FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

WIRELESS 11n ROUTER

Model: WR850RL

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

Compliance Certification Services Inc.
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
Taoyuan Hsien, (338) Taiwan, R.O.C.
http://www.ccsemc.com.tw
service@tw.ccsemc.com

Testing Laboratory
0363

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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 11n ROUTER
Trade Name:	PRO-NETS; Speed Com+; Jet Com
Model:	WR850RL
Date of Test:	October 9 ~ 24, 2008

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:

Robert Huang
Section Manager
Compliance Certification Services Inc.

Reviewed by:

Julia Wei
Senior Specialist
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	WIRELESS 11n ROUTER
Trade Name	PRO-NETS; Speed Com+; Jet Com
Model Number	WR850RL
Model Discrepancy	The EUT have three types for sale, they are identical expect the following list: 1. Horizontal appearance with Detachable Antenna (Model: WR850RLD) 2. Horizontal appearance with Non-detachable Antenna (Model: WR850RL) 3. Vertical appearance with Detachable Antenna (Model: WR850RLD)
EUT Power Rating	12VDC, 1A
Power Adapter	**1. Ktec / KSLFC1200100W1US;** **2. DVE / DSA-12G-12FUS 120120** I/P: 100-240VAC, 50/60Hz, 0.3A O/P: 12VDC, 1A
DC Power Cable	Unshielded, 1.8m (Non-detachable)
Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 18.20 dBm IEEE 802.11g mode: 15.44 dBm draft 802.11n 20 MHz Channel mode: 18.39 dBm draft 802.11n 40 MHz Channel mode: 18.32 dBm
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mpbs) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mpbs) 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	**For WR850RLD Antenna** Dipole Antenna / Gain: 2.09dBi **For WR850RL Antenna** Dipole Antenna / Gain: 2.00dBi

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: **RXZ-WR850RL** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.*

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.

2.1 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.

2.2 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.

2.3 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.

2.4 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.

2.5 DESCRIPTION OF TEST MODES

After verified, the Horizontal appearance with Detachable Antenna (Model: WR850RLD) was reported as the worst case and been tested under operating condition.

The EUT (model: WR850RL) comes with two types of power adapter for sale. After the preliminary test, the EUT with power adapter (Model KSLFC1200100W1EU) was found to emit the worst emissions and therefore had been tested under operating condition.

The EUT is a 2x3 configuration spatial MIMO (2Tx & 3Rx) without beam forming function.

The 2x3 configuration is implemented with two outside TX & RX chains (Chain 0 and 1).

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 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 20 MHz Channel mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps 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.

3. INSTRUMENT CALIBRATION

3.1 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.

3.2 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	R&S	FSP30	100112	10/14/2009

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilnet	E4411B	MY41440314	N.C.R
Spectrum Analyzer	R&S	FSP30	100112	10/14/2009
EMI Test Receiver	R&S	ESVS30	828488/004	03/20/2009
Pre-Amplifier	Mini-Circuits	ZKL-2R5	83153007374	04/02/2009
Pre-Amplifier	Agilent	8449B	3008A01738	03/28/2009
Bilog Antenna	Sunol Sciences	JB1	A031905	10/03/2009
Horn Antenna	EMCO	3115	00022250	05/08/2009
Loop Antenna	EMCO	6502	2356	05/28/2010
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	CCS	N/A	N/A	05/09/2009
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.7)			

Remark: *The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

Powerline Conducted Emissions Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	R&S	ESCS30	845552/030	04/08/2009
LISN	R&S	ENV216	100074	12/03/2008
LISN	FCC	FCC-LISN-50/ 250-16-2-07	06013	10/16/2008
Test S/W	CCS-3A1-CE			

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

4. FACILITIES AND ACCREDITATIONS

4.1 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, 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 and CISPR Publication 22.

4.2 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.”

4.3 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	ACCREDITED No. 0824-01
USA	FCC MRA	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	TW1026
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-2882/2541/2798/725/1868 C-402/747/912 T-321/325
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	ilac-MRA TAF Testing Laboratory 0363
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	Canada IC 2324C-3 IC 2324C-5

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

5. SETUP OF EQUIPMENT UNDER TEST

5.1 SETUP CONFIGURATION OF EUT

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

5.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

****No any support equipment during the test.**

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

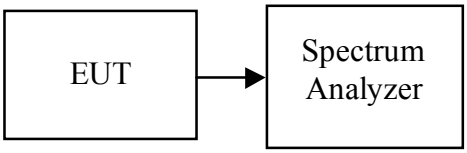
6. FCC PART 15.247 REQUIREMENTS

6.1 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 = 300 kHz, Span = 30 MHz / 50MHz,
   Sweep =auto.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.066	>500	PASS
Mid	2437	12.180		PASS
High	2462	12.186		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.623	>500	PASS
Mid	2437	16.593		PASS
High	2462	16.563		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.886	>500	PASS
Mid	2437	17.898		PASS
High	2462	17.820		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.826	>500	PASS
Mid	2437	17.820		PASS
High	2462	17.766		PASS

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

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.593	>500	PASS
Mid	2437	36.593		PASS
High	2452	36.503		PASS

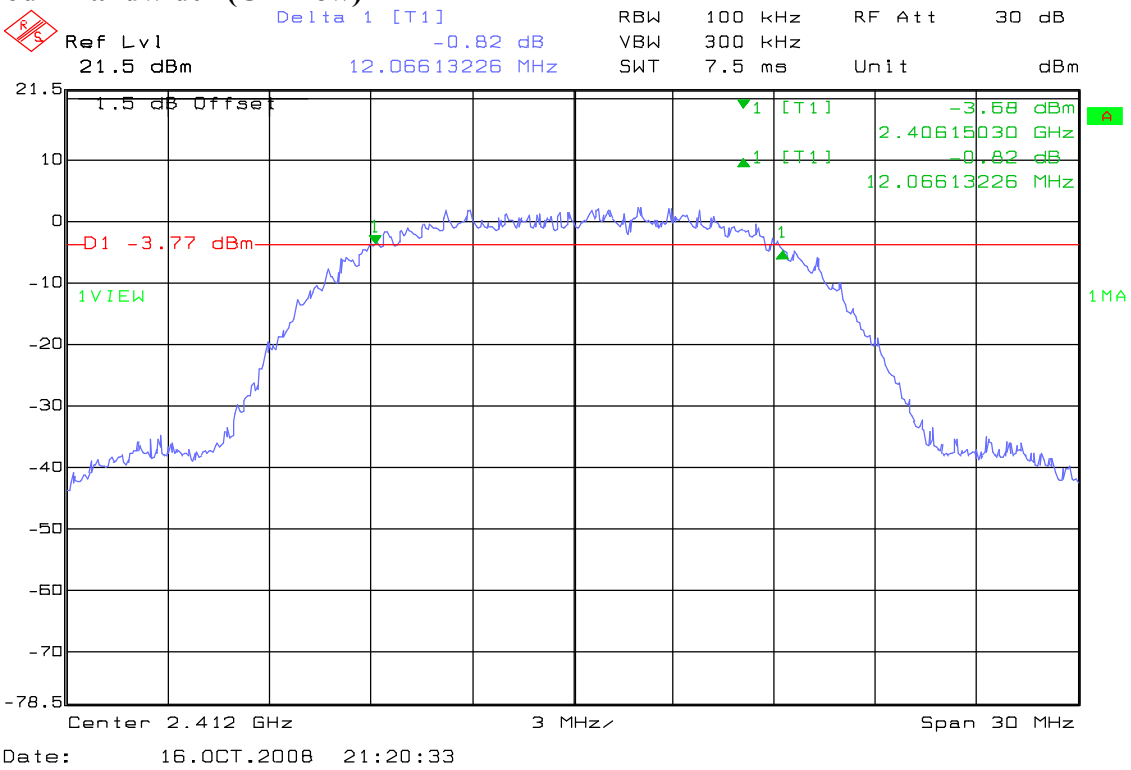
Test mode: draft 802.11n 40 MHz Channel mode / Chain 1

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.603	>500	PASS
Mid	2437	36.503		PASS
High	2452	36.603		PASS

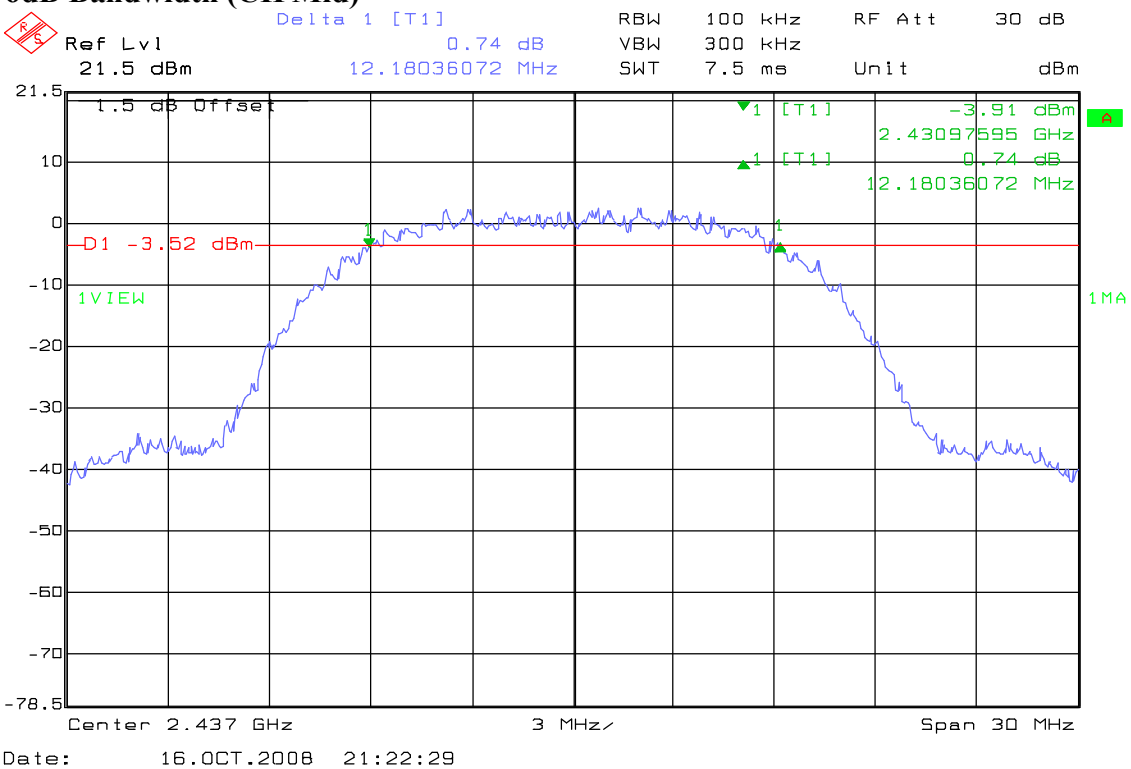
TEST PLOT

IEEE 802.11b mode

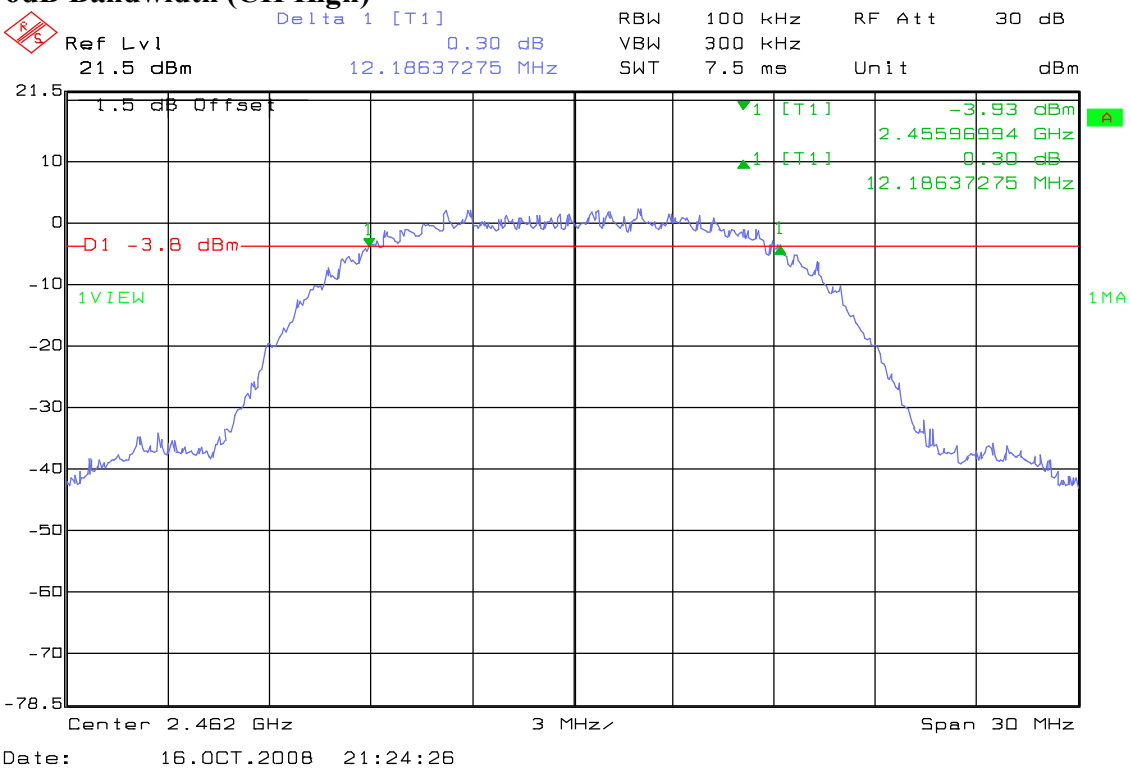
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

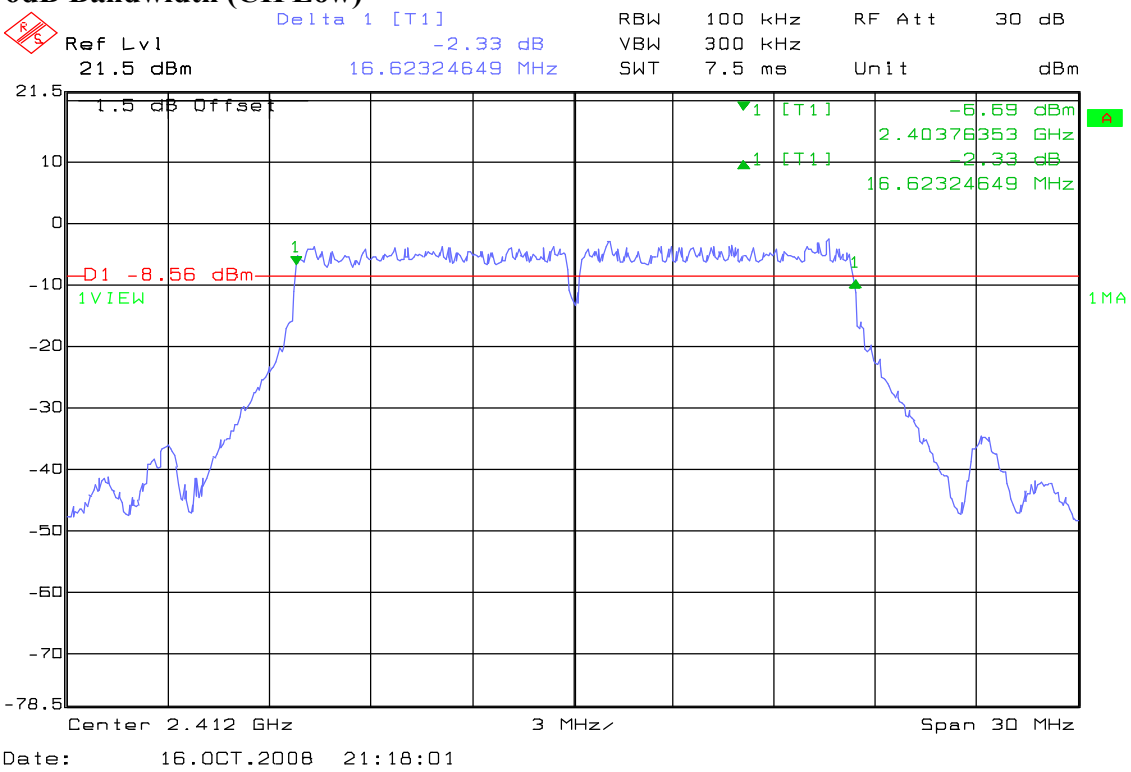


6dB Bandwidth (CH High)

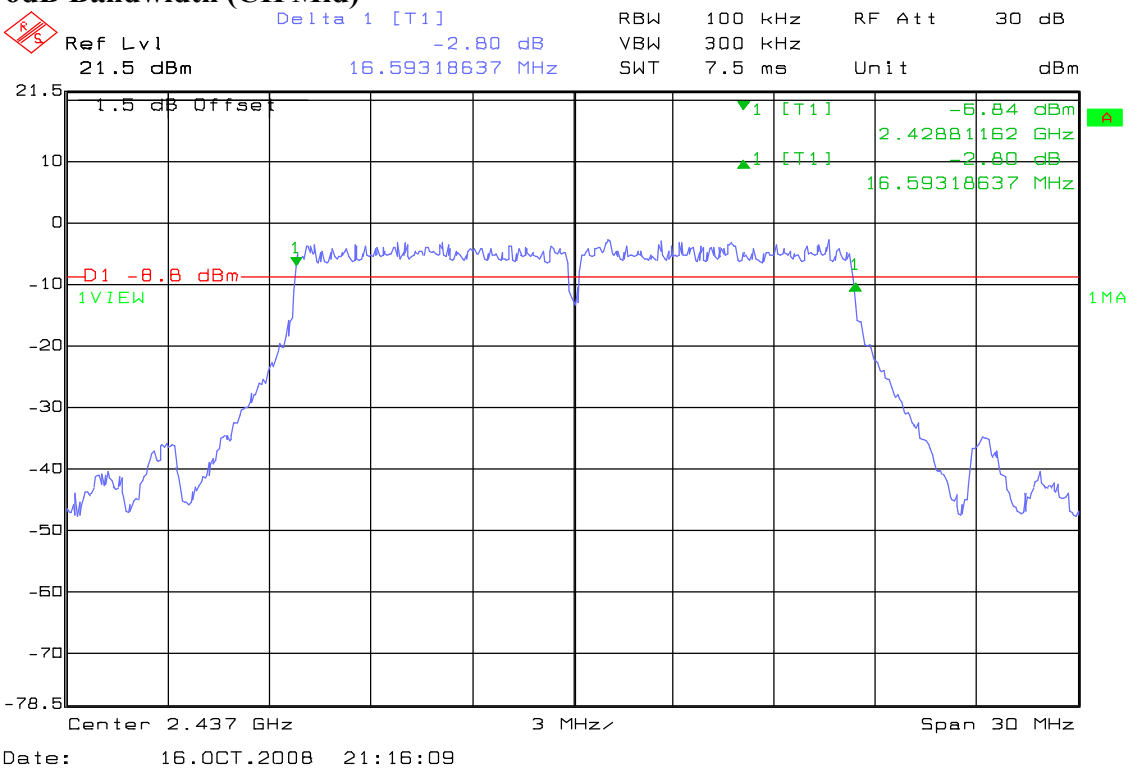


IEEE 802.11g mode

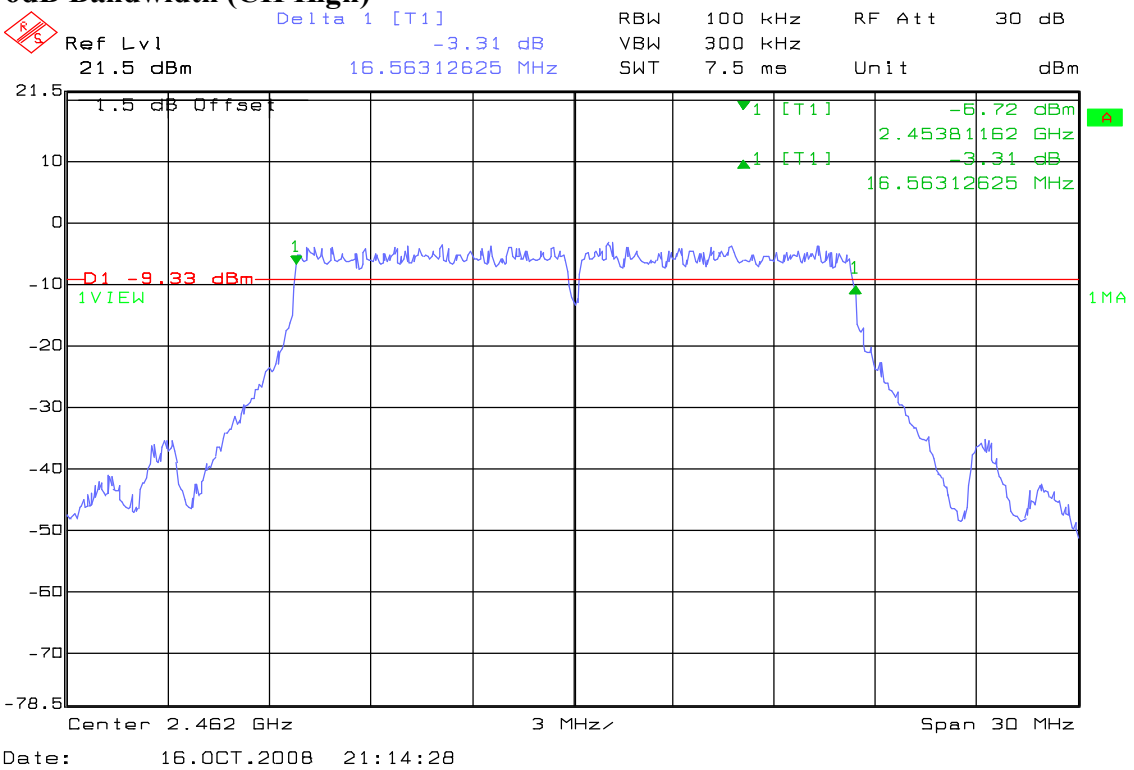
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

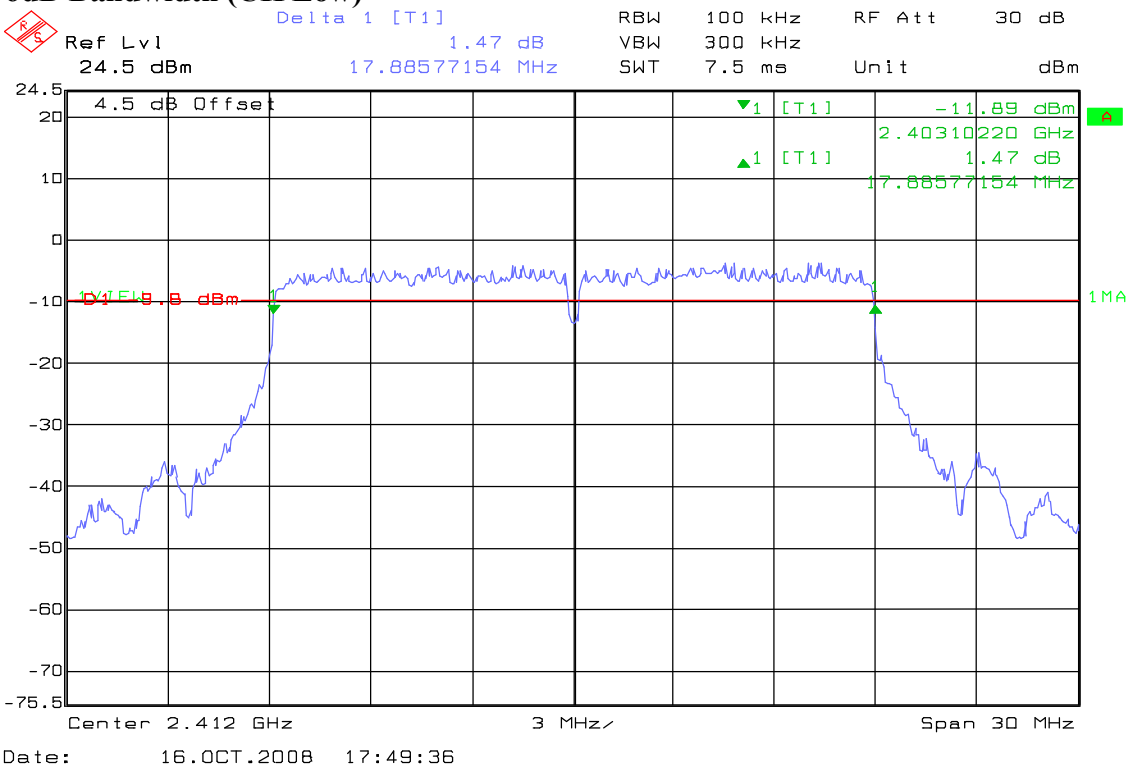


6dB Bandwidth (CH High)

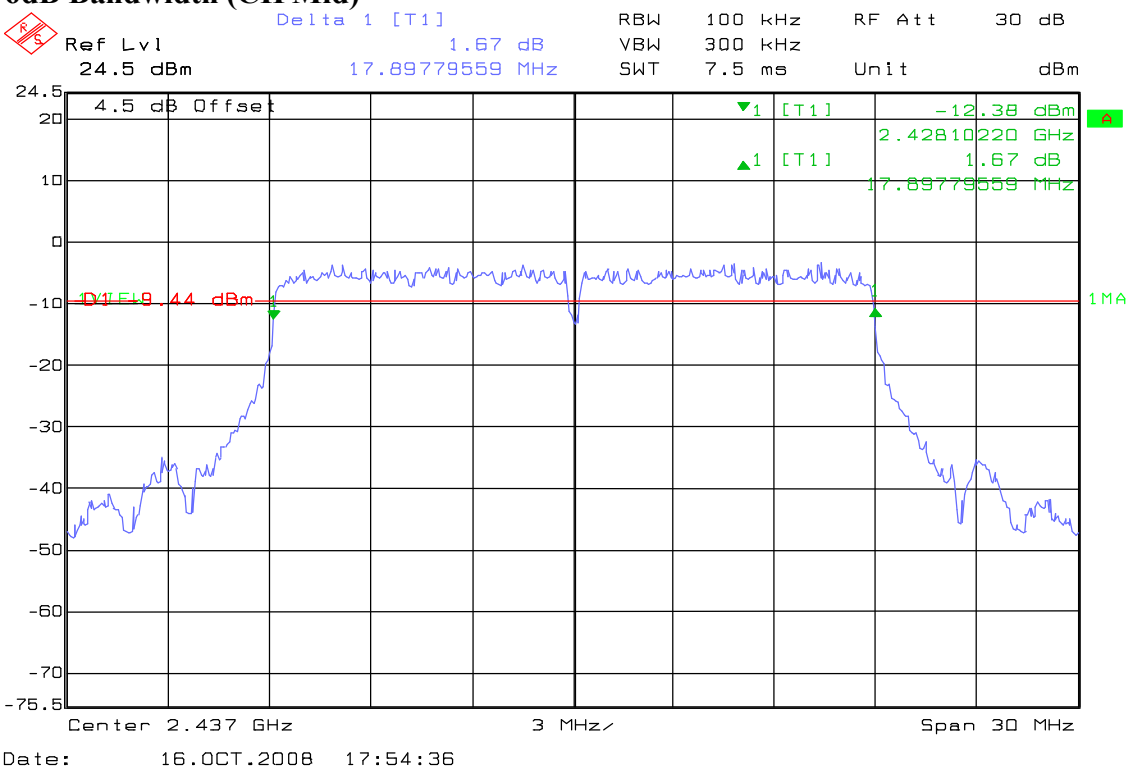


draft 802.11n 20 MHz Channel mode / Chain 0

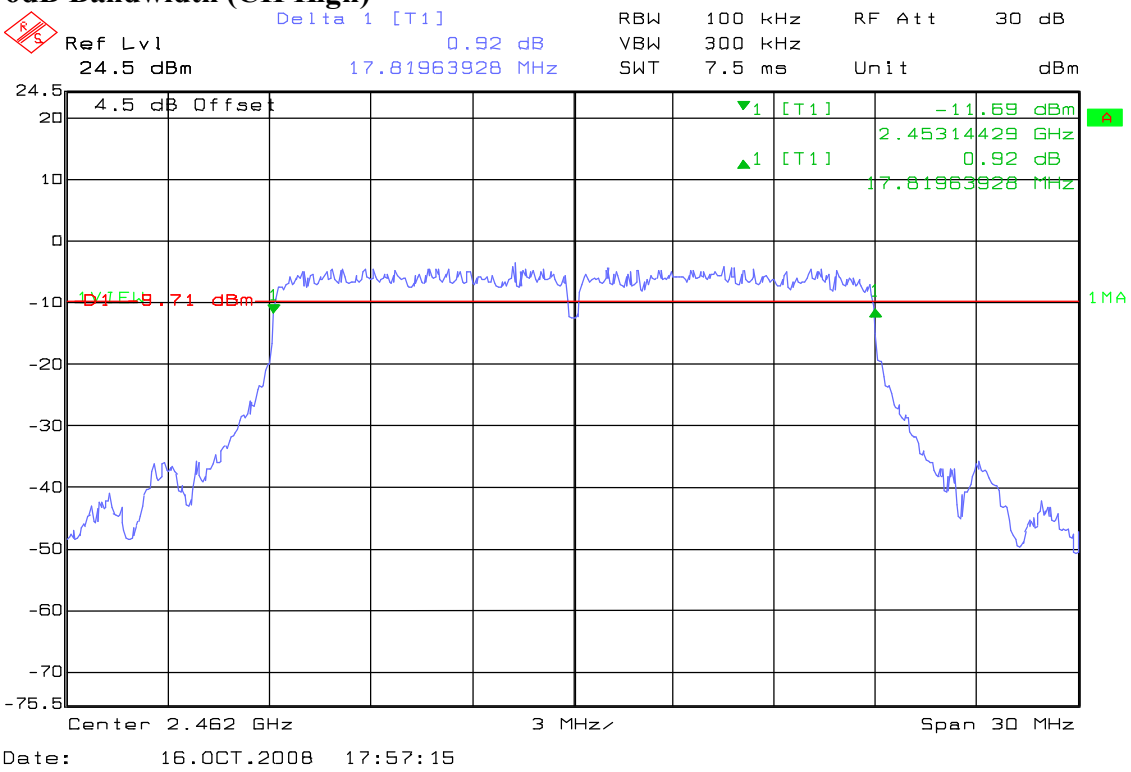
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

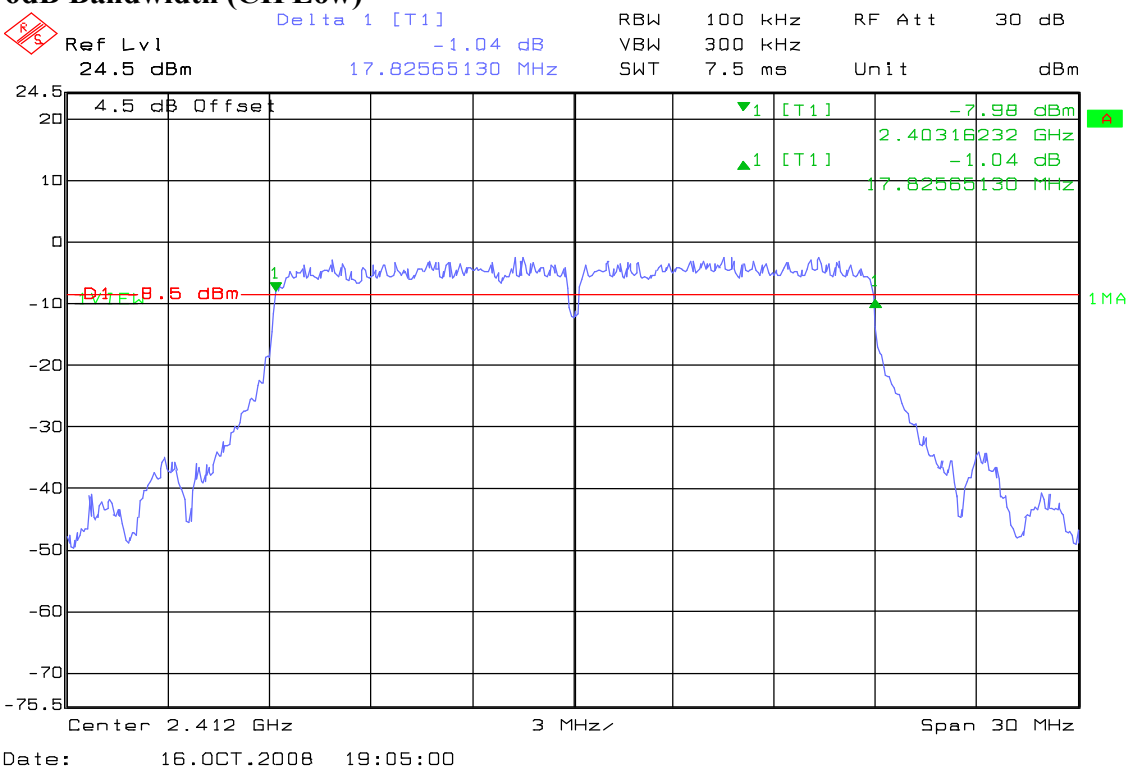


6dB Bandwidth (CH High)

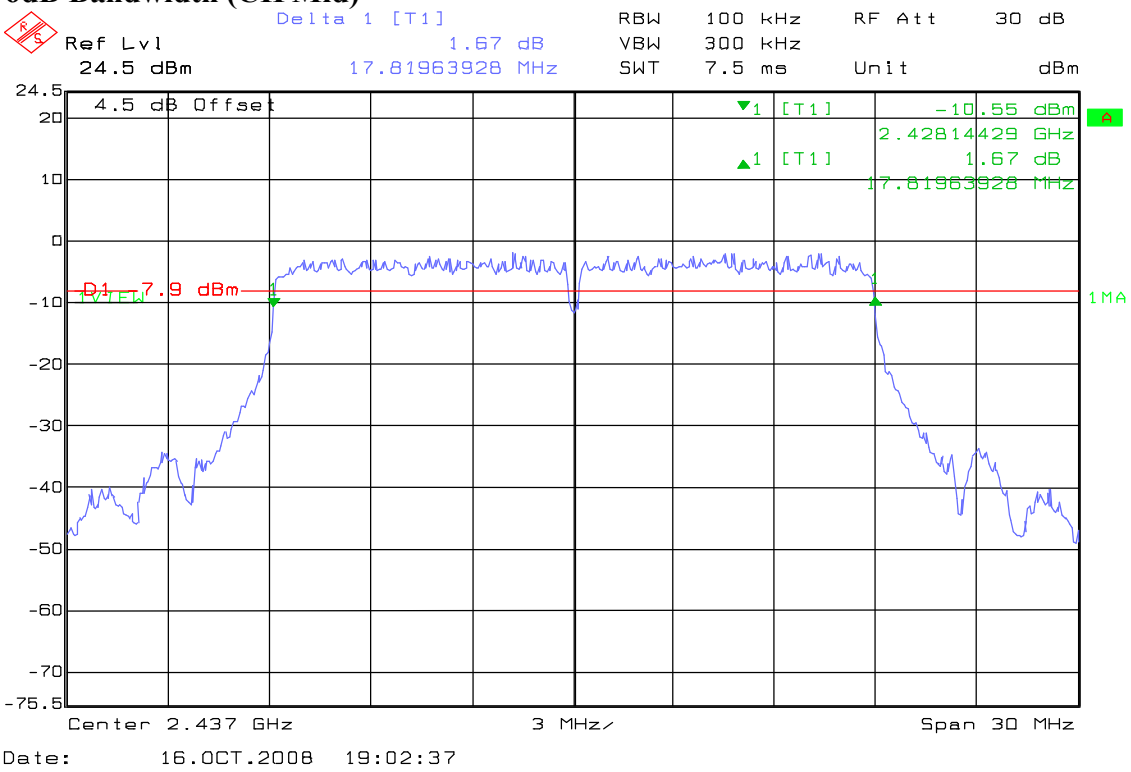


draft 802.11n 20 MHz Channel mode / Chain 1

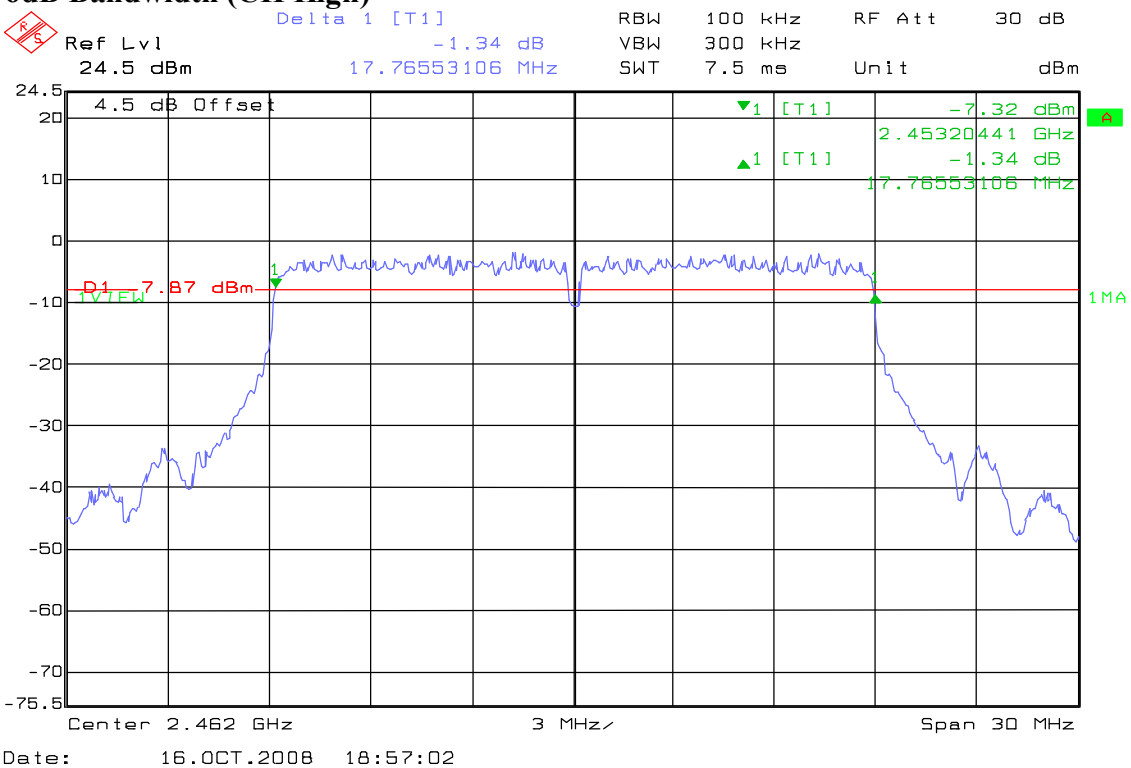
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

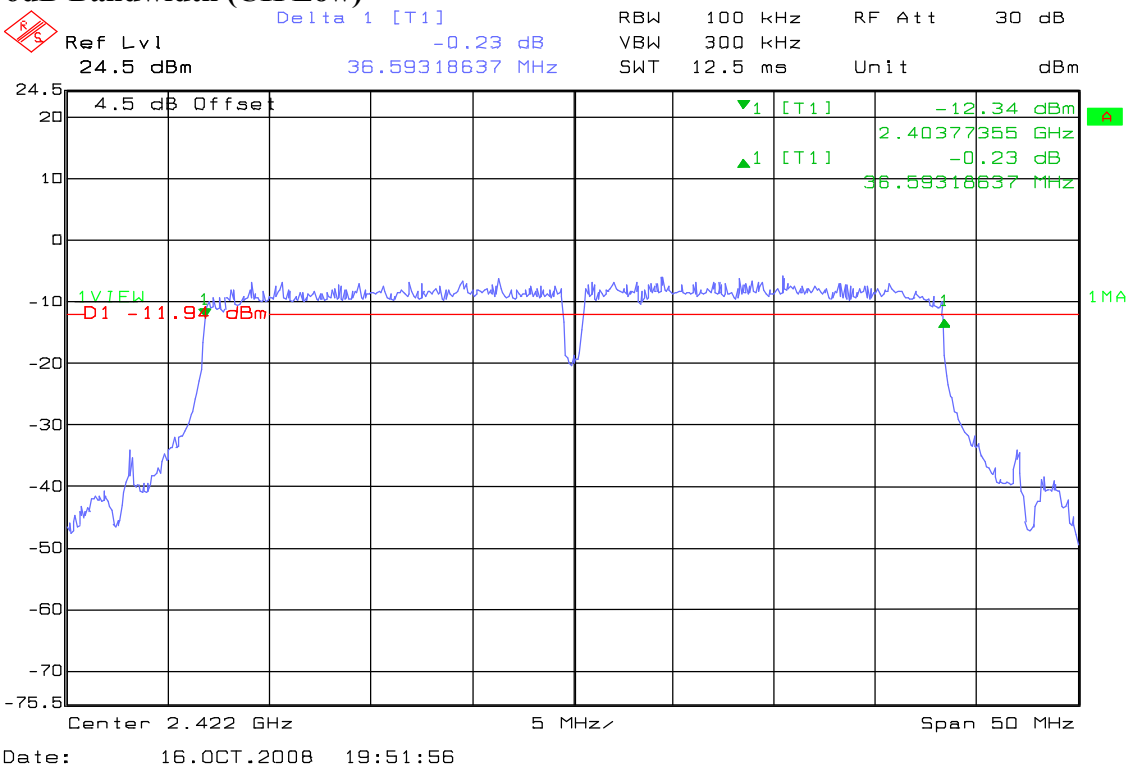


6dB Bandwidth (CH High)

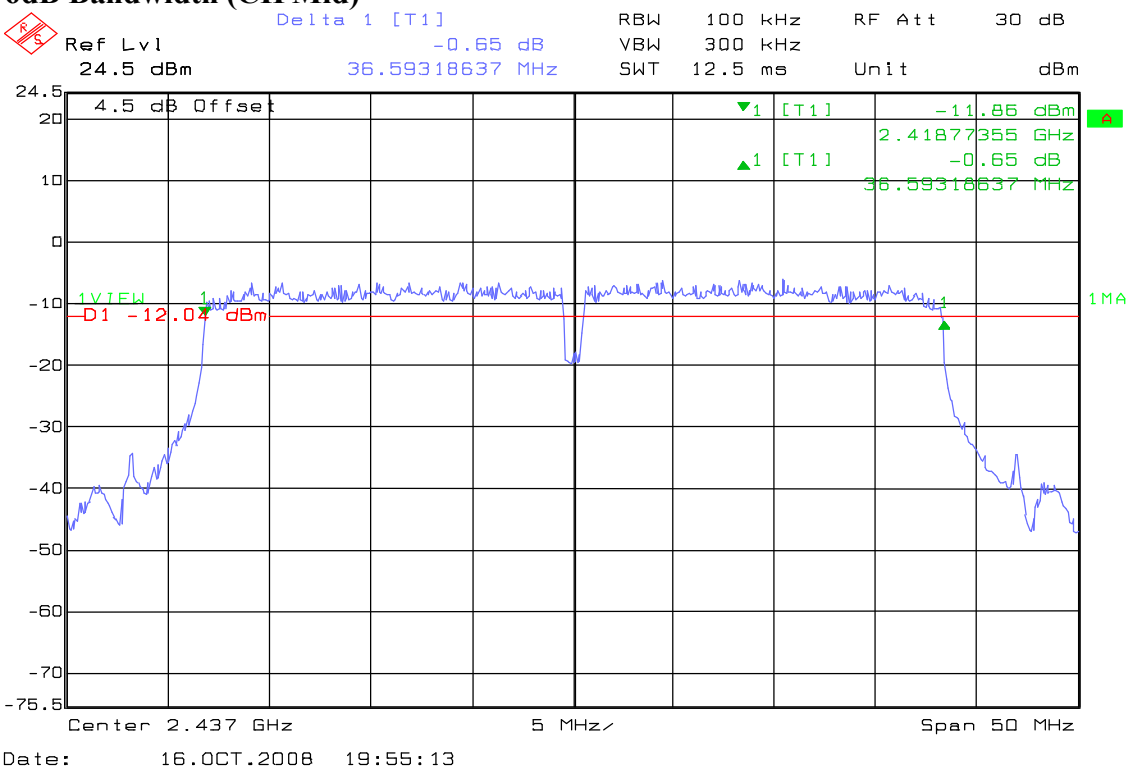


draft 802.11n 40 MHz Channel mode / Chain 0

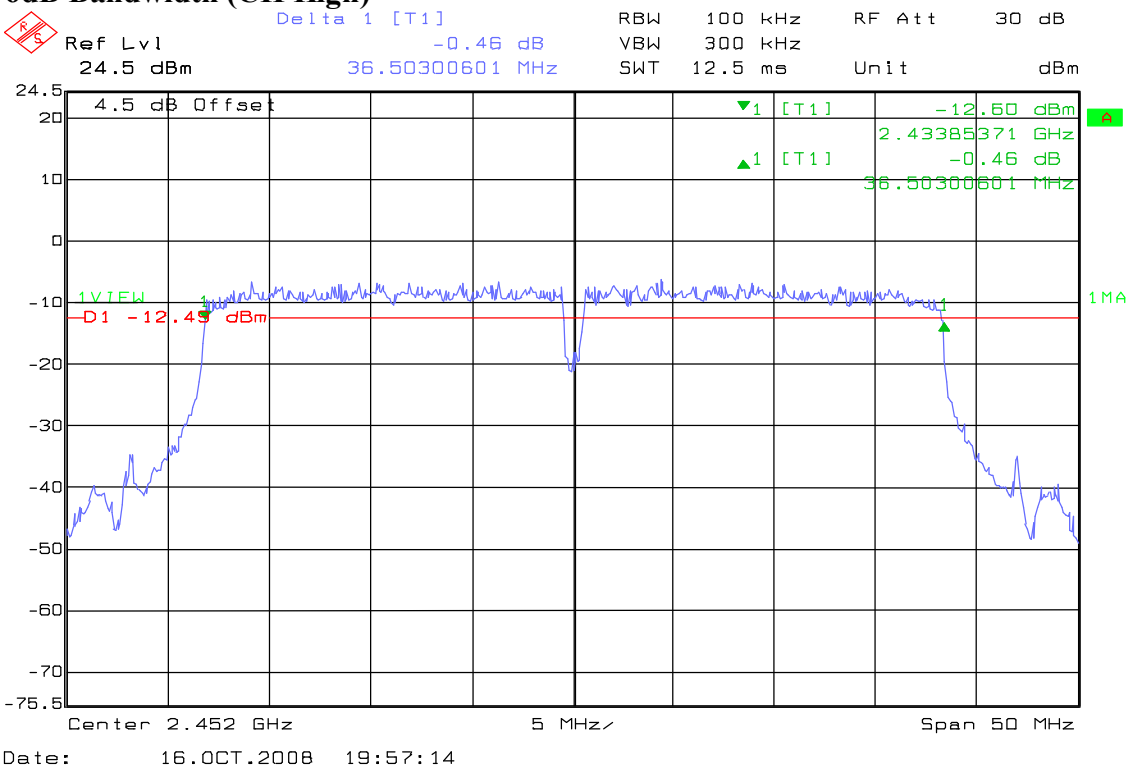
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)

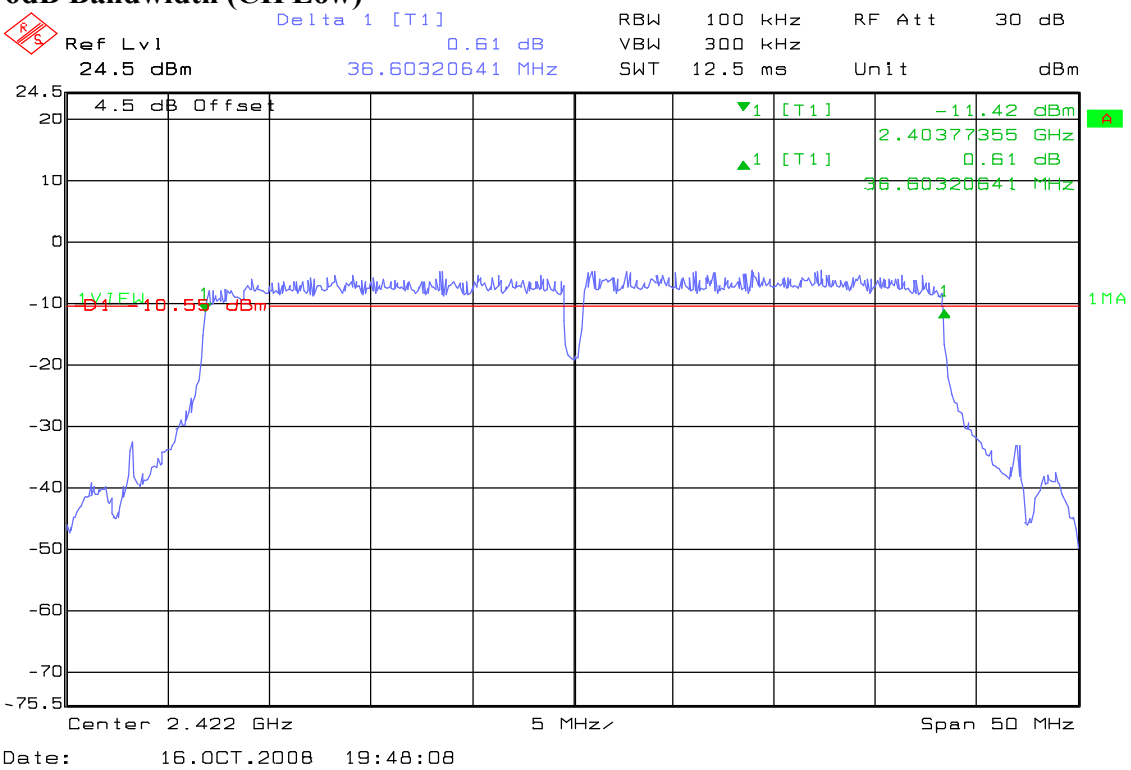


6dB Bandwidth (CH High)

