



FCC 47 CFR PART 15 SUBPART E

TEST REPORT

For

Computer

Model:

**TREK-753, TREK-753R-HWDXPAOE,
TREK-753XXXXXXXXXXXXXXXXXX;**

X= (where "X" may be any alphanumeric character , "-" or blank)

Trade Name: Advantech

Issued to

Advantech Co., Ltd.

**No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
Taipei 114, Taiwan, R.O.C.**

Issued by

Compliance Certification Services Inc.

**No.11, Wu-Gong 6th Rd., Wugu Industrial Park,
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Issued Date: February 2, 2012



**Testing Laboratory
1309**

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	February 2, 2012	Initial Issue	ALL	Eunice Shen



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1. TEST RESULT CERTIFICATION

Applicant: Advantech Co., Ltd.
 No.1, Alley 20, Lane 26, Rueiguang Road, Neihu District,
 Taipei 114, Taiwan, R.O.C.

Equipment Under Test: Computer

Trade Name: Advantech

Model: TREK-753, TREK-753R-HWDXPAOE,
 TREK-753XXXXXXXXXXXXXXXXXX;
 X= (where "X" may be any alphanumeric character , "-" or blank)

Date of Test: December 30, 2011 ~ January 10, 2012

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:

Reviewed by:

Jason Lin
 Section Manager
 Compliance Certification Services Inc.

Gina Lo
 Section Manager
 Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Computer					
Trade Name	Advantech					
Model Number	TREK-753, TREK-753R-HWDXPAOE, TREK-753XXXXXXXXXXXXXXXXXX; X= (where "X" may be any alphanumeric character, "-" or blank)					
Model Discrepancy	All the specification and layout are identical except they come with different model numbers for marketing purposes.					
Received Date	September 28, 2011					
Power Supply	DC 12V					
Operating Frequency Range & Number of Channels		Mode	Frequency Range (MHz)	Number of Channels		
	UNII Band I	IEEE 802.11a	5180 – 5240	4 Channels		
		IEEE 802.11n HT 20 MHz	5180 – 5240	4 Channels		
		IEEE 802.11n HT 40 MHz	5190 ~ 5230	2 Channels		
	UNII Band II	IEEE 802.11a	5260 - 5320	4 Channels		
		IEEE 802.11n HT 20 MHz	5260 - 5320	4 Channels		
		IEEE 802.11n HT 40 MHz	5270 - 5310	2 Channels		
	UNII Band III	IEEE 802.11a	5500 - 5700	7 Channels		
		IEEE 802.11n HT 20 MHz	5500 – 5700	7 Channels		
		IEEE 802.11n HT 40 MHz	5510 - 5670	3 Channels		
	Transmit Power		Mode	Frequency Range (MHz)	Output Power (dBm)	Output Power (mw)
		UNII Band I	IEEE 802.11a	5180 – 5240	8.62	7.2778
IEEE 802.11n HT 20 MHz			5180 – 5240	9.86	9.6828	
IEEE 802.11n HT 40 MHz			5190 ~ 5230	11.74	14.9279	
UNII Band II		IEEE 802.11a	5260 - 5320	13.11	20.4644	
		IEEE 802.11n HT 20 MHz	5260 - 5320	16.21	41.7830	
		IEEE 802.11n HT 40 MHz	5270 - 5310	14.94	31.1889	
UNII Band III		IEEE 802.11a	5500 - 5700	12.31	17.0216	
		IEEE 802.11n HT 20 MHz	5500 – 5700	16.49	44.5656	
		IEEE 802.11n HT 40 MHz	5510 - 5670	19.27	84.5279	
Modulation Technique		OFDM (QPSK, BPSK, 16-QAM, 64-QAM)				
Transmit Data Rate		IEEE 802.11a mode: 54, 48, 36, 24, 18, 12, 9, 6 Mbps IEEE 802.11n HT 20 MHz: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) IEEE 802.11n HT 40 MHz: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)				
Antenna Specification	Antenna Gain: IEEE 802.11a: 1.98 dBi MIMO: $10 \cdot \log\left(\frac{10^{1.98 \text{ dBi}/20} + 10^{1.98 \text{ dBi}/20}}{2}\right) = 4.99 \text{ dBi}$ (Numeric gain: 3.15)					
Antenna Designation	Dipole Antenna					



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
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: **M82-TREK-753** 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 and KDB 789033, 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: TREK-753) 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 (5550MHz) 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	03/17/2012
Power Meter	Anritsu	ML2495A	1012009	04/27/2012
Power Sensor	Anritsu	MA2411B	0917072	04/27/2012

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510268	11/15/2012
EMI Test Receiver	R&S	ESCI	100064	02/17/2012
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/12/2013
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/20/2012
Bilog Antenna	Sunol Sciences	JB3	A030105	10/03/2012
Horn Antenna	EMCO	3117	00055165	01/11/2013
Horn Antenna	EMCO	3116	00026370	10/12/2012
Loop Antenna	EMCO	6502	8905/2356	06/10/2013
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	12/25/2012
Test S/W	EZ-EMC (CCS-3A1RE)			

Dynamic Frequency Selection				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSEK 30	100264	05/24/2012
Signal Generator	Agilent	E8267C	US42340162	08/08/2012



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683

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



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

No.11, Wu-Gong 6th Rd., Wugu Industrial Park, New Taipei City 248, Taiwan (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

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




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

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

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



5.3 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	
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	
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	

** 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.	Equipment	Model No.	Serial No.	FCC ID / BSMI ID	Brand Name	Data Cable	Power Cord
	N/A						



7. FCC PART 15 REQUIREMENTS

7.1 DUTY CYCLE

Agilent 13:03:10 Jan 3, 2012

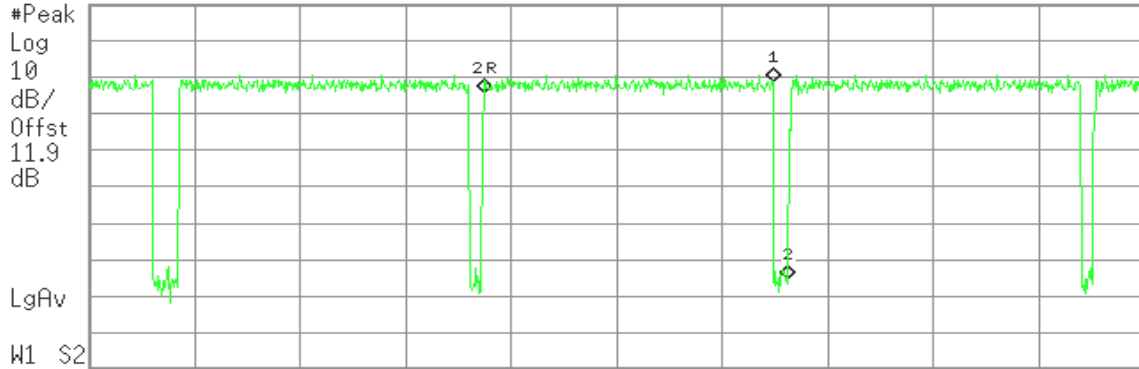
R T

Mkr2 2.177 ms

-51.07 dB

Ref 11.9 dBm

#Atten 10 dB



Center 5.180 000 GHz

Span 0 Hz

Res BW 1 MHz

#VBW 1 MHz

Sweep 7.533 ms (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	2.817 ms	-12.22 dBm
1Δ	(1)	Time	2.064 ms	2.81 dB
2R	(1)	Time	2.817 ms	-12.22 dBm
2Δ	(1)	Time	2.177 ms	-51.07 dB

A mode duty cycle

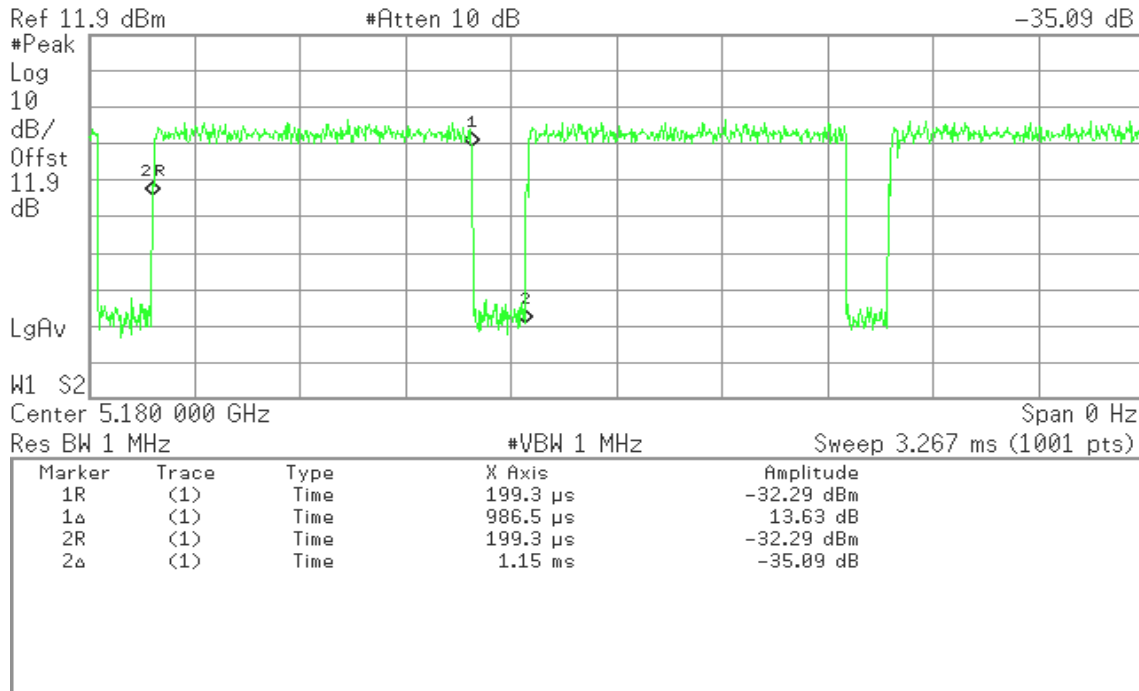
$2.064/2.177 = 0.94$ 94%



Agilent 13:01:08 Jan 3, 2012

R T

Mkr2 1.15 ms
-35.09 dB



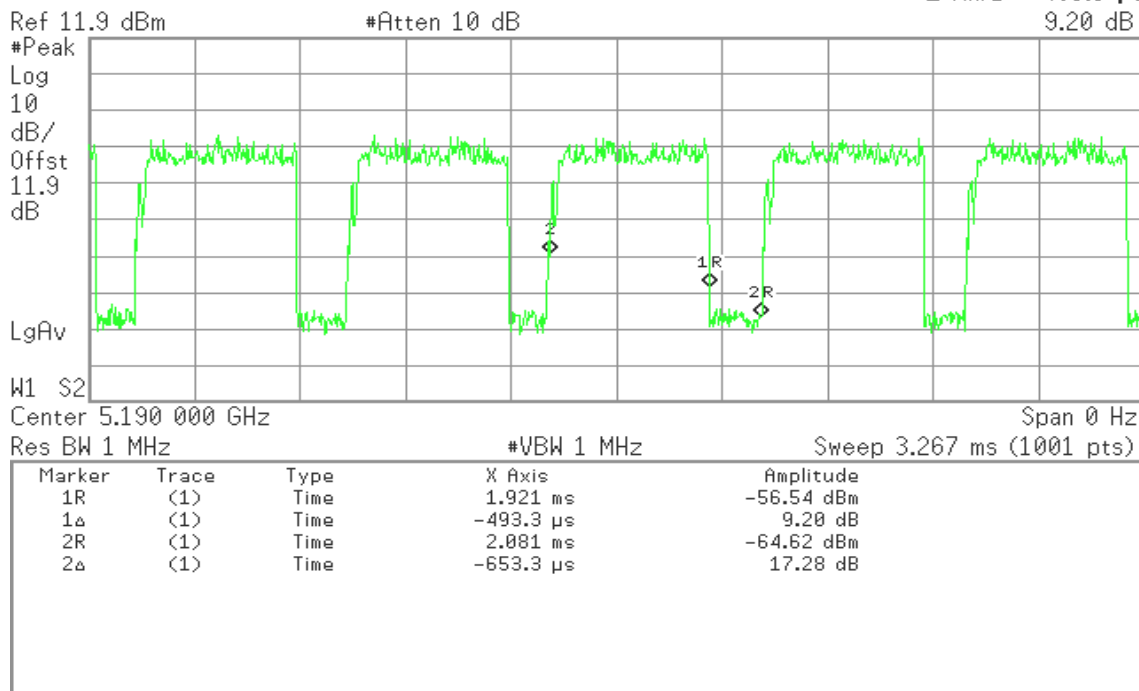
A 20 mode duty cycle

$0.9865/1.15=0.85$ 85%

Agilent 12:58:42 Jan 3, 2012

R T

Mkr1 -493.3 μs
9.20 dB



A 40 mode duty cycle

$0.493/0.653=0.75$ 75%

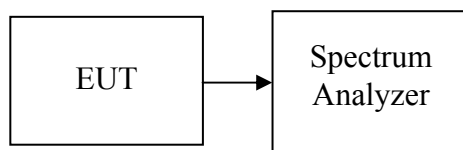


7.2 26 dB EMISSION BANDWIDTH

LIMIT

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

Test Configuration



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted



Test Data

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	20.955
Mid	5220	20.981
High	5240	20.877

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	25.083
Mid	5220	25.127
High	5240	25.164

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5180	20.374
Mid	5220	23.192
High	5240	23.058

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	39.606
High	5230	41.749

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5190	41.998
High	5230	39.934



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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5260	22.694
Mid	5280	22.614
High	5320	22.644

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5260	23.010
Mid	5280	25.180
High	5320	25.161

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5260	21.005
Mid	5280	22.630
High	5320	21.393

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5270	41.805
High	5310	42.185

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

Channel	Frequency (MHz)	Bandwidth (B) (MHz)
Low	5270	44.011
High	5310	42.295



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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	22.776
Mid	5580	22.637
High	5700	22.766

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	25.155
Mid	5580	25.137
High	5700	25.198

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5500	23.051
Mid	5580	20.759
High	5700	20.345

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	39.663
Mid	5550	44,135
High	5670	42.292

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

Channel	Frequency (MHz)	Bandwidth (MHz)
Low	5510	42.466
Mid	5550	44.690
High	5670	47.801



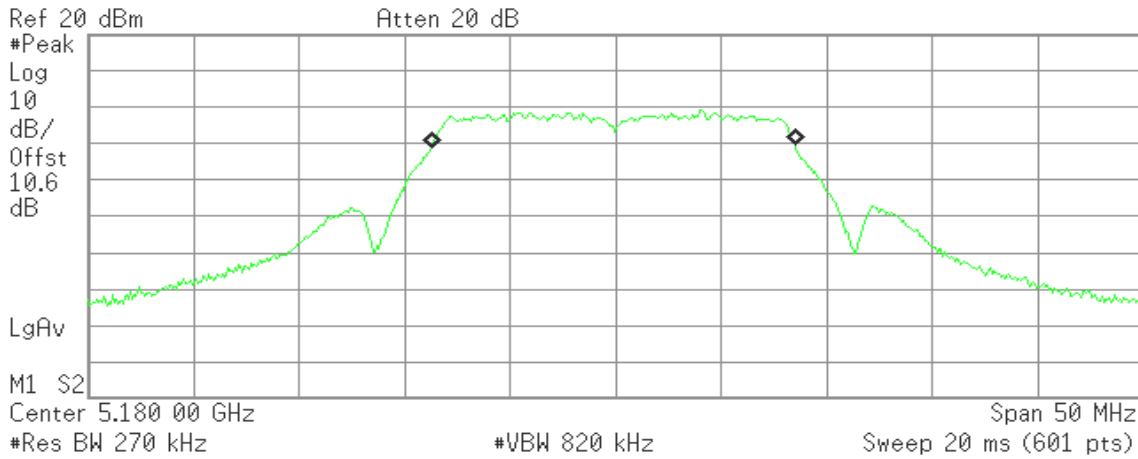
Test Plot

IEEE 802.11a for 5180 ~ 5240MHz

CH Low

Agilent 08:48:08 Dec 30, 2011

R T



Occupied Bandwidth
17.1697 MHz

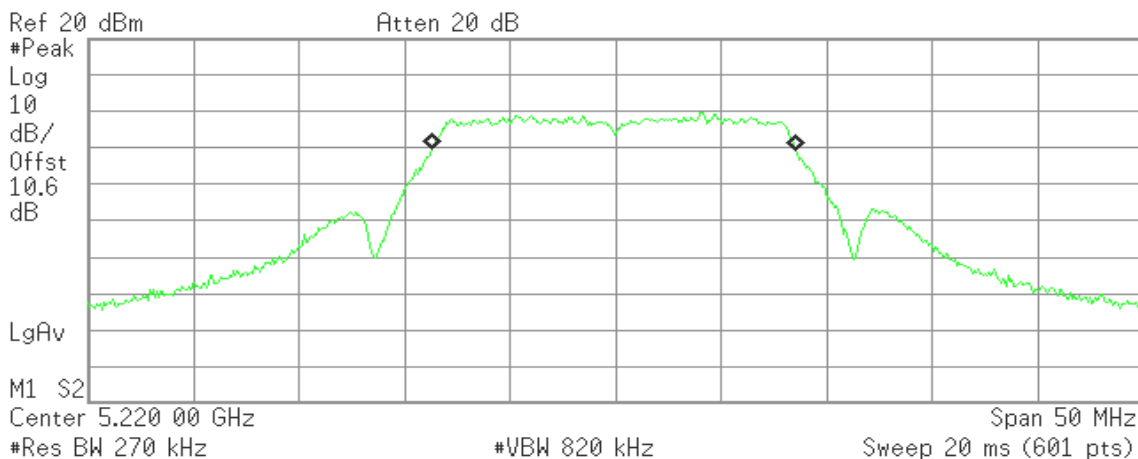
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -111.605 kHz
x dB Bandwidth 20.955 MHz

CH Mid

Agilent 08:53:22 Dec 30, 2011

R T



Occupied Bandwidth
17.1710 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

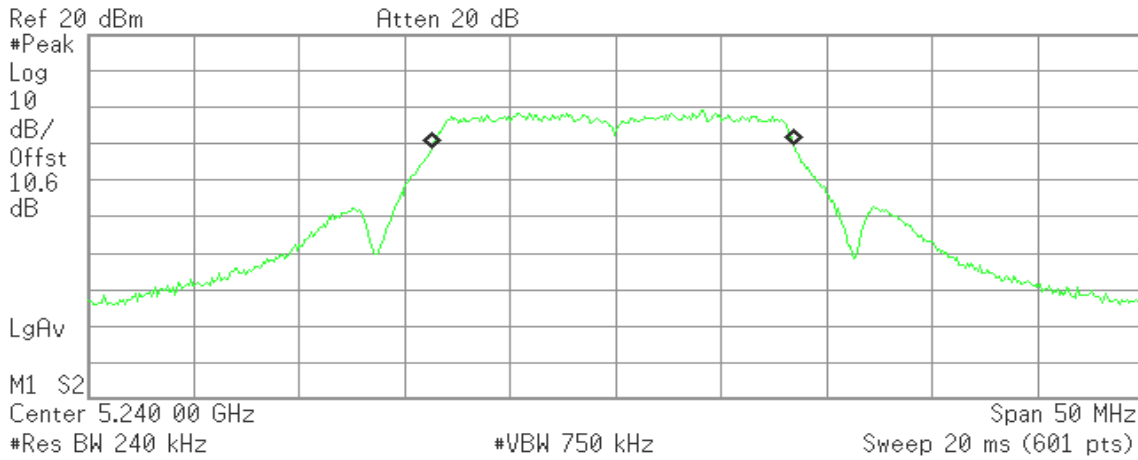
Transmit Freq Error -79.421 kHz
x dB Bandwidth 20.981 MHz



CH High

Agilent 08:59:21 Dec 30, 2011

R T



Occupied Bandwidth
17.0578 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

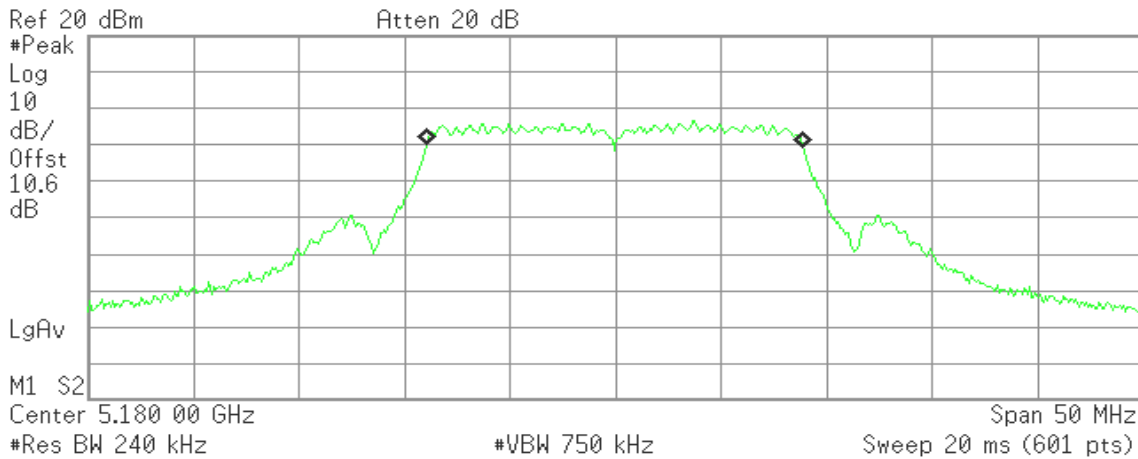
Transmit Freq Error -108.922 kHz
x dB Bandwidth 20.877 MHz

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

CH Low

Agilent 13:55:34 Dec 30, 2011

R T



Occupied Bandwidth
17.7728 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

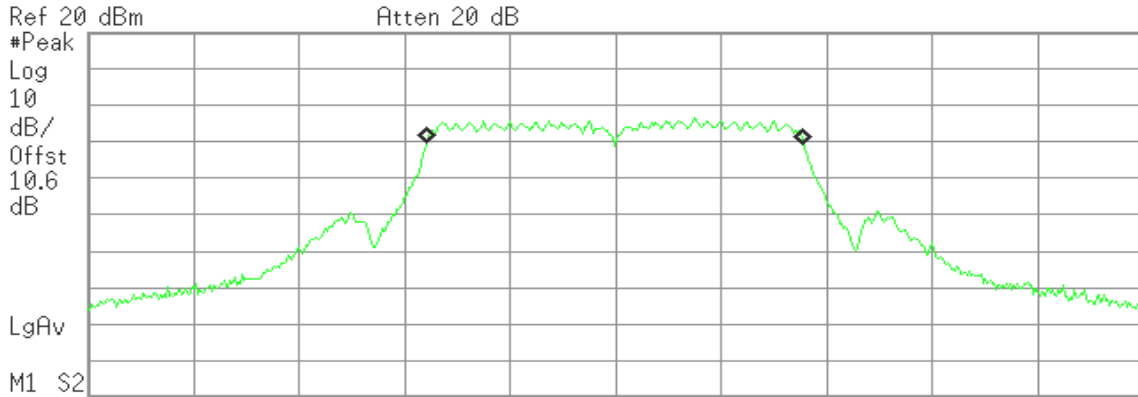
Transmit Freq Error -47.212 kHz
x dB Bandwidth 25.083 MHz



CH Mid

Agilent 14:04:29 Dec 30, 2011

R T



Occupied Bandwidth
17.7843 MHz

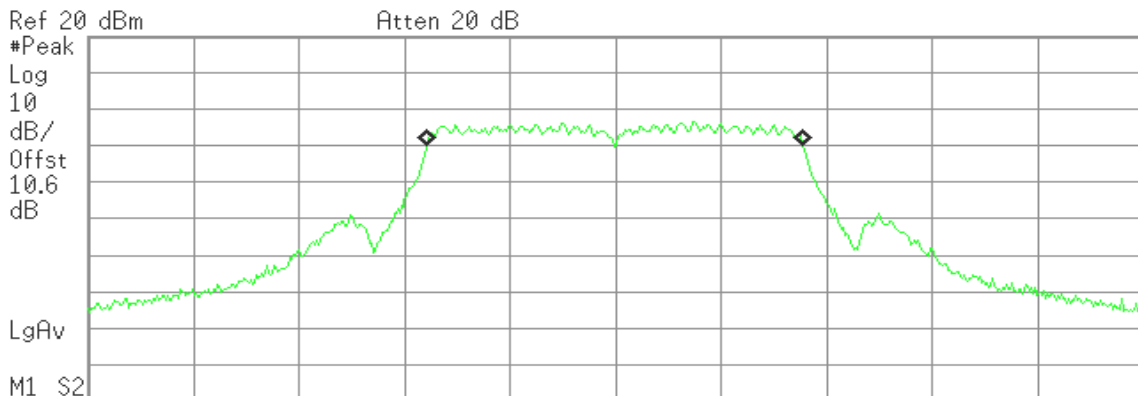
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -23.749 kHz
x dB Bandwidth 25.127 MHz

CH High

Agilent 14:08:35 Dec 30, 2011

R T



Occupied Bandwidth
17.7637 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -22.829 kHz
x dB Bandwidth 25.164 MHz

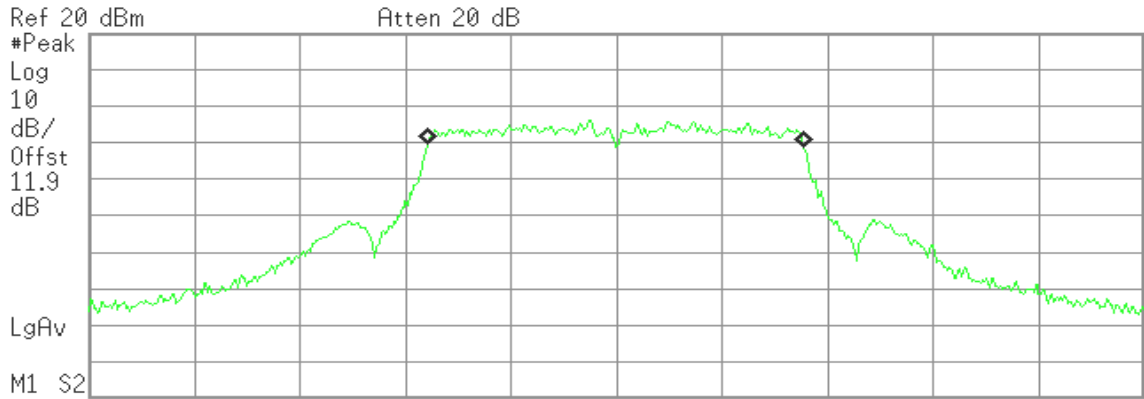


IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent 09:22:24 Jan 2, 2012

R T



Center 5.180 00 GHz Span 50 MHz
 #Res BW 220 kHz #VBW 680 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.7453 MHz

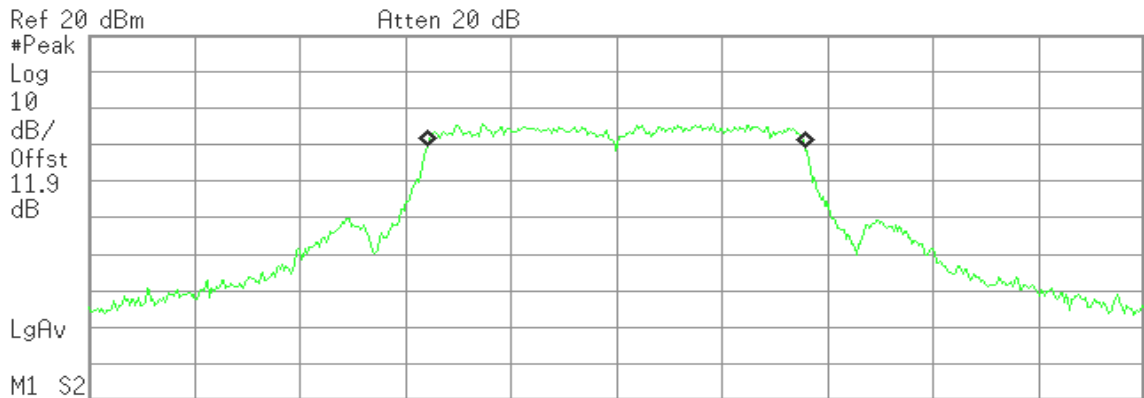
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -50.375 kHz
x dB Bandwidth 20.374 MHz

CH Mid

Agilent 09:26:46 Jan 2, 2012

R T



Center 5.220 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 680 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.8110 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

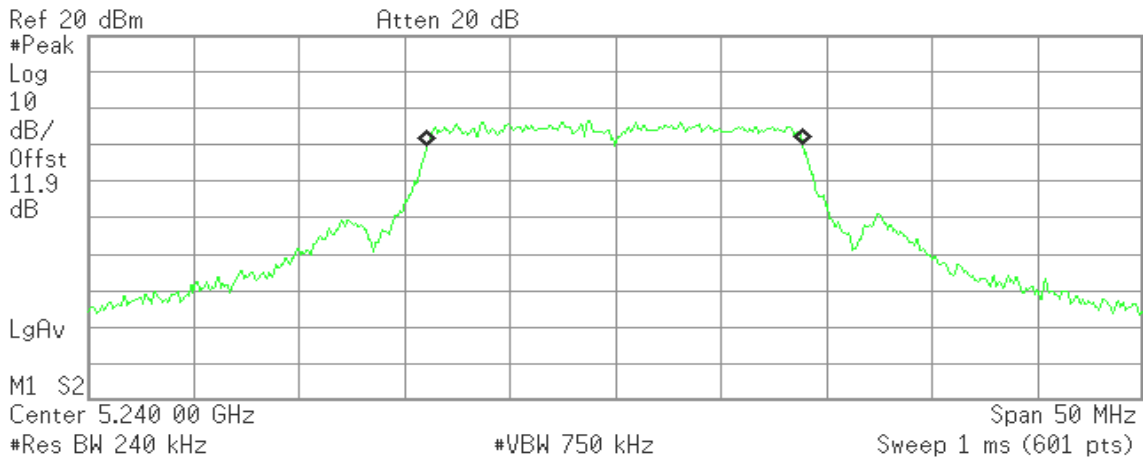
Transmit Freq Error -26.583 kHz
x dB Bandwidth 23.192 MHz



CH High

Agilent 09:30:04 Jan 2, 2012

R T



Occupied Bandwidth
17.7200 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

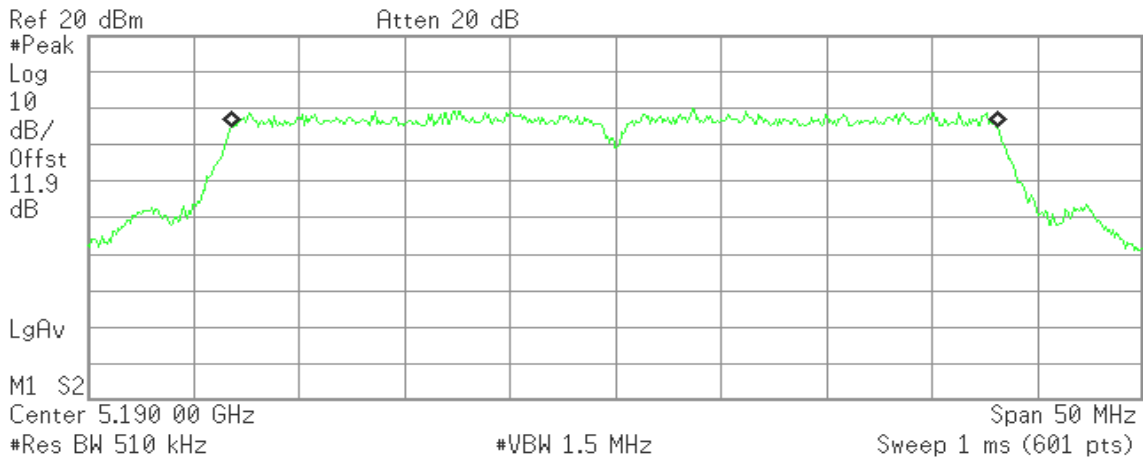
Transmit Freq Error -17.731 kHz
x dB Bandwidth 23.058 MHz

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

CH Low

Agilent 16:38:58 Dec 30, 2011

R T



Occupied Bandwidth
36.2462 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

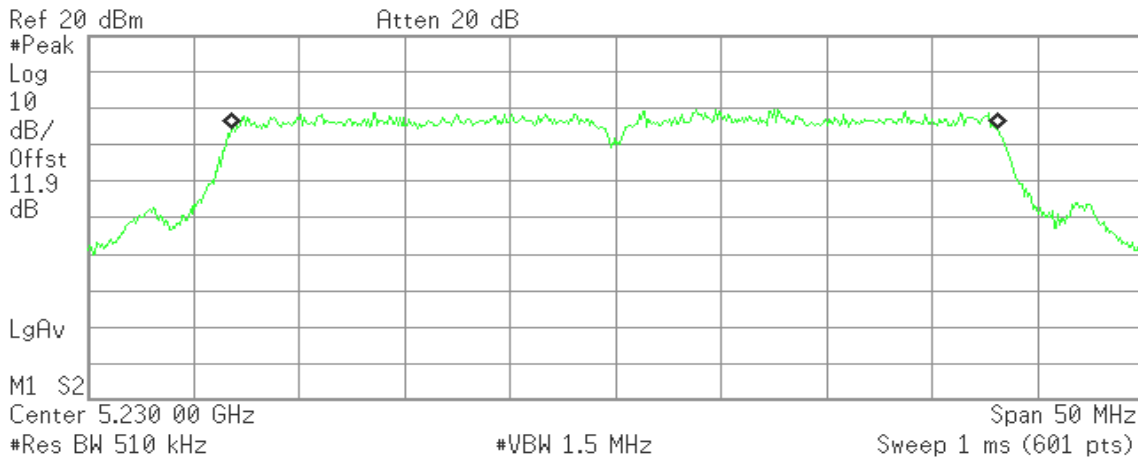
Transmit Freq Error -63.703 kHz
x dB Bandwidth 39.606 MHz



CH High

Agilent 16:43:12 Dec 30, 2011

R T



Occupied Bandwidth
36.2231 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

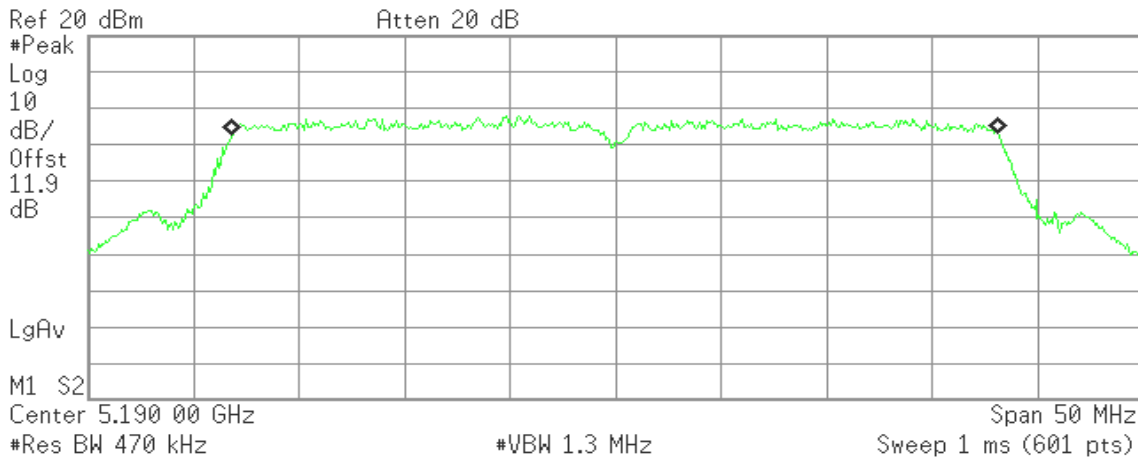
Transmit Freq Error -27.789 kHz
x dB Bandwidth 41.749 MHz

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

CH Low

Agilent 17:11:10 Dec 30, 2011

R T



Occupied Bandwidth
36.2529 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

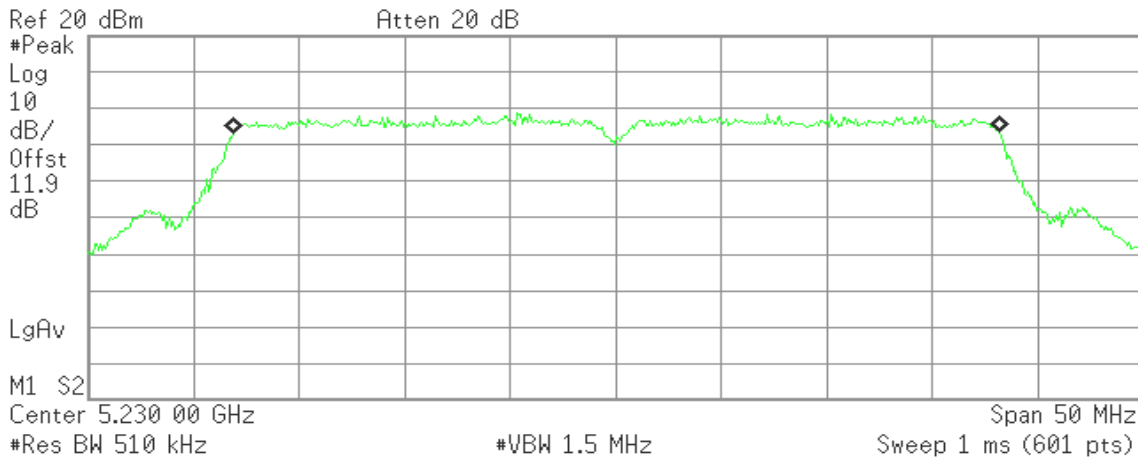
Transmit Freq Error -33.509 kHz
x dB Bandwidth 41.998 MHz



CH High

Agilent 17:14:28 Dec 30, 2011

R T



Occupied Bandwidth
36.2068 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

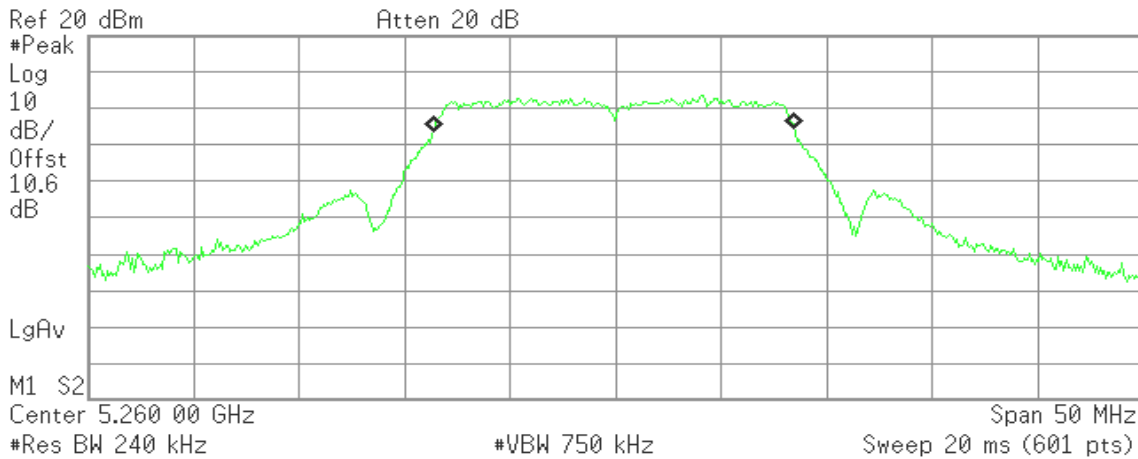
Transmit Freq Error 22.745 kHz
x dB Bandwidth 39.934 MHz

IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low

Agilent 09:06:12 Dec 30, 2011

R T



Occupied Bandwidth
17.0549 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

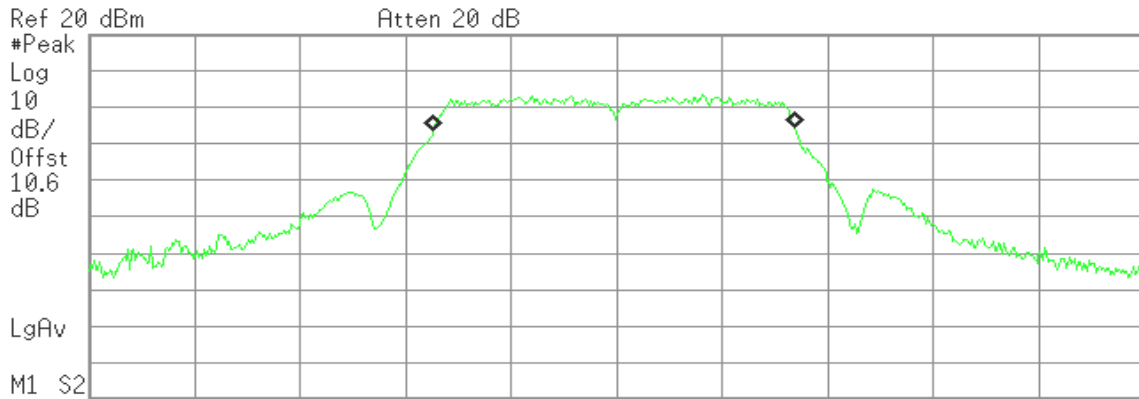
Transmit Freq Error -78.372 kHz
x dB Bandwidth 22.694 MHz



CH Mid

Agilent 09:09:39 Dec 30, 2011

R T



Occupied Bandwidth
17.0608 MHz

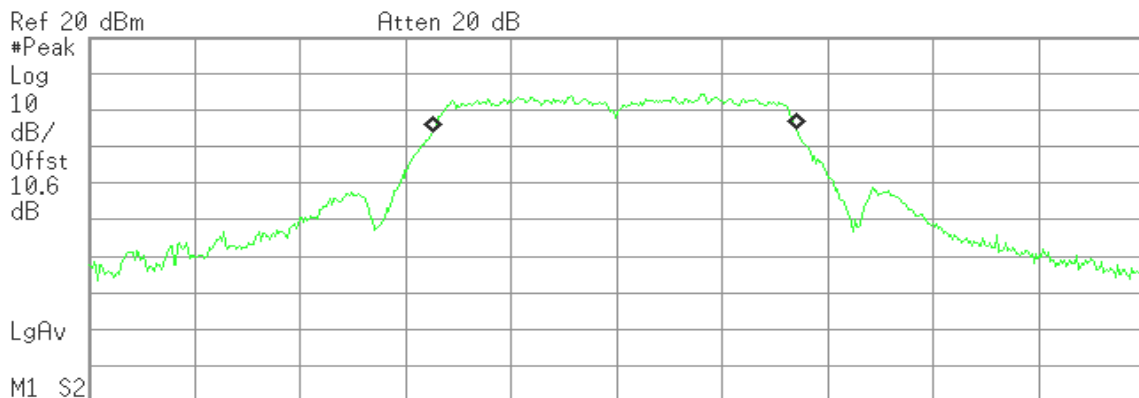
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -110.711 kHz
x dB Bandwidth 22.614 MHz

CH High

Agilent 09:13:26 Dec 30, 2011

R T



Occupied Bandwidth
17.1881 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -93.972 kHz
x dB Bandwidth 22.644 MHz

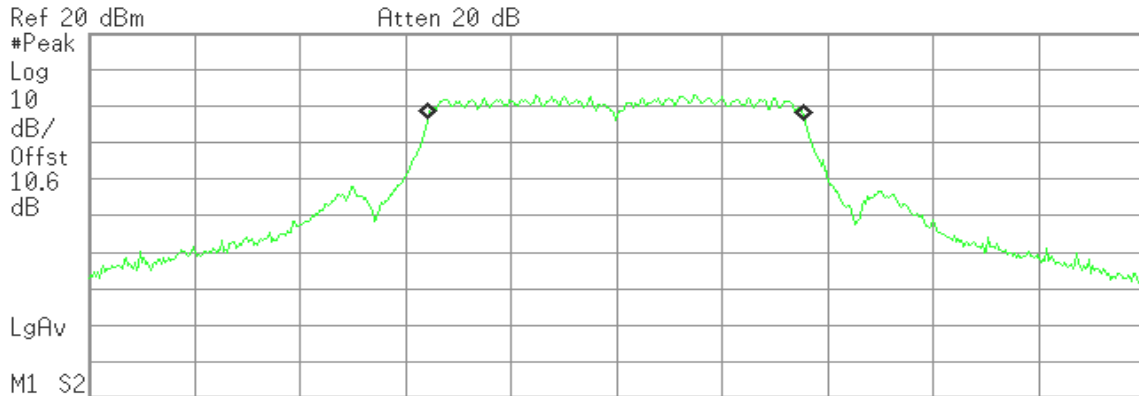


IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low

Agilent 14:15:15 Dec 30, 2011

R T



Occupied Bandwidth
17.7736 MHz

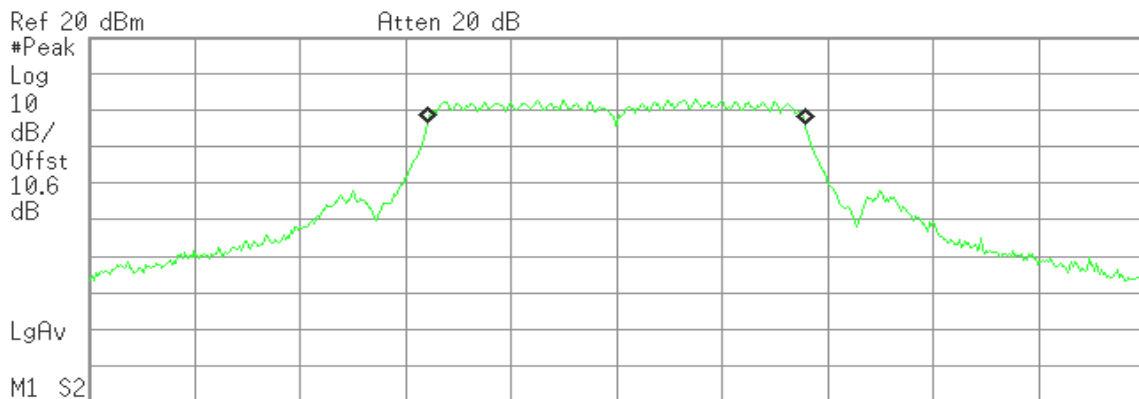
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -21.493 kHz
x dB Bandwidth 23.010 MHz

CH Mid

Agilent 14:21:30 Dec 30, 2011

R T



Occupied Bandwidth
17.7935 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

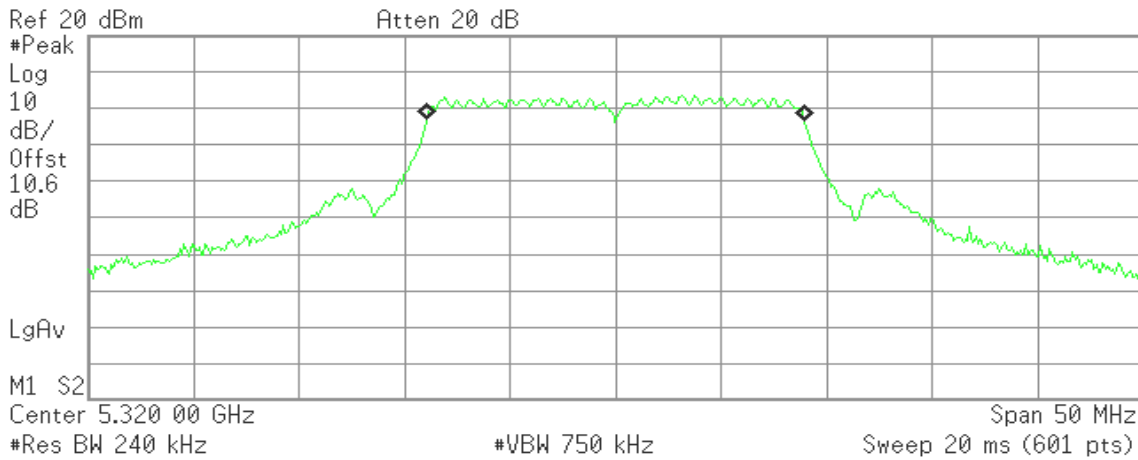
Transmit Freq Error -12.906 kHz
x dB Bandwidth 25.180 MHz



CH High

Agilent 14:31:04 Dec 30, 2011

R T



Occupied Bandwidth
17.7877 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

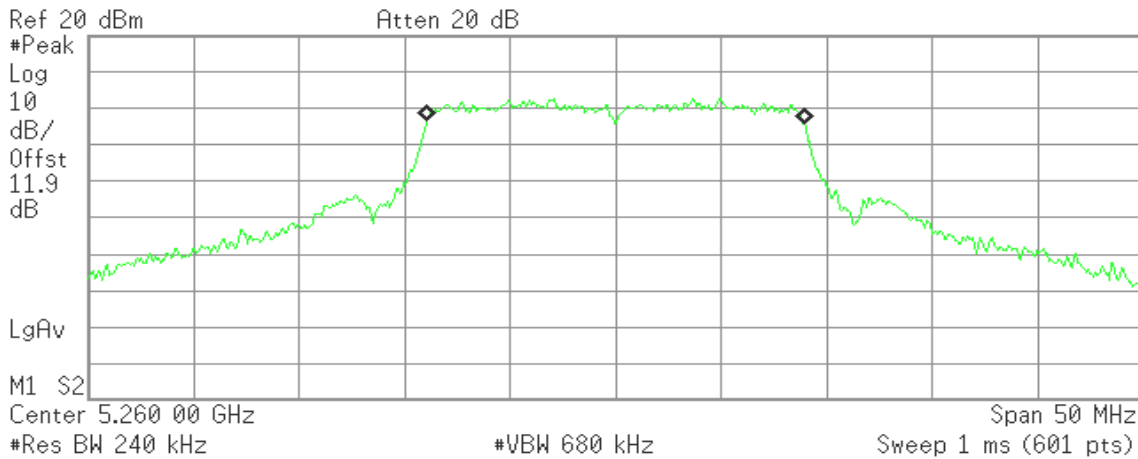
Transmit Freq Error -1.083 kHz
x dB Bandwidth 25.161 MHz

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

CH Low

Agilent 09:36:11 Jan 2, 2012

R T



Occupied Bandwidth
17.8027 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

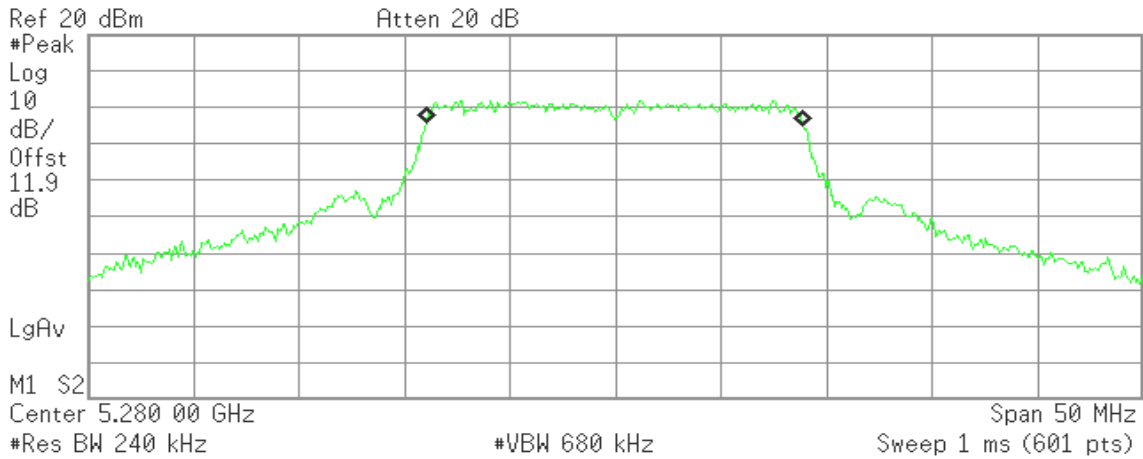
Transmit Freq Error -11.007 kHz
x dB Bandwidth 21.005 MHz



CH Mid

Agilent 09:40:39 Jan 2, 2012

R T



Occupied Bandwidth
17.8091 MHz

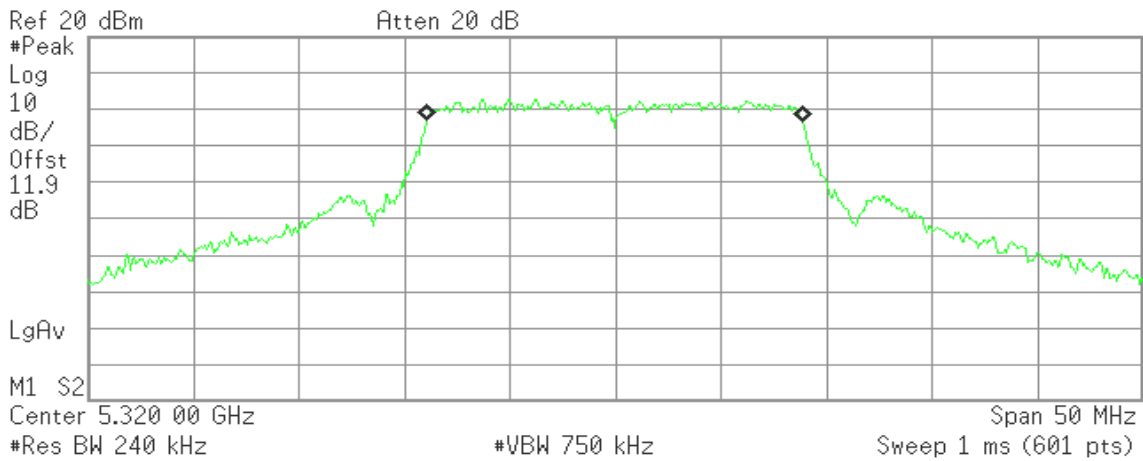
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -42.545 kHz
x dB Bandwidth 22.630 MHz

CH High

Agilent 09:43:50 Jan 2, 2012

R T



Occupied Bandwidth
17.7556 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -47.956 kHz
x dB Bandwidth 21.393 MHz

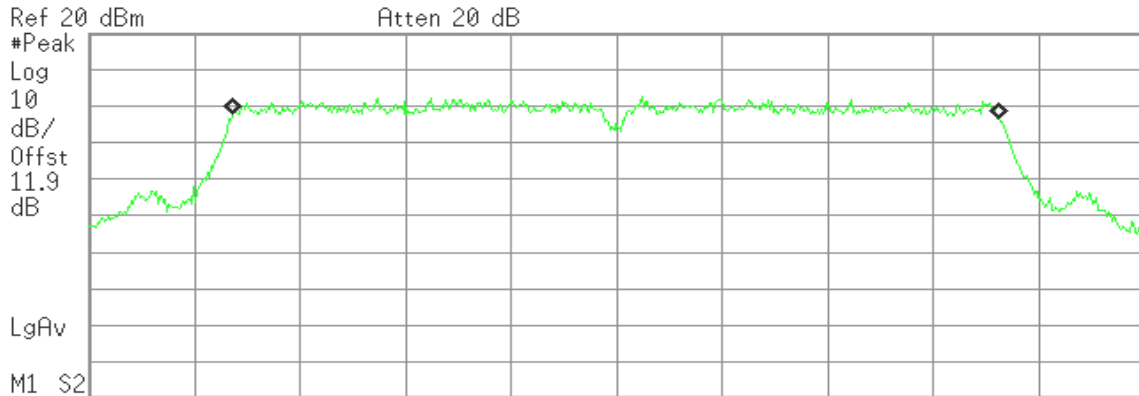


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low

Agilent 16:50:31 Dec 30, 2011

R T



Center 5.270 00 GHz Span 50 MHz
 #Res BW 470 kHz #VBW 1.5 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
36.2495 MHz

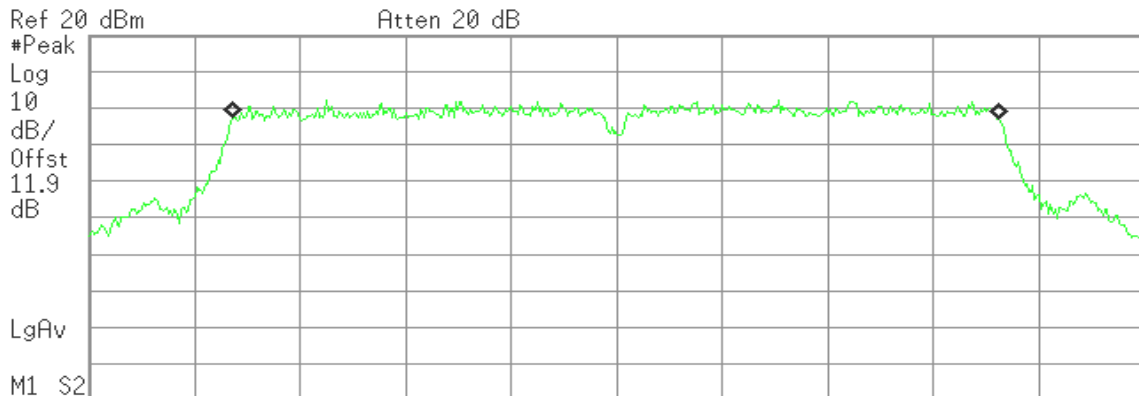
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -42.714 kHz
x dB Bandwidth 41.805 MHz

CH High

Agilent 16:56:31 Dec 30, 2011

R T



Center 5.310 00 GHz Span 50 MHz
 #Res BW 470 kHz #VBW 1.5 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
36.2162 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -22.699 kHz
x dB Bandwidth 42.185 MHz

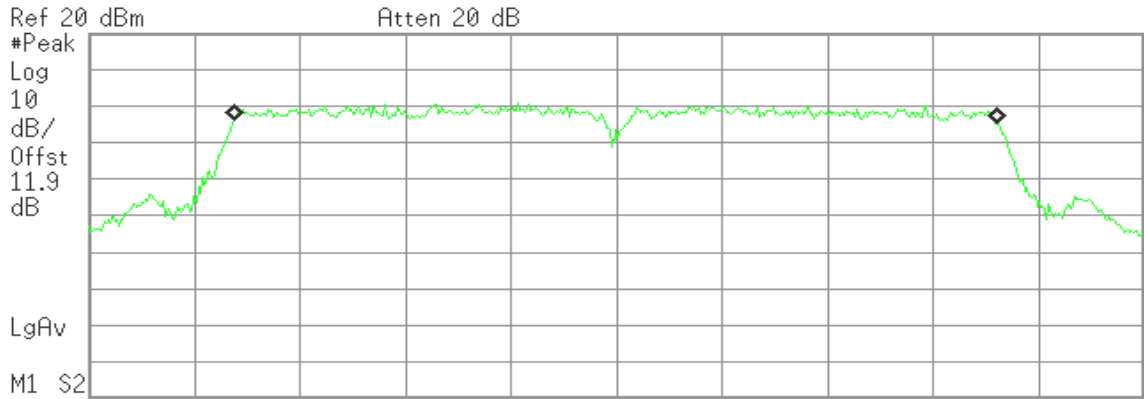


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low

Agilent 17:18:03 Dec 30, 2011

R T



Center 5.270 00 GHz Span 50 MHz
 #Res BW 430 kHz #VBW 1.3 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
36.1348 MHz

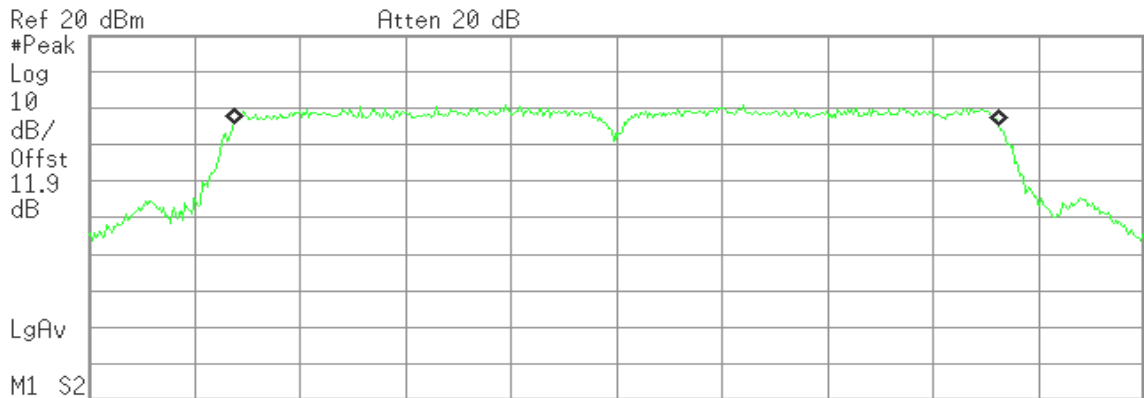
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -44.346 kHz
x dB Bandwidth 44.011 MHz

CH High

Agilent 09:01:30 Jan 2, 2012

R T



Center 5.310 00 GHz Span 50 MHz
 #Res BW 510 kHz #VBW 1.5 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
36.1945 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -21.620 kHz
x dB Bandwidth 42.295 MHz

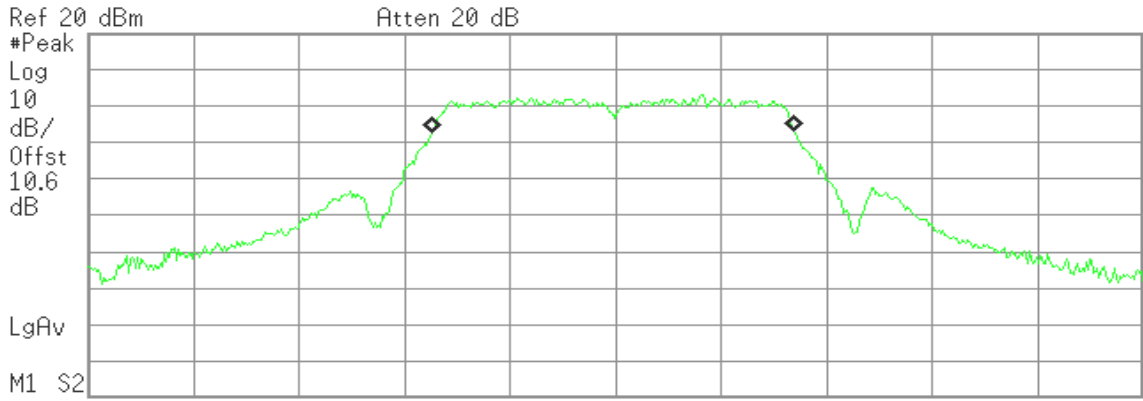


Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low

Agilent 09:38:21 Dec 30, 2011

R T



Ref 20 dBm Atten 20 dB
 M1 S2 Center 5.500 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 750 kHz Sweep 20 ms (601 pts)

Occupied Bandwidth
17.0812 MHz

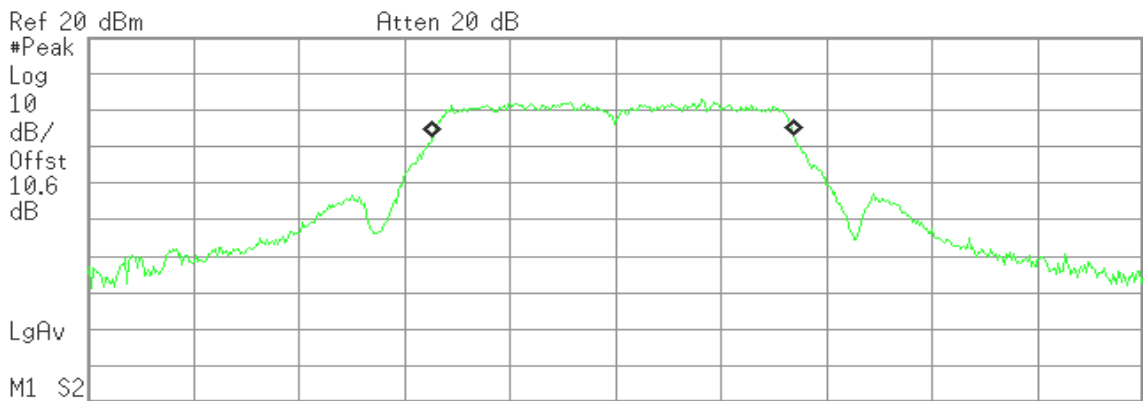
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -95.662 kHz
x dB Bandwidth 22.776 MHz

CH Mid

Agilent 09:42:28 Dec 30, 2011

R T



Ref 20 dBm Atten 20 dB
 M1 S2 Center 5.580 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 680 kHz Sweep 20 ms (601 pts)

Occupied Bandwidth
17.0411 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

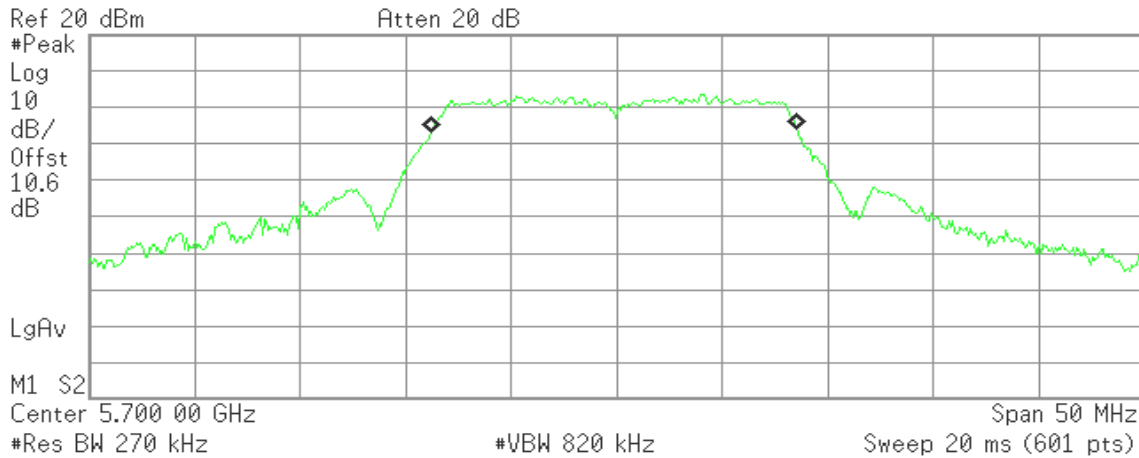
Transmit Freq Error -108.993 kHz
x dB Bandwidth 22.637 MHz



CH High

Agilent 09:45:34 Dec 30, 2011

R T



Occupied Bandwidth
17.2301 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

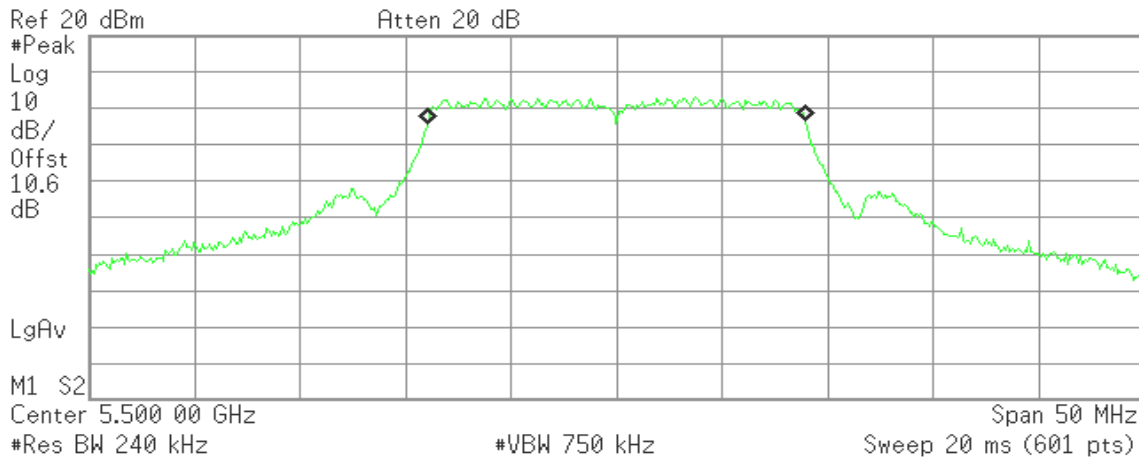
Transmit Freq Error -99.591 kHz
x dB Bandwidth 22.766 MHz

