FCC 47 CFR PART 15 SUBPART E

TEST REPORT

For

802.11n, Dual Band 2T2R Wireless USB Module

Model: WN4501L

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.)
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Issued Date: September 12, 2013

Testing Laboratory
1309

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Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		September 12, 2013		Initial Issue	ALL	Eunice Shen

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1. TEST RESULT CERTIFICATION

Applicant:	Lite-On Technology Corp. 4F, 90, Chien 1 Road, Chung Ho, New Taipei City 23585, Taiwan, R.O.C.
Equipment Under Test:	802.11n, Dual Band 2T2R Wireless USB Module
Trade Name:	LITE-ON
Model:	WN4501L
Date of Test:	September 3 ~ 13, 2013

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

We hereby certify that:

Compliance Certification Services Inc. tested the above equipment. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407.

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

Approved by:

Miller Lee
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Angel Cheng
Section Manager
Compliance Certification Services Inc.

2. EUT DESCRIPTION

<table>
<tr><td>Product</td><td>802.11n, Dual Band 2T2R Wireless USB Module</td></tr>
<tr><td>Trade Name</td><td>LITE-ON</td></tr>
<tr><td>Model Number</td><td>WN4501L</td></tr>
<tr><td>Model Discrepancy</td><td>N/A</td></tr>
<tr><td>Received Date</td><td>July 18, 2013</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="3">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>2 Channels</td></tr>
<tr><td rowspan="3">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>4 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 - 5310</td><td>2 Channels</td></tr>
<tr><td rowspan="3">UNII Band III</td><td>IEEE 802.11a</td><td>5500 - 5700</td><td>8 Channels</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 – 5700</td><td>8 Channels</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 - 5670</td><td>3 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="3">UNII Band I</td><td>IEEE 802.11a</td><td>5180 – 5240</td><td>11.83</td><td>0.0152</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5180 – 5240</td><td>15.05</td><td>0.0320</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5190 ~ 5230</td><td>15.56</td><td>0.0360</td></tr>
<tr><td rowspan="3">UNII Band II</td><td>IEEE 802.11a</td><td>5260 - 5320</td><td>11.04</td><td>0.0127</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5260 - 5320</td><td>14.49</td><td>0.0281</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5270 - 5310</td><td>14.19</td><td>0.0262</td></tr>
<tr><td rowspan="3">UNII Band III</td><td>IEEE 802.11a</td><td>5500 - 5700</td><td>10.94</td><td>0.0124</td></tr>
<tr><td>IEEE 802.11n HT 20 MHz</td><td>5500 – 5700</td><td>15.42</td><td>0.0348</td></tr>
<tr><td>IEEE 802.11n HT 40 MHz</td><td>5510 - 5670</td><td>16.01</td><td>0.0399</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)</td></tr>
<tr><td>Antenna Specification</td><td>
<table>
<tr><th>Antenna</th><th>Left (Gain)</th><th>Right (Gain)</th></tr>
<tr><td>5G</td><td>1.59 dBi</td><td>1.59 dBi</td></tr>
</table>
MIMO:
Total ANT=10*LOG(((10^(1.59+10^(1.59/20))^2)/2) = 4.64
</td></tr>
<tr><td>Antenna Designation</td><td>PIFA Antenna</td></tr>
</table>

Operation Frequency:

UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII)	
CHANNEL	**MHz**
36	5180
38	5190
40	5200
44	5220
46	5230
48	5240
52	5260
54	5270
56	5280
60	5300
62	5310
64	5320
100	5500
102	5510
104	5520
108	5540
110	5550
112	5560
116	5580
118	5590
132	5660
134	5670
136	5680
140	5700

Remark:

1. *The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID:* ***PPQ-WN4501L*** *filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.*

3. TEST METHODOLOGY

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

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

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

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

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4, 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.

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: WDF710Q) had been tested under operating condition.

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

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

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

UNII Band I:

IEEE 802.11a for 5180 ~ 5240MHz:
Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz for 5180 ~ 5240MHz:
Channel Low (5180MHz), Channel Mid (5220MHz) and Channel High (5240MHz) with 6.5Mbps data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz Channel for 5190 ~ 5230MHz:
Channel Low (5190MHz) and Channel High (5230MHz) with 13.5Mbps data rate were chosen for full testing.

UNII Band II:

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

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

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

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

UNII Band III:

IEEE 802.11a for 5500 ~ 5700MHz:
Channel Low (5500MHz), Channel Mid (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 (5590MHz) and Channel High (5670MHz) with 13.5Mbps data rate were chosen for full testing.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

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

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY43360131	03/27/2014
Power Meter	Anritsu	ML2495A	1012009	06/04/2014
Power Sensor	Anritsu	MA2411A	0917072	06/04/2014

3M Chamber Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	US42510268	11/06/2013
EMI Test Receiver	R&S	ESCI	100064	02/17/2014
Pre-Amplifier	Mini-Circults	ZFL-1000LN	SF350700823	01/12/2014
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/19/2013
Bilog Antenna	Sunol Sciences	JB3	A030105	10/02/2013
Horn Antenna	EMCO	3117	00055165	02/17/2014
Horn Antenna	EMCO	3116	2487	10/10/2013
Loop Antenna	EMCO	6502	8905/2356	06/12/2014
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	12/22/2013
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCI	101073	07/30/2014
LISN	R&S	ENV216	101054	06/05/2014
LISN	SCHWARZBECK	NSLK 8127	8127-541	12/10/2013
Capacitive Voltage Probe	FCC	F-CVP-1	100185	03/15/2014
Test S/W	CCS-3A1-CE			

Dynamic Frequency Selection				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Rohde&Schwarz	FSEK 30	100264	05/22/2014
Signal Generator	Agilent	E8267C	US42340162	08/06/2014

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.2575
3M Semi Anechoic Chamber / <200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

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

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
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., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
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 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	1951-I3V(T60)	L3B2188	FCC DoC	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Notebook PC	HP	Pavilion dv6	VX250PA#ABO	N/A	N/A	AC I/P: Unshielded, 2m DC O/P: Unshielded, 2m with a core
3.	LCD Monitor	DELL	U2713HMt	CN-0GK0KD-744 45-337-065L	FCC DoC	Unshielded, 1.8m	Shielded, 1.8m
4.	Printer	EPSON	Stylus-C63	FAPY150822	FCC DoC	Shielded, 1.8m	Unshielded, 1.8m
5.	HDD	WD	My Passport	WX21A11V0883	FCC DoC	Shielded, 1.8m	N/A

Remark:

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

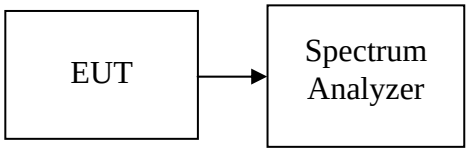
7. FCC PART 15 REQUIREMENTS

7.1 26 DB EMISSION BANDWIDTH

LIMIT

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

Test Configuration



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted

Test Data

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	39.2667
Mid	5220	37
High	5240	37

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	23.2
Mid	5220	23.4
High	5240	23.3333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5180	39.2666
Mid	5220	39.8
High	5240	39.8

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	41.4
High	5230	41.4

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5190	60
High	5230	60

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	37.0667
Mid	5280	36.2667
High	5320	36.2667

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	23.2
Mid	5280	23.4666
High	5320	23.2

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5260	39.8
Mid	5280	39.7333
High	5320	39.5333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	41.2
High	5310	41.2

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5270	60
High	5310	60

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	37.0667
Mid	5580	36.3333
High	5700	35.4

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	23.8667
Mid	5580	30.8
High	5700	23.7333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	39.5333
Mid	5580	39.6
High	5700	38.5333

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	41.3
Mid	5590	44.7
High	5670	54.4

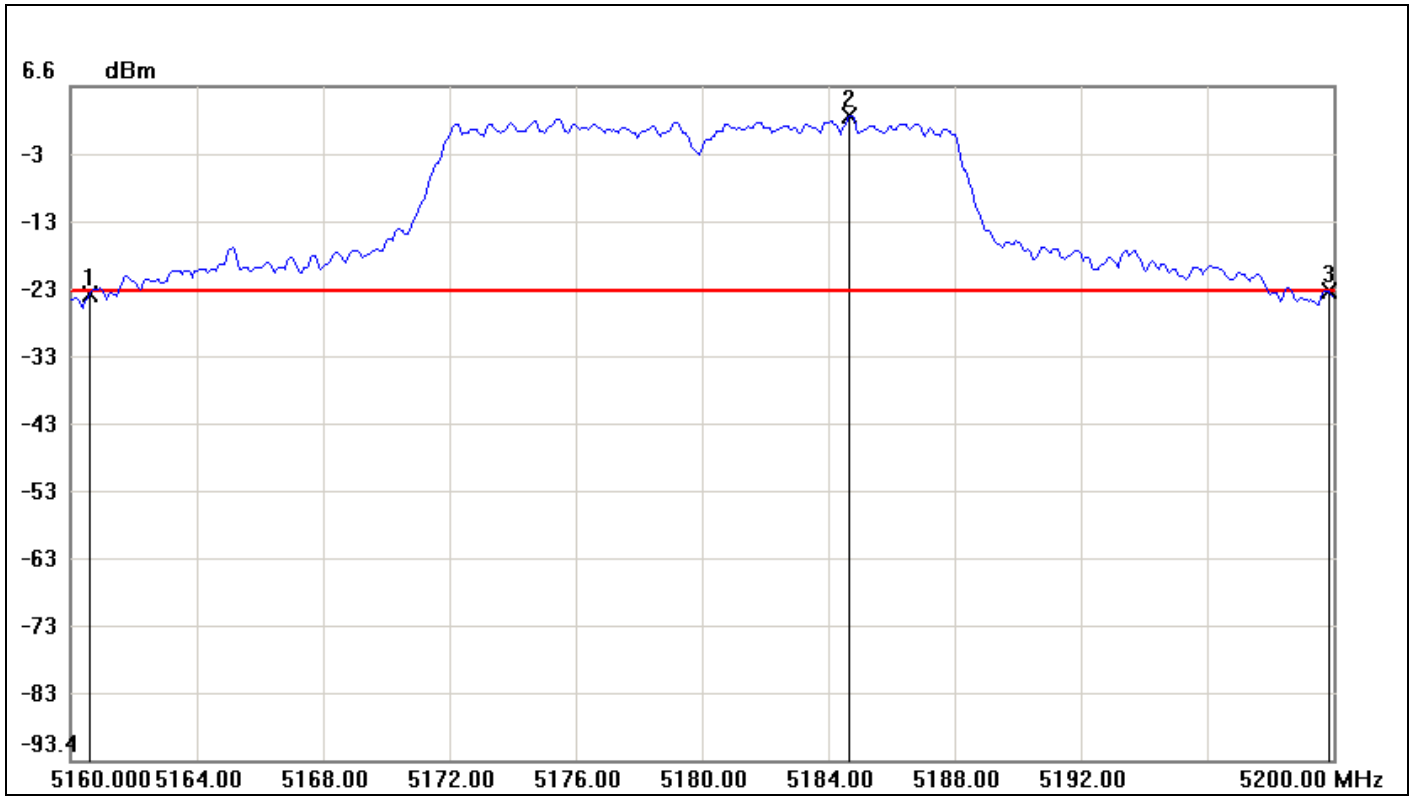
Test mode: IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	60
Mid	5590	60
High	5670	60

Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

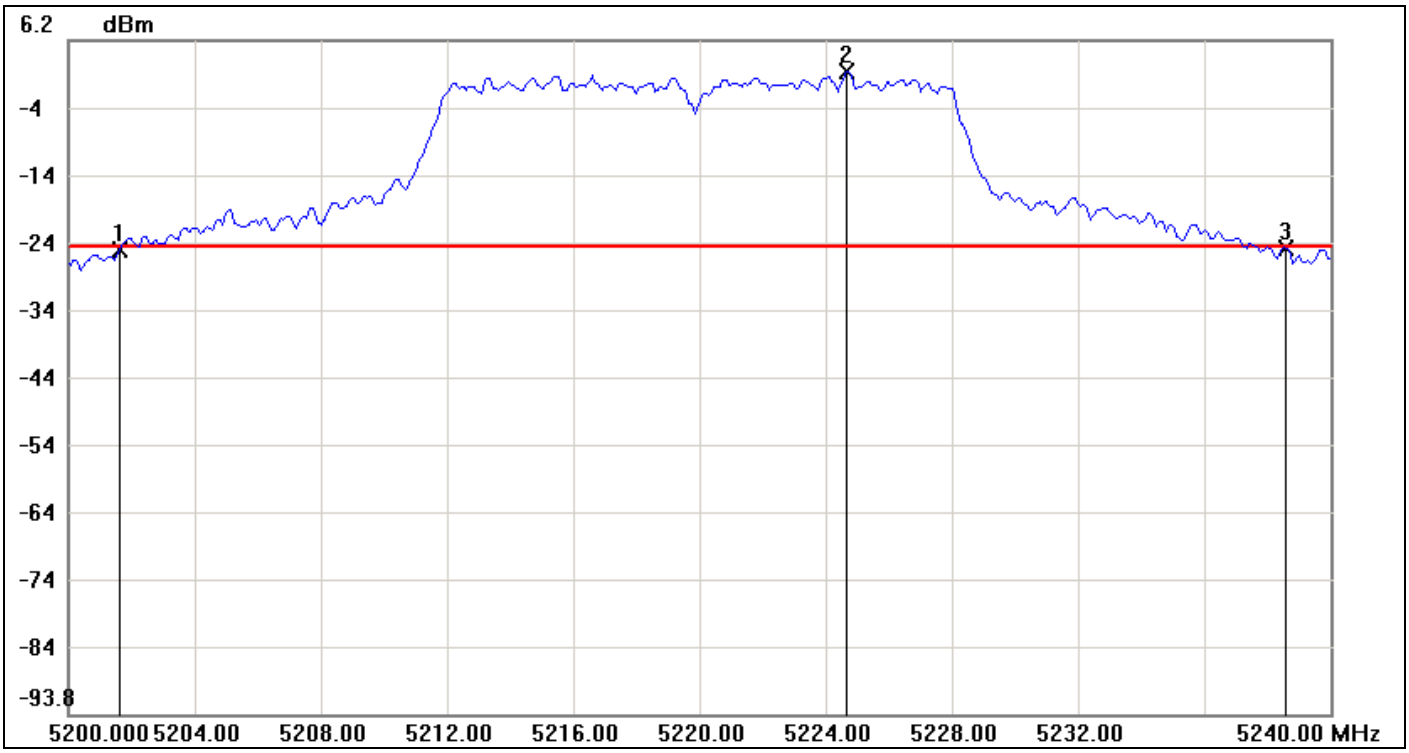
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5160.6000	-24.20	-23.88	-0.32
2	5184.6667	2.12	-23.88	26.00
3	5199.8667	-23.91	-23.88	-0.03

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.2667	0.29

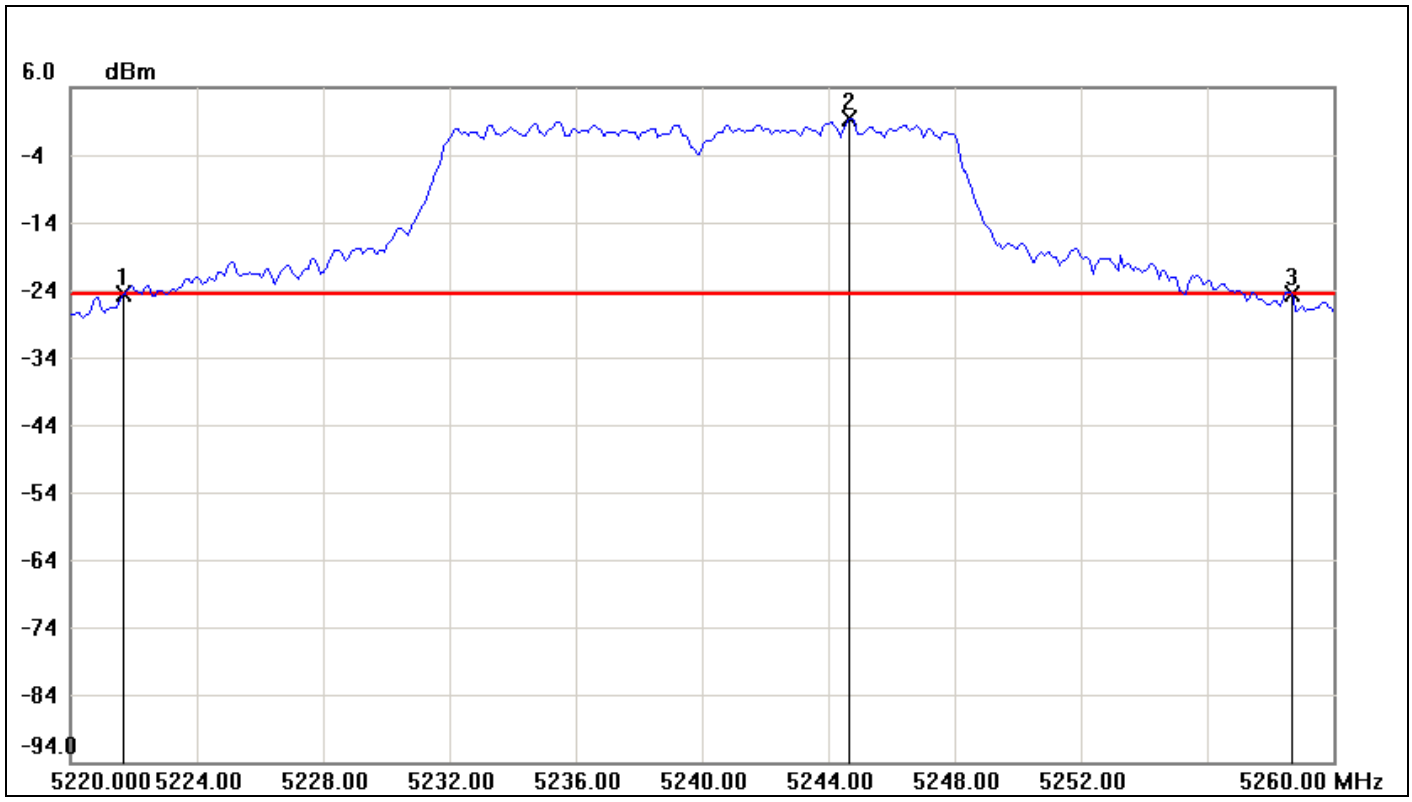
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5201.6000	-24.88	-24.58	-0.30
2	5224.6667	1.42	-24.58	26.00
3	5238.6000	-24.66	-24.58	-0.08

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	37	0.22

CH High

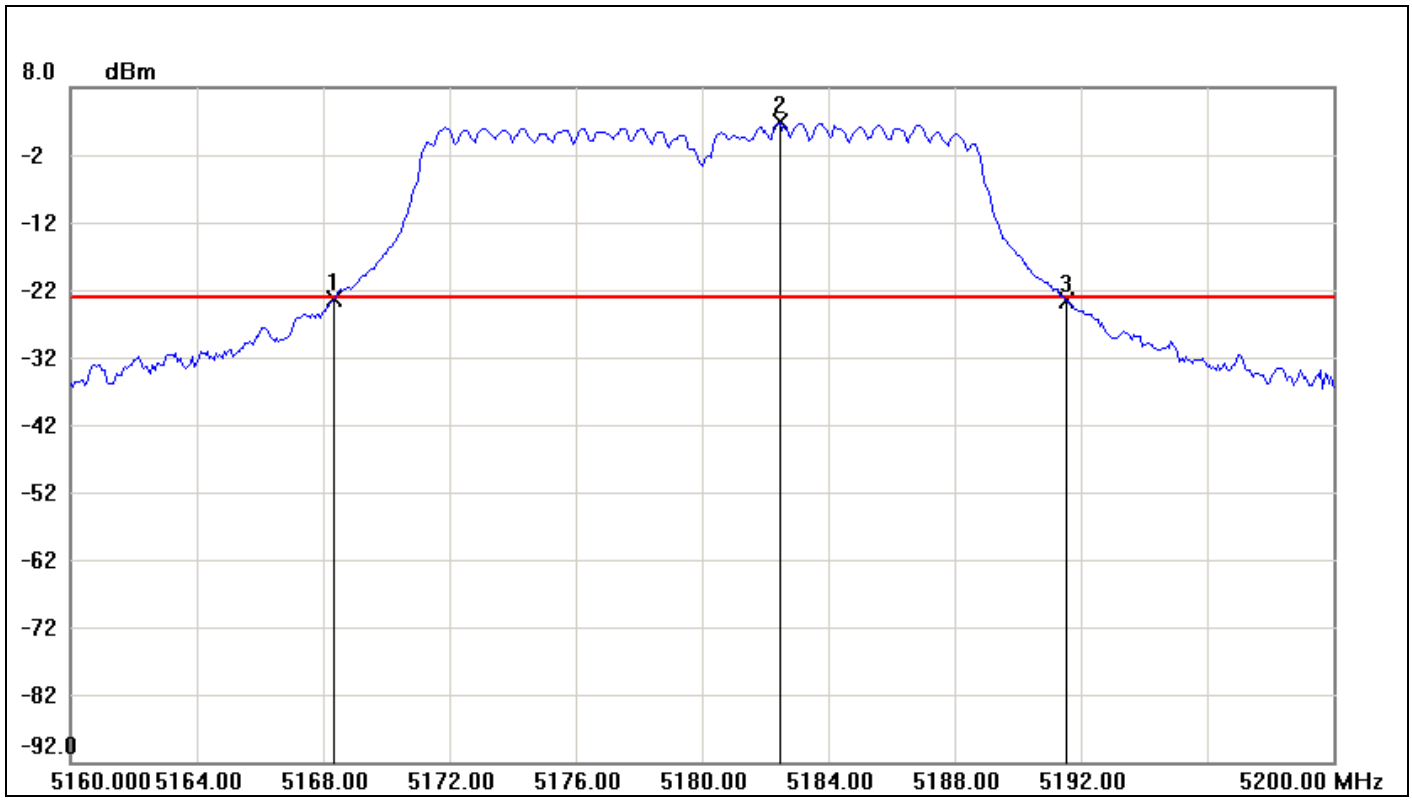


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5221.6667	-24.71	-24.60	-0.11
2	5244.6667	1.40	-24.60	26.00
3	5258.6667	-24.67	-24.60	-0.07

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	37	0.04

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

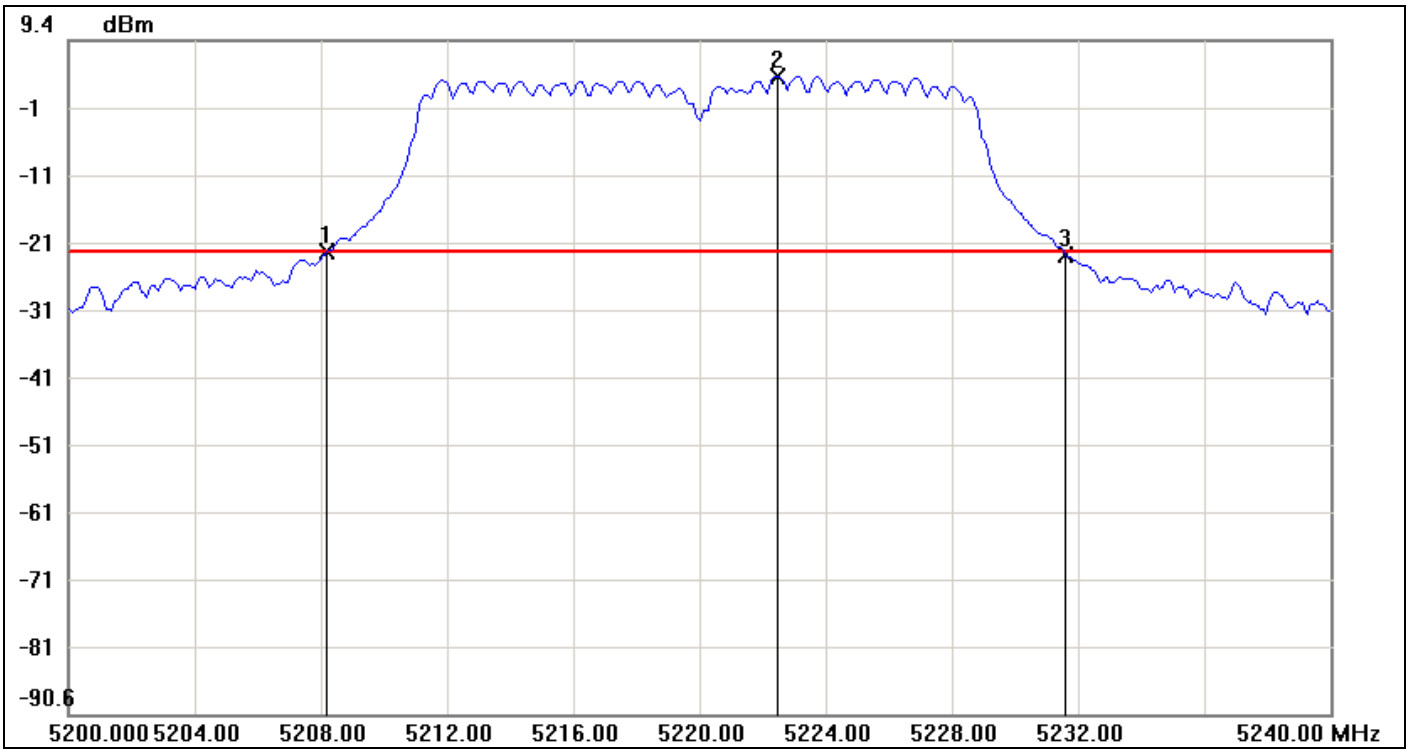
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5168.3333	-23.38	-23.25	-0.13
2	5182.4667	2.75	-23.25	26.00
3	5191.5333	-23.53	-23.25	-0.28

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.2	-0.15

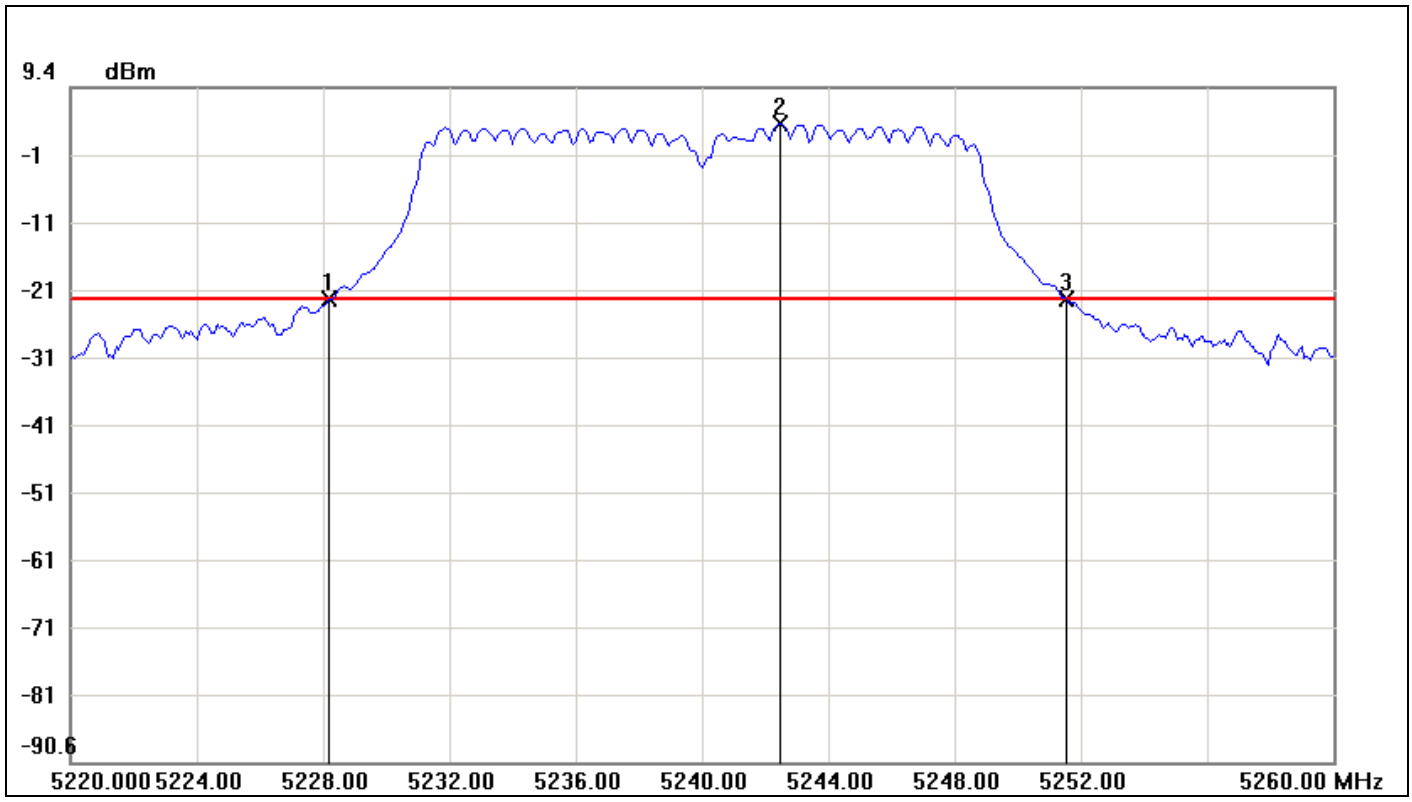
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5208.2000	-22.03	-21.86	-0.17
2	5222.4667	4.14	-21.86	26.00
3	5231.6000	-22.38	-21.86	-0.52

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.4	-0.35

CH High

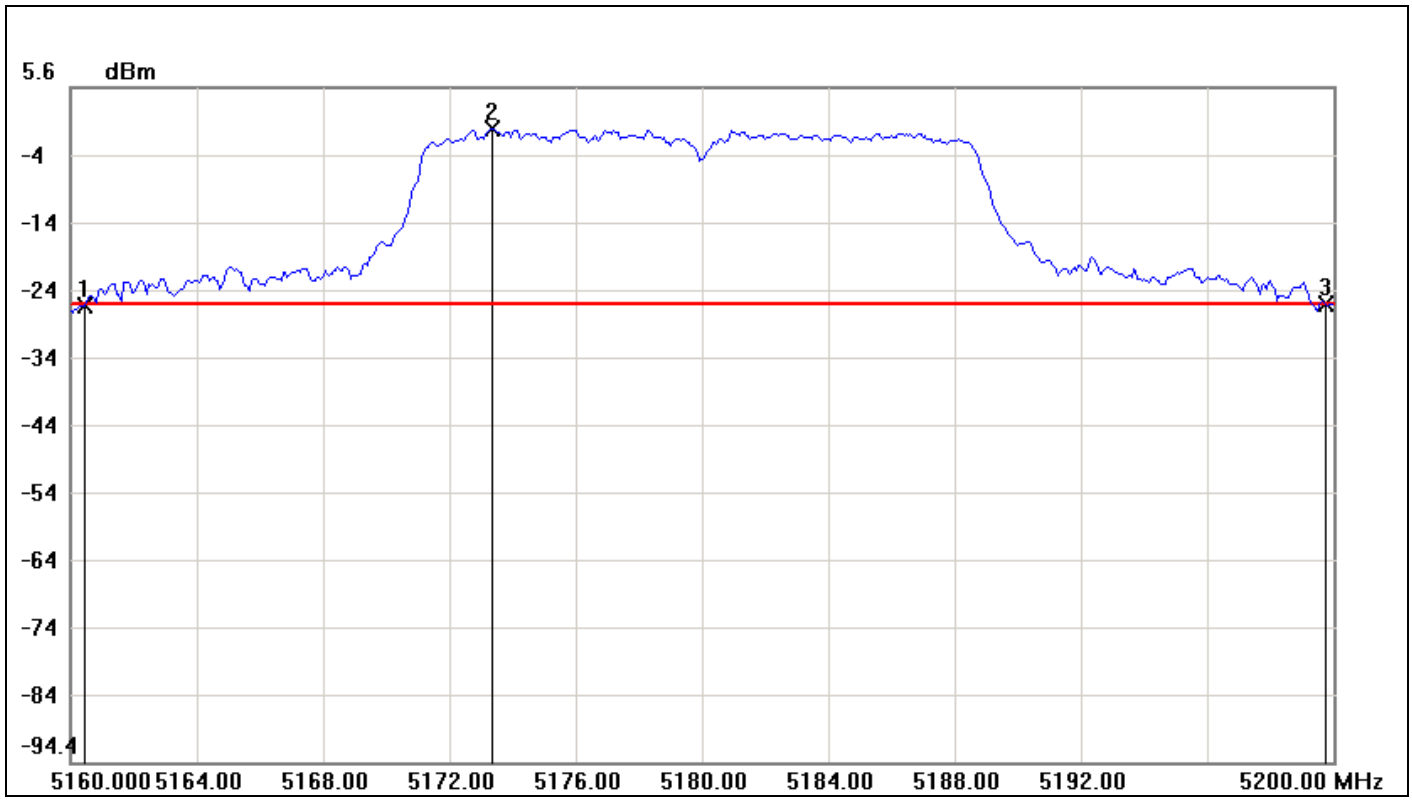


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5228.2000	-22.09	-21.97	-0.12
2	5242.4667	4.03	-21.97	26.00
3	5251.5333	-22.11	-21.97	-0.14

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.3333	-0.02

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

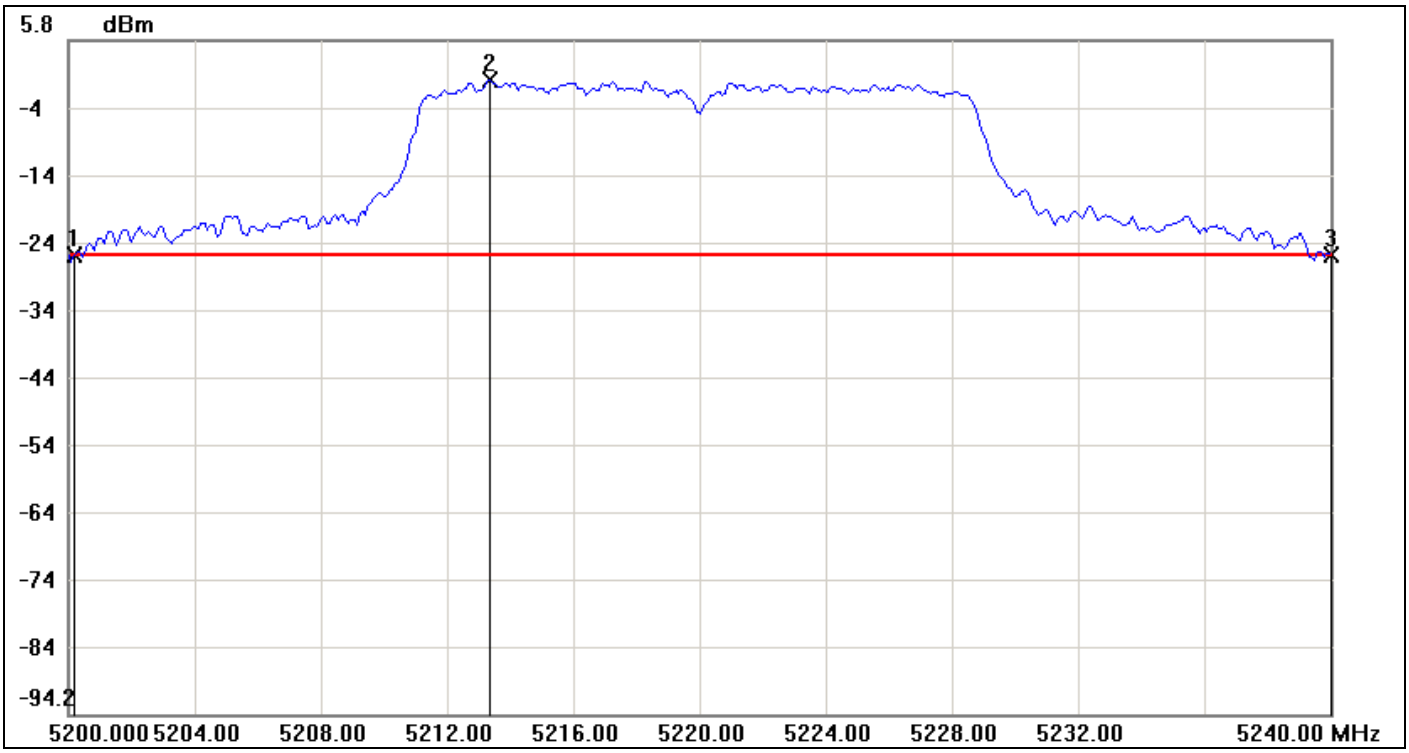
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5160.4667	-26.63	-26.39	-0.24
2	5173.3333	-0.39	-26.39	26.00
3	5199.7333	-26.46	-26.39	-0.07

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.2666	0.17

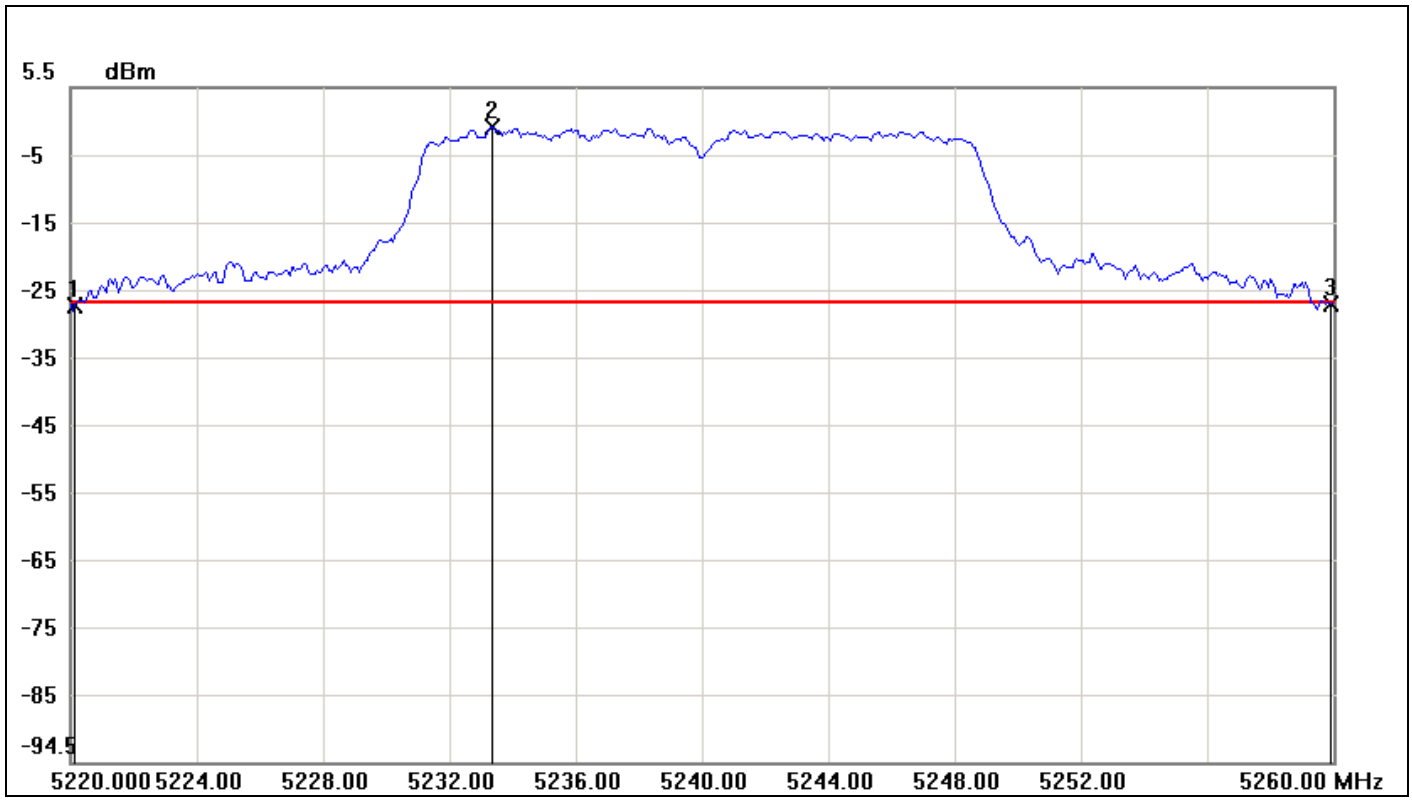
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5200.2000	-26.18	-26.18	0.00
2	5213.3333	-0.18	-26.18	26.00
3	5240.0000	-25.96	-26.18	0.22

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.8	0.22

CH High

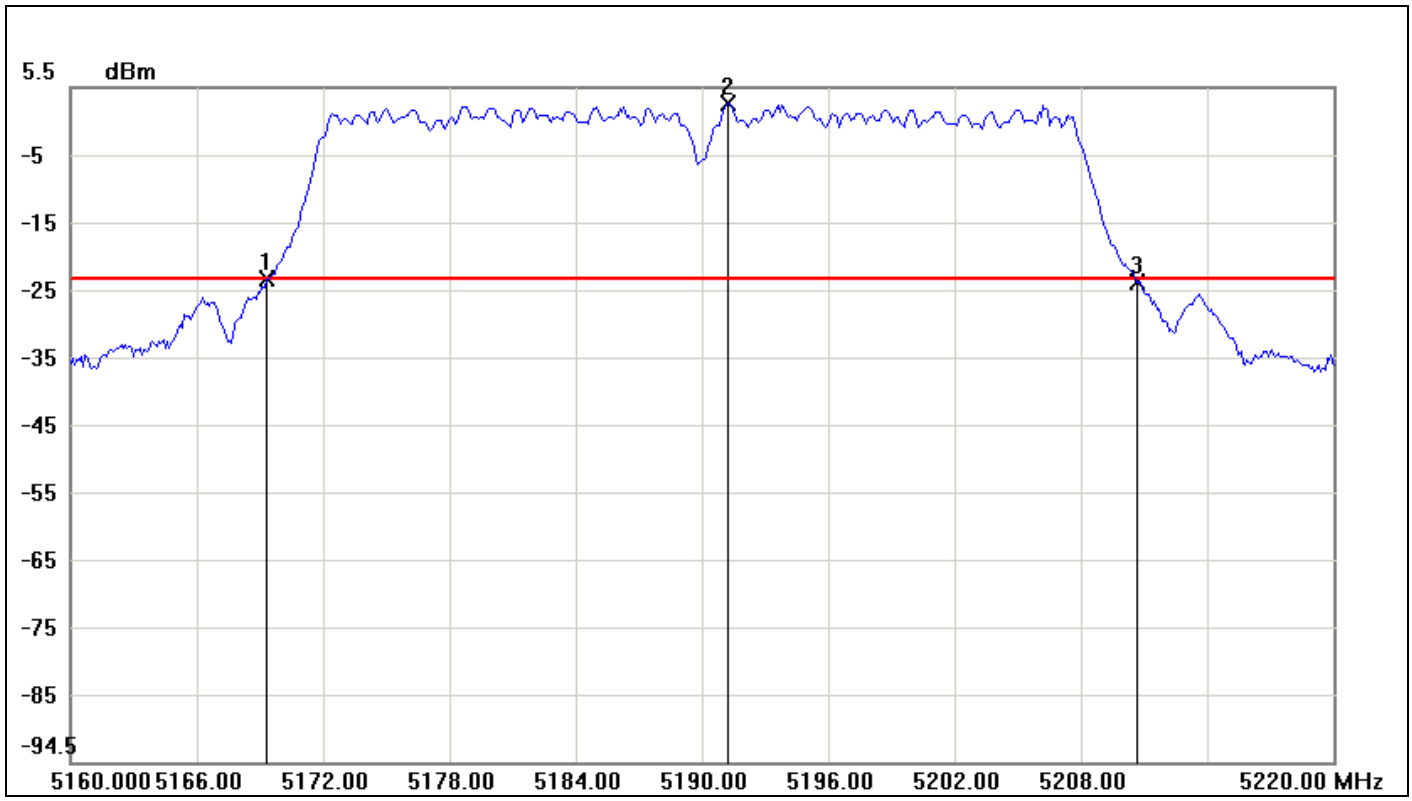


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5220.1333	-26.78	-26.48	-0.30
2	5233.3333	-0.48	-26.48	26.00
3	5259.9333	-26.62	-26.48	-0.14

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.8	0.16

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

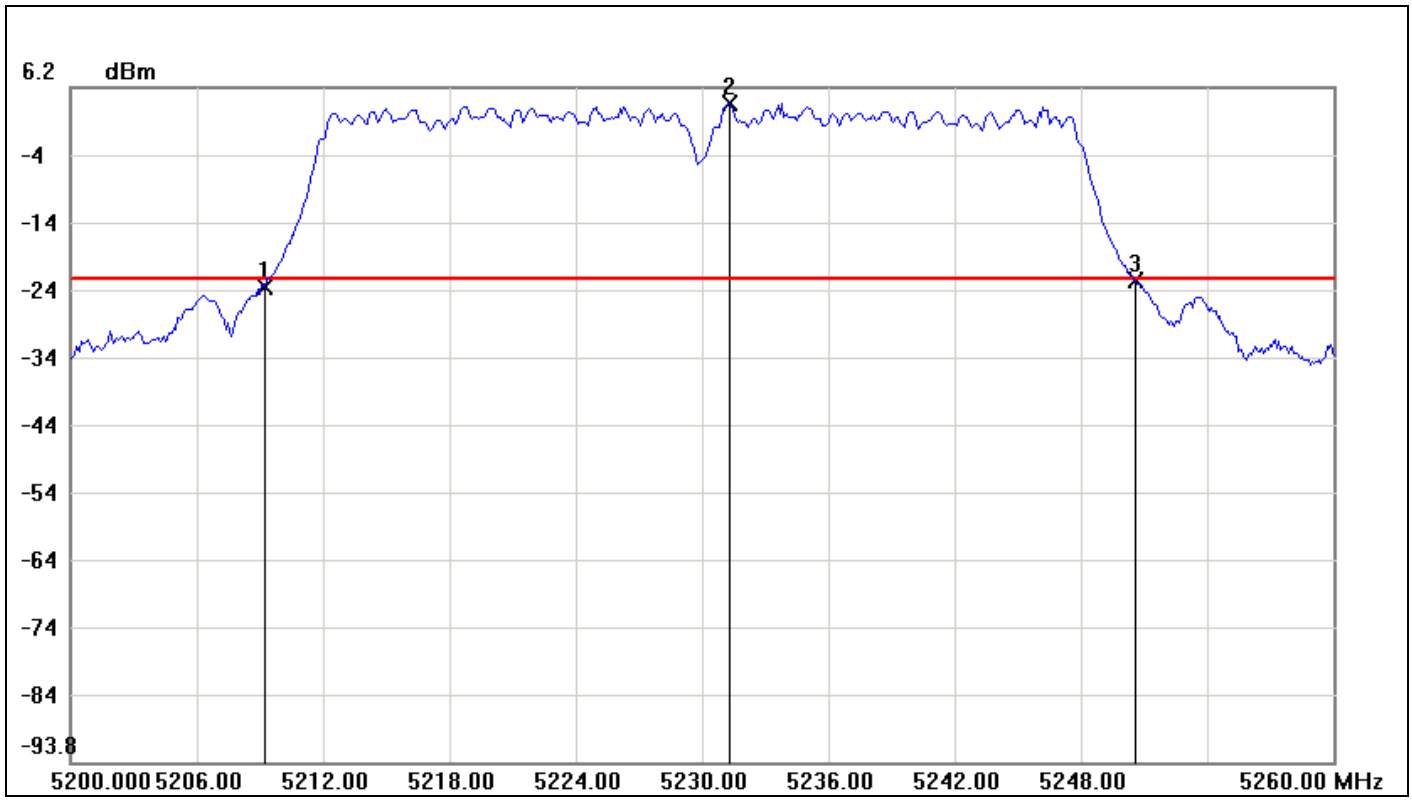
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5169.3000	-23.03	-22.90	-0.13
2	5191.2000	3.10	-22.90	26.00
3	5210.7000	-23.35	-22.90	-0.45

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	41.4	-0.32

CH High

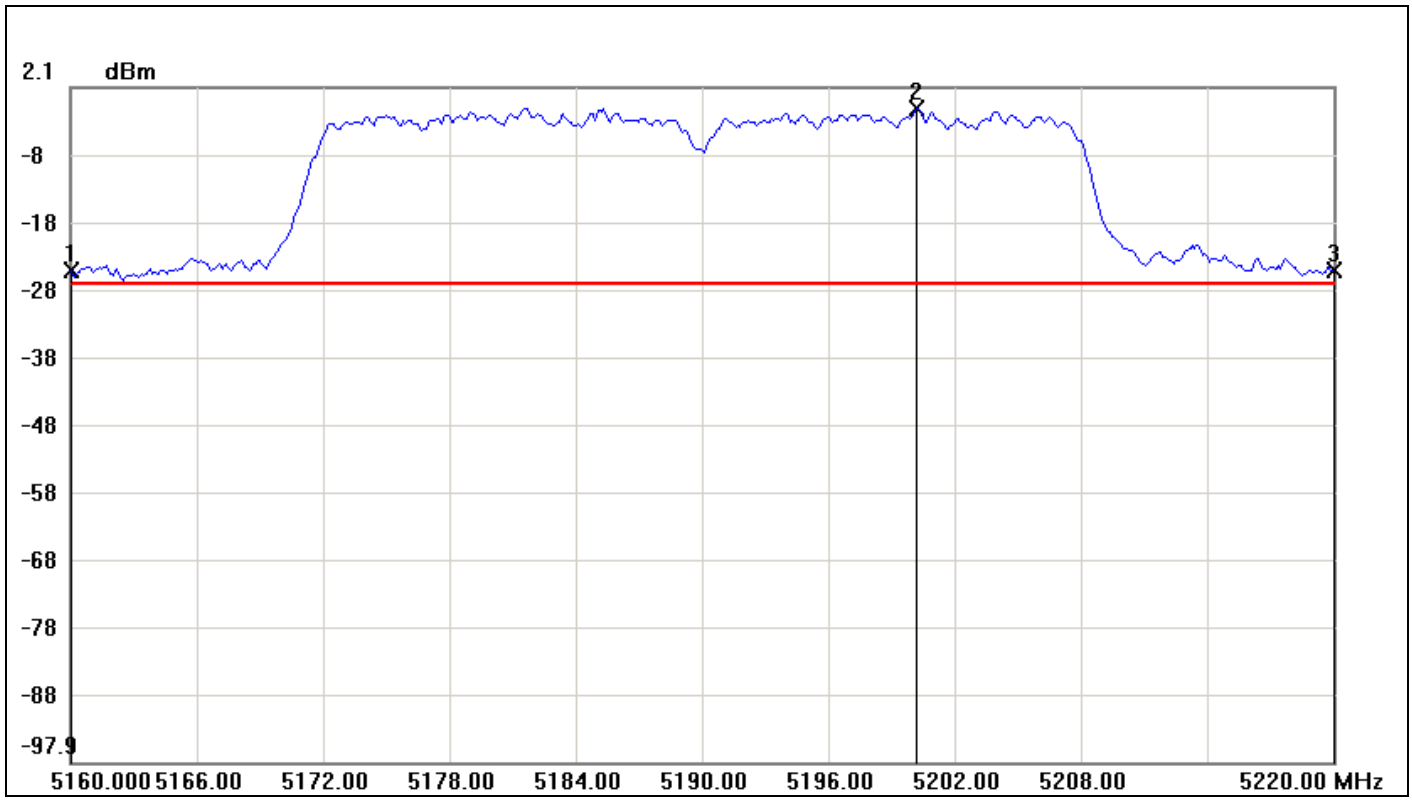


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5209.2000	-23.45	-22.20	-1.25
2	5231.3000	3.80	-22.20	26.00
3	5250.6000	-22.34	-22.20	-0.14

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	41.4	1.11

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

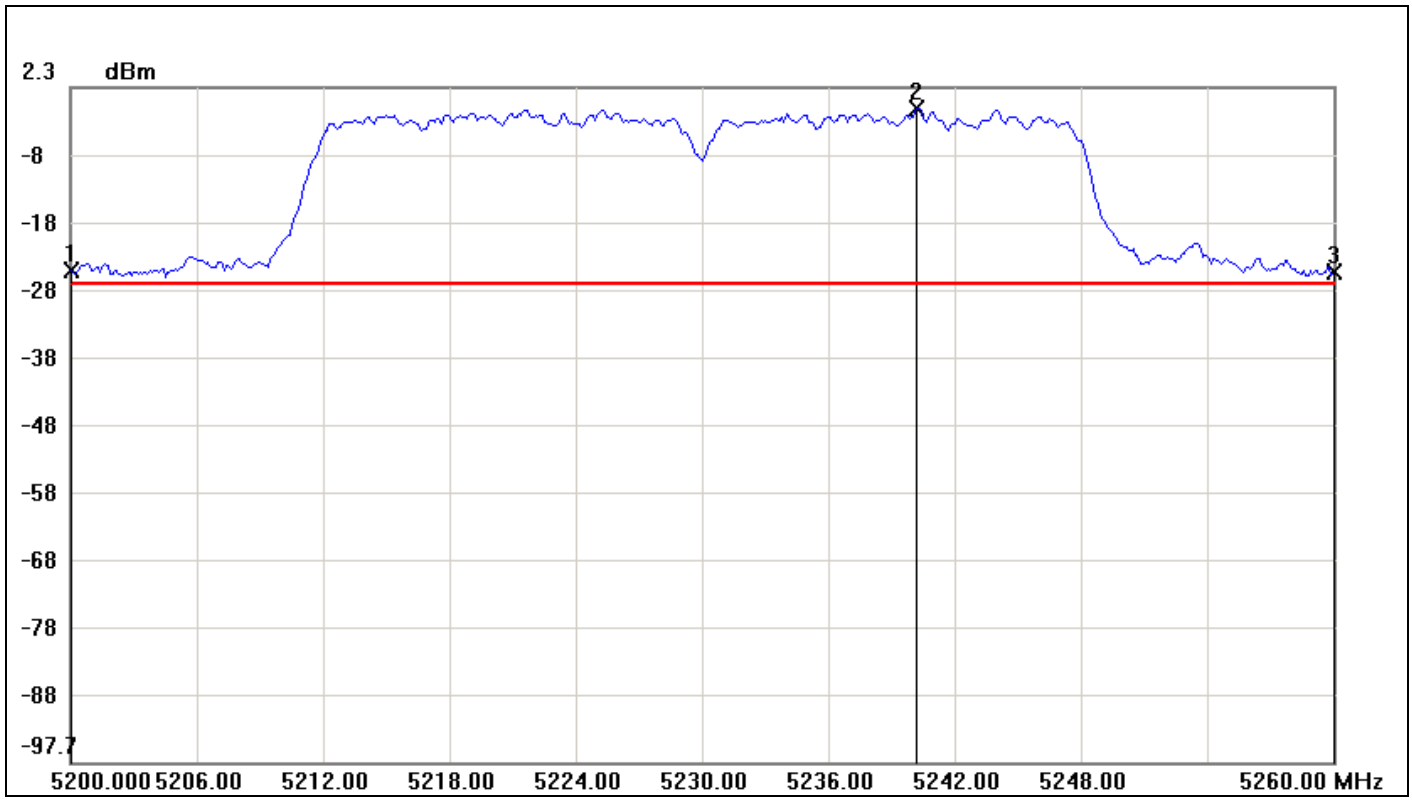
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5160.0000	-25.11	-26.98	1.87
2	5200.2000	-0.98	-26.98	26.00
3	5220.0000	-24.98	-26.98	2.00

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	0.13

CH High

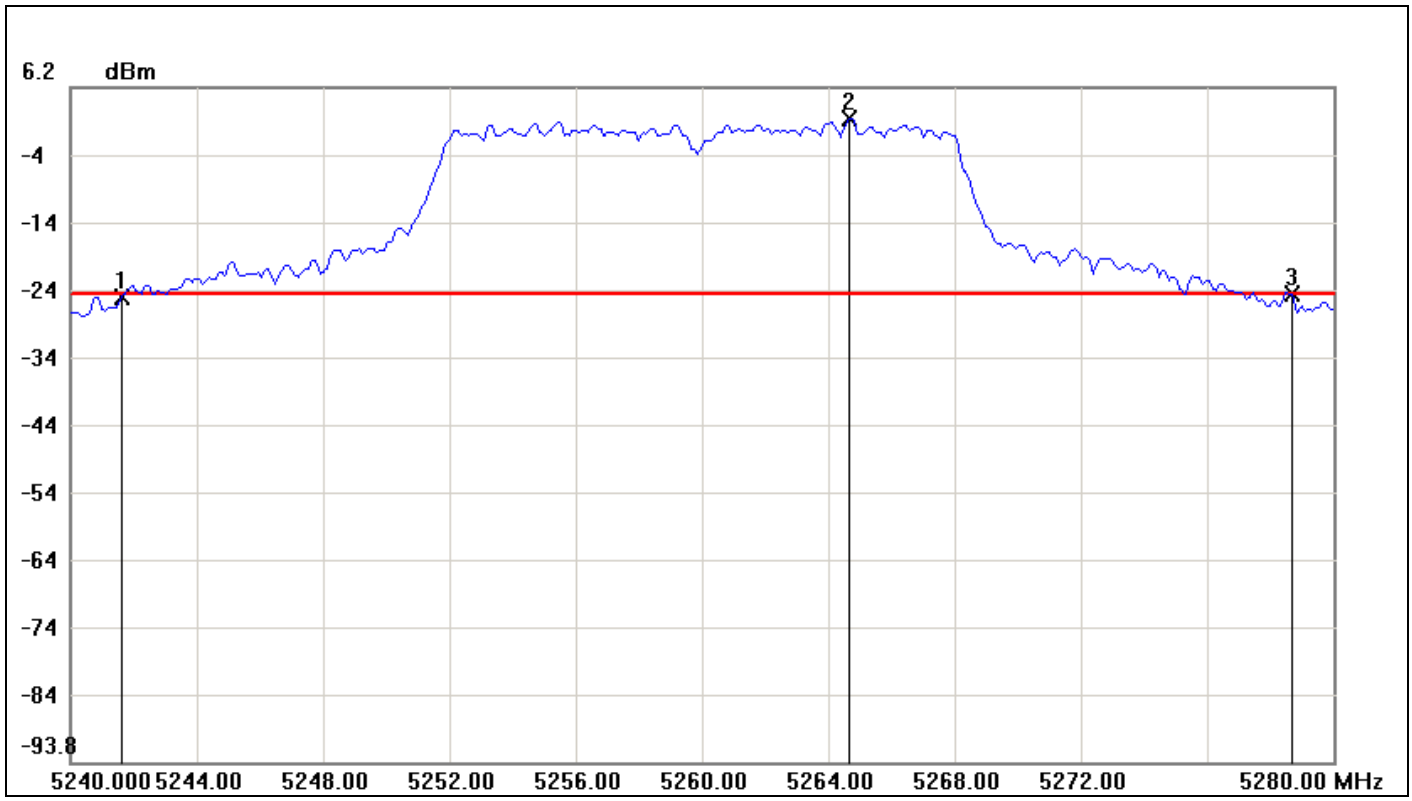


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5200.0000	-24.87	-26.81	1.94
2	5240.2000	-0.81	-26.81	26.00
3	5260.0000	-25.03	-26.81	1.78

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-0.16

IEEE 802.11a mode / 5260 ~ 5320MHz

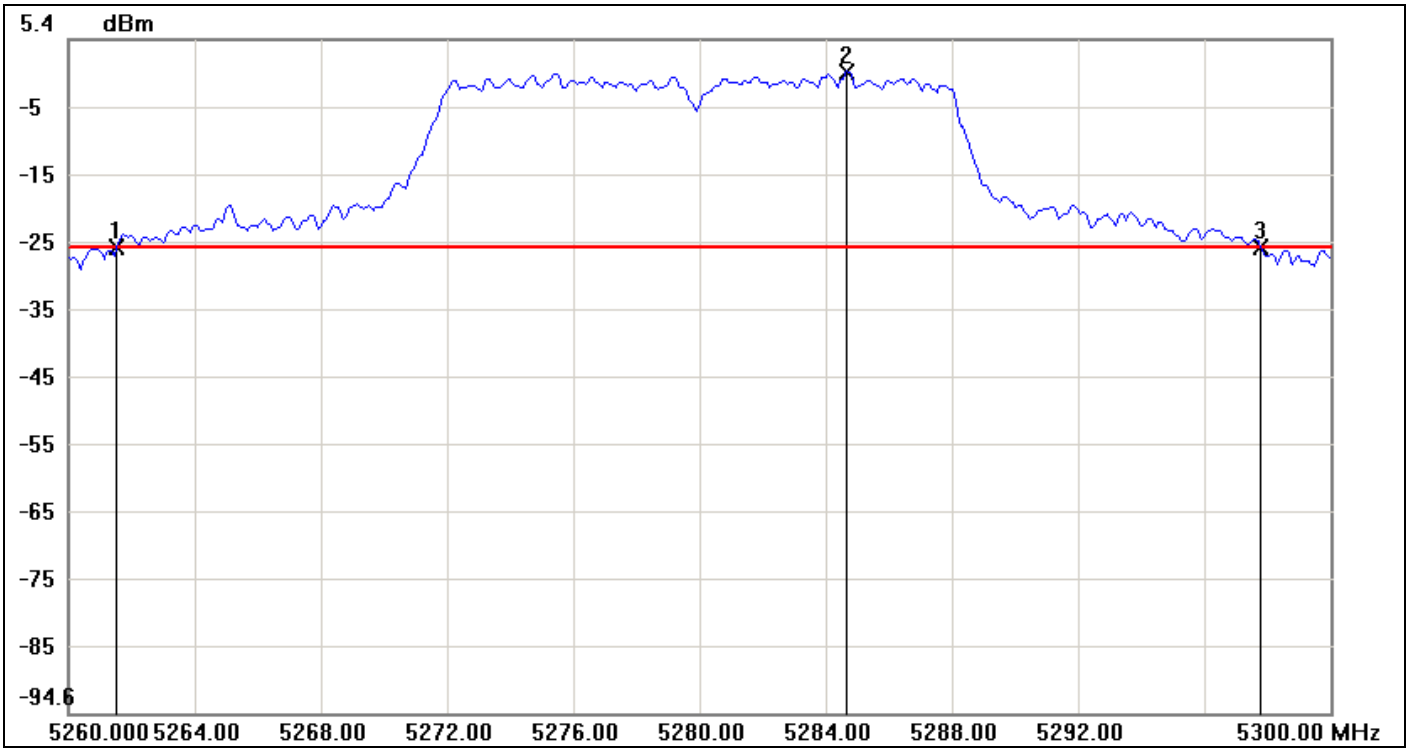
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5241.6000	-24.85	-24.44	-0.41
2	5264.6667	1.56	-24.44	26.00
3	5278.6667	-24.45	-24.44	-0.01

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	37.0667	0.4

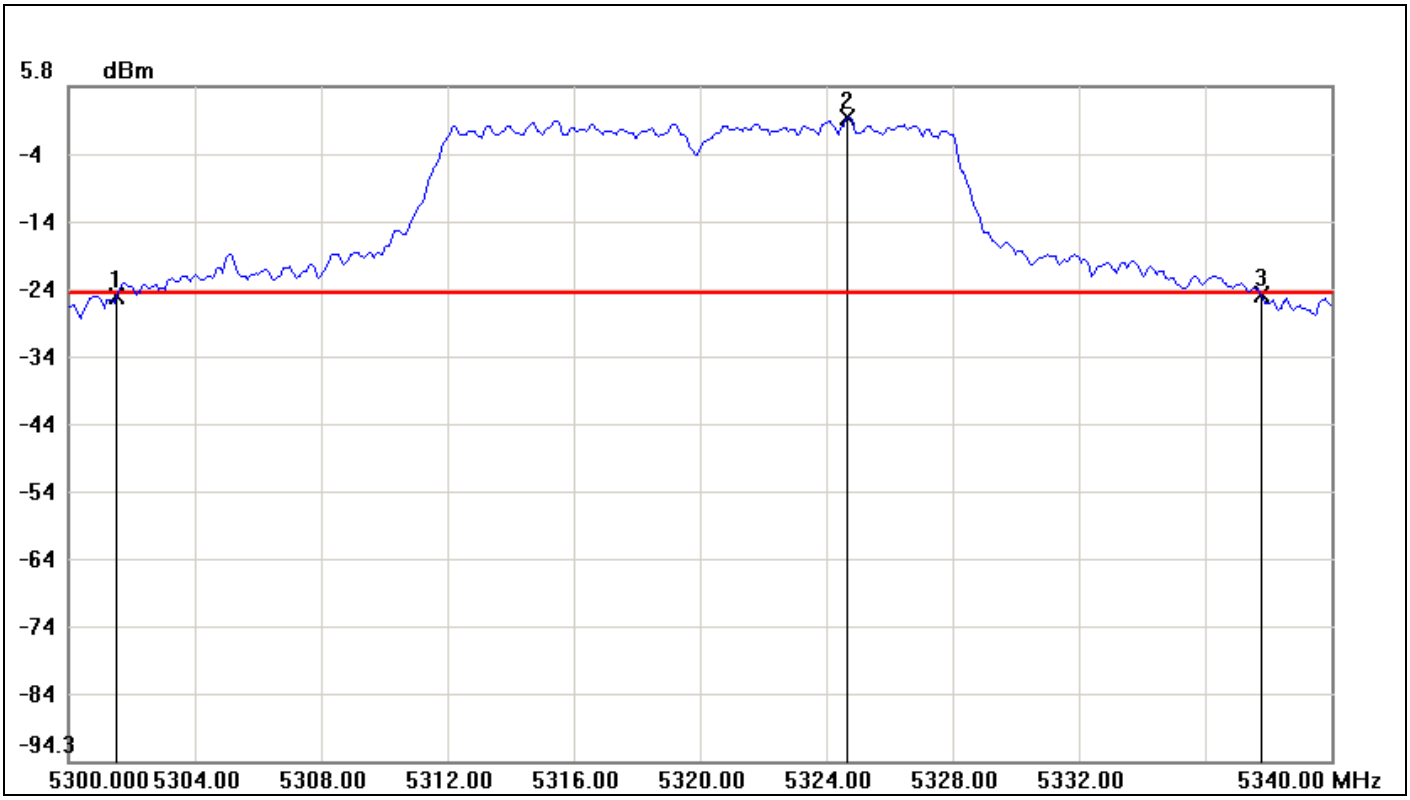
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5261.5333	-25.49	-25.31	-0.18
2	5284.6667	0.69	-25.31	26.00
3	5297.8000	-25.38	-25.31	-0.07

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	36.2667	0.11

CH High

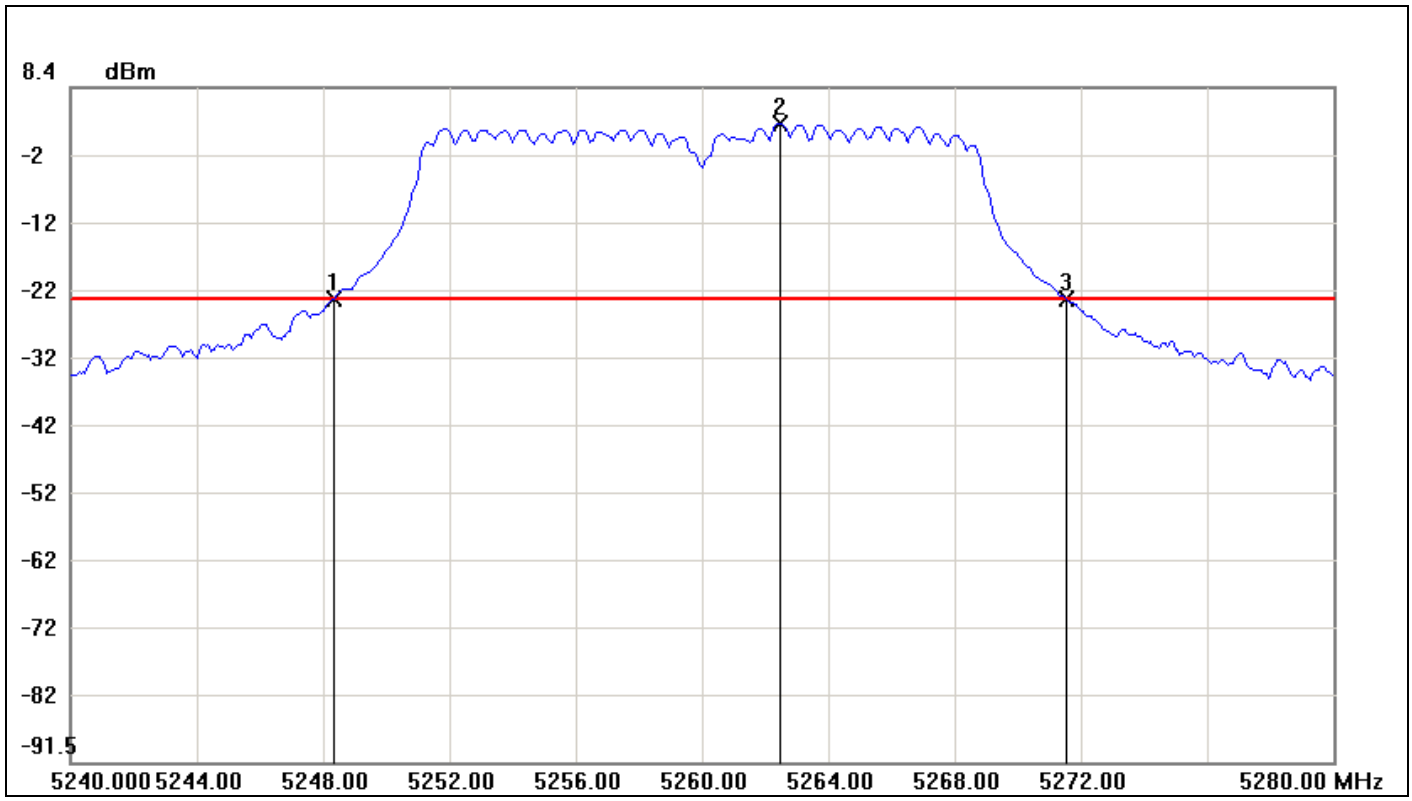


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5301.5333	-25.46	-24.87	-0.59
2	5324.6667	1.13	-24.87	26.00
3	5337.8000	-25.14	-24.87	-0.27

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	36.2667	0.32

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

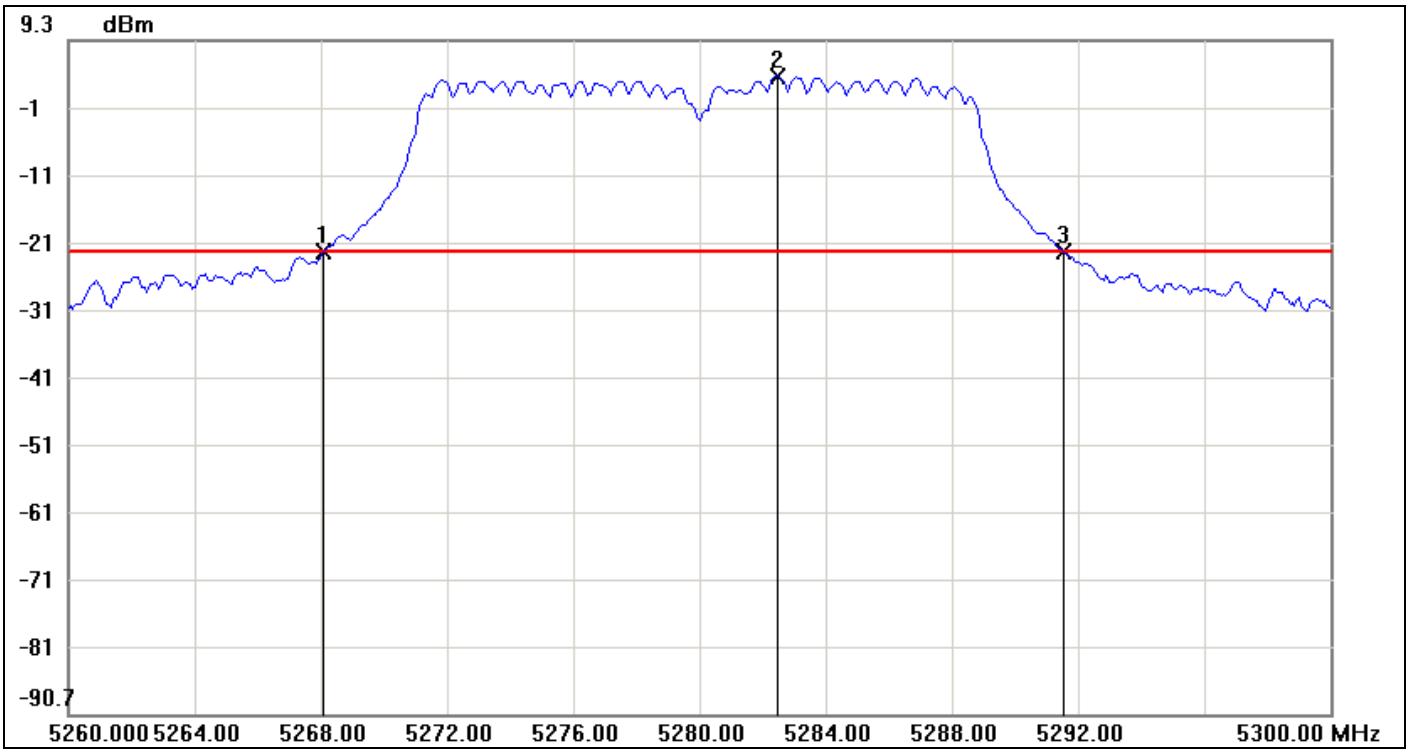
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5248.3333	-23.02	-22.98	-0.04
2	5262.4667	3.02	-22.98	26.00
3	5271.5333	-23.02	-22.98	-0.04

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.2	0

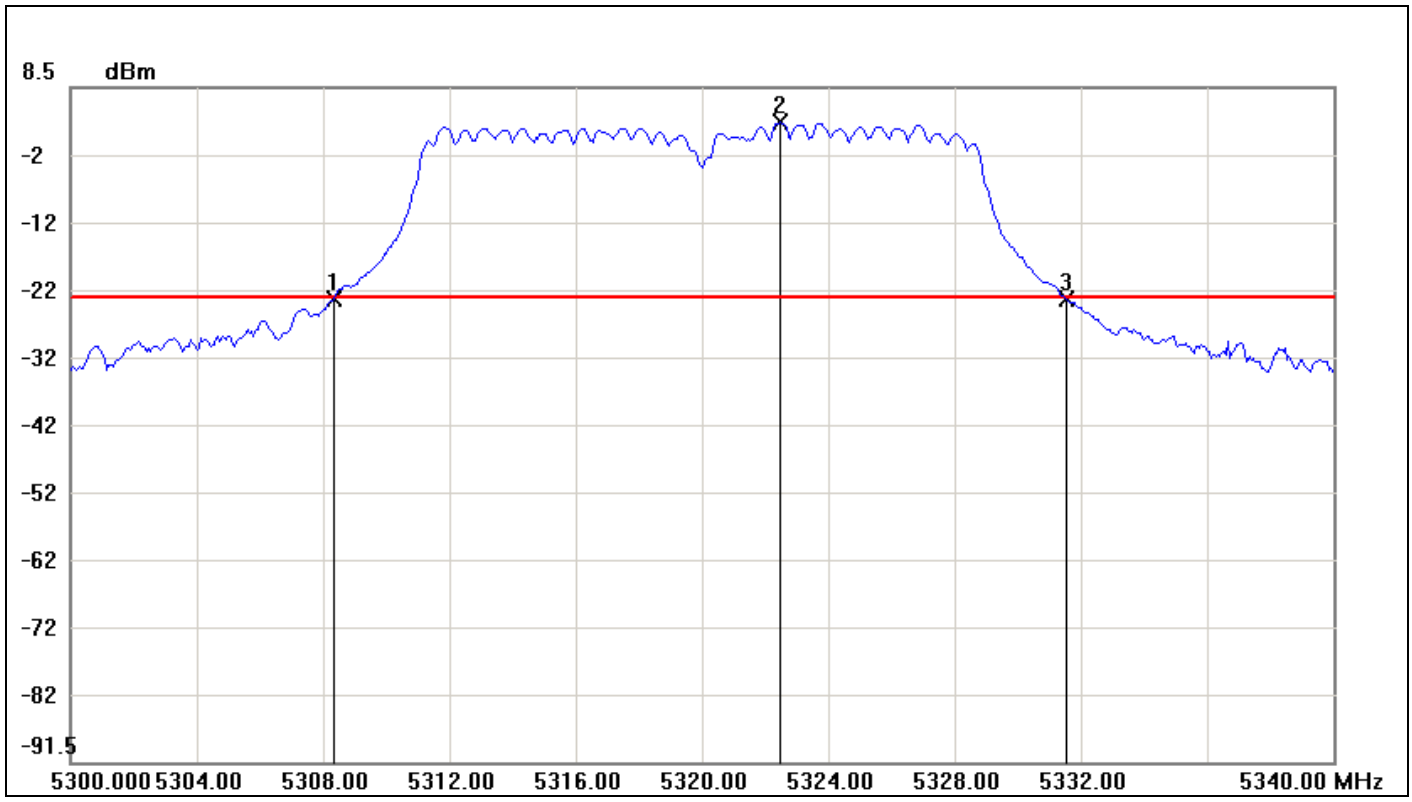
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5268.0667	-22.14	-21.95	-0.19
2	5282.4667	4.05	-21.95	26.00
3	5291.5333	-22.06	-21.95	-0.11

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.4666	0.08

CH High

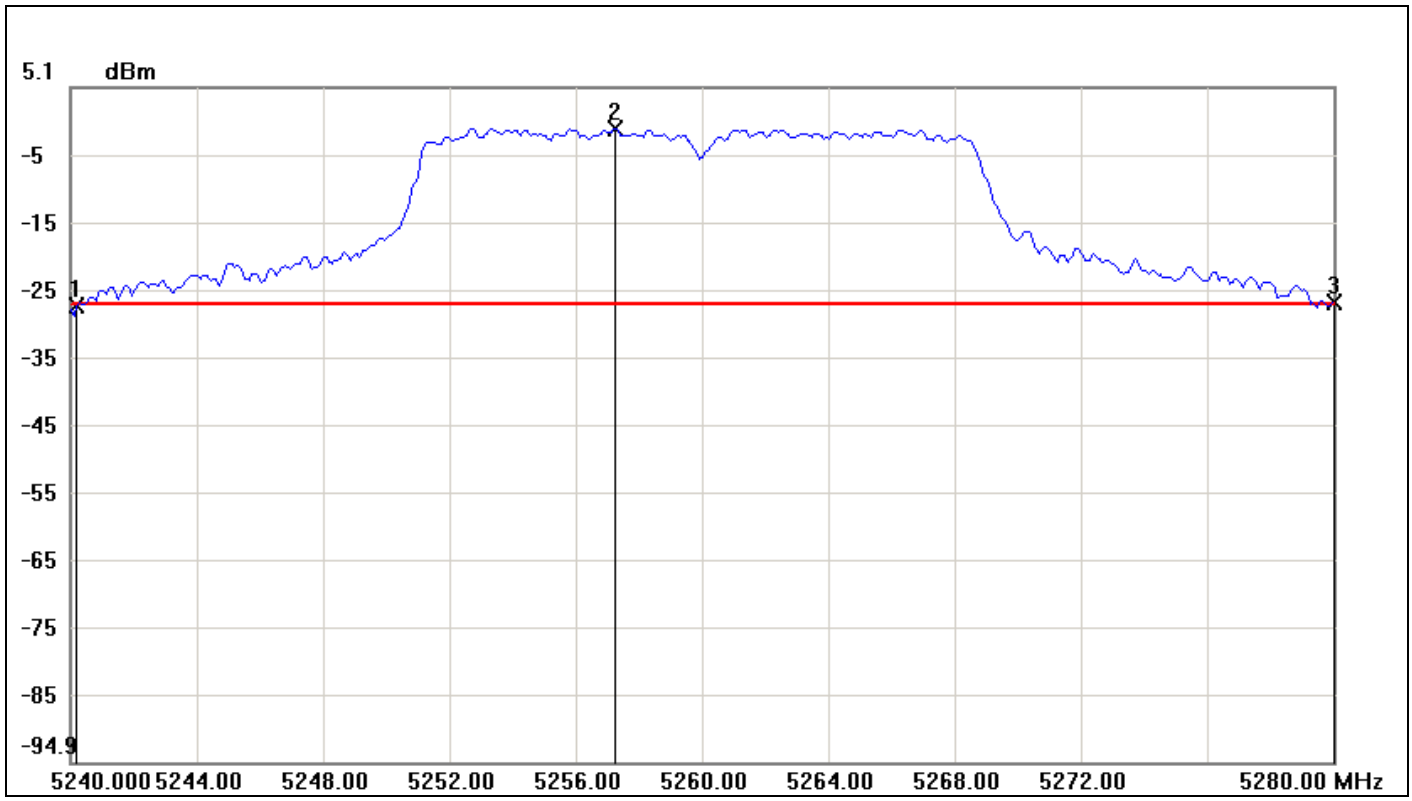


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5308.3333	-22.88	-22.77	-0.11
2	5322.4667	3.23	-22.77	26.00
3	5331.5333	-22.82	-22.77	-0.05