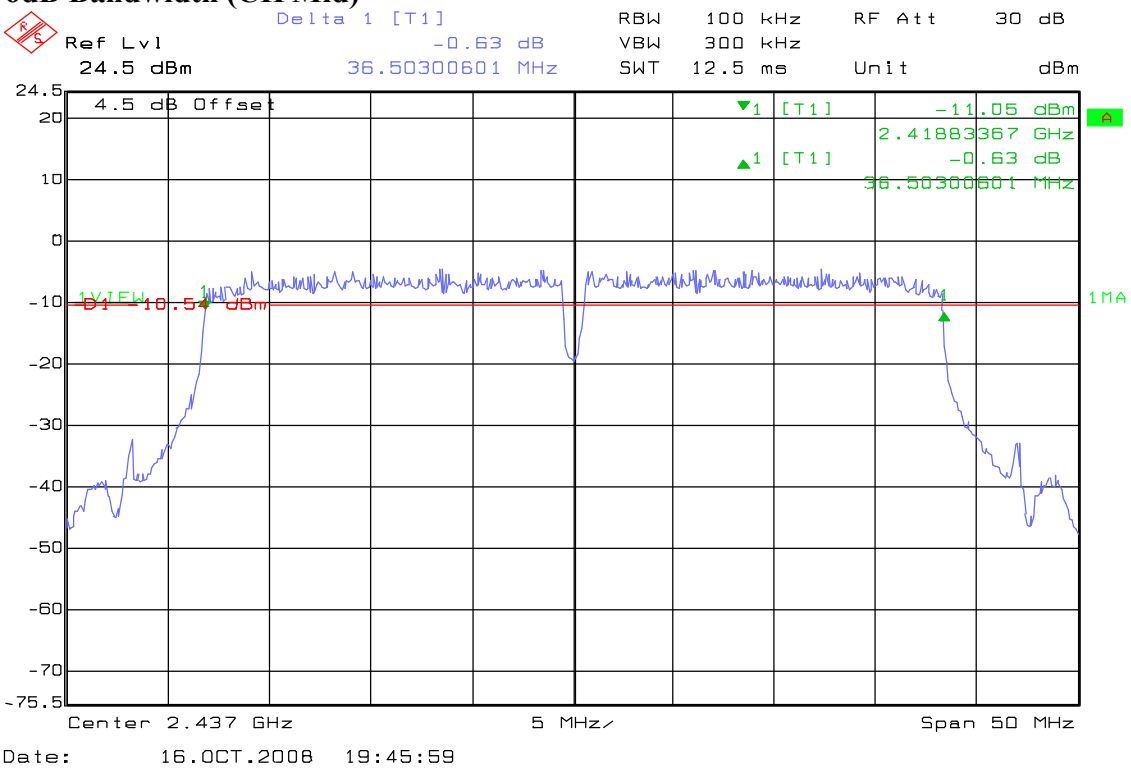


draft 802.11n 40 MHz Channel mode / Chain 1

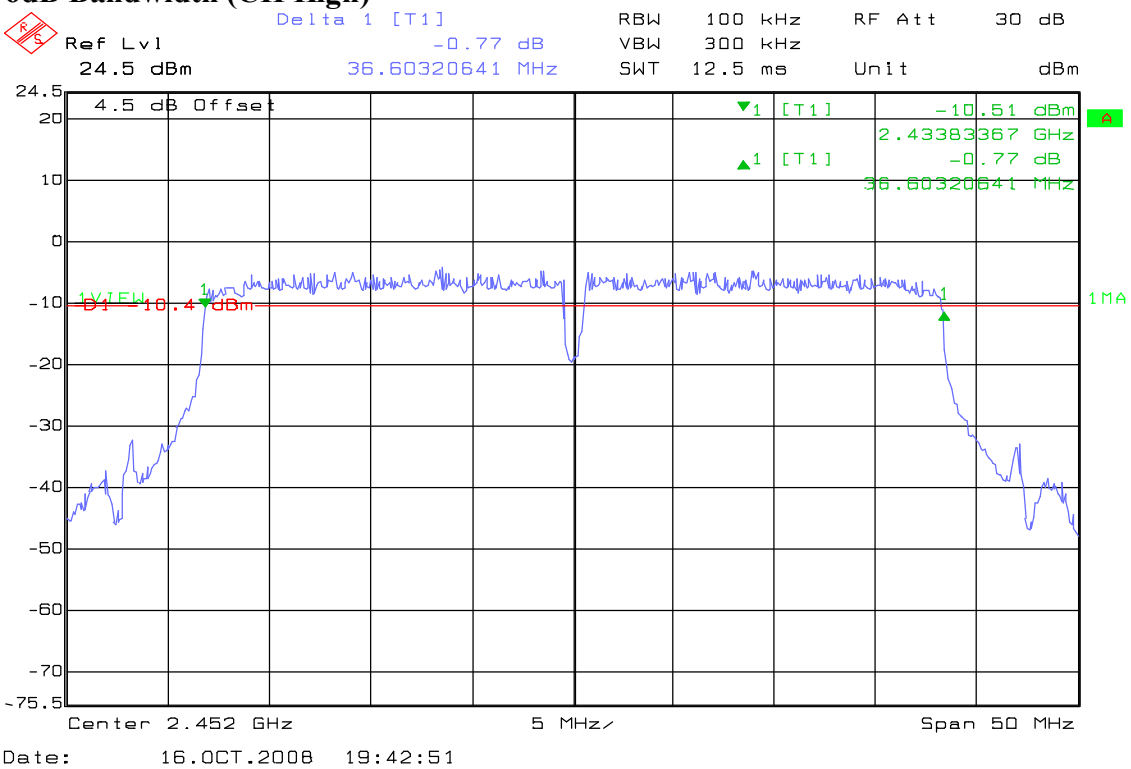
6dB Bandwidth (CH Low)



6dB Bandwidth (CH Mid)



6dB Bandwidth (CH High)



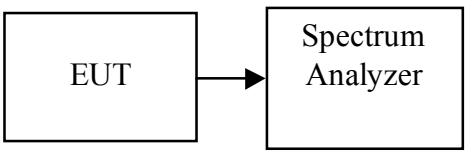
6.2 PEAK POWER

LIMIT

According to §15.247(b)(3) & (4), the maximum peak output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt.
2. 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	18.20	0.0661	1.00	PASS
Mid	2437	18.01	0.0632		PASS
High	2462	18.05	0.0638		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.28	0.0337	1.00	PASS
Mid	2437	15.44	0.0350		PASS
High	2462	15.04	0.0319		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.19	15.22	18.22	0.0663	1.00	PASS
Mid	2437	15.46	15.07	18.28	0.0673		PASS
High	2462	15.47	15.28	18.39	0.0690		PASS

Test mode: draft 802.11n 40 MHz Channel mode

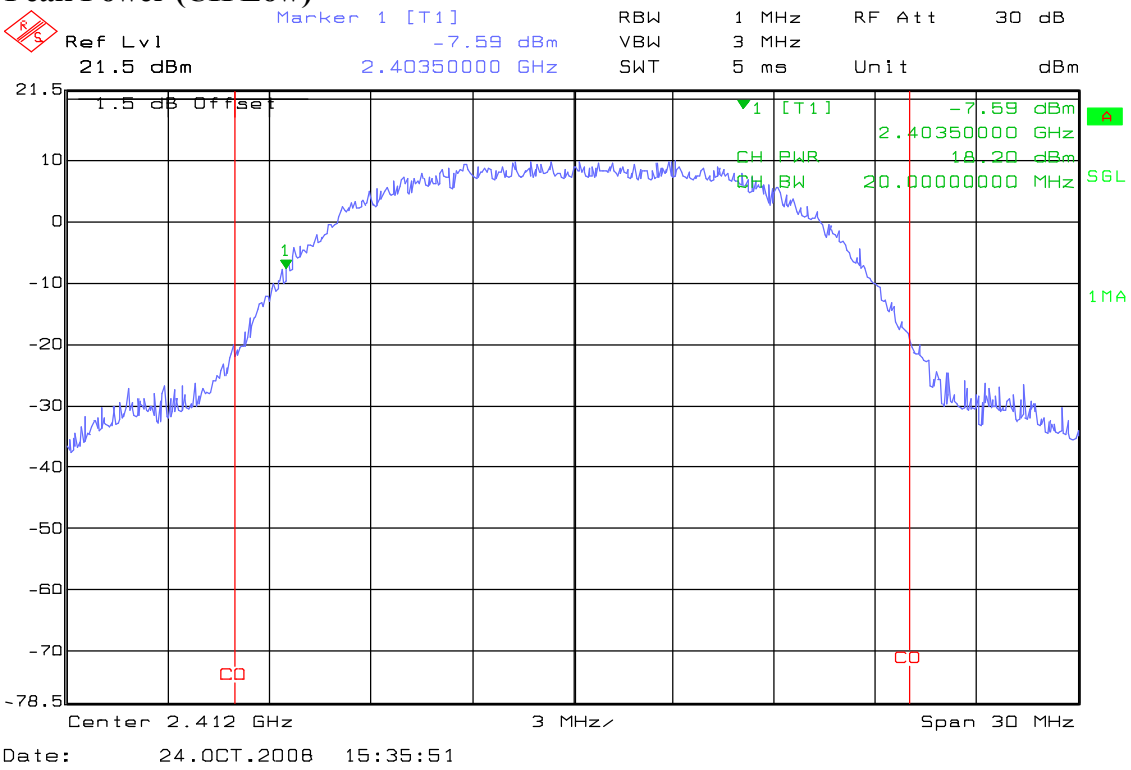
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	15.32	15.18	18.26	0.0670	1.00	PASS
Mid	2437	15.07	15.28	18.19	0.0659		PASS
High	2452	15.37	15.24	18.32	0.0679		PASS

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

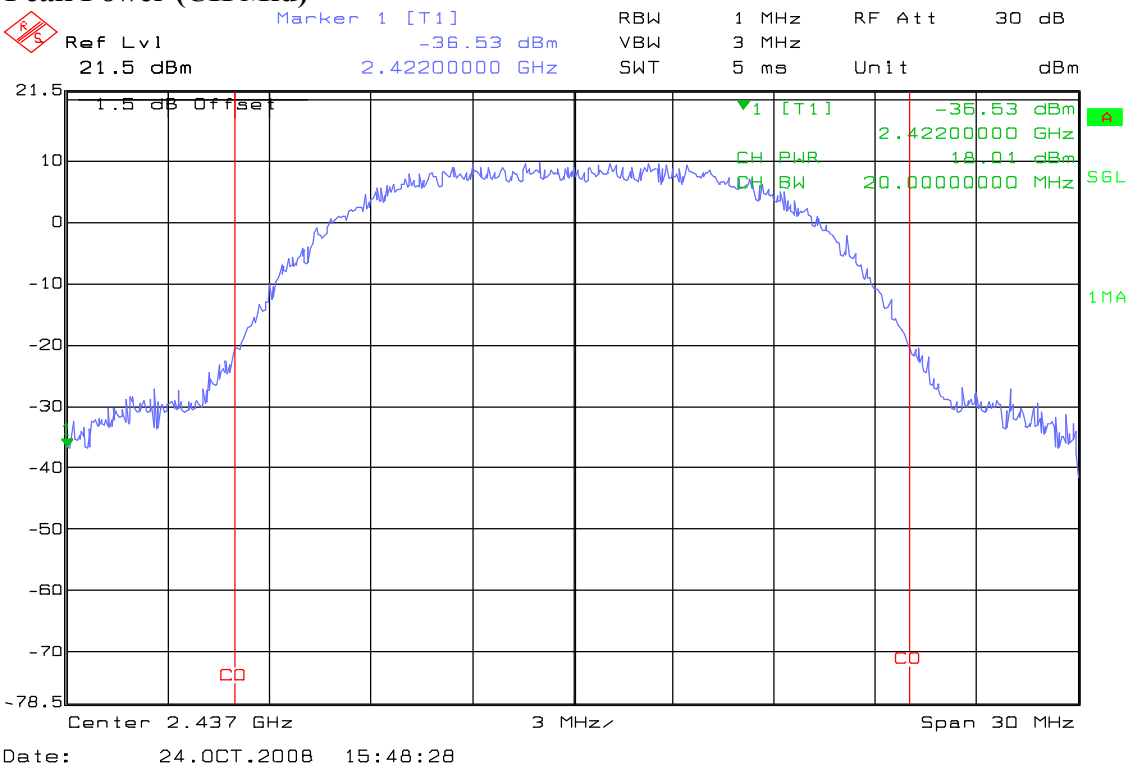
TEST PLOT

IEEE 802.11b mode

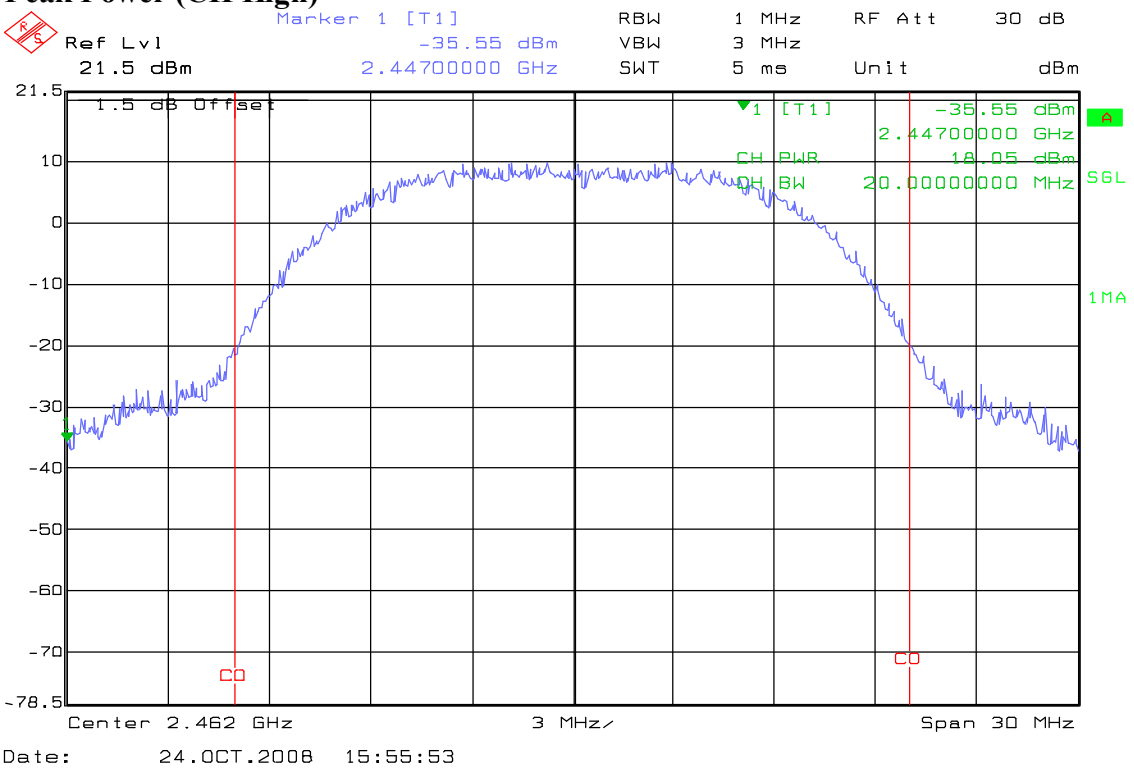
Peak Power (CH Low)



Peak Power (CH Mid)

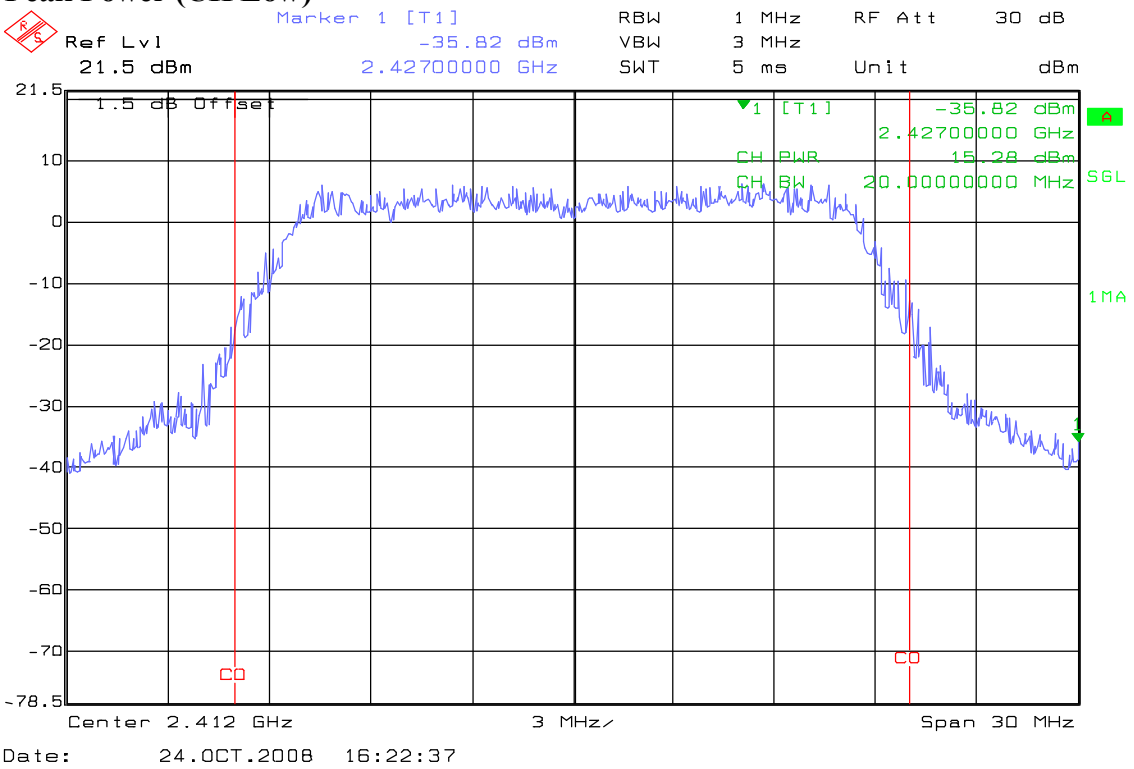


Peak Power (CH High)

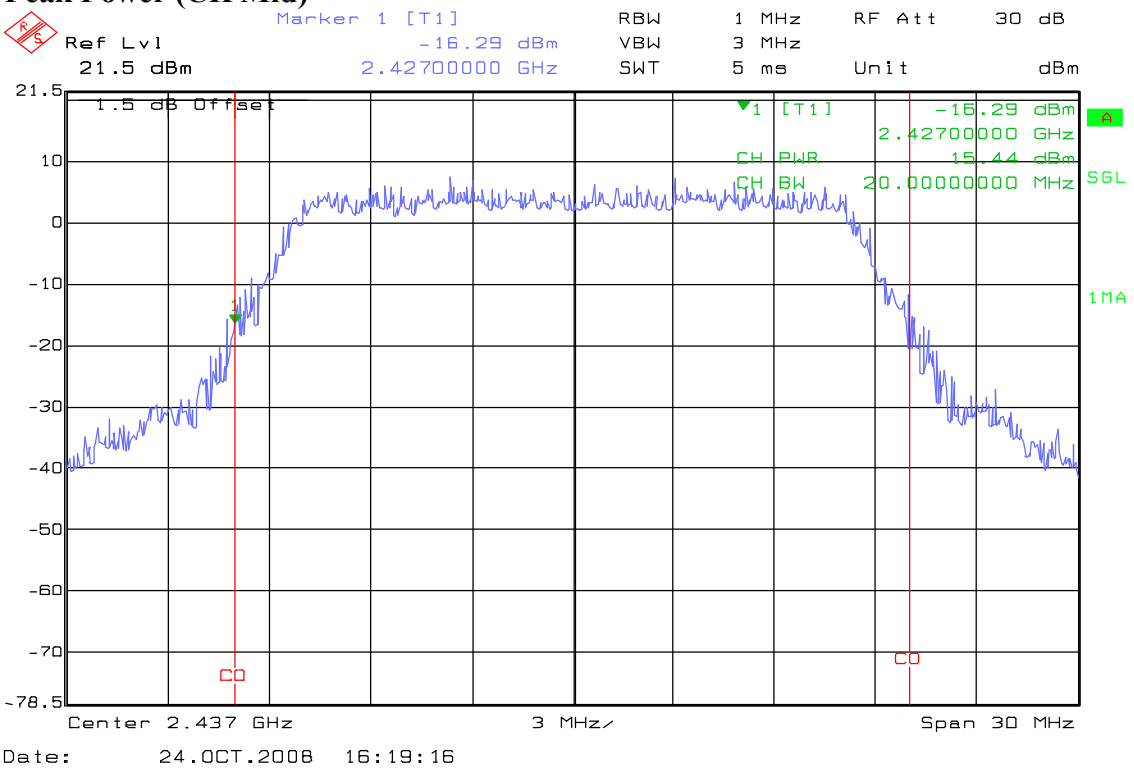


IEEE 802.11g mode

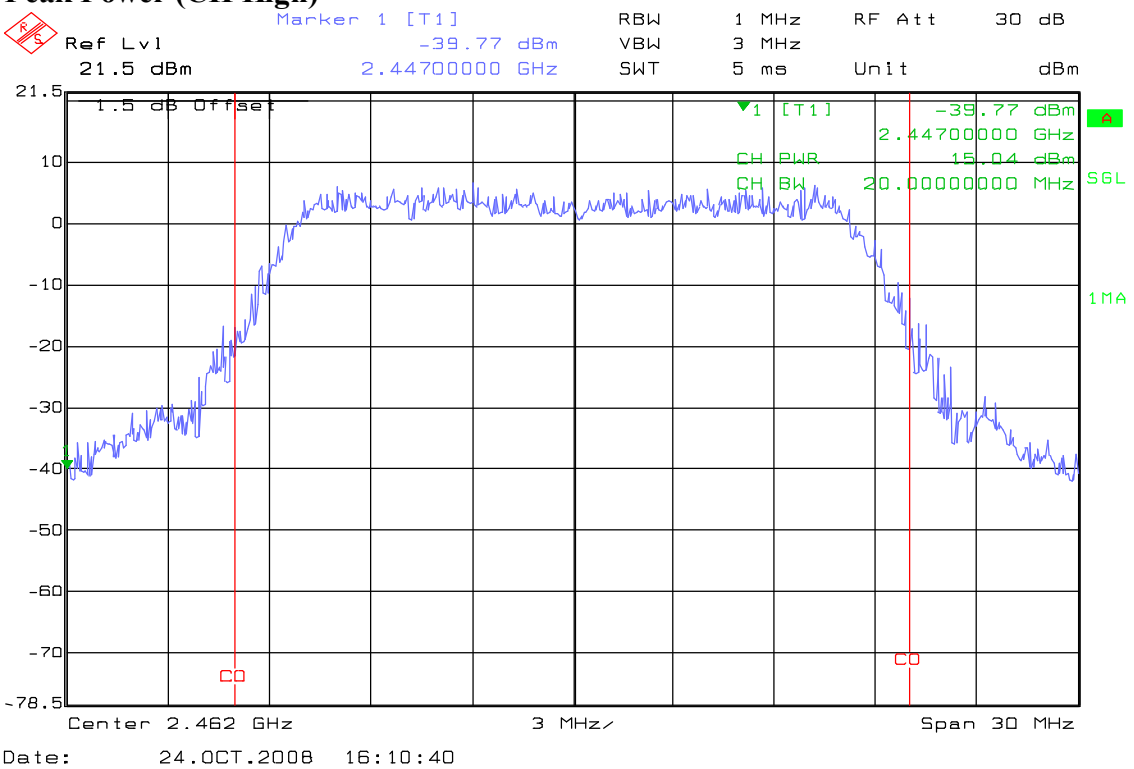
Peak Power (CH Low)



Peak Power (CH Mid)

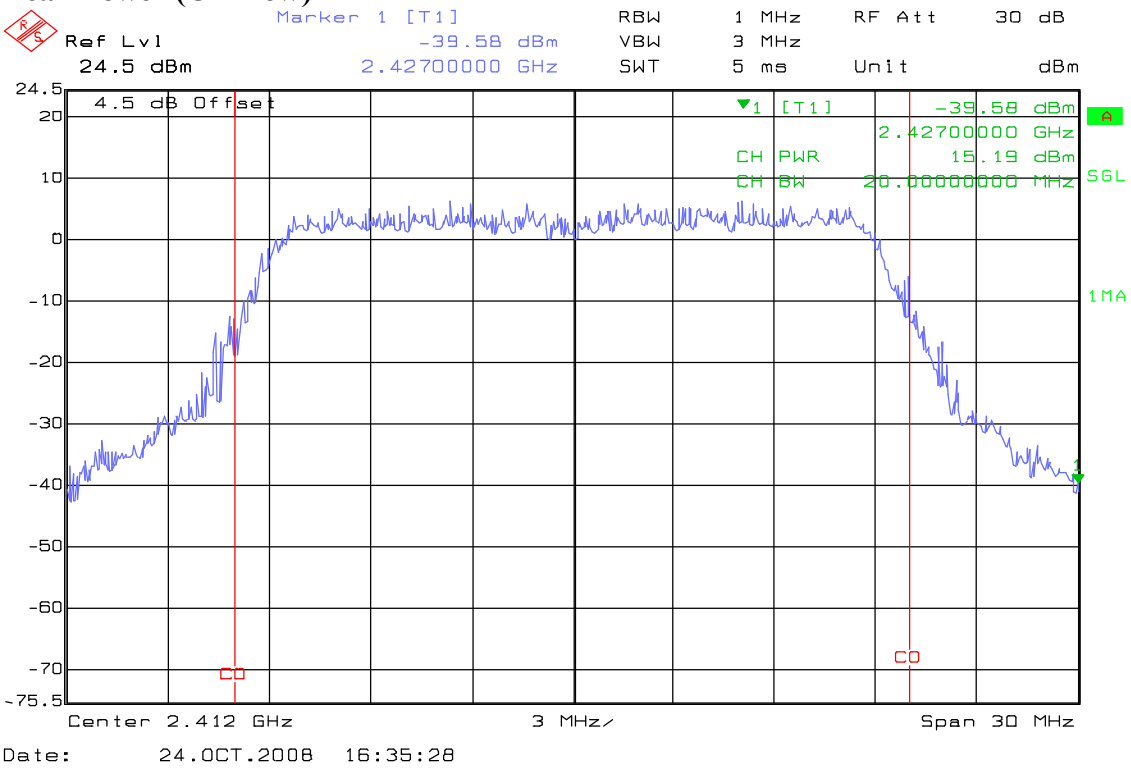


Peak Power (CH High)

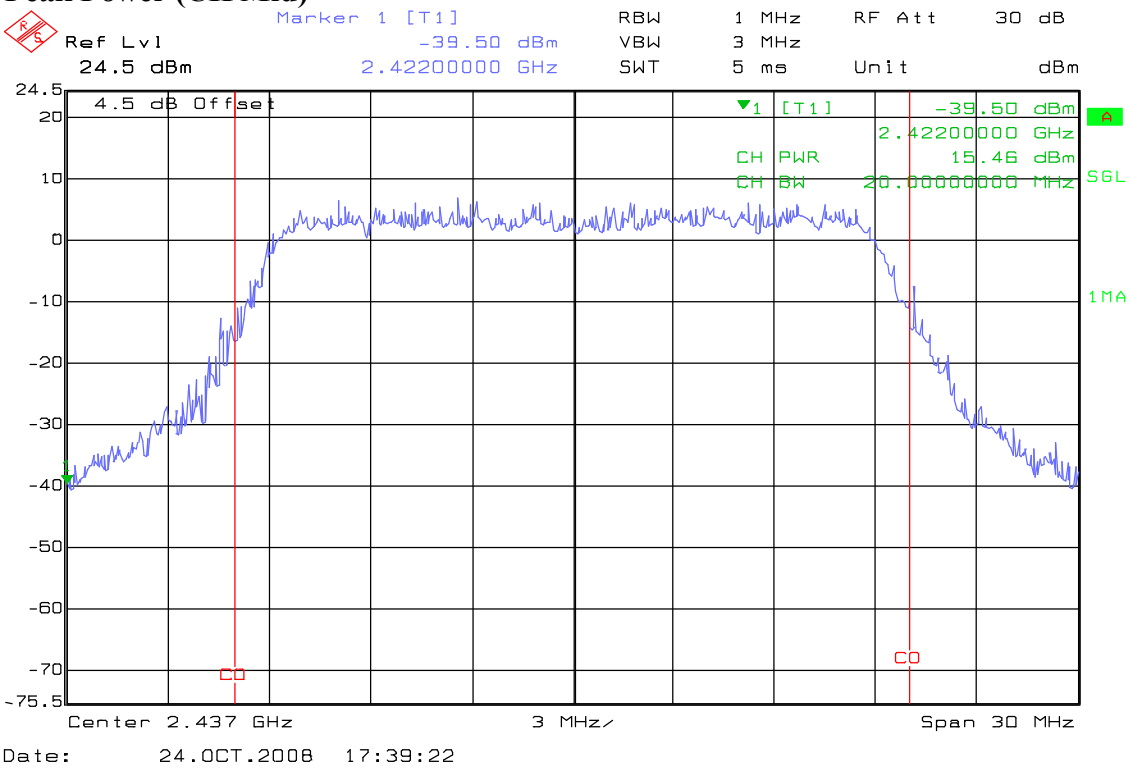


draft 802.11n 20 MHz Channel mode / Chain 0

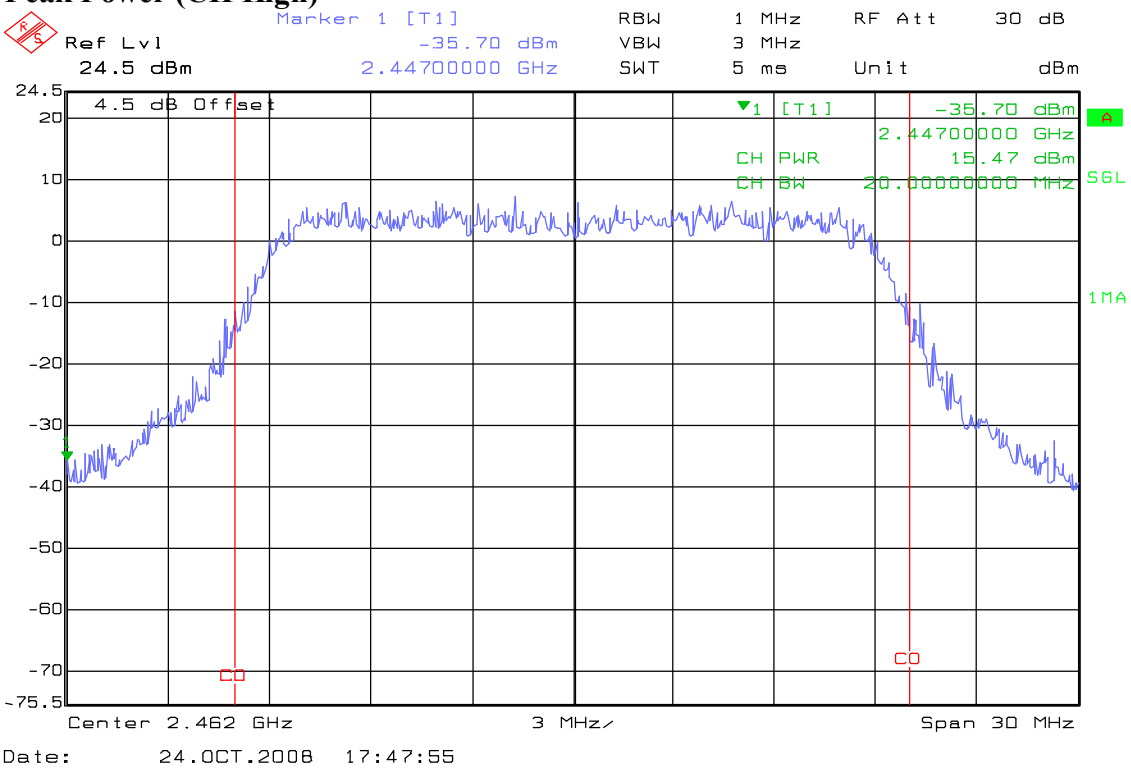
Peak Power (CH Low)



Peak Power (CH Mid)

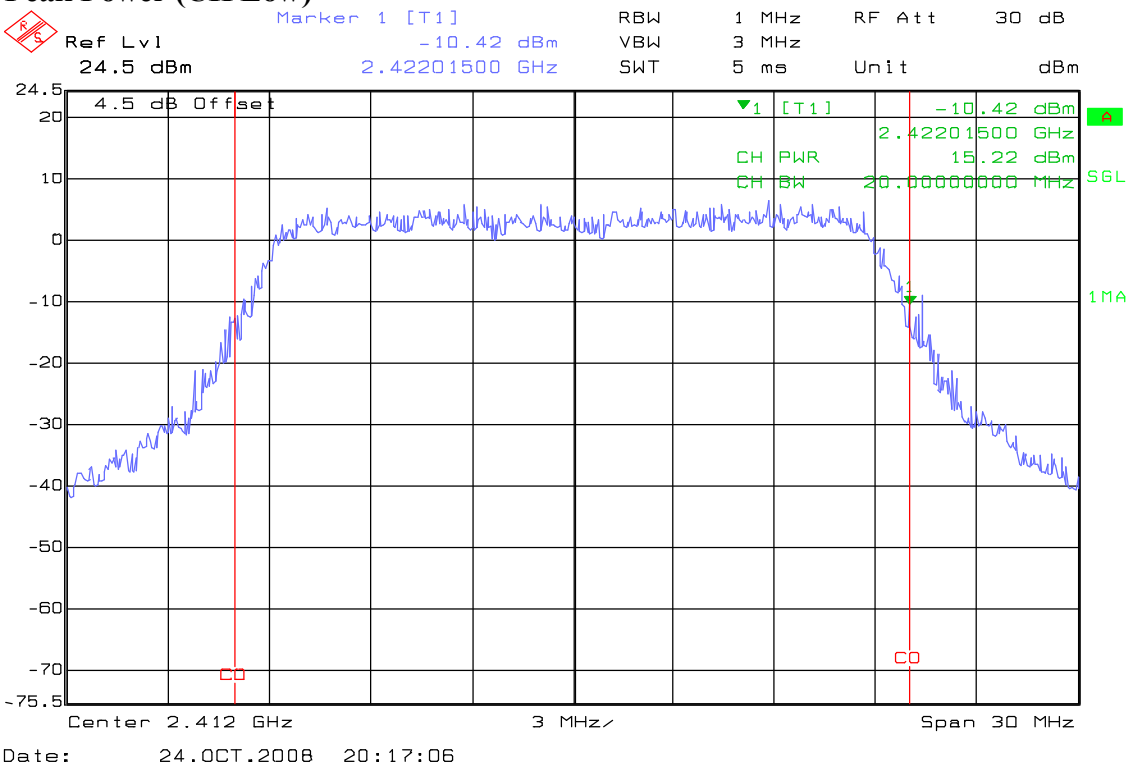


Peak Power (CH High)

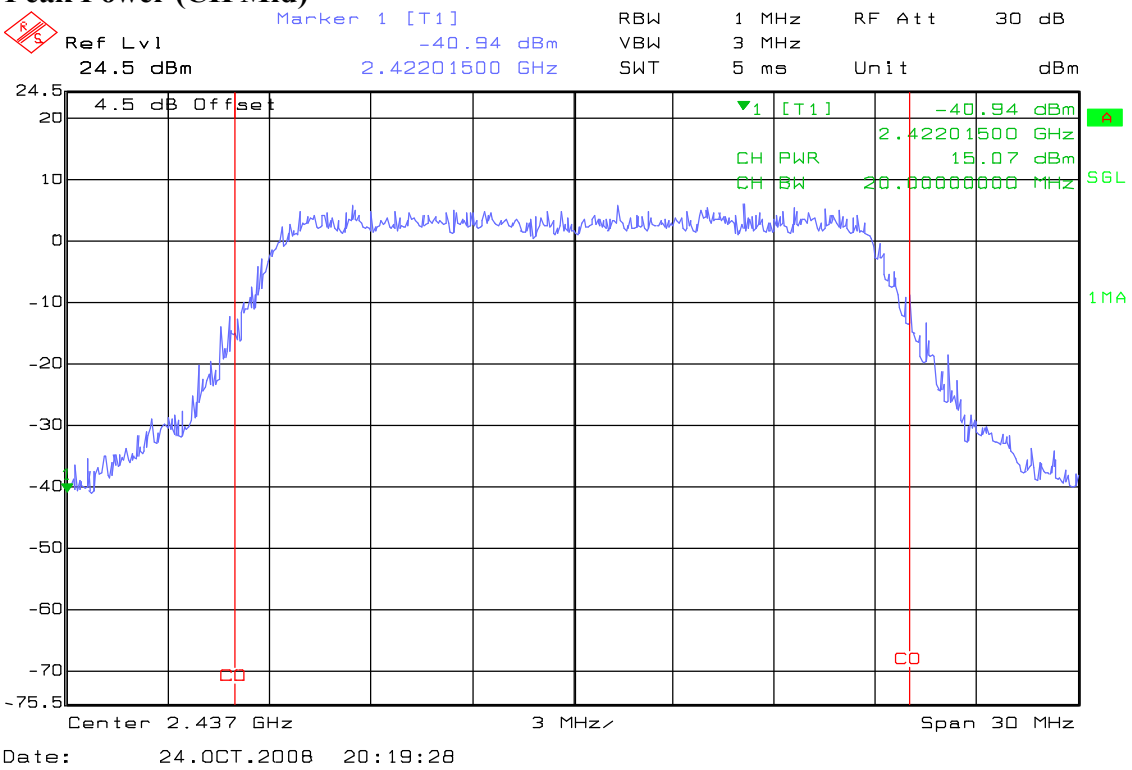


draft 802.11n 20 MHz Channel mode / Chain 1

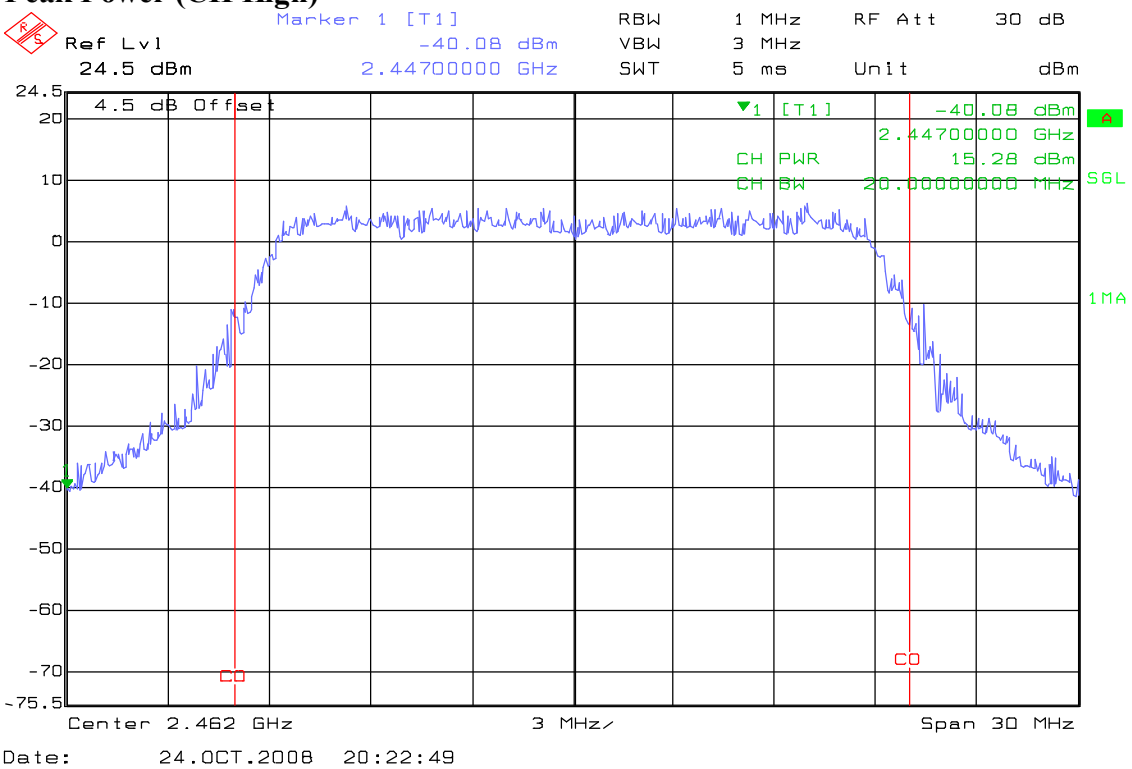
Peak Power (CH Low)



Peak Power (CH Mid)

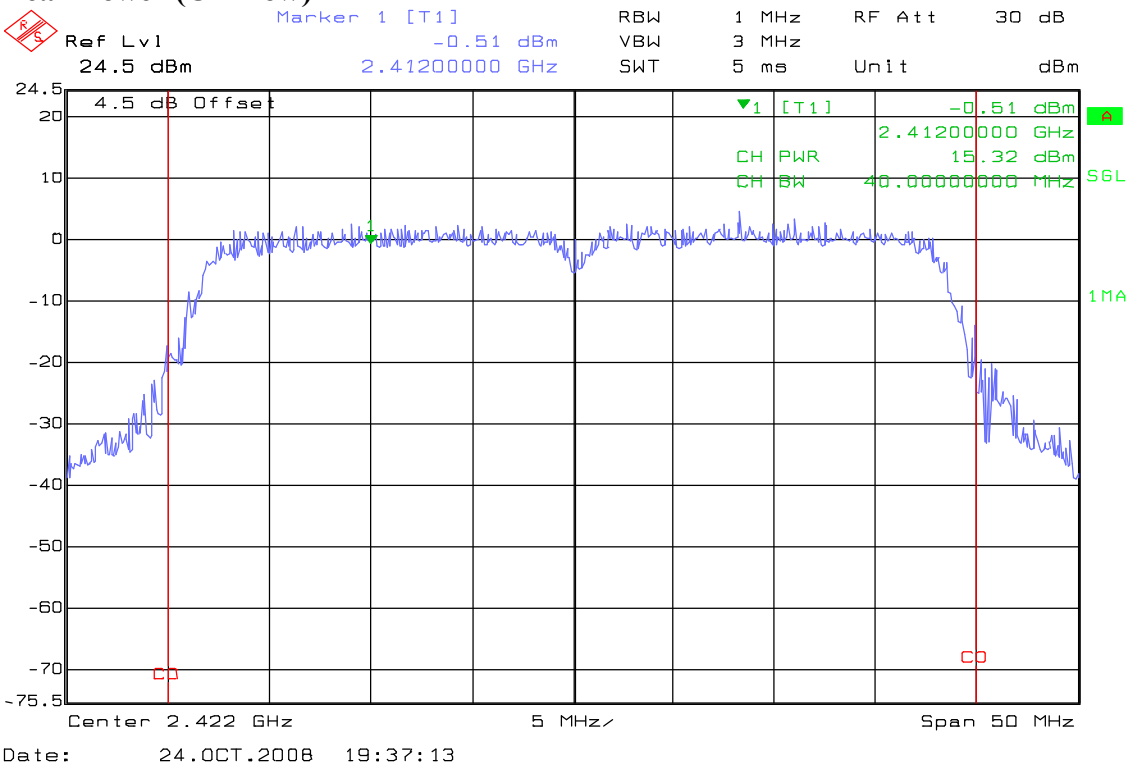


Peak Power (CH High)

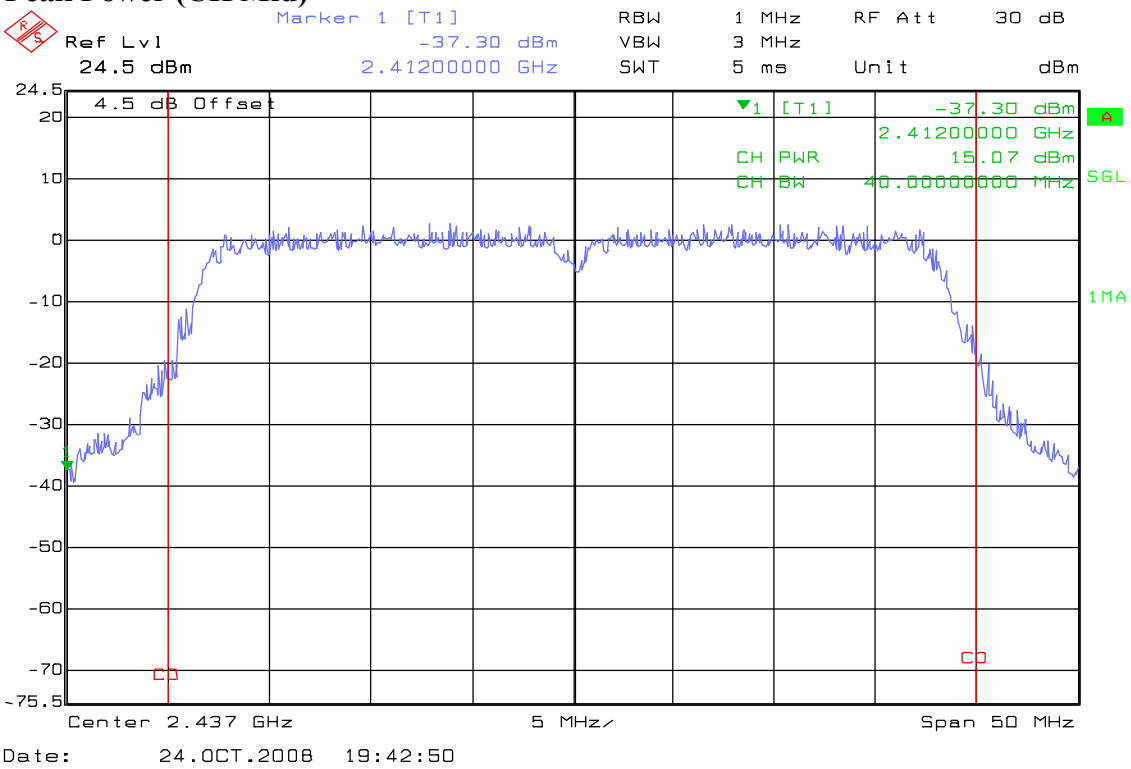


draft 802.11n 40 MHz Channel mode / Chain 0

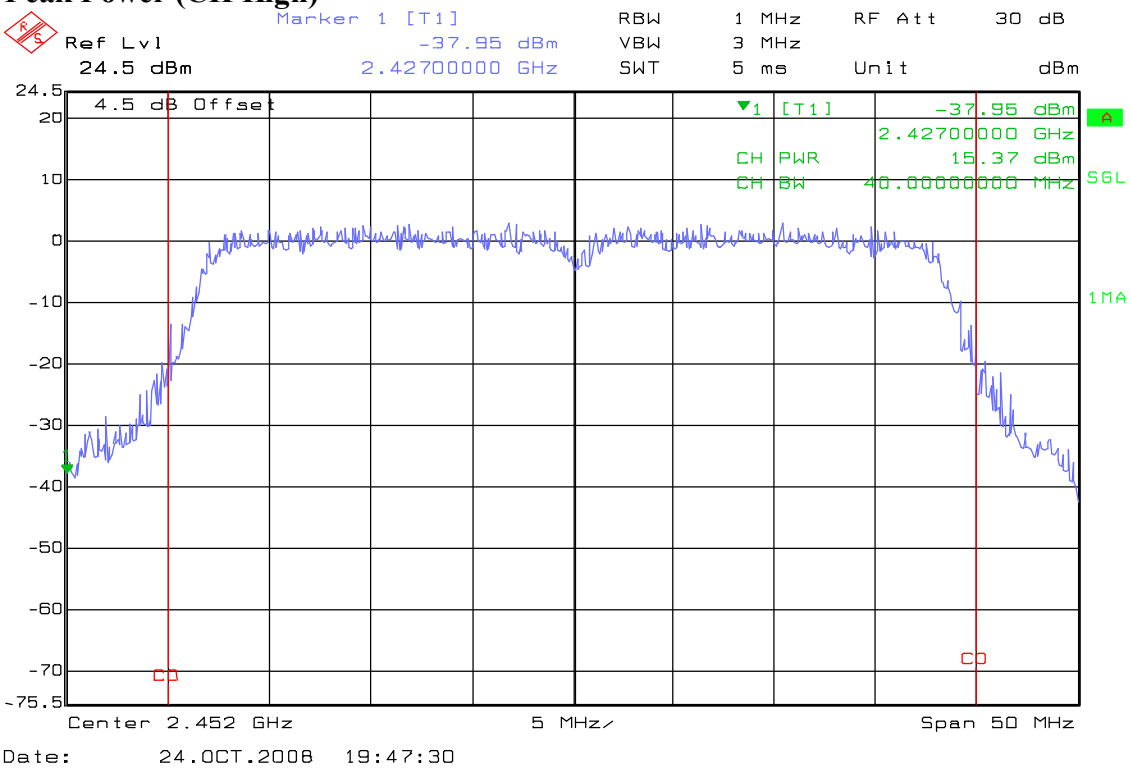
Peak Power (CH Low)



