



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

HD Multimedia Home Server

Model: CE-HE130S2 Series

Trade Name: ABLECOM

Issued to

**Ablecom Technology, Inc.
5F, No. 228, Lian-Cheng Rd., Chung-Ho City, Taipei Hsien, Taiwan**

Issued by

**Compliance Certification Services Inc.
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

<http://www.ccsrf.com>

service@ccsrf.com



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



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	Dec. 29, 2009	Initial Issue	ALL	Jill Shiau



TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION	4
2. EUT DESCRIPTION.....	5
3. TEST METHODOLOGY.....	6
3.1 EUT CONFIGURATION	6
3.2 EUT EXERCISE	6
3.3 GENERAL TEST PROCEDURES	6
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS	7
3.5 DESCRIPTION OF TEST MODES	8
4. INSTRUMENT CALIBRATION	9
4.1 MEASURING INSTRUMENT CALIBRATION	9
4.2 MEASUREMENT EQUIPMENT USED	9
4.3 MEASUREMENT UNCERTAINTY	10
5. FACILITIES AND ACCREDITATIONS	11
5.1 FACILITIES	11
5.2 EQUIPMENT	11
5.3 TABLE OF ACCREDITATIONS AND LISTINGS.....	12
6. SETUP OF EQUIPMENT UNDER TEST	13
6.1 SETUP CONFIGURATION OF EUT	13
6.2 SUPPORT EQUIPMENT	13
7. FCC PART 15.247 REQUIREMENTS	14
7.1 6dB BANDWIDTH	14
7.2 PEAK POWER	22
7.3 AVERAGE POWER	30
7.4 BAND EDGES MEASUREMENT	38
7.5 PEAK POWER SPECTRAL DENSITY	55
7.6 SPURIOUS EMISSIONS.....	63
7.7 POWERLINE CONDUCTED EMISSIONS	86
APPENDIX I PHOTOGRAPHS OF TEST SETUP.....	89



1. TEST RESULT CERTIFICATION

Applicant: **Ablecom Technology, Inc.**
5F, No. 228, Lian-Cheng Rd., Chung-Ho City, Taipei Hsien, Taiwan

Manufacturer: **Ablecom Technology, Inc.**
5F, No. 228, Lian-Cheng Rd., Chung-Ho City, Taipei Hsien, Taiwan

Equipment Under Test: HD Multimedia Home Server

Trade Name: ABLECOM

Model: CE-HE130S2 Series

Date of Test: November 28 ~ December 23, 2009

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

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

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

Approved by:

Ethan Huang
Section Manager

Reviewed by:

Stan Lin
Supervisor



2. EUT DESCRIPTION

Product	HD Multimedia Home Server
Trade Name	ABLECOM
Model Number	CE-HE130S2 Series
Model Discrepancy	N/A
EUT Power Rating	19VDC, 4.74A
Operating Frequency Range	2412 ~ 2462 MHz
Transmit Power	IEEE 802.11b mode: 18.61 dBm IEEE 802.11g mode: 24.17 dBm draft 802.11n 20 MHz Channel mode: 24.49 dBm draft 802.11n 40 MHz Channel mode: 23.90 dBm
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) draft 802.11n 20 MHz Channel mode: OFDM (6.5, 7.2, 13, 14.4, 14.44, 19.5, 21.7, 26, 28.89, 28.9, 39, 43.3, 43.33 52, 57.78, 57.8, 58.5, 65.0, 72.2, 78, 86.67, 104, 115.56, 117, 130, 144.44 Mbps) draft 802.11n 40 MHz Channel mode: OFDM (13.5, 15, 27, 30, 40.5, 45, 54, 60, 81, 90, 108, 120, 121.5, 135, 150, 162, 180, 216, 240, 243, 270, 300 Mbps)
Number of Channels	IEEE 802.11b/g mode: 11 Channels draft 802.11n 20 MHz Channel mode: 11 Channels draft 802.11n 40 MHz Channel mode: 7 Channels
Antenna Specification	PIFA Antenna / Gain: 0.32dBi

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **XXT-HE130S2** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47 Part 2, Part 15.207, 15.209 and 15.247.

3.1 EUT CONFIGURATION

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

3.2 EUT EXERCISE

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

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

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.



3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

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

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

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

² Above 38.6

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



3.5 DESCRIPTION OF TEST MODES

The EUT (model: CE-HE130S2 Series) had been tested under operating condition.

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

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

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate and cyclic delay diversity were chosen for full testing.

IEEE 802.11g mode:

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

draft 802.11n 20 MHz Channel mode:

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

draft 802.11n 40 MHz Channel mode:

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



4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

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

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	11/05/2010
Spectrum Analyzer	R&S	FSEB	825829/011	10/29/2010
USB Power Sensor	BOONTON	52012	2061194	06/08/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	11/05/2010
Spectrum Analyzer	R&S	FSEB	825829/011	10/29/2010
Pre-Amplifier	HP	8447D	2944A06530	12/31/2009
Pre-Amplifier	HP	8449B	3008A01738	04/17/2010
EMI Test Receiver	SCHAFFNER	SCR 3501	436	01/21/2010
Loop Antenna	EMCO	6502	2356	05/28/2010
Bilog Antenna	SCHWAZBECK	VULB9160	3084	09/11/2010
Horn Antenna	EMCO	3115	00022250	05/08/2010
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Test S/W	LabVIEW 6.1 (Wugu Chamber EMI Test V1_4.5.3)			

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCS30	845552/030	05/18/2010
LISN	R&S	ENV216	100074	12/09/2010
LISN	FCC	FCC-LISN-50/ 250-16-2-07	06013	10/13/2010
Test S/W	CCS-3A1-CE-Luchu			



4.3 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Powerline Conducted Emission	± 1.7983
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	± 3.8856
3M Semi Anechoic Chamber / Above 1GHz	± 3.8721

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



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

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

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

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

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

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

☒ No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, (338) Taiwan, R.O.C.

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

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4: 2003 and CISPR Publication 22.

5.2 EQUIPMENT





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

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

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

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

5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	CFR 47, FCC Part15/18, CISPR 22, EN 55022, ICES-003, AS/NZS CISPR 22, VCCI V-3, EN 55011, CISPR 11, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 61000-6-1/2/3/4, EN 55024, CISPR 24, AS/NZS CISPR 24, AS/NZS 61000.6.2, EN 55014-1/-2, ETSI EN 300 386 v1.3.2/v1.3.3, IEC/EN 61000-3-2, AS/NZS 61000.3.2, IEC/EN 61000-3-3, AS/NZS 61000.3.3	 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	 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	 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.



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

For Radiated Emission Above 1GHz & Conducted Measurement

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

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

For Radiated Emission Below 1GHz & Powerline Measurement

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	LCD Monitor	2407WFPb	CN-0FC255-46633-6 75-23TLS	FCC DoC	DELL	DVI Cable: Unshielded, 1.8m with two cores HDMI Cable: Unshielded, 1.8m	Unshielded, 1.8m
2	LCD Monitor	2407WFPb	CN-0FC255-46633-6 75-24TKS	FCC DoC	DELL	D-SUB Cable: Unshielded, 1.8m with two cores	Unshielded, 1.8m
3	PS/2 Keyboard	Y-SJ17	SY528UK	FCC DoC	Logitech	Unshielded, 1.8m	N/A
4	USB Mouse	MO19UCA	020440943	FCC DoC	HP	Unshielded, 1.8m	N/A
5	Traveling Disk	U172	C072001303348	FCC DoC	CJC	Unshielded, 1.8m	N/A
6	Traveling Disk	U172	C072001303385	FCC DoC	PQI	Unshielded, 1.8m	N/A
7	Traveling Disk	U172	C072001301690	FCC DoC	PQI	Unshielded, 1.8m	N/A
8	Traveling Disk	U172	C072001301788	FCC DoC	PQI	Unshielded, 1.8m	N/A
9	Traveling Disk	U172	C072001303234	FCC DoC	PQI	Unshielded, 1.8m	N/A
10	Traveling Disk	U172	C072001301712	FCC DoC	PQI	Unshielded, 1.8m	N/A
11	Traveling Disk	U172	C072001301599	FCC DoC	PQI	Unshielded, 1.8m	N/A
12	e-SATA External HDD	ST-M10	A01869-E48-0004	FCC DoC	Onnto	Unshielded, 1.8m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m
13	5.1CH Amp.	Z-5400	S-0180B	FCC DoC	Logitech	Unshielded, 1.8m Shielded, 0.5m*2	Unshielded, 1.8m
14	Multimedia Headset	ClearChat	N/A	FCC DoC	Logitech	Unshielded, 1.8m*2	N/A
15	Multimedia Headset	ClearChat	N/A	FCC DoC	Logitech	Unshielded, 1.8m*2	N/A
16	Walkman	RQ-L11	CD008487	FCC DoC	Panasonic	Unshielded, 1.8m	N/A
17	Notebook PC (Remote)	COMPAQ NC 4010	CNU441F8LV	FCC DoC	HP	LAN Cable: Unshielded, 3.5m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core

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



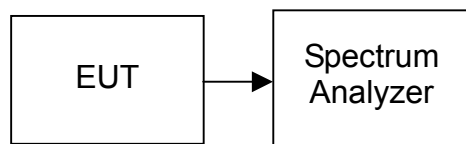
7. FCC PART 15.247 REQUIREMENTS

7.1 6dB BANDWIDTH

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100kHz, VBW = 300kHz, Span = 30MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

**TEST DATA****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	12.24	>500	PASS
Mid	2437	12.24		PASS
High	2462	12.27		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.47	>500	PASS
Mid	2437	16.47		PASS
High	2462	16.53		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.23	>500	PASS
Mid	2437	17.70		PASS
High	2462	17.65		PASS

Test mode: draft 802.11n 40 MHz Channel mode

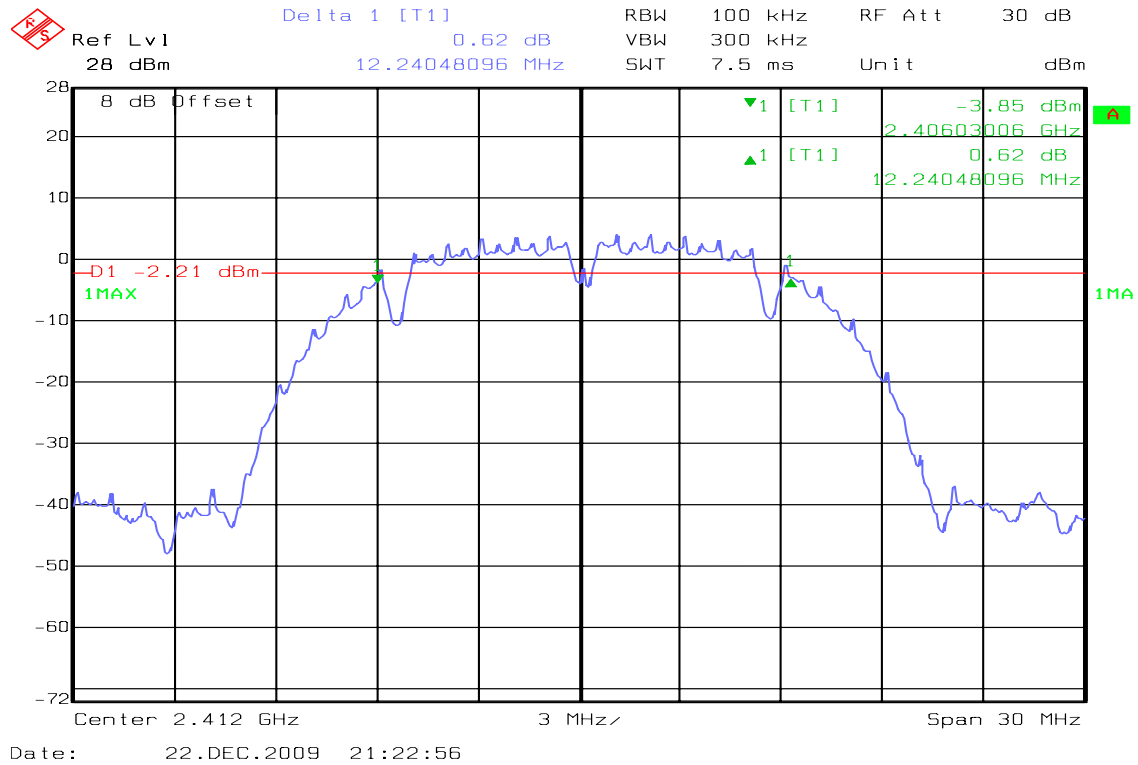
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.15	>500	PASS
Mid	2437	36.05		PASS
High	2452	36.11		PASS



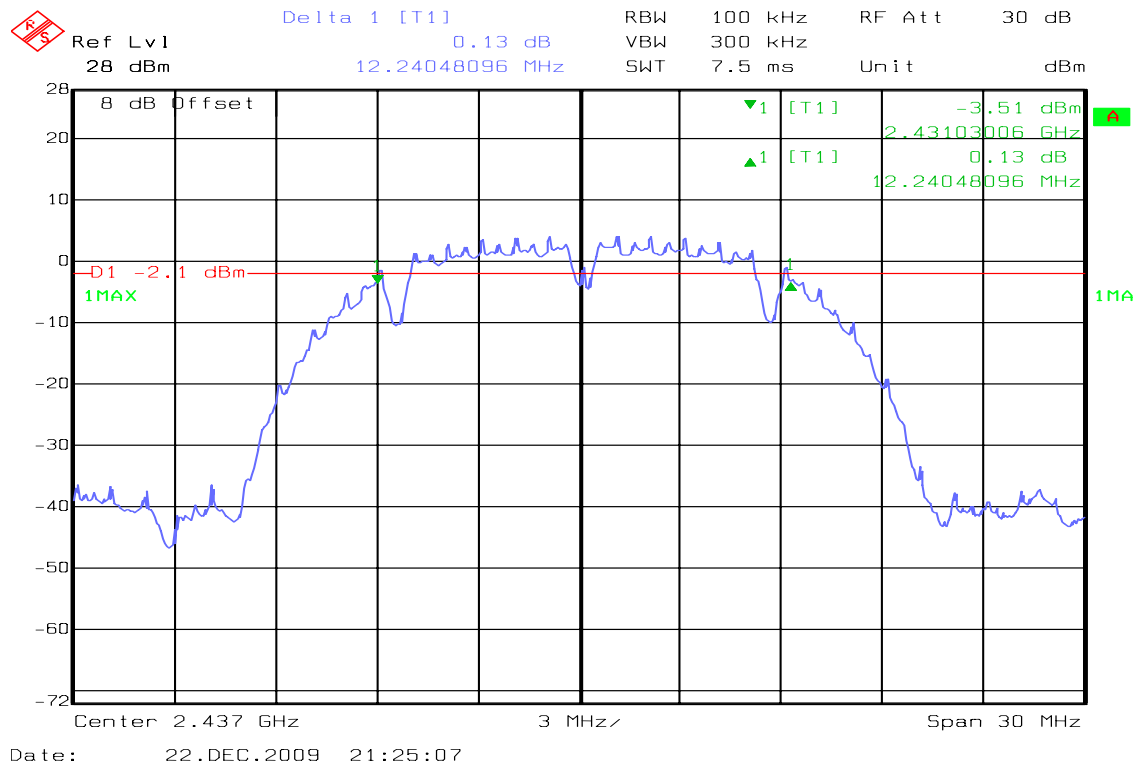
Test Plot

IEEE 802.11b mode

6dB Bandwidth (CH Low)

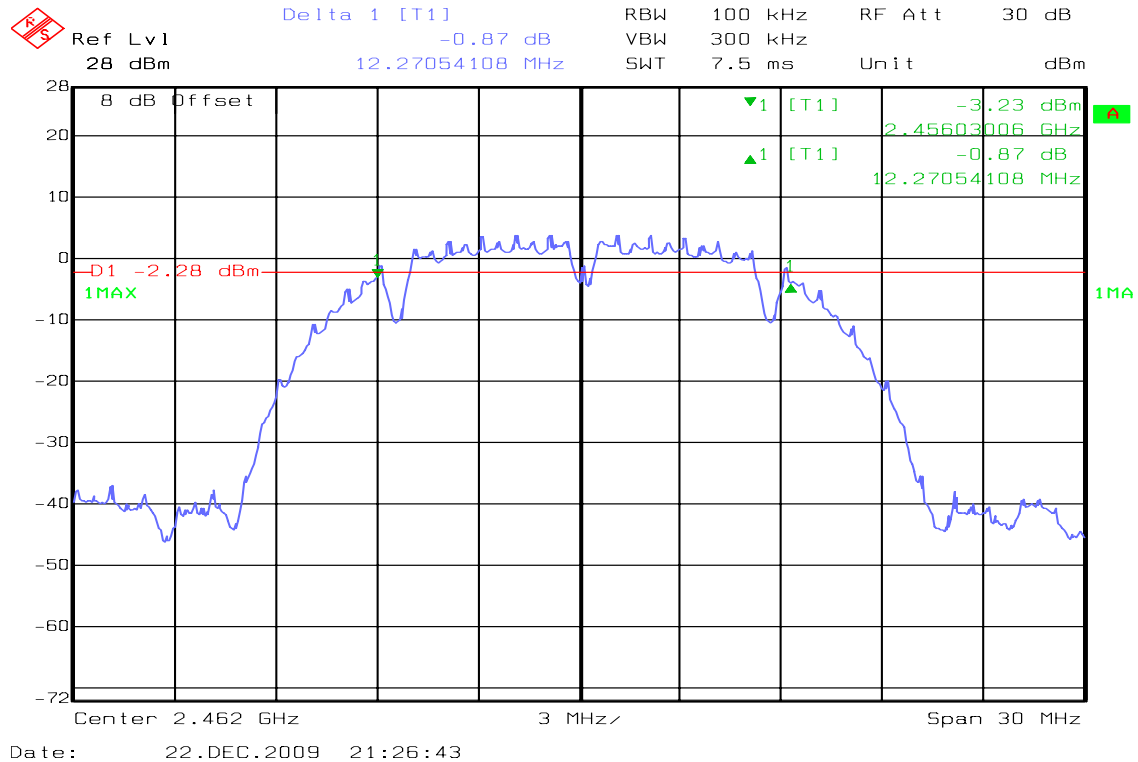


6dB Bandwidth (CH Mid)



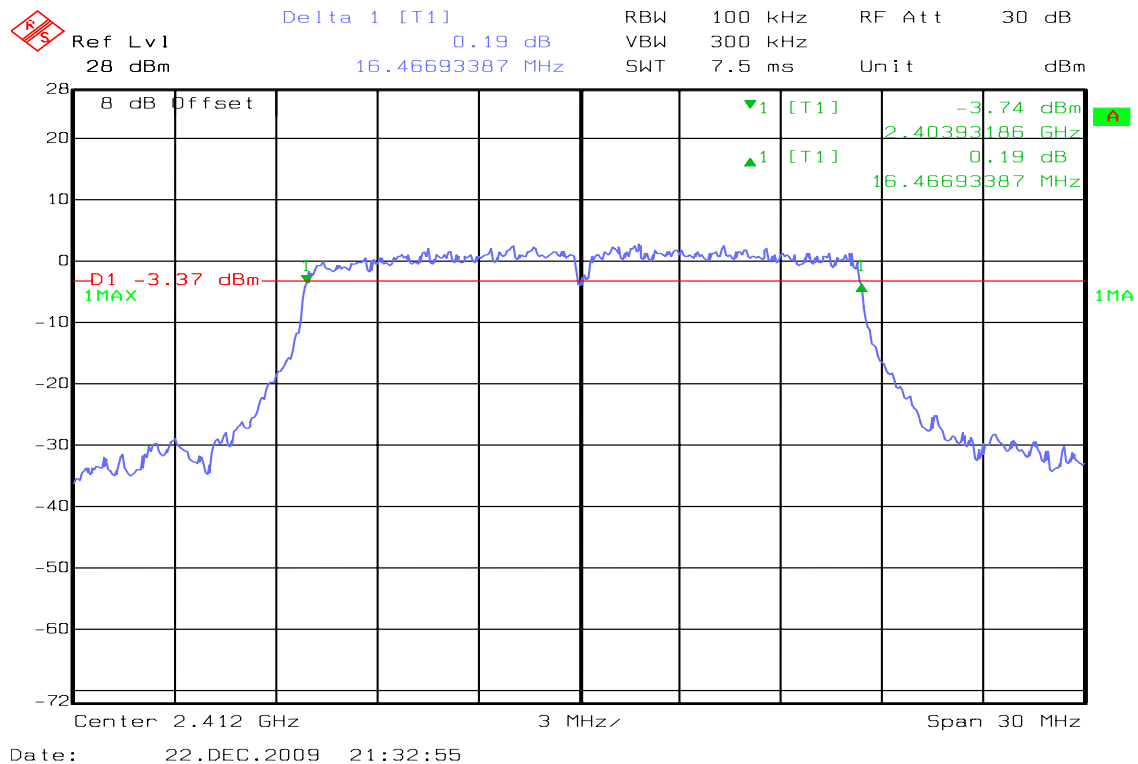


6dB Bandwidth (CH High)



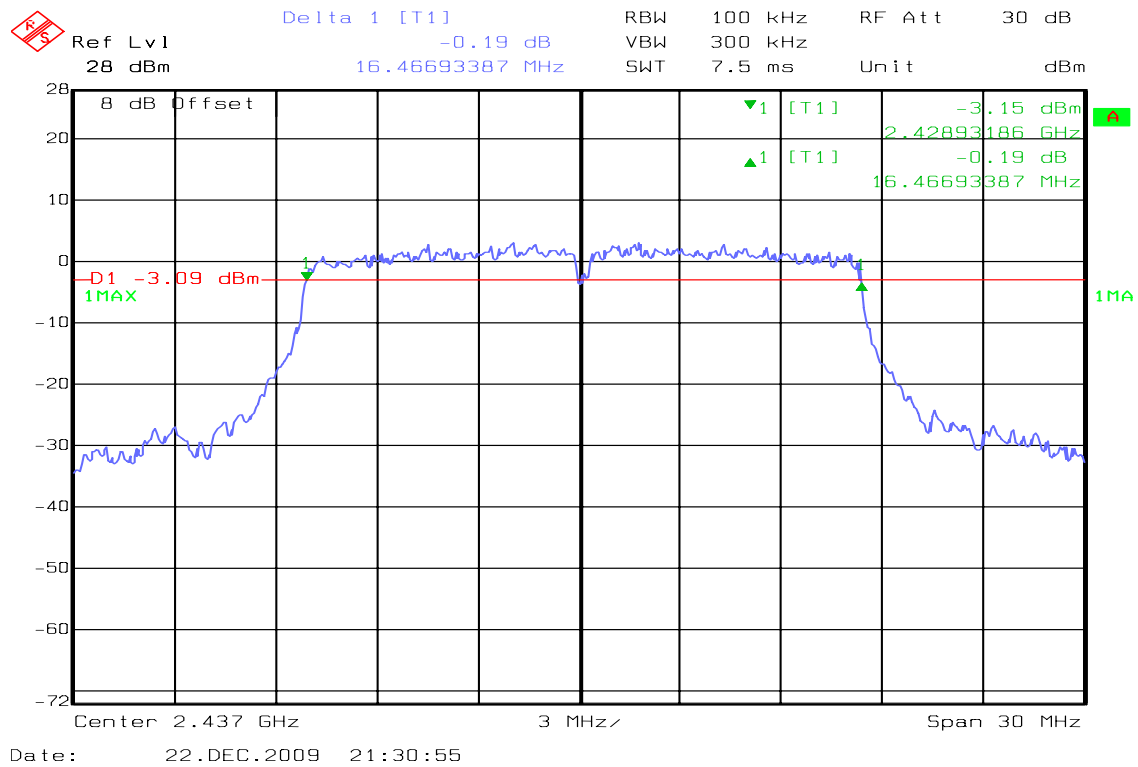
IEEE 802.11g mode

6dB Bandwidth (CH Low)

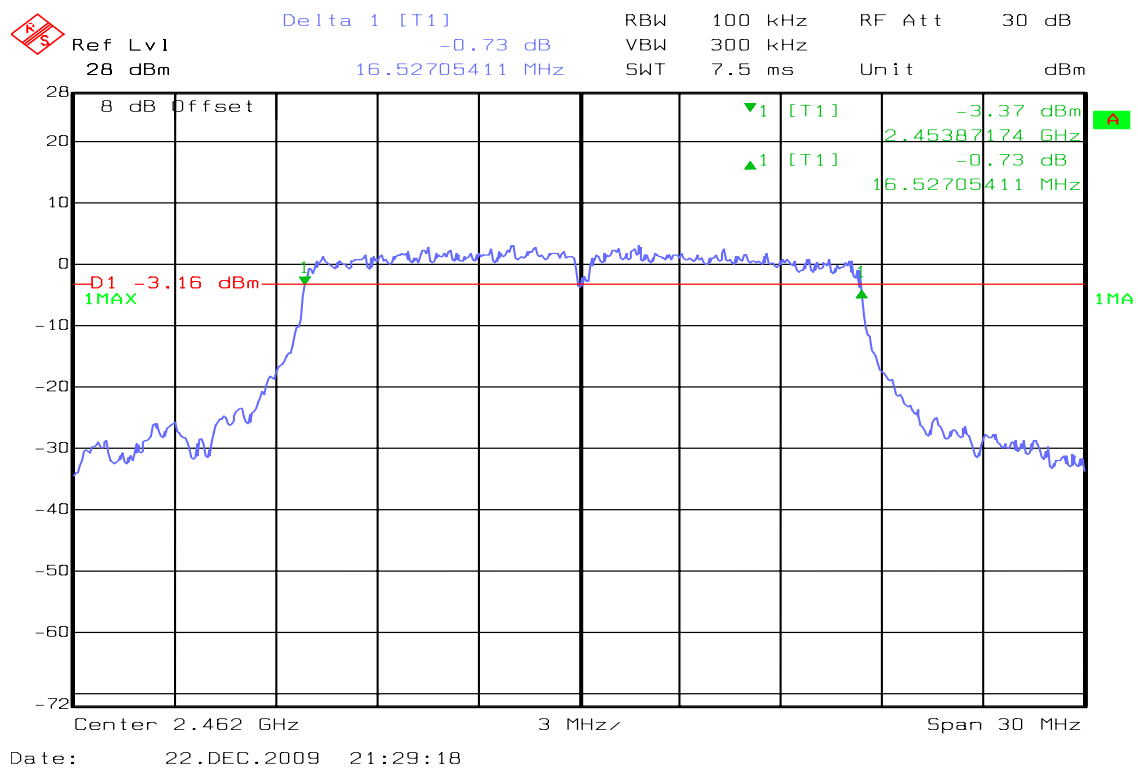




6dB Bandwidth (CH Mid)



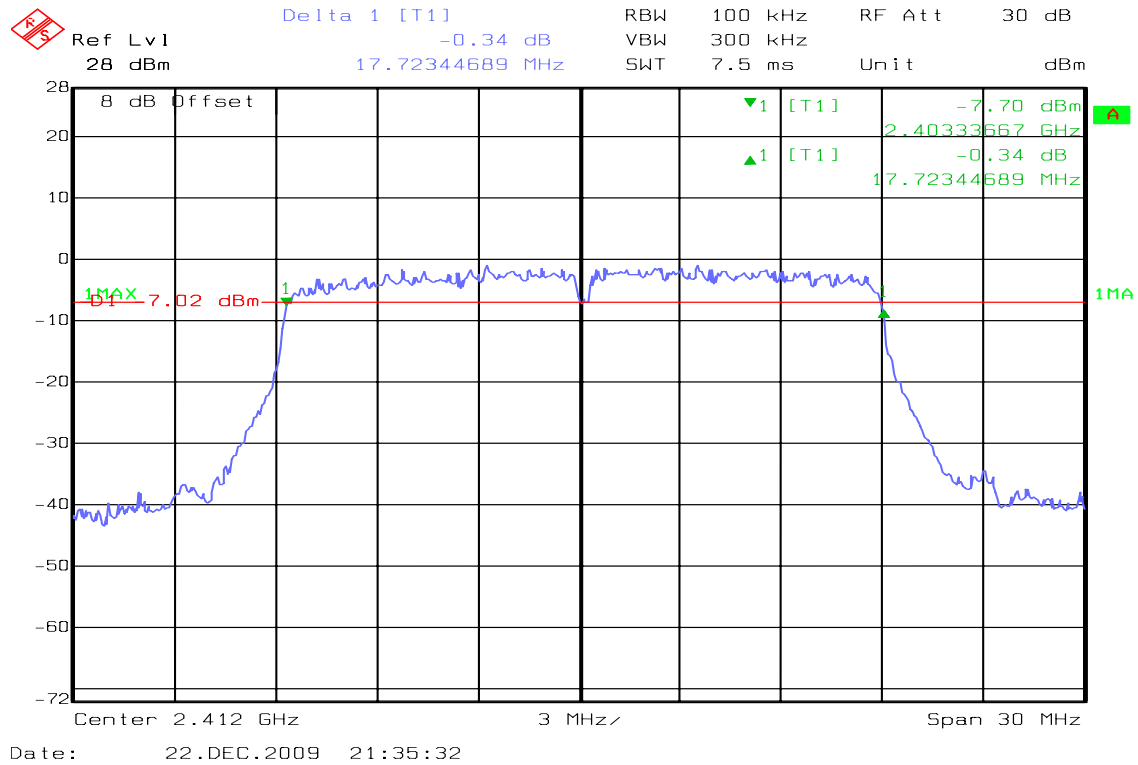
6dB Bandwidth (CH High)



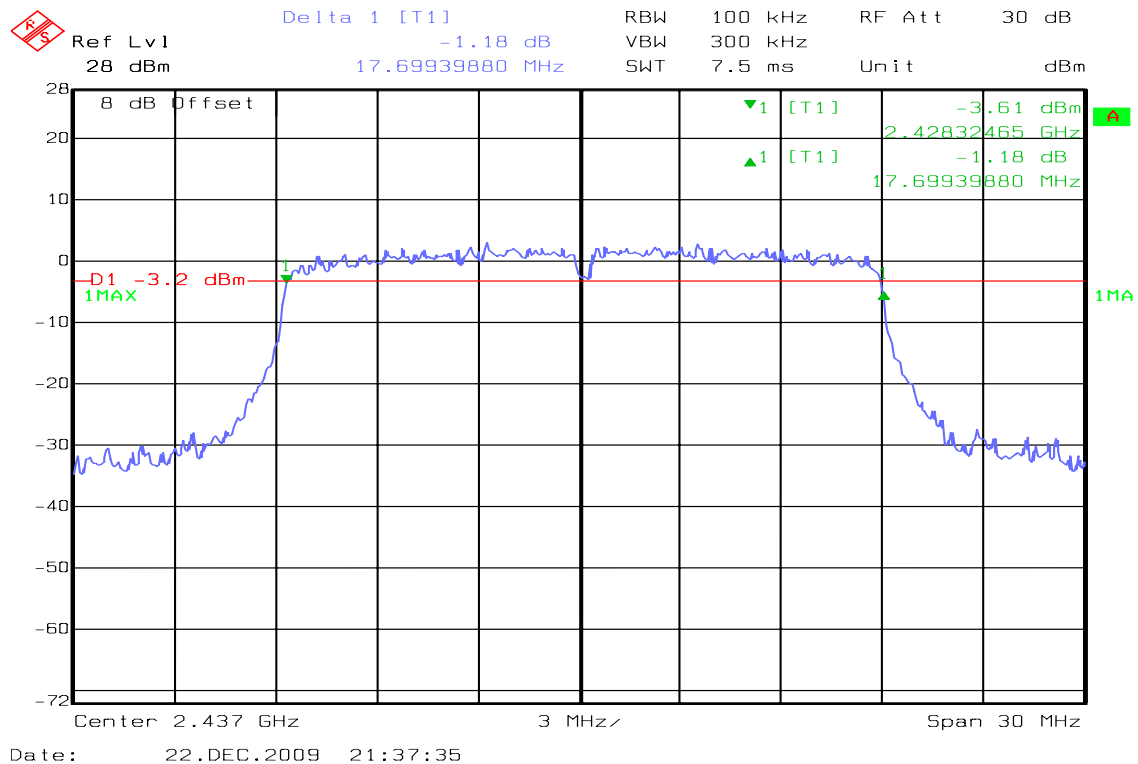


draft 802.11n 20 MHz Channel mode

6dB Bandwidth (CH Low)

