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Report No.: SHEM120800121307  
Page: 1 of 83

## ***FCC Part 15C TEST REPORT***

**Application No.:** SHEM1208001213RF  
**Applicant:** Hansong (Nanjing) Technology Ltd.  
**Manufacturer:** Paradigm Electronics Inc  
**Equipment Under Test (EUT):**  
**NOTE:** The following sample(s) submitted was/were identified on behalf of the client as  
**EUT Name:** AERA  
**Brand Name:** AERA  
**Model No:** AERA  
**FCC ID:** XCO-AERA  
**IC:** 7756A-AERA  
**Standards:** 47 CFR FCC Part 15 Subpart C (Section 15.247)  
RSS-210 Issue 8 (December 2010)  
RSS-Gen Issue 3 (December 2010)  
**Date of Receipt:** August 24, 2012  
**Date of Test:** August 28, 2012 to September 27, 2012  
**Date of Issue:** October 06, 2012  
**Test Result :** **PASS \***

In the configuration tested, the EUT complied with the standards specified above.

**Tony Wu**  
**E&E Section Manager**

**SGS-CSTC (Shanghai) Co., Ltd.**

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		October 06, 2012		Original

Authorized for issue by:				
Engineer		Zenger Zhang _____ Print Name		 _____ Print Name
Clerk		Zenger Zhang _____ Print Name		 _____ Print Name
Reviewer		Jim Xu _____ Print Name		 _____ Print Name



### 3 Test Summary

TEST ITEM	FCC REFERENCE	IC REFERENCE	Test Procedure	RESULT
Power line conducted emission	15.207	RSS-Gen Issue 8 Clause 7.2.4	ANSI C63.4,2003	Pass
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.9	PASS
Maximum peak output power	15.247(b)	RSS-210 Issue 8 Annex 8	KDB 558074 D01	PASS
Power spectrum density	15.247(e)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009 Clause 6.11	PASS
Conducted Spurious Emission (30MHz to 25GHz)	Section 15.207 &15.247(d)	RSS-210 Issue 8 Annex 8.5	---	PASS
Radiated Spurious Emission (30MHz to 25GHz)	Section 15.209 &15.247(d)	RSS-210 Issue 8 Annex 8.5	ANSI C63.4,2003 Clause 6.12	PASS
Radiated Emission BandEdge	15.247(d)	---	ANSI C63.10,2009 Clause 6.9	PASS
Occupied bandwidth	---	RSS-Gen Issue 3 Clause 4.6.1	RSS-Gen Issue 3 Clause 4.6.1	Tested



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## 5 General Information

### 5.1 Client Information

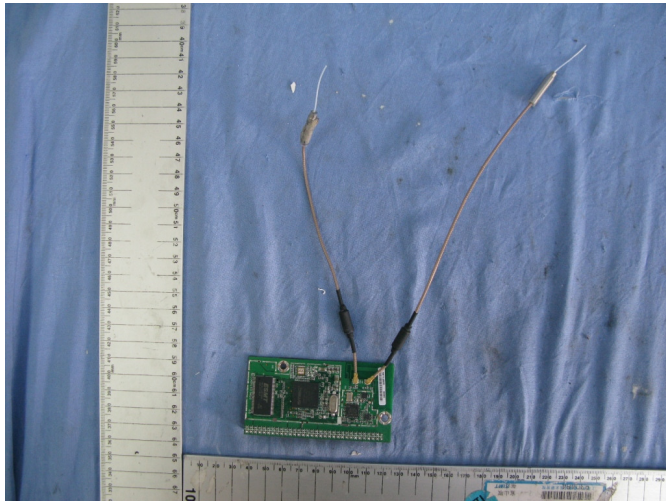
Applicant:	Hansong (Nanjing) Technology Ltd.
Address of Applicant:	8th Kanping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211106, China
Manufacturer:	Paradigm Electronics Inc
Address of Manufacturer:	205 Annagem Blvd, Mississauga, ONL5T 2V1
Factory:	Hansong (Nanjing) Technology Ltd.

### 5.2 General Description of EUT (Equipment Under Test)

Product Name:	AERA
Model No.(EUT):	AERA
Add Model No.:	N/A
Trade Mark:	AERA

### 5.3 Details of E.U.T.

#### Technical Specifications:

Modulation Technique:	<input checked="" type="checkbox"/> 802.11b: DSSS <input checked="" type="checkbox"/> 802.11g: OFDM
Modulation Type:	<input checked="" type="checkbox"/> 802.11b: DSSS(CCK, DQPSK, DBPSK) <input checked="" type="checkbox"/> 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
Frequency Range / Channel Number:	<input checked="" type="checkbox"/> 802.11b/g: 2412-2462MHz / 11 Channels
Data Rate:	<input checked="" type="checkbox"/> 802.11b: 1Mbps, 5.5Mbps, 11Mbps, <input checked="" type="checkbox"/> 802.11g: 6Mbps, 9Mbps, 12Mbps, 18Mbps, 36Mbps, 48Mbps, 54Mbps
Equipment classification:	<input checked="" type="checkbox"/> equipment for fixed use
Antenna Type:	Double integral antenna (as below figure) 



	Remark: the two integral antennas are not working simultaneously.
Antenna Gain:	2.0 dBi

**Power Supply:**

Rated Input:	100-240V AC 50/60Hz		
☒ Adapter:	Manufacturer:	KINGWALL Ltd.	
	Model No.:	AS650-180-AB356	
	Rated Input:	100V-240V AC 50-60Hz 1.6A	
	Rated Output:	18.0V D.C., 3.56A	
	Cable length:	AC port:	180 cm Length (2 wires)
		DC port:	150 cm Length (2 wires)

**5.4 Details of Test Mode**

Test Mode	Description of Test Mode
802.11b mode:	The EUT fix on 802.11b working mode
802.11g mode:	The EUT fix on 802.11g working mode
Remark: Pretest under all modes, choose the worst data for test record of the report.	

**5.5 Other Information Requested by the Customer**

None.

**5.6 Standards Applicable for Testing**

The standard used were FCC PART 15 Subpart C, ANSI C63.10: 2009. RSS-210 Issue 8, RSS-Gen Issue 3.



## **5.7 Test Location**

Tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

## **5.8 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2015-02-22.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively. Date of Registration: 2012-05-29. Date of Expiry: 2015-05-28.



## 6 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2012-03-15	2013-03-14
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2012-03-15	2013-03-14
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2012-03-15	2013-03-14
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2012-03-15	2013-03-14
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2012-03-15	2013-03-14
4	Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170 373	2012-03-15	2013-03-14
7	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2009P	--	2011-10-15	2012-10-14
8	CLAMP METER	FLUKE	316	86080010	2012-03-15	2013-03-14
9	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2012-01-16	2013-01-14
10	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/ 2000.0-0.2/40- 5SSK	11	2012-03-15	2013-03-14
11	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/8 80.0-0.2/40- 5SSK	9	2012-03-15	2013-03-14
12	High pass Filter	FSCW	HP 12/2800- 5AA2	19A45-02	2012-04-07	2013-04-06
13	Low noise amplifier	TESEQ	LNA6900	70133	2012-04-07	2013-04-06
14	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2012-04-13	2013-04-12





15	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2012-03-15	2013-03-14
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## 7 Test Procedure & Measurement Data

### 7.1 E.U.T. Operation

**Test voltage:** 120V AC 60Hz

**Operating Environment:**

Temperature: 20.0 -25.0 °C

Humidity: 35-75 % RH

Atmospheric Pressure: 992 -1020 mbar

**EUT Operation:** The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting mode is programmed.

### 7.1 Conducted Emission Test

**Test Requirement:** FCC Part15C 15.207

**Test date:** September. 03, 2012

**Standard Applicable** According to section 15.207,frequency 150KHz to 30MHz shall not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

**EUT Setup**

1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.

2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.

3.The LISN was connected with 120V AC/60Hz power source.

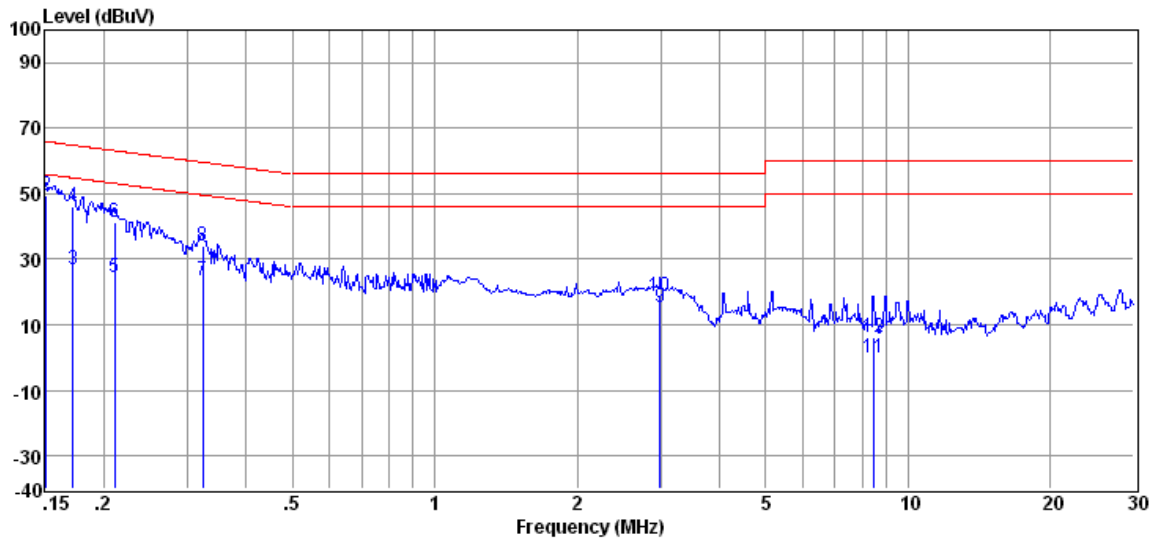


#### 7.1.1.1.1 Measurement Data

Remark: An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Test Mode: 802.11b

Test Port: AC Live Line

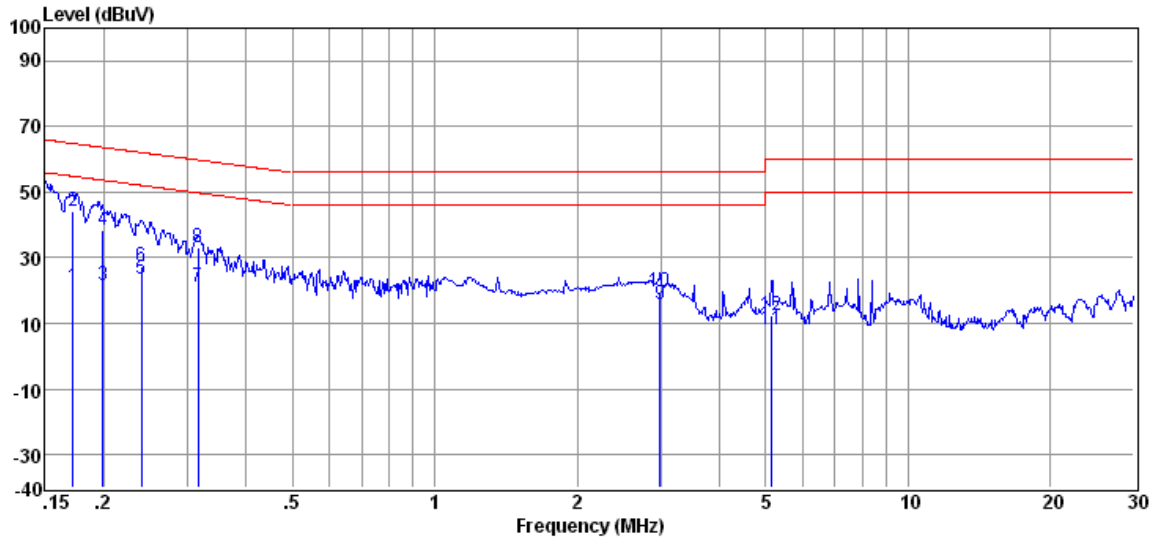


Freq (MHz)	Read Level (dBUV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBUV)	Limit Line (dBUV)	Over Limit (dB)	Detector	Phase
0.151	31.39	0.20	0.10	31.69	55.96	-24.27	Average	LINE
0.151	49.24	0.20	0.10	49.54	65.96	-16.42	QP	LINE
0.172	26.70	0.16	0.10	26.96	54.86	-27.90	Average	LINE
0.172	46.10	0.16	0.10	46.36	64.86	-18.50	QP	LINE
0.211	24.37	0.10	0.10	24.57	53.18	-28.61	Average	LINE
0.211	40.95	0.10	0.10	41.15	63.18	-22.03	QP	LINE
0.323	23.19	0.14	0.10	23.43	49.62	-26.19	Average	LINE
0.323	34.08	0.14	0.10	34.32	59.62	-25.30	QP	LINE
2.993	15.02	0.30	0.13	15.45	46.00	-30.55	Average	LINE
2.993	18.42	0.30	0.13	18.85	56.00	-37.15	QP	LINE



Test Mode: 802.11b

Test Port: AC Neutral Line



Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
0.172	21.07	0.16	0.10	21.33	54.86	-33.53	Average	NEUTRAL
0.172	43.73	0.16	0.10	43.99	64.86	-20.87	QP	NEUTRAL
0.199	21.30	0.10	0.10	21.50	53.67	-32.17	Average	NEUTRAL
0.199	38.04	0.10	0.10	38.24	63.67	-25.43	QP	NEUTRAL
0.240	23.40	0.11	0.10	23.61	52.08	-28.47	Average	NEUTRAL
0.240	26.95	0.11	0.10	27.16	62.08	-34.92	QP	NEUTRAL
0.317	21.09	0.14	0.10	21.33	49.80	-28.47	Average	NEUTRAL
0.317	32.88	0.14	0.10	33.12	59.80	-26.68	QP	NEUTRAL
2.993	15.46	0.30	0.13	15.89	46.00	-30.11	Average	NEUTRAL
2.993	19.29	0.30	0.13	19.72	56.00	-36.28	QP	NEUTRAL

## 7.2 6dB Bandwidth

- Test Requirement:** FCC Part15 247(a)(2)  
ANSI C63.10-2009
- Test date:** September. 03.2012
- Standard Applicable:** According to section 15.247(a)(2),and Systems using digital modulation techniques may operate in the 902-928MHz,2400-2483.5MHz,and 5725-5850MHz bands.The minimum 6dB bandwidth shall be at least 500KHz.
- Measurement Procedure:**
1. Place the EUT on the table and set it in 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, Sweep=auto
  4. Mark the peak frequency and -6dB (upper and lower) frequency.
  5. Repeat above procedures until all frequency measured were complete.

### Measurement Result:

#### Test Data for Antenna A

Test mode: 802.11b

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	12.00	500	PASS
Mid	2437	13.12	500	PASS
High	2462	11.86	500	PASS

#### Test Data for Antenna A

Test mode: 802.11g

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	16.40	500	PASS
Mid	2437	16.64	500	PASS
High	2462	16.48	500	PASS



Test Data for Antenna B

Test mode: 802.11b

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	12.00	500	PASS
Mid	2437	12.08	500	PASS
High	2462	9.92	500	PASS

Test Data for Antenna B

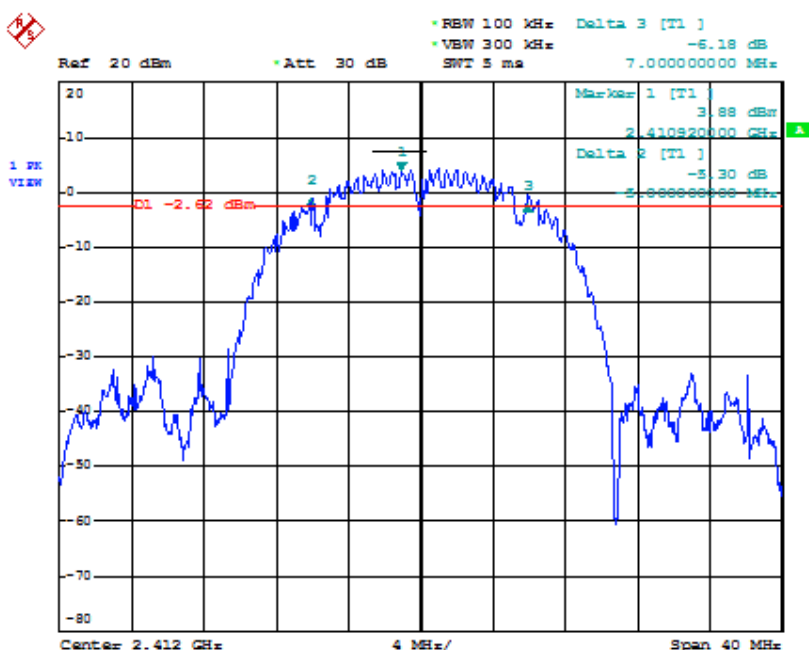
Test mode: 802.11g

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
Low	2412	16.48	500	PASS
Mid	2437	16.56	500	PASS
High	2462	16.48	500	PASS

Test Plots:

Lowest Channel for Antenna A

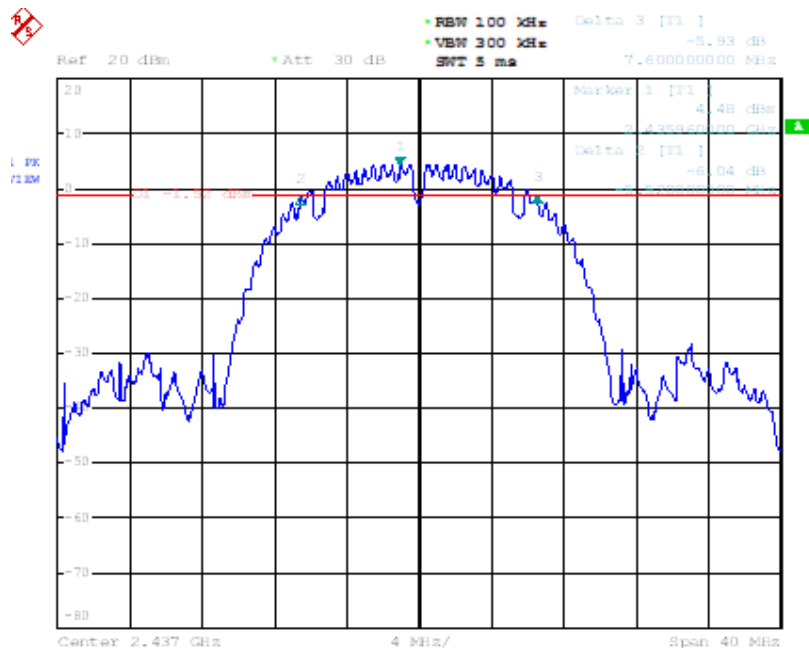
Test mode: 802.11b





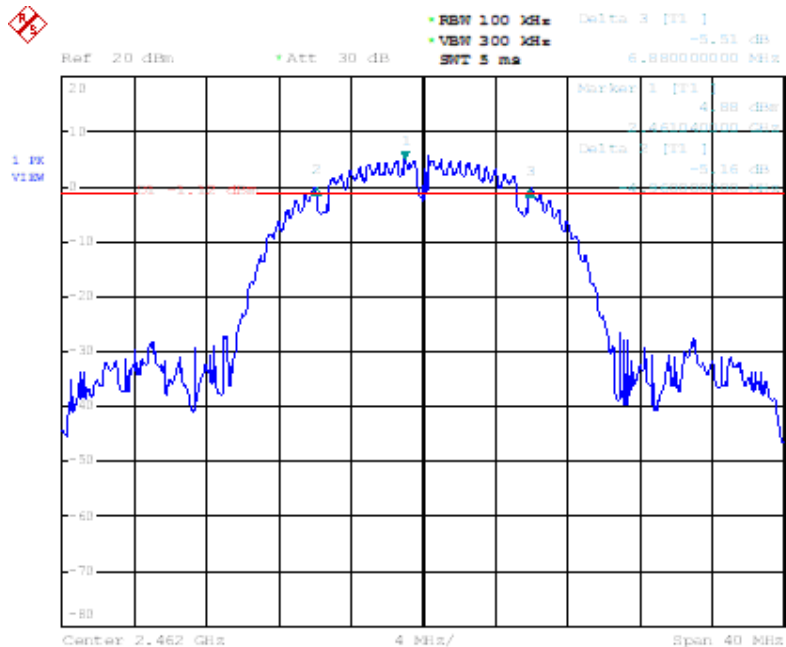
Middle Channel for Antenna A

Test mode: 802.11b



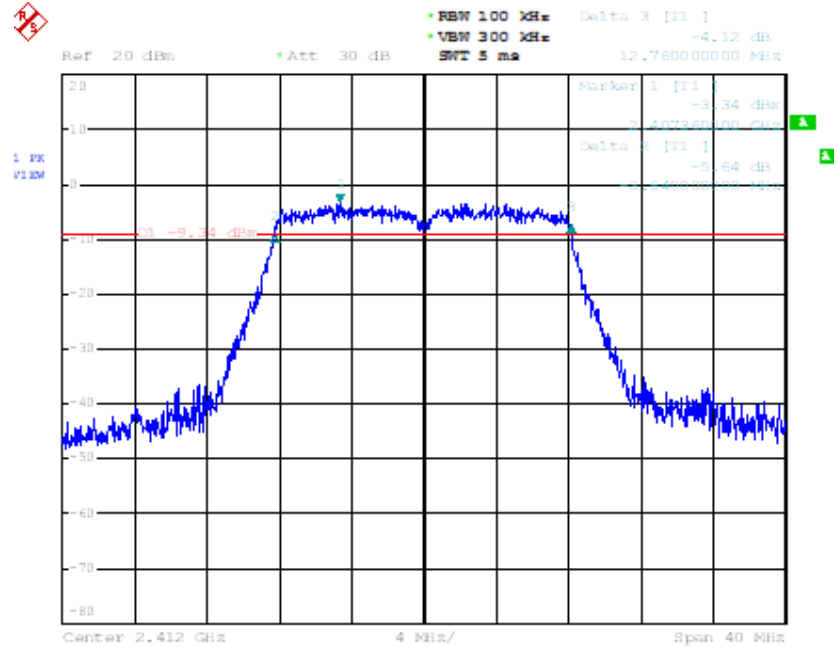
Highest Channel for Antenna A

Test mode: 802.11b



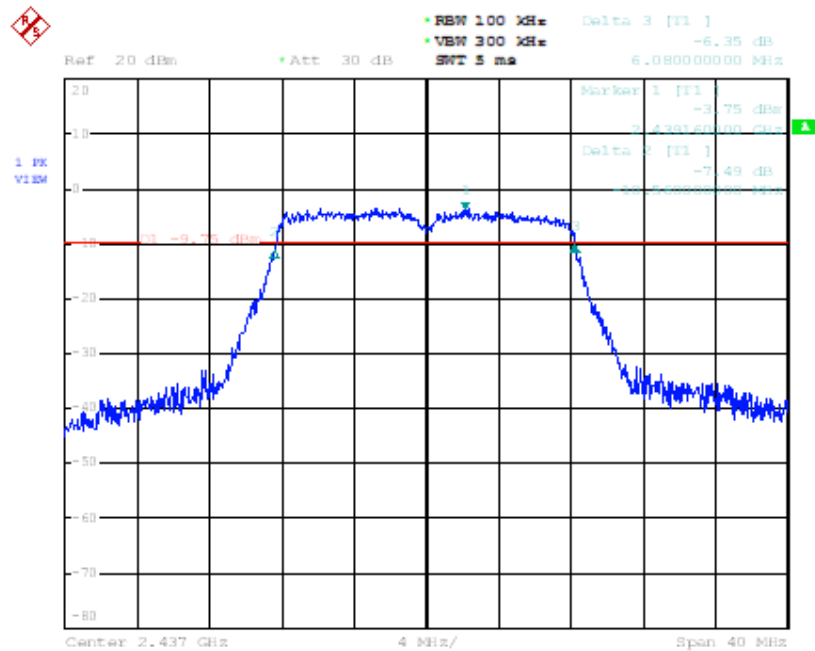
**Lowest Channel for Antenna A**

**Test mode: 802.11g**



**Middle Channel for Antenna A**

**Test mode: 802.11g**

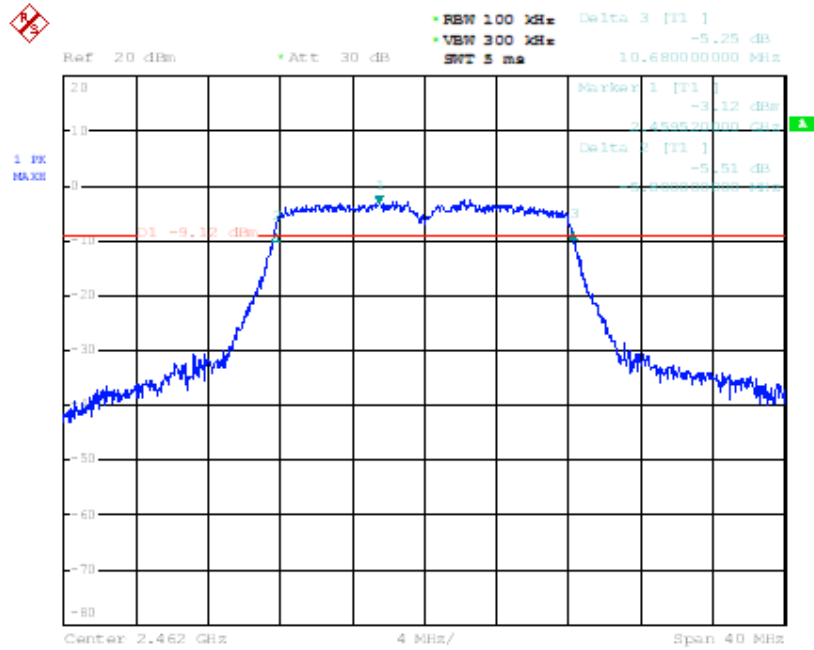






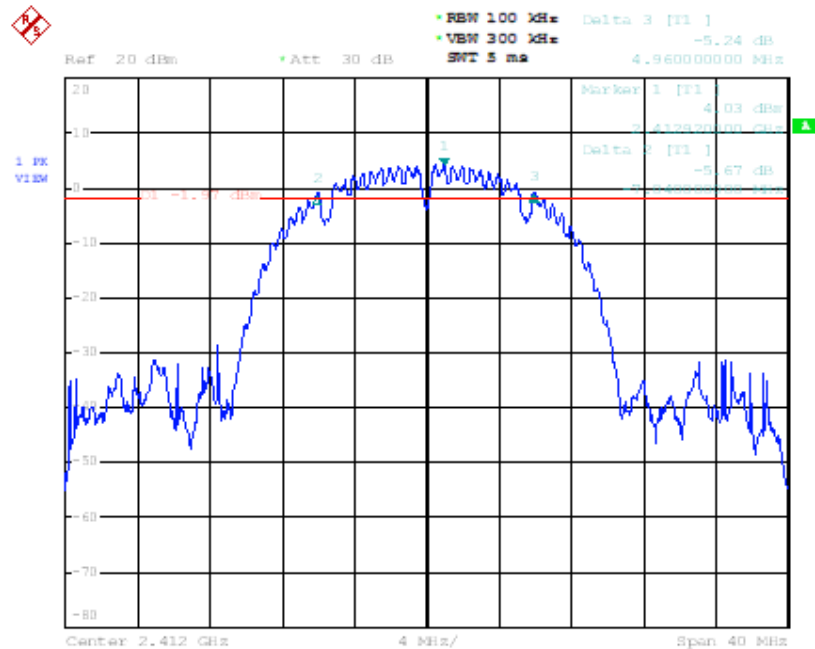
Highest Channel for Antenna A

Test mode: 802.11g



Lowest Channel for Antenna B

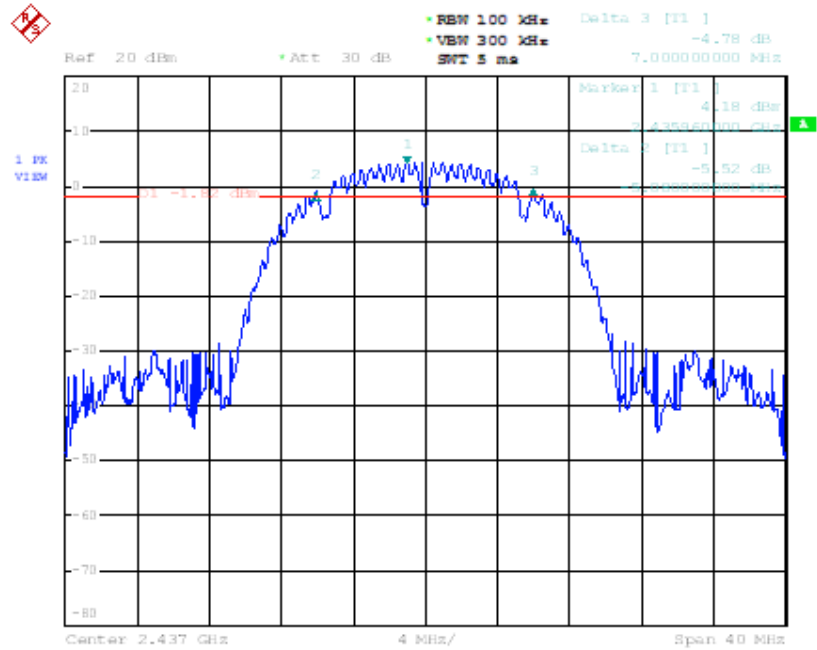
Test mode: 802.11b





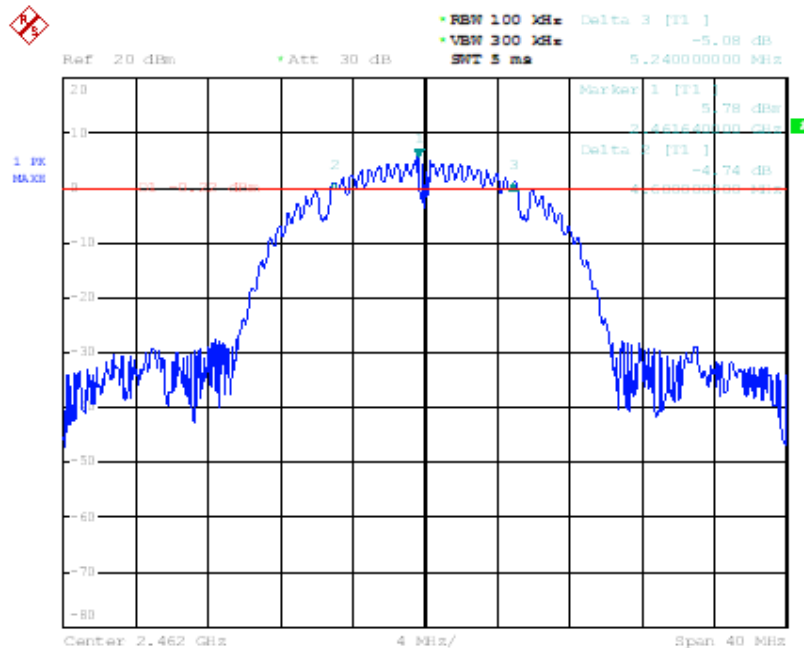
Middle Channel for Antenna B

Test mode: 802.11b



Highest Channel for Antenna B

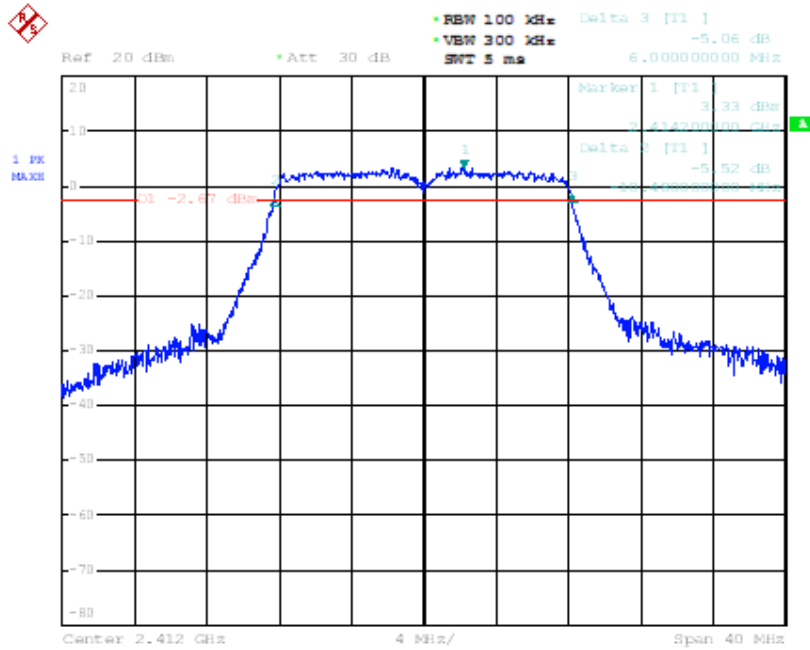
Test mode: 802.11b





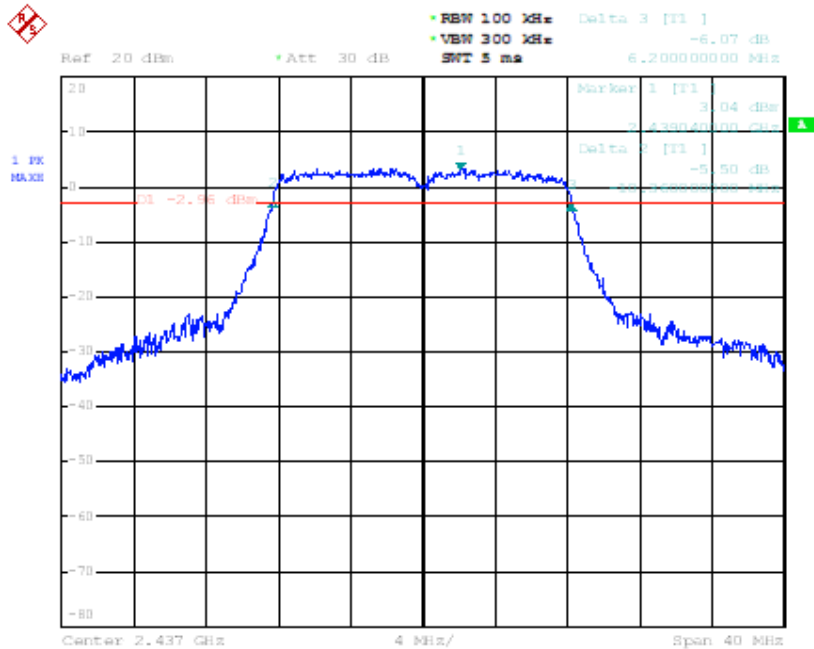
Lowest Channel for Antenna B

Test mode: 802.11g



Middle Channel for Antenna B

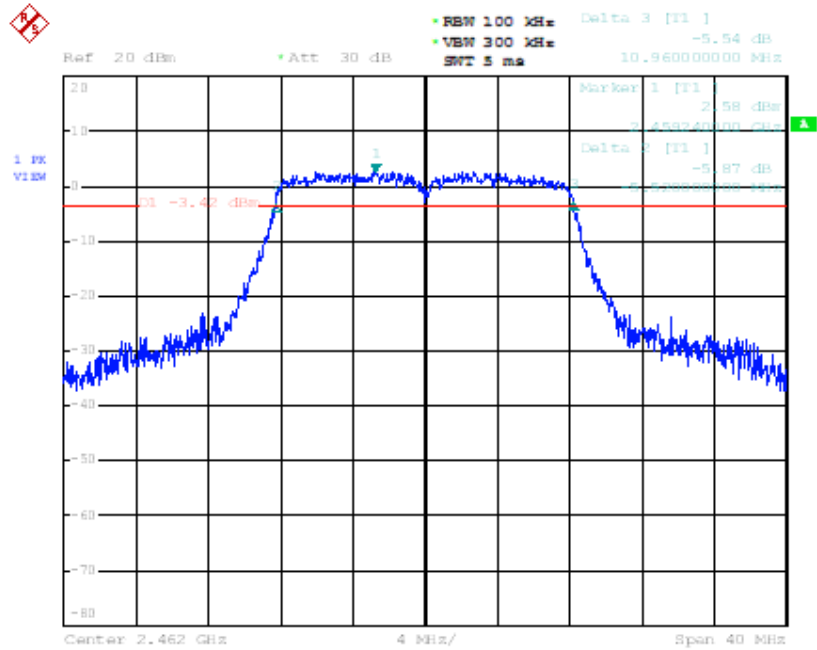
Test mode: 802.11g





Highest Channel for Antenna B

Test mode: 802.11g





### **7.3 Peak Output Power Measurement**

**Test Requirement:** FCC Part 15 15.247(a)(2),(b)  
**Test date** September. 06, 2012  
**Standard Applicable:** According to section 15.247(a)(2),(b)  
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

#### **Measuremet Produre**

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF calbe from the antenna port to the spectrum.
3. Spectrum analyzer set:  
RBW = 1MHz; VBW = 3MHz  
span fully encompass the DTS bandwidth(26dB BW).  
Detector = peak. Sweep time = auto couple.  
Trace mode = max hold.  
Allow trace to fully stabilize.
4. Use the spectrum analyzer's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges.
5. Record the max.channel power reading
6. Repeat above procedures until all the frequency measured were complete.



**Measurement Result:**

**Test Data for Antenna A**

**Test mode: 802.11b**

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	17.09	0.5	17.59	57.41	30	PASS
Mid	2437	16.91	0.5	17.41	55.08	30	PASS
High	2462	18.18	0.5	18.68	73.79	30	PASS

**Test Data for Antenna A**

**Test mode: 802.11g**

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	13.89	0.5	14.39	27.48	30	PASS
Mid	2437	13.10	0.5	13.60	22.91	30	PASS
High	2462	13.30	0.5	13.80	23.99	30	PASS



Test Data for Antenna B

Test mode: 802.11b

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	16.93	0.5	17.43	55.34	30	PASS
Mid	2437	16.92	0.5	17.42	55.21	30	PASS
High	2462	17.20	0.5	17.7	58.88	30	PASS

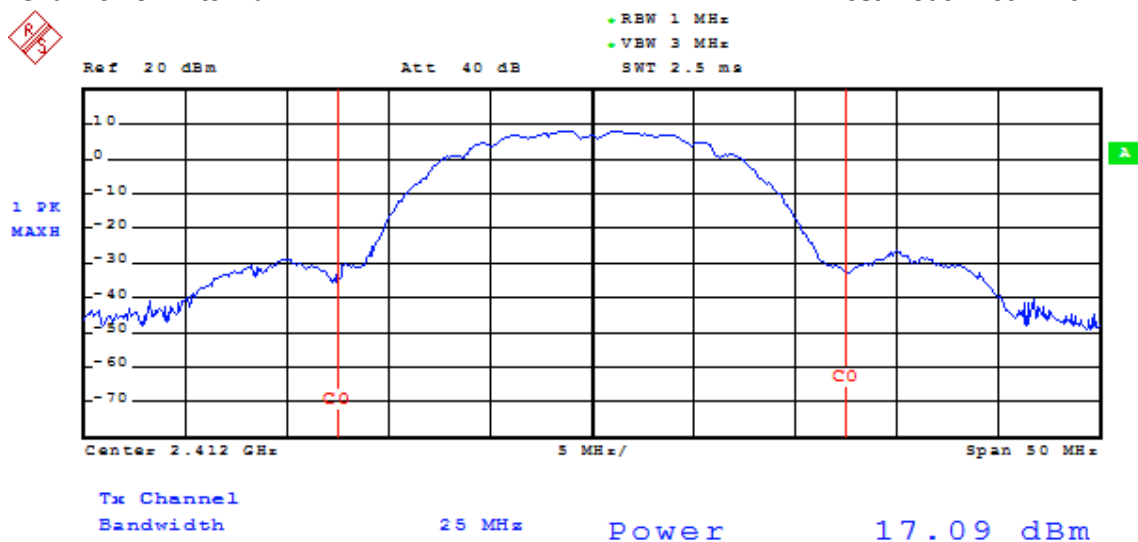
Test Data for Antenna B

Test mode: 802.11g

CH	Frequency (MHz)	Reading Peak Power (dBm)	Cable Loss (dB)	Output Peak Power (dBm)	Output Peak Power (mW)	Peak Power Limit (dBm)	Result
Low	2412	19.43	0.5	19.93	98.40	30	PASS
Mid	2437	19.33	0.5	19.83	96.16	30	PASS
High	2462	19.34	0.5	19.84	96.38	30	PASS

