



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

NexConnect II Router

Model: NEX-SH-B109

Trade Name: NexAira

Issued to

NexAira Inc.

6650 Lusk Blvd., Suite B-203, San Diego, CA 92121, USA

Issued by

Compliance Certification Services Inc.

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

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1. TEST RESULT CERTIFICATION

Applicant: NexAira Inc.
6650 Lusk Blvd., Suite B-203, San Diego, CA 92121, USA

Equipment Under Test: NexConnect II Router

Trade Name: NexAira

Model Number: NEX-SH-B109

Date of Test: February 3 ~ March 18, 2010

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

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	NexConnect II Router
Trade Name	NexAira
Model Number	NEX-SH-B109
Model Discrepancy	N/A
Power Adapter	1. JET / Model: SA08-15US12R-A I/P: 100-240V, 0.5A, 50-60Hz O/P: 12V, 1.25A 2. JFEC / Mode: JF015WR-1200125UV I/P: 100-240V, 50-60Hz, 0.5A I O/P: 12V, 1.25A
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 20.86 dBm IEEE 802.11g mode: 22.14 dBm draft 802.11n Standard-20 MHz Channel mode: 25.03 dBm draft 802.11n Wide-40 MHz Channel mode: 26.77 dBm
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) draft 802.11n Standard-20 MHz Channel mode: OFDM (14.4, 28.9, 43.3, 57.8, 86.7, 115.6, 130, 144.4Mbps) draft 802.11n Wide-40 MHz Channel mode: OFDM (30, 60, 90, 120, 180, 240, 270, 300Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n Standard-20 MHz Channel mode: 11 Channels draft 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	PIFA Antenna / Gain: 3.309 dBi MIMO: $3.309 \text{ dBi} + 10 \log (2) = 6.309 \text{ dBi}$ (Numeric gain: 4.27)

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **YAZ-NEX09** 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: NEX-SH-B109) comes with two types of power adapter (JET / JFEC) for sale. After the preliminary test, the power adapter JET was found to emit the worst emissions and therefore had been tested under operating condition.

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

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

The worst case data rate is determined as the data rate with highest output power.

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 (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

draft 802.11n Standard-20 MHz Channel mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 14.4Mbps data rate were chosen for full testing.

draft 802.11n Wide-40 MHz Channel mode:

Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 30Mbps 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.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	02/22/2011
Spectrum Analyzer	R&S	FSEK30	100264	04/14/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/09/2010
Test Receiver	Rohde&Schwarz	ESCI	100064	11/28/2010
Switch Controller	TRC	Switch Controller	SC94050010	05/02/2010
4 Port Switch	TRC	4 Port Switch	SC94050020	05/02/2010
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Horn-Antenna	TRC	HA-0502	06	06/03/2010
Horn-Antenna	TRC	HA-0801	04	06/18/2010
Horn-Antenna	TRC	HA-1201A	01	08/10/2010
Horn-Antenna	TRC	HA-1301A	01	08/10/2010
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/26/2011
Loop Antenna	EMCO	6502	8905/2356	05/28/2010
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC MRA: TW1039 IC: 2324G-1/-2	10/17/2010 11/04/2010
Test S/W	LABVIEW (V 6.1)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	11/17/2010
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/10/2010
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	04/07/2011
Test S/W	LABVIEW (V 6.1)			



4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Powerline Conducted Emission	+/-1.1559
3M Semi Anechoic Chamber / 30M~200M	+/-3.9944
3M Semi Anechoic Chamber / 200M~1000M	+/-3.9285
3M Semi Anechoic Chamber / 1G~8G	+/-2.4734
3M Semi Anechoic Chamber / 8G~18G	+/-2.4878
3M Semi Anechoic Chamber / 18G~26G	+/-2.6215
3M Semi Anechoic Chamber / 26G~40G	+/-2.8603

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



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

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

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

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

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

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

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

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

5.2 EQUIPMENT




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

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

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

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

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	 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.	3.5G Card	ASUS	T500	78W0AG003390	N/A	N/A	N/A
2.	3.5G Dongle	HUAWEI	E220	E01AB10762500585	QISE220	N/A	Unshielded, 0.1m
3.	Notebook PC (Remote)	HP	dv6-1332TX	CNF9491GLJ	N/A	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
4.	Wireless Pre-N Router (Remote)	BELKIN	F5D8230-4	N/A	SA3-AGN0901AP0100	LAN Cable: Unshielded, 10m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
5.	Notebook PC (Remote)	ASUS	M5200AE	5BN0AG019631	PD9WM3B2100	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.

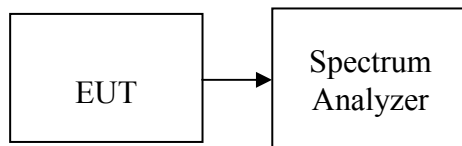
7. FCC PART 15.247 REQUIREMENTS

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 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)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	10250	>500	PASS
Mid	2437	10250		PASS
High	2462	11170		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	16420	>500	PASS
Mid	2437	16500		PASS
High	2462	16420		PASS

Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 0

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	17420	>500	PASS
Mid	2437	17330		PASS
High	2462	17500		PASS

Test mode: draft 802.11n Standard-20 MHz Channel mode / Chain 1

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2412	17000	>500	PASS
Mid	2437	17000		PASS
High	2462	17080		PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 0

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2422	35250	>500	PASS
Mid	2437	35670		PASS
High	2452	34170		PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode / Chain 1

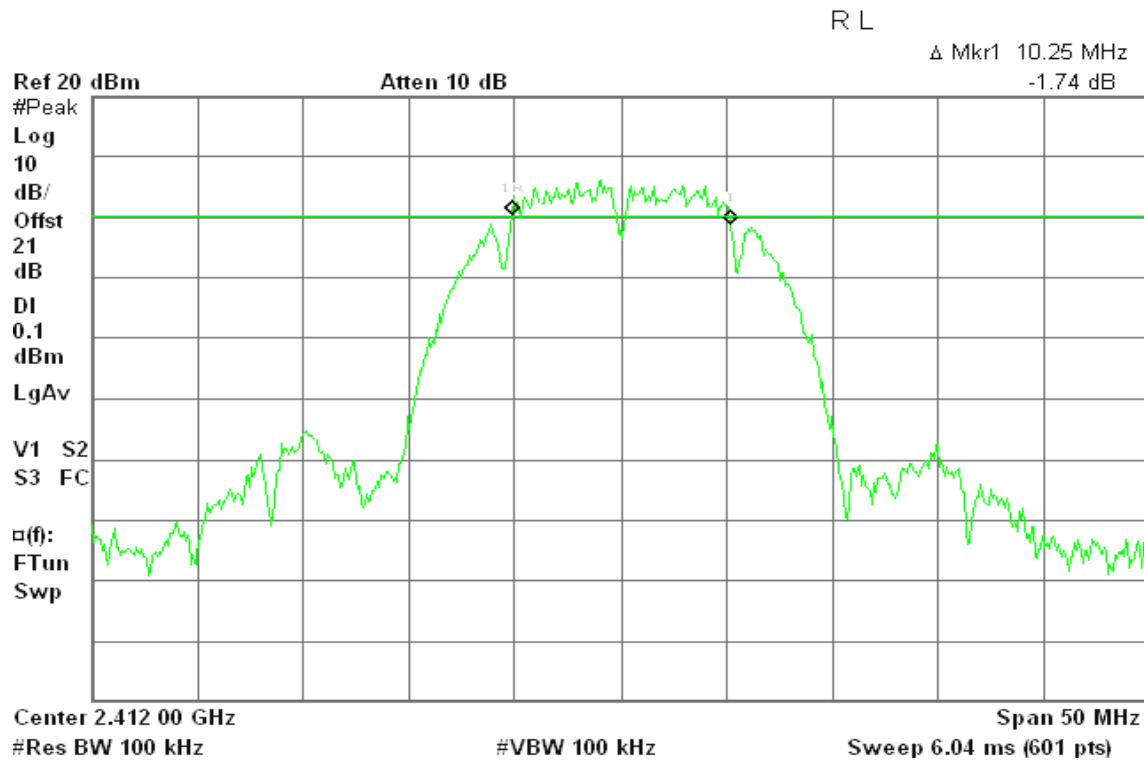
Channel	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	Result
Low	2422	35750	>500	PASS
Mid	2437	35080		PASS
High	2452	36330		PASS



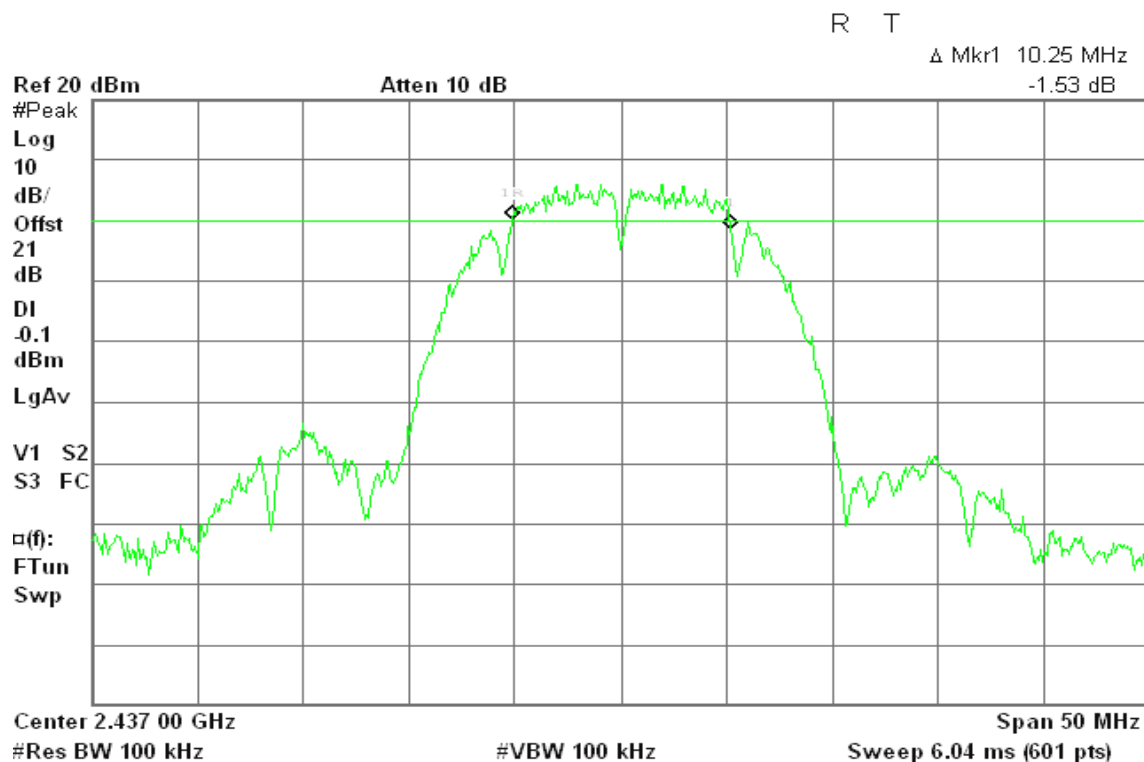
Test Plot

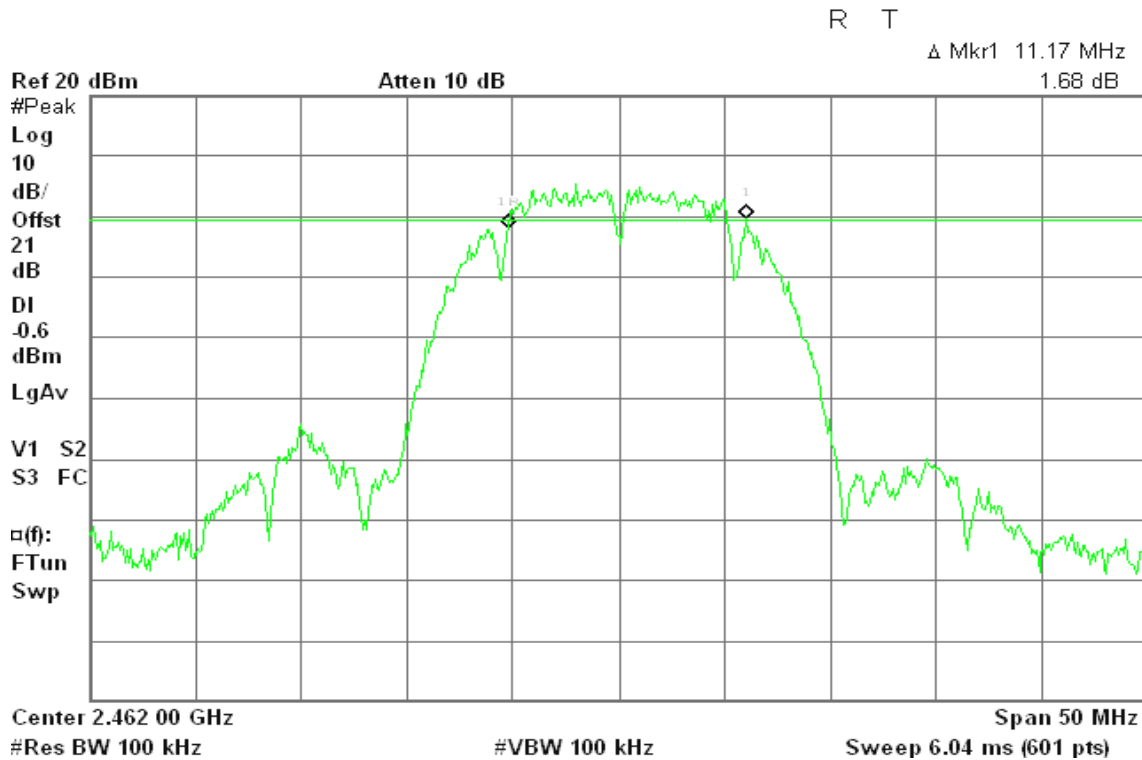
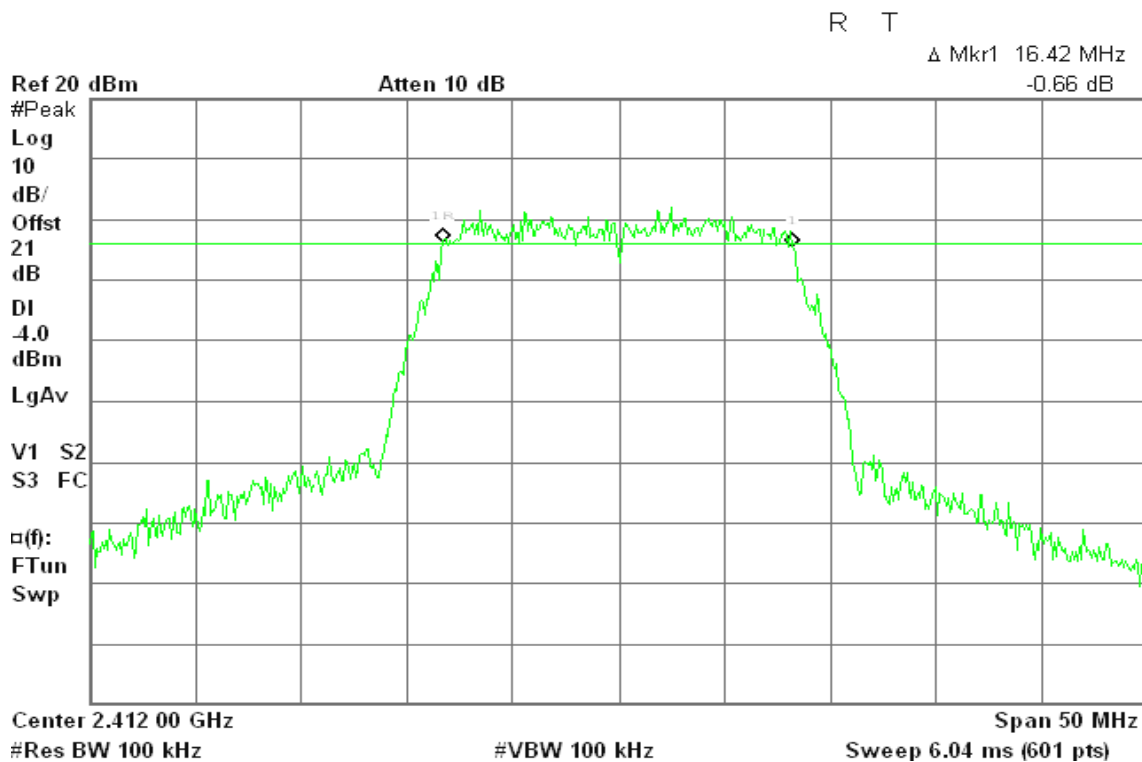
IEEE 802.11b mode

6dB Bandwidth (CH Low)



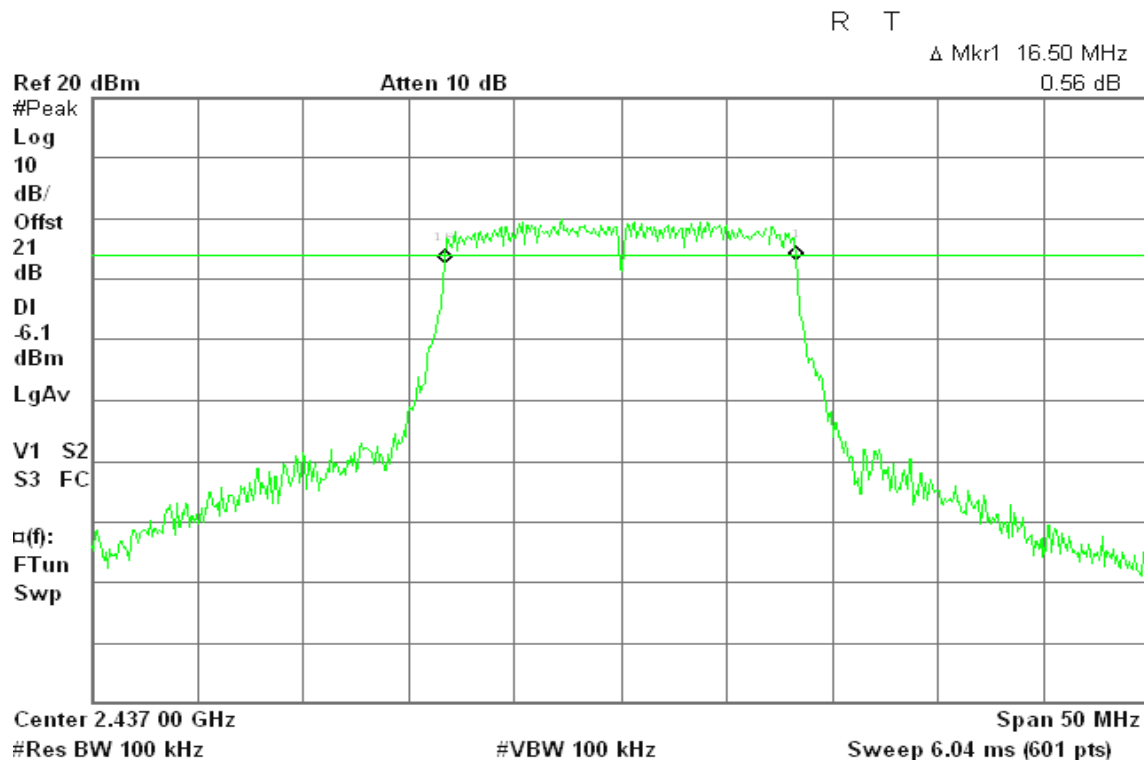
6dB Bandwidth (CH Mid)



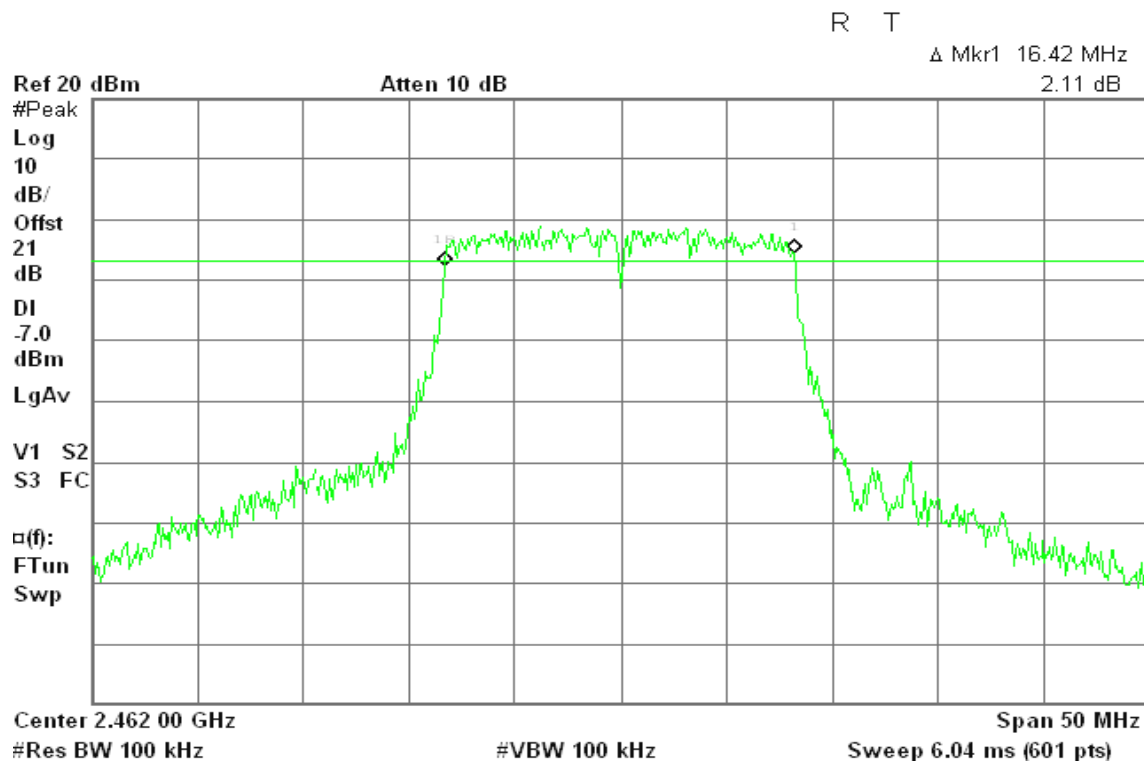
**6dB Bandwidth (CH High)****IEEE 802.11g mode****6dB Bandwidth (CH Low)**



6dB Bandwidth (CH Mid)



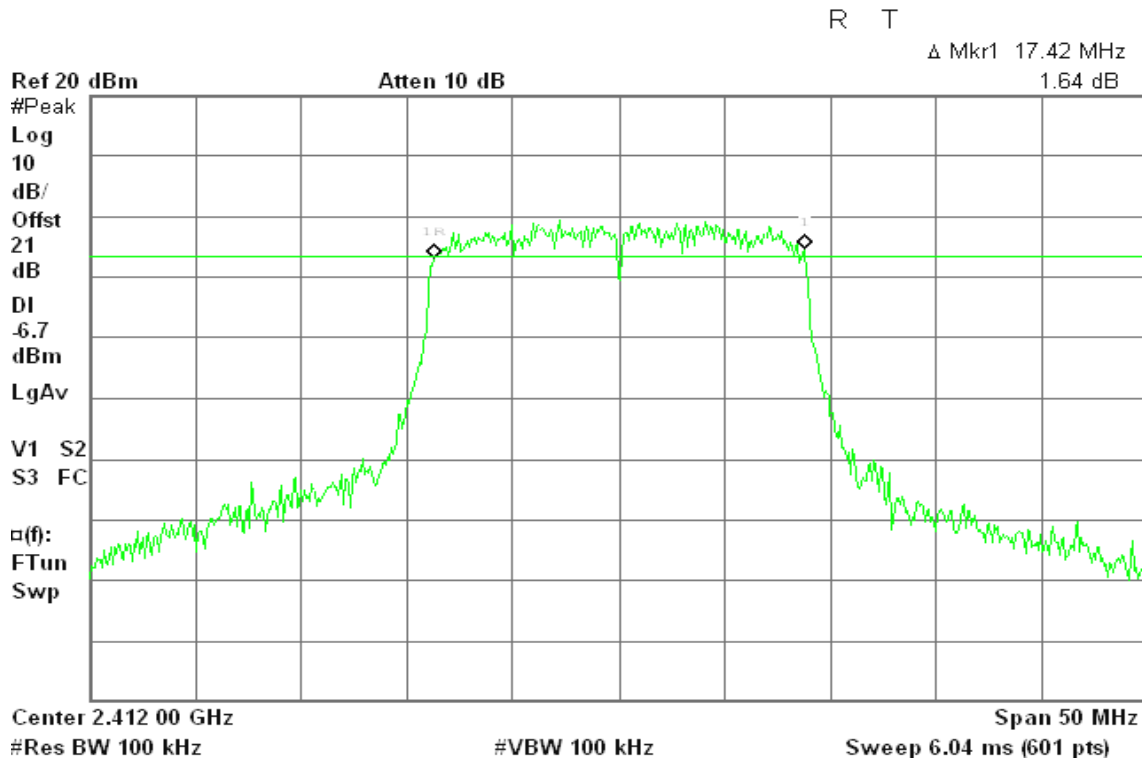
6dB Bandwidth (CH High)



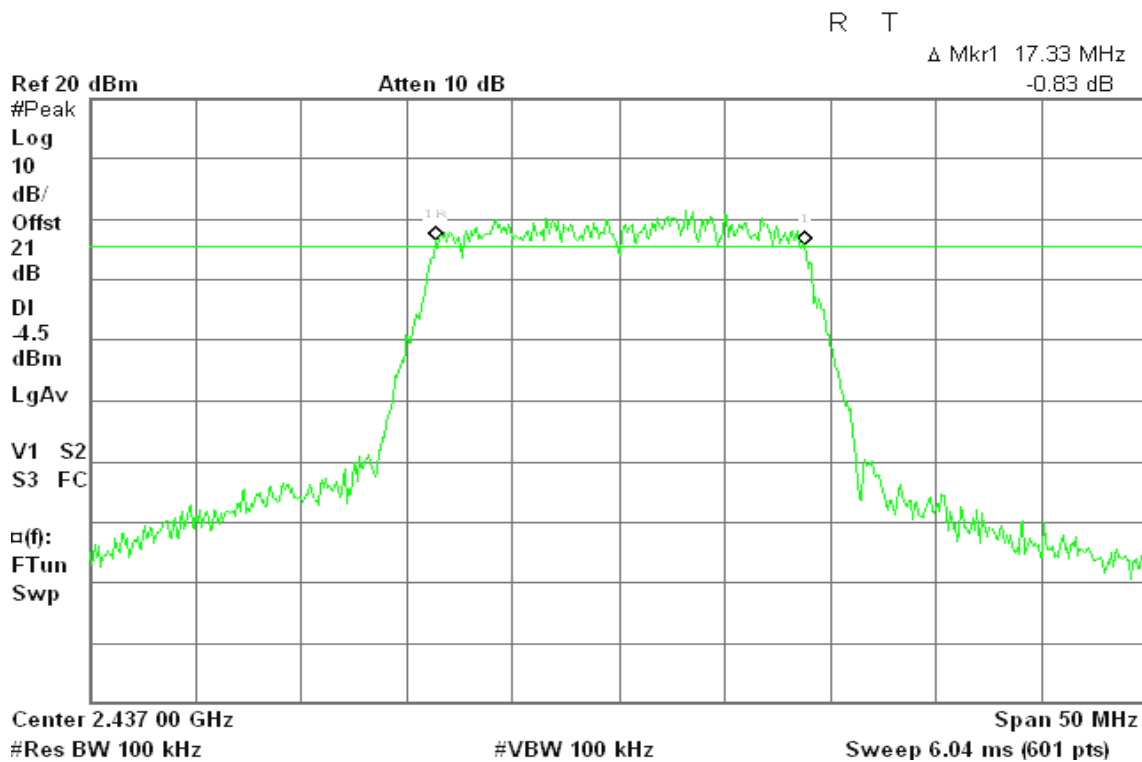


draft 802.11n Standard-20 MHz Channel mode / Chain 0

6dB Bandwidth (CH Low)

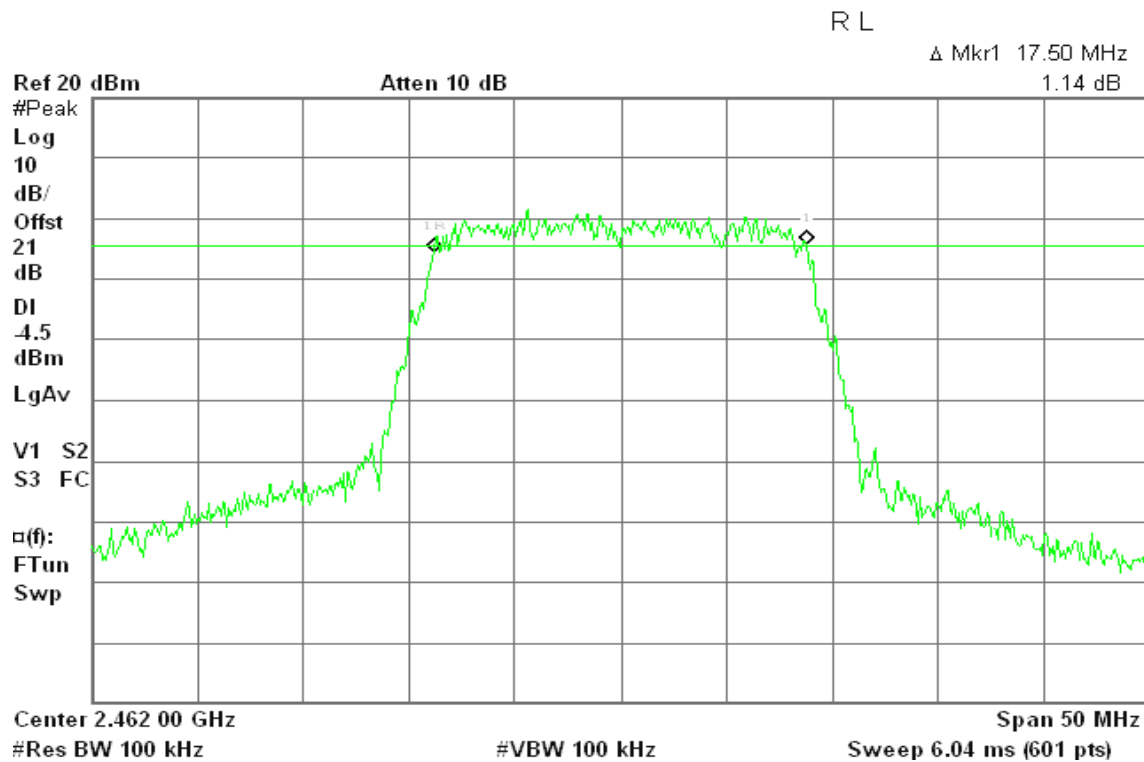


6dB Bandwidth (CH Mid)



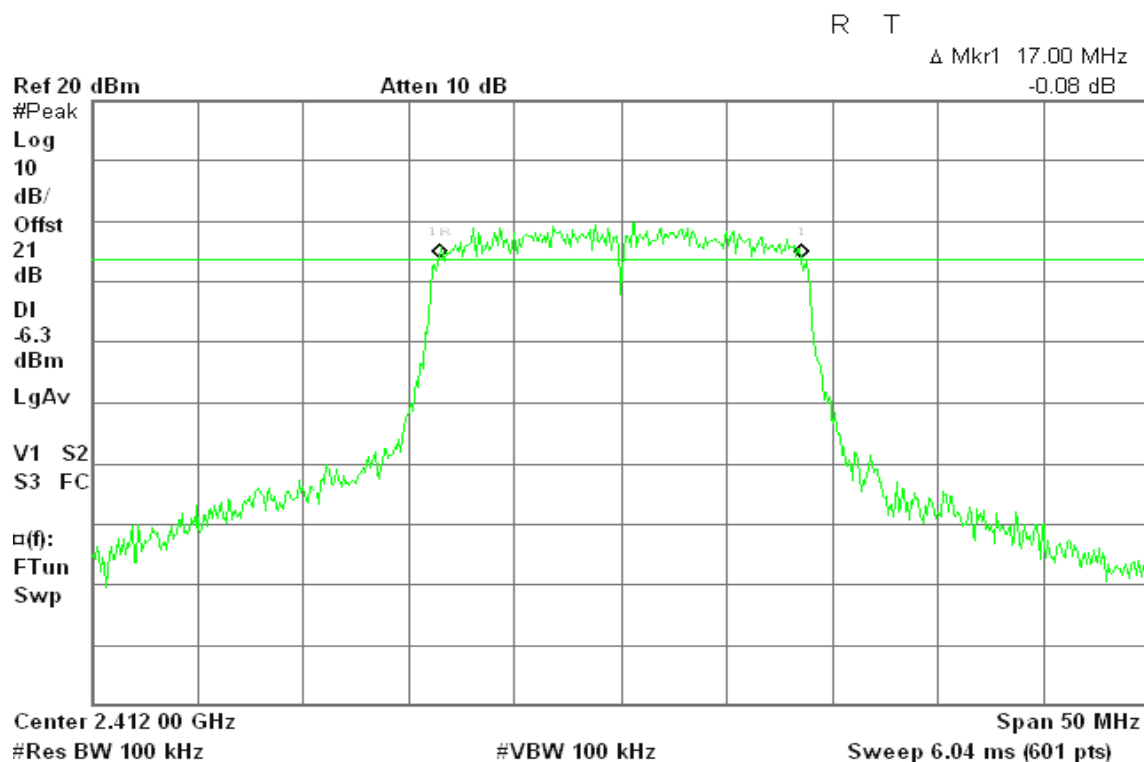


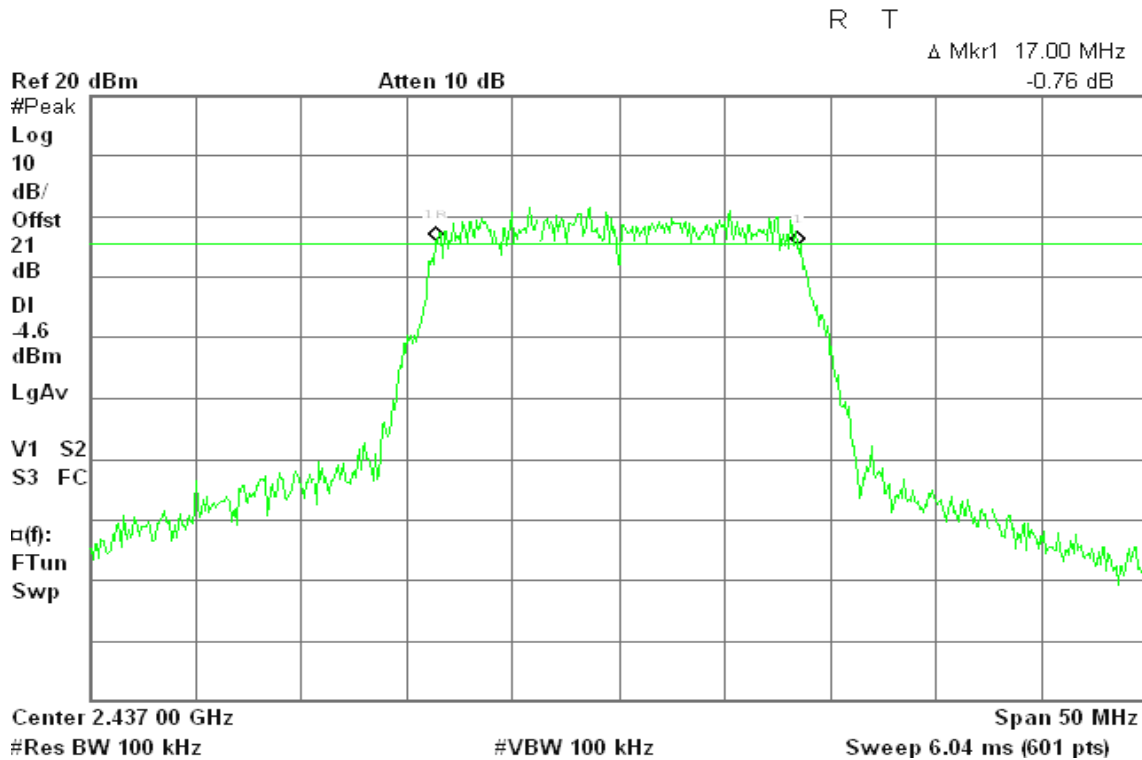
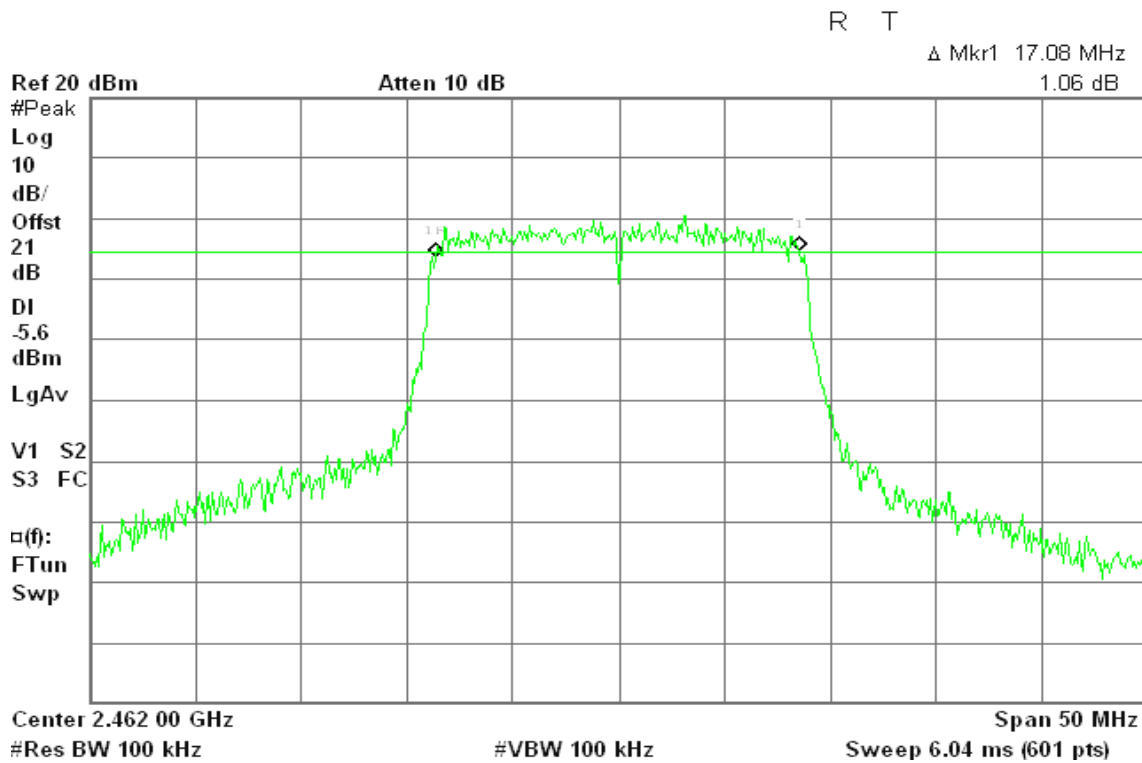
6dB Bandwidth (CH High)

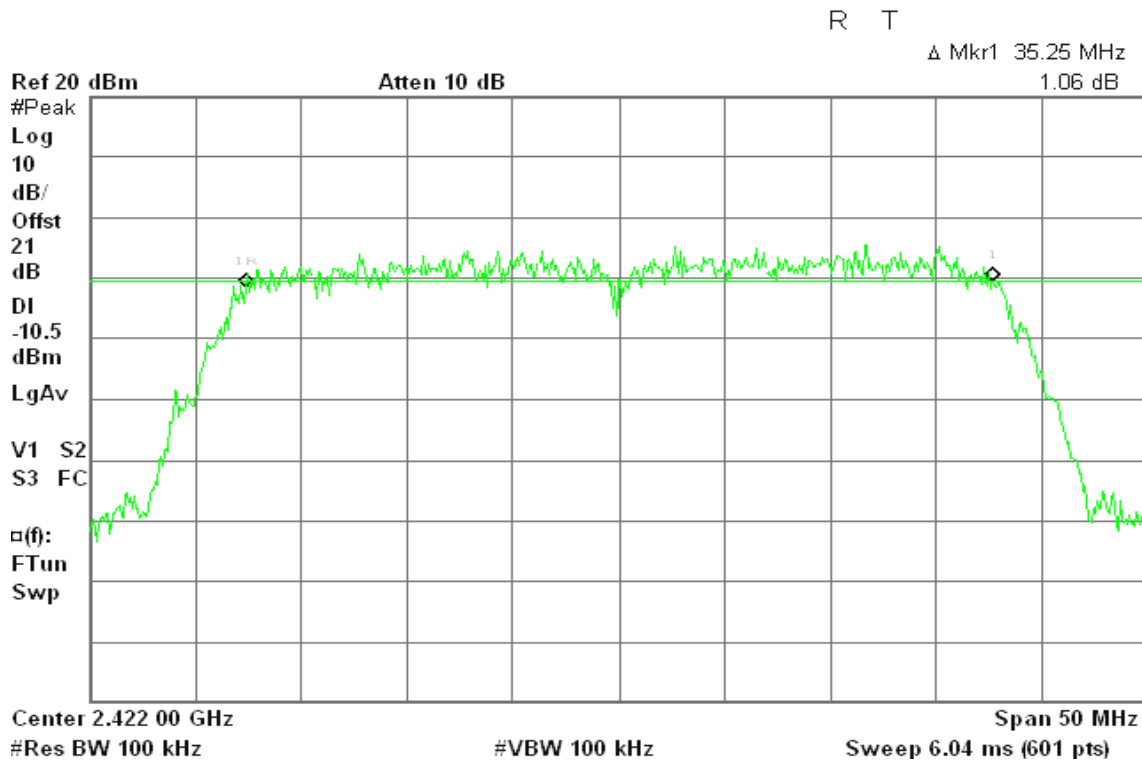
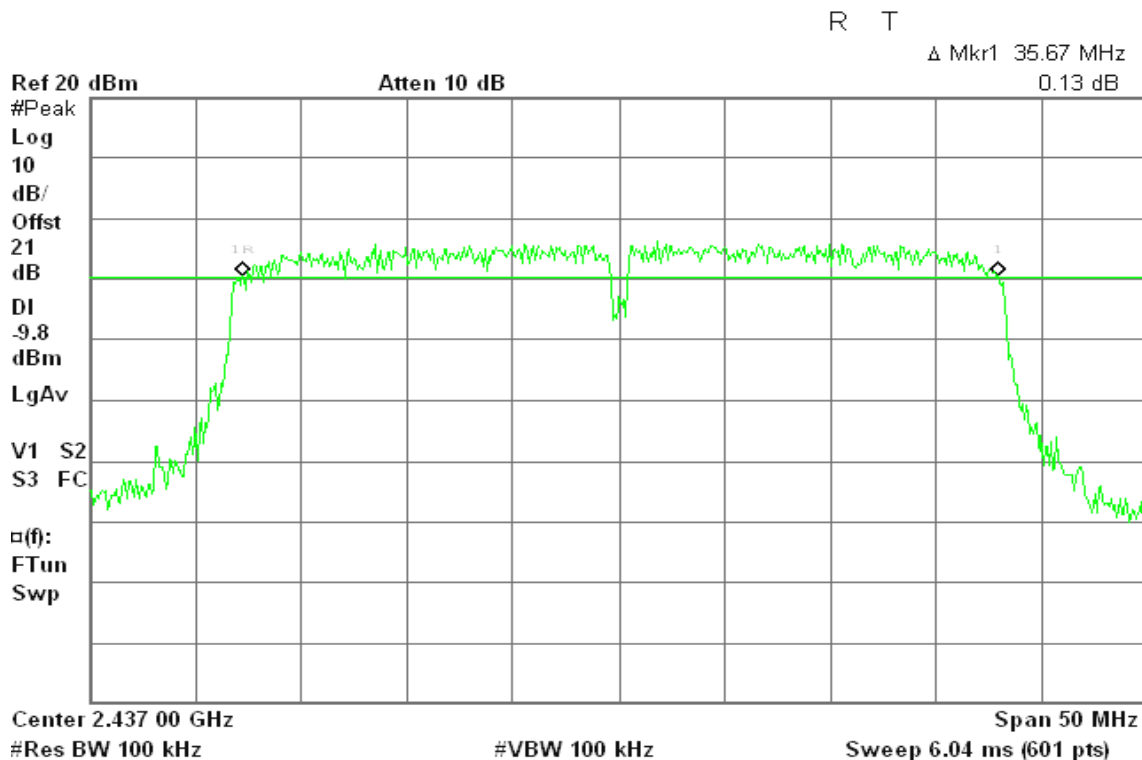


draft 802.11n Standard-20 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)

