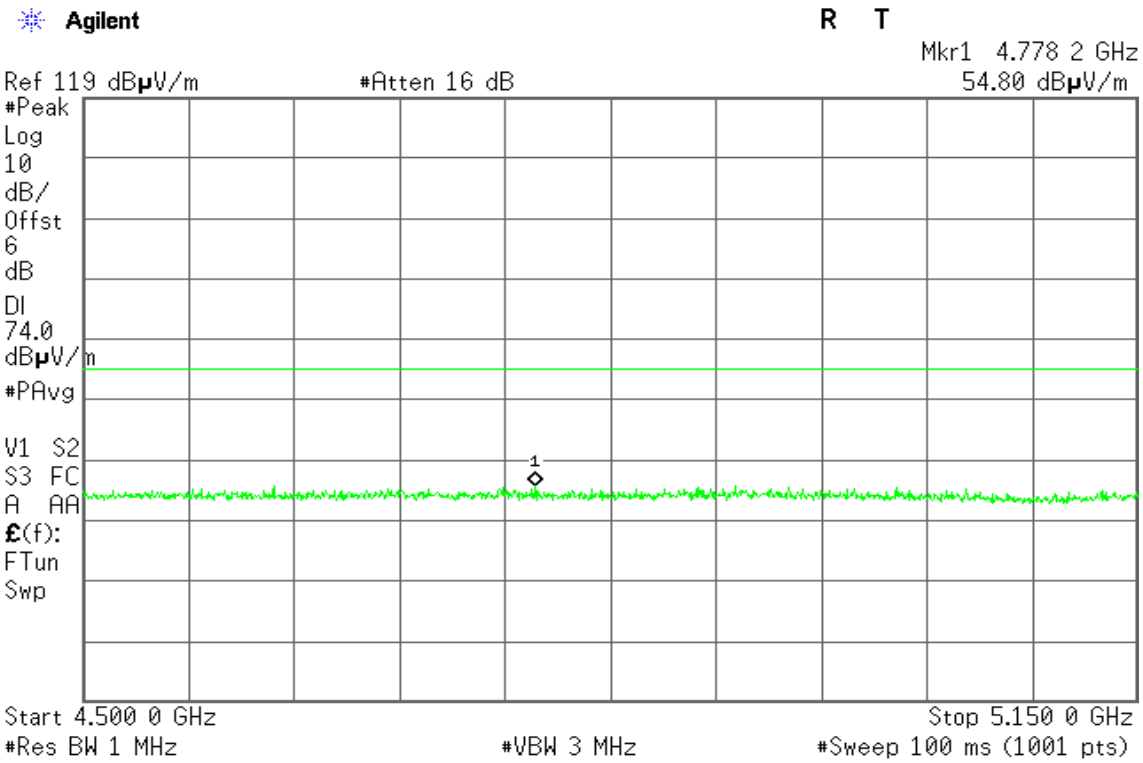


Detector mode: Average **Polarity: Horizontal**

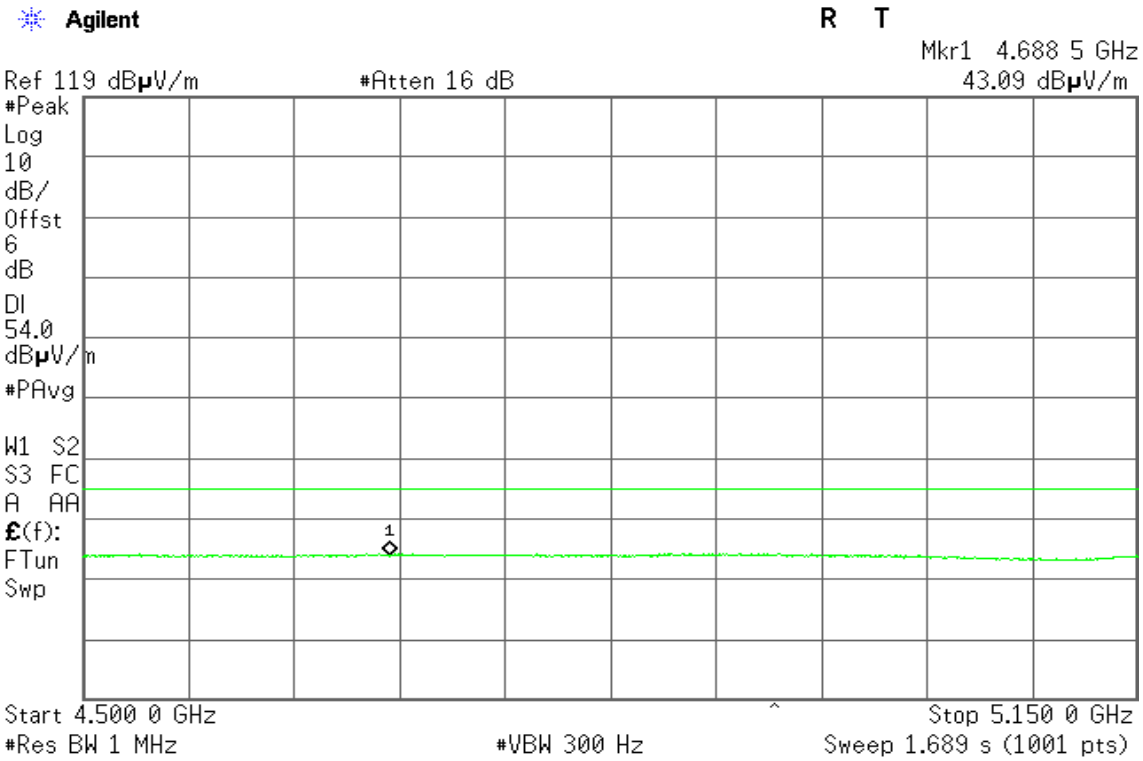


Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH 5210 MHz)

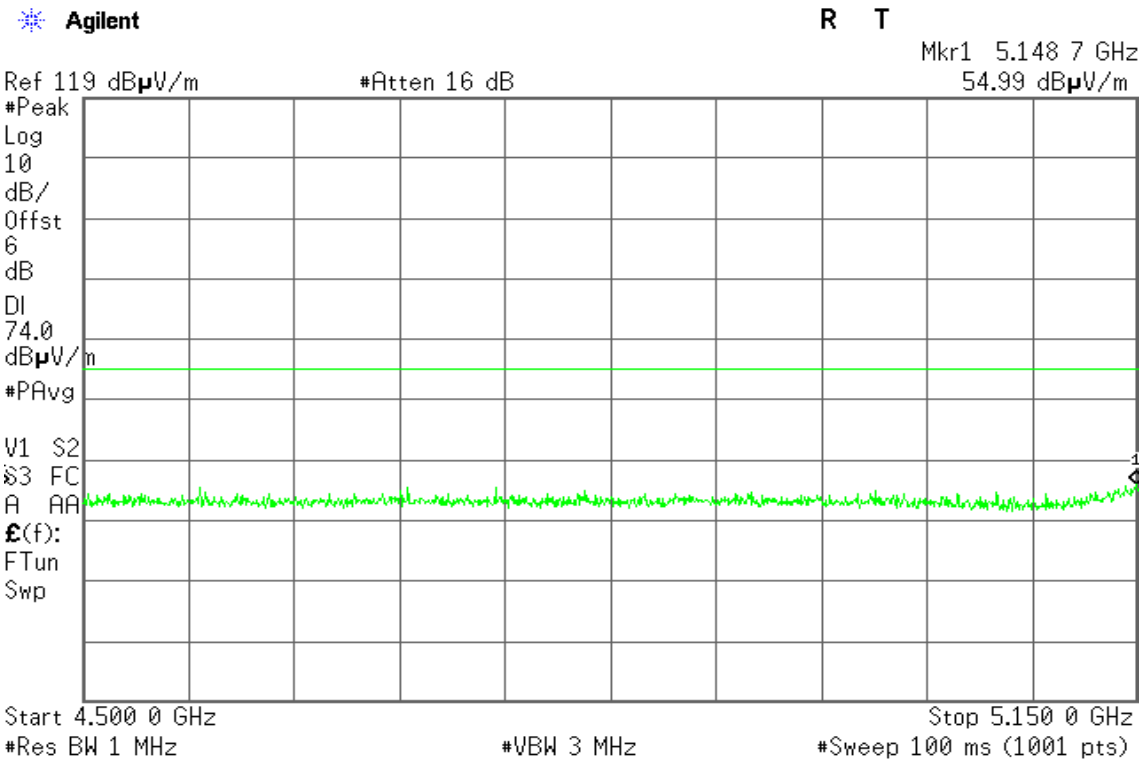
Detector mode: Peak **Polarity: Vertical**



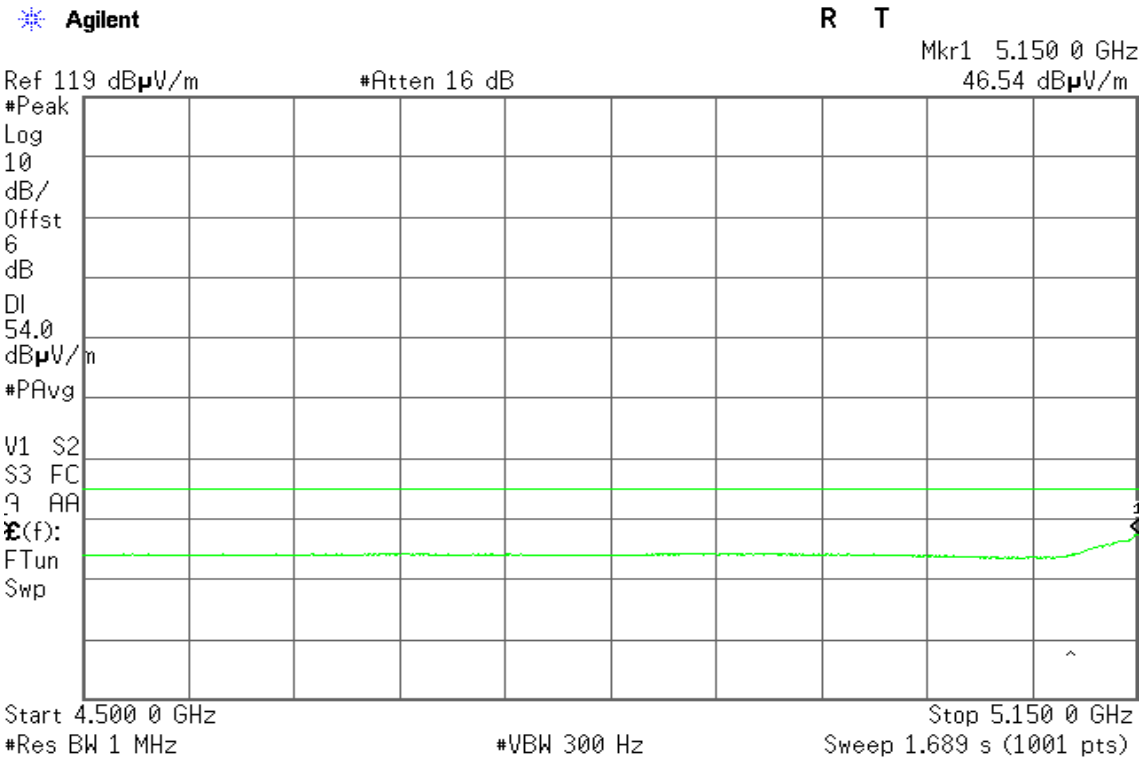
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

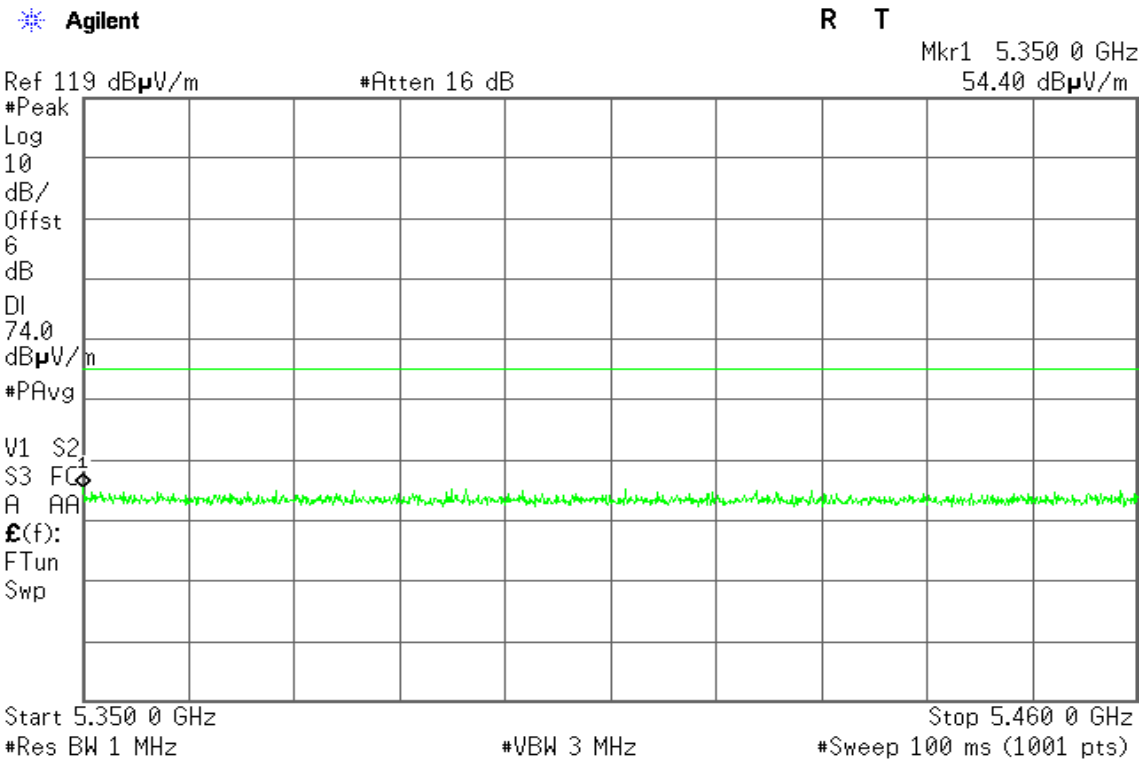


Detector mode: Average **Polarity: Horizontal**

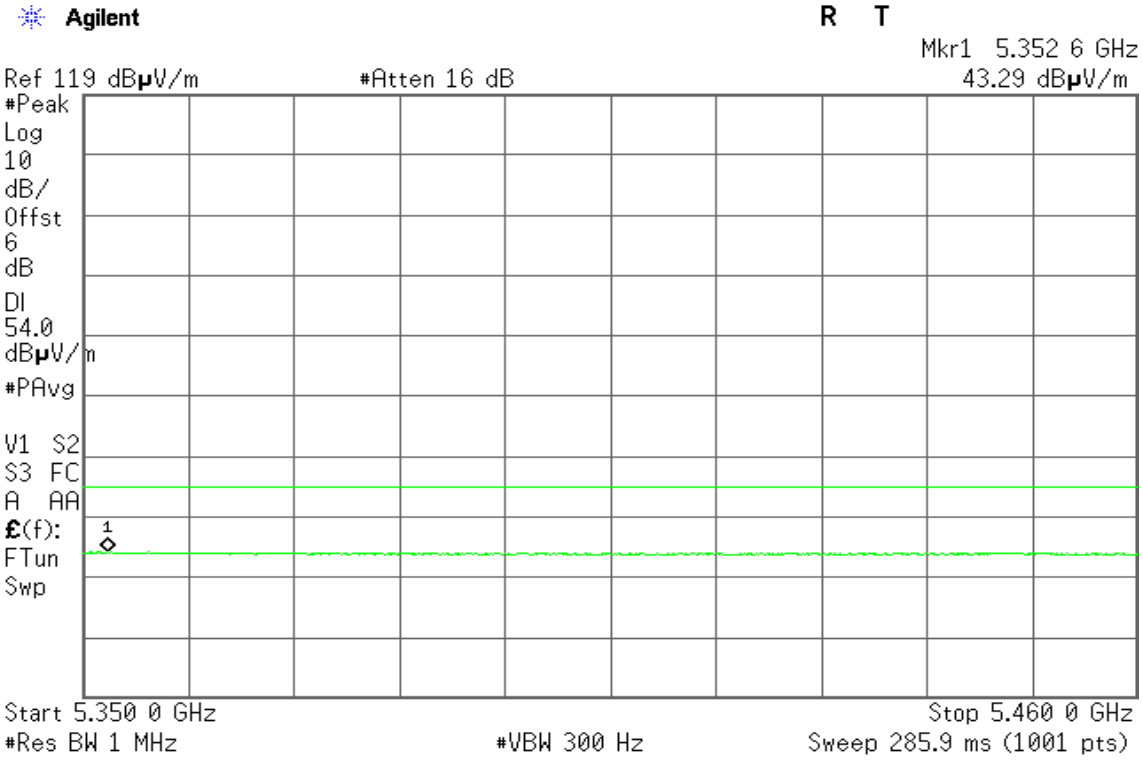


Band Edges (IEEE 802.11ac VHT 80 MHz mode / CH 5290 MHz)

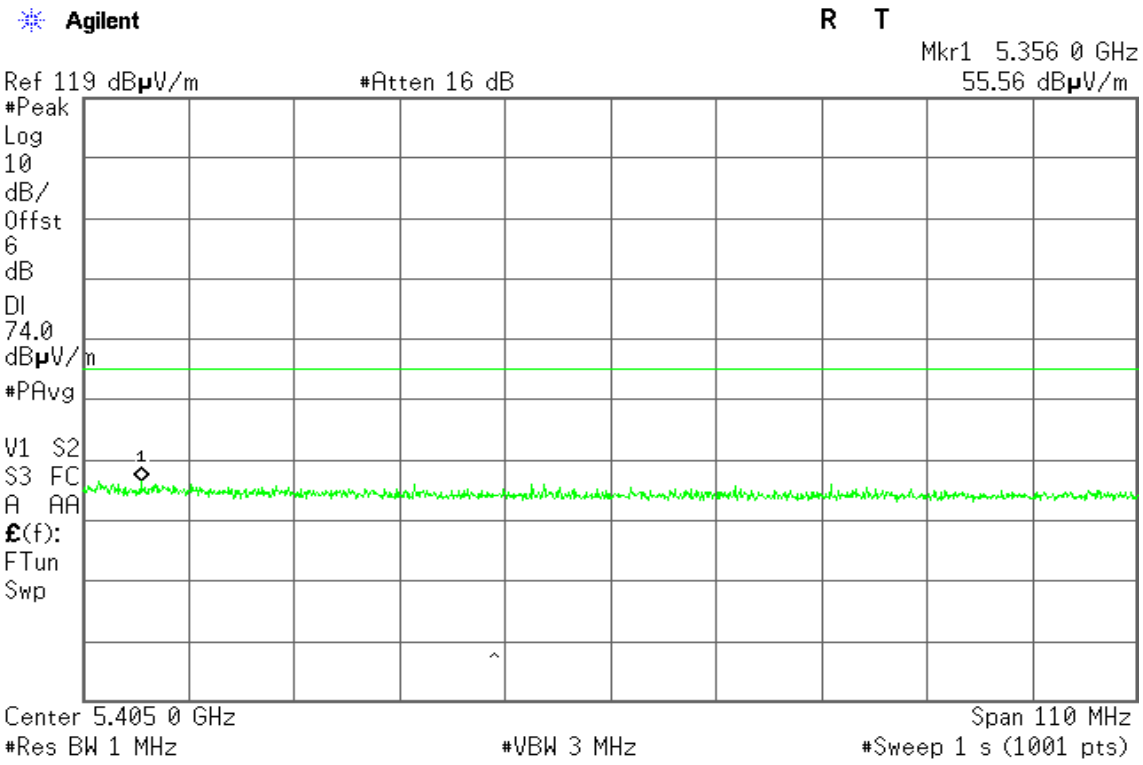
Detector mode: Peak **Polarity: Vertical**



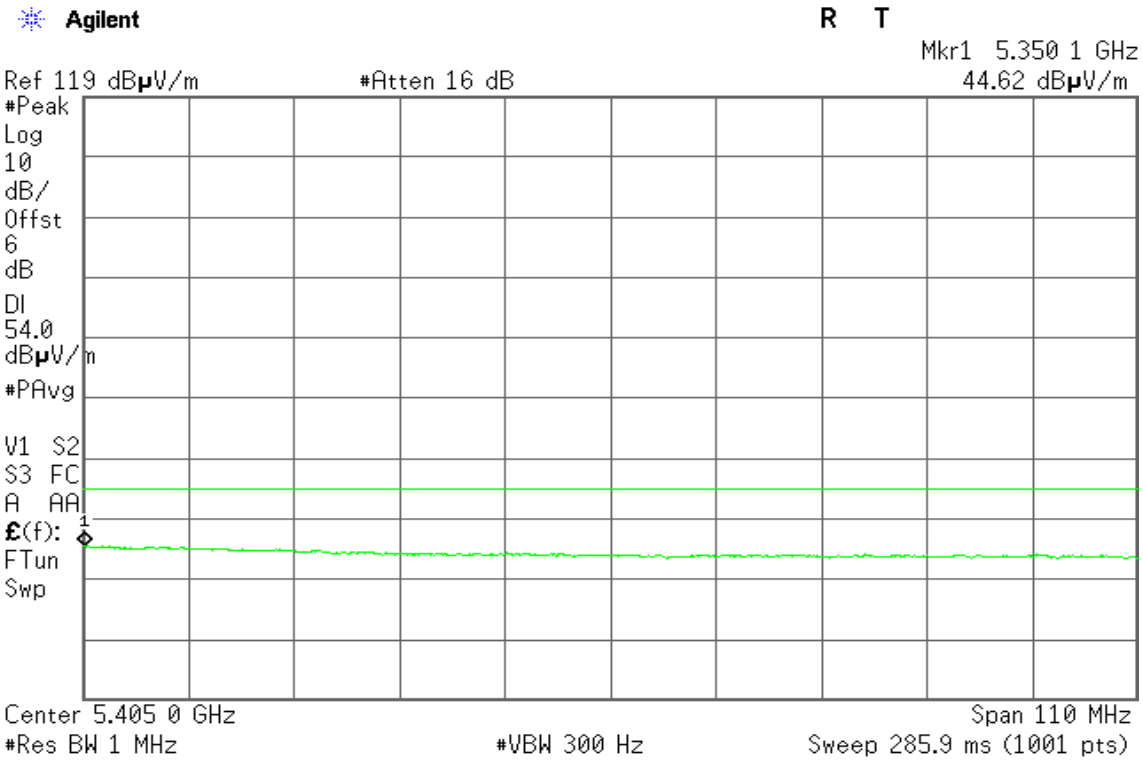
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



8.5 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 4dBm 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.

