



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

High Power 802.11g Wireless USB Adapter

Model: LP-9387C; VT920; IT-0800GC; LP-9287C; IT-8800UC

Trade Name: Loopcomm; V tech; INFINITY

Issued to

**Loopcomm Technology, Inc.
1F, No. 114, Lian Chen Rd., Chung-Ho City,
Taipei Hsien, 235, Taiwan, R.O.C.**

Issued by

**Compliance Certification Services Inc.
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Taoyuan Shien, (338) Taiwan, R.O.C.**

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Revision History

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1. TEST RESULT CERTIFICATION

Applicant: **Loopcomm Technology, Inc.**
 1F, No. 114, Lian Chen Rd., Chung-Ho City,
 Taipei Hsien, 235, Taiwan, R.O.C.

Equipment Under Test: High Power 802.11g Wireless USB Adapter

Trade Name: Loopcomm; V tech; INFINITY

Model: LP-9387C; VT920; IT-0800GC; LP-9287C; IT-8800UC

Date of Test: November 9 ~ 12, 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:

Reviewed by:

David Wang
 Director

Ethan Huang
 Section Manager



2. EUT DESCRIPTION

Product	High Power 802.11g Wireless USB Adapter																				
Trade Name	Loopcomm; V tech; INFINITY																				
Model Number	LP-9387C; VT920; IT-0800GC; LP-9287C; IT-8800UC																				
Model Discrepancy	<p>1. Different between all model numbers (list on this report) are trade name, appearance and antenna type, the detail information please see as below and refer to external photo of EUT.</p> <table border="1"> <thead> <tr> <th><i>Model</i></th> <th><i>Antenna</i></th> <th><i>Trade name</i></th> <th><i>Chip</i></th> </tr> </thead> <tbody> <tr> <td>LP-9387C</td> <td>PIFA</td> <td>Loopcomm</td> <td rowspan="5">Dip Type and SMT Type</td> </tr> <tr> <td>VT920</td> <td>PIFA</td> <td>V tech</td> </tr> <tr> <td>IT-0800GC</td> <td>PIFA</td> <td>INFINITY</td> </tr> <tr> <td>LP-9287C</td> <td>Dipole</td> <td>Loopcomm</td> </tr> <tr> <td>IT-8800UC</td> <td>Dipole</td> <td>INFINITY</td> </tr> </tbody> </table> <p>2. According to customer declaration, the EUT have two types for sale (Dip Type and SMT Type), all specification and layout are identical, except chip. (Please refer to internal photograph)</p>	<i>Model</i>	<i>Antenna</i>	<i>Trade name</i>	<i>Chip</i>	LP-9387C	PIFA	Loopcomm	Dip Type and SMT Type	VT920	PIFA	V tech	IT-0800GC	PIFA	INFINITY	LP-9287C	Dipole	Loopcomm	IT-8800UC	Dipole	INFINITY
<i>Model</i>	<i>Antenna</i>	<i>Trade name</i>	<i>Chip</i>																		
LP-9387C	PIFA	Loopcomm	Dip Type and SMT Type																		
VT920	PIFA	V tech																			
IT-0800GC	PIFA	INFINITY																			
LP-9287C	Dipole	Loopcomm																			
IT-8800UC	Dipole	INFINITY																			
EUT Power Rating	5VDC																				
Operating Frequency Range	2412 ~ 2462 MHz																				
Transmit Power	IEEE 802.11b: 9.15 dBm IEEE 802.11g: 17.18 dBm																				
Modulation Technique	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM)																				
Transmit Data Rate	IEEE 802.11b: 11, 5.5, 2, 1 Mbps IEEE 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps																				
Number of Channels	11 Channels																				
Channels Spacing	5MHz																				
Antenna Specification	PCB Antenna / Gain: 13.41dBi Dipole Antenna / Gain: 5dBi																				

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: **VYTLP-9287C** 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, 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

After verification two Types of EUT (Dip Type and SMT Type), The SMT Type were selected as the worst case for final test.

The PCB Antenna is a “peer to peer” antenna.

The two EUTs (model: LP-9387C and LP-9287C) had been tested under operating condition.

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

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

IEEE802.11b: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps 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	10/28/2010
Spectrum Analyzer	R&S	FSEB	825829/011	10/29/2010
USB Power Sensor	BOONTON	52012	2061194	06/08/2010

3M Chamber Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250064	10/28/2010
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
Controller	CCS	CC-C-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	ESCI	100782	06/01/2010
LISN	R&S	ENV216	100066	05/06/2010
LISN	R&S	ENV 4200	830326/016	04/15/2010
Test S/W	CCS-3A1-CE			



4.3 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Powerline Conducted Emission	± 1.7983
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	± 4.0474
3M Semi Anechoic Chamber / Above 1GHz	± 3.8967

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	 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	 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	
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

Radiated Emission 30MHz ~ 1GHz and PowerLine Conducted Emission Measurement:							
No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	LCD Monitor	DELL	2407WFPb	CN-0FC255-46633 -675-22TJS	FCC DoC	D-SUB Cable: Shielded, 1.8m with two core	Unshielded, 1.8m
2.	Notebook PC	DELL	D400	0932RY	E2K24GBRL	USB Cable: Shielded, 1.8m	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3.	USB Mouse	HP	M-UV69a	N/A	FCC DoC	Unshielded, 1.8m	N/A

Radiated Emission Above 1GHz and Conducted Emission Measurement:							
No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	DELL	D400	0932RY	E2K24GBRL	USB Cable: Shielded, 1.8m	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.



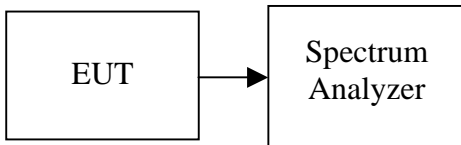
7. FCC PART 15.247 REQUIREMENTS

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 = 300MHz, 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

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	10220	>500	PASS
Mid	2437	10220		PASS
High	2462	10220		PASS

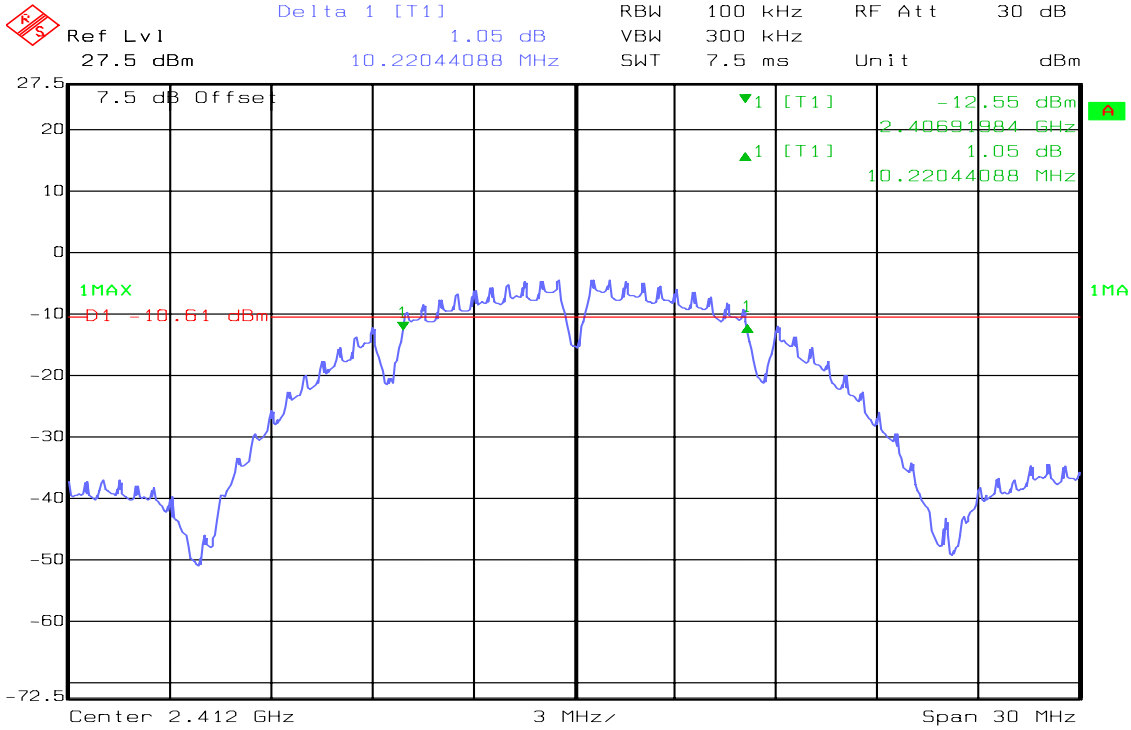
Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
Low	2412	16293	>500	PASS
Mid	2437	16293		PASS
High	2462	16172		PASS



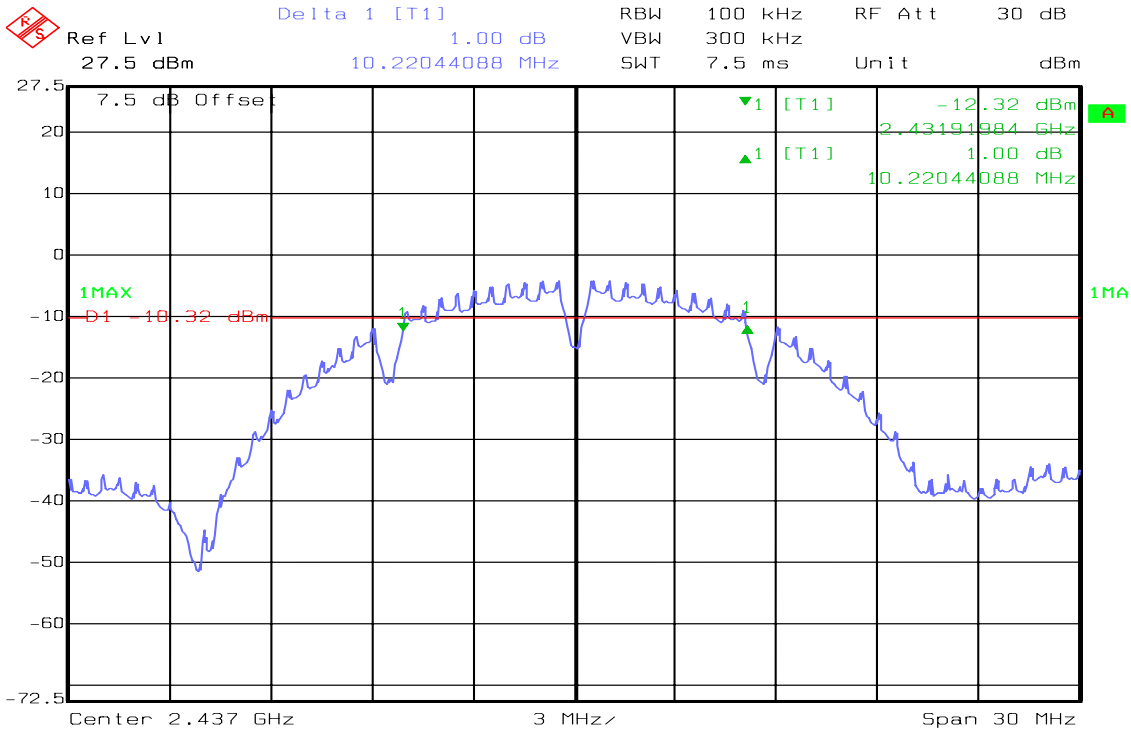
Test Plot

6dB Bandwidth (IEEE 802.11b / CH Low)



Date: 09.NOV.2009 17:10:39

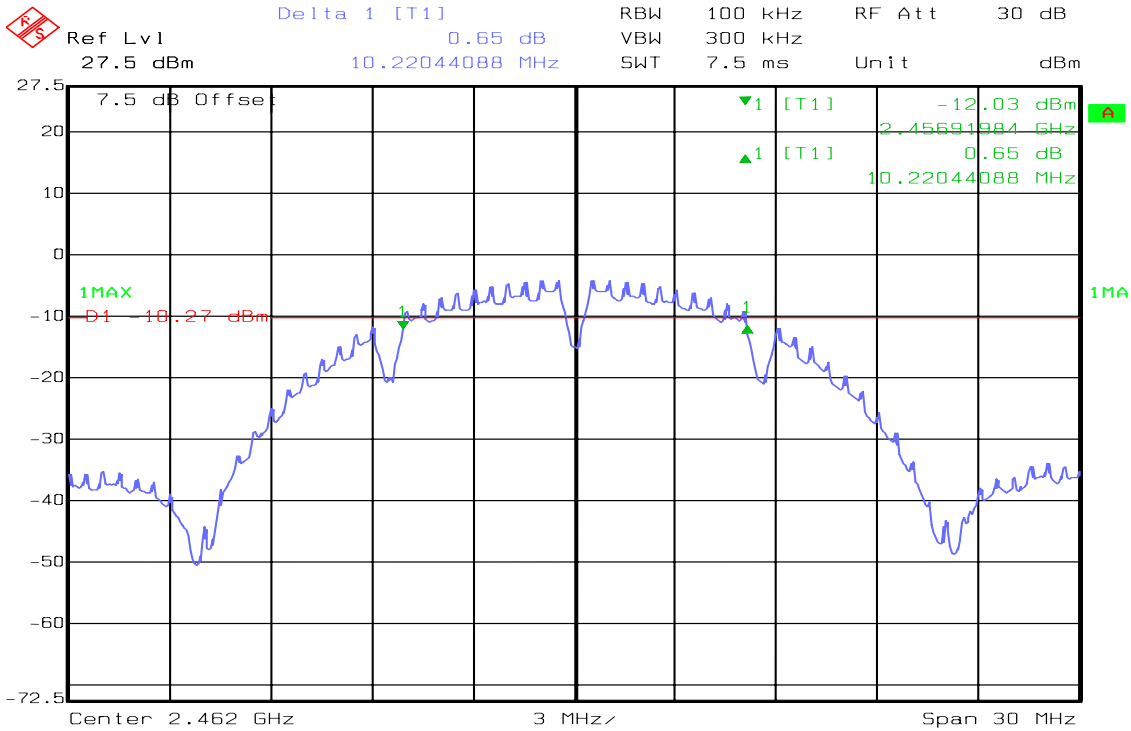
6dB Bandwidth (IEEE 802.11b / CH Mid)



Date: 09.NOV.2009 17:08:48

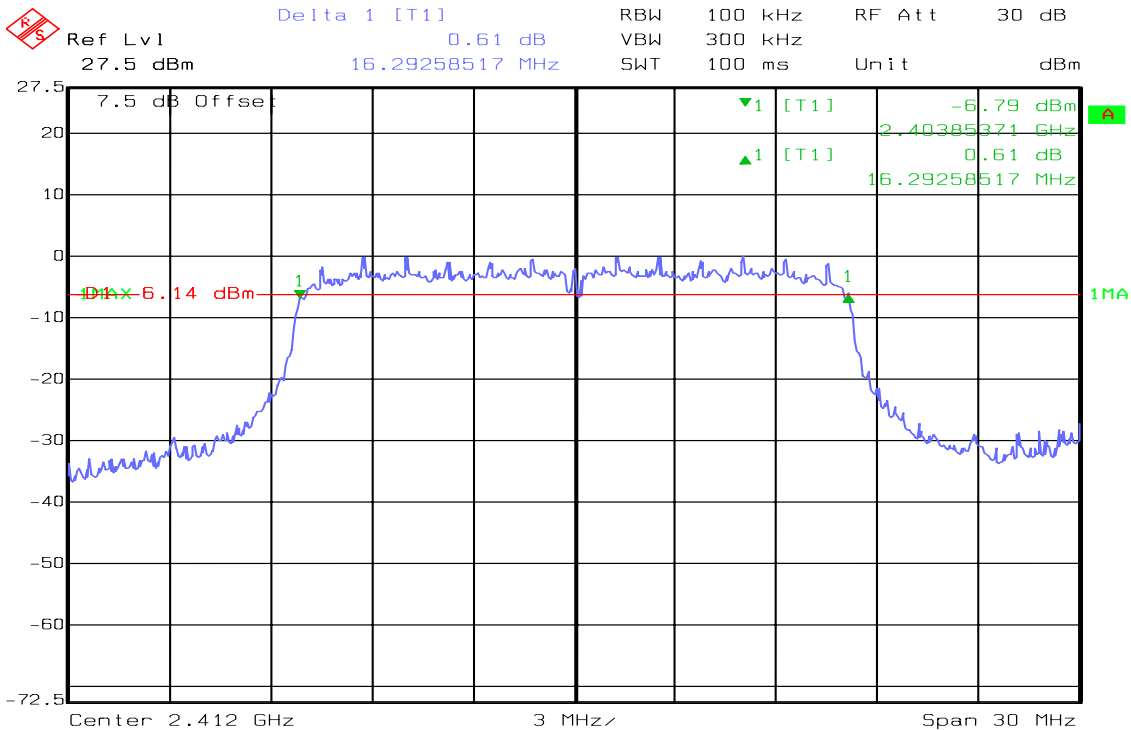


6dB Bandwidth (IEEE 802.11b / CH High)



Date: 09.NOV.2009 17:07:26

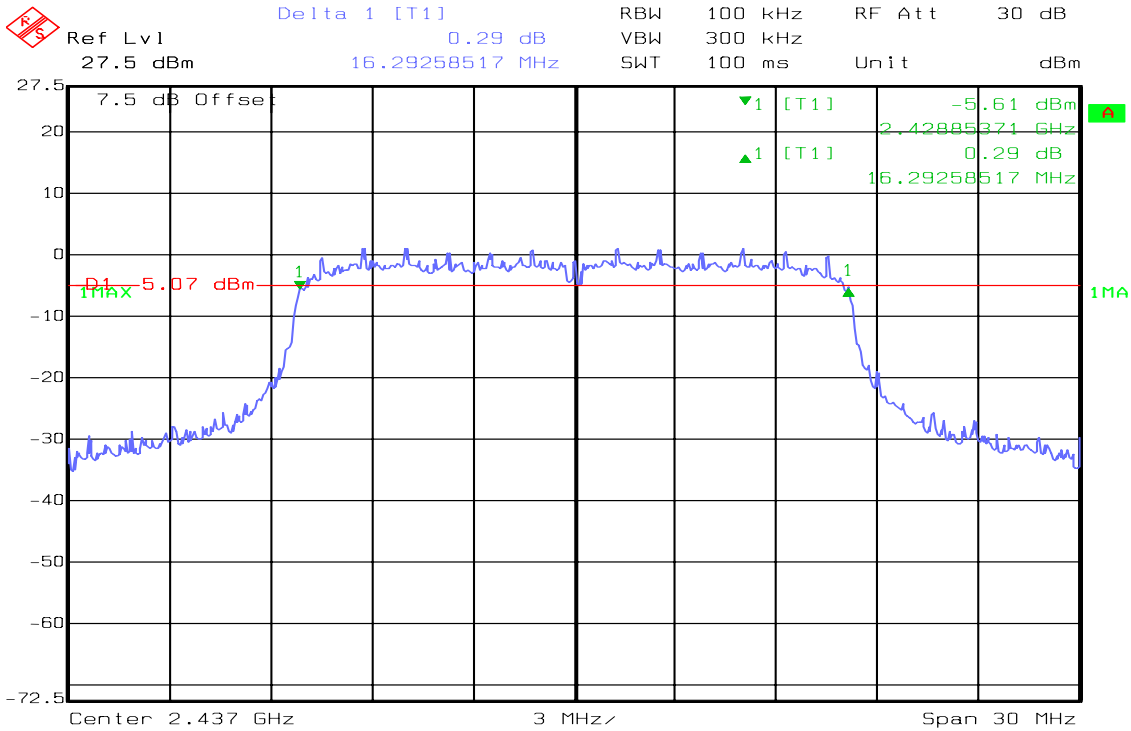
6dB Bandwidth (IEEE 802.11g / CH Low)



Date: 10.NOV.2009 11:31:11

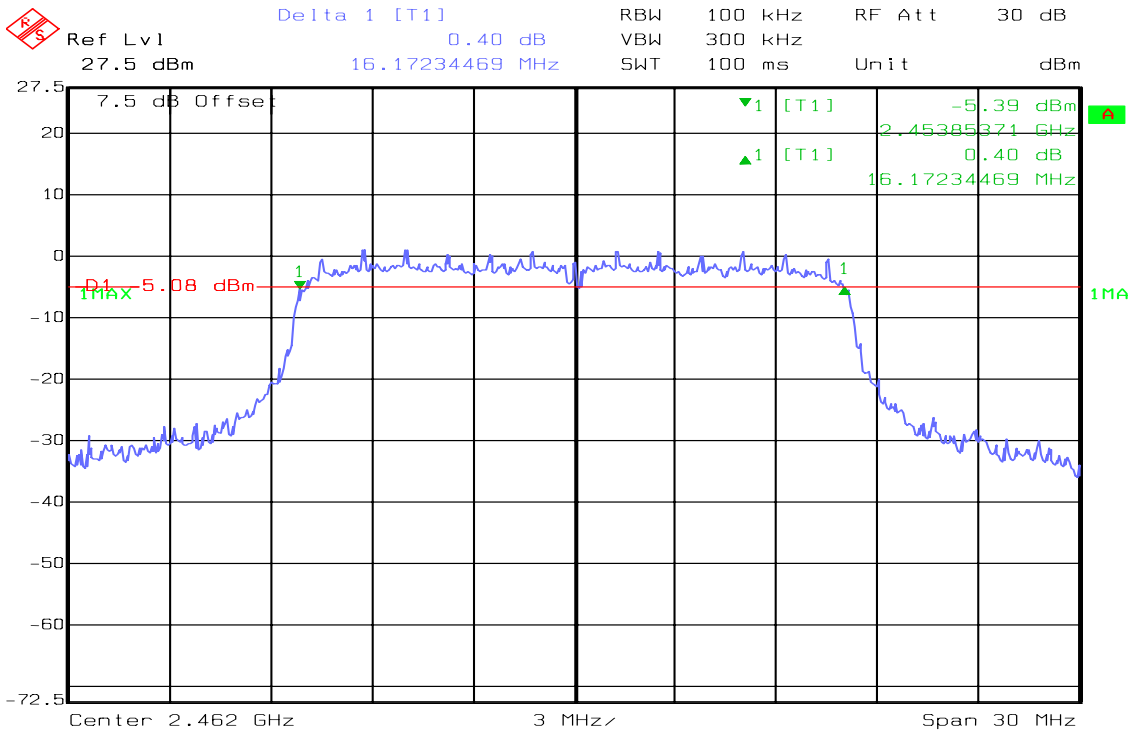


6dB Bandwidth (IEEE 802.11g / CH Mid)



Date: 10.NOV.2009 11:29:27

6dB Bandwidth (IEEE 802.11g / CH High)



Date: 10.NOV.2009 11:27:36



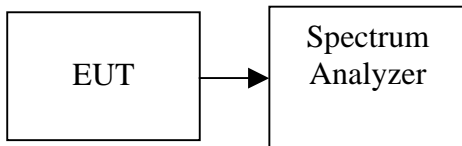
7.2 PEAK POWER

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

IEEE 802.11b

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	8.67	0.00736	0.50	PASS
Mid	2437	9.13	0.00818		PASS
High	2462	9.15	0.00822		PASS

IEEE 802.11g

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2412	17.11	0.05140	0.50	PASS
Mid	2437	17.18	0.05224		PASS
High	2462	17.15	0.05188		PASS