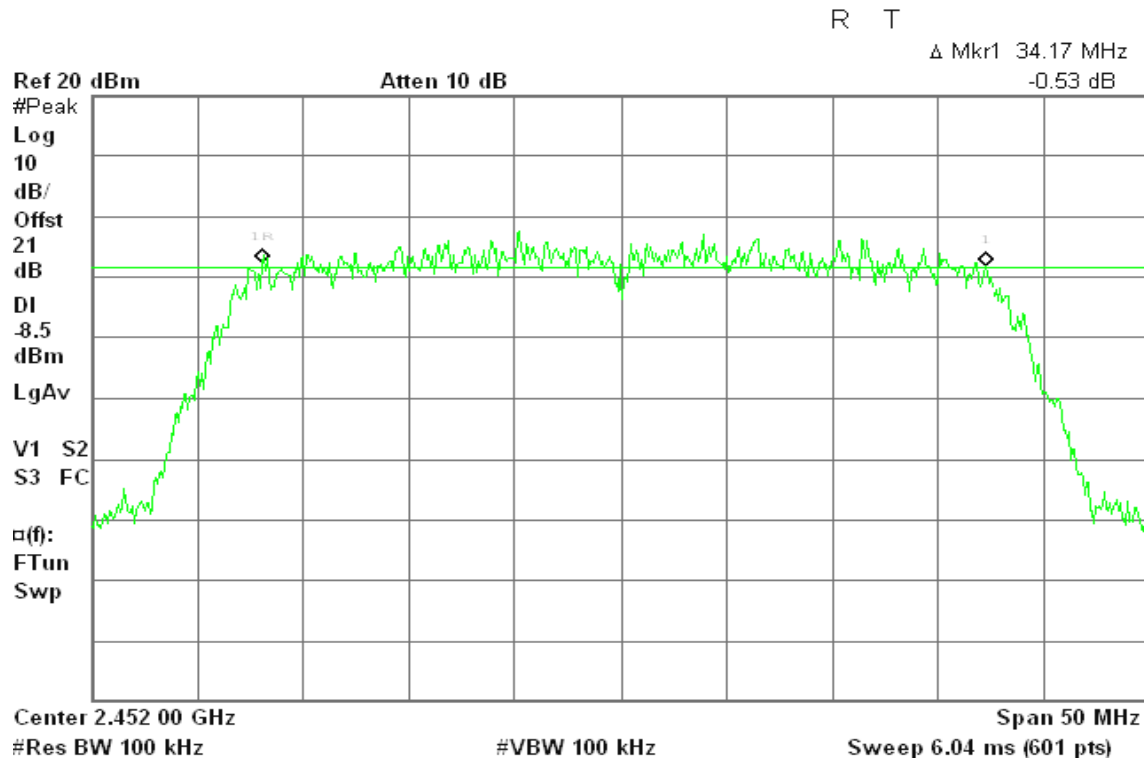


**6dB Bandwidth (CH Mid)****6dB Bandwidth (CH High)**

**draft 802.11n Wide-40 MHz Channel mode / Chain 0****6dB Bandwidth (CH Low)****6dB Bandwidth (CH Mid)**

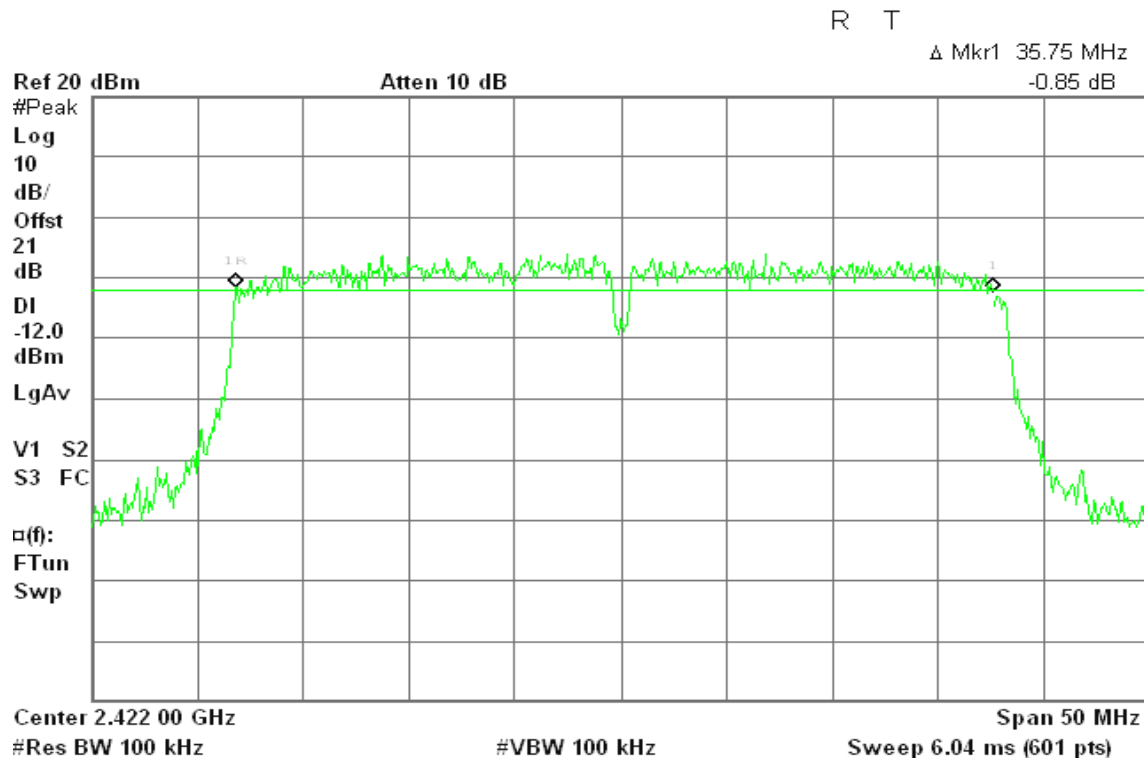


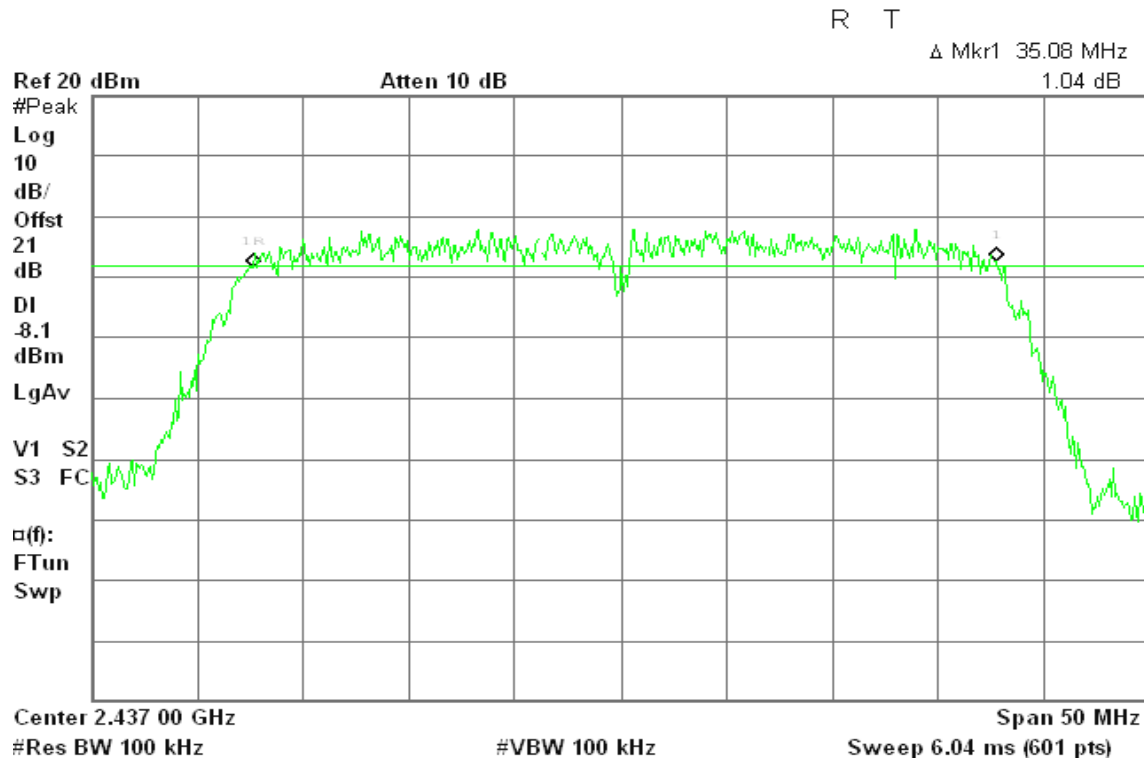
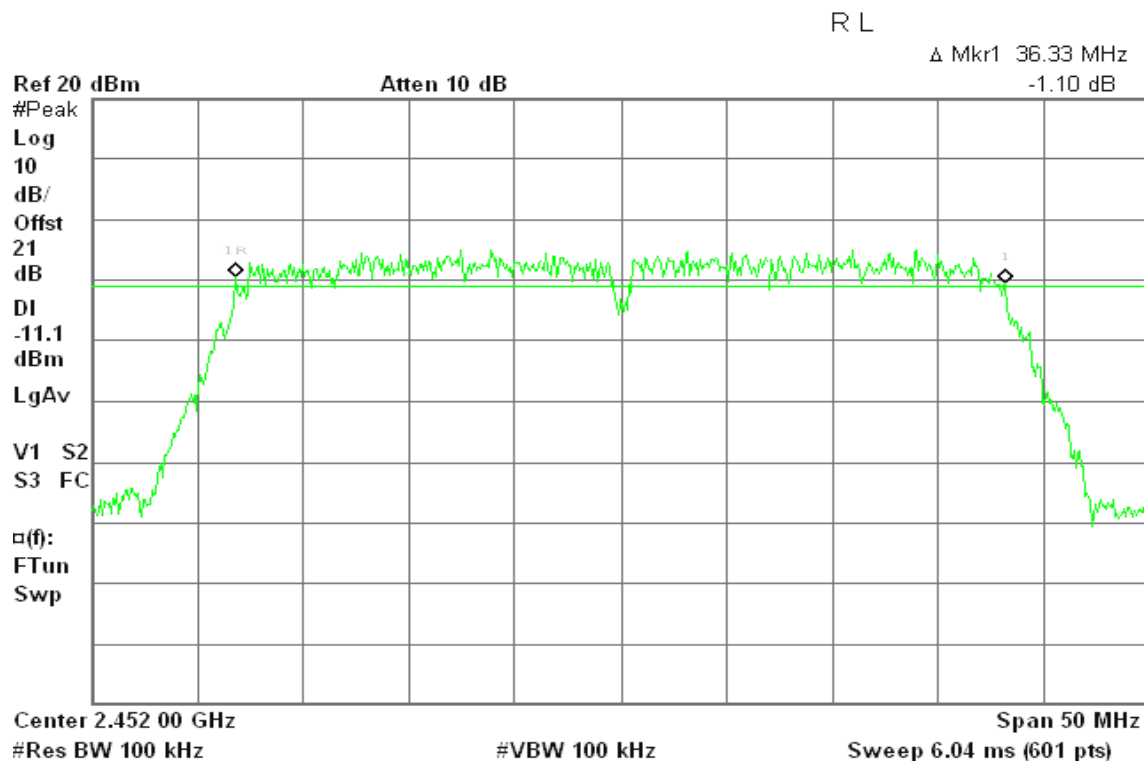
6dB Bandwidth (CH High)



draft 802.11n Wide-40 MHz Channel mode / Chain 1

6dB Bandwidth (CH Low)



**6dB Bandwidth (CH Mid)****6dB Bandwidth (CH High)**



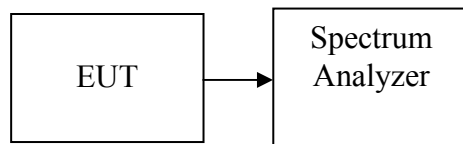
7.2 PEAK POWER

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

1. Peak power is measured using the spectrum analyzer's internal channel power integration function.
2. Power is integrated over a bandwidth greater than or equal to the 99% bandwidth.

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)	Result
Low	2412	20.79	0.1199	1.00	PASS
Mid	2437	20.86	0.1219		PASS
High	2462	20.28	0.1067		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	22.14	0.1637	1.00	PASS
Mid	2437	21.61	0.1449		PASS
High	2462	21.11	0.1291		PASS

Test mode: draft 802.11n Standard-20 MHz Channel mode

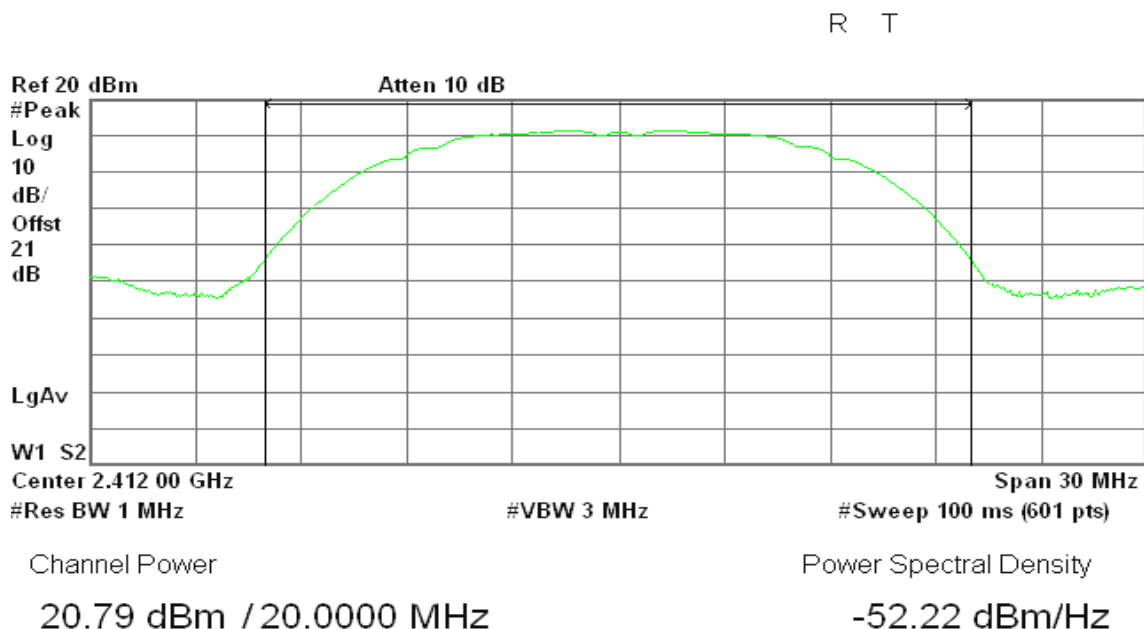
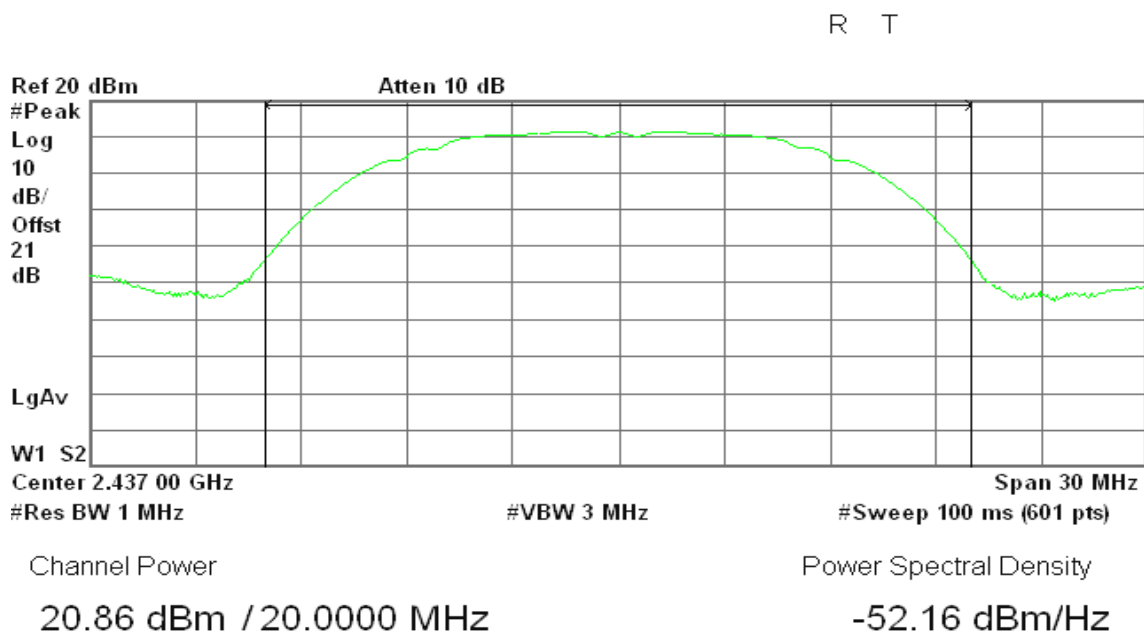
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	21.52	21.40	24.47	0.2799	0.794	PASS
Mid	2437	22.08	21.96	25.03	0.3185		PASS
High	2462	22.15	21.03	24.64	0.2908		PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	19.75	21.37	23.65	0.2315	0.794	PASS
Mid	2437	23.07	24.36	26.77	0.4757		PASS
High	2452	20.39	21.68	24.09	0.2566		PASS

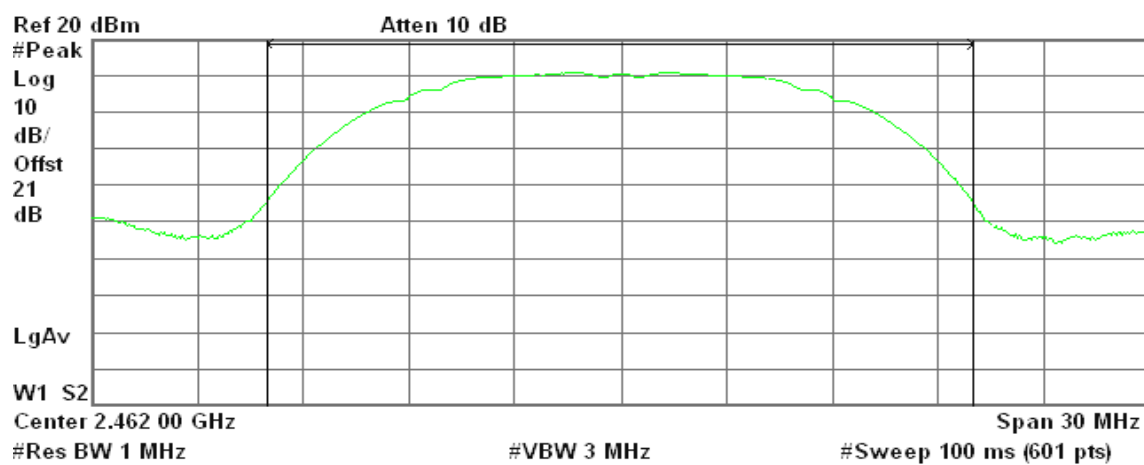
Remark:

1. Total Output Power (w) = Chain 0 ($10^{(\text{Output Power}/10)}/1000$) + Chain 1 ($10^{(\text{Output Power}/10)}/1000$)
2. The maximum antenna gain is 6.309 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 29dBm.

**Test Plot****IEEE 802.11b mode****Peak Power (CH Low)****Peak Power (CH Mid)**

**Peak Power (CH High)**

R T



Channel Power

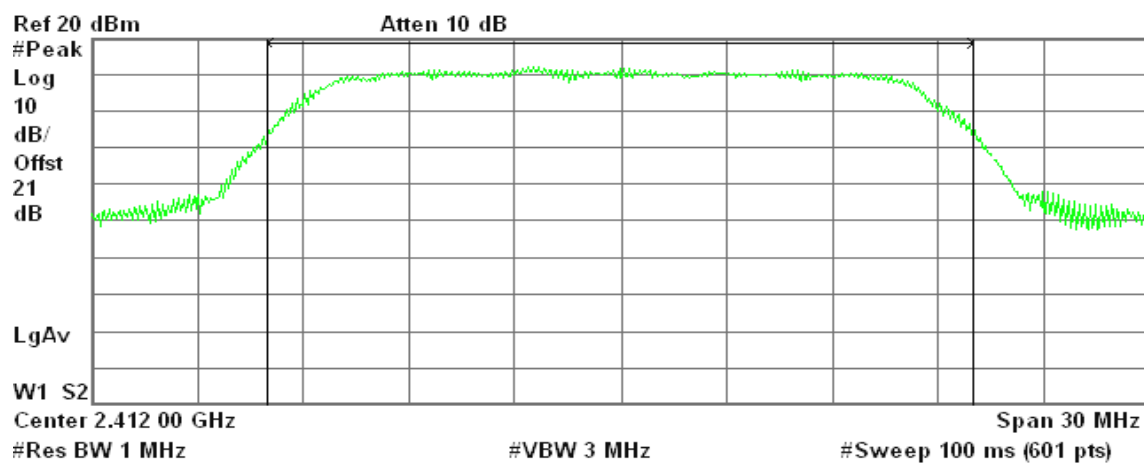
20.28 dBm / 20.0000 MHz

Power Spectral Density

-52.73 dBm/Hz

IEEE 802.11g mode**Peak Power (CH Low)**

R T



Channel Power

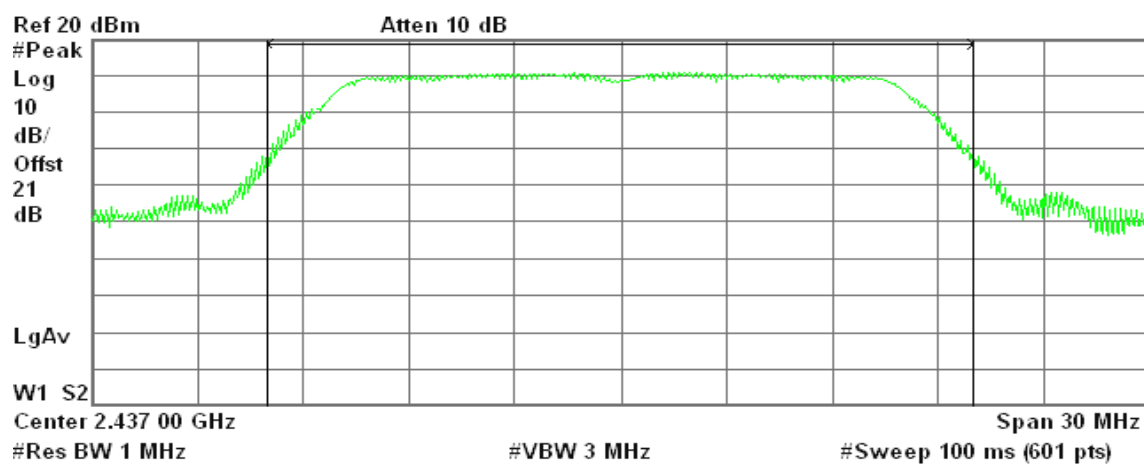
22.14 dBm / 20.0000 MHz

Power Spectral Density

-50.87 dBm/Hz

**Peak Power (CH Mid)**

R T



Channel Power

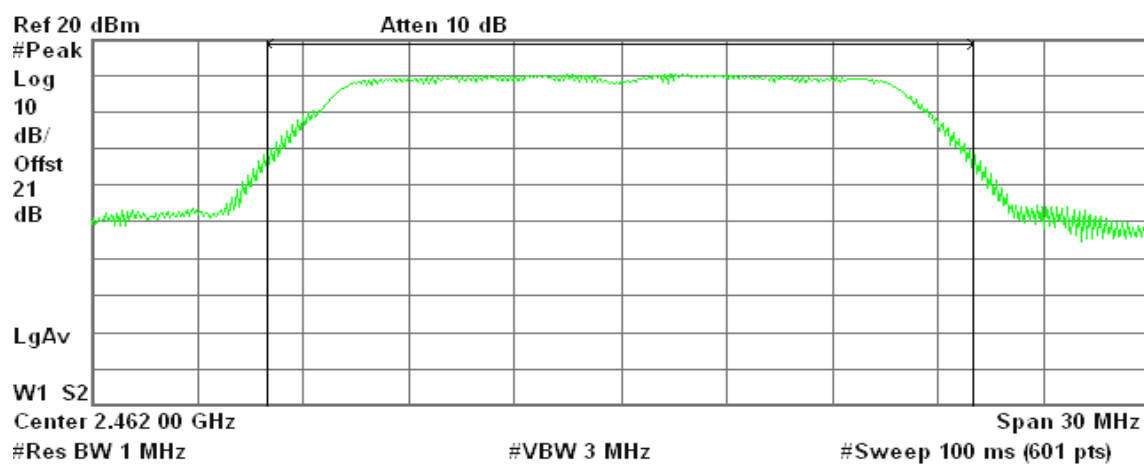
21.61 dBm / 20.0000 MHz

Power Spectral Density

-51.40 dBm/Hz

Peak Power (CH High)

R T



Channel Power

21.11 dBm / 20.0000 MHz

Power Spectral Density

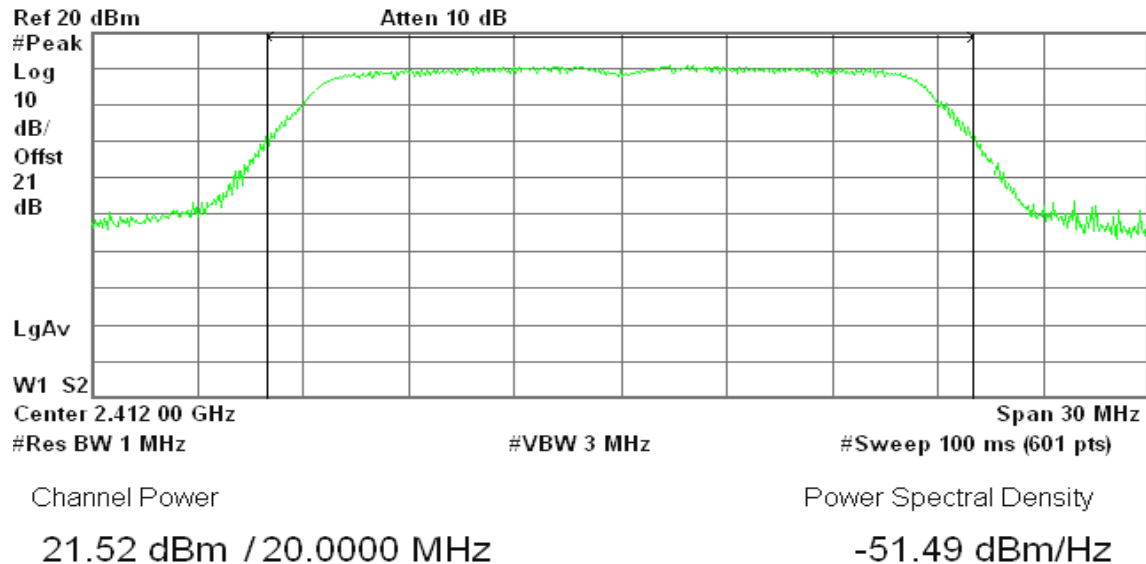
-51.90 dBm/Hz



draft 802.11n Standard-20 MHz Channel mode / Chain 0

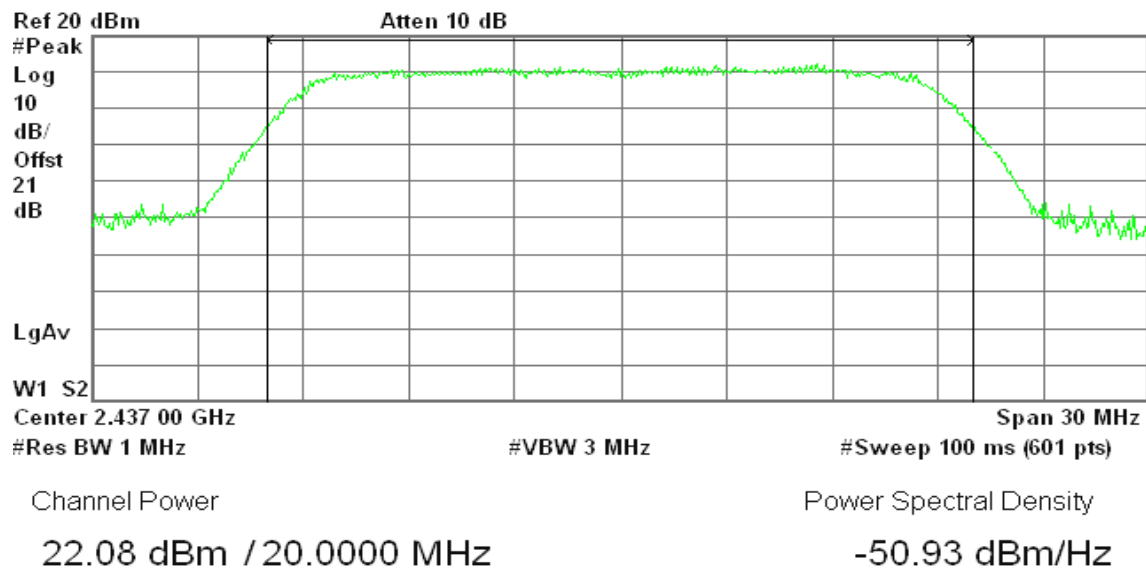
Peak Power (CH Low)

R T



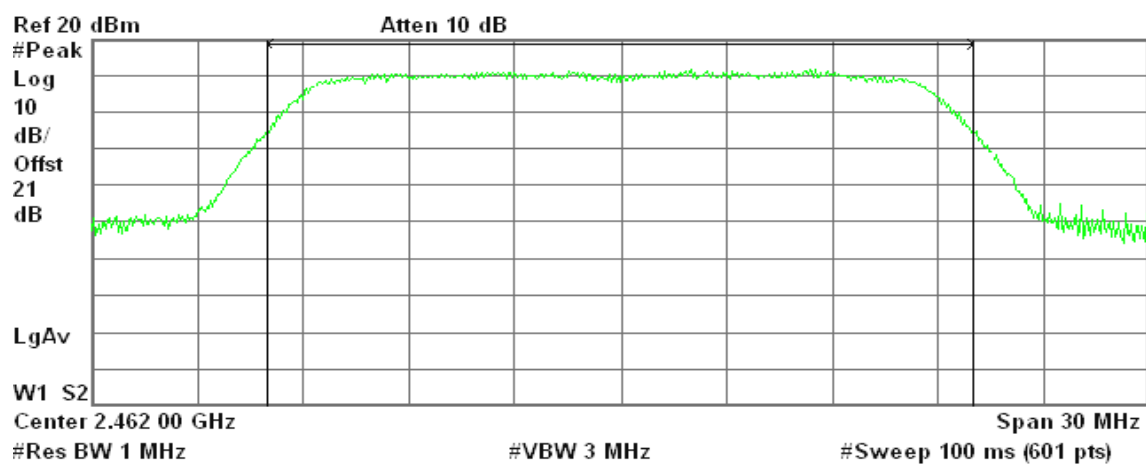
Peak Power (CH Mid)

R T



**Peak Power (CH High)**

R T



Channel Power

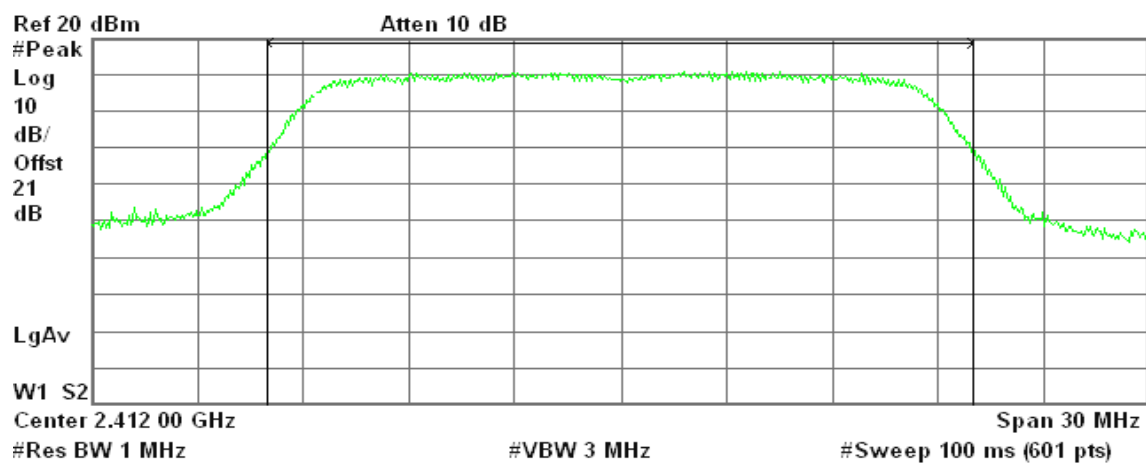
22.15 dBm / 20.0000 MHz

Power Spectral Density

-50.86 dBm/Hz

draft 802.11n Standard-20 MHz Channel mode / Chain 1**Peak Power (CH Low)**

R T



Channel Power

21.40 dBm / 20.0000 MHz

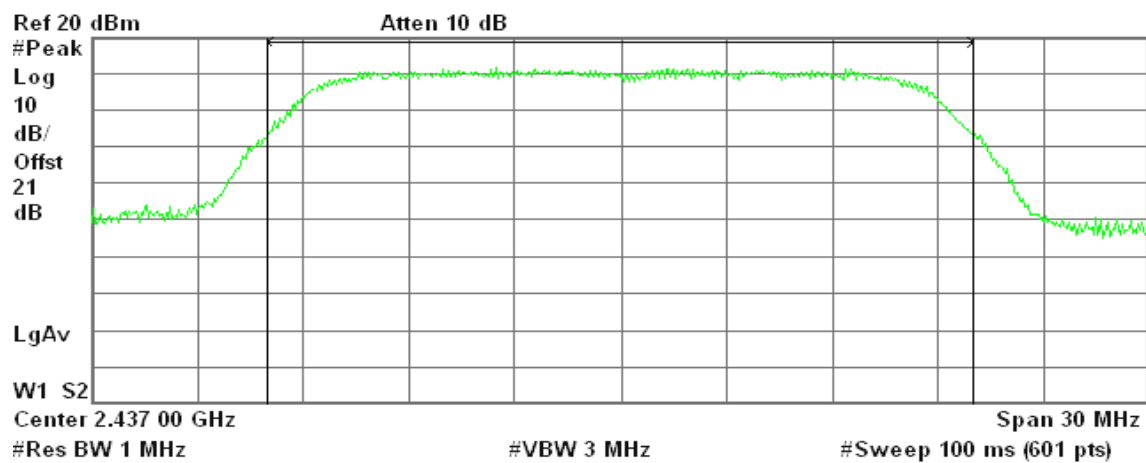
Power Spectral Density

-51.61 dBm/Hz



Peak Power (CH Mid)

R L



Channel Power

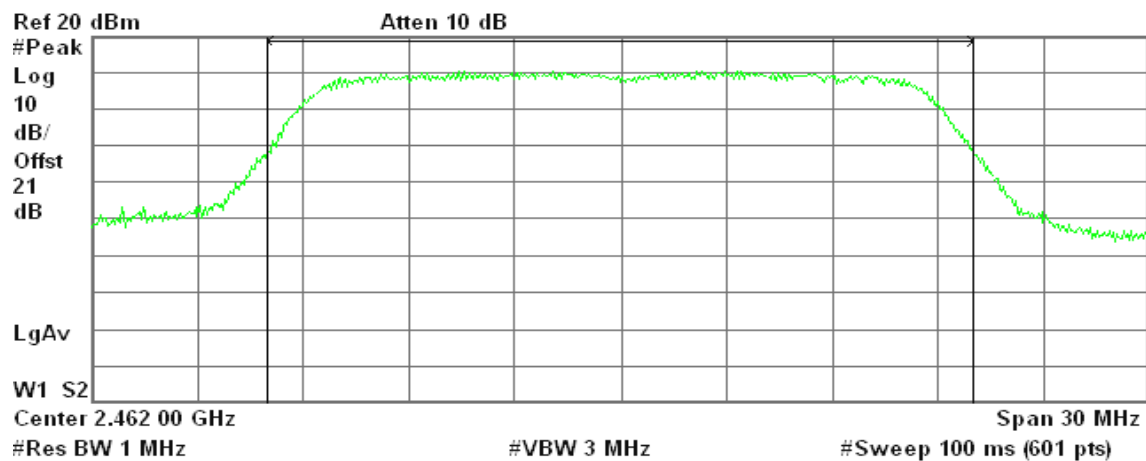
21.96 dBm / 20.0000 MHz

Power Spectral Density

-51.05 dBm/Hz

Peak Power (CH High)

R T



Channel Power

21.03 dBm / 20.0000 MHz

Power Spectral Density

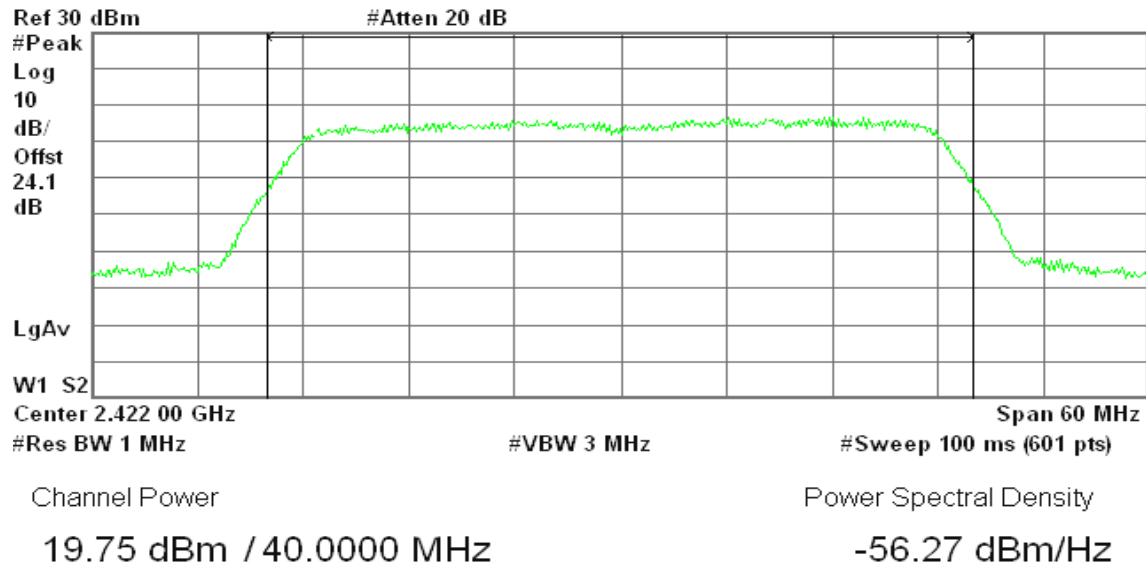
-51.98 dBm/Hz



draft 802.11n Wide-40 MHz Channel mode / Chain 0

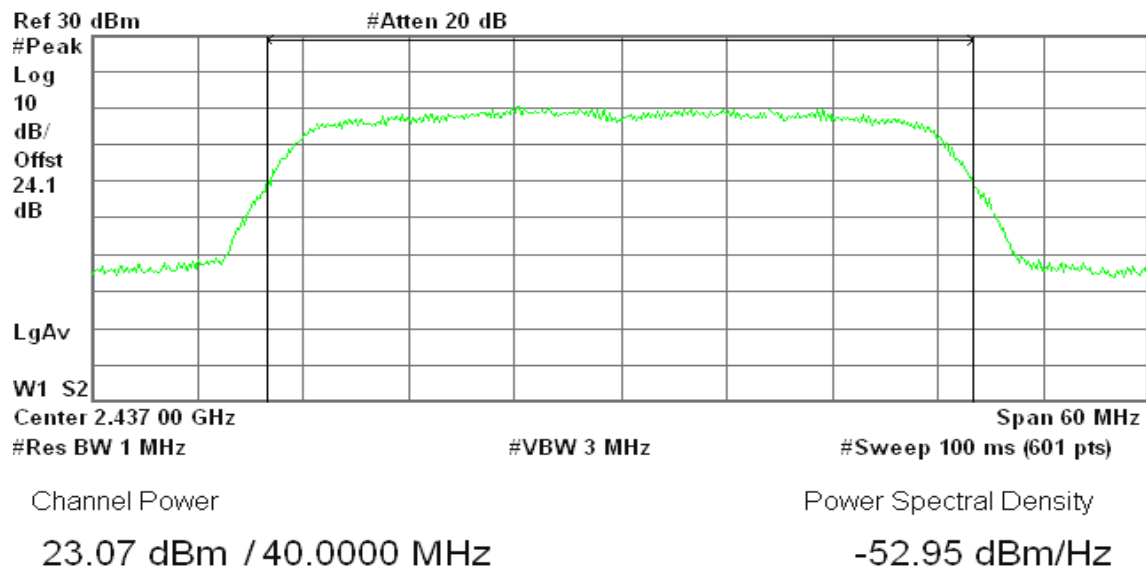
Peak Power (CH Low)

