



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

450Mbps Dual Band Wireless N 4-Port Media Bridge

Model: TEW-680MB

Trade Name: TRENDnet

Issued to

TRENDnet, Inc.
20675 Manhattan Place, Torrance, CA 90501

Issued by



Compliance Certification Services Inc.
No.11, Wu-Gong 6th Rd., Wugu Industrial Park,
New Taipei City 248, Taiwan (R.O.C.)
<http://www.ccsrf.com>
service@ccsrf.com

Issued Date: August 3, 2011



***Note:** This report shall not be reproduced except in full, without the written approval of Compliance Certification Services Inc. This document may be altered or revised by Compliance Certification Services Inc. personnel only, and shall be noted in the revision section of the document.*



Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		July 27, 2011		Initial Issue	ALL	Sandy Lin
01		August 3, 2011		Revised Conducted Spurious Emission	P.110-148	Sandy Lin
01		August 3, 2011		Revised 6DB Bandwidth	P.44	Sandy Lin



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION.....	4
2. EUT DESCRIPTION	5
3. TEST METHODOLOGY	6
3.1 EUT CONFIGURATION	6
3.2 EUT EXERCISE.....	6
3.3 GENERAL TEST PROCEDURES.....	6
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS.....	7
3.5 DESCRIPTION OF TEST MODES	8
4. INSTRUMENT CALIBRATION.....	9
4.1 MEASURING INSTRUMENT CALIBRATION	9
4.2 MEASUREMENT EQUIPMENT USED	9
4.3 MEASUREMENT UNCERTAINTY	10
5. FACILITIES AND ACCREDITATIONS	11
5.1 FACILITIES	11
5.2 EQUIPMENT.....	11
5.3 TABLE OF ACCREDITATIONS AND LISTINGS.....	12
6. SETUP OF EQUIPMENT UNDER TEST	13
6.1 SETUP CONFIGURATION OF EUT.....	13
6.2 SUPPORT EQUIPMENT	13
7. FCC PART 15.247 REQUIREMENTS.....	14
7.1 6DB BANDWIDTH.....	14
7.2 PEAK POWER.....	51
7.3 AVERAGE POWER	54
7.4 BAND EDGES MEASUREMENT	57
7.5 PEAK POWER SPECTRAL DENSITY	74
7.6 SPURIOUS EMISSIONS.....	110
7.7 RADIATED EMISSIONS	149
7.8 POWERLINE CONDUCTED EMISSIONS.....	174
APPENDIX I RADIO FREQUENCY EXPOSURE	177
APPENDIX II PHOTOGRAPHS OF TEST SETUP	183
APPENDIX 1 - PHOTOGRAPHS OF EUT	



1. TEST RESULT CERTIFICATION

Applicant: TRENDnet, Inc.
20675 Manhattan Place, Torrance, CA 90501

Equipment Under Test: 450Mbps Dual Band Wireless N 4-Port Media Bridge

Trade Name: TRENDnet

Model Number: TEW-680MB

Date of Test: July 9 ~ August 2, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Deviation from Applicable Standard	
N/A	

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. 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 the requirements of FCC Rules Part 15.207, 15.209, 15.247.

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

Approved by:

Reviewed by:

Rex Lai
Section Manager
Compliance Certification Services Inc.

Gina Lo
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	450Mbps Dual Band Wireless N 4-Port Media Bridge
Trade Name	TRENDnet
Model Number	TEW-680MB
Model Discrepancy	N/A
Received Date	July 5, 2011
Power Supply	Power Adapter Bestec / EA0121WAA I/P: 100-240V, 50-60Hz, 0.5A O/P: 12V, 1A, 12W
Frequency Range	2412 ~ 2462 MHz 5.725~5.850 GHz
Transmit Power	IEEE 802.11b mode: 20.67dBm IEEE 802.11g mode: 26.59 dBm IEEE 802.11n HT 20 MHz mode: 28.86 dBm IEEE 802.11n HT 40 MHz mode: 28.70 dBm IEEE 802.11a mode: 18.52 dBm IEEE 802.11n HT 20 MHz Channel mode: 21.57 dBm IEEE 802.11n HT 40 MHz mode: 20.90 dBm
Modulation Technique	IEEE 802.11b mode: DSSS IEEE 802.11g mode: OFDM IEEE 802.11n HT 20 MHz mode: OFDM IEEE 802.11n HT 40 MHz mode: OFDM IEEE 802.11a: OFDM IEEE 802.11n HT 20 MHz Channel mode: OFDM IEEE 802.11n HT 40 MHz mode: OFDM
Number of Channels	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n HT 20 MHz mode: 11 Channels IEEE 802.11n HT 40 MHz mode: 7 Channels IEEE 802.11a mode: 5 Channels IEEE 802.11n HT 20 MHz Channel mode: 5 Channels IEEE 802.11n HT 40 MHz mode: 2 Channels
Antenna Specification	2412 ~ 2462 MHz: PCB Antenna / Gain: 2 dBi 5.725~5.850 GHz: PCB Antenna / Gain: 1 dBi MIMO Mode: Total ANT= $10 * \text{LOG}(((10^{(\text{ANT0}/20)} + 10^{(\text{ANT1}/20)})^2 + 10^{(\text{ANT2}/20)})^2)/3)$ 2412 ~ 2462 MHz: 6.77 dBi (Numeric gain: 4.75) 5.725~5.850 GHz: 5.77 dBi (Numeric gain: 3.78)

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **XU8TEW680MB** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 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: TEW-680MB) had been tested under operating condition.

The EUT is a 3x3 configuration spatial MIMO (3Tx & 3Rx) without beam forming function that operate in triple TX chains and triple RX chains. The 3x3 configuration is implemented with three outside TX & RX chains (Chain 0, Chain 1 and Chain 2).

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 and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with chain 0 at 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with chain 0 at 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz mode:

Channel Low (2412MHz), Channel Mid (2442MHz) and Channel High (2462MHz) with 3 chain transmitting simultaneously at MCS 16 data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz mode:

Channel Low (2422MHz), Channel Mid (2442MHz) and Channel High (2452MHz) with 3 chain transmitting simultaneously at MCS 16 data rate were chosen for full testing.

IEEE 802.11a mode:

Channel Low (5745MHz), Channel Mid (5785MHz) and Channel High (5825MHz) with chain 0 at 6Mbps data rate were chosen for full testing.

IEEE 802.11n HT 20 MHz mode:

Channel Low(5745MHz), Channel Mid(5785MHz) and Channel High(5825MHz) with 3 chain transmitting simultaneously at MCS 16 data rate were chosen for full testing.

IEEE 802.11n HT 40 MHz mode:

Channel Low(5755MHz) and Channel High(5795MHz) with 3 chain transmitting simultaneously at MCS 16 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	03/02/2012
Power Meter	Anritsu	ML2495A	1012009	03/27/2012
Power Sensor	Anritsu	MA2411B	0917072	03/08/2012

Wugu 966 Chamber A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	11/03/2011
EMI Test Receiver	R&S	ESCI	100064	02/03/2012
Pre-Amplifier	Mini-Circuits	ZFL-1000LN	SF350700823	01/12/2012
Pre-Amplifier	MITEQ	AFS44-00102650-42-10P-44	1415367	11/19/2011
Bilog Antenna	Sunol Sciences	JB3	A030105	10/06/2011
Horn Antenna	EMCO	3117	00055165	01/12/2012
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	12/26/2011
Test S/W	EZ-EMC (CCS-3A1RE)			

Conducted Emission room # A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESHS10	843743/015	05/01/2012
LISN	SCHWARZBECK	NSLK 8127	8127-541	12/18/2011
LISN	SCHAFFNER	NNB 41	03/10013	N.C.R.
Test S/W	CCS-3A1-CE			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/- 1.6202
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0606
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9979
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5790
3M Semi Anechoic Chamber / 8G~18G	+/- 2.5928
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7212
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9520

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., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.

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

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

5.2 EQUIPMENT

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




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

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

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



5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 FCC MRA: TW1039
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method –47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	 IC 2324G-1 IC 2324G-2

* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No	Equipment	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Wireless Pre-N Router (MIMO) (Remote)	BELKIN	F5D8230-4	N/A	SA3-AGN0901AP0100	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Notebook PC (Remote)	HP	dv6-1332TX	CNF9491GLJ	PD9112BNHU	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

Remark:

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



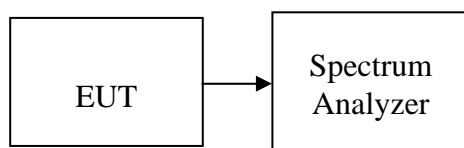
7. FCC PART 15.247 REQUIREMENTS

7.1 6DB BANDWIDTH

LIMIT

According to §15.247(a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

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
for 2.4G: RBW = 100 kHz, VBW = 300 kHz, Span = 50 MHz, Sweep = 500ms.
for 5G: RBW = 100 kHz, VBW = RBW, Span = 50 MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted



Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.4167	>500	PASS
Mid	2442	12.3334		PASS
High	2462	12.4167		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.6666	>500	PASS
Mid	2442	16.5833		PASS
High	2462	16.5833		PASS

**Test mode: IEEE 802.11n HT 20 MHz mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.6666	>500	PASS
Mid	2442	17.75		PASS
High	2462	17.75		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.6666	>500	PASS
Mid	2442	17.75		PASS
High	2462	17.75		PASS

Test mode: IEEE 802.11n HT 20 MHz mode / Chain 2

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.6666	>500	PASS
Mid	2442	17.75		PASS
High	2462	17.75		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.0833	>500	PASS
Mid	2442	36.4167		PASS
High	2452	36		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.6667	>500	PASS
Mid	2442	36		PASS
High	2452	36.25		PASS

Test mode: IEEE 802.11n HT 40 MHz mode / Chain 2

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.4167	>500	PASS
Mid	2442	36.0833		PASS
High	2452	36.1667		PASS

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	16.50	>500	PASS
Mid	5785	16.58		PASS
High	5825	16.58		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.33	>500	PASS
Mid	5785	17.58		PASS
High	5825	17.67		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	16.42	>500	PASS
Mid	5785	17.42		PASS
High	5825	17.33		PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode / Chain 2

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5745	17.00	>500	PASS
Mid	5785	17.33		PASS
High	5825	17.42		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.75	>500	PASS
High	5795	35.42		PASS

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

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.00	>500	PASS
High	5795	34.75		PASS

Test mode: IEEE 802.11n HT 40 MHz mode / Chain 2

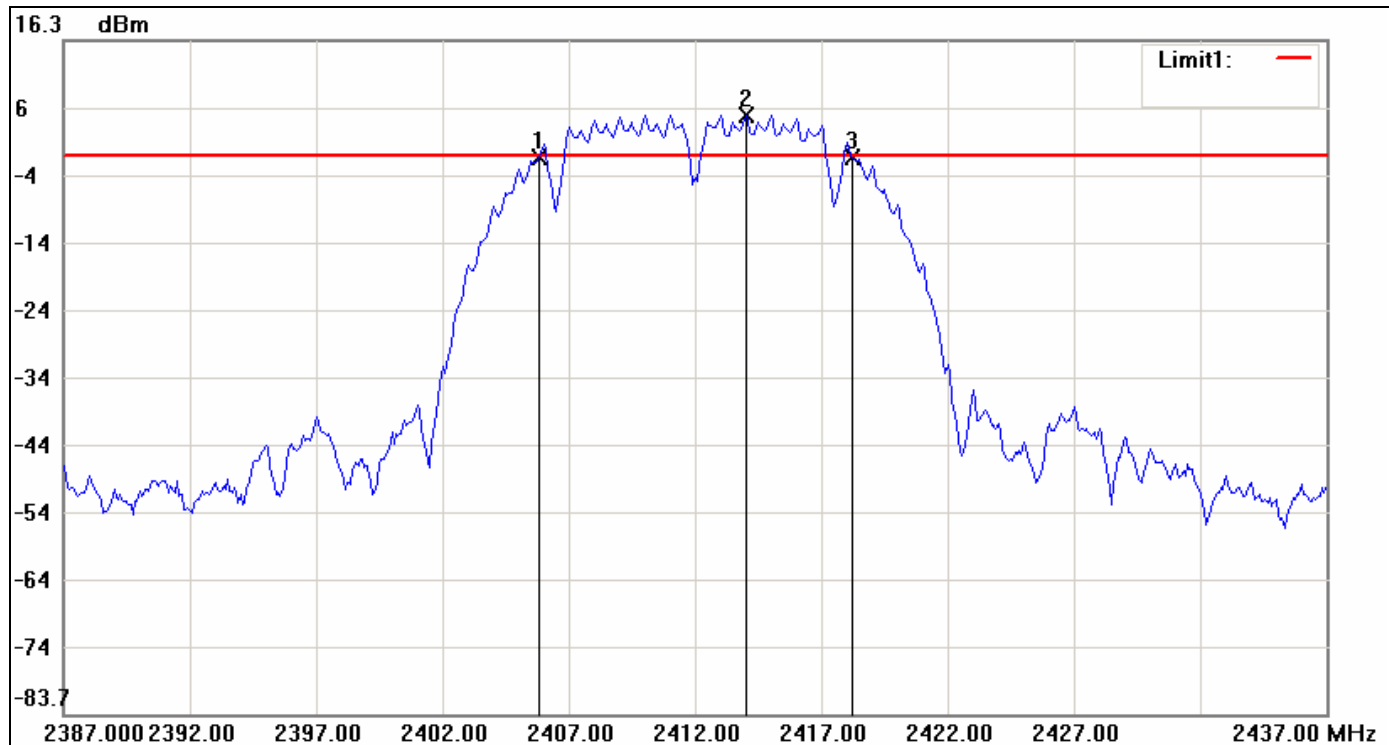
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (kHz)	Result
Low	5755	35.67	>500	PASS
High	5795	35.75		PASS



Test Plot

IEEE 802.11b mode

6dB Bandwidth (CH Low)

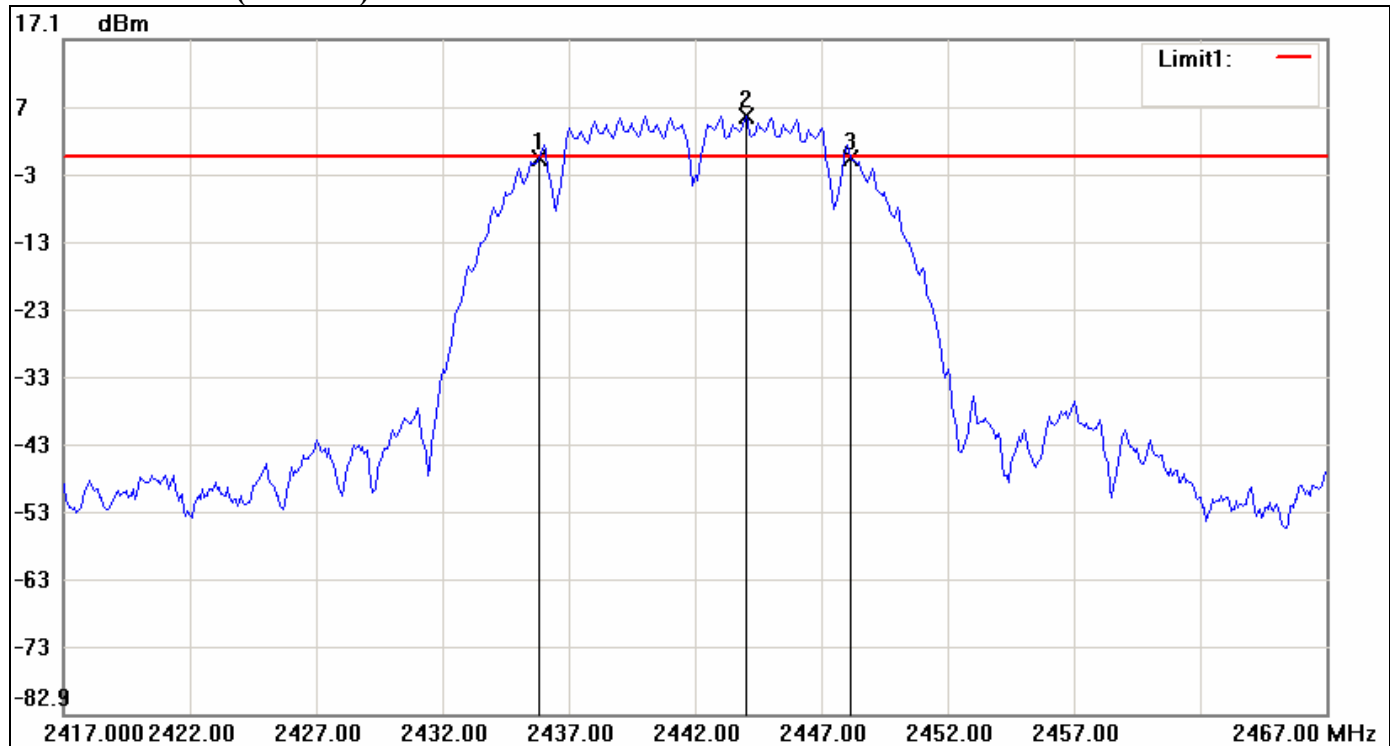


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2405.8333	-1.08	-0.86	-0.22
2	2414.0000	5.14	-0.86	6.00
3	2418.2500	-1.09	-0.86	-0.23

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	12.4167	-0.01



6dB Bandwidth (CH Mid)

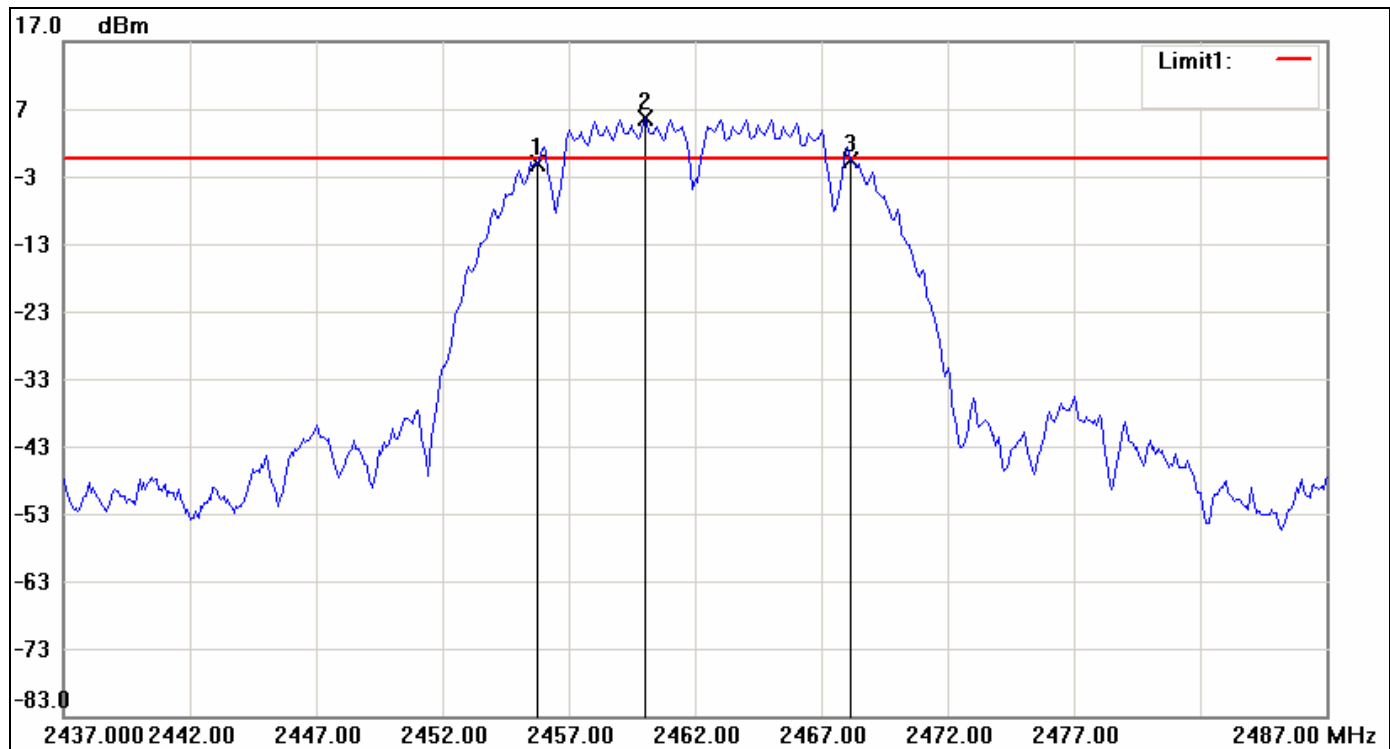


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2435.8333	-0.47	-0.39	-0.08
2	2444.0000	5.61	-0.39	6.00
3	2448.1667	-0.45	-0.39	-0.06

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	12.3334	0.02



6dB Bandwidth (CH High)



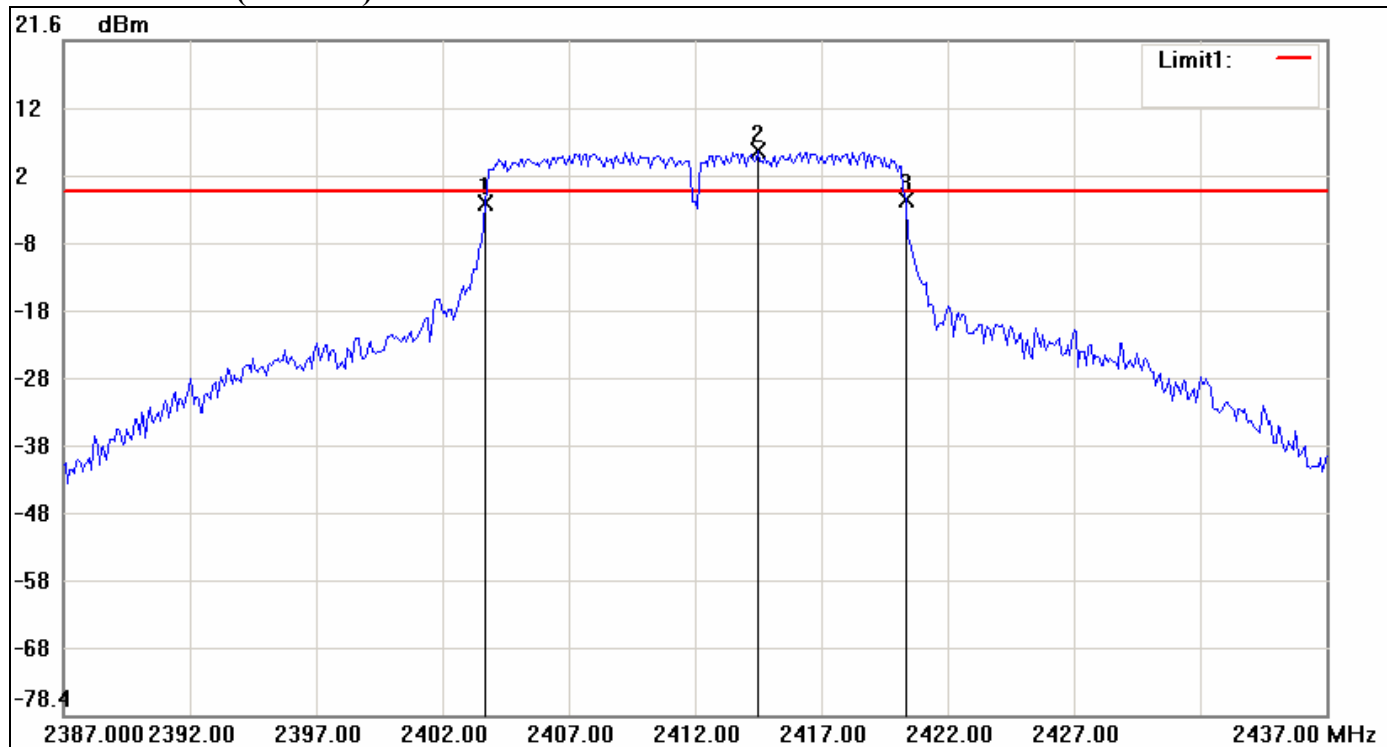
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2455.7500	-1.04	-0.44	-0.60
2	2460.0000	5.56	-0.44	6.00
3	2468.1667	-0.64	-0.44	-0.20

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	12.4167	0.4



IEEE 802.11g mode

6dB Bandwidth (CH Low)

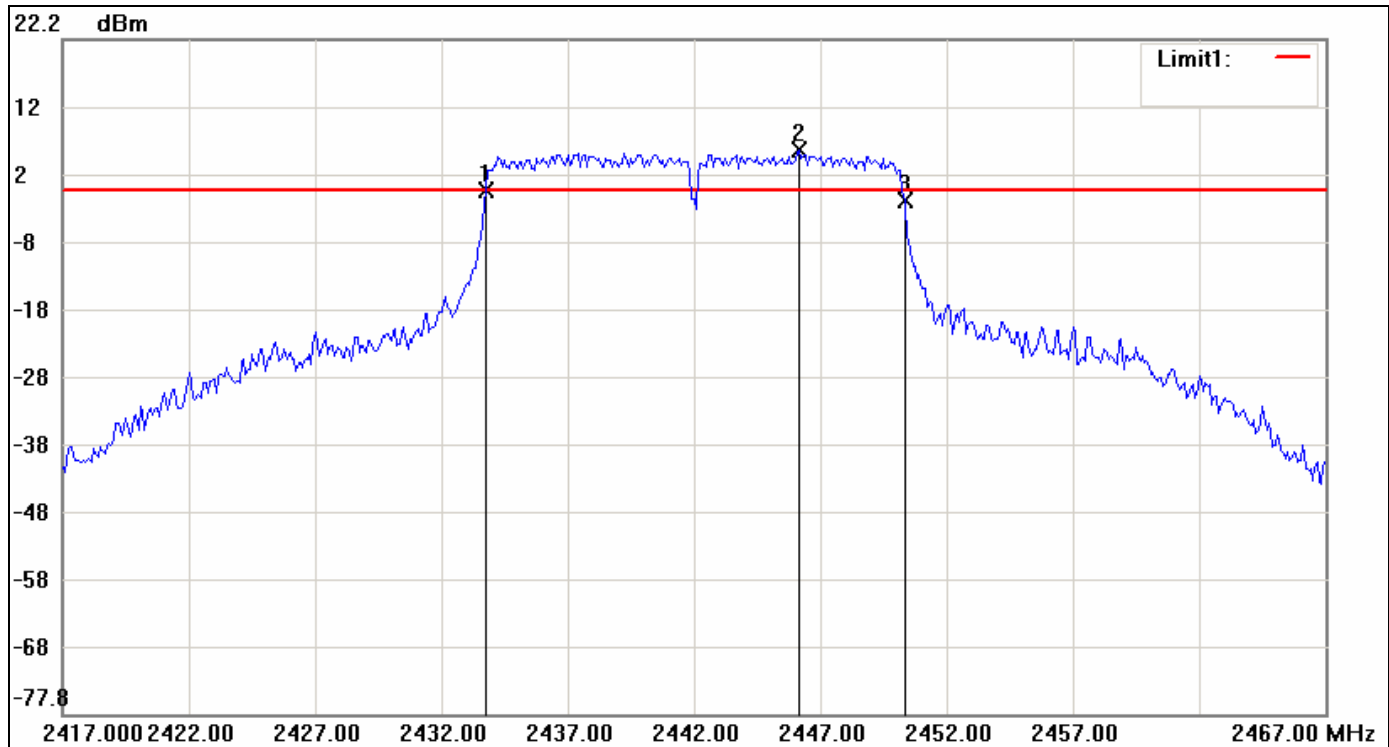


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.6667	-2.46	-0.88	-1.58
2	2414.5000	5.12	-0.88	6.00
3	2420.3333	-2.04	-0.88	-1.16

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.6666	0.42



6dB Bandwidth (CH Mid)

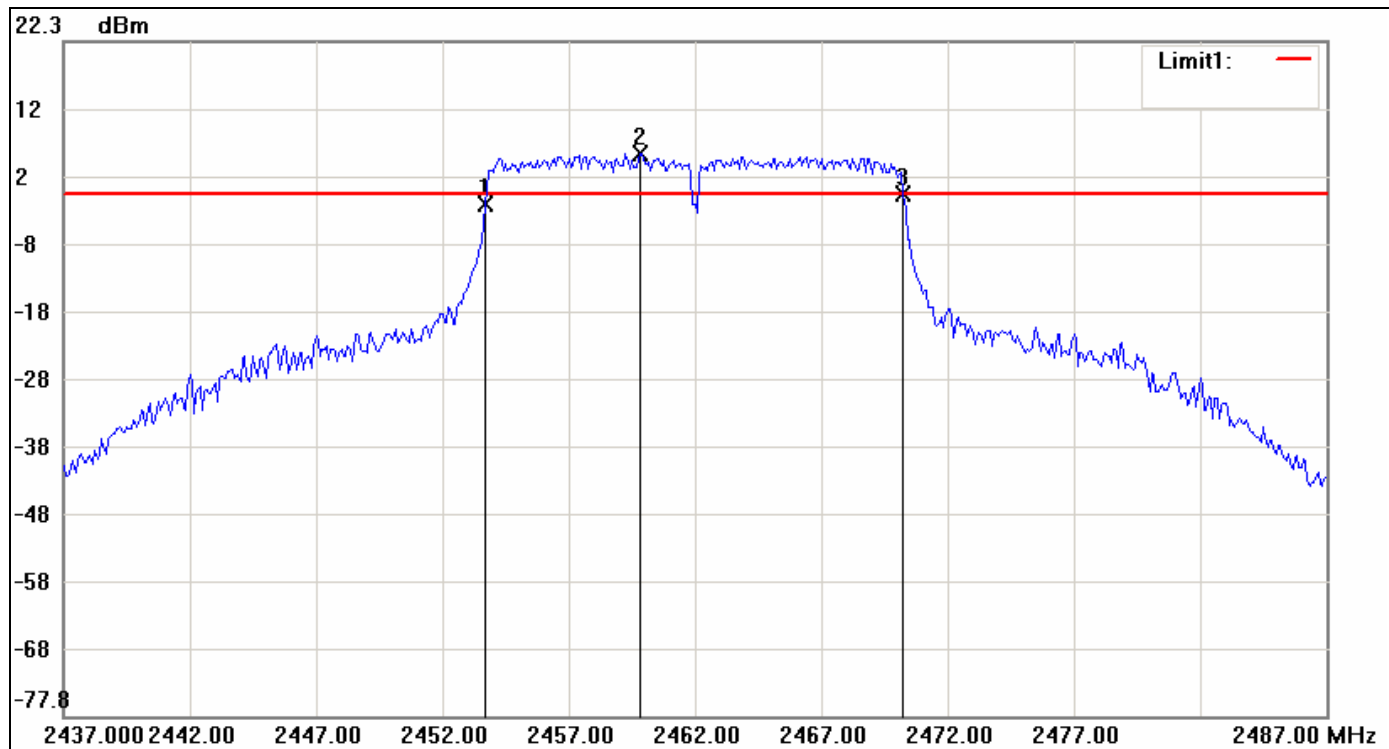


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2433.7500	-0.22	-0.16	-0.06
2	2446.1667	5.84	-0.16	6.00
3	2450.3333	-1.57	-0.16	-1.41

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.5833	-1.35



6dB Bandwidth (CH High)



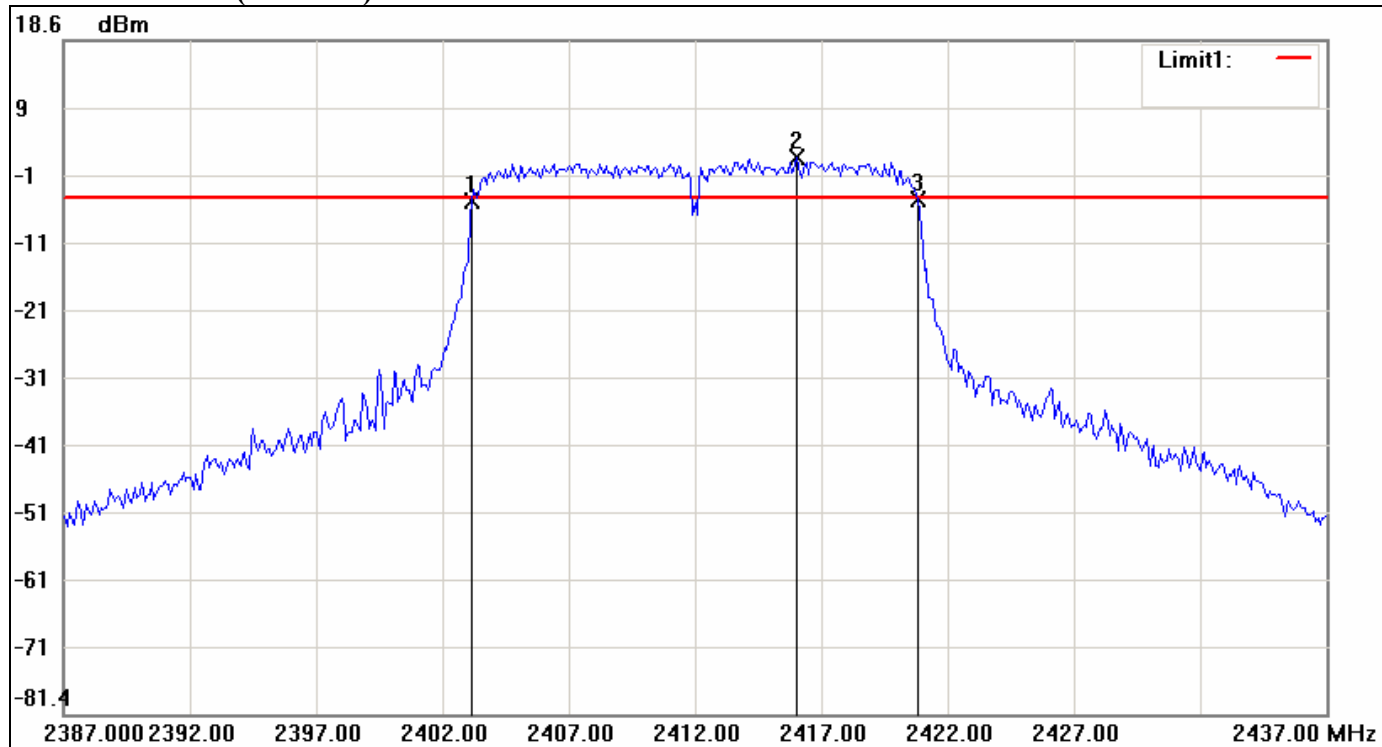
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2453.6667	-1.76	-0.32	-1.44
2	2459.8333	5.68	-0.32	6.00
3	2470.2500	-0.35	-0.32	-0.03

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	16.5833	1.41



IEEE 802.11n HT 20 MHz mode / Chain 0

6dB Bandwidth (CH Low)

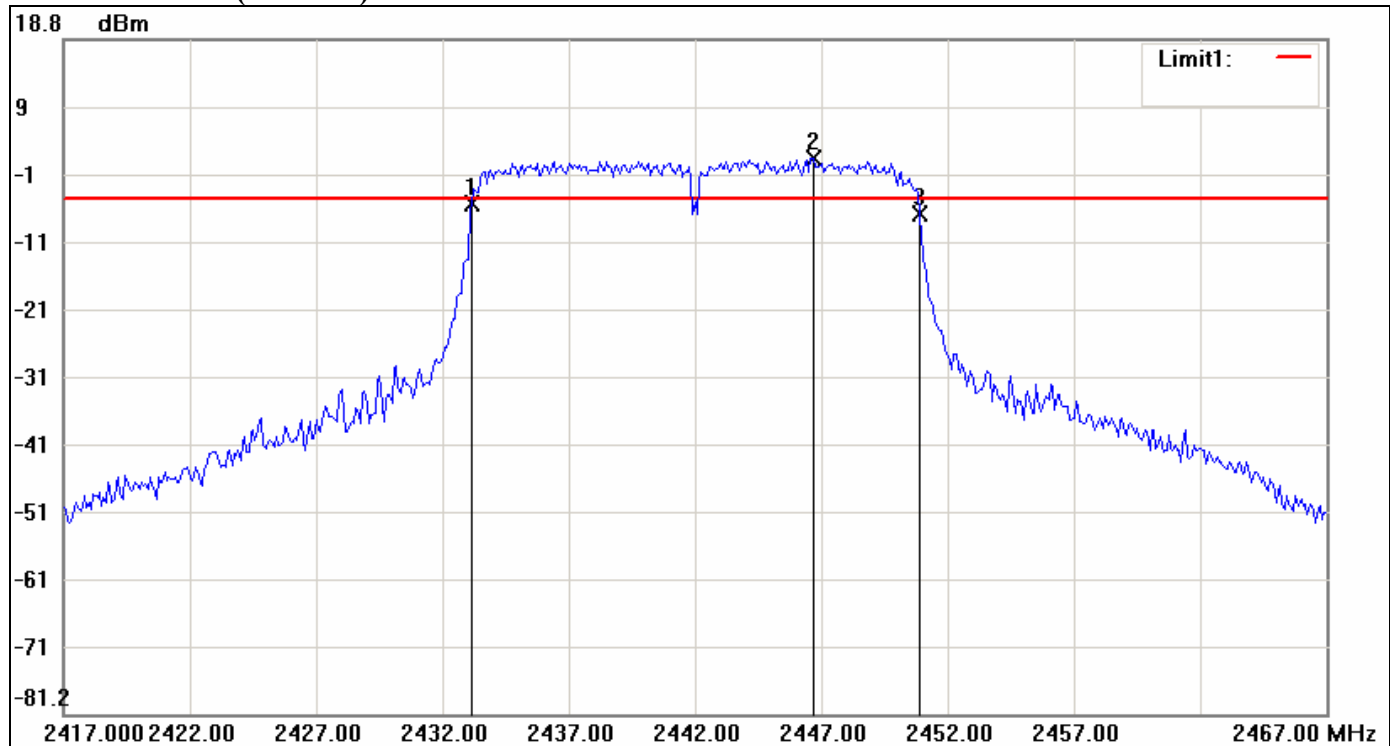


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.1667	-5.29	-4.80	-0.49
2	2416.0000	1.20	-4.80	6.00
3	2420.8333	-4.96	-4.80	-0.16

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.6666	0.33



6dB Bandwidth (CH Mid)

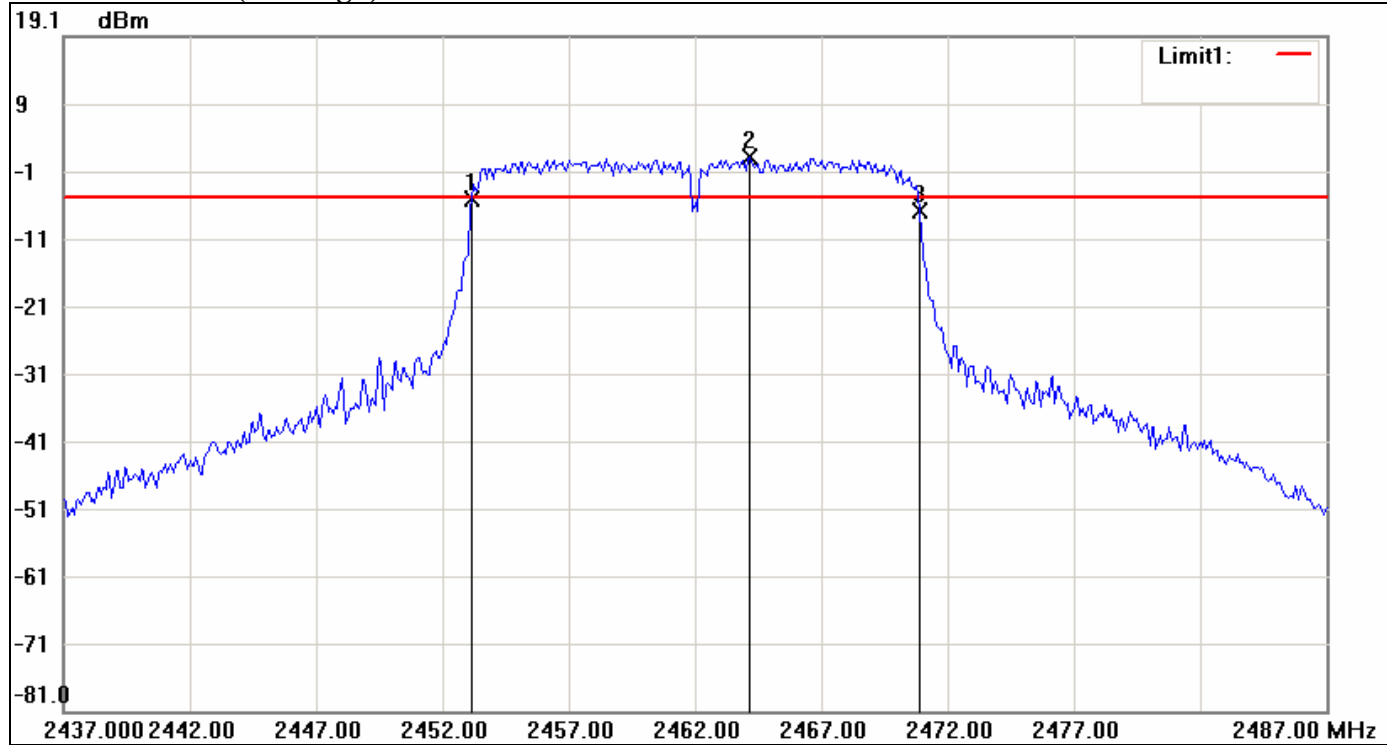


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2433.1667	-5.51	-4.77	-0.74
2	2446.6667	1.23	-4.77	6.00
3	2450.9167	-7.00	-4.77	-2.23

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	-1.49



6dB Bandwidth (CH High)



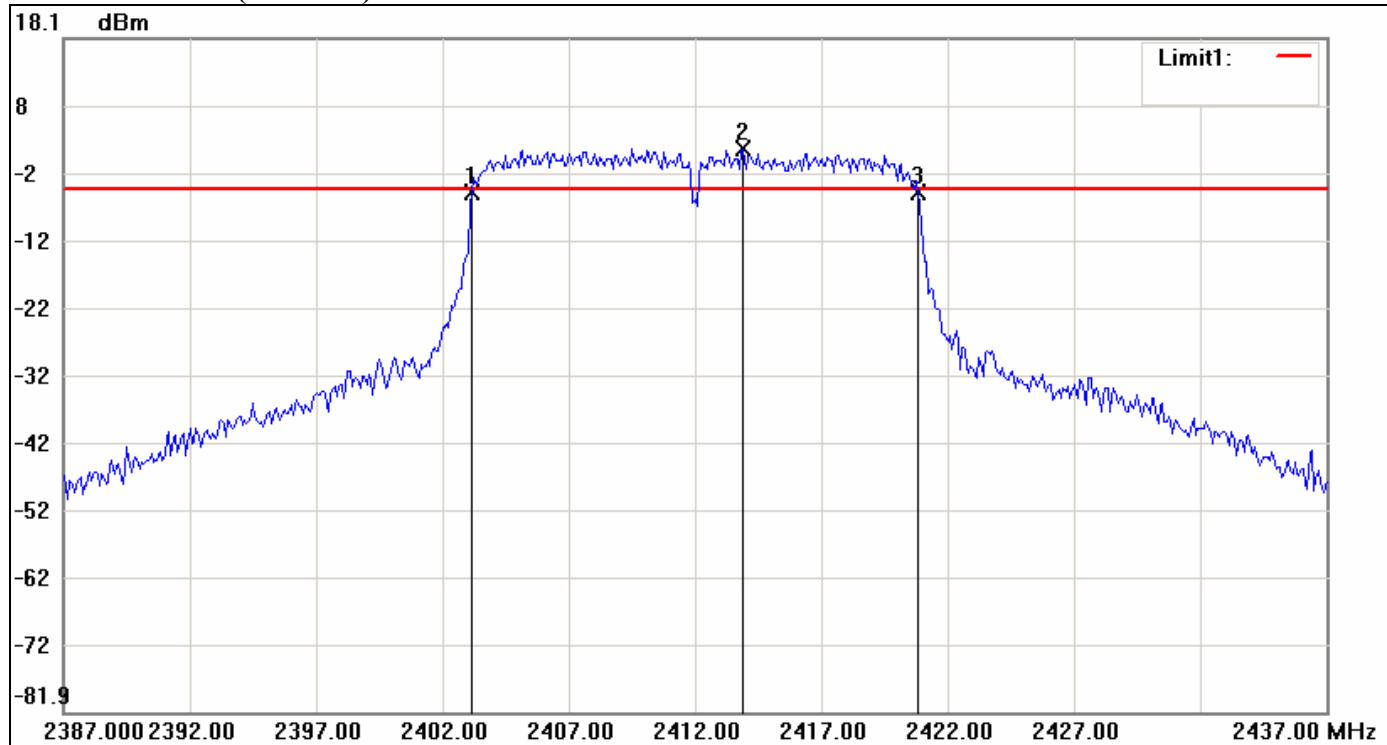
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2453.1667	-5.16	-4.92	-0.24
2	2464.1667	1.08	-4.92	6.00
3	2470.9167	-6.77	-4.92	-1.85

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	-1.61



IEEE 802.11n HT 20 MHz mode / Chain 1

6dB Bandwidth (CH Low)

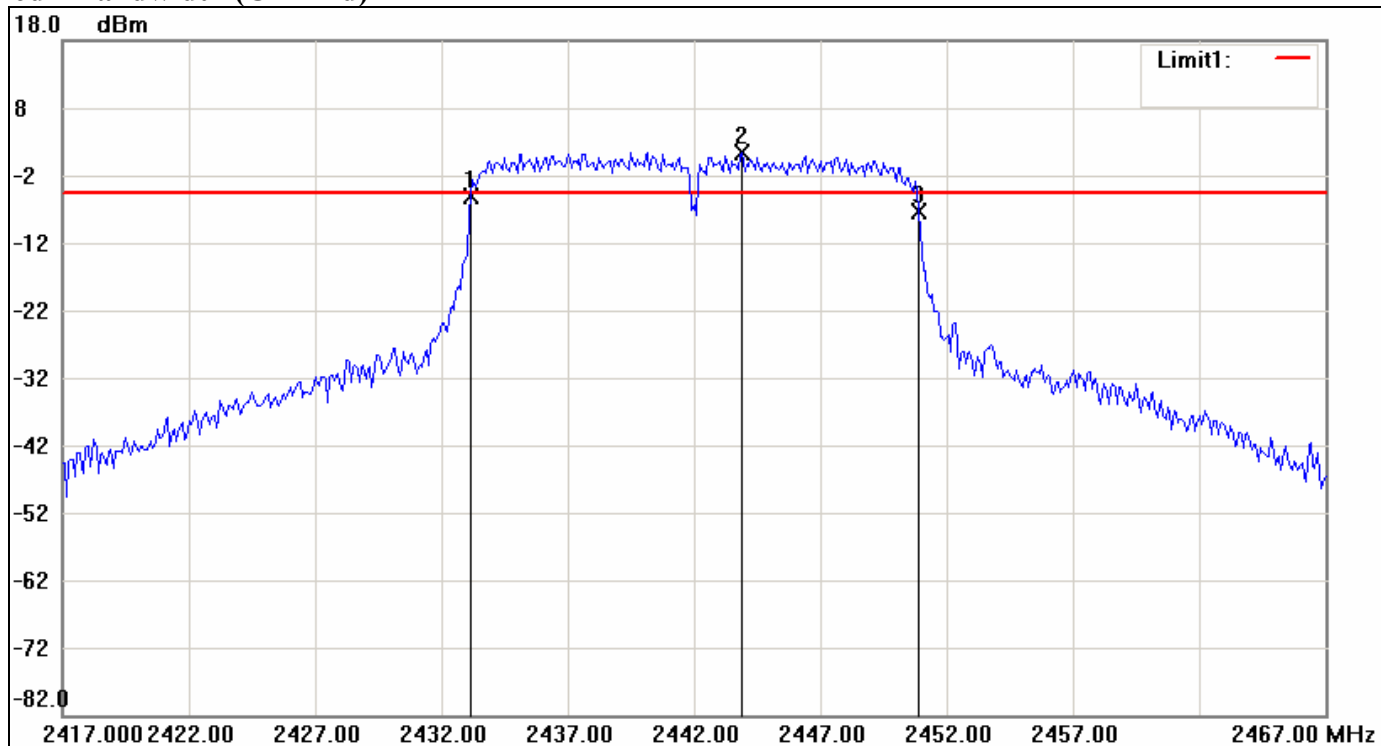


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.1667	-4.67	-4.14	-0.53
2	2413.9167	1.86	-4.14	6.00
3	2420.8333	-4.74	-4.14	-0.60

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.6666	-0.07



6dB Bandwidth (CH Mid)

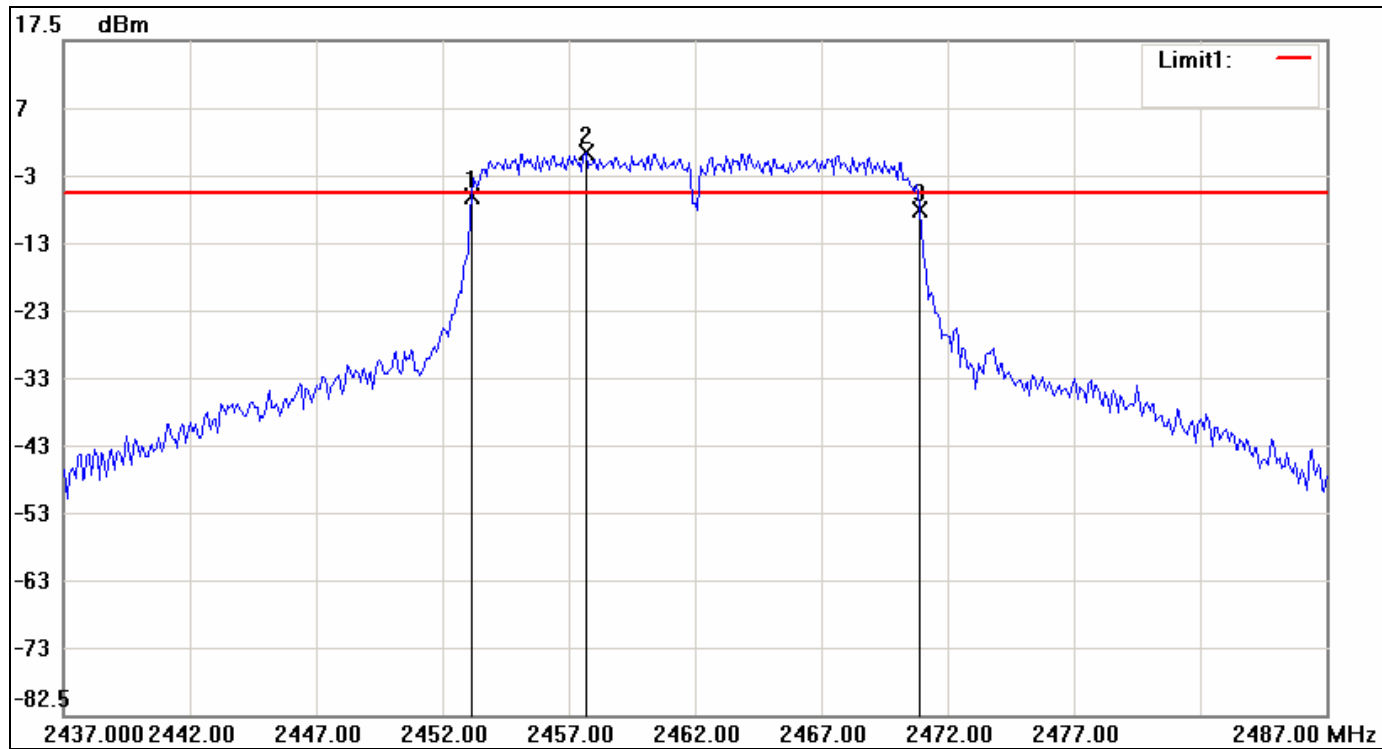


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2433.1667	-5.24	-4.65	-0.59
2	2443.9167	1.35	-4.65	6.00
3	2450.9167	-7.31	-4.65	-2.66

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	-2.07



6dB Bandwidth (CH High)



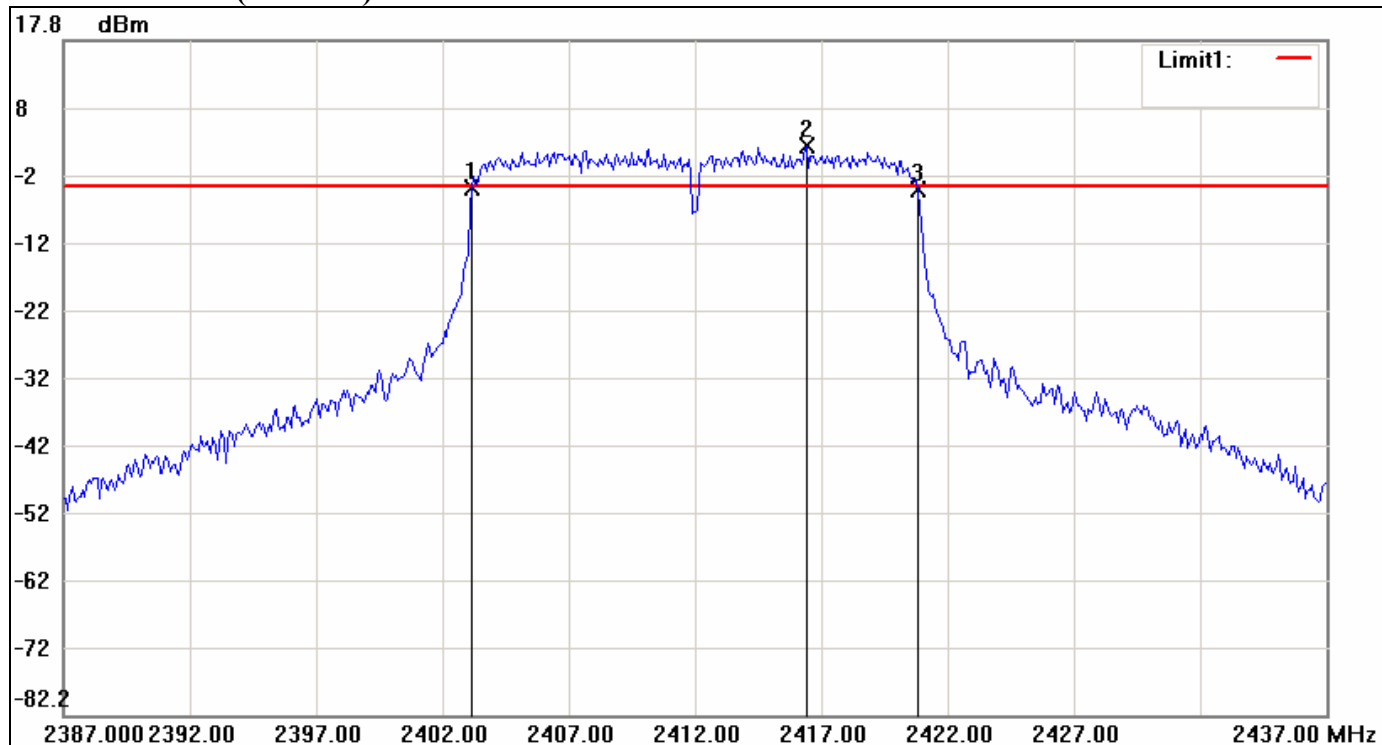
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2453.1667	-5.71	-5.22	-0.49
2	2457.6667	0.78	-5.22	6.00
3	2470.9167	-7.67	-5.22	-2.45

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	-1.96



IEEE 802.11n HT 20 MHz mode / Chain 2

6dB Bandwidth (CH Low)

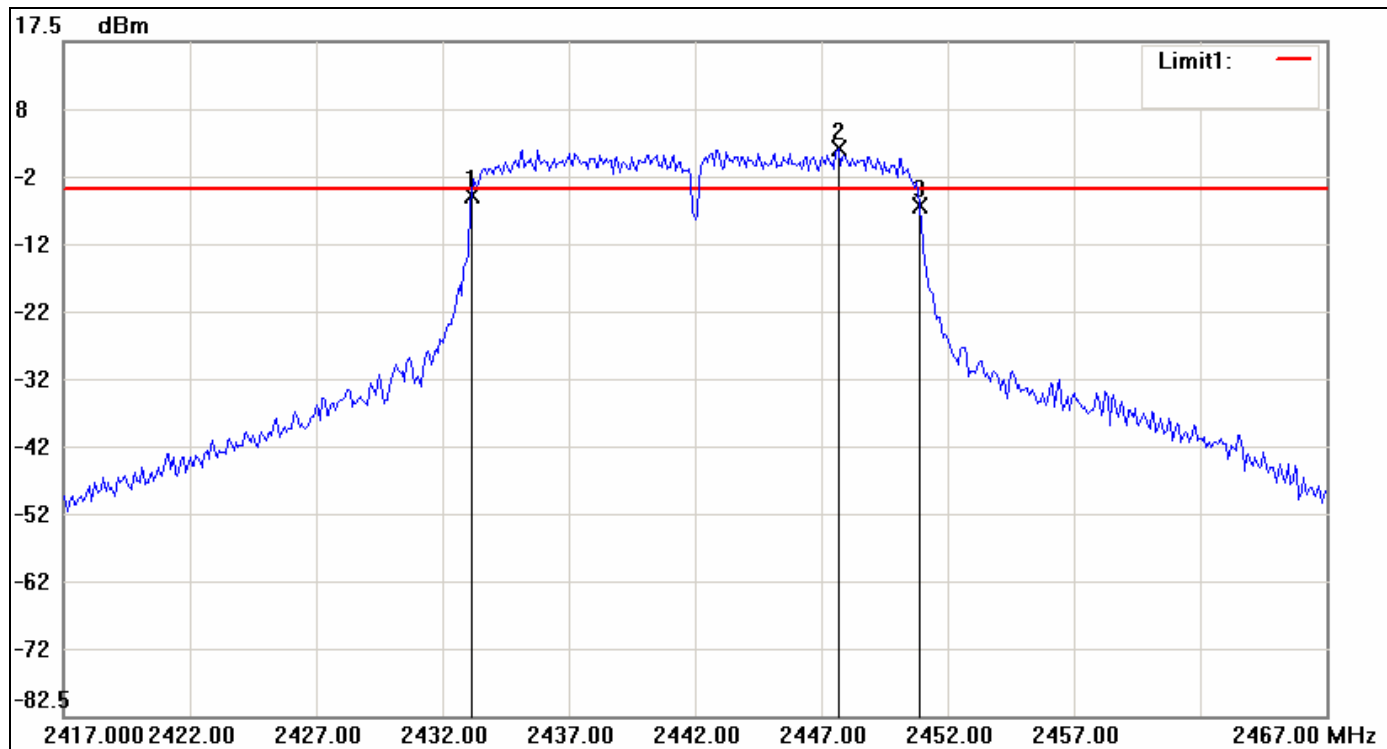


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.1667	-4.02	-3.92	-0.10
2	2416.4167	2.08	-3.92	6.00
3	2420.8333	-4.37	-3.92	-0.45

