



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

WIRELESS PCI ADAPTER

Model: WP81R1

Trade Name: PRO-NETS; Speed Com+; Jet Com

Issued to

PRO-NETS TECHNOLOGY CORPORATION
7F, No. 95, Li-De St., Chung Ho City 235, Taipei, Taiwan R.O.C.

Issued by

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	January 20, 2009	Initial Issue	ALL	Celine Chou



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1. TEST RESULT CERTIFICATION

Applicant: PRO-NETS TECHNOLOGY CORPORATION
 7F, No. 95, Li-De St., Chung Ho City 235, Taipei, Taiwan R.O.C.

Equipment Under Test: WIRELESS PCI ADAPTER

Trade Name: PRO-NETS; Speed Com+; Jet Com

Model: WP81R1

Date of Test: January 12 ~ 16, 2009

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:

 Ethan Huang
 Section Manager
 Compliance Certification Services Inc.

Reviewed by:

 Julia Wei
 Senior Specialist
 Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	WIRELESS PCI ADAPTER
Trade Name	PRO-NETS; Speed Com+; Jet Com
Model Number	WP81R1
Model Discrepancy	N/A
EUT Power Rating	Power by PC
Operating Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 18.82 dBm IEEE 802.11g mode: 15.98 dBm draft 802.11n 20 MHz Channel mode: 15.92 dBm draft 802.11n 40 MHz Channel mode: 16.01 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 20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) draft 802.11n 40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n 20 MHz Channel mode: 11 Channels draft 802.11n 40 MHz Channel mode: 7 Channels
Antenna Specification	Dipole Antenna / Gain: 2.09dBi

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **RXZ-WP81R1** 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: 2003 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: 2003 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: 2003.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



3.5 DESCRIPTION OF TEST MODES

The EUT (model: WP81R1) had been tested under operating condition.

Install EUT into the PC.

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, 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 and cyclic delay diversity were chosen for full testing.

IEEE 802.11g mode:

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

draft 802.11n 20 MHz Channel mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 13.5Mbps data rate were chosen for full testing.

draft 802.11n 40 MHz Channel mode:

Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with 13.5Mbps data rate were chosen for full testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

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

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	SCHAFFNER	SCR 3501	410	12/16/2009
LISN	R&S	ESH3-Z5	848773/014	10/27/2009
LISN	FCC	FCC-LISN-50/2 50-16-2-07	06012	11/11/2009
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)			

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSP30	100112	10/16/2009
Spectrum Analyzer	R&S	FSEB	825829/011	10/29/2009
Pre-Amplifier	Anritsu	MH648A	M89145	07/25/2009
Pre-Amplifier	Agilent	8449B	3008A01738	03/28/2009
Bilog Antenna	FRANKONIA	BTA-M	030003M	N.C.R
Horn Antenna	EMCO	3115	00022257	12/16/2009
Antenna Tower	HD	AS620E	N/A	N.C.R
Controller	HD	HD100	N/A	N.C.R
Turn Table	HD	DT-K312	N/A	N.C.R
Test S/W	LabVIEW 6.1 (Wugu Chamber EMI Test V1_4.5.3)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	SCHAFFNER	SCR 3501	410	12/16/2009
LISN	R&S	ESH3-Z5	848773/014	10/27/2009
LISN	FCC	FCC-LISN-50/2 50-16-2-07	06012	11/11/2009
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)			

Remark: The measurement uncertainty is less than +/- 1.7806dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

- No.199, Chungshen 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, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, (338) Taiwan,
R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2003 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.



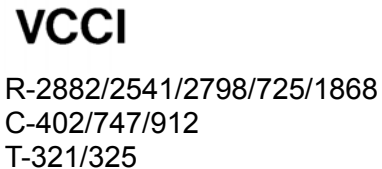


Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

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	A2LA	CFR 47, FCC Part15/18, CISPR 22, EN 55022, ICES-003, AS/NZS CISPR 22, VCCI V-3, EN 55011, CISPR 11, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 61000-6-1/2/3/4, EN 55024, CISPR 24, AS/NZS CISPR 24, AS/NZS 61000.6.2, EN 55014-1/-2, ETSI EN 300 386 v1.3.2/v1.3.3, IEC/EN 61000-3-2, AS/NZS 61000.3.2, IEC/EN 61000-3-3, AS/NZS 61000.3.3	
USA	FCC MRA	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	
Taiwan	TAF	EN 55014-1, CISPR 14, CNS 13781-1, EN 55013, CISPR 13, CNS 13439, EN 55011, CISPR 11, CNS 13803, PLMN09, IS2045-0, LP0002 FCC Part 27/90, Part 15B/C/D/E, RSS-192/193/210/310 ETSI EN 300 328/ 300 220-1/ 300 220-2/ 301 893/ 301 489-01/ 301 489-03/ 301 489-07 / 301 489-17/ 300 440-1/ 300 440-2 AS/NZS 4268, AS/NZS 4771 CISPR 22, EN 55022, CNS 13438, AS/NZS CISPR 22, VCCI, IEC/EN 61000-4-2/3/4/5/6/8/11, CNS 14676-2/3/4/5/6/8, CNS 14934-2/3, CNS 13783-1, CNS 13439, CNS 13803	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	RSS212, Issue 1	

Note: No part of this report may be used to claim or imply product endorsement by A2LA, TAF or other government agency.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	PC	DX-7300	SGH7390F4P	FCC DoC	HP	N/A	Unshielded, 1.8m
2	LCD Monitor	3008WFP	CN-0XK290-71618-84 6-169L	FCC DoC	DELL	VGA Cable: Shielded, 1.8m with two cores	Unshielded, 1.8m
3	Modem	DM-1414	304012268	IFAXDM1414	ACEEX	Unshielded, 1.8m	Unshielded, 1.8m
4	Printer	STYLUS C60	DR3K039632	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
5	PS/2 Keyboard	Y-SJ17	SY520U00642	FCC DoC	Logitech	Unshielded, 1.8m	N/A
6	PS/2 Mouse	M-SBF69	HCA45009249	FCC DoC	Logitech	Unshielded, 1.8m	N/A

Remark: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



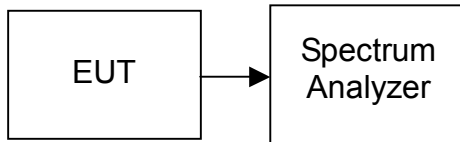
7. FCC PART 15.247 REQUIREMENTS

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 6 dB 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 = 100kHz, VBW = 300kHz, Span = 30MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted



TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.10	>500	PASS
Mid	2437	10.22		PASS
High	2462	10.70		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.29	>500	PASS
Mid	2437	16.35		PASS
High	2462	16.29		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.13	>500	PASS
Mid	2437	17.25		PASS
High	2462	17.07		PASS

Test mode: draft 802.11n 40 MHz Channel mode

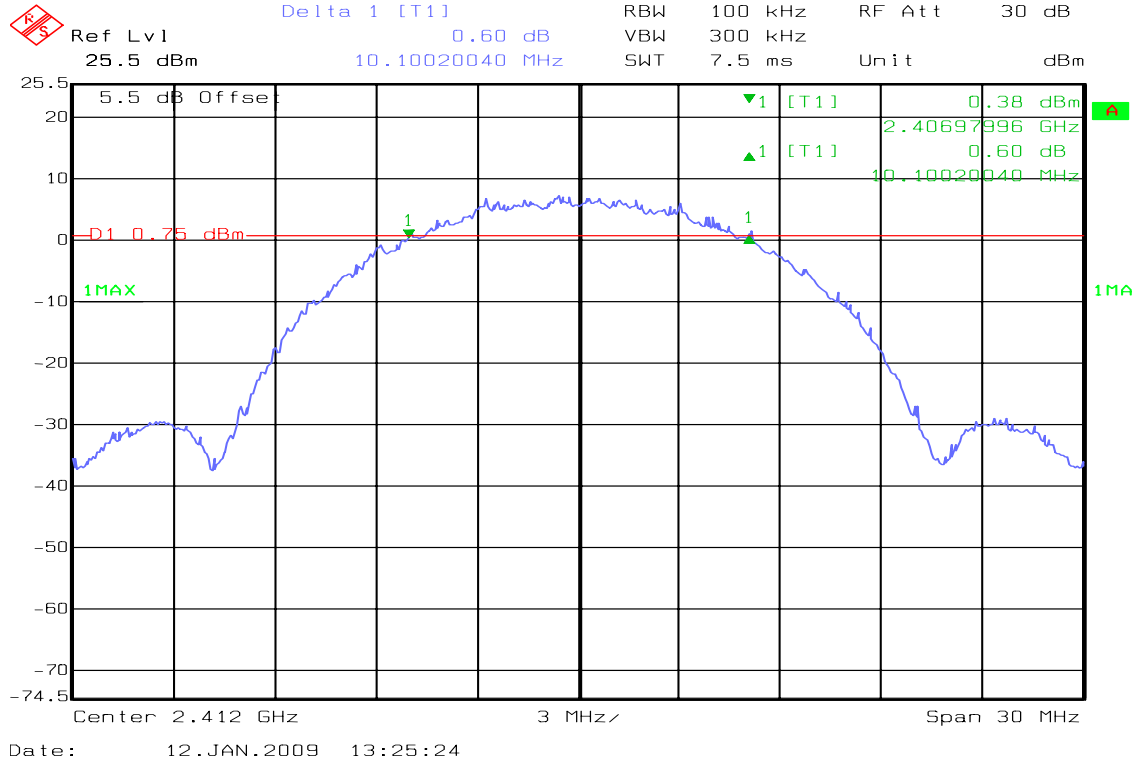
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	35.87	>500	PASS
Mid	2437	35.97		PASS
High	2452	36.07		PASS



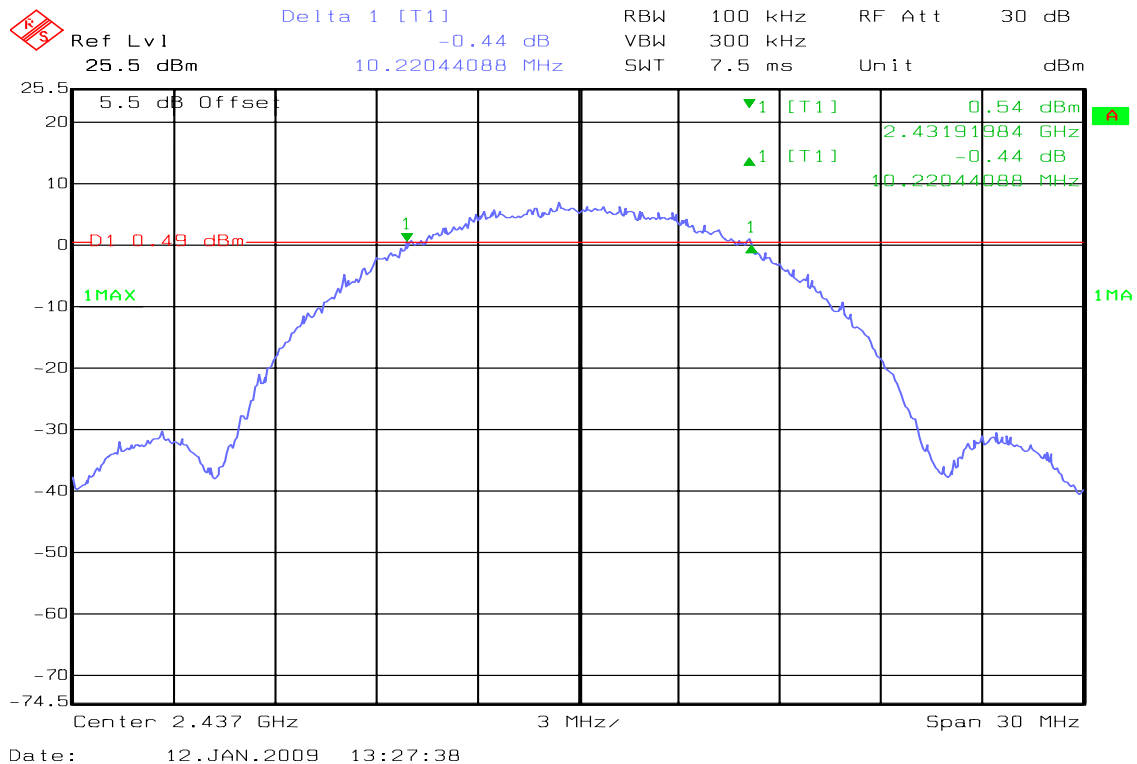
Test Plot

IEEE 802.11b mode

6dB Bandwidth (CH Low)

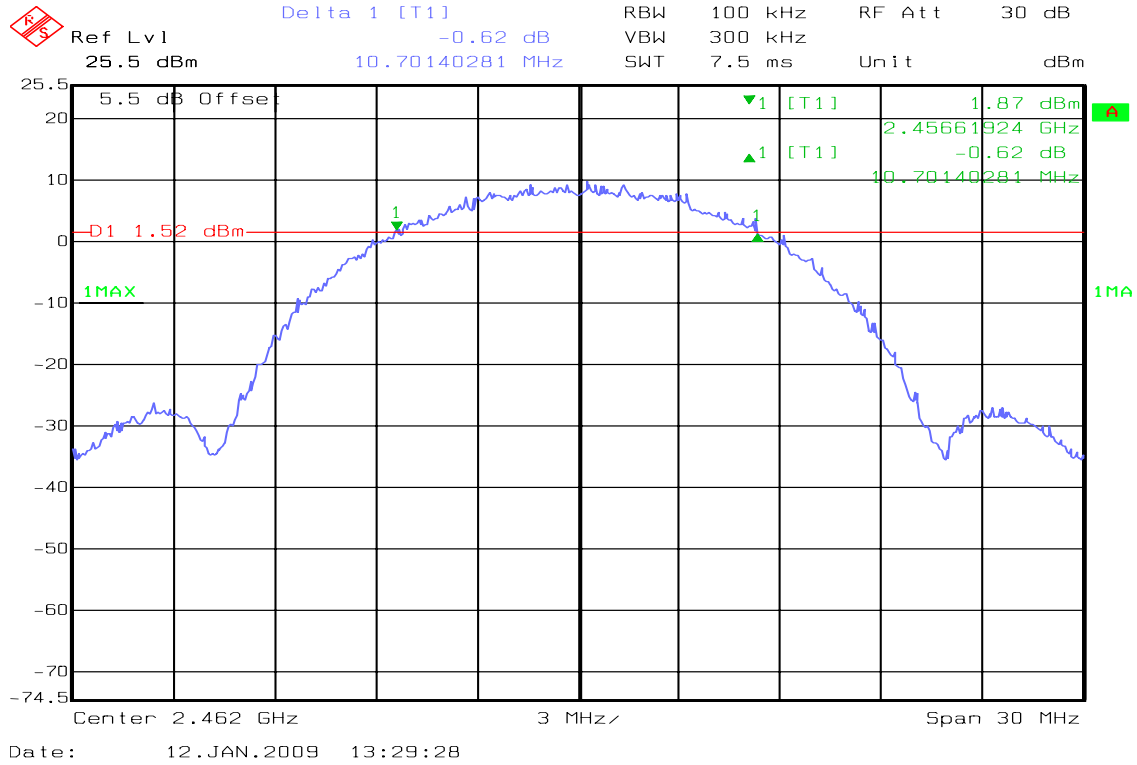


6dB Bandwidth (CH Mid)



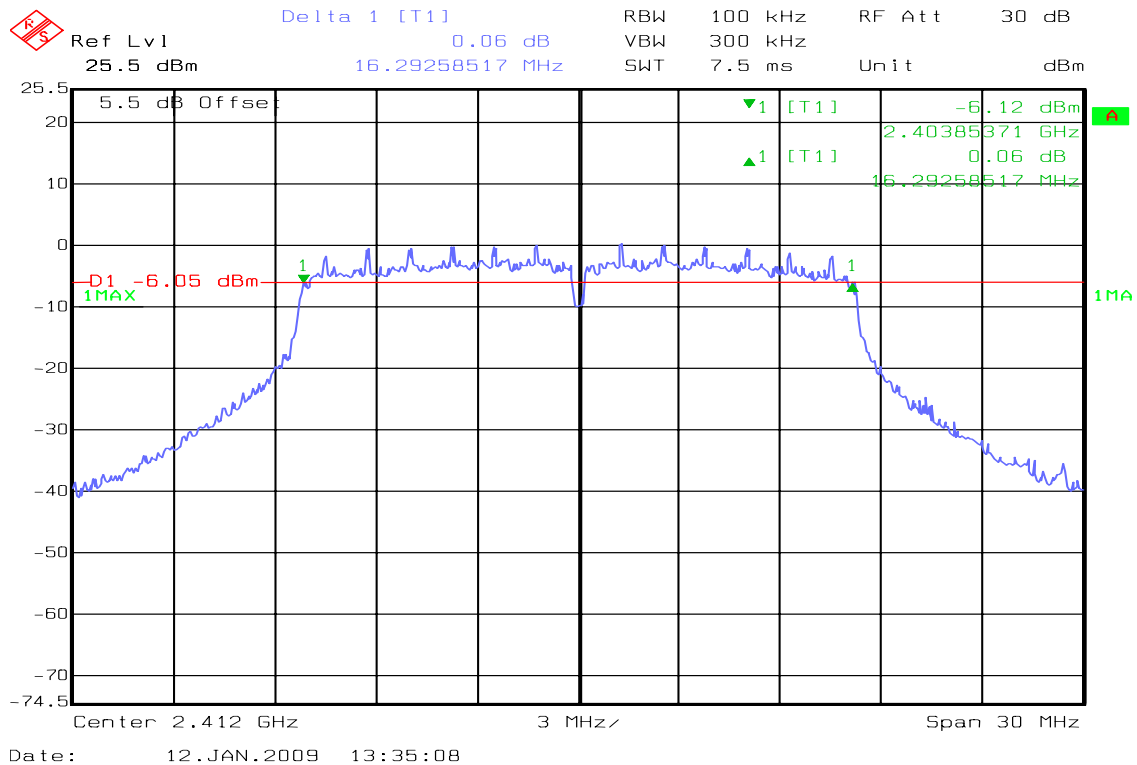


6dB Bandwidth (CH High)



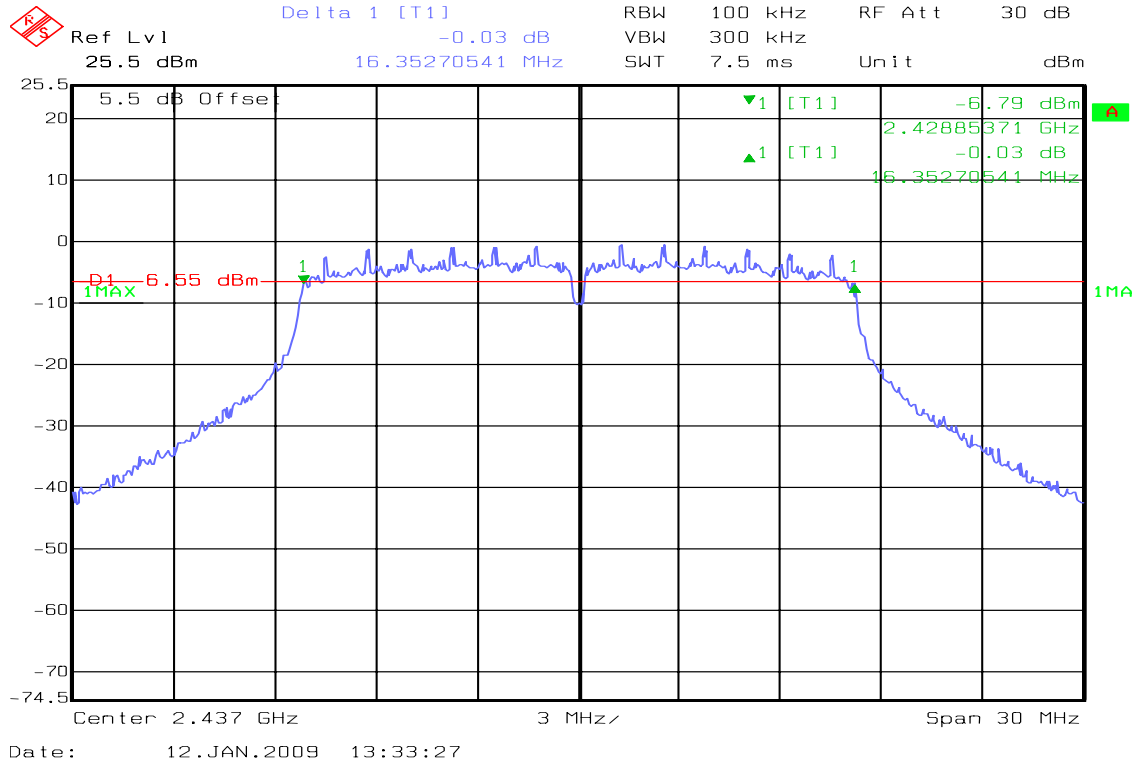
IEEE 802.11g mode

6dB Bandwidth (CH Low)

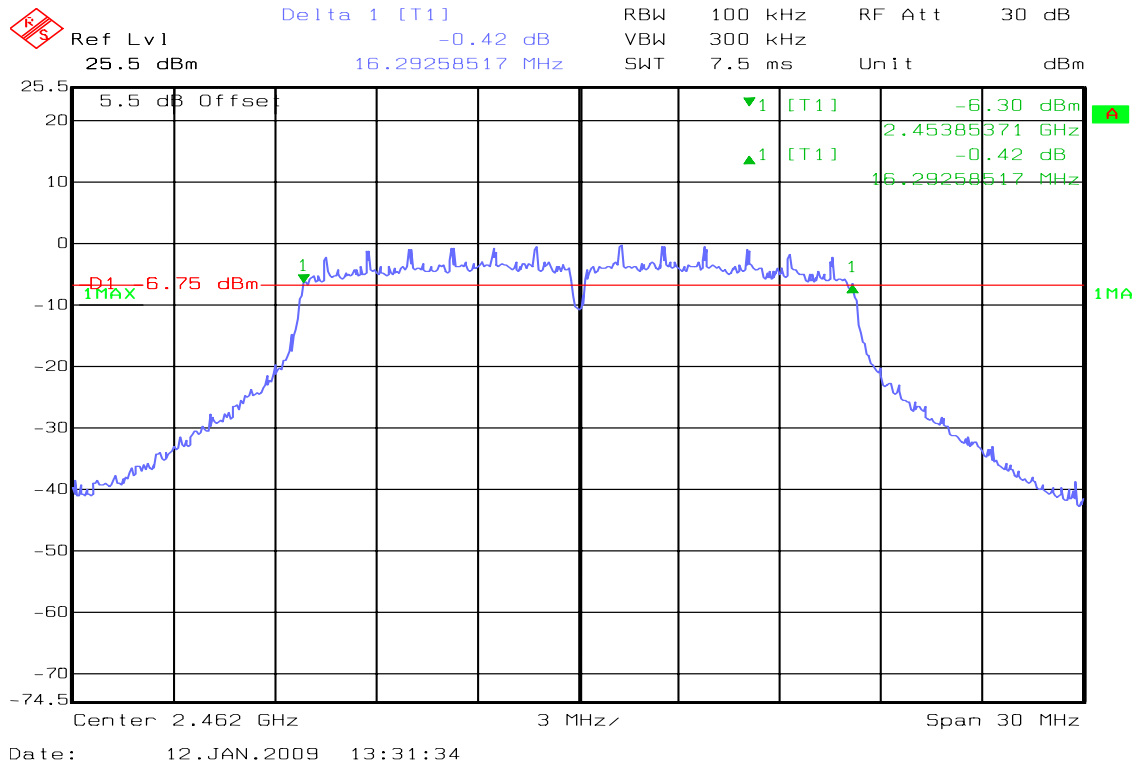




6dB Bandwidth (CH Mid)



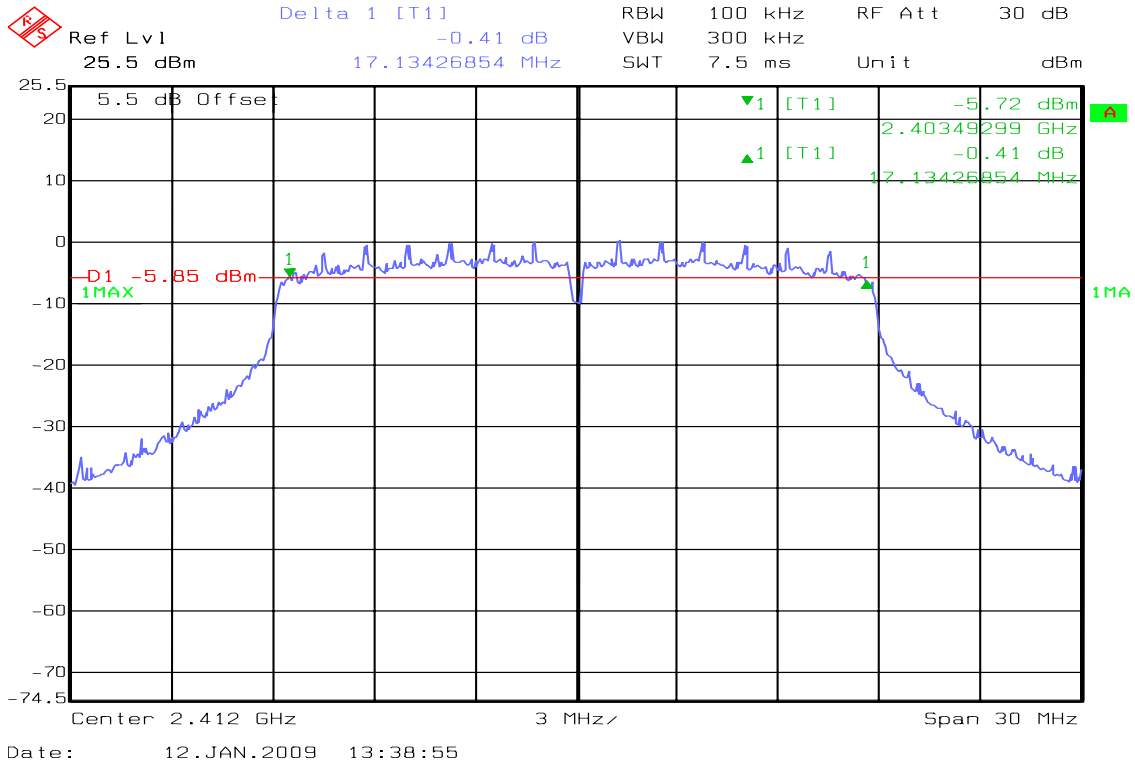
6dB Bandwidth (CH High)



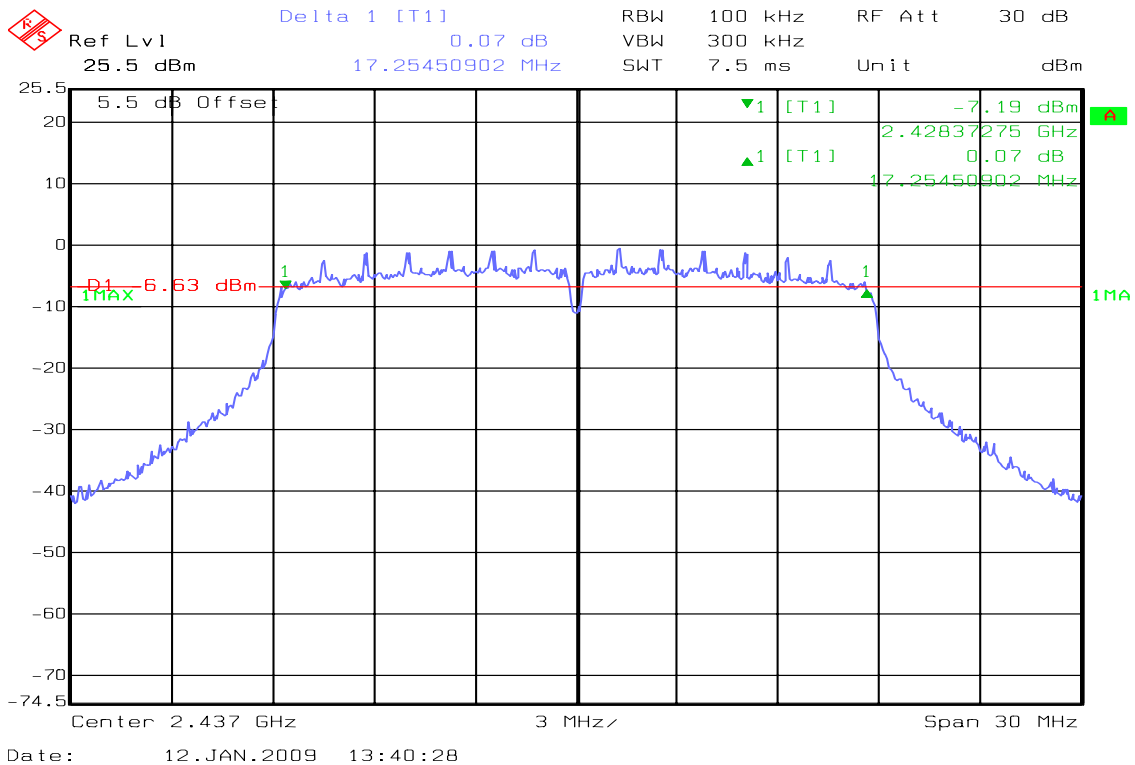


draft 802.11n 20 MHz Channel mode

6dB Bandwidth (CH Low)

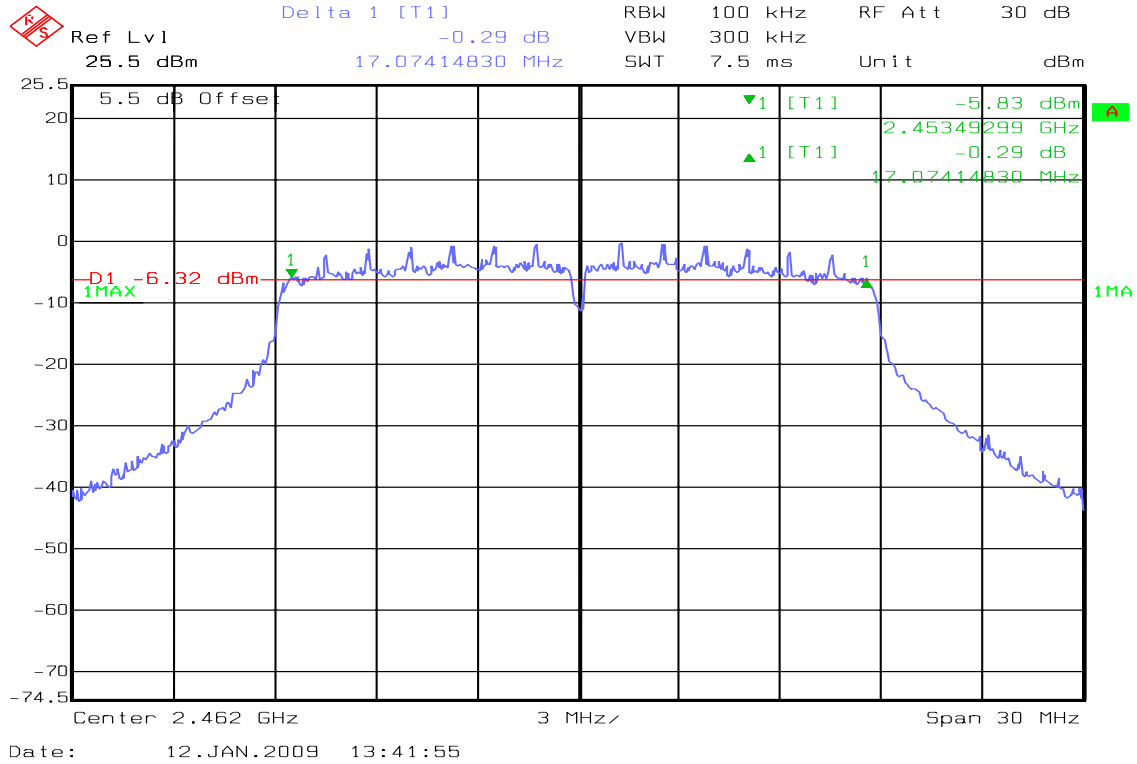


6dB Bandwidth (CH Mid)



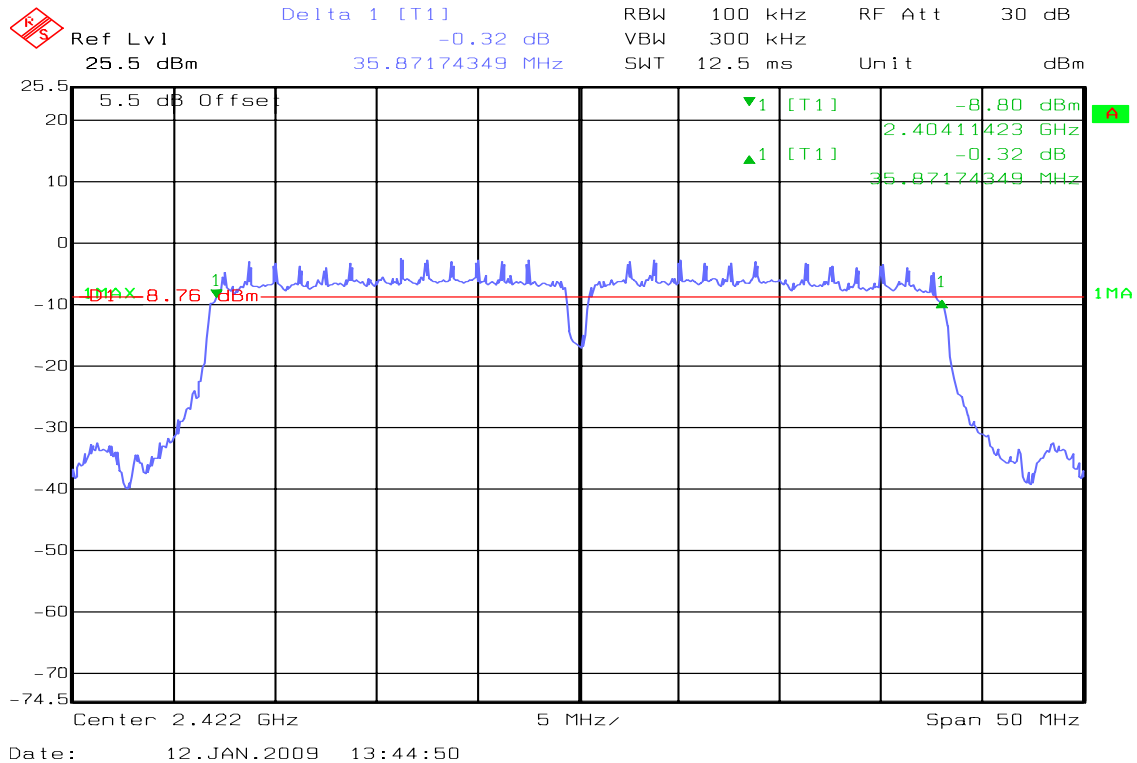


6dB Bandwidth (CH High)



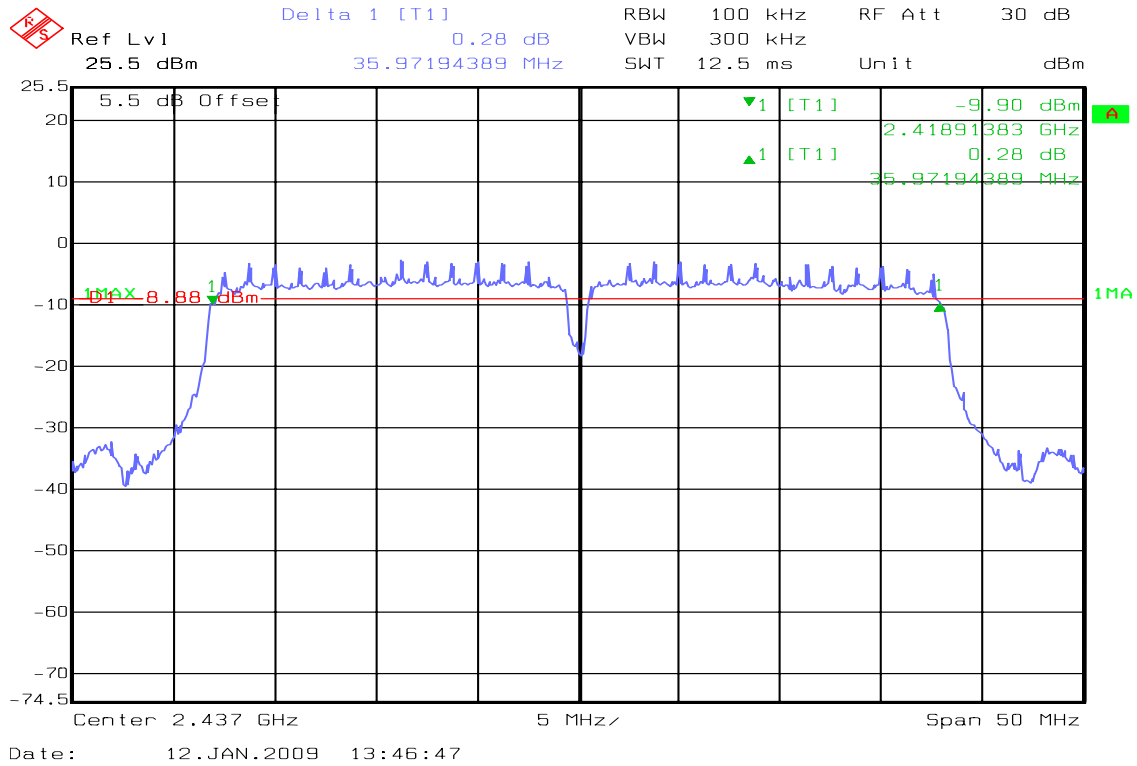
draft 802.11n 40 MHz Channel mode

6dB Bandwidth (CH Low)

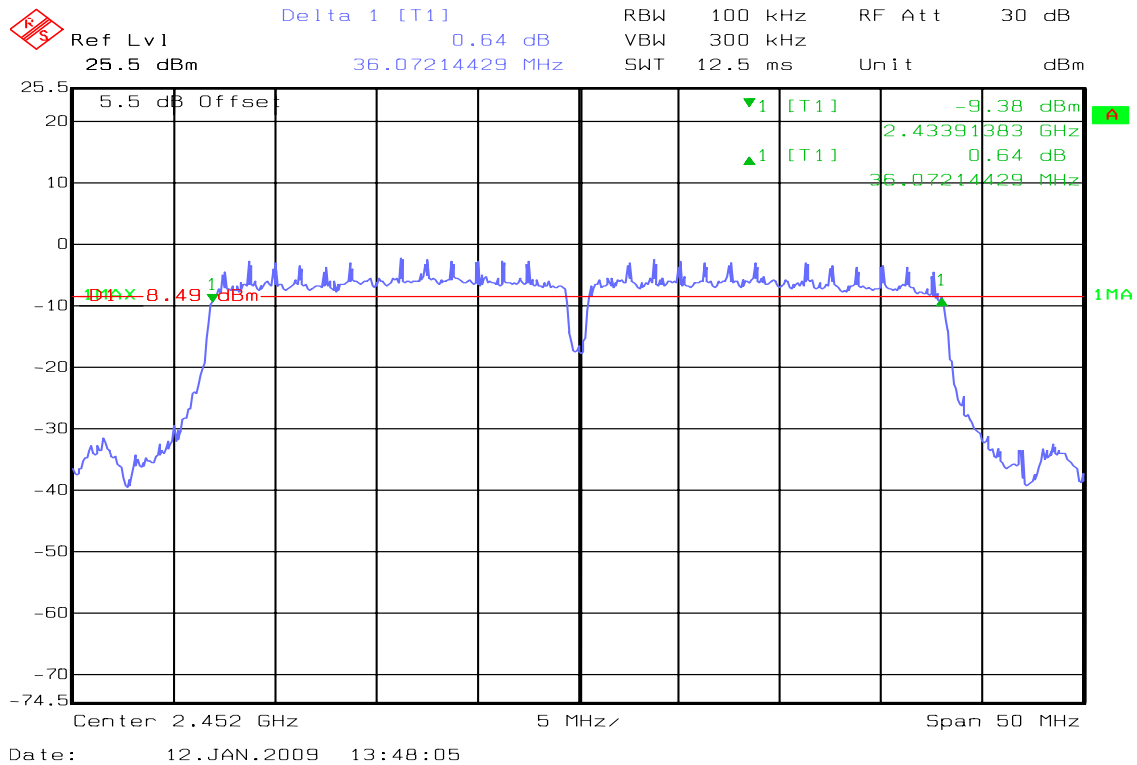




6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)





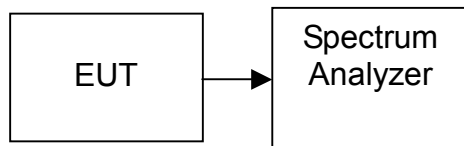
7.2 PEAK POWER

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

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.