R T



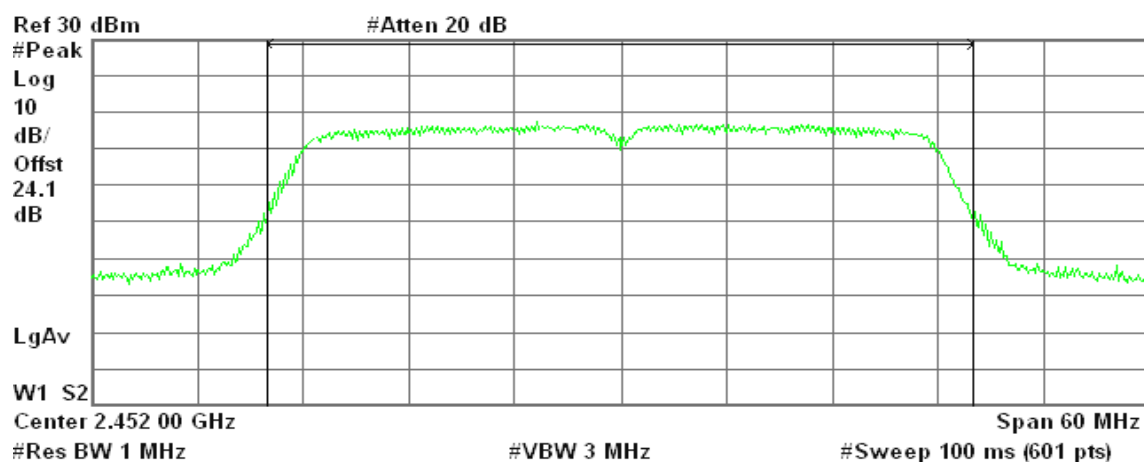
Peak Power (CH Mid)

R T



**Peak Power (CH High)**

R T



Channel Power

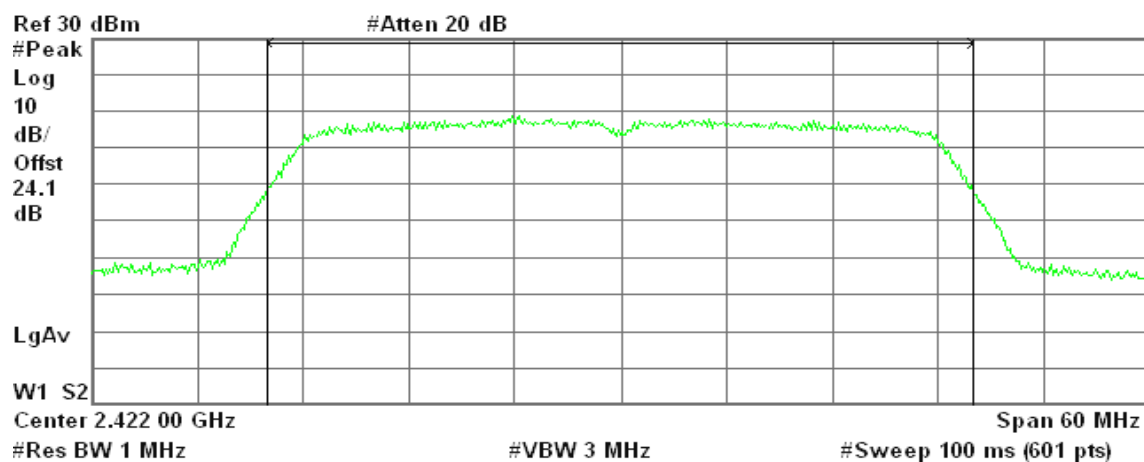
20.39 dBm / 40.0000 MHz

Power Spectral Density

-55.63 dBm/Hz

draft 802.11n Wide-40 MHz Channel mode / Chain 1**Peak Power (CH Low)**

R T



Channel Power

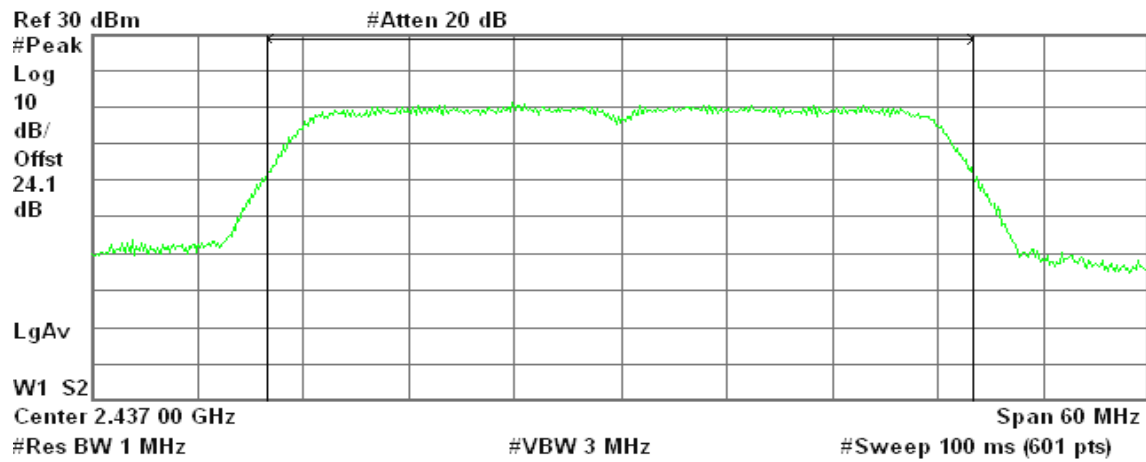
21.37 dBm / 40.0000 MHz

Power Spectral Density

-54.65 dBm/Hz

**Peak Power (CH Mid)**

R T



Channel Power

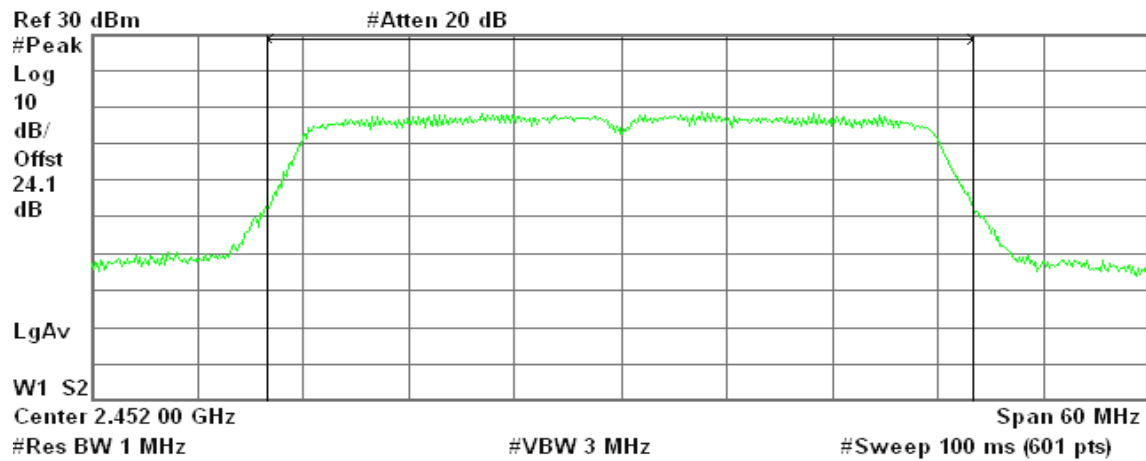
24.36 dBm / 40.0000 MHz

Power Spectral Density

-51.66 dBm/Hz

Peak Power (CH High)

R T



Channel Power

21.68 dBm / 40.0000 MHz

Power Spectral Density

-54.34 dBm/Hz

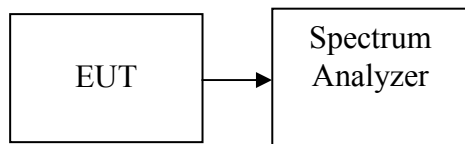


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the average 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	17.55	0.0569
Mid	2437	17.37	0.0546
High	2462	17.02	0.0504

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	13.91	0.0246
Mid	2437	13.70	0.0234
High	2462	13.76	0.0238

Test mode: draft 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2412	14.54	11.59	16.32	0.0429
Mid	2437	14.22	12.98	16.65	0.0463
High	2462	13.30	12.78	16.06	0.0403

Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2422	8.84	10.73	12.90	0.0195
Mid	2437	12.07	13.58	15.90	0.0389
High	2452	10.07	10.83	13.48	0.0223

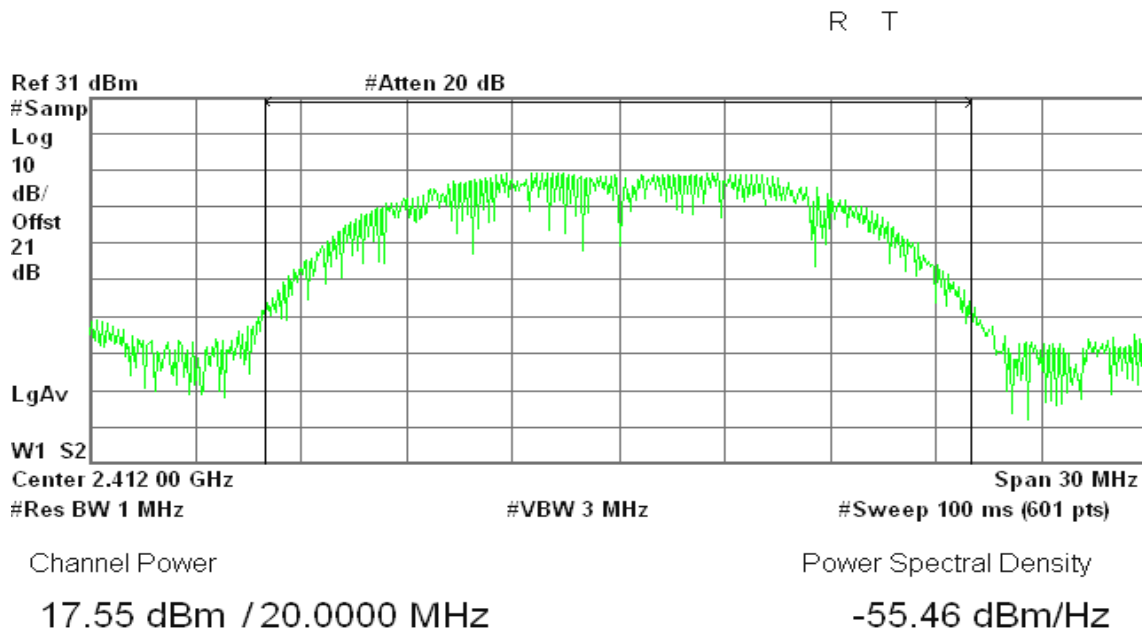
Remark: Total Output Power (w) = Chain 0 ($10^{(Output\ Power / 10)} / 1000$) + Chain 1 ($10^{(Output\ Power / 10)} / 1000$)



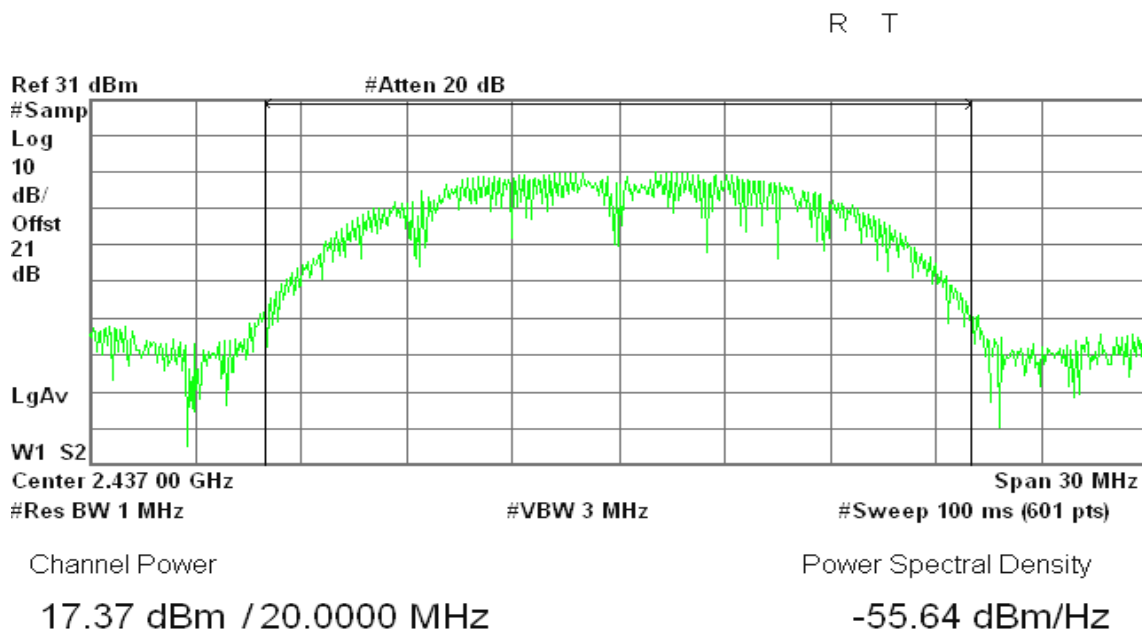
Test Plot

IEEE 802.11b mode

Average Power (CH Low)



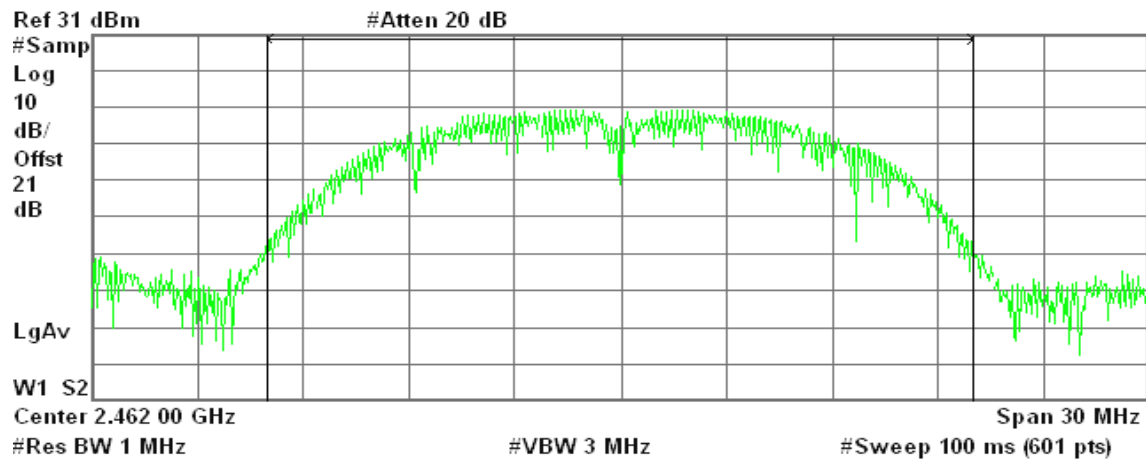
Average Power (CH Mid)





Average Power (CH High)

R T



Channel Power

17.02 dBm / 20.0000 MHz

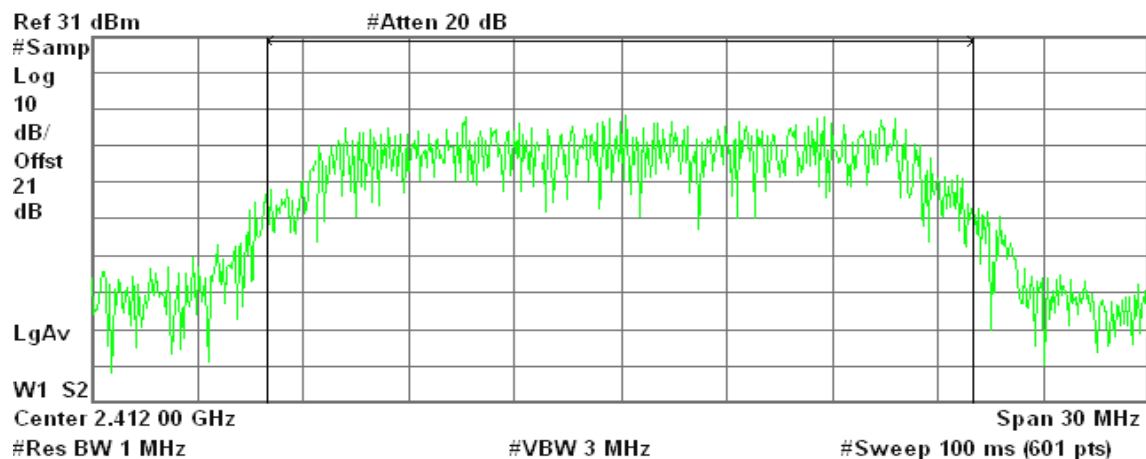
Power Spectral Density

-55.99 dBm/Hz

IEEE 802.11g mode

Average Power (CH Low)

R T



Channel Power

13.91 dBm / 20.0000 MHz

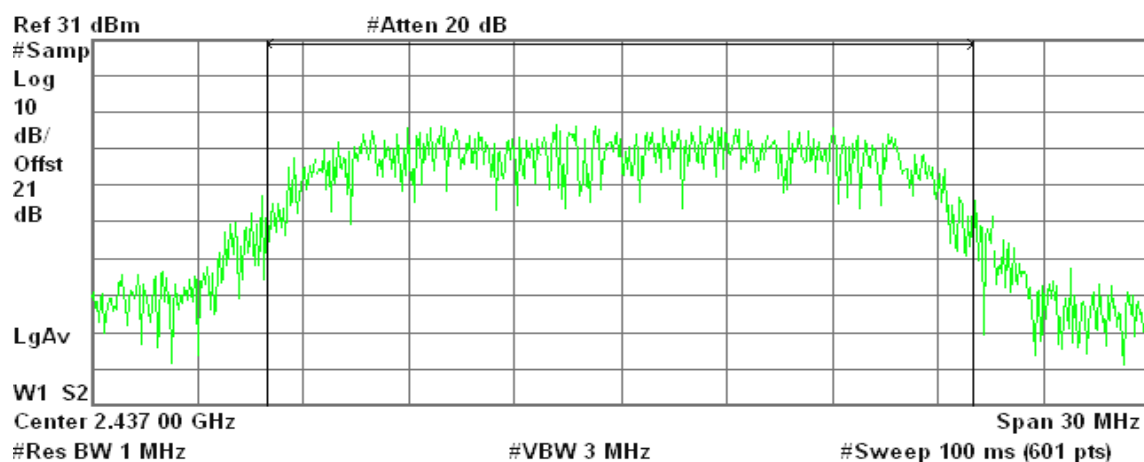
Power Spectral Density

-59.10 dBm/Hz



Average Power (CH Mid)

R T



Channel Power

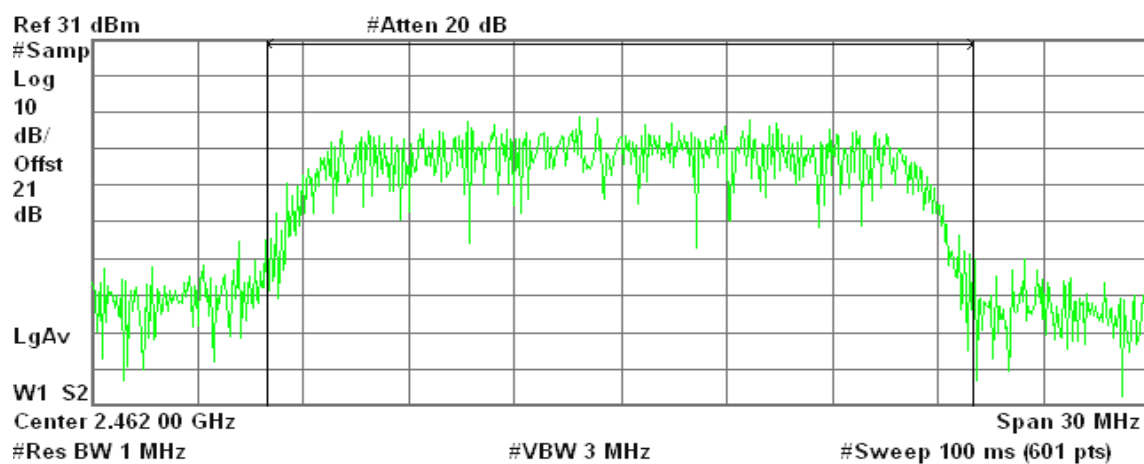
13.70 dBm / 20.0000 MHz

Power Spectral Density

-59.31 dBm/Hz

Average Power (CH High)

R T



Channel Power

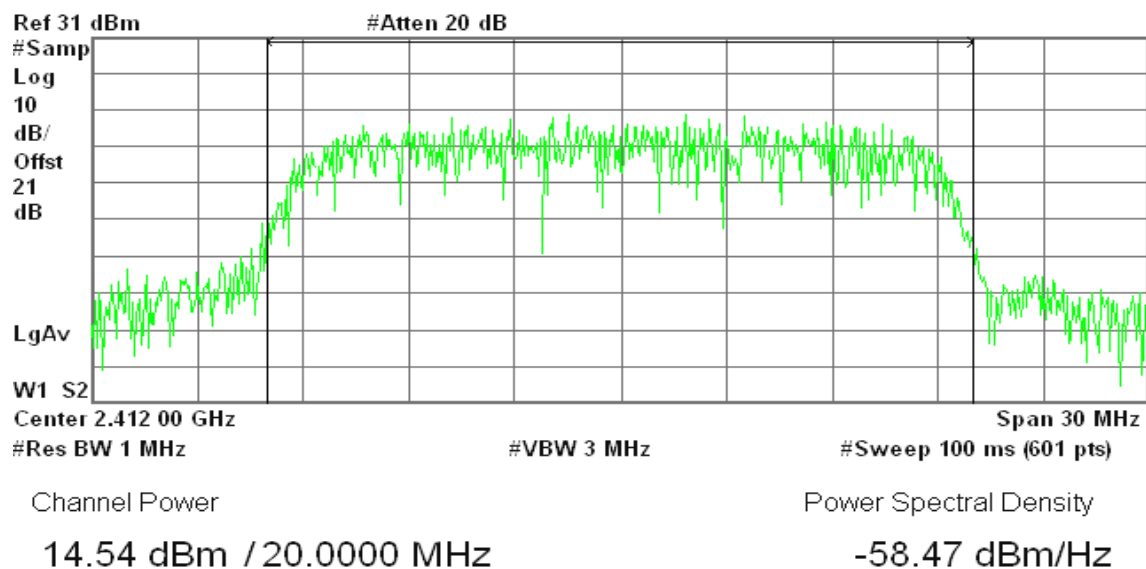
13.76 dBm / 20.0000 MHz

Power Spectral Density

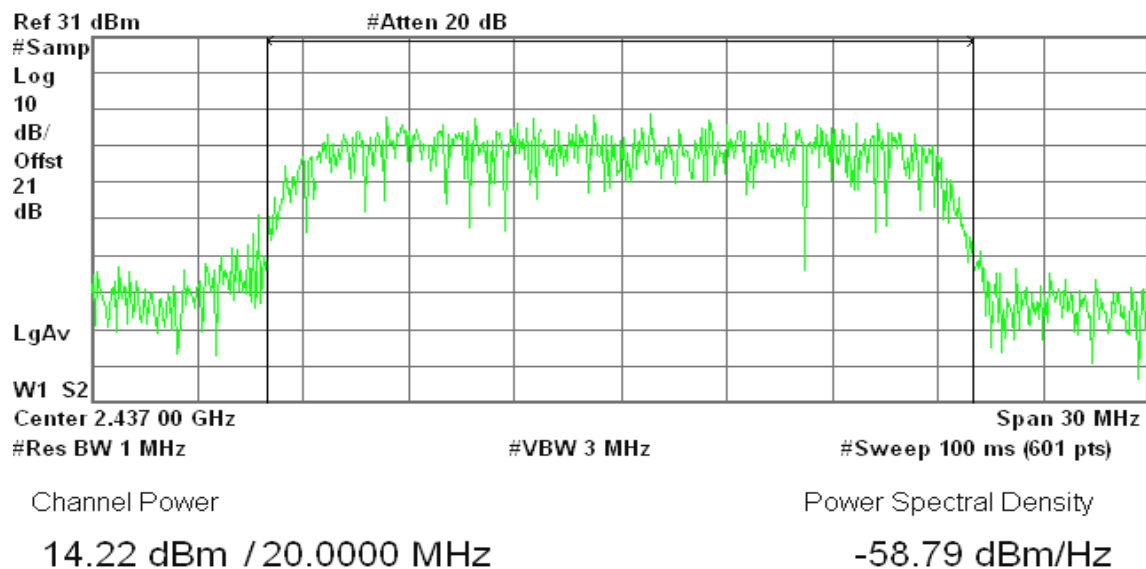
-59.25 dBm/Hz

**draft 802.11n Standard-20 MHz Channel mode / Chain 0****Average Power (CH Low)**

R T

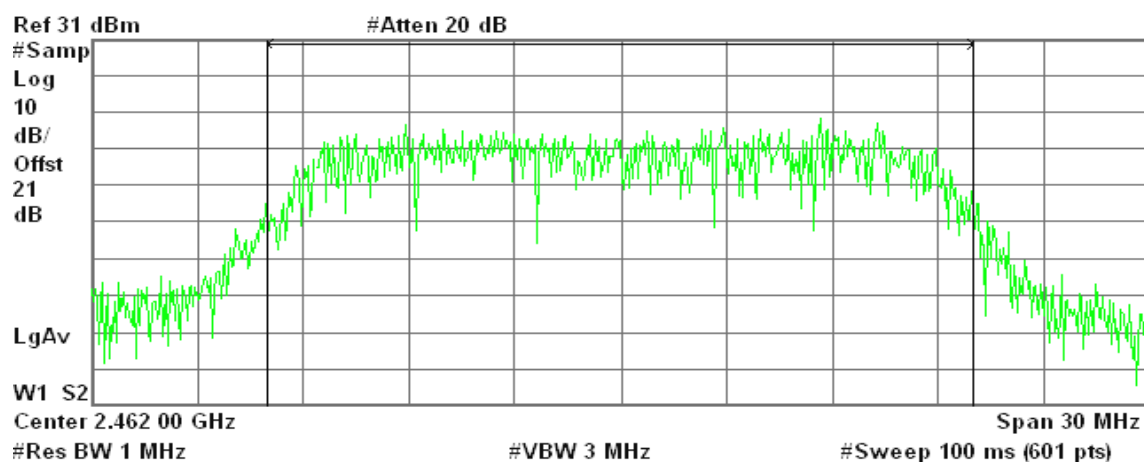
**Average Power (CH Mid)**

R T



**Average Power (CH High)**

R T



Channel Power

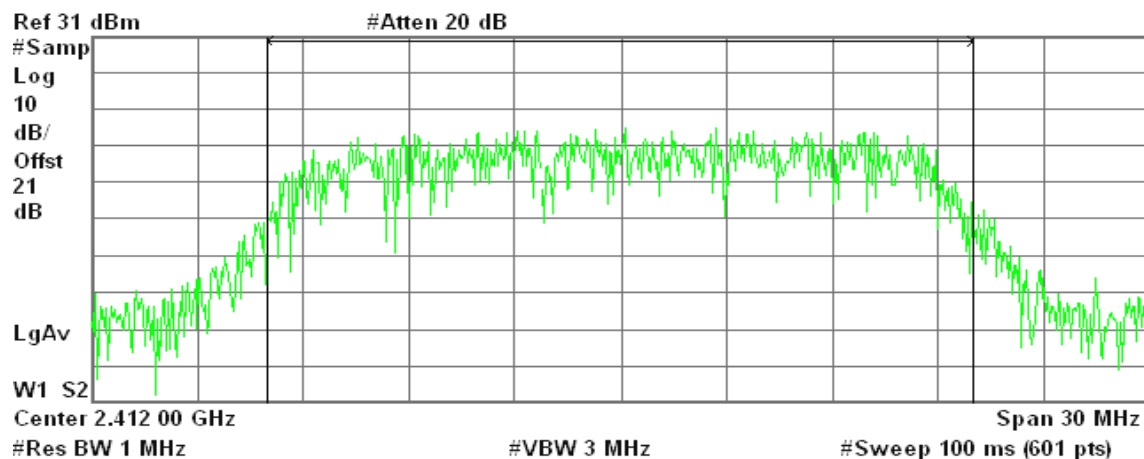
13.30 dBm / 20.0000 MHz

Power Spectral Density

-59.71 dBm/Hz

draft 802.11n Standard-20 MHz Channel mode / Chain 1**Average Power (CH Low)**

R T



Channel Power

11.59 dBm / 20.0000 MHz

Power Spectral Density

-61.42 dBm/Hz



Average Power (CH Mid)

R T



Channel Power

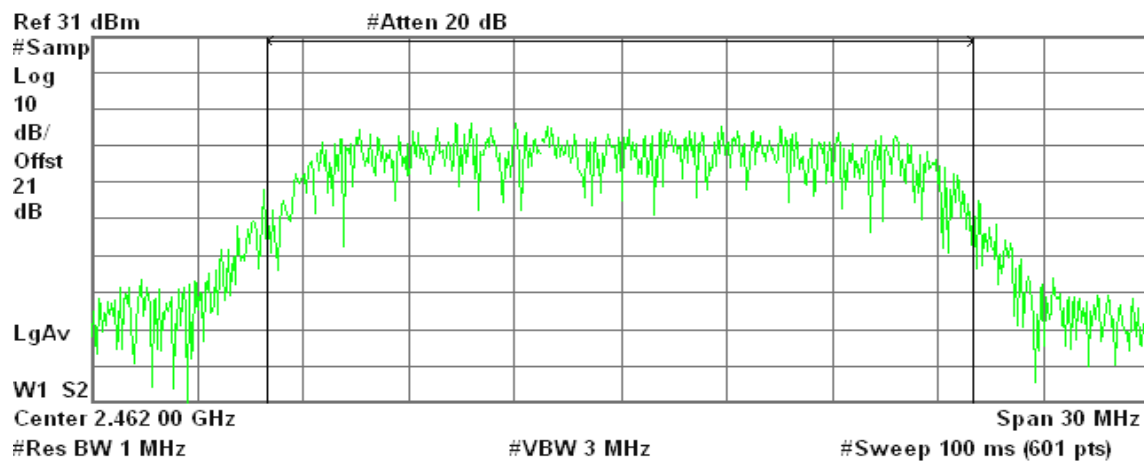
12.98 dBm / 20.0000 MHz

Power Spectral Density

-60.03 dBm/Hz

Average Power (CH High)

R T



Channel Power

12.78 dBm / 20.0000 MHz

Power Spectral Density

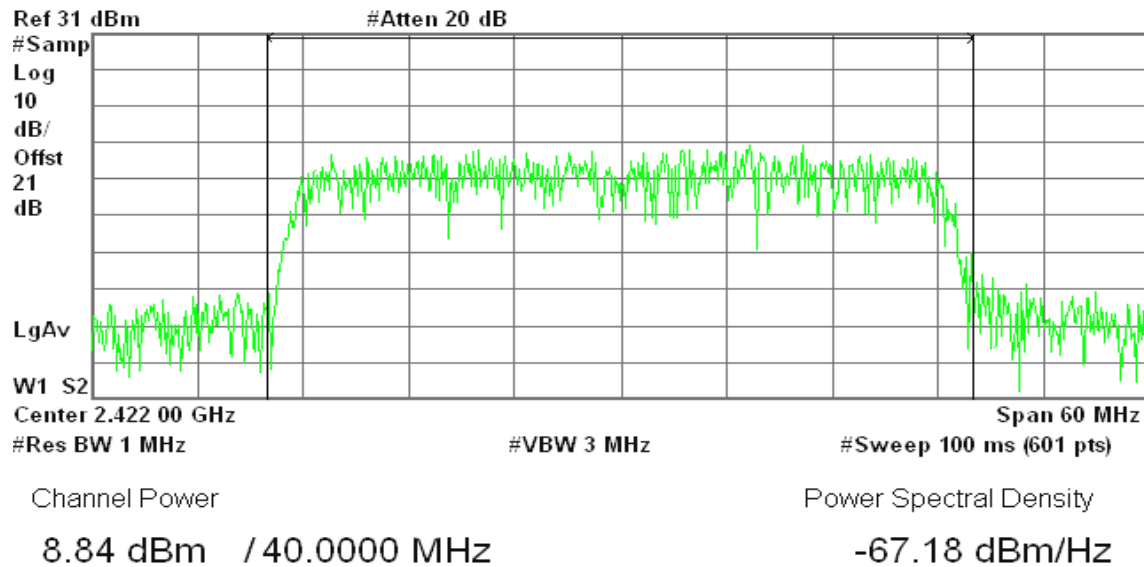
-60.23 dBm/Hz



draft 802.11n Wide-40 MHz Channel mode / Chain 0

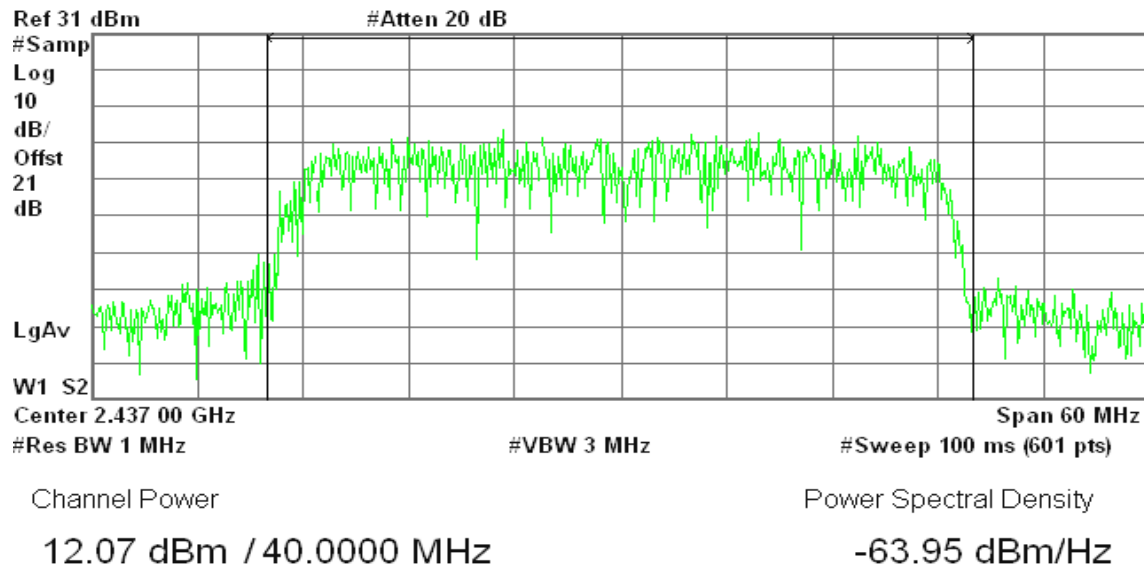
Average Power (CH Low)

R T



Average Power (CH Mid)

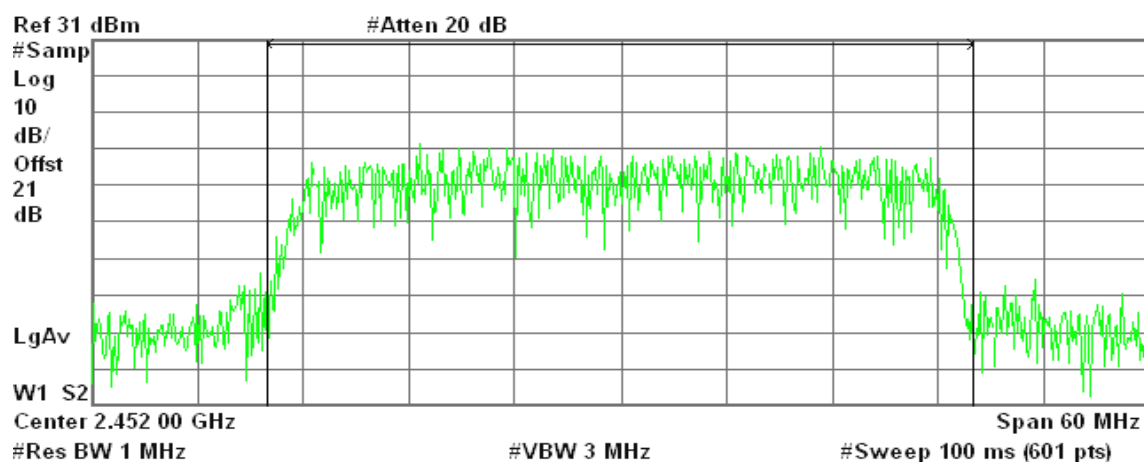
R T





Average Power (CH High)

R T



Channel Power

10.07 dBm / 40.0000 MHz

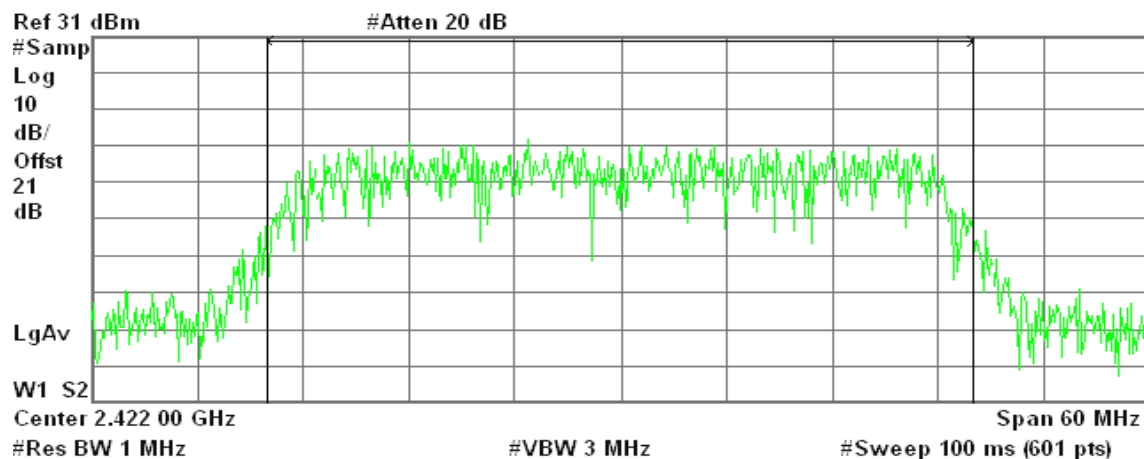
Power Spectral Density

-65.95 dBm/Hz

draft 802.11n Wide-40 MHz Channel mode / Chain 1

Average Power (CH Low)

R T



Channel Power

10.73 dBm / 40.0000 MHz

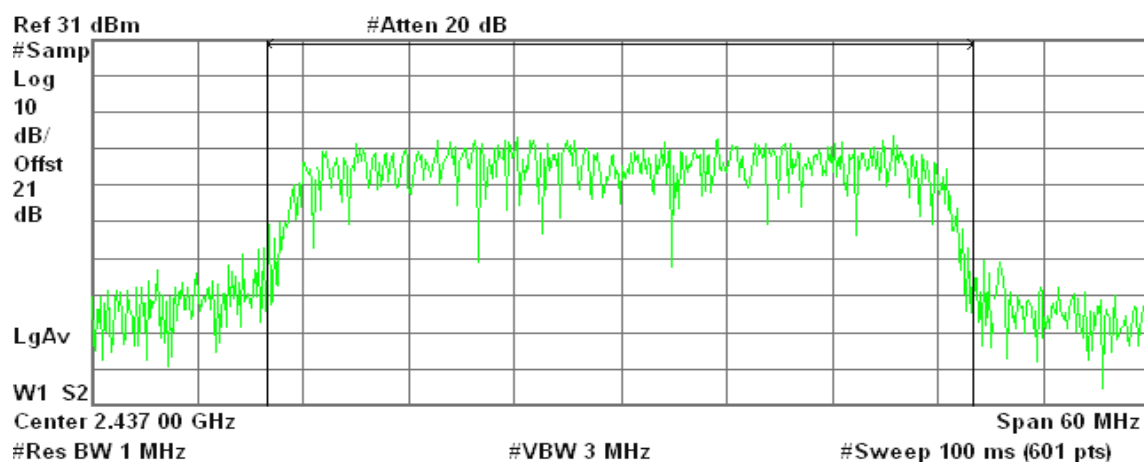
Power Spectral Density

-65.29 dBm/Hz



Average Power (CH Mid)

R T



Channel Power

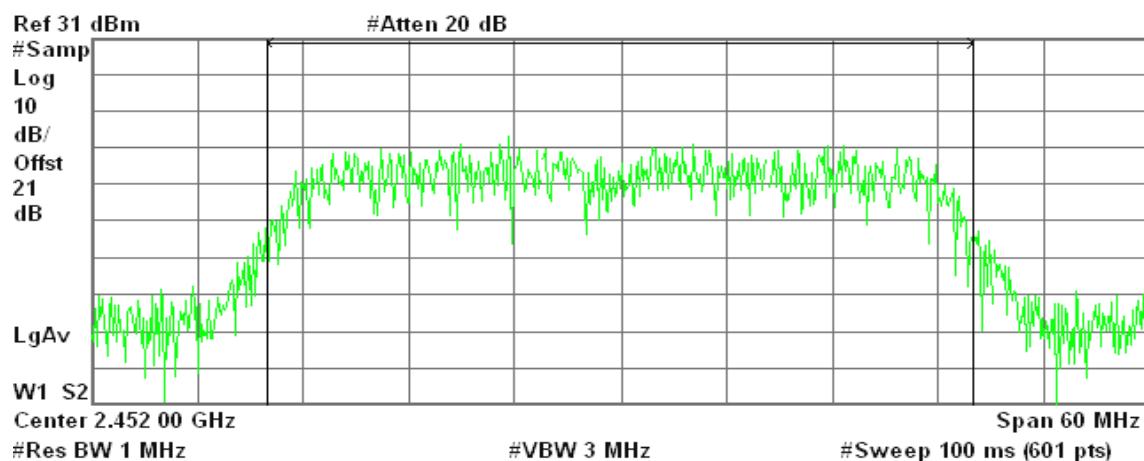
13.58 dBm / 40.0000 MHz

Power Spectral Density

-62.44 dBm/Hz

Average Power (CH High)