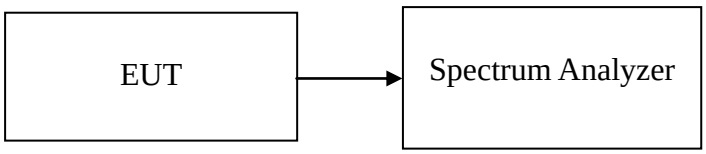
According to RSS-210 §A9.2,

(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)	Result
Low	5180	-0.16	4.00	PASS
Mid	5220	1.00	4.00	PASS
High	5240	1.38	4.00	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)	Result
Low	5180	0.20	-0.83	2.73	4.00	PASS
Mid	5220	0.79	0.15	3.49	4.00	PASS
High	5240	1.05	-0.52	3.35	4.00	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)	Result
Low	5190	-2.90	-3.10	0.01	4.00	PASS
High	5230	-1.60	-3.43	0.59	4.00	PASS

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5210MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Mid	5210	-0.61	-2.47	1.57	4.00	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)	Result
Low	5260	1.95	11.00	PASS
Mid	5280	2.31	11.00	PASS
High	5320	3.45	11.00	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)	Result
Low	5260	1.45	0.44	3.98	11.00	PASS
Mid	5280	0.23	-0.13	3.06	11.00	PASS
High	5320	1.71	-0.79	3.65	11.00	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)	Result
Low	5270	-1.26	-2.28	1.27	11.00	PASS
High	5310	-2.57	-2.36	0.55	11.00	PASS

Test mode: IEEE 802.11ac VHT 80 MHz mode / 5290MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Mid	5290	-0.89	-2.06	1.57	11.00	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)	Result
Low	5500	0.93	11.00	PASS
Mid	5580	2.13	11.00	PASS
High	5700	2.66	11.00	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)	Result
Low	5500	0.59	0.23	3.42	11.00	PASS
Mid	5580	1.88	1.29	4.61	11.00	PASS
High	5700	0.27	-1.27	2.58	11.00	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)	Result
Low	5510	-3.63	-3.35	-0.48	11.00	PASS
Mid	5550	-2.07	-2.23	0.86	11.00	PASS
High	5670	-3.26	-2.13	0.35	11.00	PASS

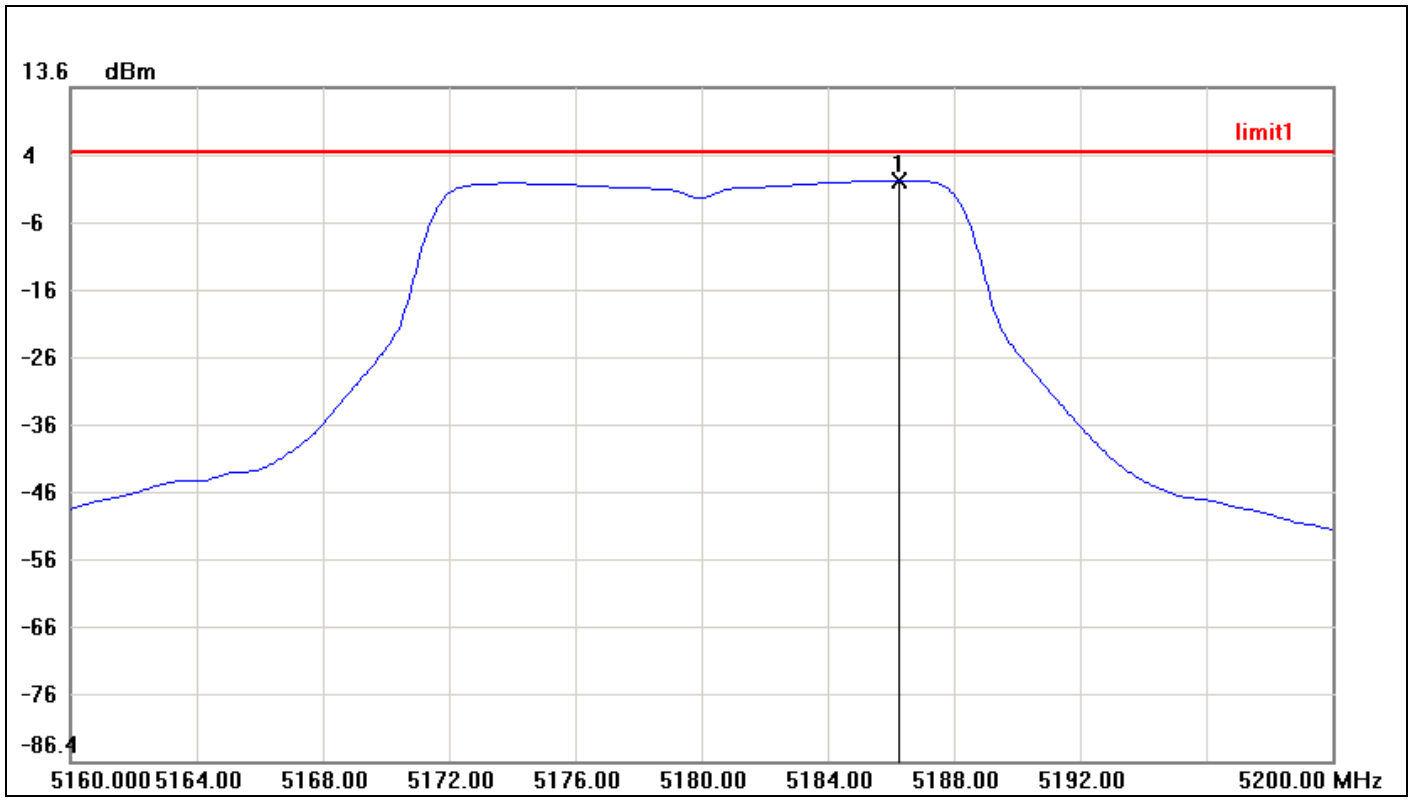
Test mode: IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5530	-1.17	-1.10	1.88	11.00	PASS
High	5690	-4.43	-2.21	-0.17	11.00	PASS

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

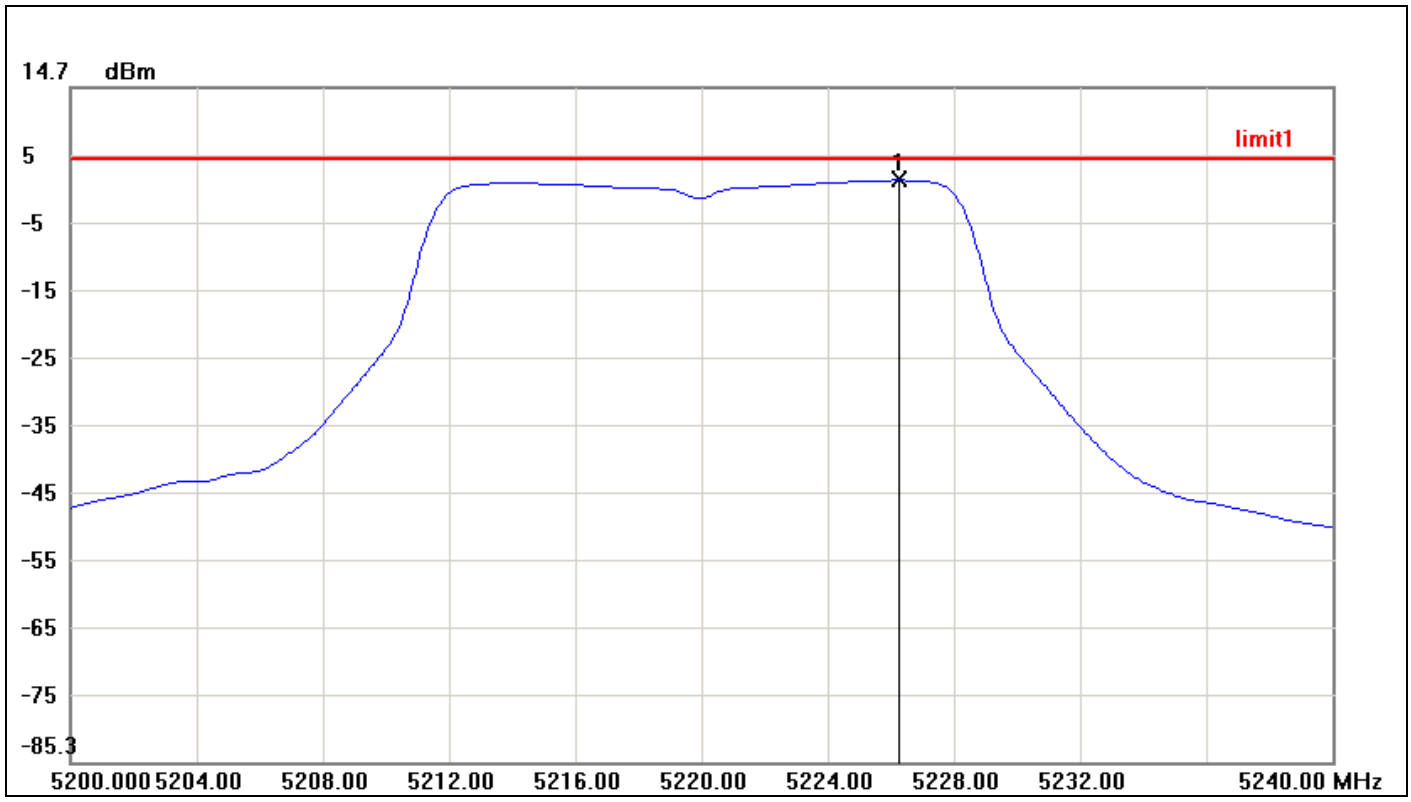
Test Plot
IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low



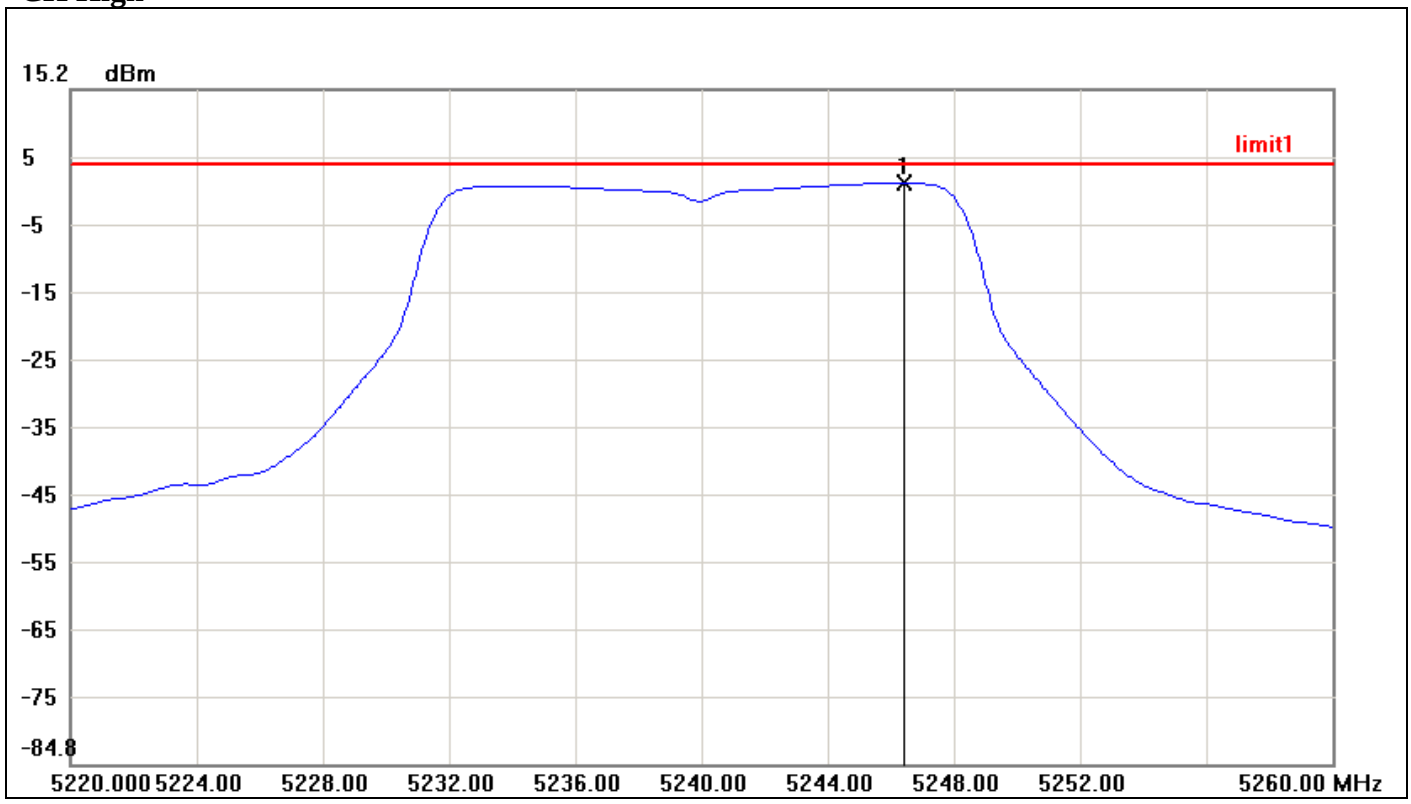
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5186.2667	-0.16	4.00	-4.16

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5226.2667	1.00	4.00	-3.00

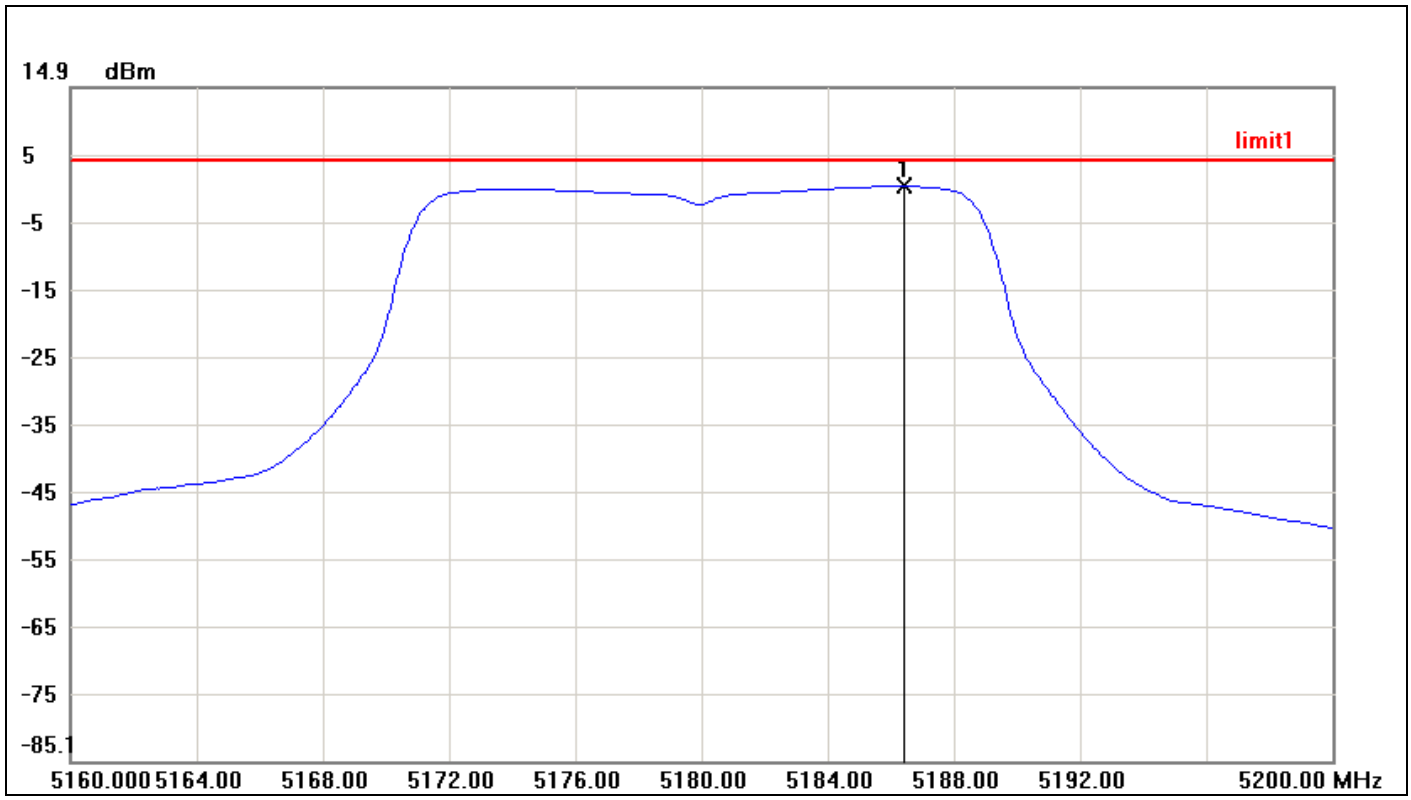
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5246.4000	1.38	4.00	-2.62

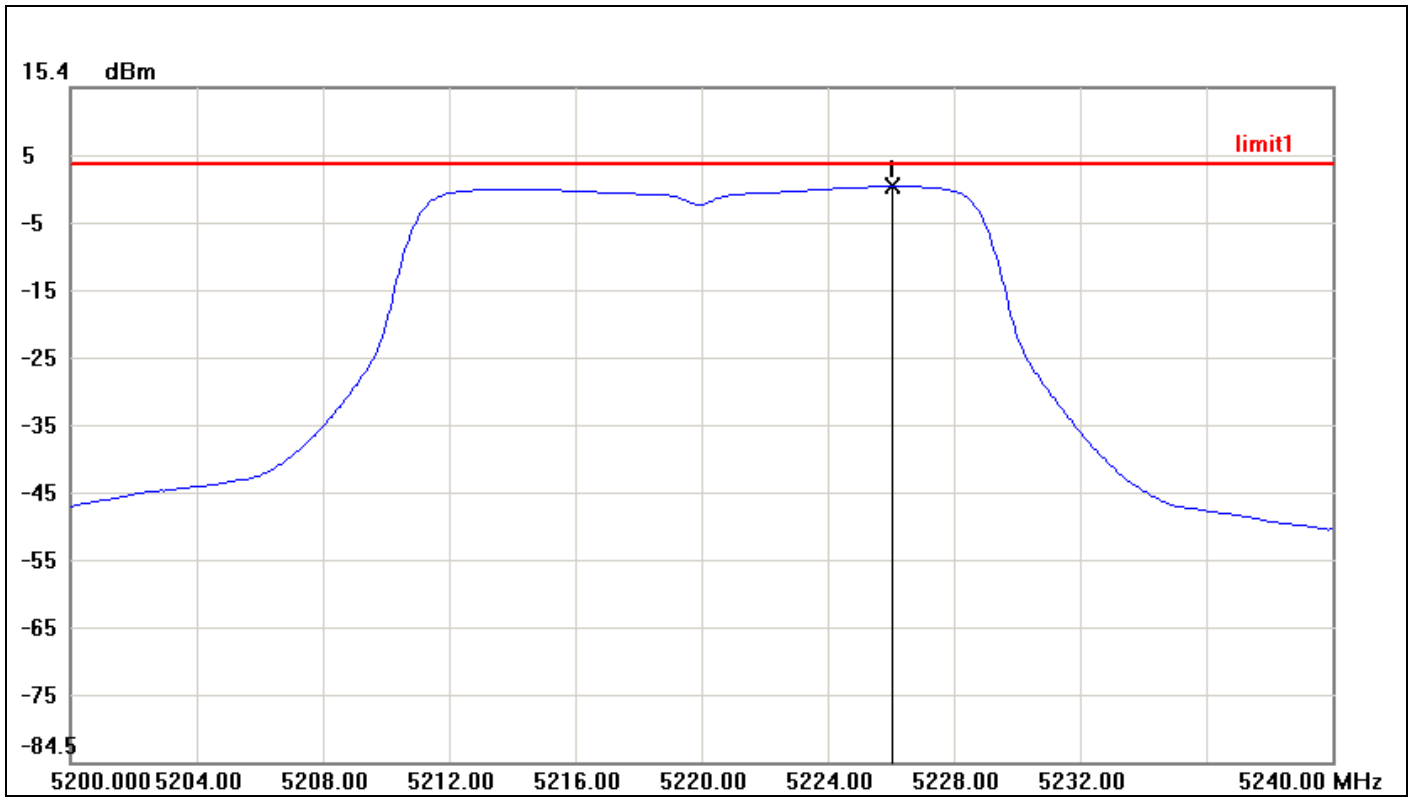
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

CH Low



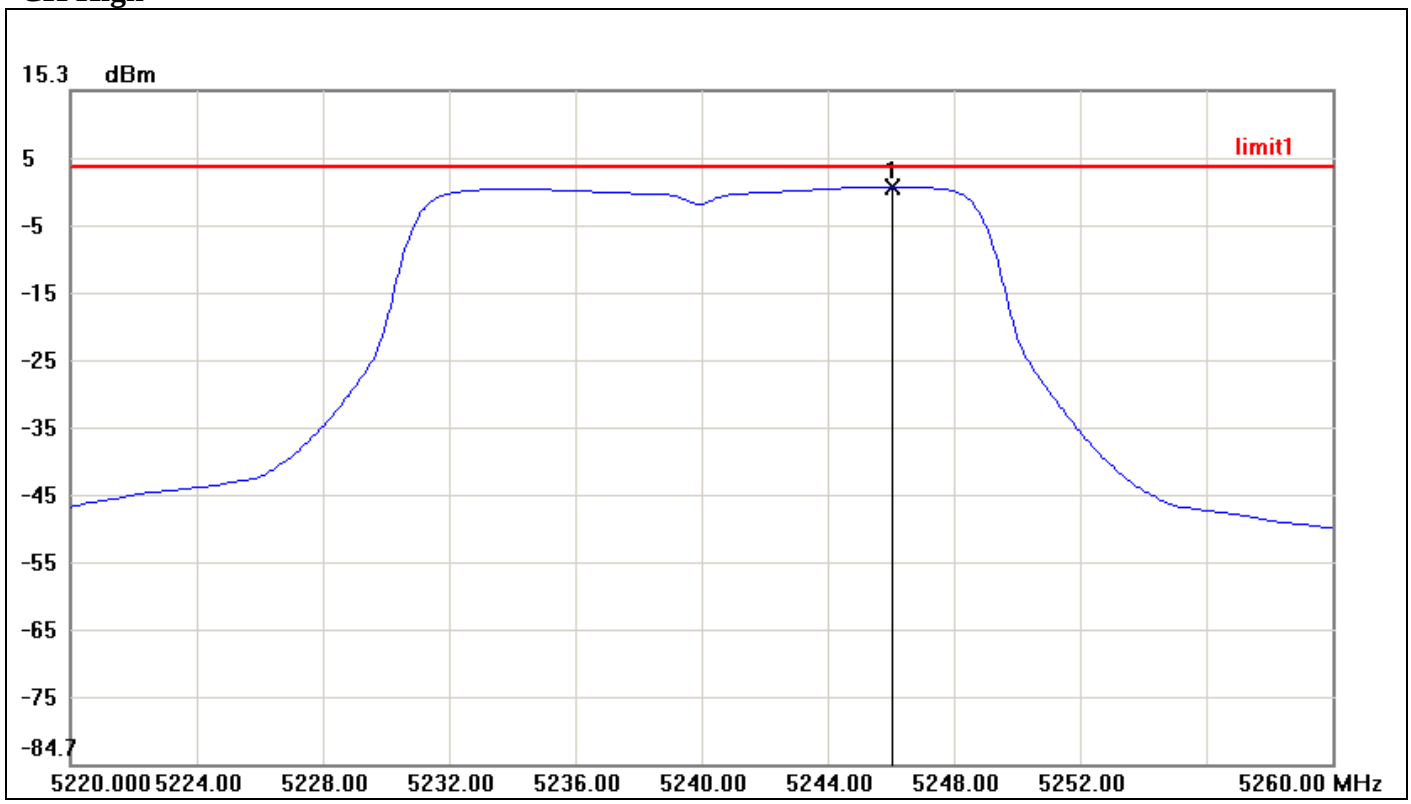
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5186.4000	0.20	4.00	-3.80

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5226.0667	0.79	4.00	-3.21

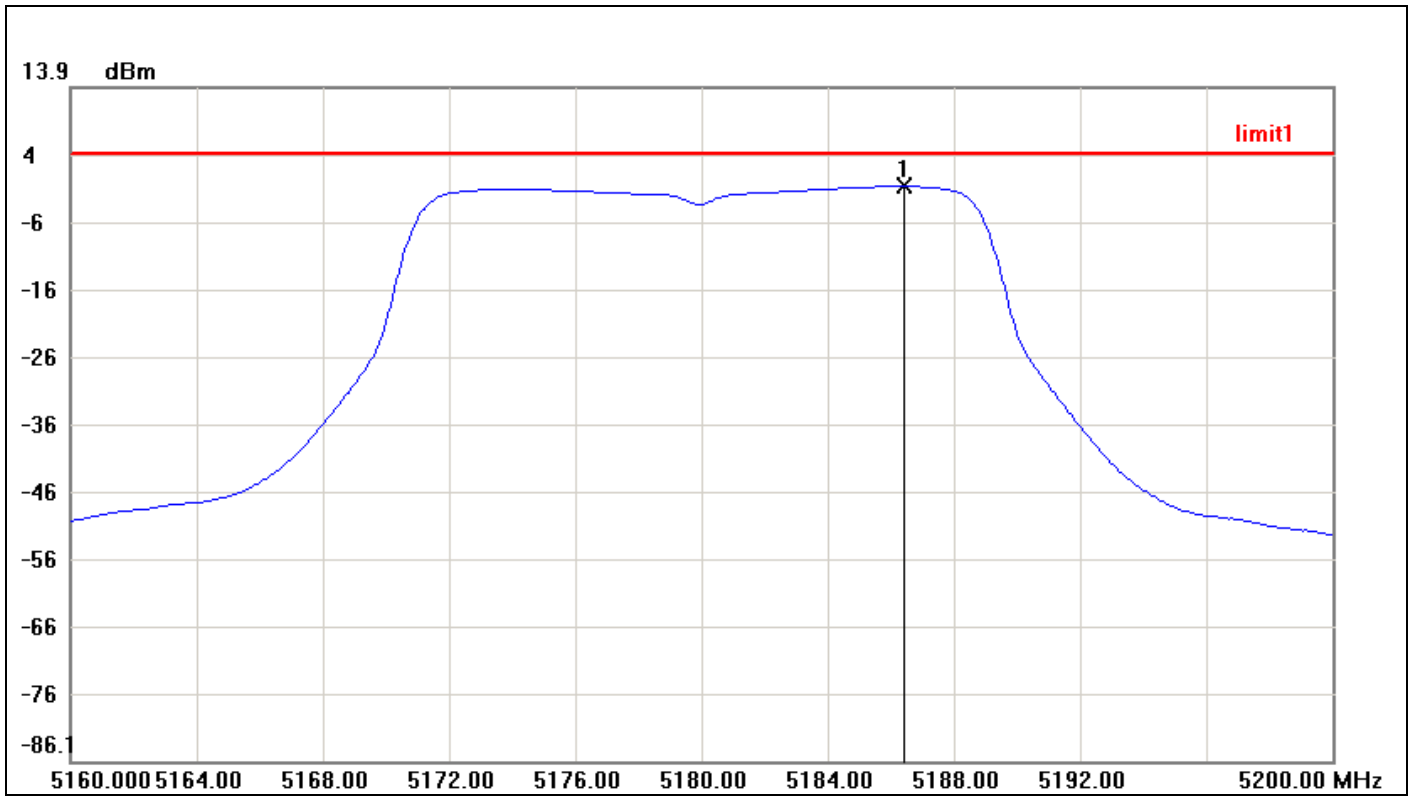
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5246.0667	1.05	4.00	-2.95