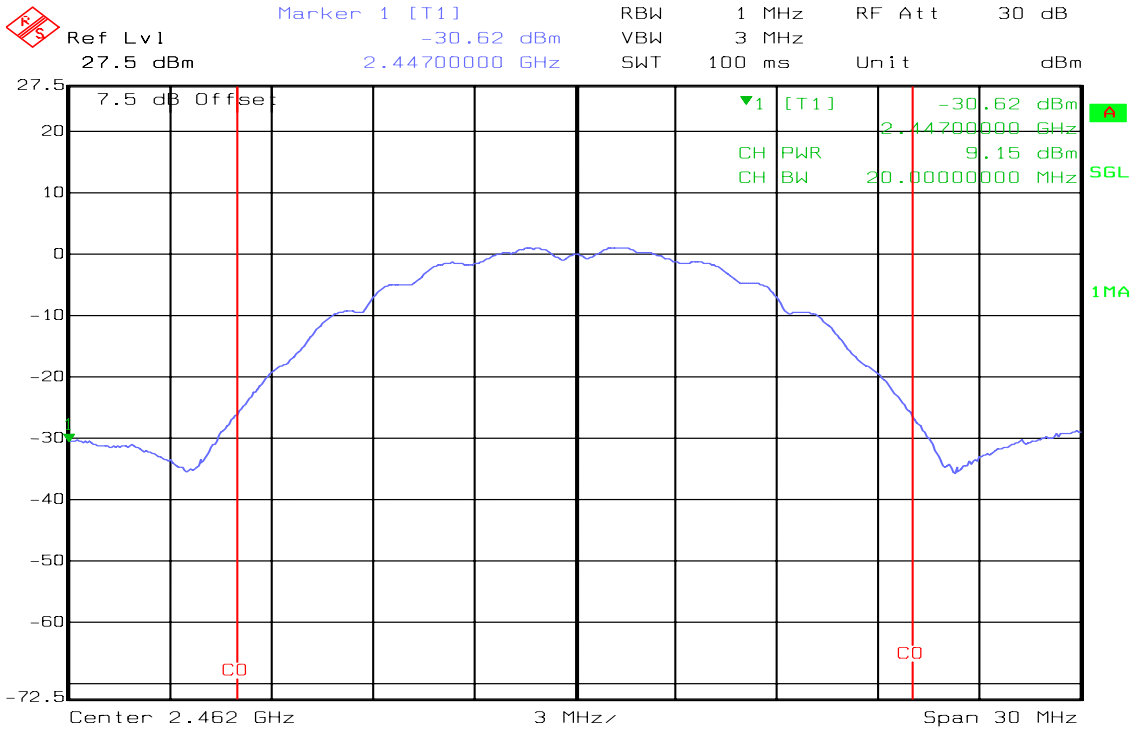
13.41 dB – 6 dB= 7.41 dB (Reduced by 1 dB for every 3 dB)

1W = 30 dB

(30 dB – 3 dB) / 10 log = 0.50W

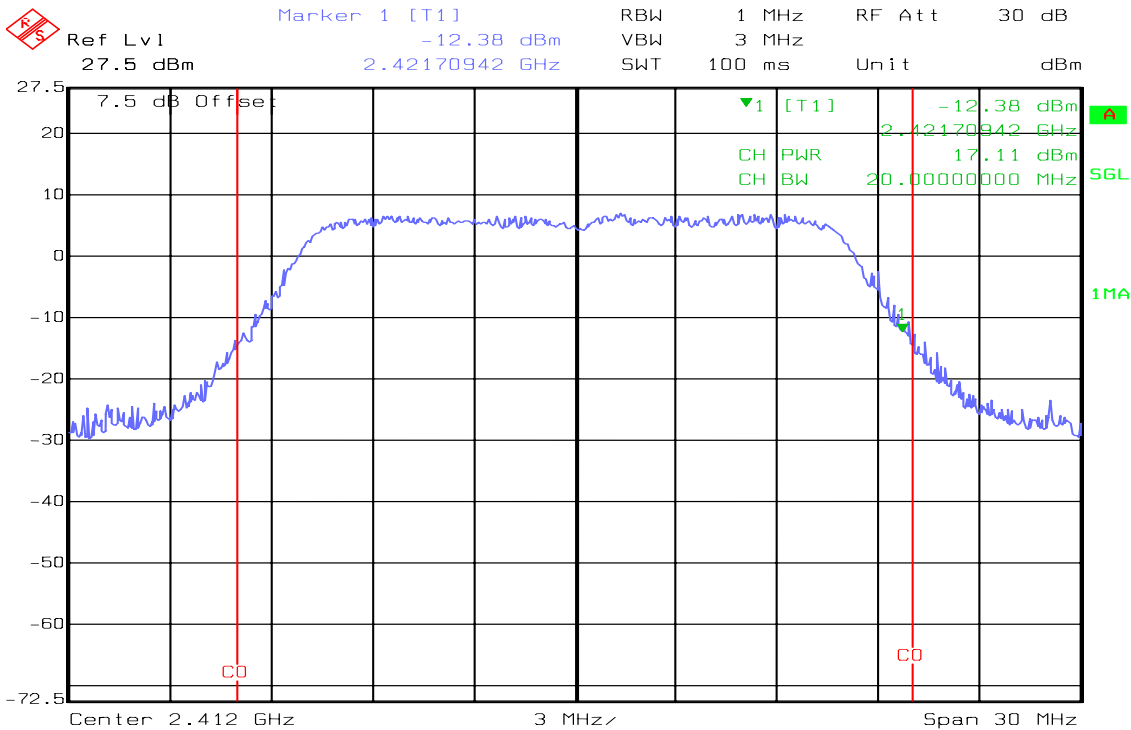


Peak Power (IEEE 802.11b / CH High)



Date: 09.NOV.2009 16:56:08

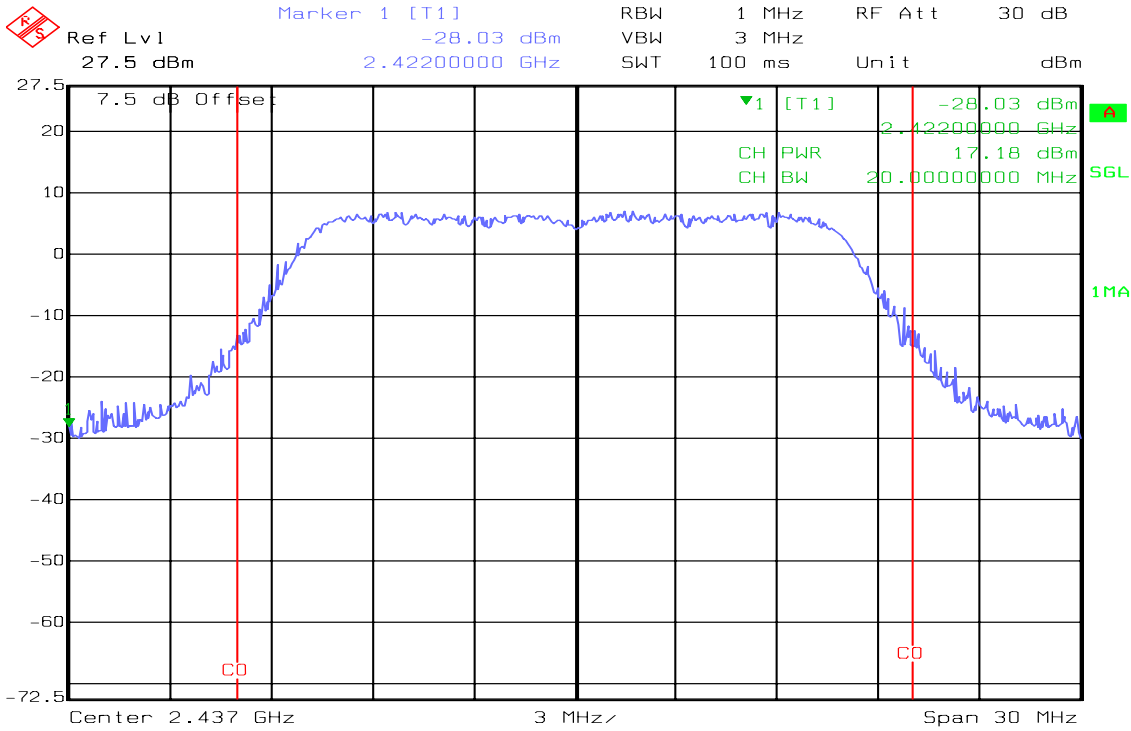
Peak Power (IEEE 802.11g / CH Low)



Date: 12.NOV.2009 09:27:57

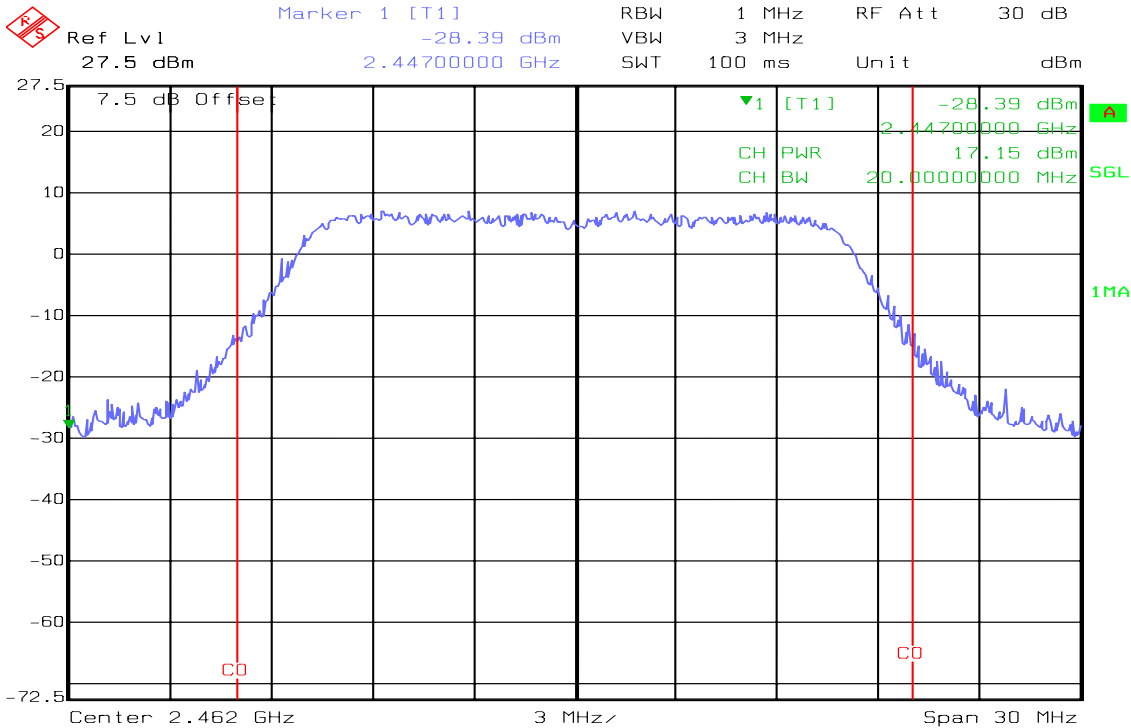


Peak Power (IEEE 802.11g / CH Mid)



Date: 12.NOV.2009 09:32:50

Peak Power (IEEE 802.11g / CH High)



Date: 12.NOV.2009 09:34:00

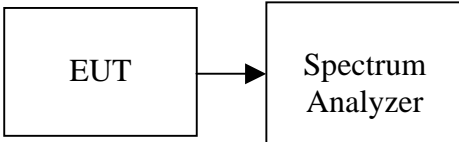


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST CONFIGURATION



TEST PROCEDURE

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

TEST RESULTS

No non-compliance noted

TEST DATA

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	5.74	0.0226
Mid	2437	6.14	0.0219
High	2462	6.33	0.0219

Test mode: IEEE 802.11g mode

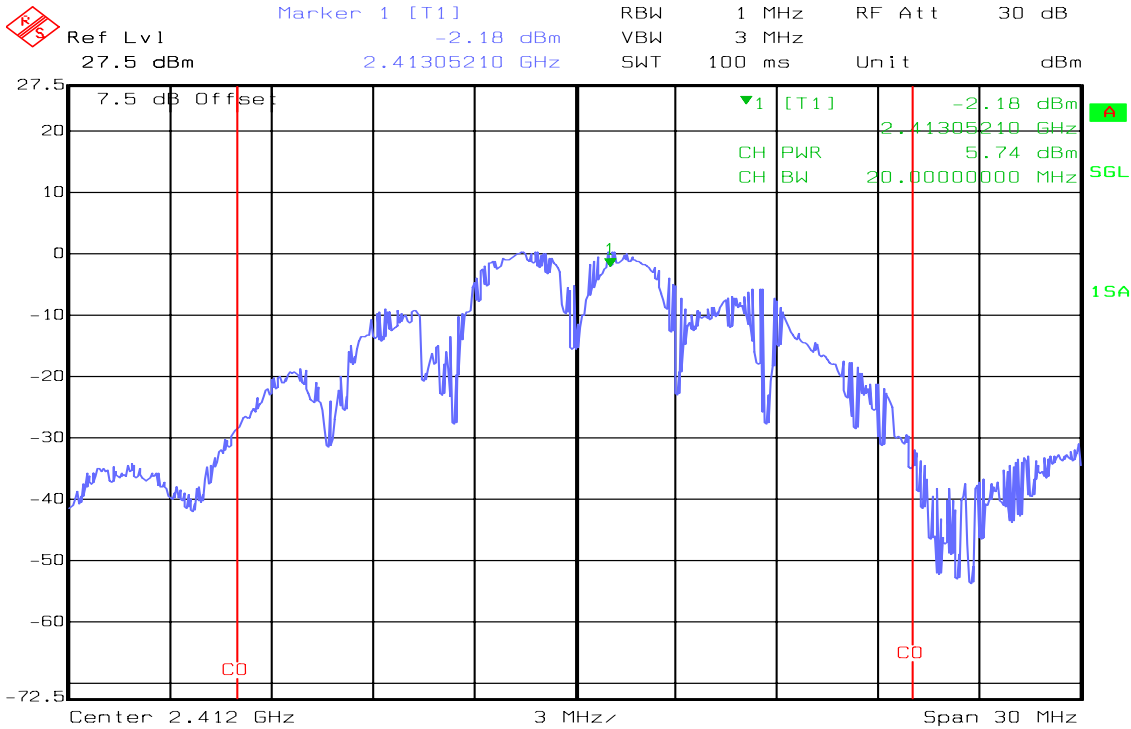
Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2412	9.65	0.0143
Mid	2437	10.18	0.0153
High	2462	9.84	0.0152



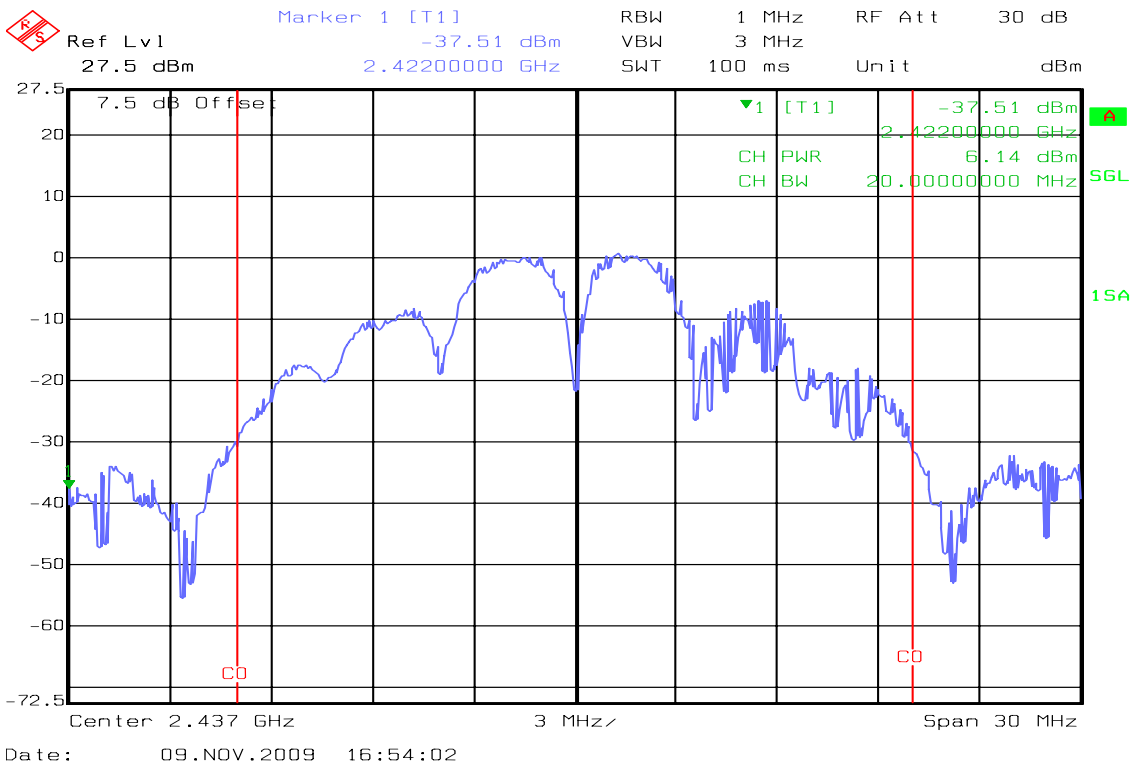
Test Plot

IEEE 802.11b

Average Power (CH Low)

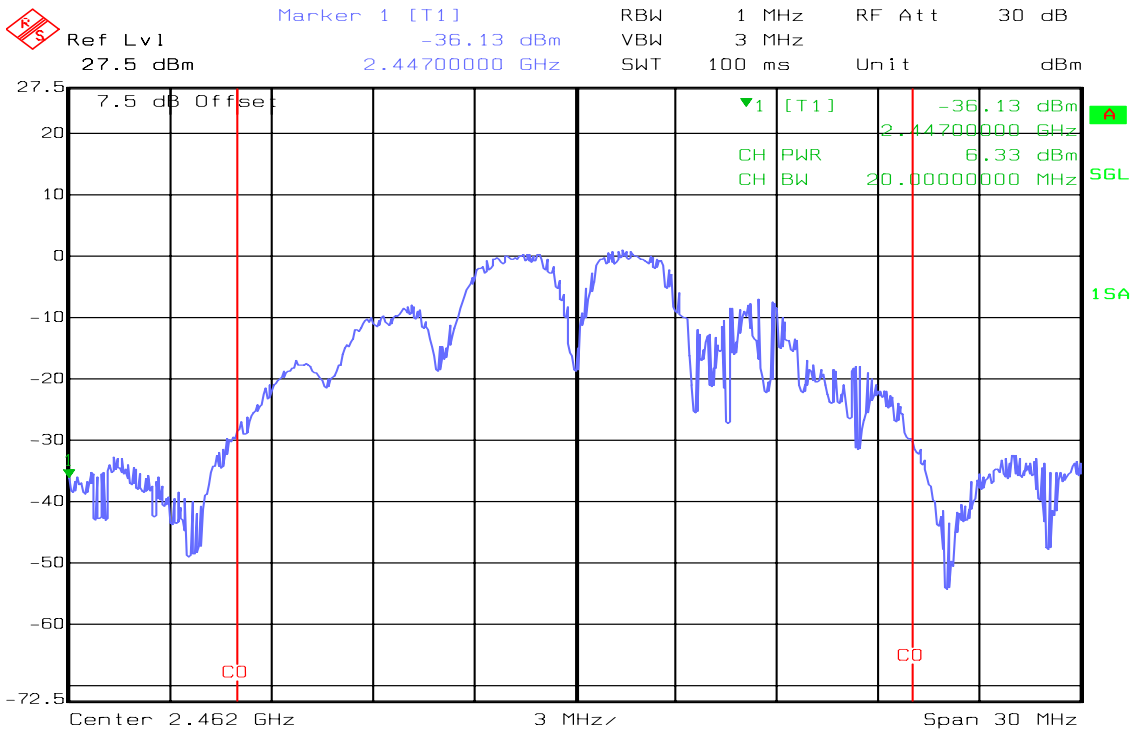


Average Power (CH Mid)





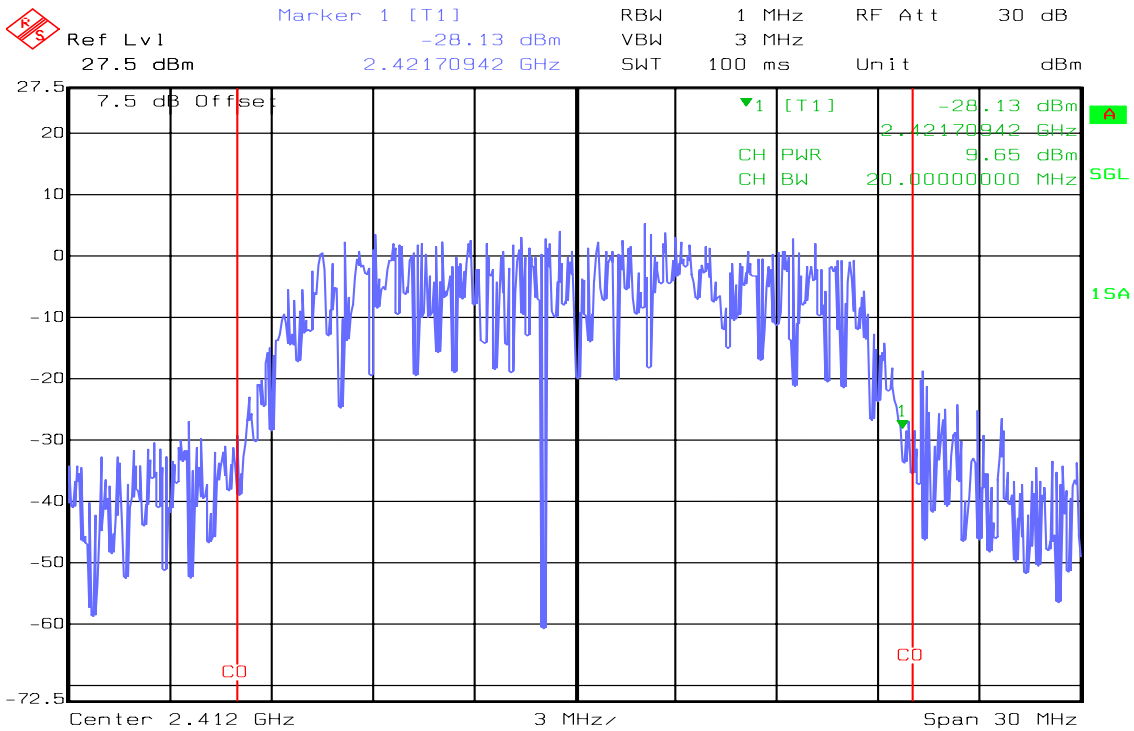
Average Power (CH High)