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.6666	-0.35



6dB Bandwidth (CH Mid)

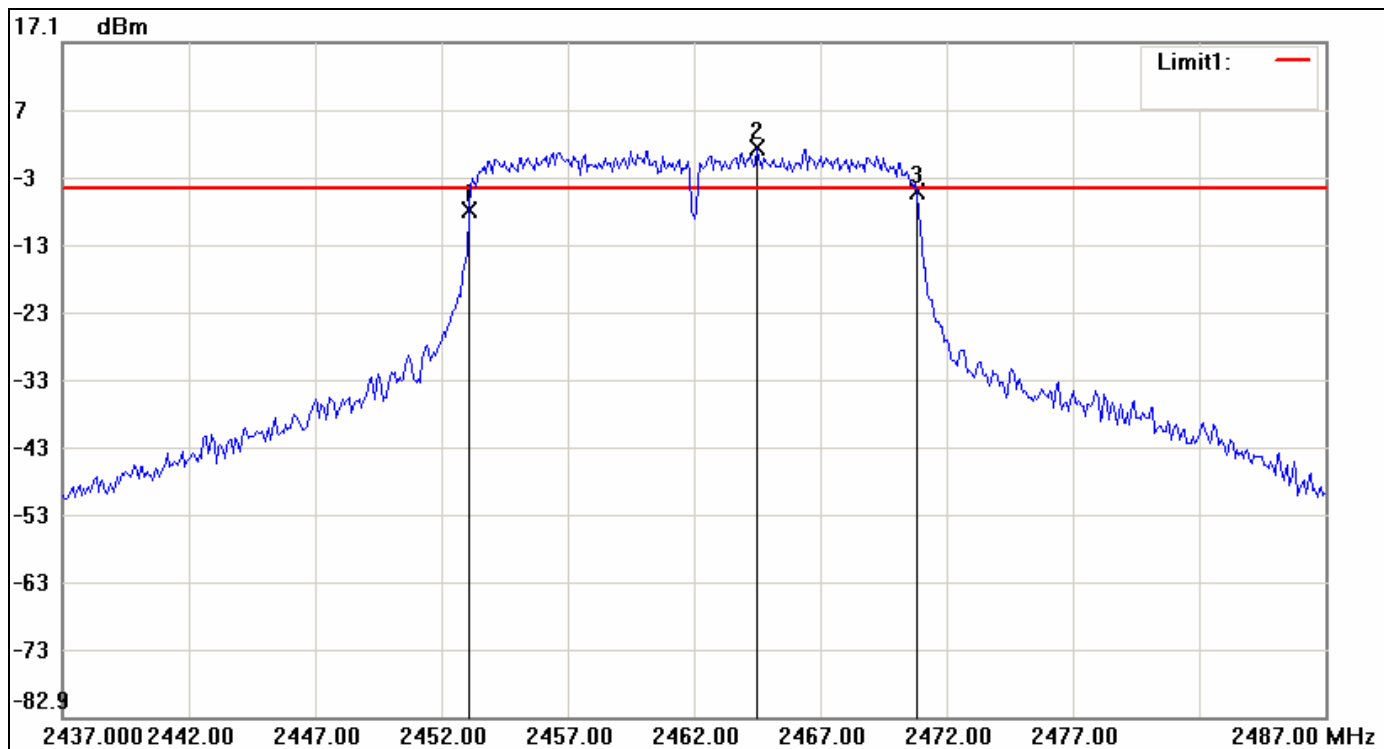


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2433.1667	-5.33	-4.44	-0.89
2	2447.6667	1.56	-4.44	6.00
3	2450.9167	-6.80	-4.44	-2.36

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	-1.47



6dB Bandwidth (CH High)



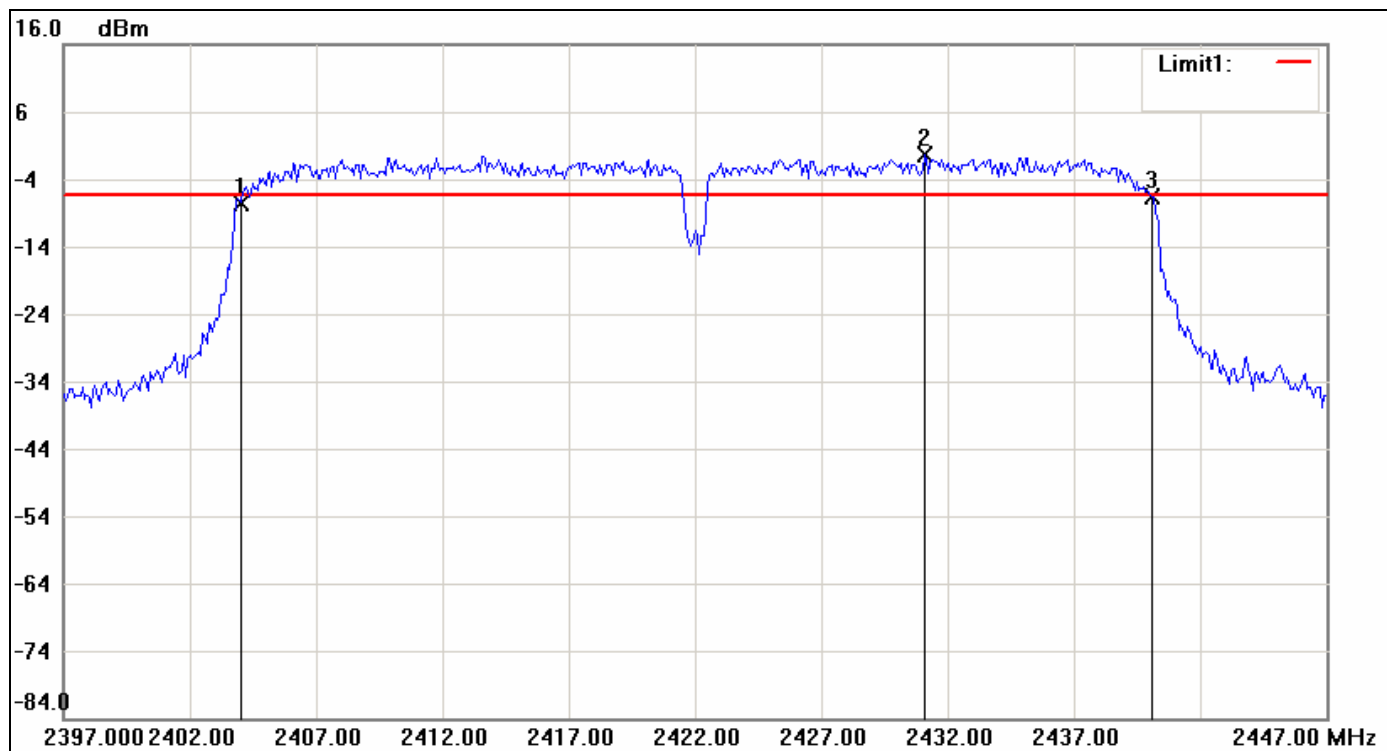
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2453.0833	-7.79	-4.53	-3.26
2	2464.5000	1.47	-4.53	6.00
3	2470.8333	-4.97	-4.53	-0.44

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	17.75	2.82



IEEE 802.11n HT 40 MHz mode / Chain 0

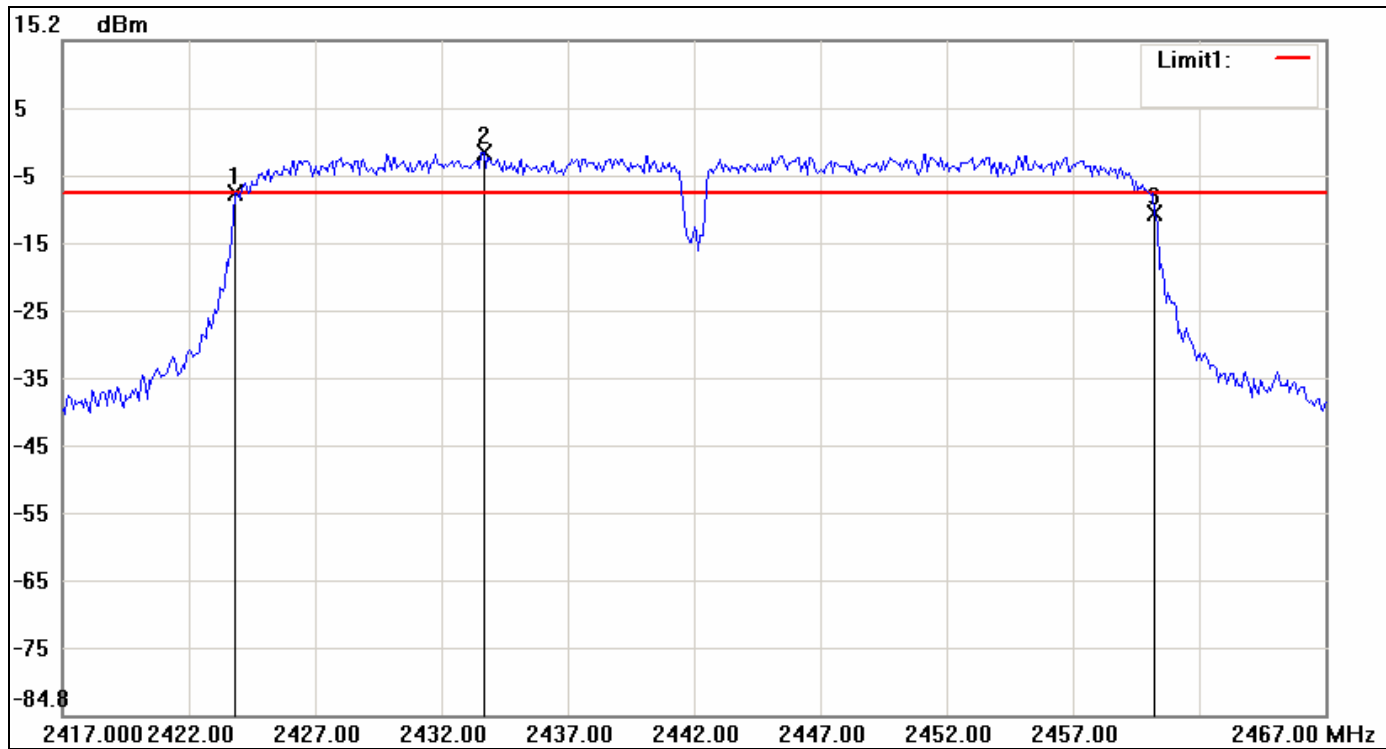
6dB Bandwidth (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2404.0000	-7.48	-6.38	-1.10
2	2431.0833	-0.38	-6.38	6.00
3	2440.0833	-6.71	-6.38	-0.33

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.0833	0.77

6dB Bandwidth (CH Mid)

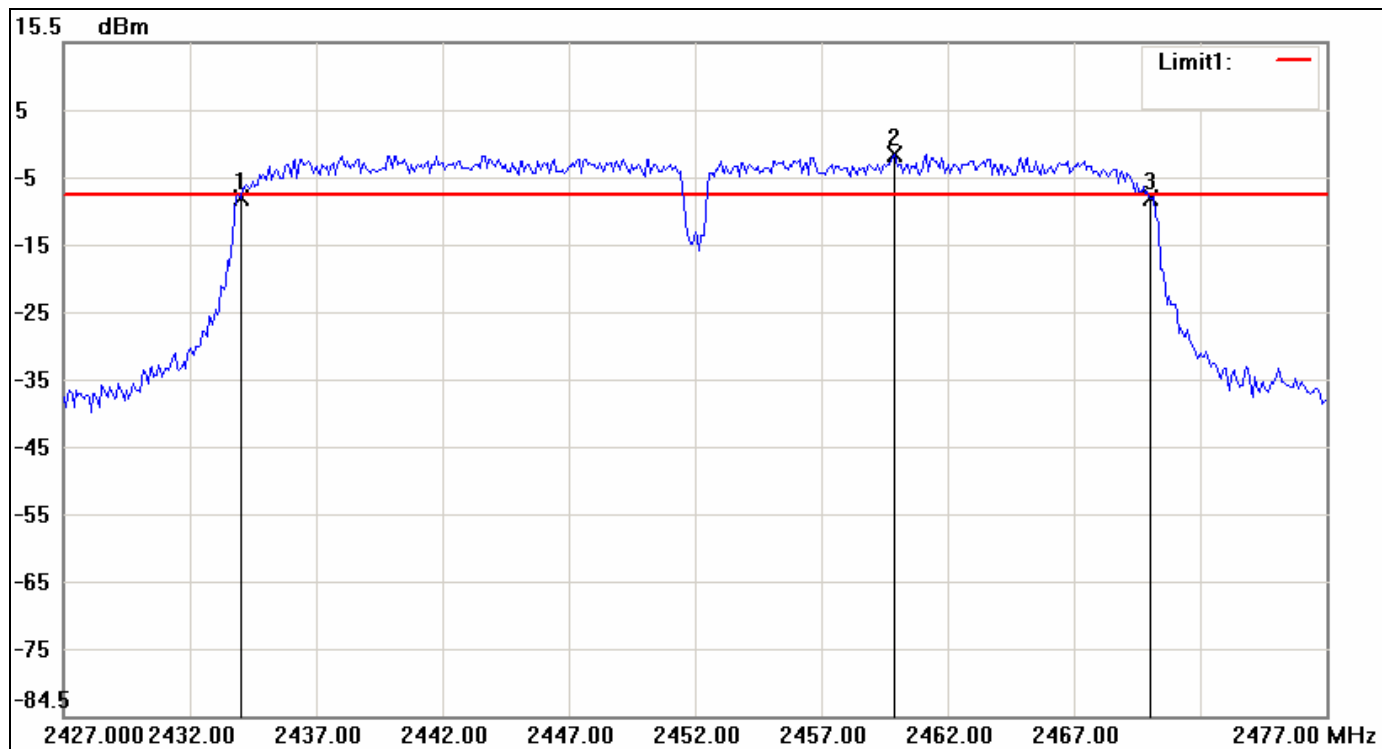


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2423.8333	-7.41	-7.40	-0.01
2	2433.6667	-1.40	-7.40	6.00
3	2460.2500	-10.35	-7.40	-2.95

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.4167	-2.94



6dB Bandwidth (CH High)



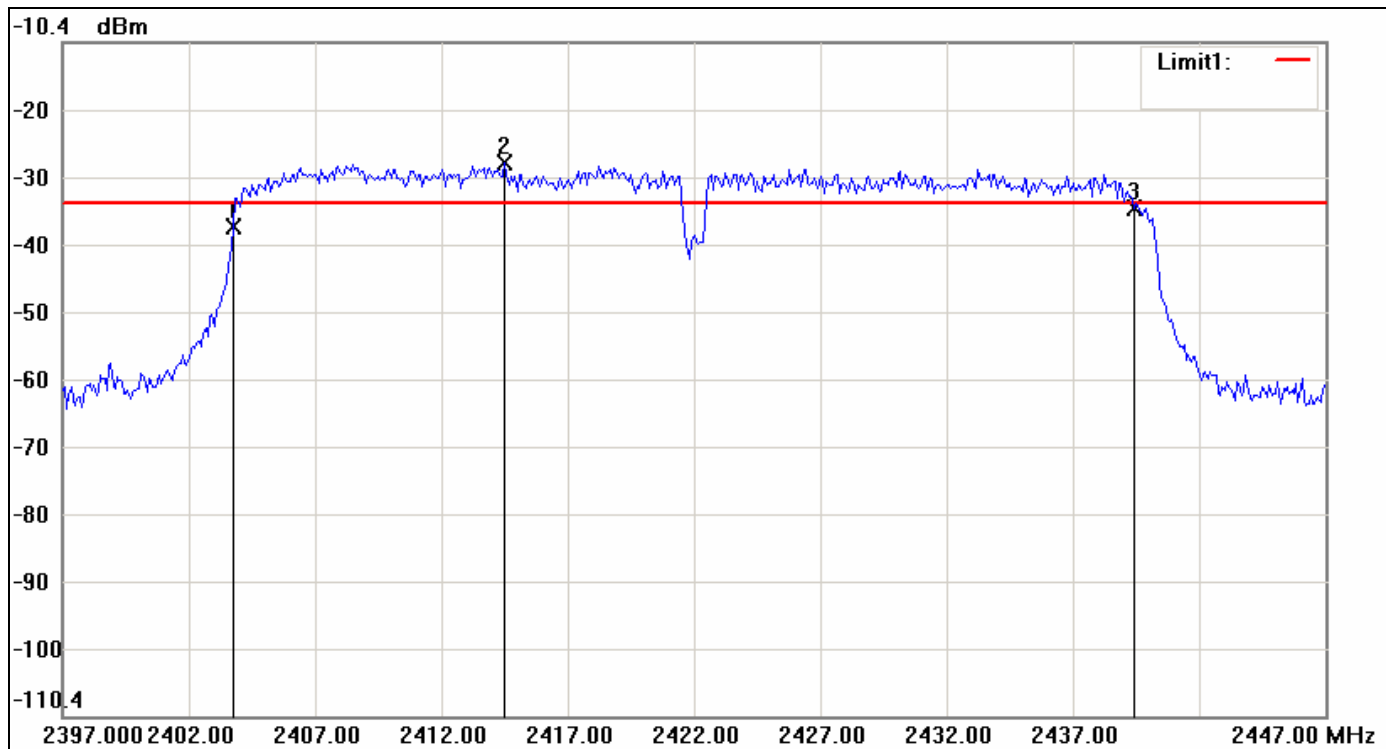
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2434.0000	-7.64	-7.10	-0.54
2	2459.9167	-1.10	-7.10	6.00
3	2470.0000	-7.72	-7.10	-0.62

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36	-0.08



IEEE 802.11n HT 40 MHz mode / Chain 1

6dB Bandwidth (CH Low)

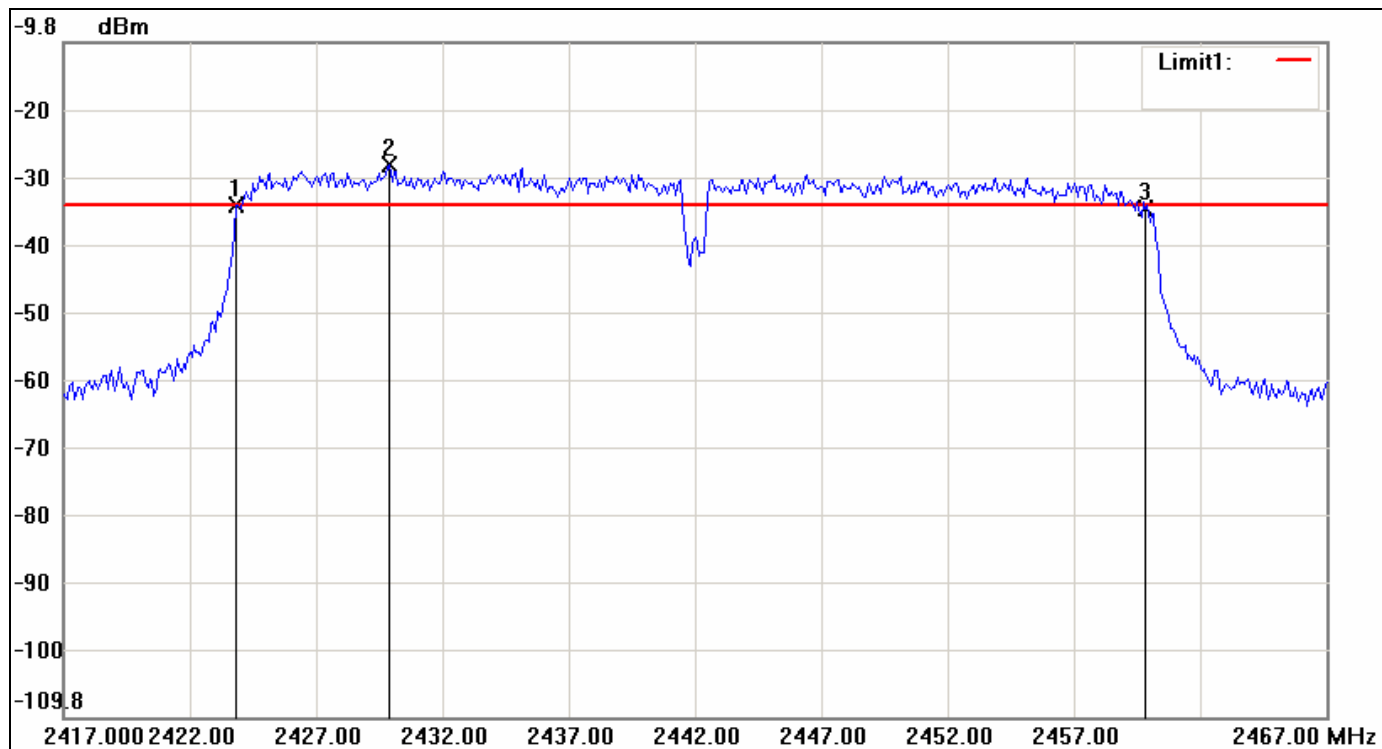


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.7500	-37.65	-34.27	-3.38
2	2414.5000	-28.27	-34.27	6.00
3	2439.4167	-34.97	-34.27	-0.70

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	35.6667	2.68



6dB Bandwidth (CH Mid)

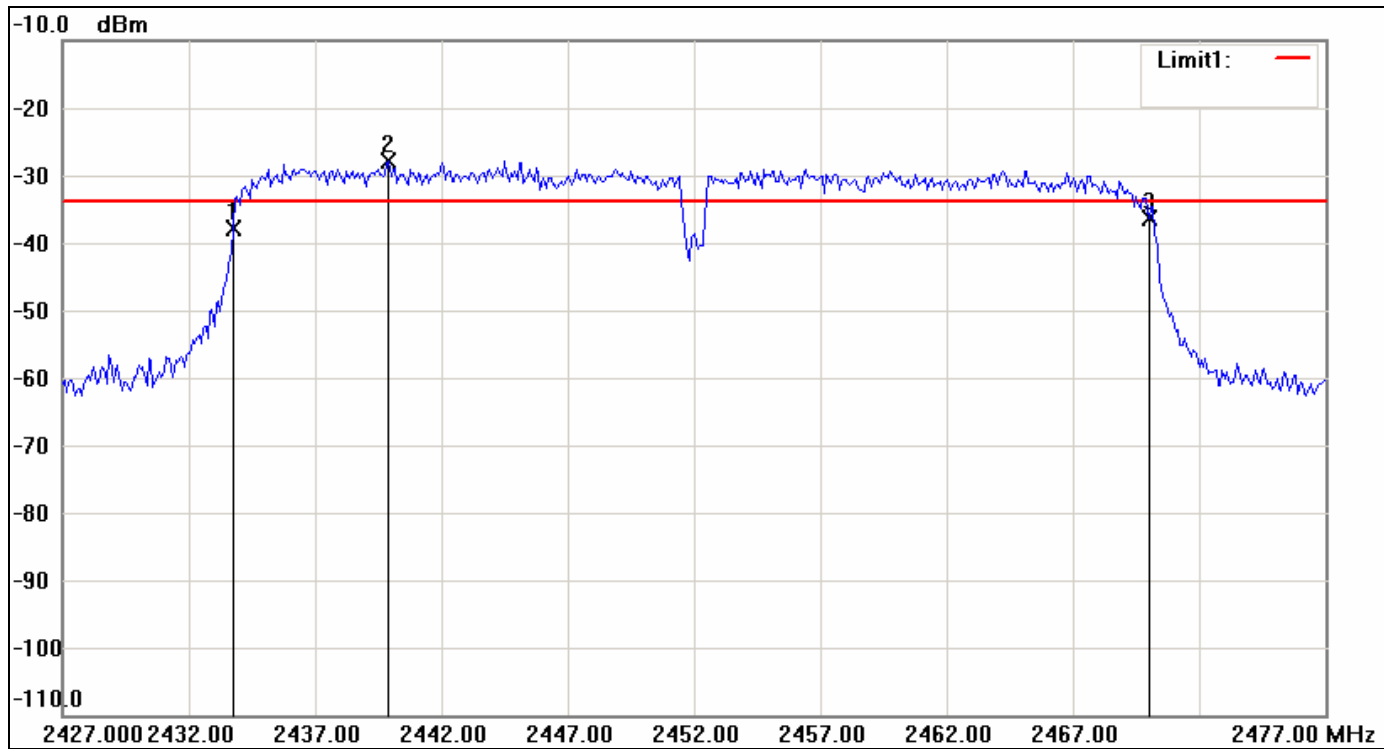


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2423.8333	-33.98	-33.90	-0.08
2	2429.9167	-27.90	-33.90	6.00
3	2459.8333	-34.40	-33.90	-0.50

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36	-0.42



6dB Bandwidth (CH High)



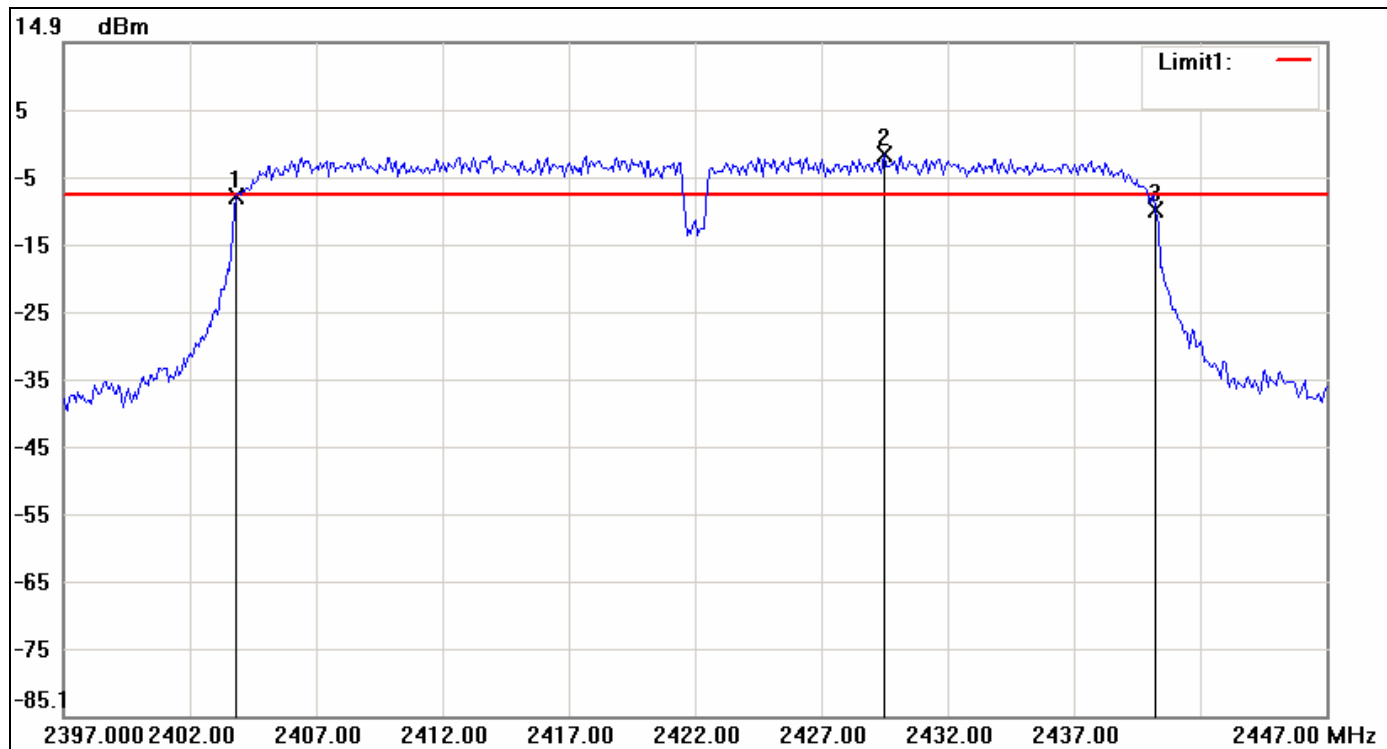
No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2433.7500	-37.84	-33.77	-4.07
2	2439.9167	-27.77	-33.77	6.00
3	2470.0000	-36.41	-33.77	-2.64

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.25	1.43



IEEE 802.11n HT 40 MHz mode / Chain 2

6dB Bandwidth (CH Low)

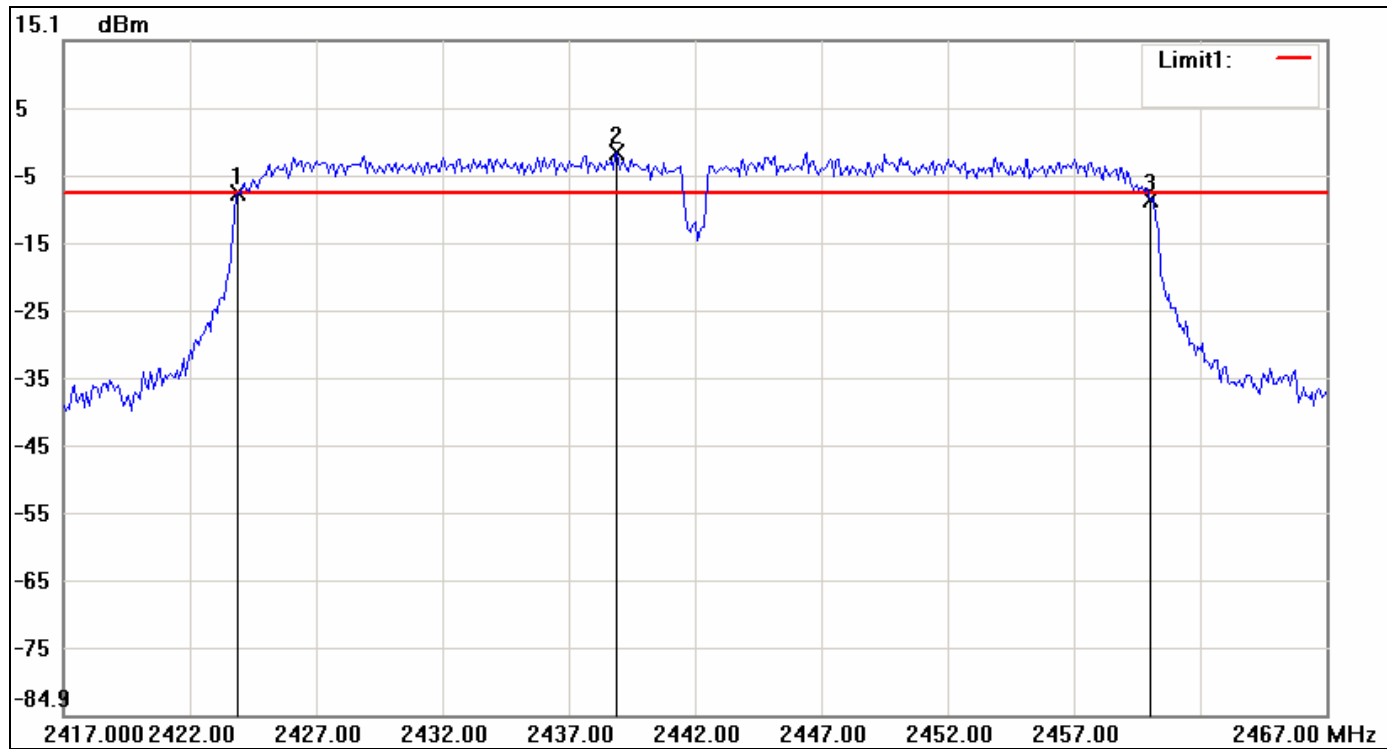


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2403.8333	-7.87	-7.84	-0.03
2	2429.5000	-1.84	-7.84	6.00
3	2440.2500	-9.91	-7.84	-2.07

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.4167	-2.04



6dB Bandwidth (CH Mid)

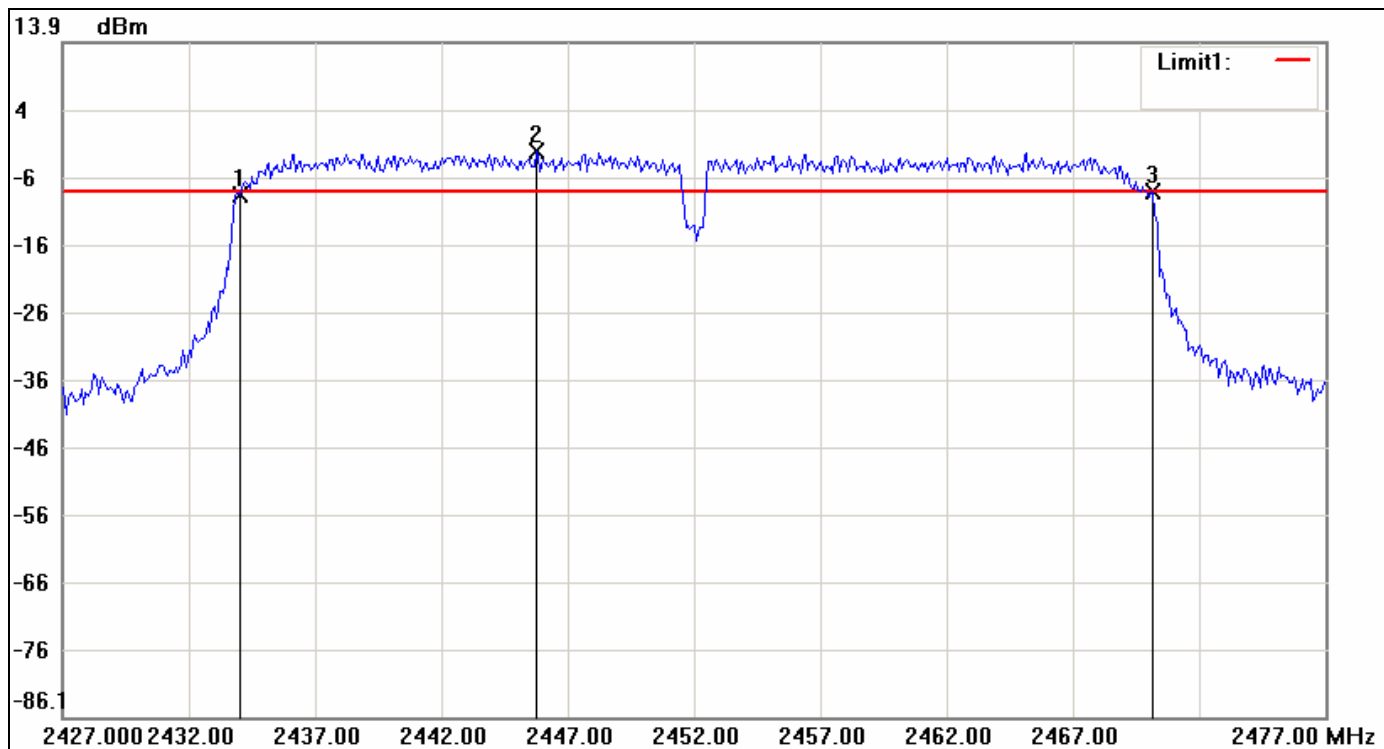


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2423.9167	-7.66	-7.60	-0.06
2	2438.9167	-1.60	-7.60	6.00
3	2460.0000	-8.46	-7.60	-0.86

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.0833	-0.8



6dB Bandwidth (CH High)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2434.0000	-8.56	-8.14	-0.42
2	2445.7500	-2.14	-8.14	6.00
3	2470.1667	-8.18	-8.14	-0.04

No.		Δ Frequency(MHz)	Δ Level(dB)
1	mk3-mk1	36.1667	0.38

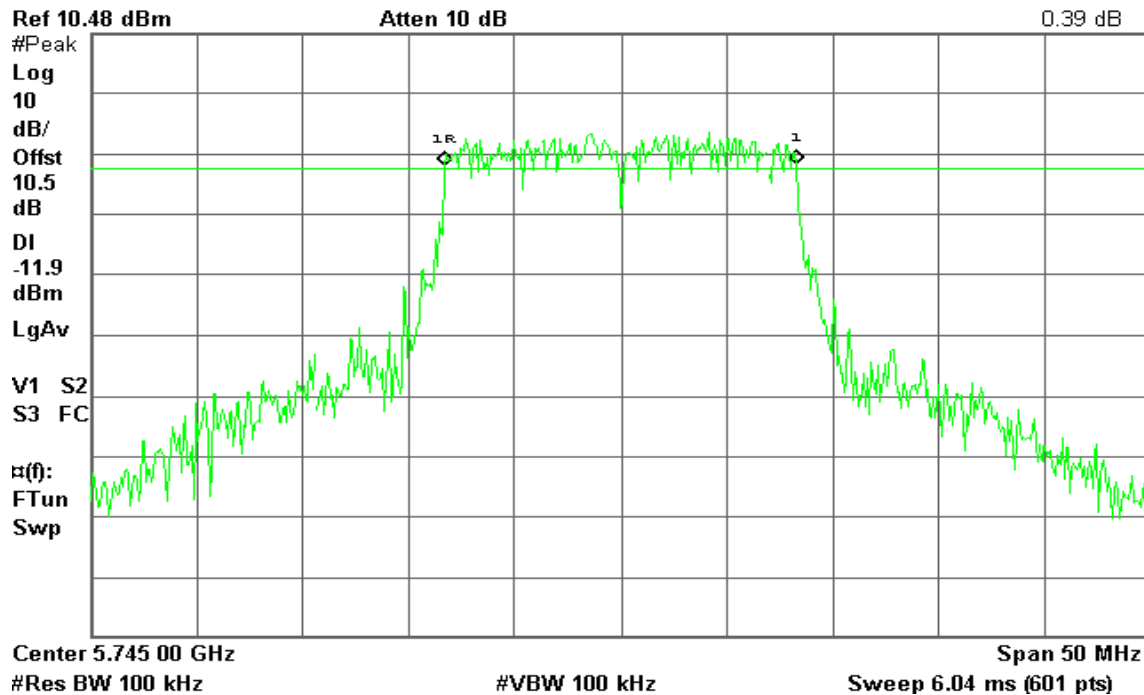


IEEE 802.11a mode 6dB Bandwidth (CH Low)

Agilent 16:58:29 Jul 20, 2011

R T

Δ Mkr1 16.50 MHz
0.39 dB

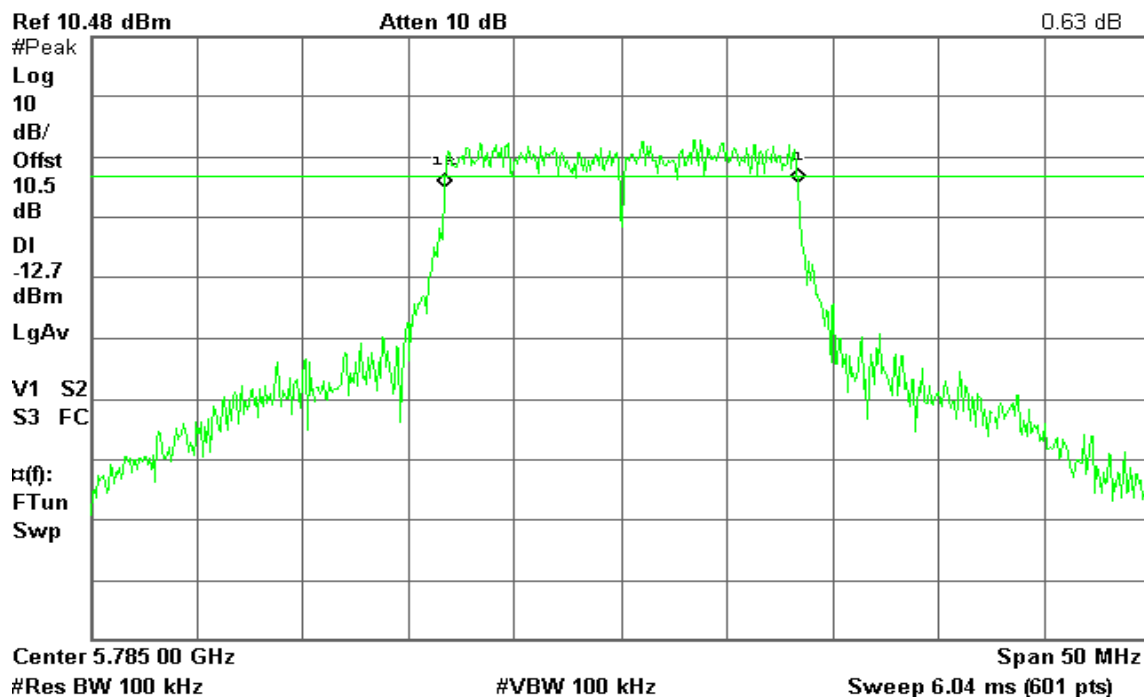


6dB Bandwidth (CH Mid)

Agilent 17:05:21 Jul 20, 2011

R T

Δ Mkr1 16.58 MHz
0.63 dB





6dB Bandwidth (CH High)

Agilent 17:12:54 Jul 20, 2011

R T

Δ Mkr1 16.58 MHz

-0.10 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-12.3

dBm

LgAv

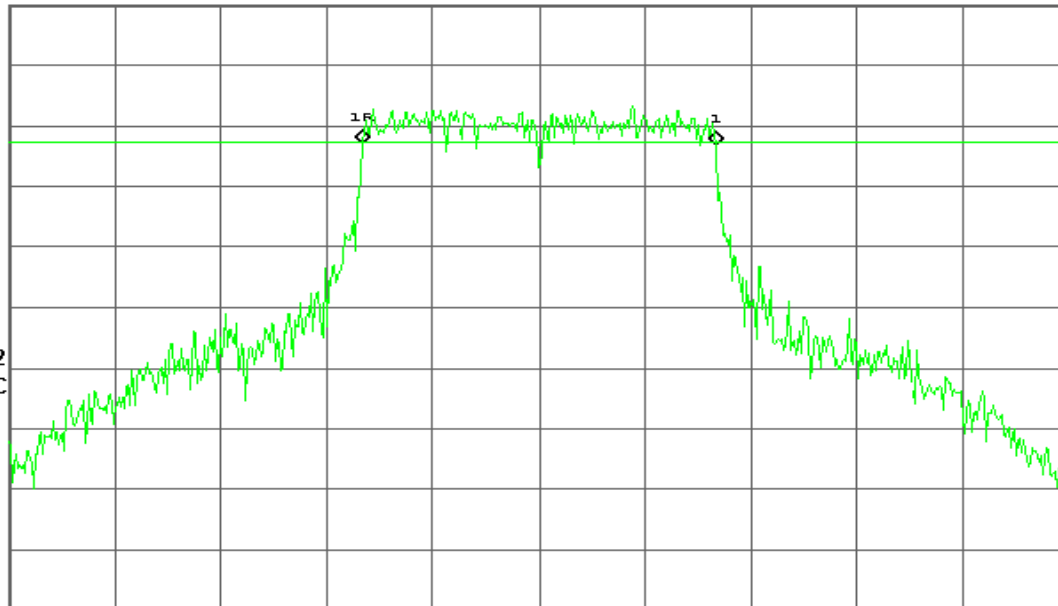
V1 S2

S3 FC

α(f):

FTun

Swp



Center 5.825 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

Agilent 17:40:47 Jul 20, 2011

R T

Δ Mkr1 17.33 MHz

-1.17 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-13.5

dBm

LgAv

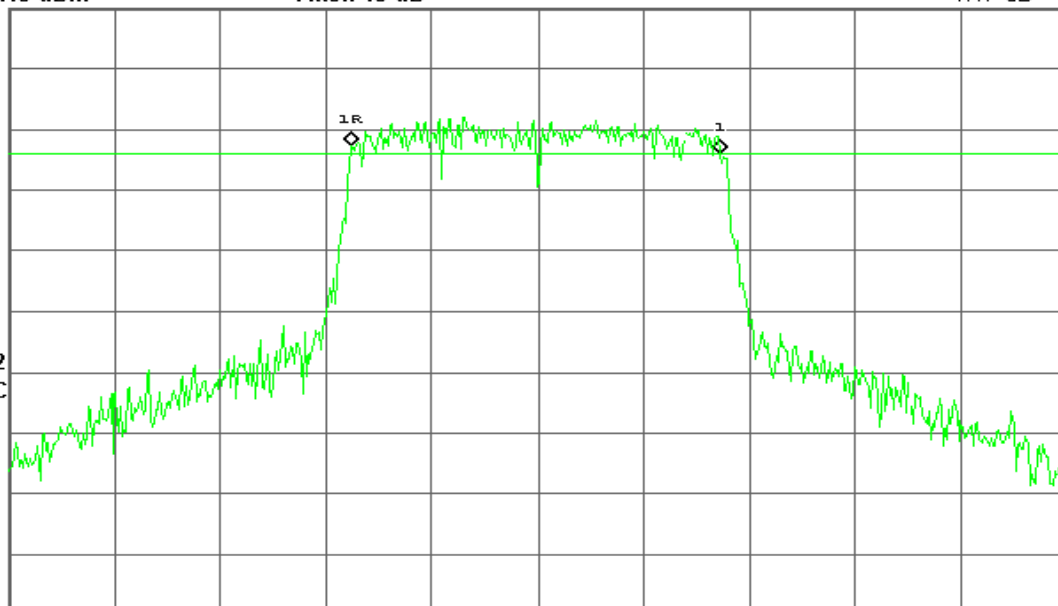
V1 S2

S3 FC

α(f):

FTun

Swp



Center 5.745 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)



6dB Bandwidth (CH Mid)

Agilent 17:35:39 Jul 20, 2011

R L

Δ Mkr1 17.58 MHz
-0.62 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-14.7

dBm

LgAv

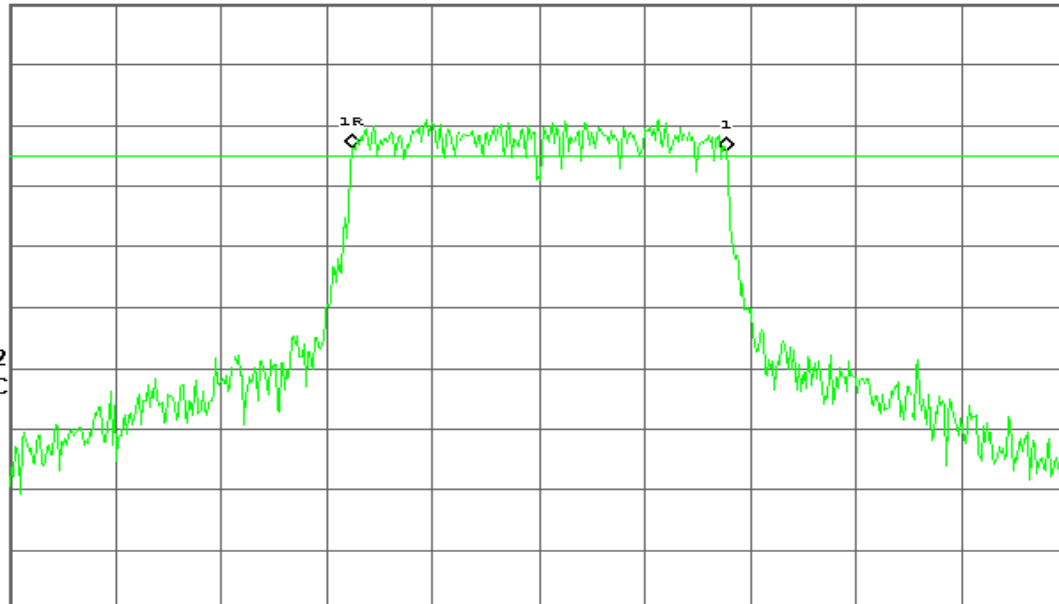
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 5.785 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH High)

Agilent 17:19:09 Jul 20, 2011

R T

Δ Mkr1 17.67 MHz
1.98 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-13.9

dBm

LgAv

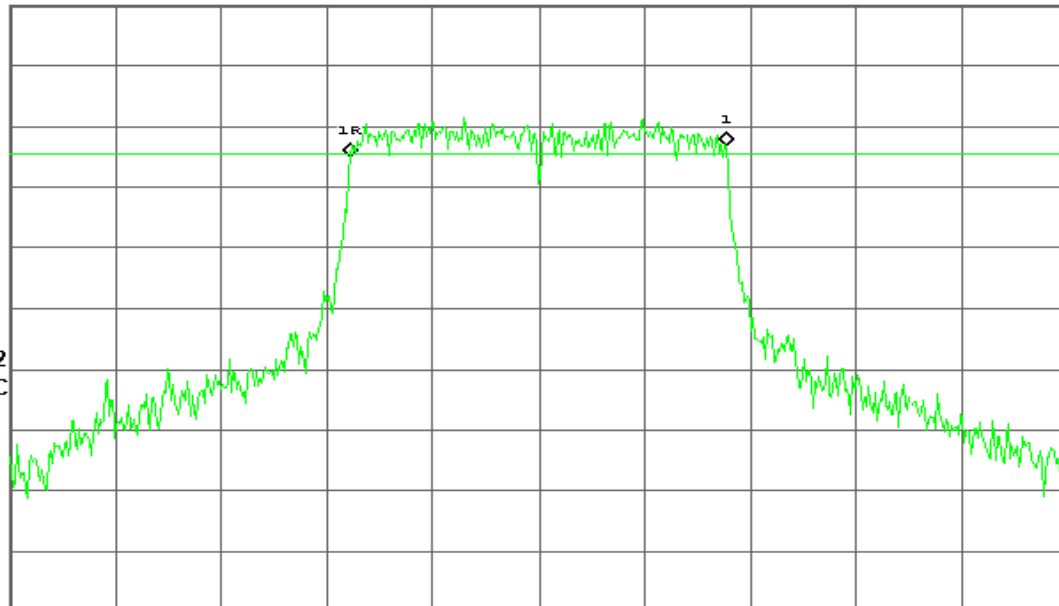
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 5.825 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



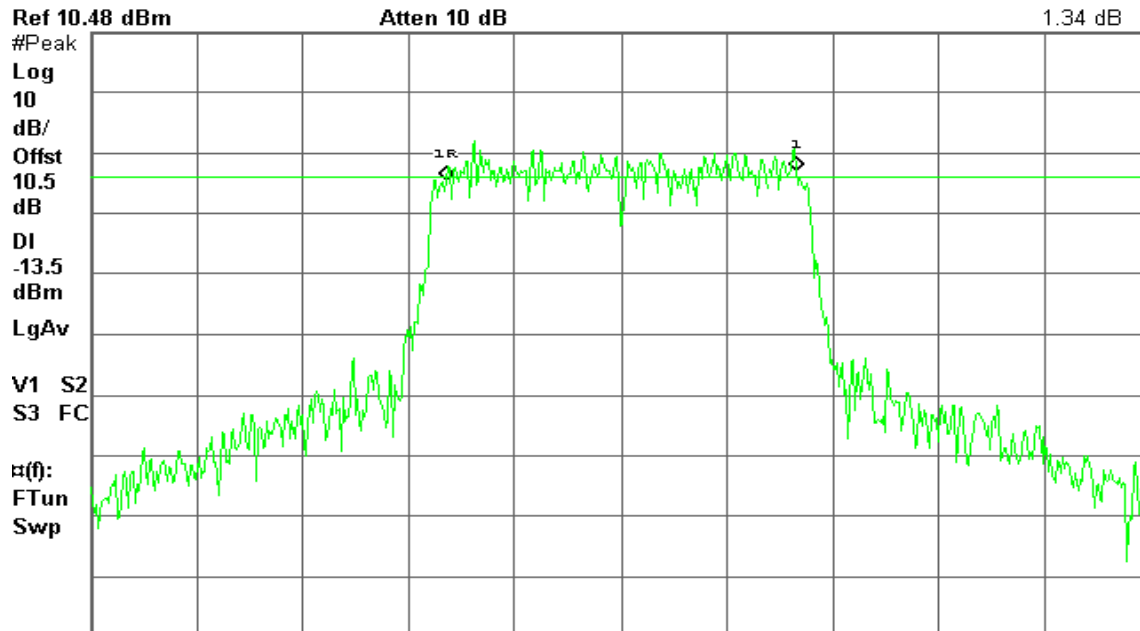
IEEE 802.11n HT 20 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

Agilent 18:22:07 Jul 20, 2011

R T

Δ Mkr1 16.42 MHz
1.34 dB

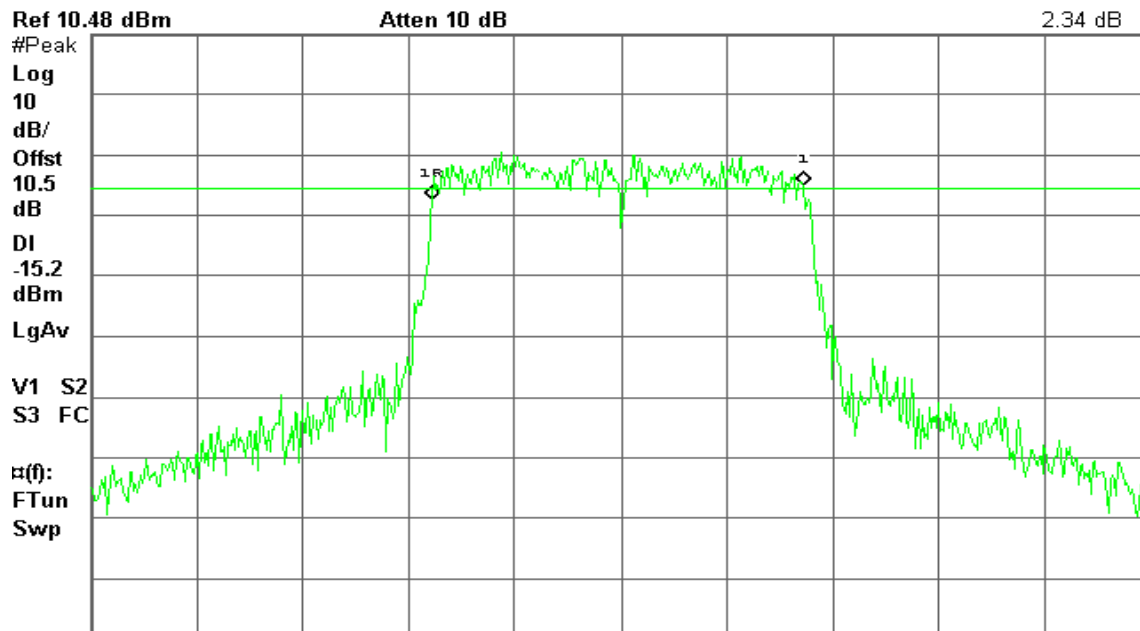


6dB Bandwidth (CH Mid)

Agilent 18:26:42 Jul 20, 2011

R L

Δ Mkr1 17.42 MHz
2.34 dB



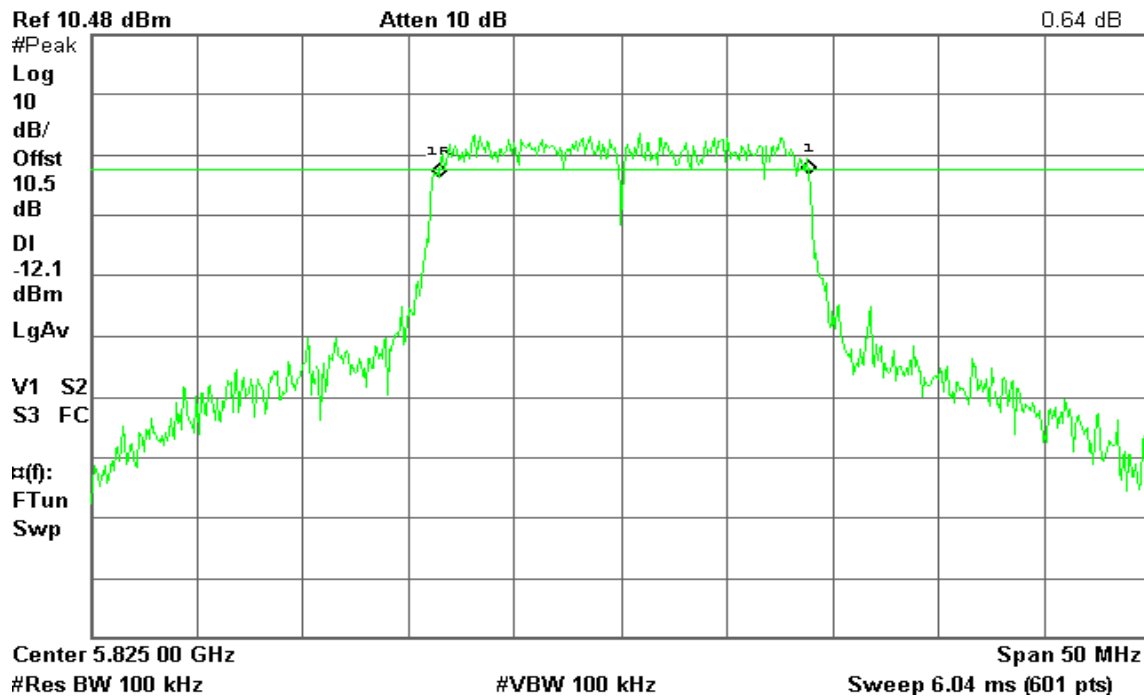


6dB Bandwidth (CH High)