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

CH Low

Agilent 14:41:31 Dec 30, 2011

R T



Occupied Bandwidth
17.7930 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

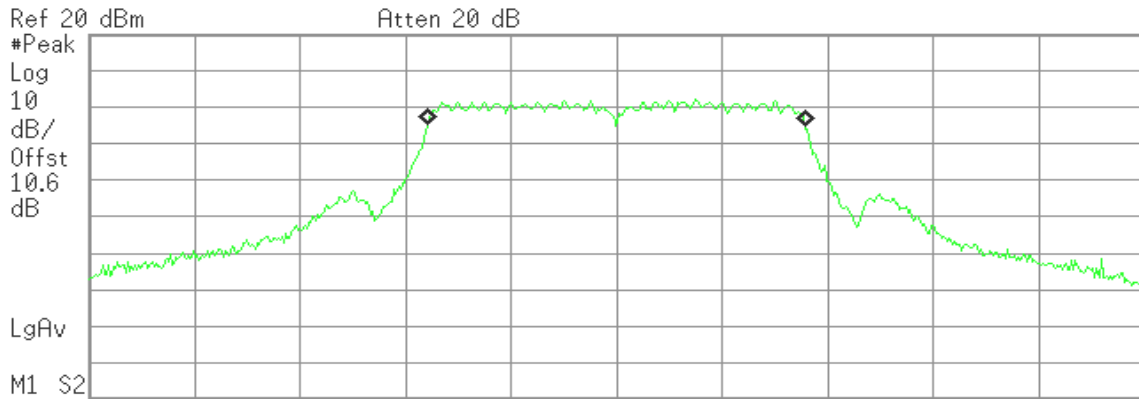
Transmit Freq Error -6.261 kHz
x dB Bandwidth 25.155 MHz



CH Mid

Agilent 14:46:16 Dec 30, 2011

R T



Center 5.580 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 750 kHz Sweep 20 ms (601 pts)

Occupied Bandwidth
17.7871 MHz

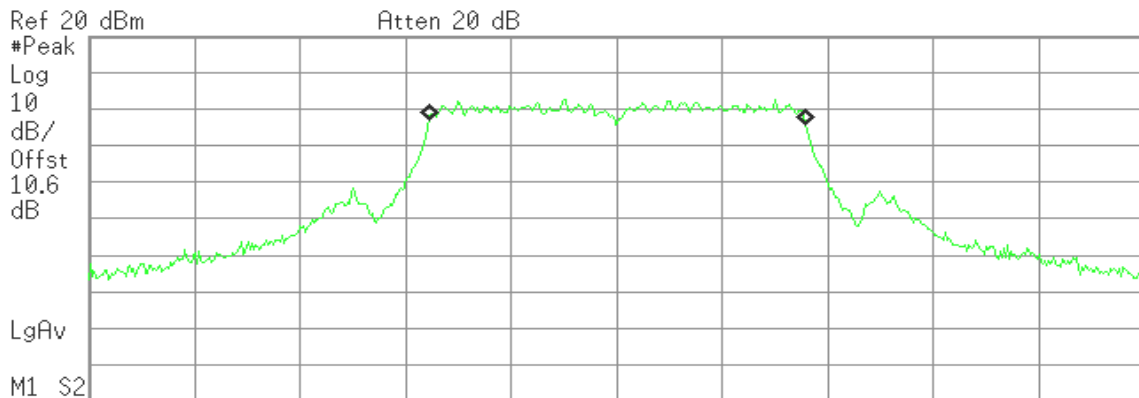
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -5.676 kHz
x dB Bandwidth 25.137 MHz

CH High

Agilent 14:53:42 Dec 30, 2011

R T



Center 5.700 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 750 kHz Sweep 20 ms (601 pts)

Occupied Bandwidth
17.7783 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 32.747 kHz
x dB Bandwidth 25.198 MHz

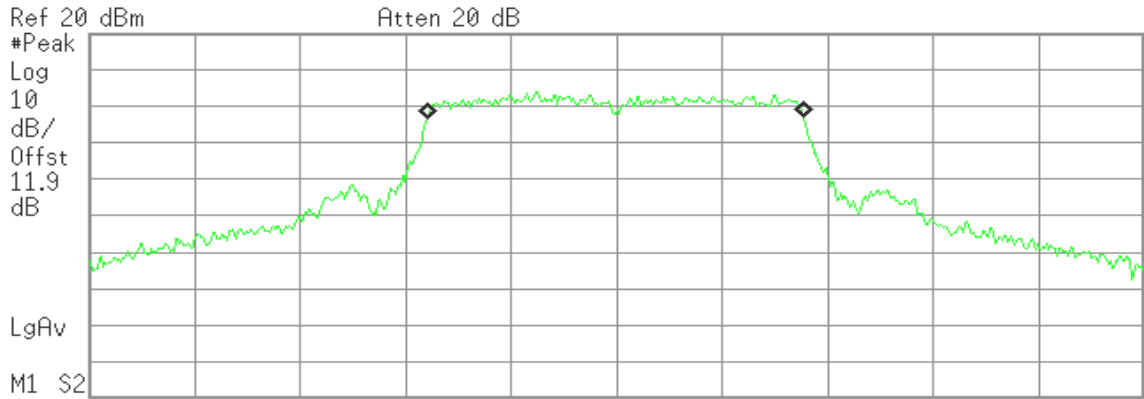


IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low

Agilent 09:48:51 Jan 2, 2012

R T



Center 5.500 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 750 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.7646 MHz

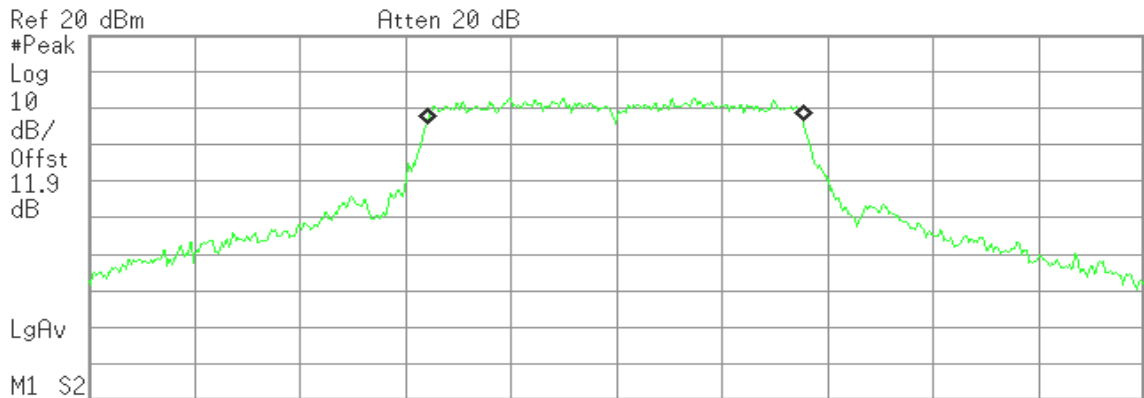
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -58.181 kHz
x dB Bandwidth 23.051 MHz

CH Mid

Agilent 09:56:36 Jan 2, 2012

R T



Center 5.580 00 GHz Span 50 MHz
 #Res BW 240 kHz #VBW 750 kHz Sweep 1 ms (601 pts)

Occupied Bandwidth
17.7584 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

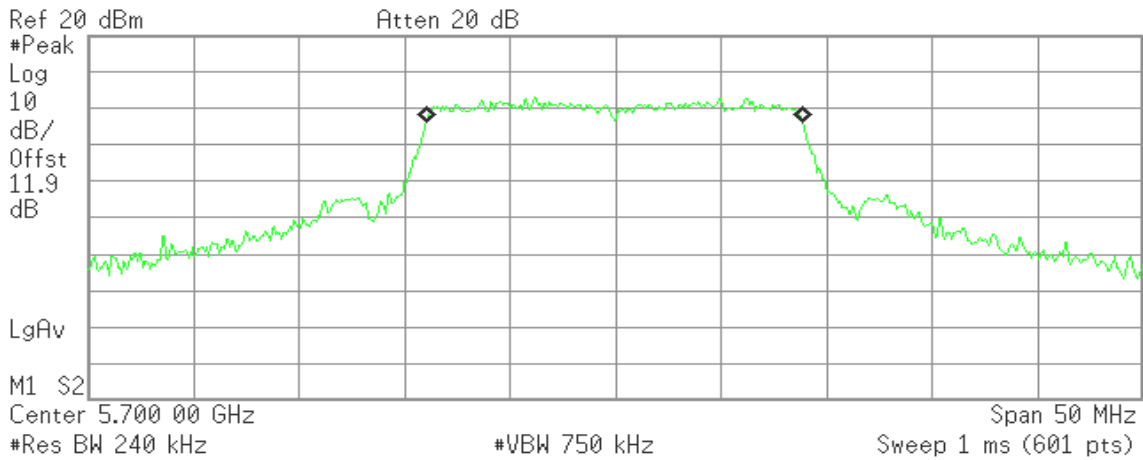
Transmit Freq Error -75.084 kHz
x dB Bandwidth 20.759 MHz



CH High

Agilent 10:06:54 Jan 2, 2012

R T



Occupied Bandwidth
17.7658 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

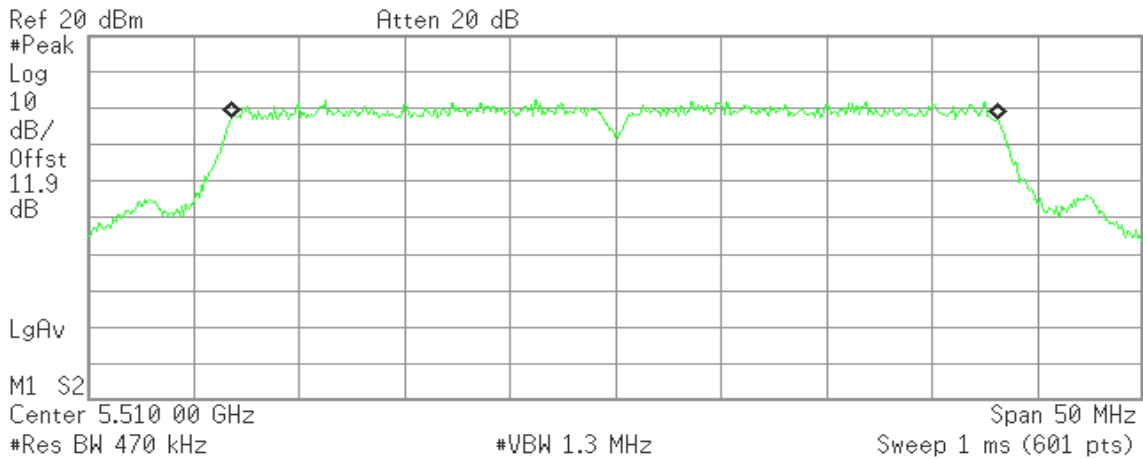
Transmit Freq Error -54.637 kHz
x dB Bandwidth 20.345 MHz

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

CH Low

Agilent 17:02:52 Dec 30, 2011

R T



Occupied Bandwidth
36.2290 MHz

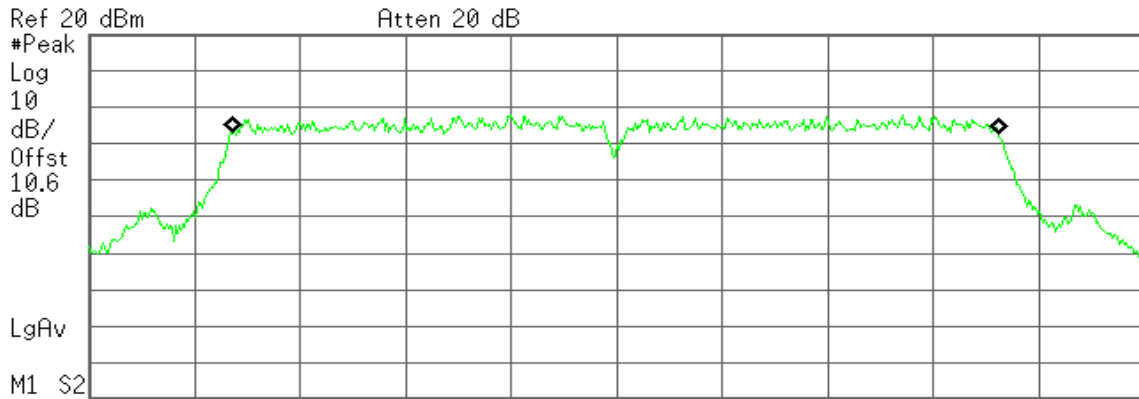
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -44.844 kHz
x dB Bandwidth 39.663 MHz



CH Mid

R T



M1 S2
 Center 5.550 00 GHz Span 50 MHz
 #Res BW 430 kHz #VBW 1.3 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
 36.2308 MHz

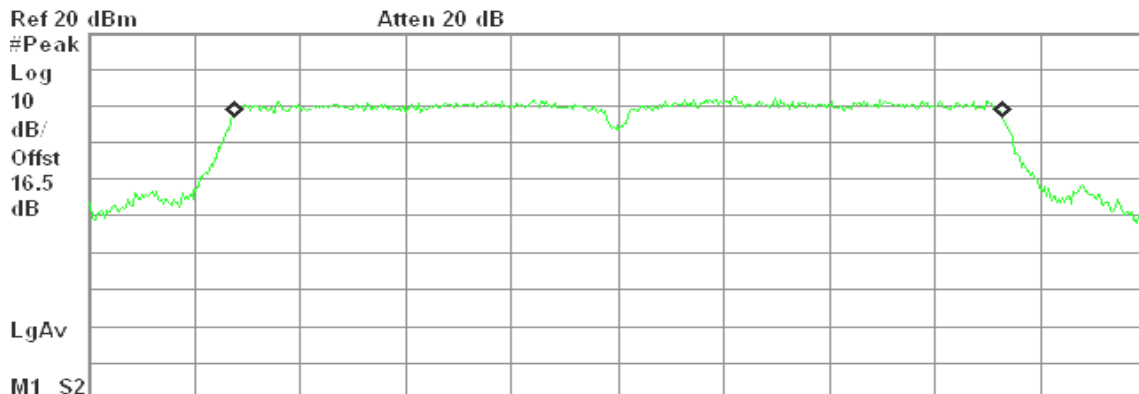
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -64.191 kHz
x dB Bandwidth 44.135 MHz

CH High

* Agilent

R T



M1 S2
 Center 5.670 00 GHz Span 50 MHz
 #Res BW 470 kHz #VBW 1.3 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
 36.2531 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 22.753 kHz
x dB Bandwidth 42.292 MHz

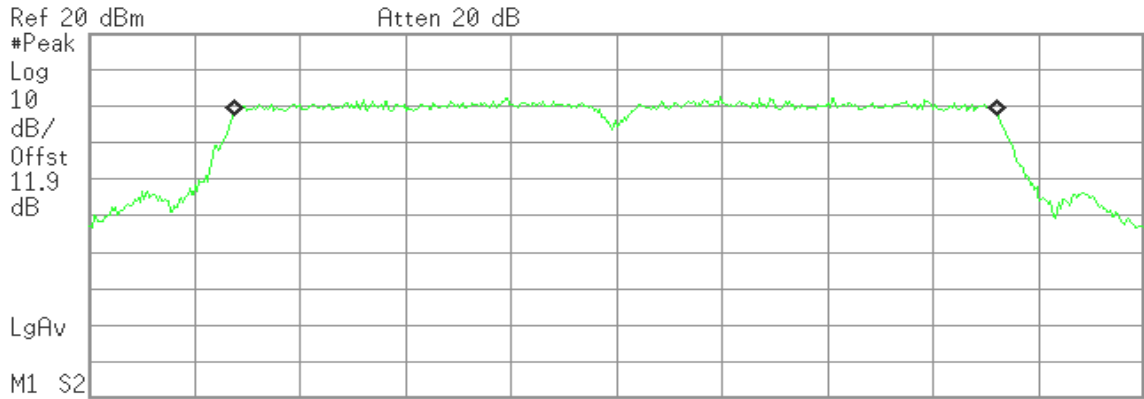


IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

CH Low

Agilent 09:06:46 Jan 2, 2012

R T



Center 5.510 00 GHz Span 50 MHz
 #Res BW 510 kHz #VBW 1.5 MHz Sweep 1 ms (601 pts)

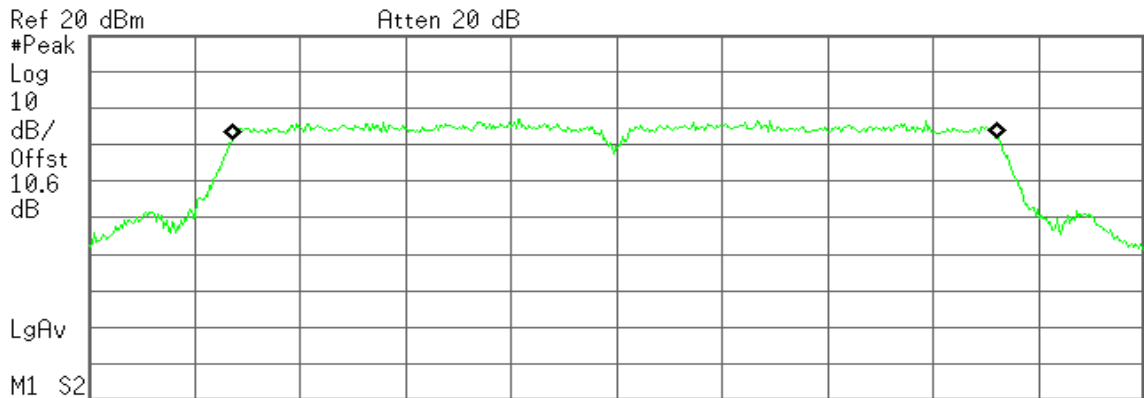
Occupied Bandwidth
36.1539 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -36.822 kHz
x dB Bandwidth 42.466 MHz

CH Mid

R T



Center 5.550 00 GHz Span 50 MHz
 #Res BW 510 kHz #VBW 1.5 MHz Sweep 1 ms (601 pts)

Occupied Bandwidth
36.2060 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

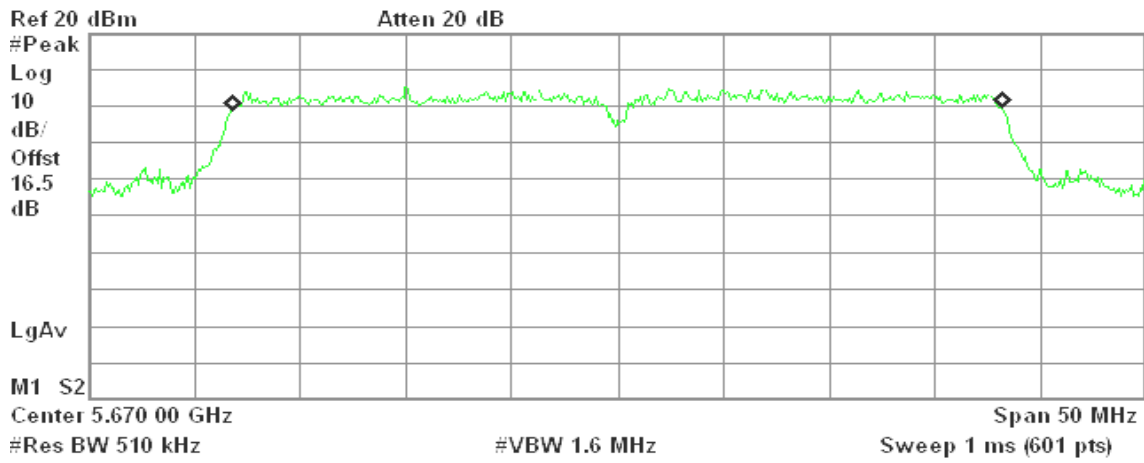
Transmit Freq Error -66.687 kHz
x dB Bandwidth 44.690 MHz



CH High

Agilent

R T



Occupied Bandwidth
36.3318 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -1.930 kHz
x dB Bandwidth 47.801 MHz



7.3 MAXIMUM CONDUCTED OUTPUT POWER

LIMIT

According to §15.407(a),

- (1) For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10\log B$, 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 $11 \text{ dBm} + 10\log B$, 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

IEEE 802.11a Channel mode / 5180 ~ 5240MHz					
Channel	Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Power Limit (dBm)
Low	5180	20.96	13.21	17.21	17.00
Mid	5220	20.98	13.22	17.22	17.00
High	5240	20.88	13.20	17.20	17.00

IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Power Limit (dBm)
Low	5180	25.08	20.37	13.99	17.99	17.00
Mid	5220	25.13	23.19	14.00	18.00	17.00
High	5240	25.16	23.06	14.01	18.01	17.00

IEEE 802.11n HT 40 MHz Channel mode / 5190 ~ 5230MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	4 + 10 Log B (dBm)	Power Limit (dBm)
Low	5190	39.61	42.00	16.23	20.23	17.00
High	5230	41.75	39.93	16.21	20.21	17.00



IEEE 802.11a MHz Channel mode / 5260 ~ 5320MHz					
Channel	Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5260	22.69	13.56	24.56	24.00
Mid	5280	22.61	13.54	24.54	24.00
High	5320	22.64	13.55	24.55	24.00

IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5260	23.01	21.01	13.62	24.62	24.00
Mid	5280	25.18	22.63	14.01	25.01	24.00
High	5320	25.16	21.39	14.01	25.01	24.00

IEEE 802.11n HT 40 MHz Channel mode / 5270 ~ 5310MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5270	41.81	44.01	16.44	27.44	24.00
High	5310	42.19	42.30	16.26	27.26	24.00



IEEE 802.11a MHz Channel mode / 5500~5700MHz					
Channel	Frequency (MHz)	26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5500	22.78	13.57	24.57	24.00
Mid	5580	22.64	13.55	24.55	24.00
High	5700	22.77	13.57	24.57	24.00

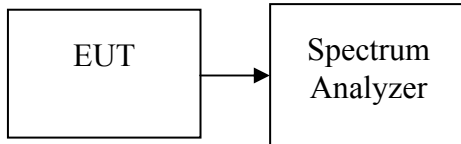
IEEE 802.11n HT 20 MHz Channel mode / 5500~5700MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5500	25.16	23.05	14.01	25.01	24.00
Mid	5580	25.14	20.76	14.00	25.00	24.00
High	5700	25.20	20.35	14.01	25.01	24.00

IEEE 802.11n HT 40 MHz Channel mode / 5510 ~ 5670MHz						
Channel	Frequency (MHz)	Chain 0 26dB Bandwidth (B) (MHz)	Chain 1 26dB Bandwidth (B) (MHz)	10 Log B (dB)	11 + 10 Log B (dBm)	Power Limit (dBm)
Low	5510	39.66	42.47	16.28	27.28	24.00
Mid	5550	44.14	44.69	16.50	27.50	24.00
High	5670	42.29	47.80	16.79	27.79	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.

Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times

TEST RESULTS

No non-compliance noted

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

Channel	Frequency (MHz)	Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Result
Low	5180	7.71	7.98	17.00	PASS
Mid	5220	7.73	8.00	17.00	PASS
High	5240	8.35	8.62	17.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5180	5.26	5.97	5.98	6.69	9.35	17.00	PASS
Mid	5220	5.53	6.24	5.30	6.01	9.13	17.00	PASS
High	5240	5.26	5.97	6.88	7.59	9.86	17.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5190	7.24	8.49	7.13	8.38	11.45	17.00	PASS
High	5230	7.67	8.92	7.28	8.53	11.74	17.00	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)

2. 10 log (1/x)=**, x=Duty cycle(**%)

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

Channel	Frequency (MHz)	Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Result
Low	5260	12.70	12.97	24.00	PASS
Mid	5280	12.27	12.54	24.00	PASS
High	5320	12.84	13.11	24.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5260	11.53	12.24	13.20	13.91	16.16	24.00	PASS
Mid	5280	11.33	12.04	12.11	12.82	15.45	24.00	PASS
High	5320	12.33	13.04	12.65	13.36	16.21	24.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5270	11.05	12.30	10.27	11.52	14.94	24.00	PASS
High	5310	10.55	11.80	9.76	11.01	14.43	24.00	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)

2. 10 log (1/x)=**, x=Duty cycle(**%)

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

Channel	Frequency (MHz)	Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Result
Low	5500	11.86	12.13	24.00	PASS
Mid	5580	11.30	11.57	24.00	PASS
High	5700	12.04	12.31	24.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5500	11.73	12.44	13.62	14.33	16.49	24.00	PASS
Mid	5580	11.35	12.06	12.58	13.29	15.72	24.00	PASS
High	5700	10.64	11.35	11.68	12.39	14.91	24.00	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Result
		Output Power (dBm)	Maximum Output Power (dBm)	Output Power (dBm)	Maximum Output Power (dBm)	Maximum Output Power (dBm)		
Low	5510	11.44	12.69	14.05	15.30	17.20	24.00	PASS
Mid	5550	9.36	10.61	10.69	11.94	14.34	24.00	PASS
High	5670	13.63	14.88	16.06	17.31	19.27	24.00	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)