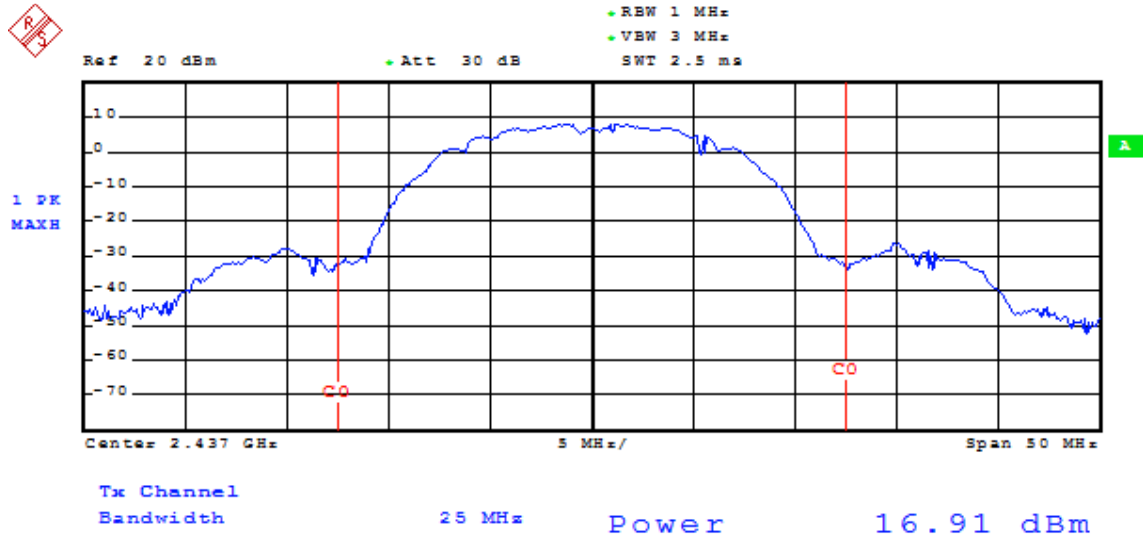
Low Channel for Antenna A

Test mode: 802.11b



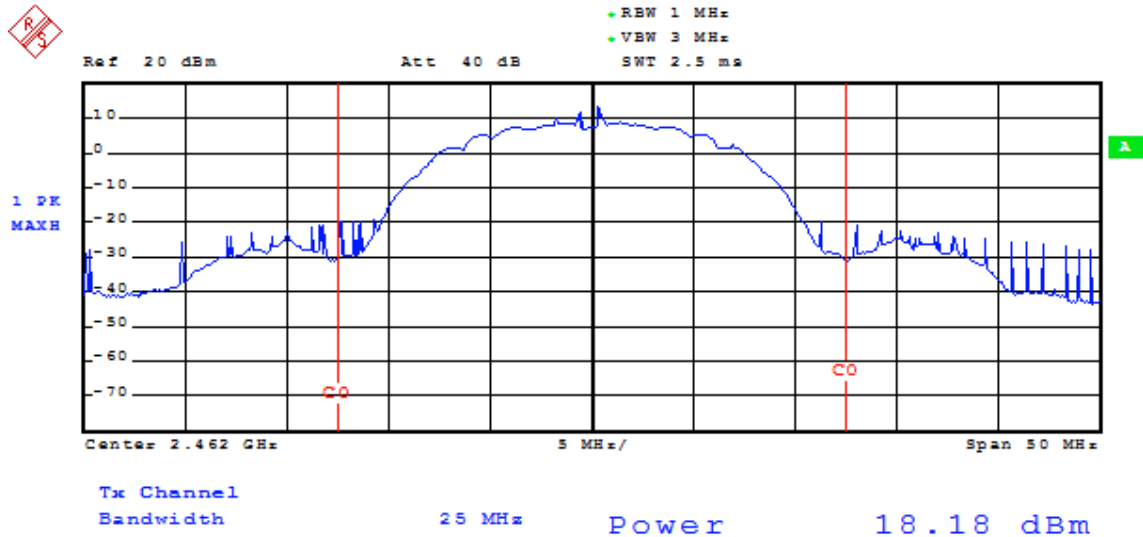
### Mid Channel for Antenna A

Test mode: 802.11b



### High Channel for Antenna A

Test mode: 802.11b

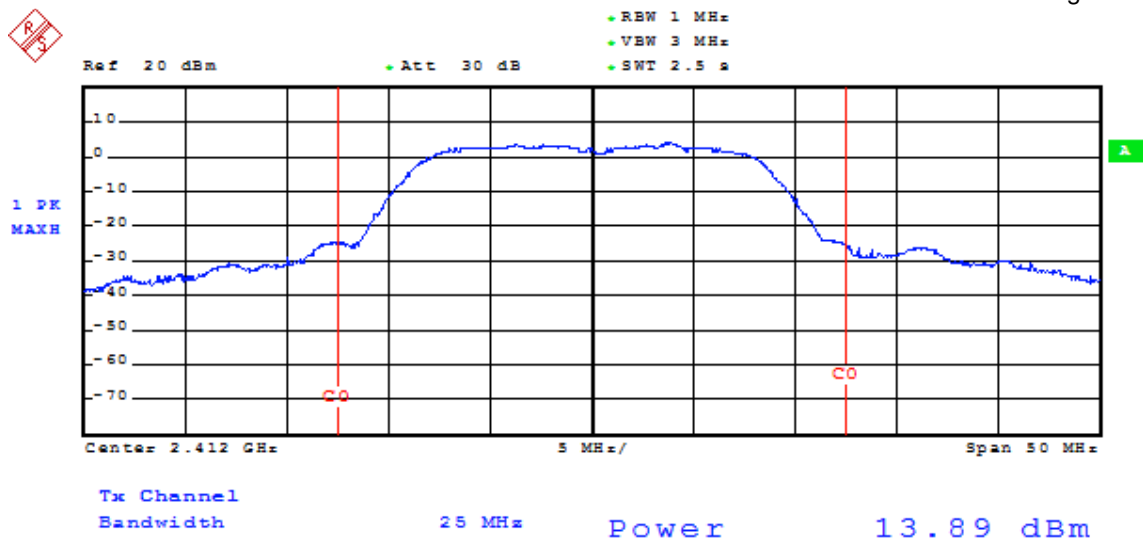






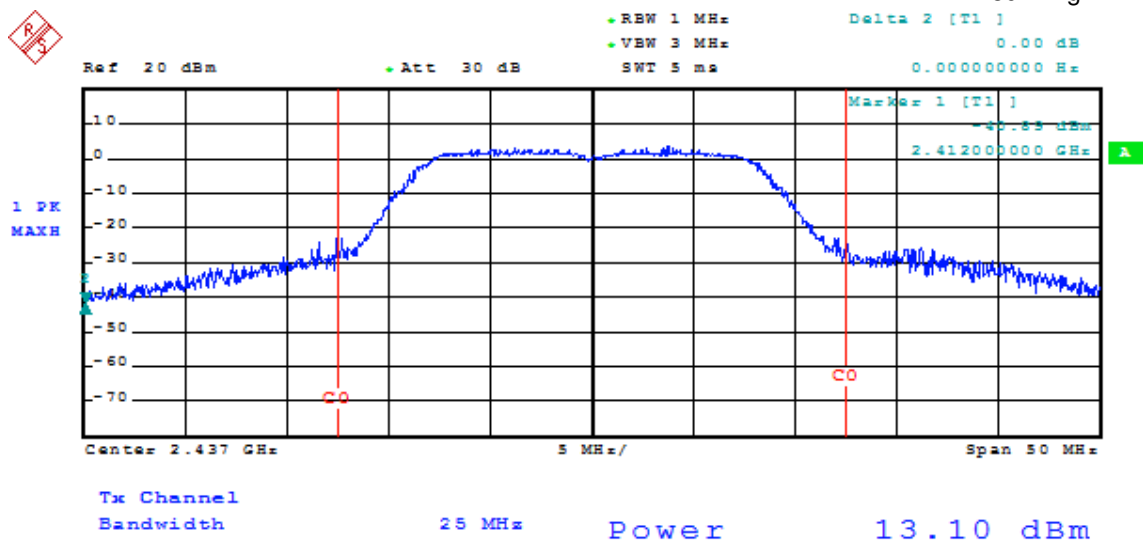
Low Channel for Antenna A

Test mode: 802.11g



Mid Channel for Antenna A

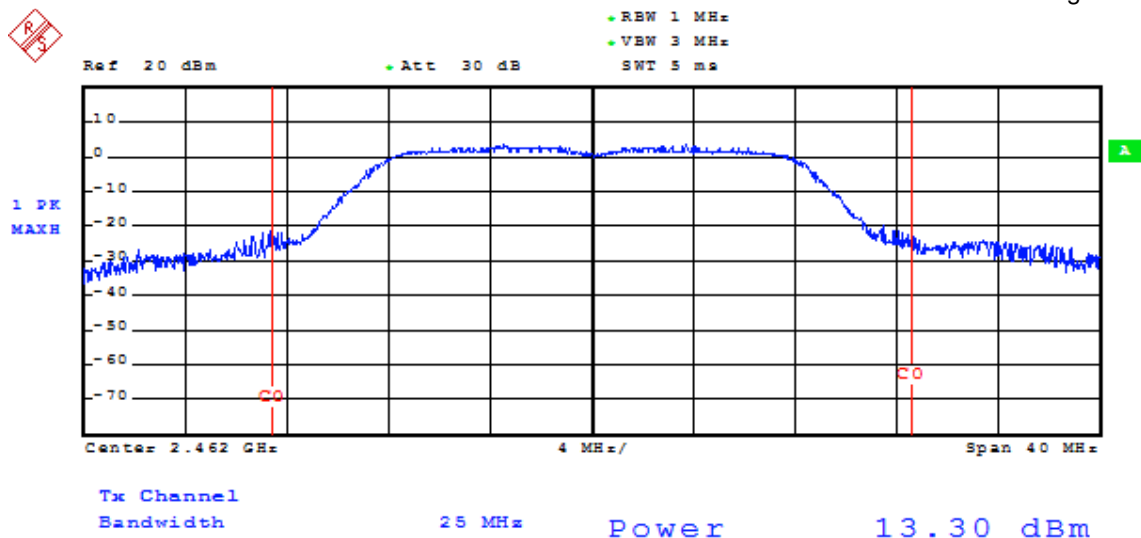
Test mode: 802.11g





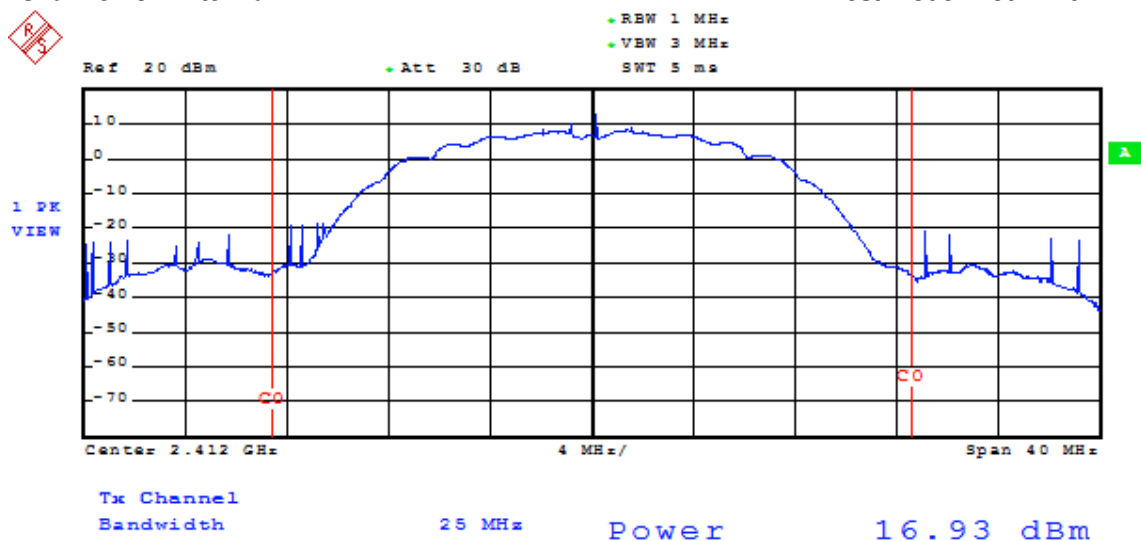
High Channel for Antenna A

Test mode: 802.11g



Low Channel for Antenna B

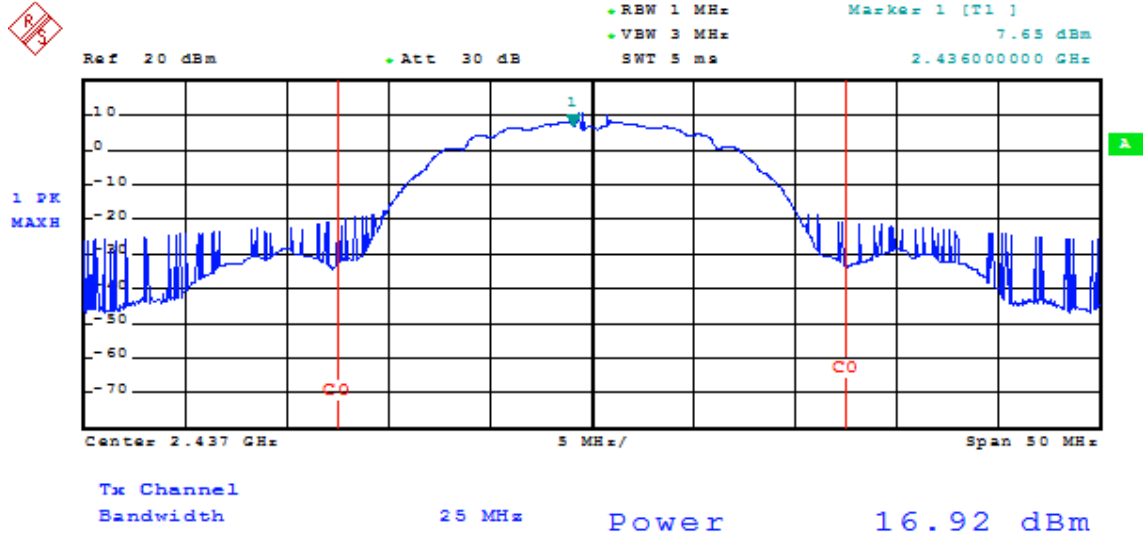
Test mode: 802.11b





Mid Channel for Antenna B

Test mode: 802.11b



High Channel for Antenna B

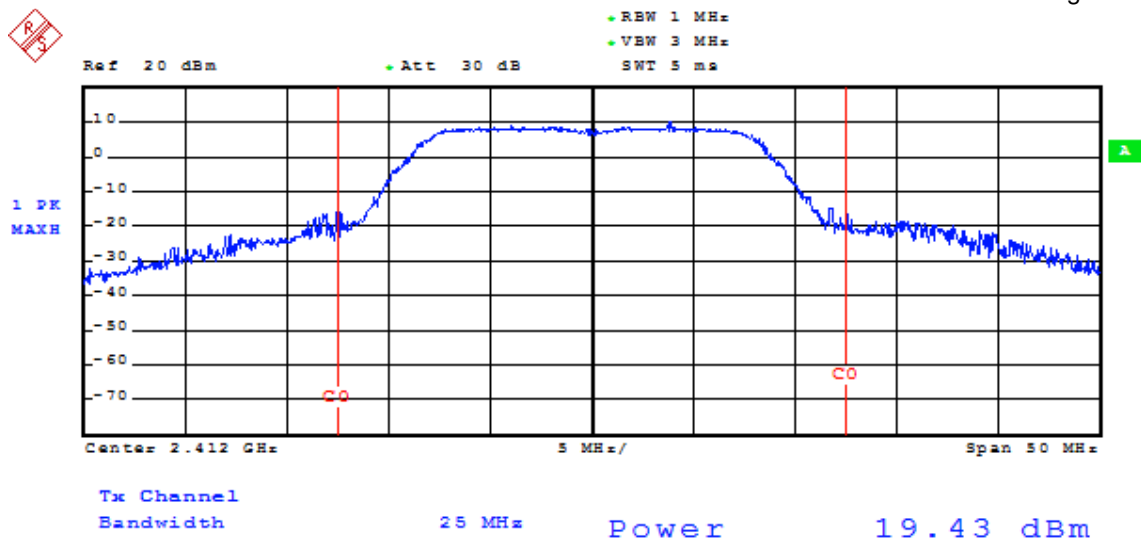
Test mode: 802.11b





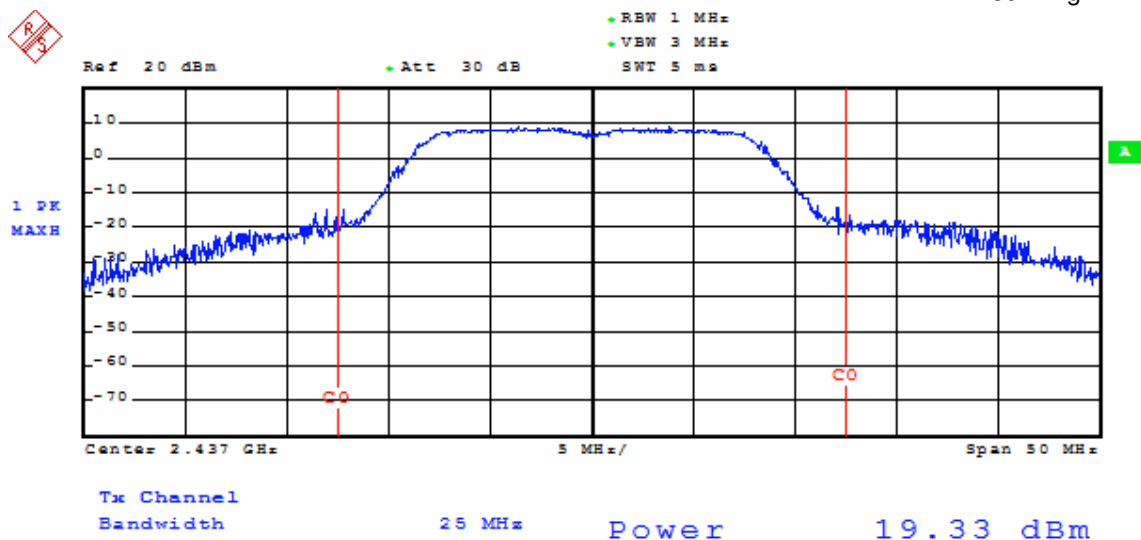
Low Channel for Antenna B

Test mode: 802.11g



Mid Channel for Antenna B

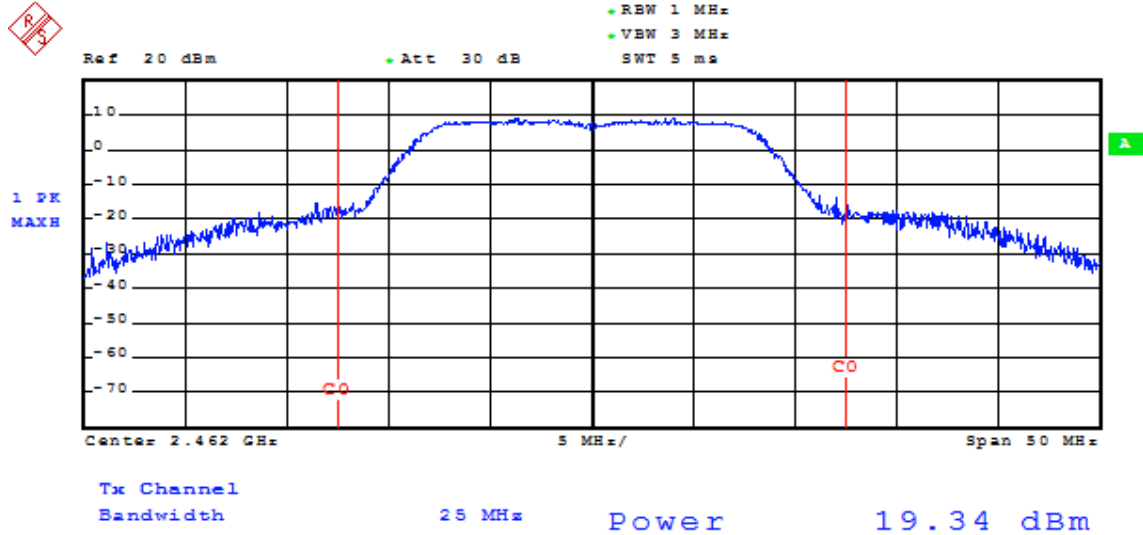
Test mode: 802.11g





High Channel for Antenna B

Test mode: 802.11g



#### 7.4 Peak Power Spectral Density

**Test Requirement:** FCC Part15 247(e)  
**Test date:** September 06, 2012  
**Standard Applicable:** According to section 15.247(e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph(b) of this section. The same method of determining the conducted output power shall be used to determine the powr spectral density.  
**Measurement Procedure:** The EUT was tested according ANSI C63.10,2009 Clause 6.11 for compliance to FCC 47CFR 15.247 requiremnts.  
RBW=3KHz;VBW=10KHz;Span=300KHz;Sweep time=100S

##### Measurement Result:

##### Test Data for Antenna A

Test mode: 802.11b

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2411.45	-8.77	0.5	-8.27	8	PASS
MID	2435.45	-8.20	0.5	-7.70	8	PASS
HIGH	2460.63	-9.25	0.5	-8.75	8	PASS

##### Test Data for Antenna A

Test mode: 802.11g

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2415.66	-19.44	0.5	-18.94	8	PASS
MID	2433.22	-19.85	0.5	-19.35	8	PASS
HIGH	2466.02	-20.41	0.5	-19.91	8	PASS

##### Test Data for Antenna B

Test mode: 802.11b

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412.95	-5.44	0.5	-4.94	8	PASS
MID	2434.95	-6.65	0.5	-6.15	8	PASS
HIGH	2461.45	-8.48	0.5	-7.98	8	PASS

##### Test Data for Antenna B

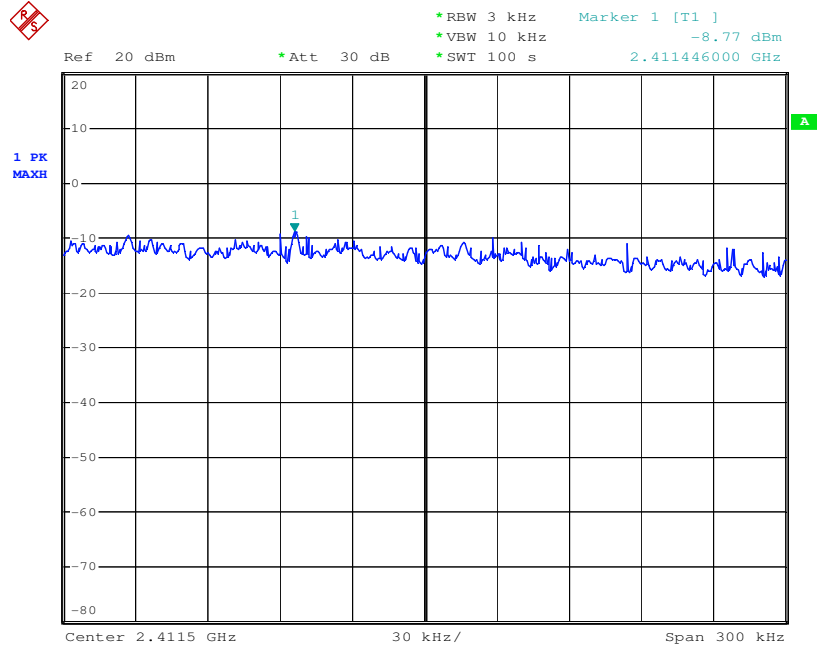
Test mode: 802.11g

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2415.70	-13.83	0.5	-13.33	8	PASS
MID	2433.51	-13.07	0.5	-12.57	8	PASS
HIGH	2464.70	-12.95	0.5	-12.45	8	PASS



Low Channel for Antenna A

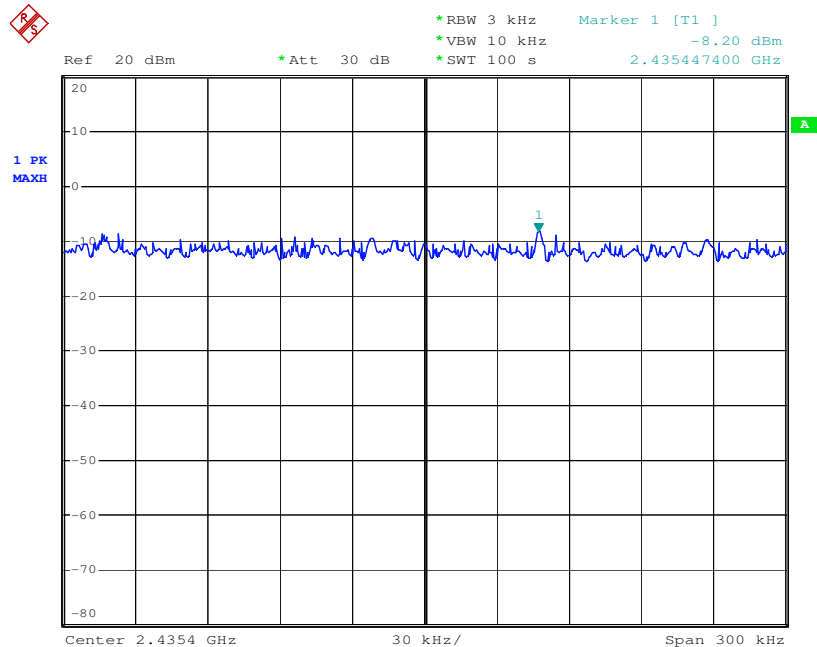
Test mode: 802.11b



Date: 20.AUG.2012 15:53:29

Mid Channel for Antenna A

Test mode: 802.11b

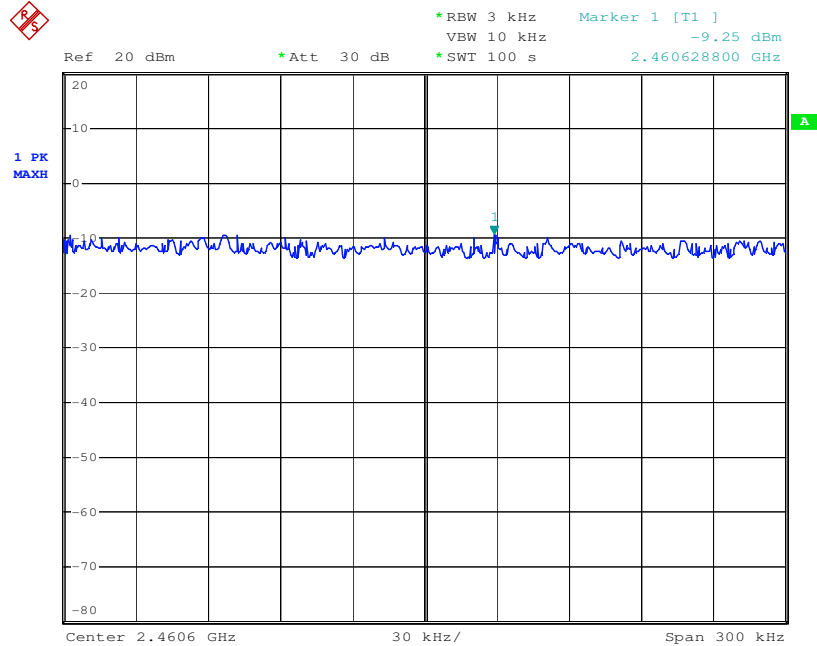


Date: 20.AUG.2012 16:37:07



High Channel for Antenna A

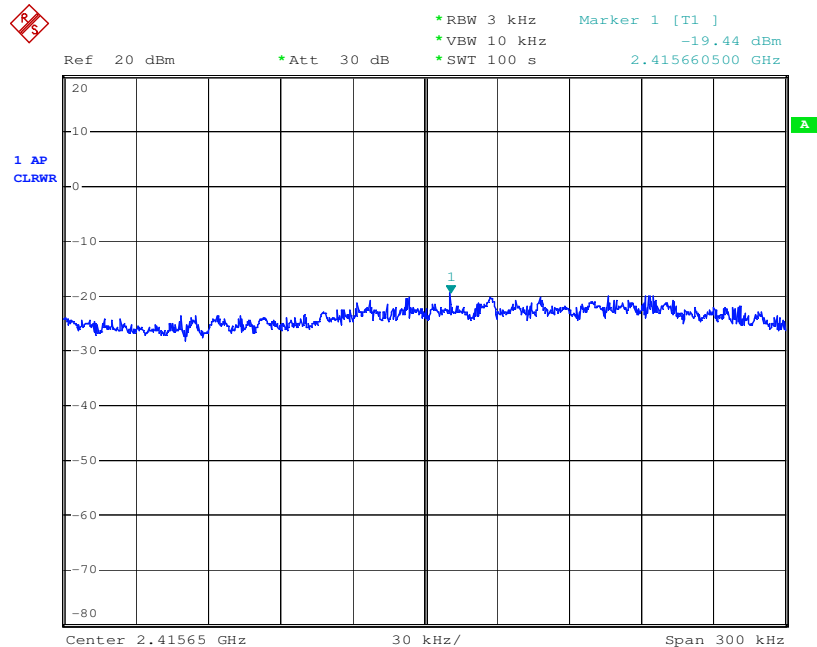
Test mode: 802.11b



Date: 20.AUG.2012 17:14:10

Low Channel for Antenna A

Test mode: 802.11g



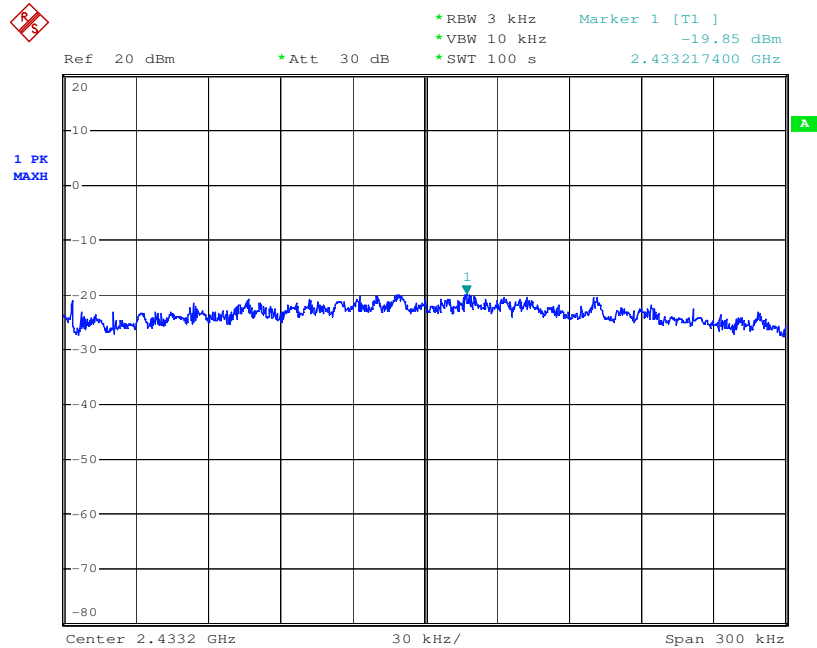
Date: 1.JAN.2000 18:35:52





Mid Channel for Antenna A

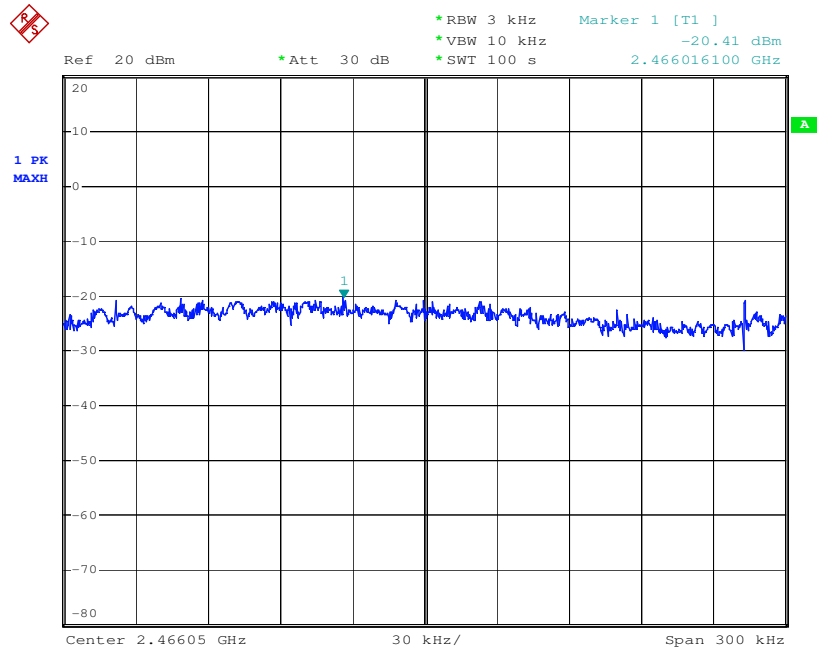
Test mode: 802.11g



Date: 1.JAN.2000 18:52:23

High Channel for Antenna A

Test mode: 802.11g

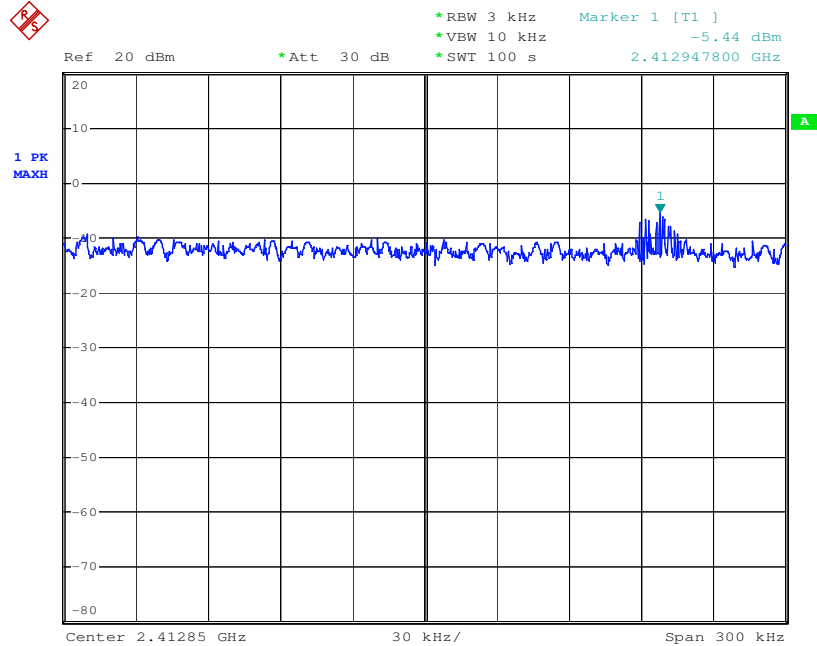


Date: 1.JAN.2000 19:03:57



Low Channel for Antenna B

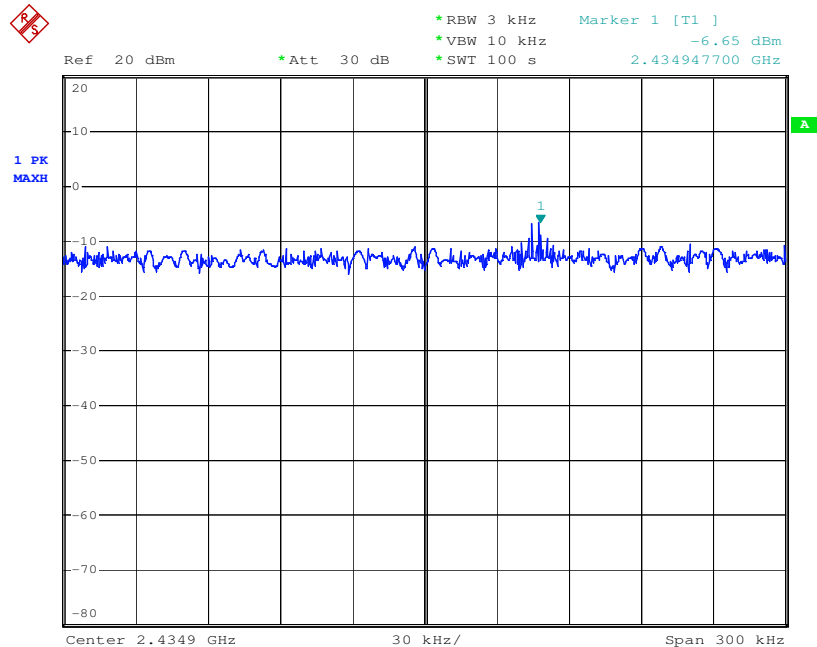
Test mode: 802.11b



Date: 1.JAN.2000 00:44:41

Mid Channel for Antenna B

Test mode: 802.11b

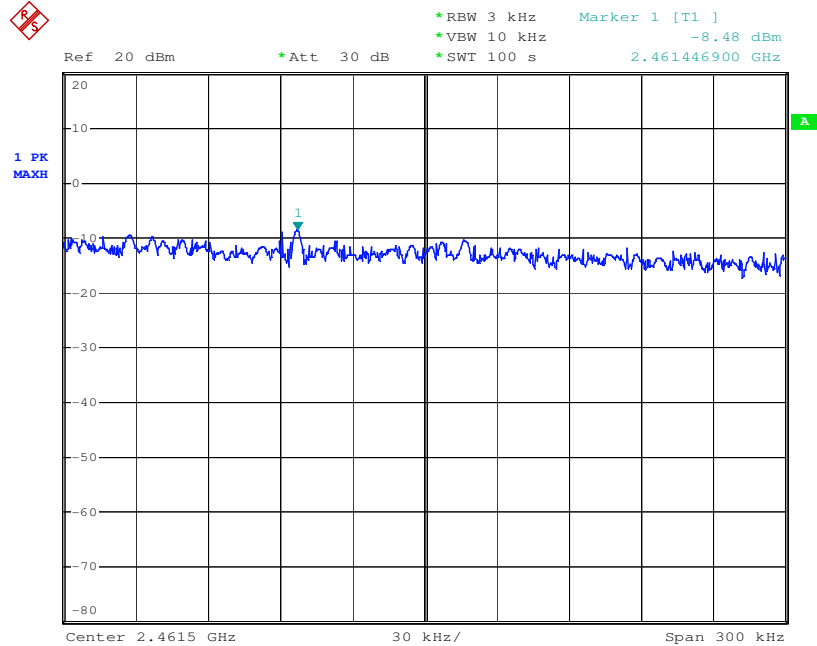


Date: 1.JAN.2000 00:55:28



High Channel for Antenna B

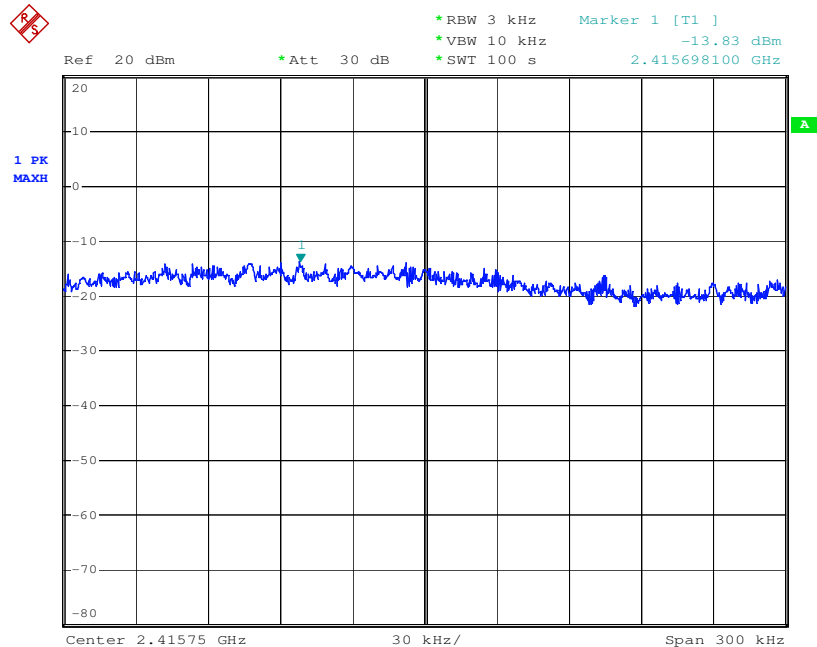
Test mode: 802.11b



Date: 1.JAN.2000 01:08:02

Low Channel for Antenna B

Test mode: 802.11g

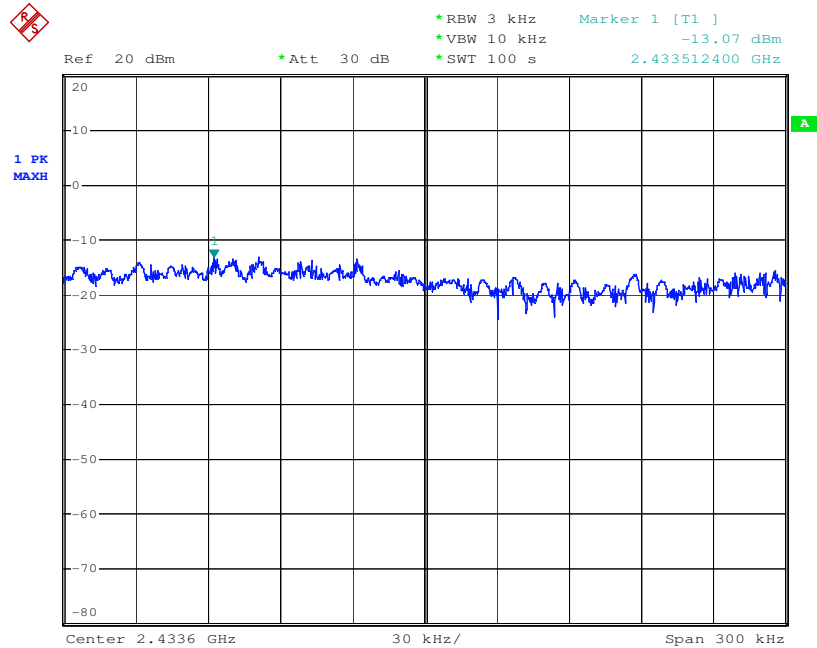


Date: 1.JAN.2000 02:01:22



Mid Channel for Antenna B

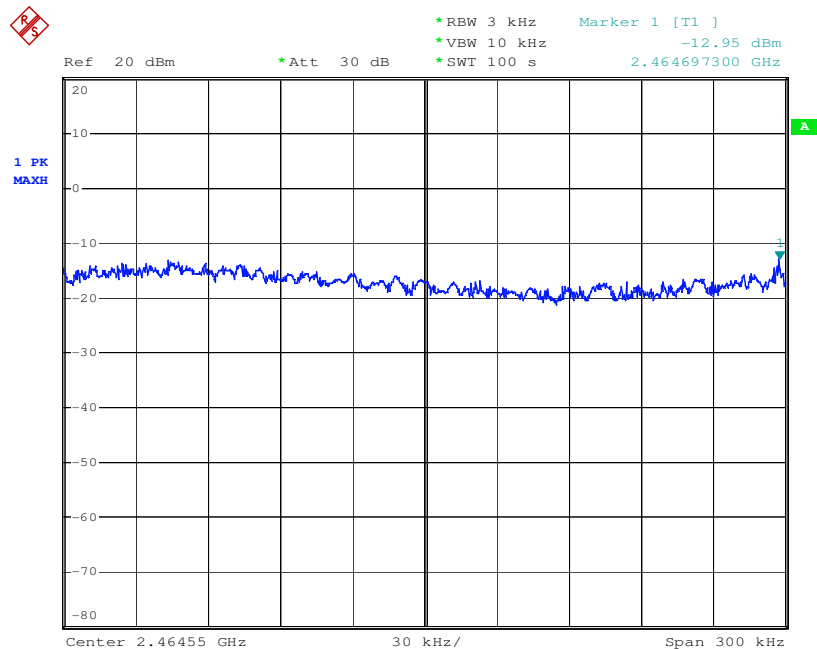
Test mode: 802.11g



Date: 1.JAN.2000 02:12:40

High Channel for Antenna B

Test mode: 802.11g



Date: 1.JAN.2000 01:15:00

## 7.5 Conducted Spurious Emission Test

**Test Requirement:** FCC Part15 247(c)

**Test date:** September 08, 2012

**Standard Applicable:** According to section 15.247(c), in any 100KHz 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 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