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.2	0.06

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

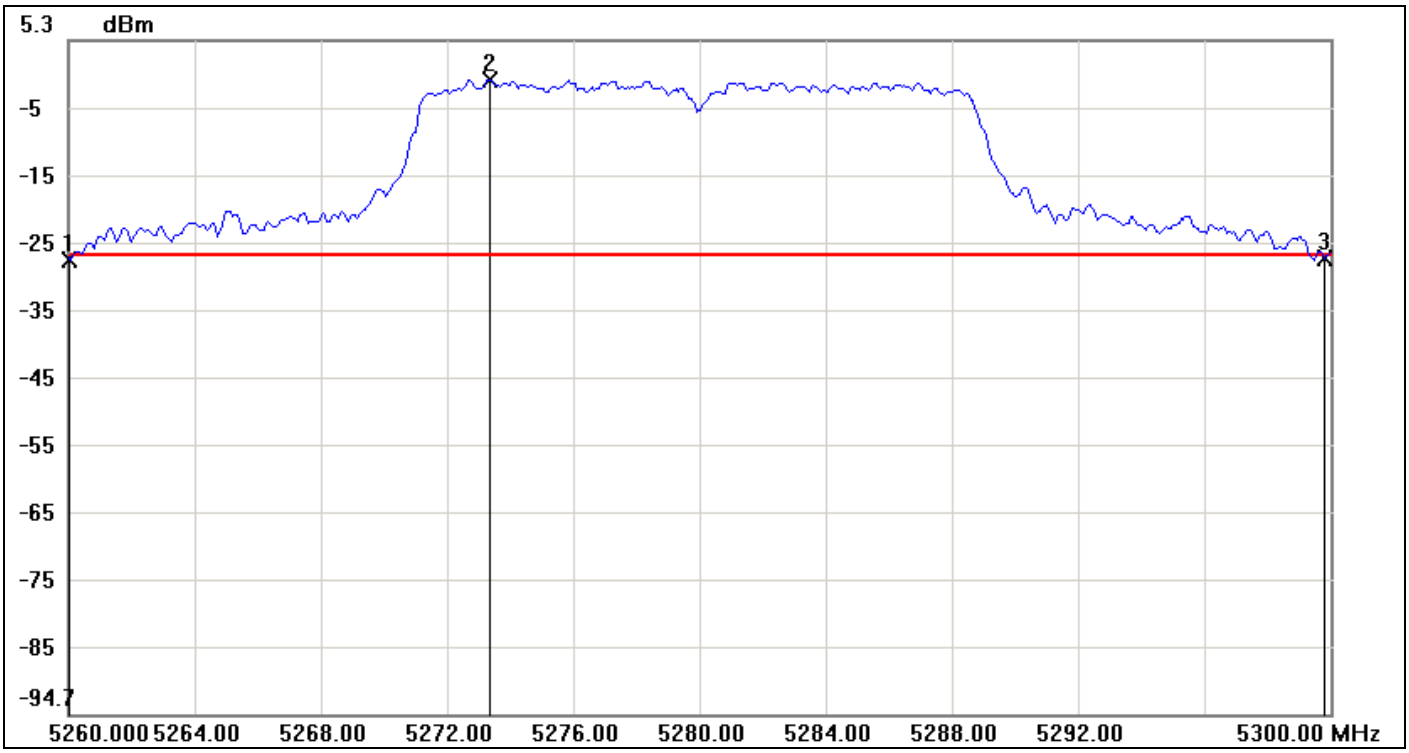
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5240.2000	-27.31	-27.07	-0.24
2	5257.2667	-1.07	-27.07	26.00
3	5280.0000	-26.89	-27.07	0.18

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.8	0.42

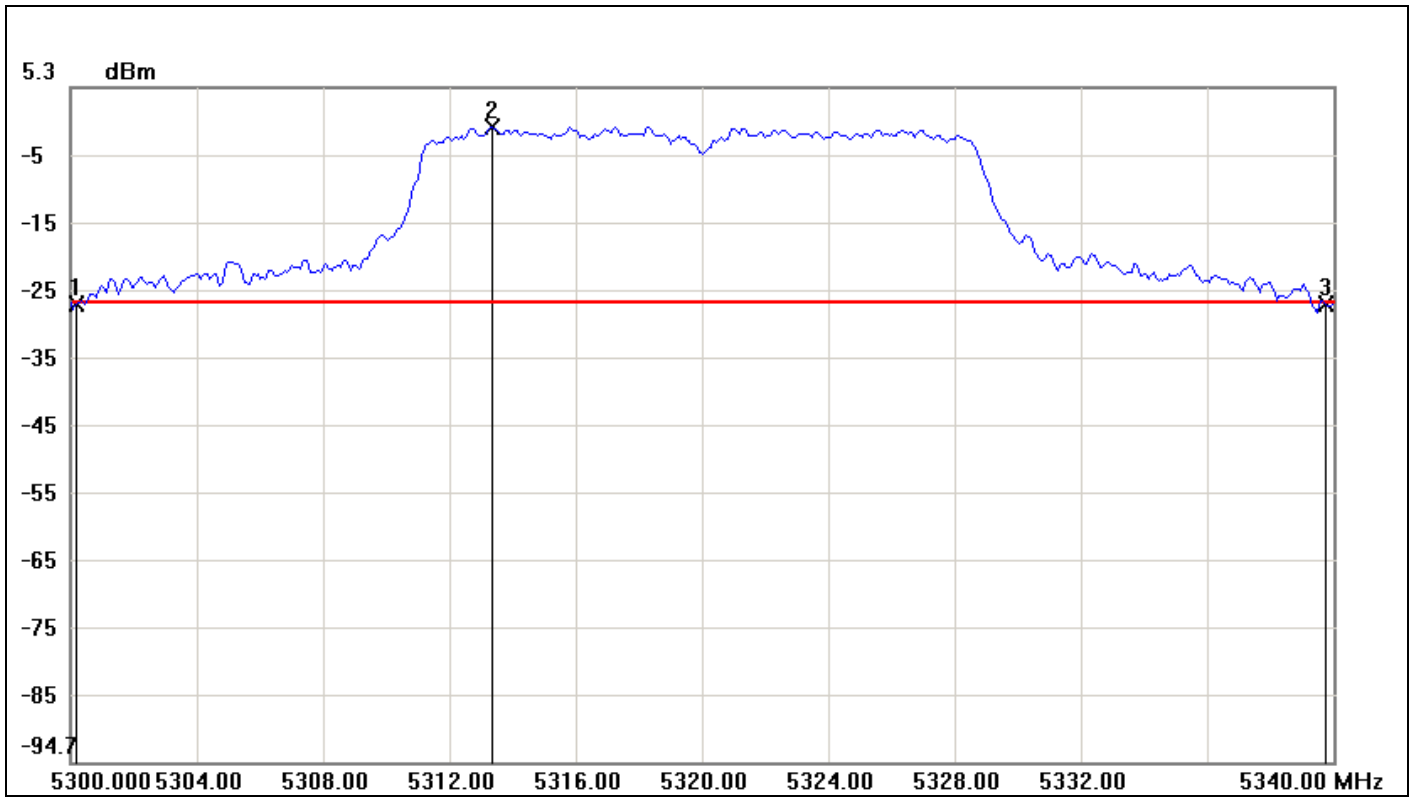
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5260.0667	-27.22	-26.50	-0.72
2	5273.3333	-0.50	-26.50	26.00
3	5299.8000	-27.05	-26.50	-0.55

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.7333	0.17

CH High

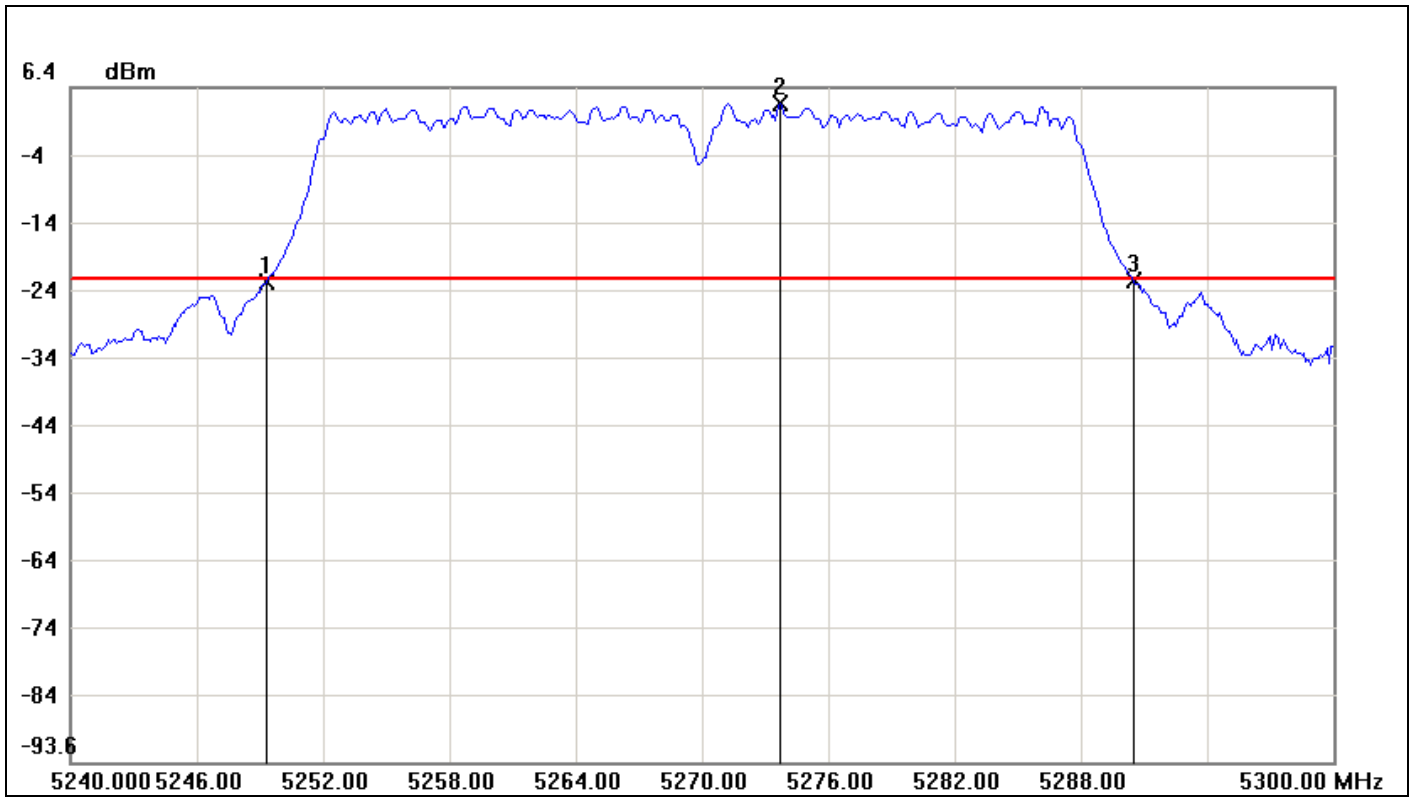


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5300.2000	-26.85	-26.57	-0.28
2	5313.3333	-0.57	-26.57	26.00
3	5339.7333	-26.80	-26.57	-0.23

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.5333	0.05

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

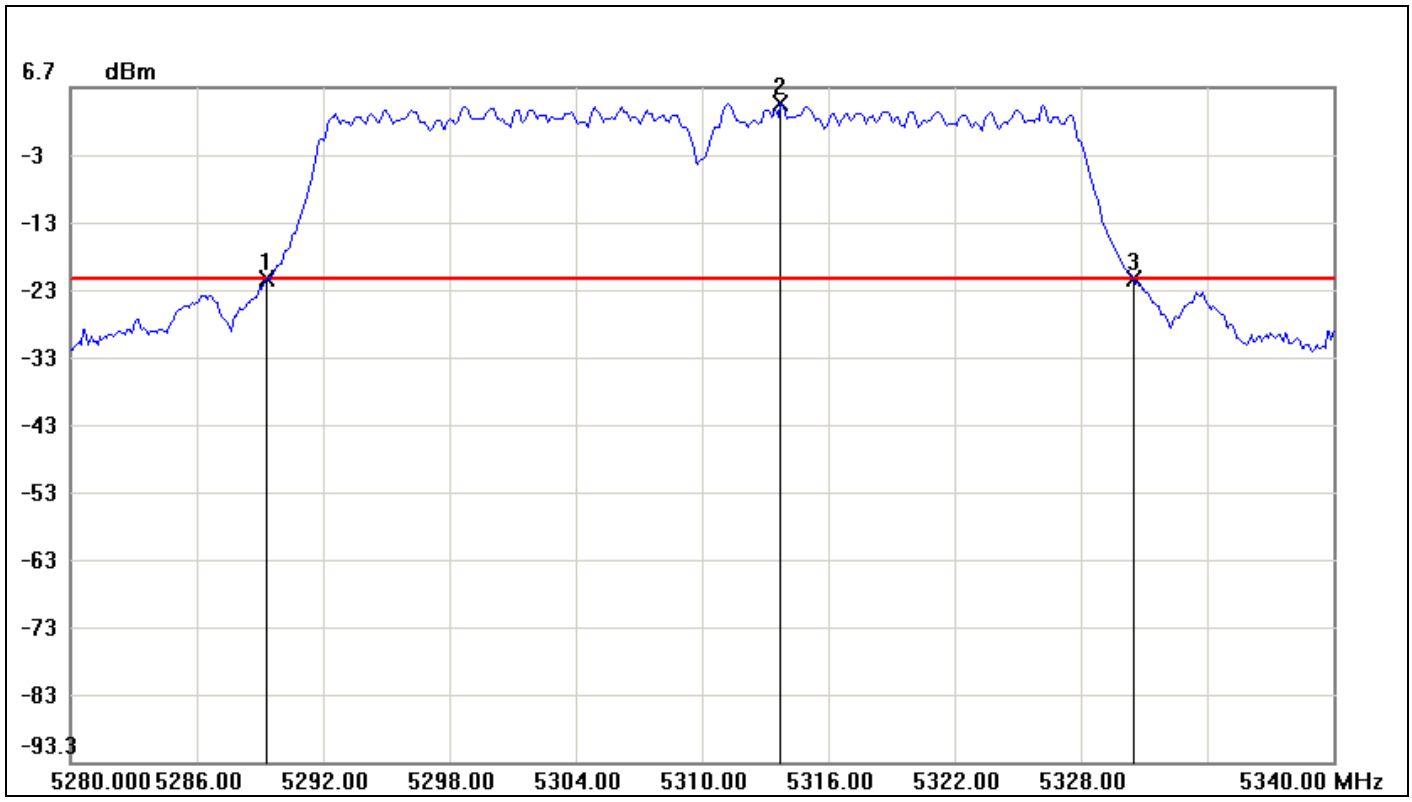
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5249.3000	-22.41	-22.06	-0.35
2	5273.7000	3.94	-22.06	26.00
3	5290.5000	-22.27	-22.06	-0.21

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	41.2	0.14

CH High

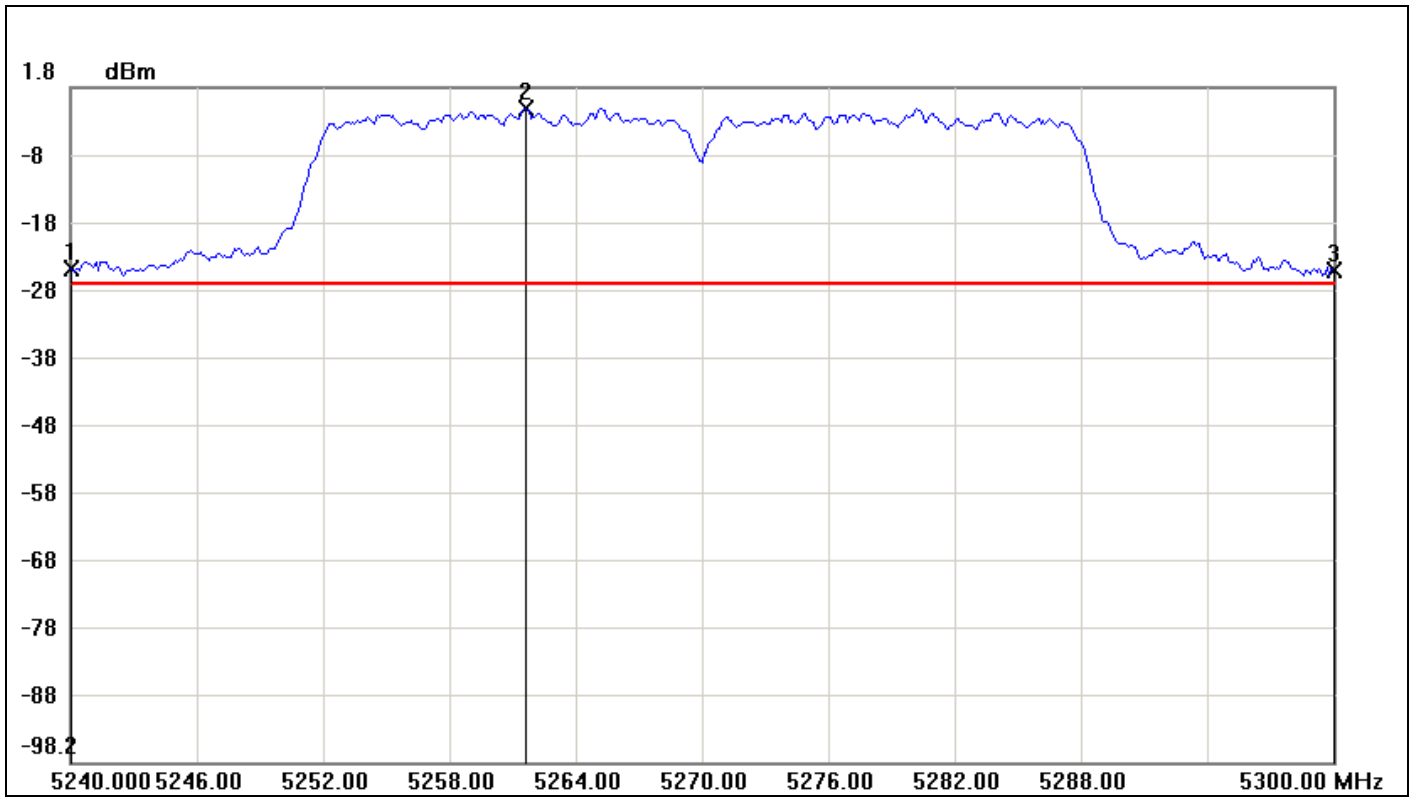


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5289.3000	-21.74	-21.72	-0.02
2	5313.7000	4.28	-21.72	26.00
3	5330.5000	-21.76	-21.72	-0.04

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	41.2	-0.02

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

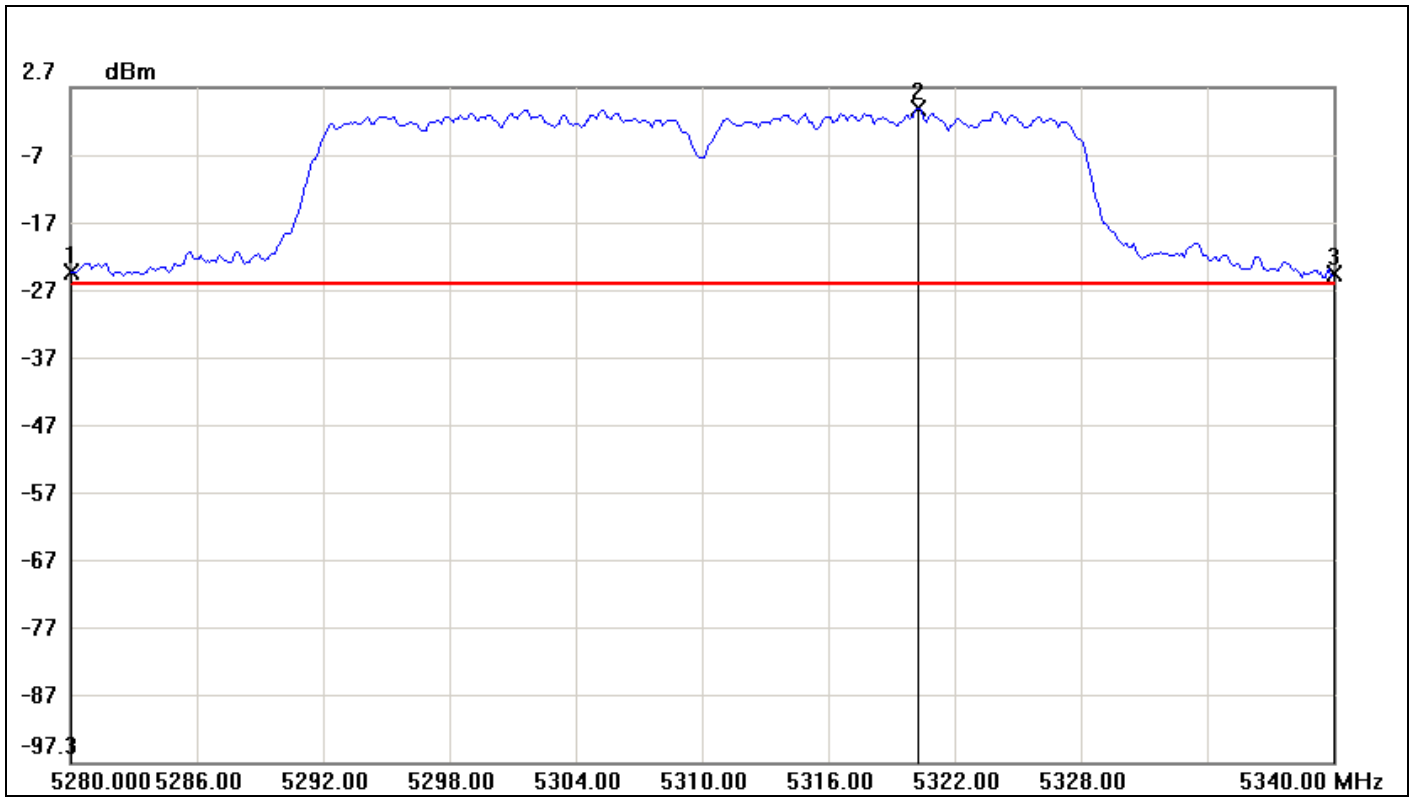
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5240.0000	-25.20	-27.36	2.16
2	5261.6000	-1.36	-27.36	26.00
3	5300.0000	-25.46	-27.36	1.90

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-0.26

CH High

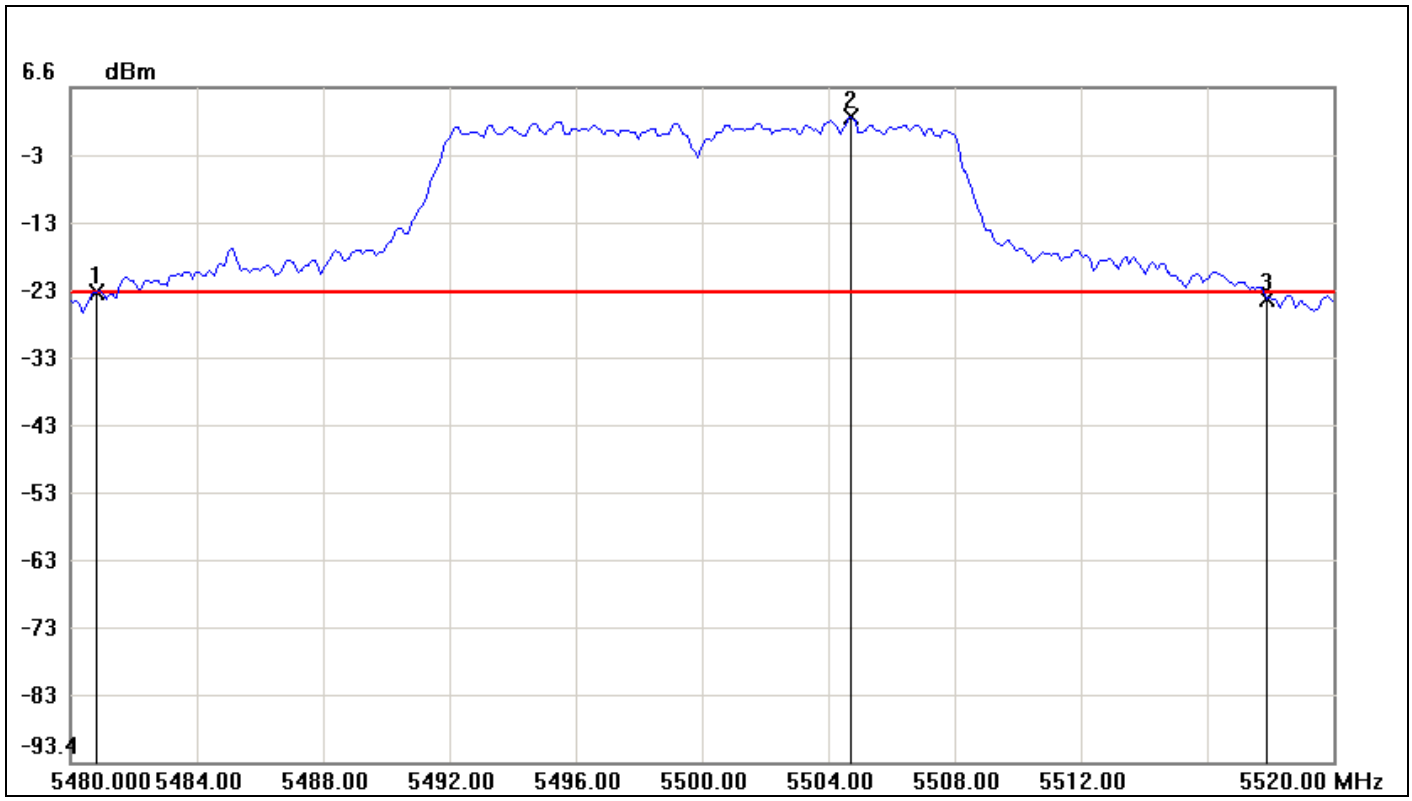


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5280.0000	-24.54	-26.45	1.91
2	5320.3000	-0.45	-26.45	26.00
3	5340.0000	-24.87	-26.45	1.58

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-0.33

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

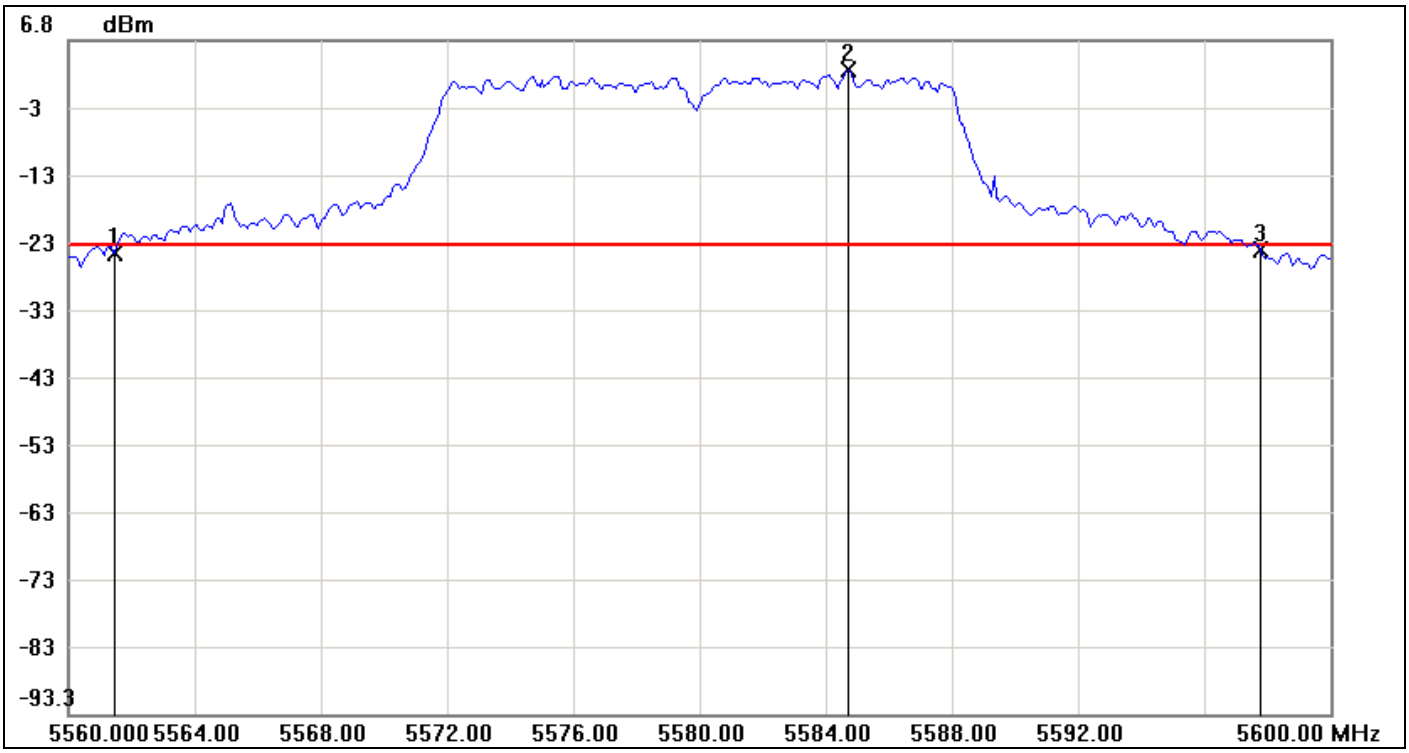
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5480.8000	-23.84	-23.84	0.00
2	5504.7333	2.16	-23.84	26.00
3	5517.8667	-24.66	-23.84	-0.82

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	37.0667	-0.82

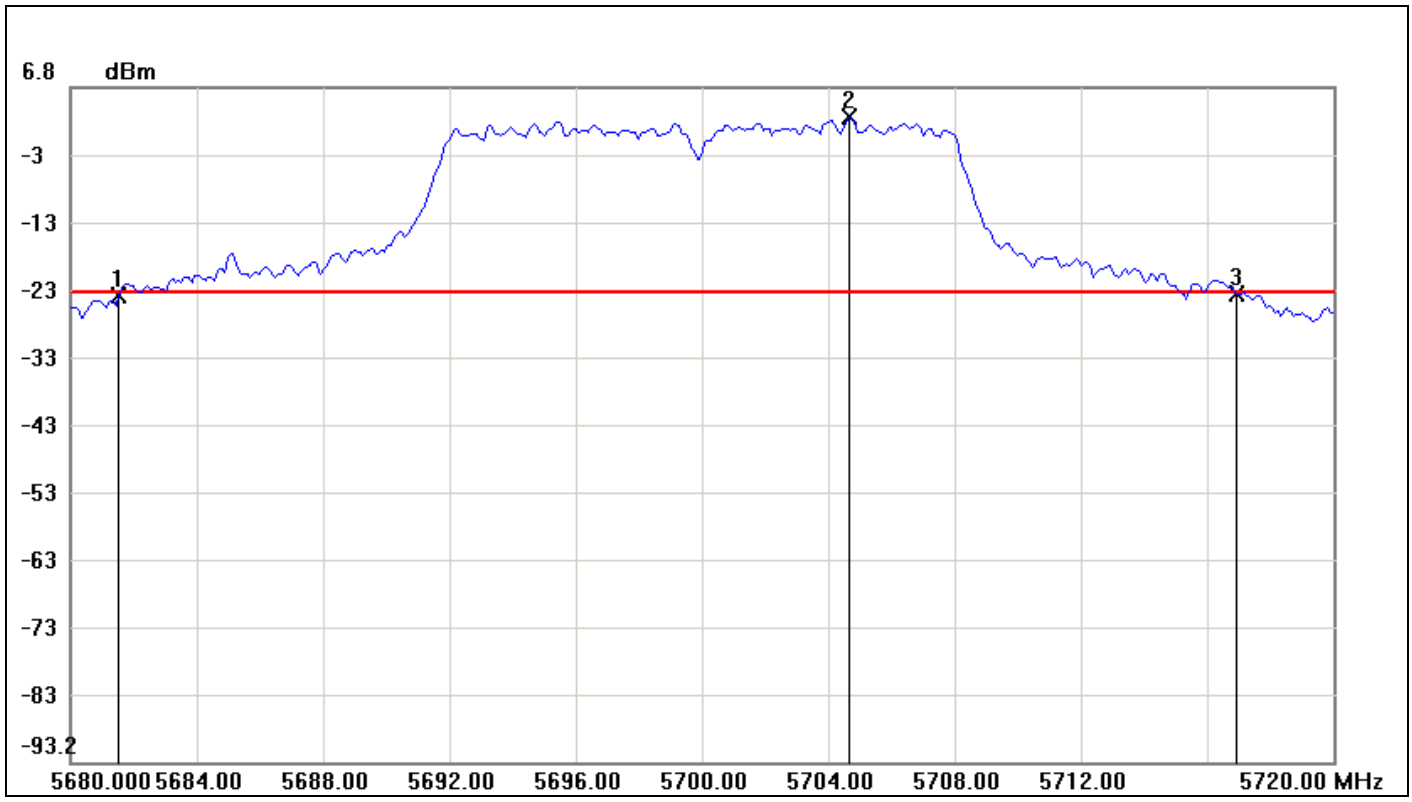
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5561.4667	-24.88	-23.74	-1.14
2	5584.7333	2.26	-23.74	26.00
3	5597.8000	-24.27	-23.74	-0.53

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	36.3333	0.61

CH High

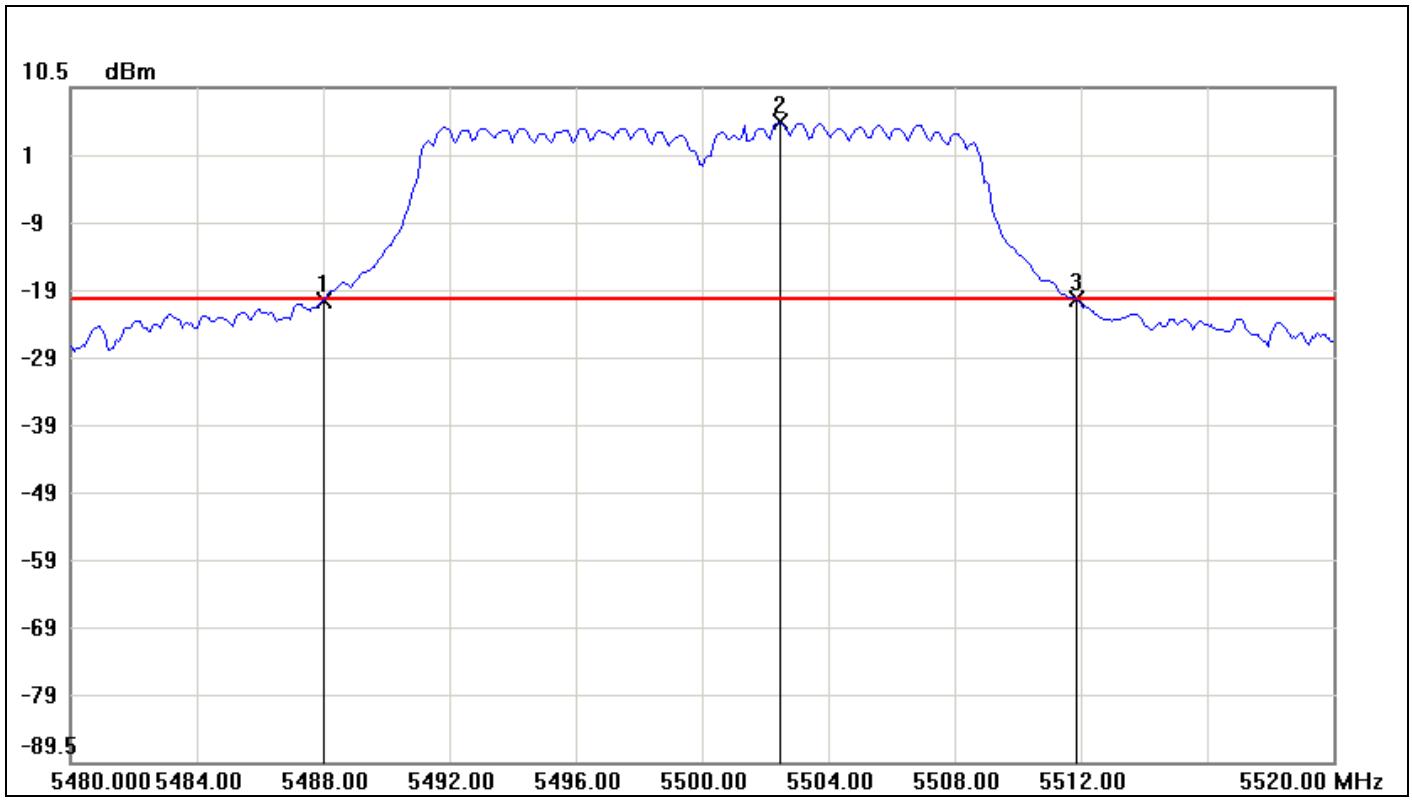


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5681.5333	-24.04	-23.59	-0.45
2	5704.6667	2.41	-23.59	26.00
3	5716.9333	-23.97	-23.59	-0.38

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	35.4	0.07

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

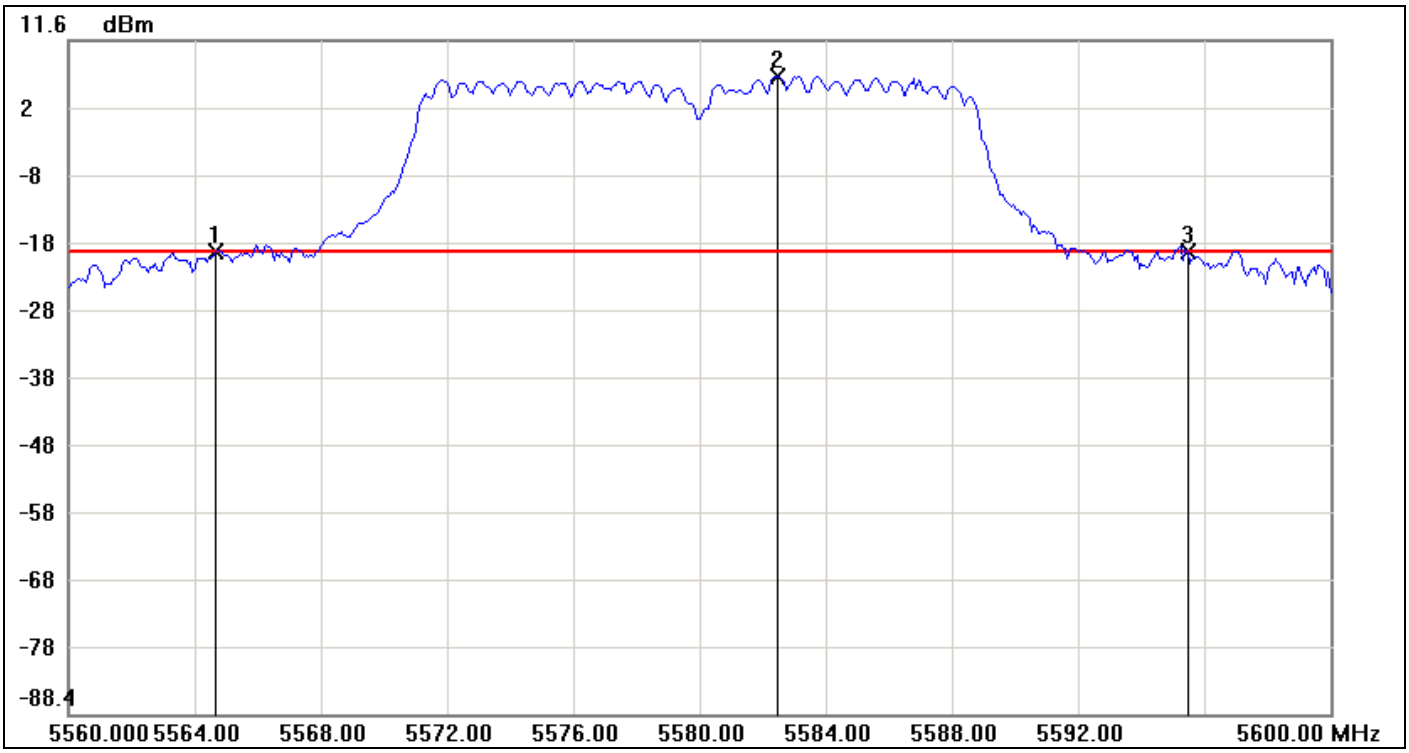
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5488.0000	-20.99	-20.71	-0.28
2	5502.4667	5.29	-20.71	26.00
3	5511.8667	-20.93	-20.71	-0.22

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.8667	0.06

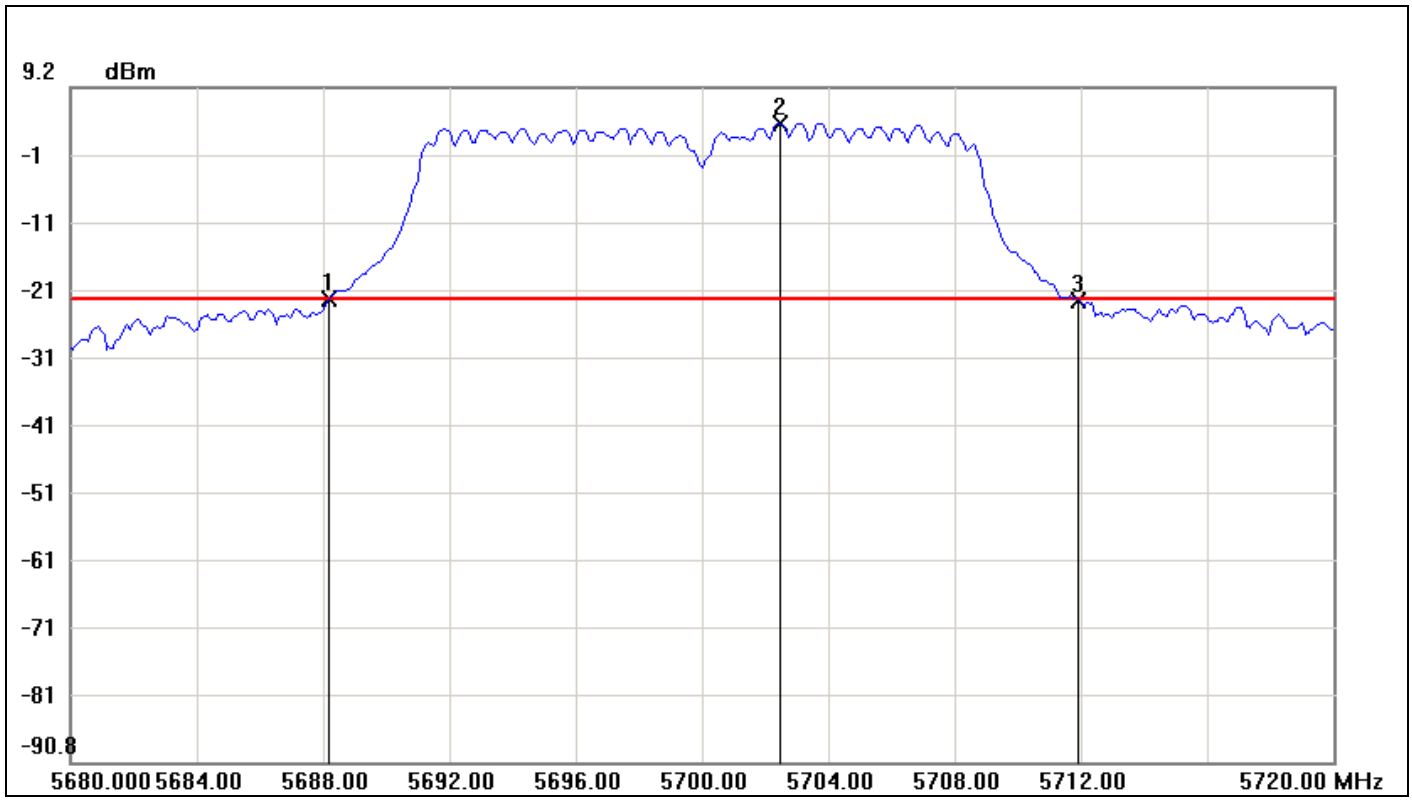
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5564.6667	-19.86	-19.73	-0.13
2	5582.4667	6.27	-19.73	26.00
3	5595.4667	-19.90	-19.73	-0.17

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	30.8	-0.04

CH High

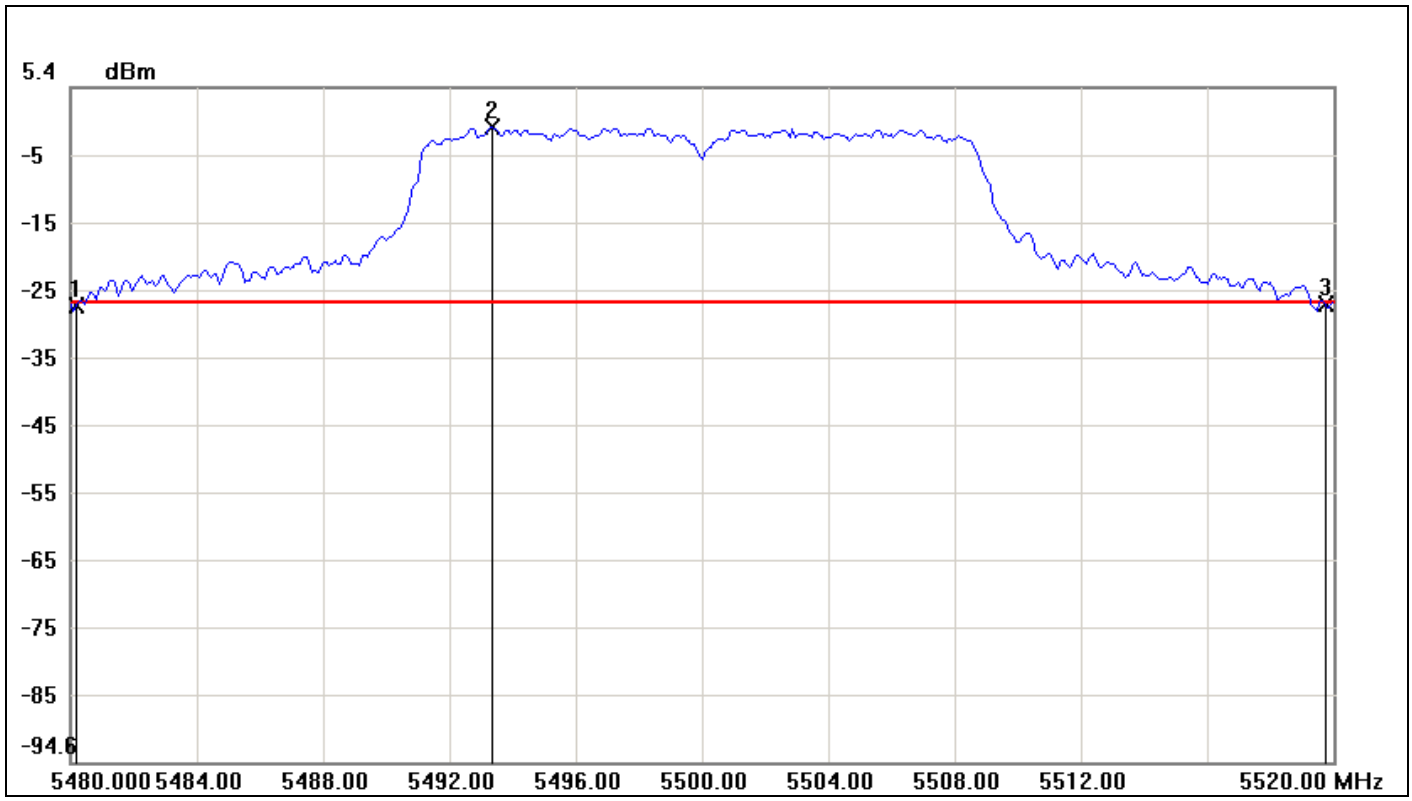


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5688.2000	-22.32	-22.14	-0.18
2	5702.4667	3.86	-22.14	26.00
3	5711.9333	-22.34	-22.14	-0.20

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	23.7333	-0.02

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

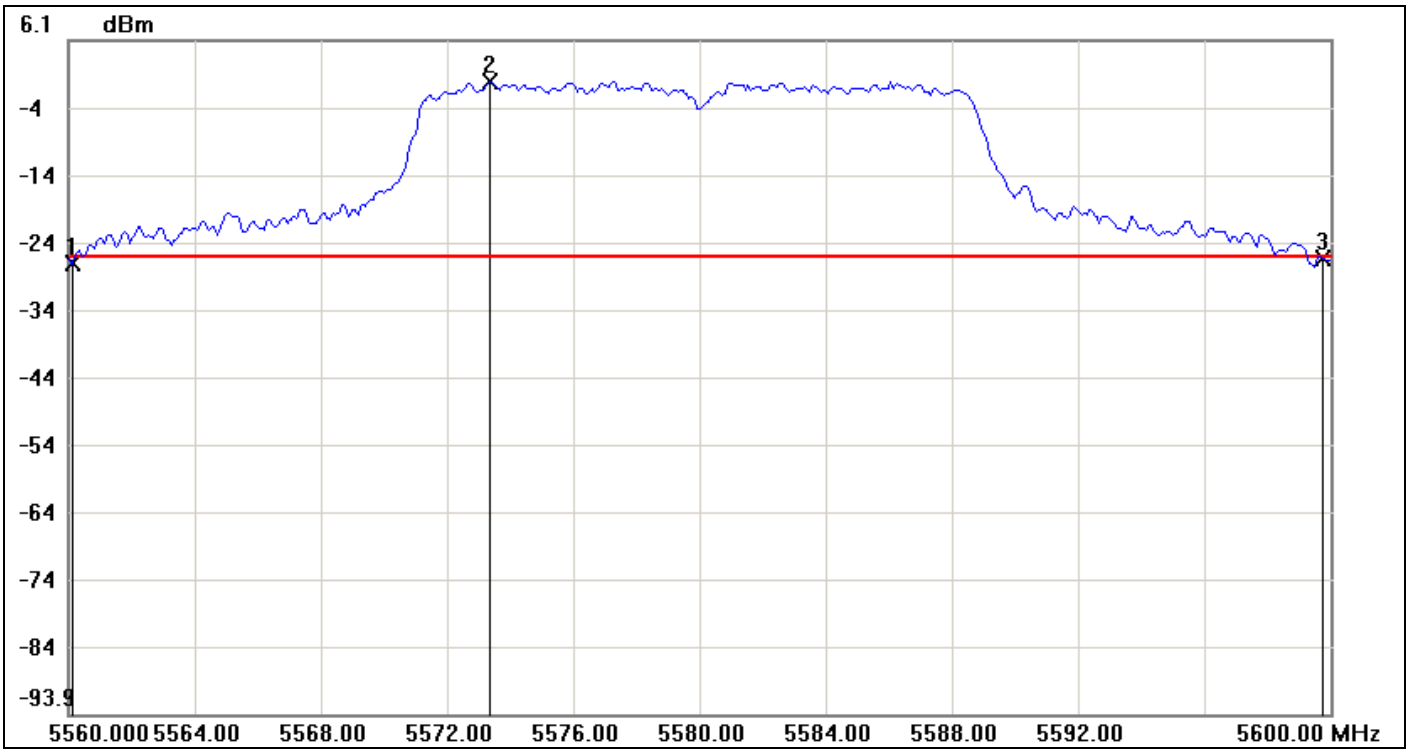
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5480.2000	-26.82	-26.55	-0.27
2	5493.3333	-0.55	-26.55	26.00
3	5519.7333	-26.61	-26.55	-0.06

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.5333	0.21

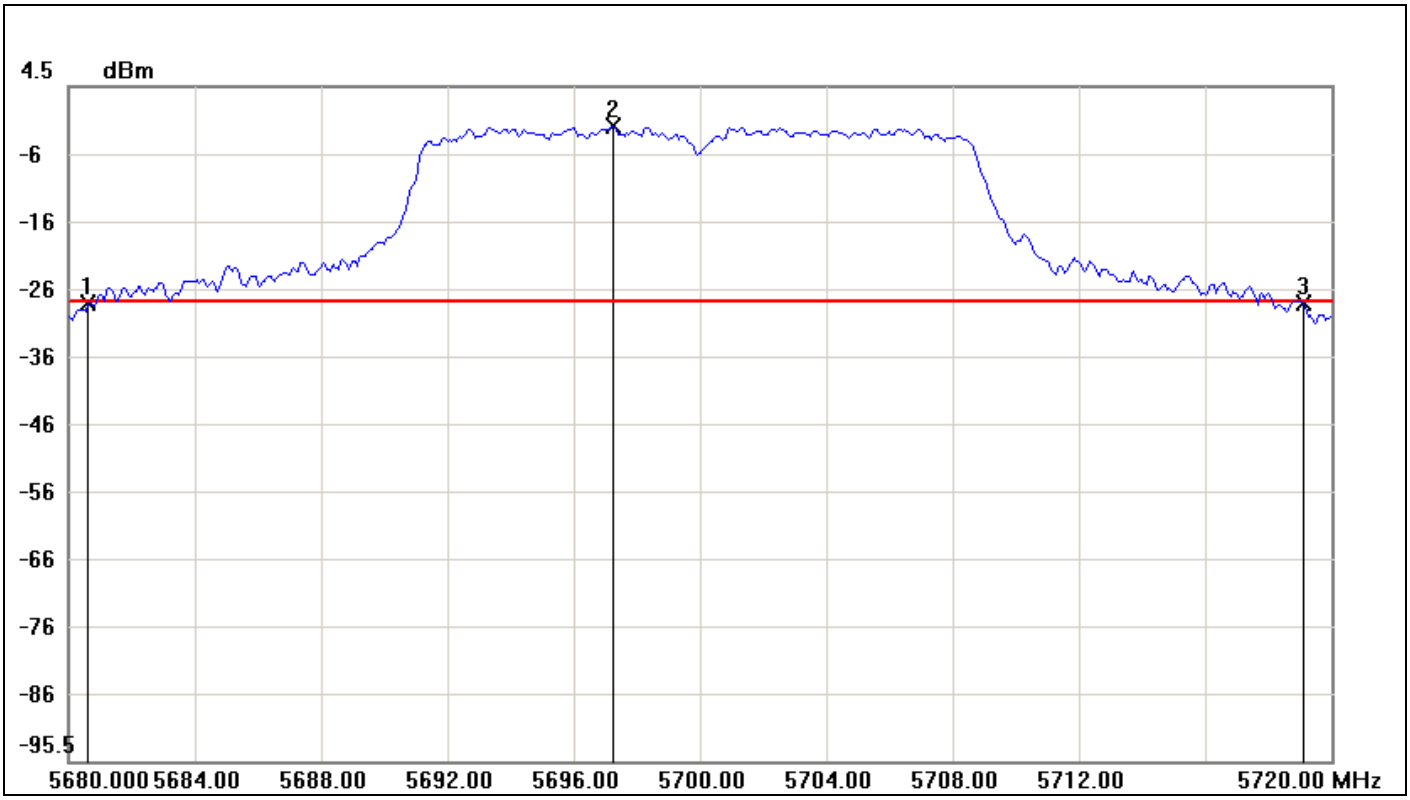
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5560.1333	-27.14	-26.07	-1.07
2	5573.3333	-0.07	-26.07	26.00
3	5599.7333	-26.26	-26.07	-0.19

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	39.6	0.88

CH High

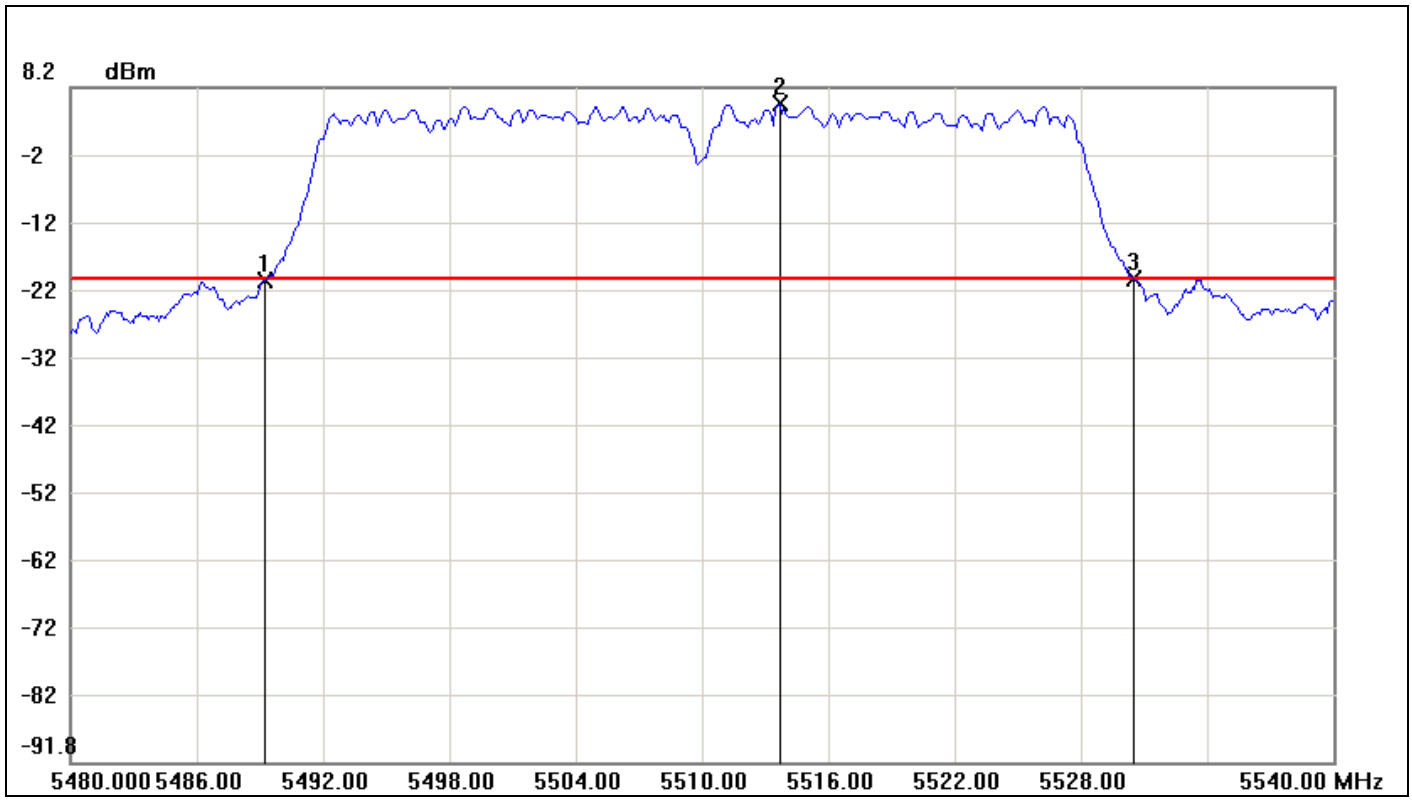


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5680.6000	-27.57	-27.50	-0.07
2	5697.2667	-1.50	-27.50	26.00
3	5719.1333	-27.74	-27.50	-0.24

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	38.5333	-0.17

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

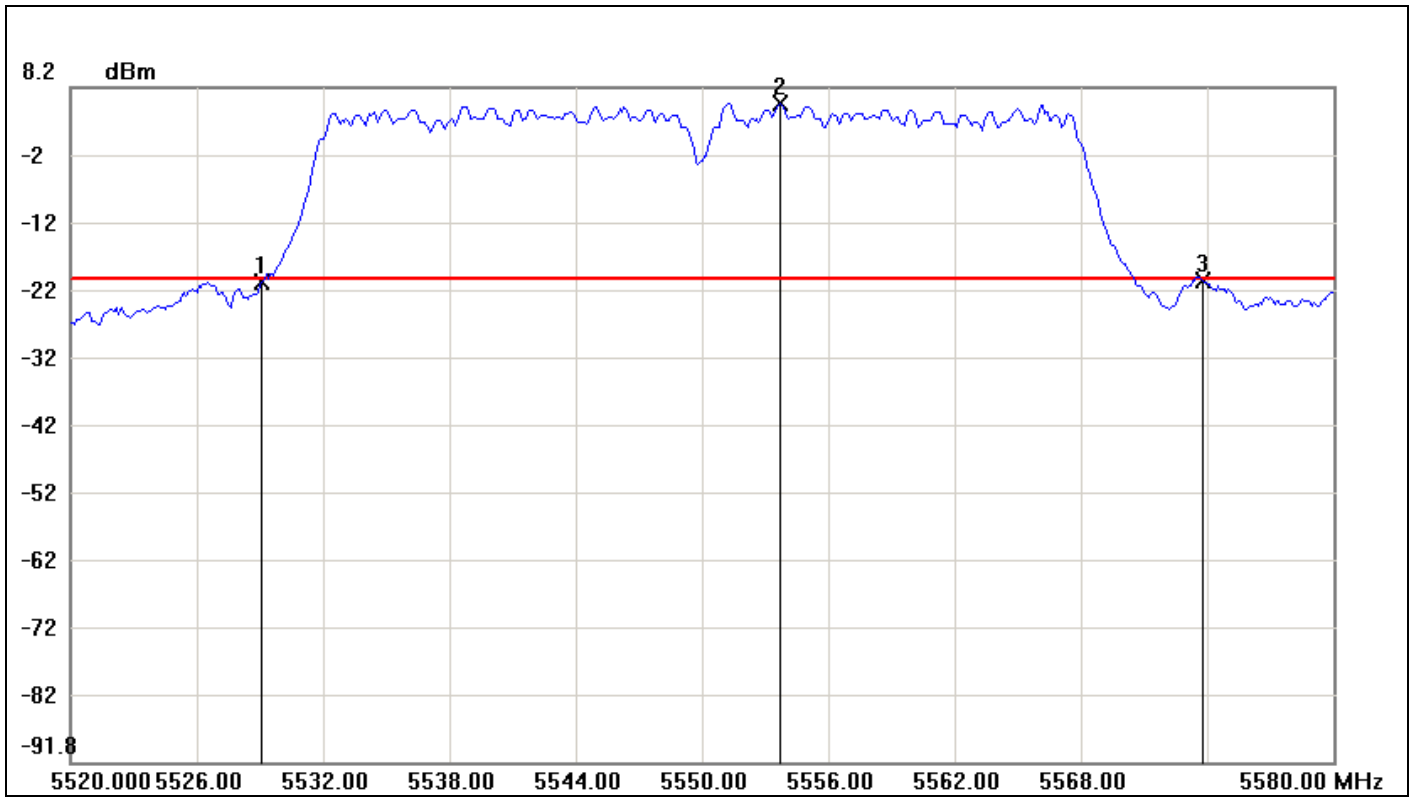
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5489.2000	-20.43	-20.24	-0.19
2	5513.7000	5.76	-20.24	26.00
3	5530.5000	-20.26	-20.24	-0.02

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	41.3	0.17

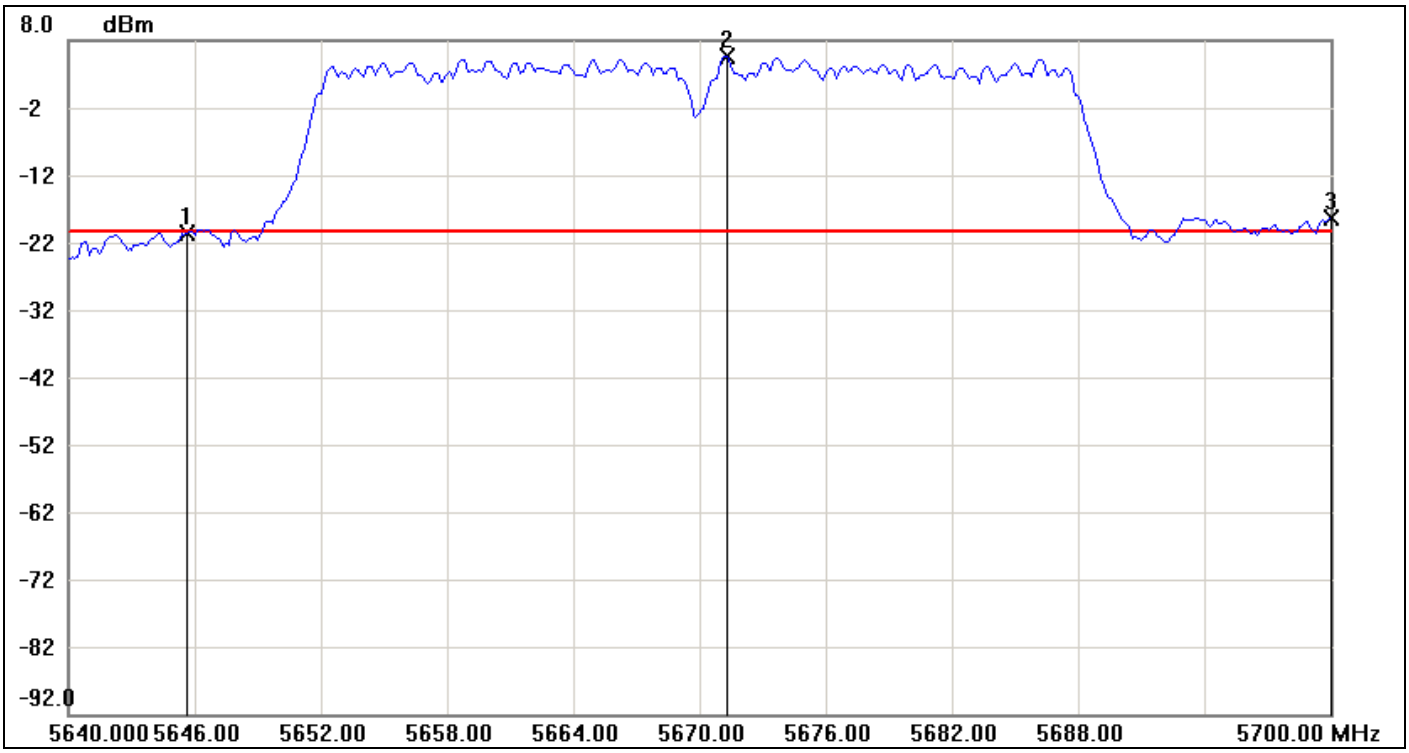
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5529.1000	-20.76	-20.23	-0.53
2	5553.7000	5.77	-20.23	26.00
3	5573.8000	-20.34	-20.23	-0.11

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	44.7	0.42

CH High

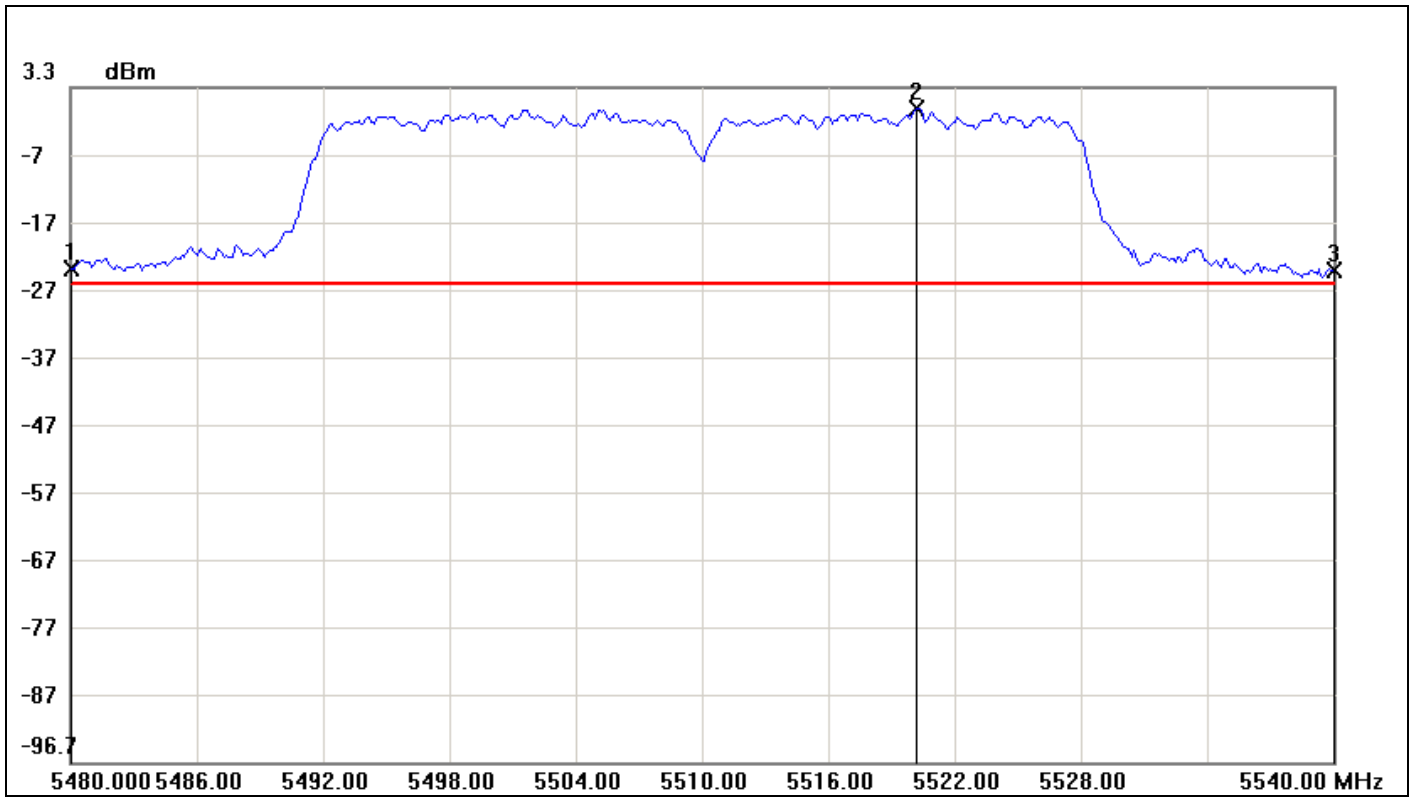


No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5645.6000	-20.60	-20.50	-0.10
2	5671.3000	5.50	-20.50	26.00
3	5700.0000	-18.44	-20.50	2.06

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	54.4	2.16

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

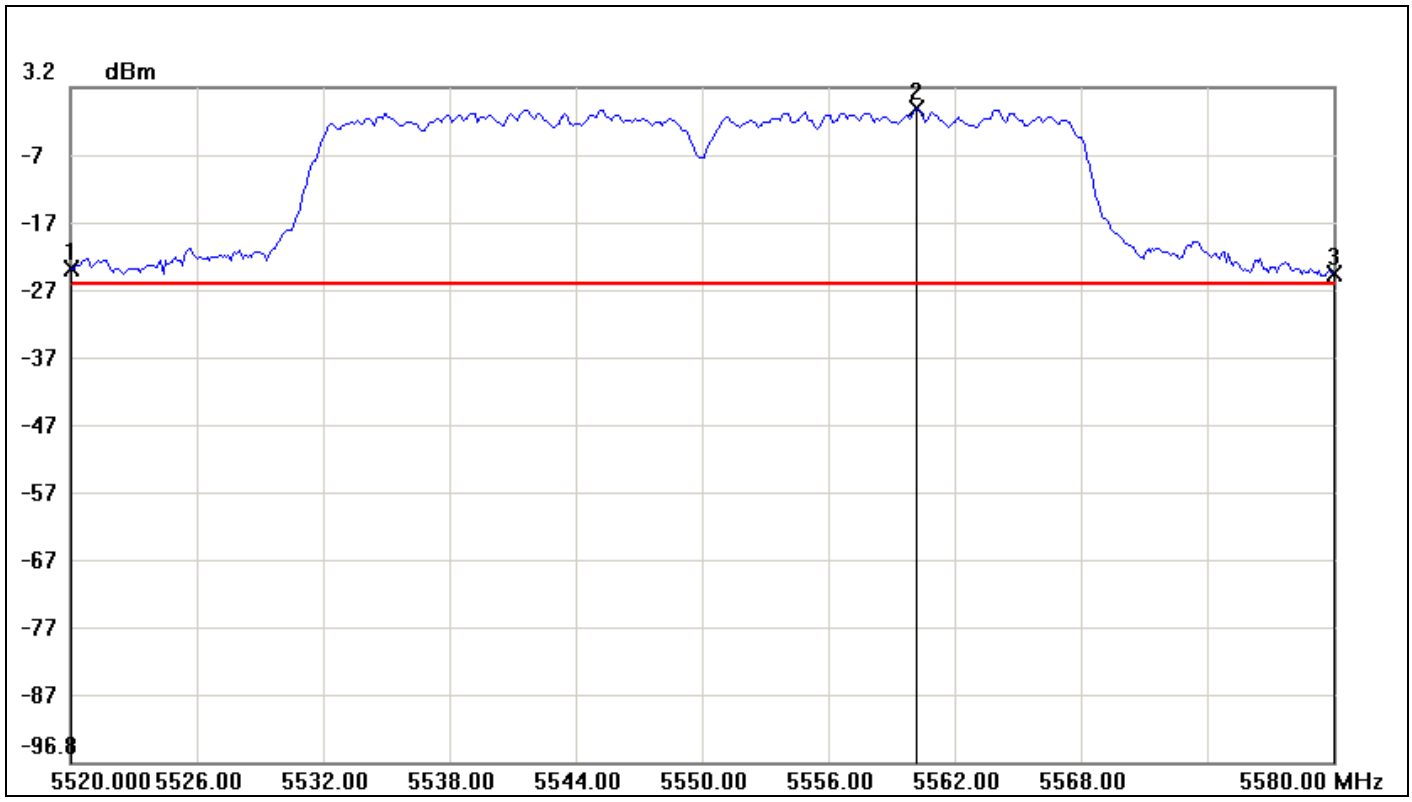
CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5480.0000	-23.60	-25.77	2.17
2	5520.2000	0.23	-25.77	26.00
3	5540.0000	-23.96	-25.77	1.81

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-0.36

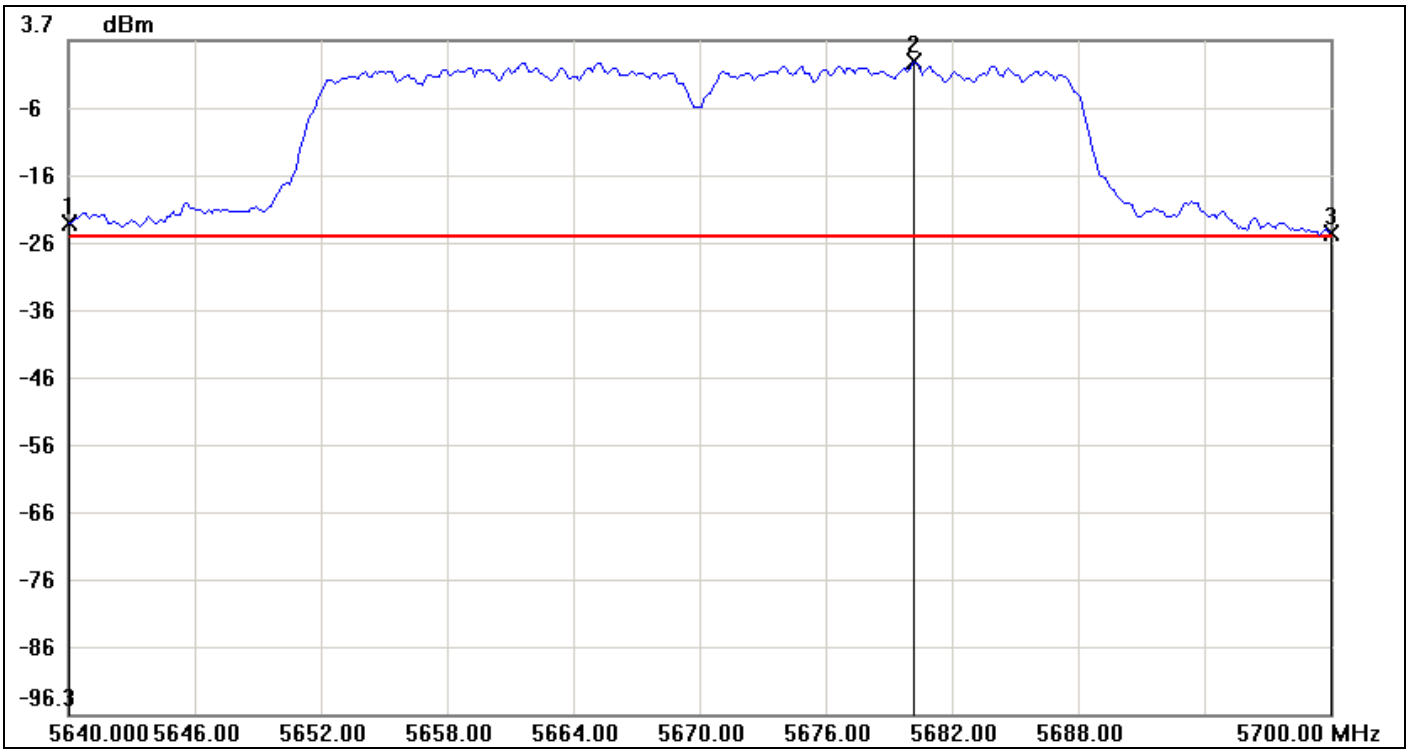
CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5520.0000	-23.61	-25.89	2.28
2	5560.2000	0.11	-25.89	26.00
3	5580.0000	-24.43	-25.89	1.46

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-0.82

CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5640.0000	-23.40	-25.53	2.13
2	5680.2000	0.47	-25.53	26.00
3	5700.0000	-24.90	-25.53	0.63

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	60	-1.5

7.2 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.