2. $10 \log (1/x)=***, x=Duty\ cycle(***)\%$



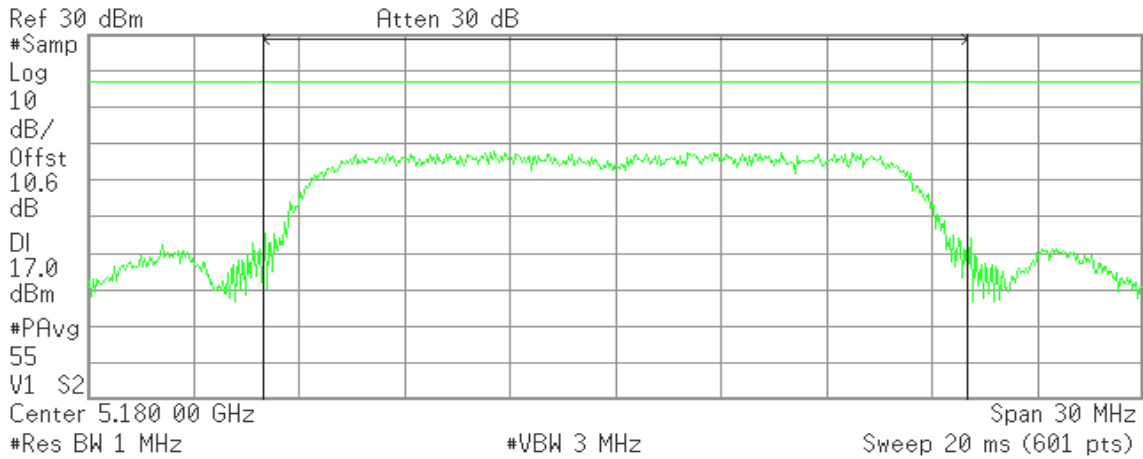
Test Plot

IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low

Agilent 08:49:04 Dec 30, 2011

R T



Channel Power

7.71 dBm /20.0000 MHz

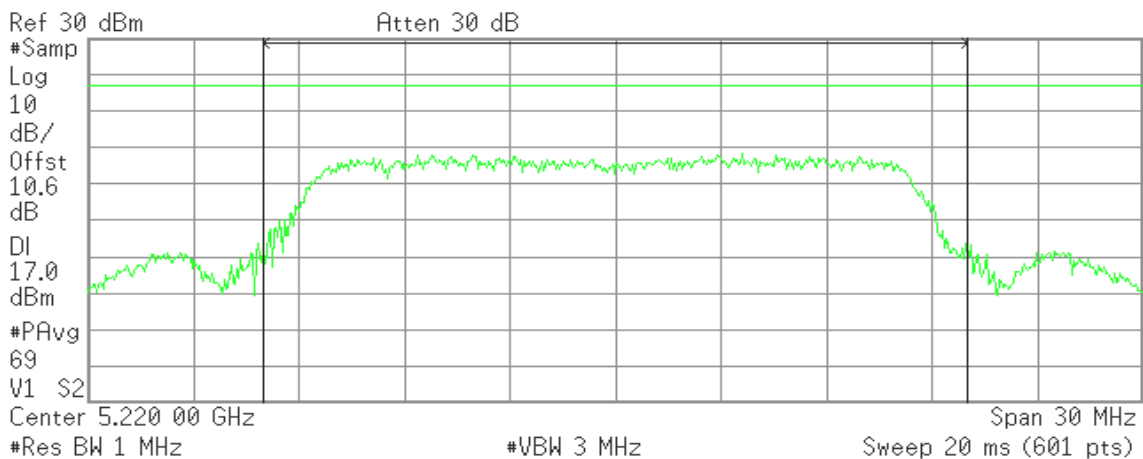
Power Spectral Density

-65.30 dBm/Hz

CH Mid

Agilent 08:55:13 Dec 30, 2011

R T



Channel Power

7.73 dBm /20.0000 MHz

Power Spectral Density

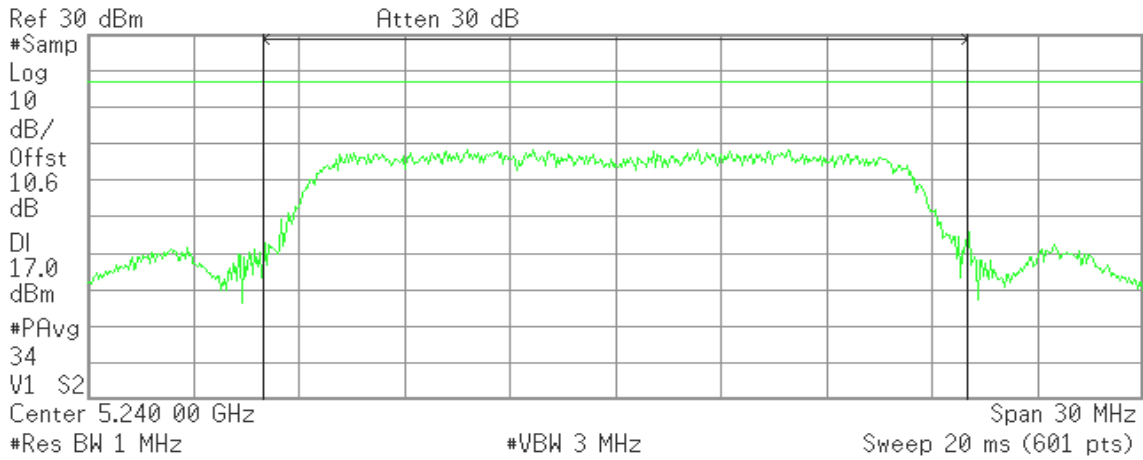
-65.28 dBm/Hz



CH High

Agilent 08:59:50 Dec 30, 2011

R T



Channel Power

8.35 dBm /20.0000 MHz

Power Spectral Density

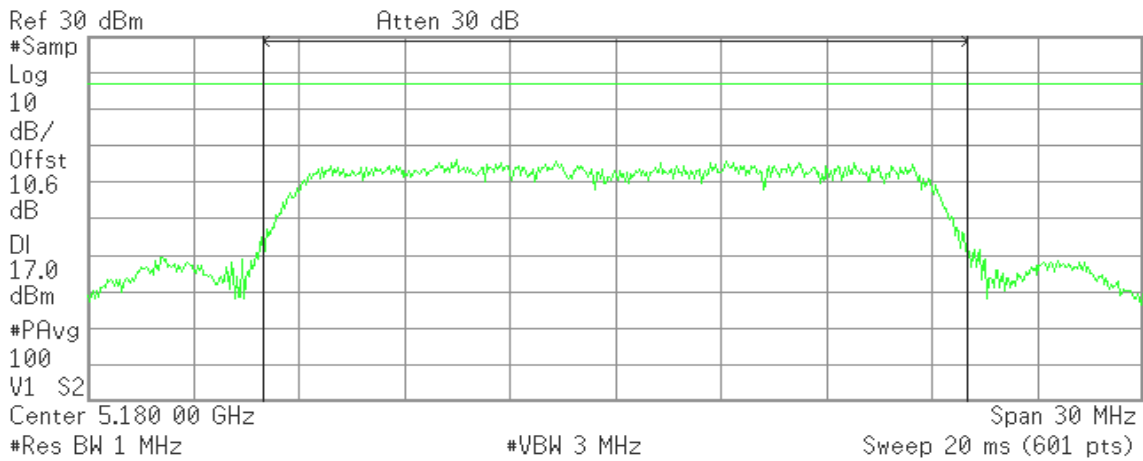
-64.66 dBm/Hz

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

CH Low

Agilent 13:56:34 Dec 30, 2011

R T



Channel Power

5.26 dBm /20.0000 MHz

Power Spectral Density

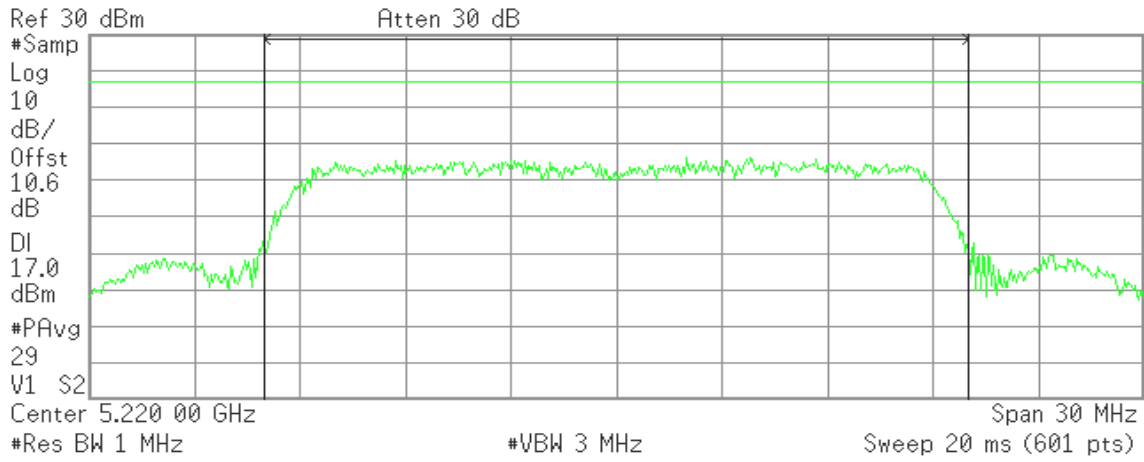
-67.75 dBm/Hz



CH Mid

Agilent 14:05:10 Dec 30, 2011

R T



Channel Power

5.53 dBm /20.0000 MHz

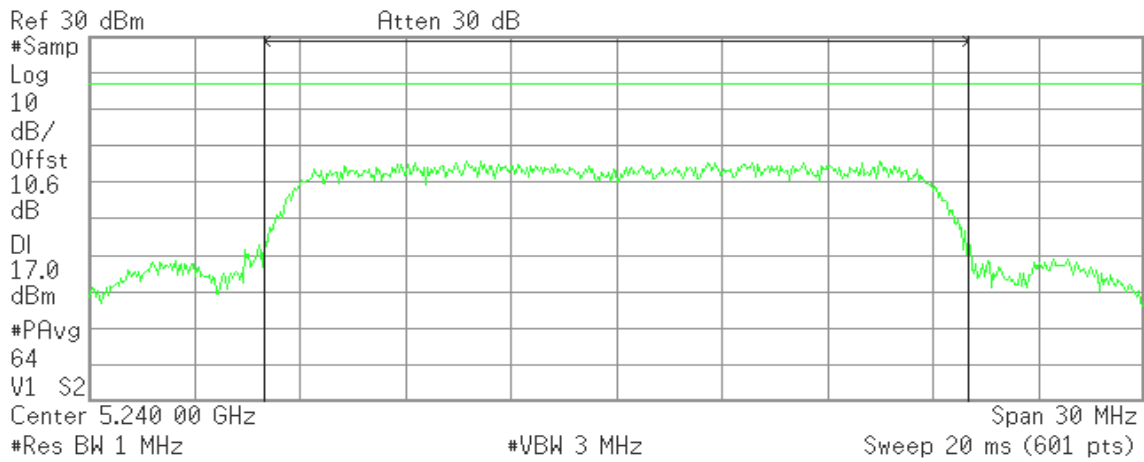
Power Spectral Density

-67.48 dBm/Hz

CH High

Agilent 14:09:17 Dec 30, 2011

R T



Channel Power

5.26 dBm /20.0000 MHz

Power Spectral Density

-67.75 dBm/Hz

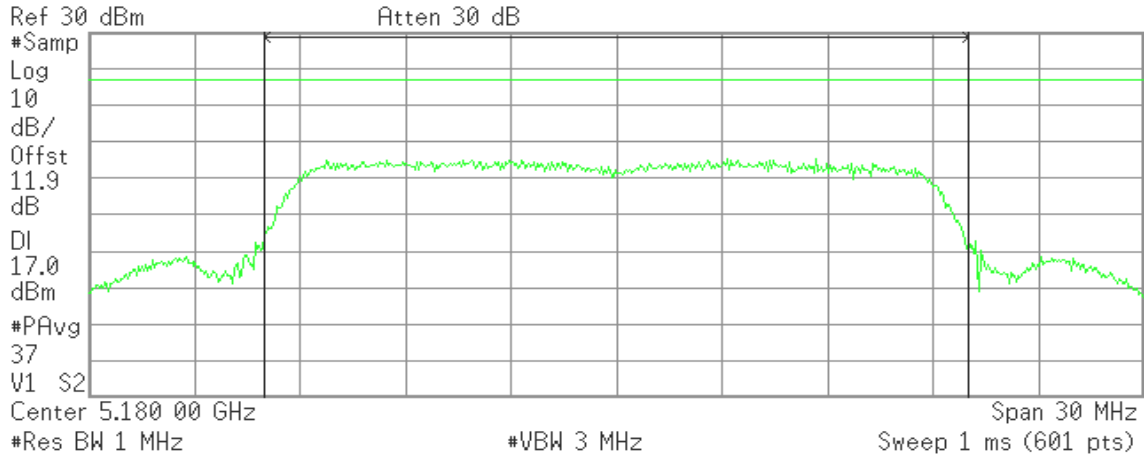


IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent 09:22:52 Jan 2, 2012

R T



Channel Power

5.98 dBm /20.0000 MHz

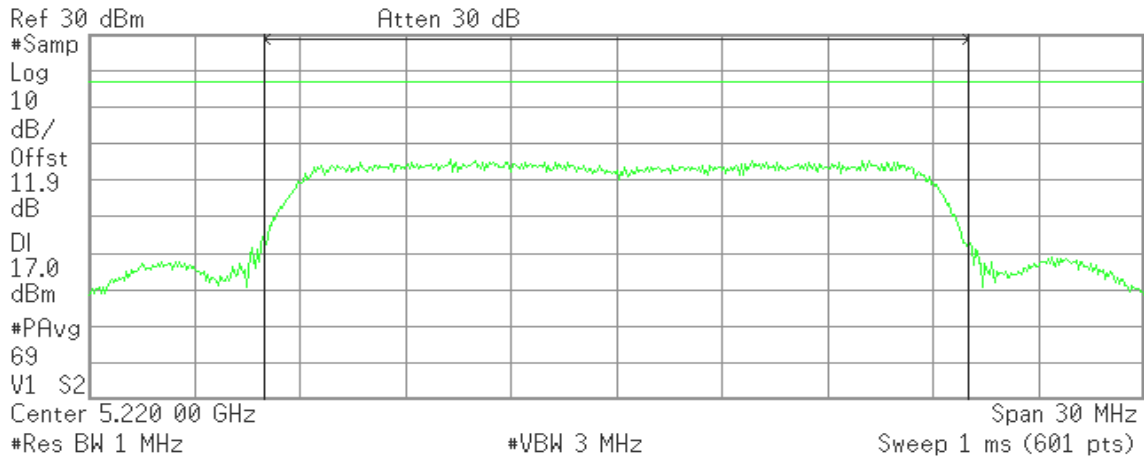
Power Spectral Density

-67.03 dBm/Hz

CH Mid

Agilent 09:27:21 Jan 2, 2012

R T



Channel Power

5.30 dBm /20.0000 MHz

Power Spectral Density

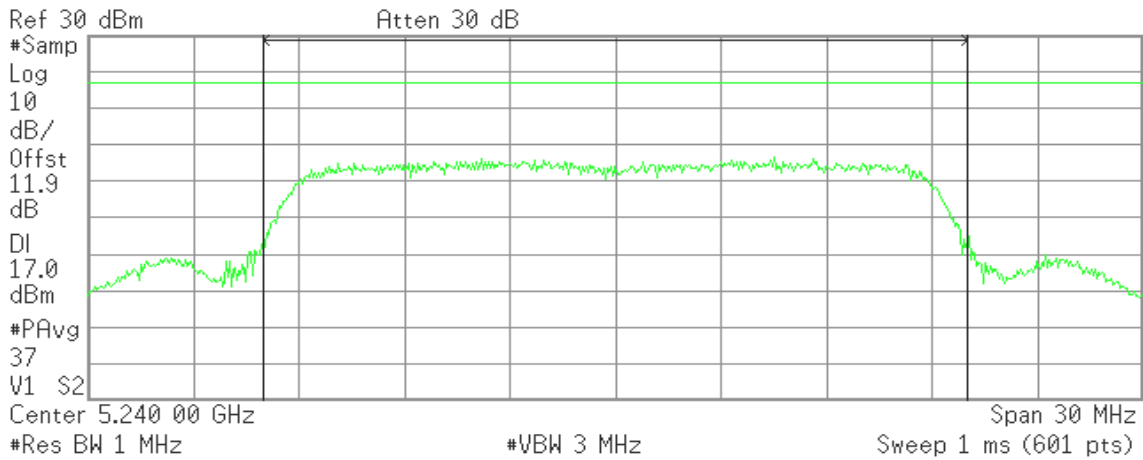
-67.71 dBm/Hz



CH High

Agilent 09:30:30 Jan 2, 2012

R T



Channel Power

6.88 dBm /20.0000 MHz

Power Spectral Density

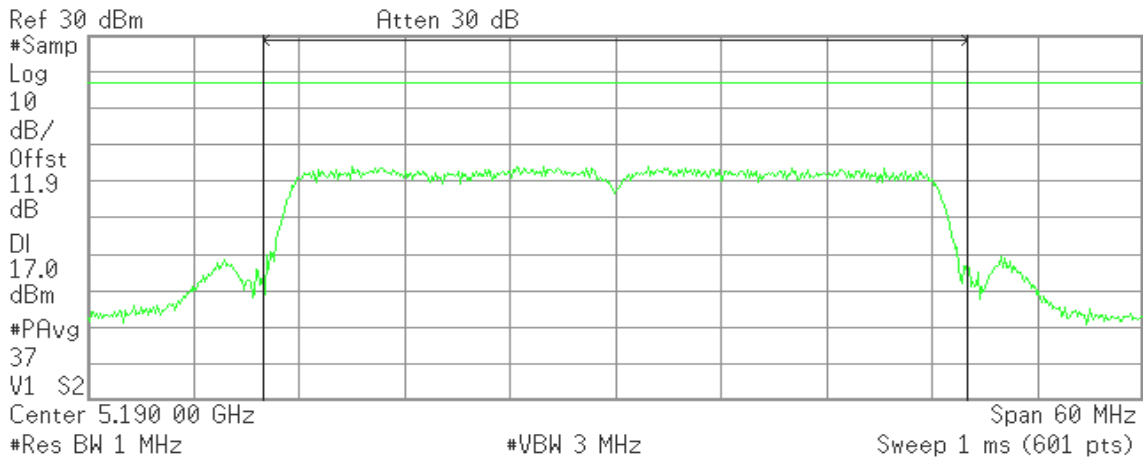
-66.13 dBm/Hz

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

CH Low

Agilent 16:39:27 Dec 30, 2011

R T



Channel Power

7.24 dBm /40.0000 MHz

Power Spectral Density

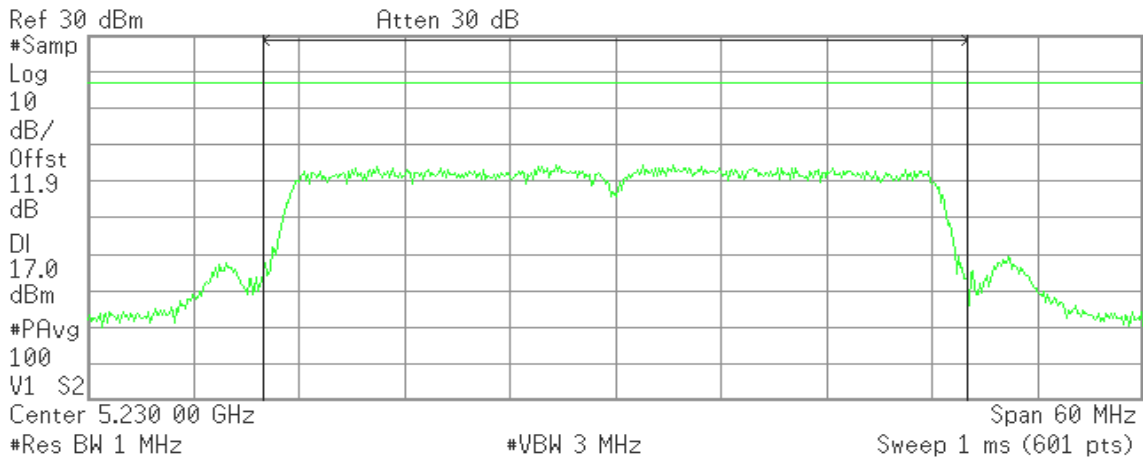
-68.78 dBm/Hz



CH High

Agilent 16:44:48 Dec 30, 2011

R T



Channel Power

7.67 dBm /40.00000 MHz

Power Spectral Density

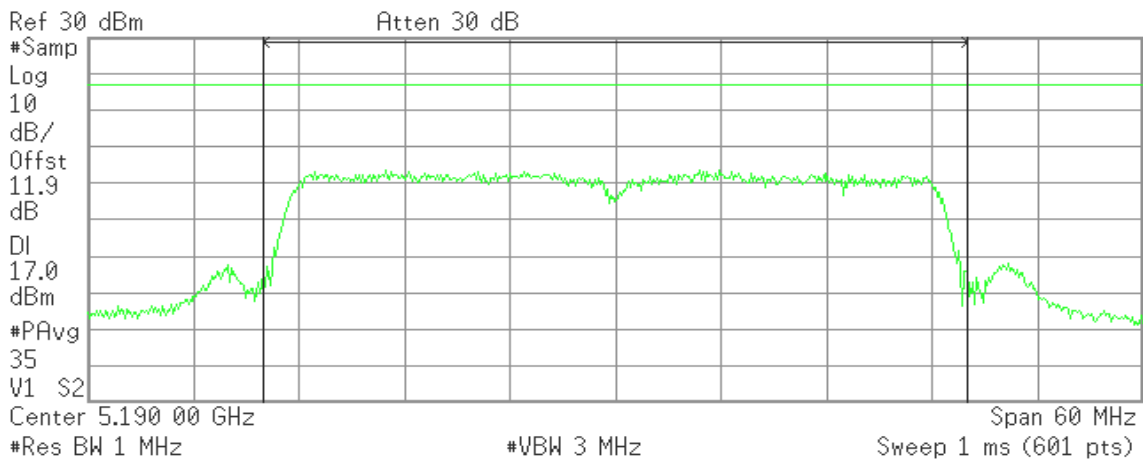
-68.35 dBm/Hz

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

CH Low

Agilent 17:11:38 Dec 30, 2011

R T



Channel Power

7.13 dBm /40.00000 MHz

Power Spectral Density

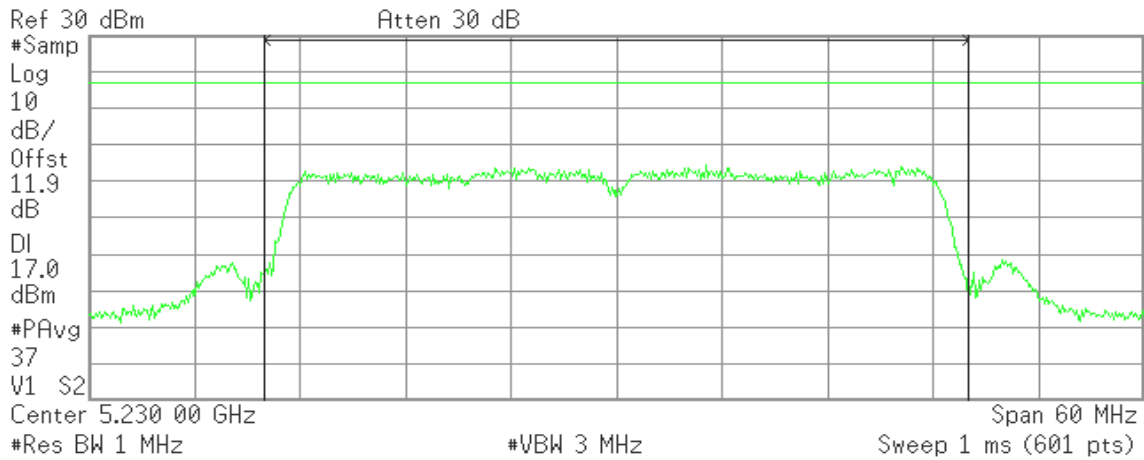
-68.89 dBm/Hz



CH High

Agilent 17:14:54 Dec 30, 2011

R T



Channel Power

7.28 dBm /40.0000 MHz

Power Spectral Density

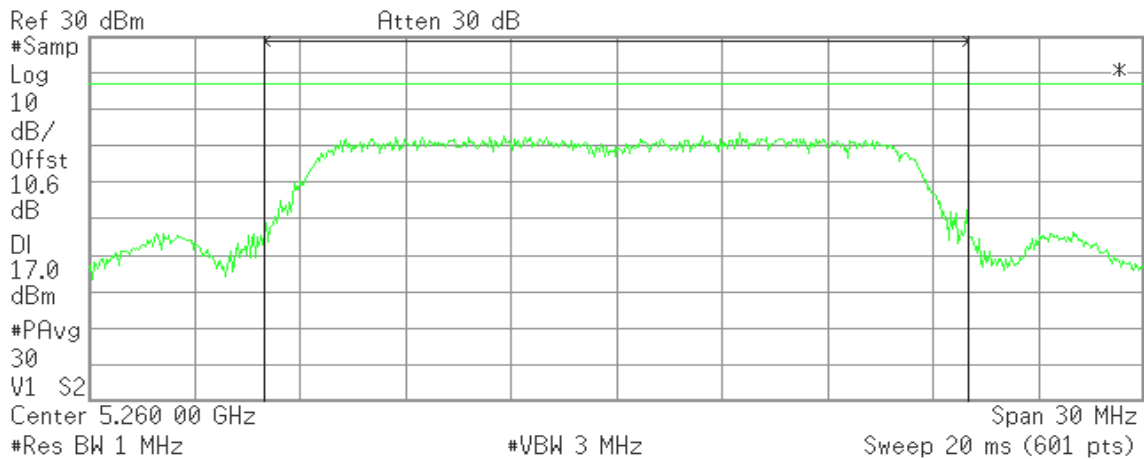
-68.74 dBm/Hz

IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low

Agilent 09:06:39 Dec 30, 2011

R T



Channel Power

12.70 dBm /20.0000 MHz

Power Spectral Density

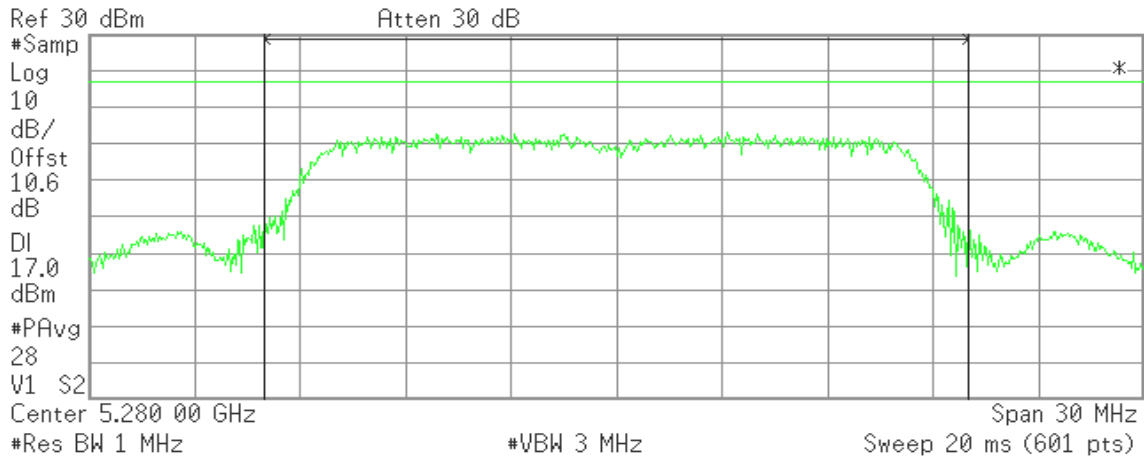
-60.31 dBm/Hz



CH Mid

Agilent 09:10:13 Dec 30, 2011

R T



Channel Power

12.27 dBm /20.0000 MHz

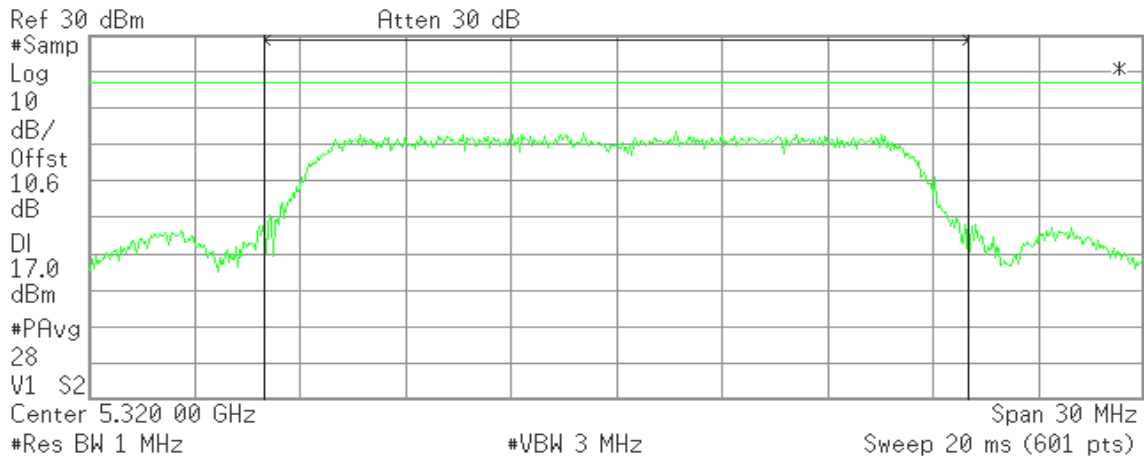
Power Spectral Density

-60.75 dBm/Hz

CH High

Agilent 09:13:53 Dec 30, 2011

R T



Channel Power

12.84 dBm /20.0000 MHz

Power Spectral Density

-60.17 dBm/Hz

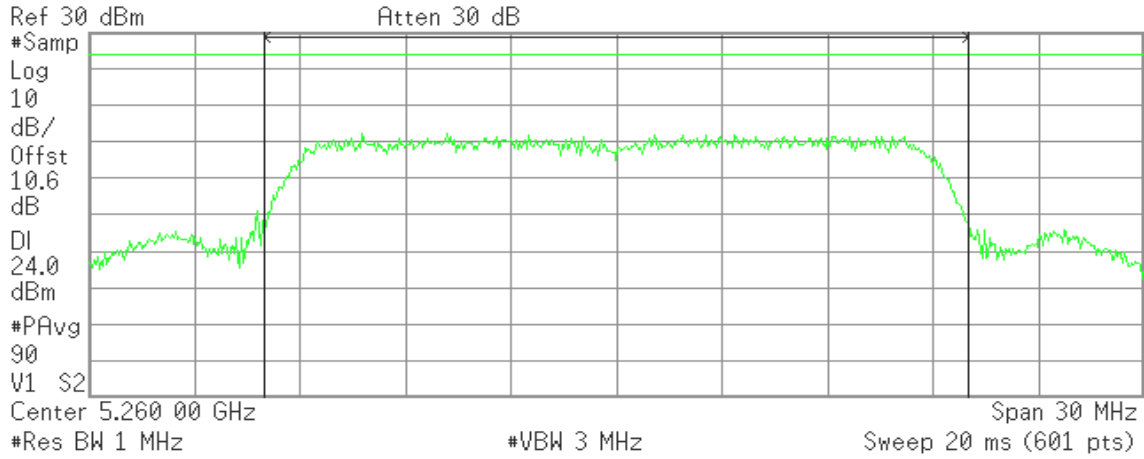


IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low

Agilent 14:16:11 Dec 30, 2011

R T



Channel Power

11.53 dBm /20.0000 MHz

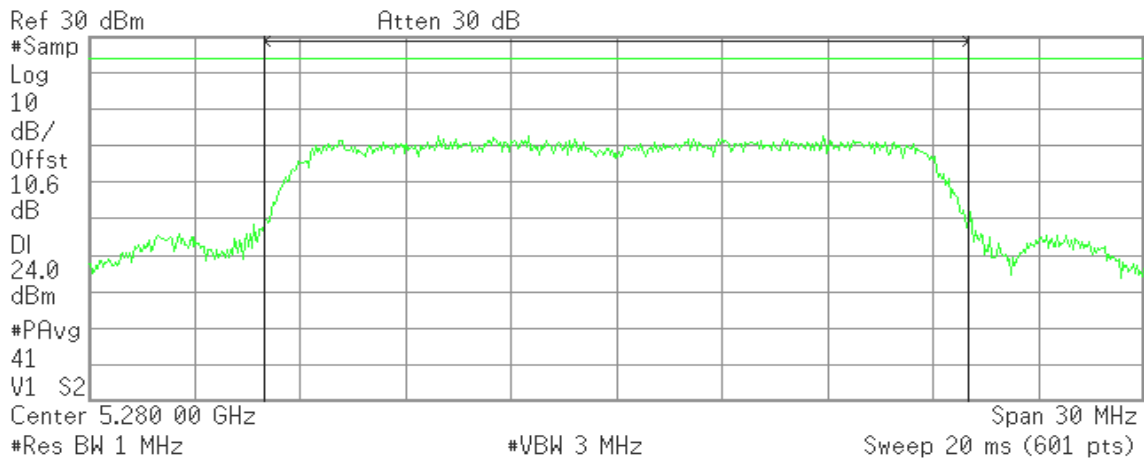
Power Spectral Density

-61.48 dBm/Hz

CH Mid

Agilent 14:22:02 Dec 30, 2011

R T



Channel Power

11.33 dBm /20.0000 MHz

Power Spectral Density

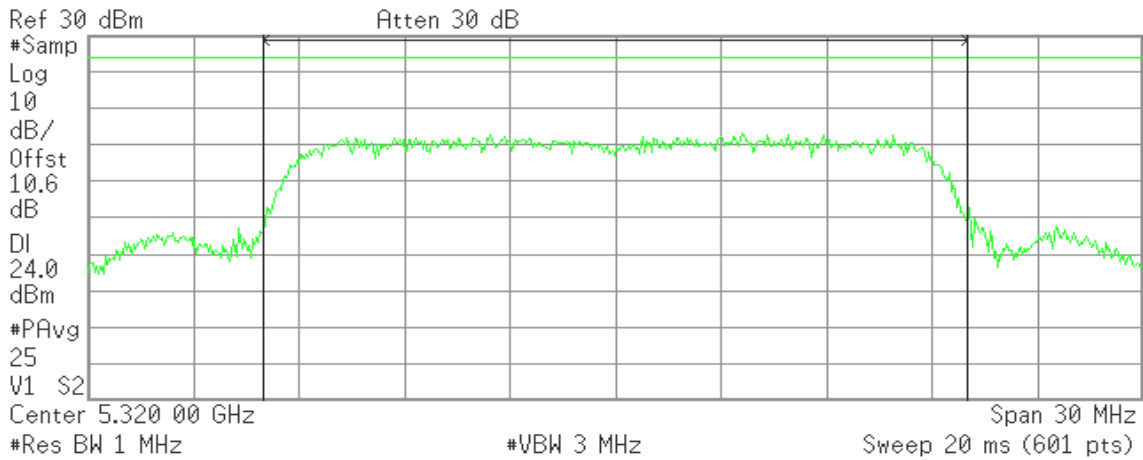
-61.68 dBm/Hz



CH High

Agilent 14:31:33 Dec 30, 2011

R T



Channel Power

12.33 dBm /20.0000 MHz

Power Spectral Density

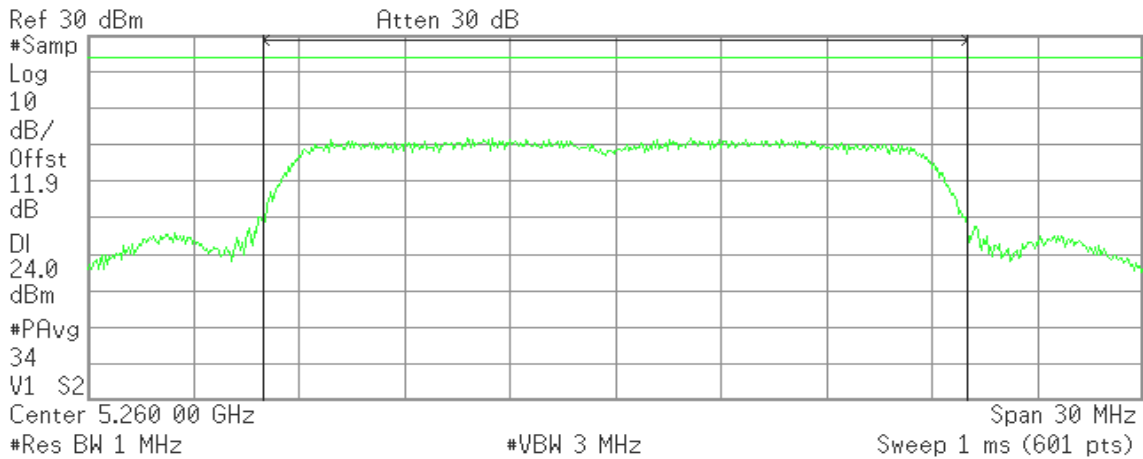
-60.68 dBm/Hz

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

CH Low

Agilent 09:36:36 Jan 2, 2012

R T



Channel Power

13.20 dBm /20.0000 MHz

Power Spectral Density

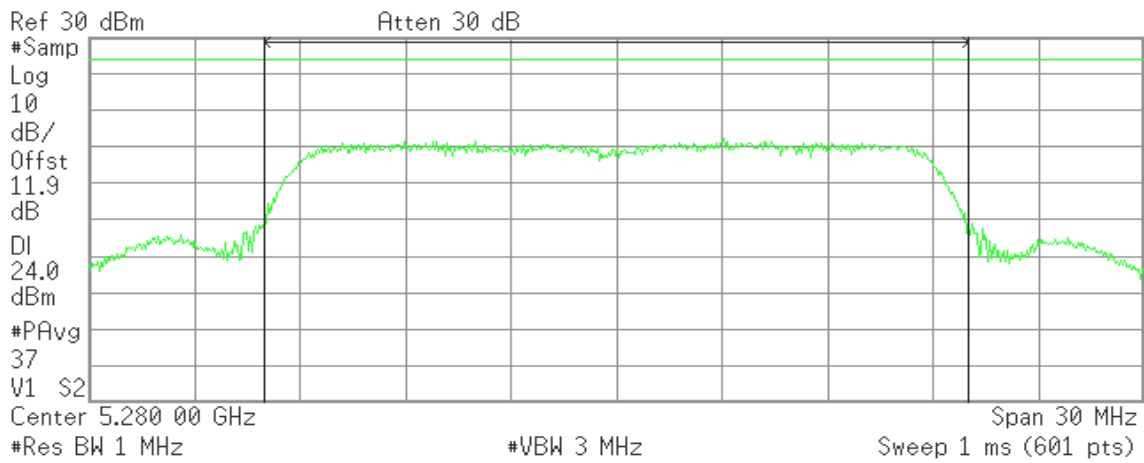
-59.81 dBm/Hz



CH Mid

Agilent 09:41:06 Jan 2, 2012

R T



Channel Power

12.11 dBm /20.0000 MHz

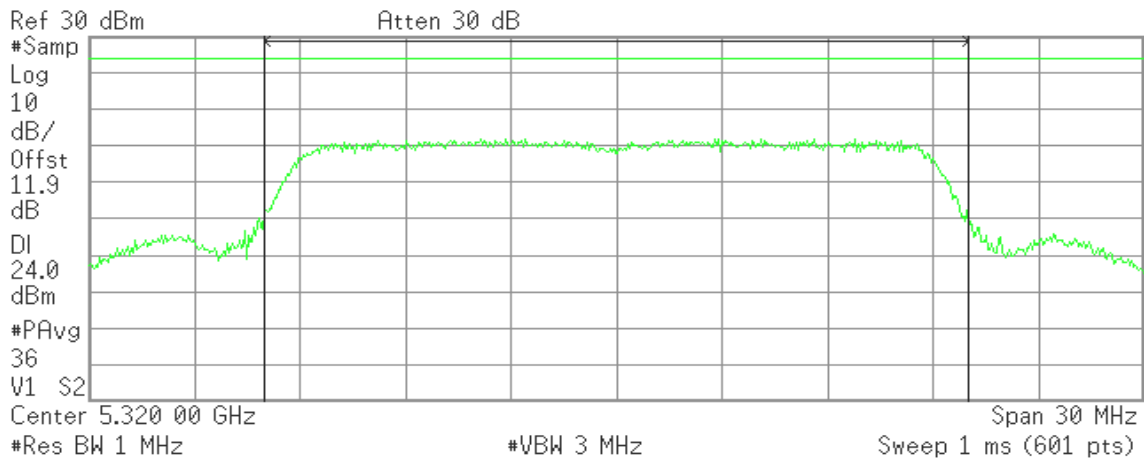
Power Spectral Density

-60.90 dBm/Hz

CH High

Agilent 09:44:14 Jan 2, 2012

R T



Channel Power

12.65 dBm /20.0000 MHz

Power Spectral Density

-60.36 dBm/Hz

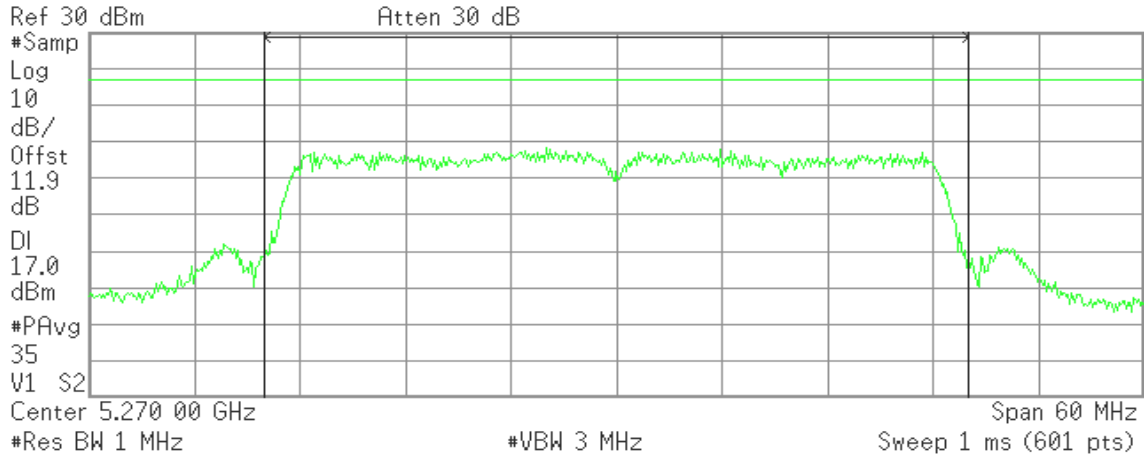


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low

Agilent 16:50:56 Dec 30, 2011

R T



Channel Power

11.05 dBm /40.0000 MHz

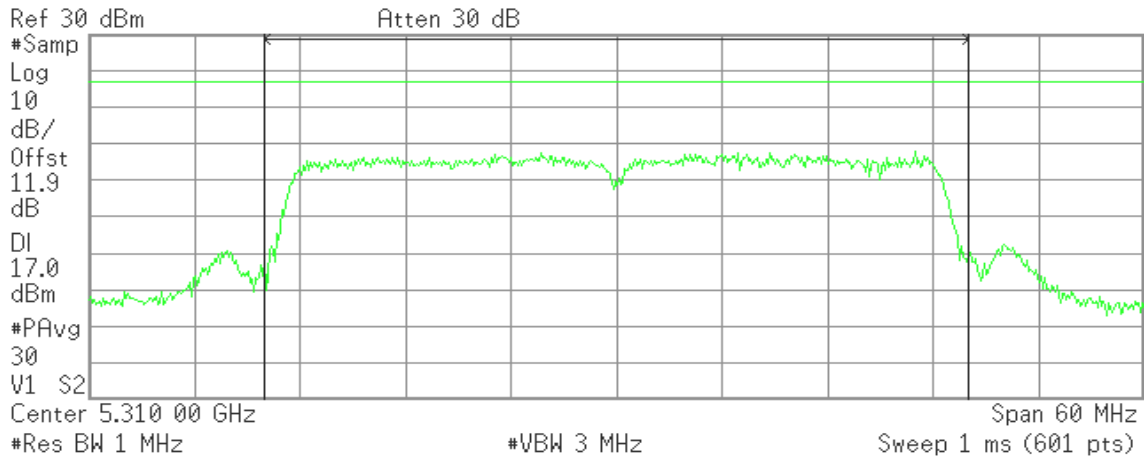
Power Spectral Density

-64.97 dBm/Hz

CH High

Agilent 16:56:56 Dec 30, 2011

R T



Channel Power

10.55 dBm /40.0000 MHz

Power Spectral Density

-65.47 dBm/Hz

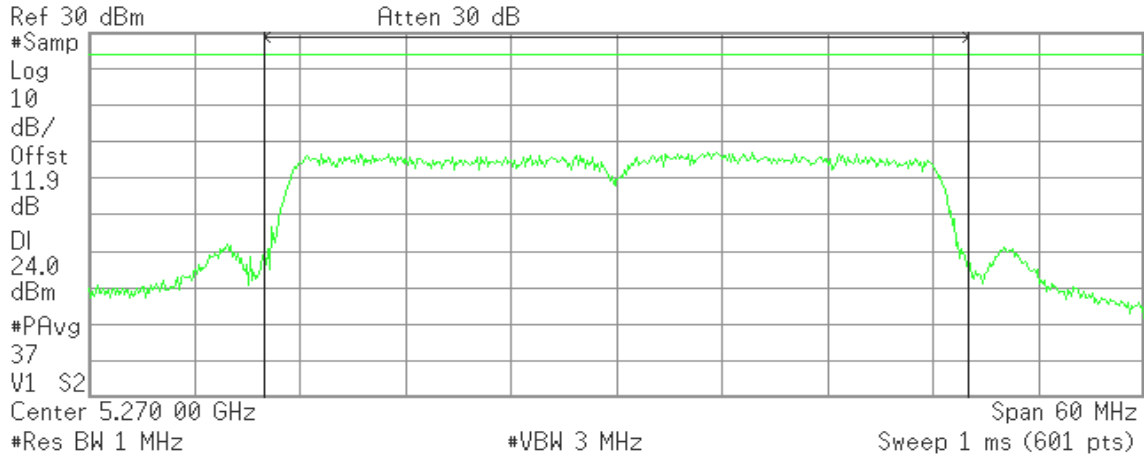


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low

Agilent 17:18:28 Dec 30, 2011

R T



Channel Power

10.27 dBm /40.0000 MHz

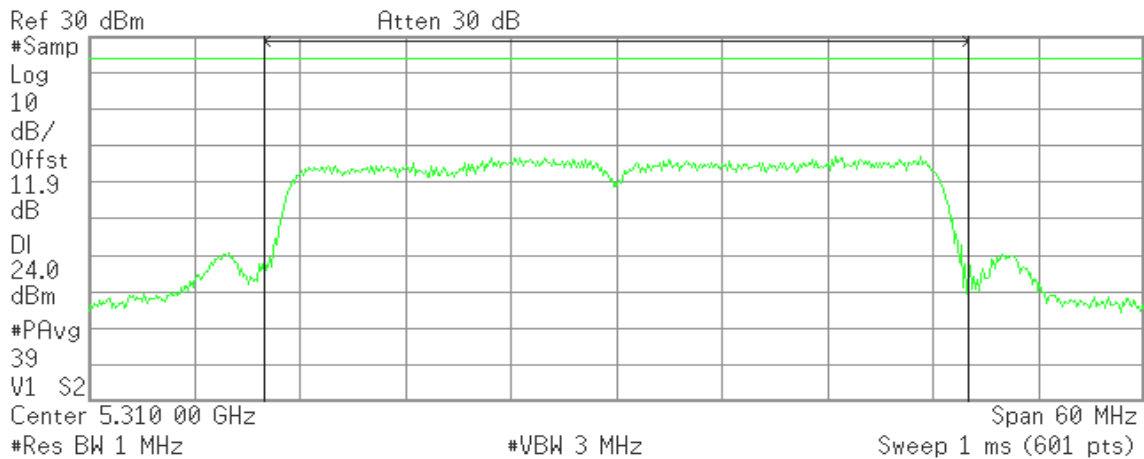
Power Spectral Density

-65.75 dBm/Hz

CH High

Agilent 09:01:58 Jan 2, 2012

R T



Channel Power

9.76 dBm /40.0000 MHz

Power Spectral Density

-66.26 dBm/Hz

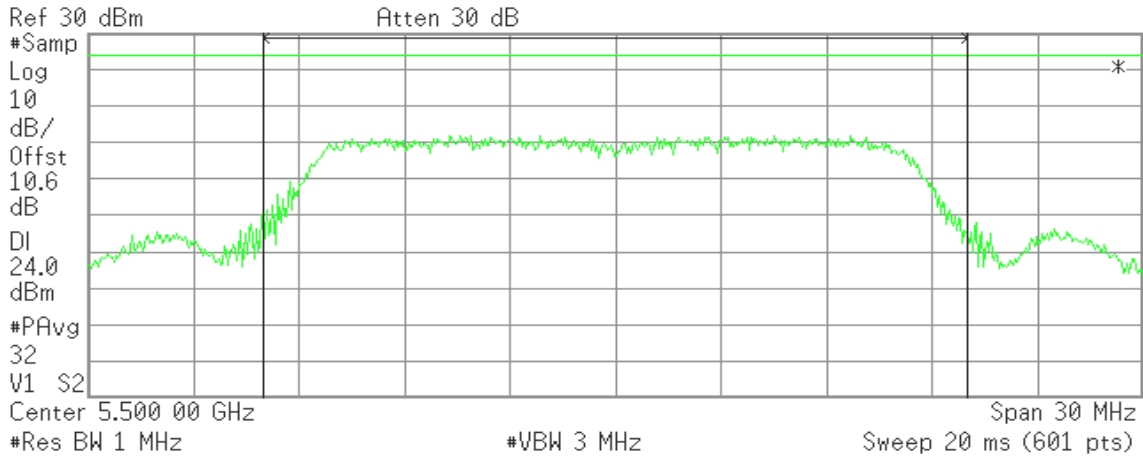


Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low

Agilent 09:38:46 Dec 30, 2011

R T



Channel Power

11.86 dBm /20.0000 MHz

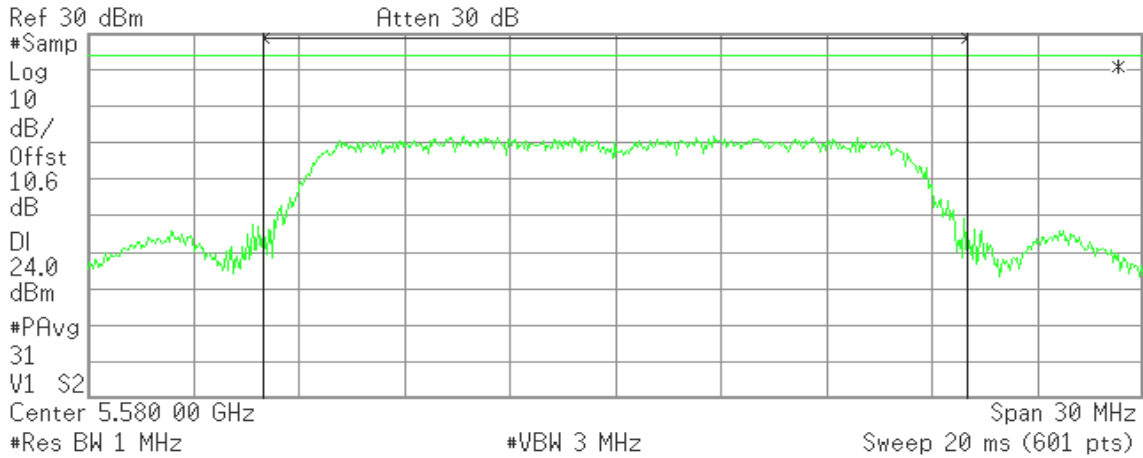
Power Spectral Density

-61.15 dBm/Hz

CH Mid

Agilent 09:42:54 Dec 30, 2011

R T



Channel Power

11.30 dBm /20.0000 MHz

Power Spectral Density

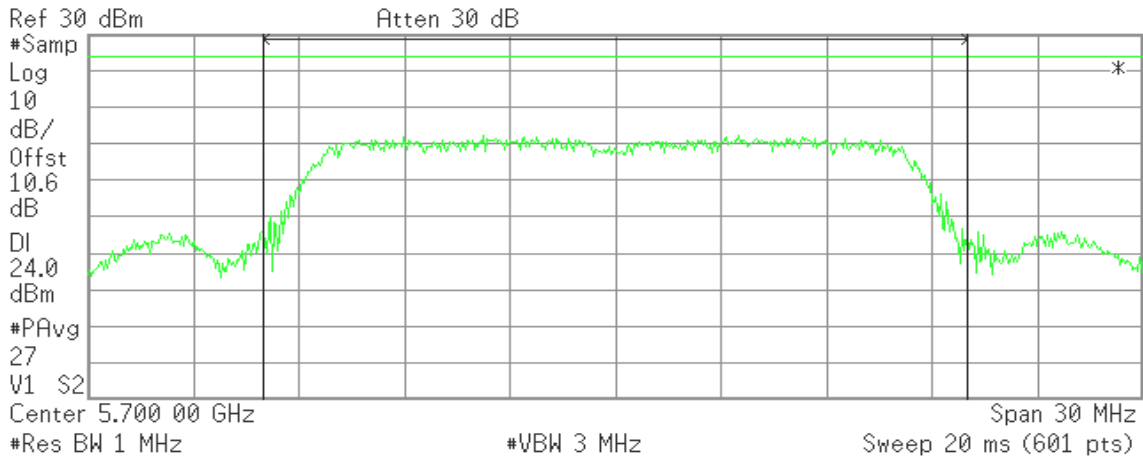
-61.71 dBm/Hz



CH High

Agilent 09:46:05 Dec 30, 2011

R T



Channel Power

12.04 dBm /20.0000 MHz

Power Spectral Density

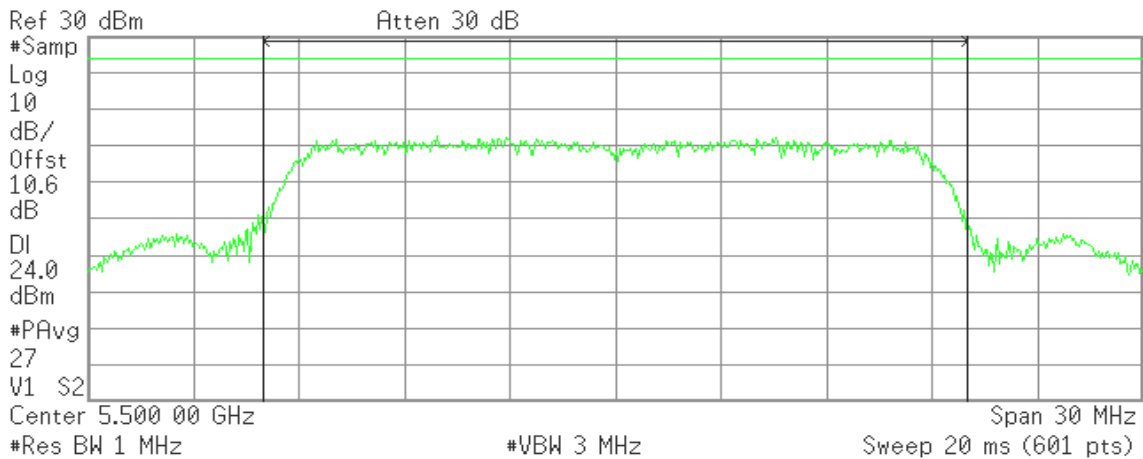
-60.97 dBm/Hz

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

CH Low

Agilent 14:41:56 Dec 30, 2011

R T



Channel Power

11.73 dBm /20.0000 MHz

Power Spectral Density

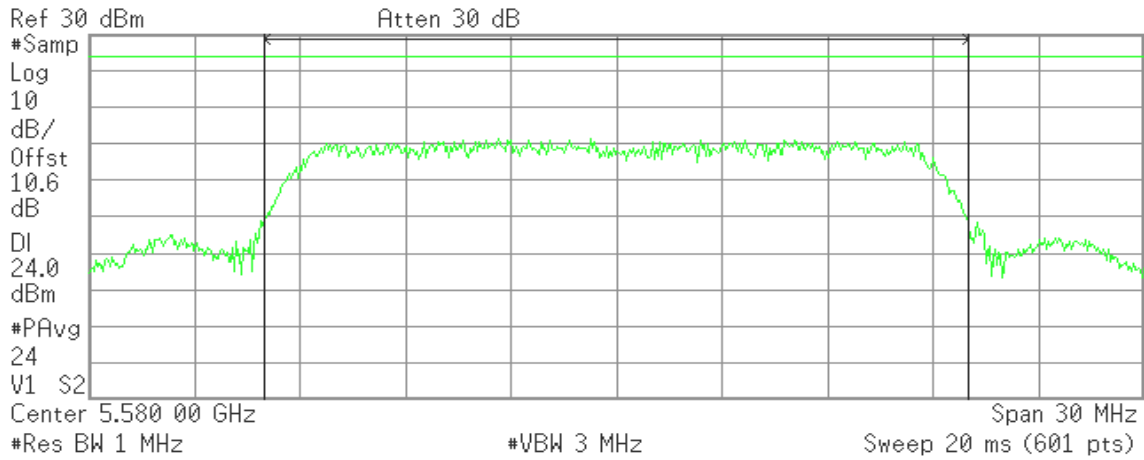
-61.28 dBm/Hz



CH Mid

Agilent 14:46:40 Dec 30, 2011

R T



Channel Power

11.35 dBm /20.0000 MHz

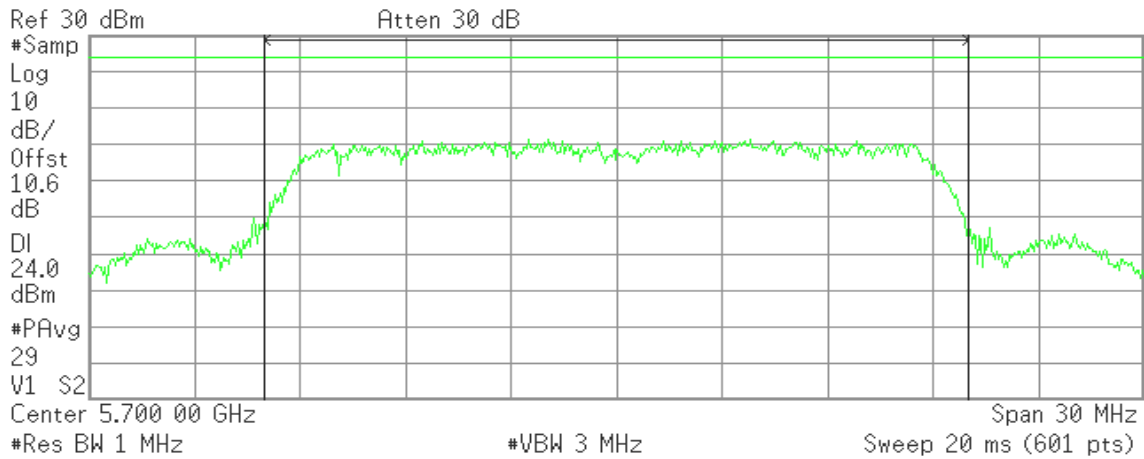
Power Spectral Density

-61.66 dBm/Hz

CH High

Agilent 14:54:08 Dec 30, 2011

R T



Channel Power

10.64 dBm /20.0000 MHz

Power Spectral Density

-62.37 dBm/Hz

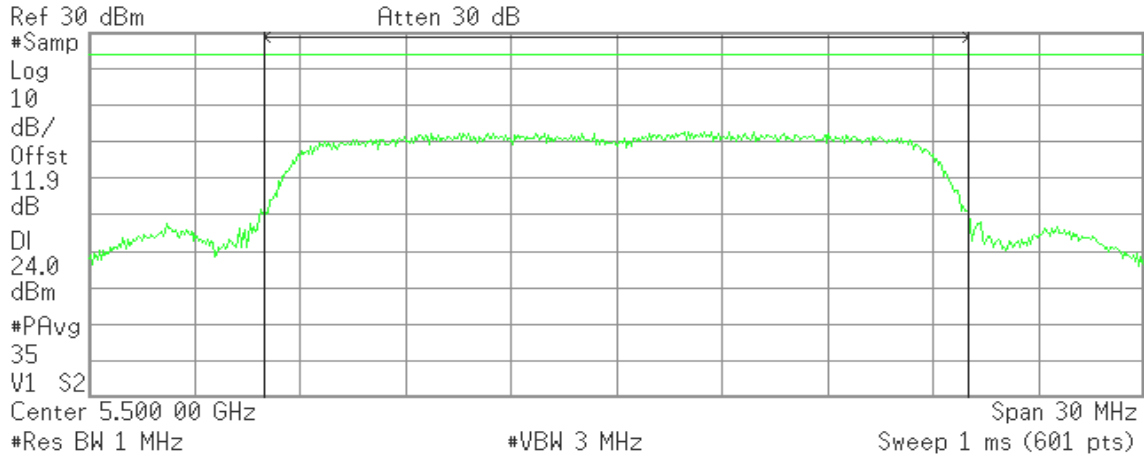


IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low

Agilent 09:49:16 Jan 2, 2012

R T



Channel Power

13.62 dBm /20.0000 MHz

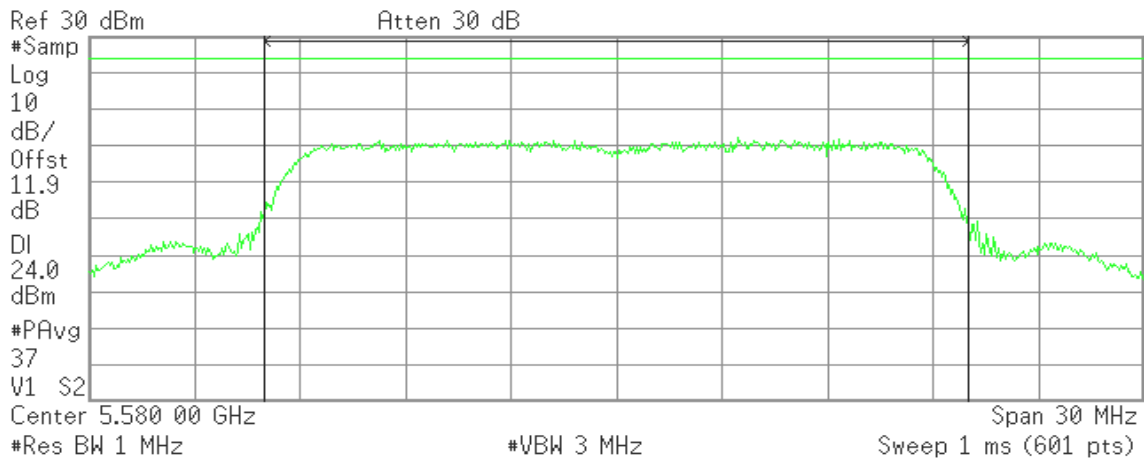
Power Spectral Density

-59.39 dBm/Hz

CH Mid

Agilent 09:57:00 Jan 2, 2012

R T



Channel Power

12.58 dBm /20.0000 MHz

Power Spectral Density

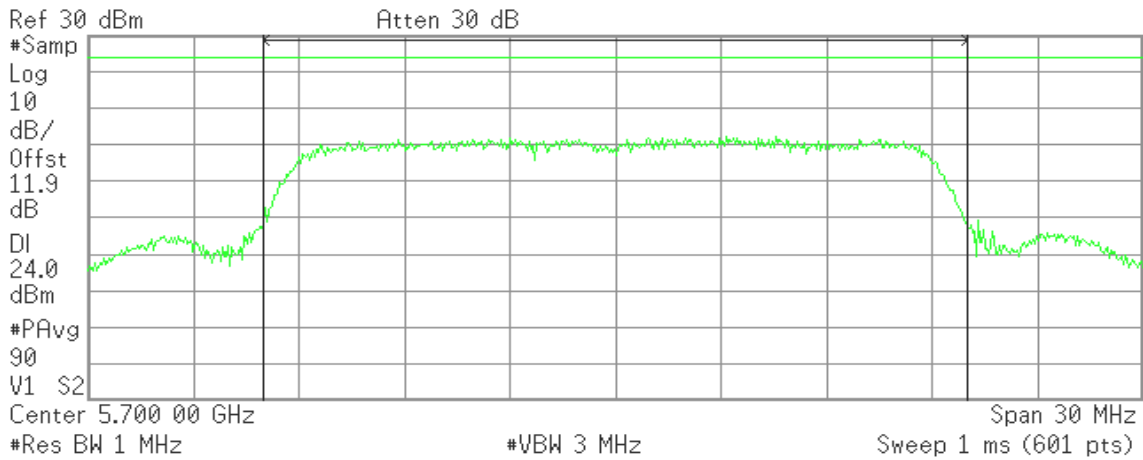
-60.43 dBm/Hz



CH High

Agilent 10:07:33 Jan 2, 2012

R T



Channel Power

11.68 dBm /20.00000 MHz

Power Spectral Density

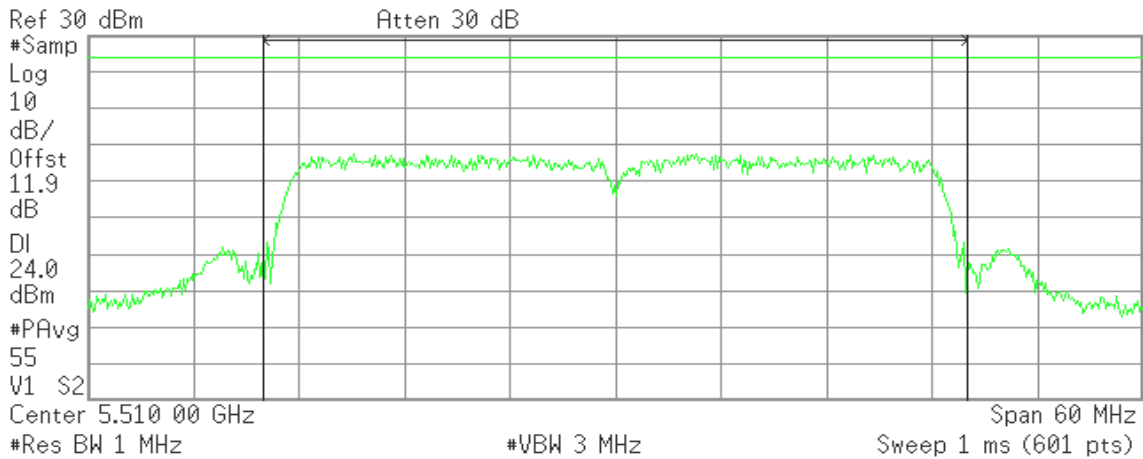
-61.33 dBm/Hz

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

CH Low

Agilent 17:03:25 Dec 30, 2011

R T



Channel Power

10.59 dBm /40.00000 MHz

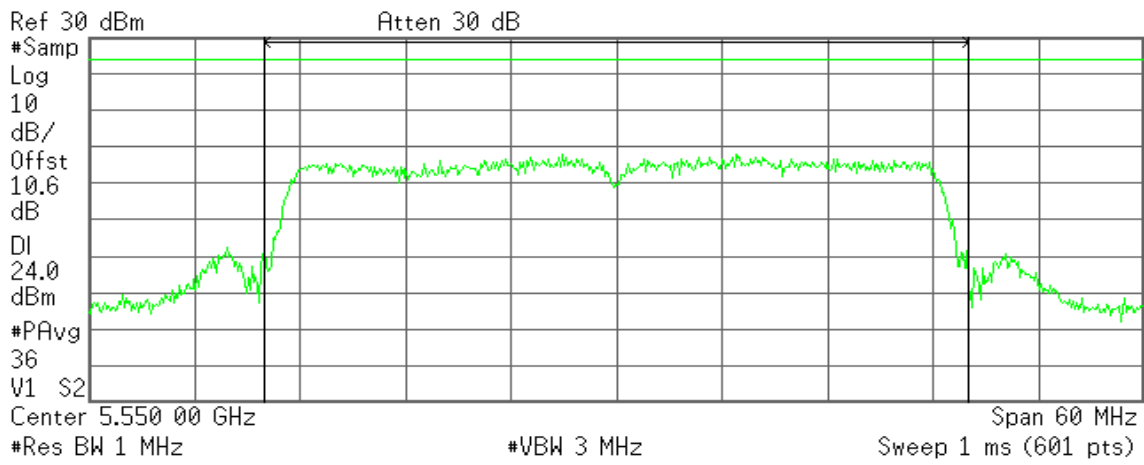
Power Spectral Density

-65.43 dBm/Hz



CH Mid

R T



Channel Power

9.36 dBm /40.0000 MHz

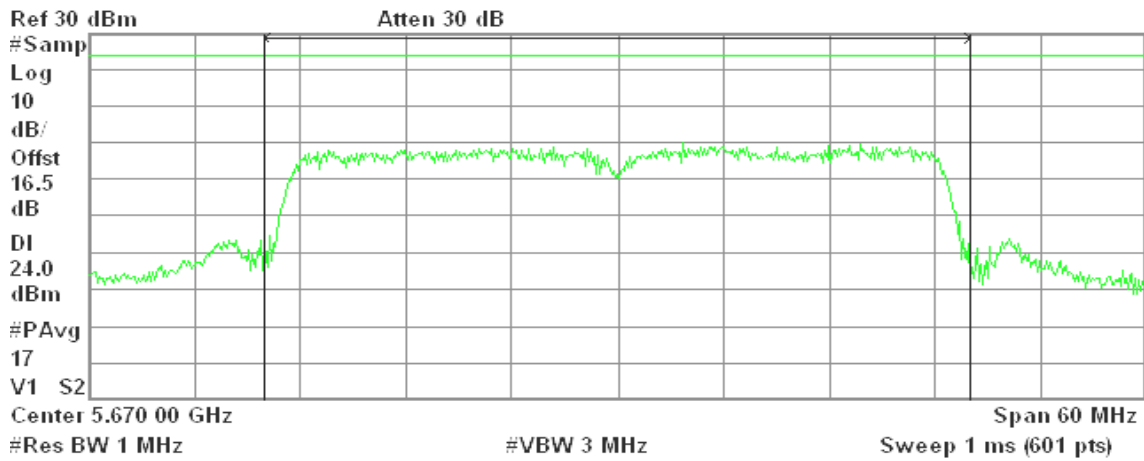
Power Spectral Density

-66.66 dBm/Hz

CH High

Agilent

R T



Channel Power

12.37 dBm /40.0000 MHz

Power Spectral Density

-63.65 dBm/Hz

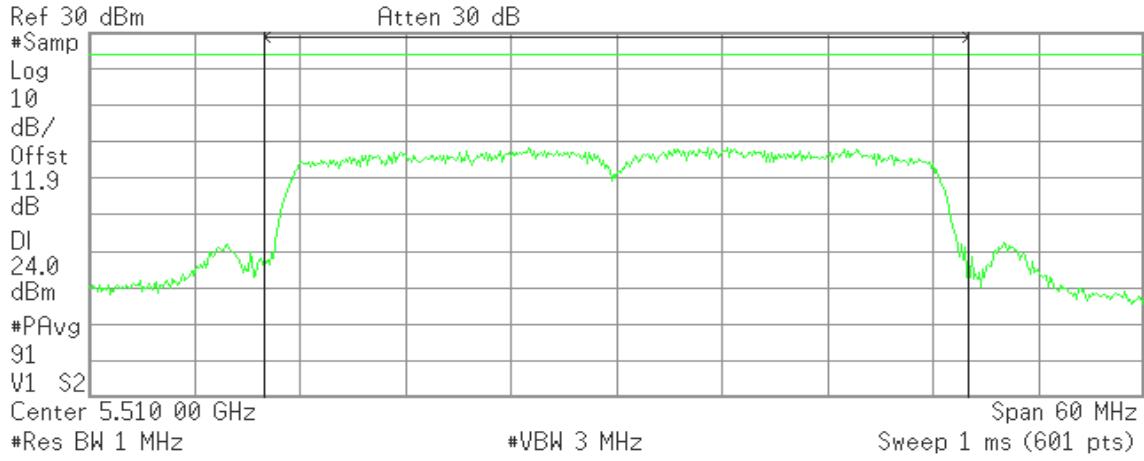


IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

CH Low

Agilent 09:07:29 Jan 2, 2012

R T



Channel Power

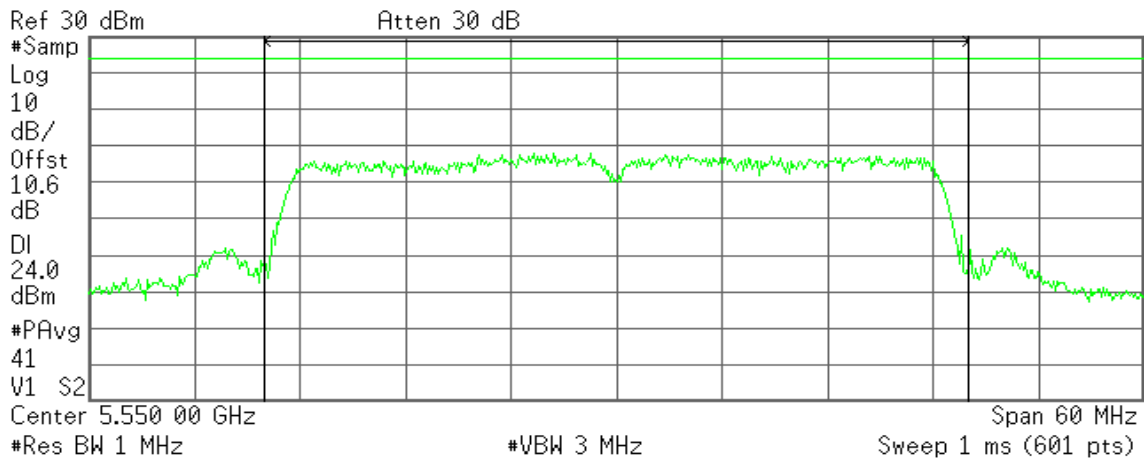
11.44 dBm /40.0000 MHz

Power Spectral Density

-64.58 dBm/Hz

CH Mid

R T



Channel Power

10.69 dBm /40.0000 MHz

Power Spectral Density

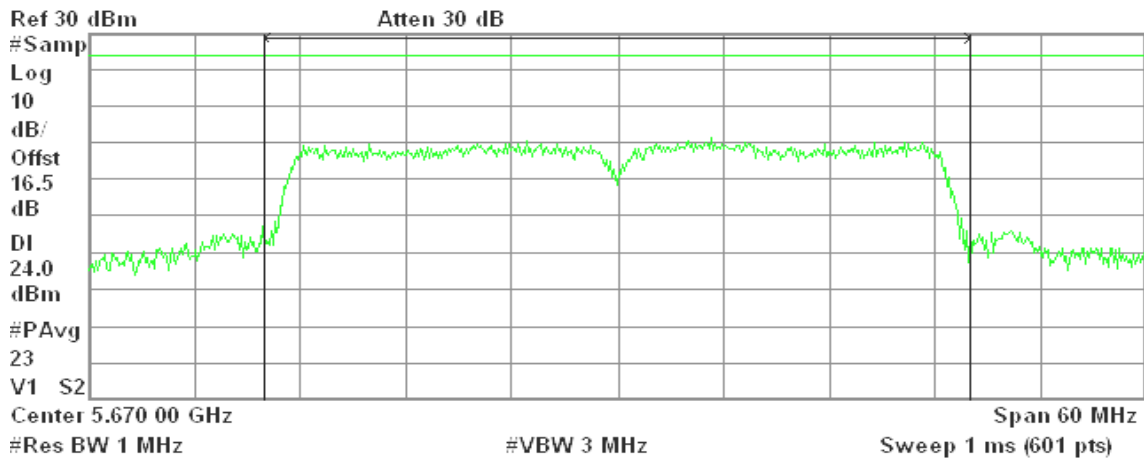
-65.33 dBm/Hz



CH High

Agilent

R L



Channel Power

13.63 dBm / 40.0000 MHz

Power Spectral Density

-62.39 dBm/Hz



7.4 BAND EDGES MEASUREMENT

LIMIT

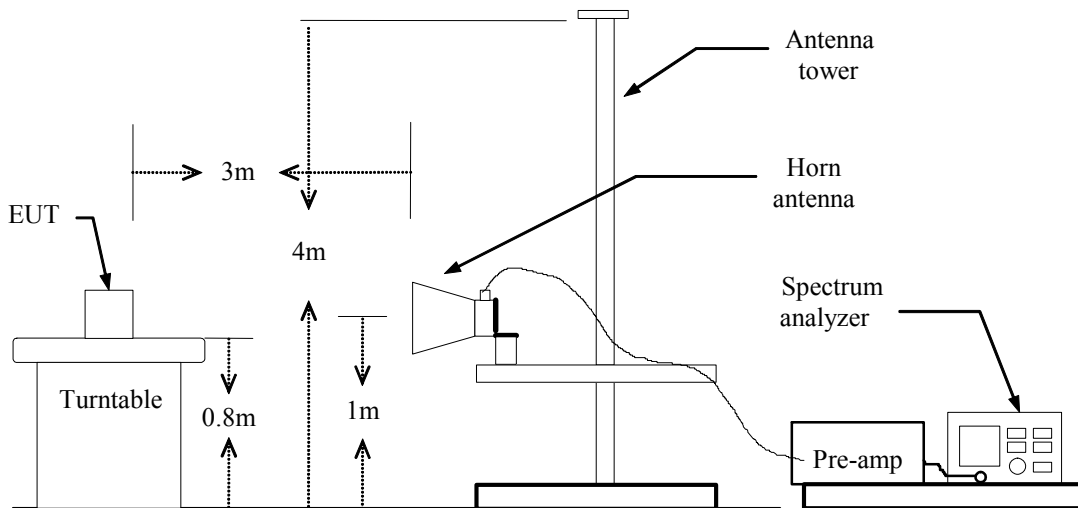
According to 15.407(b),

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

The provisions of §15.205 apply to intentional radiators operating under this section.

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=1MHz VBW=3MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz
duty cycle ≥ 98 percent, set VBW \leq RBW/100 but not less than 10 Hz.
duty cycle < 98 percent, set VBW $\geq 1/T$
 - (c) / 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.

802.11a Mode

1. Operating Frequency: 5500-5700MHz
2. CH Low: 5500MHz, CH High: 5700MHz
3. 26dB bandwidth: CH Low: 22.637MHz, CH High: 22.776MHz

Because 5500~5700MHz is Too far away from the 5460 and 7250 MHz so the test should be able to waive.

A mode duty cycle

$2.064/2.177 = 0.94$ 94%
 $1/2.064 = 484\text{Hz}$ <510Hz
VBW=510 Hz

A 20 mode duty cycle

$0.9865/1.15 = 0.85$ 85%
 $1/0.9865 = 1013\text{Hz}$ <1.2kHz
VBW=1.2 kHz

A 40mode duty cycle

$0.493/0.653 = 0.75$ 75%
 $1/0.493 = 2028\text{Hz}$ <3kHz
VBW=3kHz



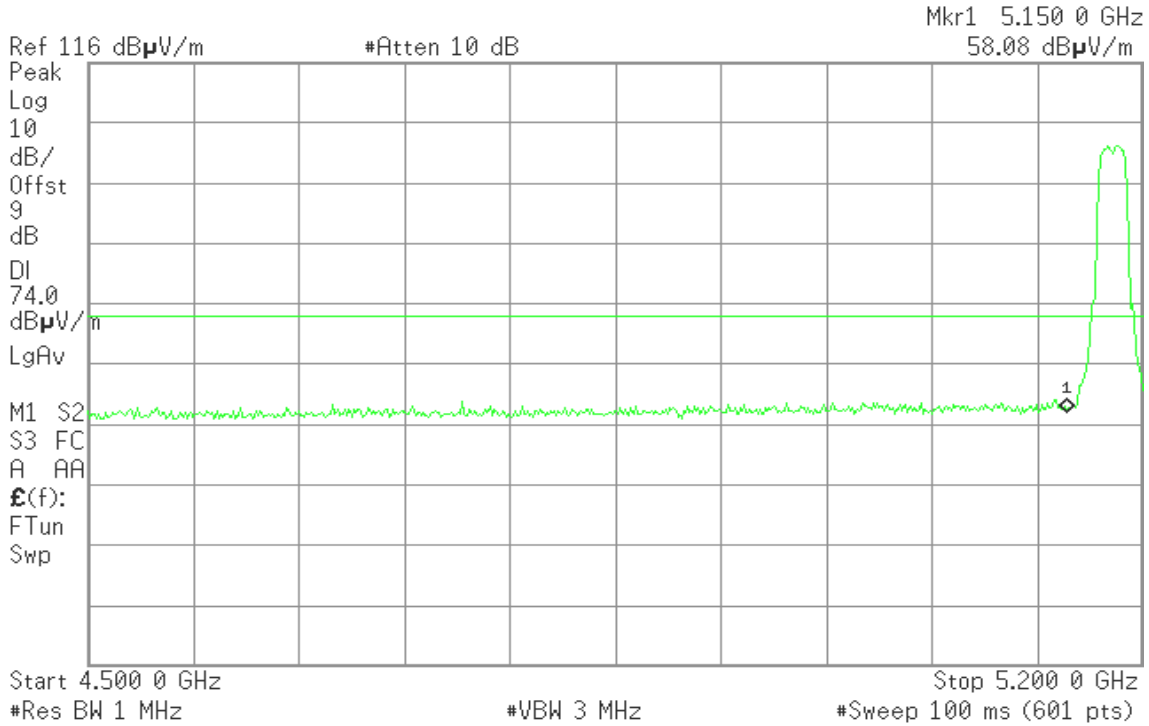
Band Edges (IEEE 802.11a mode / 5180 MHz)

Detector mode: Peak

Polarity: Vertical

Agilent 20:37:42 9 Jan 2012

R T

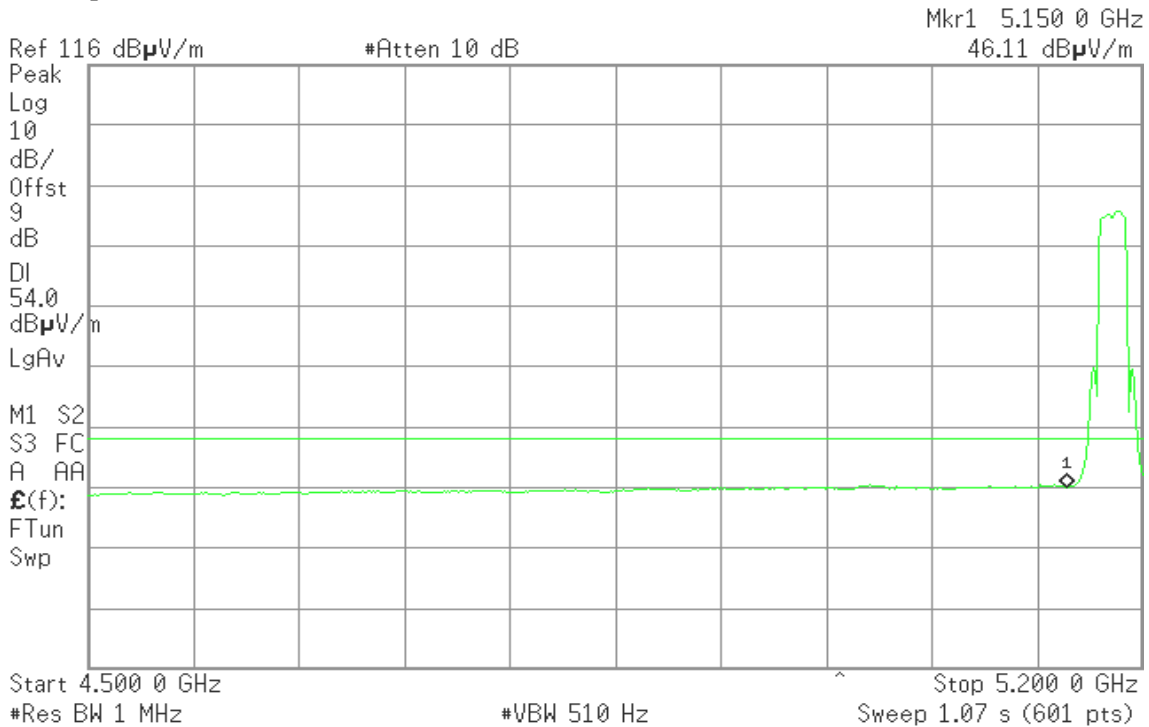


Detector mode: Average

Polarity: Vertical

Agilent 20:38:04 9 Jan 2012

R T



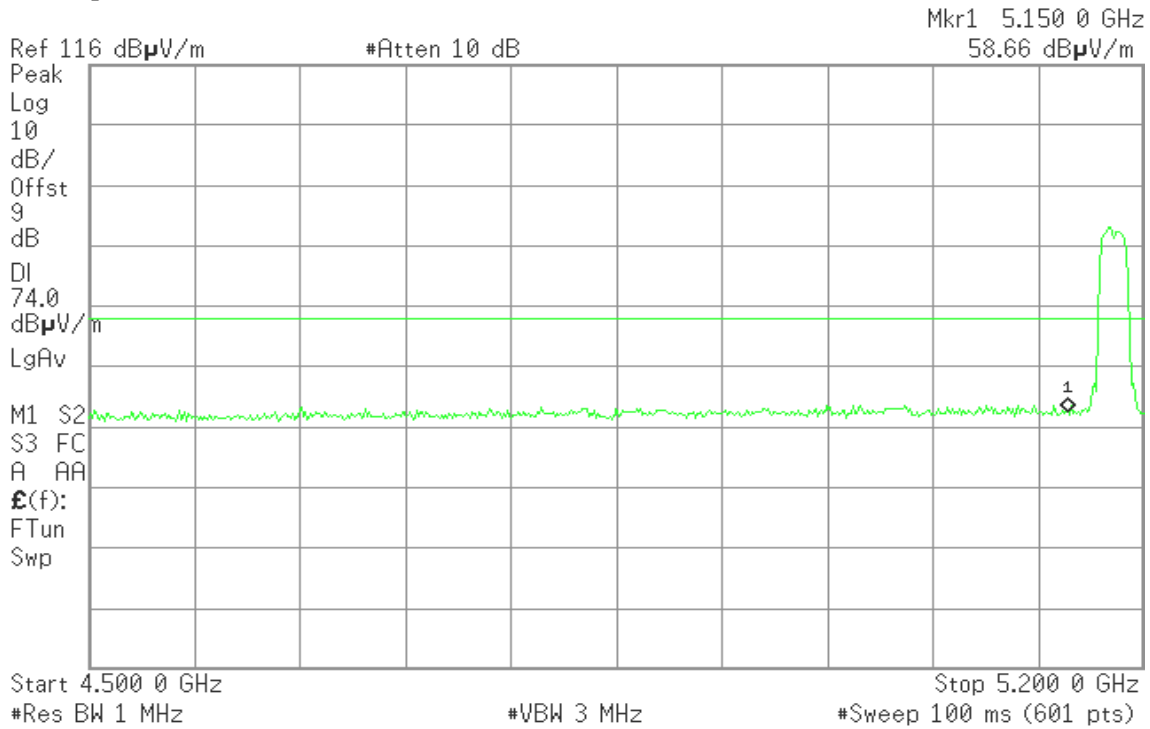


Detector mode: Peak

Polarity: Horizontal

* Agilent 20:32:51 9 Jan 2012

R T

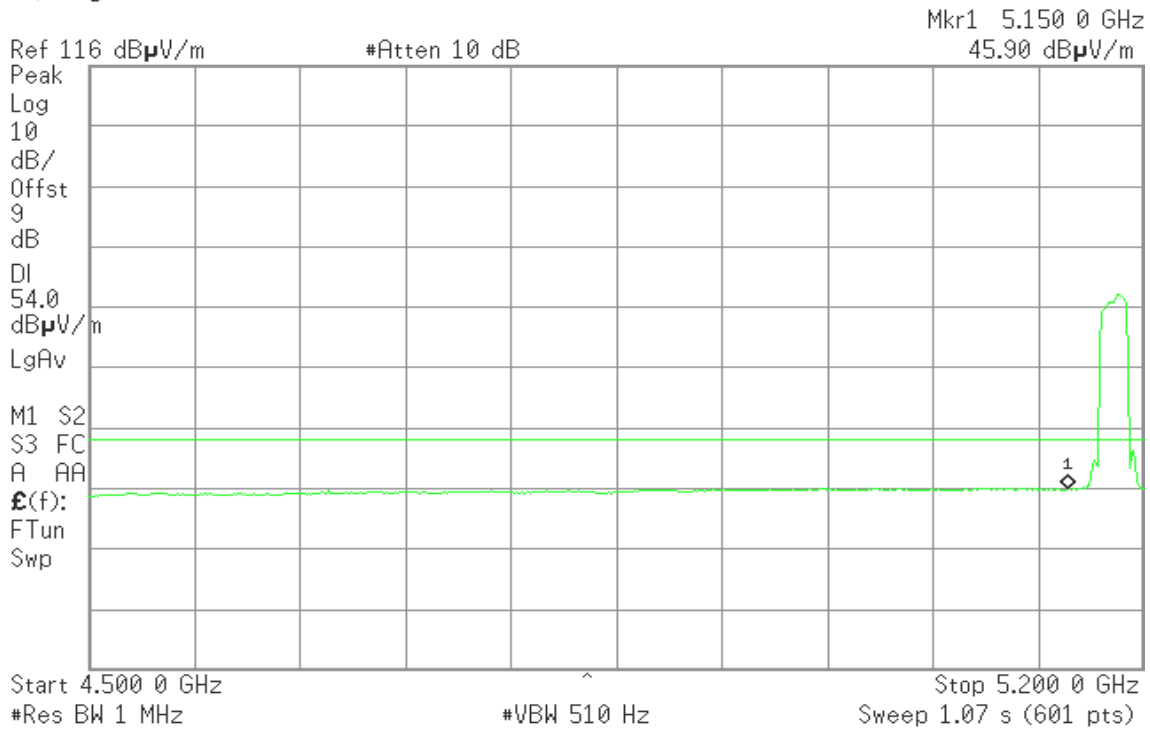


Detector mode: Average

Polarity: Horizontal

* Agilent 20:33:10 9 Jan 2012

R T





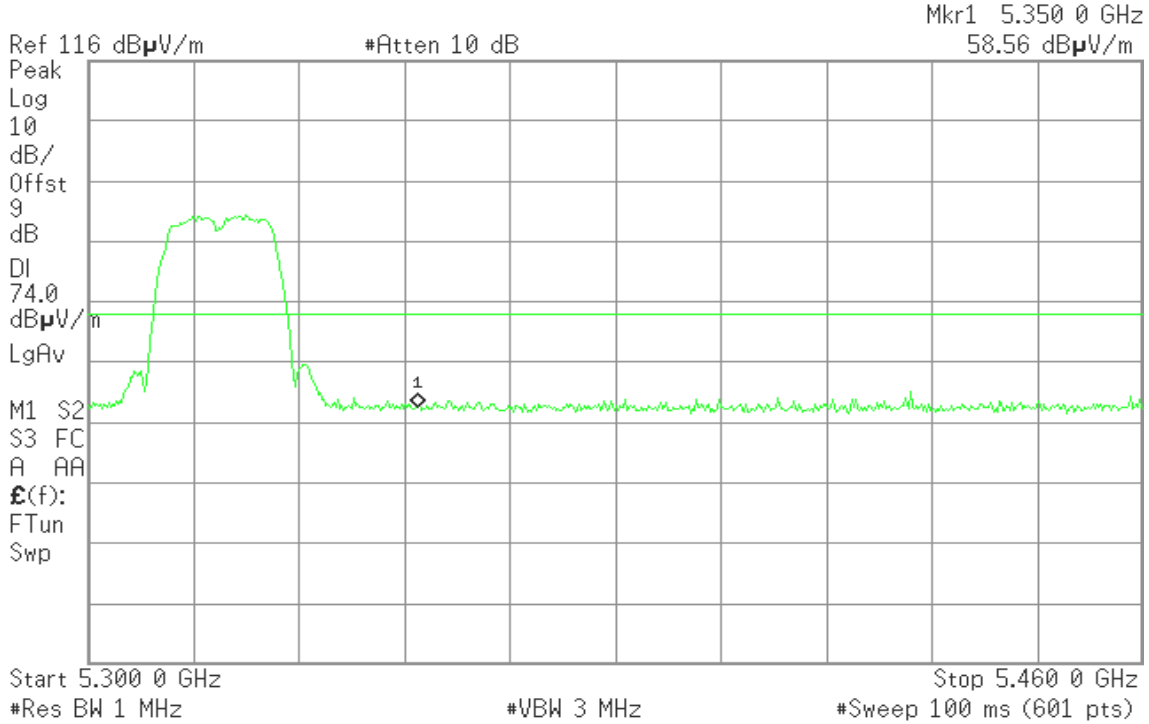
Band Edges (IEEE 802.11a mode / 5320 MHz)

Detector mode: Peak

Polarity: Vertical

Agilent 21:26:54 9 Jan 2012

R T

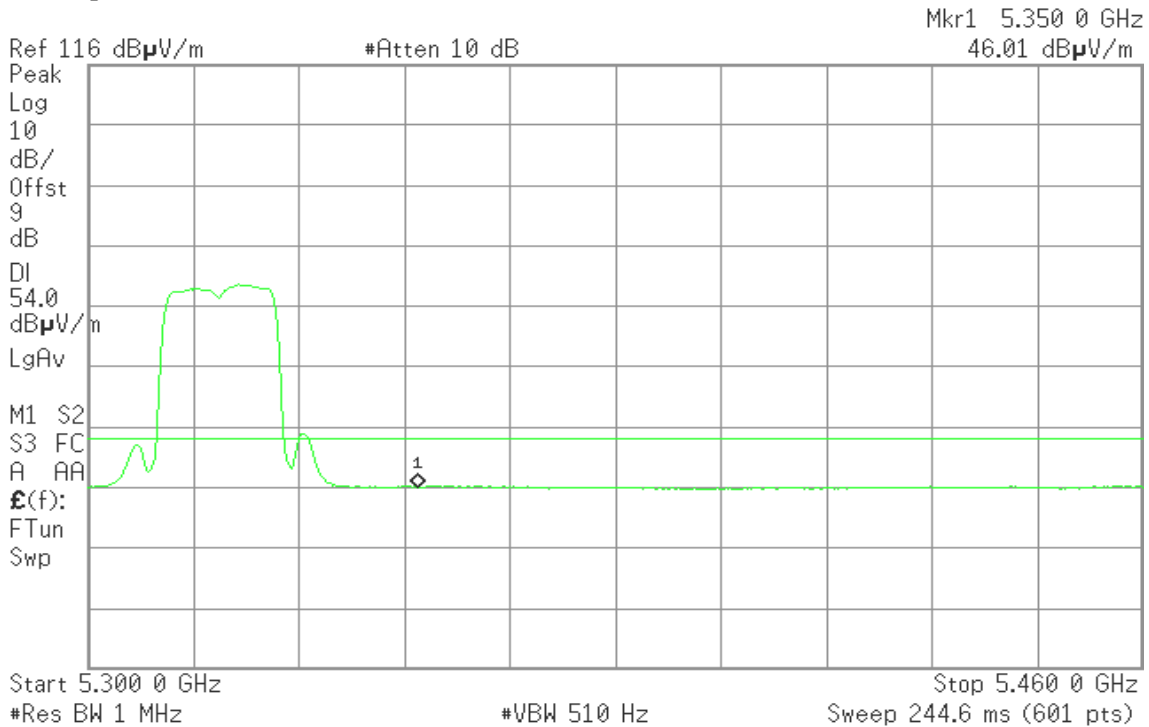


Detector mode: Average

Polarity: Vertical

Agilent 21:29:15 9 Jan 2012

R T





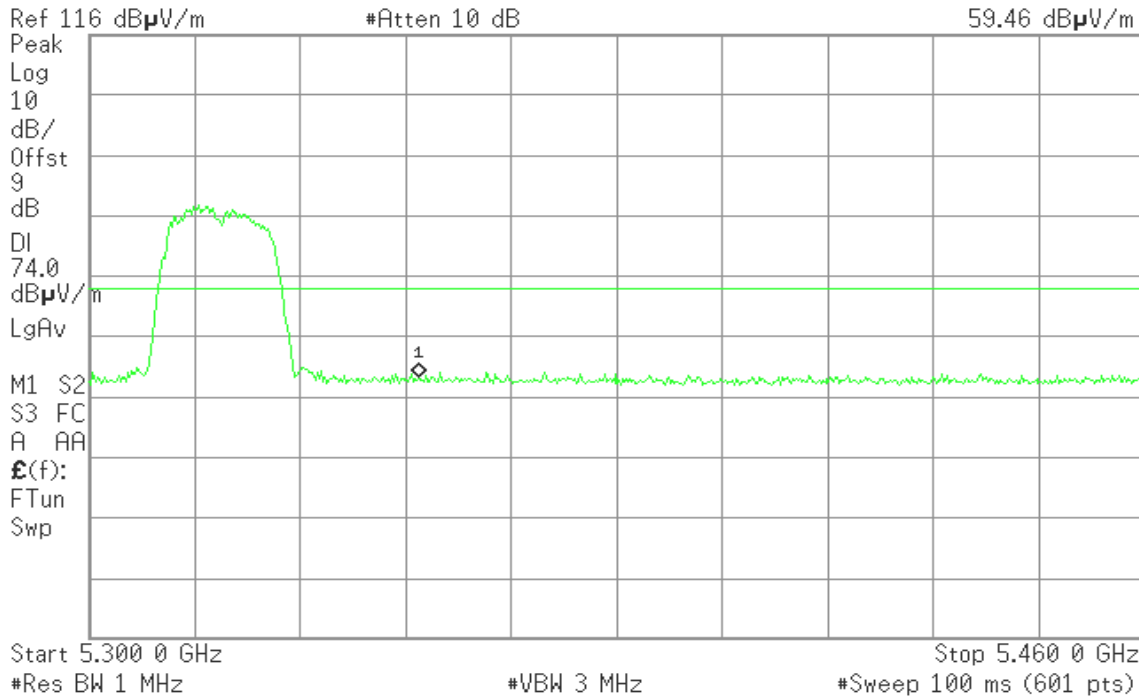
Detector mode: Peak

Polarity: Horizontal

Agilent 21:09:21 9 Jan 2012

R T

Mkr1 5.350 0 GHz
59.46 dB μ V/m



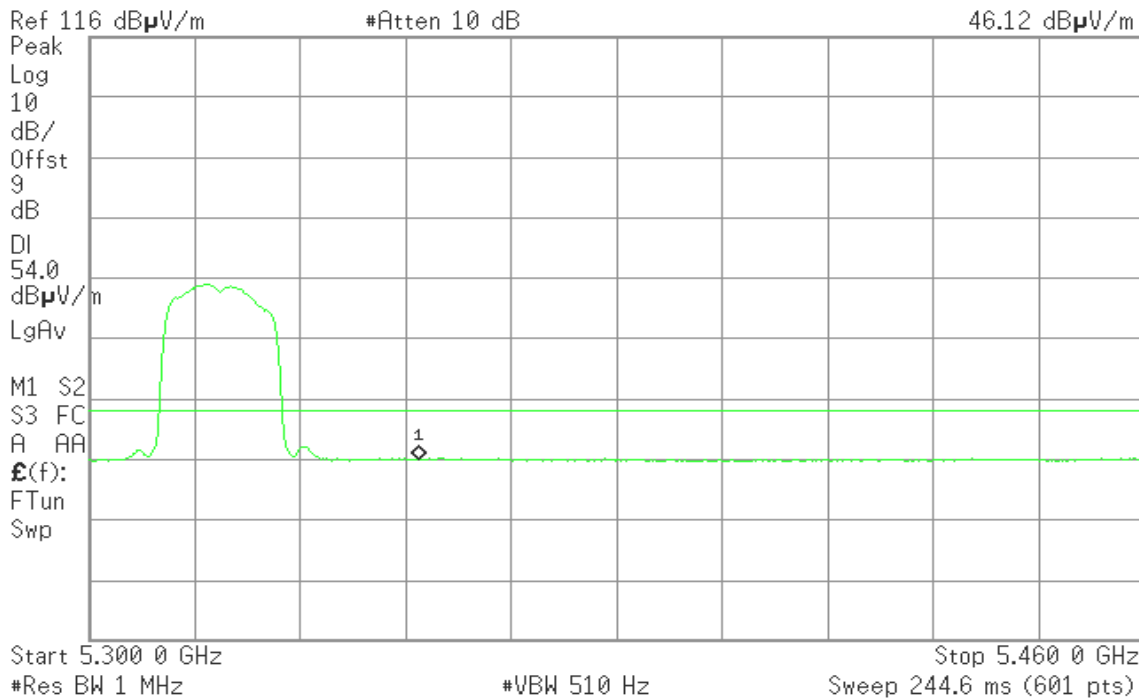
Detector mode: Average

Polarity: Horizontal

Agilent 21:09:40 9 Jan 2012

R T

Mkr1 5.350 0 GHz
46.12 dB μ V/m





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

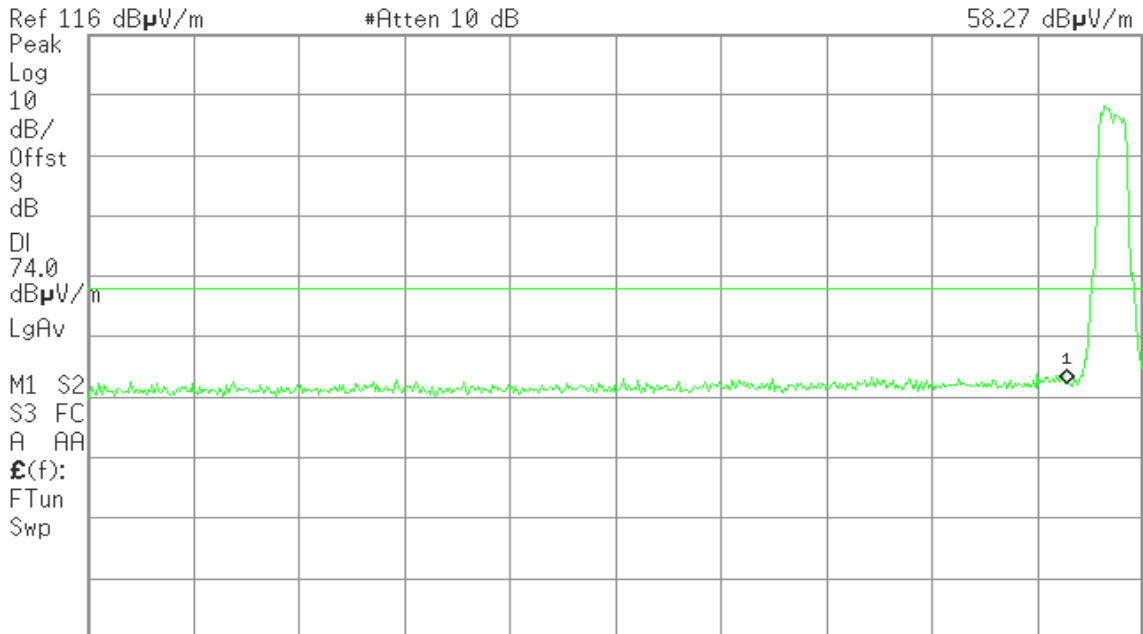
Detector mode: Peak

Polarity: Vertical

Agilent 16:50:03 10 Jan 2012

R T

Mkr1 5.150 0 GHz
58.27 dB μ V/m



Start 4.500 0 GHz Stop 5.200 0 GHz
#Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (601 pts)

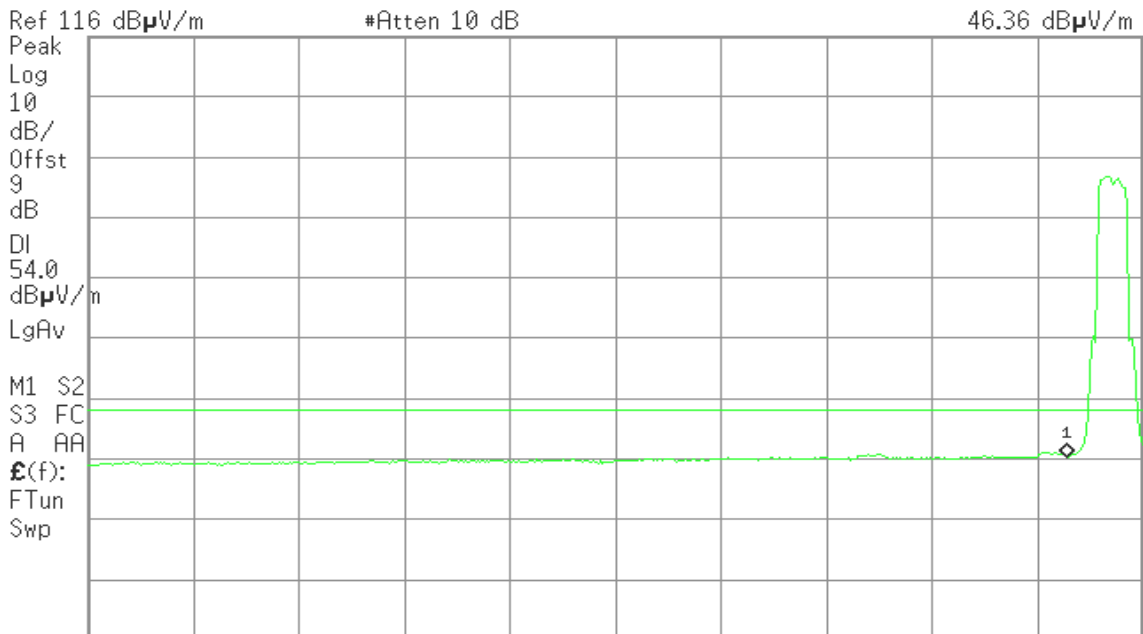
Detector mode: Average

Polarity: Vertical

Agilent 16:50:27 10 Jan 2012

R T

Mkr1 5.150 0 GHz
46.36 dB μ V/m



Start 4.500 0 GHz Stop 5.200 0 GHz
#Res BW 1 MHz #VBW 1.2 kHz Sweep 454.9 ms (601 pts)



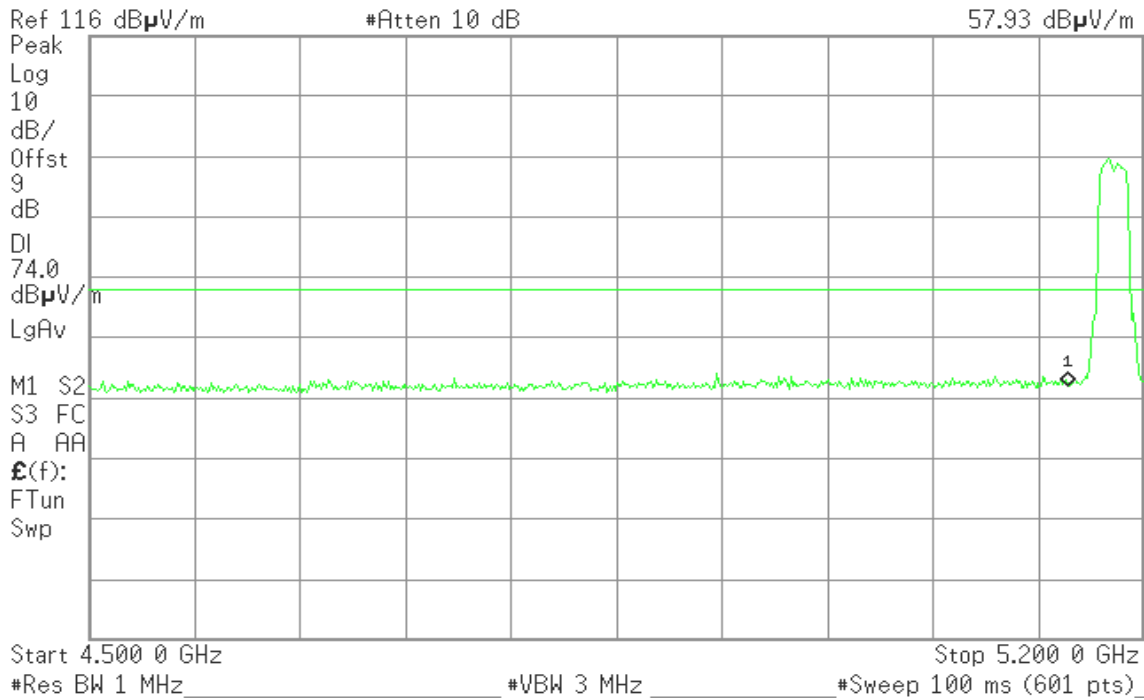
Detector mode: Peak

Polarity: Horizontal

Agilent 16:44:28 10 Jan 2012

R T

Mkr1 5.150 0 GHz
57.93 dB μ V/m



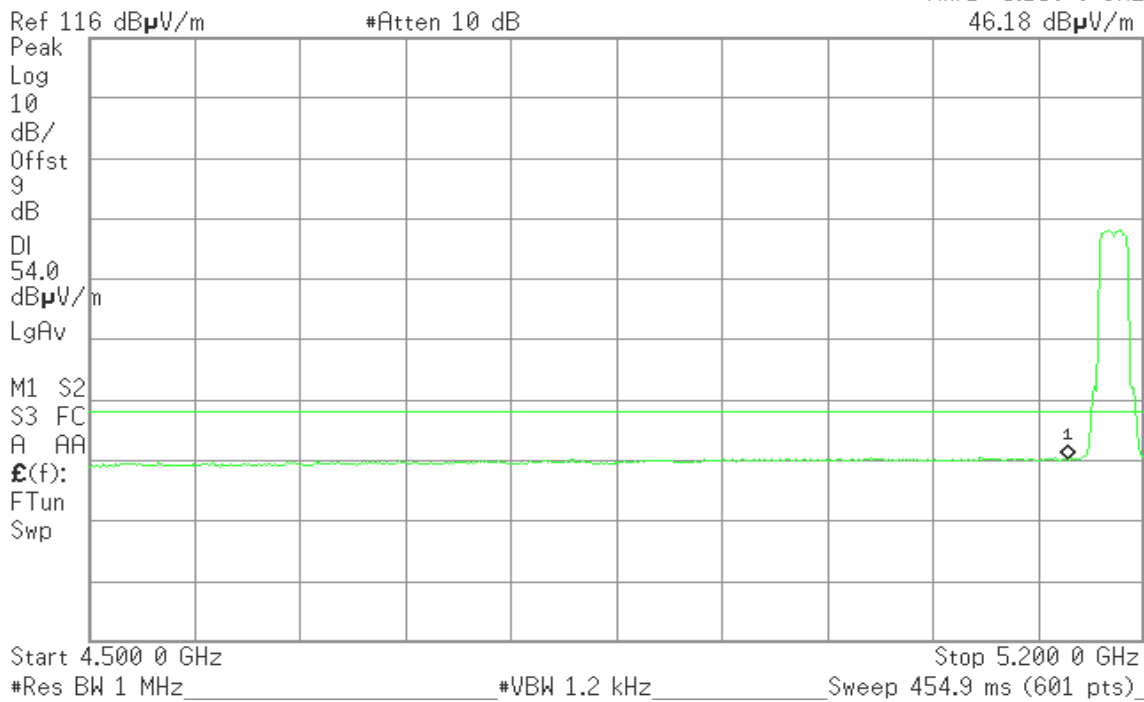
Detector mode: Average

Polarity: Horizontal

Agilent 16:45:02 10 Jan 2012

R T

Mkr1 5.150 0 GHz
46.18 dB μ V/m





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

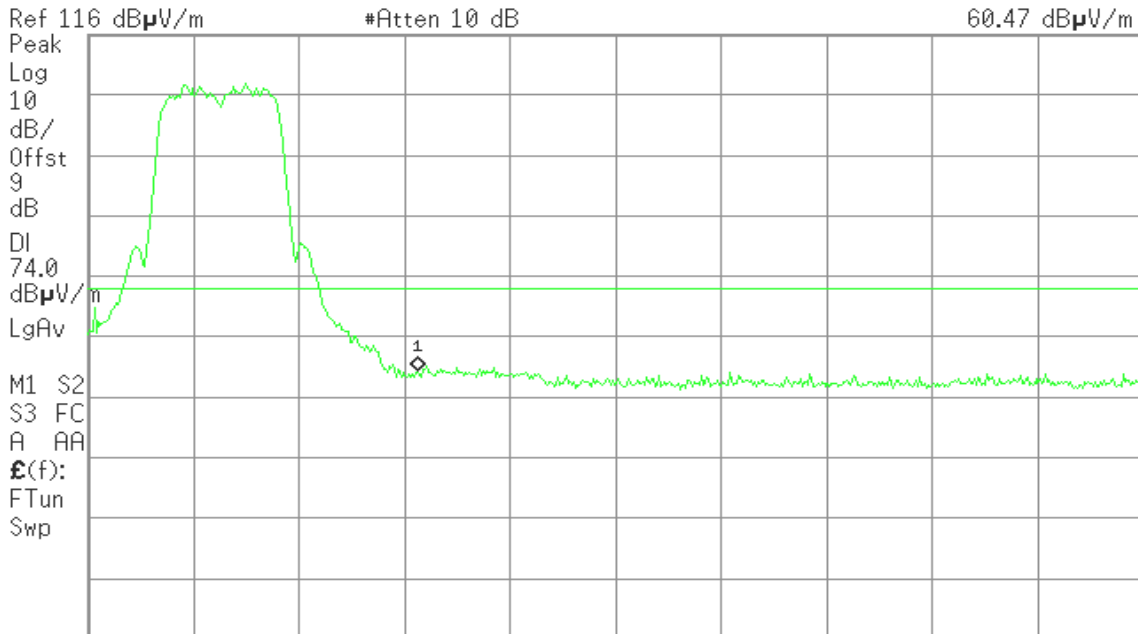
Detector mode: Peak

Polarity: Vertical

Agilent 17:30:27 10 Jan 2012

R T

Mkr1 5.350 0 GHz
60.47 dB μ V/m



#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

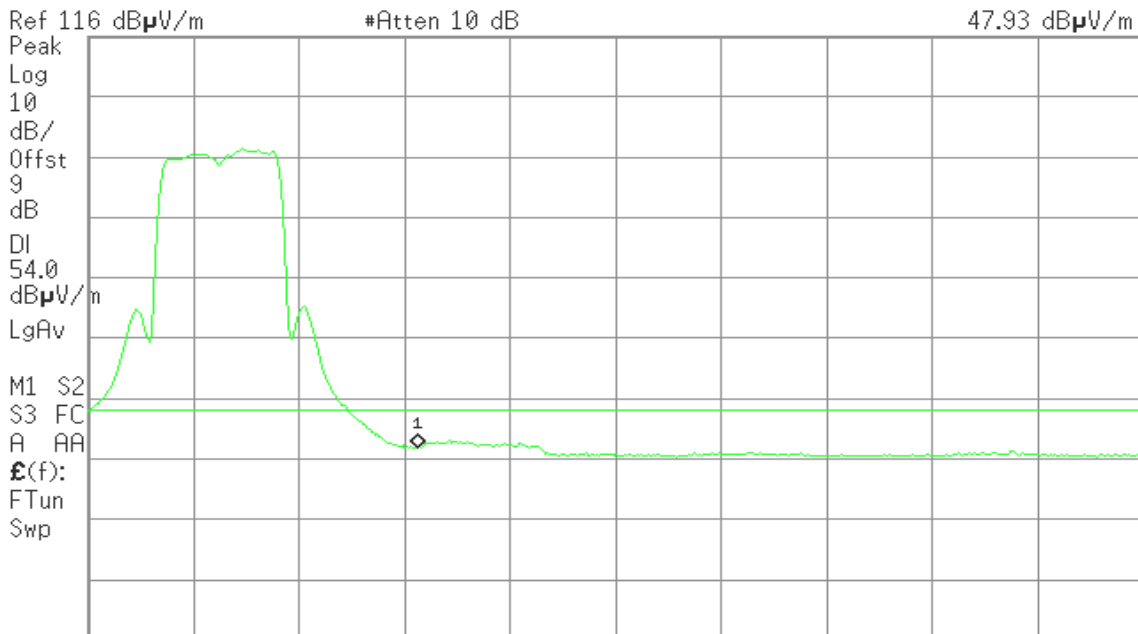
Detector mode: Average

Polarity: Vertical

Agilent 17:30:51 10 Jan 2012

R T

Mkr1 5.350 0 GHz
47.93 dB μ V/m



#Res BW 1 MHz #VBW 1.2 kHz Sweep 104 ms (601 pts)