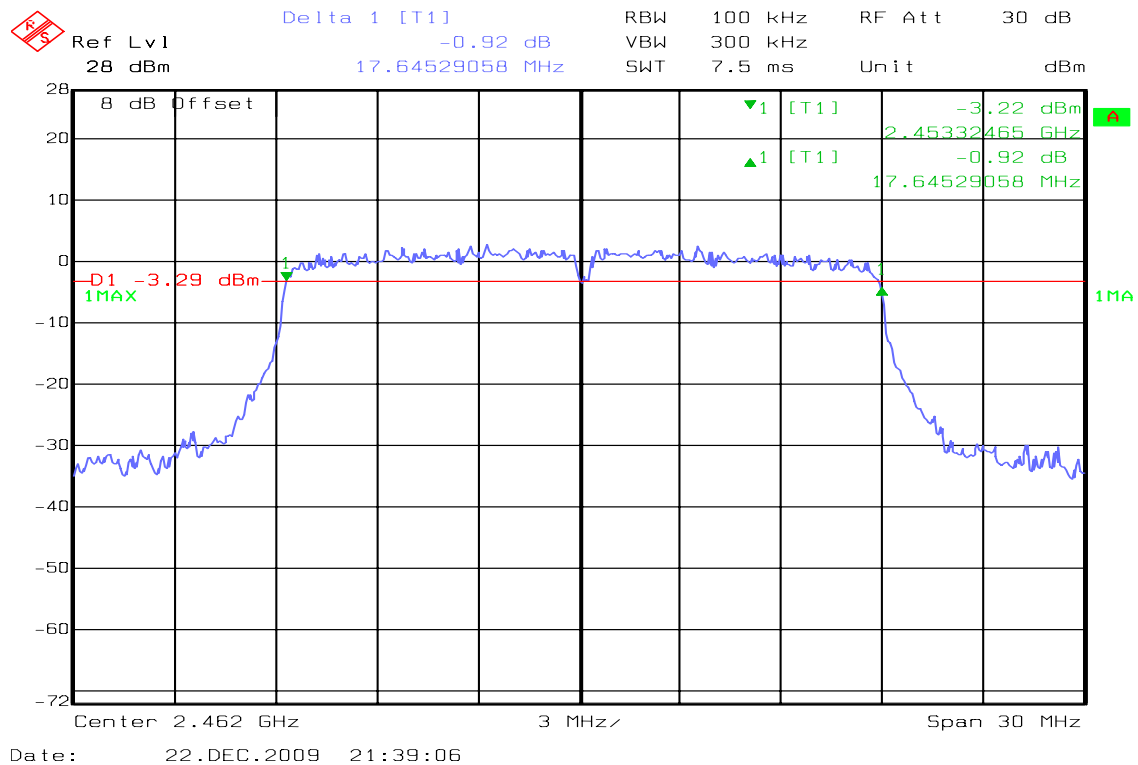


6dB Bandwidth (CH Mid)



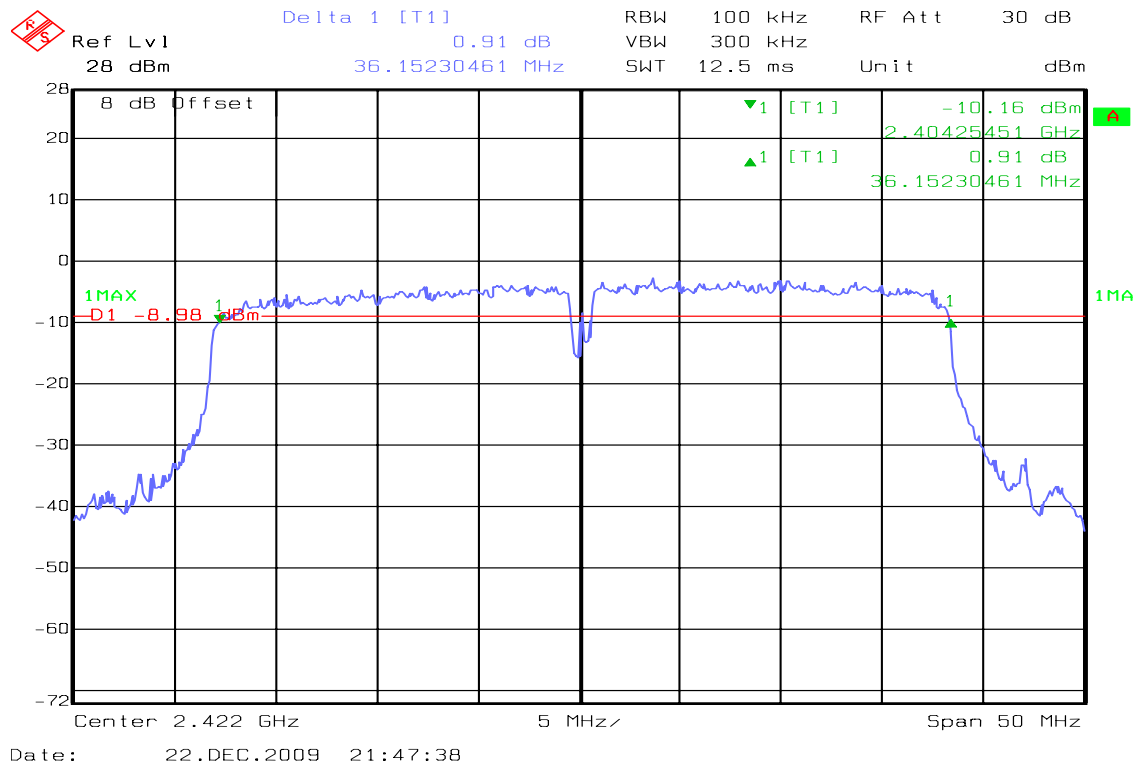


6dB Bandwidth (CH High)



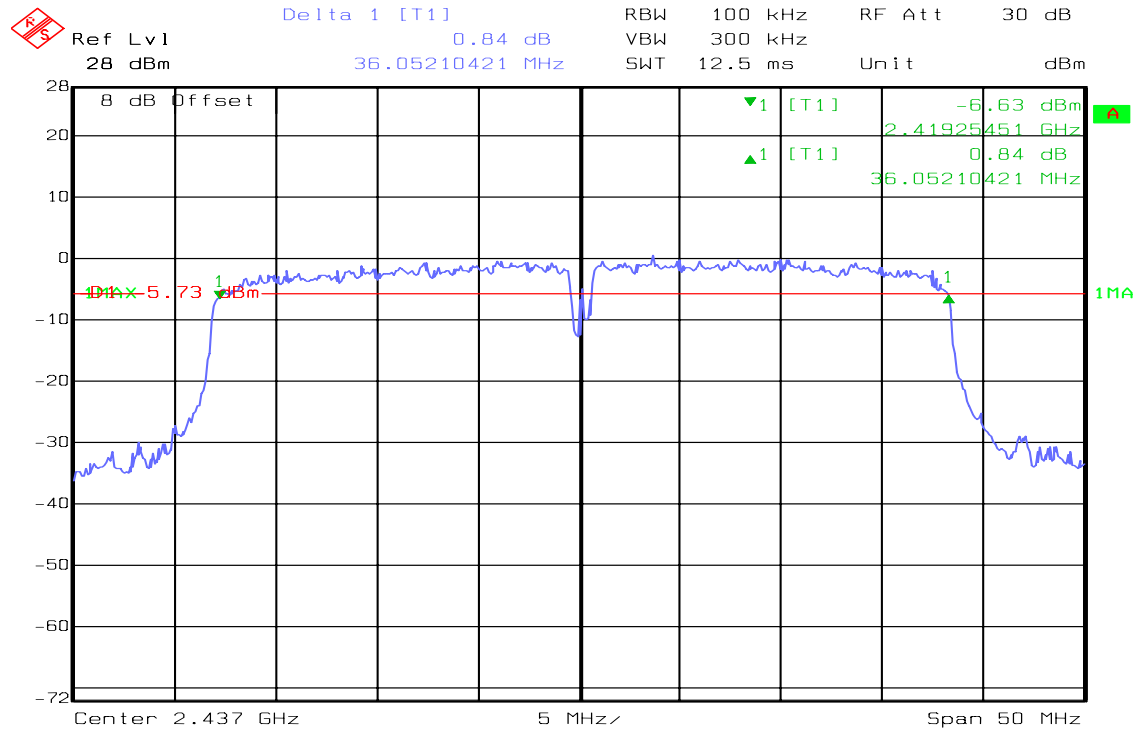
draft 802.11n 40 MHz Channel mode

6dB Bandwidth (CH Low)



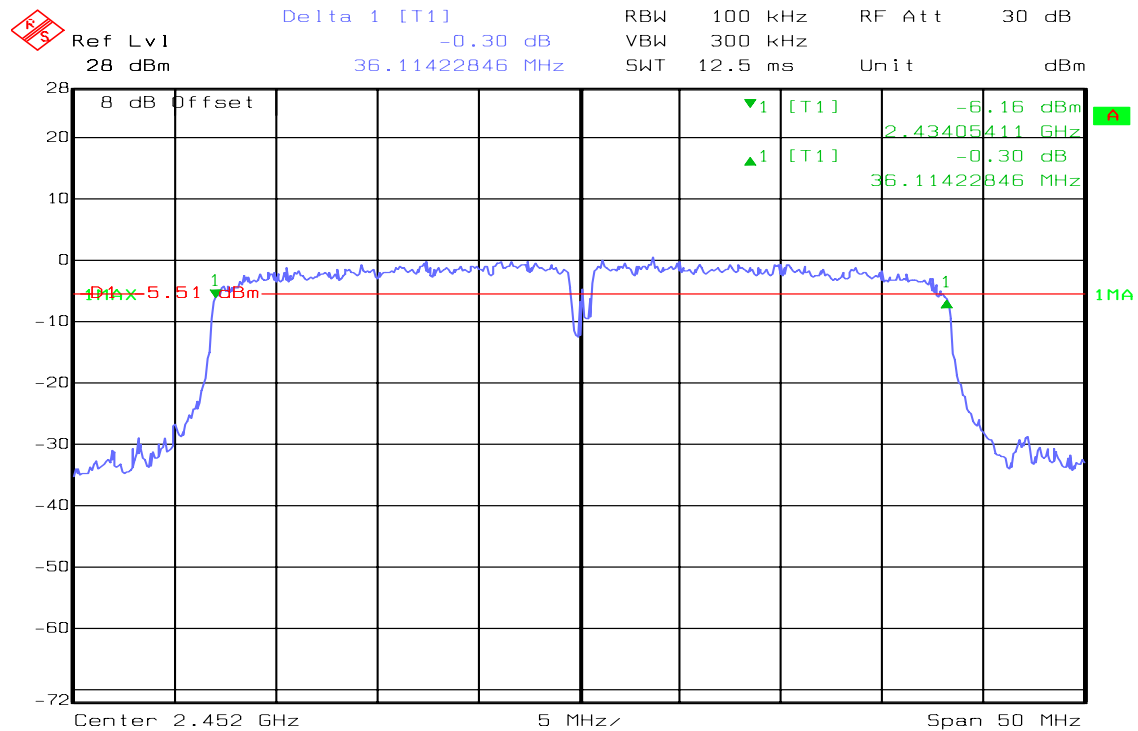


6dB Bandwidth (CH Mid)



Date: 22.DEC.2009 21:45:26

6dB Bandwidth (CH High)



Date: 22.DEC.2009 21:41:19



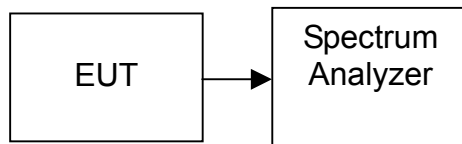
7.2 PEAK POWER

LIMIT

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

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

TEST CONFIGURATION



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted



TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	18.61	0.0726	1.00	PASS
Mid	2437	18.41	0.0693		PASS
High	2462	18.53	0.0713		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	20.14	0.1033	1.00	PASS
Mid	2437	24.17	0.2612		PASS
High	2462	23.75	0.2371		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	20.50	0.1122	1.00	PASS
Mid	2437	24.35	0.2723		PASS
High	2462	24.49	0.2812		PASS

Test mode: draft 802.11n 40 MHz Channel mode

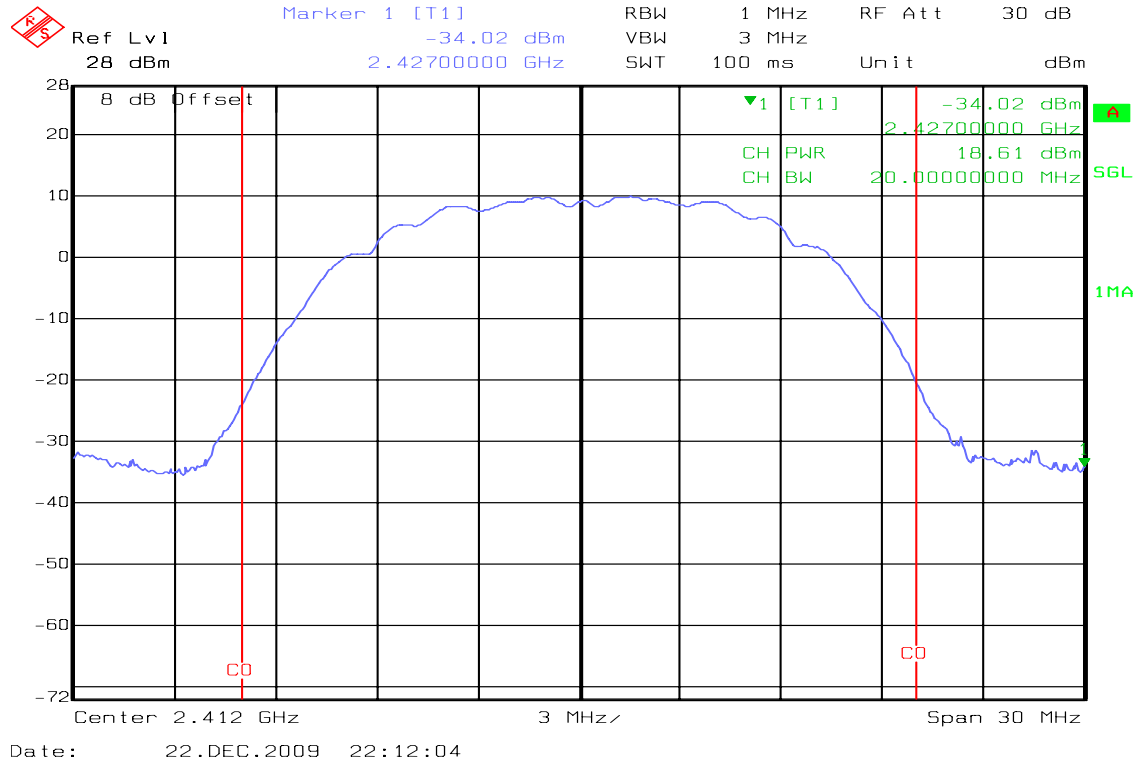
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	20.93	0.1239	1.00	PASS
Mid	2437	23.87	0.2438		PASS
High	2452	23.90	0.2455		PASS



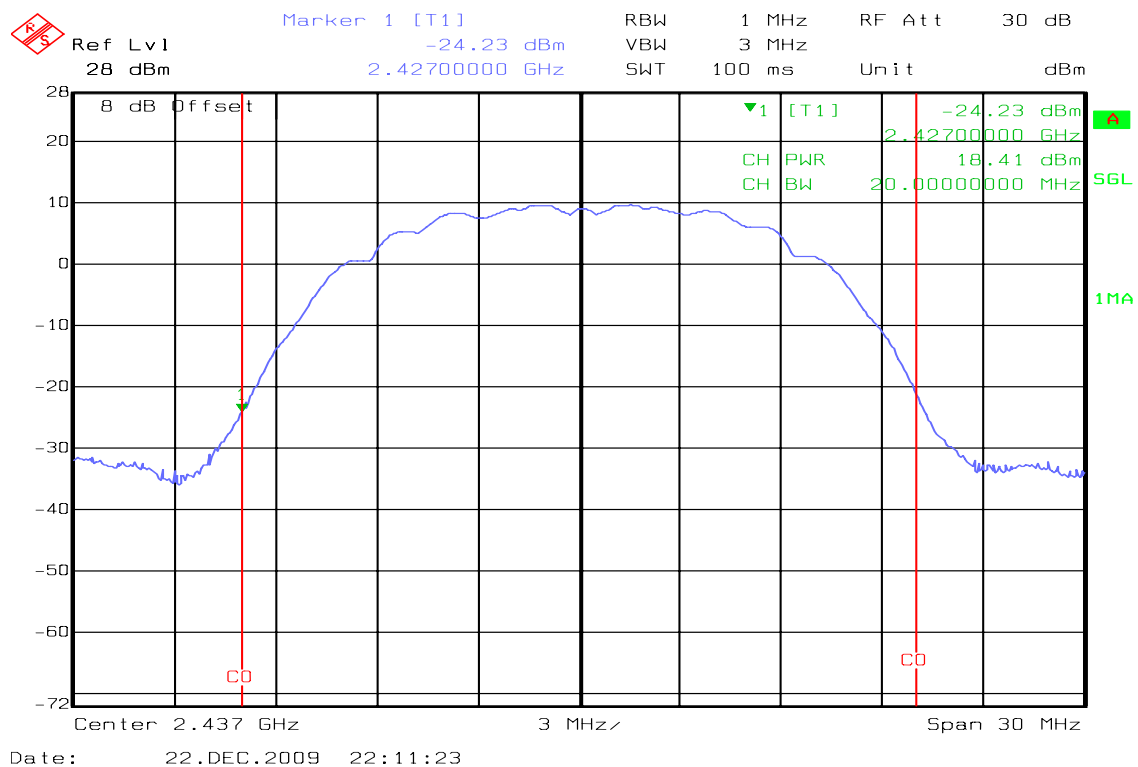
Test Plot

IEEE 802.11b mode

Peak Power (CH Low)

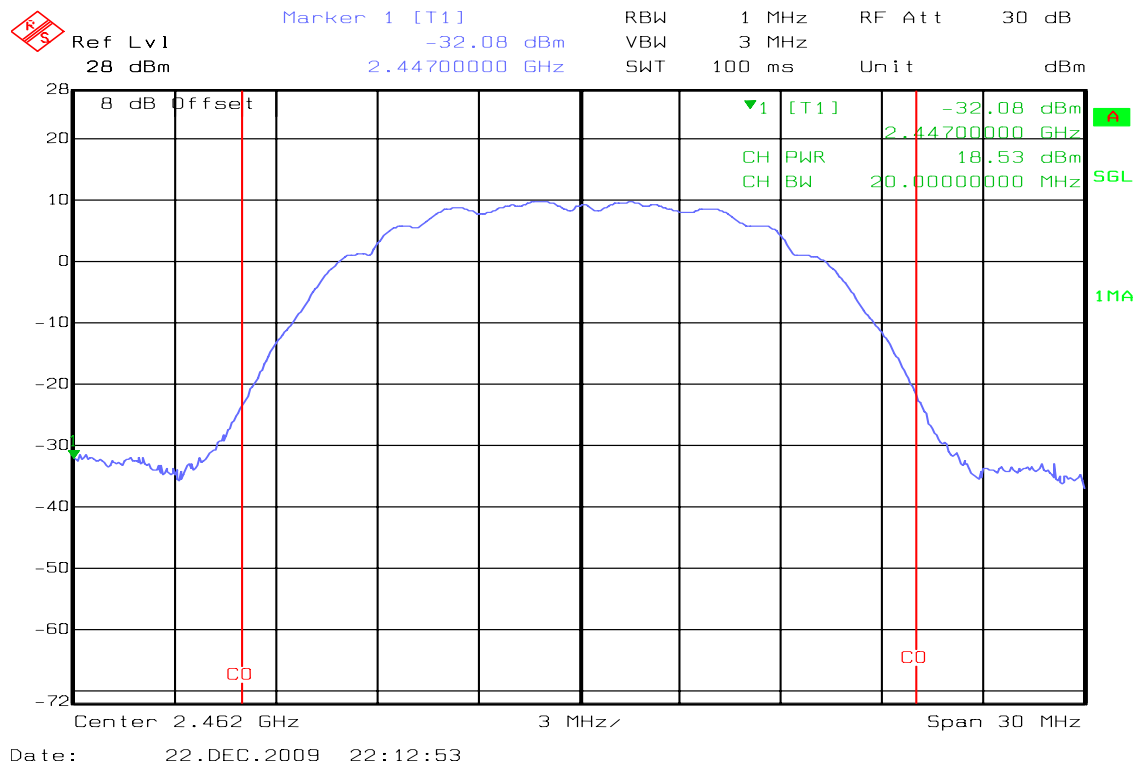


Peak Power (CH Mid)



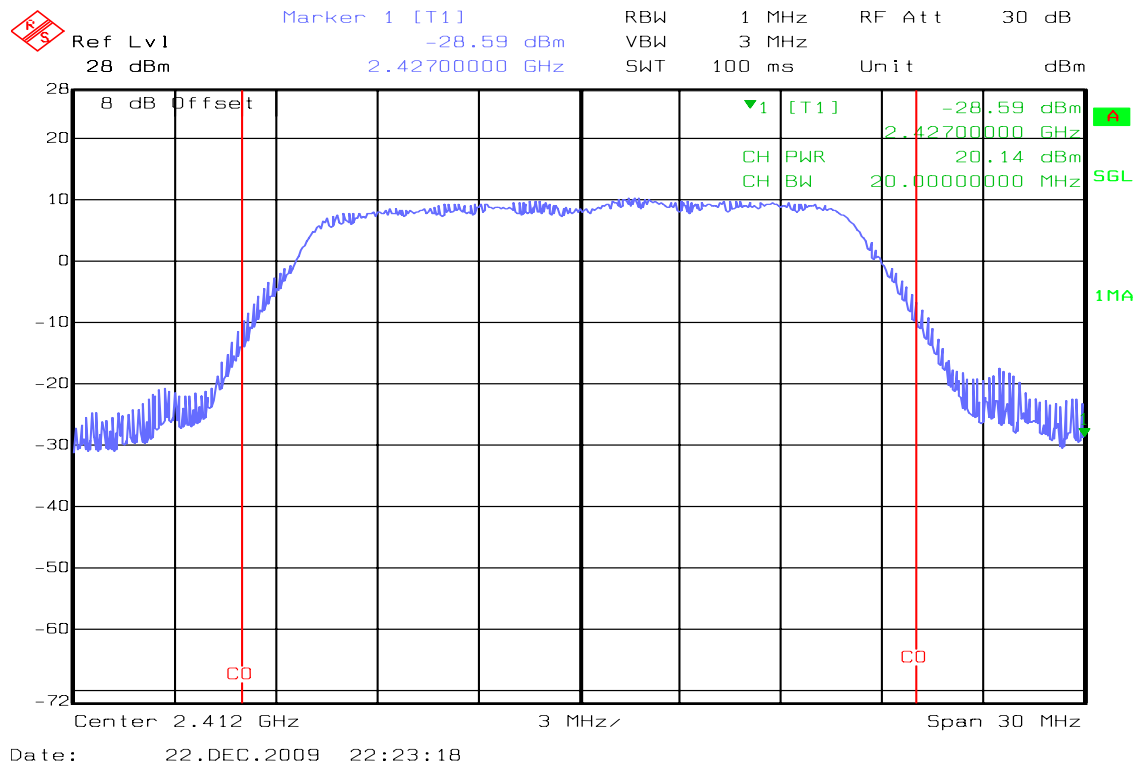


Peak Power (CH High)



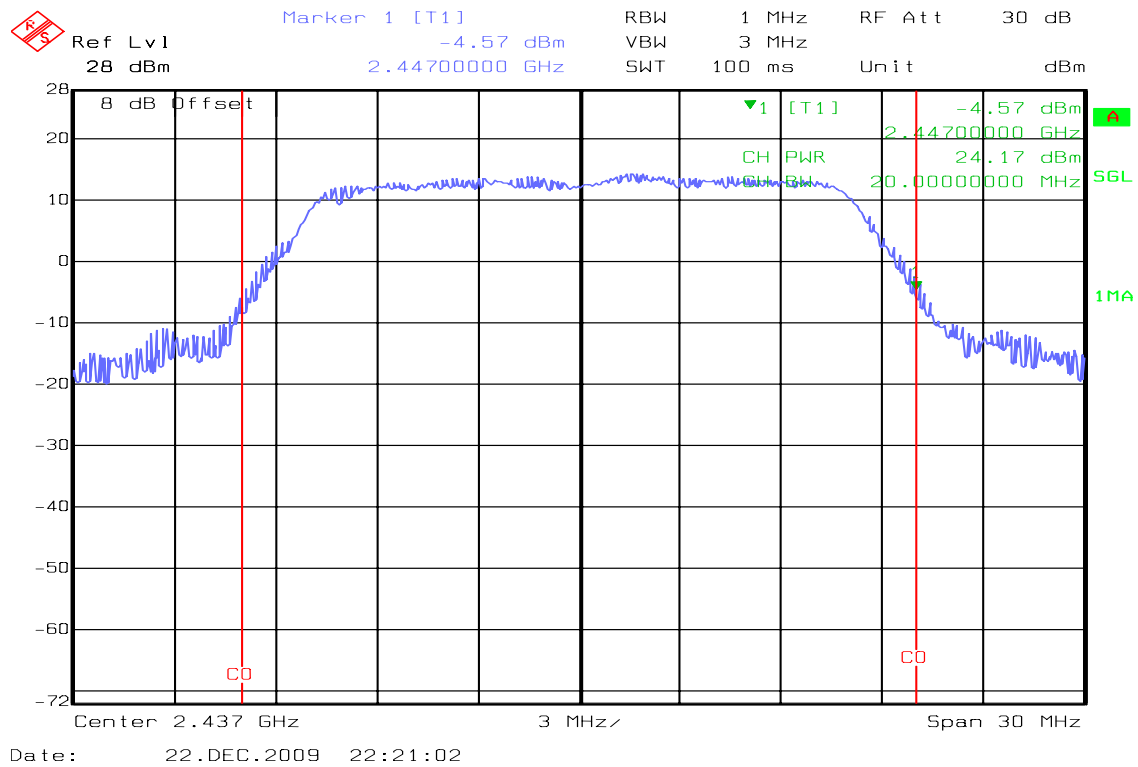
IEEE 802.11g mode

Peak Power (CH Low)

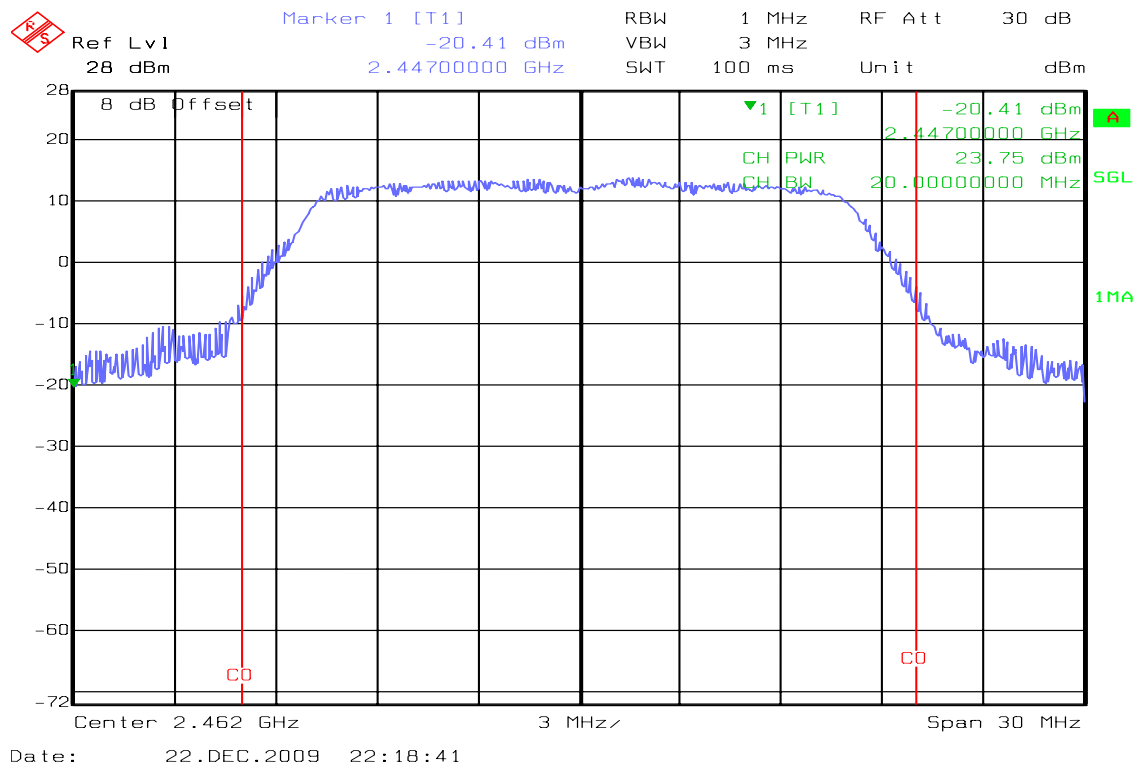




Peak Power (CH Mid)



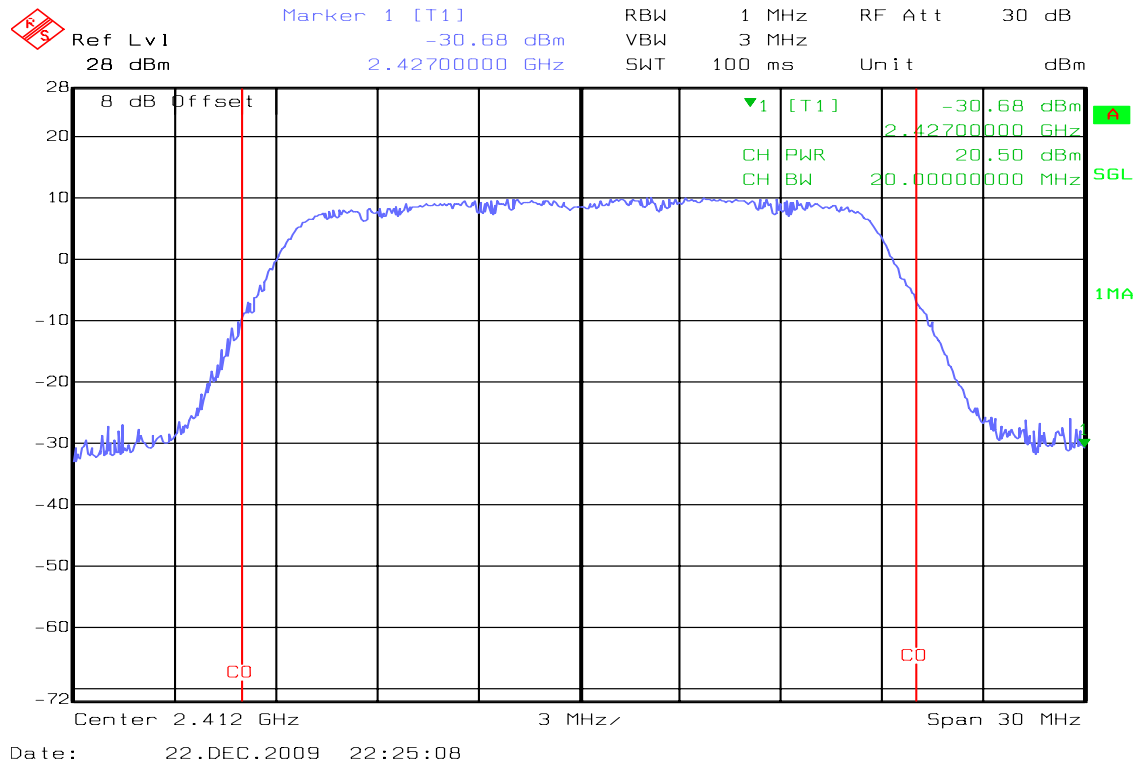
Peak Power (CH High)



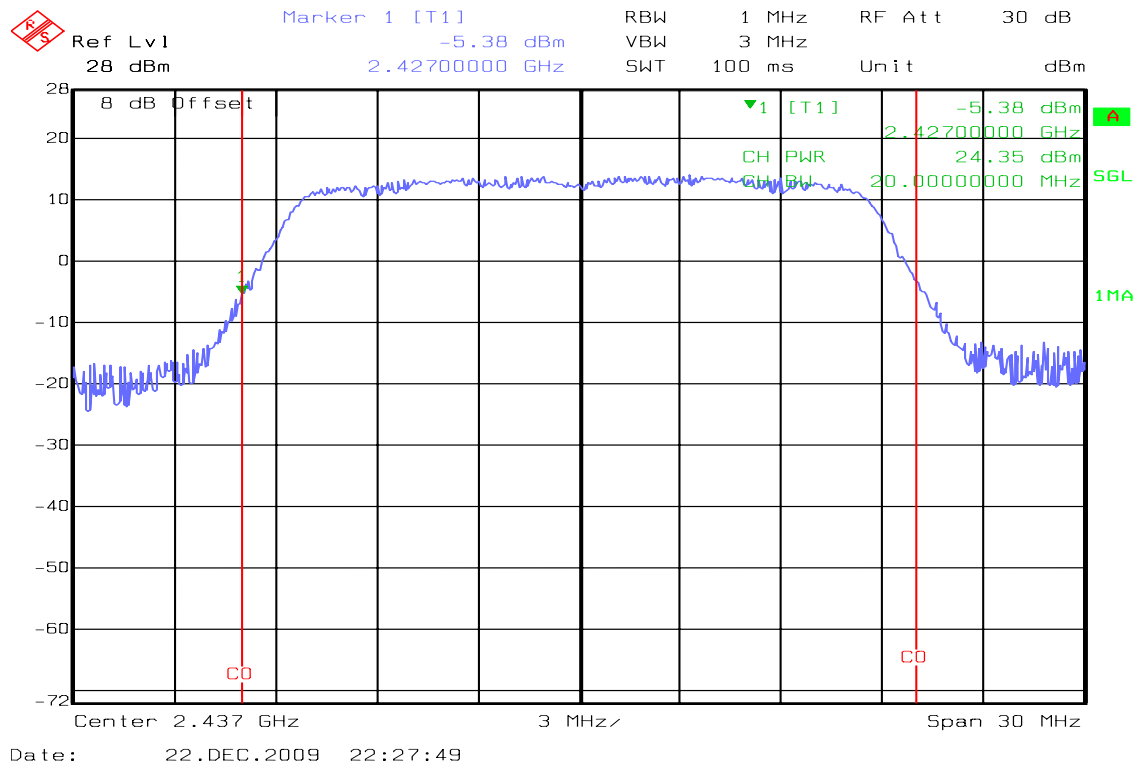


draft 802.11n 20 MHz Channel mode

Peak Power (CH Low)