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	39.2667	15.94024	19.9402	17.00
Mid	5220	37	15.68202	19.6820	17.00
High	5240	37	15.68202	19.6820	17.00

Test mode: IEEE 802.11n HT 20 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	39.2666	23.2	15.9402	19.9402	17.00
Mid	5220	39.8	23.4	15.9988	19.9988	17.00
High	5240	39.8	23.3333	15.9988	19.9988	17.00

Test mode: IEEE 802.11n HT 40 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	41.4	60	17.7815	21.7815	17.00
High	5230	41.4	60	17.7815	21.7815	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	37.0667	15.68984	26.6898	24.00
Mid	5280	36.2667	15.59508	26.5951	24.00
High	5320	36.2667	15.59508	26.5951	24.00

Test mode: IEEE 802.11n HT 20 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	39.8	23.2	15.9988	26.9988	24.00
Mid	5280	39.7333	23.4666	15.9915	26.9915	24.00
High	5320	39.5333	23.2	15.9696	26.9696	24.00

Test mode: IEEE 802.11n HT 40 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	60	41.2	17.7815	28.7815	24.00
High	5310	60	41.2	17.7815	28.7815	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	37.0667	15.68984	26.6898	24.00
Mid	5580	36.3333	15.60305	26.6030	24.00
High	5700	35.4	15.49003	26.4900	24.00

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

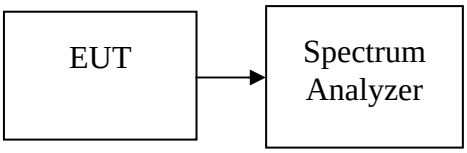
Channel	Frequency (MHz)	Chain 0 26 dB Bandwidth (B) (MHz)	Chain 1 26 dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Maximum Conducted Output Power Limit (dBm)
Low	5500	39.5333	23.8667	15.9696	26.9696	24.00
Mid	5580	39.6	30.8	15.9770	26.9770	24.00
High	5700	38.5333	23.7333	15.8584	26.8584	24.00

Test mode: IEEE 802.11n HT 40 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	60	41.3	17.7815	28.7815	24.00
Mid	5590	60	44.7	17.7815	28.7815	24.00
High	5670	60	54.4	17.7815	28.7815	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	11.83	17.00
Mid	5220	11.42	17.00
High	5240	11.18	17.00

Test mode: IEEE 802.11n HT 20 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	10.83	12.99	15.05	16.00
Mid	5220	9.72	12.92	14.62	16.00
High	5240	10.32	12.19	14.37	16.00

Test mode: IEEE 802.11n HT 40 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	10.06	14.12	15.56	16.00
High	5230	10.22	12.08	14.26	16.00

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

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5260	11.04	24.00
Mid	5280	10.98	24.00
High	5320	10.73	24.00

Test mode: IEEE 802.11n HT 20 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	10.15	12.49	14.49	23.00
Mid	5280	8.58	12.46	13.95	23.00
High	5320	9.42	11.88	13.83	23.00

Test mode: IEEE 802.11n HT 40 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	9.54	11.54	13.66	23.00
High	5310	9.65	12.31	14.19	23.00

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

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

Channel	Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
Low	5500	10.58	24.00
Mid	5580	10.88	24.00
High	5700	10.94	24.00

Test mode: IEEE 802.11n HT 20 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	10.18	13.69	15.29	23.00
Mid	5580	10.01	13.95	15.42	23.00
High	5700	9.15	12.64	14.25	23.00

Test mode: IEEE 802.11n HT 40 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	10.12	14.72	16.01	23.00
Mid	5590	9.18	13.55	14.90	23.00
High	5670	8.61	12.54	14.02	23.00

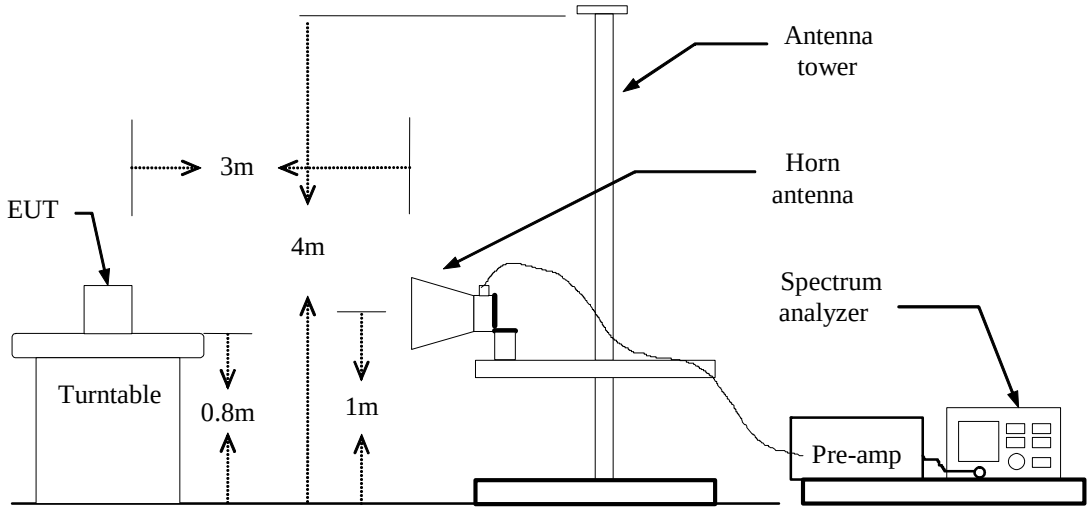
Remark: *Total Output Power (w) = Chain 0 (10^(Output Power /10)/1000) + Chain 1 (10^(Output Power /10)/1000)*

7.3 BAND EDGES MEASUREMENT

LIMIT

According to §15.407(b),
(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Test Configuration



TEST PROCEDURE

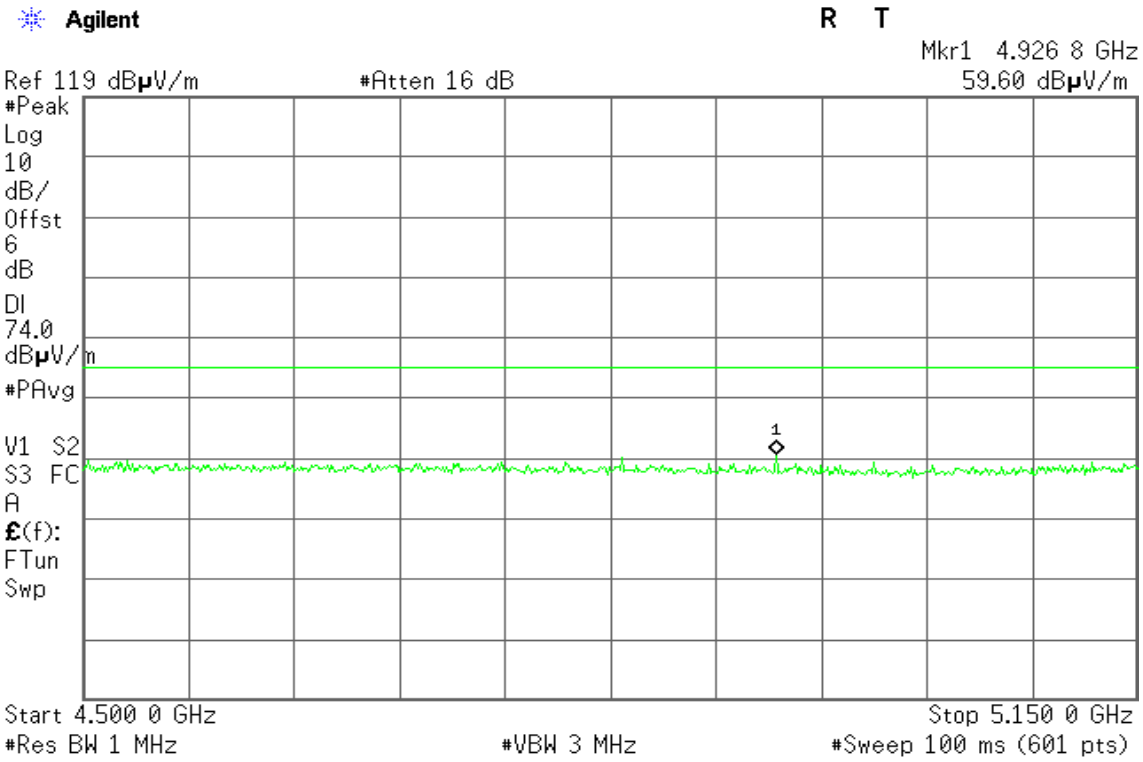
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

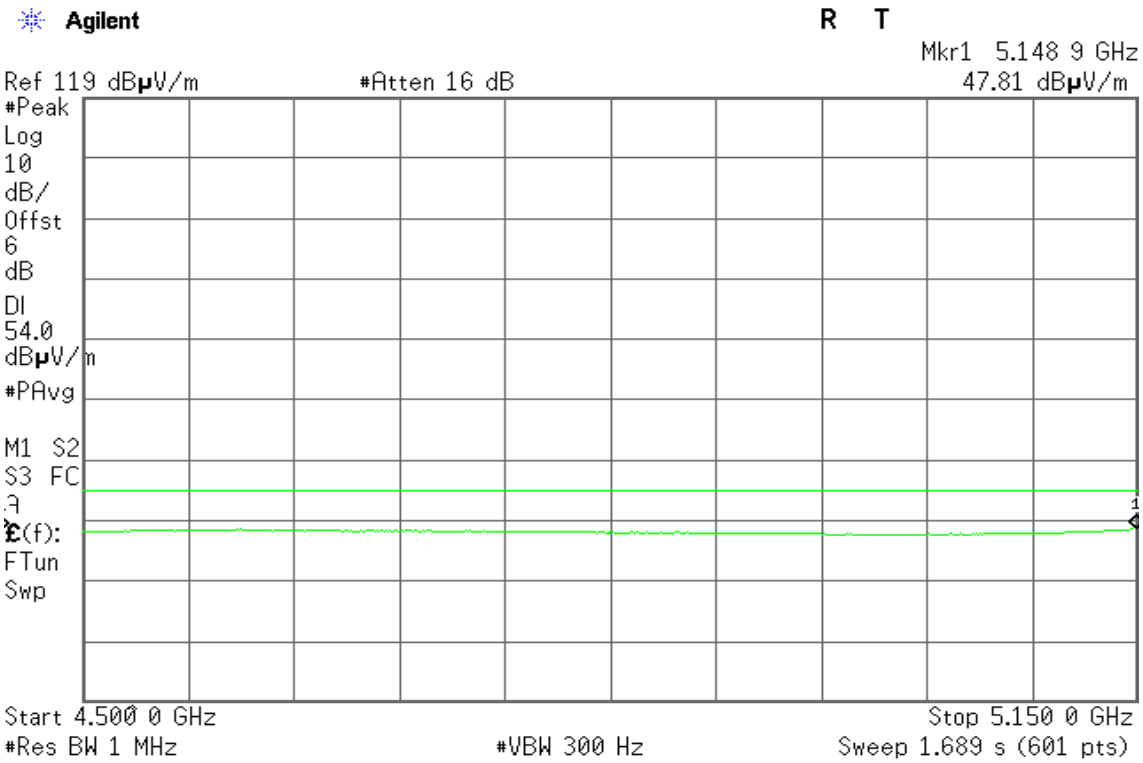
Refer to attach spectrum analyzer data chart.

Band Edges (IEEE 802.11a mode / 5180 MHz)

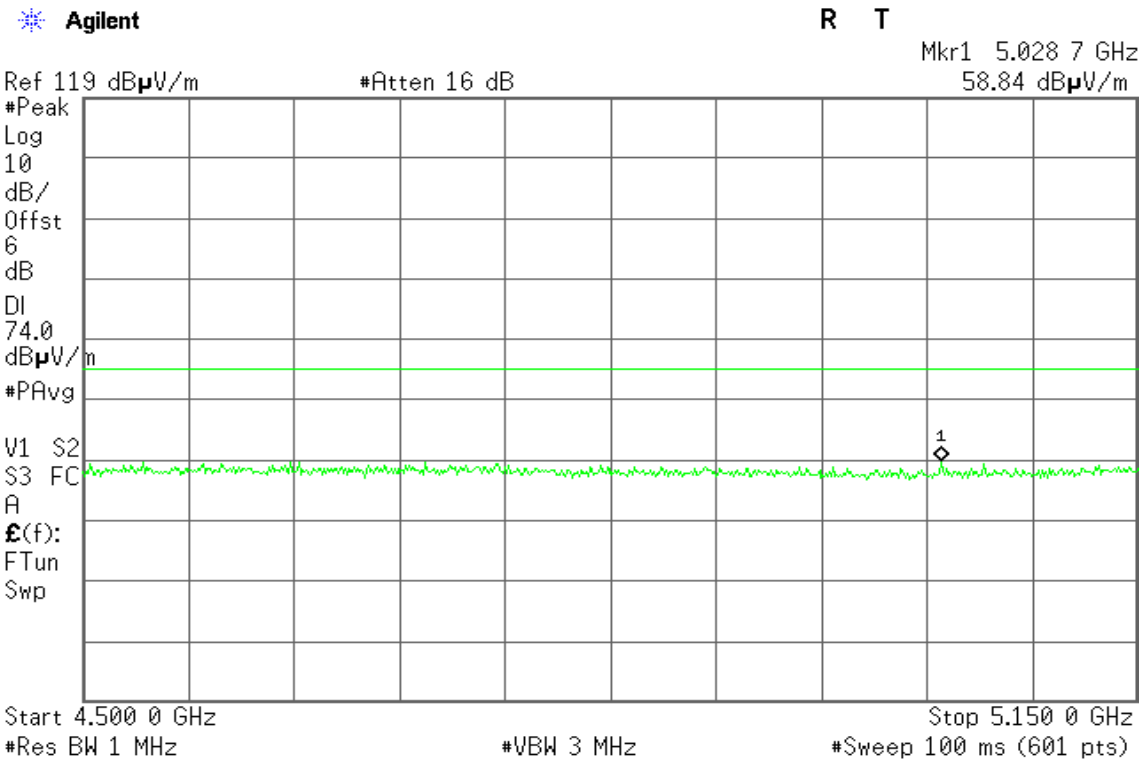
Detector mode: Peak **Polarity: Vertical**



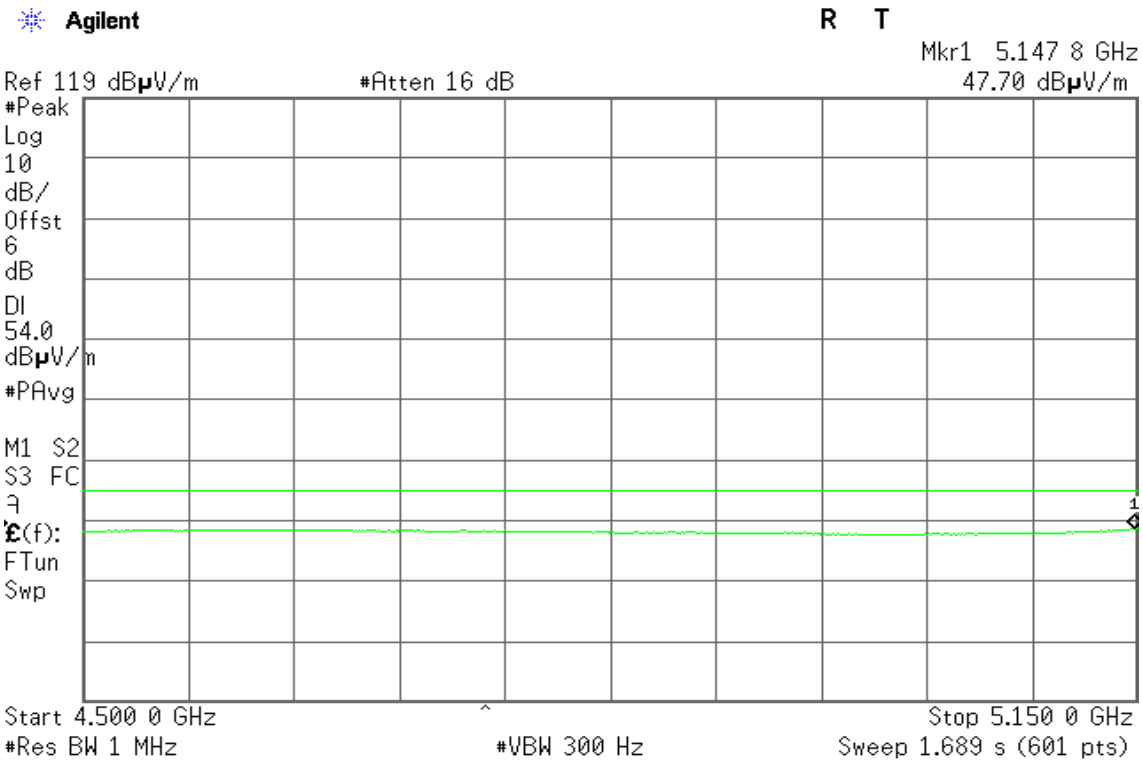
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

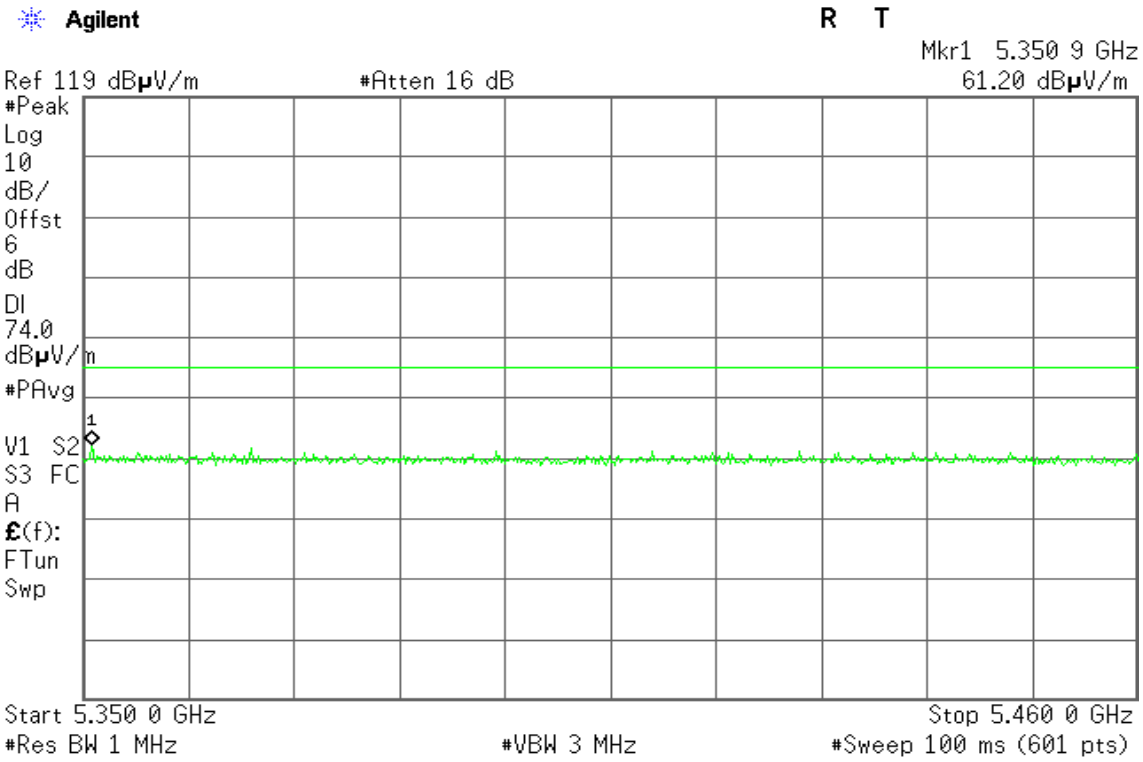


Detector mode: Average **Polarity: Horizontal**

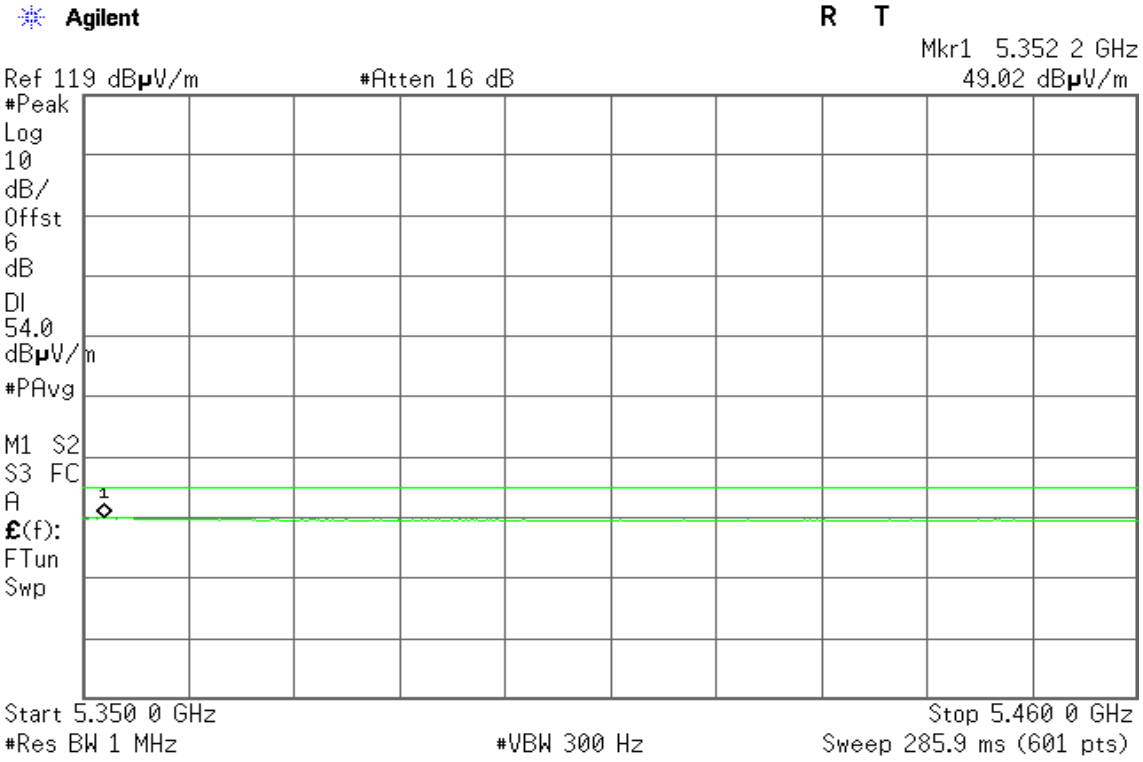


Band Edges (IEEE 802.11a mode / 5320 MHz)

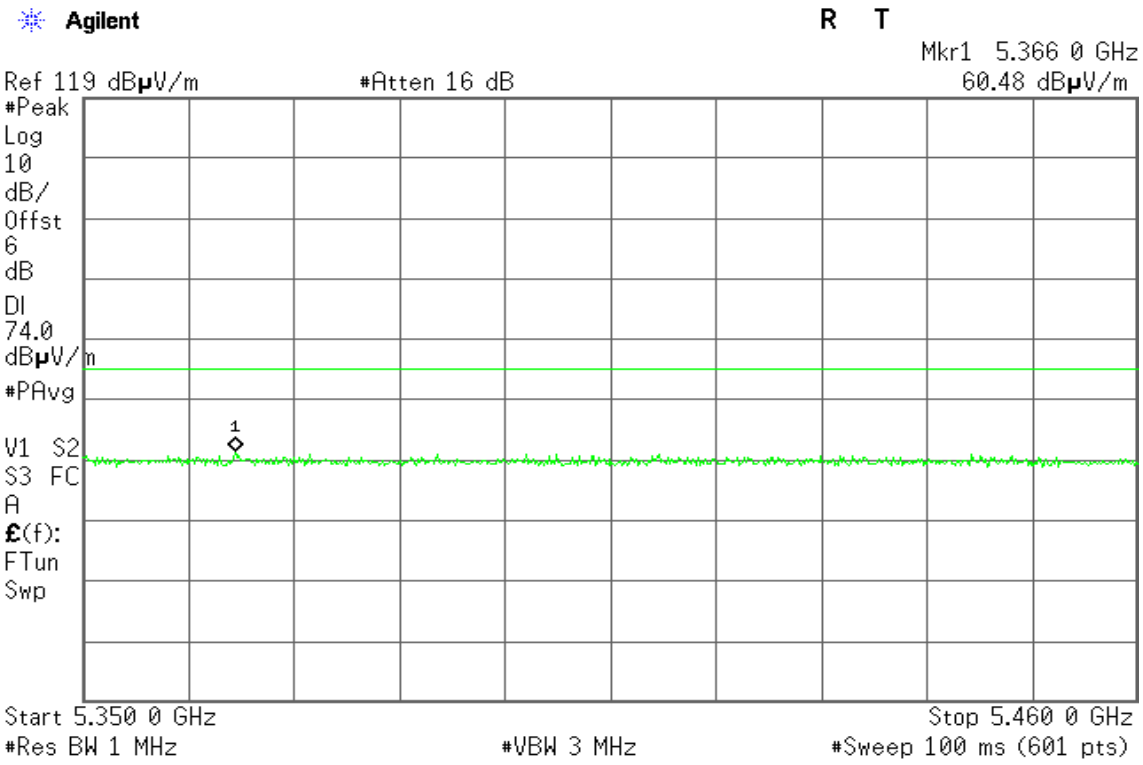
Detector mode: Peak **Polarity: Vertical**



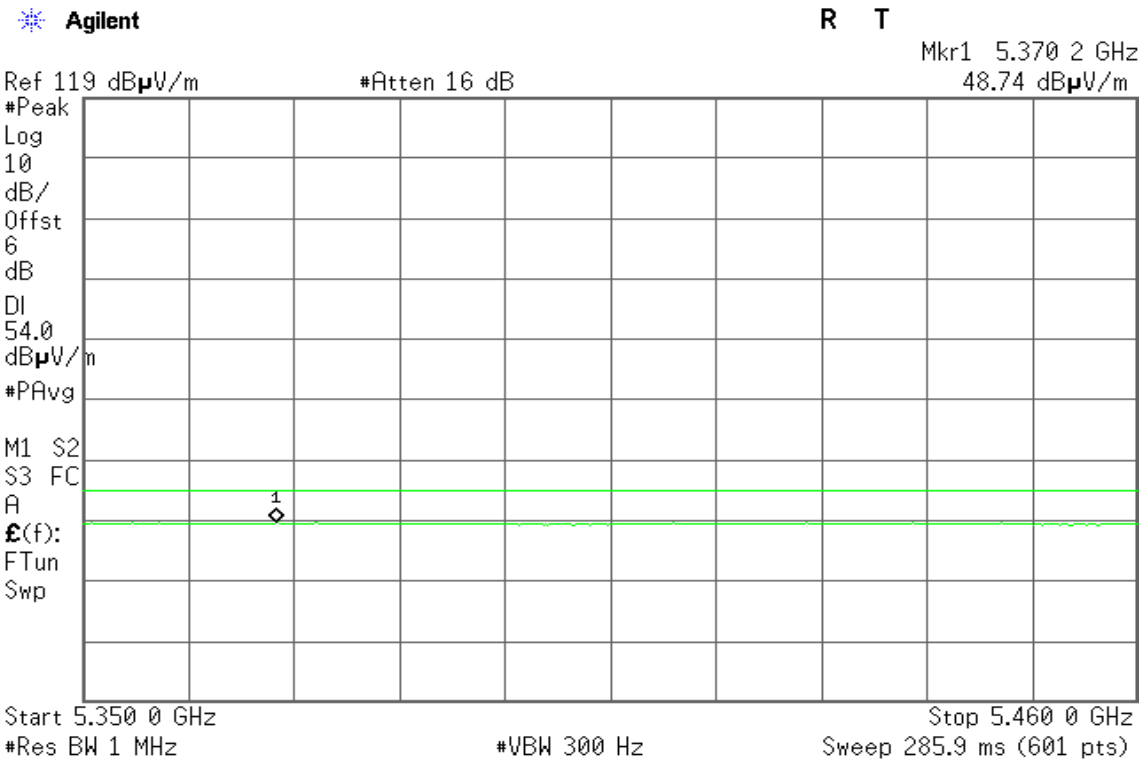
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

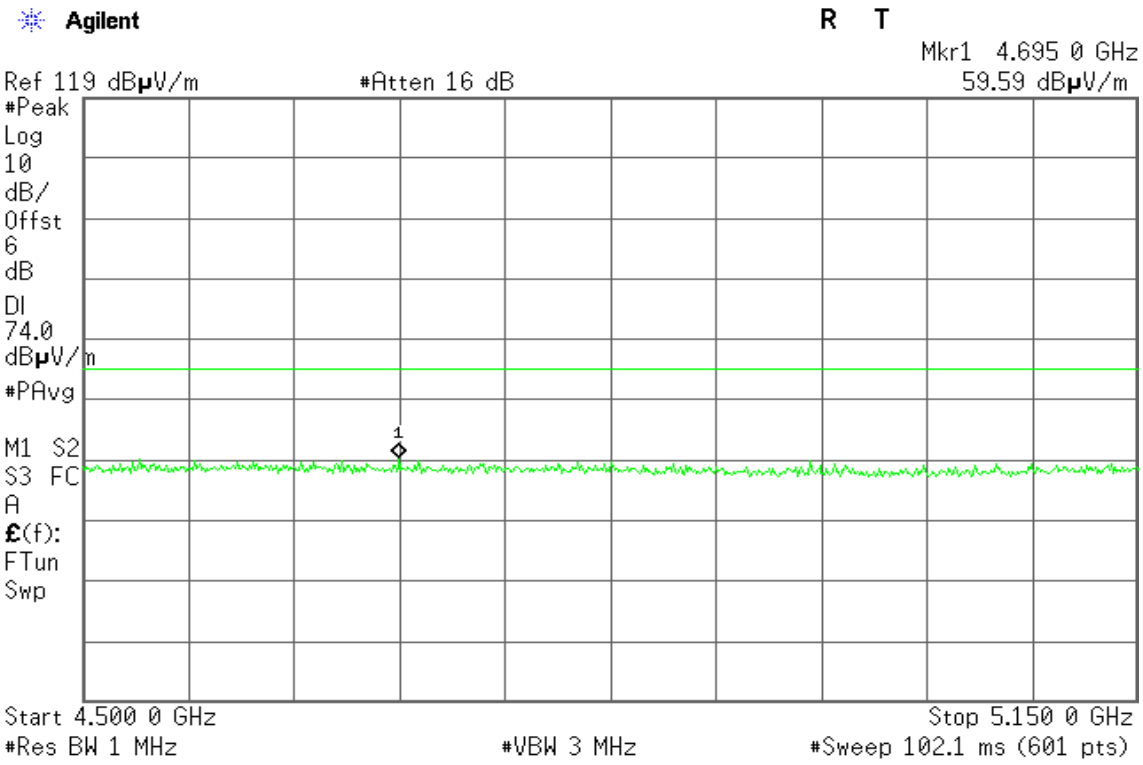


Detector mode: Average **Polarity: Horizontal**

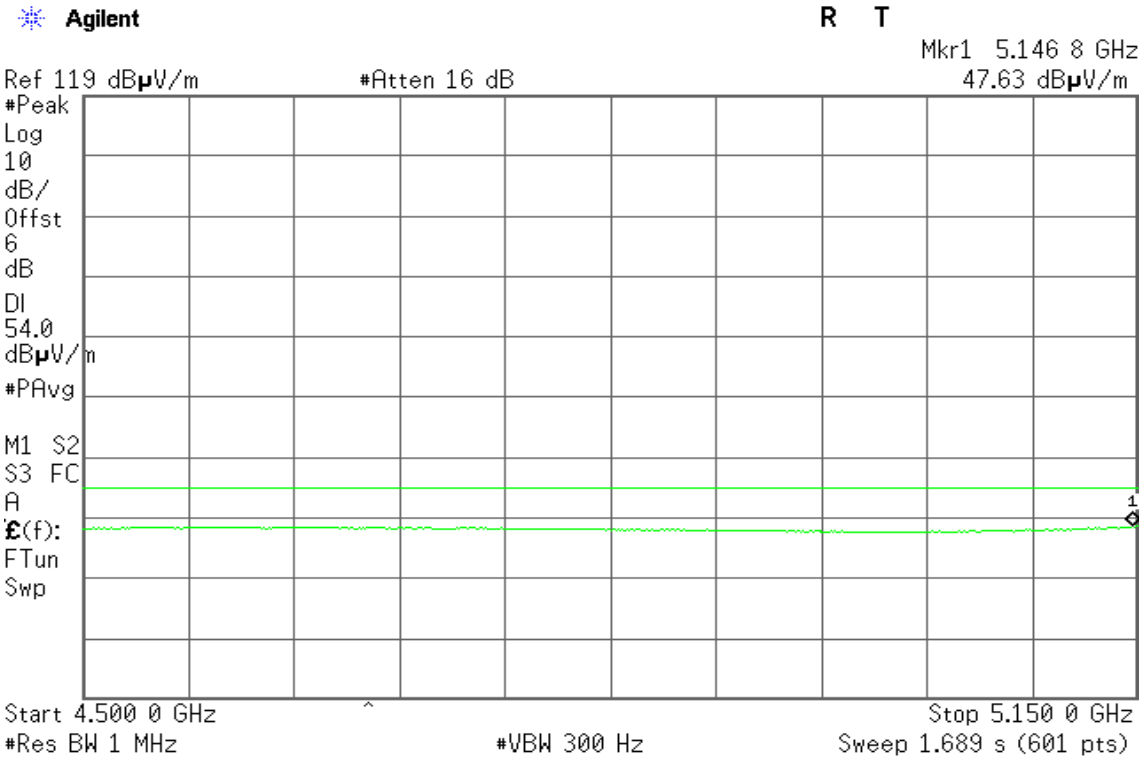


Band Edges (IEEE 802.11n HT 20 mode / 5180 MHz)

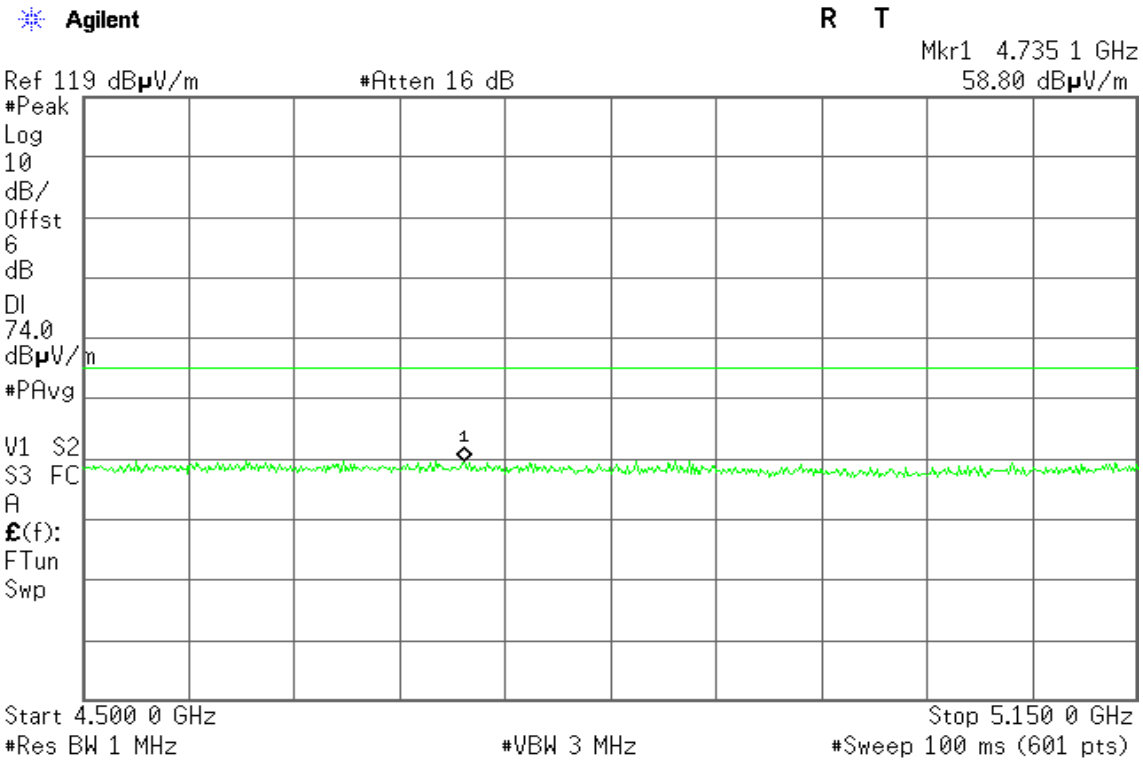
Detector mode: Peak **Polarity: Vertical**



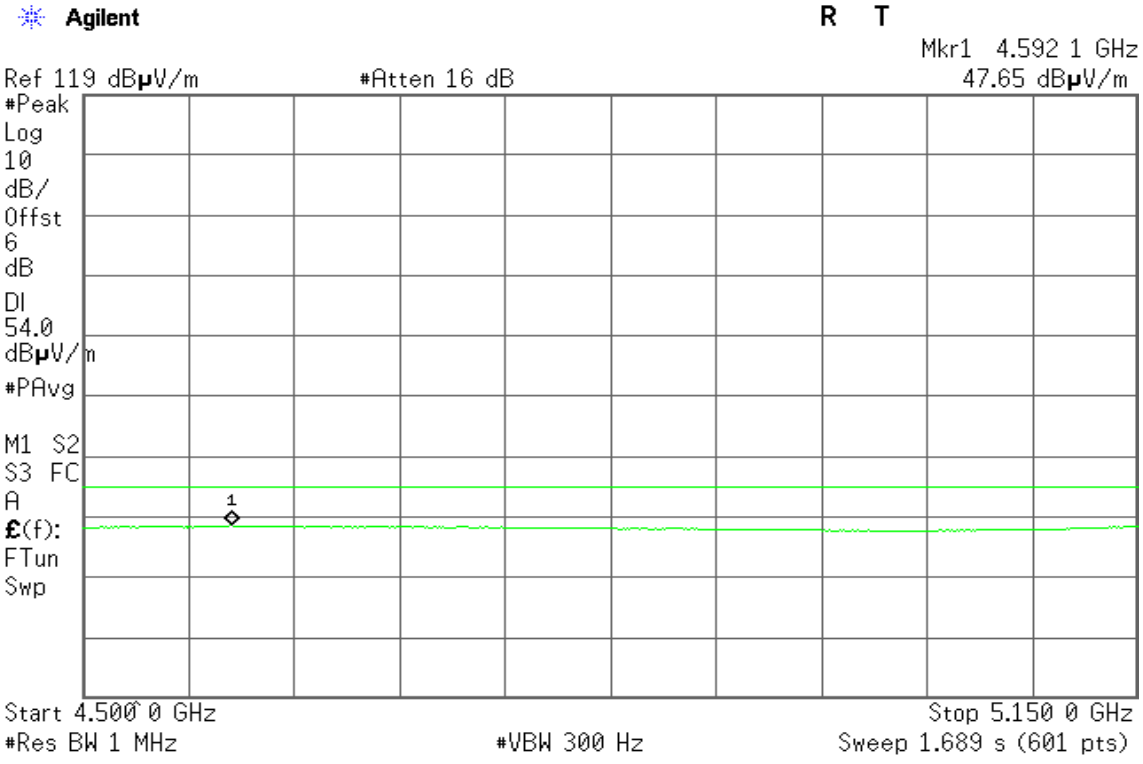
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

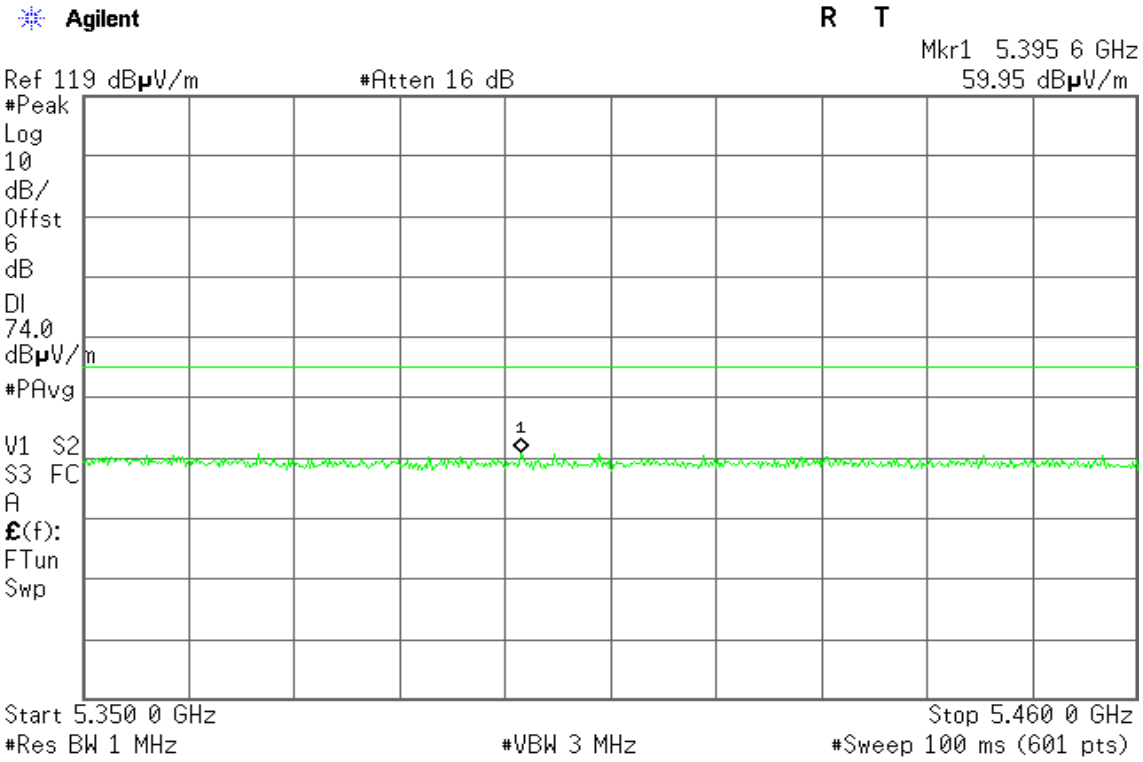


Detector mode: Average **Polarity: Horizontal**

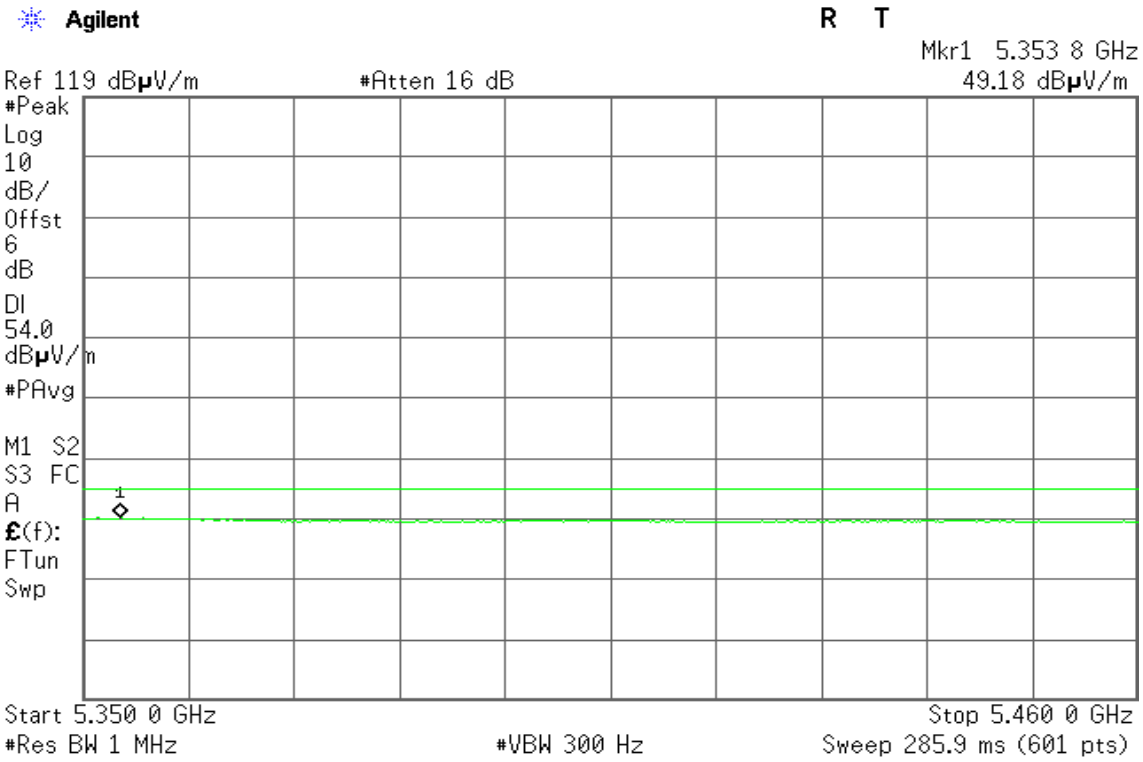


Band Edges (IEEE 802.11n HT 20 mode / 5320 MHz)

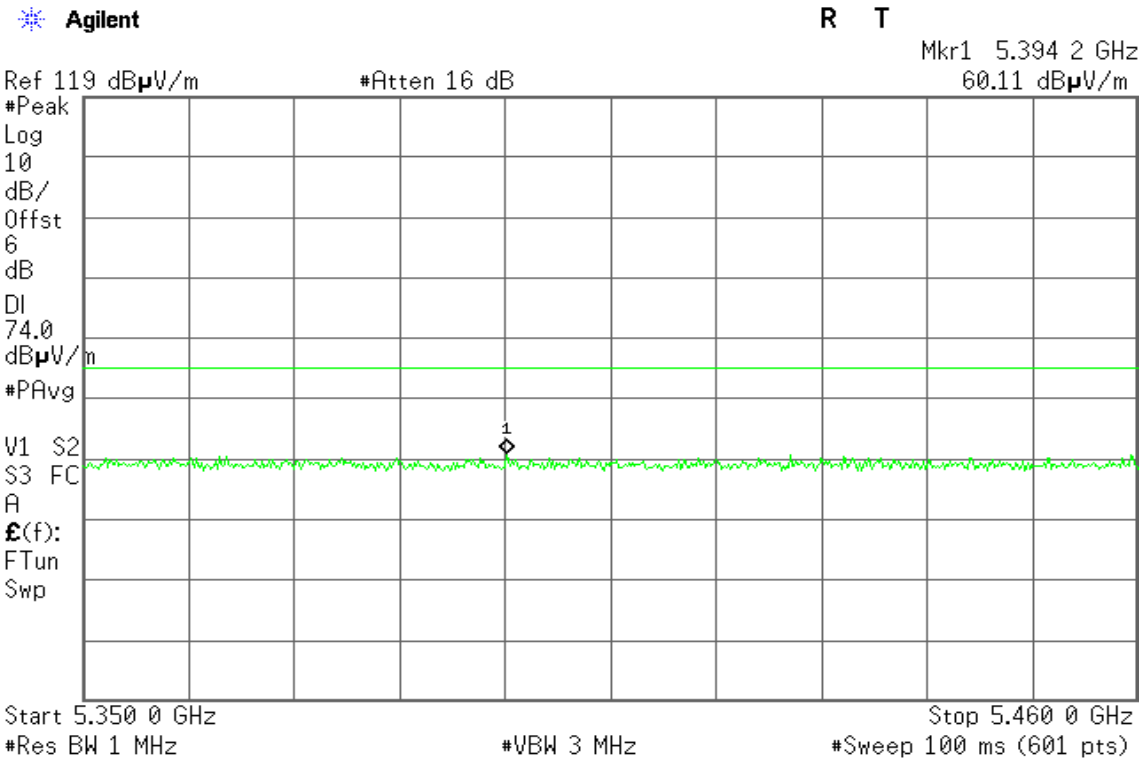
Detector mode: Peak **Polarity: Vertical**



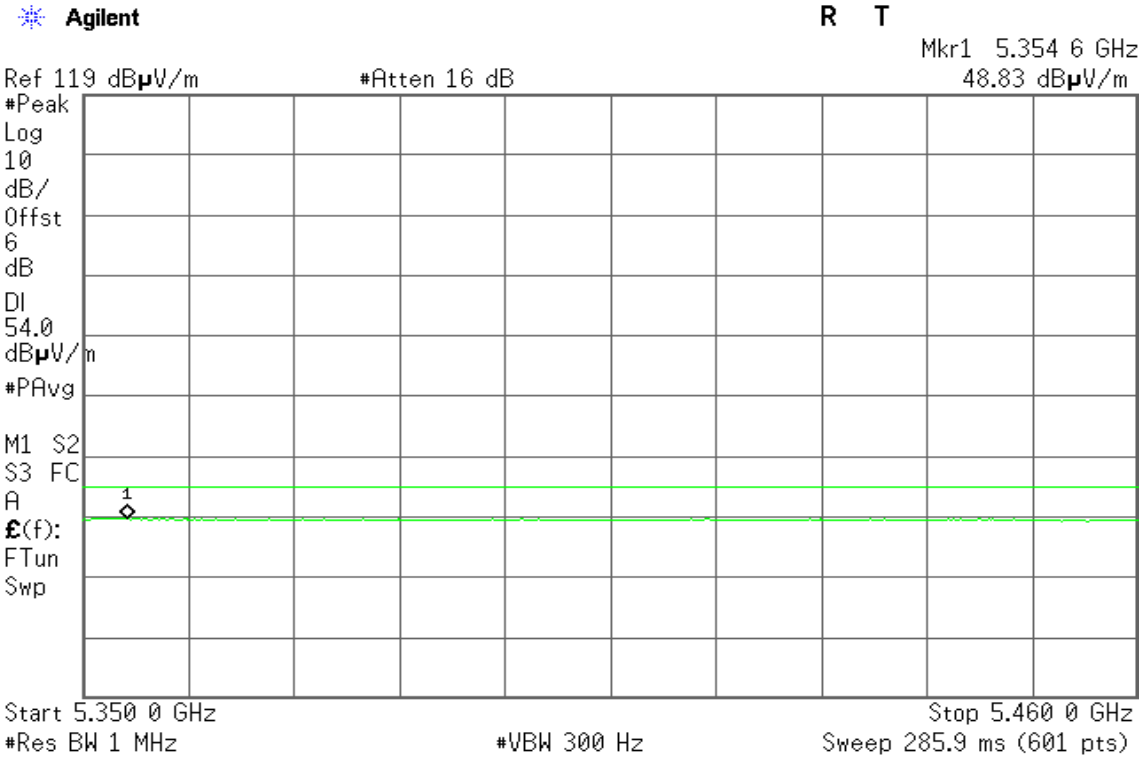
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

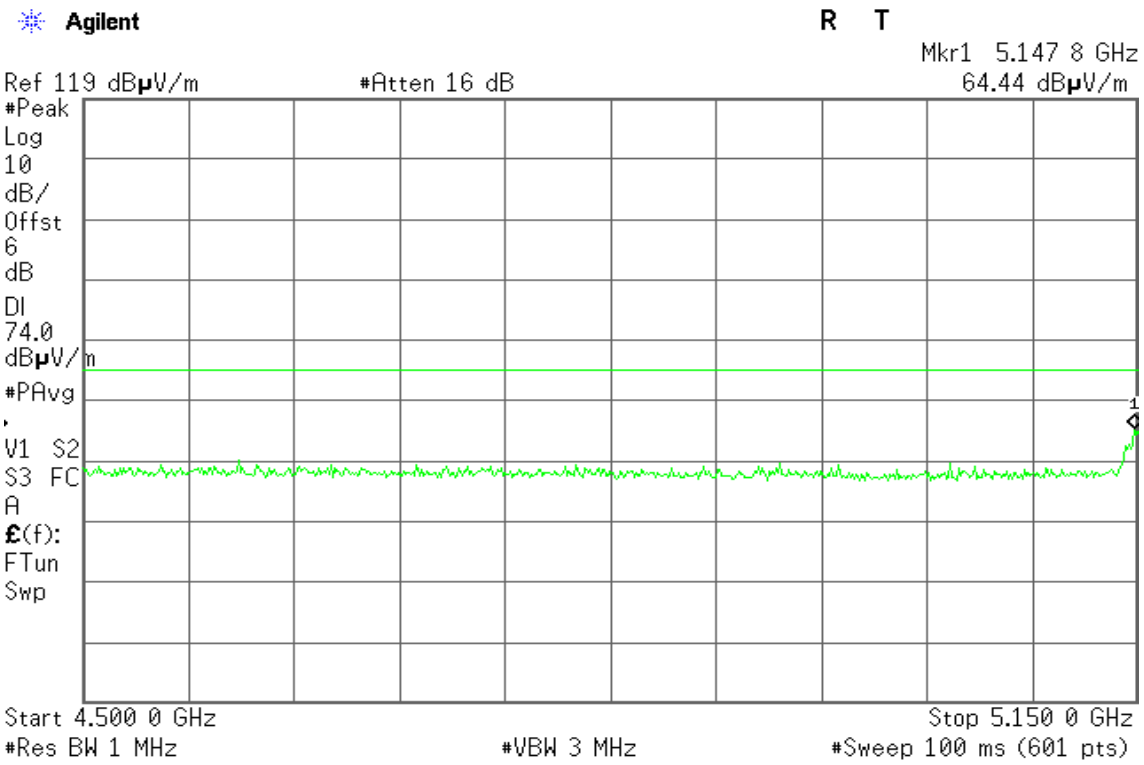


Detector mode: Average **Polarity: Horizontal**

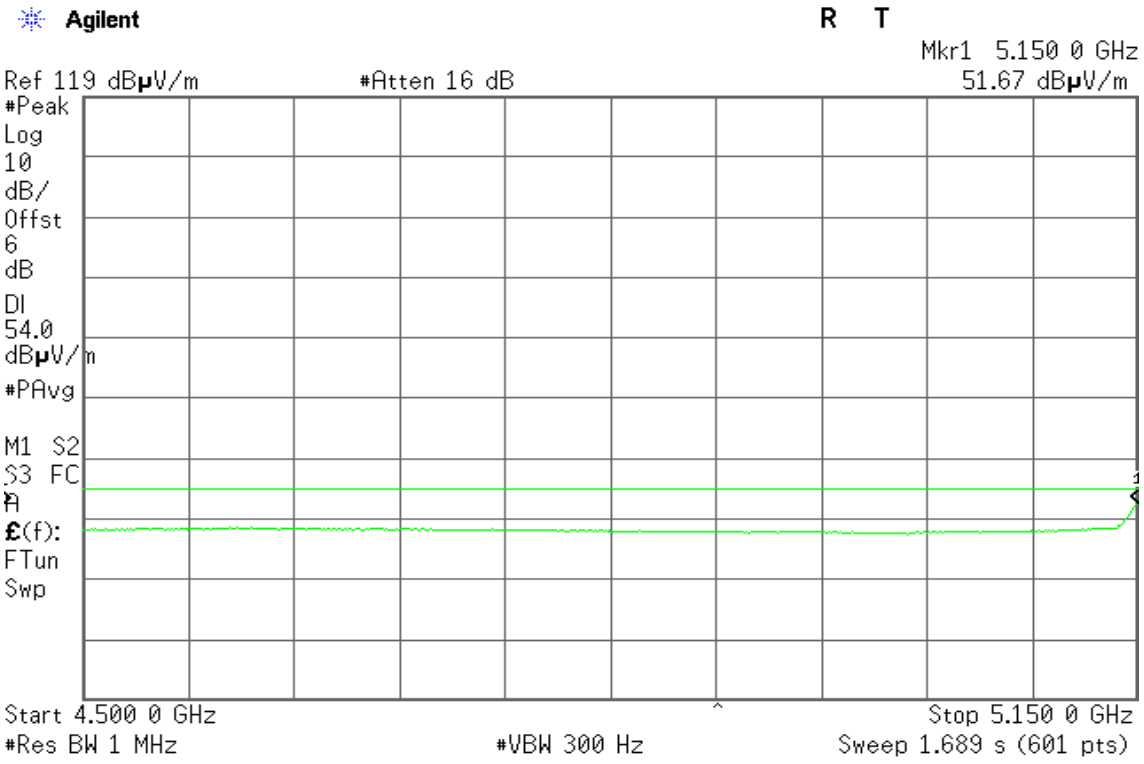


Band Edges (IEEE 802.11n HT 40 mode / 5190 MHz)

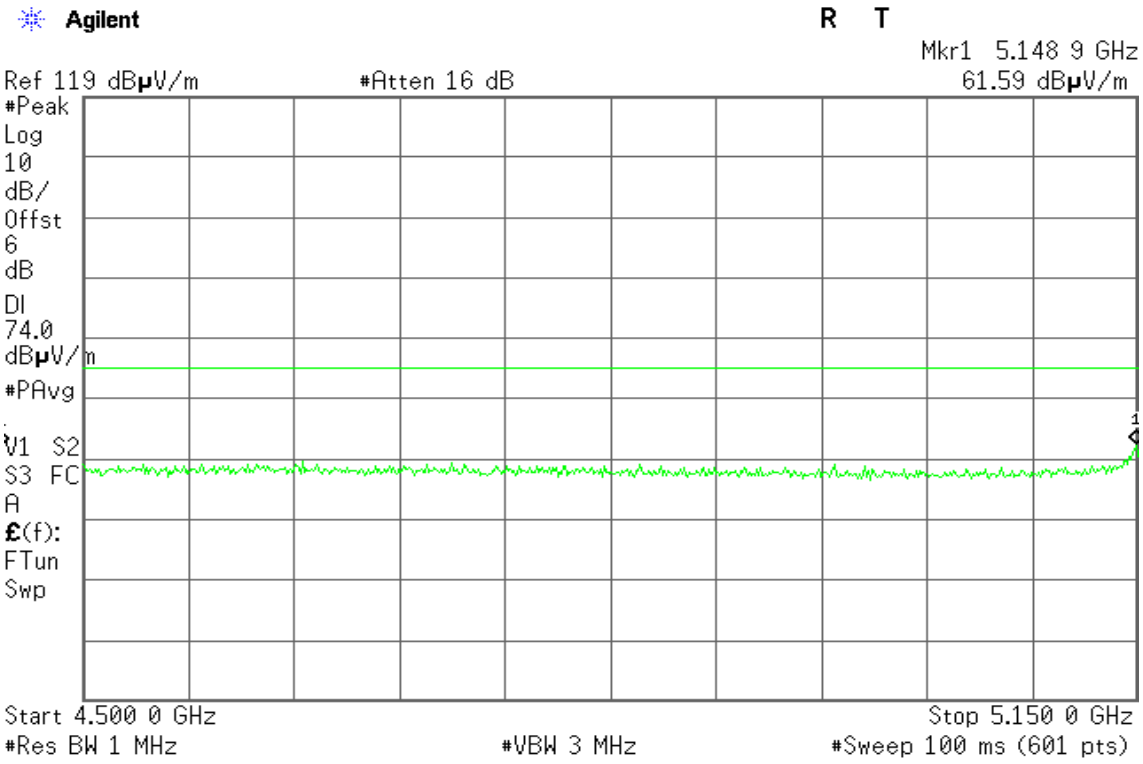
Detector mode: Peak **Polarity: Vertical**



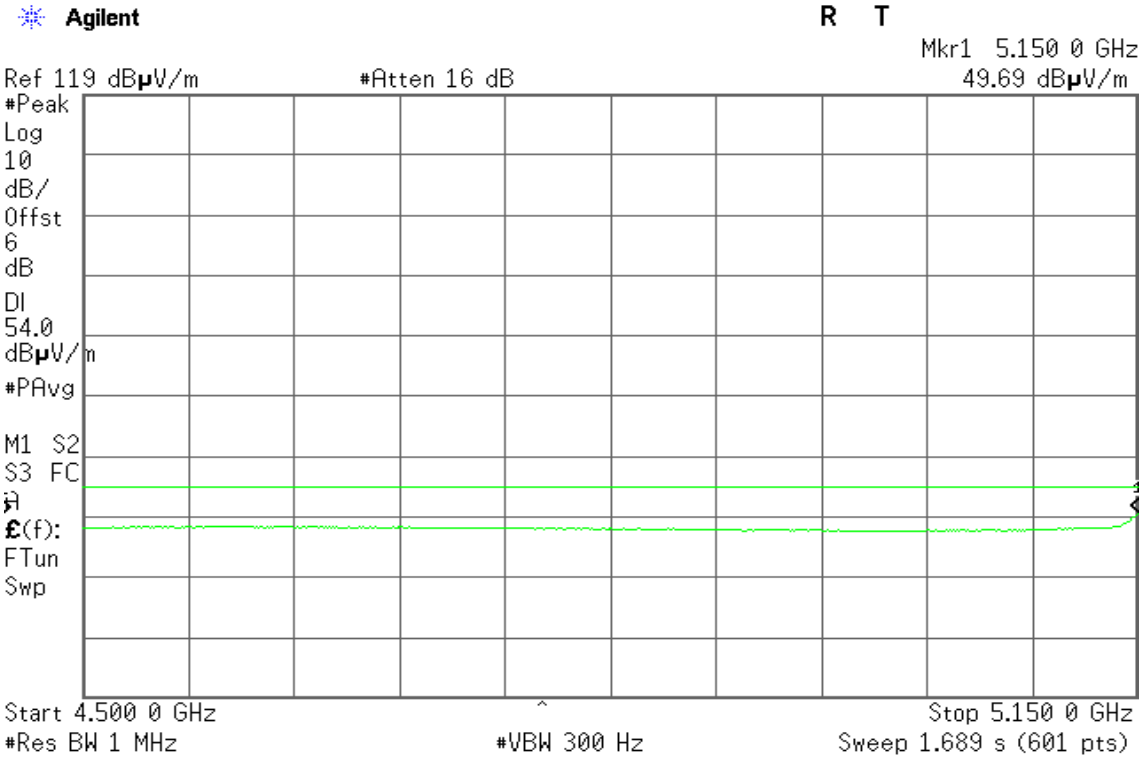
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

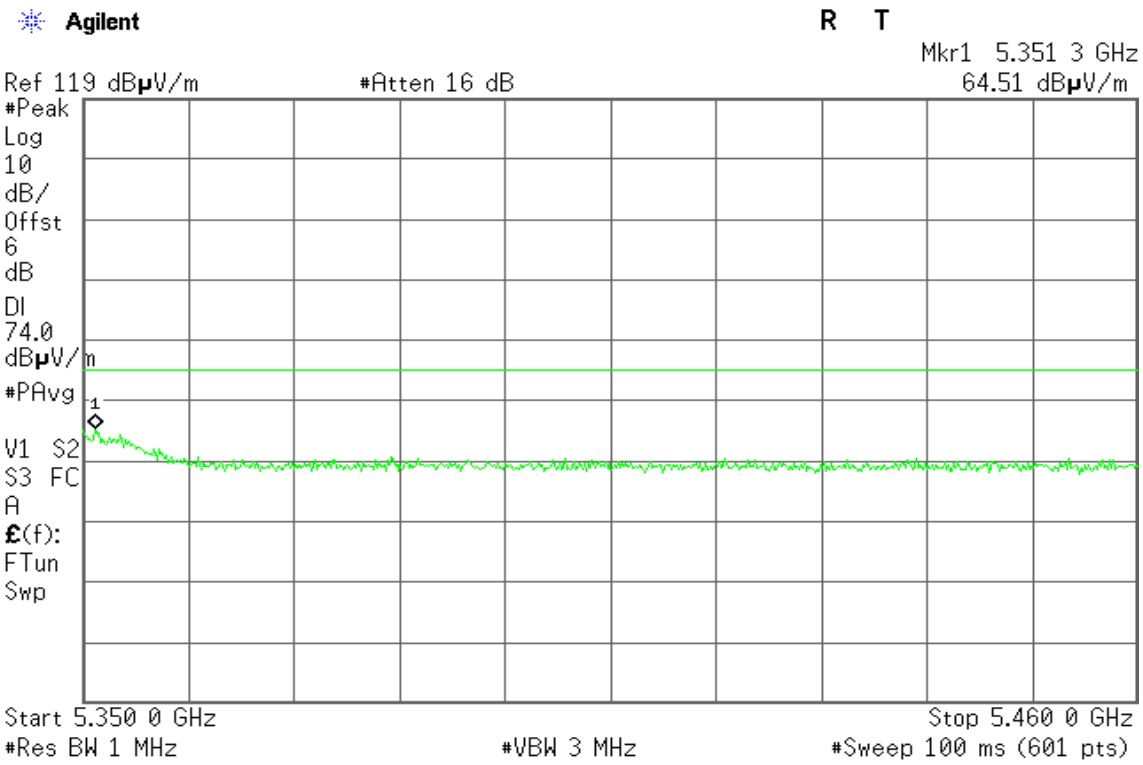


Detector mode: Average **Polarity: Horizontal**

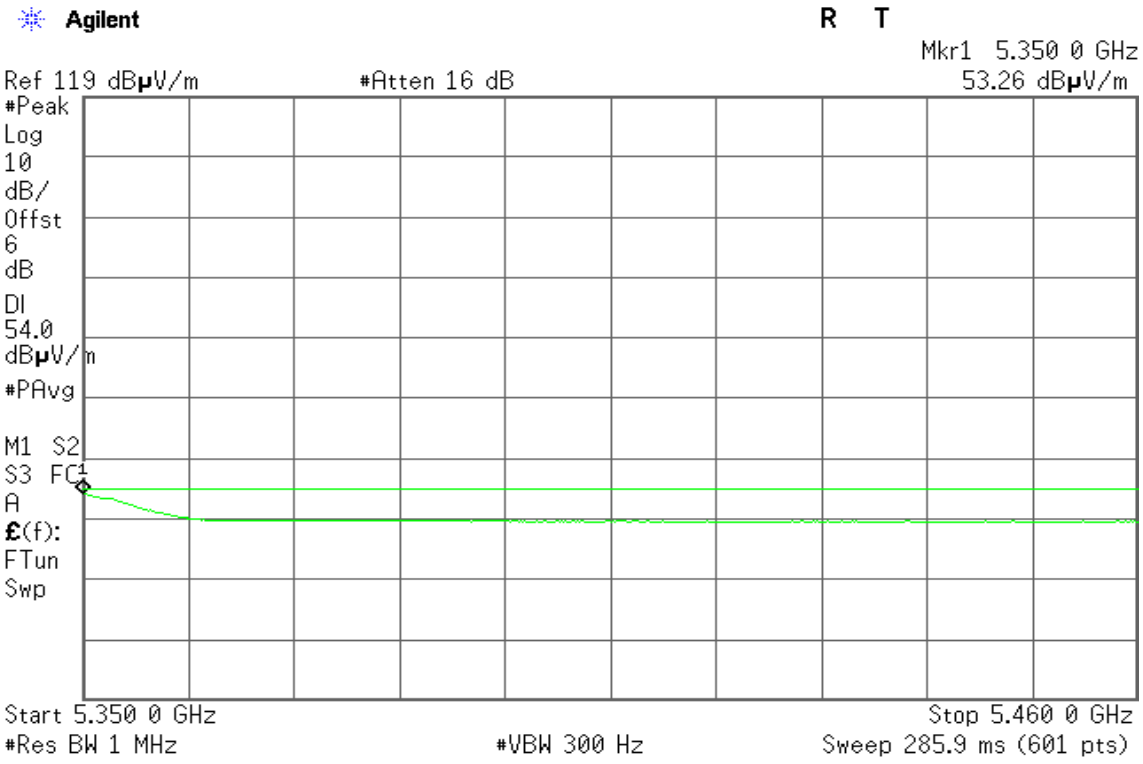


Band Edges (IEEE 802.11n HT 40 mode / CH 5310 MHz)

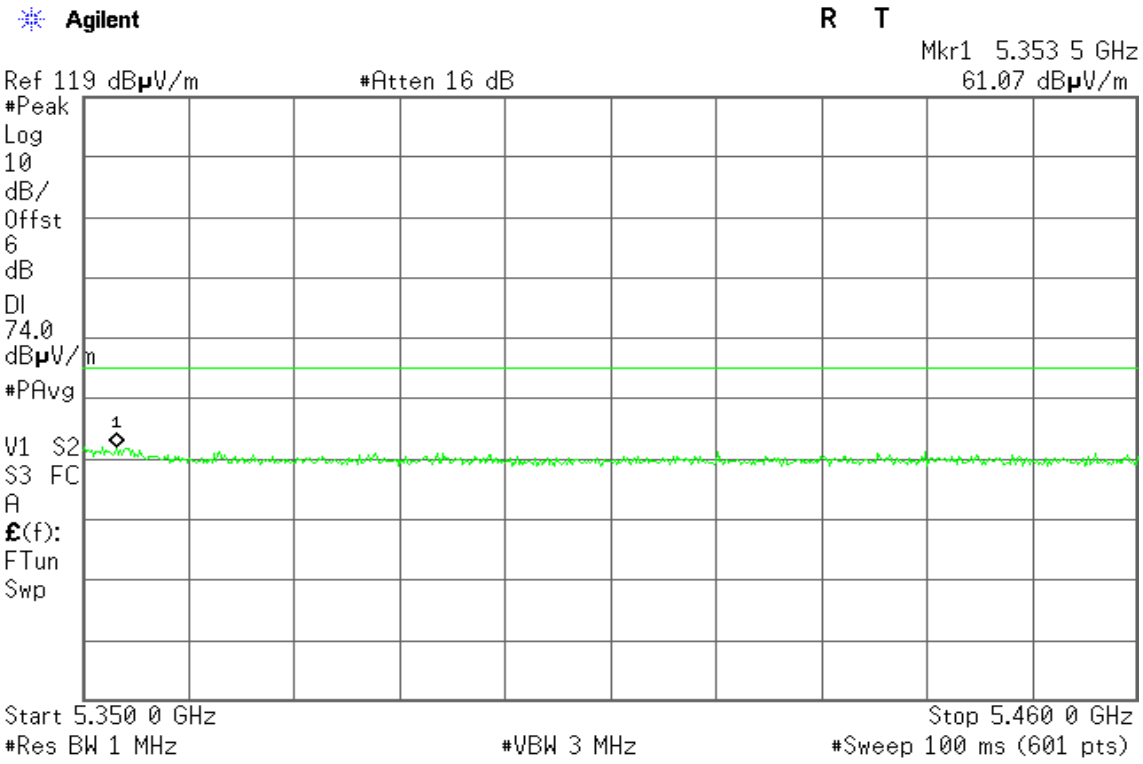
Detector mode: Peak **Polarity: Vertical**



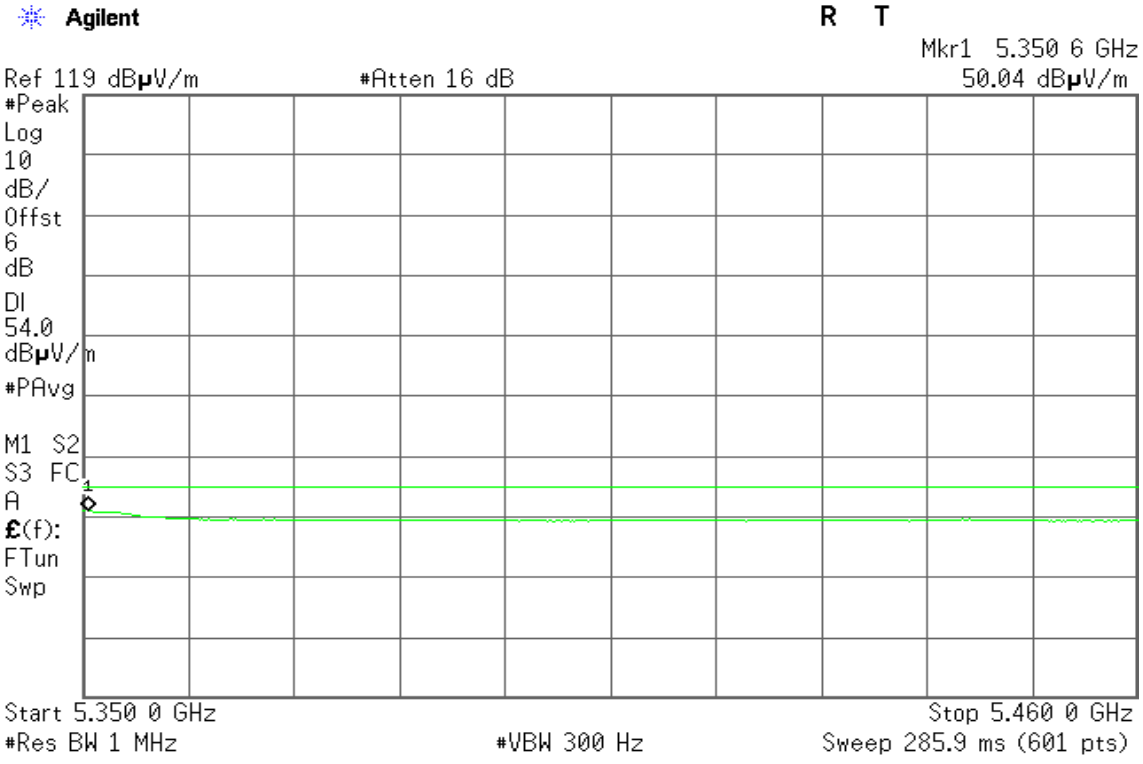
Detector mode: Average **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



7.4 PEAK POWER SPECTRAL DENSITY

LIMIT

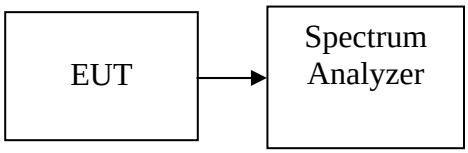
According to §15.407(a),

(1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1MHz band.

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

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

Test Configuration



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted

Test Data

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5180	-1.16	4.00	-5.16	PASS
Mid	5220	-1.86	4.00	-5.86	PASS
High	5240	-1.80	4.00	-5.80	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5180	-3.32	-0.86	1.09	4.00	-2.91	PASS
Mid	5220	-3.32	0.57	2.06	4.00	-1.94	PASS
High	5240	-3.10	0.50	2.07	4.00	-1.93	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5190	-3.48	-6.66	-1.77	4.00	-5.77	PASS
High	5230	-2.62	-6.26	-1.06	4.00	-5.06	PASS

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

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5260	-1.60	11.00	-12.60	PASS
Mid	5280	-2.37	11.00	-13.37	PASS
High	5320	-2.00	11.00	-13.00	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5260	-3.60	-0.66	1.12	11.00	-9.88	PASS
Mid	5280	-3.13	0.54	2.09	11.00	-8.91	PASS
High	5320	-3.09	-0.29	1.54	11.00	-9.46	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5270	-6.86	-2.65	-1.25	11.00	-12.25	PASS
High	5310	-5.92	-2.10	-0.59	11.00	-11.59	PASS

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

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

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5500	-1.05	11.00	-12.05	PASS
Mid	5580	-0.89	11.00	-11.89	PASS
High	5700	-0.86	11.00	-11.86	PASS

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

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5500	-3.23	1.57	2.81	11.00	-8.19	PASS
Mid	5580	-2.40	2.75	3.91	11.00	-7.09	PASS
High	5700	-3.85	0.21	1.65	11.00	-9.35	PASS

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

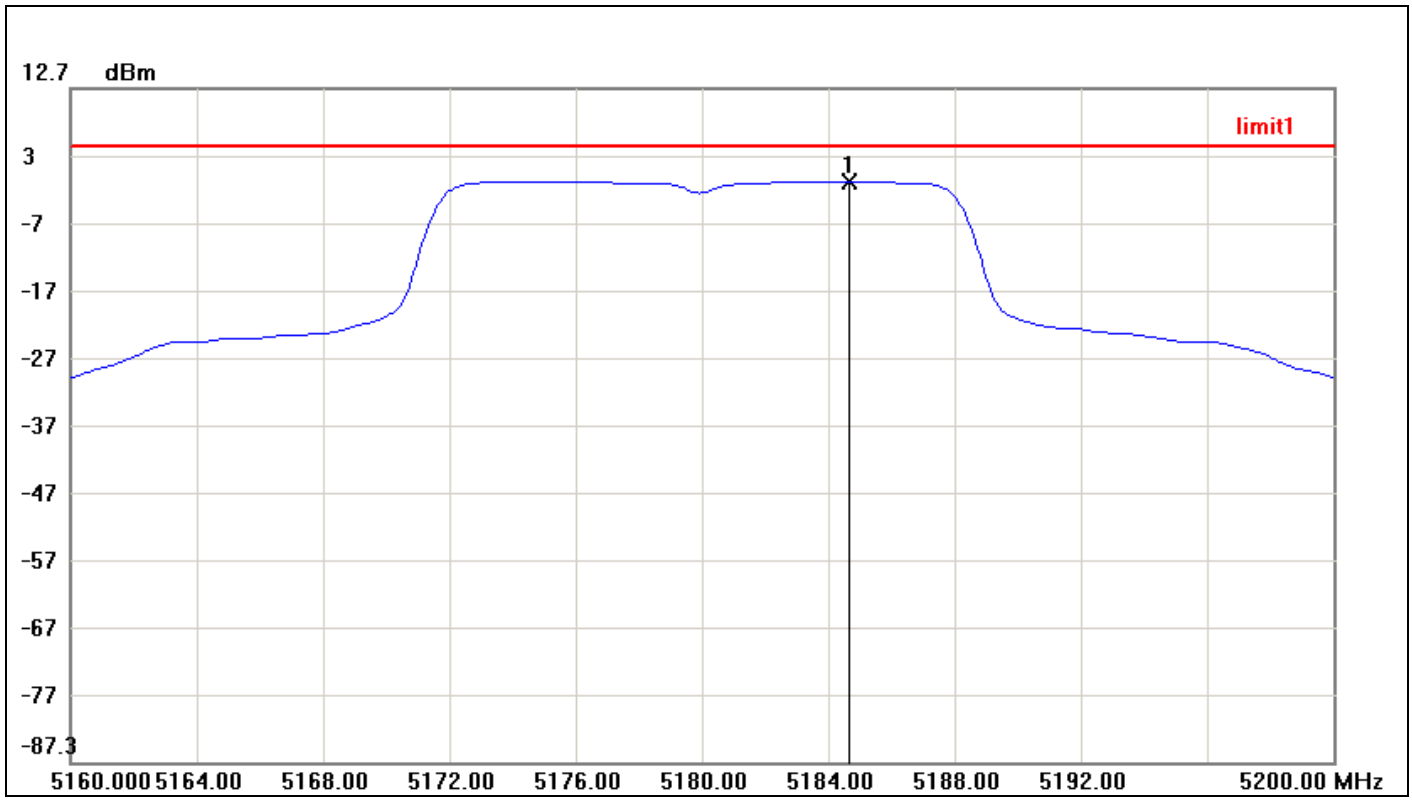
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5510	-5.46	-0.81	0.47	11.00	-10.53	PASS
Mid	5590	-5.42	-0.63	0.61	11.00	-10.39	PASS
High	5670	-5.33	-1.08	0.31	11.00	-10.69	PASS

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

Test Plot

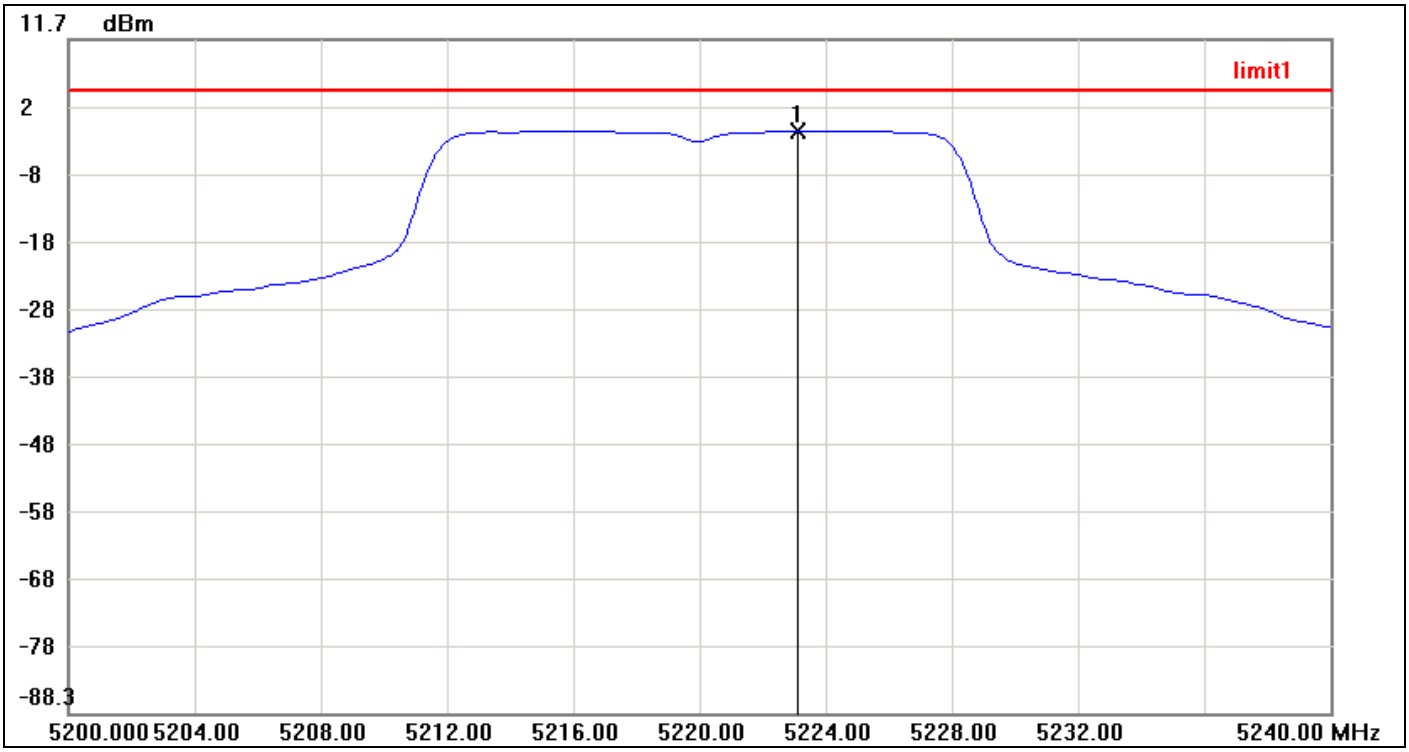
IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low



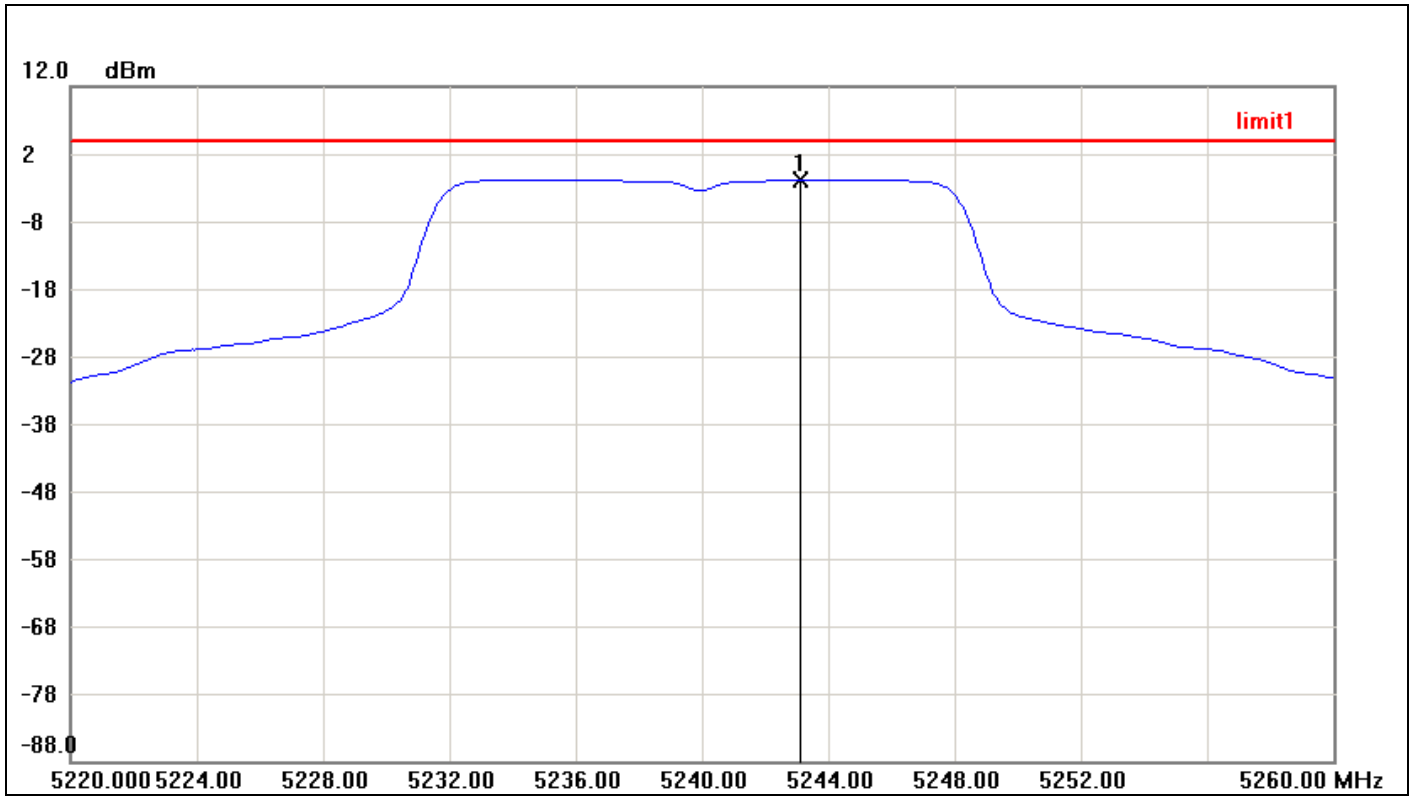
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5184.6667	-1.16	4.00	-5.16