Peak Power (CH Mid)

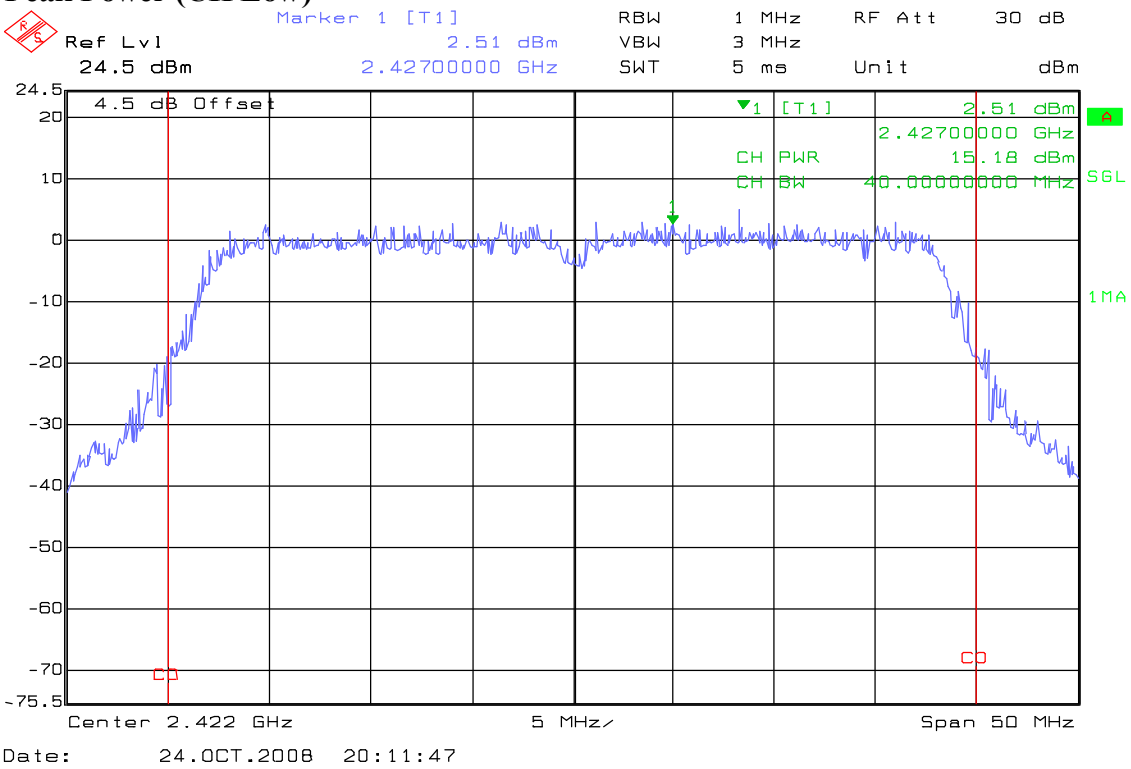


Peak Power (CH High)

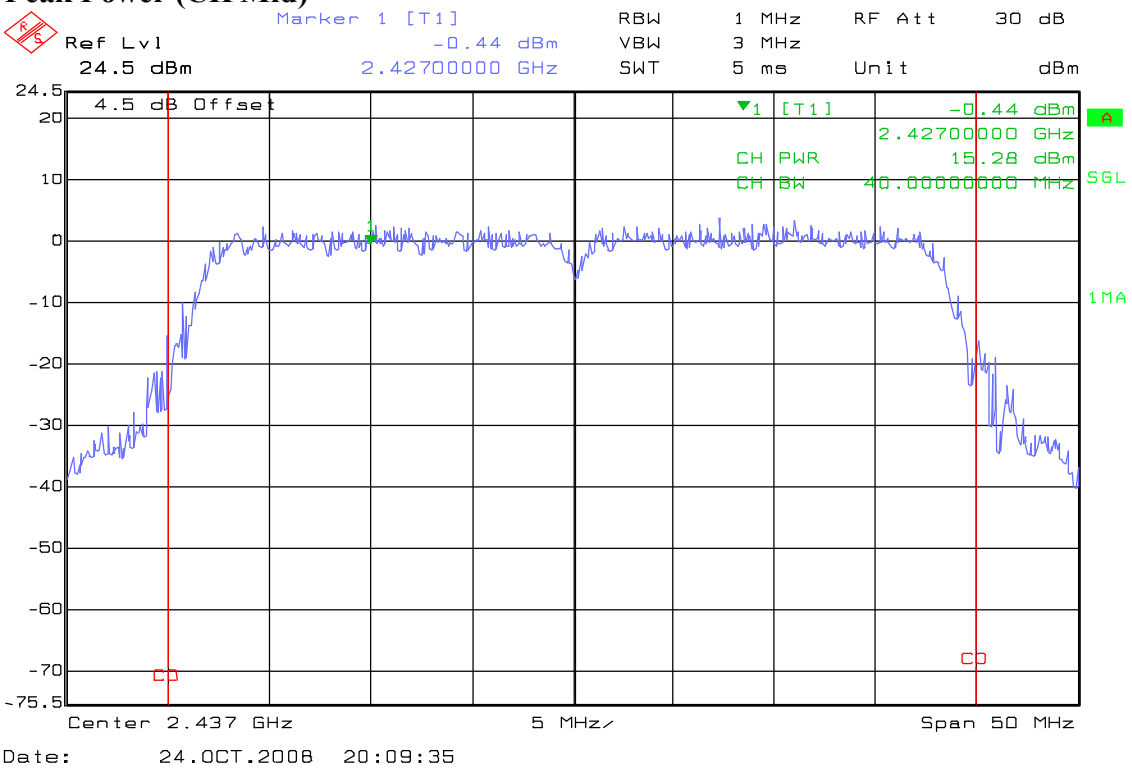


draft 802.11n 40 MHz Channel mode / Chain 1

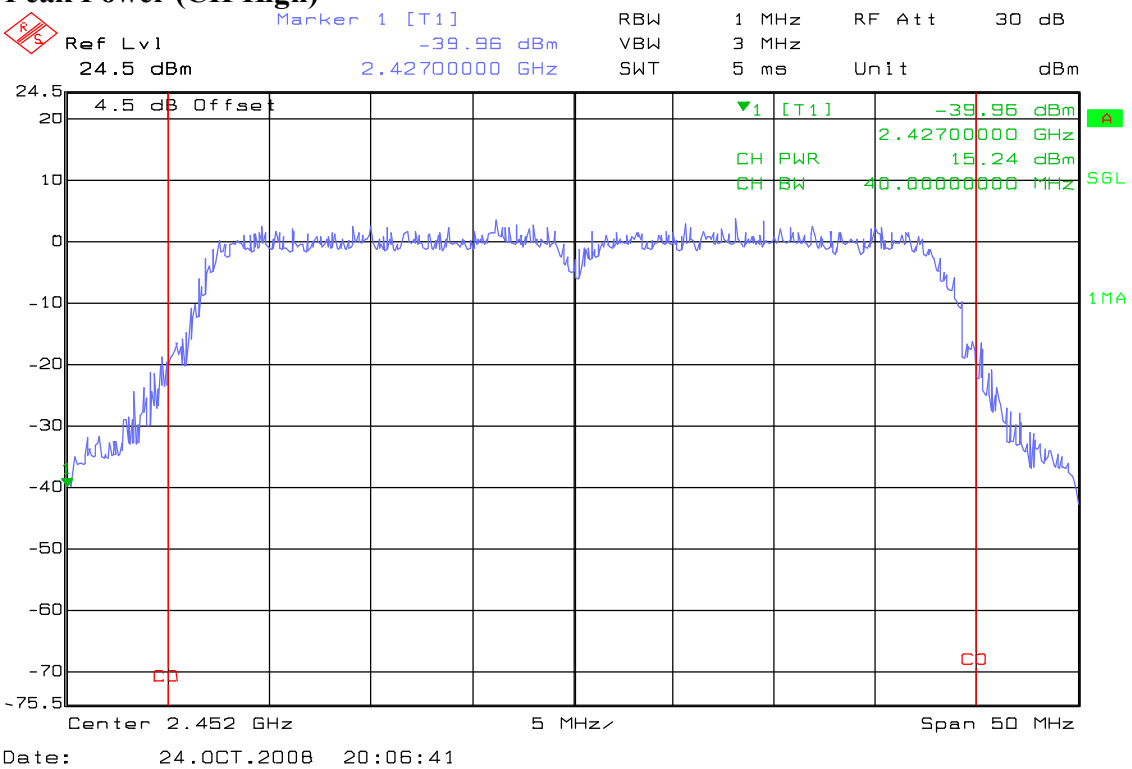
Peak Power (CH Low)



Peak Power (CH Mid)



Peak Power (CH High)

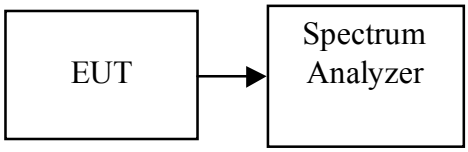


6.3 AVERAGE POWER

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	13.74	0.0237
Mid	2437	13.41	0.0219
High	2462	13.48	0.0223

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	9.72	0.0094
Mid	2437	10.21	0.0105
High	2462	9.70	0.0093

Test mode: draft 802.11n 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	9.75	9.75	12.76	0.0189
Mid	2437	9.90	9.50	12.71	0.0187
High	2462	9.90	9.81	12.87	0.0193

Test mode: draft 802.11n 40 MHz Channel mode

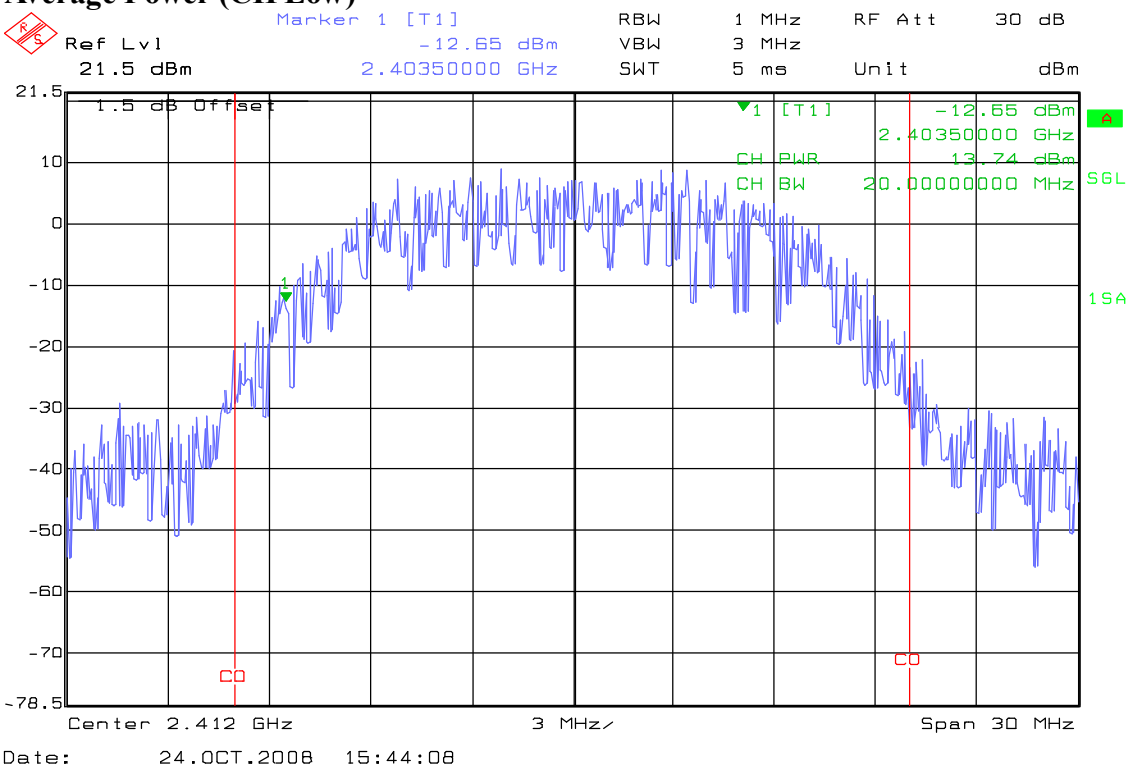
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Total Output Power (dBm)	Output Power (W)
Low	2422	9.47	9.68	12.59	0.0181
Mid	2437	9.40	9.72	12.57	0.0181
High	2452	9.70	9.84	12.78	0.0190

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

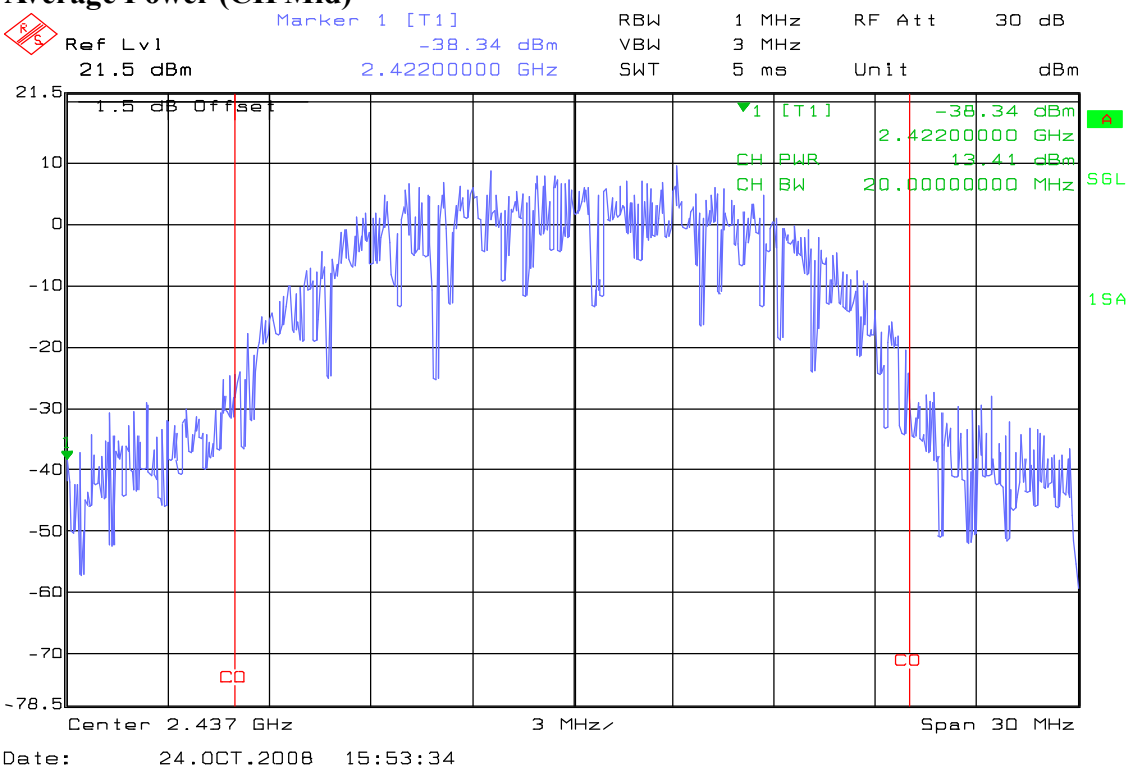
TEST PLOT

IEEE 802.11b mode

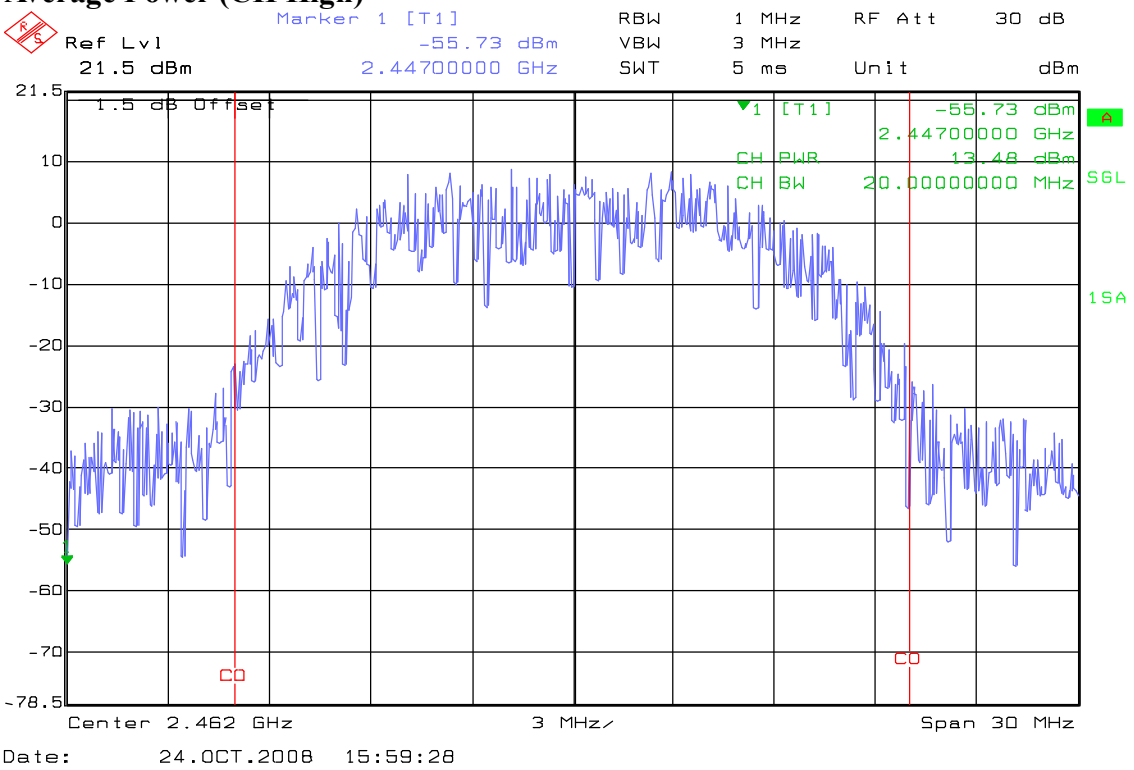
Average Power (CH Low)



Average Power (CH Mid)

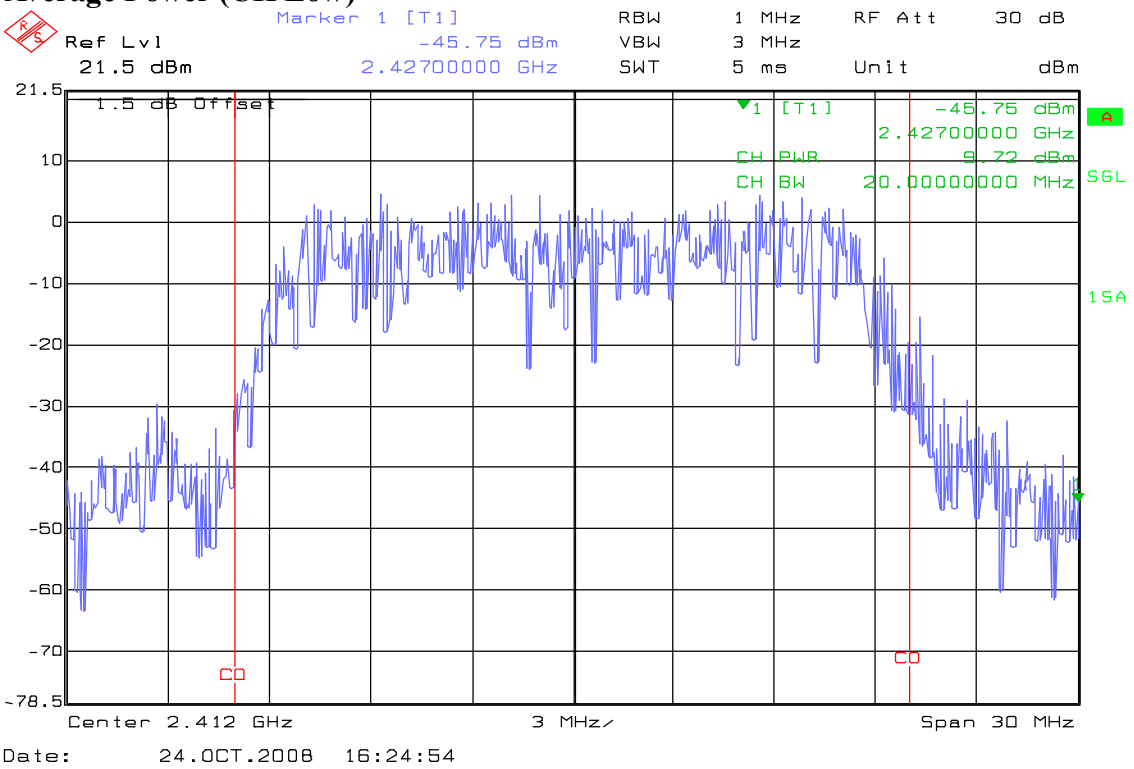


Average Power (CH High)

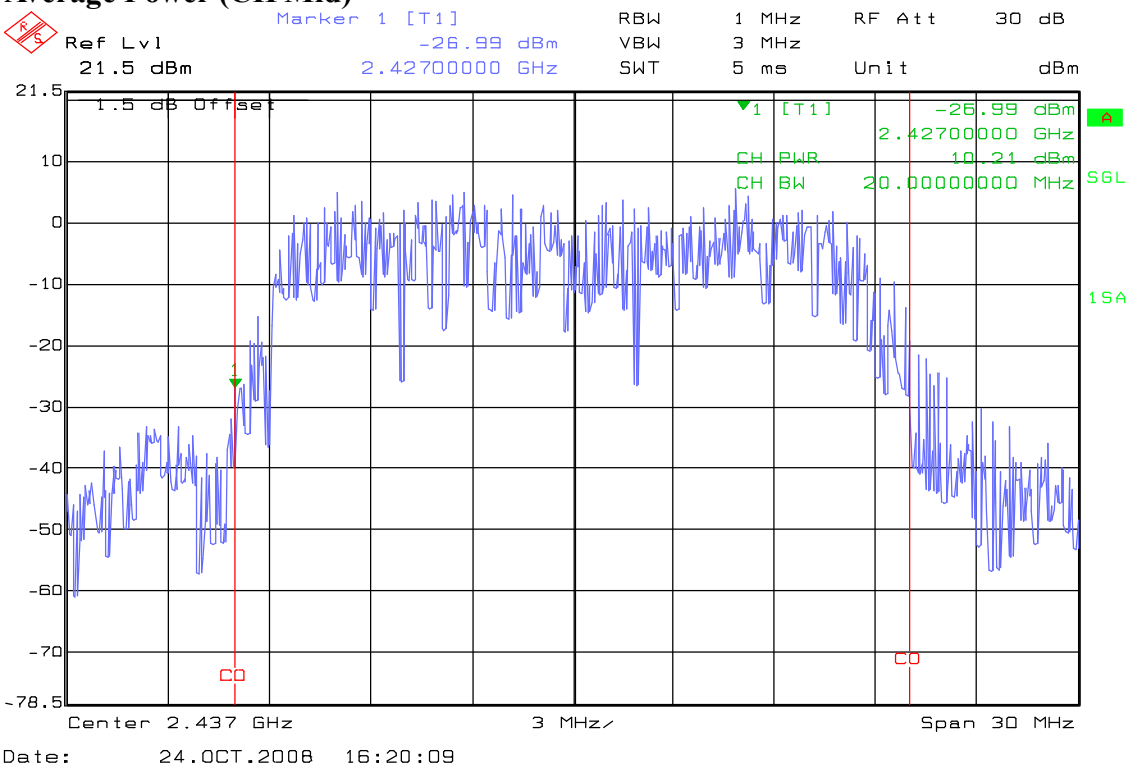


IEEE 802.11g mode

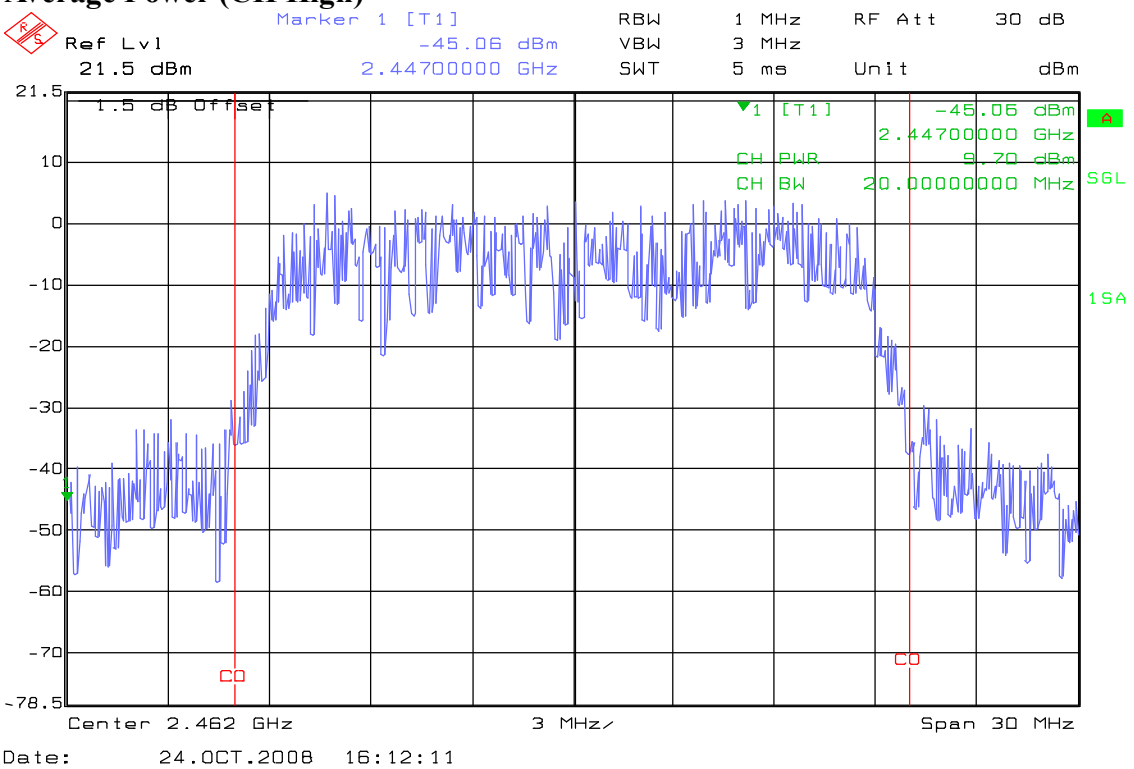
Average Power (CH Low)



Average Power (CH Mid)

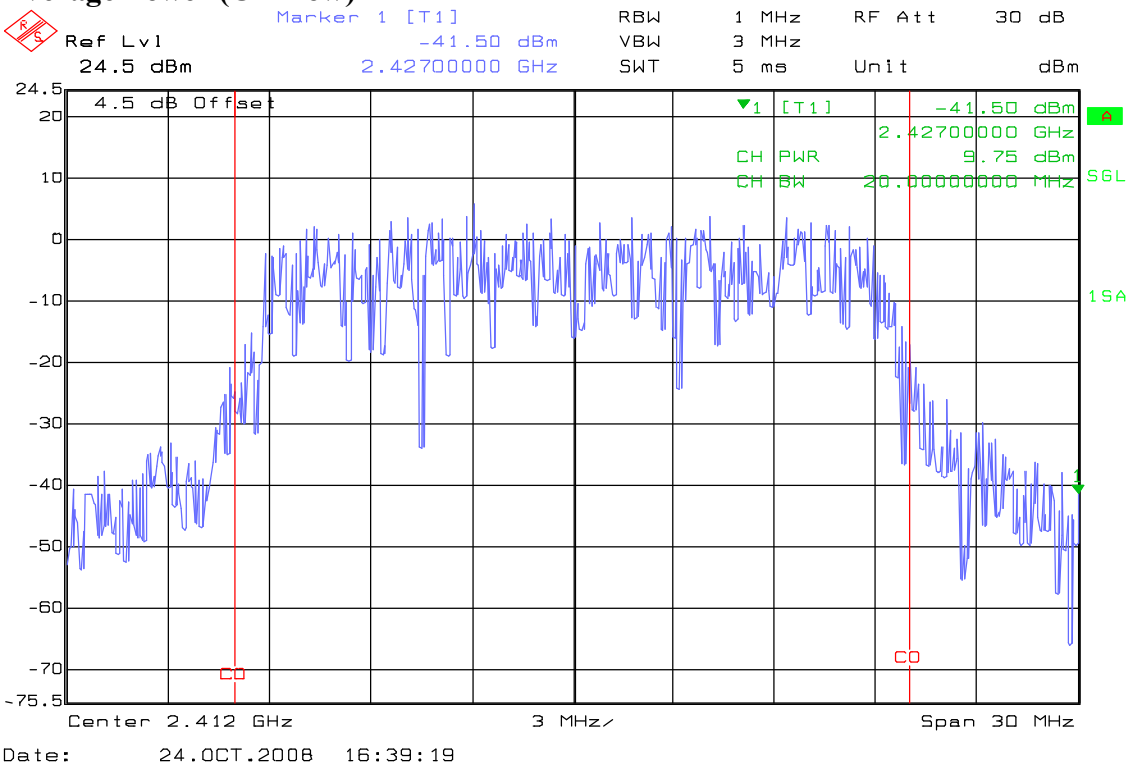


Average Power (CH High)

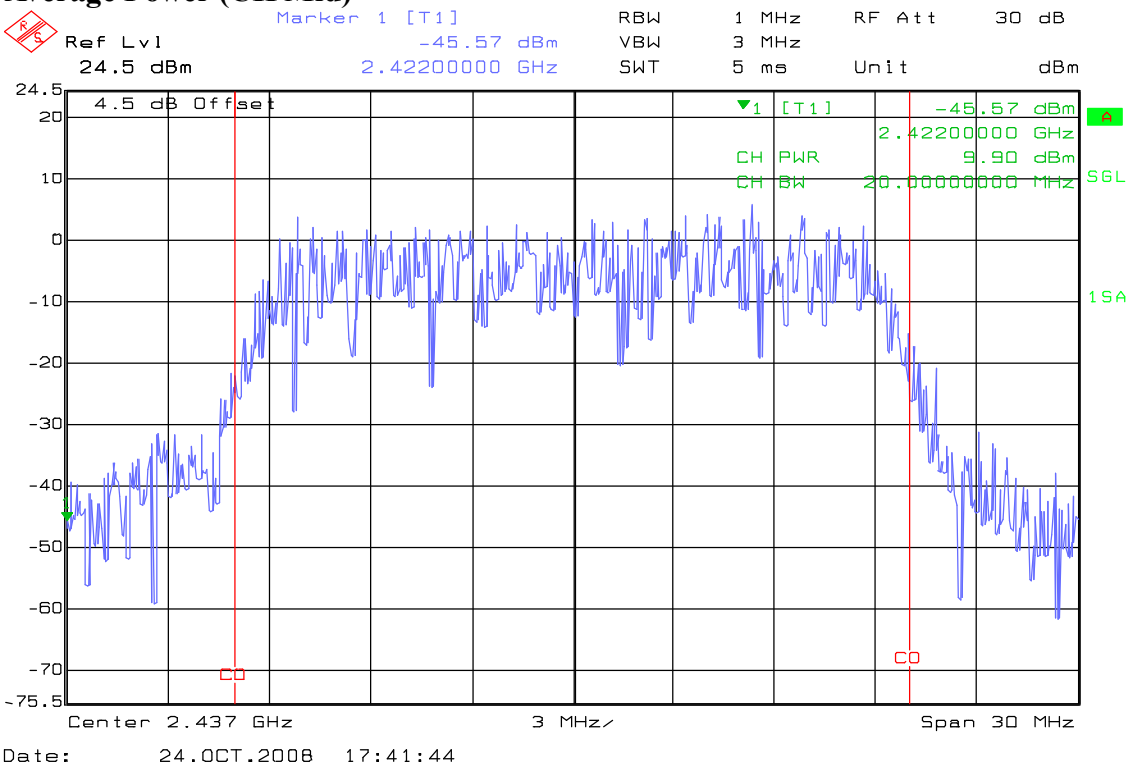


draft 802.11n 20 MHz Channel mode / Chain 0

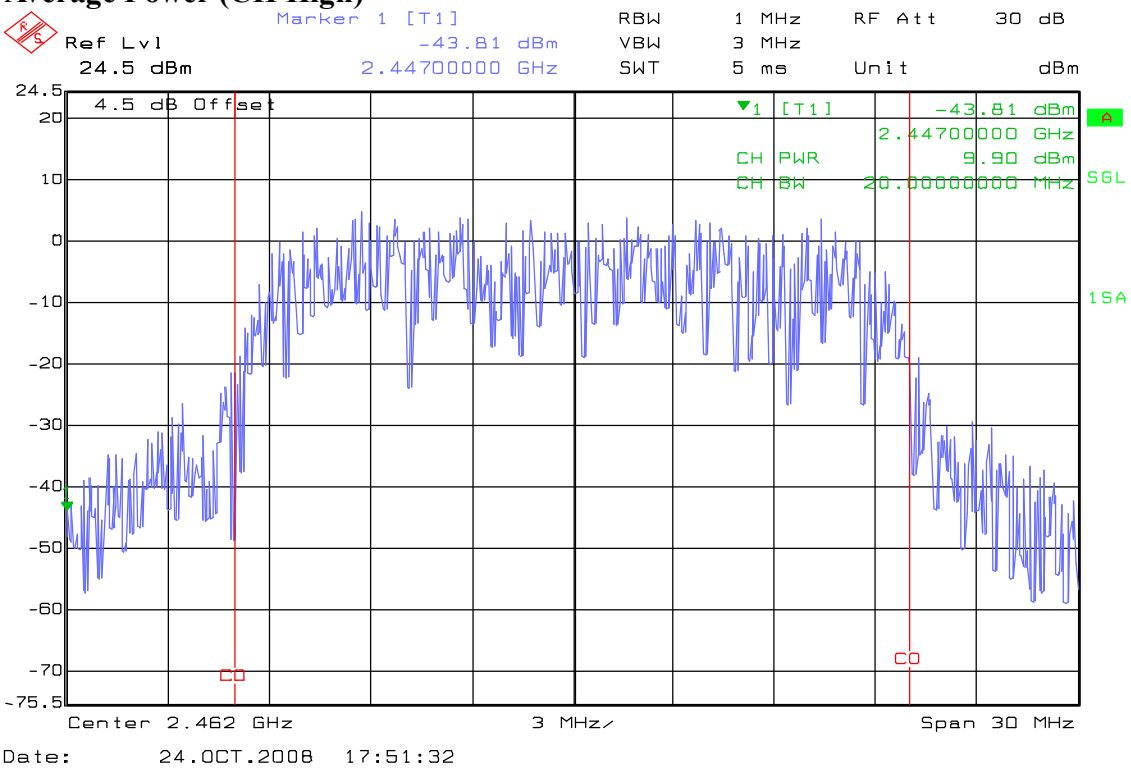
Average Power (CH Low)



Average Power (CH Mid)

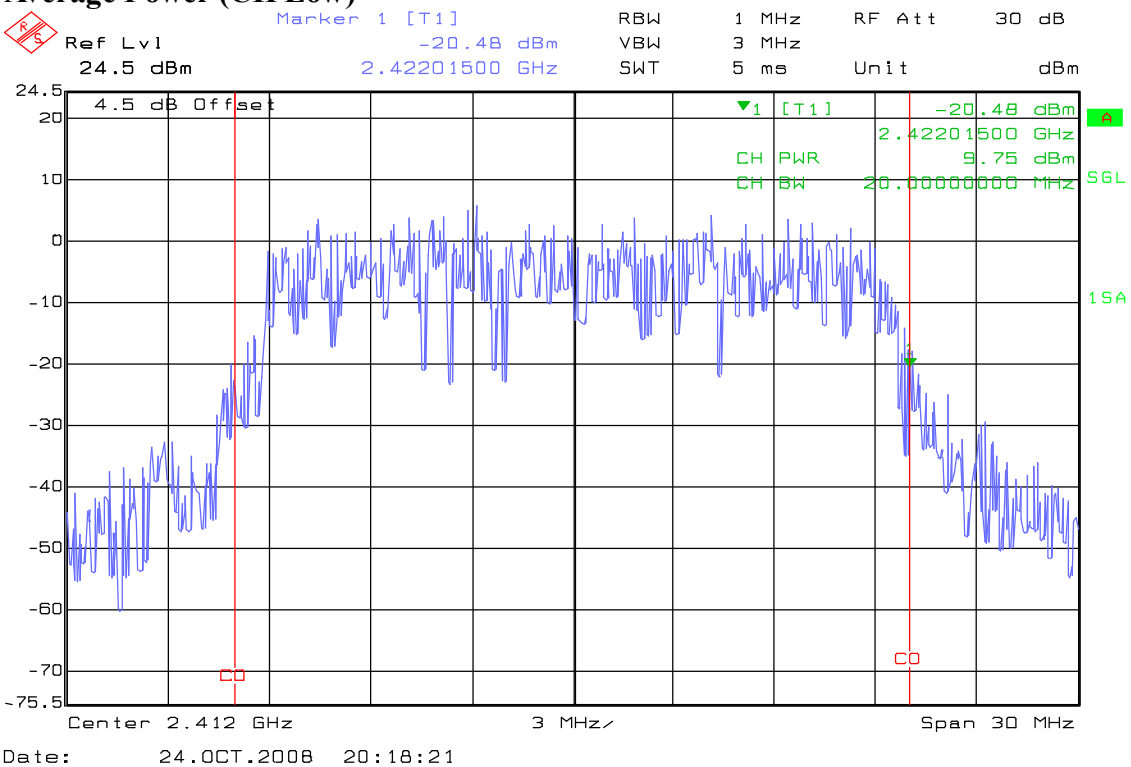


Average Power (CH High)

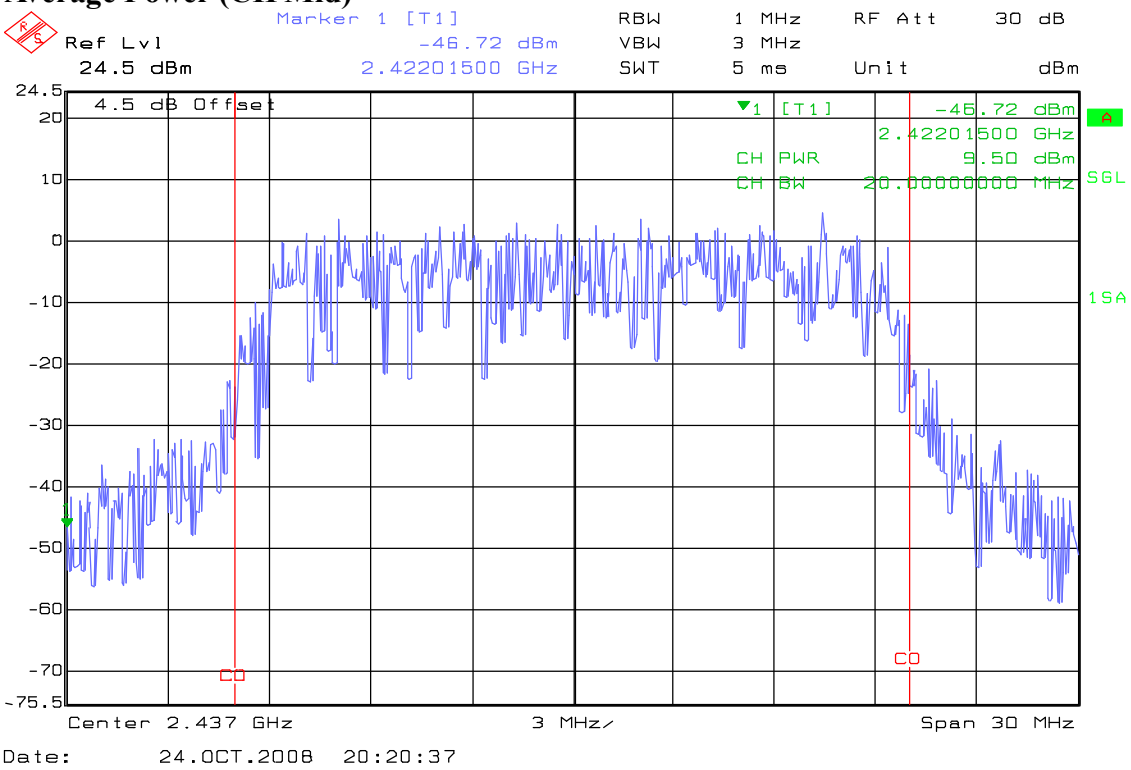


draft 802.11n 20 MHz Channel mode / Chain 1

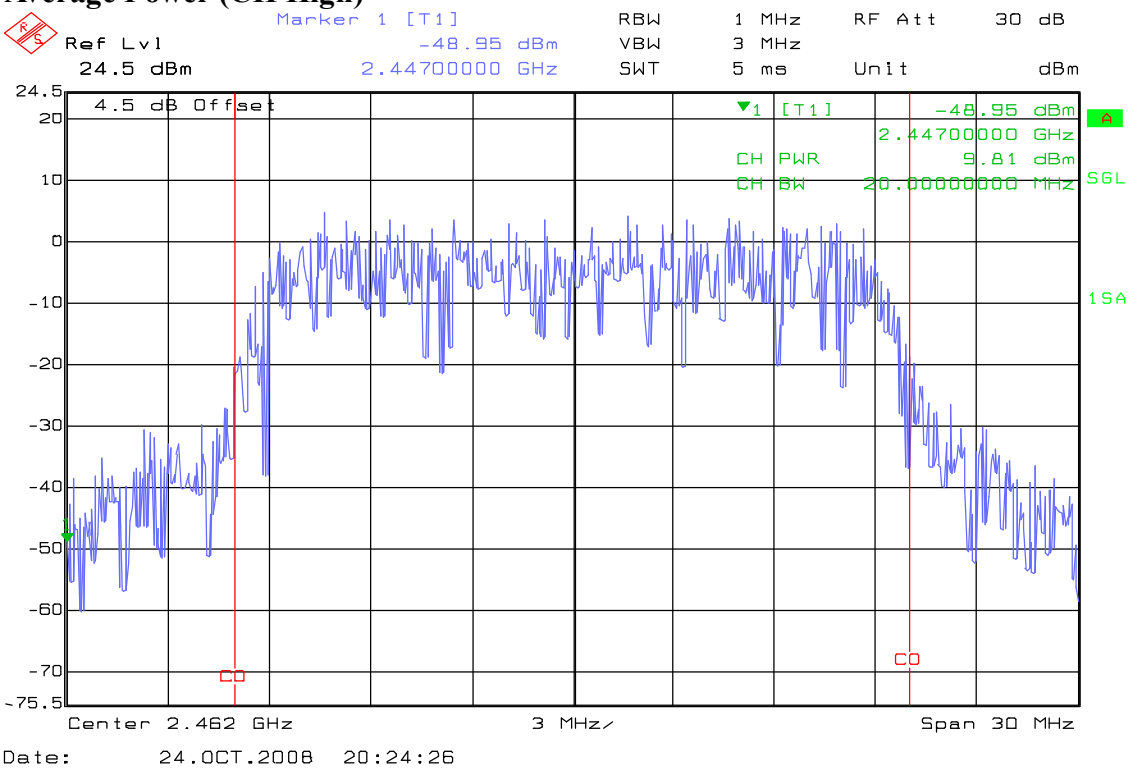
Average Power (CH Low)



Average Power (CH Mid)

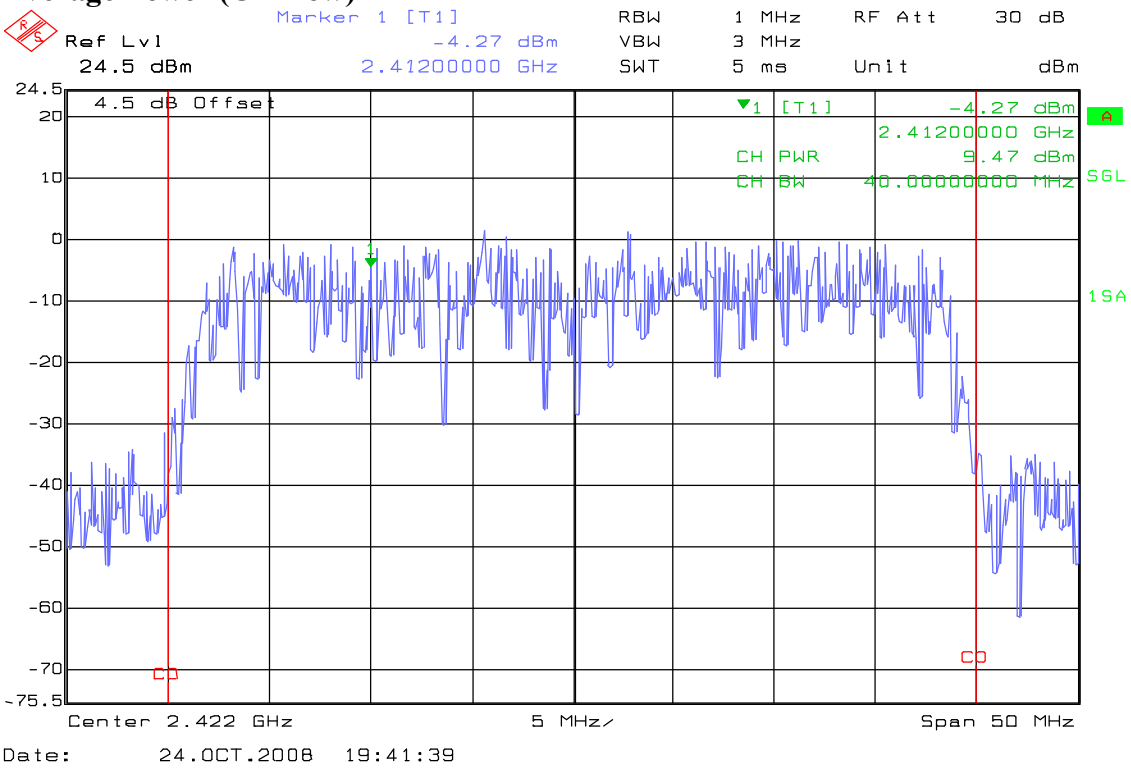


Average Power (CH High)

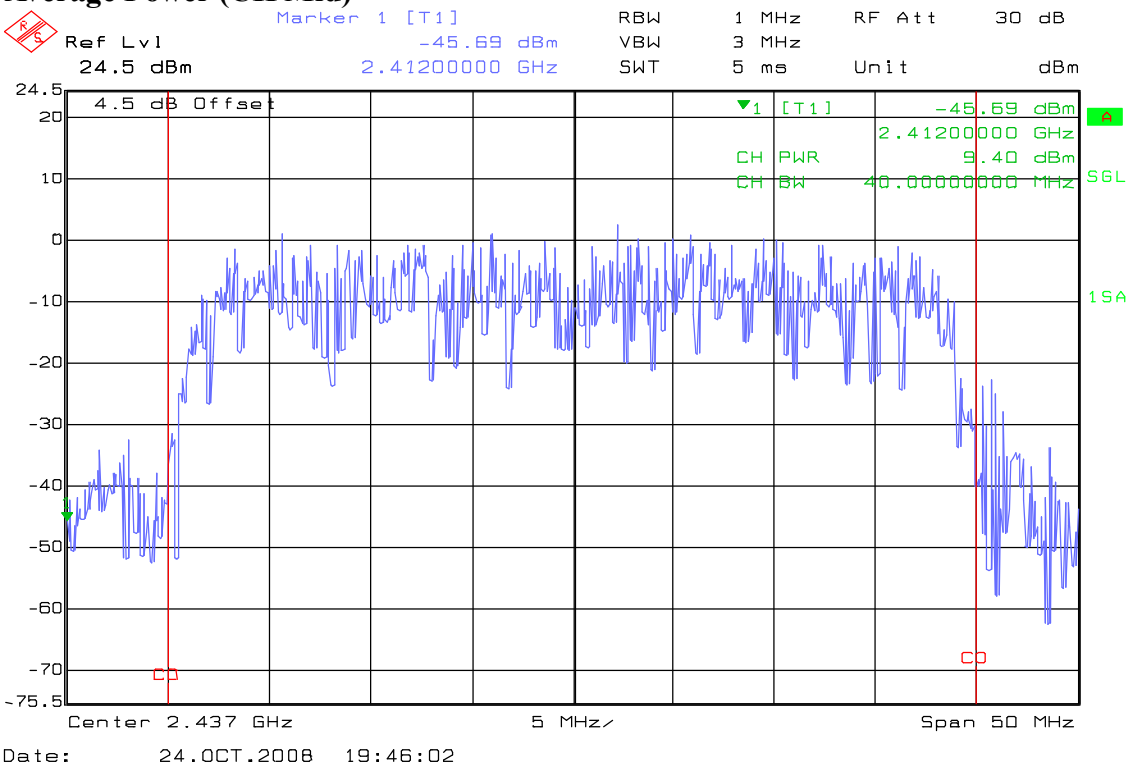


draft 802.11n 40 MHz Channel mode / Chain 0

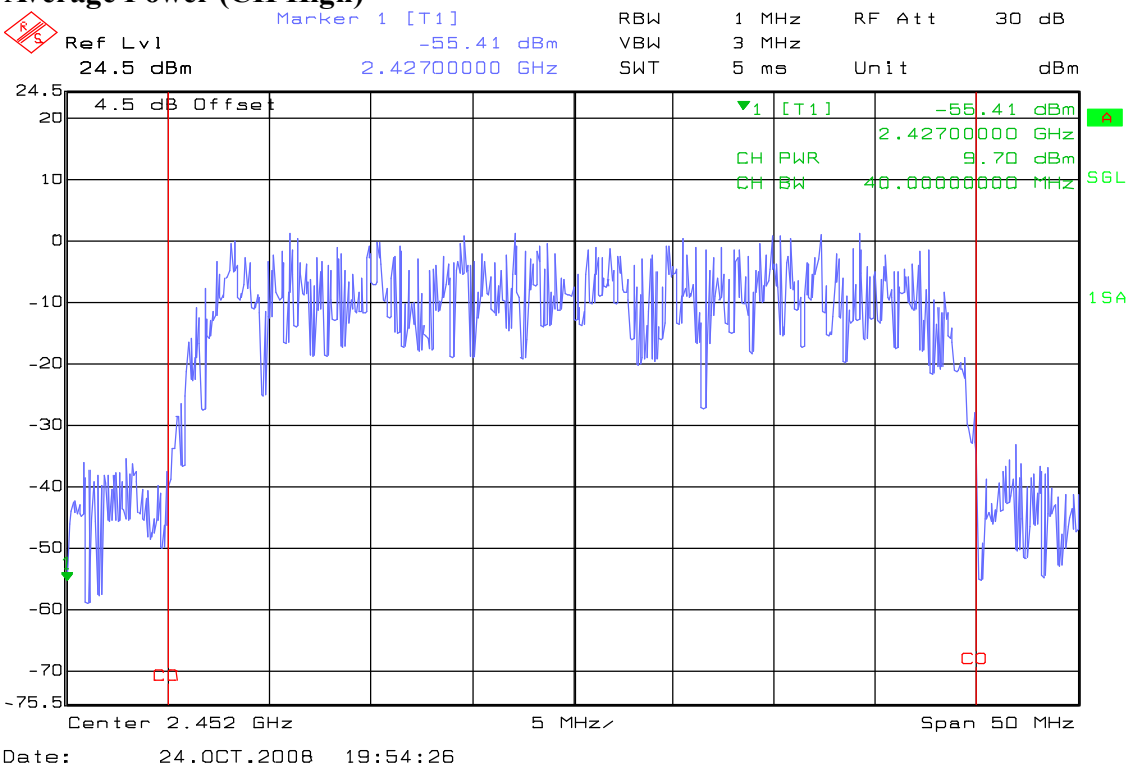
Average Power (CH Low)