Date: 09.NOV.2009 16:55:04

IEEE 802.11g

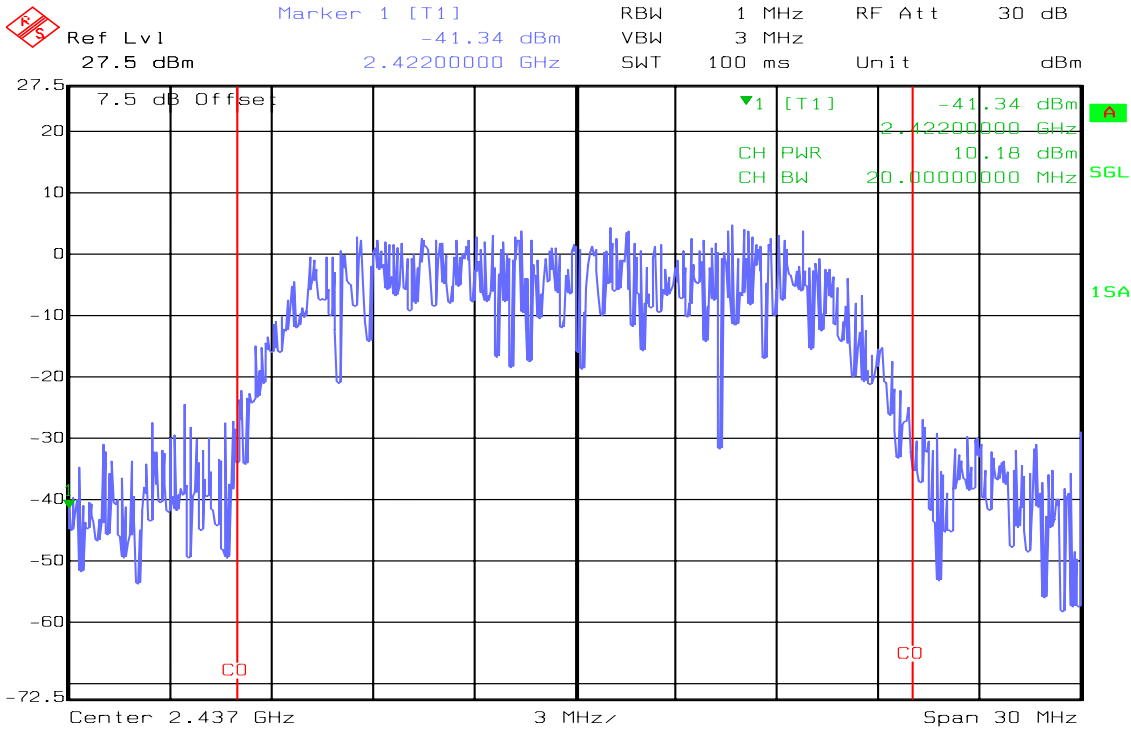
Average Power (CH Low)



Date: 12.NOV.2009 09:29:06

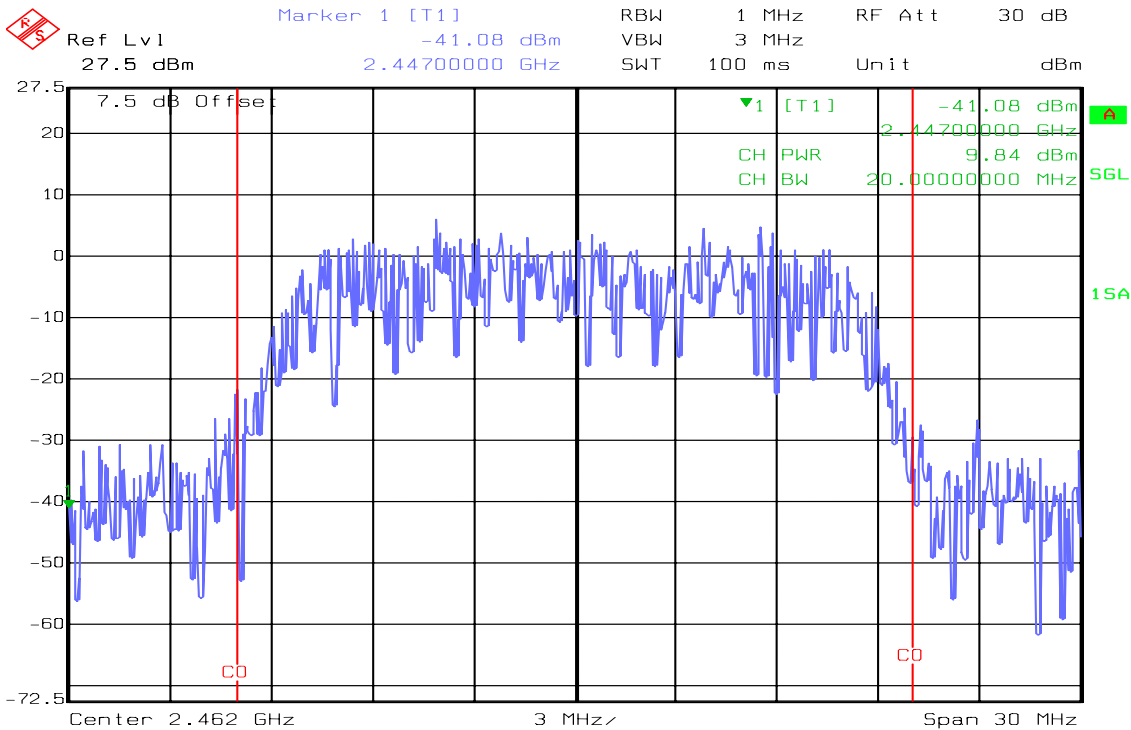


Average Power (CH Mid)



Date: 12.NOV.2009 09:31:05

Average Power (CH High)



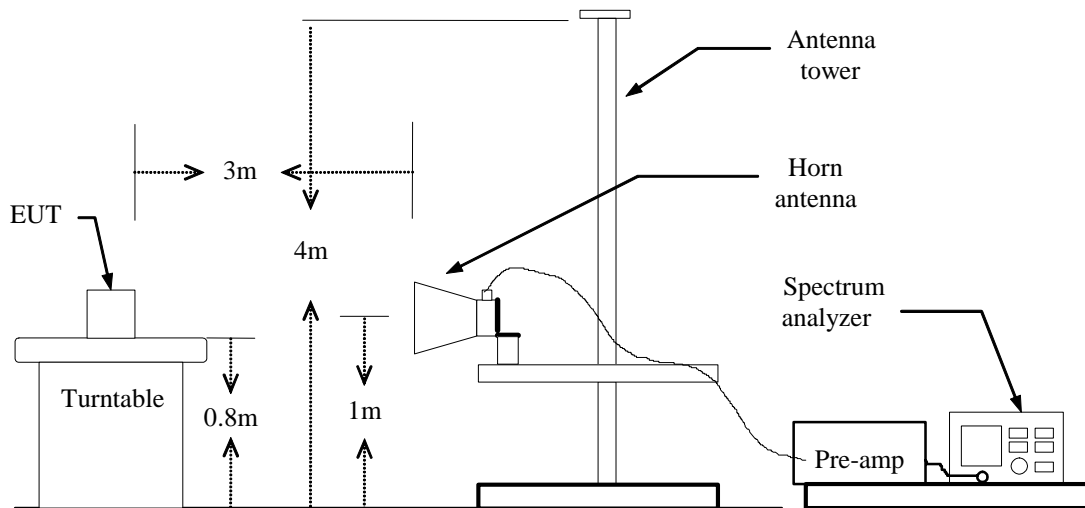
Date: 12.NOV.2009 09:36:24

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

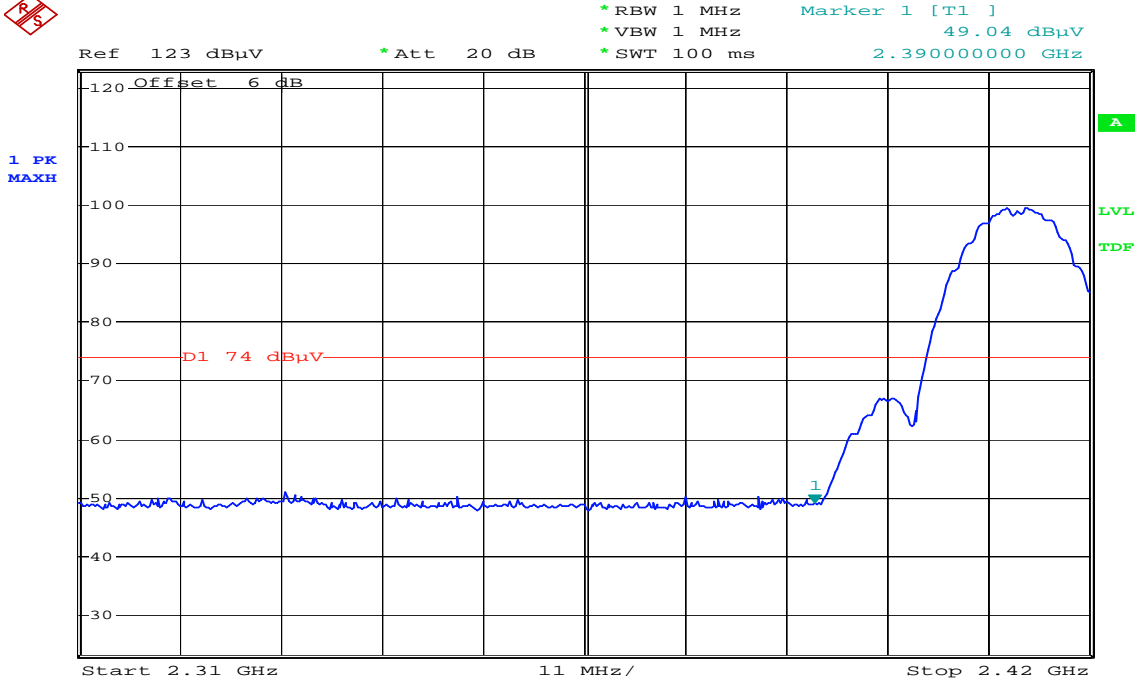
Refer to attach spectrum analyzer data chart.



Test Plot For PIFA Antenna Band Edges (IEEE 802.11b / CH Low)

Detector mode: Peak

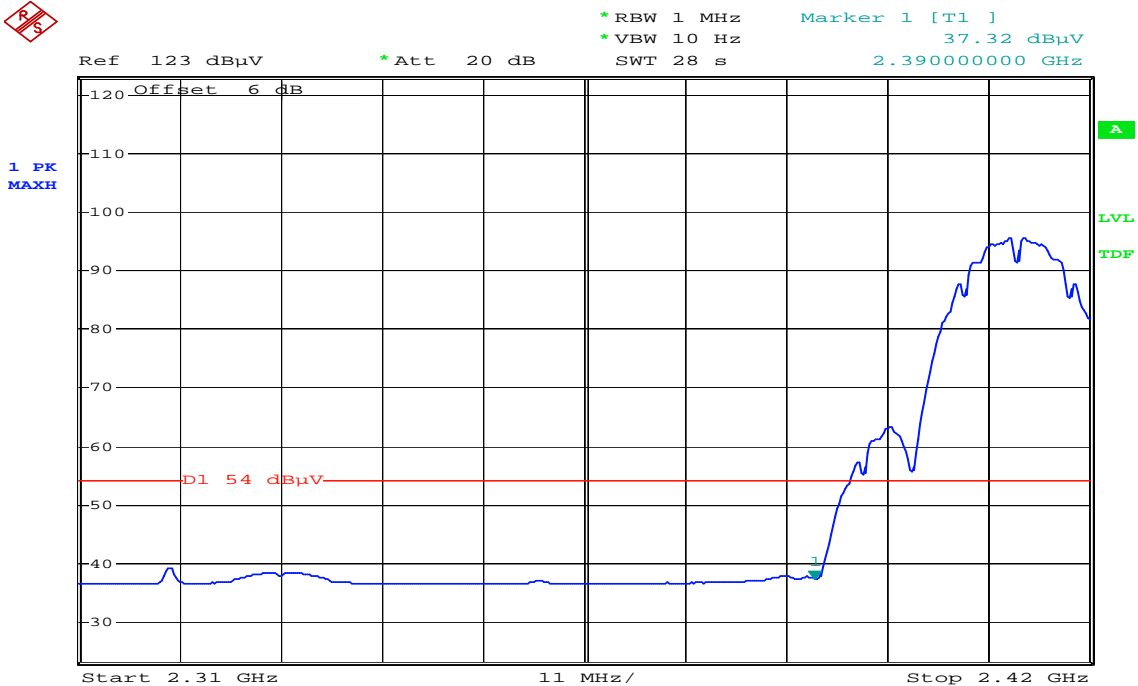
Polarity: Vertical



Date: 10.NOV.2009 07:03:07

Detector mode: Average

Polarity: Vertical

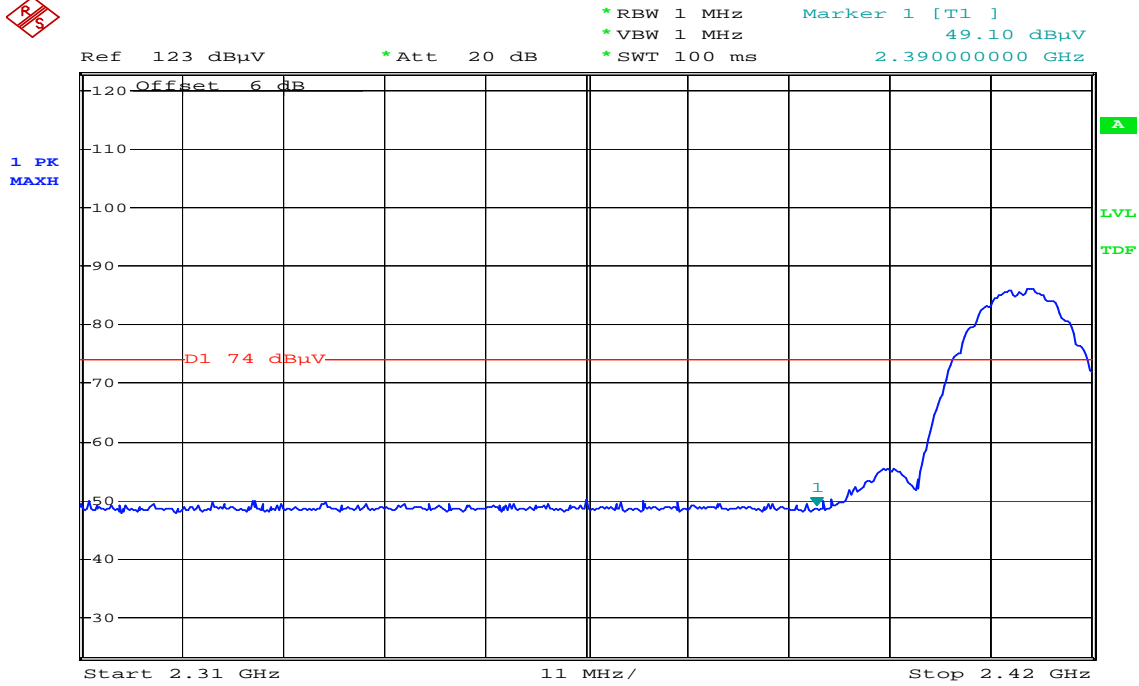


Date: 10.NOV.2009 07:04:06



Detector mode: Peak

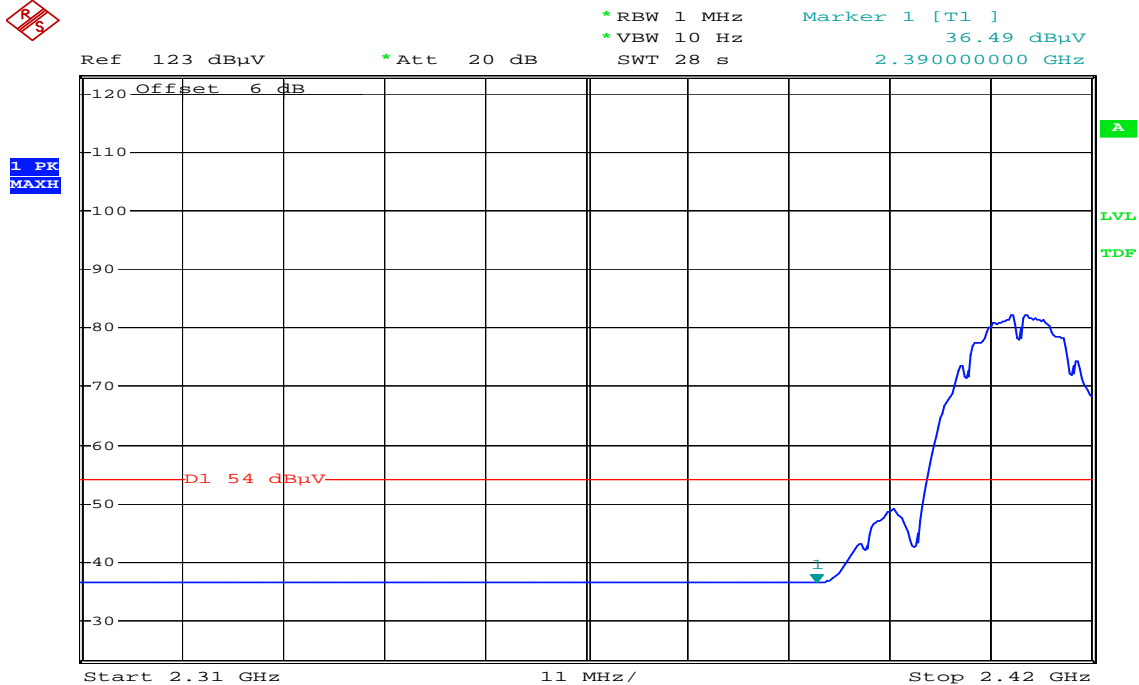
Polarity: Horizontal



Date: 10.NOV.2009 06:59:22

Detector mode: Average

Polarity: Horizontal



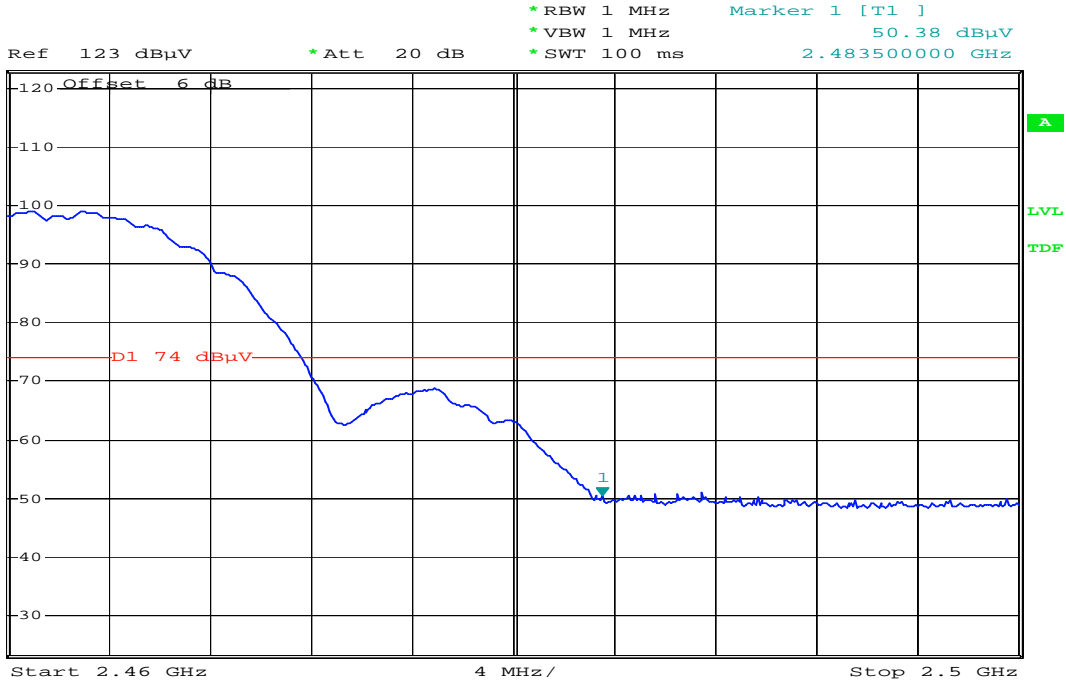
Date: 10.NOV.2009 07:00:22



Band Edges (IEEE 802.11b / CH High)

Detector mode: Peak

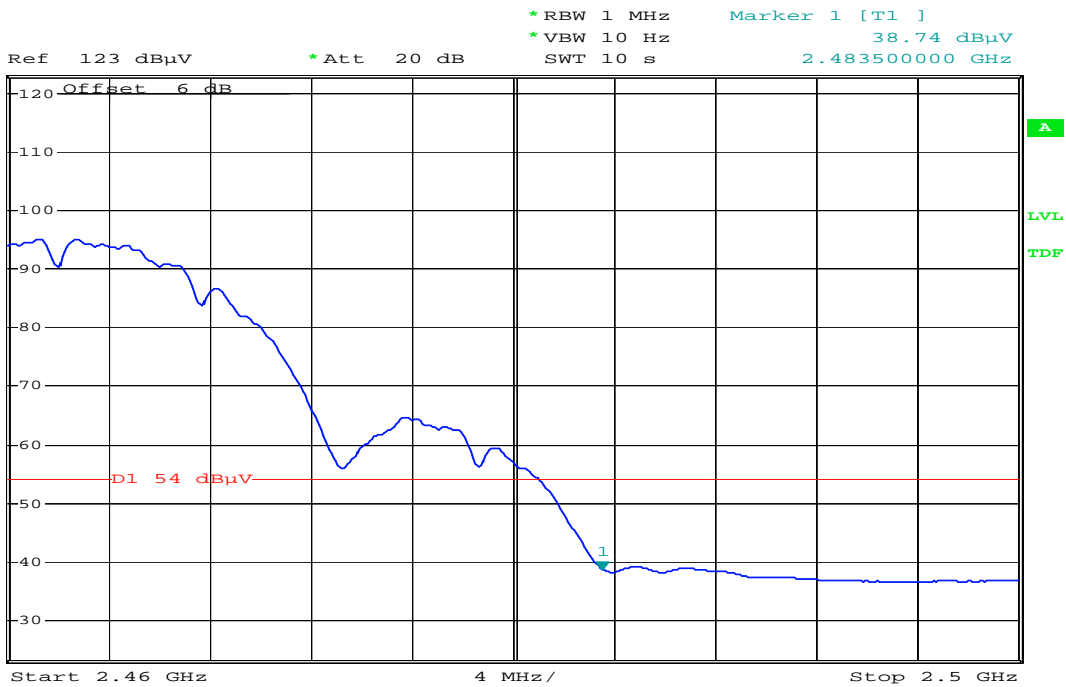
Polarity: Vertical



Date: 10.NOV.2009 07:24:58

Detector mode: Average

Polarity: Vertical



Date: 10.NOV.2009 07:26:38

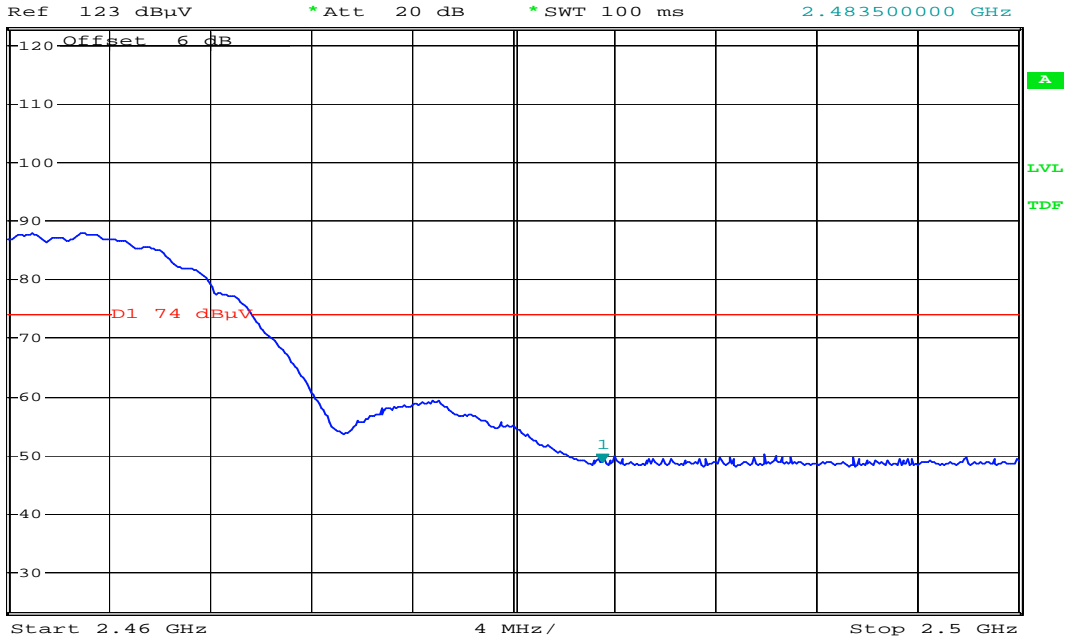


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 1 MHz 48.74 dBuV
*SWT 100 ms 2.483500000 GHz