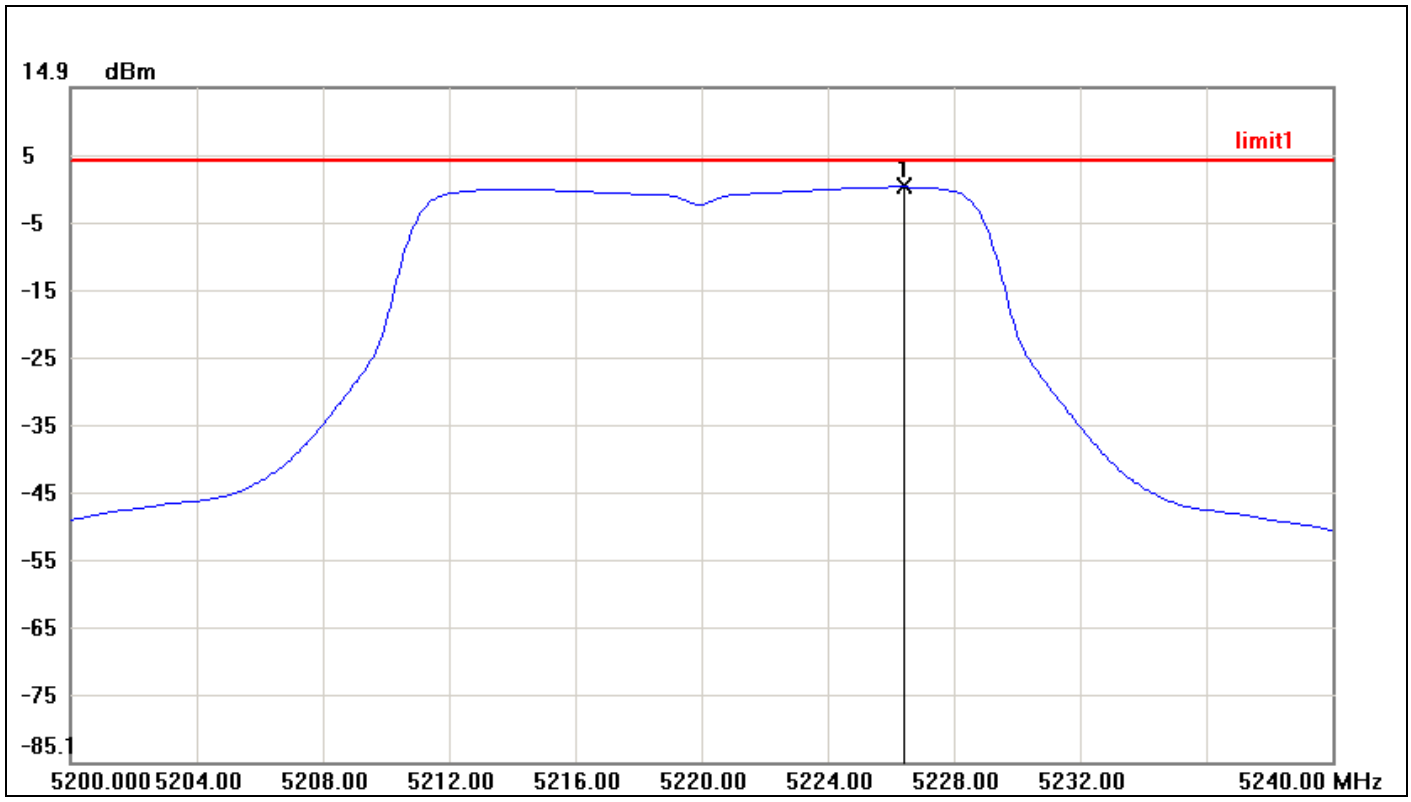
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low



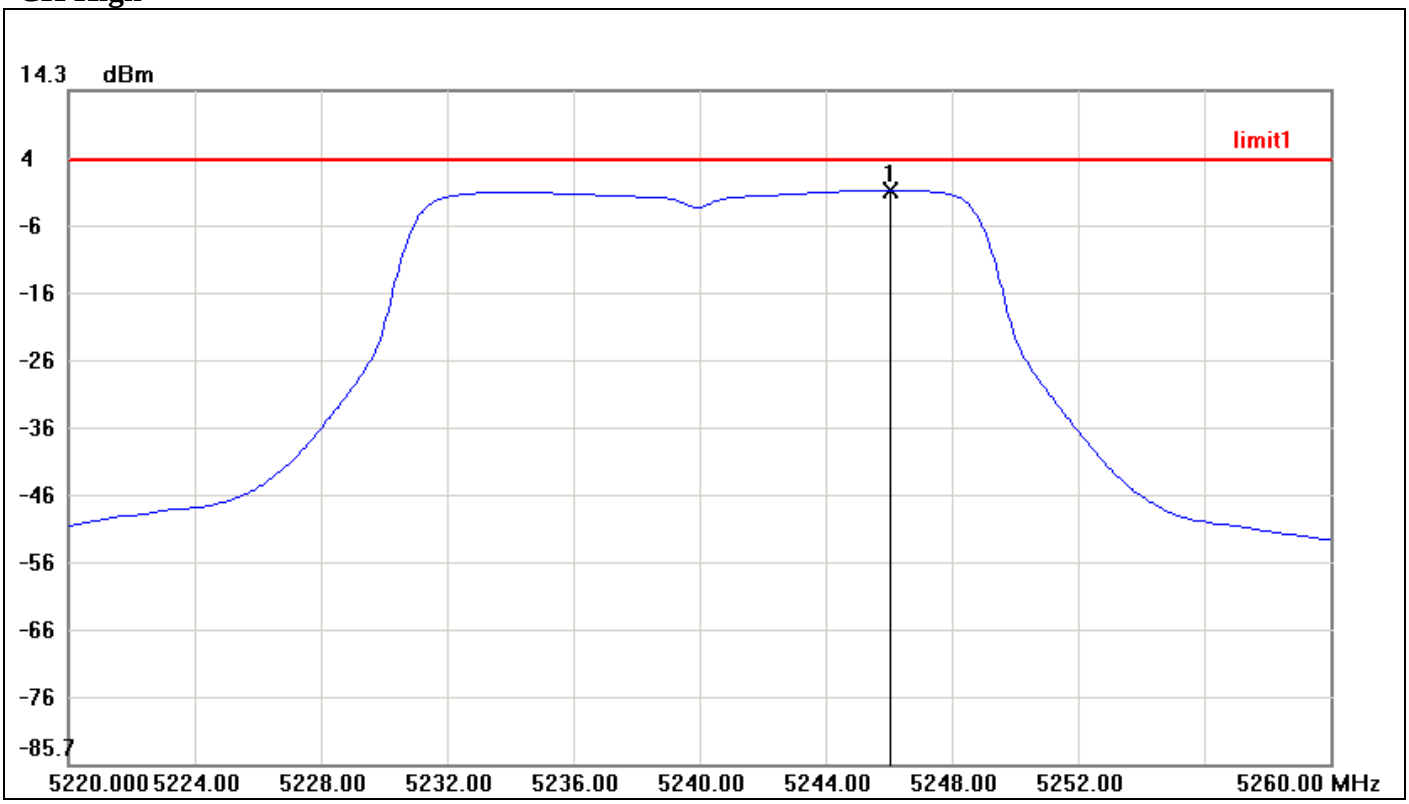
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5186.4000	-0.83	4.00	-4.83

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5226.4000	0.15	4.00	-3.85

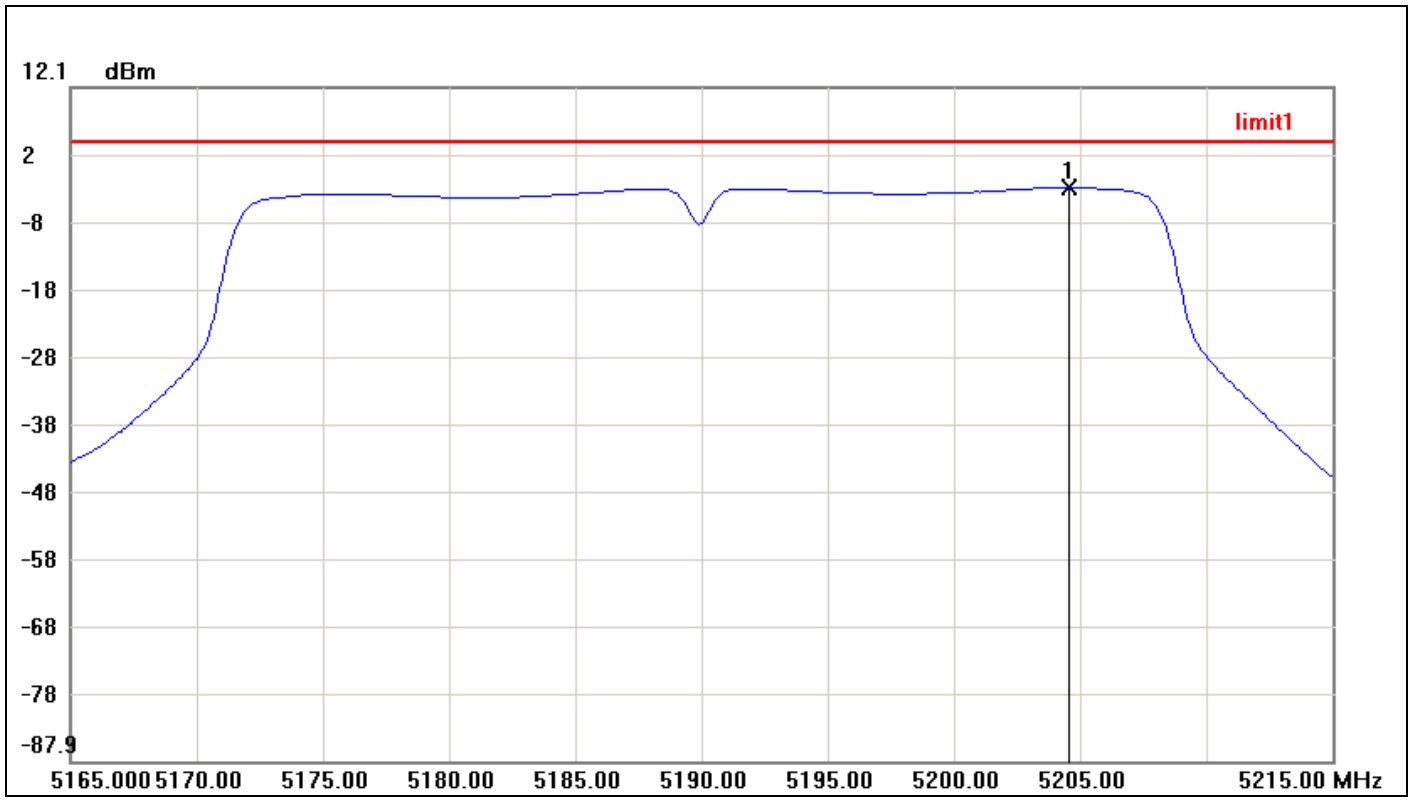
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5246.0667	-0.52	4.00	-4.52

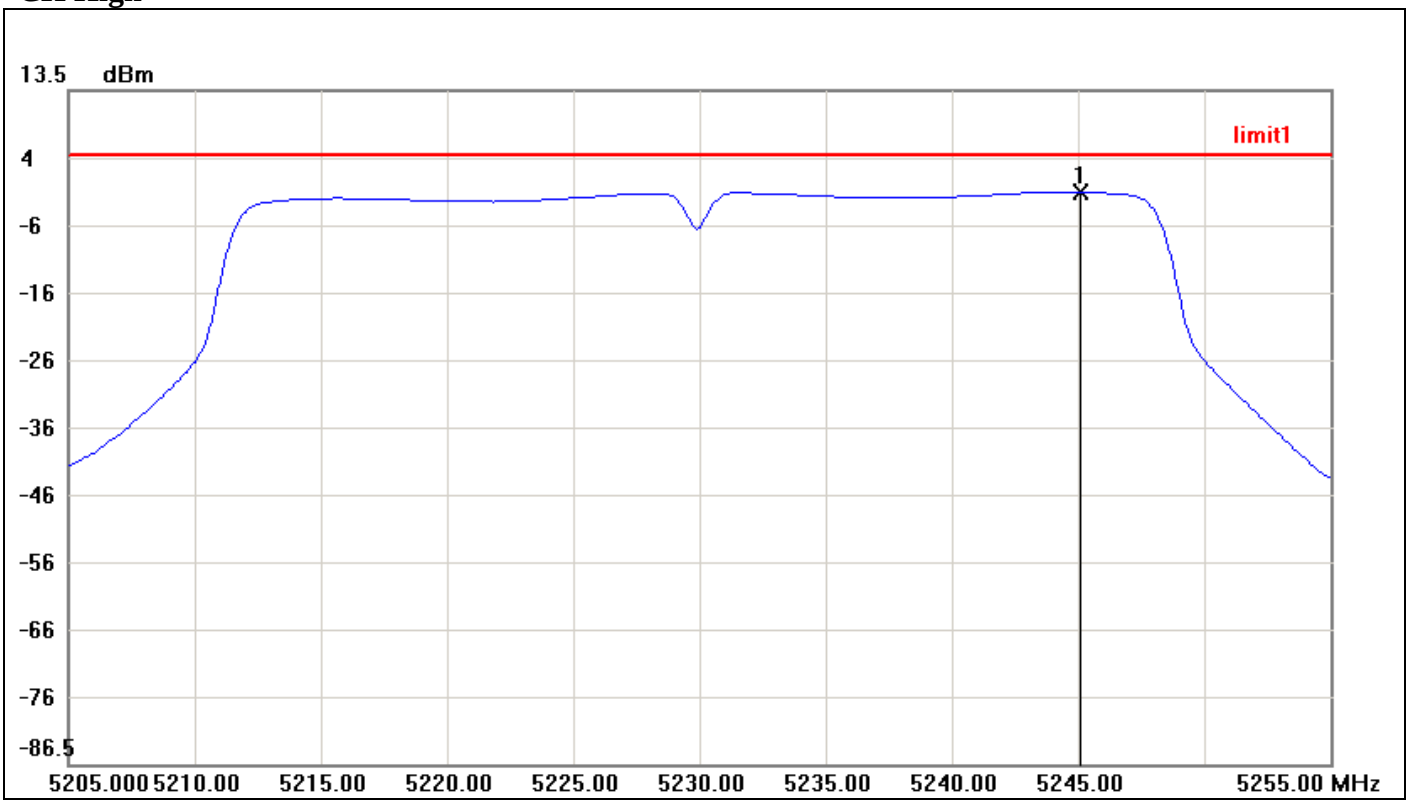
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5204.5833	-2.90	4.00	-6.90

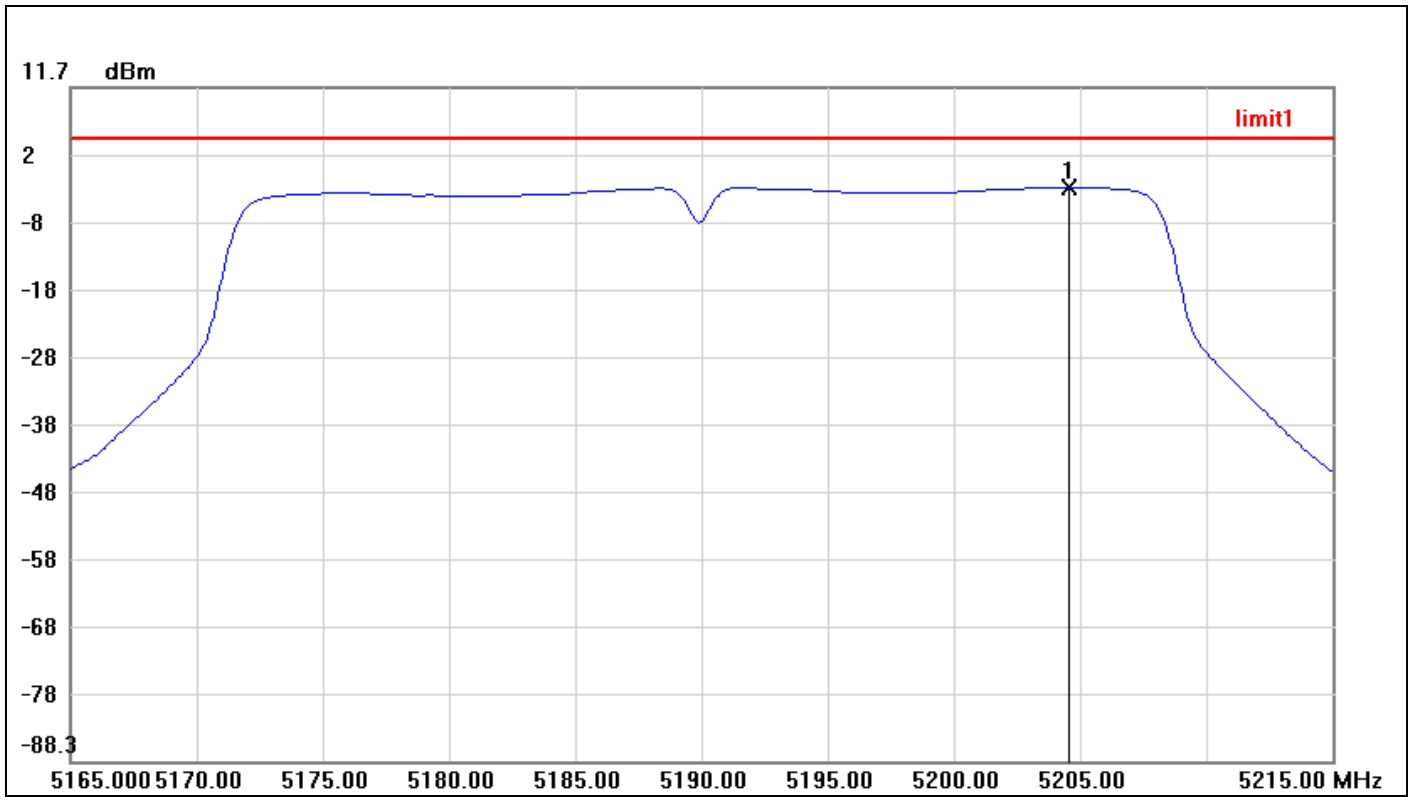
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5245.0833	-1.60	4.00	-5.60

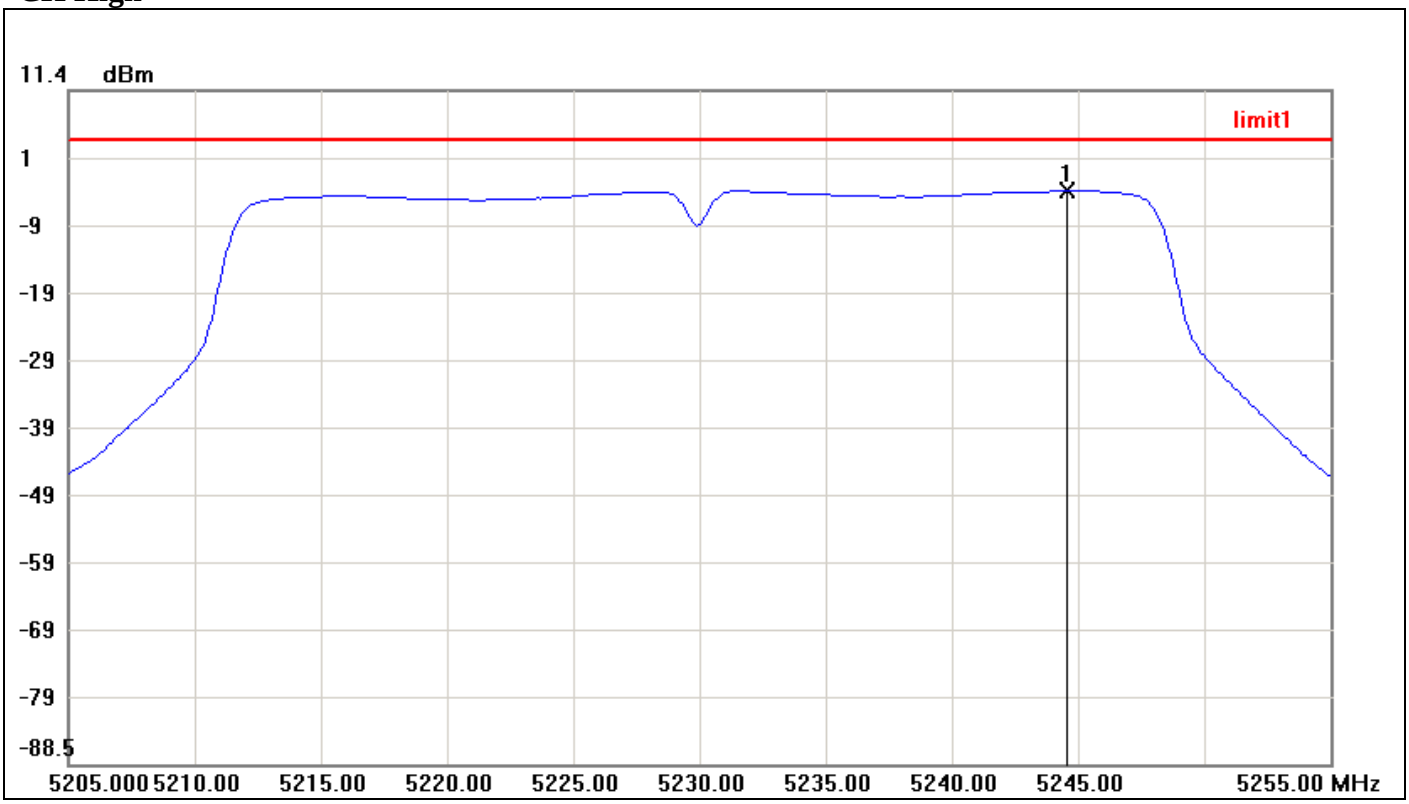
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5204.5833	-3.10	4.00	-7.10