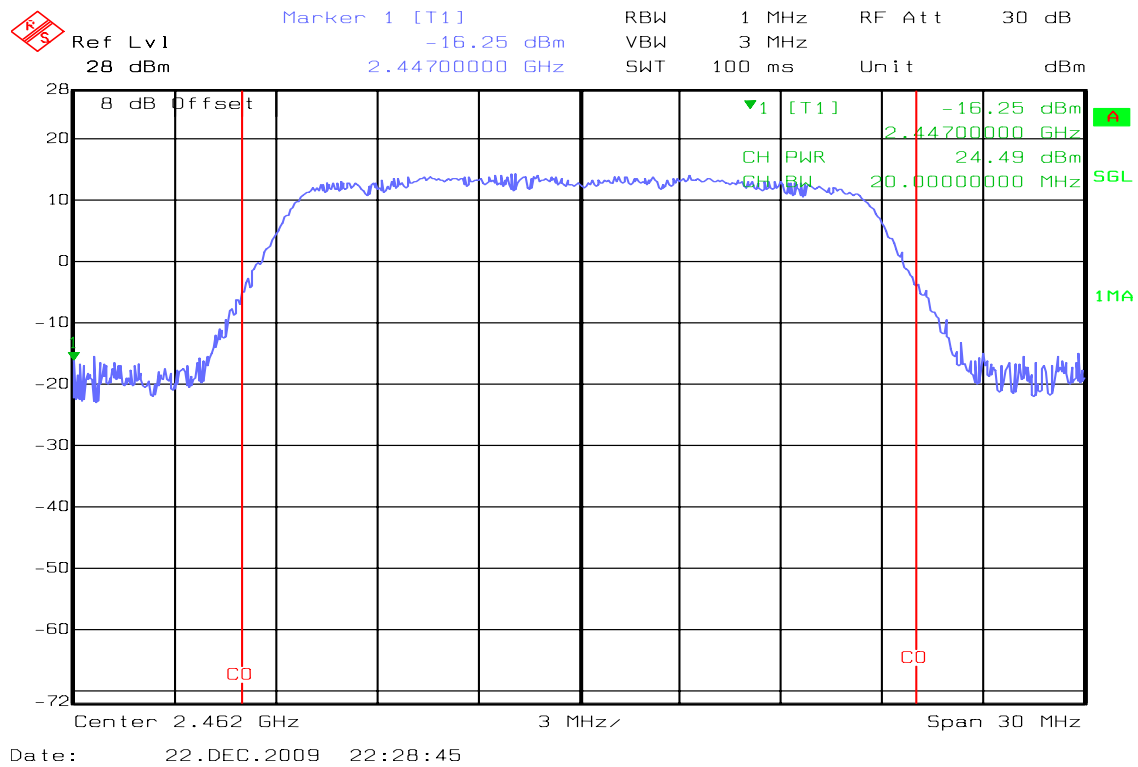


Peak Power (CH Mid)



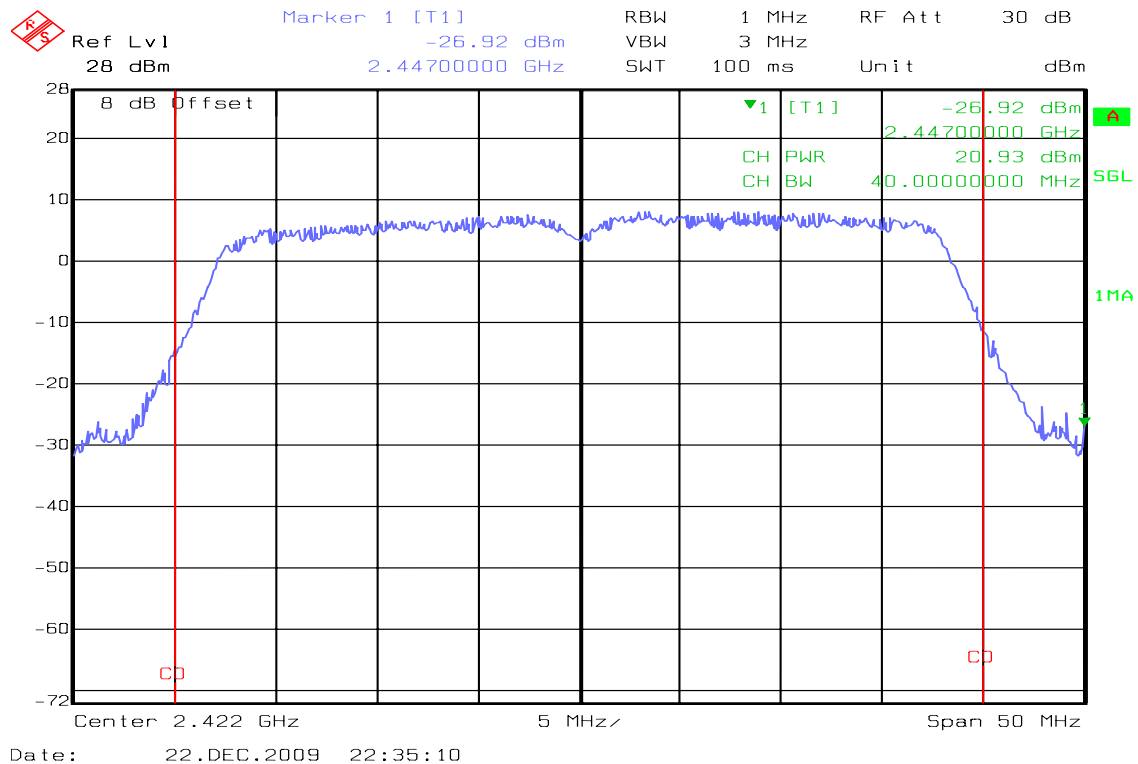


Peak Power (CH High)



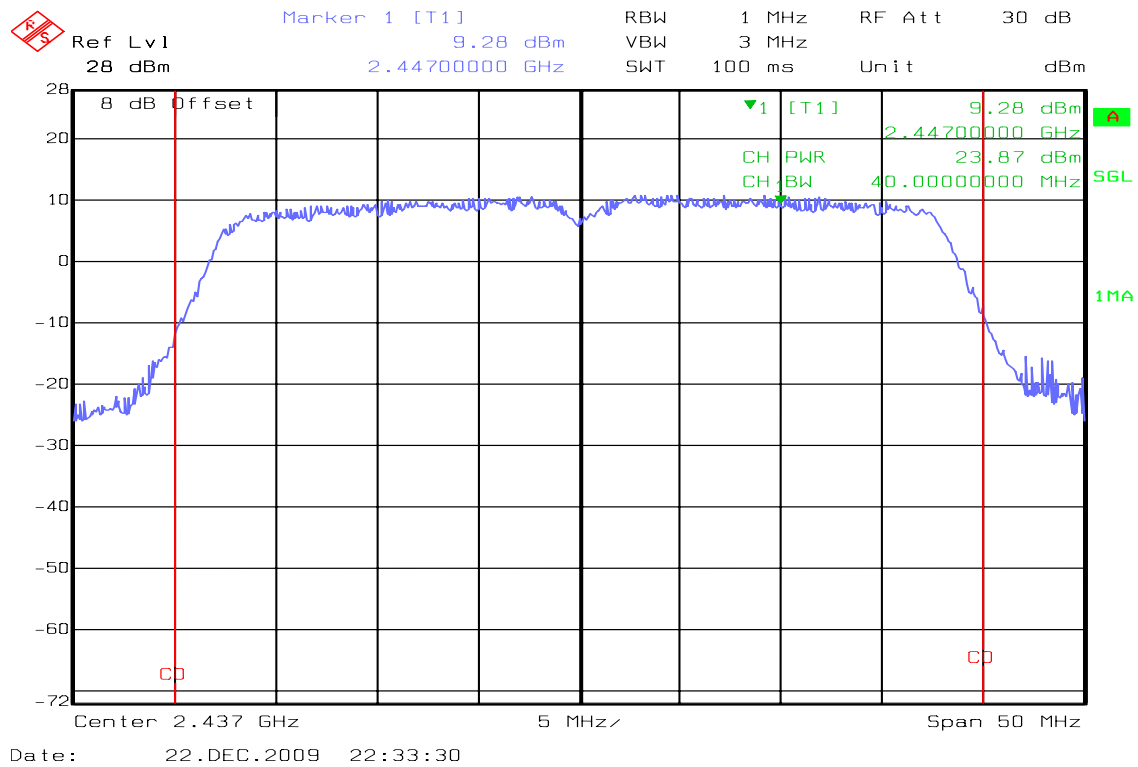
draft 802.11n 40 MHz Channel mode

Peak Power (CH Low)

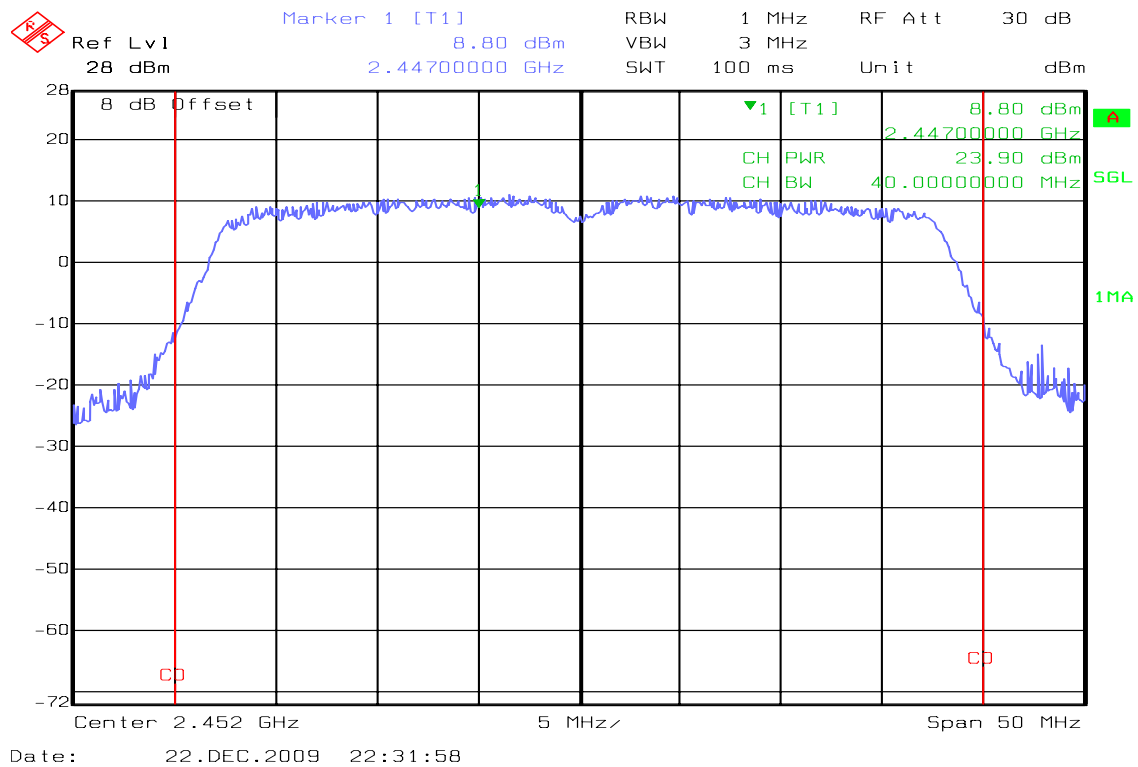




Peak Power (CH Mid)



Peak Power (CH High)



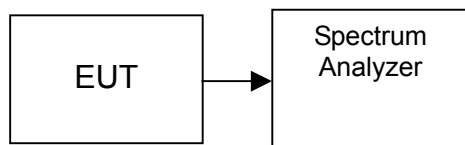


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. The Spectrum Analyzer is set to the average power detection.

TEST RESULTS

No non-compliance noted

**TEST DATA****IEEE 802.11b**

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	15.64	0.0366
Mid	2437	15.64	0.0366
High	2462	15.76	0.0377

IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	16.47	0.0444
Mid	2437	13.04	0.0201
High	2462	16.41	0.0438

draft 802.11n 20 MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	16.62	0.0459
Mid	2437	12.81	0.0191
High	2462	16.59	0.0456

draft 802.11n 40 MHz

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2422	16.70	0.0468
Mid	2437	13.47	0.0222
High	2452	16.32	0.0429



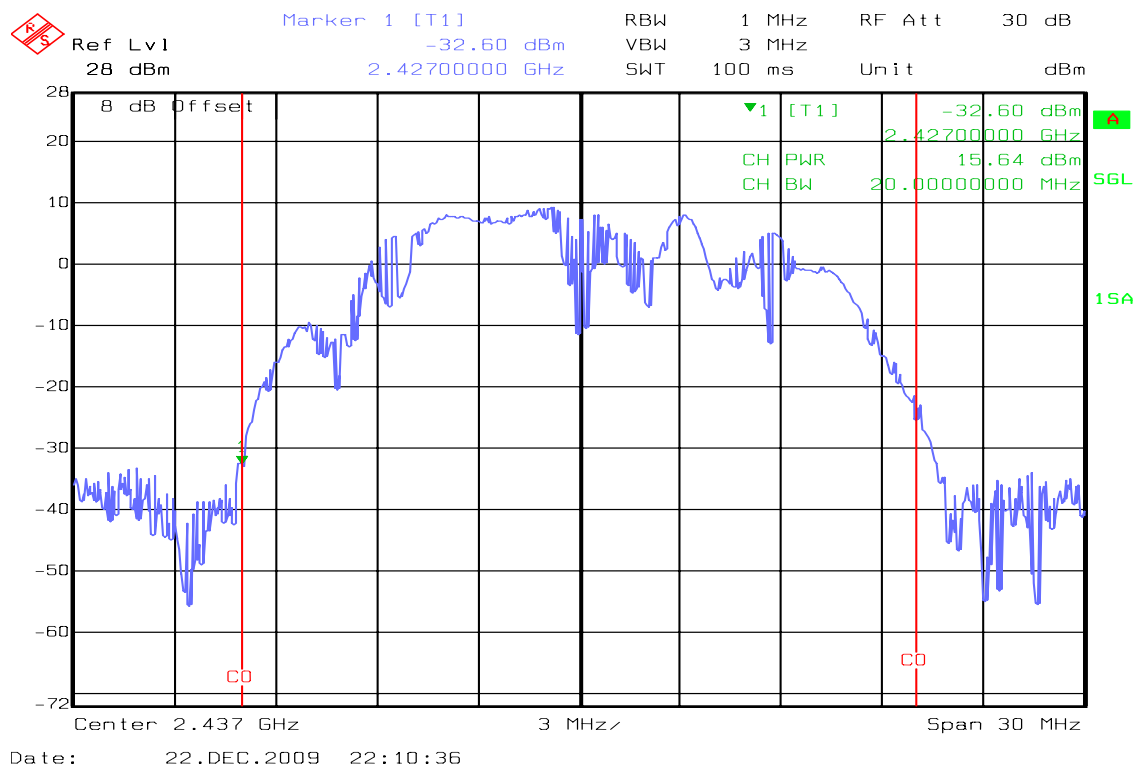
Test Plot

IEEE 802.11b mode

Average power (CH Low)

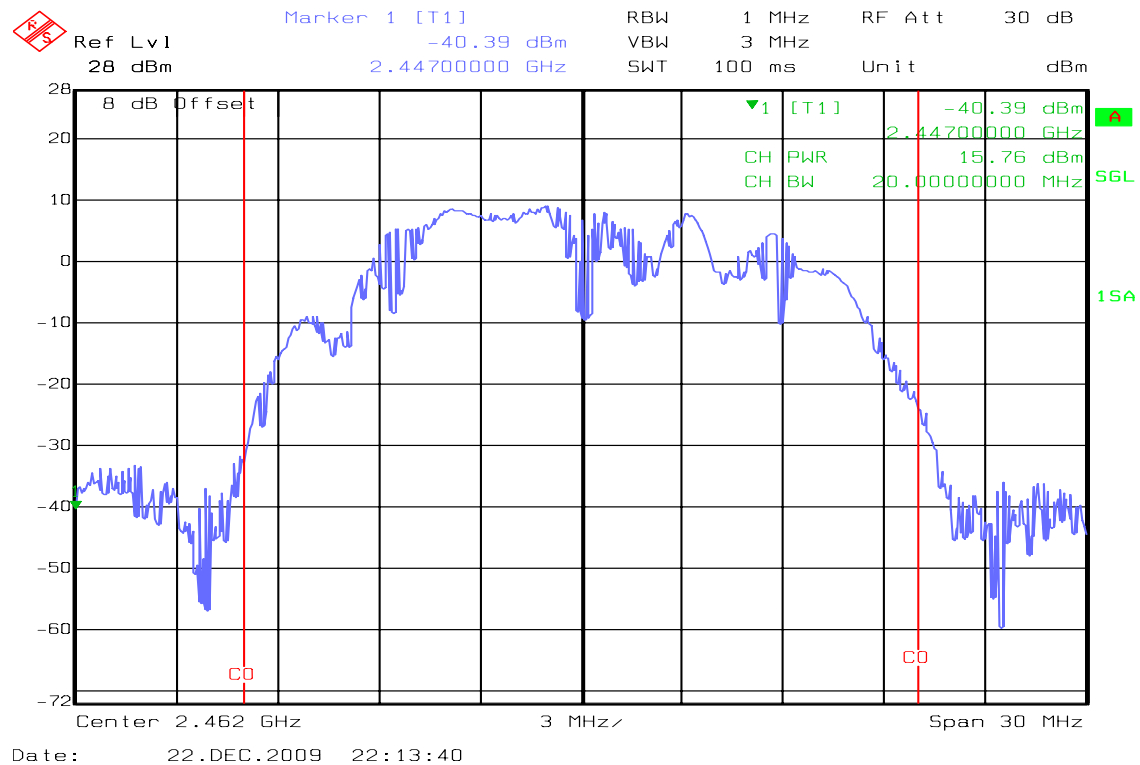


Average power (CH Mid)



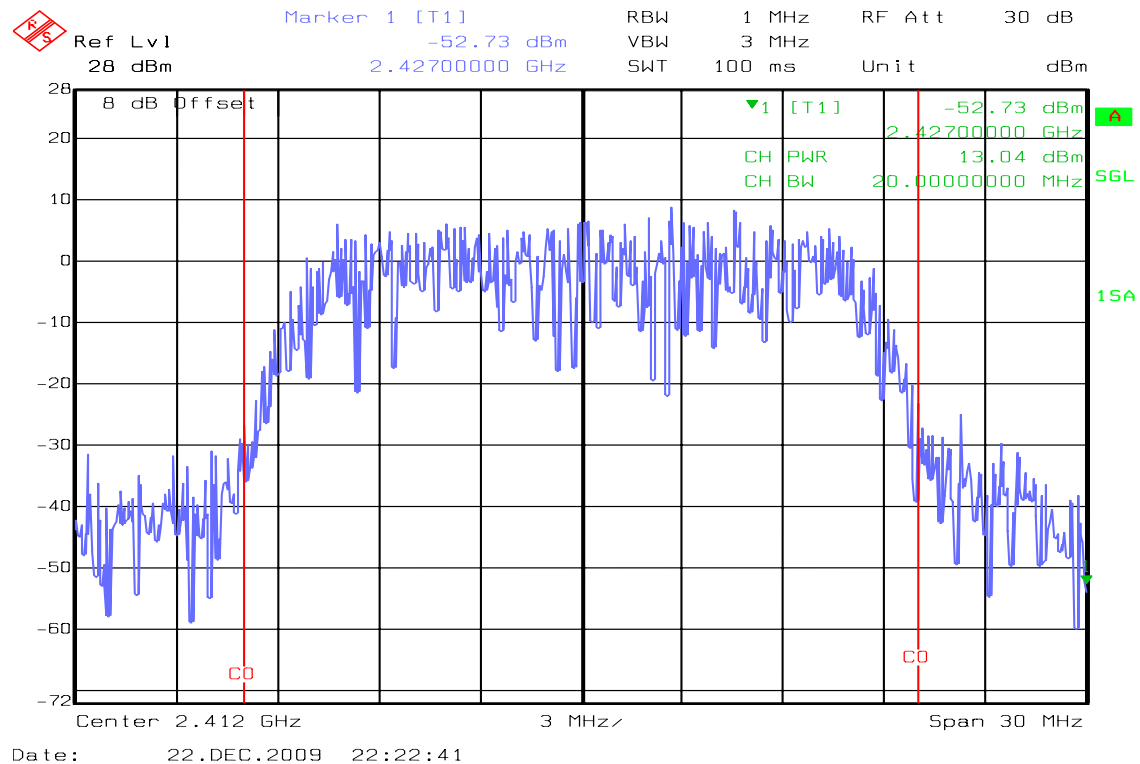


Average power (CH High)



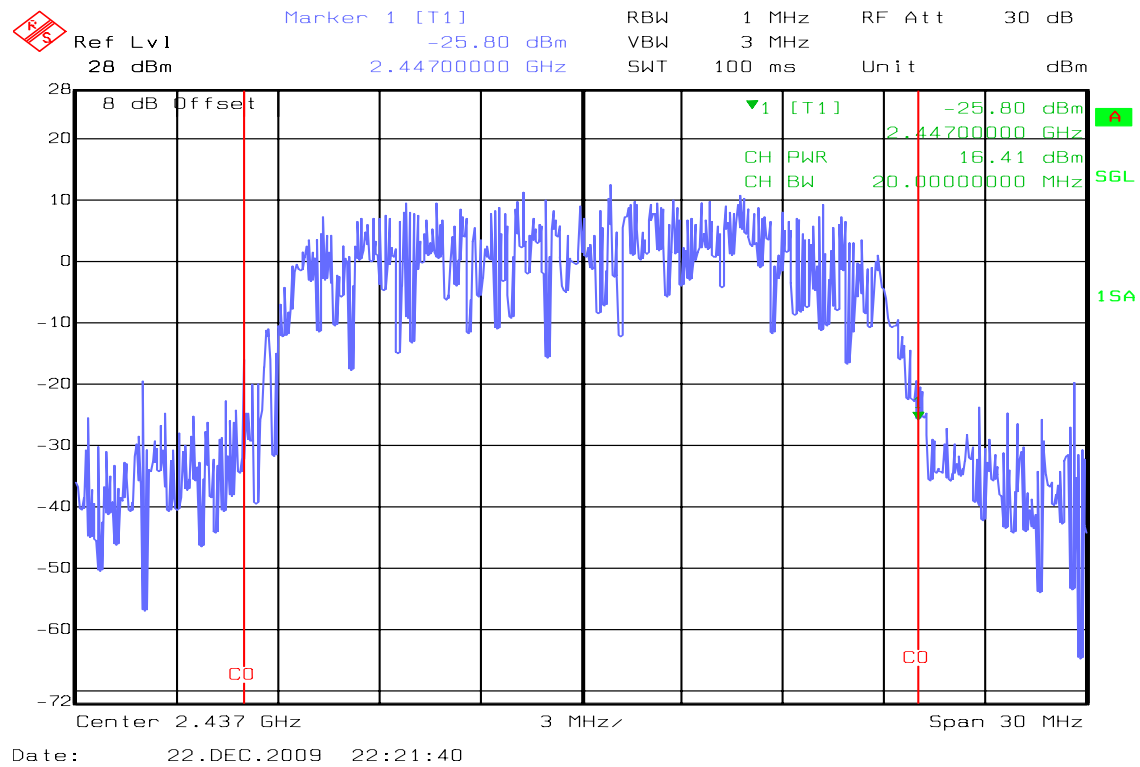
IEEE 802.11g mode

Average power (CH Low)

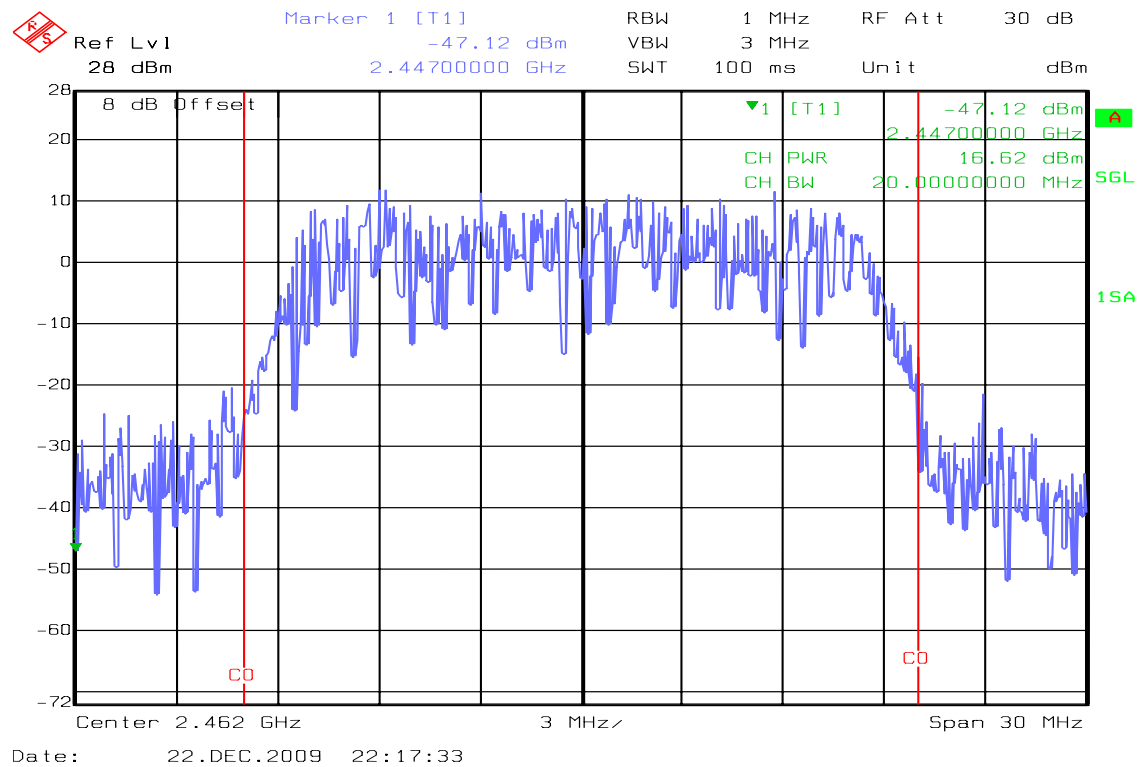




Average power (CH Mid)



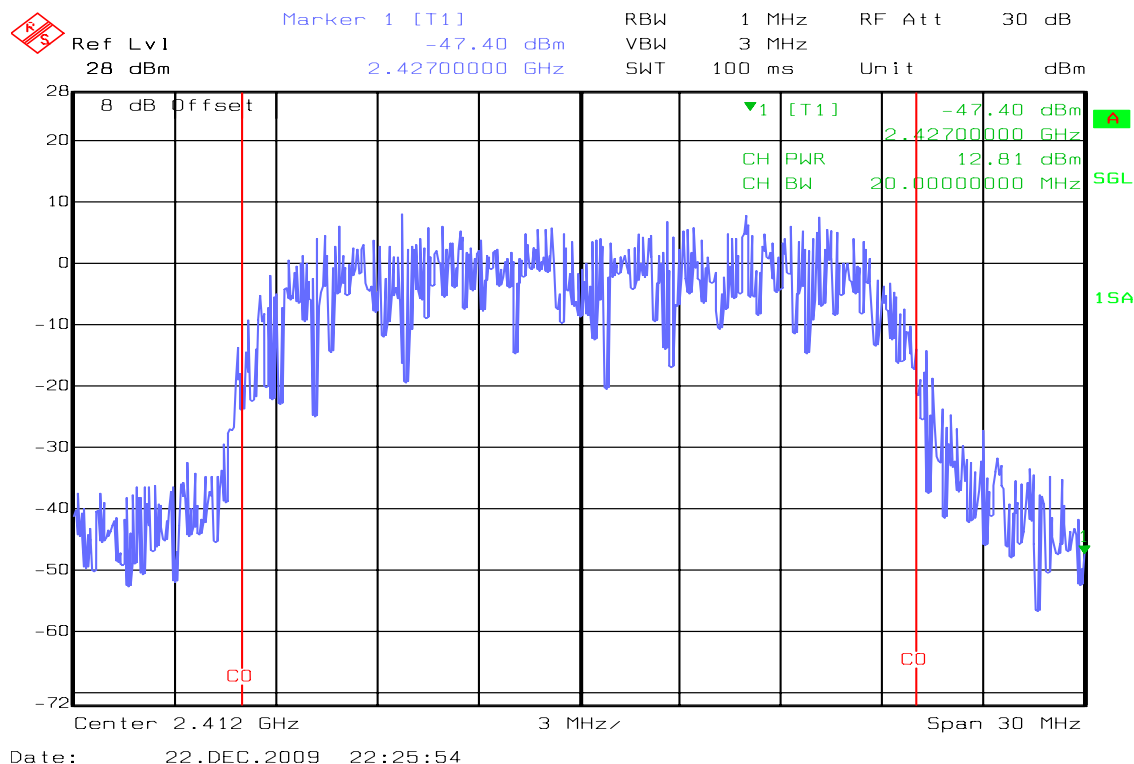
Average power (CH High)



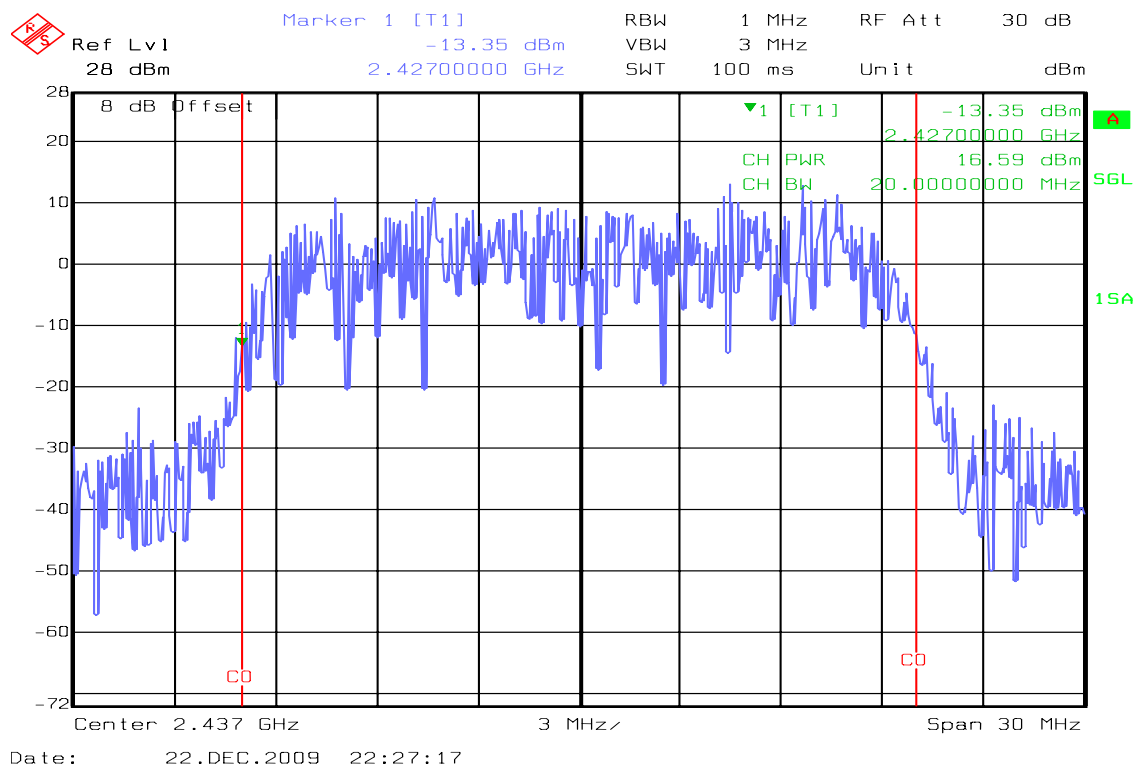


draft 802.11n 20 MHz Channel mode

Average power (CH Low)