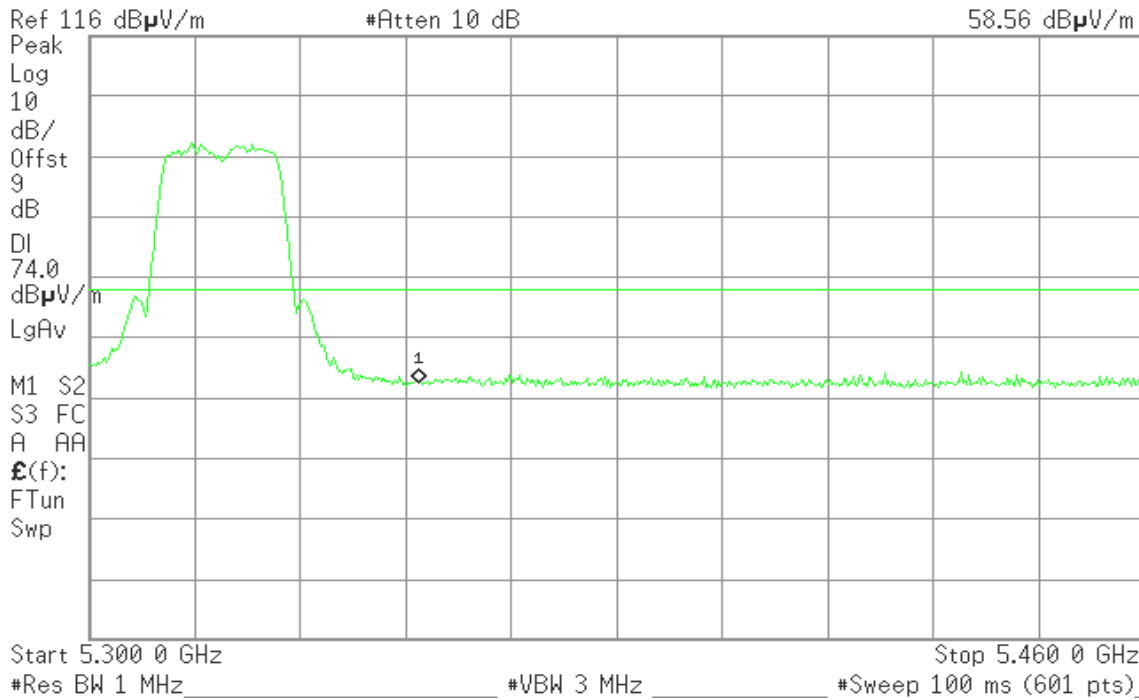
Detector mode: Peak

Polarity: Horizontal

Agilent 17:28:09 10 Jan 2012

R T

Mkr1 5.350 0 GHz
58.56 dB μ V/m



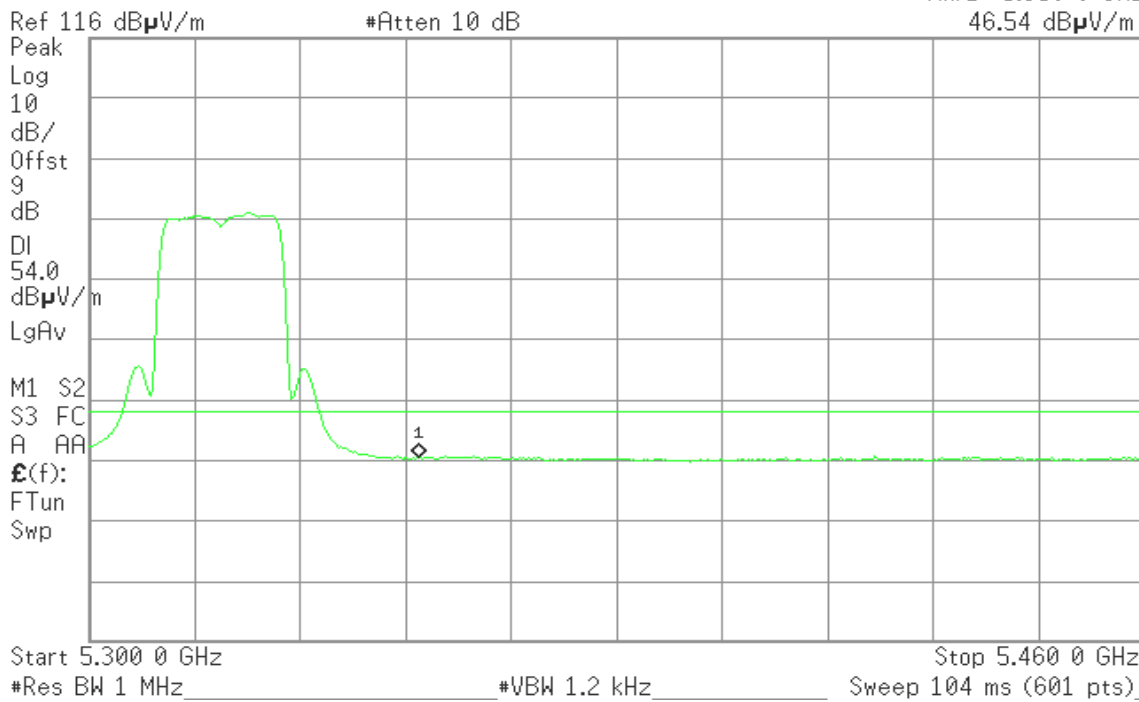
Detector mode: Average

Polarity: Horizontal

Agilent 17:28:31 10 Jan 2012

R T

Mkr1 5.350 0 GHz
46.54 dB μ V/m





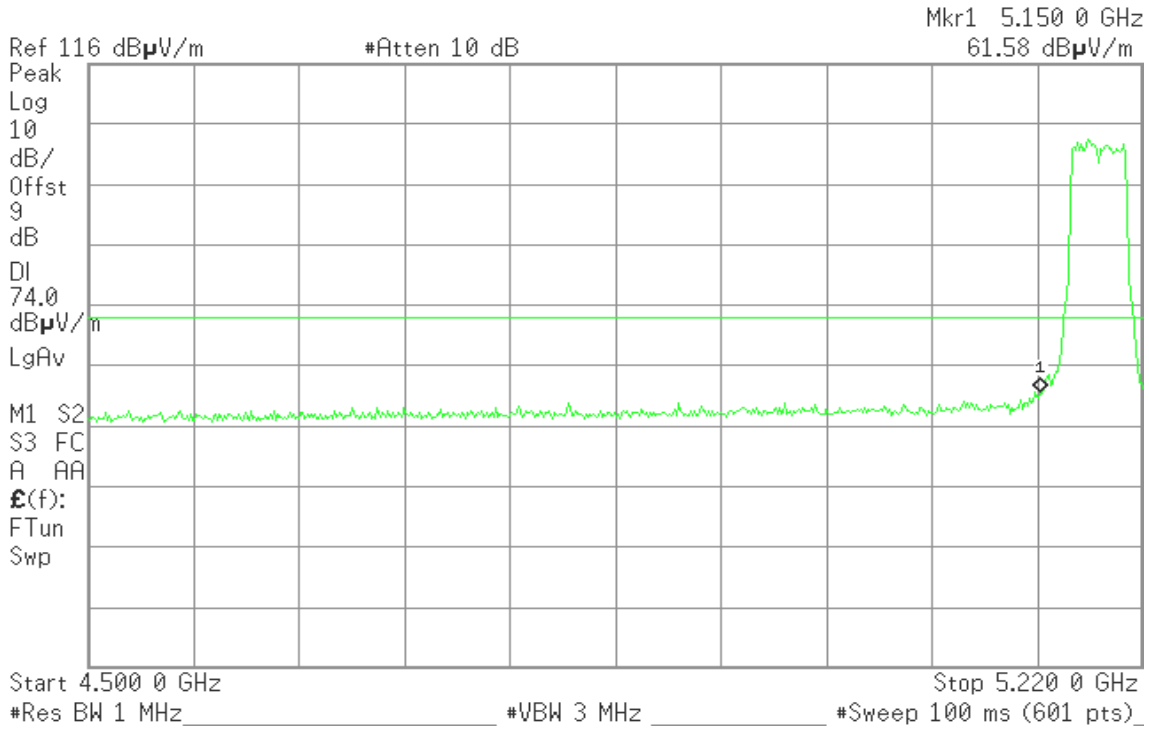
Band Edges (IEEE 802.11n HT 40 MHz mode / 5190 MHz)

Detector mode: Peak

Polarity: Vertical

Agilent 20:50:42 10 Jan 2012

R T

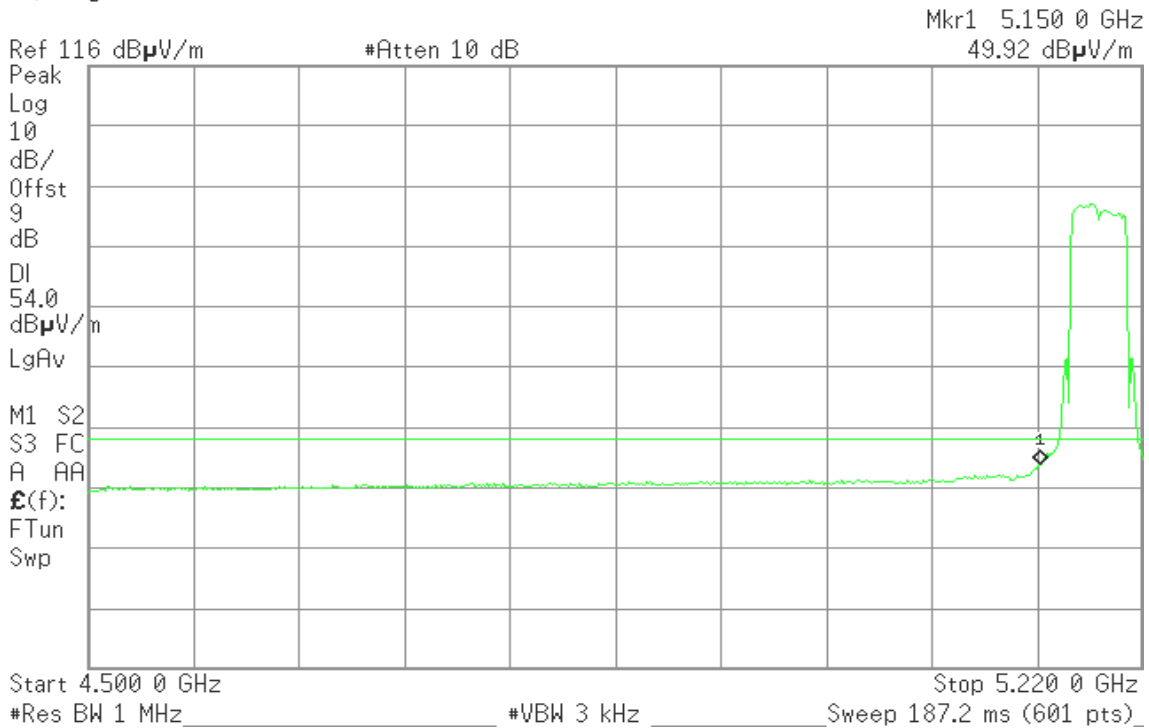


Detector mode: Average

Polarity: Vertical

Agilent 20:51:09 10 Jan 2012

R T



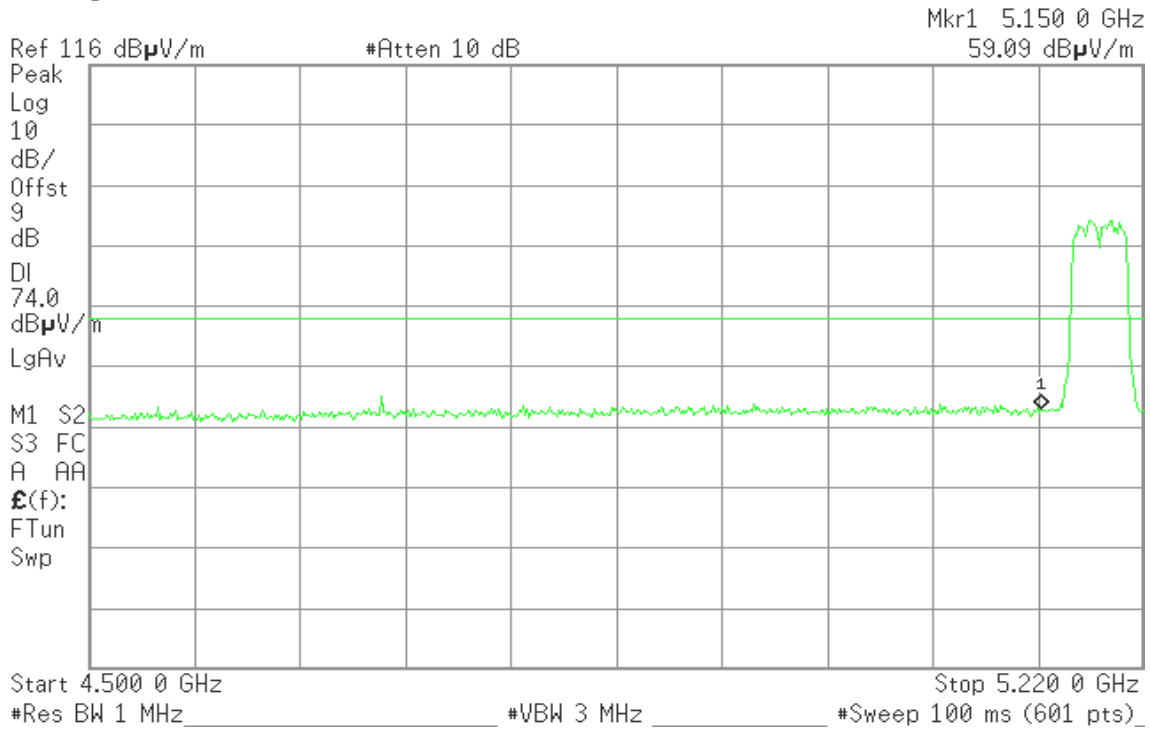


Detector mode: Peak

Polarity: Horizontal

Agilent 20:45:35 10 Jan 2012

R T

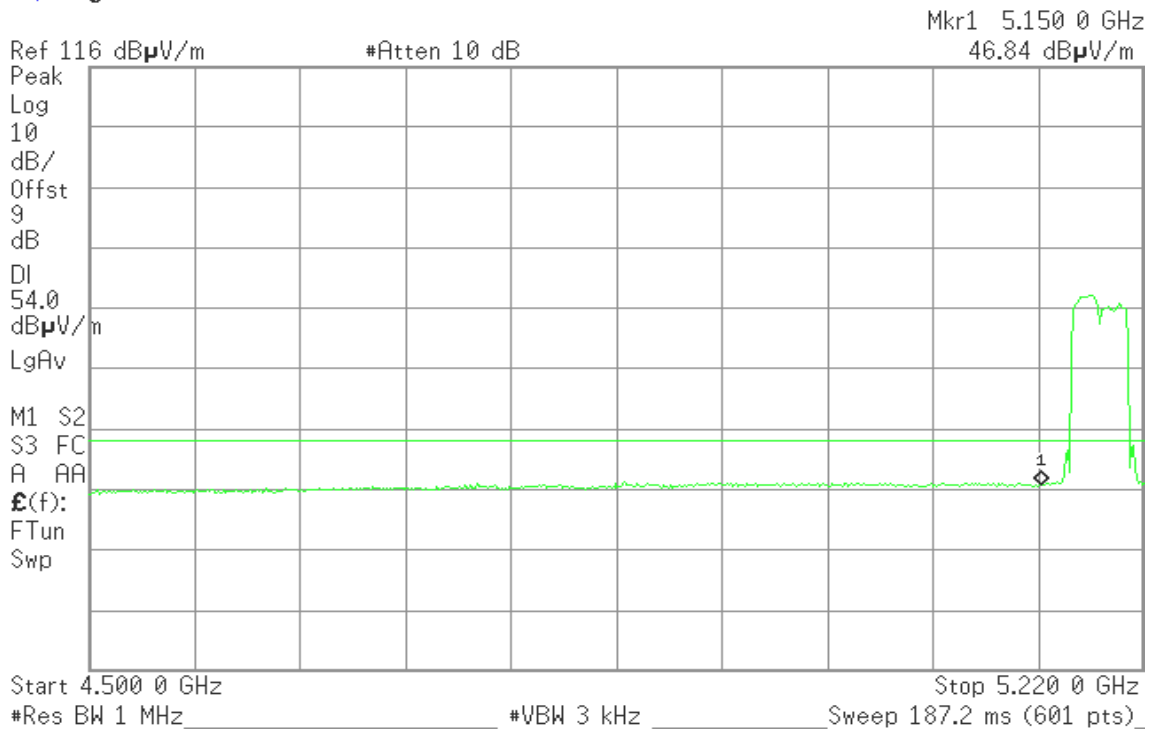


Detector mode: Average

Polarity: Horizontal

Agilent 20:45:56 10 Jan 2012

R T





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

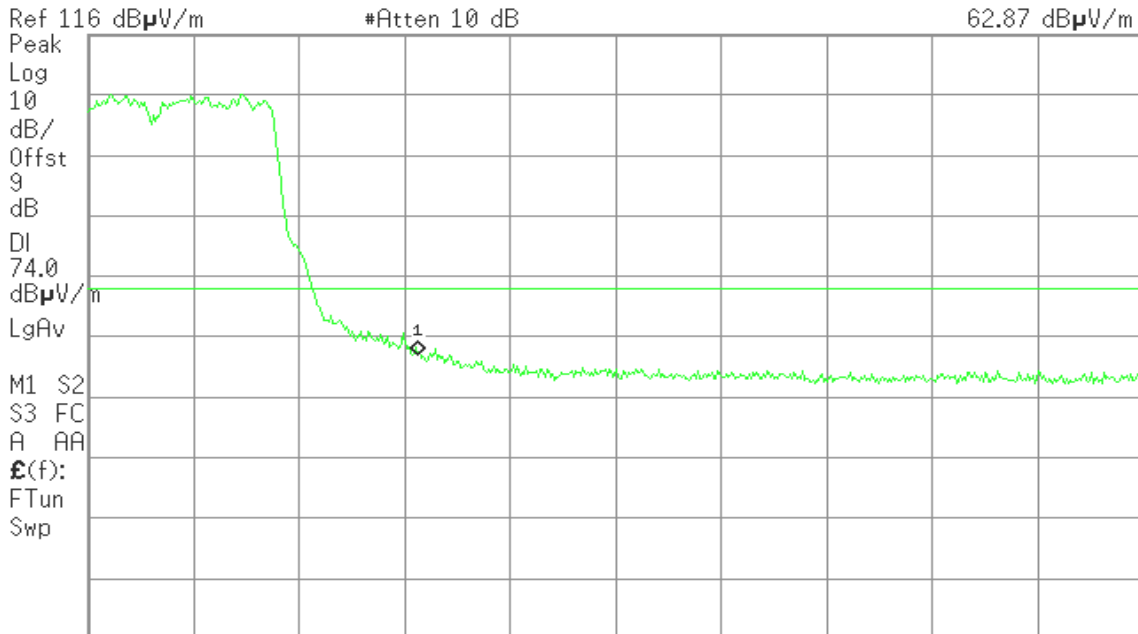
Detector mode: Peak

Polarity: Vertical

Agilent 21:04:22 10 Jan 2012

R T

Mkr1 5.350 0 GHz
62.87 dBμV/m



Start 5.300 0 GHz Stop 5.460 0 GHz
#Res BW 1 MHz #VBW 3 MHz #Sweep 100 ms (601 pts)

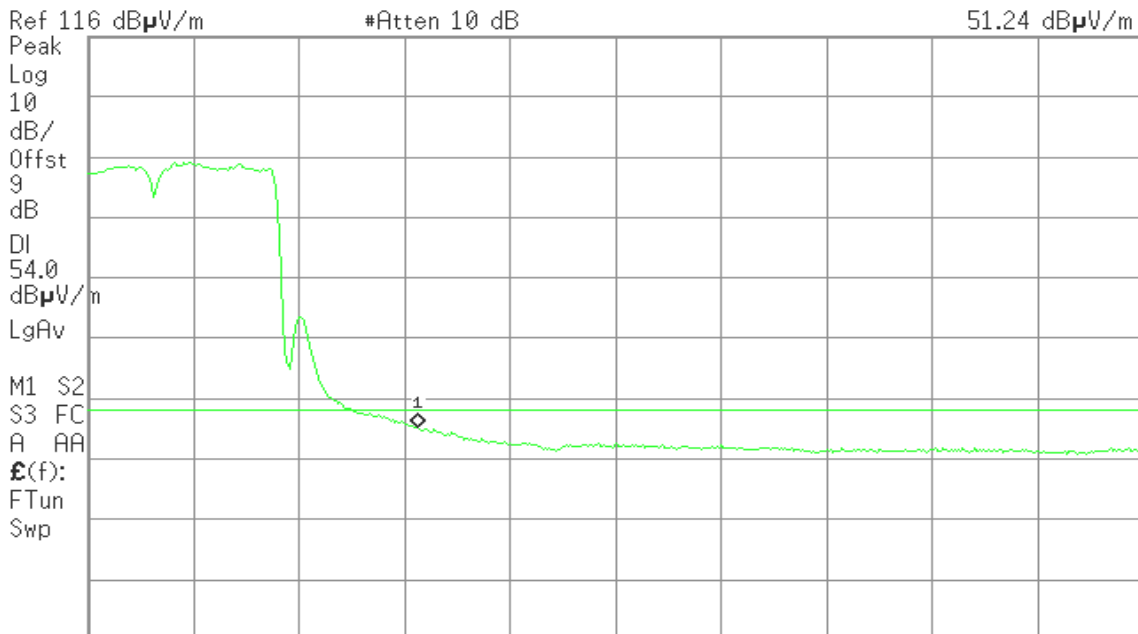
Detector mode: Average

Polarity: Vertical

Agilent 21:04:44 10 Jan 2012

R T

Mkr1 5.350 0 GHz
51.24 dBμV/m



Start 5.300 0 GHz Stop 5.460 0 GHz
#Res BW 1 MHz #VBW 3 kHz Sweep 41.6 ms (601 pts)



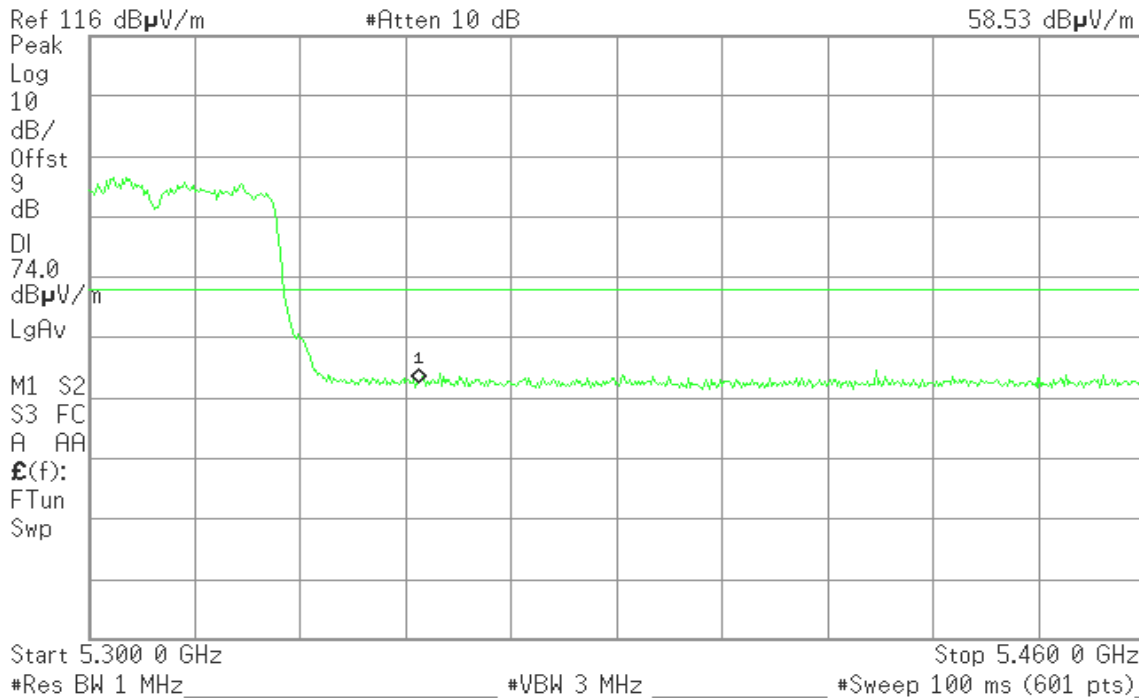
Detector mode: Peak

Polarity: Horizontal

Agilent 21:09:04 10 Jan 2012

R T

Mkr1 5.350 0 GHz
58.53 dB μ V/m



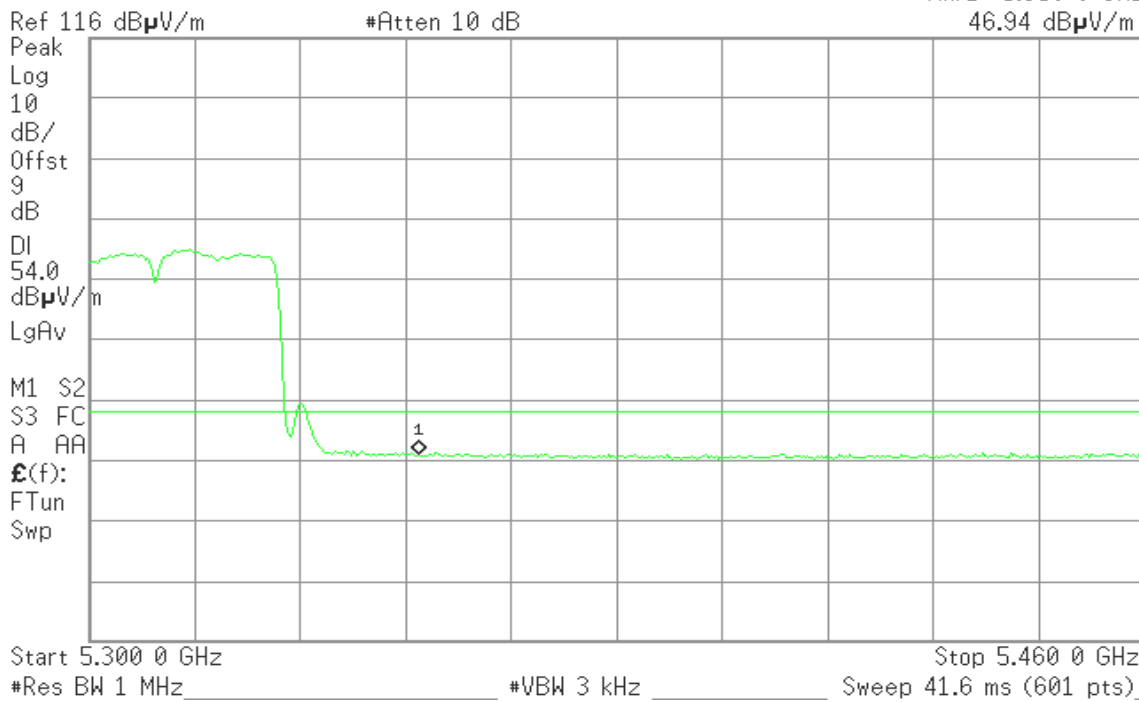
Detector mode: Average

Polarity: Horizontal

Agilent 21:09:22 10 Jan 2012

R T

Mkr1 5.350 0 GHz
46.94 dB μ V/m





7.5 PEAK POWER SPECTRAL DENSITY

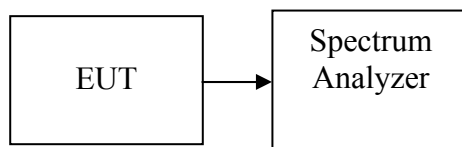
LIMIT

According to §15.407(a),

- (1) For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 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
duty cycle ≥ 98 add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

TEST RESULTS

No non-compliance noted

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

Channel	Frequency (MHz)	PPSD (dBm)	MAX PSD (dBm)	Limit (dBm)	Margin	Result
Low	5180	-1.83	-1.56	4.00	-5.56	PASS
Mid	5220	-1.62	-1.35	4.00	-5.35	PASS
High	5240	-1.56	-1.29	4.00	-5.29	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PSD (dBm)	PPSD (dBm)	Max PSD (dBm)	Max PSD (dBm)			
Low	5180	-3.80	-3.10	-4.44	-3.73	-0.39	4.00	-4.39	PASS
Mid	5220	-3.94	-3.23	-4.35	-3.64	-0.42	4.00	-4.42	PASS
High	5240	-4.08	-3.37	-3.31	-2.61	0.04	4.00	-3.96	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PSD (dBm)	PPSD (dBm)	Max PSD (dBm)	Max PSD (dBm)			
Low	5190	-5.85	-4.60	-6.35	-5.10	-1.83	4.00	-5.83	PASS
High	5230	-5.36	-4.11	-5.41	-4.16	-1.13	4.00	-5.13	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)
 2. 10 log (1/x)=0.0436481, x=Duty cycle(0.99%)

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

Channel	Frequency (MHz)	PPSD (dBm)	MAX PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5260	3.51	3.78	11.00	-7.22	PASS
Mid	5280	3.37	3.64	11.00	-7.36	PASS
High	5320	3.66	3.93	11.00	-7.07	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PPSD (dBm)	PPSD (dBm)	Max PPSD (dBm)	Max PPSD (dBm)			
Low	5260	2.26	2.96	1.69	2.40	5.70	11.00	-5.30	PASS
Mid	5280	2.93	3.64	2.11	2.81	6.26	11.00	-4.74	PASS
High	5320	3.07	3.77	2.00	2.71	6.28	11.00	-4.72	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PPSD (dBm)	PPSD (dBm)	Max PPSD (dBm)	Max PPSD (dBm)			
Low	5270	-1.53	-0.28	-2.90	-1.65	2.10	11.00	-8.90	PASS
High	5310	-2.17	-0.92	-2.91	-1.66	1.74	11.00	-9.26	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)

2. 10 log (1/x)=0.0436481, x=Duty cycle(0.99%)

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

Channel	Frequency (MHz)	PPSD (dBm)	MAX PPSD (dBm)	Limit (dBm)	Margin	Result
Low	5500	2.11	2.38	11.00	-8.62	PASS
Mid	5580	2.02	2.28	11.00	-8.72	PASS
High	5700	2.28	2.54	11.00	-8.46	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PPSD (dBm)	PPSD (dBm)	Max PPSD (dBm)	Max PPSD (dBm)			
Low	5500	2.63	3.33	2.91	3.61	6.48	11.00	-4.52	PASS
Mid	5580	2.13	2.84	2.13	2.84	5.85	11.00	-5.15	PASS
High	5700	2.10	2.80	2.10	2.80	5.81	11.00	-5.19	PASS

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

Channel	Frequency (MHz)	Chain 0	Chain 0	Chain 1	Chain 1	Total	Limit (dBm)	Margin	Result
		PPSD (dBm)	Max PPSD (dBm)	PPSD (dBm)	Max PPSD (dBm)	Max PPSD (dBm)			
Low	5510	-2.25	-1.00	-1.55	-0.30	2.38	11.00	-8.62	PASS
Mid	5550	-2.42	-1.17	-2.20	-0.95	1.95	11.00	-9.05	PASS
High	5670	0.04	1.29	1.32	2.57	4.99	11.00	-6.01	PASS

Remark: 1. Maximum Conducted Output Power=Conducted Output Power+10 log(1/x)

2. 10 log (1/x)=0.0436481, x=Duty cycle(0.99%)



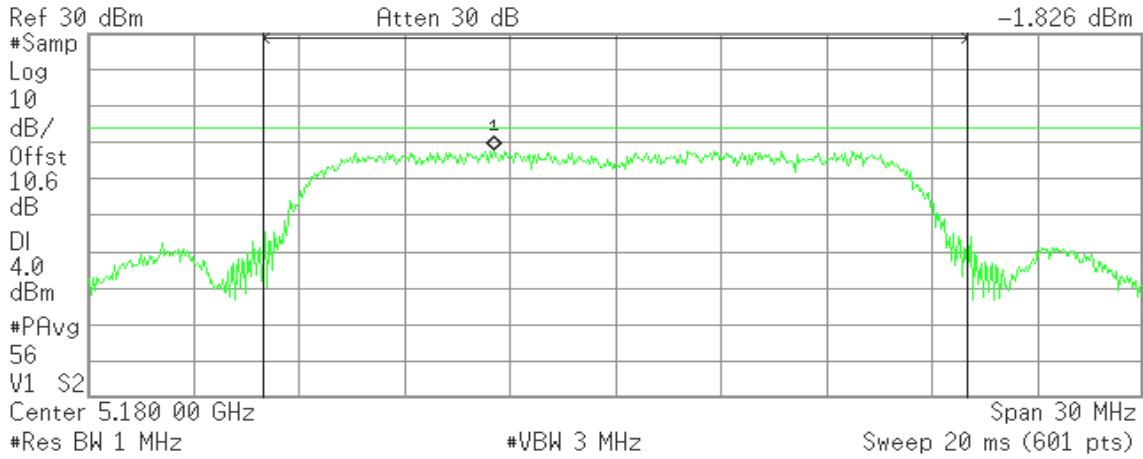
Test Plot
IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low

Agilent 08:49:30 Dec 30, 2011

R T

Mkr1 5.176 55 GHz
-1.826 dBm



Channel Power

7.51 dBm /20.0000 MHz

Power Spectral Density

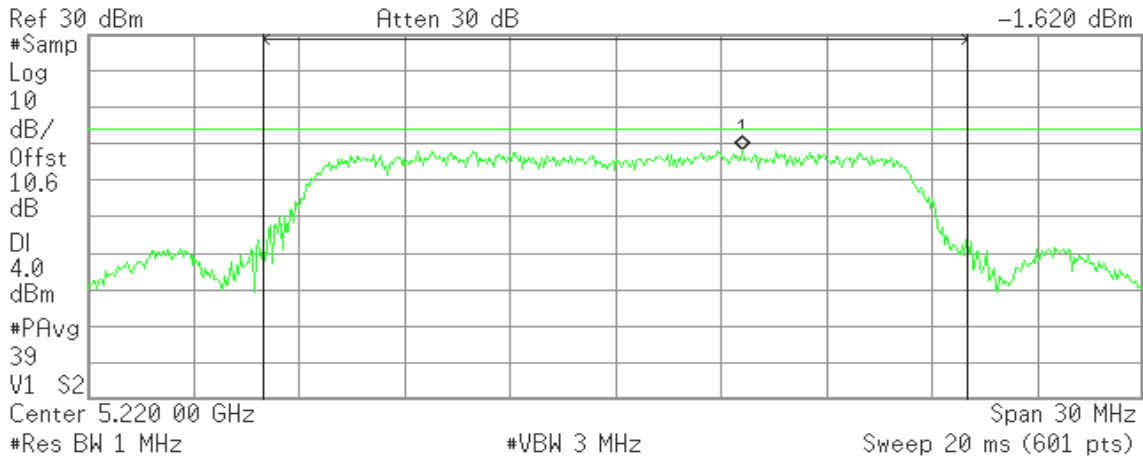
-65.50 dBm/Hz

CH Mid

Agilent 08:55:35 Dec 30, 2011

R T

Mkr1 5.223 60 GHz
-1.620 dBm



Channel Power

8.05 dBm /20.0000 MHz

Power Spectral Density

-64.96 dBm/Hz

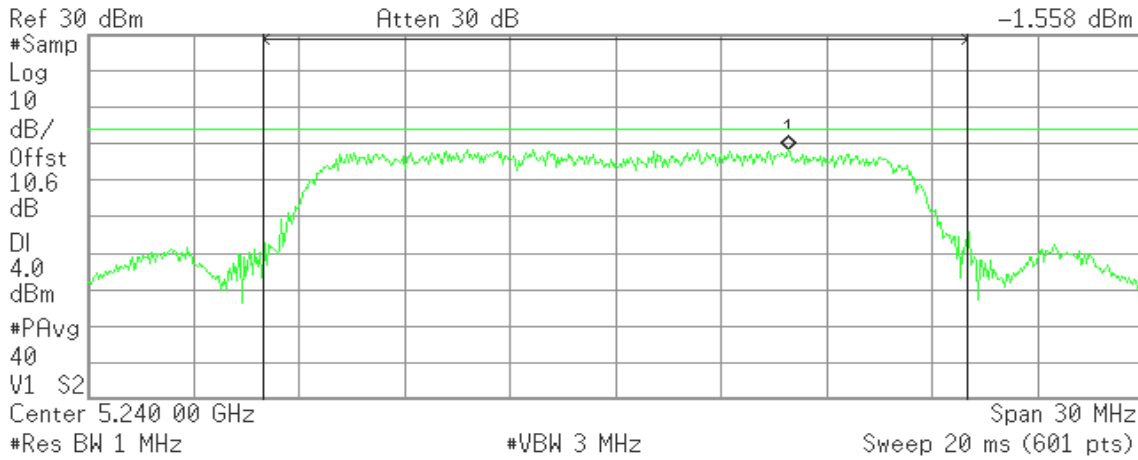


CH High

Agilent 09:00:08 Dec 30, 2011

R T

Mkr1 5.244 90 GHz
-1.558 dBm



Channel Power

7.53 dBm /20.0000 MHz

Power Spectral Density

-65.48 dBm/Hz

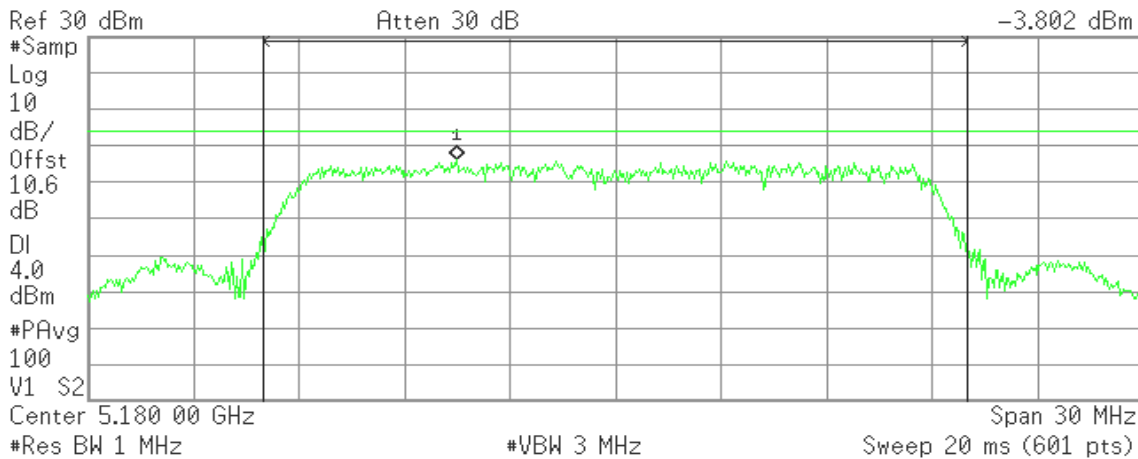
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

CH Low

Agilent 13:58:15 Dec 30, 2011

R T

Mkr1 5.175 50 GHz
-3.802 dBm



Channel Power

5.49 dBm /20.0000 MHz

Power Spectral Density

-67.52 dBm/Hz

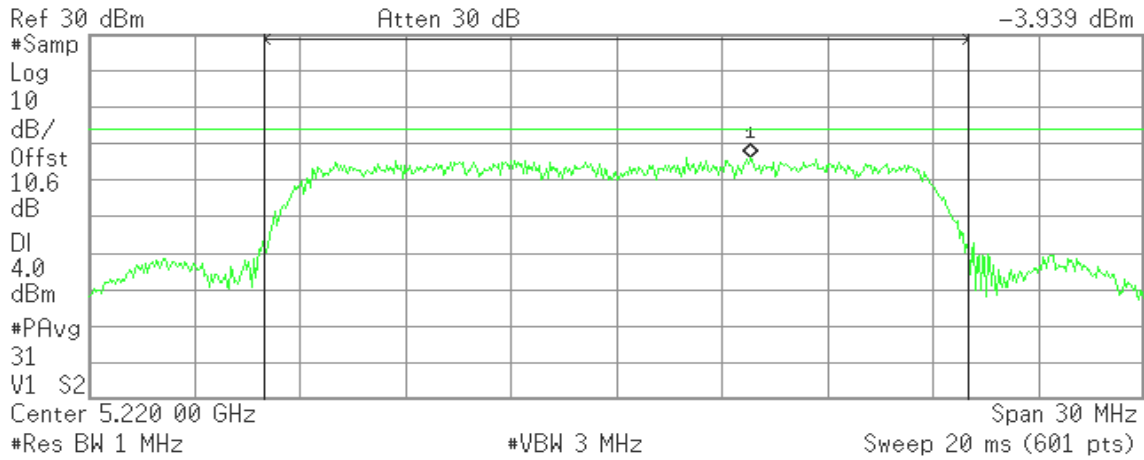


CH Mid

Agilent 14:05:29 Dec 30, 2011

R T

Mkr1 5.223 80 GHz
-3.939 dBm



Channel Power

5.06 dBm /20.0000 MHz

Power Spectral Density

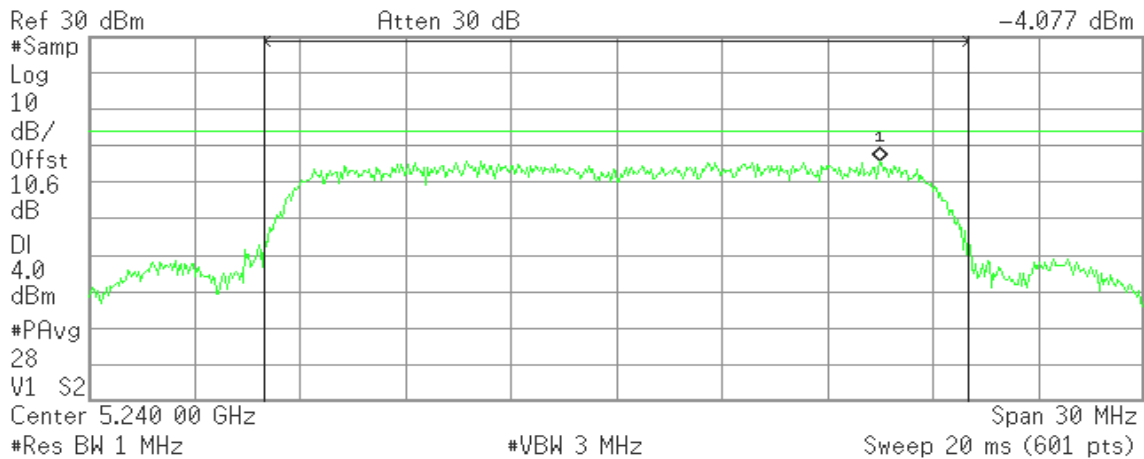
-67.95 dBm/Hz

CH High

Agilent 14:09:32 Dec 30, 2011

R T

Mkr1 5.247 50 GHz
-4.077 dBm



Channel Power

5.30 dBm /20.0000 MHz

Power Spectral Density

-67.71 dBm/Hz



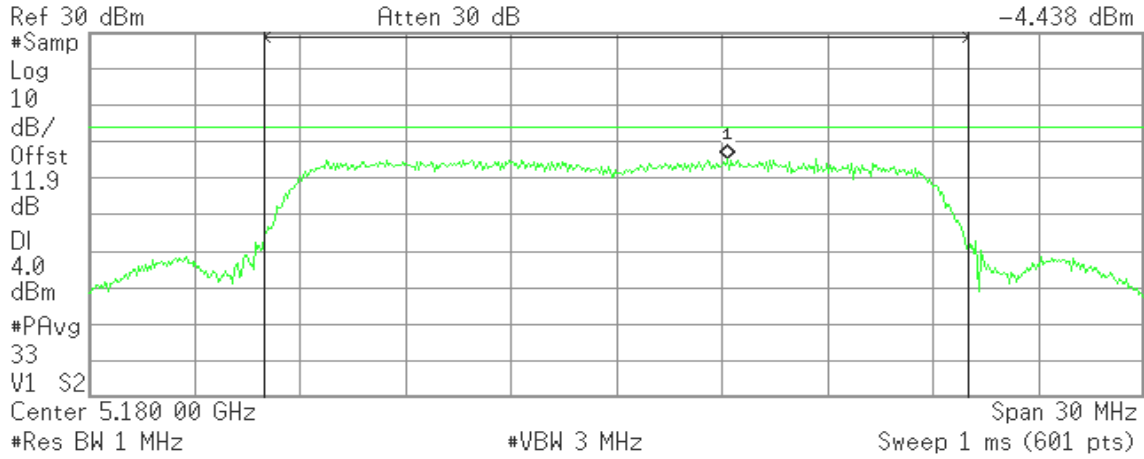
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent 09:23:08 Jan 2, 2012

R T

Mkr1 5.183 15 GHz
-4.438 dBm



Channel Power

5.12 dBm /20.0000 MHz

Power Spectral Density

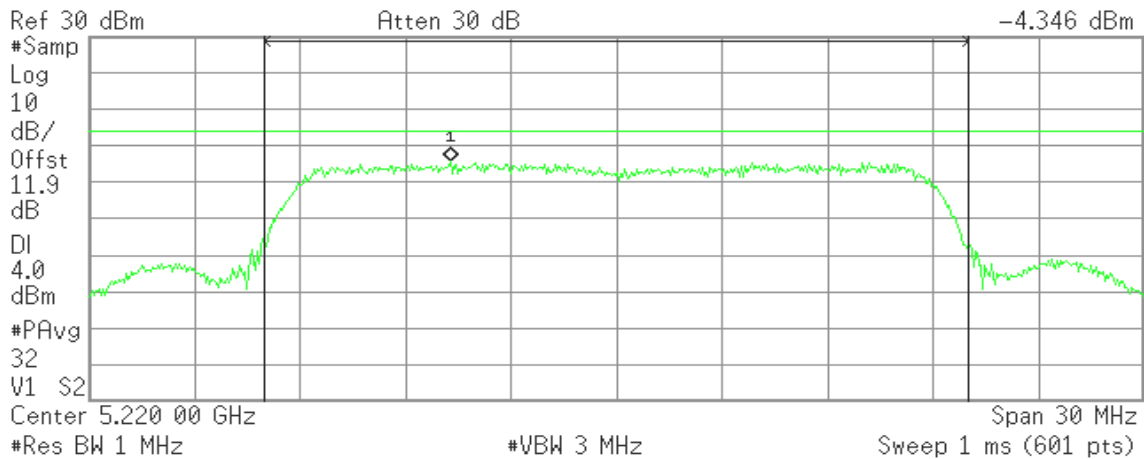
-67.89 dBm/Hz

CH Mid

Agilent 09:27:34 Jan 2, 2012

R T

Mkr1 5.215 30 GHz
-4.346 dBm



Channel Power

4.96 dBm /20.0000 MHz

Power Spectral Density

-68.05 dBm/Hz

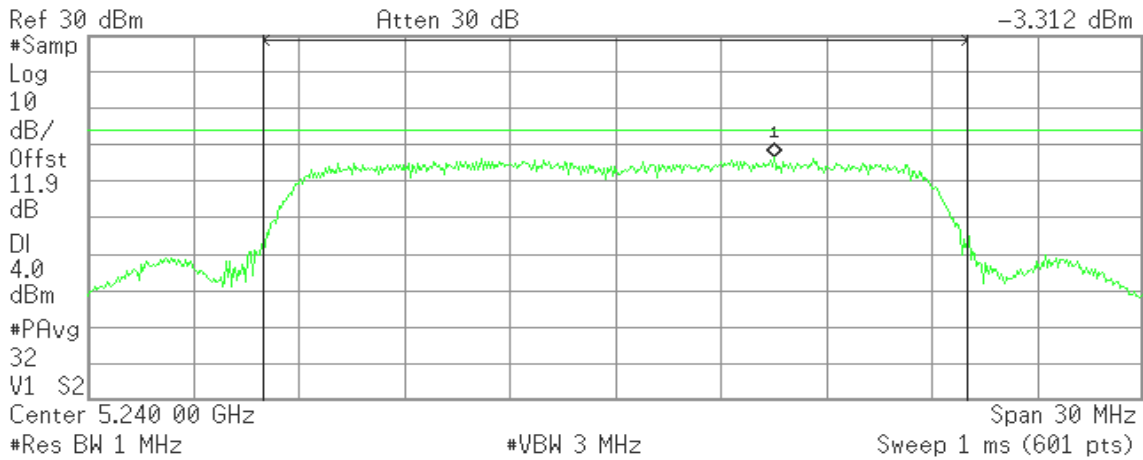


CH High

Agilent 09:30:43 Jan 2, 2012

R T

Mkr1 5.244 50 GHz
-3.312 dBm



Channel Power

5.69 dBm /20.00000 MHz

Power Spectral Density

-67.32 dBm/Hz

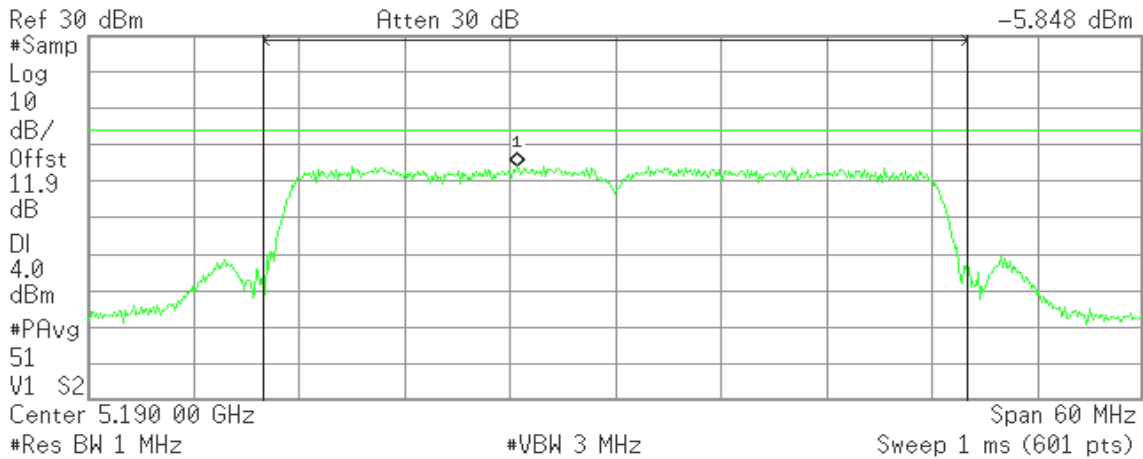
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 0

CH Low

Agilent 16:39:42 Dec 30, 2011

R T

Mkr1 5.184 40 GHz
-5.848 dBm



Channel Power

7.90 dBm /40.00000 MHz

Power Spectral Density

-68.12 dBm/Hz

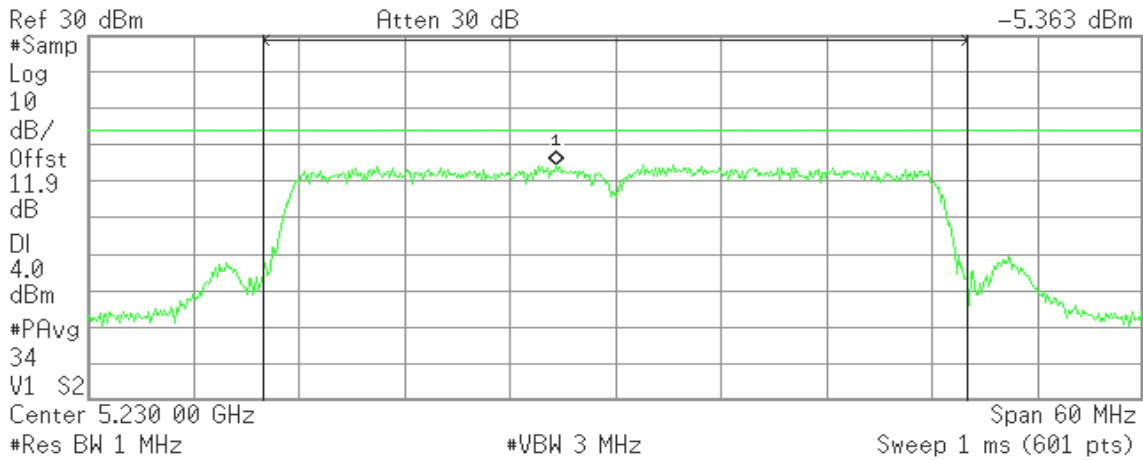


CH High

Agilent 16:45:05 Dec 30, 2011

R T

Mkr1 5.226 60 GHz
-5.363 dBm



Channel Power

6.58 dBm /40.00000 MHz

Power Spectral Density

-69.44 dBm/Hz

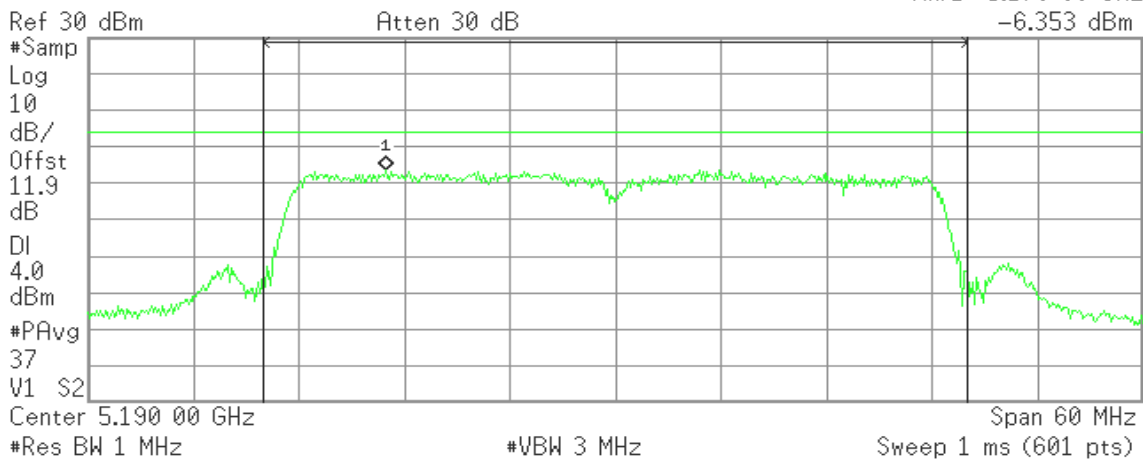
IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / Chain 1

CH Low

Agilent 17:11:54 Dec 30, 2011

R T

Mkr1 5.176 90 GHz
-6.353 dBm



Channel Power

7.66 dBm /40.00000 MHz

Power Spectral Density

-68.36 dBm/Hz

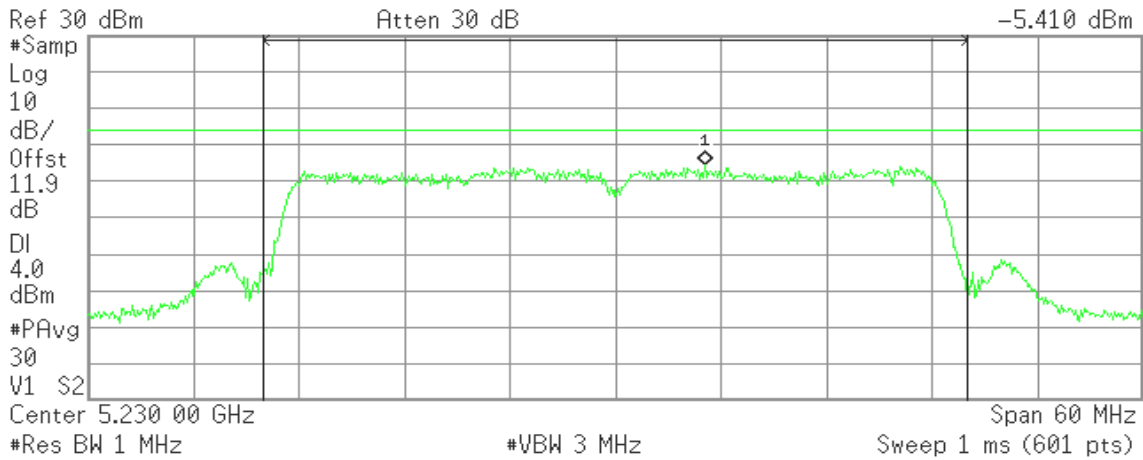


CH High

Agilent 17:15:09 Dec 30, 2011

R T

Mkr1 5.235 10 GHz
-5.410 dBm



Channel Power

7.29 dBm /40.0000 MHz

Power Spectral Density

-68.73 dBm/Hz

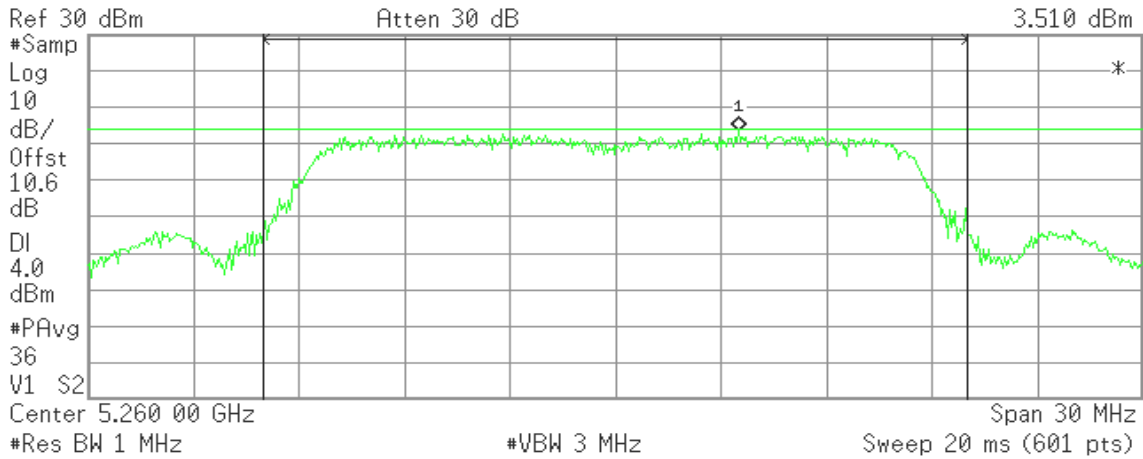
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low

Agilent 09:06:58 Dec 30, 2011

R T

Mkr1 5.263 50 GHz
3.510 dBm



Channel Power

12.27 dBm /20.0000 MHz

Power Spectral Density

-60.74 dBm/Hz

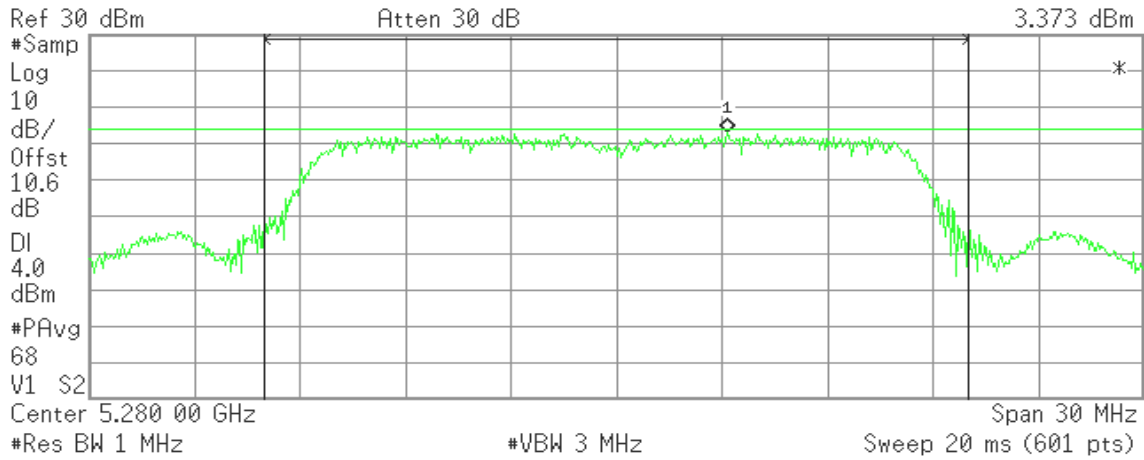


CH Mid

Agilent 09:10:40 Dec 30, 2011

R T

Mkr1 5.283 15 GHz
3.373 dBm



Channel Power

12.48 dBm /20.0000 MHz

Power Spectral Density

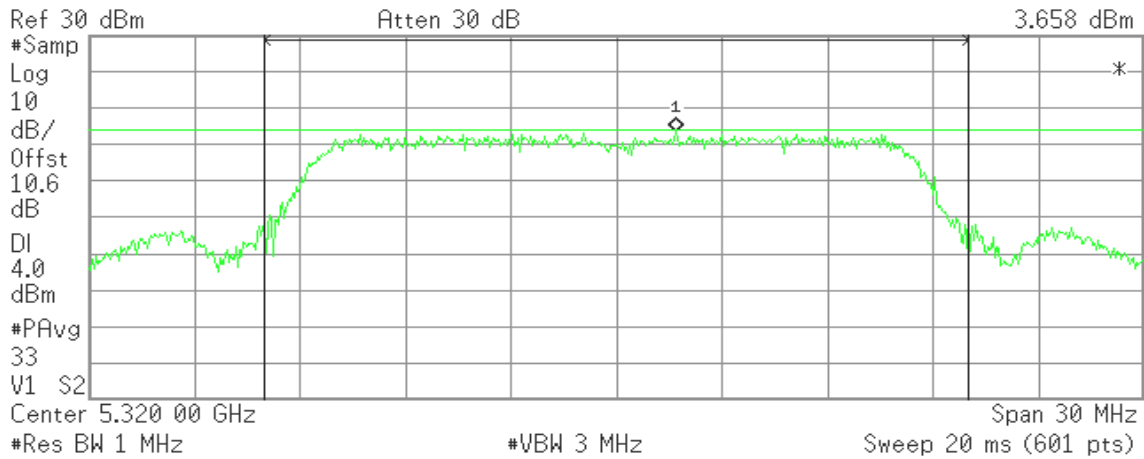
-60.53 dBm/Hz

CH High

Agilent 09:14:12 Dec 30, 2011

R T

Mkr1 5.321 70 GHz
3.658 dBm



Channel Power

13.03 dBm /20.0000 MHz

Power Spectral Density

-59.98 dBm/Hz



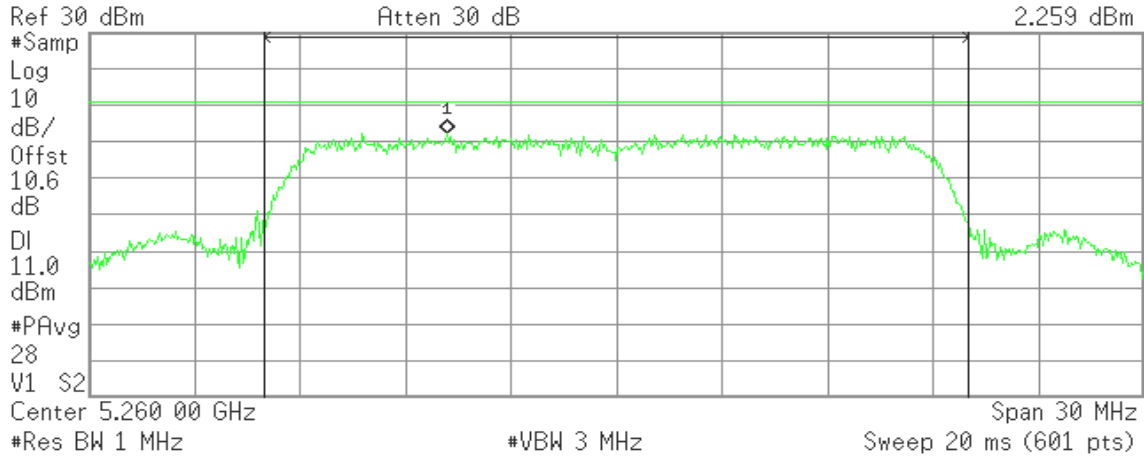
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low