Average Power (CH Mid)

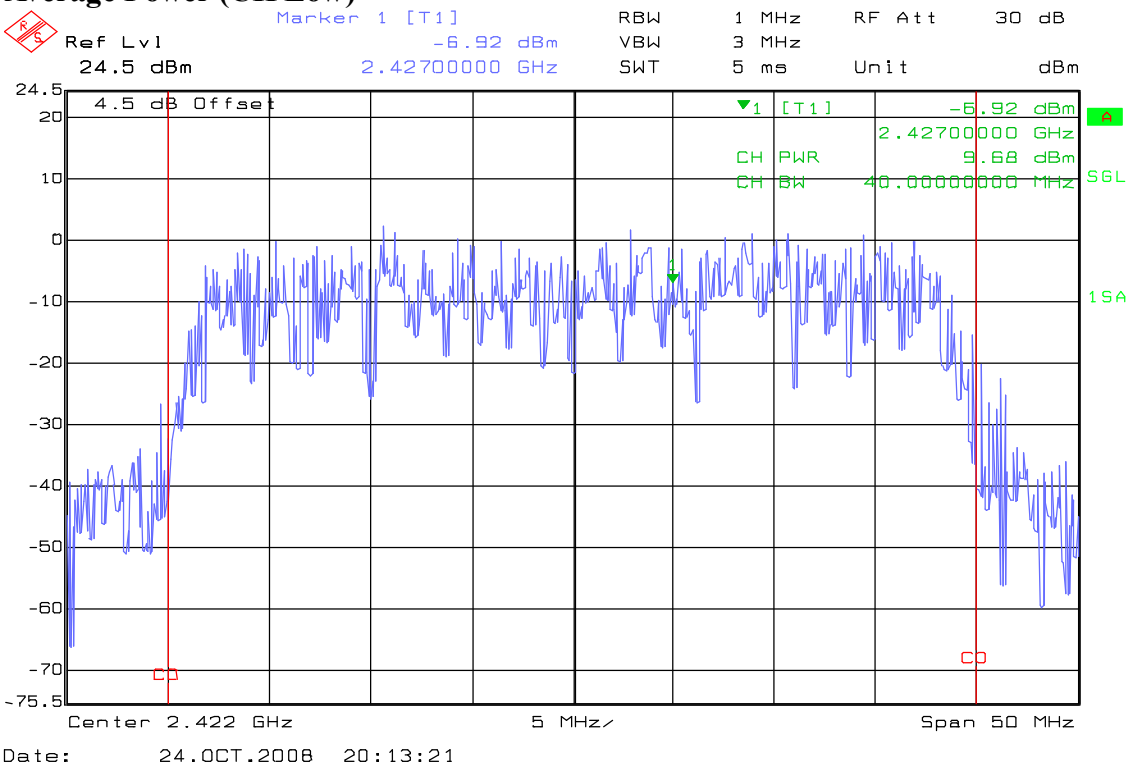


Average Power (CH High)

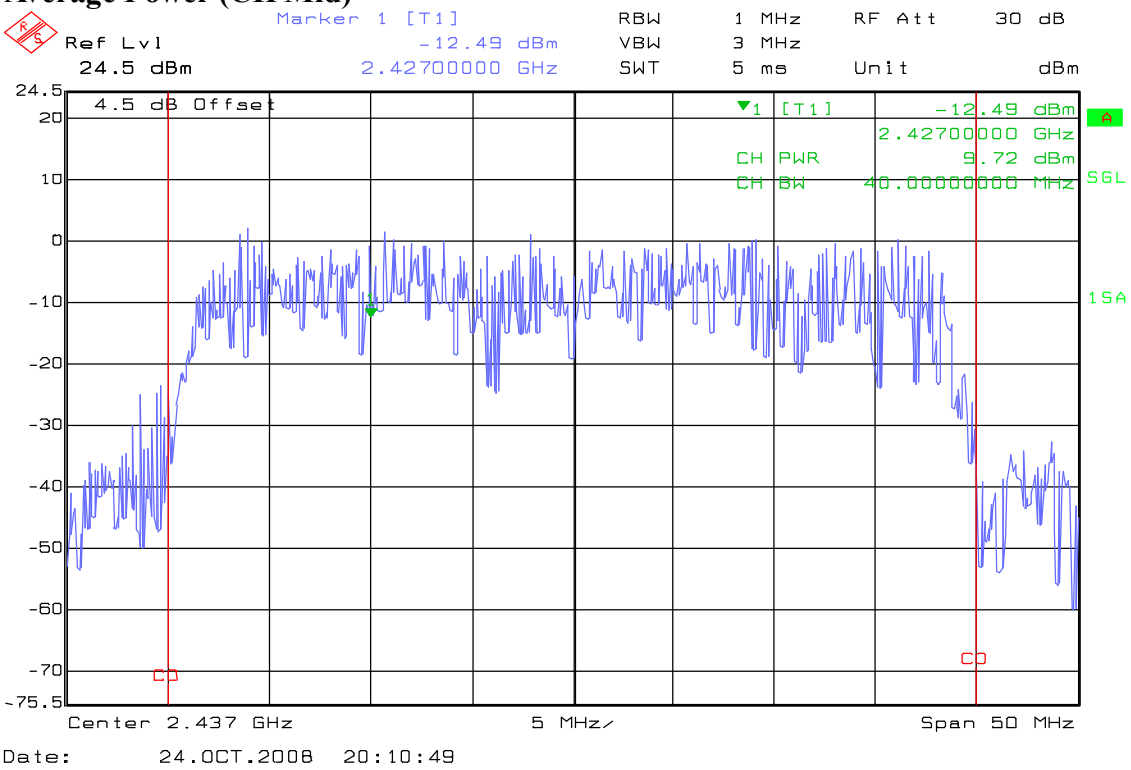


draft 802.11n 40 MHz Channel mode / Chain 1

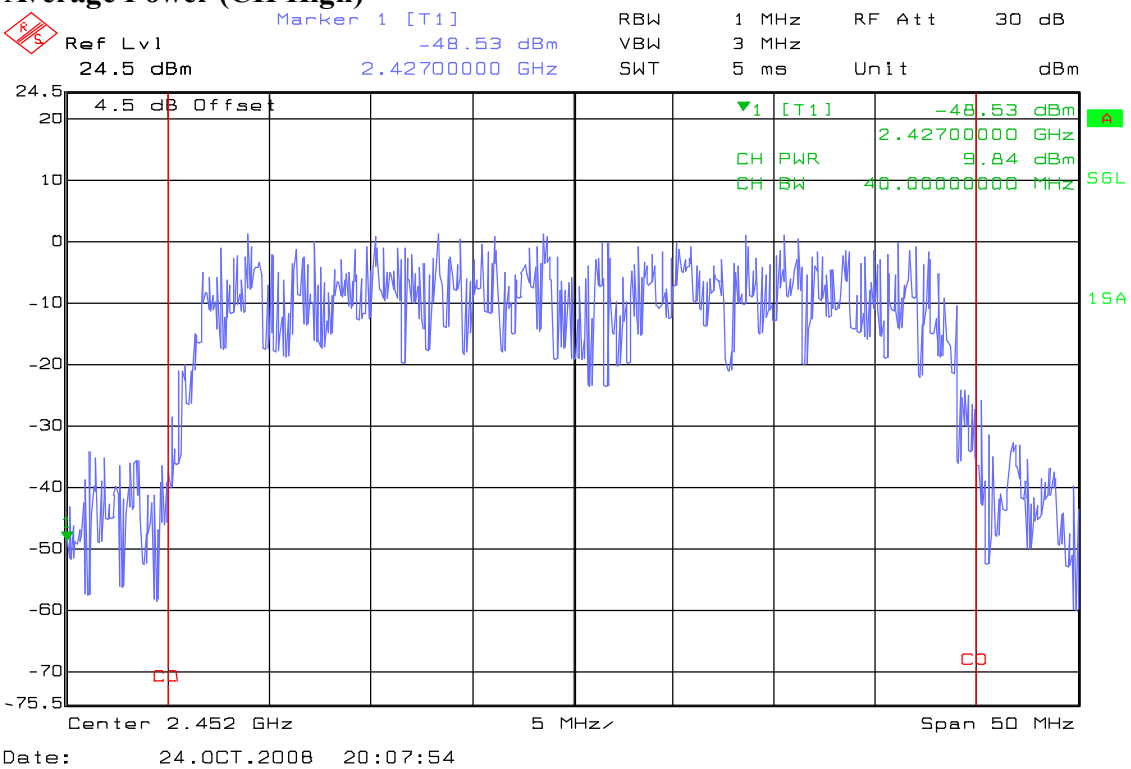
Average Power (CH Low)



Average Power (CH Mid)



Average Power (CH High)

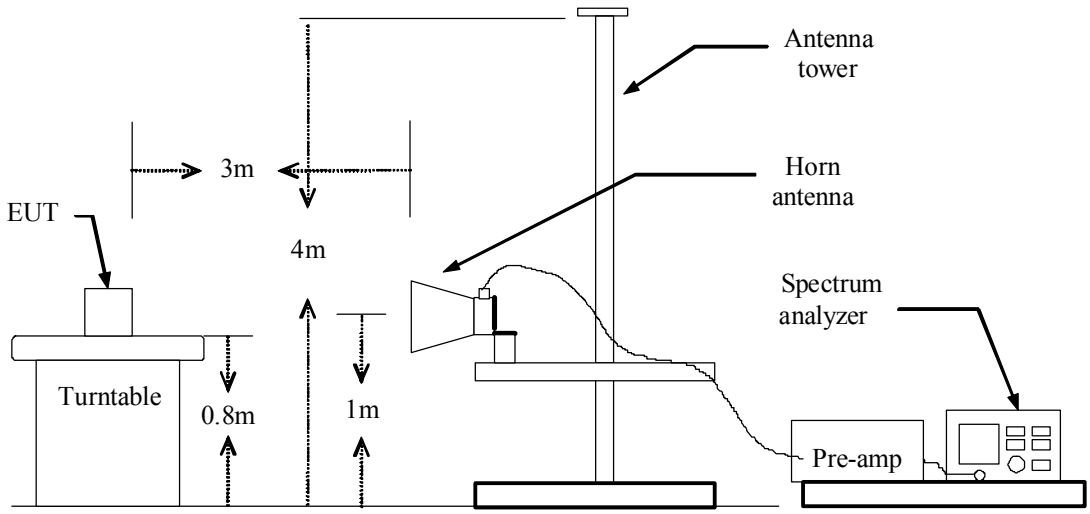


6.4 BAND EDGES MEASUREMENT

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

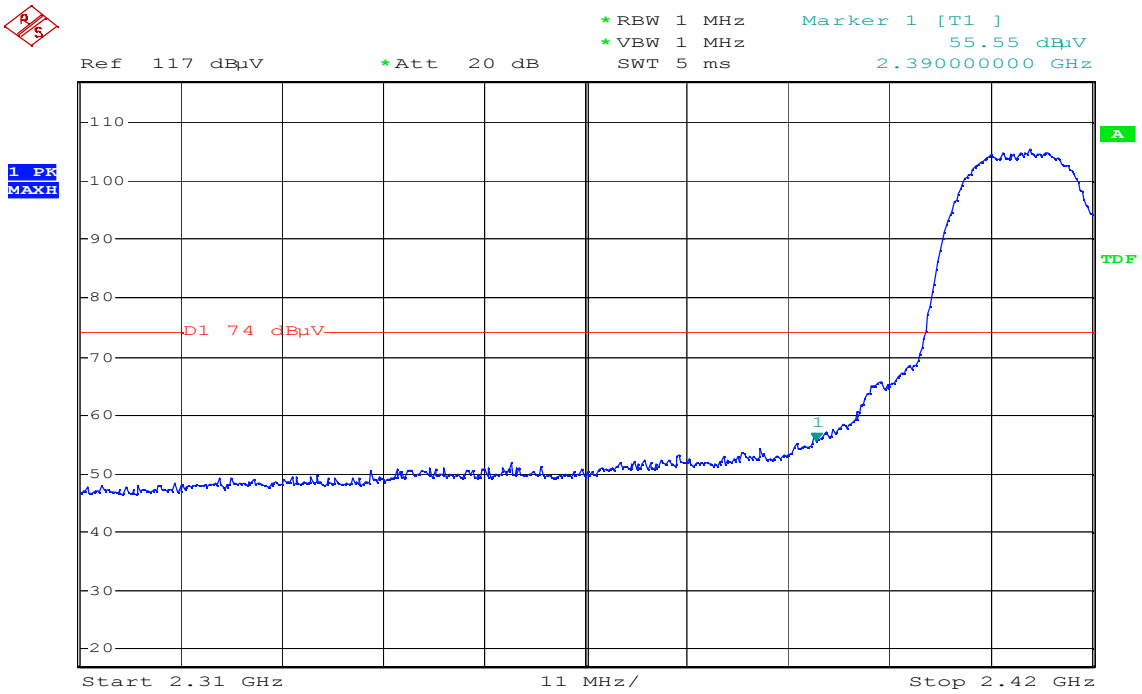
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the 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.

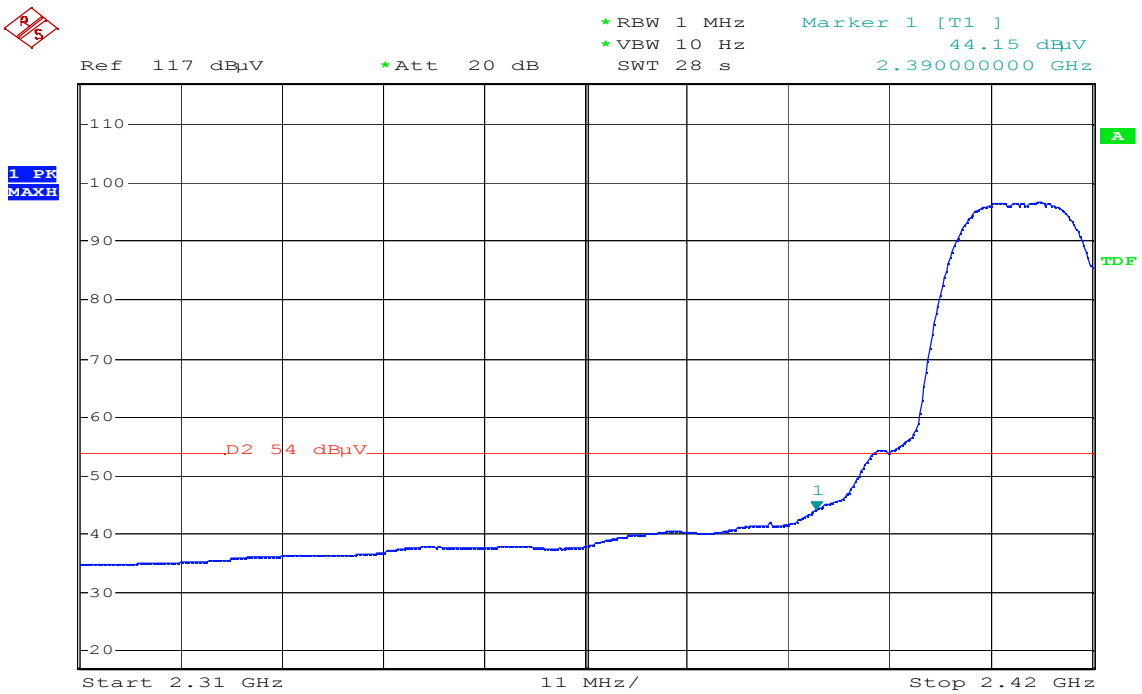
Band Edges (IEEE 802.11b mode / CH Low)

Detector mode: Peak Polarity: Vertical



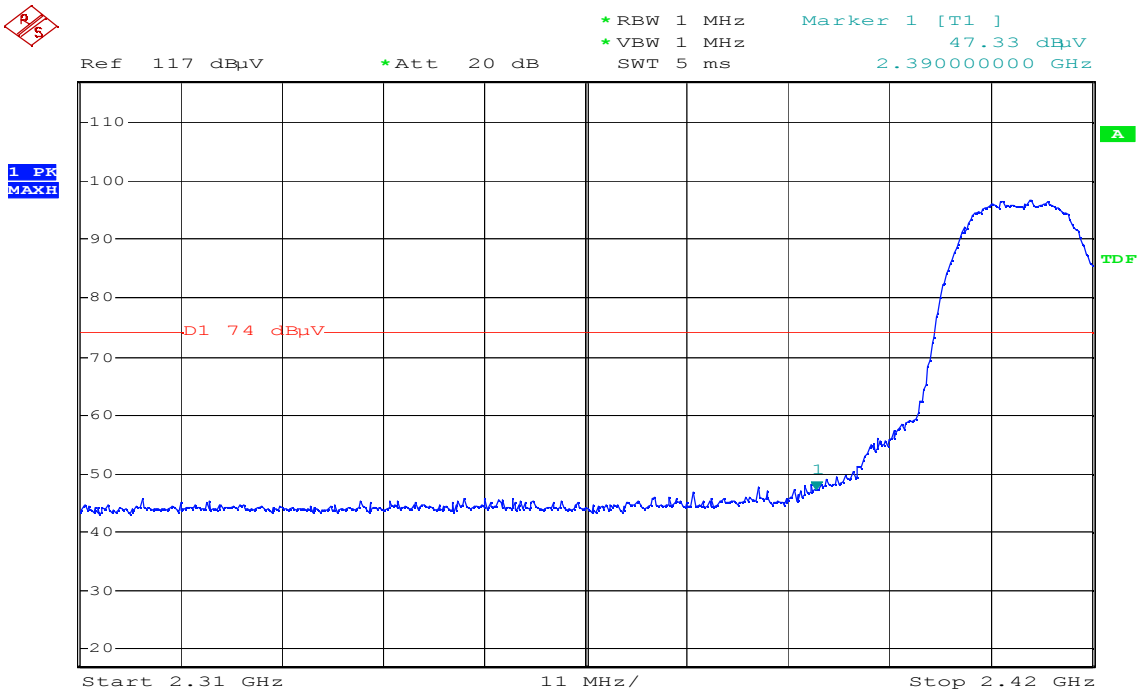
Date: 14.OCT.2008 14:34:27

Detector mode: Average Polarity: Vertical



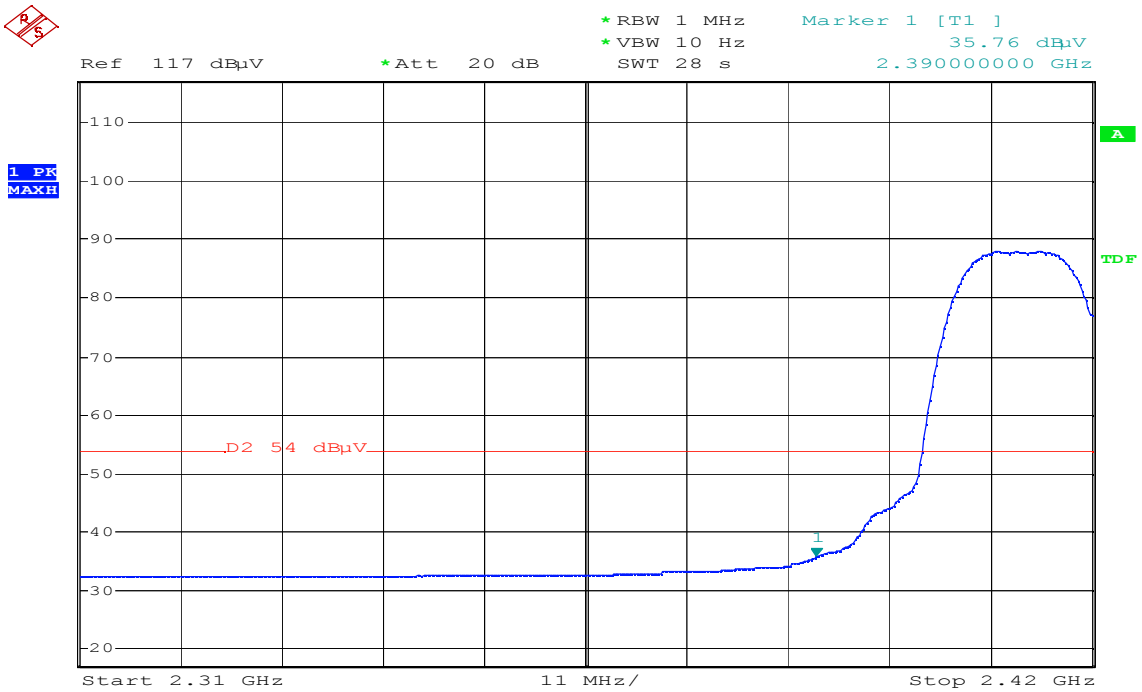
Date: 14.OCT.2008 14:35:12

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 14:37:24

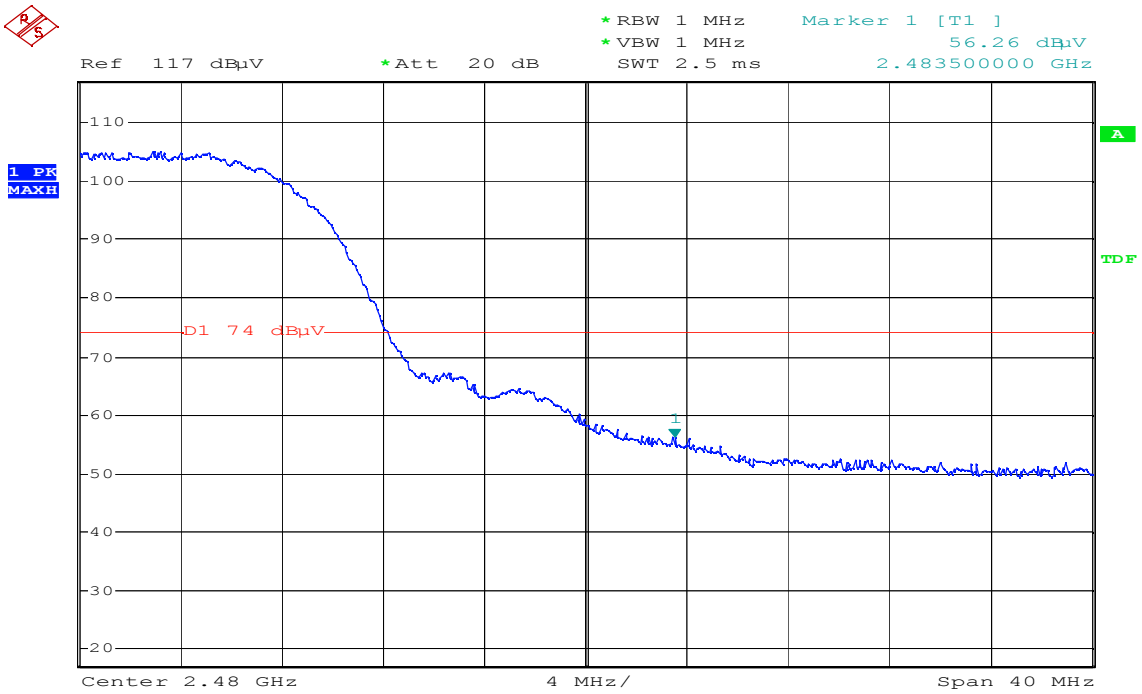
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 14:38:24

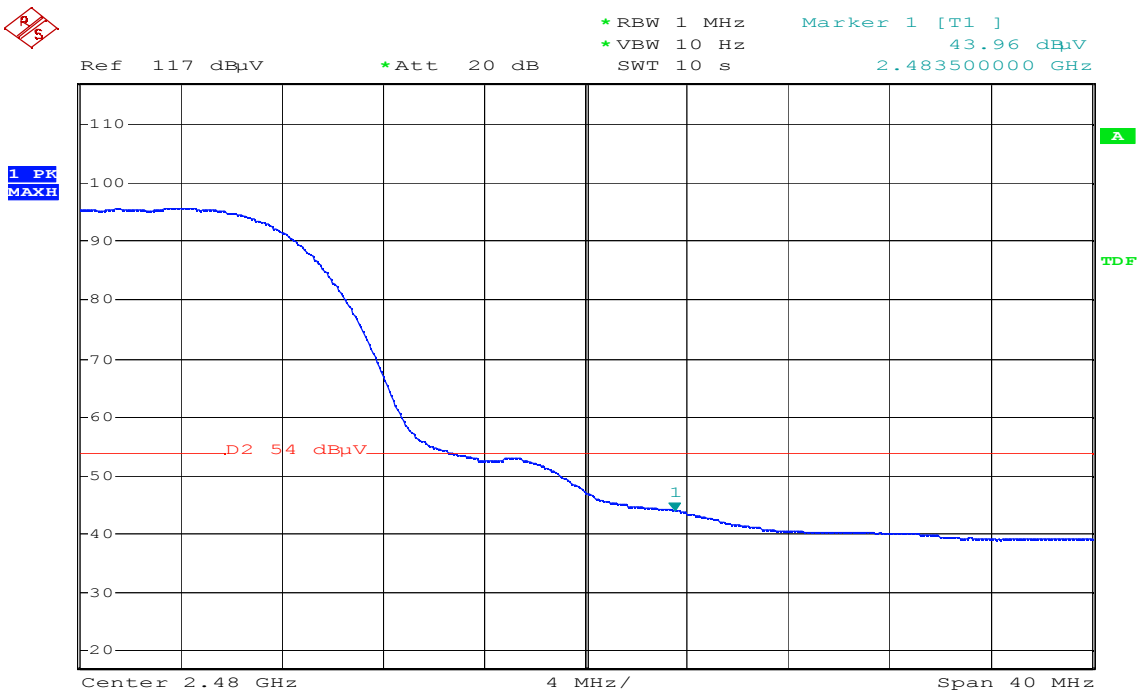
Band Edges (IEEE 802.11b mode / CH High)

Detector mode: Peak Polarity: Vertical



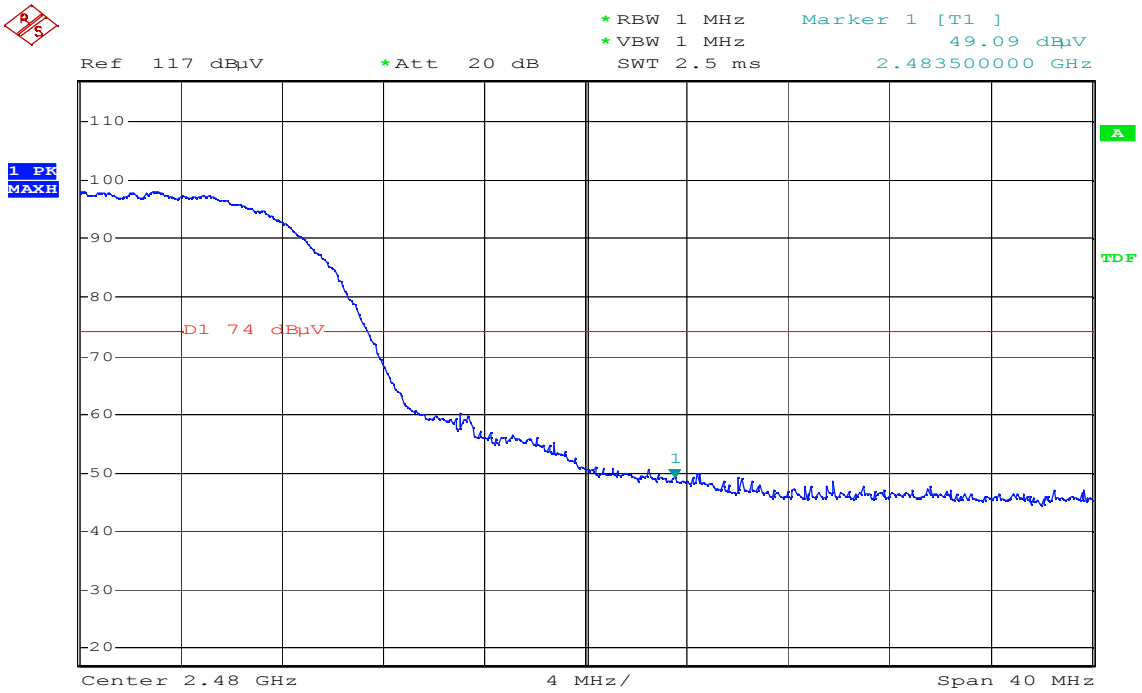
Date: 14.OCT.2008 16:19:35

Detector mode: Average Polarity: Vertical



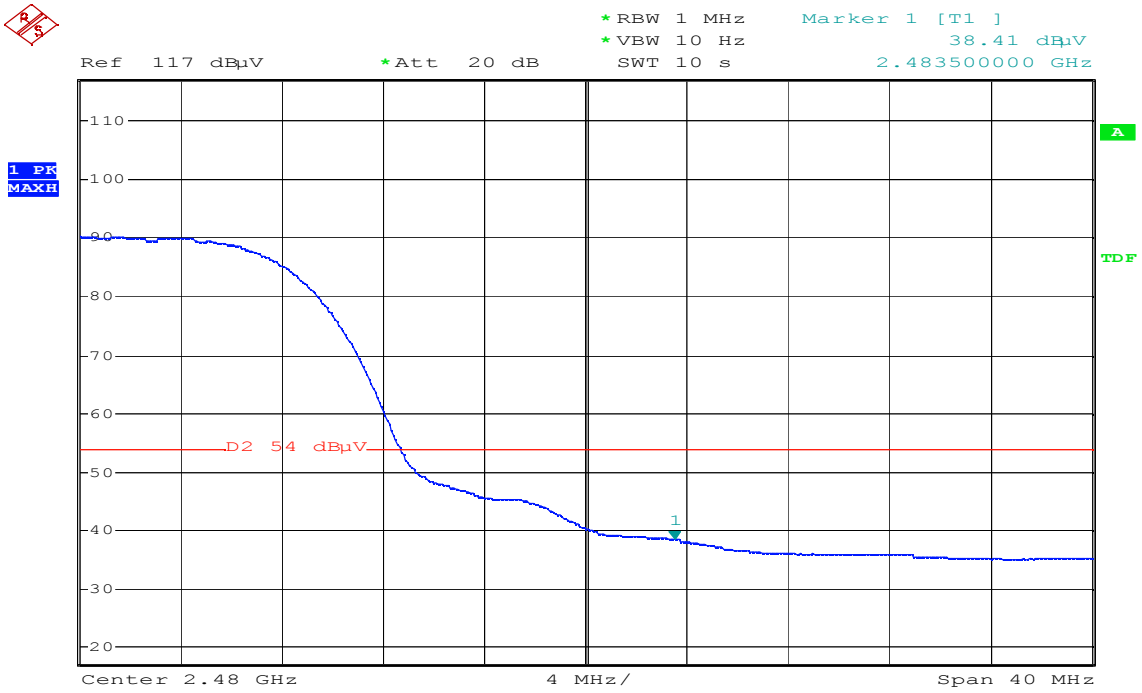
Date: 14.OCT.2008 16:20:03

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 16:32:05

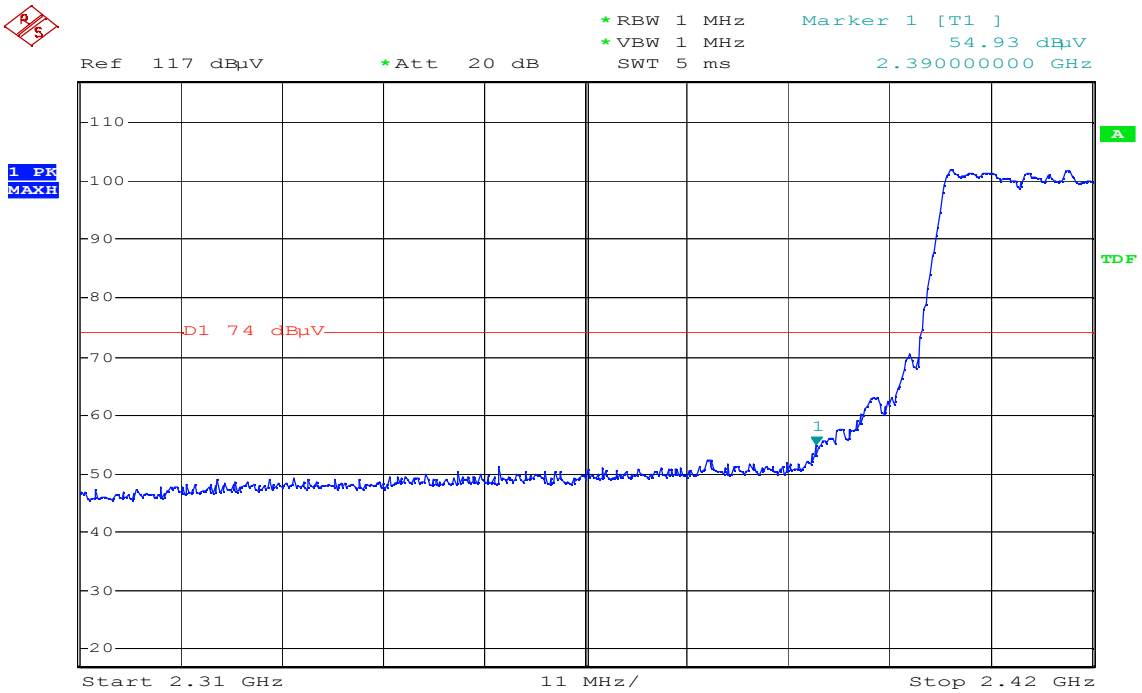
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 16:32:33

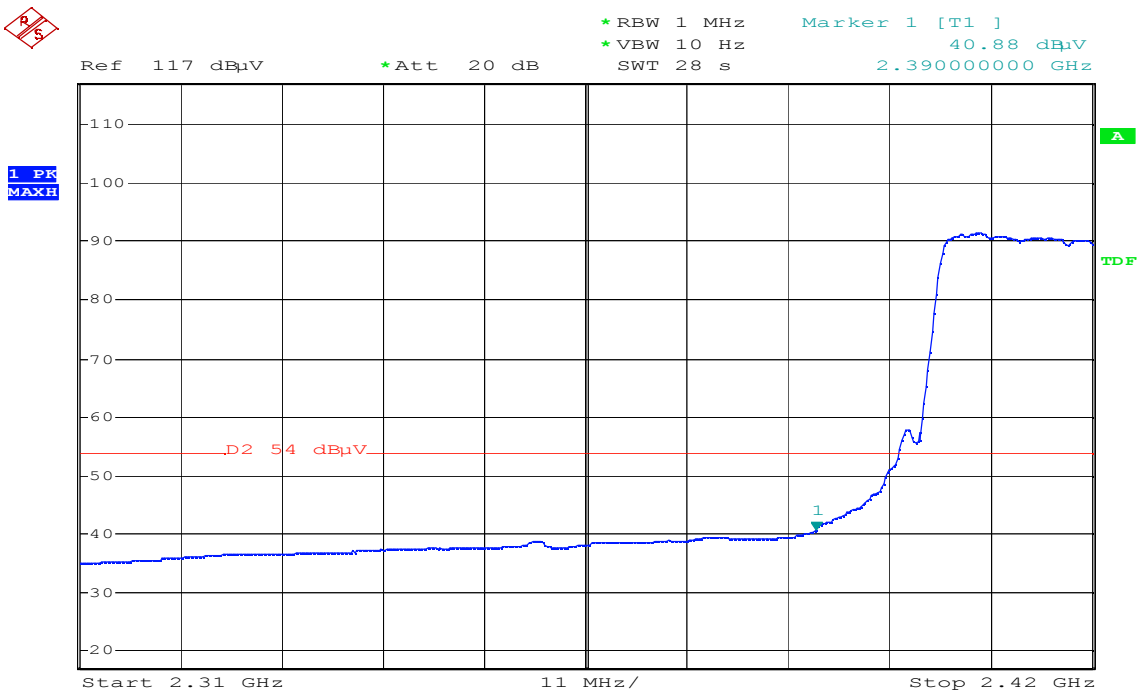
Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak Polarity: Vertical



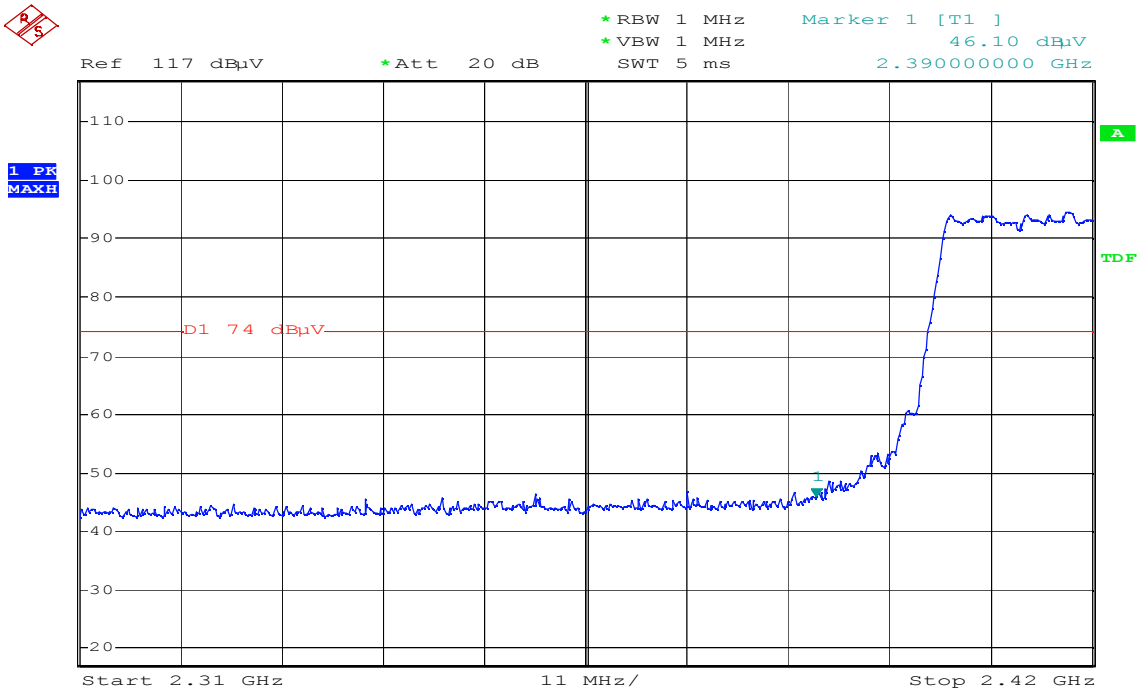
Date: 14.OCT.2008 14:10:39

Detector mode: Average Polarity: Vertical



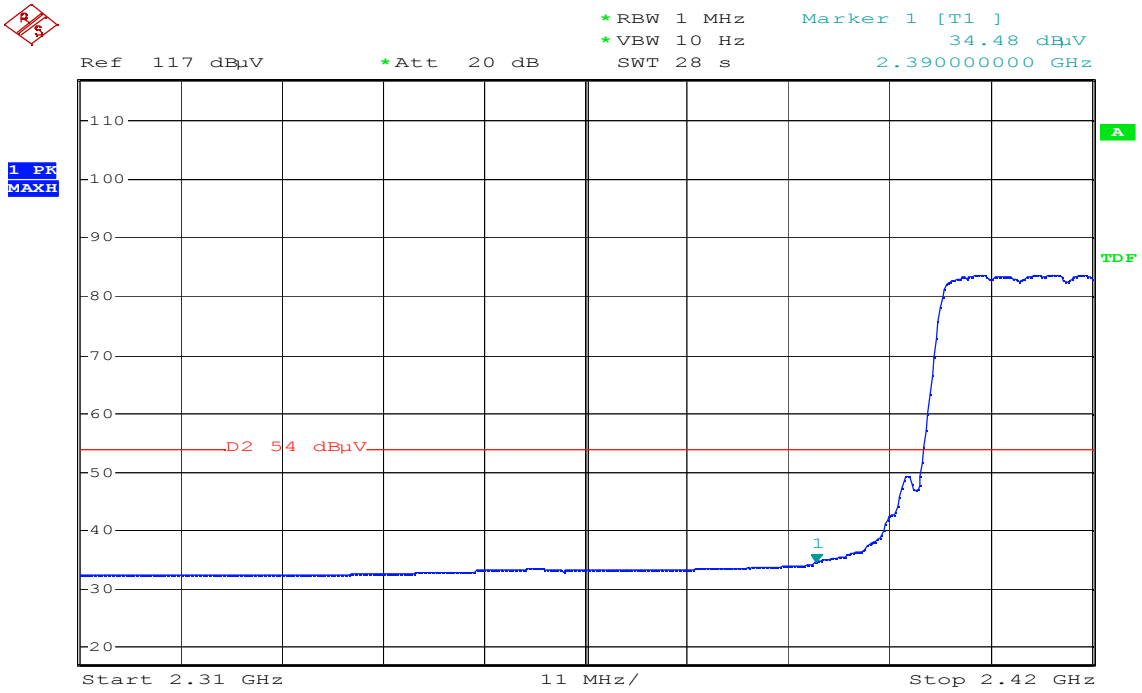
Date: 14.OCT.2008 14:11:27

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 14:08:50

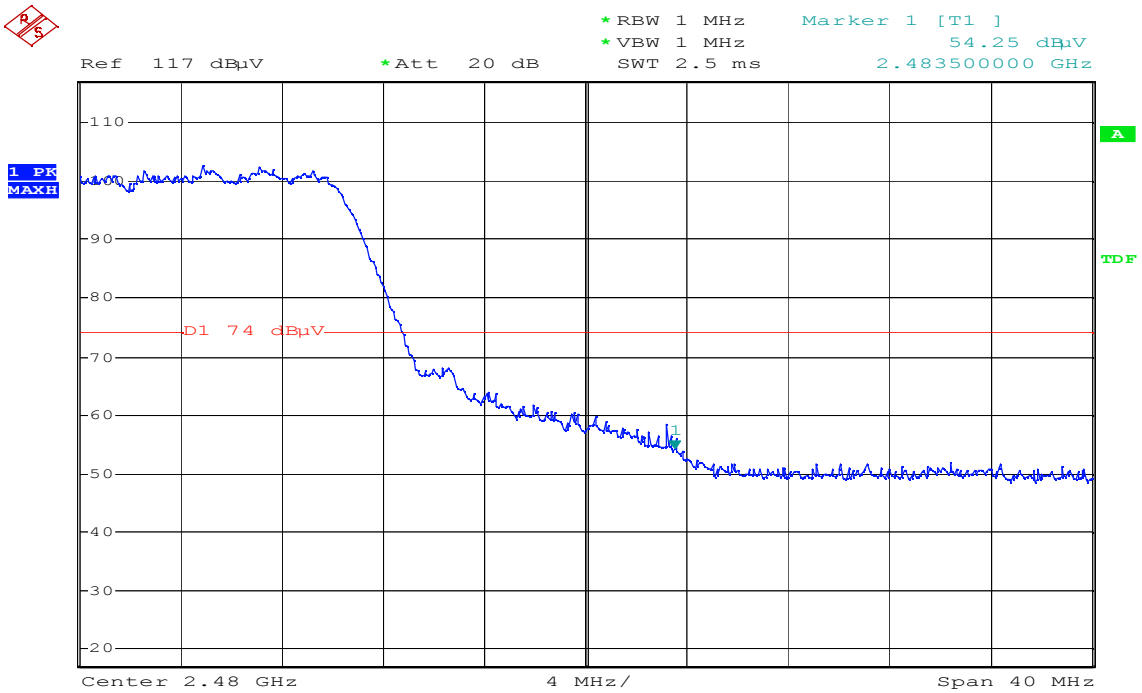
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 14:07:53

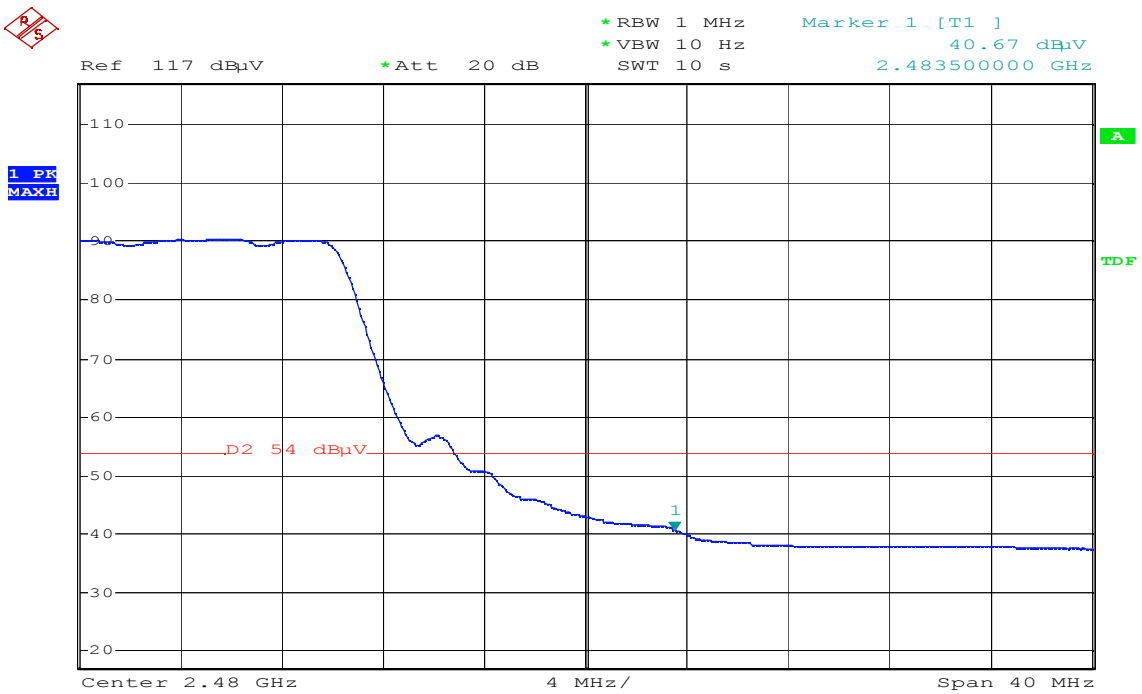
Band Edges (IEEE 802.11g mode / CH High)