R T



Channel Power

10.83 dBm / 40.0000 MHz

Power Spectral Density

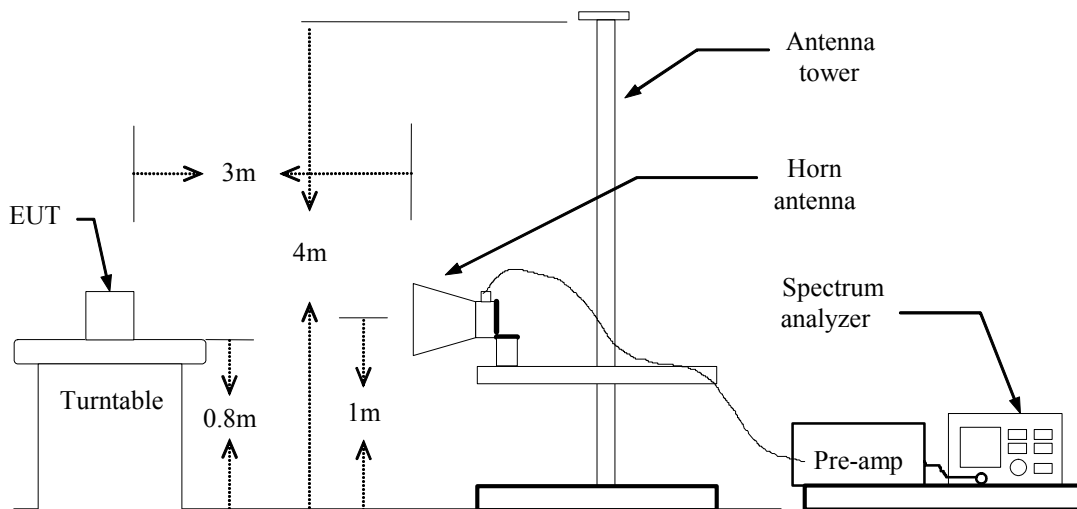
-65.19 dBm/Hz

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 10:10:49 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
57.71 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent 10:11:21 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
46.31 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

**Detector mode: Peak****Polarity: Horizontal**

* Agilent 10:16:03 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
56.91 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Horizontal**

* Agilent 10:16:19 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
45.83 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

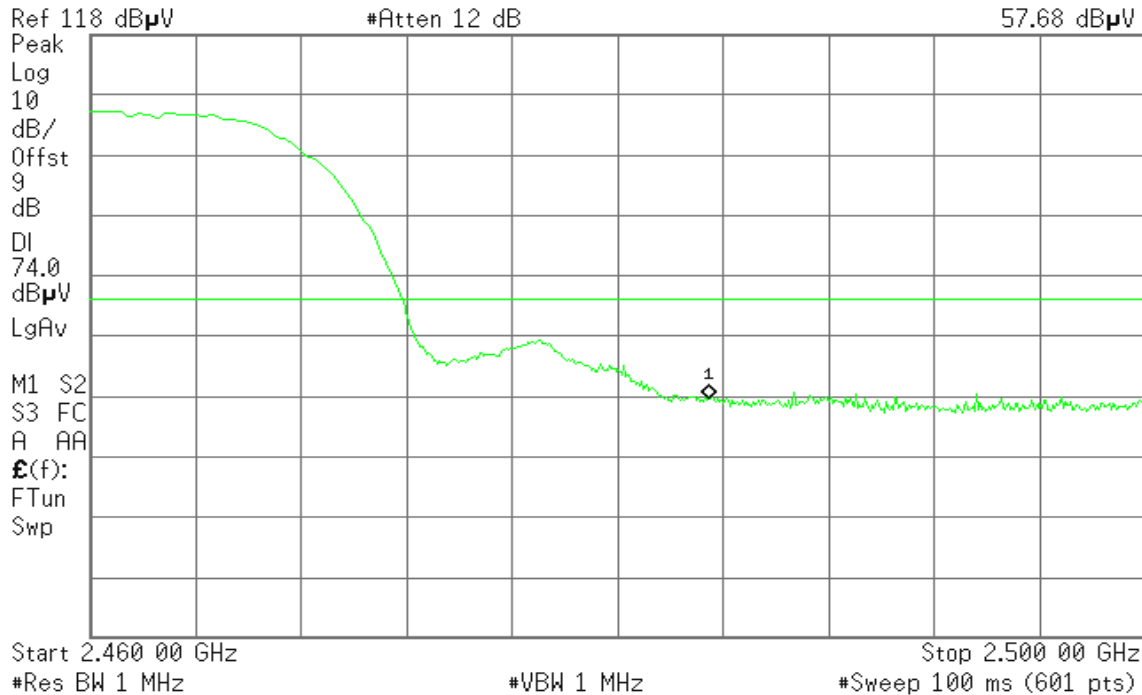
Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

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

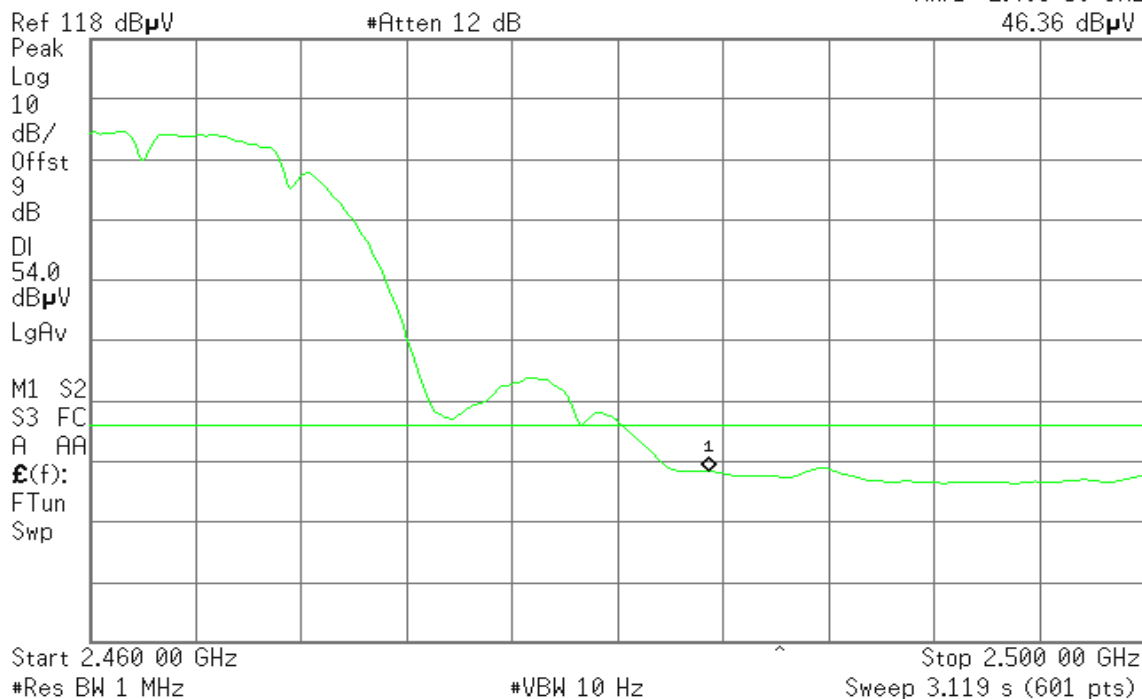
Agilent 10:26:53 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
57.68 dB μ V**Detector mode: Average****Polarity: Vertical**

Agilent 10:27:04 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
46.36 dB μ V

**Detector mode: Peak****Polarity: Horizontal**

* Agilent 10:22:10 Feb 4, 2010

R T

Mkr1 2.483 50 GHz
57.85 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

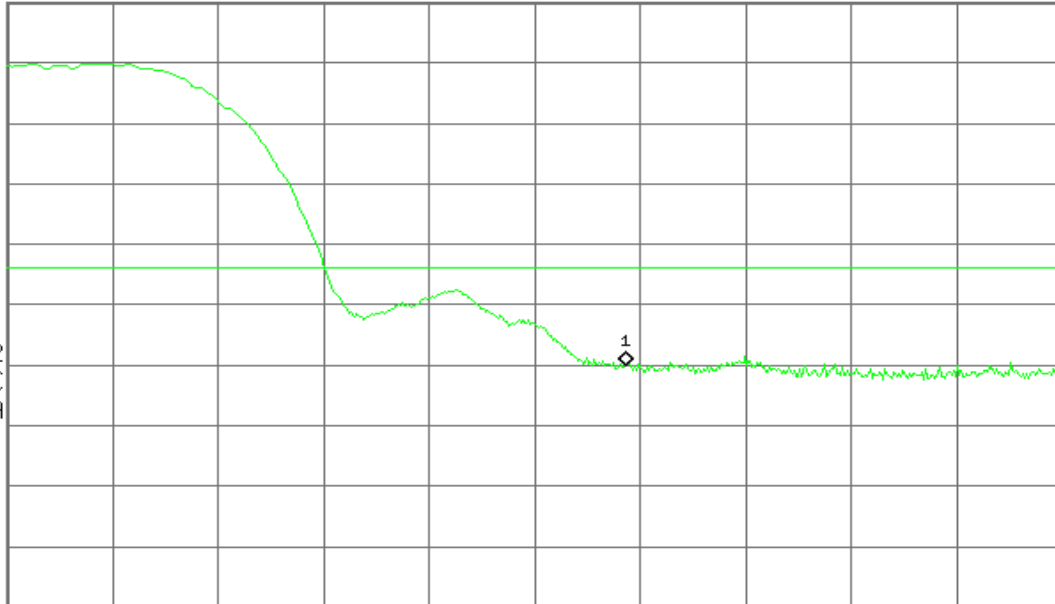
S3 FC

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 10:22:24 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
46.85 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

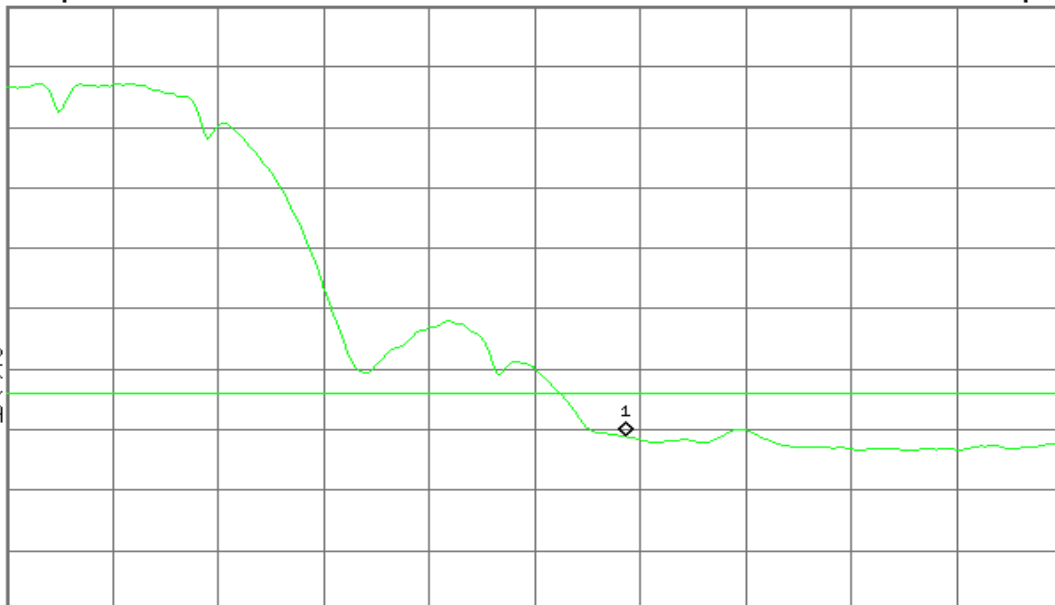
S3 FC

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 10:10:19 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
66.23 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average**Polarity: Vertical**

* Agilent 10:10:07 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
49.70 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A AA

E(f):

FTun

Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

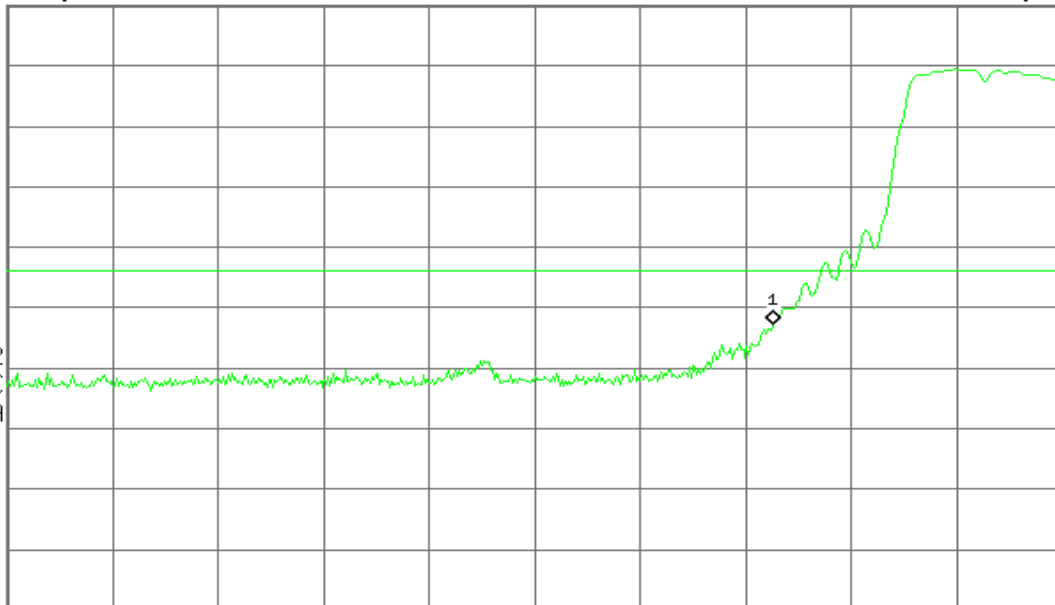
**Detector mode: Peak****Polarity: Horizontal**

* Agilent 10:15:35 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
65.21 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
74.0
dB μ V
LgAvM1 S2
S3 FC
A AA
E(f):
FTun
Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

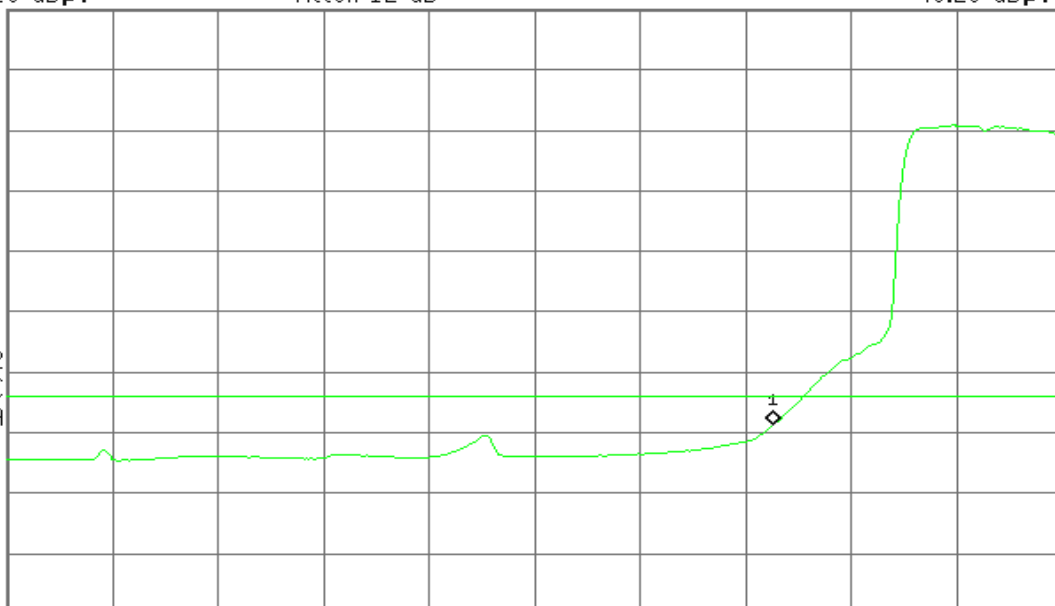
Detector mode: Average**Polarity: Horizontal**

* Agilent 10:15:19 Feb 4, 2010

R L

Mkr1 2.390 0 GHz
49.26 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
54.0
dB μ V
LgAvM1 S2
S3 FC
A AA
E(f):
FTun
Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

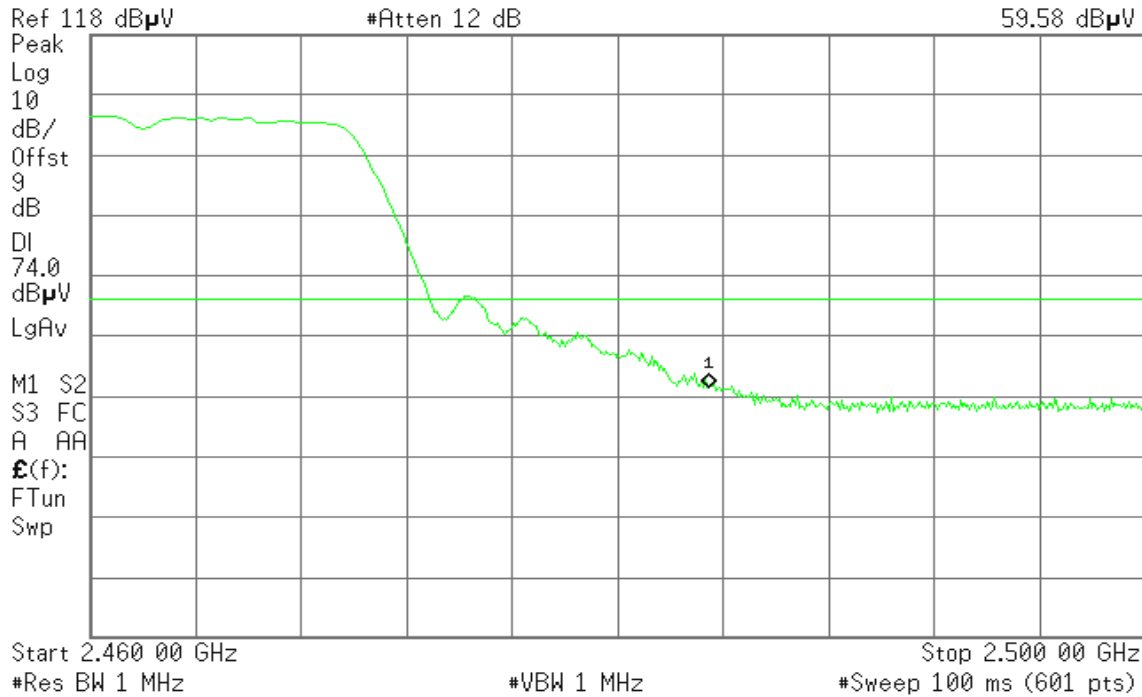
Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

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

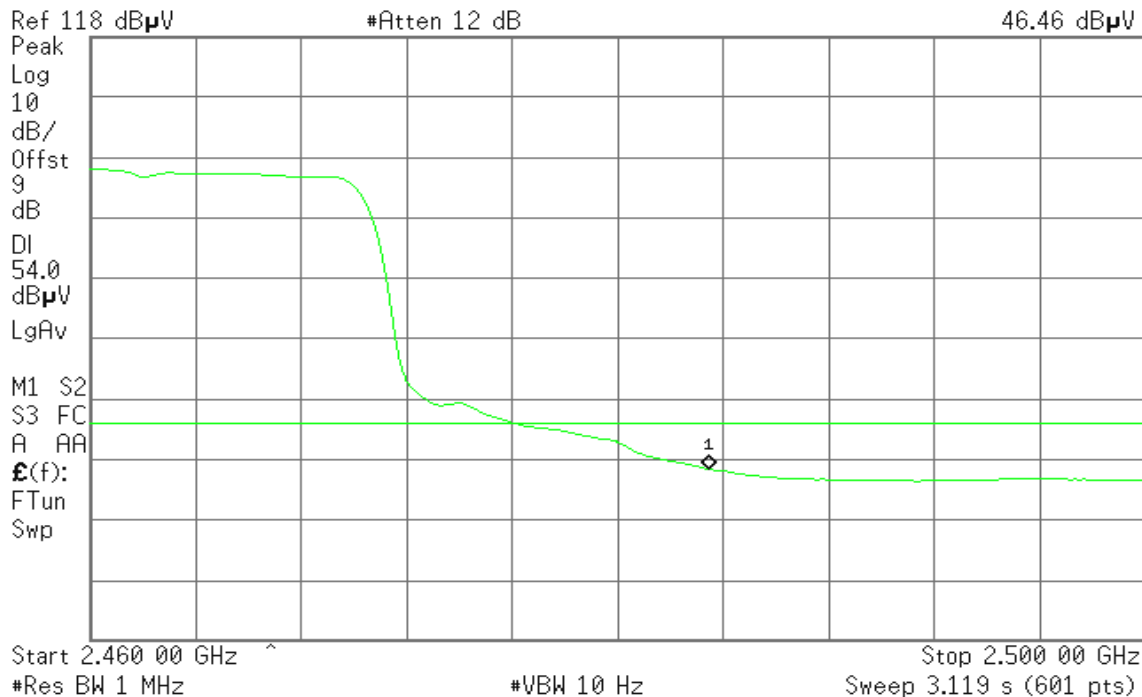
* Agilent 10:26:27 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
59.58 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 10:26:13 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
46.46 dB μ V

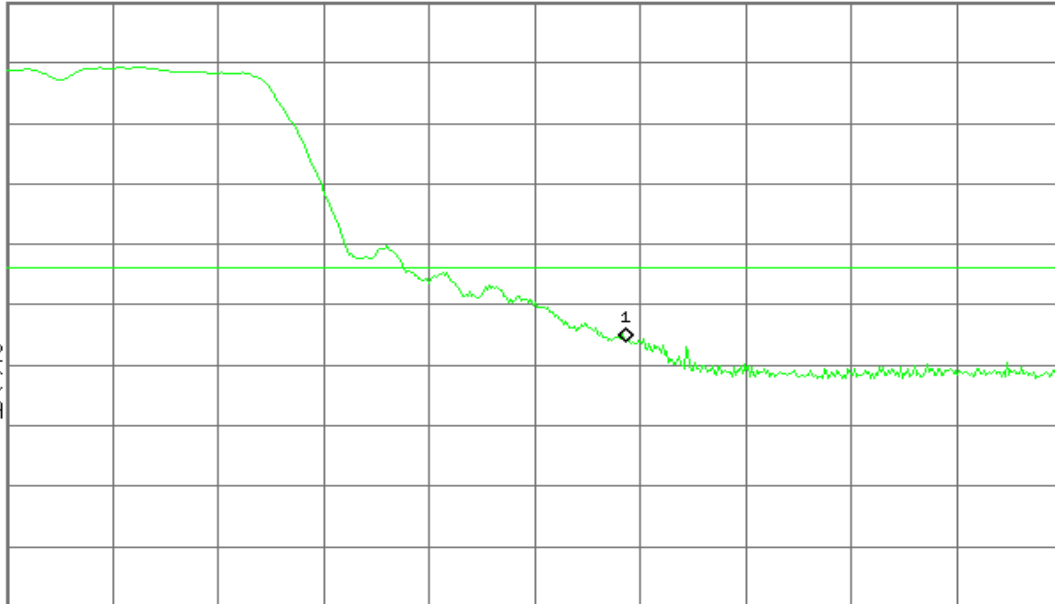
**Detector mode: Peak****Polarity: Horizontal**

* Agilent 10:21:42 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
61.93 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
74.0
dB μ V
LgAvM1 S2
S3 FC
A AA
£(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)

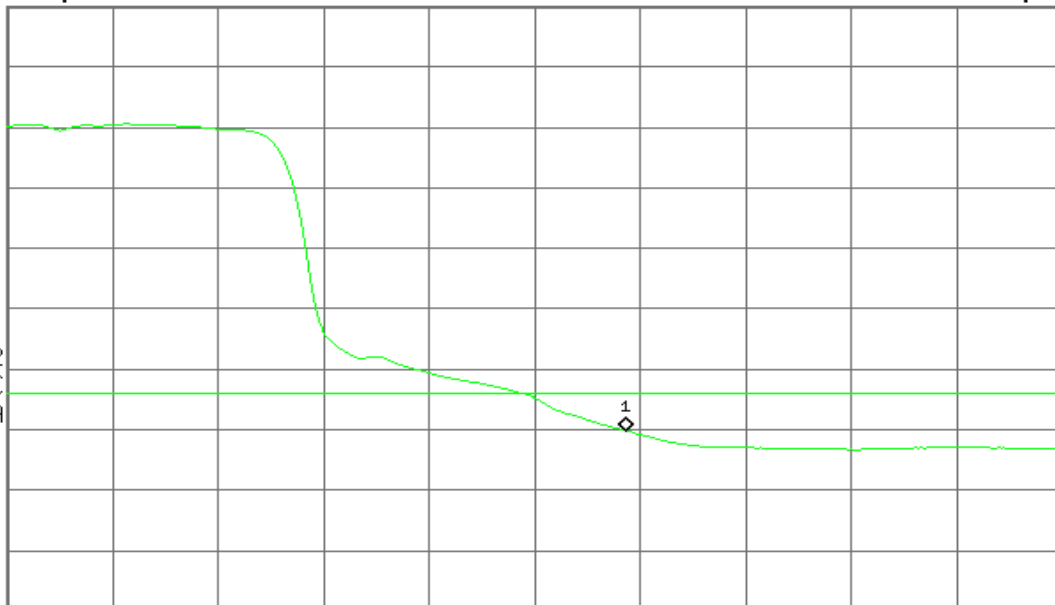
Detector mode: Average**Polarity: Horizontal**

* Agilent 10:21:29 Feb 4, 2010

R L

Mkr1 2.483 50 GHz
47.87 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
54.0
dB μ V
LgAvM1 S2
S3 FC
A AA
£(f):
FTun
Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

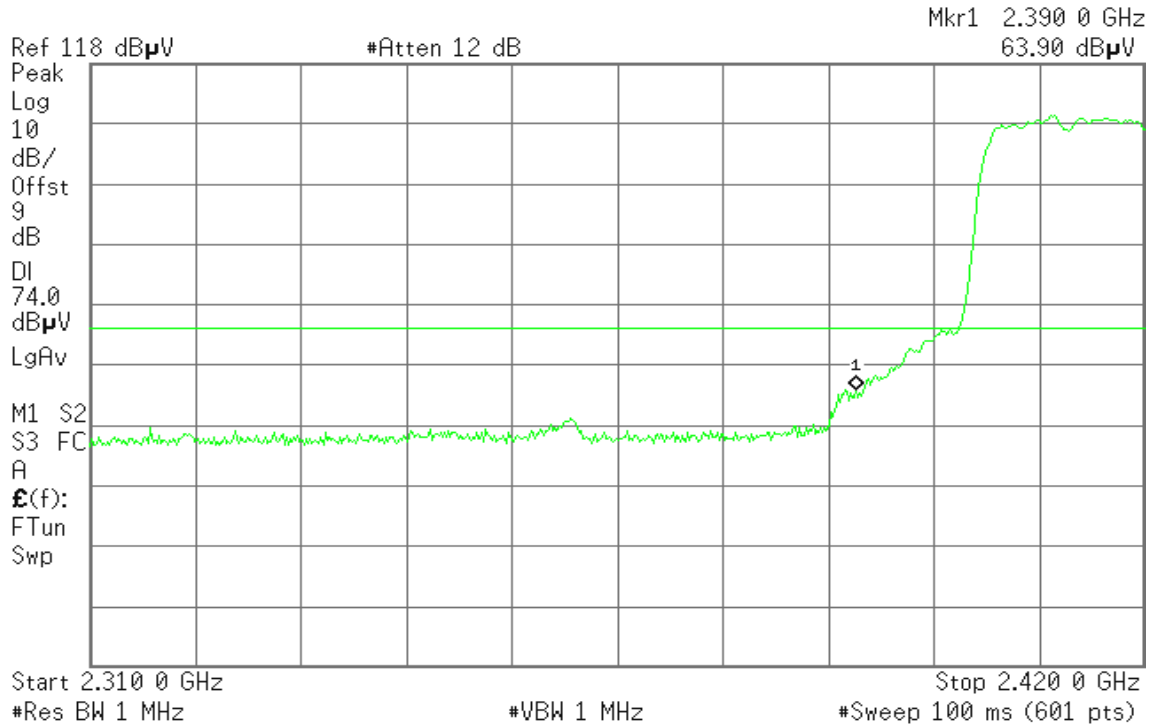
Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)

**Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

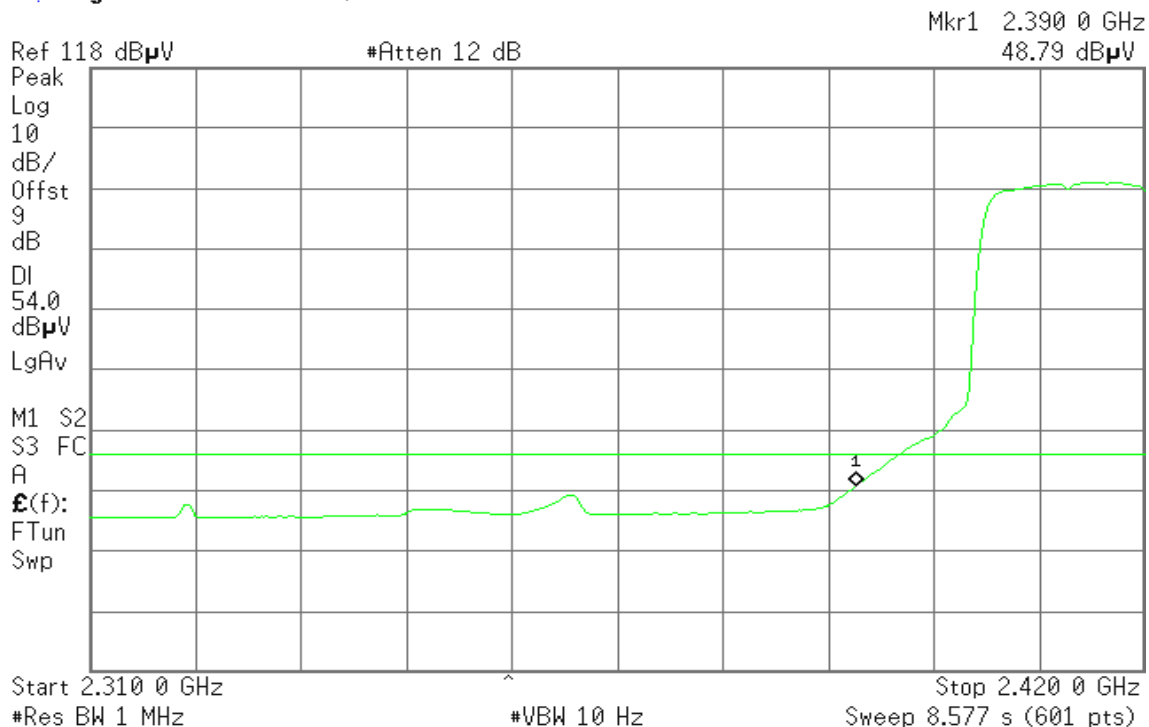
* Agilent 17:23:53 Feb 3, 2010

R L

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

* Agilent 17:24:12 Feb 3, 2010

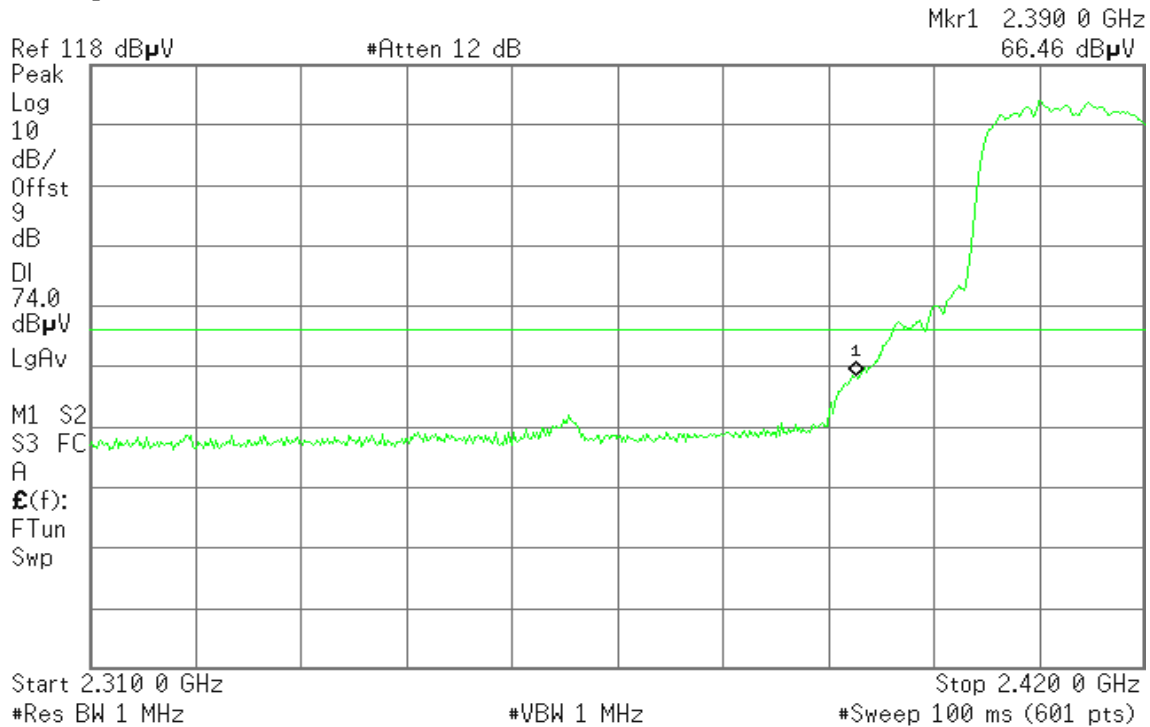
R L



**Detector mode: Peak****Polarity: Horizontal**

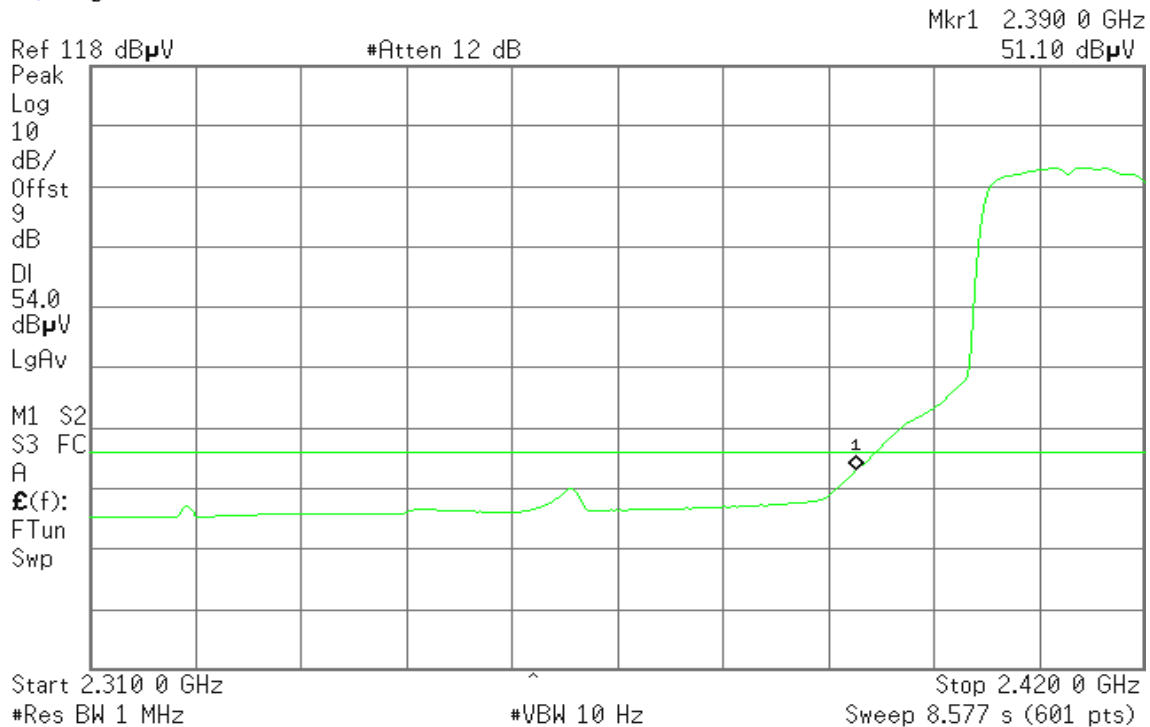
* Agilent 17:19:02 Feb 3, 2010

R L

**Detector mode: Average****Polarity: Horizontal**

* Agilent 17:18:48 Feb 3, 2010

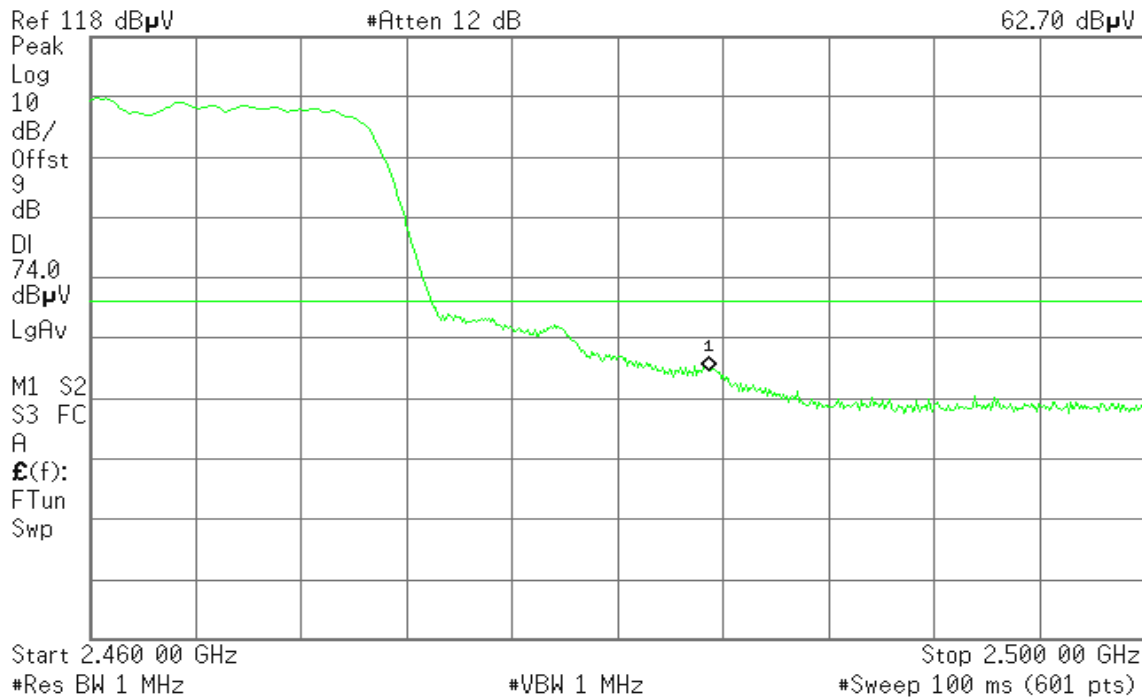
R L



**Band Edges (draft 802.11n Standard-20 MHz Channel mode / CH High)****Detector mode: Peak****Polarity: Vertical**

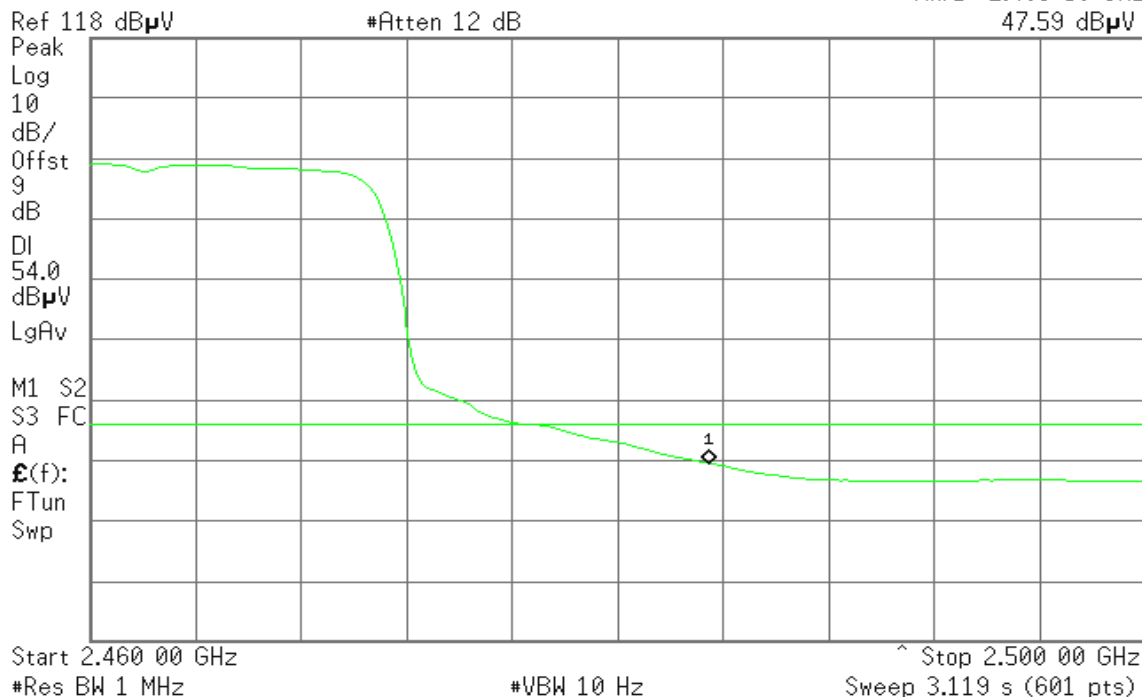
* Agilent 17:36:47 Feb 3, 2010

R T

Mkr1 2.483 50 GHz
62.70 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 17:36:58 Feb 3, 2010

R T

Mkr1 2.483 50 GHz
47.59 dB μ V

**Detector mode: Peak****Polarity: Horizontal**

* Agilent 17:28:44 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
67.49 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A

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 17:28:34 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
50.89 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak

Log

10

dB/

Offst

9

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A

E(f):