Agilent 14:16:26 Dec 30, 2011

R T

Mkr1 5.255 20 GHz
2.259 dBm



Channel Power

12.02 dBm /20.0000 MHz

Power Spectral Density

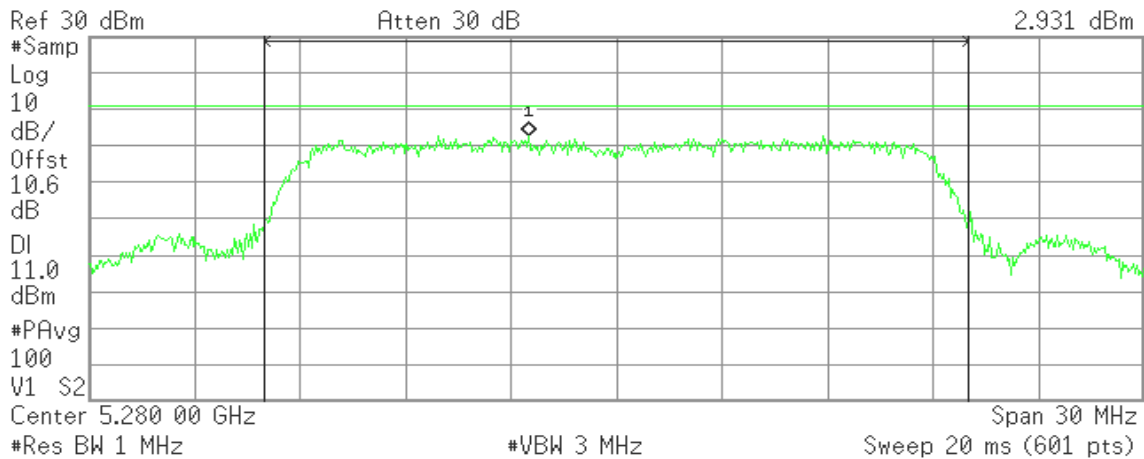
-60.99 dBm/Hz

CH Mid

Agilent 14:22:38 Dec 30, 2011

R T

Mkr1 5.277 50 GHz
2.931 dBm



Channel Power

12.37 dBm /20.0000 MHz

Power Spectral Density

-60.64 dBm/Hz

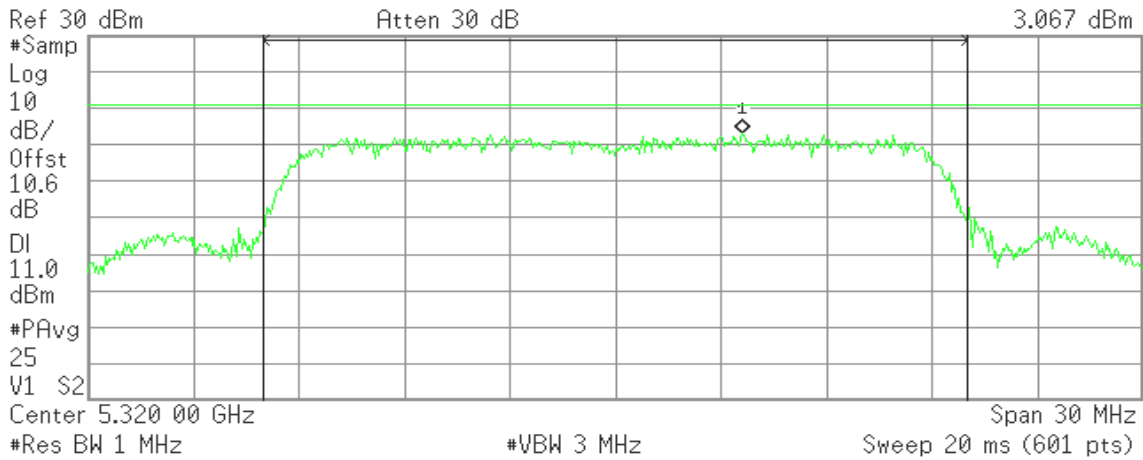


CH High

Agilent 14:31:46 Dec 30, 2011

R T

Mkr1 5.323 60 GHz
3.067 dBm



Channel Power

12.50 dBm /20.0000 MHz

Power Spectral Density

-60.51 dBm/Hz

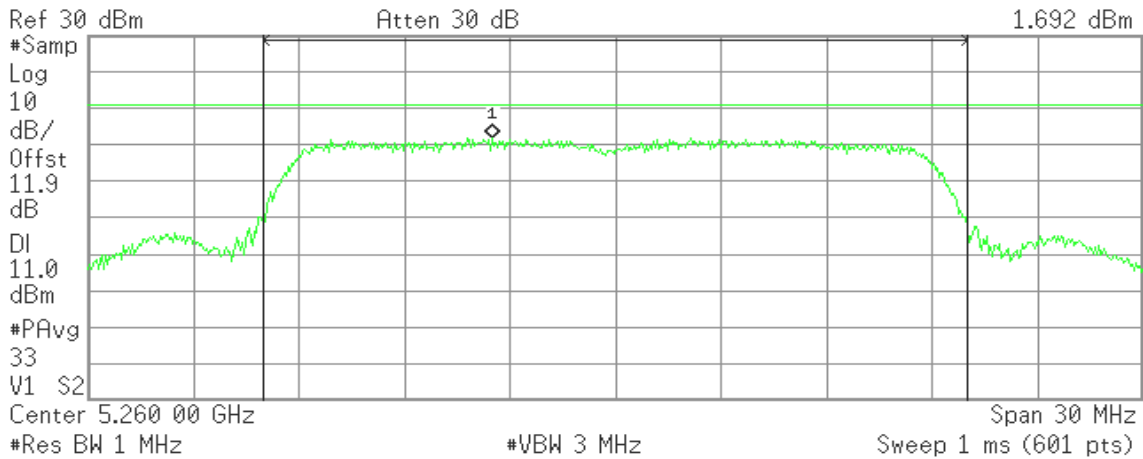
IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 1

CH Low

Agilent 09:36:50 Jan 2, 2012

R T

Mkr1 5.256 50 GHz
1.692 dBm



Channel Power

11.13 dBm /20.0000 MHz

Power Spectral Density

-61.88 dBm/Hz

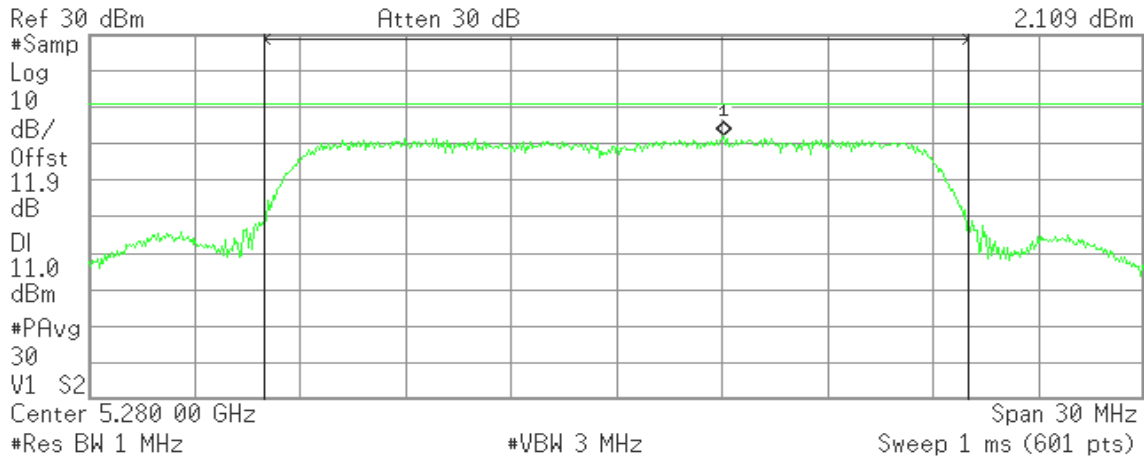


CH Mid

Agilent 09:41:19 Jan 2, 2012

R T

Mkr1 5.283 05 GHz
2.109 dBm



Channel Power

10.73 dBm /20.0000 MHz

Power Spectral Density

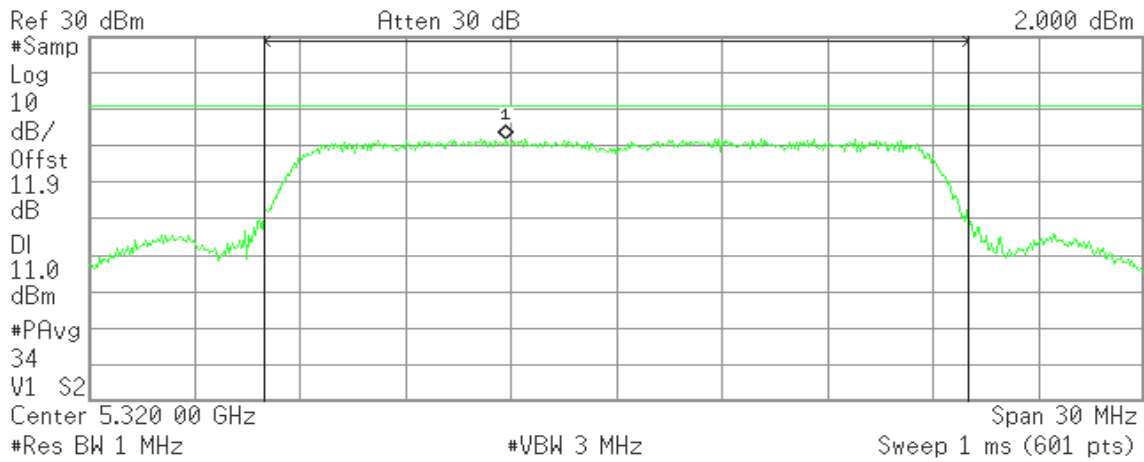
-62.28 dBm/Hz

CH High

Agilent 09:44:29 Jan 2, 2012

R T

Mkr1 5.316 85 GHz
2.000 dBm



Channel Power

10.80 dBm /20.0000 MHz

Power Spectral Density

-62.21 dBm/Hz



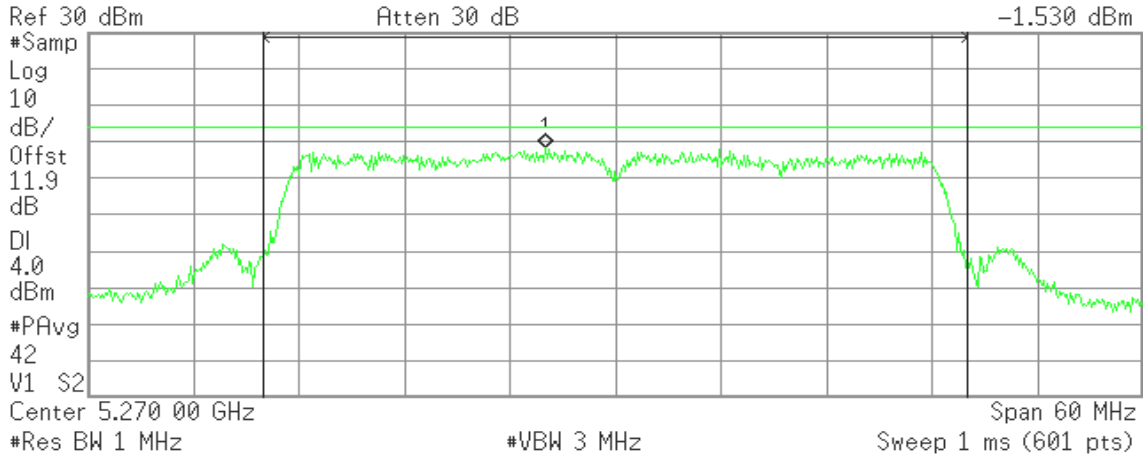
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low

Agilent 16:51:13 Dec 30, 2011

R T

Mkr1 5.266 00 GHz
-1.530 dBm



Channel Power

10.62 dBm /40.0000 MHz

Power Spectral Density

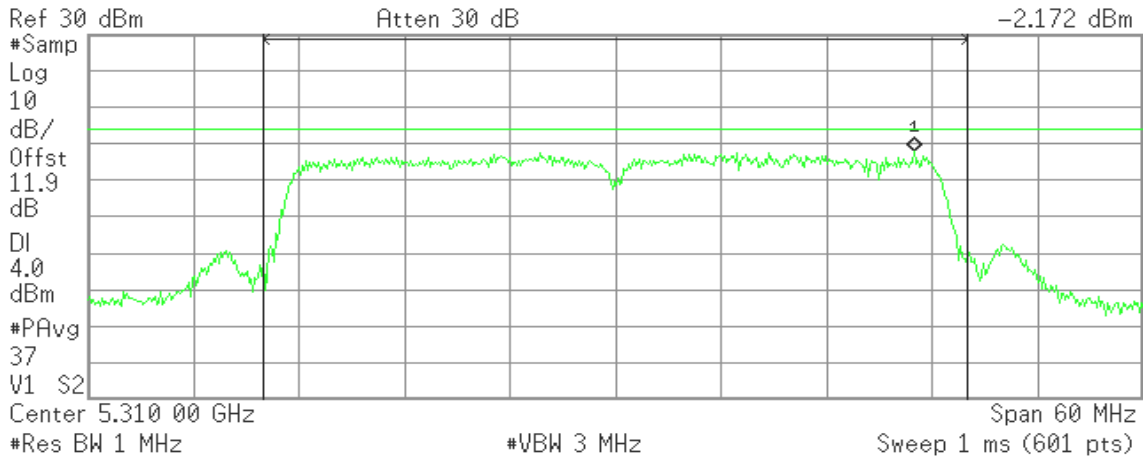
-65.40 dBm/Hz

CH High

Agilent 16:57:09 Dec 30, 2011

R T

Mkr1 5.327 00 GHz
-2.172 dBm



Channel Power

10.61 dBm /40.0000 MHz

Power Spectral Density

-65.41 dBm/Hz



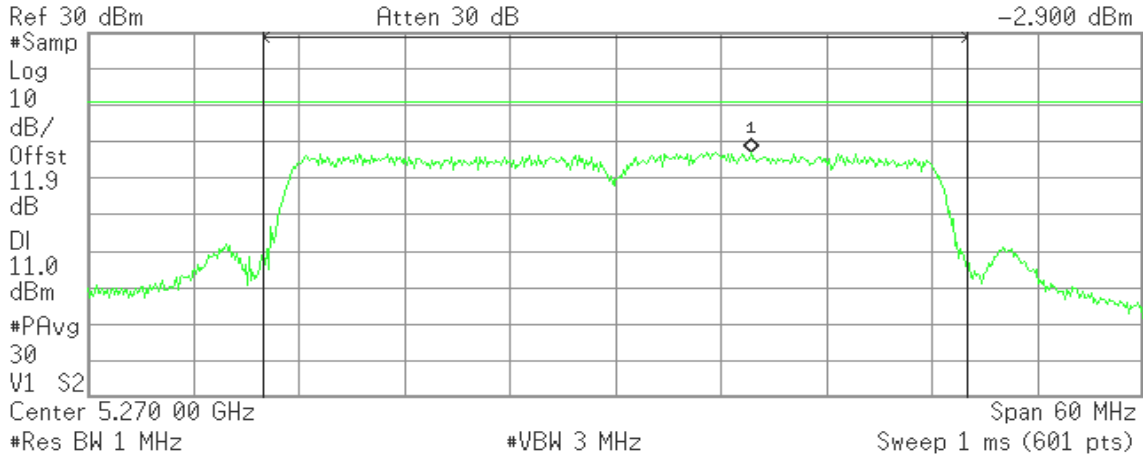
IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low

Agilent 17:18:42 Dec 30, 2011

R T

Mkr1 5.277 70 GHz
-2.900 dBm



Channel Power

10.28 dBm /40.0000 MHz

Power Spectral Density

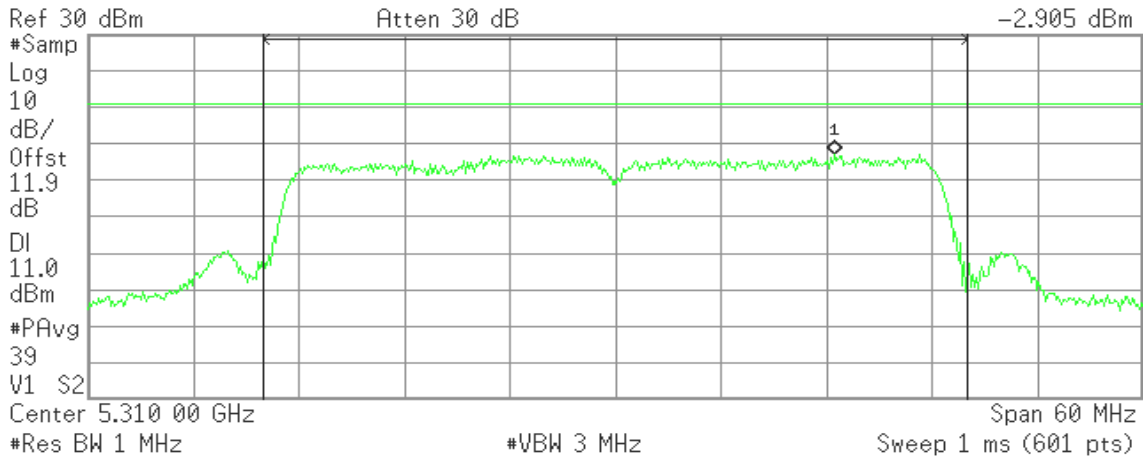
-65.74 dBm/Hz

CH High

Agilent 09:02:14 Jan 2, 2012

R T

Mkr1 5.322 50 GHz
-2.905 dBm



Channel Power

8.97 dBm /40.0000 MHz

Power Spectral Density

-67.05 dBm/Hz



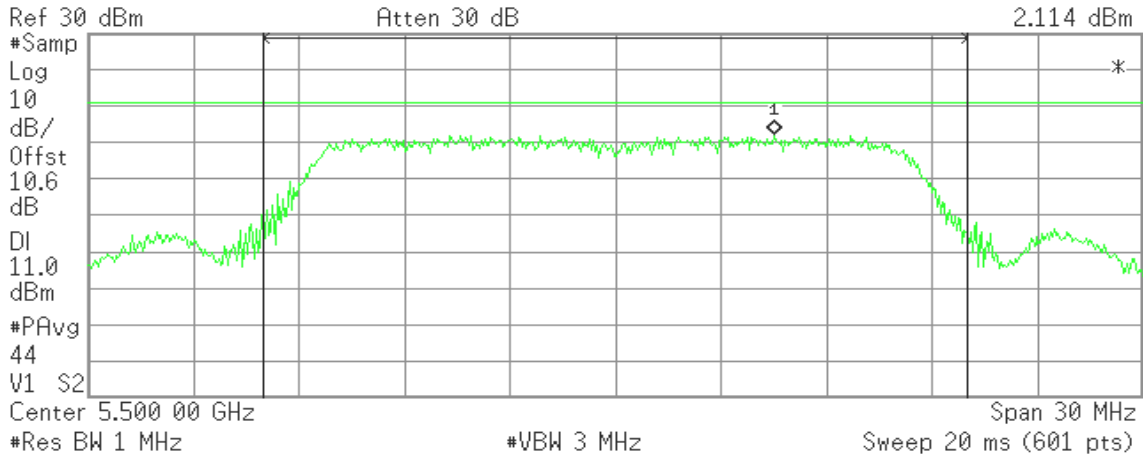
Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low

Agilent 09:39:14 Dec 30, 2011

R T

Mkr1 5.504 50 GHz
2.114 dBm



Channel Power

11.53 dBm /20.0000 MHz

Power Spectral Density

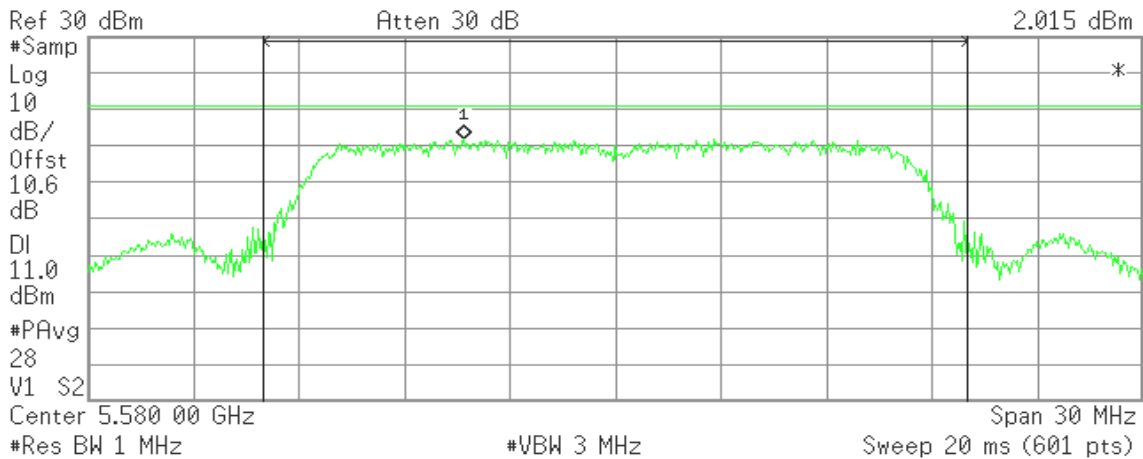
-61.48 dBm/Hz

CH Mid

Agilent 09:43:09 Dec 30, 2011

R T

Mkr1 5.575 70 GHz
2.015 dBm



Channel Power

11.63 dBm /20.0000 MHz

Power Spectral Density

-61.38 dBm/Hz

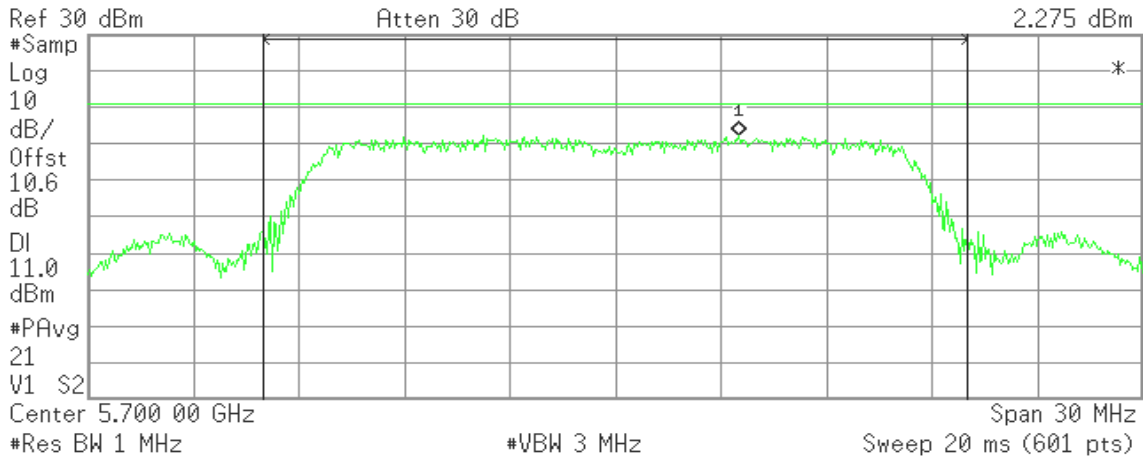


CH High

Agilent 09:46:18 Dec 30, 2011

R T

Mkr1 5.703 50 GHz
2.275 dBm



Channel Power

12.04 dBm /20.0000 MHz

Power Spectral Density

-60.97 dBm/Hz

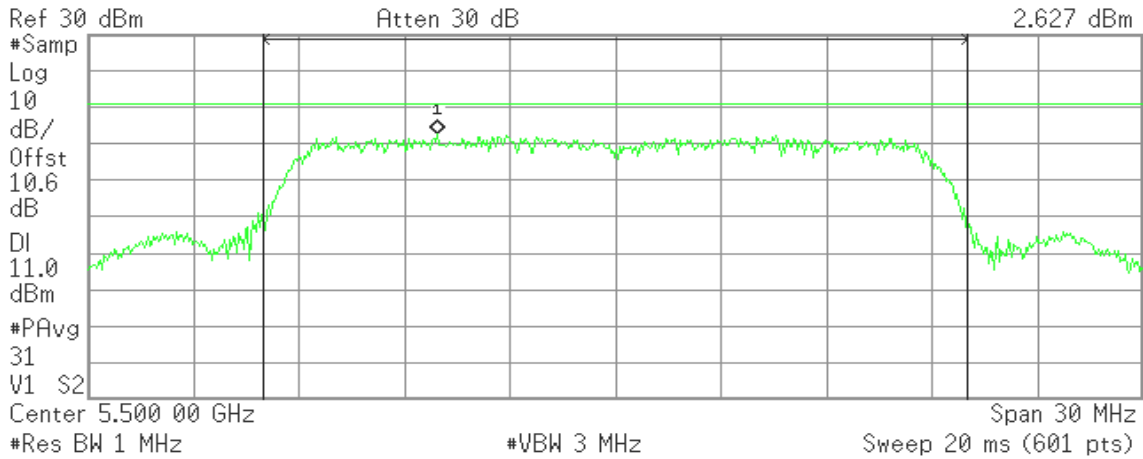
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 0

CH Low

Agilent 14:42:11 Dec 30, 2011

R T

Mkr1 5.494 95 GHz
2.627 dBm



Channel Power

12.32 dBm /20.0000 MHz

Power Spectral Density

-60.69 dBm/Hz

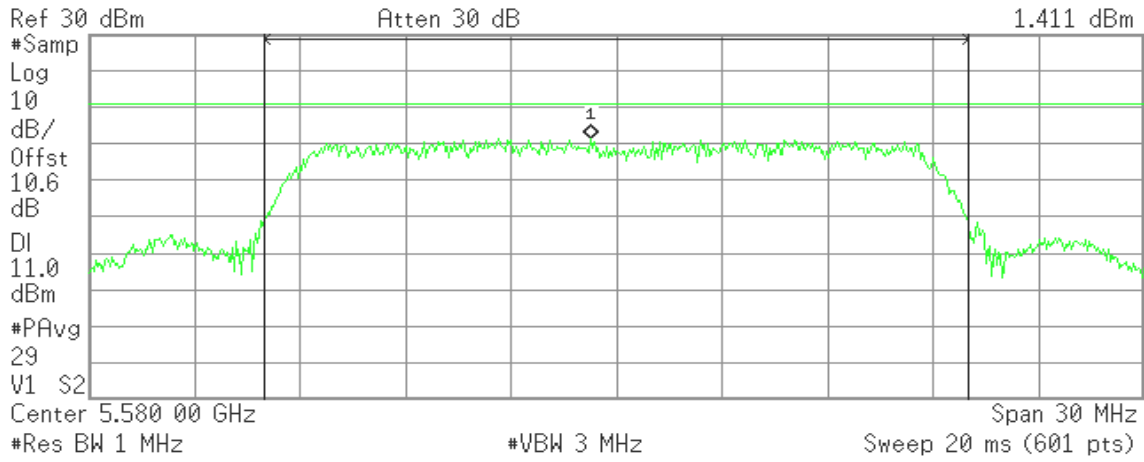


CH Mid

Agilent 14:46:58 Dec 30, 2011

R T

Mkr1 5.579 25 GHz
1.411 dBm



Channel Power

11.42 dBm /20.0000 MHz

Power Spectral Density

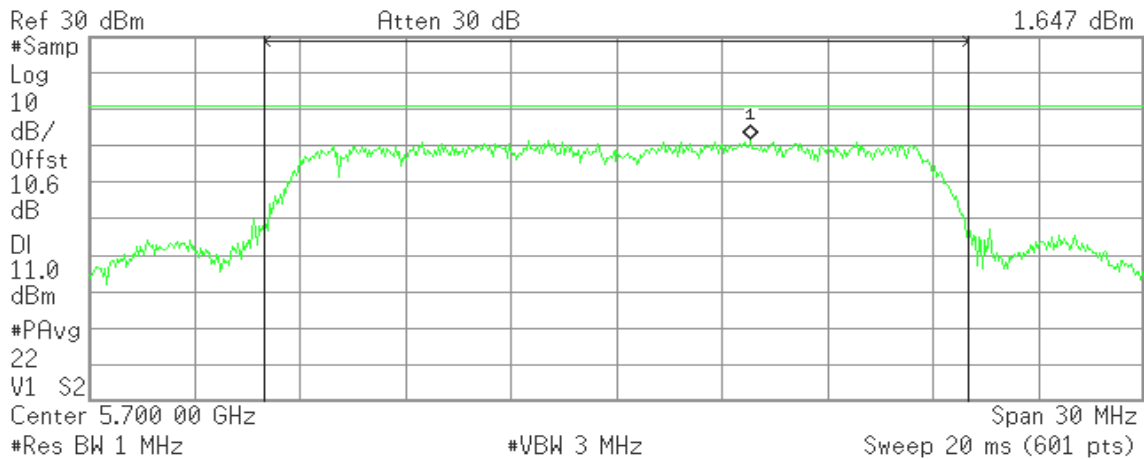
-61.59 dBm/Hz

CH High

Agilent 14:54:23 Dec 30, 2011

R T

Mkr1 5.703 80 GHz
1.647 dBm



Channel Power

11.40 dBm /20.0000 MHz

Power Spectral Density

-61.61 dBm/Hz



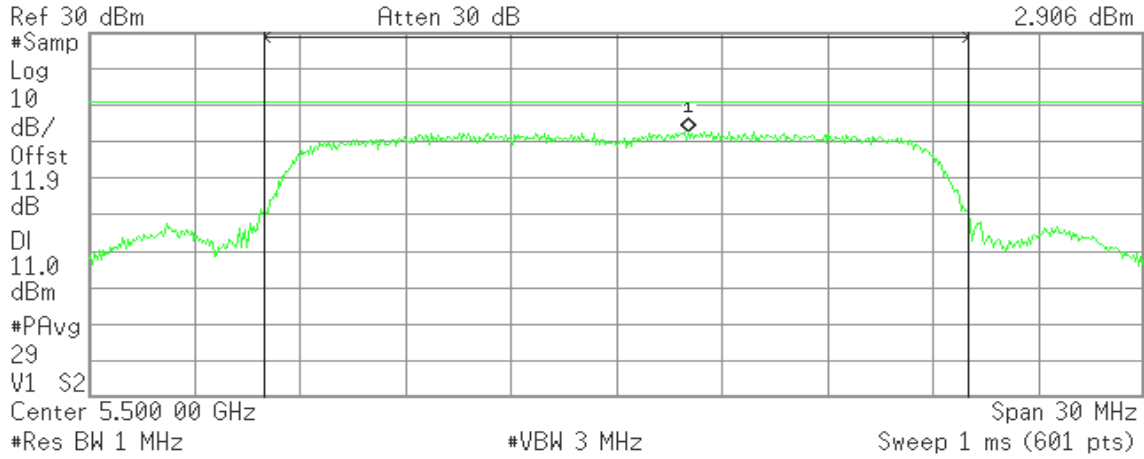
IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low

Agilent 09:49:29 Jan 2, 2012

R T

Mkr1 5.502 05 GHz
2.906 dBm



Channel Power

13.86 dBm /20.0000 MHz

Power Spectral Density

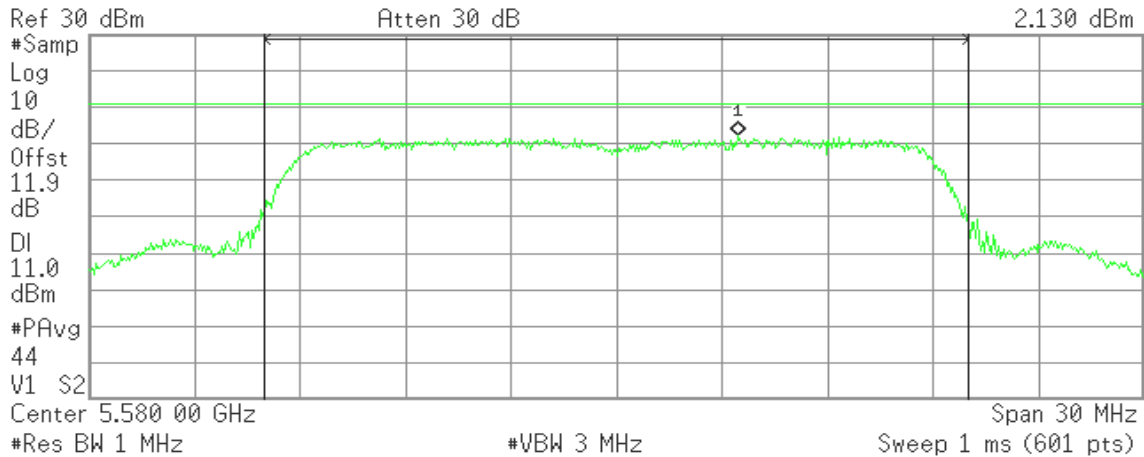
-59.16 dBm/Hz

CH Mid

Agilent 09:57:17 Jan 2, 2012

R T

Mkr1 5.583 45 GHz
2.130 dBm



Channel Power

13.14 dBm /20.0000 MHz

Power Spectral Density

-59.87 dBm/Hz

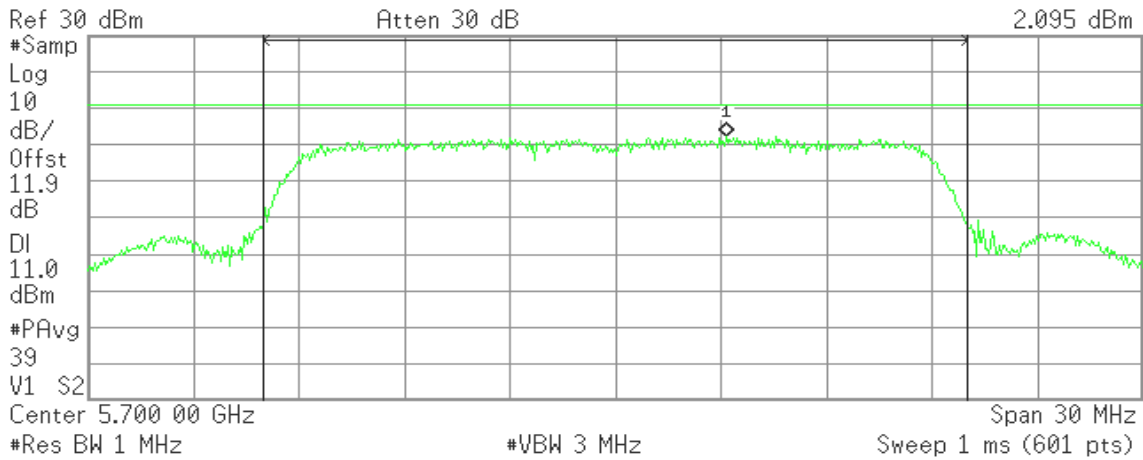


CH High

Agilent 10:07:50 Jan 2, 2012

R T

Mkr1 5.703 15 GHz
2.095 dBm



Channel Power

11.80 dBm /20.00000 MHz

Power Spectral Density

-61.21 dBm/Hz

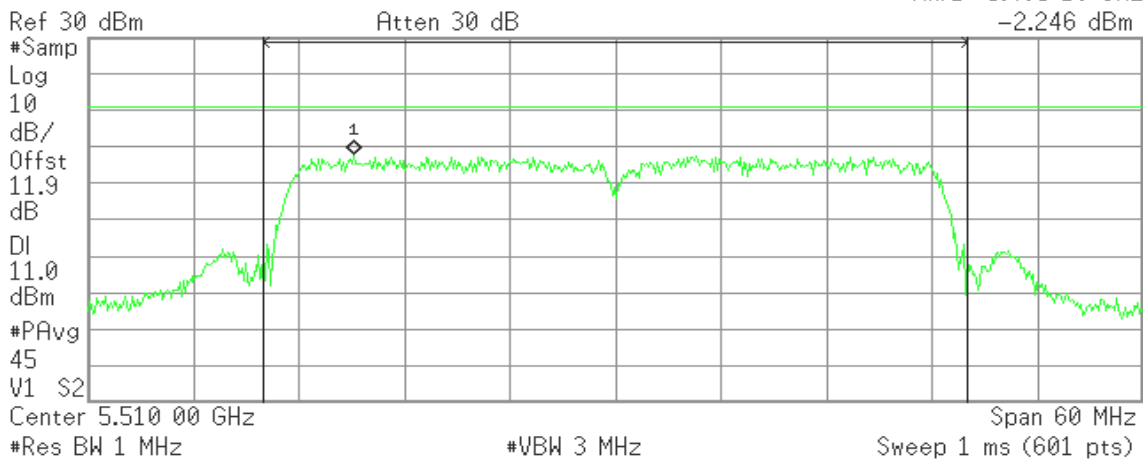
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 0

CH Low

Agilent 17:03:40 Dec 30, 2011

R T

Mkr1 5.495 10 GHz
-2.246 dBm



Channel Power

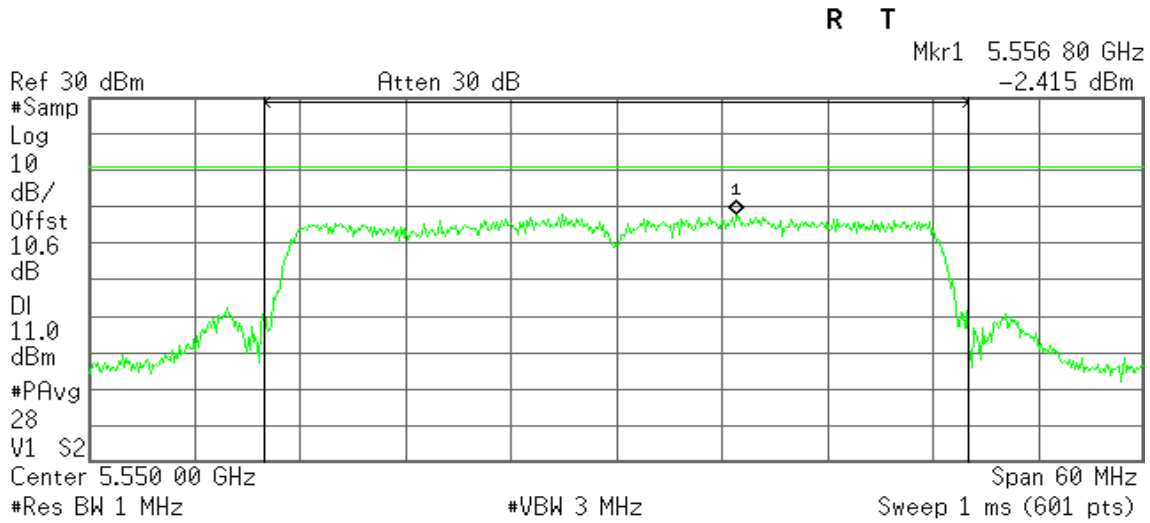
10.64 dBm /40.00000 MHz

Power Spectral Density

-65.38 dBm/Hz



CH Mid



Channel Power

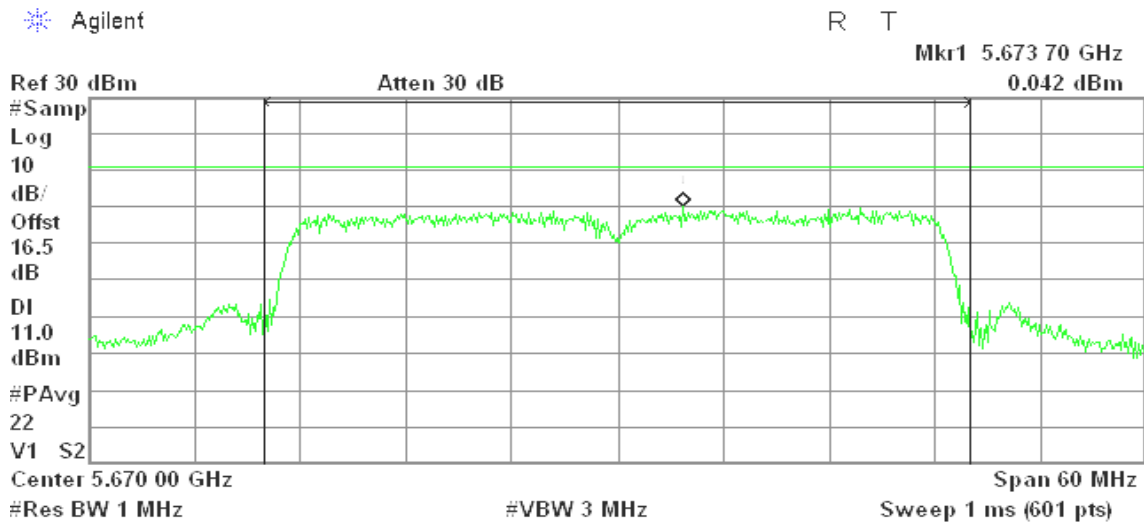
9.36 dBm /40.0000 MHz

Power Spectral Density

-66.56 dBm/Hz

CH High

Agilent



Channel Power

12.37 dBm /40.0000 MHz

Power Spectral Density

-63.65 dBm/Hz



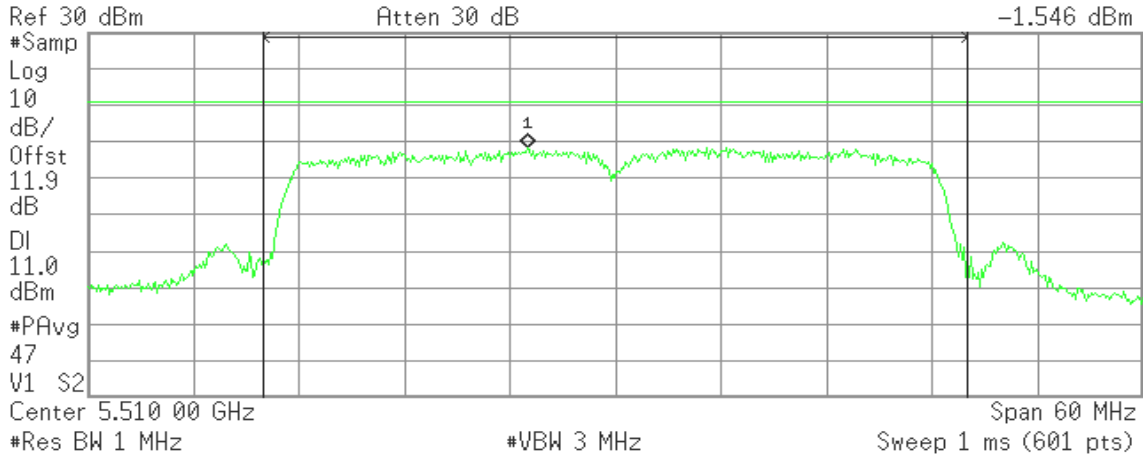
IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

CH Low

Agilent 09:07:53 Jan 2, 2012

R T

Mkr1 5.505 00 GHz
-1.546 dBm



Channel Power

11.68 dBm /40.0000 MHz

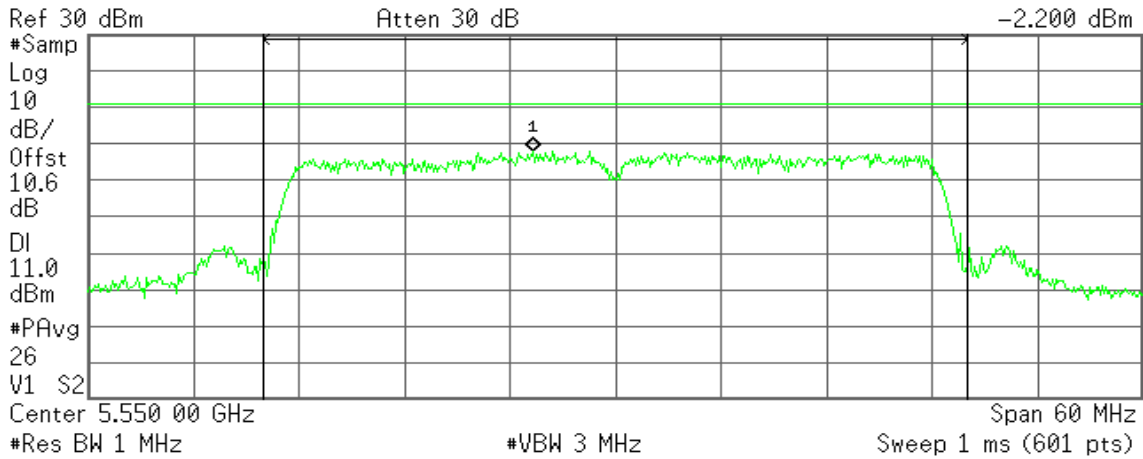
Power Spectral Density

-64.34 dBm/Hz

CH Mid

R T

Mkr1 5.545 30 GHz
-2.200 dBm



Channel Power

10.67 dBm /40.0000 MHz

Power Spectral Density

-65.30 dBm/Hz



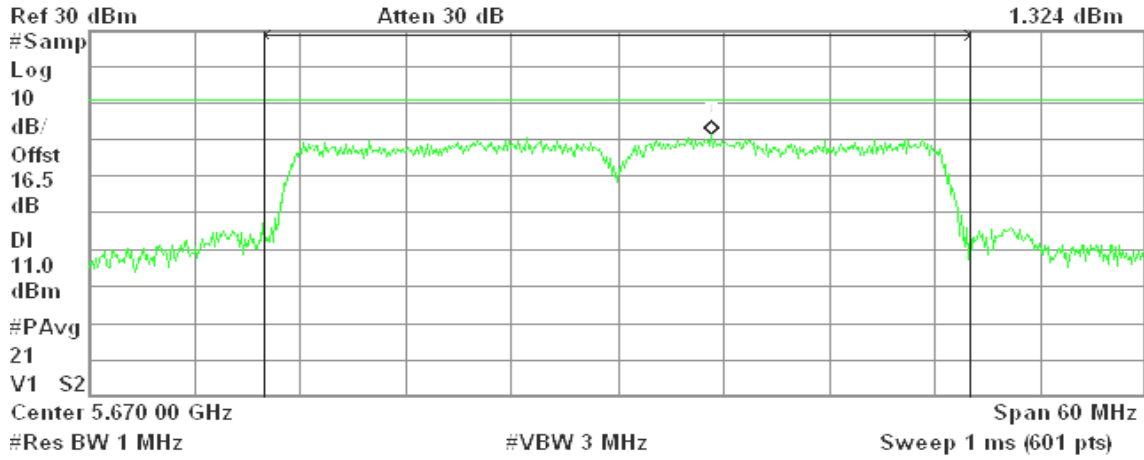
CH High

Agilent

R T

Mkr1 5.675 30 GHz

1.324 dBm



Channel Power

13.58 dBm / 40.0000 MHz

Power Spectral Density

-62.44 dBm/Hz

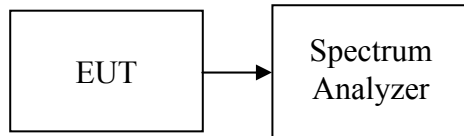


7.6 PEAK EXCURSION

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	10.55	13.00	-2.45	PASS
Mid	5220	9.13	13.00	-3.87	PASS
High	5240	8.76	13.00	-4.24	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5180	9.49	13.00	-3.51	PASS
Mid	5220	10.02	13.00	-2.98	PASS
High	5240	10.59	13.00	-2.41	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5180	9.47	13.00	-3.53	PASS
Mid	5220	10.44	13.00	-2.56	PASS
High	5240	9.50	13.00	-3.50	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5190	12.25	13.00	-0.75	PASS
High	5230	11.17	13.00	-1.83	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5190	11.11	13.00	-1.89	PASS
High	5230	9.46	13.00	-3.54	PASS



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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	8.46	13.00	-4.54	PASS
Mid	5280	10.20	13.00	-2.80	PASS
High	5320	8.25	13.00	-4.75	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	8.85	13.00	-4.15	PASS
Mid	5280	11.88	13.00	-1.12	PASS
High	5320	10.40	13.00	-2.60	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5260	9.77	13.00	-3.23	PASS
Mid	5280	9.73	13.00	-3.27	PASS
High	5320	9.65	13.00	-3.35	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5270	11.35	13.00	-1.65	PASS
High	5310	9.40	13.00	-3.60	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5270	12.03	13.00	-0.97	PASS
High	5310	10.84	13.00	-2.16	PASS



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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	10.95	13.00	-2.05	PASS
Mid	5580	8.72	13.00	-4.28	PASS
High	5700	8.58	13.00	-4.42	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	9.38	13.00	-3.62	PASS
Mid	5580	9.05	13.00	-3.95	PASS
High	5700	10.43	13.00	-2.57	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5500	8.81	13.00	-4.19	PASS
Mid	5580	10.67	13.00	-2.33	PASS
High	5700	10.24	13.00	-2.76	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5510	9.00	13.00	-4.00	PASS
Mid	5550	11.99	13.00	-1.01	PASS
High	5670	8.73	13.00	-4.27	PASS

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

Channel	Frequency (MHz)	Peak Excursion (dB)	Limit (dB)	Margin (dB)	Result
Low	5510	9.51	13.00	-3.49	PASS
Mid	5550	8.22	13.00	-4.78	PASS
High	5670	8.63	13.00	-4.37	PASS



Test Plot

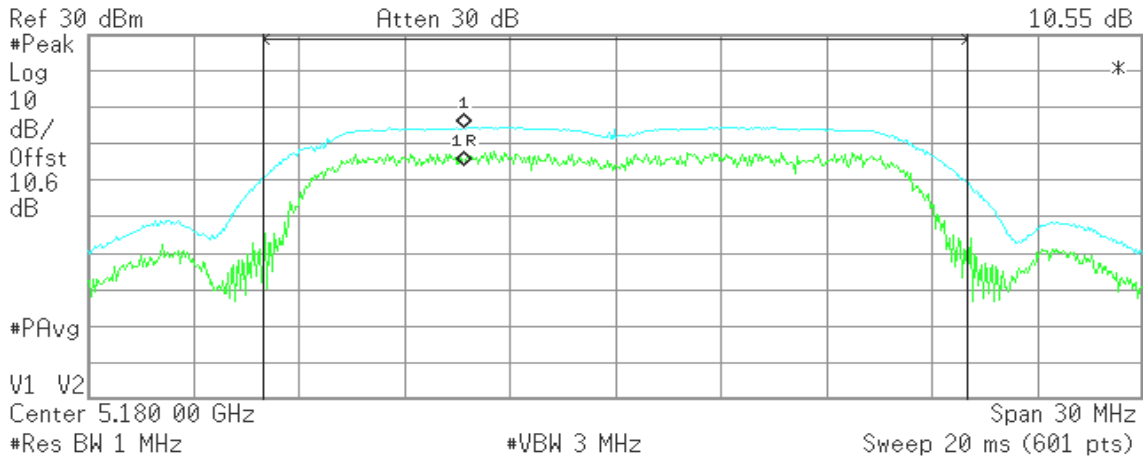
IEEE 802.11a mode / 5180 ~ 5240MHz

CH Low

Agilent 08:50:16 Dec 30, 2011

R T

Mkr1 0 Hz
10.55 dB



Channel Power

14.05 dBm /20.0000 MHz

Power Spectral Density

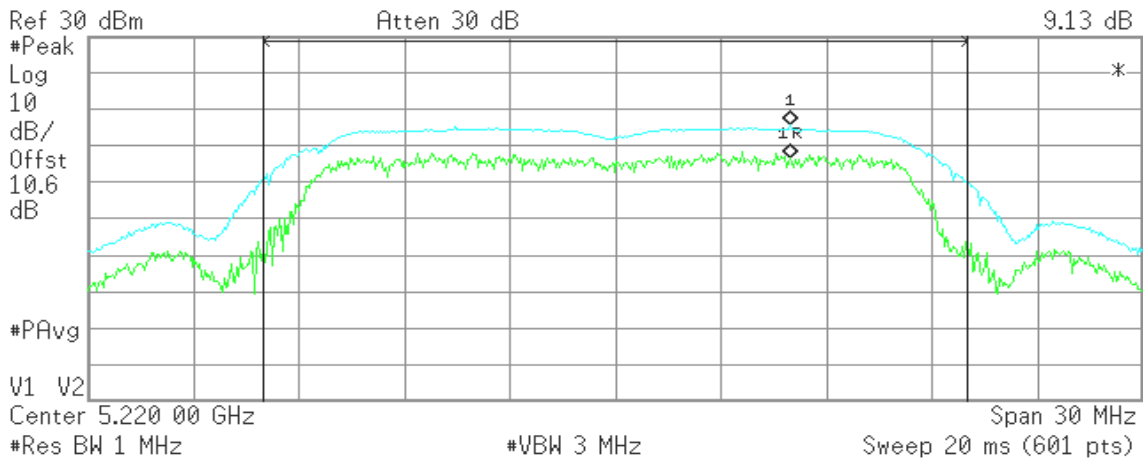
-58.96 dBm/Hz

CH Mid

Agilent 08:56:08 Dec 30, 2011

R T

Mkr1 0 Hz
9.13 dB



Channel Power

14.19 dBm /20.0000 MHz

Power Spectral Density

-58.82 dBm/Hz

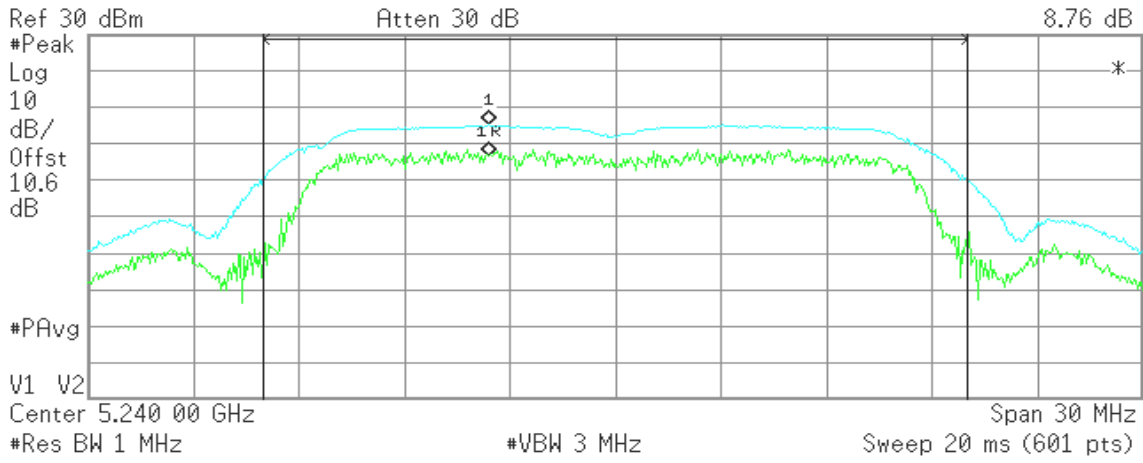


CH High

Agilent 09:00:39 Dec 30, 2011

R T

Mkr1 0 Hz
8.76 dB



Channel Power

14.27 dBm /20.0000 MHz

Power Spectral Density

-58.74 dBm/Hz

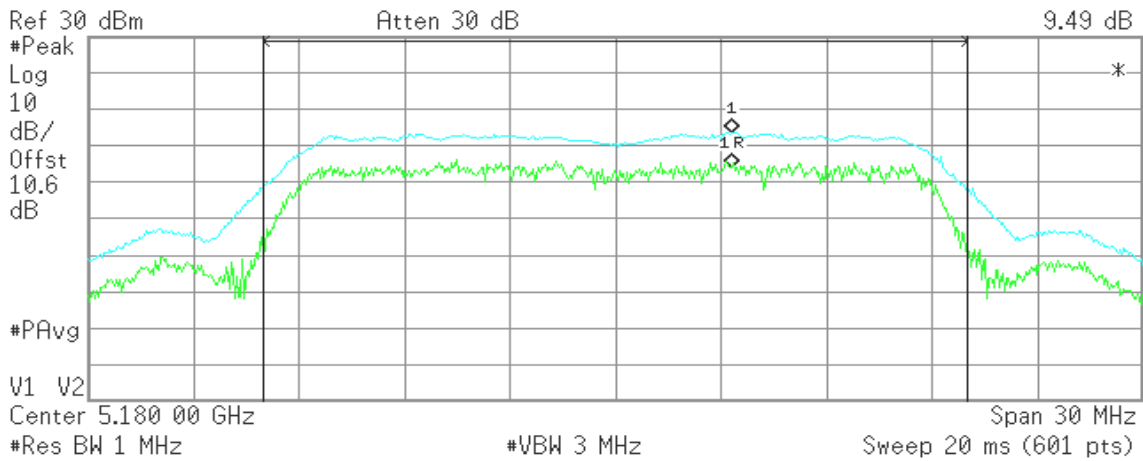
IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 0