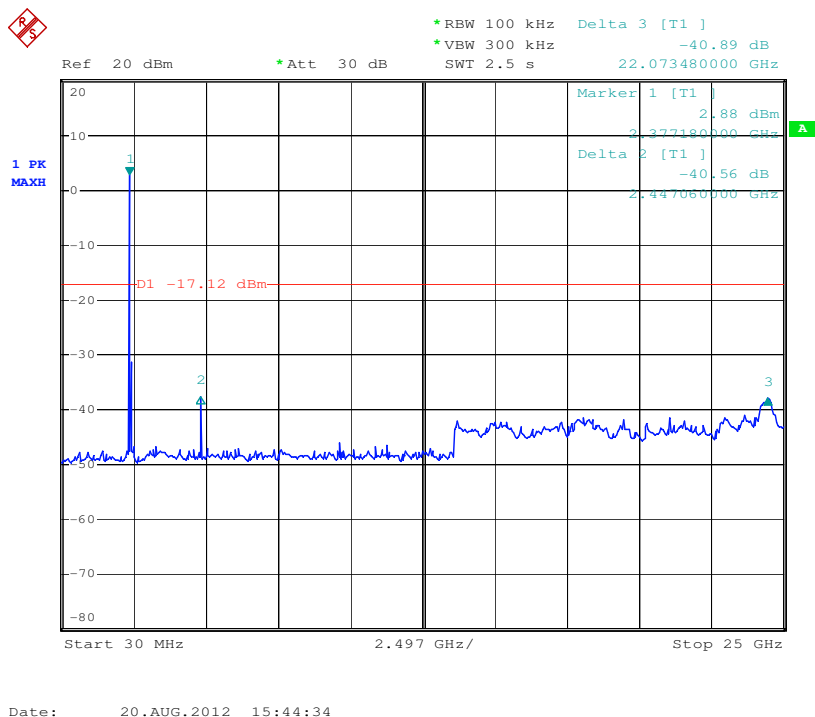
### Measurement Procedure:

1. Place the EUT on the table and set it in 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 center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto
6. Repeat above procedures until all frequency measured were complete.

## Measurement Result:

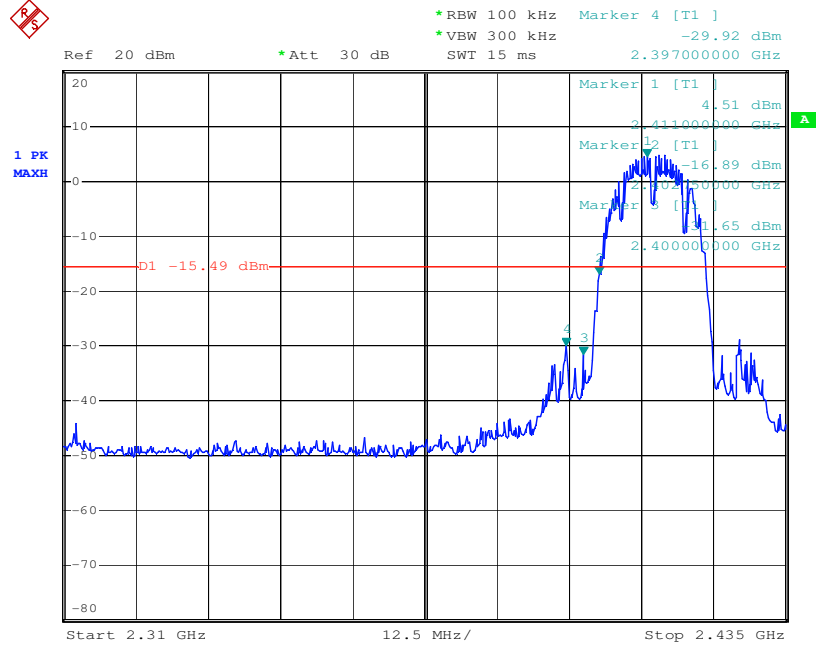
### Low Channel for Antenna A

**Test mode:** 802.11b





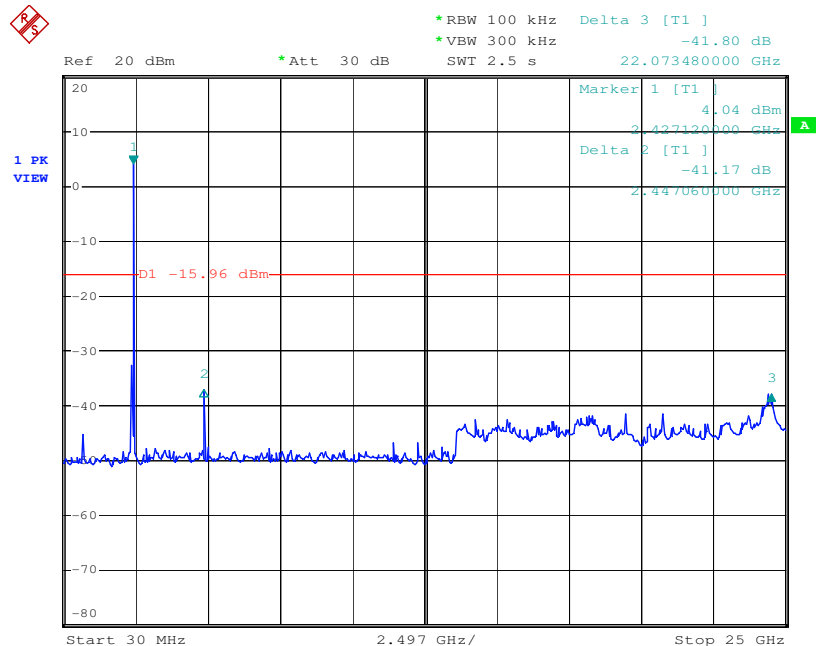
Band Edge (Conducted Mode)



Date: 20.AUG.2012 16:05:30

Middle Channel for Antenna A

Test mode: 802.11b

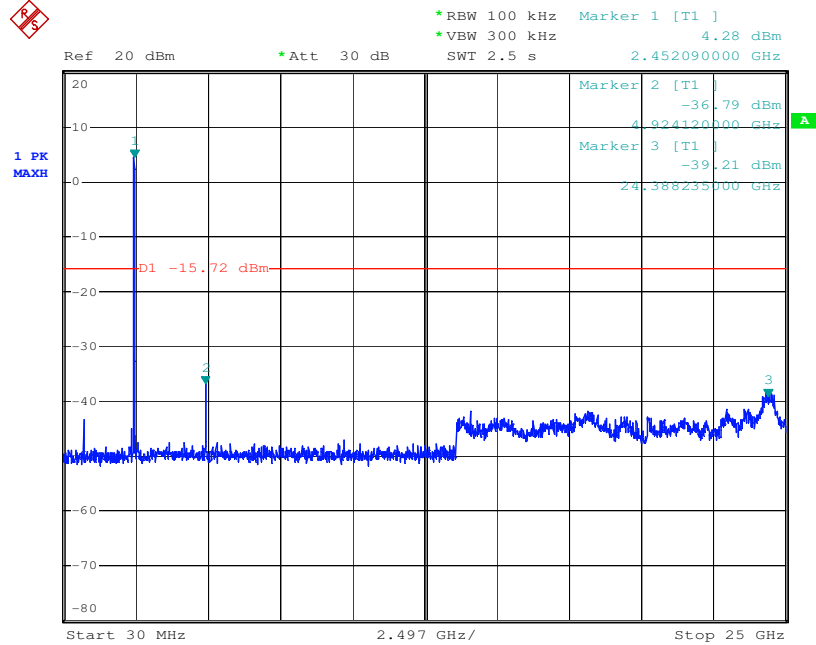


Date: 20.AUG.2012 16:25:43



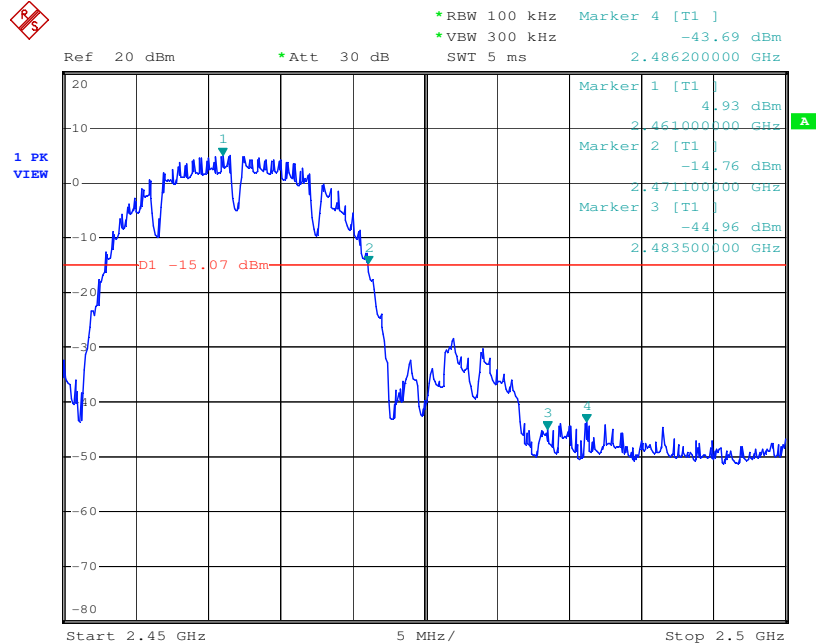
High Channel for Antenna A

Test mode: 802.11b



Date: 20.AUG.2012 17:47:13

Band Edge (Conducted Mode)

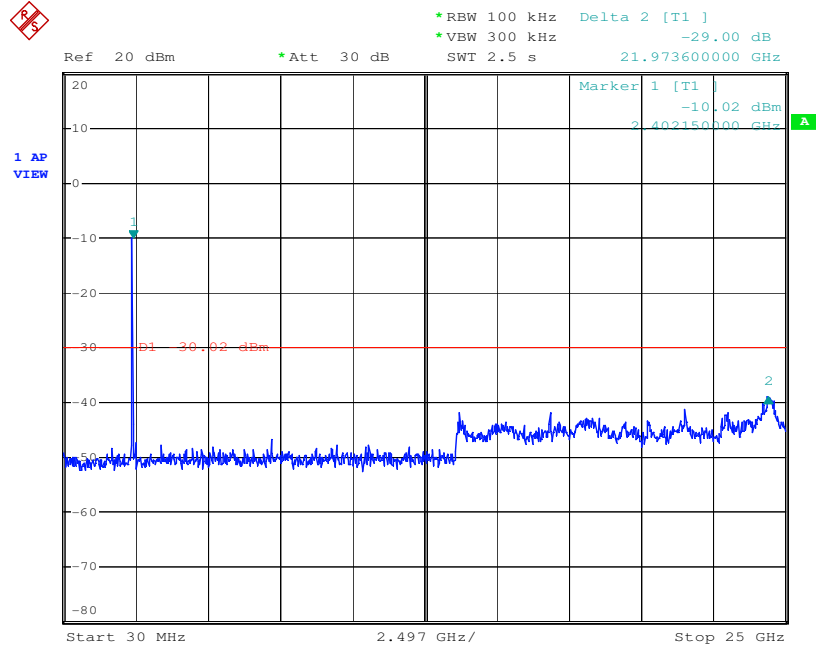


Date: 20.AUG.2012 17:01:05



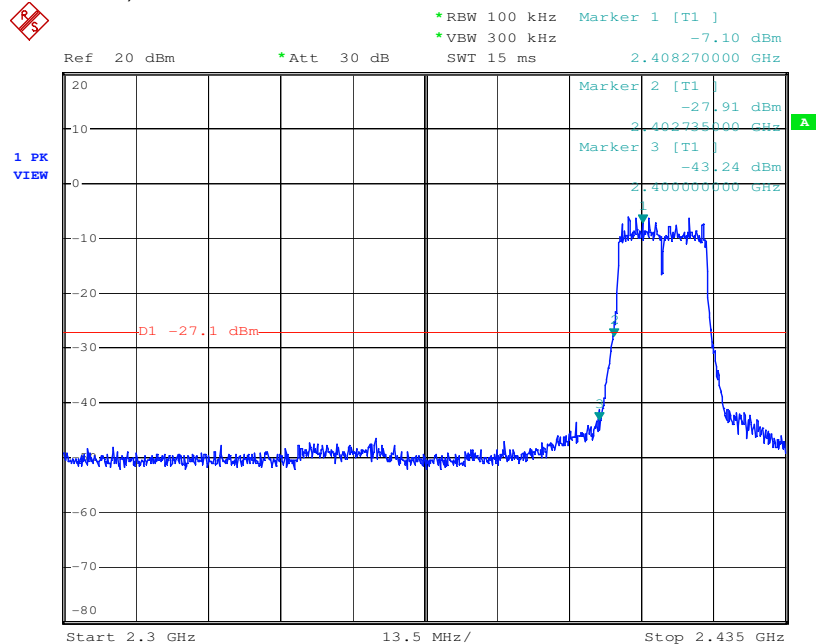
Low Channel for Antenna A

Test mode: 802.11g



Date: 1.JAN.2000 18:04:10

Band Edge (Conducted Mode)



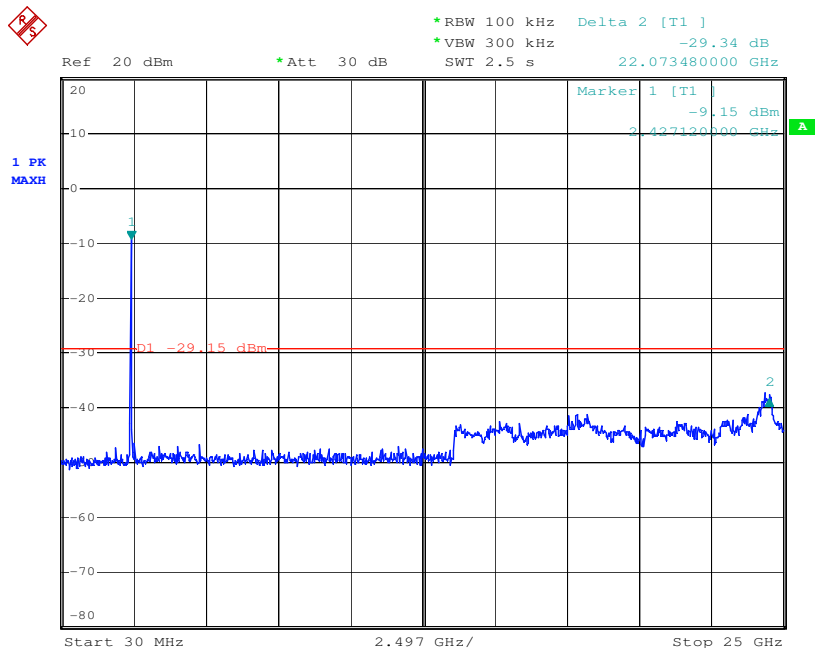
Date: 1.JAN.2000 18:13:06





Middle Channel for Antenna A

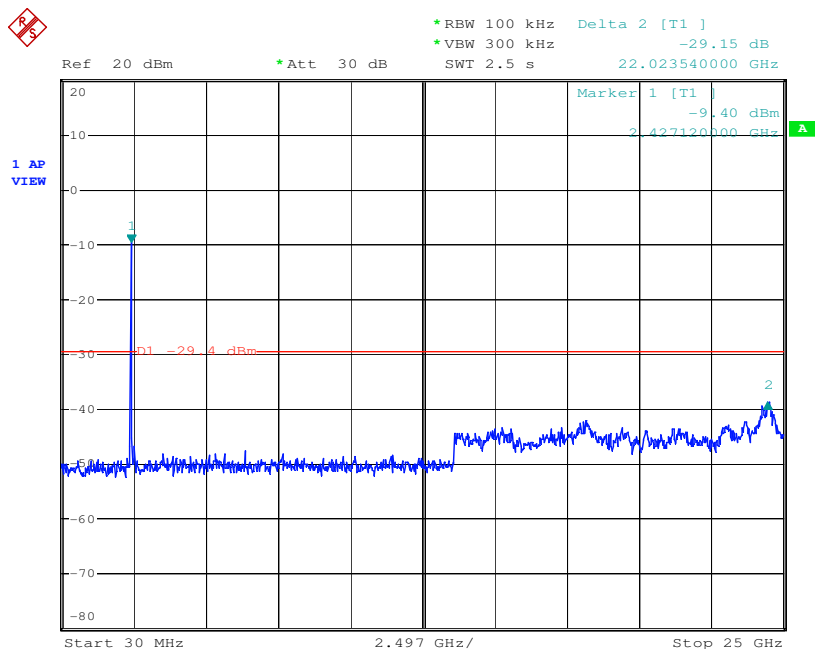
Test mode: 802.11g



Date: 1.JAN.2000 18:47:45

High Channel for Antenna A

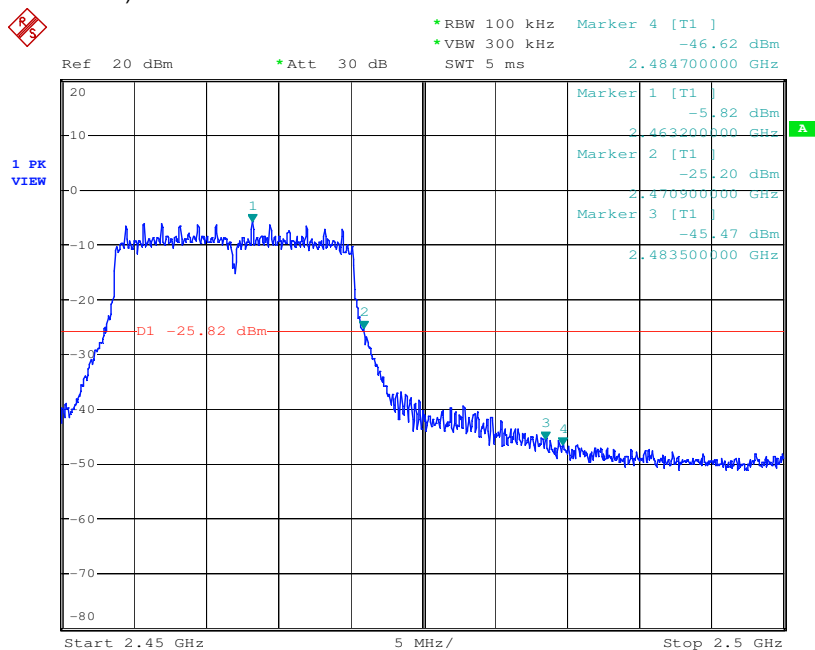
Test mode: 802.11g



Date: 1.JAN.2000 19:07:47



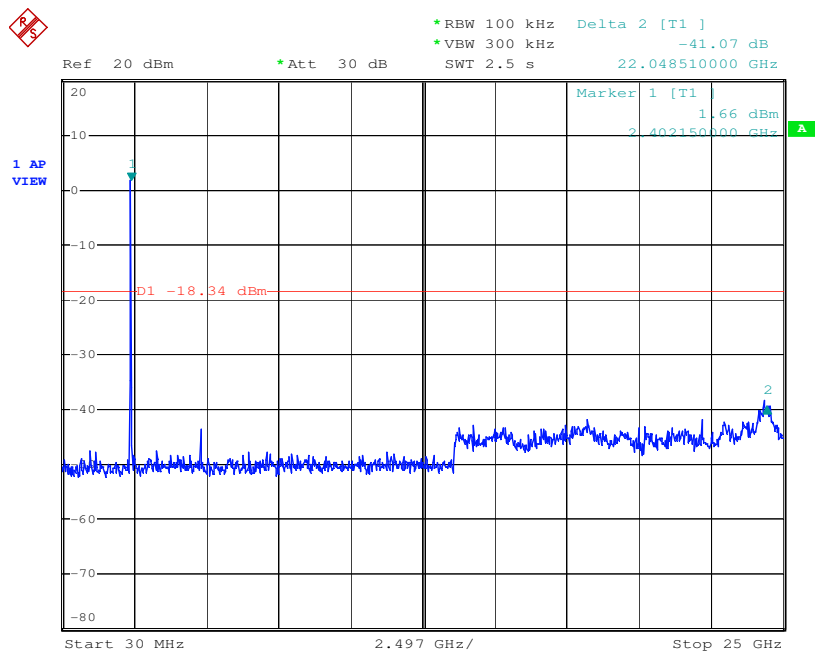
### Band Edge (Conducted Mode)



Date: 1.JAN.2000 19:14:22

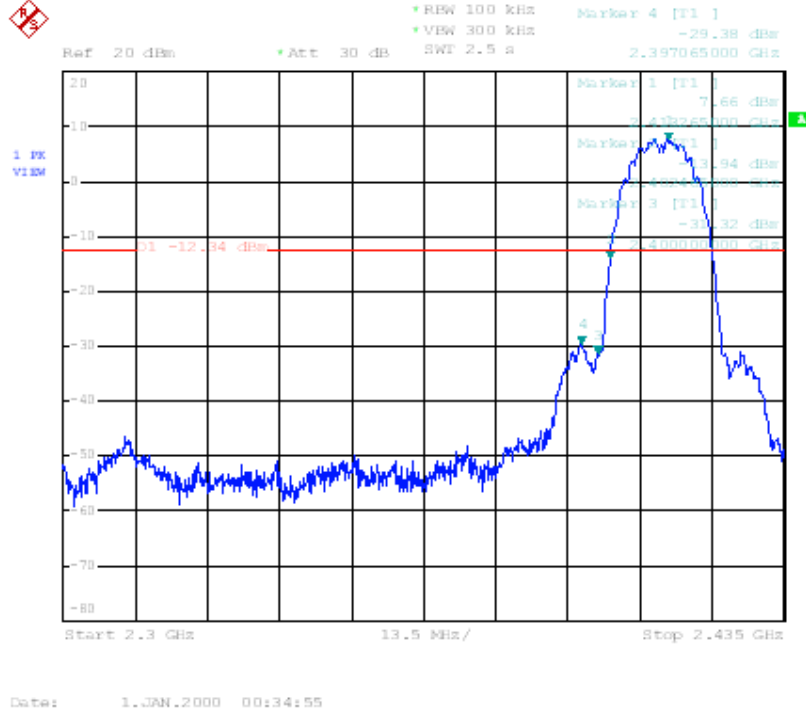
### Low Channel for Antenna B

Test mode: 802.11b



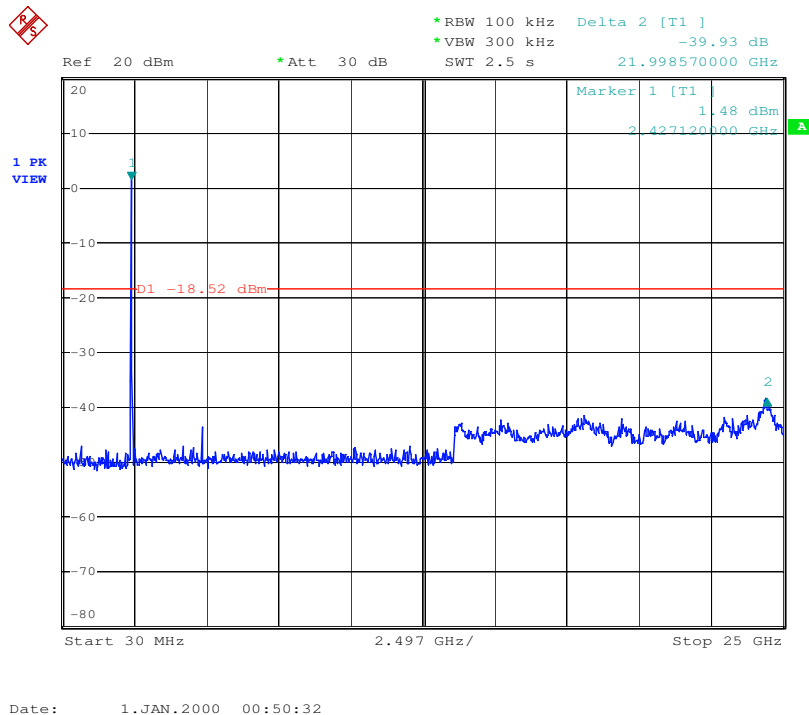
Date: 1.JAN.2000 00:29:38

Band Edge (Conducted Mode)