FTun

Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

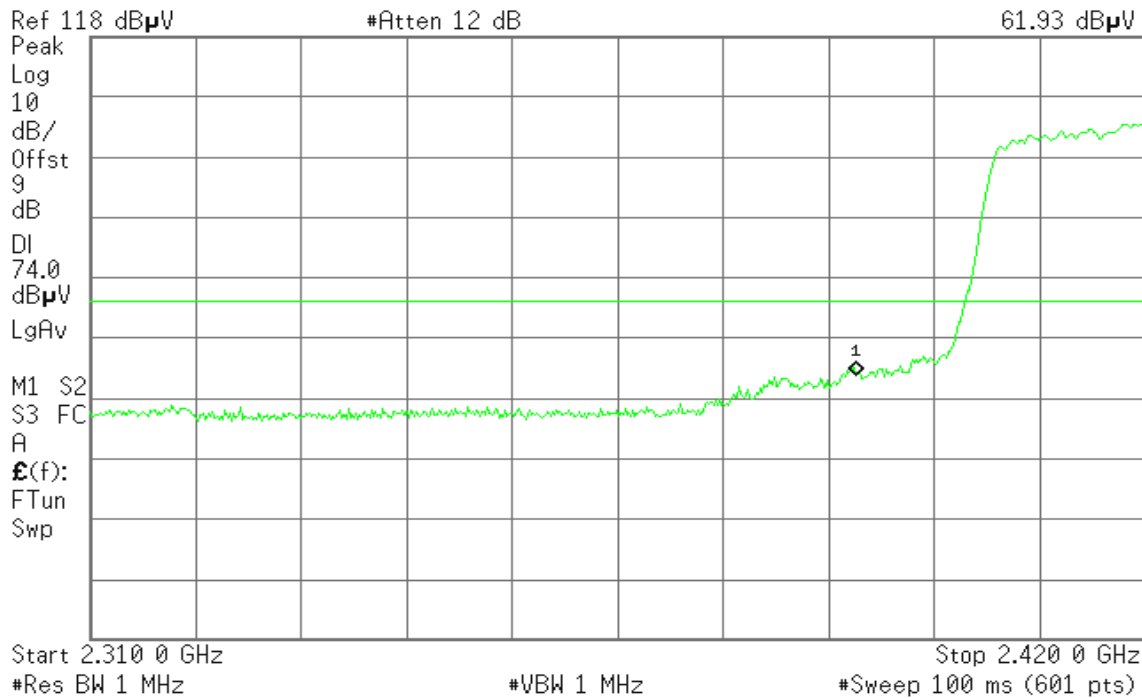
Stop 2.500 00 GHz

Sweep 3.119 s (601 pts)

**Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH Low)****Detector mode: Peak****Polarity: Vertical**

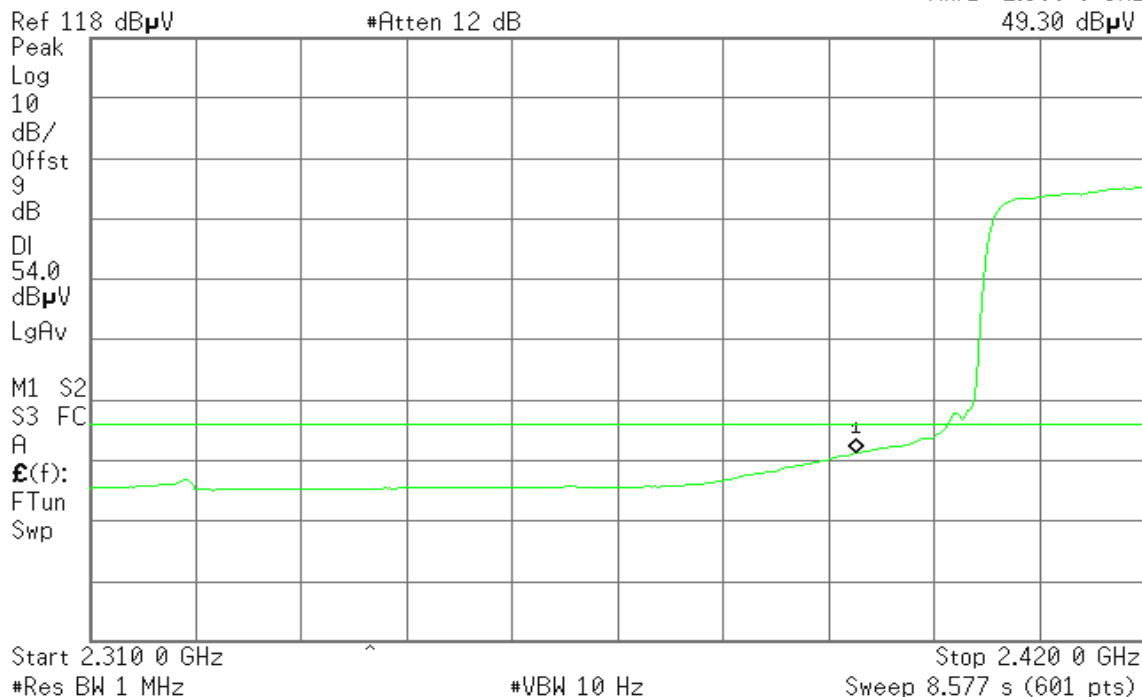
* Agilent 17:23:16 Feb 3, 2010

R L

Mkr1 2.390 0 GHz
61.93 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 17:22:58 Feb 3, 2010

R L

Mkr1 2.390 0 GHz
49.30 dB μ V

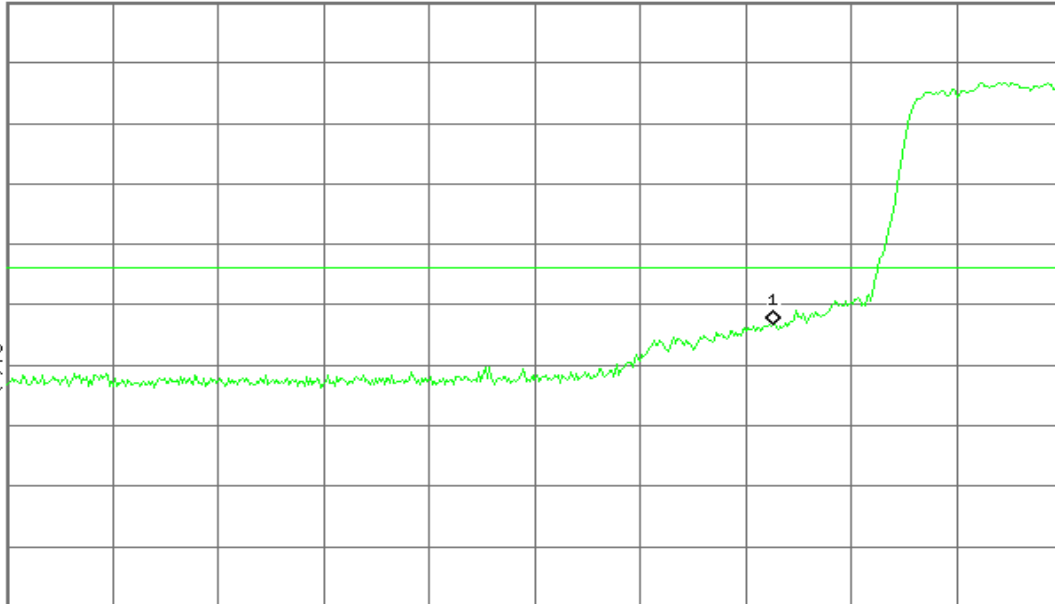
**Detector mode: Peak****Polarity: Horizontal**

* Agilent 17:20:01 Feb 3, 2010

R L

Mkr1 2.390 0 GHz
64.81 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
74.0
dB μ V
LgAvM1 S2
S3 FC
A
E(f):
FTun
Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.420 0 GHz

#Sweep 100 ms (601 pts)

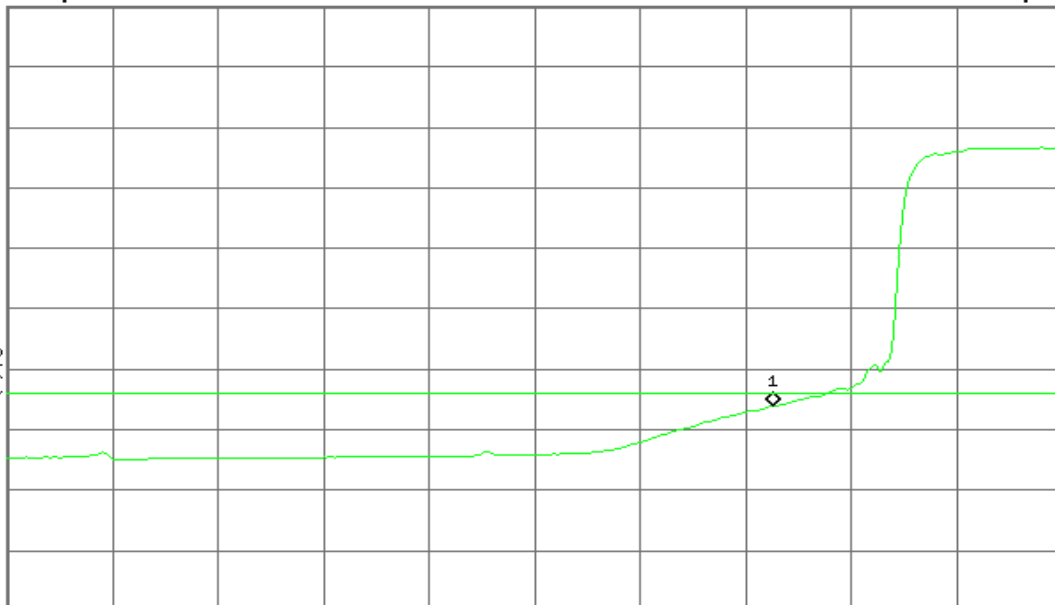
Detector mode: Average**Polarity: Horizontal**

* Agilent 17:20:24 Feb 3, 2010

R L

Mkr1 2.390 0 GHz
51.98 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
54.0
dB μ V
LgAvM1 S2
S3 FC
A
E(f):
FTun
Swp

Start 2.310 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

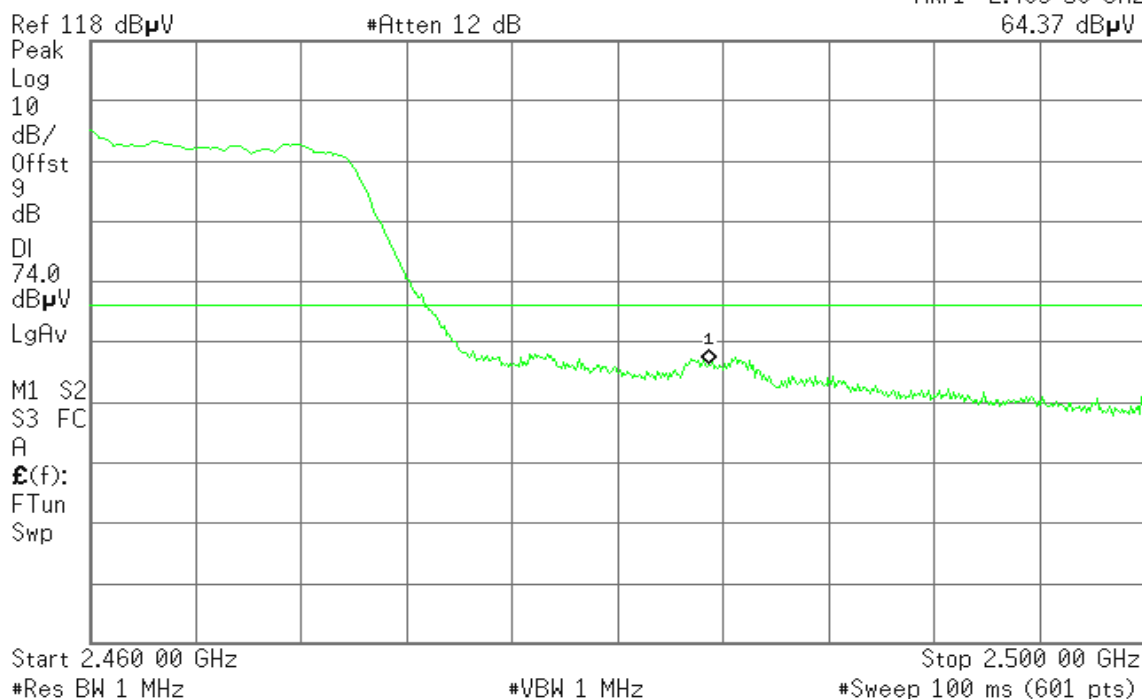
Stop 2.420 0 GHz

Sweep 8.577 s (601 pts)

**Band Edges (draft 802.11n Wide-40 MHz Channel mode / CH High)****Detector mode: Peak****Polarity: Vertical**

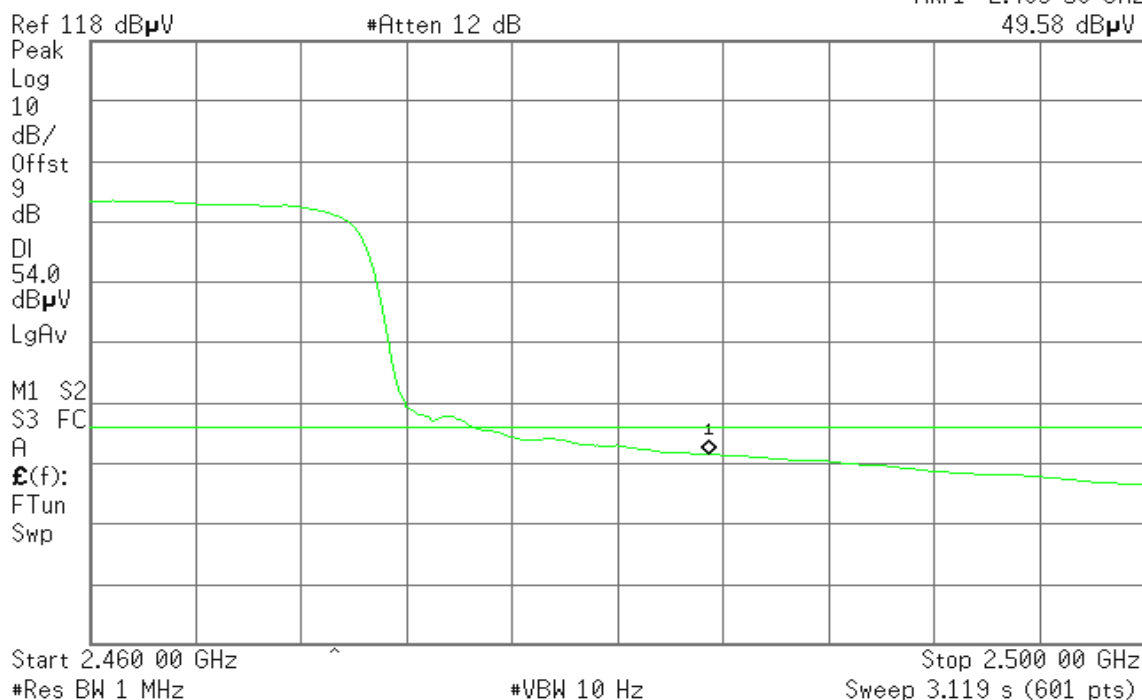
* Agilent 17:36:10 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
64.37 dB μ V**Detector mode: Average****Polarity: Vertical**

* Agilent 17:35:57 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
49.58 dB μ V

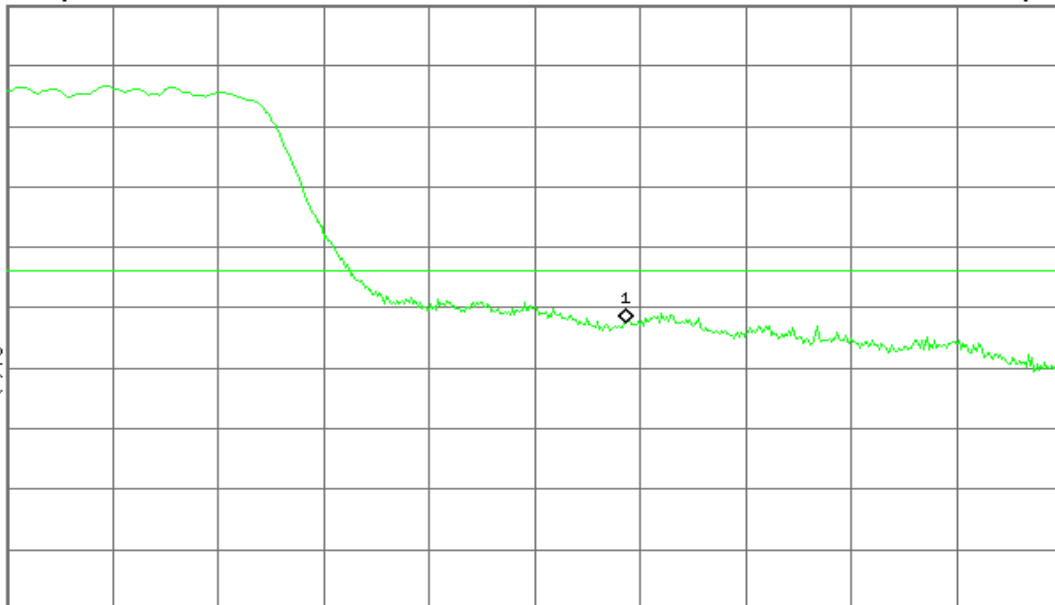
**Detector mode: Peak****Polarity: Horizontal**

* Agilent 17:30:37 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
65.45 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
74.0
dB μ V
LgAvM1 S2
S3 FC
A
£(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)

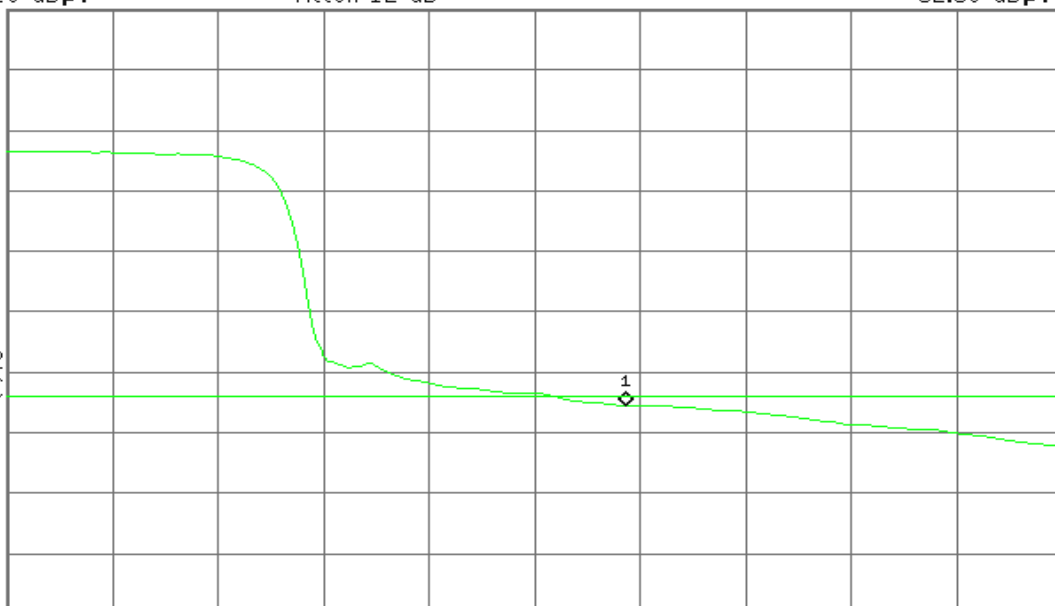
Detector mode: Average**Polarity: Horizontal**

* Agilent 17:30:26 Feb 3, 2010

R L

Mkr1 2.483 50 GHz
52.56 dB μ VRef 118 dB μ V

#Atten 12 dB

Peak
Log
10
dB/
Offst
9
dB
DI
54.0
dB μ V
LgAvM1 S2
S3 FC
A
£(f):
FTun
Swp

Start 2.460 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

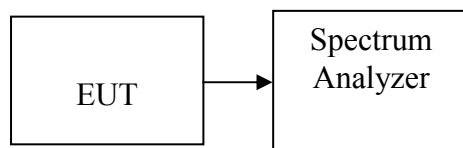
Sweep 3.119 s (601 pts)

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)	Result
Low	2412	-11.87	8.00	PASS
Mid	2437	-11.82		PASS
High	2462	-12.35		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.72	8.00	PASS
Mid	2437	-14.95		PASS
High	2462	-14.71		PASS

Test mode: draft 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-13.95	-13.98	-10.95	7.00	PASS
Mid	2437	-13.42	-13.86	-10.62		PASS
High	2462	-12.26	-14.29	-10.15		PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 PSD (dBm)	Chain 1 PSD (dBm)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-18.37	-20.08	-16.13	7.00	PASS
Mid	2437	-16.10	-16.35	-13.21		PASS
High	2452	-16.38	-18.09	-14.14		PASS

Remark:

- Total PSD (dBm) = $10 \cdot \log(10^{\text{Chain 0 PSD} / 10} + 10^{\text{Chain 1 PSD} / 10})$
- The maximum antenna gain is 6.309 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 7dBm.

**Test mode: draft 802.11n Standard-20 MHz Channel mode with combiner**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-10.42	7.00	PASS
Mid	2437	-10.41		PASS
High	2462	-10.18		PASS

Test mode: draft 802.11n Wide-40 MHz Channel mode with combiner

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-15.32	7.00	PASS
Mid	2437	-12.78		PASS
High	2452	-14.55		PASS

Remark:

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

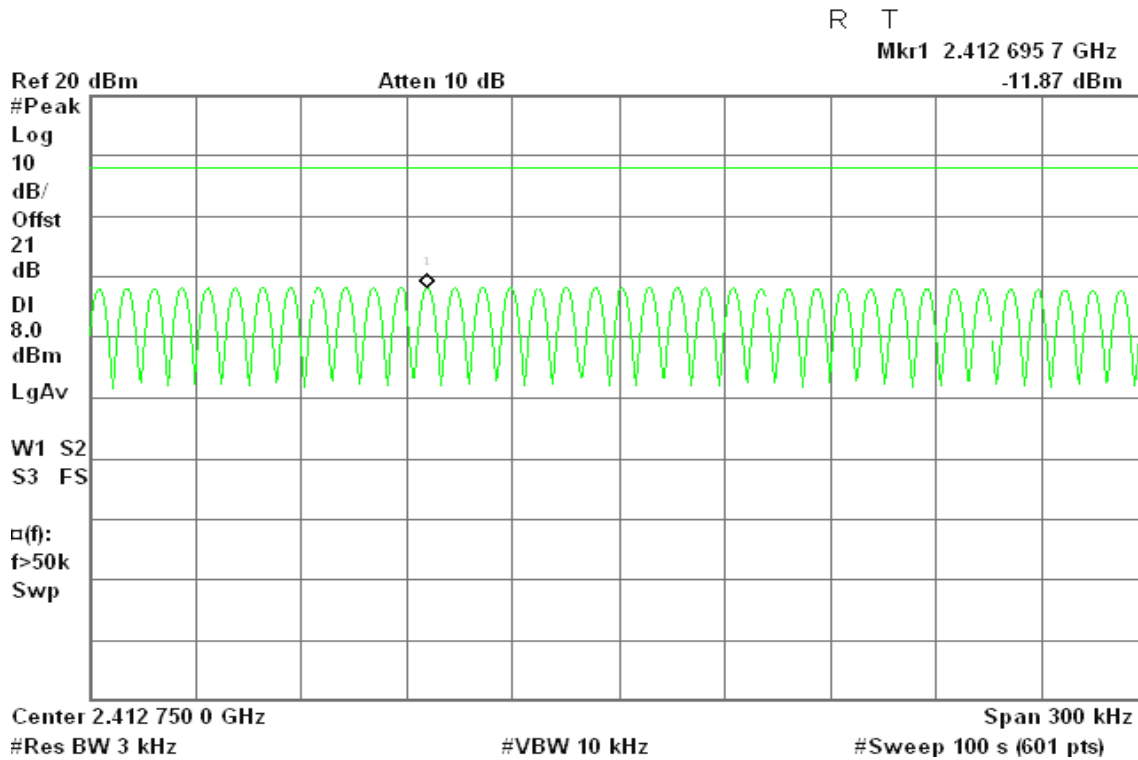
2. The maximum antenna gain is 6.309 dBi; therefore the reduction due to antenna gain is 1dB, so the limit is 7dBm.



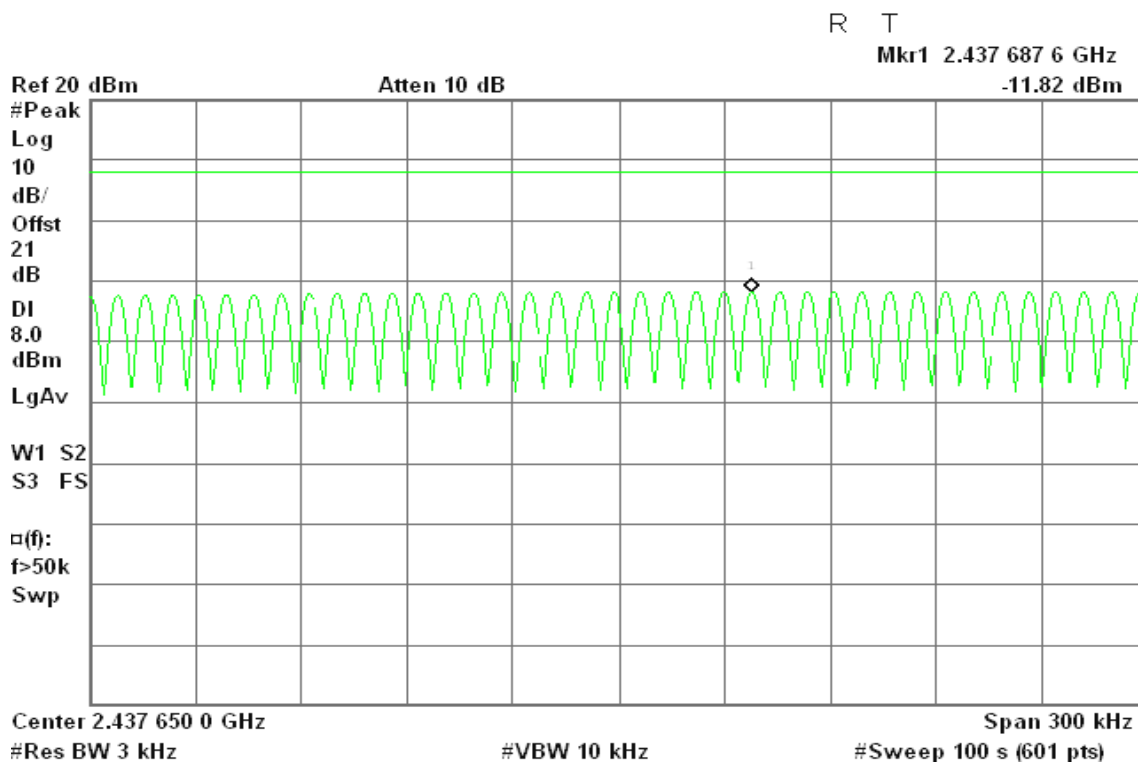
Test Plot

IEEE 802.11b mode

PPSD (CH Low)

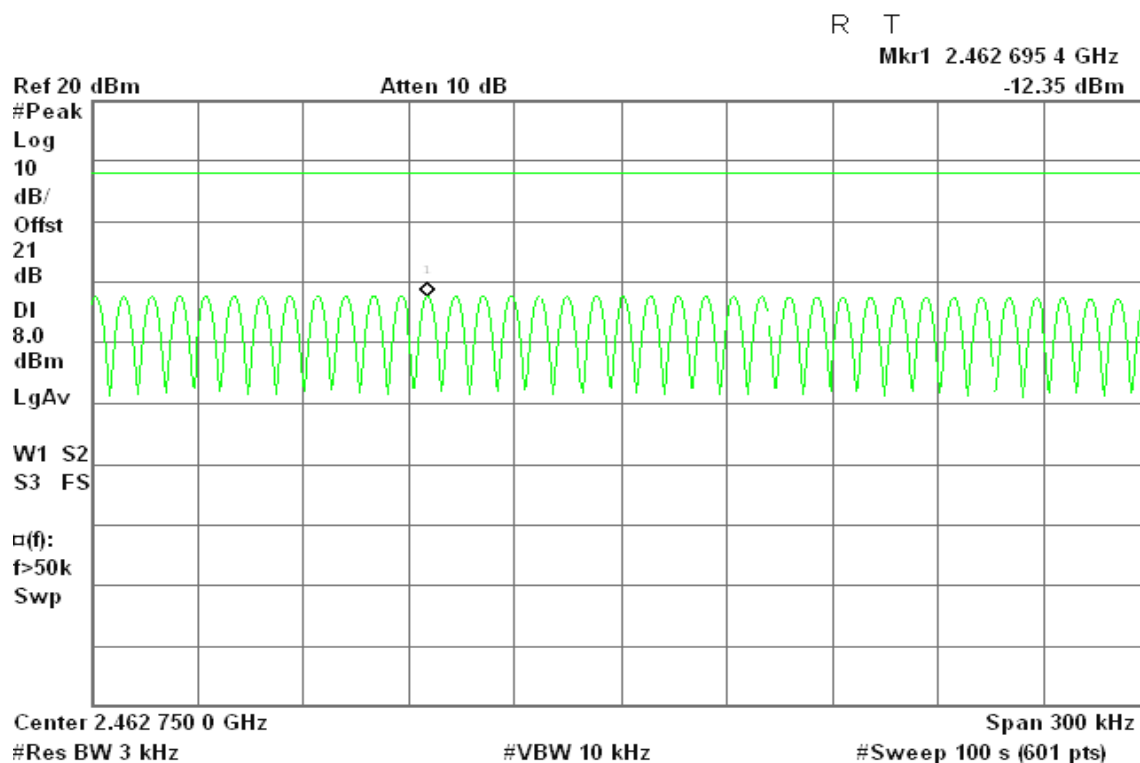


PPSD (CH Mid)



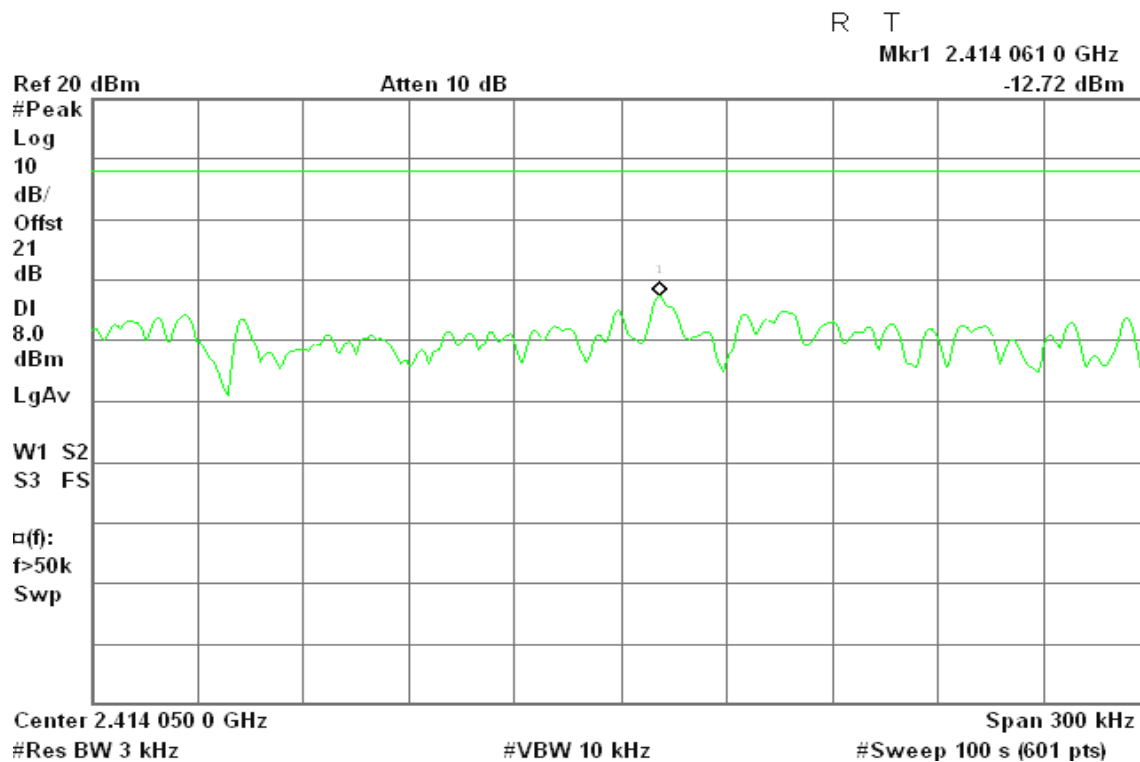


PPSD (CH High)



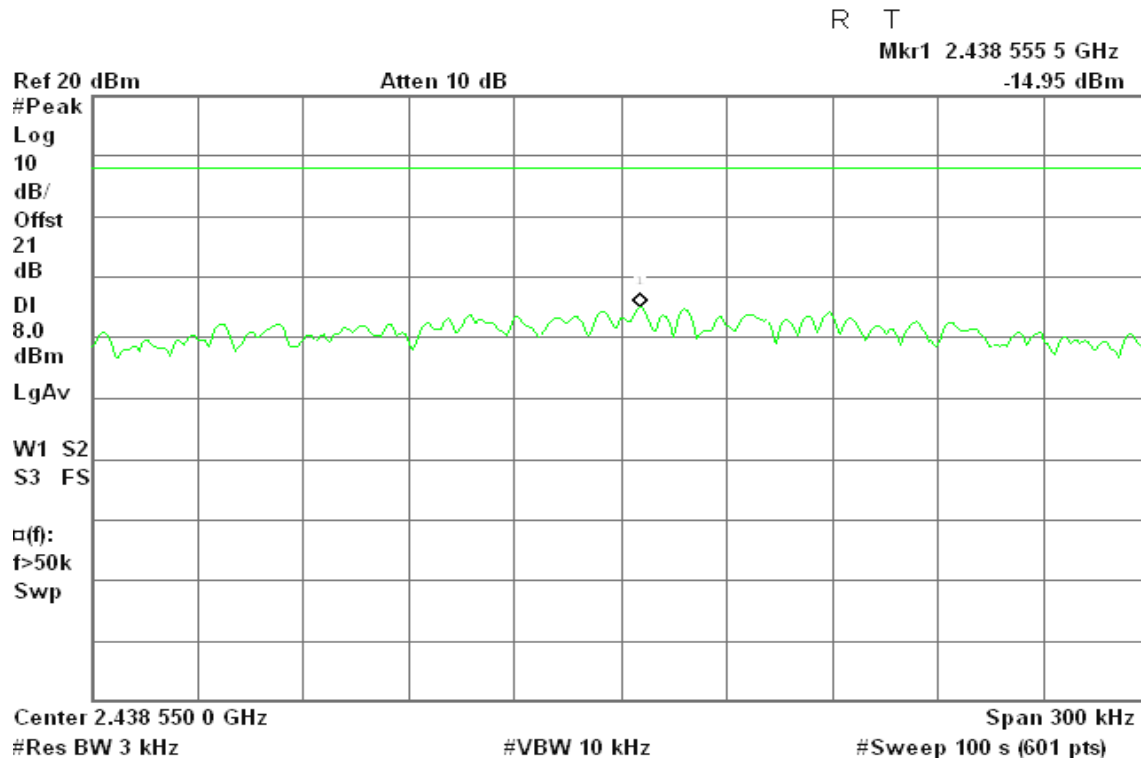
IEEE 802.11g mode

PPSD (CH Low)

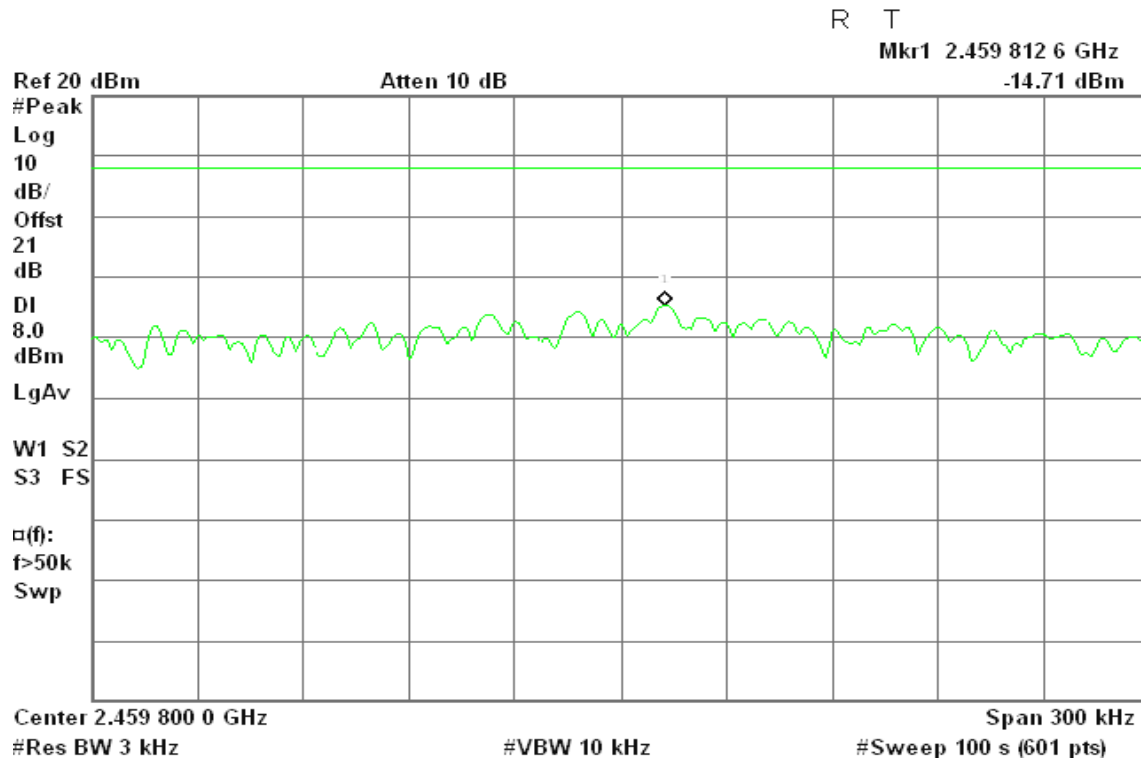




PPSD (CH Mid)



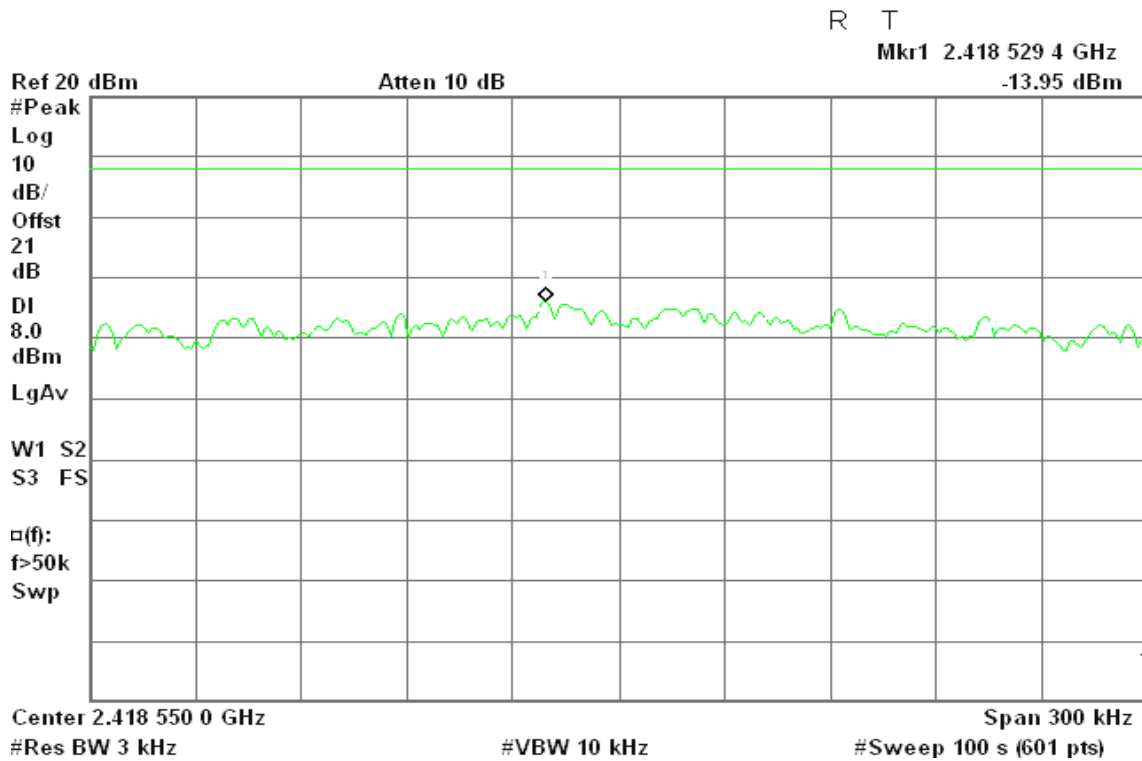
PPSD (CH High)



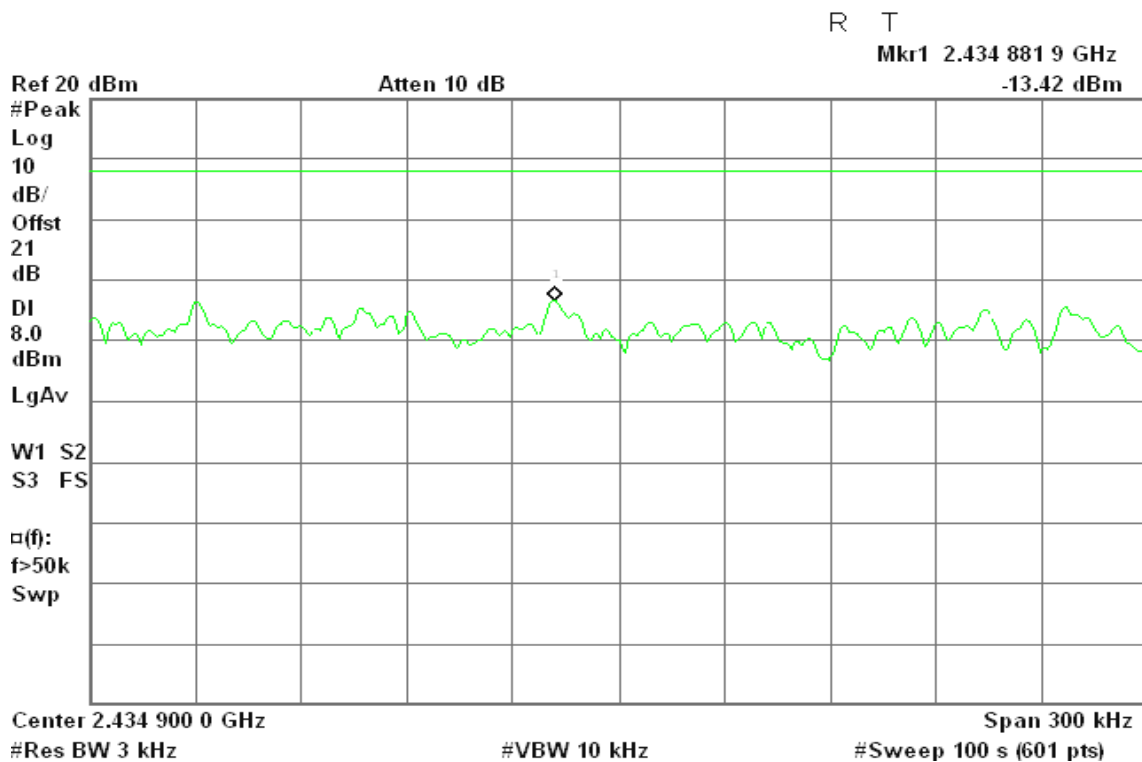


draft 802.11n Standard-20 MHz Channel mode / Chain 0

PPSD (CH Low)