Agilent 18:30:53 Jul 20, 2011

R L

Δ Mkr1 17.33 MHz
0.64 dB



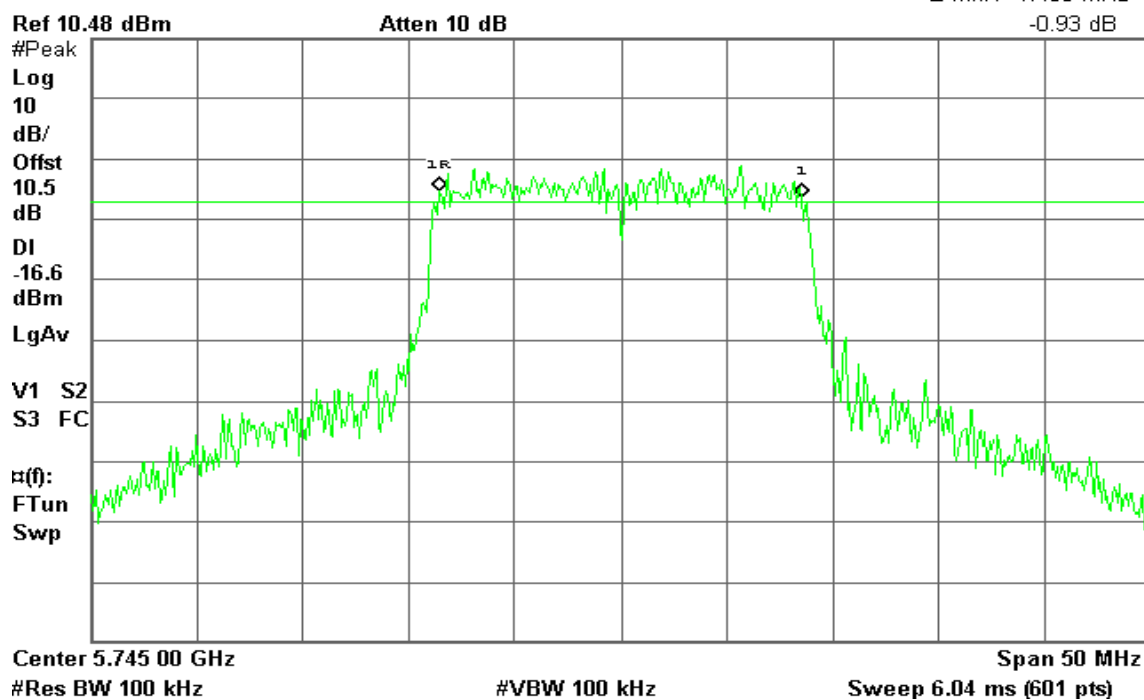
IEEE 802.11n HT 20 MHz Channel mode / Chain 2

6dB Bandwidth (CH Low)

Agilent 18:59:30 Jul 20, 2011

R T

Δ Mkr1 17.00 MHz
-0.93 dB





6dB Bandwidth (CH Mid)

Agilent 19:07:24 Jul 20, 2011

R T

Δ Mkr1 17.33 MHz
-0.61 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-14.9

dBm

LgAv

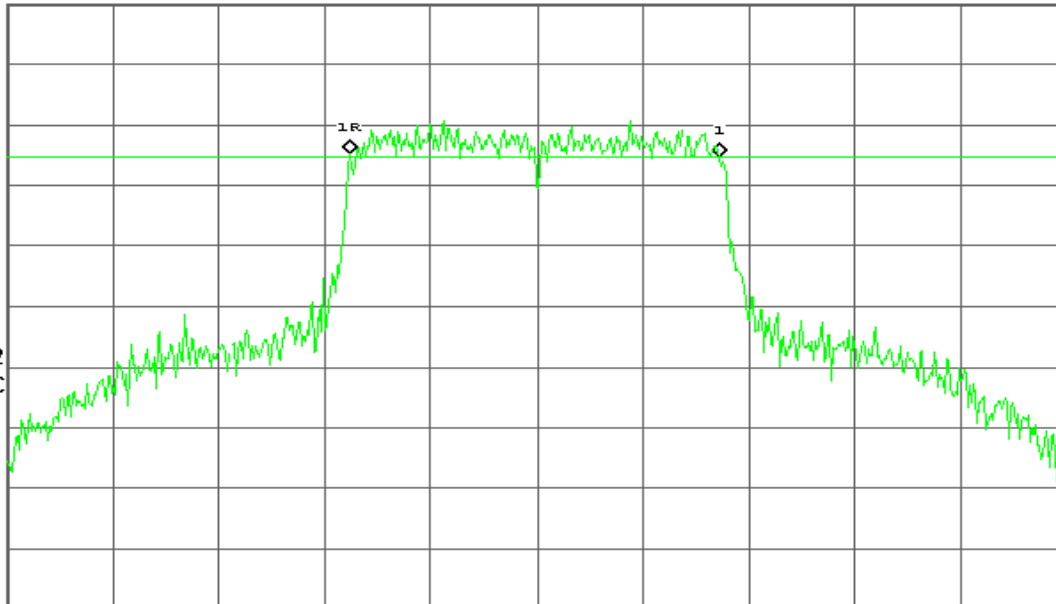
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 5.785 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH High)

Agilent 19:17:09 Jul 20, 2011

R T

Δ Mkr1 17.42 MHz
0.44 dB

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-14.4

dBm

LgAv

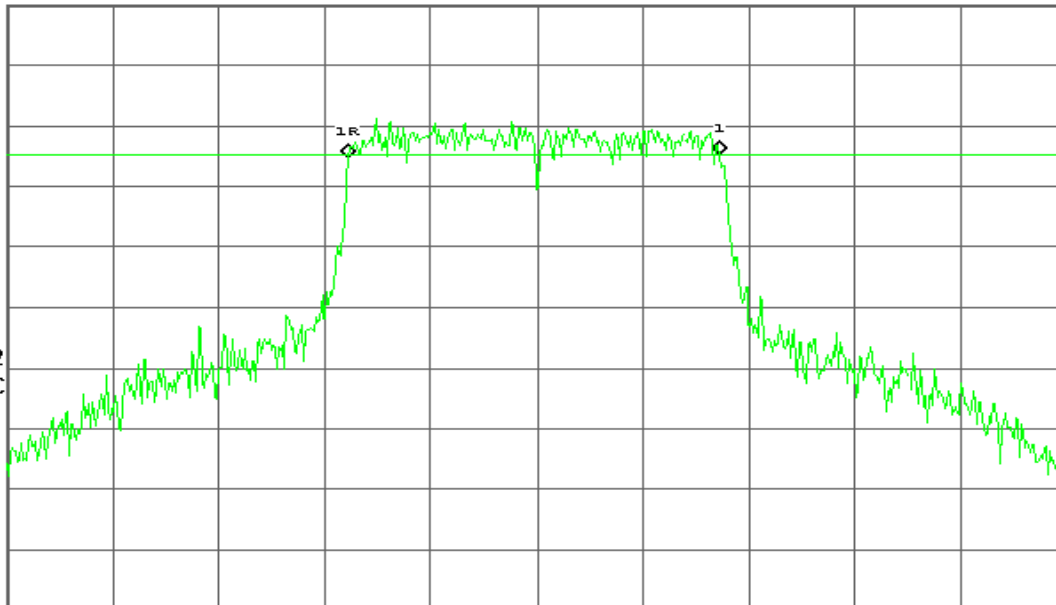
V1 S2

S3 FC

$\alpha(f)$:

FTun

Swp



Center 5.825 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



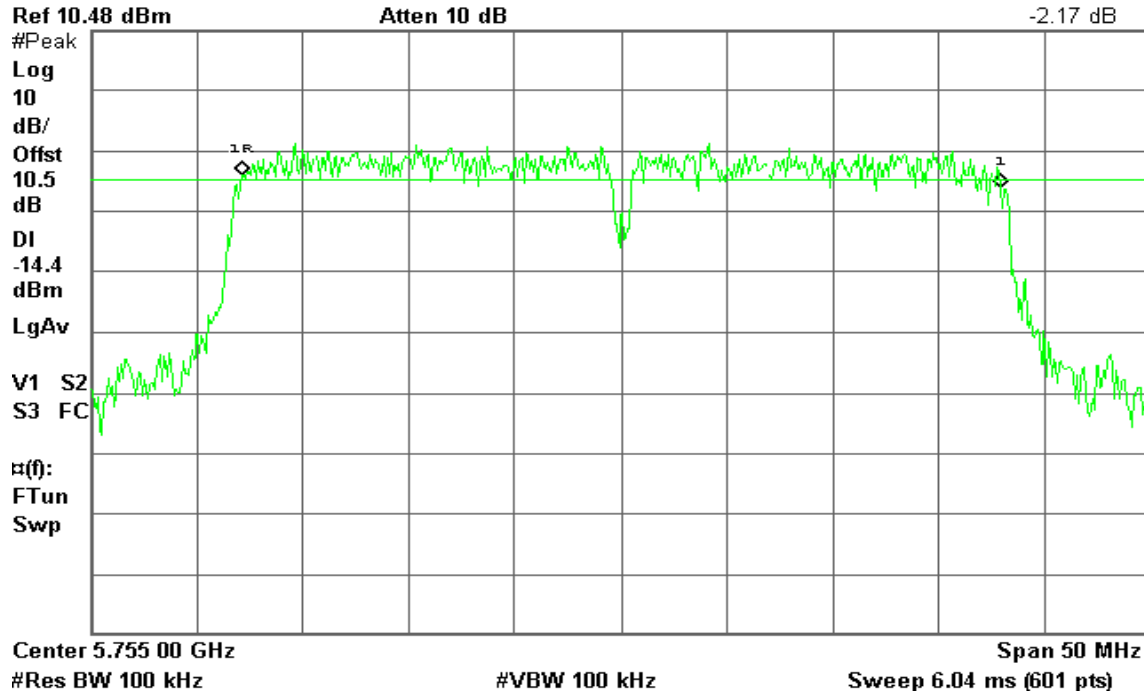
IEEE 802.11n HT 40 MHz mode / Chain 0

6dB Bandwidth (CH Low)

Agilent 10:36:19 Jul 21, 2011

R T

Δ Mkr1 35.75 MHz
-2.17 dB

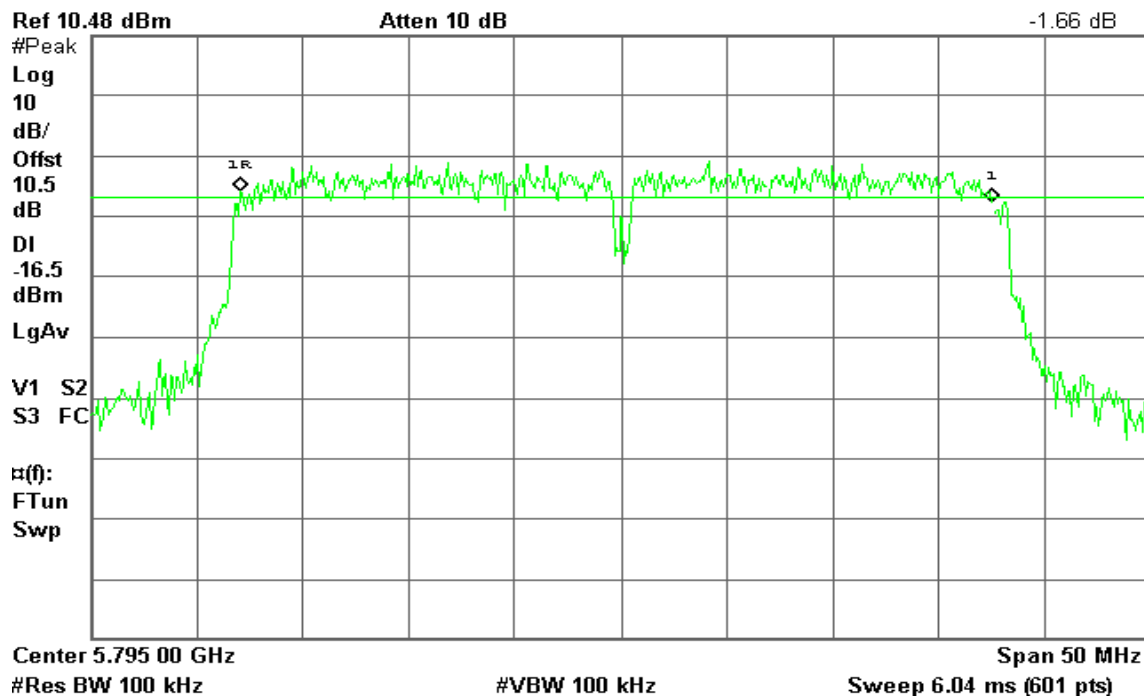


6dB Bandwidth (CH High)

Agilent 10:40:28 Jul 21, 2011

R T

Δ Mkr1 35.42 MHz
-1.66 dB





IEEE 802.11n HT 40 MHz mode / Chain 1

6dB Bandwidth (CH Low)

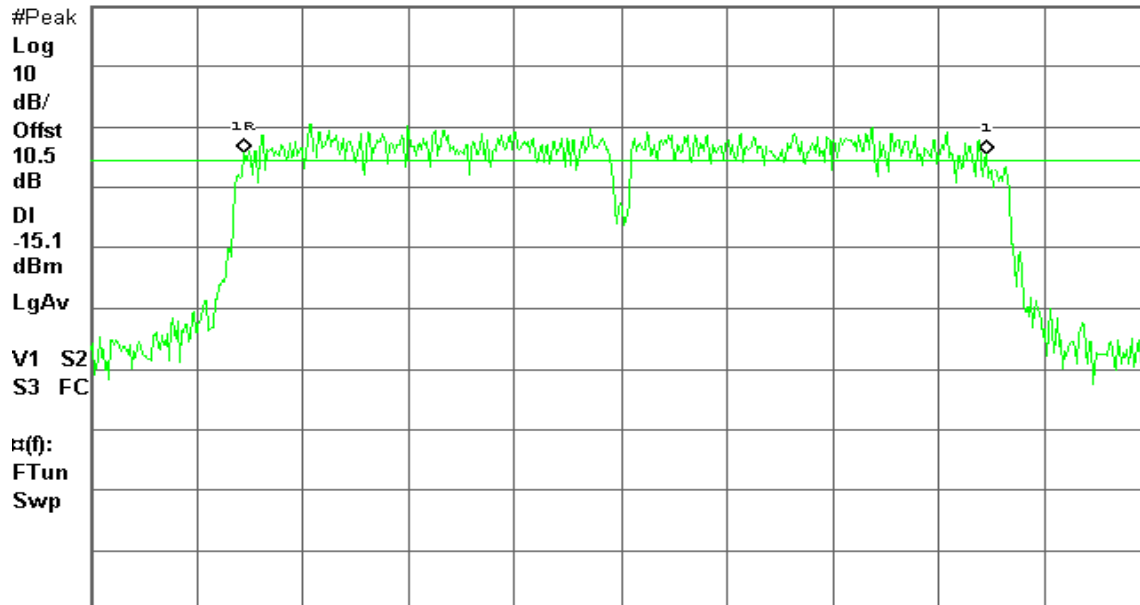
Agilent 10:54:39 Jul 21, 2011

R T

Δ Mkr1 35.00 MHz
-0.21 dB

Ref 10.48 dBm

Atten 10 dB



Center 5.755 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz
Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH High)

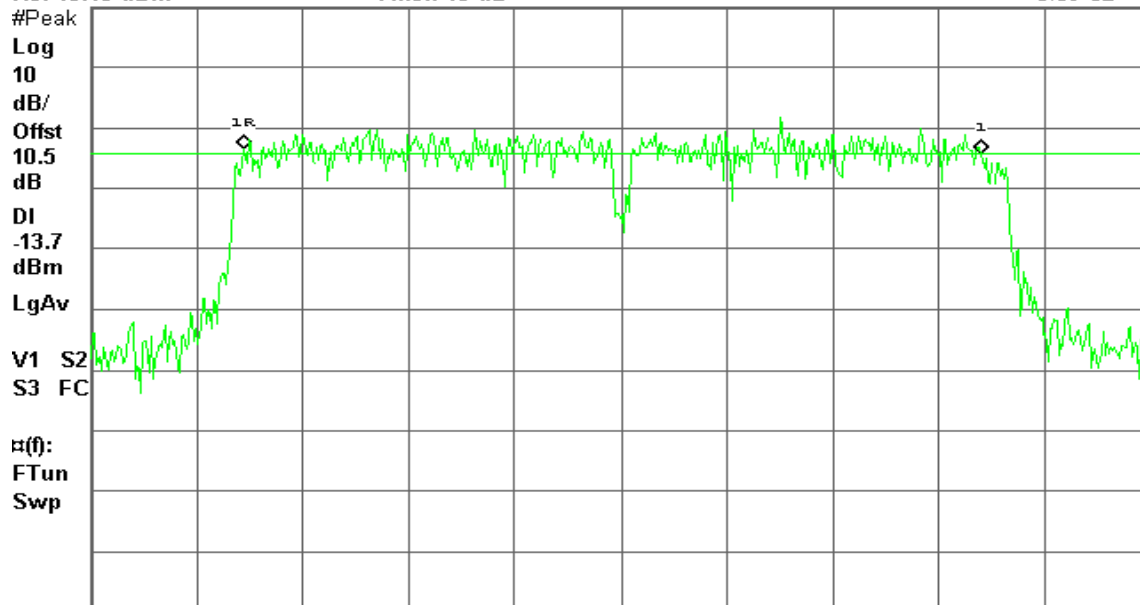
Agilent 10:49:18 Jul 21, 2011

R T

Δ Mkr1 34.75 MHz
-0.89 dB

Ref 10.48 dBm

Atten 10 dB



Center 5.795 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz
Sweep 6.04 ms (601 pts)



IEEE 802.11n HT 40 MHz mode / Chain 2

6dB Bandwidth (CH Low)

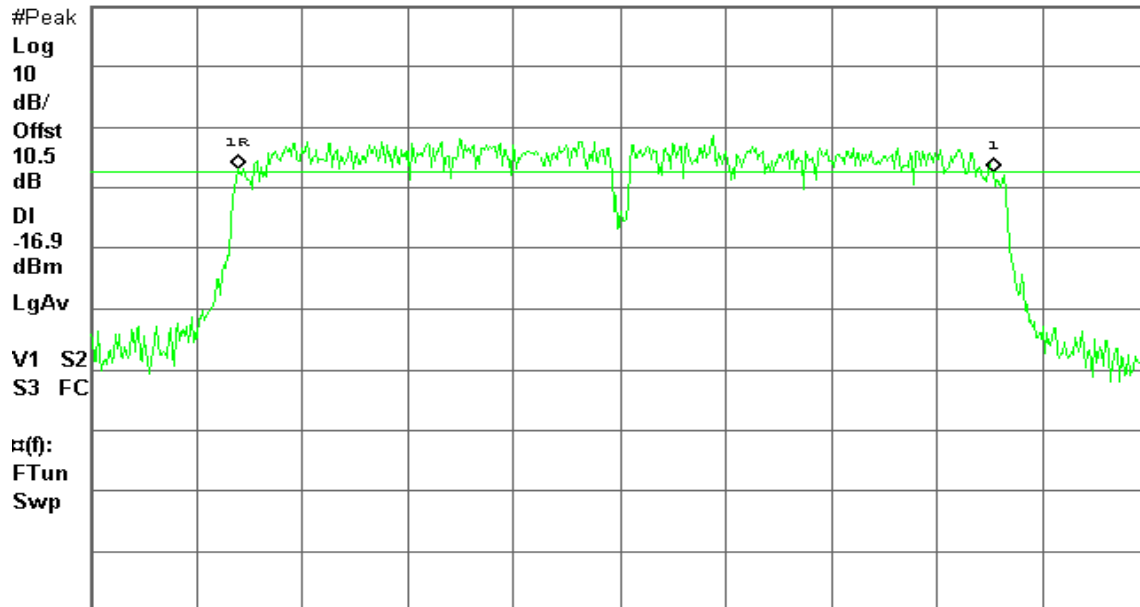
Agilent 11:00:40 Jul 21, 2011

R T

Δ Mkr1 35.67 MHz
-0.42 dB

Ref 10.48 dBm

Atten 10 dB



Center 5.755 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)

6dB Bandwidth (CH High)

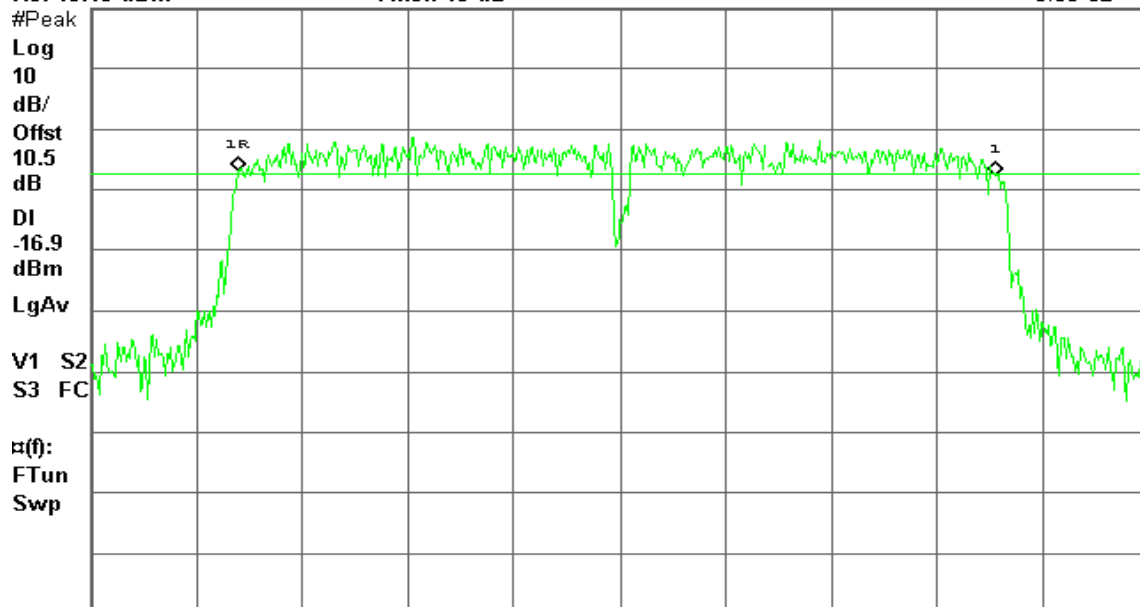
Agilent 11:05:33 Jul 21, 2011

R T

Δ Mkr1 35.75 MHz
-0.85 dB

Ref 10.48 dBm

Atten 10 dB



Center 5.795 00 GHz

#Res BW 100 kHz

#VBW 100 kHz

Span 50 MHz

Sweep 6.04 ms (601 pts)



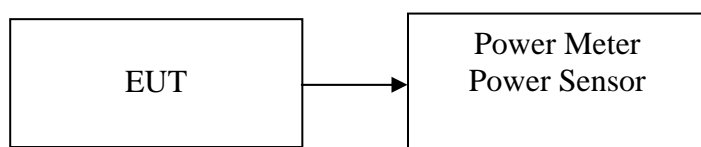
7.2 PEAK POWER

LIMIT

The maximum peak output power of the intentional radiator shall not exceed the following:

1. According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.
2. According to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	19.54	0.08995	1	PASS
Mid	2442	20.59	0.11455		PASS
High	2462	20.67	0.11668		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	26.13	0.41020	1	PASS
Mid	2442	26.59	0.45604		PASS
High	2462	26.49	0.44566		PASS

Test mode: IEEE 802.11n HT 20 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	23.71	23.66	24.35	28.69	0.7395	0.9988	PASS
Mid	2442	24.43	23.76	24.05	28.86	0.7691		PASS
High	2462	24.57	23.57	23.98	28.83	0.7640		PASS

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	24.09	23.66	24.01	28.70	0.7405	0.9988	PASS
Mid	2442	24.19	23.34	23.78	28.56	0.7170		PASS
High	2452	24.31	22.69	23.45	28.31	0.6769		PASS

Remark:

1. Total PPSD (dBm) = $10 * \log(10^{(Chain\ 0\ PPSD / 10)} + 10^{(Chain\ 1\ PPSD / 10)} + 10^{(Chain\ 2\ PPSD / 10)})$
2. The maximum antenna gain is 6.77 dBi; therefore the reduction due to antenna gain is 0.77 dBi, so the limit is 0.9988W.

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	18.52	0.07112	1.00	PASS
Mid	5785	18.25	0.06683		PASS
High	5825	18.27	0.06714		PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5745	17.04	15.22	13.61	20.29	0.1068	1.00	PASS
Mid	5785	16.04	15.11	14.95	20.17	0.1039		PASS
High	5825	15.81	18.01	16.25	21.57	0.1435		PASS

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	5755	16.44	17.16	14.31	20.90	0.1230	1.00	PASS
High	5795	14.86	16.89	15.81	20.70	0.1176		PASS

Remark:

1. Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)/1000}$) + Chain 1 ($10^{(\text{Output Power}/10)/1000}$) + Chain 2 ($10^{(\text{Output Power}/10)/1000}$)

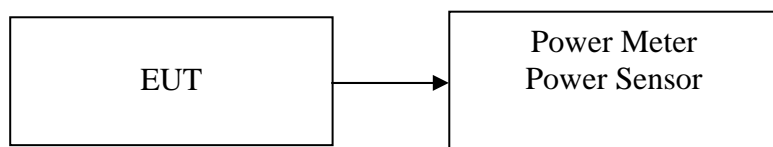


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power Meter. The Power Meter is set to the peak power detection.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	16.67	0.04645
Mid	2442	17.61	0.05768
High	2462	17.72	0.05916

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	19.54	0.08995
Mid	2442	20.06	0.10139
High	2462	20.25	0.10593

Test mode: IEEE 802.11n HT 20 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	15.27	15.48	15.83	20.30	0.1073
Mid	2442	16.12	15.71	15.46	20.54	0.1133
High	2462	16.39	15.41	15.46	20.55	0.1135

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2422	15.67	15.61	15.62	20.40	0.1098
Mid	2442	15.98	15.57	15.18	20.36	0.1086
High	2452	16.17	14.67	14.56	19.97	0.0993

Remark: Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)/1000}$) + Chain 1 ($10^{(\text{Output Power}/10)/1000}$) + Chain 2 ($10^{(\text{Output Power}/10)/1000}$)

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	5745	9.77	0.00948
Mid	5785	10.06	0.01014
High	5825	10.16	0.01038

Test mode: IEEE 802.11n HT 20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	5745	8.32	7.09	5.28	11.84	0.0153
Mid	5785	7.26	6.63	7.01	11.75	0.0149
High	5825	7.11	9.84	8.02	13.25	0.0211

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Chain 2 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	5755	7.99	8.65	6.37	12.54	0.0180
High	5795	6.63	9.19	7.55	12.69	0.0186

Remark:

1. Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)/1000}$) + Chain 1 ($10^{(\text{Output Power}/10)/1000}$) + Chain 2 ($10^{(\text{Output Power}/10)/1000}$)

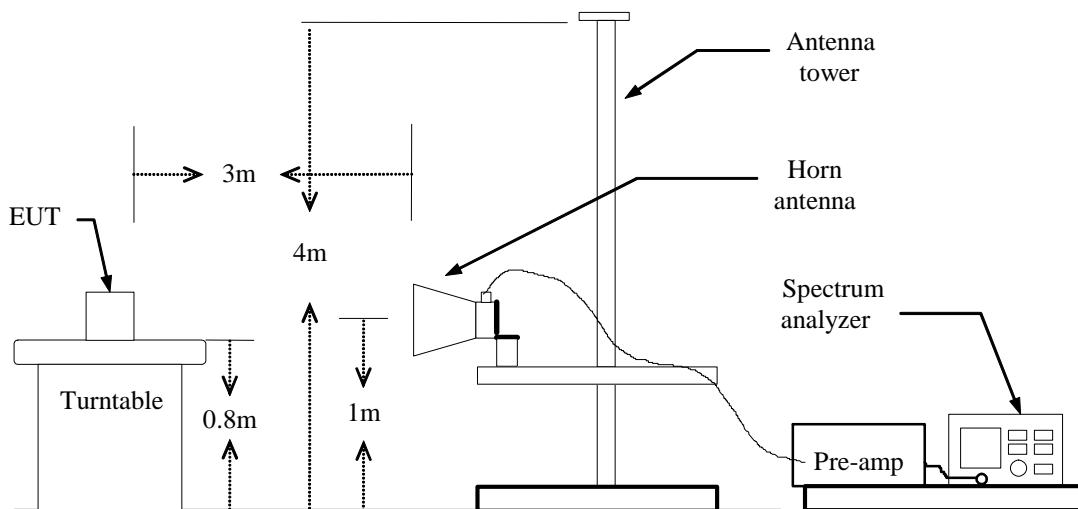


7.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

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

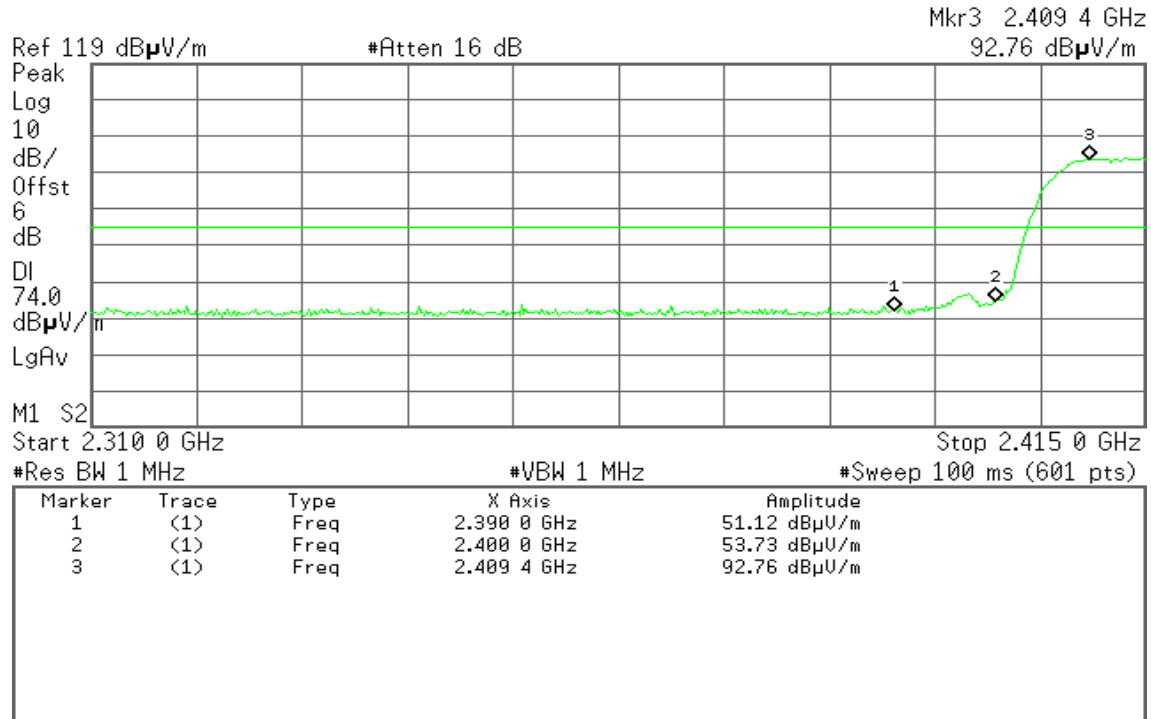
TEST RESULTS

Refer to attach spectrum analyzer data chart.

**Band Edges (IEEE 802.11b mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

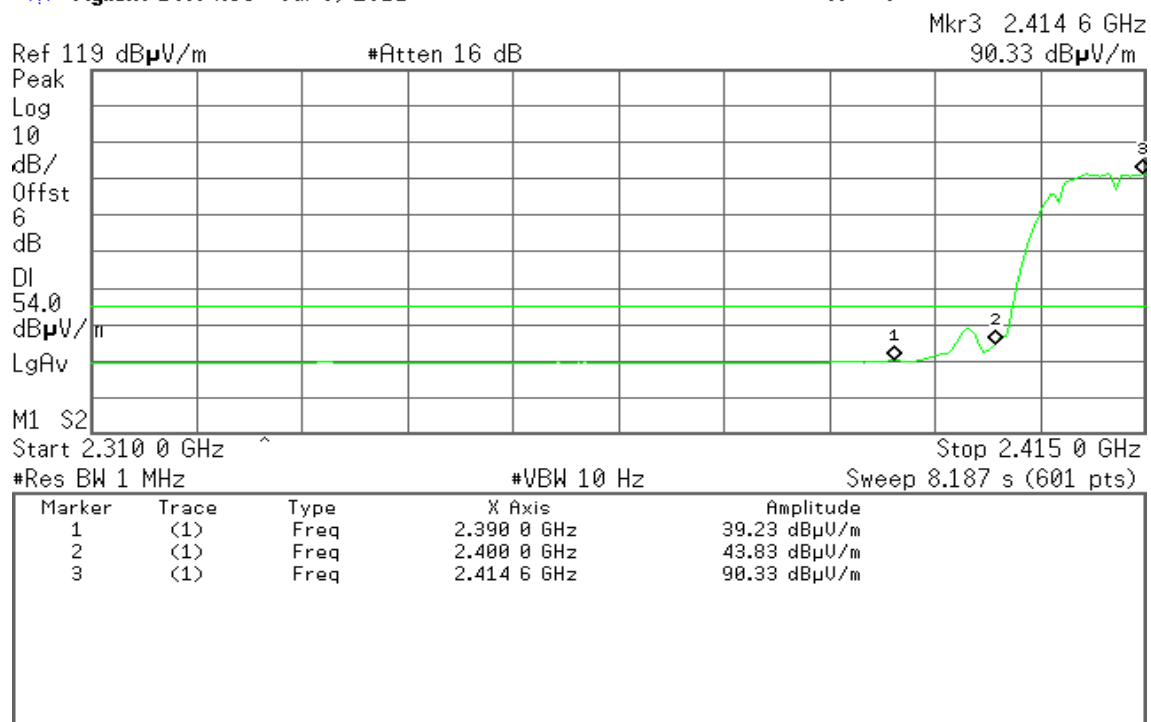
* Agilent 10:03:47 Jul 9, 2011

R T

**Detector mode: Average****Polarity: Vertical**

* Agilent 10:04:33 Jul 9, 2011

R T



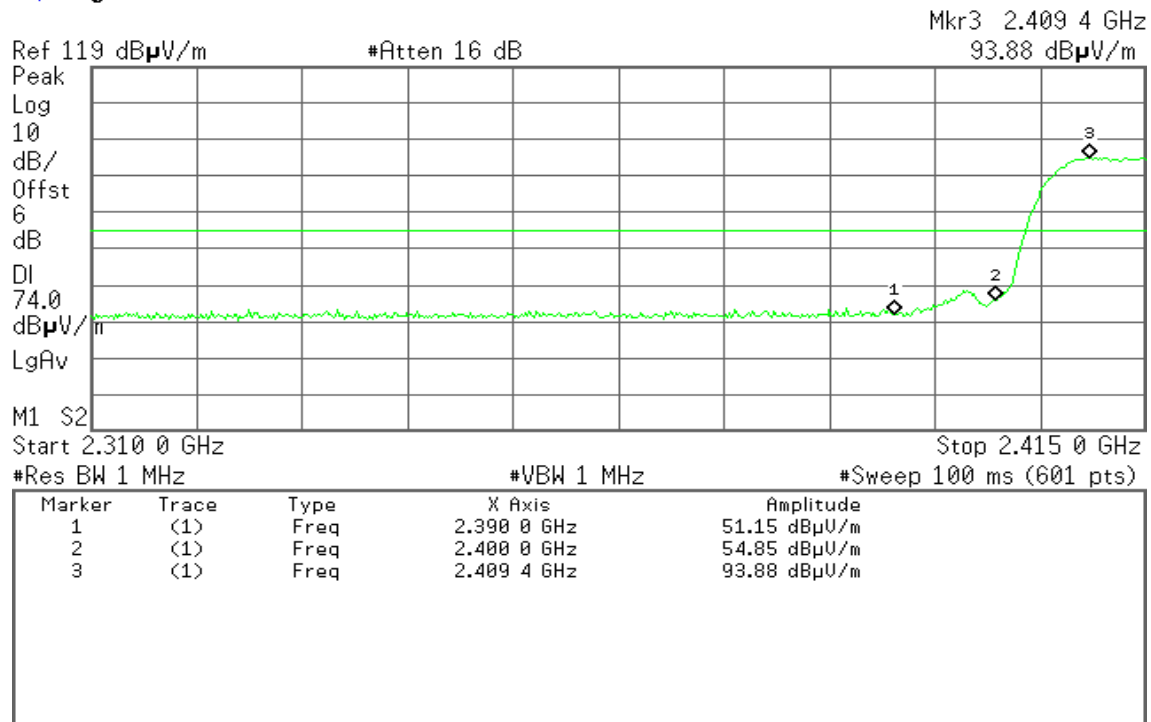


Detector mode: Peak

Polarity: Horizontal

* Agilent 09:58:53 Jul 9, 2011

R T

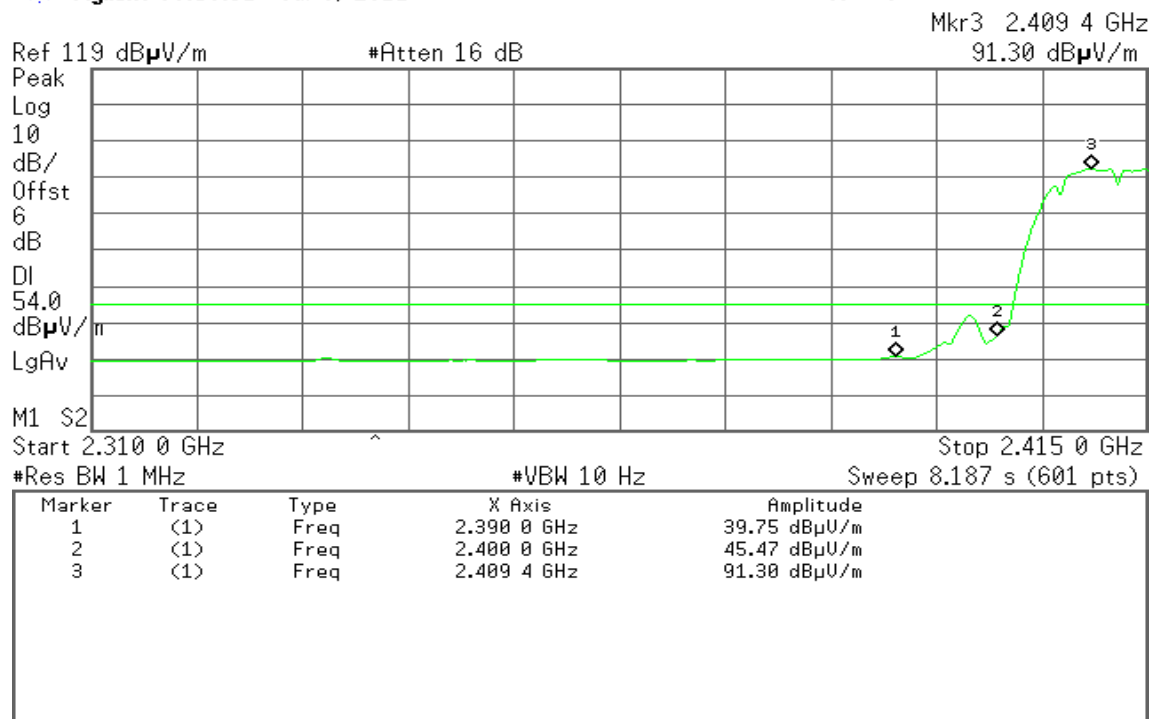


Detector mode: Average

Polarity: Horizontal

* Agilent 09:59:31 Jul 9, 2011

R T



**Band Edges (IEEE 802.11b mode / CH High)****Detector mode: Peak****Polarity: Vertical**

* Agilent 10:23:37 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

52.65 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent 10:24:08 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

39.79 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

* Agilent 10:16:42 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

51.47 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

* Agilent 10:17:17 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

40.14 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

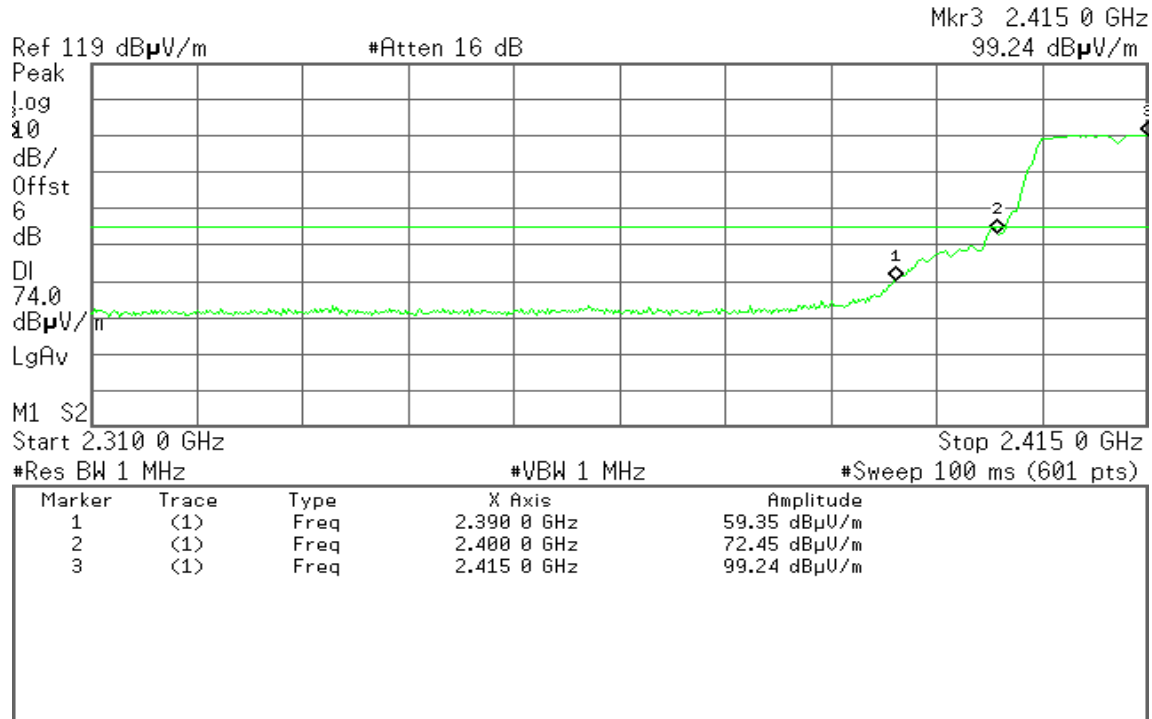
^ Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)

**Band Edges (IEEE 802.11g mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

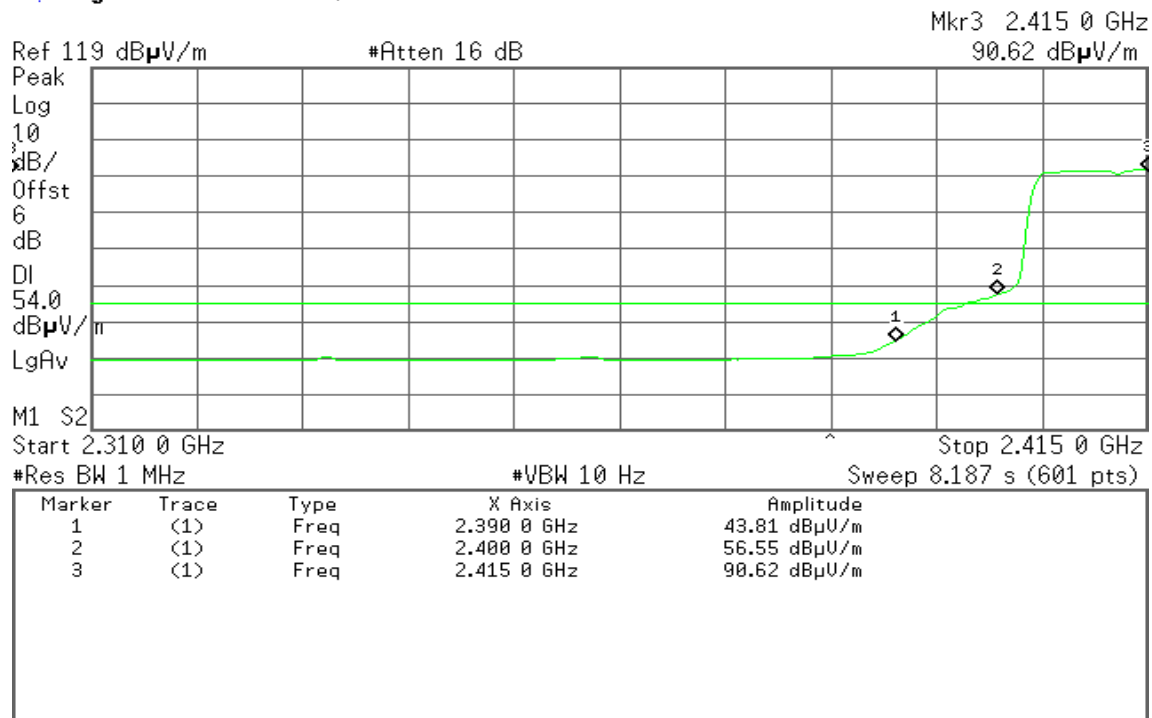
* Agilent 10:31:26 Jul 9, 2011

R T

**Detector mode: Average****Polarity: Vertical**

* Agilent 10:31:55 Jul 9, 2011

R T



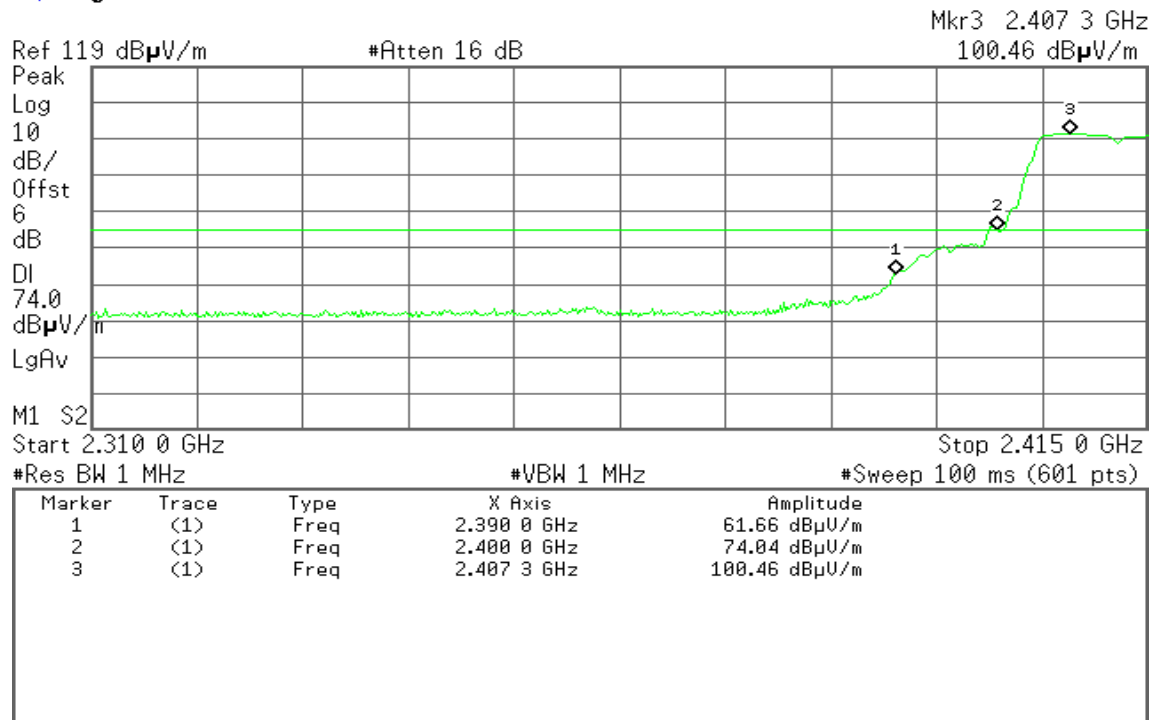


Detector mode: Peak

Polarity: Horizontal

* Agilent 10:35:59 Jul 9, 2011

R T

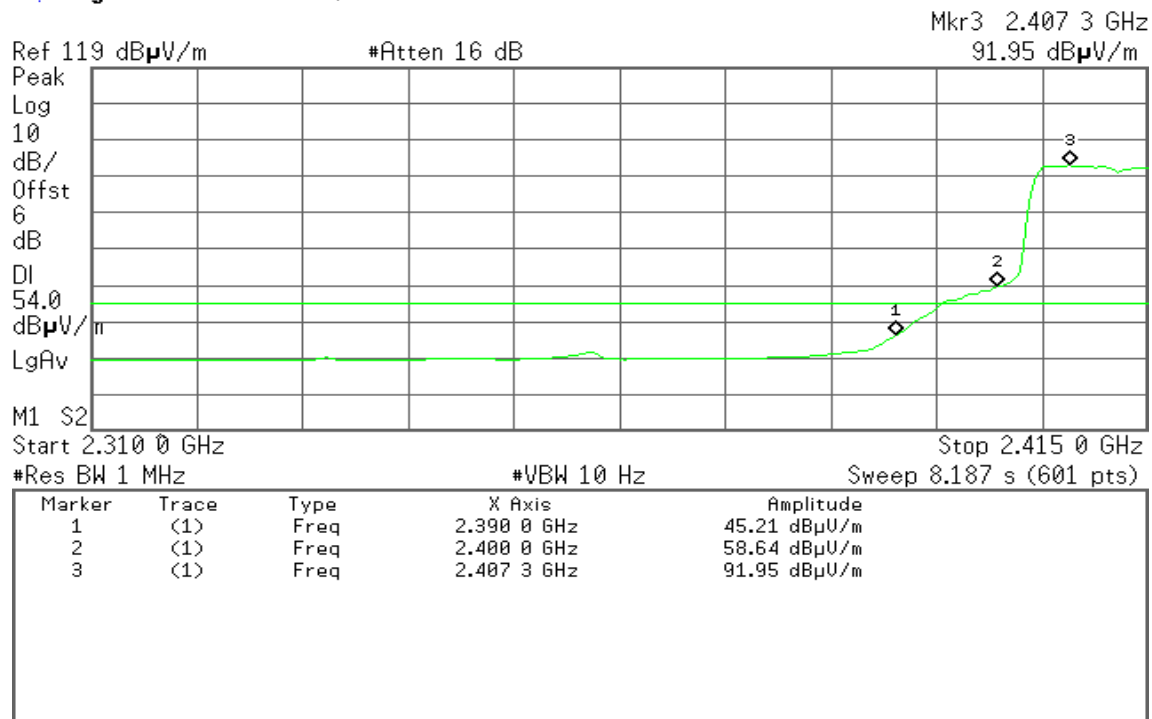


Detector mode: Average

Polarity: Horizontal

* Agilent 10:36:37 Jul 9, 2011

R T



**Band Edges (IEEE 802.11g mode / CH High)****Detector mode: Peak****Polarity: Vertical**

* Agilent 10:44:52 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

59.15 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent 10:45:23 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

44.80 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.460 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.119 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

* Agilent 10:49:27 Jul 9, 2011

R T

Mkr1 2.483 55 GHz

60.25 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

* Agilent 10:49:53 Jul 9, 2011

R T

Mkr1 2.483 55 GHz

45.45 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

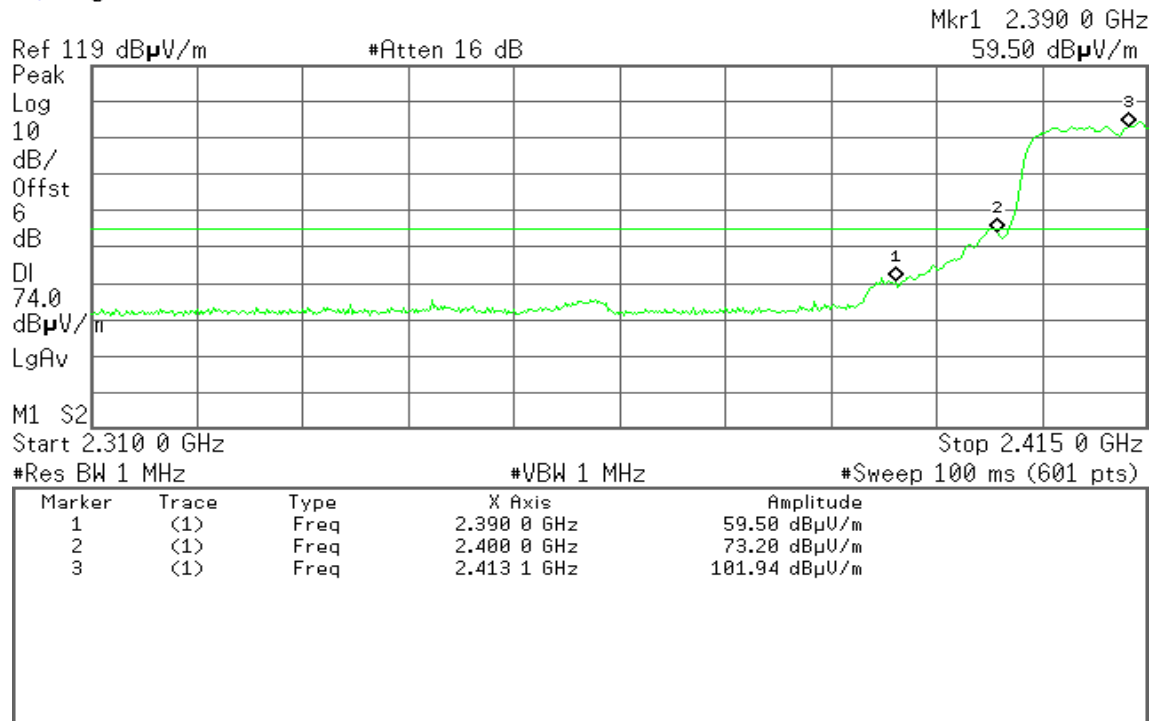
Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)