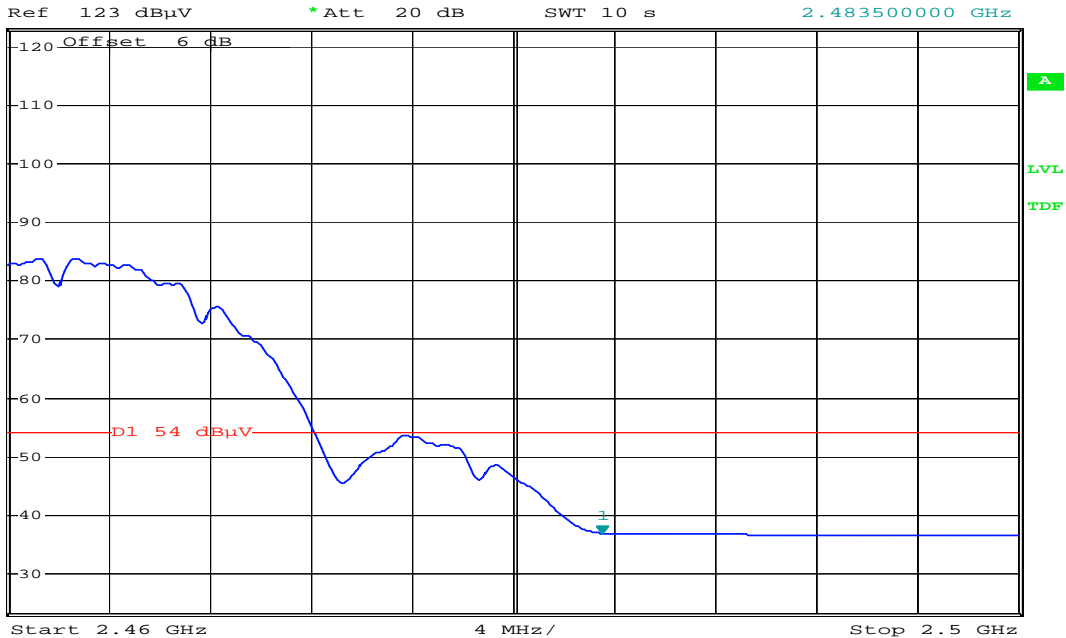
Date: 10.NOV.2009 07:19:45

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 10 Hz 36.84 dBuV
SWT 10 s 2.483500000 GHz



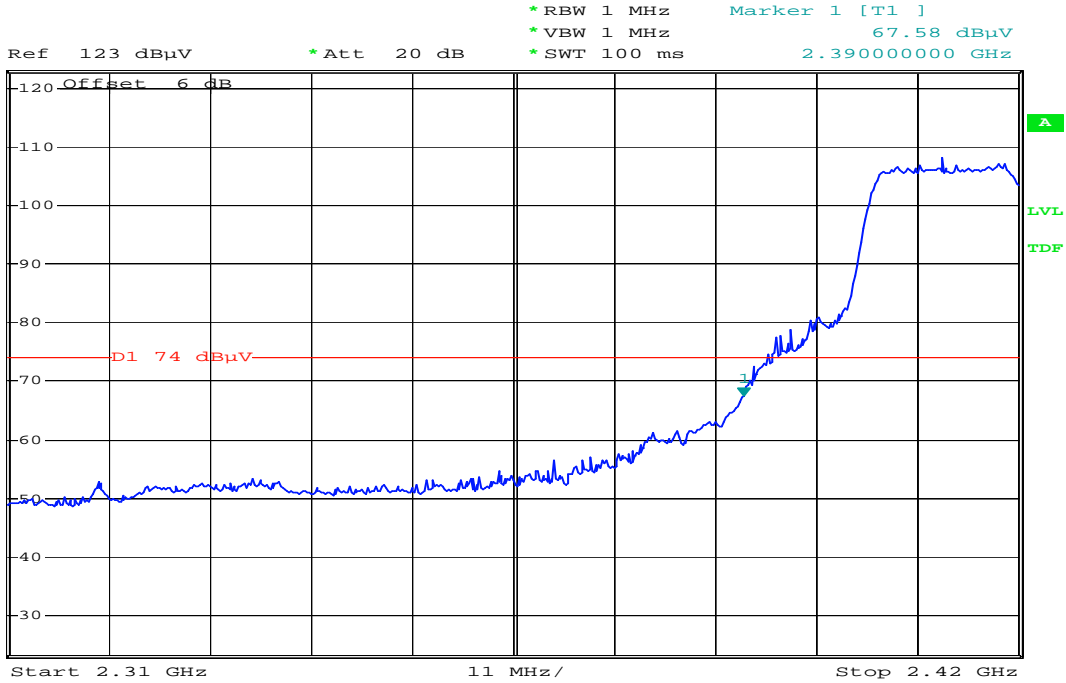
Date: 10.NOV.2009 07:20:56



Band Edges (IEEE 802.11g / CH Low)

Detector mode: Peak

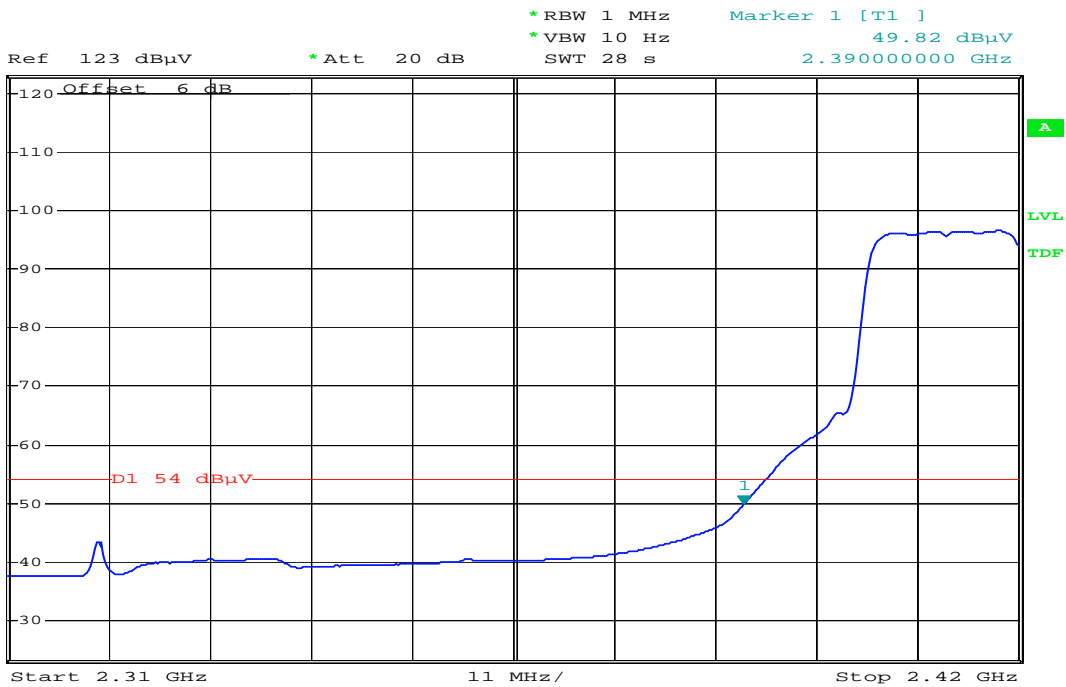
Polarity: Vertical



Date: 10.NOV.2009 06:49:51

Detector mode: Average

Polarity: Vertical

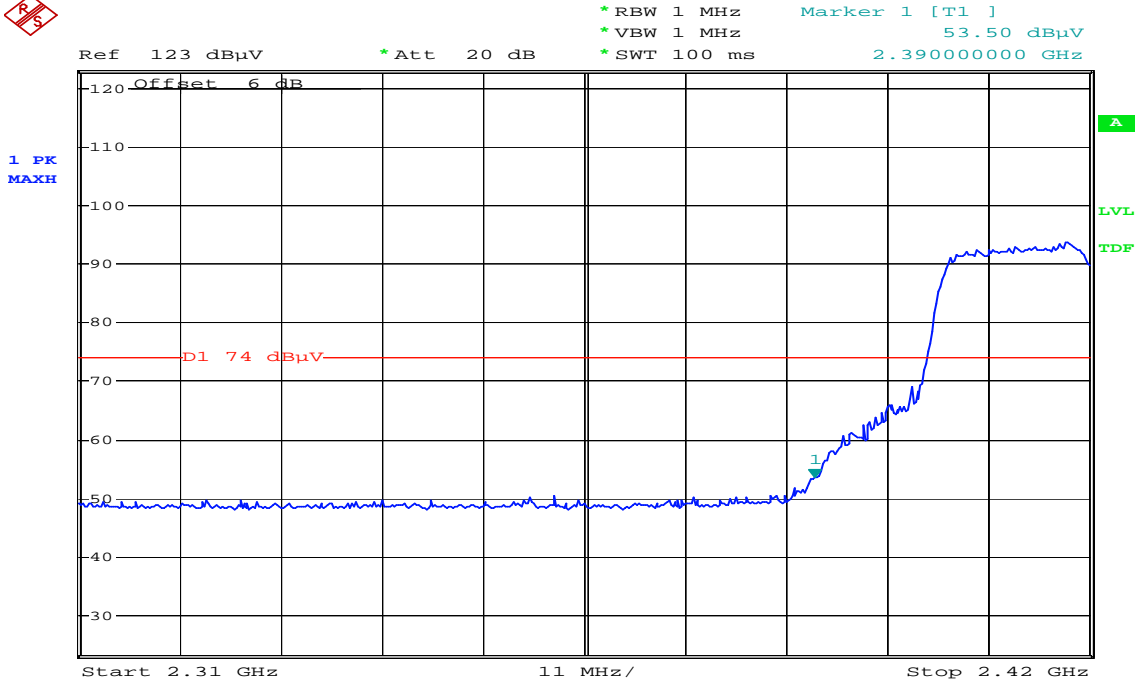


Date: 10.NOV.2009 06:51:30



Detector mode: Peak

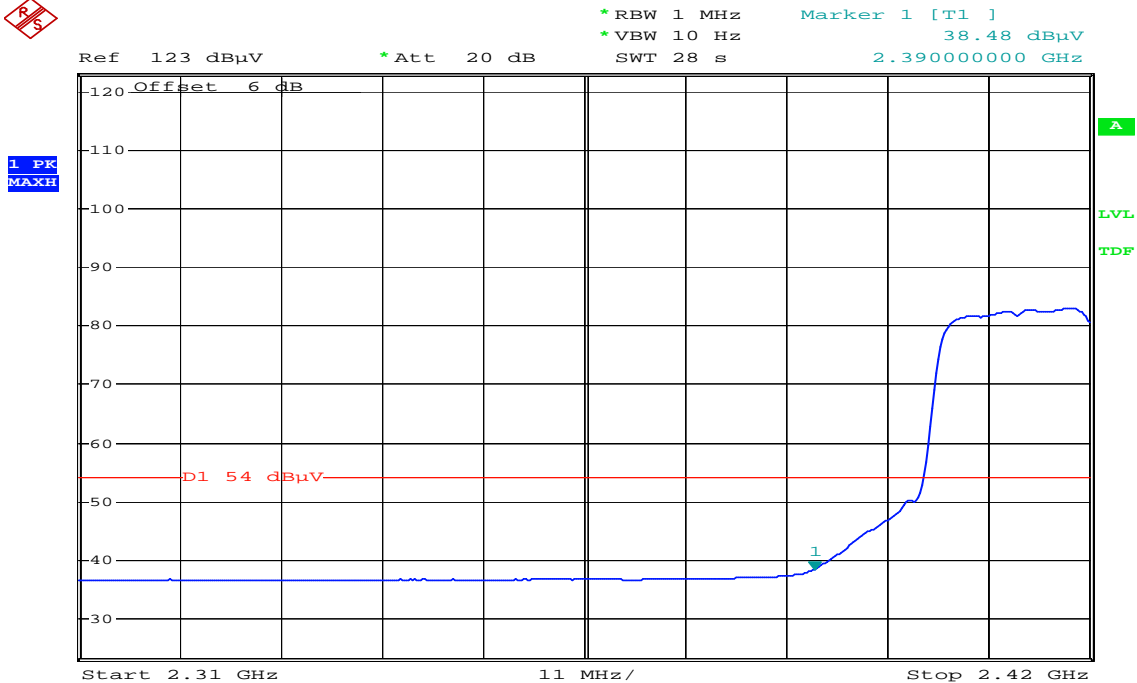
Polarity: Horizontal



Date: 10.NOV.2009 06:54:09

Detector mode: Average

Polarity: Horizontal



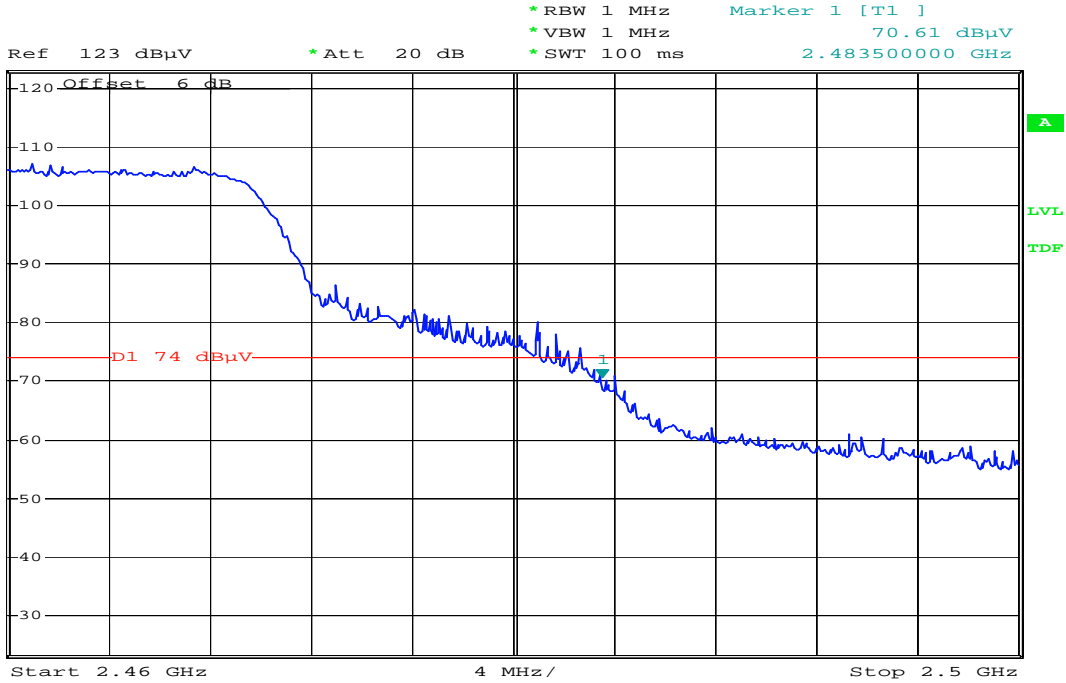
Date: 10.NOV.2009 06:56:10



Band Edges (IEEE 802.11g / CH High)

Detector mode: Peak

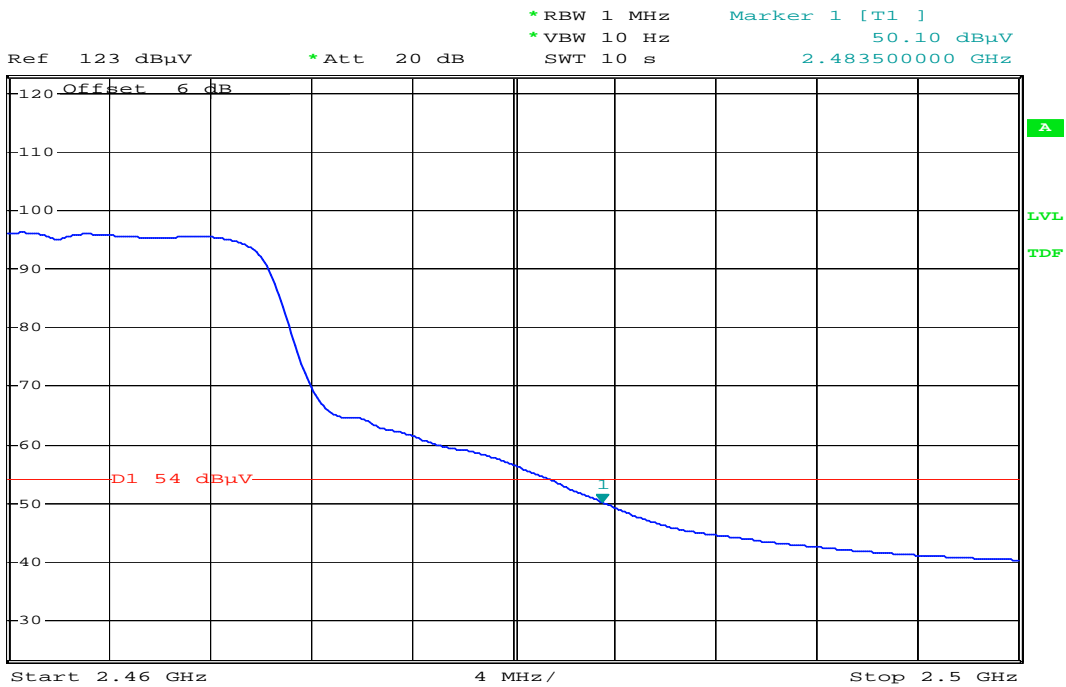
Polarity: Vertical



Date: 10.NOV.2009 07:11:47

Detector mode: Average

Polarity: Vertical

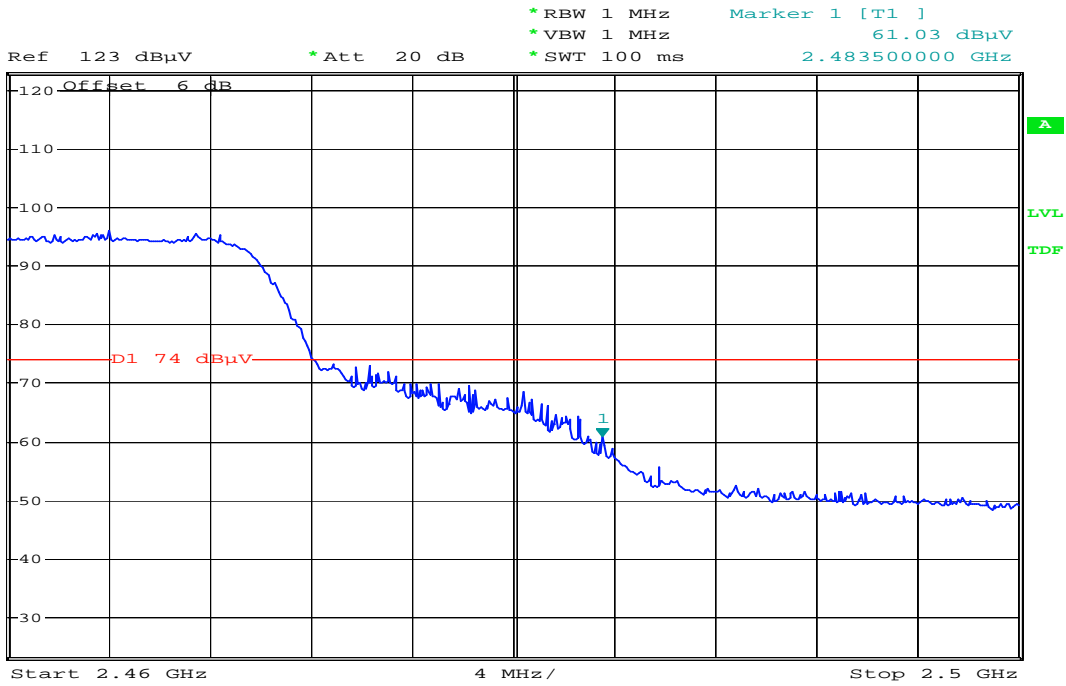


Date: 10.NOV.2009 07:12:32



Detector mode: Peak

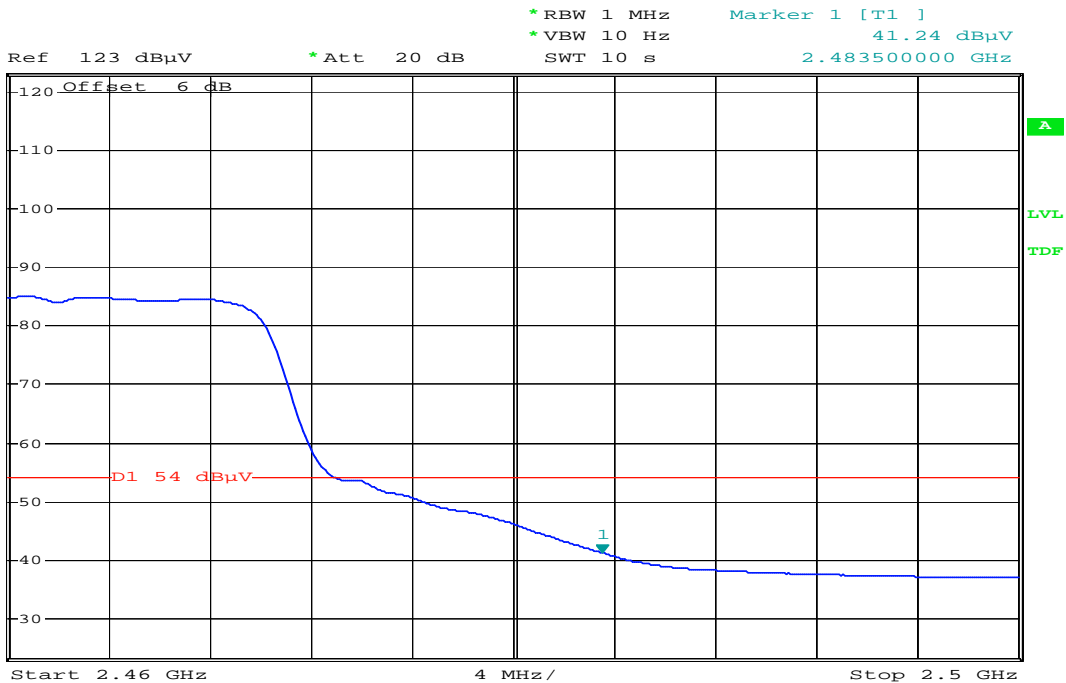
Polarity: Horizontal



Date: 10.NOV.2009 07:15:52

Detector mode: Average

Polarity: Horizontal



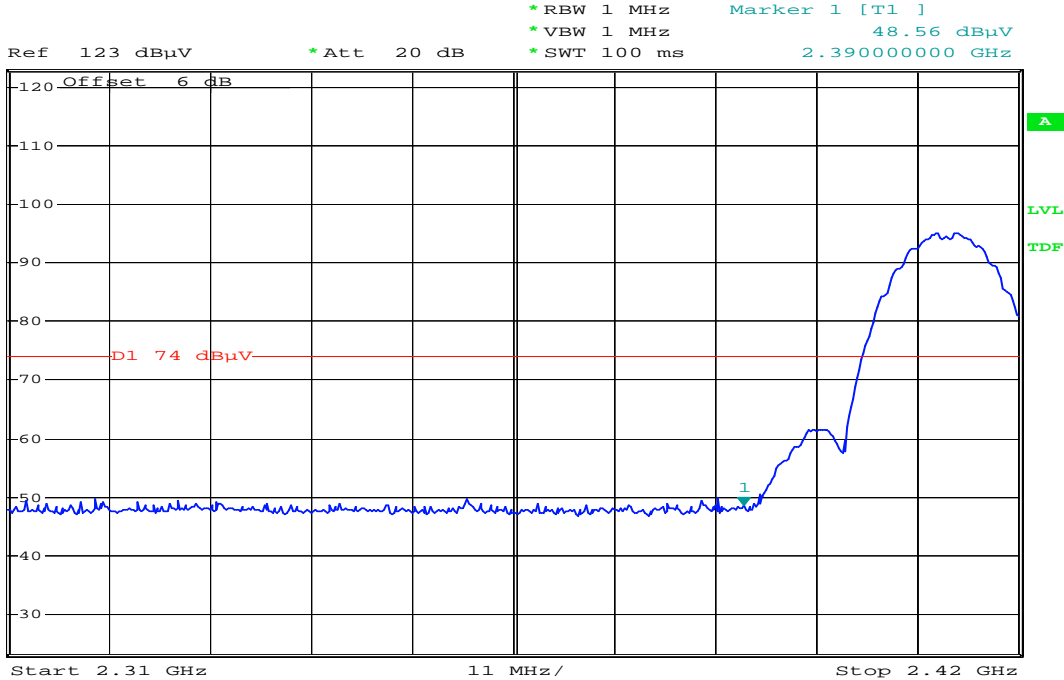
Date: 10.NOV.2009 07:16:47



For Dipole Antenna
Band Edges (IEEE 802.11b / CH Low)