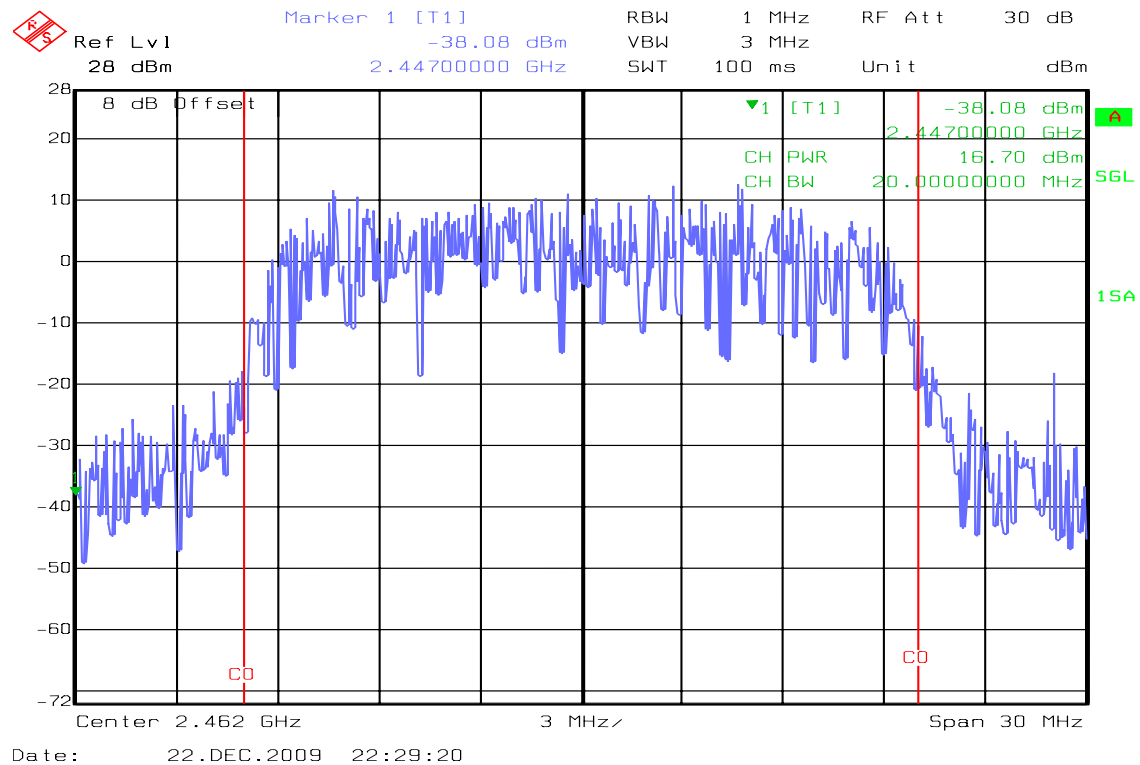


Average power (CH Mid)



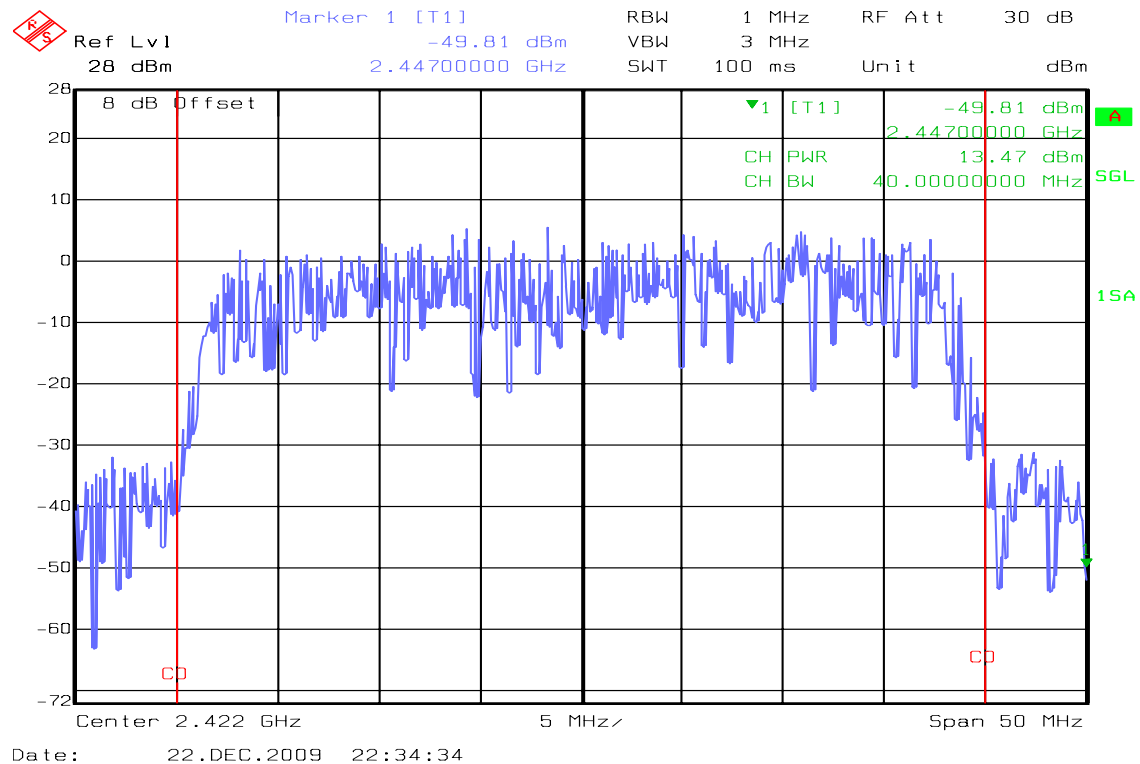


Average power (CH High)



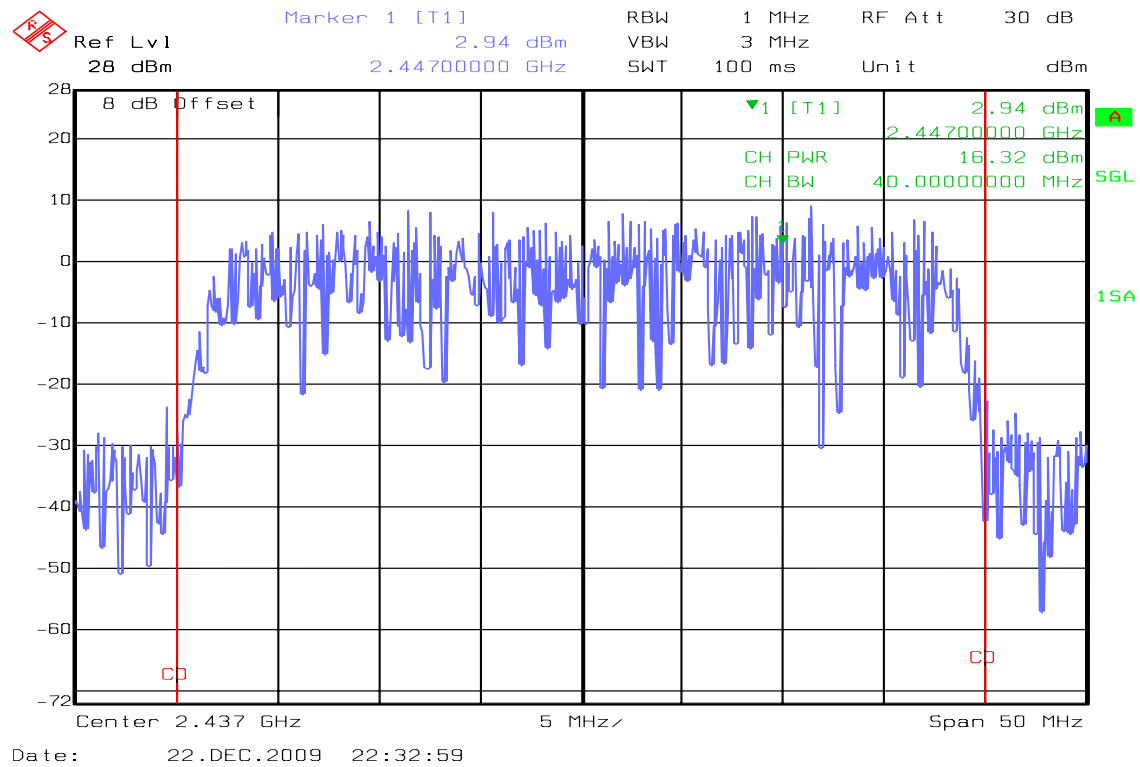
draft 802.11n 40 MHz Channel mode

Average power (CH Low)

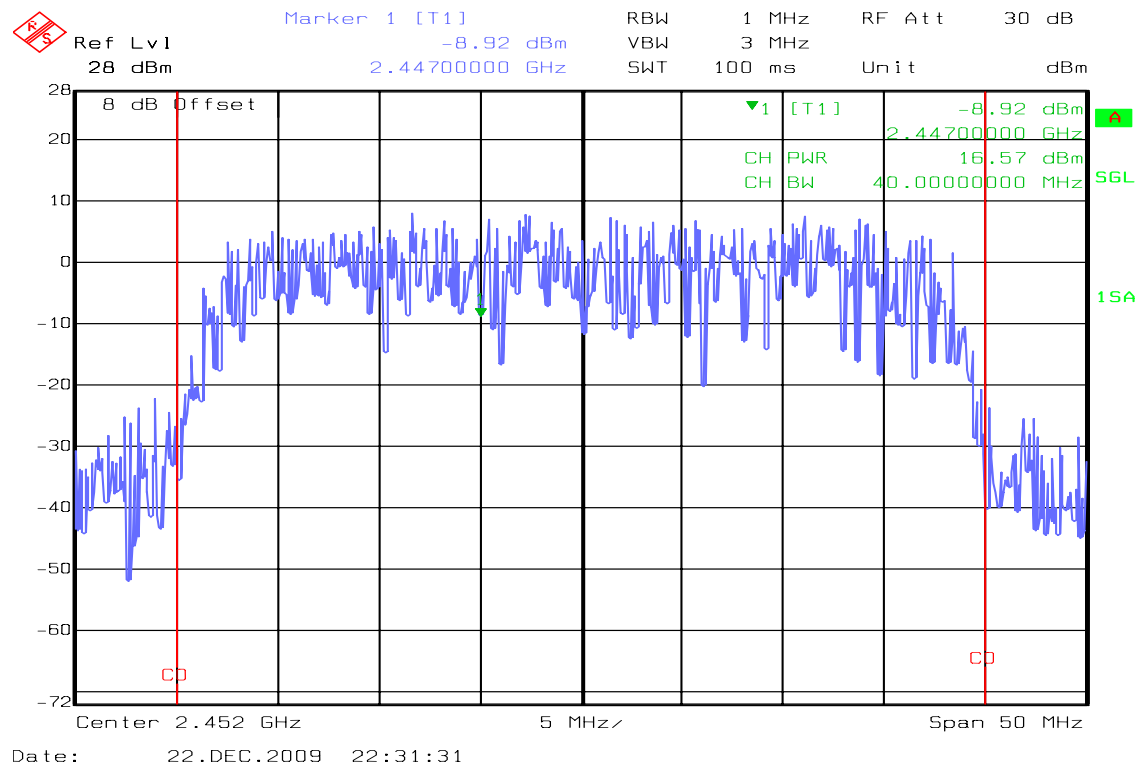




Average power (CH Mid)



Average power (CH High)

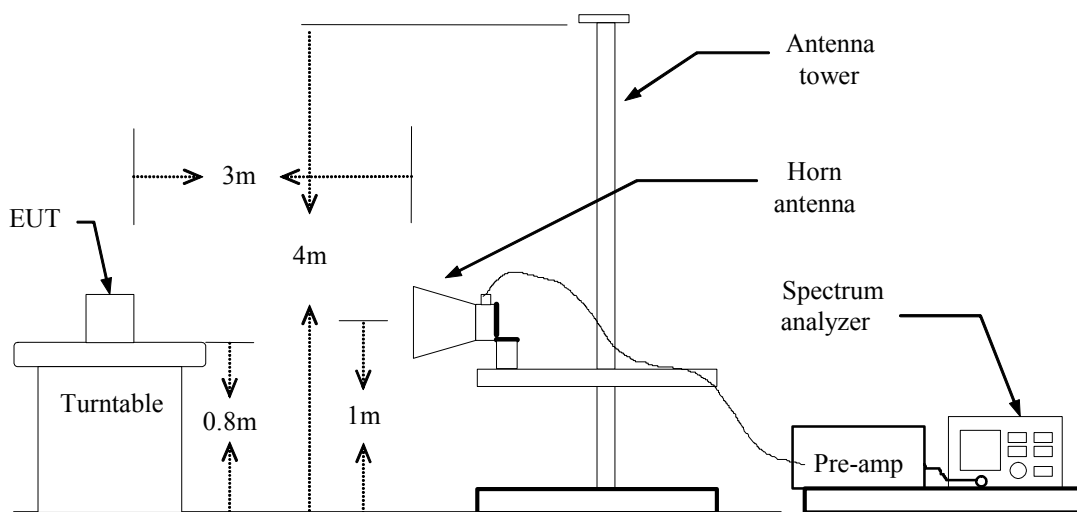


7.4 BAND EDGES MEASUREMENT

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

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

TEST RESULTS

Refer to attach spectrum analyzer data chart.



Test Plot

Band Edges (IEEE 802.11b mode / CH Low)

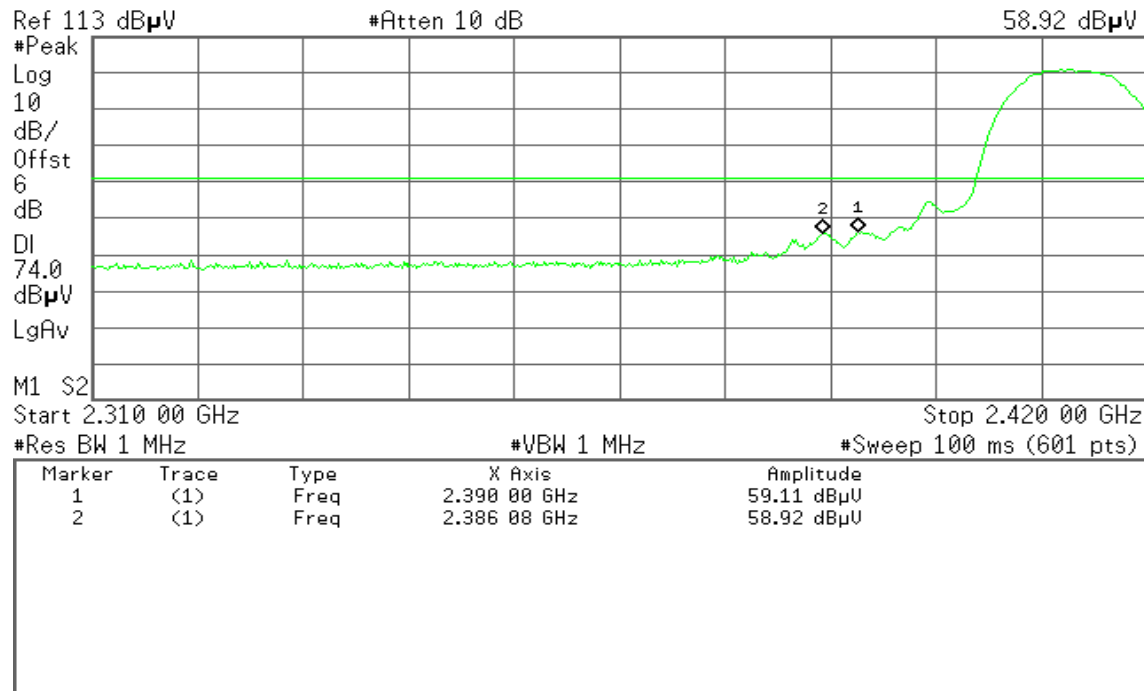
Detector mode: Peak

Polarity: Vertical

Agilent 10:04:41 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
58.92 dBμV



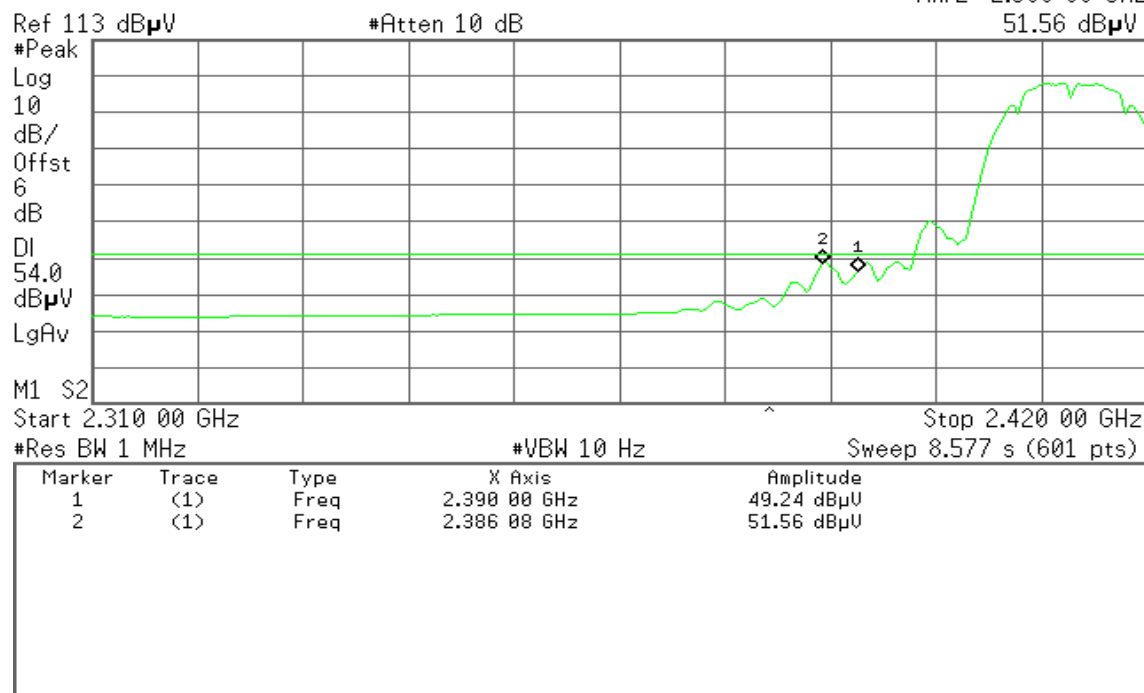
Detector mode: Average

Polarity: Vertical

Agilent 10:05:19 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
51.56 dBμV





Detector mode: Peak

Polarity: Horizontal

Agilent 10:08:34 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
59.23 dB μ V

Ref 113 dB μ V

#Atten 10 dB

#Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V

LgAv

M1 S2

Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	59.43 dB μ V
2	(1)	Freq	2.386 08 GHz	59.23 dB μ V

Detector mode: Average

Polarity: Horizontal

Agilent 10:09:14 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
52.25 dB μ V

Ref 113 dB μ V

#Atten 10 dB

#Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V

LgAv

M1 S2

Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	49.87 dB μ V
2	(1)	Freq	2.386 08 GHz	52.25 dB μ V



Band Edges (IEEE 802.11b mode / CH High)

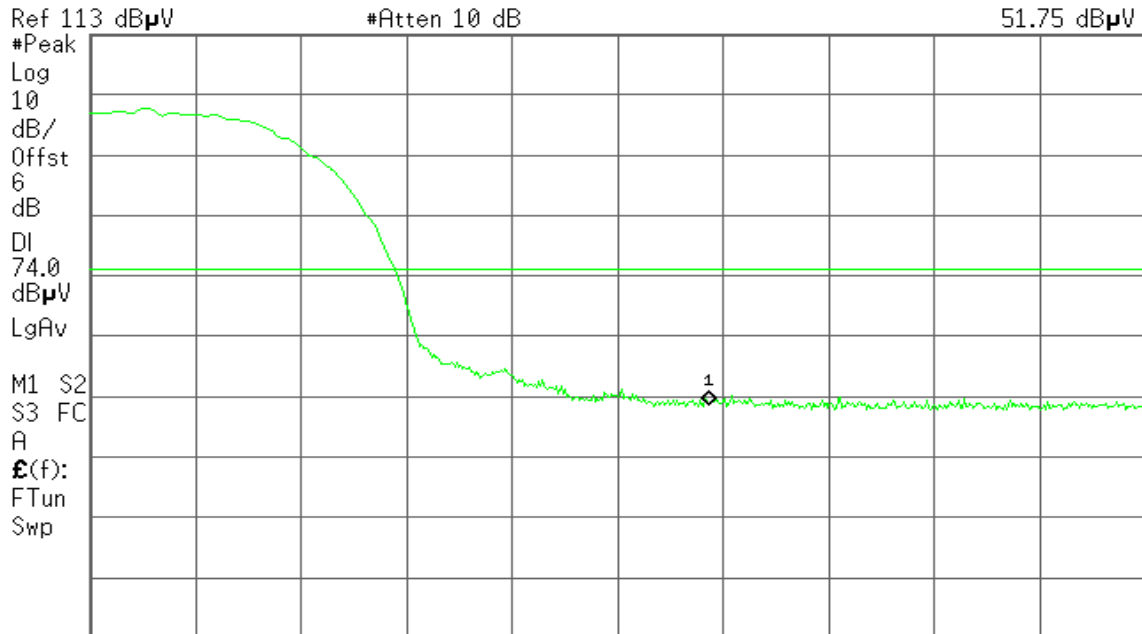
Detector mode: Peak

Polarity: Vertical

Agilent 10:18:59 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
51.75 dBμV



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

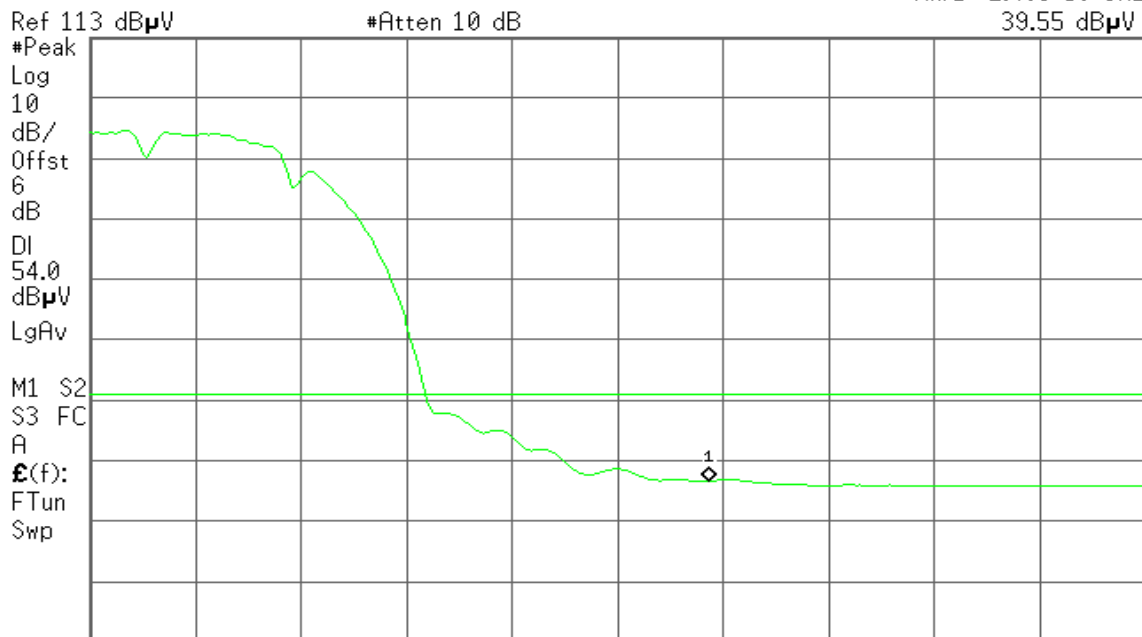
Detector mode: Average

Polarity: Vertical

Agilent 10:19:27 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
39.55 dBμV



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



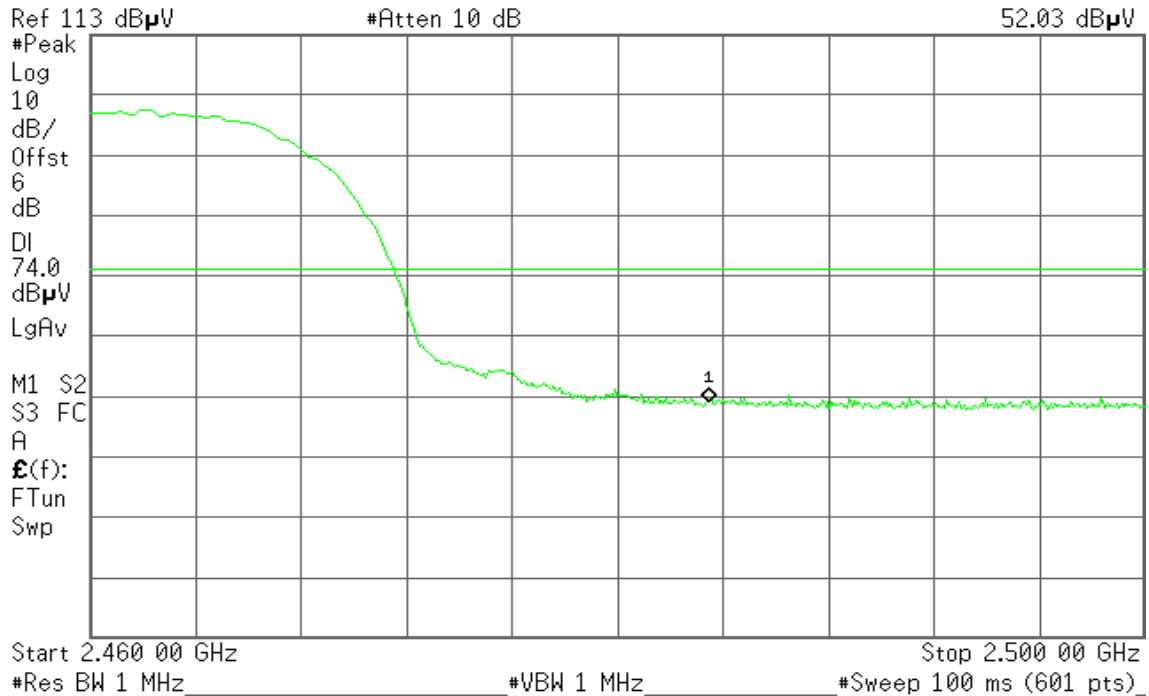
Detector mode: Peak

Polarity: Horizontal

Agilent 10:14:41 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
52.03 dB μ V



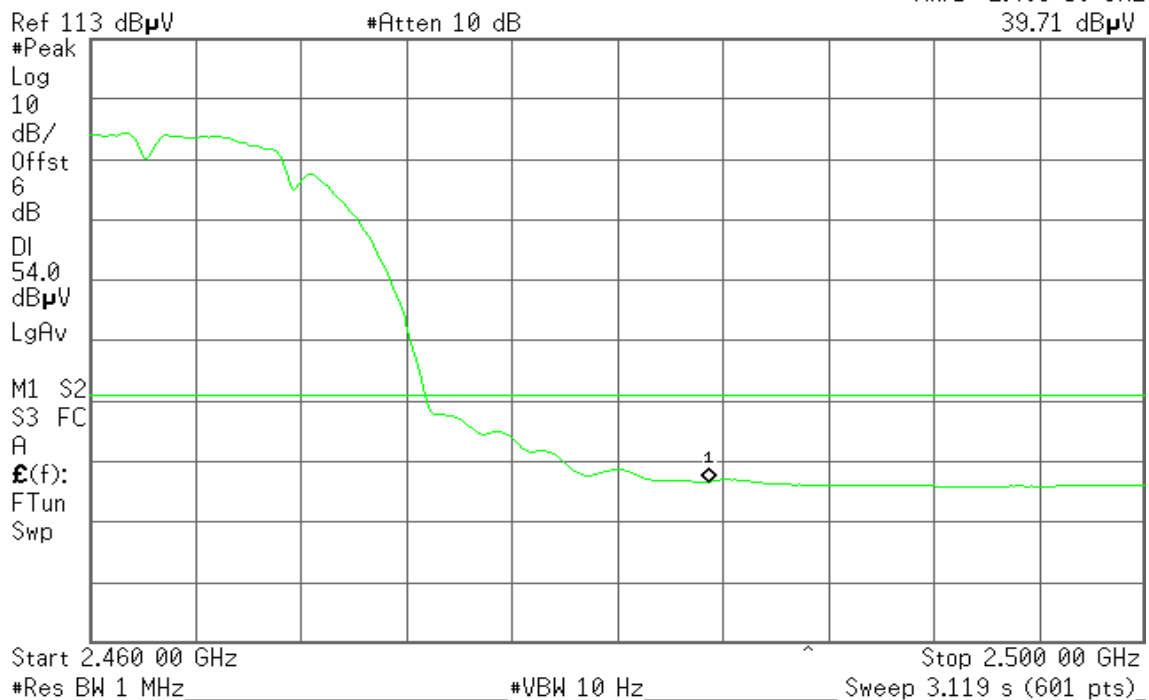
Detector mode: Average

Polarity: Horizontal

Agilent 10:15:09 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
39.71 dB μ V





Band Edges (IEEE 802.11g mode / CH Low)

Detector mode: Peak

Polarity: Vertical

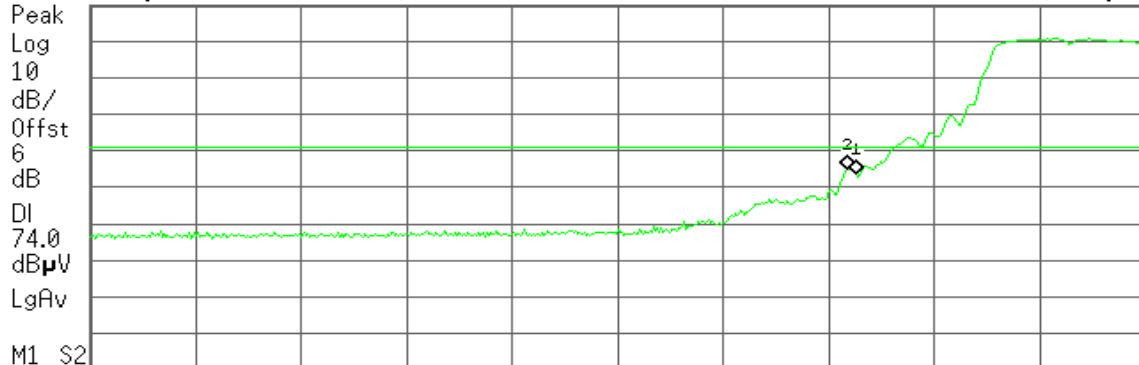
Agilent 09:59:51 Dec 17, 2009

R T

Mkr2 2.389 02 GHz
67.84 dBμV

Ref 113 dBμV

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	66.72 dBμV
2	(1)	Freq	2.389 02 GHz	67.84 dBμV

Detector mode: Average

Polarity: Vertical

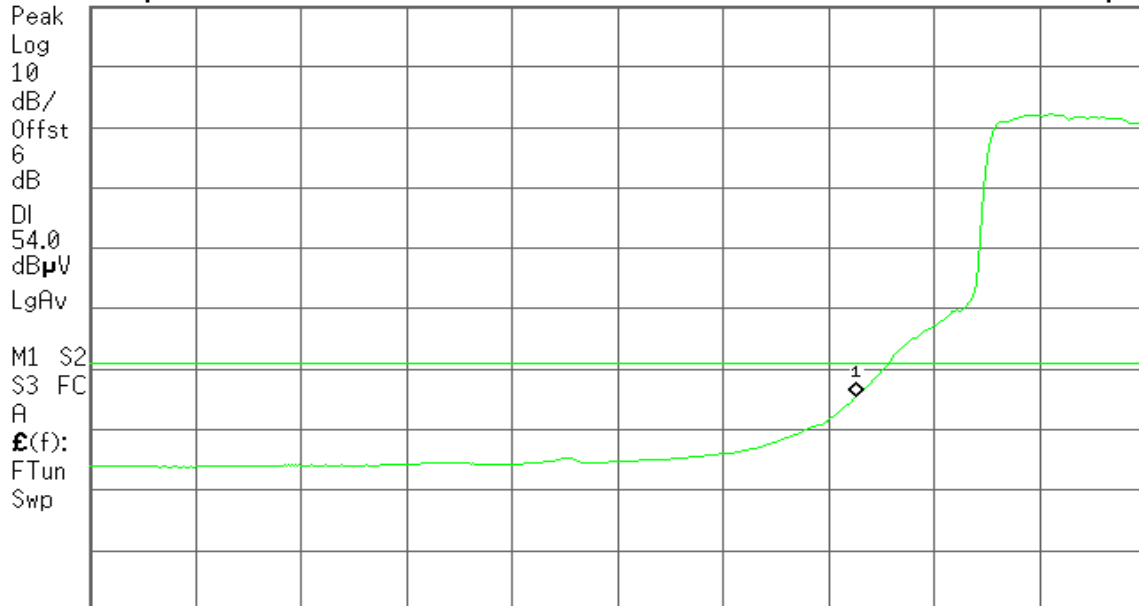
Agilent 10:00:39 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
48.52 dBμV

Ref 113 dBμV

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

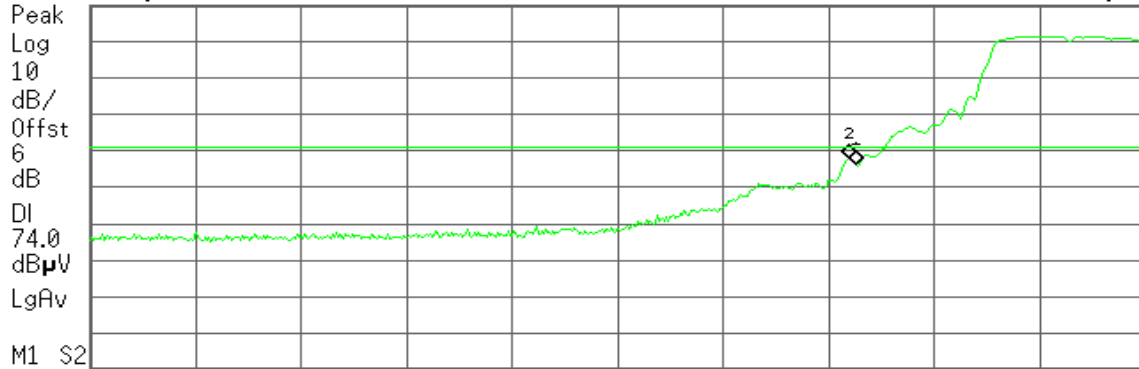
Agilent 09:55:43 Dec 17, 2009

R T

Mkr2 2.389 20 GHz
70.98 dBμV

Ref 113 dBμV

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	69.07 dBμV
2	(1)	Freq	2.389 20 GHz	70.98 dBμV