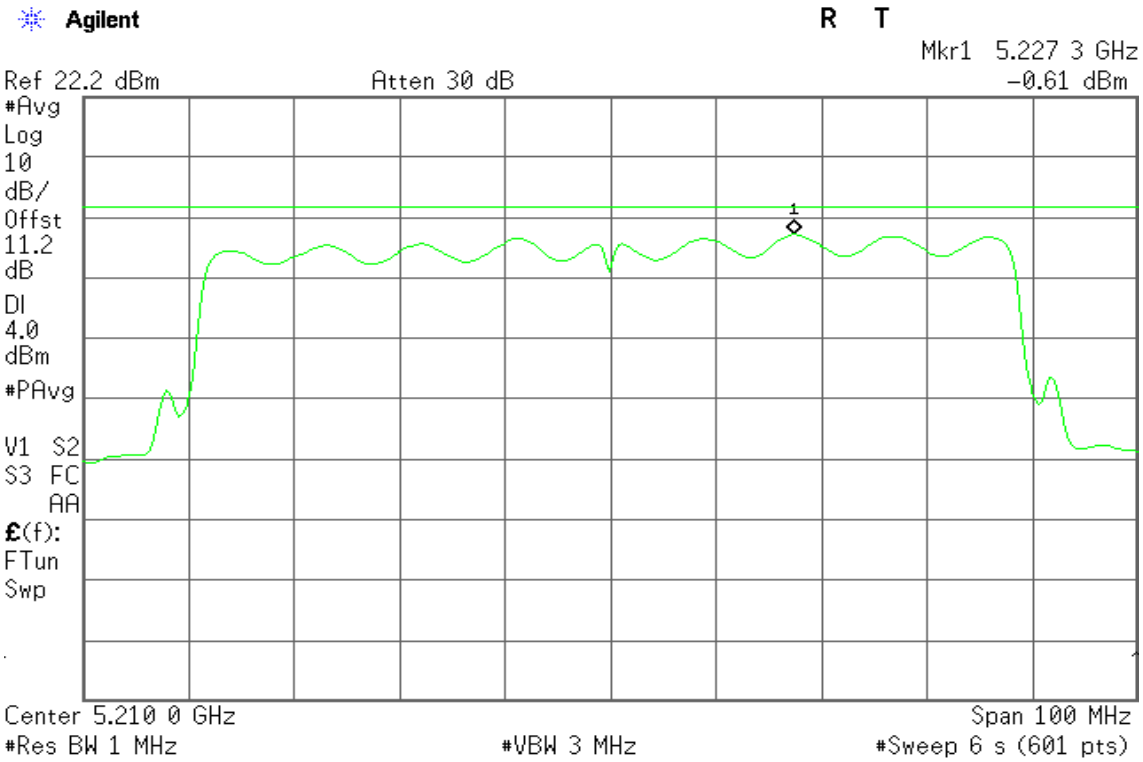
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5244.5833	-3.43	4.00	-7.43

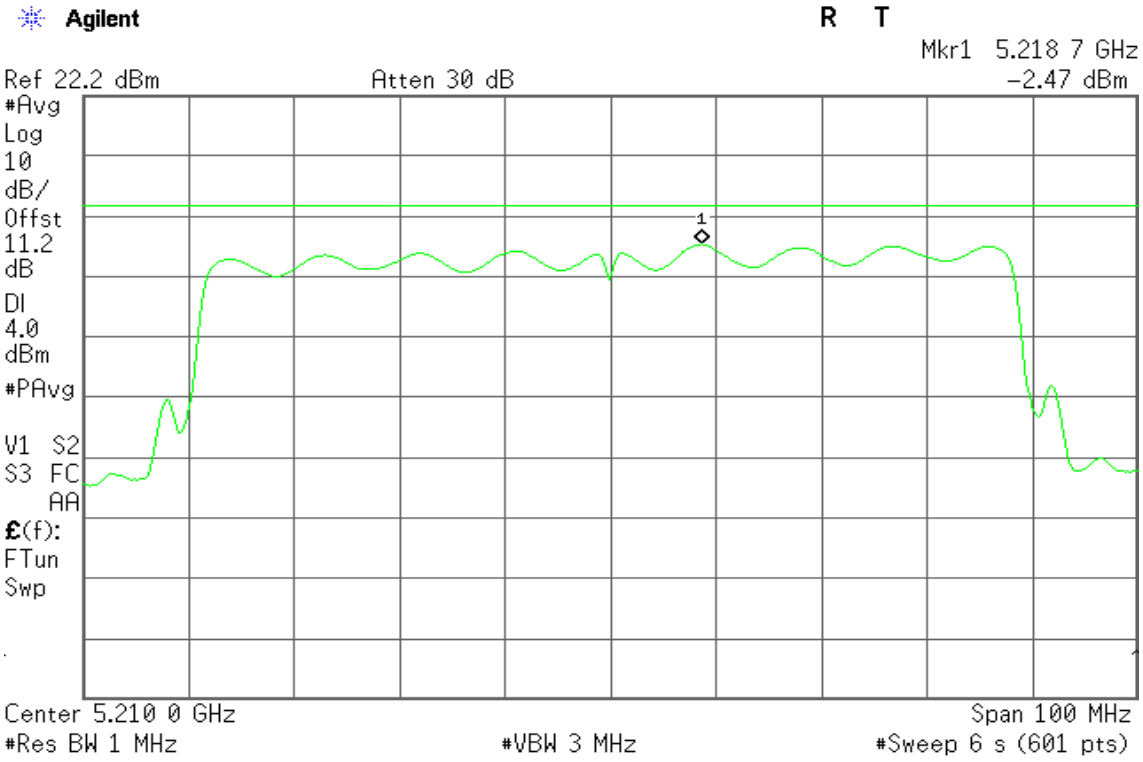
IEEE 802.11ac VHT 80 MHz mode / 5210MHz /

Chain 0 CH Mid



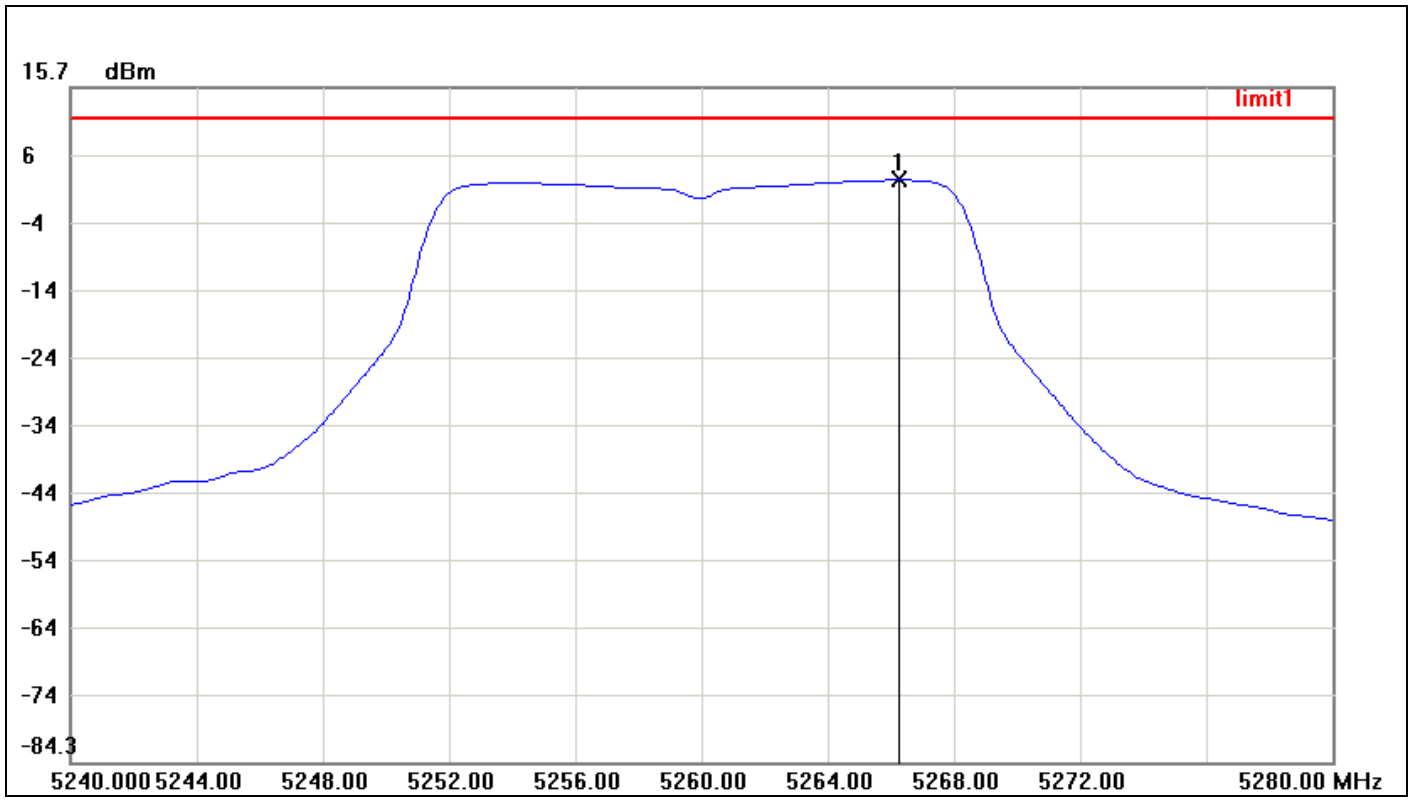
IEEE 802.11ac VHT 80 MHz mode / 5210MHz /

Chain 1 CH Mid



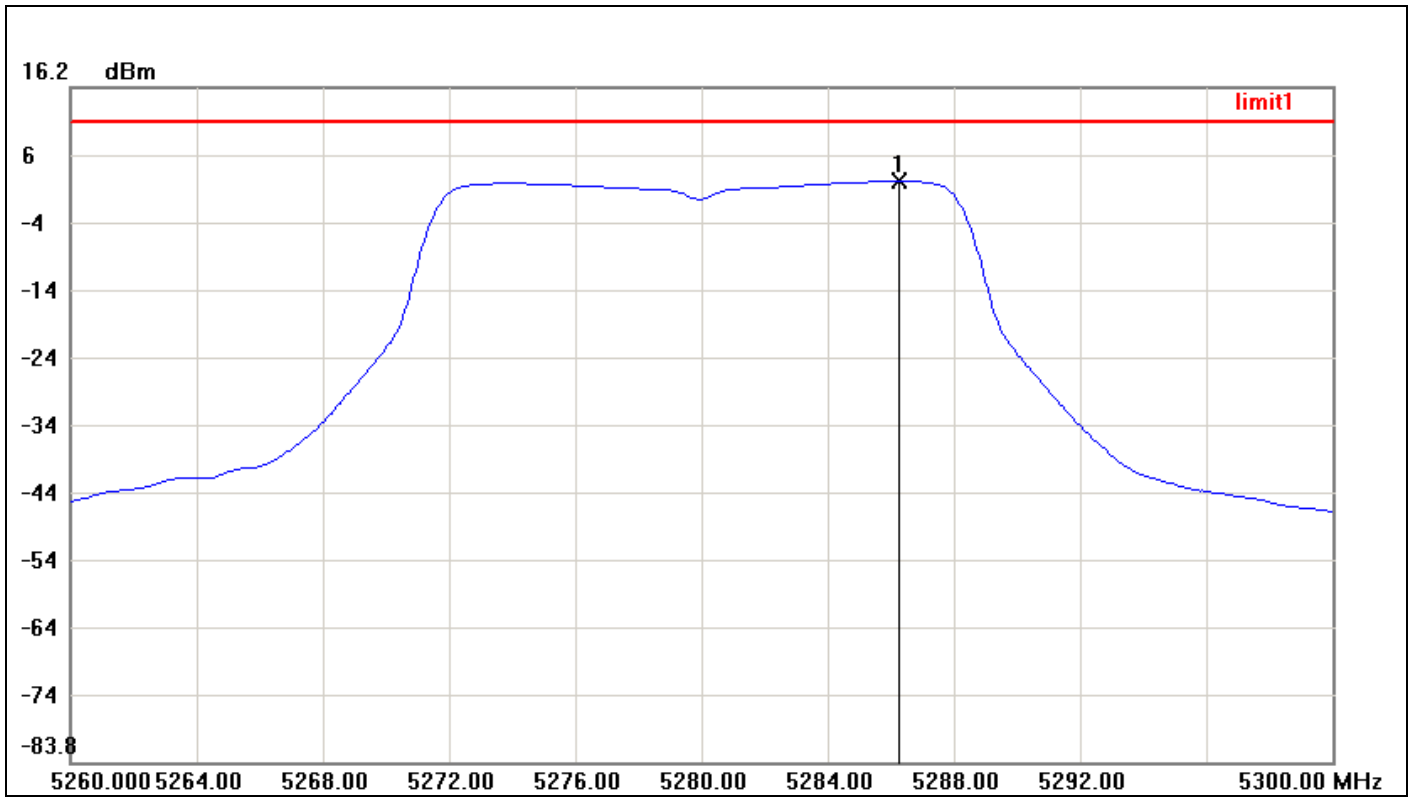
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low



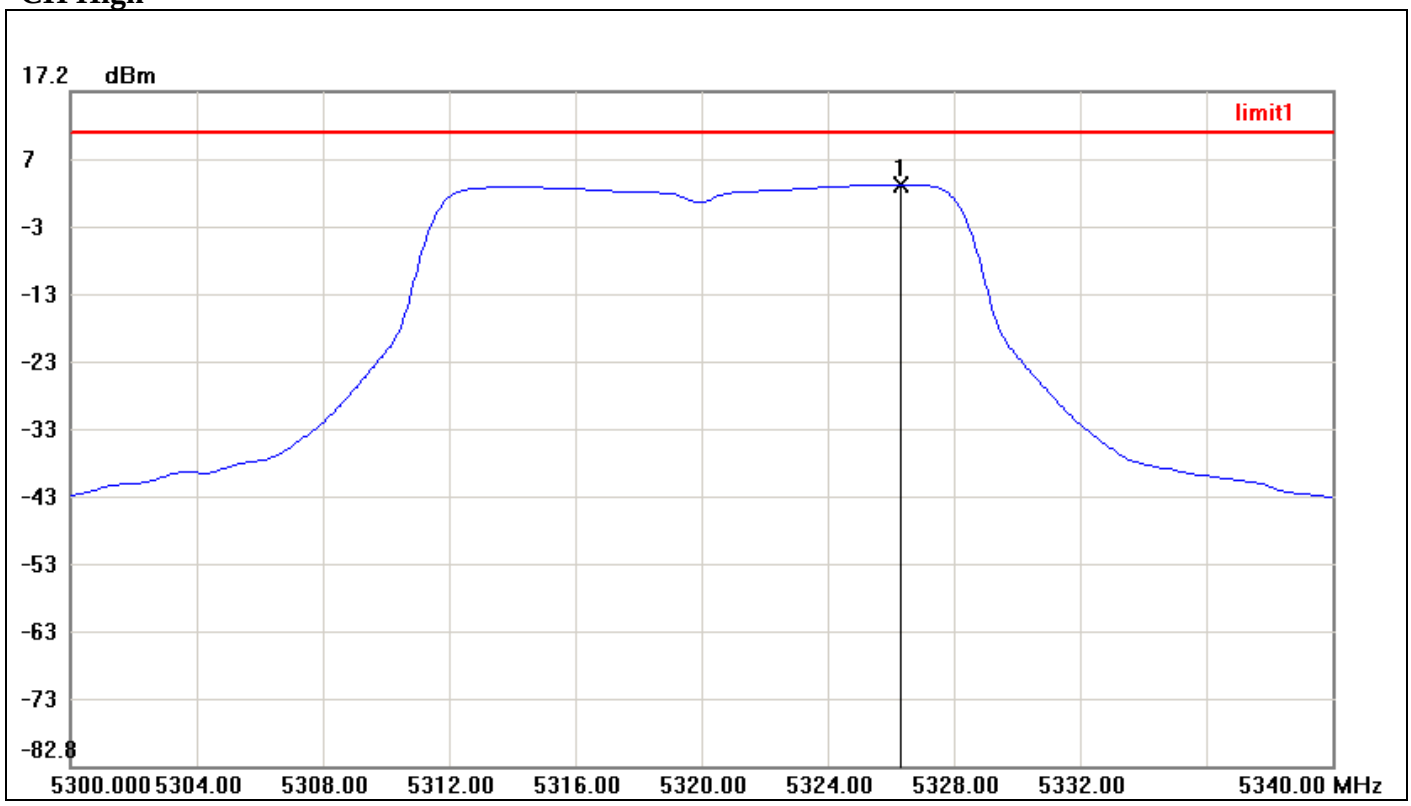
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5266.2667	1.95	11.00	-9.05

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5286.2667	2.31	11.00	-8.69

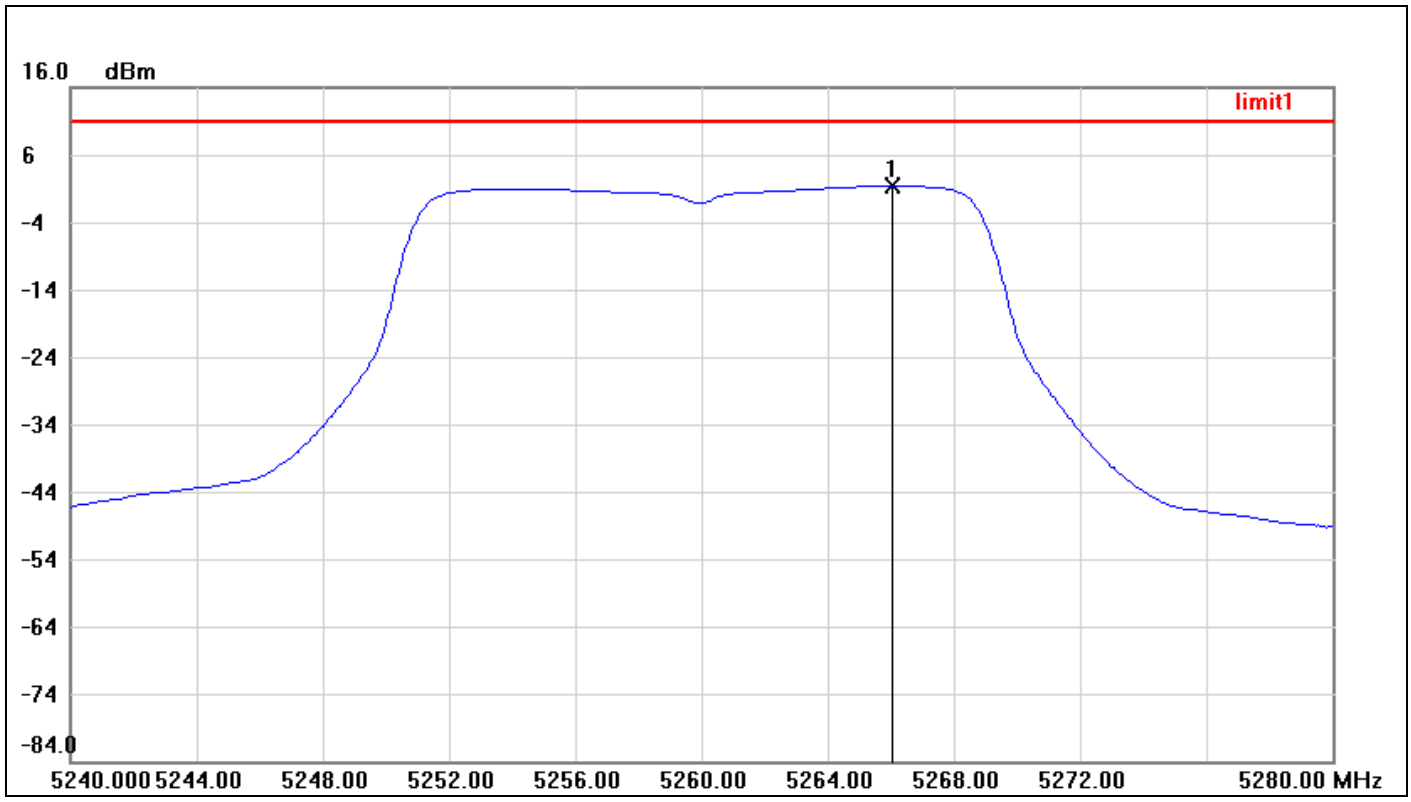
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5326.3333	3.45	11.00	-7.55

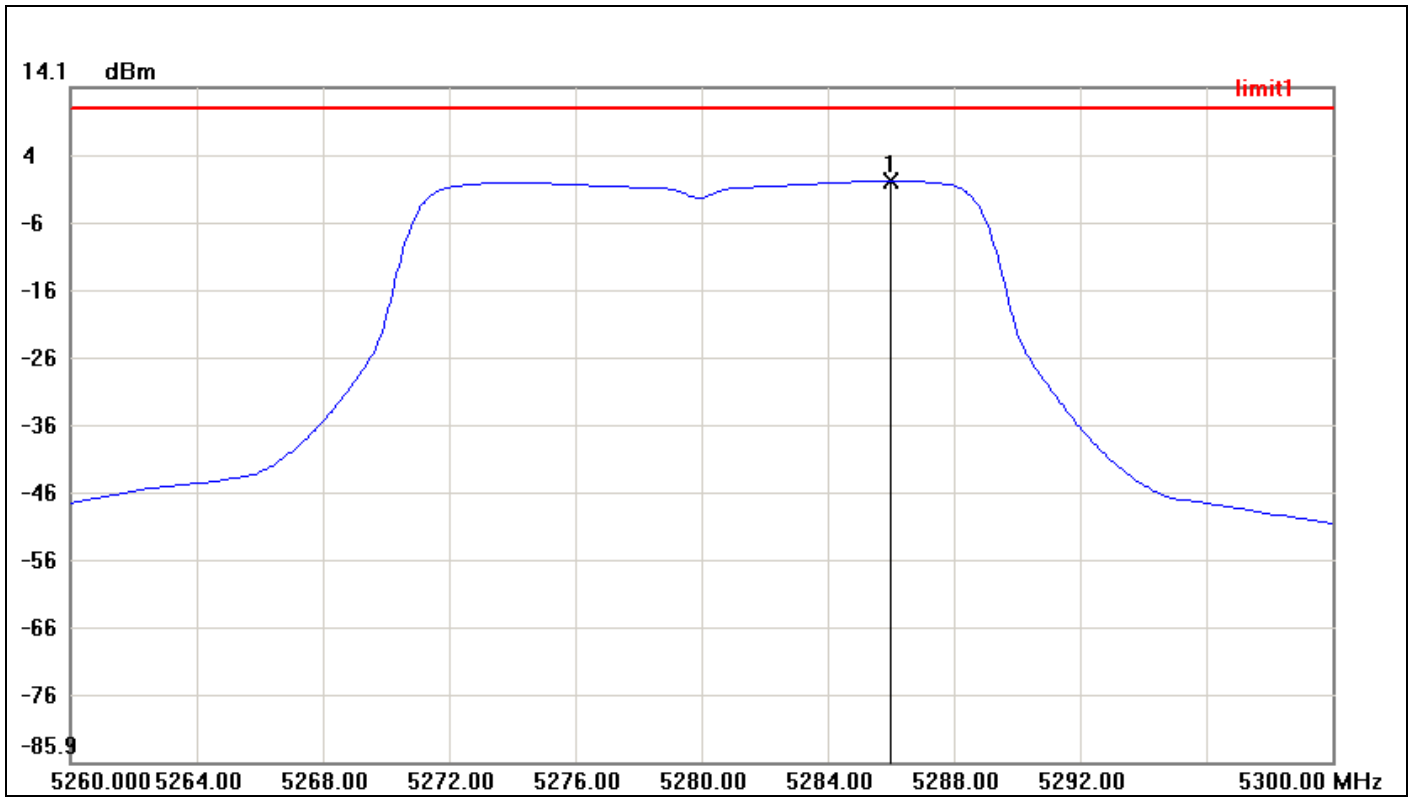
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low