Middle Channel for Antenna B

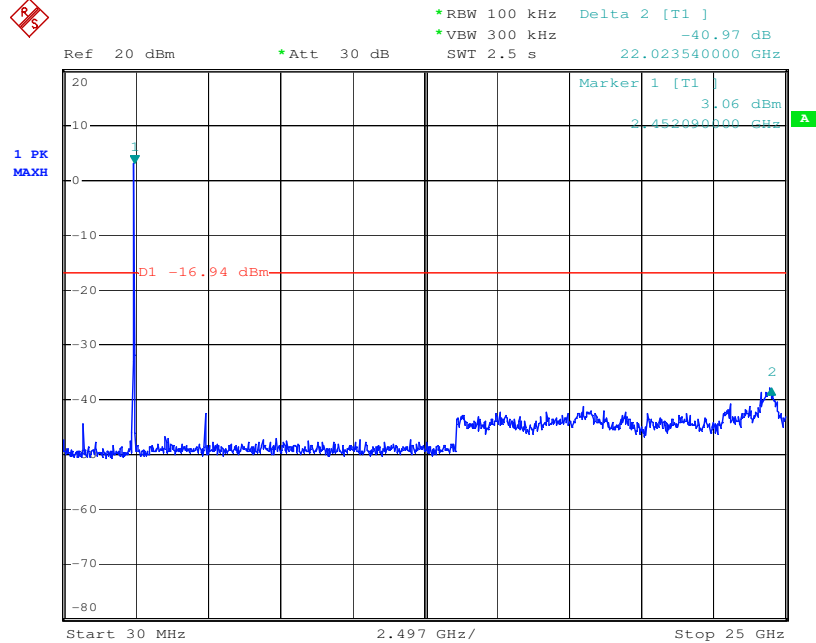
Test mode: 802.11b





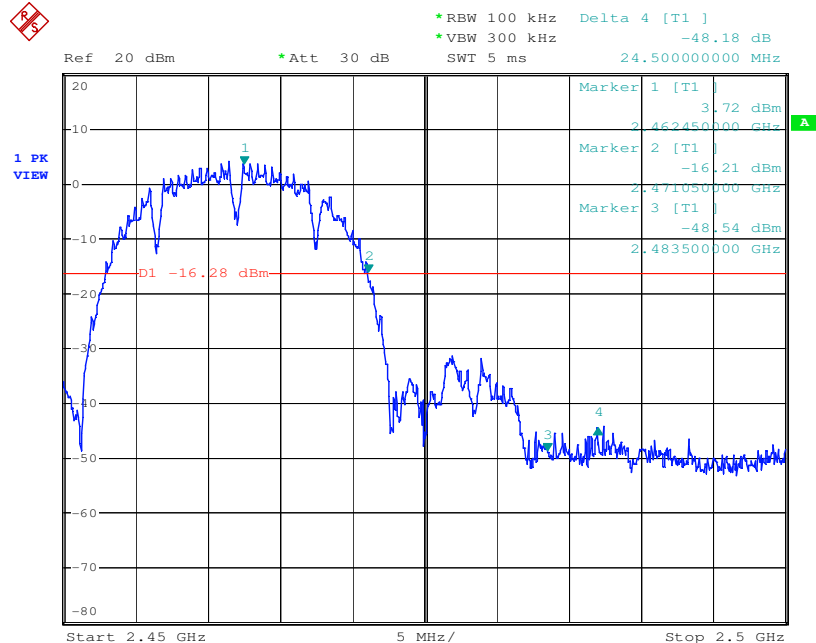
High Channel for Antenna B

Test mode: 802.11b



Date: 1.JAN.2000 01:03:38

Band Edge (Conducted Mode)

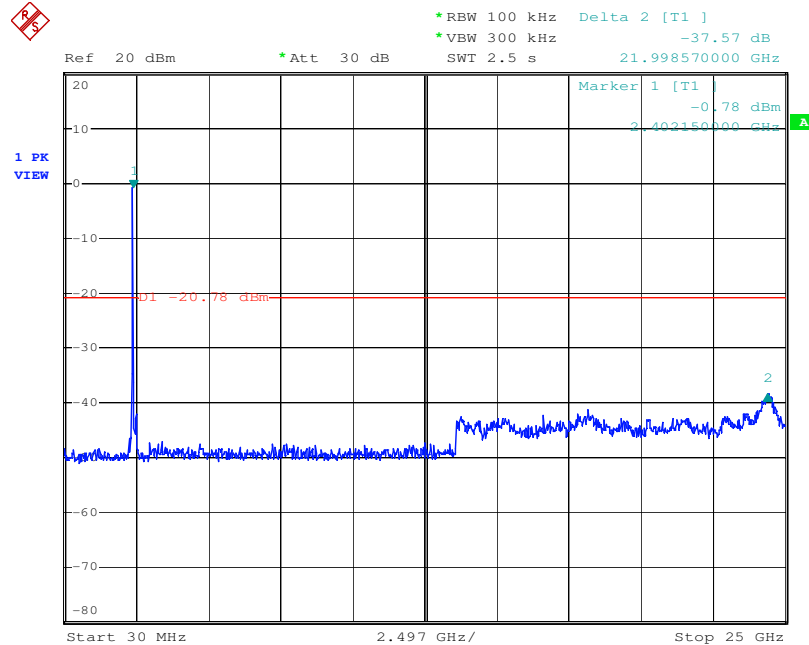


Date: 1.JAN.2000 01:01:57

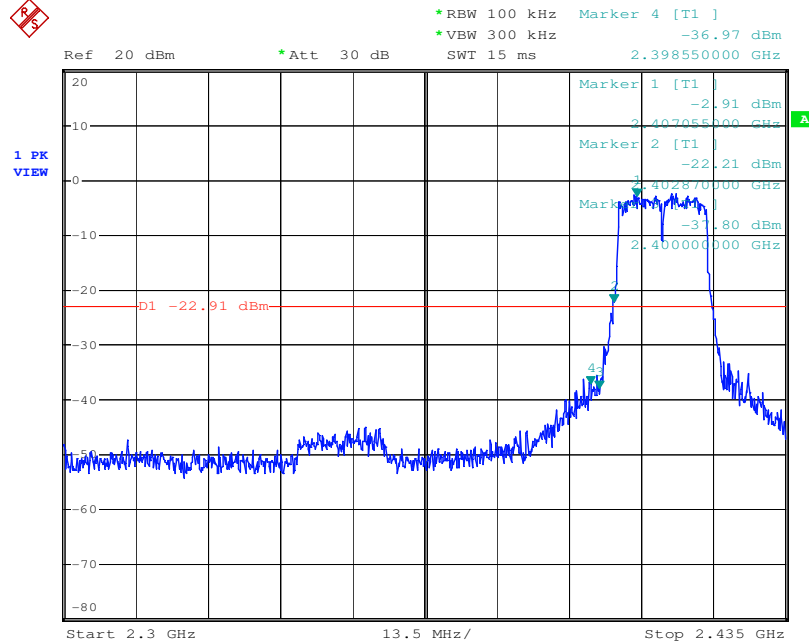


Low Channel for Antenna B

Test mode: 802.11g



Band Edge (Conducted Mode)

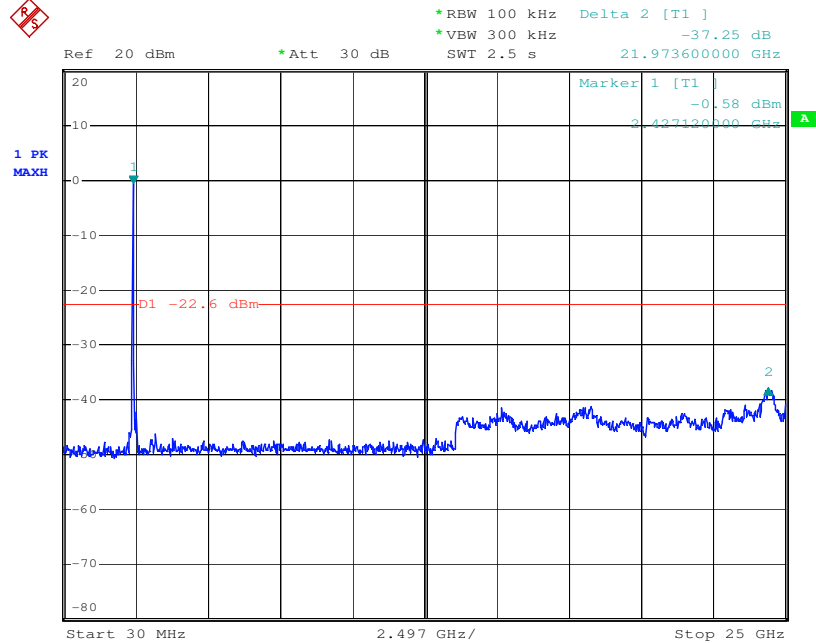


Date: 1.JAN.2000 01:55:51



Middle Channel for Antenna B

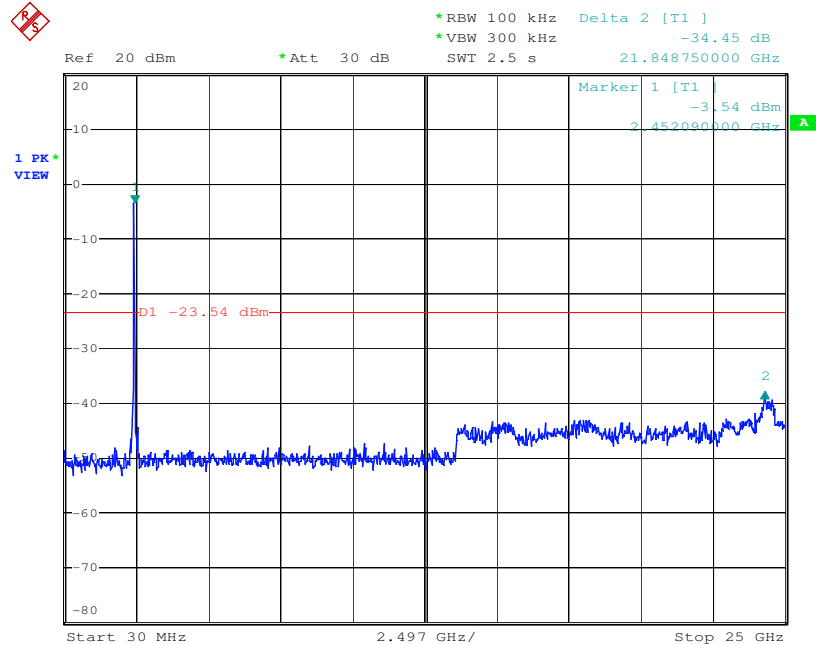
Test mode: 802.11g



Date: 1.JAN.2000 02:07:21

High Channel for Antenna B

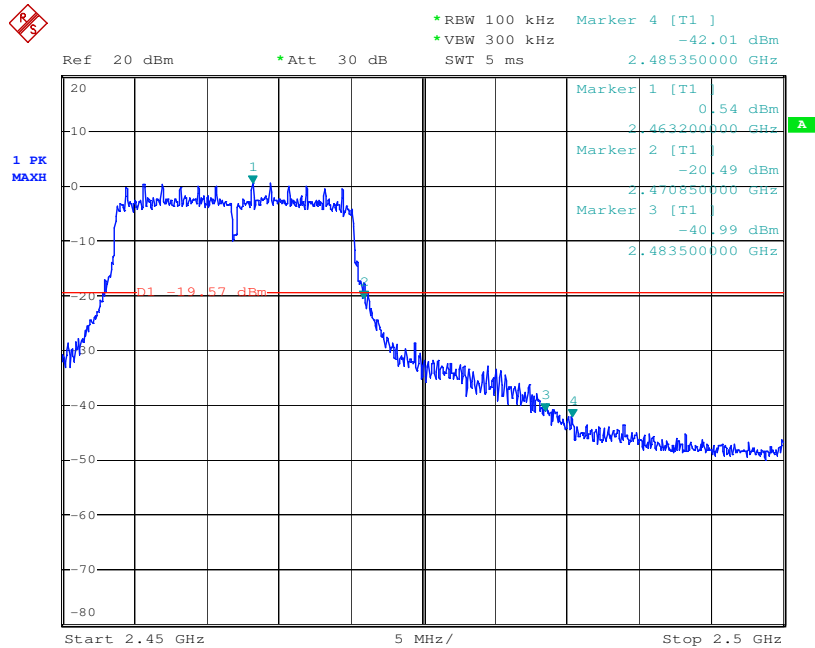
Test mode: 802.11g



Date: 1.JAN.2000 01:20:47



Band Edge (Conducted Mode)



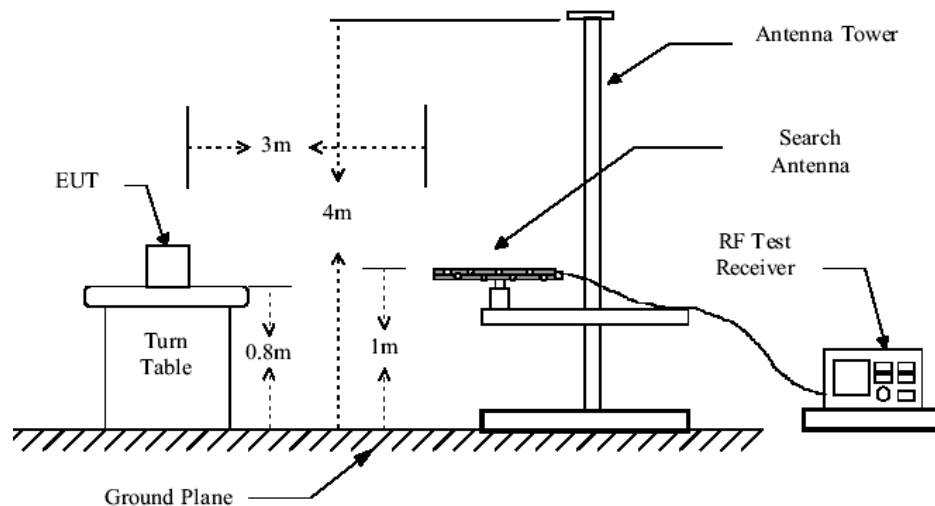
Date: 1.JAN.2000 01:25:15

## 7.6 Spurious Radiated Emission Test

- Test Requirement:** FCC Part 15.247(d) and FCC Part 15.209
- Test date:** August 28, 2012
- Standard Applicable:** According to section 15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in section 15.209(a). And according to section 15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, which is lower.
- Measurement Procedure:**
1. The EUT was placed on a turn table which is 0.8m above ground plane.
  2. Pre-test on 802.11b mode and 802.11g mode both with antenna A and antenna B to find the worst status.
  3. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
  4. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.  
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz - 25GHz )  
Above 1GHz  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.
  5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
  6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
  7. Repeat above procedures until all frequency measured were complete.

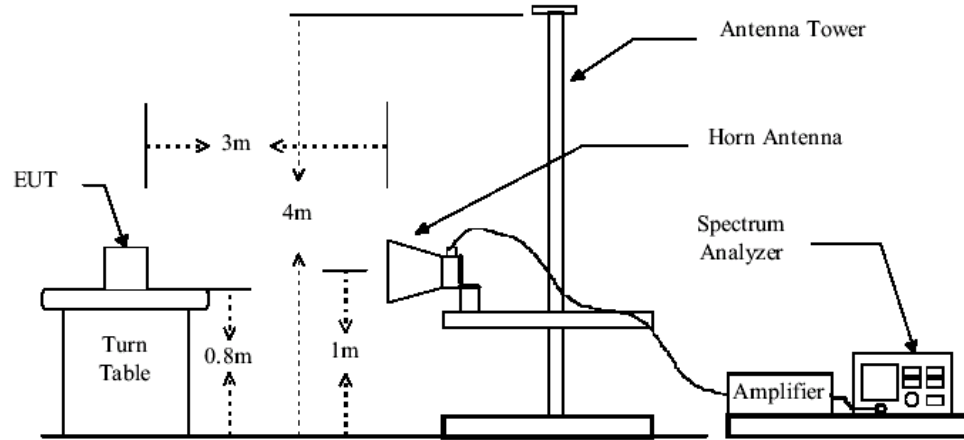
### Radiated Test Set-up:

#### Radiated Emission Test Set-up, Frequency Below 1000MHz





#### Radiated Emission Test Set-up Frequency Over 1GHz



Low noise amplifier was used below 1GHz, High pass Filter was used above 1GHz.

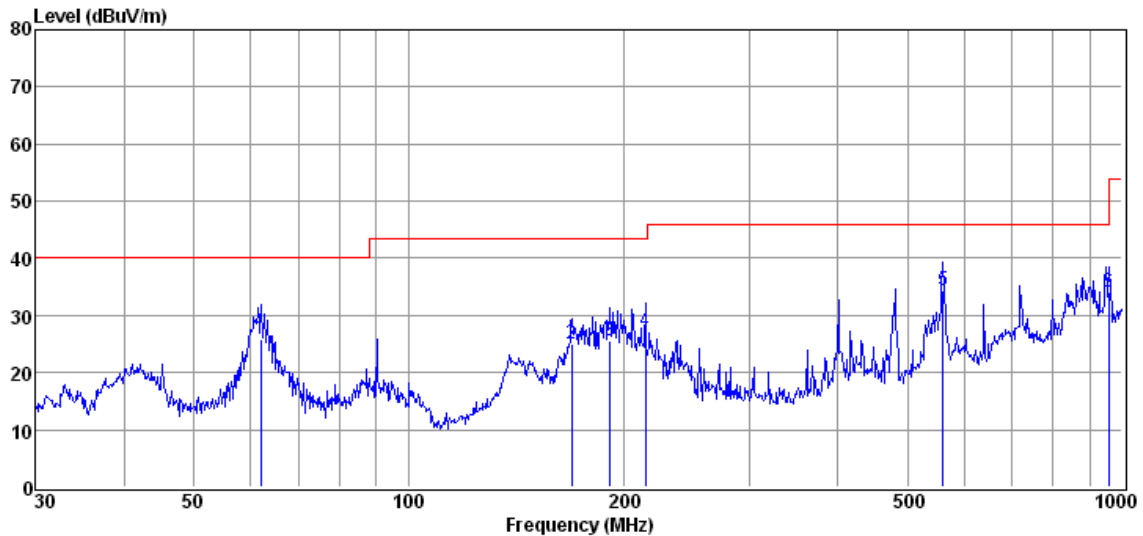


#### Tests results:

Remark: Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor.

30MHz to 1GHz Test Mode: 802.11b

Test Antenna Status: Vertical

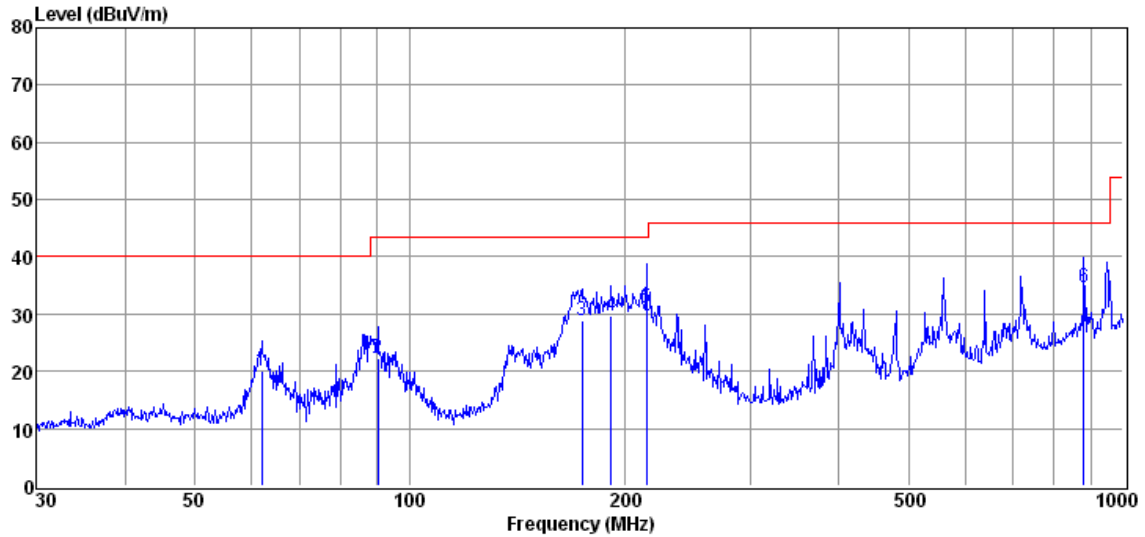


Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
62.03	37.84	11.92	24.70	0.74	25.80	40.00	-14.20	QP	VERTICAL
169.35	35.81	12.32	24.61	1.36	24.88	43.50	-18.62	QP	VERTICAL
191.75	39.18	9.63	24.60	1.47	25.68	43.50	-17.82	QP	VERTICAL
214.57	41.03	9.15	24.60	1.57	27.15	43.50	-16.35	QP	VERTICAL
560.71	37.59	18.20	24.26	2.78	34.31	46.00	-11.69	QP	VERTICAL
958.76	30.01	23.97	23.76	3.82	34.04	46.00	-11.96	QP	VERTICAL



30MHz to 1GHz Test Mode: 802.11b

Test Antenna Status: Horizontal



Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Preamp Factor (dB)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
62.03	32.05	11.92	24.70	0.74	20.01	40.00	-19.99	QP	HORIZONTAL
90.28	37.54	8.52	24.70	0.95	22.31	43.50	-21.19	QP	HORIZONTAL
174.38	40.23	11.77	24.60	1.38	28.78	43.50	-14.72	QP	HORIZONTAL
191.75	43.19	9.63	24.60	1.47	29.69	43.50	-13.81	QP	HORIZONTAL
214.63	45.03	9.15	24.60	1.57	31.15	43.50	-12.35	QP	HORIZONTAL
881.46	32.19	22.75	23.87	3.61	34.68	46.00	-11.32	QP	HORIZONTAL



**Operation Mode: TX Low Mid CH 2412MHz Antenna A**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV /m)	Limit (dBμV /m)	Antenna polarization
4829.45	31.0	1.2	0.5	43.4	59.88	49.18	74	Vertical
7240.61	35.5	1.7	0.6	43.1	48.83	43.53	74	Vertical
9653.01	37.7	2.1	0.9	43.3	51.42	48.82	74	Vertical
4829.22	31.0	1.2	0.5	43.4	57.62	46.92	74	Horizontal
7240.62	35.5	1.7	0.6	43.1	48.89	43.59	74	Horizontal
9652.57	37.7	2.1	0.9	43.3	47.00	44.40	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV /m)	Limit (dBμV /m)	Antenna polarization
4828.60	31.0	1.2	0.5	43.4	51.37	40.67	54	Vertical
7239.62	35.5	1.7	0.6	43.1	38.87	33.57	54	Vertical
9651.90	37.7	2.1	0.9	43.3	40.37	37.77	54	Vertical
4828.30	31.0	1.2	0.5	43.4	48.38	37.68	54	Horizontal
7239.64	35.5	1.7	0.6	43.1	39.10	33.80	54	Horizontal
9651.65	37.7	2.1	0.9	43.3	37.84	35.24	54	Horizontal

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Preamplifier Factor



**Operation Mode: TX Mid CH 2437MHz Antenna A**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4880.93	31.1	1.3	0.5	43.5	54.67	44.07	74	Vertical
7318.66	35.7	1.7	0.6	43.1	49.23	44.13	74	Vertical
9756.87	37.8	2.1	0.9	43.0	49.84	47.64	74	Vertical
4881.32	31.1	1.3	0.5	43.5	58.58	47.98	74	Horizontal
7318.66	35.7	1.7	0.6	43.1	49.20	44.10	74	Horizontal
9756.99	37.8	2.1	0.9	43.0	51.03	48.83	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4880.31	31.1	1.3	0.5	43.5	48.41	37.81	54	Vertical
7317.71	35.7	1.7	0.6	43.1	39.71	34.61	54	Vertical
9755.88	37.8	2.1	0.9	43.0	39.92	37.72	54	Vertical
4880.63	31.1	1.3	0.5	43.5	51.63	41.03	54	Horizontal
7317.60	35.7	1.7	0.6	43.1	38.59	33.49	54	Horizontal
9755.90	37.8	2.1	0.9	43.0	40.10	37.90	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +Filter–Preamplifier Factor



**Operation Mode:TX High CH 2462MHz Antenna A**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV/m)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4933.00	31.4	1.4	0.5	43.9	55.30	44.70	74	Vertical
7396.65	35.8	1.7	0.6	43.1	49.05	44.05	74	Vertical
9860.78	38.0	2.2	0.9	42.8	48.72	47.02	74	Vertical
4933.38	31.4	1.4	0.5	43.9	59.16	48.56	74	Horizontal
7396.95	35.8	1.7	0.6	43.1	52.04	47.04	74	Horizontal
9860.84	38.0	2.2	0.9	42.8	49.28	47.58	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4932.44	31.4	1.4	0.5	43.9	49.78	39.18	54	Vertical
7395.57	35.8	1.7	0.6	43.1	38.26	33.26	54	Vertical
9859.75	38.0	2.2	0.9	42.8	38.44	36.74	54	Vertical
4932.88	31.4	1.4	0.5	43.9	54.17	43.57	54	Horizontal
7395.76	35.8	1.7	0.6	43.1	40.13	35.13	54	Horizontal
9859.81	38.0	2.2	0.9	42.8	38.98	37.28	54	Horizontal



**Operation Mode: TX Low Mid CH 2412MHz Antenna B**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4835.58	31.0	1.2	0.5	43.4	56.78	46.08	74	Vertical
7246.08	35.5	1.7	0.6	43.1	46.23	40.93	74	Vertical
9658.87	37.7	2.1	0.9	43.3	49.28	46.68	74	Vertical
4835.13	31.0	1.2	0.5	43.4	54.52	43.82	74	Horizontal
7246.10	35.5	1.7	0.6	43.1	46.29	40.99	74	Horizontal
9657.99	37.7	2.1	0.9	43.3	44.86	42.26	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamplifier factor (dB)	Reading Level (dBμV)	Emission Level (dBμV /m)	Limit (dBμV /m)	Antenna polarization
4835.95	31.0	1.2	0.5	43.4	48.47	37.77	54	Vertical
7246.74	35.5	1.7	0.6	43.1	35.82	30.52	54	Vertical
9659.74	37.7	2.1	0.9	43.3	36.90	34.30	54	Vertical
4835.43	31.0	1.2	0.5	43.4	45.48	34.78	54	Horizontal
7246.78	35.5	1.7	0.6	43.1	36.05	30.75	54	Horizontal
9659.04	37.7	2.1	0.9	43.3	34.37	31.77	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +Filter–Preamplifier Factor