Detector mode: Peak

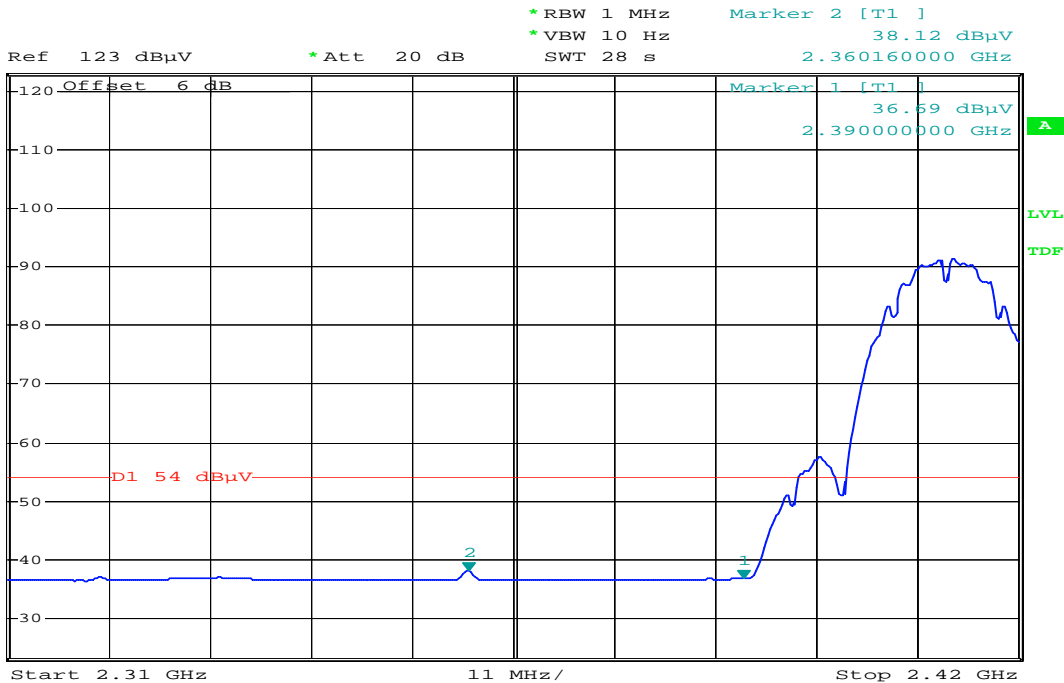
Polarity: Vertical



Date: 10.NOV.2009 08:02:01

Detector mode: Average

Polarity: Vertical



Date: 10.NOV.2009 08:03:15

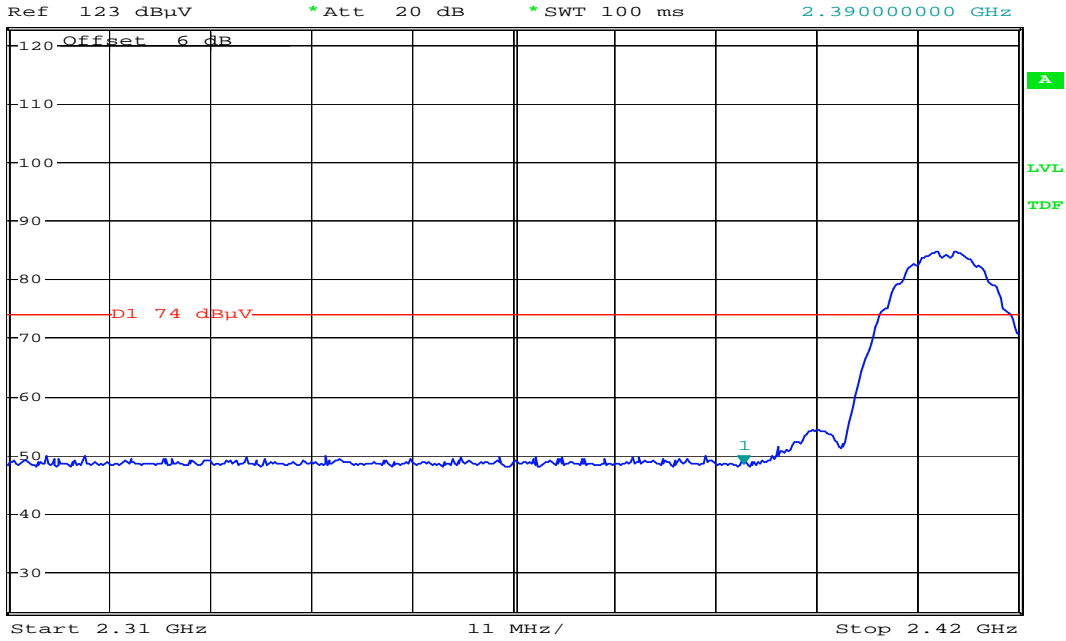


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 1 MHz 48.70 dBuV
*SWT 100 ms 2.390000000 GHz



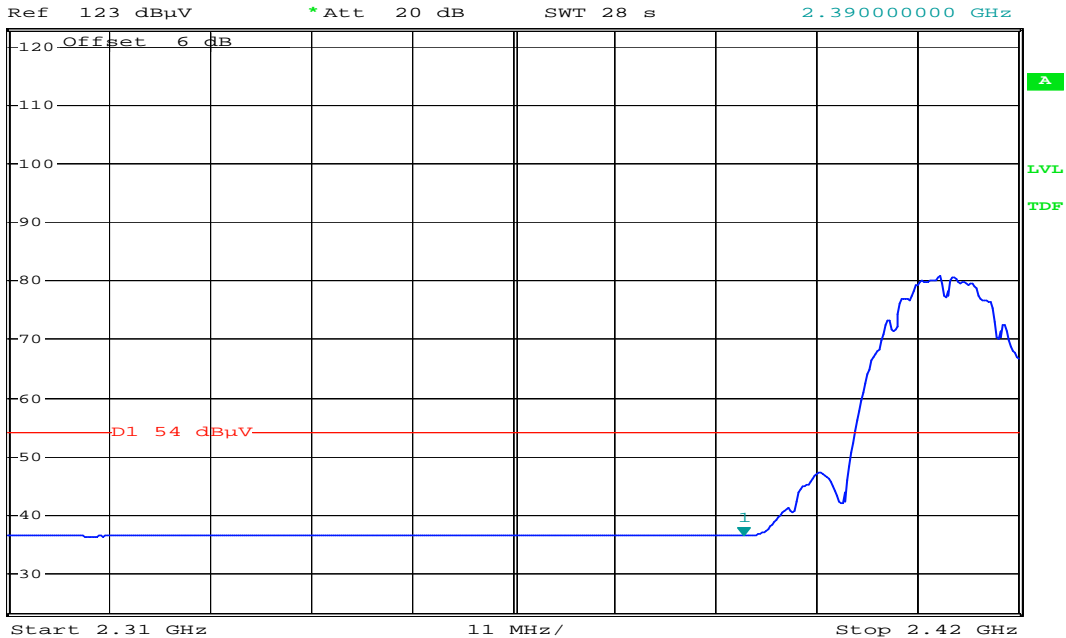
Date: 10.NOV.2009 08:06:58

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 10 Hz 36.44 dBuV
SWT 28 s 2.390000000 GHz



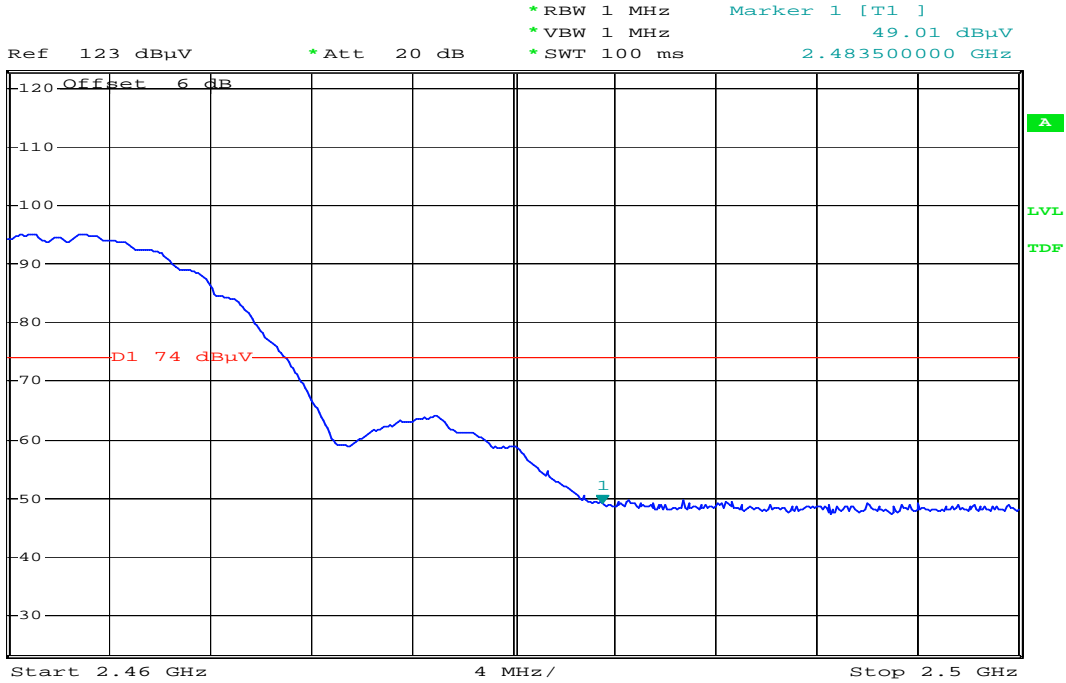
Date: 10.NOV.2009 08:08:05



Band Edges (IEEE 802.11b / CH High)

Detector mode: Peak

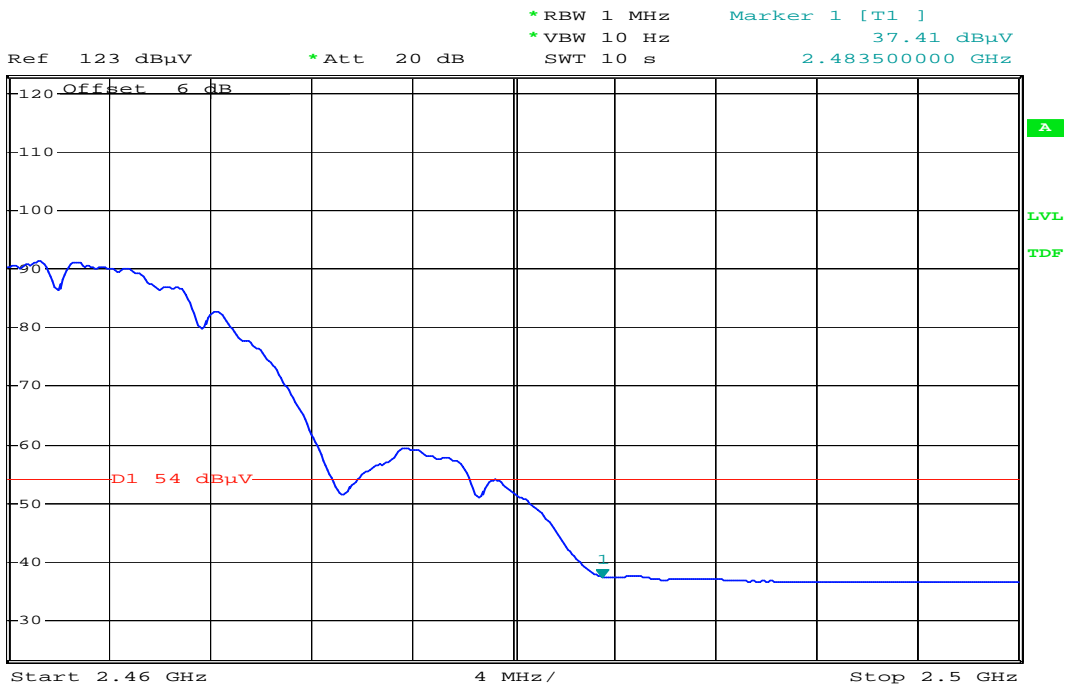
Polarity: Vertical



Date: 10.NOV.2009 07:55:08

Detector mode: Average

Polarity: Vertical



Date: 10.NOV.2009 07:55:49

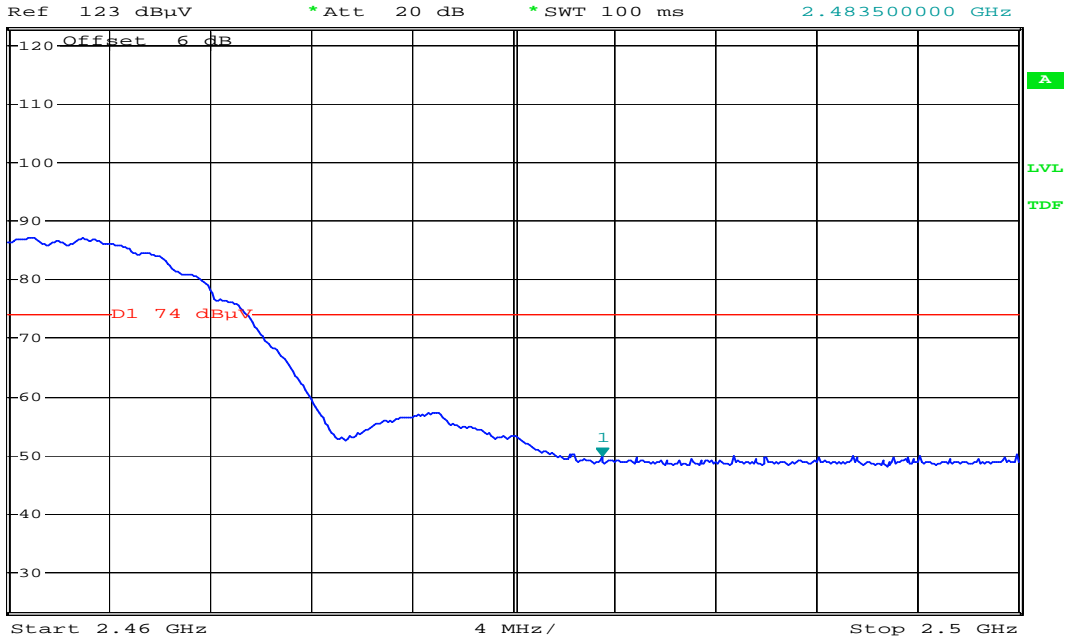


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 1 MHz 49.79 dBuV
*SWT 100 ms 2.483500000 GHz



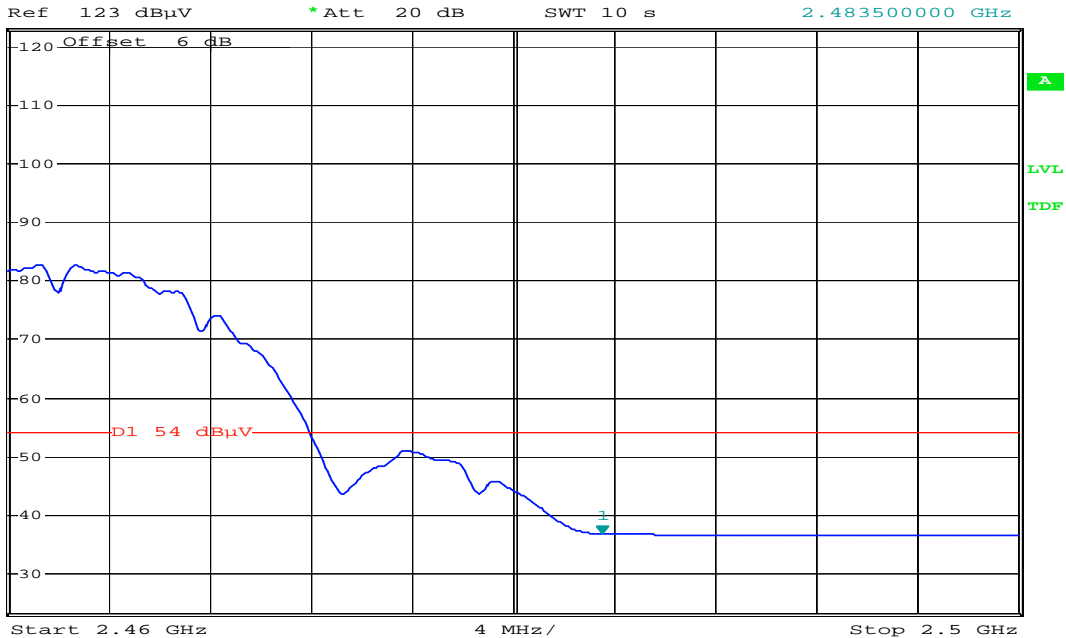
Date: 10.NOV.2009 07:48:59

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 10 Hz 36.71 dBuV
*SWT 10 s 2.483500000 GHz



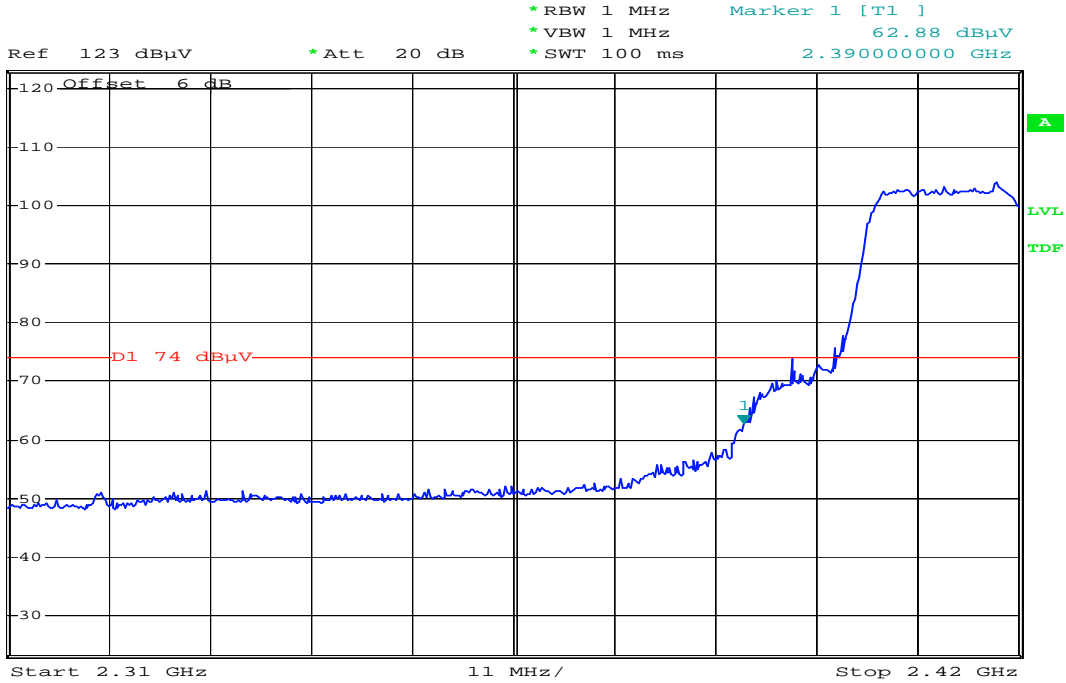
Date: 10.NOV.2009 07:50:32



Band Edges (IEEE 802.11g / CH Low)

Detector mode: Peak

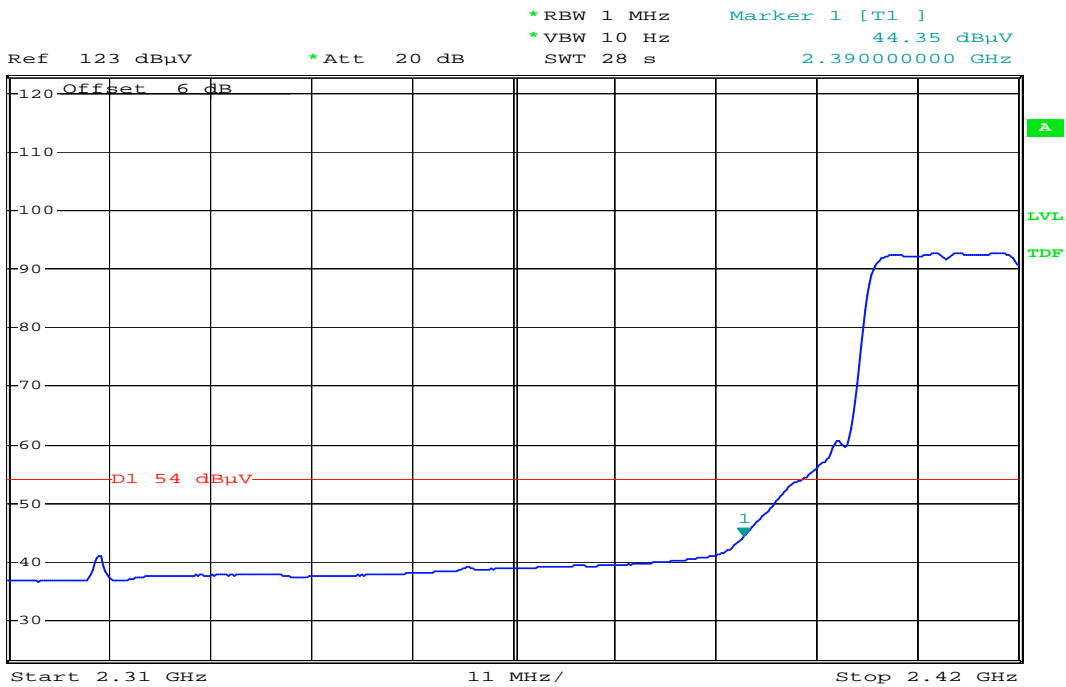
Polarity: Vertical



Date: 10.NOV.2009 08:18:39

Detector mode: Average

Polarity: Vertical



Date: 10.NOV.2009 08:19:33

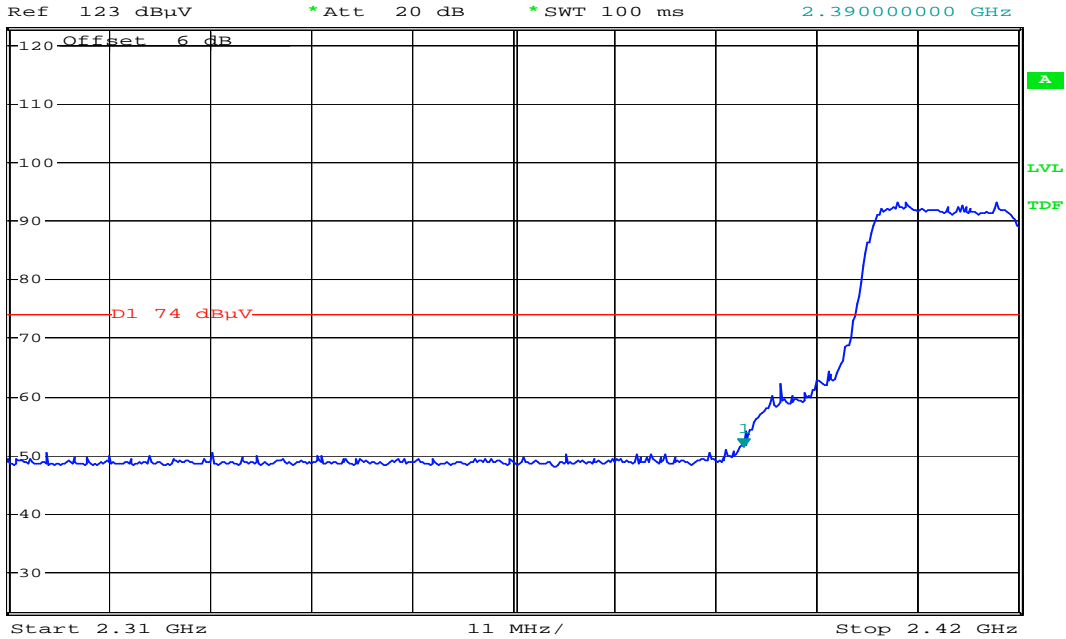


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 1 MHz 51.58 dBuV
*SWT 100 ms 2.390000000 GHz