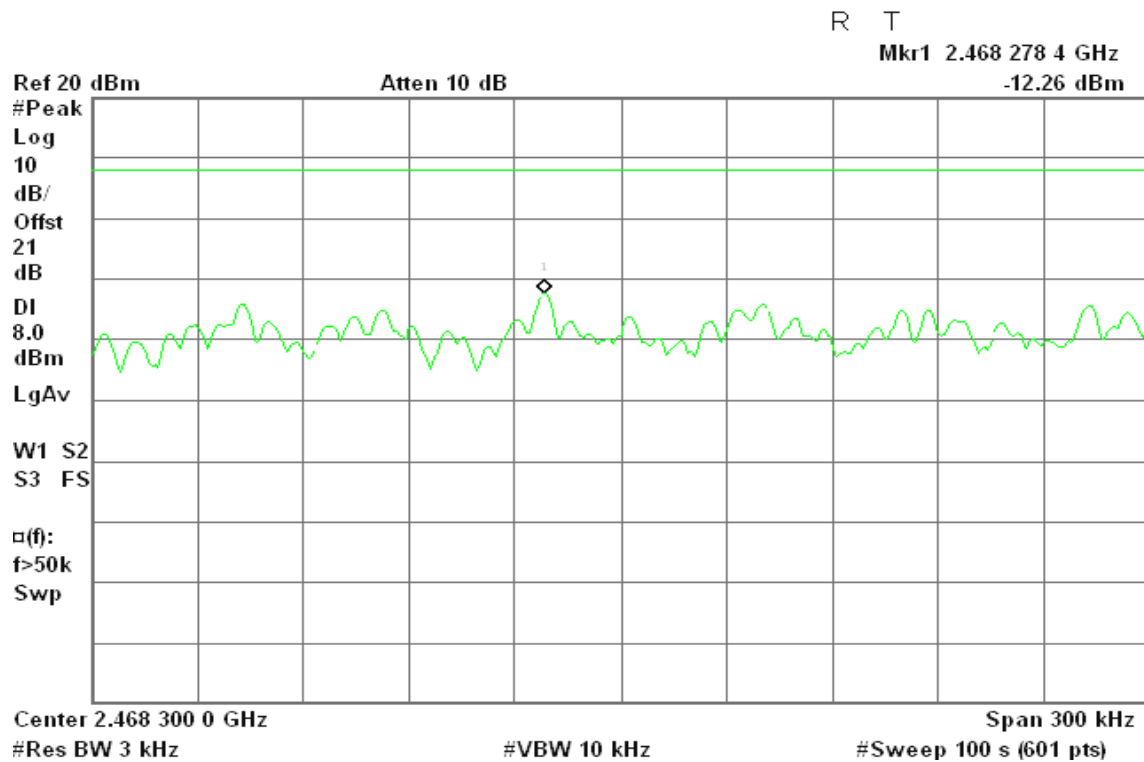


PPSD (CH Mid)



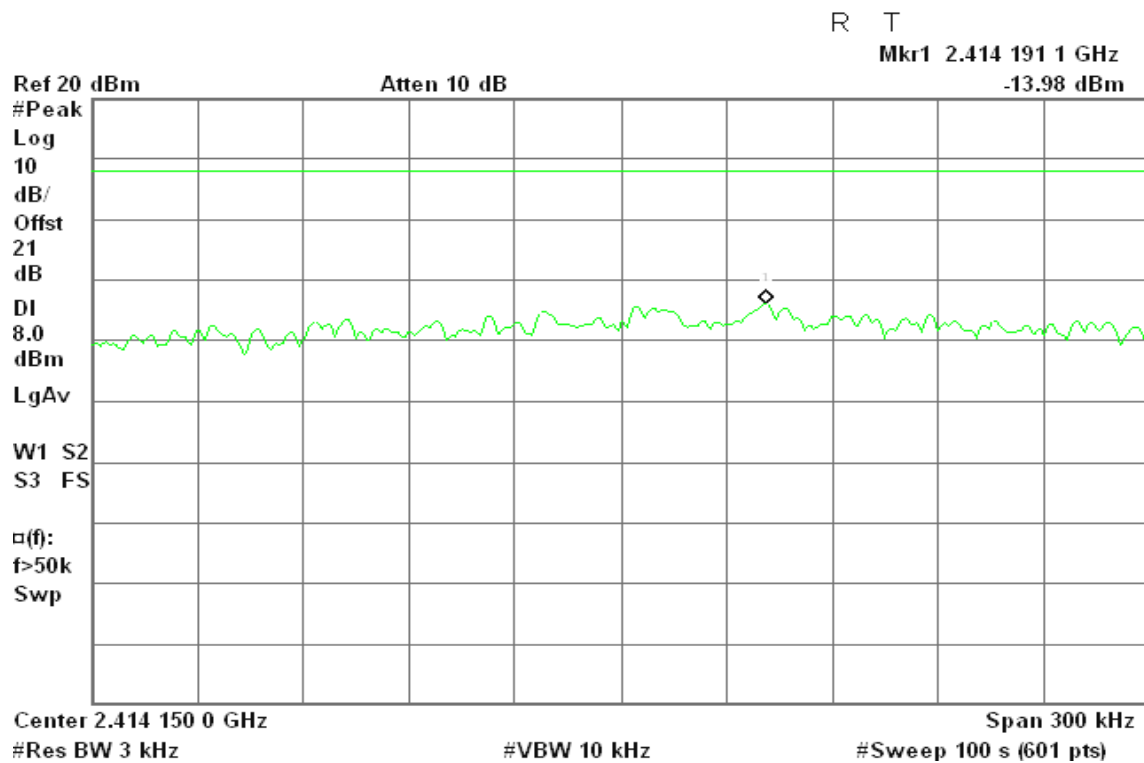


PPSD (CH High)



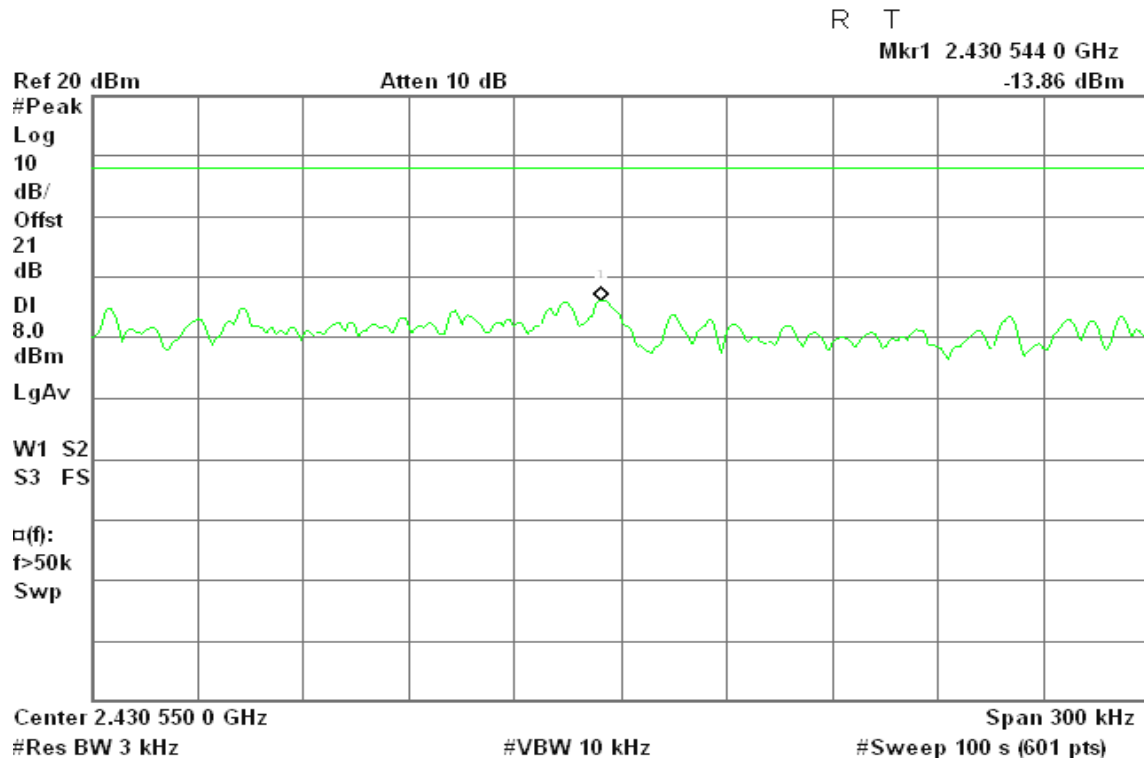
draft 802.11n Standard-20 MHz Channel mode / Chain 1

PPSD (CH Low)

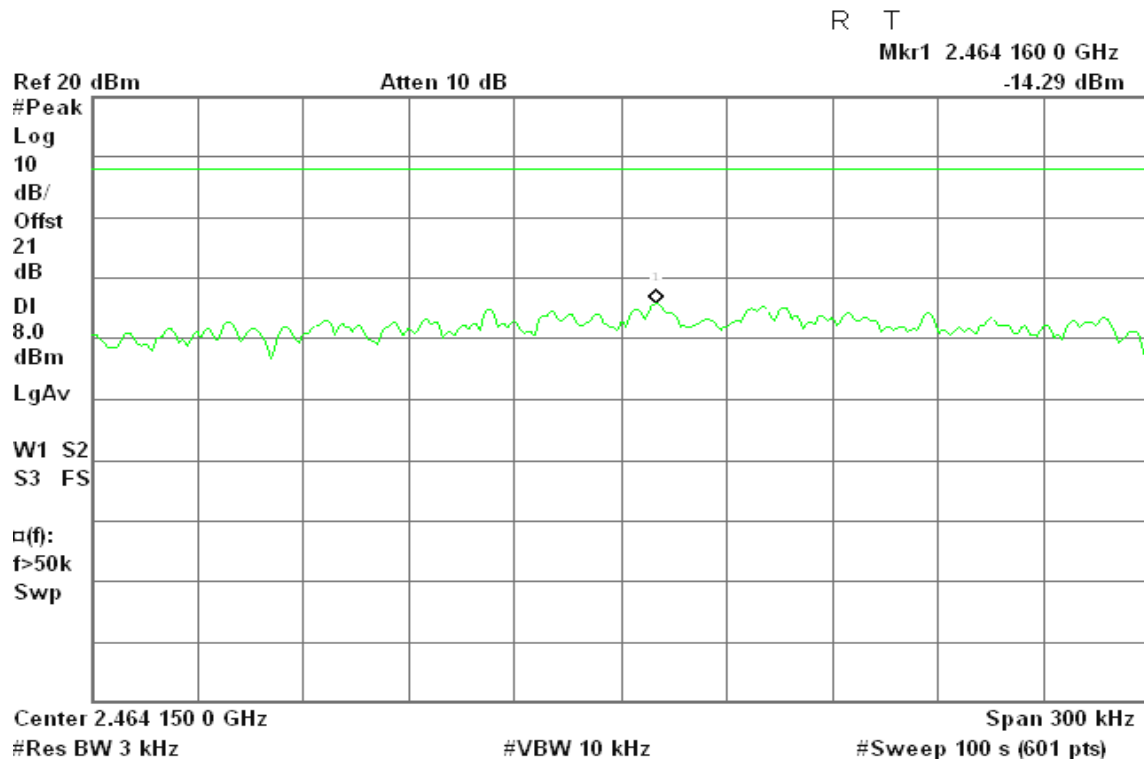




PPSD (CH Mid)



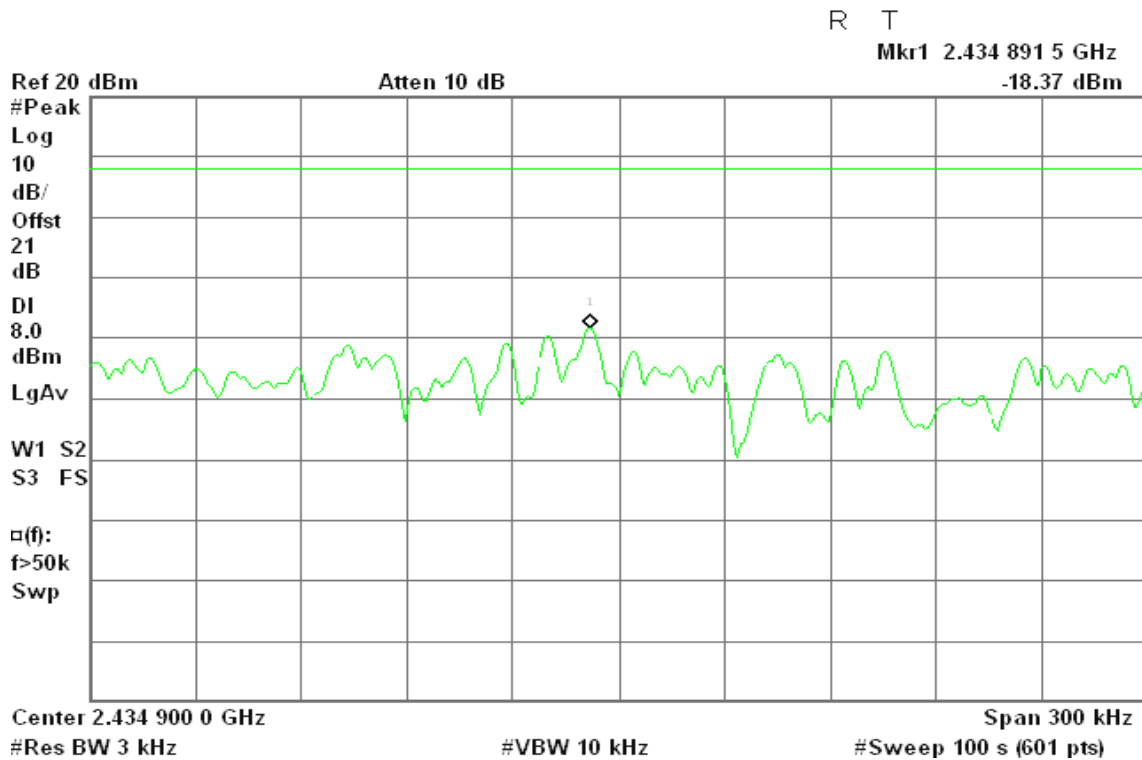
PPSD (CH High)



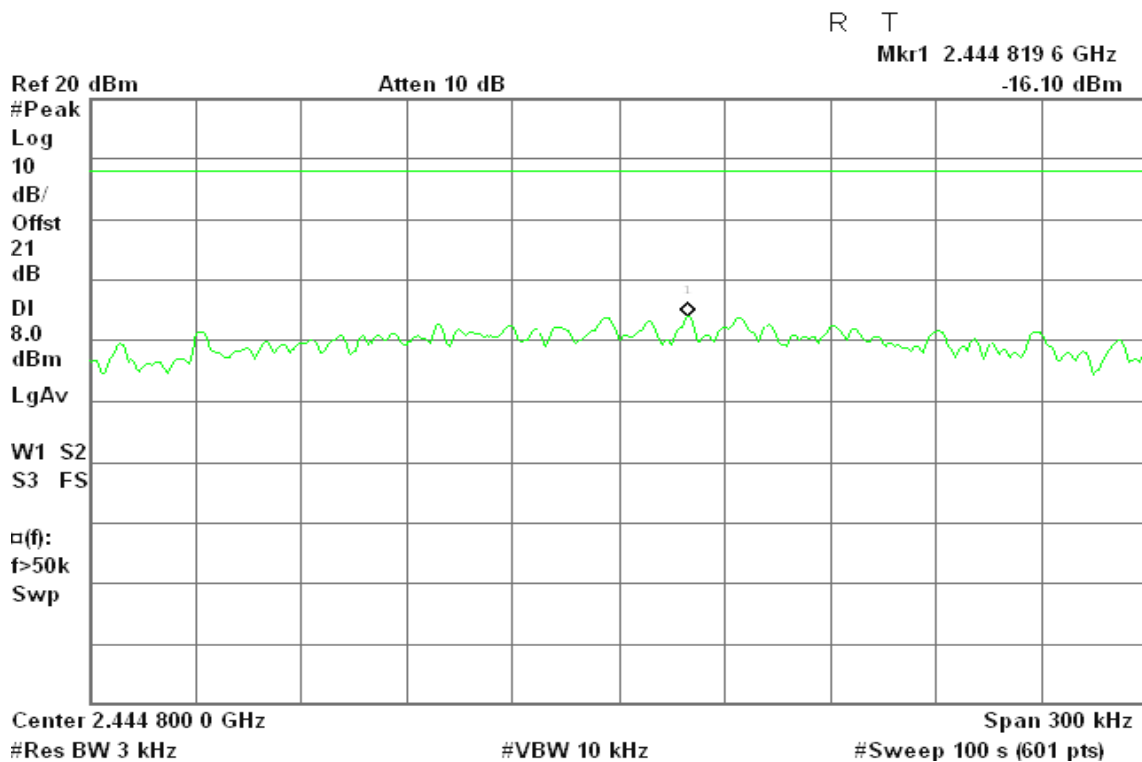


draft 802.11n Wide-40 MHz Channel mode / Chain 0

PPSD (CH Low)

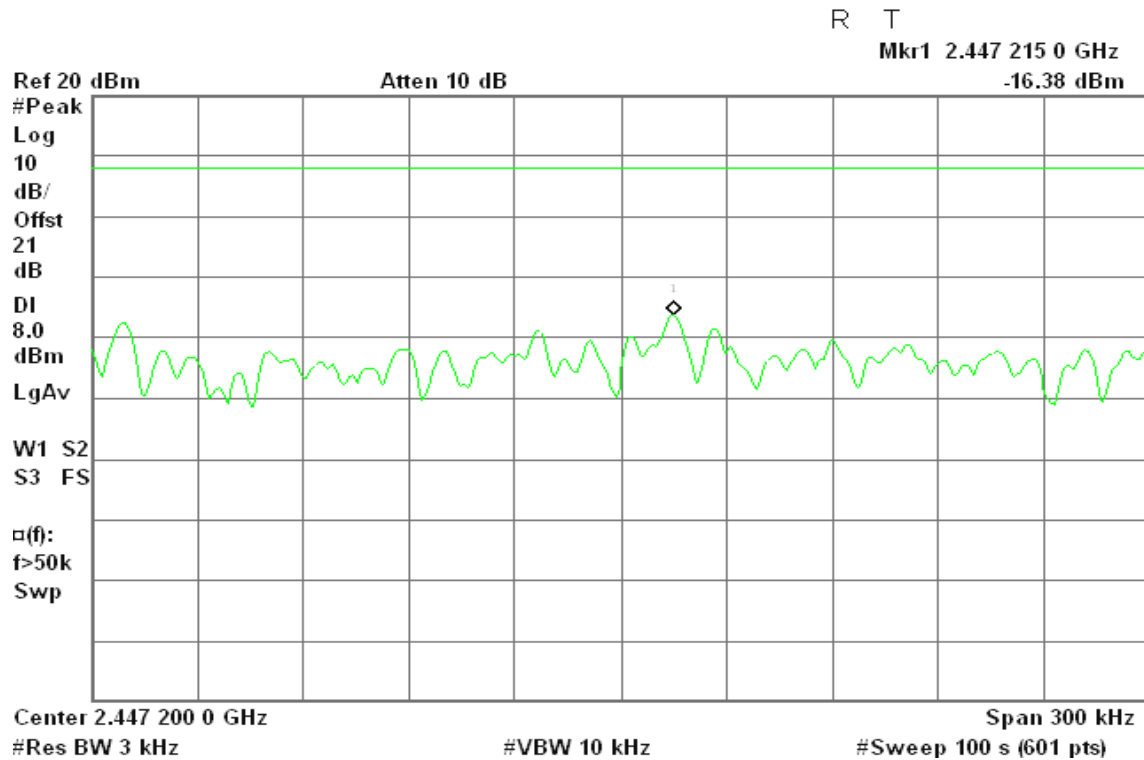


PPSD (CH Mid)



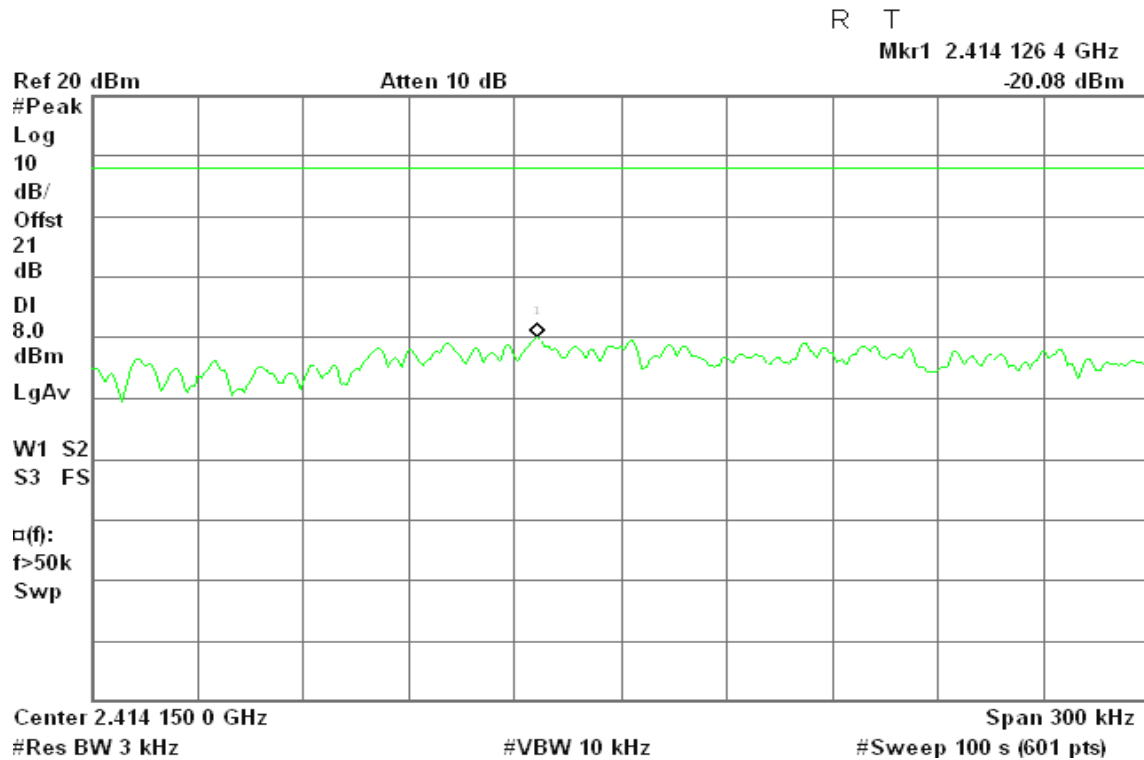


PPSD (CH High)



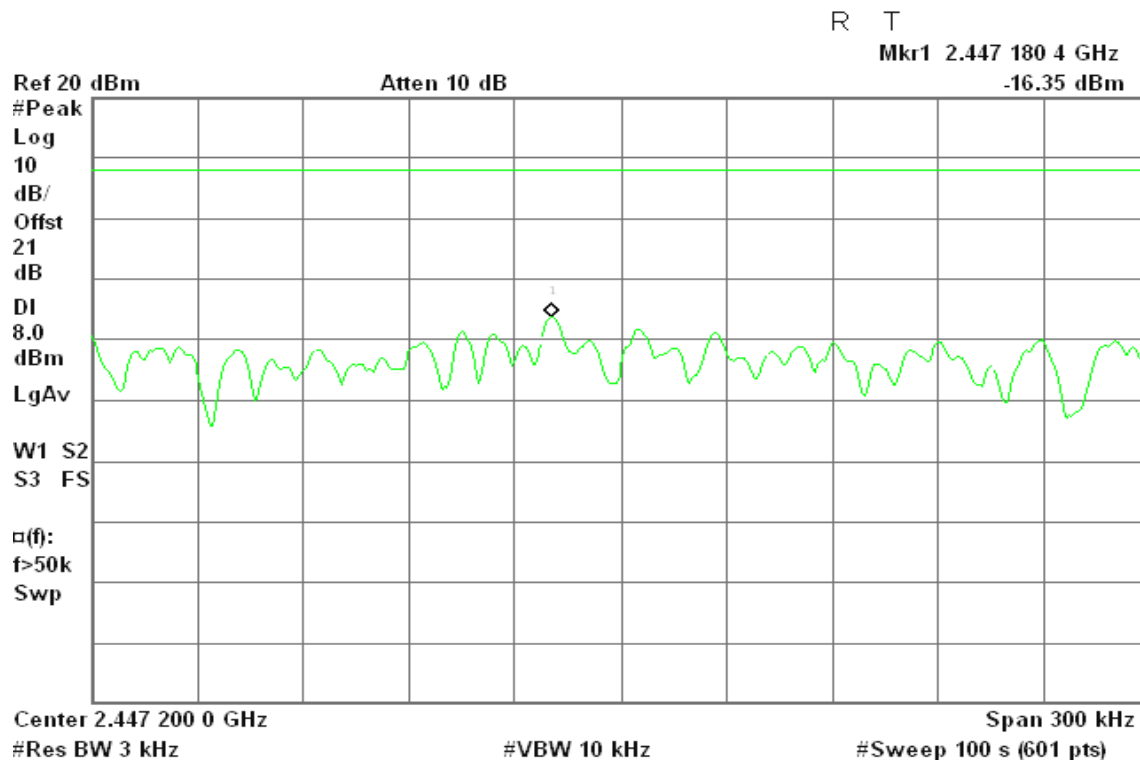
draft 802.11n Wide-40 MHz Channel mode / Chain 1

PPSD (CH Low)

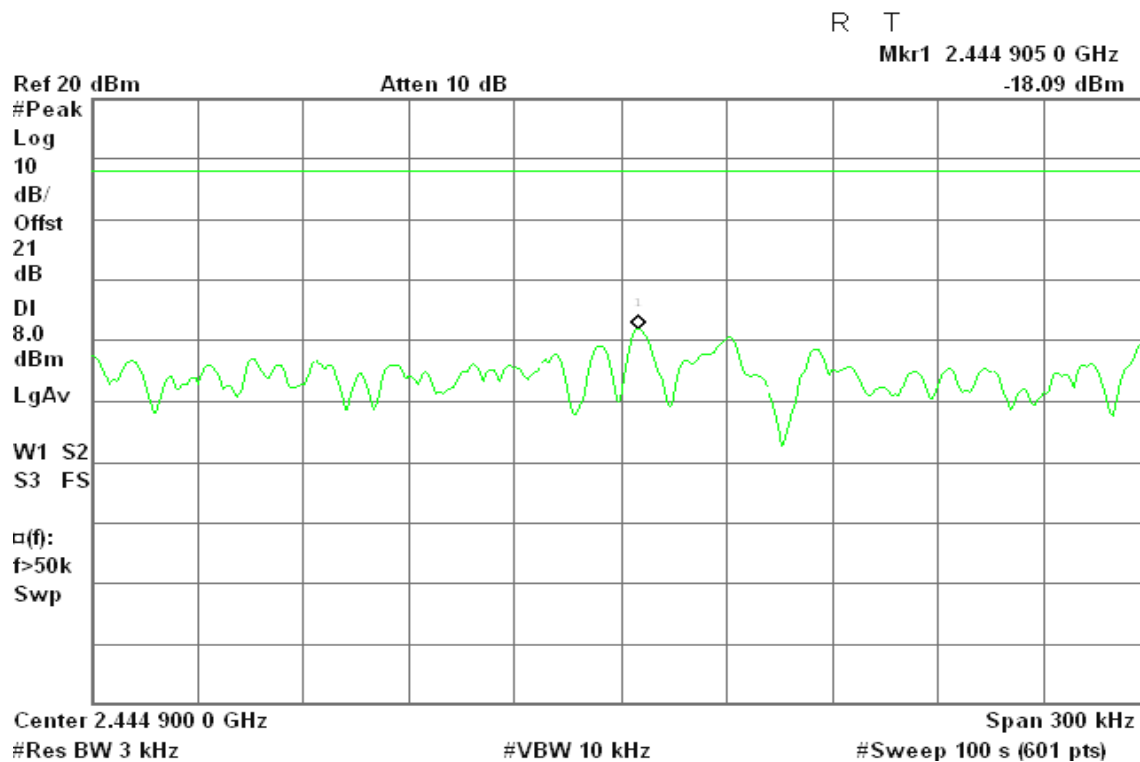


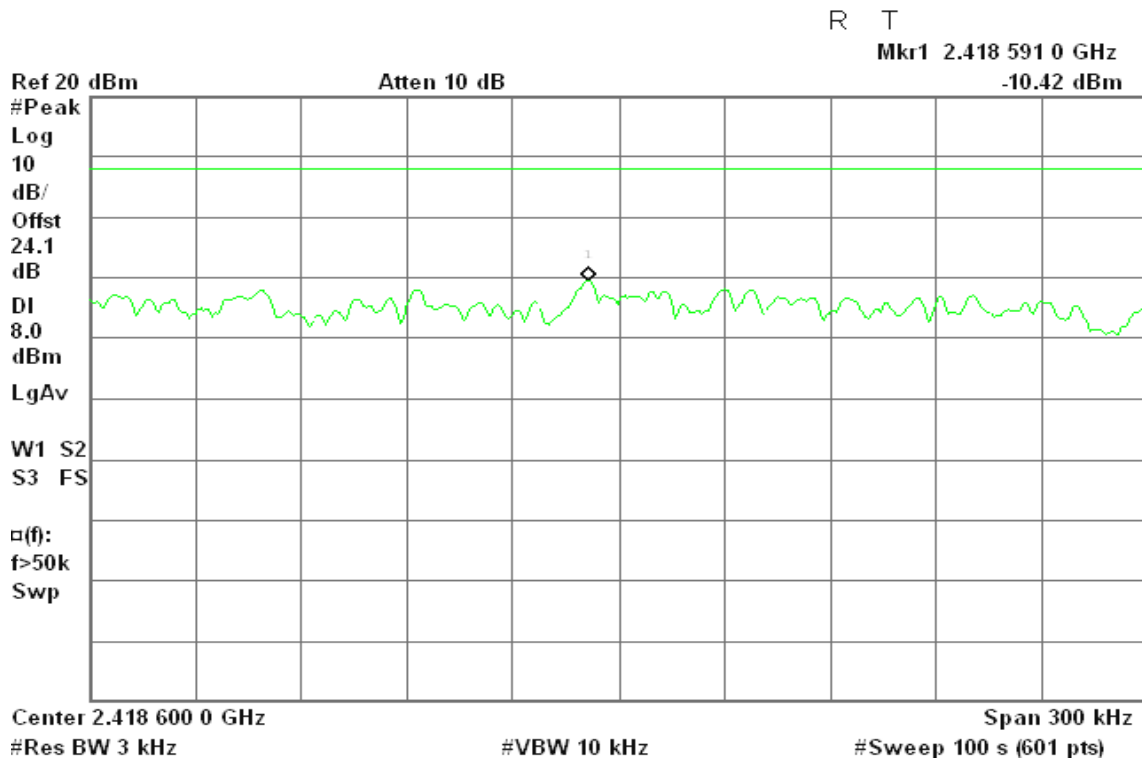
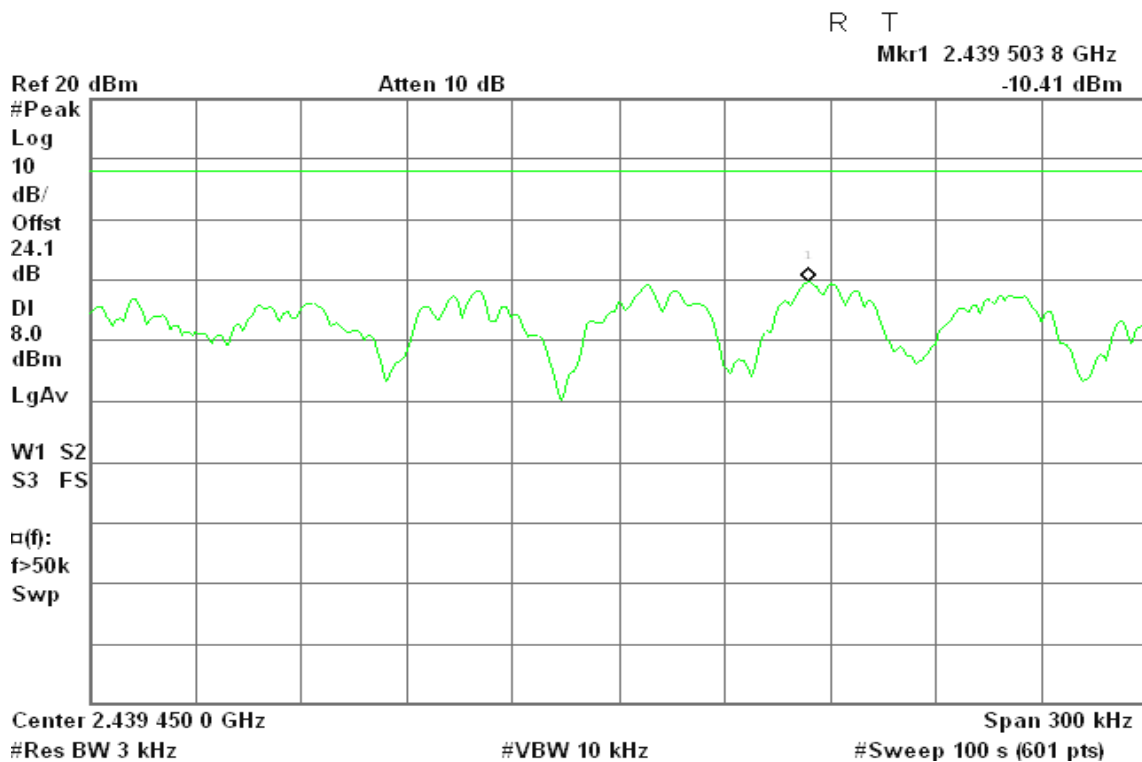


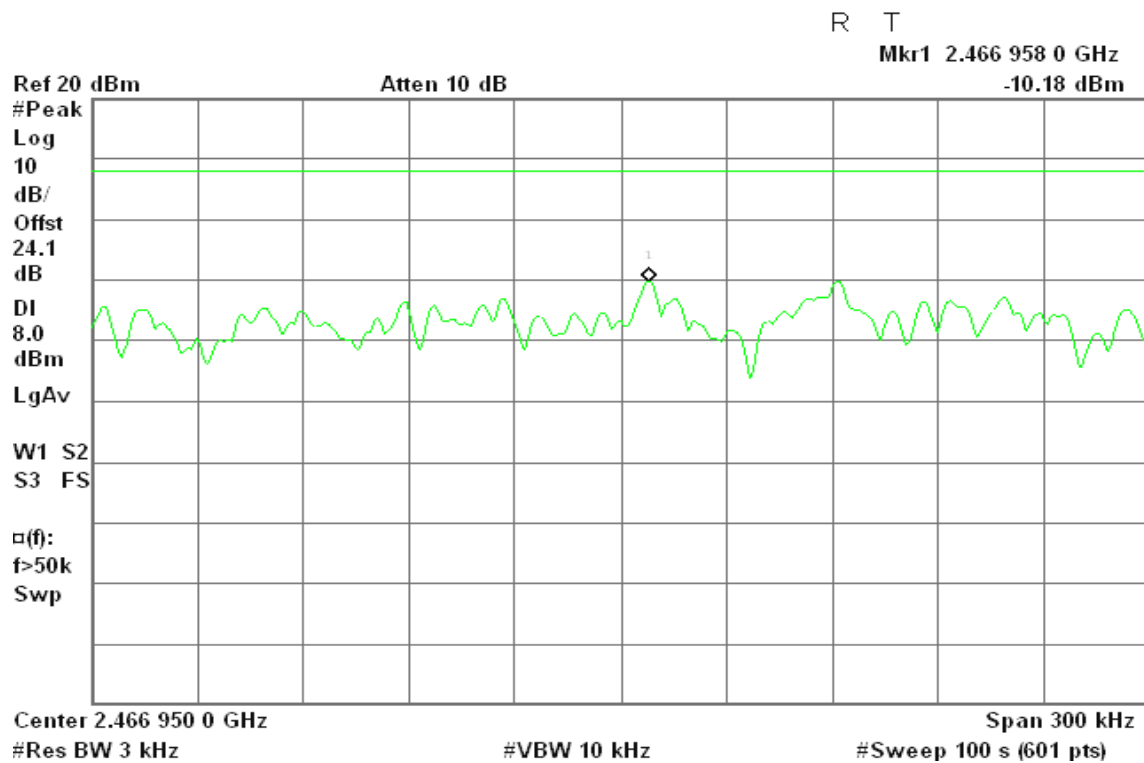
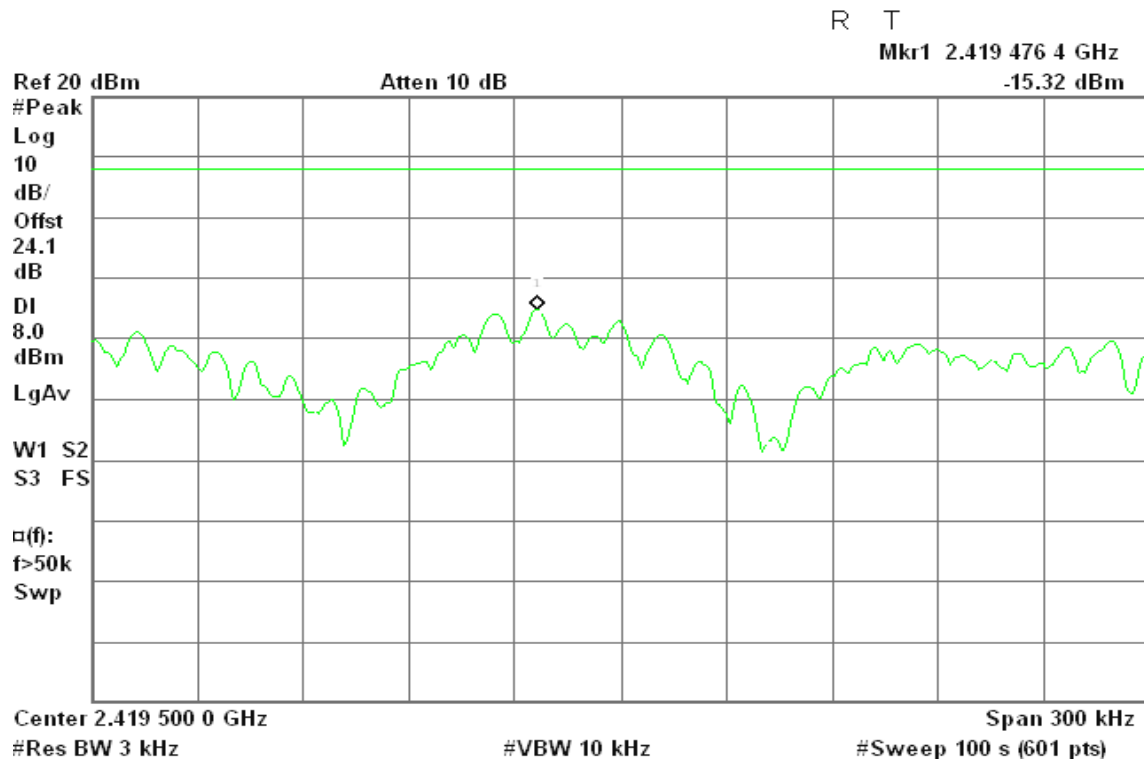
PPSD (CH Mid)



PPSD (CH High)