**Band Edges (IEEE 802.11n HT 20 MHz mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

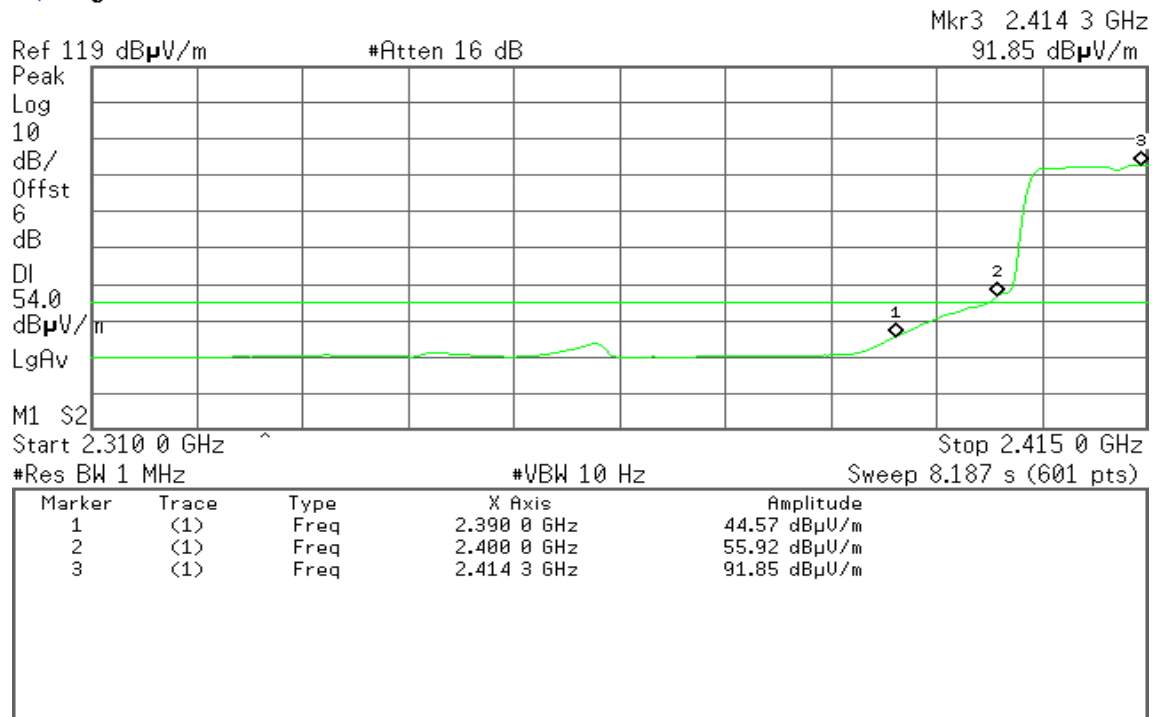
* Agilent 11:39:45 Jul 9, 2011

R T

**Detector mode: Average****Polarity: Vertical**

* Agilent 11:40:51 Jul 9, 2011

R T



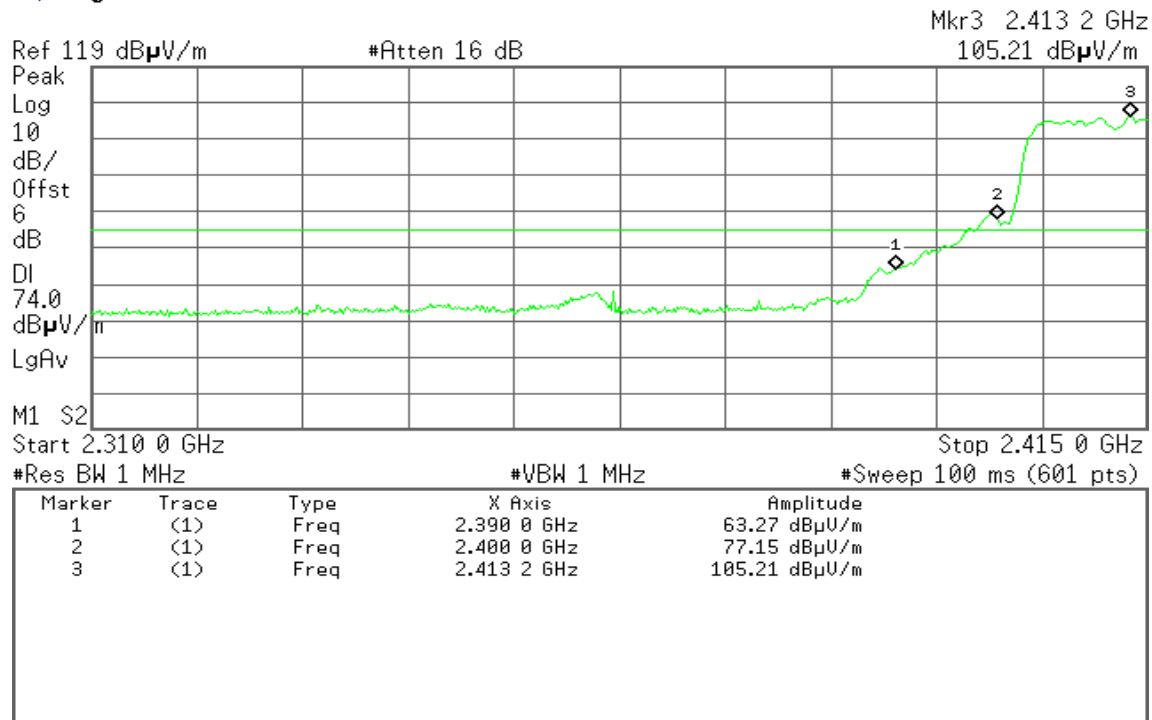


Detector mode: Peak

Polarity: Horizontal

* Agilent 11:33:52 Jul 9, 2011

T

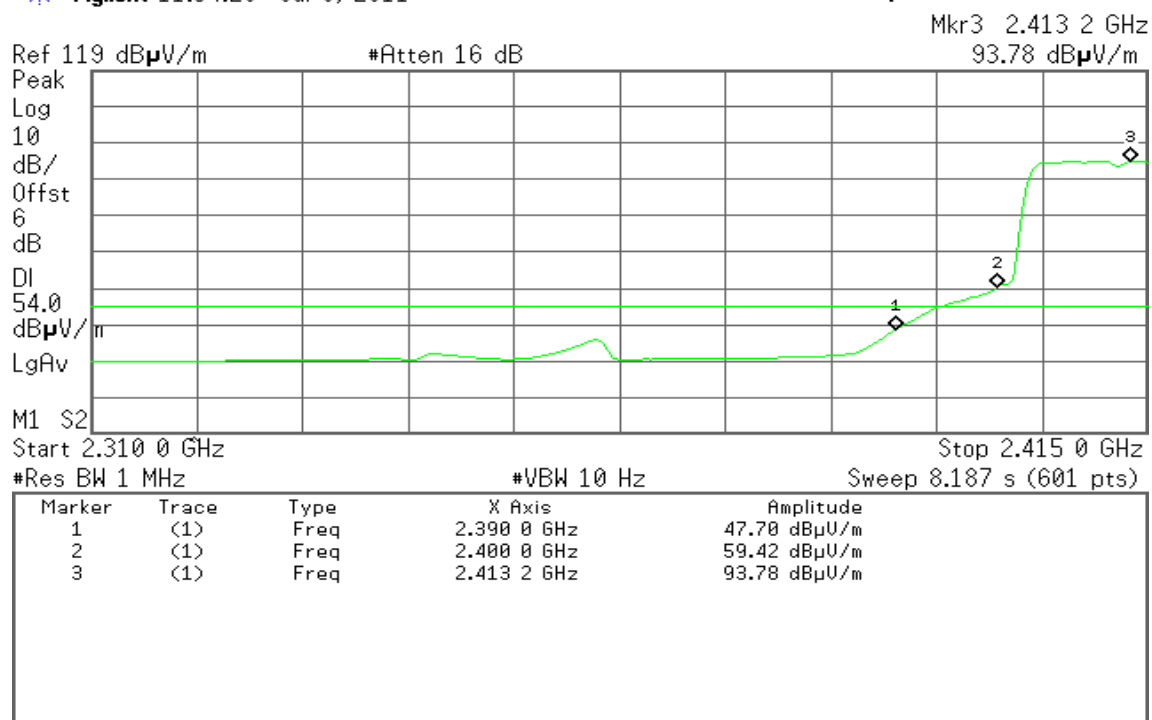


Detector mode: Average

Polarity: Horizontal

* Agilent 11:34:29 Jul 9, 2011

T





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

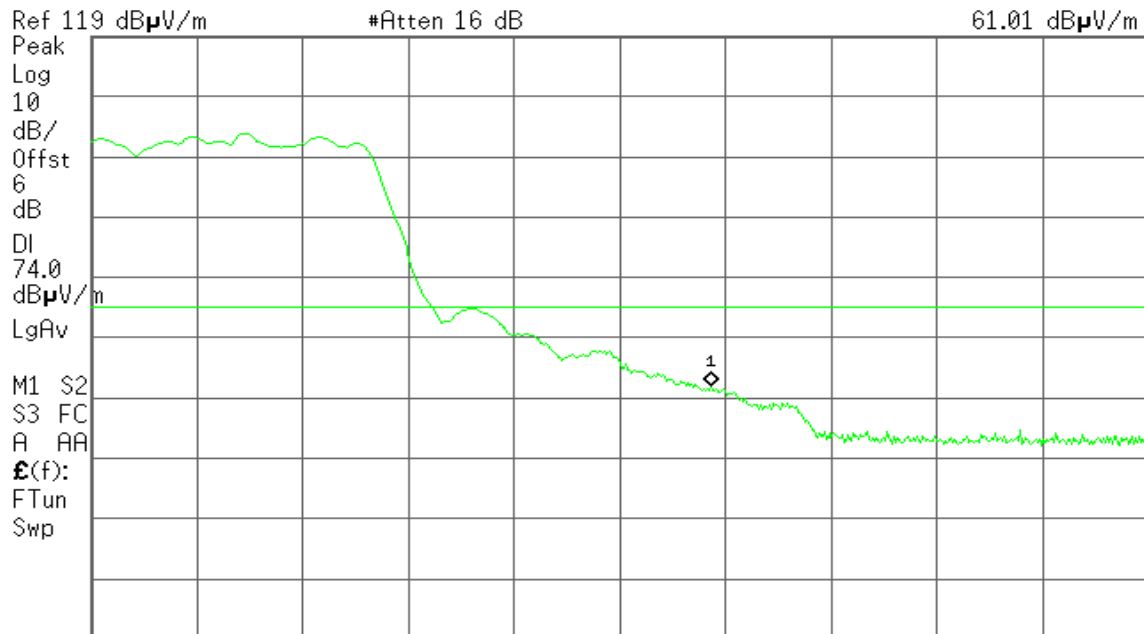
Detector mode: Peak

Polarity: Vertical

Agilent 11:46:40 Jul 9, 2011

R T

Mkr1 2.483 50 GHz
61.01 dBμV/m



Start 2.460 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

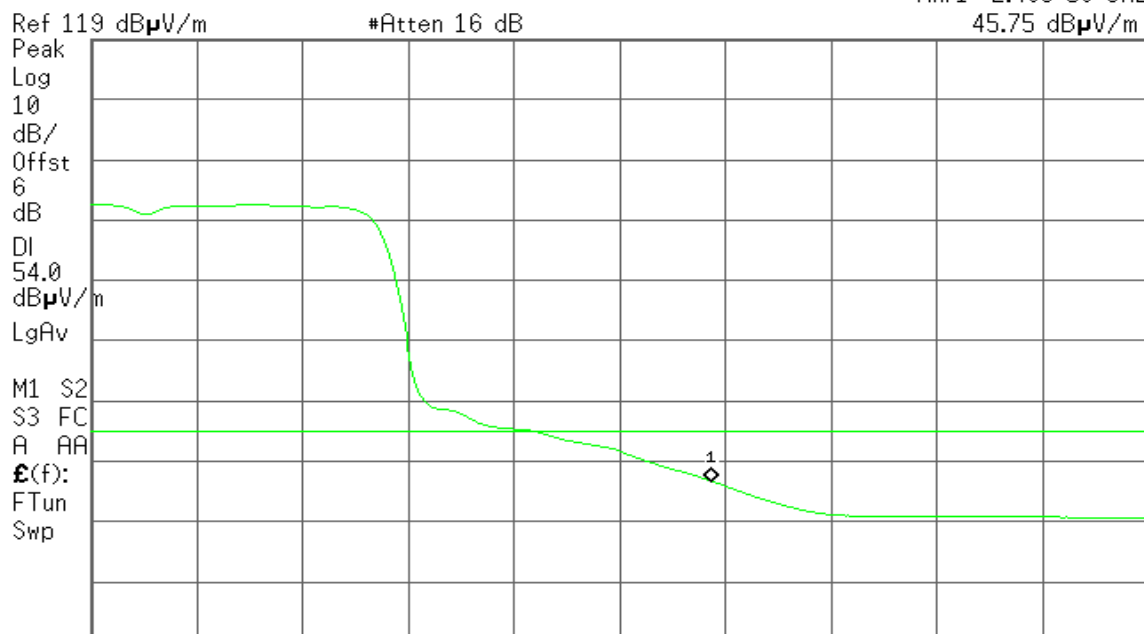
Detector mode: Average

Polarity: Vertical

Agilent 11:47:11 Jul 9, 2011

R T

Mkr1 2.483 50 GHz
45.75 dBμV/m



Start 2.460 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 3.119 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

* Agilent 11:55:26 Jul 9, 2011

T

Mkr1 2.483 50 GHz

66.06 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

* Agilent 11:55:51 Jul 9, 2011

T

Mkr1 2.483 50 GHz

50.54 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

 $\mathcal{E}(f)$:

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

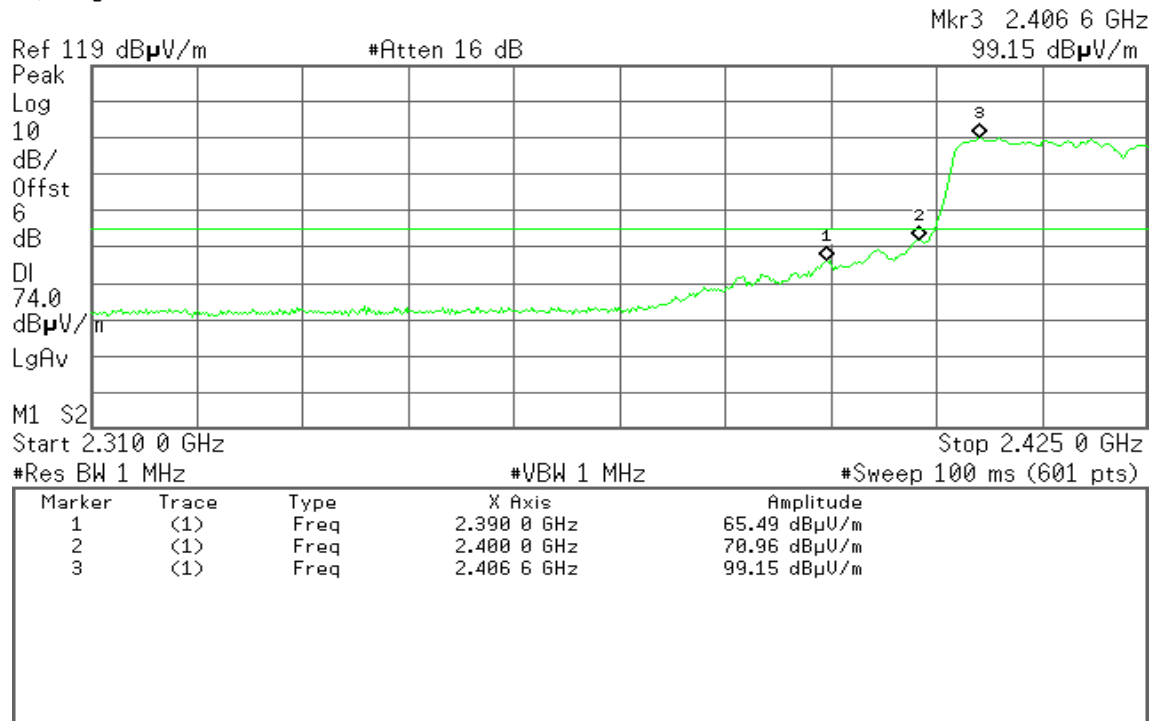
Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)

**Band Edges (IEEE 802.11n HT 40 MHz mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

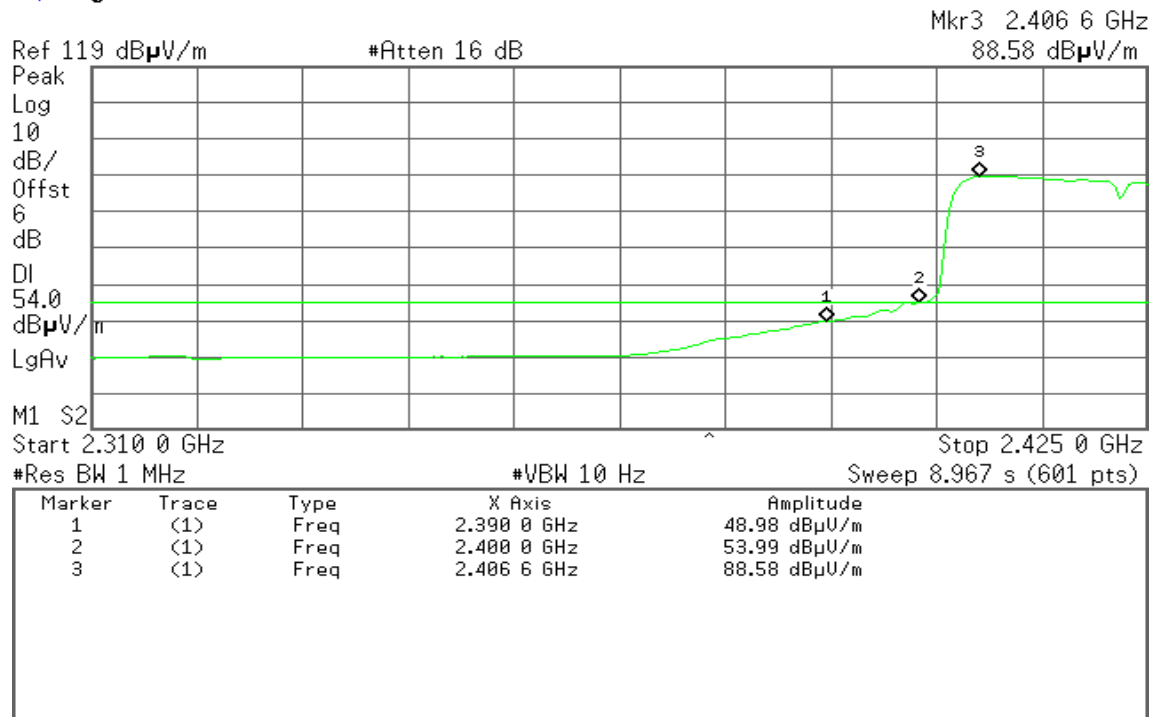
* Agilent 12:06:13 Jul 9, 2011

R T

**Detector mode: Average****Polarity: Vertical**

* Agilent 12:06:46 Jul 9, 2011

R T



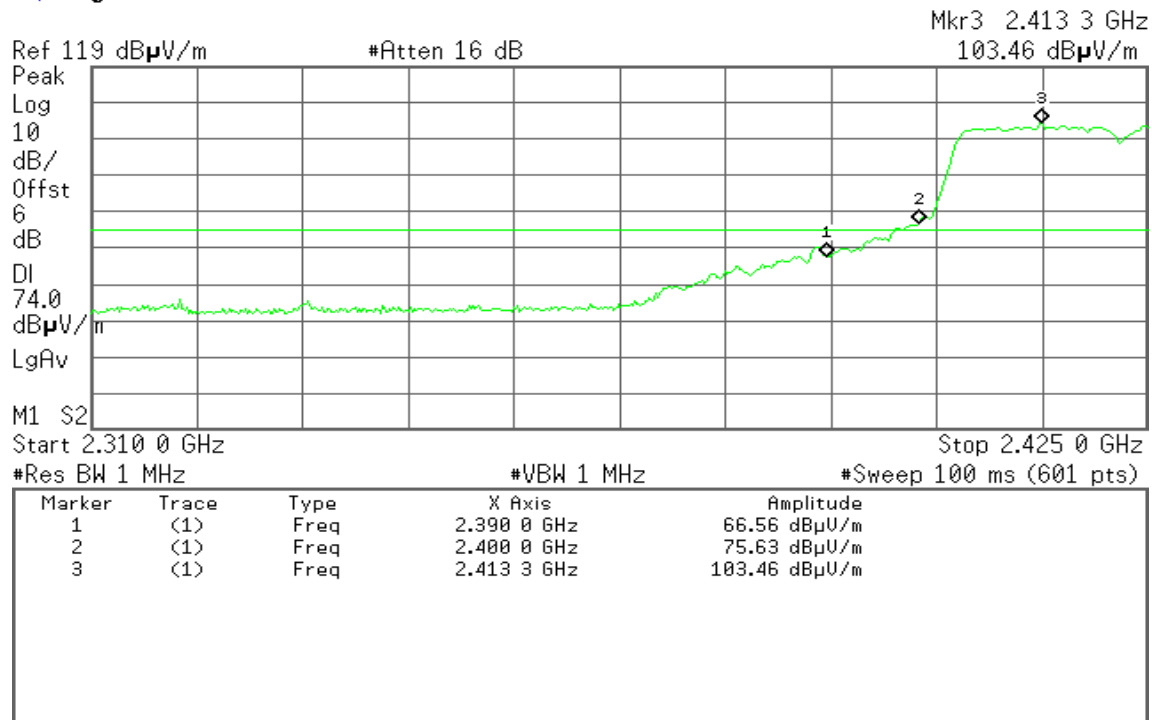


Detector mode: Peak

Polarity: Horizontal

* Agilent 12:01:40 Jul 9, 2011

R T

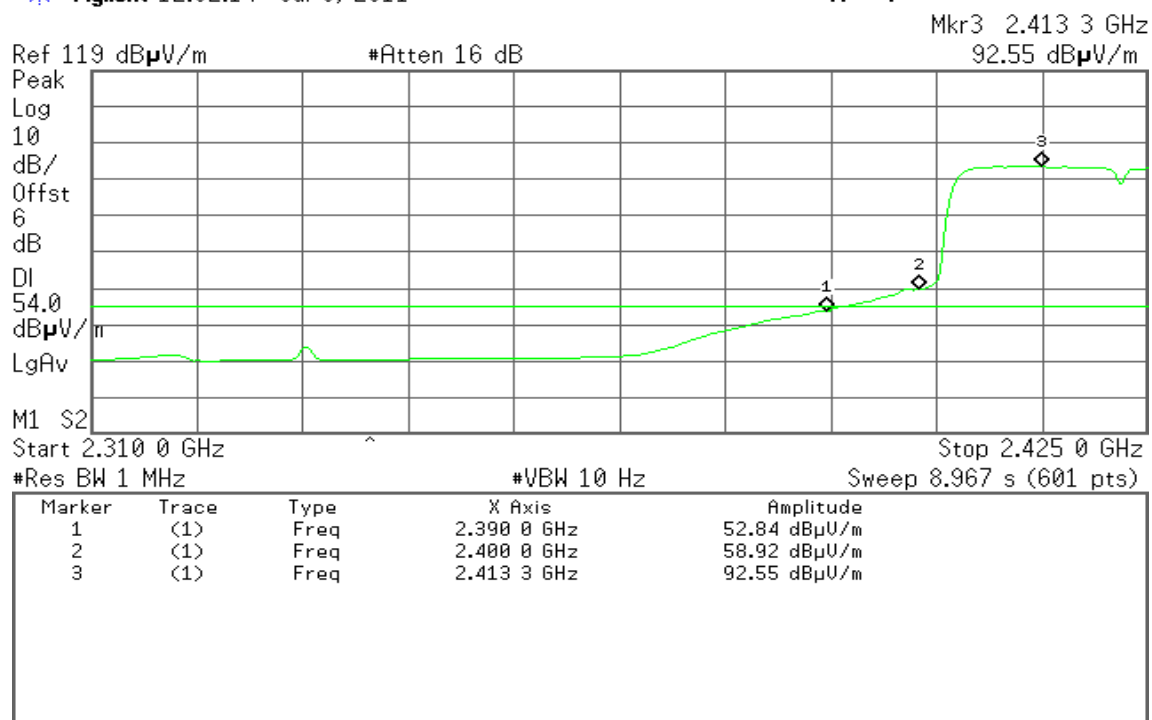


Detector mode: Average

Polarity: Horizontal

* Agilent 12:02:14 Jul 9, 2011

R T





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

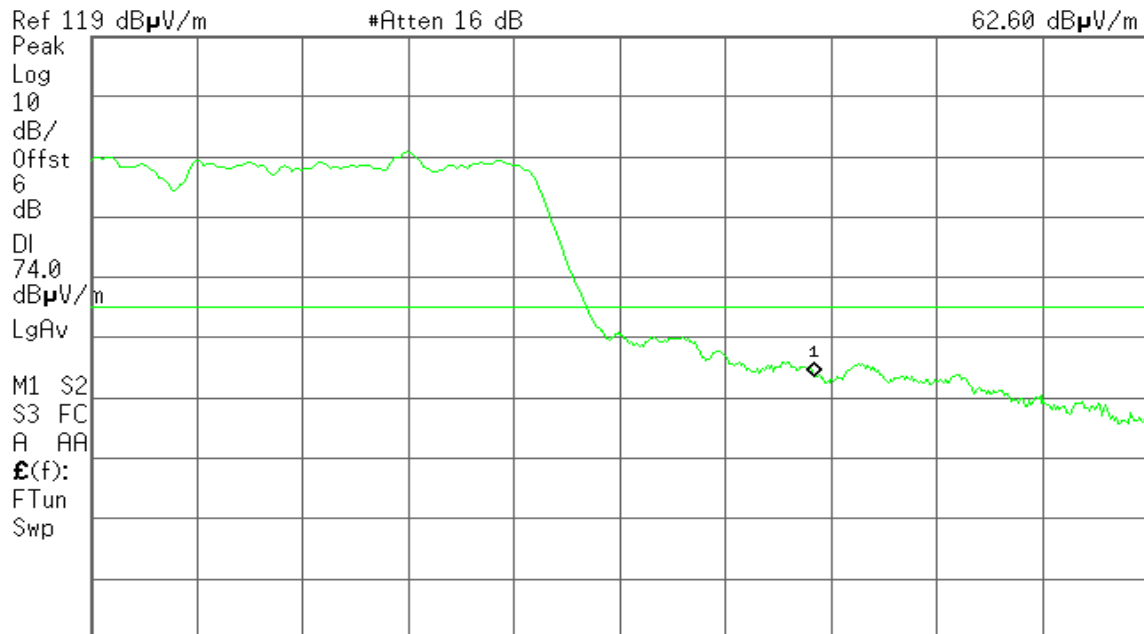
Detector mode: Peak

Polarity: Vertical

Agilent 12:26:52 Jul 9, 2011

R T

Mkr1 2.483 50 GHz
62.60 dB μ V/m



Start 2.448 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 1 MHz #Sweep 100 ms (601 pts)

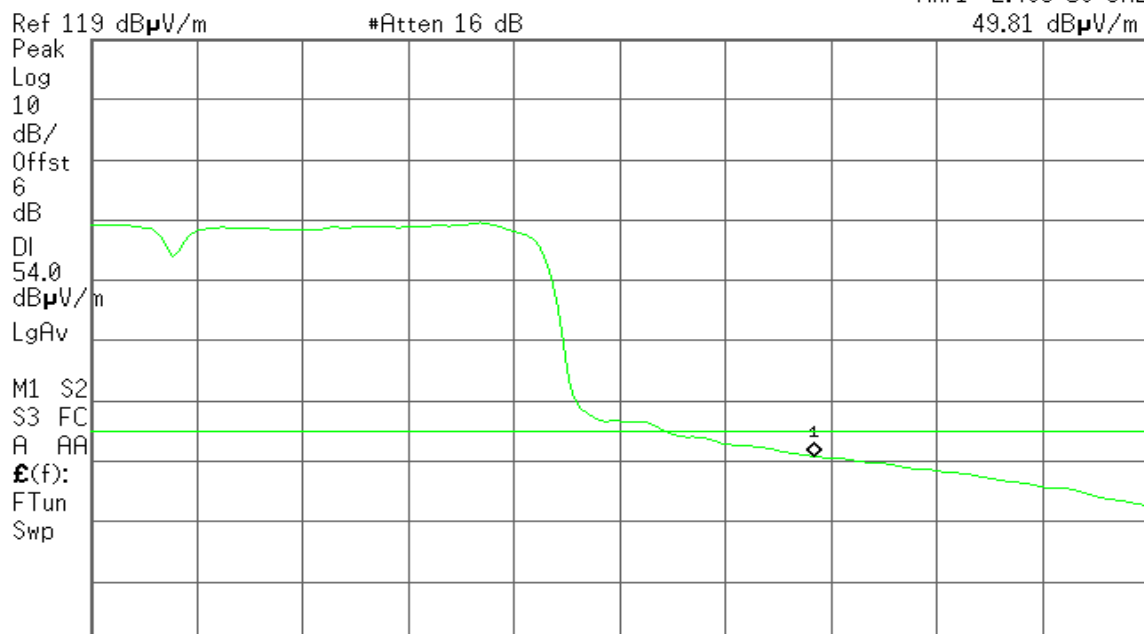
Detector mode: Average

Polarity: Vertical

Agilent 12:27:20 Jul 9, 2011

R T

Mkr1 2.483 50 GHz
49.81 dB μ V/m



Start 2.448 00 GHz Stop 2.500 00 GHz
#Res BW 1 MHz #VBW 10 Hz Sweep 4.055 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent 12:19:04 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

68.36 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.448 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent 12:20:53 Jul 9, 2011

R T

Mkr1 2.483 50 GHz

53.35 dB μ V/mRef 119 dB μ V/m

#Atten 16 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V/m

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.448 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

Sweep 4.055 s (601 pts)

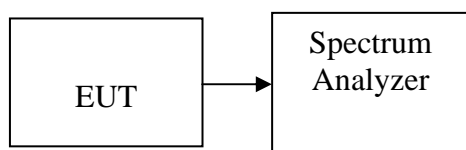


7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

1. According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
2. According to §15.247(f), the digital modulation operation of the hybrid system, with the frequency hopping turned off, shall comply with the power density requirements of paragraph (d) of this section.

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 = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep time = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

**Test Data****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-13.42	8.00	PASS
Mid	2442	-12.76		PASS
High	2462	-12.77		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Test Result
Low	2412	-9.95	8.00	PASS
Mid	2442	-9.68		PASS
High	2462	-9.62		PASS

Test mode: IEEE 802.11n HT 20 MHz mode

Channel	Frequency (MHz)	Chain 0 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Chain 2 PPSSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-14.61	-14.71	-14.30	-9.77	7.23	PASS
Mid	2442	-14.13	-14.41	-14.18	-9.47		PASS
High	2462	-13.67	-15.03	-14.89	-9.71		PASS

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 PPSSD (dBm)	Chain 1 PPSSD (dBm)	Chain 2 PPSSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-14.60	-17.89	-16.66	-11.40	7.23	PASS
Mid	2442	-16.28	-18.40	-17.15	-12.42		PASS
High	2452	-16.16	-17.74	-18.17	-14.04		PASS

Remark:

1. Total PPSSD (dBm) = $10 \cdot \log(10^{(\text{Chain 0 PPSSD} / 10)} + 10^{(\text{Chain 1 PPSSD} / 10)} + 10^{(\text{Chain 2 PPSSD} / 10)})$
2. The maximum antenna gain is 6.77 dBi; therefore the reduction due to antenna gain is 0.77 dBi, so the limit is 7.23dBm.

**Test mode: IEEE 802.11a mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	-20.37	8.00	PASS
Mid	5785	-20.49		PASS
High	5825	-20.14		PASS

Test mode: IEEE 802.11n HT 20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5745	-20.03	-23.23	-23.50	-17.18	8.00	PASS
Mid	5785	-20.77	-24.01	-22.73	-17.53		PASS
High	5825	-21.60	-21.31	-22.03	-16.87		PASS

Test mode: IEEE 802.11n HT 40 MHz mode

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	Chain 2 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	5755	-21.38	-23.50	-24.37	-18.12	8.00	PASS
High	5795	-24.53	-21.93	-23.64	-18.46		PASS

Remark:

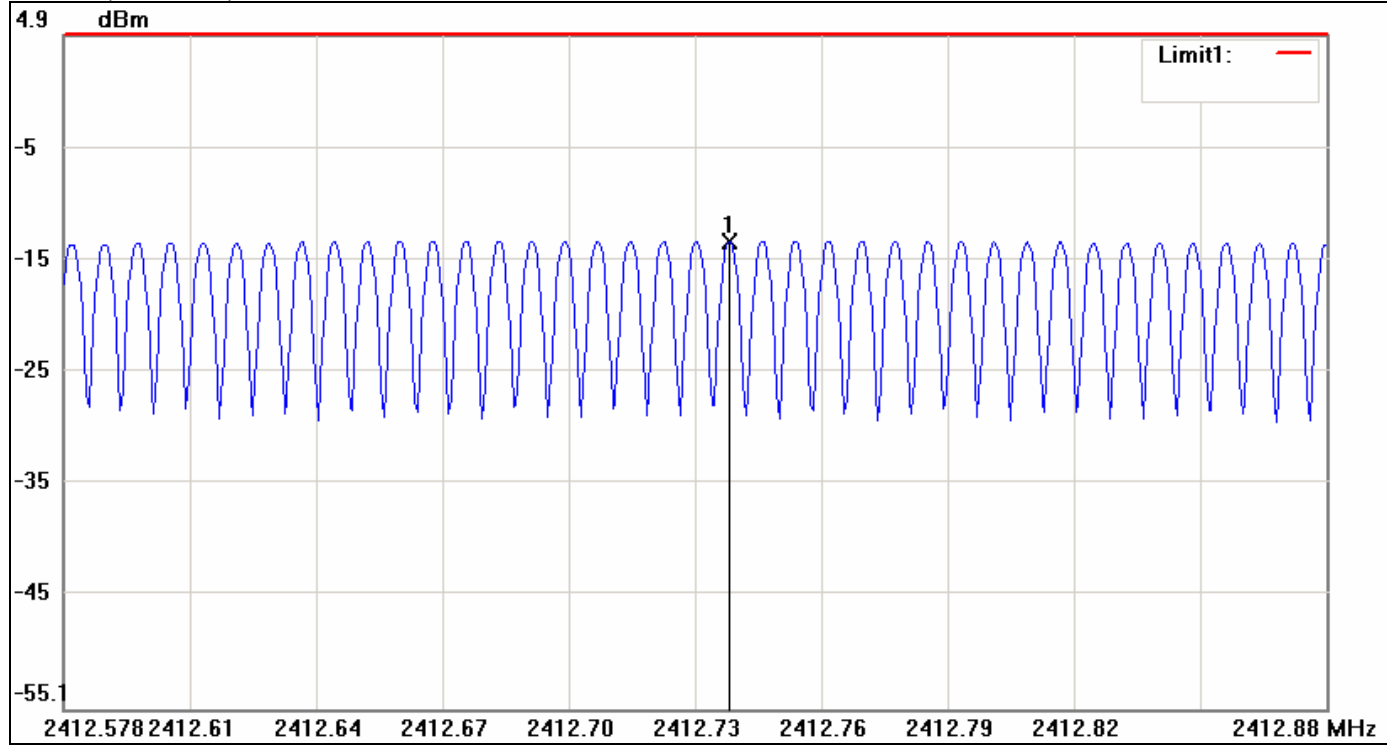
1. Total PSD (dBm) = $10 \cdot \log(10^{(\text{Chain 0 PSD} / 10)} + 10^{(\text{Chain 1 PSD} / 10)} + 10^{(\text{Chain 2 PSD} / 10)})$



Test Plot

IEEE 802.11b mode

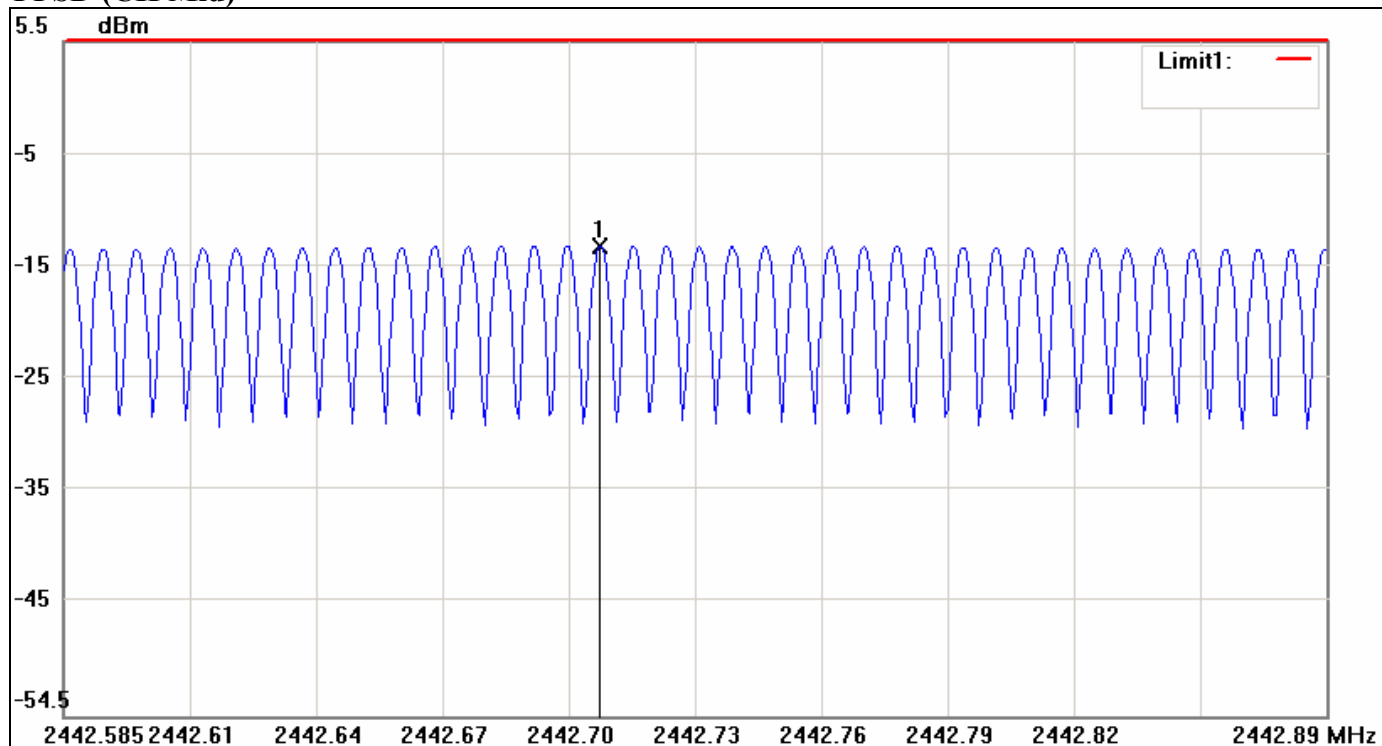
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2412.7360	-13.42	8.00	-21.42



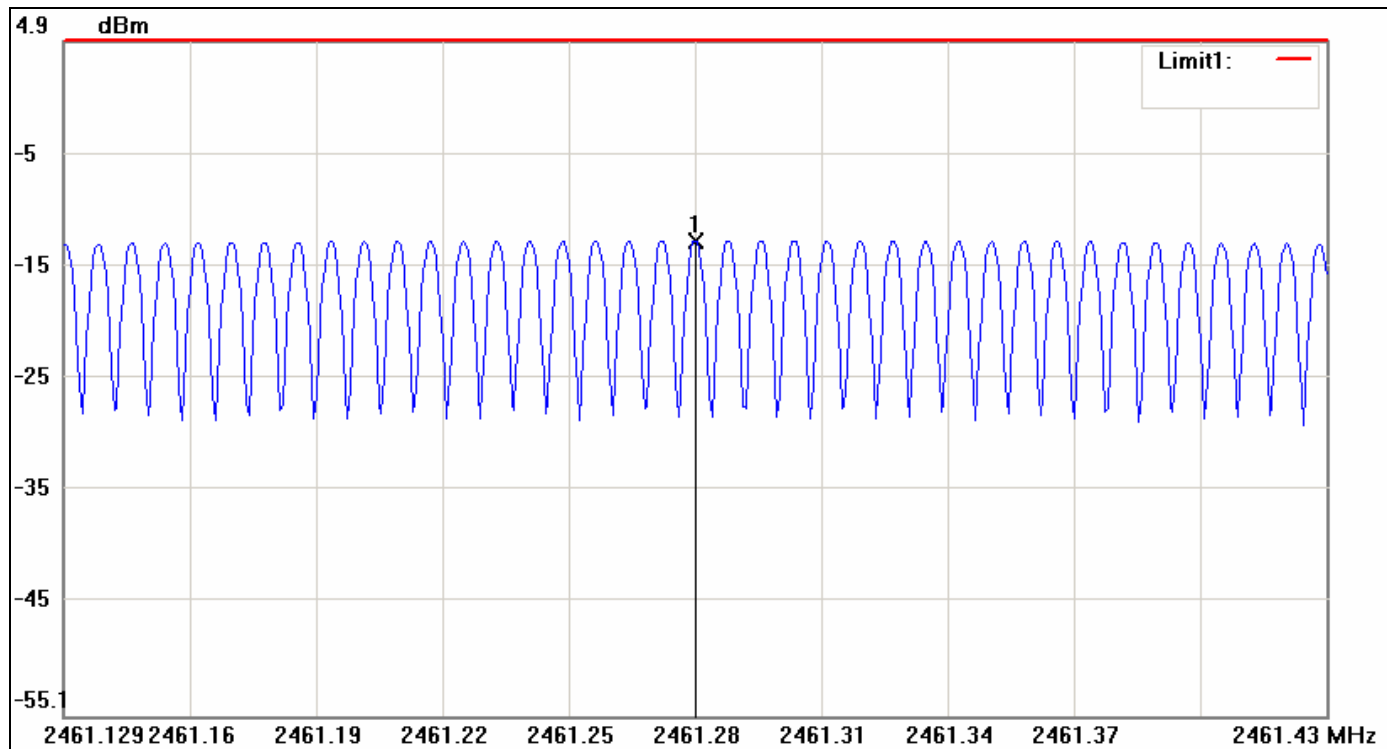
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2442.7122	-12.76	8.00	-20.76



PPSD (CH High)

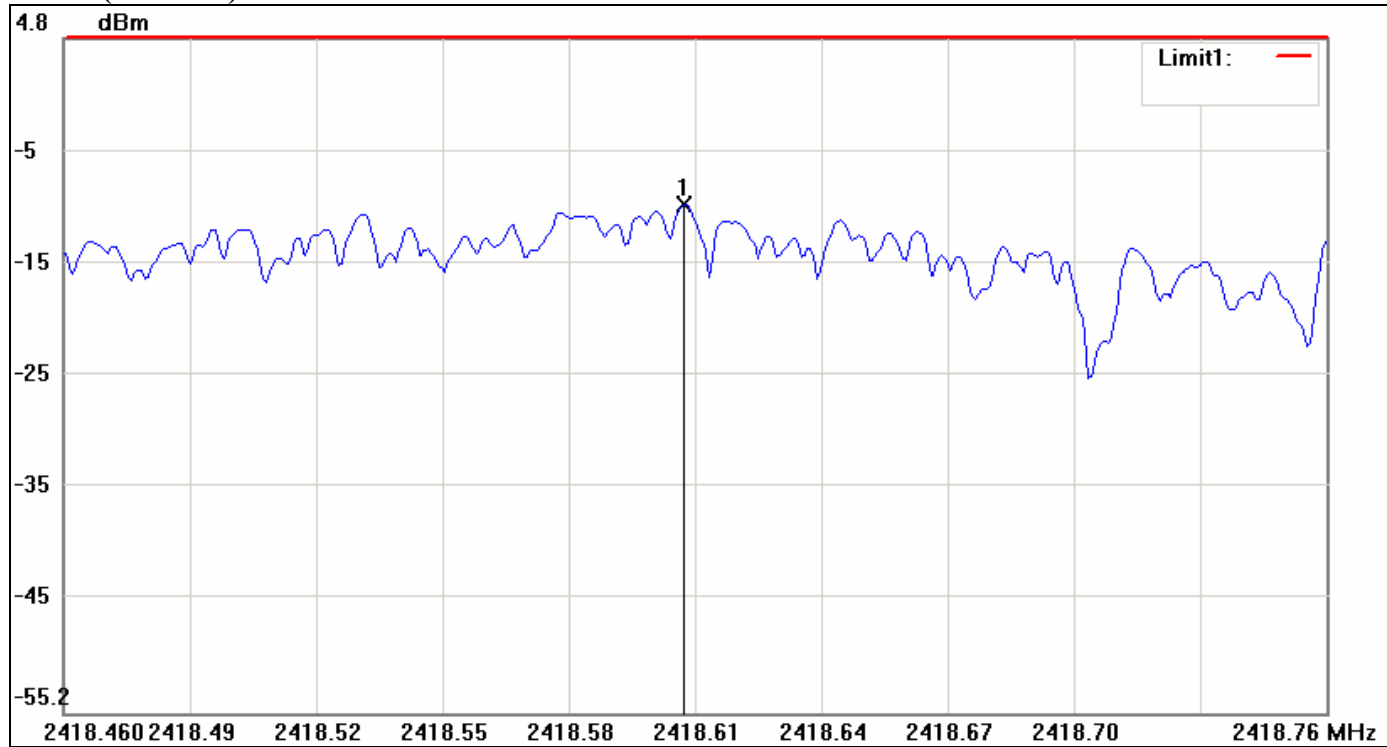


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2461.2790	-12.77	8.00	-20.77



IEEE 802.11g mode

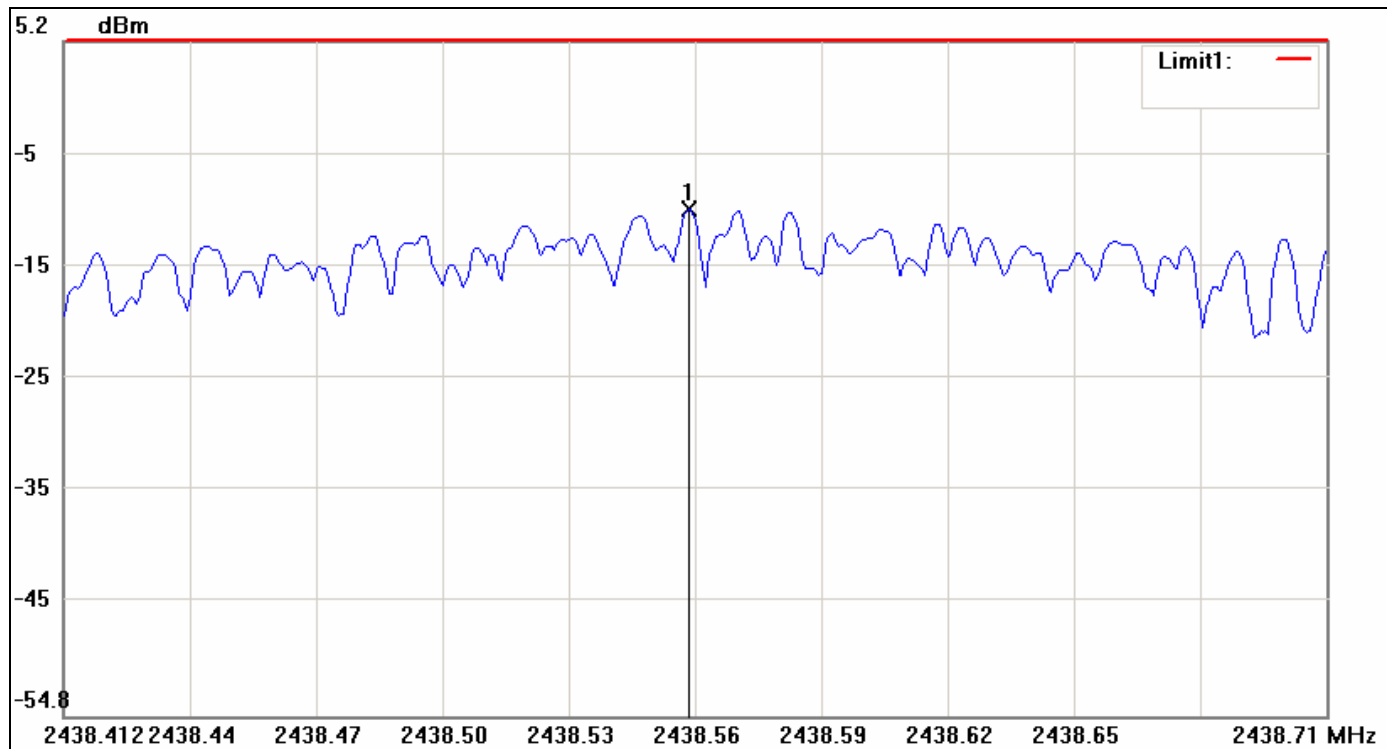
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2418.6072	-9.95	8.00	-17.95



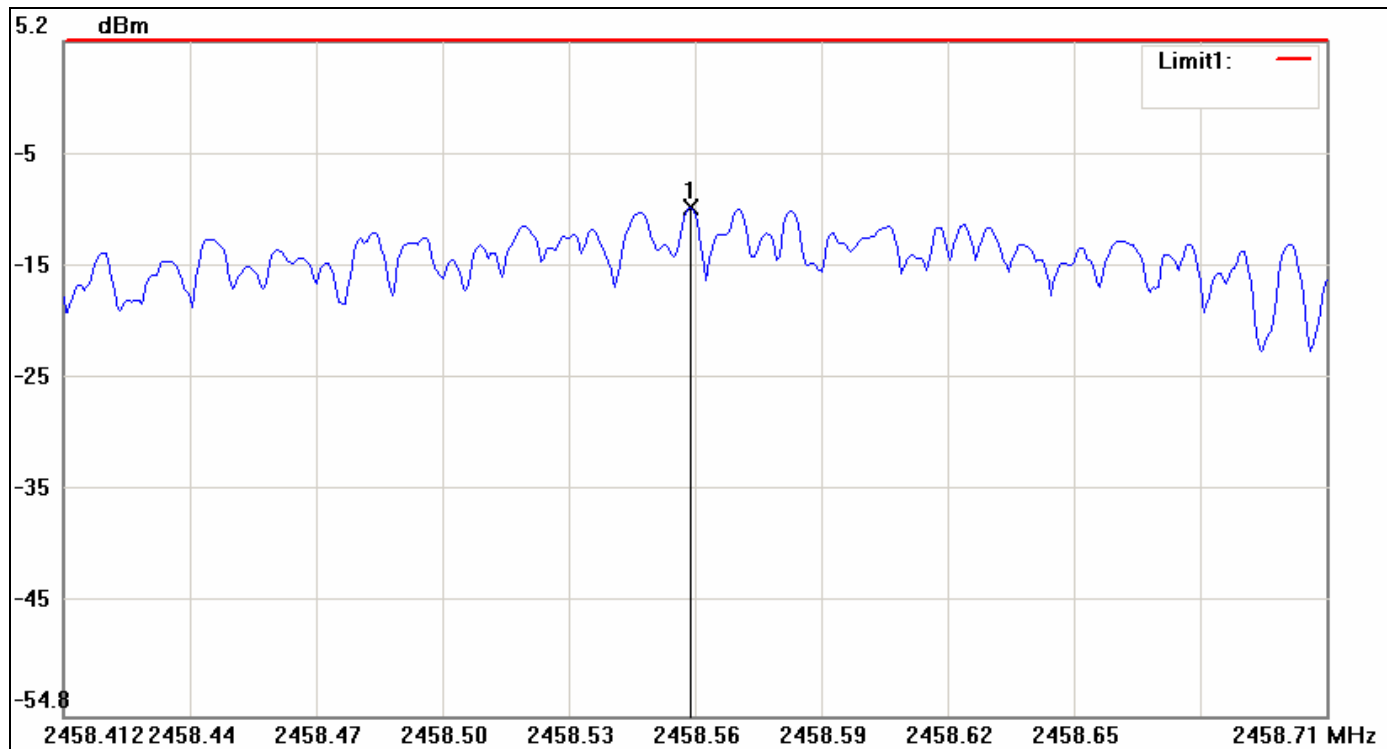
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2438.5601	-9.68	8.00	-17.68



PPSD (CH High)

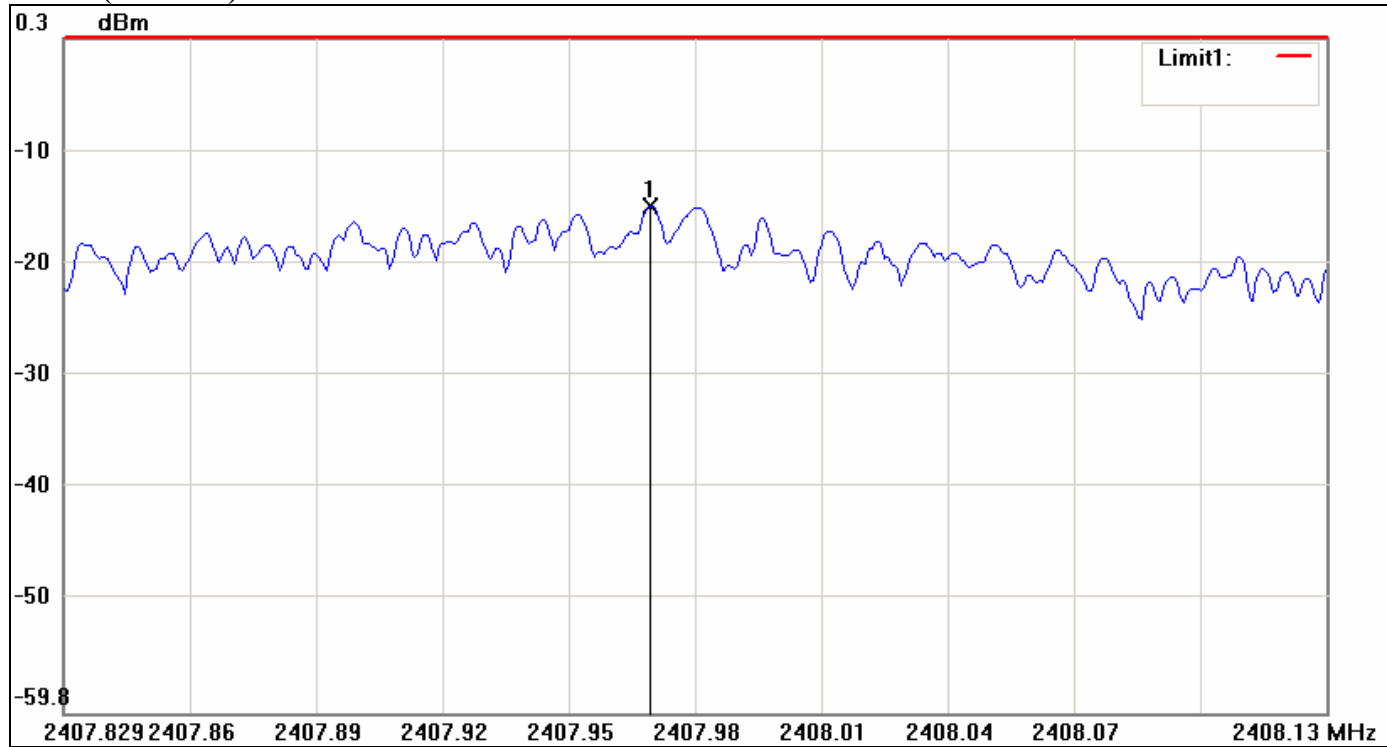


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2458.5605	-9.62	8.00	-17.62



IEEE 802.11n HT 20 MHz mode / Chain 0

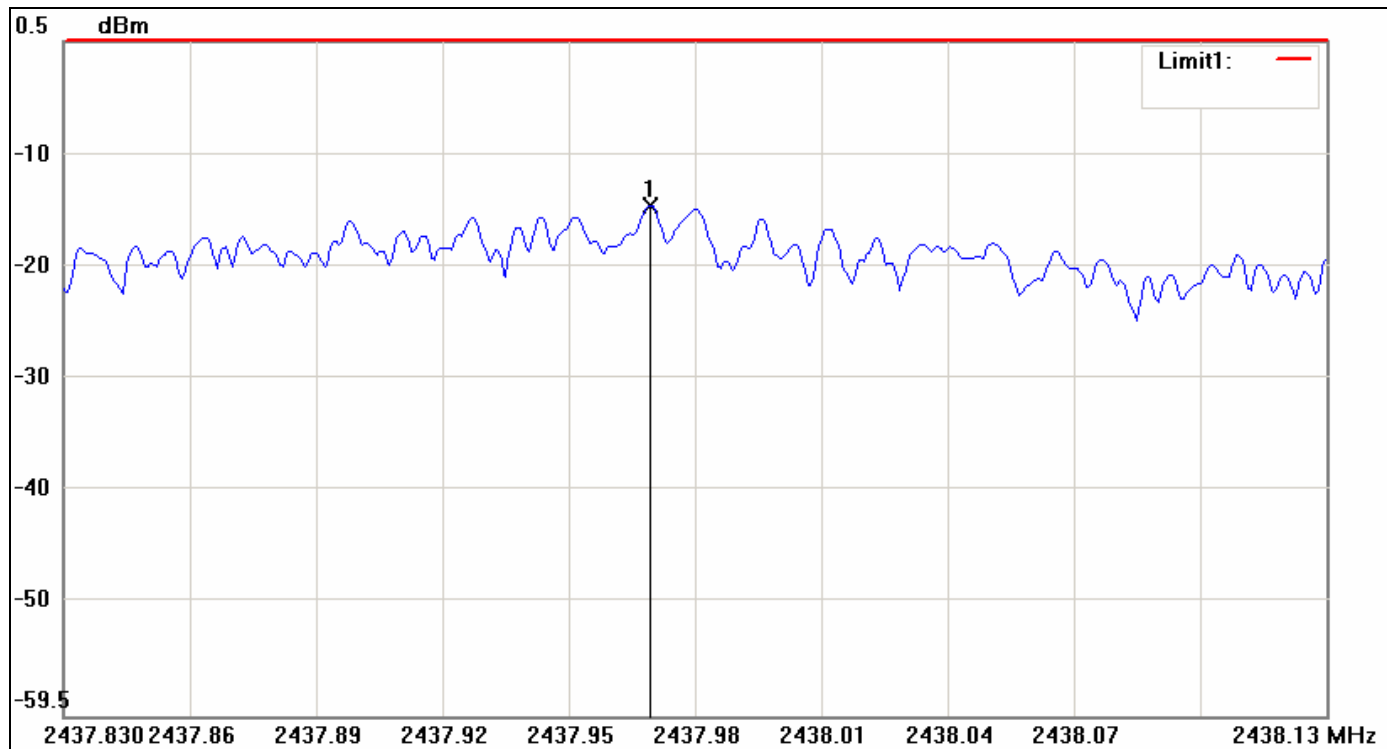
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2407.9687	-14.61	8.00	-22.61



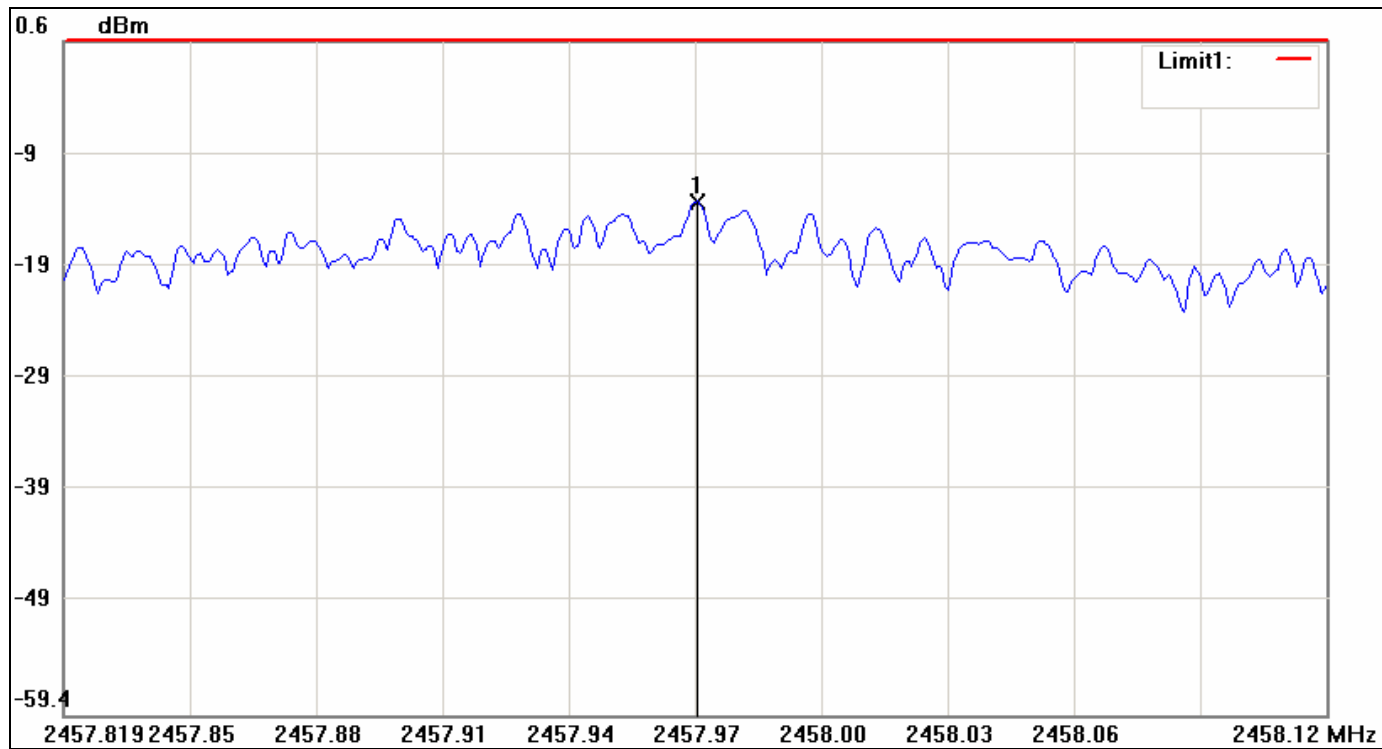
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2437.9693	-14.13	8.00	-22.13