TEST RESULTS

No non-compliance noted



TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	18.75	0.07499	1.00	PASS
Mid	2437	18.82	0.07621		PASS
High	2462	18.38	0.06887		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.98	0.03963	1.00	PASS
Mid	2437	15.57	0.03606		PASS
High	2462	15.50	0.03548		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.92	0.03908	1.00	PASS
Mid	2437	15.21	0.03319		PASS
High	2462	15.46	0.03516		PASS

Test mode: draft 802.11n 40 MHz Channel mode

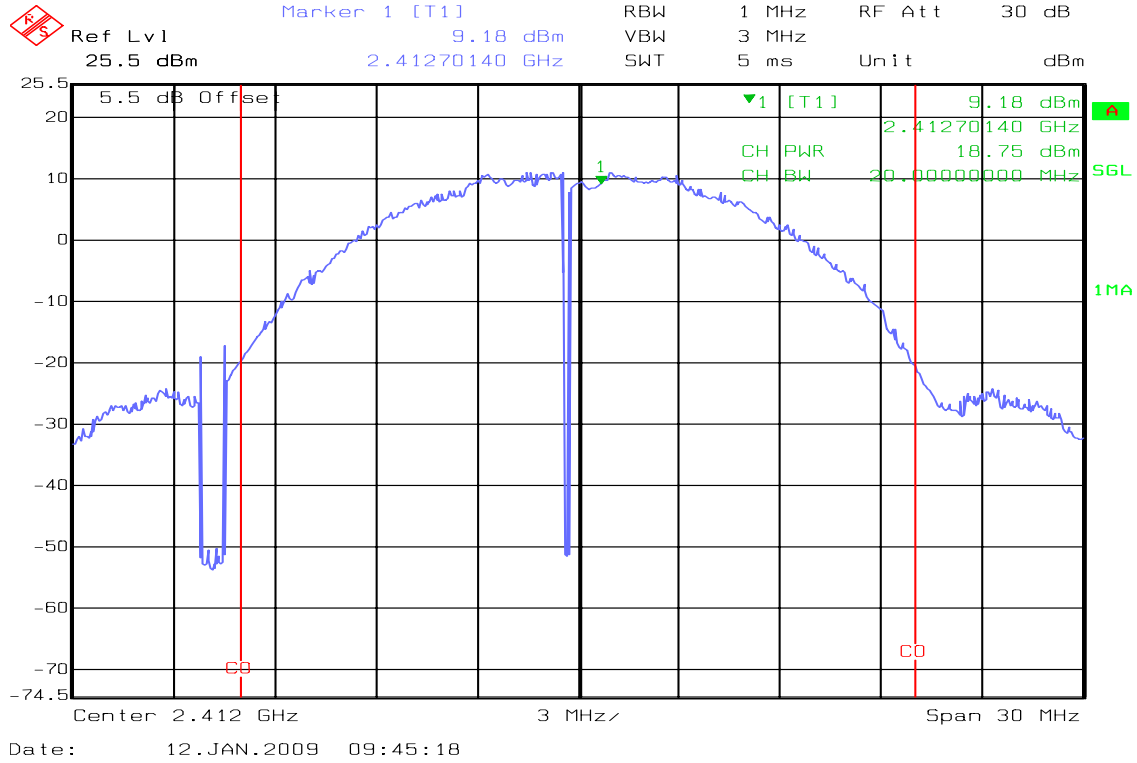
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	16.01	0.03990	1.00	PASS
Mid	2437	15.98	0.03963		PASS
High	2452	16.00	0.03981		PASS



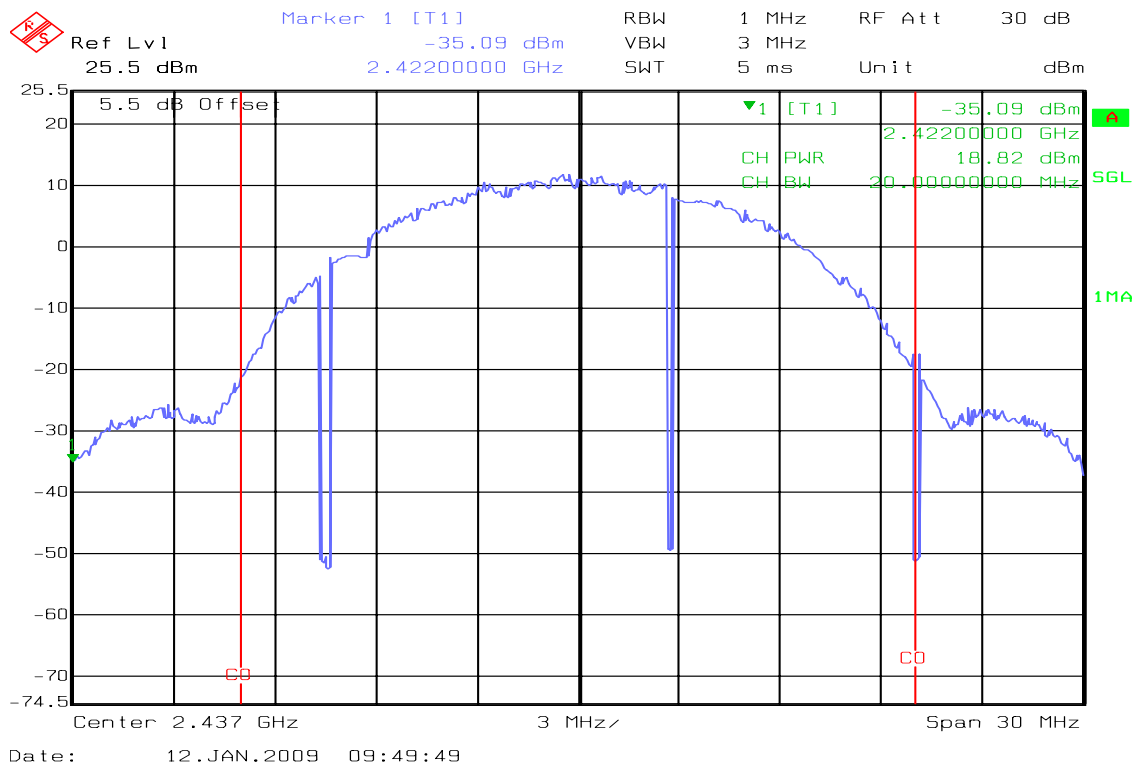
Test Plot

IEEE 802.11b mode

Peak Power (CH Low)

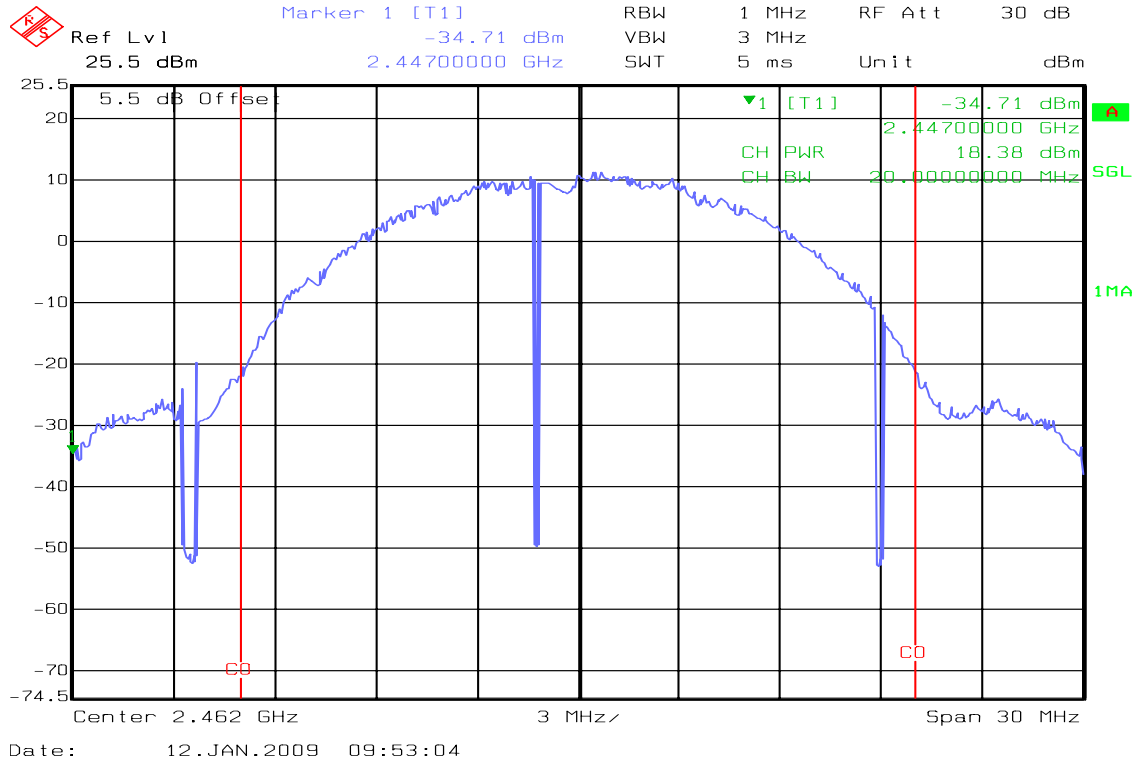


Peak Power (CH Mid)



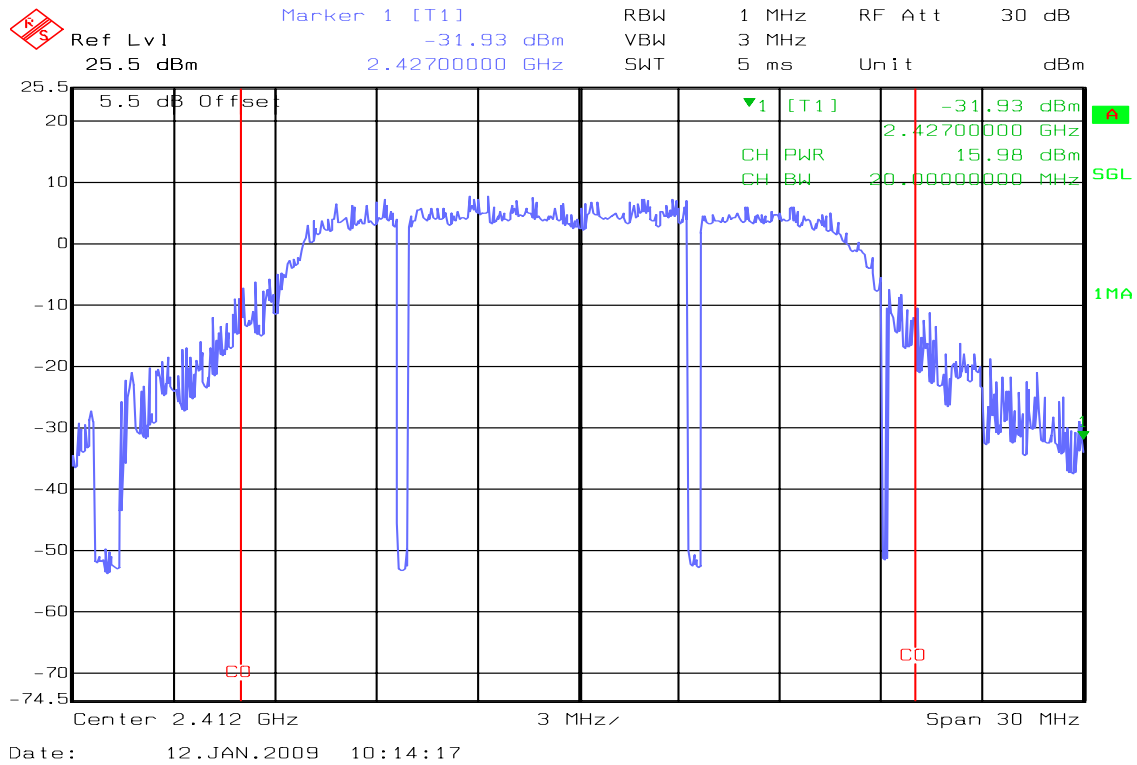


Peak Power (CH High)



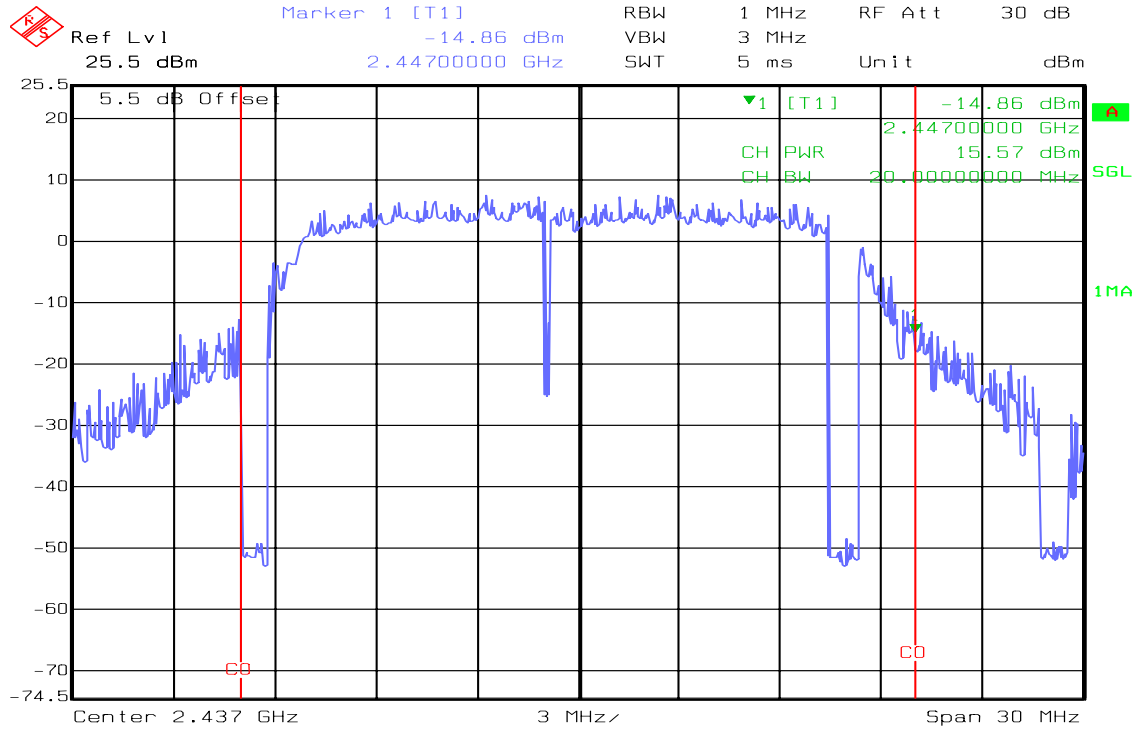
IEEE 802.11g mode

Peak Power (CH Low)

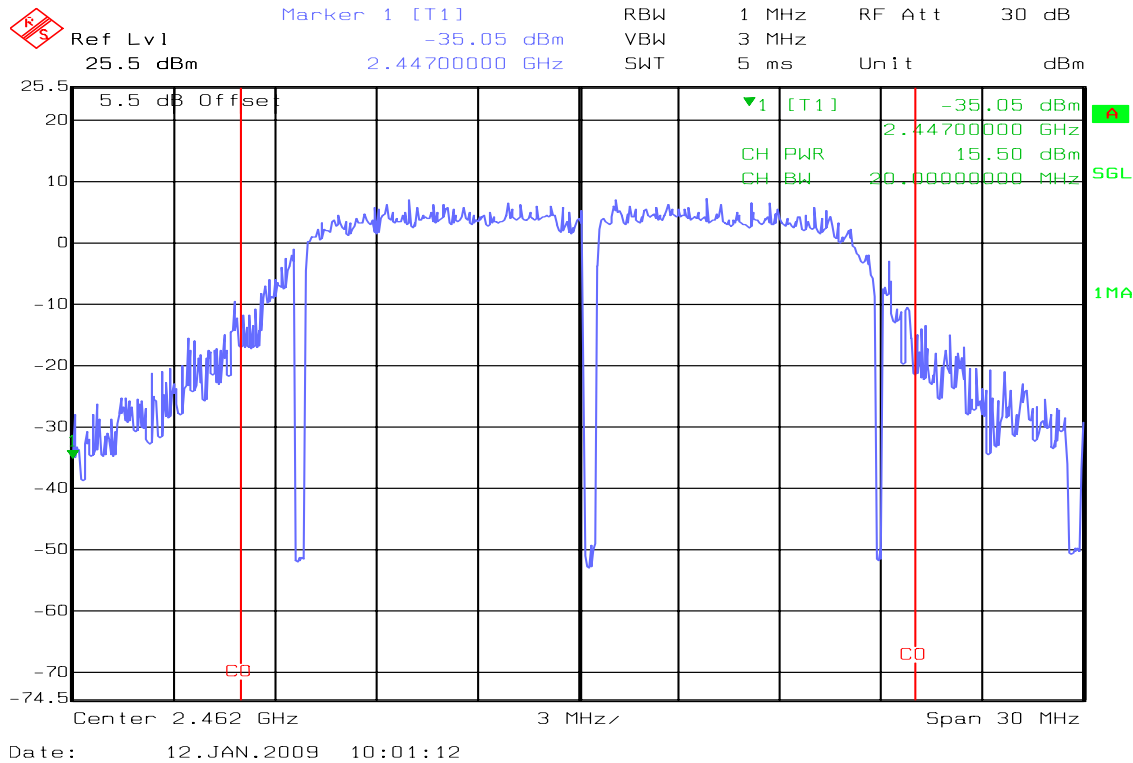




Peak Power (CH Mid)



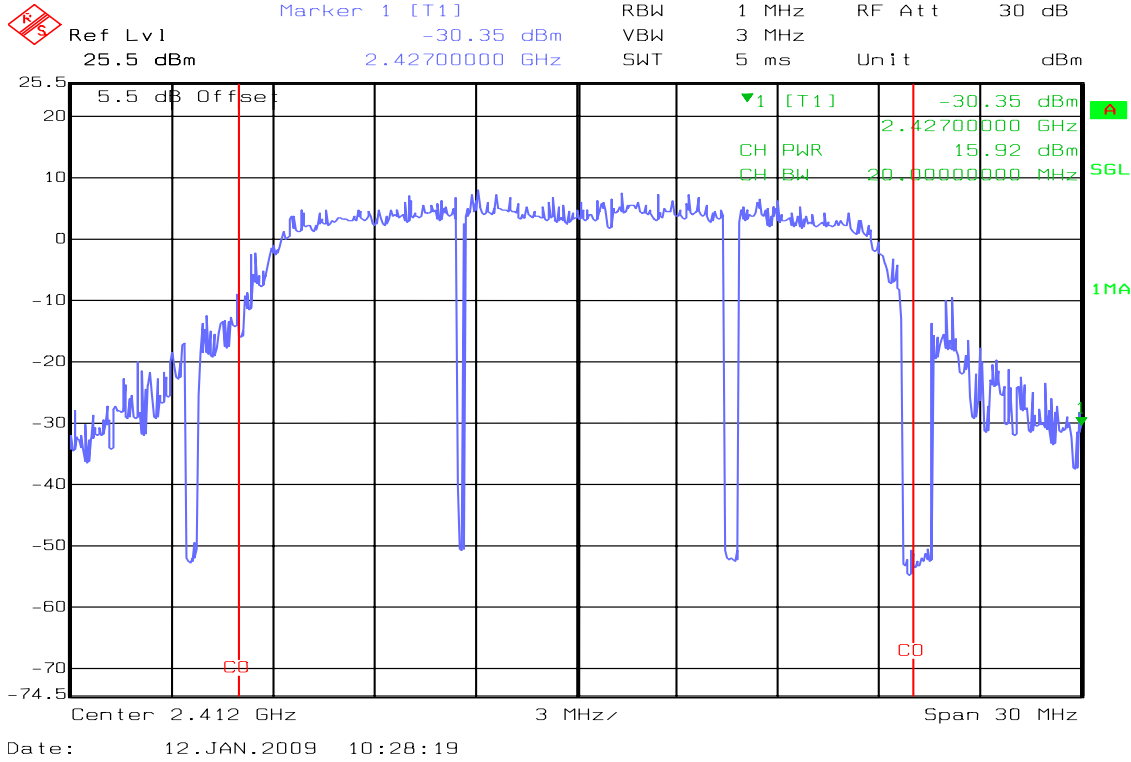
Peak Power (CH High)



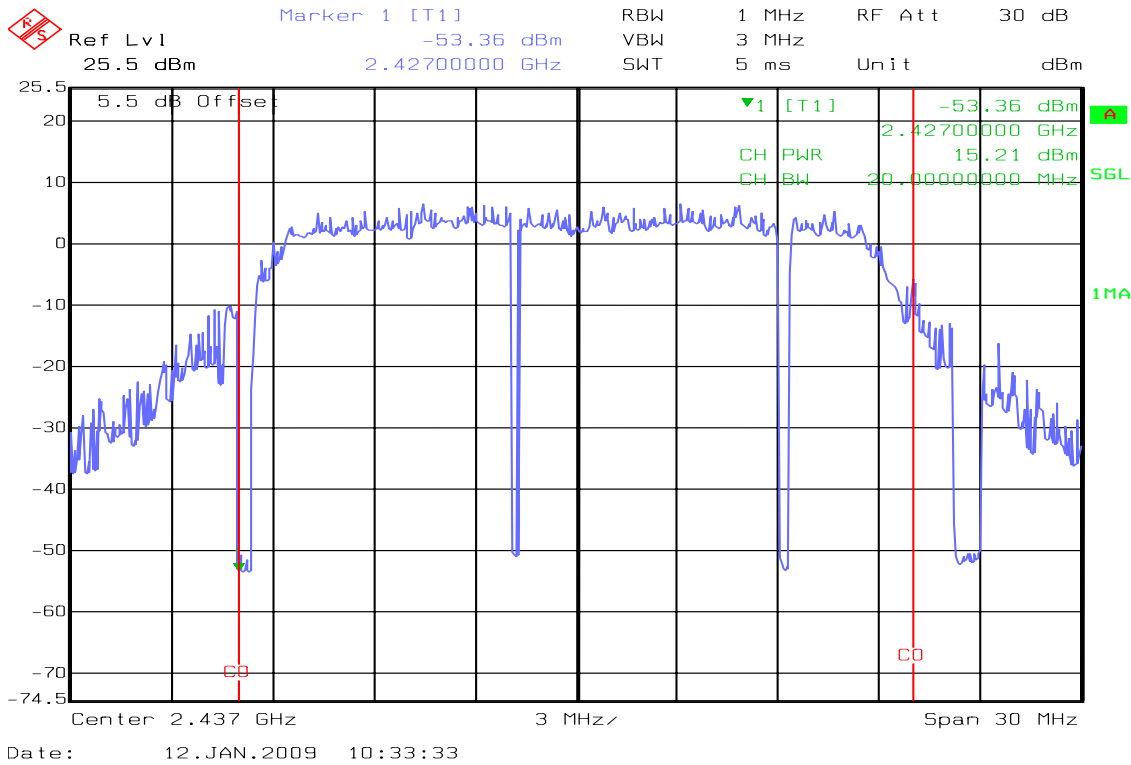


draft 802.11n 20 MHz Channel mode

Peak Power (CH Low)

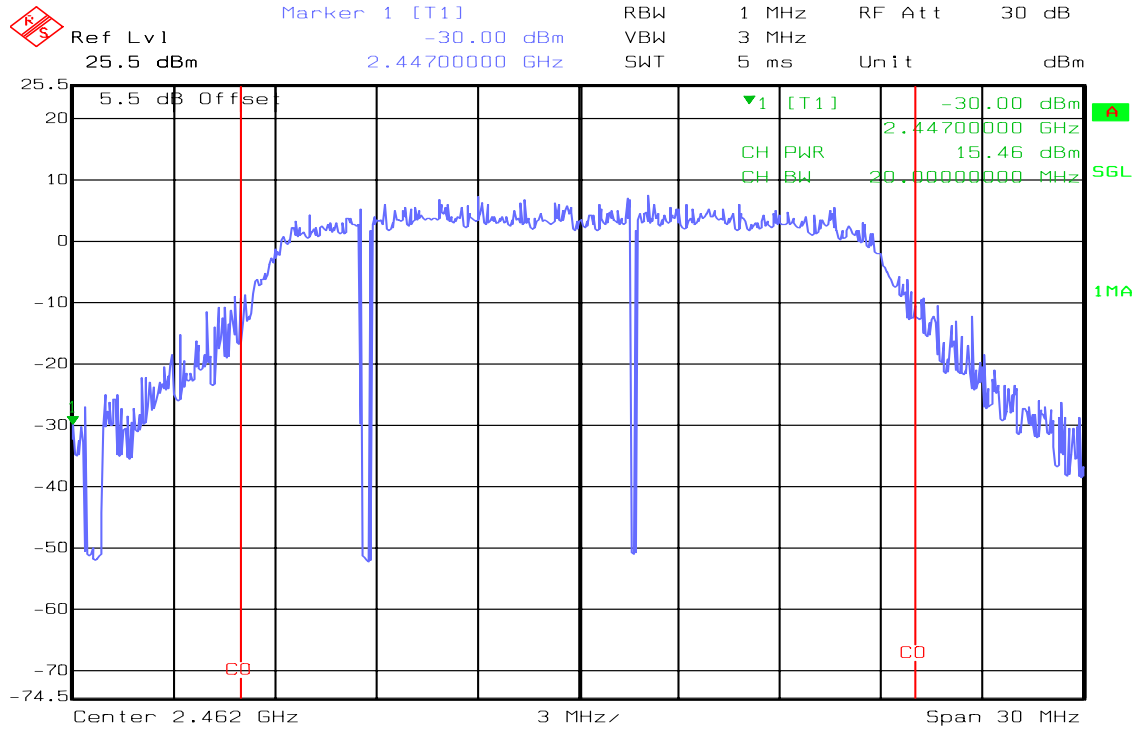


Peak Power (CH Mid)





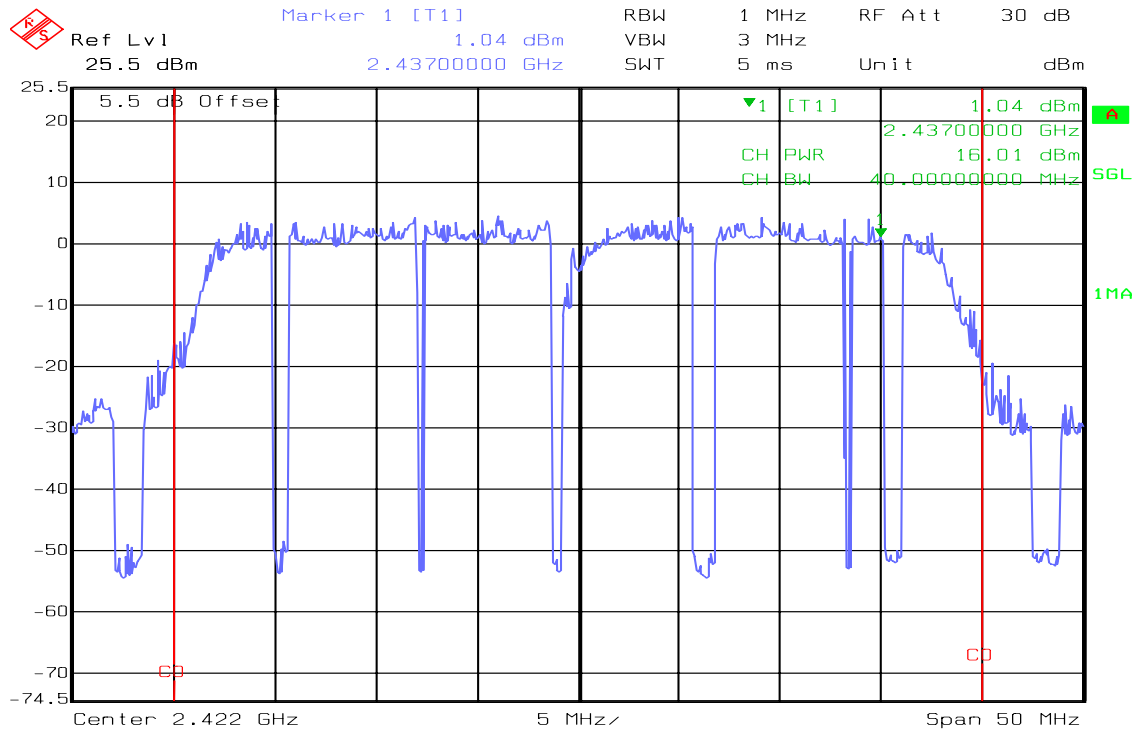
Peak Power (CH High)



Date: 12.JAN.2009 10:36:52

draft 802.11n 40 MHz Channel mode

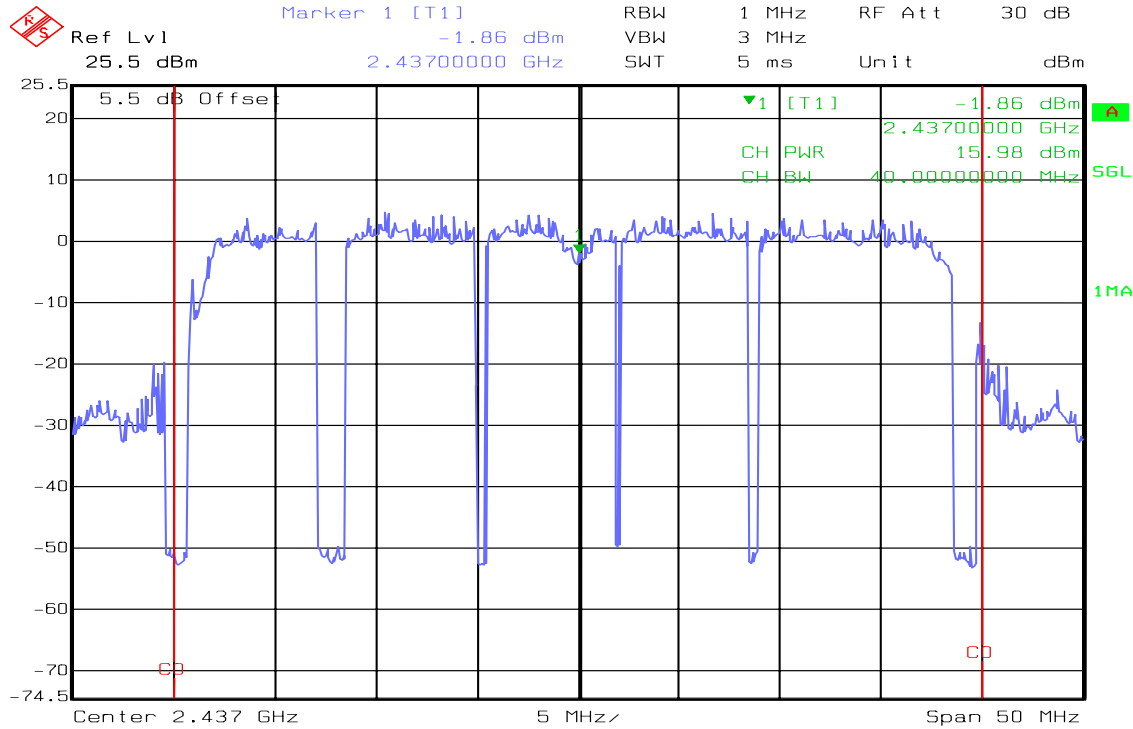
Peak Power (CH Low)