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5223.1333	-1.86	4.00	-5.86

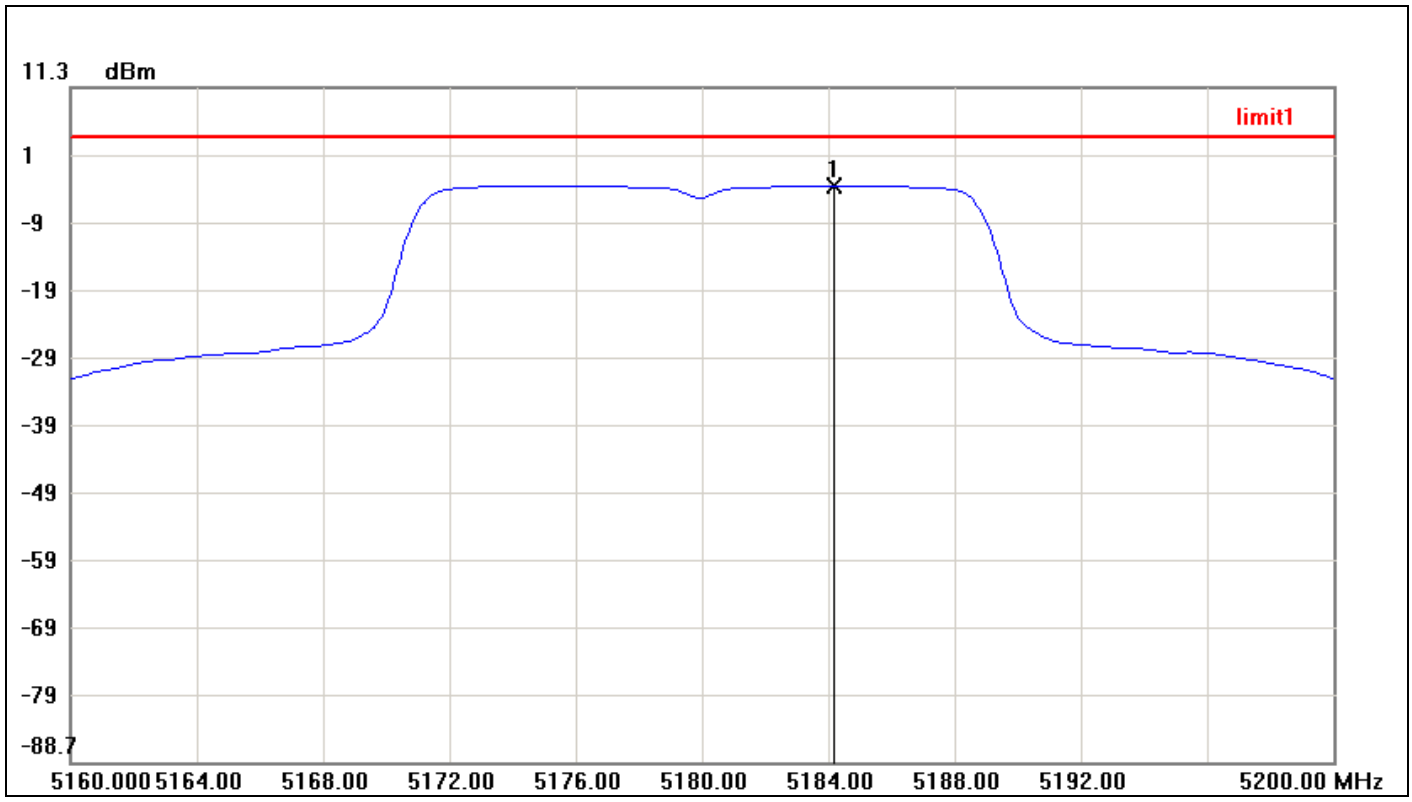
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5243.1333	-1.80	4.00	-5.80

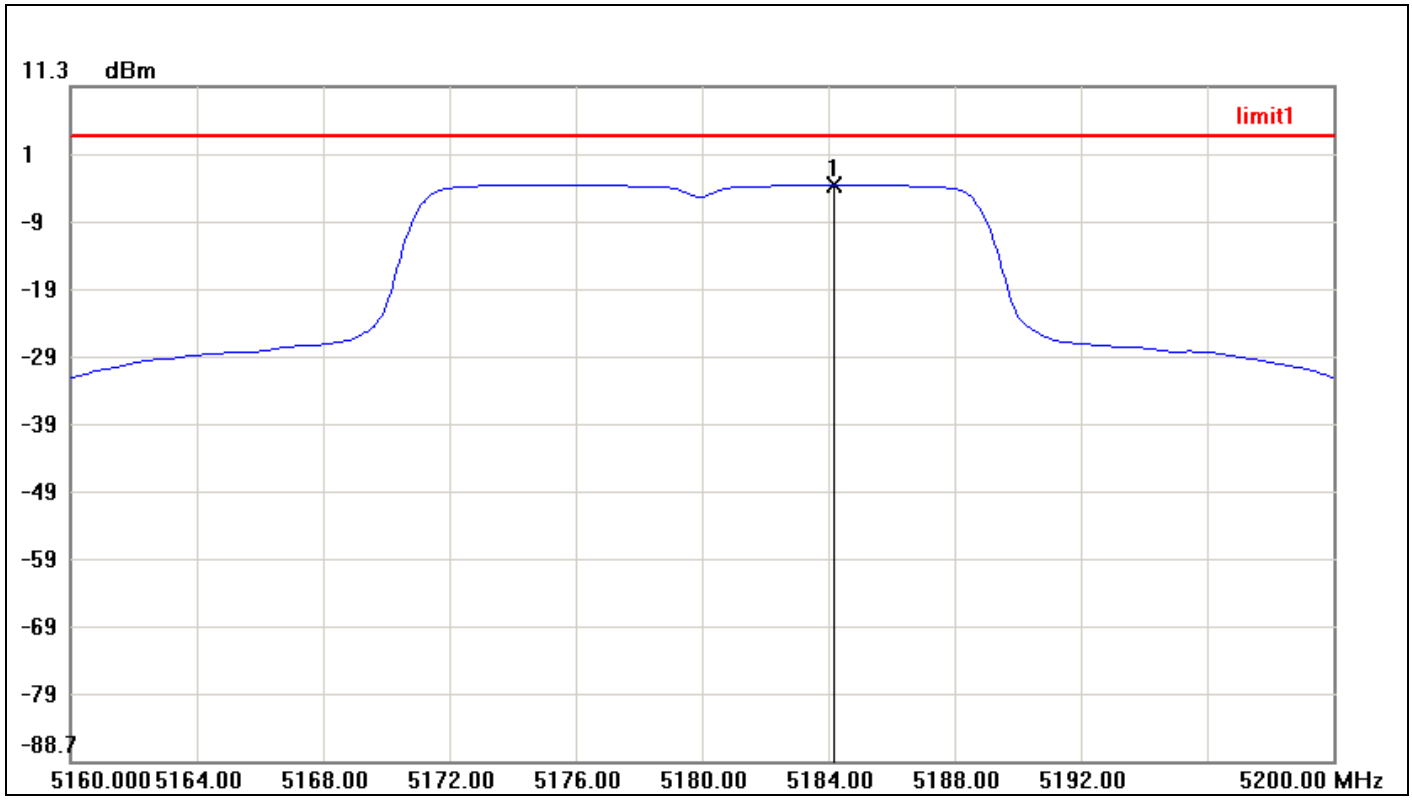
IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 0

CH Low



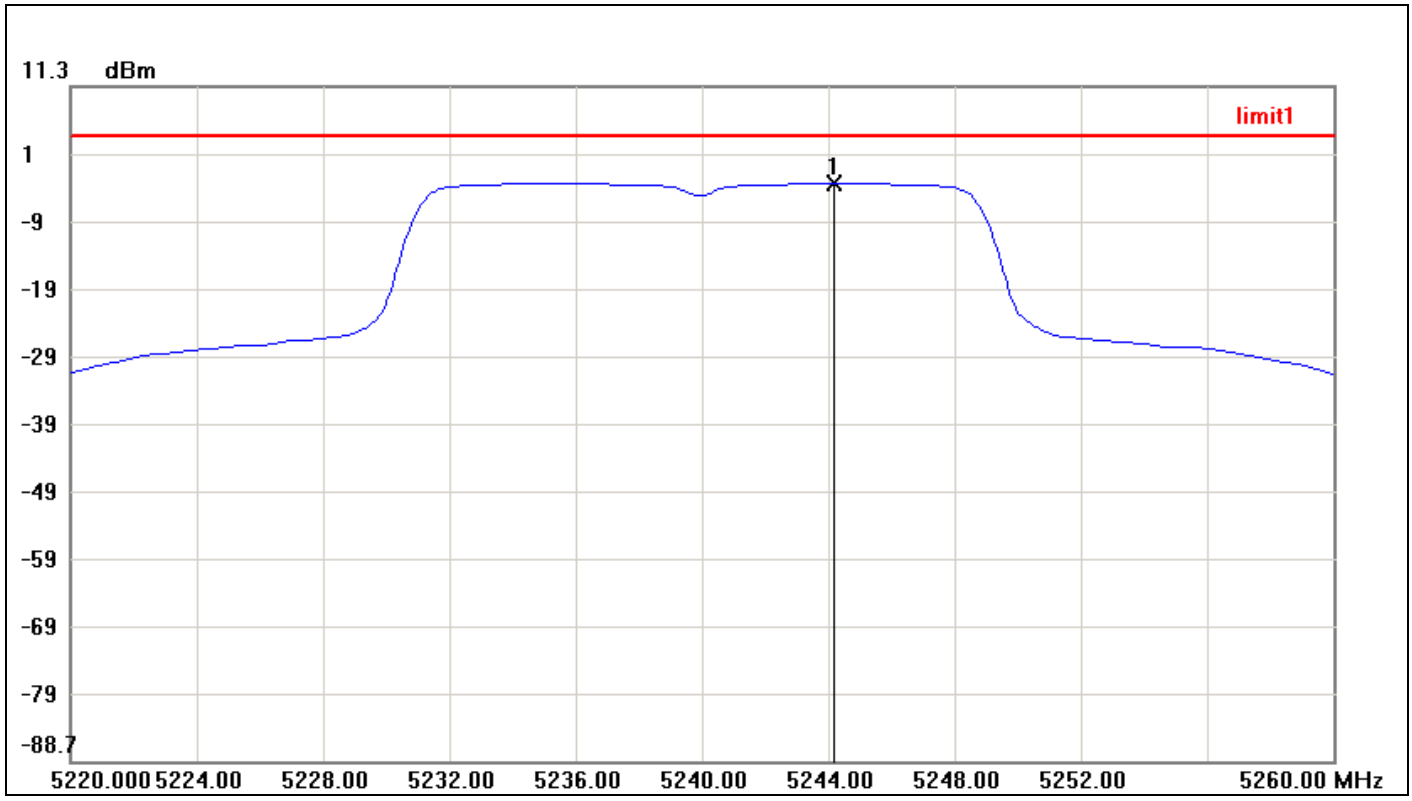
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5184.2000	-3.32	4.00	-7.32

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5184.2000	-3.32	4.00	-7.32

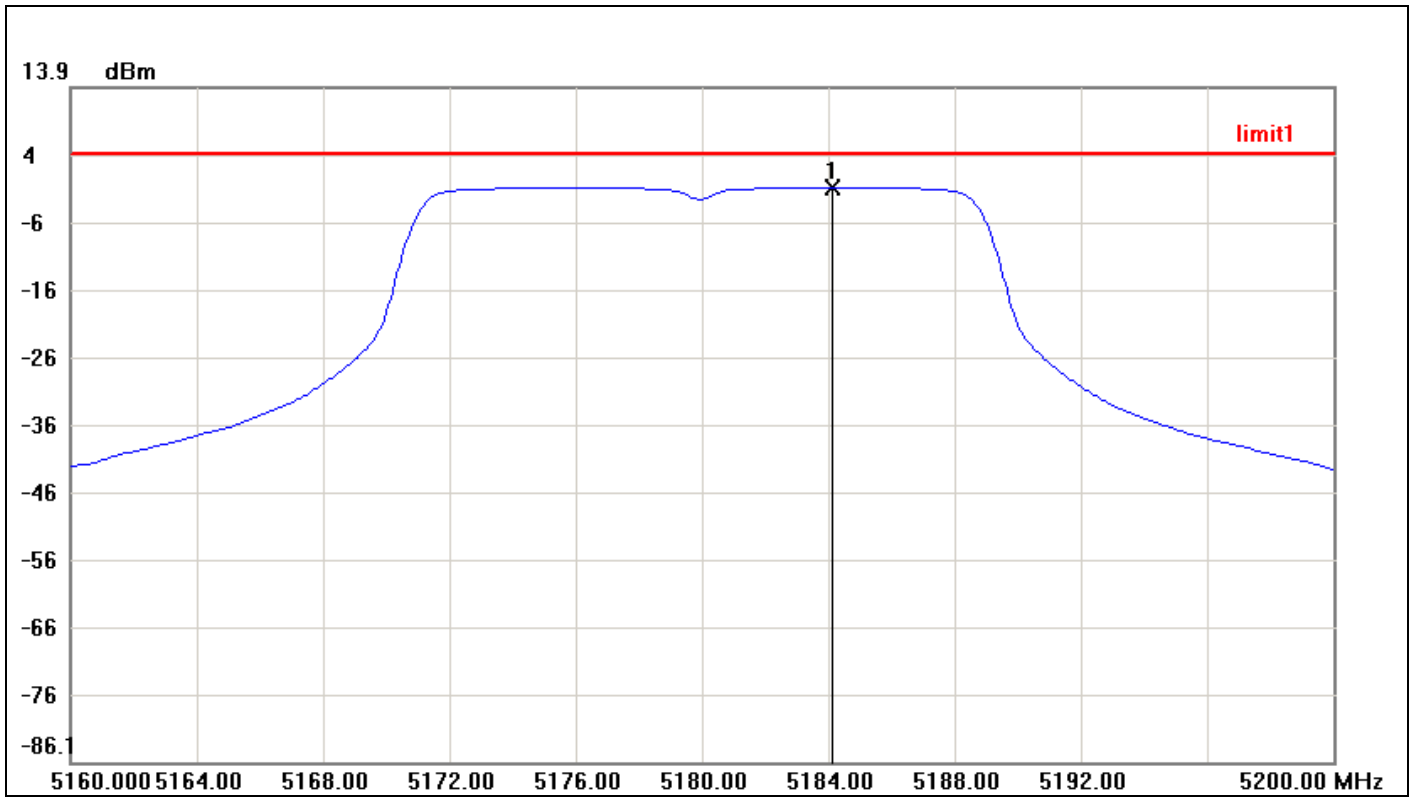
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5244.2000	-3.10	4.00	-7.10

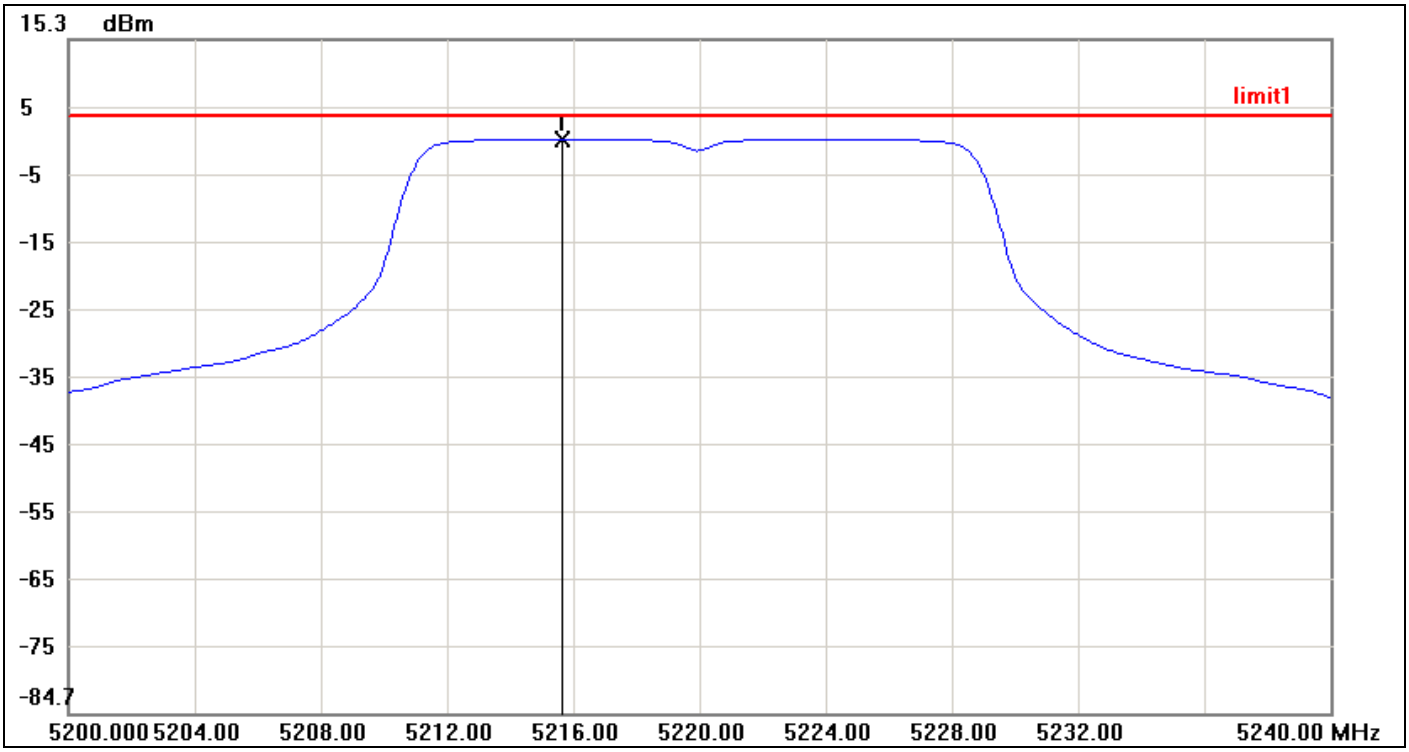
IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 1

CH Low



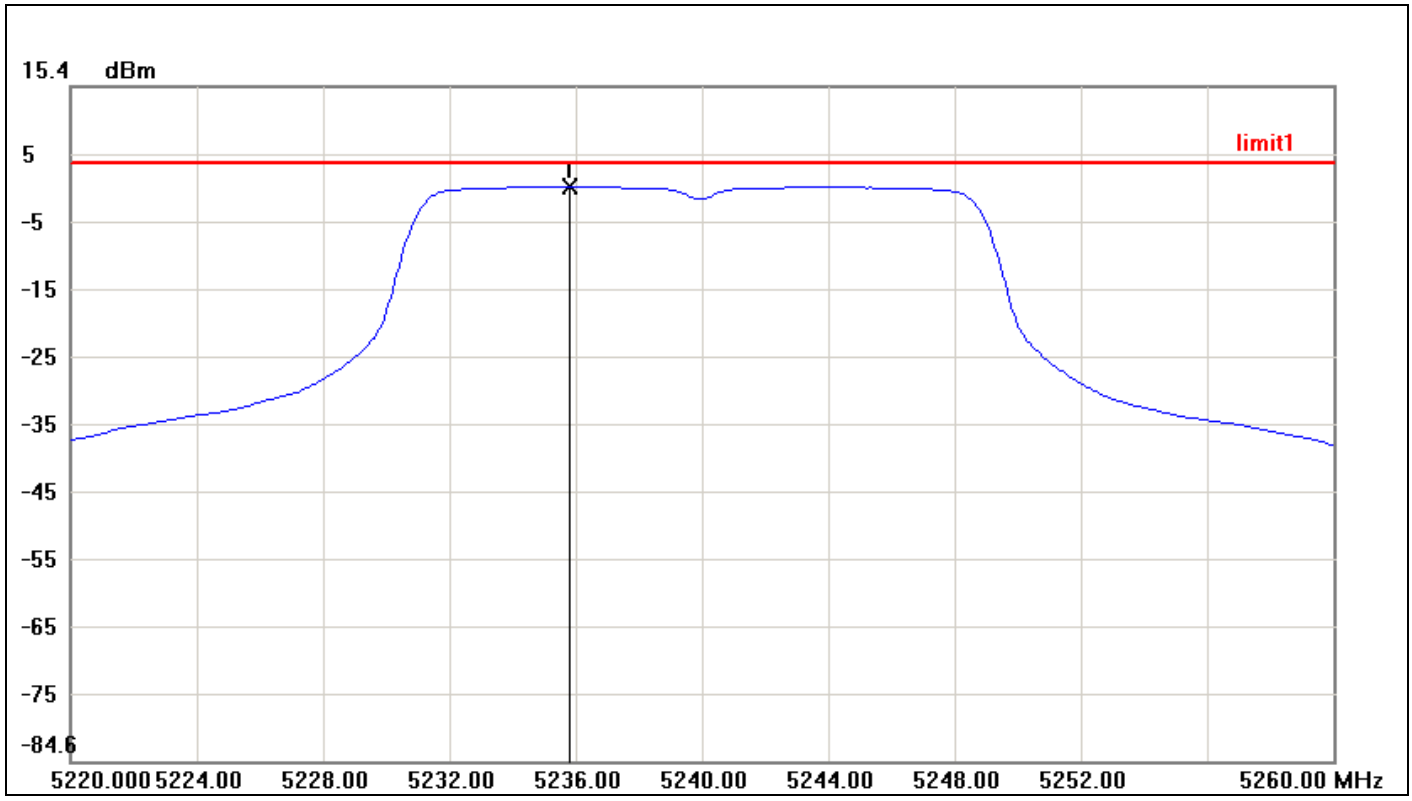
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5184.1333	-0.86	4.00	-4.86

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5215.6667	0.57	4.00	-3.43

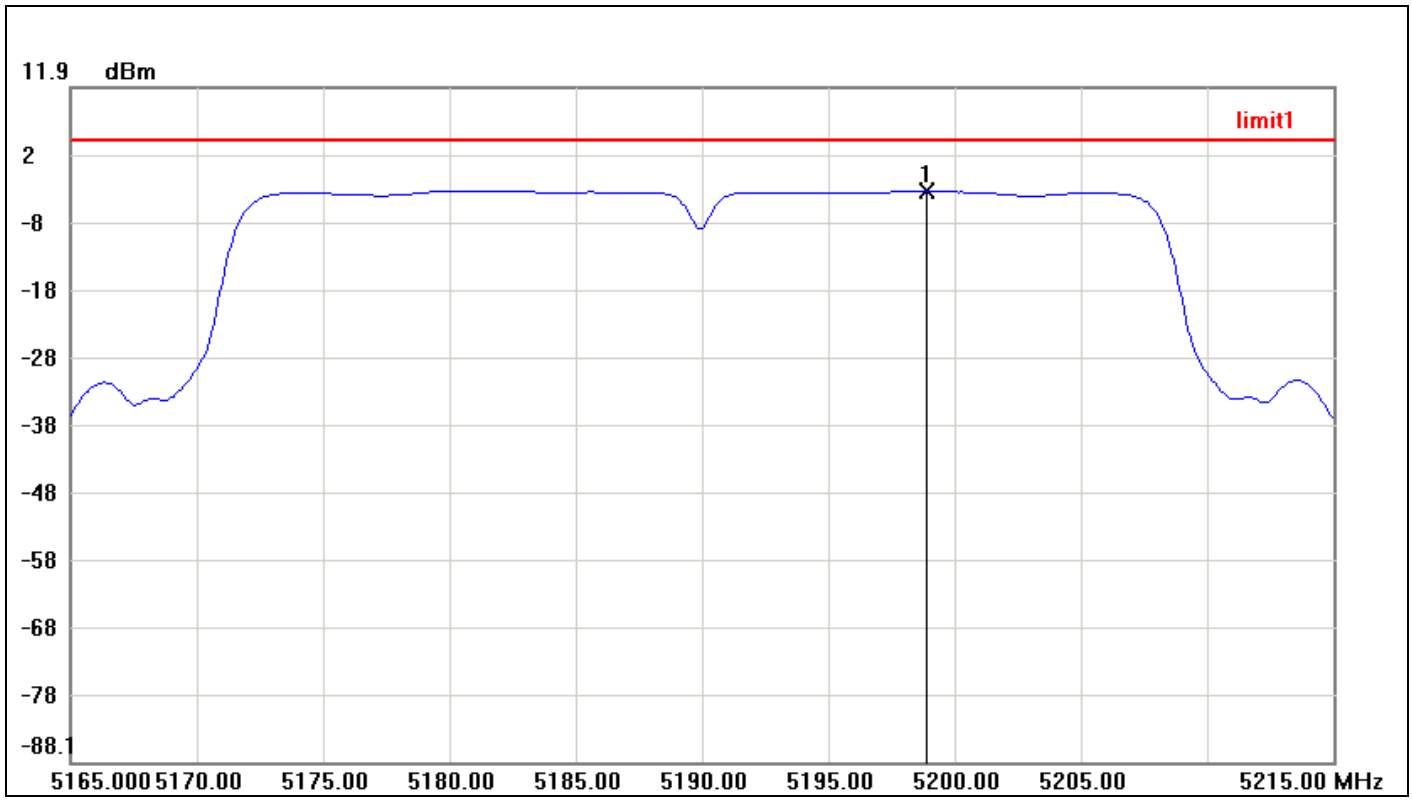
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5235.8000	0.50	4.00	-3.50

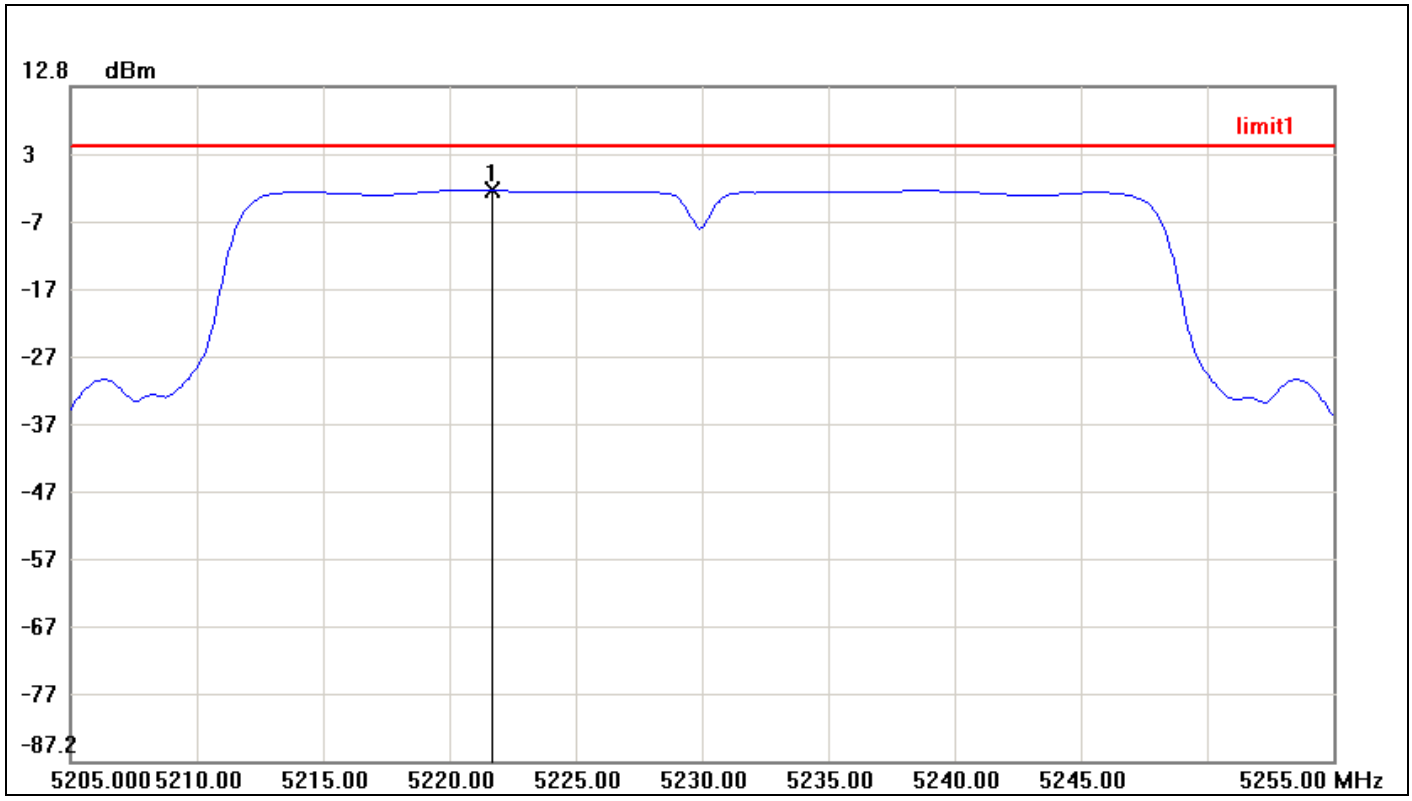
IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 0

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5198.9167	-3.48	4.00	-7.48

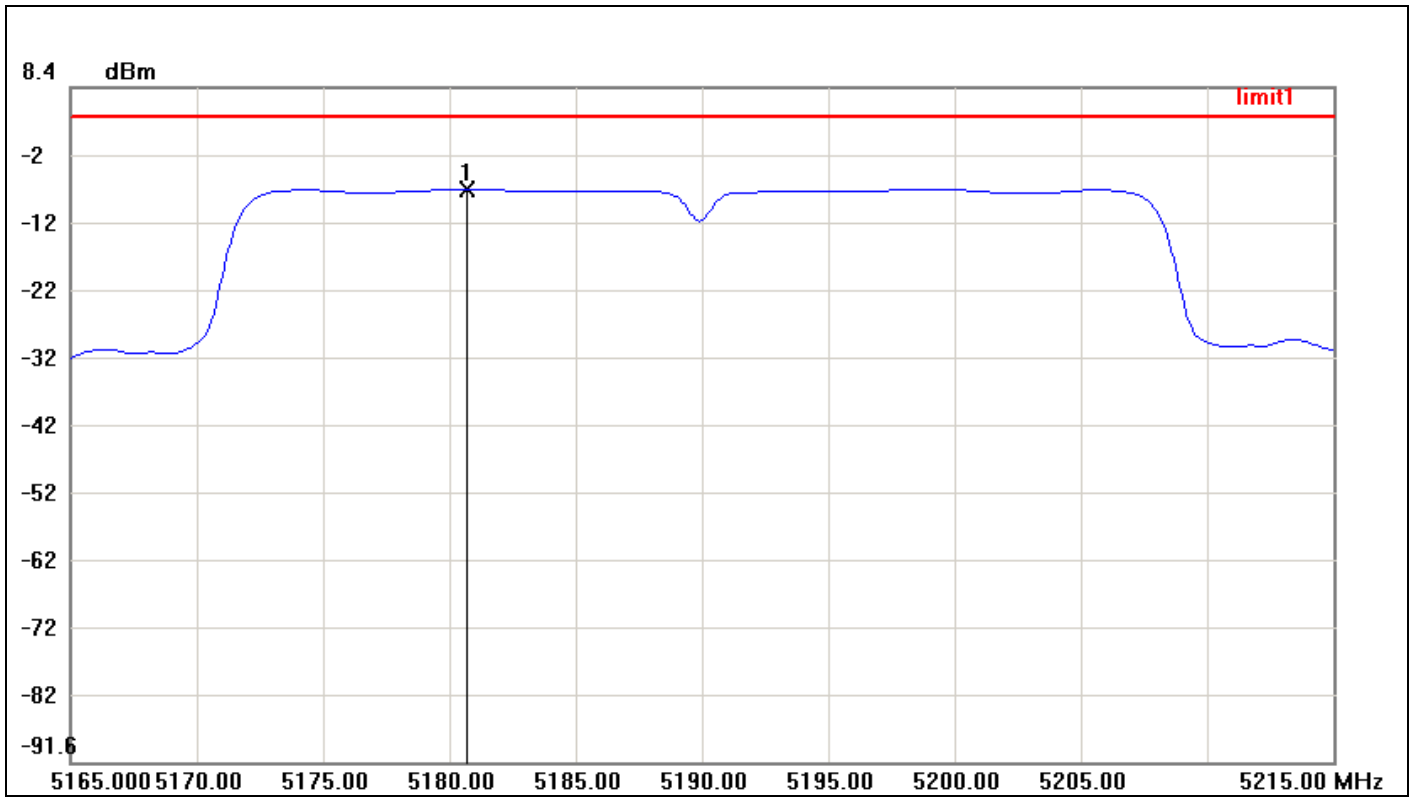
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5221.6667	-2.62	4.00	-6.62

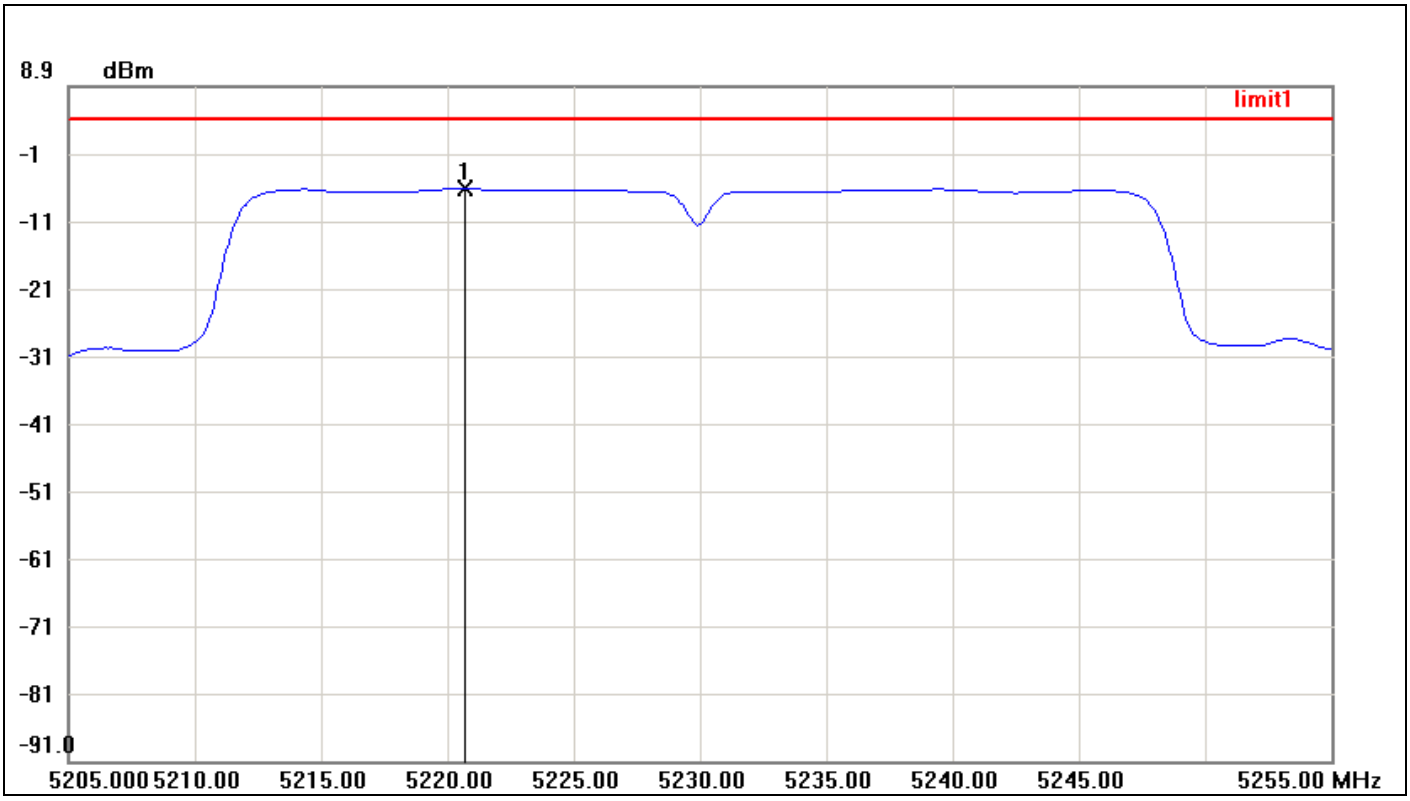
IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 1

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5180.6667	-6.66	4.00	-10.66

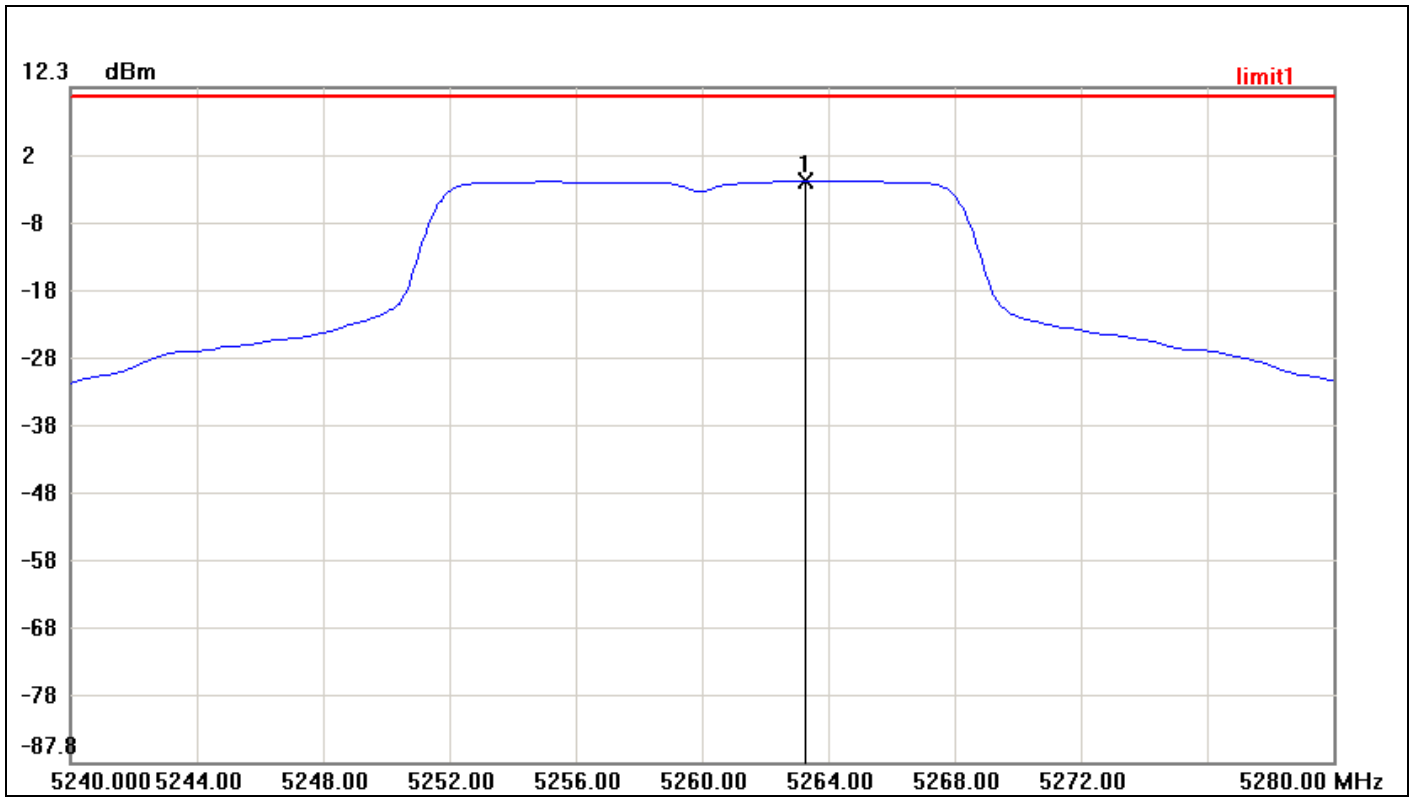
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5220.6667	-6.26	4.00	-10.26

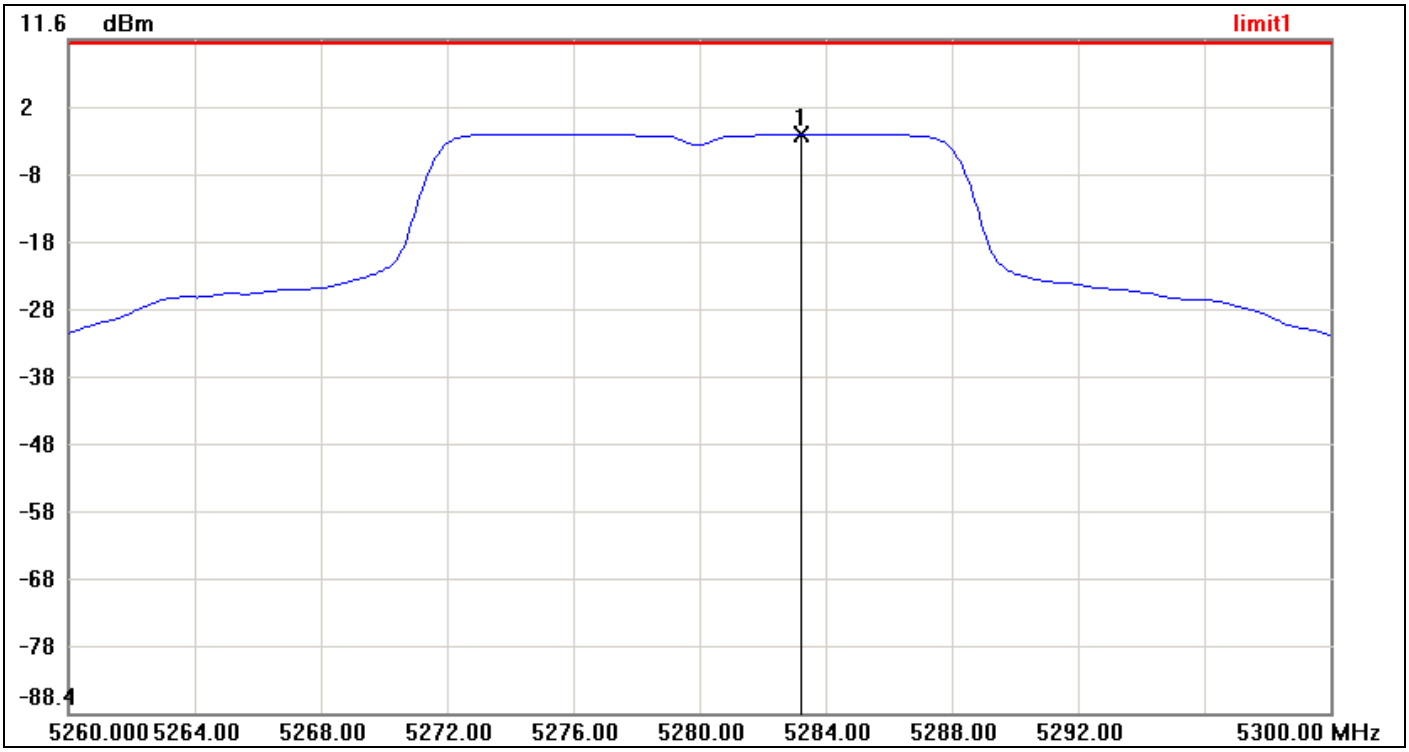
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low



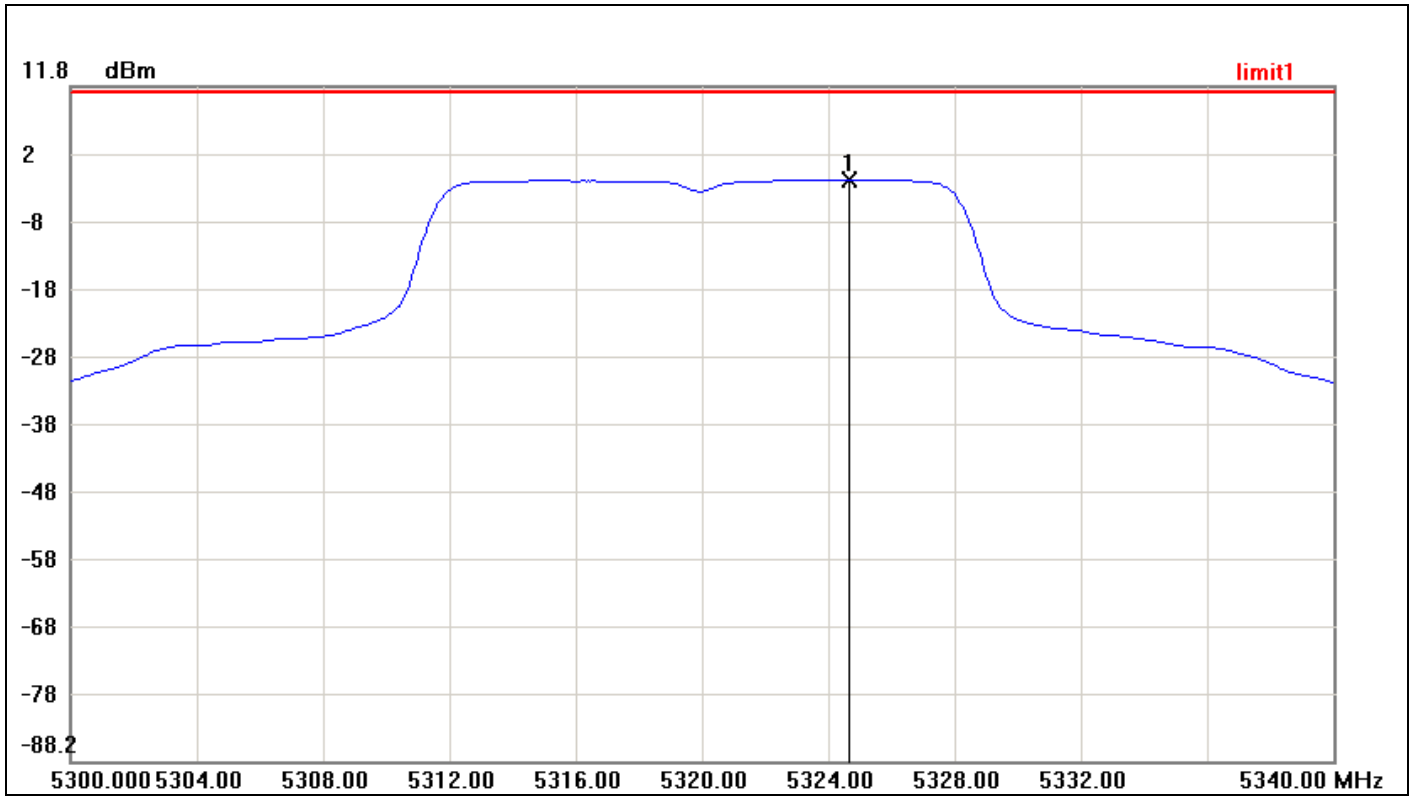
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5263.2667	-1.60	11.00	-12.60

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5283.2000	-2.37	11.00	-13.37

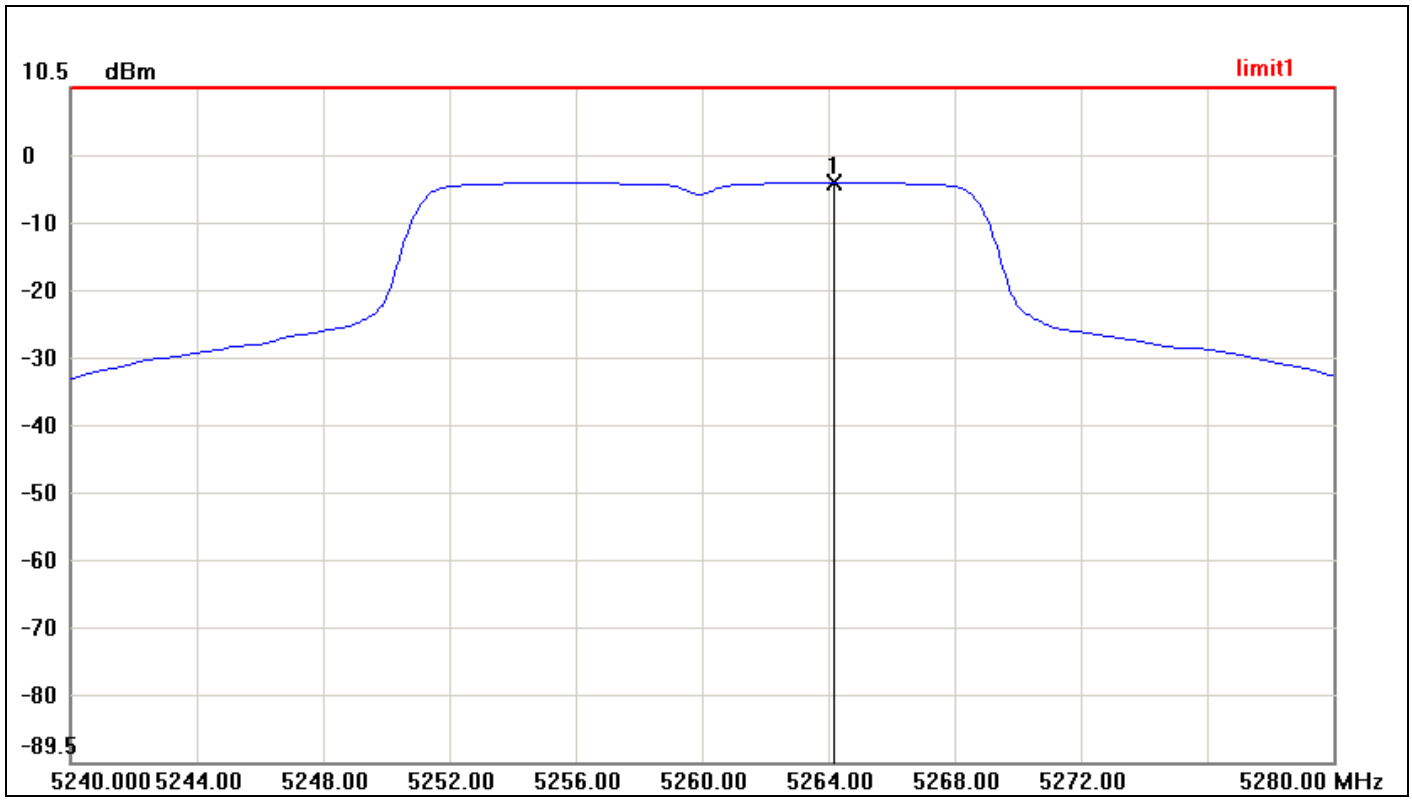
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5324.6667	-2.00	11.00	-13.00

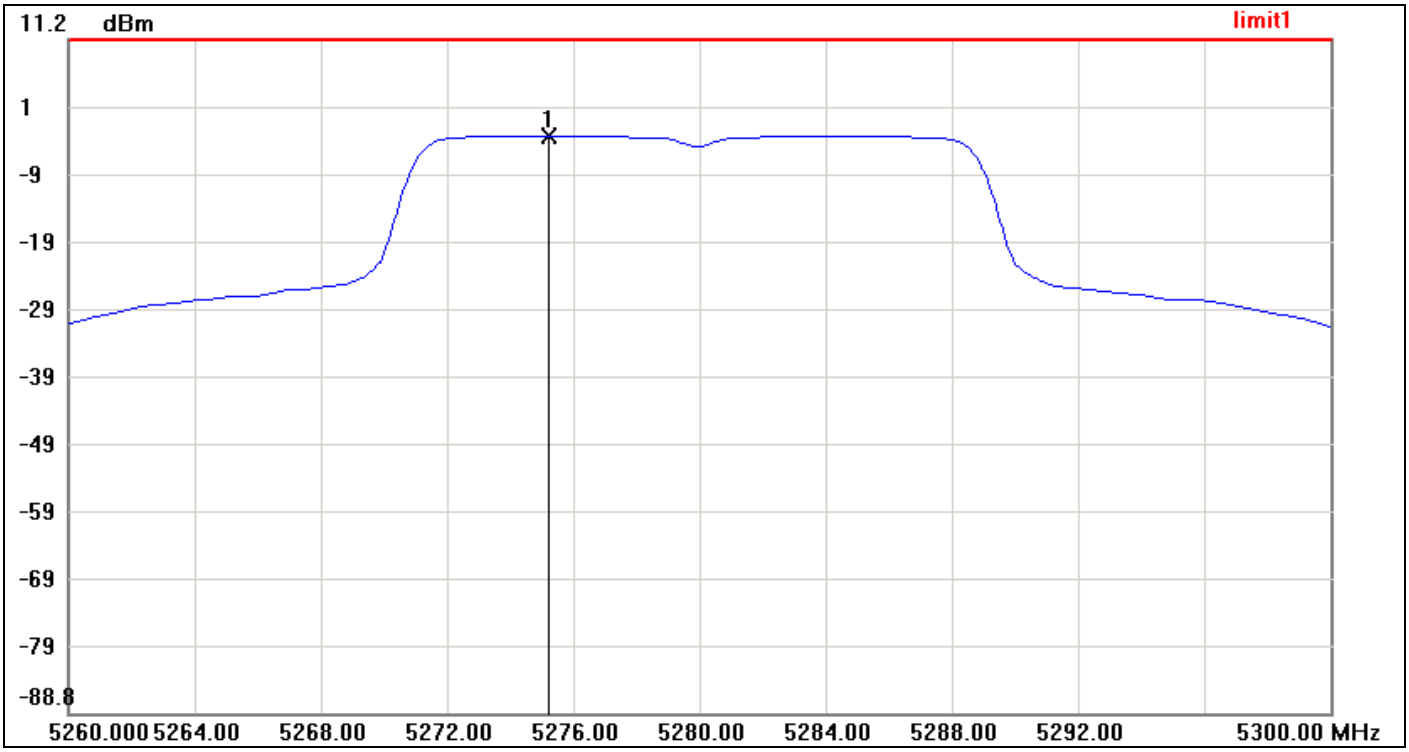
IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / Chain 0

CH Low



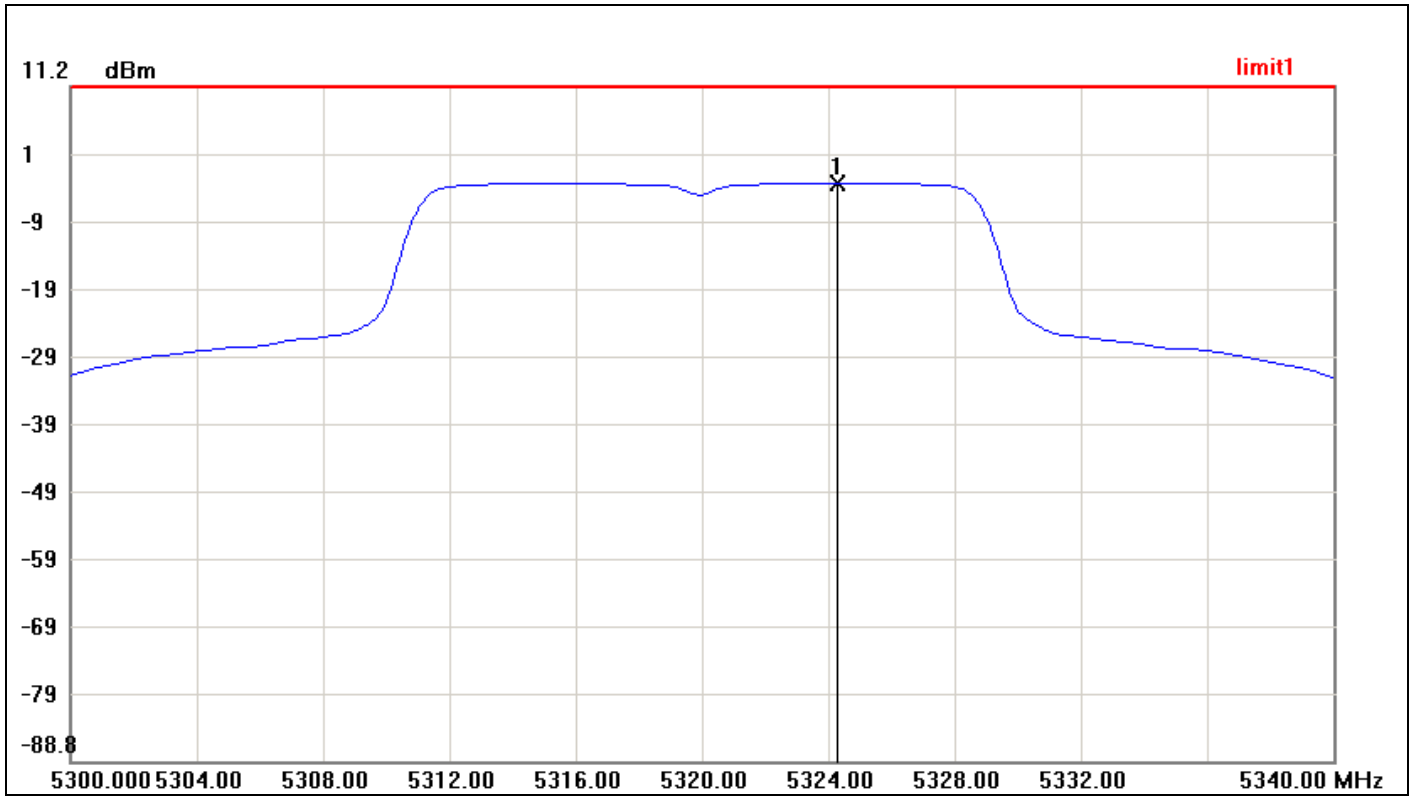
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5264.2000	-3.60	11.00	-14.60

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5275.2000	-3.13	11.00	-14.13

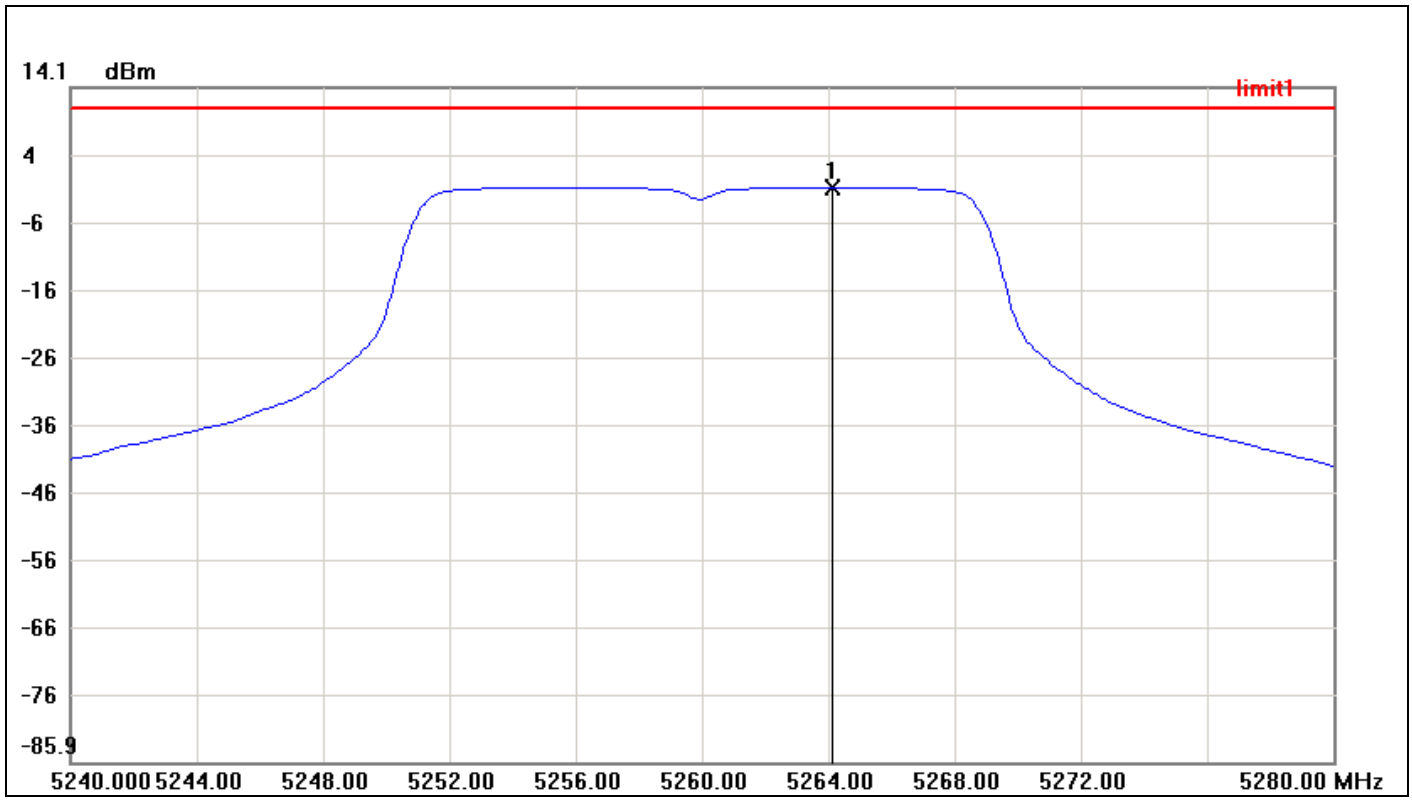
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5324.2667	-3.09	11.00	-14.09

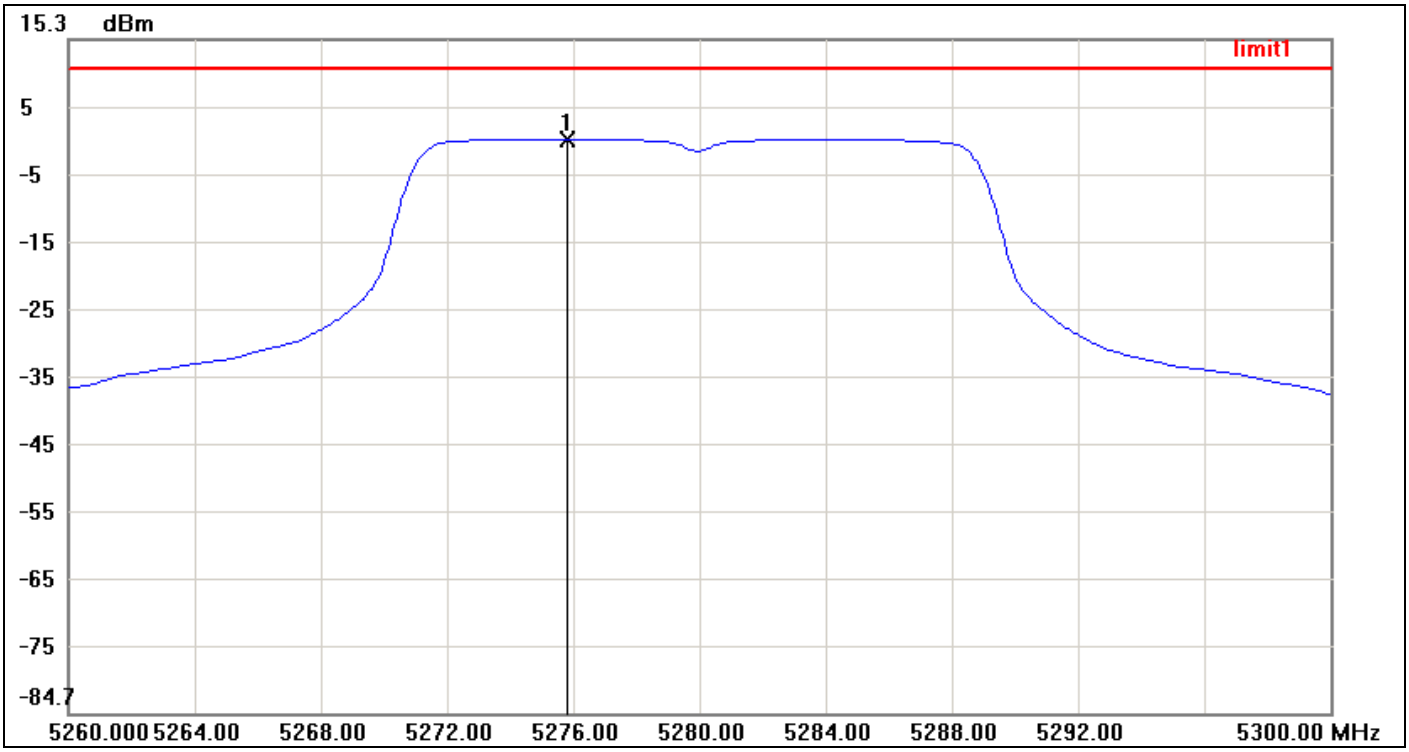
IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / Chain 1

CH Low



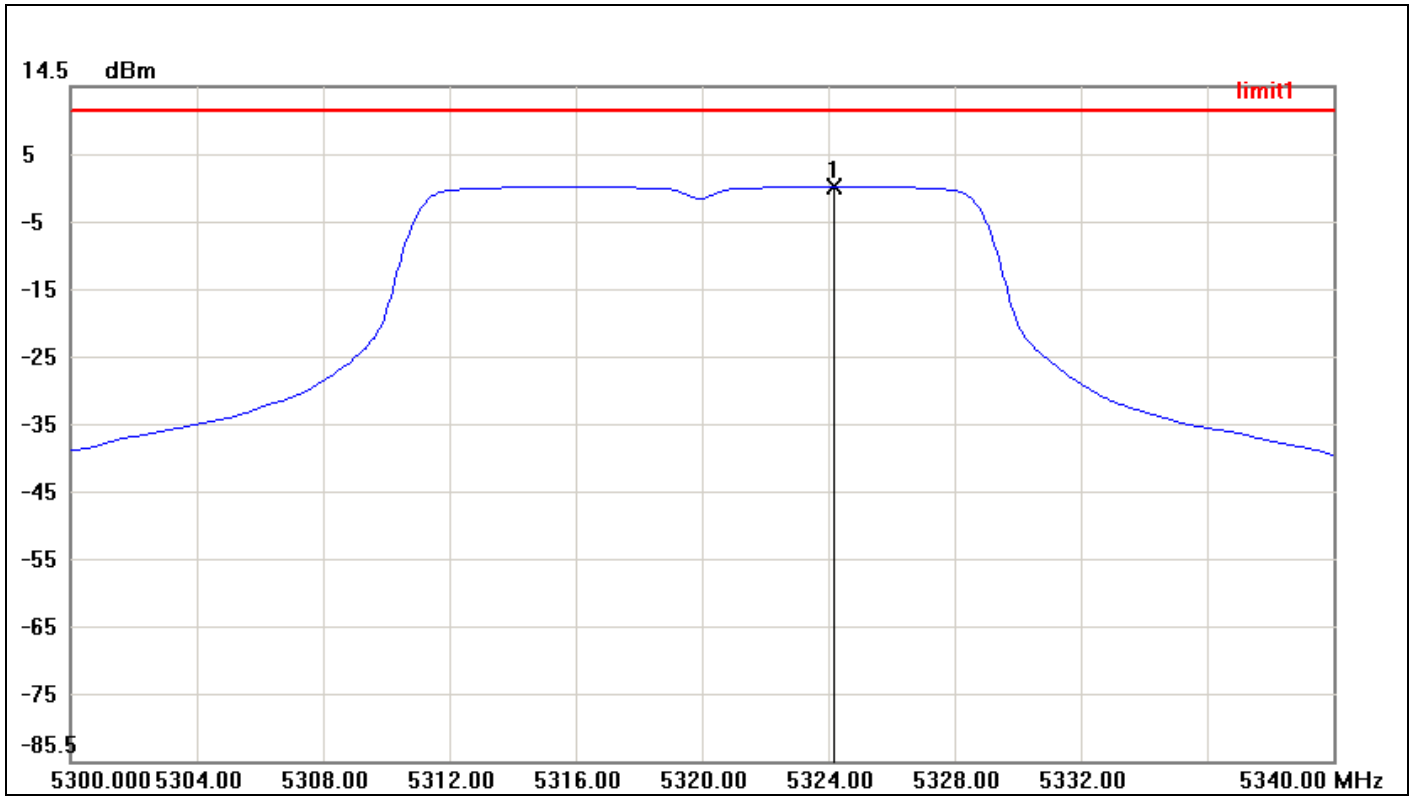
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5264.1333	-0.66	11.00	-11.66

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5275.8000	0.54	11.00	-10.46

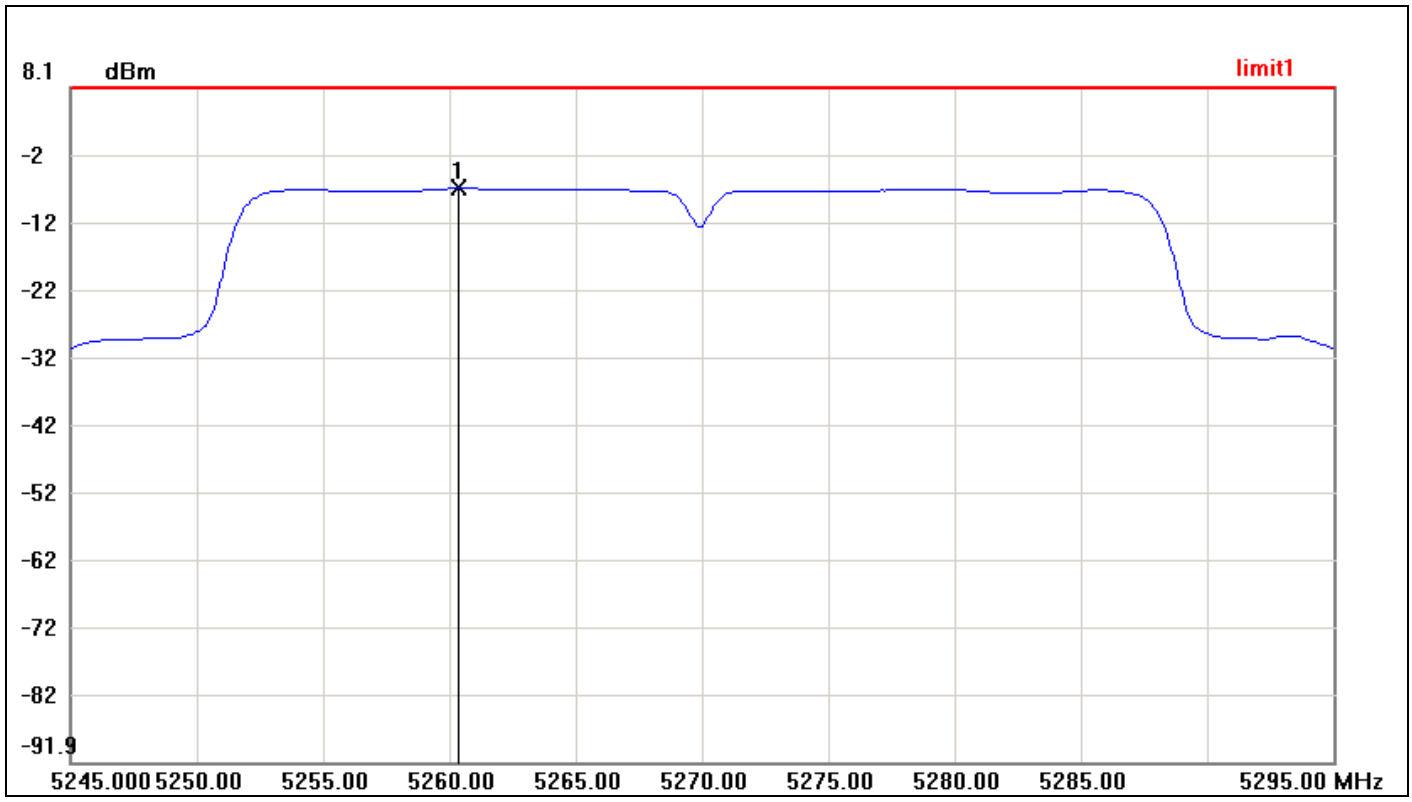
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5324.2000	-0.29	11.00	-11.29

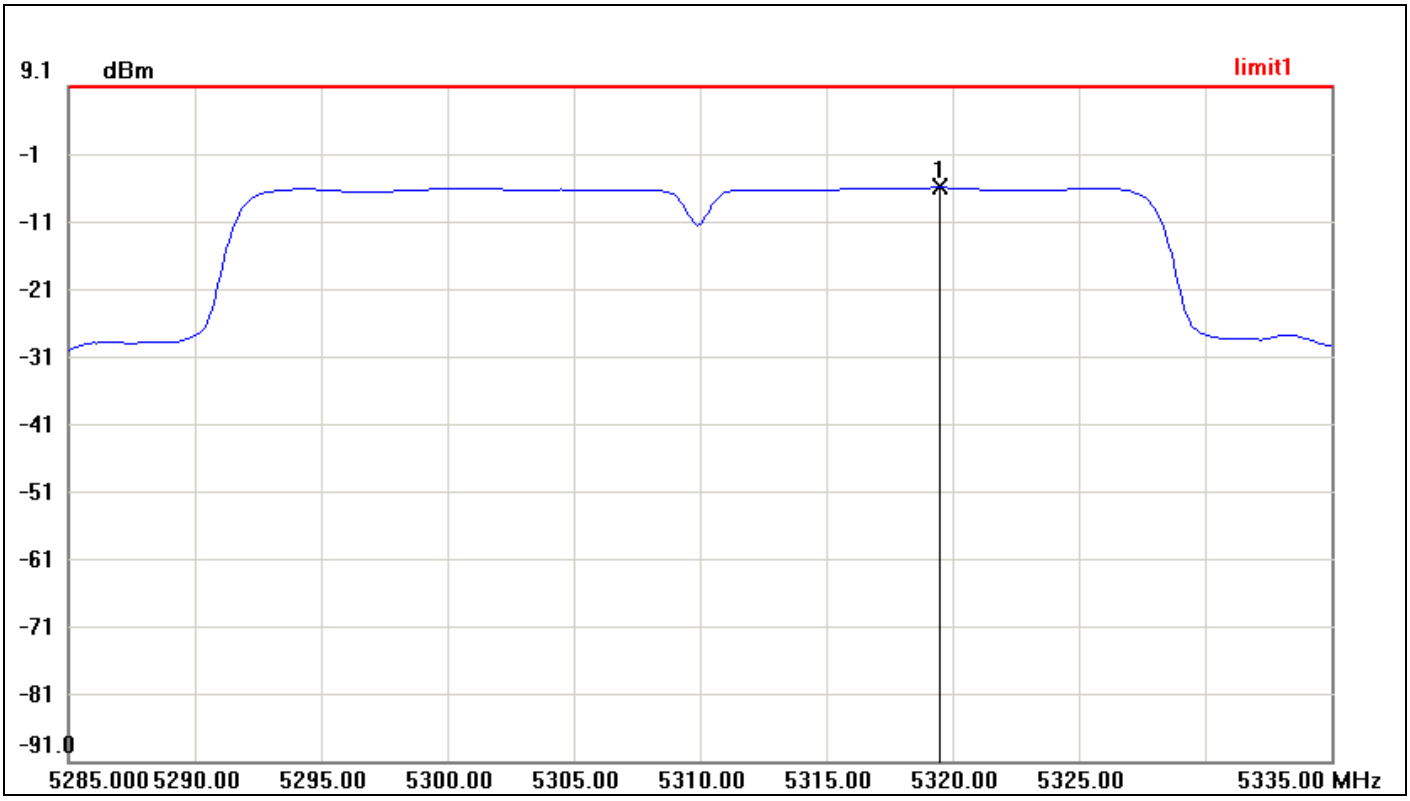
IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / Chain 0

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5260.3333	-6.86	11.00	-17.86

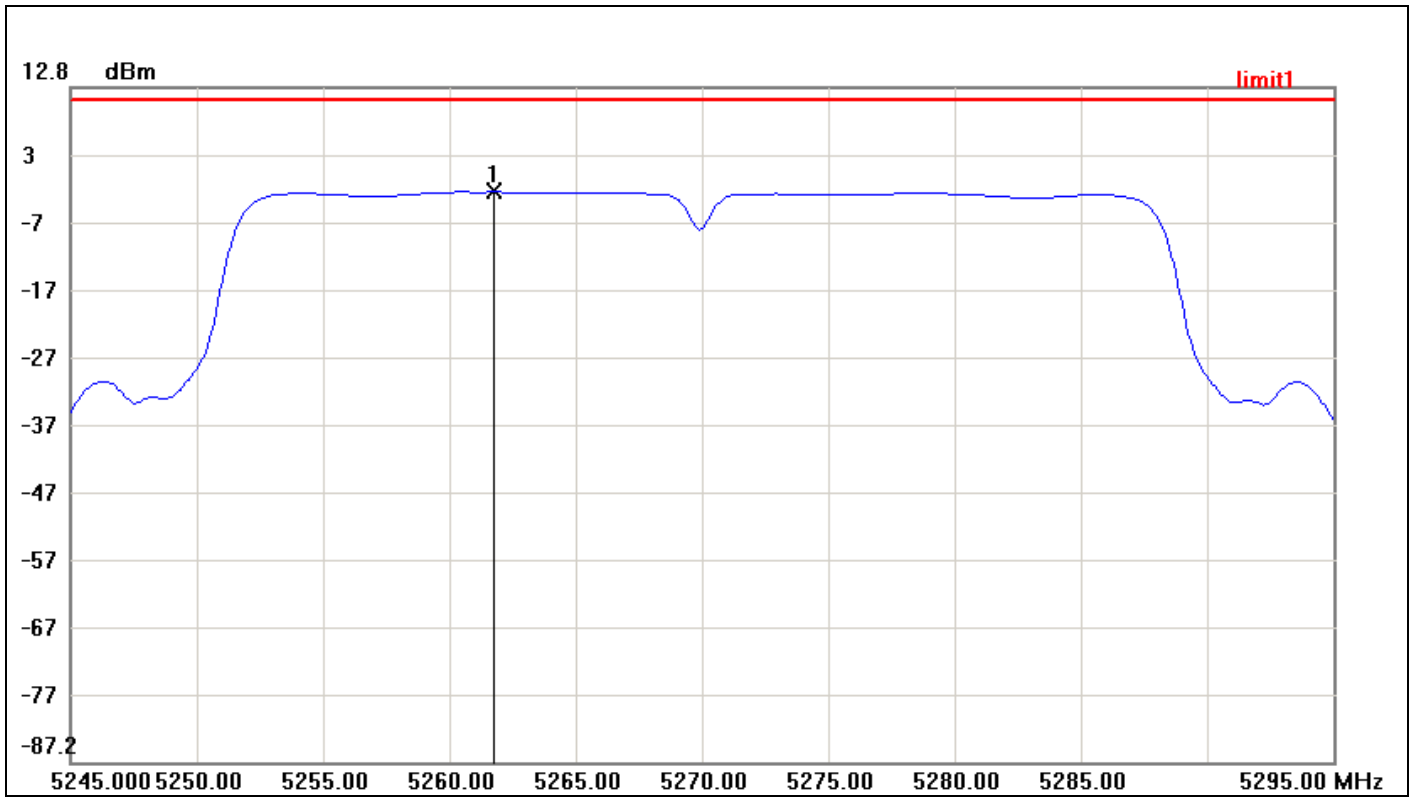
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5319.5000	-5.92	11.00	-16.92

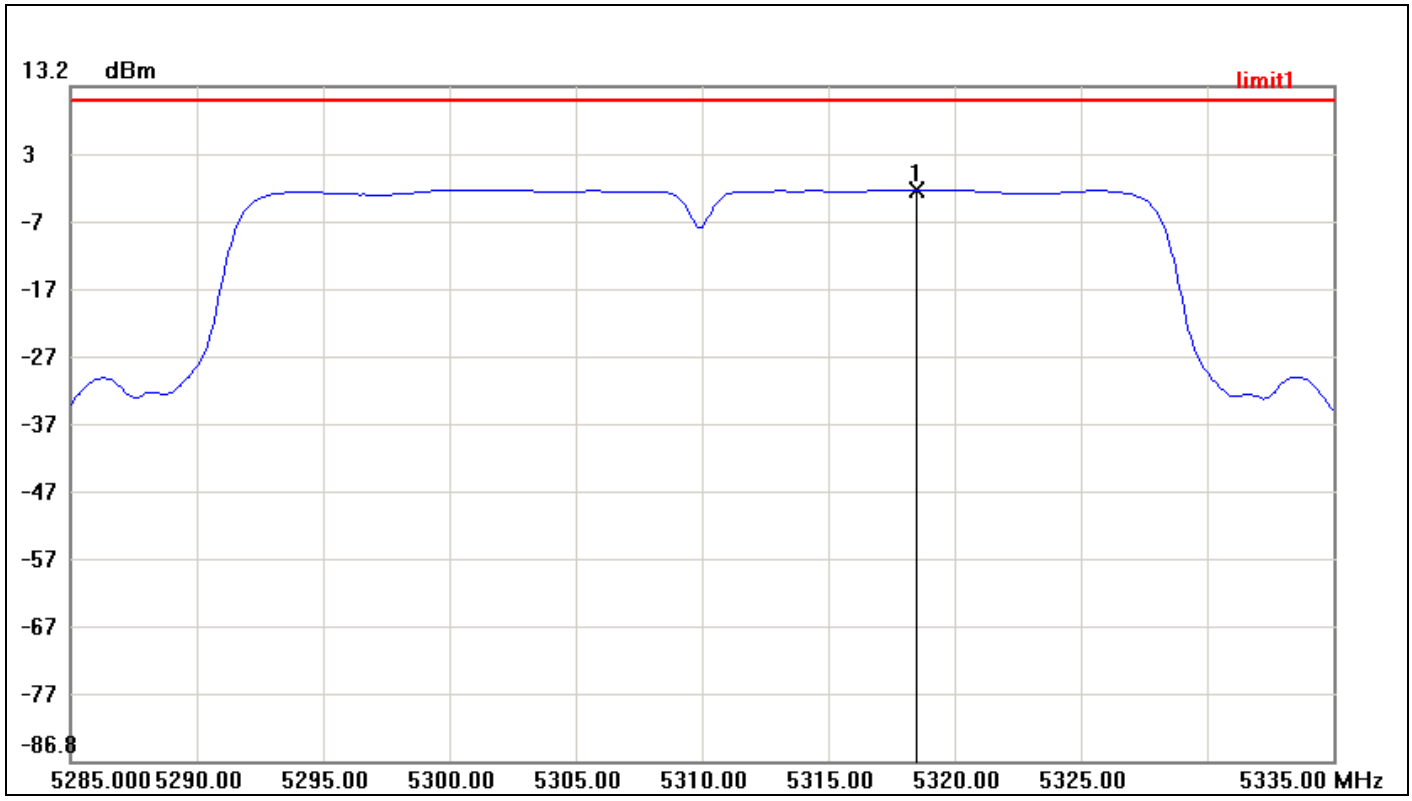
IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / Chain 1