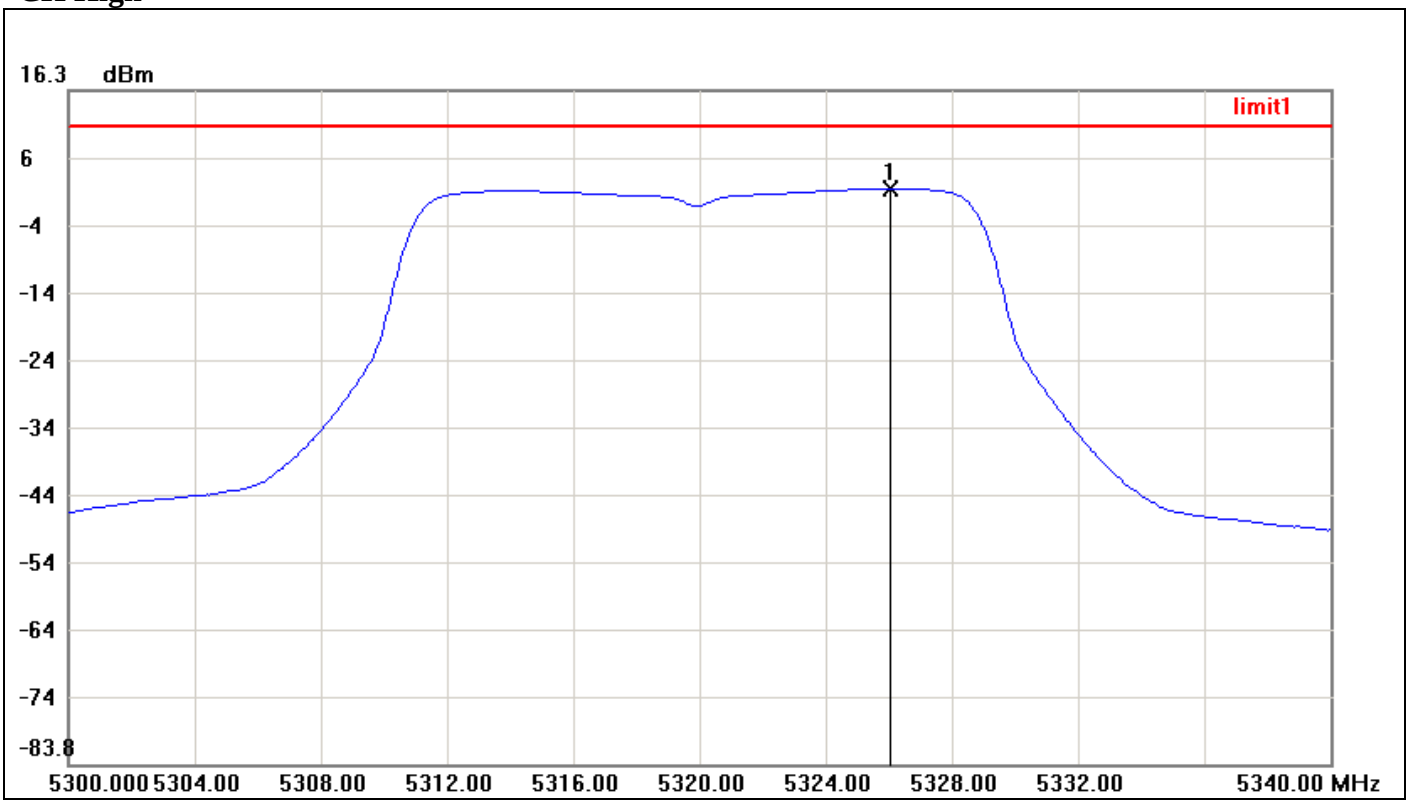
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5266.0667	1.45	11.00	-9.55

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5286.0000	0.23	11.00	-10.77

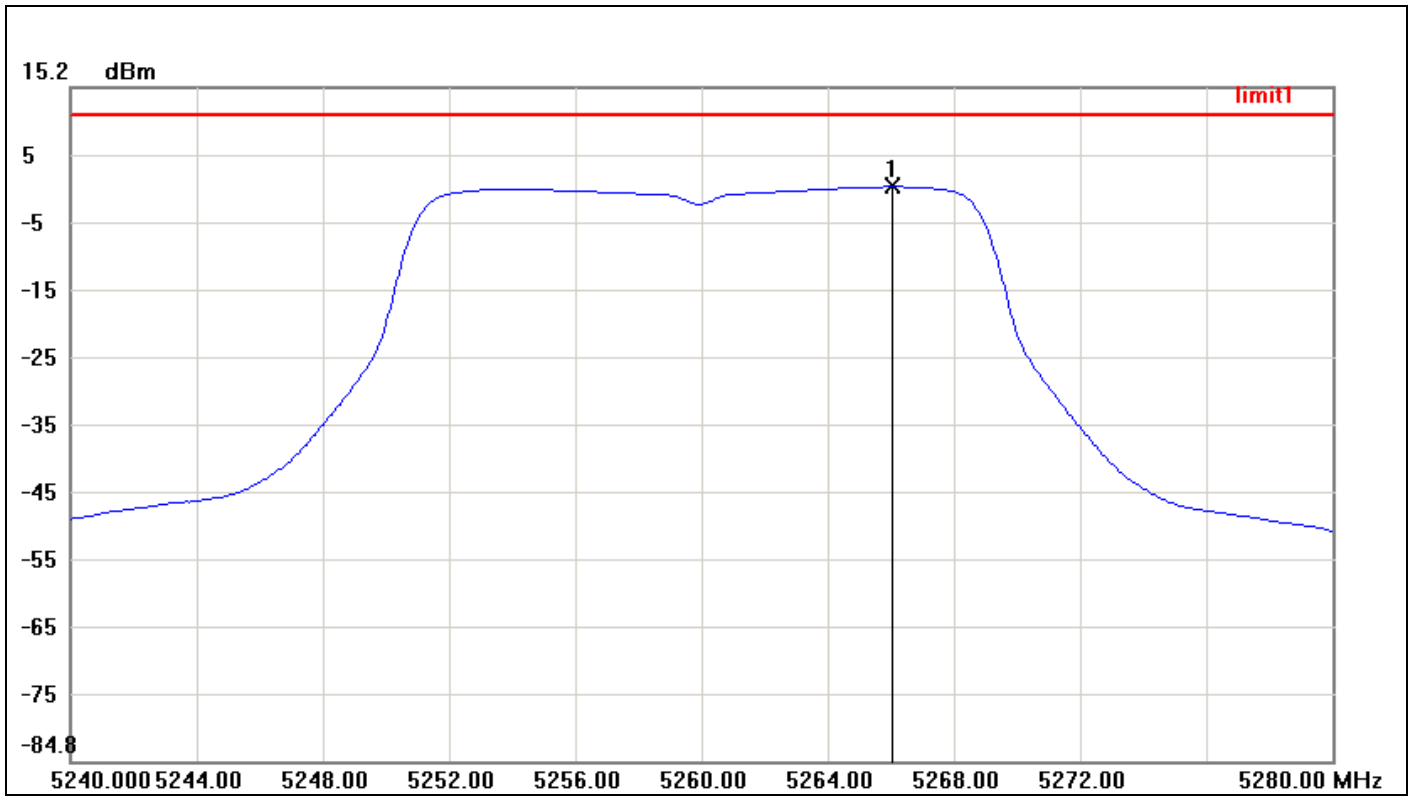
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5326.0667	1.71	11.00	-9.29

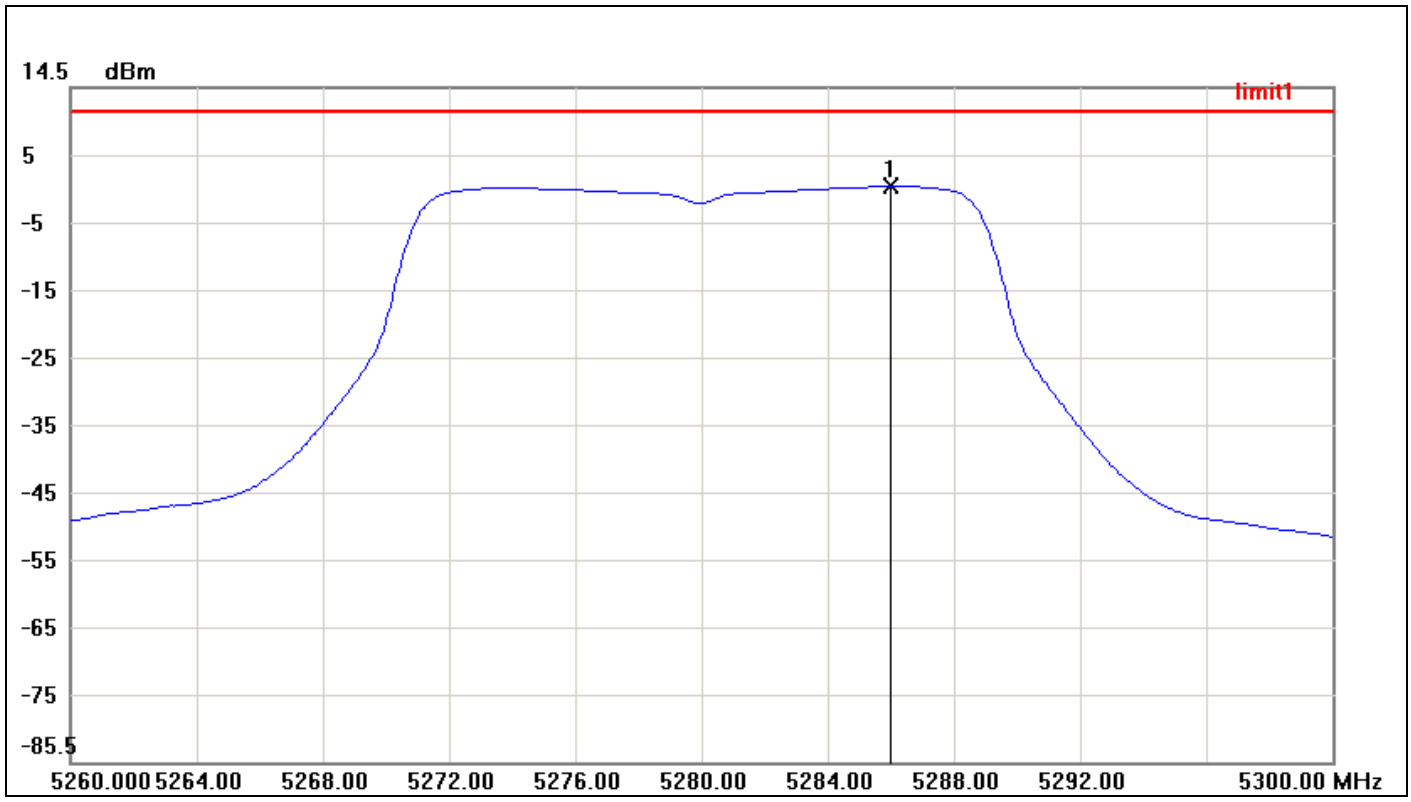
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

CH Low



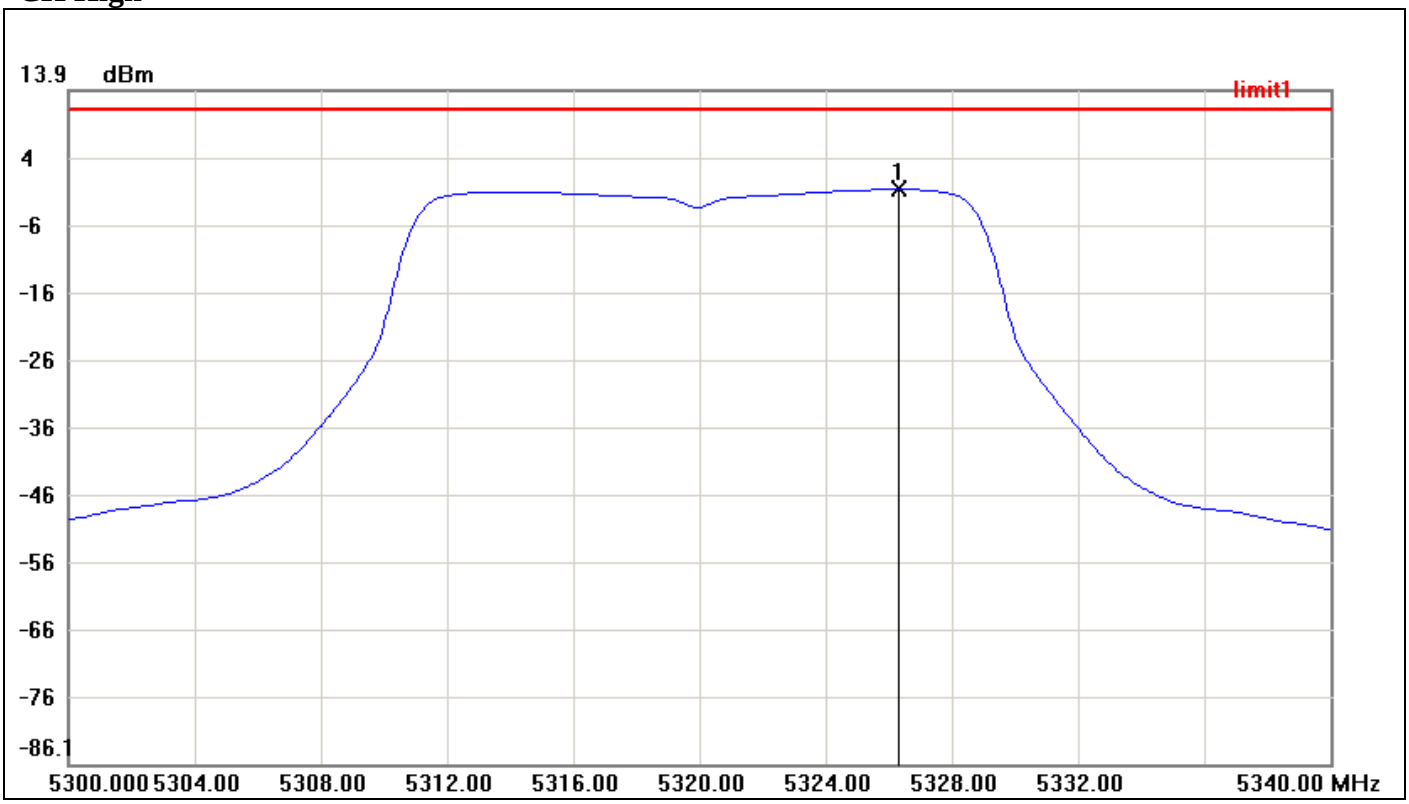
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5266.0667	0.44	11.00	-10.56

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5286.0000	-0.13	11.00	-11.13

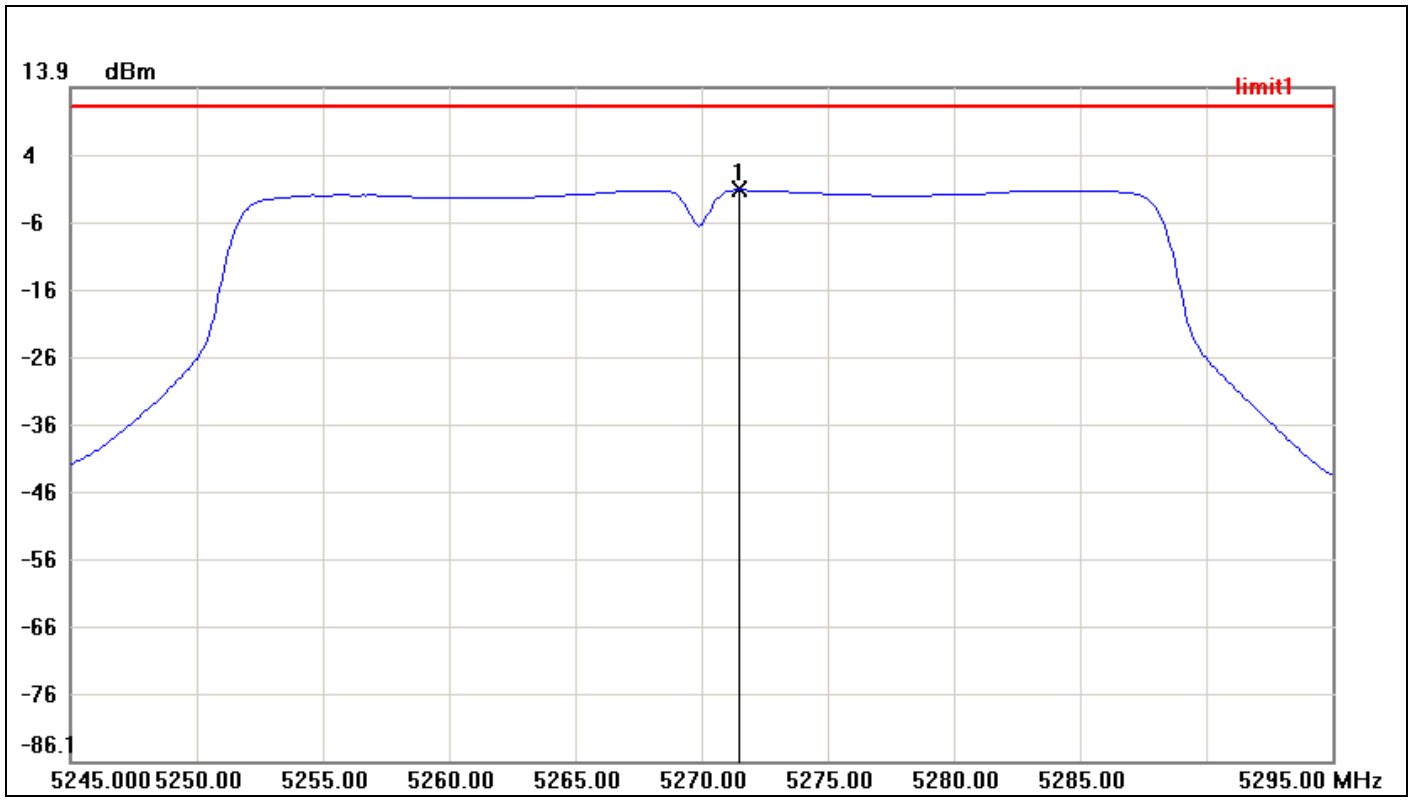
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5326.3333	-0.79	11.00	-11.79

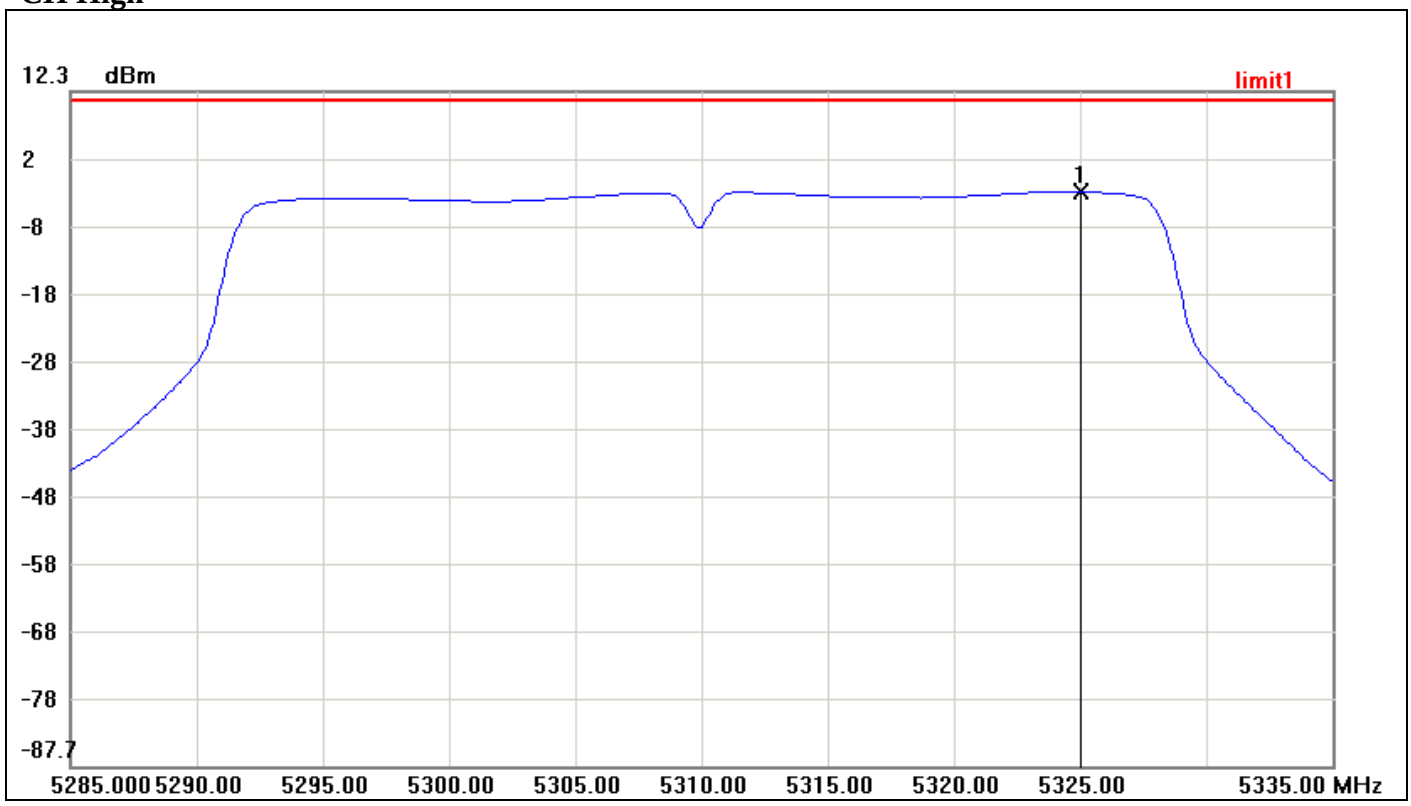
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5271.5000	-1.26	11.00	-12.26

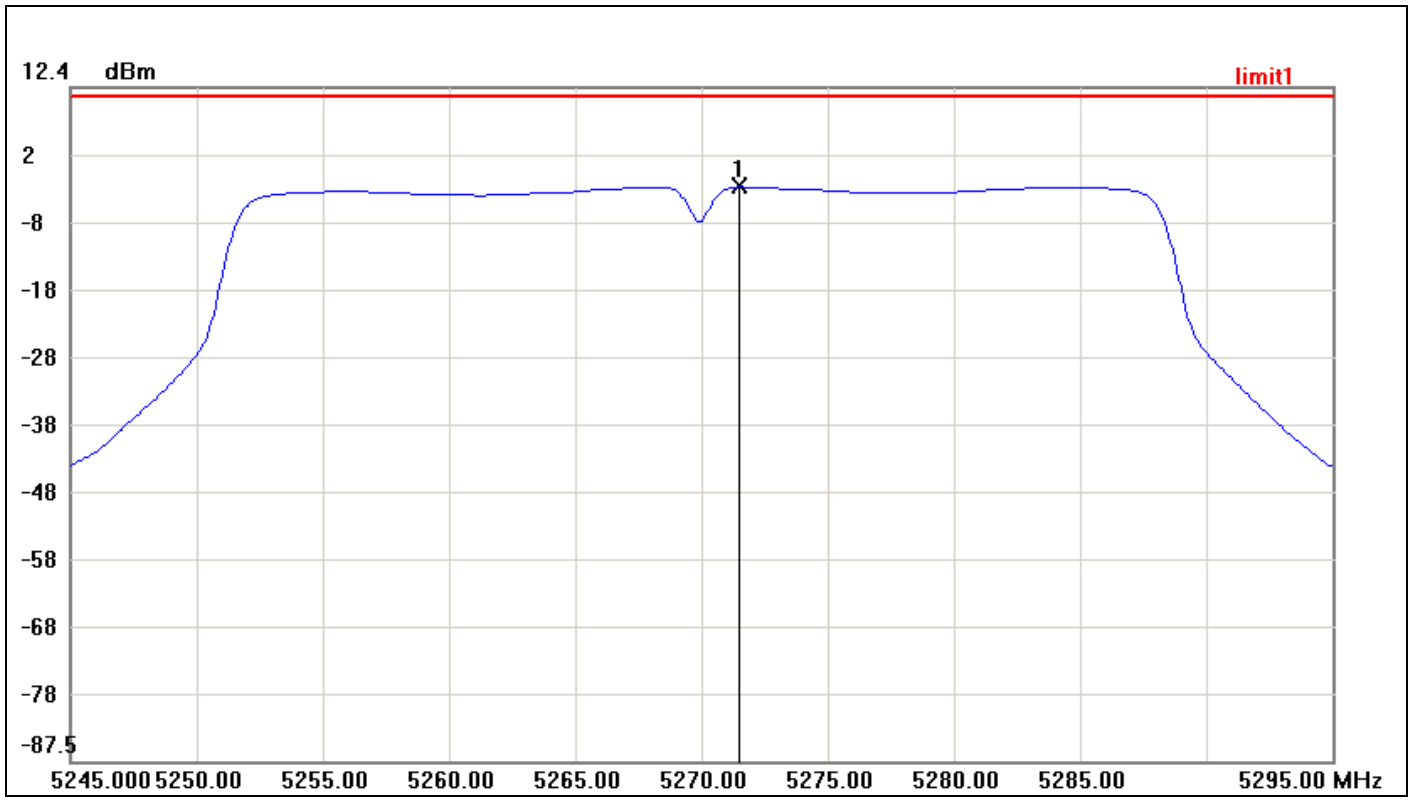
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5325.0000	-2.57	11.00	-13.57