CH Low

Agilent 13:59:28 Dec 30, 2011

R T

Mkr1 0 Hz
9.49 dB



Channel Power

12.02 dBm /20.0000 MHz

Power Spectral Density

-60.99 dBm/Hz

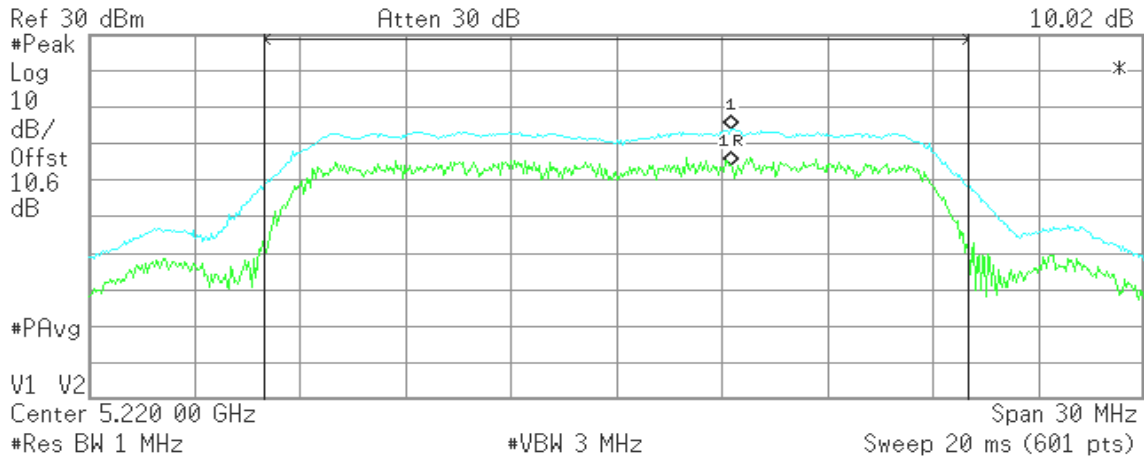


CH Mid

Agilent 14:05:57 Dec 30, 2011

R T

Mkr1 0 Hz
10.02 dB



Channel Power

12.04 dBm /20.0000 MHz

Power Spectral Density

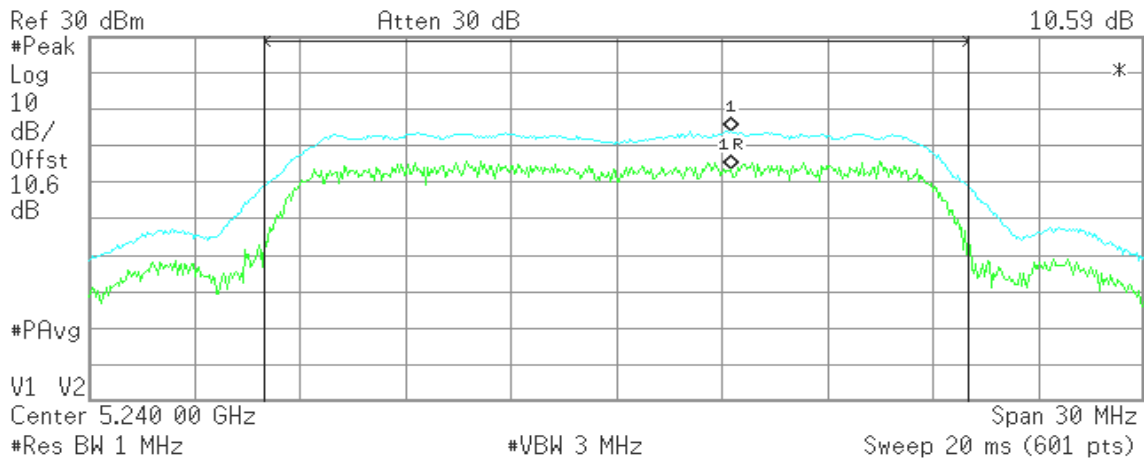
-60.97 dBm/Hz

CH High

Agilent 14:10:01 Dec 30, 2011

R T

Mkr1 0 Hz
10.59 dB



Channel Power

12.22 dBm /20.0000 MHz

Power Spectral Density

-60.79 dBm/Hz

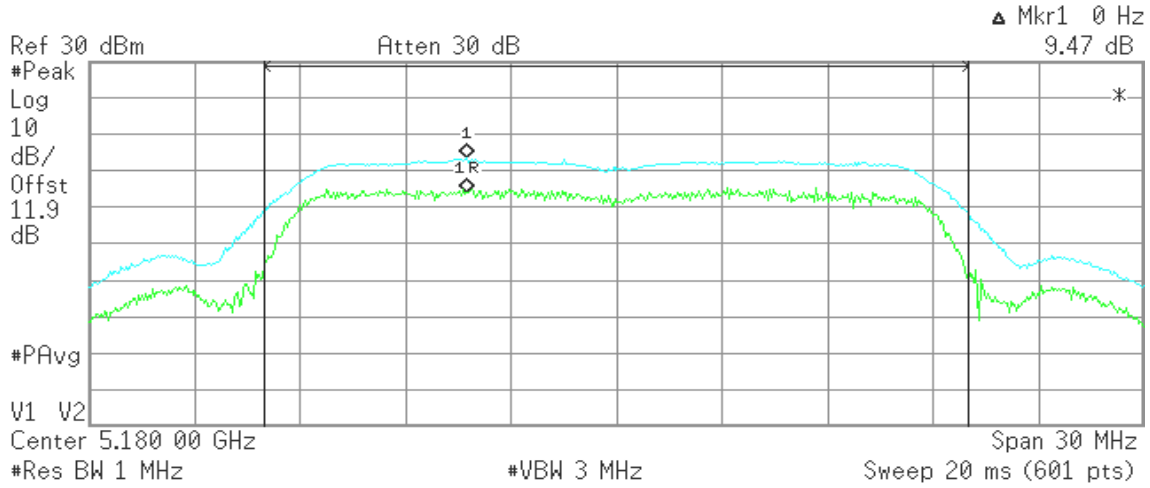


IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / Chain 1

CH Low

Agilent 09:23:34 Jan 2, 2012

R T



Channel Power

12.18 dBm /20.0000 MHz

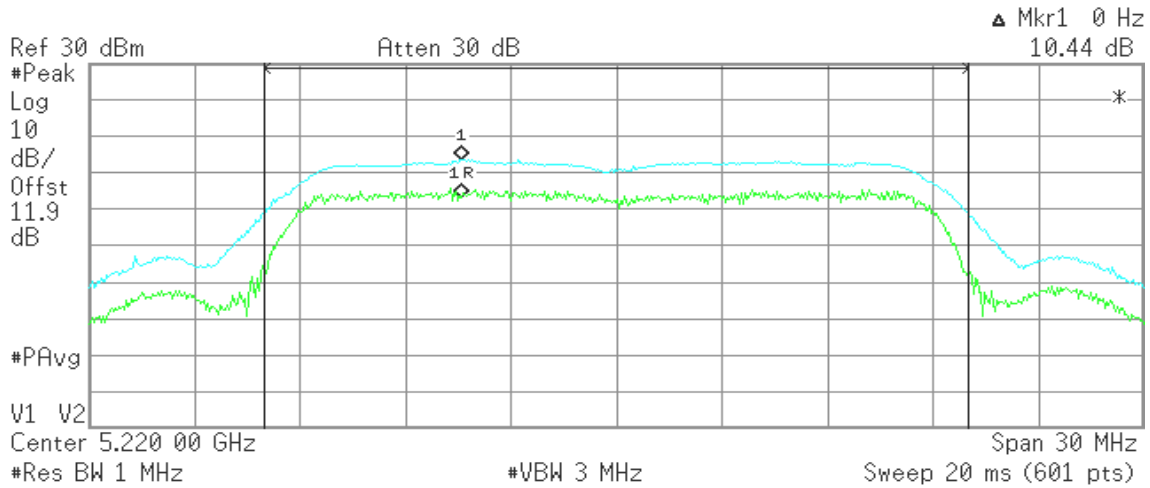
Power Spectral Density

-60.83 dBm/Hz

CH Mid

Agilent 09:28:03 Jan 2, 2012

R T



Channel Power

12.43 dBm /20.0000 MHz

Power Spectral Density

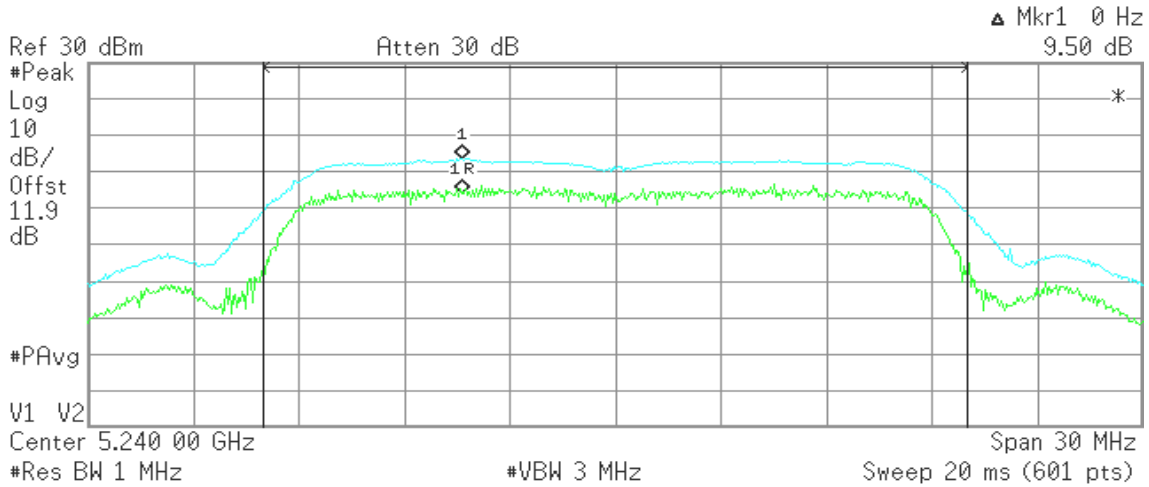
-60.58 dBm/Hz



CH High

Agilent 09:31:09 Jan 2, 2012

R T



Channel Power

12.53 dBm /20.0000 MHz

Power Spectral Density

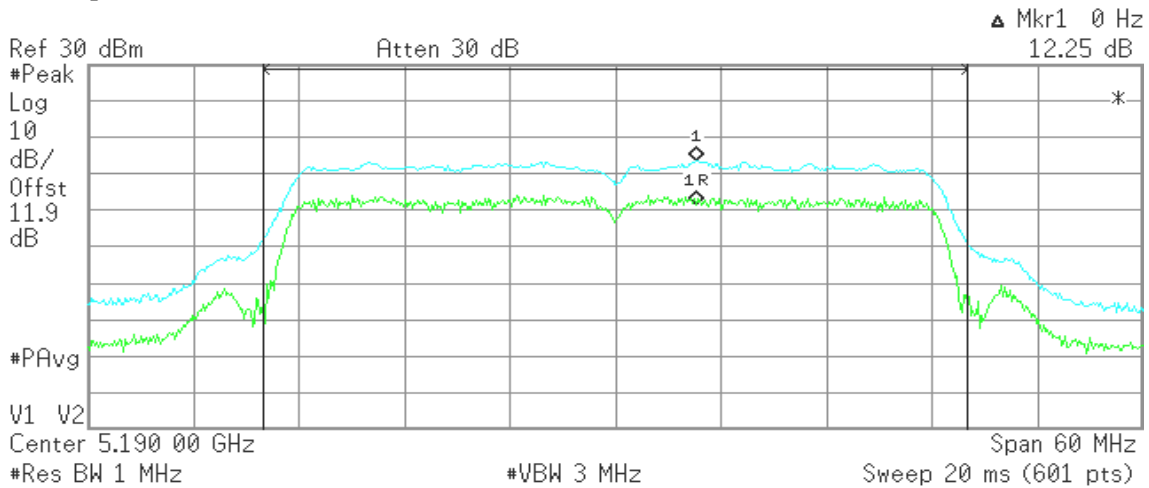
-60.48 dBm/Hz

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

CH Low

Agilent 16:40:10 Dec 30, 2011

R T



Channel Power

14.05 dBm /40.0000 MHz

Power Spectral Density

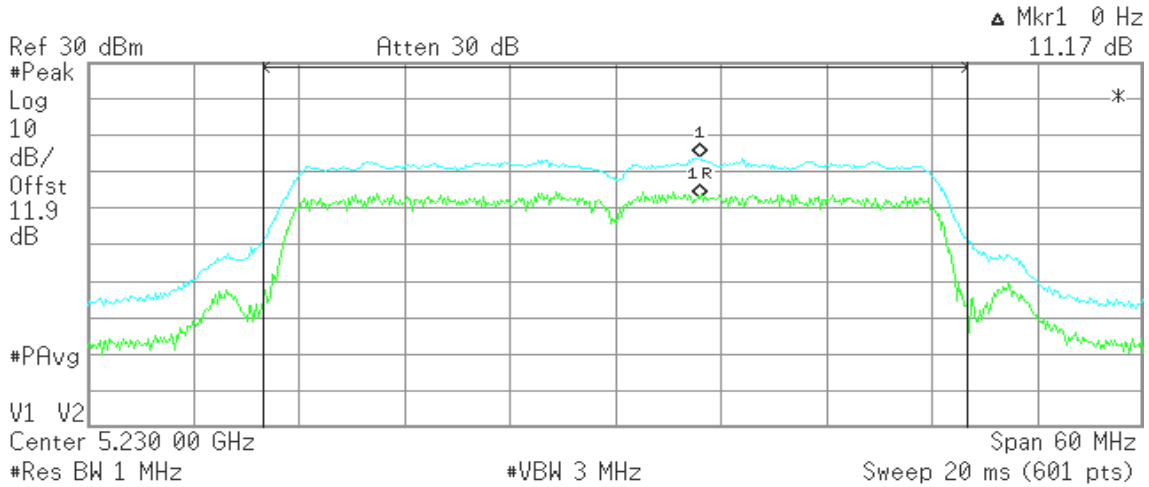
-61.97 dBm/Hz



CH High

Agilent 16:45:46 Dec 30, 2011

R T



Channel Power

13.83 dBm /40.00000 MHz

Power Spectral Density

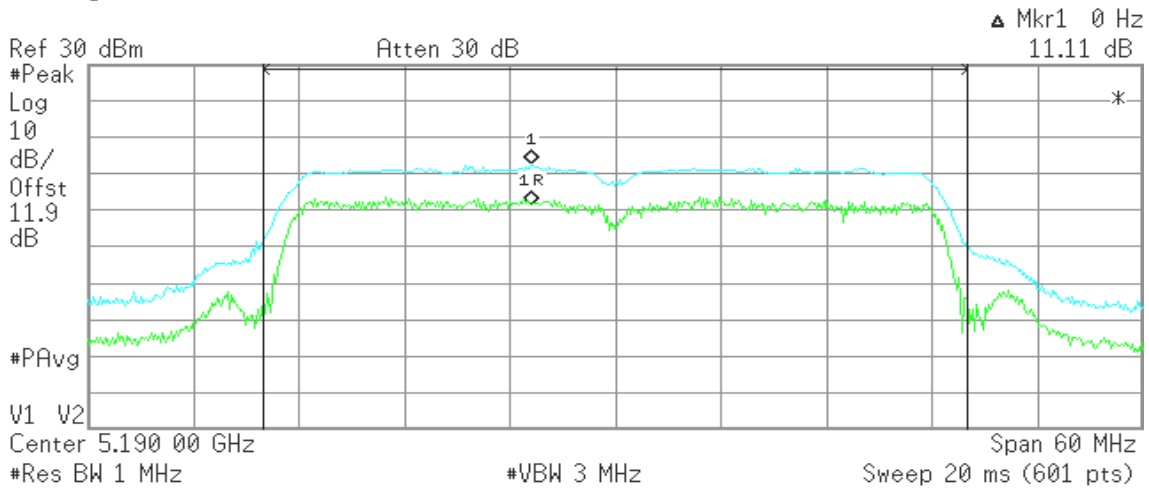
-62.19 dBm/Hz

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

CH Low

Agilent 17:12:19 Dec 30, 2011

R T



Channel Power

13.23 dBm /40.00000 MHz

Power Spectral Density

-62.79 dBm/Hz

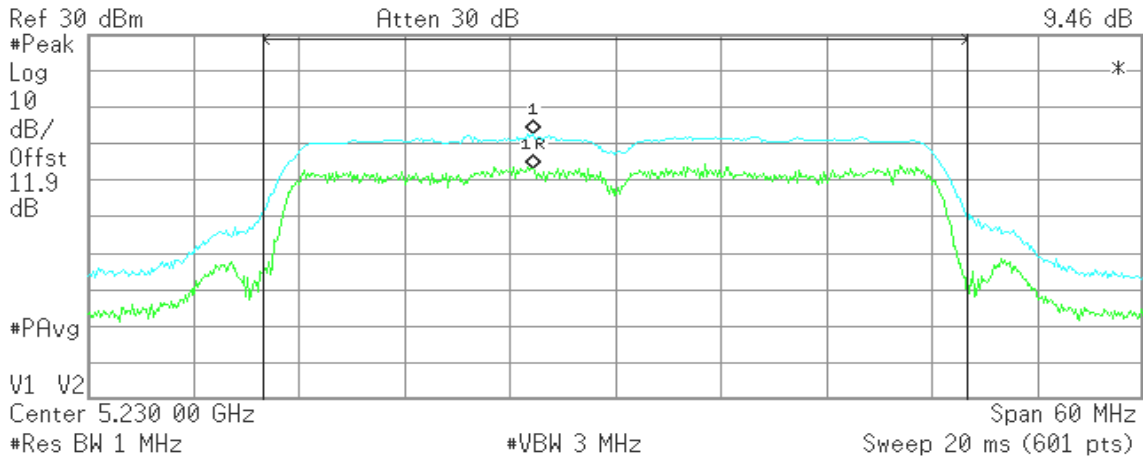


CH High

Agilent 17:15:36 Dec 30, 2011

R T

Mkr1 0 Hz
9.46 dB



Channel Power

13.39 dBm / 40.0000 MHz

Power Spectral Density

-62.63 dBm/Hz

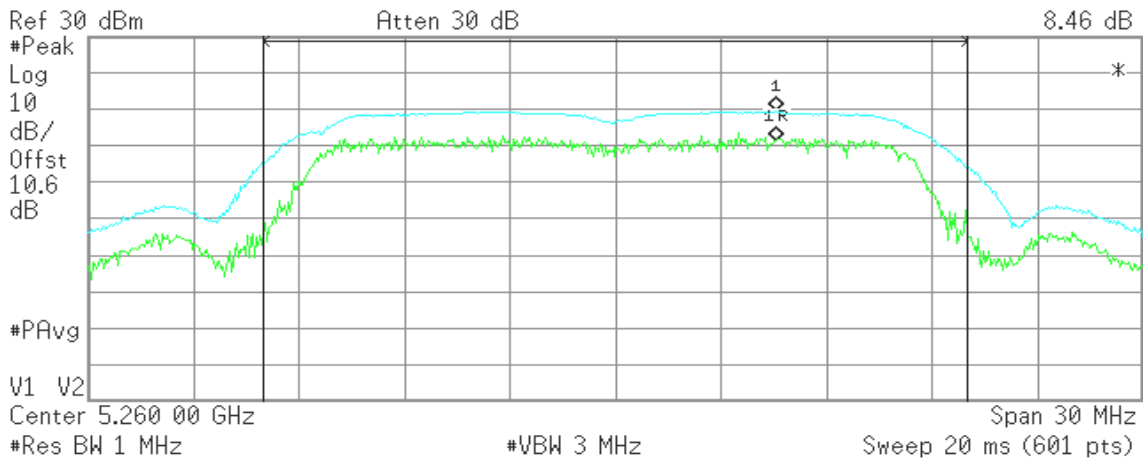
IEEE 802.11a mode / 5260 ~ 5320MHz

CH Low

Agilent 09:07:23 Dec 30, 2011

R T

Mkr1 0 Hz
8.46 dB



Channel Power

18.73 dBm / 20.0000 MHz

Power Spectral Density

-54.28 dBm/Hz

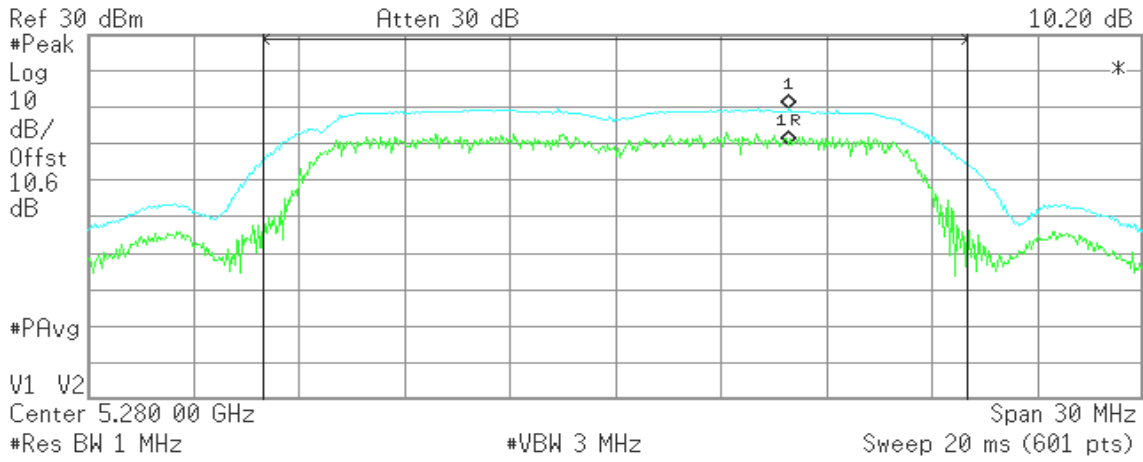


CH Mid

Agilent 09:11:21 Dec 30, 2011

R T

Mkr1 0 Hz
10.20 dB



Channel Power

18.73 dBm /20.0000 MHz

Power Spectral Density

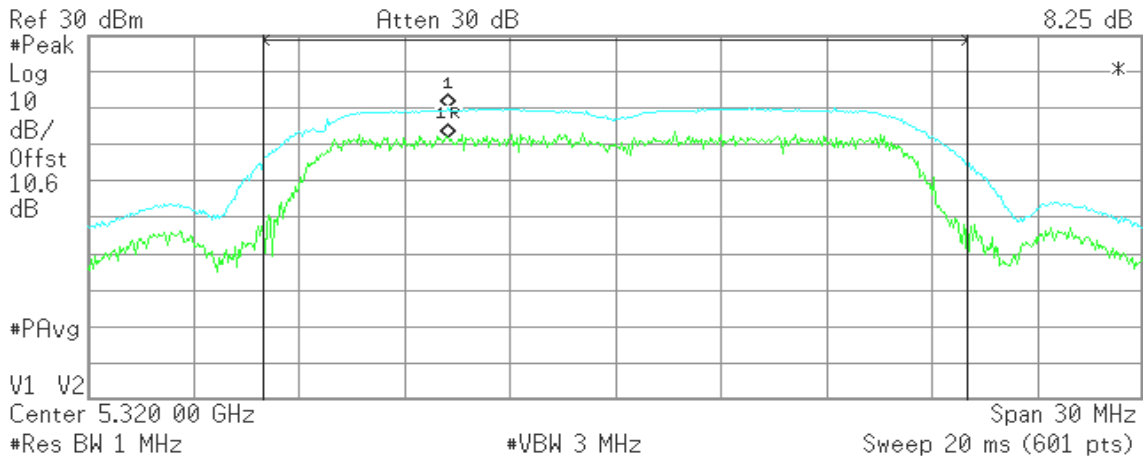
-54.28 dBm/Hz

CH High

Agilent 09:14:38 Dec 30, 2011

R T

Mkr1 0 Hz
8.25 dB



Channel Power

19.32 dBm /20.0000 MHz

Power Spectral Density

-53.69 dBm/Hz

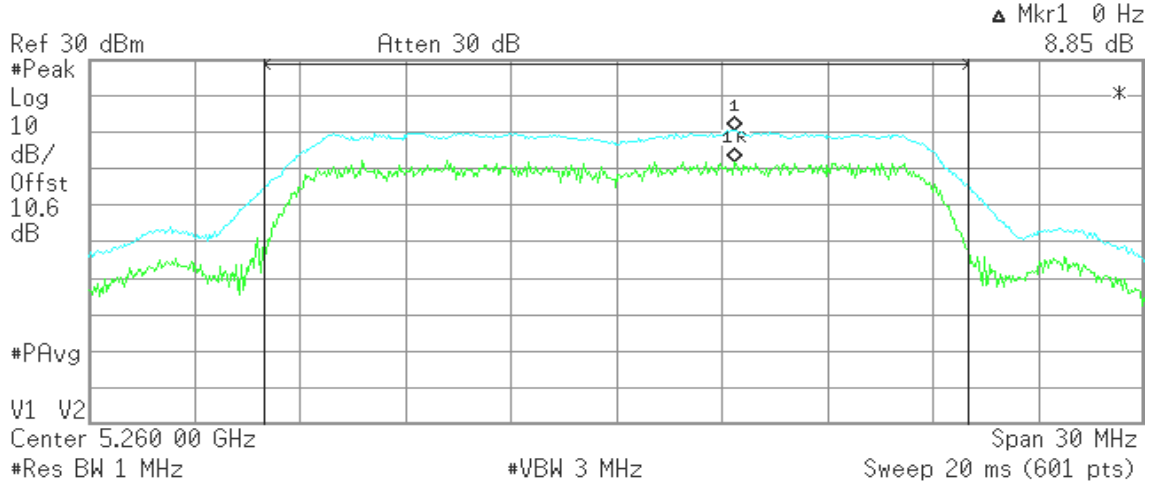


IEEE 802.11n HT 20 MHz Channel mode / 5260 ~ 5320MHz / Chain 0

CH Low

Agilent 14:16:52 Dec 30, 2011

R T



Channel Power

18.41 dBm /20.0000 MHz

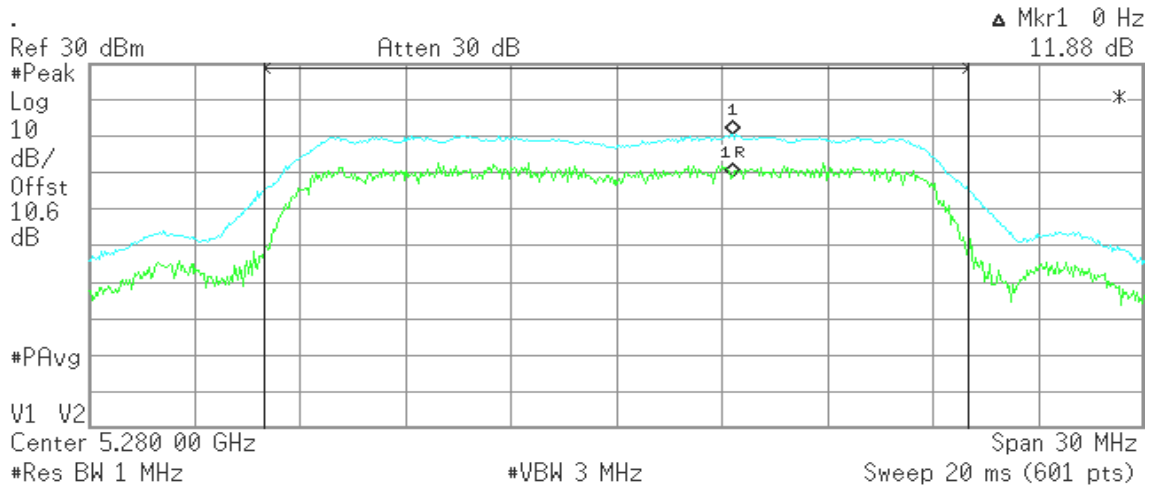
Power Spectral Density

-54.60 dBm/Hz

CH Mid

Agilent 14:23:18 Dec 30, 2011

R T



Channel Power

18.52 dBm /20.0000 MHz

Power Spectral Density

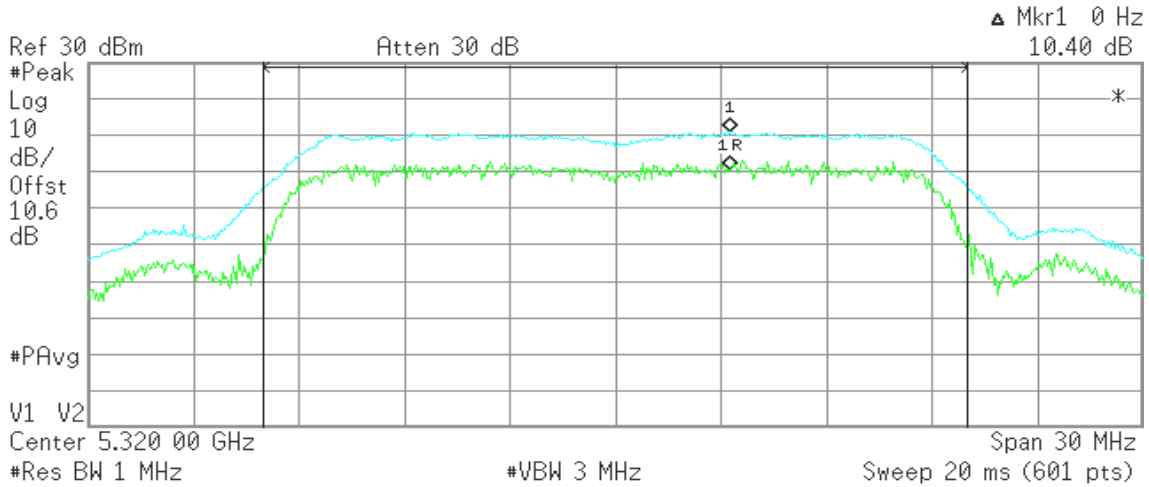
-54.49 dBm/Hz



CH High

Agilent 14:32:13 Dec 30, 2011

R T



Channel Power

19.10 dBm /20.0000 MHz

Power Spectral Density

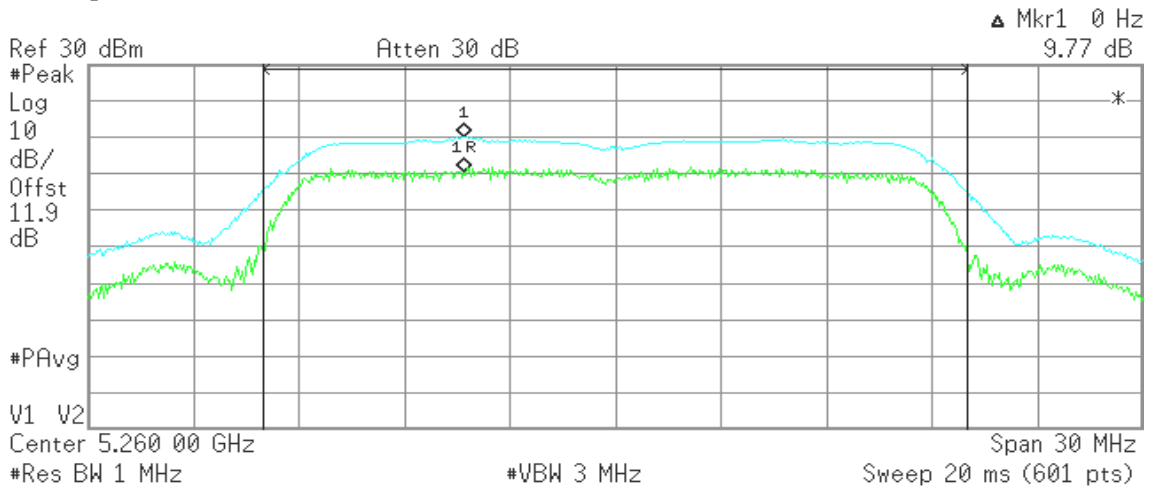
-53.91 dBm/Hz

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

CH Low

Agilent 09:37:15 Jan 2, 2012

R T



Channel Power

18.80 dBm /20.0000 MHz

Power Spectral Density

-54.22 dBm/Hz

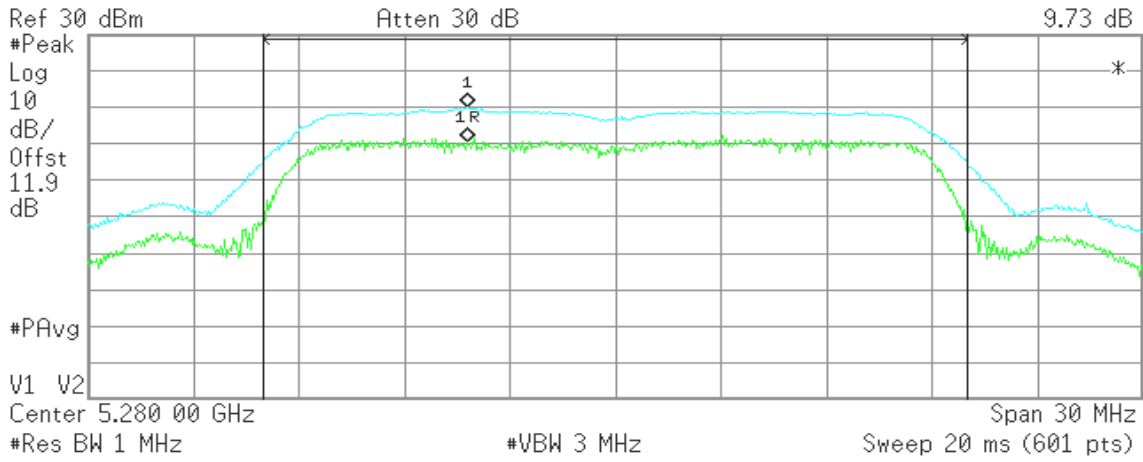


CH Mid

Agilent 09:41:46 Jan 2, 2012

R T

Mkr1 0 Hz
9.73 dB



Channel Power

18.42 dBm /20.0000 MHz

Power Spectral Density

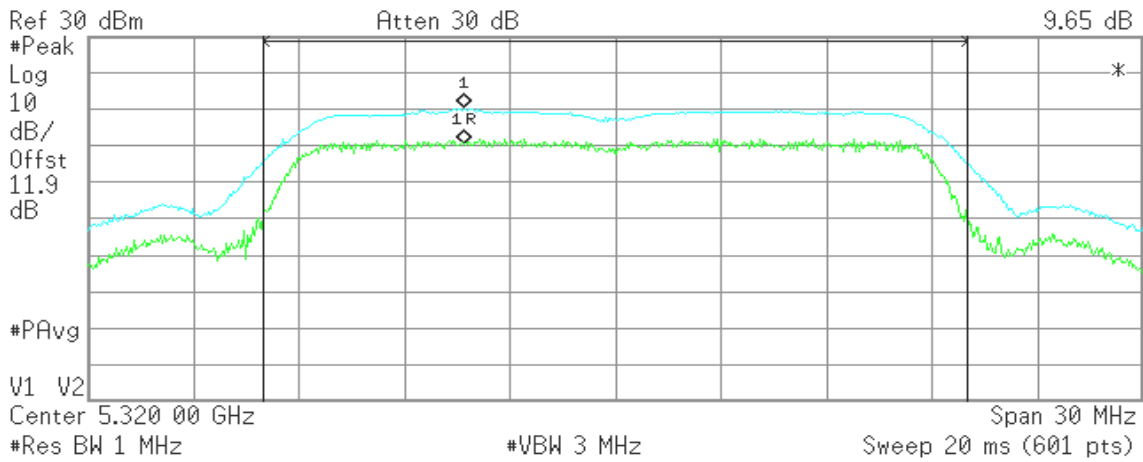
-54.59 dBm/Hz

CH High

Agilent 09:44:53 Jan 2, 2012

R T

Mkr1 0 Hz
9.65 dB



Channel Power

18.91 dBm /20.0000 MHz

Power Spectral Density

-54.10 dBm/Hz

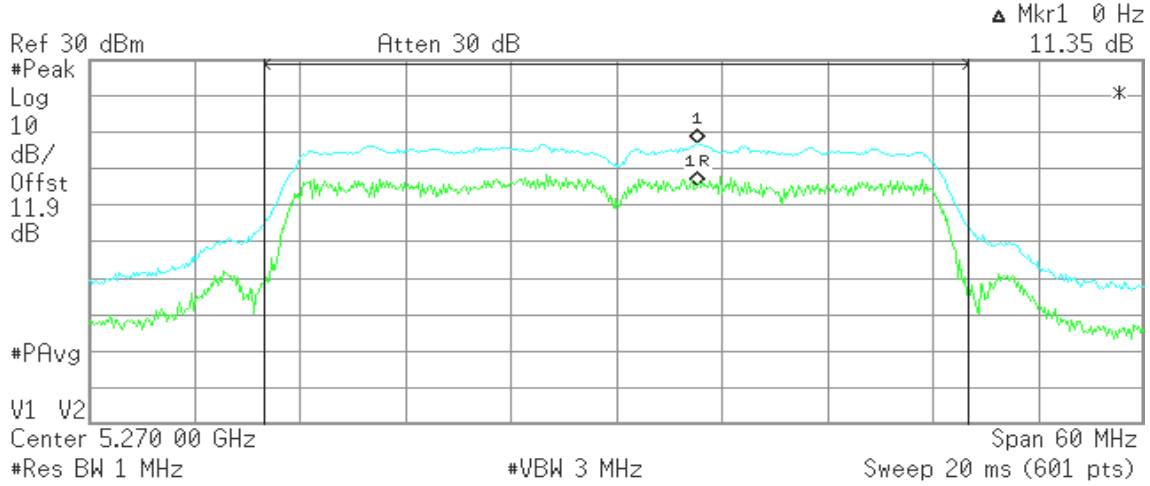


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 0

CH Low

Agilent 16:51:43 Dec 30, 2011

R T



Channel Power

17.23 dBm /40.0000 MHz

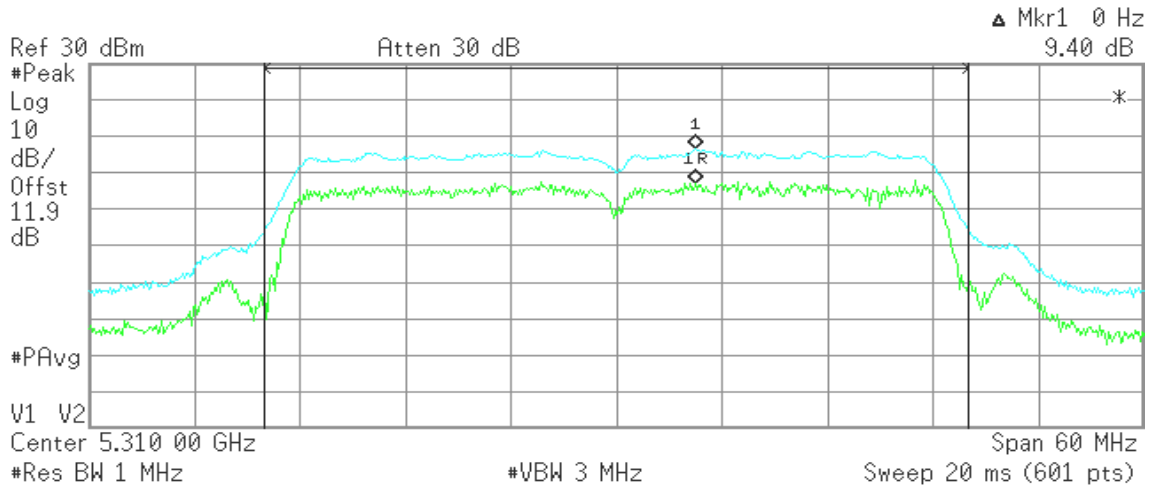
Power Spectral Density

-58.79 dBm/Hz

CH High

Agilent 16:57:41 Dec 30, 2011

R T



Channel Power

16.95 dBm /40.0000 MHz

Power Spectral Density

-59.07 dBm/Hz

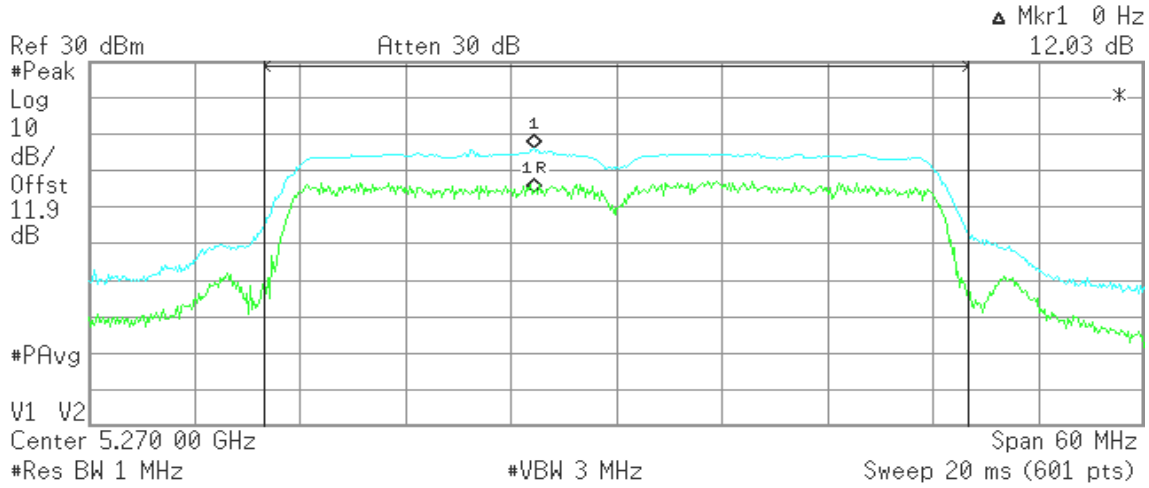


IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / Chain 1

CH Low

Agilent 17:19:19 Dec 30, 2011

R T



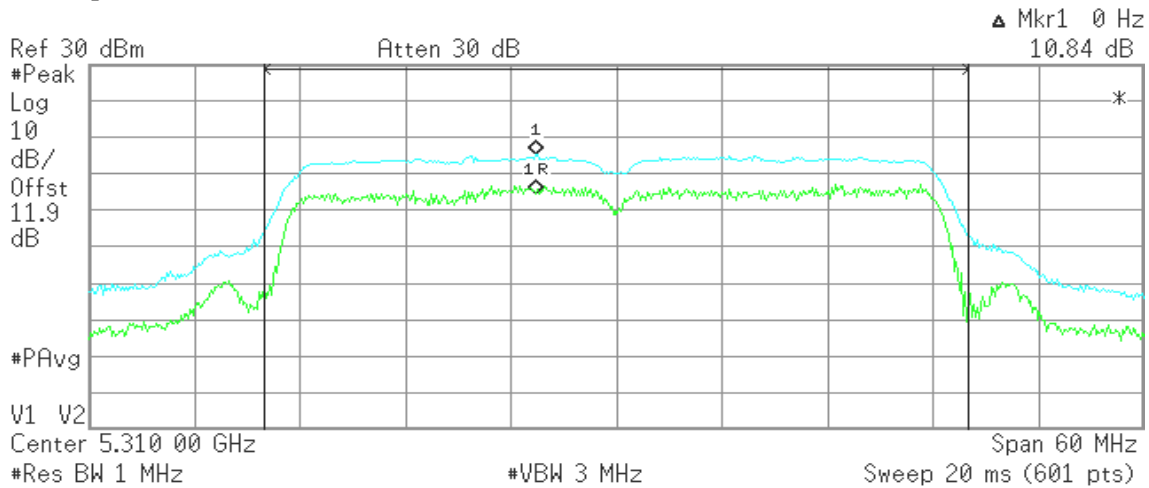
Channel Power
16.75 dBm /40.0000 MHz

Power Spectral Density
-59.27 dBm/Hz

CH High

Agilent 09:02:39 Jan 2, 2012

R T



Channel Power
16.39 dBm /40.0000 MHz

Power Spectral Density
-59.63 dBm/Hz

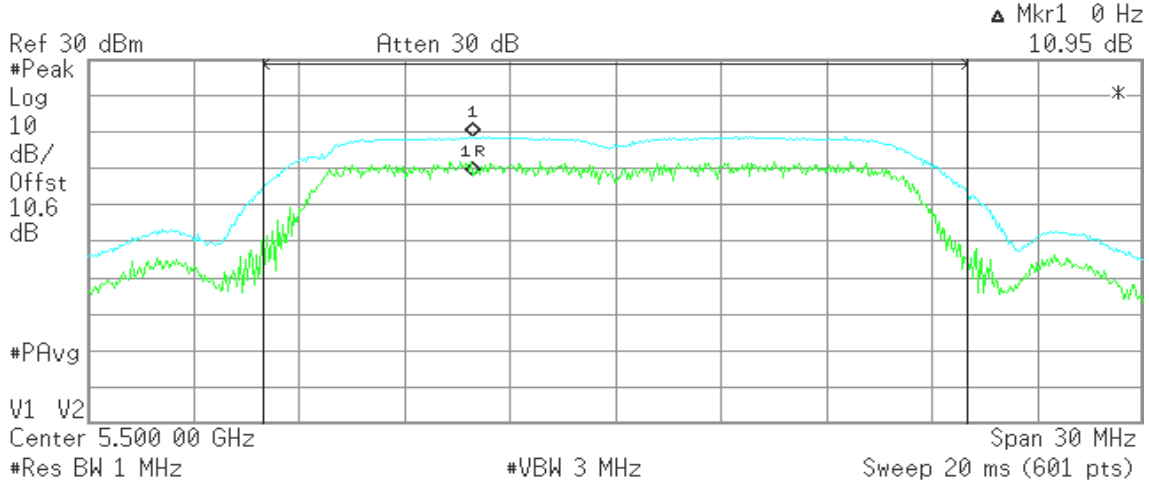


Test mode: IEEE 802.11a mode / 5500 ~ 5700MHz

CH Low

Agilent 09:40:09 Dec 30, 2011

R T



Channel Power

18.09 dBm /20.0000 MHz

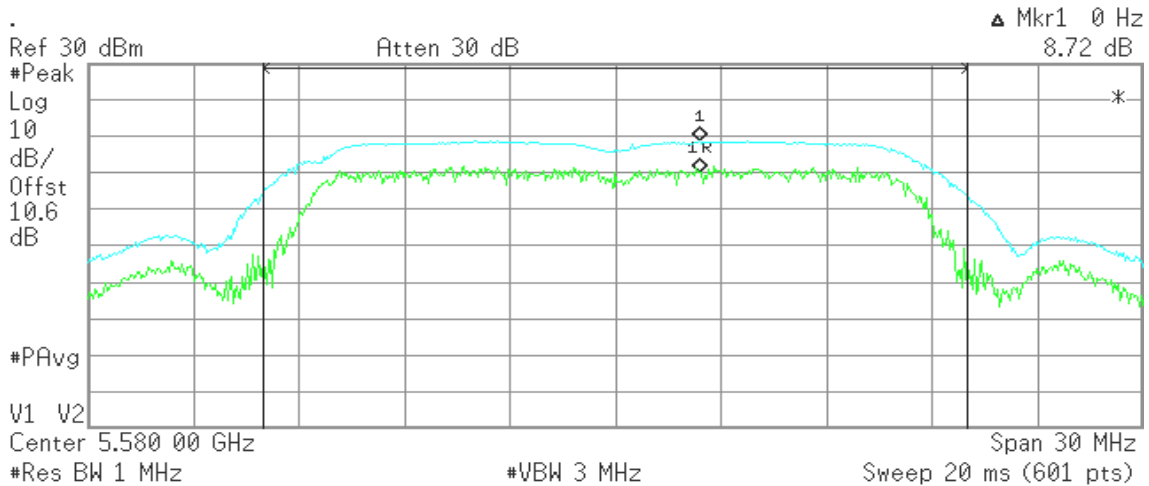
Power Spectral Density

-54.92 dBm/Hz

CH Mid

Agilent 09:43:40 Dec 30, 2011

R T



Channel Power

18.03 dBm /20.0000 MHz

Power Spectral Density

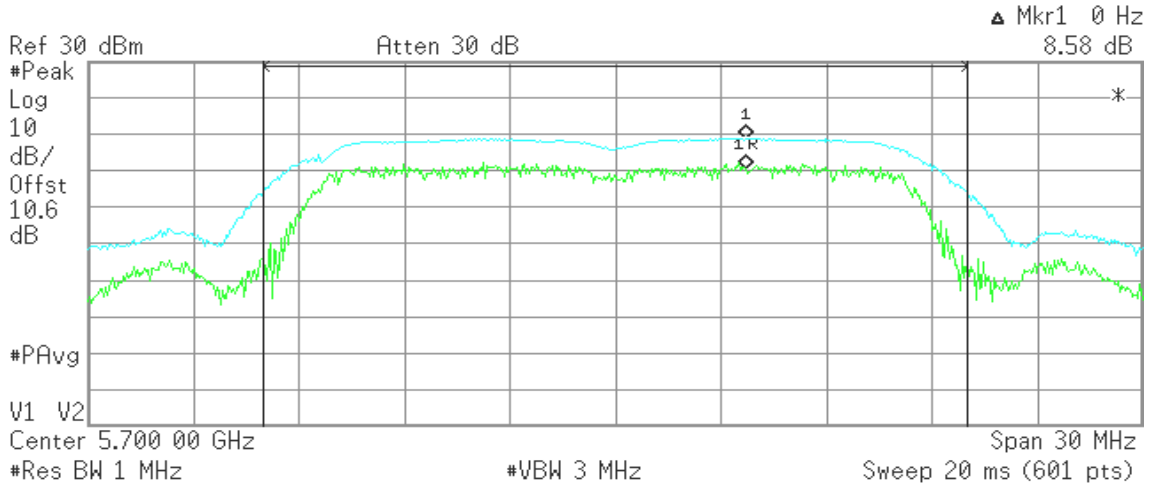
-54.98 dBm/Hz



CH High

Agilent 09:46:46 Dec 30, 2011

R T



Channel Power

18.18 dBm /20.0000 MHz

Power Spectral Density

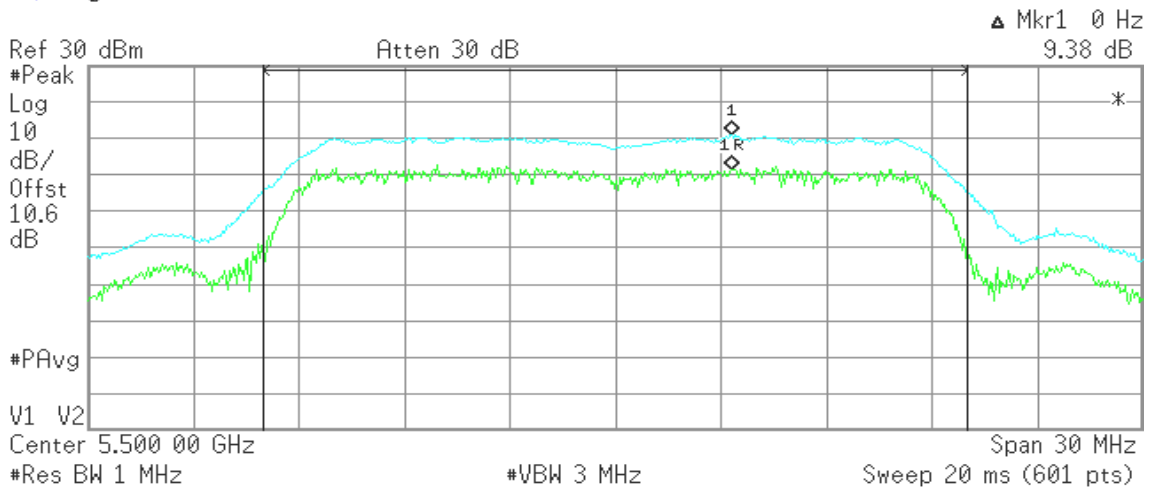
-54.83 dBm/Hz

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

CH Low

Agilent 14:42:36 Dec 30, 2011

R T



Channel Power

18.90 dBm /20.0000 MHz

Power Spectral Density

-54.11 dBm/Hz

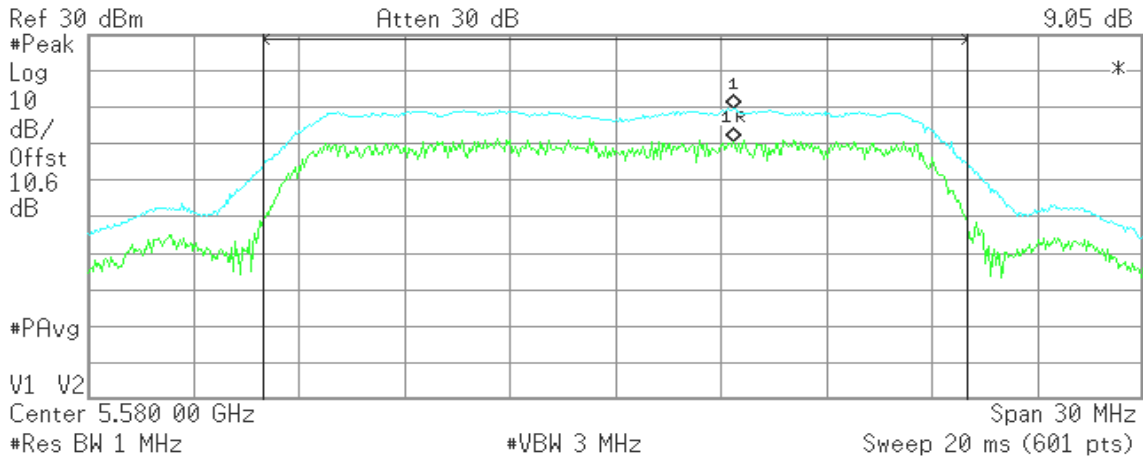


CH Mid

Agilent 14:47:25 Dec 30, 2011

R T

Mkr1 0 Hz
9.05 dB



Channel Power

17.73 dBm /20.0000 MHz

Power Spectral Density

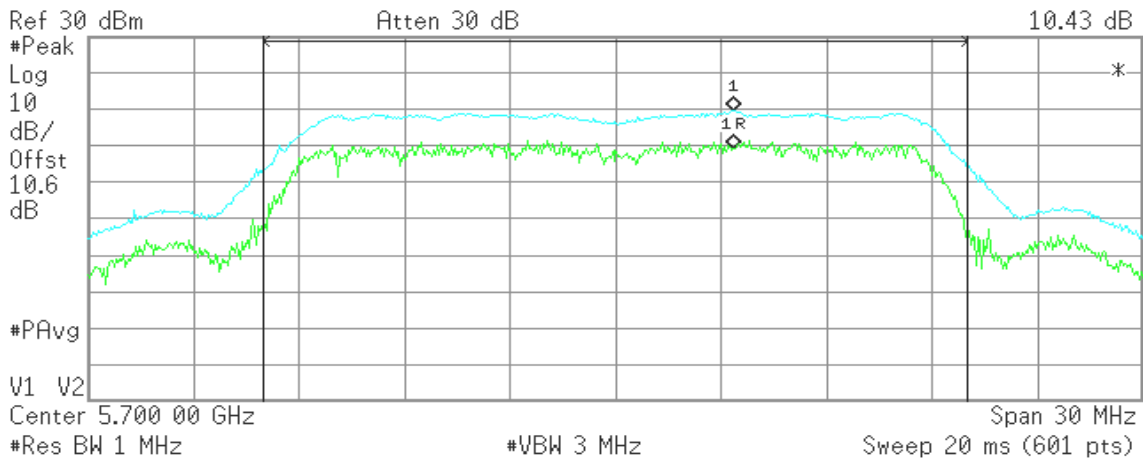
-55.28 dBm/Hz

CH High

Agilent 14:54:48 Dec 30, 2011

R T

Mkr1 0 Hz
10.43 dB



Channel Power

17.71 dBm /20.0000 MHz

Power Spectral Density

-55.30 dBm/Hz

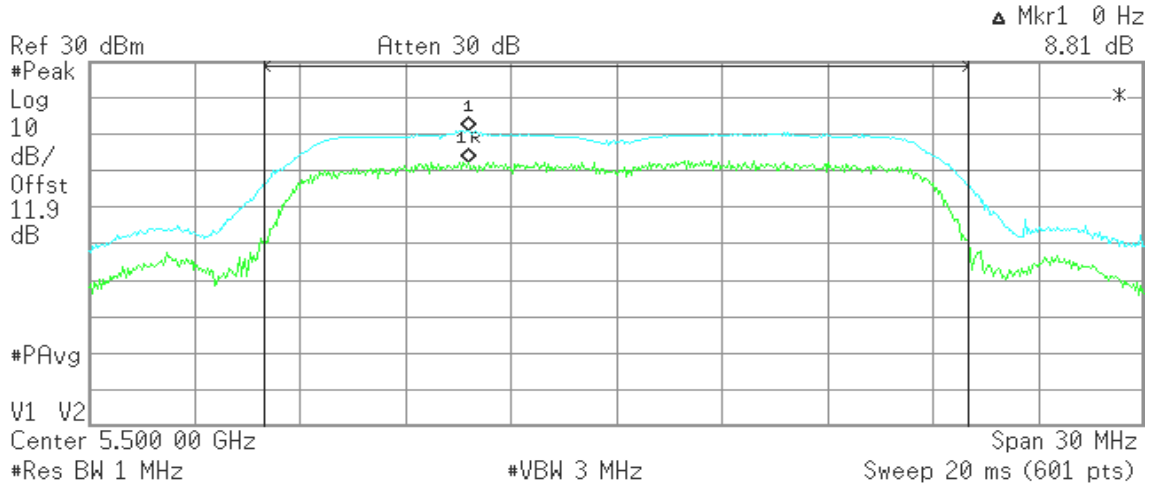


IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / Chain 1

CH Low

Agilent 09:49:56 Jan 2, 2012

R T



Channel Power

19.40 dBm /20.0000 MHz

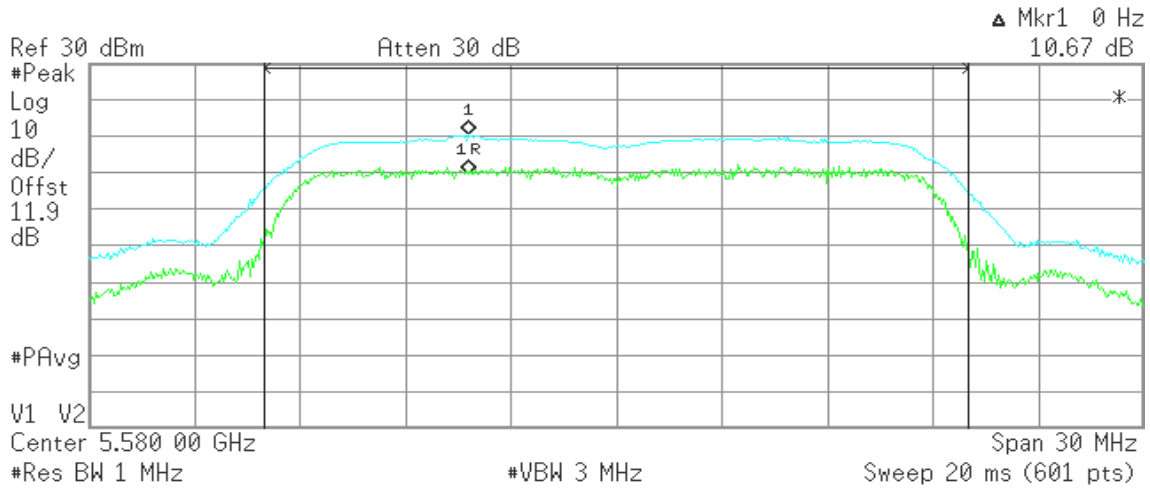
Power Spectral Density

-53.61 dBm/Hz

CH Mid

Agilent 09:57:44 Jan 2, 2012

R T



Channel Power

18.75 dBm /20.0000 MHz

Power Spectral Density

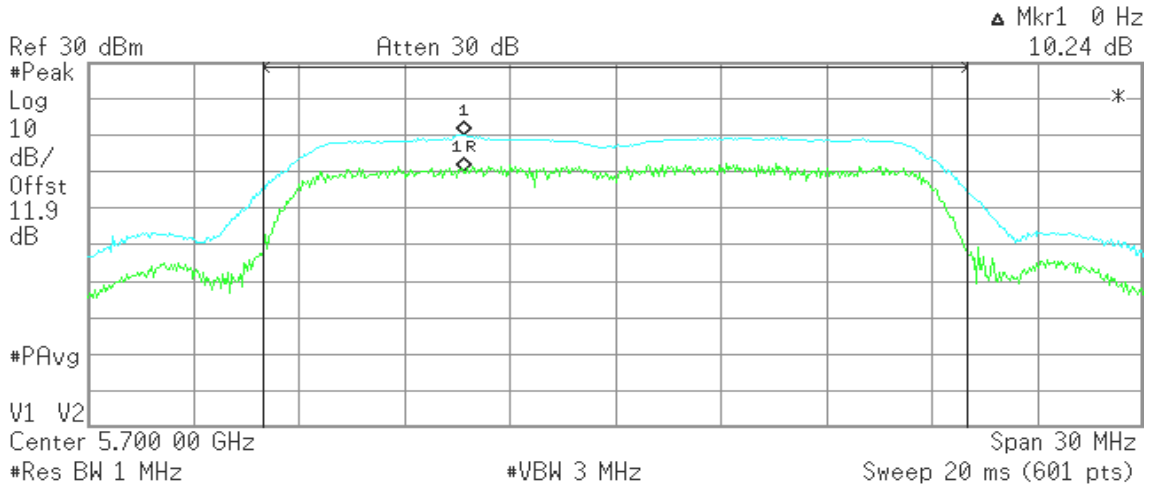
-54.26 dBm/Hz



CH High

Agilent 10:08:16 Jan 2, 2012

R T



Channel Power

18.62 dBm /20.0000 MHz

Power Spectral Density

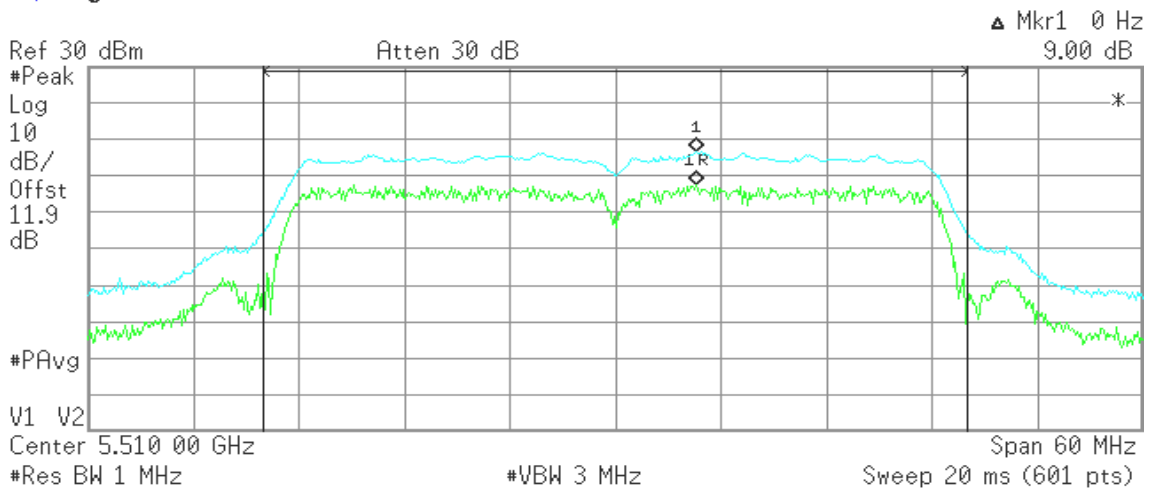
-54.39 dBm/Hz

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

CH Low

Agilent 17:04:06 Dec 30, 2011

R T



Channel Power

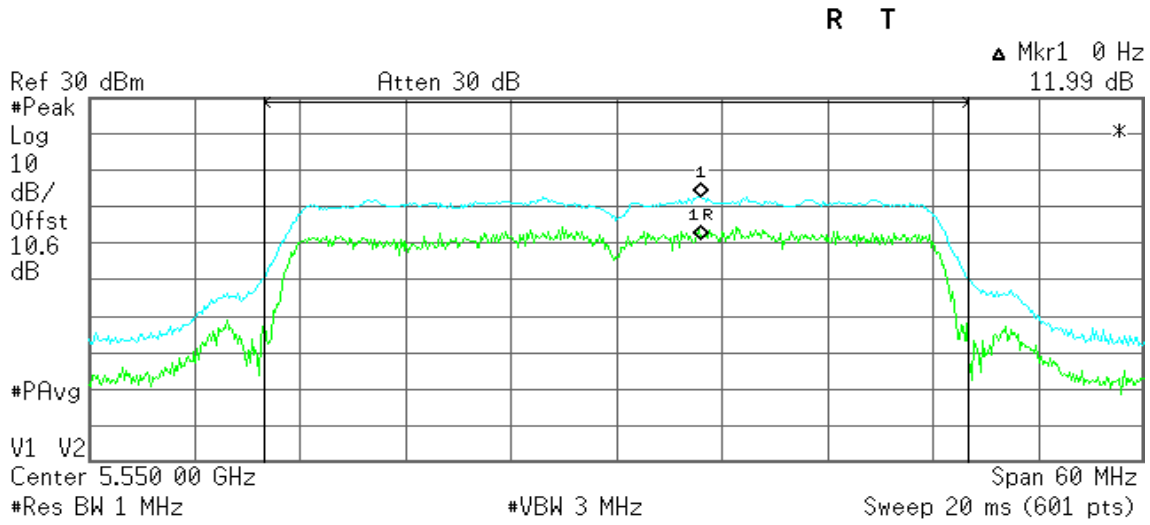
16.54 dBm /40.0000 MHz

Power Spectral Density

-59.48 dBm/Hz



CH Mid



Channel Power

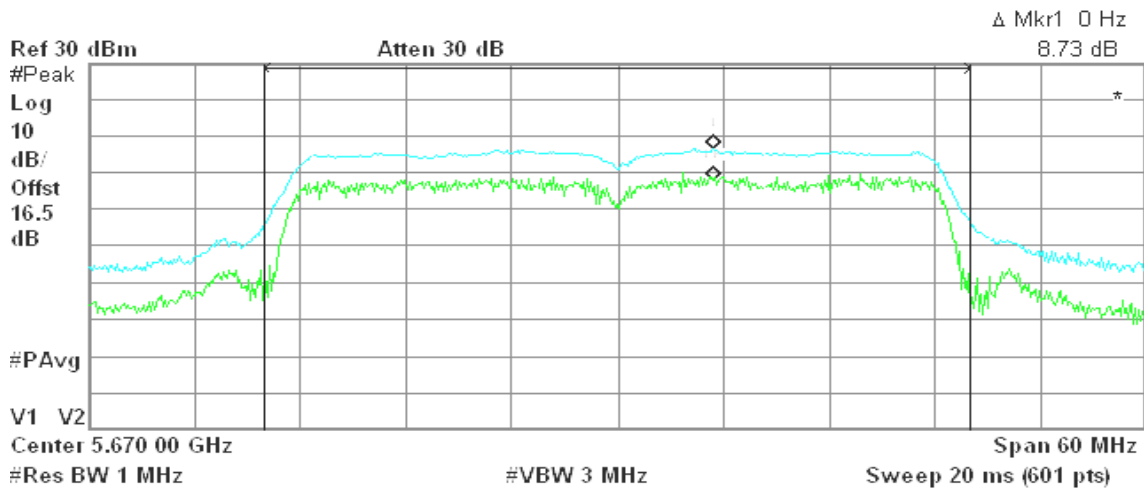
13.11 dBm /40.0000 MHz

Power Spectral Density

-62.91 dBm/Hz

CH High

Agilent



Channel Power

18.37 dBm /40.0000 MHz

Power Spectral Density

-57.65 dBm/Hz

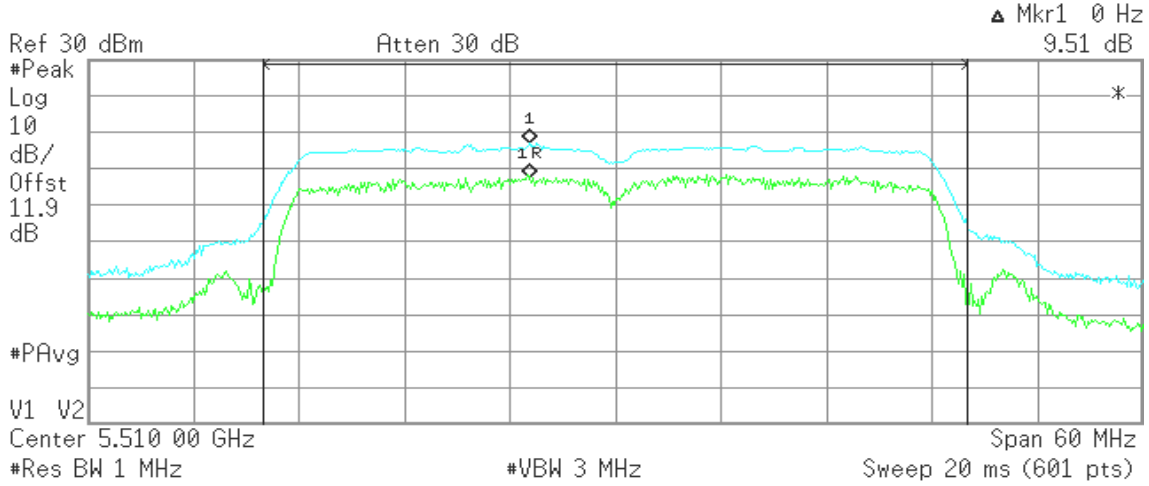


IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / Chain 1

CH Low

Agilent 09:08:23 Jan 2, 2012

R T



Channel Power

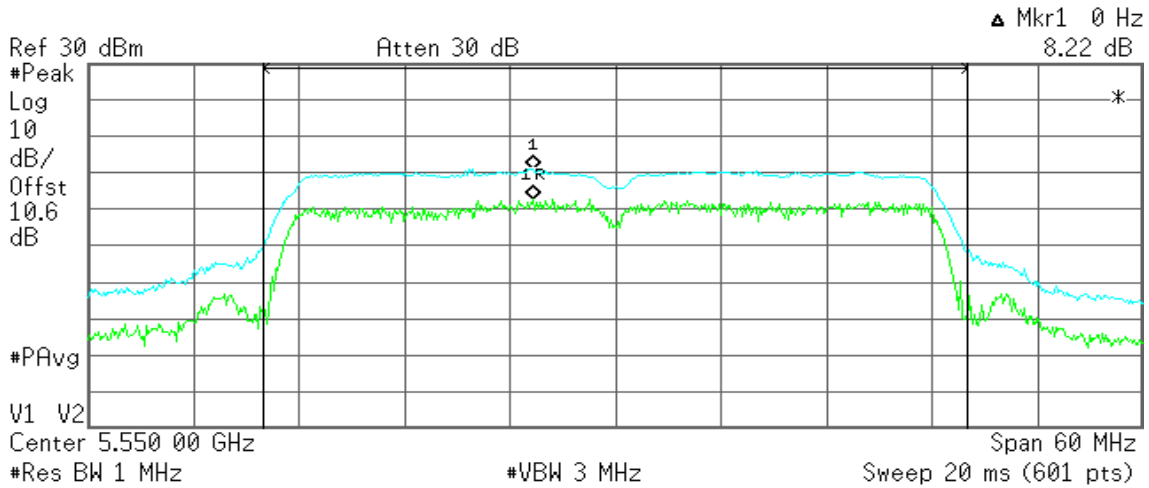
17.75 dBm /40.0000 MHz

Power Spectral Density

-58.27 dBm/Hz

CH Mid

R T



Channel Power

11.80 dBm /40.0000 MHz

Power Spectral Density

-64.22 dBm/Hz

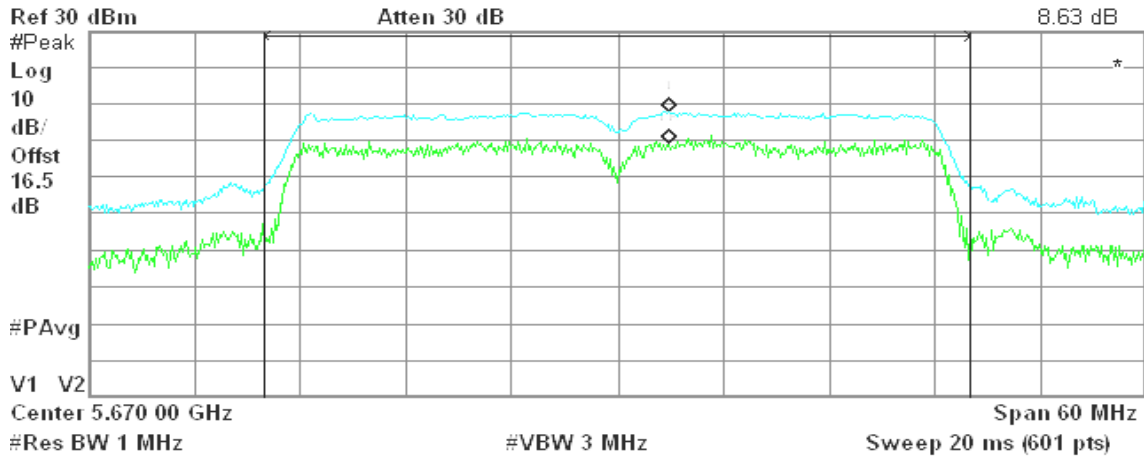


CH High

Agilent

R T

Δ Mkr1 0 Hz
8.63 dB



Channel Power

19.55 dBm / 40.0000 MHz

Power Spectral Density

-56.47 dBm/Hz



7.7 RADIATED UNDESIRABLE EMISSION

LIMIT

According to 15.407(b),

1. For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
2. For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

The provisions of §15.205 apply to intentional radiators operating under this section.

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

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

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

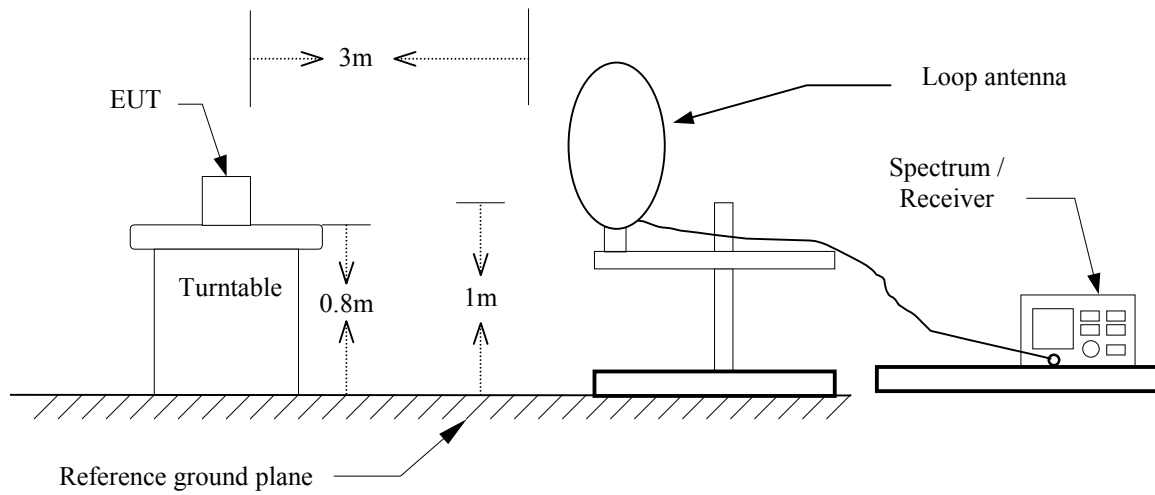
In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3-meter)	Field Strength (dB $\mu\text{V}/\text{m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

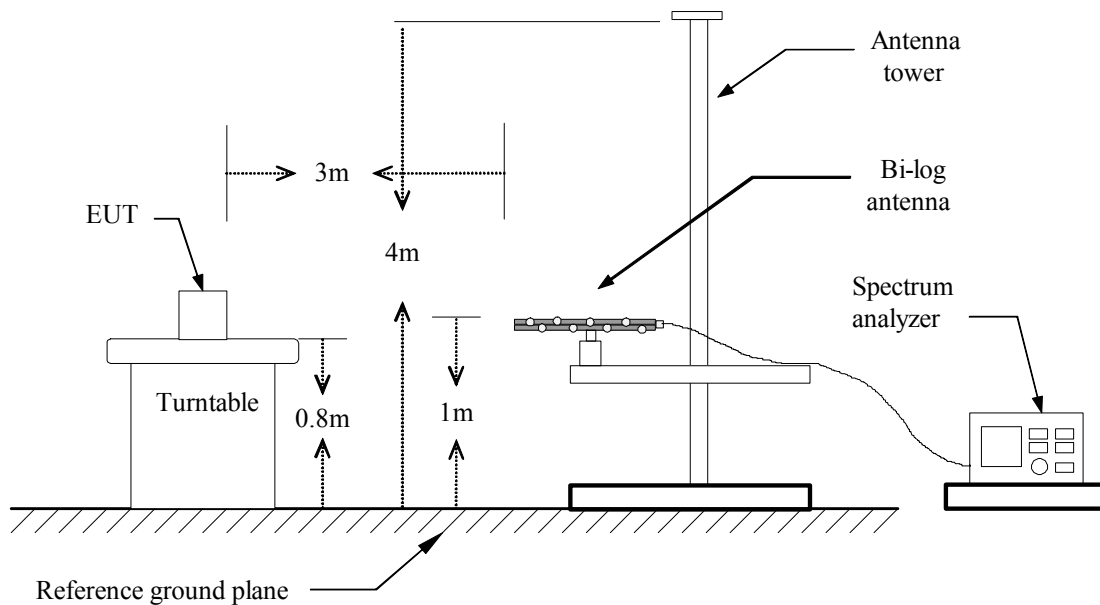


Test Configuration

9kHz ~ 30MHz

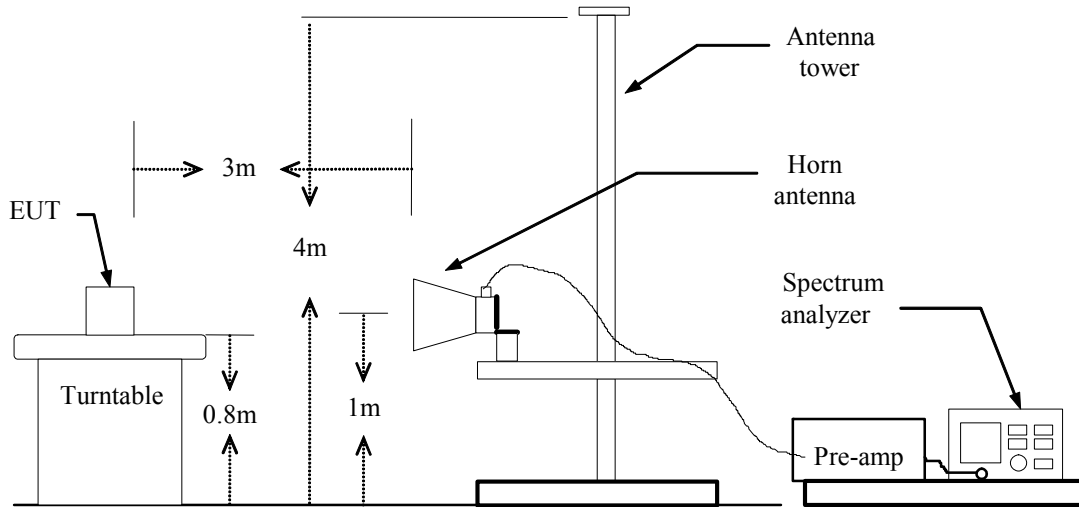


30MHz ~ 1GHz





Above 1 GHz





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=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz

duty cycle \geq 98 percent, set VBW \leq RBW/100 but not less than 10 Hz.

duty cycle $<$ 98 percent, set VBW \geq 1/T / Sweep=AUTO

7. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.
8. Repeat above procedures until the measurements for all frequencies are complete.