CH Low



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5261.7500	-2.65	11.00	-13.65

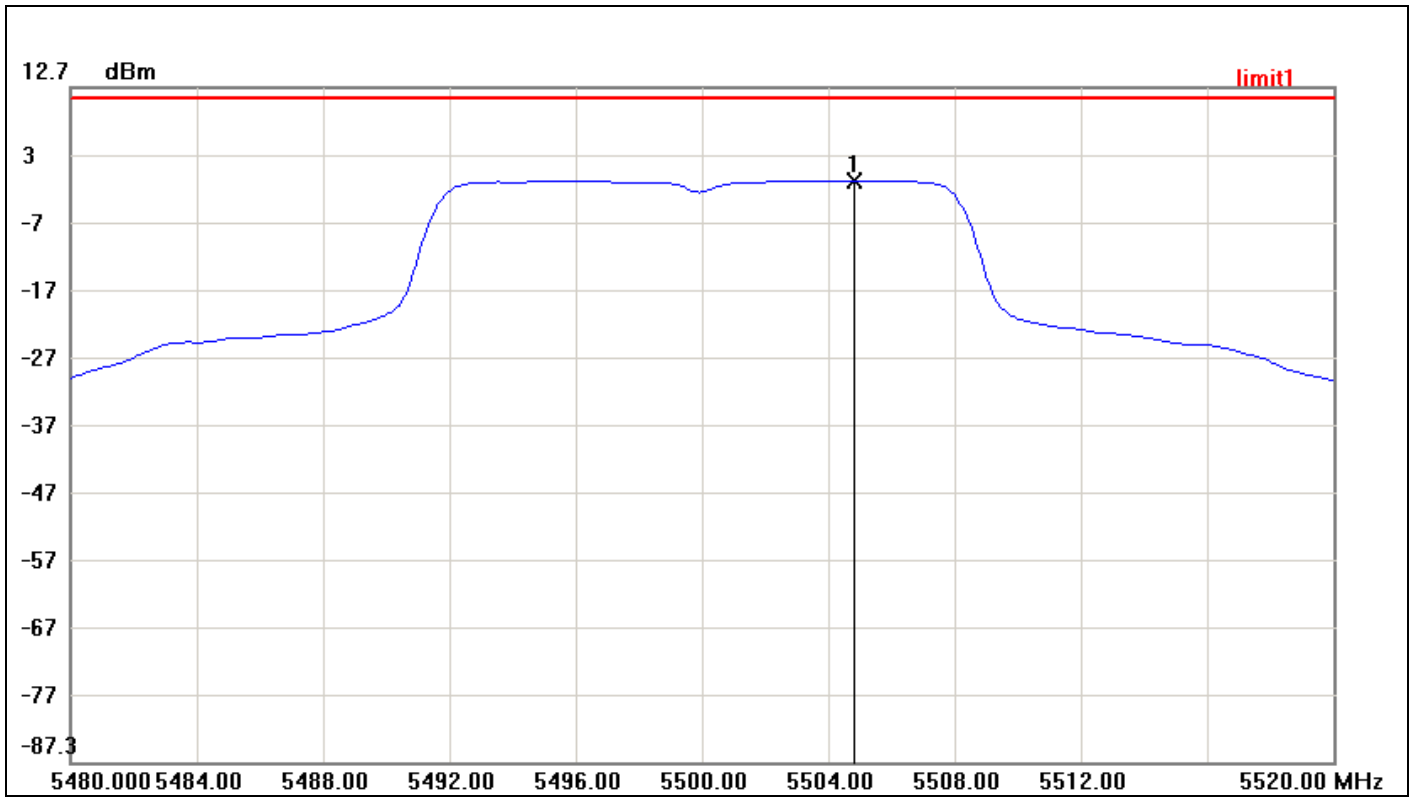
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5318.5000	-2.10	11.00	-13.10

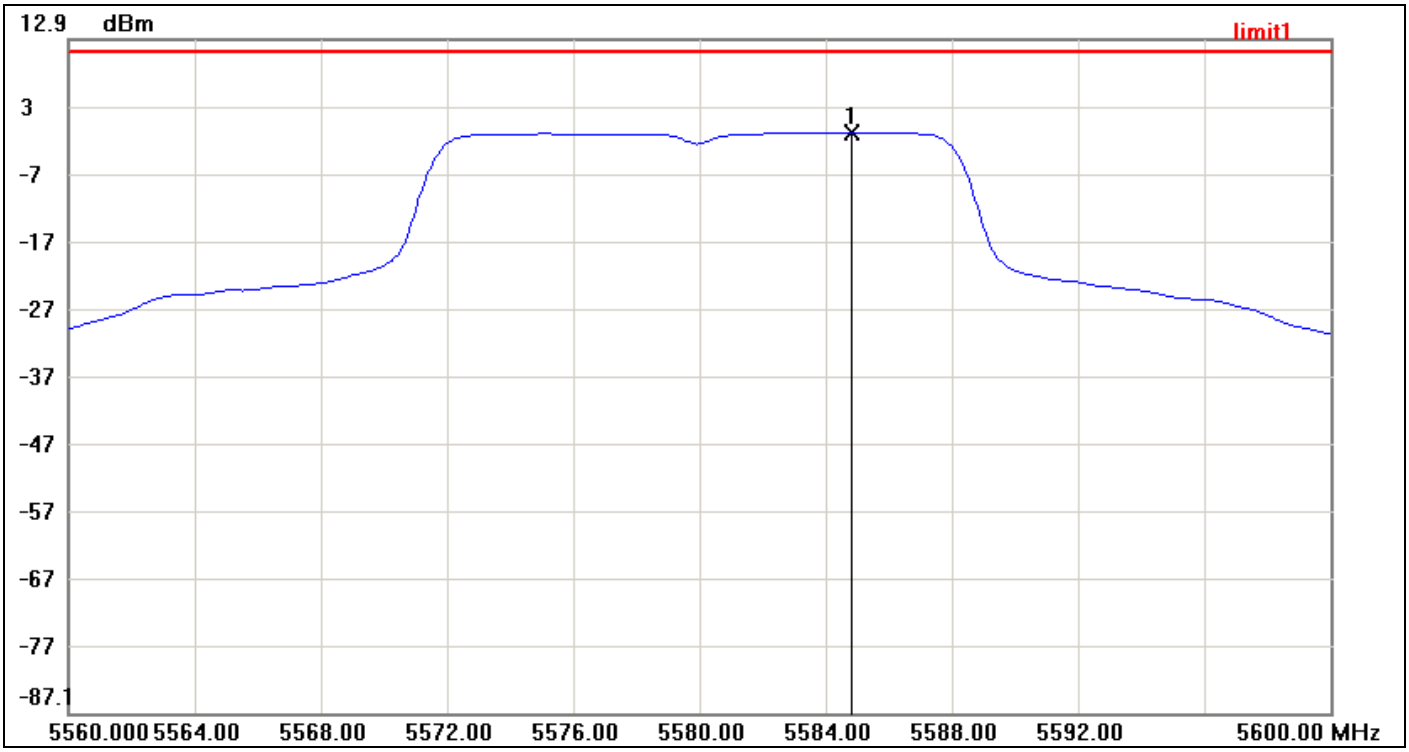
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low



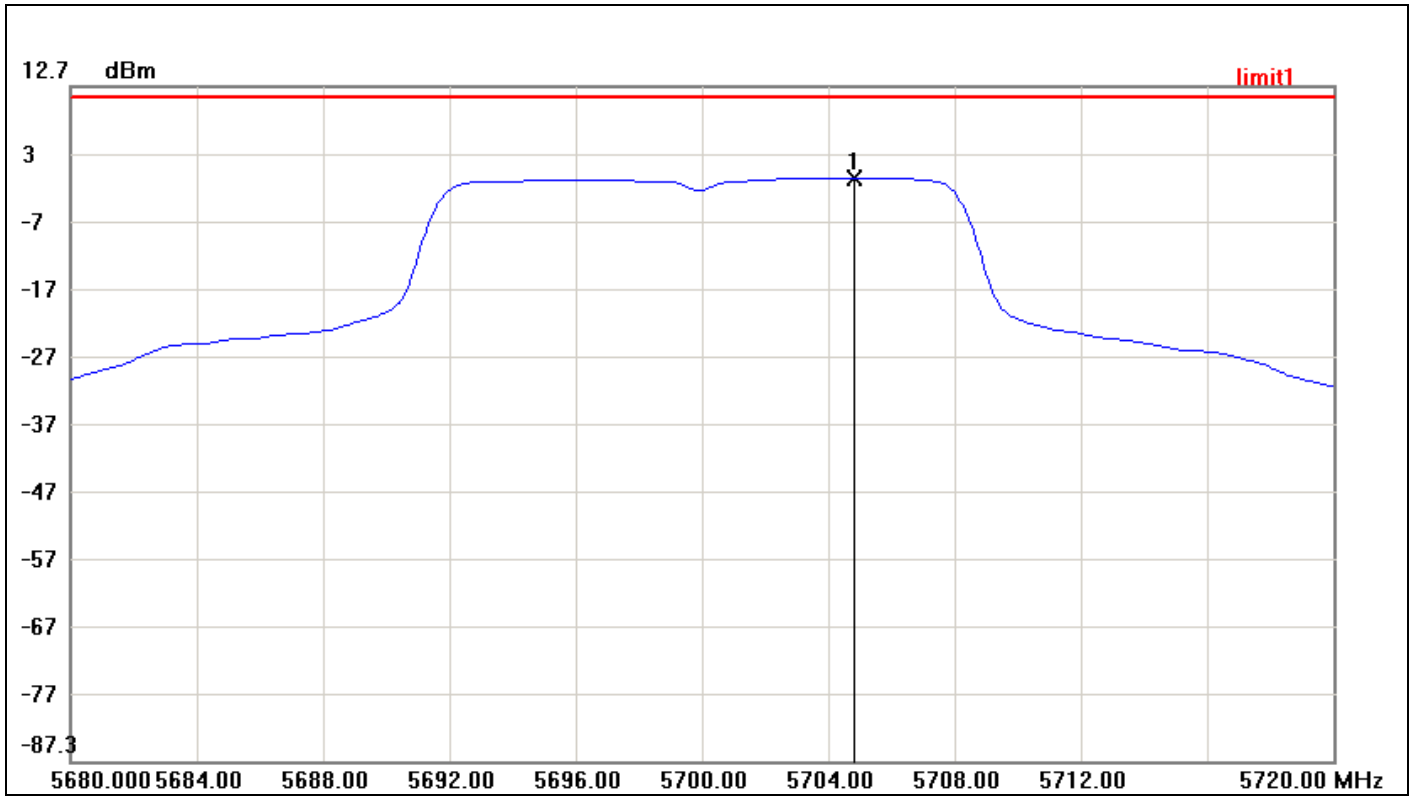
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5504.8000	-1.05	11.00	-12.05

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5584.8000	-0.89	11.00	-11.89

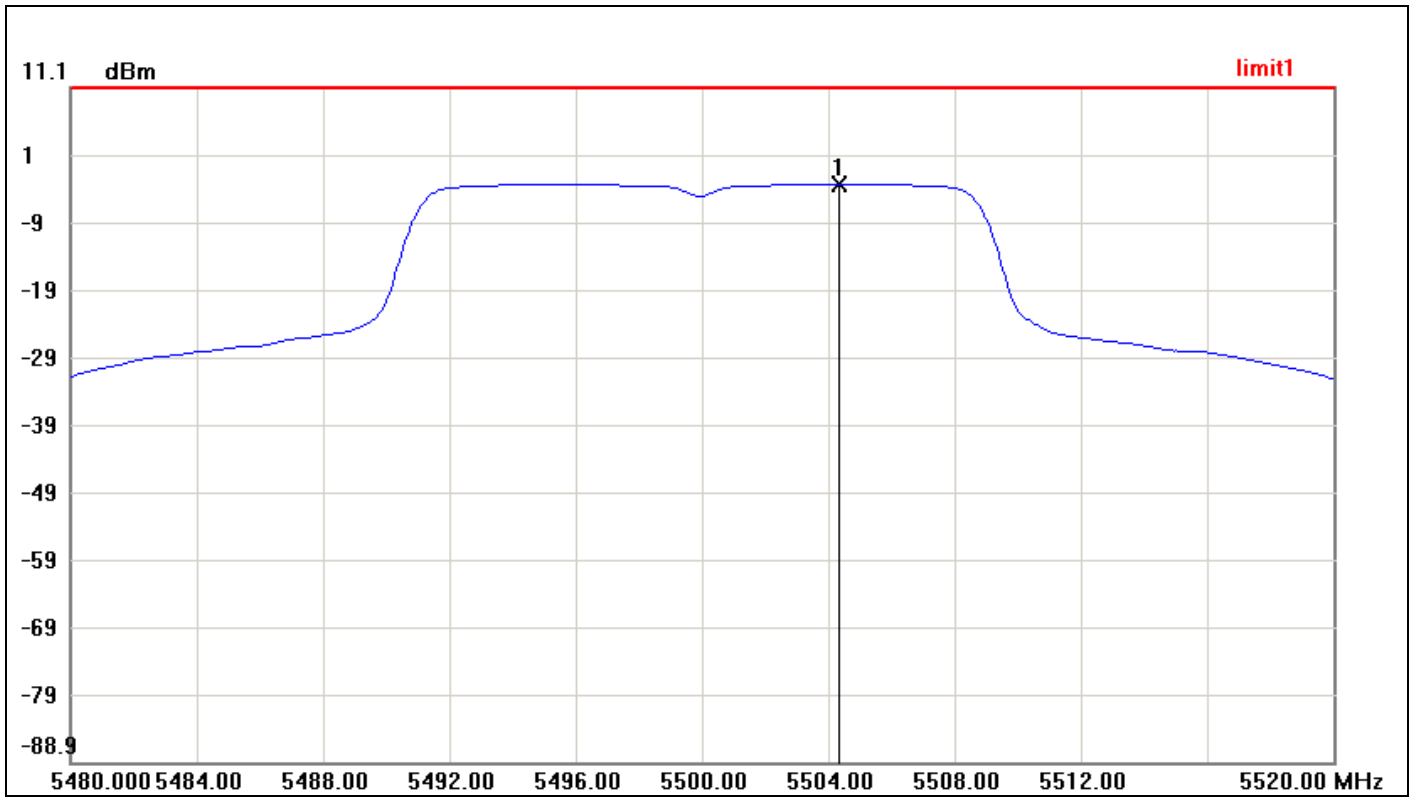
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5704.8000	-0.86	11.00	-11.86

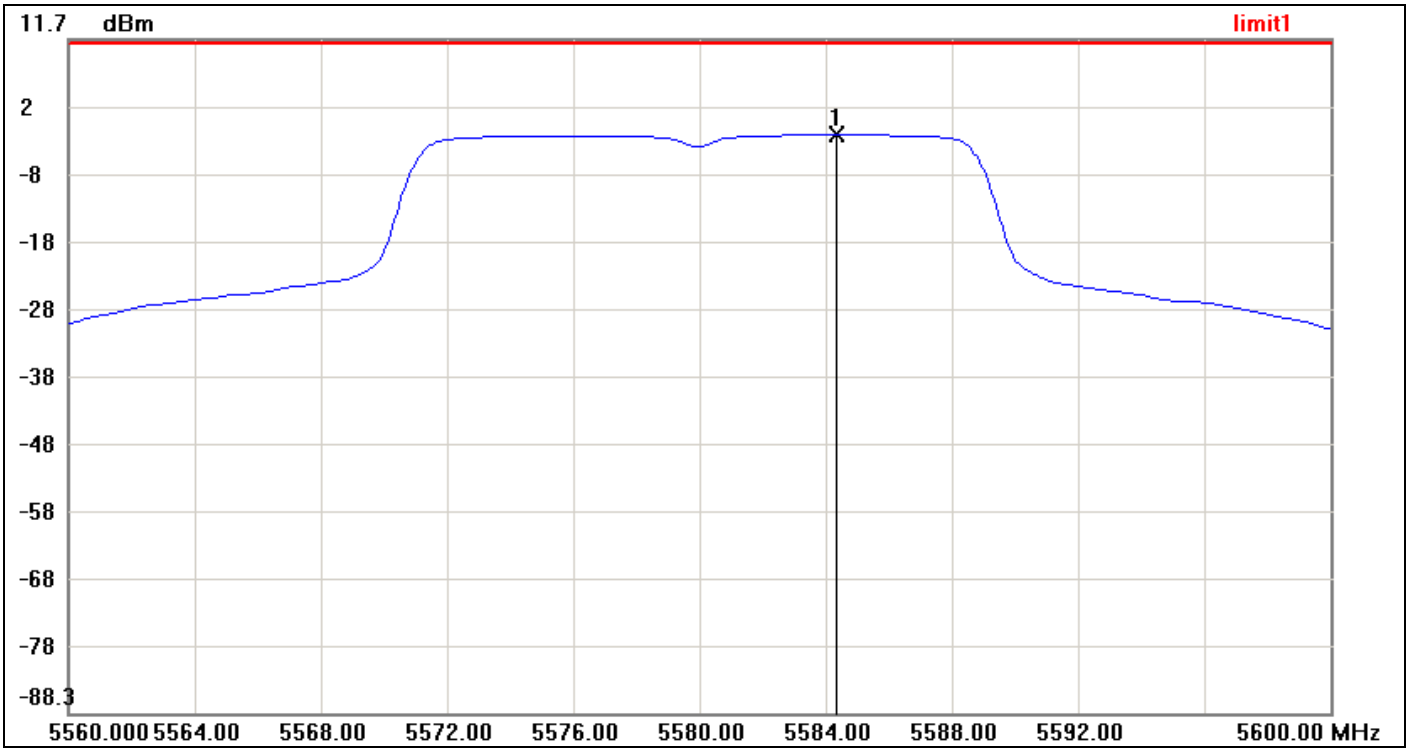
IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / Chain 0

CH Low



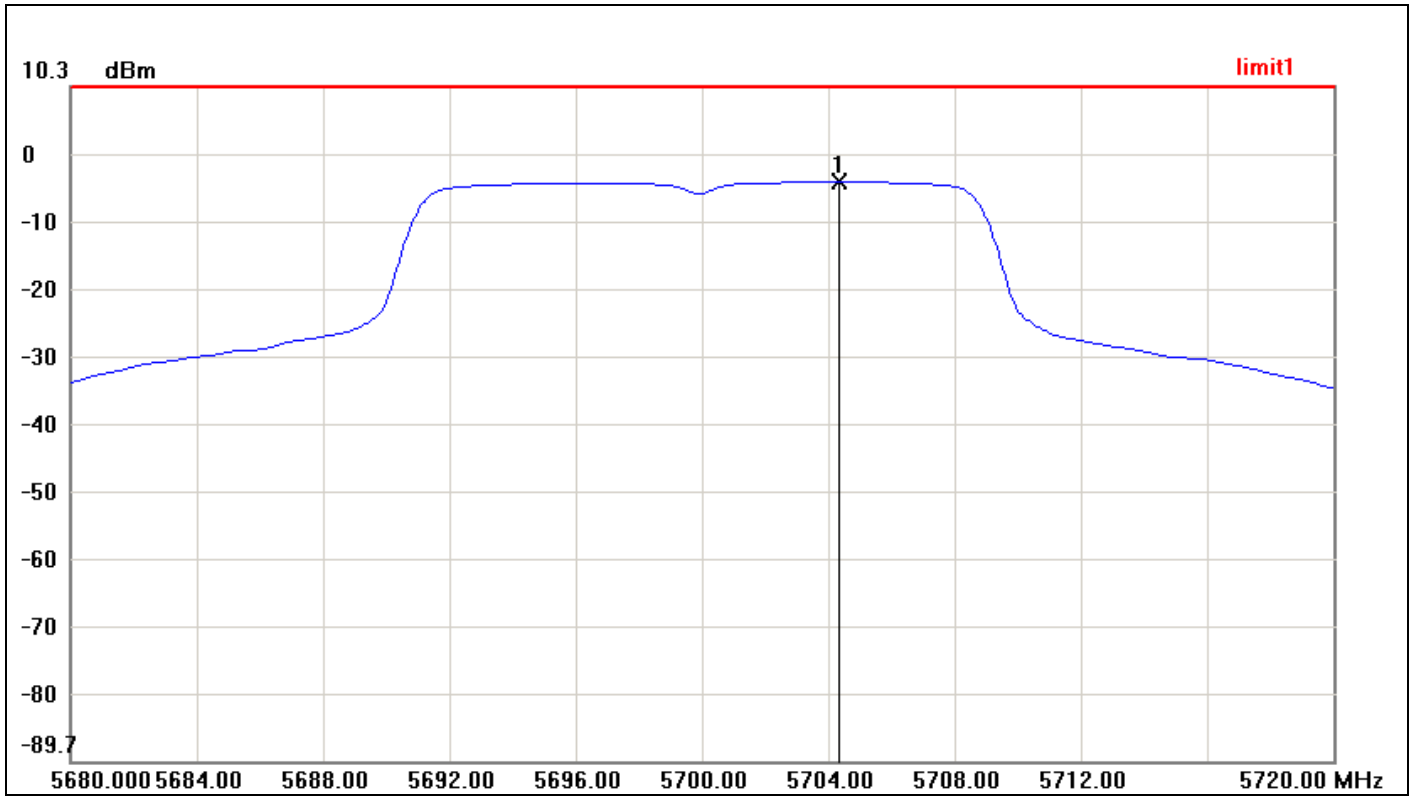
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5504.3333	-3.23	11.00	-14.23

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5584.3333	-2.40	11.00	-13.40

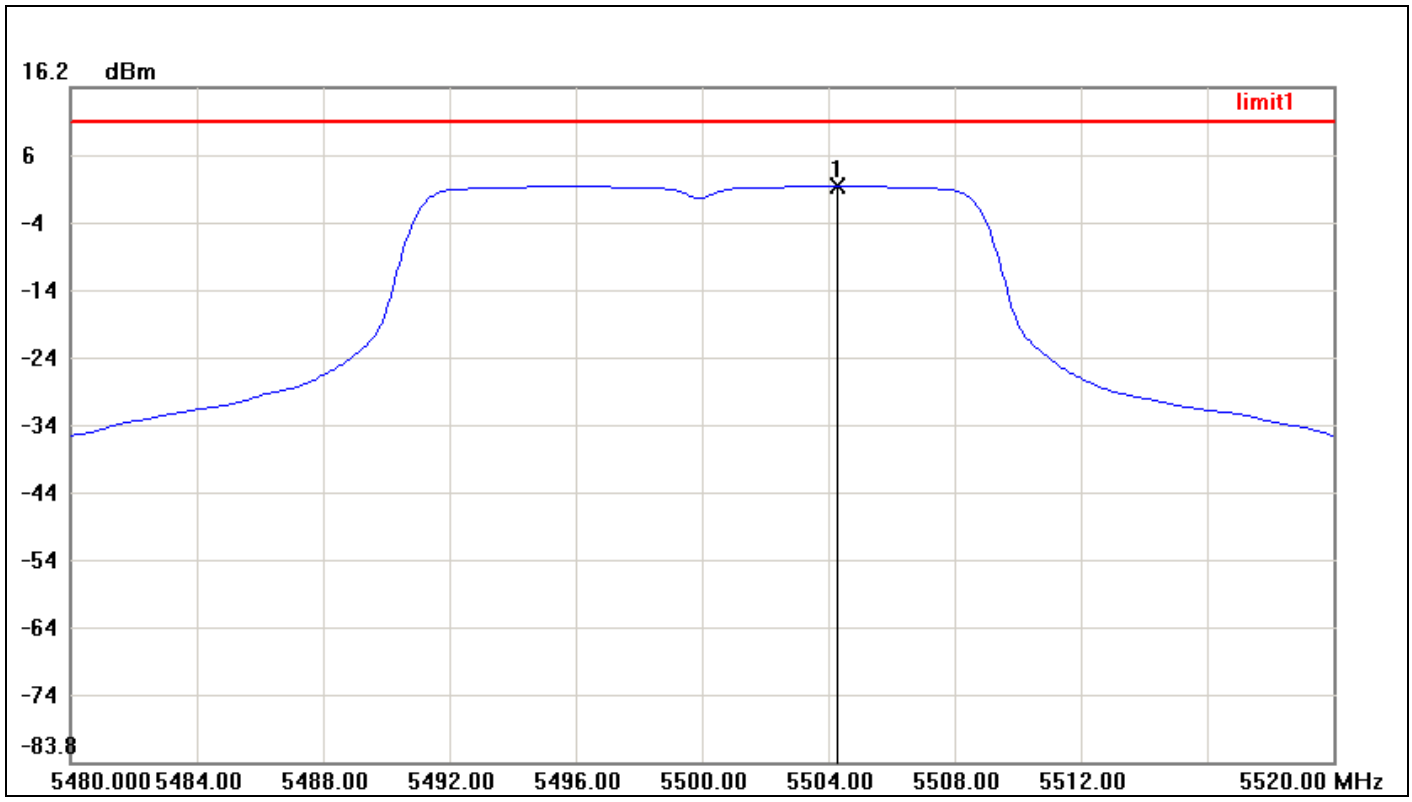
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5704.3333	-3.85	11.00	-14.85

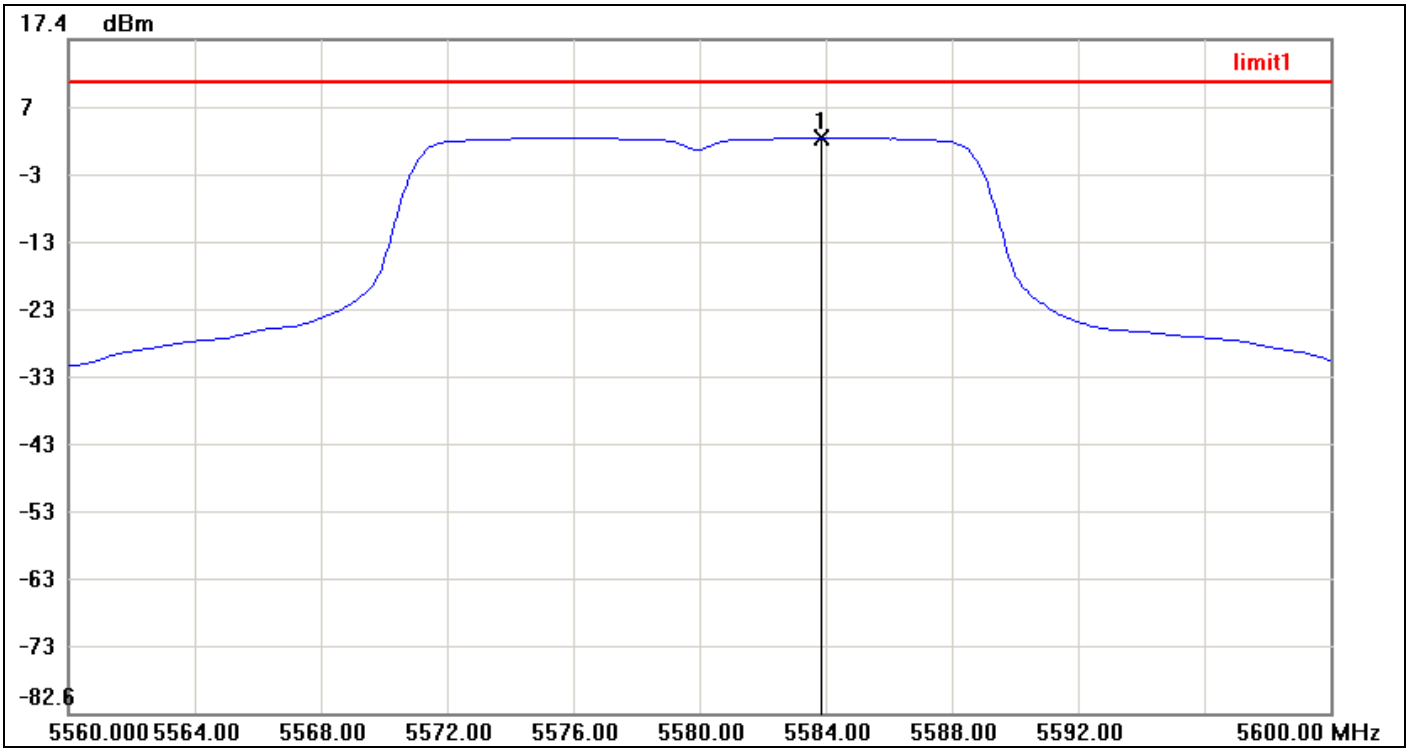
IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / Chain 1

CH Low



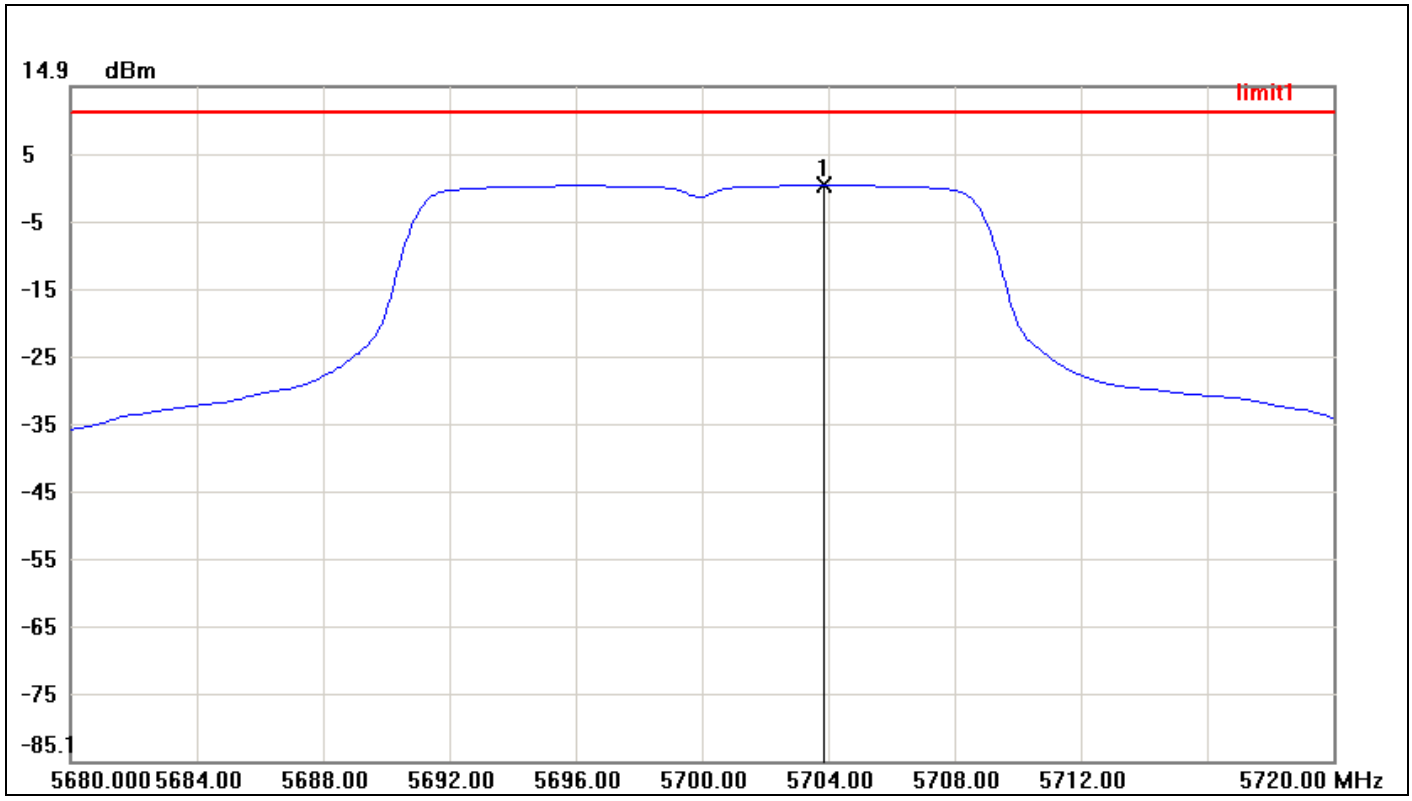
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5504.2667	1.57	11.00	-9.43

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5583.8667	2.75	11.00	-8.25

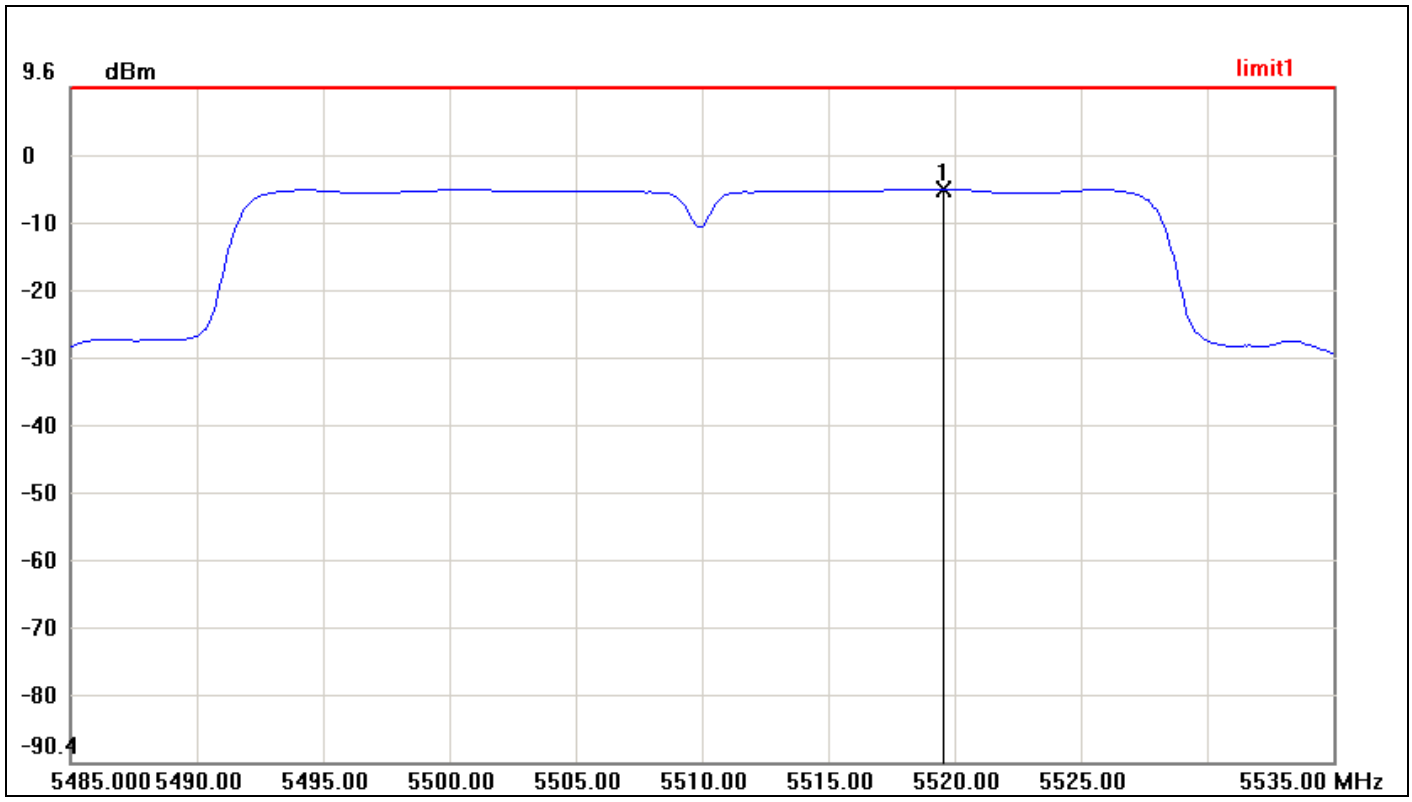
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5703.8667	0.21	11.00	-10.79

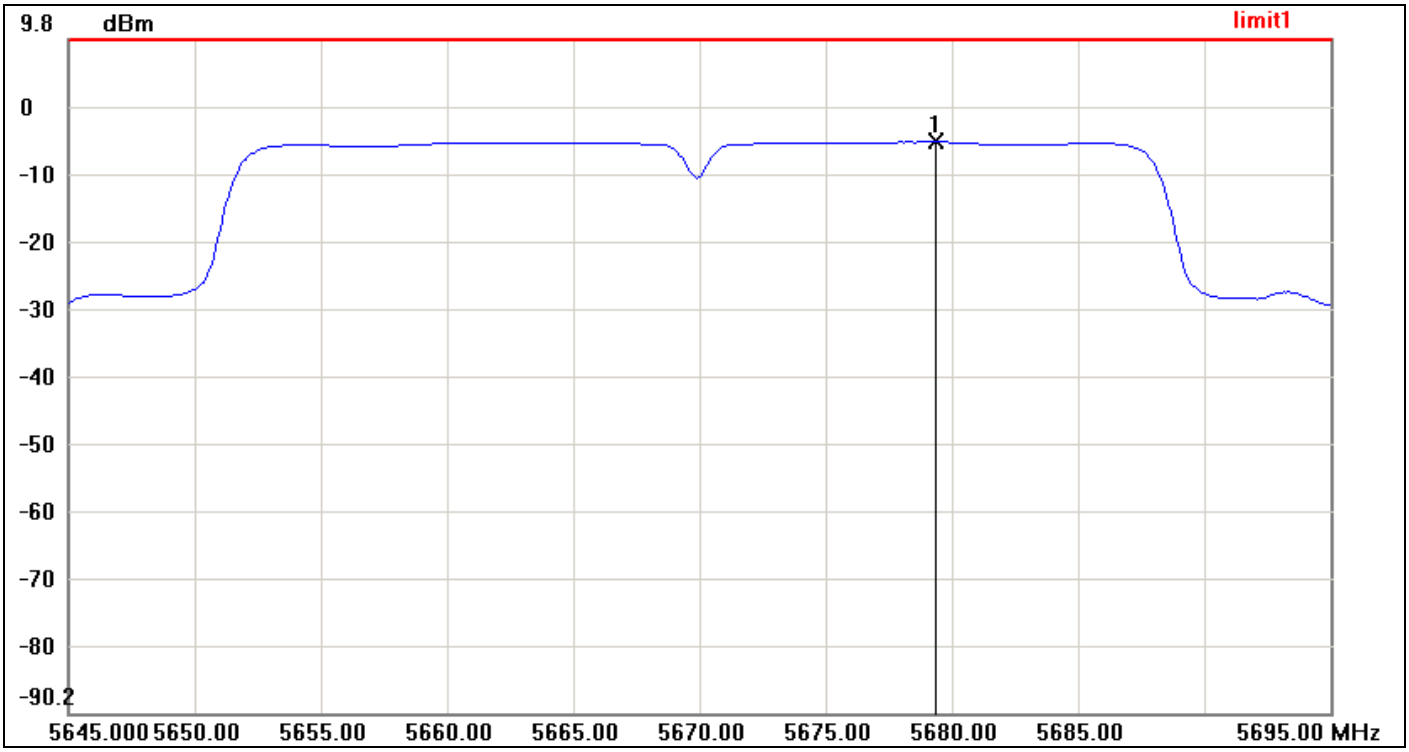
IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 0

CH Low



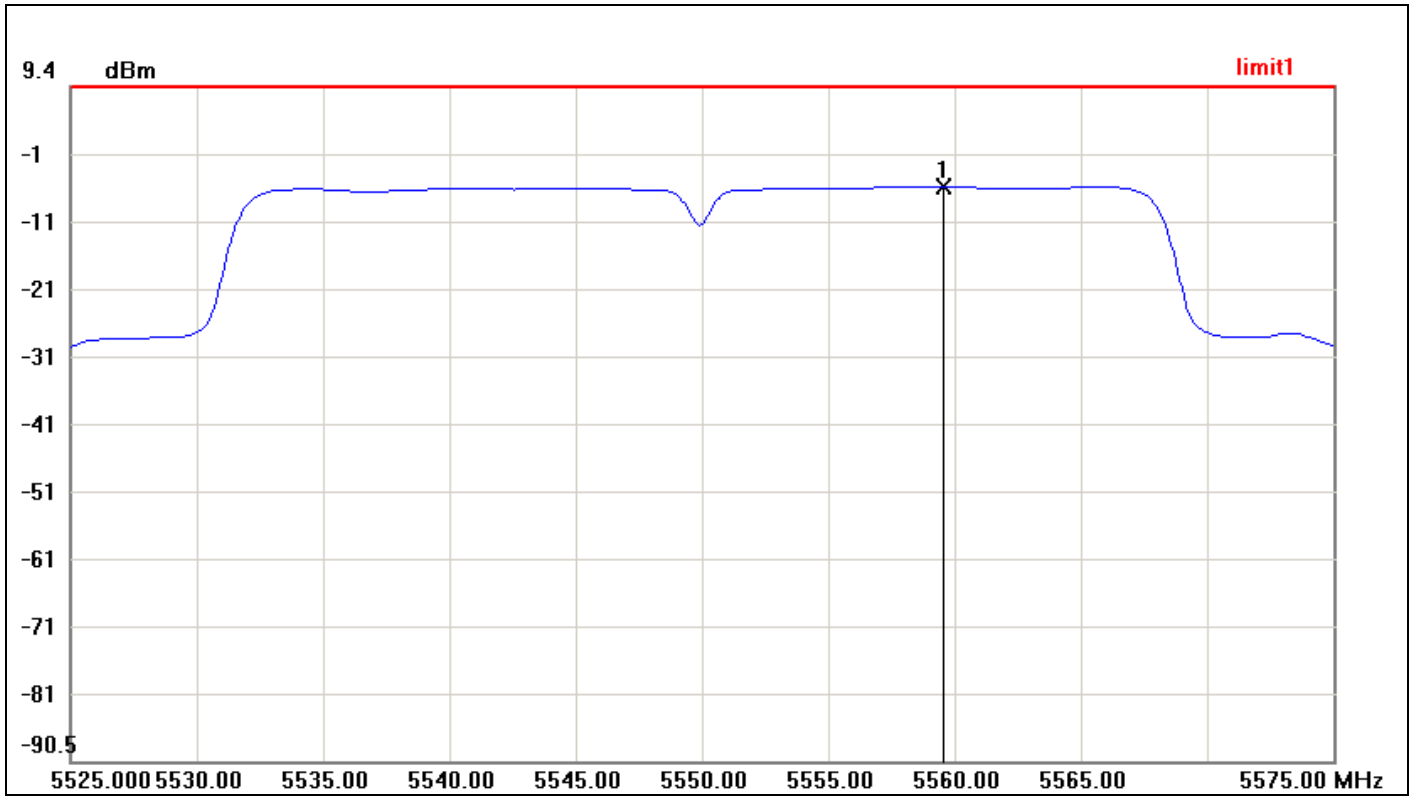
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5519.5833	-5.46	11.00	-16.46

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5679.3333	-5.42	11.00	-16.42

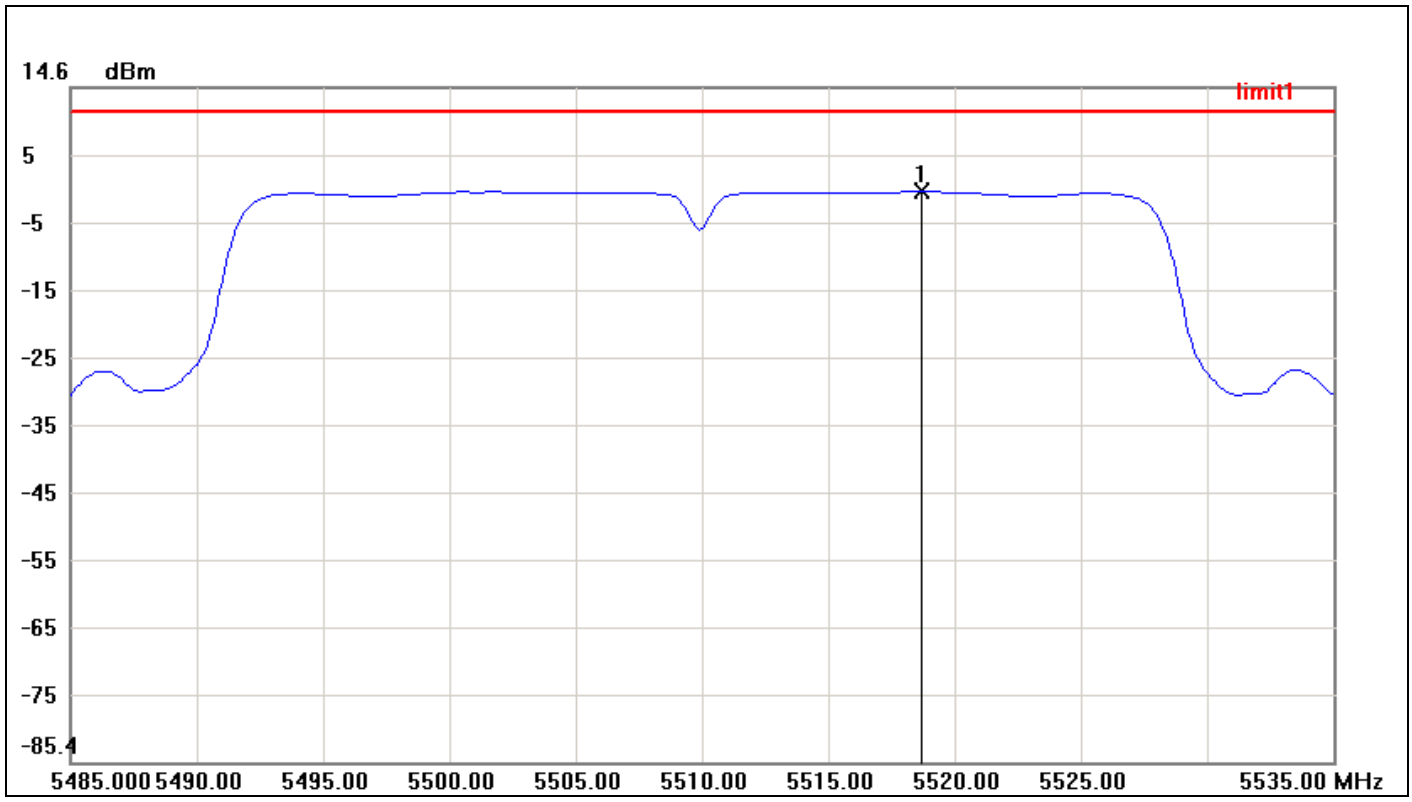
CH High



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5559.5833	-5.33	11.00	-16.33

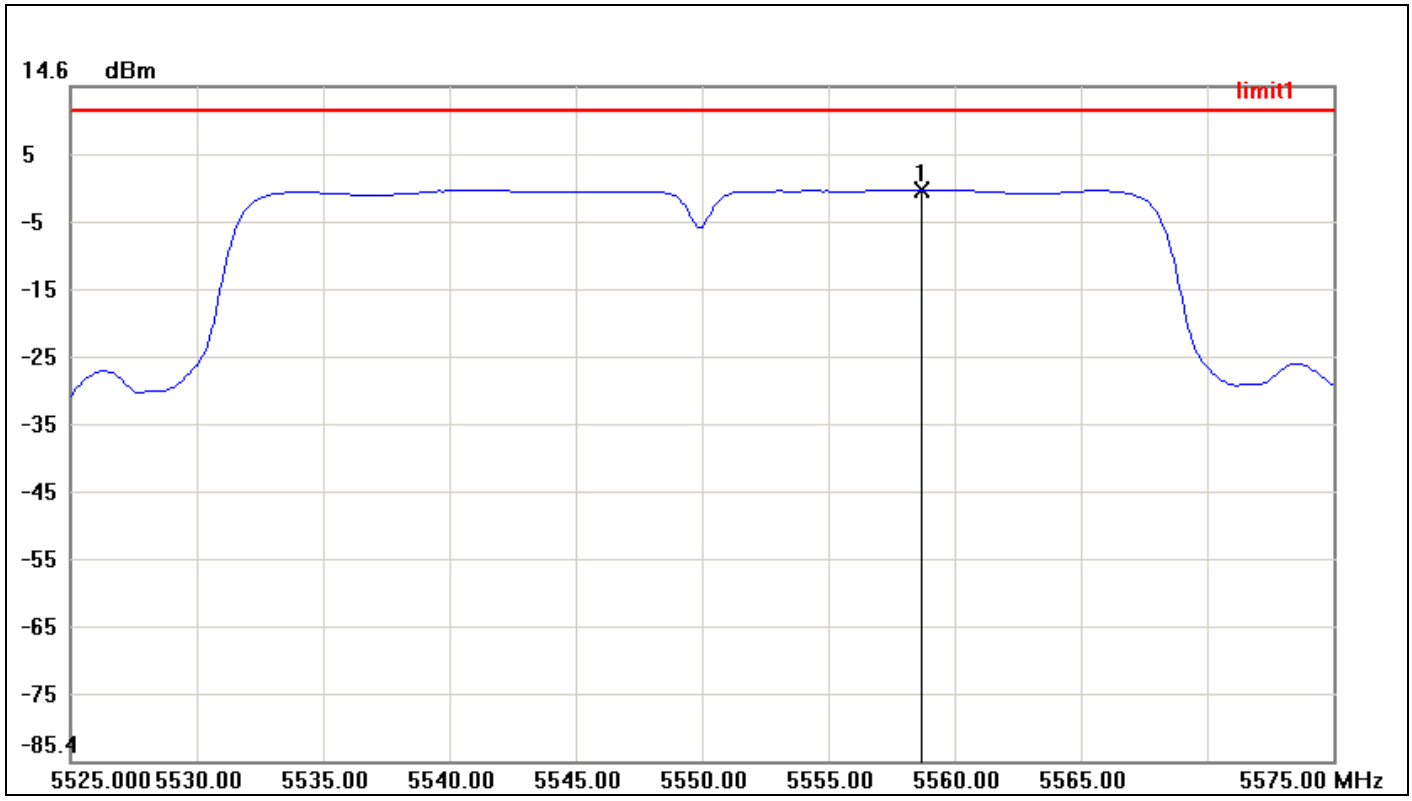
IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 1

CH Low



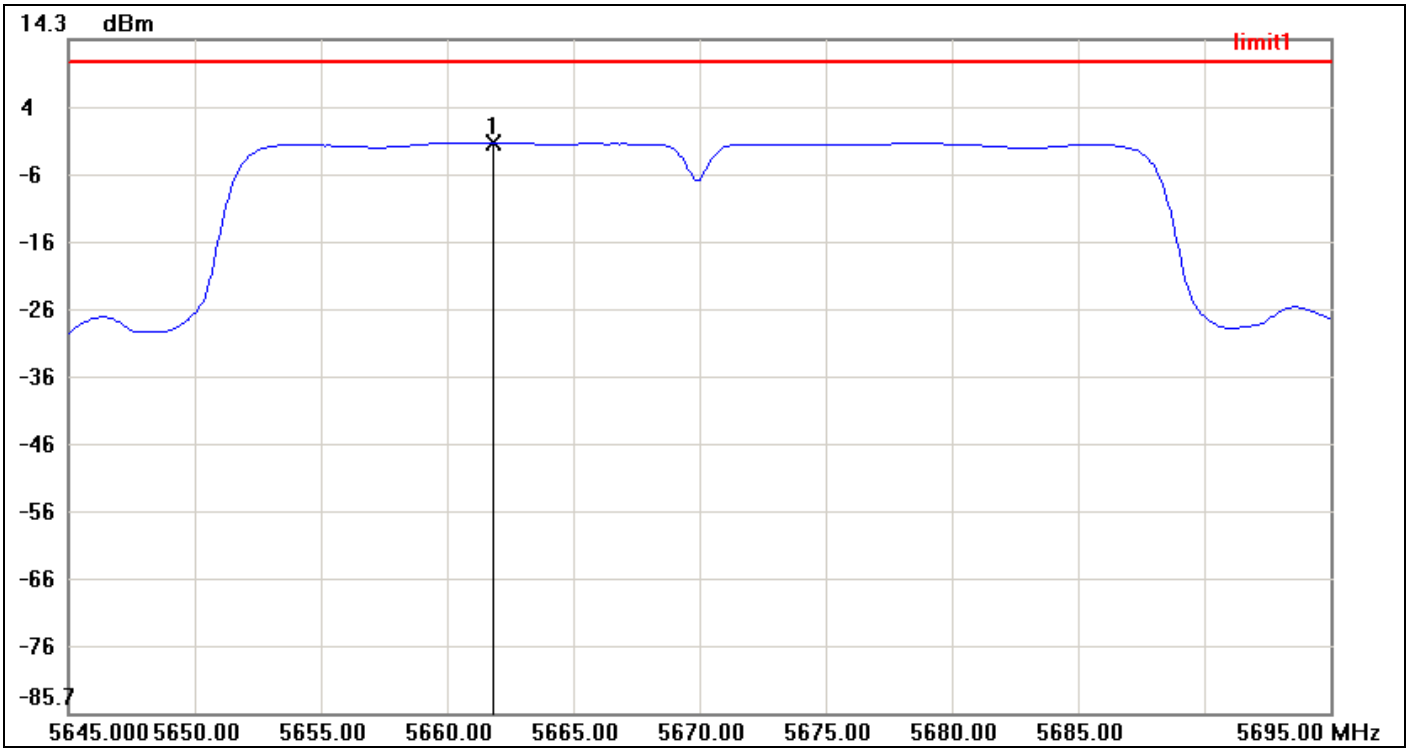
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5518.6667	-0.81	11.00	-11.81

CH Mid



No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5558.6667	-0.63	11.00	-11.63

CH High



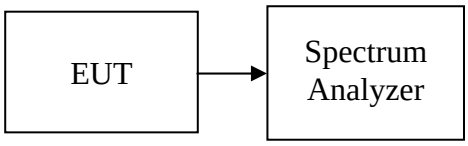
No.	Frequency(MHz)	Result(dBm)	Limit(dBm)	Margin(dBm)
1	5661.8333	-1.08	11.00	-12.08

7.5 PEAK EXCURSION

LIMIT

According to §15.407(a)(6), the ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Configuration



TEST PROCEDURE

The test is performed in accordance with <FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices> – Part 15, Subpart E, August 2002.

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
3. Trace A, Set RBW =1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.
4. Delta Mark trace A Maximum frequency and trace B same frequency.
5. Repeat the above procedure until measurements for all frequencies were complete.

TEST RESULTS

No non-compliance noted

Test Data

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5180	8.04	13.00	-4.96	PASS
Mid	5220	8.29	13.00	-4.71	PASS
High	5240	2.17	13.00	-10.83	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5180	8.93	13.00	-4.07	PASS
Mid	5220	8.77	13.00	-4.23	PASS
High	5240	8.76	13.00	-4.24	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5180	9.03	13.00	-3.97	PASS
Mid	5220	9.00	13.00	-4.00	PASS
High	5240	8.86	13.00	-4.14	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5190	9.01	13.00	-3.99	PASS
High	5230	9.00	13.00	-4.00	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5190	8.70	13.00	-4.30	PASS
High	5230	8.55	13.00	-4.45	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	8.20	13.00	-4.80	PASS
Mid	5280	8.04	13.00	-4.96	PASS
High	5320	8.06	13.00	-4.94	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	8.64	13.00	-4.36	PASS
Mid	5280	8.50	13.00	-4.50	PASS
High	5320	8.72	13.00	-4.28	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	8.83	13.00	-4.17	PASS
Mid	5280	8.84	13.00	-4.16	PASS
High	5320	8.89	13.00	-4.11	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5270	8.64	13.00	-4.36	PASS
High	5310	8.68	13.00	-4.32	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5270	8.83	13.00	-4.17	PASS
High	5310	9.10	13.00	-3.90	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	8.07	13.00	-4.93	PASS
Mid	5600	8.03	13.00	-4.97	PASS
High	5700	8.04	13.00	-4.96	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	8.64	13.00	-4.36	PASS
Mid	5600	8.70	13.00	-4.30	PASS
High	5700	8.81	13.00	-4.19	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	9.08	13.00	-3.92	PASS
Mid	5600	9.03	13.00	-3.97	PASS
High	5700	9.01	13.00	-3.99	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5510	8.71	13.00	-4.29	PASS
Mid	5590	8.60	13.00	-4.40	PASS
High	5670	8.63	13.00	-4.37	PASS

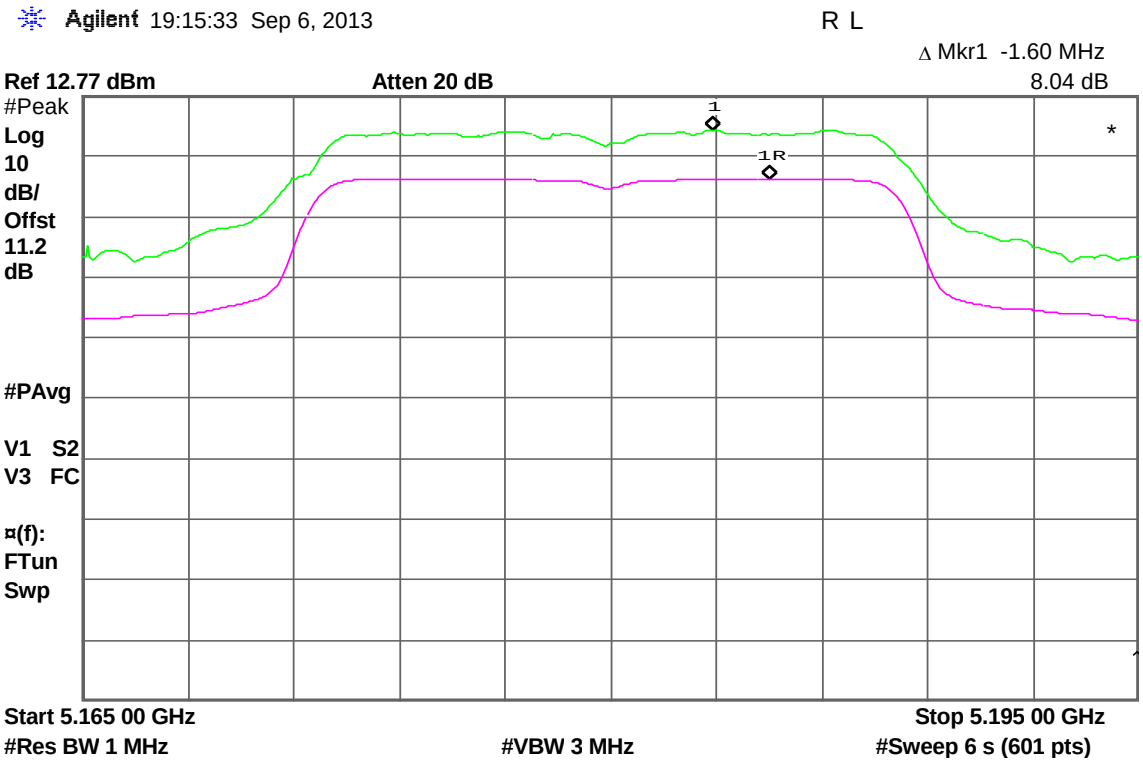
Test mode: IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 1

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5510	9.09	13.00	-3.91	PASS
Mid	5590	8.96	13.00	-4.04	PASS
High	5670	8.95	13.00	-4.05	PASS

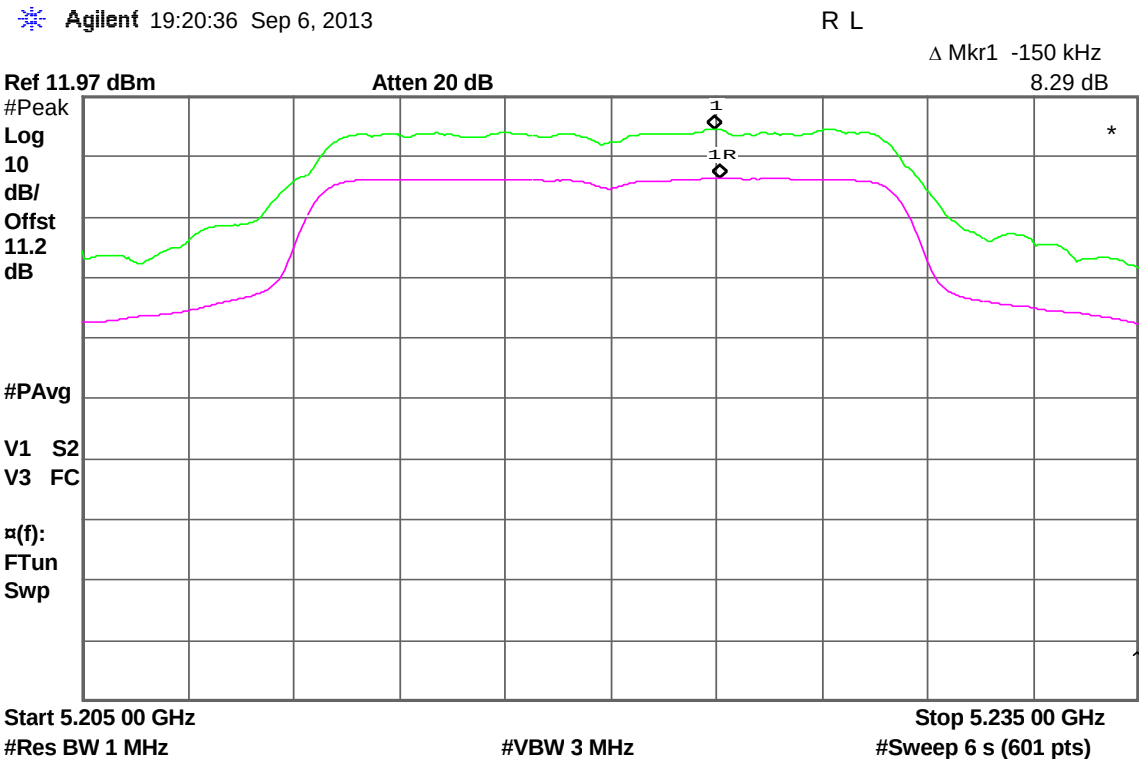
Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