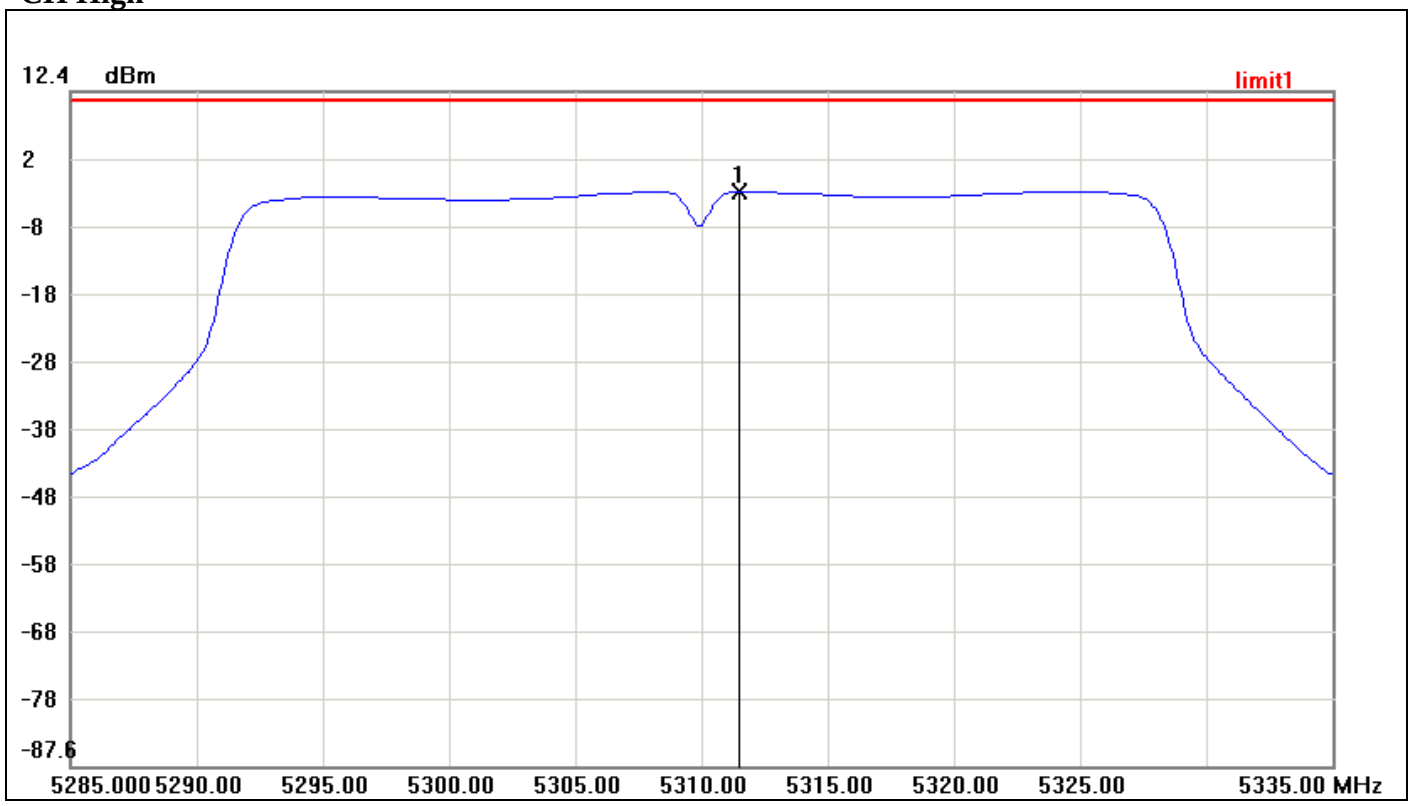
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5271.5000	-2.28	11.00	-13.28

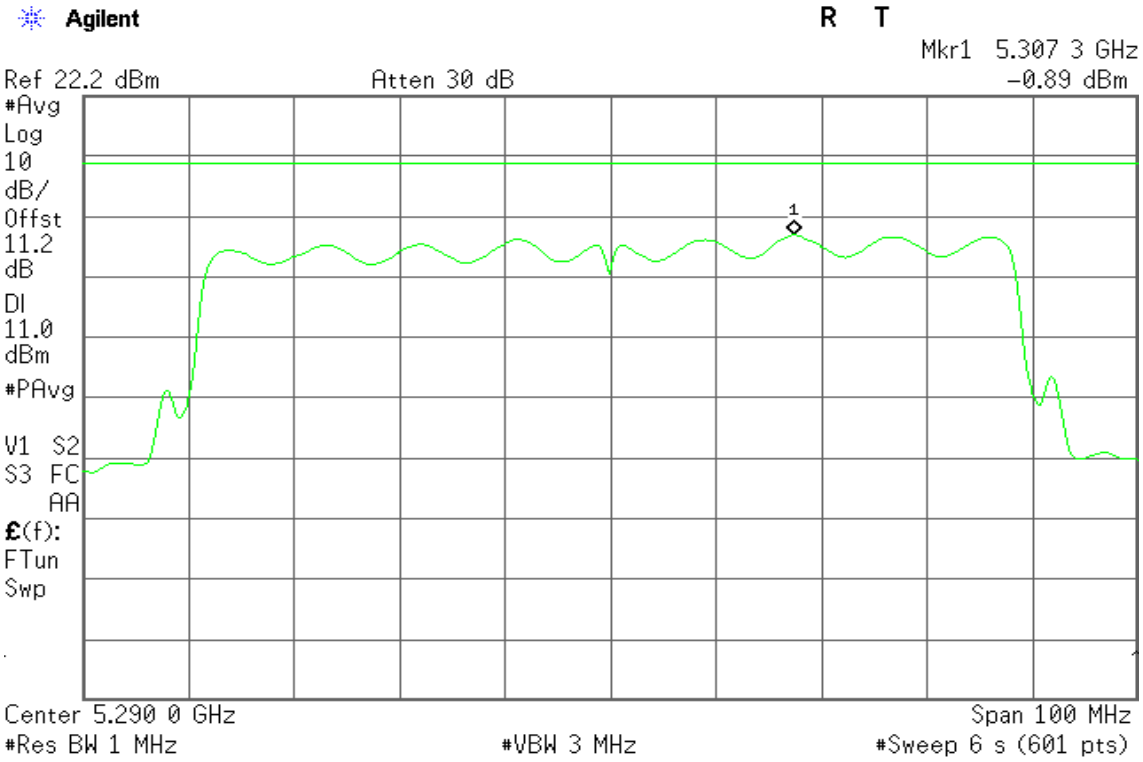
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5311.5000	-2.36	11.00	-13.36

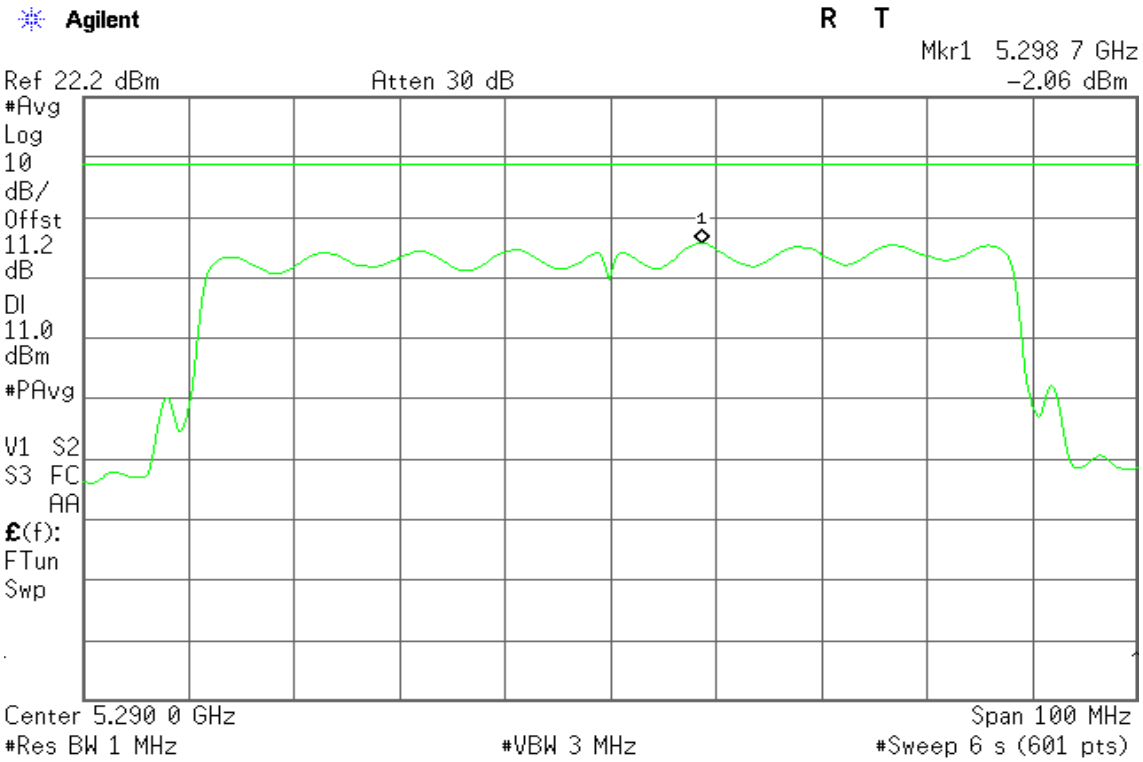
IEEE 802.11ac VHT 80 MHz mode / 5290MHz /

Chain 0 CH Mid



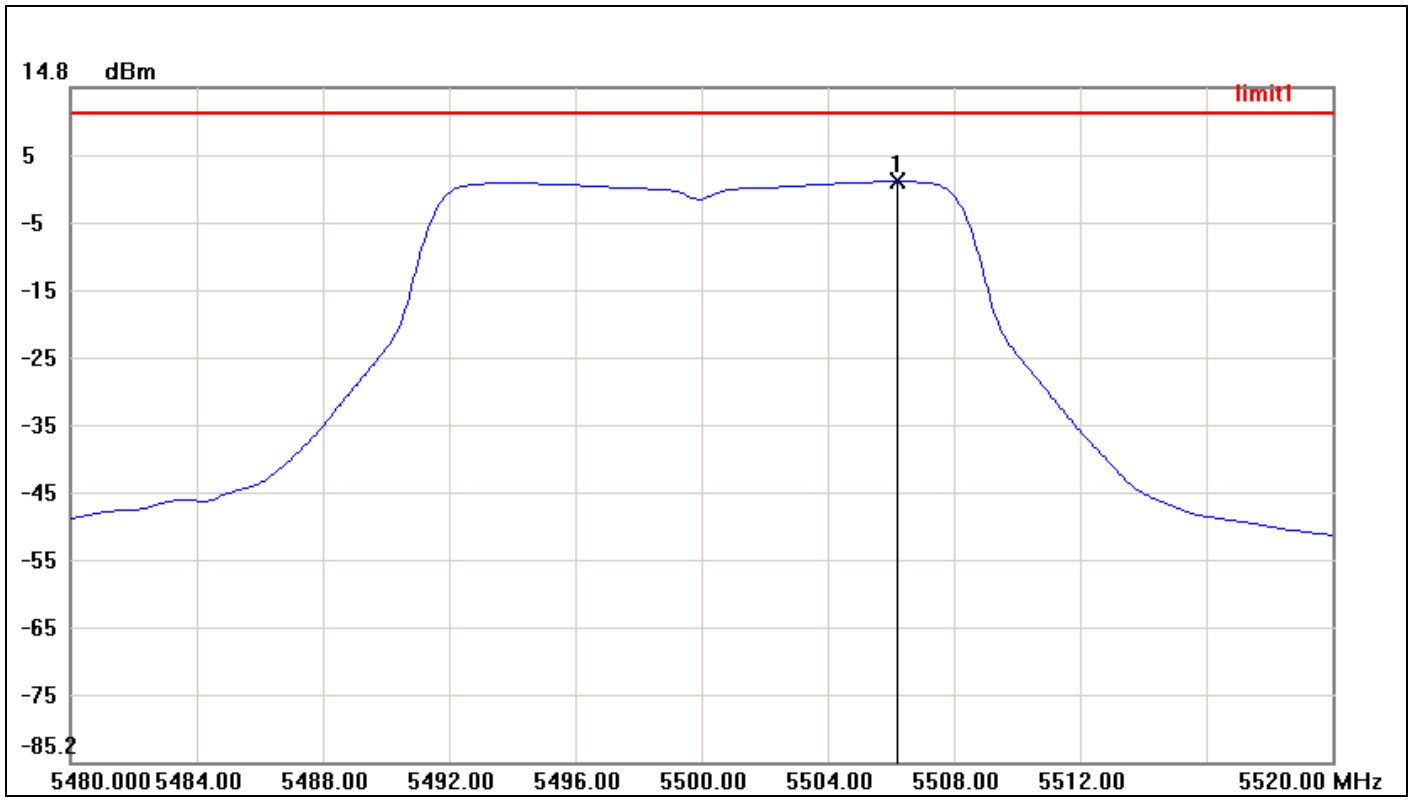
IEEE 802.11ac VHT 80 MHz mode / 5290MHz /

Chain 1 CH Mid



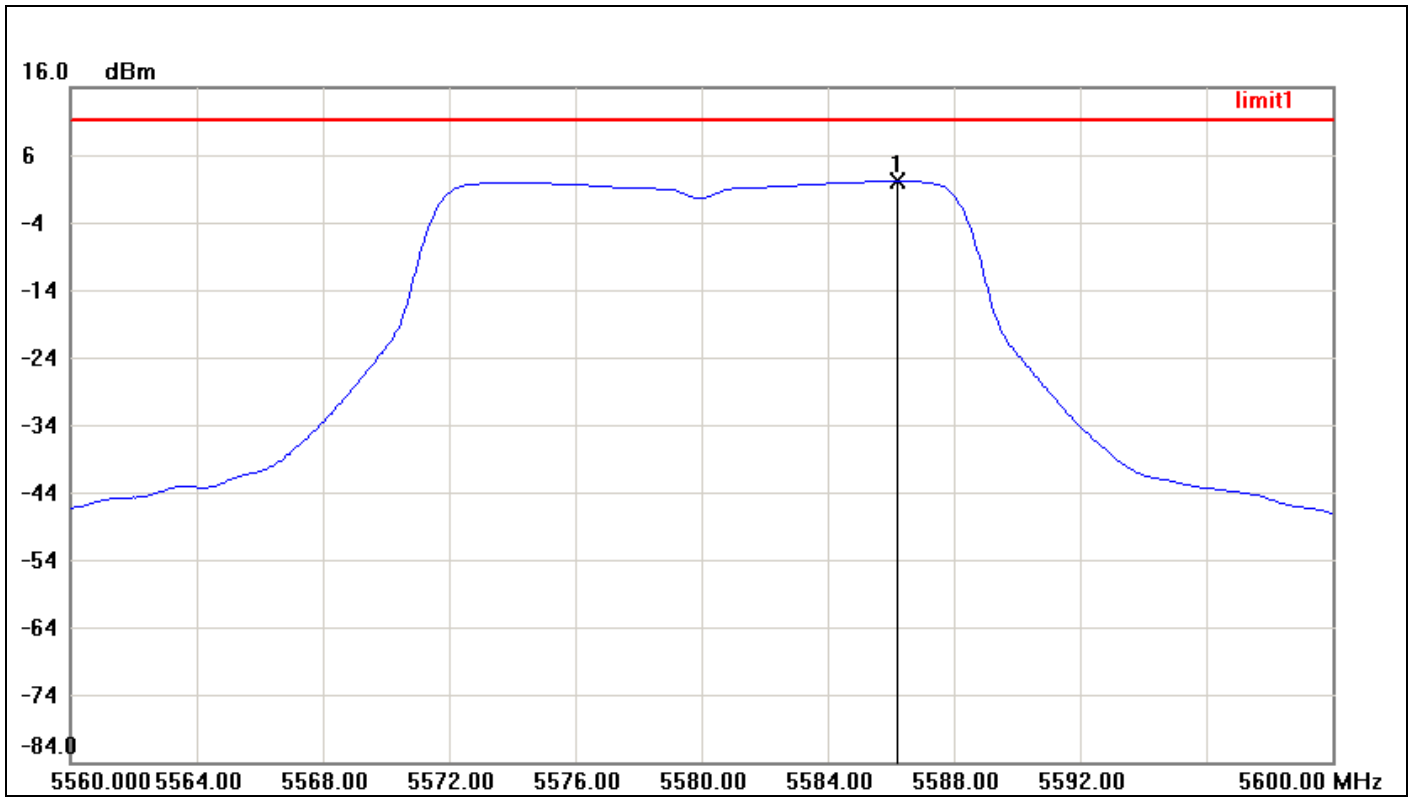
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low



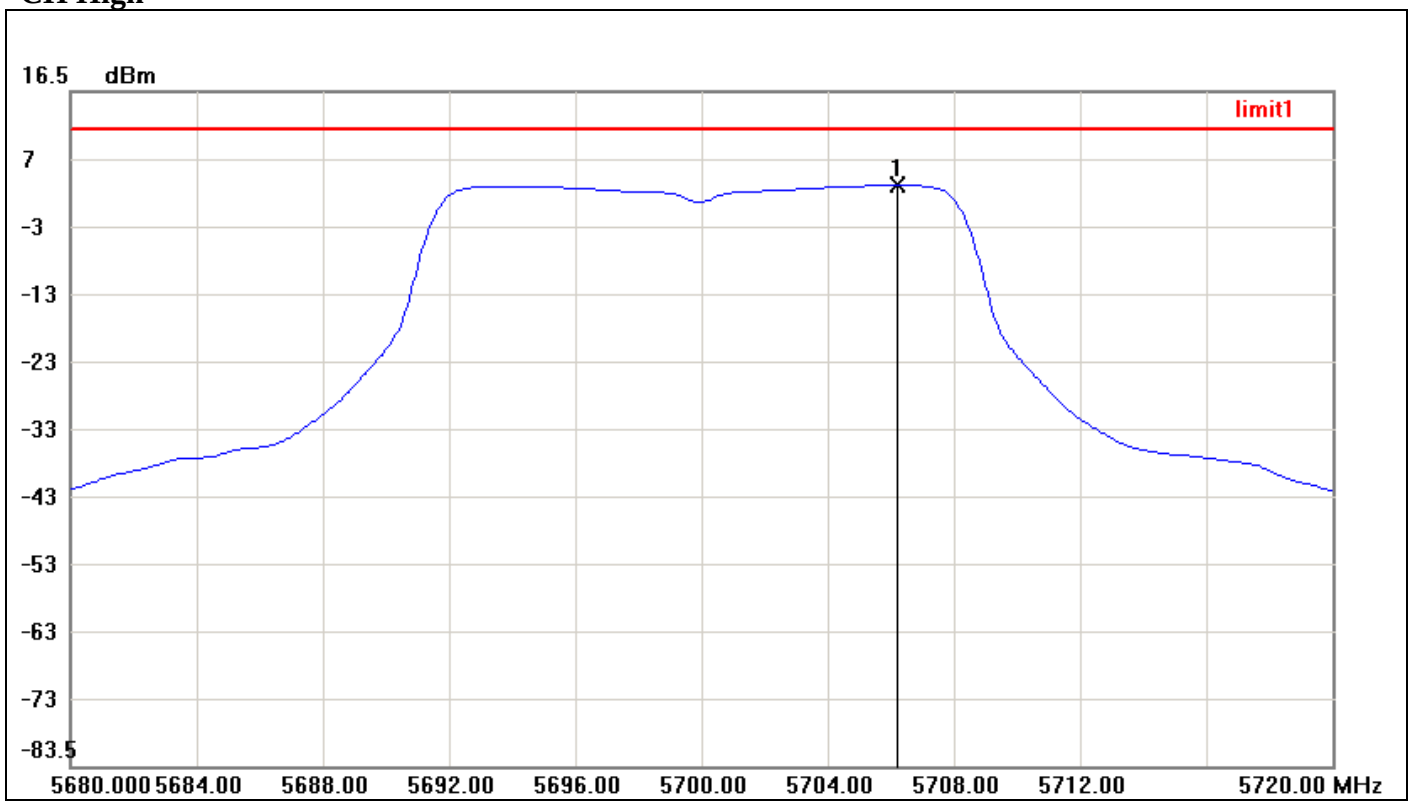
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5506.2000	0.93	11.00	-10.07

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5586.2000	2.13	11.00	-8.87

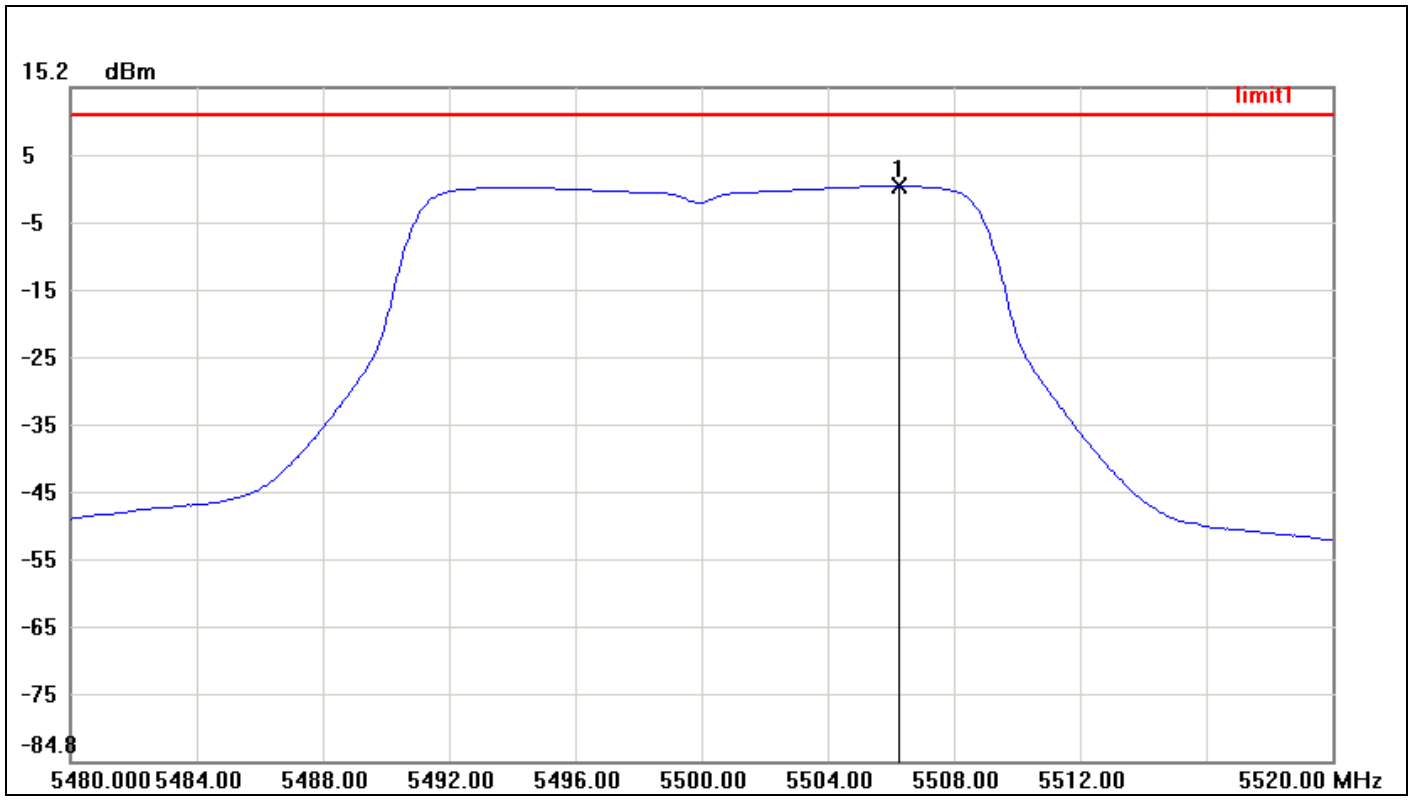
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5706.2000	2.66	11.00	-8.34