Detector mode: Peak Polarity: Vertical



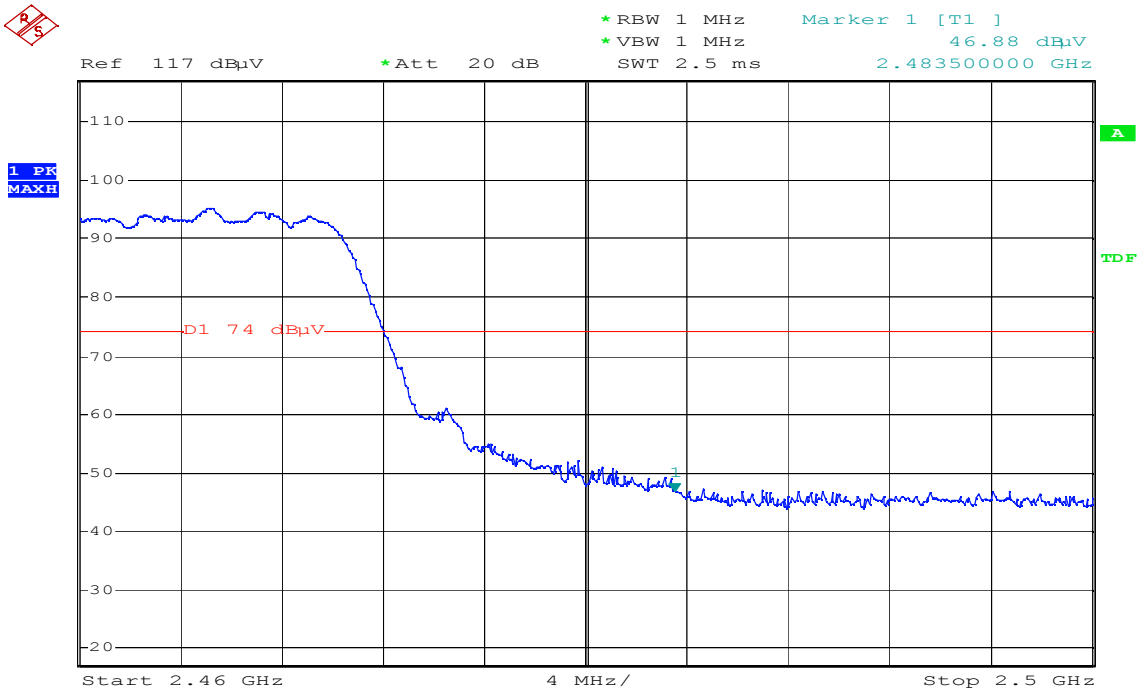
Date: 14.OCT.2008 16:15:50

Detector mode: Average Polarity: Vertical



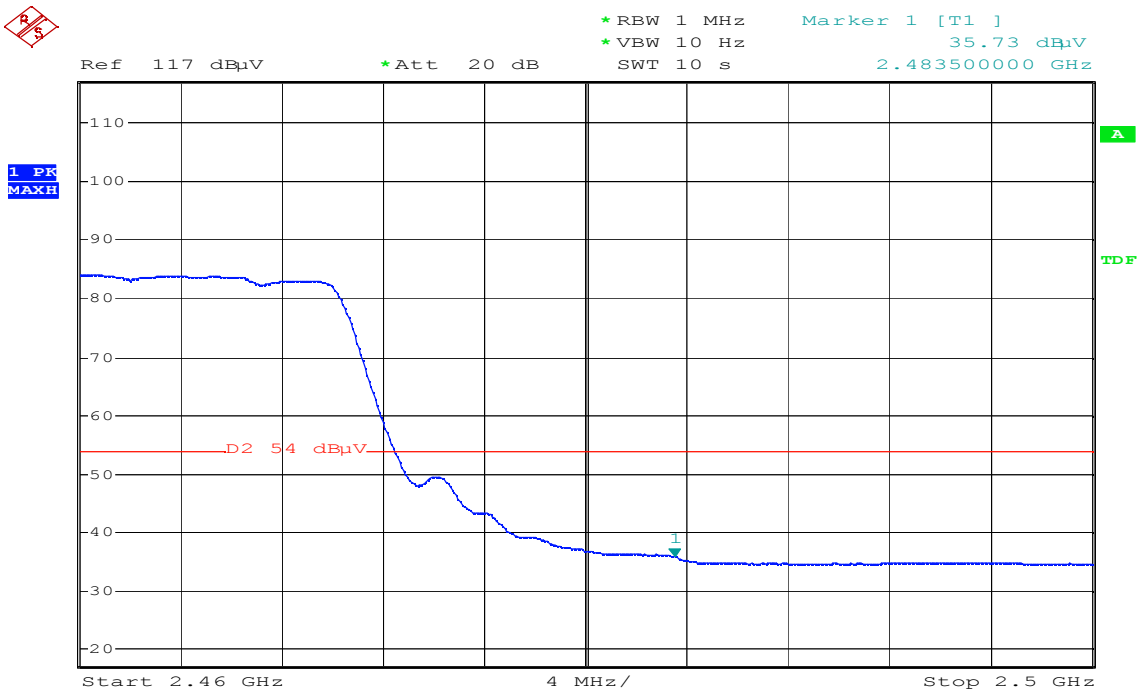
Date: 14.OCT.2008 16:16:17

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 16:12:06

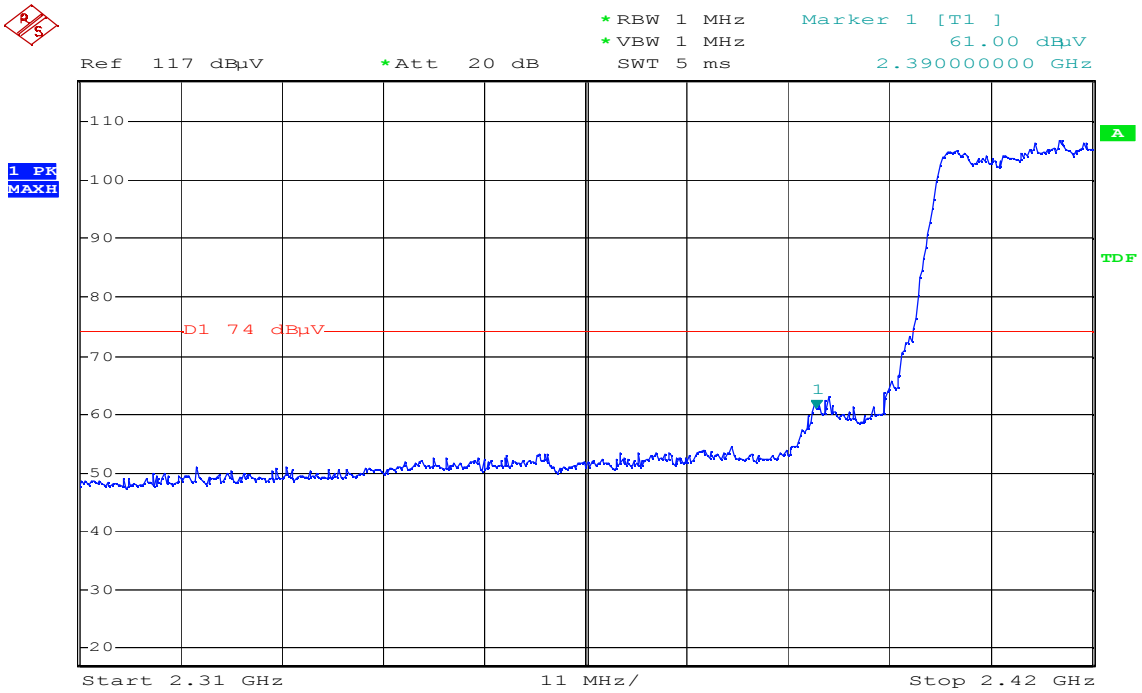
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 16:12:33

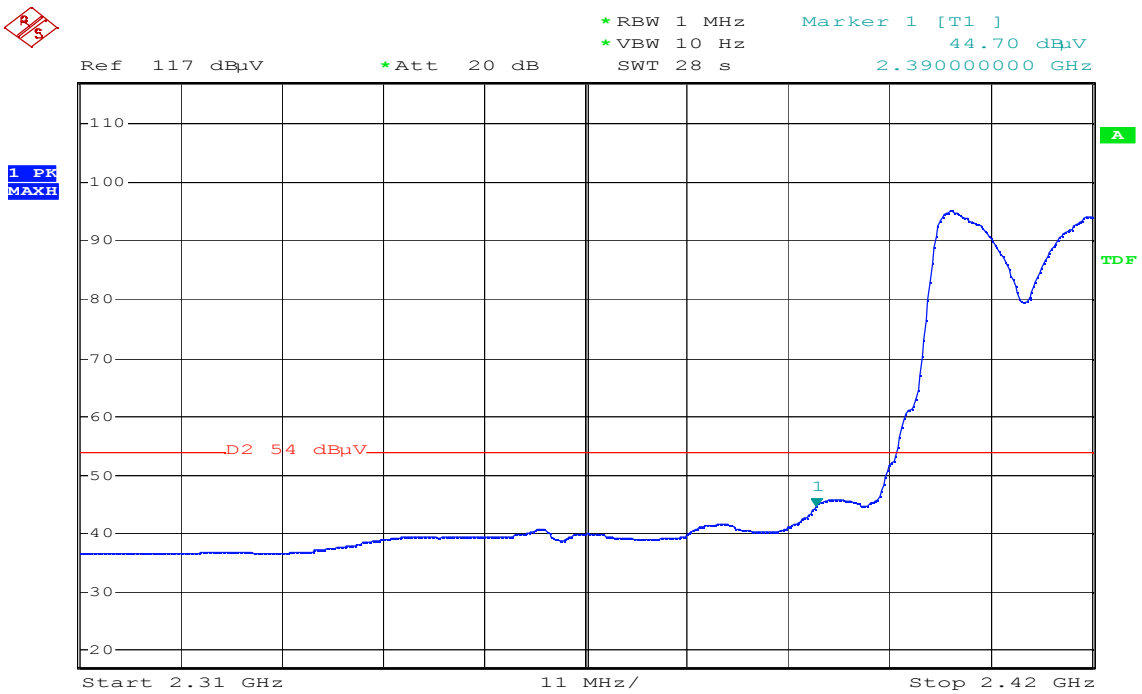
Band Edges (draft 802.11n 20 MHz Channel mode / CH Low)

Detector mode: Peak Polarity: Vertical



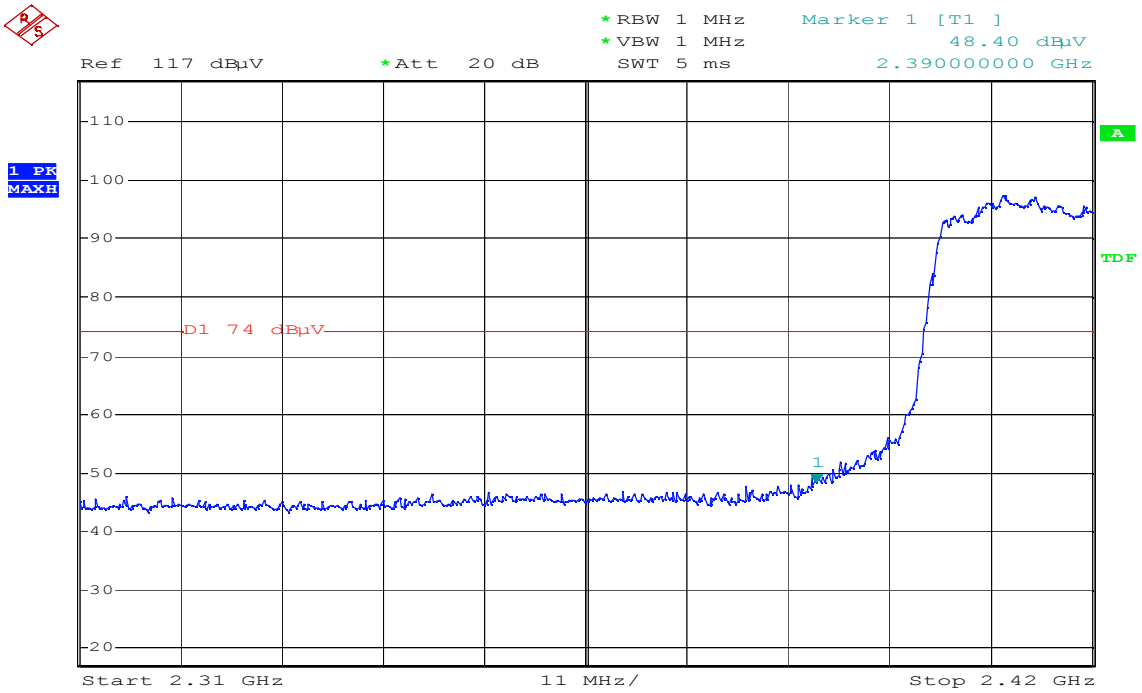
Date: 14.OCT.2008 14:48:18

Detector mode: Average Polarity: Vertical



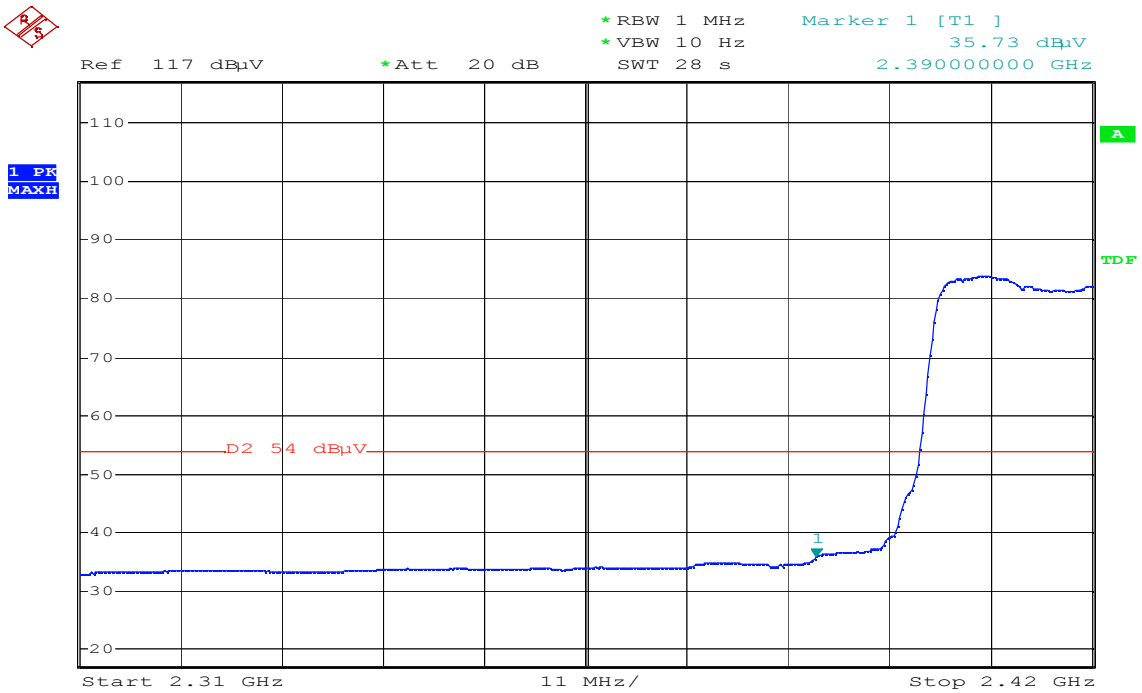
Date: 14.OCT.2008 14:49:10

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 14:41:53

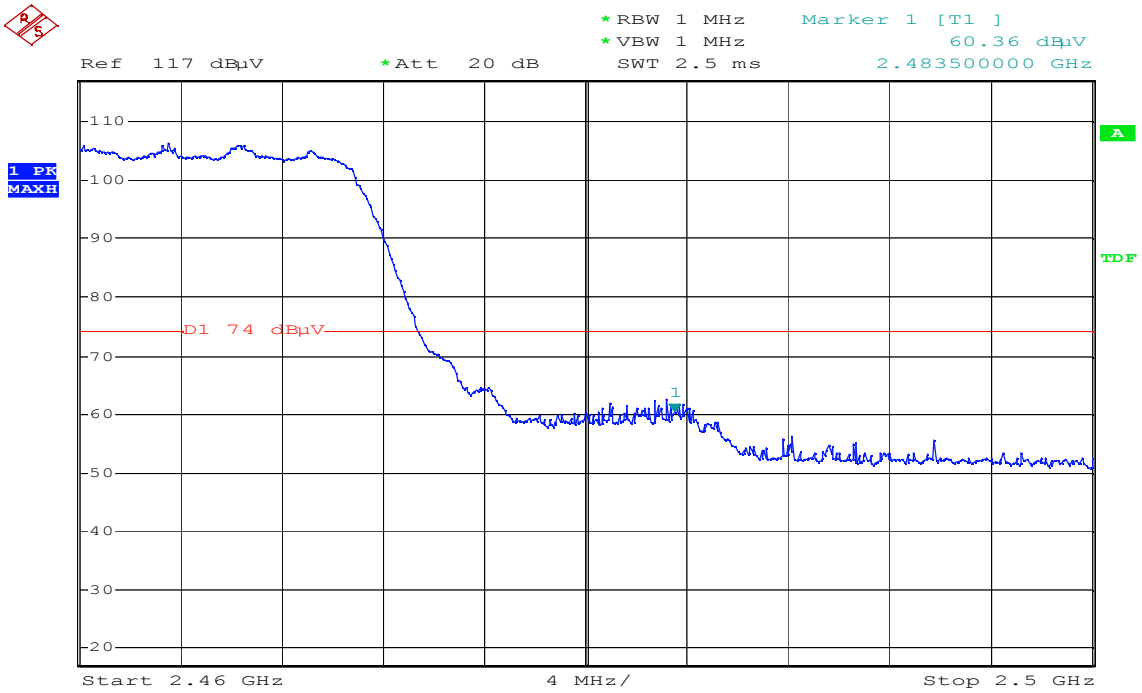
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 14:44:32

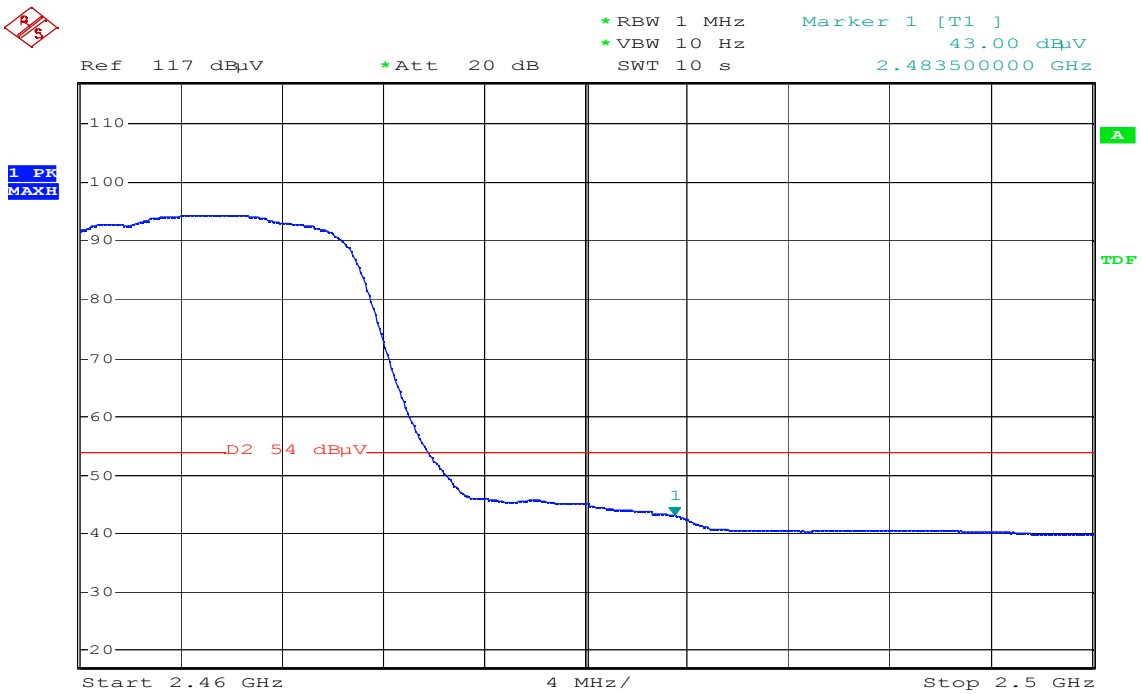
Band Edges (draft 802.11n 20 MHz Channel mode / CH High)

Detector mode: Peak Polarity: Vertical



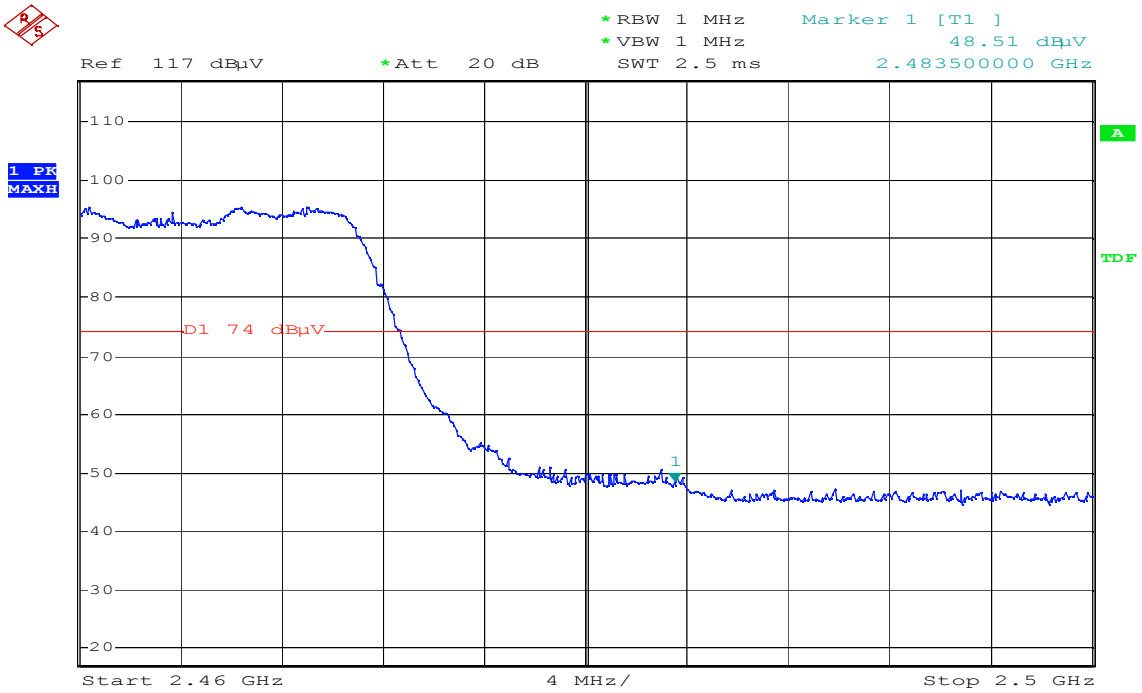
Date: 14.OCT.2008 16:04:24

Detector mode: Average Polarity: Vertical



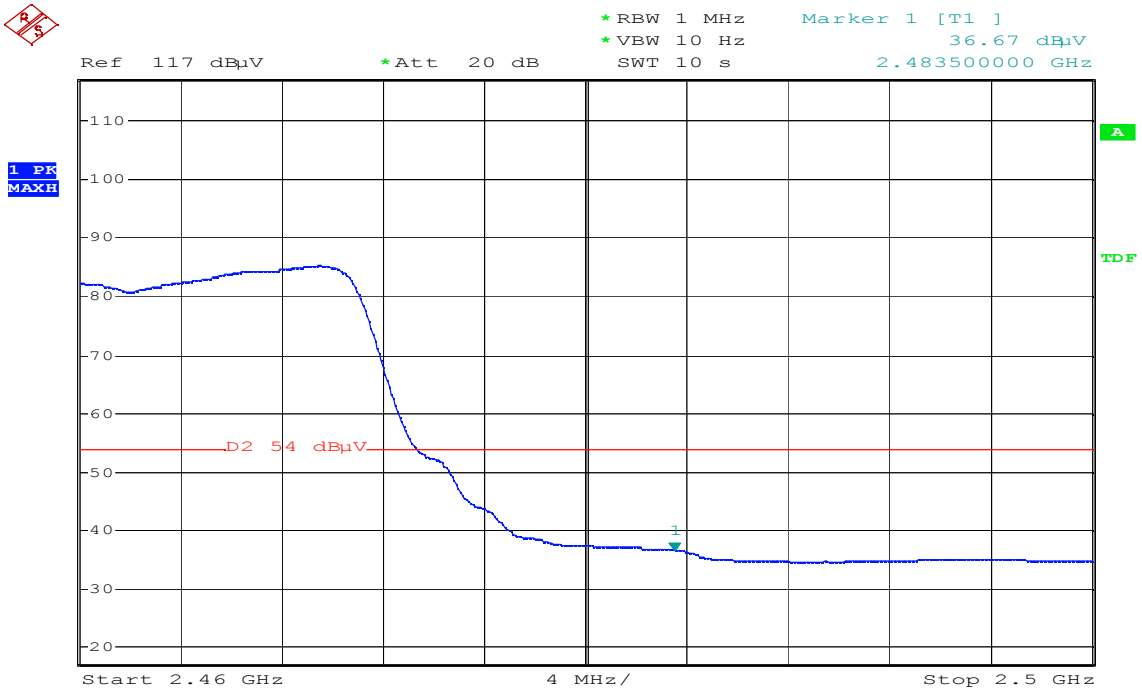
Date: 14.OCT.2008 16:04:51

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 16:09:45

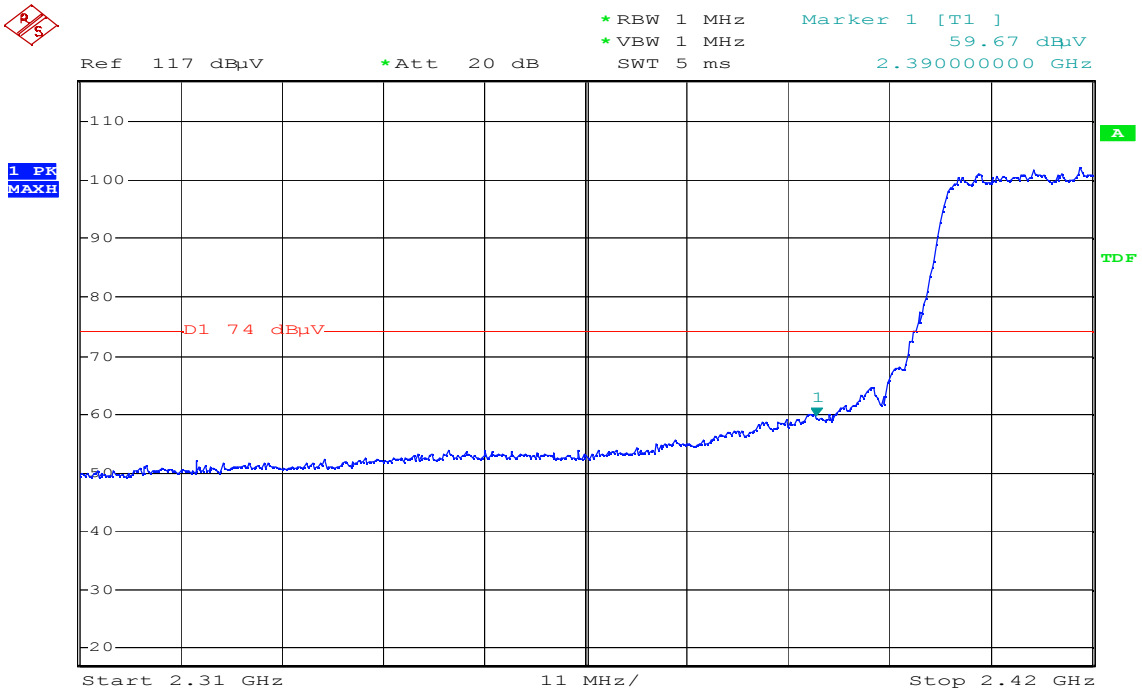
Detector mode: Average Polarity: Horizontal



Date: 14.OCT.2008 16:10:14

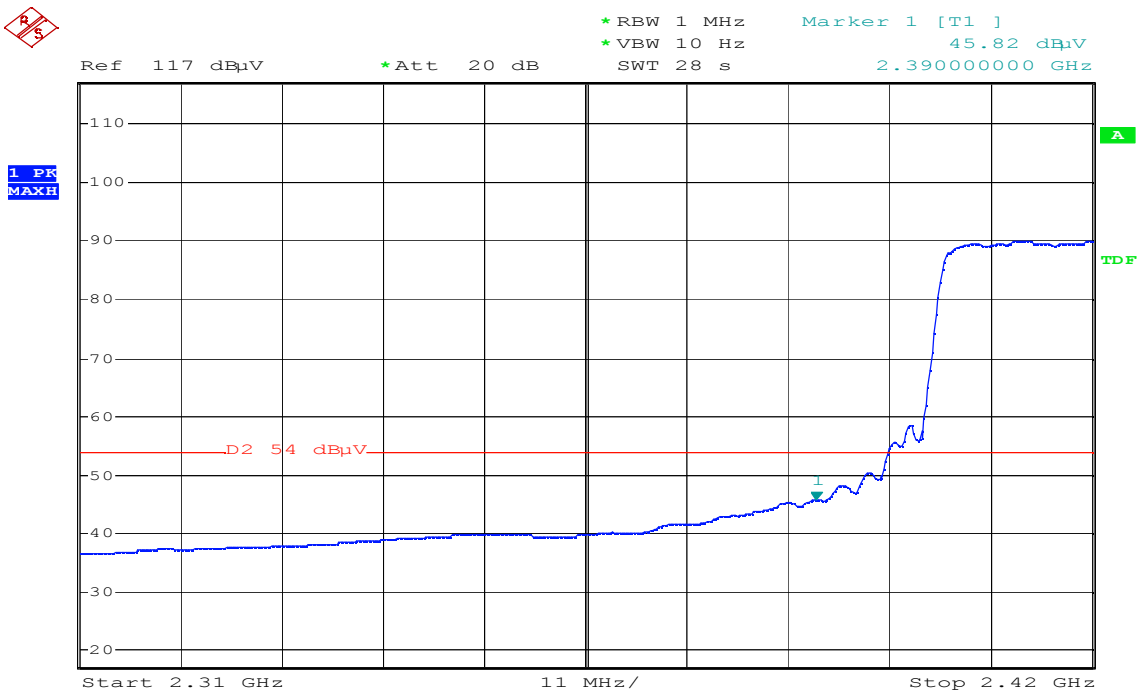
Band Edges (draft 802.11n 40 MHz Channel mode / CH Low)

Detector mode: Peak Polarity: Vertical



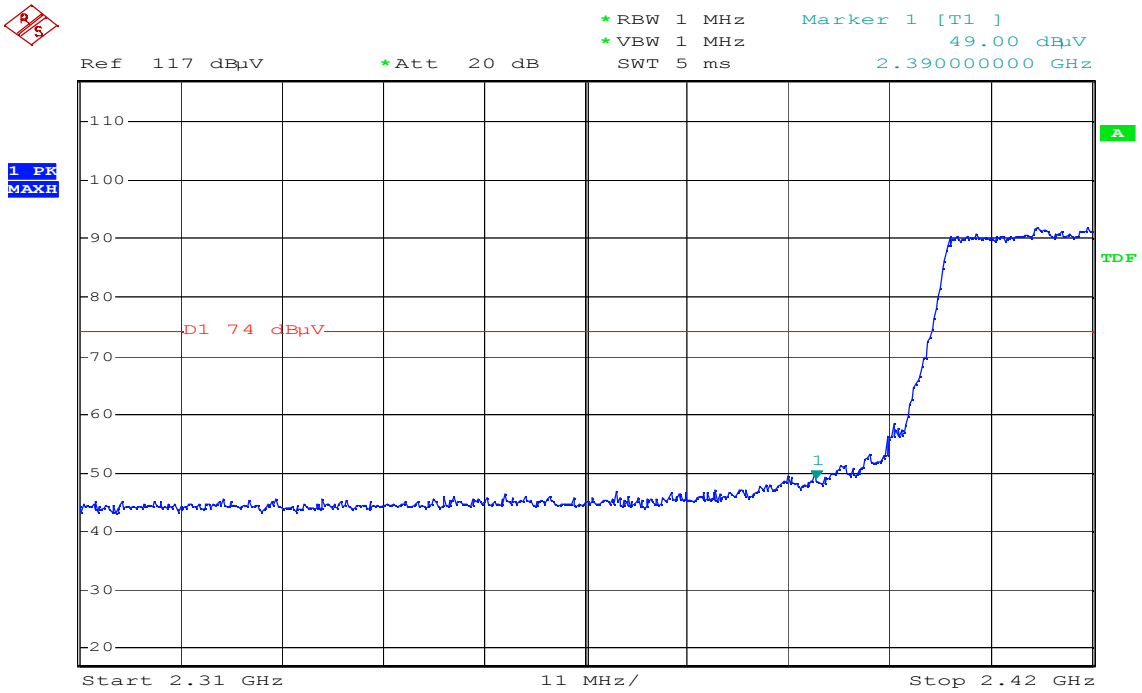
Date: 14.OCT.2008 15:28:50

Detector mode: Average Polarity: Vertical



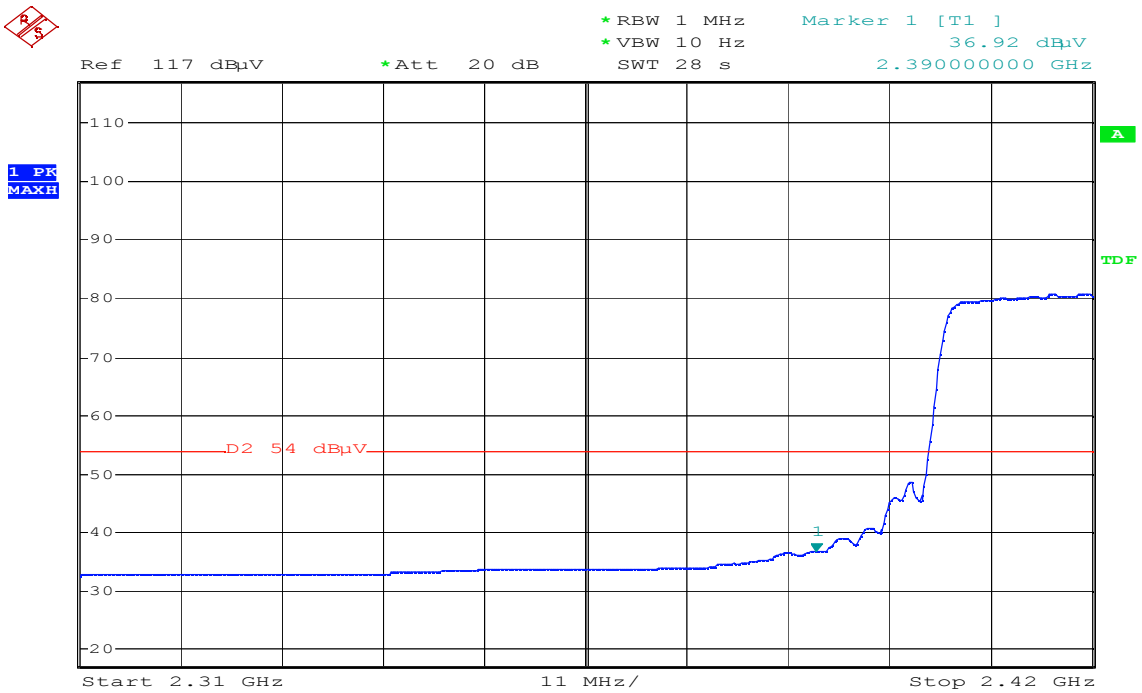
Date: 14.OCT.2008 15:31:43

Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 15:34:41

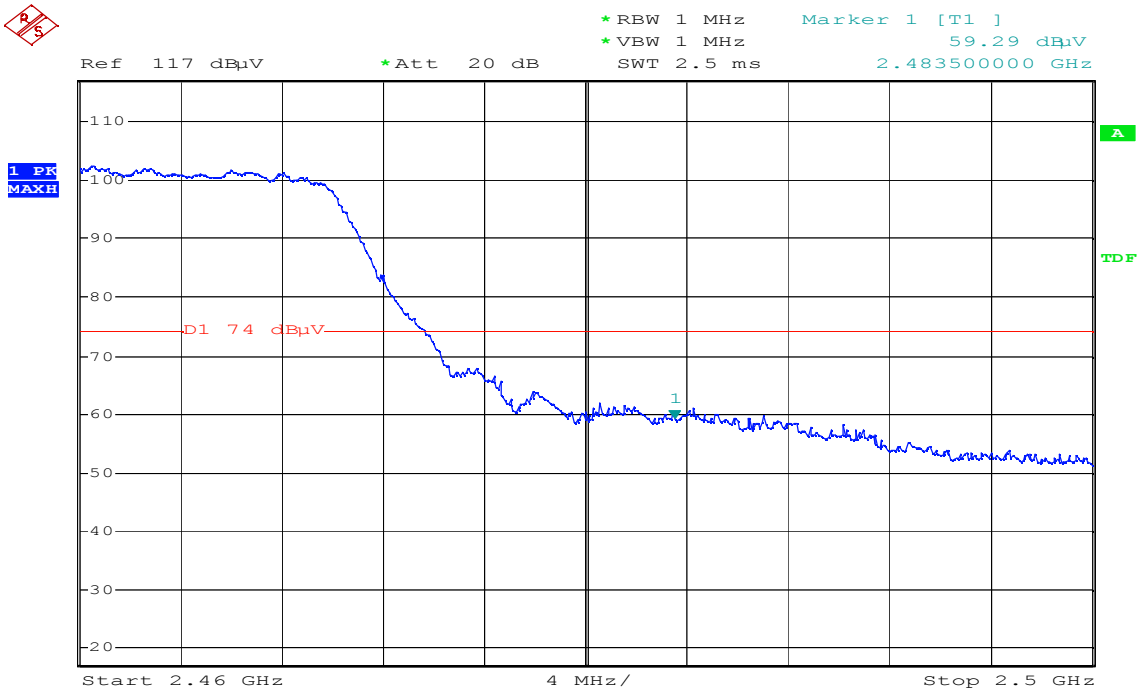
Detector mode: Average Polarity: Horizontal



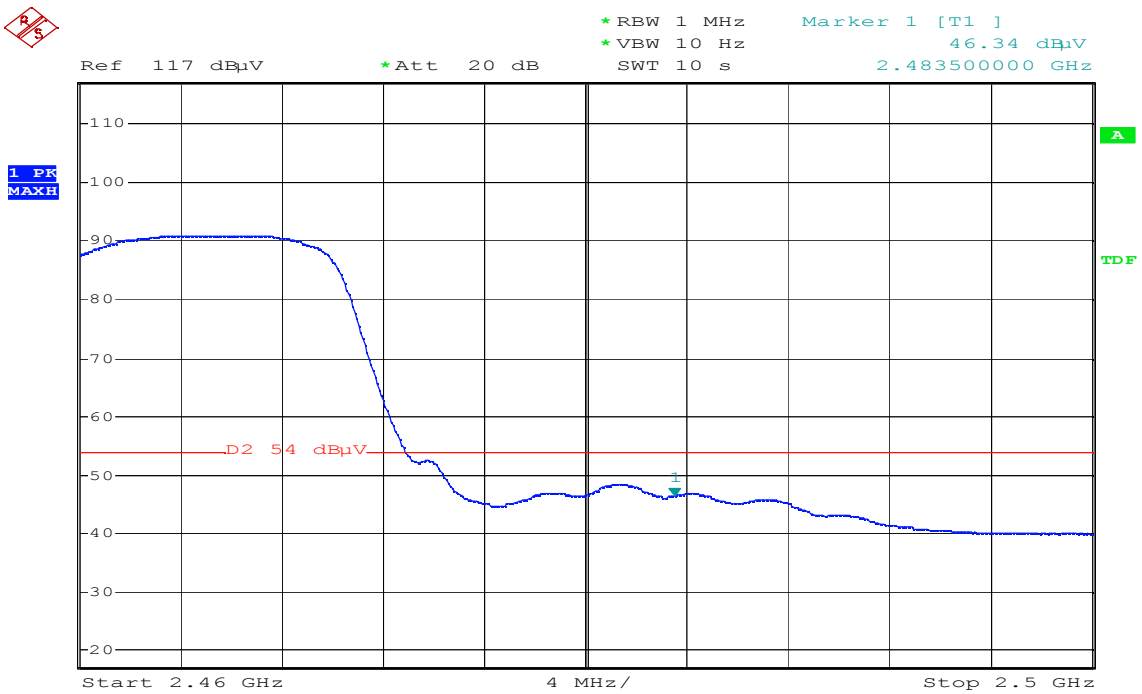
Date: 14.OCT.2008 15:36:05

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

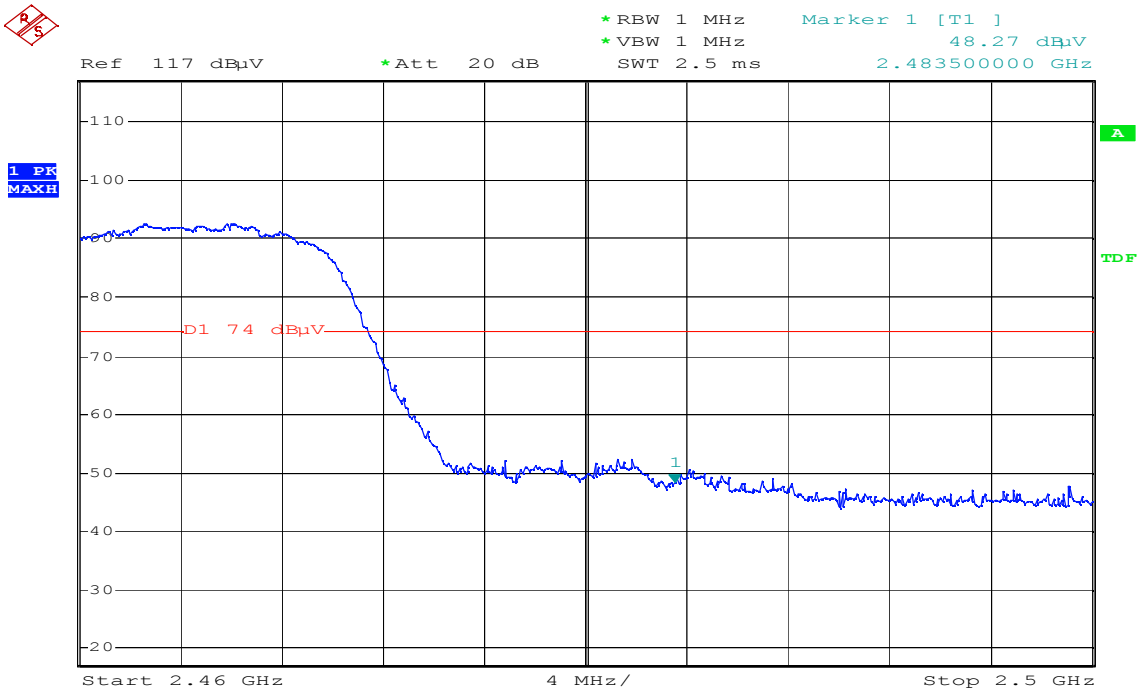
Detector mode: Peak Polarity: Vertical



Detector mode: Average Polarity: Vertical

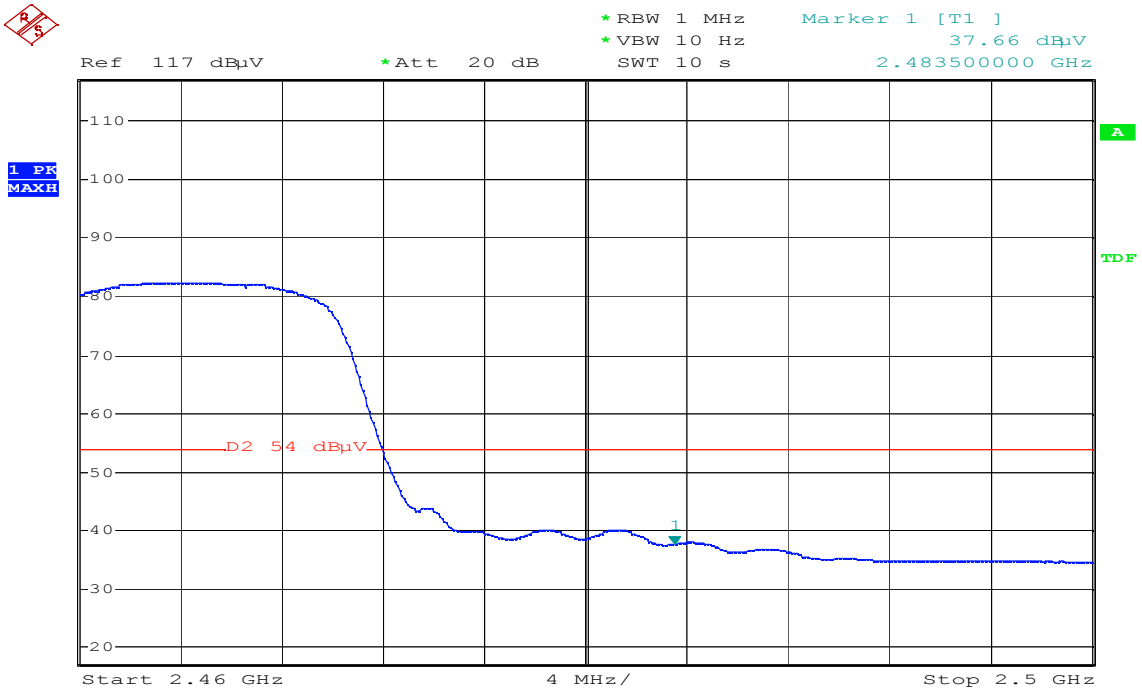


Detector mode: Peak Polarity: Horizontal



Date: 14.OCT.2008 15:52:24

Detector mode: Average Polarity: Horizontal



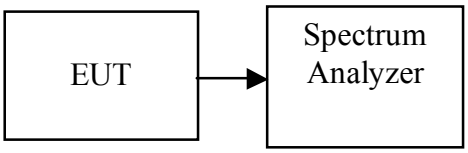
Date: 14.OCT.2008 15:52:56

6.5 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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

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= auto
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-13.28	8.00	PASS
Mid	2437	-13.24		PASS
High	2462	-13.72		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-17.19	8.00	PASS
Mid	2437	-16.96		PASS
High	2462	-18.02		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Combiner PPSD (dBm)	Limit (dBm)	Result
Low	2412	-18.66	-16.30	-13.33	8.00	PASS
Mid	2437	-18.68	-17.74	-12.87		PASS
High	2462	-17.81	-16.00	-13.09		PASS

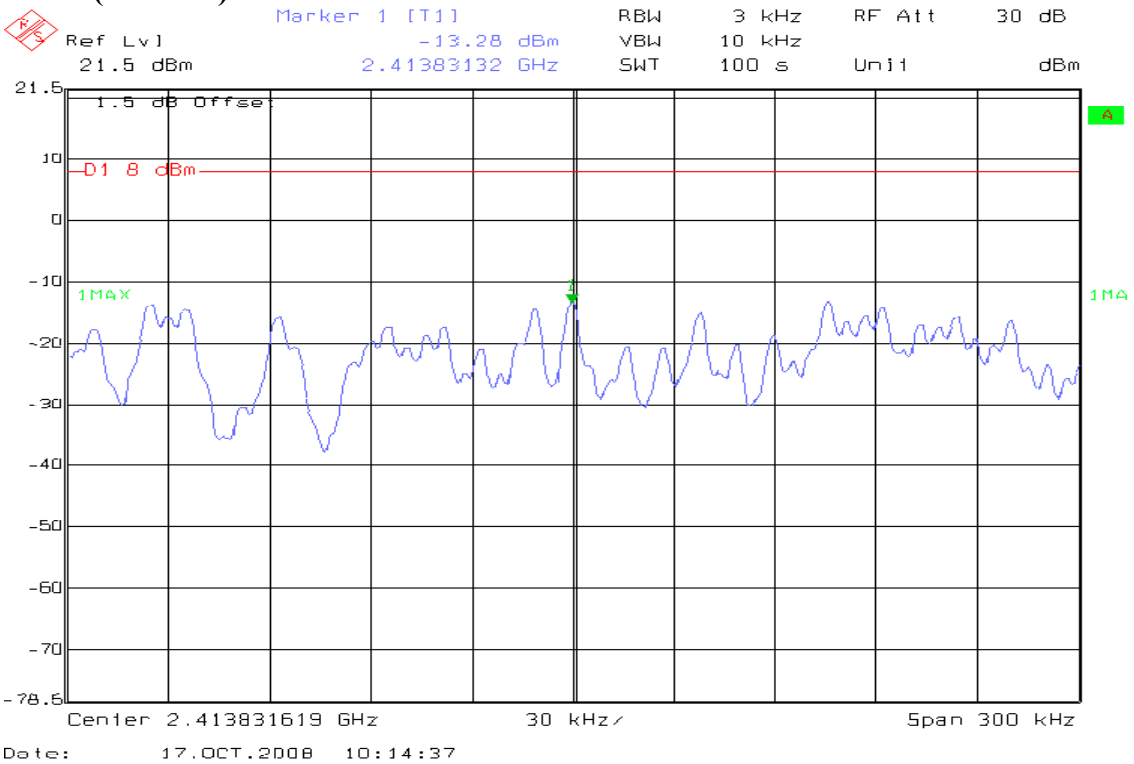
Test mode: draft 802.11n 40 MHz Channel mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Combiner PPSD (dBm)	Limit (dBm)	Result
Low	2422	-22.41	-18.59	-17.46	8.00	PASS
Mid	2437	-22.34	-18.53	-17.21		PASS
High	2452	-22.57	-18.63	-16.98		PASS