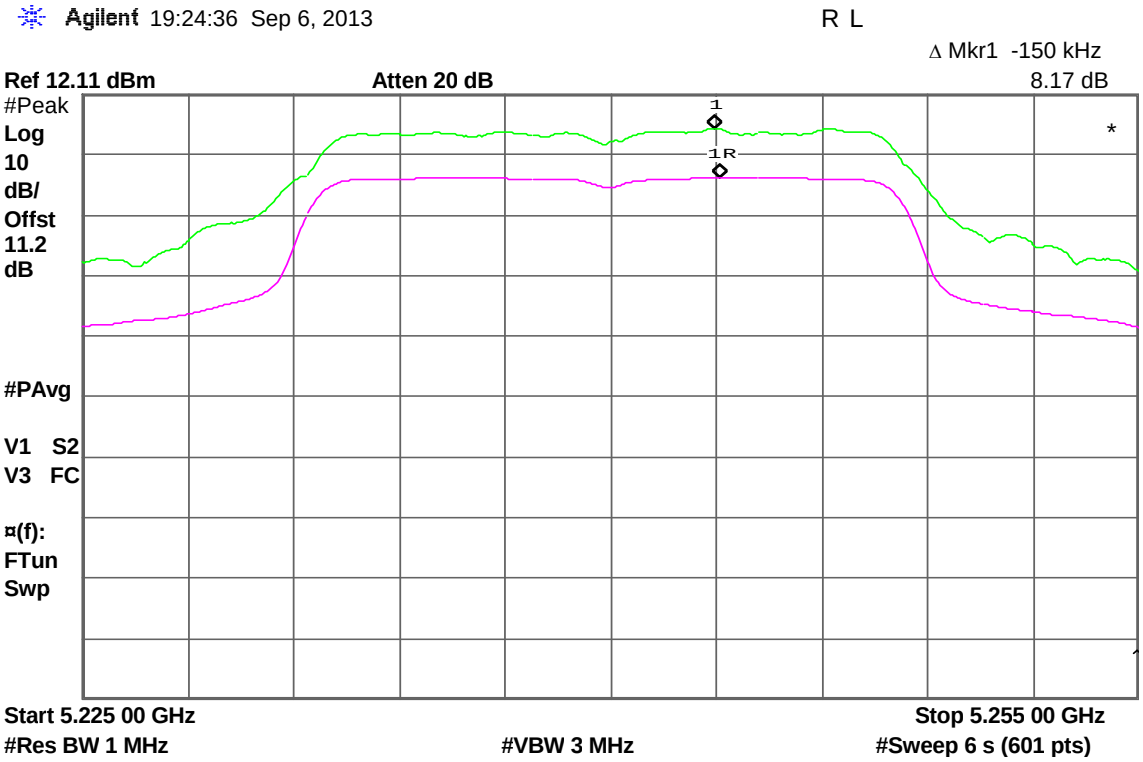
CH Low



CH Mid

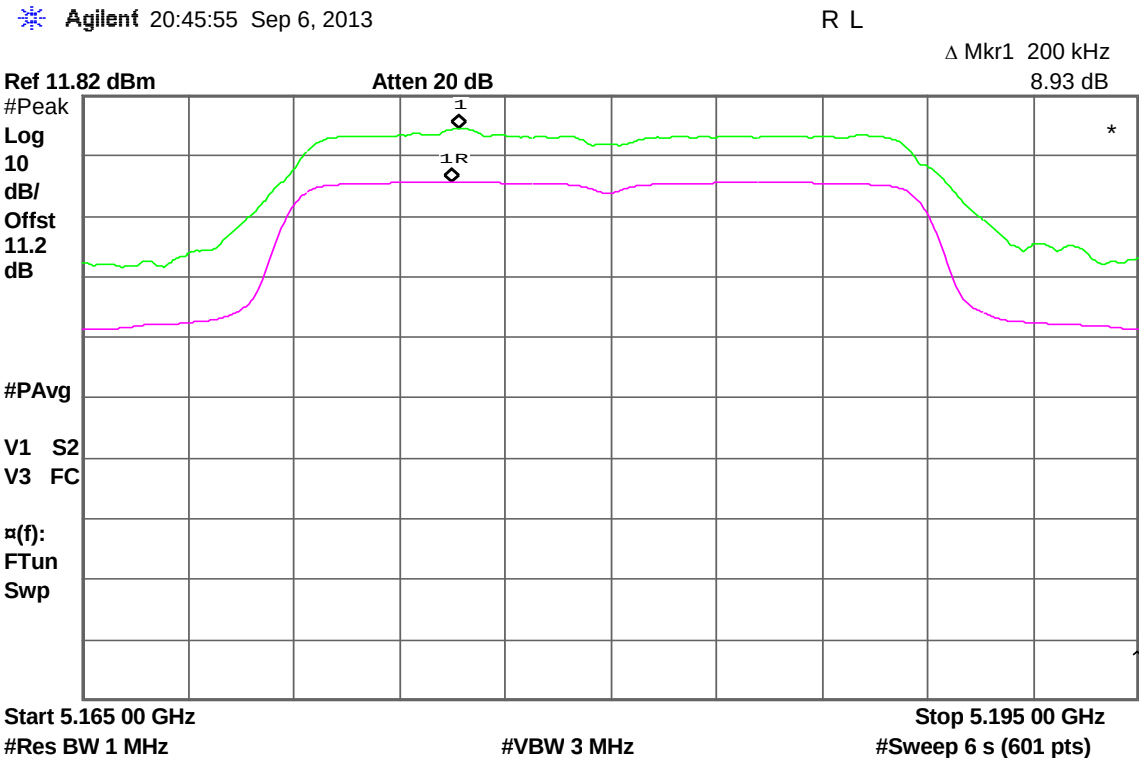


CH High

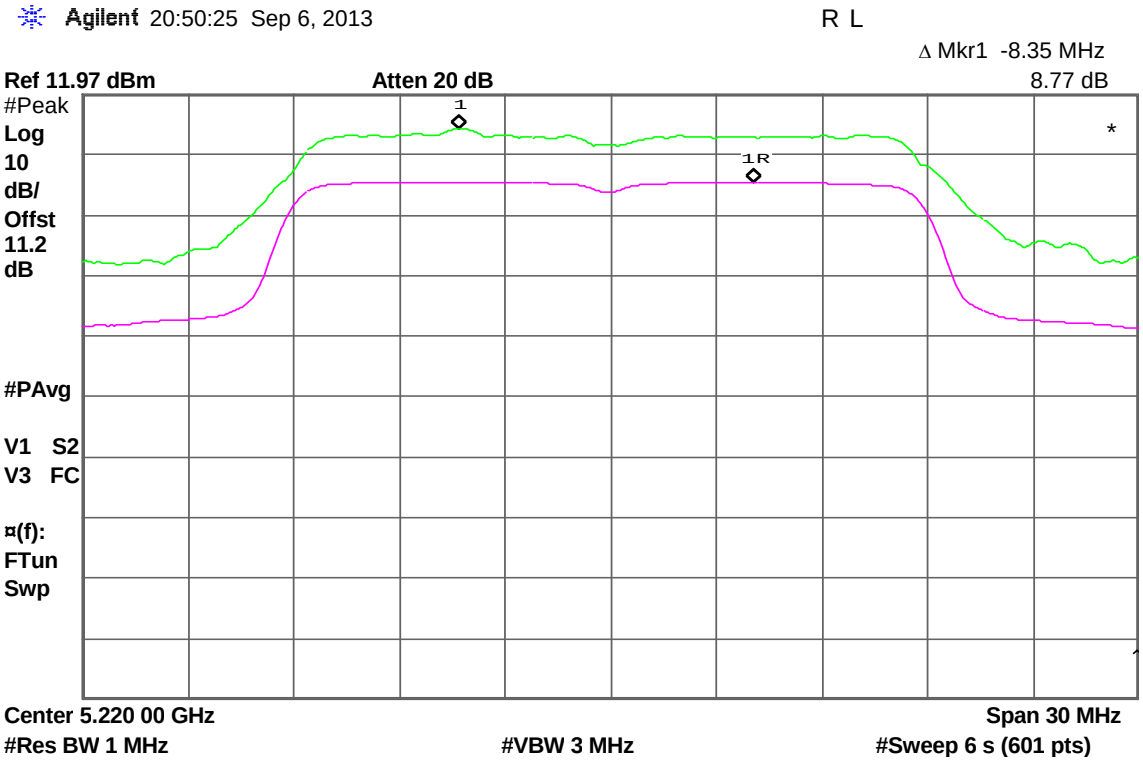


IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 0

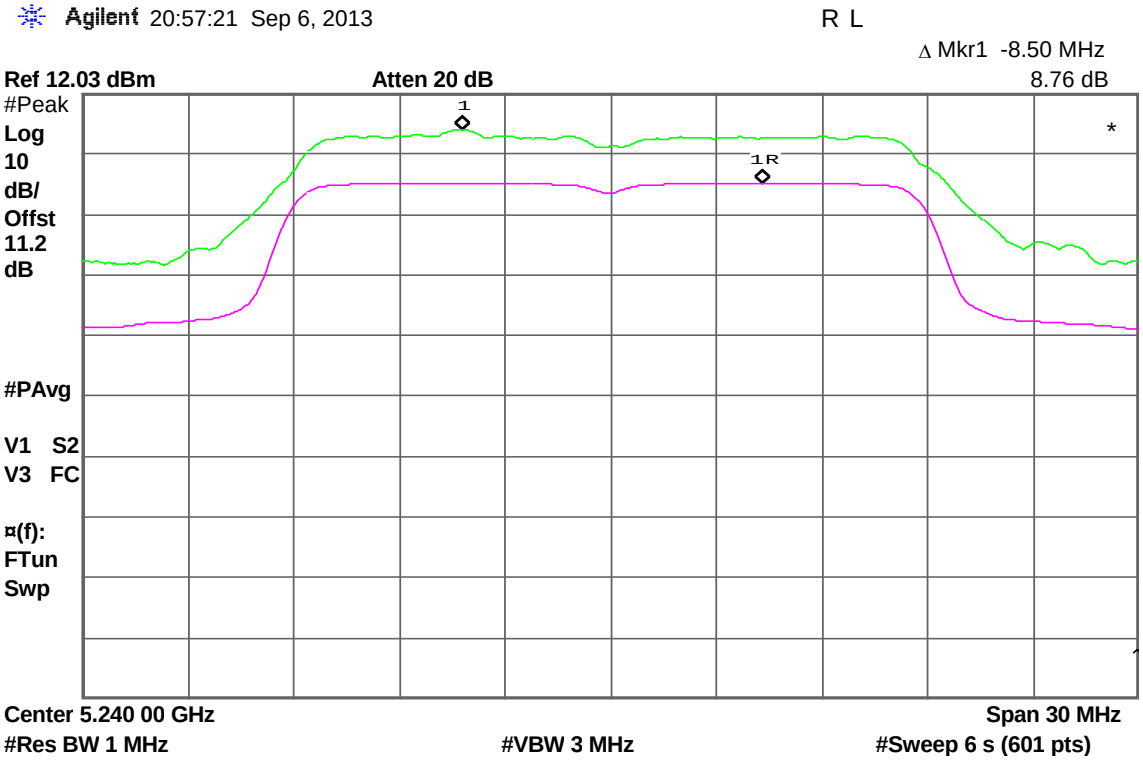
CH Low



CH Mid

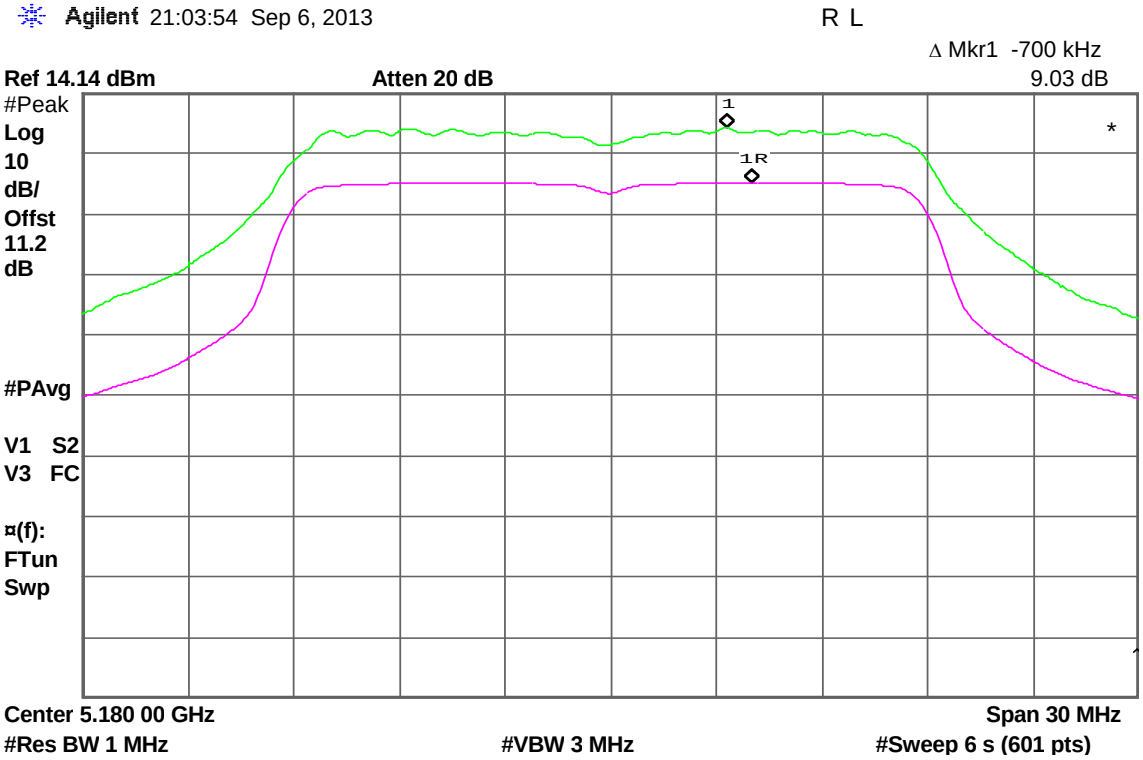


CH High

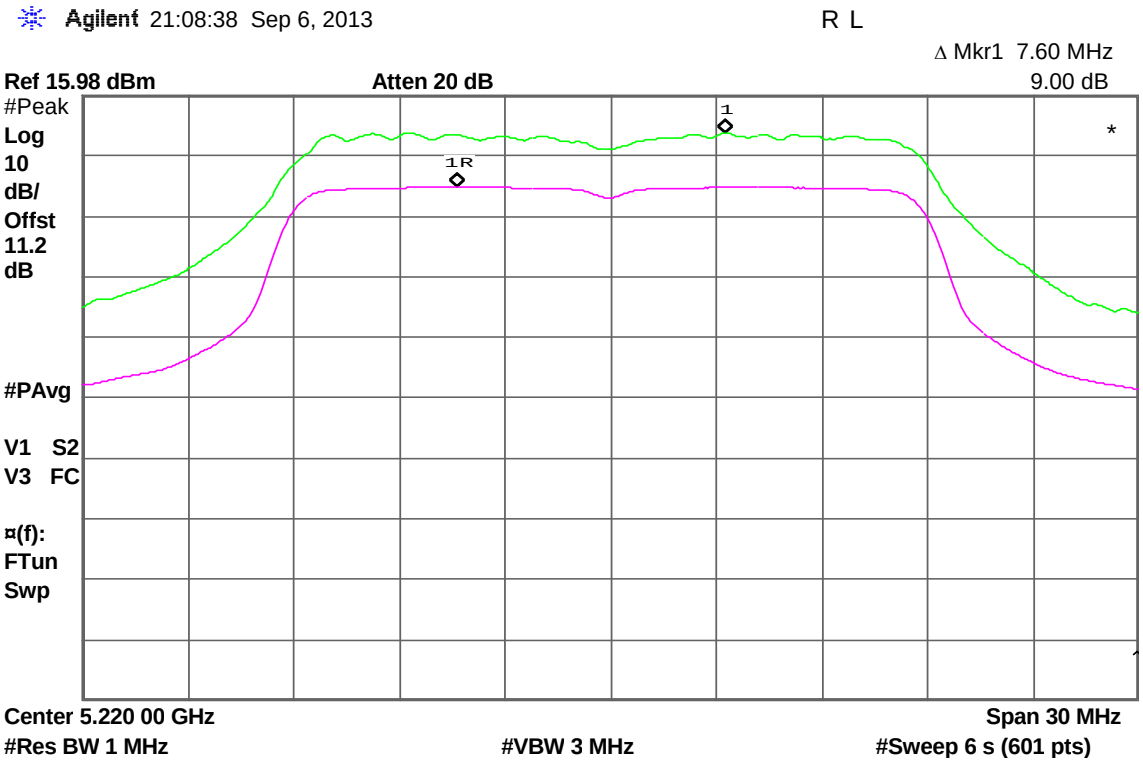


IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / Chain 1

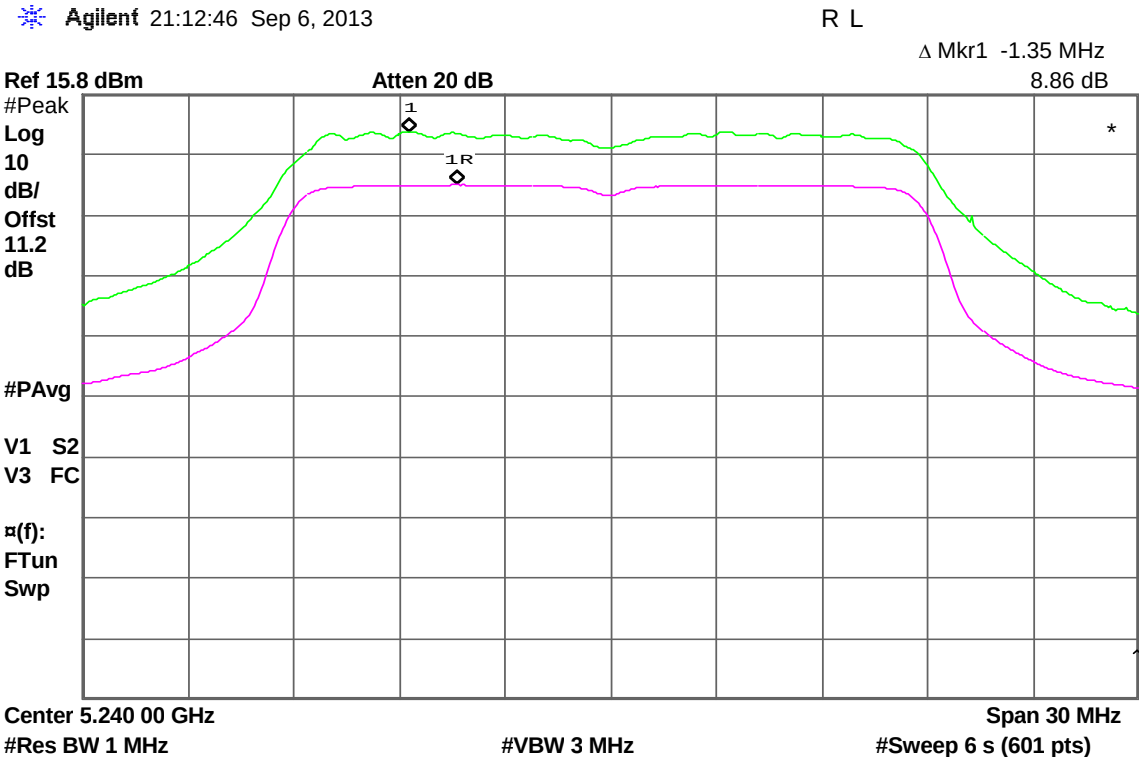
CH Low



CH Mid

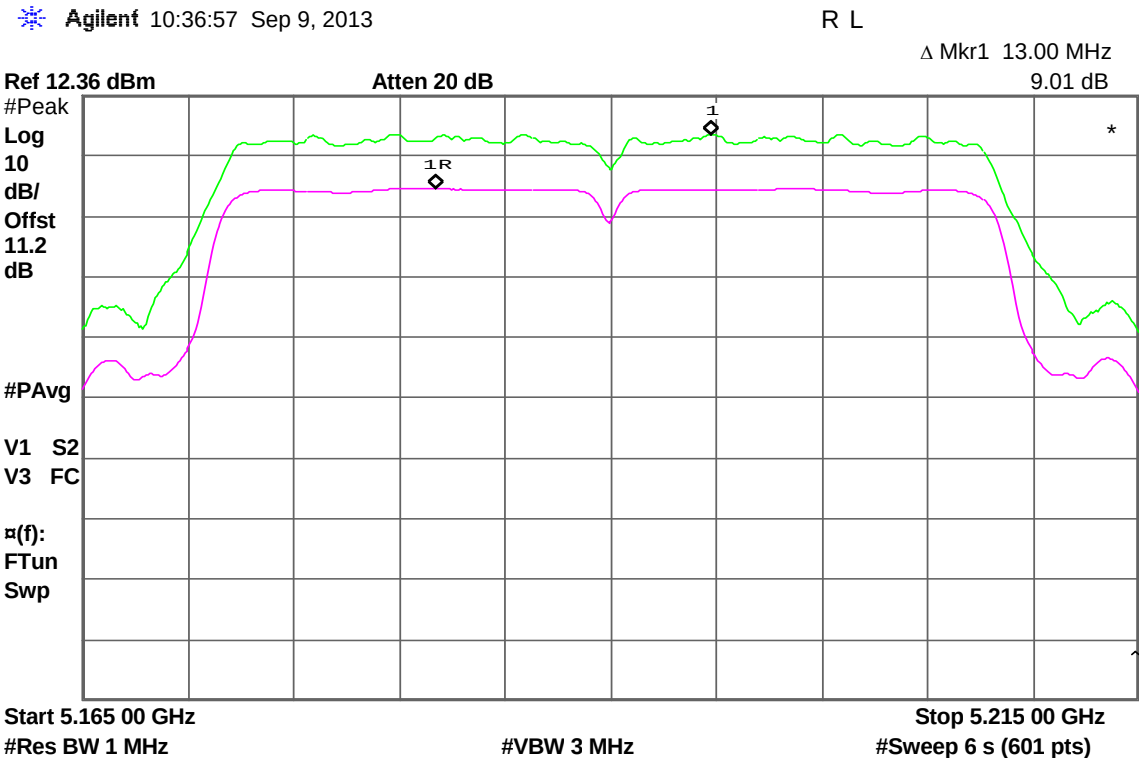


CH High

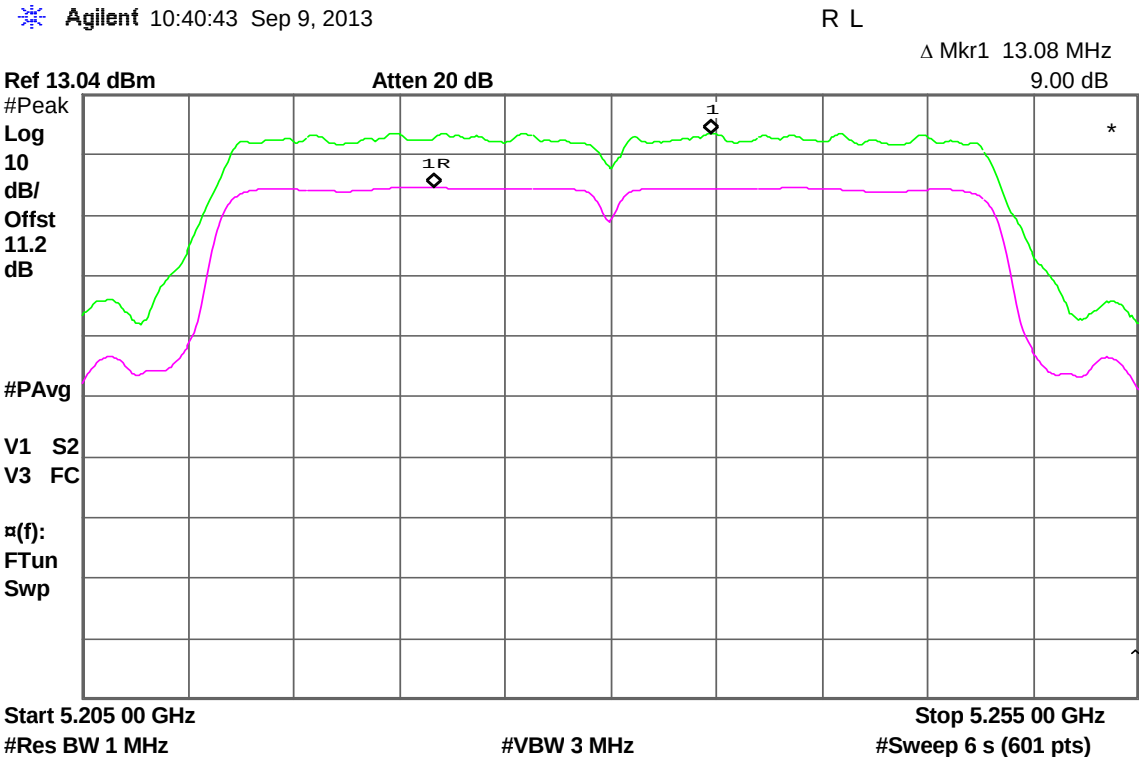


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 0

CH Low

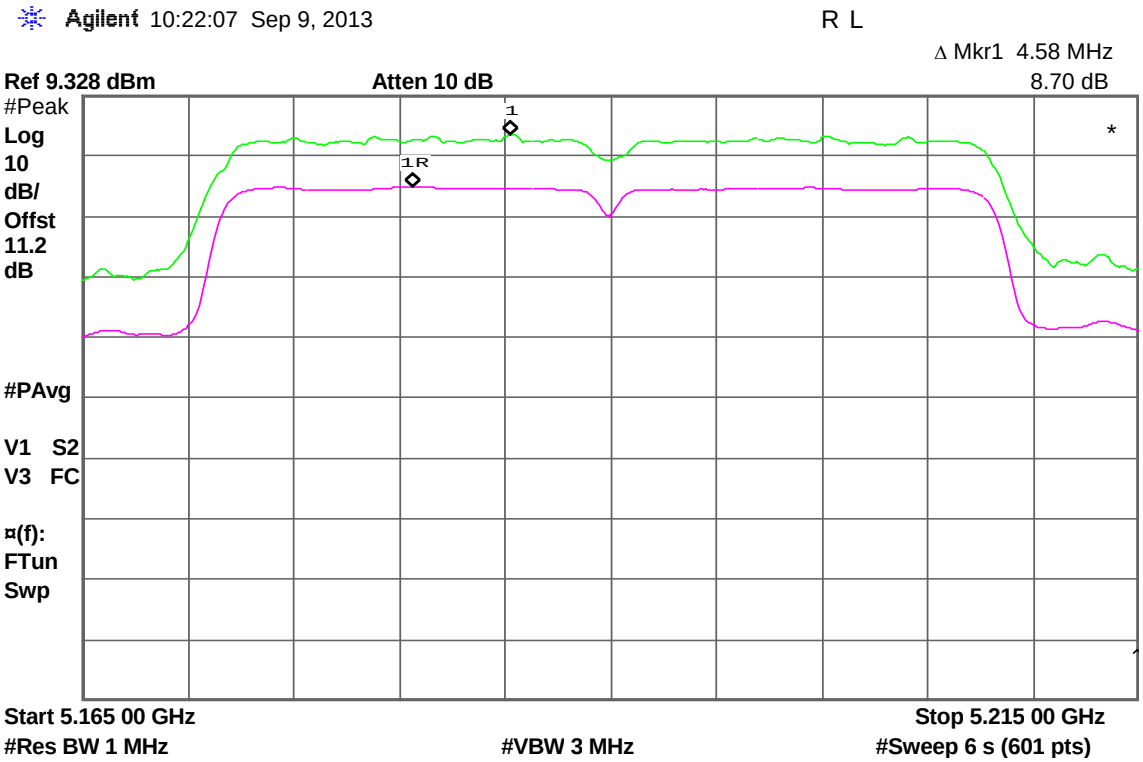


CH High

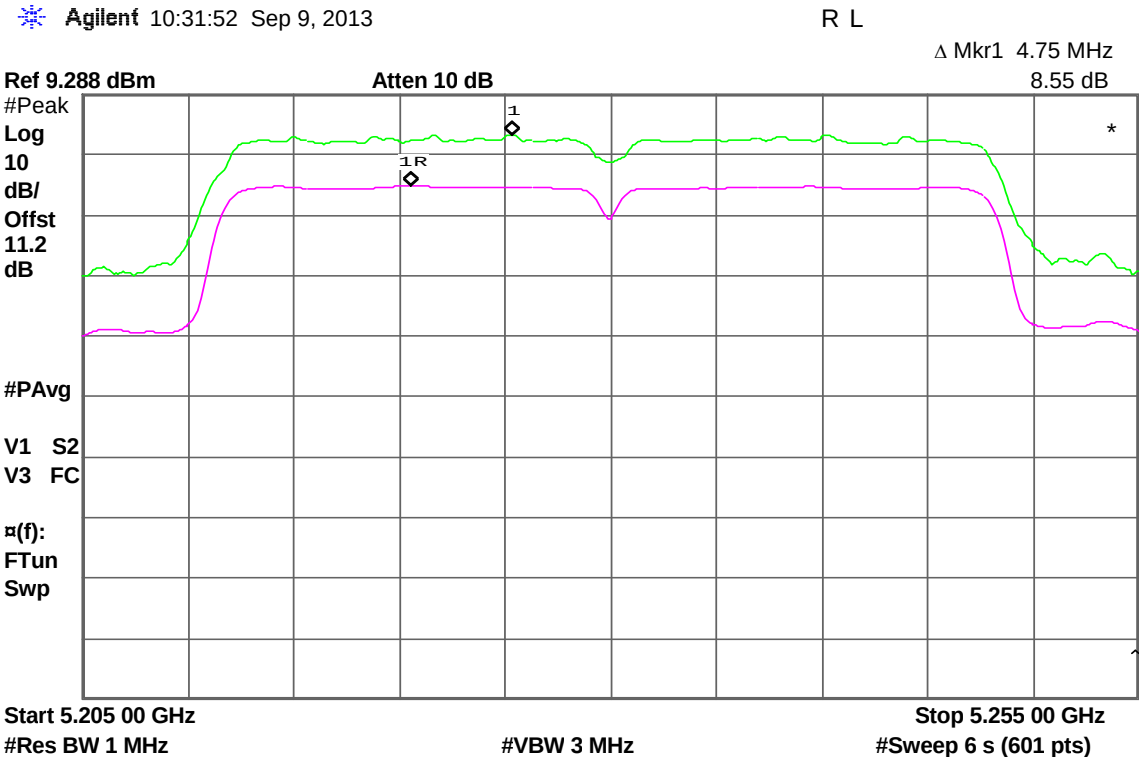


IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / Chain 1

CH Low

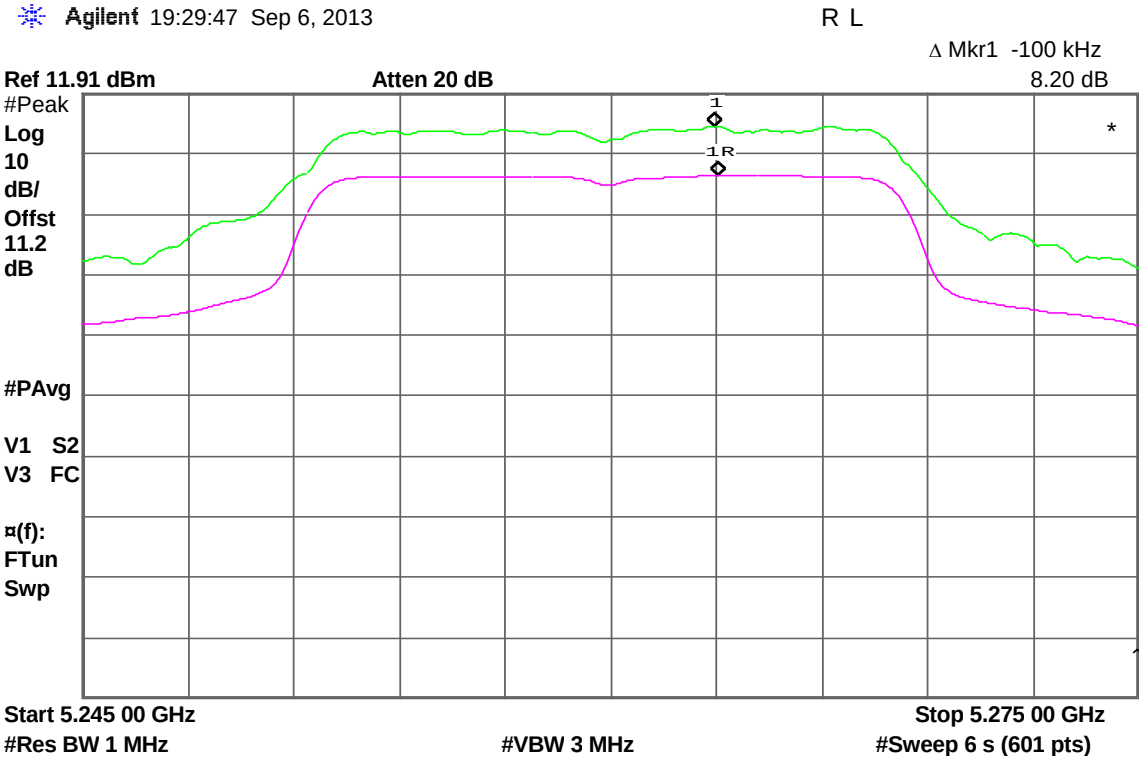


CH High

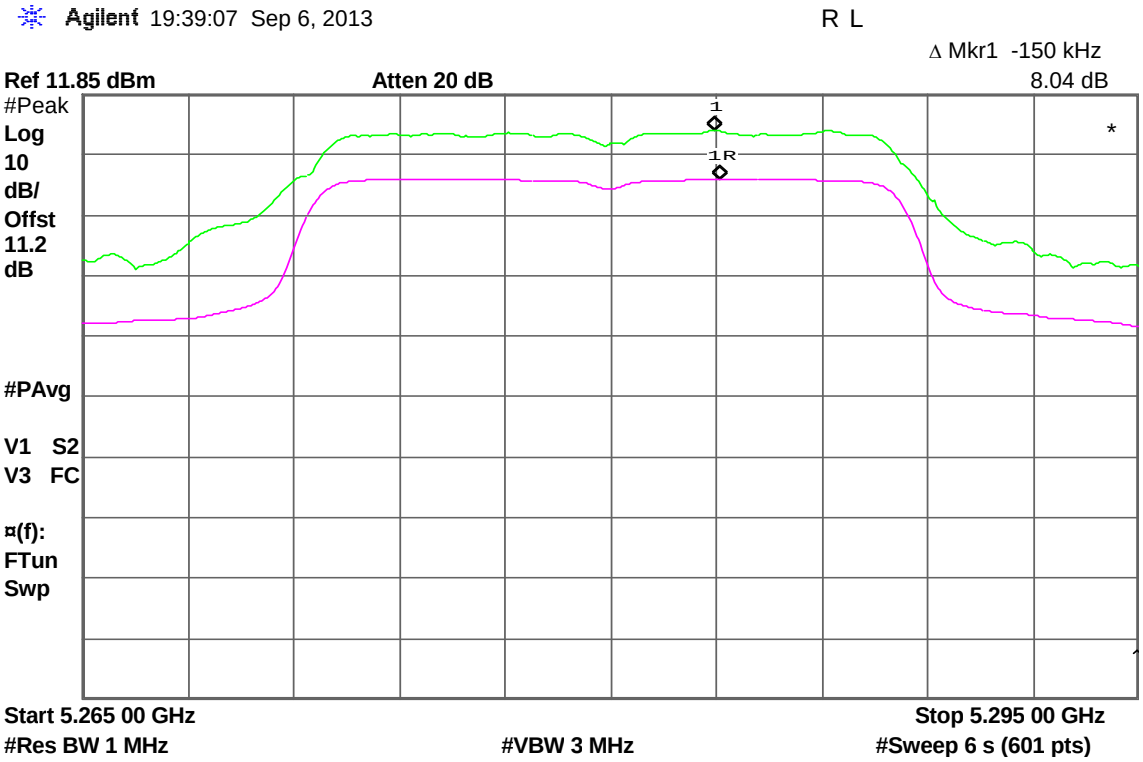


IEEE 802.11a mode / 5260 ~ 5320MHz

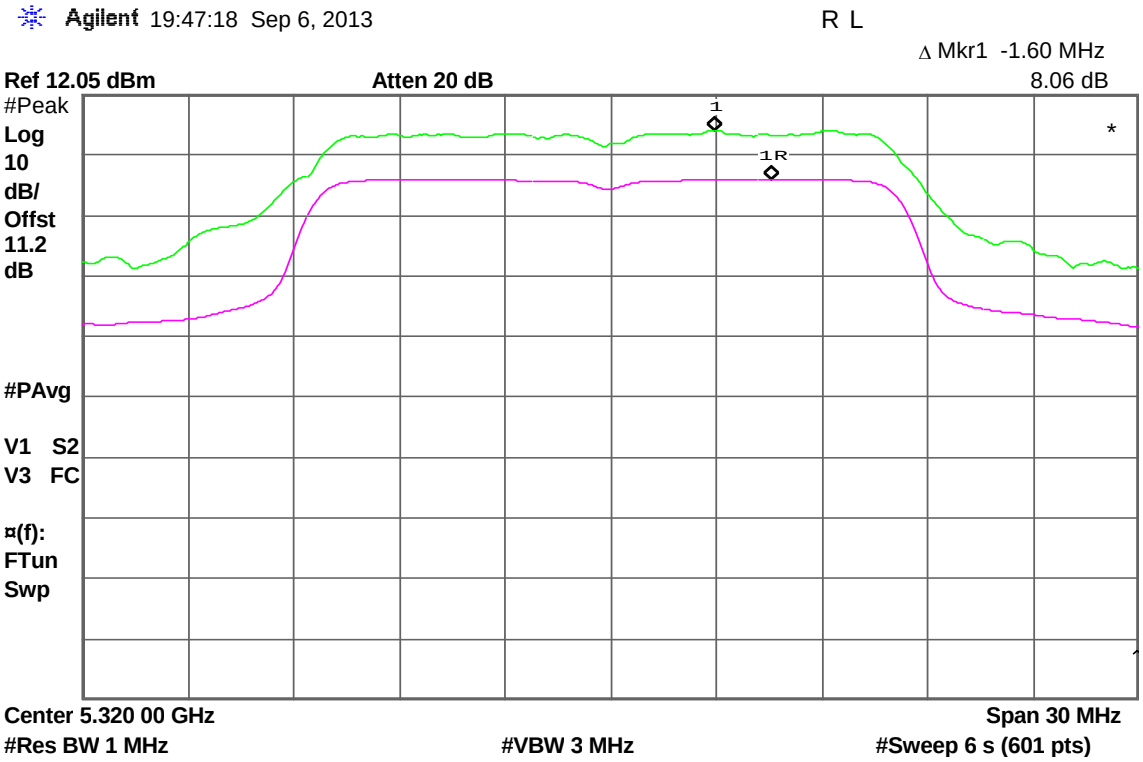
CH Low



CH Mid

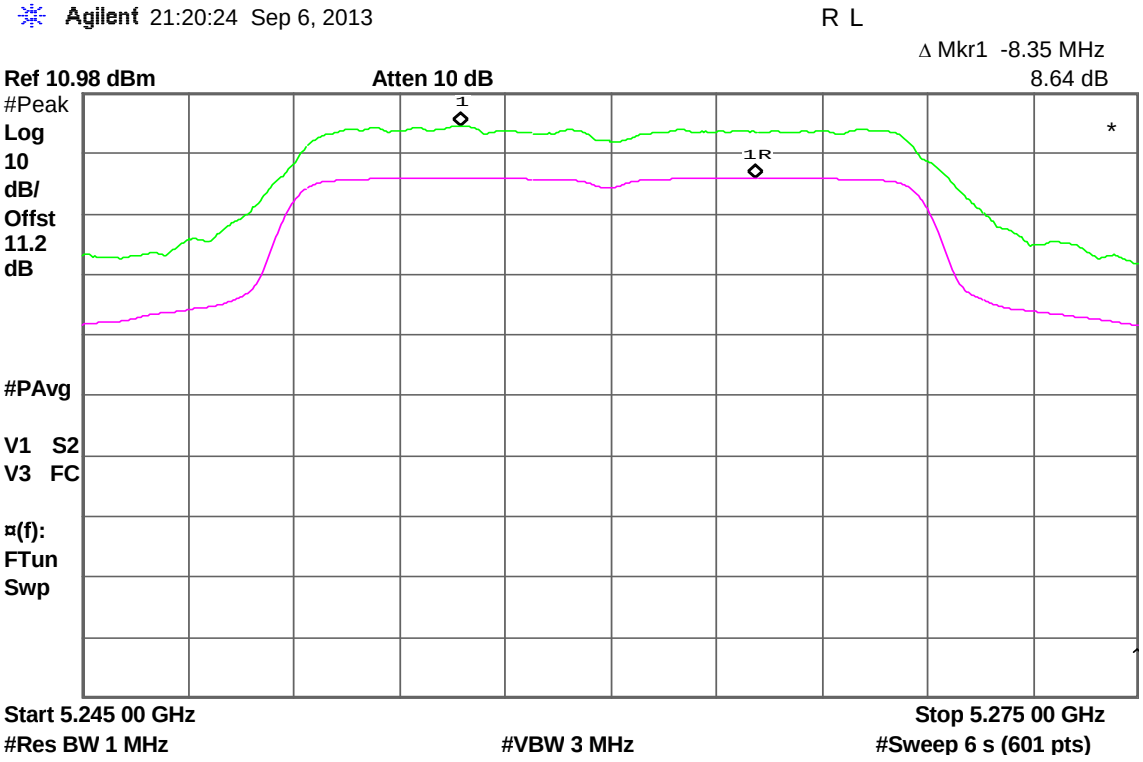


CH High

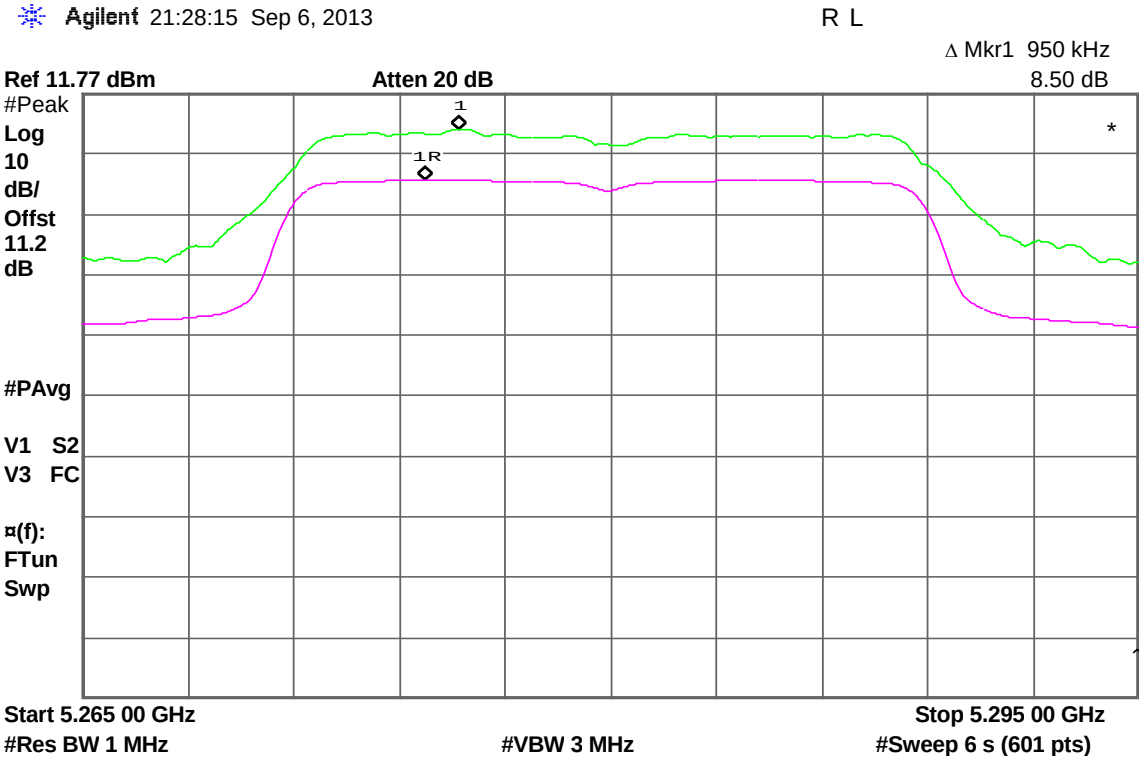


IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / Chain 0

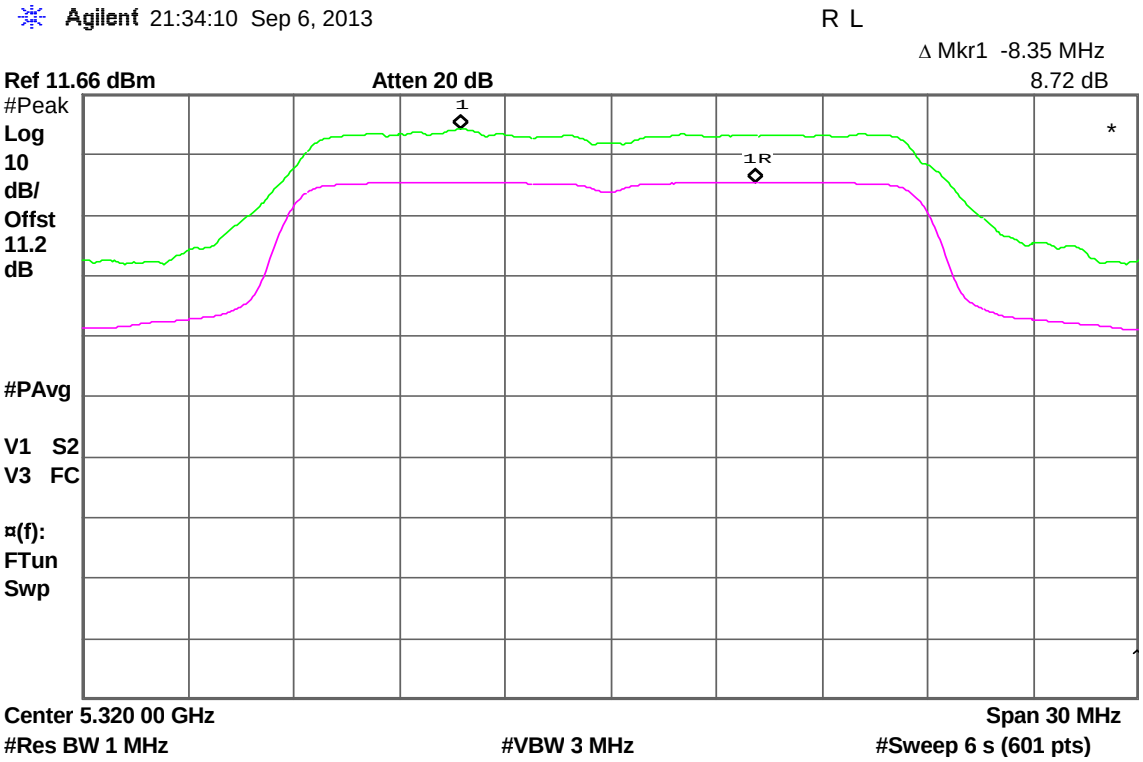
CH Low



CH Mid

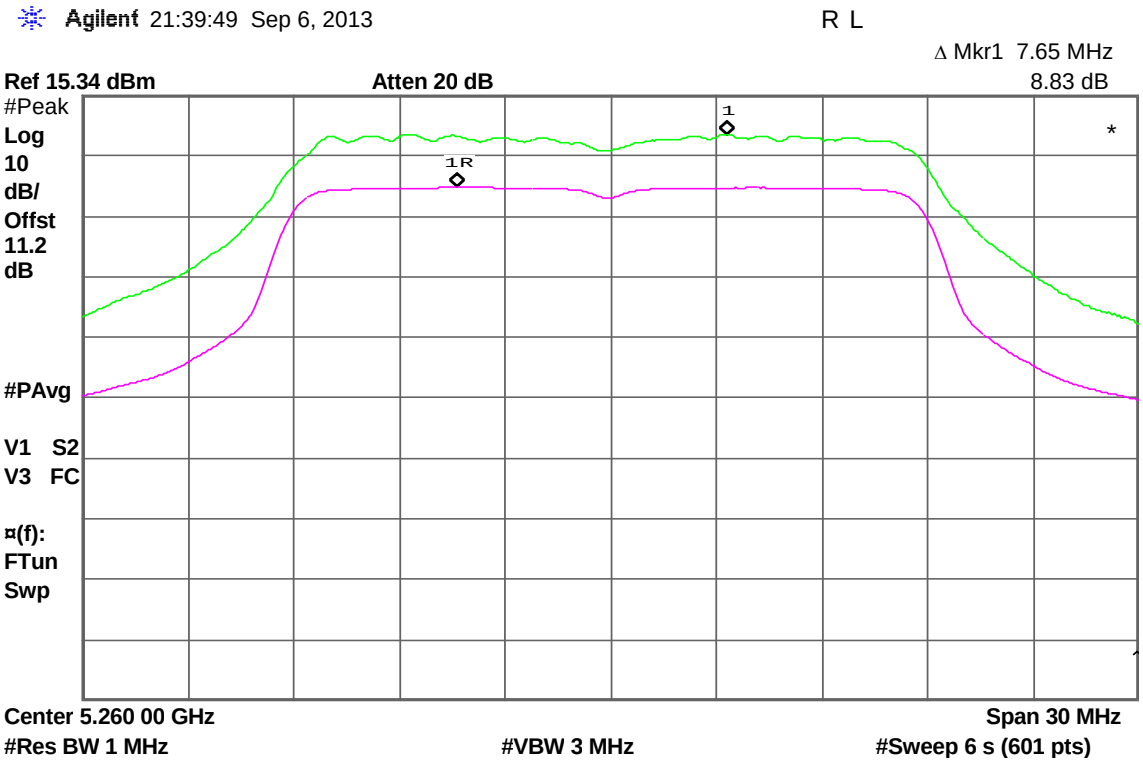


CH High

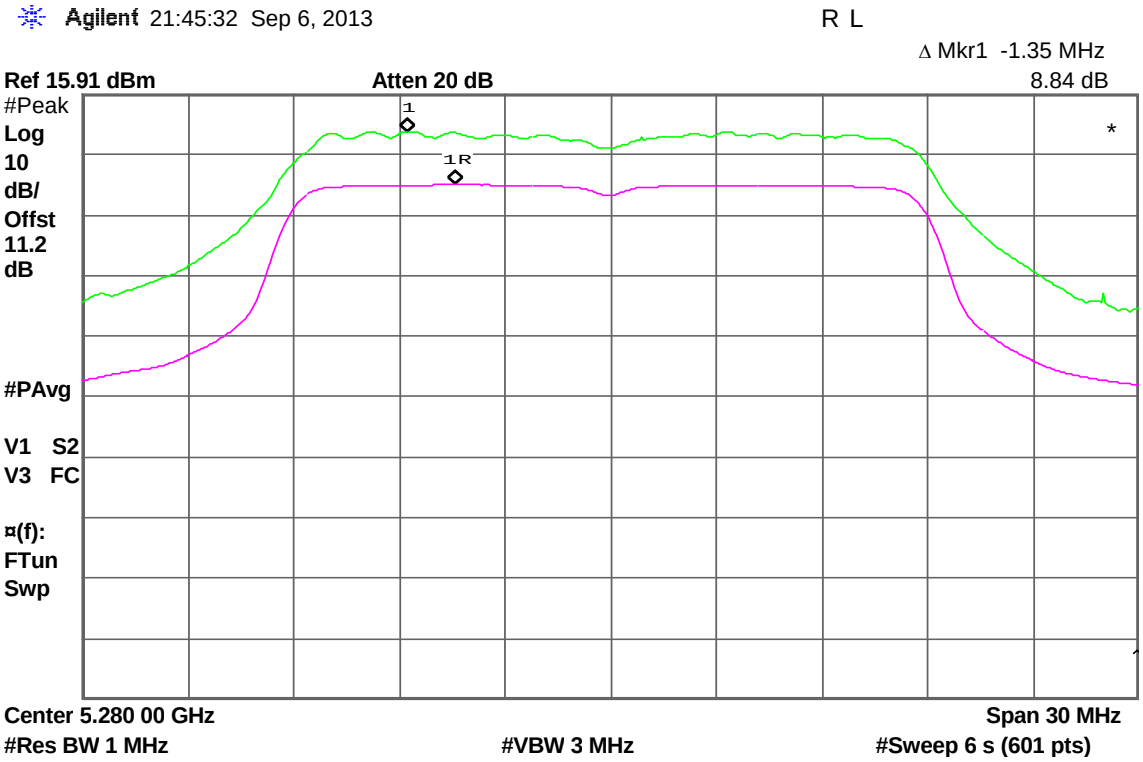


IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / Chain 1

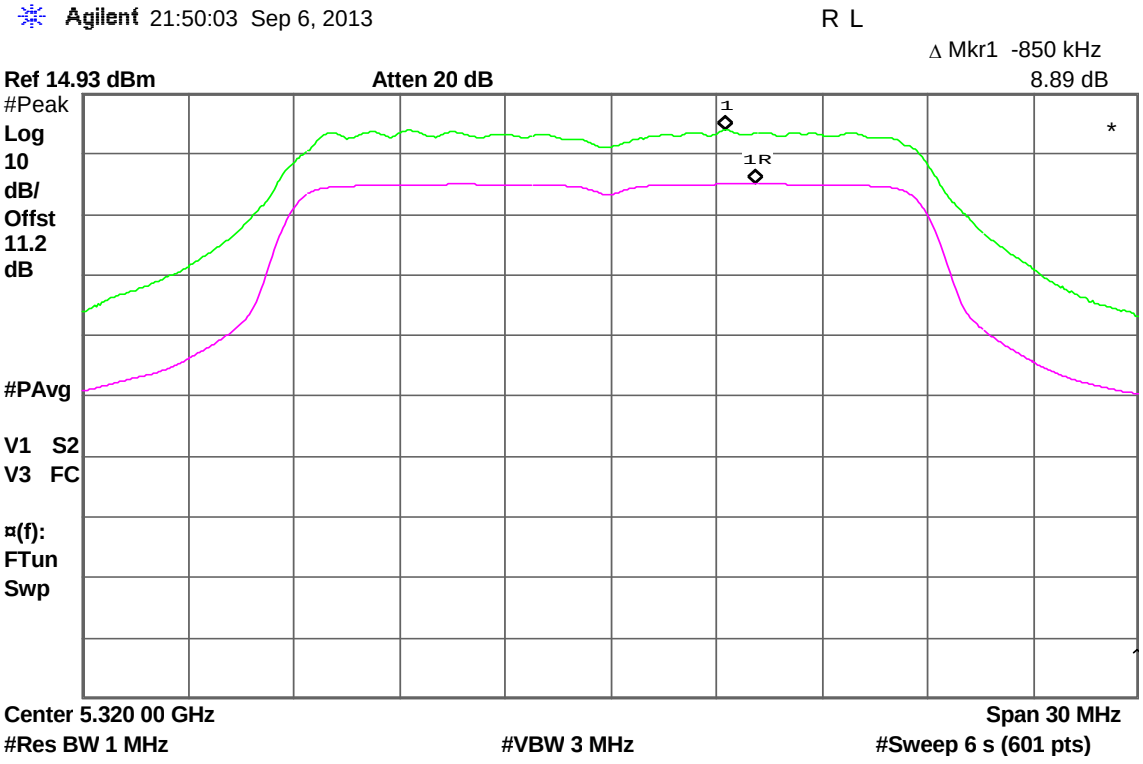
CH Low



CH Mid

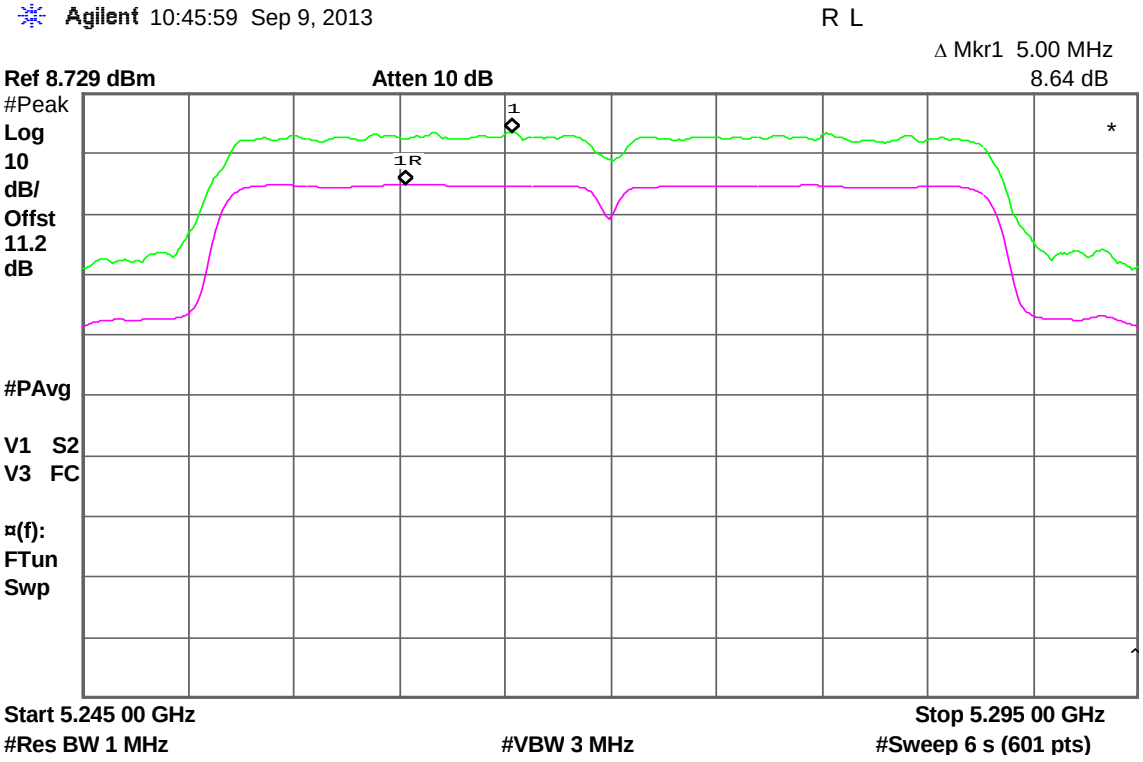


CH High

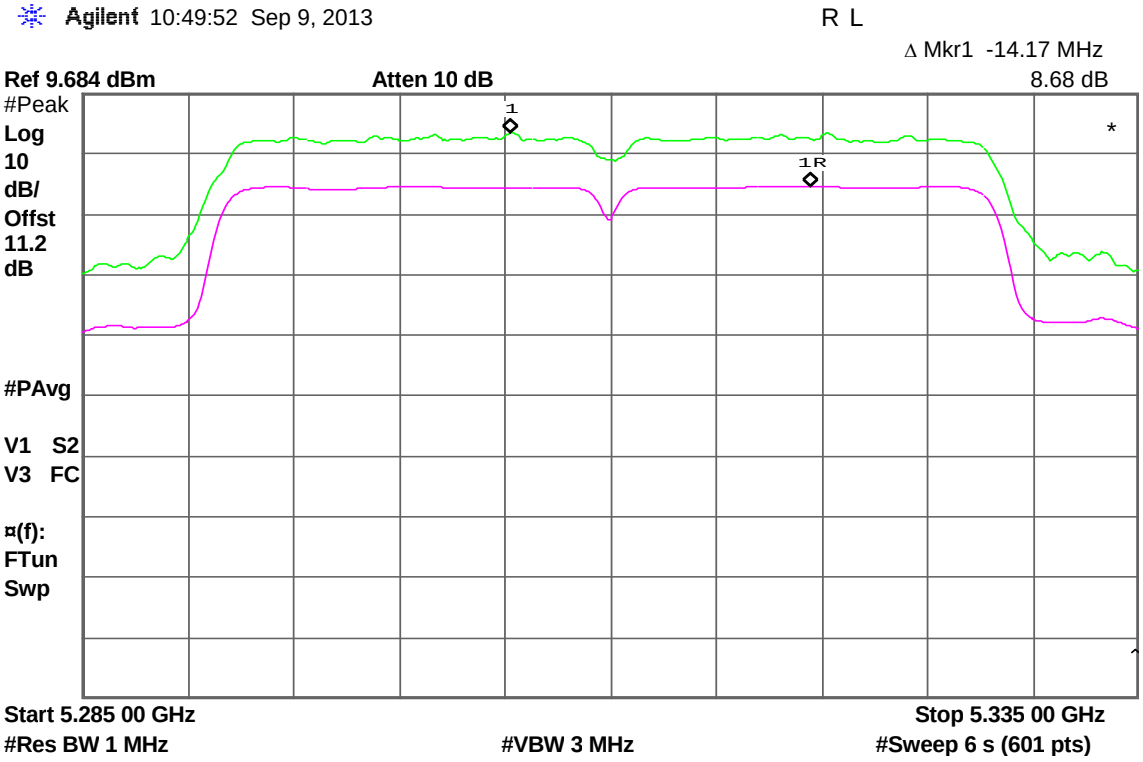


IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / Chain 0

CH Low

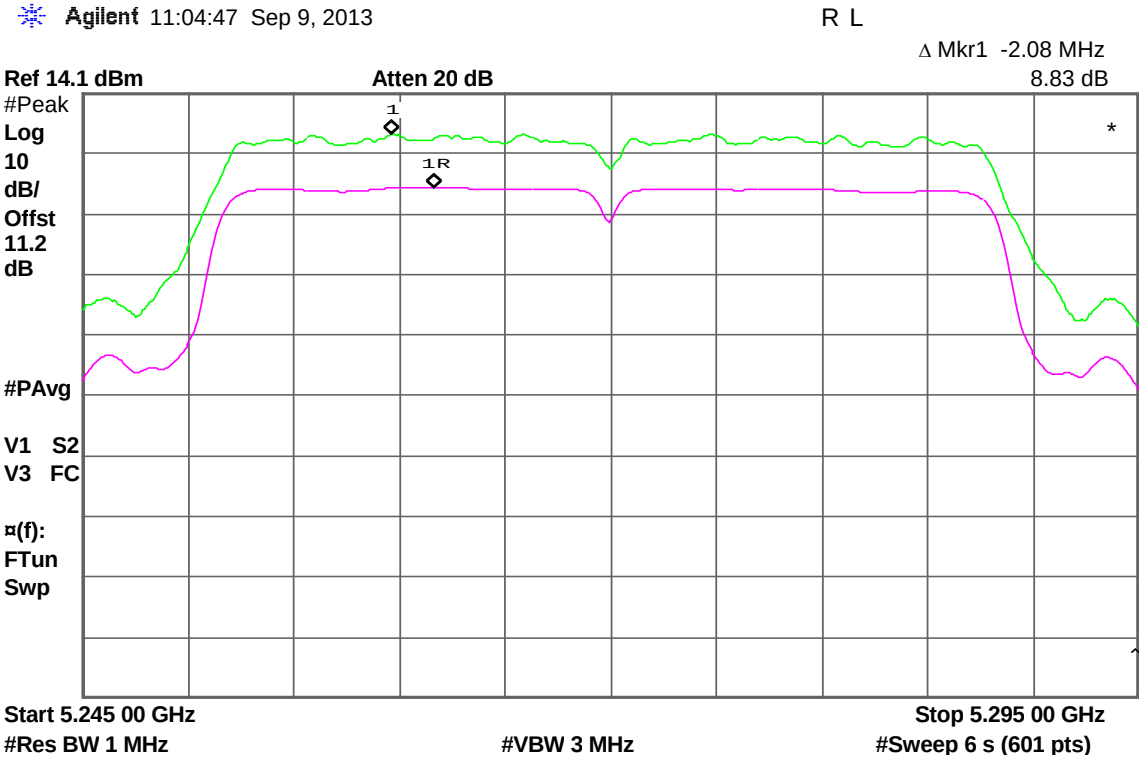


CH High

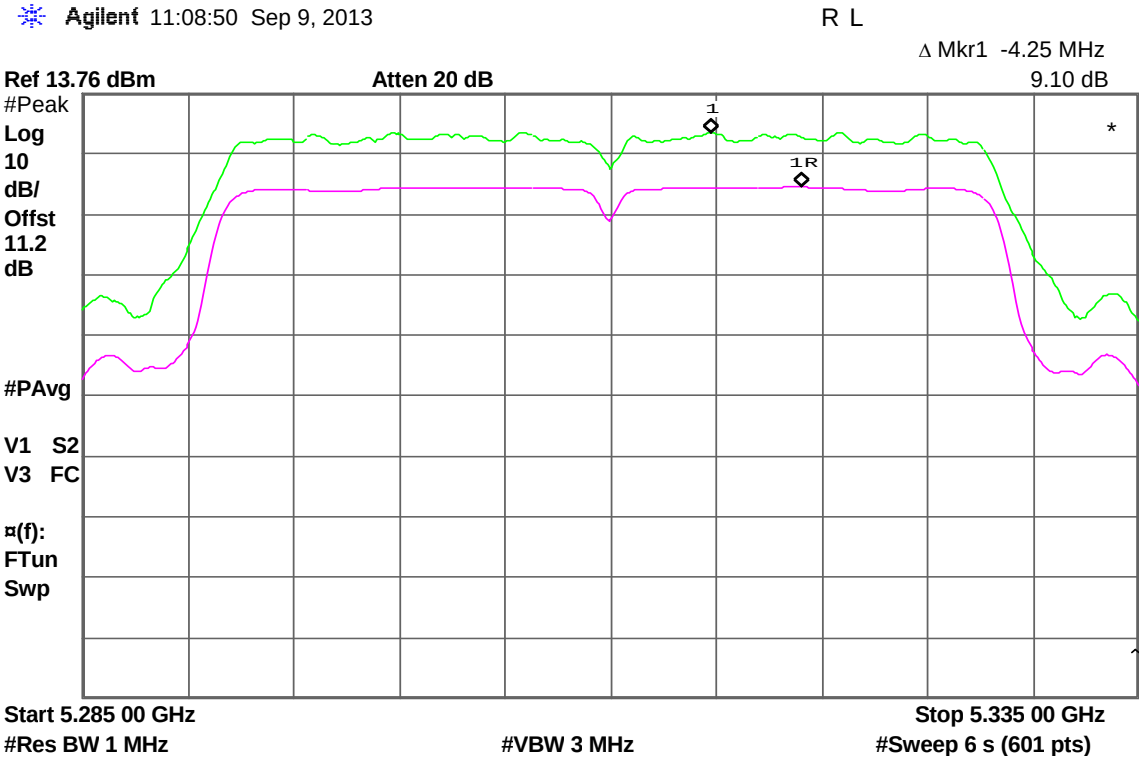


IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / Chain 1

CH Low

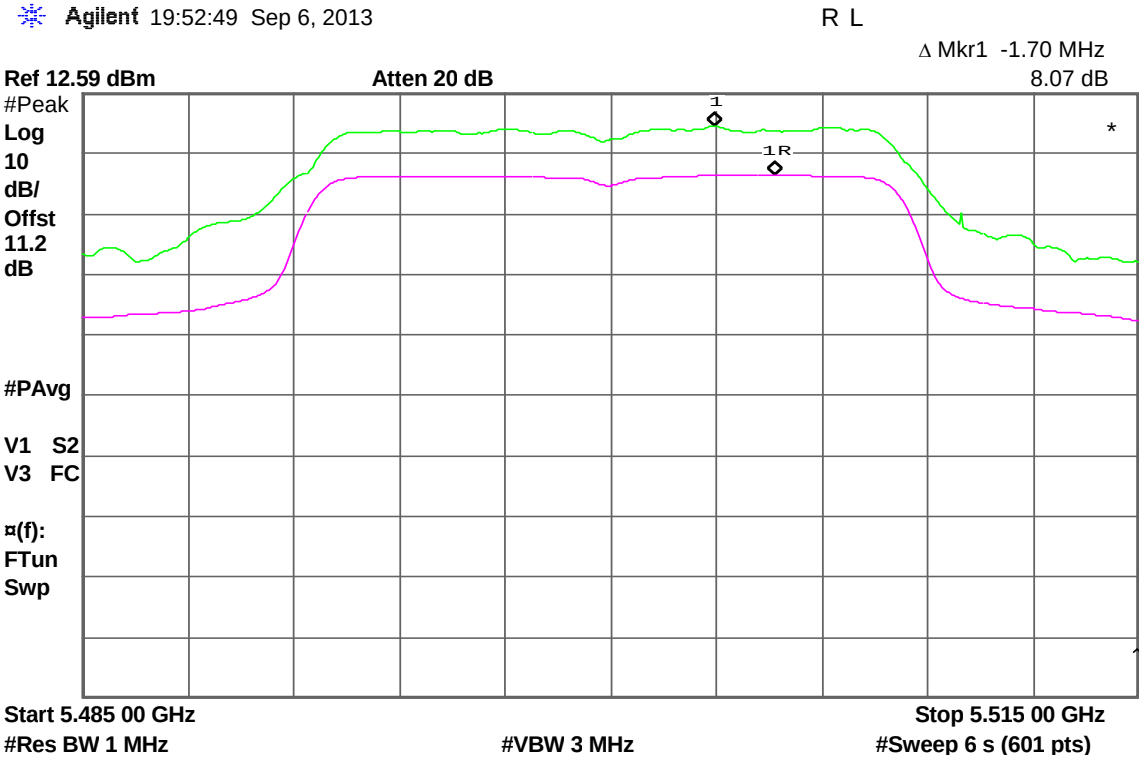


CH High

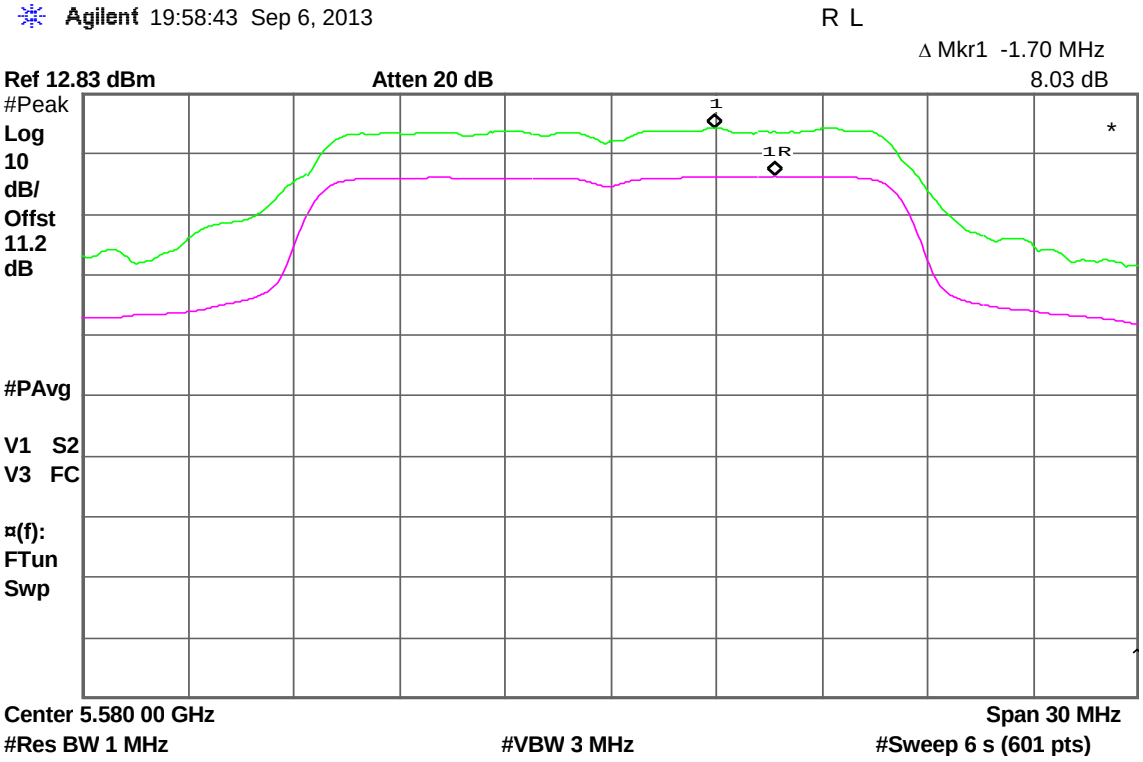


EEE 802.11a mode / 5500 ~ 5700MHz

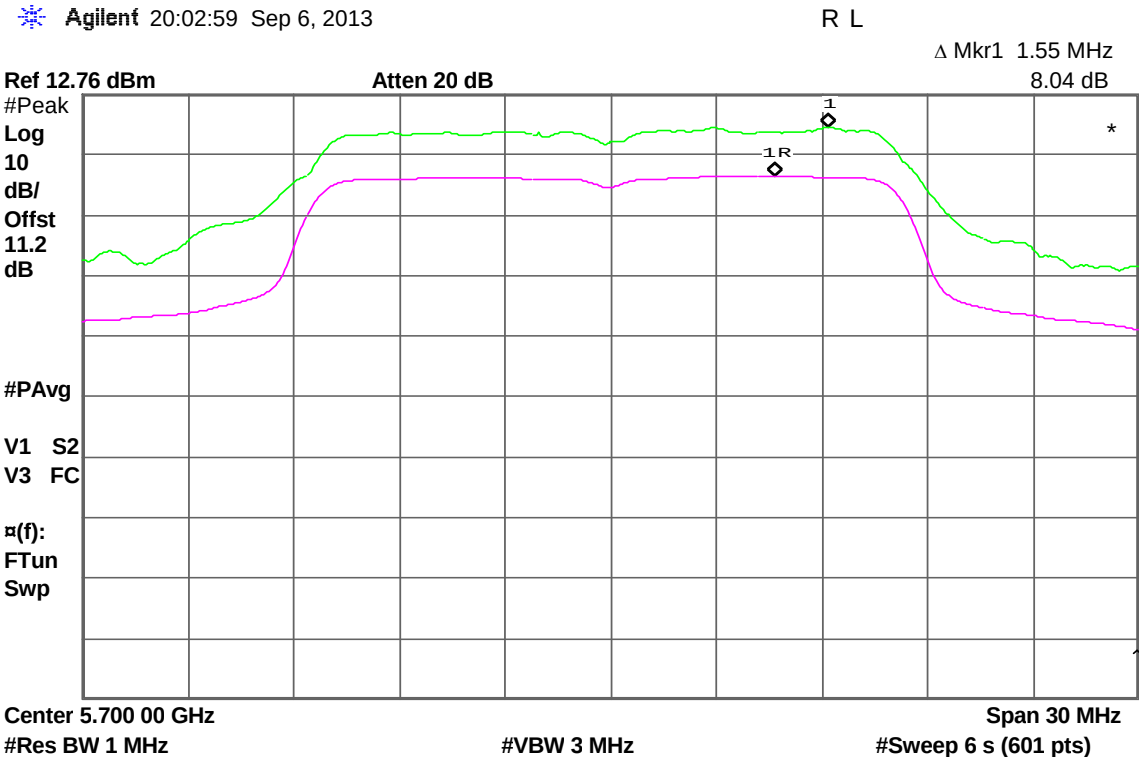
CH Low



CH Mid

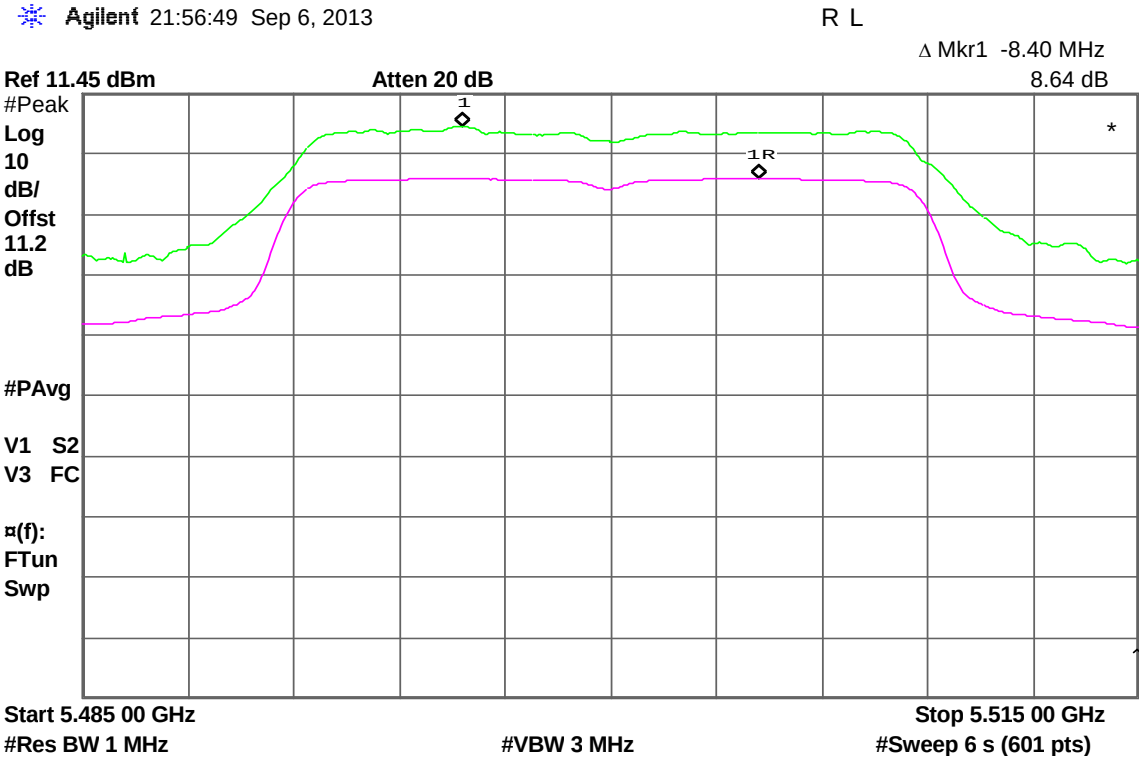


CH High

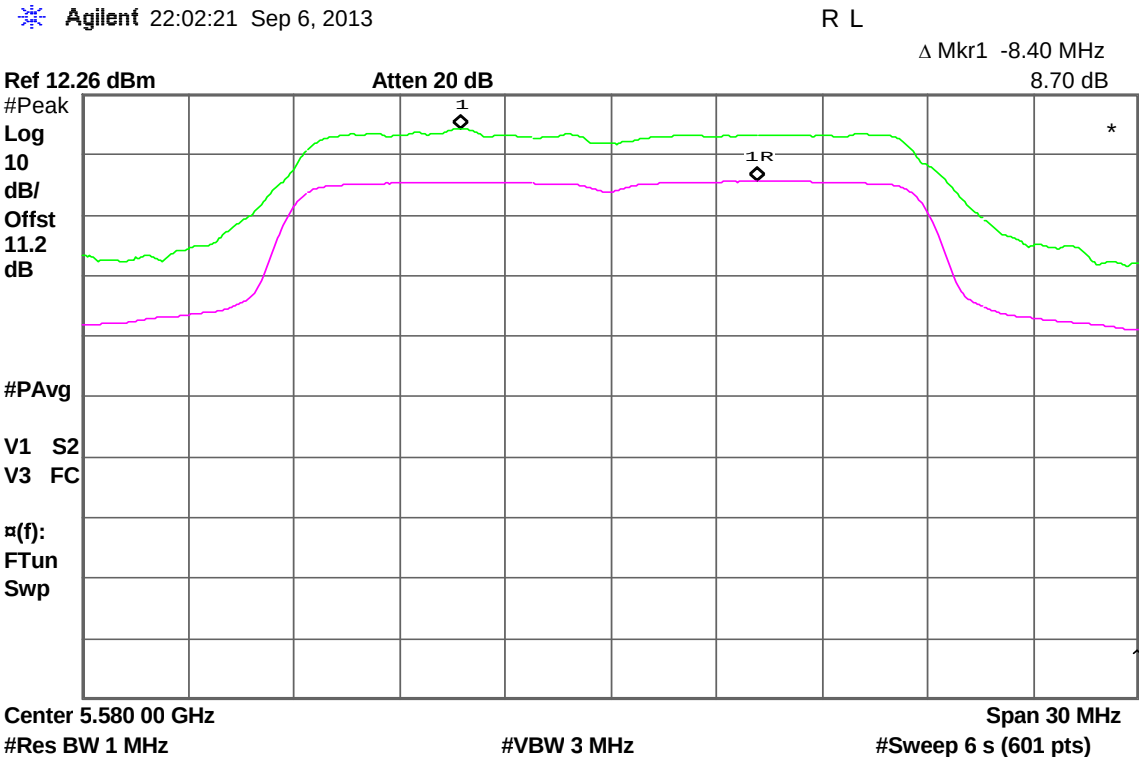


IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / Chain 0

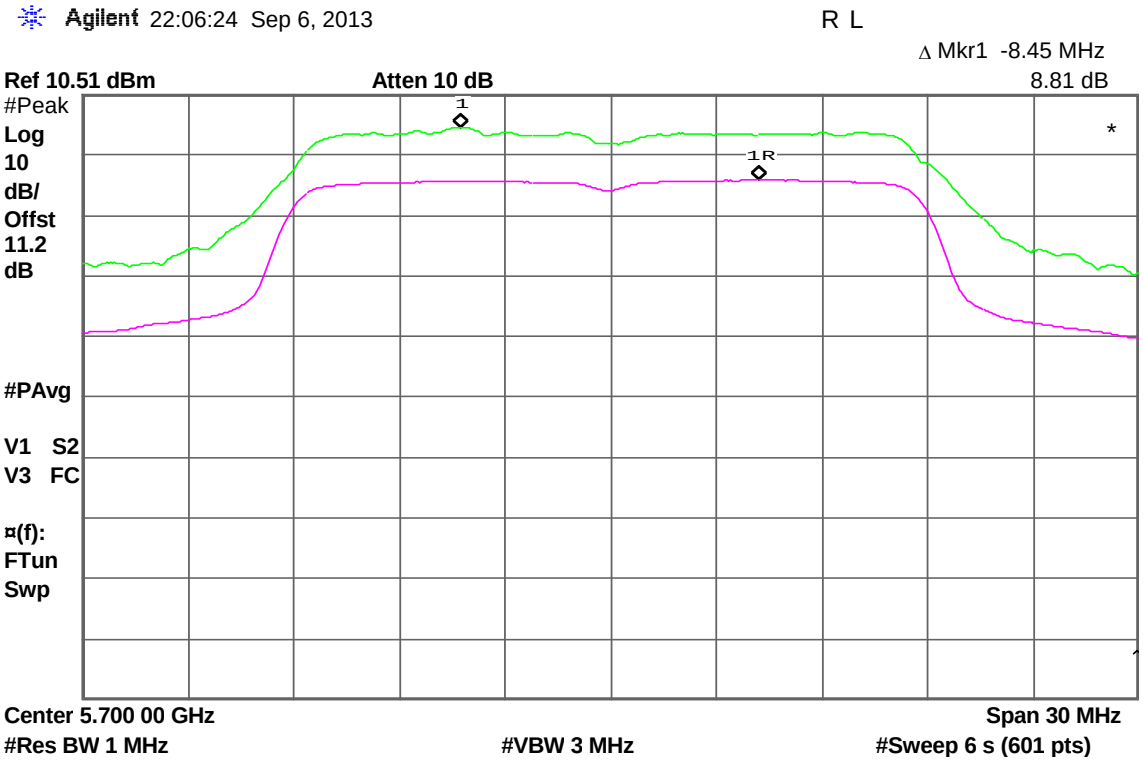
CH Low



CH Mid

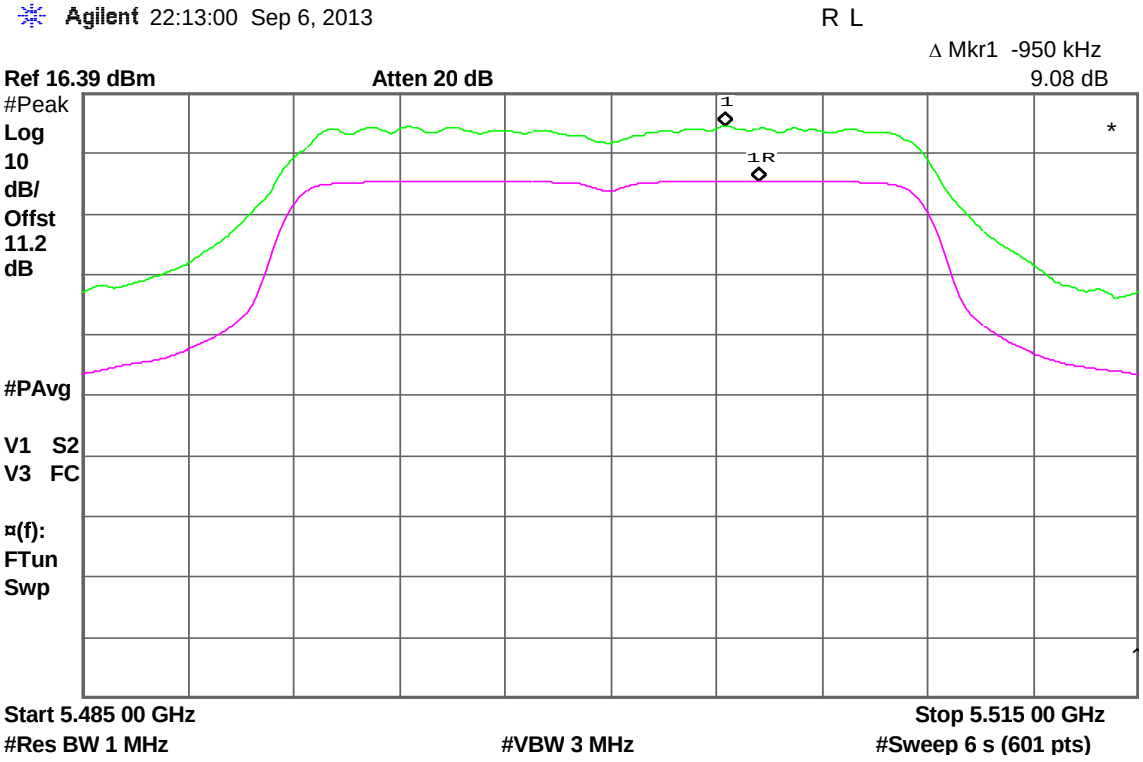


CH High

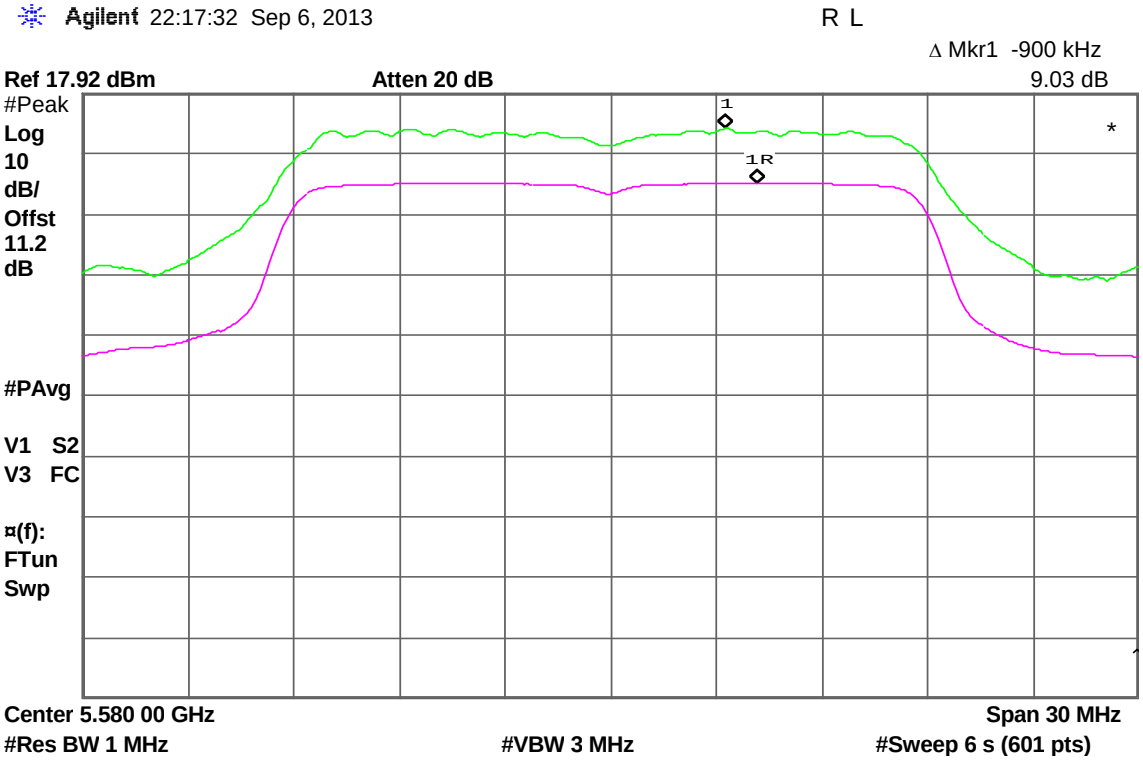


IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / Chain 1

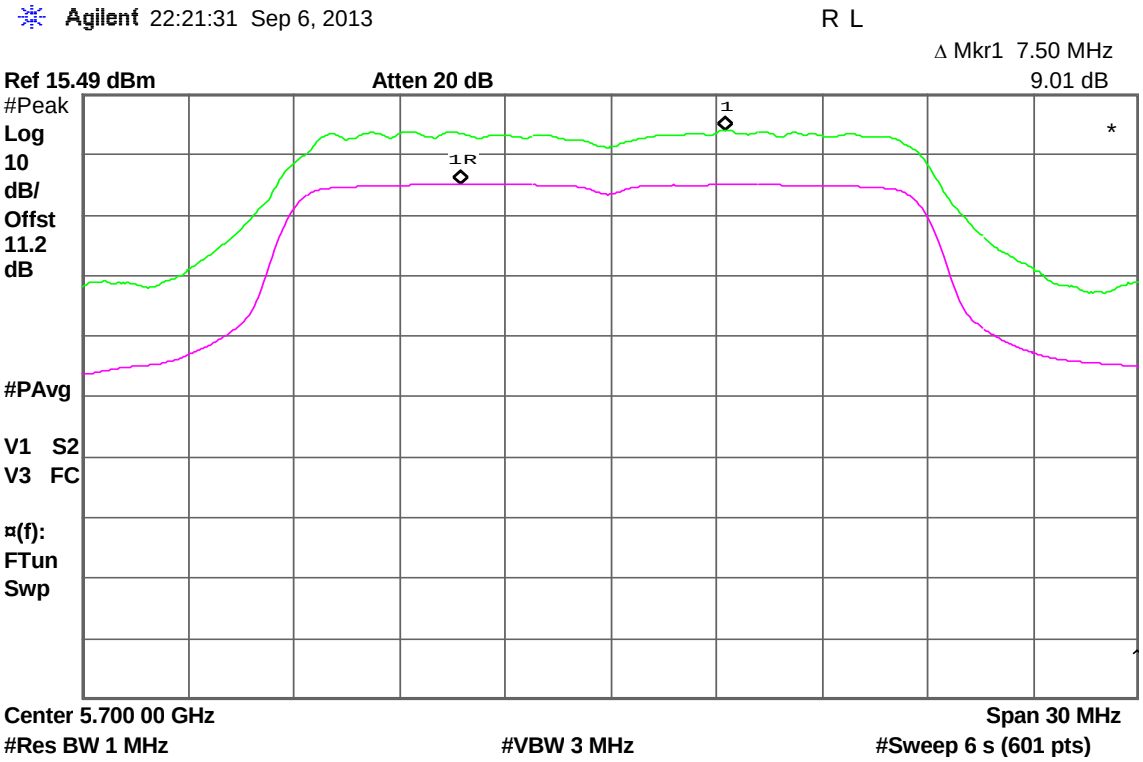
CH Low



CH Mid

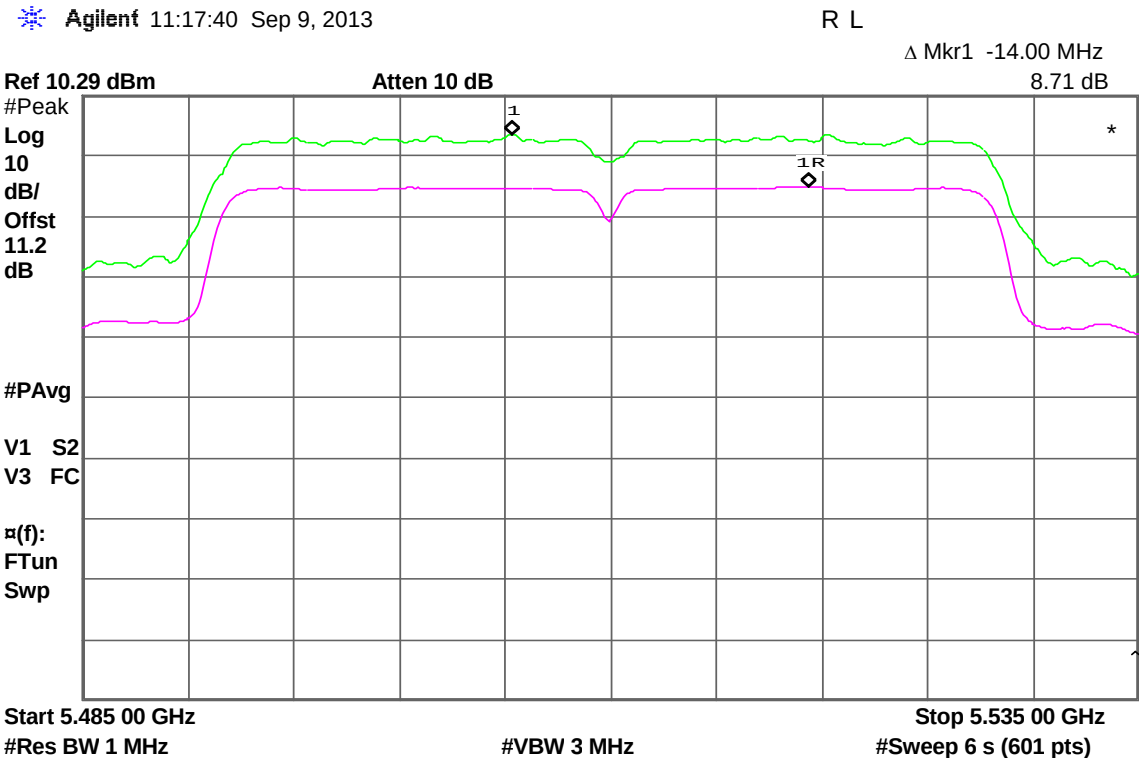


CH High

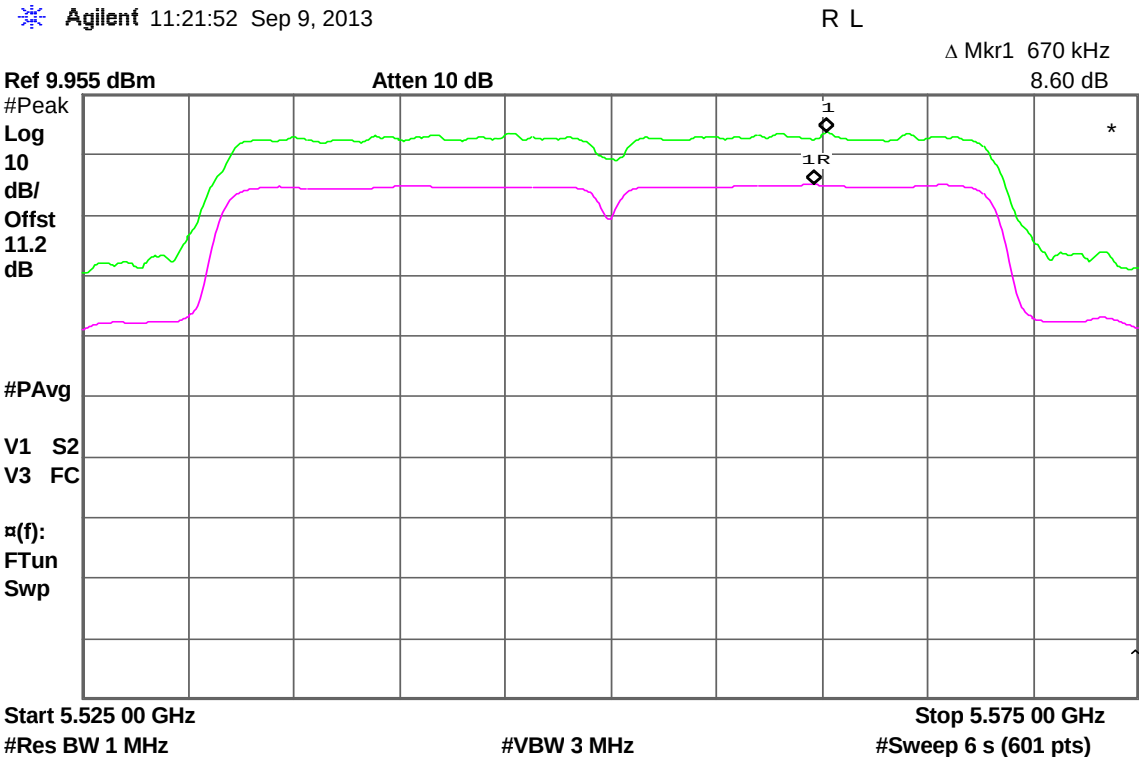


IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 0

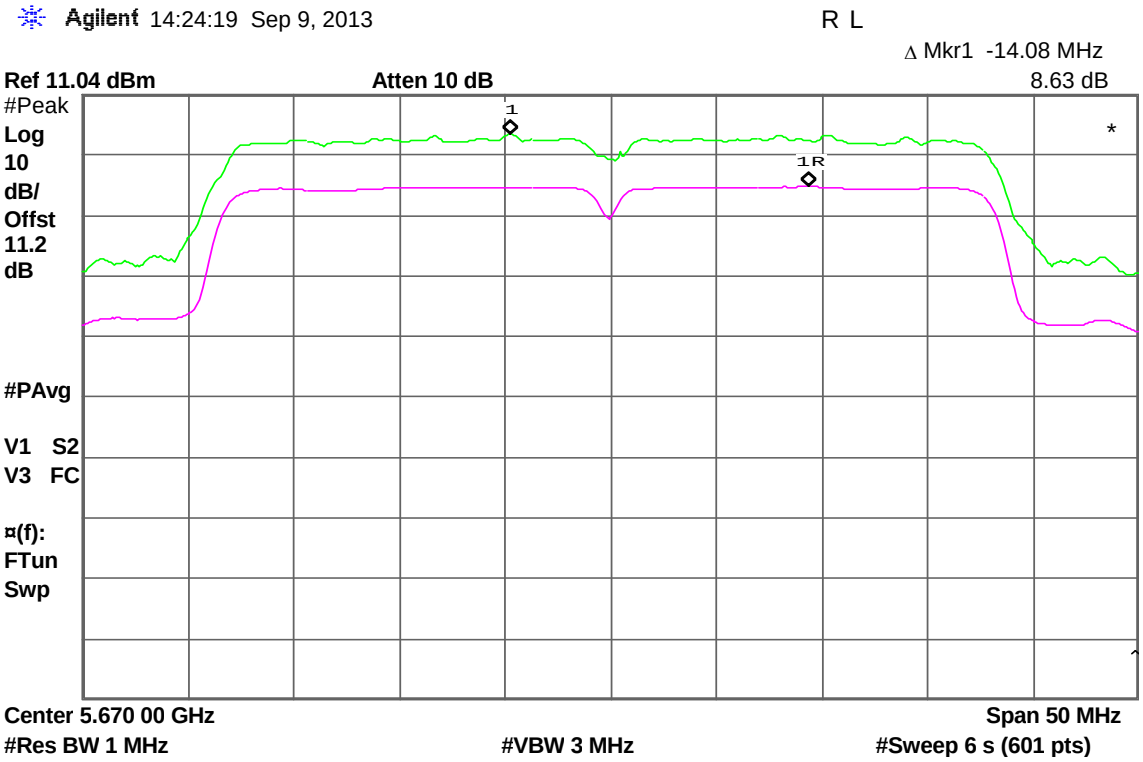
CH Low



CH Mid

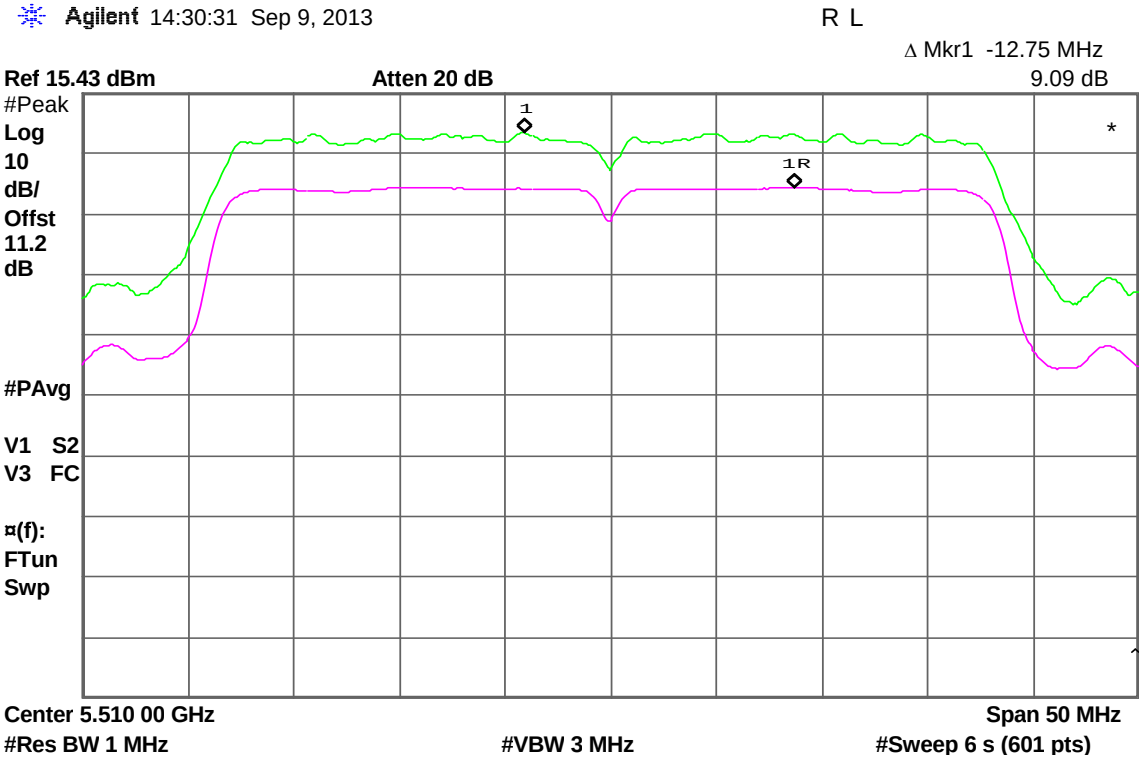


CH High

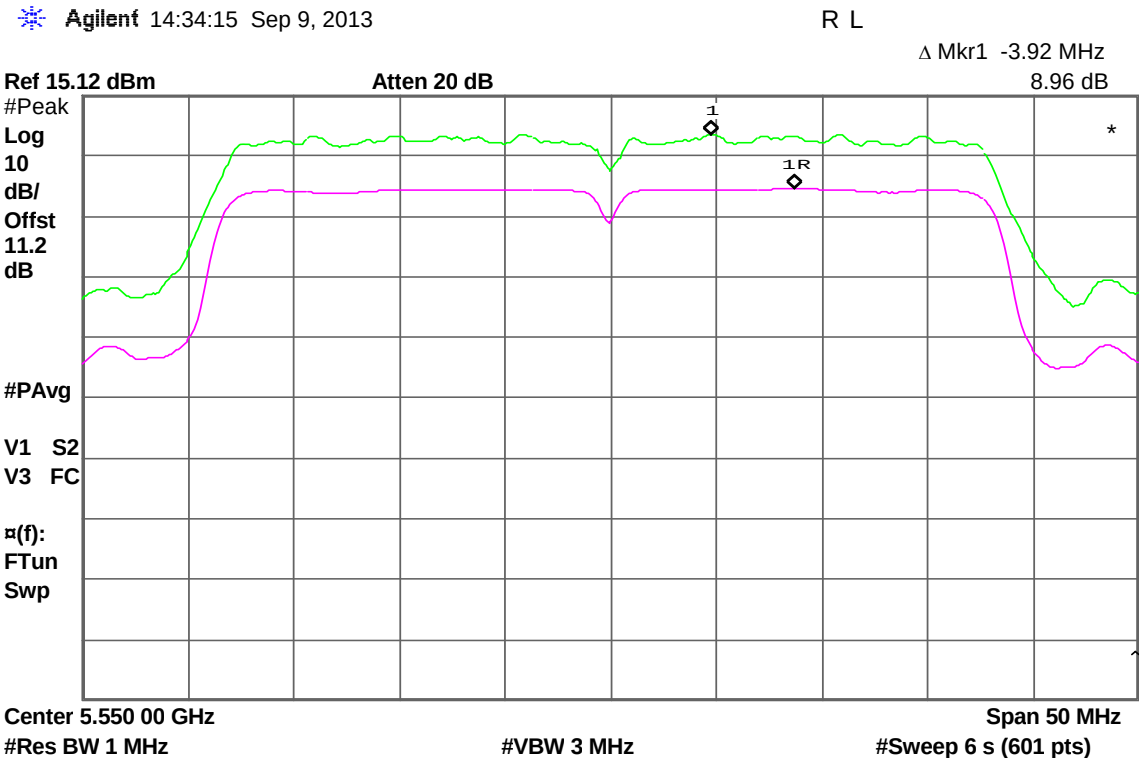


IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / Chain 1

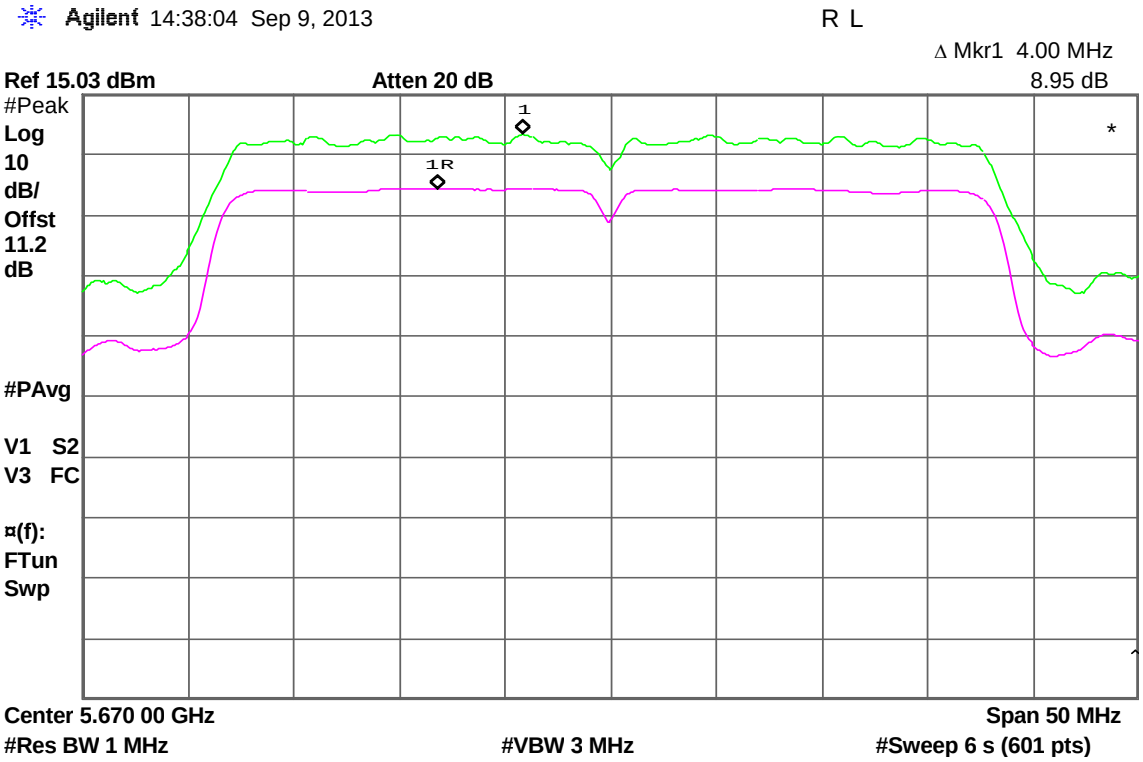
CH Low



CH Mid



CH High


Agilent 14:38:04 Sep 9, 2013
R L
Δ Mkr1 4.00 MHz
8.95 dB
Ref 15.03 dBm
Atten 20 dB
#Peak
Log
10
dB/
Offst
11.2
dB
#PAvg
V1 S2
V3 FC
¤(f):
FTun
Swp
1
1R
*
Center 5.670 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 3 MHz
#Sweep 6 s (601 pts)