Detector mode: Average

Polarity: Horizontal

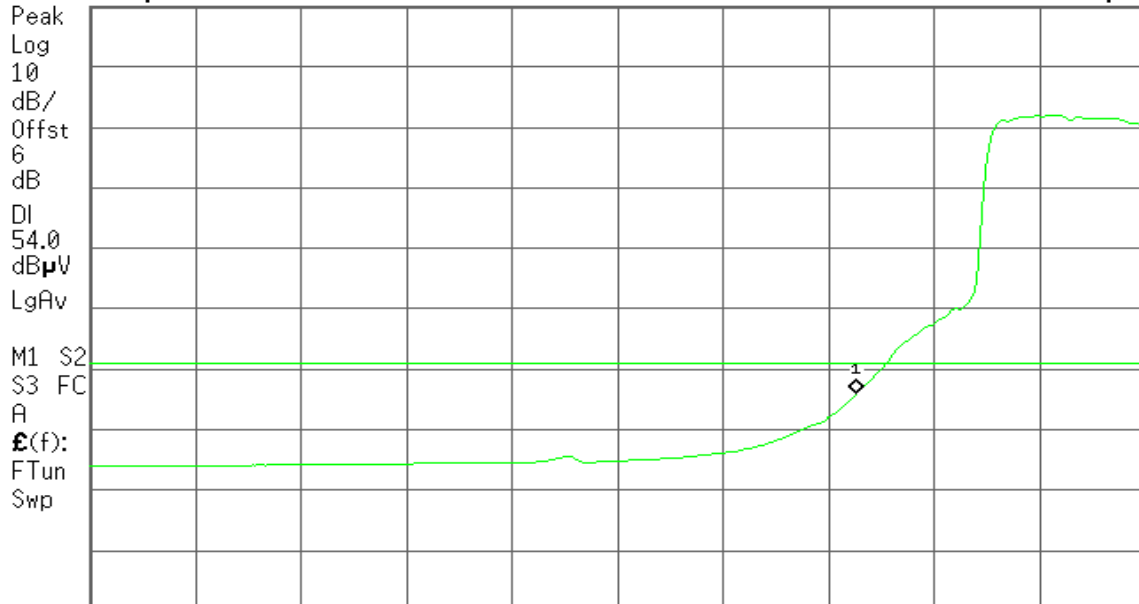
Agilent 09:56:48 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
48.93 dBμV

Ref 113 dBμV

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)



Band Edges (IEEE 802.11g mode / CH High)

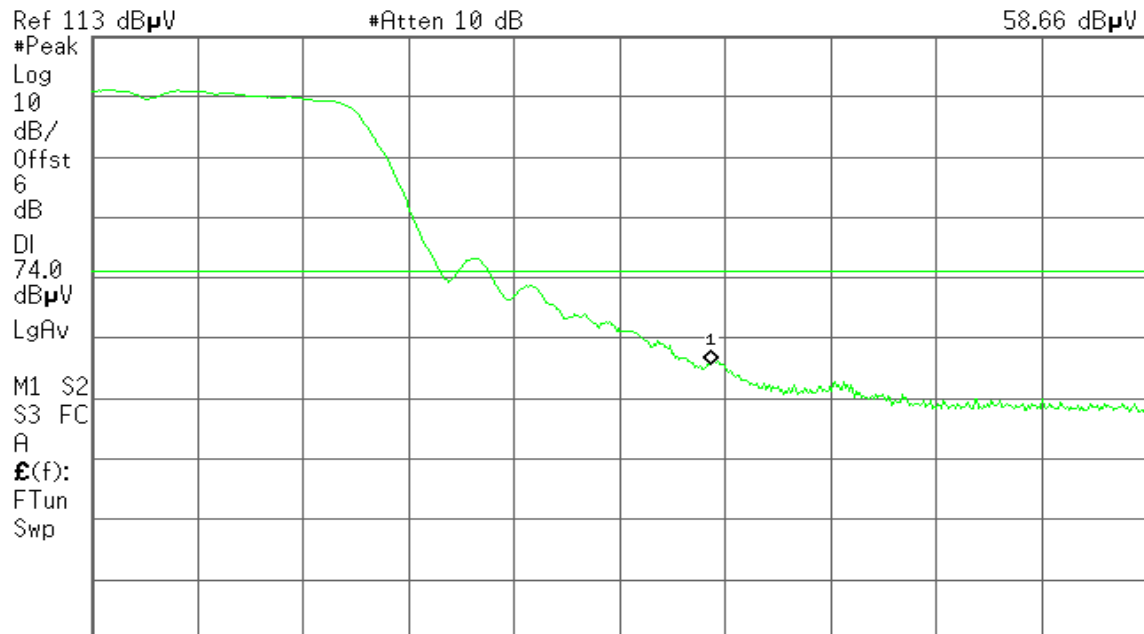
Detector mode: Peak

Polarity: Vertical

Agilent 10:23:54 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
58.66 dB μ V



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

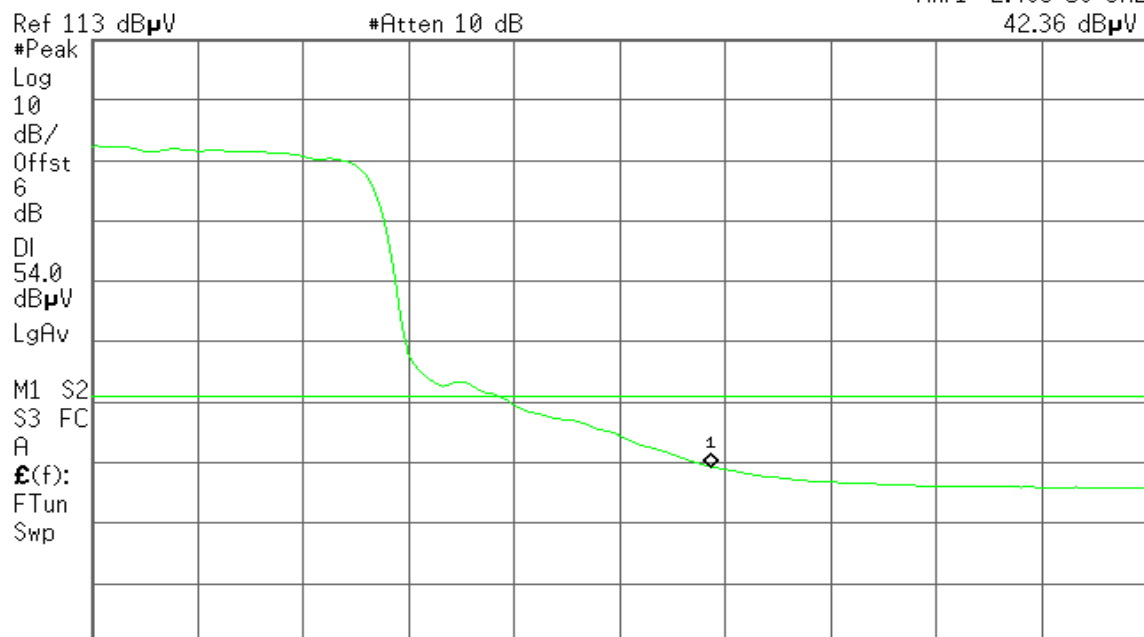
Detector mode: Average

Polarity: Vertical

Agilent 10:24:24 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
42.36 dB μ V



#Res BW 1 MHz #VBW 10 Hz Sweep 3.119 s (601 pts)



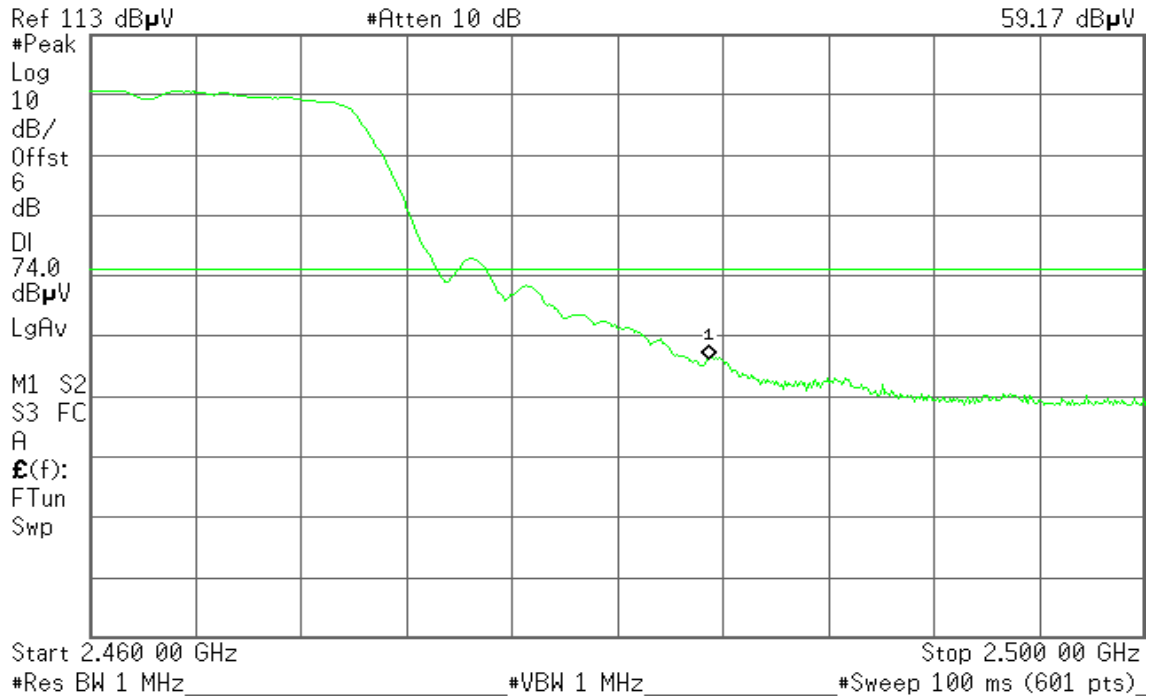
Detector mode: Peak

Polarity: Horizontal

Agilent 10:29:31 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
59.17 dB μ V



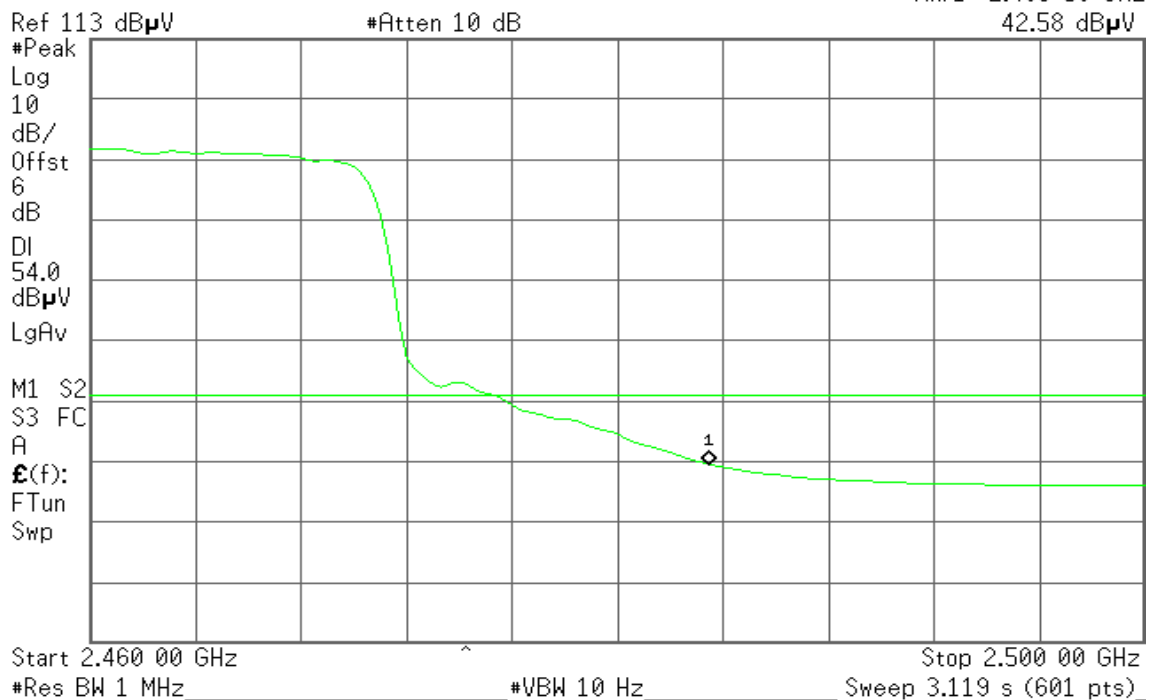
Detector mode: Average

Polarity: Horizontal

Agilent 10:30:34 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
42.58 dB μ V





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

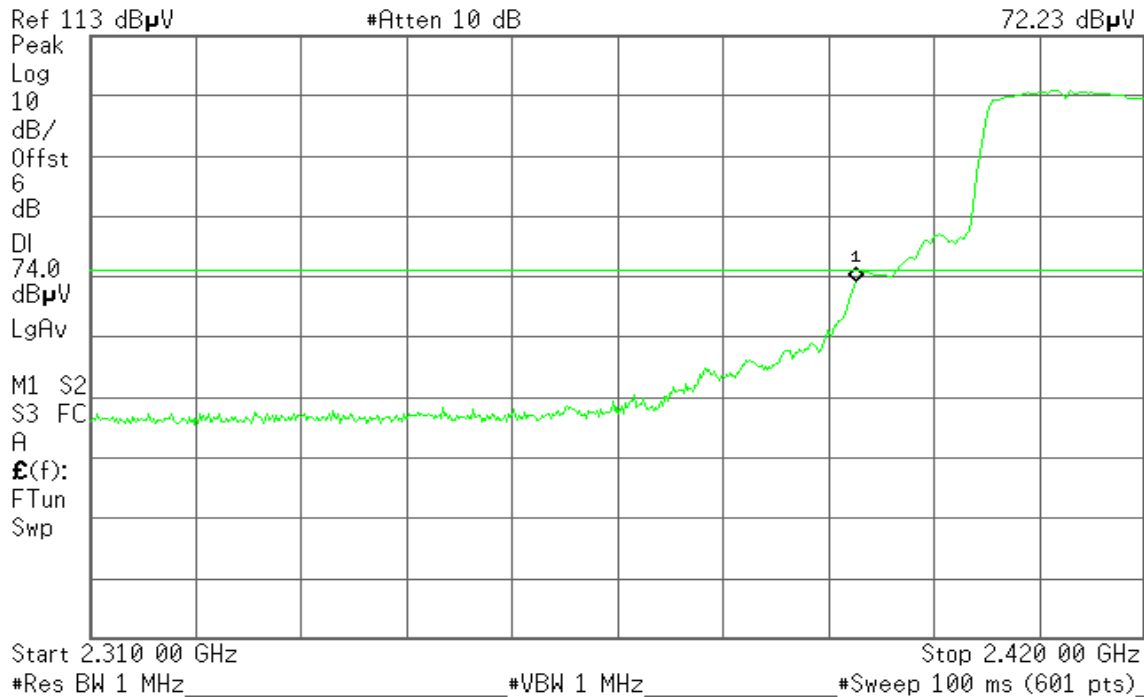
Detector mode: Peak

Polarity: Vertical

Agilent 09:44:19 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
72.23 dB μ V



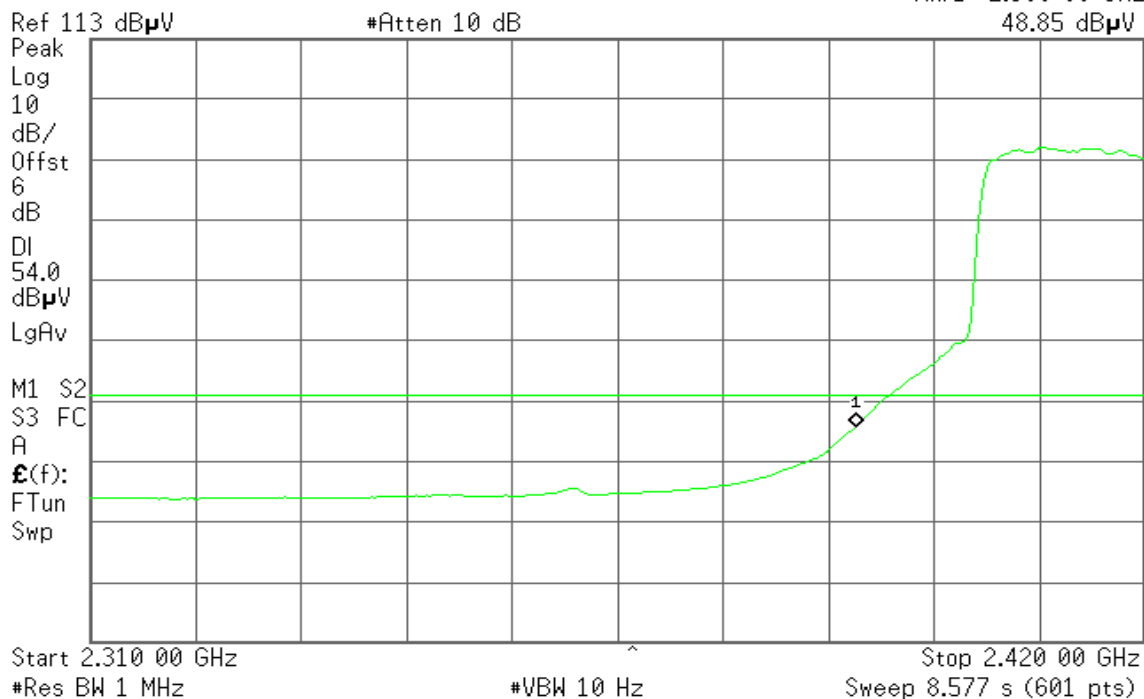
Detector mode: Average

Polarity: Vertical

Agilent 09:45:24 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
48.85 dB μ V





Detector mode: Peak

Polarity: Horizontal

Agilent 09:48:05 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
72.82 dB μ V

Ref 113 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

6

dB

DI

74.0

dB μ V

LgAv

M1 S2

S3 FC

A

$\mathcal{E}(f)$:

FTun

Swp

Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent 09:48:43 Dec 17, 2009

R T

Mkr1 2.390 00 GHz
49.38 dB μ V

Ref 113 dB μ V

#Atten 10 dB

Peak

Log

10

dB/

Offst

6

dB

DI

54.0

dB μ V

LgAv

M1 S2

S3 FC

A

$\mathcal{E}(f)$:

FTun

Swp

Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)



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

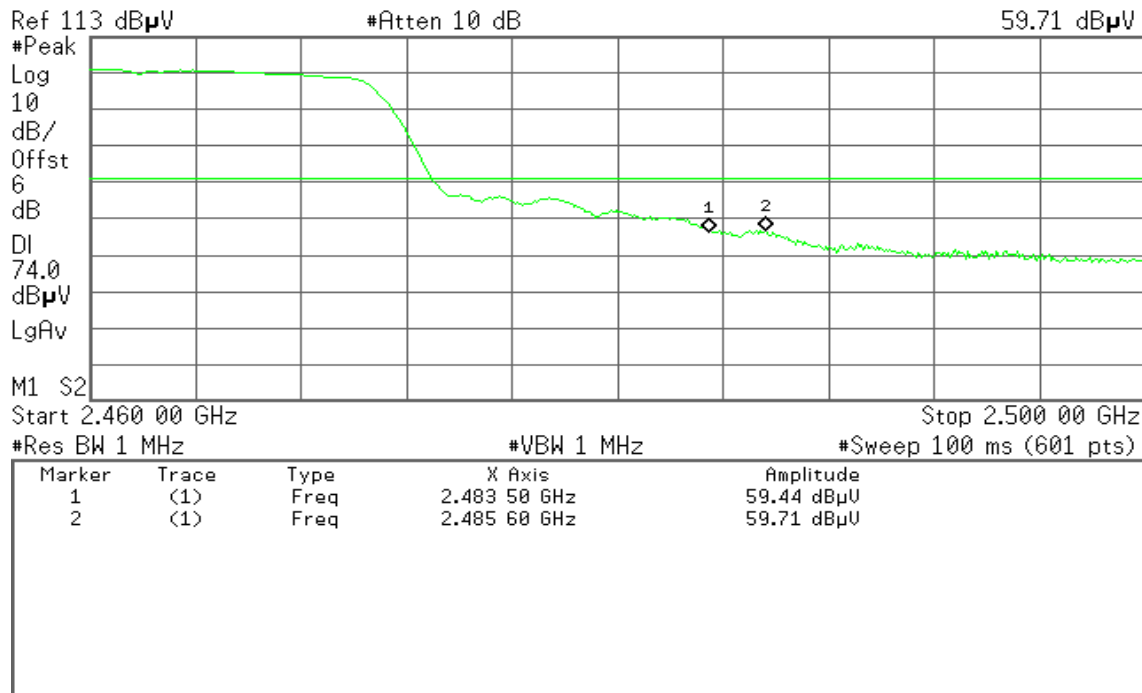
Detector mode: Peak

Polarity: Vertical

Agilent 10:36:17 Dec 17, 2009

R T

Mkr2 2.485 60 GHz
59.71 dBμV



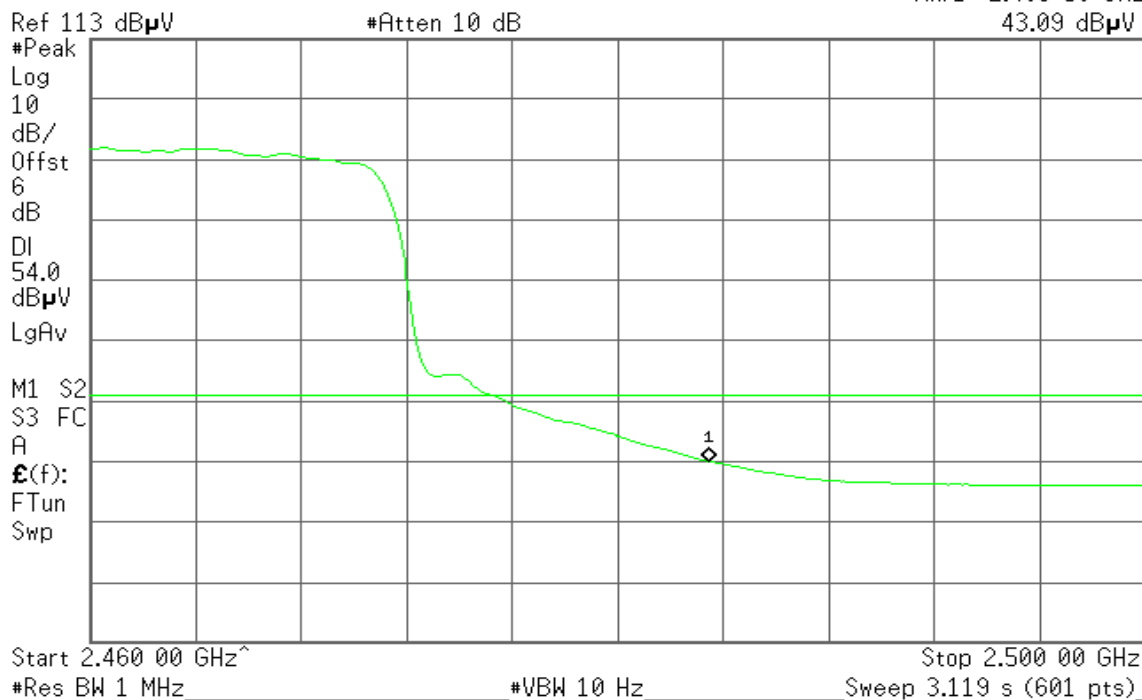
Detector mode: Average

Polarity: Vertical

Agilent 10:37:07 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
43.09 dBμV





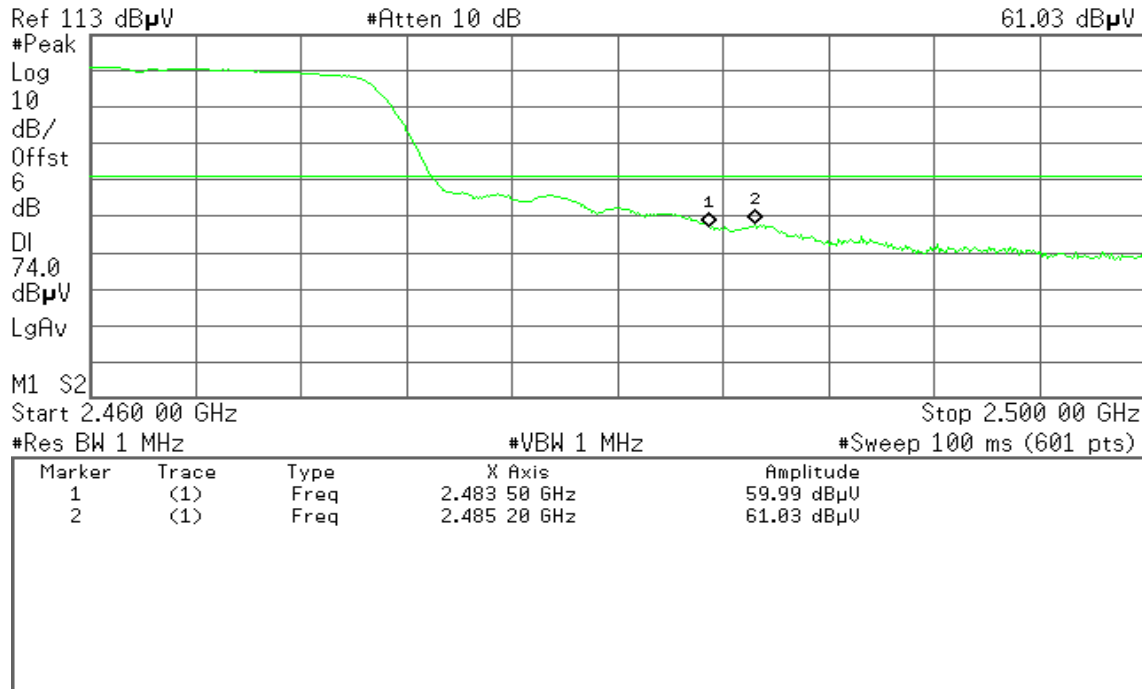
Detector mode: Peak

Polarity: Horizontal

Agilent 10:33:26 Dec 17, 2009

R T

Mkr2 2.485 20 GHz
61.03 dBμV



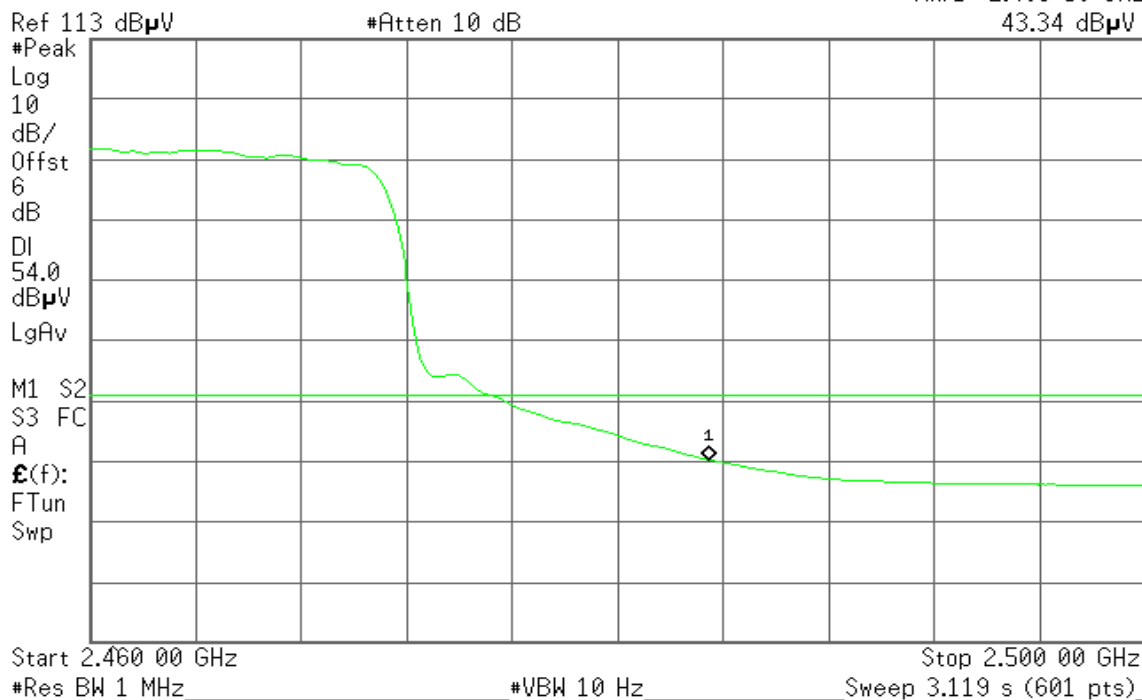
Detector mode: Average

Polarity: Horizontal

Agilent 10:34:15 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
43.34 dBμV





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

Detector mode: Peak

Polarity: Vertical

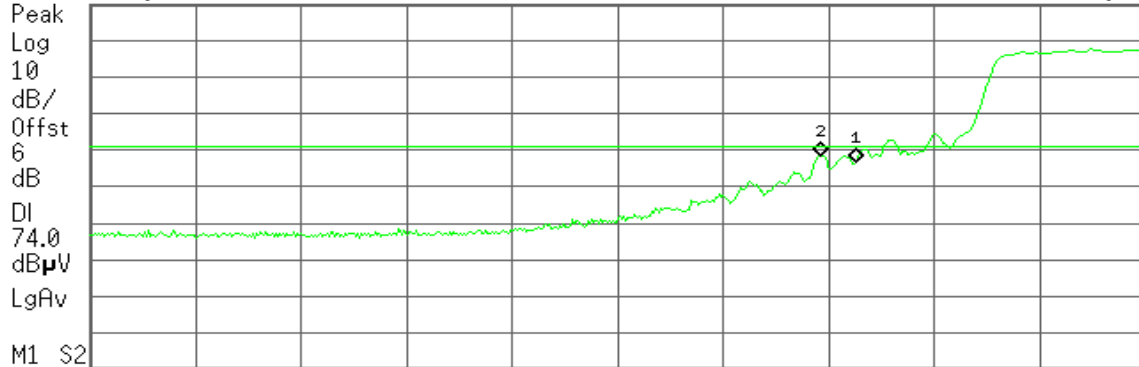
Agilent 09:37:09 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
71.63 dB μ V

Ref 113 dB μ V

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	69.55 dB μ V
2	(1)	Freq	2.386 08 GHz	71.63 dB μ V

Detector mode: Average

Polarity: Vertical

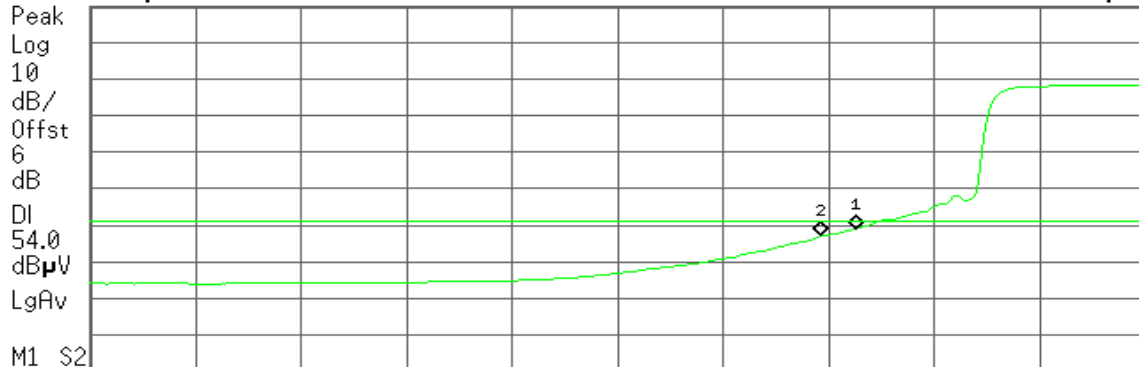
Agilent 09:37:46 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
50.01 dB μ V

Ref 113 dB μ V

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	52.07 dB μ V
2	(1)	Freq	2.386 08 GHz	50.01 dB μ V



Detector mode: Peak

Polarity: Horizontal

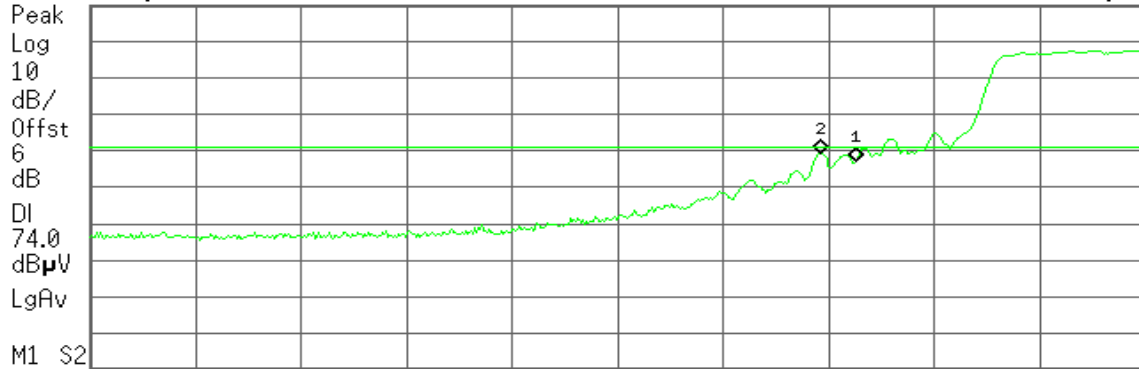
Agilent 09:33:19 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
72.20 dB μ V