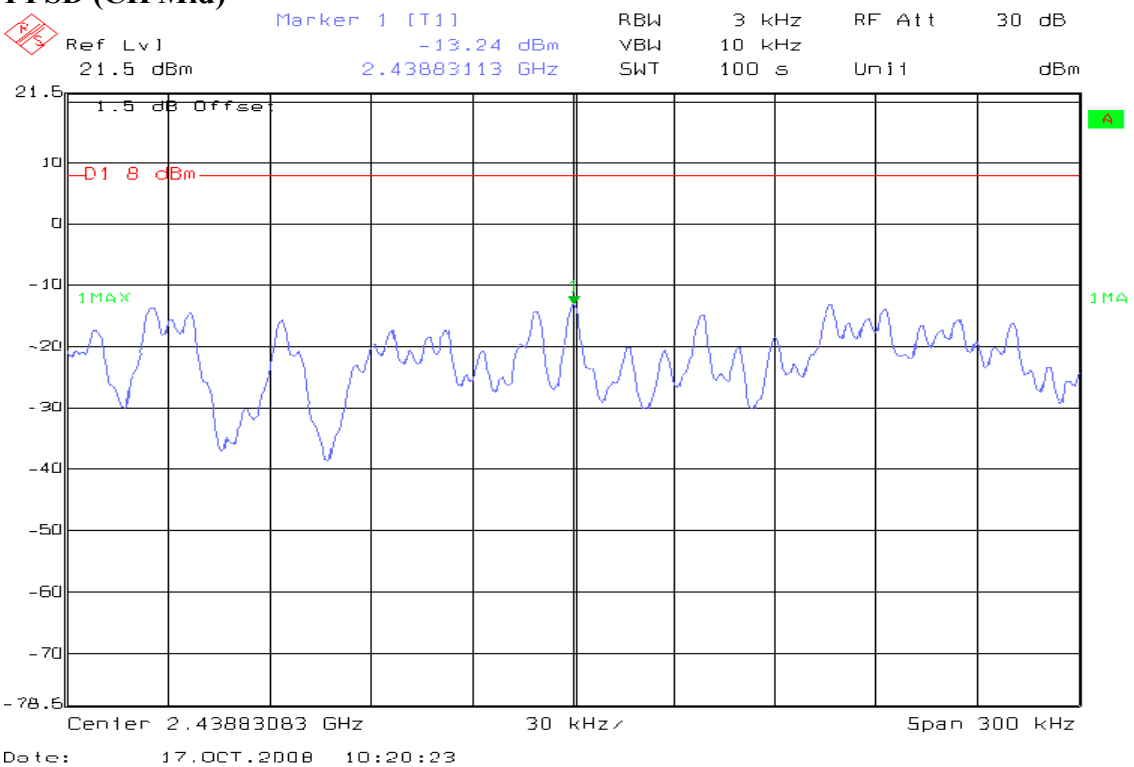
TEST PLOT

IEEE 802.11b mode

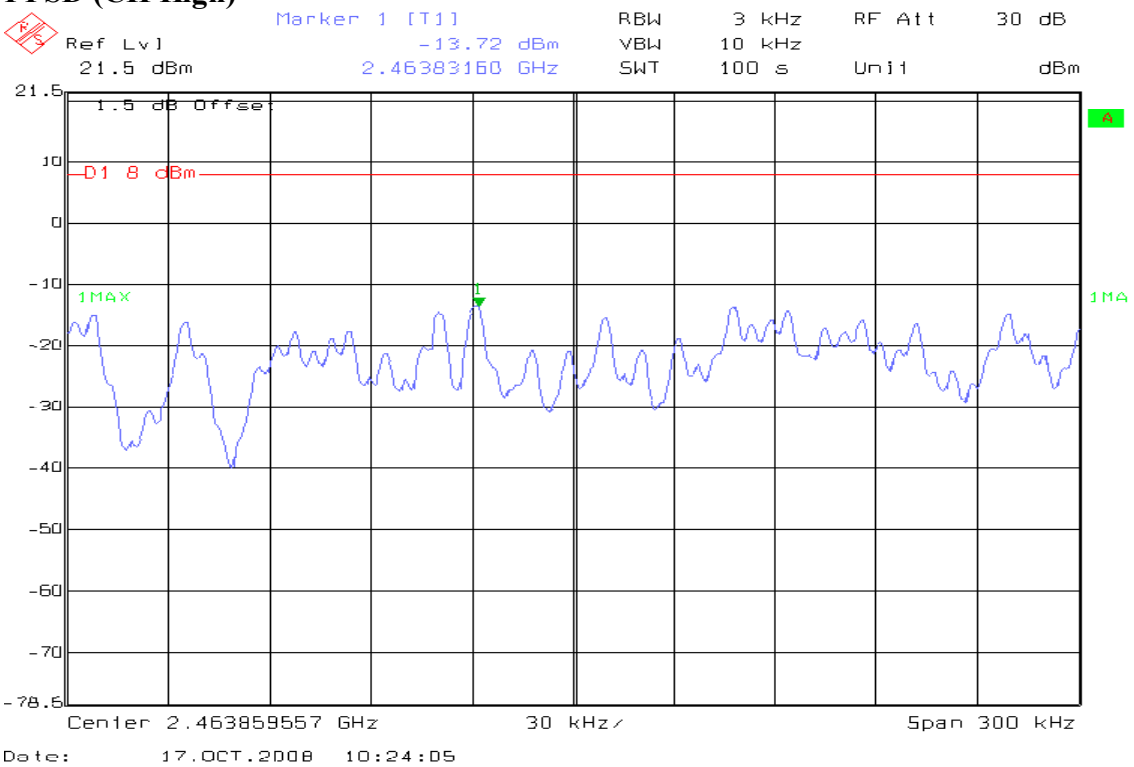
PPSD (CH Low)



PPSD (CH Mid)

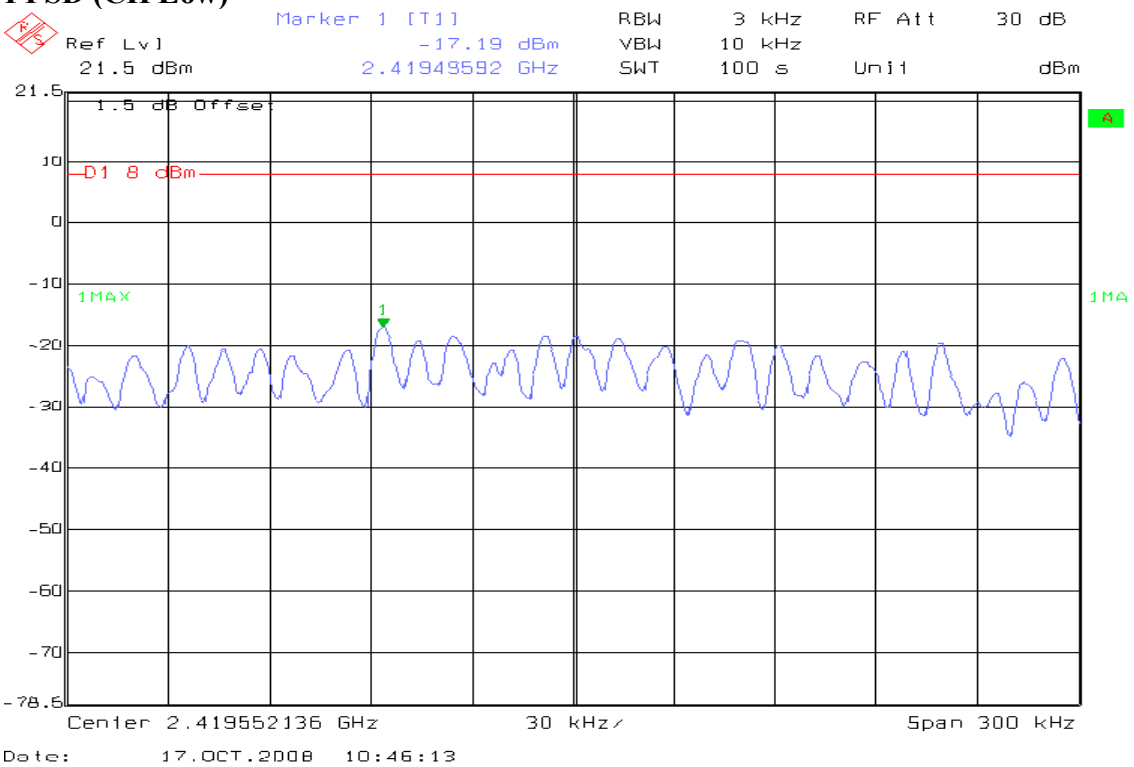


PPSD (CH High)

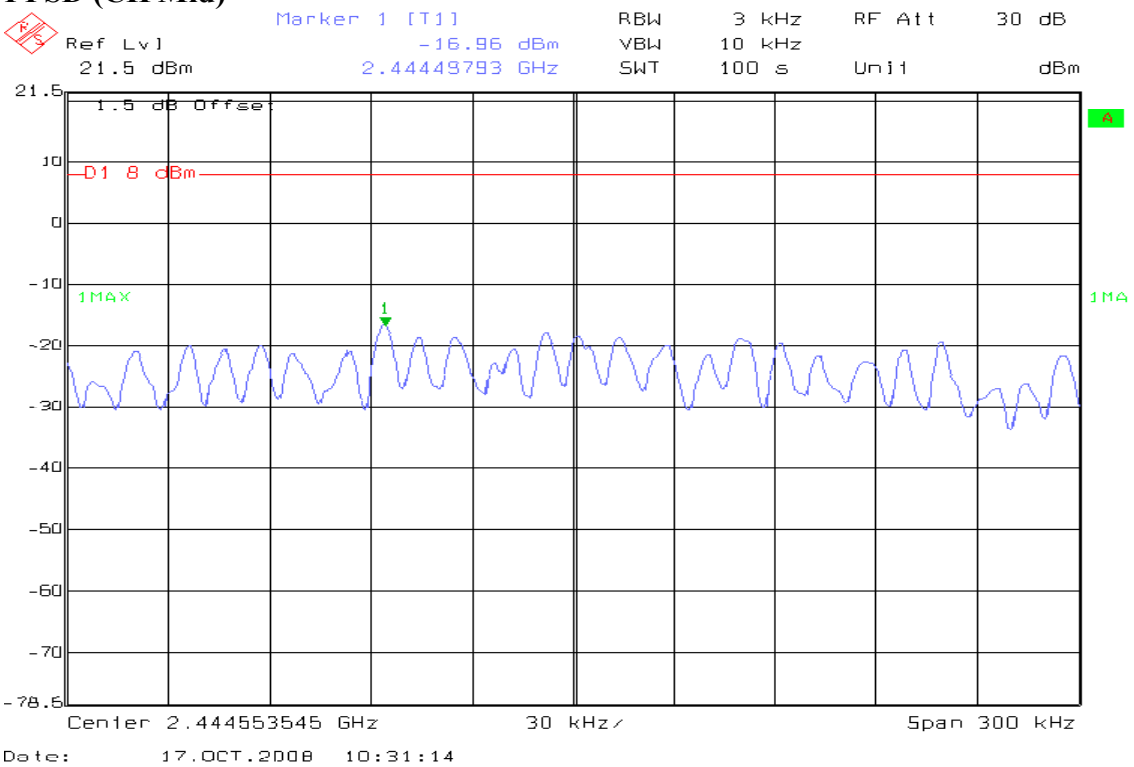


IEEE 802.11g mode

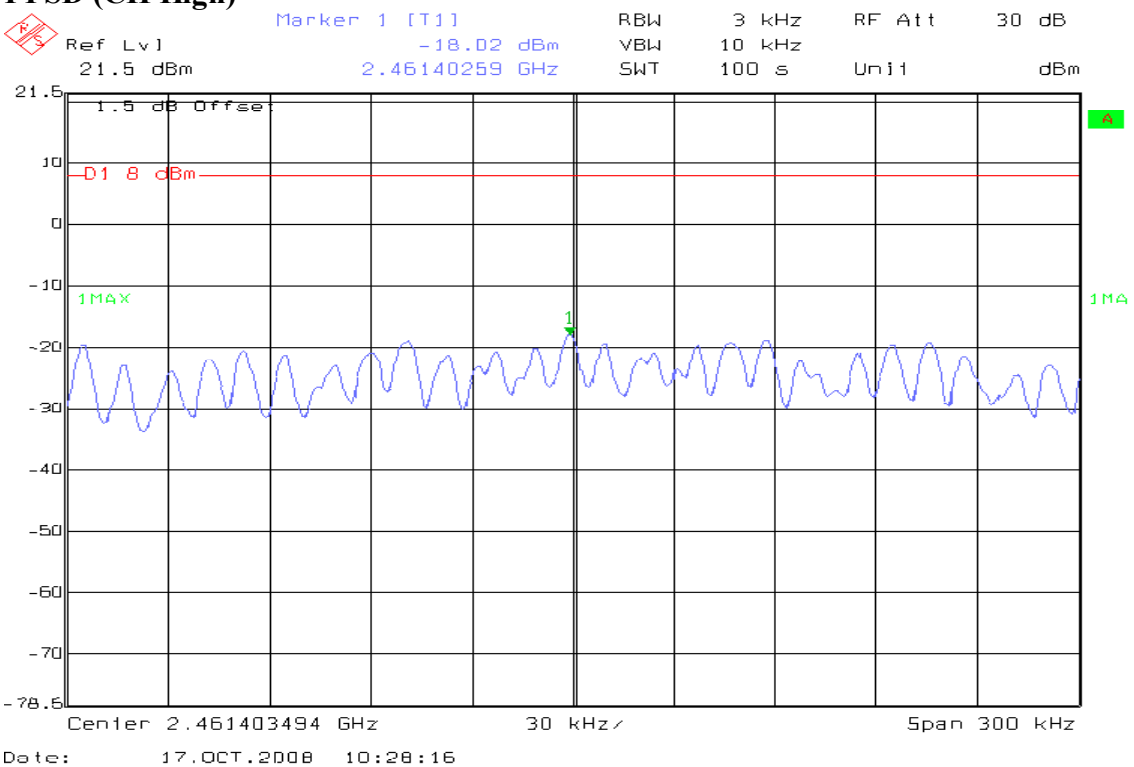
PPSD (CH Low)



PPSD (CH Mid)

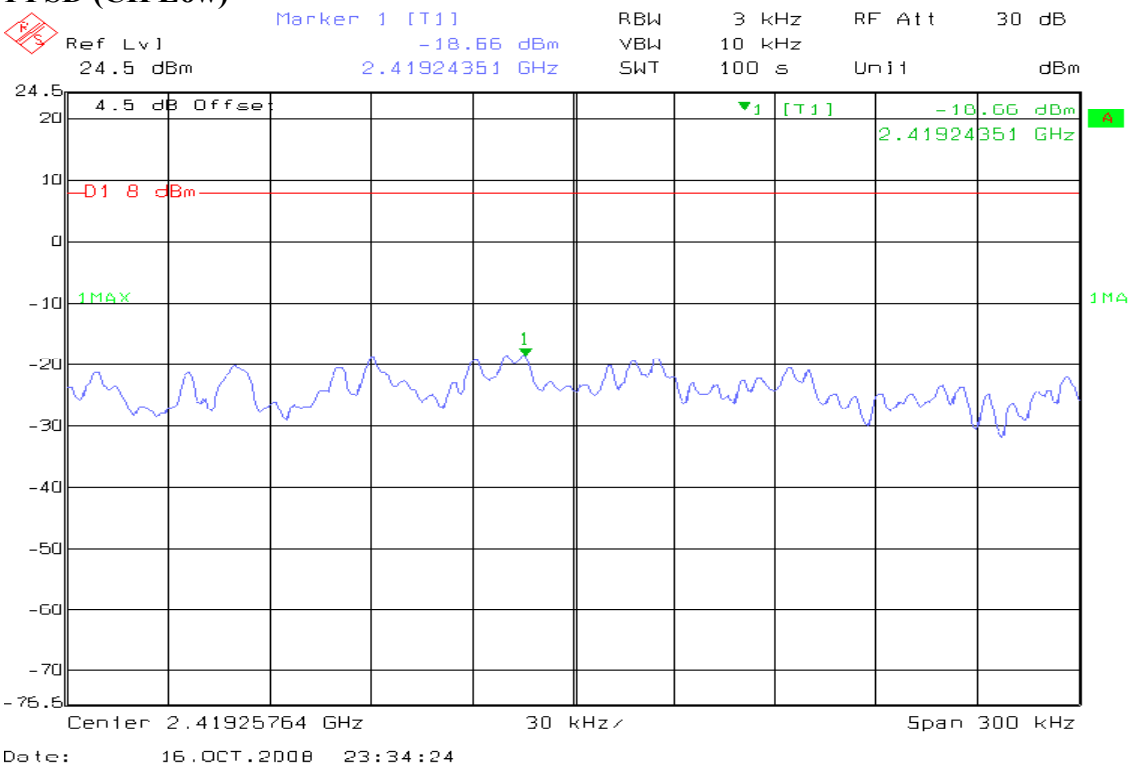


PPSD (CH High)

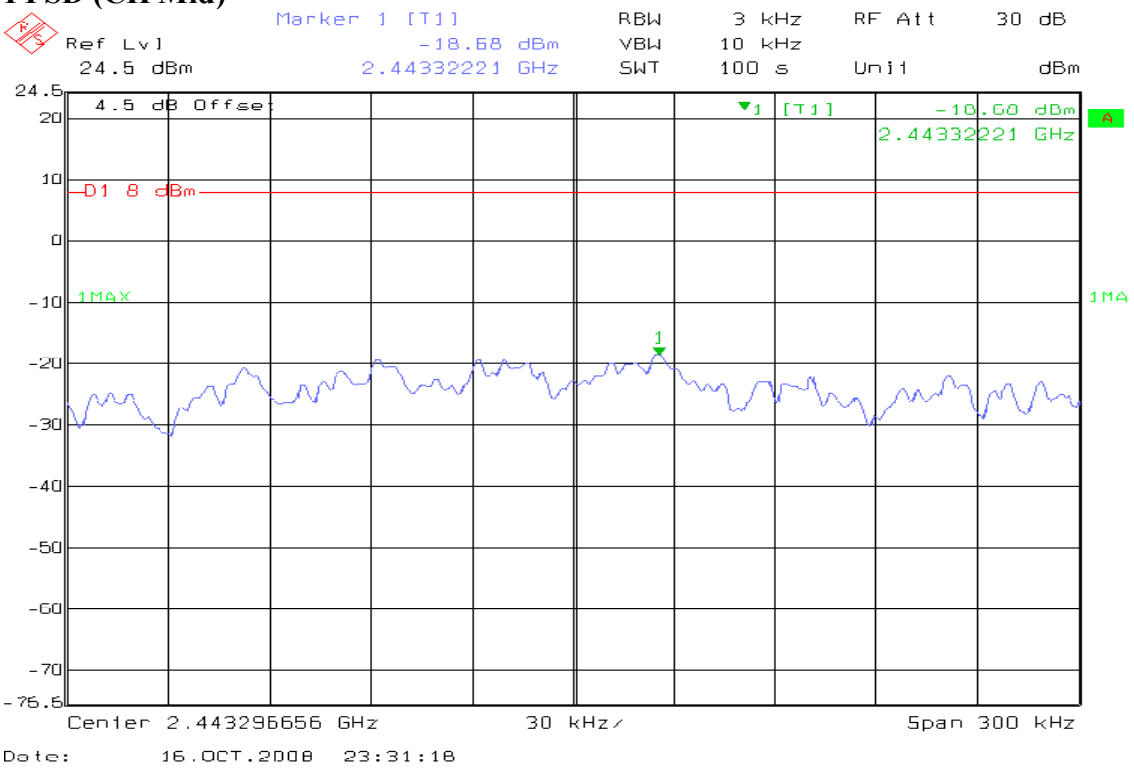


draft 802.11n 20 MHz Channel mode / Chian 0

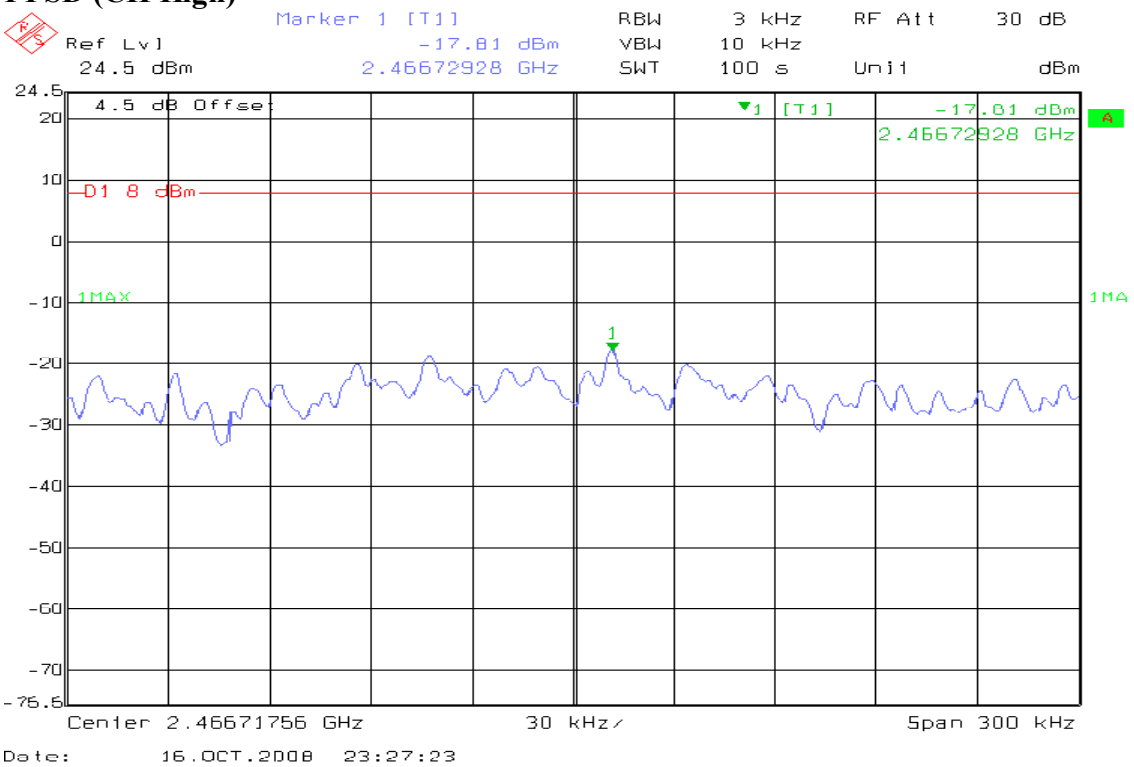
PPSD (CH Low)



PPSD (CH Mid)

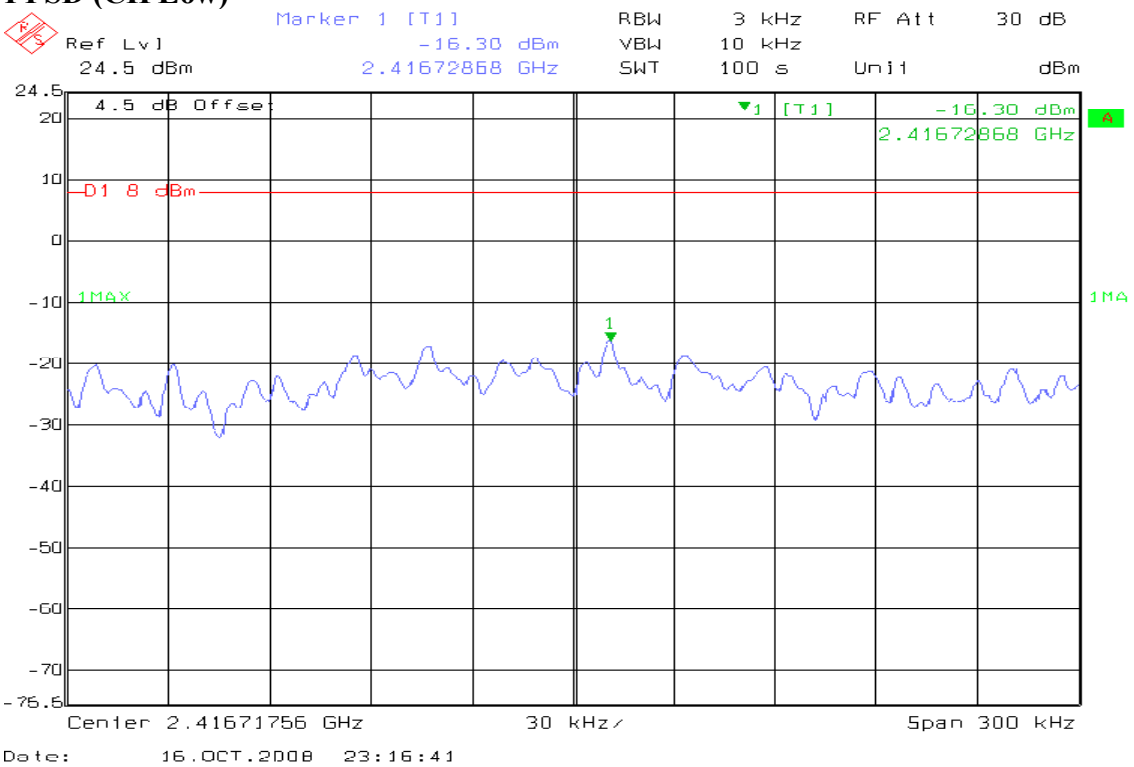


PPSD (CH High)

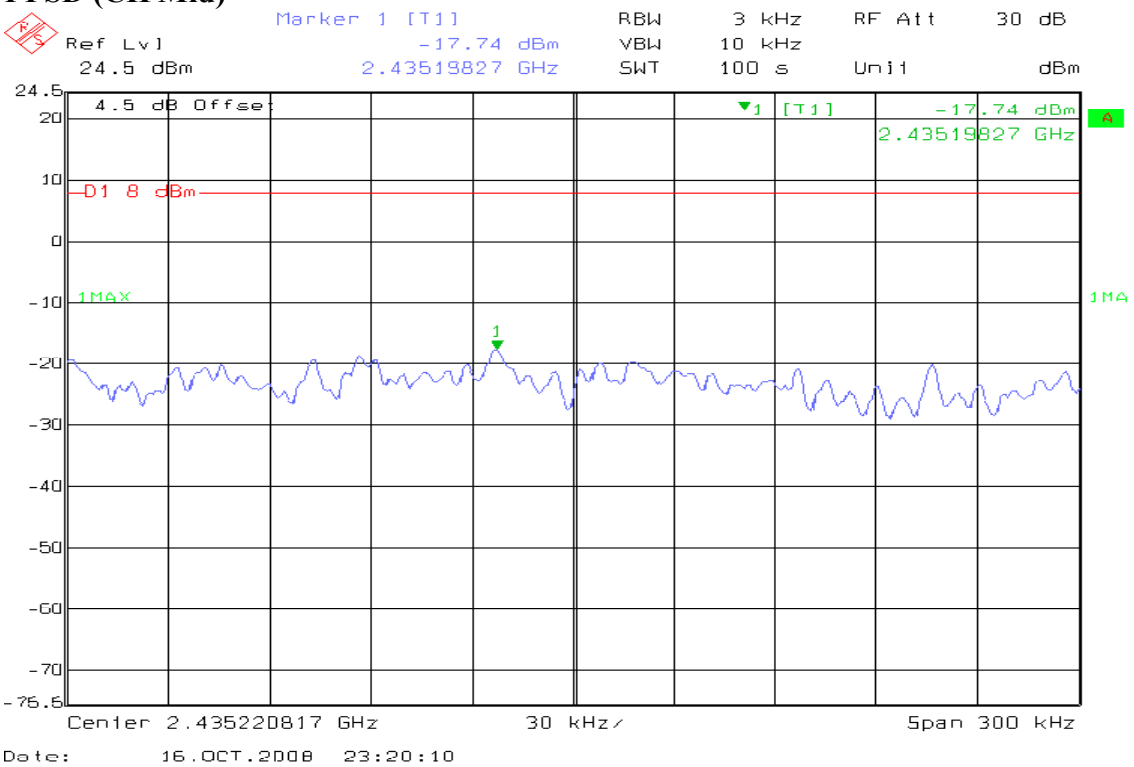


draft 802.11n 20 MHz Channel mode / Chain 1

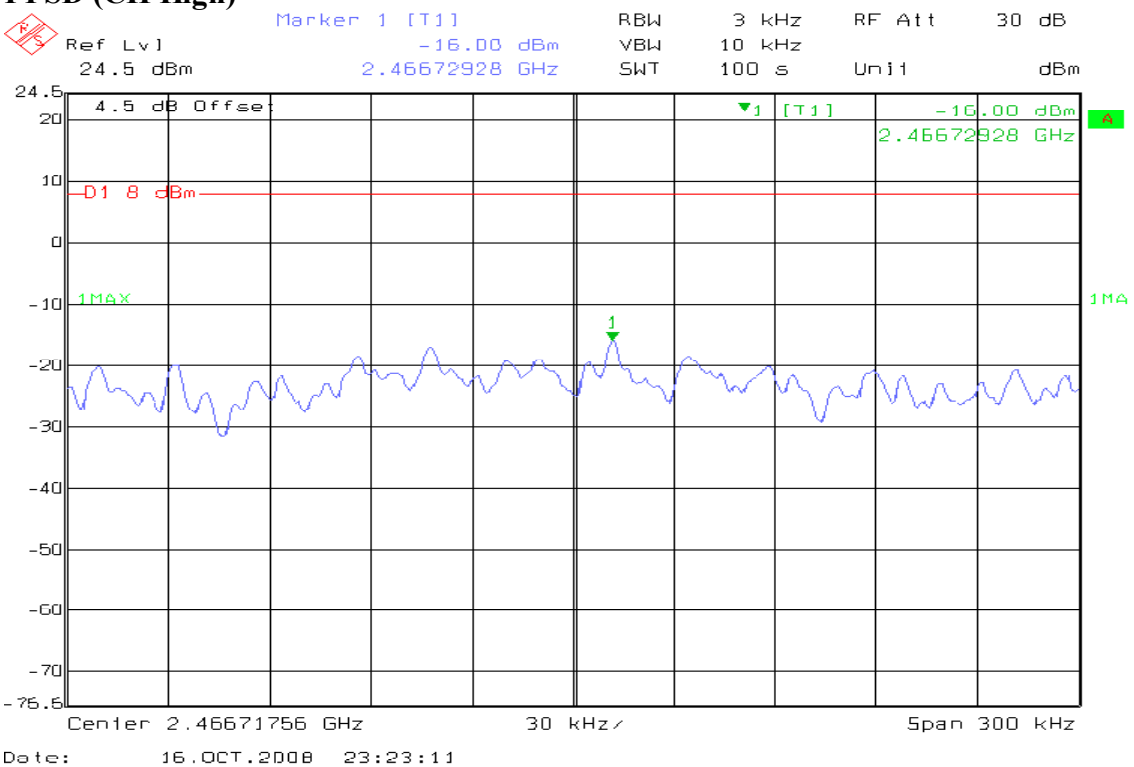
PPSD (CH Low)



PPSD (CH Mid)

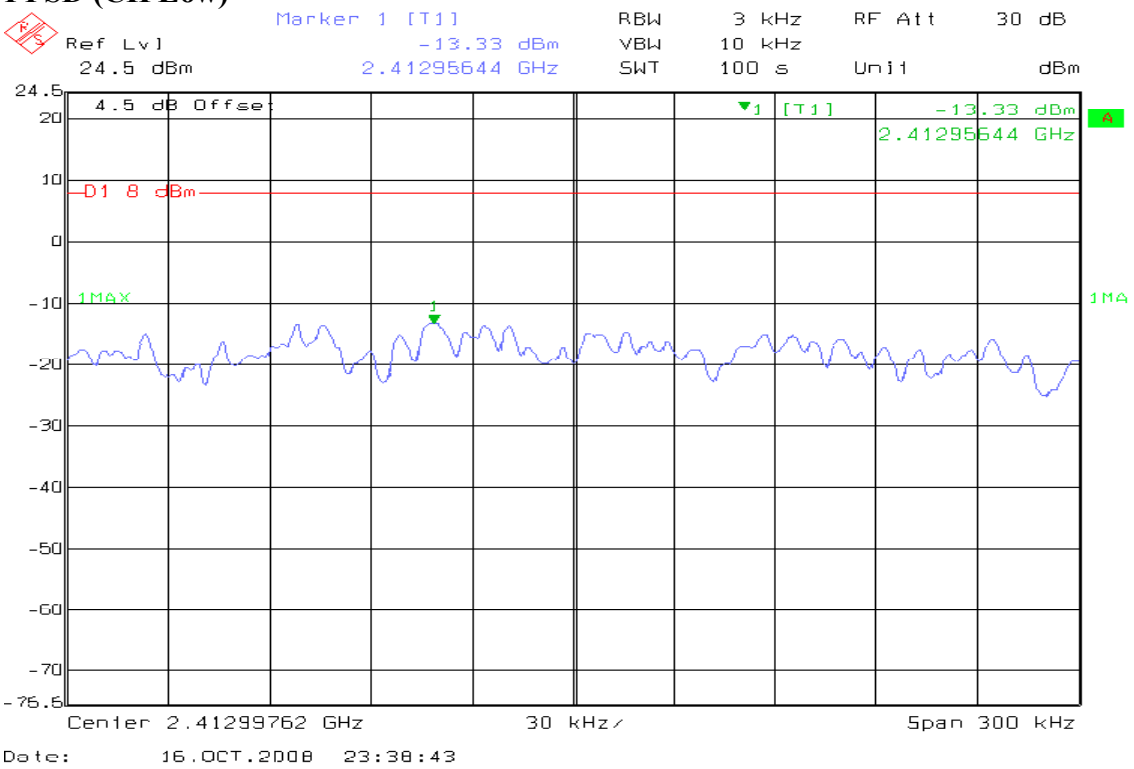


PPSD (CH High)

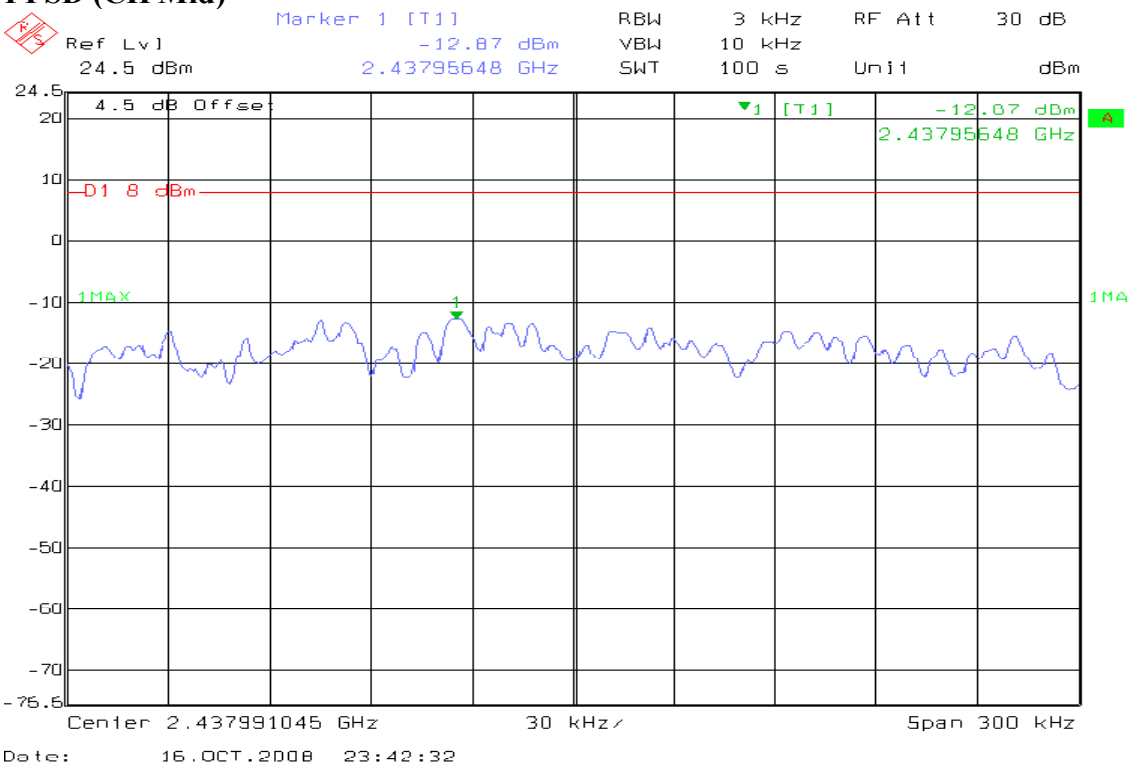


draft 802.11n 20 MHz Channel mode / Combiner

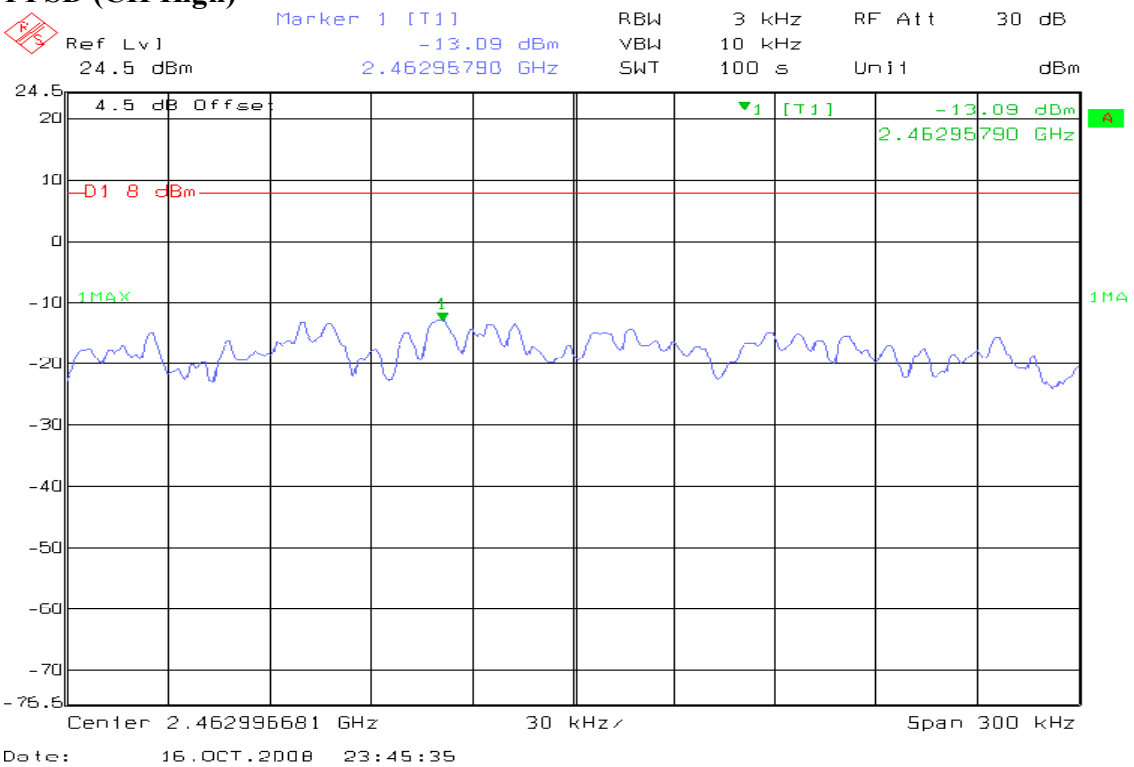
PPSD (CH Low)



PPSD (CH Mid)

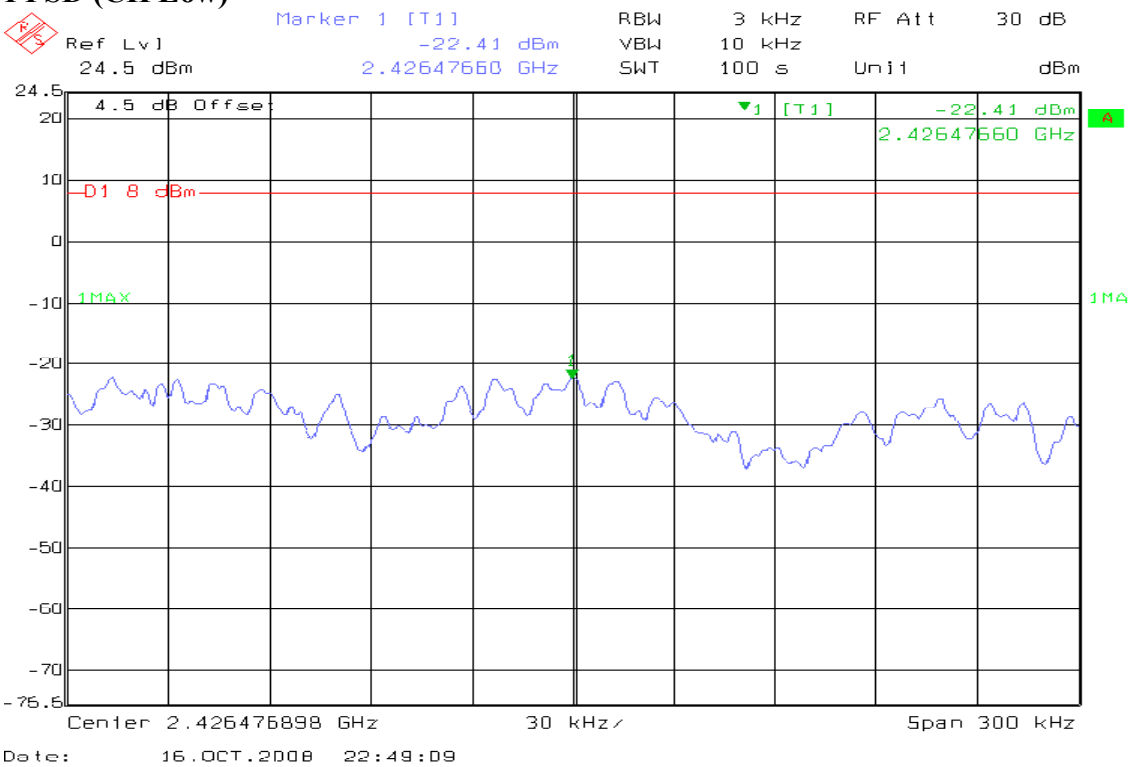


PPSD (CH High)

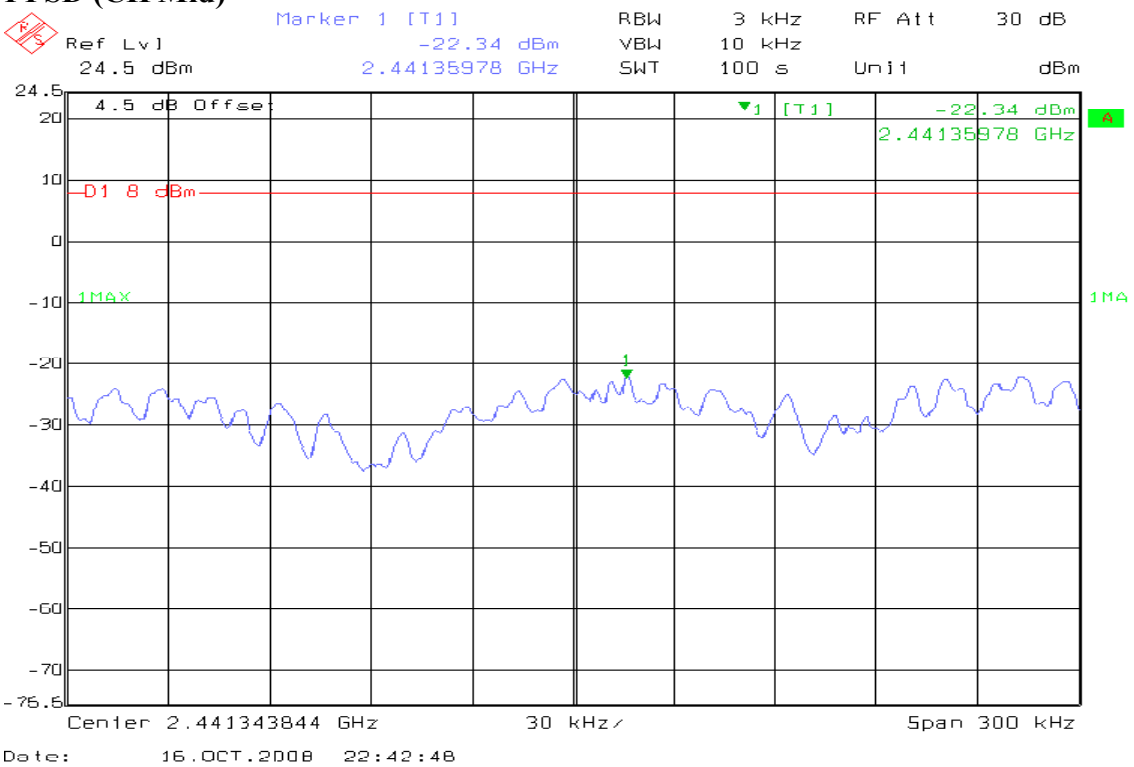


draft 802.11n 40 MHz Channel mode / Chian 0

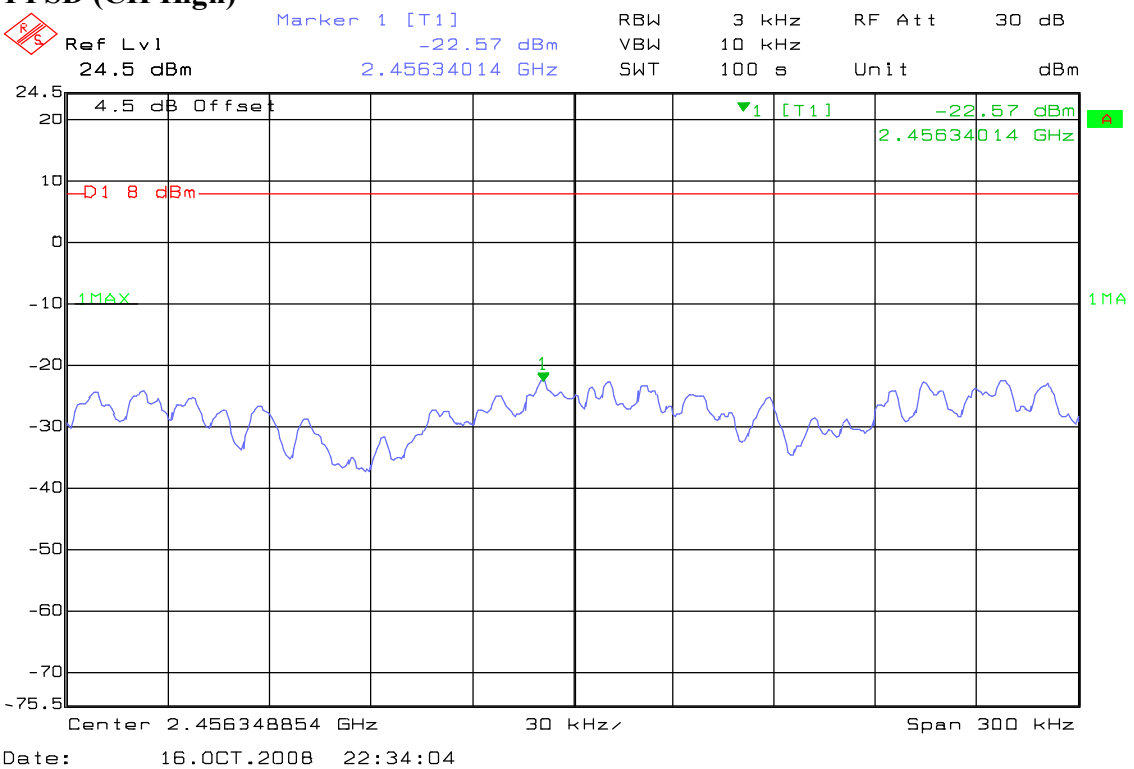
PPSD (CH Low)



PPSD (CH Mid)

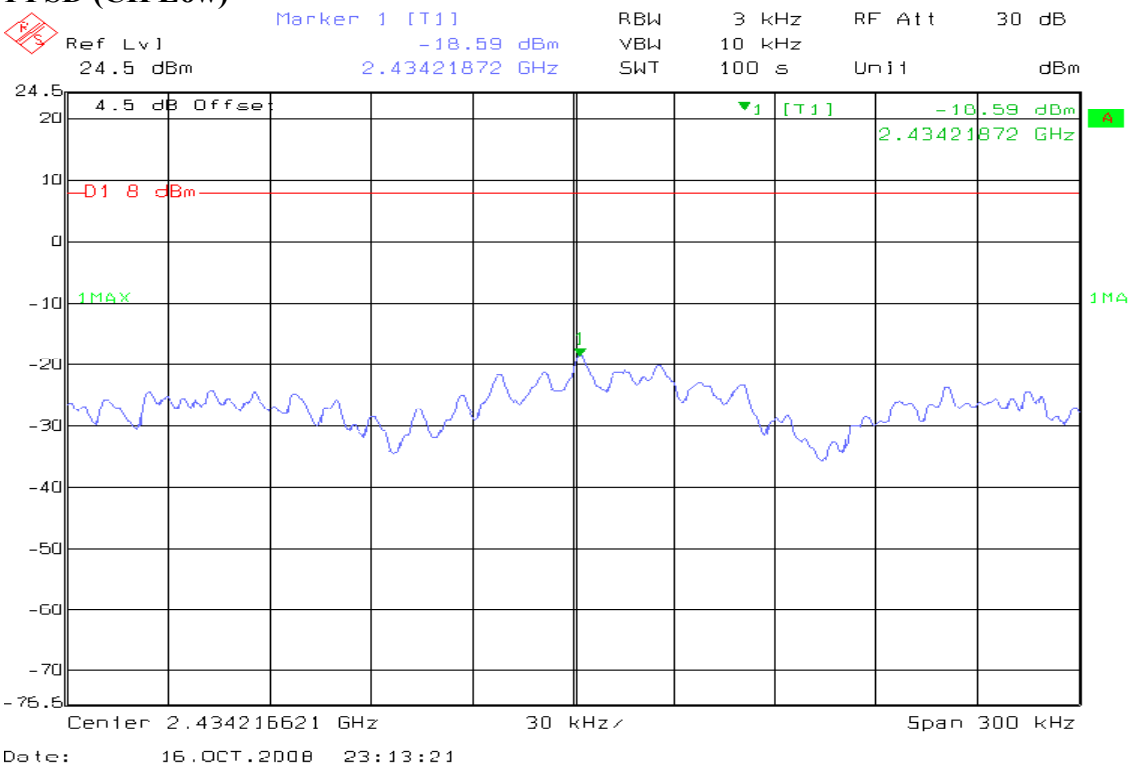


PPSD (CH High)