**Operation Mode: TX Mid CH 2437MHz Antenna B**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4883.05	31.1	1.3	0.5	43.5	46.61	36.01	74	Vertical
7325.79	35.7	1.7	0.6	43.1	41.91	36.81	74	Vertical
9766.55	37.8	2.1	0.9	43.0	42.95	40.75	74	Vertical
4883.44	31.1	1.3	0.5	43.5	50.13	39.53	74	Horizontal
7325.79	35.7	1.7	0.6	43.1	41.88	36.78	74	Horizontal
9766.67	37.8	2.1	0.9	43.0	44.02	41.82	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4884.83	31.1	1.3	0.5	43.5	44.90	34.30	54	Vertical
7324.68	35.7	1.7	0.6	43.1	36.22	31.12	54	Vertical
9765.28	37.8	2.1	0.9	43.0	36.33	34.13	54	Vertical
4885.15	31.1	1.3	0.5	43.5	48.12	37.52	54	Horizontal
7324.57	35.7	1.7	0.6	43.1	35.10	30.00	54	Horizontal
9765.30	37.8	2.1	0.9	43.0	36.51	34.31	54	Horizontal

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor + Filter - Preamplifier Factor





**Operation Mode:TX High CH 2462MHz Antenna B**

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

**Peak Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4935.98	31.4	1.4	0.5	43.9	51.17	40.57	74	Vertical
7398.47	35.8	1.7	0.6	43.1	43.72	38.72	74	Vertical
9861.72	38.0	2.2	0.9	42.8	42.90	41.20	74	Vertical
4936.76	31.4	1.4	0.5	43.9	55.03	44.43	74	Horizontal
7399.07	35.8	1.7	0.6	43.1	46.71	41.71	74	Horizontal
9861.83	38.0	2.2	0.9	42.8	43.46	41.76	74	Horizontal

**Average Measurement:**

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4938.45	31.4	1.4	0.5	43.9	46.54	35.94	54	Vertical
7404.29	35.8	1.7	0.6	43.1	34.58	29.58	54	Vertical
9871.37	38.0	2.2	0.9	42.8	34.14	32.44	54	Vertical
4938.83	31.4	1.4	0.5	43.9	50.93	40.33	54	Horizontal
7404.48	35.8	1.7	0.6	43.1	36.45	31.45	54	Horizontal
9871.43	38.0	2.2	0.9	42.8	34.68	32.98	54	Horizontal

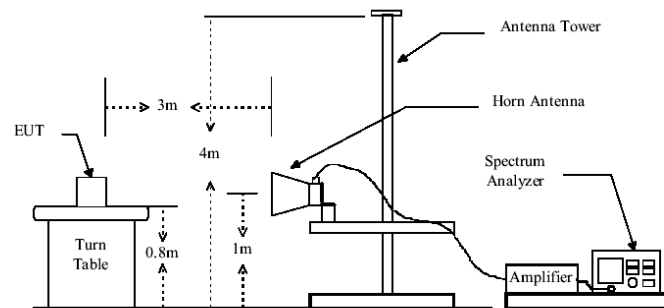
The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor +Filter–Preamplifier Factor

## 7.7 Radiated Emission Band Edge

- Test Requirement:** FCC Part15 247(c)
- Test date:** August.26.2012
- Standard Applicable:** According to section 15.247(c),in any 100KHz 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 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).
- Measurement Distance:** 3m (Semi-Anechoic Chamber)
- Limit:**  
40.0 dBμV/m between 30MHz & 88MHz;  
43.5 dBμV/m between 88MHz & 216MHz;  
46.0 dBμV/m between 216MHz & 960MHz;  
AV 54.0 dBμV/m PK 74.0dBμV/m above 960MHz.
- Measurement Procedure:** The EUT was setup according to ANSI 63.10.2009 for compliance to FCC 47 CFR 15.247 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 meters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level  
This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.10:2009 on radiated measurement.  
Spectrum analyzer parameters setting as shown below:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

### Radiated Emission Test Set-up Frequency Over 1GHz

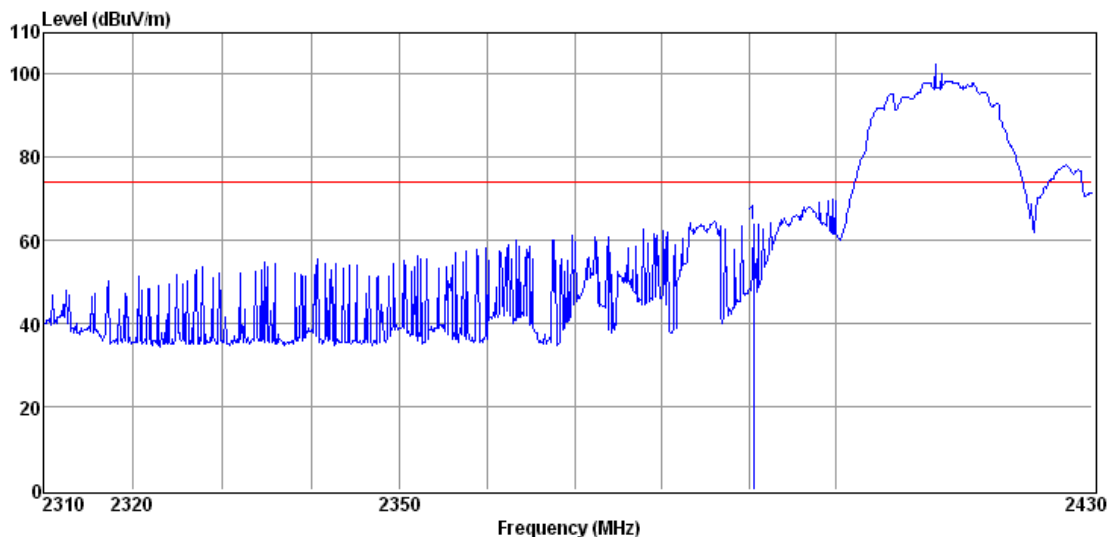


The field strength is calculated by adding the Antenna Factor, Preamplifier Factor & Cable Factor. The basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

**Radiated Bandedge Measurement Result:  
802.11b Low Channel for Antenna A**

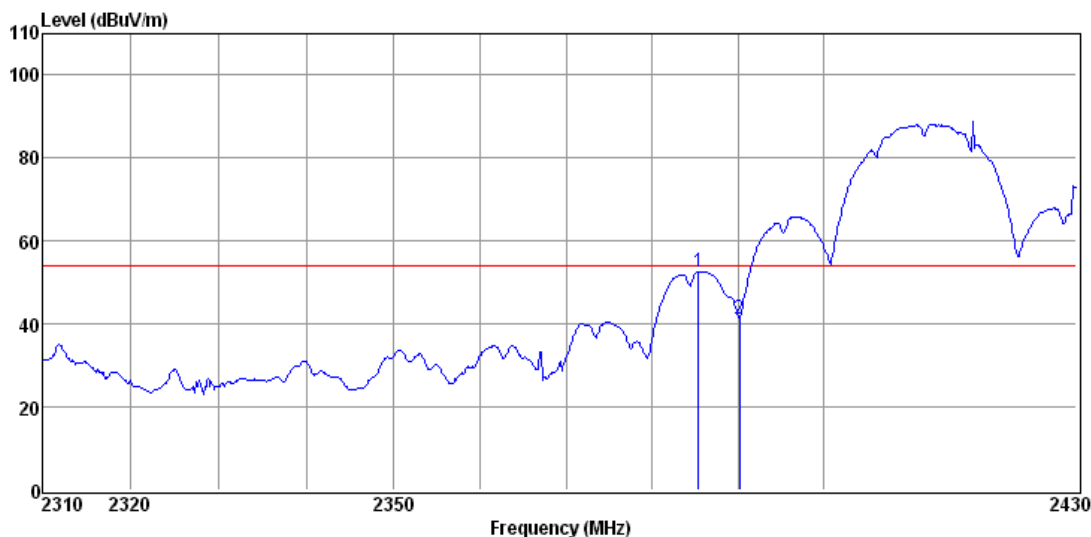
**Horizontal, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.57	71.93	27.07	42.46	7.33	63.87	74.00	-10.13

**802.11b Low Channel for Antenna A**

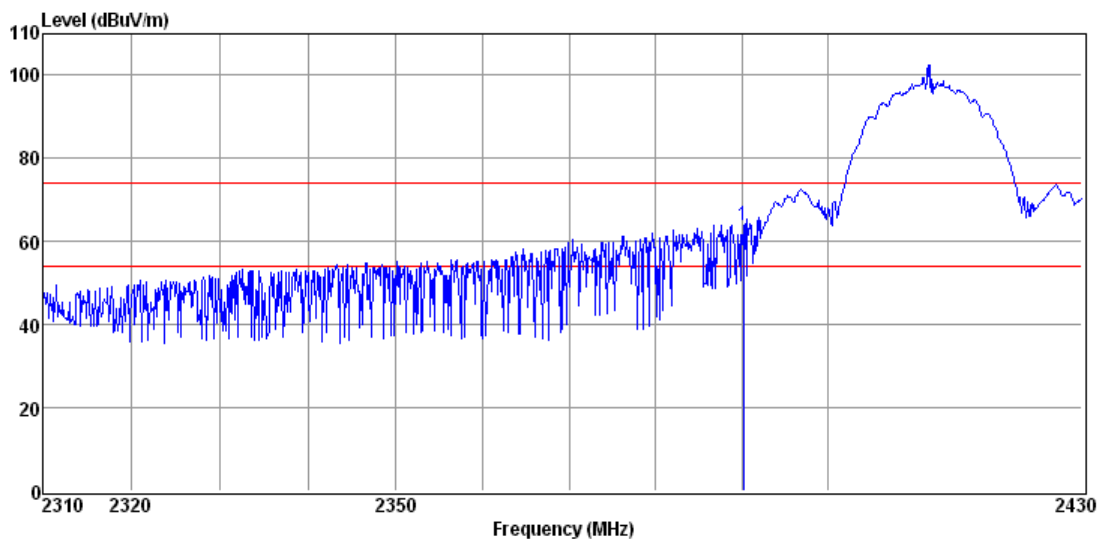
**Horizontal, Average Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2385.37	60.67	27.06	42.45	7.33	52.61	54.00	-1.39

**802.11b Low Channel for Antenna A**

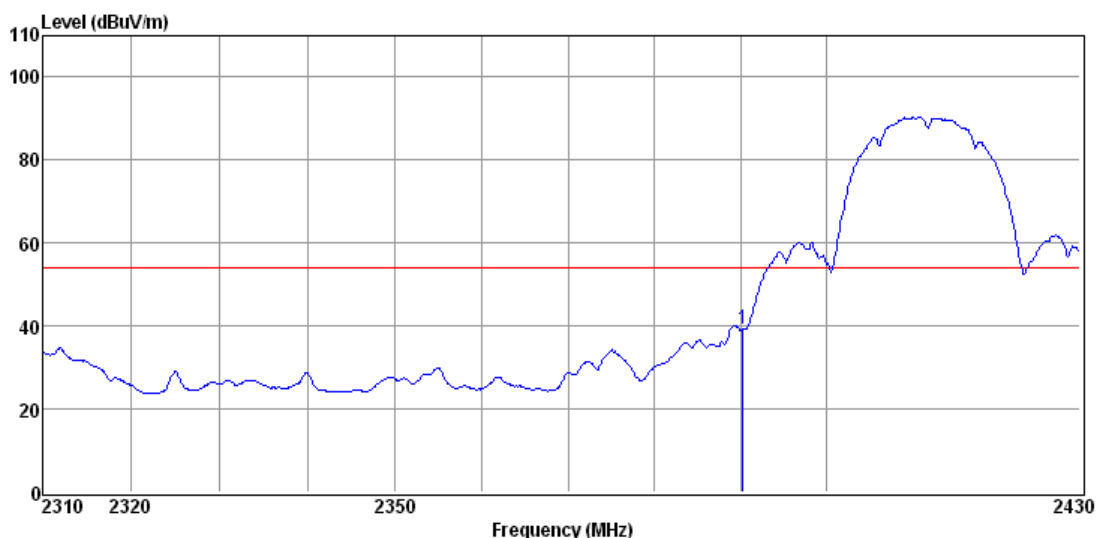
**Vertical, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.21	71.76	27.07	42.46	7.33	63.70	74.00	-10.30

**802.11b Low Channel for Antenna A**

**Vertical, Average Detector:**

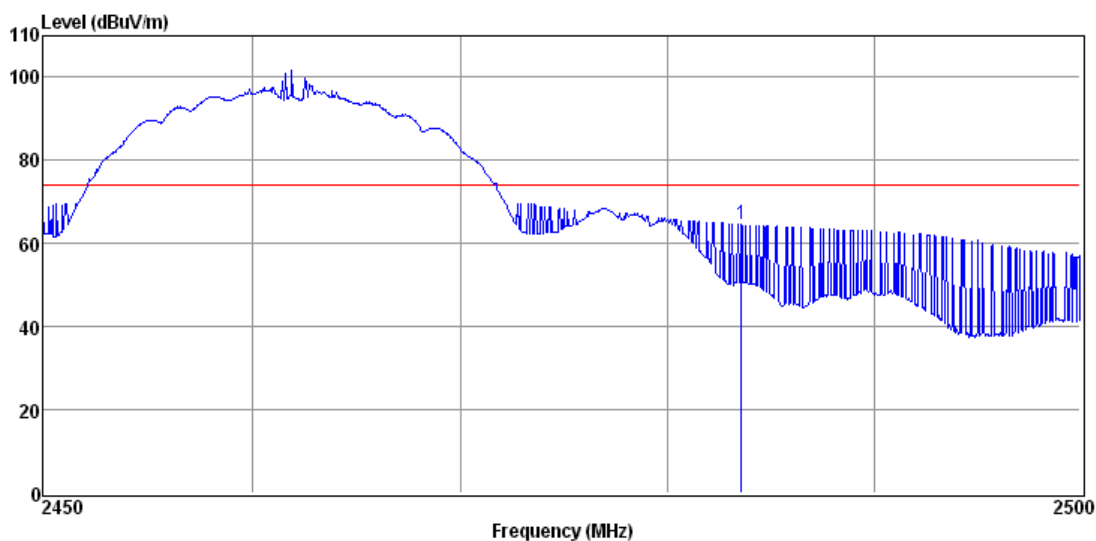


Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.33	47.26	27.07	42.46	7.33	39.20	54.00	-14.80



802.11b High Channel for Antenna A

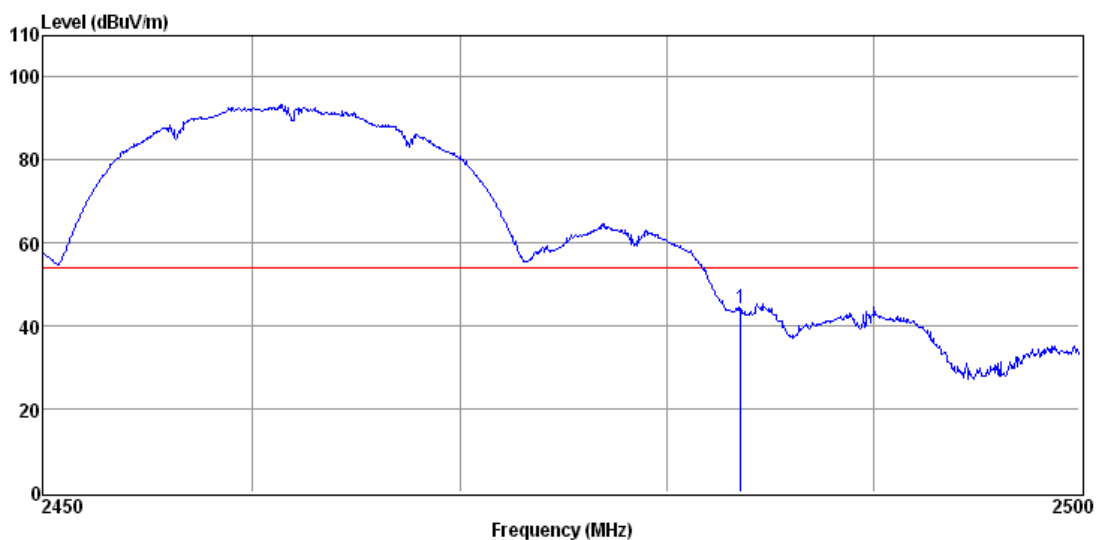
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.54	72.29	27.35	42.49	7.31	64.46	74.00	-9.54

802.11b High Channel for Antenna A

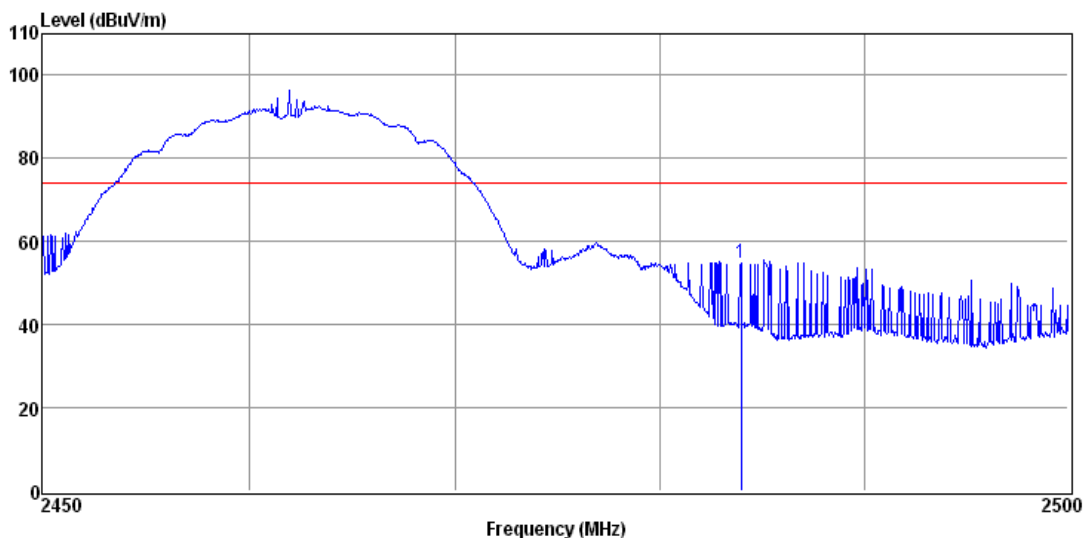
Horizontal, Average Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	51.89	27.35	42.49	7.31	44.06	54.00	-9.94

**802.11b High Channel for Antenna A**

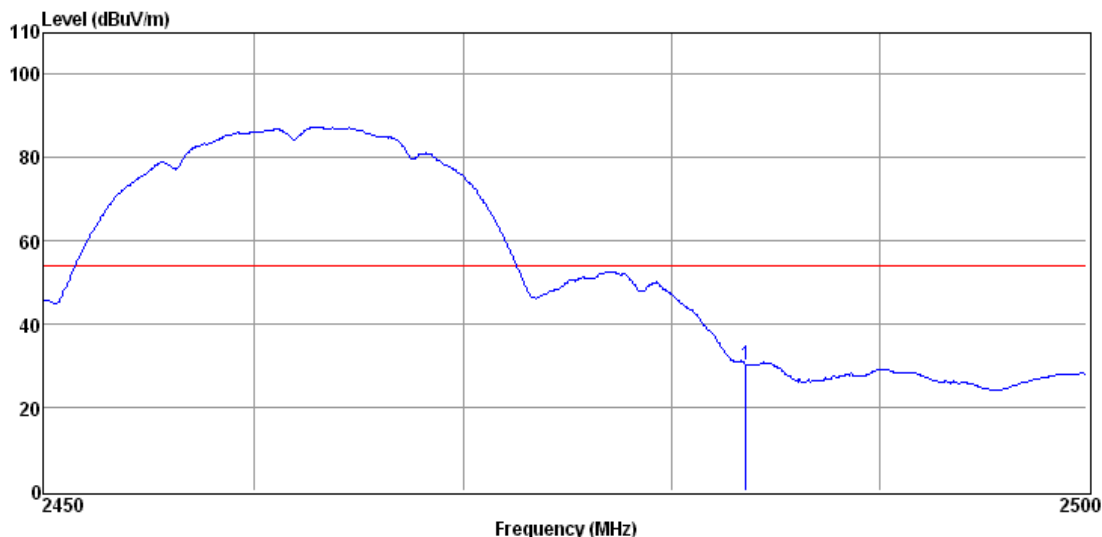
**Vertical, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.94	62.74	27.35	42.49	7.31	54.91	74.00	-19.09

**802.11b High Channel for Antenna A**

**Vertical, Average Detector:**



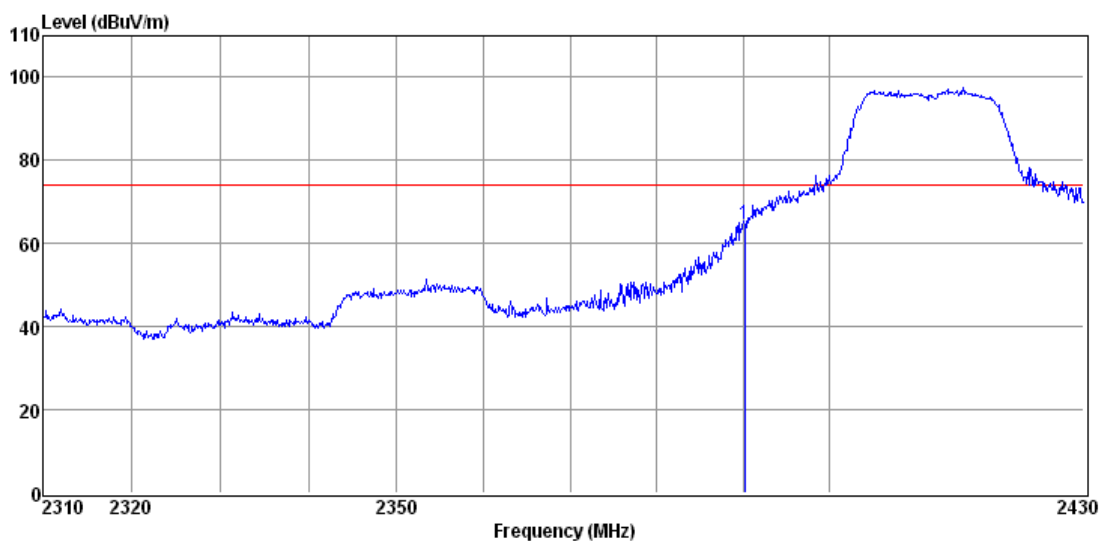
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	38.18	27.35	42.49	7.31	30.35	54.00	-23.65

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802.11g Low Channel for Antenna A

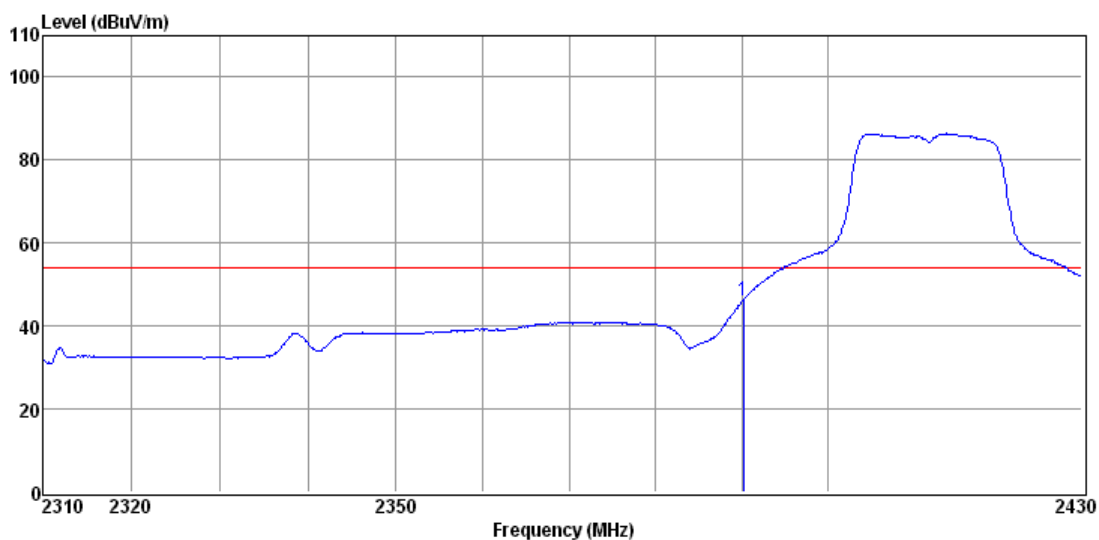
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.21	72.66	27.07	42.46	7.33	64.60	74.00	-9.40

802.11g Low Channel for Antenna A

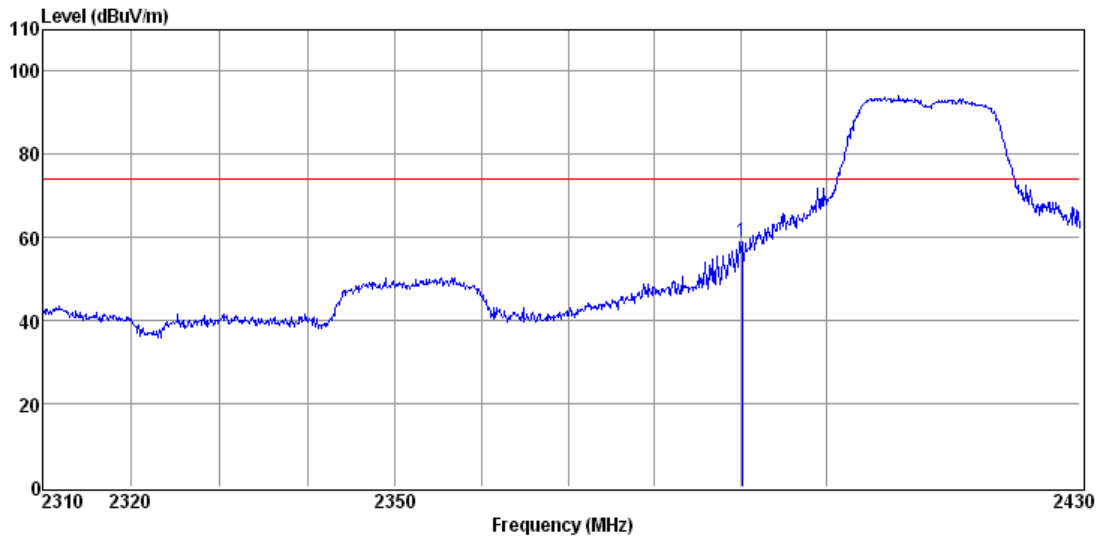
Horizontal, Average Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.21	54.36	27.07	42.46	7.33	46.30	54.00	-7.70