Ref 113 dB μ V

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	69.97 dB μ V
2	(1)	Freq	2.386 08 GHz	72.20 dB μ V

Detector mode: Average

Polarity: Horizontal

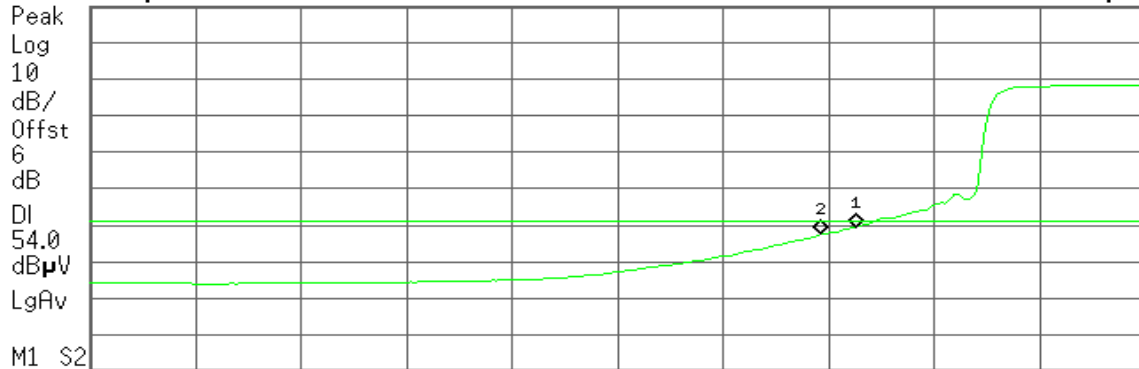
Agilent 09:34:10 Dec 17, 2009

R T

Mkr2 2.386 08 GHz
50.57 dB μ V

Ref 113 dB μ V

#Atten 10 dB



Start 2.310 00 GHz

Stop 2.420 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.390 00 GHz	52.53 dB μ V
2	(1)	Freq	2.386 08 GHz	50.57 dB μ V



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

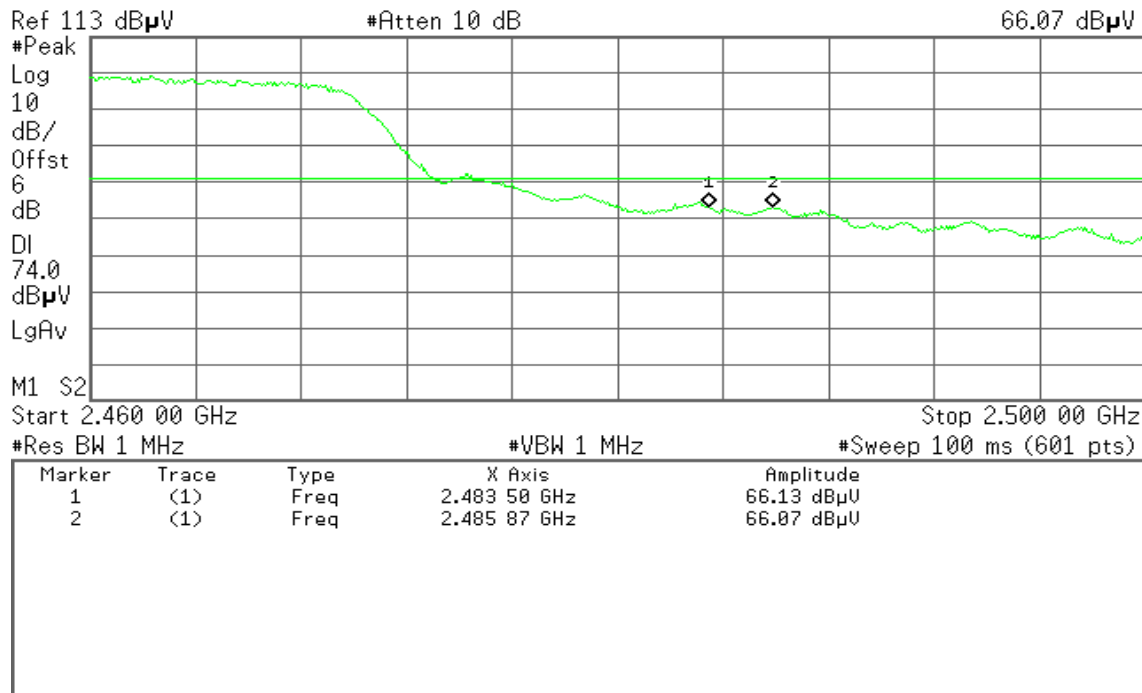
Detector mode: Peak

Polarity: Vertical

Agilent 10:40:13 Dec 17, 2009

R T

Mkr2 2.485 87 GHz
66.07 dBμV



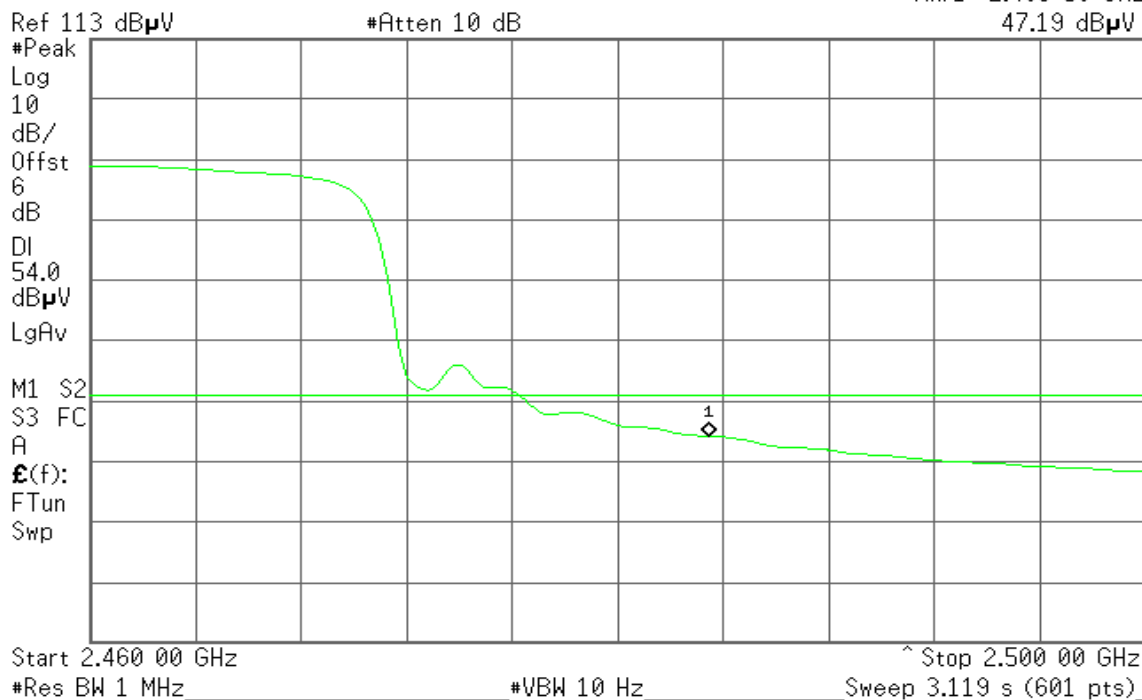
Detector mode: Average

Polarity: Vertical

Agilent 10:41:34 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
47.19 dBμV





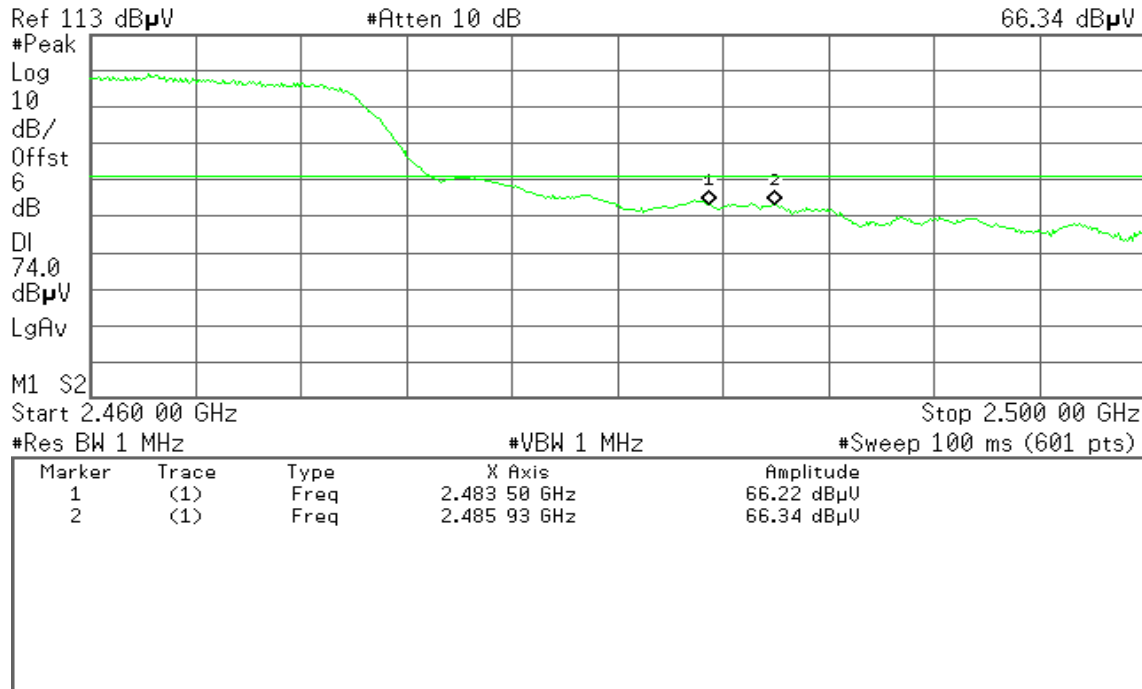
Detector mode: Peak

Polarity: Horizontal

Agilent 10:44:22 Dec 17, 2009

R T

Mkr2 2.485 93 GHz
66.34 dBμV



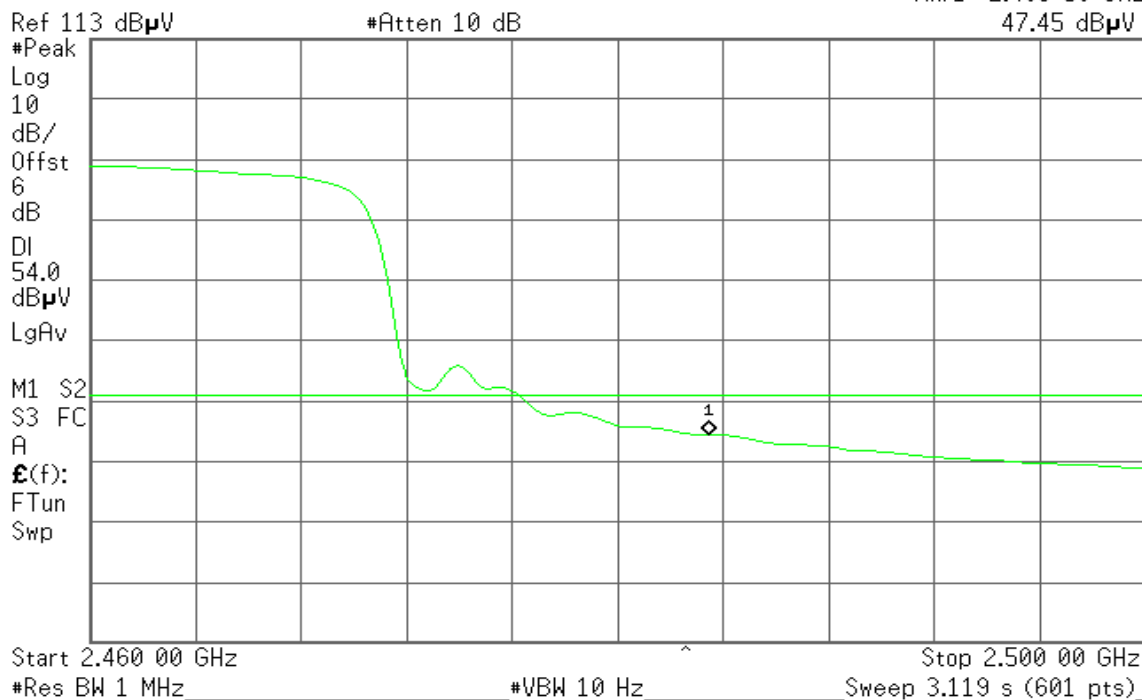
Detector mode: Average

Polarity: Horizontal

Agilent 10:45:10 Dec 17, 2009

R T

Mkr1 2.483 50 GHz
47.45 dBμV



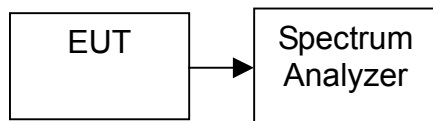


7.5 PEAK POWER SPECTRAL DENSITY

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

TEST RESULTS

No non-compliance noted

**TEST DATA****Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-9.08	8.00	PASS
Mid	2437	-8.45		PASS
High	2462	-8.60		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-13.36	8.00	PASS
Mid	2437	-8.74		PASS
High	2462	-8.65		PASS

Test mode: draft 802.11n 20 MHz Channel mode

Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2412	-13.14	8.00	PASS
Mid	2437	-8.85		PASS
High	2462	-8.85		PASS

Test mode: draft 802.11n 40 MHz Channel mode

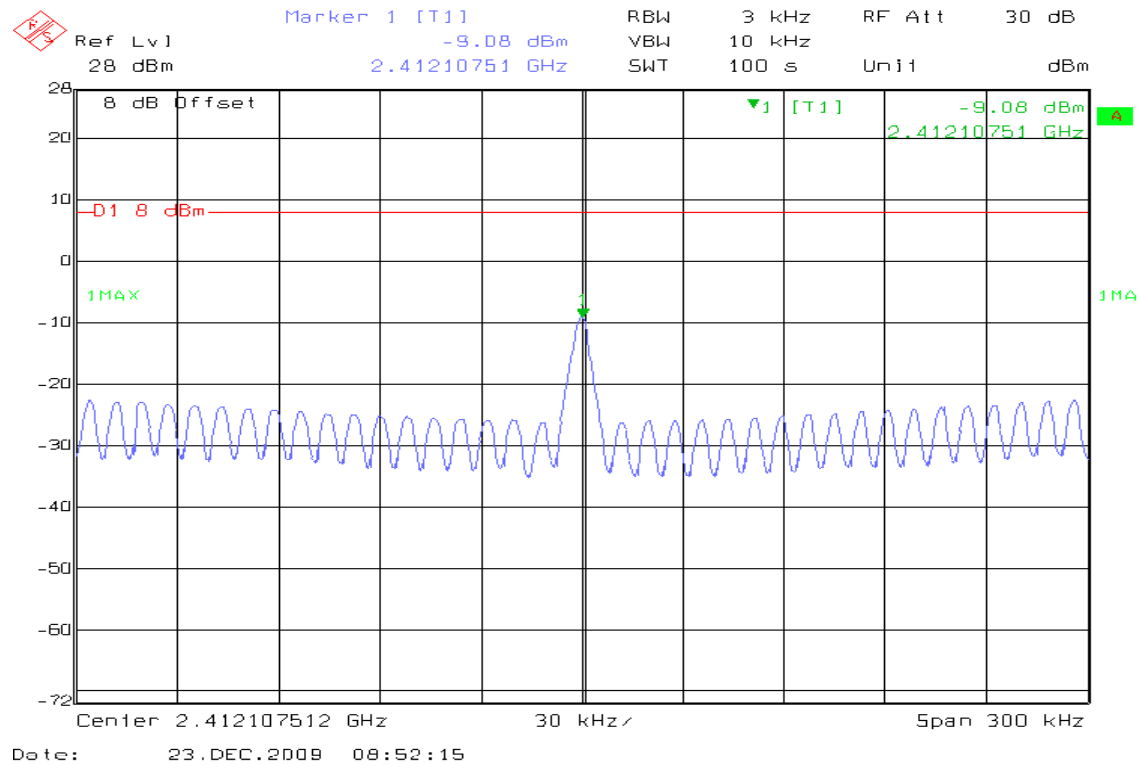
Channel	Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Result
Low	2422	-12.95	8.00	PASS
Mid	2437	-9.35		PASS
High	2452	-9.12		PASS



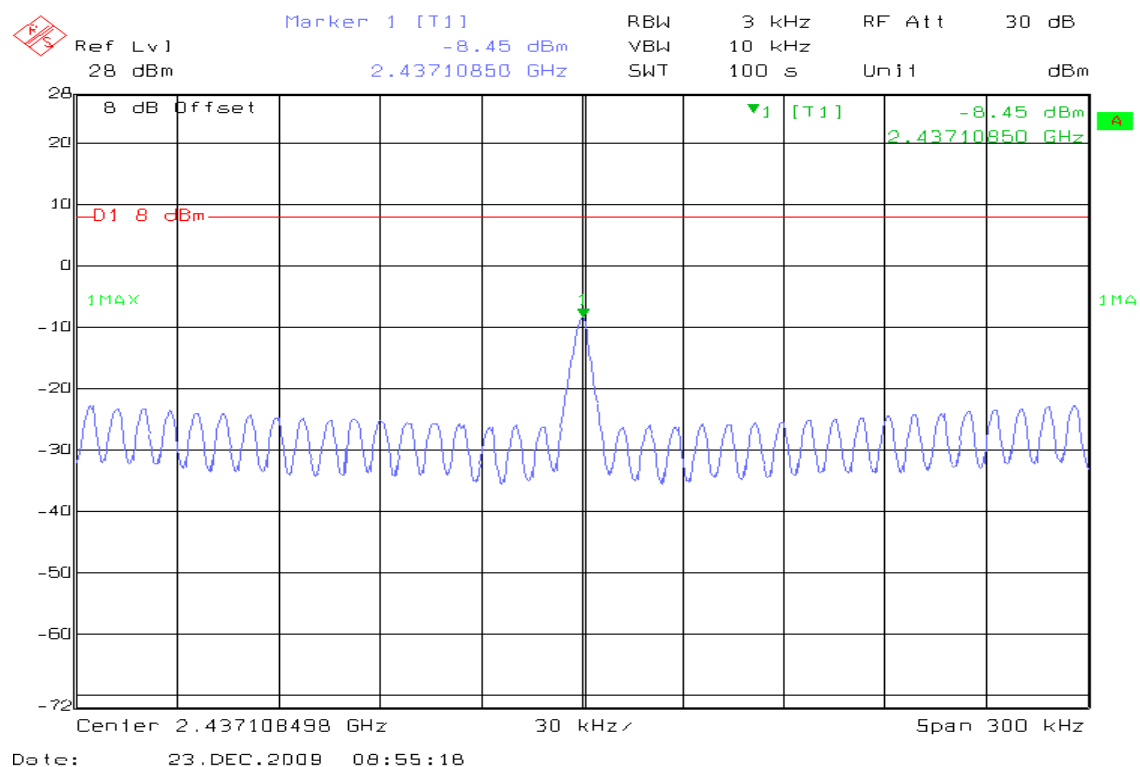
Test Plot

IEEE 802.11b mode

PPSD (CH Low)

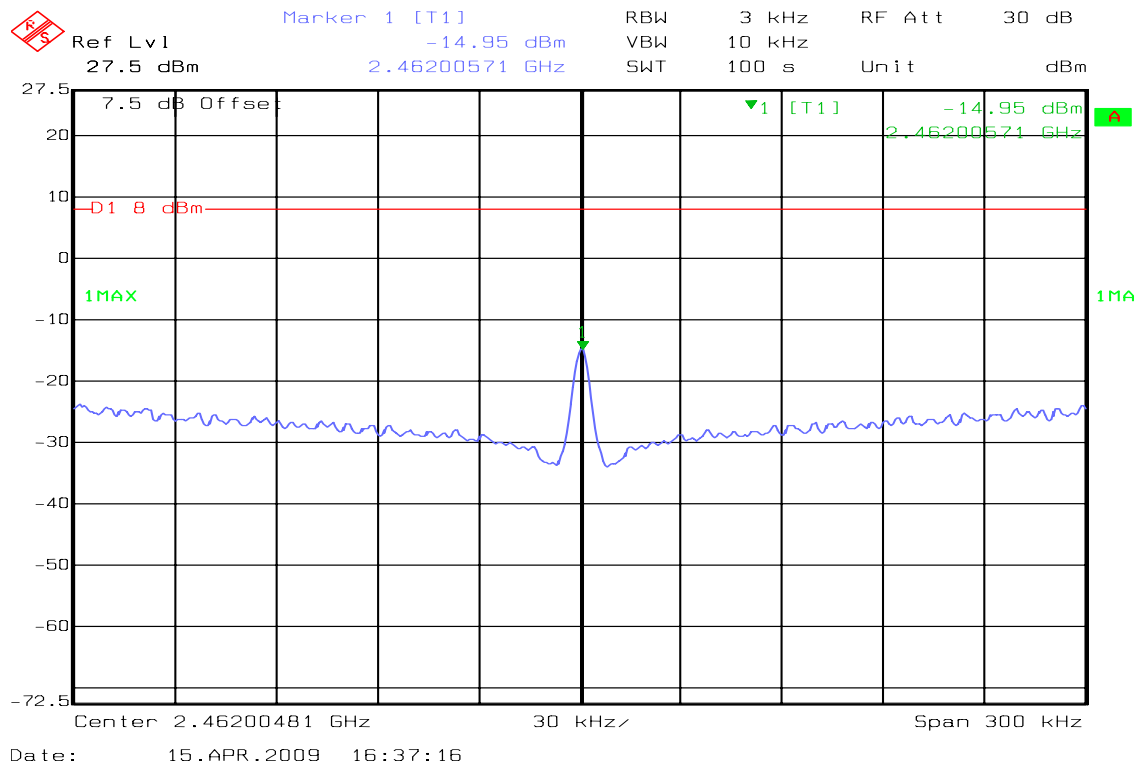


PPSD (CH Mid)



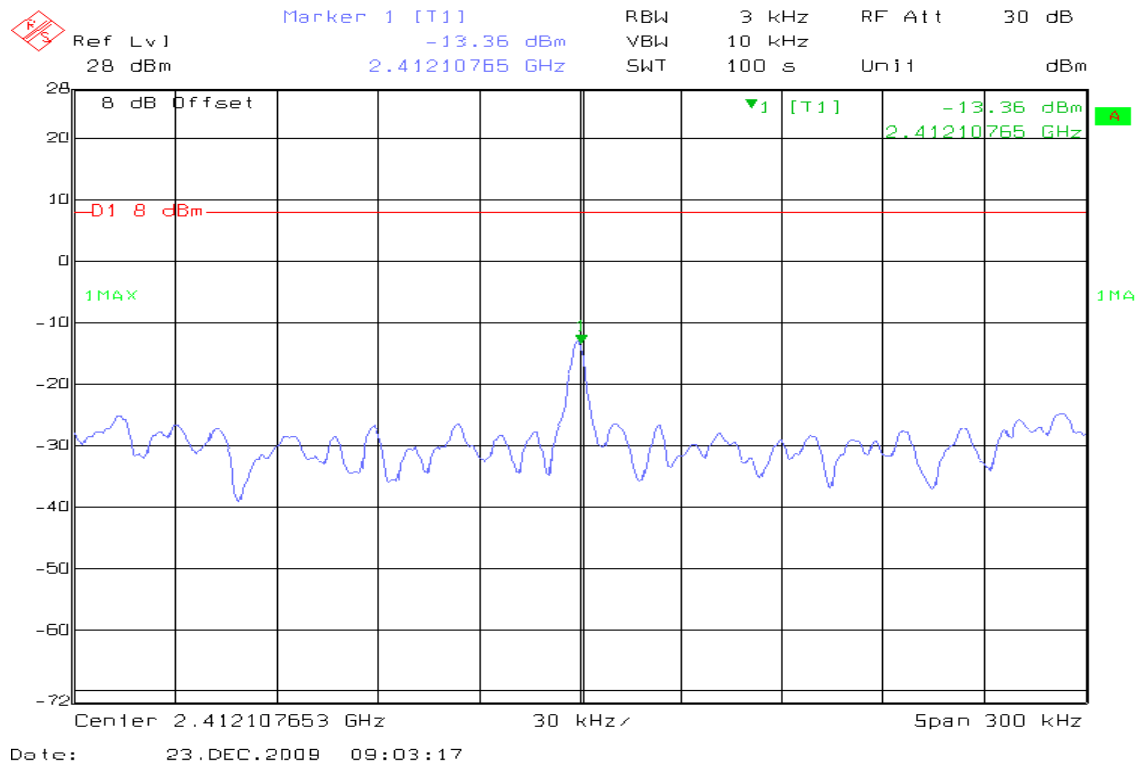


PPSD (CH High)



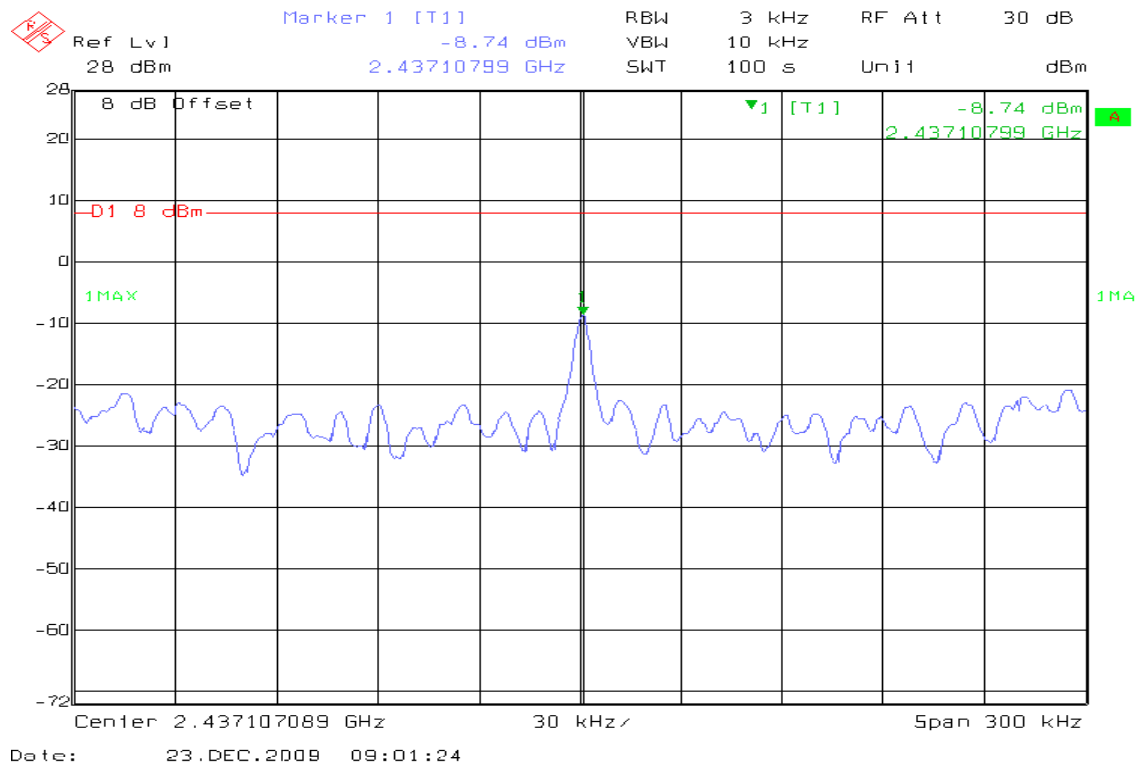
IEEE 802.11g mode

PPSD (CH Low)

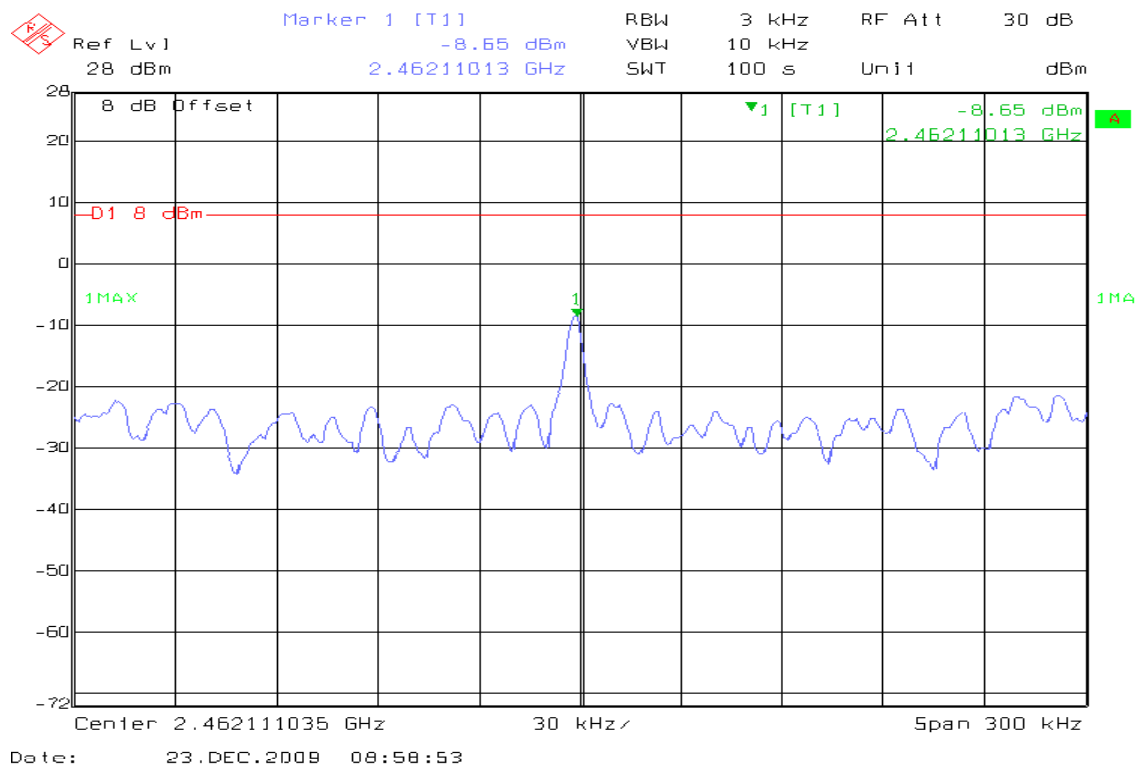




PPSD (CH Mid)



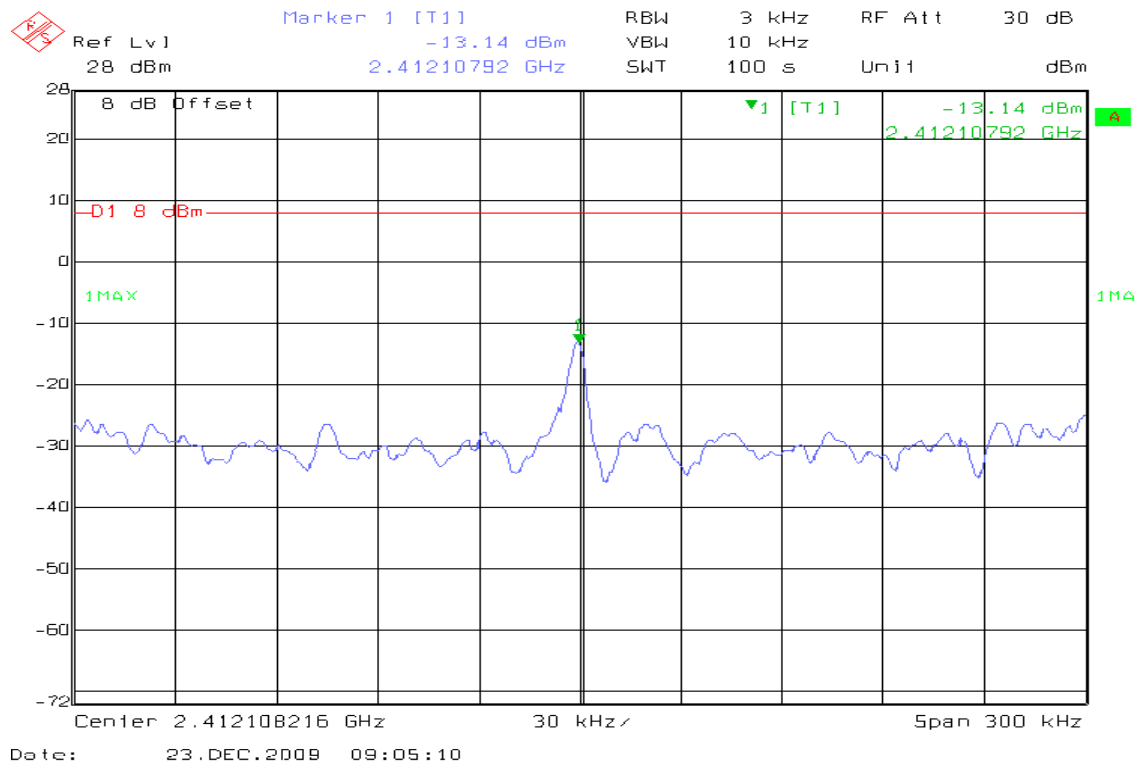
PPSD (CH High)