7.6 RADIATED UNDESIRABLE EMISSION

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

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

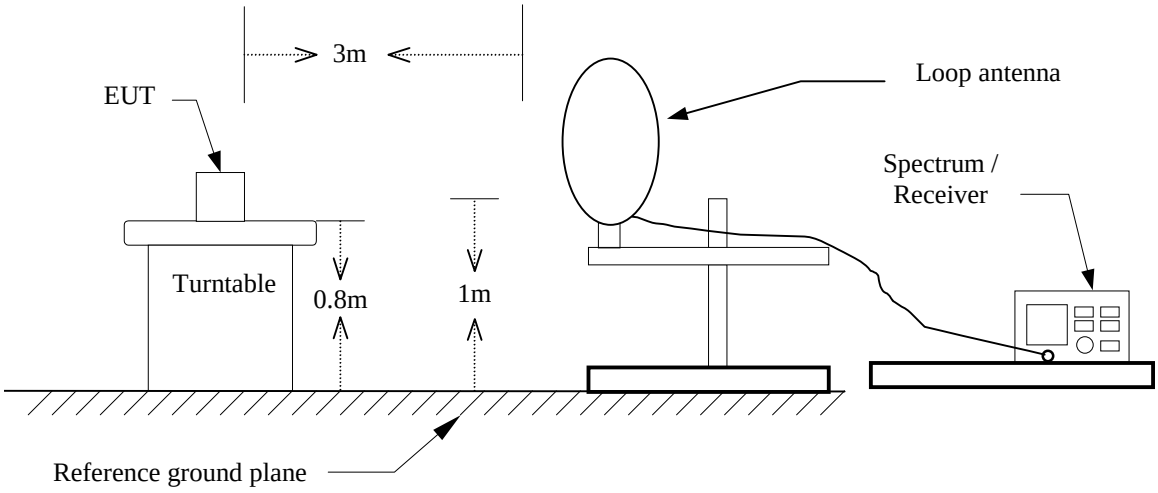
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

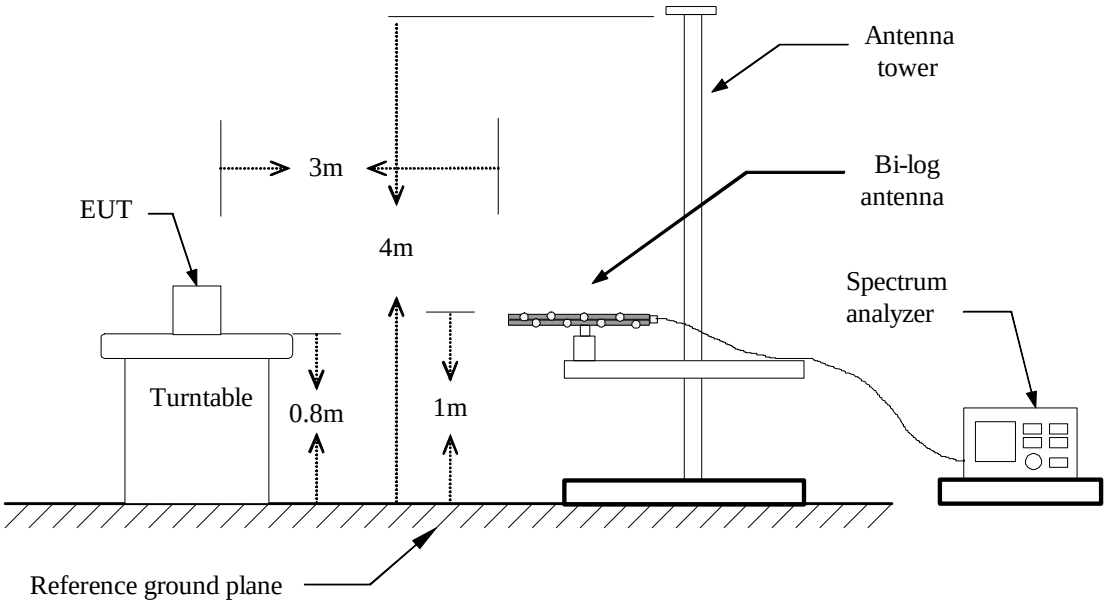
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
0.009 - 0.490	2400/F(kHz) +80	20LOG((2400/F(kHz))+80)
0.490 - 1.705	24000/F(kHz) +40	20LOG((24000/F(kHz))+40)
1.705 – 30.0	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

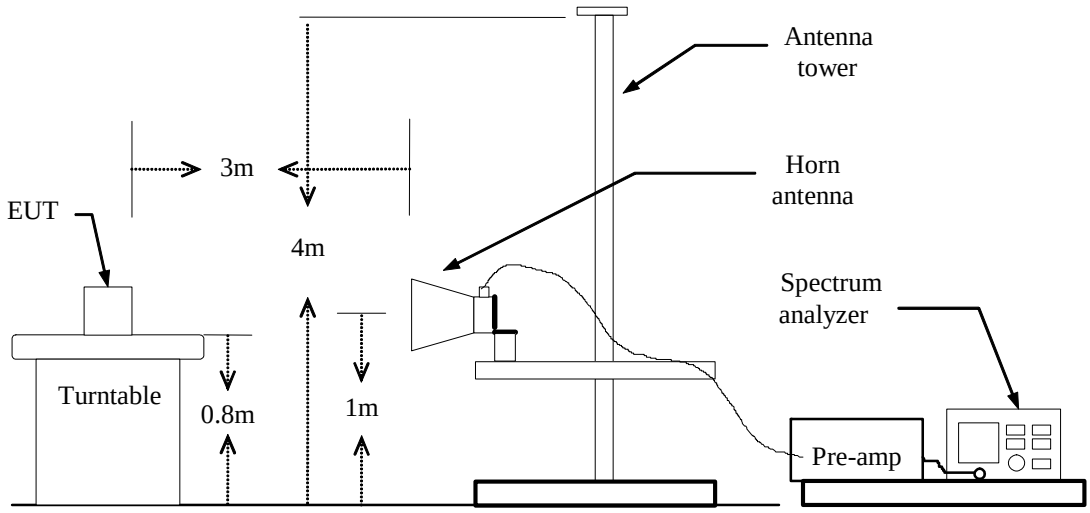
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz


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

TEST PROCEDURE

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

   Below 1GHz:

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

   Above 1GHz:

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

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode:	Normal Link	**Test Date:**	September 4, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP)	Ant.Pol. (H/V)
165.8000	67.83	-29.58	38.25	43.50	-5.25	Peak	V
206.2167	62.84	-29.13	33.71	43.50	-9.79	Peak	V
233.7000	70.08	-29.92	40.16	46.00	-5.84	Peak	V
299.9833	65.17	-27.73	37.44	46.00	-8.56	Peak	V
416.3833	57.31	-25.10	32.21	46.00	-13.79	Peak	V
666.9667	56.16	-20.59	35.57	46.00	-10.43	Peak	V
165.8000	67.58	-29.58	38.00	43.50	-5.50	Peak	H
207.8333	69.12	-29.25	39.87	43.50	-3.63	Peak	H
232.0833	71.55	-29.94	41.61	46.00	-4.39	Peak	H
299.9833	67.55	-27.73	39.82	46.00	-6.18	Peak	H
364.6500	65.99	-26.26	39.73	46.00	-6.27	Peak	H
624.9333	55.93	-21.60	34.33	46.00	-11.67	Peak	H

Remark:

1. *No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).*
2. *Measuring frequencies from 30 MHz to the 1GHz.*
3. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
4. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2761.667	50.36	1.38	51.74	74.00	-22.26	peak	V
N/A							
2540.000	51.11	0.79	51.90	74.00	-22.10	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2668.333	50.86	1.13	51.99	74.00	-22.01	peak	V
N/A							
2878.333	50.17	1.69	51.86	74.00	-22.14	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2563.333	50.96	0.85	51.81	74.00	-22.19	peak	V
N/A							
2785.000	50.35	1.44	51.79	74.00	-22.21	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2855.000	50.25	1.62	51.87	74.00	-22.13	peak	V
N/A							
2785.000	50.41	1.44	51.85	74.00	-22.15	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2796.667	50.46	1.47	51.93	74.00	-22.07	peak	V
N/A							
2668.333	50.82	1.13	51.95	74.00	-22.05	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5180 ~ 5240MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2668.333	50.76	1.13	51.89	74.00	-22.11	peak	V
N/A							
2738.333	50.42	1.31	51.73	74.00	-22.27	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2796.667	50.31	1.47	51.78	74.00	-22.22	peak	V
N/A							
2866.667	50.09	1.66	51.75	74.00	-22.25	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5190 ~ 5230MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2796.667	50.31	1.47	51.78	74.00	-22.22	peak	V
N/A							
2703.333	50.58	1.22	51.80	74.00	-22.20	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2878.333	50.22	1.69	51.91	74.00	-22.09	peak	V
N/A							
2773.333	50.37	1.41	51.78	74.00	-22.22	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2761.667	50.56	1.38	51.94	74.00	-22.06	peak	V
N/A							
2750.000	50.37	1.34	51.71	74.00	-22.29	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2820.000	50.34	1.53	51.87	74.00	-22.13	peak	V
N/A							
2796.667	50.18	1.47	51.65	74.00	-22.35	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2855.000	50.01	1.62	51.63	74.00	-22.37	peak	V
N/A							
2750.000	50.49	1.34	51.83	74.00	-22.17	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2831.667	50.41	1.56	51.97	74.00	-22.03	peak	V
N/A							
2726.667	50.49	1.28	51.77	74.00	-22.23	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5260 ~ 5320MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2843.333	50.00	1.59	51.59	74.00	-22.41	peak	V
N/A							
2831.667	50.33	1.56	51.89	74.00	-22.11	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2680.000	50.62	1.16	51.78	74.00	-22.22	peak	V
N/A							
2878.333	50.03	1.69	51.72	74.00	-22.28	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5270 ~ 5310MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2645.000	50.89	1.07	51.96	74.00	-22.04	peak	V
N/A							
2750.000	50.63	1.34	51.97	74.00	-22.03	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2656.667	50.89	1.10	51.99	74.00	-22.01	peak	V
N/A							
2773.333	50.53	1.41	51.94	74.00	-22.06	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz /CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2656.667	50.46	1.10	51.56	74.00	-22.44	peak	V
N/A							
2843.333	49.99	1.59	51.58	74.00	-22.42	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2855.000	50.28	1.62	51.90	74.00	-22.10	peak	V
N/A							
2785.000	50.31	1.44	51.75	74.00	-22.25	peak	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2866.667	50.15	1.66	51.81	74.00	-22.19	peak	V
11000.000	42.20	14.79	56.99	74.00	-17.01	peak	V
11000.000	34.58	14.79	49.37	54.00	-4.63	AVG	V
N/A							
2715.000	50.73	1.25	51.98	74.00	-22.02	peak	H
11000.000	43.01	14.79	57.80	74.00	-16.20	peak	H
11000.000	35.99	14.79	50.78	54.00	-3.22	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2901.667	49.89	1.75	51.64	74.00	-22.36	peak	V
11150.000	41.88	14.81	56.69	74.00	-17.31	peak	V
11150.000	35.23	14.81	50.04	54.00	-3.96	AVG	V
N/A							
2901.667	50.23	1.75	51.98	74.00	-22.02	peak	H
11166.667	42.06	14.82	56.88	74.00	-17.12	peak	H
11166.667	35.96	14.82	50.78	54.00	-3.22	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 20 mode / 5500 ~ 5700MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2528.333	51.00	0.76	51.76	74.00	-22.24	peak	V
11400.000	41.79	14.85	56.64	74.00	-17.36	peak	V
11400.000	38.45	14.85	53.30	54.00	-0.70	AVG	V
N/A							
2866.667	50.23	1.66	51.89	74.00	-22.11	peak	H
11400.000	43.32	14.85	58.17	74.00	-15.83	peak	H
11400.000	38.88	14.85	53.73	54.00	-0.27	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / CH Low	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2843.333	50.31	1.59	51.90	74.00	-22.10	peak	V
11033.333	41.82	14.80	56.62	74.00	-17.38	peak	V
11033.333	32.56	14.80	47.36	54.00	-6.64	AVG	V
N/A							
2645.000	50.73	1.07	51.80	74.00	-22.20	peak	H
11016.667	41.53	14.79	56.32	74.00	-17.68	peak	H
11016.667	33.42	14.79	48.21	54.00	-5.79	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / CH Mid	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2866.667	49.88	1.66	51.54	74.00	-22.46	peak	V
11083.333	41.80	14.80	56.60	74.00	-17.40	peak	V
11083.333	34.09	14.80	48.89	54.00	-5.11	AVG	V
N/A							
2761.667	50.26	1.38	51.64	74.00	-22.36	peak	H
11116.667	43.82	14.81	58.63	74.00	-15.37	peak	H
11116.667	36.41	14.81	51.22	54.00	-2.78	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode:	Tx / IEEE 802.11n HT 40 mode / 5510 ~ 5670MHz / CH High	**Test Date:**	September 3, 2013
Temperature:	27°C	**Tested by:**	Rex Huang
Humidity:	53% RH	**Polarity:**	Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2785.000	50.26	1.44	51.70	74.00	-22.30	peak	V
11333.333	43.11	14.84	57.95	74.00	-16.05	peak	V
11333.333	37.83	14.84	52.67	54.00	-1.33	AVG	V
N/A							
2808.333	50.42	1.50	51.92	74.00	-22.08	peak	H
11333.333	44.77	14.84	59.61	74.00	-14.39	peak	H
11333.333	38.37	14.84	53.21	54.00	-0.79	AVG	H
N/A							

Remark:

1. *Measuring frequencies from 1 GHz to the 40 GHz of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

** Decreases with the logarithm of the frequency.*

TEST CONFIGURATION

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

TEST PROCEDURE

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

TEST RESULTS

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

Test Data

Operation Mode:	Normal Link	**Test Date:**	September 13, 2013
Temperature:	27.2°C	**Tested by:**	Robin Yang
Humidity:	53% RH		

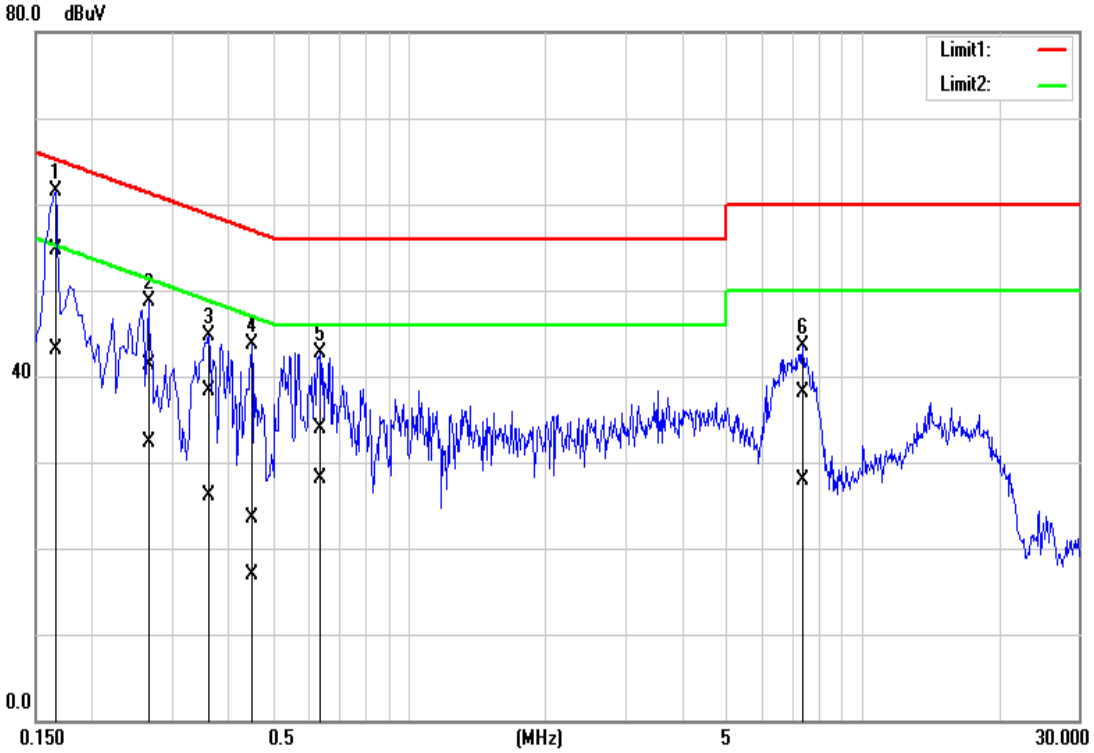
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1662	45.13	33.58	9.61	54.74	43.19	65.15	55.15	-10.41	-11.96	L1
0.2651	31.75	22.74	9.62	41.37	32.36	61.27	51.27	-19.90	-18.91	L1
0.3583	28.63	16.58	9.62	38.25	26.20	58.77	48.77	-20.52	-22.57	L1
0.4468	13.94	7.38	9.62	23.56	17.00	56.93	46.93	-33.37	-29.93	L1
0.6386	24.26	18.47	9.63	33.89	28.10	56.00	46.00	-22.11	-17.90	L1
7.4015	28.30	18.19	9.80	38.10	27.99	60.00	50.00	-21.90	-22.01	L1
0.1538	34.00	21.49	9.66	43.66	31.15	65.79	55.79	-22.13	-24.64	L2
0.2010	32.20	22.34	9.67	41.87	32.01	63.57	53.57	-21.70	-21.56	L2
0.4659	30.94	26.63	9.67	40.61	36.30	56.59	46.59	-15.98	-10.29	L2
1.2829	28.43	16.61	9.71	38.14	26.32	56.00	46.00	-17.86	-19.68	L2
2.0583	29.84	17.73	9.73	39.57	27.46	56.00	46.00	-16.43	-18.54	L2
6.8779	24.02	16.18	9.85	33.87	26.03	60.00	50.00	-26.13	-23.97	L2

Remark:

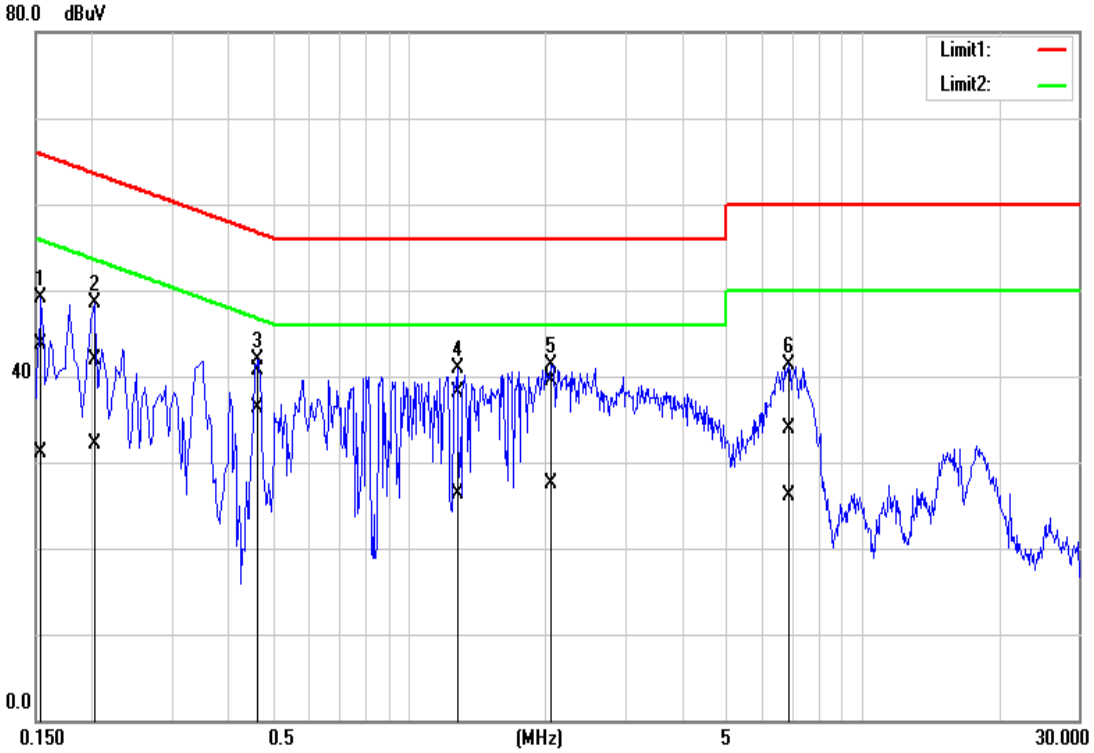
1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
4. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

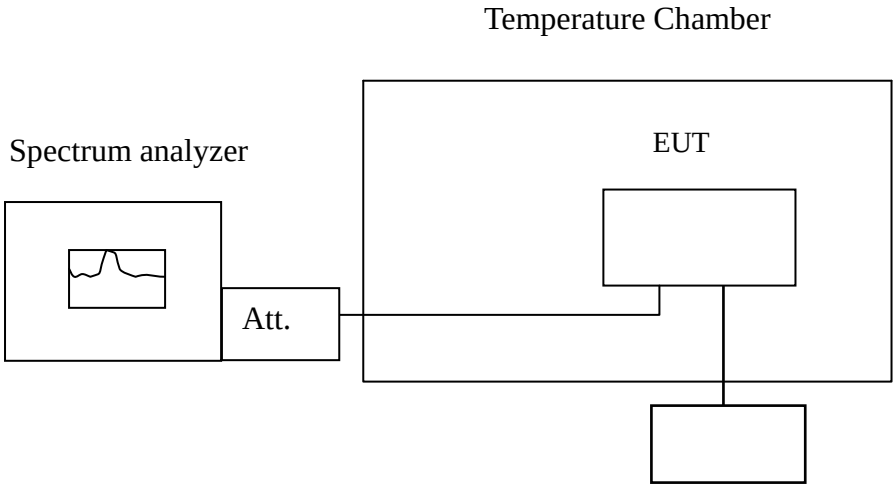


7.8 FREQUENCY STABILITY

LIMIT

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

Test Configuration



Remark: *Measurement setup for testing on Antenna connector*

TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted.

IEEE 802.11a mode / 5180 ~ 5240 MHz:

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5179.989523	5150~5250	Pass
40	120	5179.988312	5150~5250	Pass
30	120	5179.998286	5150~5250	Pass
20	120	5180.007437	5150~5250	Pass
10	120	5179.991483	5150~5250	Pass
0	120	5179.985953	5150~5250	Pass
-10	120	5179.974197	5150~5250	Pass
-20	120	5179.990587	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5180.00355	5150~5250	Pass
	120	5180.004409	5150~5250	Pass
	132	5179.998988	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5239.989419	5150~5250	Pass
40	120	5240.020681	5150~5250	Pass
30	120	5240.003290	5150~5250	Pass
20	120	5239.970001	5150~5250	Pass
10	120	5239.998110	5150~5250	Pass
0	120	5240.018288	5150~5250	Pass
-10	120	5240.002642	5150~5250	Pass
-20	120	5239.977821	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	108	5240.017469	5150~5250	Pass
	120	5239.996448	5150~5250	Pass
	132	5239.988832	5150~5250	Pass

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

CH Low

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5179.997416	5150~5250	Pass
40	120	5179.979583	5150~5250	Pass
30	120	5179.979588	5150~5250	Pass
20	120	5179.998196	5150~5250	Pass
10	120	5180.003426	5150~5250	Pass
0	120	5179.982241	5150~5250	Pass
-10	120	5179.986851	5150~5250	Pass
-20	120	5179.990860	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5179.970218	5150~5250	Pass
	120	5180.014203	5150~5250	Pass
	132	5180.017003	5150~5250	Pass

CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5240.007436	5150~5250	Pass
40	120	5239.974199	5150~5250	Pass
30	120	5239.994157	5150~5250	Pass
20	120	5240.015372	5150~5250	Pass
10	120	5239.998311	5150~5250	Pass
0	120	5240.014170	5150~5250	Pass
-10	120	5239.985436	5150~5250	Pass
-20	120	5239.999026	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5239.985865	5150~5250	Pass
	120	5240.00024	5150~5250	Pass
	132	5239.976755	5150~5250	Pass

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

CH Low

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5189.990312	5150~5250	Pass
40	120	5190.009795	5150~5250	Pass
30	120	5189.990737	5150~5250	Pass
20	120	5190.010902	5150~5250	Pass
10	120	5189.996789	5150~5250	Pass
0	120	5189.995233	5150~5250	Pass
-10	120	5189.998835	5150~5250	Pass
-20	120	5190.001506	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5189.990312	5150~5250	Pass
	120	5190.009795	5150~5250	Pass
	132	5189.990737	5150~5250	Pass

CH High

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5230.005807	5150~5250	Pass
40	120	5230.001463	5150~5250	Pass
30	120	5230.005369	5150~5250	Pass
20	120	5230.008129	5150~5250	Pass
10	120	5230.002974	5150~5250	Pass
0	120	5229.990174	5150~5250	Pass
-10	120	5229.990312	5150~5250	Pass
-20	120	5230.009795	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5230.000007	5150~5250	Pass
	120	5230.002992	5150~5250	Pass
	132	5229.991235	5150~5250	Pass

IEEE 802.11a mode / 5260 ~ 5320 MHz:

CH Low

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5260.000790	5250~5350	Pass
40	120	5259.981939	5250~5350	Pass
30	120	5260.004912	5250~5350	Pass
20	120	5260.013449	5250~5350	Pass
10	120	5260.009856	5250~5350	Pass
0	120	5259.978192	5250~5350	Pass
-10	120	5259.971300	5250~5350	Pass
-20	120	5260.015207	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5260.008806	5250~5350	Pass
	120	5259.987984	5250~5350	Pass
	132	5260.001798	5250~5350	Pass

CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5320.015003	5250~5350	Pass
40	120	5320.010180	5250~5350	Pass
30	120	5319.983557	5250~5350	Pass
20	120	5320.009327	5250~5350	Pass
10	120	5319.995049	5250~5350	Pass
0	120	5319.988055	5250~5350	Pass
-10	120	5319.982589	5250~5350	Pass
-20	120	5319.997877	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	108	5319.979245	5250~5350	Pass
	120	5319.983498	5250~5350	Pass
	132	5320.016241	5250~5350	Pass

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

CH Low

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5260.006767	5250~5350	Pass
40	120	5259.988357	5250~5350	Pass
30	120	5259.991982	5250~5350	Pass
20	120	5259.995440	5250~5350	Pass
10	120	5260.014623	5250~5350	Pass
0	120	5259.983867	5250~5350	Pass
-10	120	5259.994107	5250~5350	Pass
-20	120	5259.981503	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5260.0097	5250~5350	Pass
	120	5259.993322	5250~5350	Pass
	132	5259.978913	5250~5350	Pass

CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5320.008093	5250~5350	Pass
40	120	5319.974507	5250~5350	Pass
30	120	5320.010987	5250~5350	Pass
20	120	5320.008051	5250~5350	Pass
10	120	5319.999249	5250~5350	Pass
0	120	5320.014166	5250~5350	Pass
-10	120	5319.974986	5250~5350	Pass
-20	120	5319.999356	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	108	5319.970161	5250~5350	Pass
	120	5319.984009	5250~5350	Pass
	132	5319.987334	5250~5350	Pass

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

CH Low

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5270.007264	5250~5350	Pass
40	120	5270.004666	5250~5350	Pass
30	120	5270.000277	5250~5350	Pass
20	120	5269.996376	5250~5350	Pass
10	120	5270.006274	5250~5350	Pass
0	120	5270.002083	5250~5350	Pass
-10	120	5269.999703	5250~5350	Pass
-20	120	5269.993783	5250~5350	Pass

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5270.003714	5250~5350	Pass
	120	5270.000123	5250~5350	Pass
	132	5269.995363	5250~5350	Pass

CH High

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5310.001779	5250~5350	Pass
40	120	5310.010430	5250~5350	Pass
30	120	5309.999448	5250~5350	Pass
20	120	5310.006643	5250~5350	Pass
10	120	5309.990581	5250~5350	Pass
0	120	5310.010131	5250~5350	Pass
-10	120	5310.007507	5250~5350	Pass
-20	120	5309.994057	5250~5350	Pass

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	108	5310.003851	5250~5350	Pass
	120	5309.994346	5250~5350	Pass
	132	5309.992727	5250~5350	Pass

IEEE 802.11a mode / 5500 ~ 5700 MHz:

CH Low

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5499.981556	5250~5350	Pass
40	120	5499.980743	5250~5350	Pass
30	120	5500.018759	5250~5350	Pass
20	120	5500.006819	5250~5350	Pass
10	120	5499.971269	5250~5350	Pass
0	120	5500.002637	5250~5350	Pass
-10	120	5500.020558	5250~5350	Pass
-20	120	5499.994926	5250~5350	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5499.976246	5250~5350	Pass
	120	5500.002323	5250~5350	Pass
	132	5499.974829	5250~5350	Pass

CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
50	120	5699.990575	5250~5350	Pass
40	120	5700.017006	5250~5350	Pass
30	120	5700.008576	5250~5350	Pass
20	120	5699.972451	5250~5350	Pass
10	120	5700.012964	5250~5350	Pass
0	120	5699.994966	5250~5350	Pass
-10	120	5700.013206	5250~5350	Pass
-20	120	5700.017128	5250~5350	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	**Voltage (V)**	**Measured Frequency (MHz)**	**Limit Range**	**Test Result**
20	108	5700.005735	5250~5350	Pass
	120	5699.992222	5250~5350	Pass
	132	5699.98767	5250~5350	Pass

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

CH Low

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5499.984976	5250~5350	Pass
40	120	5499.971681	5250~5350	Pass
30	120	5500.007799	5250~5350	Pass
20	120	5499.977233	5250~5350	Pass
10	120	5500.012248	5250~5350	Pass
0	120	5499.999387	5250~5350	Pass
-10	120	5499.991675	5250~5350	Pass
-20	120	5499.984289	5250~5350	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5499.990697	5250~5350	Pass
	120	5500.009397	5250~5350	Pass
	132	5499.970732	5250~5350	Pass

CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5699.972288	5250~5350	Pass
40	120	5699.987482	5250~5350	Pass
30	120	5699.972719	5250~5350	Pass
20	120	5699.982575	5250~5350	Pass
10	120	5700.013833	5250~5350	Pass
0	120	5699.973165	5250~5350	Pass
-10	120	5700.002159	5250~5350	Pass
-20	120	5699.982367	5250~5350	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5699.972477	5250~5350	Pass
	120	5699.991943	5250~5350	Pass
	132	5700.012427	5250~5350	Pass

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

CH Low

Operating Frequency: 5510 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5510.007667	5250~5350	Pass
40	120	5509.991079	5250~5350	Pass
30	120	5510.005038	5250~5350	Pass
20	120	5510.002980	5250~5350	Pass
10	120	5509.990309	5250~5350	Pass
0	120	5509.995782	5250~5350	Pass
-10	120	5510.001216	5250~5350	Pass
-20	120	5510.000882	5250~5350	Pass

Operating Frequency: 5510 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5509.995306	5250~5350	Pass
	120	5509.991429	5250~5350	Pass
	132	5510.002996	5250~5350	Pass

CH High

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	120	5669.991585	5250~5350	Pass
40	120	5670.005599	5250~5350	Pass
30	120	5669.995621	5250~5350	Pass
20	120	5670.008340	5250~5350	Pass
10	120	5670.002315	5250~5350	Pass
0	120	5669.992798	5250~5350	Pass
-10	120	5670.009419	5250~5350	Pass
-20	120	5670.002928	5250~5350	Pass

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	108	5670.006712	5250~5350	Pass
	120	5669.991156	5250~5350	Pass
	132	5670.002874	5250~5350	Pass

7.9 DYNAMIC FREQUENCY SELECTION

LIMIT

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

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

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

Table 2: Applicability of DFS requirements during normal operation

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

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

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

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

Table 4: DFS Response requirement values

Parameter	Value
Non-occupancy period	30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds
Channel Closing Transmission Time	200 milliseconds + approx. 60 milliseconds over remaining 10 second period
U-NII Detection Bandwidth	Minimum 80% of the UNII 99% transmission power bandwidth. See Note 3.

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

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

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

Table 5 – Short Pulse Radar Test Waveforms

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

Table 6 – Long Pulse Radar Test Signal

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

Table 7 – Frequency Hopping Radar Test Signal

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

DESCRIPTION OF EUT

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

The firmware installed in the EUT during testing was:
Firmware Rev: 1016.1.413.2012

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

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

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

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

TPC is not required since the maximum EIRP is less than 500 mW (27 dBm).

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

The Master Device is a Cisco Aironet 802.11a/b/g Access Point, FCC ID: LDK102056.

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

The calibrated conducted DFS Detection Threshold level is set to -62 dBm. The tested level is lower than the required level hence it provides margin to the limit.

Manufacturer’s Statement Regarding Uniform Channel Spreading

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

TEST AND MEASUREMENT SYSTEM

System Overview

The measurement system is based on a conducted test method.

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

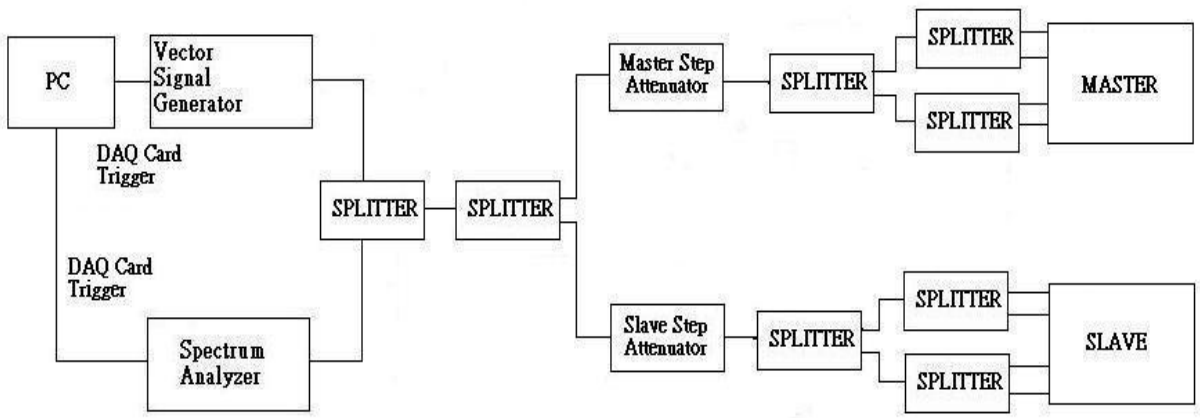
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

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

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

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

Conducted Method System Block Diagram



System Calibration

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

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

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

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

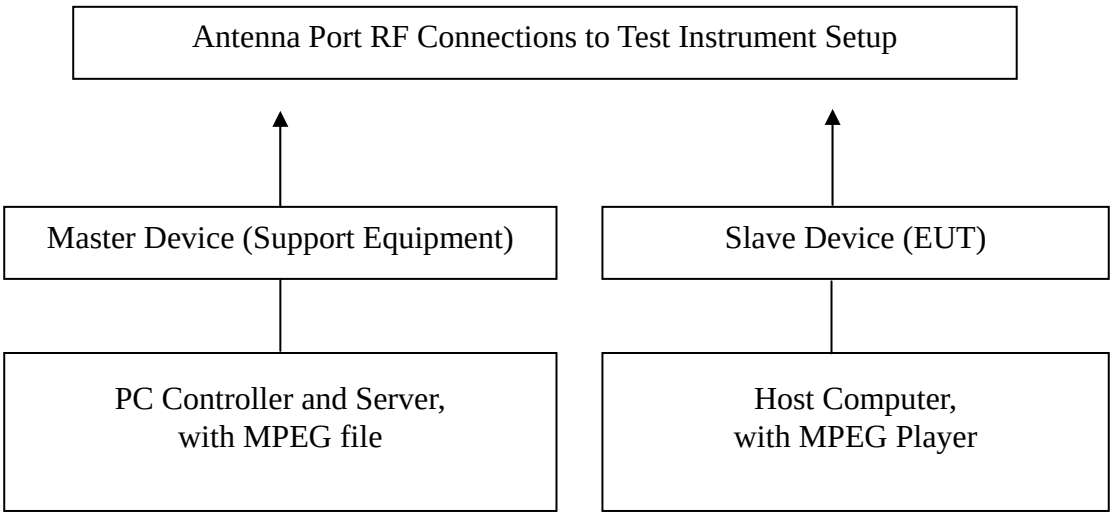
Set the signal generator to produce a radar waveform, trigger a burst manually and measure the level on the spectrum analyzer. Readjust the amplitude of the signal generator as required so that the peak level of the waveform is at a displayed level equal to the required or desired interference detection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

Adjustment Of Displayed Traffic Level

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

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

Test Setup



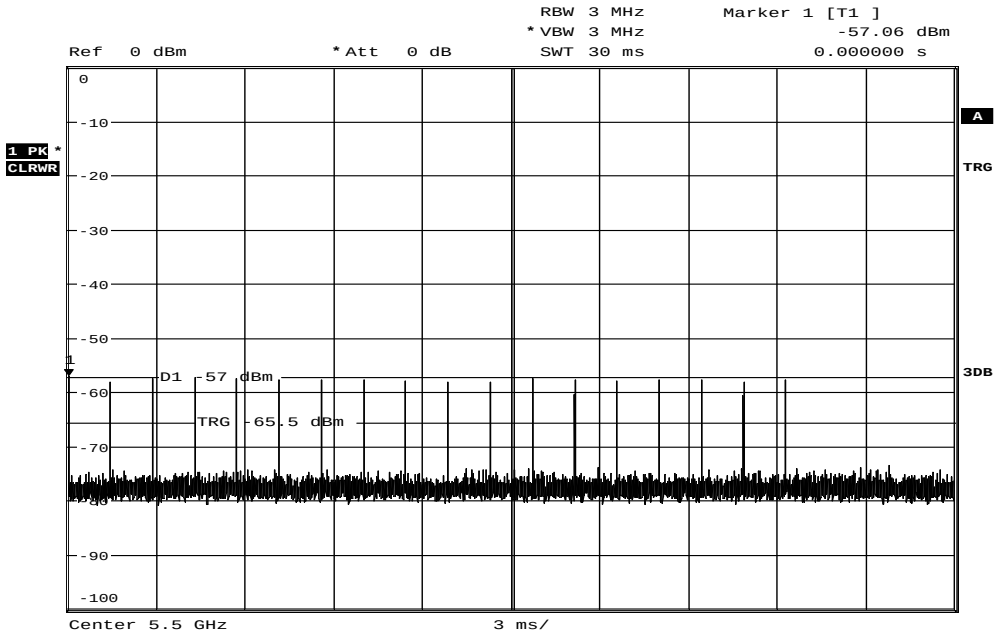
TEST RESULTS

No non-compliance noted

Test Plot

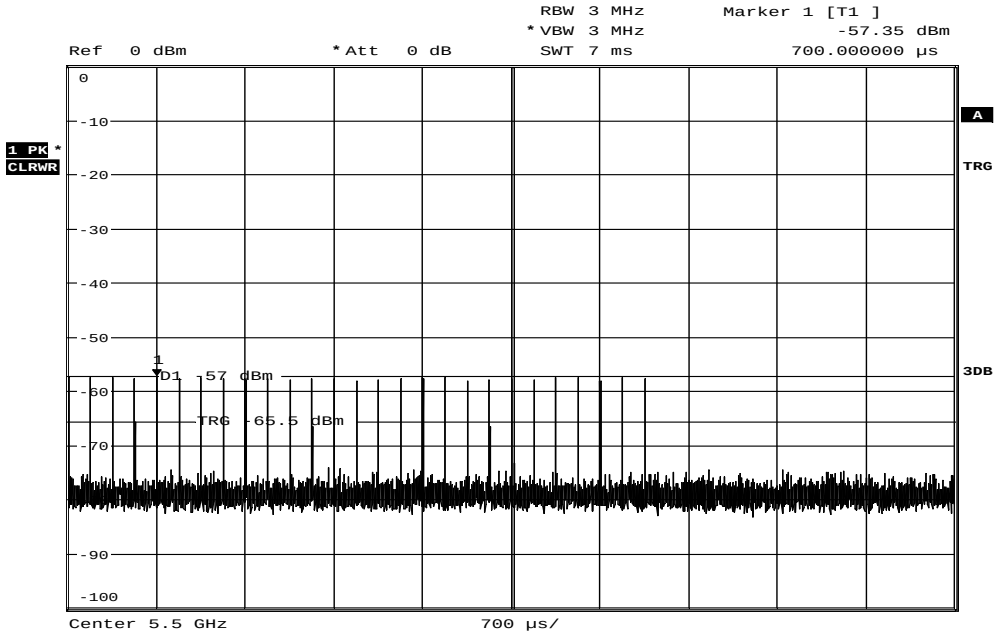
PLOTS OF RADAR WAVEFORMS

Sample of Short Pulse Radar Type 1



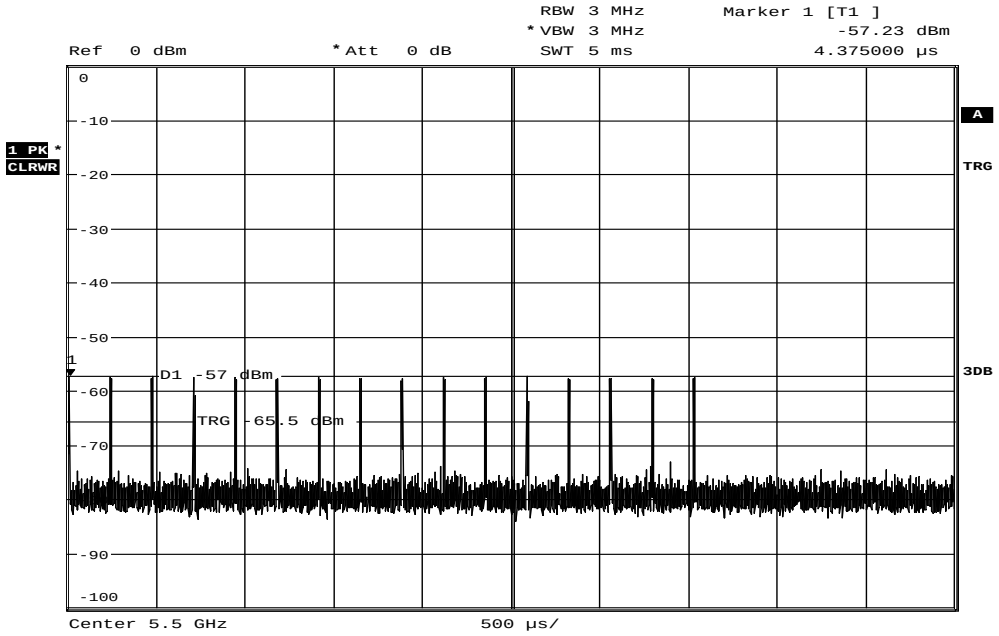
Date: 9.SEP.2013 17:13:10

Sample of Short Pulse Radar Type 2



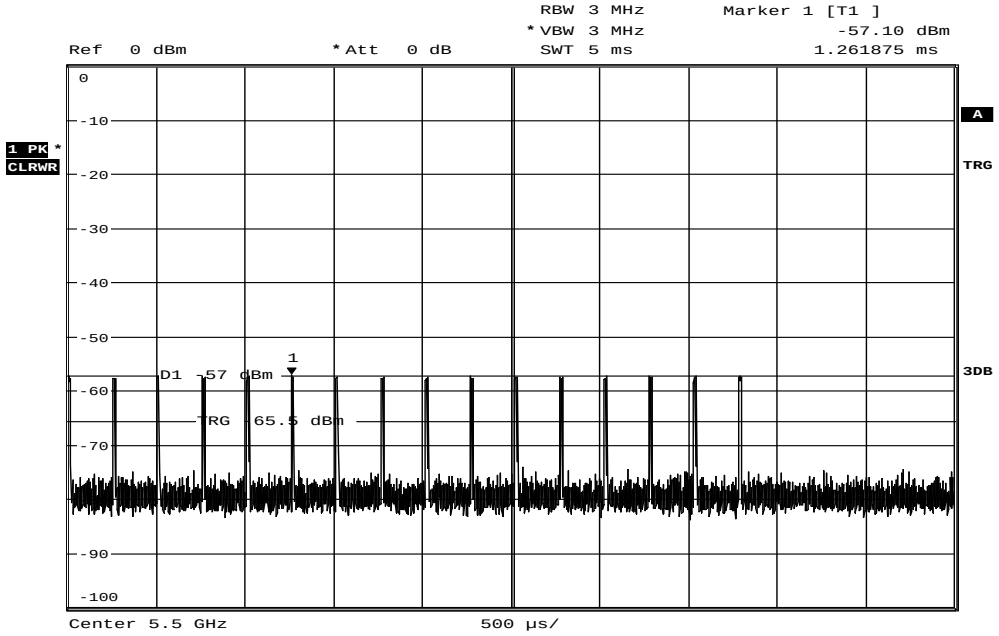
Date: 9.SEP.2013 17:13:55

Sample of Short Pulse Radar Type 3



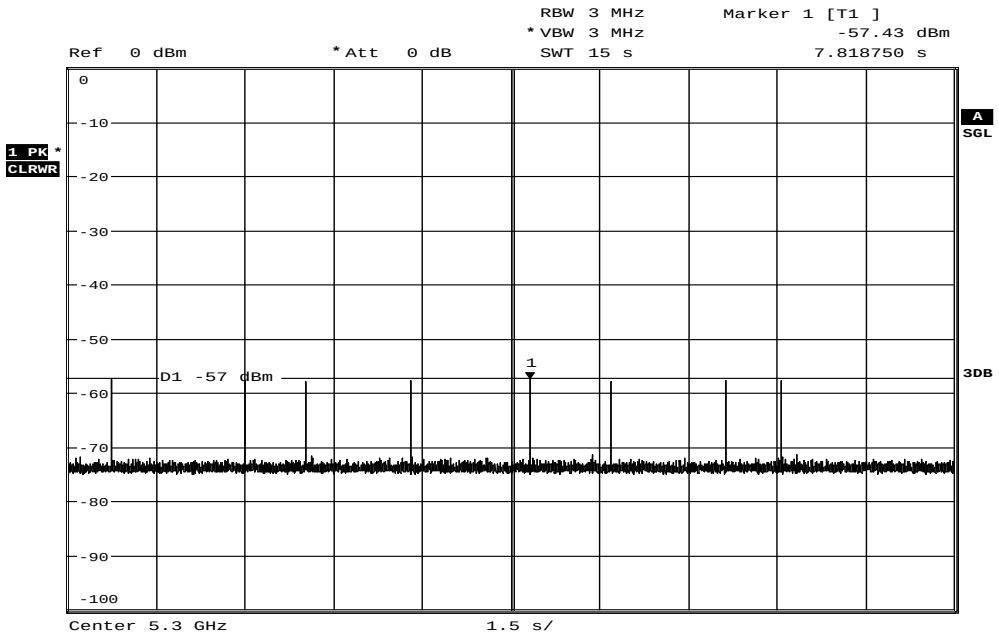
Date: 9.SEP.2013 17:14:49

Sample of Short Pulse Radar Type 4



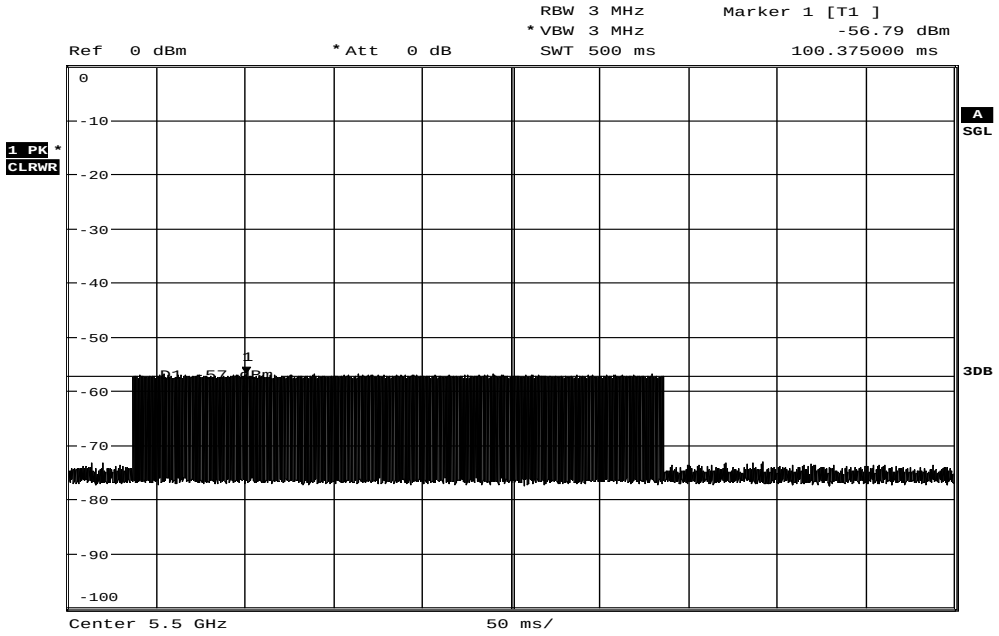
Date: 9.SEP.2013 17:15:20

Sample of Long Pulse Radar Type 5

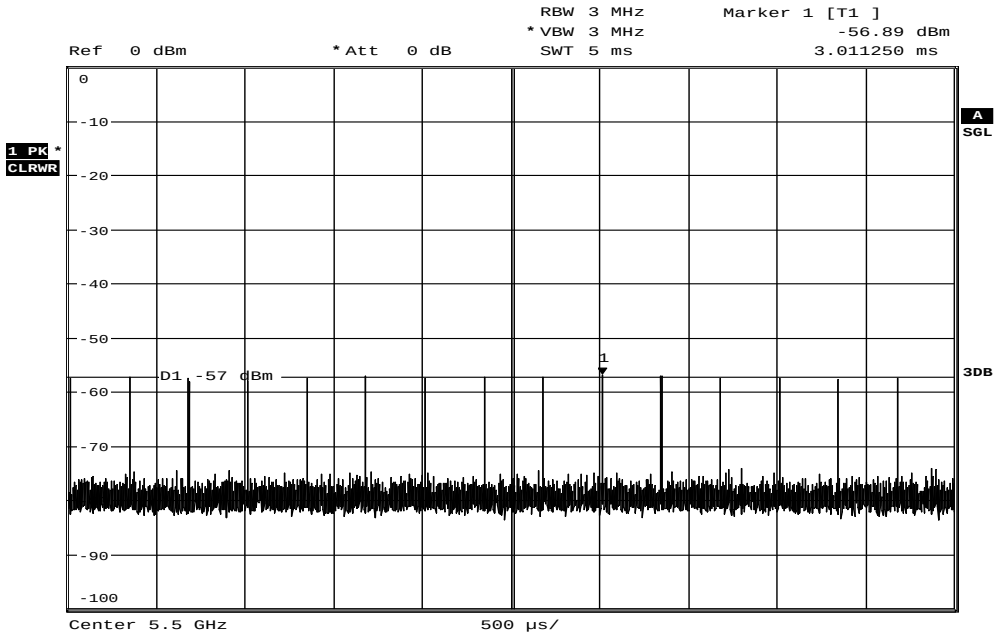


Date: 10.SEP.2013 11:02:52

Sample of Frequency Hopping Radar Type 6



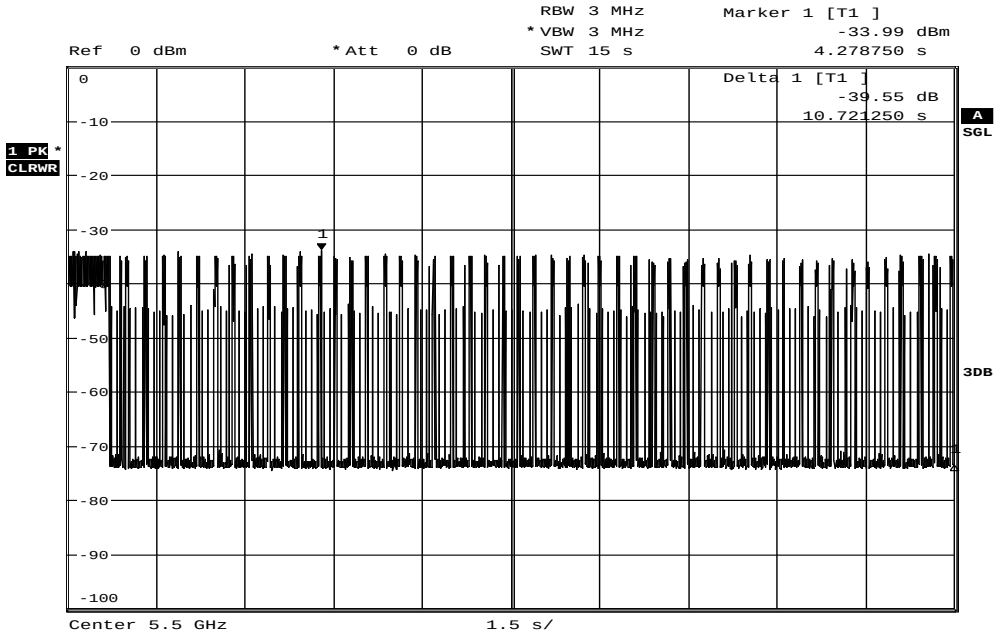
Date: 9.SEP.2013 17:21:33



Date: 9.SEP.2013 17:22:08

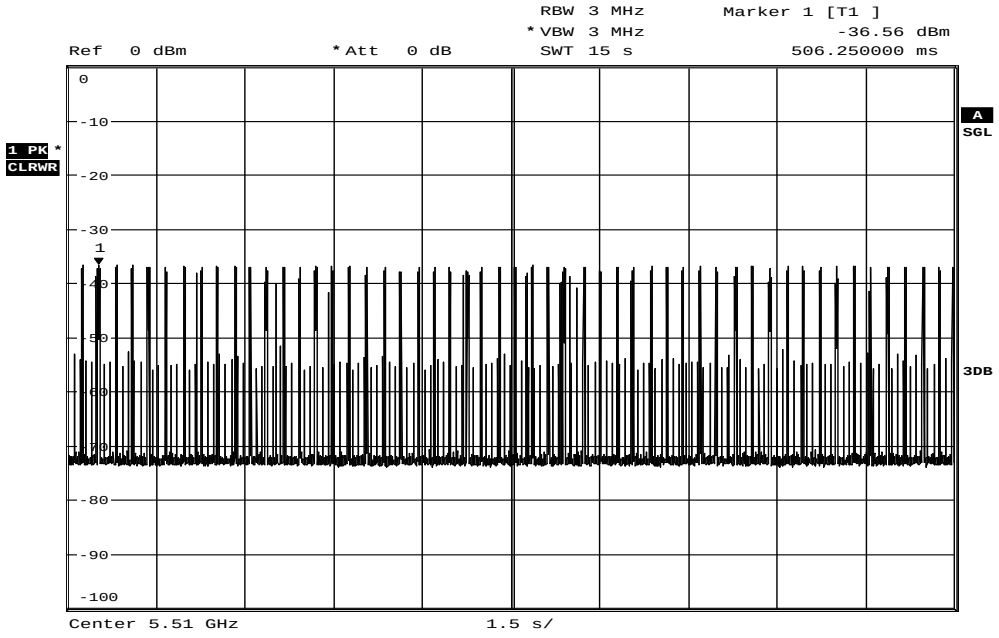
Plot of WLAN Traffic from Slave

IEEE 802.11n HT 20 MHz mode



Date: 10.SEP.2013 08:57:59

IEEE 802.11n HT 40 MHz mode



Date: 9.SEP.2013 18:22:21

TEST CHANNEL AND METHOD

All tests were performed at a channel center frequency of IEEE 802.11n HT 20 MHz: 5300MHz and 5500MHz; IEEE 802.11n HT 40 MHz: 5310MHz and 5510MHz utilizing a conducted test method.

CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

GENERAL REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

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

The observation period over which the aggregate time is calculated

Begins at (Reference Marker + 200 msec) and

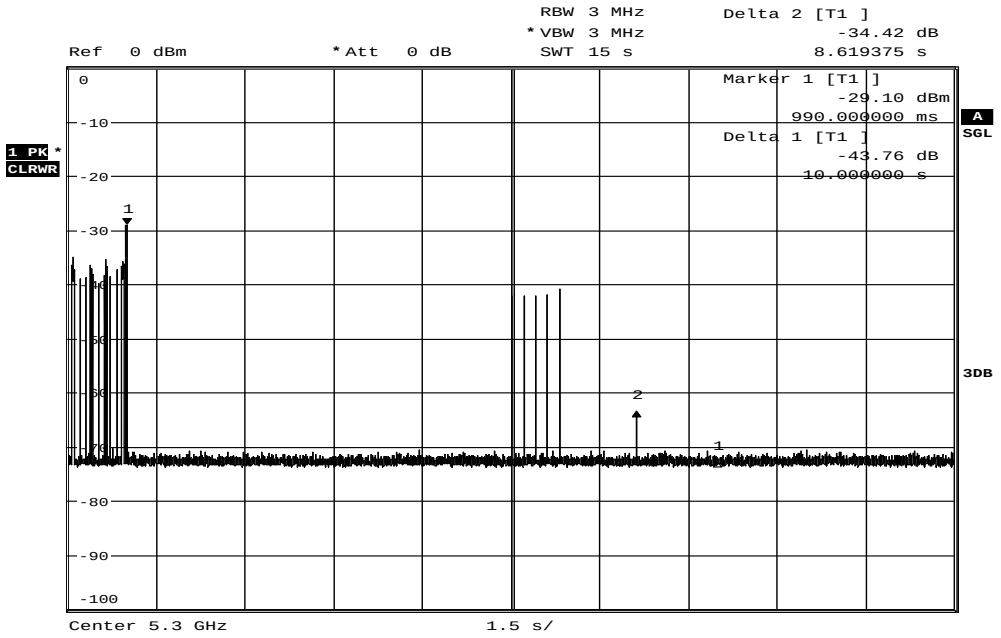
Ends no earlier than (Reference Marker + 10 sec).

IEEE 802.11n HT 20 MHz Channel mode for Band II

Type 1 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0.990	10



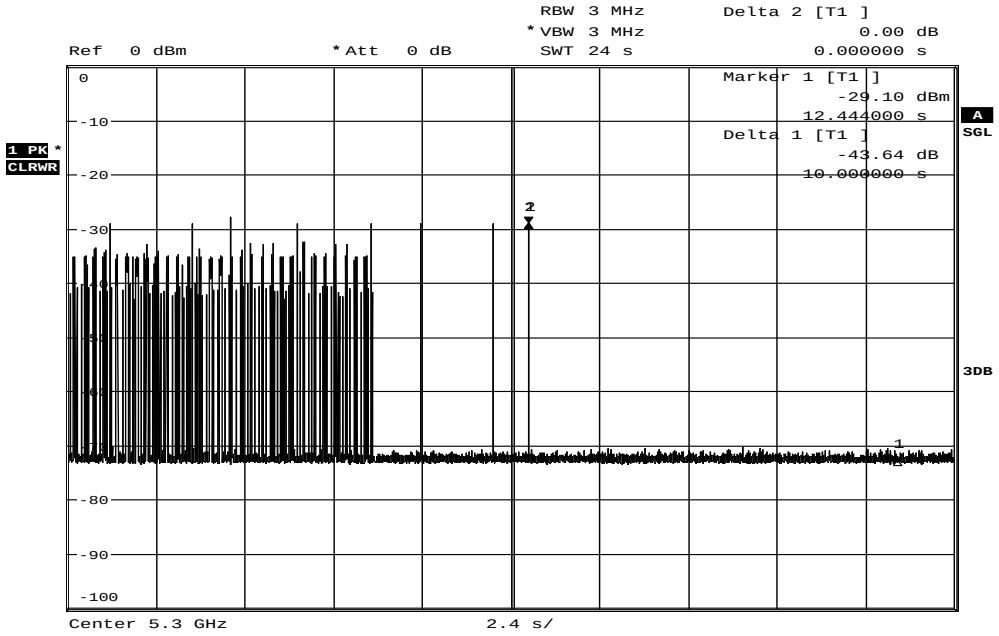
Date: 9.SEP.2013 20:15:02

IEEE 802.11n HT 20 MHz Channel mode for Band II

Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
12.444000	10



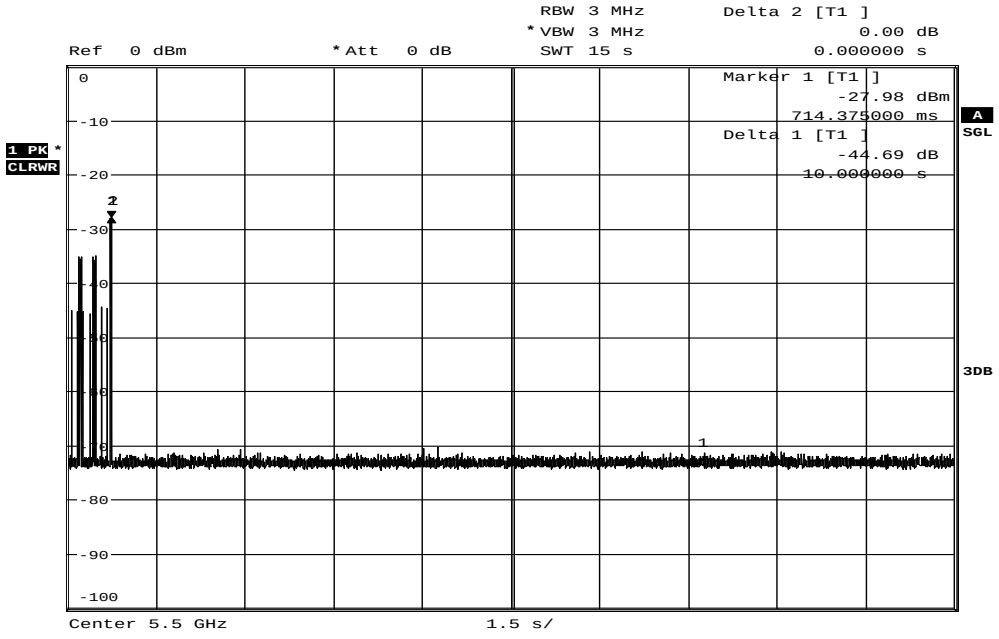
Date: 10.SEP.2013 10:44:51

IEEE 802.11n HT 20 MHz Channel mode for Band III

Type 1 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
0.71437	10



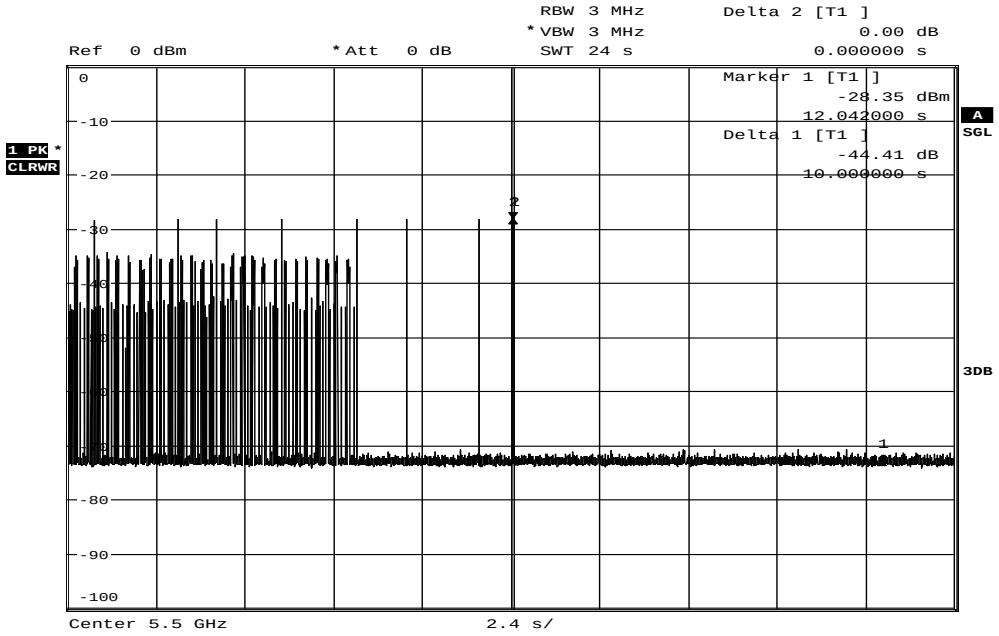
Date: 10.SEP.2013 08:59:38

IEEE 802.11n HT 20 MHz Channel mode for Band III

Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
12.04200	10



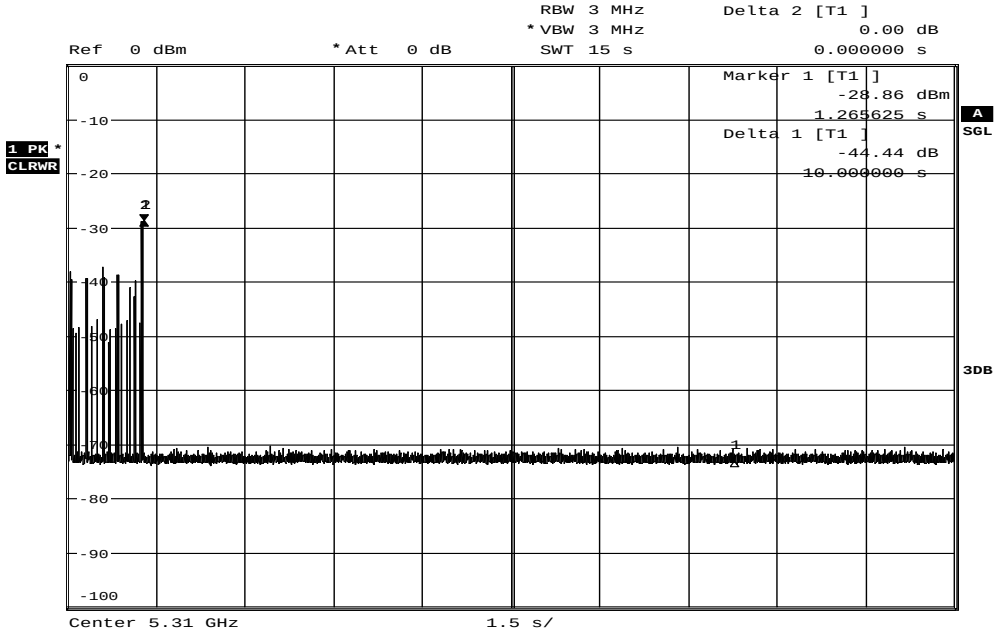
Date: 10.SEP.2013 10:38:02

IEEE 802.11n HT 40 MHz mode for Band II

Type 1 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
1.265625	10

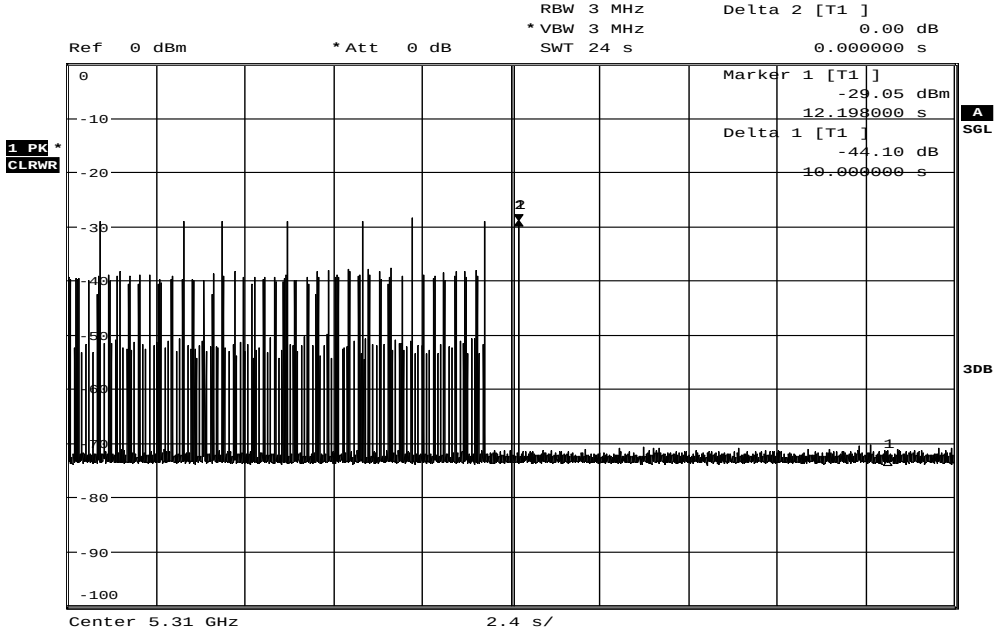


IEEE 802.11n HT 40 MHz mode for Band II

Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
12.198000	10



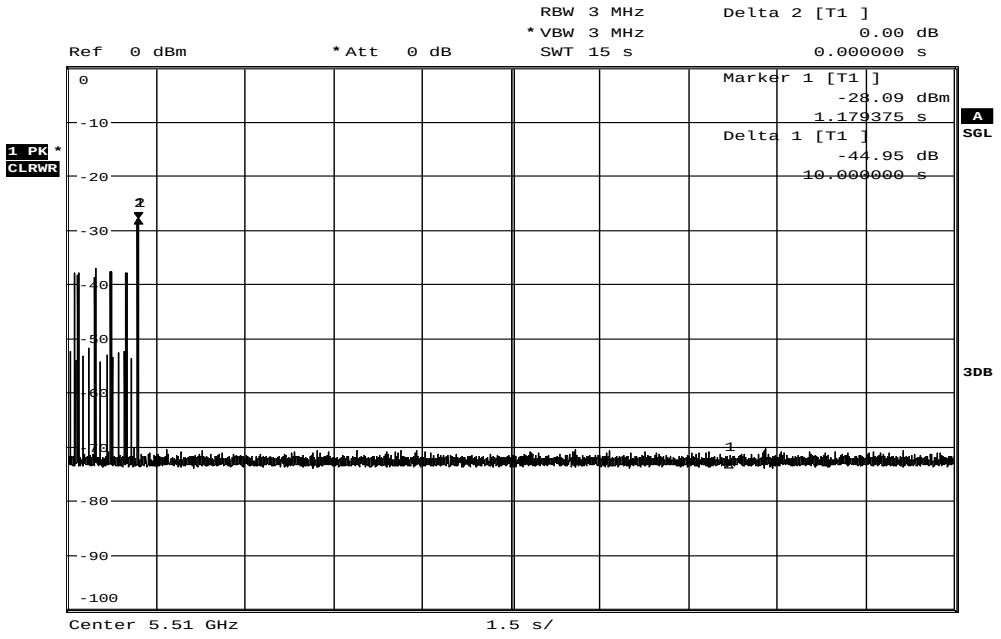
Date: 10.SEP.2013 10:30:44

IEEE 802.11n HT 40 MHz mode for Band III

Type 1 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
1.179375	10



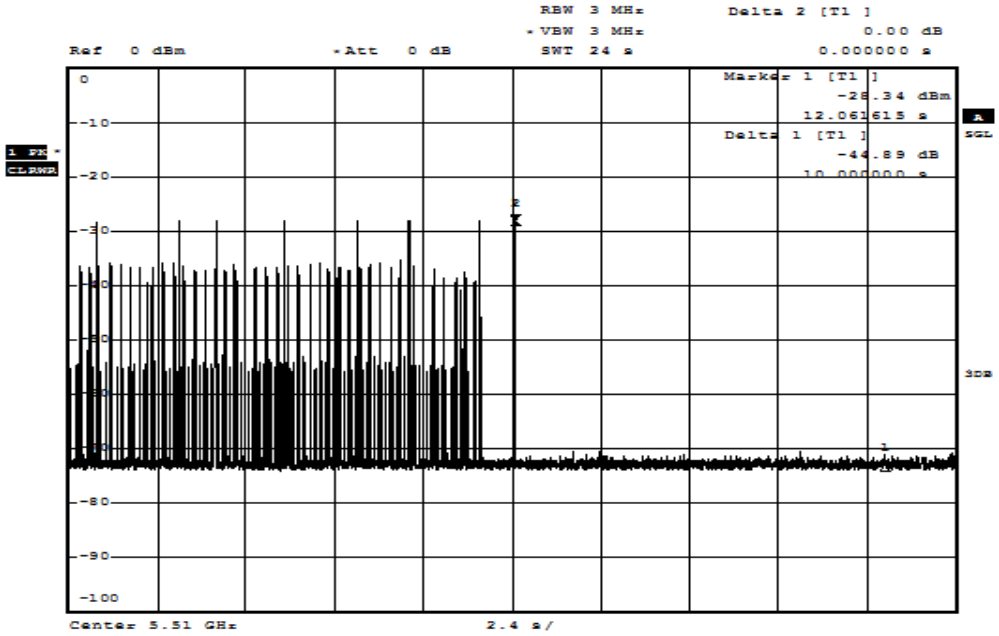
Date: 9.SEP.2013 18:17:22

IEEE 802.11n HT 40 MHz mode for Band III

Type 5 Channel Move Time Results

No non-compliance noted.