Date: 12.JAN.2009 10:40:26

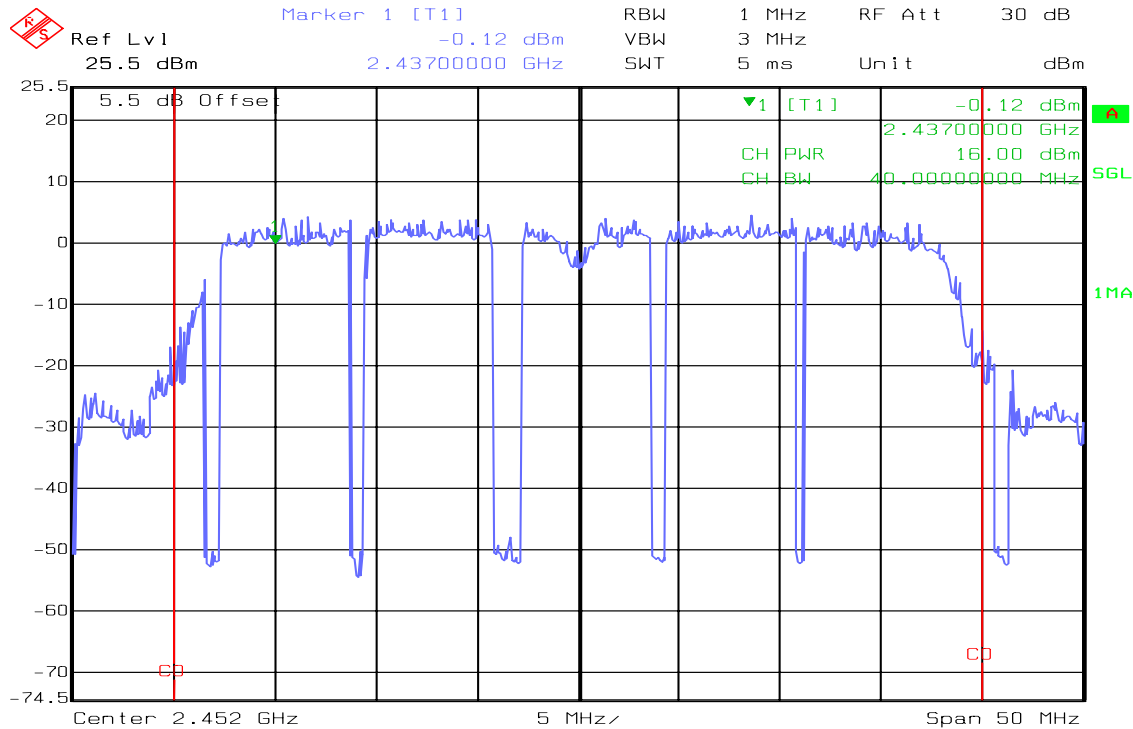


Peak Power (CH Mid)



Date: 12.JAN.2009 10:43:18

Peak Power (CH High)



Date: 12.JAN.2009 10:46:19

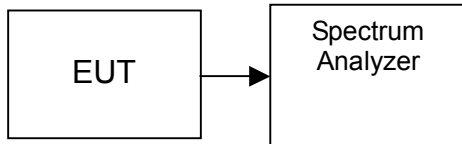


7.3 AVERAGE POWER

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

IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	15.12	0.03251
Mid	2437	14.88	0.03076
High	2462	14.78	0.03006

IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	10.56	0.01138
Mid	2437	10.25	0.01059
High	2462	10.31	0.01074

draft 802.11n 20 MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	10.50	0.01122
Mid	2437	9.84	0.00964
High	2462	10.03	0.01007

draft 802.11n 40 MHz

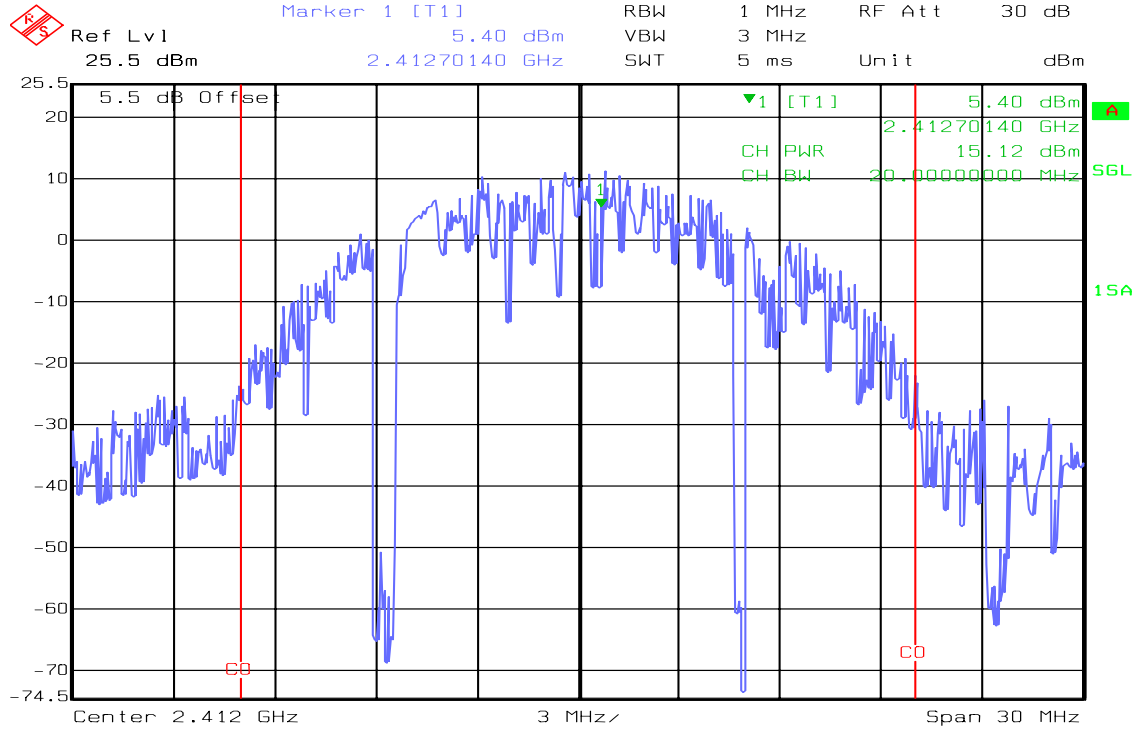
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	10.41	0.01099
Mid	2437	10.46	0.01112
High	2452	10.68	0.01169



Test Plot

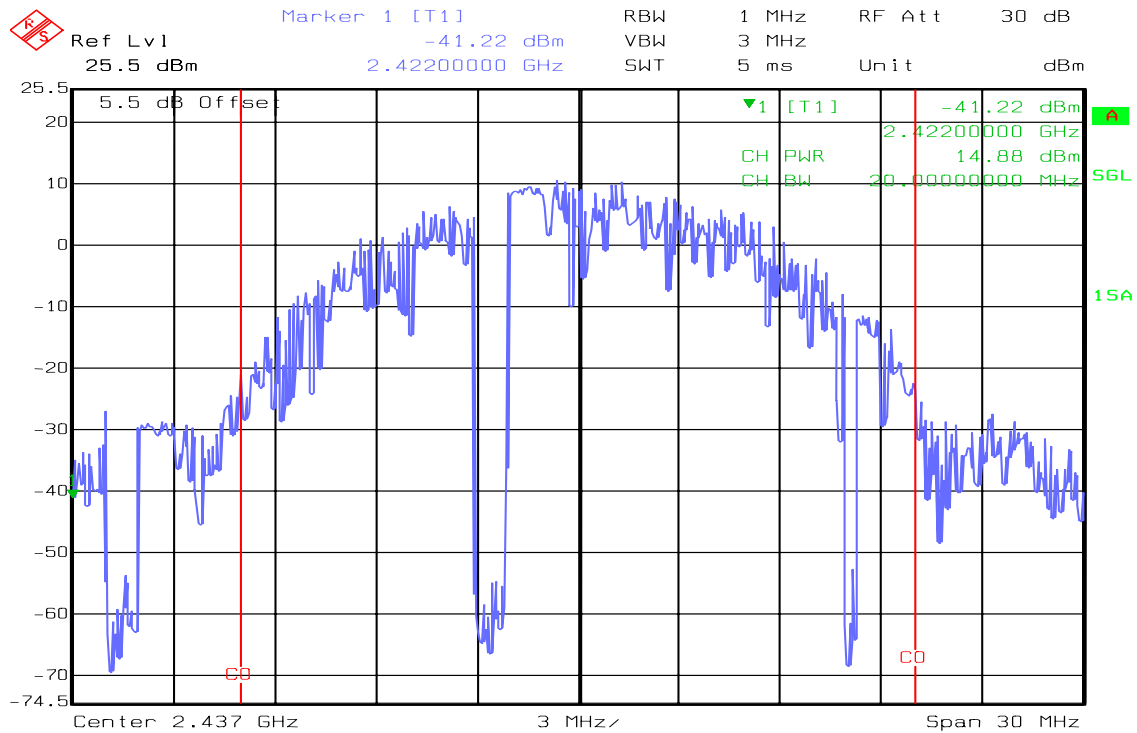
IEEE 802.11b mode

Average power (CH Low)



Date: 12.JAN.2009 09:46:15

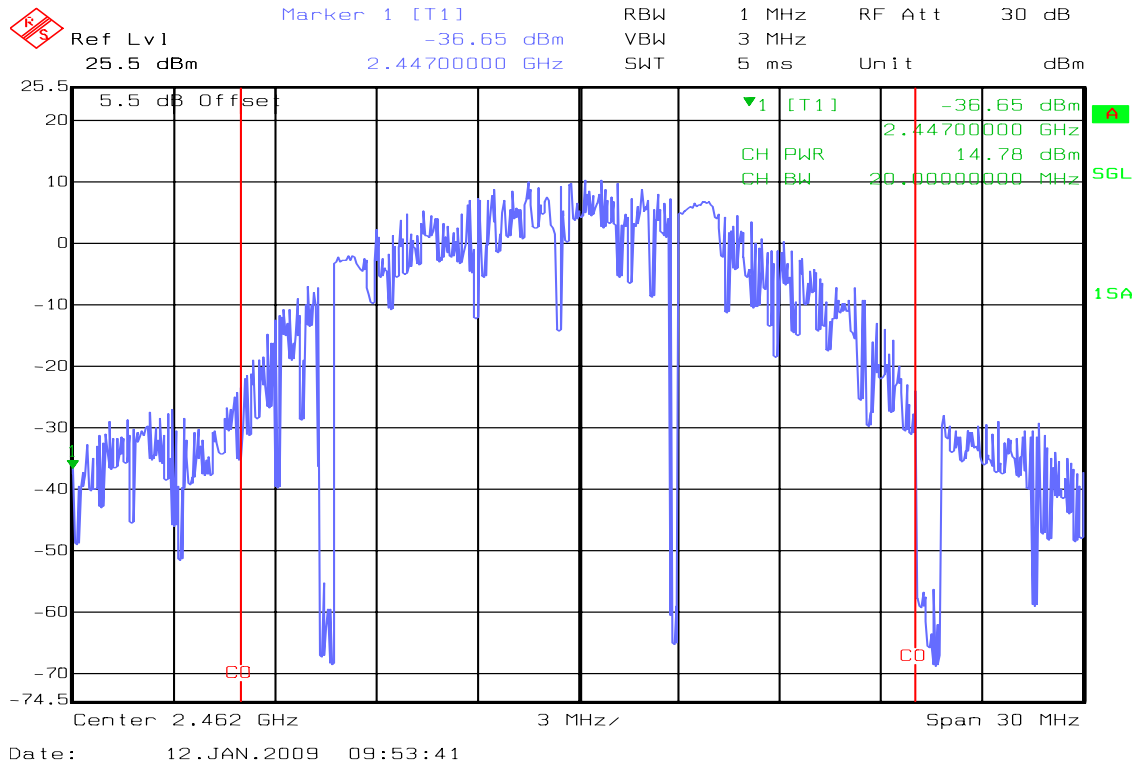
Average power (CH Mid)



Date: 12.JAN.2009 09:51:35

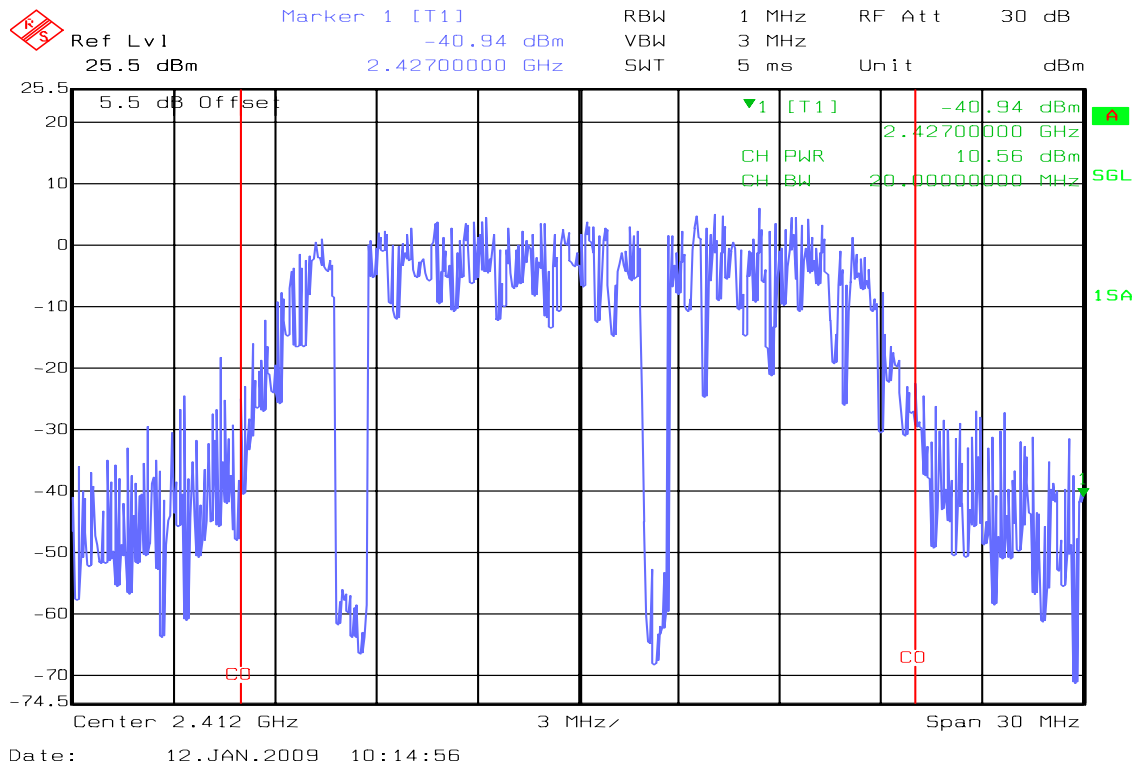


Average power (CH High)



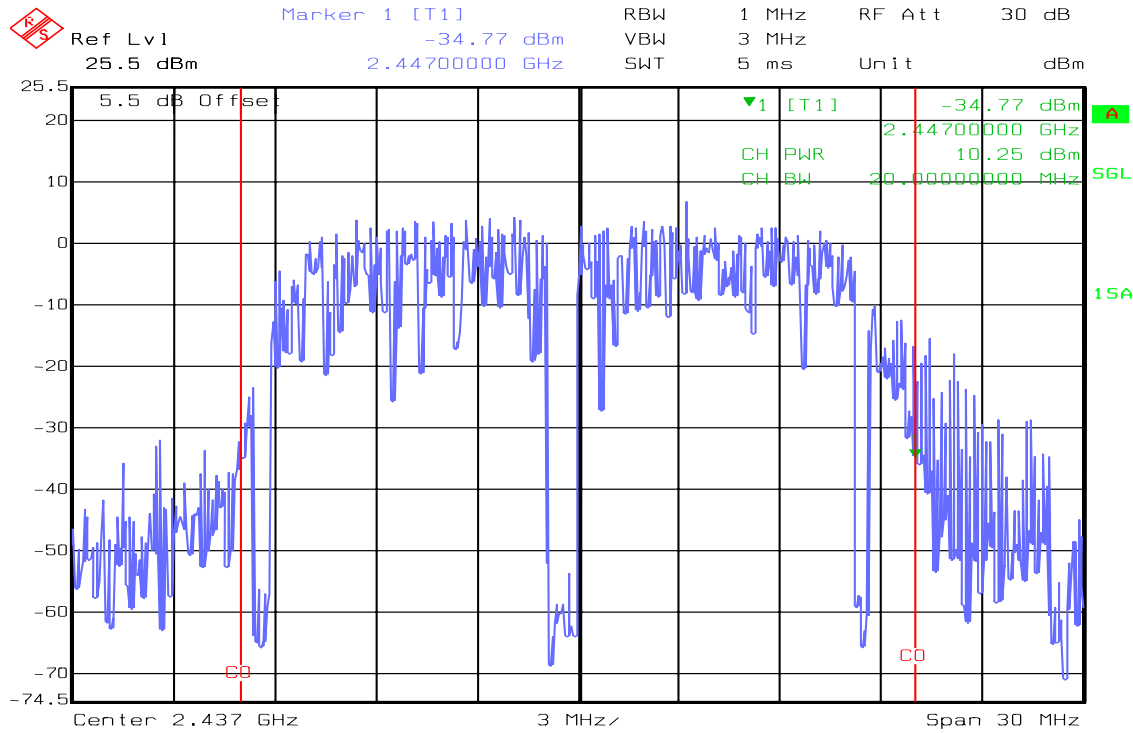
IEEE 802.11g mode

Average power (CH Low)



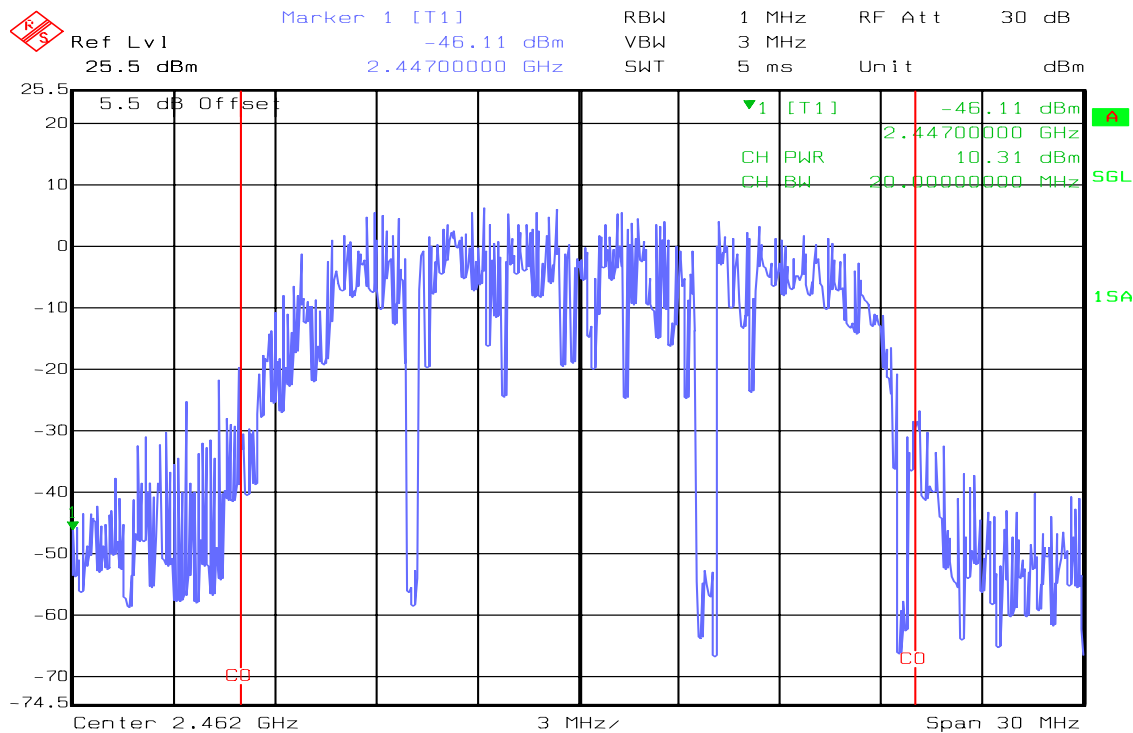


Average power (CH Mid)



Date: 12.JAN.2009 10:11:51

Average power (CH High)

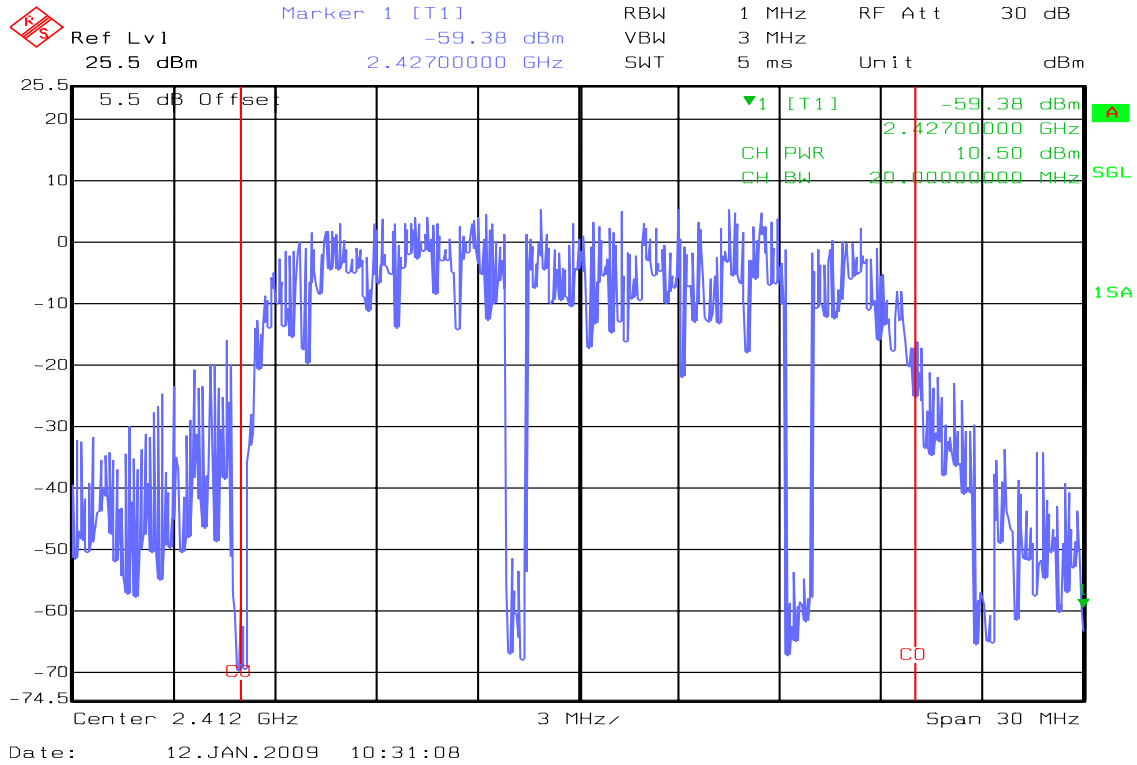


Date: 12.JAN.2009 10:02:06

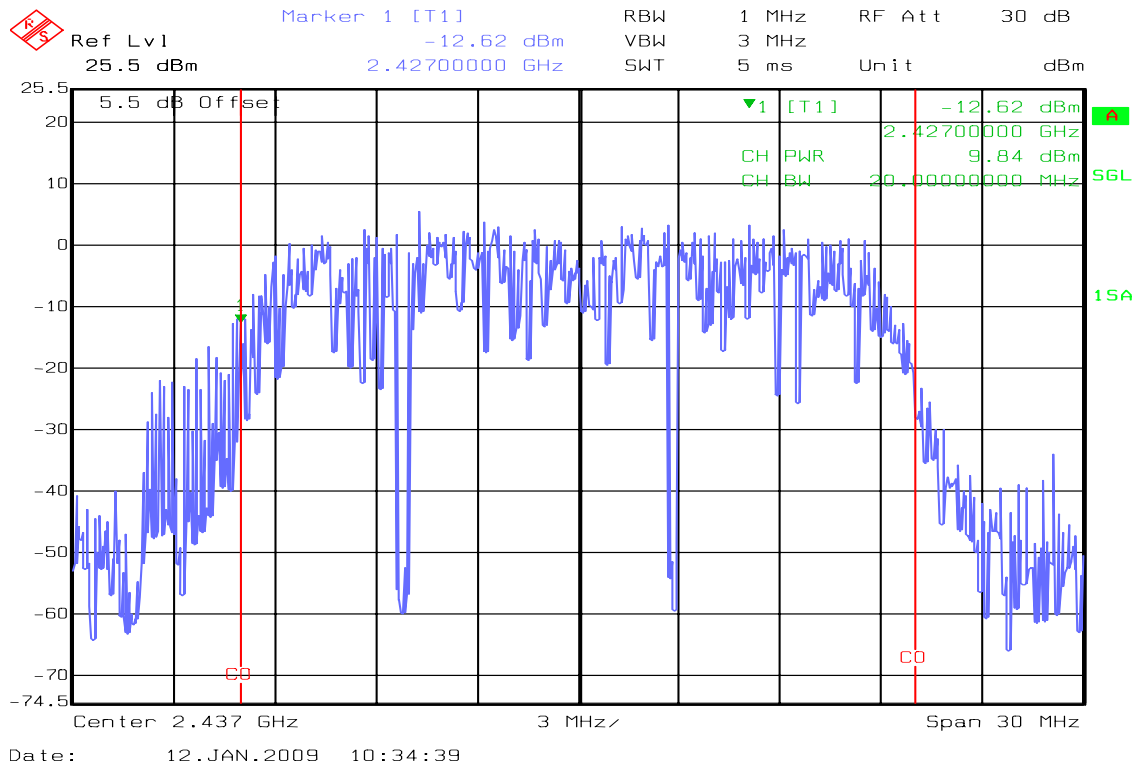


draft 802.11n 20 MHz Channel mode

Average power (CH Low)

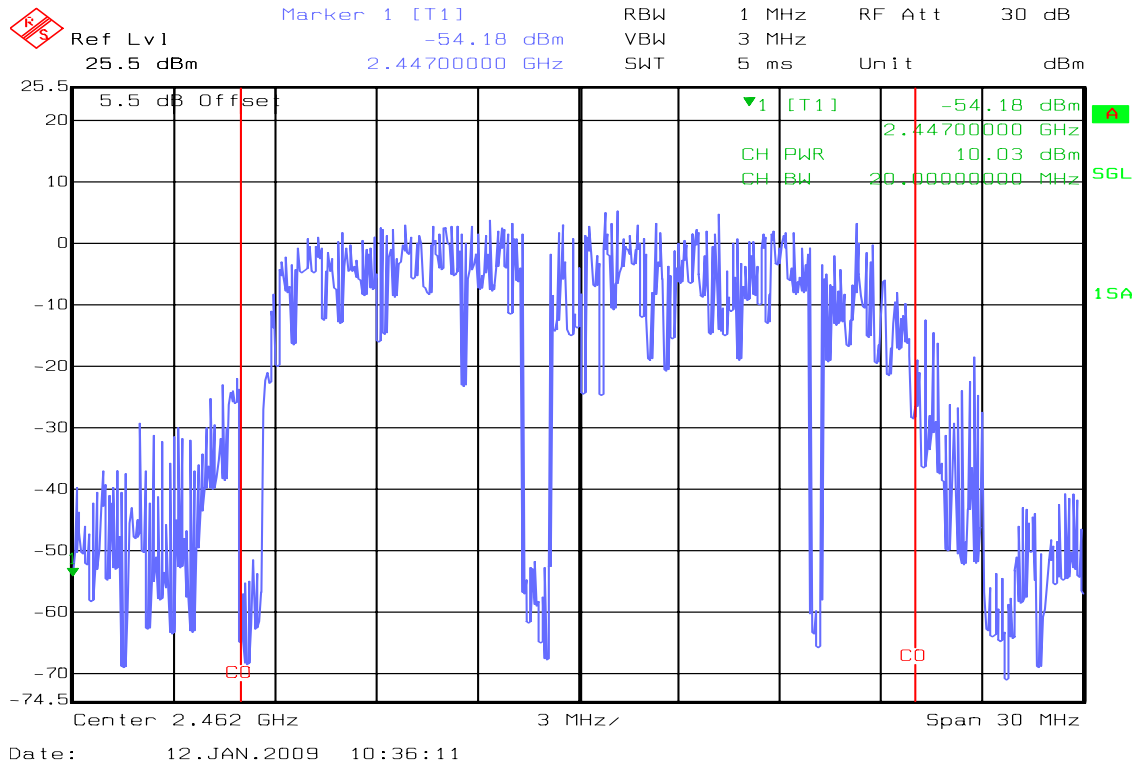


Average power (CH Mid)



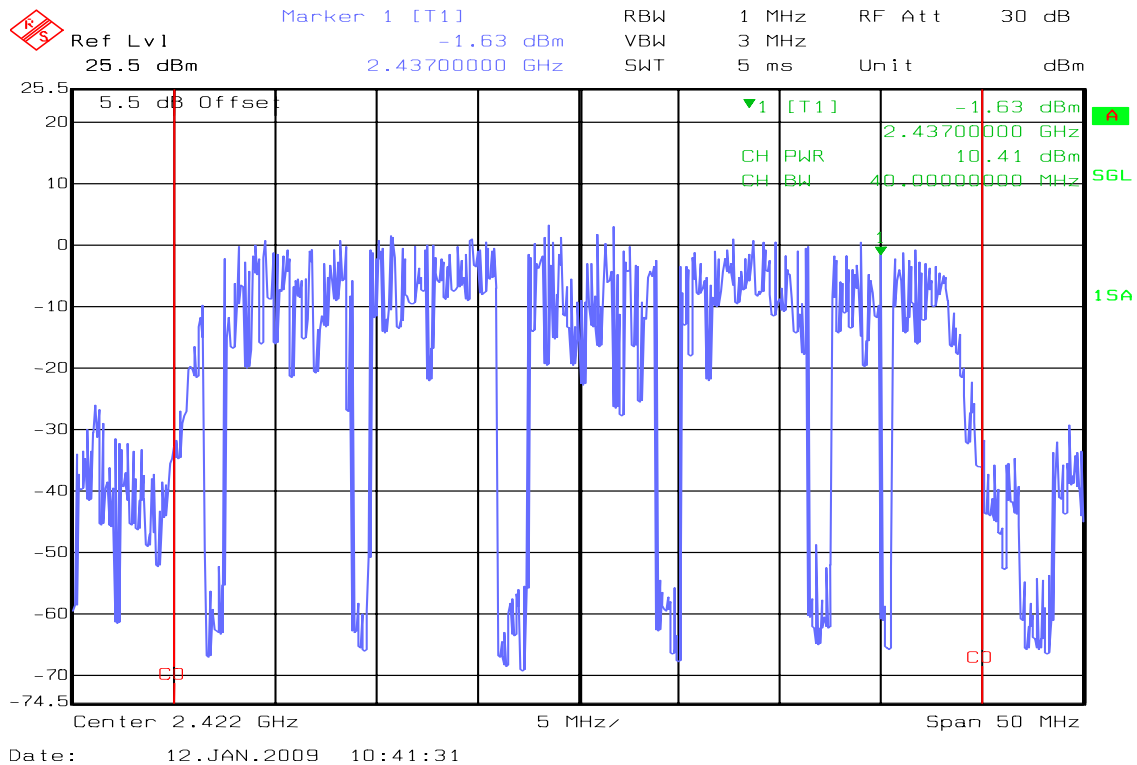


Average power (CH High)



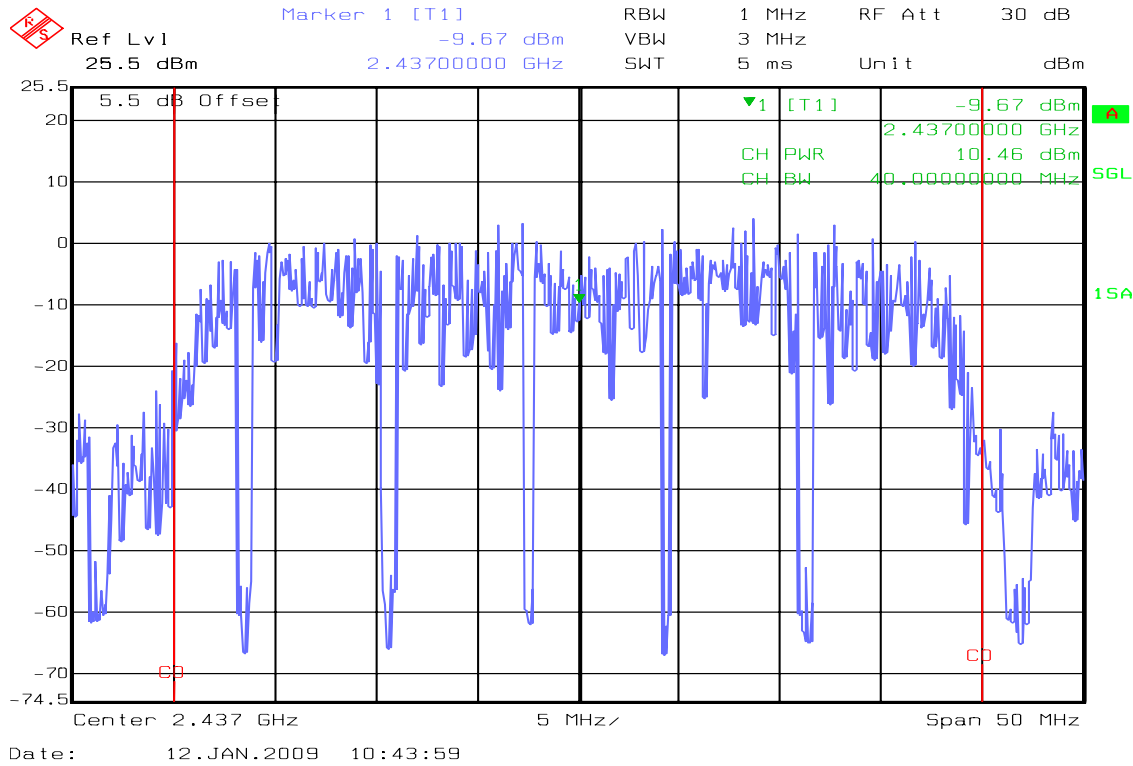
draft 802.11n 40 MHz Channel mode

Average power (CH Low)

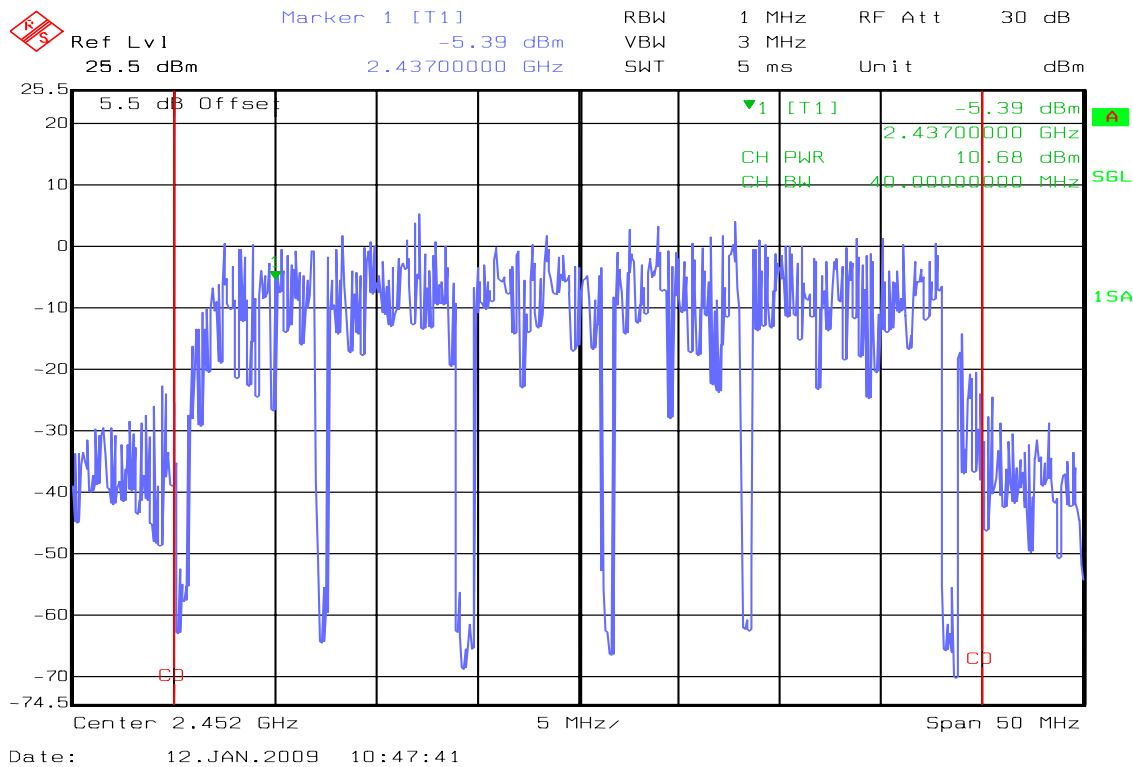




Average power (CH Mid)



Average power (CH High)

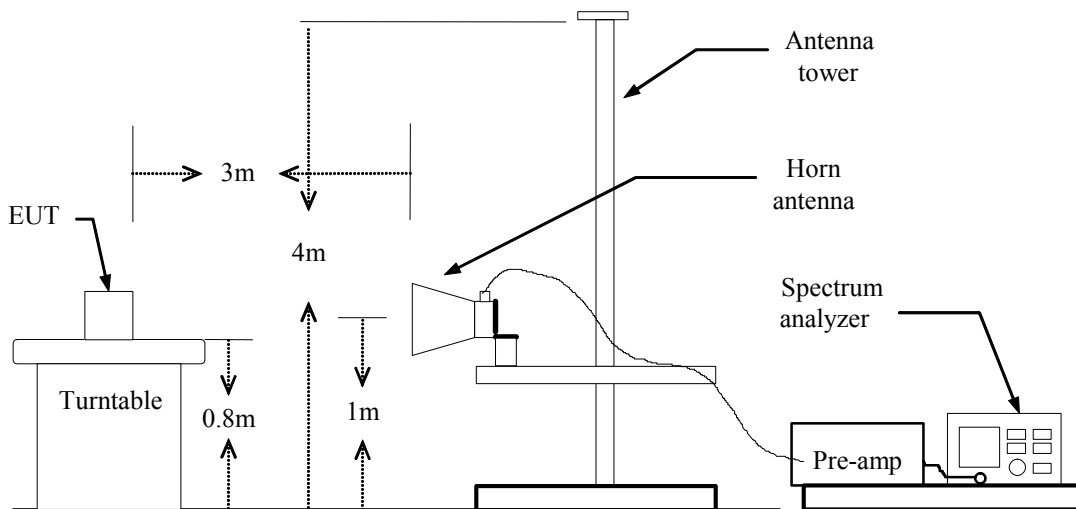


7.4 BAND EDGES MEASUREMENT

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.