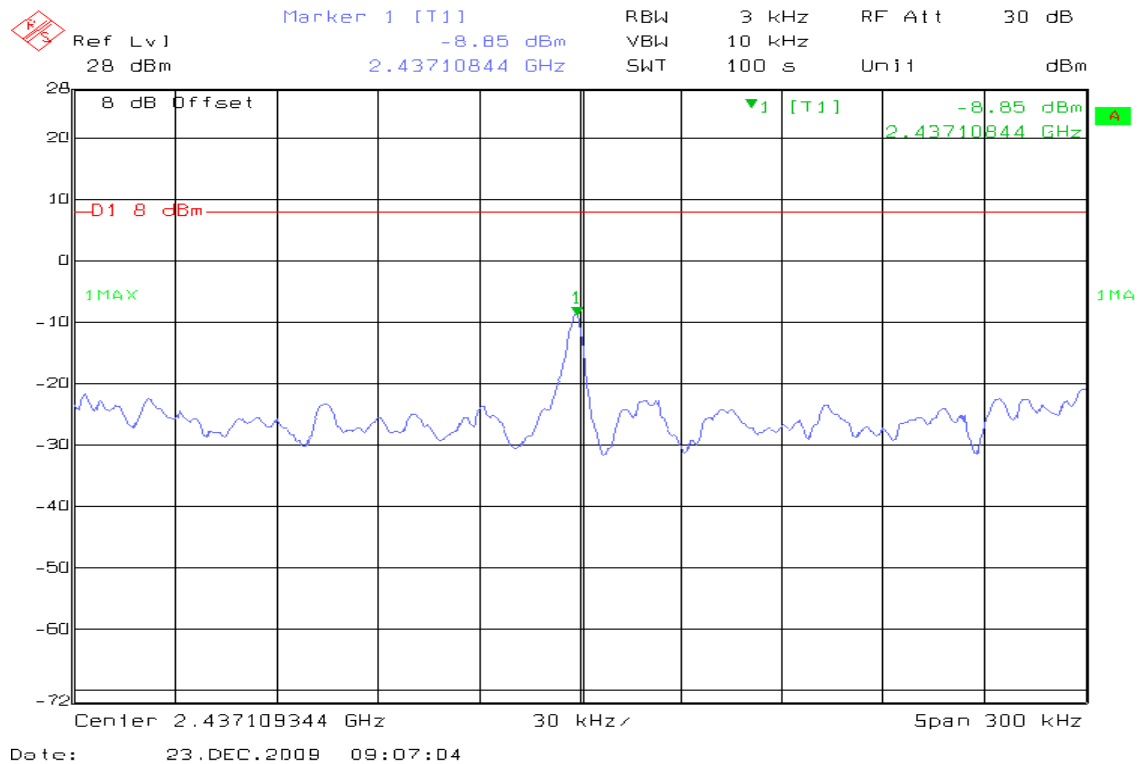


draft 802.11n 20 MHz Channel mode

PPSD (CH Low)

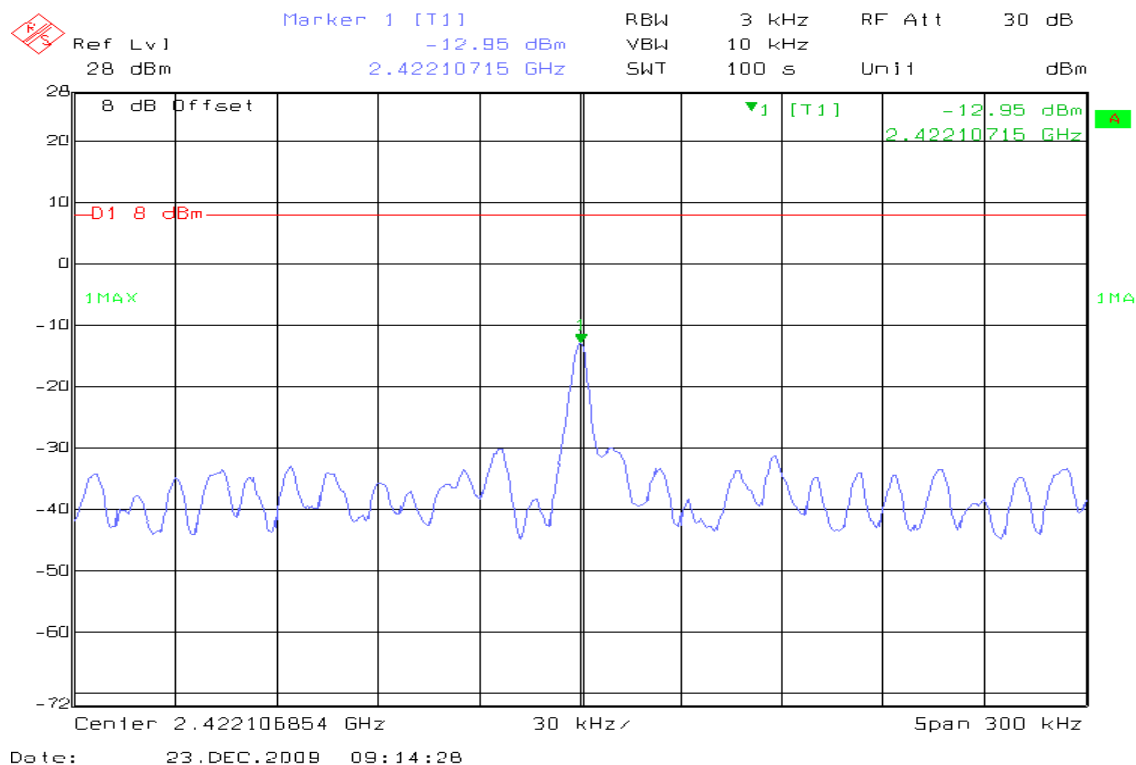


PPSD (CH Mid)



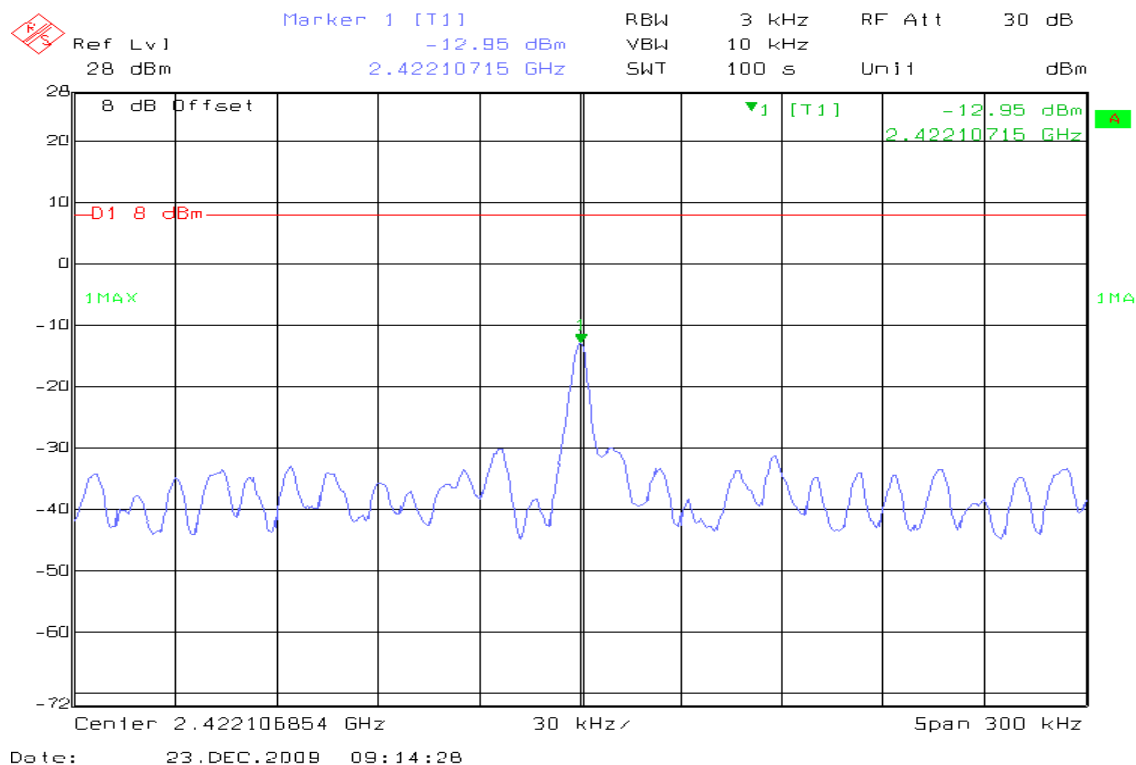


PPSD (CH High)



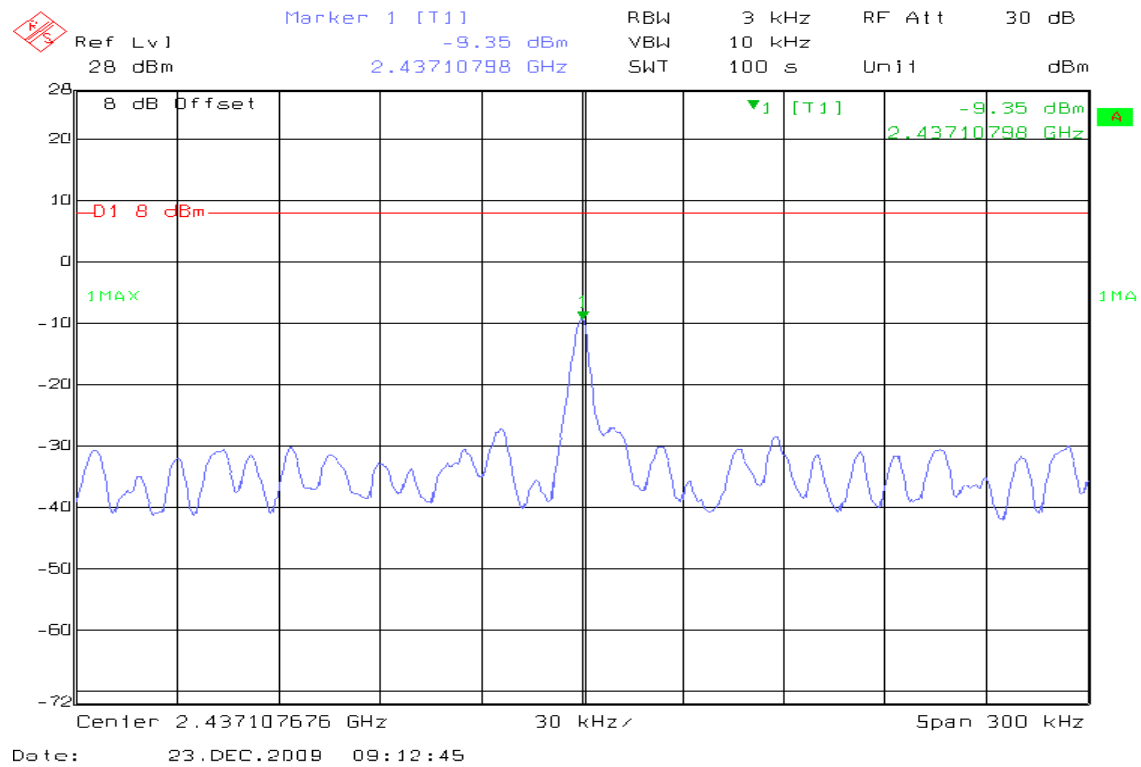
draft 802.11n 40 MHz Channel mode

PPSD (CH Low)

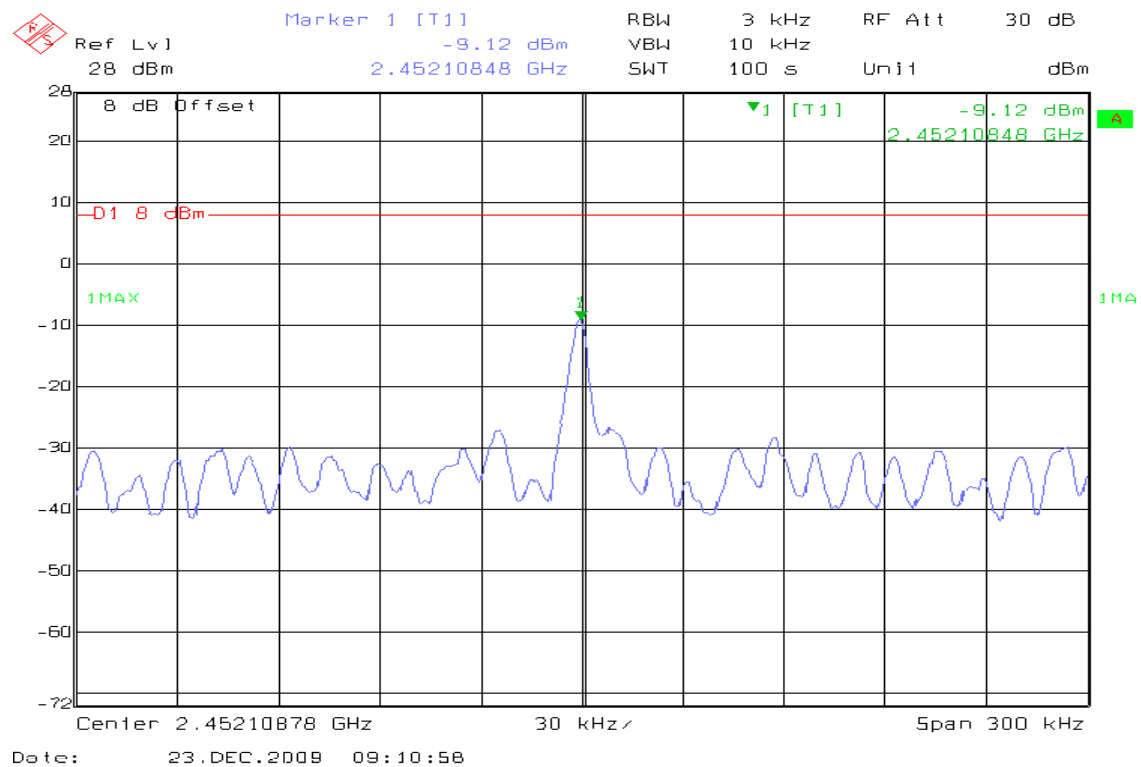




PPSD (CH Mid)



PPSD (CH High)





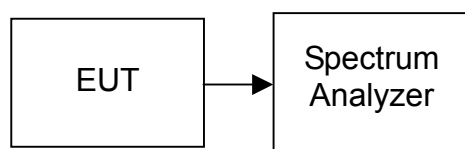
7.6 SPURIOUS EMISSIONS

7.6.1 CONDUCTED MEASUREMENT

LIMIT

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

TEST CONFIGURATION



TEST PROCEDURE

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

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

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

TEST RESULTS

No non-compliance noted.