**Below 1 GHz**

Operation Mode: Normal Link **Test Date:** January 11, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
199.75	44.77	-11.99	32.78	43.50	-10.72	Peak	V
432.55	43.01	-8.84	34.17	46.00	-11.83	Peak	V
500.45	41.52	-8.04	33.48	46.00	-12.52	Peak	V
739.72	41.91	-4.49	37.43	46.00	-8.57	Peak	V
796.30	41.40	-3.91	37.49	46.00	-8.51	QP	V
852.88	41.57	-2.82	38.75	46.00	-7.25	Peak	V
146.40	50.81	-12.33	38.48	43.50	-5.02	Peak	H
199.75	49.60	-11.99	37.61	43.50	-5.89	QP	H
220.77	43.84	-13.48	30.36	46.00	-15.64	QP	H
699.30	45.33	-5.21	40.13	46.00	-5.87	Peak	H
757.50	43.88	-4.24	39.64	46.00	-6.36	Peak	H
796.30	43.44	-3.91	39.53	46.00	-6.47	QP	H

Remark:

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



Above 1 GHz

Operation Mode: Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Low **Test Date:** January 9, 2012

Temperature: 25°C **Tested by:** Sehni Hu

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1758.33	58.11	---	-7.93	50.19	---	68.30	54.00	-18.11	Peak	V
15540.33	40.80	27.87	20.48	61.28	48.35	74.00	54.00	-5.65	AVG	V
N/A										
2038.33	57.33	---	-5.37	51.96	---	68.30	54.00	-16.34	Peak	H
15483.33	40.52	27.94	19.71	60.24	47.65	74.00	54.00	-6.35	AVG	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH Mid **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1980.00	57.24	---	-5.67	51.57	---	68.30	54.00	-16.73	Peak	V
N/A										
1840.00	56.65	---	-7.10	49.55	---	68.30	54.00	-18.75	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5180 ~ 5240MHz / CH High

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1840.00	57.25	---	-7.10	50.15	---	68.30	54.00	-18.15	Peak	V
N/A										
2003.33	57.12	---	-5.46	51.66	---	68.30	54.00	-16.64	Peak	H
15700.00	41.64	27.97	20.87	62.51	48.84	74.00	54.00	-5.16	AVG	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz / 5180 ~ 5240MHz / CH Low

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1921.67	57.11	---	-6.27	50.84	---	68.30	54.00	-17.46	Peak	V
N/A										
1875.00	57.46	---	-6.74	50.72	---	68.30	54.00	-17.58	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz / 5180 ~ 5240MHz / CH Mid

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1956.67	56.96	---	-5.91	51.05	---	68.30	54.00	-17.25	Peak	V
N/A										
1793.33	57.24	---	-7.57	49.67	---	68.30	54.00	-18.63	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5180 ~ 5240MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2096.67	56.42	---	-5.22	51.20	---	68.30	54.00	-17.1	Peak	V
N/A										
2015.00	57.01	---	-5.43	51.58	---	68.30	54.00	-16.72	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / CH Low **Test Date:** January 9, 2012

Temperature: 25°C **Tested by:** Sehni Hu

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2015.00	57.39	---	-5.43	51.96	---	68.30	54.00	-16.34	Peak	V
N/A										
1746.67	58.64	---	-8.04	50.60	---	68.30	54.00	-17.7	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5190 ~ 5230MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1851.67	57.44	---	-6.98	50.47	---	68.30	54.00	-17.83	Peak	V
N/A										
1770.00	57.86	---	-7.81	50.05	---	68.30	54.00	-18.25	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Low **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
2015.00	56.94	---	-5.43	51.50	---	68.30	54.00	-16.8	Peak	V
N/A										
1851.67	57.80	---	-6.98	50.82	---	68.30	54.00	-17.48	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH Mid **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1781.67	57.61	---	-7.69	49.92	---	68.30	54.00	-18.38	Peak	V
15816.67	41.61	28.75	21.55	63.16	50.30	74.00	54.00	-3.70	AVG	V
N/A										
1921.67	57.82	---	-6.27	51.55	---	68.30	54.00	-16.75	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5260 ~ 5320MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1886.67	58.38	---	-6.62	51.76	---	68.30	54.00	-2.24	Peak	V
N/A										
1875.00	57.86	---	-6.74	51.12	---	68.30	54.00	-2.88	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz / 5260 ~ 5320MHz / CH Low

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1886.67	57.44	---	-6.62	50.82	---	68.30	54.00	-17.48	Peak	V
N/A										
1910.00	57.39	---	-6.38	51.01	---	68.30	54.00	-17.29	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz / 5260 ~ 5320MHz / CH Mid

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1875.00	57.31	---	-6.74	50.57	---	68.30	54.00	-17.73	Peak	V
N/A										
1980.00	57.37	---	-5.67	51.70	---	68.30	54.00	-16.6	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz / 5260 ~ 5320MHz / CH High

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
10650.00	38.31	27.14	17.87	56.18	45.01	74.00	54.00	-8.99	AVG	V
15983.33	40.01	27.66	22.51	62.52	50.17	74.00	54.00	-3.83	AVG	V
5480.00	57.72	44.37	2.94	60.66	47.31	68.30	54.00	-6.69	AVG	V
N/A										
10650.00	39.27	27.05	17.87	57.14	44.92	74.00	54.00	-9.08	AVG	H
15950.00	40.87	28.14	22.32	63.19	50.46	74.00	54.00	-3.54	AVG	H
1793.33	58.51	---	-7.57	50.94	---	68.30	54.00	-17.36	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / CH Low **Test Date:** January 9, 2012

Temperature: 25°C **Tested by:** Sehni Hu

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1945.00	57.60	---	-6.03	51.57	---	68.30	54.00	-16.73	Peak	V
N/A										
1840.00	57.42	---	-7.10	50.32	---	68.30	54.00	-17.98	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5270 ~ 5310MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1921.67	57.48	---	-6.27	51.21	---	68.30	54.00	-17.09	Peak	V
10633.33	37.12	27.12	17.85	54.97	44.97	74.00	54.00	-9.03	AVG	V
15933.33	39.85	29.12	22.22	62.07	51.34	74.00	54.00	-2.66	AVG	V
N/A										
2026.67	56.61	---	-5.40	51.21	---	68.30	54.00	-17.09	Peak	H
10633.33	38.61	27.46	17.85	56.46	45.31	74.00	54.00	-8.69	AVG	H
15866.67	40.68	28.27	21.84	62.52	50.11	74.00	54.00	-3.89	AVG	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH Low
Temperature: 25°C
Humidity: 50% RH

Test Date: January 9, 2012
Tested by: Sehni Hu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1875.00	57.49	---	-6.74	50.75	---	68.30	54.00	-17.55	Peak	V
N/A										
1945.00	57.45	---	-6.03	51.42	---	68.30	54.00	-16.88	Peak	H
10966.67	41.36	27.75	18.22	59.58	45.97	74.00	54.00	-8.03	AVG	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit 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:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1945.00	57.71	---	-6.03	51.68	---	68.30	54.00	-16.62	Peak	V
N/A										
1980.00	57.19	---	-5.67	51.52	---	68.30	54.00	-16.78	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11a mode / 5500 ~ 5700MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1910.00	57.67	---	-6.38	51.28	---	68.30	54.00	-17.02	Peak	V
N/A										
1758.33	57.27	---	-7.93	49.34	---	68.30	54.00	-18.96	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH Low

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1886.67	57.54	---	-6.62	50.92	---	68.30	54.00	-17.38	Peak	V
N/A										
1933.33	57.35	---	-6.15	51.20	---	68.30	54.00	-17.1	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH Mid
Temperature: 25°C
Humidity: 50% RH

Test Date: January 9, 2012
Tested by: Sehni Hu
Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
5421.67	58.83	47.49	2.94	61.77	50.43	74.00	54.00	-3.57	AVG	V
N/A										
2166.67	57.00	---	-5.04	51.96	---	68.30	54.00	-16.34	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 20 MHz Channel mode / 5500 ~ 5700MHz / CH High

Test Date: January 9, 2012

Temperature: 25°C

Tested by: Sehni Hu

Humidity: 50% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1933.33	57.30	---	-6.15	51.16	---	68.30	54.00	-17.14	Peak	V
N/A										
1945.00	56.99	---	-6.03	50.96	---	68.30	54.00	-17.34	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH Low **Test Date:** January 9, 2012

Temperature: 25°C **Tested by:** Sehni Hu

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1875.00	57.99	---	-6.74	51.25	---	68.30	54.00	-17.05	Peak	V
N/A										
1665.00	58.21	---	-8.87	49.33	---	74.00	54.00	-24.67	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH Mid **Test Date:** January 9, 2012

Temperature: 25°C **Tested by:** Sehni Hu

Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1840.00	57.51	---	-7.10	50.41	---	68.30	54.00	-17.89	Peak	V
N/A										
1875.00	57.08	---	-6.74	50.34	---	68.30	54.00	-17.96	Peak	H
N/A										

Remark:

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



Operation Mode: Tx / IEEE 802.11n HT 40 MHz mode / 5510 ~ 5670MHz / CH High **Test Date:** January 9, 2012
Temperature: 25°C **Tested by:** Sehni Hu
Humidity: 50% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark	Ant.Pol. (H/V)
1688.33	57.97	---	-8.64	49.34	---	74.00	54.00	-24.66	Peak	V
11333.33	37.83	27.22	20.13	57.96	47.35	74.00	54.00	-6.65	AVG	V
N/A										
1910.00	57.44	---	-6.38	51.06	---	68.30	54.00	-17.24	Peak	H
11333.33	38.41	27.41	20.13	58.54	47.54	74.00	54.00	-6.46	AVG	H
N/A										

Remark:

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



7.8 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

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

TEST PROCEDURE

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

TEST RESULTS

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

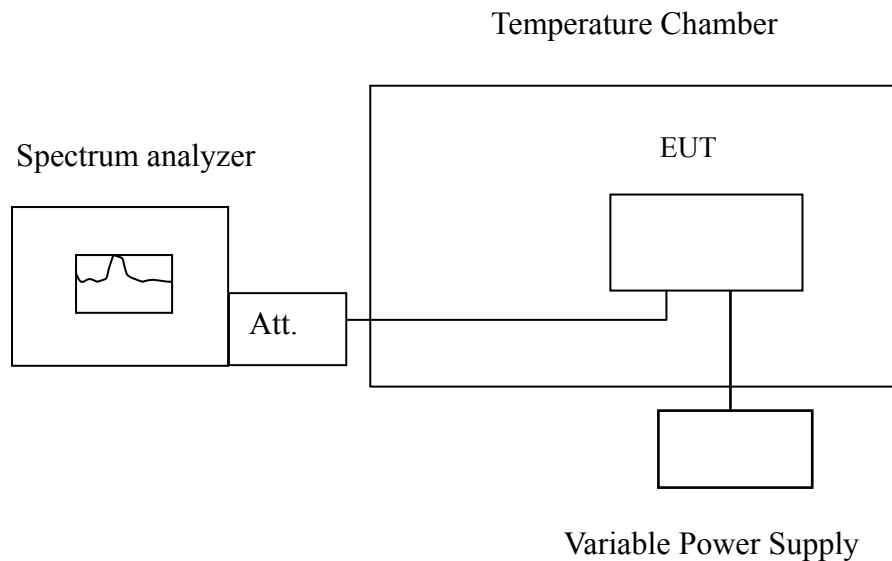


7.9 FREQUENCY STABILITY

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	110	5179.995551	5150~5250	Pass
40	110	5180.007250	5150~5250	Pass
30	110	5179.984113	5150~5250	Pass
20	110	5180.000837	5150~5250	Pass
10	110	5180.019402	5150~5250	Pass
0	110	5179.998510	5150~5250	Pass
-10	110	5179.976438	5150~5250	Pass
-20	110	5180.003926	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5179.979617	5150~5250	Pass
	110	5179.982161	5150~5250	Pass
	121	5180.001334	5150~5250	Pass



CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5239.999519	5150~5250	Pass
40	110	5239.970517	5150~5250	Pass
30	110	5240.005847	5150~5250	Pass
20	110	5240.013896	5150~5250	Pass
10	110	5240.010839	5150~5250	Pass
0	110	5240.002315	5150~5250	Pass
-10	110	5239.998456	5150~5250	Pass
-20	110	5240.014221	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5239.989963	5150~5250	Pass
	110	5239.973508	5150~5250	Pass
	121	5239.985993	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	110	5179.988731	5150~5250	Pass
40	110	5180.016290	5150~5250	Pass
30	110	5179.999310	5150~5250	Pass
20	110	5179.972238	5150~5250	Pass
10	110	5179.978640	5150~5250	Pass
0	110	5179.992193	5150~5250	Pass
-10	110	5179.993801	5150~5250	Pass
-20	110	5180.009936	5150~5250	Pass

Operating Frequency: 5180 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5179.997712	5150~5250	Pass
	110	5179.998622	5150~5250	Pass
	121	5180.000398	5150~5250	Pass



CH High

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5240.016699	5150~5250	Pass
40	110	5239.970743	5150~5250	Pass
30	110	5239.992353	5150~5250	Pass
20	110	5239.995954	5150~5250	Pass
10	110	5239.973575	5150~5250	Pass
0	110	5239.989670	5150~5250	Pass
-10	110	5239.986357	5150~5250	Pass
-20	110	5240.004678	5150~5250	Pass

Operating Frequency: 5240 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5240.015079	5150~5250	Pass
	110	5239.985717	5150~5250	Pass
	121	5240.017814	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	110	5190.003618	5150~5250	Pass
40	110	5189.991050	5150~5250	Pass
30	110	5189.970152	5150~5250	Pass
20	110	5189.982370	5150~5250	Pass
10	110	5189.978128	5150~5250	Pass
0	110	5190.009590	5150~5250	Pass
-10	110	5190.014016	5150~5250	Pass
-20	110	5189.980278	5150~5250	Pass

Operating Frequency: 5190 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5190.018476	5150~5250	Pass
	110	5190.011771	5150~5250	Pass
	121	5189.991251	5150~5250	Pass



CH High

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5229.974095	5150~5250	Pass
40	110	5229.975663	5150~5250	Pass
30	110	5230.004448	5150~5250	Pass
20	110	5230.000807	5150~5250	Pass
10	110	5229.974892	5150~5250	Pass
0	110	5230.002533	5150~5250	Pass
-10	110	5229.995594	5150~5250	Pass
-20	110	5229.992843	5150~5250	Pass

Operating Frequency: 5230 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5229.97213	5150~5250	Pass
	110	5229.975477	5150~5250	Pass
	121	5229.987494	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	110	5260.018090	5250~5350	Pass
40	110	5259.975844	5250~5350	Pass
30	110	5260.018169	5250~5350	Pass
20	110	5259.984836	5250~5350	Pass
10	110	5259.987890	5250~5350	Pass
0	110	5259.992750	5250~5350	Pass
-10	110	5260.012738	5250~5350	Pass
-20	110	5259.983327	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5260.00306	5250~5350	Pass
	110	5260.005335	5250~5350	Pass
	121	5260.000863	5250~5350	Pass



CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5319.989190	5250~5350	Pass
40	110	5319.995074	5250~5350	Pass
30	110	5319.976564	5250~5350	Pass
20	110	5319.995286	5250~5350	Pass
10	110	5319.976093	5250~5350	Pass
0	110	5320.011481	5250~5350	Pass
-10	110	5320.012252	5250~5350	Pass
-20	110	5319.981994	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5319.99146	5250~5350	Pass
	110	5319.995097	5250~5350	Pass
	121	5319.970181	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	110	5259.993333	5250~5350	Pass
40	110	5259.970388	5250~5350	Pass
30	110	5260.018199	5250~5350	Pass
20	110	5259.982446	5250~5350	Pass
10	110	5260.010155	5250~5350	Pass
0	110	5259.996781	5250~5350	Pass
-10	110	5259.998590	5250~5350	Pass
-20	110	5260.015717	5250~5350	Pass

Operating Frequency: 5260 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5259.983781	5250~5350	Pass
	110	5260.006034	5250~5350	Pass
	121	5260.006438	5250~5350	Pass



CH High

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5319.993609	5250~5350	Pass
40	110	5319.973675	5250~5350	Pass
30	110	5320.010866	5250~5350	Pass
20	110	5320.012145	5250~5350	Pass
10	110	5319.999509	5250~5350	Pass
0	110	5319.971742	5250~5350	Pass
-10	110	5319.998356	5250~5350	Pass
-20	110	5320.002801	5250~5350	Pass

Operating Frequency: 5320 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5319.97422	5250~5350	Pass
	110	5319.987611	5250~5350	Pass
	121	5320.005992	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	110	5270.011229	5250~5350	Pass
40	110	5269.975416	5250~5350	Pass
30	110	5269.982626	5250~5350	Pass
20	110	5269.991647	5250~5350	Pass
10	110	5269.998658	5250~5350	Pass
0	110	5269.977998	5250~5350	Pass
-10	110	5270.016185	5250~5350	Pass
-20	110	5269.970282	5250~5350	Pass

Operating Frequency: 5270 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5269.970014	5250~5350	Pass
	110	5269.996218	5250~5350	Pass
	121	5269.973556	5250~5350	Pass



CH High

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5309.981525	5250~5350	Pass
40	110	5310.011112	5250~5350	Pass
30	110	5310.011542	5250~5350	Pass
20	110	5309.986124	5250~5350	Pass
10	110	5309.979894	5250~5350	Pass
0	110	5309.997169	5250~5350	Pass
-10	110	5310.006455	5250~5350	Pass
-20	110	5309.974578	5250~5350	Pass

Operating Frequency: 5310 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5309.980417	5250~5350	Pass
	110	5310.014637	5250~5350	Pass
	121	5310.012426	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	110	5499.989886	5470~5725	Pass
40	110	5500.008952	5470~5725	Pass
30	110	5499.998523	5470~5725	Pass
20	110	5500.007663	5470~5725	Pass
10	110	5499.986230	5470~5725	Pass
0	110	5500.001305	5470~5725	Pass
-10	110	5500.011264	5470~5725	Pass
-20	110	5499.976749	5470~5725	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5499.982684	5470~5725	Pass
	110	5499.97056	5470~5725	Pass
	121	5499.98762	5470~5725	Pass



CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5700.005049	5470~5725	Pass
40	110	5700.009211	5470~5725	Pass
30	110	5699.997425	5470~5725	Pass
20	110	5700.017191	5470~5725	Pass
10	110	5700.010798	5470~5725	Pass
0	110	5699.971385	5470~5725	Pass
-10	110	5700.018202	5470~5725	Pass
-20	110	5699.977368	5470~5725	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5699.99576	5470~5725	Pass
	110	5700.003088	5470~5725	Pass
	121	5699.985091	5470~5725	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	110	5500.005306	5470~5725	Pass
40	110	5499.998700	5470~5725	Pass
30	110	5500.005605	5470~5725	Pass
20	110	5500.002153	5470~5725	Pass
10	110	5500.001699	5470~5725	Pass
0	110	5499.971290	5470~5725	Pass
-10	110	5500.016623	5470~5725	Pass
-20	110	5500.008557	5470~5725	Pass

Operating Frequency: 5500 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5500.007646	5470~5725	Pass
	110	5500.004318	5470~5725	Pass
	121	5500.014692	5470~5725	Pass



CH High

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5700.007662	5470~5725	Pass
40	110	5699.987581	5470~5725	Pass
30	110	5700.007492	5470~5725	Pass
20	110	5699.989649	5470~5725	Pass
10	110	5699.974922	5470~5725	Pass
0	110	5699.977919	5470~5725	Pass
-10	110	5700.004986	5470~5725	Pass
-20	110	5700.009744	5470~5725	Pass

Operating Frequency: 5700 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5700.008151	5470~5725	Pass
	110	5699.983301	5470~5725	Pass
	121	5700.011246	5470~5725	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	110	5510.018810	5470~5725	Pass
40	110	5509.998660	5470~5725	Pass
30	110	5510.009993	5470~5725	Pass
20	110	5509.988057	5470~5725	Pass
10	110	5510.002033	5470~5725	Pass
0	110	5509.989329	5470~5725	Pass
-10	110	5509.983617	5470~5725	Pass
-20	110	5509.986851	5470~5725	Pass

Operating Frequency: 5510 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5509.976821	5470~5725	Pass
	110	5510.008611	5470~5725	Pass
	121	5510.001688	5470~5725	Pass



CH High

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
50	110	5669.984395	5470~5725	Pass
40	110	5669.993757	5470~5725	Pass
30	110	5670.006720	5470~5725	Pass
20	110	5669.988756	5470~5725	Pass
10	110	5669.988538	5470~5725	Pass
0	110	5670.004697	5470~5725	Pass
-10	110	5669.991533	5470~5725	Pass
-20	110	5670.009293	5470~5725	Pass

Operating Frequency: 5670 MHz				
Environment Temperature (°C)	Voltage (V)	Measured Frequency (MHz)	Limit Range	Test Result
20	99	5669.988488	5470~5725	Pass
	110	5669.998263	5470~5725	Pass
	121	5669.972947	5470~5725	Pass



7.10 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: 3.3.8.0

The EUT operates over the 5250-5350 MHz, 5500-5700MHz 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 Air-AP1262N-A-K9 Point, FCC ID: LDK102073.

The rated output power of the Master unit is < 23dBm (EIRP). Therefore the required interference threshold level is -62 dBm. After correction for antenna gain and procedural adjustments, the required conducted threshold at the antenna port is $-62 + 3.5 = -58.5$ dBm.

The calibrated conducted DFS Detection Threshold level is set to -58.5 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.

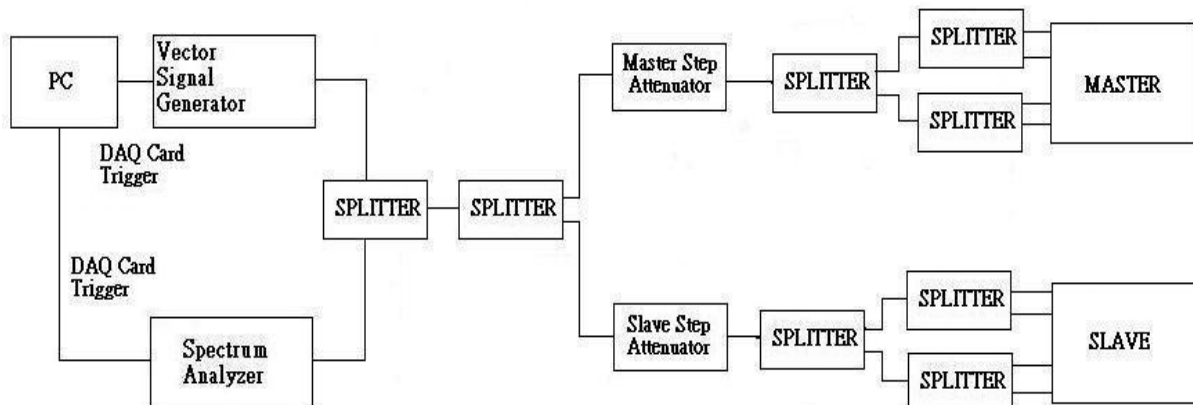
The short pulse types 2, 3 and 4, and the long pulse type 5 parameters are randomized at run-time.

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.

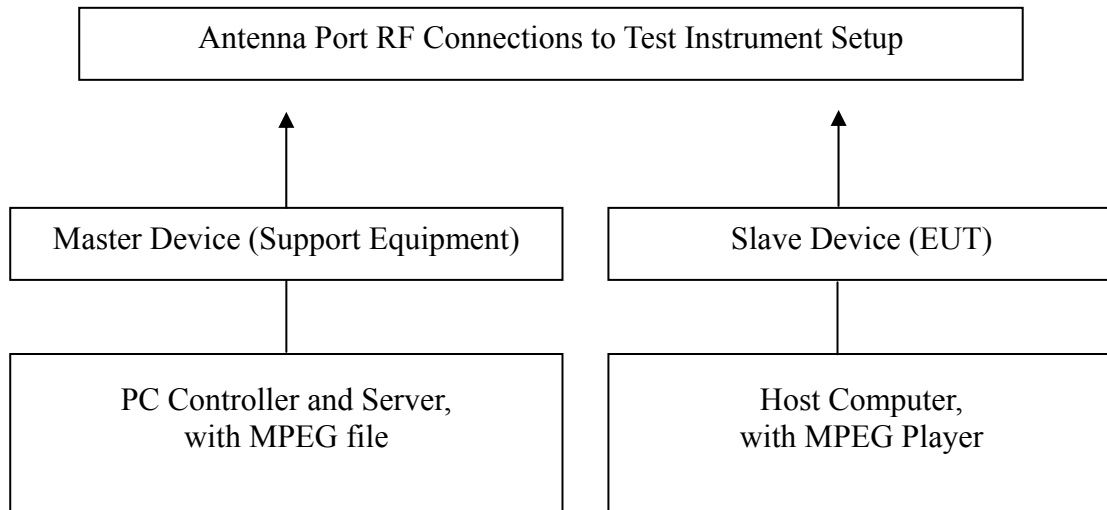
Adjustment Of Displayed Traffic Level

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

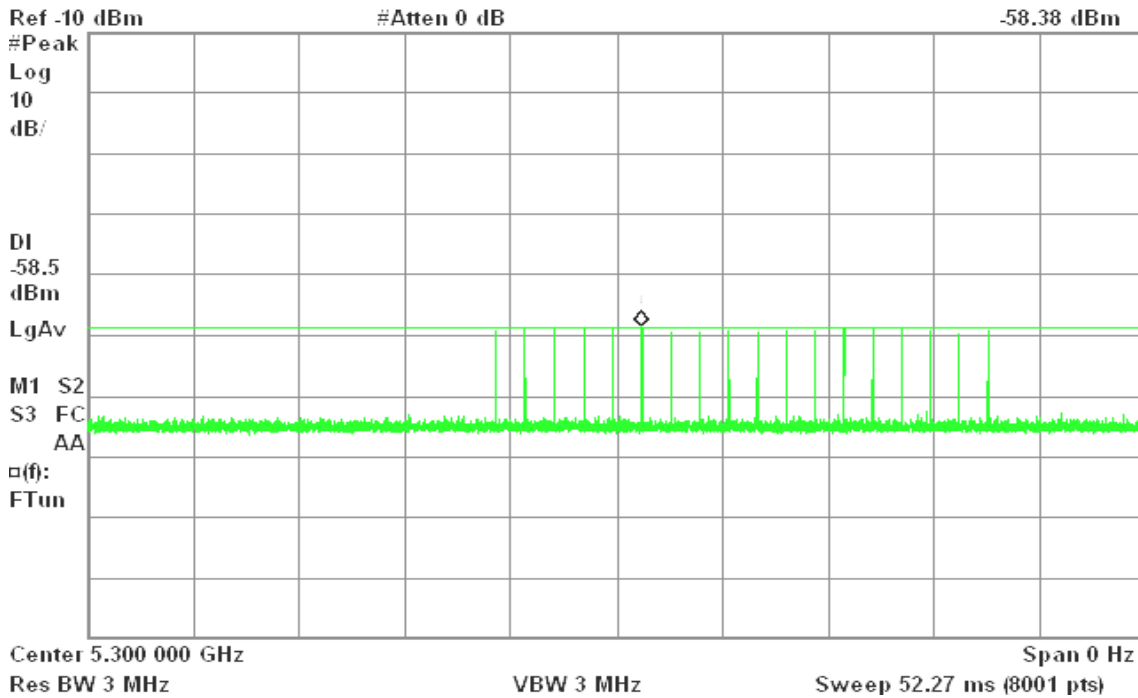
PLOTS OF RADAR WAVEFORMS

Sample of Short Pulse Radar Type 1

Agilent 20:42:38 Jan 17, 2012

R T

Mkr1 27.36 ms
-58.38 dBm

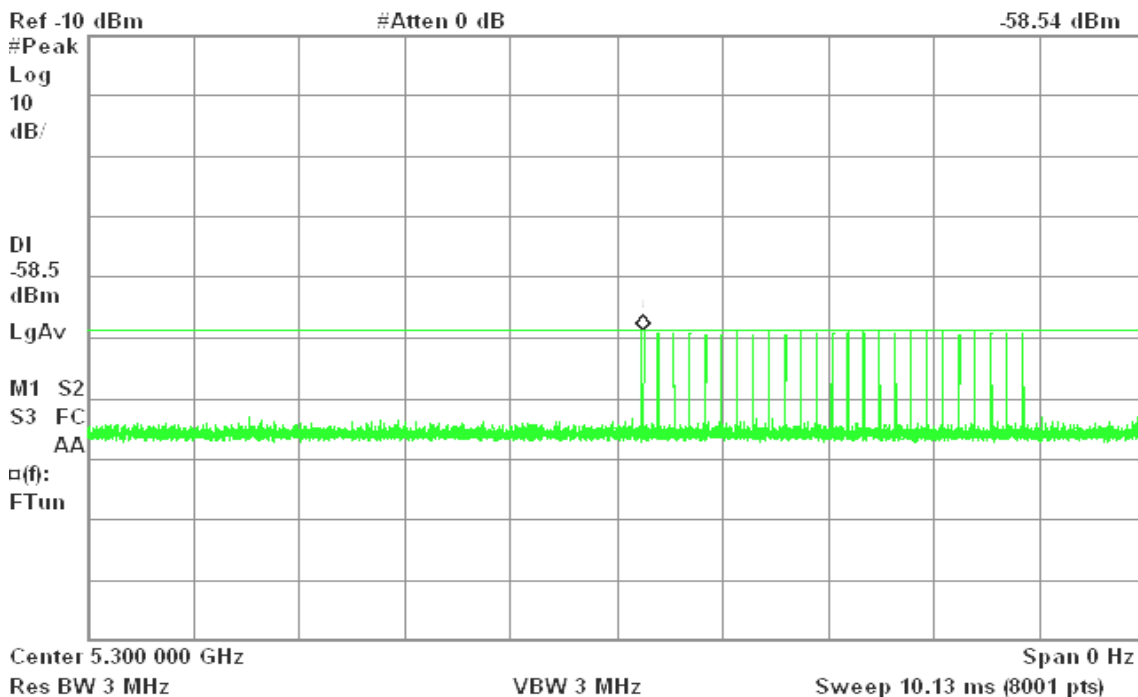


Sample of Short Pulse Radar Type 2

Agilent 20:45:52 Jan 17, 2012

R T

Mkr1 5.306 ms
-58.54 dBm



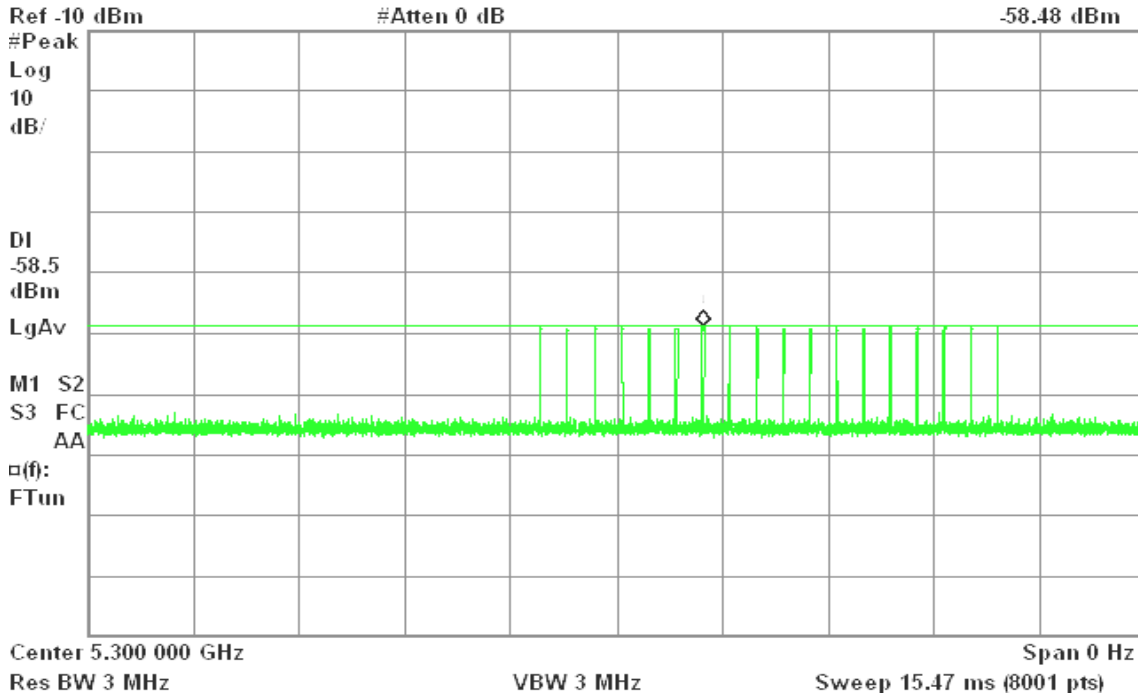


Sample of Short Pulse Radar Type 3

Agilent 20:53:26 Jan 17, 2012

R T

Mkr1 8.984 ms
-58.48 dBm

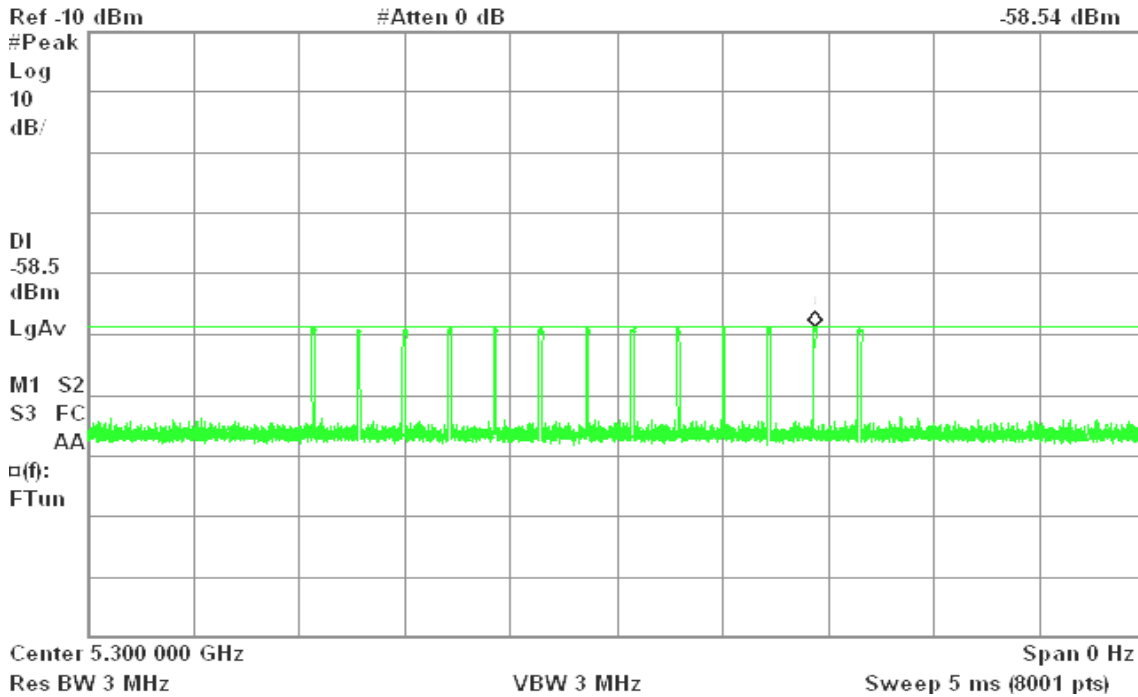


Sample of Short Pulse Radar Type 4

Agilent 20:55:26 Jan 17, 2012

R T

Mkr1 3.437 ms
-58.54 dBm



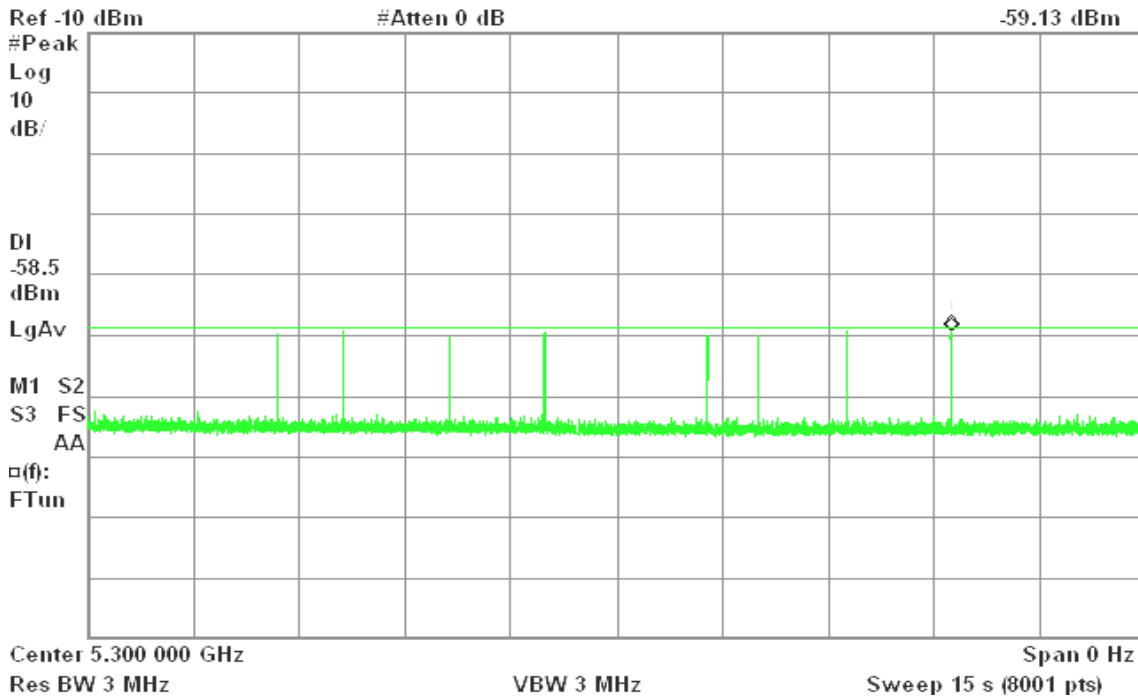


Sample of Long Pulse Radar Type 5

Agilent 21:01:16 Jan 17, 2012

L

Mkr1 12.24 s
-59.13 dBm

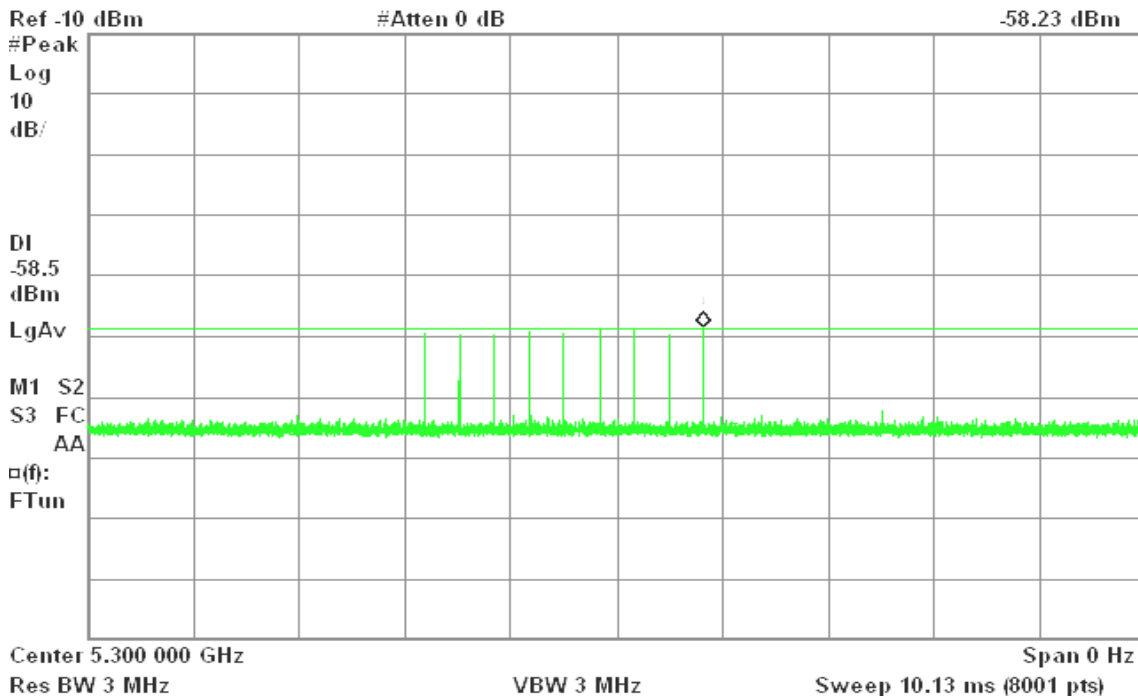


Sample of Frequency Hopping Radar Type 6

Agilent 21:15:51 Jan 17, 2012

T

Mkr1 5.899 ms
-58.23 dBm



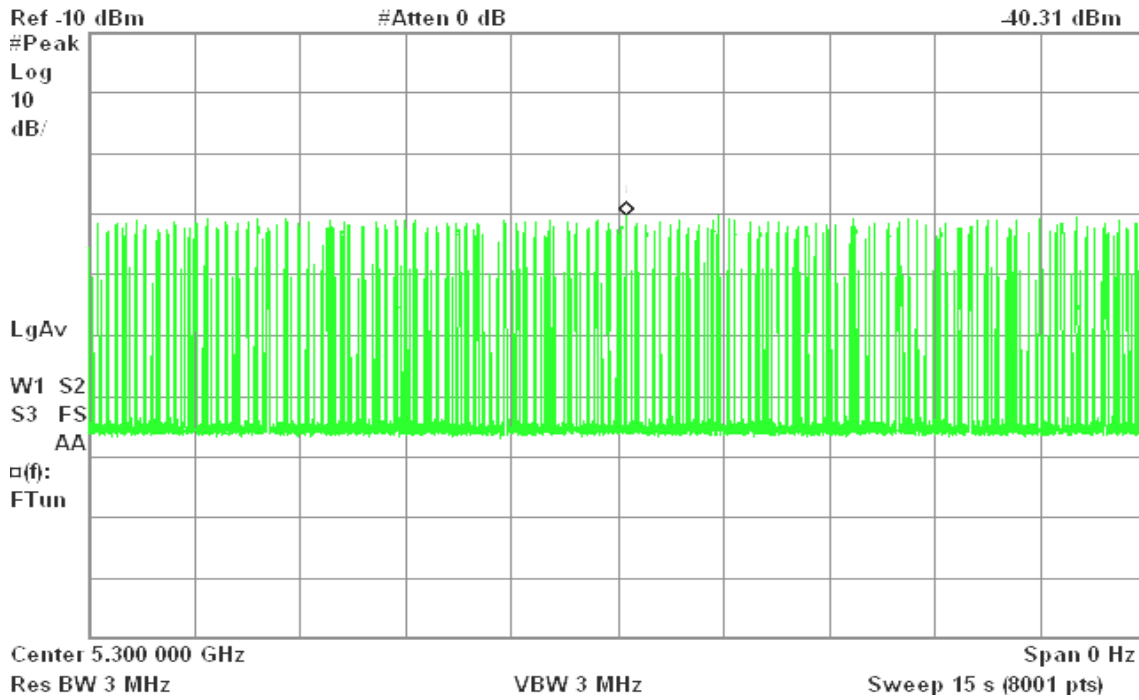


Plot of WLAN Traffic from Slave

Agilent 19:47:58 Jan 17, 2012

R T

Mkr1 7.616 s
-40.31 dBm





TEST CHANNEL AND METHOD

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

CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME

GENERAL REPORTING NOTES

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

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

The aggregate channel closing transmission time is calculated as follows:

Aggregate Transmission Time =

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

The observation period over which the aggregate time is calculated

Begins at (Reference Marker + 200 msec) and

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



LOW BAND RESULTS

IEEE 802.11n HT 20 MHz Channel mode

Type 1 Channel Move Time Results

No non-compliance noted.

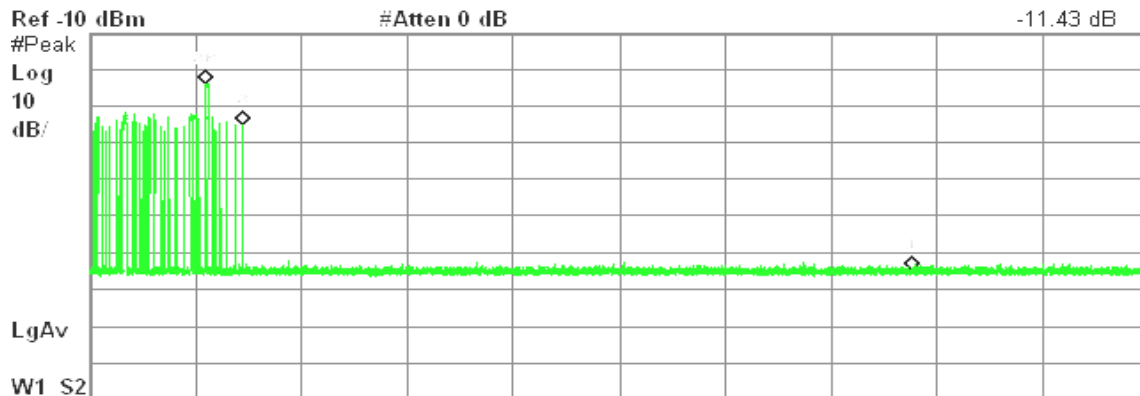
Channel Move Time (s)	Limit (s)
1.648	10

Agilent 13:02:27 Dec 27, 2011

R T

Δ Mkr2 513.8 ms

-11.43 dB



Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	1.648 s	-23.78 dBm
1Δ	(1)	Time	10 s	-51.16 dB
2R	(1)	Time	1.648 s	-23.78 dBm
2Δ	(1)	Time	513.8 ms	-11.43 dB



IEEE 802.11n HT 40 MHz mode

Type 1 Channel Move Time Results

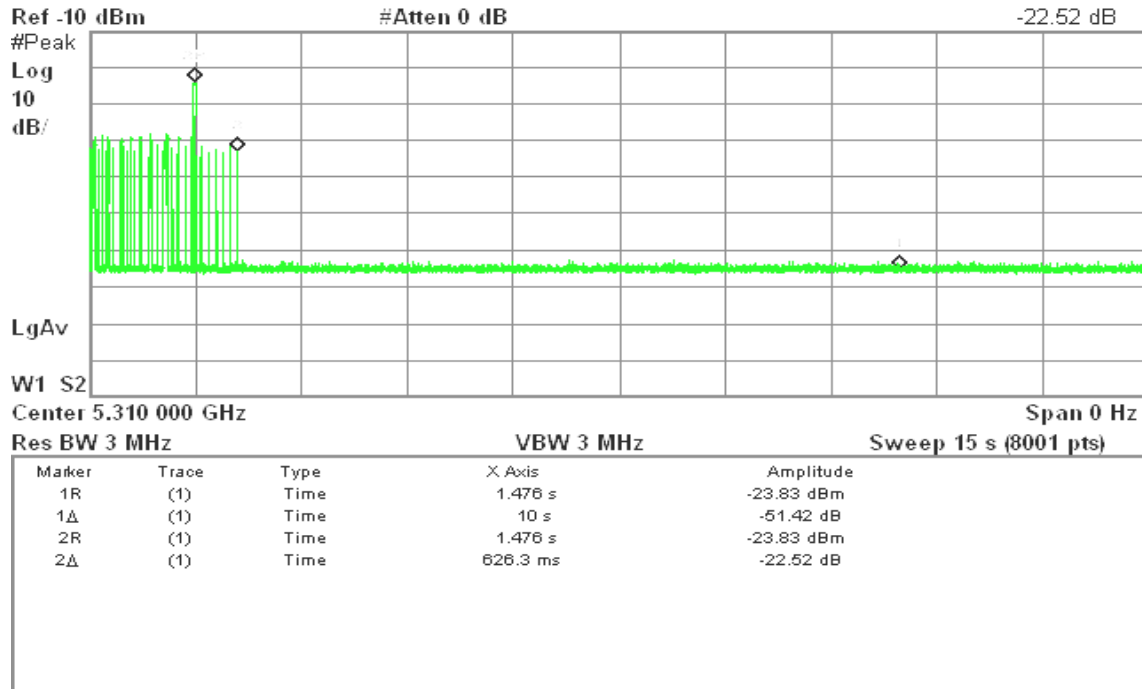
No non-compliance noted.

Channel Move Time (s)	Limit (s)
1.476	10

Agilent 15:22:52 Dec 27, 2011

R T

Δ Mkr2 626.3 ms
-22.52 dB





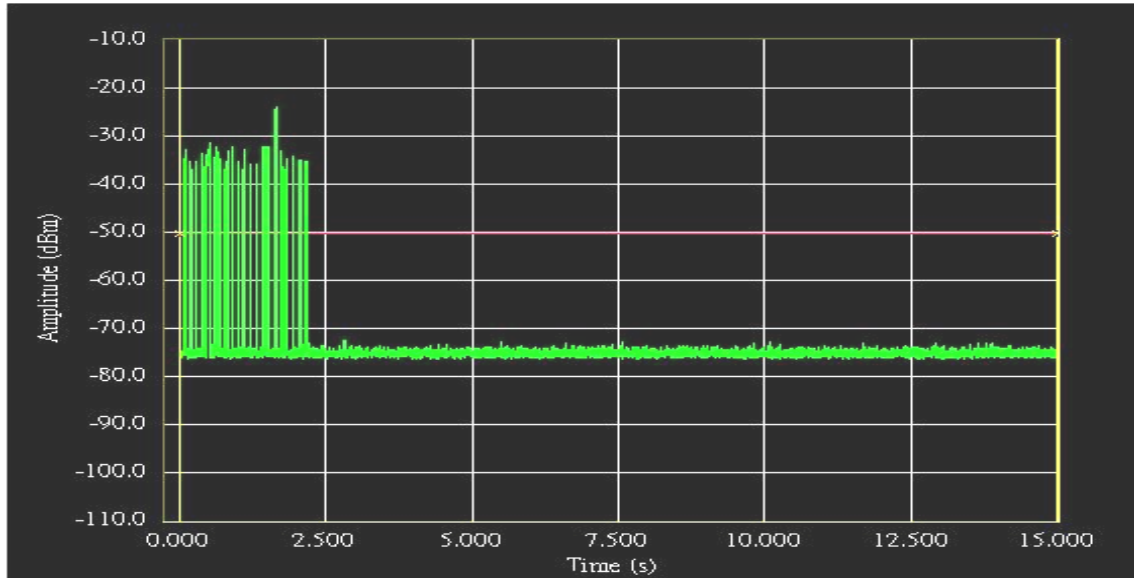
IEEE 802.11n HT 20 MHz Channel mode

Type 1 Channel Closing Transmission Time Results

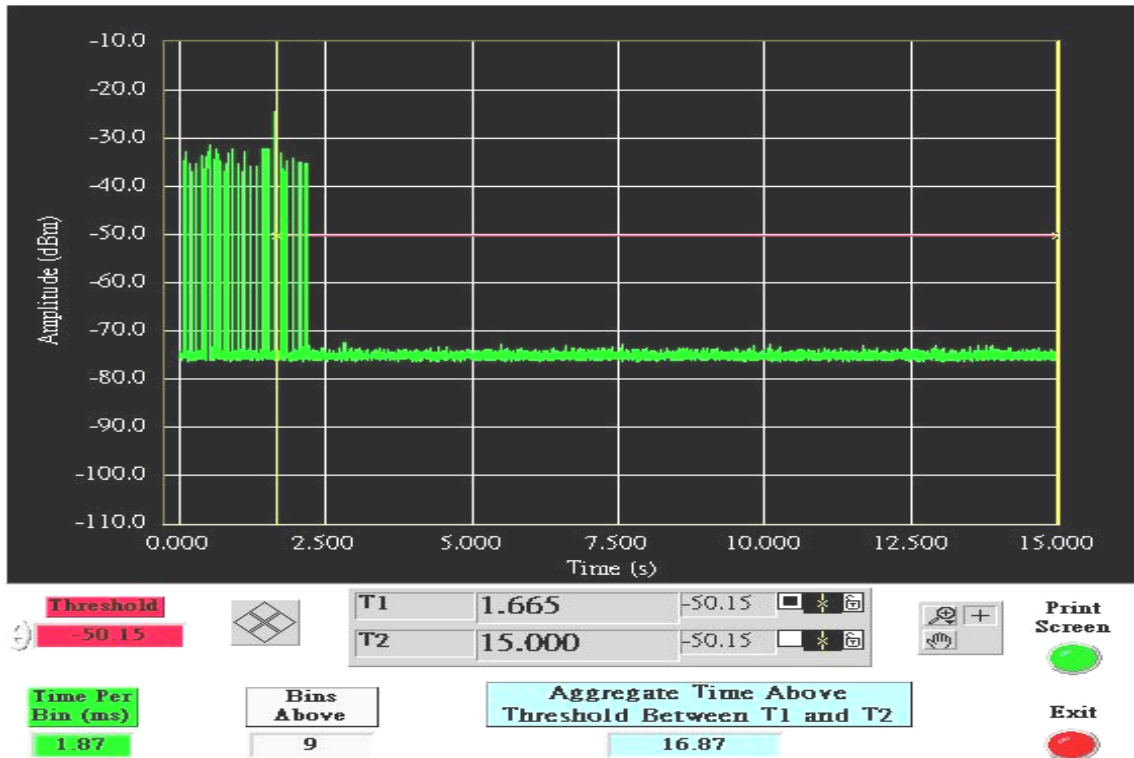
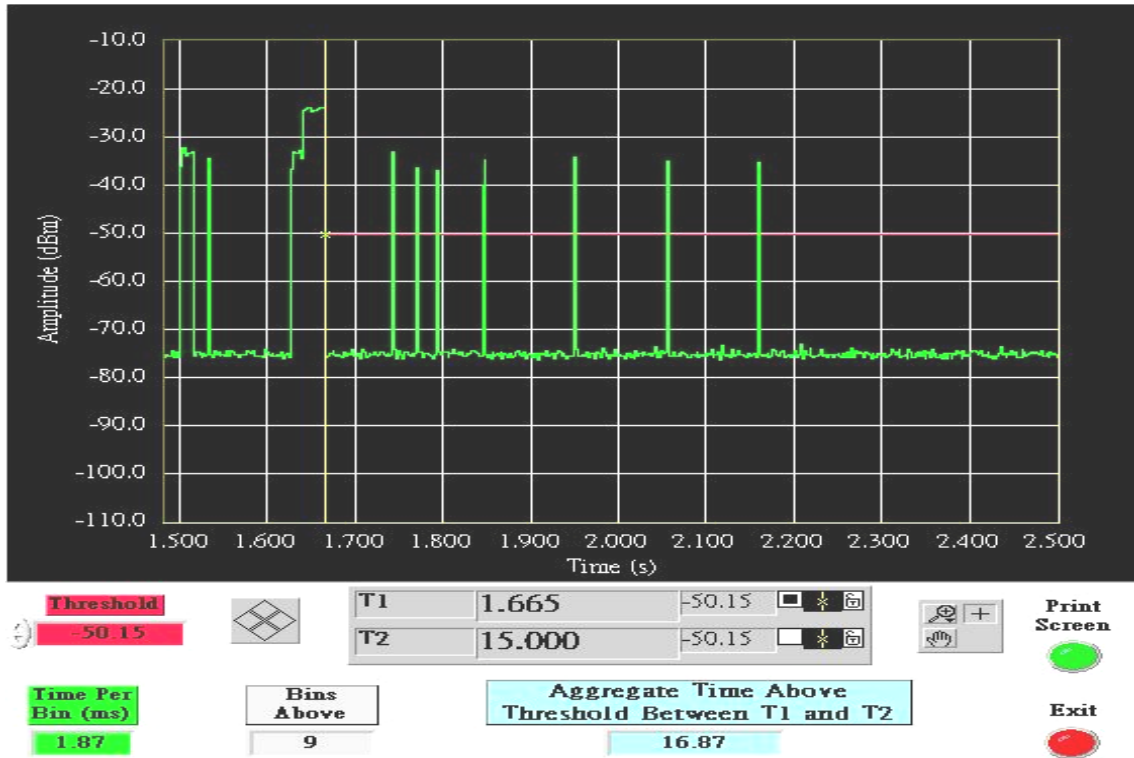
No non-compliance noted.

For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
16.87	60	-43.13



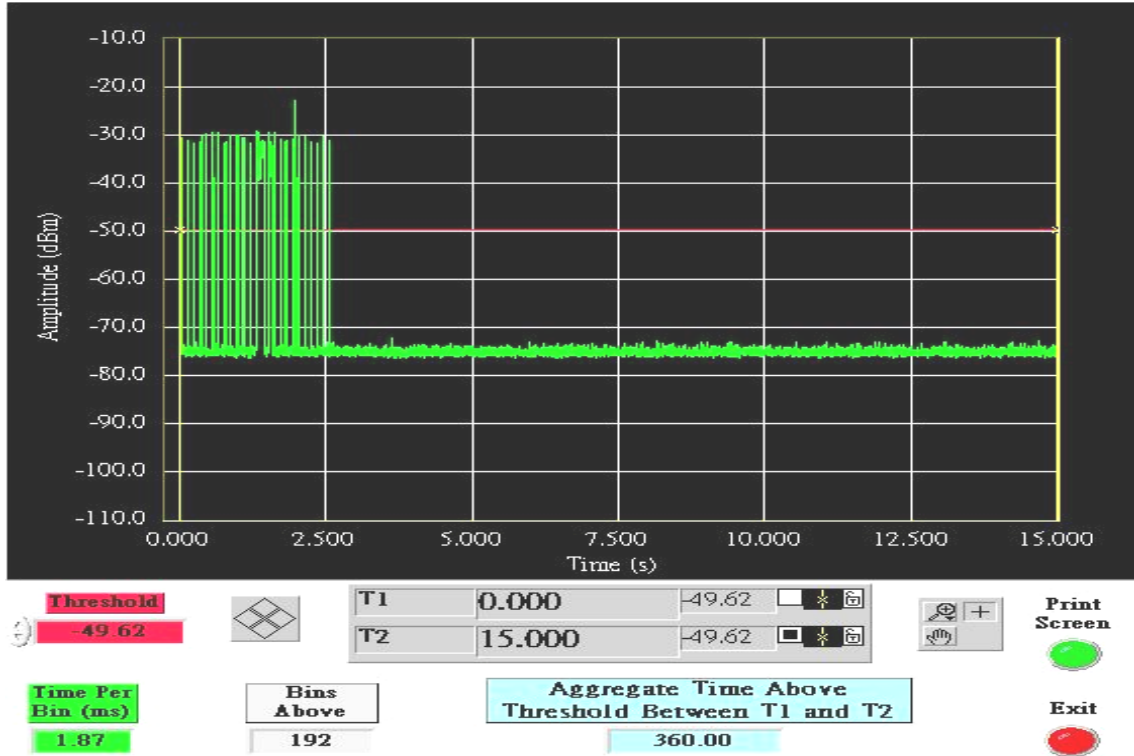
Threshold -50.15		T1 0.000 -50.15			Print Screen
Time Per Bin (ms) 1.87	Bins Above 157	Aggregate Time Above Threshold Between T1 and T2 294.37			Exit

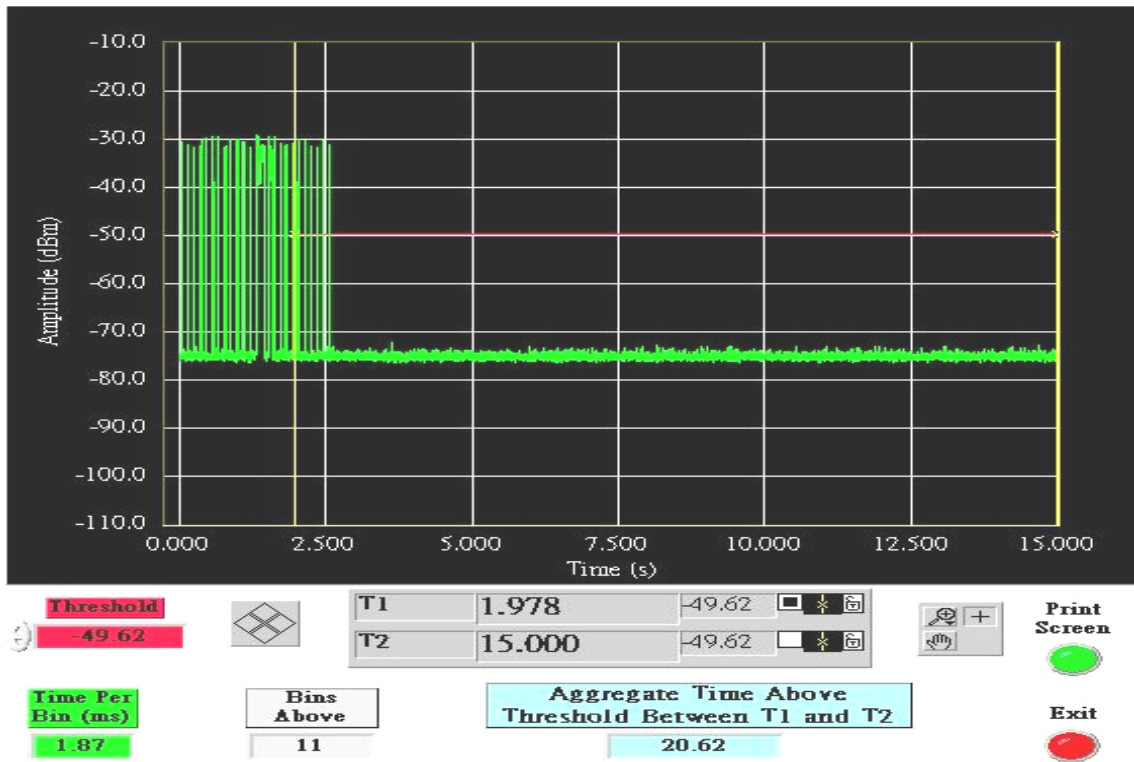
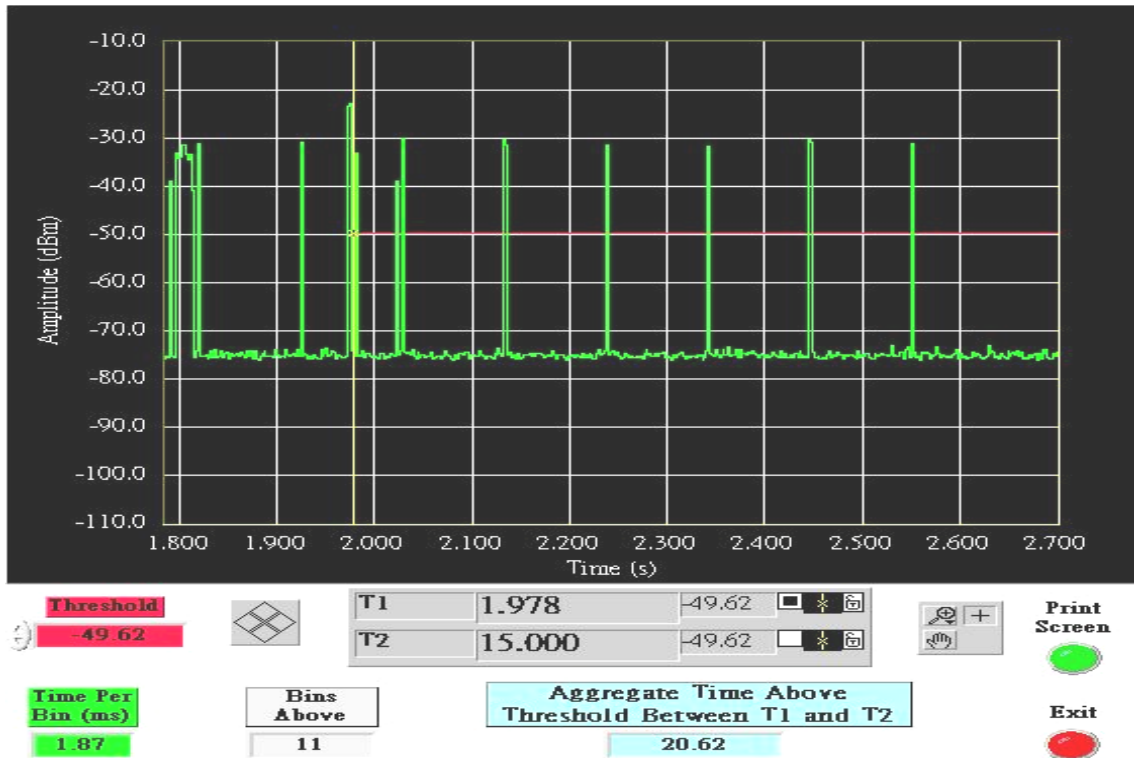




For R5

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







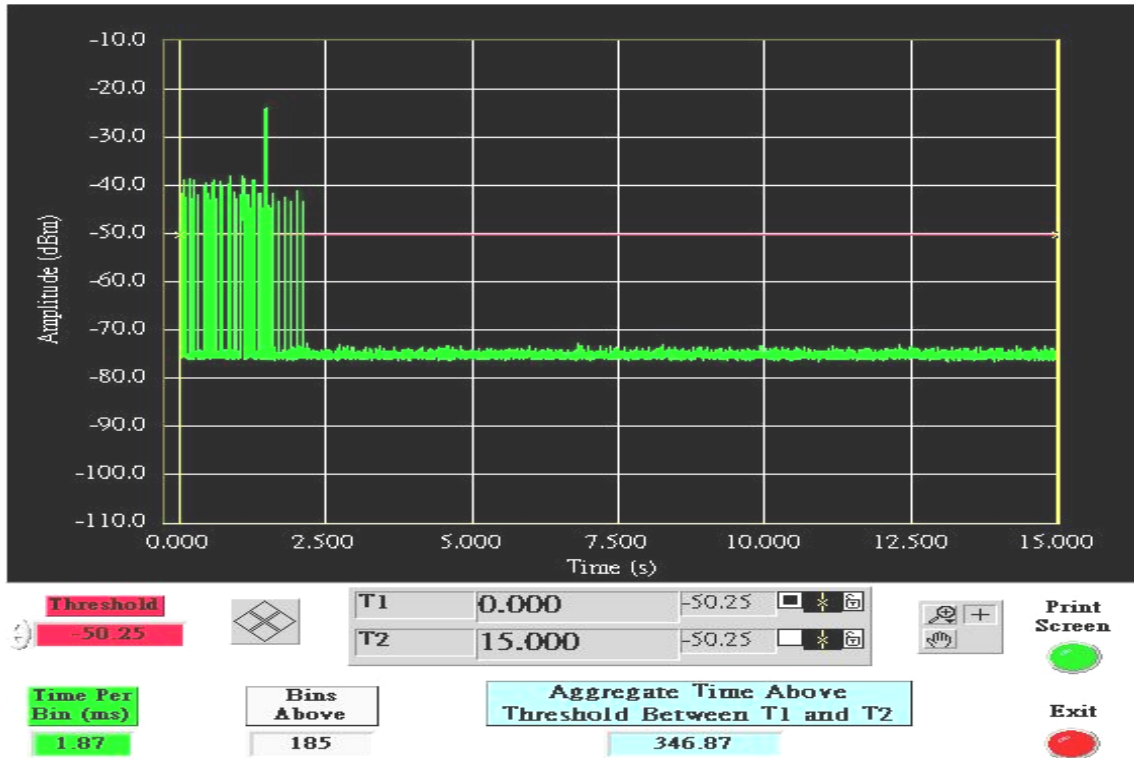
IEEE 802.11n HT 40 MHz mode

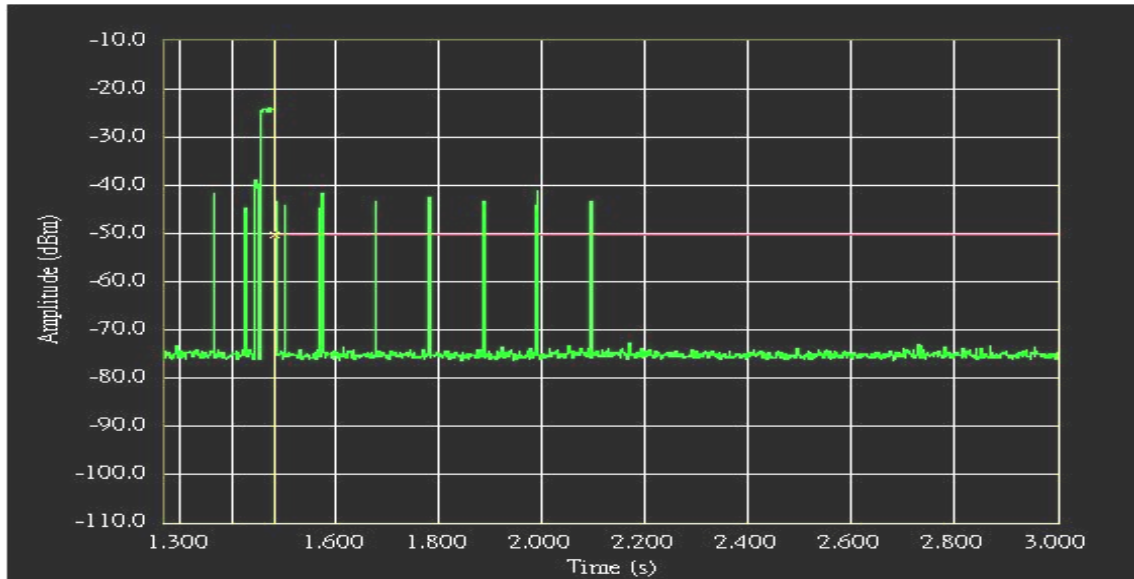
Type 1 Channel Closing Transmission Time Results

No non-compliance noted.