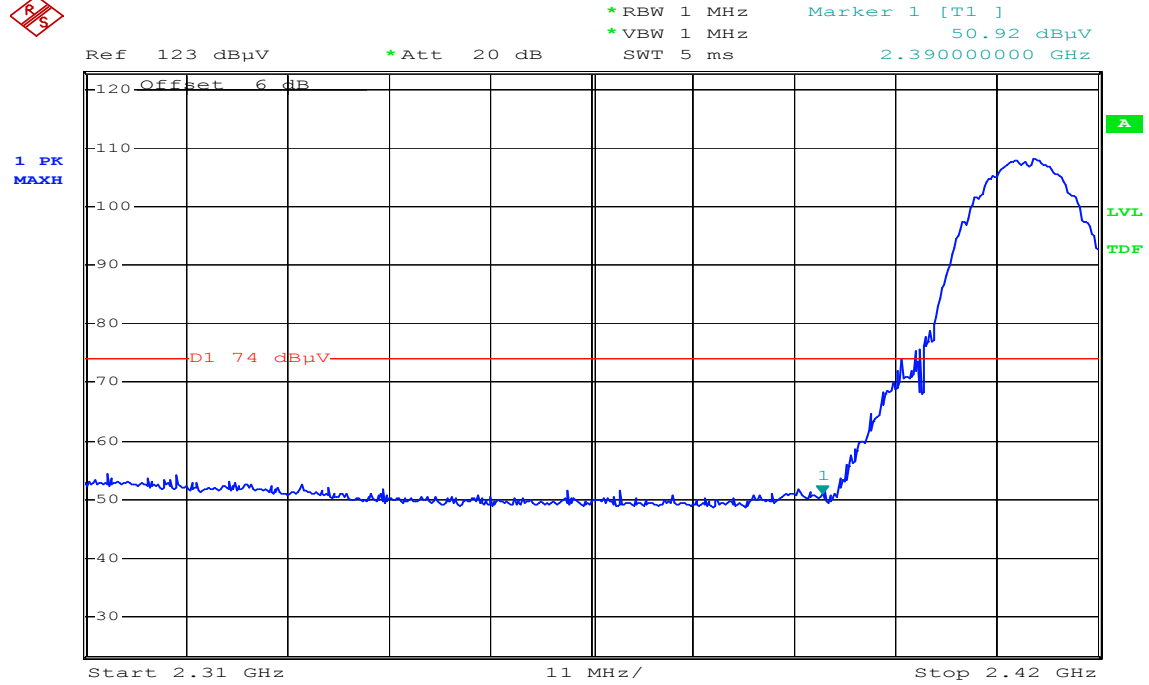


Test Plot

Band Edges (IEEE 802.11b mode / CH Low)

Detector mode: Peak

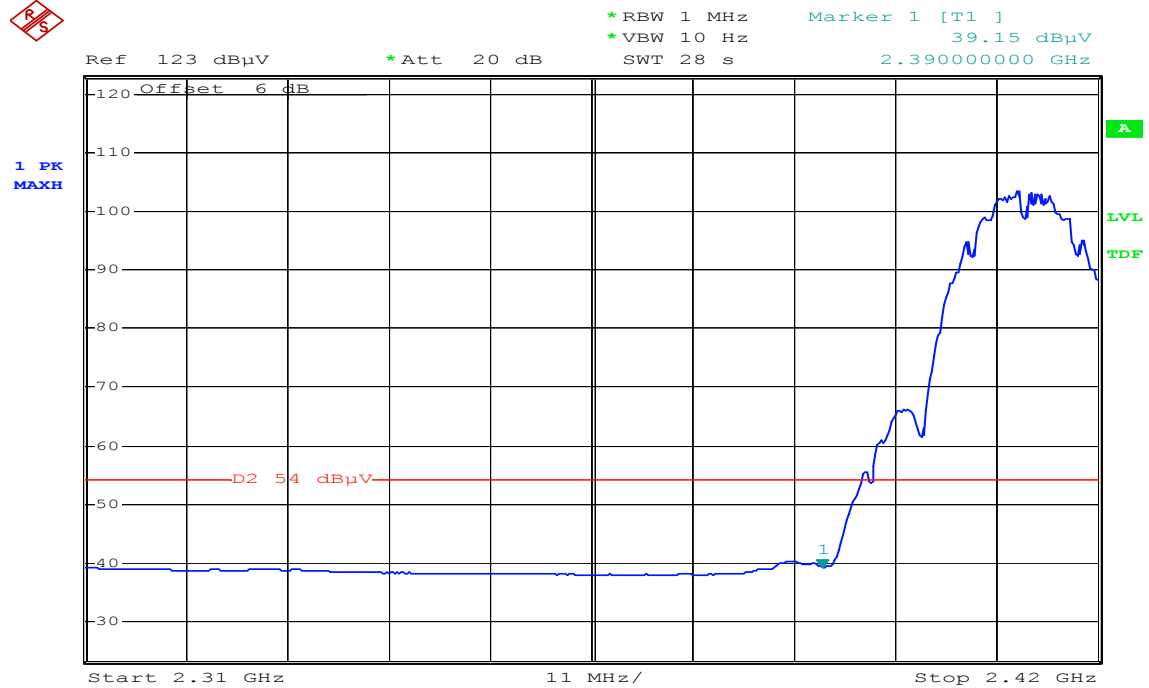
Polarity: Vertical



Date: 16.JAN.2009 09:11:42

Detector mode: Average

Polarity: Vertical

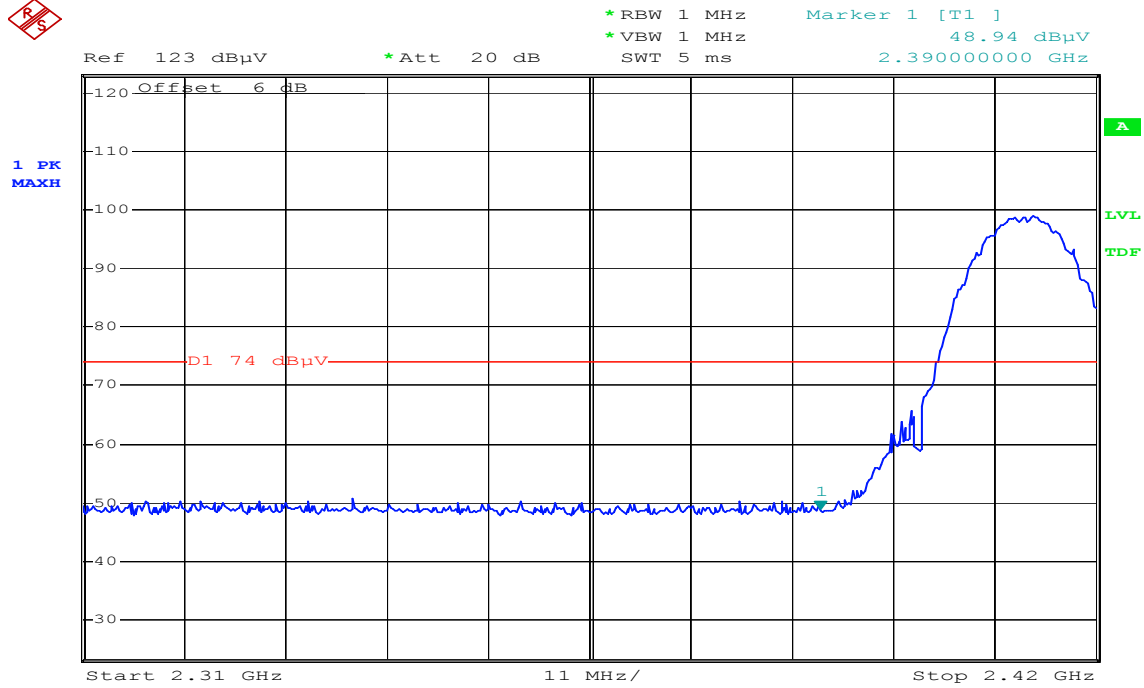


Date: 16.JAN.2009 09:12:32



Detector mode: Peak

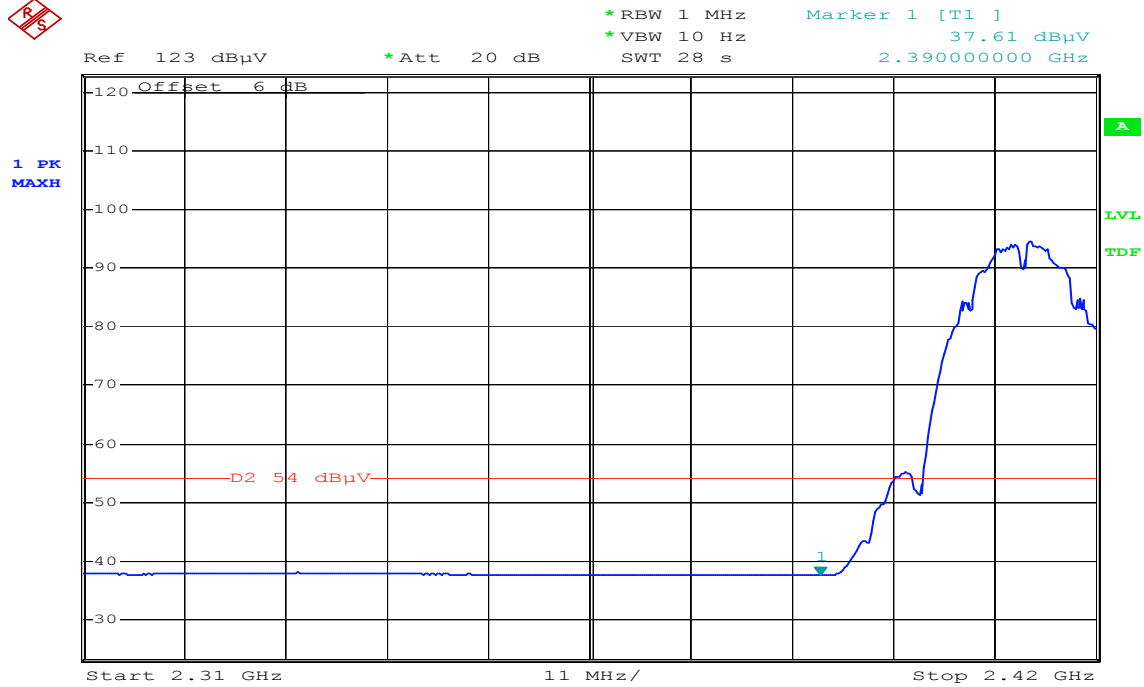
Polarity: Horizontal



Date: 16.JAN.2009 09:08:31

Detector mode: Average

Polarity: Horizontal



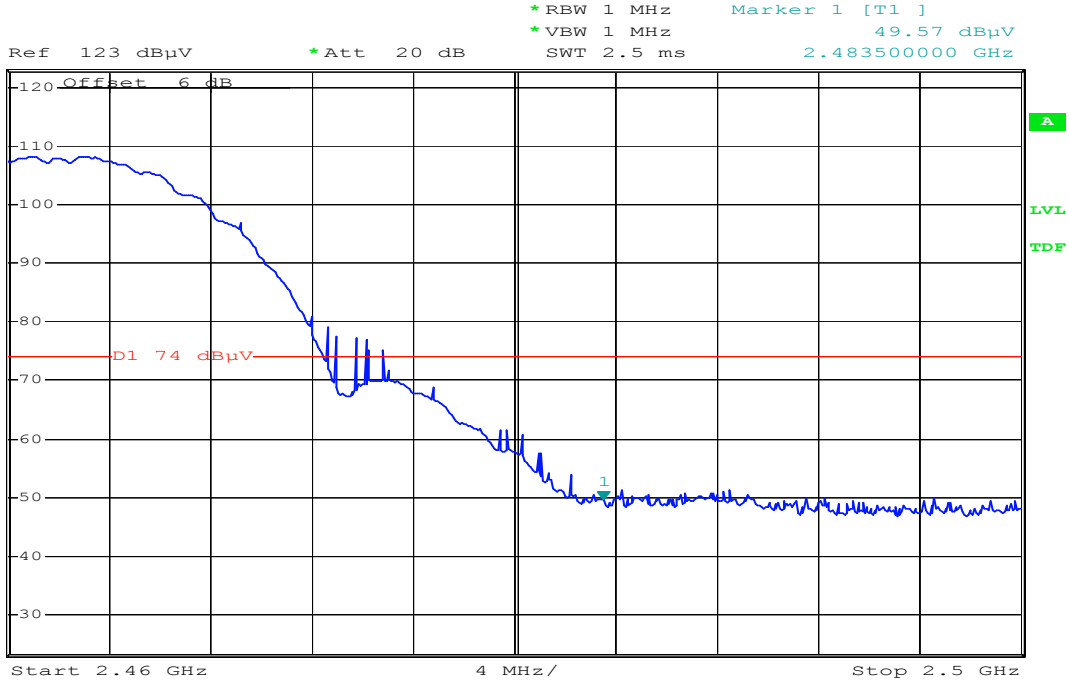
Date: 16.JAN.2009 09:09:24



Band Edges (IEEE 802.11b mode / CH High)

Detector mode: Peak

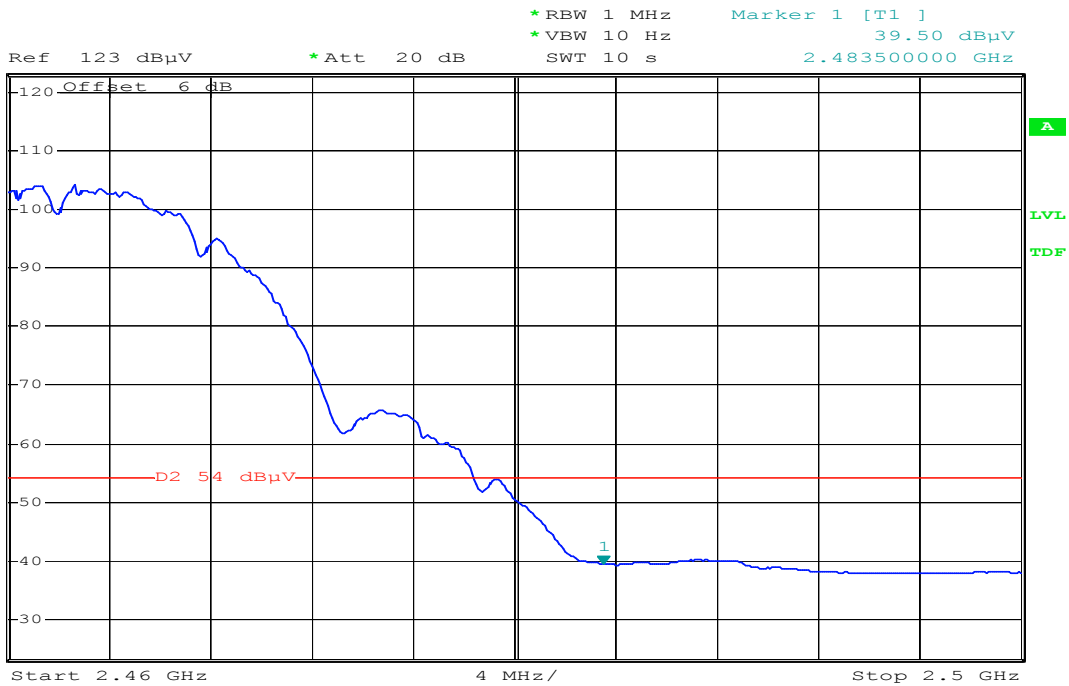
Polarity: Vertical



Date: 16.JAN.2009 16:18:03

Detector mode: Average

Polarity: Vertical

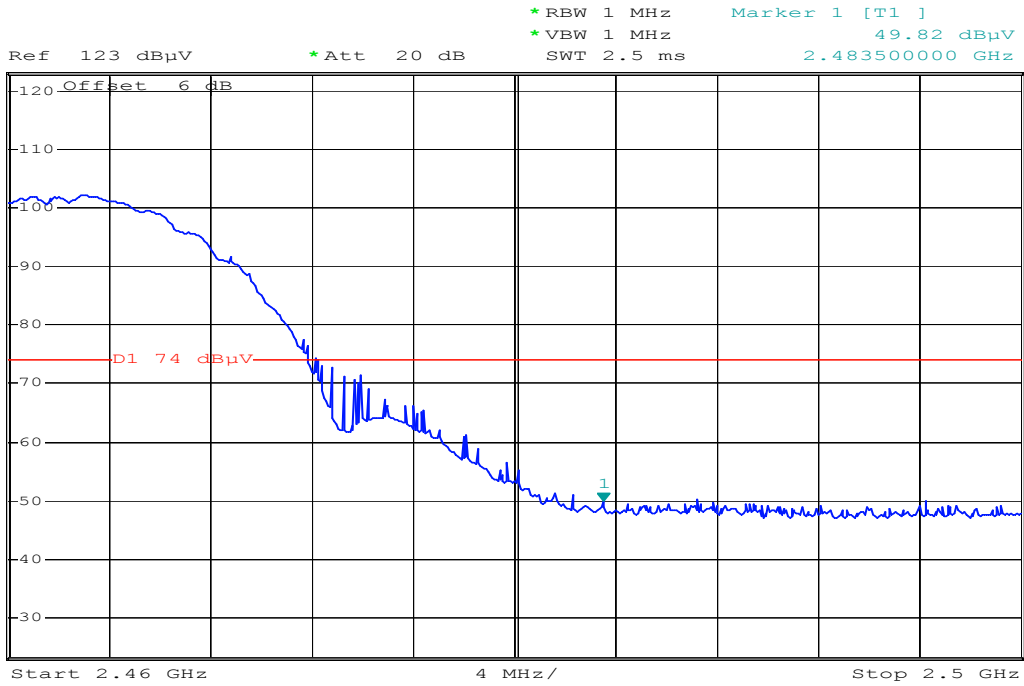


Date: 16.JAN.2009 16:18:38



Detector mode: Peak

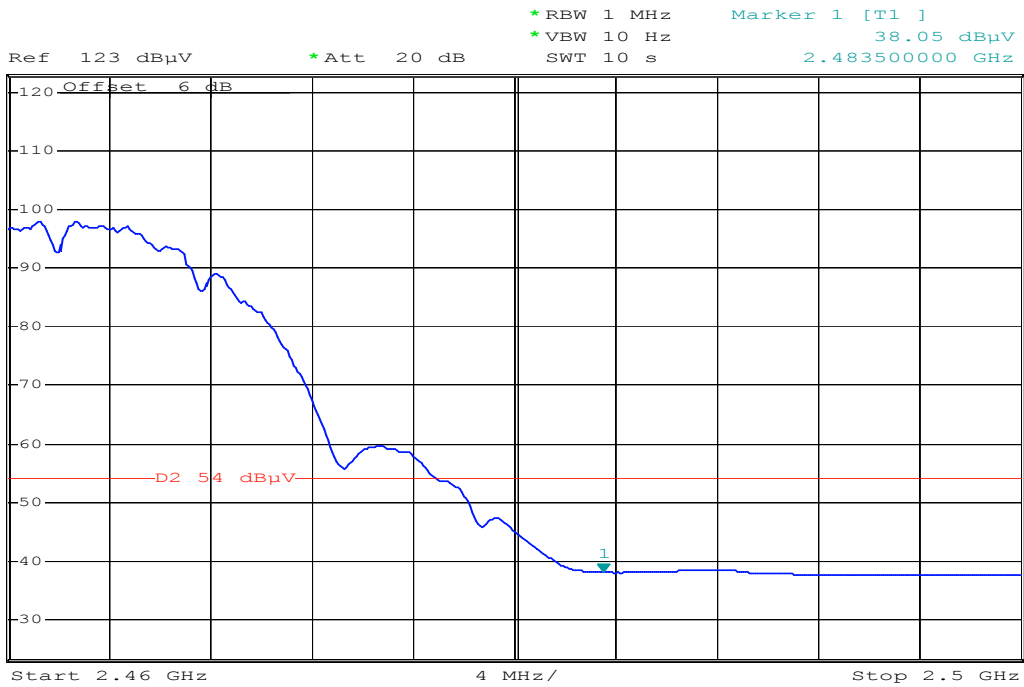
Polarity: Horizontal



Date: 16.JAN.2009 16:16:15

Detector mode: Average

Polarity: Horizontal



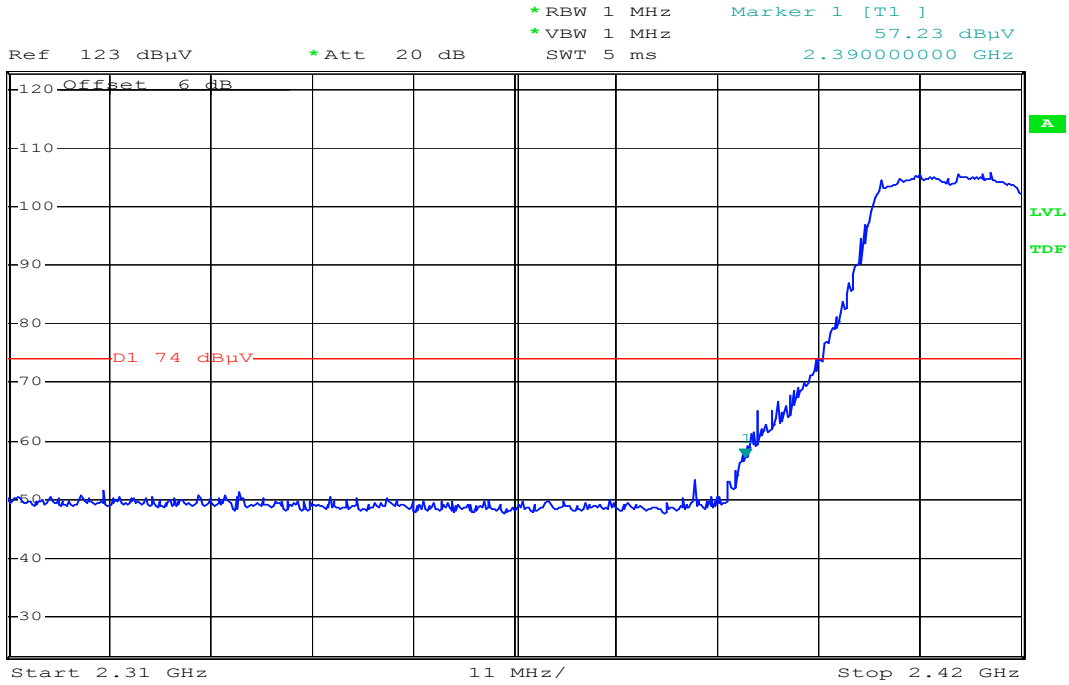
Date: 16.JAN.2009 16:16:56



Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak

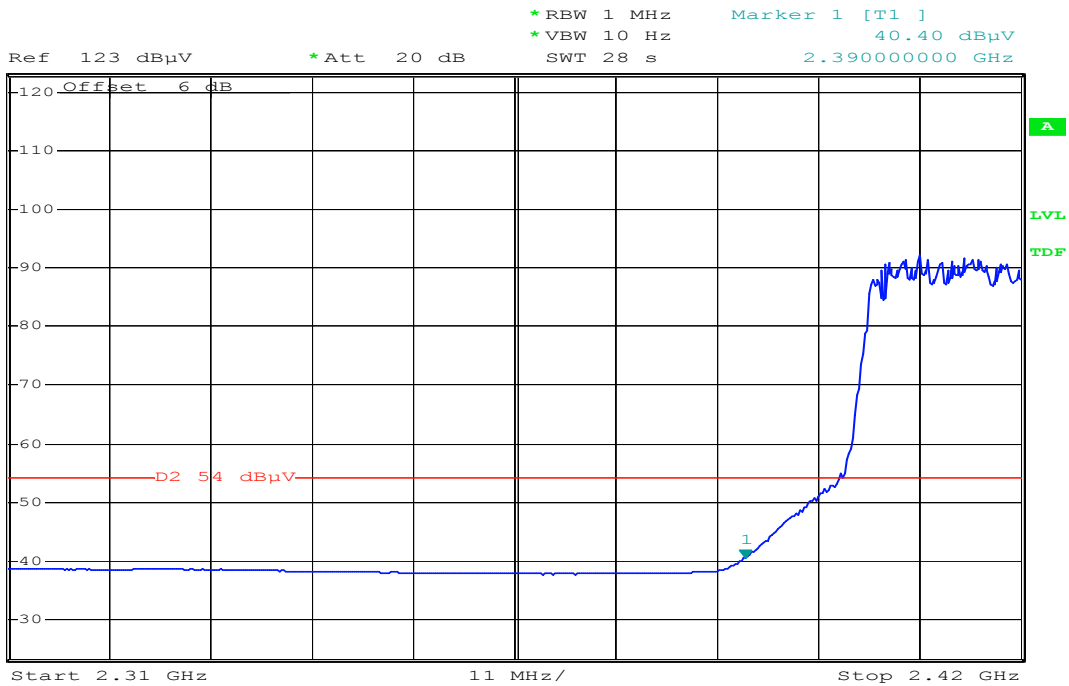
Polarity: Vertical



Date: 16.JAN.2009 10:07:31

Detector mode: Average

Polarity: Vertical

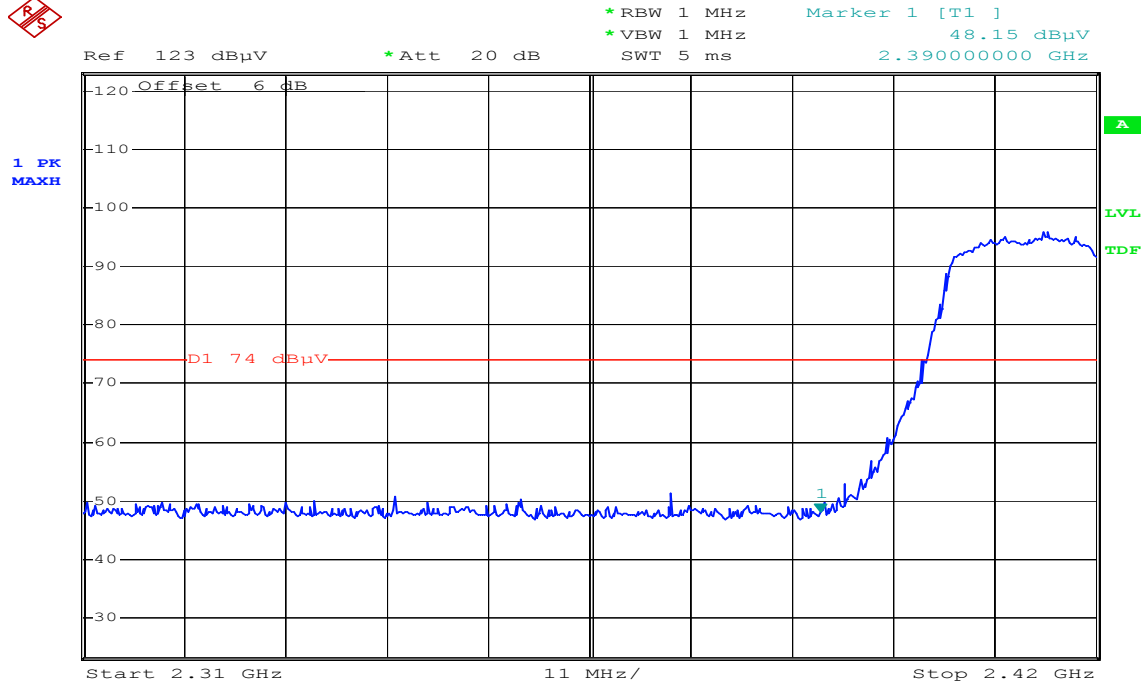


Date: 16.JAN.2009 10:08:20



Detector mode: Peak

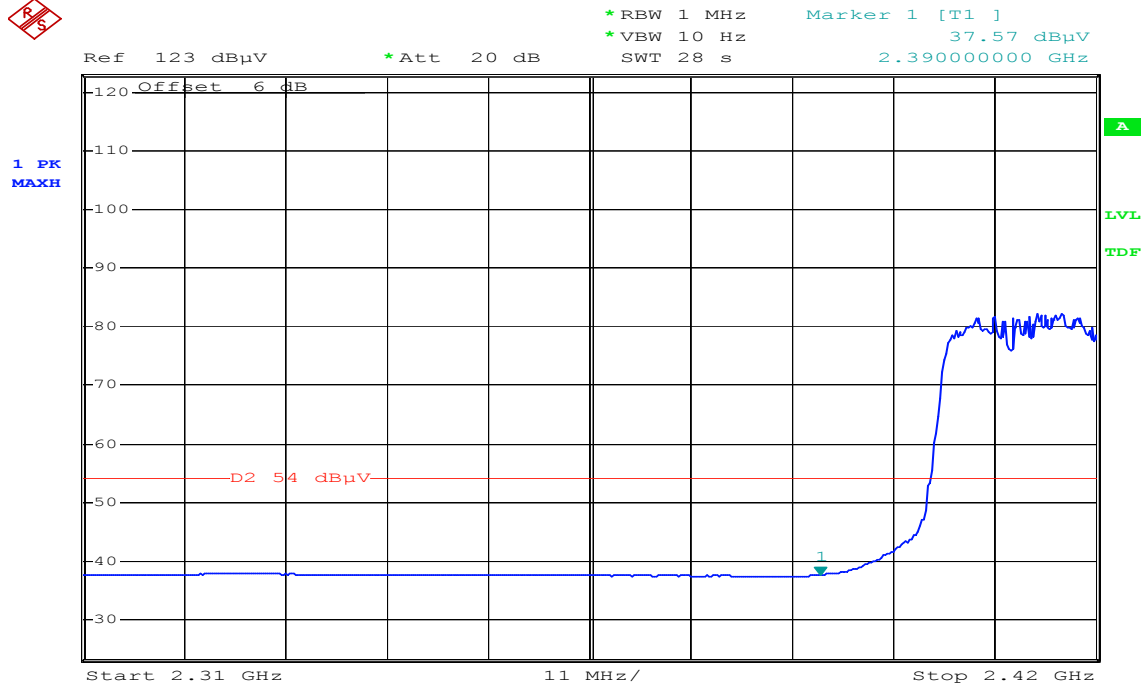
Polarity: Horizontal



Date: 16.JAN.2009 10:10:24

Detector mode: Average

Polarity: Horizontal



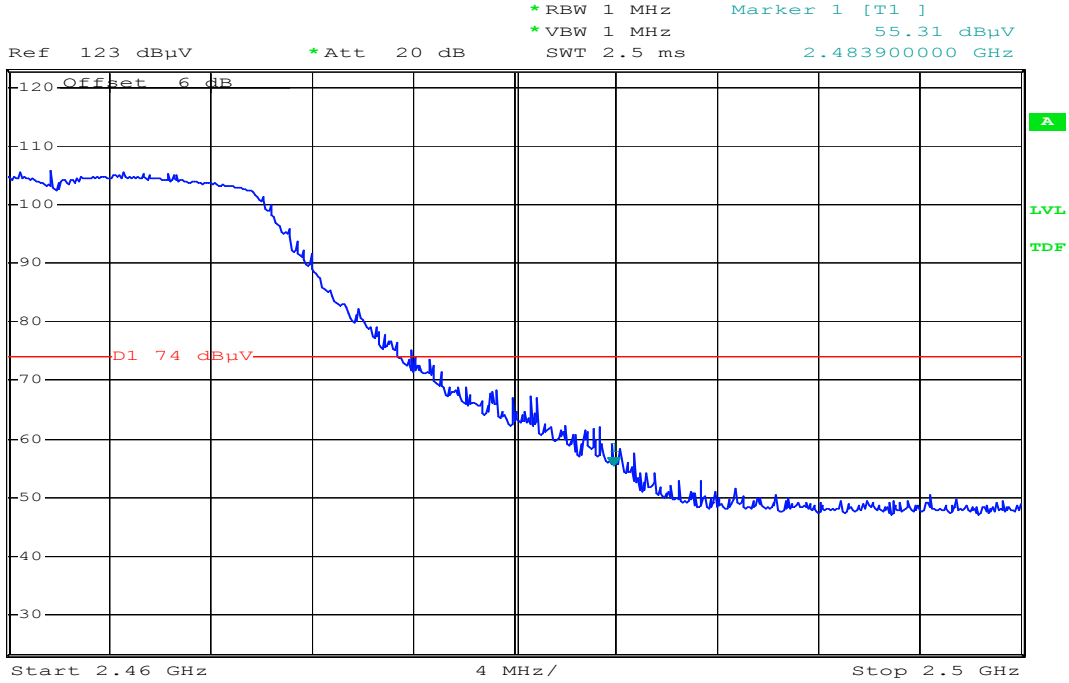
Date: 16.JAN.2009 10:11:13



Band Edges (IEEE 802.11g mode / CH High)

Detector mode: Peak

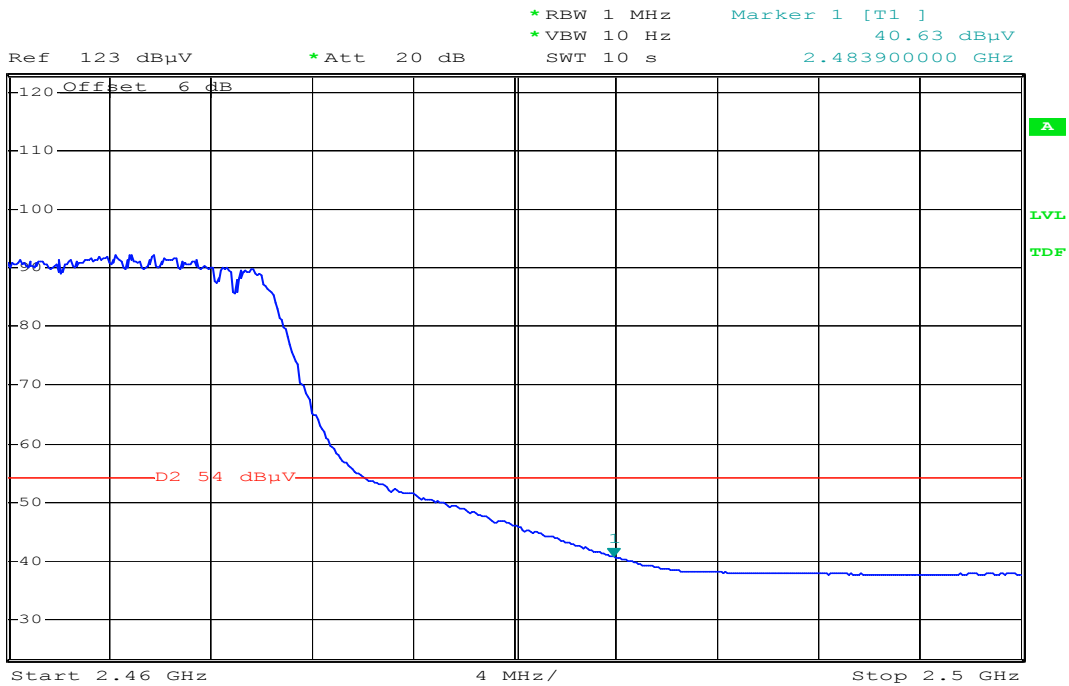
Polarity: Vertical



Date: 16.JAN.2009 15:49:03

Detector mode: Average

Polarity: Vertical



Date: 16.JAN.2009 15:49:58

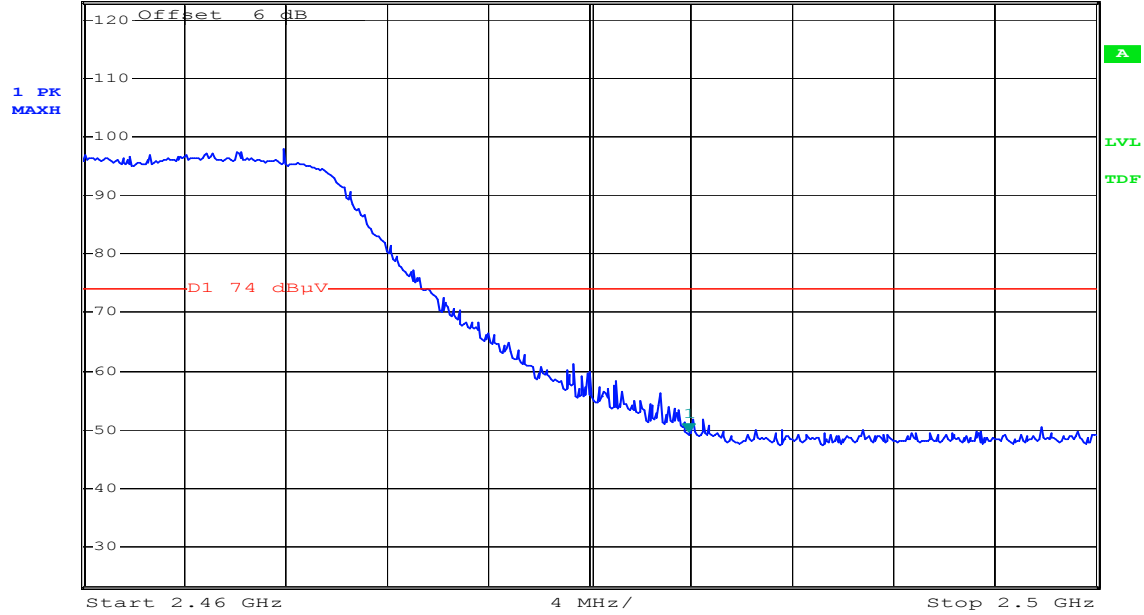


Detector mode: Peak

Polarity: Horizontal



Ref 123 dB μ V *Att 20 dB *RBW 1 MHz Marker 1 [T1] *VBW 1 MHz 49.52 dB μ V SWT 2.5 ms 2.483900000 GHz