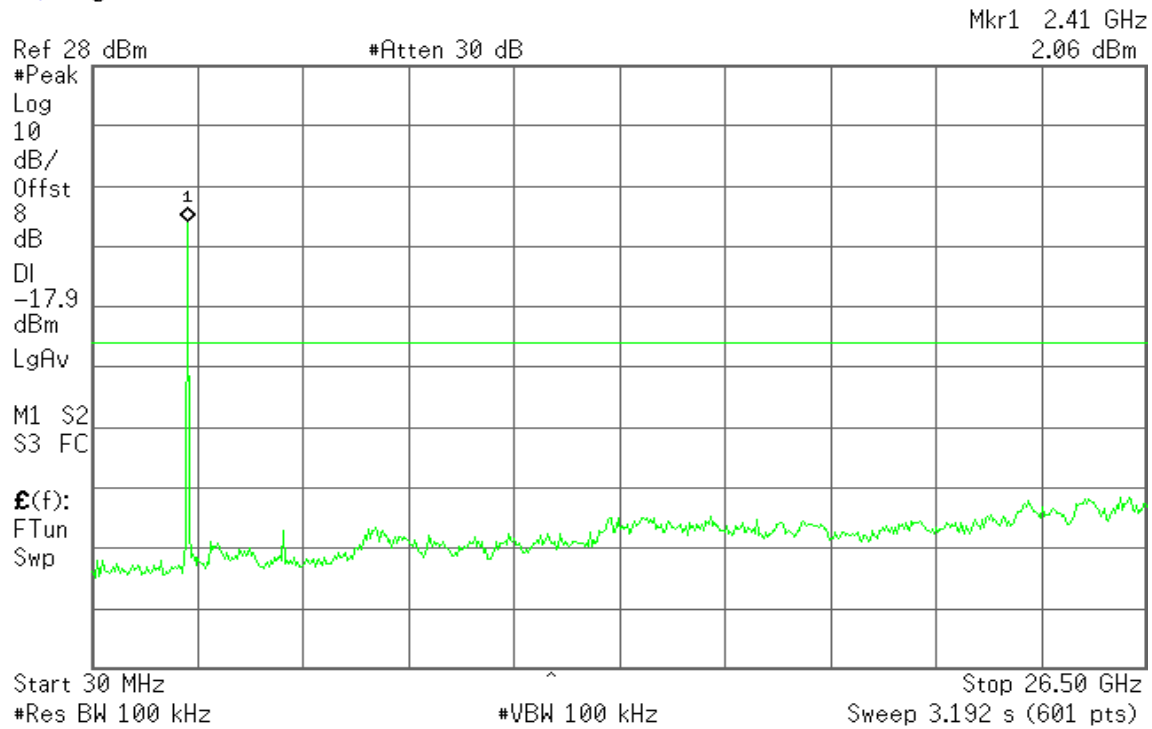
Test Plot

IEEE 802.11b mode

CH Low

Agilent 15:52:43 Dec 22, 2009

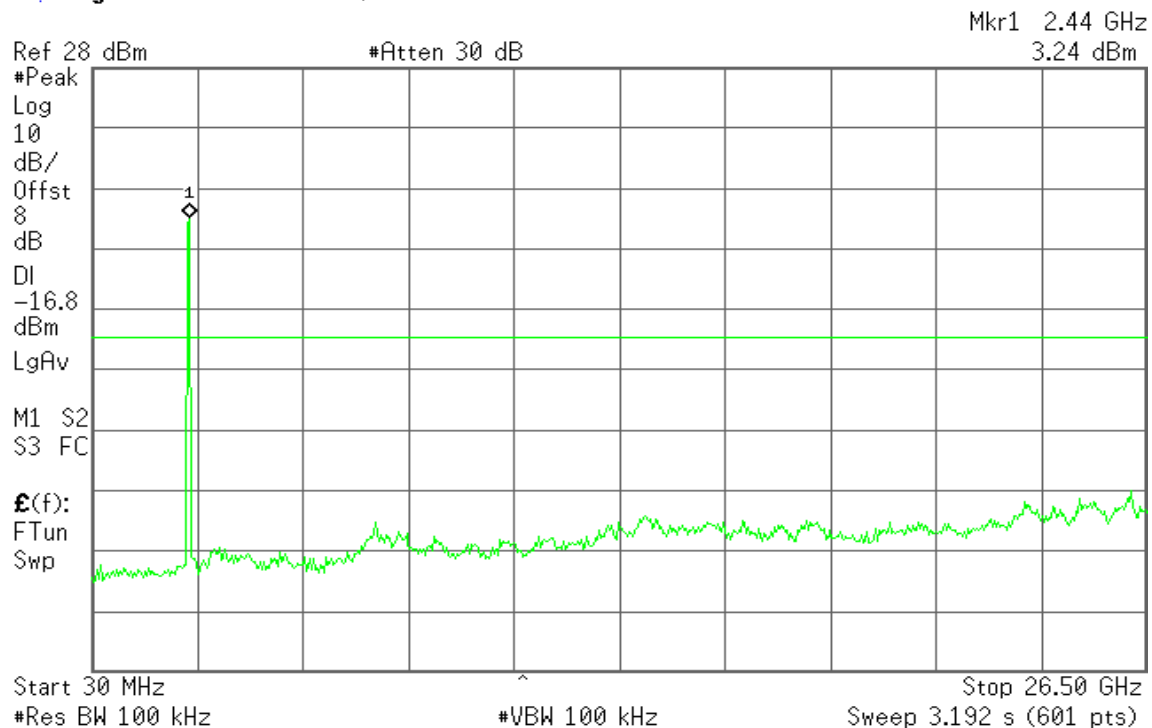
R T



CH Mid

Agilent 15:54:22 Dec 22, 2009

R T



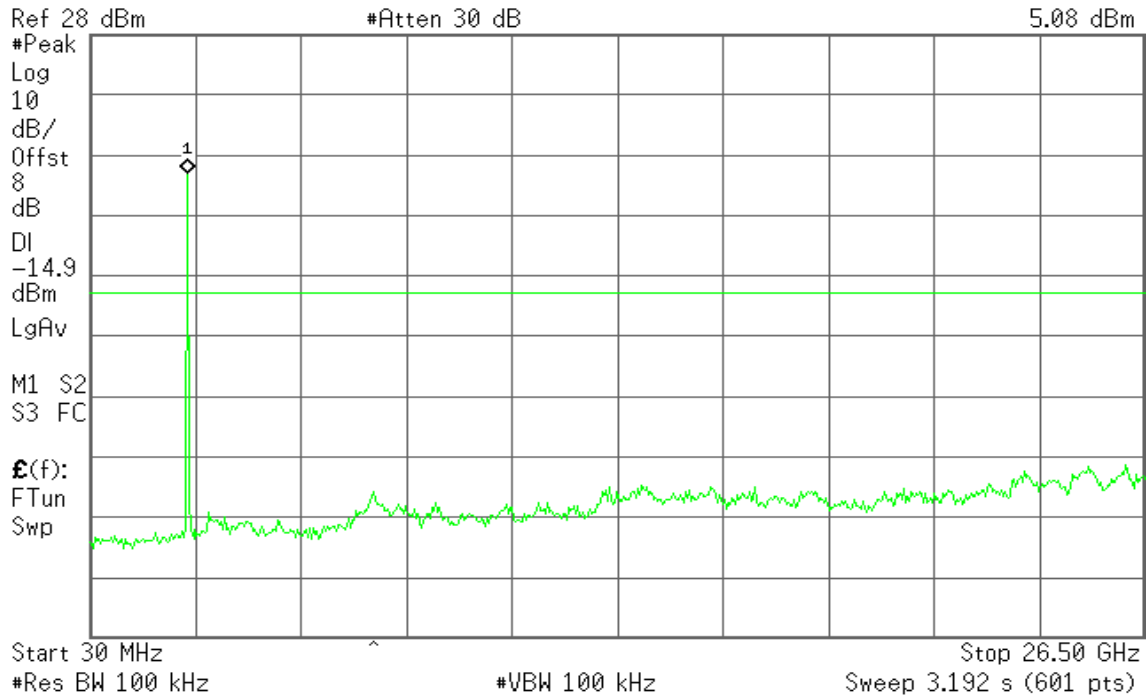


CH High

Agilent 15:55:30 Dec 22, 2009

R T

Mkr1 2.46 GHz
5.08 dBm



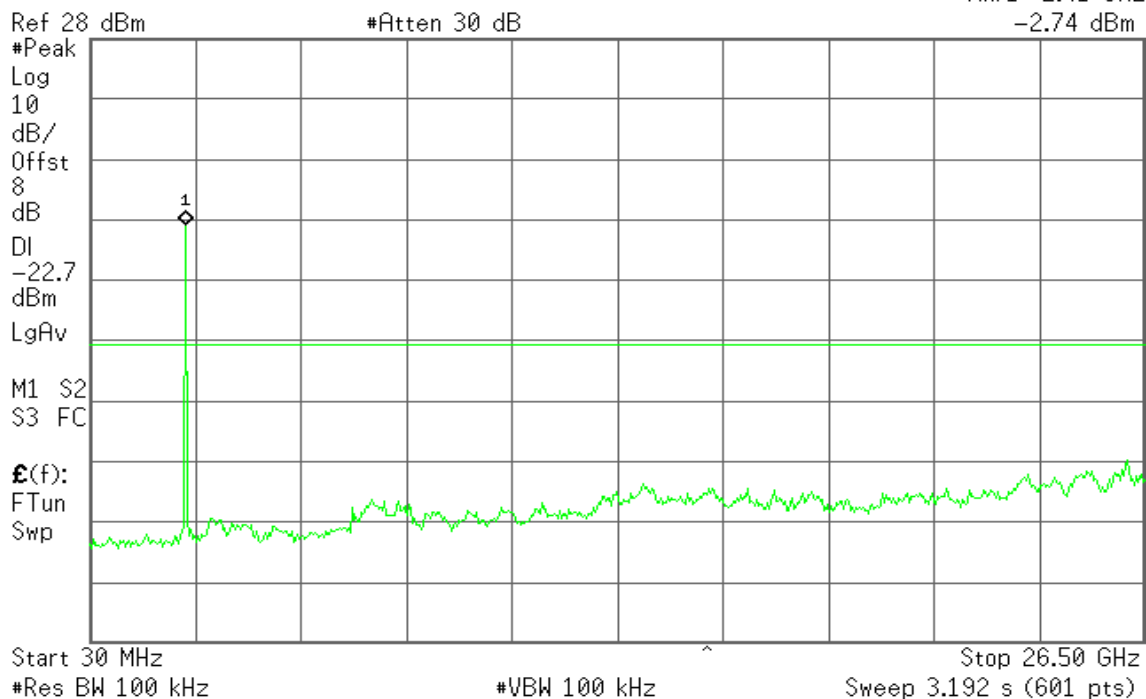
IEEE 802.11g mode

CH Low

Agilent 16:01:38 Dec 22, 2009

R T

Mkr1 2.41 GHz
-2.74 dBm



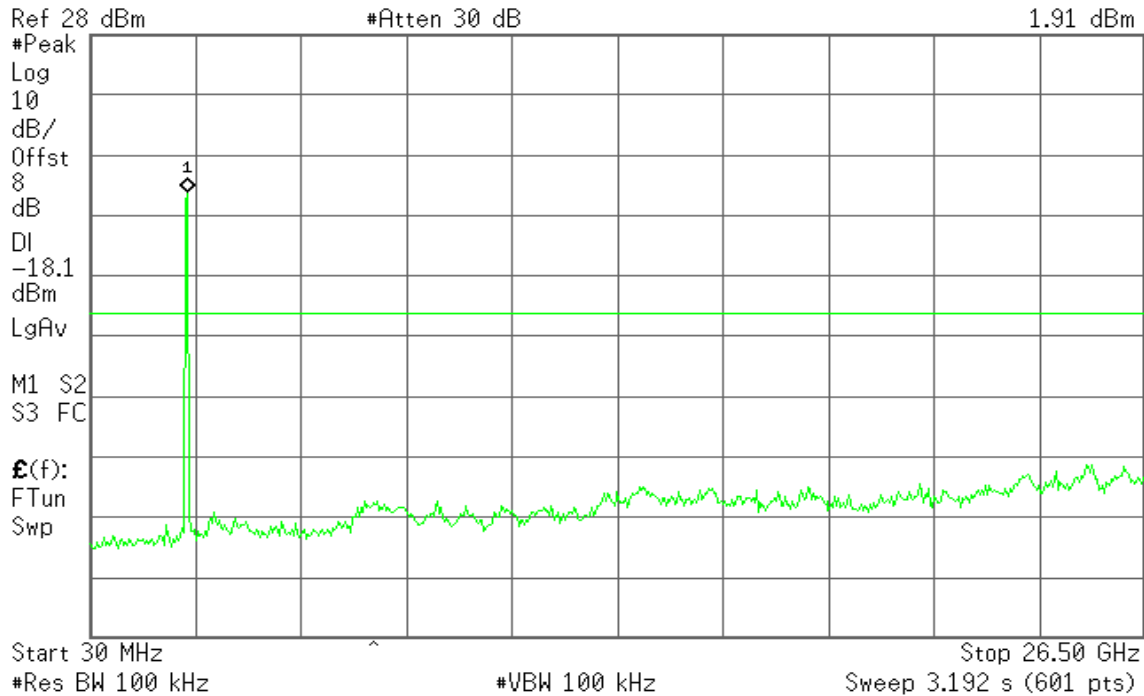


CH Mid

Agilent 15:59:47 Dec 22, 2009

R T

Mkr1 2.44 GHz
1.91 dBm

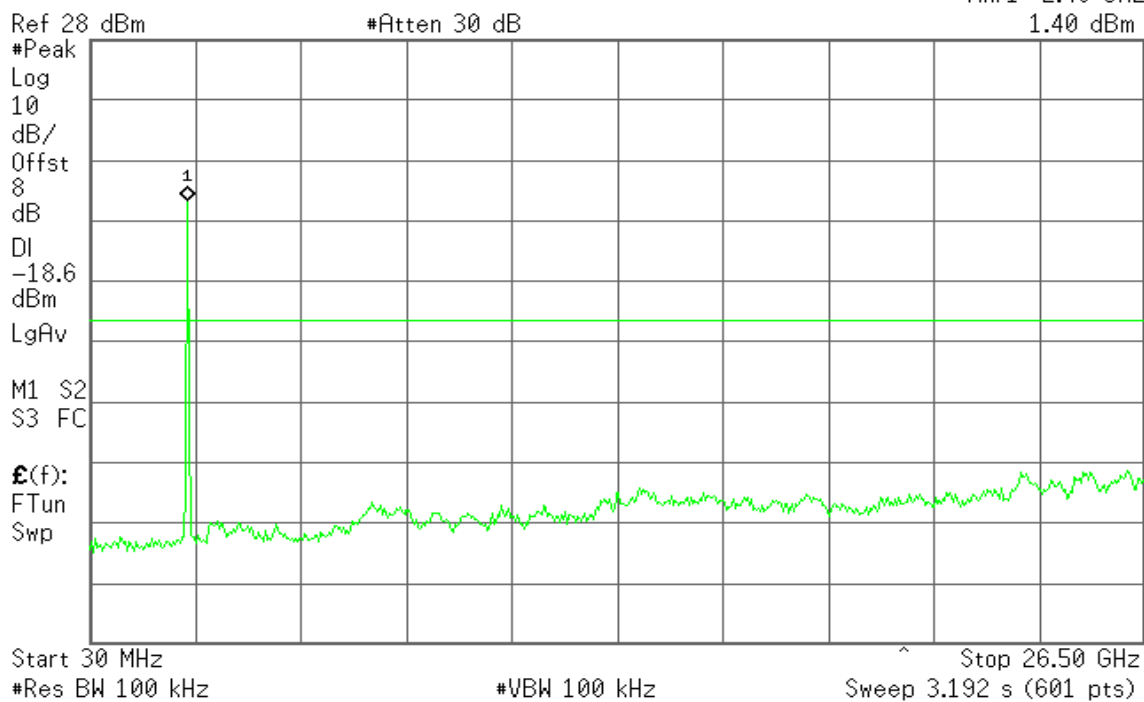


CH High

Agilent 15:58:44 Dec 22, 2009

R T

Mkr1 2.46 GHz
1.40 dBm





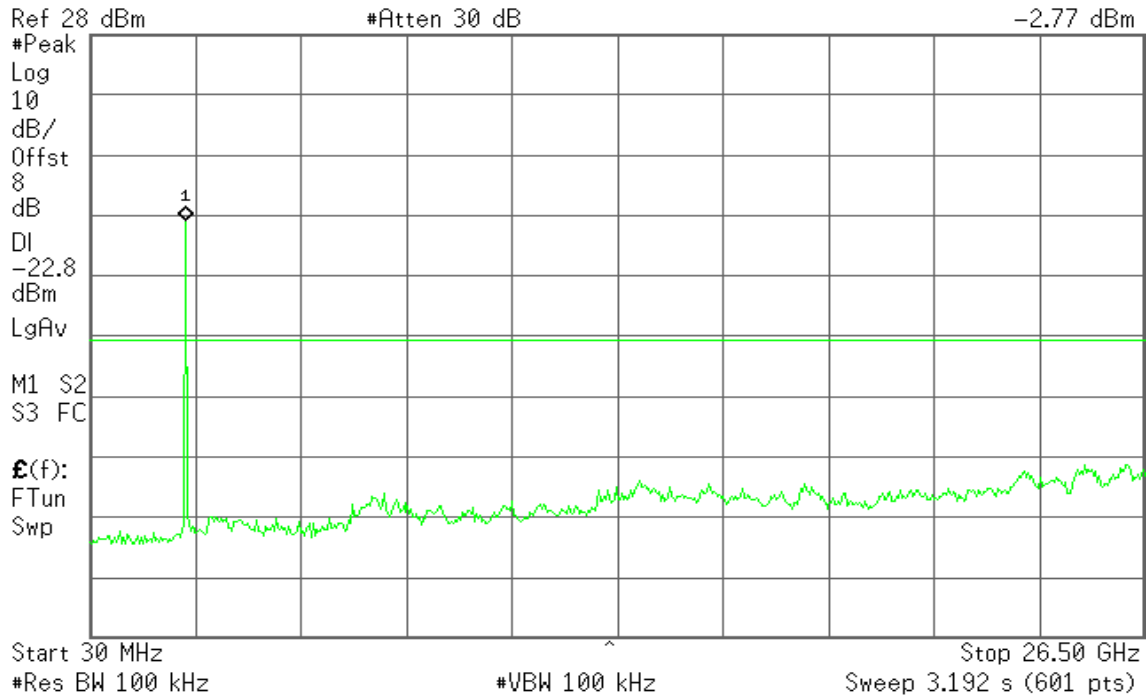
draft 802.11n 20 MHz Channel mode

CH Low

Agilent 16:05:03 Dec 22, 2009

R T

Mkr1 2.41 GHz
-2.77 dBm

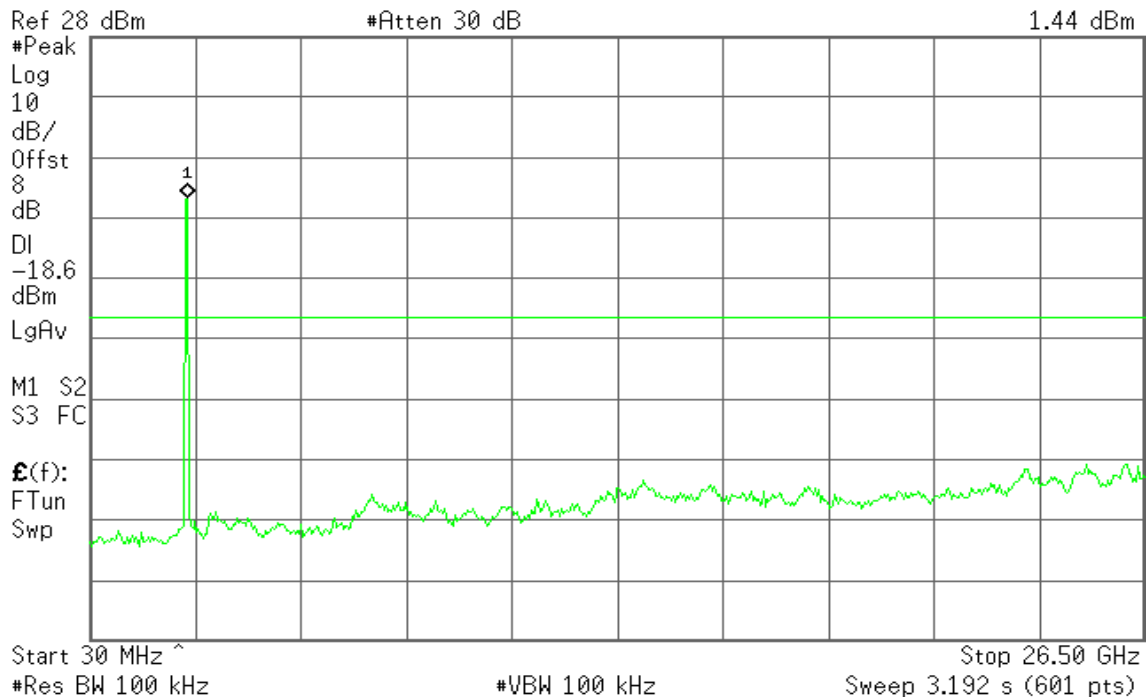


CH Mid

Agilent 16:09:34 Dec 22, 2009

R T

Mkr1 2.44 GHz
1.44 dBm



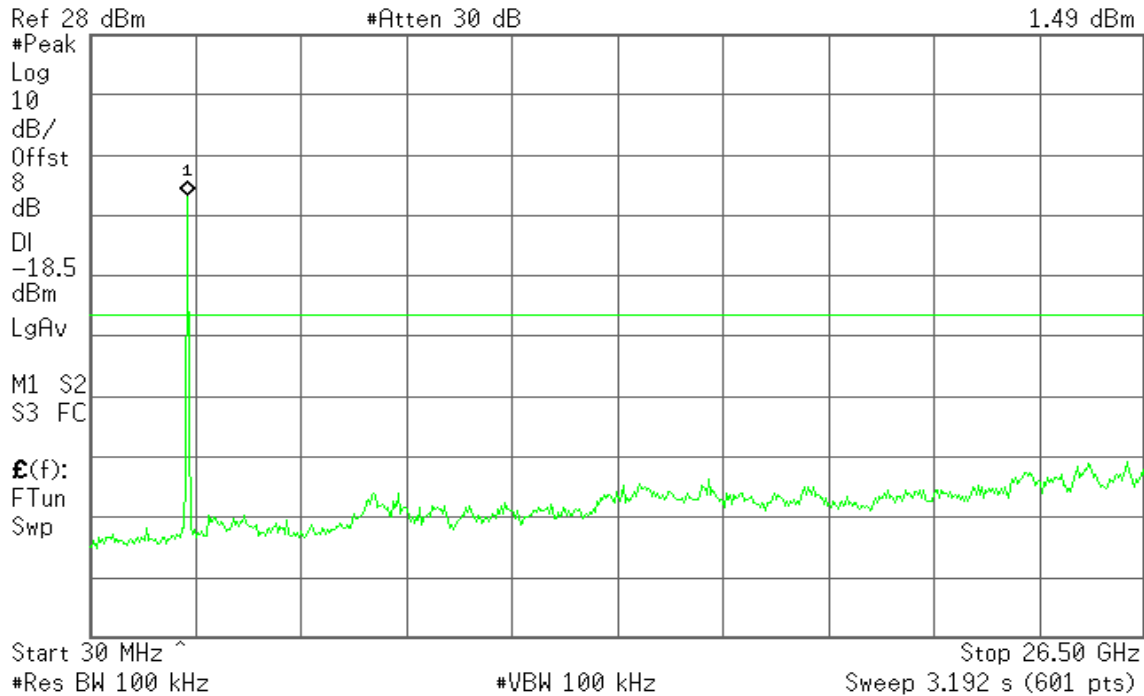


CH High

Agilent 16:15:02 Dec 22, 2009

R T

Mkr1 2.46 GHz
1.49 dBm



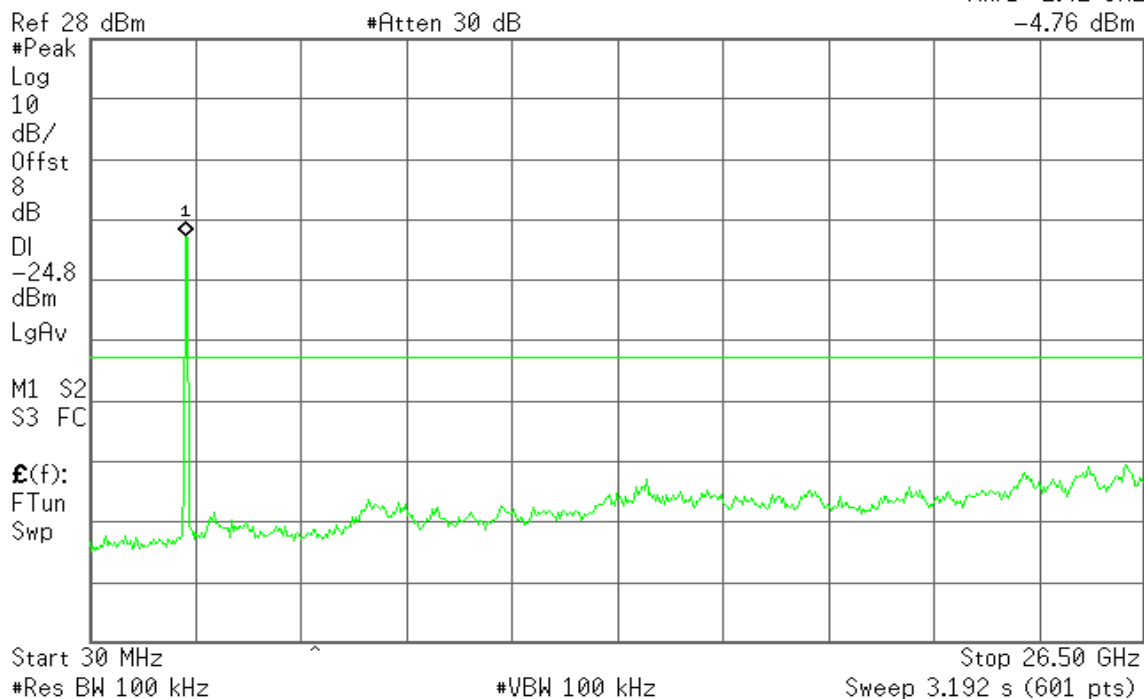
draft 802.11n 40 MHz Channel mode

CH Low

Agilent 16:17:17 Dec 22, 2009

R T

Mkr1 2.42 GHz
-4.76 dBm



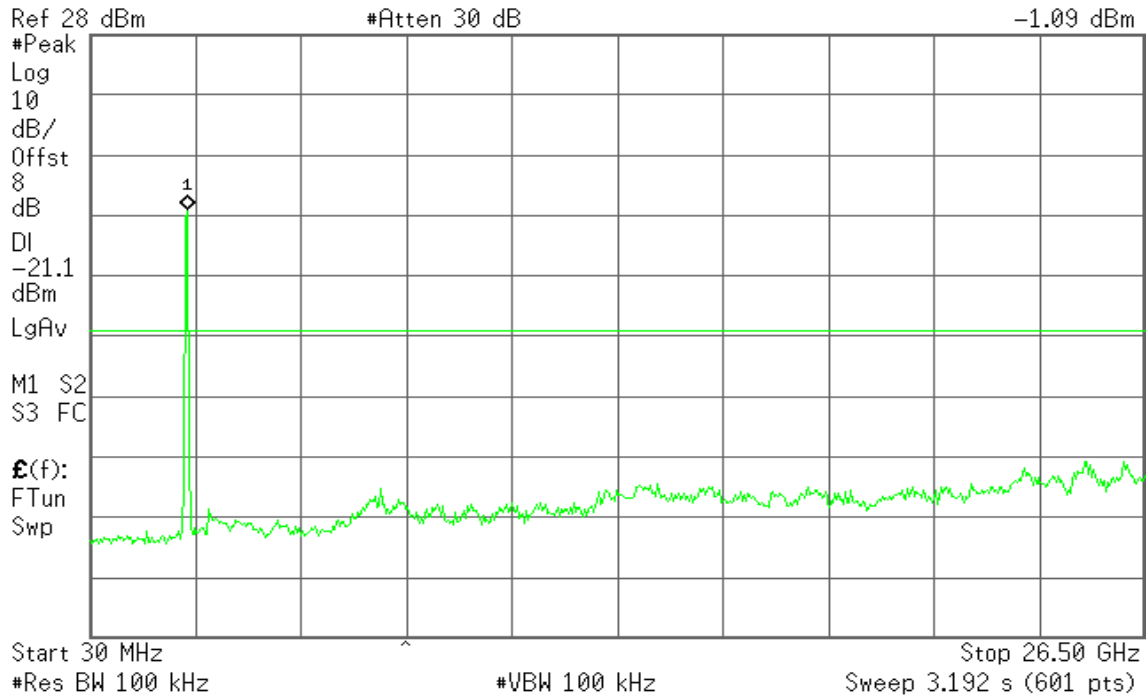


CH Mid

Agilent 16:19:16 Dec 22, 2009

R T

Mkr1 2.44 GHz
-1.09 dBm

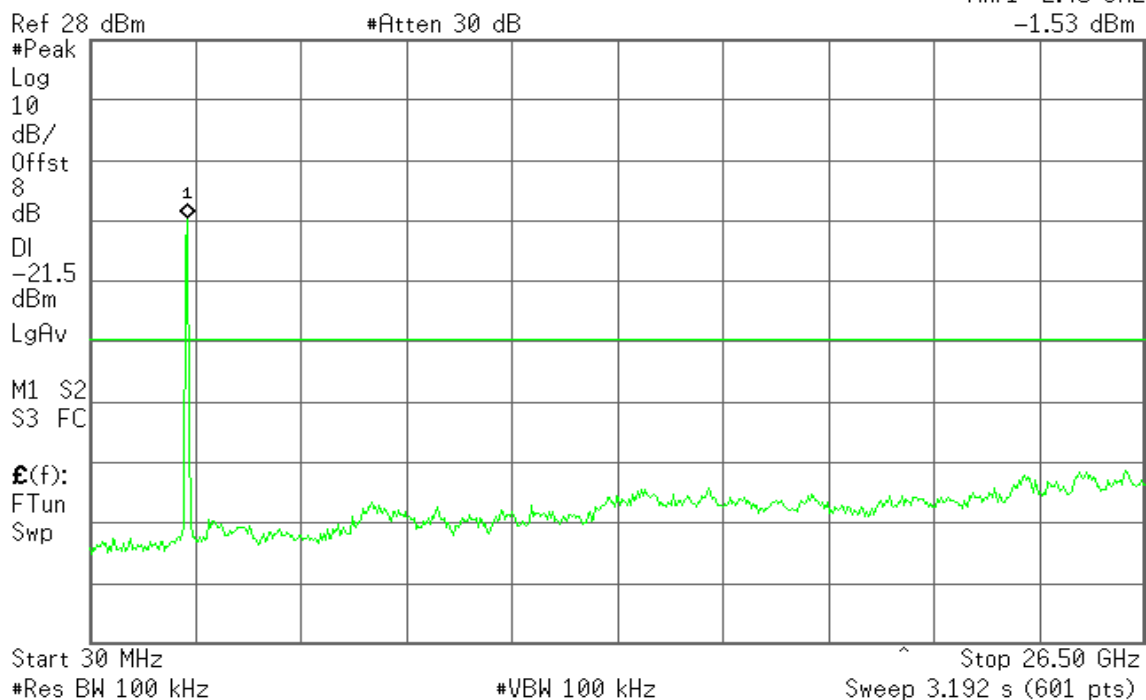


CH High

Agilent 16:21:02 Dec 22, 2009

R T

Mkr1 2.45 GHz
-1.53 dBm





7.6.2 RADIATED EMISSIONS

LIMIT

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

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

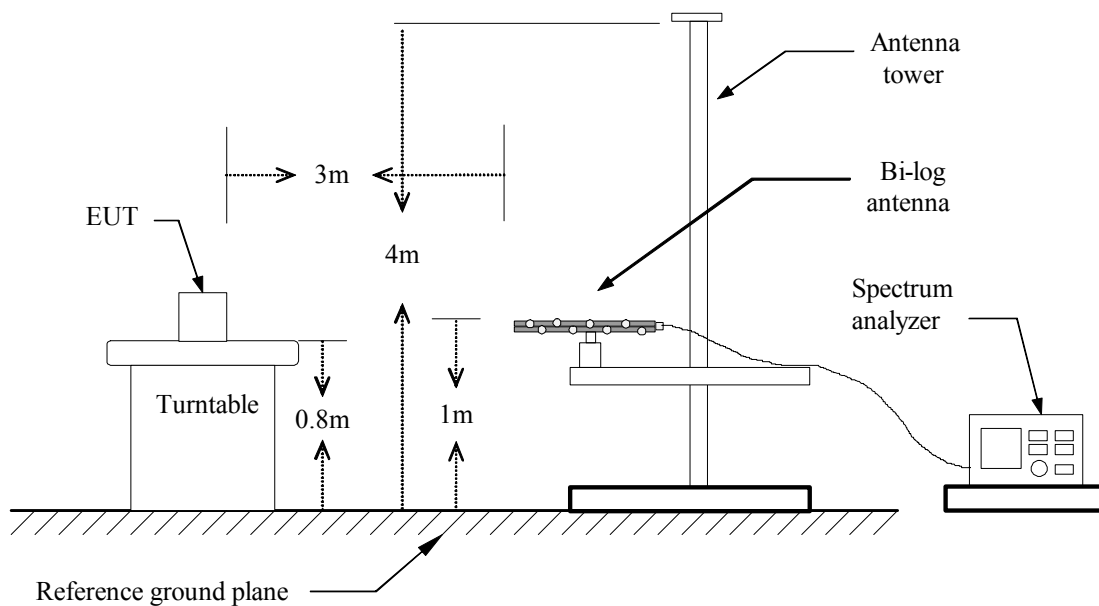
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

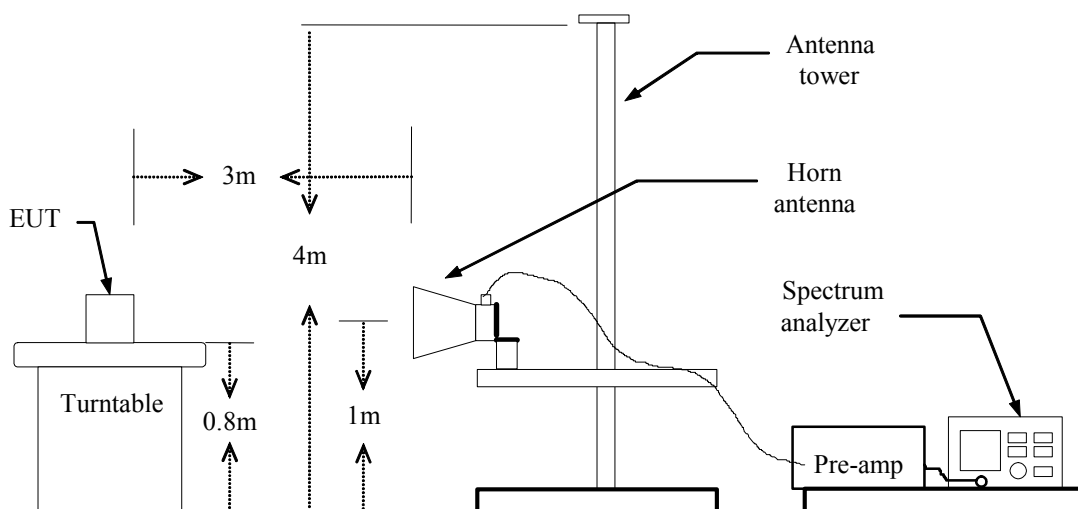
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

TEST CONFIGURATION

Below 1 GHz



Above 1 GHz





TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

No non-compliance noted.



TEST DATA

Below 1GHz

Operation Mode: Normal Link **Test Date:** Dec. 21, 2009
Temperature: 18°C **Tested by:** Tony Tsai
Humidity: 60% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
34.8500	V	45.40	-14.30	31.10	40.00	-8.90	QP
112.4500	V	55.44	-16.86	38.58	43.50	-4.92	QP
153.6750	V	53.56	-12.72	40.84	43.50	-2.66	QP
364.6500	V	43.07	-9.61	33.46	46.00	-12.54	QP
488.3250	V	44.30	-7.36	36.94	46.00	-9.06	QP
539.2500	V	46.21	-6.39	39.82	46.00	-6.18	QP
839.9500	V	44.18	-0.64	43.54	46.00	-2.46	QP
110.0250	H	52.62	-16.99	35.63	43.50	-7.87	Peak
156.1000	H	49.20	-12.81	36.39	43.50	-7.11	Peak
194.9000	H	49.17	-15.19	33.98	43.50	-9.52	Peak
231.3120	H	48.33	-14.21	34.12	46.00	-11.88	Peak
359.8000	H	52.27	-9.63	42.64	46.00	-3.36	Peak
461.6500	H	45.62	-8.00	37.62	46.00	-8.38	Peak
534.4000	H	49.50	-6.48	43.02	46.00	-2.98	Peak

Remark:

1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 9 kHz to the 1GHz.
3. Radiated emissions measured in the measured frequency range were made with an instrument using peak detector or quasi-peak detector mode.
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. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.



Above 1 GHz

Operation Mode: TX / IEEE 802.11b / CH Low

Test Date: Dec. 17, 2009

Temperature: 18°C

Tested by: Alonso Lu

Humidity: 55 % 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
1496.67	V	52.77	---	-4.95	47.82	---	74.00	54.00	-6.18	Peak
1860.00	V	49.82	---	-0.94	48.88	---	74.00	54.00	-5.12	Peak
2213.33	V	49.73	---	0.75	50.48	---	74.00	54.00	-3.52	Peak
3208.33	V	44.59	---	5.04	49.64	---	74.00	54.00	-4.36	Peak
4825.00	V	47.60	33.91	6.51	54.12	40.42	74.00	54.00	-13.58	AVG
N/A										
1500.00	H	53.20	---	-6.13	47.07	---	74.00	54.00	-6.93	Peak
2120.00	H	49.71	---	-1.68	48.03	---	74.00	54.00	-5.97	Peak
4816.67	H	45.48	32.43	7.73	53.21	40.16	74.00	54.00	-13.84	AVG
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:** Dec. 17, 2009**Temperature:** 18°C**Tested by:** Alonso Lu**Humidity:** 55 % 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
1200.00	V	54.69	---	-5.70	48.99	---	74.00	54.00	-5.01	Peak
1803.33	V	50.35	---	-0.98	49.38	---	74.00	54.00	-4.62	Peak
2510.00	V	48.77	---	2.30	51.07	---	74.00	54.00	-2.93	Peak
3200.00	V	42.68	---	5.14	47.82	---	74.00	54.00	-6.18	Peak
6250.00	V	39.45	---	10.31	49.76	---	74.00	54.00	-4.24	Peak
6400.00	V	39.93	---	9.93	49.86	---	74.00	54.00	-4.14	Peak
1493.33	H	52.87	---	-6.14	46.72	---	74.00	54.00	-7.28	Peak
2120.00	H	49.78	---	-1.68	48.10	---	74.00	54.00	-5.90	Peak
2686.67	H	49.37	---	-0.40	48.97	---	74.00	54.00	-5.03	Peak
6175.00	H	41.35	---	9.95	51.30	---	74.00	54.00	-2.70	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:** Dec. 17, 2009**Temperature:** 18°C**Tested by:** Alonso Lu**Humidity:** 55 % 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
1496.67	V	52.37	---	-4.95	47.41	---	74.00	54.00	-6.59	Peak
2243.33	V	51.47	---	0.64	52.11	---	74.00	54.00	-1.89	Peak
2710.00	V	49.57	---	1.47	51.04	---	74.00	54.00	-2.96	Peak
3208.33	V	43.49	---	5.04	48.54	---	74.00	54.00	-5.46	Peak
4925.00	V	44.37	---	7.38	51.75	---	74.00	54.00	-2.25	Peak
N/A										
1493.33	H	52.78	---	-6.14	46.64	---	74.00	54.00	-7.36	Peak
2180.00	H	49.37	---	-2.07	47.30	---	74.00	54.00	-6.70	Peak
4358.33	H	40.71	---	8.92	49.63	---	74.00	54.00	-4.37	Peak
5008.33	H	40.47	---	9.39	49.86	---	74.00	54.00	-4.14	Peak
N/A		41.77	---	3.63	45.40	---	74.00	54.00	-8.60	Peak

Remark:

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



Operation Mode: TX / IEEE 802.11g / CH Low

Test Date: Dec. 17, 2009

Temperature: 18°C

Tested by: Alonso Lu

Humidity: 55 % 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
1496.67	V	52.11	---	-4.95	47.16	---	74.00	54.00	-6.84	Peak
1600.00	V	50.83	---	-3.33	47.50	---	74.00	54.00	-6.50	Peak
2143.33	V	50.48	---	-0.92	49.56	---	74.00	54.00	-4.44	Peak
2660.00	V	49.22	---	1.37	50.60	---	74.00	54.00	-3.40	Peak
3200.00	V	44.32	---	5.14	49.46	---	74.00	54.00	-4.54	Peak
4816.67	V	41.41	---	6.38	47.79	---	74.00	54.00	-6.21	Peak
1273.33	H	52.31	---	-7.93	44.38	---	74.00	54.00	-9.62	Peak
1496.67	H	52.76	---	-6.14	46.63	---	74.00	54.00	-7.37	Peak
2096.67	H	49.45	---	-1.63	47.82	---	74.00	54.00	-6.18	Peak
5600.00	H	39.93	---	10.00	49.93	---	74.00	54.00	-4.07	Peak
6166.67	H	39.94	---	9.94	49.88	---	74.00	54.00	-4.12	6166.67
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:** Dec. 17, 2009**Temperature:** 18°C**Tested by:** Alonso Lu**Humidity:** 55 % 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
1493.33	V	52.65	---	-4.94	47.71	---	74.00	54.00	-6.29	Peak
1860.00	V	50.41	---	-0.94	49.47	---	74.00	54.00	-4.53	Peak
2206.67	V	49.54	---	0.78	50.32	---	74.00	54.00	-3.68	Peak
3200.00	V	43.52	---	5.14	48.66	---	74.00	54.00	-5.34	Peak
4875.00	V	41.96	---	7.30	49.26	---	74.00	54.00	-4.74	Peak
N/A										
1603.33	H	51.95	---	-6.02	45.93	---	74.00	54.00	-8.07	Peak
2193.33	H	51.24	---	-2.16	49.09	---	74.00	54.00	-4.91	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:** Dec. 17, 2009**Temperature:** 18°C**Tested by:** Alonso Lu**Humidity:** 55 % 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
1496.67	V	53.12	---	-4.95	48.17	---	74.00	54.00	-5.83	Peak
1843.33	V	50.20	---	-0.95	49.25	---	74.00	54.00	-4.75	Peak
2406.67	V	51.56	---	1.36	52.92	---	74.00	54.00	-1.08	Peak
3200.00	V	43.45	---	5.14	48.59	---	74.00	54.00	-5.41	Peak
4925.00	V	44.62	---	7.38	52.00	---	74.00	54.00	-2.00	Peak
N/A										
1496.67	H	53.12	---	-6.14	46.98	---	74.00	54.00	-7.02	Peak
2136.67	H	50.12	---	-1.79	48.34	---	74.00	54.00	-5.66	Peak
2410.00	H	52.13	---	-1.54	50.60	---	74.00	54.00	-3.40	Peak
1496.67	H	53.12	---	-6.14	46.98	---	74.00	54.00	-7.02	Peak
4616.67	H	39.91	---	9.41	49.33	---	74.00	54.00	-4.67	Peak
N/A										

Remark:

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



Operation Mode: TX / draft 802.11n 20 MHz Channel mode / CH Low **Test Date:** Dec. 17, 2009

Temperature: 18°C **Tested by:** Alonso Lu

Humidity: 55 % 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
1823.33	V	51.19	---	-0.96	50.23	---	74.00	54.00	-3.77	Peak
2530.00	V	50.79	---	2.05	52.84	---	74.00	54.00	-1.16	Peak
2623.33	V	49.52	---	1.25	50.77	---	74.00	54.00	-3.23	Peak
3208.33	V	44.39	---	5.04	49.43	---	74.00	54.00	-4.57	Peak
4825.00	V	42.23	---	6.51	48.75	---	74.00	54.00	-5.25	Peak
5608.33	V	40.82	---	9.00	49.82	---	74.00	54.00	-4.18	Peak
1720.00	H	50.48	---	-3.82	46.66	---	74.00	54.00	-7.34	Peak
2193.33	H	49.80	---	-2.16	47.65	---	74.00	54.00	-6.35	Peak
2643.33	H	49.34	---	-0.09	49.25	---	74.00	54.00	-4.75	Peak
6175.00	H	40.49	---	9.95	50.44	---	74.00	54.00	-3.56	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:** Dec. 17, 2009
Temperature: 18°C **Tested by:** Alonso Lu
Humidity: 55 % 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
1496.67	V	52.88	---	-4.95	47.93	---	74.00	54.00	-6.07	Peak
1600.00	V	52.14	---	-3.33	48.81	---	74.00	54.00	-5.19	Peak
2190.00	V	51.26	---	0.50	51.76	---	74.00	54.00	-2.24	Peak
3200.00	V	42.63	---	5.14	47.77	---	74.00	54.00	-6.23	Peak
4491.67	V	43.23	---	5.79	49.01	---	74.00	54.00	-4.99	Peak
N/A										
1176.67	H	52.22	---	-7.73	44.49	---	74.00	54.00	-9.51	Peak
1496.67	H	52.35	---	-6.14	46.21	---	74.00	54.00	-7.79	Peak
1603.33	H	52.42	---	-6.02	46.40	---	74.00	54.00	-7.60	Peak
2140.00	H	50.00	---	-1.81	48.19	---	74.00	54.00	-5.81	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 High **Test Date:** Dec. 17, 2009
Temperature: 18°C **Tested by:** Alonso Lu
Humidity: 55 % 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
1663.33	V	51.59	---	-2.88	48.71	---	74.00	54.00	-5.29	Peak
2410.00	V	52.83	---	1.39	54.23	---	74.00	54.00	0.23	Peak
3208.33	V	45.13	---	5.04	50.17	---	74.00	54.00	-3.83	Peak
4925.00	V	44.47	---	7.38	51.85	---	74.00	54.00	-2.15	Peak
N/A										
1493.33	1493.33	53.00	---	-6.14	46.85	---	74.00	54.00	-7.15	Peak
1603.33	1603.33	53.09	---	-6.02	47.07	---	74.00	54.00	-6.93	Peak
2410.00	2410.00	55.42	---	-1.54	53.89	---	74.00	54.00	-0.11	Peak
4925.00	4925.00	41.17	---	8.18	49.35	---	74.00	54.00	-4.65	Peak
6008.33	6008.33	39.88	---	10.28	50.17	---	74.00	54.00	-3.83	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:** Dec. 17, 2009

Temperature: 18°C **Tested by:** Alonso Lu

Humidity: 55 % 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
1796.67	V	50.51	---	-1.03	49.48	---	74.00	54.00	-4.52	Peak
2243.33	V	50.49	---	0.64	51.13	---	74.00	54.00	-2.87	Peak
2786.67	V	49.45	---	1.19	50.64	---	74.00	54.00	-3.36	Peak
4875.00	V	39.94	---	7.30	47.25	---	74.00	54.00	-6.75	Peak
6308.33	V	39.37	---	10.60	49.97	---	74.00	54.00	-4.03	Peak
N/A										
1496.67	H	52.72	---	-6.14	46.58	---	74.00	54.00	-7.42	Peak
2116.67	H	49.52	---	-1.66	47.86	---	74.00	54.00	-6.14	Peak
2576.67	H	49.83	---	-0.18	49.65	---	74.00	54.00	-4.35	Peak
5366.67	H	38.82	---	10.48	49.31	---	74.00	54.00	-4.69	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:** Dec. 17, 2009**Temperature:** 18°C**Tested by:** Alonso Lu**Humidity:** 55 % 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
1496.67	V	52.44	---	-4.95	47.49	---	74.00	54.00	-6.51	Peak
1863.33	V	49.99	---	-0.94	49.06	---	74.00	54.00	-4.94	Peak
2196.67	V	49.86	---	0.70	50.56	---	74.00	54.00	-3.44	Peak
3208.33	V	42.03	---	5.04	47.07	---	74.00	54.00	-6.93	Peak
5366.67	V	39.57	---	9.29	48.85	---	74.00	54.00	-5.15	Peak
N/A										
1496.67	H	52.47	---	-6.14	46.34	---	74.00	54.00	-7.66	Peak
1723.33	H	51.41	---	-3.85	47.56	---	74.00	54.00	-6.44	Peak
2126.67	H	50.20	---	-1.72	48.48	---	74.00	54.00	-5.52	Peak
4641.67	H	40.53	---	9.44	49.96	---	74.00	54.00	-4.04	Peak
5908.33	H	39.97	---	10.27	50.24	---	74.00	54.00	-3.76	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: Dec. 17, 2009

Temperature: 18°C

Tested by: Alonso Lu

Humidity: 55 % 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
1716.67	V	51.15	---	-2.35	48.80	---	74.00	54.00	-5.20	Peak
2246.67	V	49.54	---	0.63	50.17	---	74.00	54.00	-3.83	Peak
3208.33	V	42.67	---	5.04	47.72	---	74.00	54.00	-6.28	Peak
4916.67	V	42.42	---	7.49	49.91	---	74.00	54.00	-4.09	Peak
3208.33	V	42.67	---	5.04	47.72	---	74.00	54.00	-6.28	Peak
N/A										
1493.33	H	52.34	---	-6.14	46.19	---	74.00	54.00	-7.81	Peak
2303.33	H	50.20	---	-1.33	48.88	---	74.00	54.00	-5.12	Peak
4916.67	H	41.90	---	8.04	49.94	---	74.00	54.00	-4.06	Peak
N/A										

Remark:

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



7.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

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

TEST PROCEDURE

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

TEST RESULTS

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

**TEST DATA****Operation Mode:** Normal Link**Test Date:** Nov. 28, 2009**Temperature:** 25°C**Tested by:** Eason Chen**Humidity:** 57% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1734	34.62	24.92	9.68	44.30	34.60	64.80	54.80	-20.50	-20.20	L1
0.7008	38.31	28.11	9.59	47.90	37.70	56.00	46.00	-8.10	-8.30	L1
1.0641	29.20	17.30	9.60	38.80	26.90	56.00	46.00	-17.20	-19.10	L1
1.4156	25.87	14.67	9.63	35.50	24.30	56.00	46.00	-20.50	-21.70	L1
6.8453	34.47	26.87	9.83	44.30	36.70	60.00	50.00	-15.70	-13.30	L1
16.2281	32.80	27.60	10.30	43.10	37.90	60.00	50.00	-16.90	-12.10	L1
0.1734	34.62	24.92	9.68	44.30	34.60	64.80	54.80	-20.50	-20.20	L1
0.1773	32.81	21.71	9.69	42.50	31.40	64.61	54.61	-22.11	-23.21	L2
0.2672	25.91	13.21	9.69	35.60	22.90	61.20	51.20	-25.60	-28.30	L2
0.3766	22.81	11.91	9.69	32.50	21.60	58.35	48.35	-25.85	-26.75	L2
0.7047	36.61	24.61	9.59	46.20	34.20	56.00	46.00	-9.80	-11.80	L2
2.5562	27.89	17.99	9.71	37.60	27.70	56.00	46.00	-18.40	-18.30	L2
6.8180	31.14	24.14	9.86	41.00	34.00	60.00	50.00	-19.00	-16.00	L2
15.1773	30.94	23.14	10.36	41.30	33.50	60.00	50.00	-18.70	-16.50	L2

Remark:

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



Test Plot

Conducted emissions (Line 1)



Conducted emissions (Line 2)