PPSD (CH High)

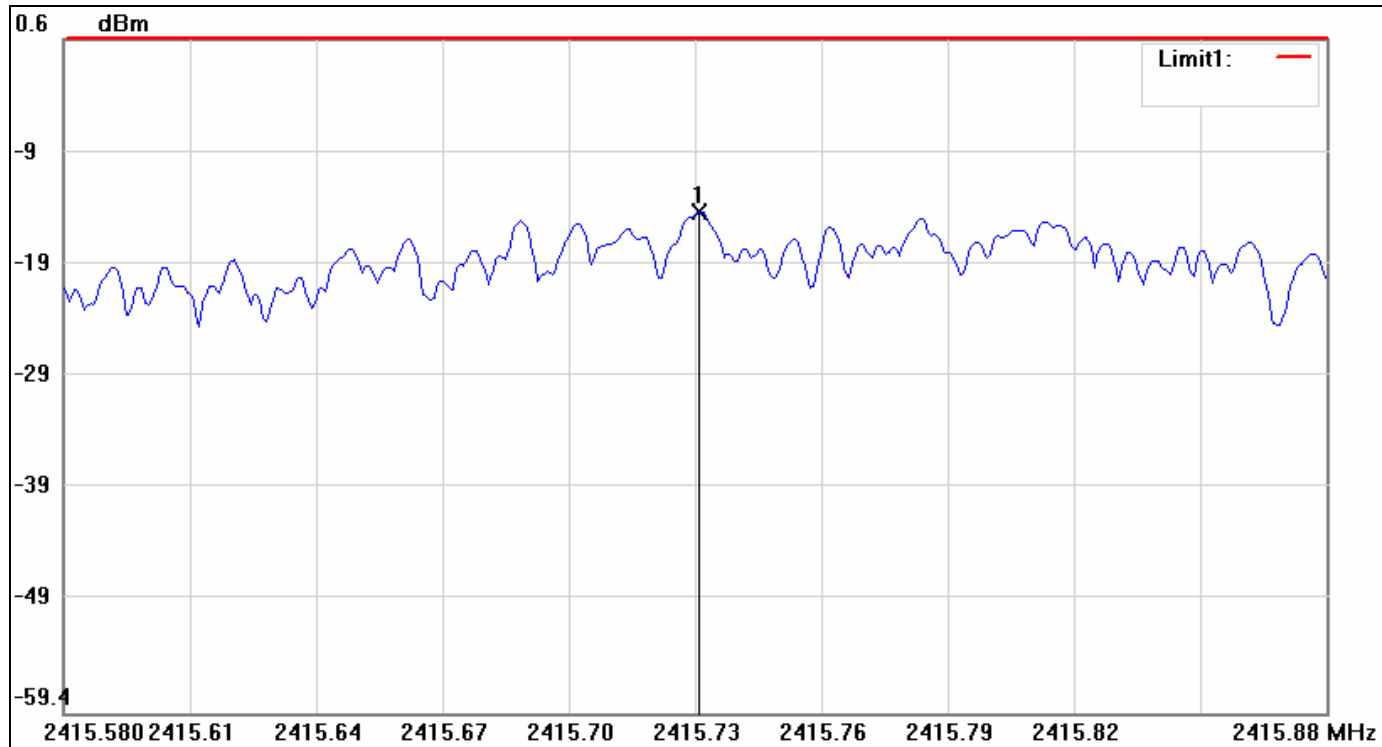


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2457.9691	-13.67	8.00	-21.67



IEEE 802.11n HT 20 MHz mode / Chain 1

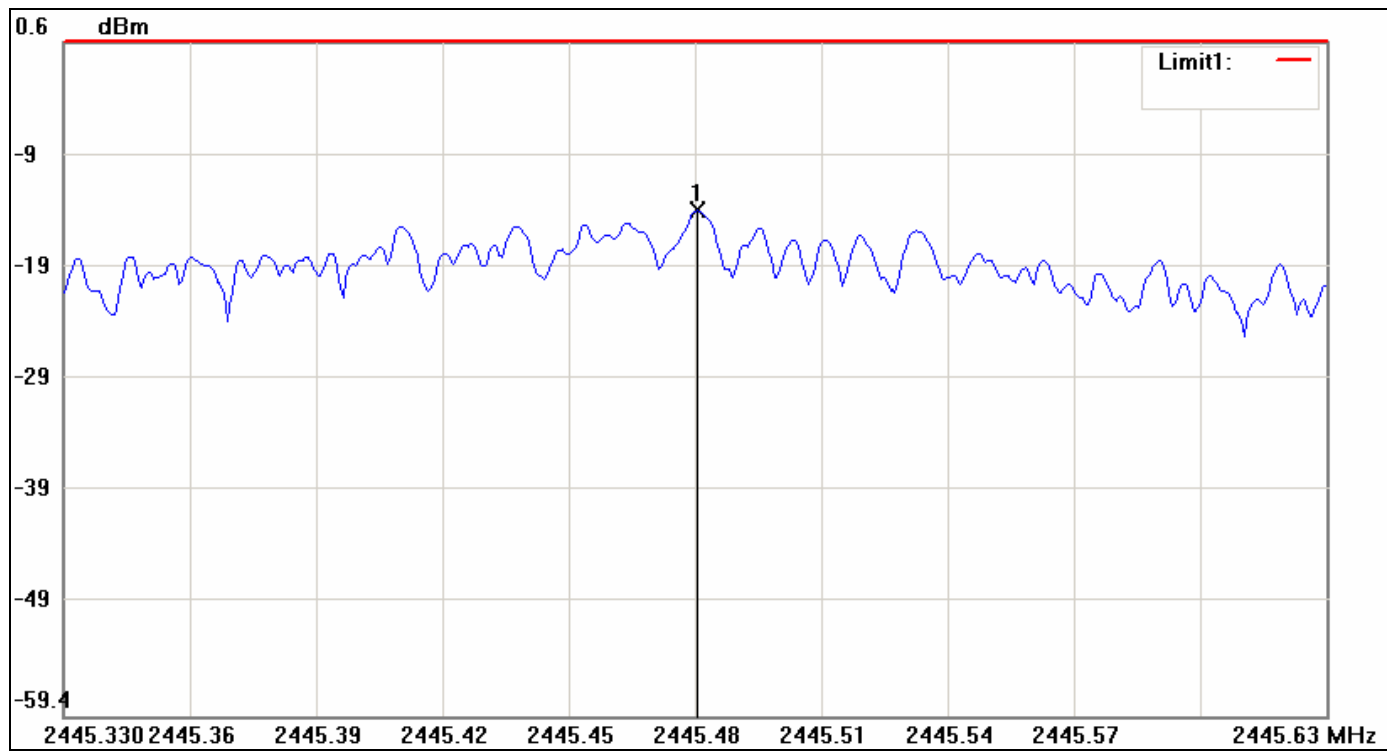
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2415.7306	-14.71	8.00	-22.71



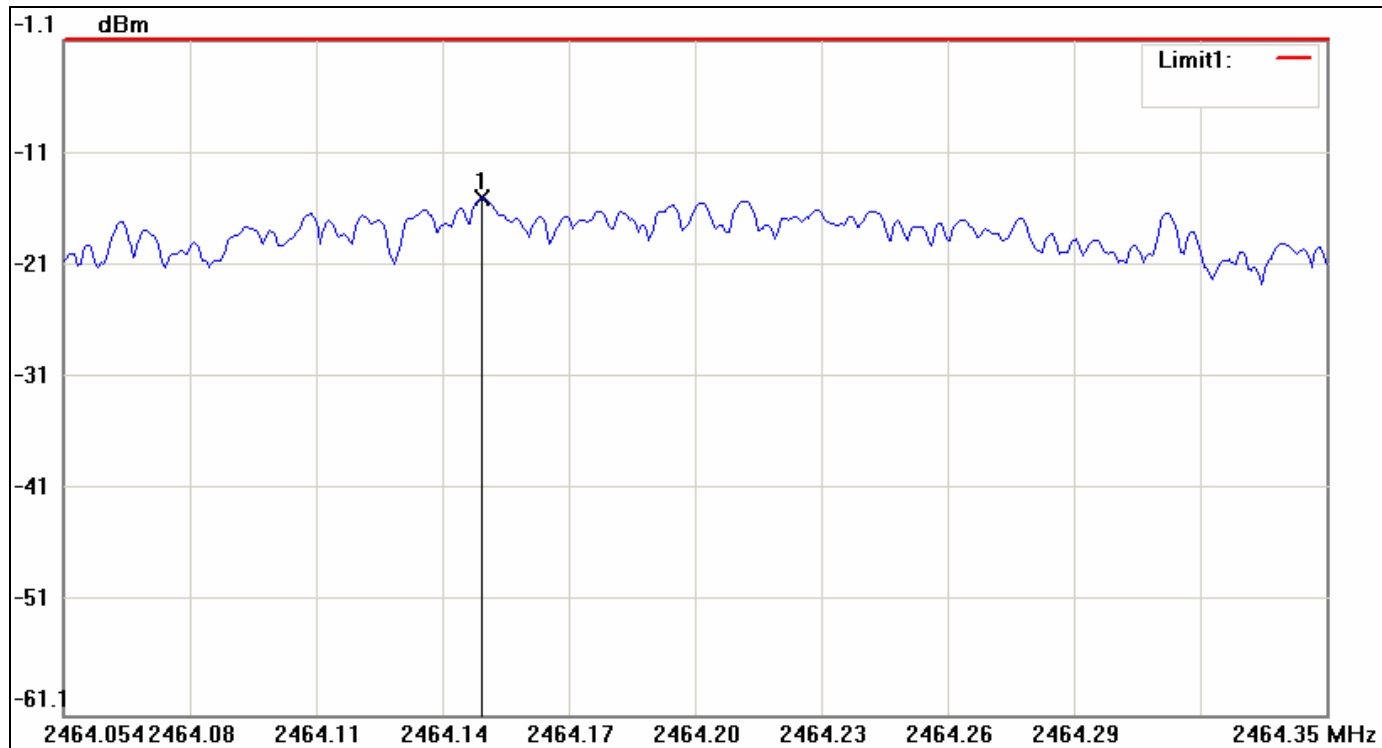
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2445.4806	-14.41	8.00	-22.41



PPSD (CH High)

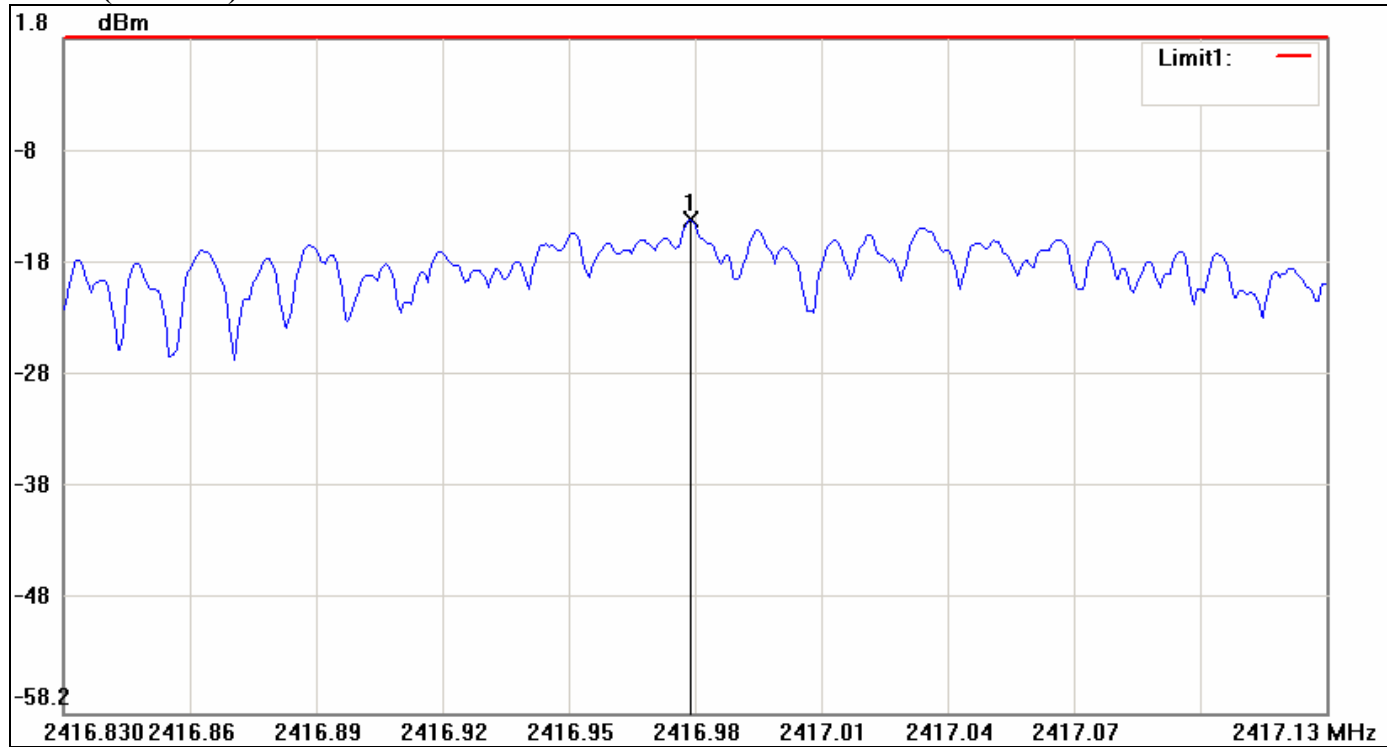


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2464.1535	-15.03	8.00	-23.03



IEEE 802.11n HT 20 MHz mode / Chain 2

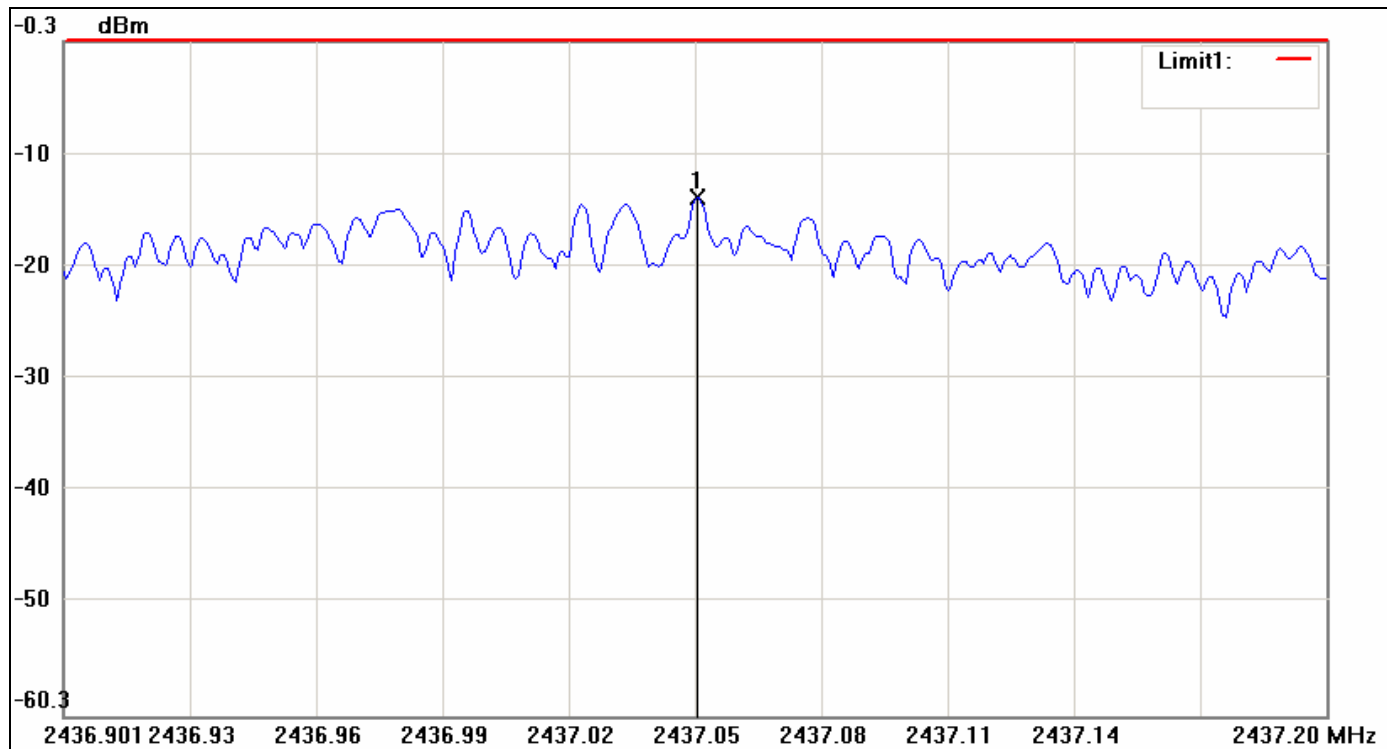
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2416.9790	-14.30	8.00	-22.30



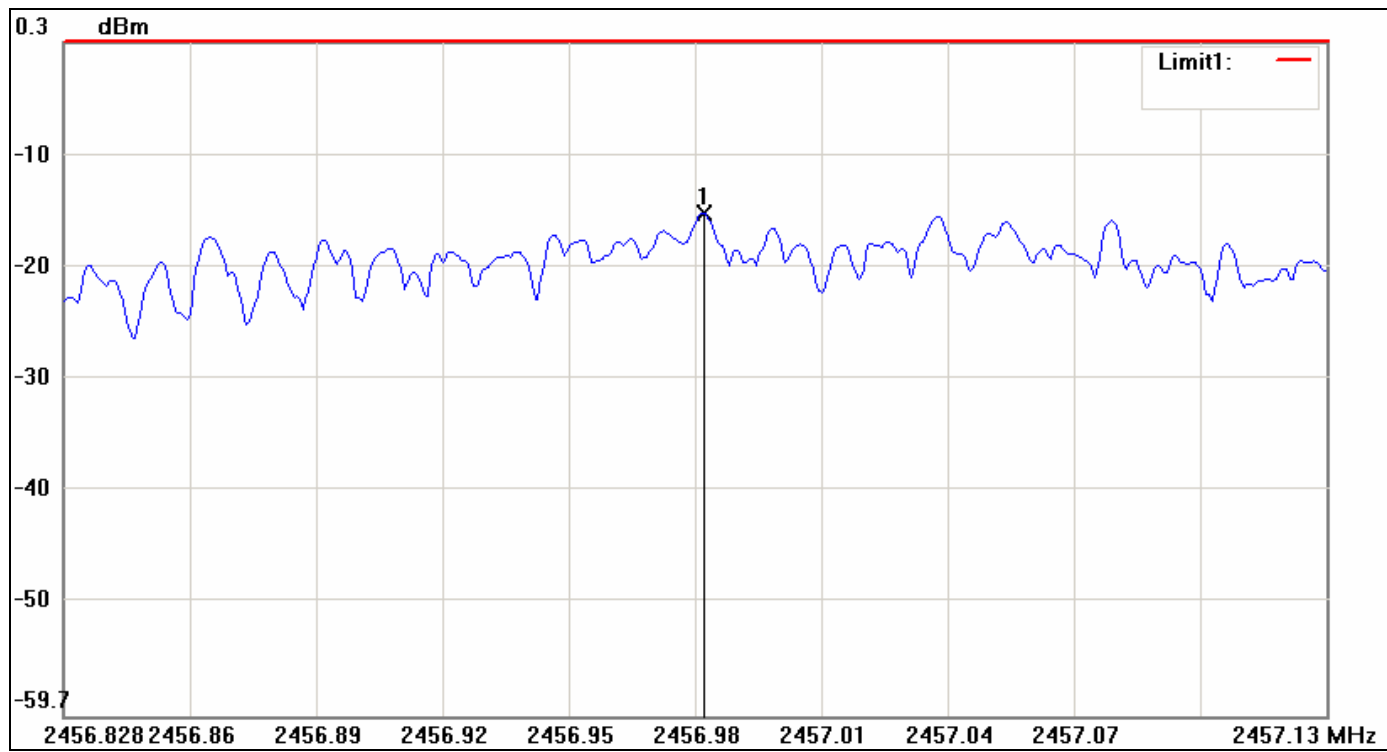
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2437.0512	-14.18	8.00	-22.18



PPSD (CH High)

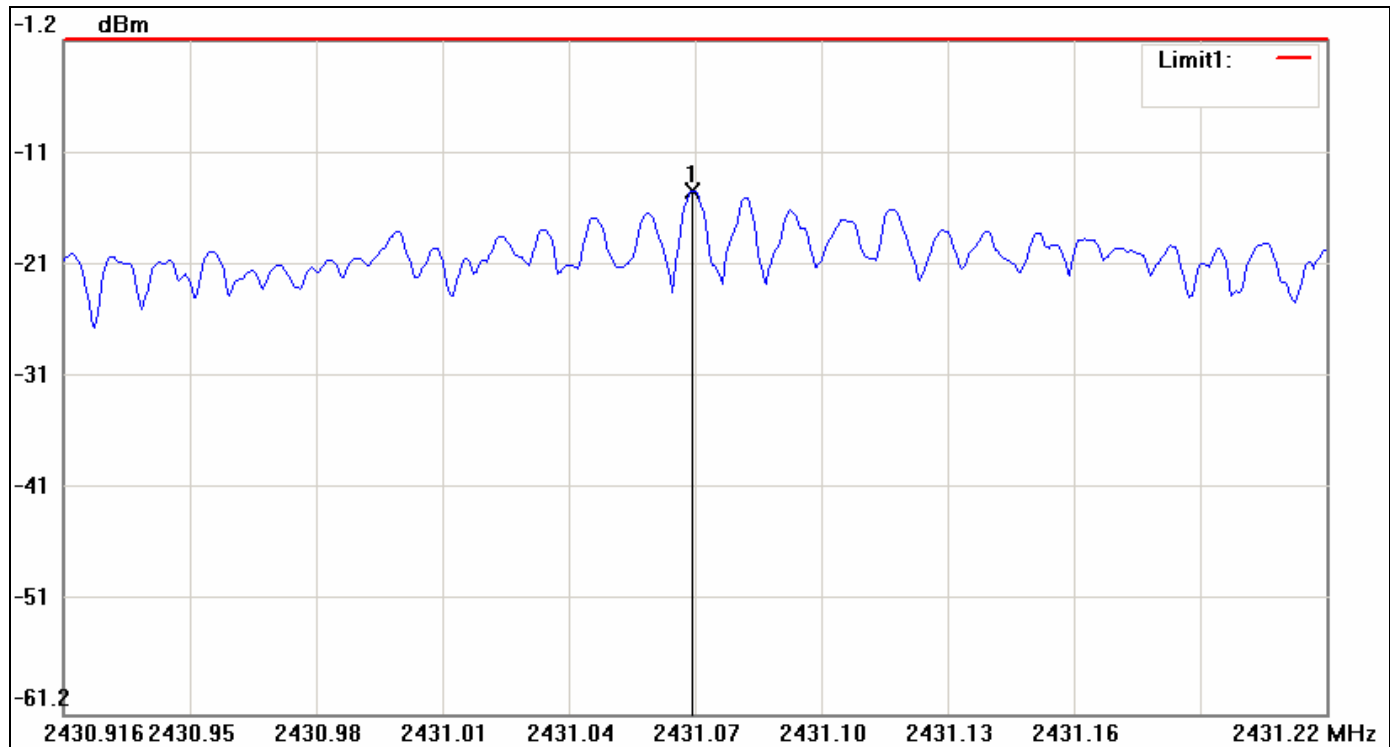


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2456.9800	-14.89	8.00	-22.89



IEEE 802.11n HT 40 MHz mode / Chain 0

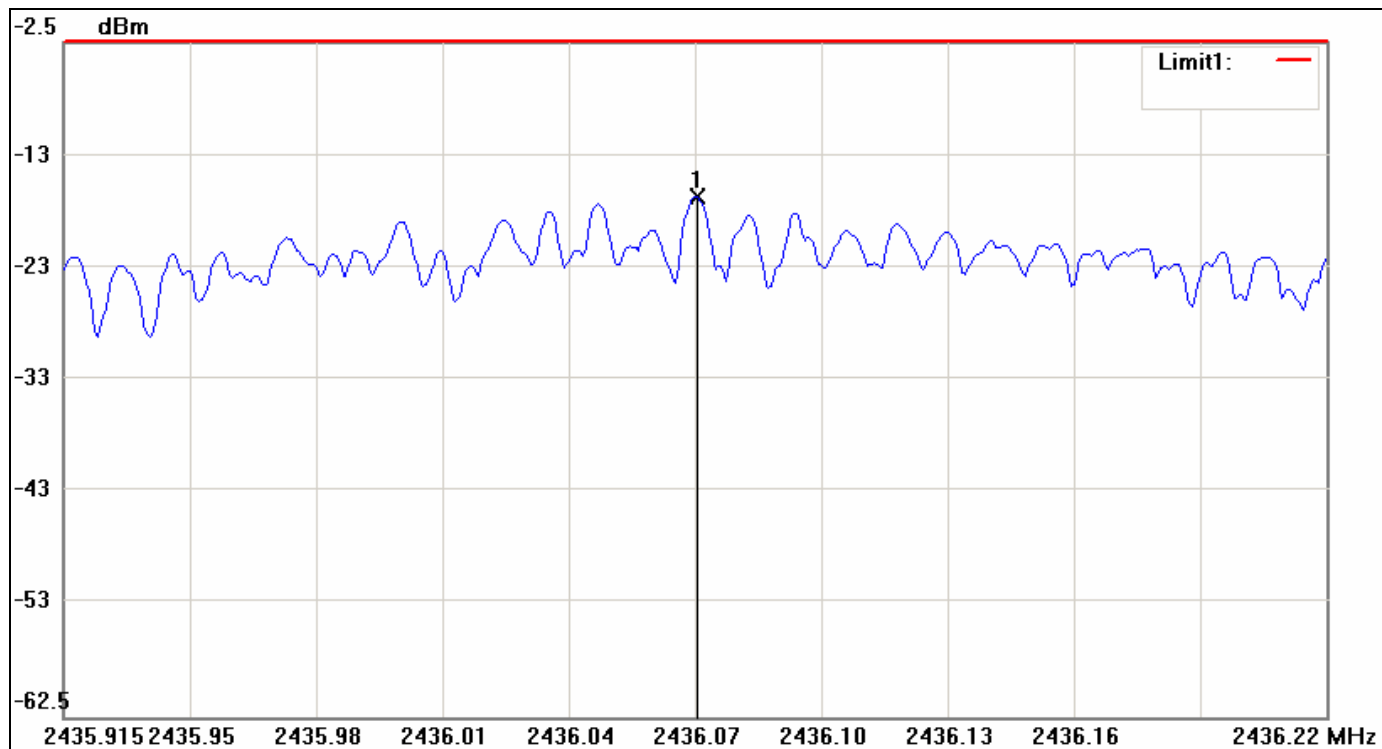
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2431.0657	-14.60	8.00	-22.60



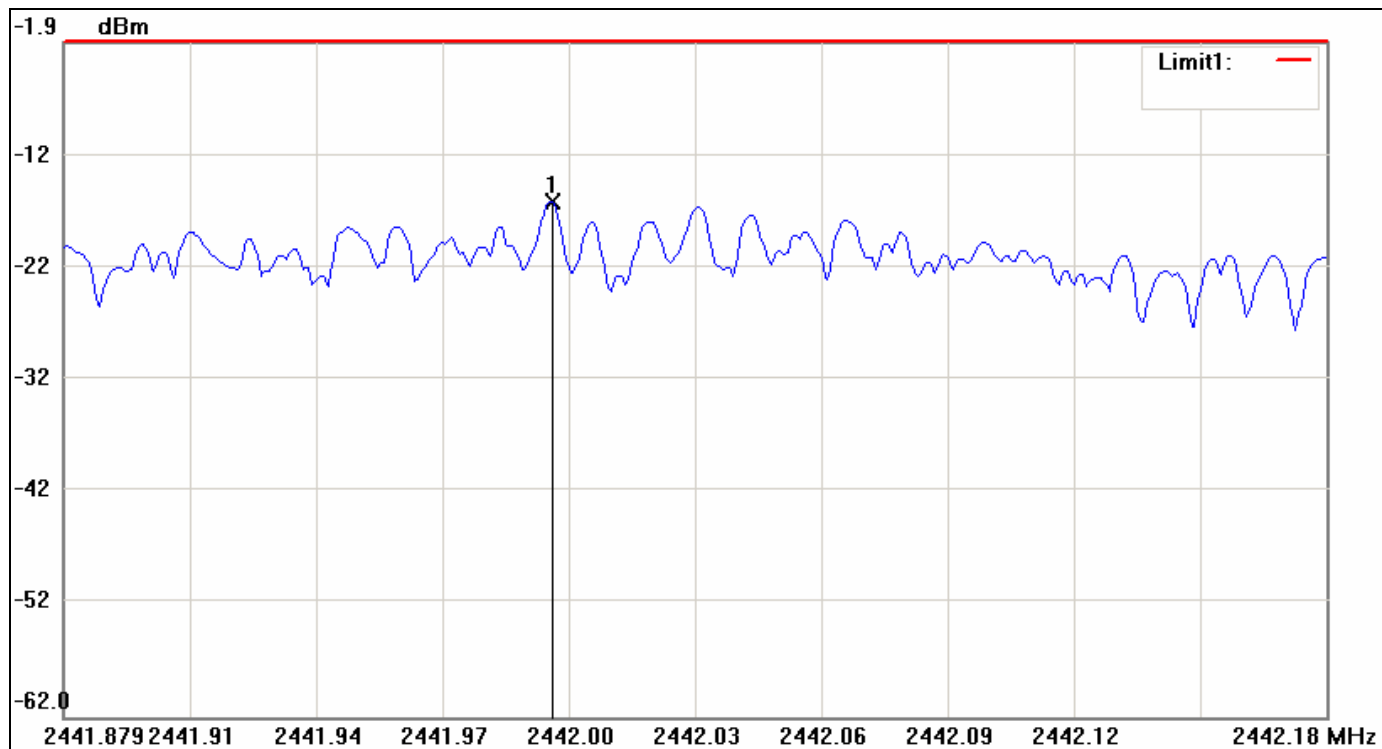
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2436.0656	-16.28	8.00	-24.28



PPSD (CH High)

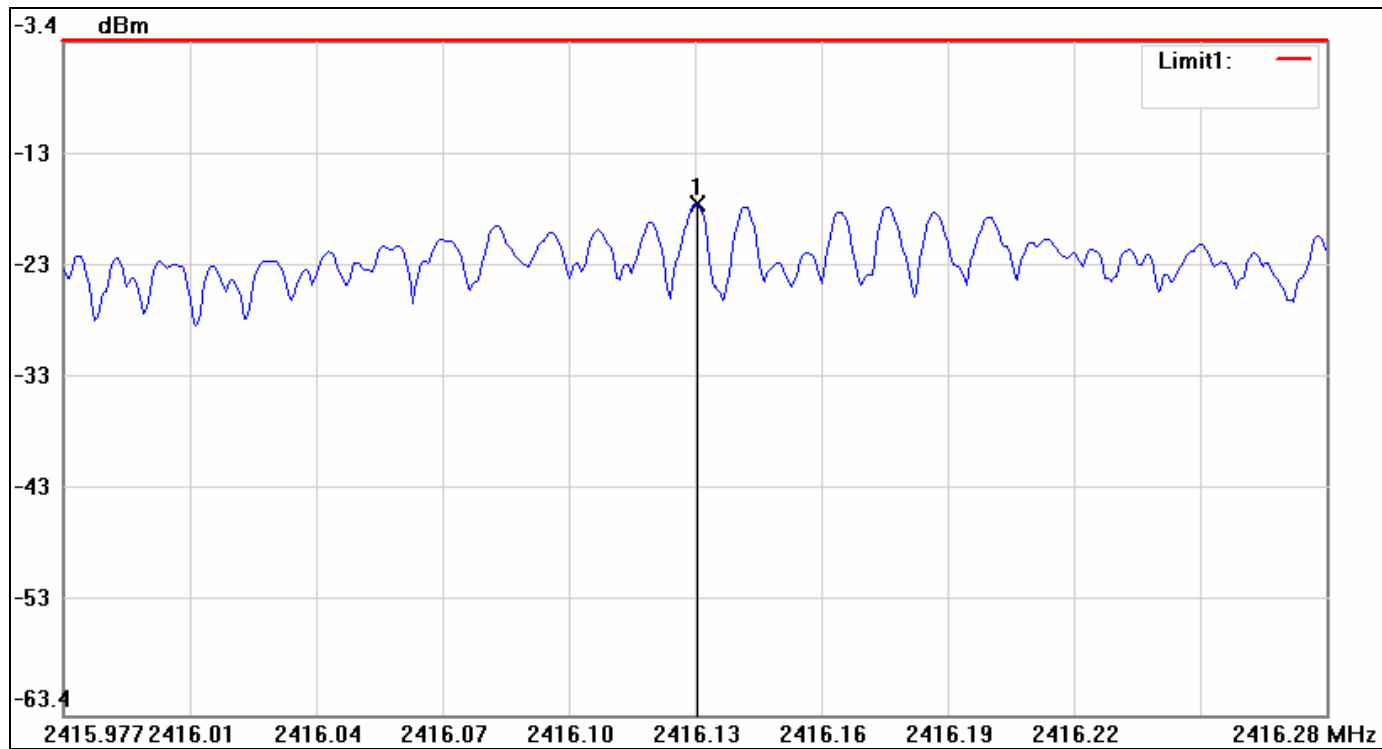


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2441.9953	-16.16	8.00	-24.16



IEEE 802.11n HT 40 MHz mode / Chain 1

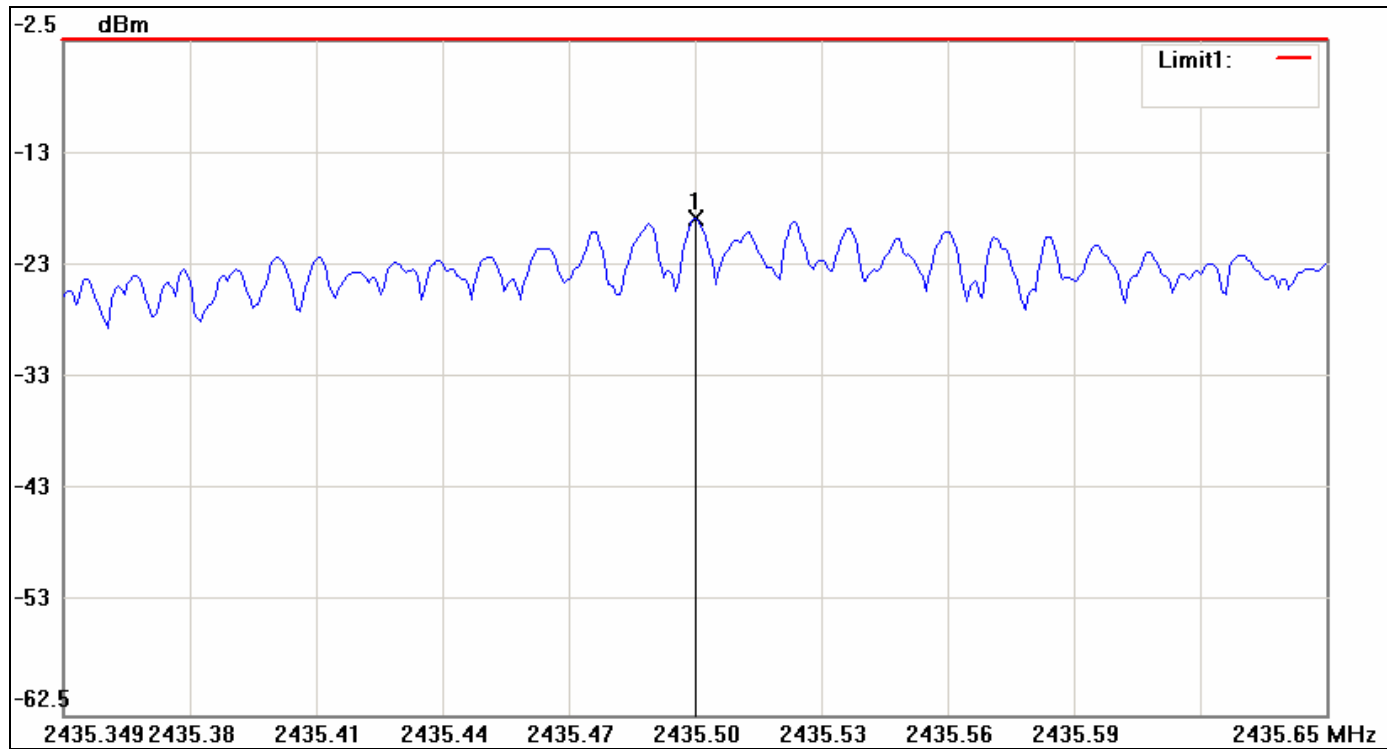
PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2416.1275	-17.89	8.00	-25.89



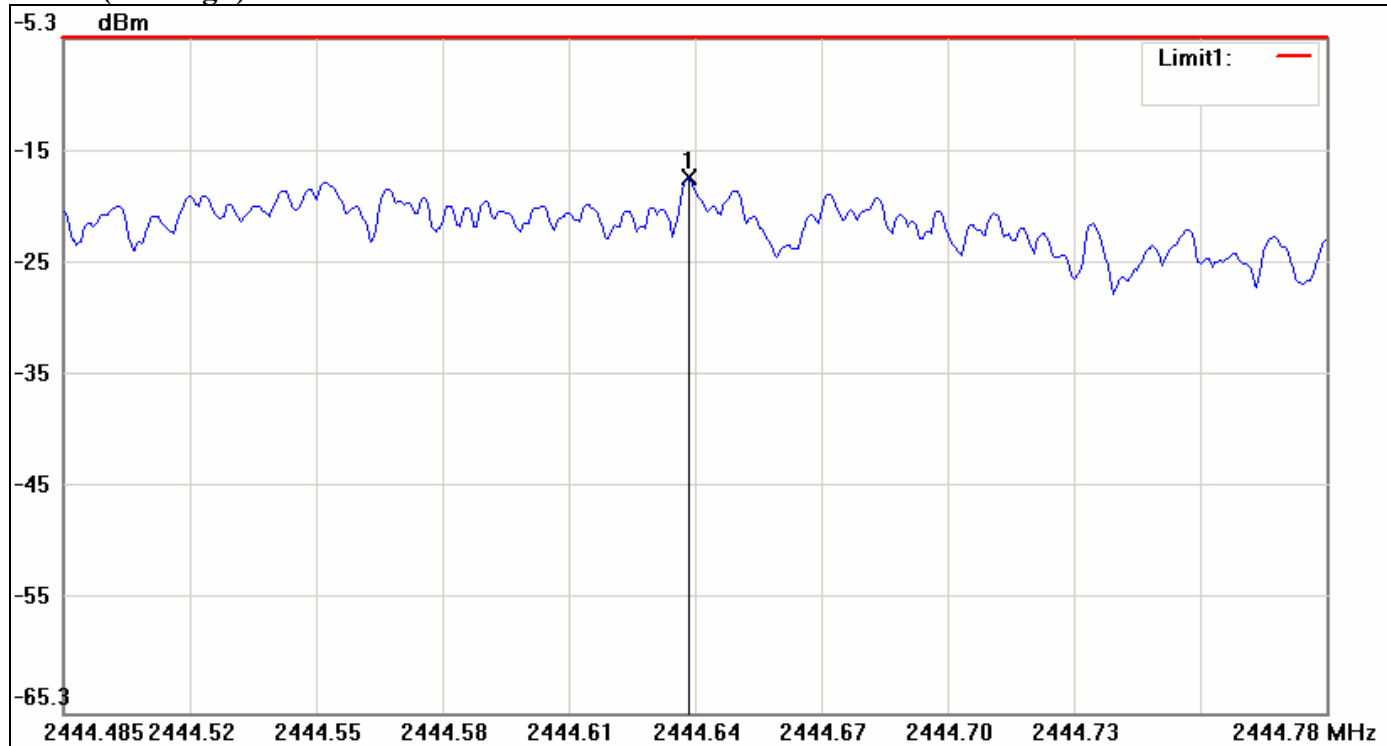
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2435.4987	-18.40	8.00	-26.40



PPSD (CH High)

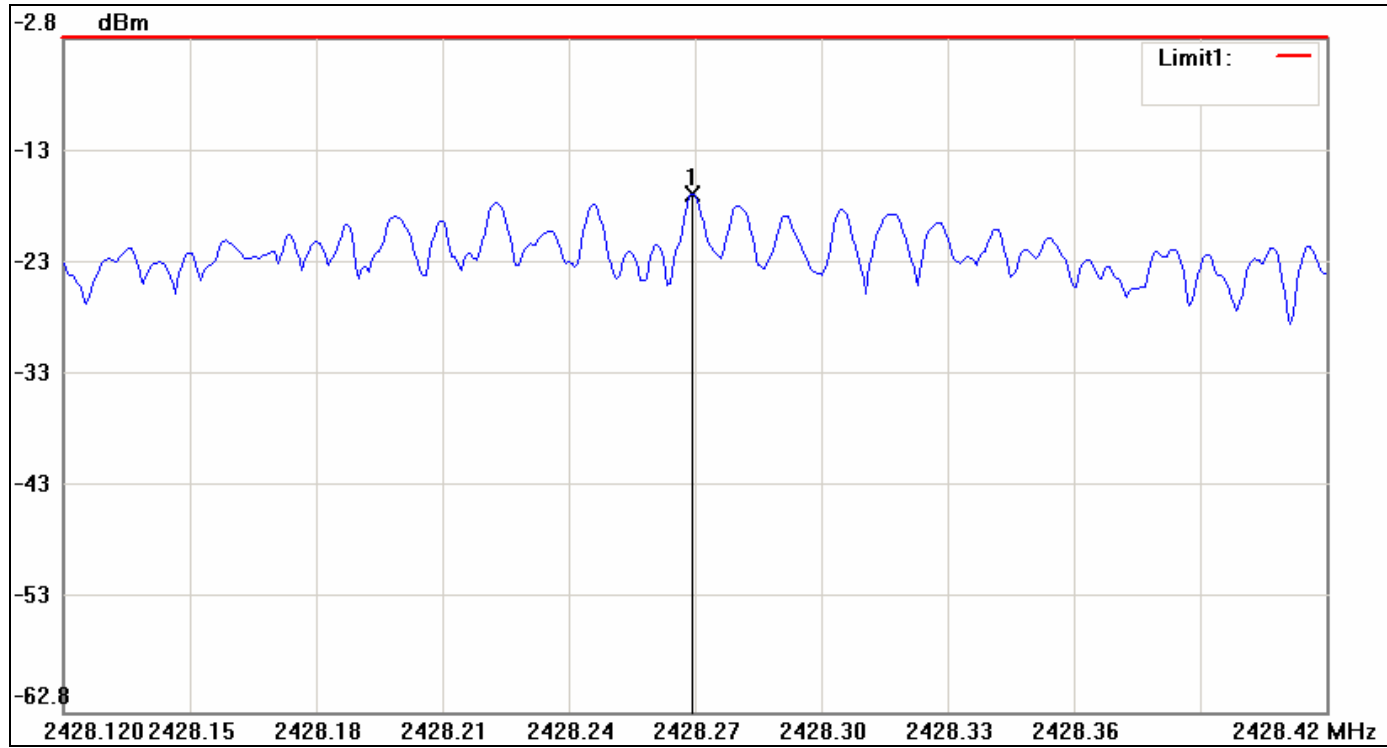


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2444.6335	-17.74	8.00	-25.74



IEEE 802.11n HT 40 MHz mode / Chain 2

PPSD (CH Low)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2428.2692	-16.66	8.00	-24.66



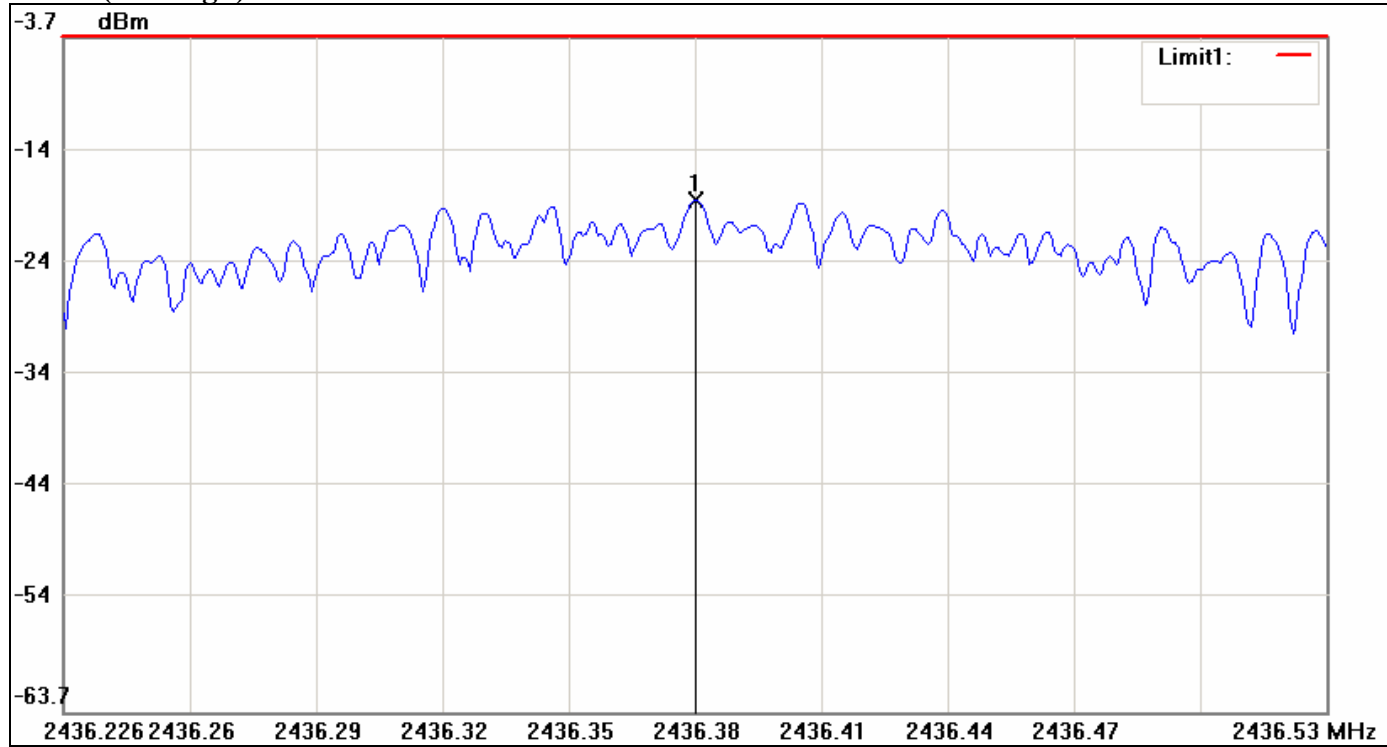
PPSD (CH Mid)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2427.3162	-17.15	8.00	-25.15



PPSD (CH High)



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	2436.3758	-18.17	8.00	-26.17



IEEE 802.11a mode

PPSD (CH Low)

* Agilent 17:03:02 Jul 20, 2011

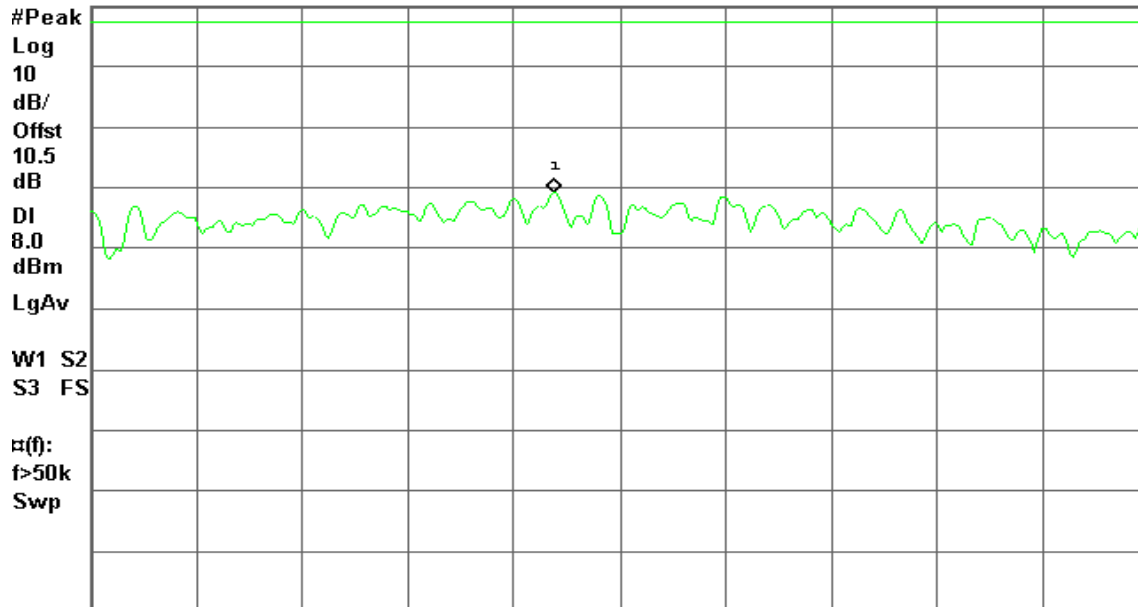
R T

Mkr1 5.744 081 4 GHz

-20.37 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.744 100 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH Mid)

* Agilent 17:10:32 Jul 20, 2011

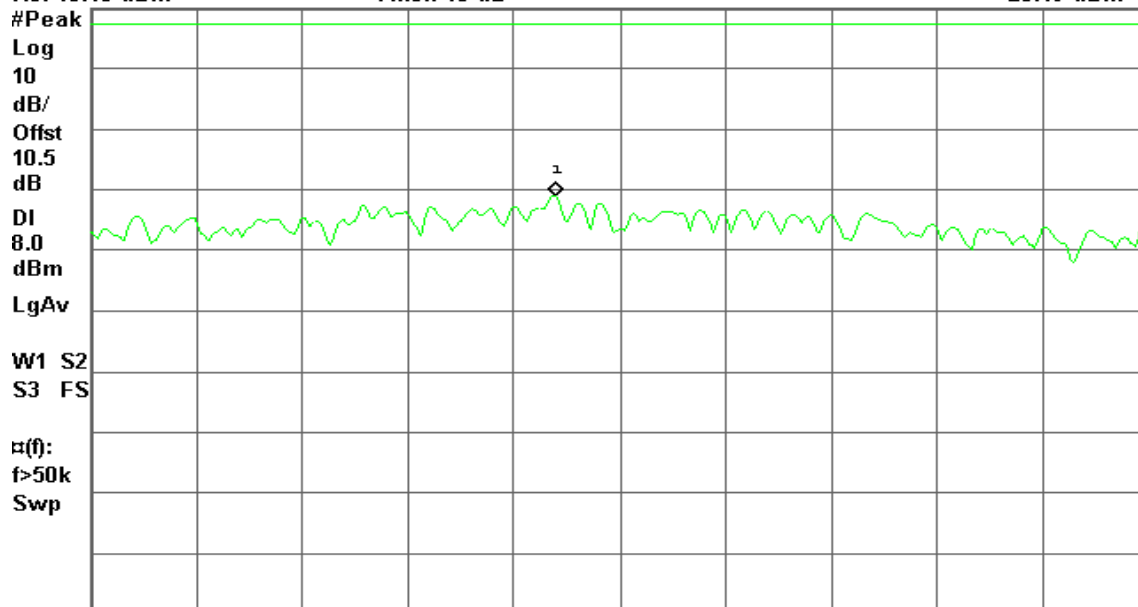
R T

Mkr1 5.786 581 9 GHz

-20.49 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.786 600 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



PPSD (CH High)

Agilent 17:16:01 Jul 20, 2011

R T

Mkr1 5.827 182.9 GHz

-20.14 dBm

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

$\alpha(f)$:

f>50k

Swp

Center 5.827 200.0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)

IEEE 802.11n HT 20 MHz Channel mode / Chain 0

PPSD (CH Low)

Agilent 17:43:45 Jul 20, 2011

R L

Mkr1 5.747 226.1 GHz

-20.03 dBm

Ref 10.48 dBm

Atten 10 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

8.0

dBm

LgAv

W1 S2

S3 FS

$\alpha(f)$:

f>50k

Swp

Center 5.747 200.0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)



PPSD (CH Mid)

* Agilent 17:39:25 Jul 20, 2011

R L

Mkr1 5.787 226 1 GHz
-20.77 dBm

Center 5.787 200 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

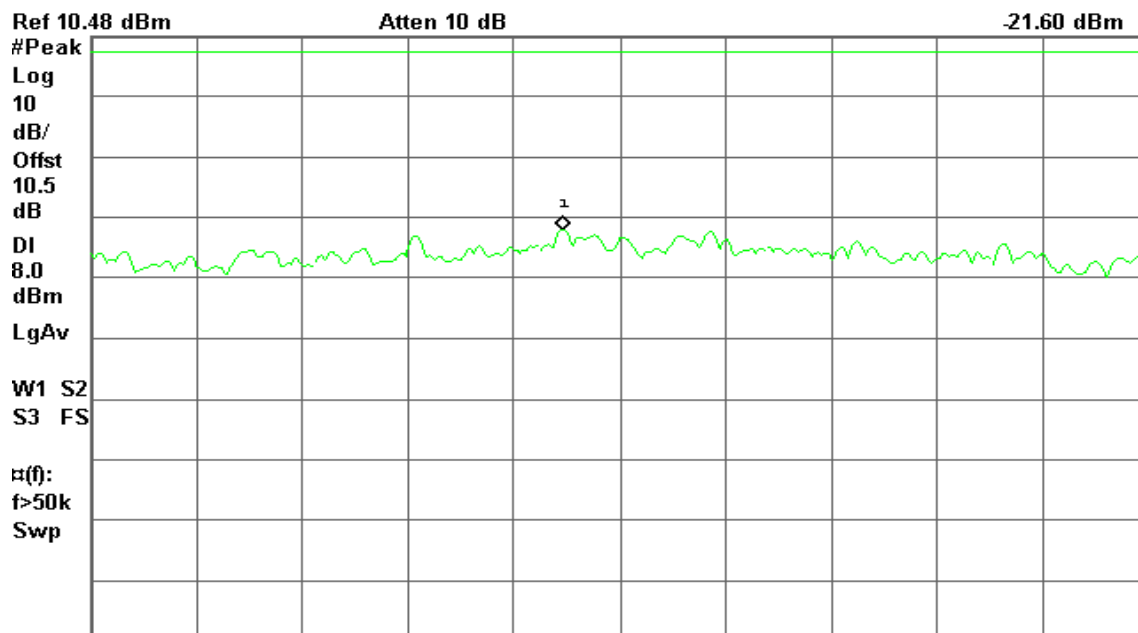
Span 300 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

* Agilent 17:34:07 Jul 20, 2011

R T

Mkr1 5.818 433 9 GHz
-21.60 dBm

Center 5.818 450 0 GHz

#Res BW 3 kHz

#VBW 10 kHz

Span 300 kHz

#Sweep 100 s (601 pts)



IEEE 802.11n HT 20 MHz Channel mode / Chain 1

PPSD (CH Low)

* Agilent 18:24:32 Jul 20, 2011

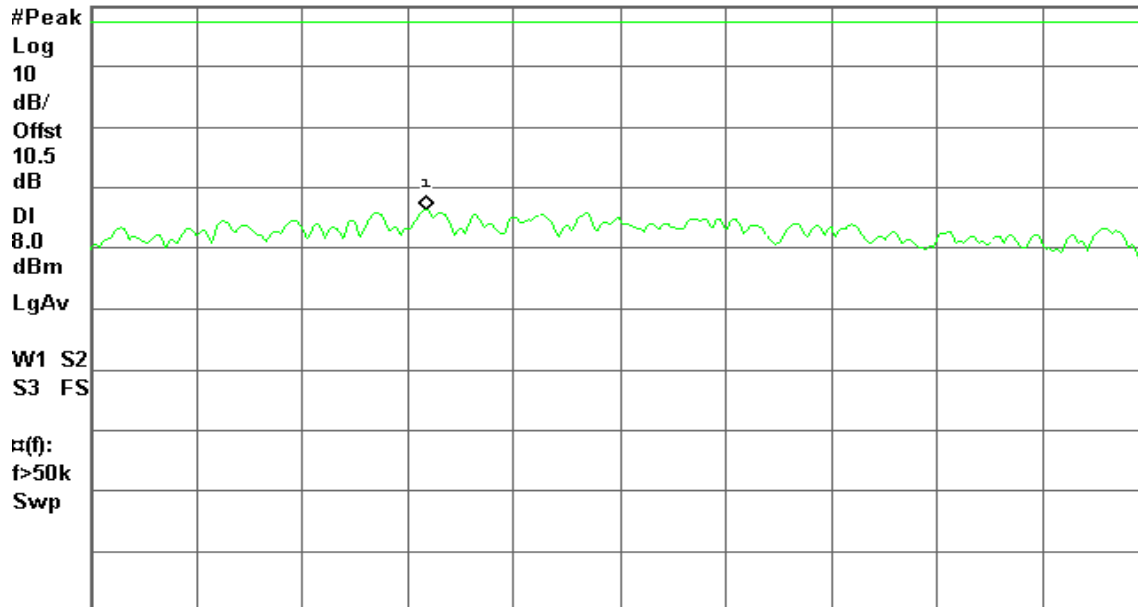
R L

Mkr1 5.742 795 4 GHz

-23.23 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.742 850 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH Mid)