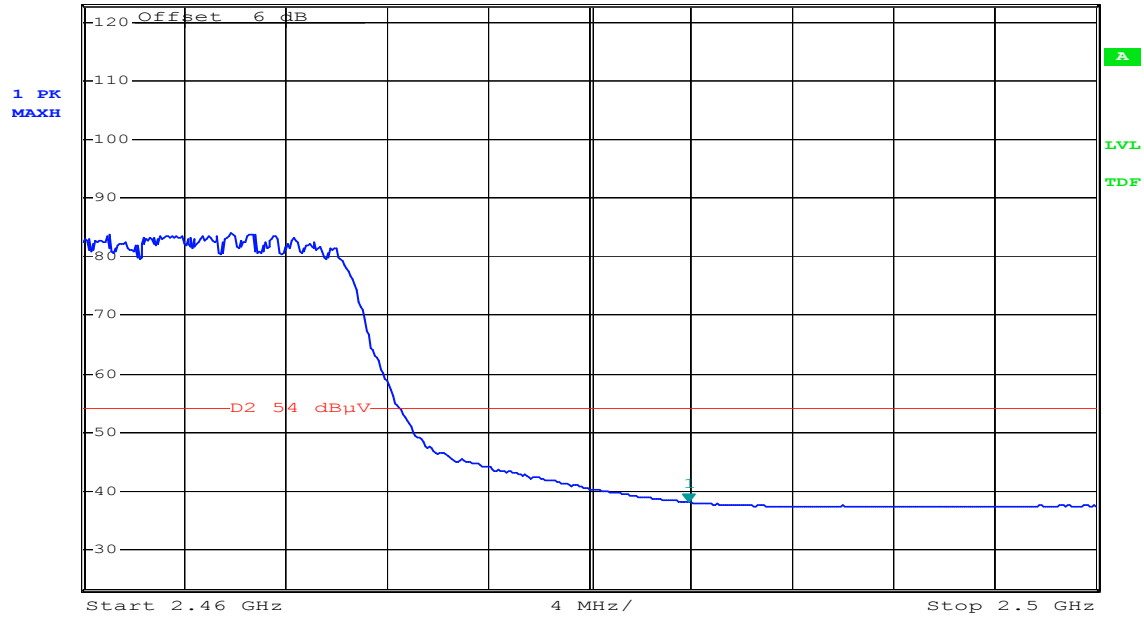
Date: 16.JAN.2009 15:51:21

Detector mode: Average

Polarity: Horizontal



Ref 123 dB μ V *Att 20 dB *RBW 1 MHz Marker 1 [T1] *VBW 10 Hz 38.03 dB μ V SWT 10 s 2.483900000 GHz



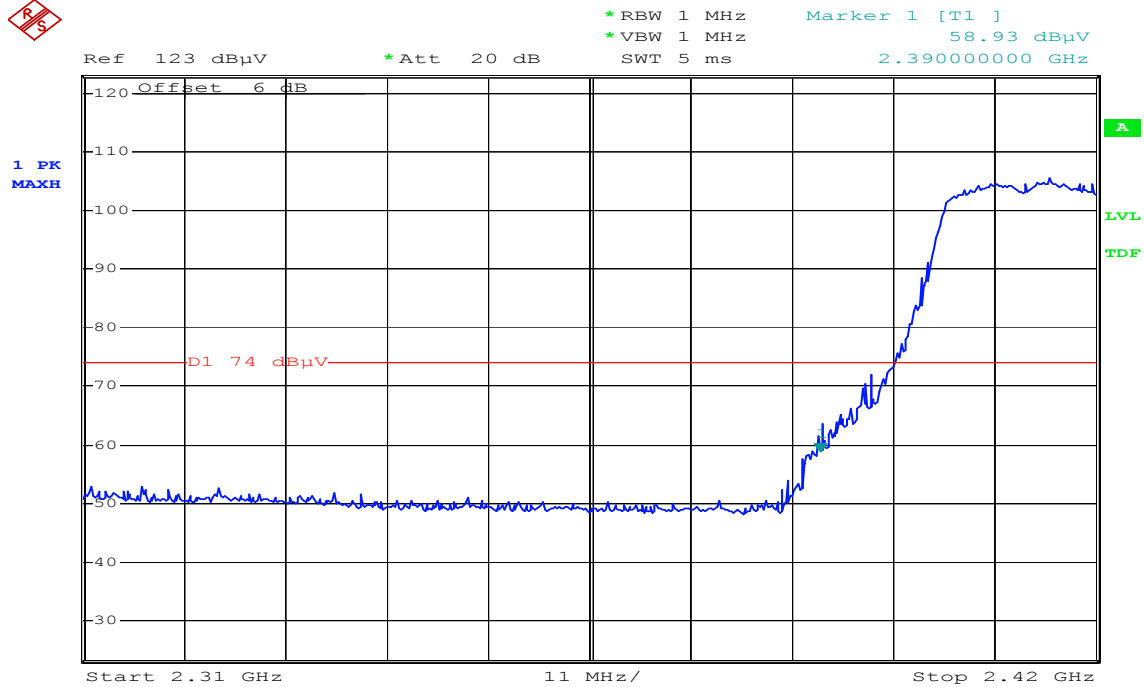
Date: 16.JAN.2009 15:51:59



Band Edges (draft 802.11n 20 MHz Channel mode / CH Low)

Detector mode: Peak

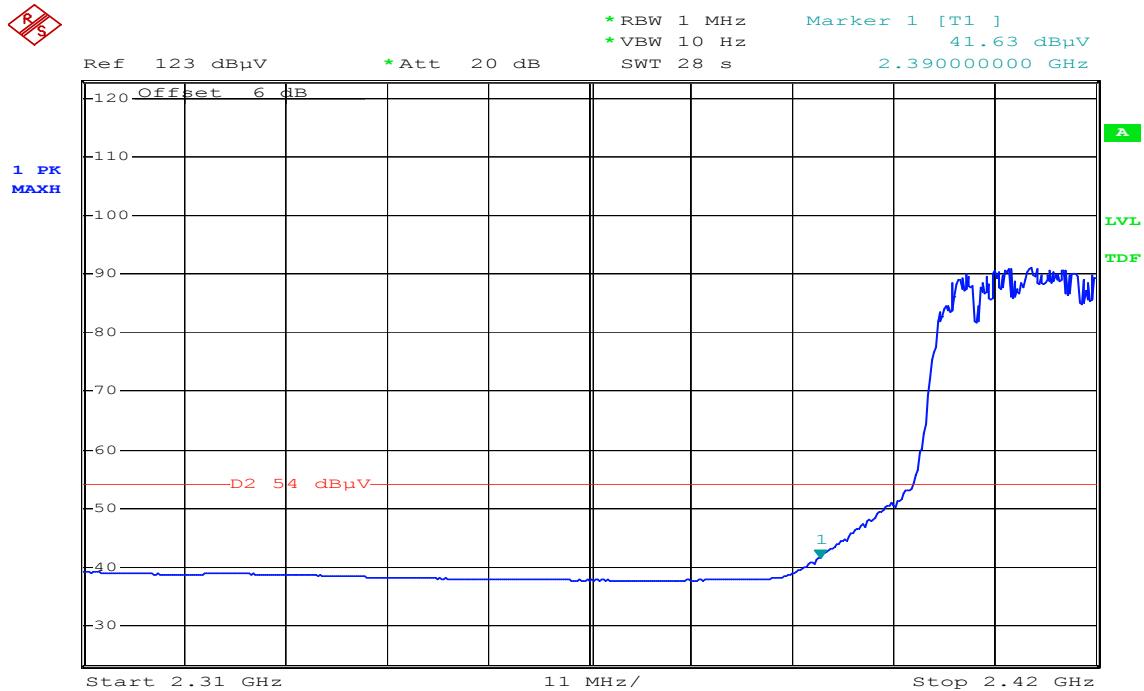
Polarity: Vertical



Date: 16.JAN.2009 10:18:38

Detector mode: Average

Polarity: Vertical



Date: 16.JAN.2009 10:19:27

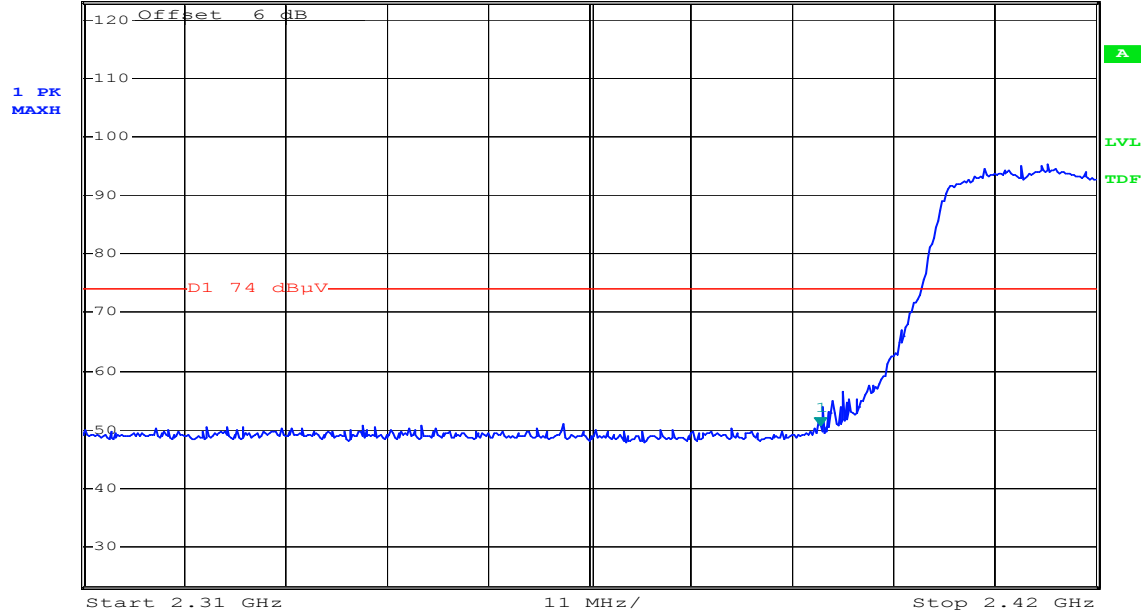


Detector mode: Peak

Polarity: Horizontal



Ref 123 dB μ V *Att 20 dB *RBW 1 MHz Marker 1 [T1] 50.59 dB μ V
*VBW 1 MHz 2.390000000 GHz
SWT 5 ms



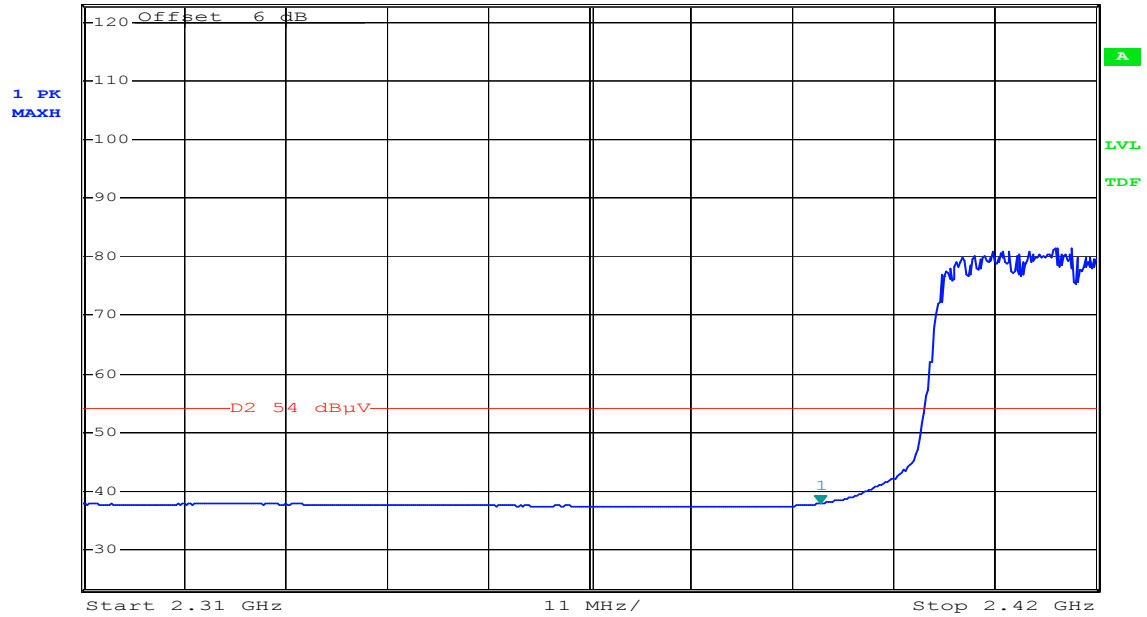
Date: 16.JAN.2009 10:15:53

Detector mode: Average

Polarity: Horizontal



Ref 123 dB μ V *Att 20 dB *RBW 1 MHz Marker 1 [T1] 37.80 dB μ V
*VBW 10 Hz 2.390000000 GHz
SWT 28 s



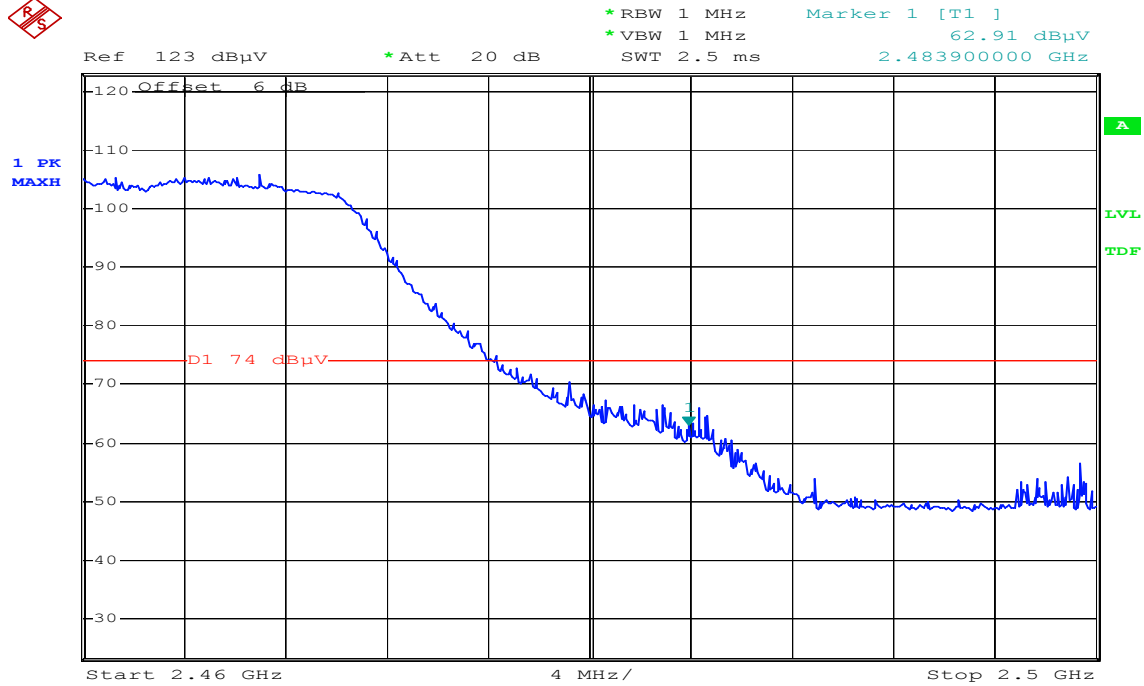
Date: 16.JAN.2009 10:16:57



Band Edges (draft 802.11n 20 MHz Channel mode / CH High)

Detector mode: Peak

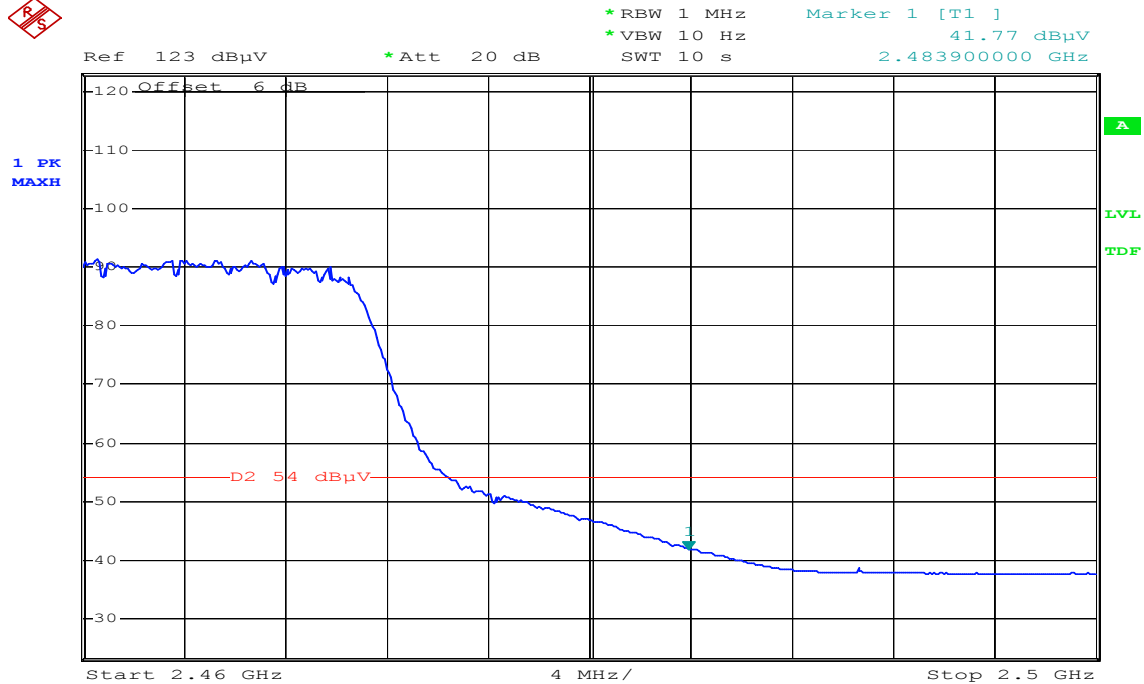
Polarity: Vertical



Date: 16.JAN.2009 15:36:58

Detector mode: Average

Polarity: Vertical

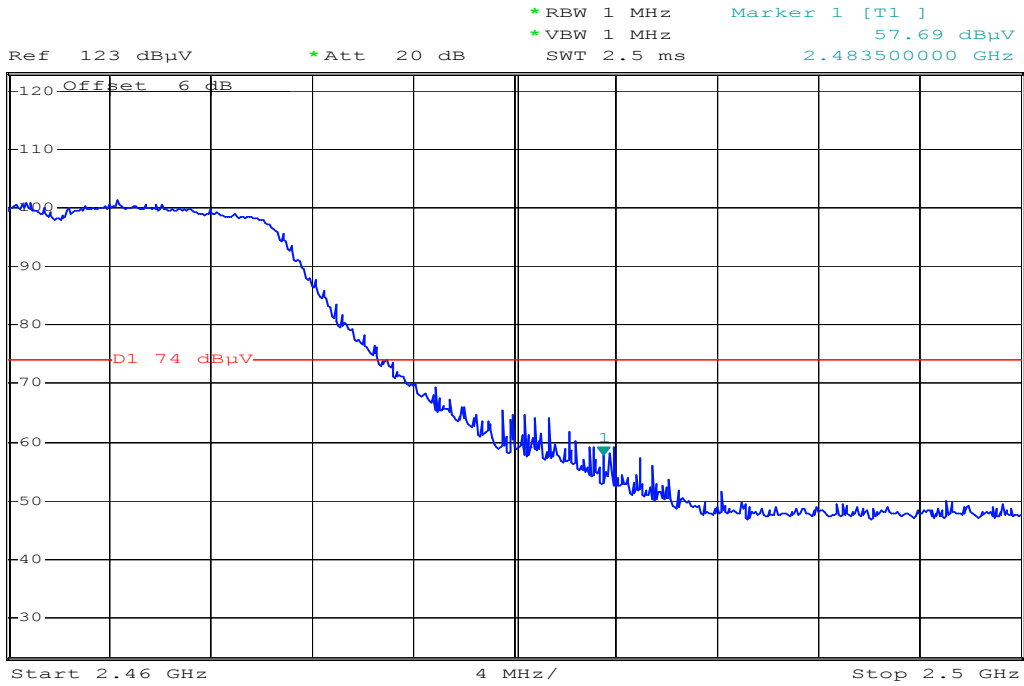


Date: 16.JAN.2009 15:37:51



Detector mode: Peak

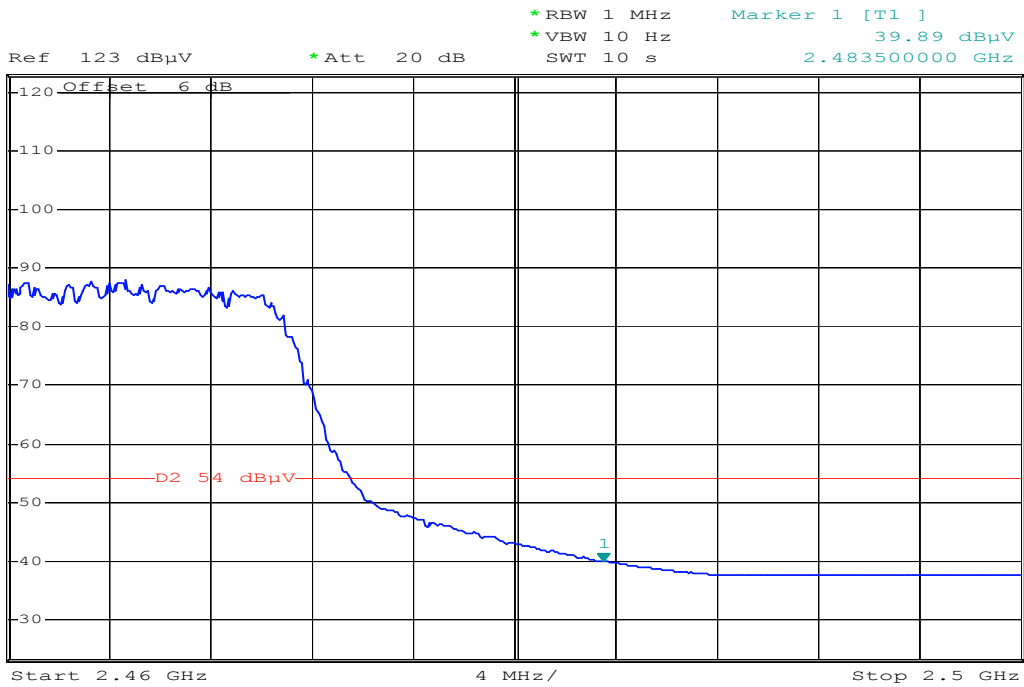
Polarity: Horizontal



Date: 16.JAN.2009 15:33:33

Detector mode: Average

Polarity: Horizontal



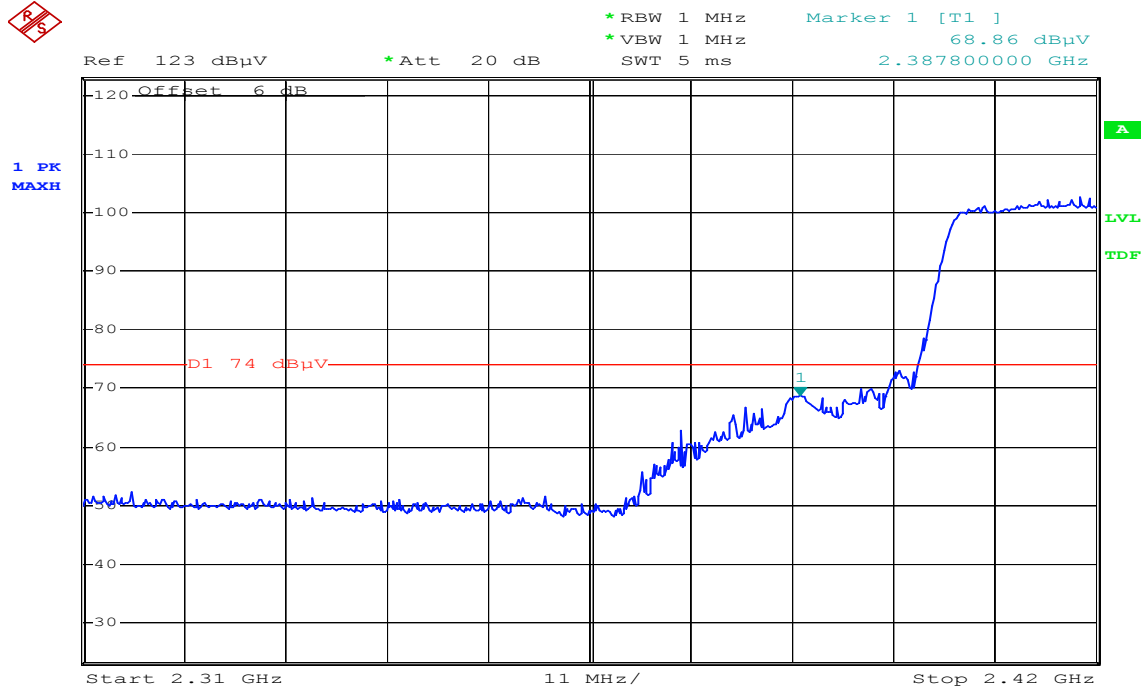
Date: 16.JAN.2009 15:34:25



Band Edges (draft 802.11n 40 MHz Channel mode / CH Low)

Detector mode: Peak

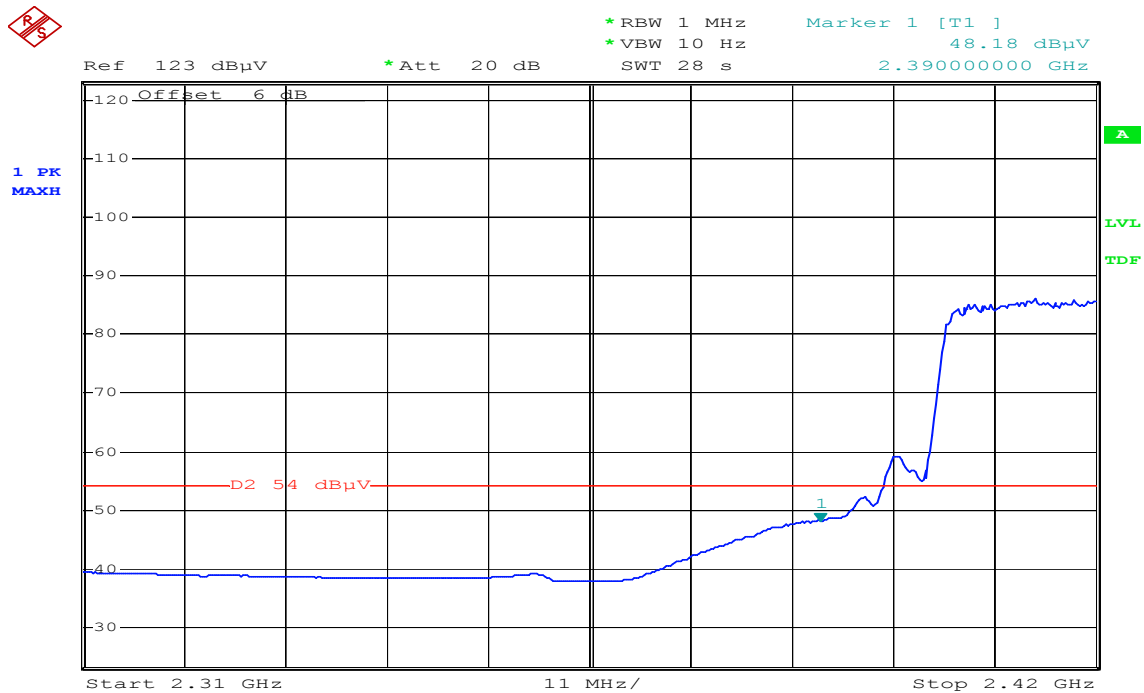
Polarity: Vertical



Date: 16.JAN.2009 11:57:13

Detector mode: Average

Polarity: Vertical

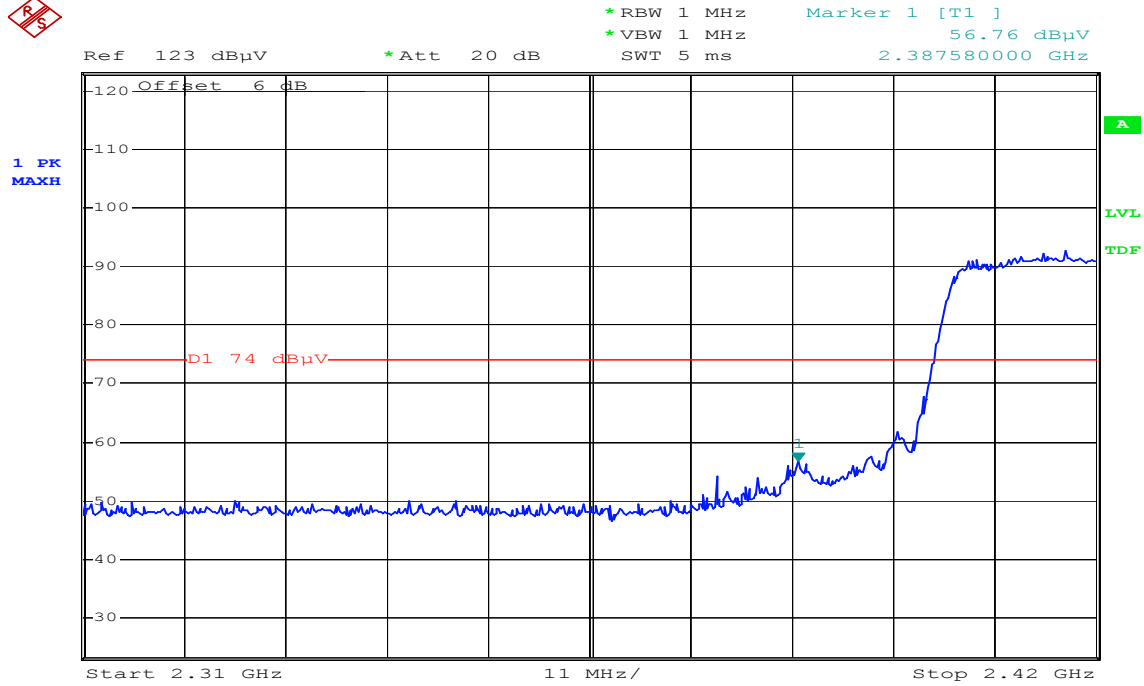


Date: 16.JAN.2009 11:58:51



Detector mode: Peak

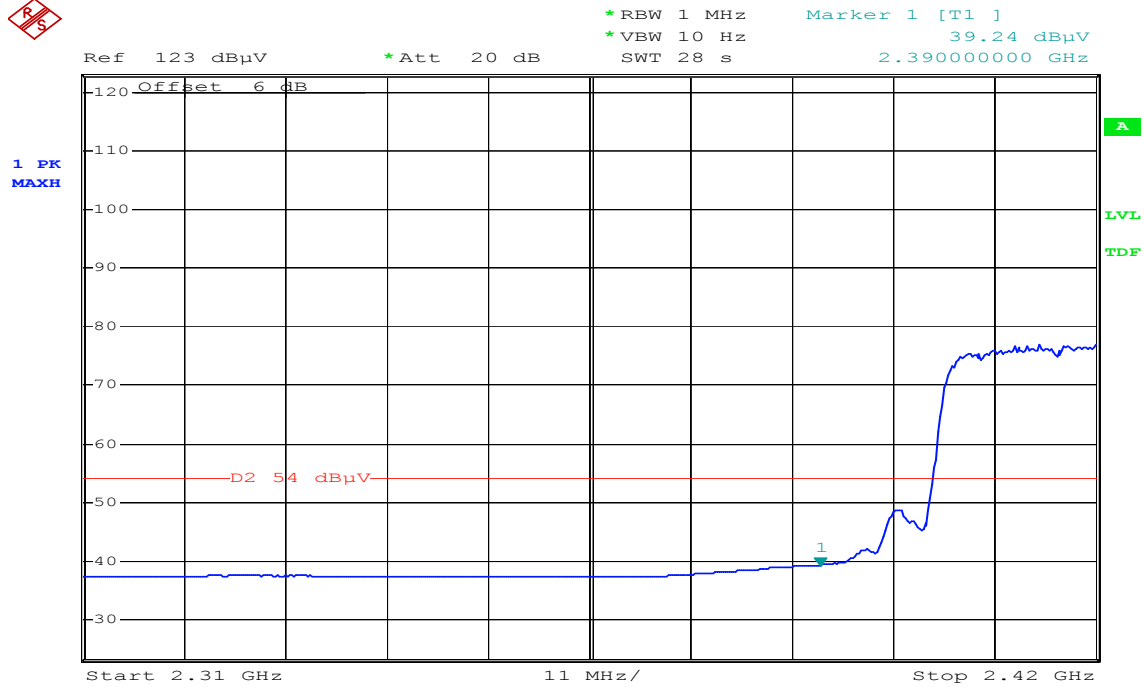
Polarity: Horizontal



Date: 16.JAN.2009 12:01:47

Detector mode: Average

Polarity: Horizontal



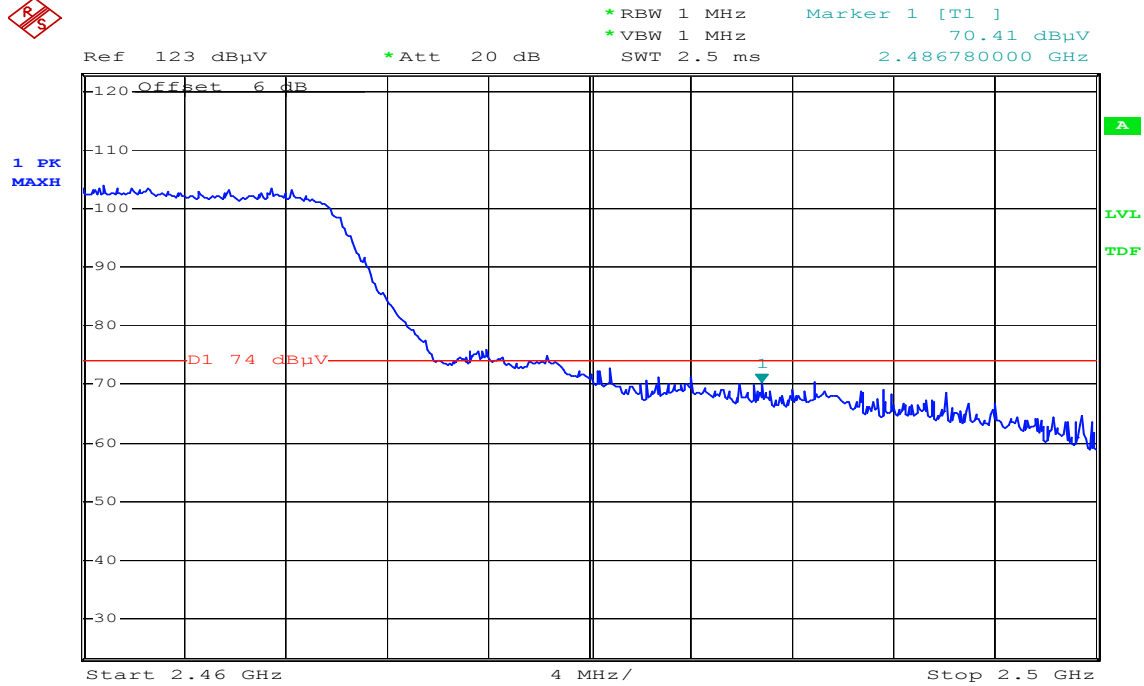
Date: 16.JAN.2009 12:02:51



Band Edges (draft 802.11n 40 MHz Channel mode / CH High)