Channel Move Time (s)	Limit (s)
12.06161	10



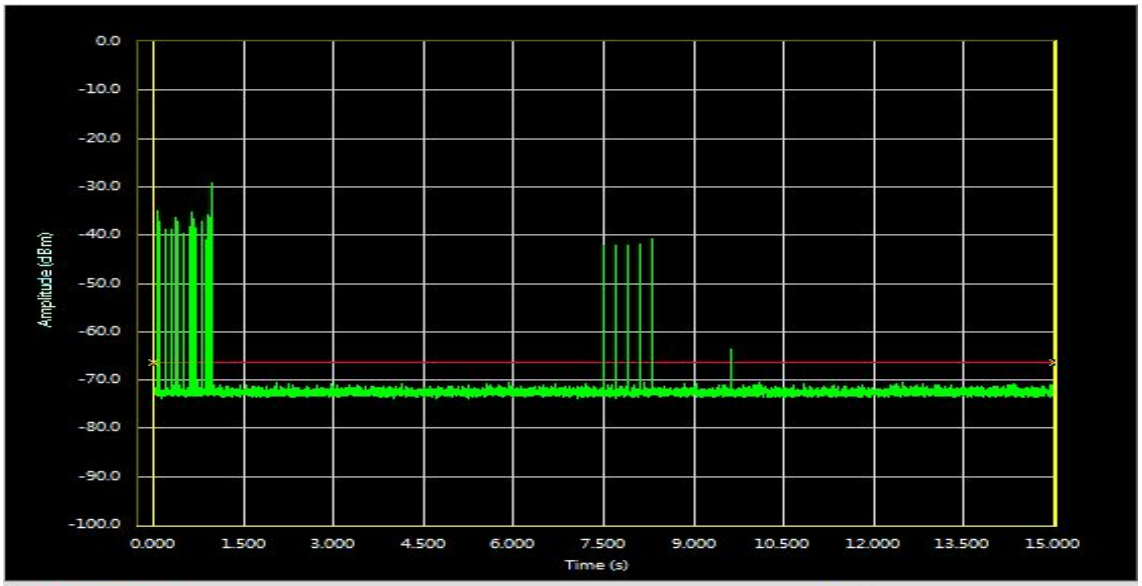
Date: 10.SEP.2013 10:23:13

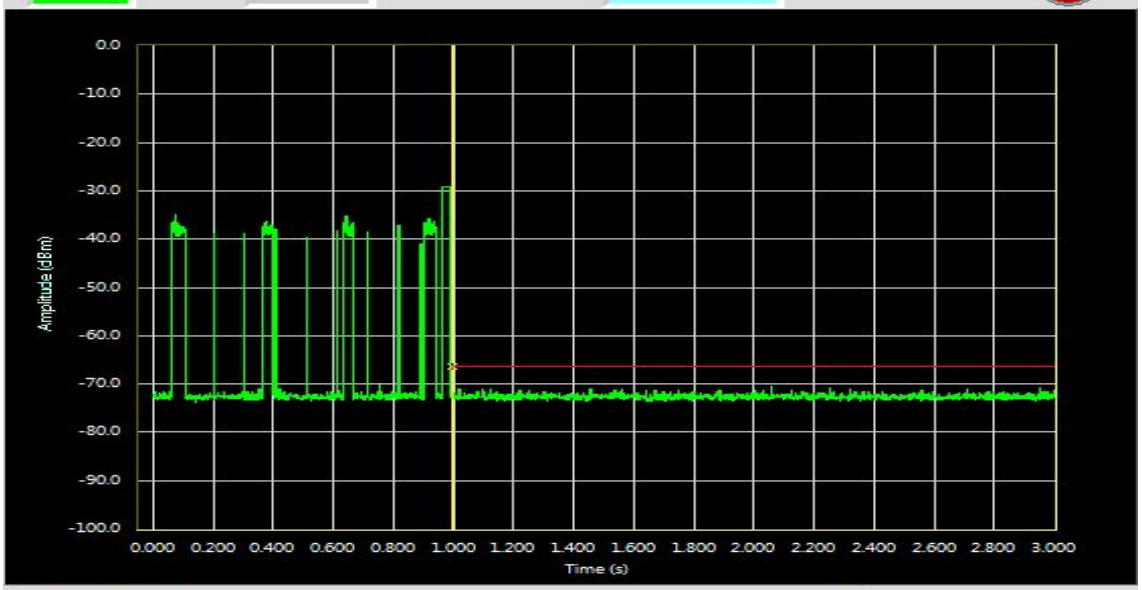
IEEE 802.11n HT 20 MHz Channel mode for Band II

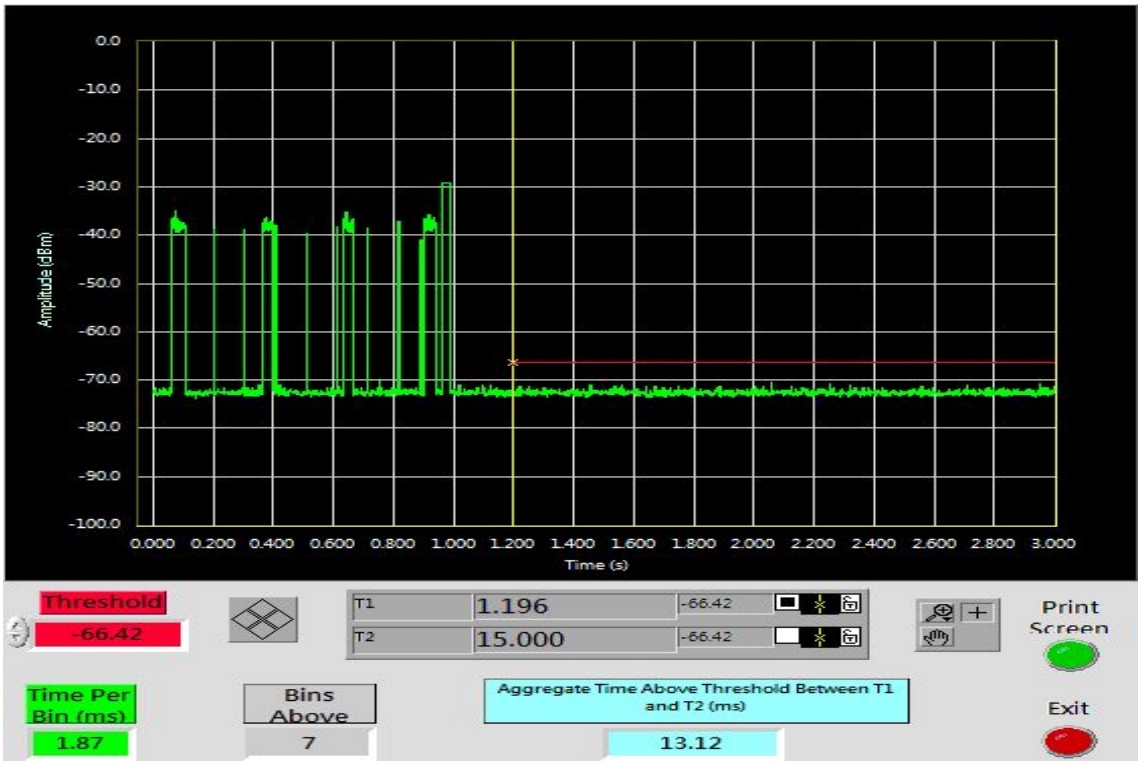
Type 1 Channel Closing Transmission Time Results

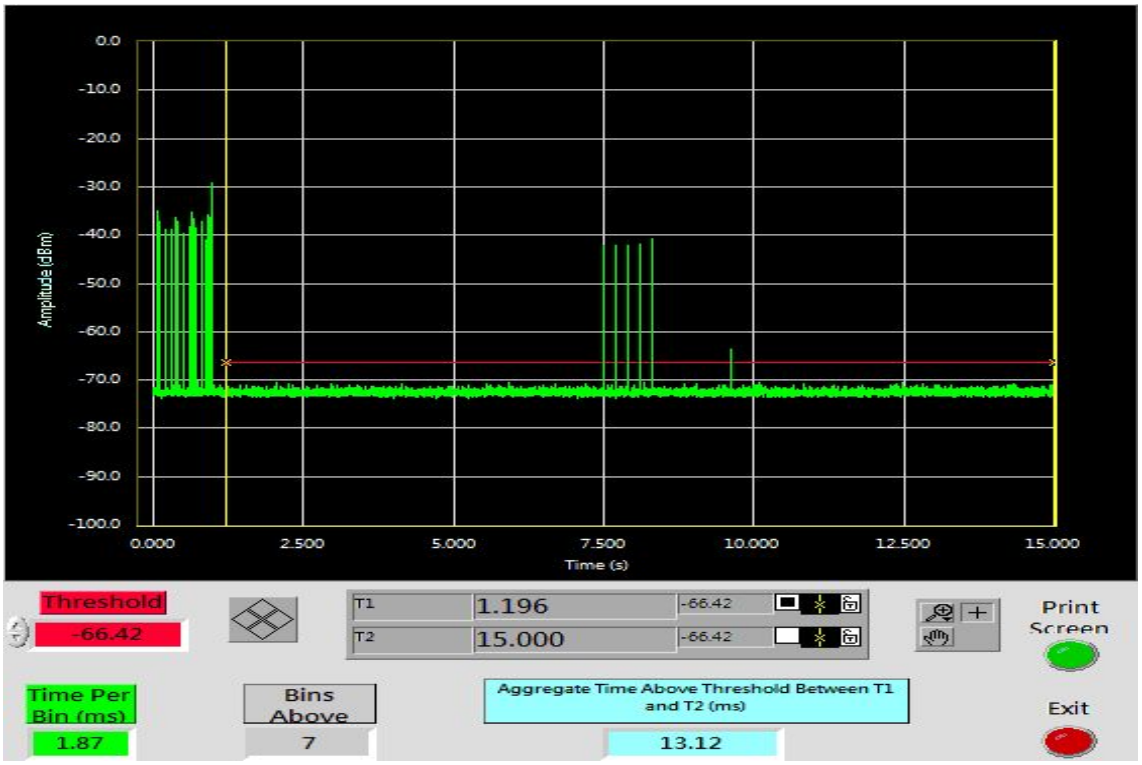
No non-compliance noted.

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
13.12	60	-46.88






0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-66.42
T1
1.196
-66.42
T2
15.000
-66.42
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
7
Aggregate Time Above Threshold Between T1 and T2 (ms)
13.12

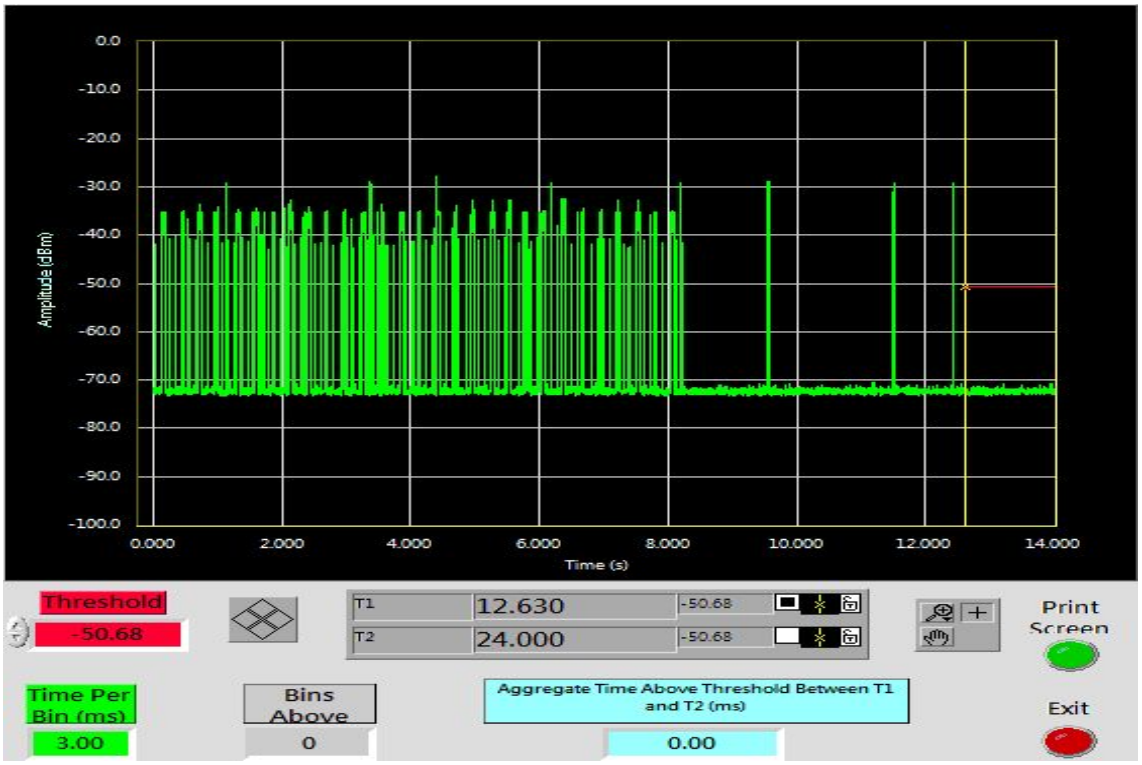

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-66.42
T1
1.196
-66.42
T2
15.000
-66.42
Print Screen
Exit
Time Per Bin (ms)
1.87
Bins Above
7
Aggregate Time Above Threshold Between T1 and T2 (ms)
13.12

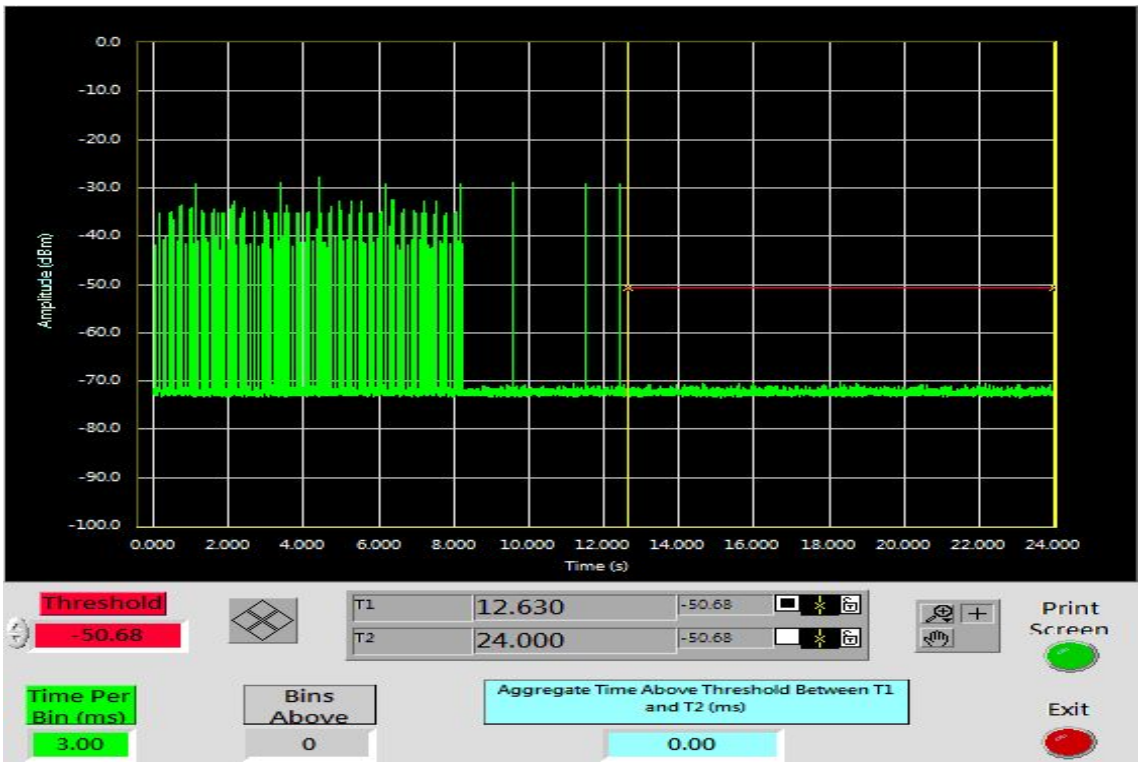
IEEE 802.11n HT 20 MHz Channel mode for Band II

Type 5 Channel Closing Transmission Time Results

No non-compliance noted.

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


0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
Time (s)
Threshold
-50.68
T1
12.630
-50.68
T2
24.000
-50.68
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

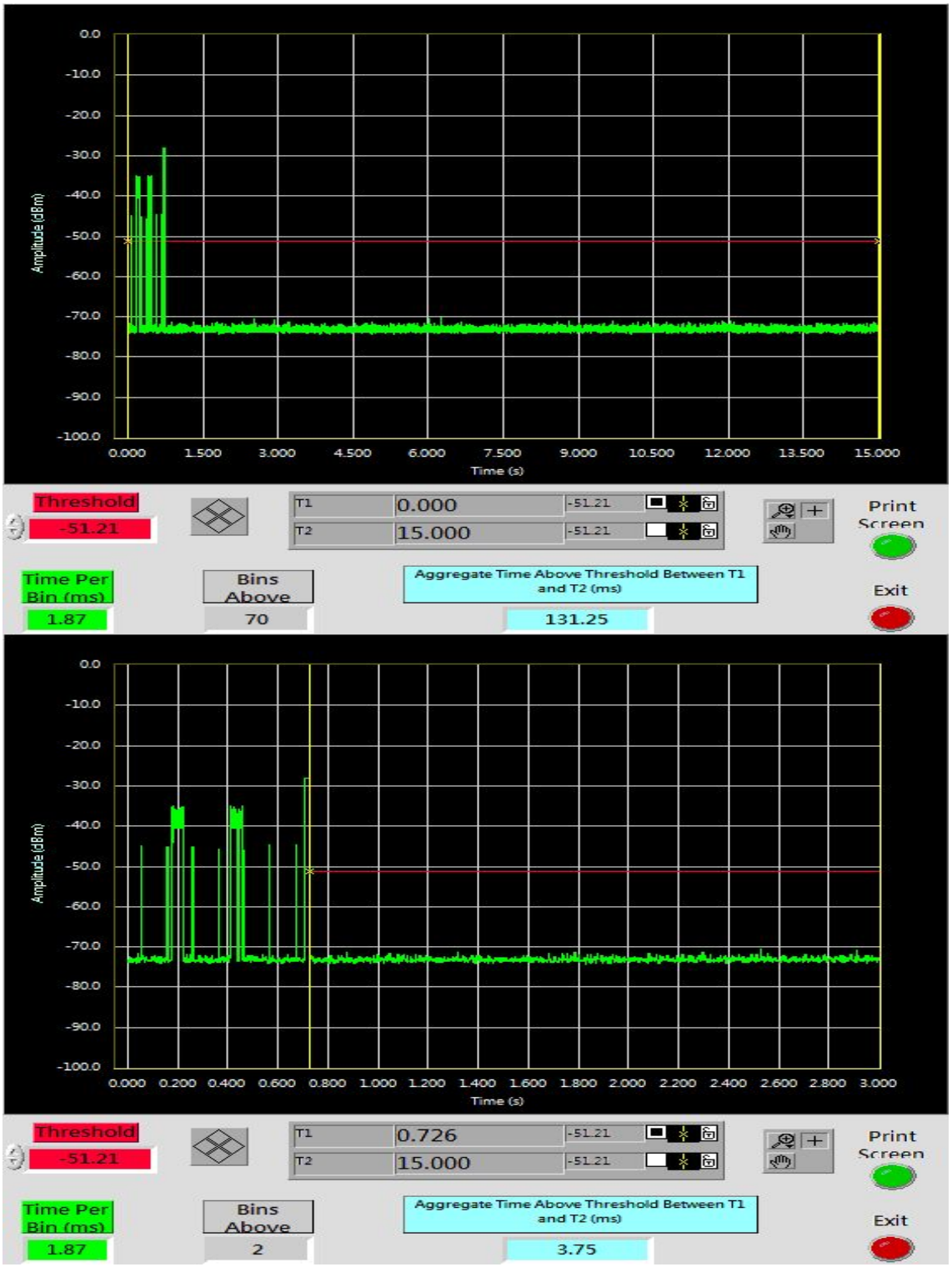

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-50.68
T1
12.630
-50.68
T2
24.000
-50.68
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

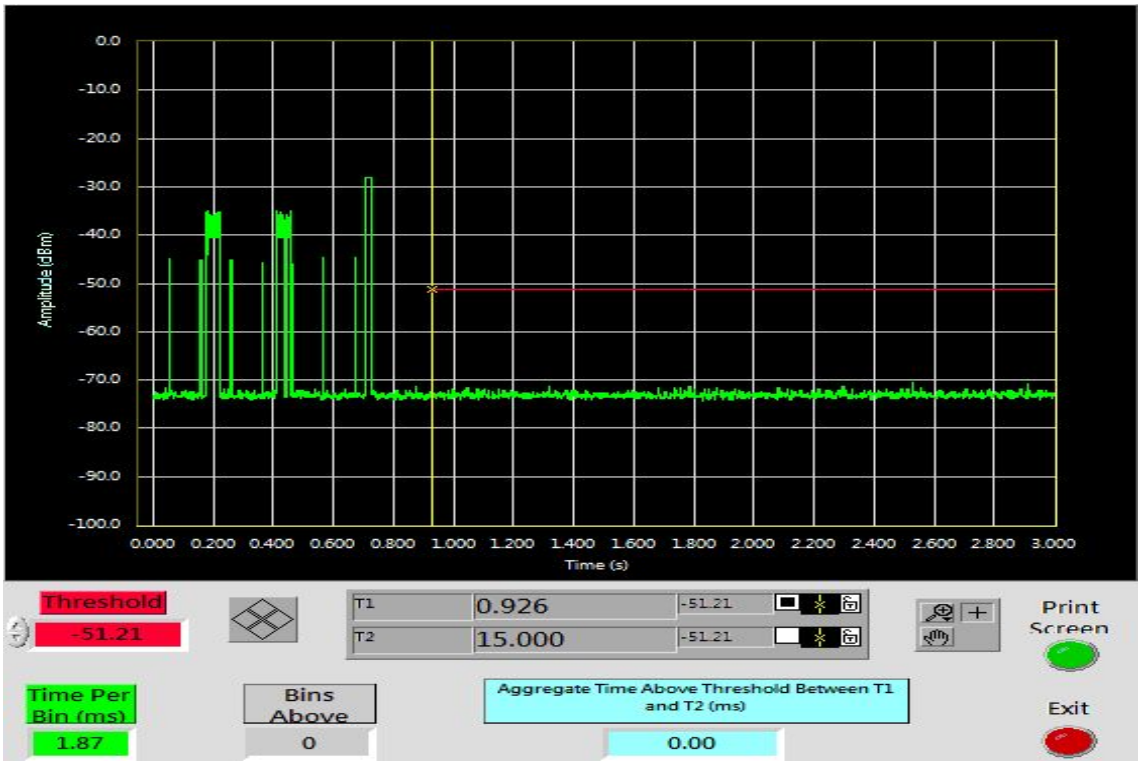
IEEE 802.11n HT 20 MHz Channel mode for Band III

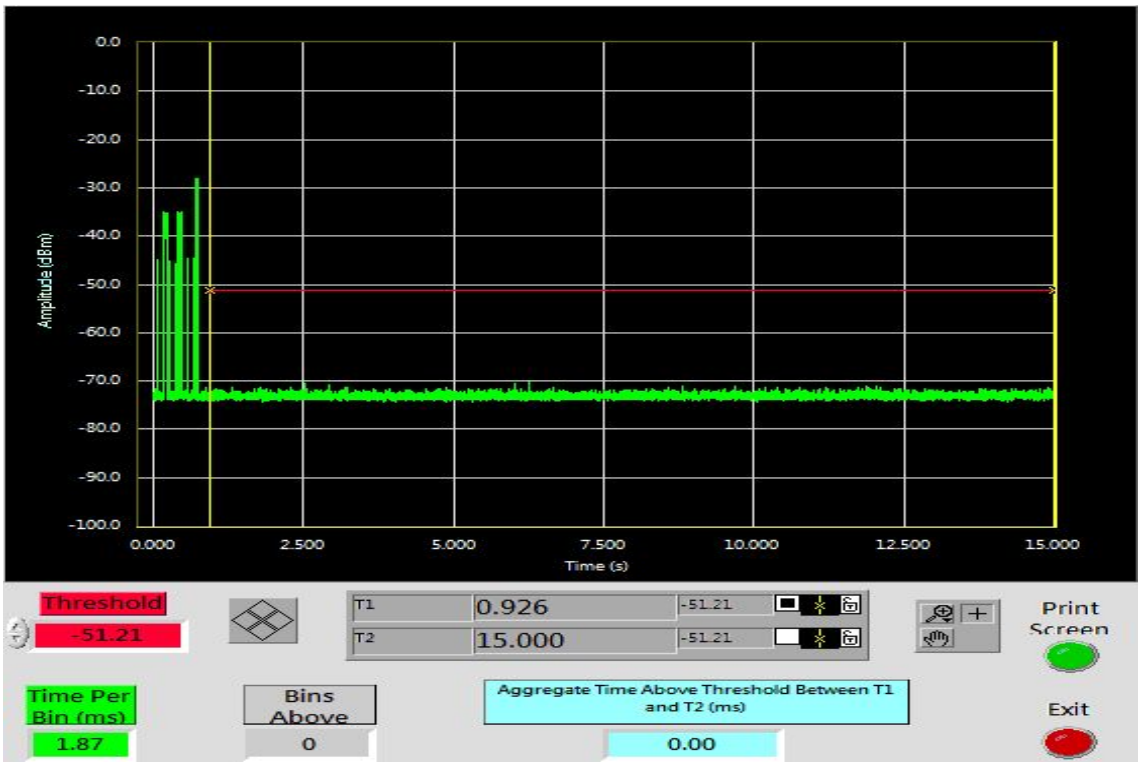
Type 1 Channel Closing Transmission Time Results

No non-compliance noted.

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




0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-51.21
T1 0.926 -51.21
T2 15.000 -51.21
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

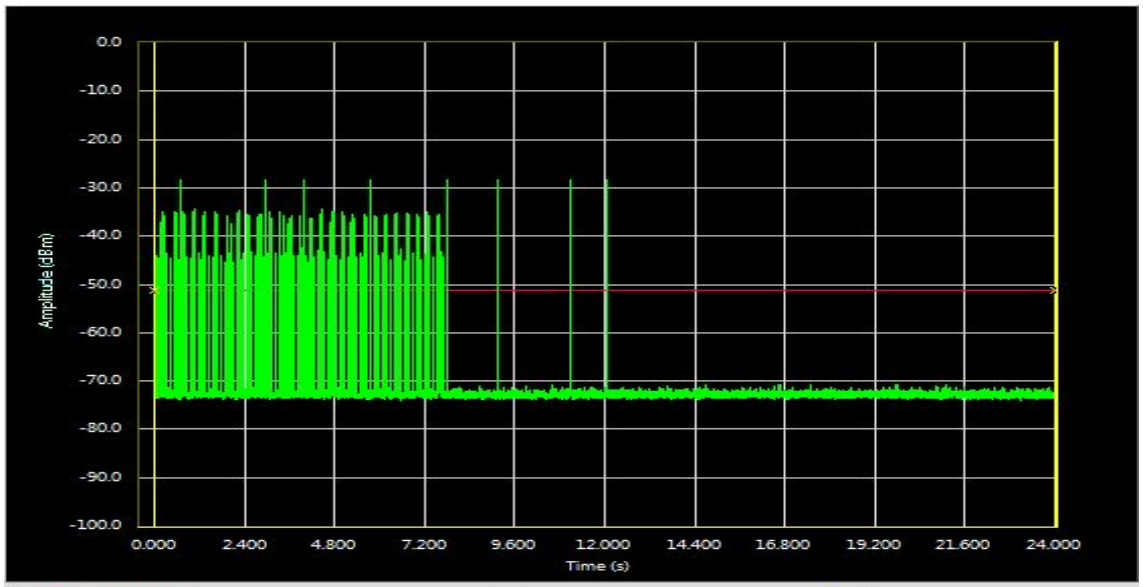

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-51.21
T1 0.926 -51.21
T2 15.000 -51.21
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

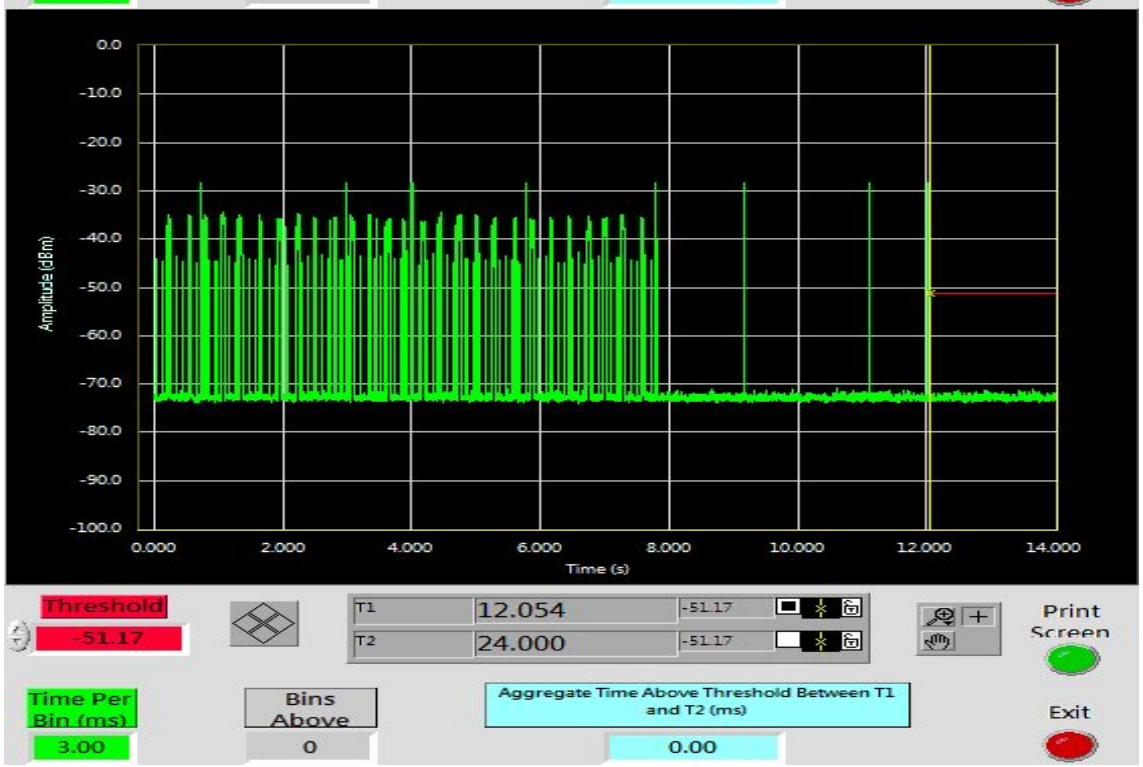
IEEE 802.11n HT 20 MHz Channel mode for Band III

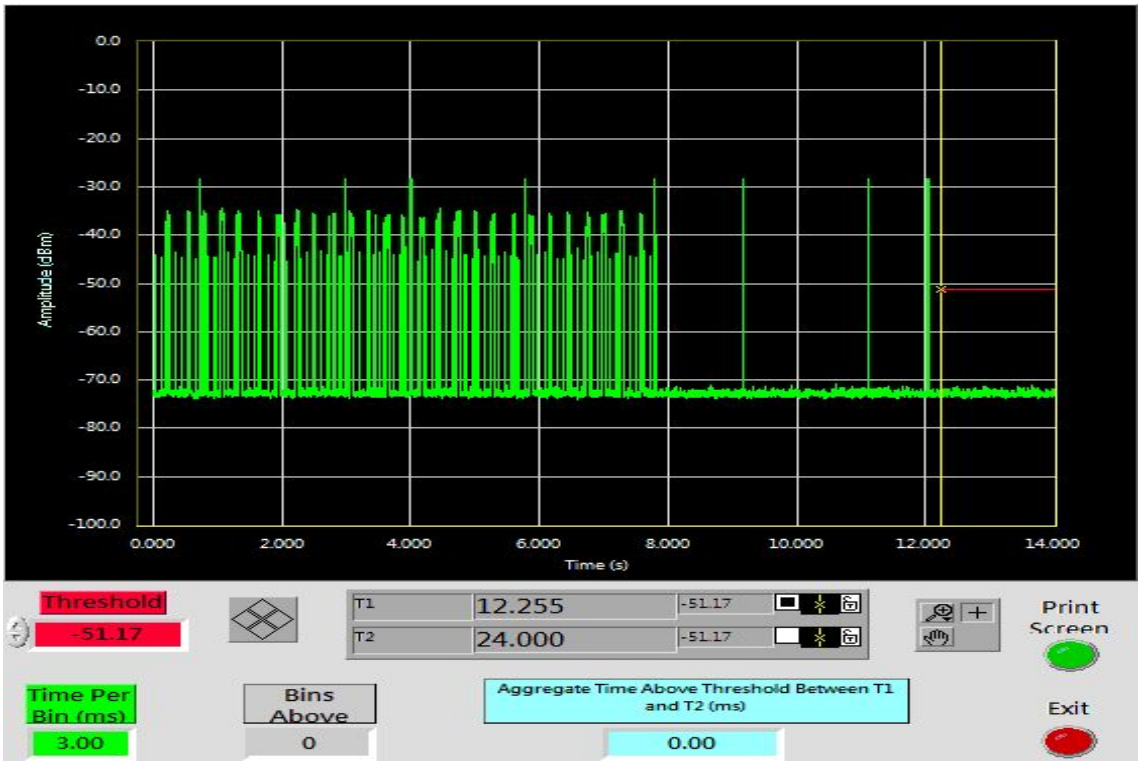
Type 5 Channel Closing Transmission Time Results

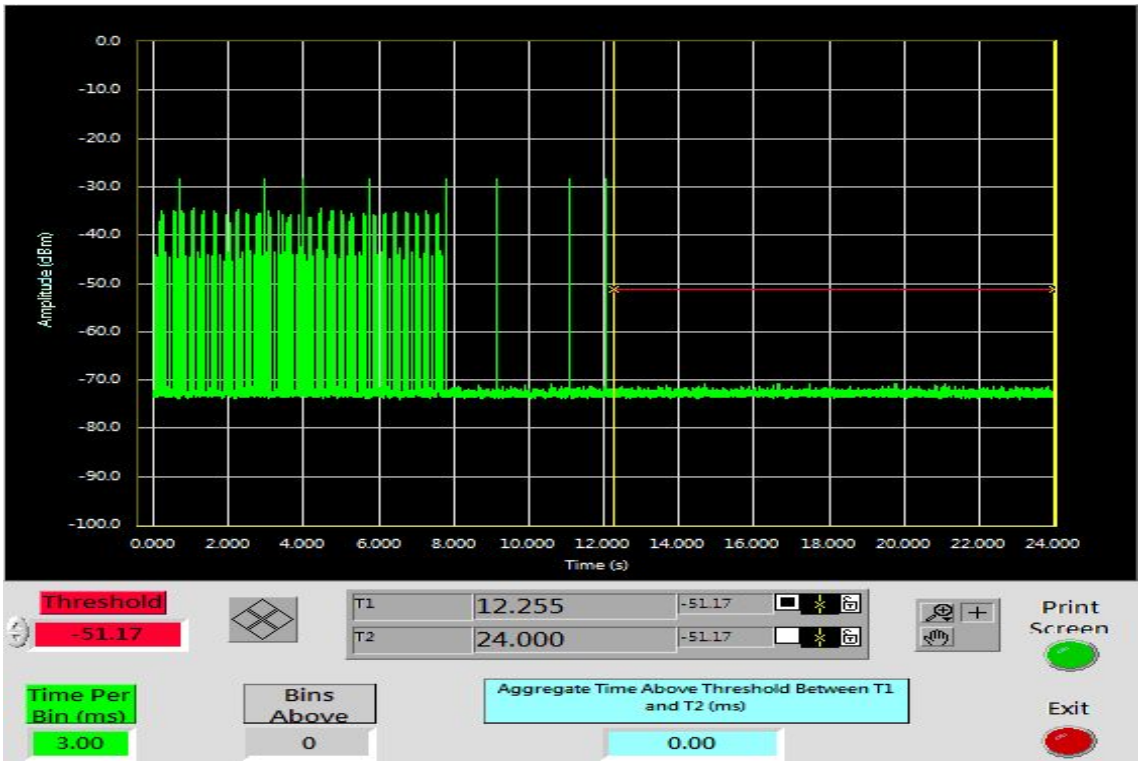
No non-compliance noted.

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






0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
Time (s)
Threshold
-51.17
T1
12.255
-51.17
T2
24.000
-51.17
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

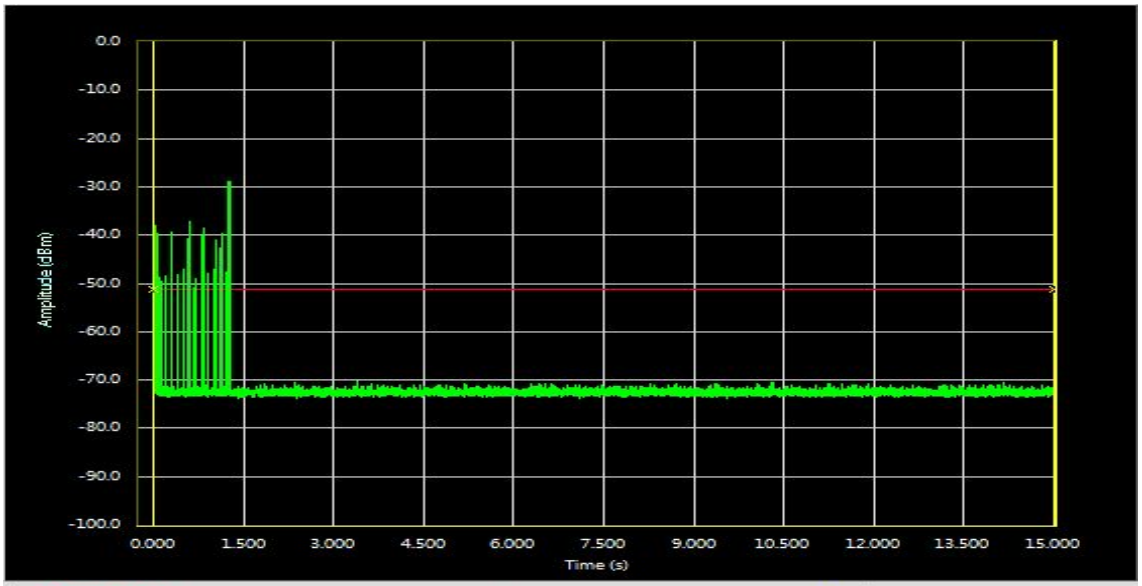

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-51.17
T1
12.255
-51.17
T2
24.000
-51.17
Print Screen
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

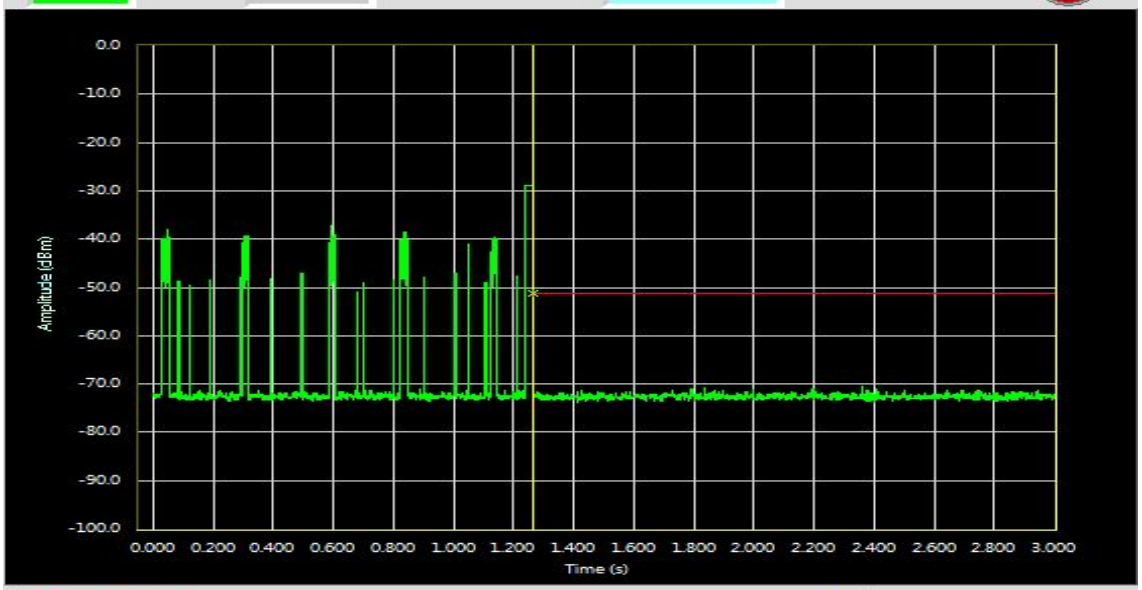
IEEE 802.11n HT 40 MHz mode for Band II

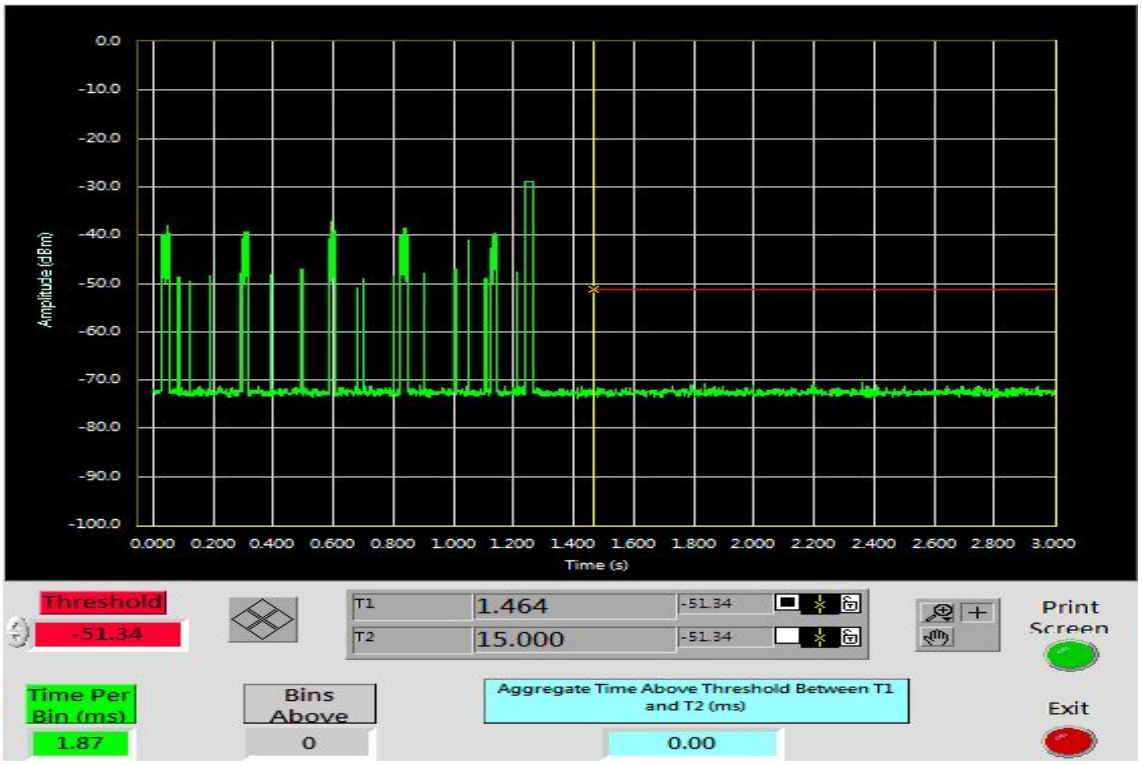
Type 1 Channel Closing Transmission Time Results

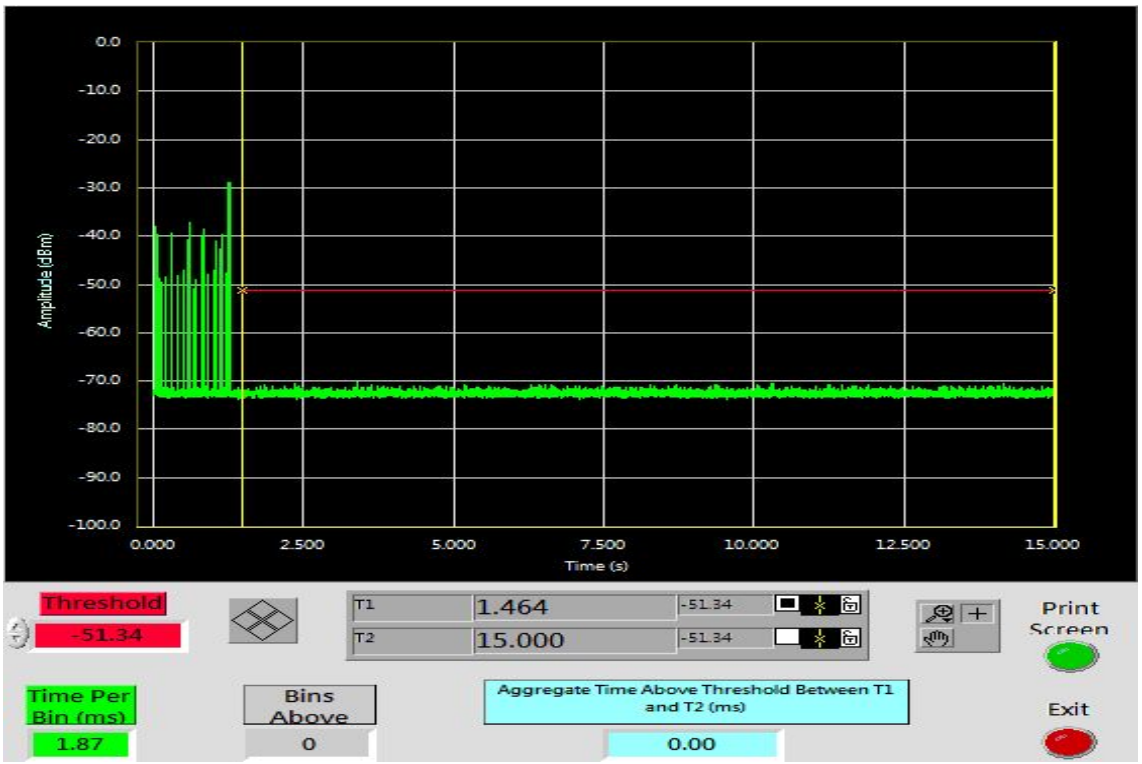
No non-compliance noted.

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






0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-51.34
T1 1.464 -51.34
T2 15.000 -51.34
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

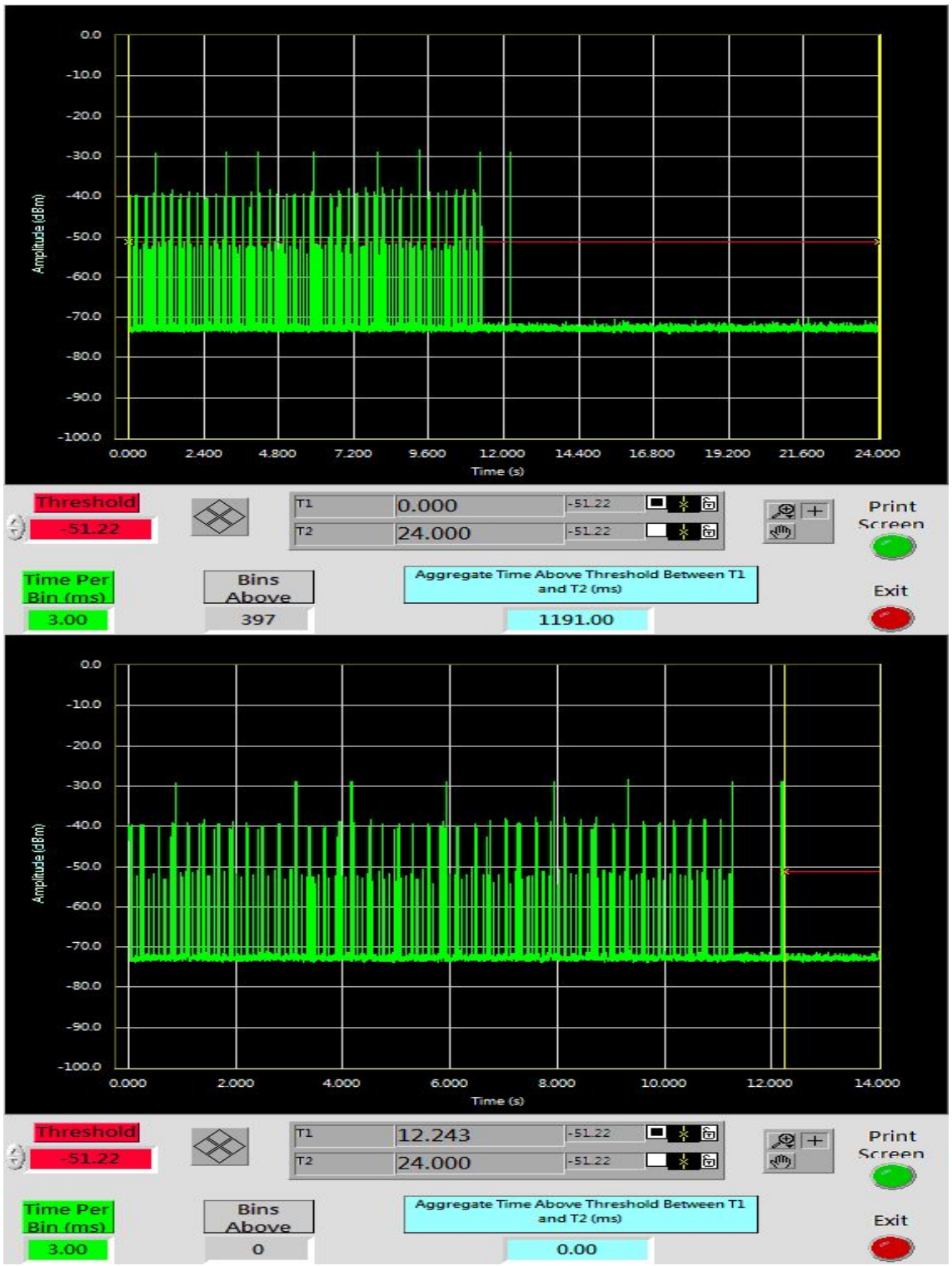

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-51.34
T1 1.464 -51.34
T2 15.000 -51.34
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

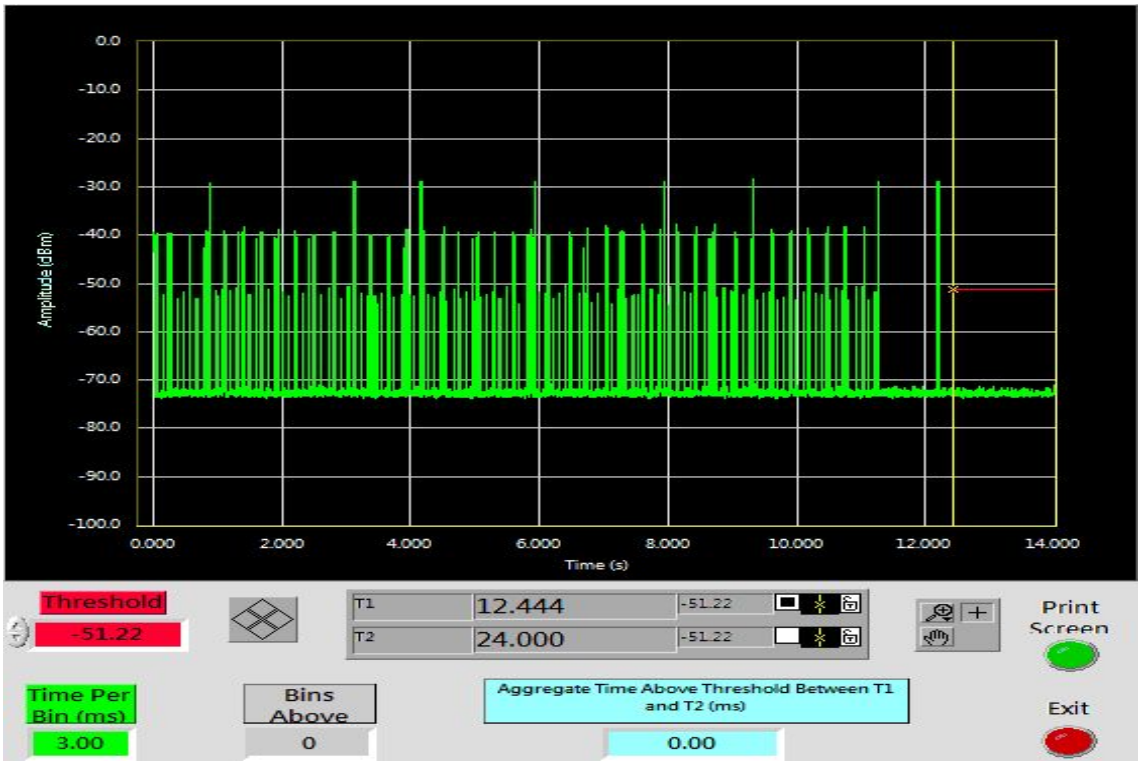
IEEE 802.11n HT 40 MHz mode for Band II

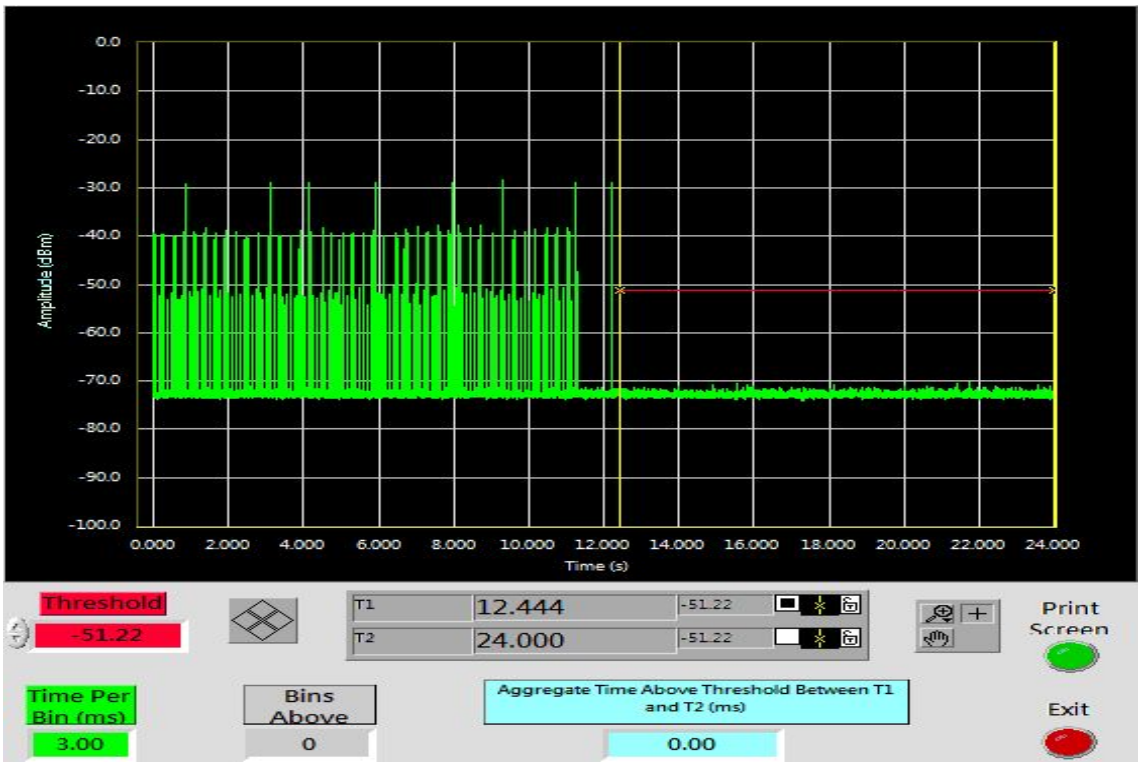
Type 5 Channel Closing Transmission Time Results

No non-compliance noted.

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




0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
Time (s)
Threshold
-51.22
T1
12.444
-51.22
T2
24.000
-51.22
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00

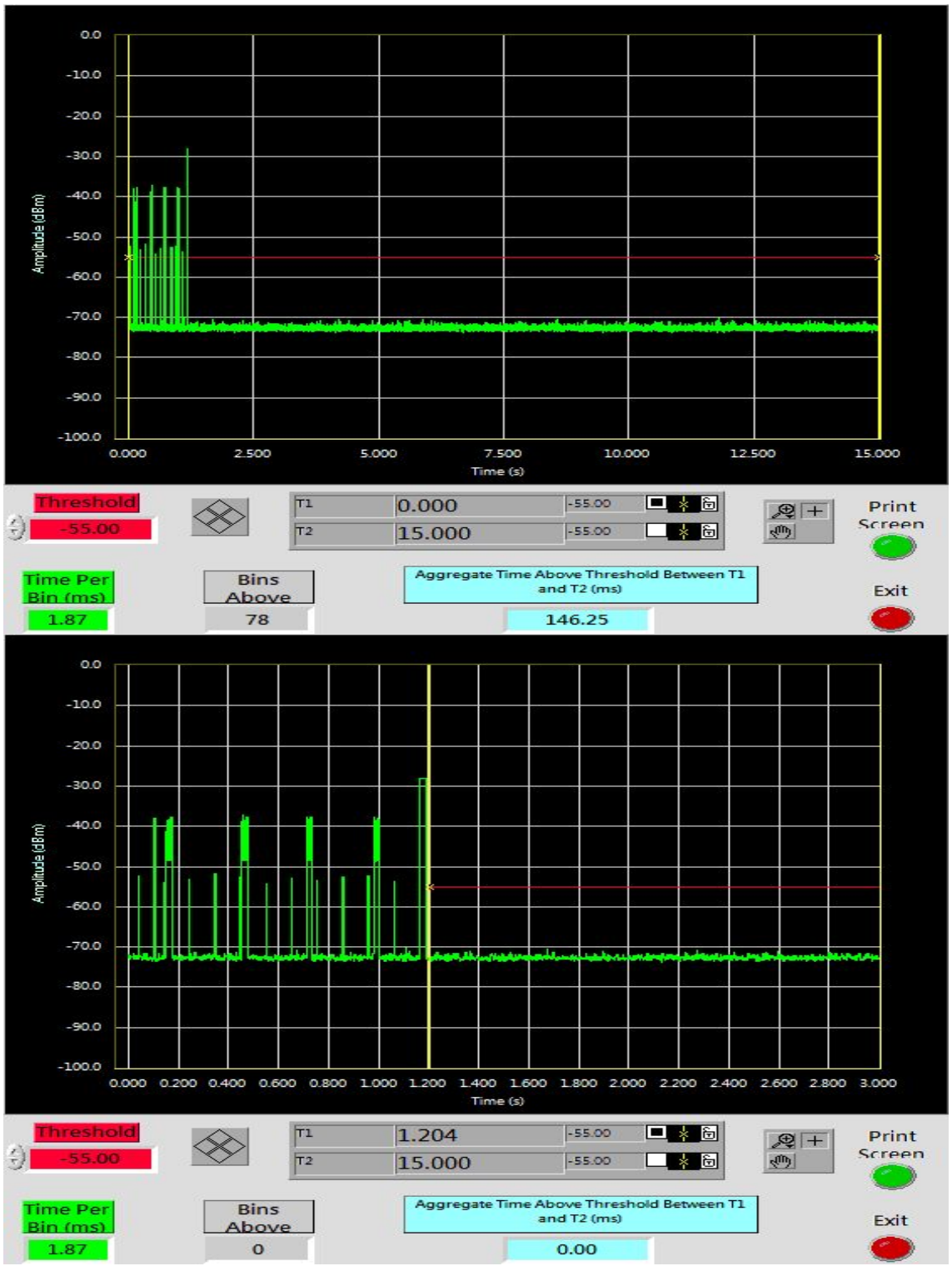

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-51.22
T1
12.444
-51.22
T2
24.000
-51.22
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00

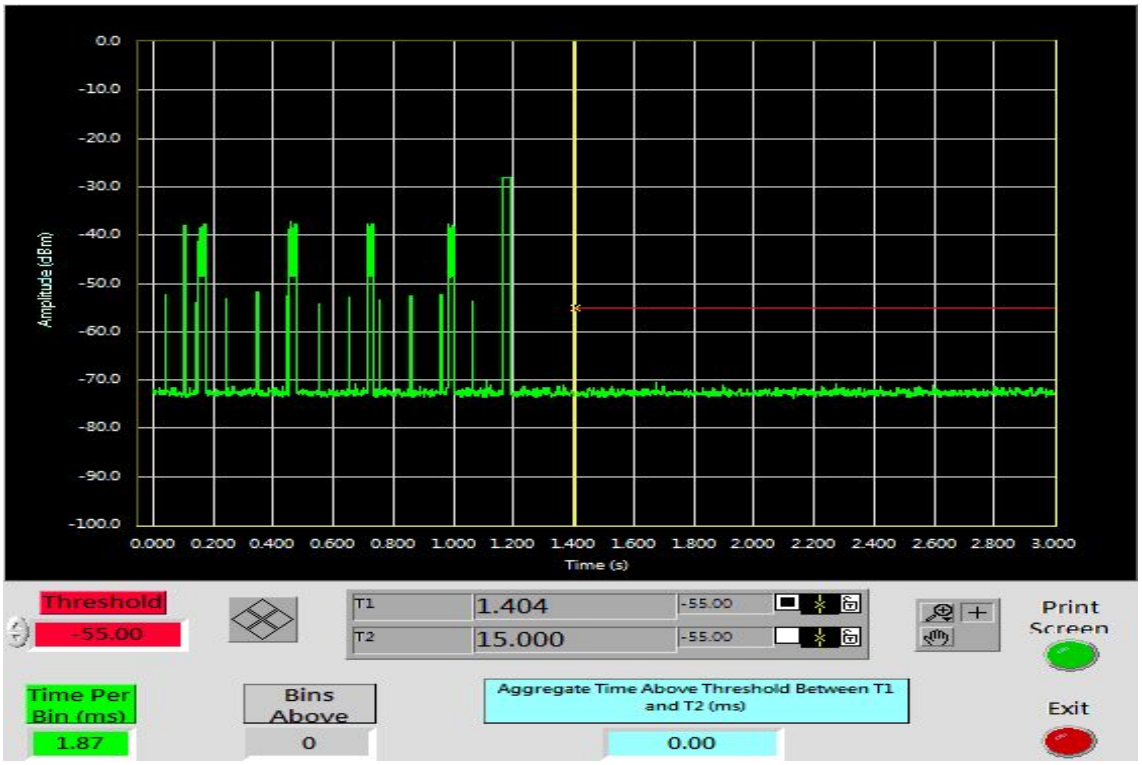
IEEE 802.11n HT 40 MHz mode for Band III

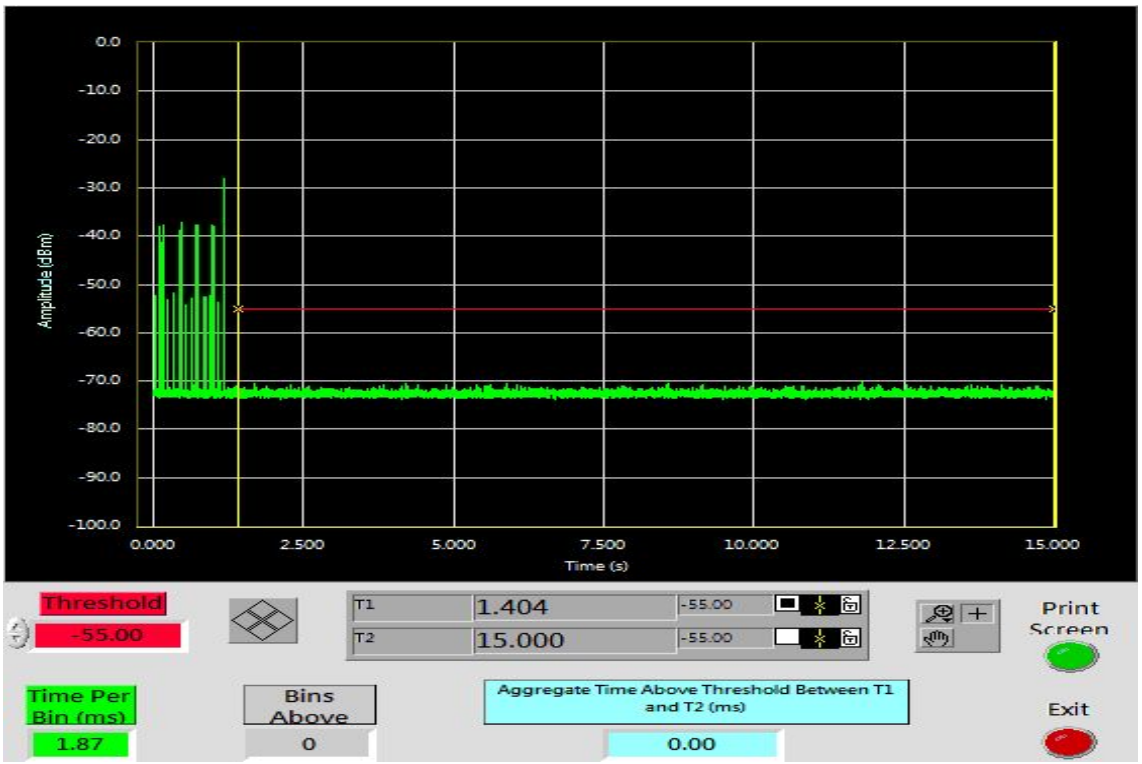
Type 1 Channel Closing Transmission Time Results

No non-compliance noted.

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




0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 0.200 0.400 0.600 0.800 1.000 1.200 1.400 1.600 1.800 2.000 2.200 2.400 2.600 2.800 3.000
Time (s)
Threshold
-55.00
T1 1.404 -55.00
T2 15.000 -55.00
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

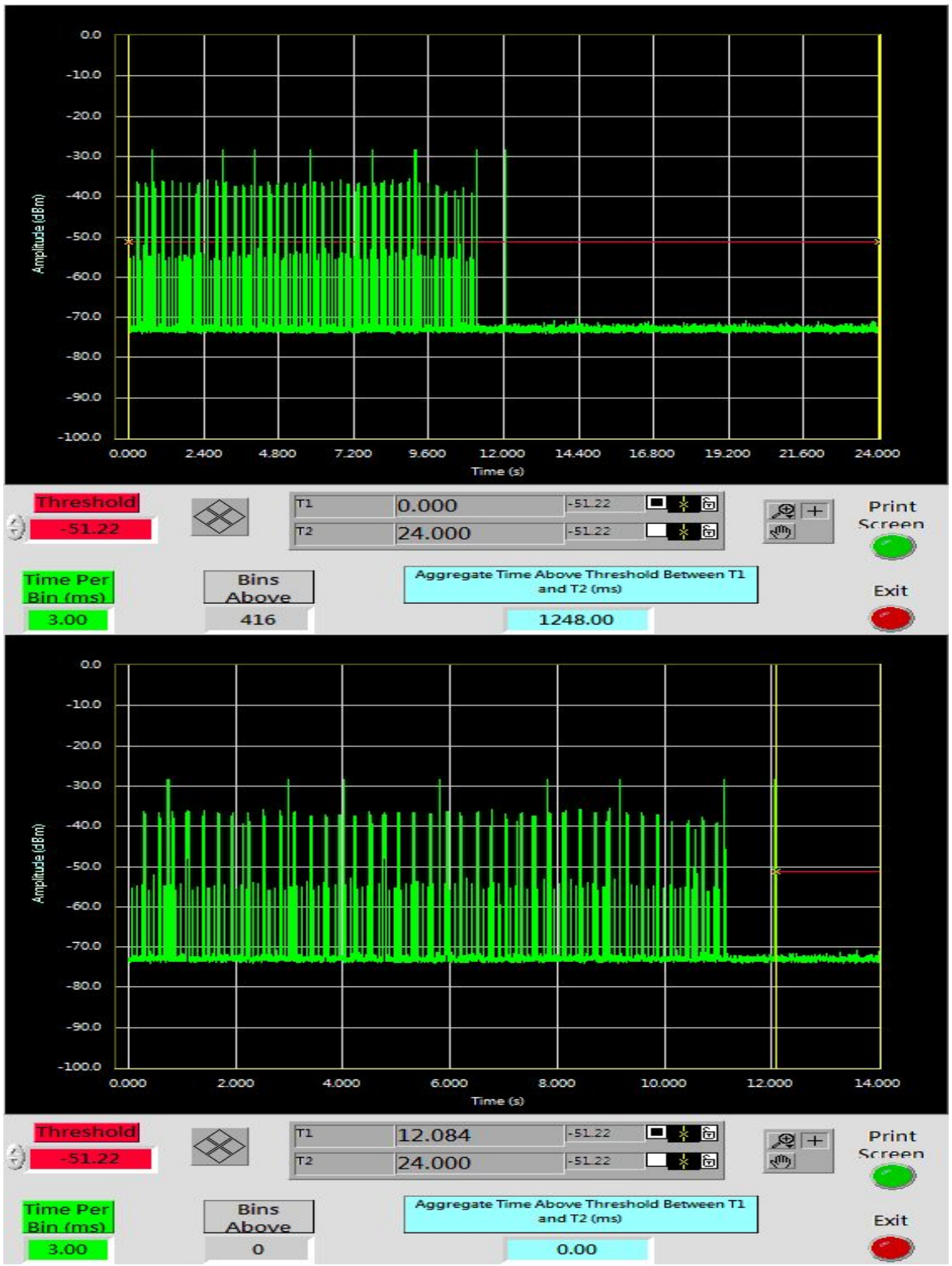

0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000 2.500 5.000 7.500 10.000 12.500 15.000
Time (s)
Threshold
-55.00
T1 1.404 -55.00
T2 15.000 -55.00
Print Screen
Time Per Bin (ms)
1.87
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00
Exit

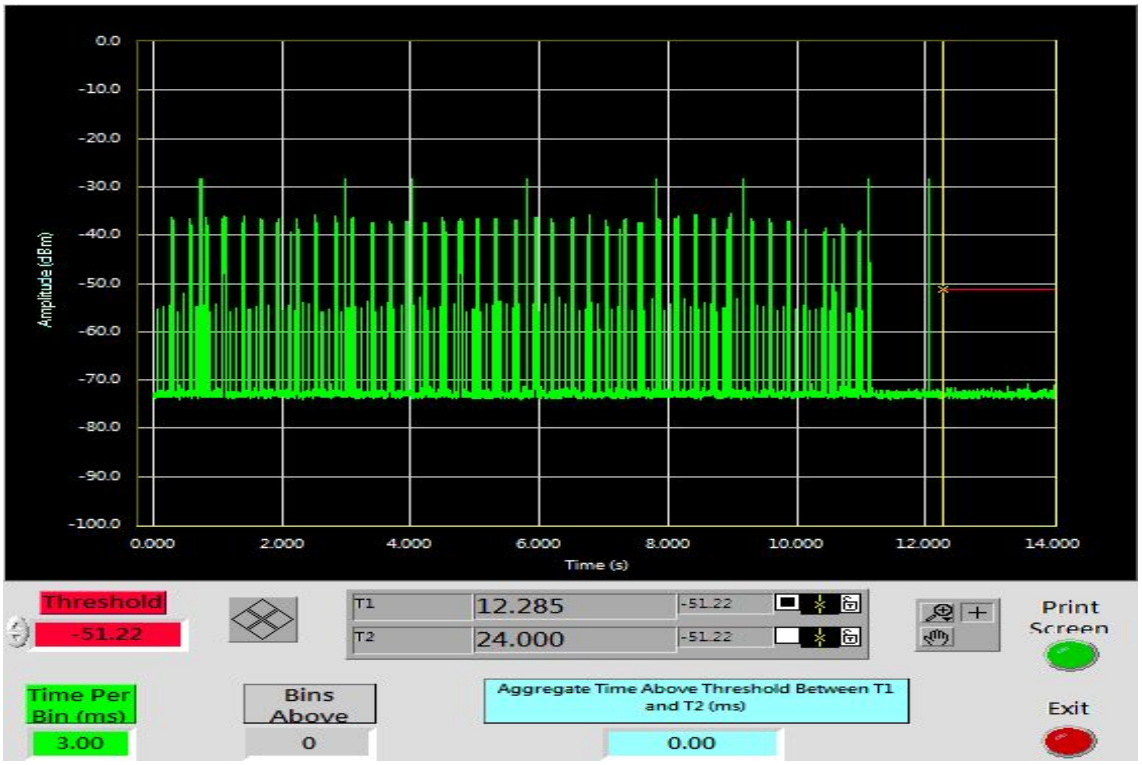
IEEE 802.11n HT 40 MHz mode for Band III

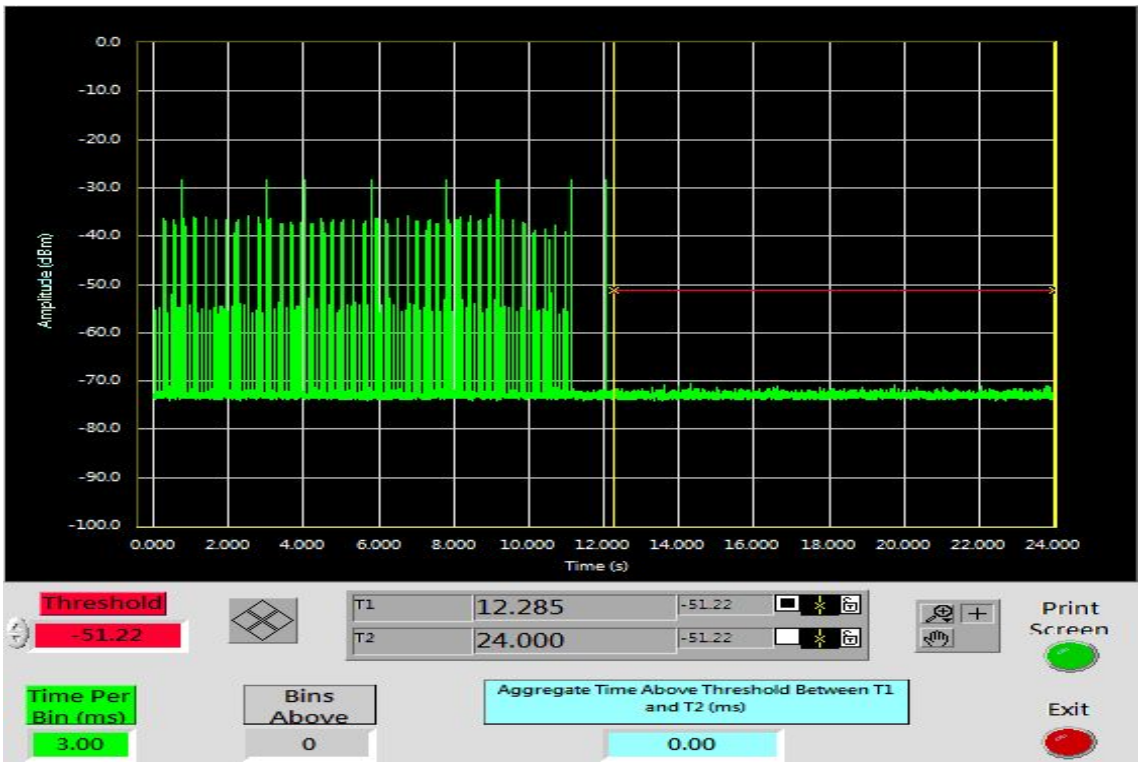
Type 5 Channel Closing Transmission Time Results

No non-compliance noted.

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




0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
Time (s)
Threshold
-51.22
T1
12.285
-51.22
T2
24.000
-51.22
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00


0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100.0
Amplitude (dBm)
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
22.000
24.000
Time (s)
Threshold
-51.22
T1
12.285
-51.22
T2
24.000
-51.22
Print Screen
Exit
Time Per Bin (ms)
3.00
Bins Above
0
Aggregate Time Above Threshold Between T1 and T2 (ms)
0.00

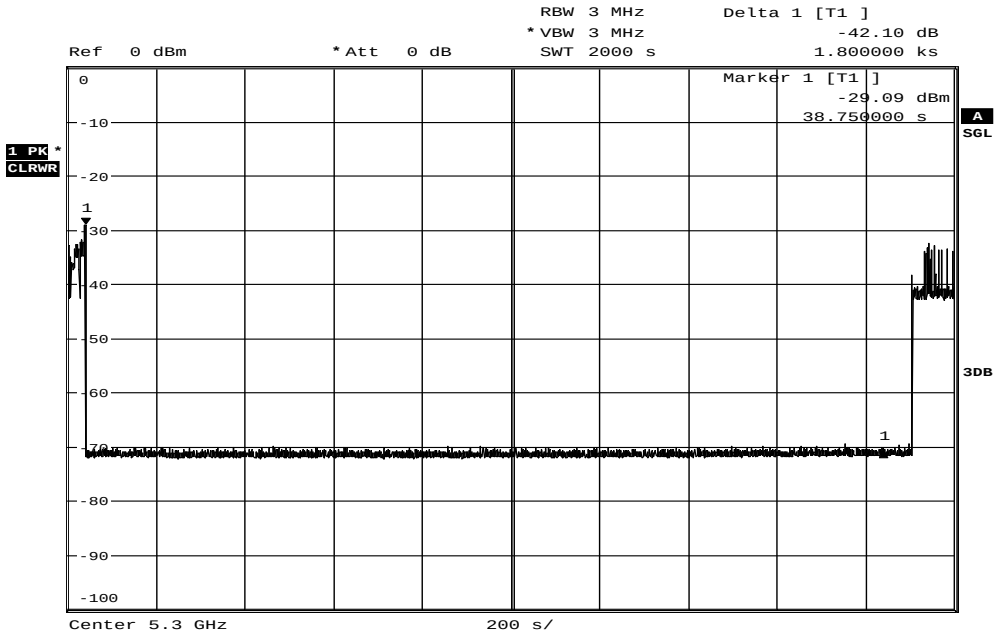
NON-OCCUPANCY PERIOD

IEEE 802.11n HT 20 MHz mode for Band II

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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

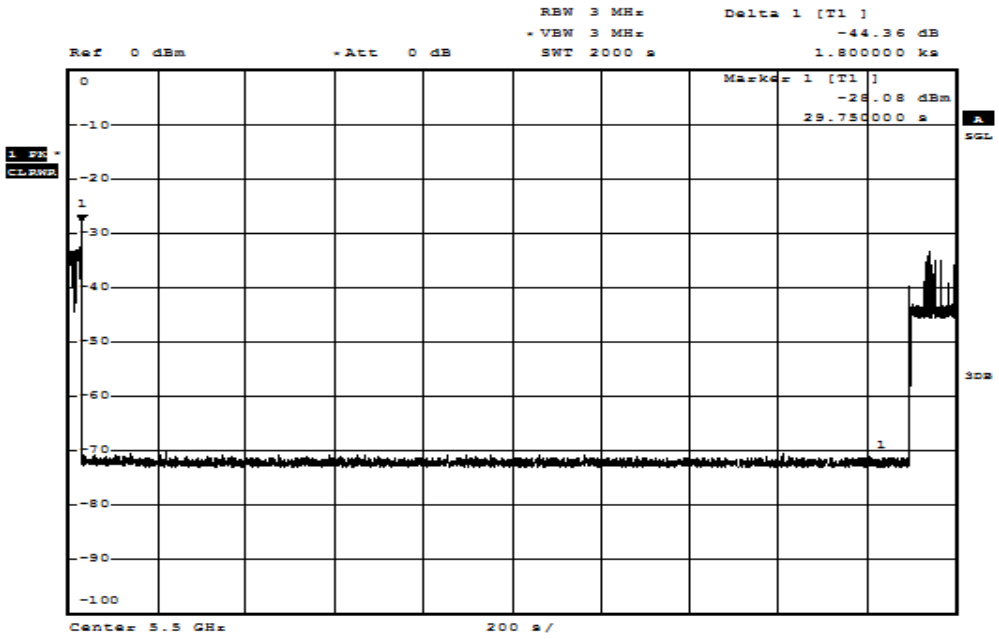


IEEE 802.11n HT 20 MHz mode for Band III

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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

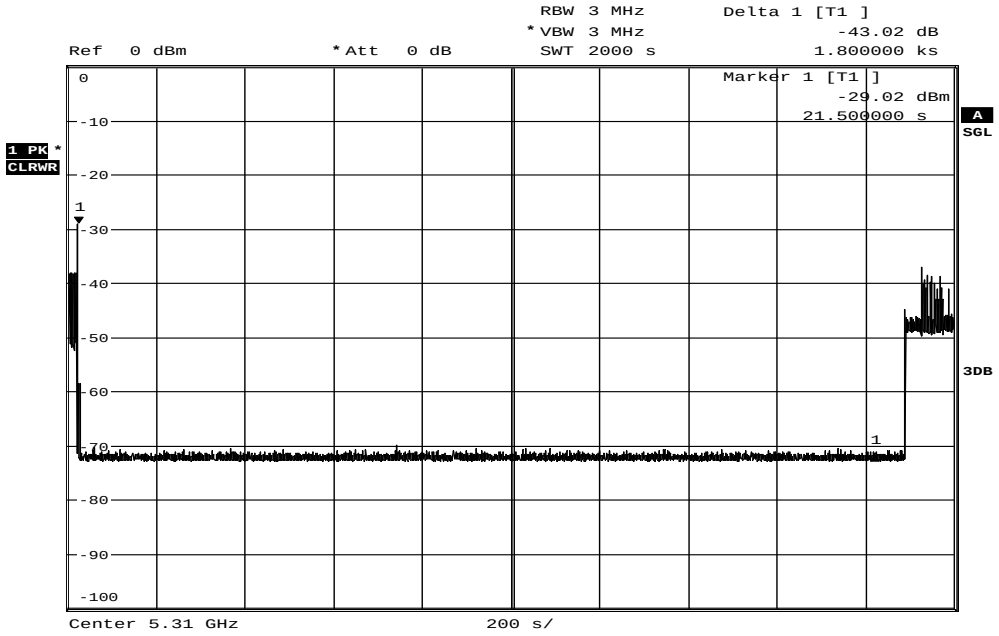


IEEE 802.11n HT 40 MHz mode for Band II

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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



IEEE 802.11n HT 40 MHz mode for Band III

Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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