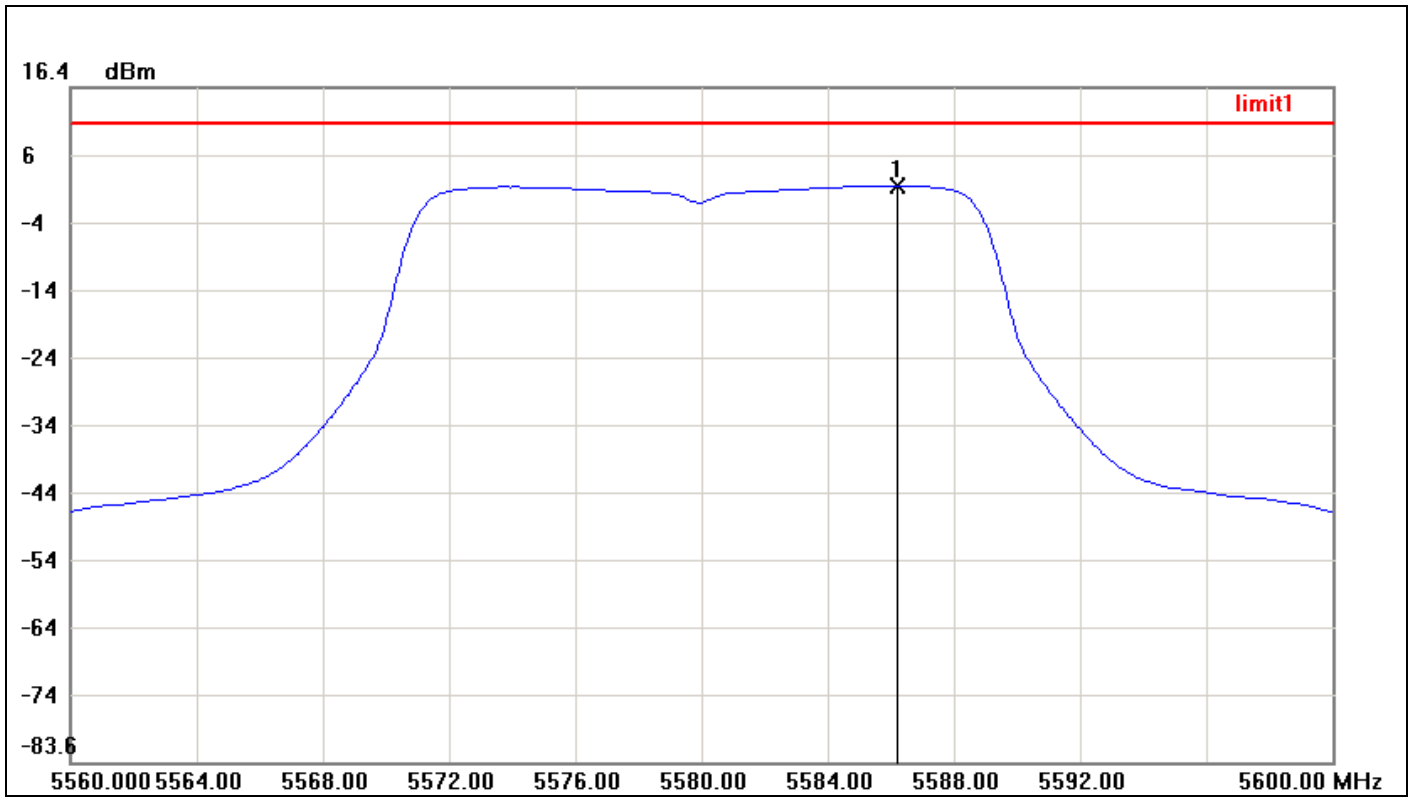
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

CH Low



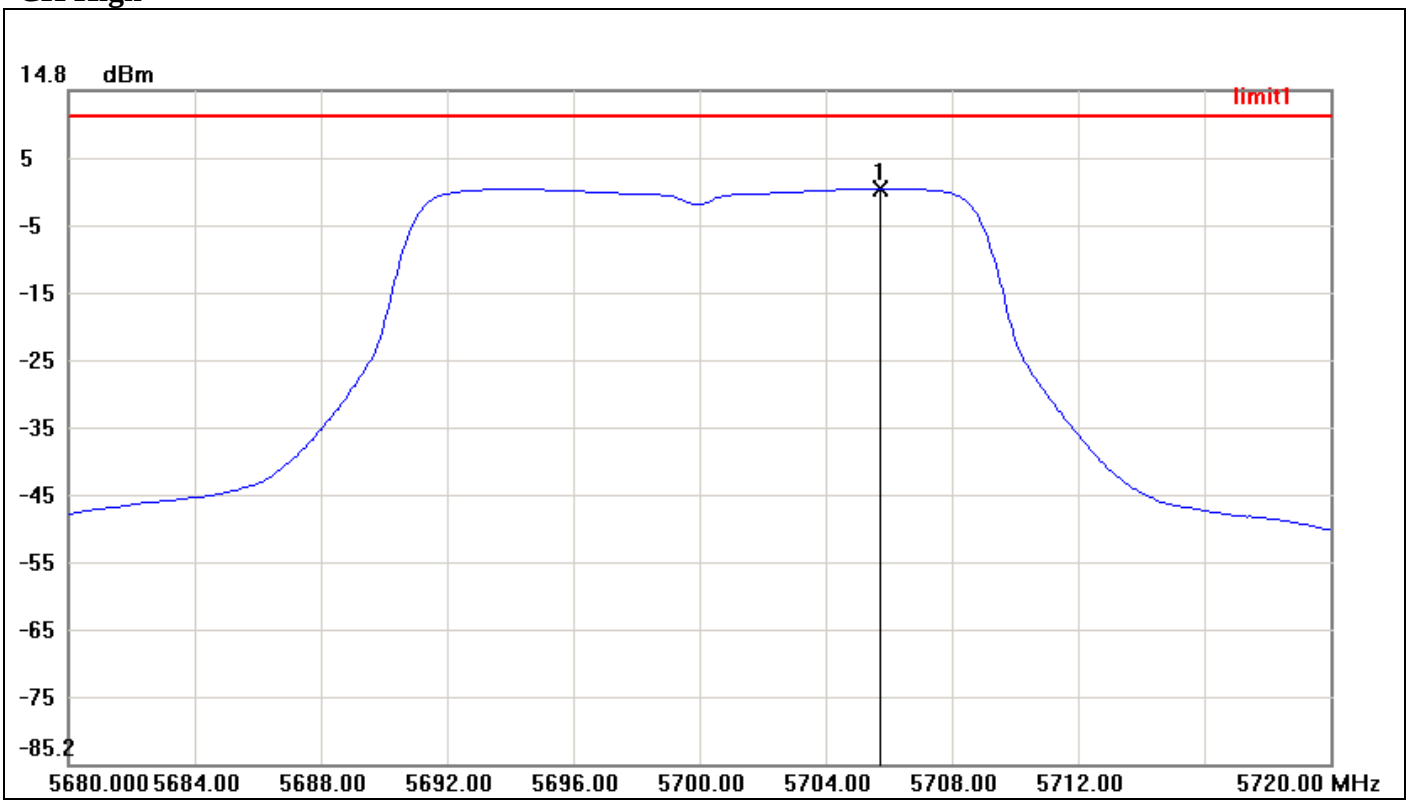
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5506.2667	0.59	11.00	-10.41

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5586.2000	1.88	11.00	-9.12

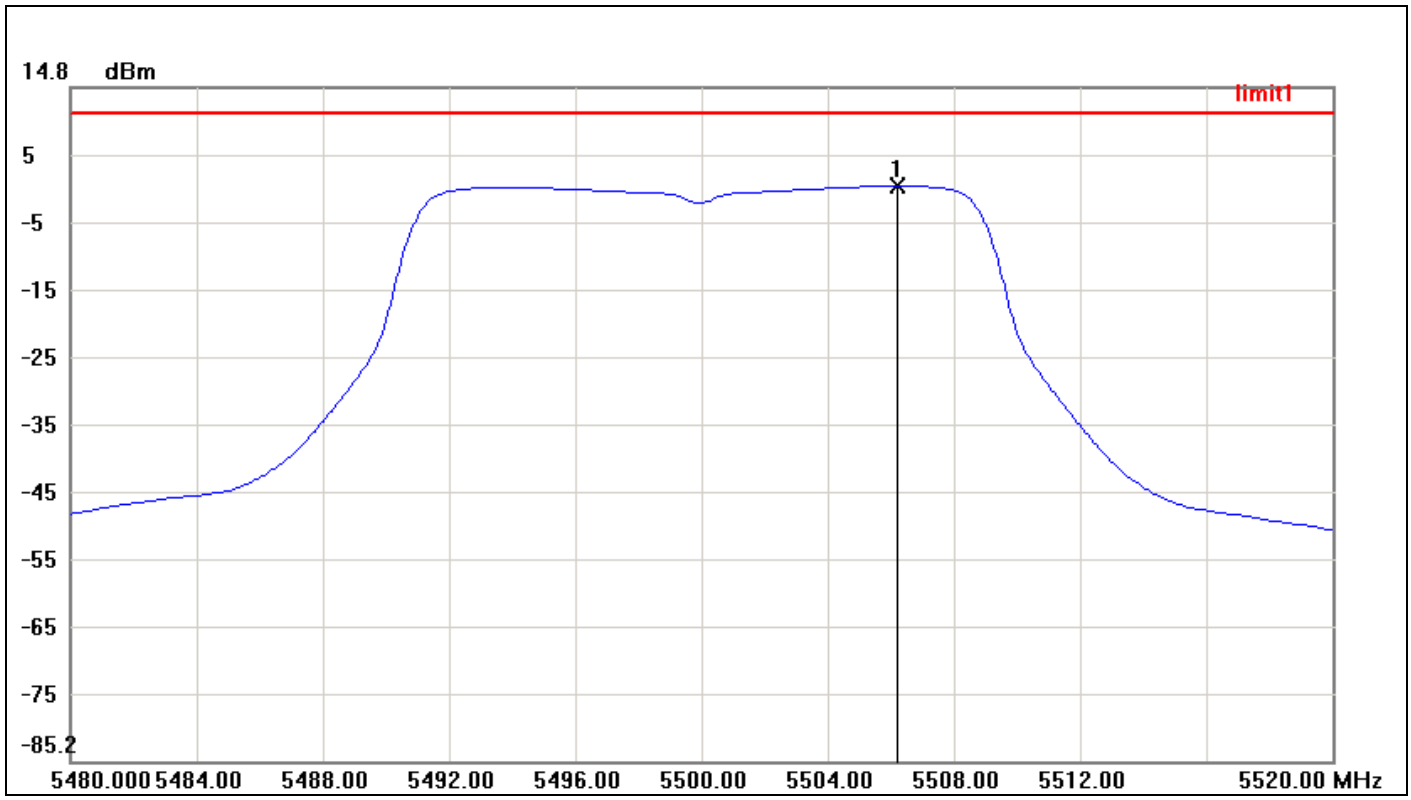
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5705.7333	0.27	11.00	-10.73

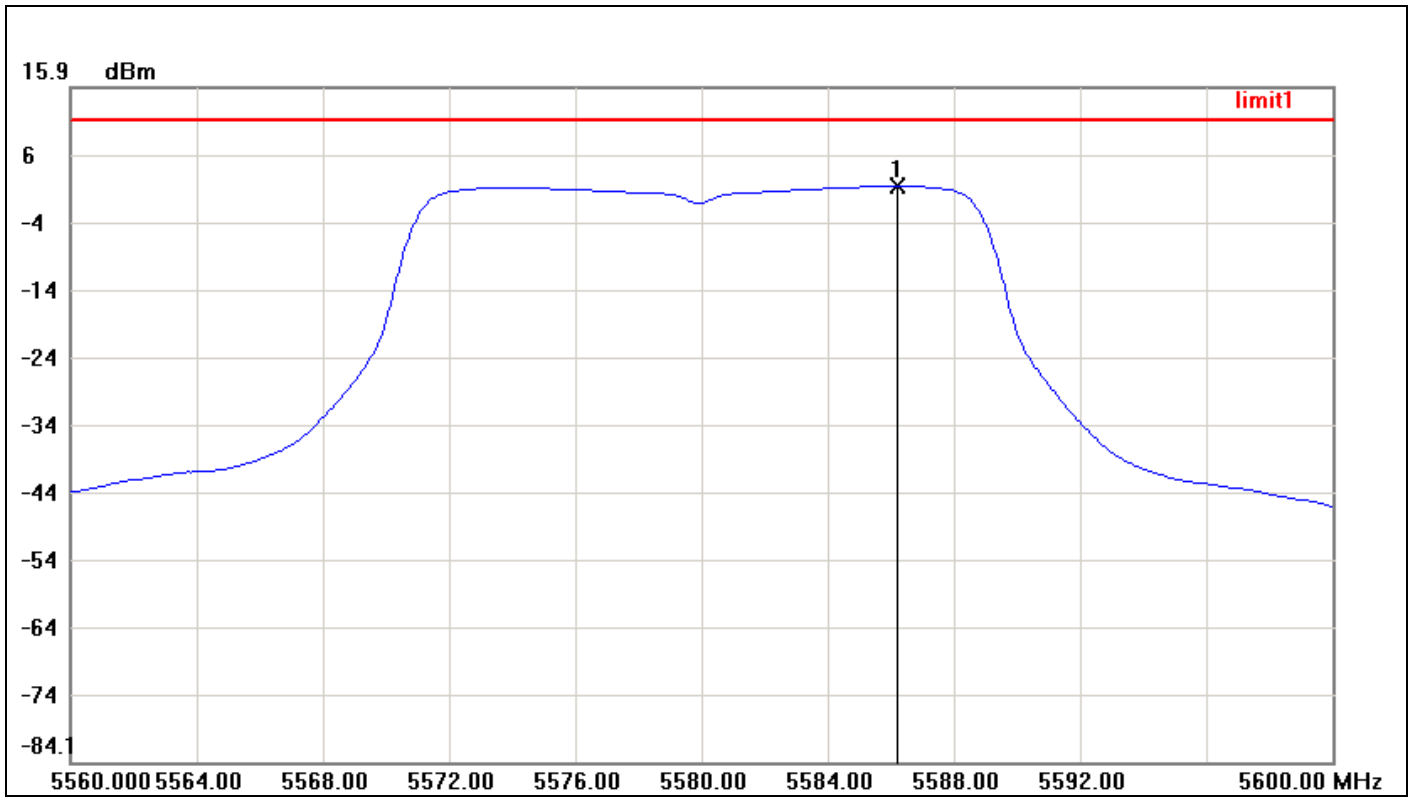
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low



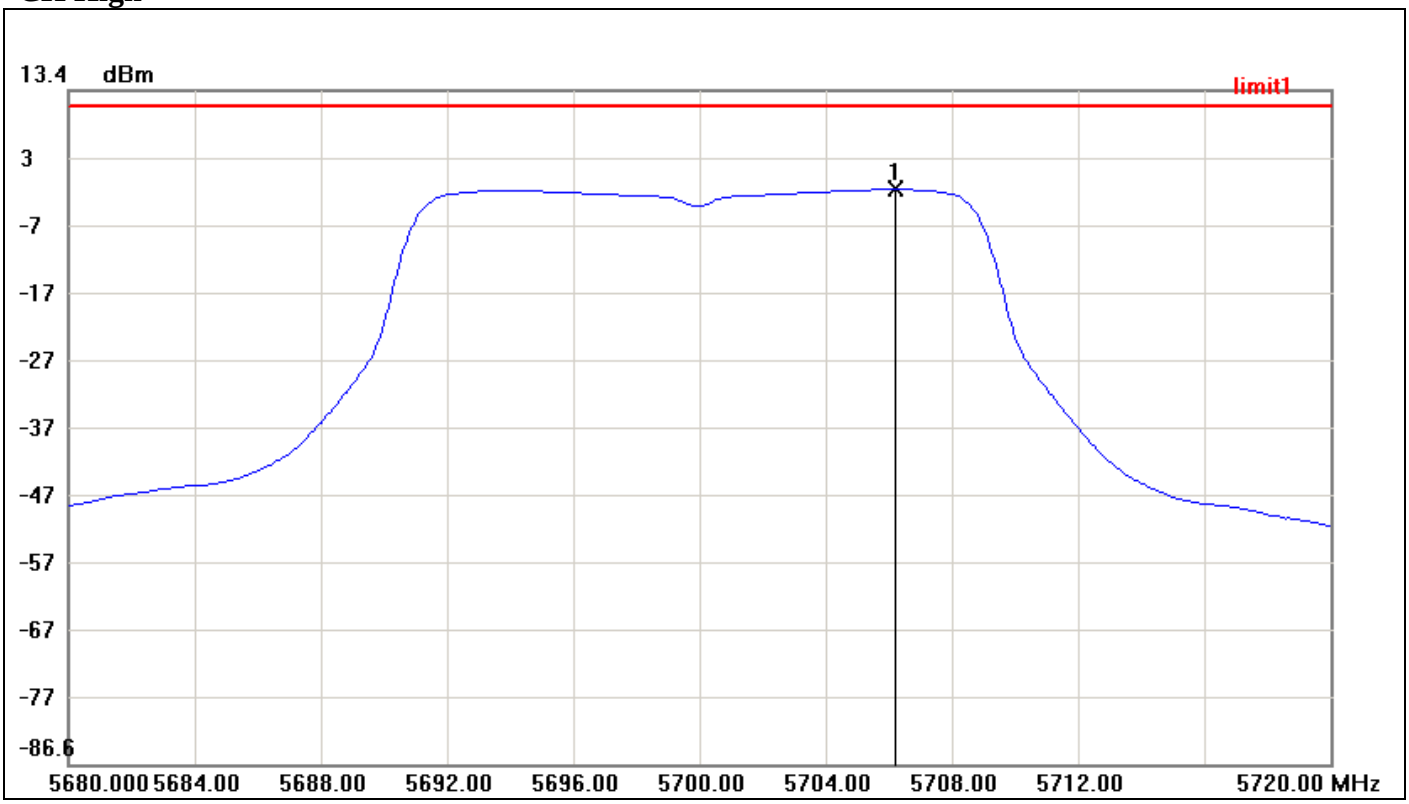
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5506.2000	0.23	11.00	-10.77

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5586.2000	1.29	11.00	-9.71

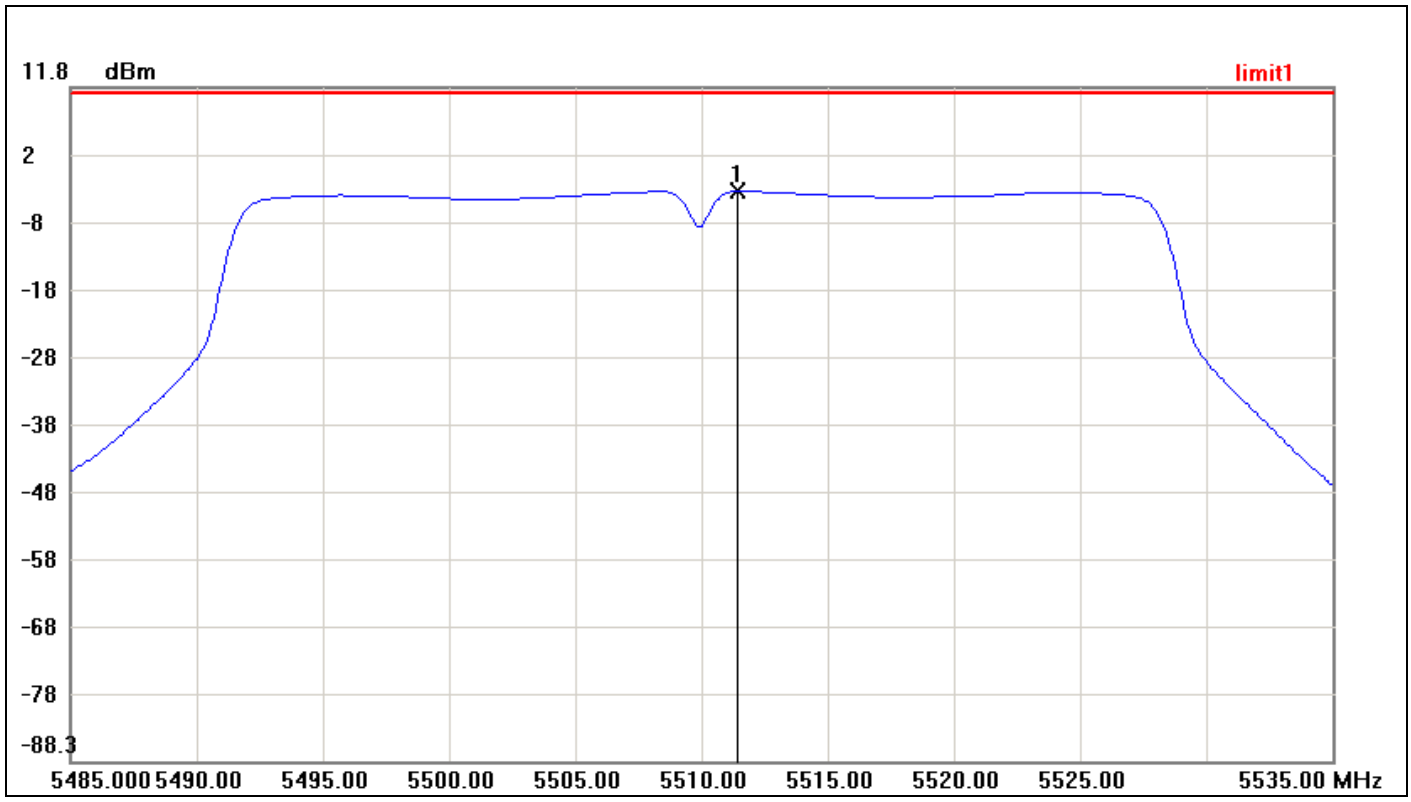
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5706.2000	-1.27	11.00	-12.27

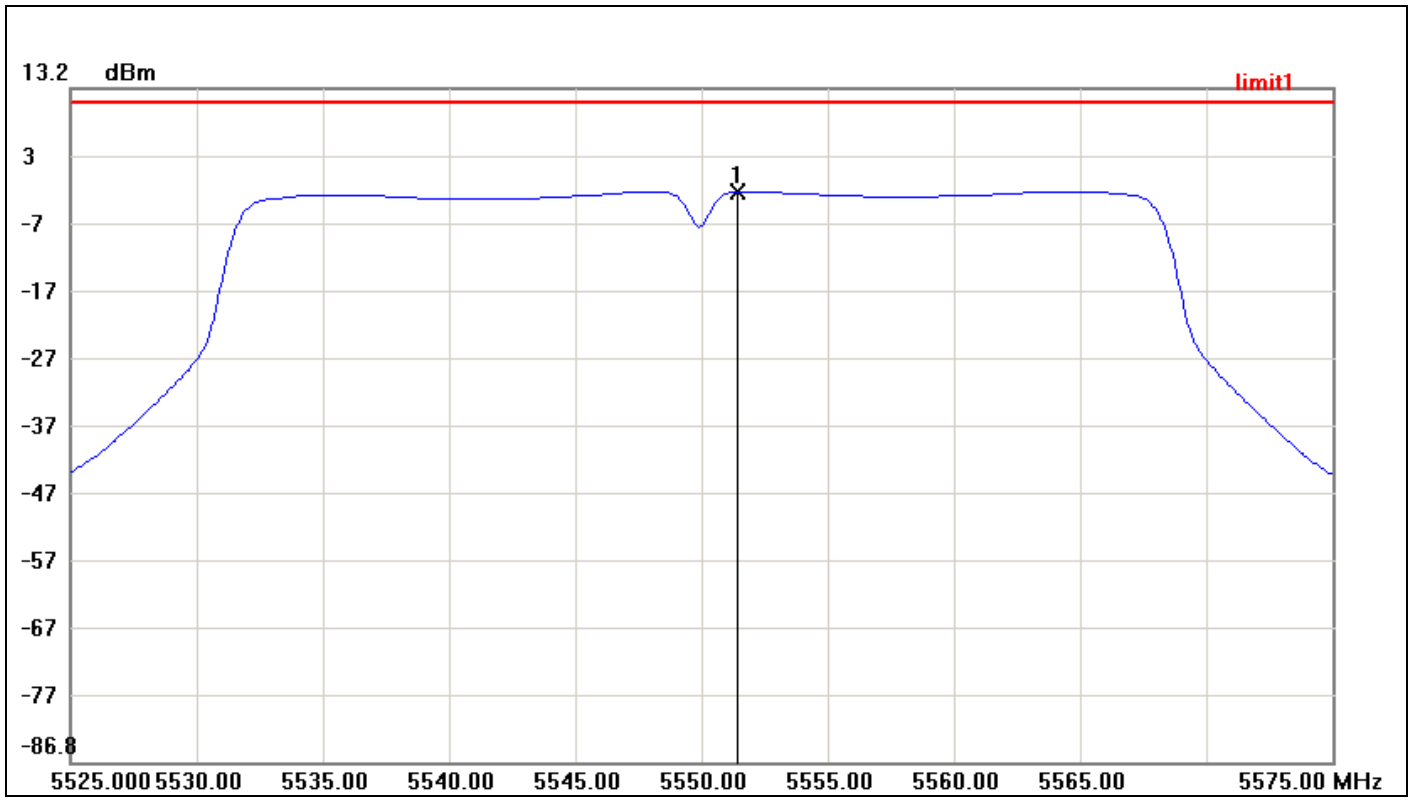
IEEE 802.11n HT 40 MHz mode / 5530 ~ 5690MHz / Chain 0