Detector mode: Peak

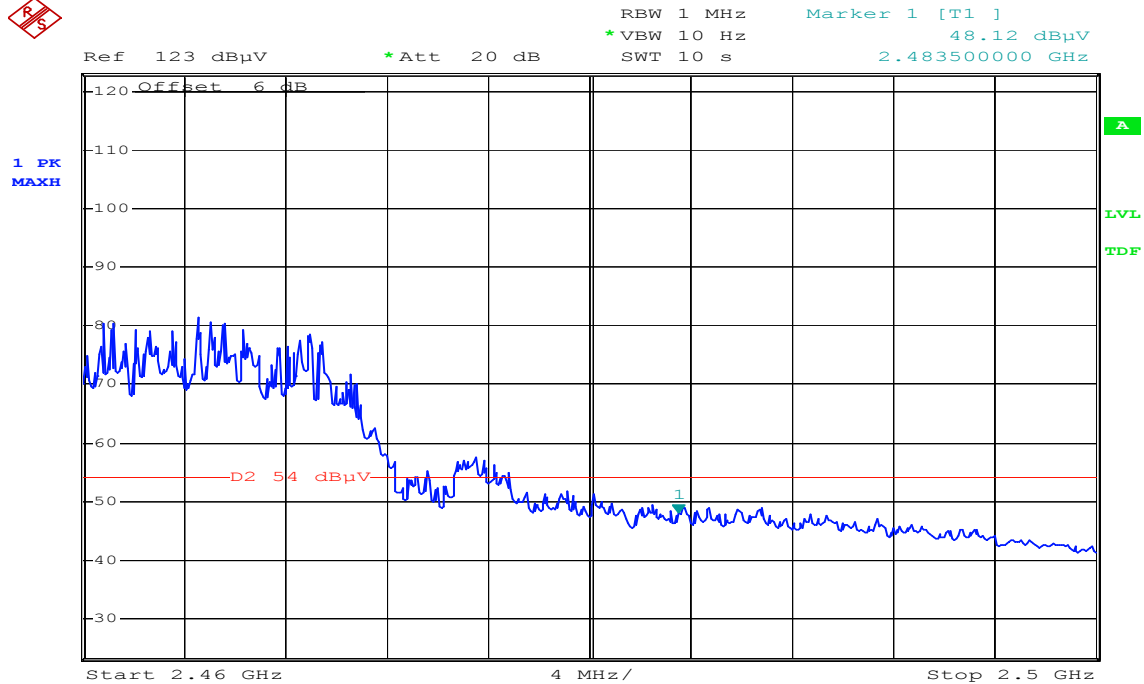
Polarity: Vertical



Date: 16.JAN.2009 12:29:02

Detector mode: Average

Polarity: Vertical

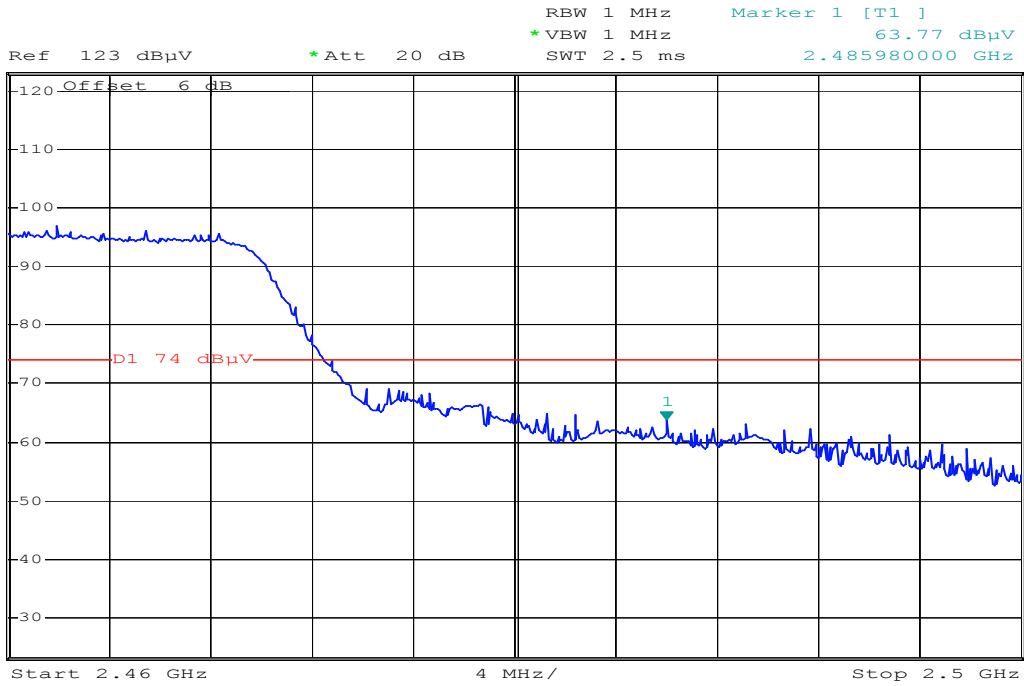


Date: 16.JAN.2009 12:32:17



Detector mode: Peak

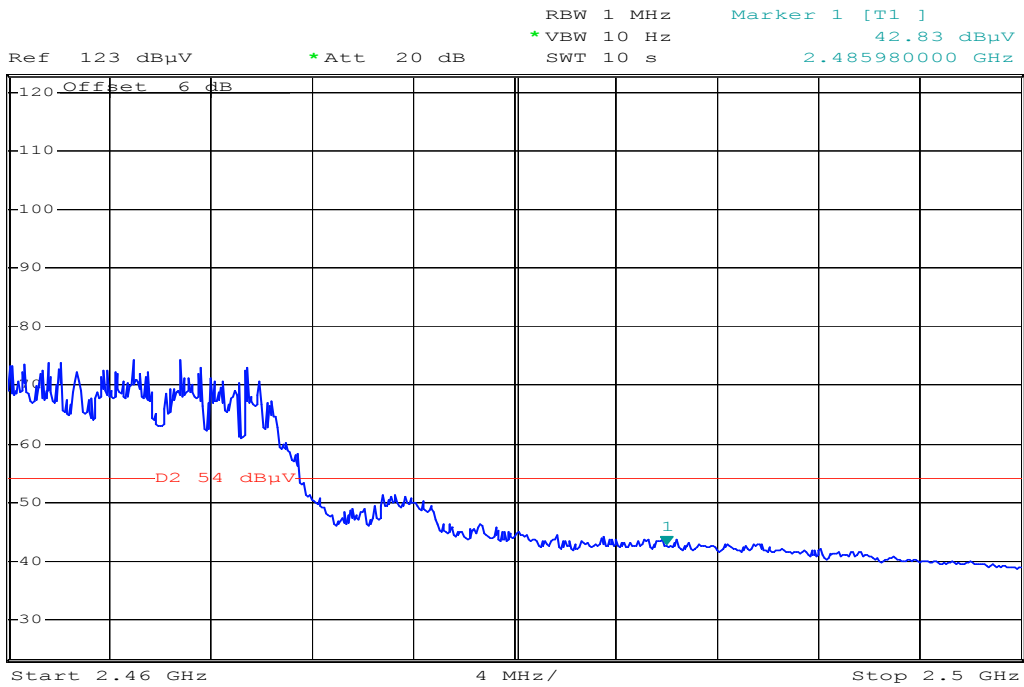
Polarity: Horizontal



Date: 16.JAN.2009 12:34:25

Detector mode: Average

Polarity: Horizontal



Date: 16.JAN.2009 12:35:26

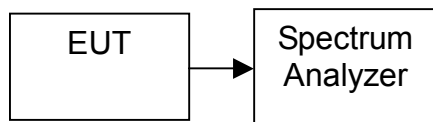


7.5 PEAK POWER SPECTRAL DENSITY

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 = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
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	-6.65	8.00	PASS
Mid	2437	-7.26		PASS
High	2462	-7.10		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-12.48	8.00	PASS
Mid	2437	-13.67		PASS
High	2462	-13.75		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-13.08	8.00	PASS
Mid	2437	-14.24		PASS
High	2462	-13.12		PASS

Test mode: draft 802.11n 40 MHz Channel mode

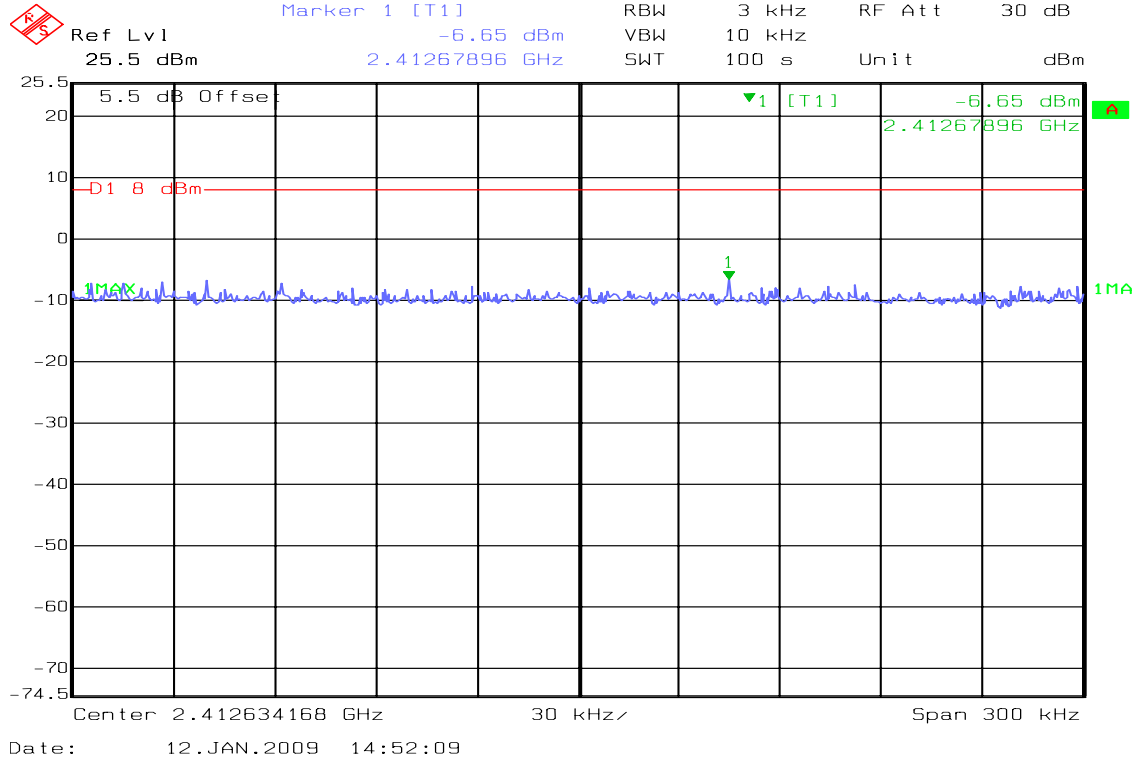
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-14.66	8.00	PASS
Mid	2437	-17.08		PASS
High	2452	-16.38		PASS



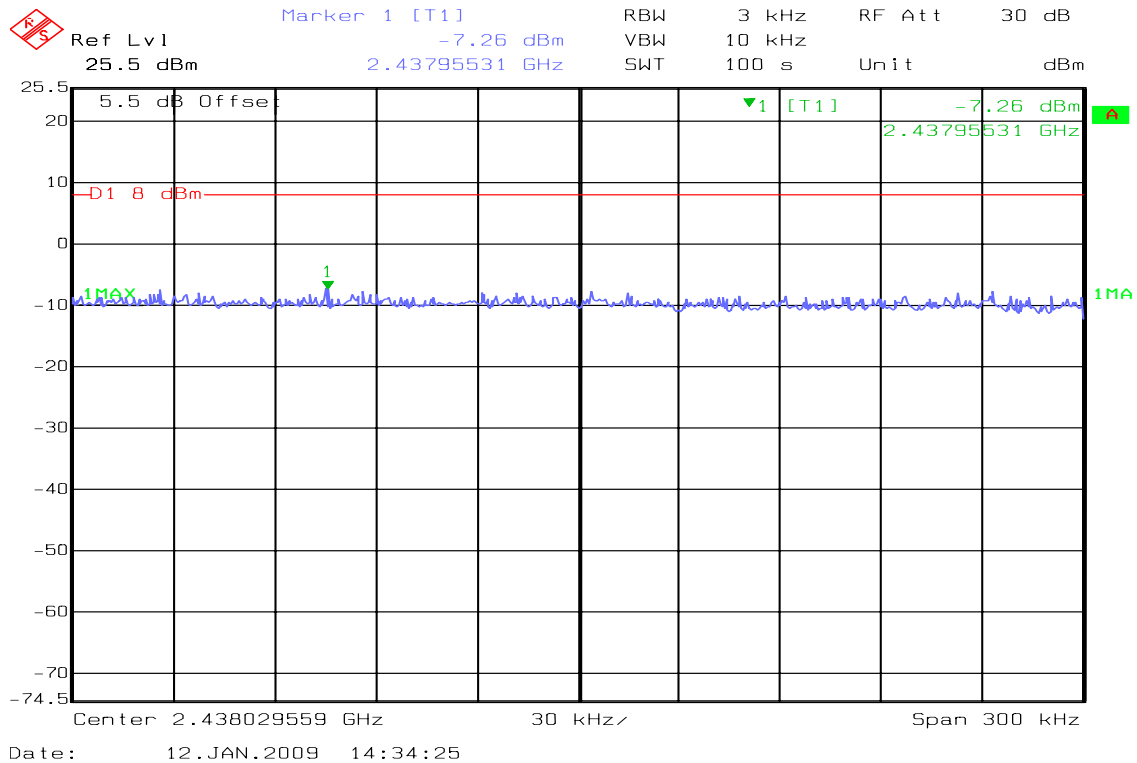
Test Plot

IEEE 802.11b mode

PPSD (CH Low)

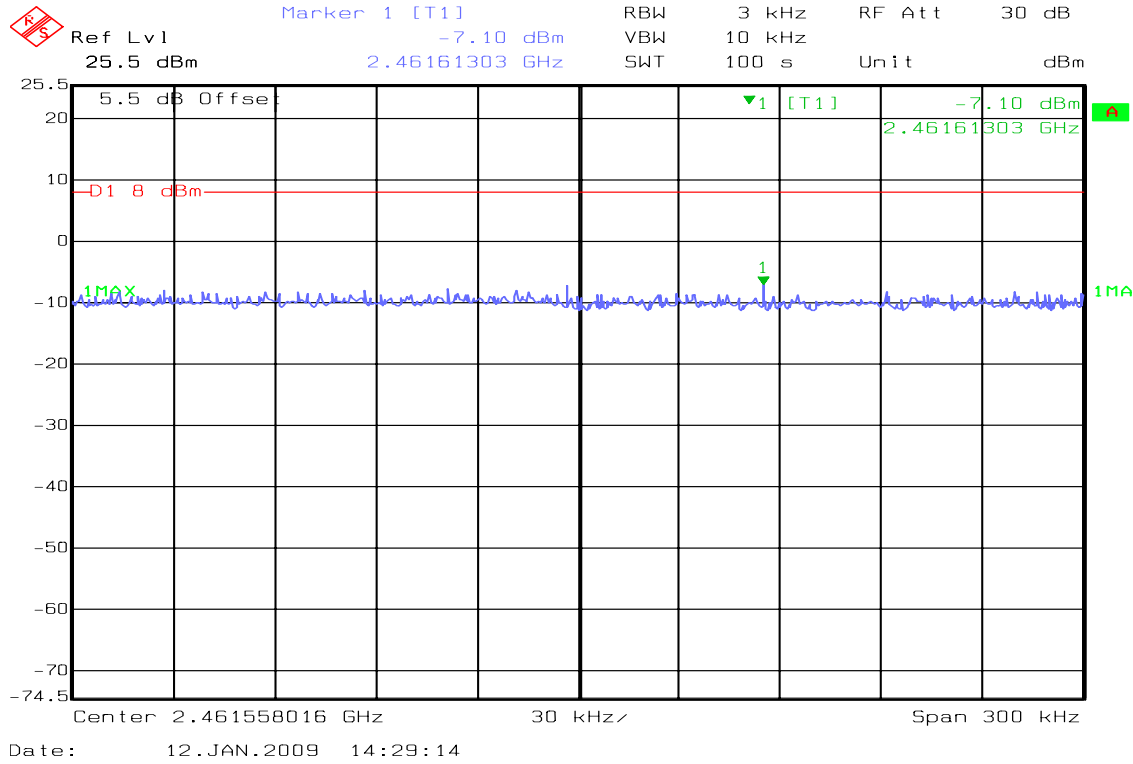


PPSD (CH Mid)



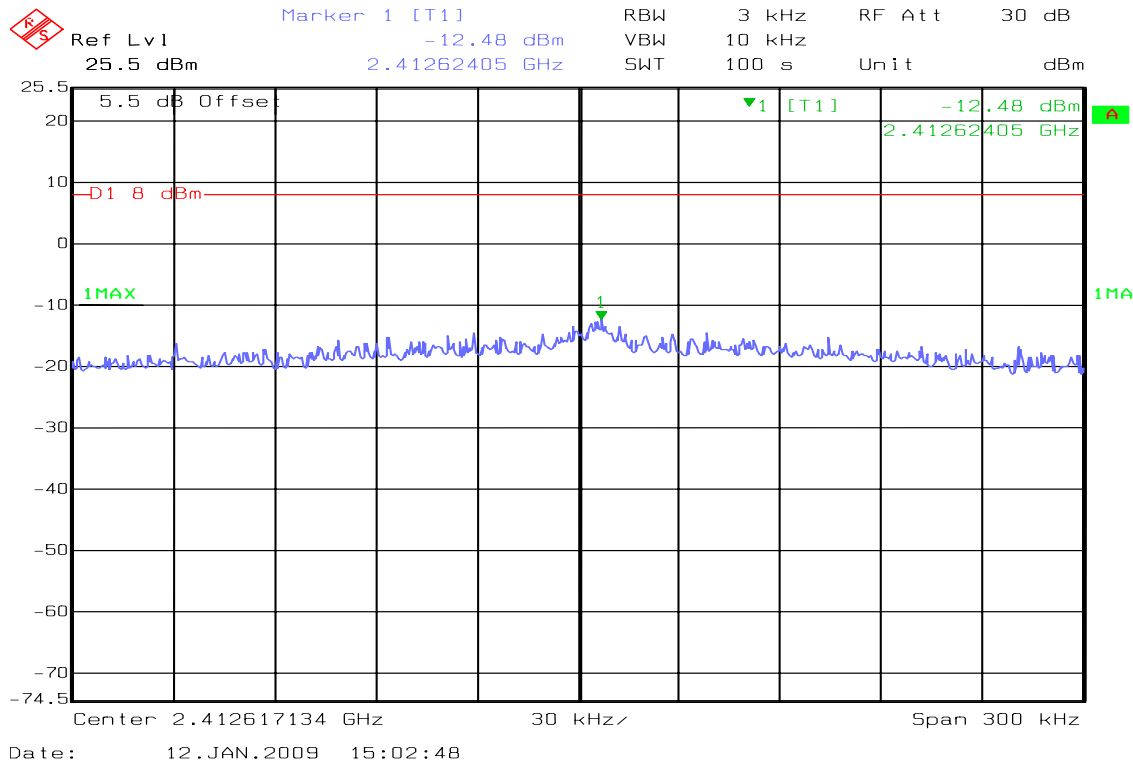


PPSD (CH High)



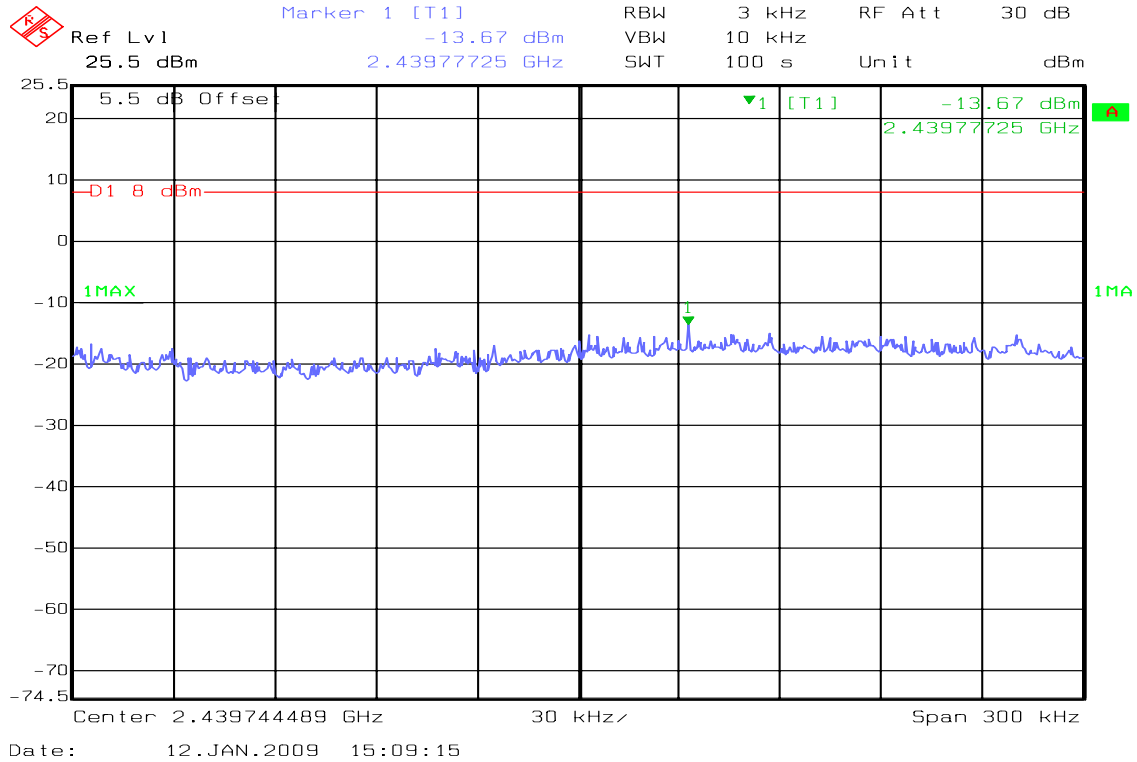
IEEE 802.11g mode

PPSD (CH Low)

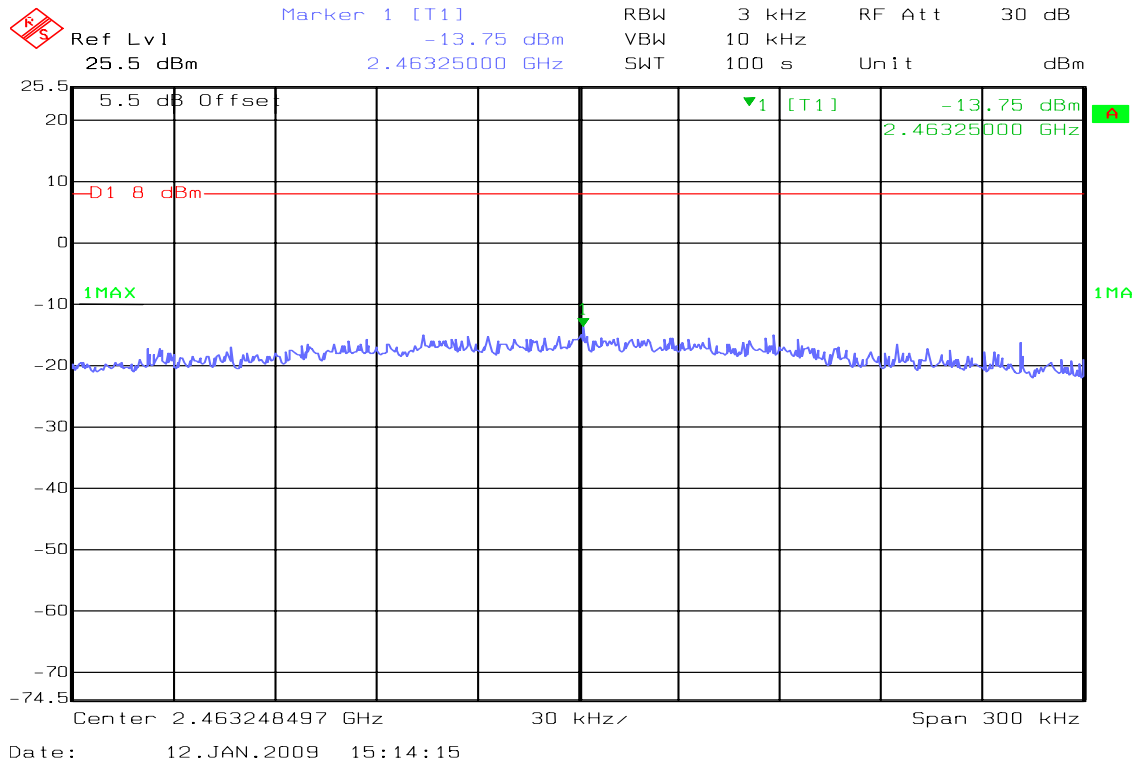




PPSD (CH Mid)



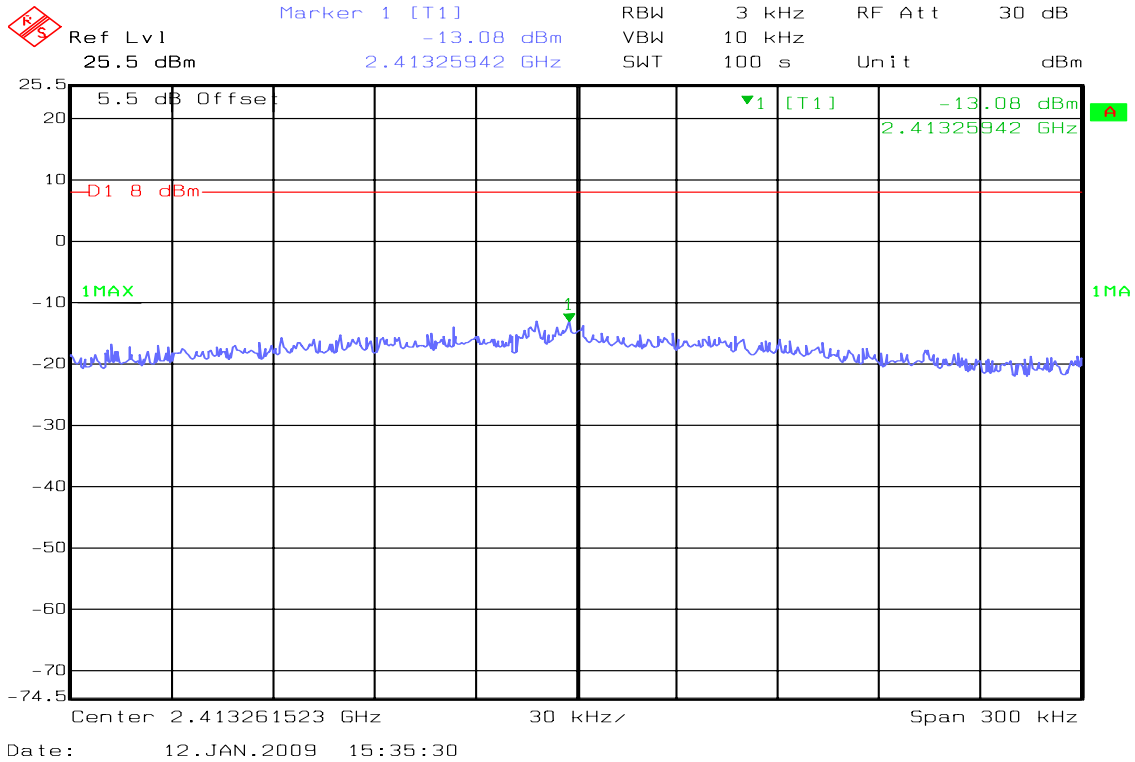
PPSD (CH High)



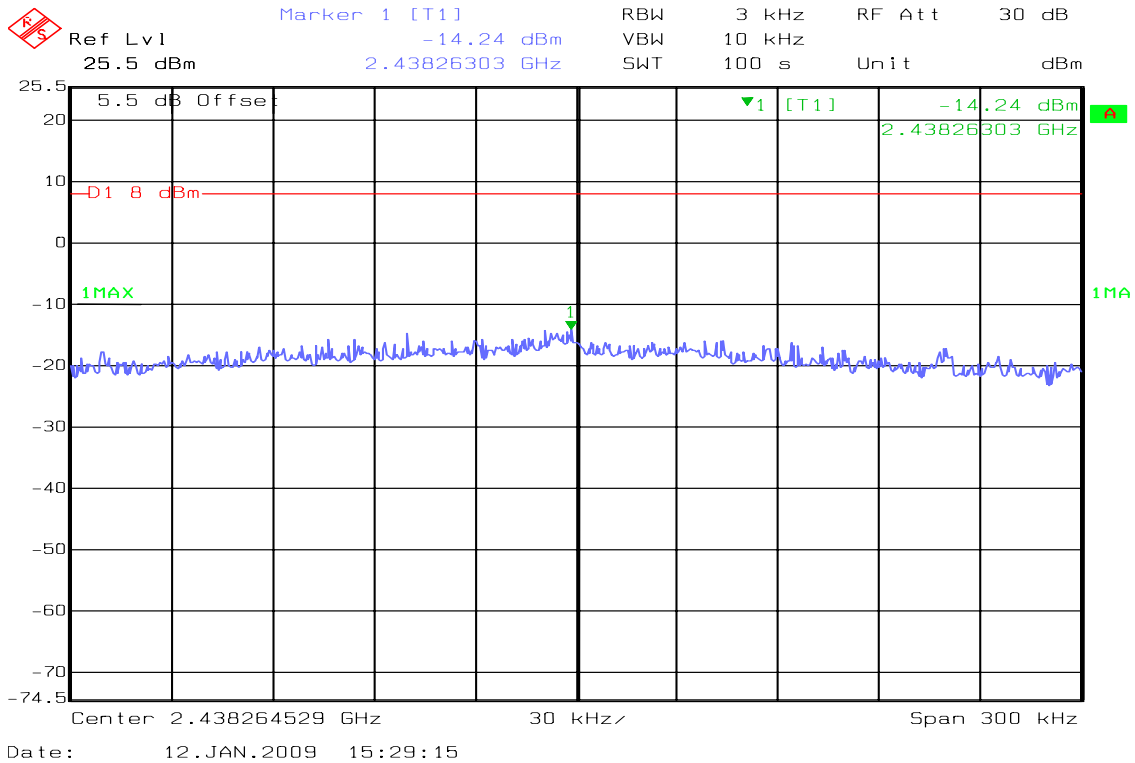


draft 802.11n 20 MHz Channel mode

PPSD (CH Low)

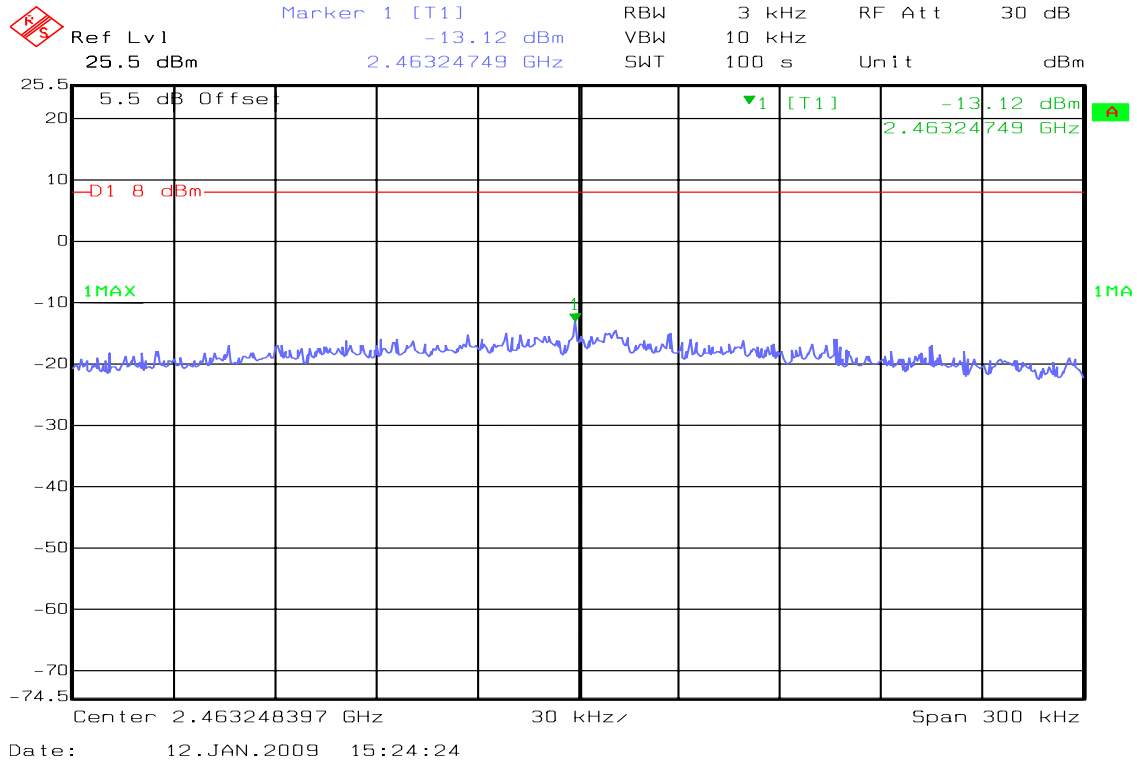


PPSD (CH Mid)



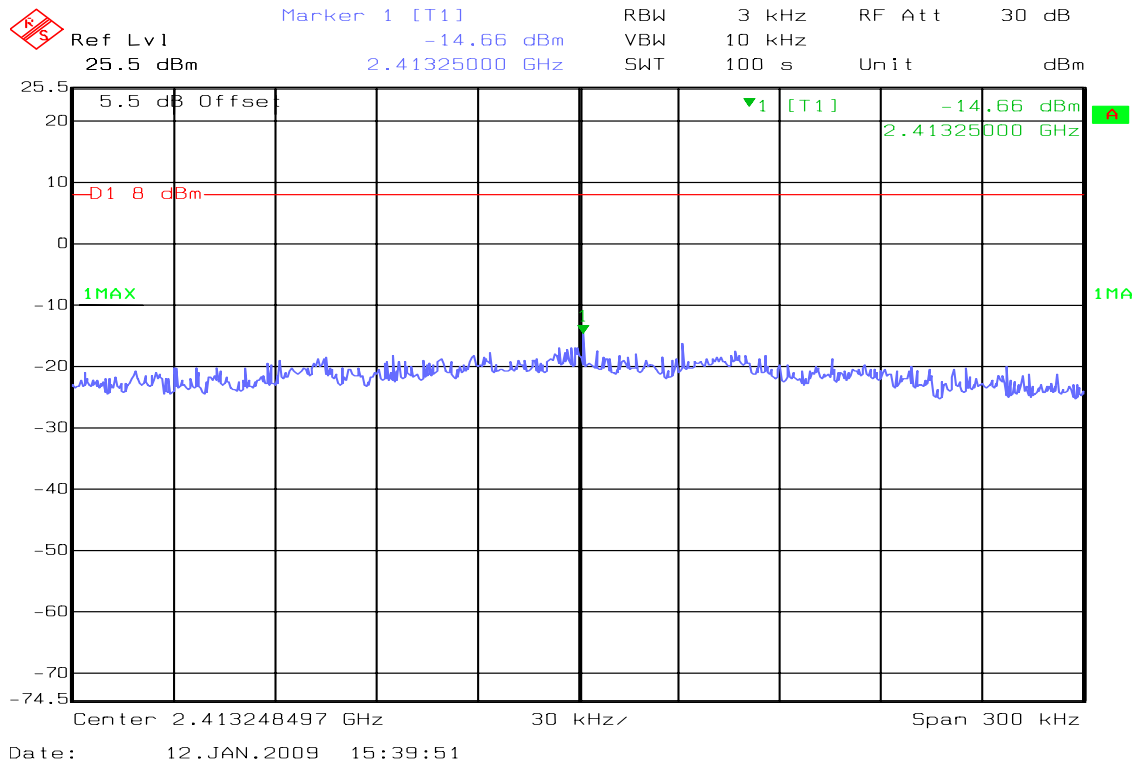


PPSD (CH High)