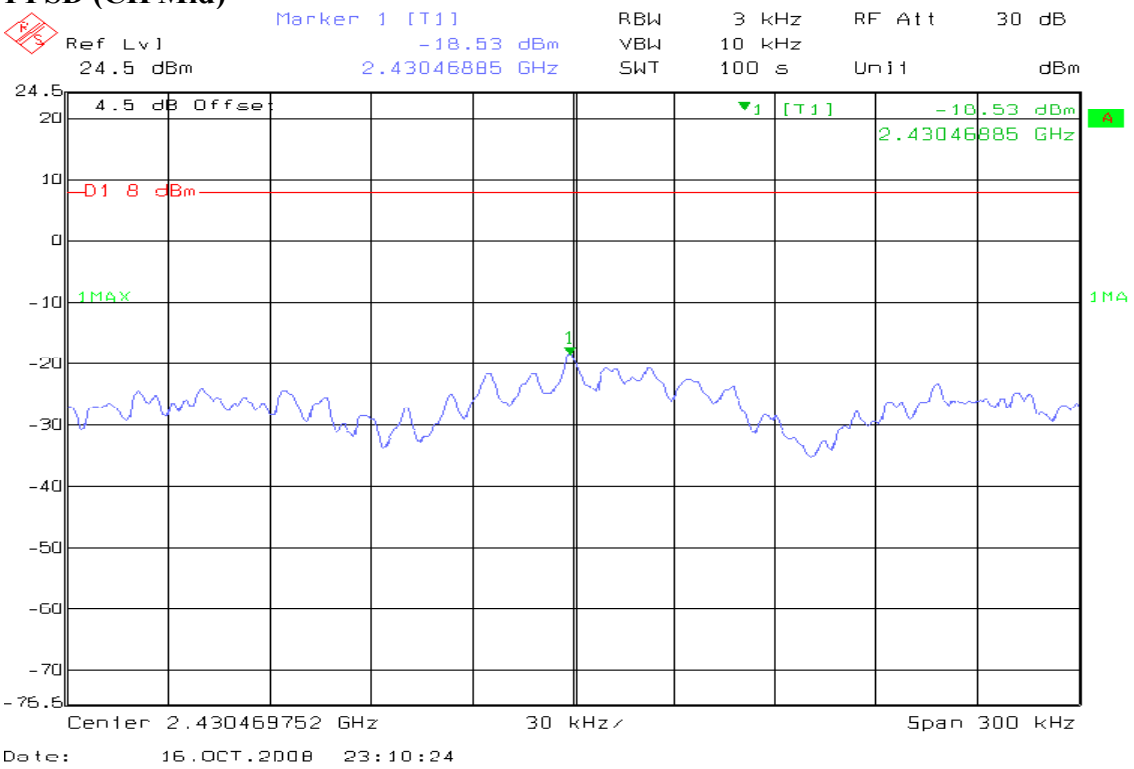


draft 802.11n 40 MHz Channel mode / Chain 1

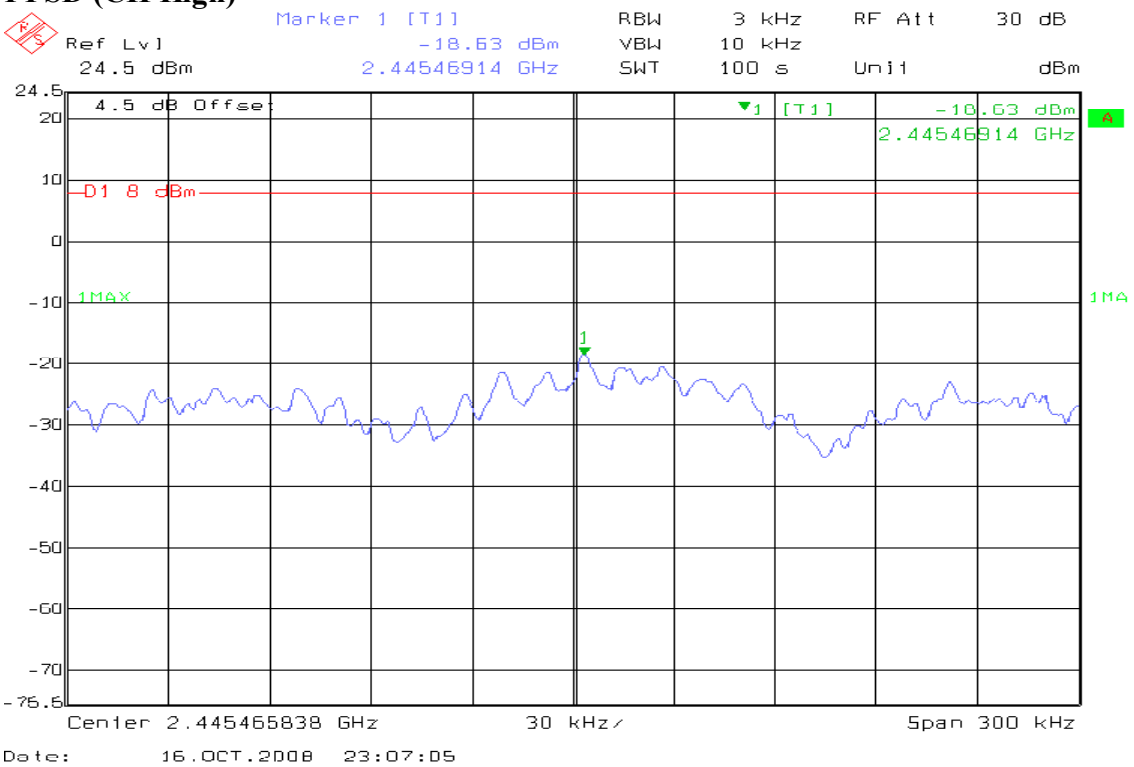
PPSD (CH Low)



PPSD (CH Mid)

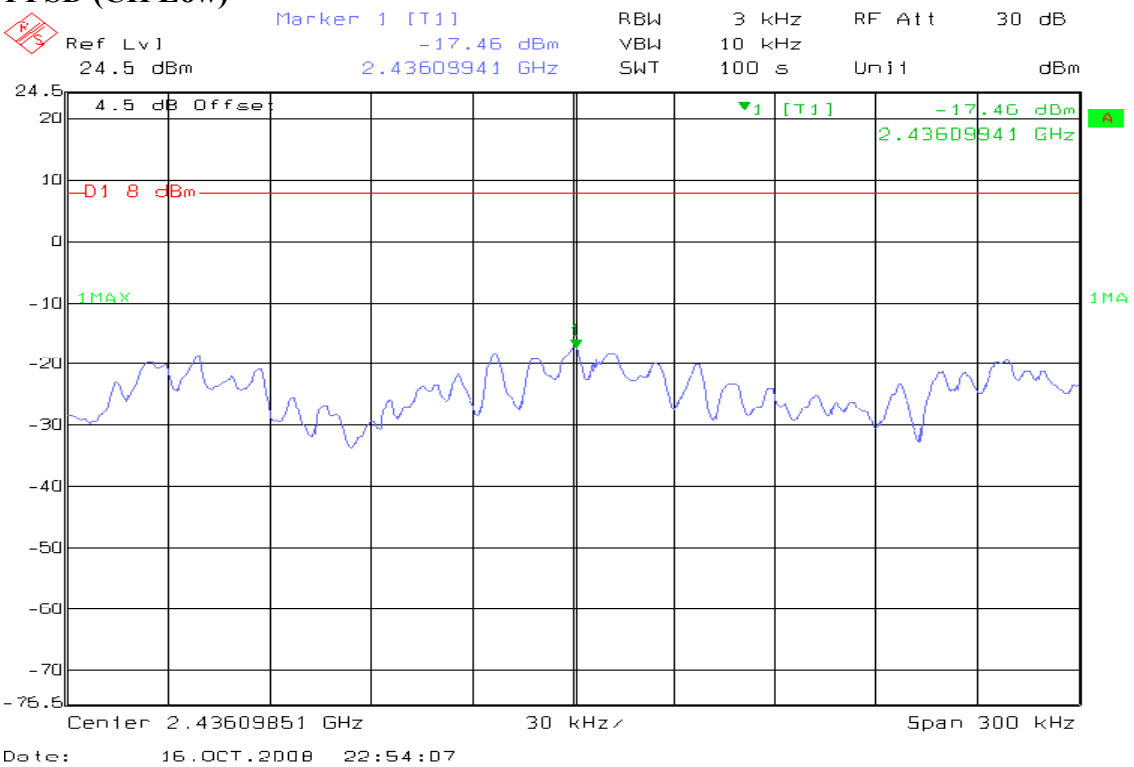


PPSD (CH High)

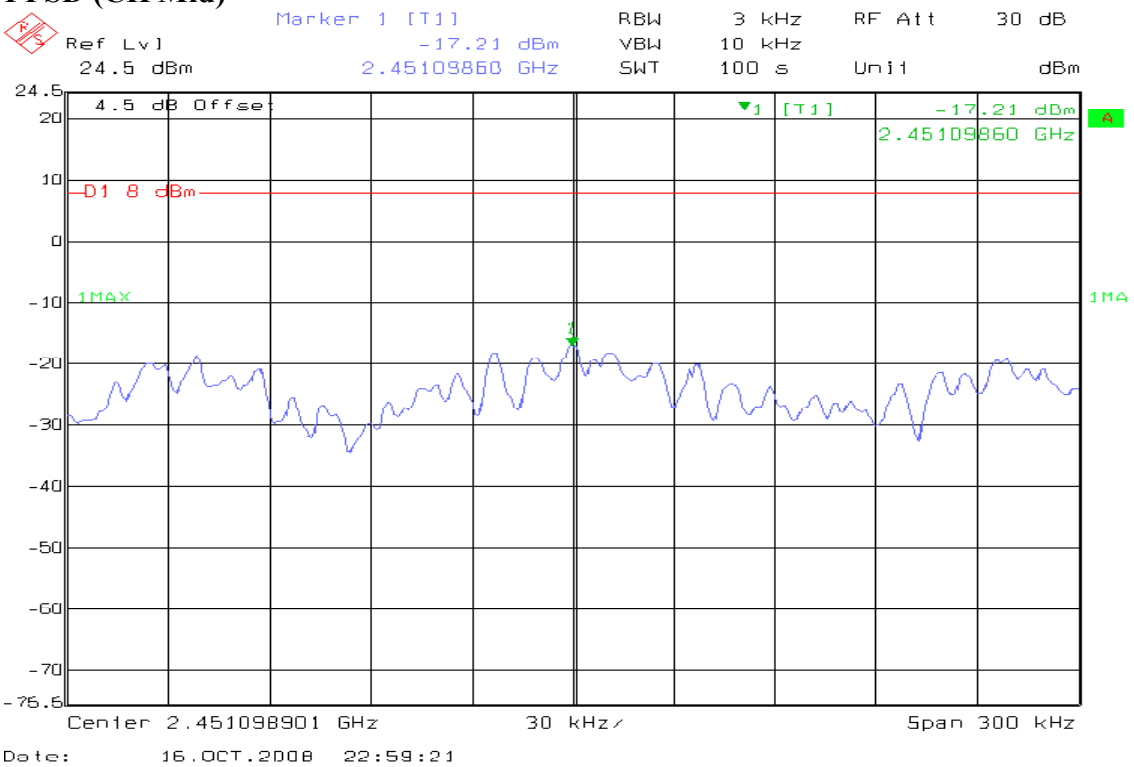


draft 802.11n 40 MHz Channel mode / Combiner

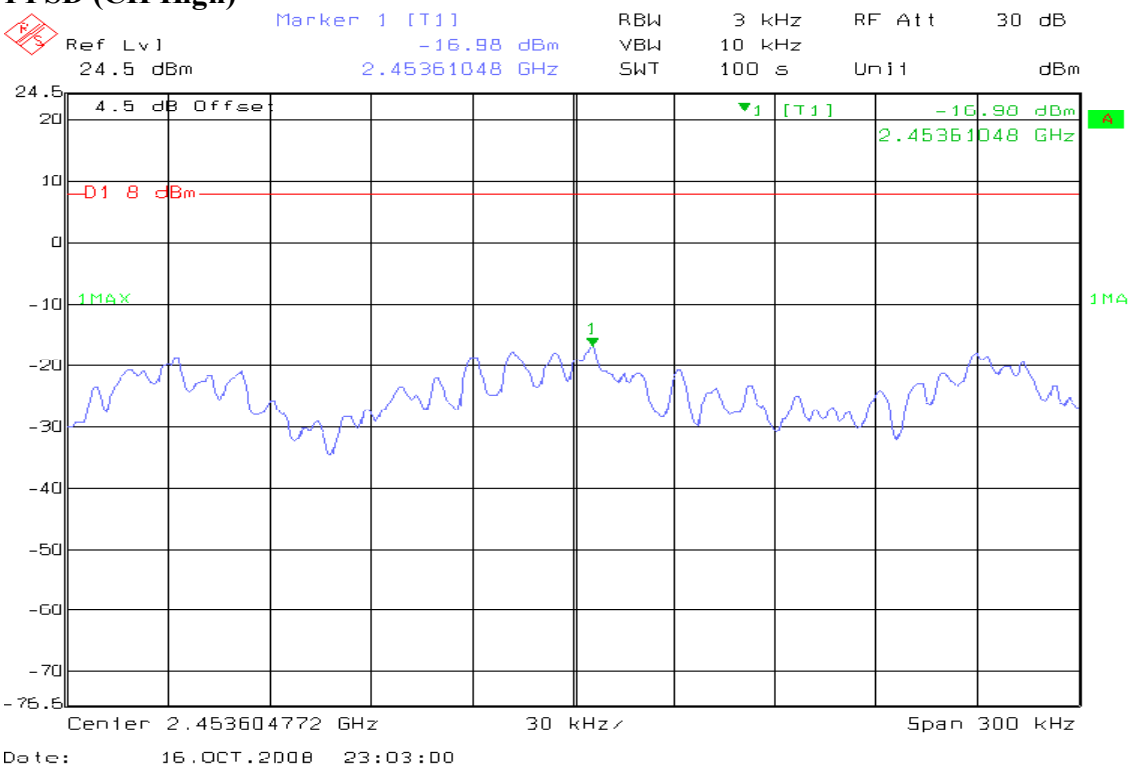
PPSD (CH Low)



PPSD (CH Mid)



PPSD (CH High)



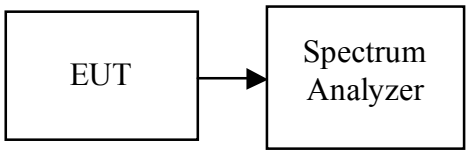
6.6 SPURIOUS EMISSIONS

6.6.1 CONDUCTED MEASUREMENT

LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 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.

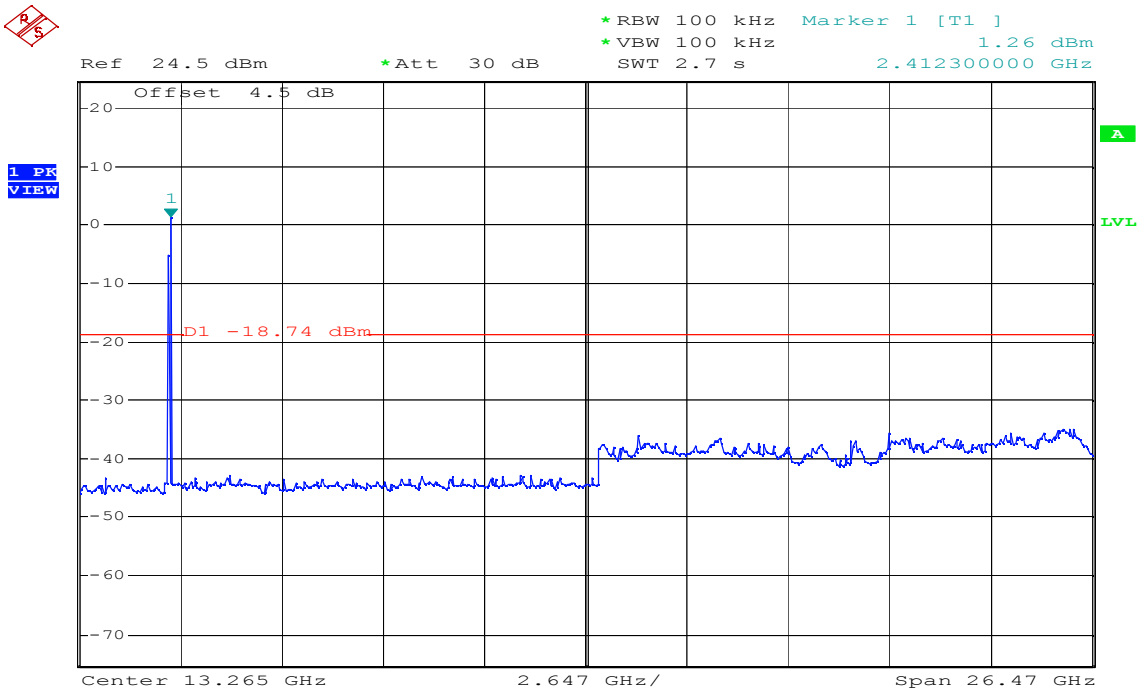
TEST RESULTS

No non-compliance noted

TEST PLOT

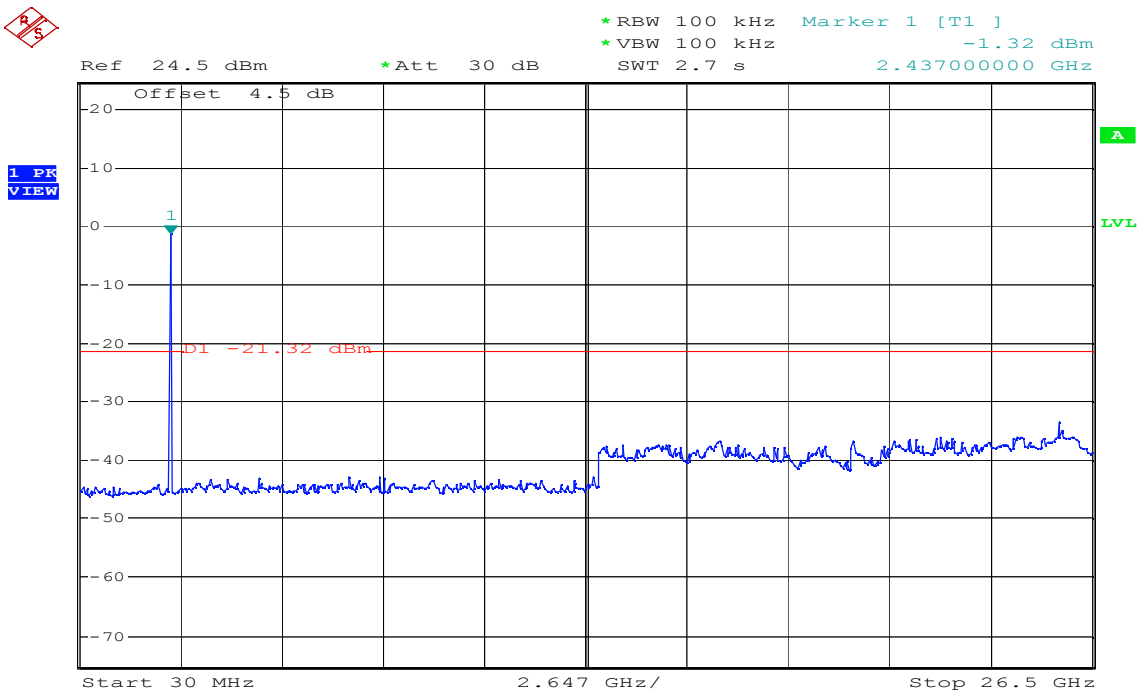
IEEE 802.11b mode

CH Low



Date: 23.OCT.2008 11:07:27

CH Mid



Date: 23.OCT.2008 11:16:45

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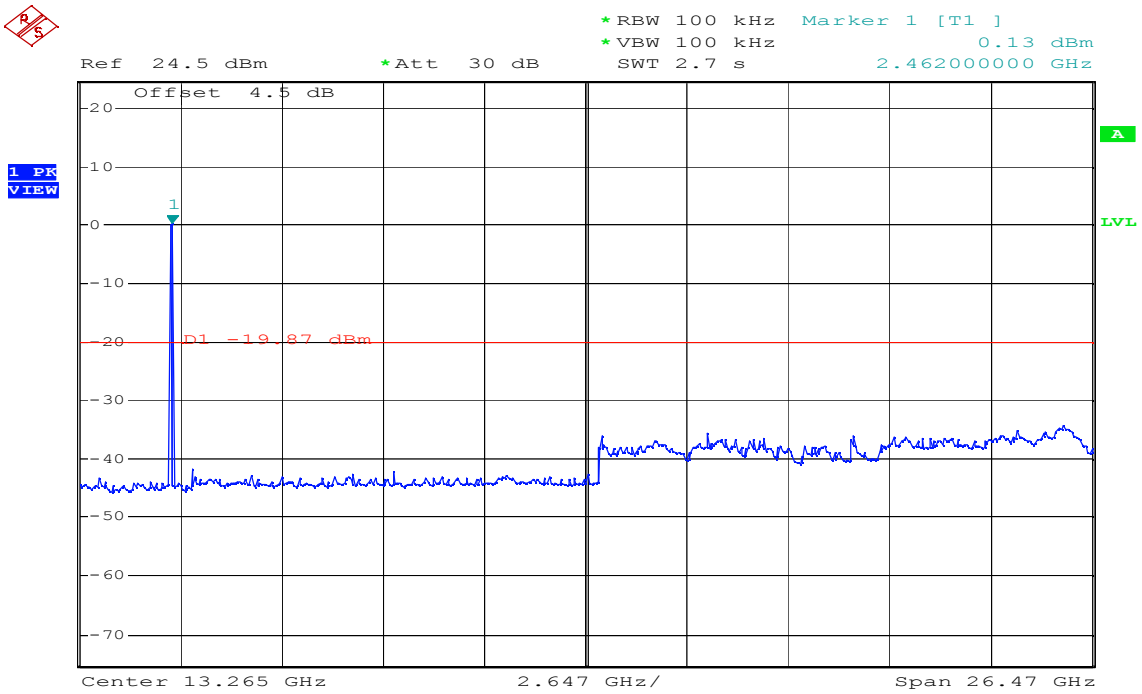
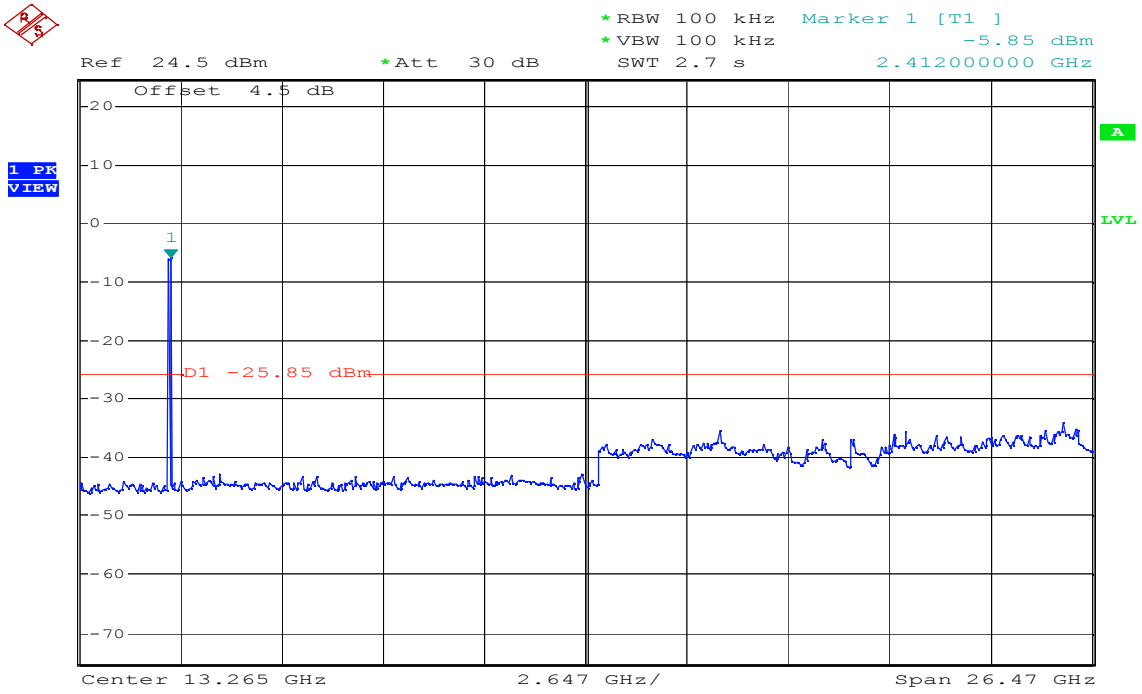


Date: 23.OCT.2008 12:49:25

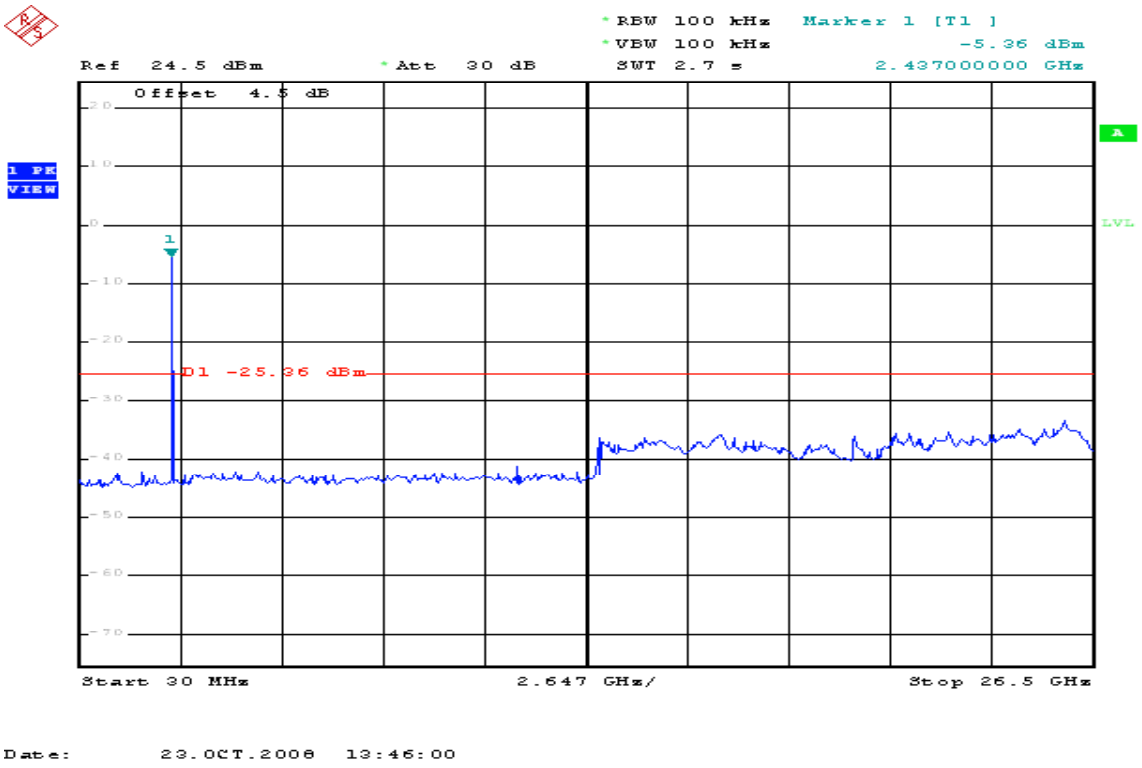
IEEE 802.11g mode

CH Low



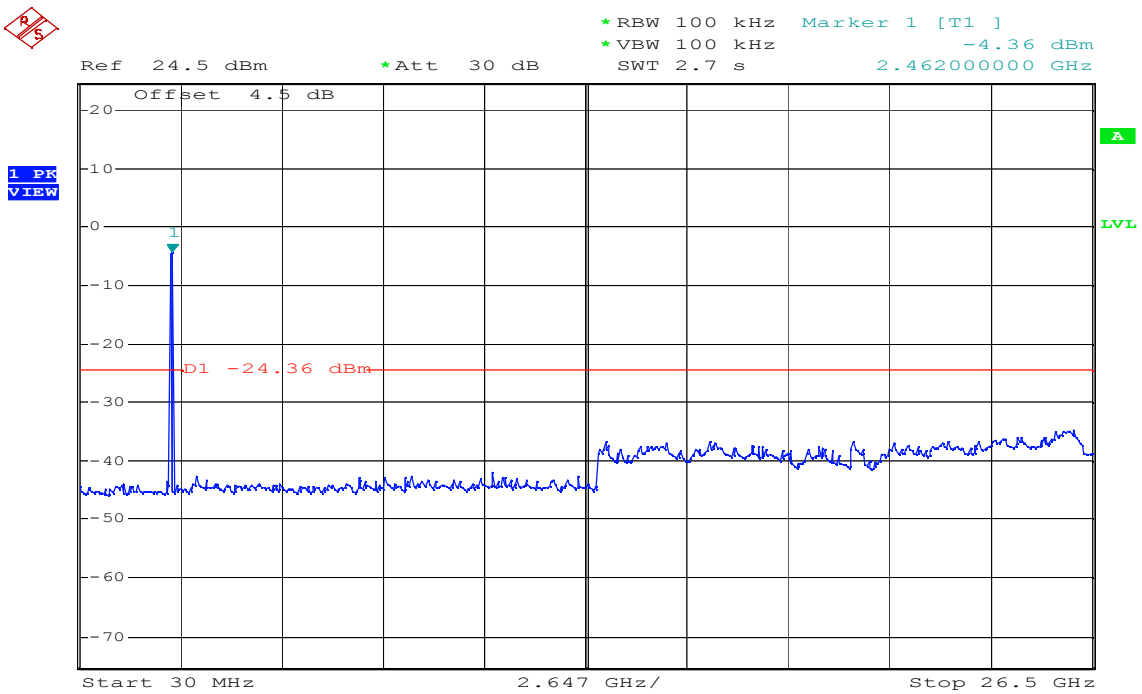
Date: 23.OCT.2008 13:20:35

CH Mid



Date: 23.OCT.2008 13:46:00

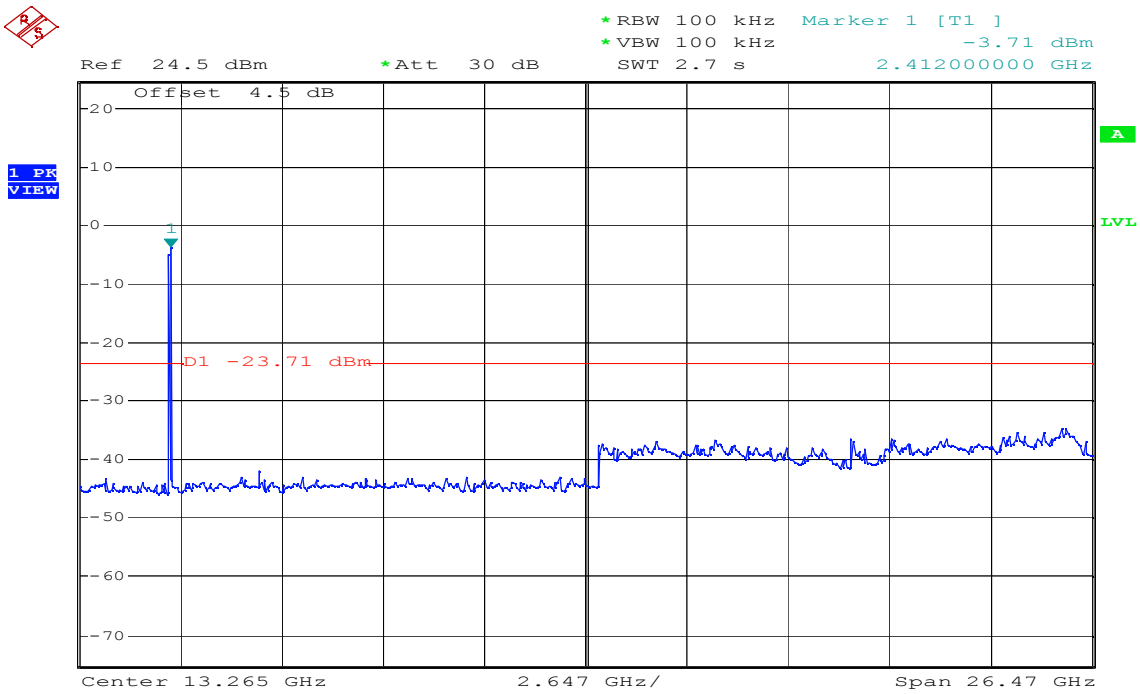
CH High



Date: 23.OCT.2008 13:29:15

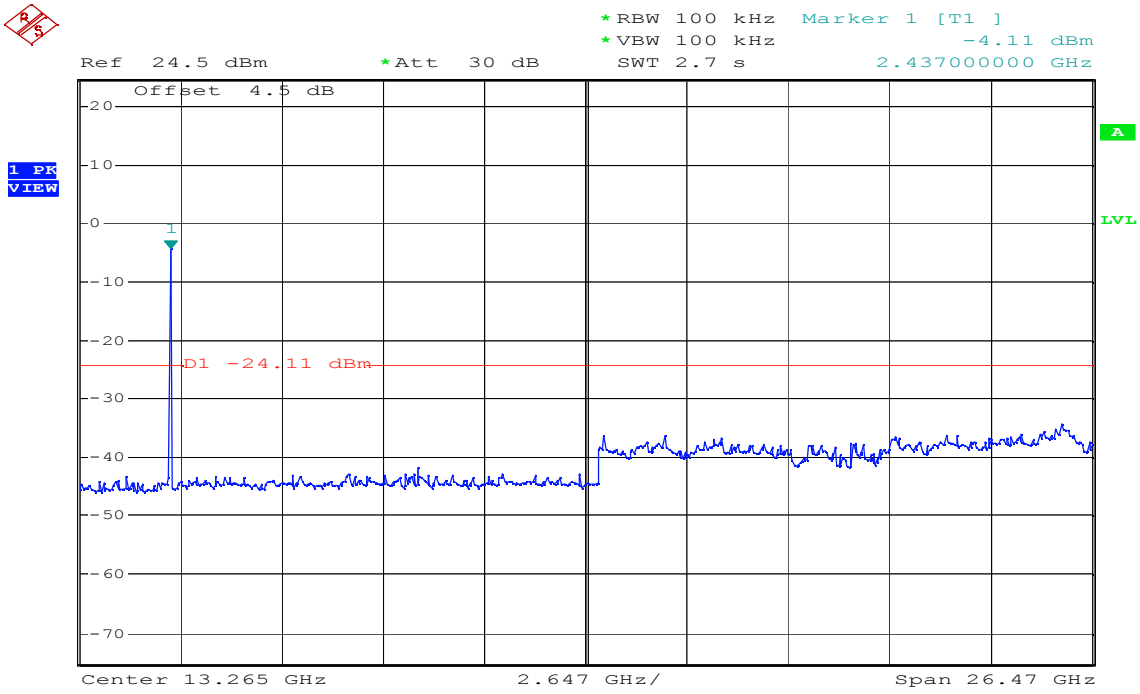
draft 802.11n 20 MHz Channel mode / Chain 0

CH Low



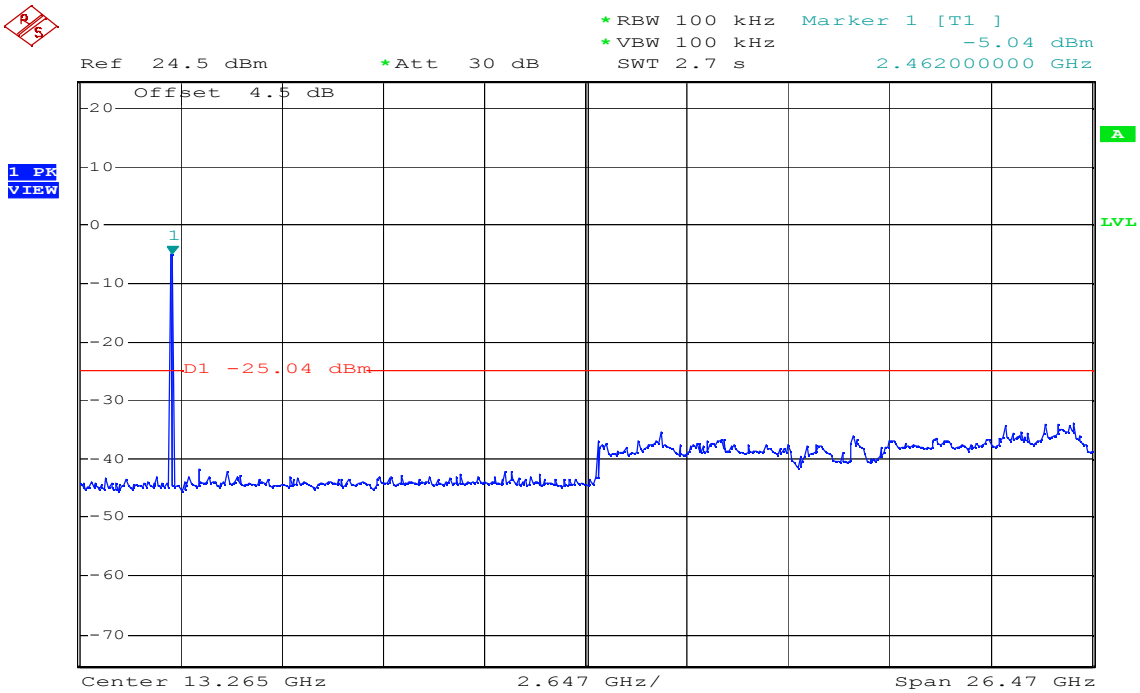
Date: 23.OCT.2008 13:50:04

CH Mid



Date: 23.OCT.2008 13:54:37

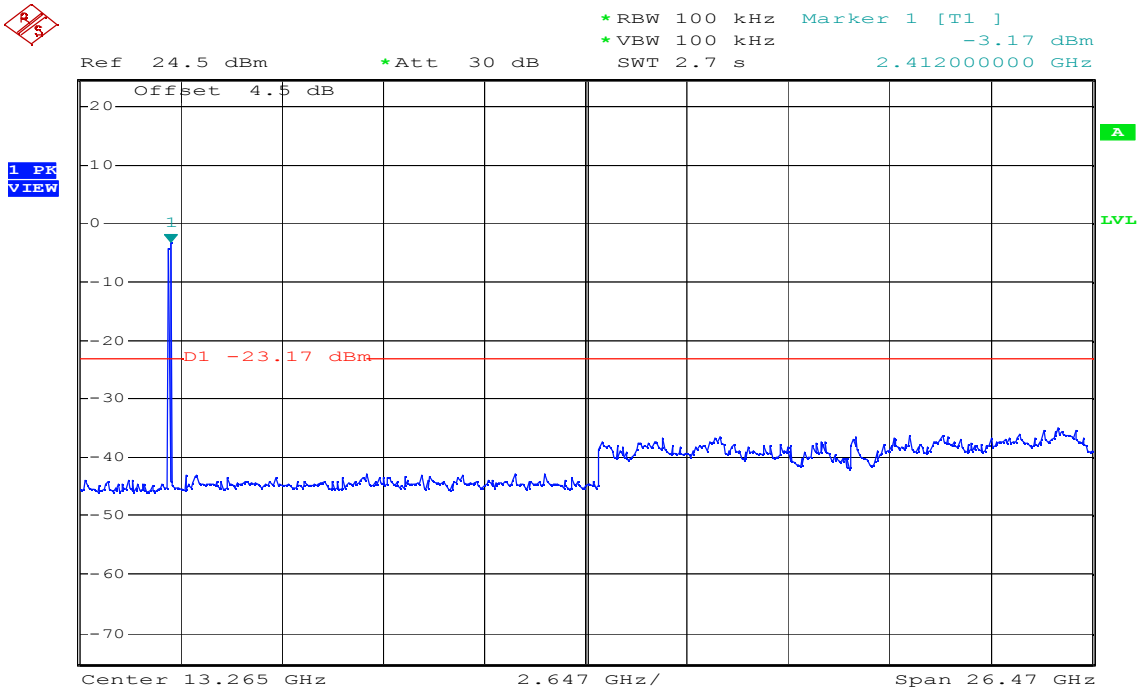
CH High



Date: 23.OCT.2008 13:57:56

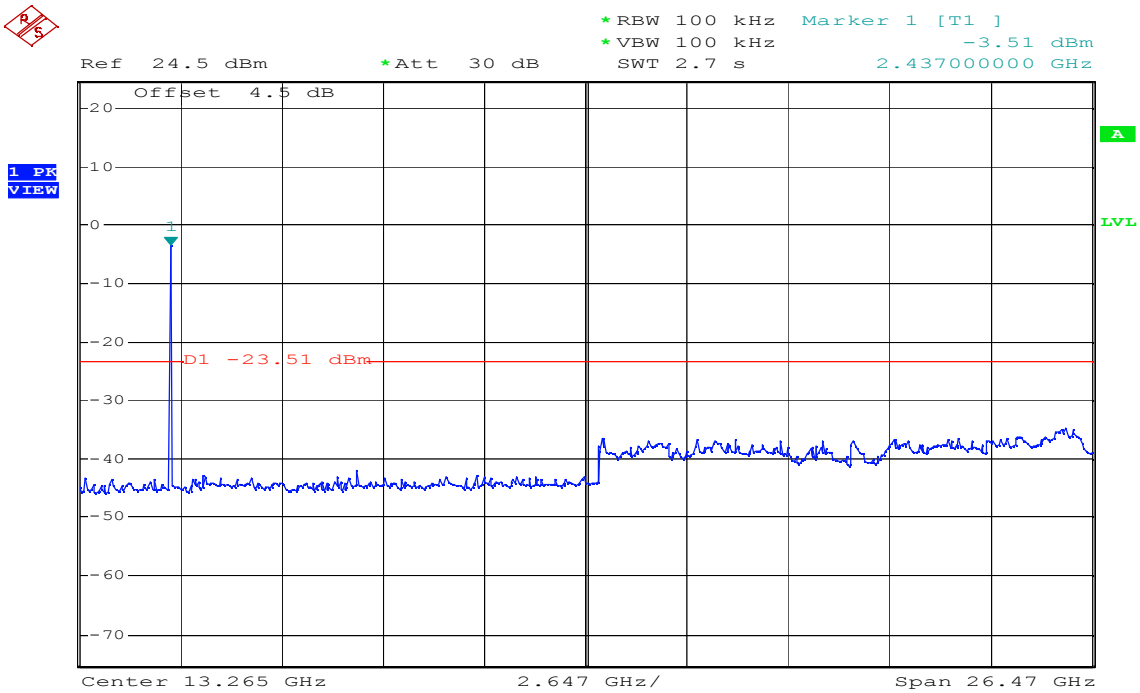
draft 802.11n 20 MHz Channel mode / Chain 1

CH Low



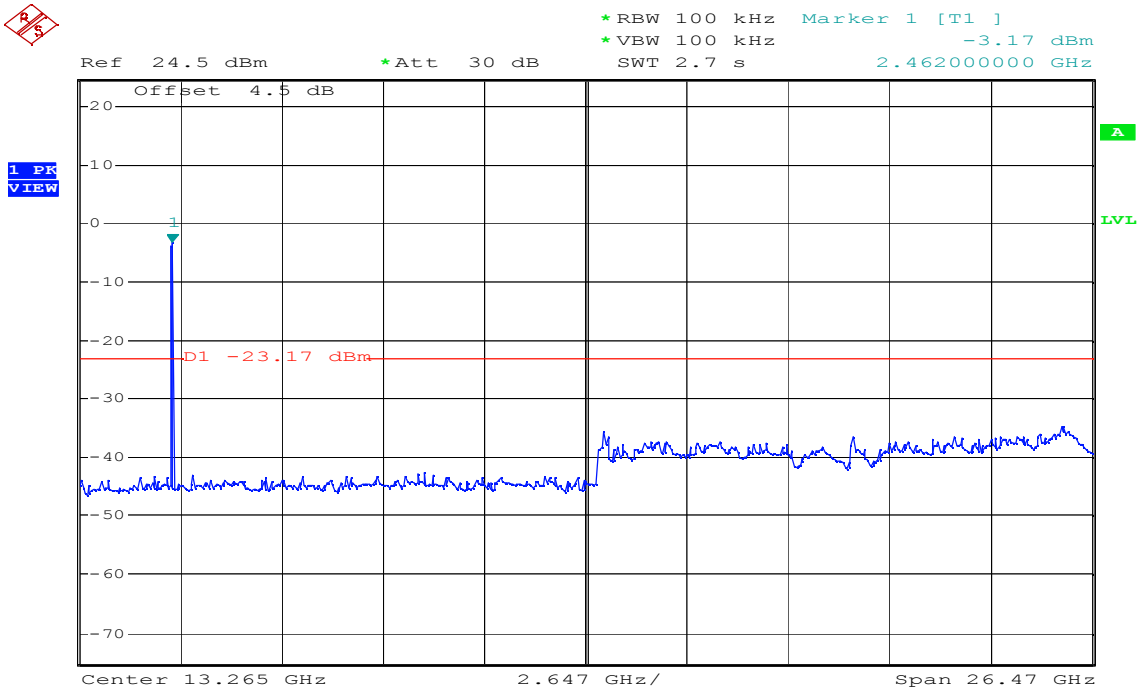
Date: 23.OCT.2008 14:07:14

CH Mid



Date: 23.OCT.2008 14:04:46

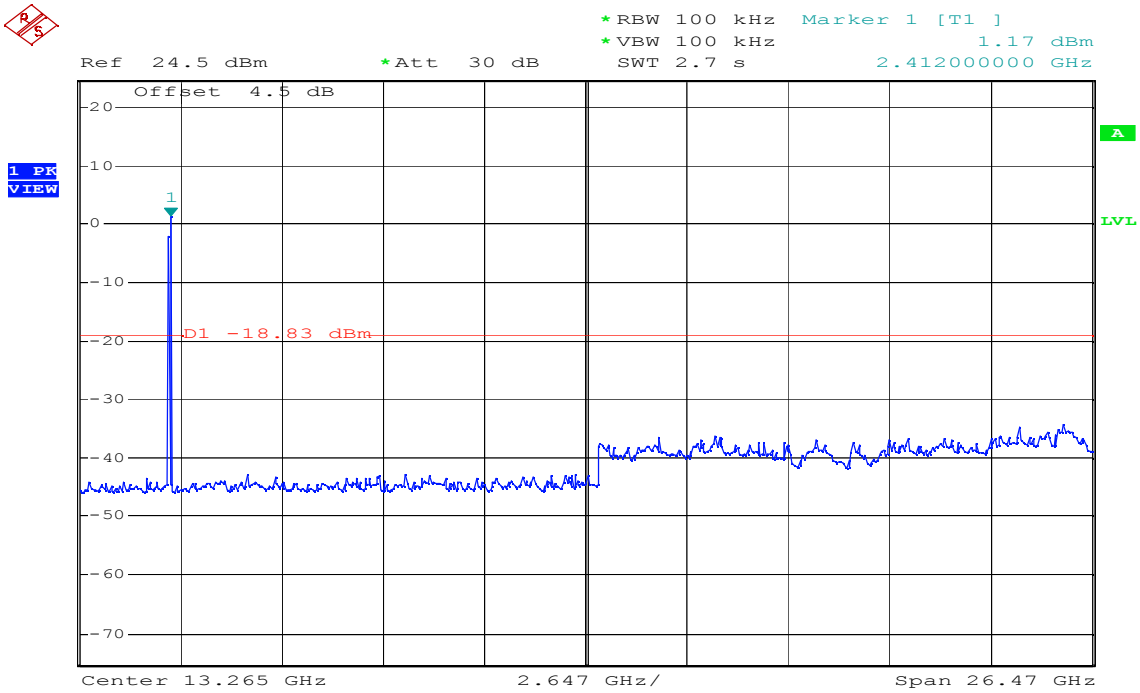
CH High



Date: 23.OCT.2008 14:01:43

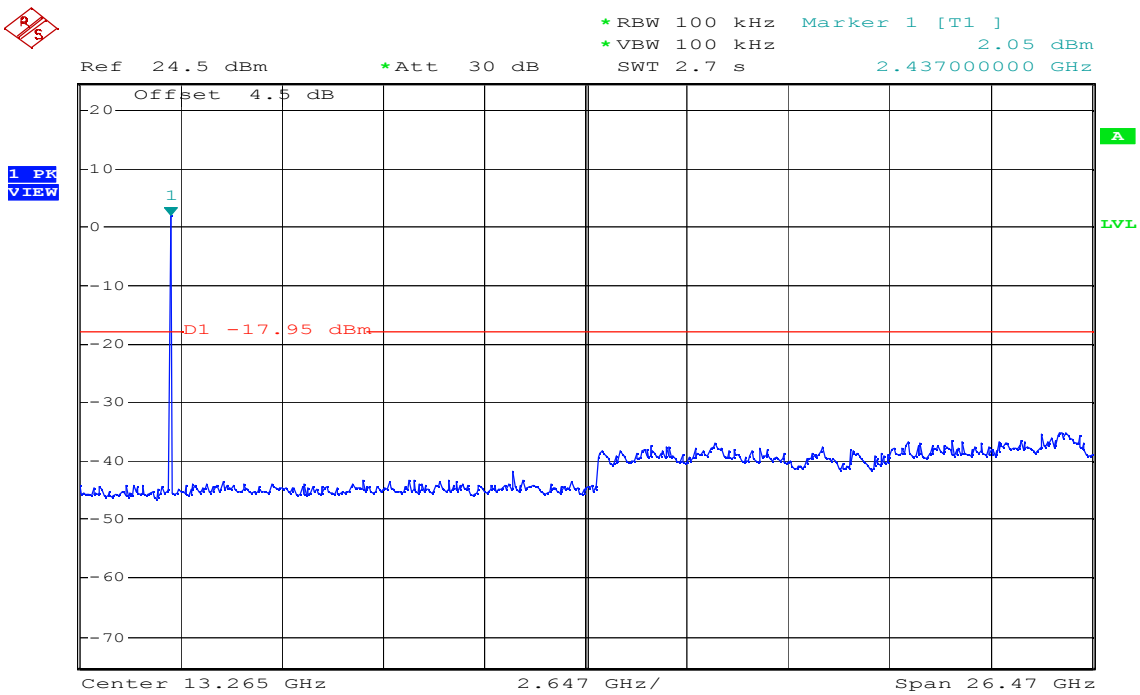
draft 802.11n 20 MHz Channel mode / Combiner