* Agilent 18:29:06 Jul 20, 2011

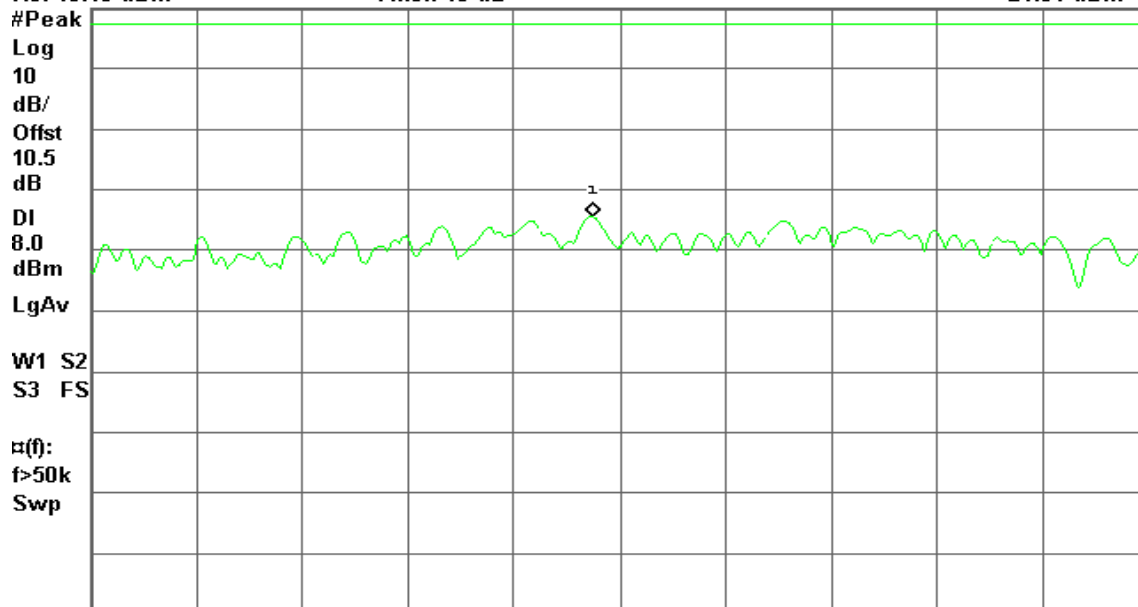
R T

Mkr1 5.779 992 0 GHz

-24.01 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.780 000 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



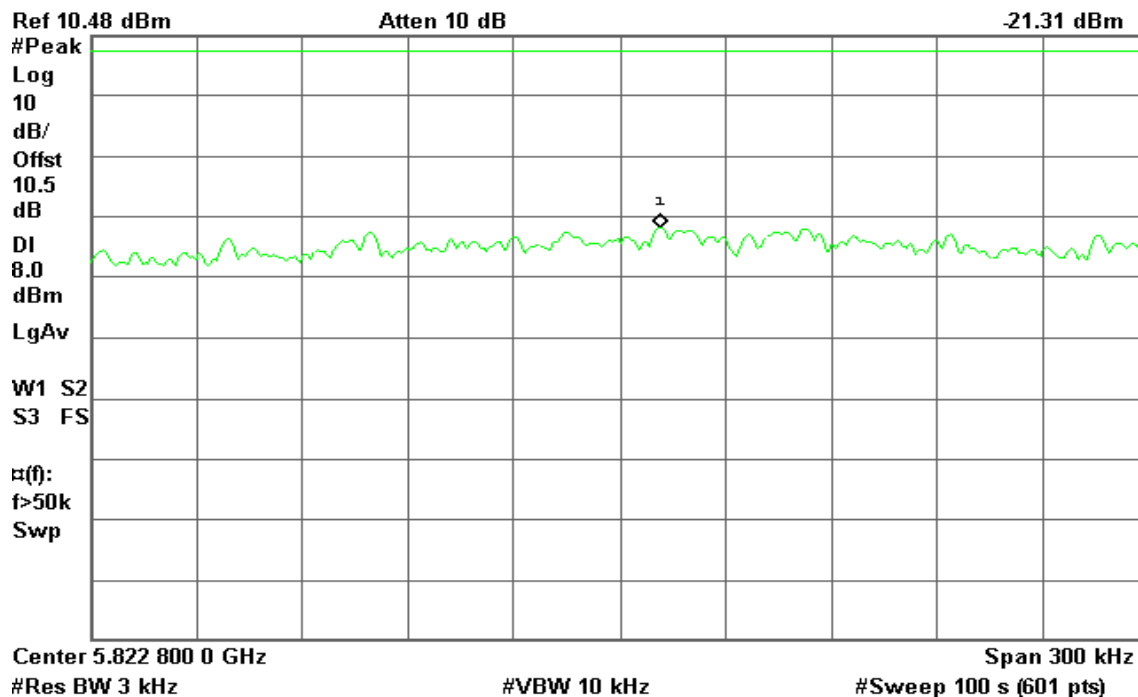
PPSD (CH High)

* Agilent 10:31:49 Jul 21, 2011

R T

Mkr1 5.822 811 5 GHz

-21.31 dBm



IEEE 802.11n HT 20 MHz Channel mode / Chain 2

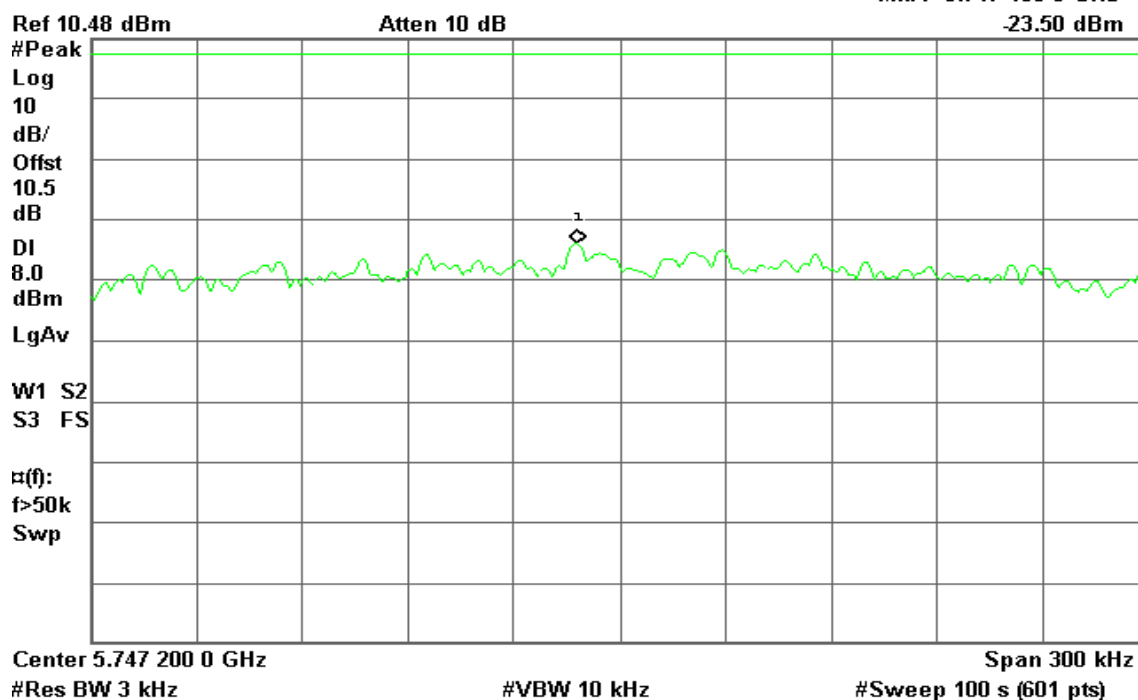
PPSD (CH Low)

* Agilent 19:02:48 Jul 20, 2011

R T

Mkr1 5.747 188 0 GHz

-23.50 dBm

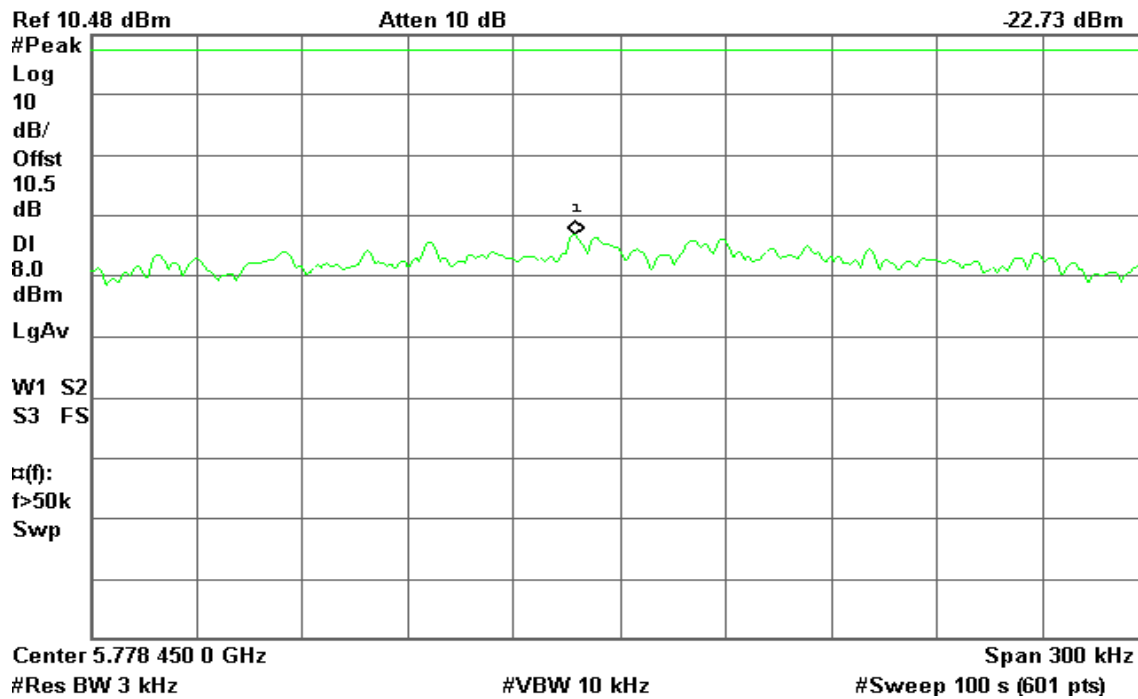




PPSD (CH Mid)

* Agilent 19:15:44 Jul 20, 2011

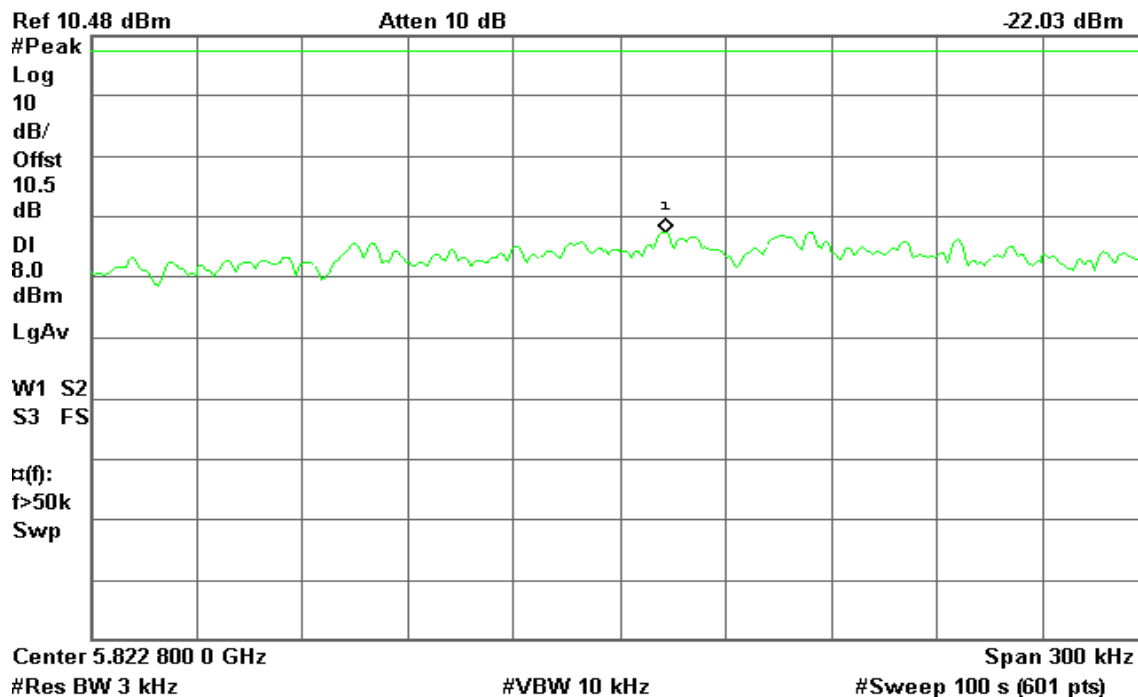
R L

Mkr1 5.778 437 4 GHz
-22.73 dBm

PPSD (CH High)

* Agilent 19:20:22 Jul 20, 2011

R T

Mkr1 5.822 813 0 GHz
-22.03 dBm



IEEE 802.11n HT 40 MHz mode / Chain 0

PPSD (CH Low)

Agilent 10:39:02 Jul 21, 2011

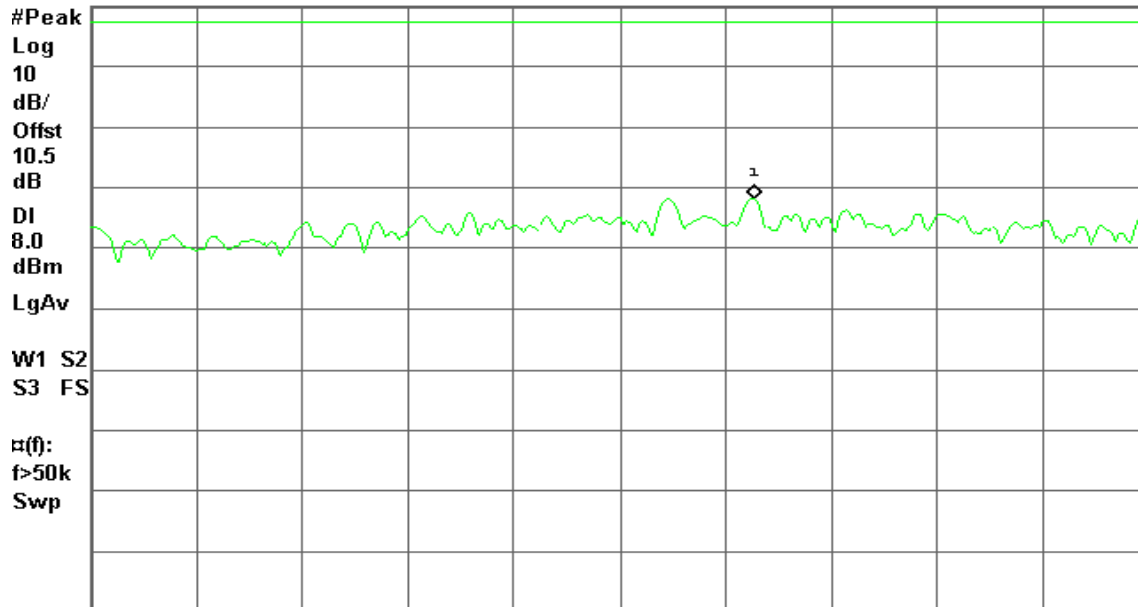
R T

Mkr1 5.762 838 1 GHz

-21.38 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.762 800 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

Agilent 10:43:41 Jul 21, 2011

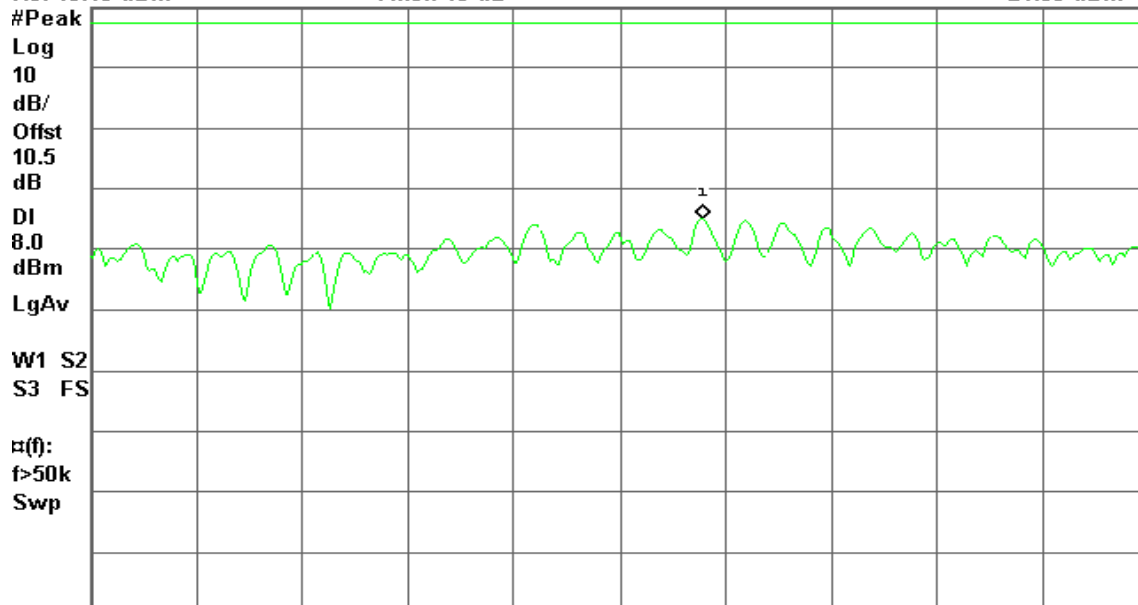
R L

Mkr1 5.783 123 6 GHz

-24.53 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.783 100 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



IEEE 802.11n HT 40 MHz mode / Chain 1

PPSD (CH Low)

* Agilent 10:57:21 Jul 21, 2011

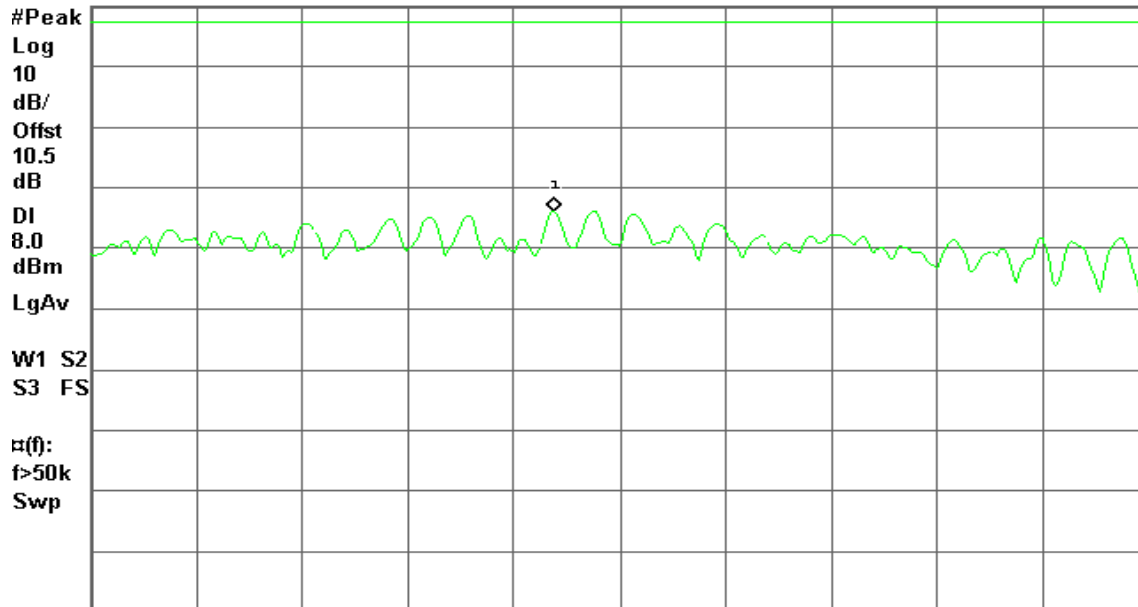
R L

Mkr1 5.757 531 4 GHz

-23.50 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.757 550 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

PPSD (CH High)

* Agilent 10:51:58 Jul 21, 2011

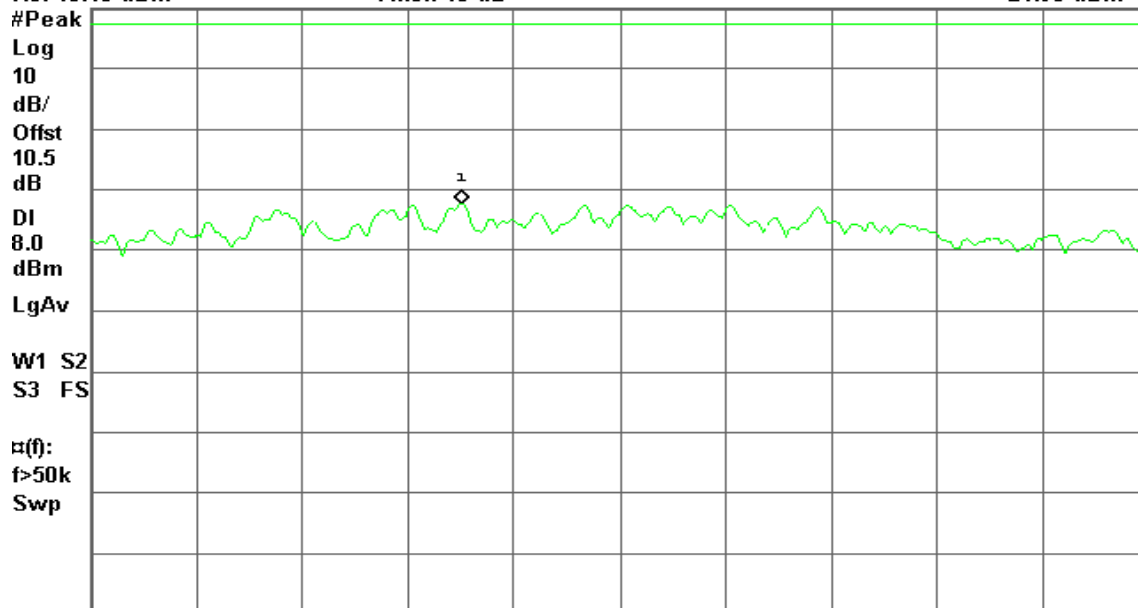
R L

Mkr1 5.802 805 3 GHz

-21.93 dBm

Ref 10.48 dBm

Atten 10 dB



Center 5.802 850 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



IEEE 802.11n HT 40 MHz mode / Chain 2

PPSD (CH Low)

Agilent 11:03:33 Jul 21, 2011

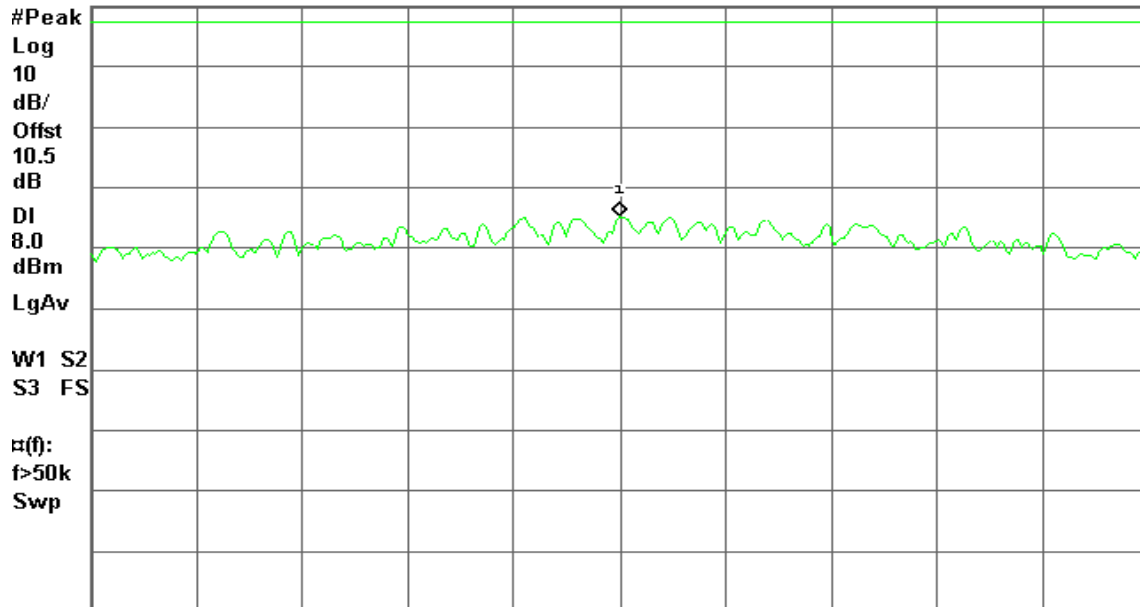
R T

Mkr1 5.747 200 0 GHz

-24.37 dBm

Ref 10.48 dBm

Atten 10 dB



PPSD (CH High)

Agilent 11:20:46 Jul 21, 2011

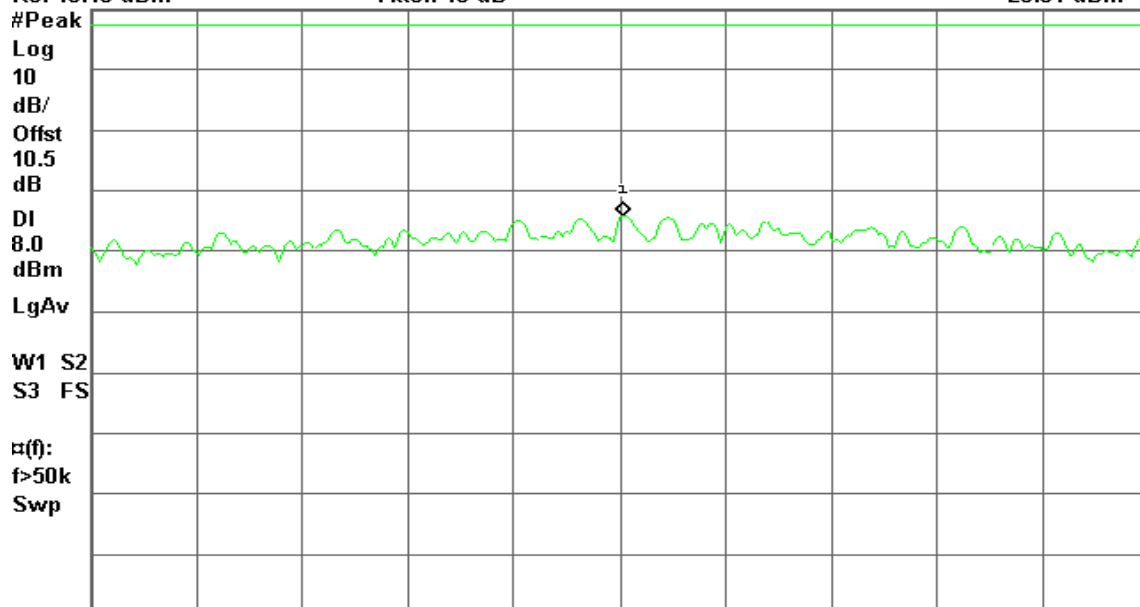
R L

Mkr1 5.787 201 0 GHz

-23.64 dBm

Ref 10.48 dBm

Atten 10 dB





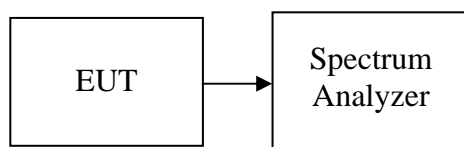
7.6 SPURIOUS EMISSIONS

7.6.1 Conducted Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)).

Test Configuration



TEST PROCEDURE

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

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

Measurements are made over the 30MHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

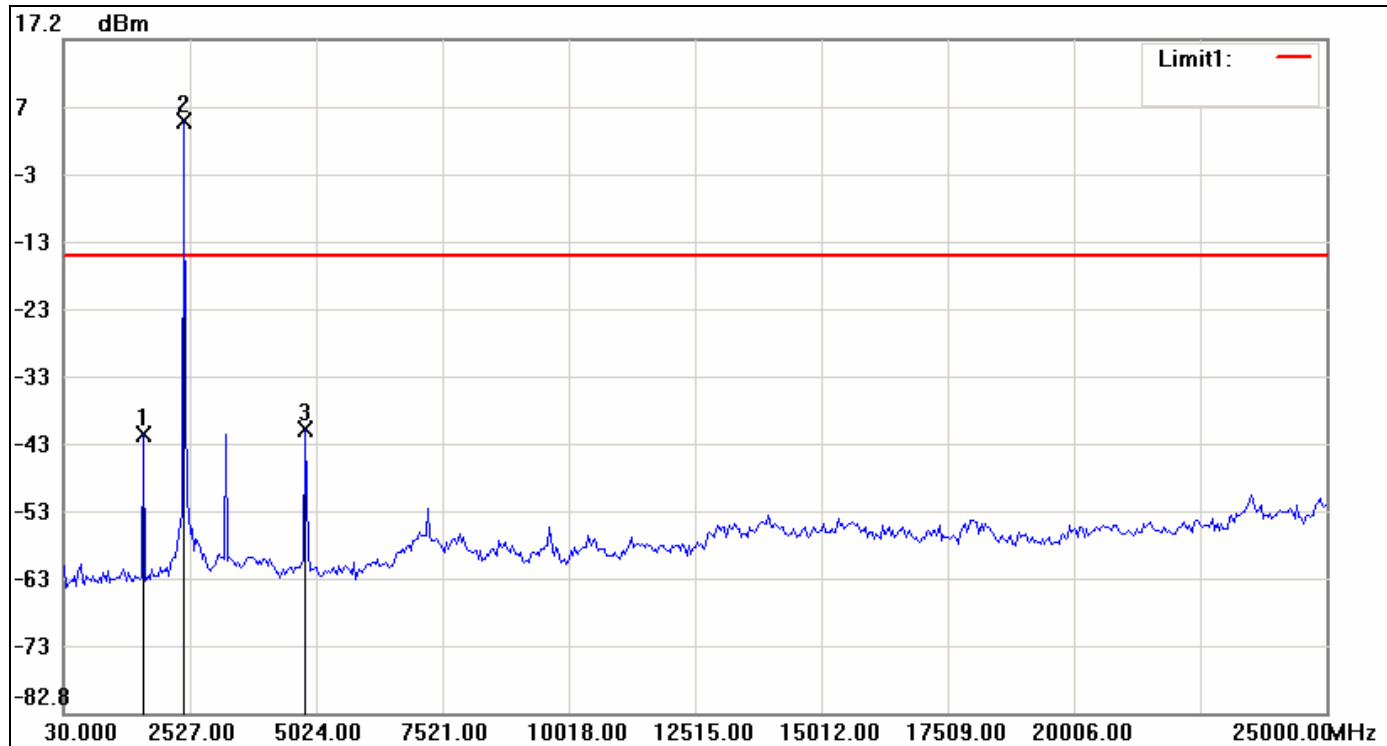
No non-compliance noted



Test Plot

IEEE 802.11b mode

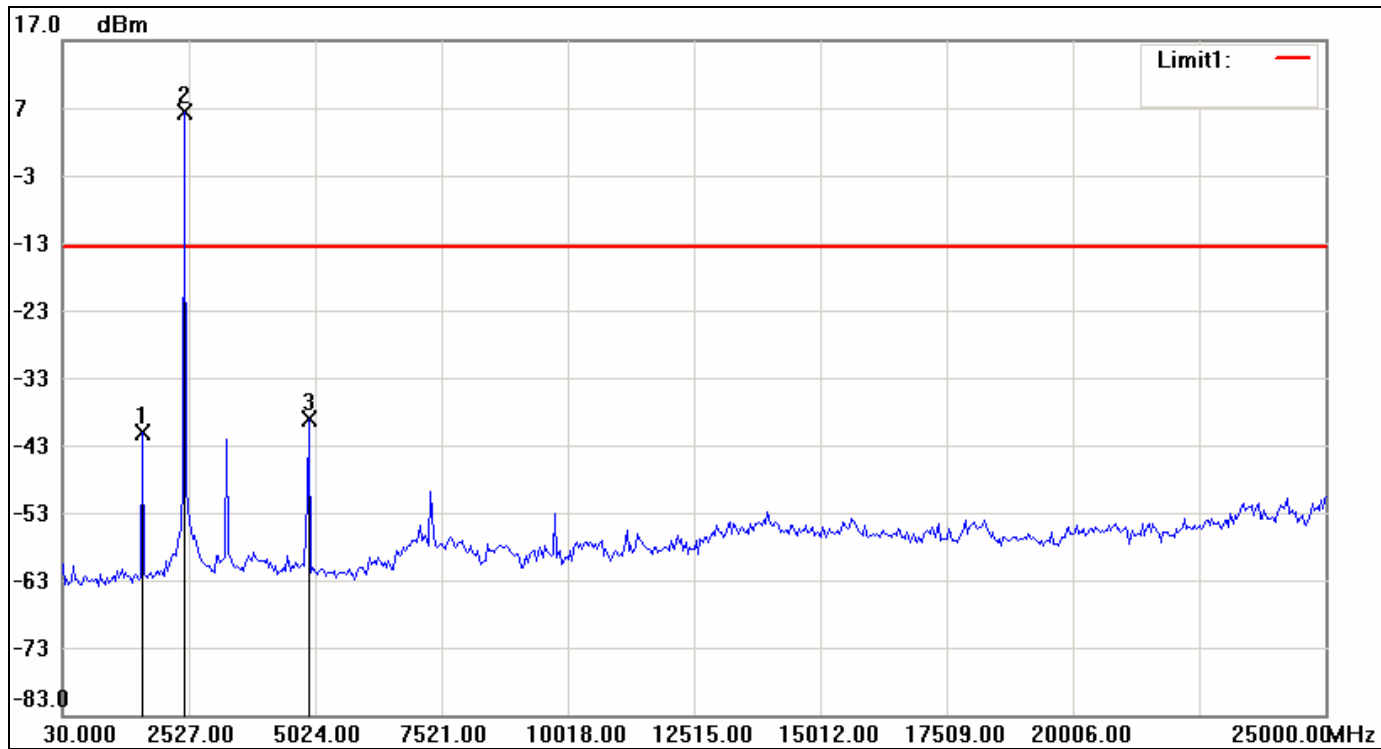
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-41.55	-14.84	-26.71
2	2402.1500	5.16	-14.84	---
3	4815.9167	-40.62	-14.84	-25.78



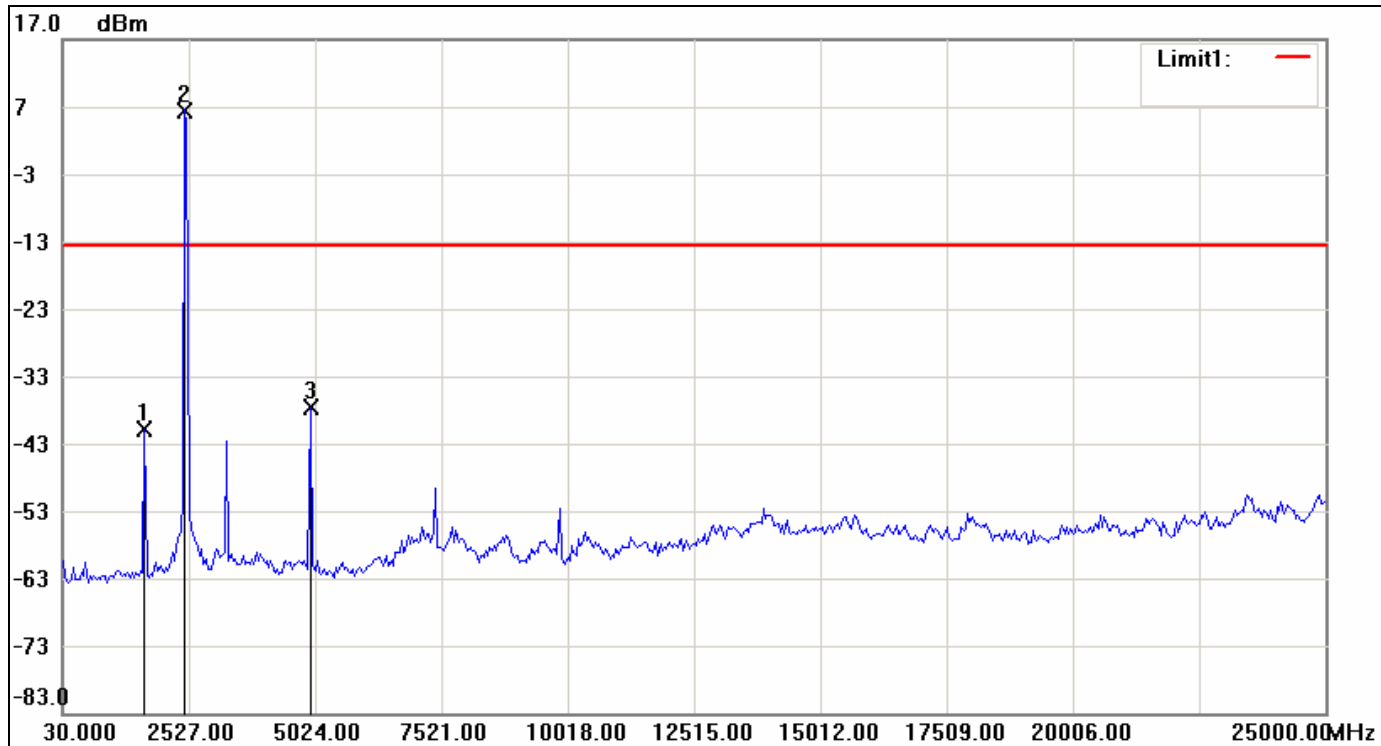
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-40.99	-13.58	-27.41
2	2443.7667	6.42	-13.58	---
3	4899.1500	-39.22	-13.58	-25.64



CH High

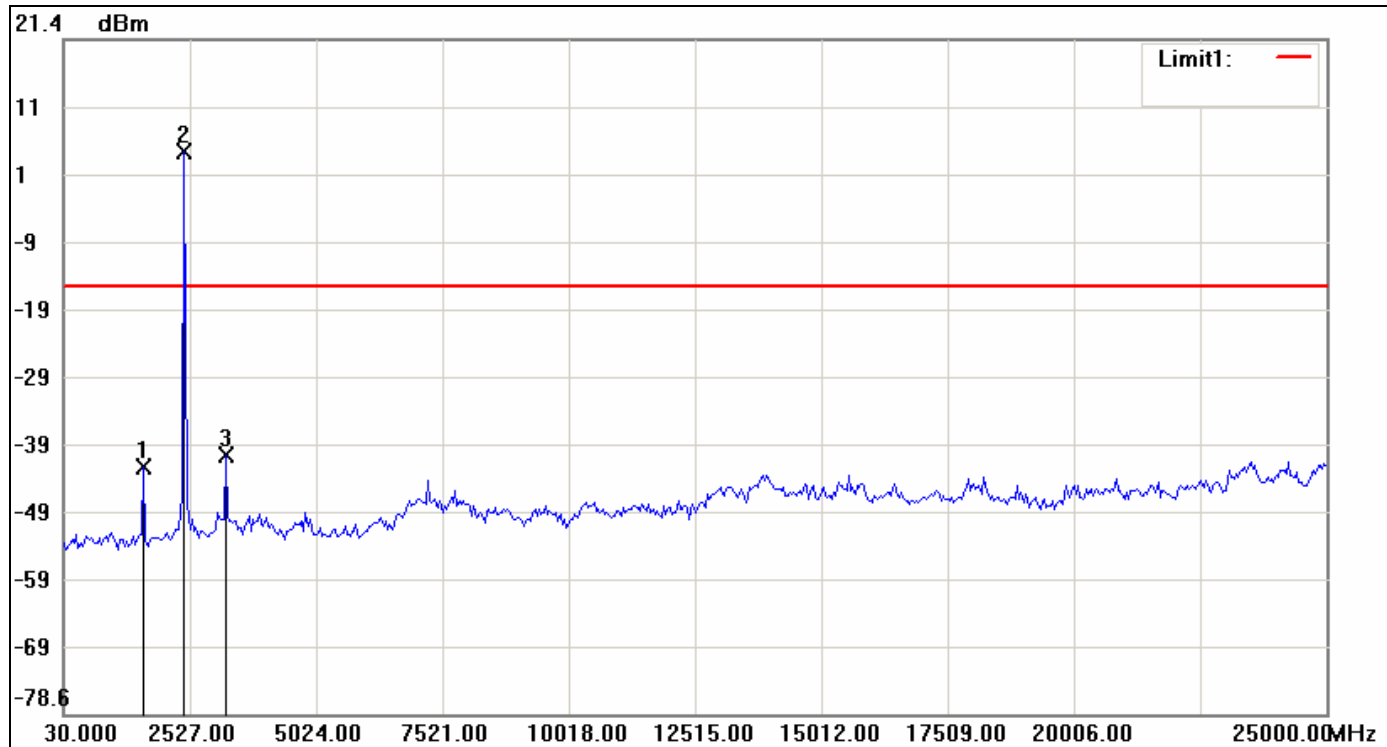


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-40.80	-13.53	-27.27
2	2443.7667	6.47	-13.53	---
3	4940.7667	-37.63	-13.53	-24.10



IEEE 802.11g mode

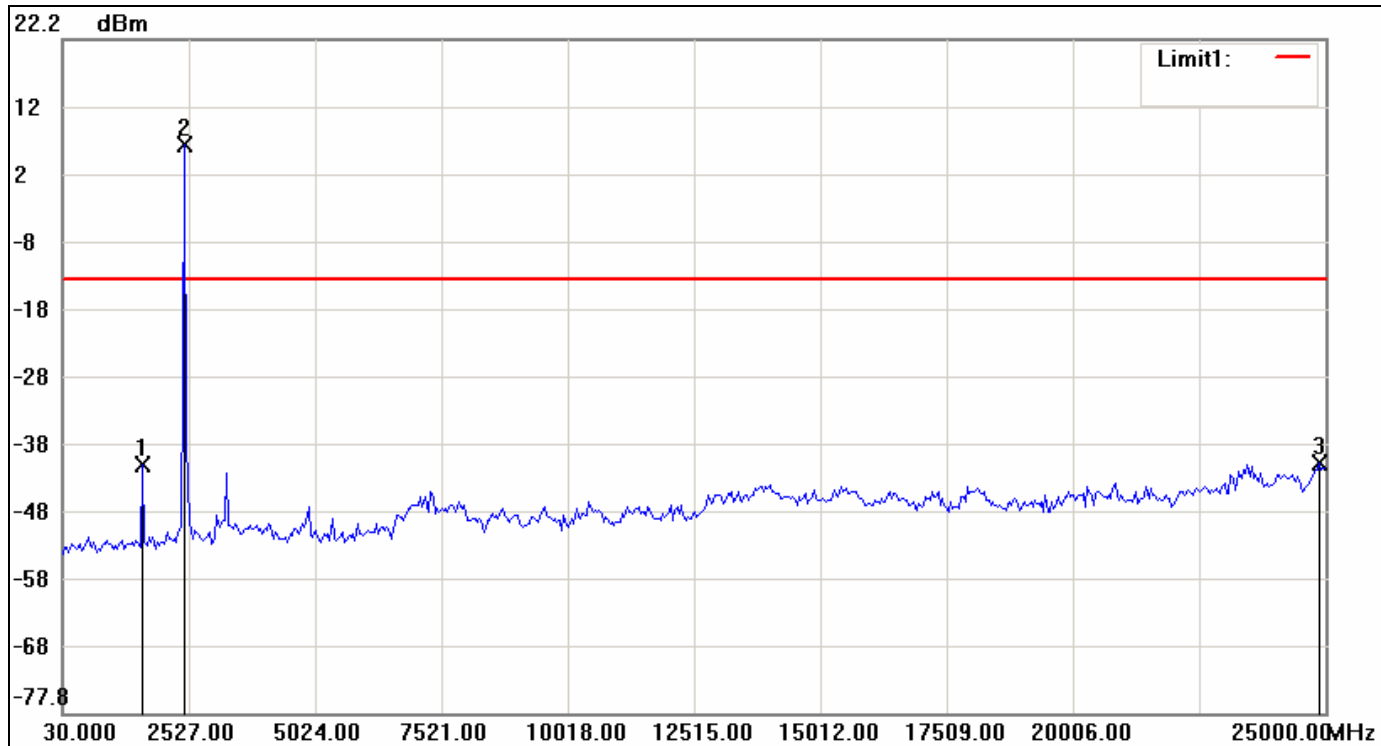
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-42.01	-15.15	-26.86
2	2402.1500	4.85	-15.15	---
3	3234.4833	-40.18	-15.15	-25.03



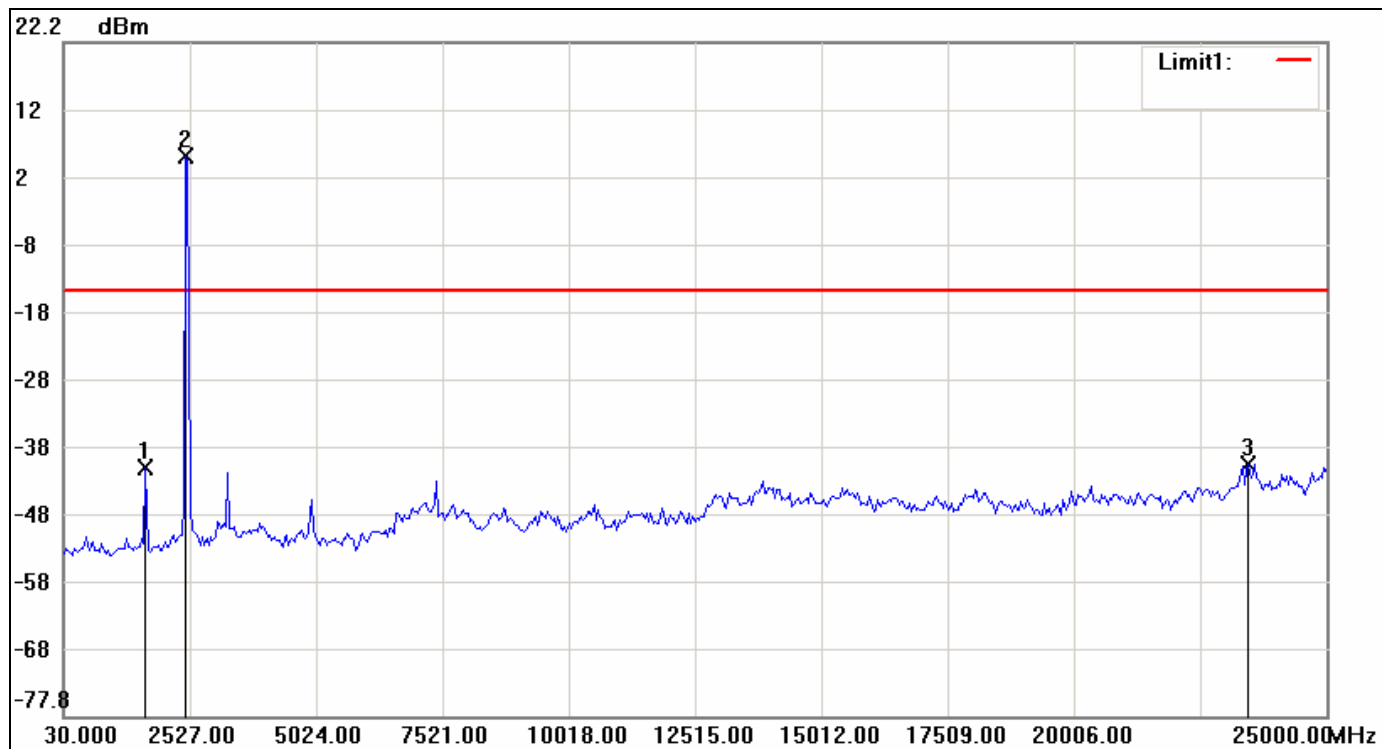
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-40.84	-13.52	-27.32
2	2443.7667	6.48	-13.52	---
3	24875.1500	-40.63	-13.52	-27.11



CH High

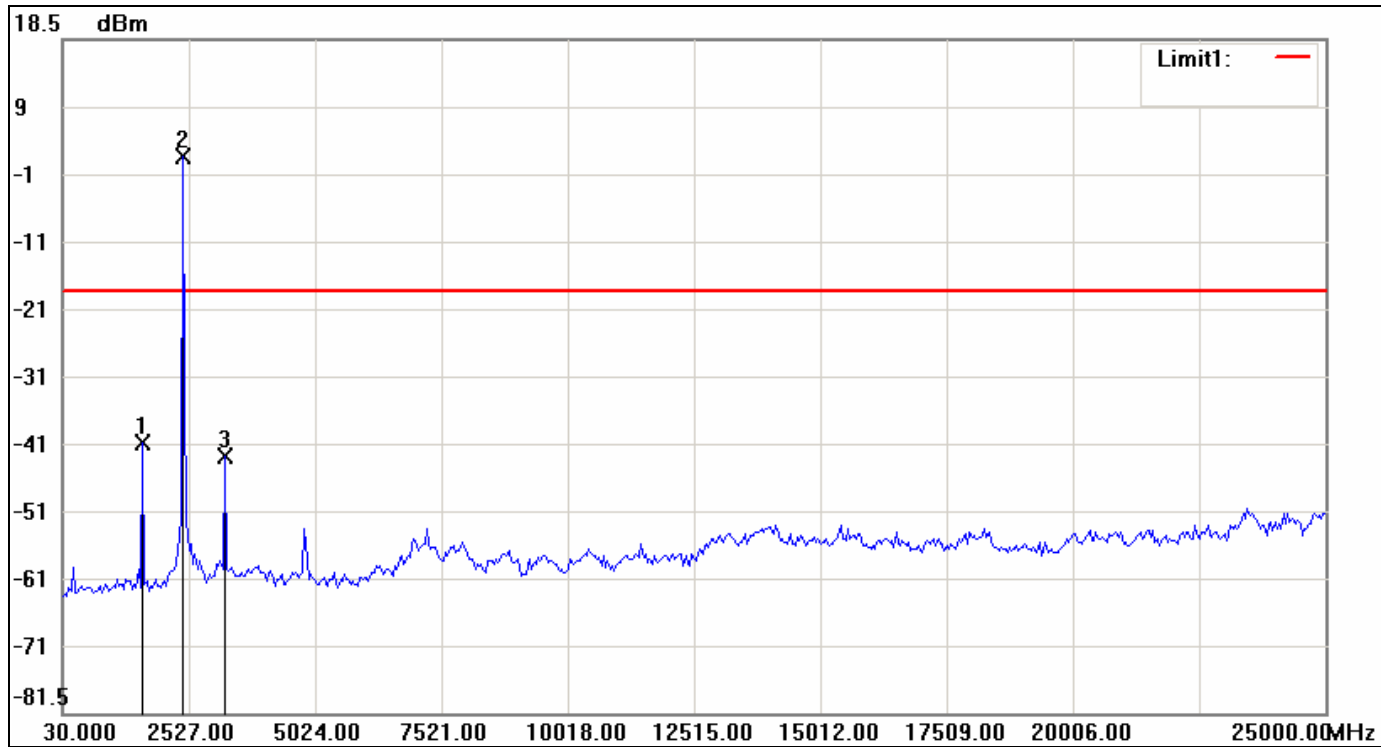


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-40.81	-14.58	-26.23
2	2443.7667	5.42	-14.58	---
3	23460.1833	-40.33	-14.58	-25.75



IEEE 802.11n HT 20 MHz mode / Chain 0

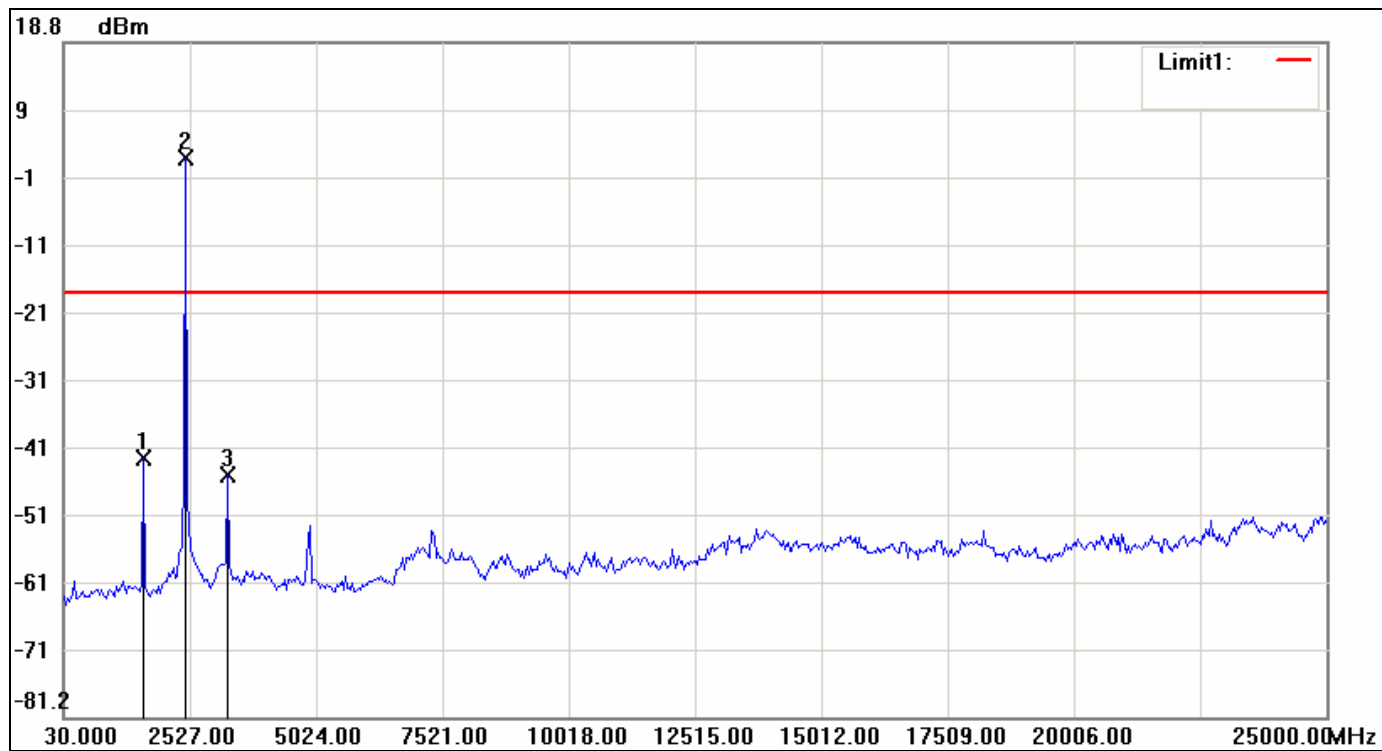
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-41.26	-18.92	-22.34
2	2402.1500	1.08	-18.92	---
3	3234.4833	-43.41	-18.92	-24.49



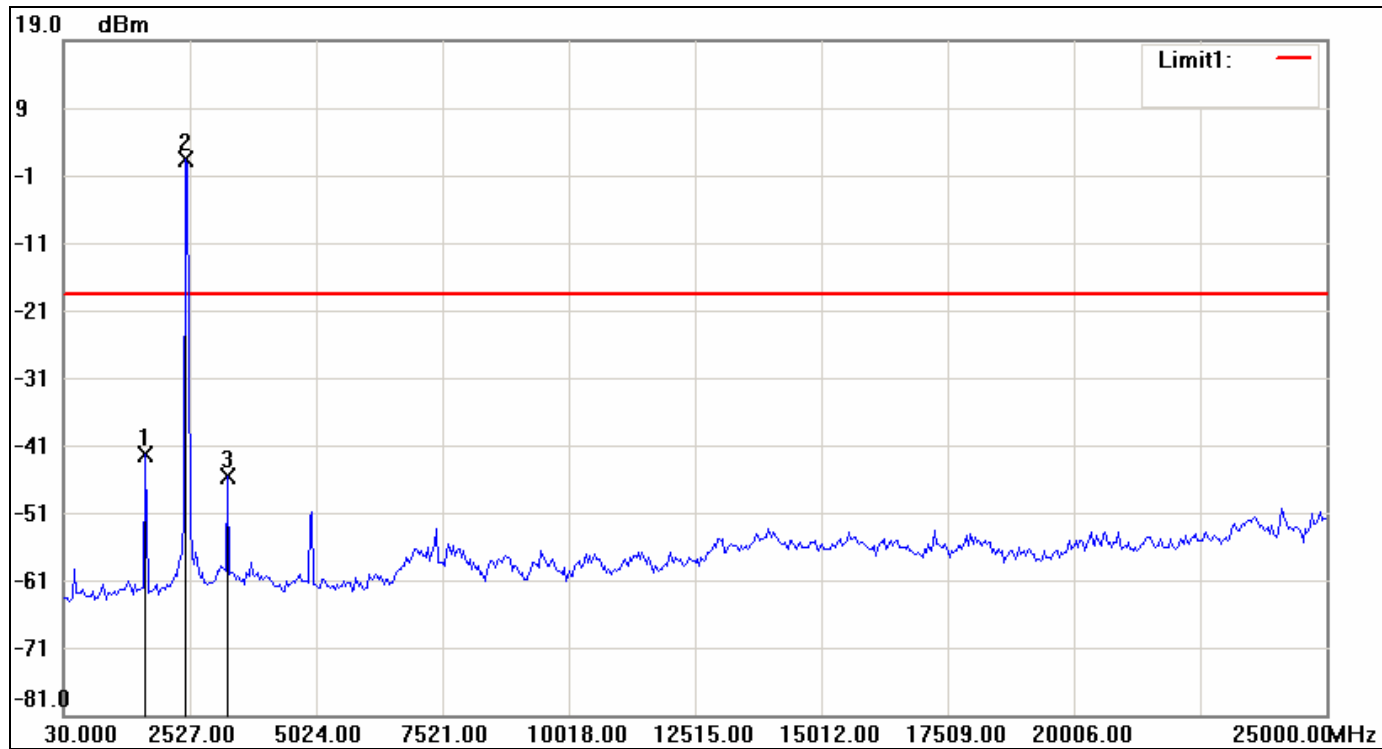
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-42.81	-18.42	-24.39
2	2443.7667	1.58	-18.42	---
3	3276.1000	-45.37	-18.42	-26.95