CH Low



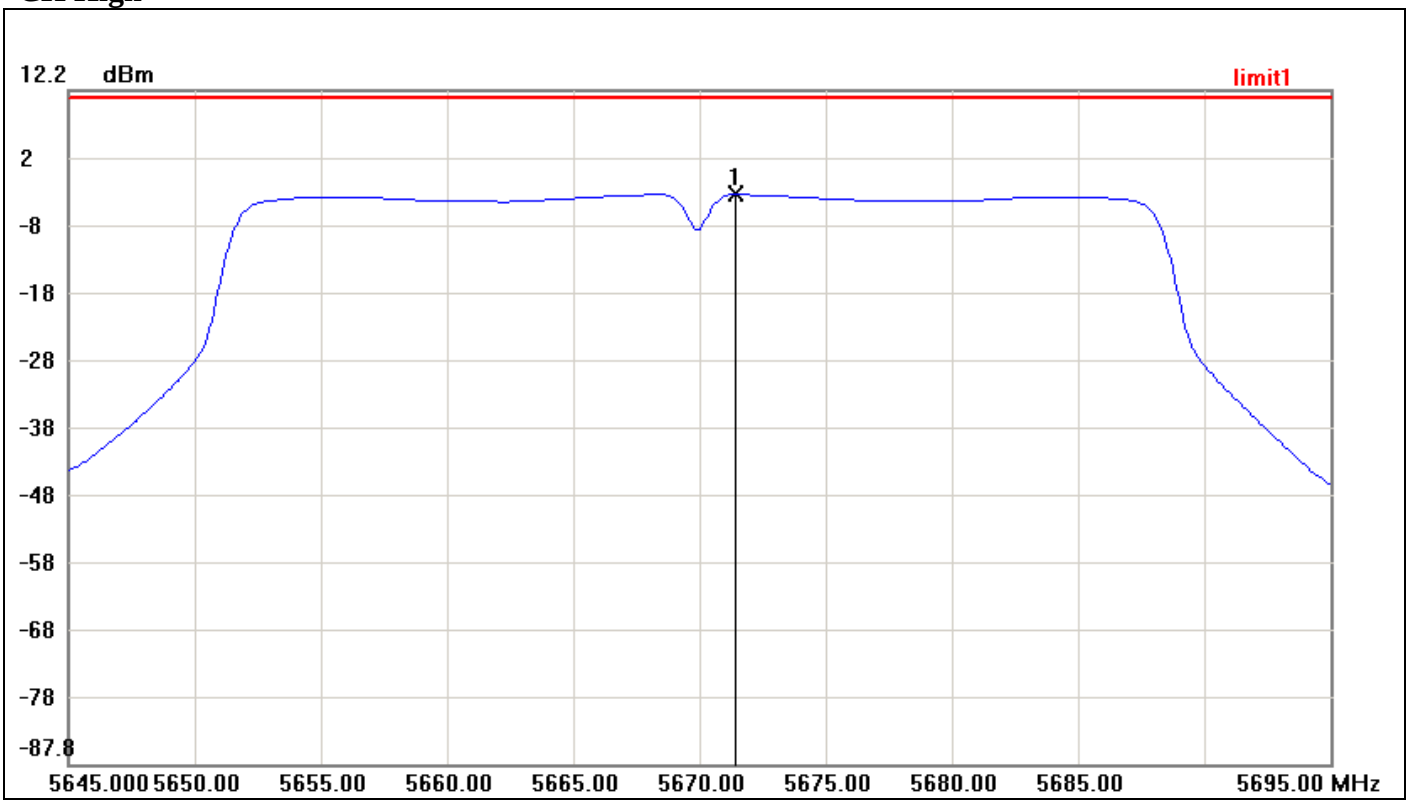
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5511.4167	-3.63	11.00	-14.63

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5551.4167	-2.07	11.00	-13.07

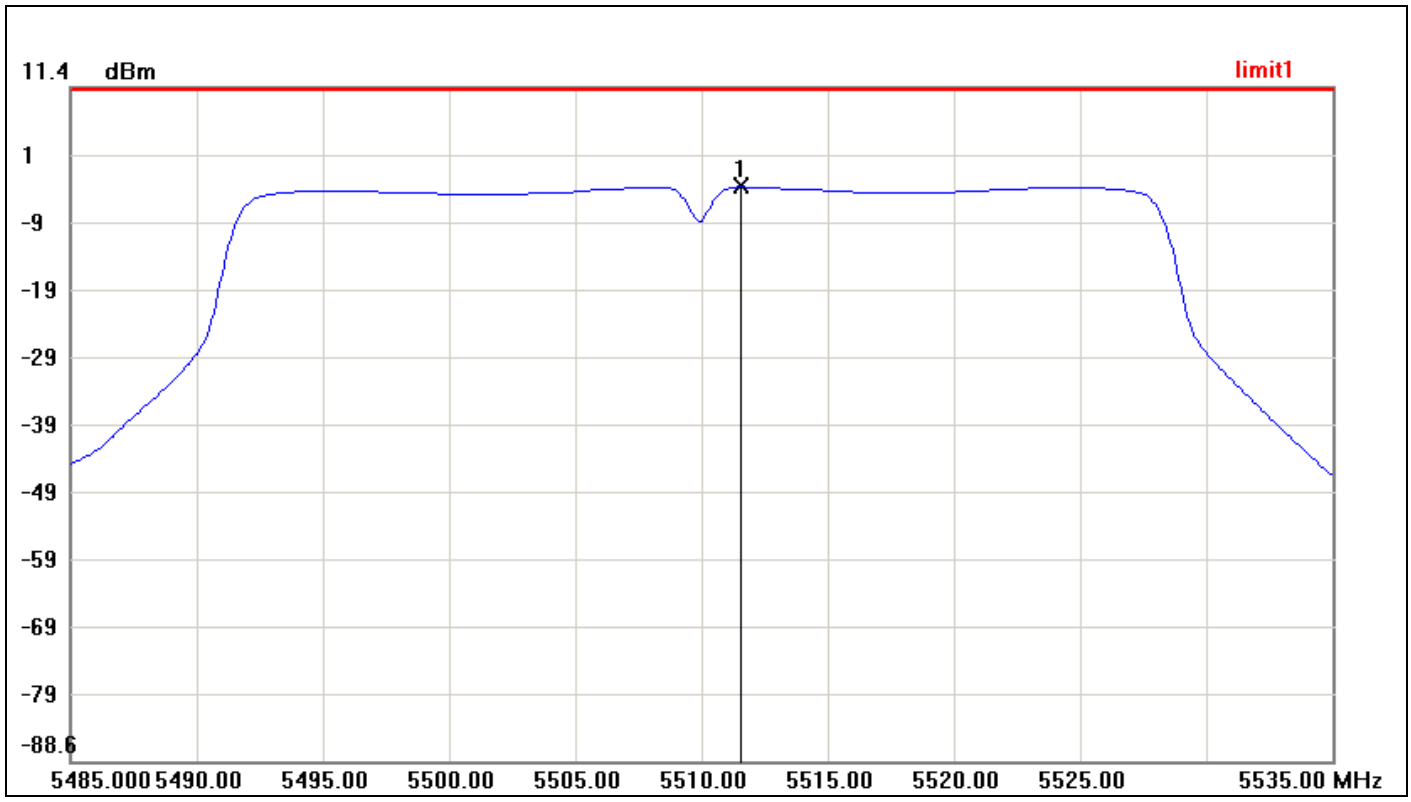
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5671.4167	-3.26	11.00	-14.26

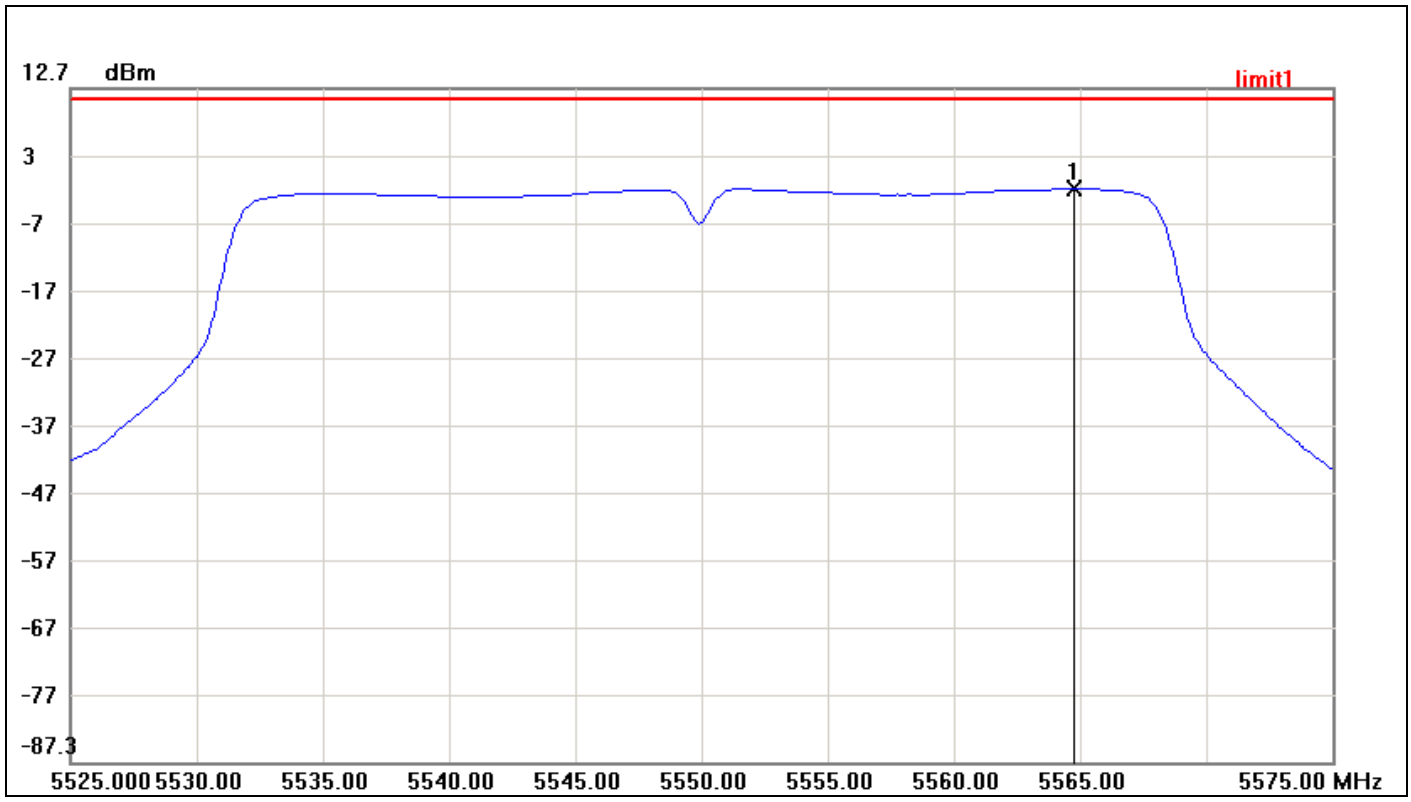
IEEE 802.11n HT 40 MHz mode / 5530 ~ 5690MHz / Chain 1

CH Low



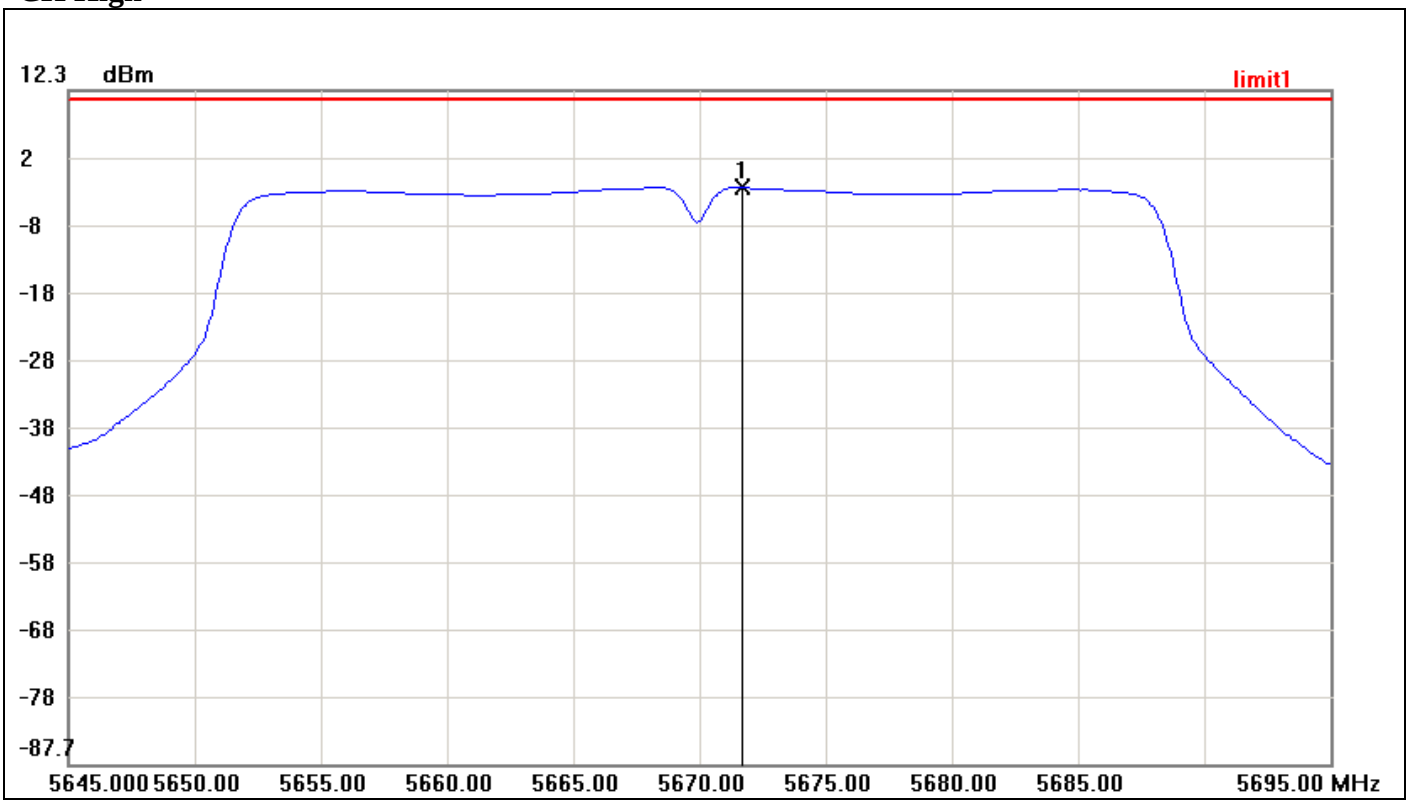
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5511.5833	-3.35	11.00	-14.35

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5564.7500	-2.23	11.00	-13.23

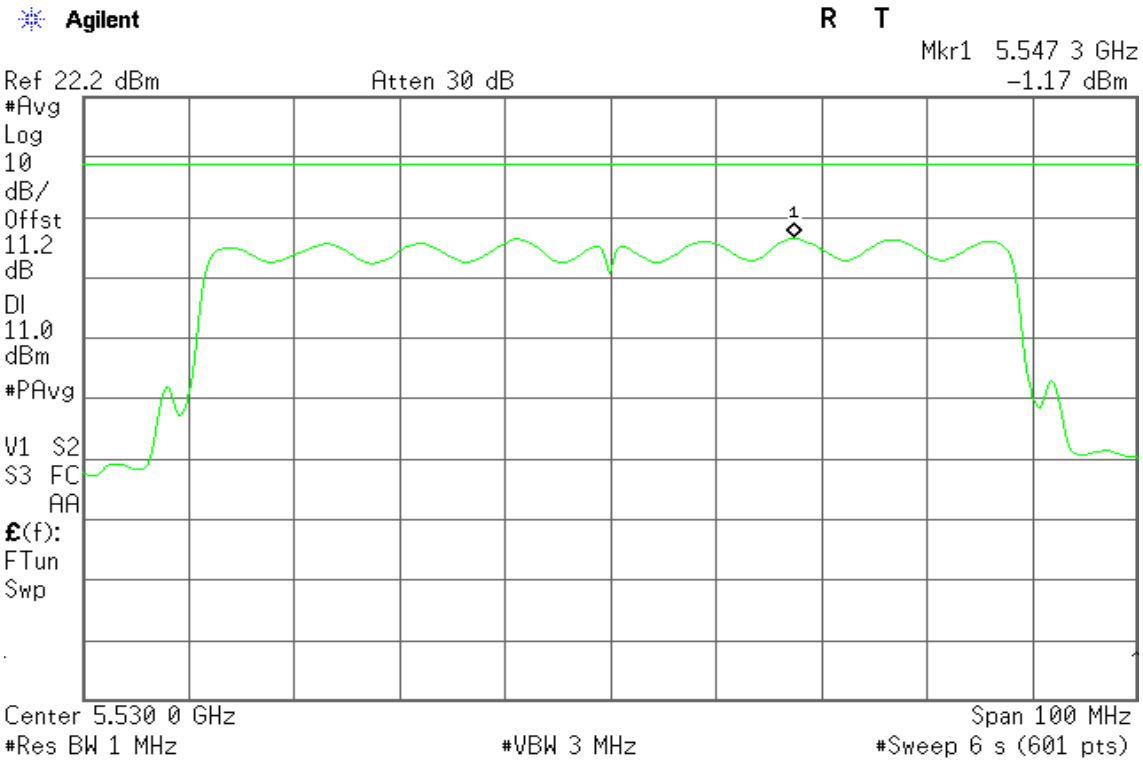
CH High



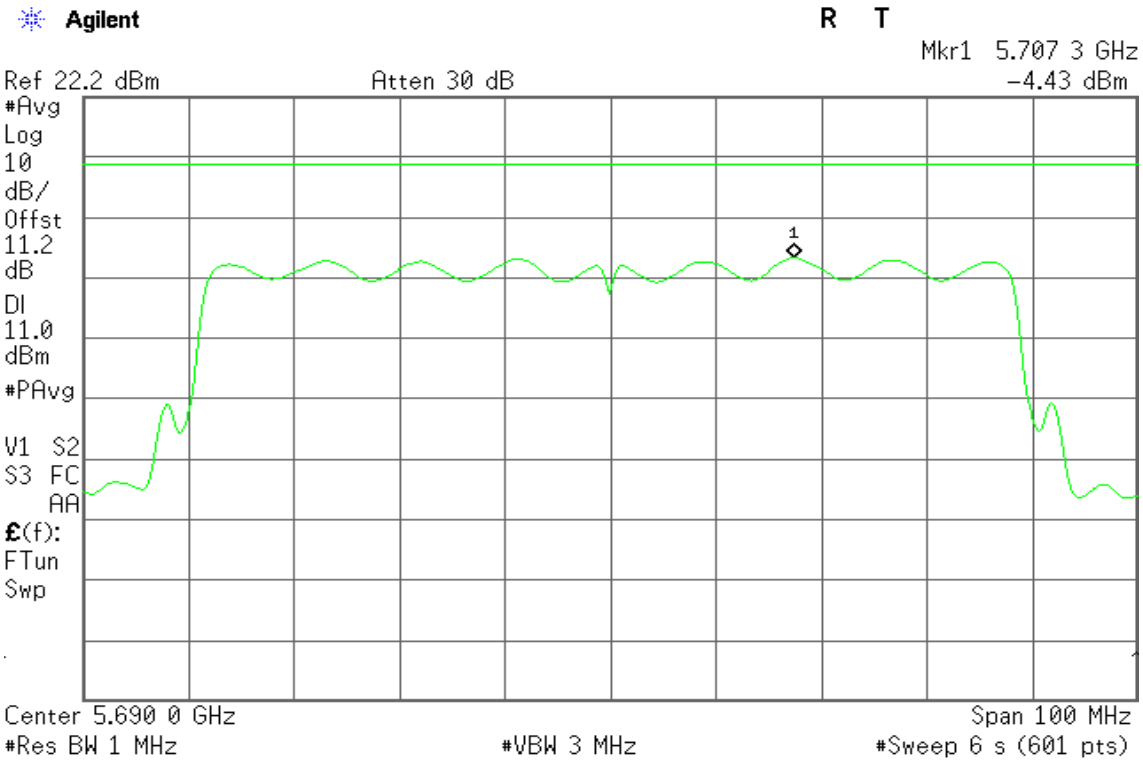
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5671.6667	-2.13	11.00	-13.13

IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz /

Chain 0 CH Low

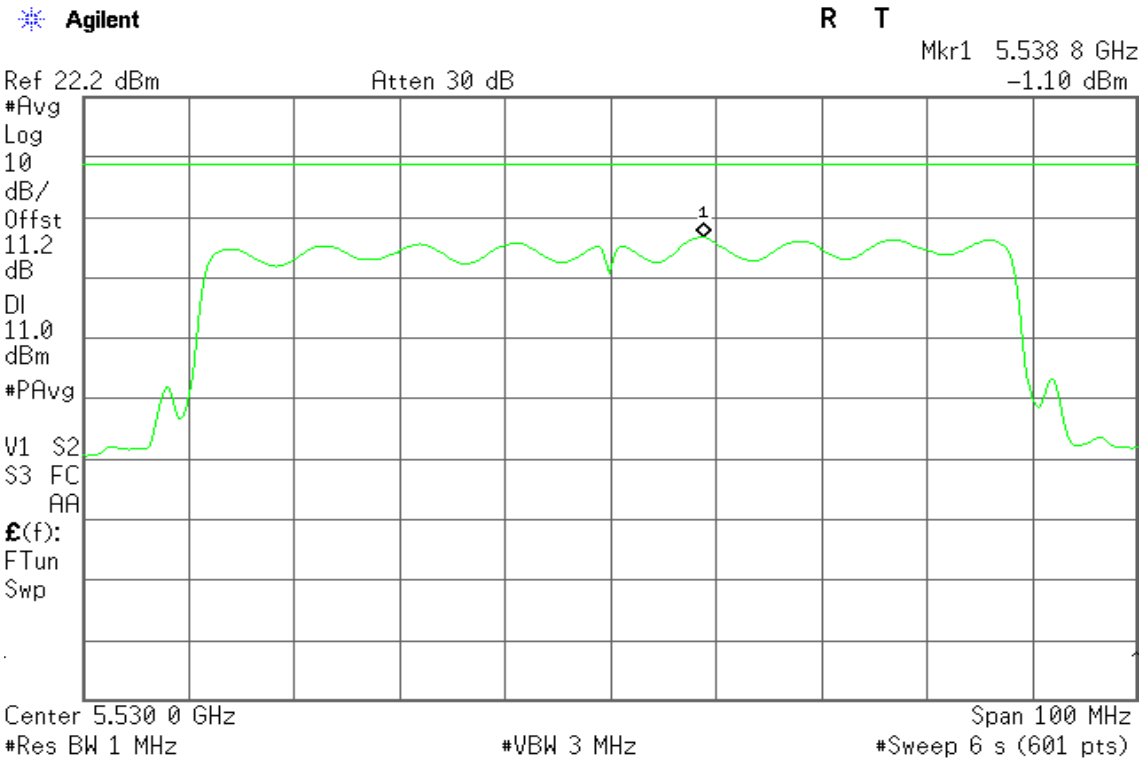


CH High



IEEE 802.11ac VHT 80 MHz mode / 5530 ~ 5690MHz /

Chain 1 CH Low



CH High