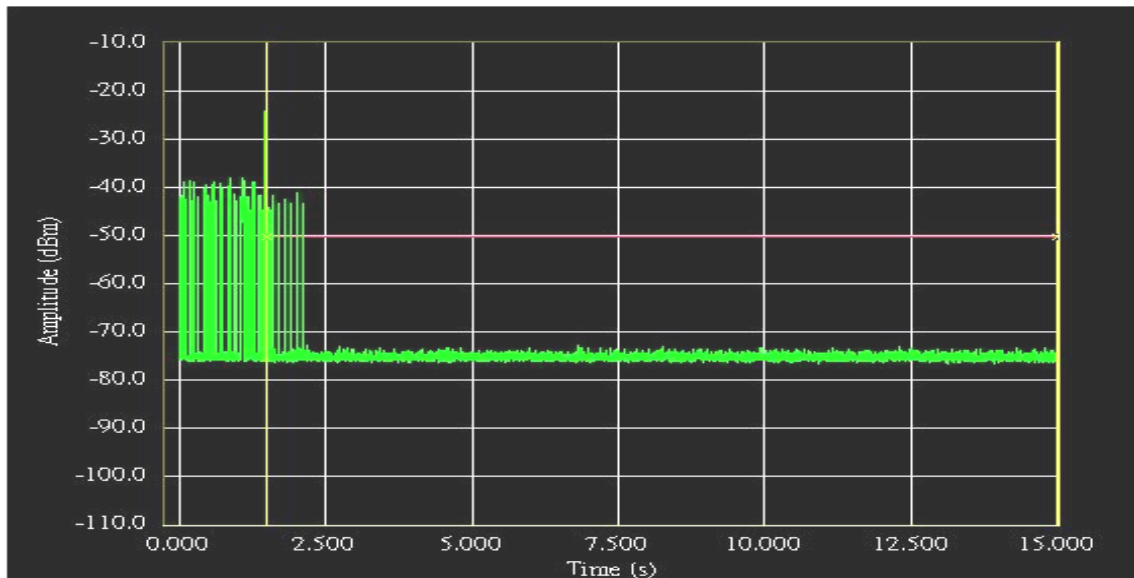
For R1

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





Threshold		T1	1.485	-50.25			Print Screen
-50.25		T2	15.000	-50.25			
Time Per Bin (ms)	Bins Above	Aggregate Time Above Threshold Between T1 and T2				Exit	
1.87	11	20.62					

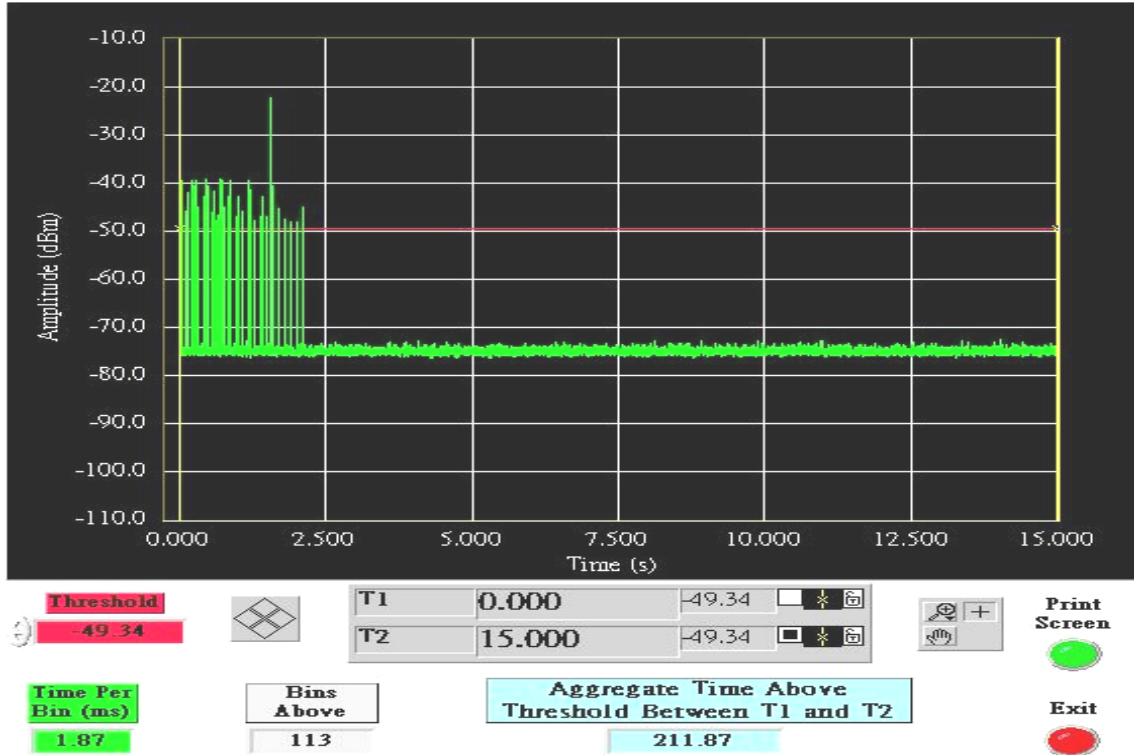


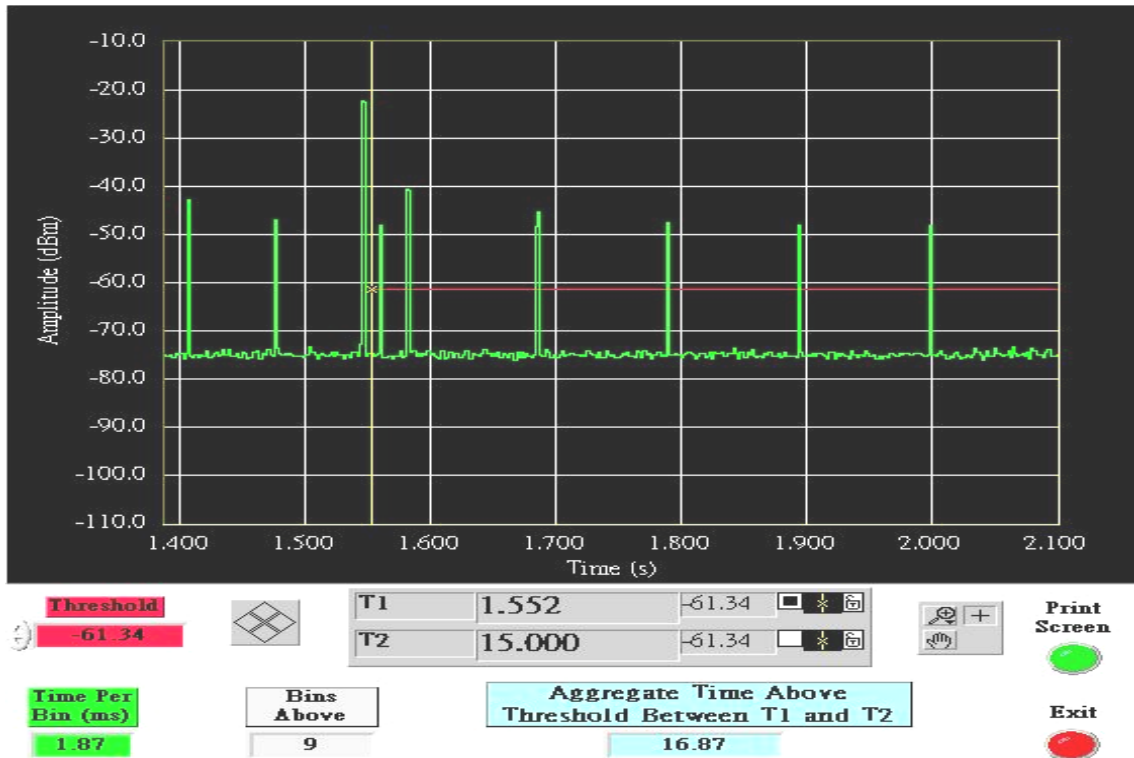
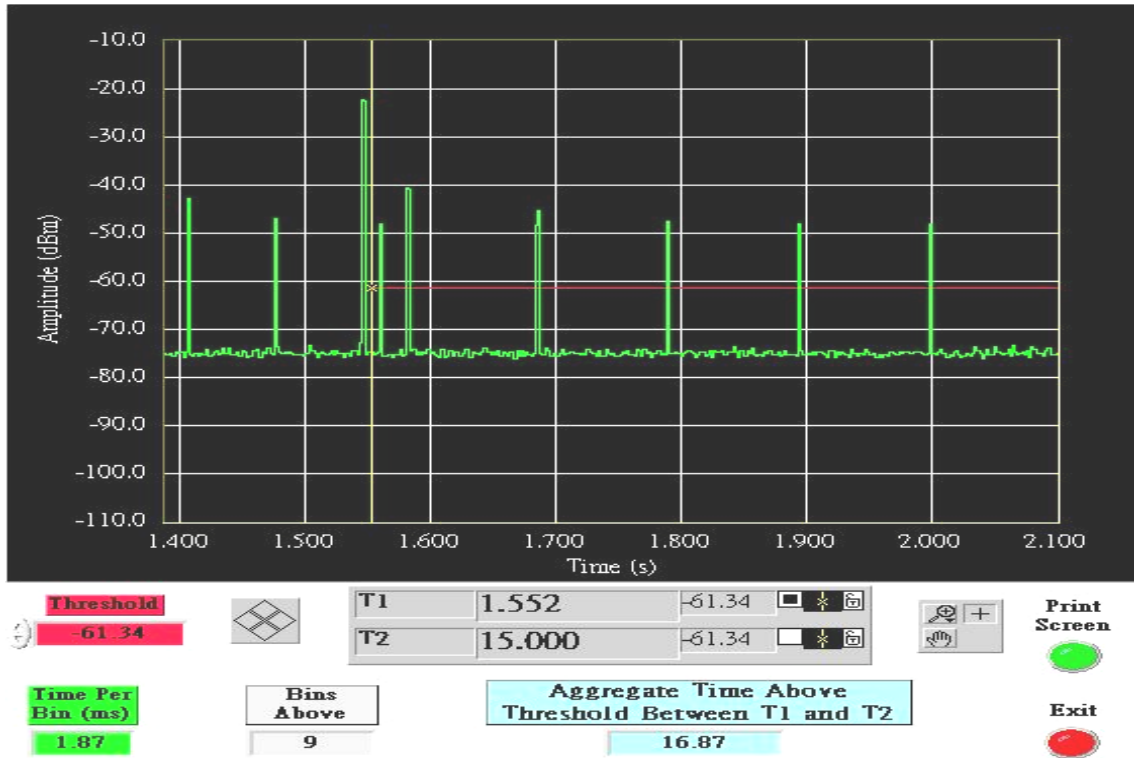
Threshold		T1	1.485	-50.25			Print Screen
-50.25		T2	15.000	-50.25			
Time Per Bin (ms)	Bins Above	Aggregate Time Above Threshold Between T1 and T2				Exit	
1.87	11	20.62					



For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
16.87	60	-43.13







HIGH BAND RESULTS

IEEE 802.11n HT 20 MHz Channel mode

Type 1 Channel Move Time Results

No non-compliance noted.

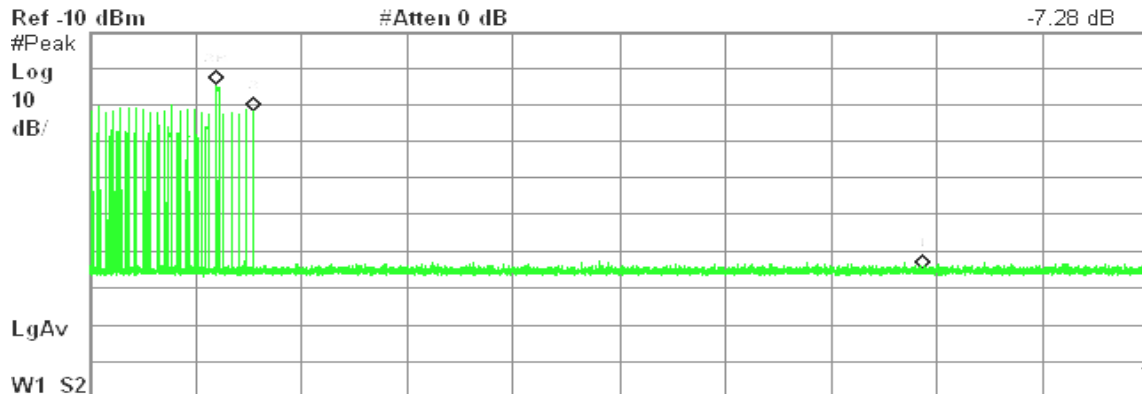
Channel Move Time (s)	Limit (s)
1.796	10

Agilent 15:43:30 Dec 27, 2011

R T

Δ Mkr2 523.1 ms

-7.28 dB



Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	1.796 s	-24.36 dBm
1Δ	(1)	Time	10 s	-50.61 dB
2R	(1)	Time	1.796 s	-24.36 dBm
2Δ	(1)	Time	523.1 ms	-7.28 dB



IEEE 802.11n HT 40 MHz mode

Type 1 Channel Move Time Results

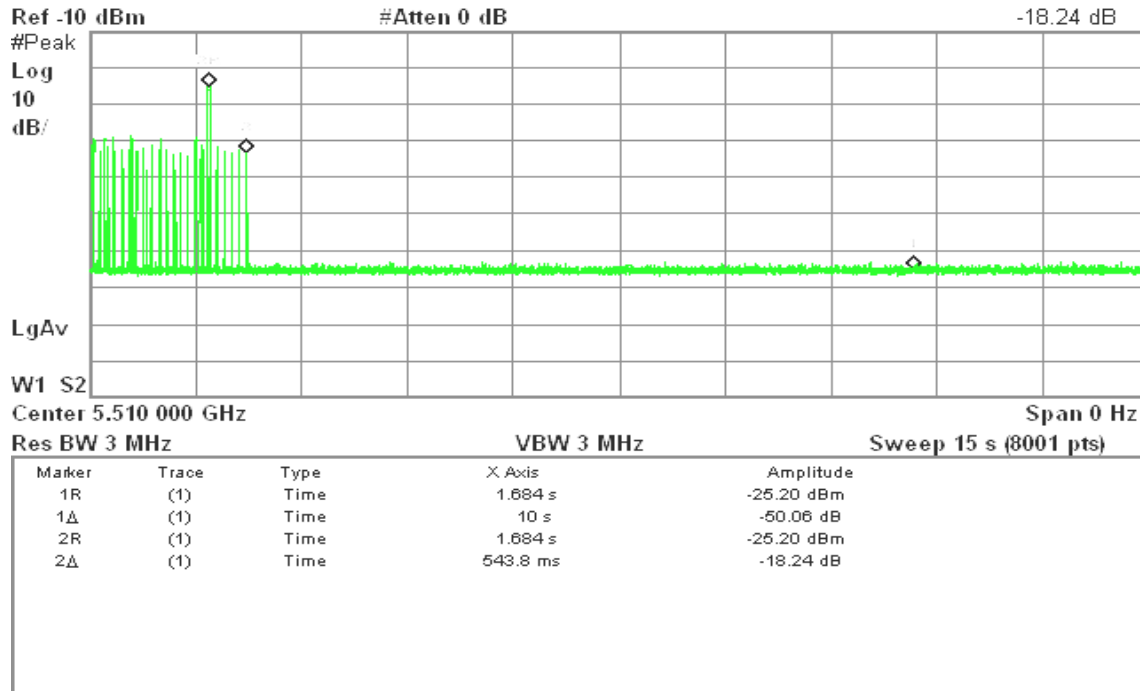
No non-compliance noted.

Channel Move Time (s)	Limit (s)
1.684	10

Agilent 15:29:34 Dec 27, 2011

R T

Δ Mkr2 543.8 ms
-18.24 dB





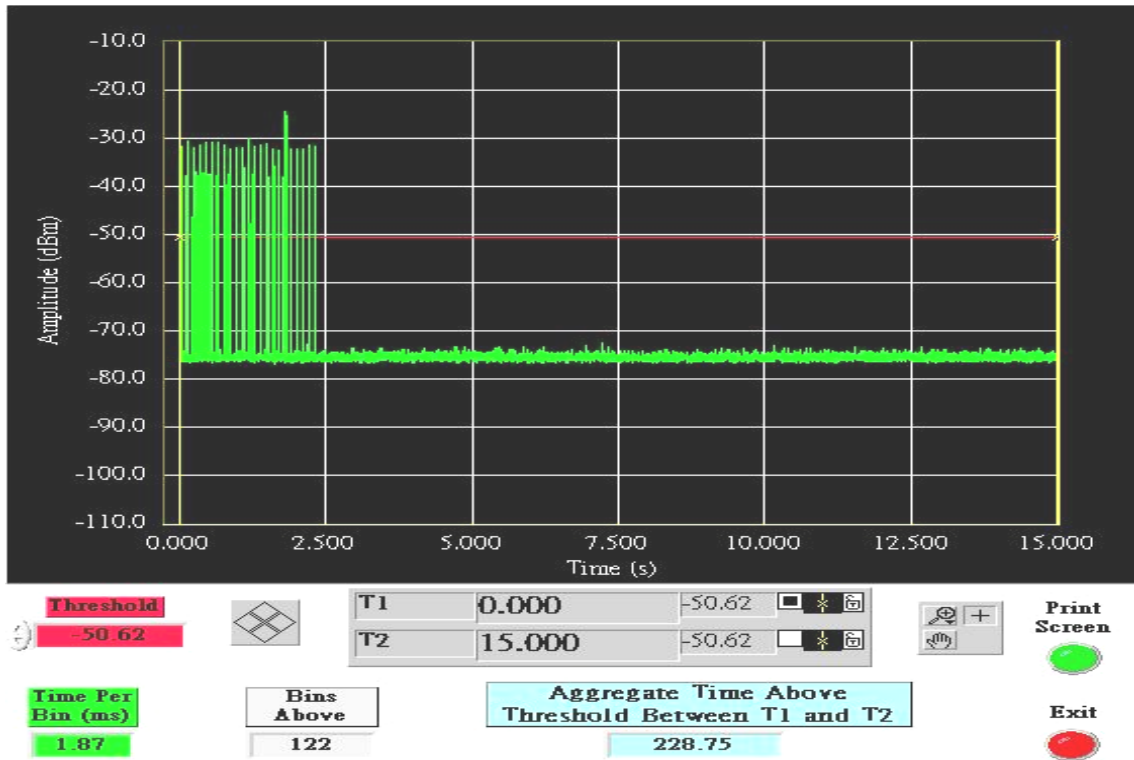
IEEE 802.11n HT 20 MHz Channel mode

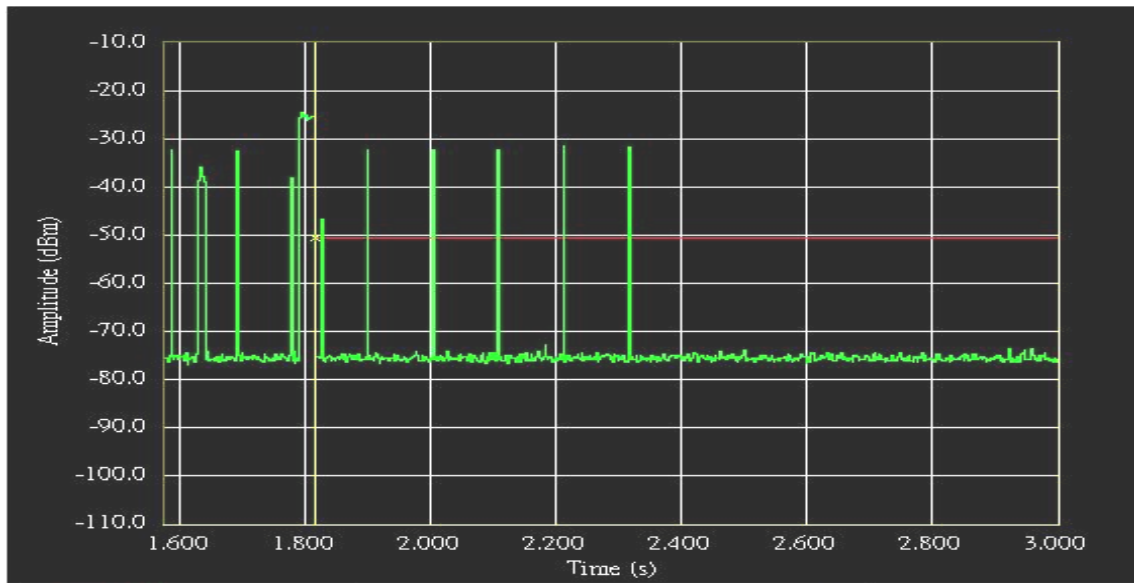
Type 1 Channel Closing Transmission Time Results

No non-compliance noted.

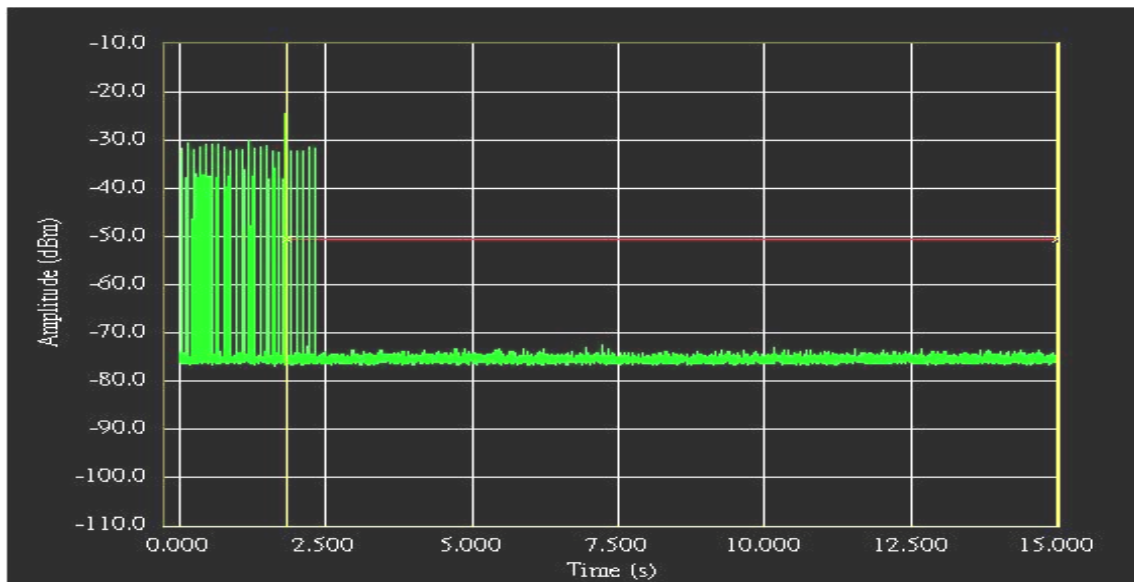
For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
11.25	60	-48.75





Threshold -50.62		T1 1.817	-50.62				Print Screen
Time Per Bin (ms) 1.87	Bins Above 6	Aggregate Time Above Threshold Between T1 and T2 11.25					Exit

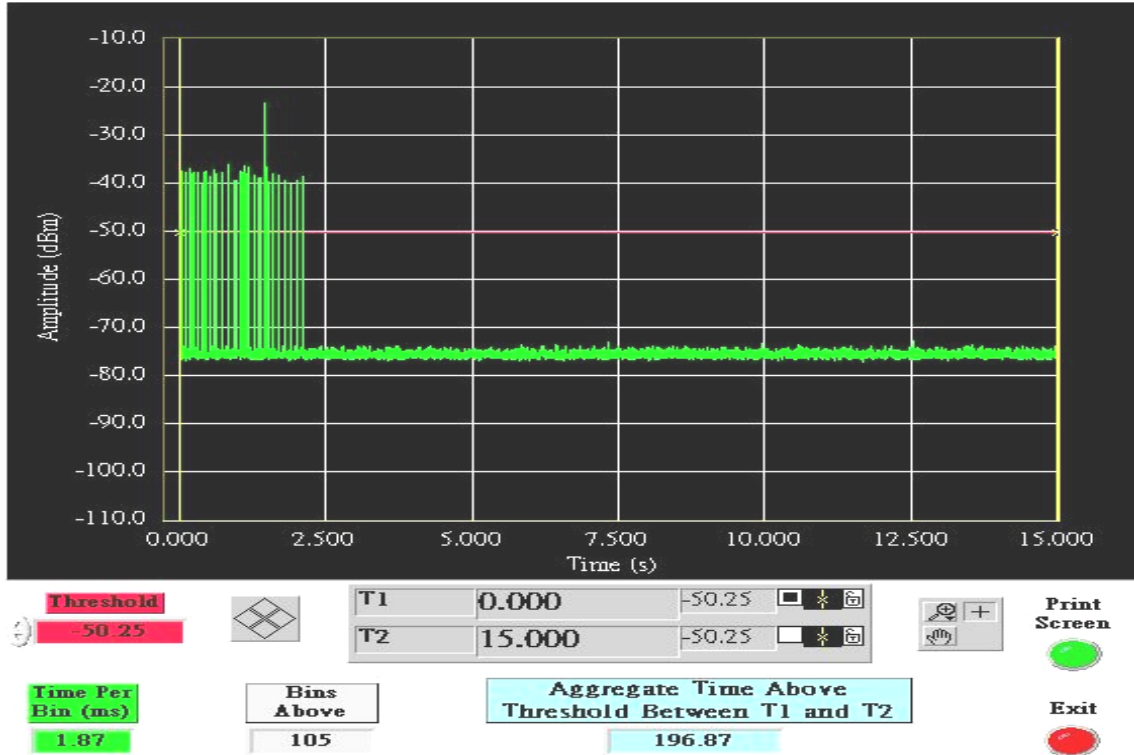


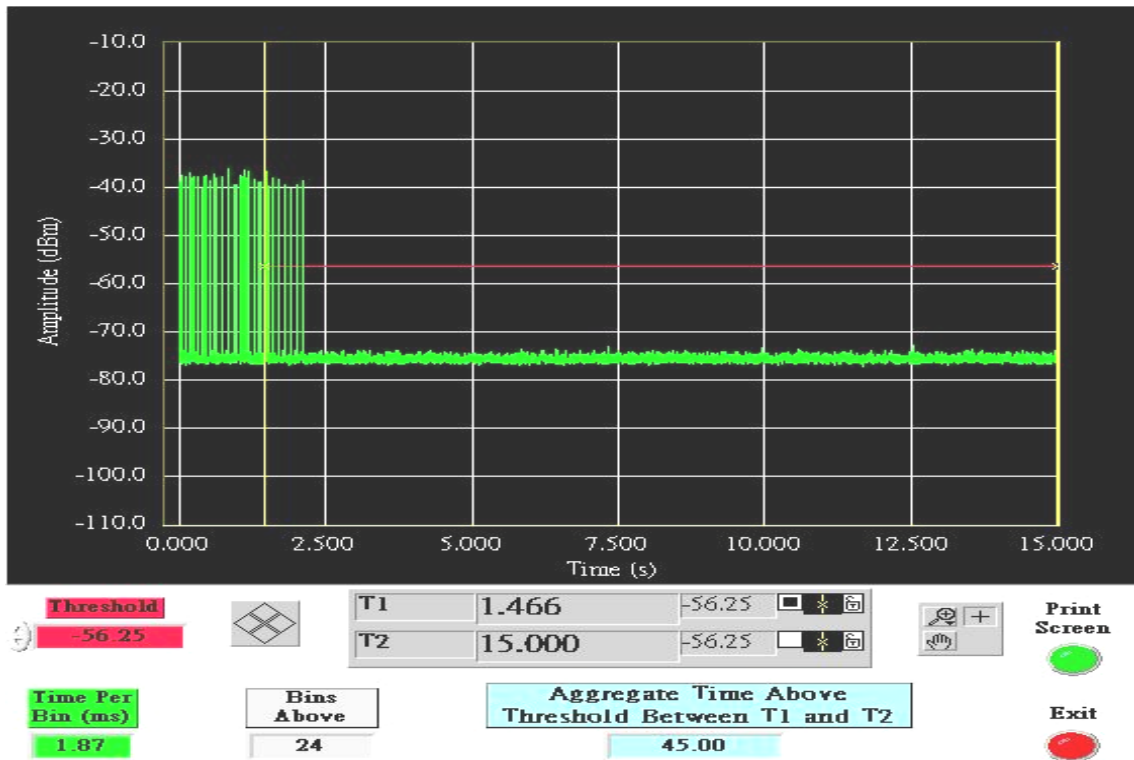
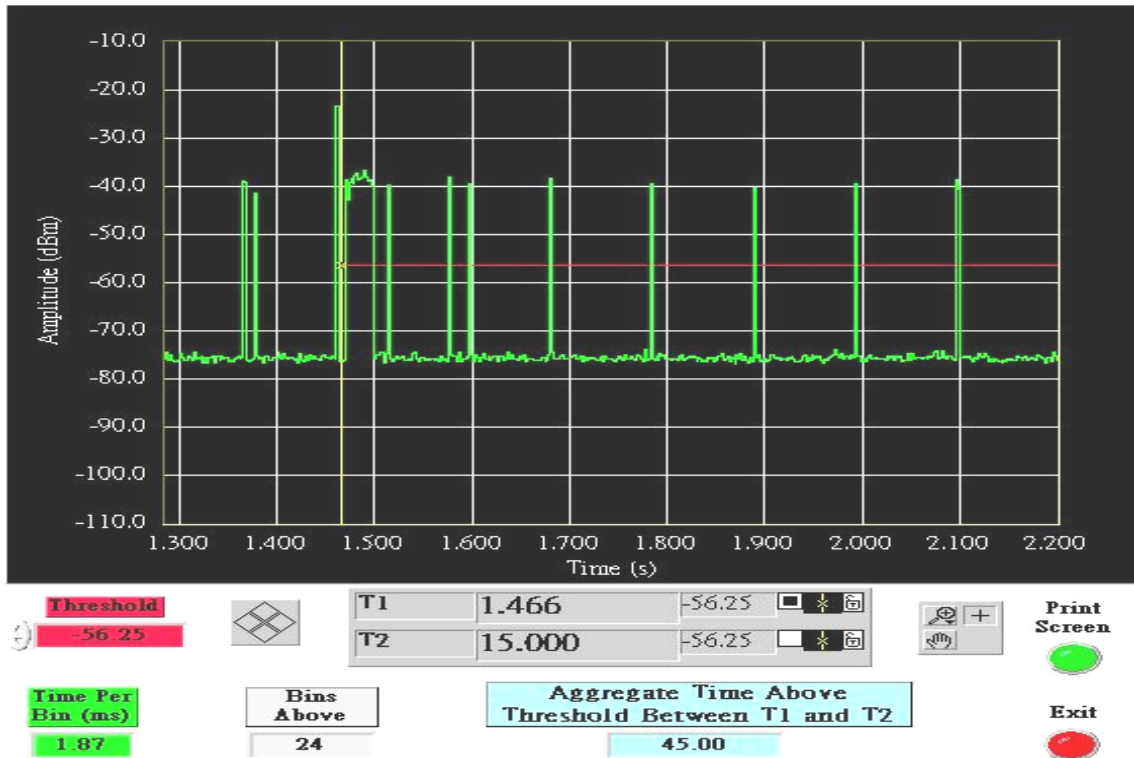
Threshold -50.62		T1 1.817	-50.62				Print Screen
Time Per Bin (ms) 1.87	Bins Above 6	Aggregate Time Above Threshold Between T1 and T2 11.25					Exit



For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
45.00	60	-15







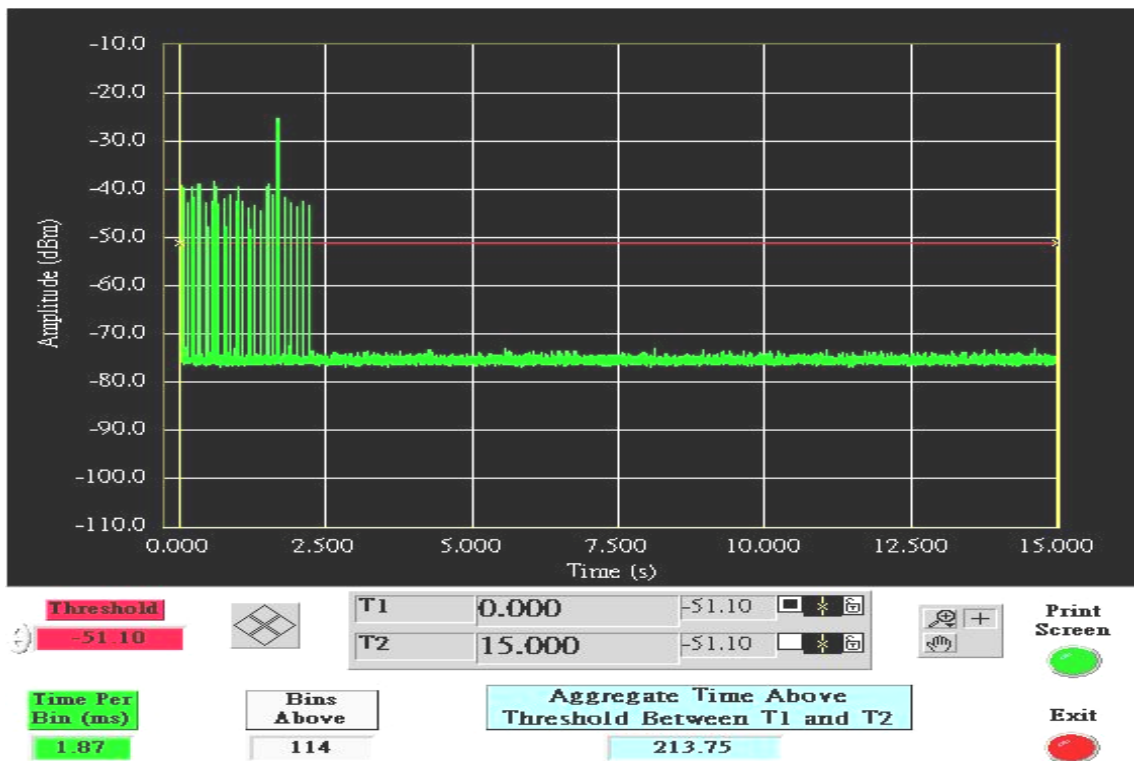
IEEE 802.11n HT 40 MHz mode

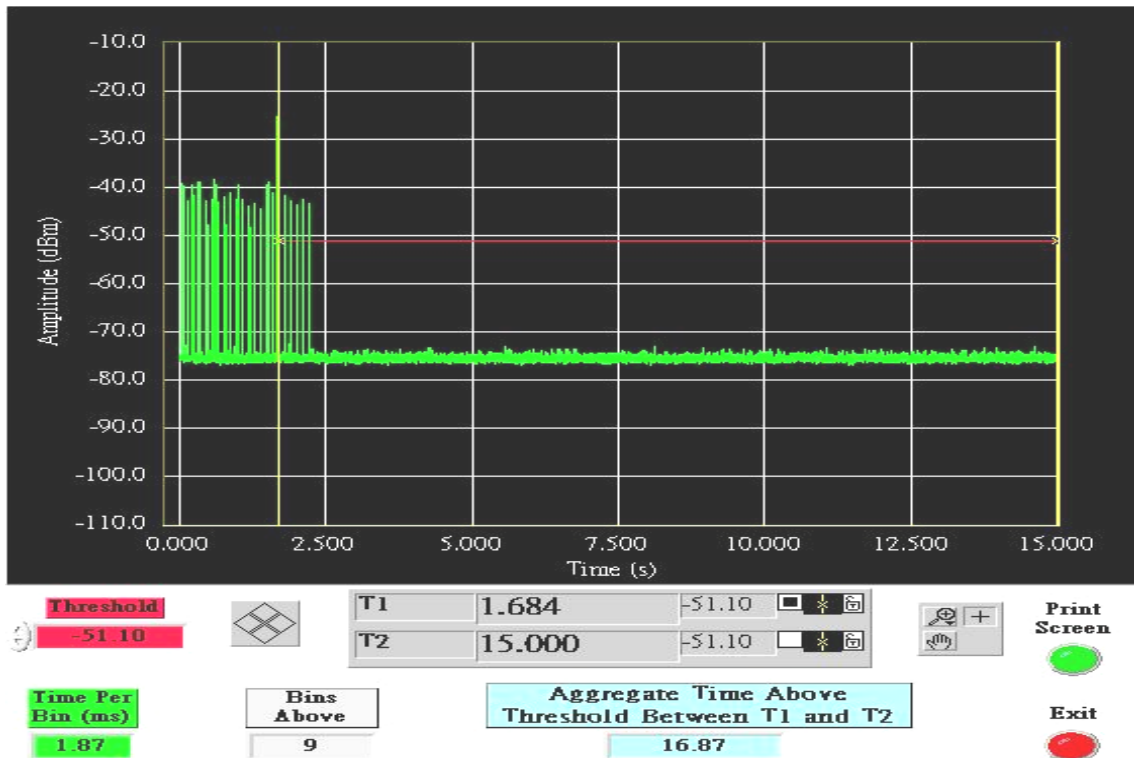
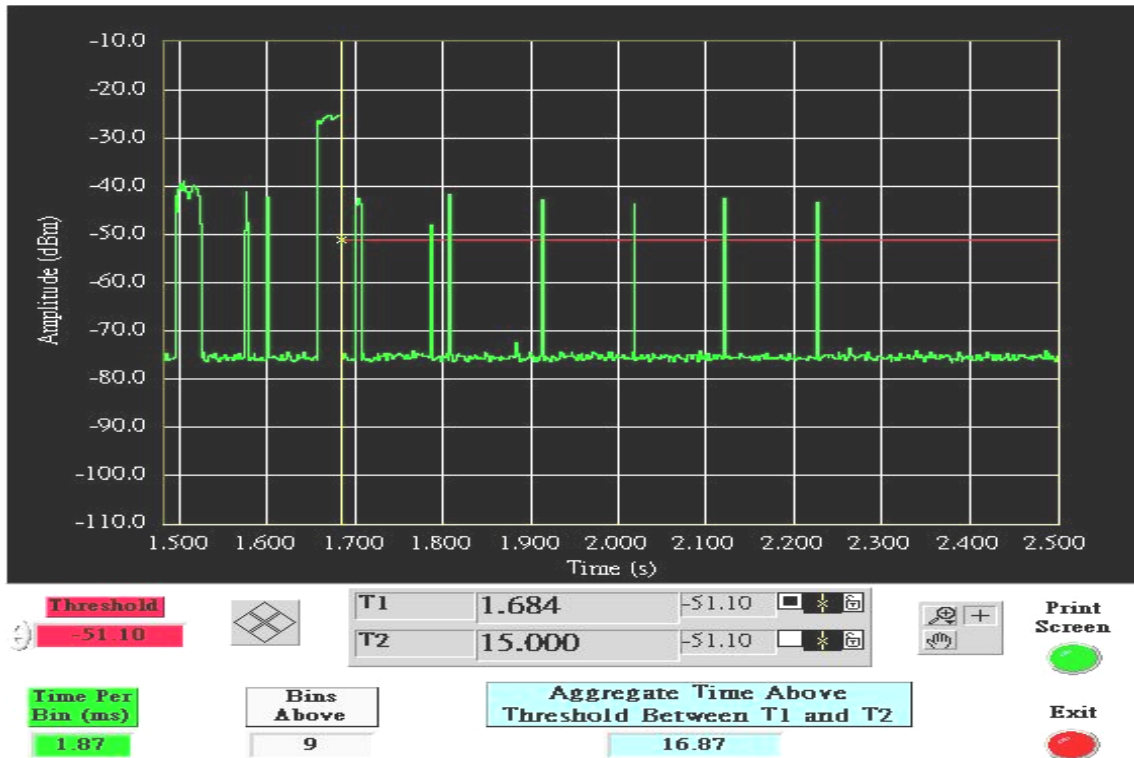
Type 1 Channel Closing Transmission Time Results

No non-compliance noted.

For R1

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
16.87	60	-43.13

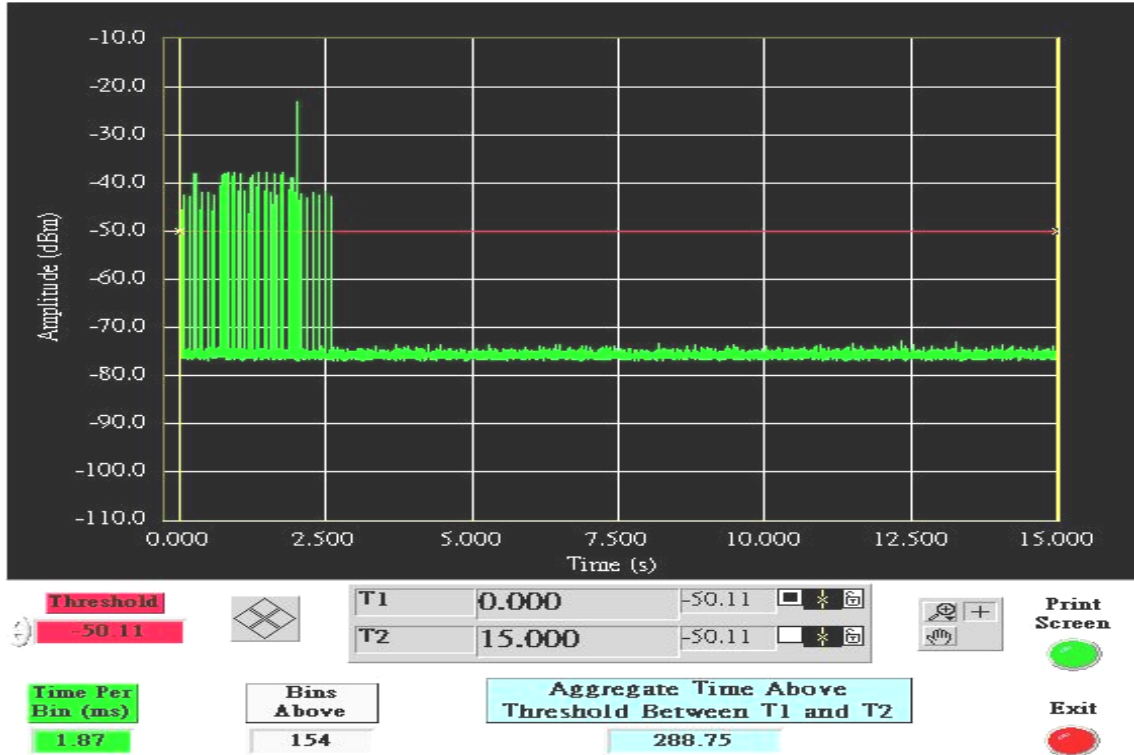


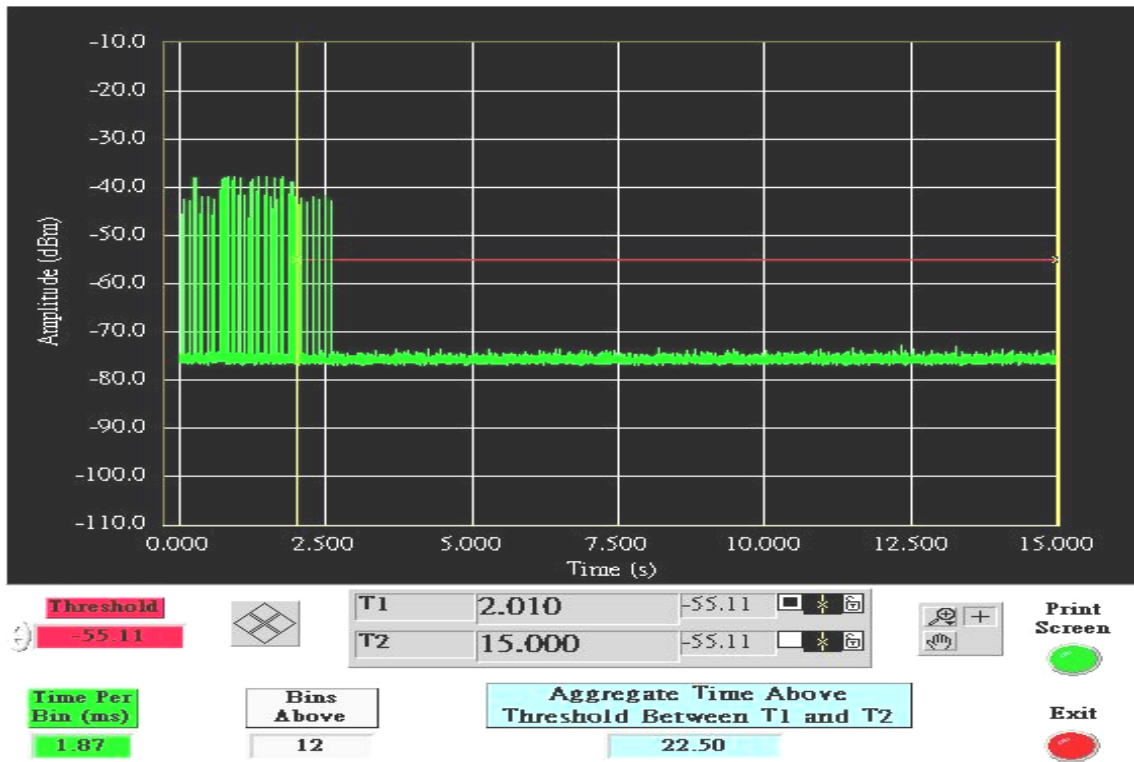
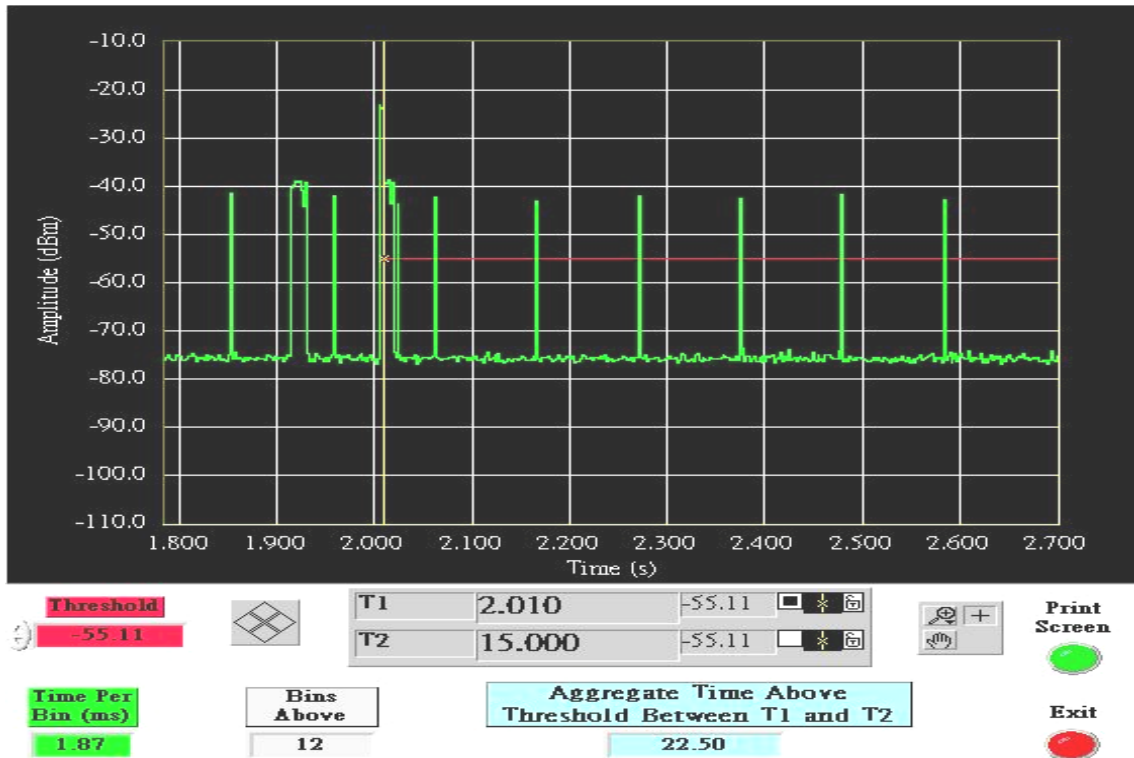




For R5

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
22.50	60	-37.5







NON-OCCUPANCY PERIOD

UNII Band II

IEEE 802.11n HT 20 MHz mode

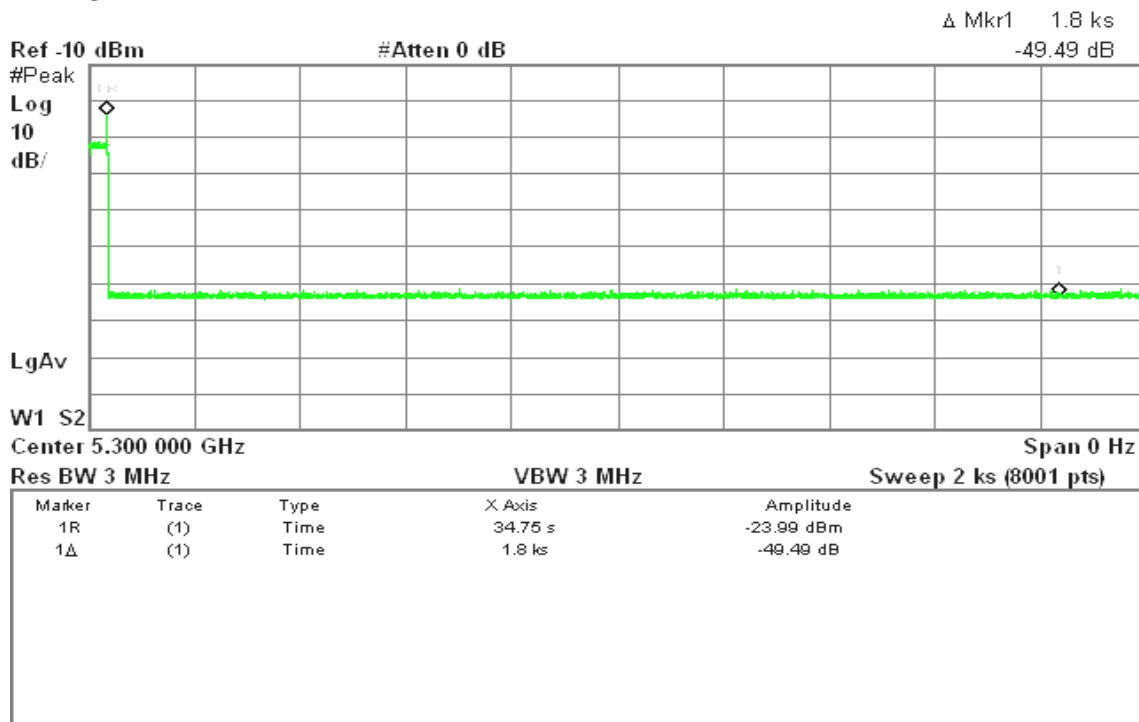
Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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

Agilent 13:41:22 Dec 27, 2011

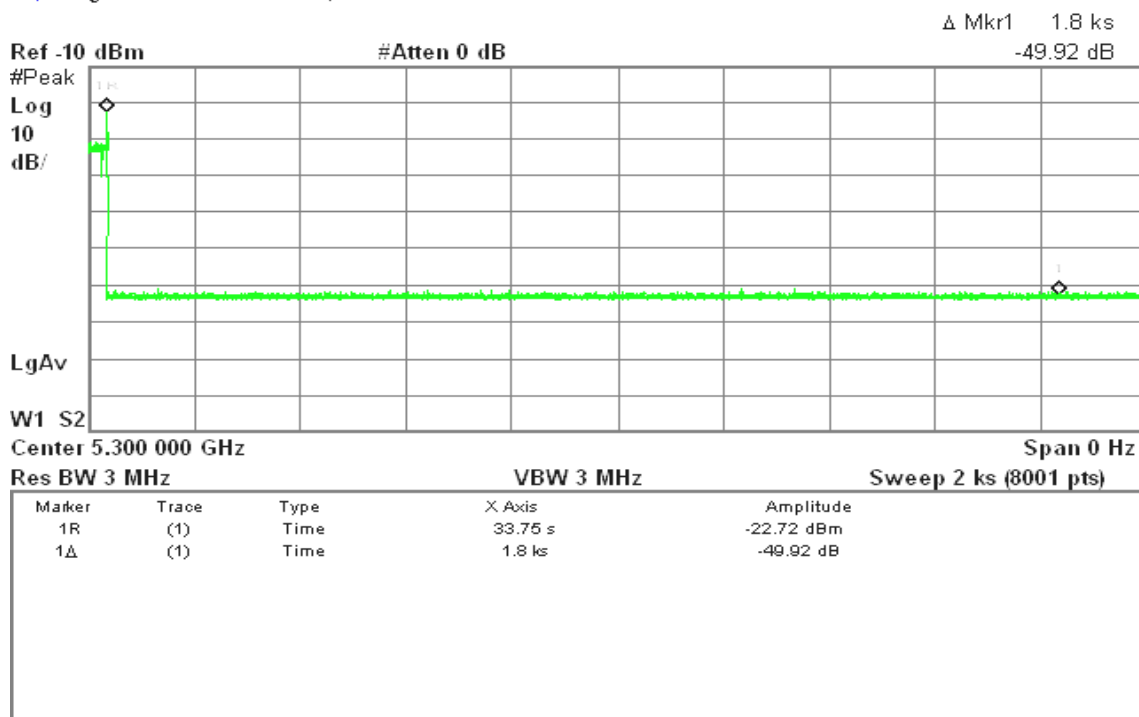
R T



Type 5 Non-Occupancy Period Test Results

Agilent 01:05:49 Jan 18, 2012

R T





IEEE 802.11n HT 40 MHz mode

Type 1 Non-Occupancy Period Test Results

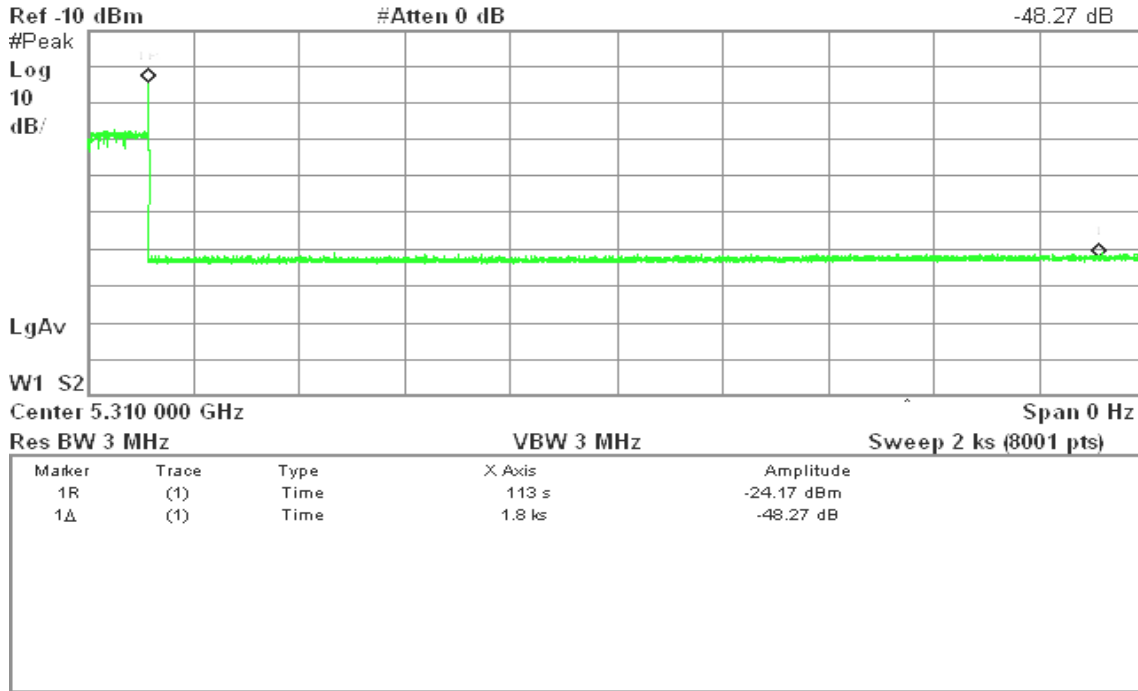
No non-compliance noted.

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

Agilent 19:18:25 Jan 17, 2012

R T

Δ Mkr1 1.8 ks
-48.27 dB

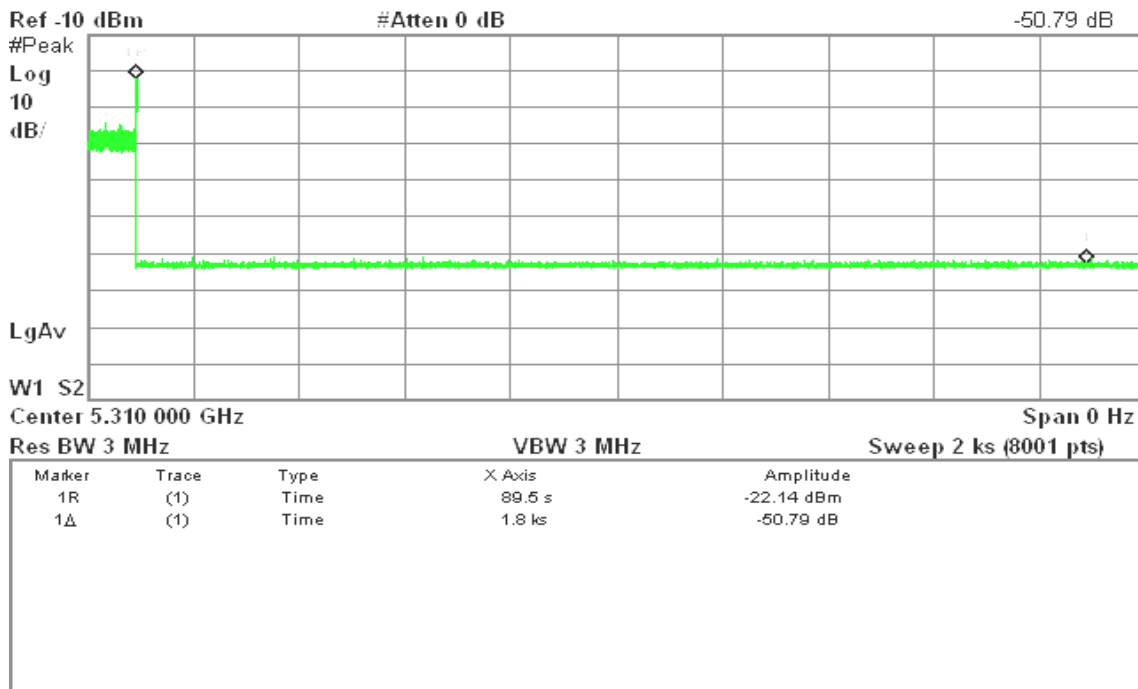


Type 5 Non-Occupancy Period Test Results

Agilent 03:39:55 Jan 18, 2012

R T

Δ Mkr1 1.8 ks
-50.79 dB





UNII Band III

IEEE 802.11n HT 20 MHz mode

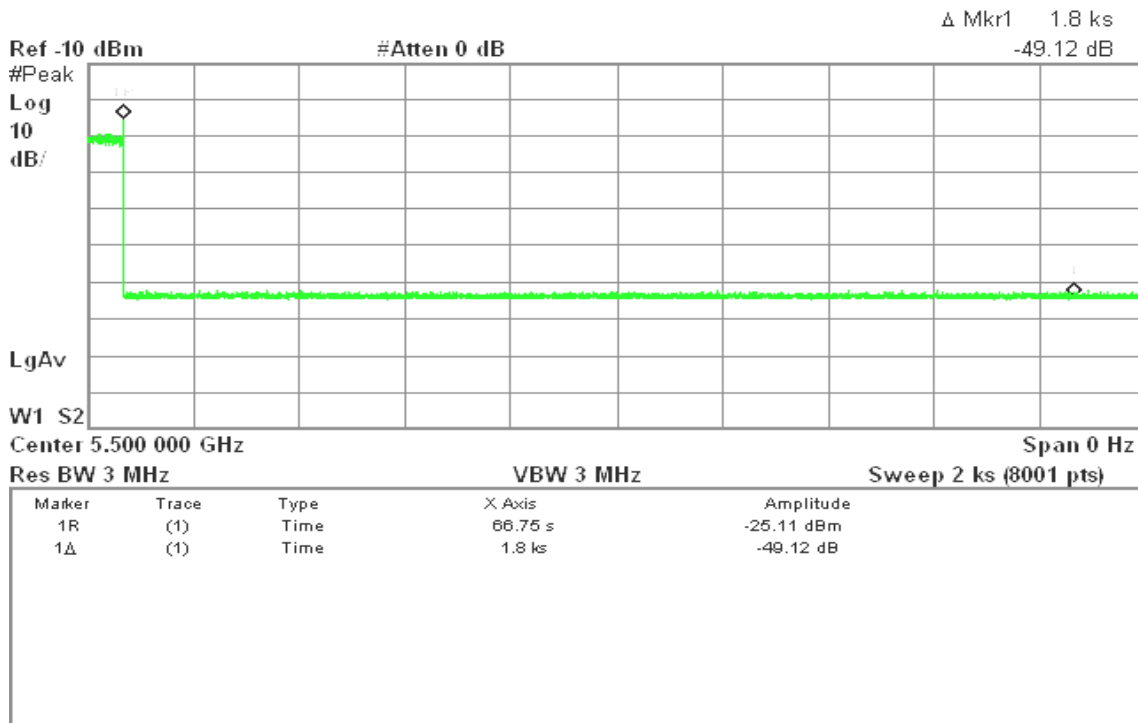
Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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

Agilent 17:02:27 Dec 27, 2011

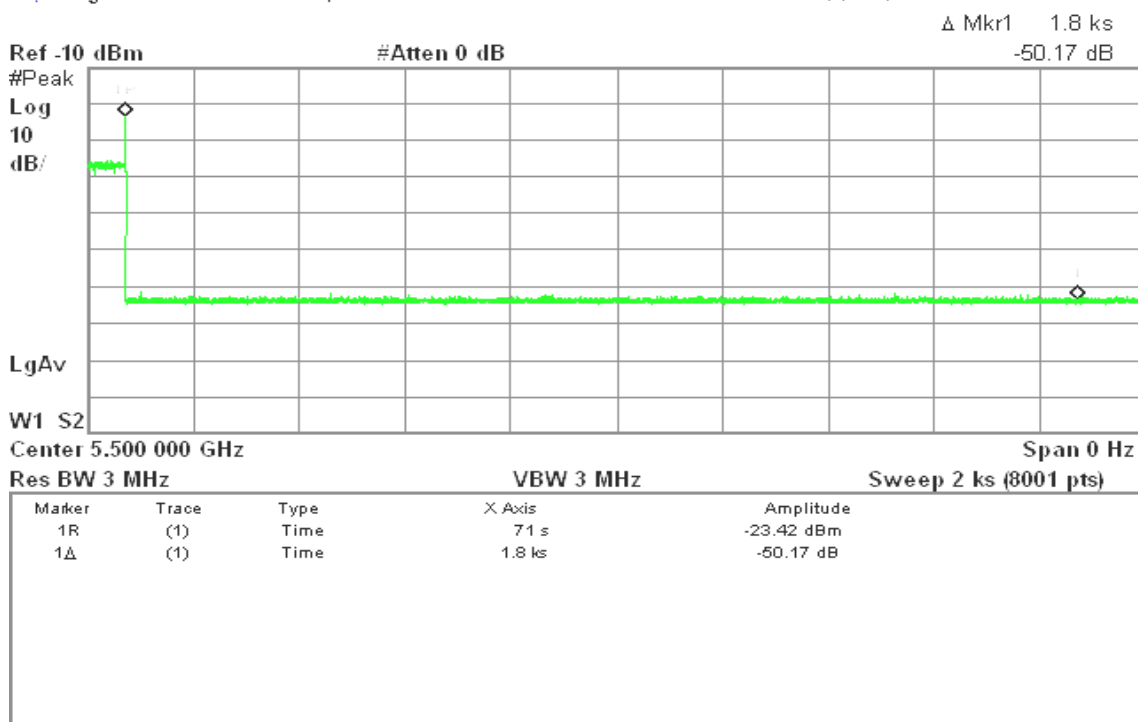
R T



Type 5 Non-Occupancy Period Test Results

Agilent 01:57:02 Jan 18, 2012

R T





IEEE 802.11n HT 40 MHz mode

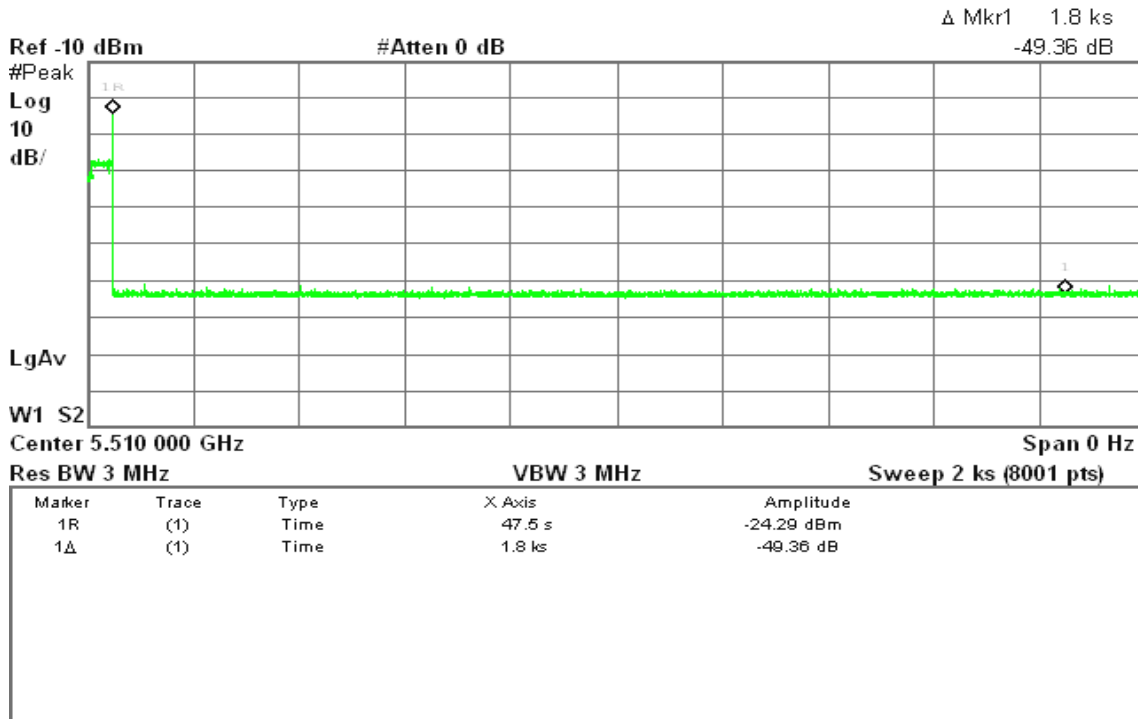
Type 1 Non-Occupancy Period Test Results

No non-compliance noted.

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

Agilent 18:26:49 Dec 27, 2011

R T



Type 5 Non-Occupancy Period Test Results

Agilent 02:49:01 Jan 18, 2012

R T