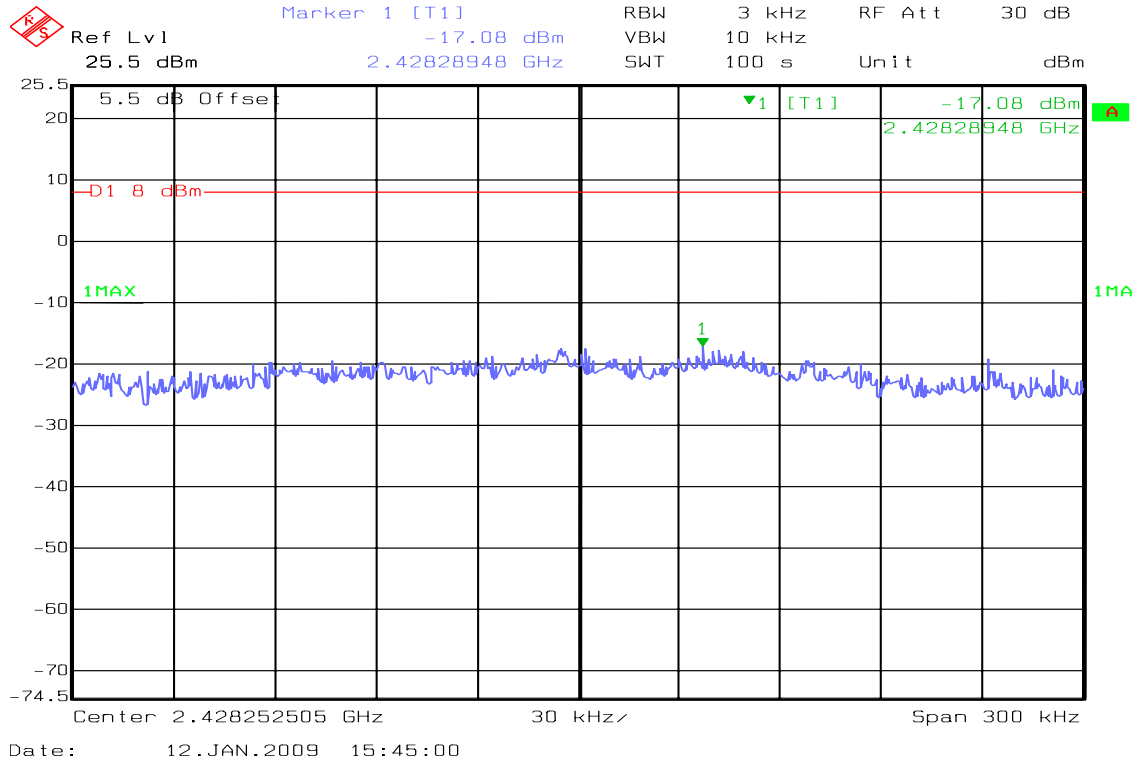
draft 802.11n 40 MHz Channel mode

PPSD (CH Low)

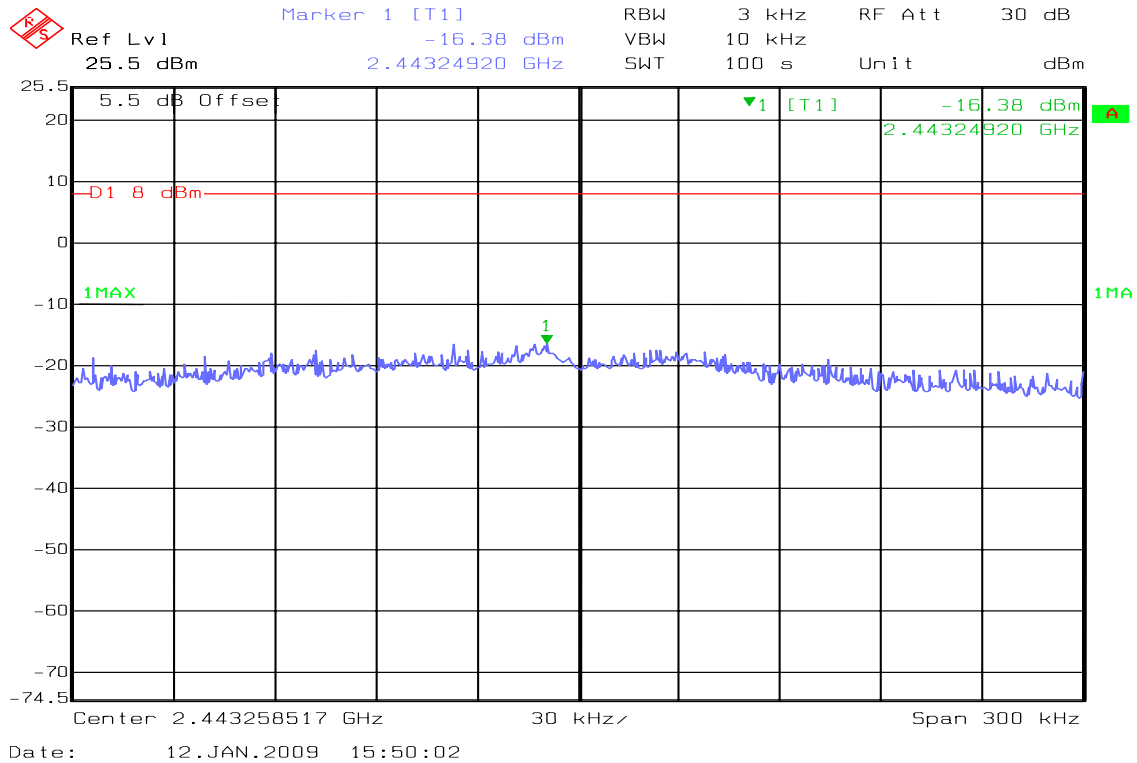




PPSD (CH Mid)



PPSD (CH High)





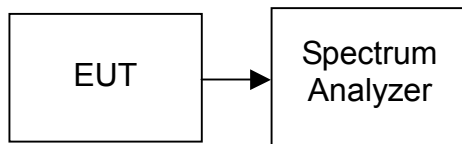
7.6 SPURIOUS EMISSIONS

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

TEST RESULTS

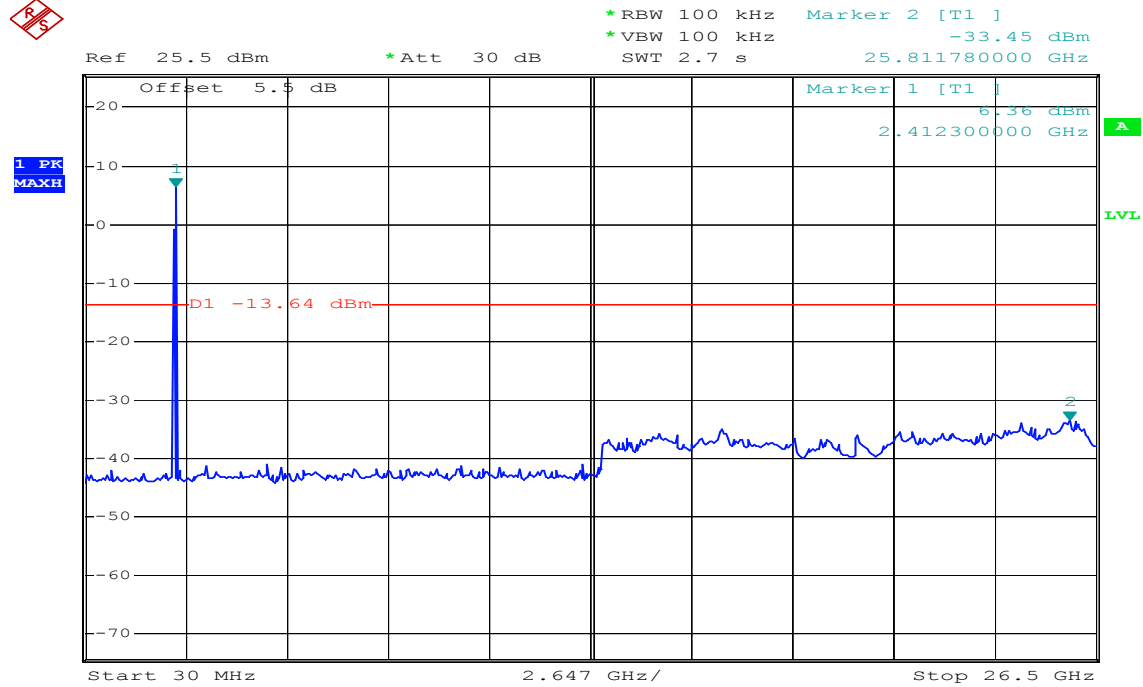
No non-compliance noted.



Test Plot

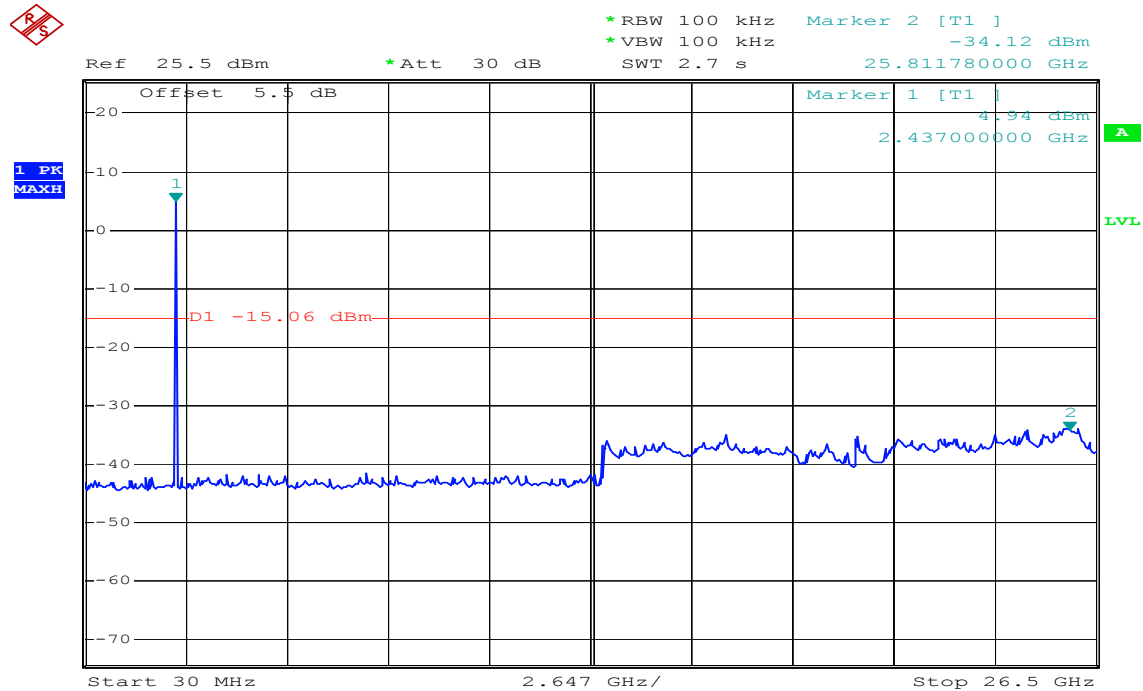
IEEE 802.11b mode

CH Low



Date: 16.JAN.2009 07:48:33

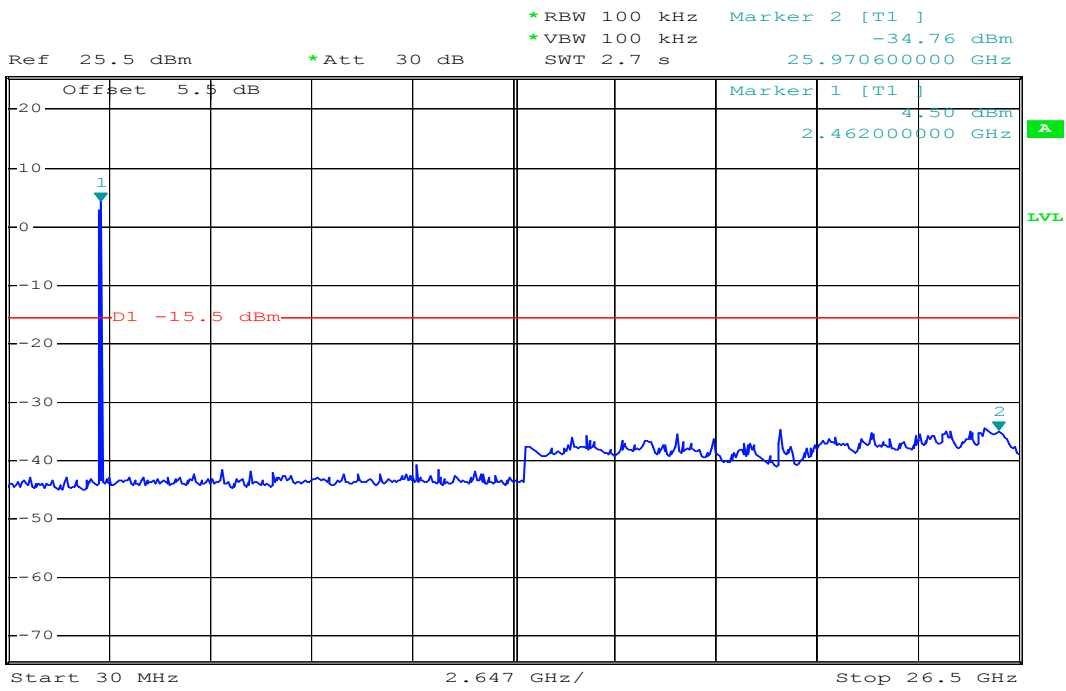
CH Mid



Date: 16.JAN.2009 07:51:19



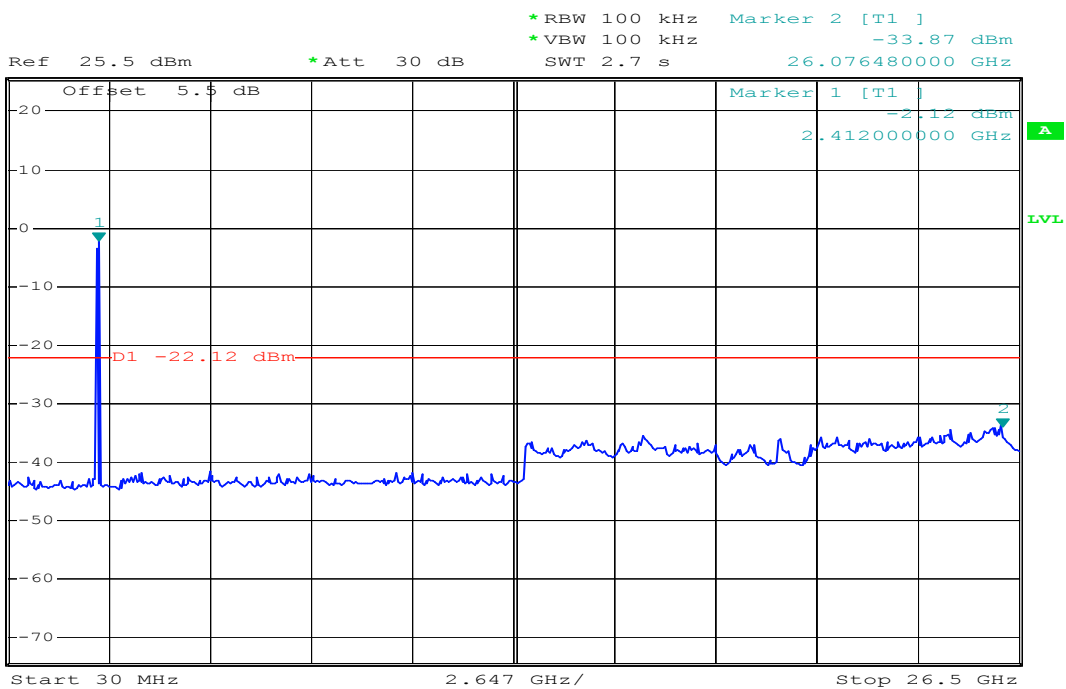
CH High



Date: 16.JAN.2009 07:53:11

IEEE 802.11g mode

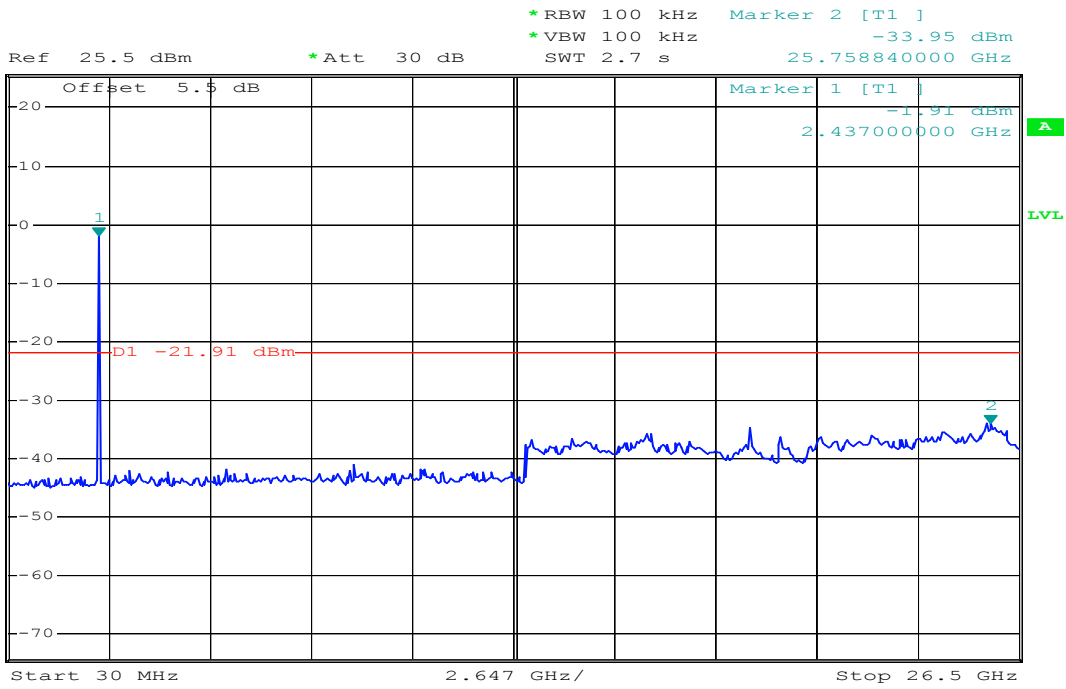
CH Low



Date: 16.JAN.2009 07:59:12

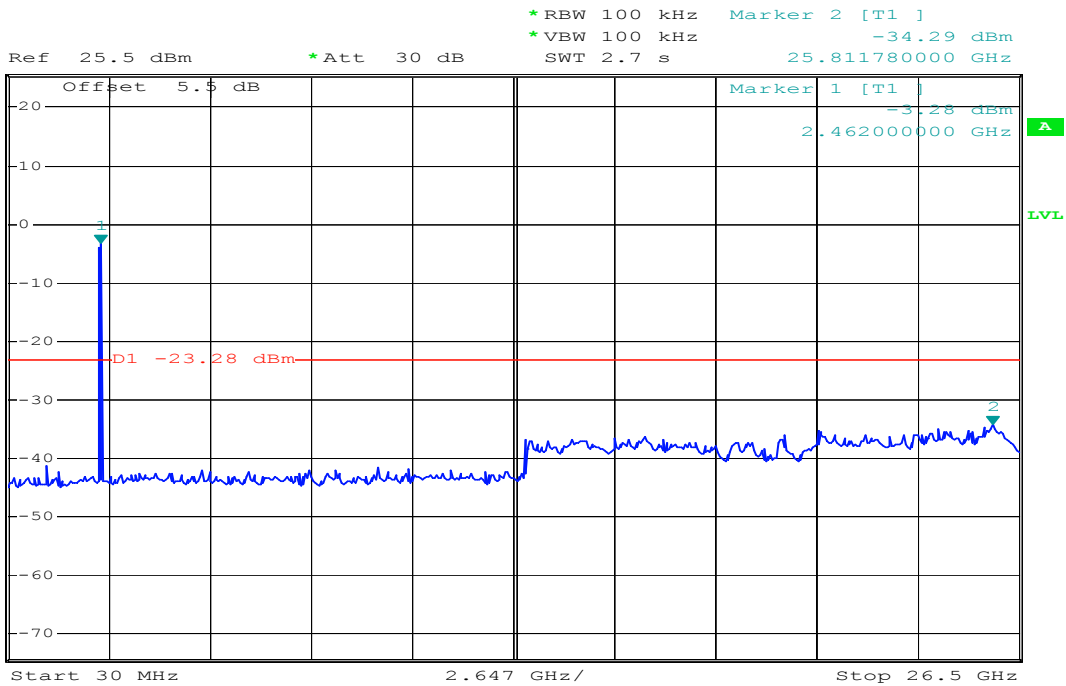


CH Mid



Date: 16.JAN.2009 08:00:21

CH High

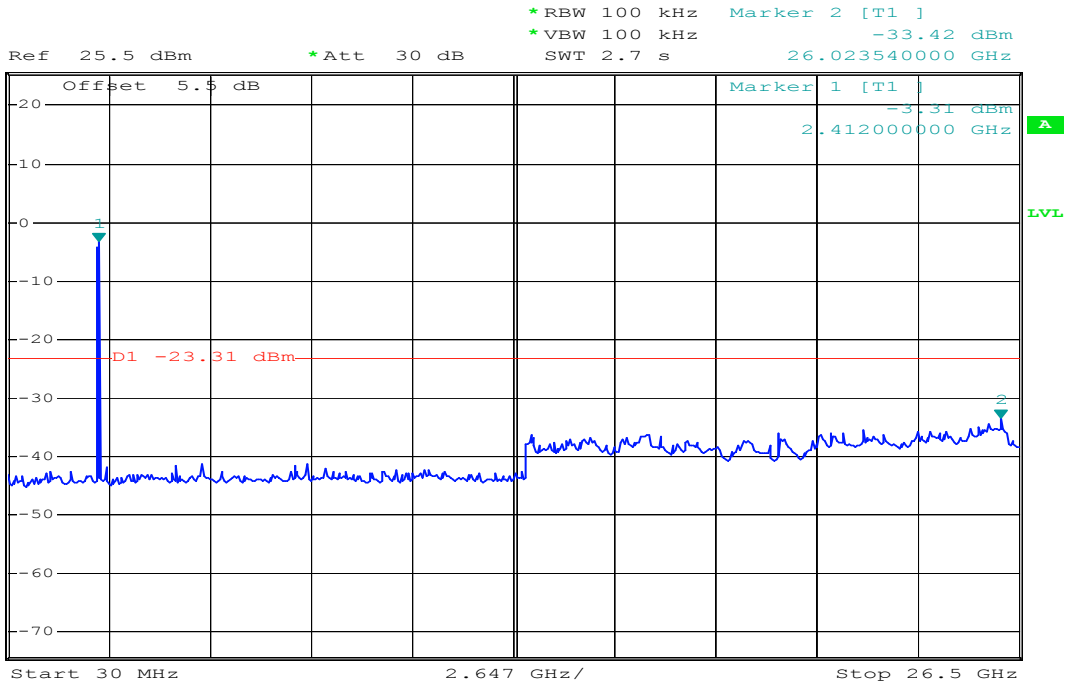


Date: 16.JAN.2009 08:01:57



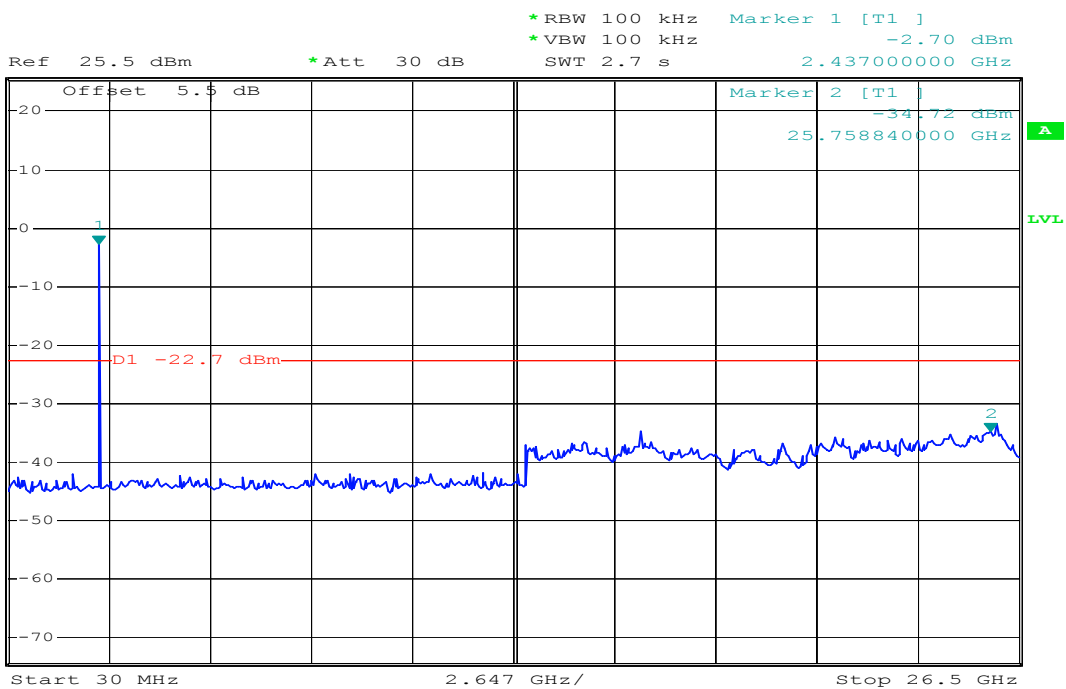
draft 802.11n 20 MHz Channel mode

CH Low



Date: 16.JAN.2009 08:07:49

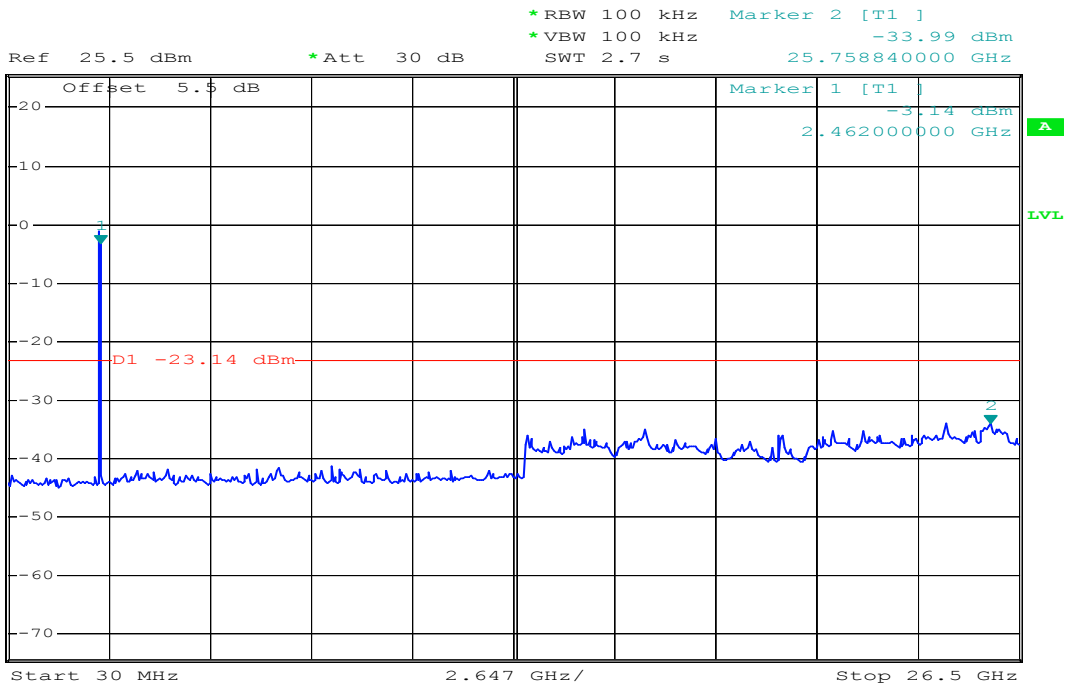
CH Mid



Date: 16.JAN.2009 08:06:49



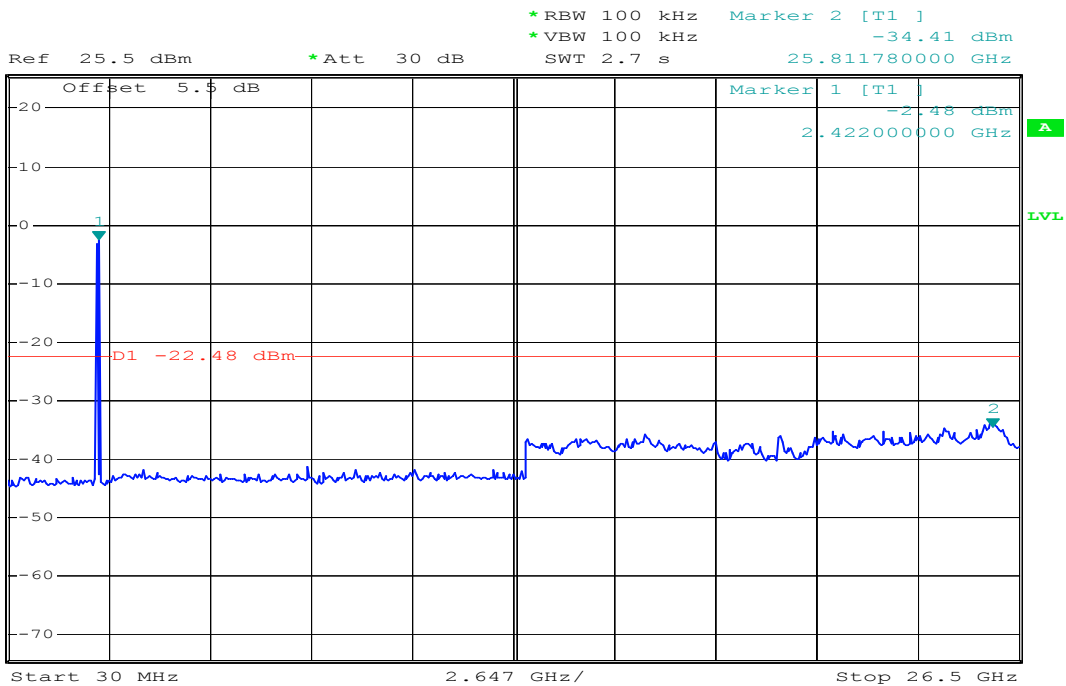
CH High



Date: 16.JAN.2009 08:05:33

draft 802.11n 40 MHz Channel mode

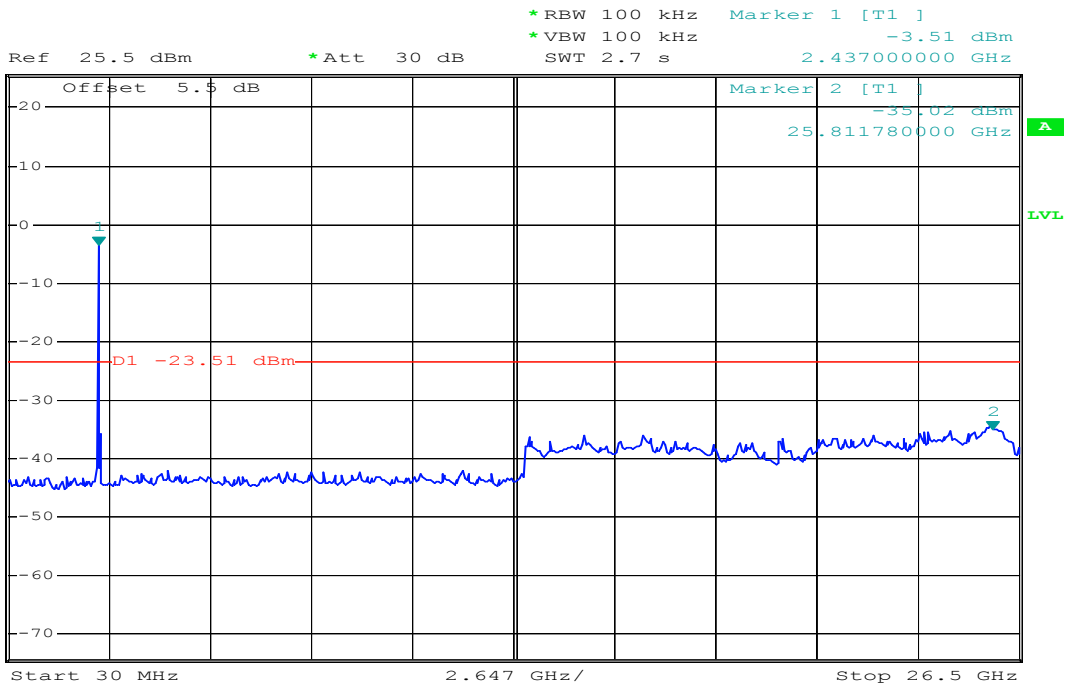
CH Low



Date: 16.JAN.2009 08:10:14

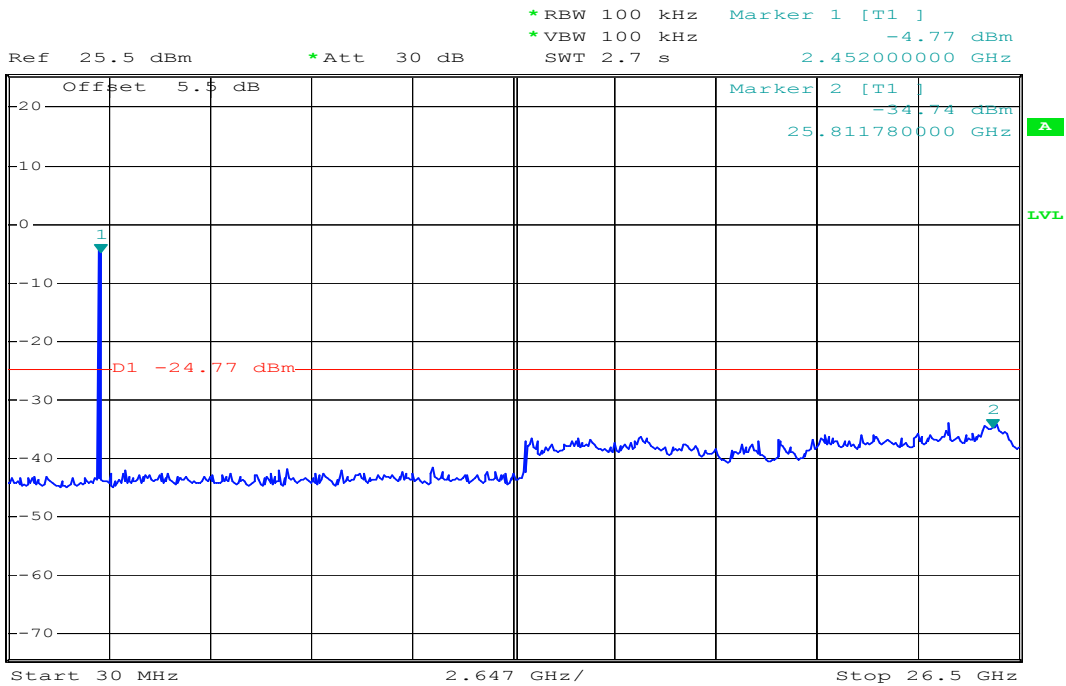


CH Mid



Date: 16.JAN.2009 08:11:10

CH High



Date: 16.JAN.2009 08:13:56



7.6.2 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 (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

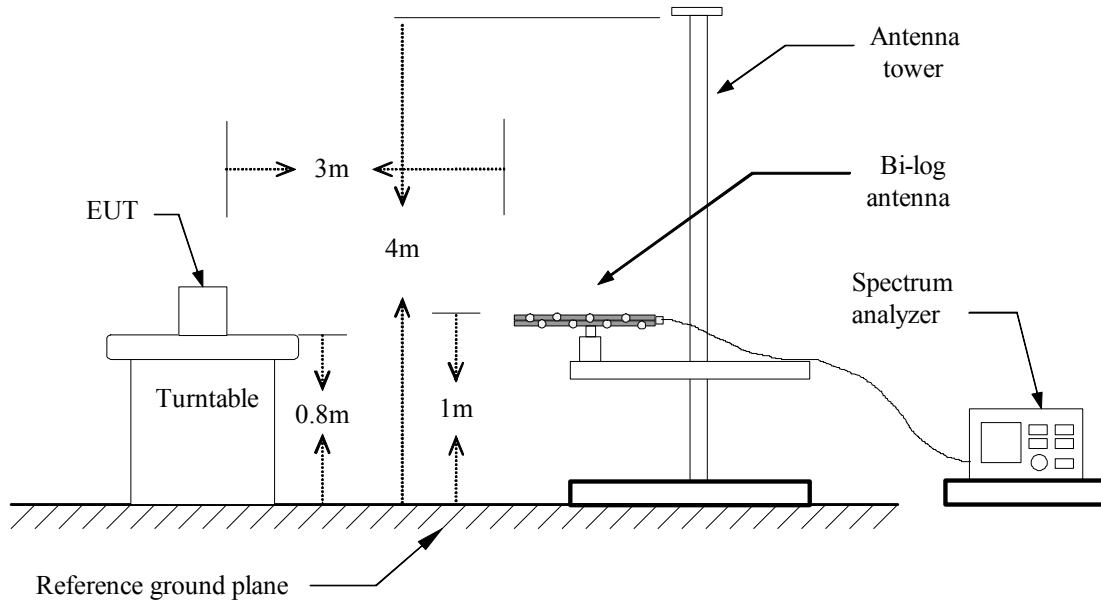
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

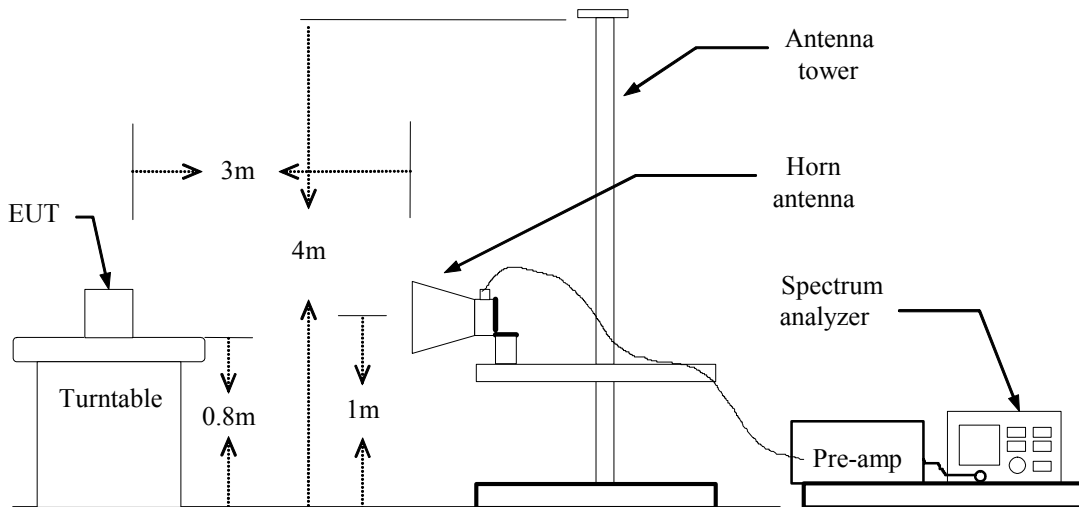
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

TEST CONFIGURATION

Below 1 GHz



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

No non-compliance noted.