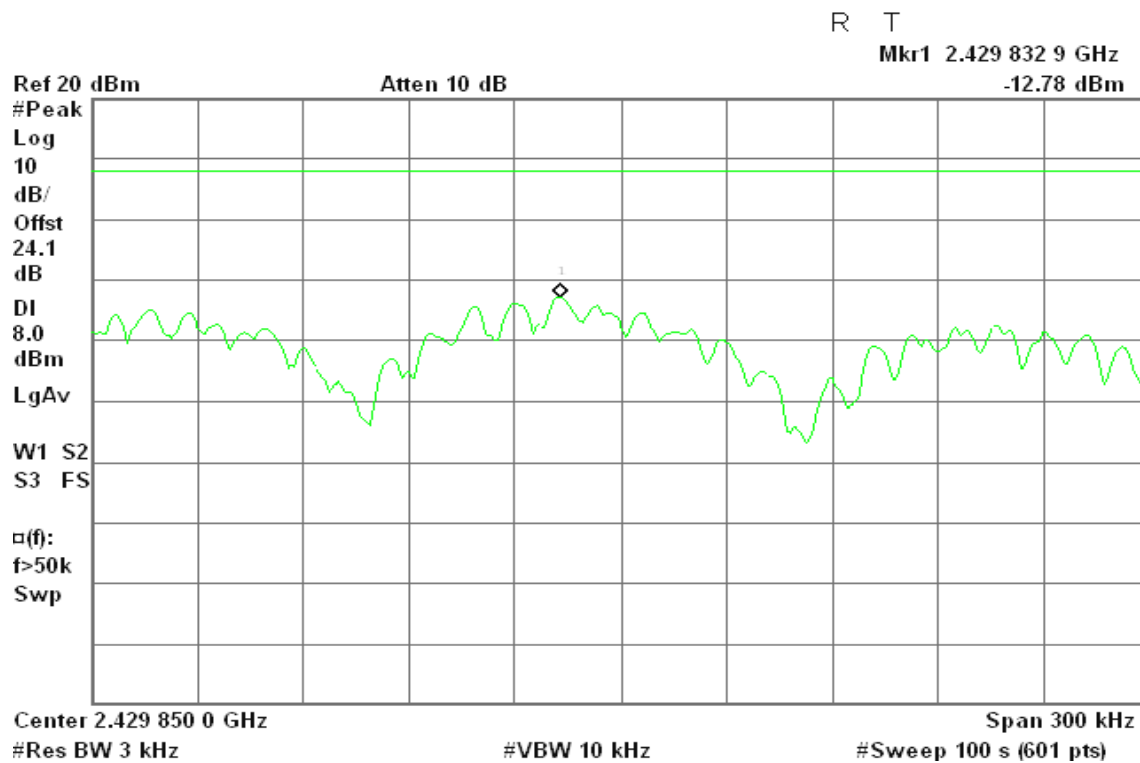


**draft 802.11n Standard-20 MHz Channel mode with combiner****PPSD (CH Low)****PPSD (CH Mid)**

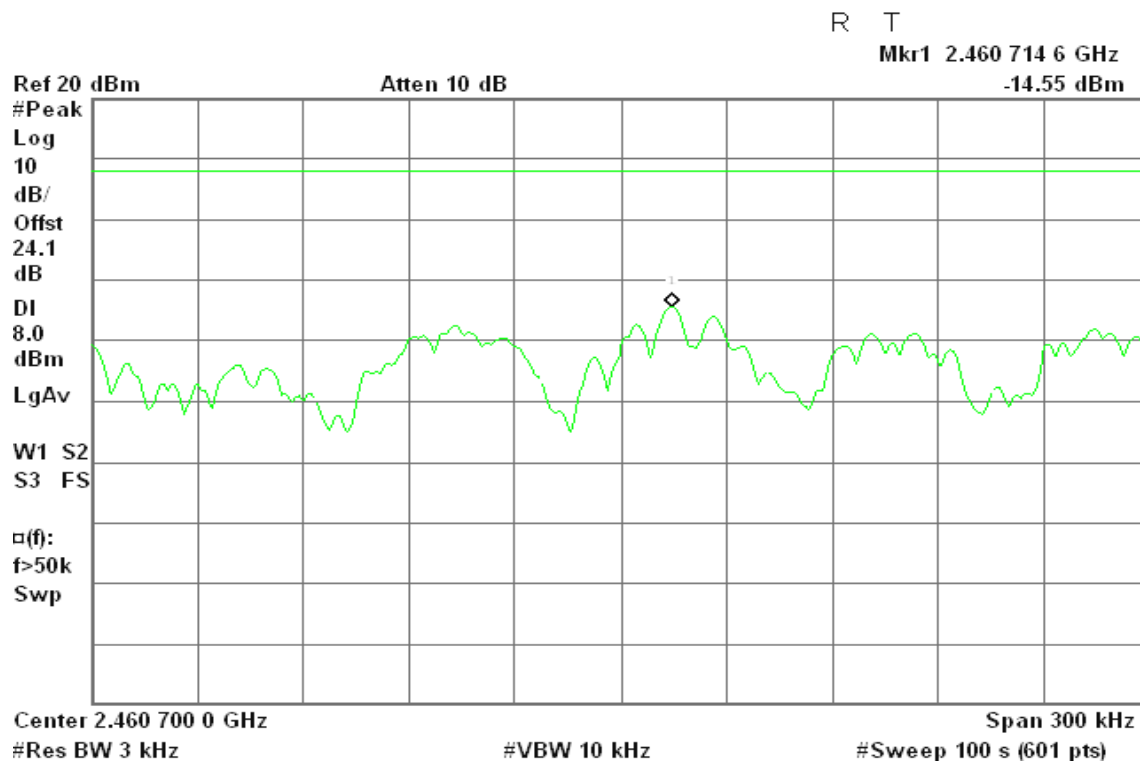
**PPSD (CH High)****draft 802.11n Wide-40 MHz Channel mode with combiner****PPSD (CH Low)**



PPSD (CH Mid)



PPSD (CH High)





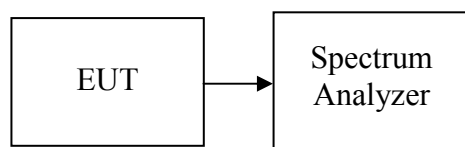
7.6 SPURIOUS EMISSIONS

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 13GHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

No non-compliance noted



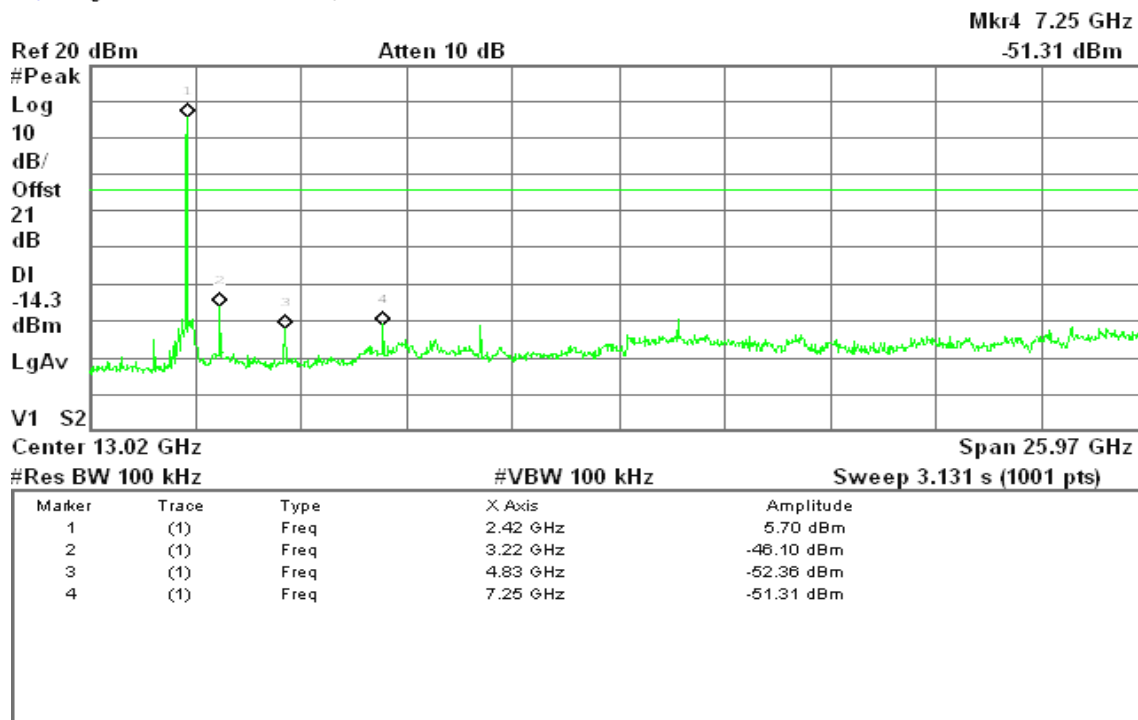
Test Plot

IEEE 802.11b mode

CH Low

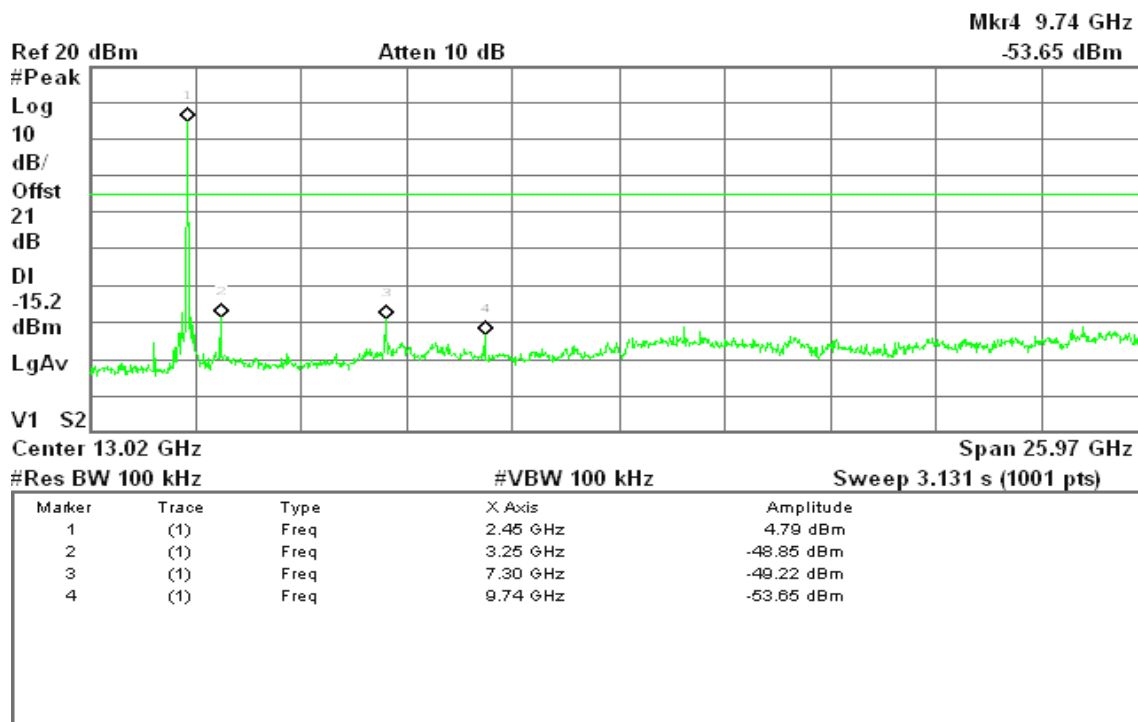
* Agilent 15:14:38 Feb 25, 2010

R T



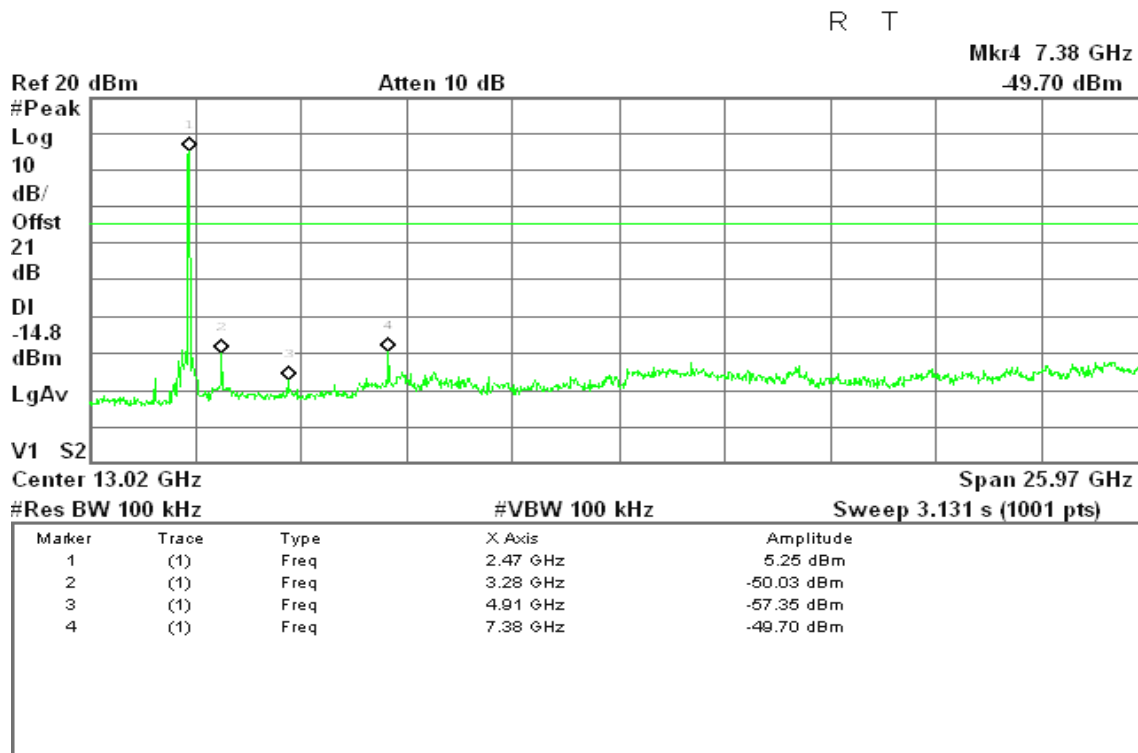
CH Mid

R T



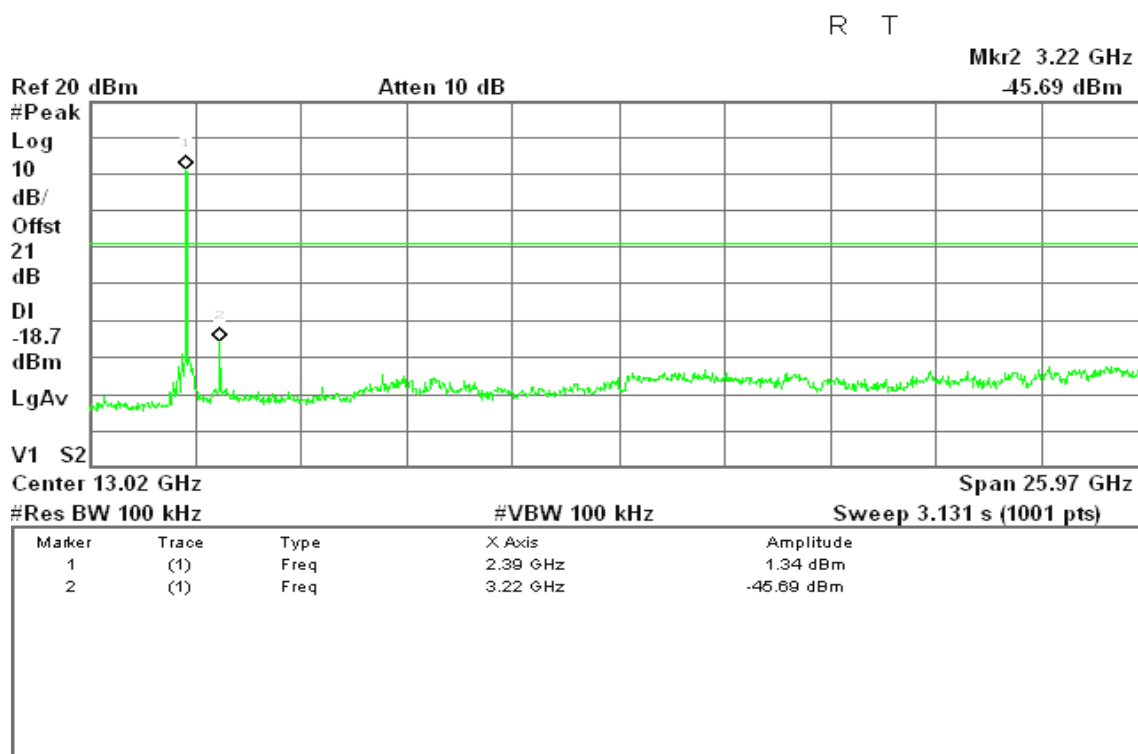


CH High



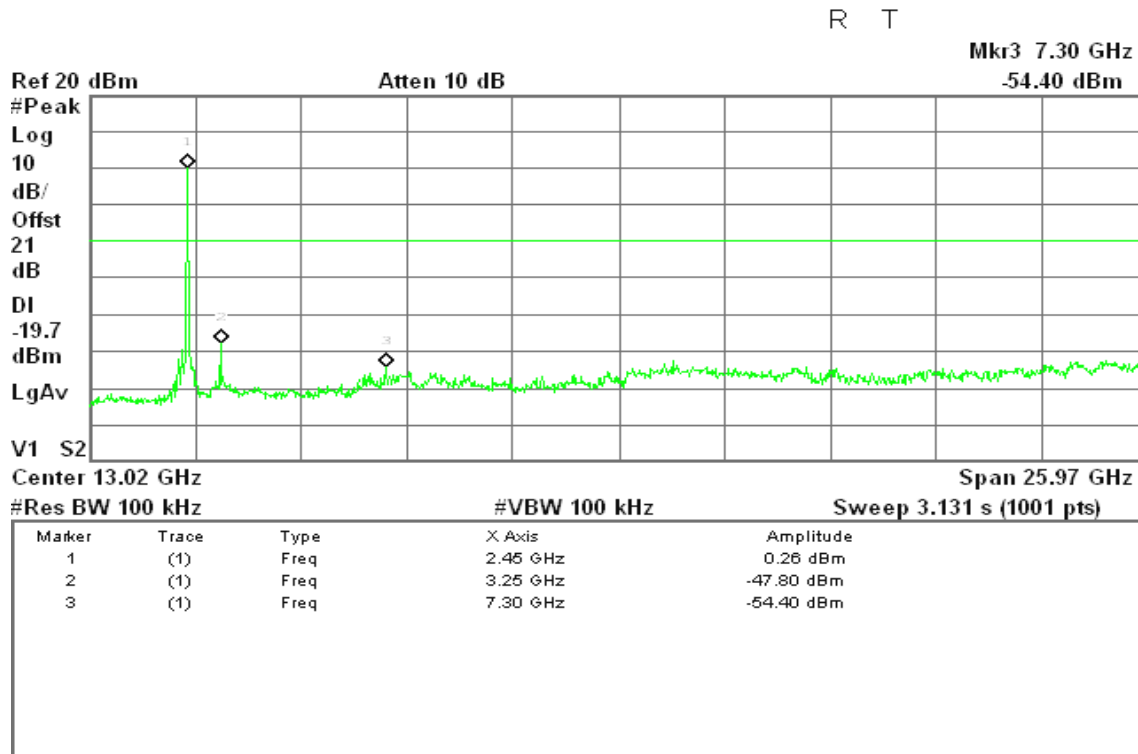
IEEE 802.11g mode

CH Low

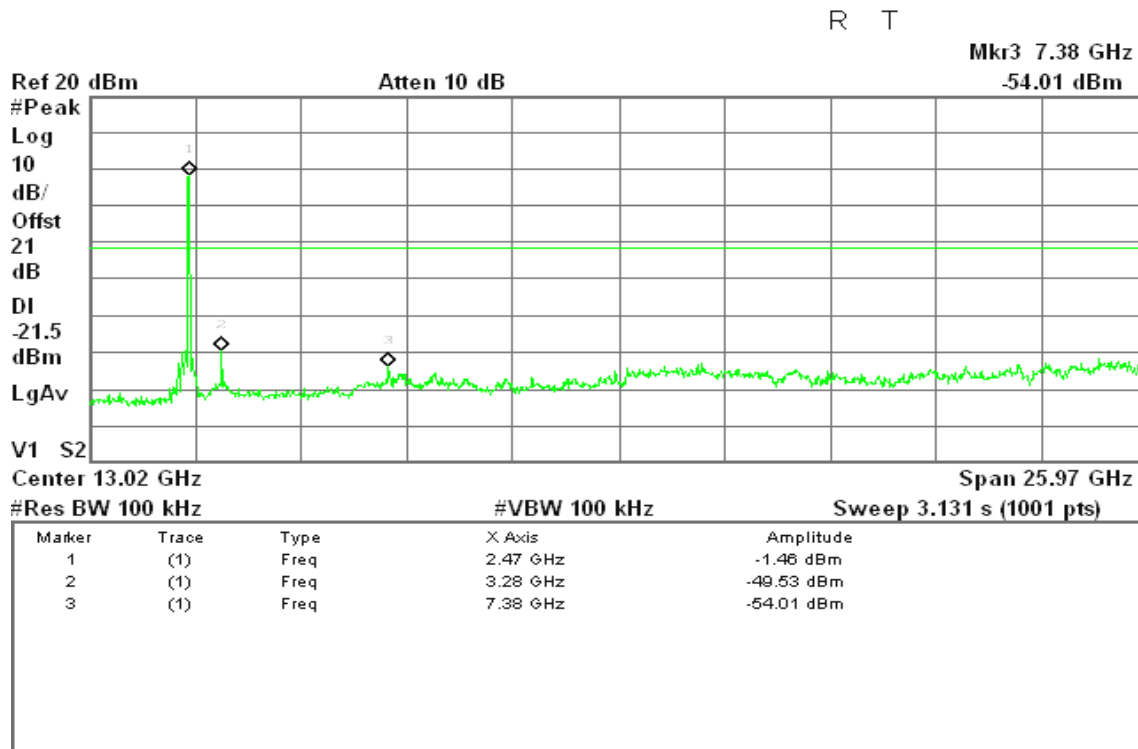




CH Mid



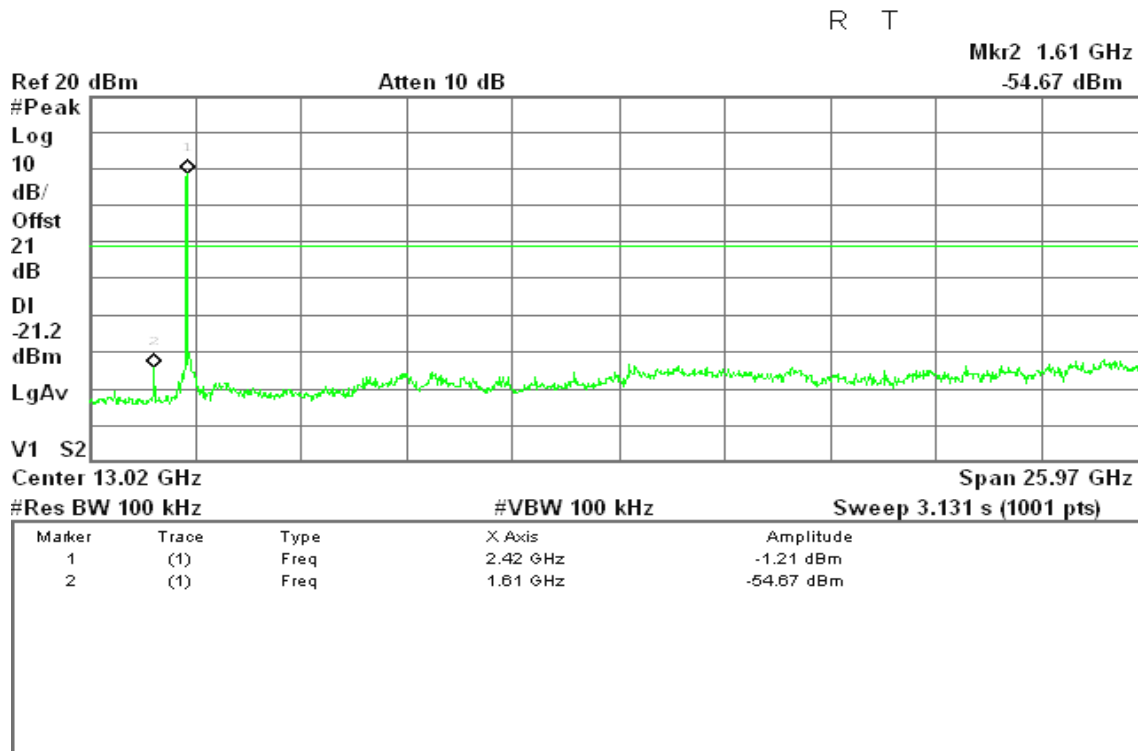
CH High



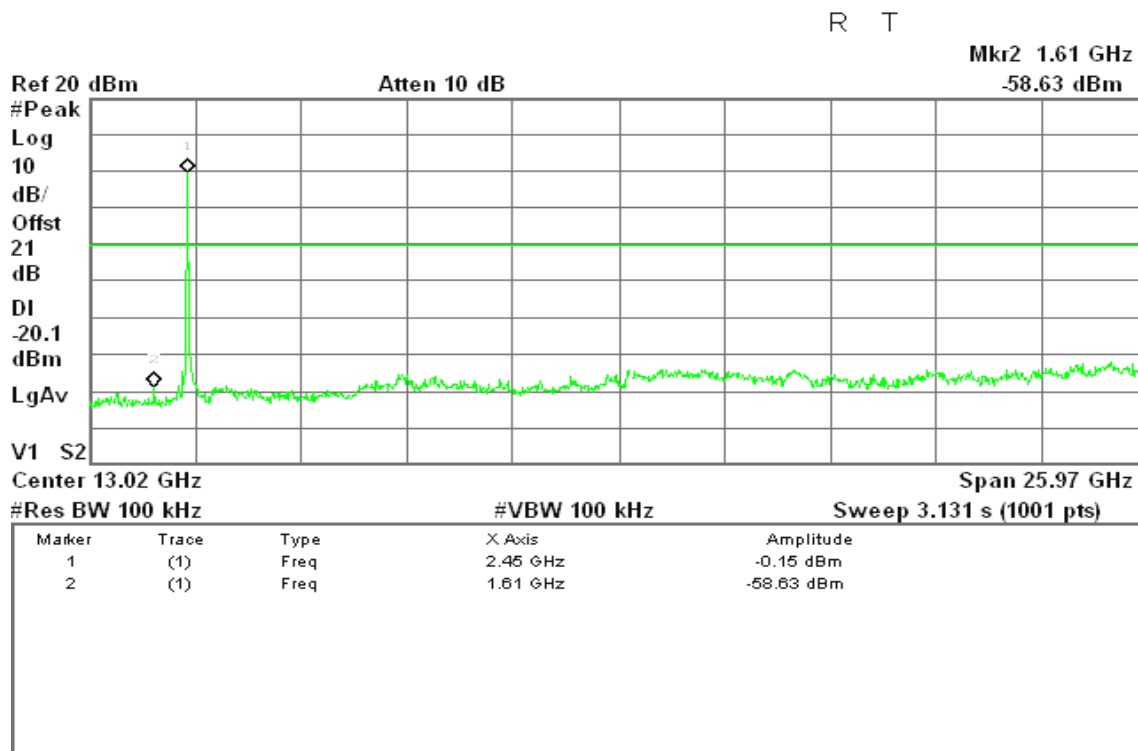


draft 802.11n Standard-20 MHz Channel mode / Chain 0

CH Low

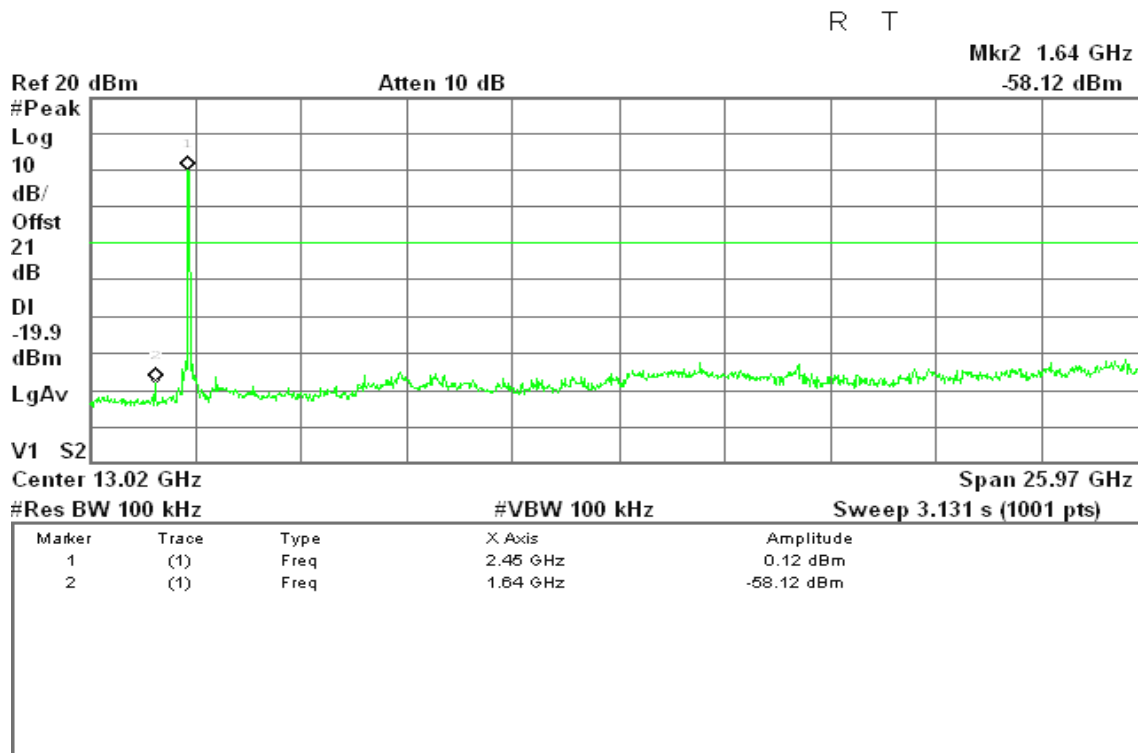


CH Mid



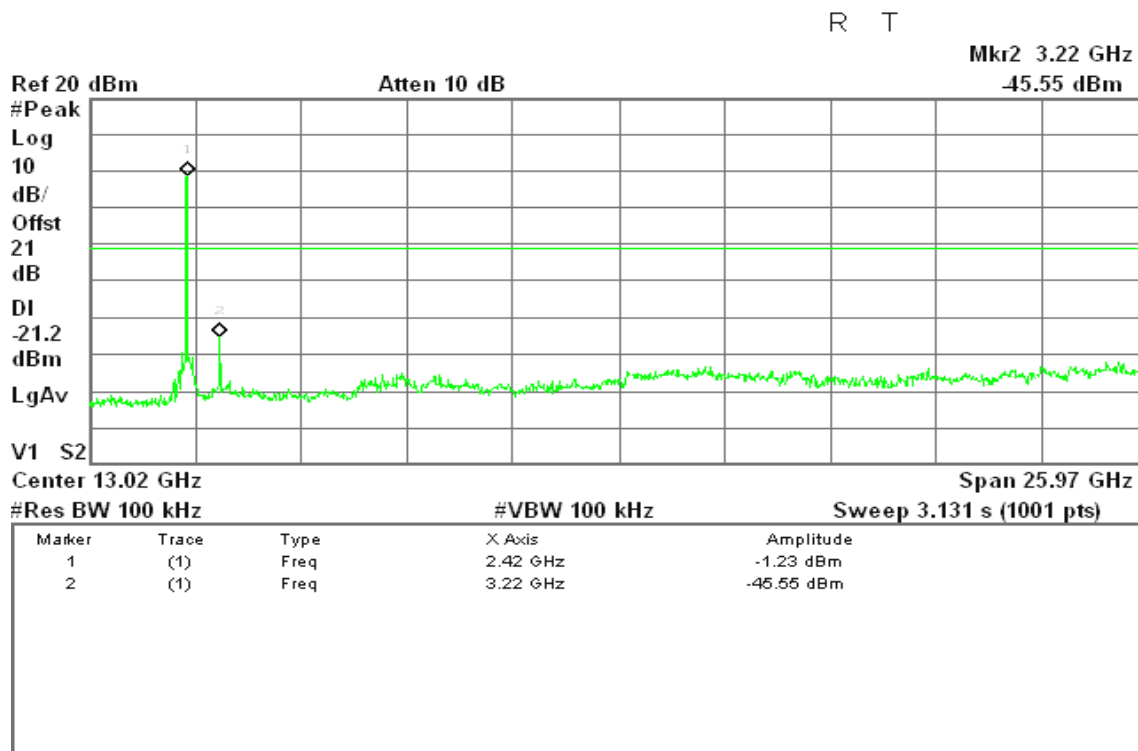


CH High



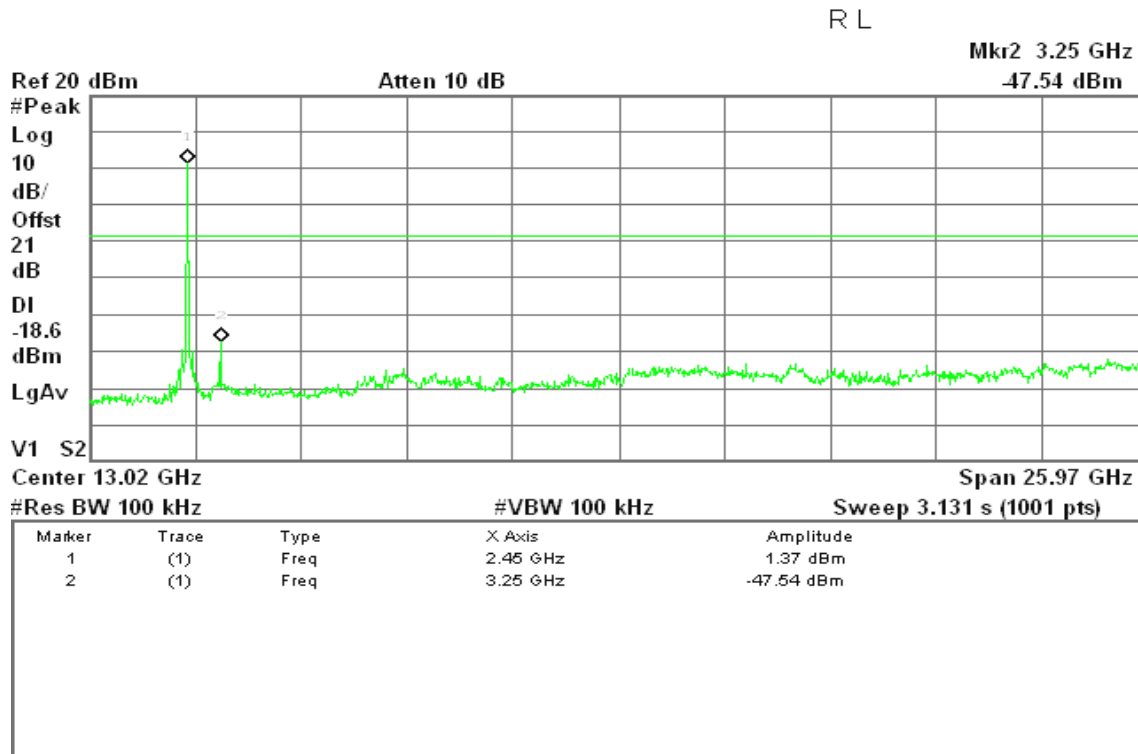
draft 802.11n Standard-20 MHz Channel mode / Chain 1