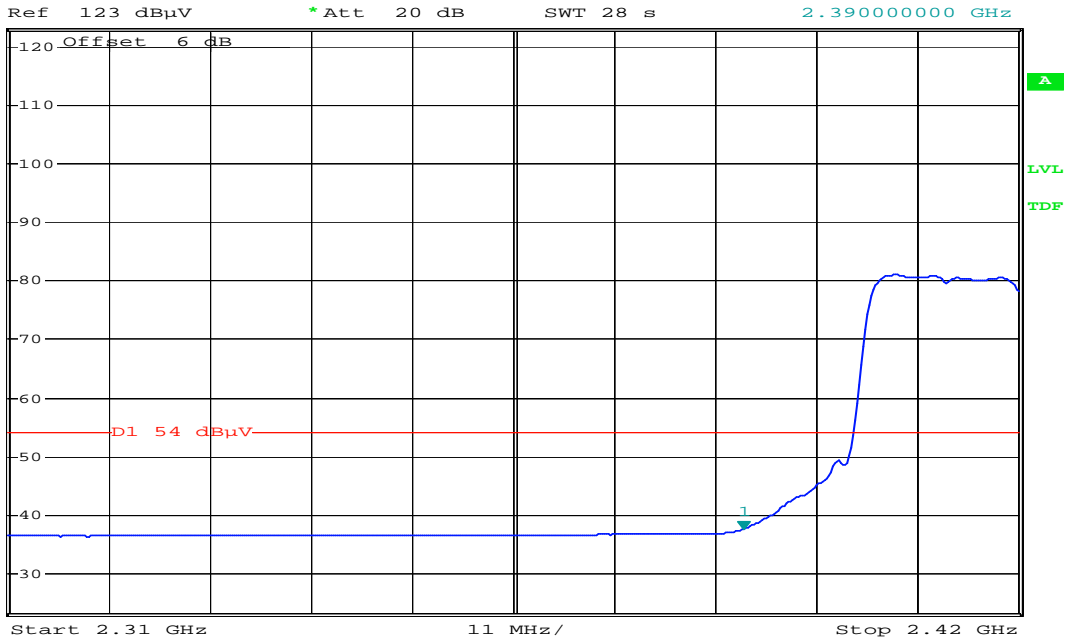
Date: 10.NOV.2009 08:15:09

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 10 Hz 37.64 dBuV
SWT 28 s 2.390000000 GHz



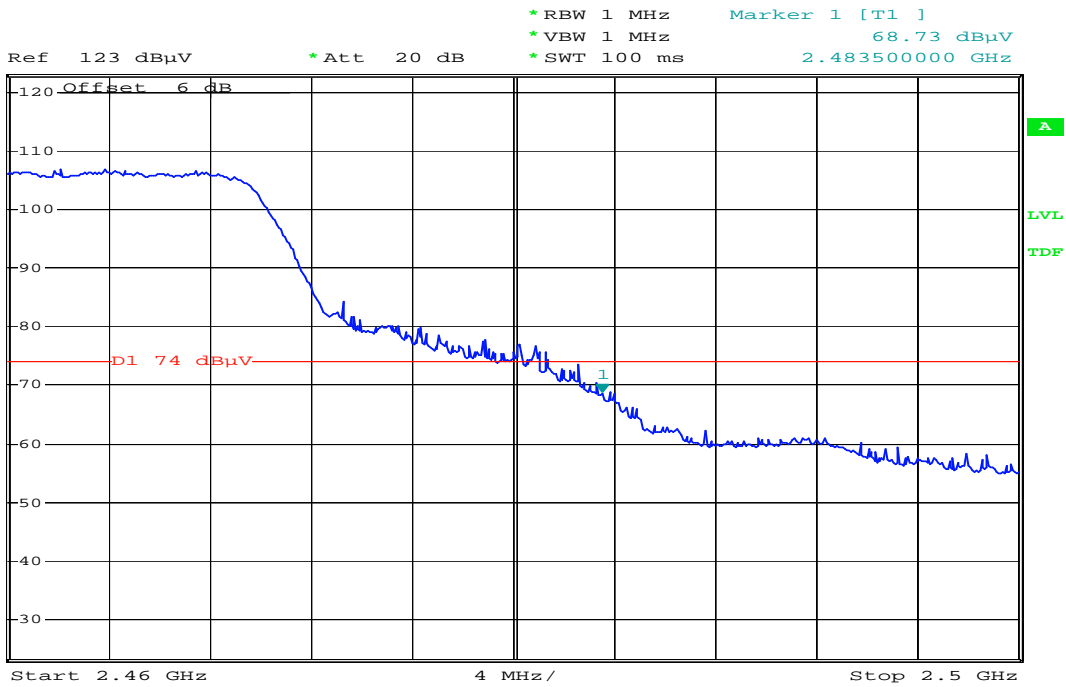
Date: 10.NOV.2009 08:16:11



Band Edges (IEEE 802.11g / CH High)

Detector mode: Peak

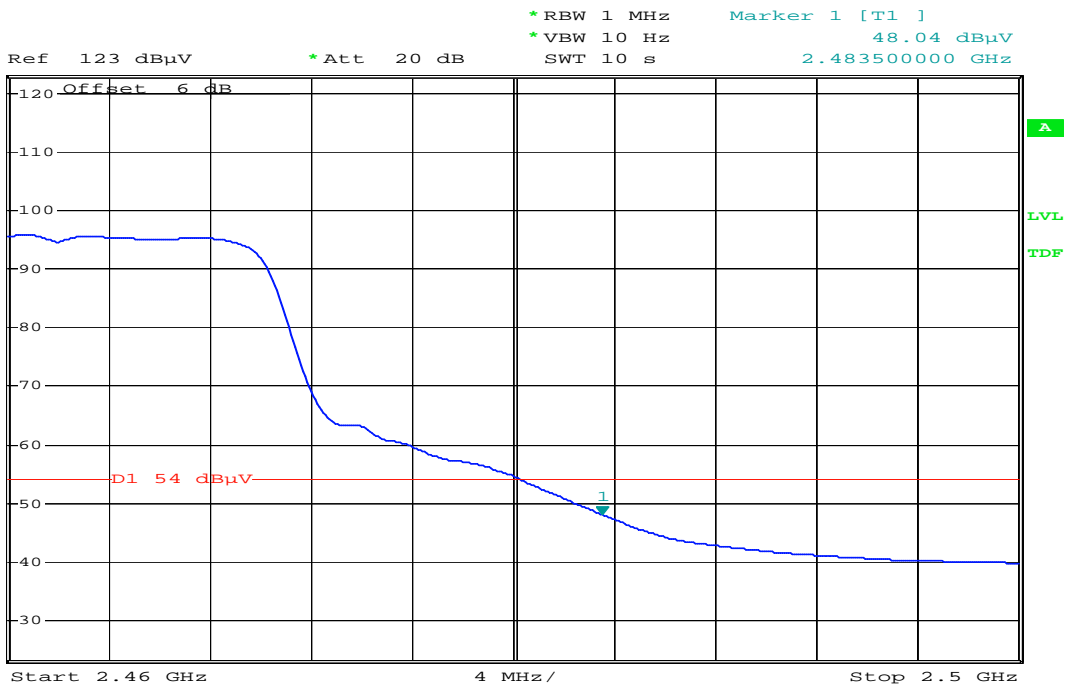
Polarity: Vertical



Date: 10.NOV.2009 07:38:15

Detector mode: Average

Polarity: Vertical



Date: 10.NOV.2009 07:39:03

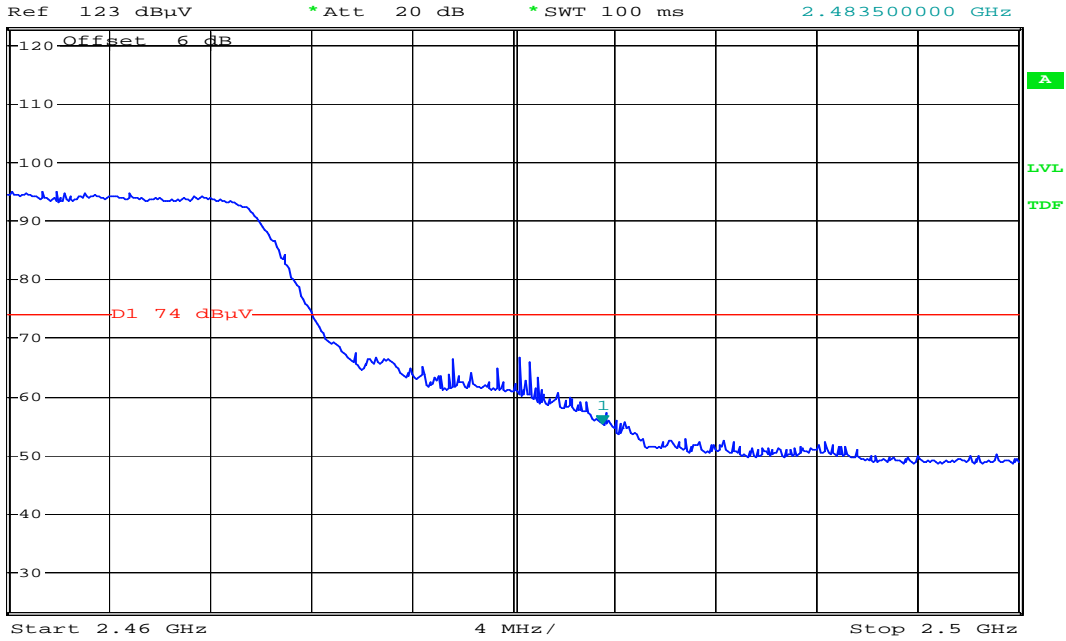


Detector mode: Peak

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 1 MHz 55.52 dBuV
*SWT 100 ms 2.483500000 GHz



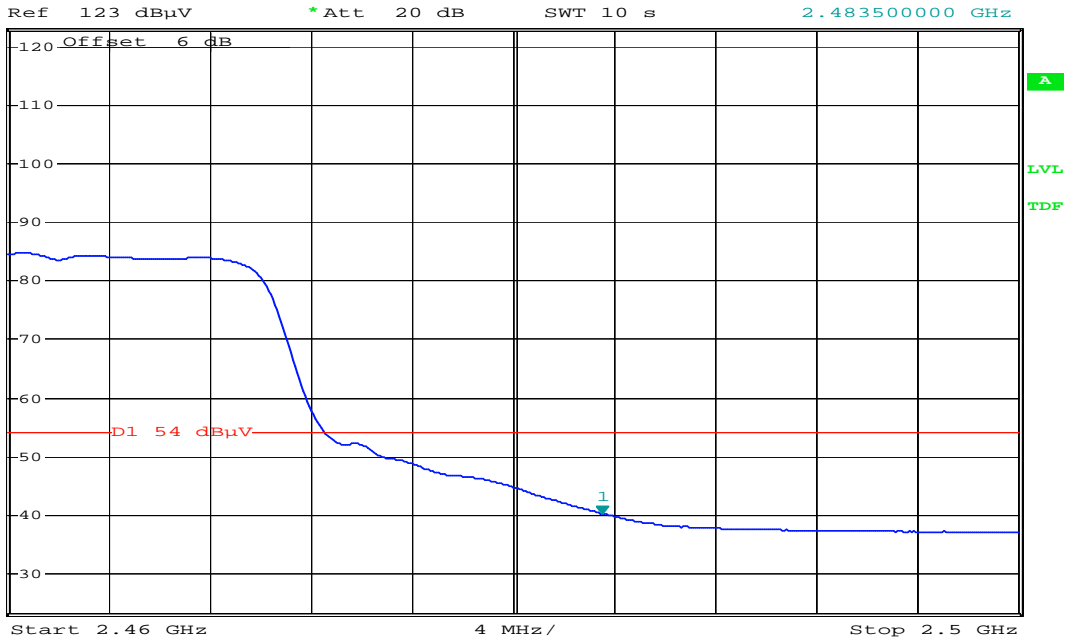
Date: 10.NOV.2009 07:41:41

Detector mode: Average

Polarity: Horizontal



*RBW 1 MHz Marker 1 [T1]
*VBW 10 Hz 40.28 dBuV
*SWT 10 s 2.483500000 GHz



Date: 10.NOV.2009 07:42:38

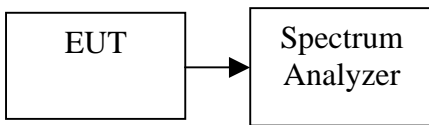


7.5 PEAK POWER SPECTRAL DENSITY

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

IEEE 802.11b

Table with 5 columns: Channel, Frequency (MHz), PPSD (dBm), Limit (dBm), Test Result. Rows for Low, Mid, High channels.

IEEE 802.11g

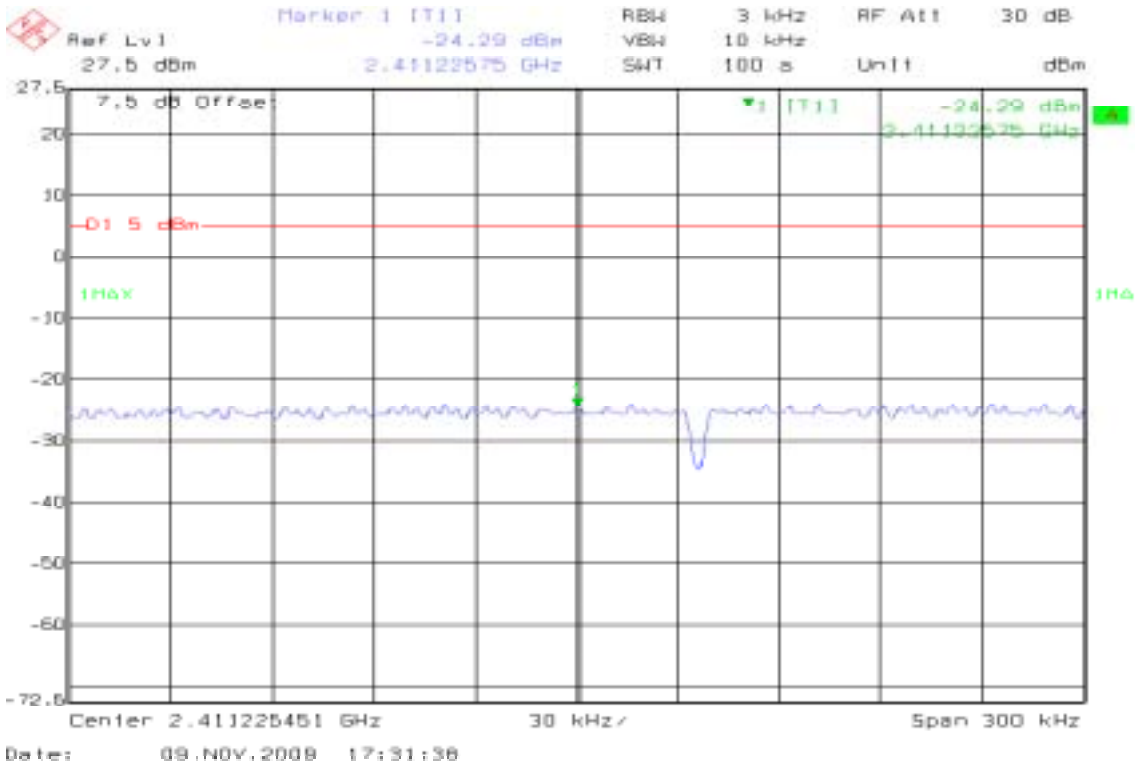
Table with 5 columns: Channel, Frequency (MHz), PPSD (dBm), Limit (dBm), Test Result. Rows for Low, Mid, High channels.



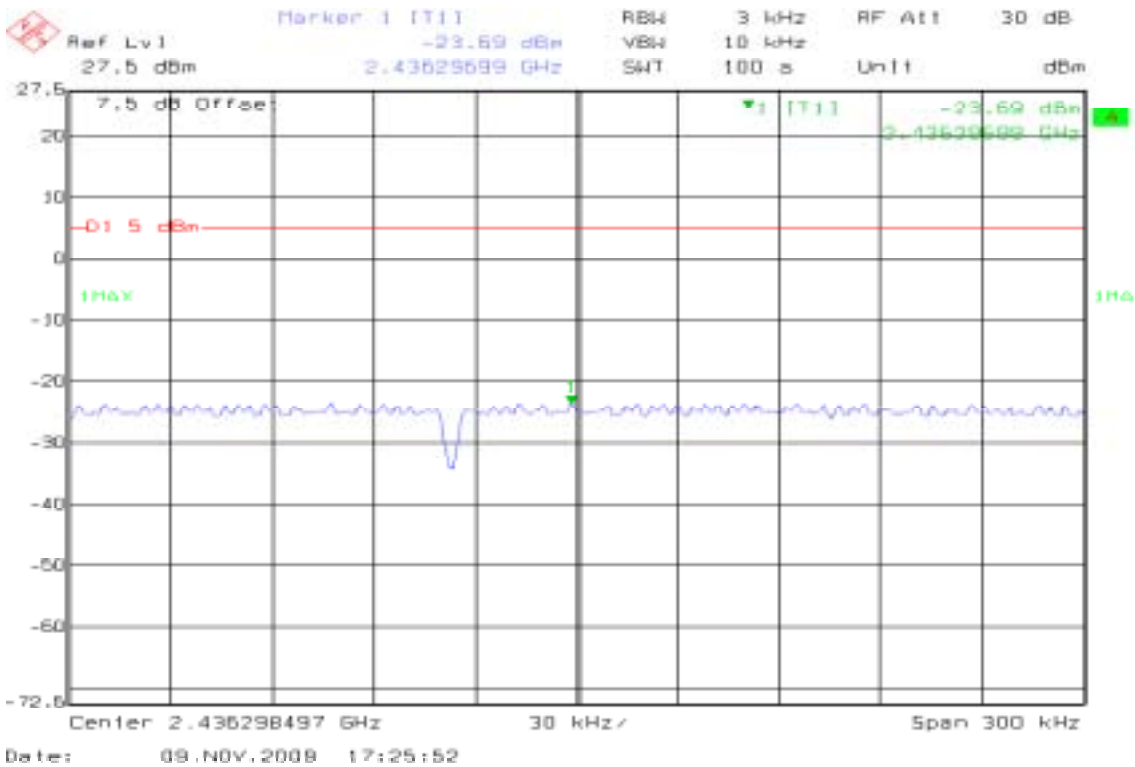
Test Plot

IEEE 802.11b

PPSD (CH Low)

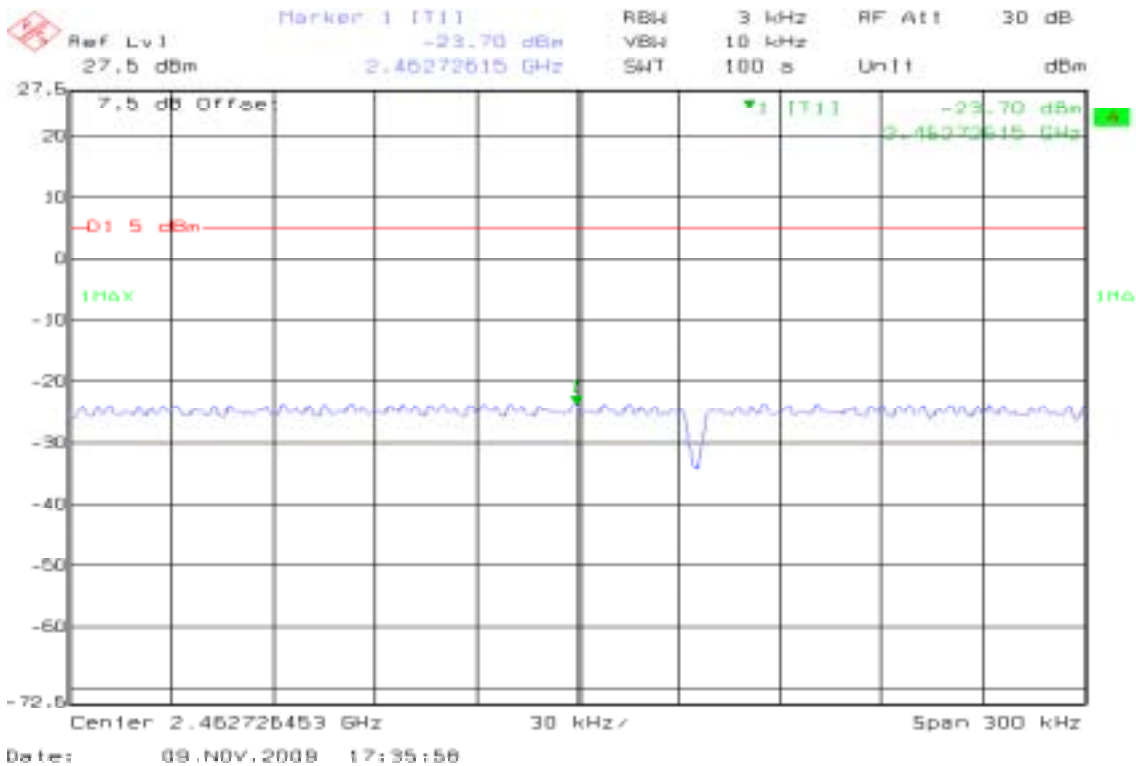


PPSD (CH Mid)