TEST DATA

Below 1GHz

Operation Mode: Normal Link **Test Date:** January 16, 2009
Temperature: 17°C **Tested by:** Tony Tsai
Humidity: 60% 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
32.7714	V	36.51	-15.14	21.37	40.00	-18.63	Peak
36.9285	V	35.99	-15.05	20.94	40.00	-19.06	Peak
53.5571	V	37.24	-14.72	22.52	40.00	-17.48	Peak
57.7143	V	38.25	-14.68	23.57	40.00	-16.43	Peak
72.9571	V	40.54	-16.87	23.67	40.00	-16.33	Peak
143.6286	V	33.99	-12.85	21.14	43.50	-22.36	Peak
297.4428	V	35.95	-11.62	24.33	46.00	-21.67	Peak
337.6286	V	35.99	-10.85	25.14	46.00	-20.86	Peak
36.9285	H	33.99	-15.05	18.94	40.00	-21.06	Peak
77.1143	H	36.53	-17.62	18.91	40.00	-21.09	Peak
232.3143	H	40.96	-14.06	26.90	46.00	-19.10	Peak
301.6000	H	42.24	-11.51	30.73	46.00	-15.27	Peak
333.4714	H	39.23	-10.93	28.30	46.00	-17.70	Peak
684.0571	H	40.75	-4.64	36.11	46.00	-9.89	Peak
713.1571	H	41.68	-4.05	37.63	46.00	-8.37	Peak

Remark:

1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 9 kHz to the 1GHz.
3. Radiated emissions measured in the measured frequency range were made with an instrument using Peak detector mode.
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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	55.50	---	-8.98	46.52	---	74.00	54.00	-7.48	Peak
1500.00	V	56.17	---	-8.39	47.78	---	74.00	54.00	-6.22	Peak
1668.00	V	55.03	---	-7.43	47.60	---	74.00	54.00	-6.40	Peak
1920.00	V	63.50	42.25	-5.99	57.52	36.26	74.00	54.00	-17.74	AVG
2256.00	V	58.79	47.37	-4.95	53.83	42.42	74.00	54.00	-11.58	AVG
2884.00	V	53.95	---	-2.63	51.32	---	74.00	54.00	-2.68	Peak
3290.00	V	46.96	---	-1.25	45.71	---	74.00	54.00	-8.29	Peak
3840.00	V	43.53	---	0.63	44.17	---	74.00	54.00	-9.83	Peak
4820.00	V	45.95	---	1.87	47.83	---	74.00	54.00	-6.17	Peak
7240.00	V	41.78	---	6.43	48.21	---	74.00	54.00	-5.79	Peak
1372.00	H	55.71	---	-8.98	46.73	---	74.00	54.00	-7.27	Peak
1500.00	H	57.35	---	-8.39	48.96	---	74.00	54.00	-5.04	Peak
1920.00	H	61.66	42.11	-5.99	55.67	36.12	74.00	54.00	-17.88	AVG
2192.00	H	56.63	---	-5.10	51.53	---	74.00	54.00	-2.47	Peak
2744.00	H	56.10	48.10	-3.28	52.82	44.82	74.00	54.00	-9.18	AVG
3290.00	H	49.51	---	-1.25	48.26	---	74.00	54.00	-5.74	Peak
3560.00	H	45.88	---	-0.41	45.47	---	74.00	54.00	-8.53	Peak
4110.00	H	44.58	---	1.16	45.74	---	74.00	54.00	-8.26	Peak
4390.00	H	45.66	---	1.00	46.66	---	74.00	54.00	-7.34	Peak
4820.00	H	48.33	---	1.87	50.20	---	74.00	54.00	-3.80	Peak
4980.00	H	47.35	---	2.34	49.69	---	74.00	54.00	-4.31	Peak
7490.00	H	45.32	37.36	7.10	52.43	44.46	74.00	54.00	-9.54	AVG

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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1164.00	V	57.75	---	-9.94	47.81	---	74.00	54.00	-6.19	Peak
1372.00	V	61.01	47.59	-8.98	52.03	38.61	74.00	54.00	-15.39	AVG
1500.00	V	58.07	---	-8.39	49.68	---	74.00	54.00	-4.32	Peak
1920.00	V	61.28	42.67	-5.99	55.30	36.68	74.00	54.00	-17.32	AVG
2308.00	V	60.11	49.97	-4.83	55.28	45.14	74.00	54.00	-8.86	AVG
3290.00	V	44.76	---	-1.25	43.51	---	74.00	54.00	-10.49	Peak
4250.00	V	43.21	---	1.08	44.29	---	74.00	54.00	-9.71	Peak
4870.00	V	47.23	---	2.02	49.25	---	74.00	54.00	-4.75	Peak
7470.00	V	41.74	---	7.05	48.79	---	74.00	54.00	-5.21	Peak
1500.00	H	56.56	---	-8.39	48.17	---	74.00	54.00	-5.83	Peak
1920.00	H	60.46	42.25	-5.99	54.47	36.26	74.00	54.00	-17.74	AVG
2192.00	H	55.93	---	-5.10	50.84	---	74.00	54.00	-3.16	Peak
2744.00	H	56.49	45.12	-3.28	53.21	41.84	74.00	54.00	-12.16	AVG
3290.00	H	45.07	---	-1.25	43.83	---	74.00	54.00	-10.17	Peak
3840.00	H	44.22	---	0.63	44.85	---	74.00	54.00	-9.15	Peak
4380.00	H	44.76	---	1.00	45.77	---	74.00	54.00	-8.23	Peak
4870.00	H	46.18	---	2.02	48.19	---	74.00	54.00	-5.81	Peak
7480.00	H	43.67	---	7.08	50.74	---	74.00	54.00	-3.26	Peak

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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	60.03	---	-8.98	51.05	---	74.00	54.00	-2.95	Peak
1500.00	V	56.83	---	-8.39	48.44	---	74.00	54.00	-5.56	Peak
1668.00	V	56.05	---	-7.43	48.62	---	74.00	54.00	-5.38	Peak
1920.00	V	60.55	44.32	-5.99	54.56	38.33	74.00	54.00	-15.67	AVG
2304.00	V	59.43	49.57	-4.84	54.59	44.73	74.00	54.00	-9.27	AVG
2744.00	V	54.59	---	-3.28	51.32	---	74.00	54.00	-2.68	Peak
3290.00	V	45.83	---	-1.25	44.59	---	74.00	54.00	-9.41	Peak
4250.00	V	42.05	---	1.08	43.13	---	74.00	54.00	-10.87	Peak
4920.00	V	44.38	---	2.16	46.55	---	74.00	54.00	-7.45	Peak
7490.00	V	41.29	---	7.10	48.39	---	74.00	54.00	-5.61	Peak
1920.00	H	58.63	43.12	-5.99	52.64	37.13	74.00	54.00	-16.87	AVG
2196.00	H	56.89	---	-5.09	51.81	---	74.00	54.00	-2.19	Peak
2748.00	H	55.74	48.79	-3.26	52.48	45.53	74.00	54.00	-8.47	AVG
3290.00	H	50.51	---	-1.25	49.26	---	74.00	54.00	-4.74	Peak
3560.00	H	44.85	---	-0.41	44.44	---	74.00	54.00	-9.56	Peak
4390.00	H	45.27	---	1.00	46.27	---	74.00	54.00	-7.73	Peak
4660.00	H	44.52	---	1.40	45.92	---	74.00	54.00	-8.08	Peak
4980.00	H	45.63	---	2.34	47.97	---	74.00	54.00	-6.03	Peak
7490.00	H	42.71	---	7.10	49.82	---	74.00	54.00	-4.18	Peak

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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1164.00	V	56.96	---	-9.94	47.02	---	74.00	54.00	-6.98	Peak
1500.00	V	56.45	---	-8.39	48.06	---	74.00	54.00	-5.94	Peak
1920.00	V	62.11	42.65	-5.99	56.13	36.66	74.00	54.00	-17.34	AVG
2260.00	V	58.13	47.59	-4.94	53.19	42.65	74.00	54.00	-11.35	AVG
2572.00	V	56.50	48.03	-4.07	52.43	43.96	74.00	54.00	-10.04	AVG
3290.00	V	45.96	---	-1.25	44.71	---	74.00	54.00	-9.29	Peak
5580.00	V	41.36	---	3.51	44.87	---	74.00	54.00	-9.13	Peak
7500.00	V	42.07	---	7.13	49.20	---	74.00	54.00	-4.80	Peak
1500.00	H	55.71	---	-8.39	47.32	---	74.00	54.00	-6.68	Peak
1920.00	H	60.38	42.52	-5.99	54.39	36.53	74.00	54.00	-17.47	AVG
2196.00	H	57.30	51.19	-5.09	52.21	46.10	74.00	54.00	-7.90	AVG
2744.00	H	55.62	48.34	-3.28	52.35	45.06	74.00	54.00	-8.94	AVG
3290.00	H	50.15	---	-1.25	48.90	---	74.00	54.00	-5.10	Peak
4120.00	H	48.80	---	1.16	49.96	---	74.00	54.00	-4.04	Peak
4660.00	H	44.52	---	1.40	45.92	---	74.00	54.00	-8.08	Peak
4980.00	H	46.27	---	2.34	48.61	---	74.00	54.00	-5.39	Peak
7490.00	H	45.36	36.93	7.10	52.46	44.03	74.00	54.00	-9.97	AVG

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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	61.21	47.12	-8.98	52.23	38.14	74.00	54.00	-15.86	AVG
1500.00	V	58.79	---	-8.39	50.40	---	74.00	54.00	-3.60	Peak
1920.00	V	62.38	42.87	-5.99	56.39	36.88	74.00	54.00	-17.12	AVG
2196.00	V	56.79	---	-5.09	51.70	---	74.00	54.00	-2.30	Peak
2320.00	V	56.83	49.64	-4.81	52.02	44.83	74.00	54.00	-9.17	AVG
3290.00	V	45.83	---	-1.25	44.58	---	74.00	54.00	-9.42	Peak
4120.00	V	43.27	---	1.16	44.43	---	74.00	54.00	-9.57	Peak
6060.00	V	41.65	---	4.25	45.90	---	74.00	54.00	-8.10	Peak
7500.00	V	41.78	---	7.13	48.91	---	74.00	54.00	-5.09	Peak
1920.00	H	61.88	42.41	-5.99	55.90	36.42	74.00	54.00	-17.58	AVG
2196.00	H	56.12	---	-5.09	51.04	---	74.00	54.00	-2.96	Peak
2744.00	H	55.31	48.69	-3.28	52.04	45.41	74.00	54.00	-8.59	AVG
3290.00	H	49.66	---	-1.25	48.41	---	74.00	54.00	-5.59	Peak
4110.00	H	45.37	---	1.16	46.54	---	74.00	54.00	-7.46	Peak
4390.00	H	45.60	---	1.00	46.60	---	74.00	54.00	-7.40	Peak
4990.00	H	45.13	---	2.37	47.50	---	74.00	54.00	-6.50	Peak
7480.00	H	44.98	37.55	7.08	52.05	44.63	74.00	54.00	-9.37	AVG

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: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	59.08	---	-8.98	50.10	---	74.00	54.00	-3.90	Peak
1500.00	V	56.70	---	-8.39	48.31	---	74.00	54.00	-5.69	Peak
1668.00	V	55.94	---	-7.43	48.51	---	74.00	54.00	-5.49	Peak
1920.00	V	60.65	43.45	-5.99	54.66	37.46	74.00	54.00	-16.54	AVG
2304.00	V	58.24	48.59	-4.84	53.40	43.75	74.00	54.00	-10.25	AVG
2744.00	V	53.86	---	-3.28	50.58	---	74.00	54.00	-3.42	Peak
3290.00	V	47.11	---	-1.25	45.86	---	74.00	54.00	-8.14	Peak
4250.00	V	44.33	---	1.08	45.41	---	74.00	54.00	-8.59	Peak
7470.00	V	42.53	---	7.05	49.58	---	74.00	54.00	-4.42	Peak
1920.00	H	57.15	---	-5.99	51.16	---	74.00	54.00	-2.84	Peak
2196.00	H	55.64	---	-5.09	50.56	---	74.00	54.00	-3.44	Peak
2744.00	H	56.13	50.50	-3.28	52.85	47.22	74.00	54.00	-6.78	AVG
3290.00	H	50.63	---	-1.25	49.38	---	74.00	54.00	-4.62	Peak
3840.00	H	44.47	---	0.63	45.11	---	74.00	54.00	-8.89	Peak
4120.00	H	46.09	---	1.16	47.25	---	74.00	54.00	-6.75	Peak
4390.00	H	45.77	---	1.00	46.76	---	74.00	54.00	-7.24	Peak
4660.00	H	43.87	---	1.40	45.27	---	74.00	54.00	-8.73	Peak
4980.00	H	46.20	---	2.34	48.54	---	74.00	54.00	-5.46	Peak
5990.00	H	42.54	---	4.22	46.76	---	74.00	54.00	-7.24	Peak
7490.00	H	44.73	---	7.10	51.83	---	74.00	54.00	-2.17	Peak

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 20 MHz Channel mode / CH Low

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1164.00	V	55.90	---	-9.94	45.96	---	74.00	54.00	-8.04	Peak
1500.00	V	57.48	---	-8.39	49.09	---	74.00	54.00	-4.91	Peak
1920.00	V	59.70	42.58	-5.99	53.72	36.59	74.00	54.00	-17.41	AVG
2304.00	V	55.88	---	-4.84	51.03	---	74.00	54.00	-2.97	Peak
2744.00	V	53.72	---	-3.28	50.45	---	74.00	54.00	-3.55	Peak
3290.00	V	45.59	---	-1.25	44.34	---	74.00	54.00	-9.66	Peak
4990.00	V	41.62	---	2.37	43.99	---	74.00	54.00	-10.01	Peak
7490.00	V	41.55	---	7.10	48.66	---	74.00	54.00	-5.34	Peak
1500.00	H	54.62	---	-8.39	46.23	---	74.00	54.00	-7.77	Peak
1924.00	H	58.67	43.11	-5.96	52.70	37.15	74.00	54.00	-16.85	AVG
2196.00	H	56.54	---	-5.09	51.46	---	74.00	54.00	-2.54	Peak
2744.00	H	54.56	---	-3.28	51.28	---	74.00	54.00	-2.72	Peak
3290.00	H	50.89	---	-1.25	49.64	---	74.00	54.00	-4.36	Peak
4120.00	H	45.77	---	1.16	46.93	---	74.00	54.00	-7.07	Peak
4390.00	H	46.40	---	1.00	47.39	---	74.00	54.00	-6.61	Peak
4980.00	H	46.50	---	2.34	48.84	---	74.00	54.00	-5.16	Peak
7490.00	H	44.44	---	7.10	51.55	---	74.00	54.00	-2.45	Peak

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 20 MHz Channel mode / CH Mid

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	62.04	46.45	-8.98	53.06	37.47	74.00	54.00	-7.53	AVG
1500.00	V	58.32	---	-8.39	49.93	---	74.00	54.00	-4.07	Peak
1920.00	V	64.81	42.79	-5.99	58.83	36.80	74.00	54.00	-17.20	AVG
2284.00	V	56.82	---	-4.89	51.93	---	74.00	54.00	-2.07	Peak
3290.00	V	45.72	---	-1.25	44.48	---	74.00	54.00	-9.52	Peak
3840.00	V	43.99	---	0.63	44.62	---	74.00	54.00	-9.38	Peak
4260.00	V	42.83	---	1.07	43.90	---	74.00	54.00	-10.10	Peak
7490.00	V	41.31	---	7.10	48.41	---	74.00	54.00	-5.59	Peak
1500.00	H	54.91	---	-8.39	46.52	---	74.00	54.00	-7.48	Peak
1920.00	H	59.61	43.08	-5.99	53.62	37.09	74.00	54.00	-16.91	AVG
2192.00	H	56.20	---	-5.10	51.10	---	74.00	54.00	-2.90	Peak
2744.00	H	55.25	---	-3.28	51.97	---	74.00	54.00	-2.03	Peak
3290.00	H	50.90	---	-1.25	49.66	---	74.00	54.00	-4.34	Peak
4110.00	H	45.15	---	1.16	46.32	---	74.00	54.00	-7.68	Peak
4390.00	H	45.23	---	1.00	46.22	---	74.00	54.00	-7.78	Peak
4980.00	H	46.58	---	2.34	48.92	---	74.00	54.00	-5.08	Peak
7470.00	H	44.61	---	7.05	51.66	---	74.00	54.00	-2.34	Peak

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 20 MHz Channel mode / CH High

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1920.00	V	59.04	41.38	-5.99	53.05	35.39	74.00	54.00	-18.61	AVG
2196.00	V	56.19	---	-5.09	51.10	---	74.00	54.00	-2.90	Peak
2744.00	V	55.89	---	-3.28	52.61	---	74.00	54.00	-1.39	Peak
3290.00	V	46.63	---	-1.25	45.39	---	74.00	54.00	-8.61	Peak
3840.00	V	43.70	---	0.63	44.34	---	74.00	54.00	-9.66	Peak
7480.00	V	41.93	---	7.08	49.01	---	74.00	54.00	-4.99	Peak
1920.00	H	59.46	42.50	-5.99	53.47	36.51	74.00	54.00	-17.49	AVG
2196.00	H	56.77	---	-5.09	51.68	---	74.00	54.00	-2.32	Peak
2744.00	H	54.78	---	-3.28	51.50	---	74.00	54.00	-2.50	Peak
3290.00	H	50.14	---	-1.25	48.89	---	74.00	54.00	-5.11	Peak
4110.00	H	45.46	---	1.16	46.63	---	74.00	54.00	-7.37	Peak
4390.00	H	45.64	---	1.00	46.63	---	74.00	54.00	-7.37	Peak
4660.00	H	45.09	---	1.40	46.49	---	74.00	54.00	-7.51	Peak
4980.00	H	45.78	---	2.34	48.12	---	74.00	54.00	-5.88	Peak
7480.00	H	44.37	---	7.08	51.45	---	74.00	54.00	-2.55	Peak

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 40 MHz Channel mode / CH Low

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1164.00	V	56.21	---	-9.94	46.27	---	74.00	54.00	-7.73	Peak
1500.00	V	55.78	---	-8.39	47.39	---	74.00	54.00	-6.61	Peak
1668.00	V	55.48	---	-7.43	48.05	---	74.00	54.00	-5.95	Peak
1924.00	V	59.90	42.07	-5.96	53.93	36.11	74.00	54.00	-17.89	AVG
2252.00	V	56.90	---	-4.96	51.94	---	74.00	54.00	-2.06	Peak
3290.00	V	45.73	---	-1.25	44.48	---	74.00	54.00	-9.52	Peak
3840.00	V	43.44	---	0.63	44.07	---	74.00	54.00	-9.93	Peak
5570.00	V	41.41	---	3.49	44.90	---	74.00	54.00	-9.10	Peak
7500.00	V	42.73	---	7.13	49.86	---	74.00	54.00	-4.14	Peak
1372.00	H	55.38	---	-8.98	46.40	---	74.00	54.00	-7.60	Peak
1920.00	H	60.68	41.40	-5.99	54.70	35.41	74.00	54.00	-18.59	AVG
2196.00	H	55.66	---	-5.09	50.57	---	74.00	54.00	-3.43	Peak
2744.00	H	55.96	47.42	-3.28	52.68	44.14	74.00	54.00	-9.86	AVG
3290.00	H	50.26	---	-1.25	49.01	---	74.00	54.00	-4.99	Peak
3840.00	H	45.30	---	0.63	45.94	---	74.00	54.00	-8.06	Peak
4110.00	H	46.41	---	1.16	47.57	---	74.00	54.00	-6.43	Peak
4660.00	H	45.27	---	1.40	46.67	---	74.00	54.00	-7.33	Peak
4980.00	H	47.70	---	2.34	50.05	---	74.00	54.00	-3.95	Peak
7490.00	H	45.01	28.87	7.10	52.11	35.97	74.00	54.00	-18.03	AVG
11360.00	H	40.73	---	10.49	51.22	---	74.00	54.00	-2.78	Peak

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 40 MHz Channel mode / CH Mid

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1372.00	V	61.61	47.36	-8.98	52.63	38.38	74.00	54.00	-15.62	AVG
1500.00	V	58.38	---	-8.39	49.99	---	74.00	54.00	-4.01	Peak
1920.00	V	62.86	42.19	-5.99	56.88	36.20	74.00	54.00	-17.80	AVG
2324.00	V	56.39	---	-4.80	51.59	---	74.00	54.00	-2.41	Peak
3290.00	V	46.75	---	-1.25	45.50	---	74.00	54.00	-8.50	Peak
4110.00	V	43.67	---	1.16	44.83	---	74.00	54.00	-9.17	Peak
7500.00	V	43.03	---	7.13	50.16	---	74.00	54.00	-3.84	Peak
1500.00	H	55.10	---	-8.39	46.71	---	74.00	54.00	-7.29	Peak
1920.00	H	62.10	42.62	-5.99	56.11	36.63	74.00	54.00	-17.37	AVG
2192.00	H	56.29	---	-5.10	51.20	---	74.00	54.00	-2.80	Peak
2744.00	H	55.79	48.62	-3.28	52.51	45.34	74.00	54.00	-8.66	AVG
3290.00	H	50.58	---	-1.25	49.33	---	74.00	54.00	-4.67	Peak
4120.00	H	47.86	---	1.16	49.02	---	74.00	54.00	-4.98	Peak
4390.00	H	47.54	---	1.00	48.54	---	74.00	54.00	-5.46	Peak
4660.00	H	44.39	---	1.40	45.79	---	74.00	54.00	-8.21	Peak
4990.00	H	45.88	---	2.37	48.25	---	74.00	54.00	-5.75	Peak
7490.00	H	44.63	---	7.10	51.74	---	74.00	54.00	-2.26	Peak

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 40 MHz Channel mode / CH High

Test Date: January 16, 2009

Temperature: 16°C

Tested by: Alonso Lu

Humidity: 47 % 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
1164.00	V	55.65	---	-9.94	45.71	---	74.00	54.00	-8.29	Peak
1500.00	V	55.12	---	-8.39	46.73	---	74.00	54.00	-7.27	Peak
1668.00	V	54.76	---	-7.43	47.33	---	74.00	54.00	-6.67	Peak
1924.00	V	60.07	47.69	-5.96	54.11	41.73	74.00	54.00	-12.27	AVG
2308.00	V	57.33	50.88	-4.83	52.50	46.05	74.00	54.00	-7.95	AVG
2852.00	V	53.40	---	-2.78	50.62	---	74.00	54.00	-3.38	Peak
3290.00	V	45.07	---	-1.25	43.82	---	74.00	54.00	-10.18	Peak
3840.00	V	43.58	---	0.63	44.21	---	74.00	54.00	-9.79	Peak
7490.00	V	42.02	---	7.10	49.12	---	74.00	54.00	-4.88	Peak
1372.00	H	56.05	---	-8.98	47.07	---	74.00	54.00	-6.93	Peak
1500.00	H	54.82	---	-8.39	46.43	---	74.00	54.00	-7.57	Peak
1920.00	H	60.09	42.35	-5.99	54.10	36.36	74.00	54.00	-17.64	AVG
2196.00	H	57.11	51.32	-5.09	52.02	46.23	74.00	54.00	-7.77	AVG
2744.00	H	57.04	48.23	-3.28	53.76	44.95	74.00	54.00	-9.05	AVG
3290.00	H	50.69	---	-1.25	49.44	---	74.00	54.00	-4.56	Peak
4110.00	H	47.29	---	1.16	48.45	---	74.00	54.00	-5.55	Peak
4390.00	H	46.88	---	1.00	47.87	---	74.00	54.00	-6.13	Peak
4660.00	H	45.15	---	1.40	46.55	---	74.00	54.00	-7.45	Peak
4990.00	H	45.87	---	2.37	48.24	---	74.00	54.00	-5.76	Peak
7490.00	H	44.48	---	7.10	51.58	---	74.00	54.00	-2.42	Peak

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).



7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

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

TEST PROCEDURE

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

TEST RESULTS

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



TEST DATA

Operation Mode: Normal Link

Test Date: January 15, 2009

Temperature: 25°C

Tested by: Alonso Lu

Humidity: 57% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1812	44.12	38.32	9.68	53.80	48.00	64.43	54.43	-10.63	-6.43	L1
0.2437	35.72	29.02	9.68	45.40	38.70	61.97	51.97	-16.57	-13.27	L1
0.3648	30.32	27.22	9.68	40.00	36.90	58.62	48.62	-18.62	-11.72	L1
0.7281	26.41	24.41	9.59	36.00	34.00	56.00	46.00	-20.00	-12.00	L1
8.2203	43.63	36.73	9.97	53.60	46.70	60.00	50.00	-6.40	-3.30	L1
12.6617	40.58	33.48	10.22	50.80	43.70	60.00	50.00	-9.20	-6.30	L1
0.1852	41.22	36.42	9.68	50.90	46.10	64.25	54.25	-13.35	-8.15	L2
0.2437	37.72	31.72	9.68	47.40	41.40	61.97	51.97	-14.57	-10.57	L2
0.3023	33.52	29.22	9.68	43.20	38.90	60.18	50.18	-16.98	-11.28	L2
0.4859	28.21	26.11	9.59	37.80	35.70	56.24	46.24	-18.44	-10.54	L2
8.4000	41.81	34.11	9.99	51.80	44.10	60.00	50.00	-8.20	-5.90	L2
12.9664	39.27	32.37	10.23	49.50	42.60	60.00	50.00	-10.50	-7.40	L2

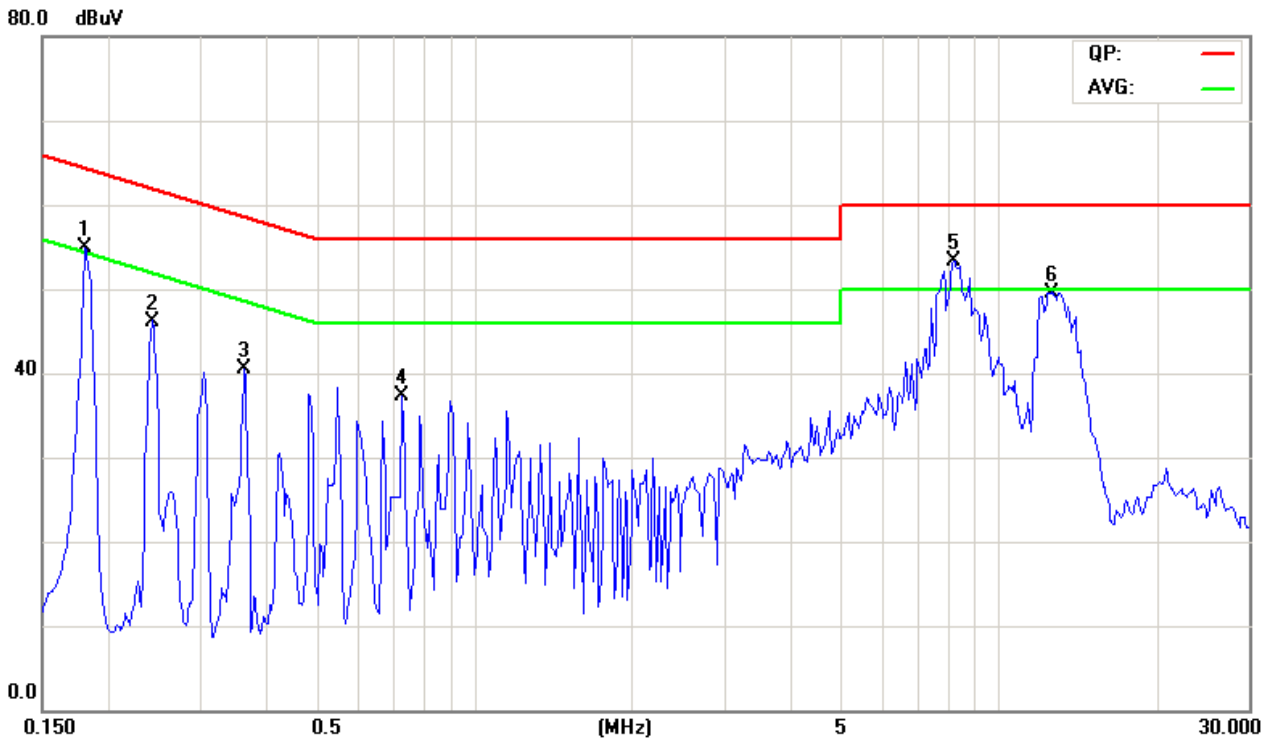
Remark:

1. The measuring frequencies range between 0.15 MHz and 30 MHz.
2. The emissions measured in the frequency range between 0.15 MHz and 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 10kHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)

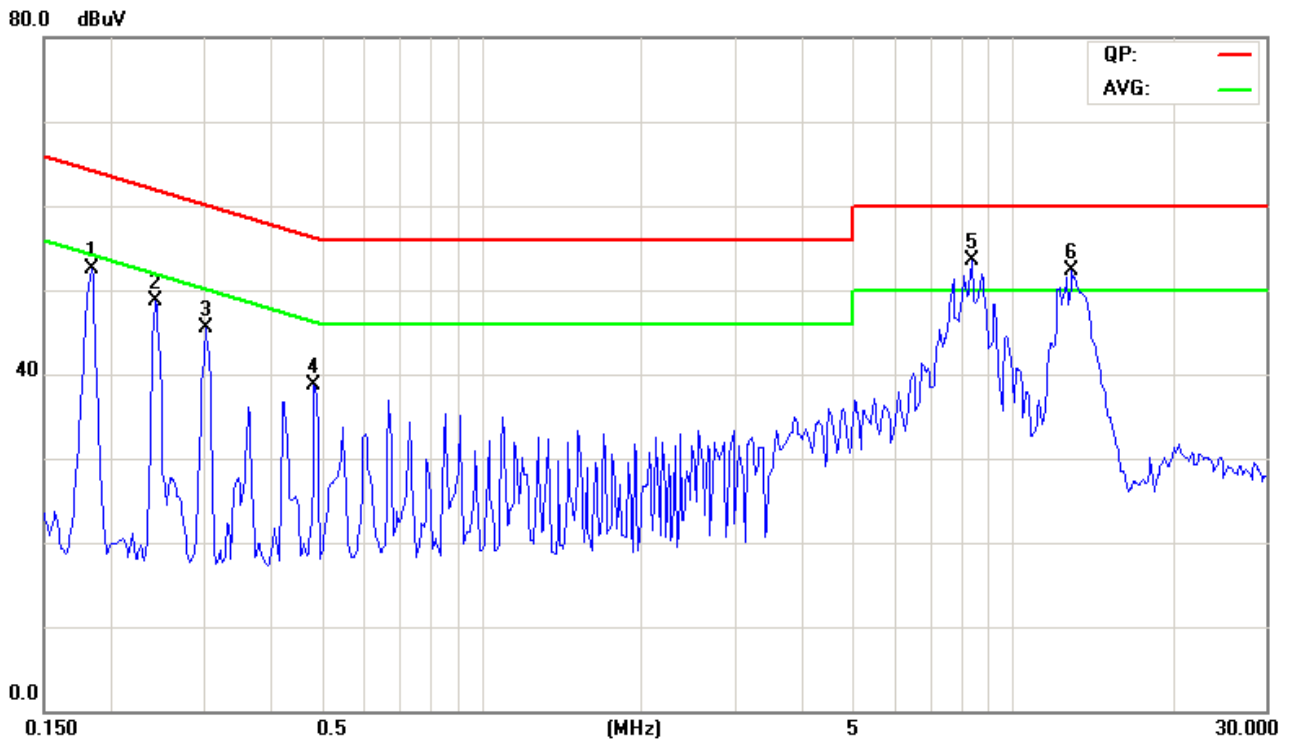


Test Plot

Conducted emissions (Line 1)



Conducted emissions (Line 2)





APPENDIX I RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	WIRELESS PCI ADAPTER
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input checked="" type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 18.82 dBm (76.21 mW) IEEE 802.11g mode: 15.98dBm (39.63 mW) draft 802.11n 20 MHz Channel mode: 15.92 dBm (39.08mW) draft 802.11n 40 MHz Channel mode: 16.01 dBm (39.90mW)
Antenna gain (Max)	2.09dBi (including cable loss) (Numeric gain: 1.62)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

Remark:

1. The maximum output power is 18.82dBm (76.21mW) at 2437MHz (with 1.62numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.

TEST RESULTS

No non-compliance noted.



Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$$P (mW) = P (W) / 1000 \text{ and}$$

$$d (cm) = d(m) / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Maximum Permissible Exposure

EUT output power = 76.21mW

Numeric Antenna gain = 1.62

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

→ Power density = 0.02457 mW / cm²

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)