CH Low

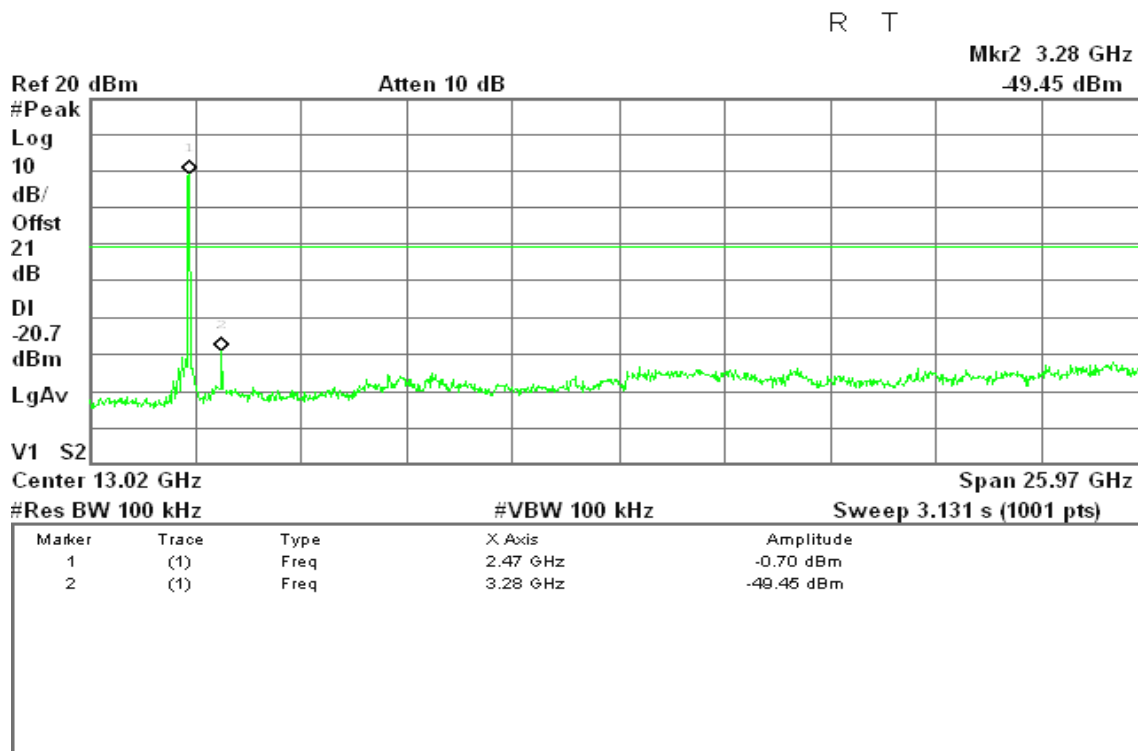




CH Mid



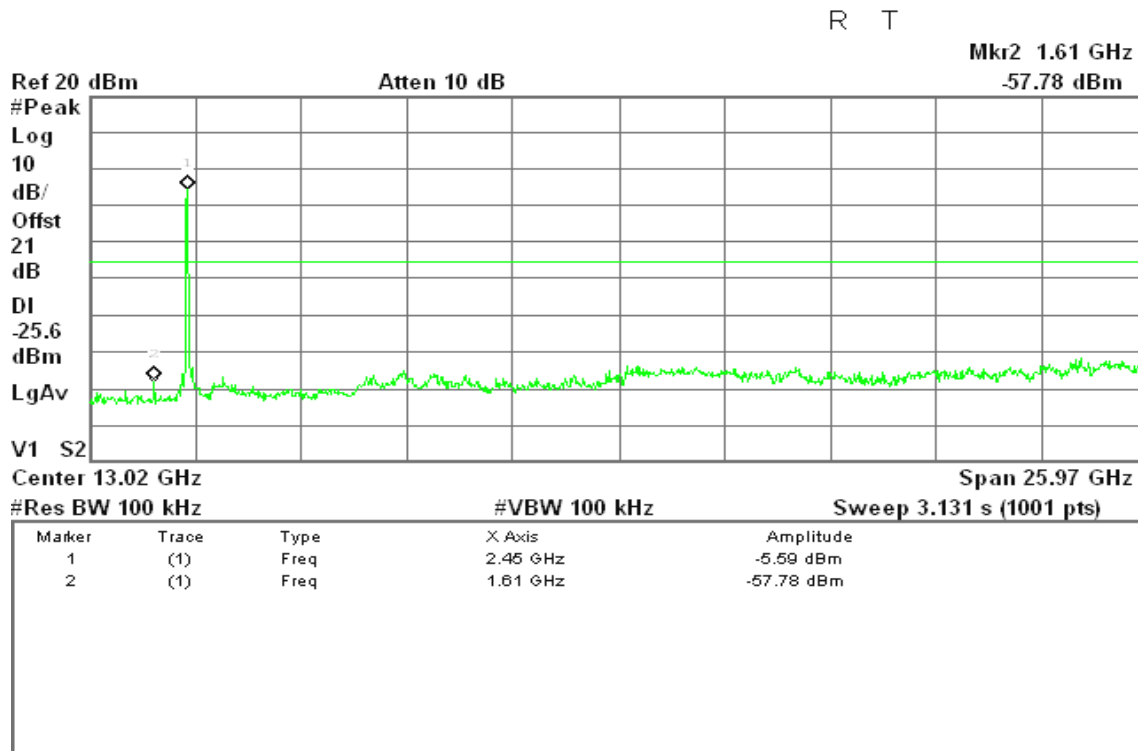
CH High



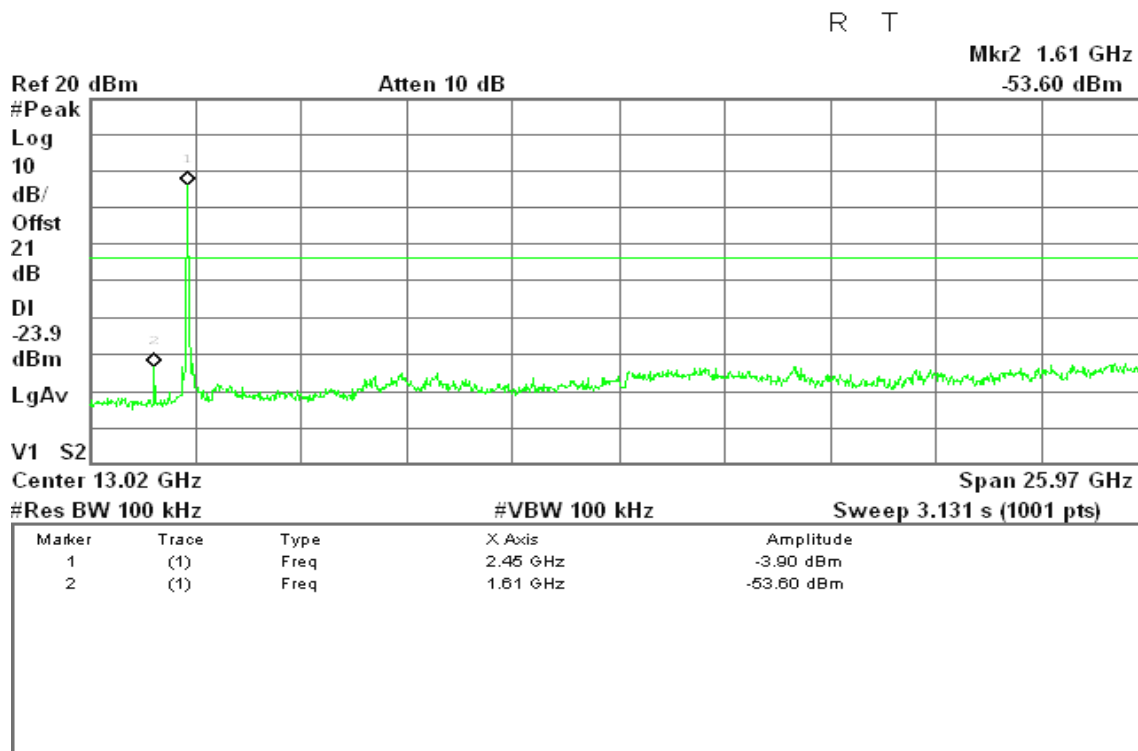


draft 802.11n Wide-40 MHz Channel mode / Chain 0

CH Low

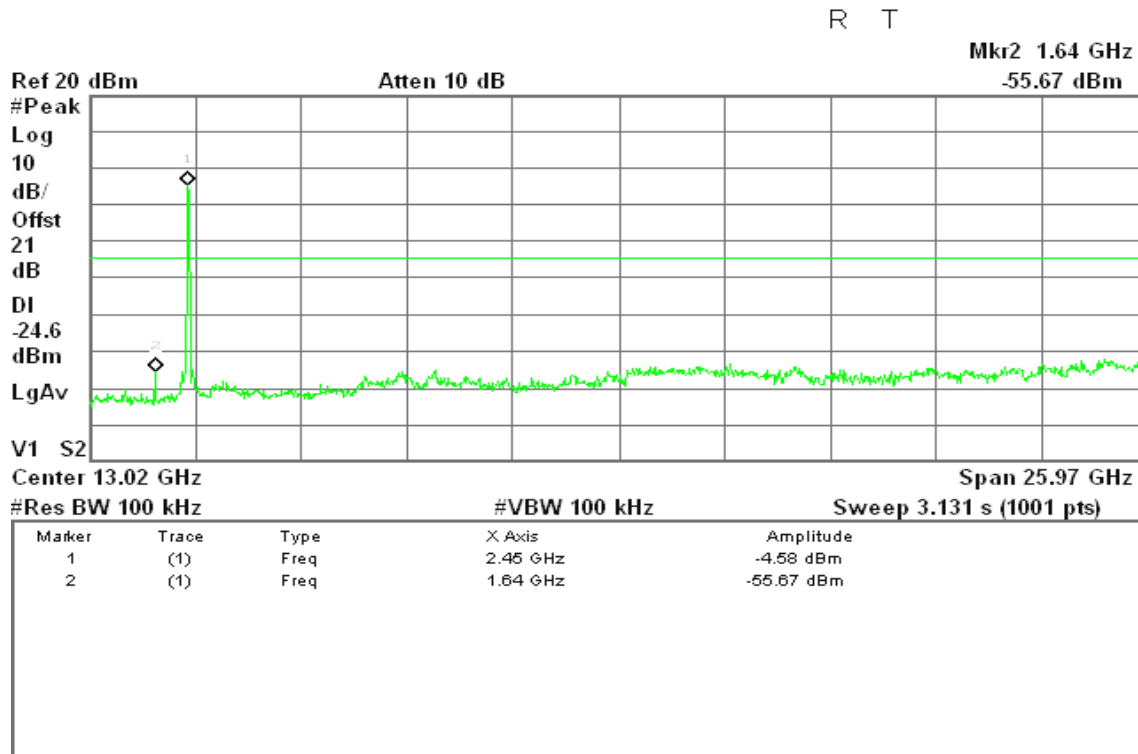


CH Mid



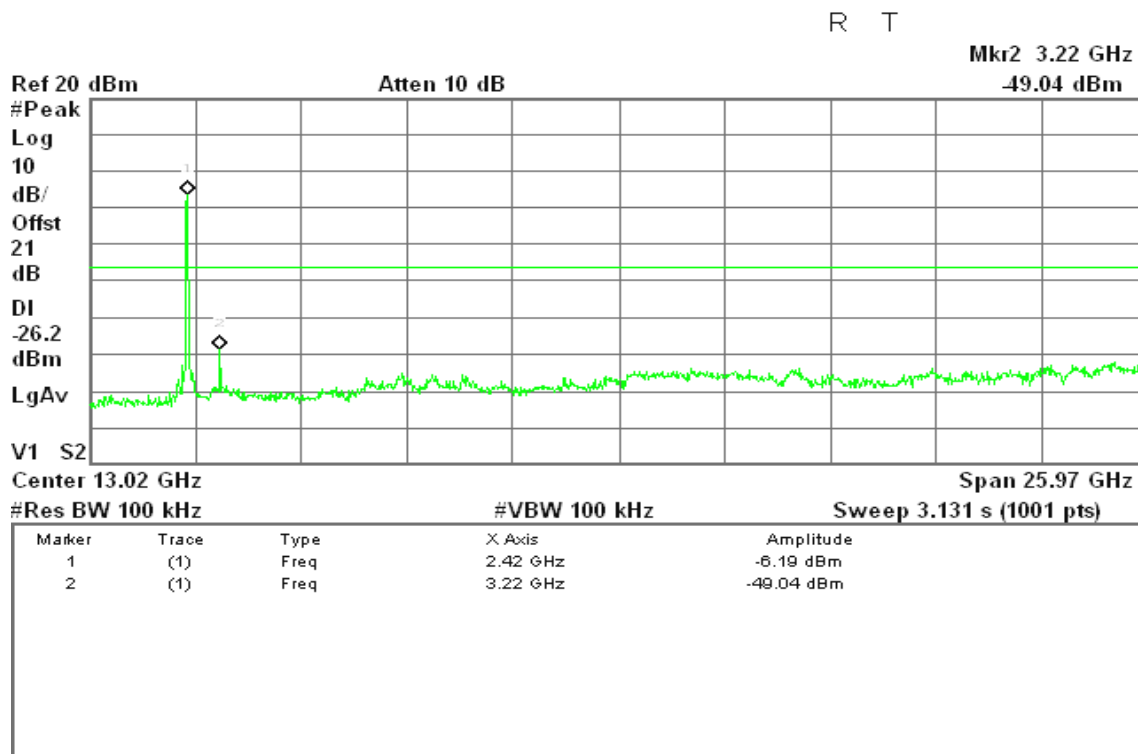


CH High



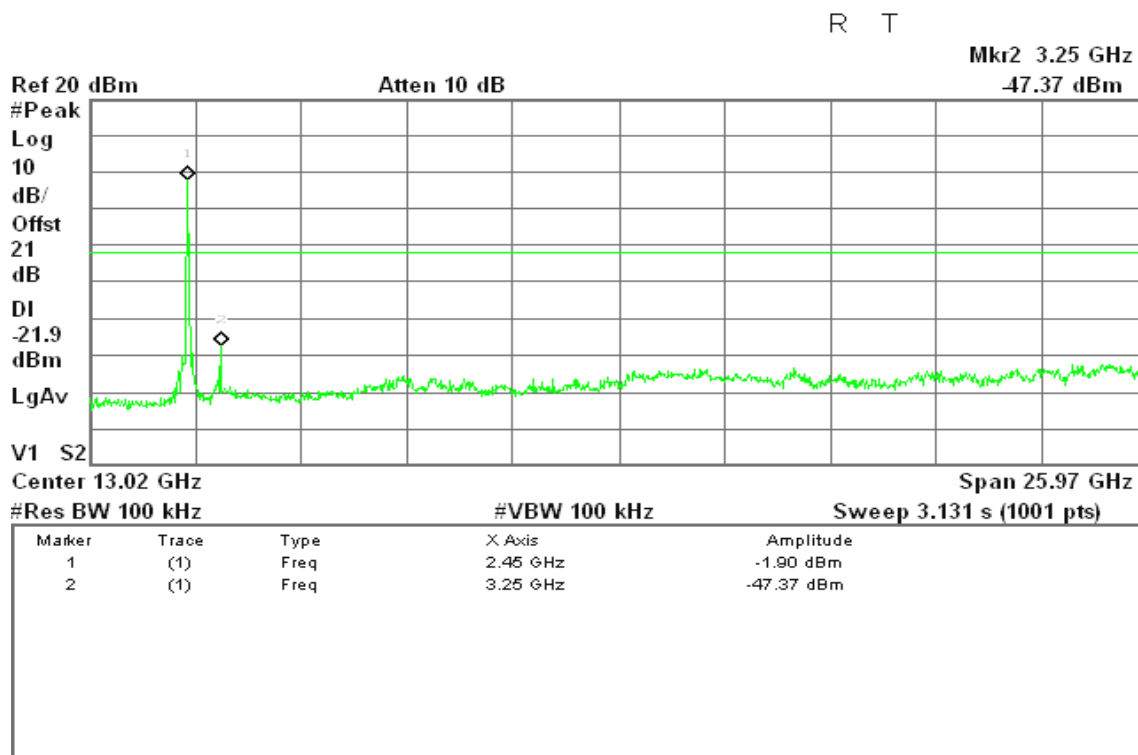
draft 802.11n Wide-40 MHz Channel mode / Chain 1

CH Low

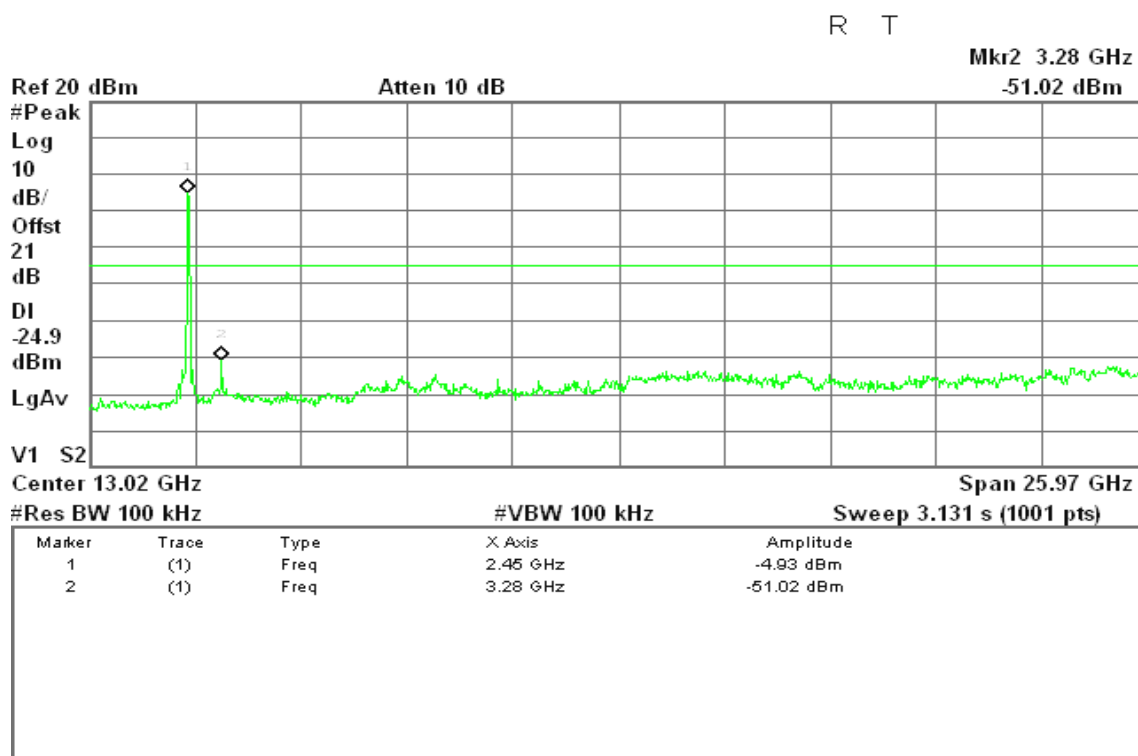


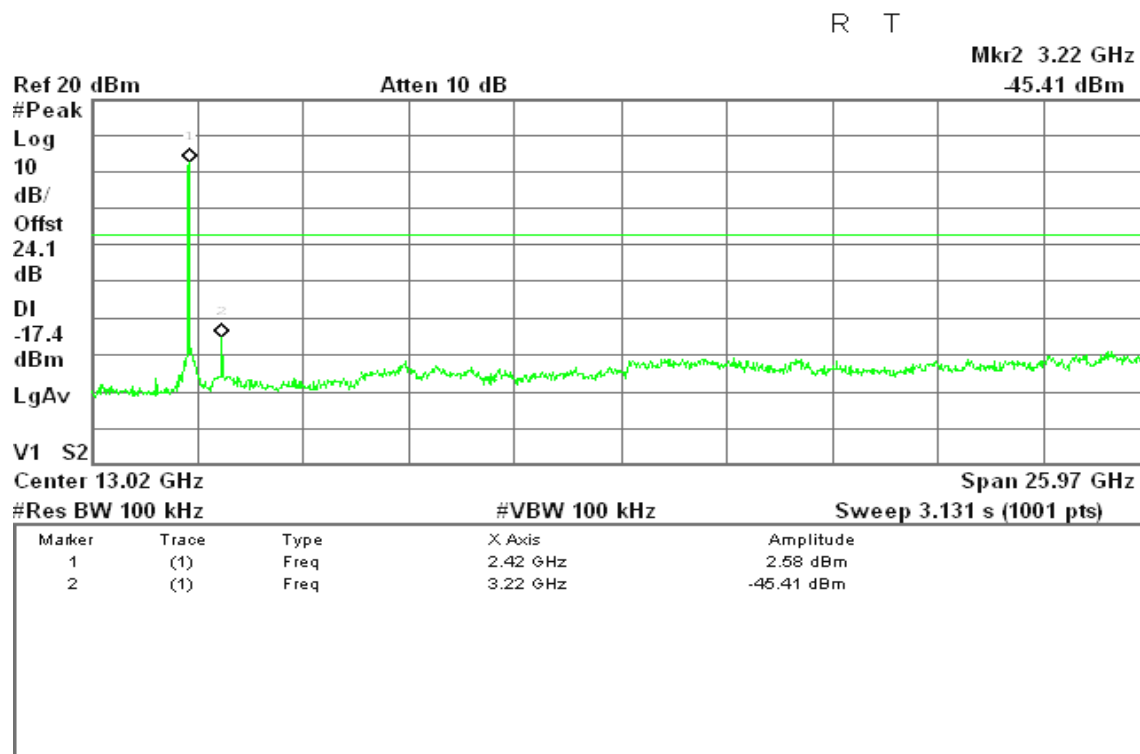
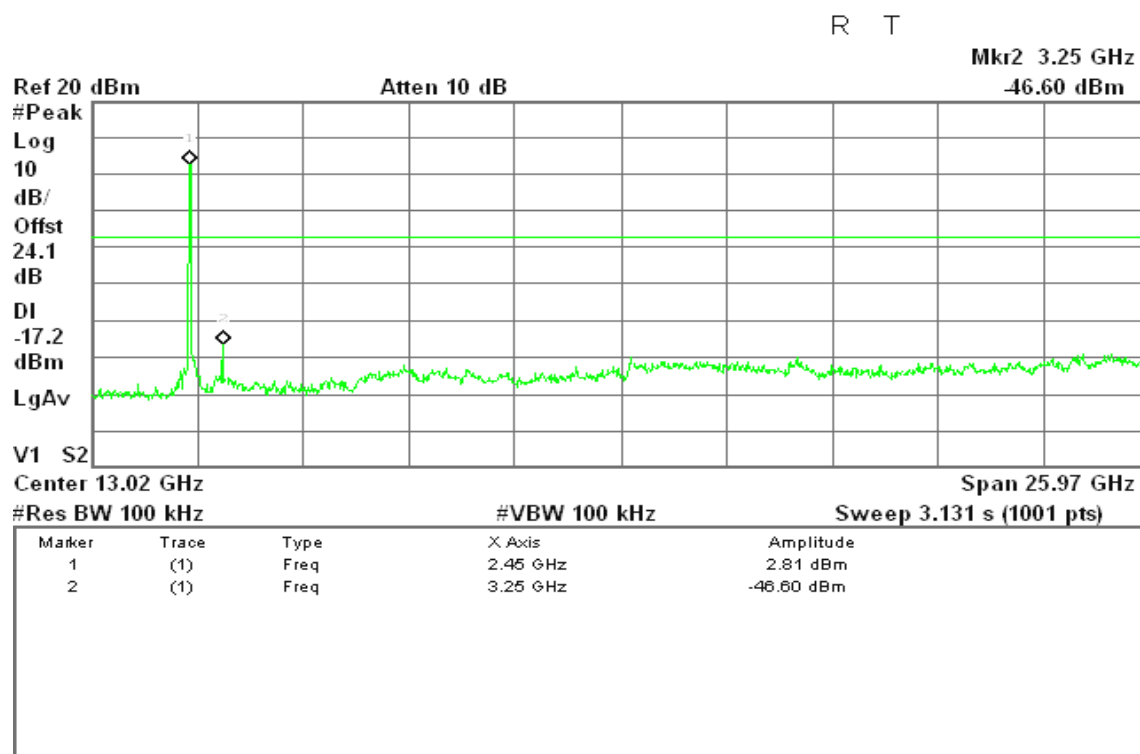


CH Mid



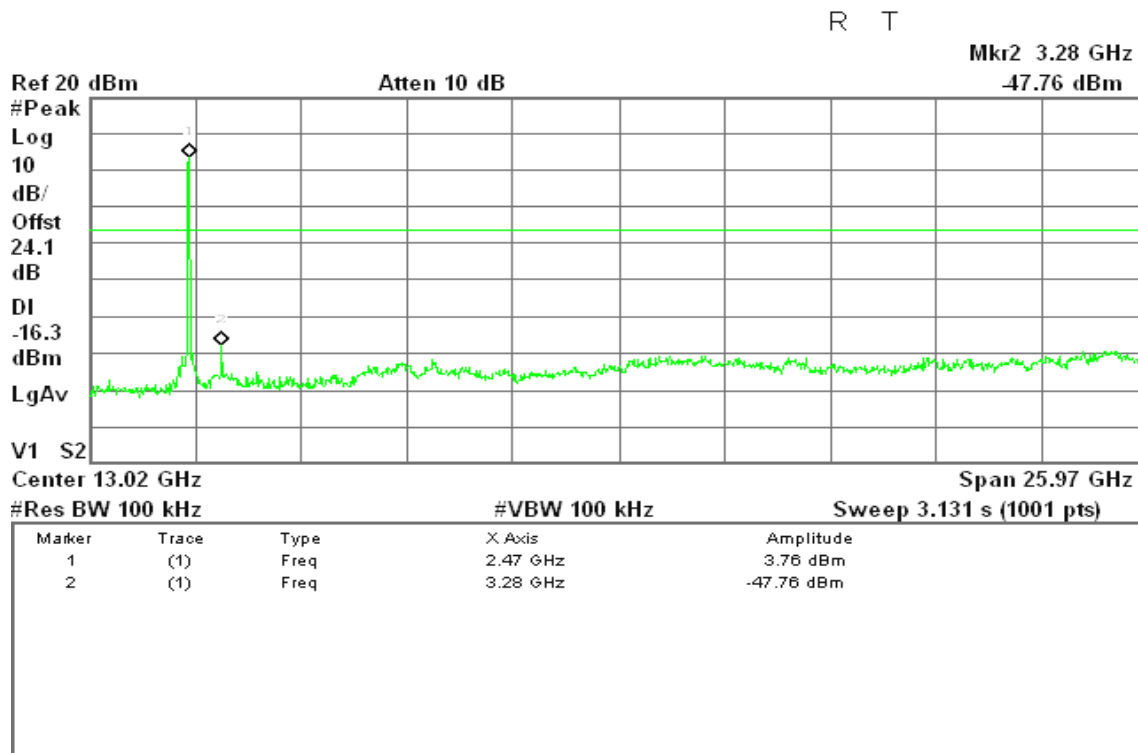
CH High



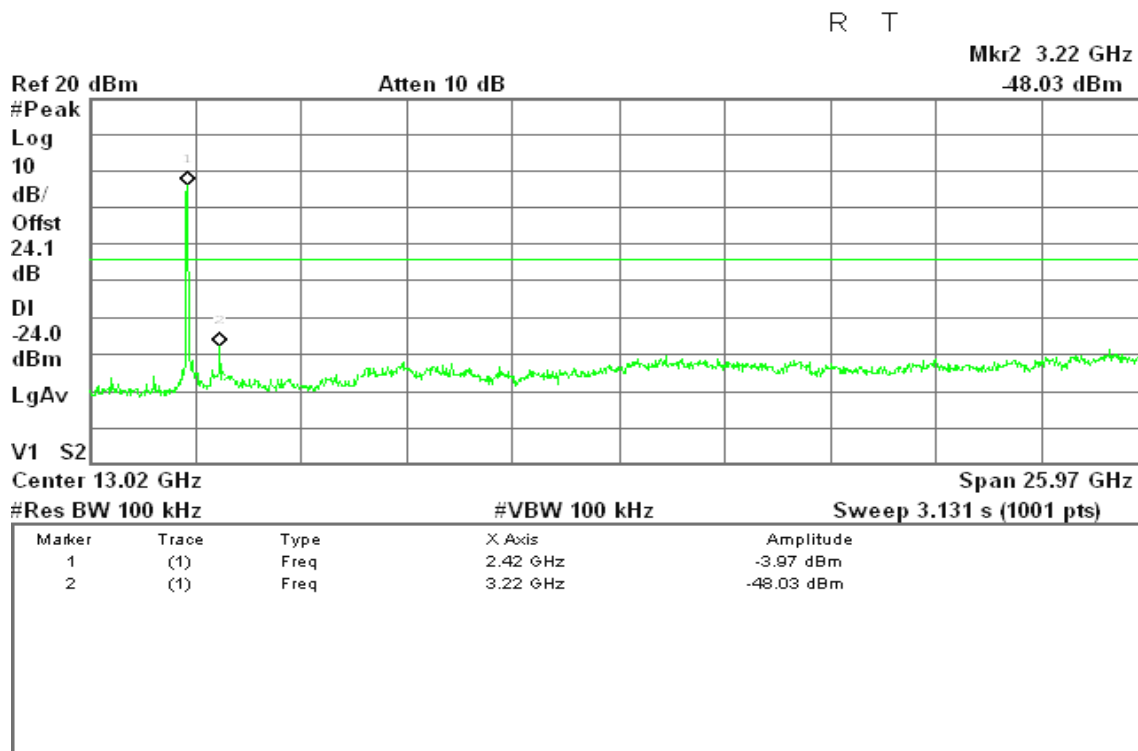
**draft 802.11n Standard-20 MHz Channel mode with combiner****CH Low****CH Mid**



CH High

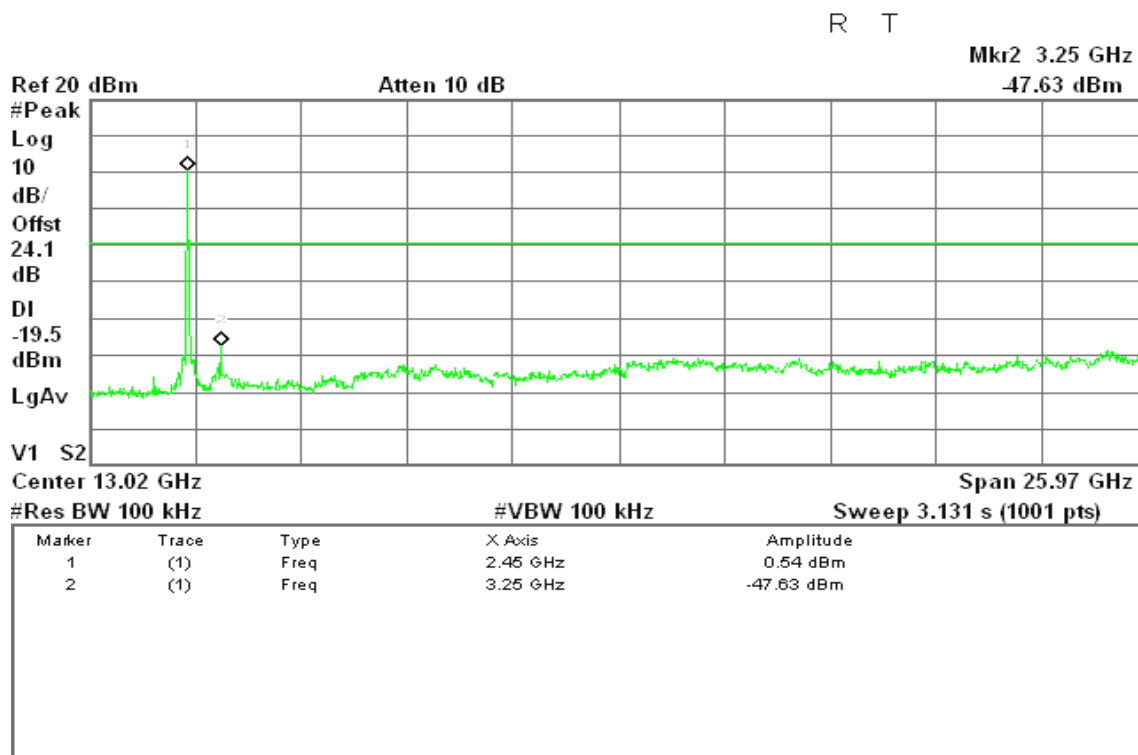
draft 802.11n Wide-40 MHz Channel mode with combiner

CH Low

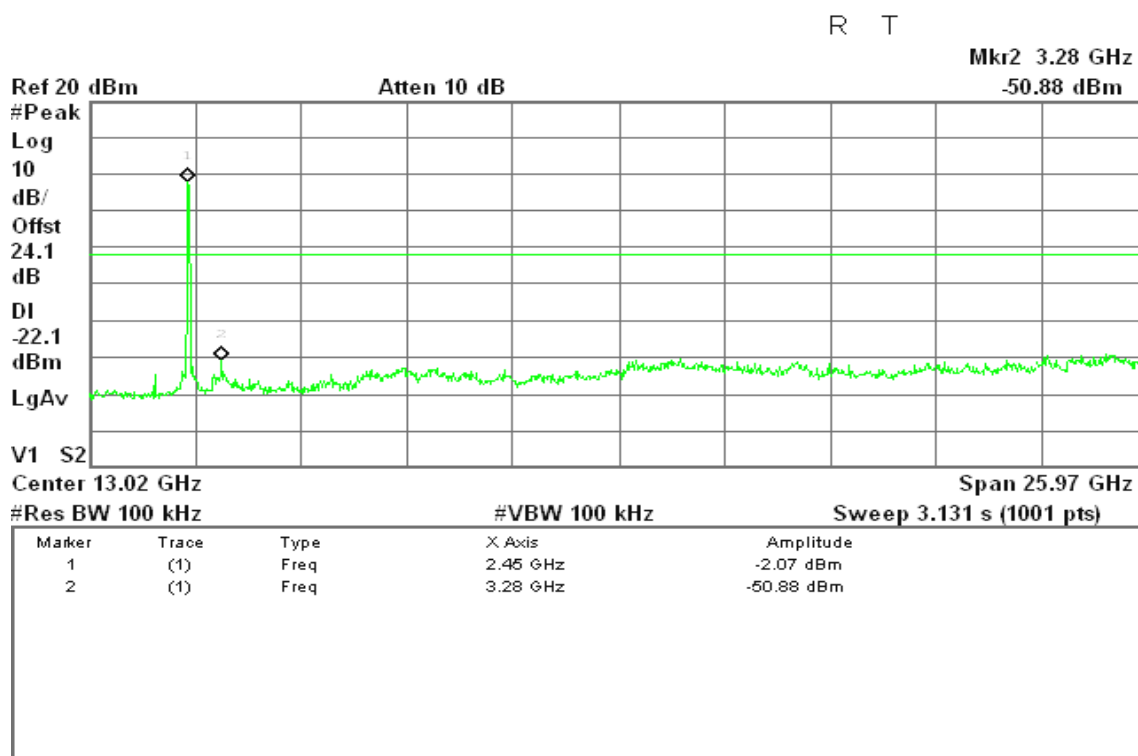




CH Mid



CH High





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

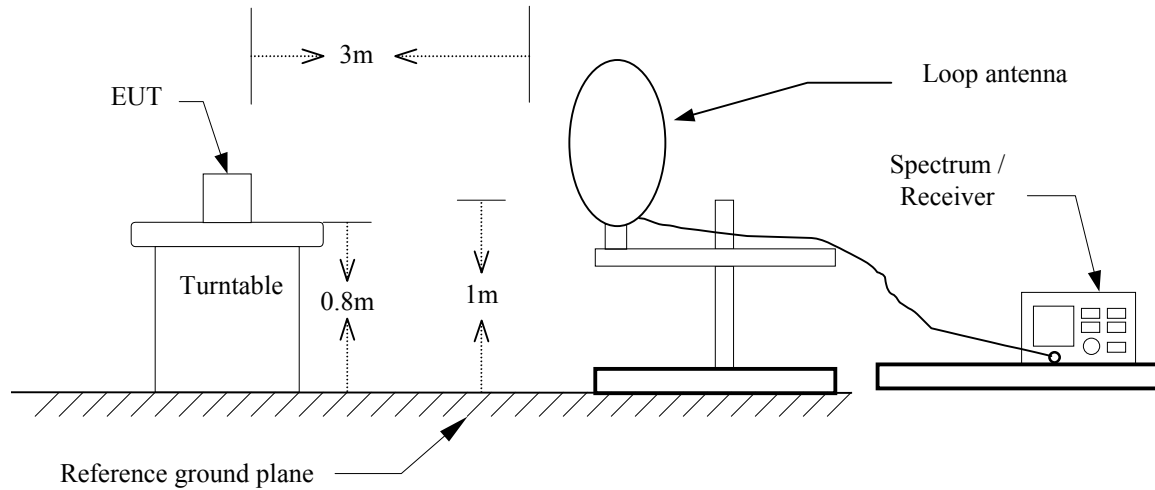
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

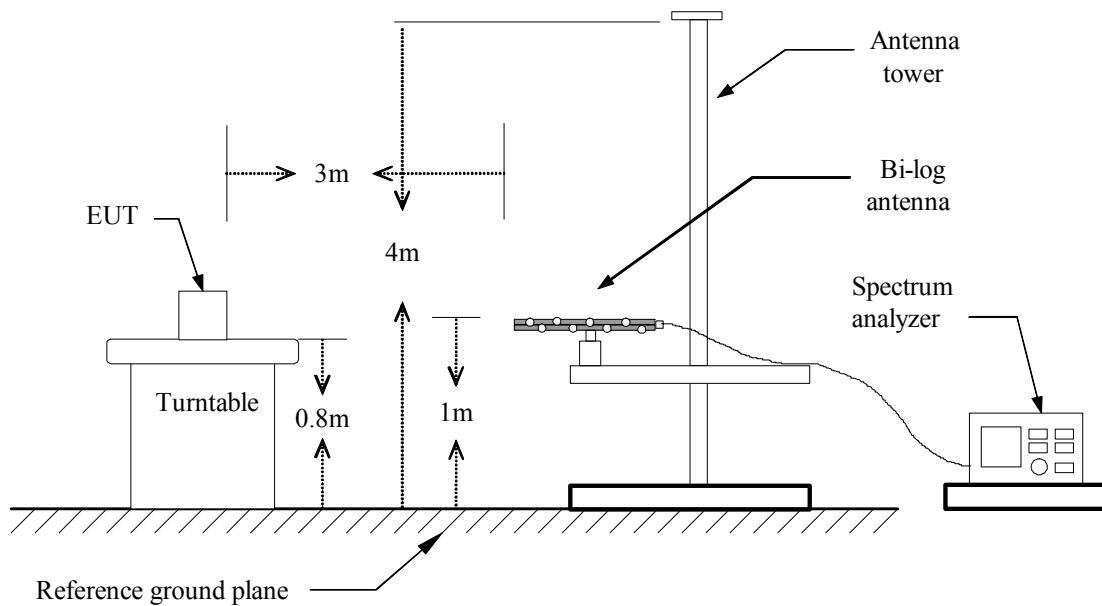
Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

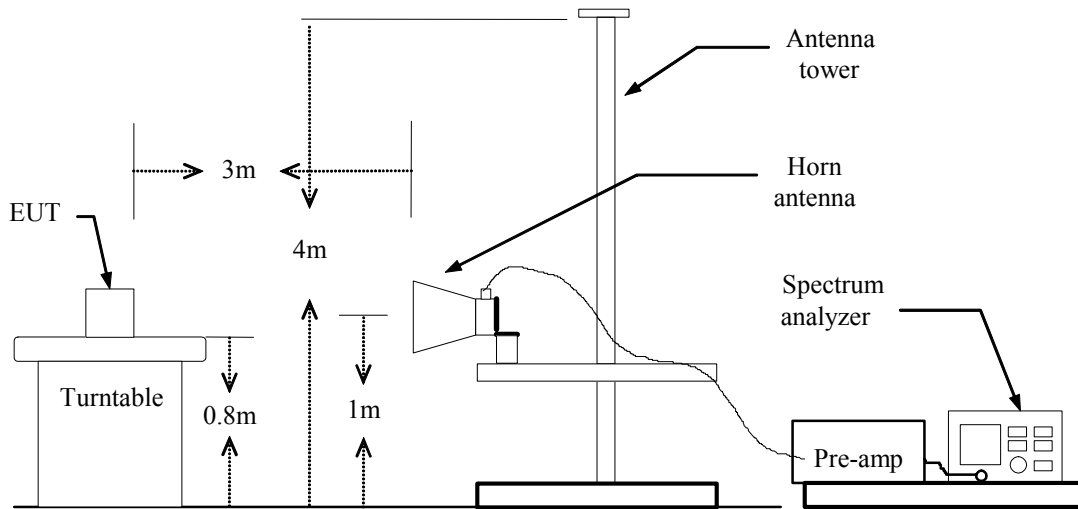
Test Configuration

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.

**TEST RESULTS****Below 1GHz****Operation Mode:** Normal Link**Test Date:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
67.18	V	47.93	-14.98	32.94	40.00	-7.06	Peak
125.38	V	40.32	-9.65	30.67	43.50	-12.83	Peak
249.87	V	44.74	-10.90	33.84	46.00	-12.16	Peak
351.72	V	40.10	-8.02	32.08	46.00	-13.92	Peak
544.10	V	37.21	-4.55	32.66	46.00	-13.34	Peak
639.48	V	38.85	-3.14	35.71	46.00	-10.29	Peak
125.38	H	40.17	-9.65	30.52	43.50	-12.98	Peak
143.17	H	40.45	-10.00	30.44	43.50	-13.06	Peak
249.87	H	44.83	-10.90	33.92	46.00	-12.08	Peak
384.05	H	43.16	-7.40	35.76	46.00	-10.24	Peak
639.48	H	38.59	-3.14	35.45	46.00	-10.55	Peak
896.53	H	35.69	-0.65	35.03	46.00	-10.97	Peak

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. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
- 4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
- 5. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m).*

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1343.33	V	57.52	---	-9.02	48.50	---	74.00	54.00	-5.50	Peak
N/A										
1326.67	H	57.86	---	-9.05	48.81	---	74.00	54.00	-5.19	Peak
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:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1280.00	V	57.50	---	-9.13	48.37	---	74.00	54.00	-5.63	Peak
N/A										
1343.33	H	57.37	---	-9.02	48.35	---	74.00	54.00	-5.65	Peak
3250.00	H	52.19	---	-1.16	51.03	---	74.00	54.00	-2.97	Peak
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:** February 4, 2010**Temperature:** 20°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1296.67	V	58.15	---	-9.10	49.05	---	74.00	54.00	-4.95	Peak
N/A										
1340.00	H	57.72	---	-9.03	48.70	---	74.00	54.00	-5.30	Peak
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:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1396.67	V	58.37	---	-8.93	49.44	---	74.00	54.00	-4.56	Peak
N/A										
1310.00	H	57.12	---	-9.08	48.04	---	74.00	54.00	-5.96	Peak
3216.67	H	52.14	---	-1.17	50.97	---	74.00	54.00	-3.03	Peak
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:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1370.00	V	57.25	---	-8.98	48.27	---	74.00	54.00	-5.73	Peak
N/A										
1433.33	H	58.07	---	-8.87	49.20	---	74.00	54.00	-4.80	Peak
3250.00	H	52.05	---	-1.16	50.89	---	74.00	54.00	-3.11	Peak
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:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1553.33	V	57.88	---	-8.27	49.61	---	74.00	54.00	-4.39	Peak
N/A										
1463.33	H	58.57	---	-8.82	49.75	---	74.00	54.00	-4.25	Peak
3283.33	H	50.48	---	-1.15	49.33	---	74.00	54.00	-4.67	Peak
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 / draft 802.11n Standard-20 MHz Channel mode / CH Low

Test Date: February 4, 2010

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
2360.00	V	62.78	50.36	-3.08	59.71	47.28	74.00	54.00	-6.72	AVG
2463.33	V	60.89	50.53	-2.77	58.12	47.76	74.00	54.00	-6.24	AVG
3216.67	V	51.02	---	-1.17	49.85	---	74.00	54.00	-4.15	Peak
N/A										
2480.00	H	60.23	50.69	-2.72	57.51	47.97	74.00	54.00	-6.03	AVG
3216.67	H	51.38	---	-1.17	50.22	---	74.00	54.00	-3.78	Peak
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 / draft 802.11n Standard-20 MHz Channel mode / CH Mid

Test Date: February 4, 2010

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
2383.33	V	60.53	50.51	-3.01	57.53	47.50	74.00	54.00	-6.50	AVG
3250.00	V	49.85	---	-1.16	48.69	---	74.00	54.00	-5.31	Peak
N/A										
2490.00	H	62.45	50.40	-2.69	59.76	47.71	74.00	54.00	-6.29	AVG
3250.00	H	51.24	---	-1.16	50.08	---	74.00	54.00	-3.92	Peak
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 / draft 802.11n Standard-20 MHz Channel mode / CH High

Test Date: February 4, 2010

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
2410.00	V	61.00	49.96	-2.93	58.07	47.03	74.00	54.00	-6.97	AVG
2513.33	V	59.00	46.67	-2.62	56.38	44.05	74.00	54.00	-9.95	AVG
N/A										
2513.33	H	60.24	51.03	-2.62	57.62	48.41	74.00	54.00	-5.59	AVG
3283.33	H	50.08	---	-1.15	48.93	---	74.00	54.00	-5.07	Peak
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 / draft 802.11n Wide-40 MHz Channel mode
/ CH Low

Test Date: February 4, 2010

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1310.00	V	58.19	---	-9.08	49.11	---	74.00	54.00	-4.89	Peak
N/A										
1293.33	H	58.31	---	-9.10	49.21	---	74.00	54.00	-4.79	Peak
3233.33	H	50.83	---	-1.16	49.67	---	74.00	54.00	-4.33	Peak
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 / draft 802.11n Wide-40 MHz Channel mode
/ CH Mid**Test Date:** February 4, 2010**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53 % RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1316.67	V	57.34	---	-9.06	48.28	---	74.00	54.00	-5.72	Peak
N/A										
2550.00	H	59.64	47.41	-2.51	57.12	44.90	74.00	54.00	-9.10	AVG
3250.00	H	51.12	---	-1.16	49.96	---	74.00	54.00	-4.04	Peak
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 / draft 802.11n Wide-40 MHz Channel mode
/ CH High

Test Date: February 4, 2010

Temperature: 23°C

Tested by: Mimic Yang

Humidity: 53 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	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
1363.33	V	57.72	---	-8.99	48.73	---	74.00	54.00	-5.27	Peak
N/A										
1396.67	H	57.88	---	-8.93	48.95	---	74.00	54.00	-5.05	Peak
3266.67	H	50.65	---	-1.16	49.49	---	74.00	54.00	-4.51	Peak
N/A										

Remark:

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



7.8 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

* Decreases with the logarithm of the frequency.

Test Configuration

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

TEST PROCEDURE

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



TEST RESULTS

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:** March 18, 2010
Temperature: 22°C **Tested by:** Wolf Huang
Humidity: 45% 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
0.1600	57.79	39.09	0.21	58.00	39.30	65.46	55.46	-7.46	-16.16	L1
0.2100	54.02	37.42	0.18	54.20	37.60	63.21	53.21	-9.01	-15.61	L1
0.2400	49.24	29.04	0.16	49.40	29.20	62.10	52.10	-12.70	-22.90	L1
0.4550	47.32	34.22	0.08	47.40	34.30	56.78	46.78	-9.38	-12.48	L1
0.6850	38.44	24.54	0.06	38.50	24.60	56.00	46.00	-17.50	-21.40	L1
3.9900	37.48	27.98	0.12	37.60	28.10	56.00	46.00	-18.40	-17.90	L1
0.1650	56.97	28.57	0.23	57.20	28.80	65.21	55.21	-8.01	-26.41	L2
0.2100	55.50	33.70	0.20	55.70	33.90	63.21	53.21	-7.51	-19.31	L2
0.2500	51.62	32.22	0.18	51.80	32.40	61.76	51.76	-9.96	-19.36	L2
0.4400	42.50	26.60	0.10	42.60	26.70	57.06	47.06	-14.46	-20.36	L2
0.5150	41.12	24.32	0.08	41.20	24.40	56.00	46.00	-14.80	-21.60	L2
10.1900	29.86	20.96	0.64	30.50	21.60	60.00	50.00	-29.50	-28.40	L2

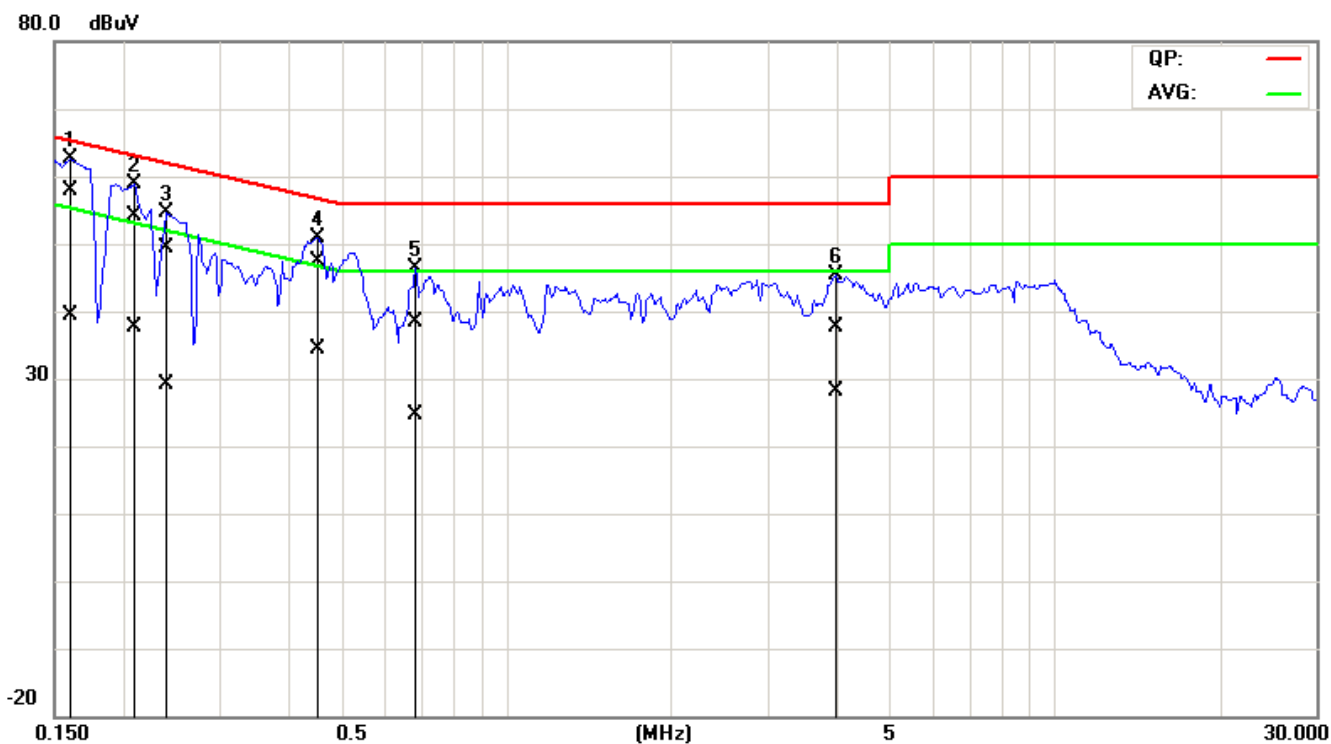
Remark:

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)