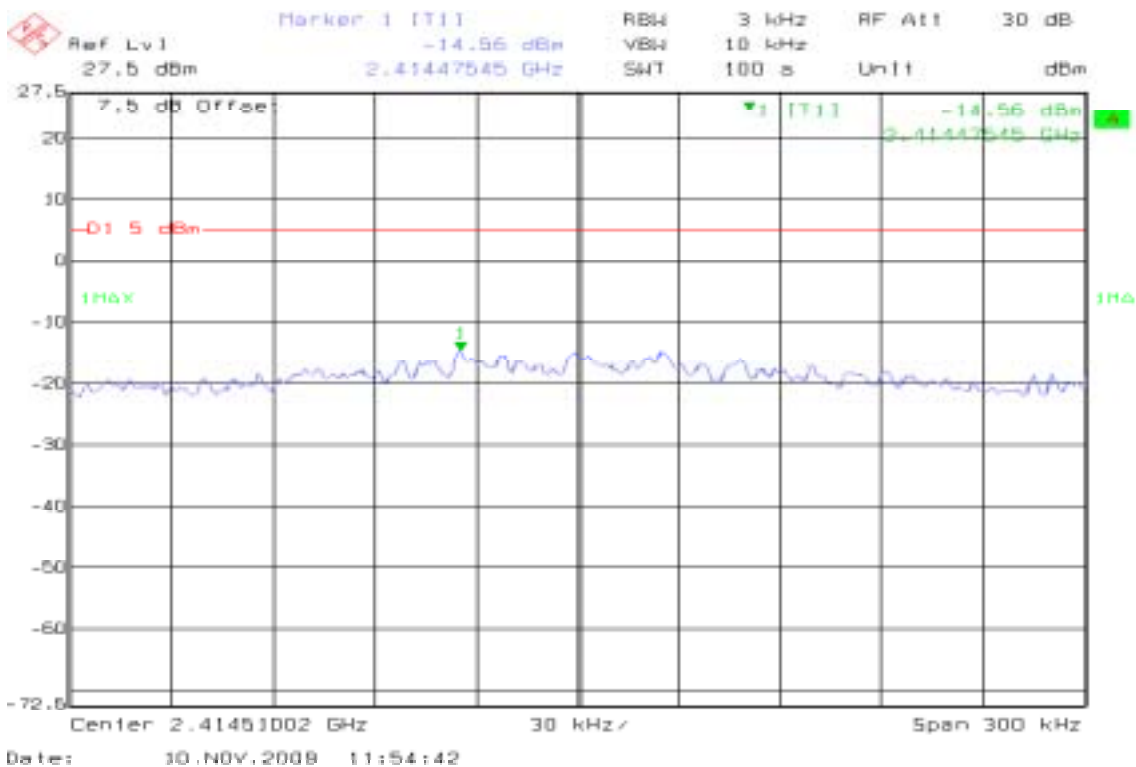


PPSD (CH High)



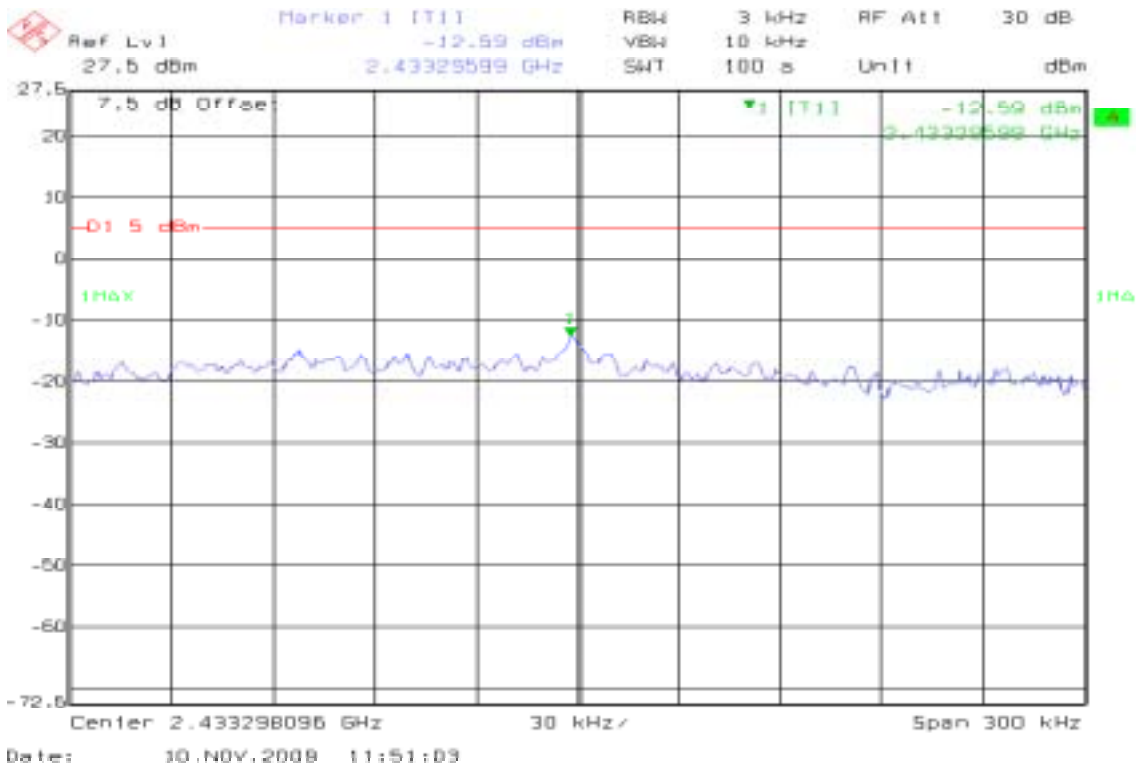
IEEE 802.11g

PPSD (CH Low)

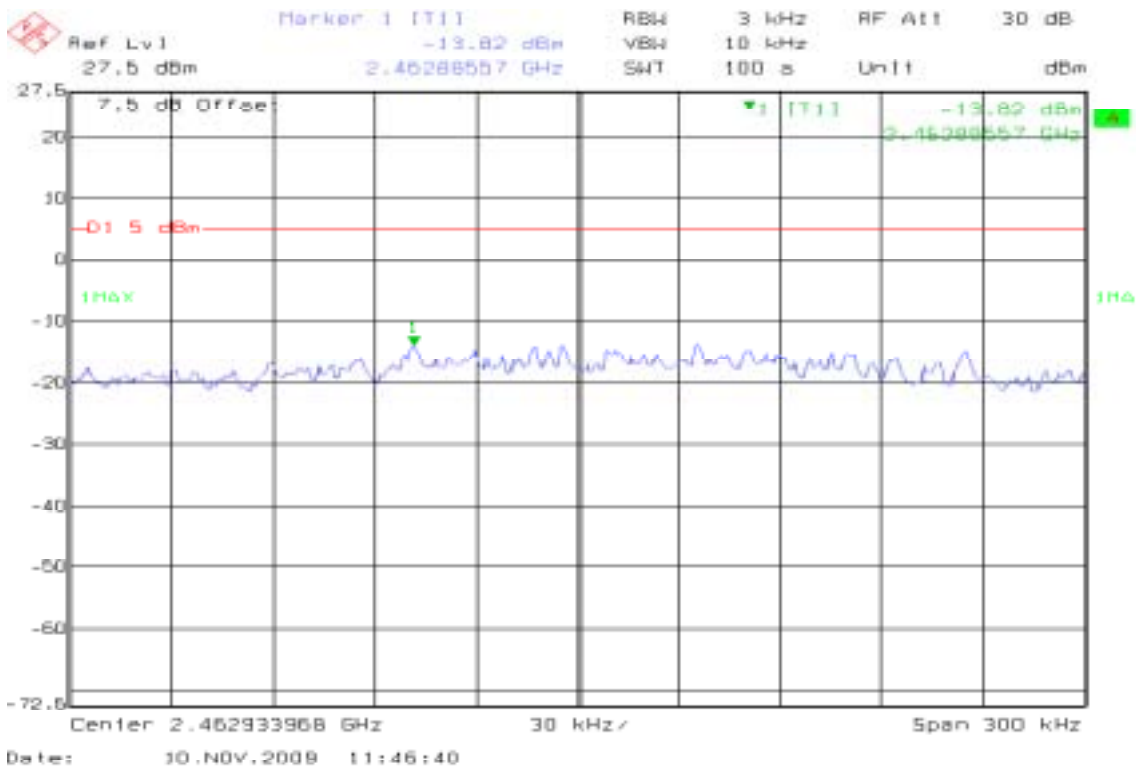




PPSD (CH Mid)



PPSD (CH High)





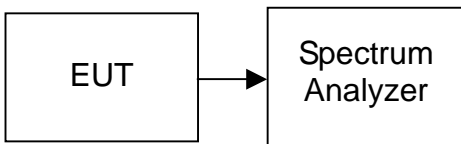
7.6 SPURIOUS EMISSIONS

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.



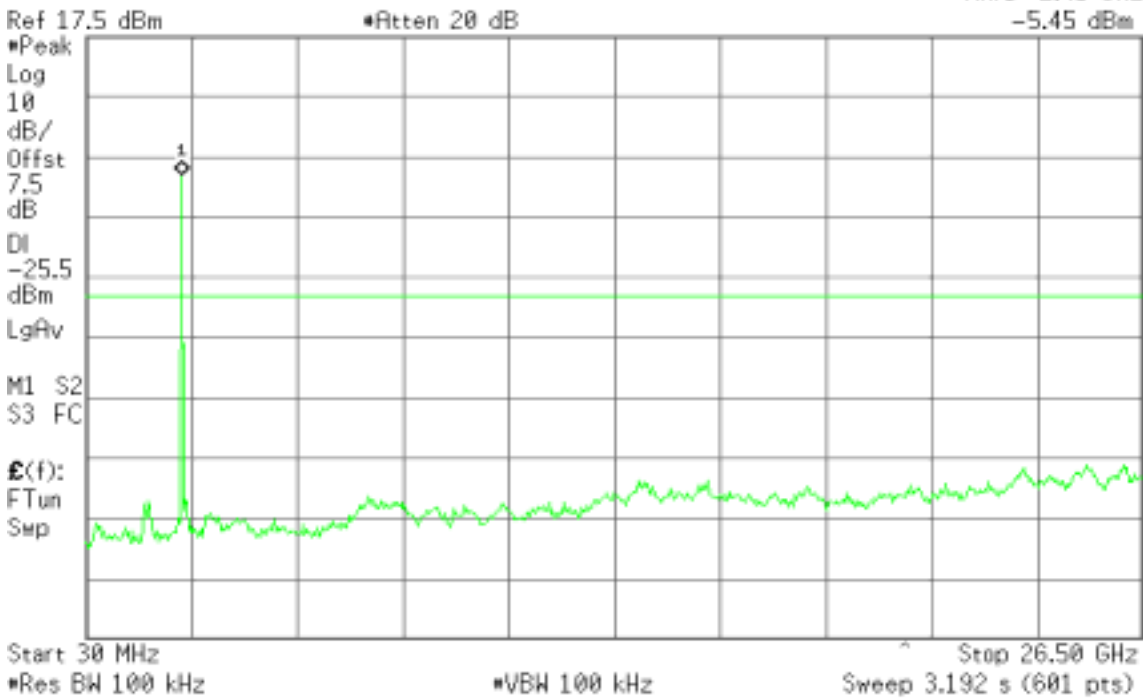
Test Plot

IEEE 802.11b / CH Low

Agilent 18:46:44 Nov 11, 2009

R T

Mkr1 2.41 GHz
-5.45 dBm

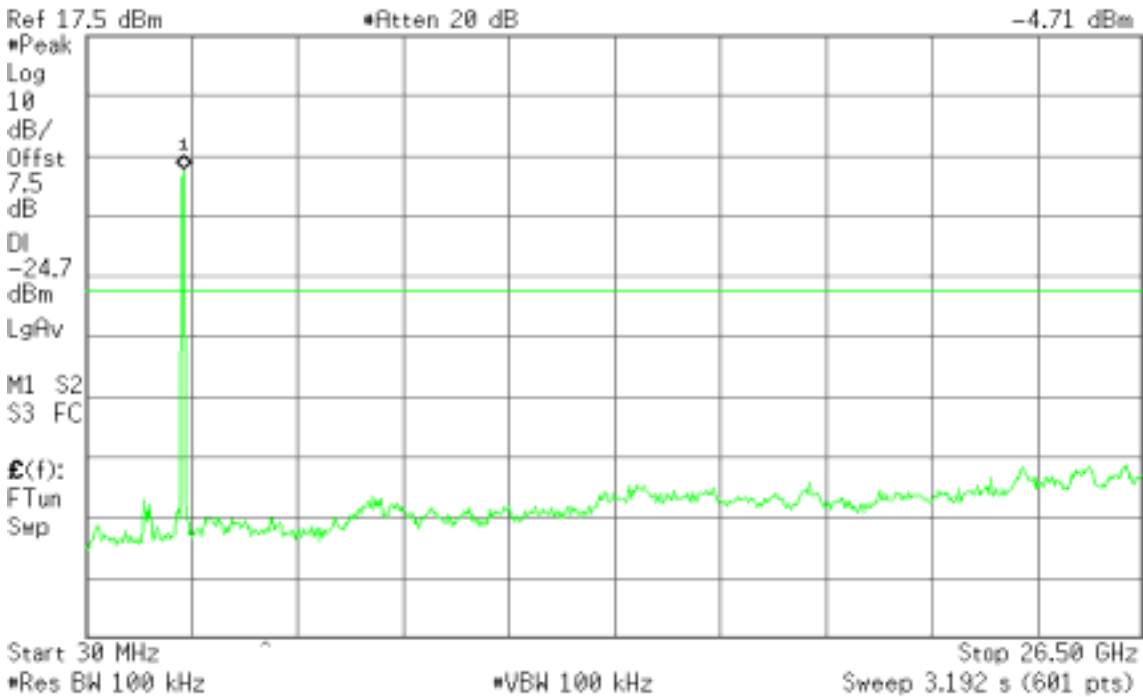


IEEE 802.11b / CH Mid

Agilent 18:47:27 Nov 11, 2009

R T

Mkr1 2.44 GHz
-4.71 dBm

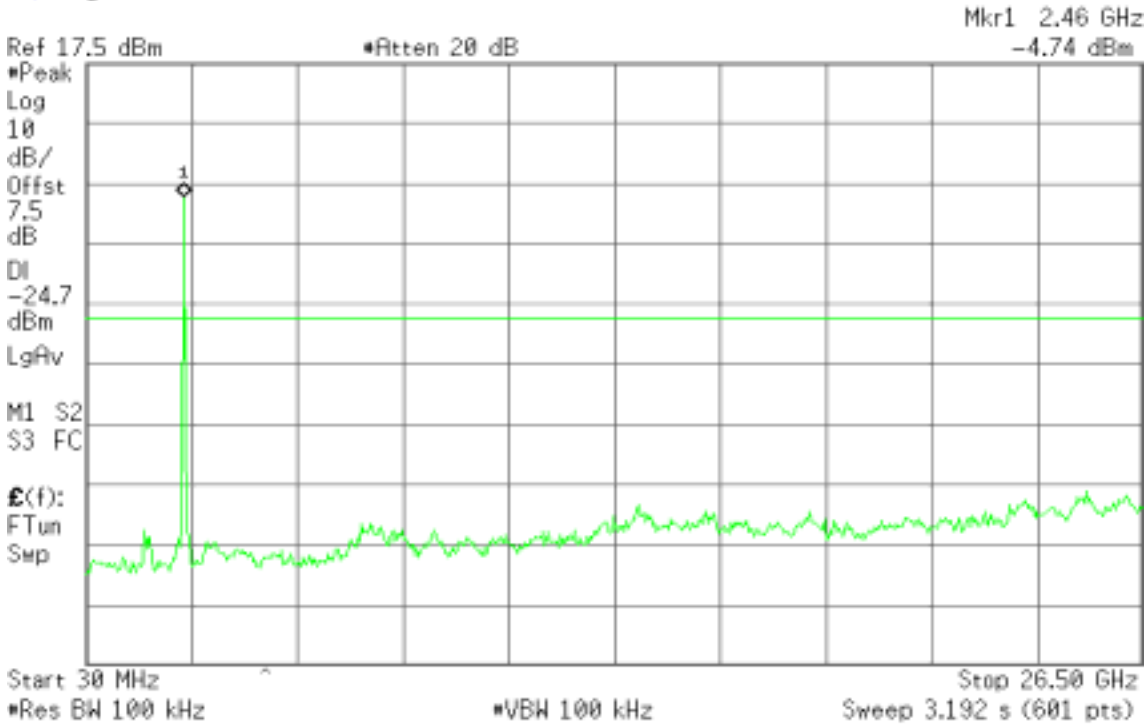




IEEE 802.11b / CH High

Agilent 18:48:06 Nov 11, 2009

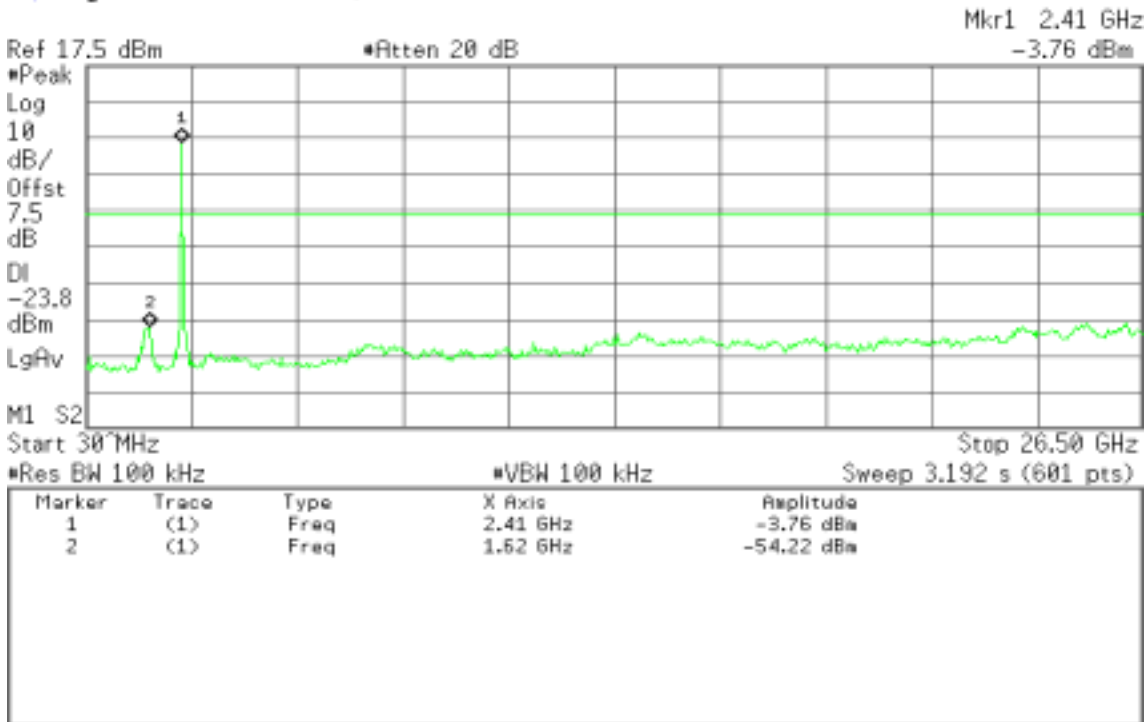
R T



IEEE 802.11g / CH Low

Agilent 18:51:22 Nov 11, 2009

R T

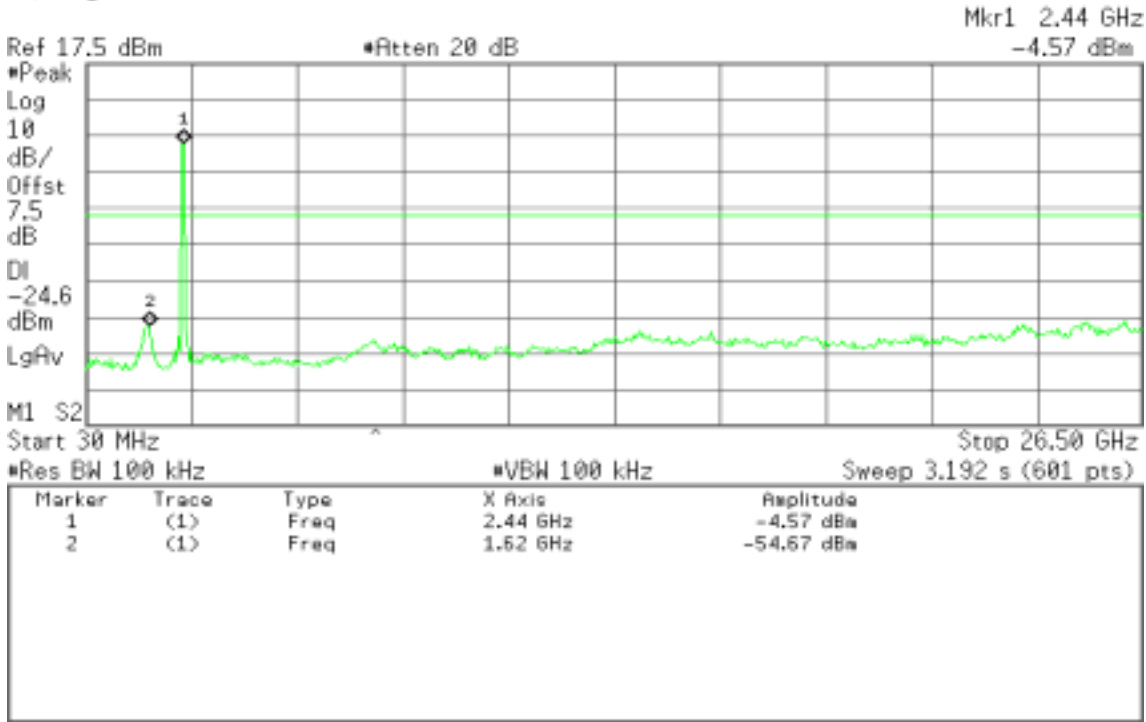




IEEE 802.11g / CH Mid

Agilent 18:50:09 Nov 11, 2009

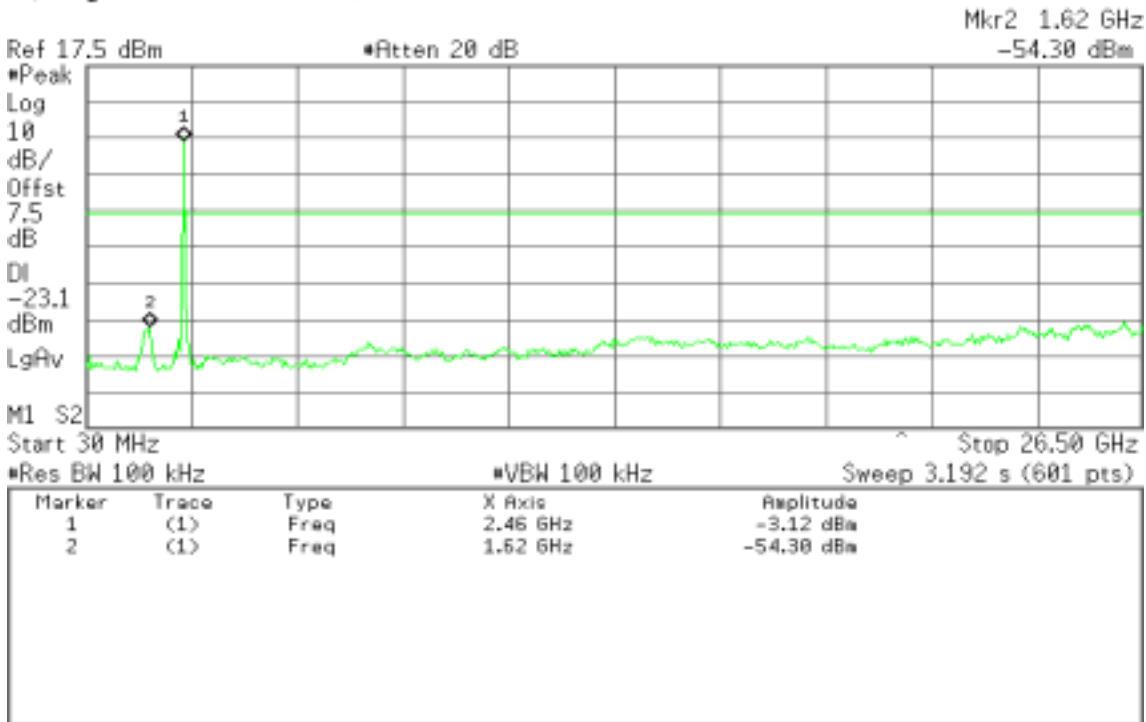
R T



IEEE 802.11g / CH High

Agilent 18:49:13 Nov 11, 2009

R T





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

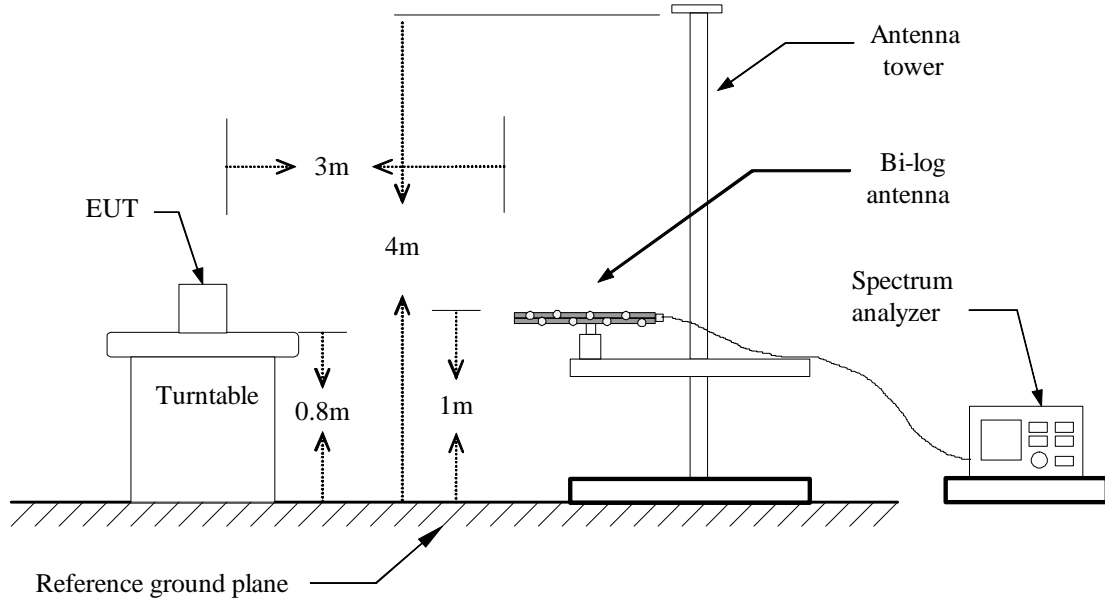
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