CH High

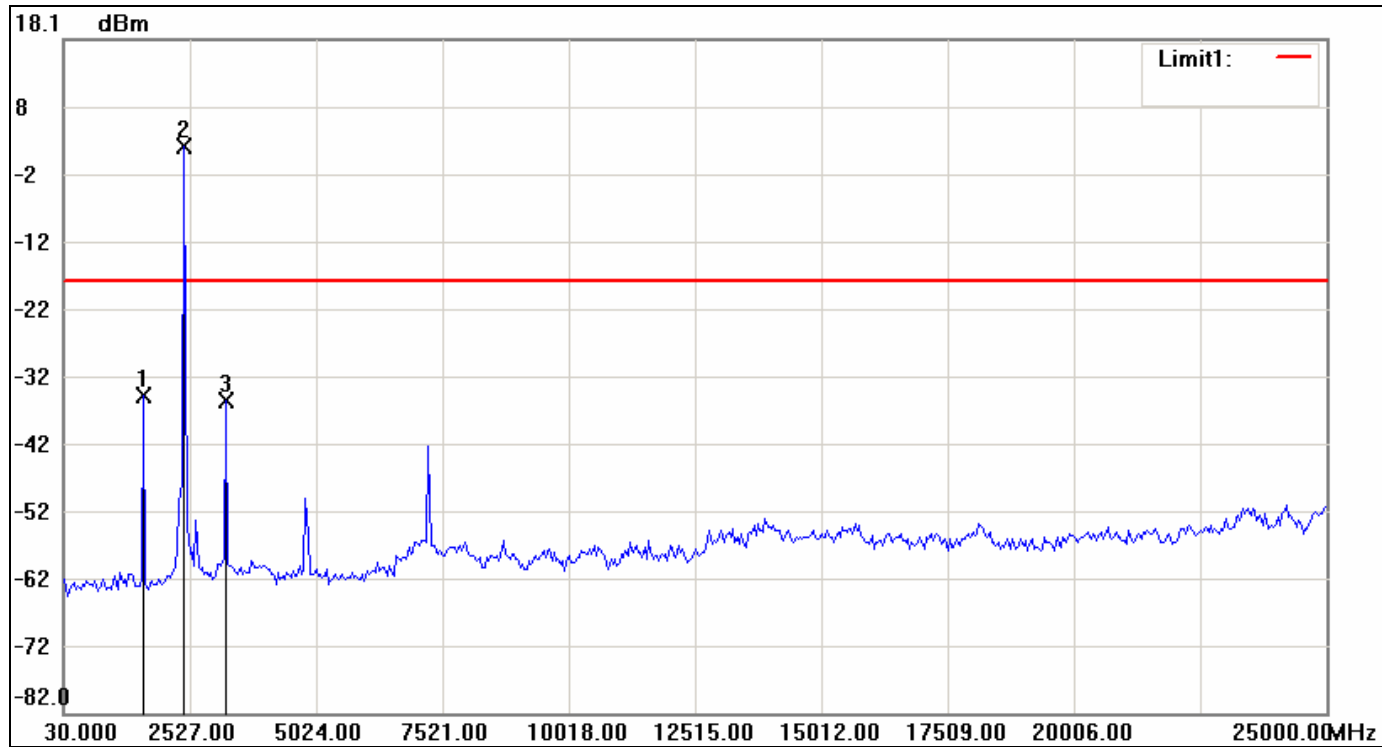


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-42.50	-18.71	-23.79
2	2443.7667	1.29	-18.71	---
3	3276.1000	-45.70	-18.71	-26.99



IEEE 802.11n HT 20 MHz mode / Chain 1

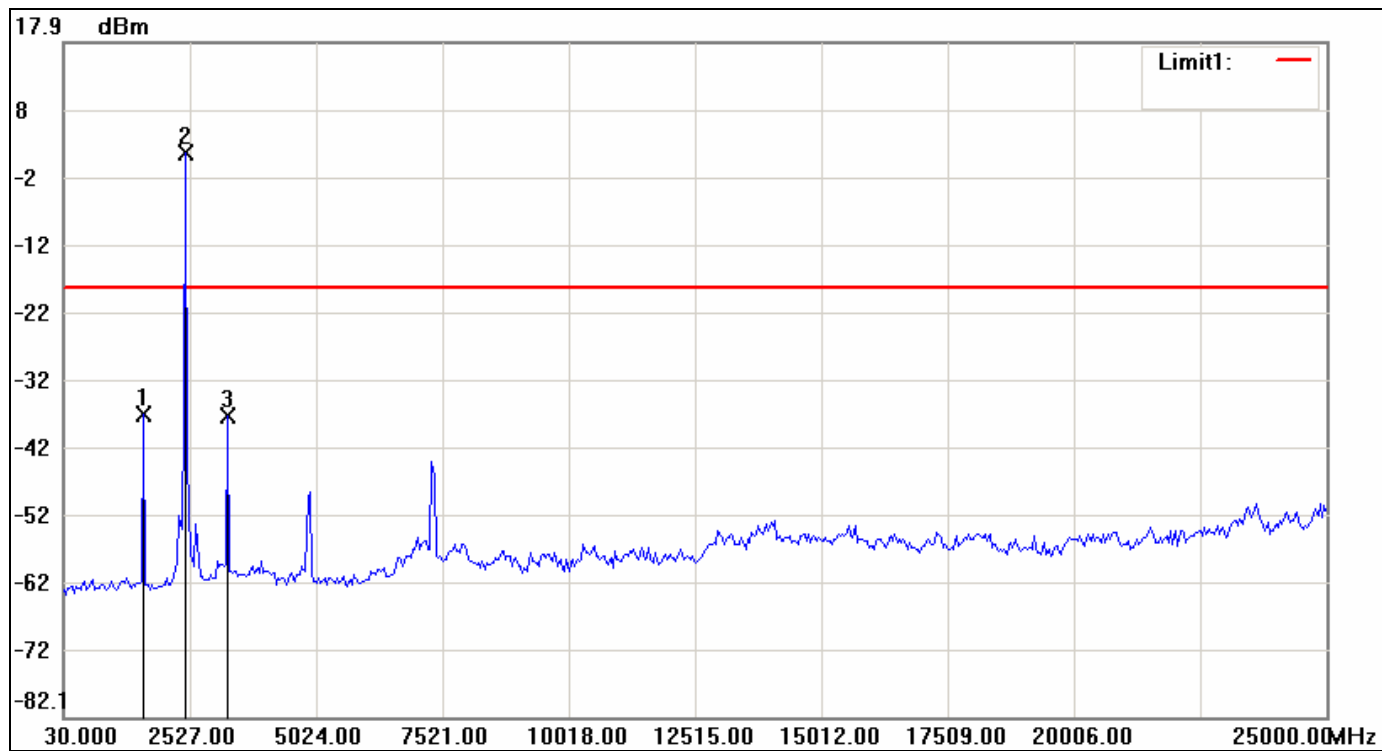
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-34.73	-17.92	-16.81
2	2402.1500	2.08	-17.92	---
3	3234.4833	-35.45	-17.92	-17.53



CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-37.23	-18.50	-18.73
2	2443.7667	1.50	-18.50	---
3	3276.1000	-37.43	-18.50	-18.93



CH High

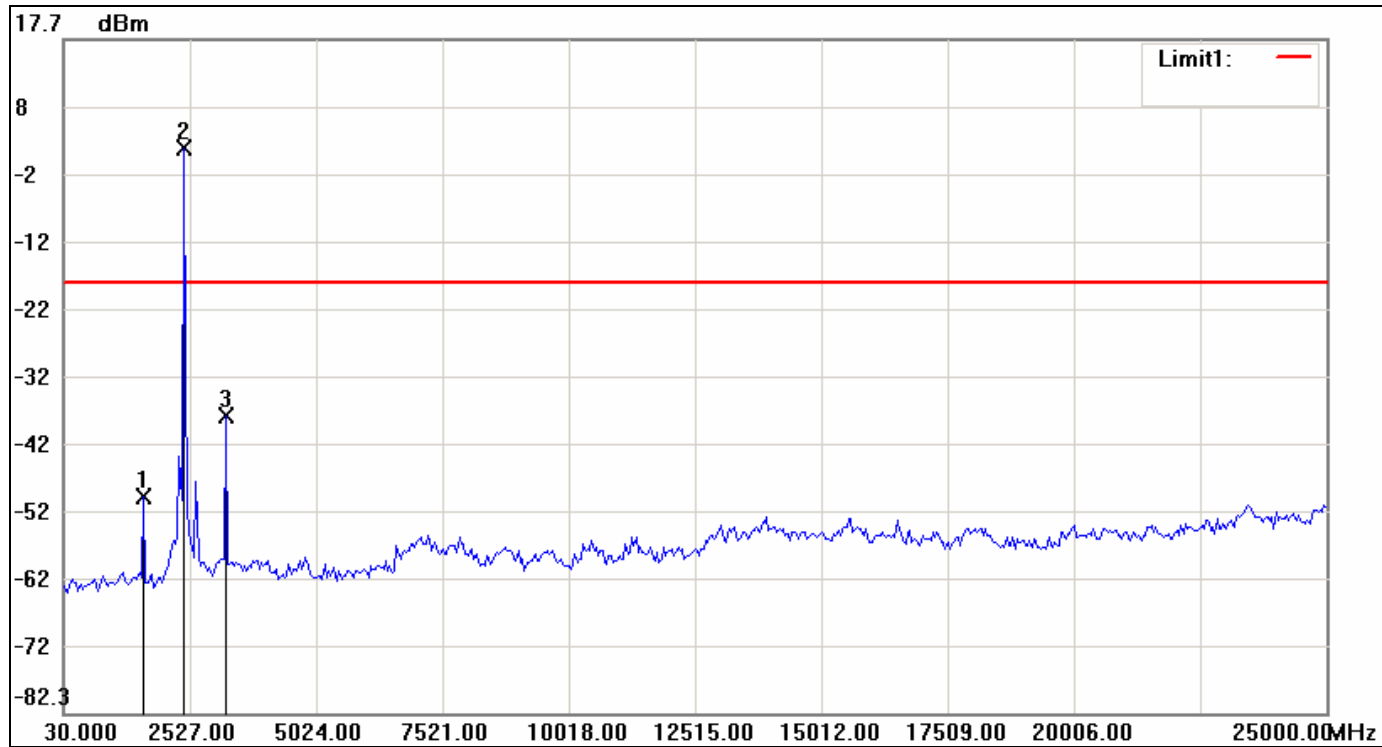


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-39.80	-18.95	-20.85
2	2443.7667	1.05	-18.95	---
3	3276.1000	-38.94	-18.95	-19.99



IEEE 802.11n HT 20 MHz mode / Chain 2

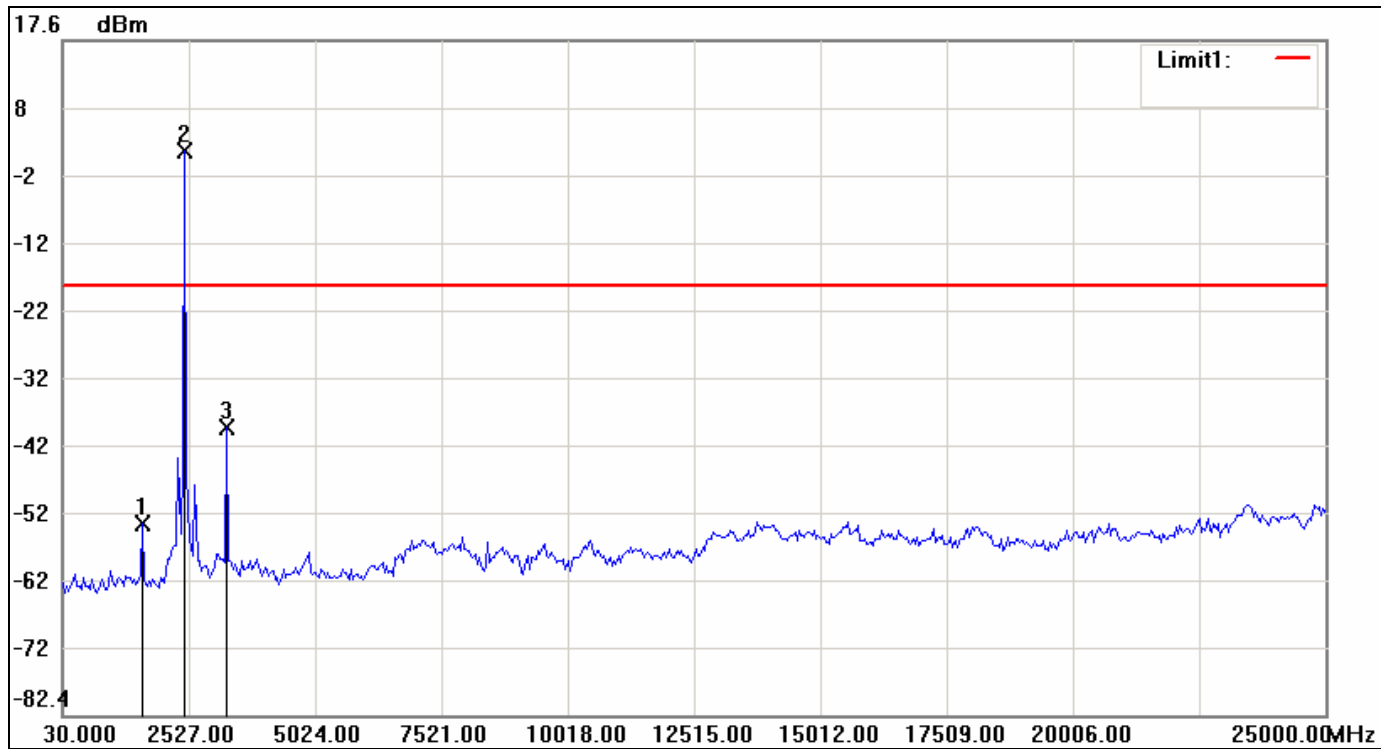
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-50.19	-18.33	-31.86
2	2402.1500	1.67	-18.33	---
3	3234.4833	-38.21	-18.33	-19.88



CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-54.12	-18.70	-35.42
2	2443.7667	1.30	-18.70	---
3	3276.1000	-39.87	-18.70	-21.17



CH High



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-49.57	-19.13	-30.44
2	2443.7667	0.87	-19.13	---
3	3276.1000	-40.94	-19.13	-21.81

**IEEE 802.11n HT 20 MHz mode**

Low Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1611.4330	-41.26	-34.73	-50.19	-29.96	-17.92	-12.04
3234.4800	-43.41	-35.45	-38.21	-30.68	-17.92	-12.76
Fundamental limit	-18.92	-17.92	-18.33	---	---	---

Mid Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1611.4330	-42.81	-37.23	-54.12	-32.46	-18.42	-14.04
3276.1000	-45.37	-37.43	-39.87	-32.66	-18.42	-14.24
Fundamental limit	-18.42	-18.50	-18.70	---	---	---

High Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1653.0500	-42.50	-39.80	-49.57	-35.03	-18.71	-16.32
3276.1000	-45.70	-38.94	-40.94	-34.17	-18.71	-52.88
Fundamental limit	-18.71	-18.95	-19.13	---	---	---

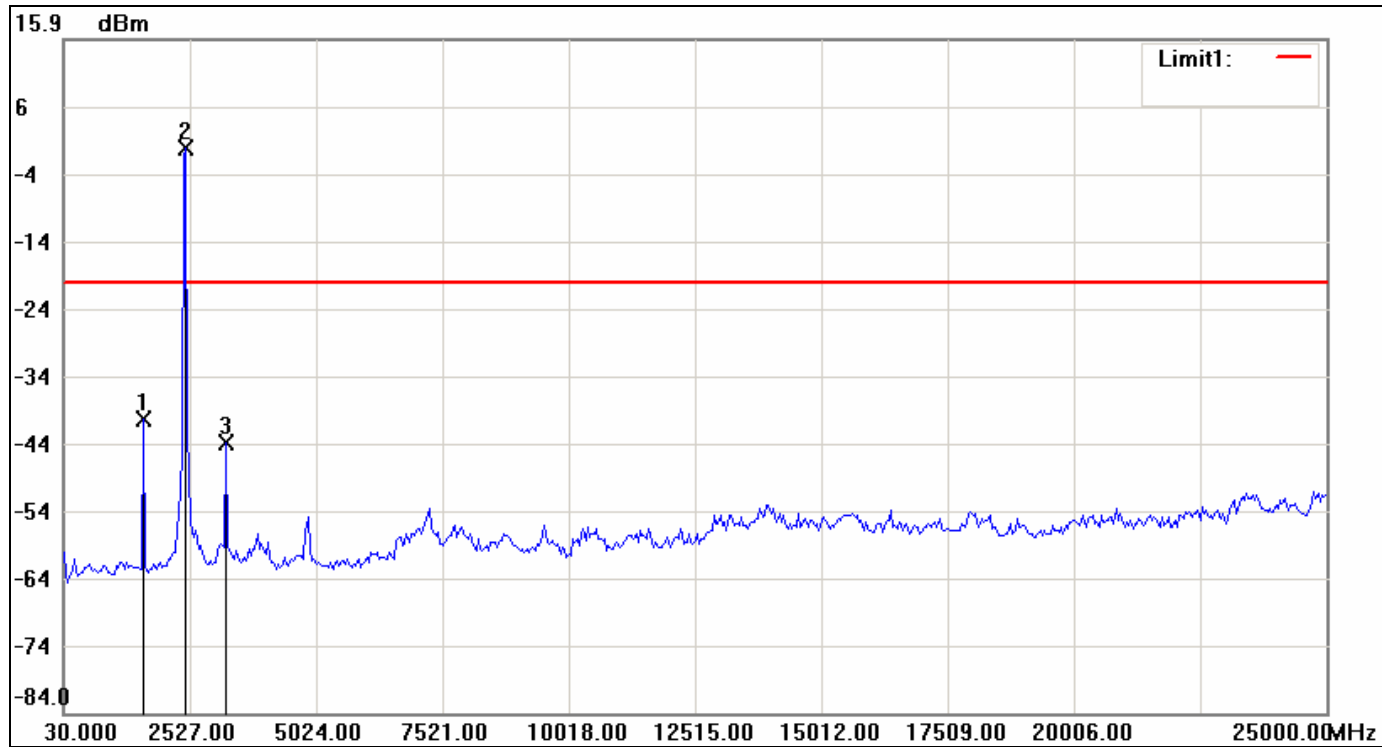
Remark:

1. $Total (dBm) = Measure + 10 \log(3) dB$,
Measure=Choose the max chain value



IEEE 802.11n HT 40 MHz mode / Chain 0

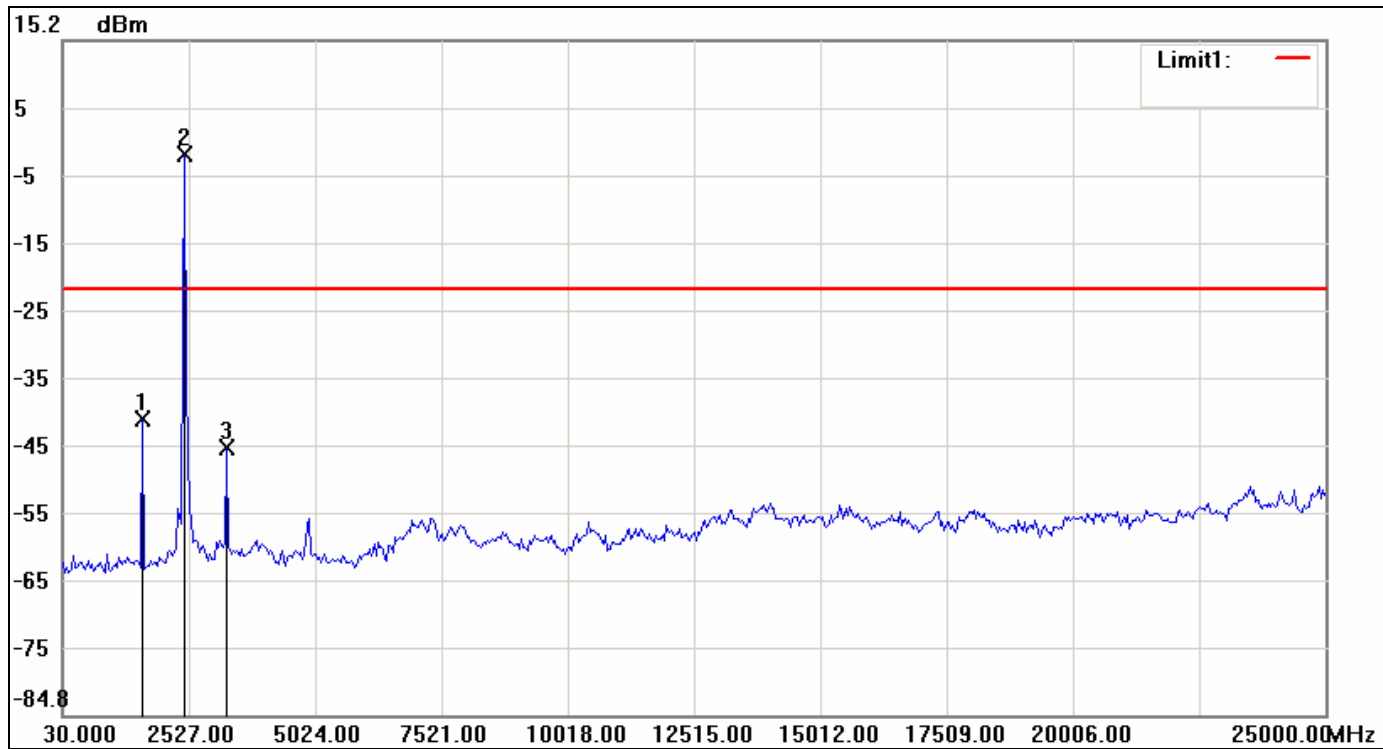
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-40.37	-20.06	-20.31
2	2443.7667	-0.06	-20.06	---
3	3234.4833	-43.91	-20.06	-23.85



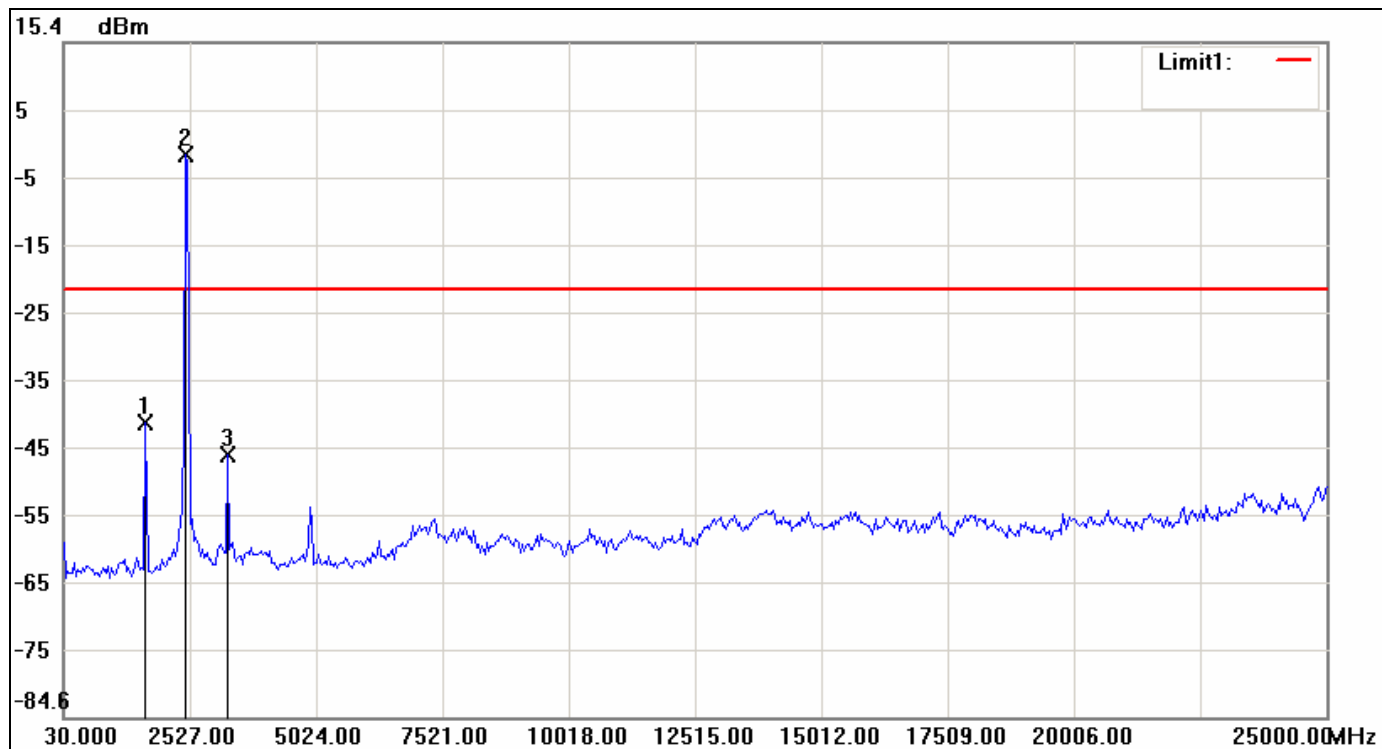
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-40.98	-21.61	-19.37
2	2443.7667	-1.61	-21.61	---
3	3276.1000	-45.07	-21.61	-23.46



CH High

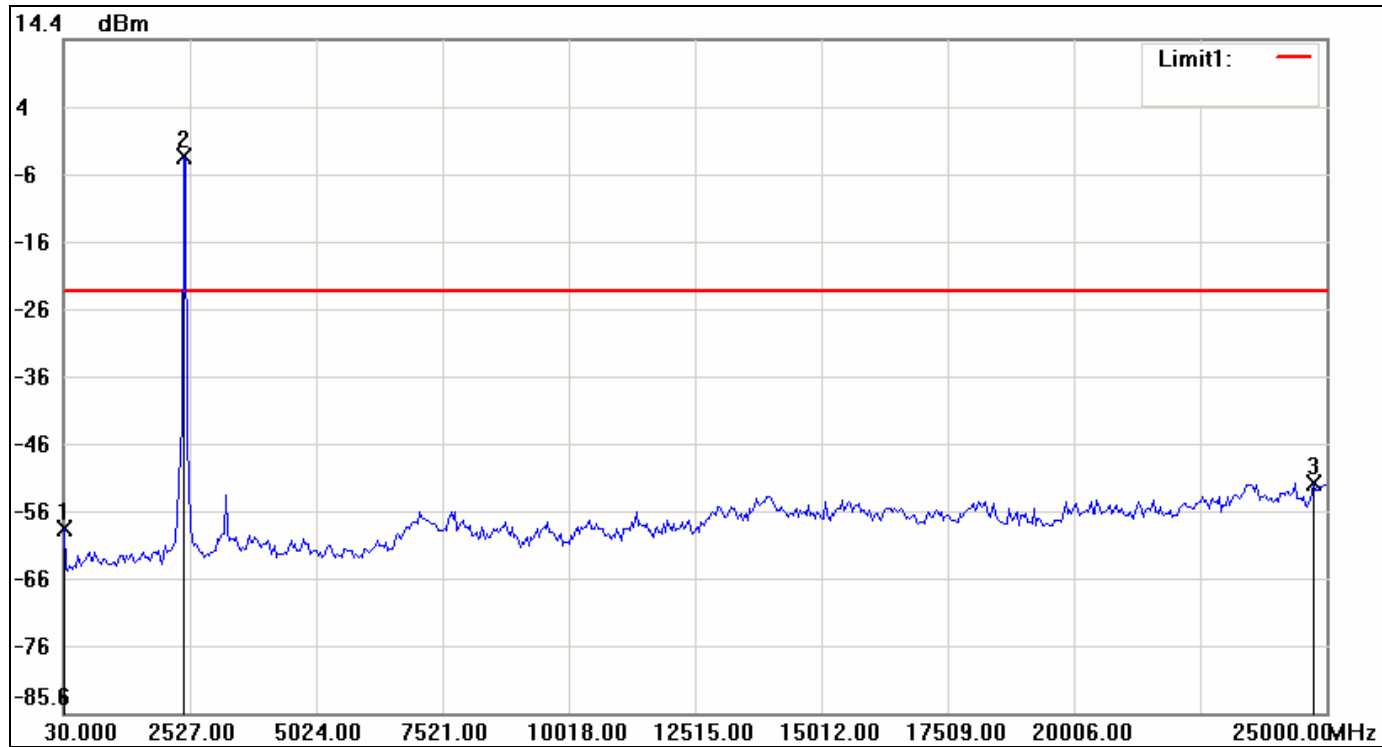


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-40.89	-21.30	-19.59
2	2443.7667	-1.30	-21.30	---
3	3276.1000	-45.77	-21.30	-24.47



IEEE 802.11n HT 40 MHz mode / Chain 1

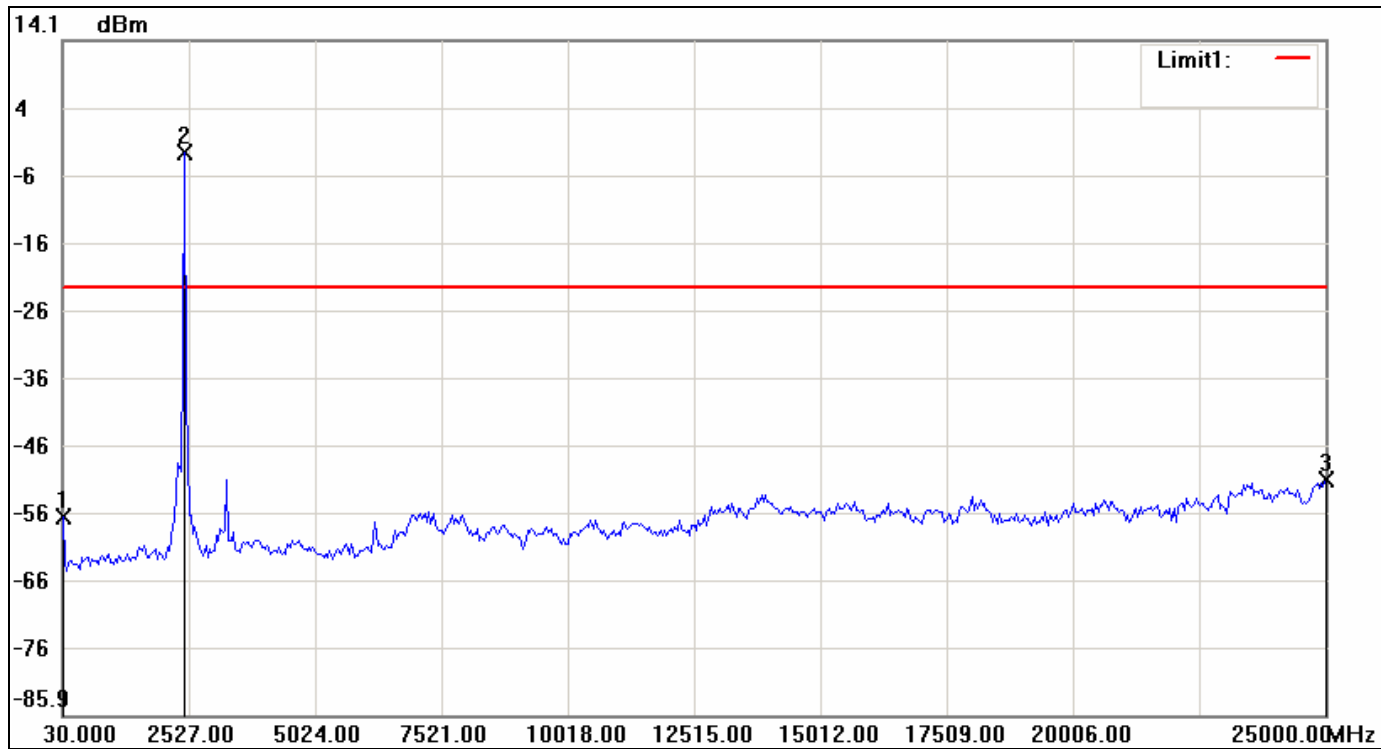
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	30.0000	-58.13	-22.92	-35.21
2	2402.1500	-2.92	-22.92	---
3	24750.3000	-51.46	-22.92	-28.54



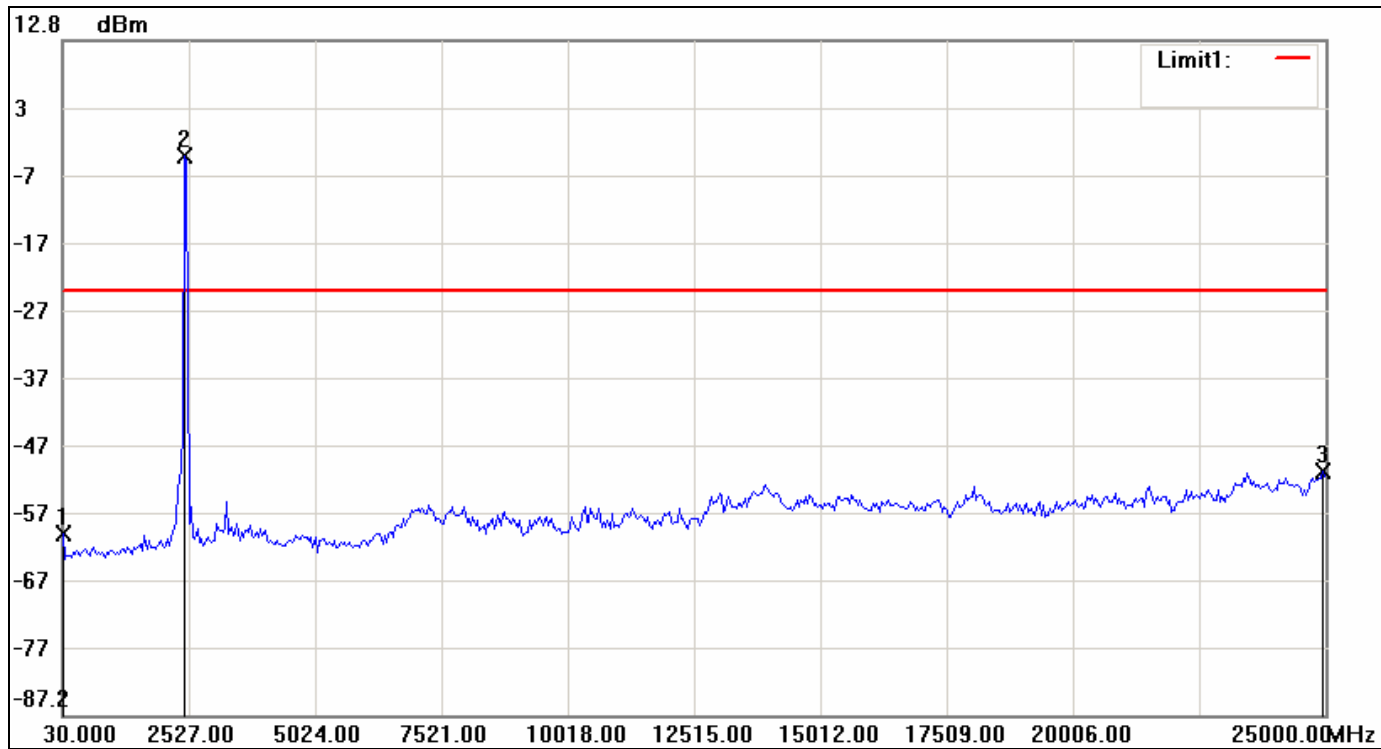
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	30.0000	-56.61	-22.49	-34.12
2	2443.7667	-2.49	-22.49	---
3	25000.0000	-51.09	-22.49	-28.60



CH High

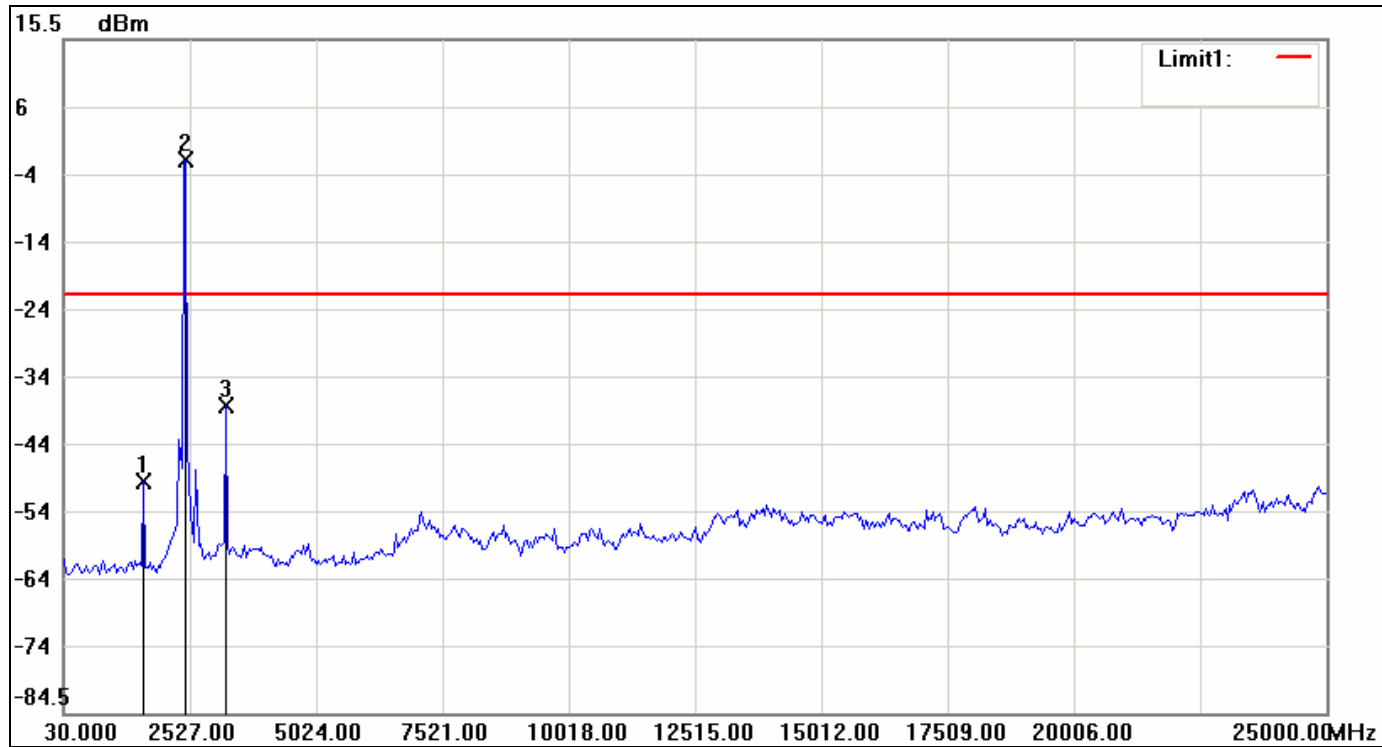


No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	30.0000	-60.39	-24.29	-36.10
2	2443.7667	-4.29	-24.29	---
3	24958.3833	-51.10	-24.29	-26.81



IEEE 802.11n HT 40 MHz mode / Chain 2

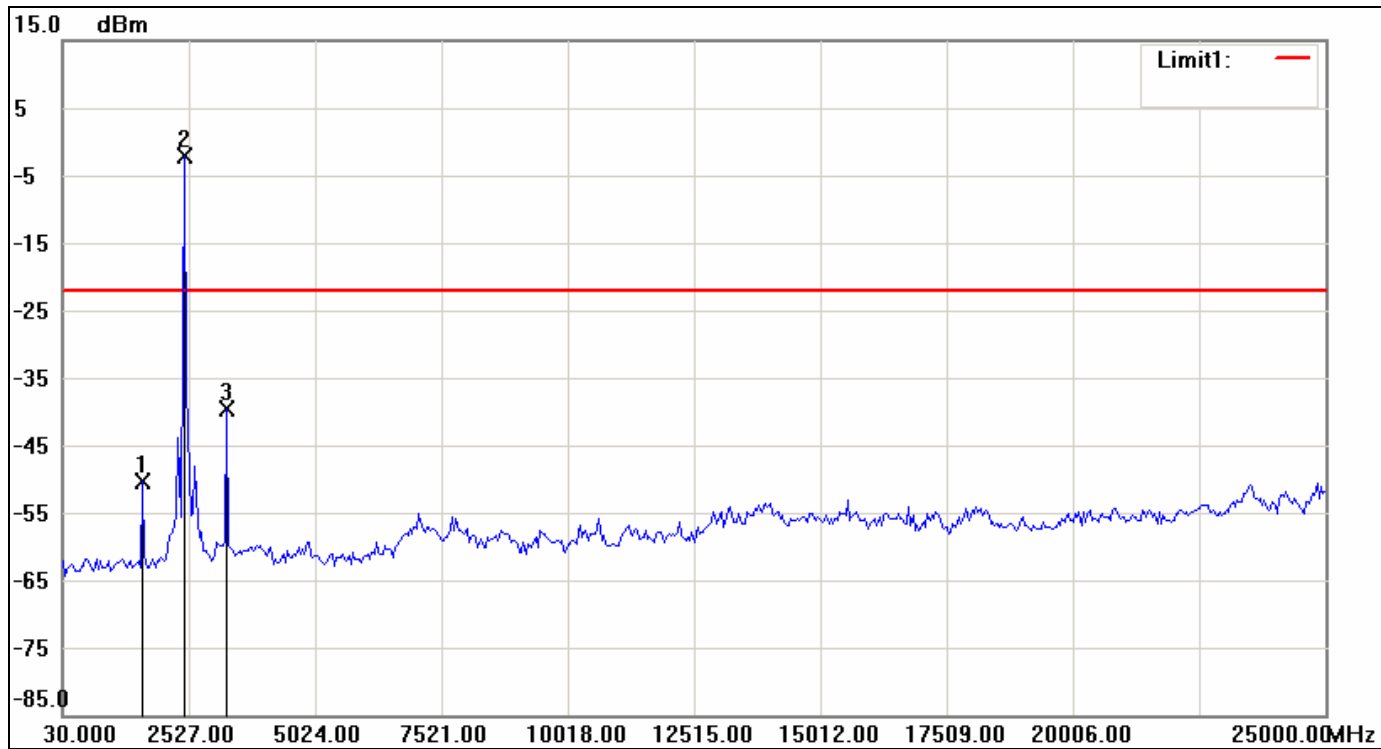
CH Low



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-50.16	-22.29	-27.87
2	2443.7667	-2.29	-22.29	---
3	3234.4833	-38.81	-22.29	-16.52



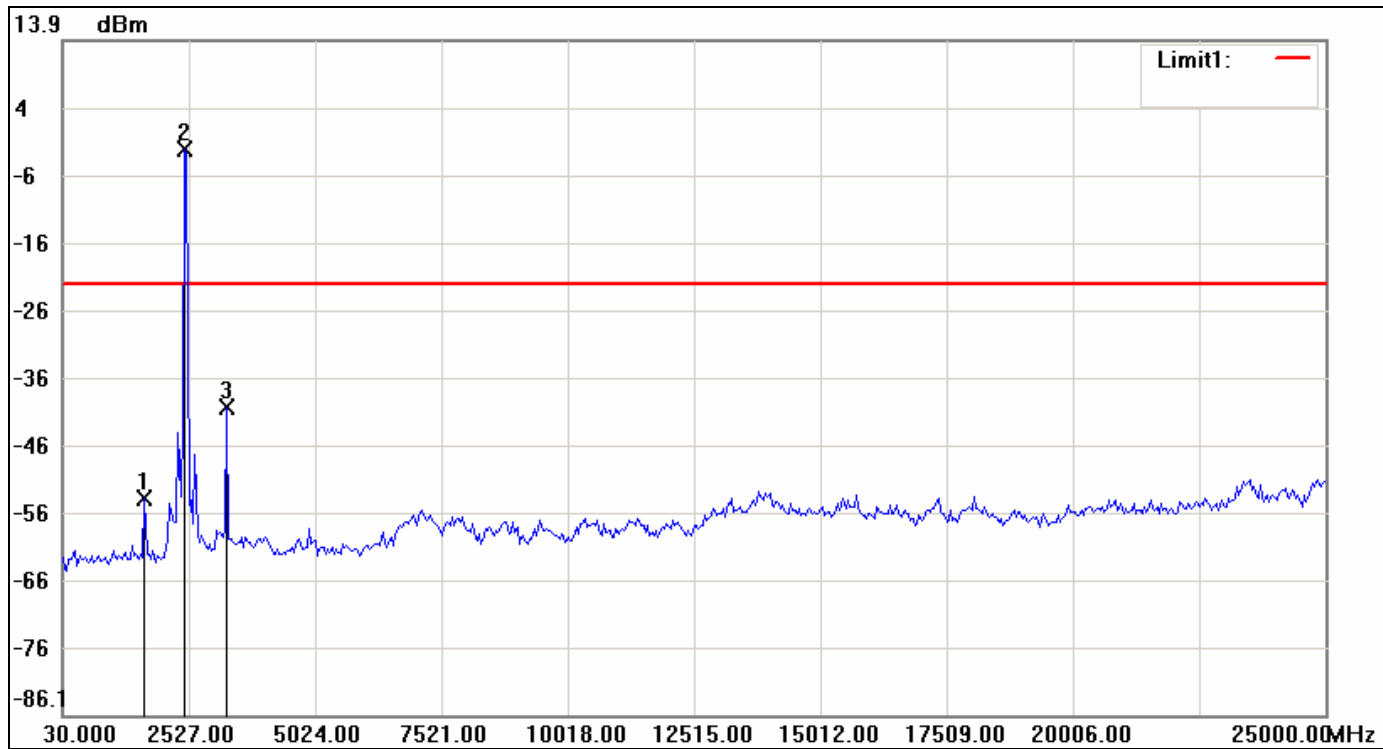
CH Mid



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1611.4333	-50.29	-22.05	-28.24
2	2443.7667	-2.05	-22.05	---
3	3276.1000	-39.70	-22.05	-17.65



CH High



No.	Frequency(MHz)	Level(dBm)	Limit(dBm)	Margin(dBm)
1	1653.0500	-54.08	-22.26	-31.82
2	2443.7667	-2.26	-22.26	---
3	3276.1000	-40.44	-22.26	-18.18

**IEEE 802.11n HT 40 MHz mode**

Low Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1611.4330	-40.37	---	-50.16	-35.60	-20.06	-15.54
3234.4800	-43.91	---	-38.81	-34.04	-20.06	-13.98
30.0000	---	-58.13	---	-53.36	-20.06	-33.30
24750.0000	---	-51.46	---	-46.69	-20.06	-26.63
Fundamental limit	-20.06	-22.92	-22.29	---	---	---

Mid Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1611.4330	-40.98	---	-50.29	-36.21	-21.61	-14.60
3276.1000	-45.07	---	-39.7	-34.93	-21.61	-13.32
30.0000	---	-56.61	---	-51.84	-21.61	-30.23
25000.0000	---	-51.09	---	-46.32	-21.61	-24.71
Fundamental limit	-21.61	-22.49	-22.05	---	---	---

High Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
1653.0500	-40.89	---	-54.08	-36.12	-21.30	-14.82
3276.1000	-45.77	---	-40.44	-35.67	-21.30	-14.37
30.0000	---	-60.39	---	-55.62	-21.30	-34.32
24958.0000	---	-51.1	---	-46.33	-21.30	-25.03
Fundamental limit	-21.30	-24.29	-22.26	---	---	---

Remark:

1. $Total (dBm) = Measure + 10 \log(3) dB$,
Measure=Choose the max chain value

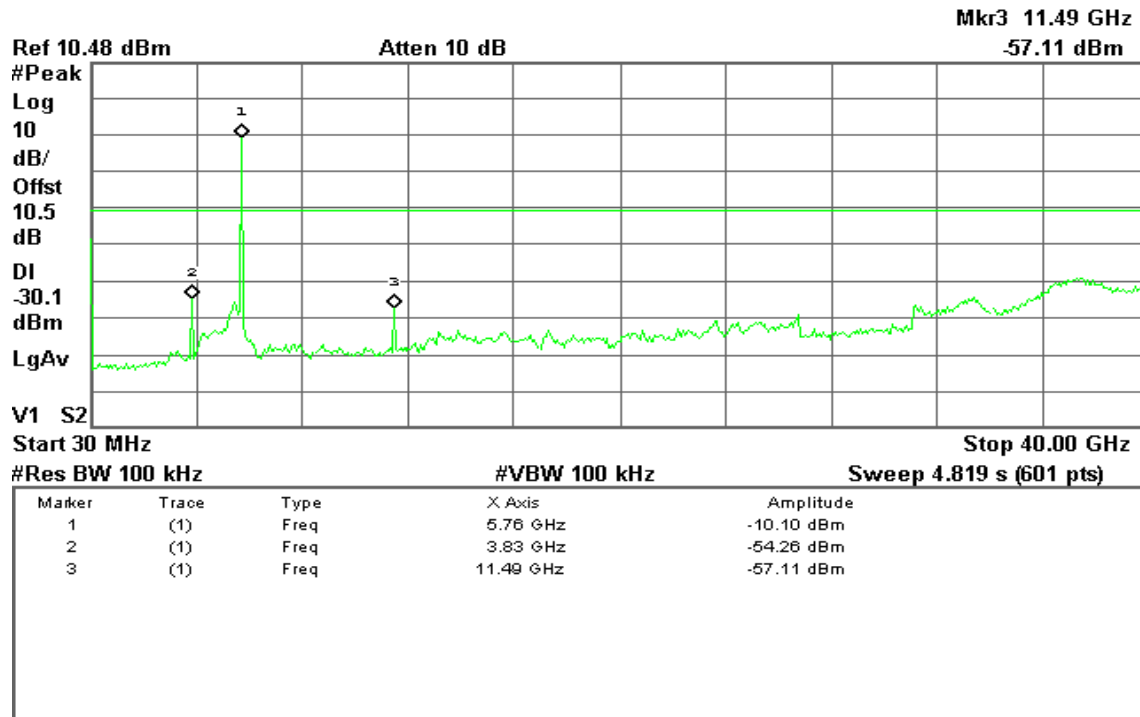


IEEE 802.11a mode

CH Low

* Agilent 16:52:19 Aug 2, 2011

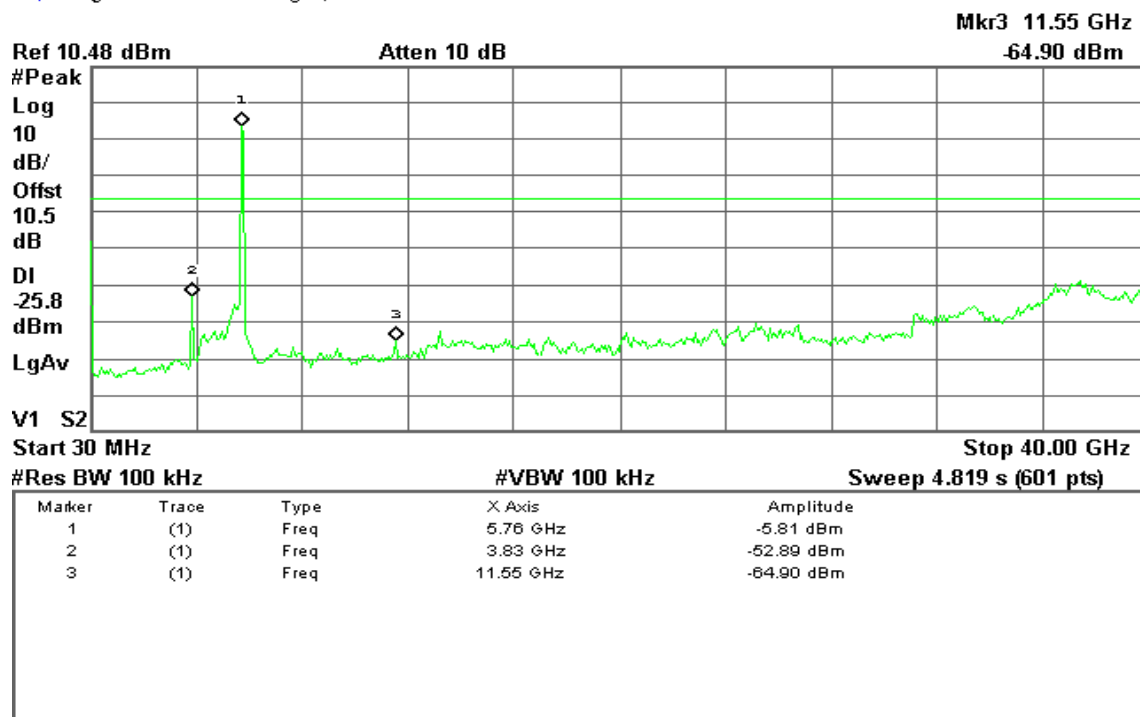
R T



CH Mid

* Agilent 16:54:37 Aug 2, 2011

R T

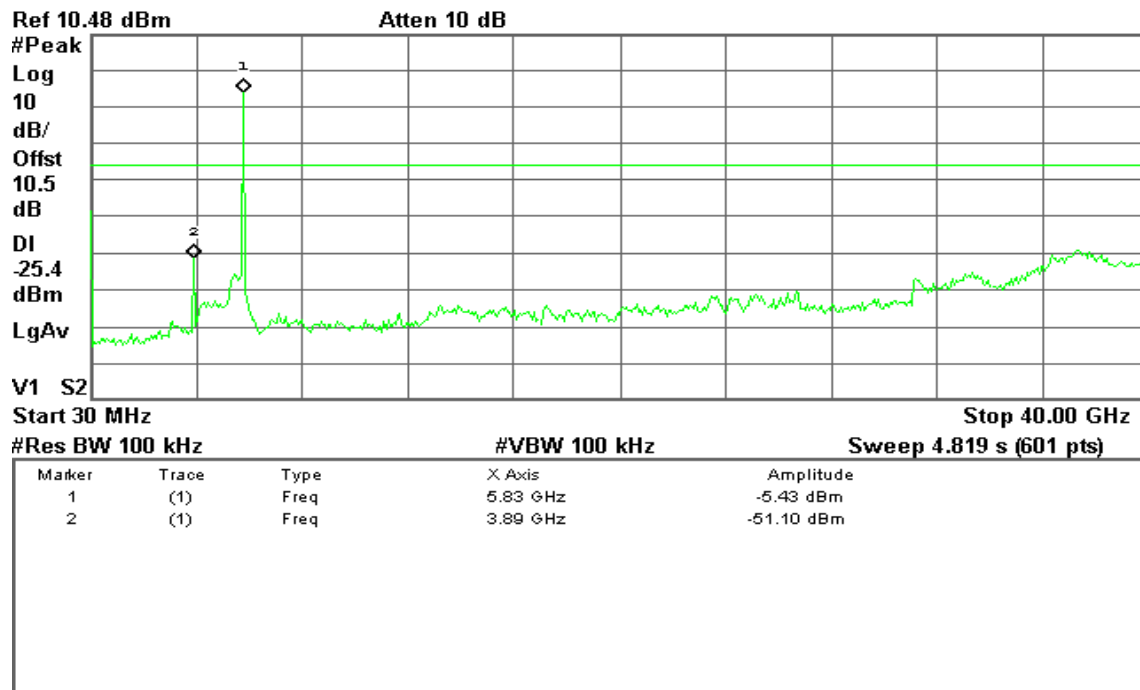




CH High

Agilent 16:55:42 Aug 2, 2011

R T



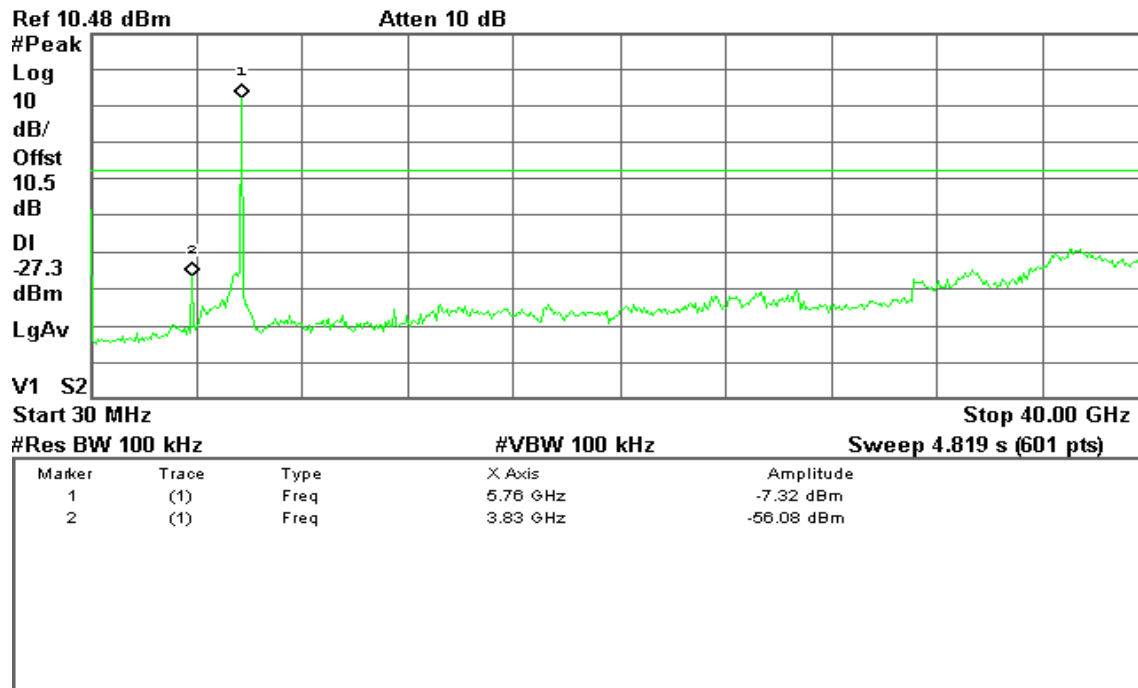


IEEE 802.11n HT 20 MHz Channel mode / Chain 0

CH Low

* Agilent 16:59:04 Aug 2, 2011

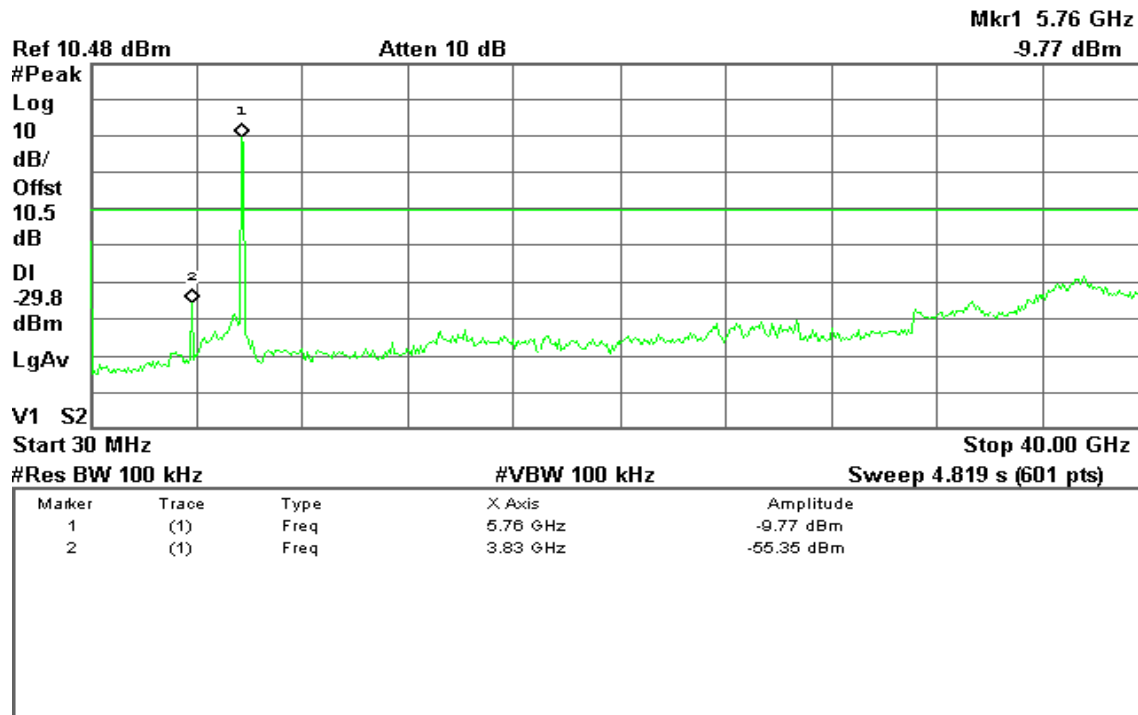
R T



CH Mid

* Agilent 17:04:21 Aug 2, 2011

R T

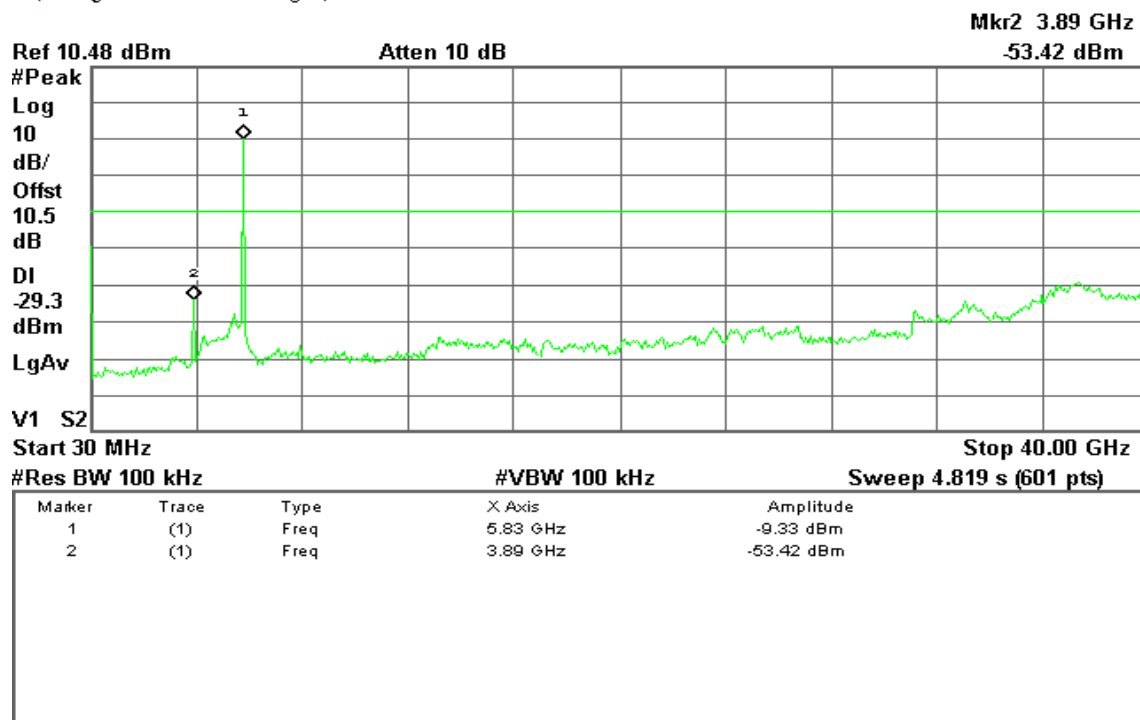




CH High

* Agilent 17:05:26 Aug 2, 2011

R T

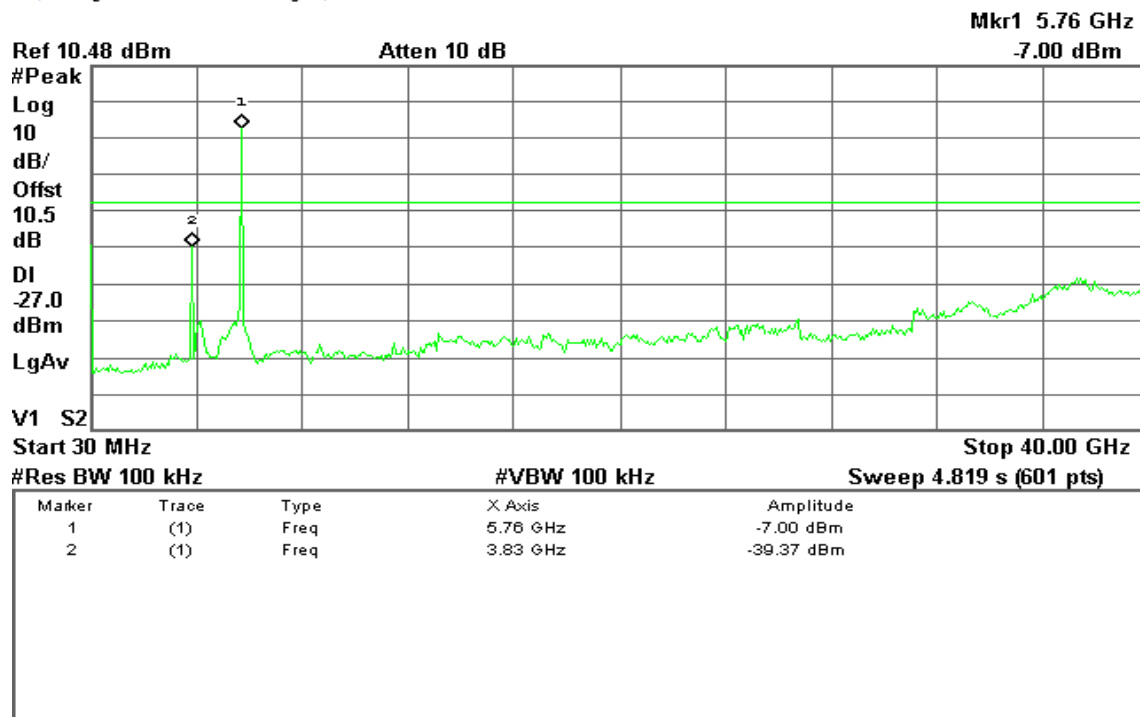


IEEE 802.11n HT 20 MHz Channel mode / Chain 1

CH Low

* Agilent 17:00:56 Aug 2, 2011

R T

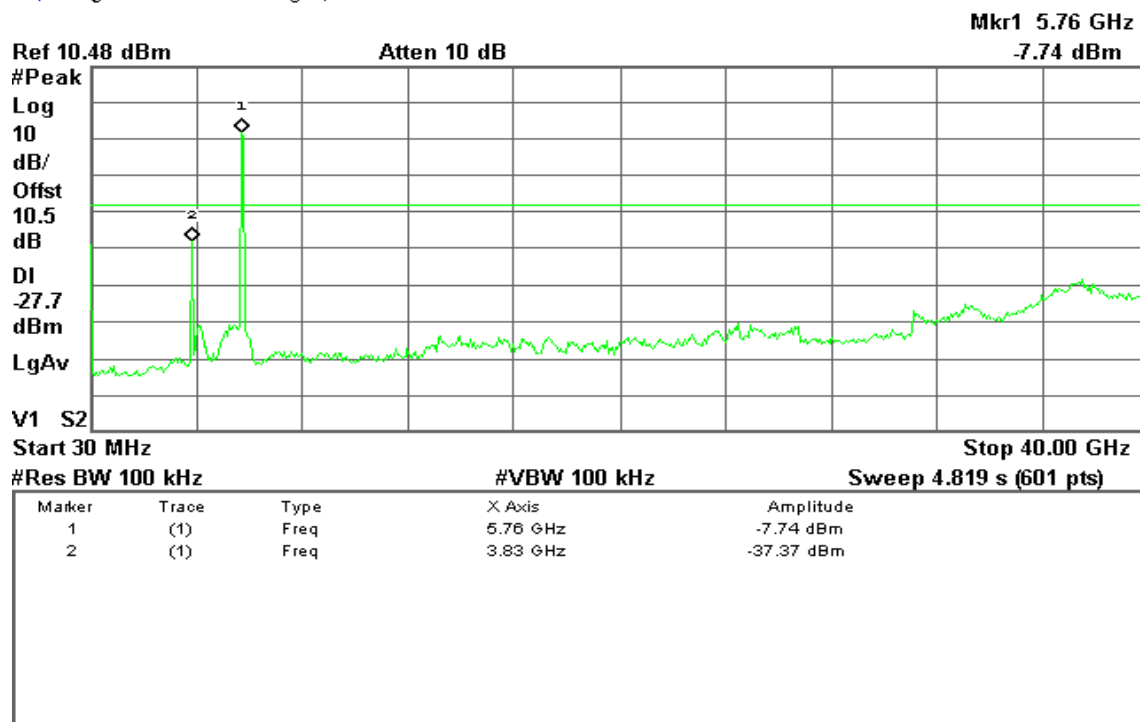




CH Mid

* Agilent 17:03:41 Aug 2, 2011

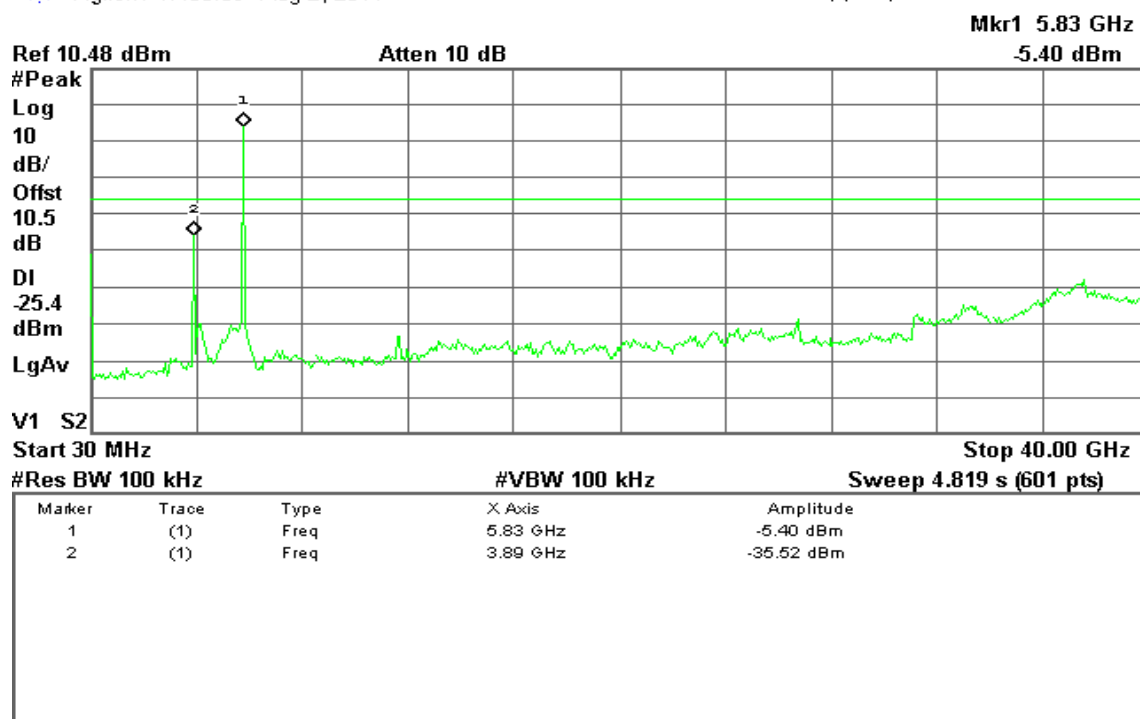
R L



CH High

* Agilent 17:06:09 Aug 2, 2011

R T



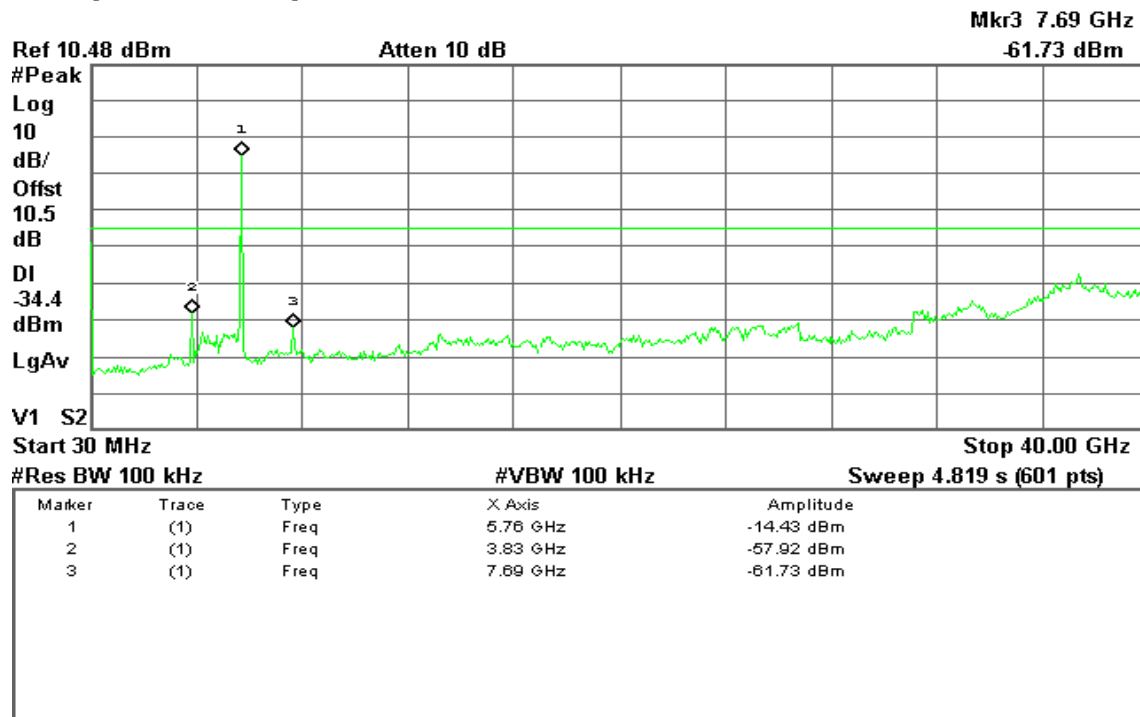


IEEE 802.11n HT 20 MHz Channel mode / Chain 2

CH Low

* Agilent 17:01:50 Aug 2, 2011

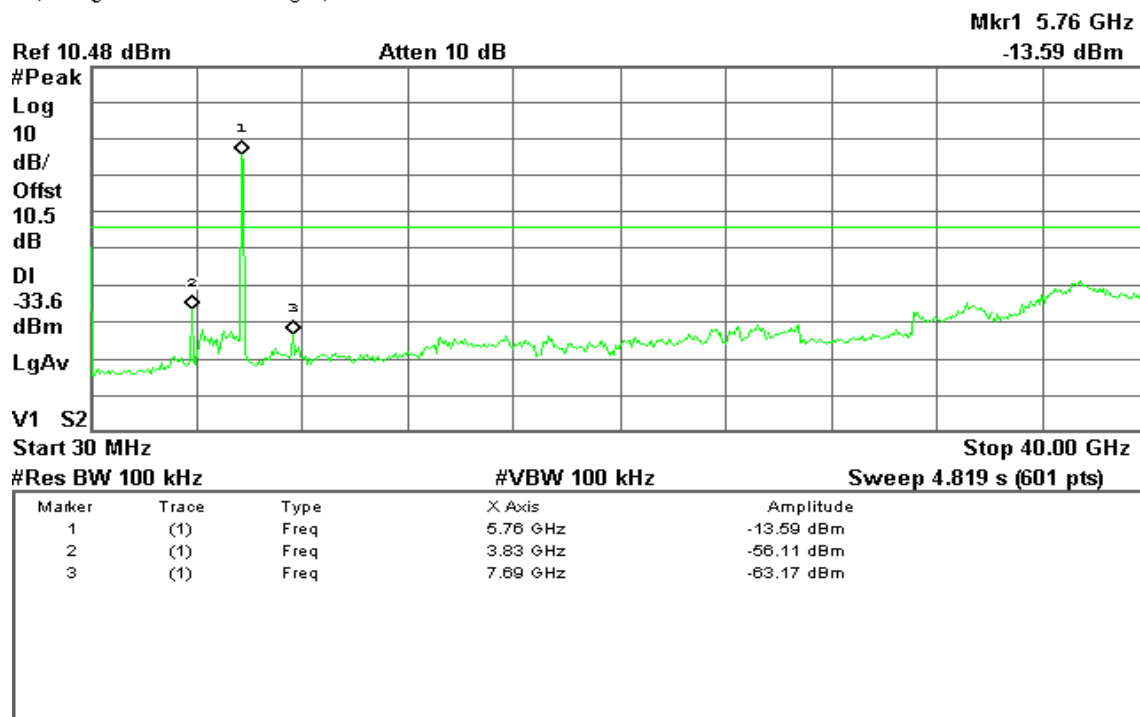
R T



CH Mid

* Agilent 17:02:52 Aug 2, 2011

R T

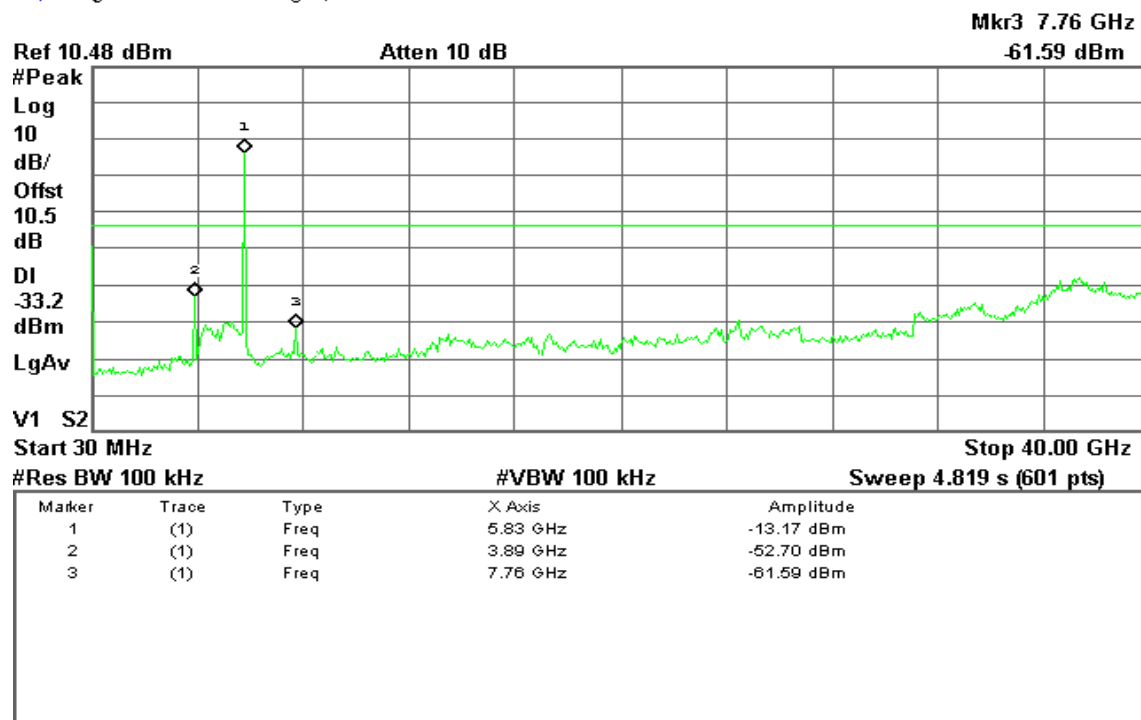




CH High

* Agilent 17:07:40 Aug 2, 2011

R T



**IEEE 802.11n HT 20 MHz Channel mode**

Low Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
3830	-56.08	-39.37	-57.92	-34.60	-27.00	-7.60
7690	---	---	-61.73	-56.96	-27.00	-29.96
Fundamental limit	-27.30	-27	-34.40	---	---	---

Mid Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
3830	-55.35	-37.37	-56.11	-32.60	-27.70	-4.90
7690	---	---	-63.17	-58.40	-27.70	-30.70
Fundamental limit	-29.80	-27.7	-33.60	---	---	---

High Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
3890	-53.42	-35.52	-52.70	-30.75	-25.40	-5.35
7760	---	---	-61.59	-56.82	-25.40	-31.42
Fundamental limit	-29.30	-25.40	-33.20	---	---	---

Remark:

1. $Total (dBm) = Measure + 10 \log(3) dB$,
Measure=Choose the max chain value

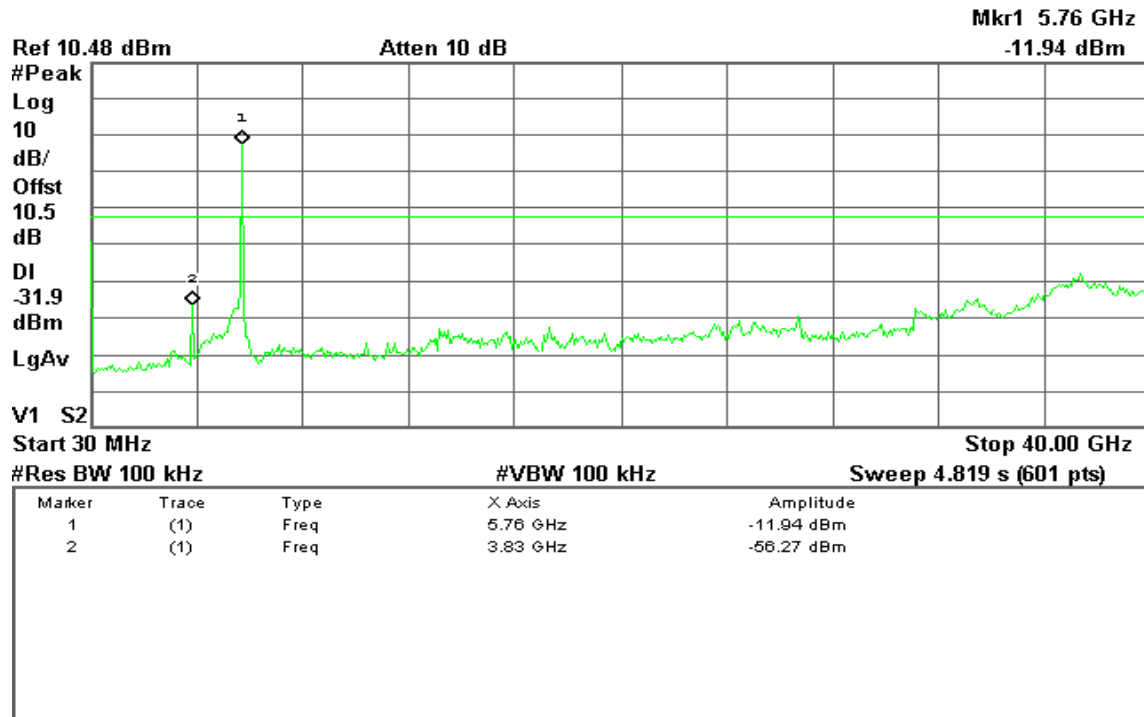


IEEE 802.11n HT 40 MHz mode / Chain 0

CH Low

* Agilent 17:12:44 Aug 2, 2011

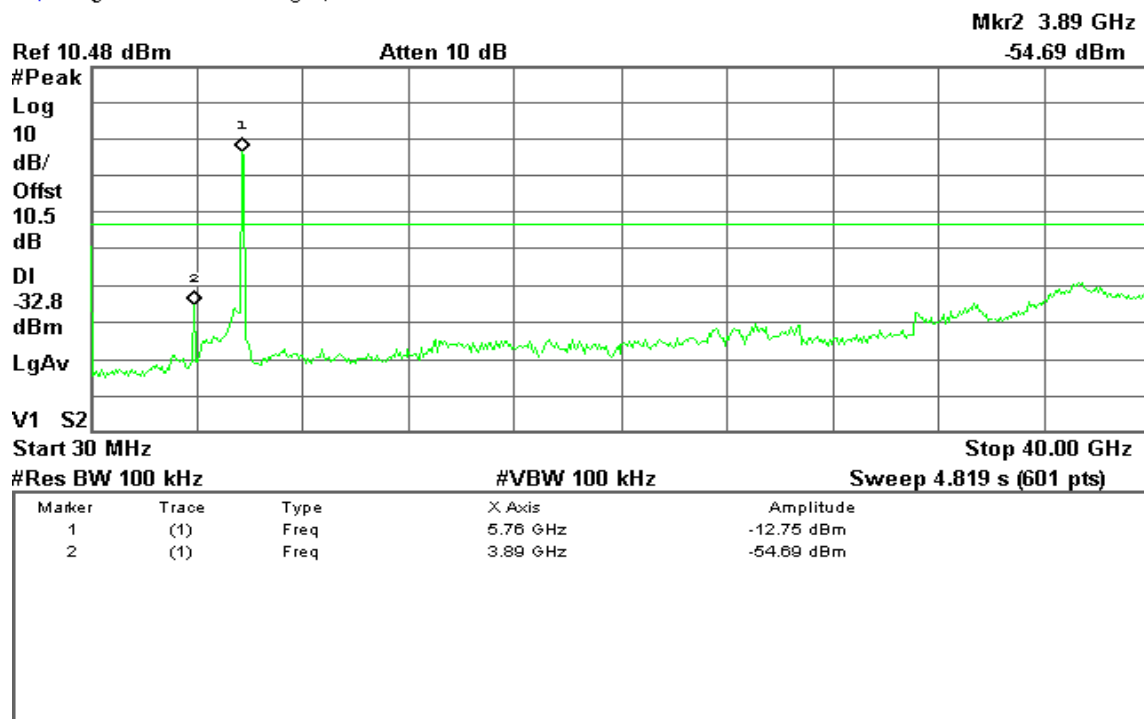
R T



CH High

* Agilent 17:13:41 Aug 2, 2011

R T



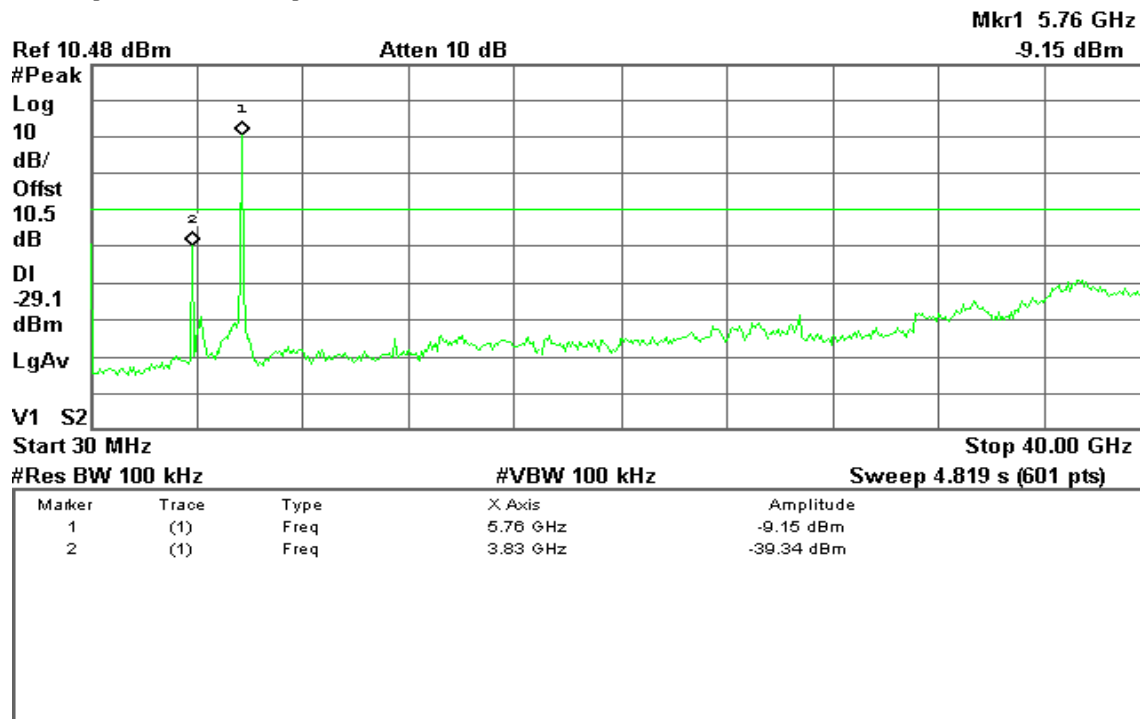


IEEE 802.11n HT 40 MHz mode / Chain 1

CH Low

* Agilent 17:12:06 Aug 2, 2011

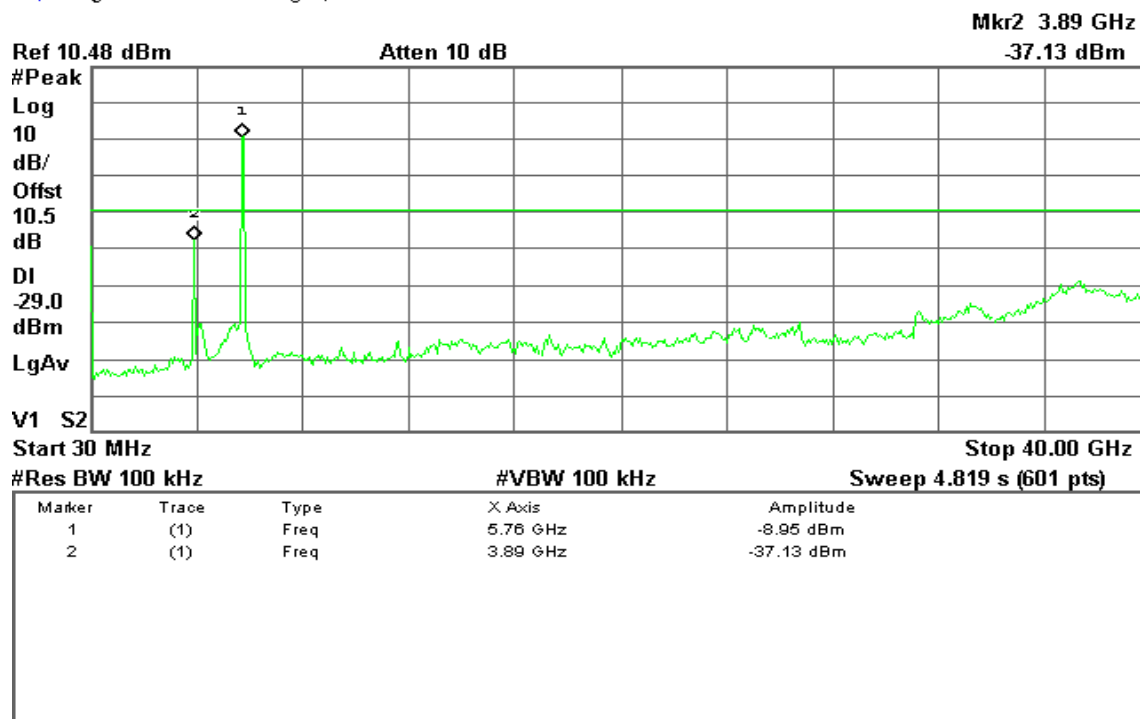
R T



CH High

* Agilent 17:14:37 Aug 2, 2011

R T



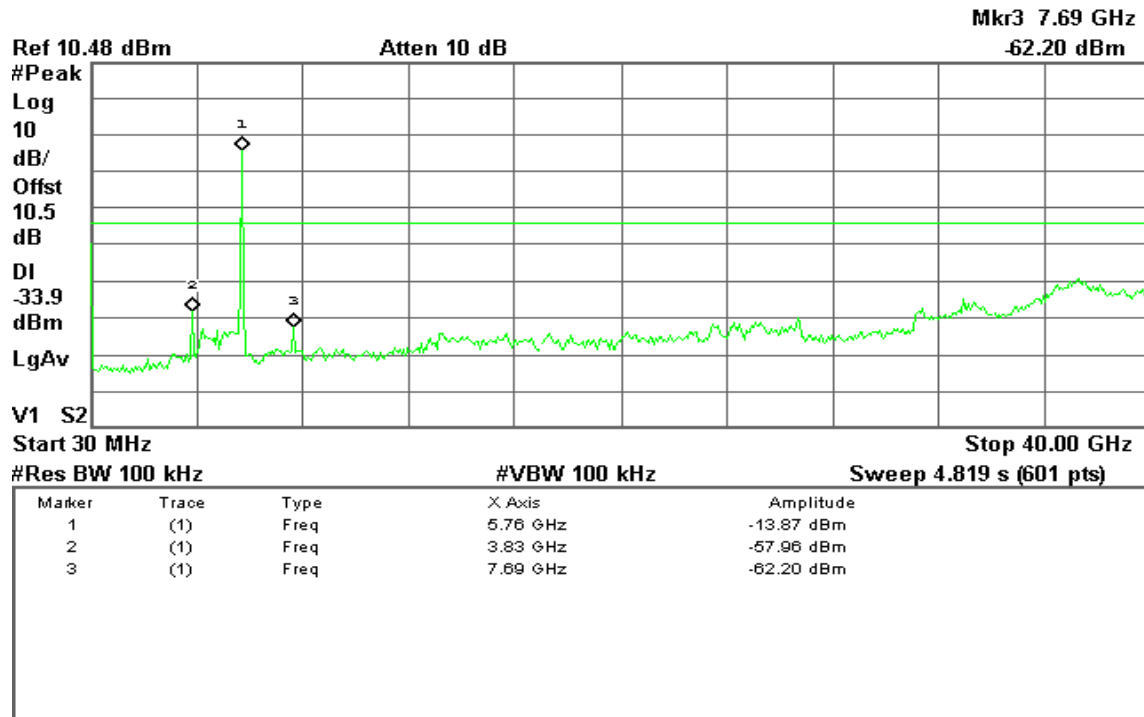


IEEE 802.11n HT 40 MHz mode / Chain 2

CH Low

* Agilent 17:11:24 Aug 2, 2011

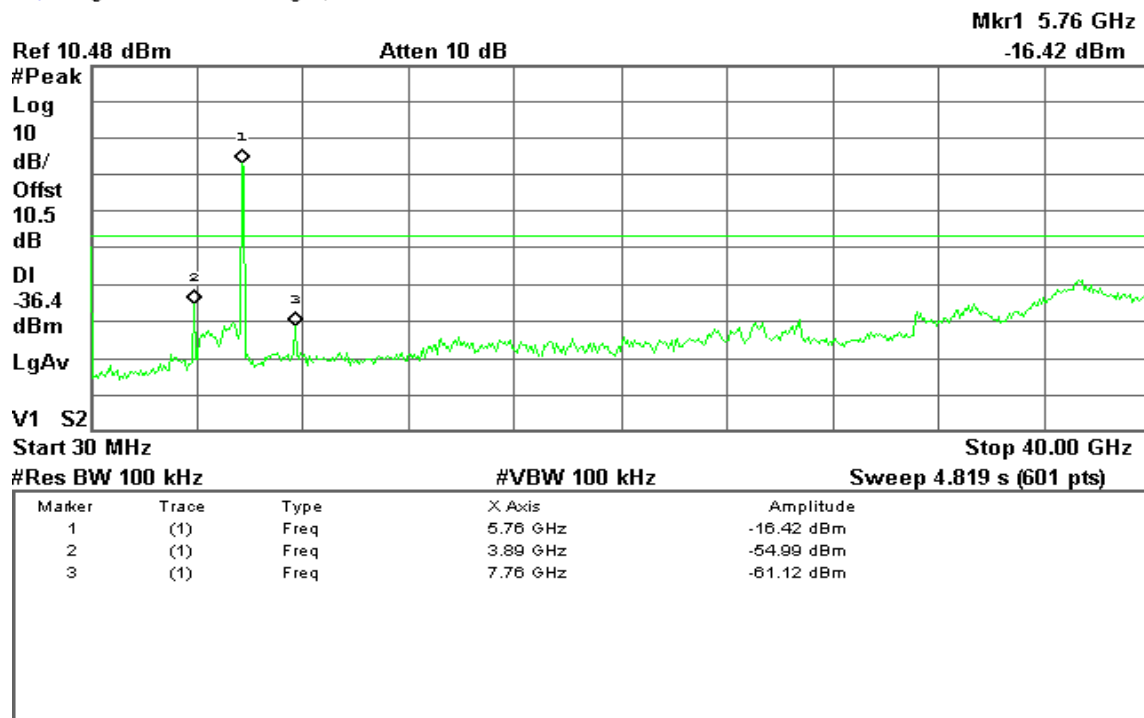
R T



CH High

* Agilent 17:17:19 Aug 2, 2011

R T



**IEEE 802.11n HT 40 MHz Channel mode**

Low Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
3830	-56.27	-39.34	-57.96	-34.57	-29.10	-5.47
7690	---	---	-62.20	-57.43	-29.10	-28.33
Fundamental limit	-31.90	-29.10	-33.90	---	---	---

High Channel						
Frequency (MHz)	Chain0 (dBm)	Chain1 (dBm)	Chain2 (dBm)	Total (dBm)	Limit (dBm)	Margin (dBm)
3890	-54.69	-37.13	-54.99	-32.36	-29.00	-3.36
7760	---	---	-61.12	-56.35	-29.00	-27.35
Fundamental limit	-32.80	-29.00	-36.40	---	---	---

Remark:

1. $Total (dBm) = Measure + 10 \log(3) dB$,
Measure=Choose the max chain value



7.7 RADIATED EMISSIONS

LIMIT

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

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

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

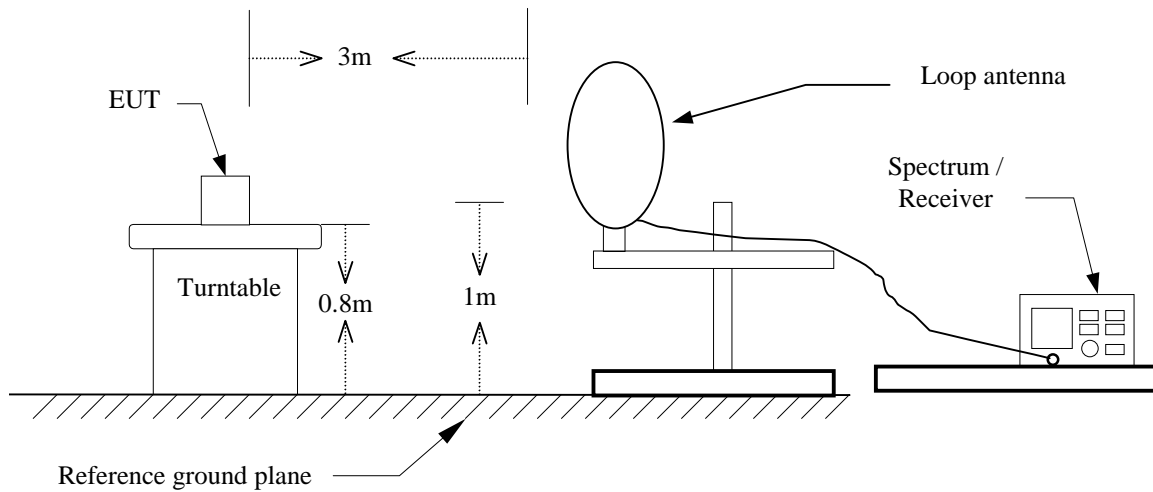
2. In the emission table above, the tighter limit applies at the band edges.

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

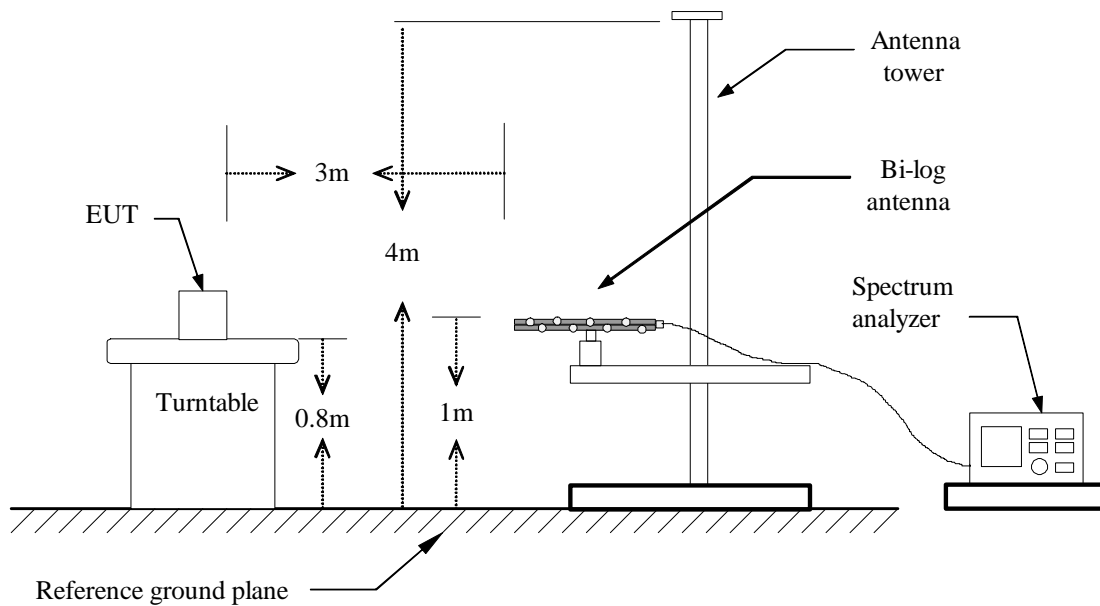


Test Configuration

9kHz ~ 30MHz

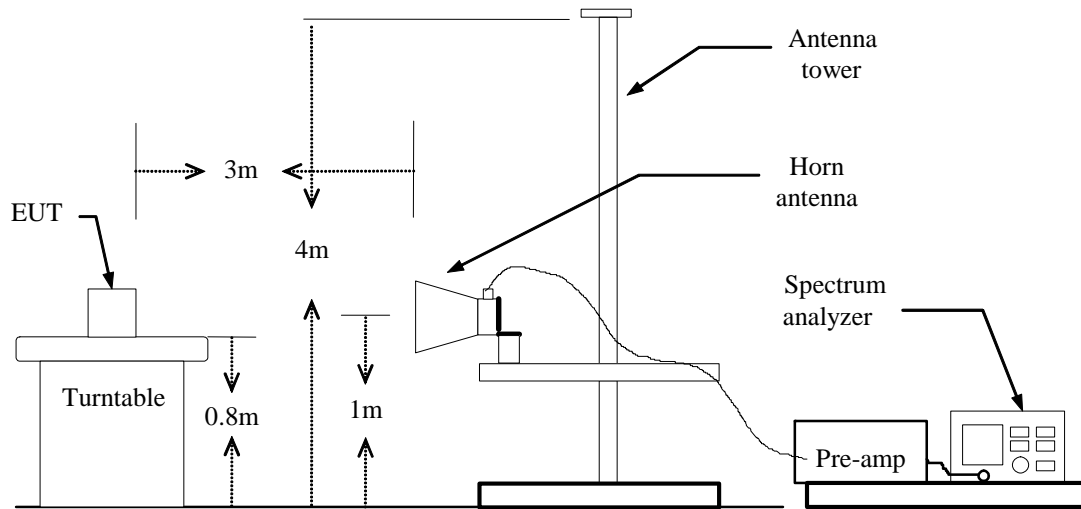


30MHz ~ 1GHz





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

**Below 1GHz****Operation Mode:** Normal Link**Test Date:** July 11, 2011**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)
84.97	45.12	-15.31	29.81	40.00	-10.19	QP	V
249.87	42.17	-10.90	31.26	46.00	-14.74	Peak	V
374.35	39.63	-7.58	32.05	46.00	-13.95	Peak	V
500.45	35.38	-5.14	30.24	46.00	-15.76	Peak	V
624.93	37.88	-3.48	34.41	46.00	-11.59	Peak	V
875.52	31.51	-0.73	30.78	46.00	-15.22	Peak	V
160.95	40.93	-10.60	30.33	43.50	-13.17	Peak	H
249.87	46.51	-10.90	35.61	46.00	-10.39	Peak	H
374.35	43.59	-7.58	36.01	46.00	-9.99	Peak	H
624.93	38.30	-3.48	34.82	46.00	-11.18	Peak	H
749.42	34.25	-1.83	32.42	46.00	-13.58	Peak	H
875.52	33.06	-0.73	32.32	46.00	-13.68	Peak	H

Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.
3. 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.
4. $\text{Margin (dB)} = \text{Result (dBuV/m)} - \text{Limit (dBuV/m)}$.

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** July 9, 2011**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)
1930.00	57.22	---	-6.18	51.04	---	74.00	54.00	-2.96	Peak	V
N/A										
1533.33	57.66	---	-10.21	47.44	---	74.00	54.00	-6.56	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit 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 802.11b / CH Mid

Test Date: July 9, 2011

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)
2026.67	56.73	---	-5.40	51.33	---	74.00	54.00	-2.67	Peak	V
N/A										
1793.33	56.27	---	-7.57	48.70	---	74.00	54.00	-5.30	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 802.11b / CH High

Test Date: July 9, 2011

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)
2036.67	56.90	---	-5.37	51.52	---	74.00	54.00	-2.48	Peak	V
N/A										
1793.33	55.82	---	-7.57	48.25	---	74.00	54.00	-5.75	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 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 802.11g / CH Low

Test Date: July 9, 2011

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)
1863.33	57.93	---	-6.86	51.08	---	74.00	54.00	-2.92	Peak	V
N/A										
1913.33	56.85	---	-6.35	50.50	---	74.00	54.00	-3.50	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit 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 802.11g / CH Mid

Test Date: July 9, 2011

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)
1746.67	56.95	---	-8.04	48.91	---	74.00	54.00	-5.09	Peak	V
N/A										
2193.33	56.36	---	-4.97	51.39	---	74.00	54.00	-2.61	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 802.11g / CH High

Test Date: July 9, 2011

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)
1646.67	58.24	---	-9.06	49.18	---	74.00	54.00	-4.82	Peak	V
N/A										
1743.33	56.58	---	-8.08	48.51	---	74.00	54.00	-5.49	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit 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 mode / CH Low **Test Date:** July 9, 2011

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)
1666.67	56.23	---	-8.86	47.37	---	74.00	54.00	-6.63	Peak	V
3216.67	53.29	49.89	-1.60	51.70	48.29	74.00	54.00	-5.71	AVG	V
N/A										
2360.00	59.28	50.11	-4.44	54.84	45.67	74.00	54.00	-8.33	AVG	H
2463.33	59.72	48.94	-4.02	55.70	44.92	74.00	54.00	-9.08	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 802.11n HT 20 MHz mode / CH Mid **Test Date:** July 9, 2011

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)
2390.00	57.53	48.17	-4.32	53.21	43.85	74.00	54.00	-10.15	AVG	V
3258.33	51.18	47.80	-1.49	49.69	46.31	74.00	54.00	-7.69	AVG	V
N/A										
2390.00	59.16	48.58	-4.32	54.84	44.26	74.00	54.00	-9.74	AVG	H
2493.33	58.74	49.01	-3.90	54.84	45.11	74.00	54.00	-8.89	AVG	H
4891.67	51.35	41.51	2.74	54.09	44.25	74.00	54.00	-9.75	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 802.11n HT 20 MHz mode / CH High **Test Date:** July 9, 2011**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)
1906.67	56.86	---	-6.42	50.44	---	74.00	54.00	-3.56	Peak	V
N/A										
2410.00	59.31	50.17	-4.24	55.07	45.93	74.00	54.00	-8.07	AVG	H
2513.33	58.12	46.09	-3.82	54.29	42.27	74.00	54.00	-11.73	AVG	H
4925.00	52.56	41.88	2.81	55.37	44.69	74.00	54.00	-9.31	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 802.11n HT 40 MHz mode
/ CH Low

Test Date: July 9, 2011

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)
1653.33	57.46	---	-8.99	48.47	---	74.00	54.00	-5.53	Peak	V
3233.33	53.30	---	-1.55	51.74	---	74.00	54.00	-2.26	Peak	V
N/A										
1556.67	57.08	---	-9.97	47.11	---	74.00	54.00	-6.89	Peak	H
N/A										

Remark:

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

Test Date: July 9, 2011

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)
1626.67	57.83	---	-9.26	48.57	---	74.00	54.00	-5.43	Peak	V
3258.33	51.57	---	-1.49	50.08	---	74.00	54.00	-3.92	Peak	V
N/A										
2546.67	58.28	45.29	-3.71	54.57	41.58	74.00	54.00	-12.42	AVG	H
4883.33	50.06	38.40	2.73	52.79	41.13	74.00	54.00	-12.87	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 802.11n HT 40 MHz mode
/ CH High

Test Date: July 9, 2011

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)
1810.00	56.67	---	-7.40	49.27	---	74.00	54.00	-4.73	Peak	V
3266.67	51.24	---	-1.47	49.77	---	74.00	54.00	-4.23	Peak	V
N/A										
1450.00	57.47	---	-10.60	46.86	---	74.00	54.00	-7.14	Peak	H
4891.67	49.85	35.21	2.74	52.60	37.95	74.00	54.00	-16.05	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/ CH Low**Test Date:** July 9, 2011**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)
2341.67	56.12	---	-4.52	51.60	---	74.00	54.00	-2.40	Peak	V
N/A										
2680.00	54.78	---	-3.26	51.52	---	74.00	54.00	-2.48	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 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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11a mode/ CH Mid**Test Date:** July 9, 2011**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)
2691.67	55.03	---	-3.22	51.81	---	74.00	54.00	-2.19	Peak	V
N/A										
2551.67	55.29	---	-3.69	51.60	---	74.00	54.00	-2.40	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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** Tx / IEEE 802.11a mode/ CH High**Test Date:** July 9, 2011**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)
2306.67	55.61	---	-4.66	50.95	---	74.00	54.00	-3.05	Peak	V
N/A										
1653.33	58.40	---	-8.99	49.41	---	74.00	54.00	-4.59	Peak	H
N/A										

Remark:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3. Average test would be performed if the peak result were greater than the average limit 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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.



Operation Mode: TX / IEEE 802.11n HT 20 MHz Channel mode /
CH Low

Test Date: July 9, 2011

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)
2575.00	55.52	---	-3.62	51.90	---	74.00	54.00	-2.10	Peak	V
N/A										
2178.33	55.08	---	-5.01	50.07	---	74.00	54.00	-3.93	Peak	H
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11n HT 20 MHz Channel mode /
CH Mid

Test Date: July 9, 2011

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)
2645.00	55.14	---	-3.38	51.76	---	74.00	54.00	-2.24	Peak	V
N/A										
2120.00	56.72	---	-5.16	51.56	---	74.00	54.00	-2.44	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 /
CH High

Test Date: July 9, 2011

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)
2388.33	55.48	---	-4.33	51.15	---	74.00	54.00	-2.85	Peak	V
N/A										
2470.00	55.61	---	-3.99	51.62	---	74.00	54.00	-2.38	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
/ CH Low

Test Date: July 9, 2011

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)
2143.33	55.90	---	-5.10	50.80	---	74.00	54.00	-3.20	Peak	V
N/A										
2050.00	55.27	---	-5.34	49.93	---	74.00	54.00	-4.07	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
/ CH High

Test Date: July 9, 2011

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)
2143.33	55.24	---	-5.10	50.14	---	74.00	54.00	-3.86	Peak	V
N/A										
2143.33	56.74	---	-5.10	51.65	---	74.00	54.00	-2.35	Peak	H
N/A										

Remark:

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

TEST PROCEDURE

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

**TEST RESULTS**

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

Test Data

Operation Mode: Normal Link **Test Date:** July 26, 2011
Temperature: 26°C **Tested by:** David Lee
Humidity: 60% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1680	42.13	29.33	0.17	42.30	29.50	65.06	55.06	-22.76	-25.56	L1
0.2117	35.74	25.24	0.16	35.90	25.40	63.14	53.14	-27.24	-27.74	L1
0.5370	36.04	24.54	0.16	36.20	24.70	56.00	46.00	-19.80	-21.30	L1
0.7084	38.63	28.63	0.17	38.80	28.80	56.00	46.00	-17.20	-17.20	L1
6.2025	23.75	11.25	0.35	24.10	11.60	60.00	50.00	-35.90	-38.40	L1
8.5965	27.47	15.47	0.43	27.90	15.90	60.00	50.00	-32.10	-34.10	L1
0.1680	33.14	17.64	0.26	33.40	17.90	65.06	55.06	-31.66	-37.16	L2
0.2175	42.15	25.95	0.25	42.40	26.20	62.91	52.91	-20.51	-26.71	L2
0.4065	33.35	18.15	0.25	33.60	18.40	57.72	47.72	-24.12	-29.32	L2
0.6990	26.95	12.95	0.25	27.20	13.20	56.00	46.00	-28.80	-32.80	L2
9.4065	24.36	15.86	0.44	24.80	16.30	60.00	50.00	-35.20	-33.70	L2
12.1965	33.71	27.71	0.49	34.20	28.20	60.00	50.00	-25.80	-21.80	L2

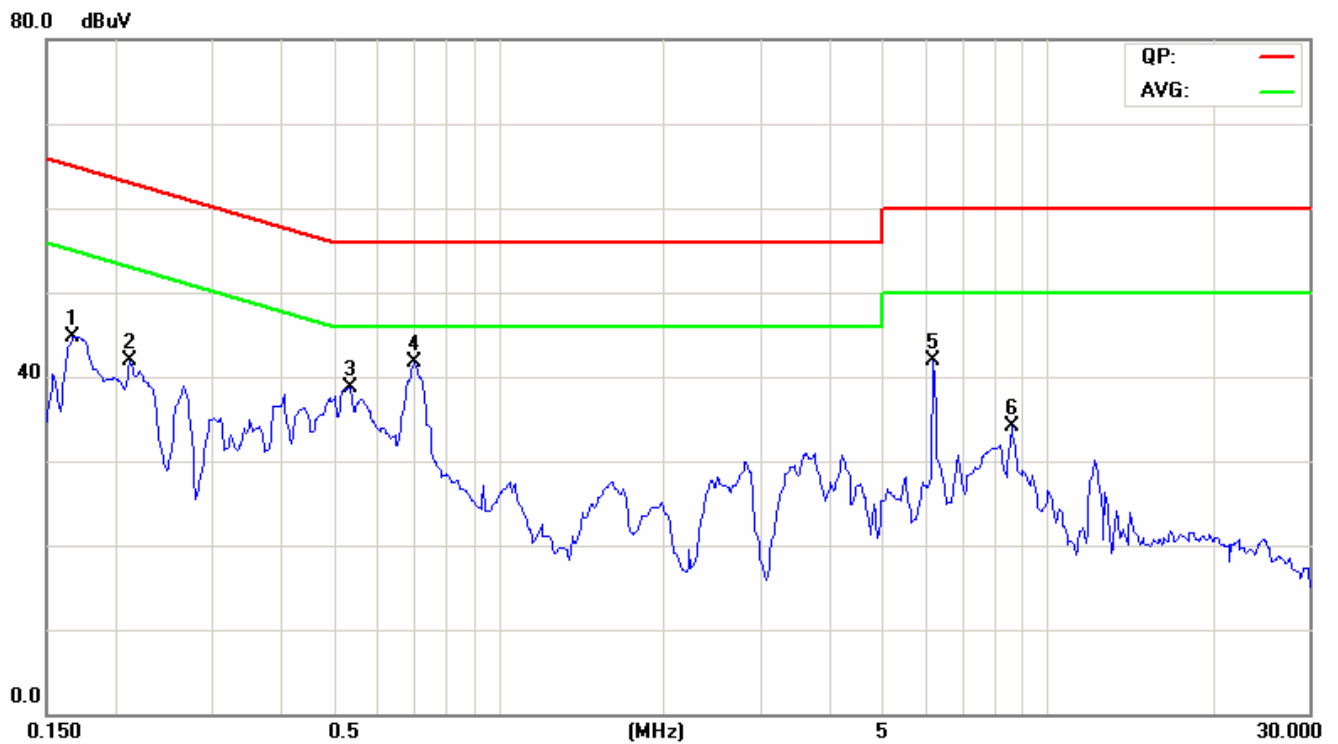
Remark:

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



Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