CH Low



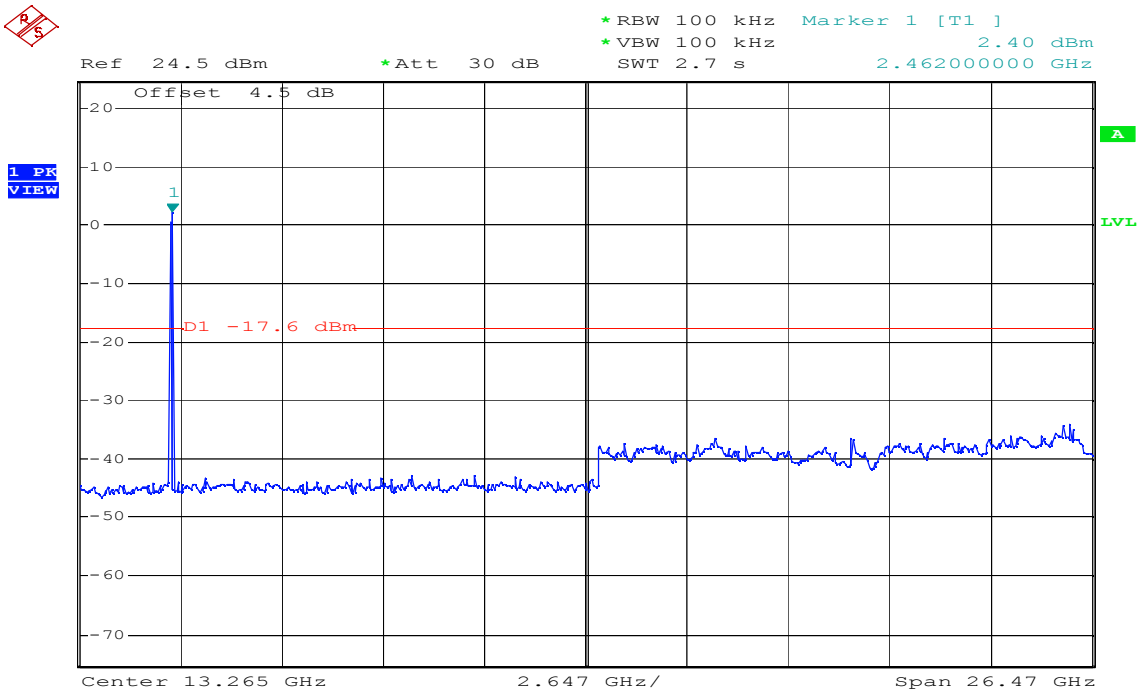
Date: 23.OCT.2008 14:10:39

CH Mid



Date: 23.OCT.2008 14:13:36

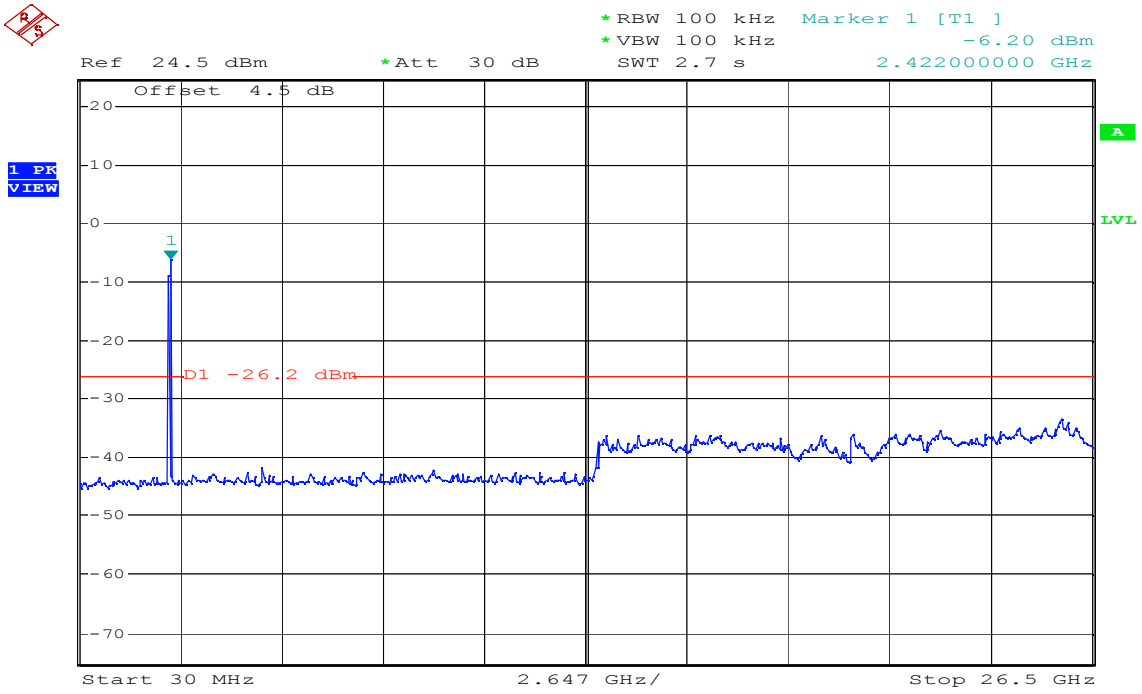
CH High



Date: 23.OCT.2008 14:15:41

draft 802.11n 40 MHz Channel mode / Chain 0

CH Low



Date: 23.OCT.2008 15:08:45

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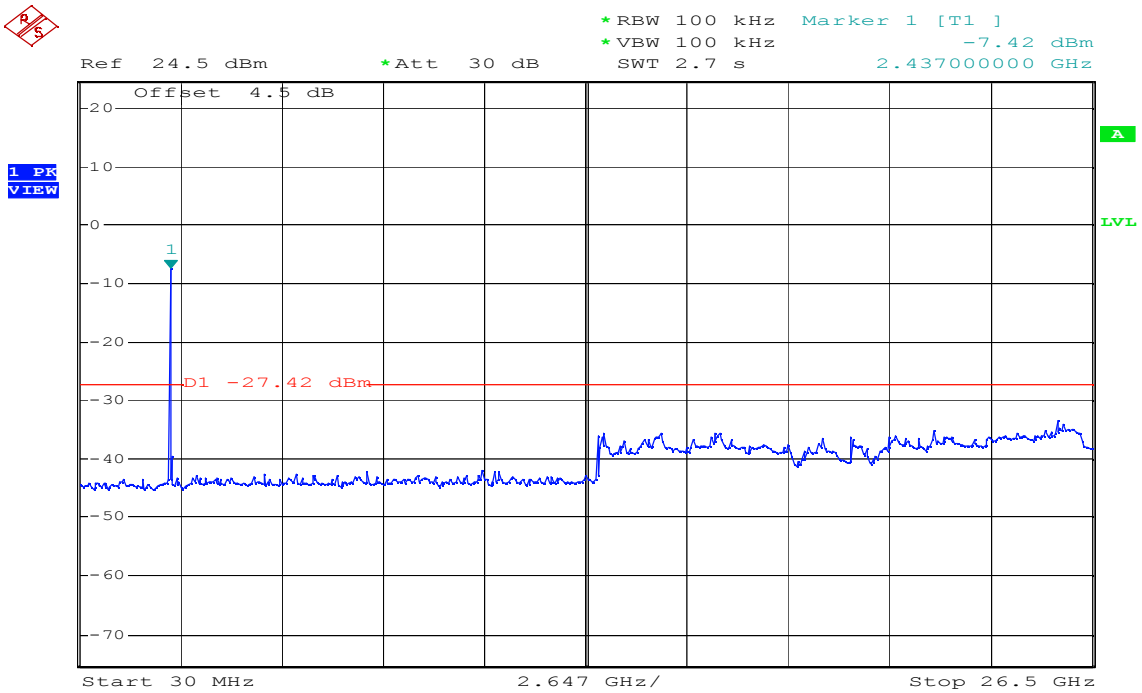

Date: 23.OCT.2008 15:05:03

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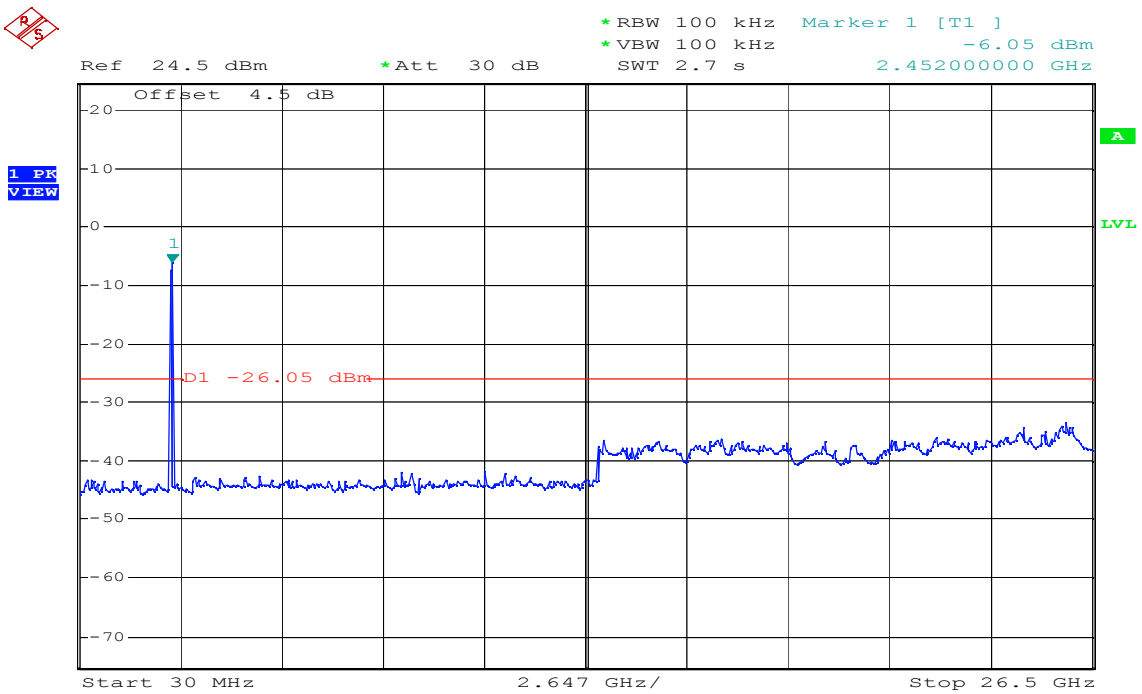
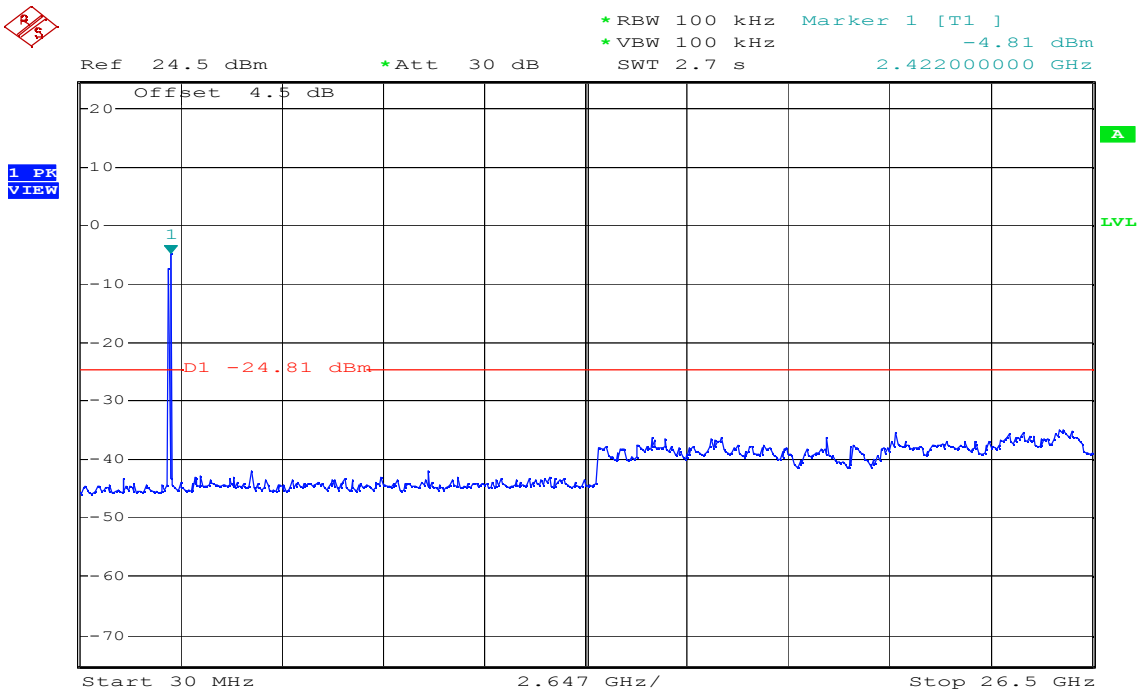


Date: 23.OCT.2008 15:00:41

draft 802.11n 40 MHz Channel mode / Chain 1

CH Low



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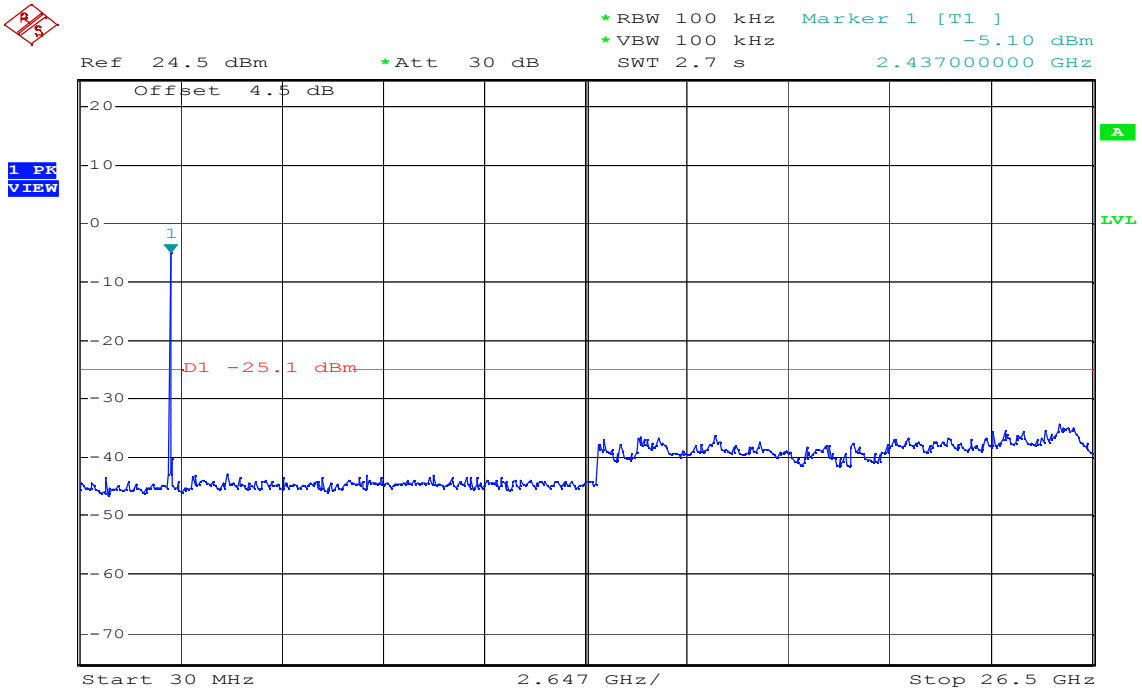
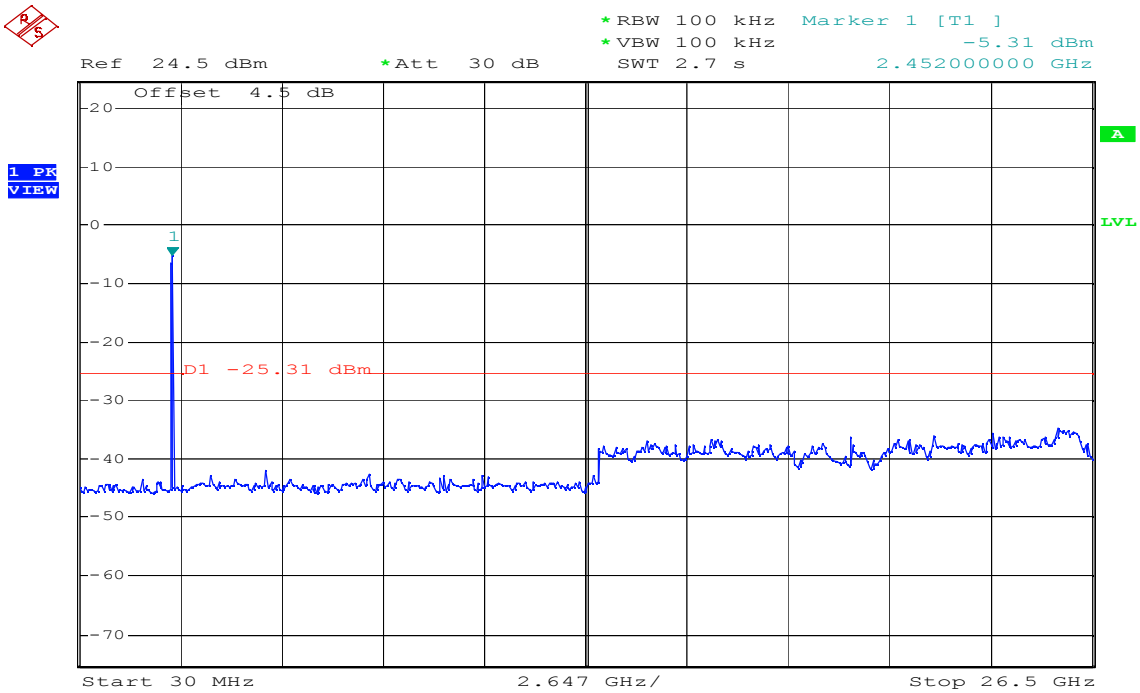
CH Mid



Date: 23.OCT.2008 14:52:38

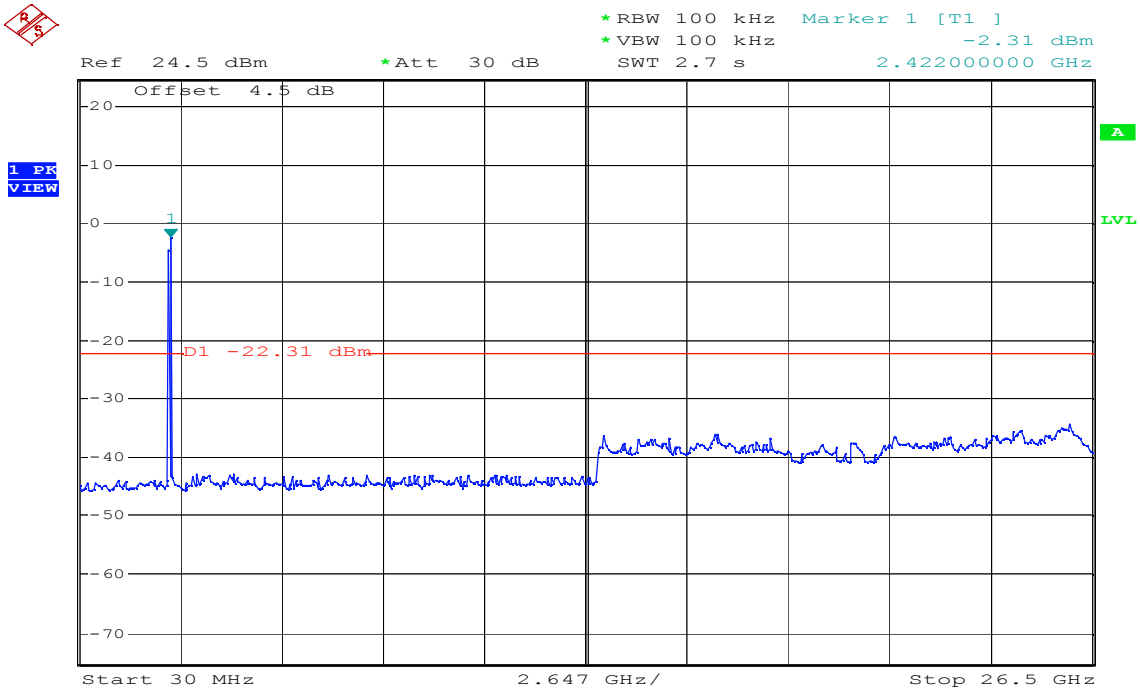
CH High



Date: 23.OCT.2008 14:57:15

draft 802.11n 40 MHz Channel mode / Combiner

CH Low



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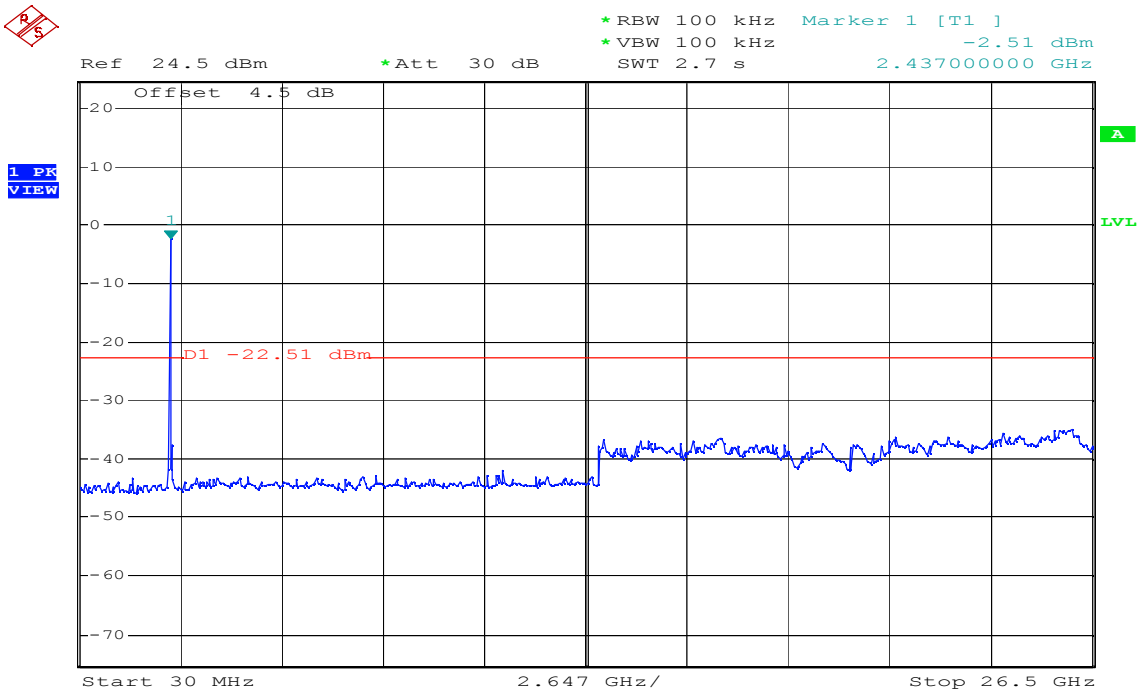
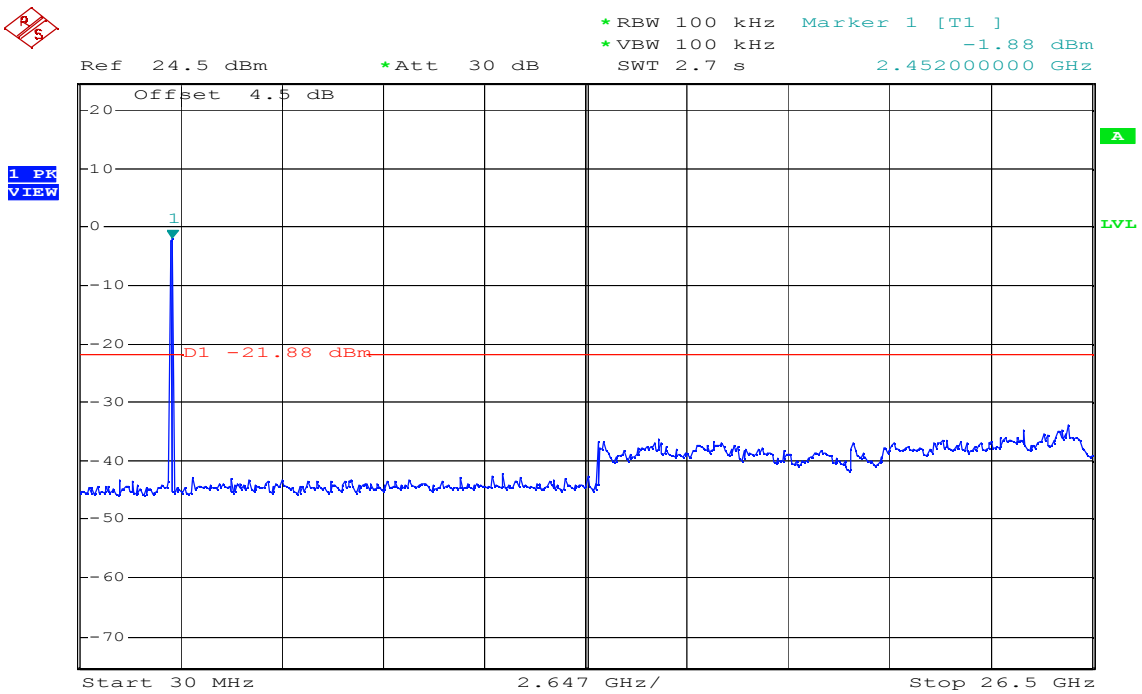
CH Mid



Date: 23.OCT.2008 14:21:21

CH High



Date: 23.OCT.2008 14:18:45

6.7 RADIATED EMISSIONS

LIMIT

1. According to §15.209(), 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

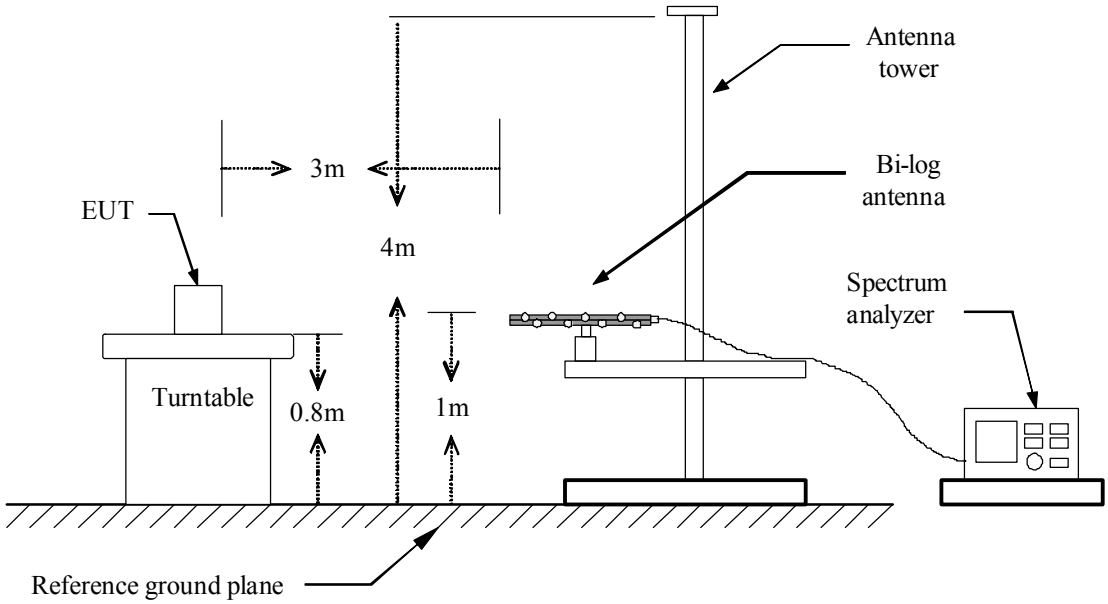
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

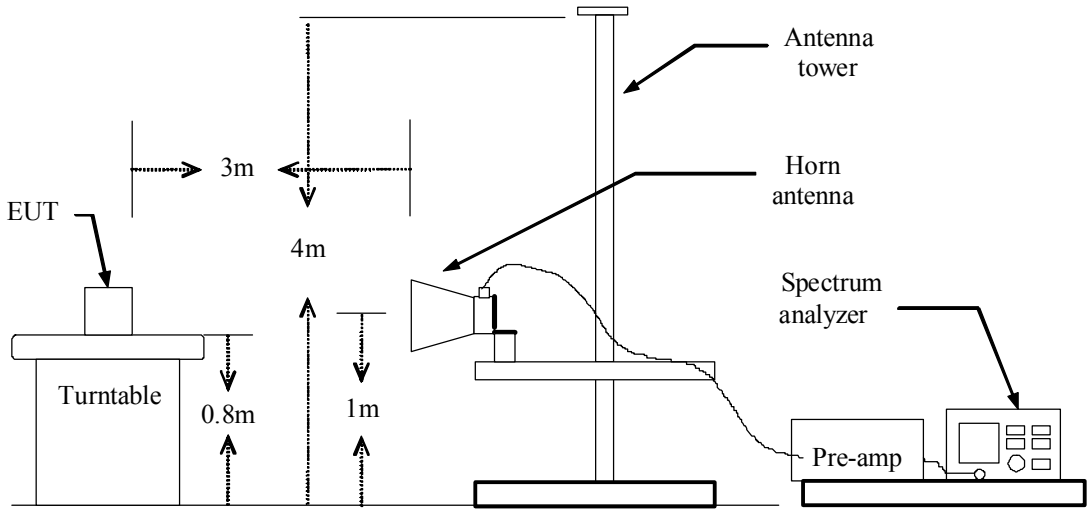
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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

Below 1GHz

Operation Mode: Normal Link **Test Date:** October 18, 2008

Temperature: 26°C **Tested by:** Stan Lin

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
79.8857	V	52.52	-18.04	34.48	40.00	-5.52	Peak
133.3400	V	53.10	-13.55	39.55	43.50	-3.95	QP
225.3857	V	47.98	-14.46	33.52	46.00	-12.48	Peak
480.3571	V	49.74	-8.53	41.21	46.00	-4.79	Peak
639.7143	V	44.95	-5.14	39.81	46.00	-6.19	Peak
800.0100	V	45.65	-1.76	43.89	46.00	-2.11	QP
133.9286	H	54.22	-13.51	40.71	43.50	-2.79	Peak
266.7000	H	46.20	-12.80	33.40	46.00	-12.60	QP
319.6200	H	55.10	-11.28	43.82	46.00	-2.18	QP
480.0300	H	52.62	-8.53	44.09	46.00	-1.91	QP
639.7143	H	49.45	-5.14	44.31	46.00	-1.69	Peak
799.1600	H	45.71	-1.79	43.92	46.00	-2.08	QP

Remark:

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

Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low **Test Date:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1066.67	V	49.68	---	-10.39	39.29	---	74.00	54.00	-14.71	Peak
1996.67	V	49.13	---	-5.55	43.58	---	74.00	54.00	-10.42	Peak
2783.33	V	48.69	---	-3.10	45.59	---	74.00	54.00	-8.41	Peak
6433.33	V	46.85	---	4.34	51.20	---	74.00	54.00	-2.80	Peak
N/A										
1466.67	H	49.34	---	-8.54	40.80	---	74.00	54.00	-13.20	Peak
1896.67	H	49.02	---	-6.12	42.90	---	74.00	54.00	-11.10	Peak
3216.67	H	44.18	---	-1.46	42.72	---	74.00	54.00	-11.28	Peak
6433.33	H	44.77	---	4.34	49.11	---	74.00	54.00	-4.89	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:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1466.67	V	49.25	---	-8.54	40.70	---	74.00	54.00	-13.30	Peak
6500.00	V	47.02	---	4.36	51.38	---	74.00	54.00	-2.62	Peak
N/A										
1466.67	H	49.51	---	-8.54	40.97	---	74.00	54.00	-13.03	Peak
3275.00	H	44.00	---	-1.29	42.70	---	74.00	54.00	-11.30	Peak
6500.00	H	43.33	---	4.36	47.69	---	74.00	54.00	-6.31	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:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1466.67	V	49.89	---	-8.54	41.35	---	74.00	54.00	-12.65	Peak
6566.67	V	42.79	---	4.55	47.34	---	74.00	54.00	-6.66	Peak
N/A										
1333.33	H	49.15	---	-9.16	39.99	---	74.00	54.00	-14.01	Peak
3283.33	H	43.88	---	-1.27	42.61	---	74.00	54.00	-11.39	Peak
6566.67	H	43.49	---	4.55	48.04	---	74.00	54.00	-5.96	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:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1060.00	V	51.48	---	-10.42	41.06	---	74.00	54.00	-12.94	Peak
3250.00	V	43.31	---	-1.36	41.94	---	74.00	54.00	-12.06	Peak
6025.00	V	41.17	---	4.25	45.42	---	74.00	54.00	-8.58	Peak
6433.33	V	41.86	---	4.34	46.20	---	74.00	54.00	-7.80	Peak
N/A										
1323.33	H	52.21	---	-9.21	43.01	---	74.00	54.00	-10.99	Peak
1353.33	H	54.70	---	-9.07	45.63	---	74.00	54.00	-8.37	Peak
3216.67	H	44.86	---	-1.46	43.39	---	74.00	54.00	-10.61	Peak
6941.67	H	41.76	---	5.62	47.38	---	74.00	54.00	-6.62	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:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1700.00	V	48.88	---	-7.25	41.63	---	74.00	54.00	-12.37	Peak
2590.00	V	53.31	---	-3.99	49.33	---	74.00	54.00	-4.67	Peak
7250.00	V	40.04	---	6.46	46.50	---	74.00	54.00	-7.50	Peak
N/A										
1466.67	H	49.46	---	-8.54	40.92	---	74.00	54.00	-13.08	Peak
3250.00	H	44.57	---	-1.36	43.21	---	74.00	54.00	-10.79	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:** October 15, 2008

Temperature: 21°C **Tested by:** Alonso Lu

Humidity: 57 % 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
1366.67	V	52.42	---	-9.01	43.42	---	74.00	54.00	-10.58	Peak
6566.67	V	41.28	---	4.55	45.83	---	74.00	54.00	-8.17	Peak
N/A										
1383.33	H	49.64	---	-8.93	40.71	---	74.00	54.00	-13.29	Peak
3283.33	H	45.21	---	-1.27	43.94	---	74.00	54.00	-10.06	Peak
6233.33	H	41.25	---	4.30	45.54	---	74.00	54.00	-8.46	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 20 MHz Channel mode / CH Low	**Test Date:**	October 15, 2008
Temperature:	21°C	**Tested by:**	Alonso Lu
Humidity:	57 % 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
1066.67	V	49.92	---	-10.39	39.52	---	74.00	54.00	-14.48	Peak
3941.67	V	42.14	---	1.01	43.16	---	74.00	54.00	-10.84	Peak
6433.33	V	47.52	---	4.34	51.86	---	74.00	54.00	-2.14	Peak
N/A										
1466.67	H	49.34	---	-8.54	40.80	---	74.00	54.00	-13.20	Peak
3216.67	H	44.44	---	-1.46	42.98	---	74.00	54.00	-11.02	Peak
6433.33	H	45.03	---	4.34	49.38	---	74.00	54.00	-4.62	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 20 MHz Channel mode / CH Mid	**Test Date:**	October 15, 2008
Temperature:	21°C	**Tested by:**	Alonso Lu
Humidity:	57 % 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
1390.00	V	50.59	---	-8.90	41.69	---	74.00	54.00	-12.31	Peak
1646.67	V	49.98	---	-7.55	42.43	---	74.00	54.00	-11.57	Peak
6500.00	V	46.80	---	4.36	51.16	---	74.00	54.00	-2.84	Peak
N/A										
1466.67	H	50.15	---	-8.54	41.60	---	74.00	54.00	-12.40	Peak
3250.00	H	44.96	---	-1.36	43.59	---	74.00	54.00	-10.41	Peak
6500.00	H	44.91	---	4.36	49.27	---	74.00	54.00	-4.73	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 40 MHz Channel mode / CH Low	**Test Date:**	October 14, 2008
Temperature:	20°C	**Tested by:**	Alonso Lu
Humidity:	57 % 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
1426.67	V	57.36	---	-8.73	48.63	---	74.00	54.00	-5.37	Peak
6458.33	V	48.77	46.49	4.35	53.12	50.84	74.00	54.00	-3.16	AVG
N/A										
1393.33	H	51.35	---	-8.88	42.47	---	74.00	54.00	-11.53	Peak
3883.33	H	41.91	---	0.80	42.70	---	74.00	54.00	-11.30	Peak
6458.33	H	44.75	---	4.35	49.10	---	74.00	54.00	-4.90	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 40 MHz Channel mode / CH Mid	**Test Date:**	October 14, 2008
Temperature:	20°C	**Tested by:**	Alonso Lu
Humidity:	57 % 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
1746.67	V	52.36	---	-6.98	45.38	---	74.00	54.00	-8.62	Peak
3250.00	V	45.02	---	-1.36	43.65	---	74.00	54.00	-10.35	Peak
6500.00	V	49.80	47.44	4.36	54.16	51.80	74.00	54.00	-2.20	AVG
N/A										
1080.00	H	50.98	---	-10.33	40.65	---	74.00	54.00	-13.35	Peak
1393.33	H	50.59	---	-8.88	41.71	---	74.00	54.00	-12.29	Peak
3250.00	H	44.00	---	-1.36	42.63	---	74.00	54.00	-11.37	Peak
6500.00	H	45.21	---	4.36	49.57	---	74.00	54.00	-4.43	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 40 MHz Channel mode / CH High	**Test Date:**	October 14, 2008
Temperature:	20°C	**Tested by:**	Alonso Lu
Humidity:	57 % 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
1383.33	V	50.64	---	-8.93	41.71	---	74.00	54.00	-12.29	Peak
1993.33	V	50.14	---	-5.57	44.57	---	74.00	54.00	-9.43	Peak
4058.33	V	42.55	---	1.20	43.75	---	74.00	54.00	-10.25	Peak
6541.67	V	48.03	47.96	4.48	52.51	52.44	74.00	54.00	-1.56	AVG
7908.33	V	40.99	---	7.05	48.04	---	74.00	54.00	-5.96	Peak
N/A										
1380.00	H	49.89	---	-8.94	40.95	---	74.00	54.00	-13.05	Peak
3266.67	H	43.38	---	-1.32	42.07	---	74.00	54.00	-11.93	Peak
5375.00	H	41.46	---	3.13	44.59	---	74.00	54.00	-9.41	Peak
6541.67	H	44.49	---	4.48	48.97	---	74.00	54.00	-5.03	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).*

6.8 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 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

** Decreases with the logarithm of the frequency.*

TEST CONFIGURATION

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

TEST PROCEDURE

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

TEST RESULTS

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

TEST DATA

Operation Mode: Normal Link **Test Date:** October 9, 2008

Temperature: 25°C **Tested by:** Alonso Lu

Humidity: 57% RH

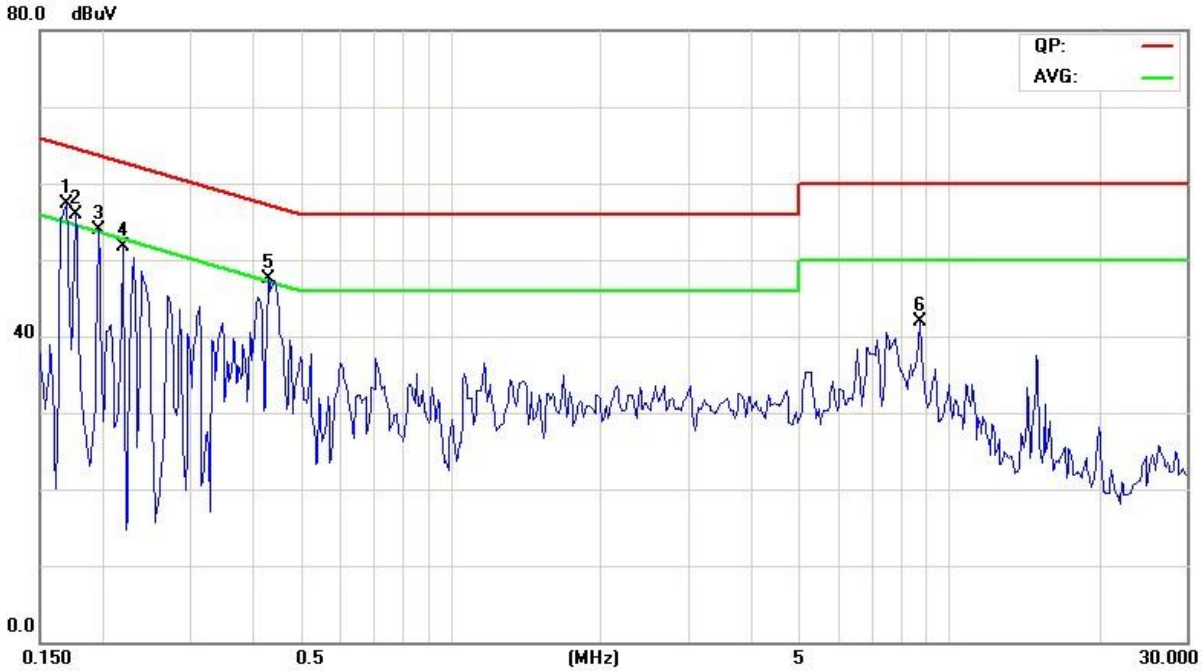
Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB/m)	QP Result (dBuV/m)	AV Result (dBuV/m)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1695	46.39	34.19	9.71	56.10	43.90	64.98	54.98	-8.88	-11.08	L1
0.1773	45.10	28.20	9.70	54.80	37.90	64.61	54.61	-9.81	-16.71	L1
0.1969	41.60	24.10	9.70	51.30	33.80	63.74	53.74	-12.44	-19.94	L1
0.2203	37.40	14.30	9.70	47.10	24.00	62.81	52.81	-15.71	-28.81	L1
0.4313	38.12	27.42	9.68	47.80	37.10	57.23	47.23	-9.43	-10.13	L1
8.7516	26.24	14.44	10.06	36.30	24.50	60.00	50.00	-23.70	-25.50	L1
0.1733	44.69	31.49	9.71	54.40	41.20	64.80	54.80	-10.40	-13.60	L2
0.1968	39.90	21.50	9.70	49.60	31.20	63.74	53.74	-14.14	-22.54	L2
0.2086	40.50	26.60	9.70	50.20	36.30	63.26	53.26	-13.06	-16.96	L2
0.2320	37.00	20.00	9.70	46.70	29.70	62.37	52.38	-15.67	-22.68	L2
0.4546	32.04	19.84	9.66	41.70	29.50	56.79	46.79	-15.09	-17.29	L2
6.8727	27.74	20.04	9.86	37.60	29.90	60.00	50.00	-22.40	-20.10	L2

Remark:

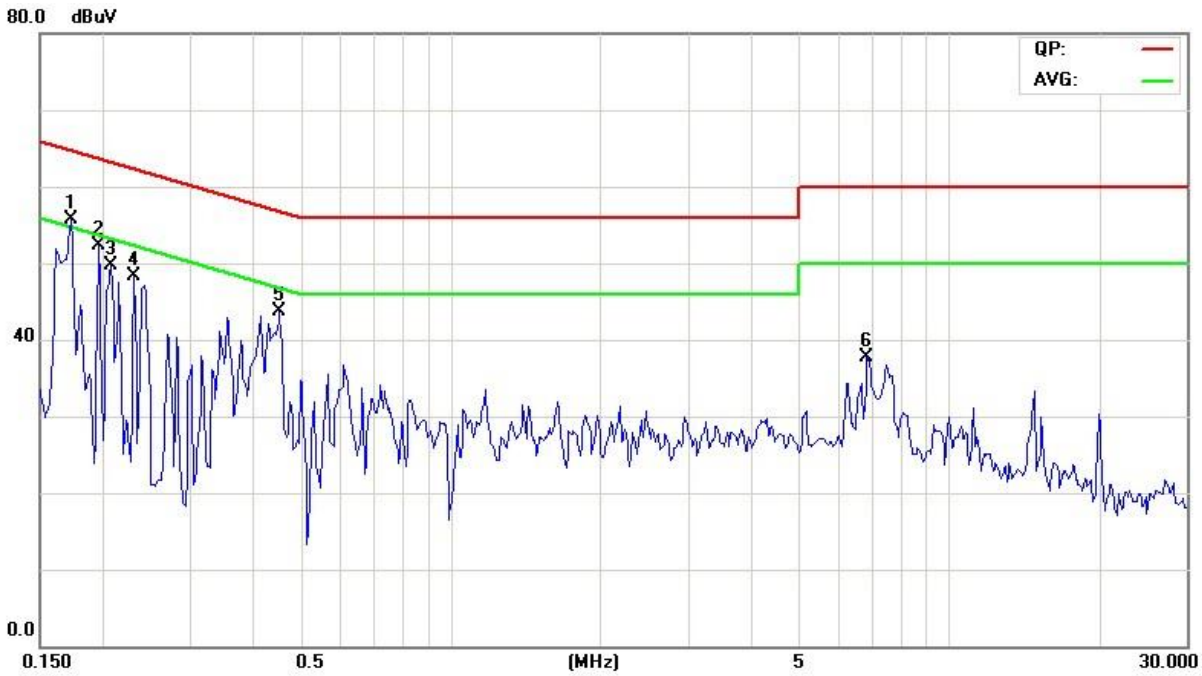
1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *The IF bandwidth of SPA between 0.15MHz and 30MHz was 10 kHz; the IF bandwidth of Test Receiver between 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)



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 11n ROUTER
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 18.20 dBm (66.10 mW) IEEE 802.11g mode: 15.44 dBm (35.00 mW) draft 802.11n 20 MHz Channel mode: 18.39 dBm (69.02mW) draft 802.11n 40 MHz Channel mode: 18.32 dBm (67.90mW)
Antenna gain (Max)	2.09dBi (including cable loss) (Numeric gain: 1.62)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Remark:

1. *The maximum output power is 18.32dBm (67.90mW) at 2452MHz (with 1.62 numeric 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.

MPE evaluation

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:

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

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

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

Where d = *Distance in cm*
P = *Power in mW*
G = *Numeric antenna gain*
S = *Power density in* mW / cm^2

Maximum Permissible Exposure

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 / cm^2

IEEE 802.11b Mode:

EUT output power = 66.10mW

Numeric Antenna gain = 1.62

→ Power density = 0.0213 mW / cm^2

IEEE 802.11g Mode:

EUT output power = 35.00mW

Numeric Antenna gain = 1.62

→ Power density = 0.0113 mW / cm^2

draft 802.11n 20 MHz Channel Mode::

EUT output power = 69.02mW

Numeric Antenna gain = 1.62

→ Power density = 0.0222 mW / cm^2

draft 802.11n 40 MHz Channel Mode::

EUT output power = 67.90mW

Numeric Antenna gain = 1.62

→ Power density = 0.0219 mW / cm^2

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)