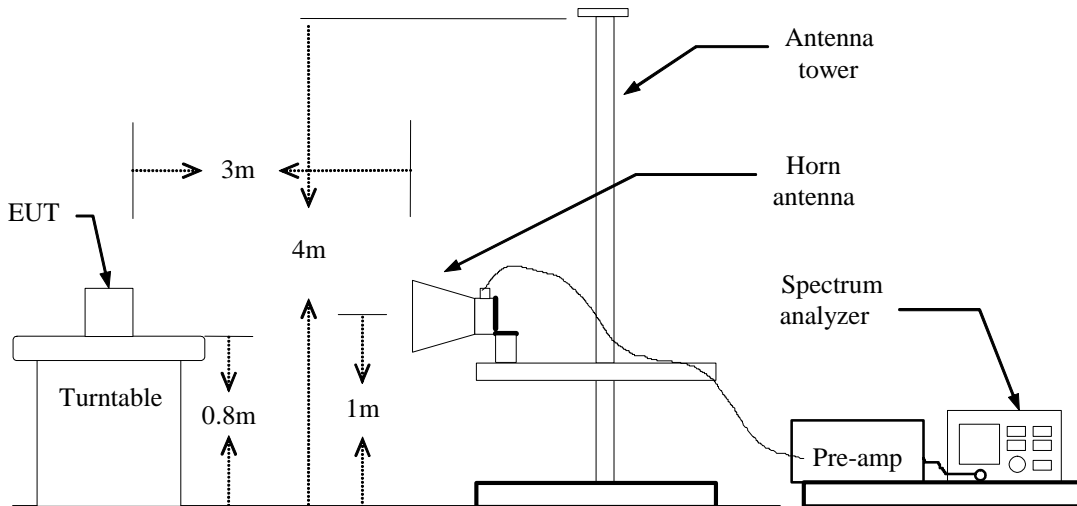
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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 1 GHz

For PIFA Antenna

Operation Mode: Normal Link

Test Date: November 10, 2009

Temperature: 18°C

Tested by: Alonso Lu

Humidity: 60% RH

Polarity: Ver. / Hor.

Table with 8 columns: Freq. (MHz), Ant. Pol. H/V, Detector Mode (PK/QP), Reading (dBuV), Factor (dB), Actual FS (dBuV/m), Limit 3m (dBuV/m), Safe Margin (dB). Rows include frequencies like 44.1202, 47.3255, 117.3000, 141.5500, 160.9500, 401.0250, 425.2750, 694.4500, 114.8750, 129.6950, 160.9500, 374.3500, 398.6000, 425.2750, 898.1500.

Remark:

- 1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 30 MHz to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using QP 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.



For Dipole Antenna

Operation Mode: Normal Link

Test Date: November 10, 2009

Temperature: 18°C

Tested by: Alonso Lu

Humidity: 60% RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBUV)	Factor (dB)	Actual FS (dBUV/m)	Limit 3m (dBUV/m)	Safe Margin (dB)
61.5250	V	QP	45.07	-15.44	29.63	40.00	-10.37
160.9500	V	QP	41.35	-12.43	28.92	43.50	-14.58
199.7500	V	QP	43.04	-14.77	28.27	43.50	-15.23
238.5500	V	QP	41.09	-12.79	28.30	46.00	-17.70
481.0500	V	QP	37.87	-6.82	31.05	46.00	-14.95
599.8750	V	QP	46.59	-3.15	43.44	46.00	-2.56
961.2000	V	QP	34.04	2.14	36.18	53.90	-17.72
66.3750	H	QP	43.43	-16.62	26.81	40.00	-13.19
165.8000	H	QP	40.41	-12.75	27.66	43.50	-15.84
240.9750	H	QP	42.78	-12.57	30.21	46.00	-15.79
401.0250	H	QP	40.95	-8.85	32.10	46.00	-13.90
481.0500	H	QP	42.54	-6.82	35.72	46.00	-10.28
600.0000	H	QP	46.10	-3.15	42.95	46.00	-3.05
839.9500	H	QP	36.64	-0.07	36.57	46.00	-9.43
961.2000	H	QP	36.47	2.14	38.61	53.90	-15.29

Remark:

1. No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)
2. Measuring frequencies from 30 MHz to the 1GHz.
3. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using QP 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

For PIFA Antenna

Operation Mode: IEEE 802.11b / TX / CH Low

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
2204.00	V	49.03	---	0.56	49.59	---	74.00	54.00	-4.41	Peak
2328.00	V	49.62	---	-0.24	49.37	---	74.00	54.00	-4.63	Peak
2496.00	V	49.43	---	1.19	50.62	---	74.00	54.00	-3.38	Peak
4824.00	V	42.42	---	7.72	50.14	---	74.00	54.00	-3.86	Peak
N/A										
2084.00	H	48.21	---	-1.51	46.70	---	74.00	54.00	-7.30	Peak
2680.00	H	49.34	---	0.00	49.35	---	74.00	54.00	-4.65	Peak
4824.00	H	53.36	44.60	6.91	60.27	51.51	74.00	54.00	-2.49	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11b / TX / CH Mid

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
2208.00	V	48.44	---	0.53	48.97	---	74.00	54.00	-5.03	Peak
2520.00	V	49.62	---	0.85	50.47	---	74.00	54.00	-3.53	Peak
4872.00	V	43.54	---	7.94	51.48	---	74.00	54.00	-2.52	Peak
N/A										
1828.00	H	49.83	---	-3.80	46.03	---	74.00	54.00	-7.97	Peak
2092.00	H	48.50	---	-1.38	47.12	---	74.00	54.00	-6.88	Peak
2580.00	H	48.65	---	-0.29	48.35	---	74.00	54.00	-5.65	Peak
4104.00	H	42.37	---	8.26	50.64	---	74.00	54.00	-3.36	Peak
4872.00	H	49.33	43.29	7.32	56.66	50.61	74.00	54.00	-3.39	AVG
10208.33	H	40.75	---	8.73	49.48	---	74.00	54.00	-4.52	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11b / TX / CH High

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1692.00	V	50.54	---	-2.26	48.28	---	74.00	54.00	-5.72	Peak
2236.00	V	48.95	---	0.31	49.26	---	74.00	54.00	-4.74	Peak
2548.00	V	49.82	---	0.28	50.10	---	74.00	54.00	-3.90	Peak
4928.00	V	46.02	41.45	7.88	53.90	49.33	74.00	54.00	-4.67	AVG
11803.33	V	39.11	---	10.70	49.81	---	74.00	54.00	-4.19	Peak
N/A										
2260.00	H	50.45	---	-2.19	48.26	---	74.00	54.00	-5.74	Peak
2560.00	H	49.11	---	-0.36	48.74	---	74.00	54.00	-5.26	Peak
4920.00	H	48.11	43.24	7.68	55.78	50.92	74.00	54.00	-3.08	AVG
5960.00	H	40.77	---	7.68	48.44	---	74.00	54.00	-5.56	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH Low

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
2216.00	V	48.40	---	0.46	48.86	---	74.00	54.00	-5.14	Peak
2496.00	V	53.71	45.45	1.19	54.89	46.64	74.00	54.00	-7.36	AVG
2736.00	V	49.61	---	-0.61	48.99	---	74.00	54.00	-5.01	Peak
4832.00	V	50.00	37.21	7.76	57.76	44.97	74.00	54.00	-9.03	AVG
N/A										
2088.00	H	48.87	---	-1.44	47.43	---	74.00	54.00	-6.57	Peak
2908.00	H	49.33	---	1.01	50.33	---	74.00	54.00	-3.67	Peak
4816.00	H	56.74	45.52	6.85	63.59	52.37	74.00	54.00	-1.63	AVG
7238.33	H	46.48	35.69	10.42	56.91	46.11	74.00	54.00	-7.89	AVG
9640.00	H	42.15	---	7.81	49.95	---	74.00	54.00	-4.05	Peak
12041.67	H	40.85	---	10.78	51.63	---	74.00	54.00	-2.37	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)



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH Mid

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1748.00	V	49.47	---	-1.98	47.49	---	74.00	54.00	-6.51	Peak
2320.00	V	51.16	---	-0.23	50.93	---	74.00	54.00	-3.07	Peak
2520.00	V	52.07	44.93	0.85	52.92	45.78	74.00	54.00	-8.22	AVG
2560.00	V	51.56	---	0.04	51.60	---	74.00	54.00	-2.40	Peak
4872.00	V	51.16	36.13	7.94	59.10	44.07	74.00	54.00	-9.93	AVG
7311.67	V	49.04	37.59	13.07	62.12	50.66	74.00	54.00	-3.34	AVG
2128.00	H	48.99	---	-1.77	47.23	---	74.00	54.00	-6.77	Peak
2616.00	H	48.67	---	-0.18	48.49	---	74.00	54.00	-5.51	Peak
4872.00	H	56.21	44.14	7.32	63.53	51.46	74.00	54.00	-2.54	AVG
7330.00	H	46.81	35.51	9.97	56.78	45.48	74.00	54.00	-8.52	AVG
9731.67	H	41.93	---	7.92	49.85	---	74.00	54.00	-4.15	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH High

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
2256.00	V	50.36	---	0.15	50.51	---	74.00	54.00	-3.49	Peak
2384.00	V	52.00	---	-0.33	51.67	---	74.00	54.00	-2.33	Peak
2548.00	V	51.66	---	0.28	51.94	---	74.00	54.00	-2.06	Peak
2588.00	V	50.35	---	-0.53	49.82	---	74.00	54.00	-4.18	Peak
4920.00	V	50.87	39.86	7.93	58.80	47.79	74.00	54.00	-6.21	AVG
7385.00	V	54.75	39.39	12.85	67.60	52.24	74.00	54.00	-1.76	AVG
9841.67	V	41.55	---	8.05	49.60	---	74.00	54.00	-4.40	Peak
2096.00	H	48.75	---	-1.31	47.44	---	74.00	54.00	-6.56	Peak
2580.00	H	48.30	---	-0.29	48.01	---	74.00	54.00	-5.99	Peak
4928.00	H	55.71	44.37	7.73	63.44	52.10	74.00	54.00	-1.90	AVG
7385.00	H	49.30	37.49	10.93	60.23	48.42	74.00	54.00	-5.58	AVG
9860.00	H	42.06	---	8.07	50.13	---	74.00	54.00	-3.87	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).



For Dipole Antenna

Operation Mode: IEEE 802.11b / TX / CH Low

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1752.00	V	49.09	---	-1.96	47.12	---	74.00	54.00	-6.88	Peak
2208.00	V	48.87	---	0.53	49.40	---	74.00	54.00	-4.60	Peak
2500.00	V	48.94	---	1.25	50.19	---	74.00	54.00	-3.81	Peak
4824.00	V	43.77	---	7.72	51.49	---	74.00	54.00	-2.51	Peak
7623.33	V	37.46	---	13.56	51.02	---	74.00	54.00	-2.98	Peak
N/A										
2092.00	H	48.87	---	-1.38	47.50	---	74.00	54.00	-6.50	Peak
2276.00	H	49.43	---	-1.94	47.49	---	74.00	54.00	-6.51	Peak
2696.00	H	48.04	---	0.05	48.09	---	74.00	54.00	-5.91	Peak
4824.00	H	43.95	---	6.91	50.87	---	74.00	54.00	-3.13	Peak
7623.33	H	36.48	---	13.15	49.63	---	74.00	54.00	-4.37	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11b / TX / CH Mid

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1696.00	V	49.23	---	-2.18	47.05	---	74.00	54.00	-6.95	Peak
2212.00	V	48.42	---	0.50	48.91	---	74.00	54.00	-5.09	Peak
2564.00	V	48.90	---	-0.04	48.86	---	74.00	54.00	-5.14	Peak
2696.00	V	48.28	---	-0.30	47.98	---	74.00	54.00	-6.02	Peak
4872.00	V	44.48	41.68	7.94	52.42	49.62	74.00	54.00	-4.38	AVG
12903.33	V	37.76	---	13.83	51.58	---	74.00	54.00	-2.42	Peak
2096.00	H	49.24	---	-1.31	47.92	---	74.00	54.00	-6.08	Peak
2676.00	H	48.43	---	-0.01	48.43	---	74.00	54.00	-5.57	Peak
4872.00	H	45.25	40.48	7.32	52.57	47.80	74.00	54.00	-6.20	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11b / TX / CH High

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1948.00	V	49.21	---	-2.05	47.16	---	74.00	54.00	-6.84	Peak
2344.00	V	49.25	---	-0.27	48.98	---	74.00	54.00	-5.02	Peak
2548.00	V	49.51	---	0.28	49.79	---	74.00	54.00	-4.21	Peak
2656.00	V	48.31	---	-0.50	47.81	---	74.00	54.00	-6.19	Peak
4928.00	V	45.14	42.62	7.88	53.02	50.50	74.00	54.00	-3.50	AVG
11821.67	V	38.73	---	10.70	49.44	---	74.00	54.00	-4.56	Peak
1744.00	H	50.30	---	-4.08	46.21	---	74.00	54.00	-7.79	Peak
2120.00	H	48.22	---	-1.62	46.60	---	74.00	54.00	-7.40	Peak
2588.00	H	48.18	---	-0.26	47.92	---	74.00	54.00	-6.08	Peak
2732.00	H	47.67	---	-0.05	47.62	---	74.00	54.00	-6.38	Peak
4072.00	H	40.78	---	8.19	48.97	---	74.00	54.00	-5.03	Peak
4928.00	H	43.87	---	7.73	51.60	---	74.00	54.00	-2.40	Peak
11986.67	H	38.58	---	10.76	49.33	---	74.00	54.00	-4.67	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH Low

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1720.00	V	50.01	---	-2.05	47.96	---	74.00	54.00	-6.04	Peak
2224.00	V	49.93	---	0.40	50.33	---	74.00	54.00	-3.67	Peak
2540.00	V	49.81	---	0.44	50.26	---	74.00	54.00	-3.74	Peak
4832.00	V	54.24	39.79	7.76	62.00	47.55	74.00	54.00	-6.45	AVG
7238.33	V	39.14	---	12.86	52.00	---	74.00	54.00	-2.00	Peak
N/A										
2080.00	H	48.71	---	-1.57	47.14	---	74.00	54.00	-6.86	Peak
2968.00	H	49.70	---	2.25	51.94	---	74.00	54.00	-2.06	Peak
4824.00	H	53.43	38.53	6.91	60.35	45.44	74.00	54.00	-8.56	AVG
7641.67	H	36.43	---	12.85	49.28	---	74.00	54.00	-4.72	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. $Margin (dB) = Remark\ result (dBuV/m) - Average\ limit (dBuV/m)$



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH Mid

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1680.00	V	49.73	---	-2.48	47.25	---	74.00	54.00	-6.75	Peak
2184.00	V	49.27	---	-0.03	49.24	---	74.00	54.00	-4.76	Peak
2320.00	V	50.80	---	-0.23	50.56	---	74.00	54.00	-3.44	Peak
2716.00	V	48.02	---	-0.43	47.59	---	74.00	54.00	-6.41	Peak
4872.00	V	57.54	43.79	7.94	65.48	51.73	74.00	54.00	-2.27	AVG
7641.67	V	37.47	---	13.24	50.70	---	74.00	54.00	-3.30	Peak
1628.00	H	50.13	---	-5.07	45.07	---	74.00	54.00	-8.93	Peak
2100.00	H	49.05	---	-1.25	47.80	---	74.00	54.00	-6.20	Peak
2960.00	H	49.19	---	2.08	51.27	---	74.00	54.00	-2.73	Peak
4880.00	H	47.14	32.82	7.39	54.53	40.21	74.00	54.00	-13.79	AVG
7641.67	H	36.40	---	12.85	49.26	---	74.00	54.00	-4.74	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).



Compliance Certification Services Inc.

Report No: 90428207-RP1 FCC ID: VYTLP-9287C Date of Issue: November 12, 2009

Operation Mode: IEEE 802.11g / TX / CH High

Test Date: November 11, 2009

Temperature: 20°C

Tested by: Alonso Lu

Humidity: 50% 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
1680.00	V	50.92	---	-2.48	48.43	---	74.00	54.00	-5.57	Peak
2196.00	V	49.43	---	0.43	49.86	---	74.00	54.00	-4.14	Peak
2320.00	V	51.89	---	-0.23	51.65	---	74.00	54.00	-2.35	Peak
2552.00	V	50.42	---	0.20	50.62	---	74.00	54.00	-3.38	Peak
4928.00	V	56.49	43.97	7.88	64.37	51.85	74.00	54.00	-2.15	AVG
7385.00	V	40.36	29.15	12.85	53.20	42.00	74.00	54.00	-12.00	AVG
1808.00	H	50.41	---	-3.71	46.70	---	74.00	54.00	-7.30	Peak
2052.00	H	50.11	---	-2.02	48.08	---	74.00	54.00	-5.92	Peak
2652.00	H	49.62	---	-0.07	49.55	---	74.00	54.00	-4.45	Peak
4928.00	H	55.80	41.93	7.73	63.53	49.66	74.00	54.00	-4.34	AVG
7605.00	H	36.33	---	13.45	49.78	---	74.00	54.00	-4.22	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 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 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: November 10, 2009

Temperature: 20°C

Tested by: Stan Lin

Humidity: 58% RH

Table with 11 columns: 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. It contains two groups of data rows, each with 10 rows.

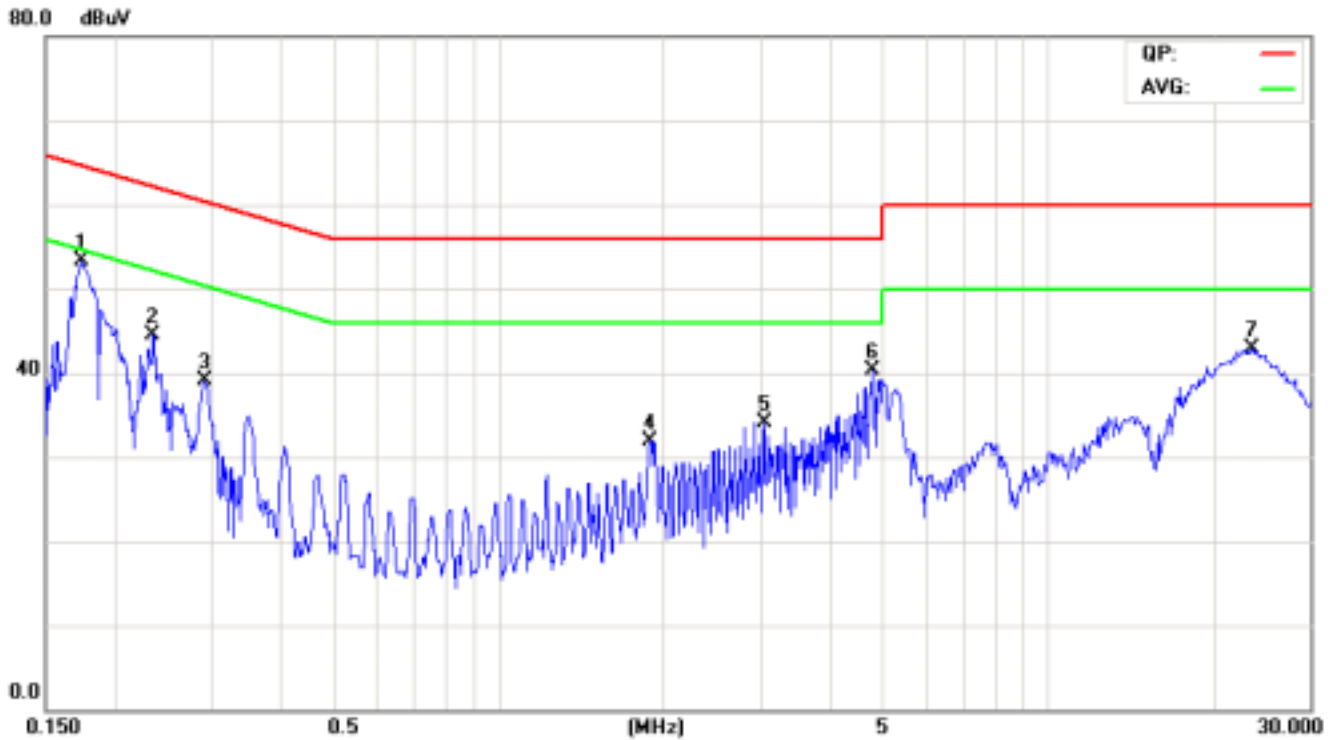
Remark:

- 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.



Test Plot

Conducted emissions (Line 1)



Conducted emissions (Line 2)