**802.11g Low Channel for Antenna A**

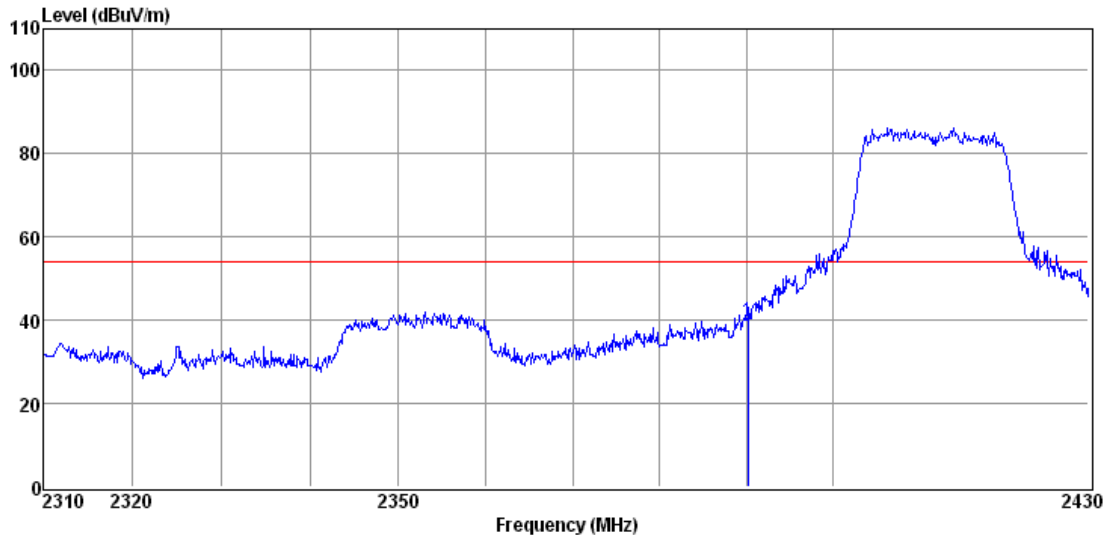
**Vertical, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.21	66.87	27.07	42.46	7.33	58.81	74.00	-15.19

**802.11g Low Channel for Antenna A**

**Vertical, Average Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.21	47.81	27.07	42.46	7.33	39.75	54.00	-14.25

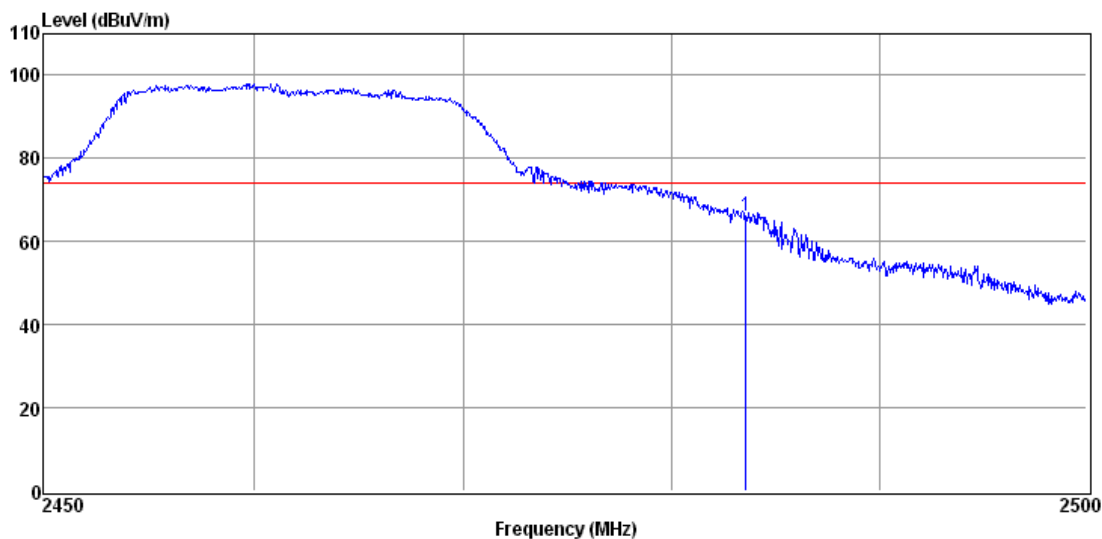
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802.11g High Channel for Antenna A

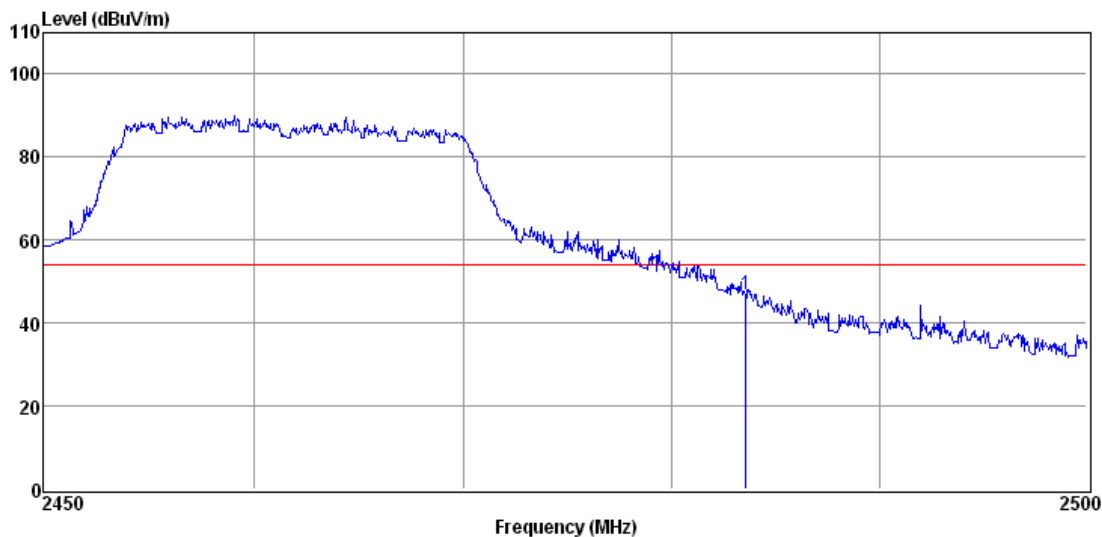
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.54	73.82	27.35	42.49	7.31	65.99	74.00	-8.01

802.11g High Channel for Antenna A

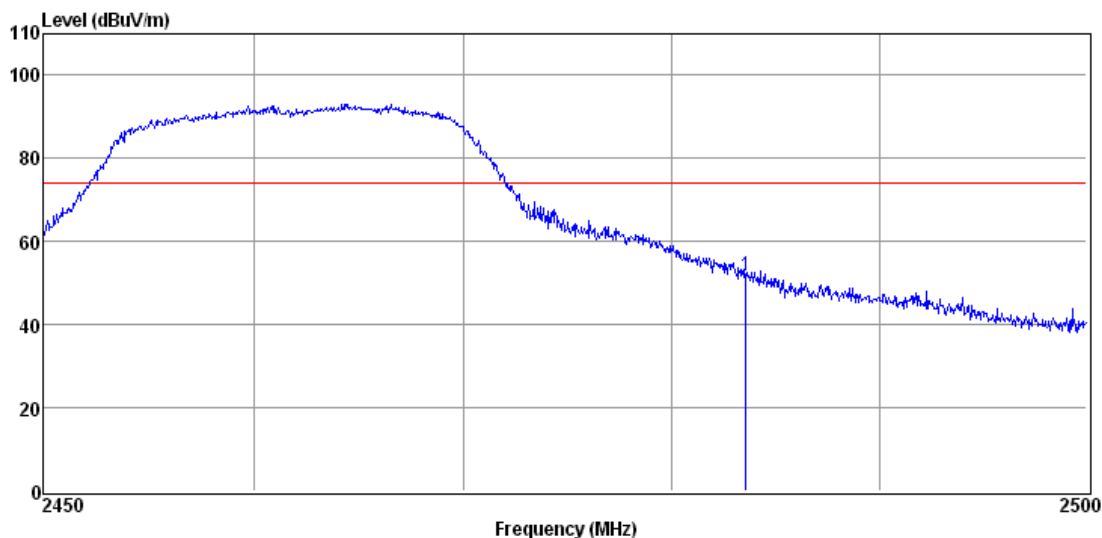
Horizontal, Average Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	54.62	27.35	42.49	7.31	46.79	54.00	-7.21

**802.11g High Channel for Antenna A**

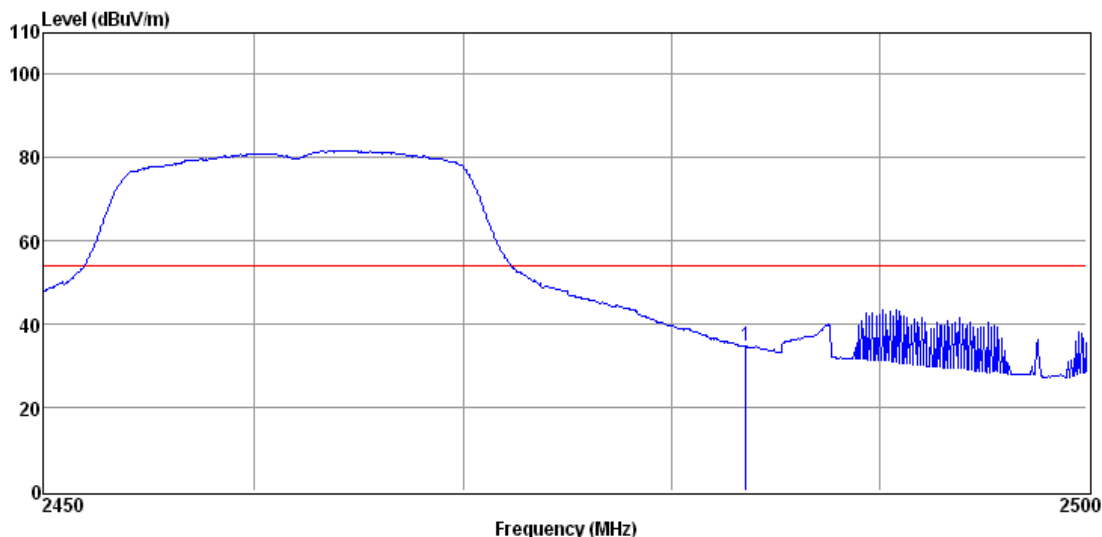
**Vertical, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.54	59.60	27.35	42.49	7.31	51.77	74.00	-22.23

**802.11g High Channel for Antenna A**

**Vertical, Average Detector:**

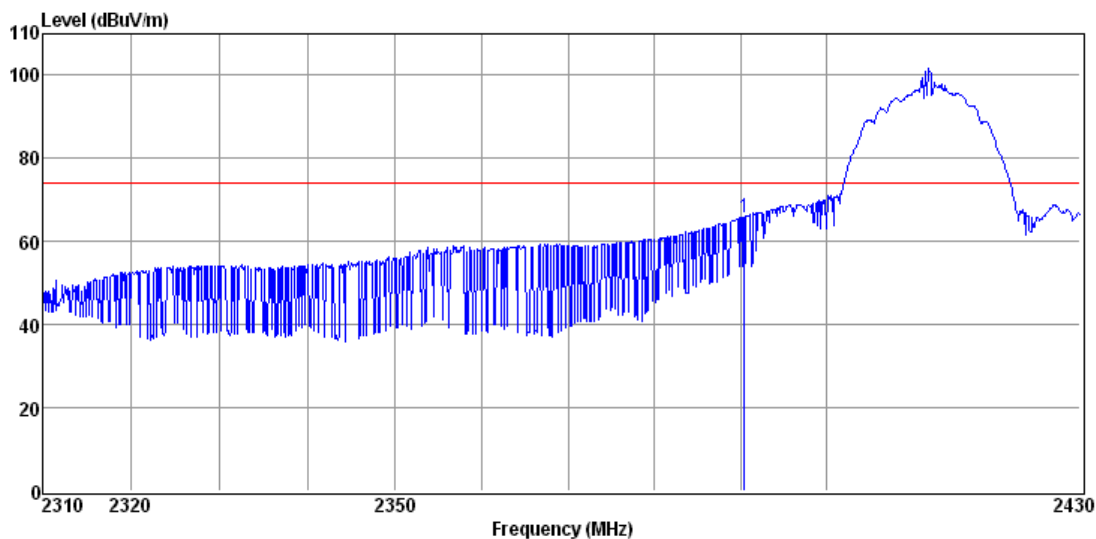


Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	42.50	27.35	42.49	7.31	34.67	54.00	-19.33

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**802.11b Low Channel for Antenna B**

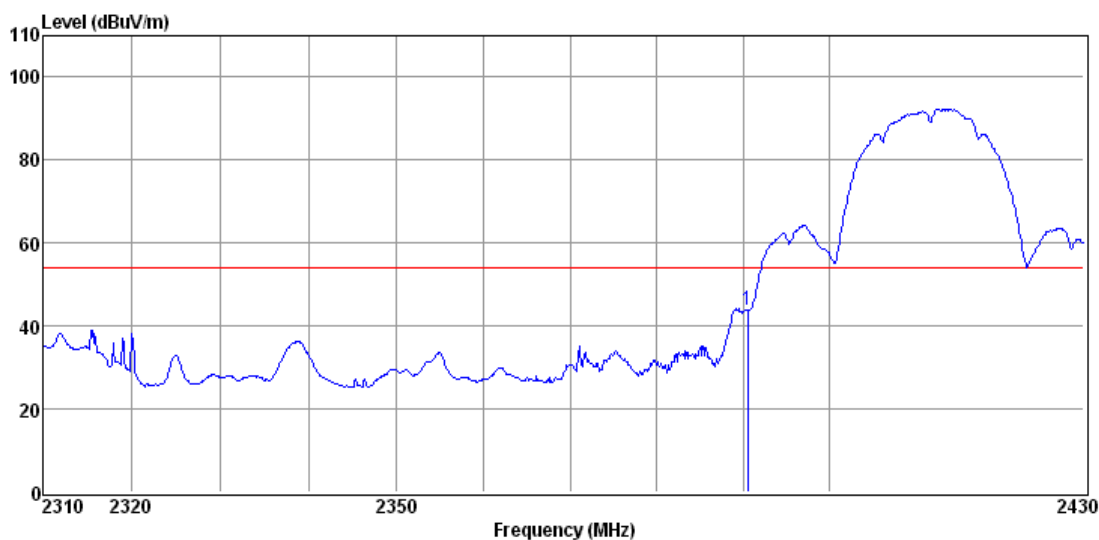
**Horizontal, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.45	74.02	27.07	42.46	7.33	65.96	74.00	-8.04

**802.11b Low Channel for Antenna B**

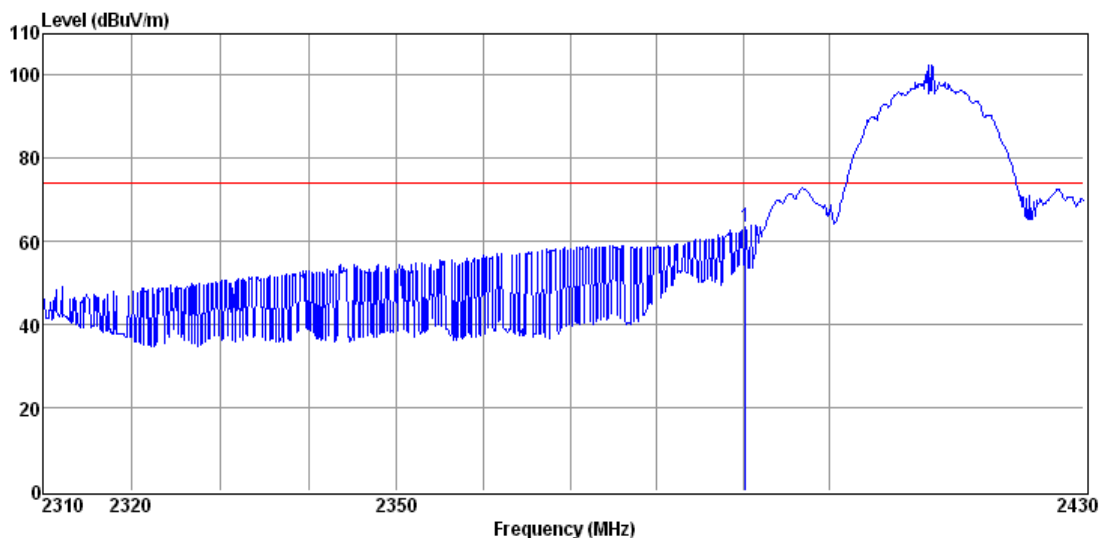
**Horizontal, Average Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.57	52.07	27.07	42.46	7.33	44.01	54.00	-9.99

**802.11b Low Channel for Antenna B**

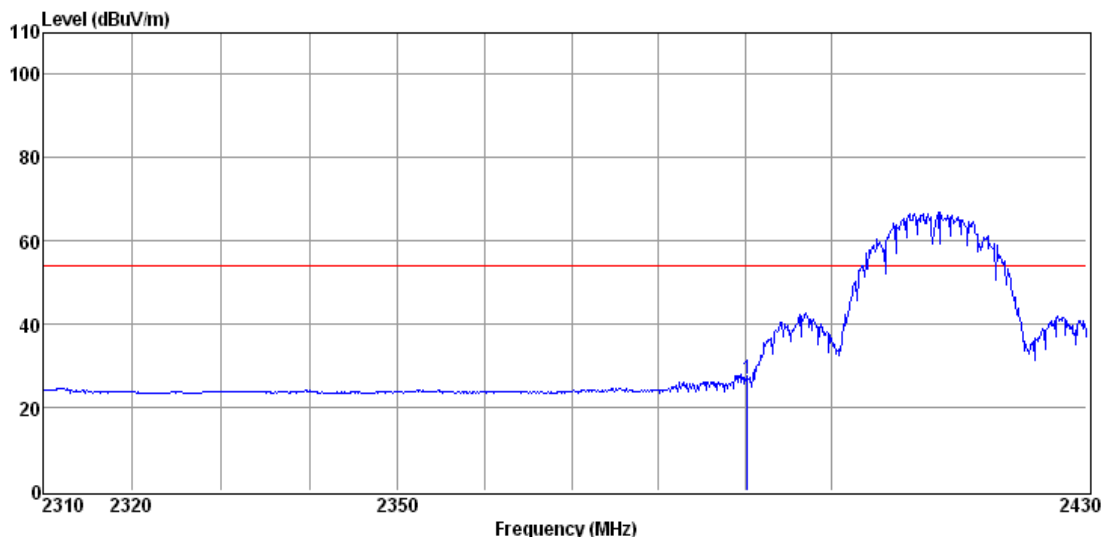
**Vertical, Peak Detector:**



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.33	71.48	27.07	42.46	7.33	63.42	74.00	-10.58

**802.11b Low Channel for Antenna B**

**Vertical, Average Detector:**



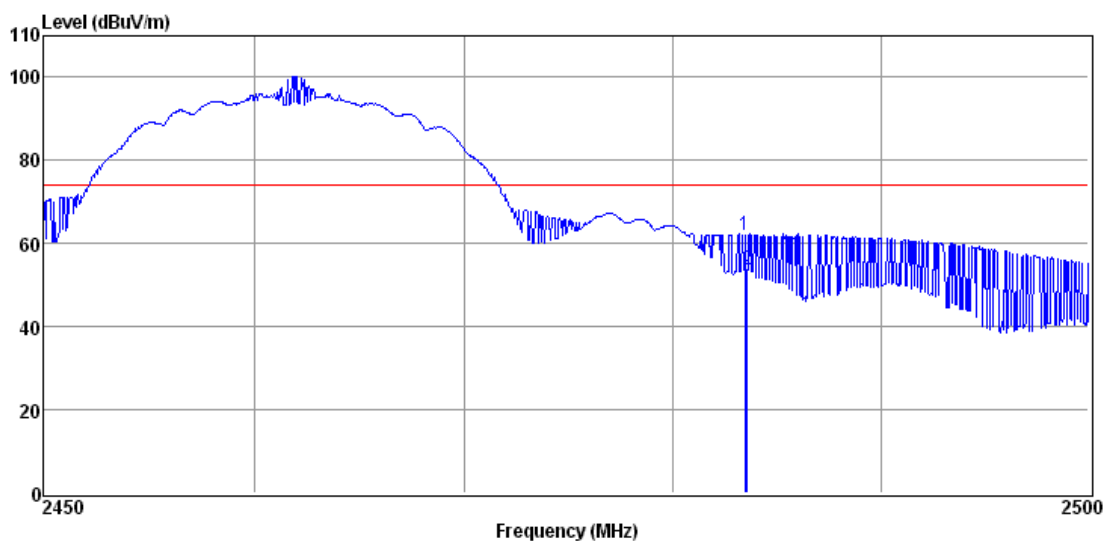
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.33	34.93	27.07	42.46	7.33	26.87	54.00	-27.13

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802.11b High Channel for Antenna B

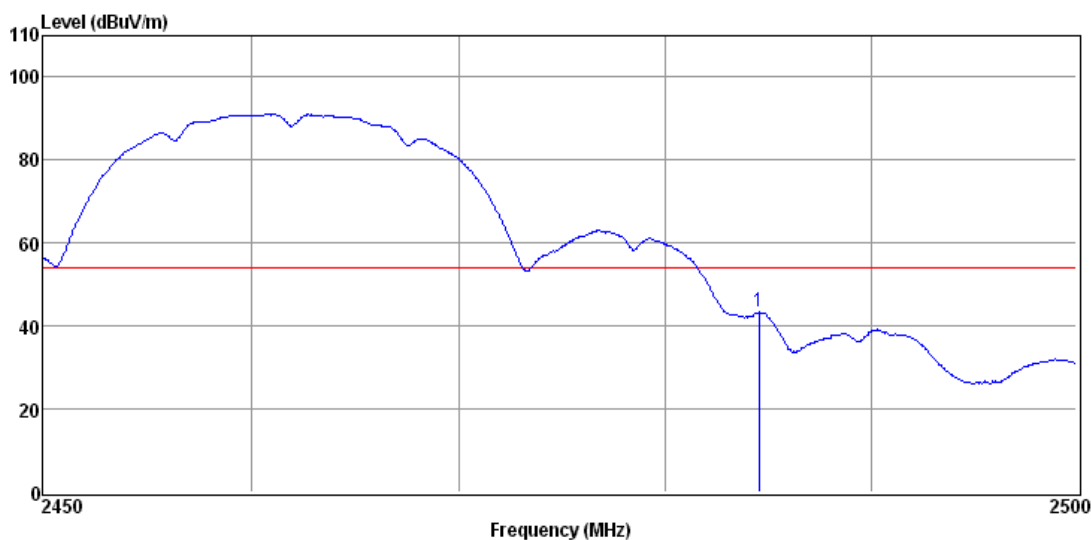
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.44	69.92	27.35	42.49	7.31	62.09	74.00	-11.91

802.11b High Channel for Antenna B

Horizontal, Average Detector:

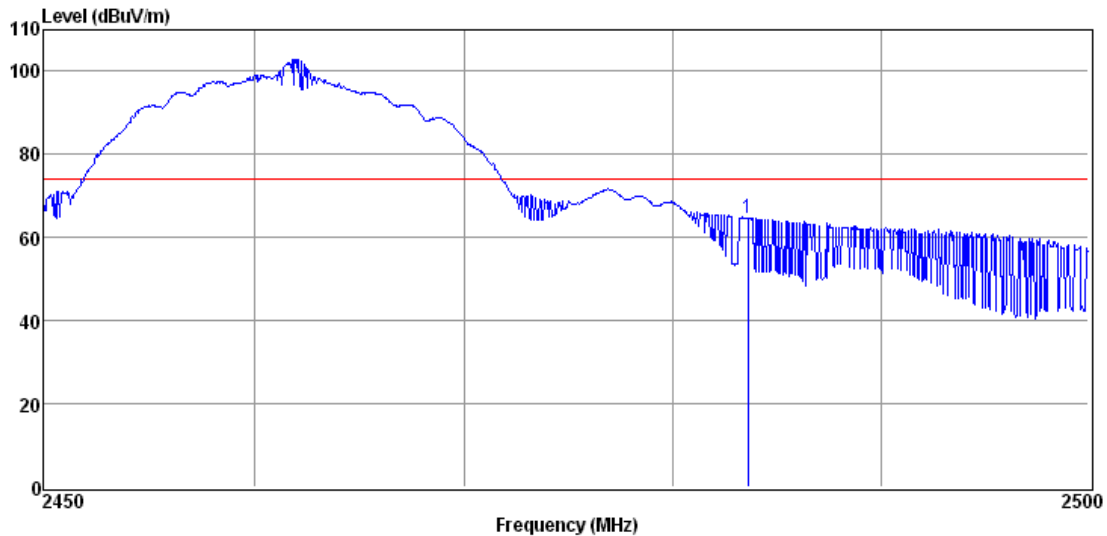


Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2484.54	51.13	27.35	42.49	7.31	43.30	54.00	-10.70



802.11b High Channel for Antenna B

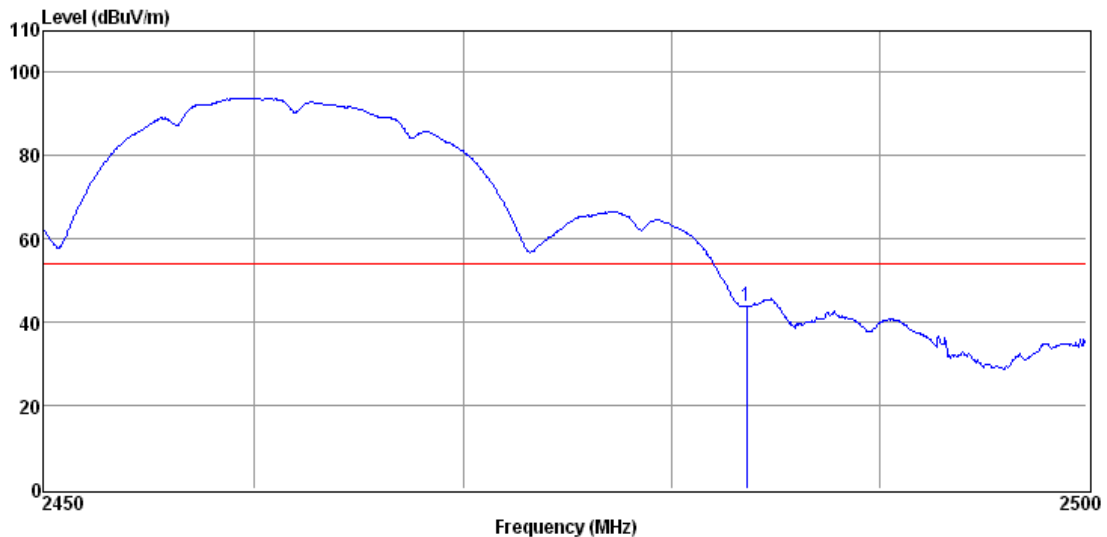
Vertical, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.59	72.44	27.35	42.49	7.31	64.61	74.00	-9.39

802.11b High Channel for Antenna B

Vertical, Average Detector:



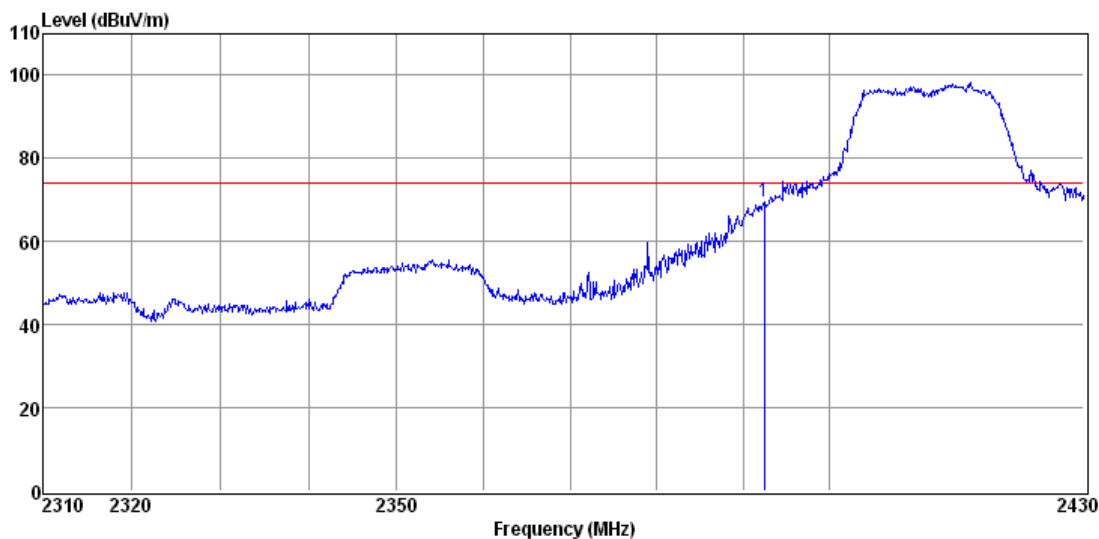
Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.59	51.68	27.35	42.49	7.31	43.85	54.00	-10.15

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802.11g Low Channel for Antenna B

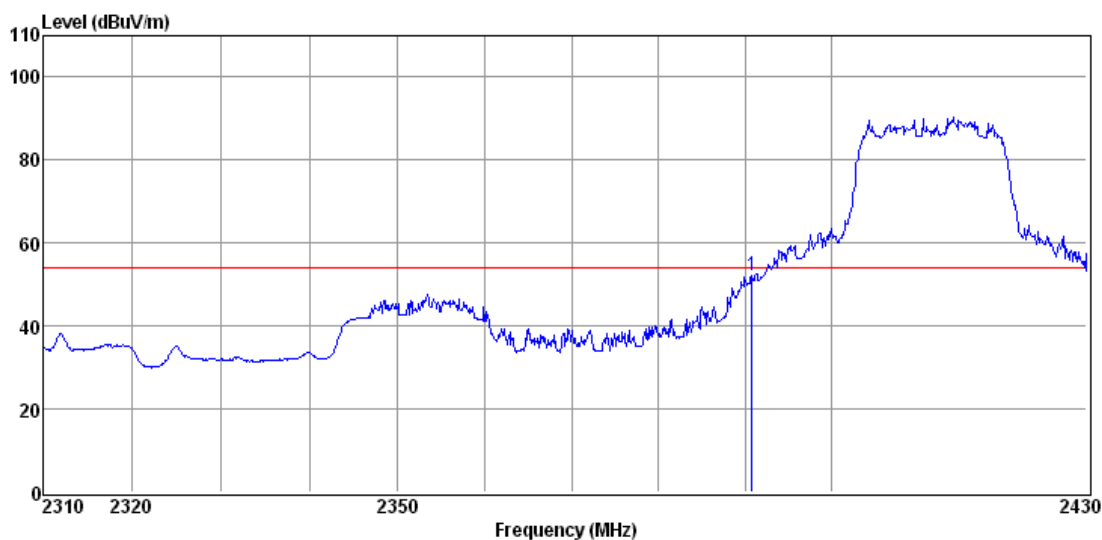
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2392.51	77.58	27.08	42.46	7.33	69.53	74.00	-4.47

802.11g Low Channel for Antenna B

Horizontal, Average Detector:

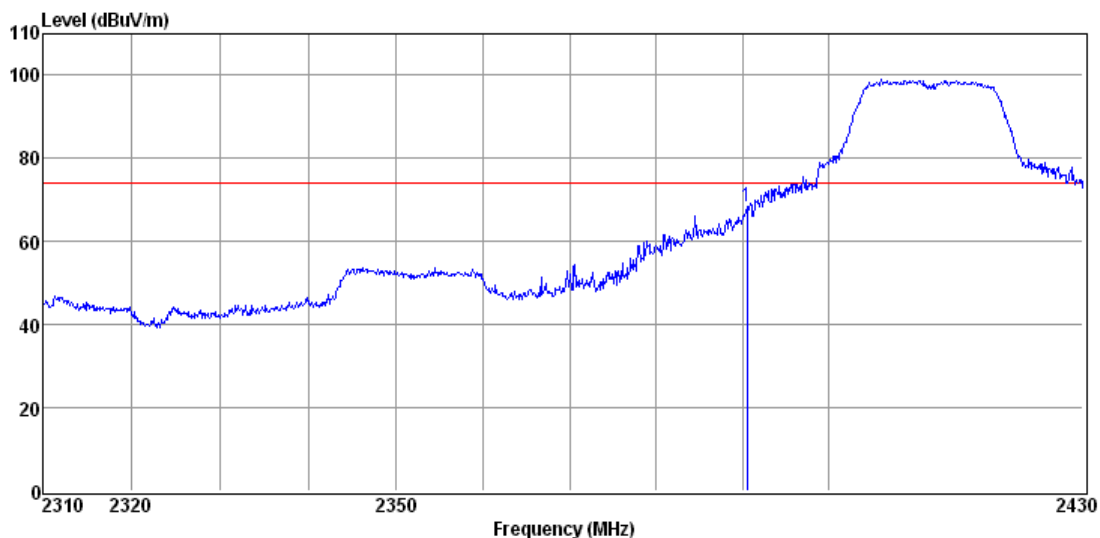


Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.82	60.30	27.07	42.46	7.33	52.24	54.00	-1.76



802.11g Low Channel for Antenna B

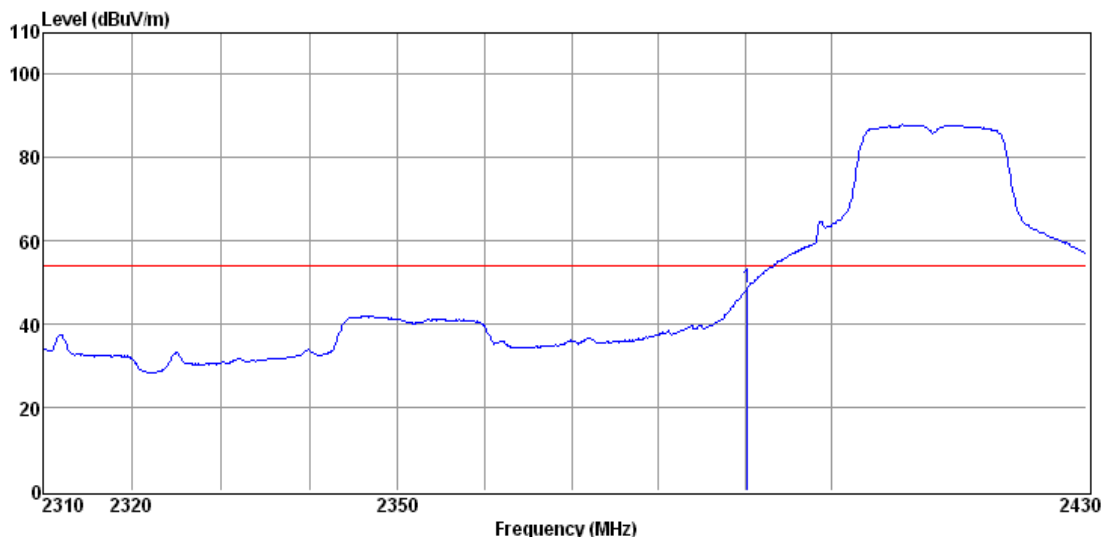
Vertical, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2390.57	76.45	27.07	42.46	7.33	68.39	74.00	-5.61

802.11g Low Channel for Antenna B

Vertical, Average Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2390.33	56.71	27.07	42.46	7.33	48.65	54.00	-5.35

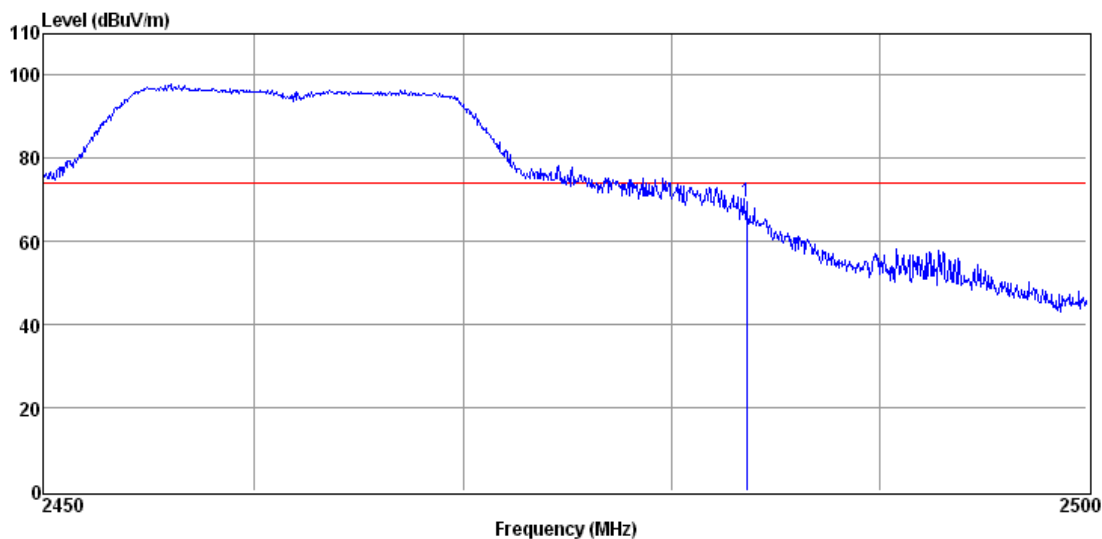
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802.11g High Channel for Antenna B

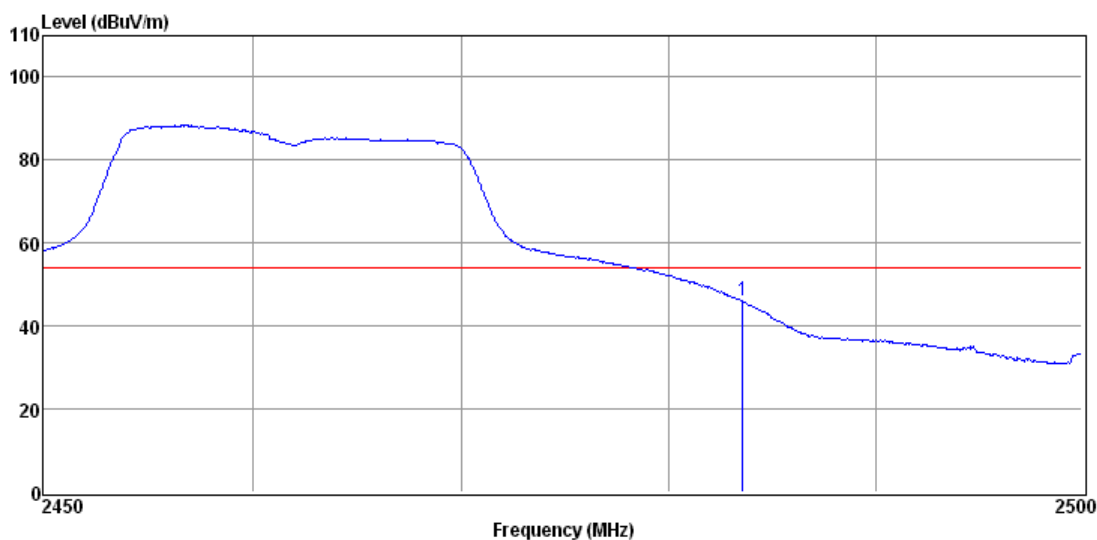
Horizontal, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.59	77.46	27.35	42.49	7.31	69.63	74.00	-4.37

802.11g High Channel for Antenna B

Horizontal, Average Detector:

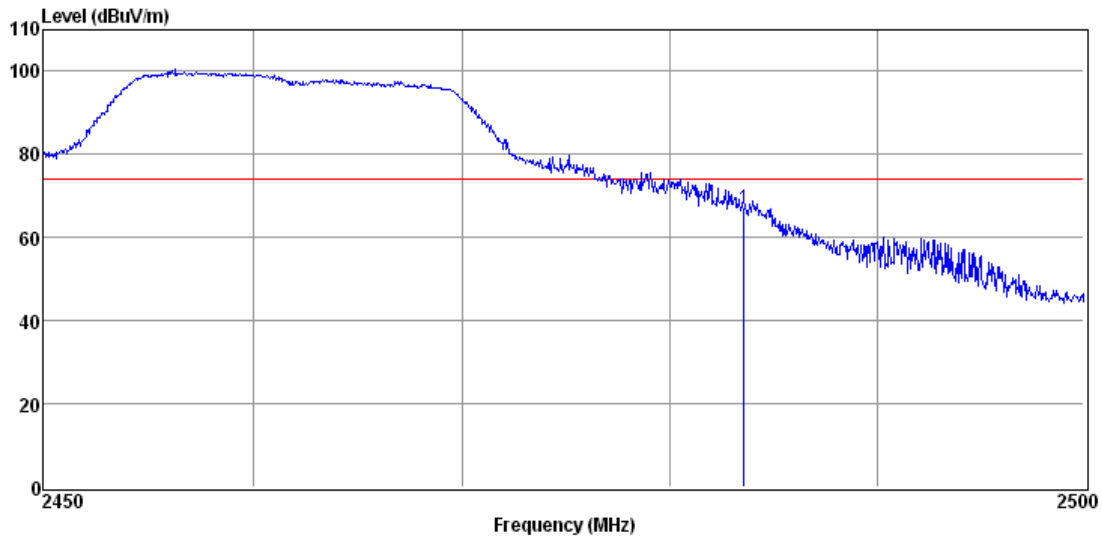


Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	53.90	27.35	42.49	7.31	46.07	54.00	-7.93



802.11g High Channel for Antenna B

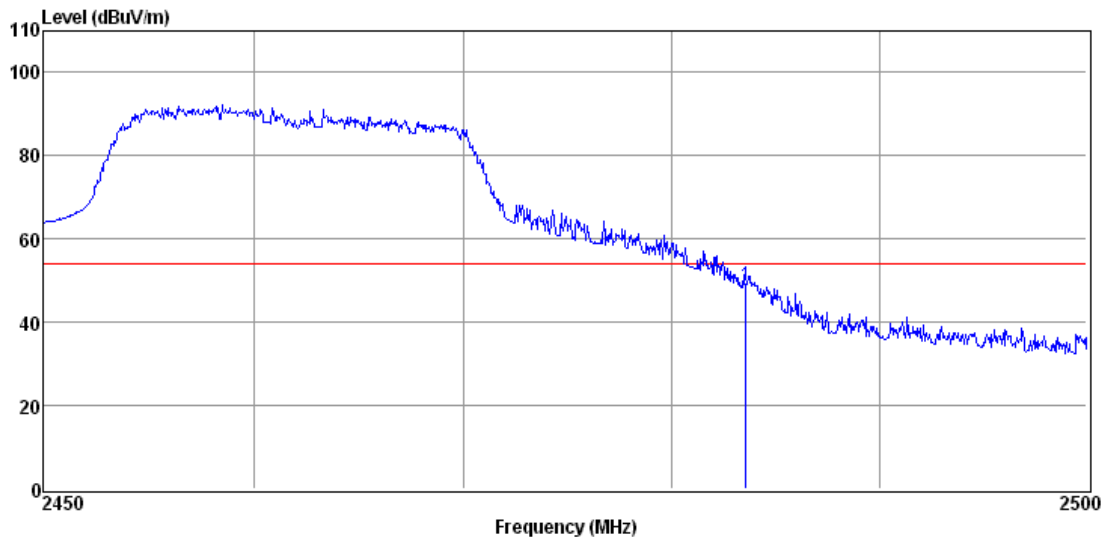
Vertical, Peak Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Over Limit (dB)
2483.54	74.86	27.35	42.49	7.31	67.03	74.00	-6.97

802.11g High Channel for Antenna B

Vertical, Average Detector:



Frequency (MHz)	Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	AV Level (dBuV/m)	AV Limit (dBuV/m)	Over Limit (dB)
2483.54	56.67	27.35	42.49	7.31	48.84	54.00	-5.16

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Remark: 1. No any other emission which fall in restricted bands can be detected and be reported.

All frequencies within the "Restricted bands" have been evaluated to compliance. Section 15.205 Restricted bands of operation.



## 7.8 Occupied Bandwidth Test

**Test Requirement:** RSS-Gen Issue 3 Clause 4.6.1  
**Test date:** September. 16, 2012  
**Standard Applicable** According to the section RSS-Gen Issue 3 Clause 4.6.1  
**EUT Setup** The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz, the video bandwidth set at 1MHz.

### Measurement Result:

#### Test Data for Antenna A

**Test mode: 802.11b**

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.08
MID	2437	16.12
HIGH	2462	16.12

#### Test Data for Antenna A

**Test mode: 802.11g**

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.48
MID	2437	16.48
HIGH	2462	16.52

#### Test Data for Antenna B

**Test mode: 802.11b**

Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.12
MID	2437	16.16
HIGH	2462	16.08

#### Test Data for Antenna B

**Test mode: 802.11g**

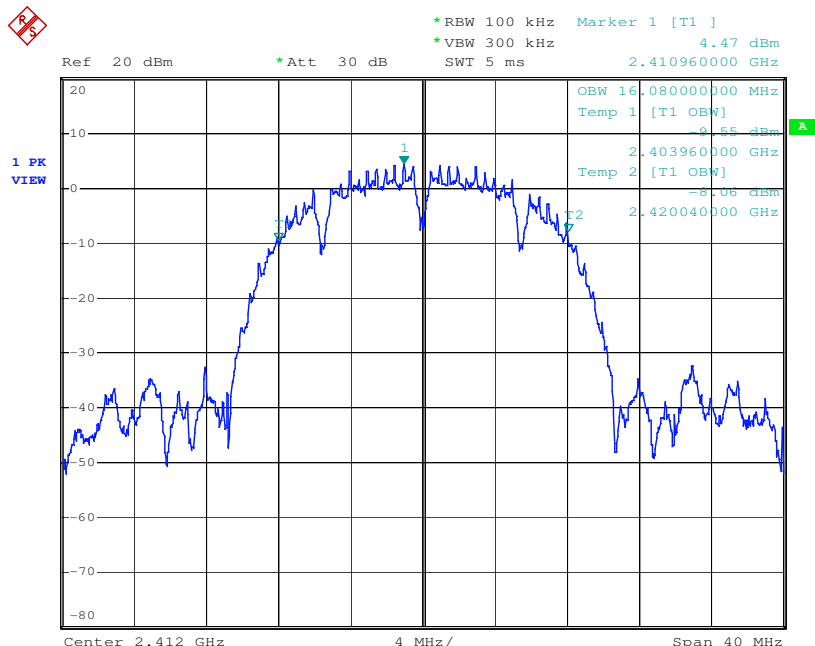
Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.48
MID	2437	16.48
HIGH	2462	16.48



Test Plots:

Low Channel for Antenna A

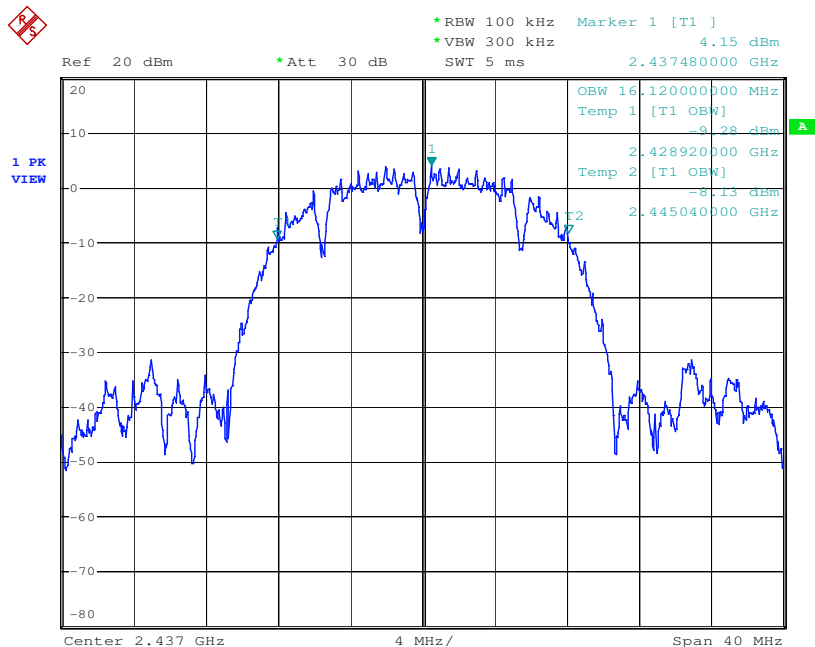
Test mode: 802.11b



Date: 1.JAN.2000 07:30:53

Middle Channel for Antenna A

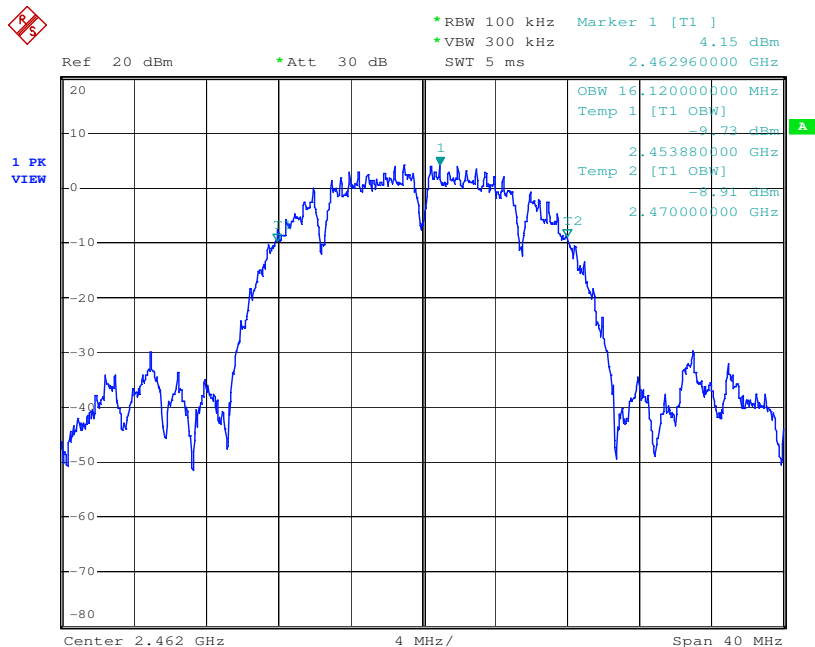
Test mode: 802.11b



Date: 1.JAN.2000 07:31:50

## High Channel for Antenna A

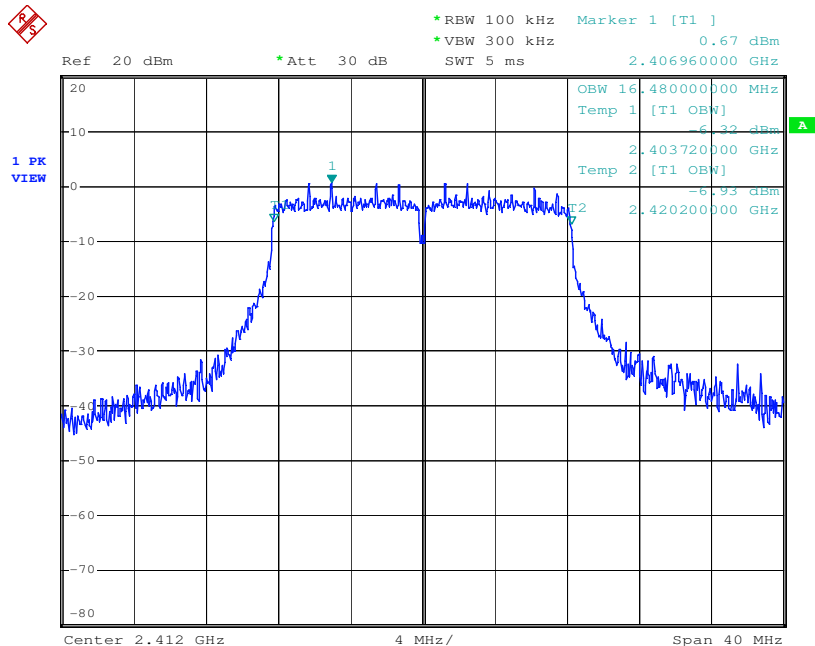
Test mode: 802.11b



Date: 1.JAN.2000 07:32:52

### Low Channel for Antenna A

Test mode: 802.11g

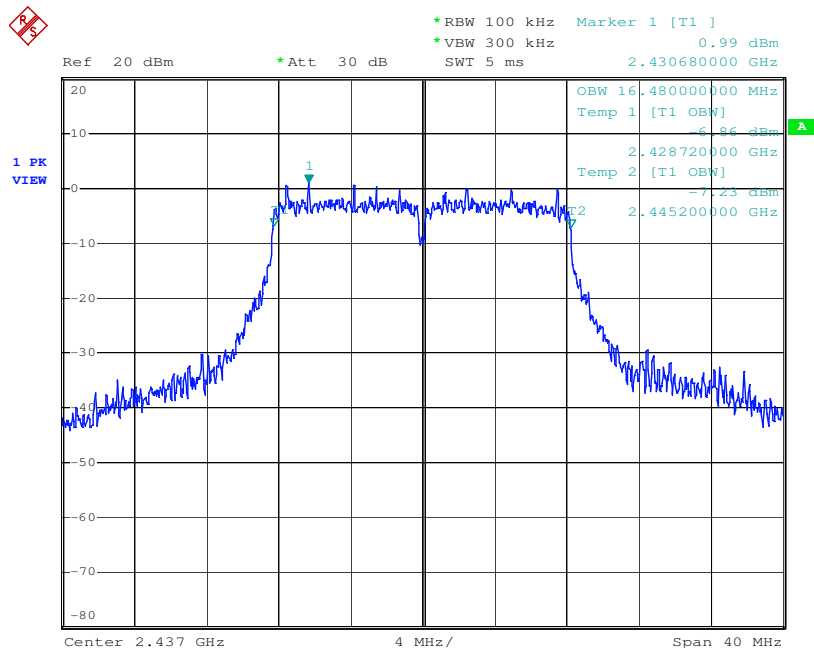


Date: 1.JAN.2000 07:33:57



Middle Channel for Antenna A

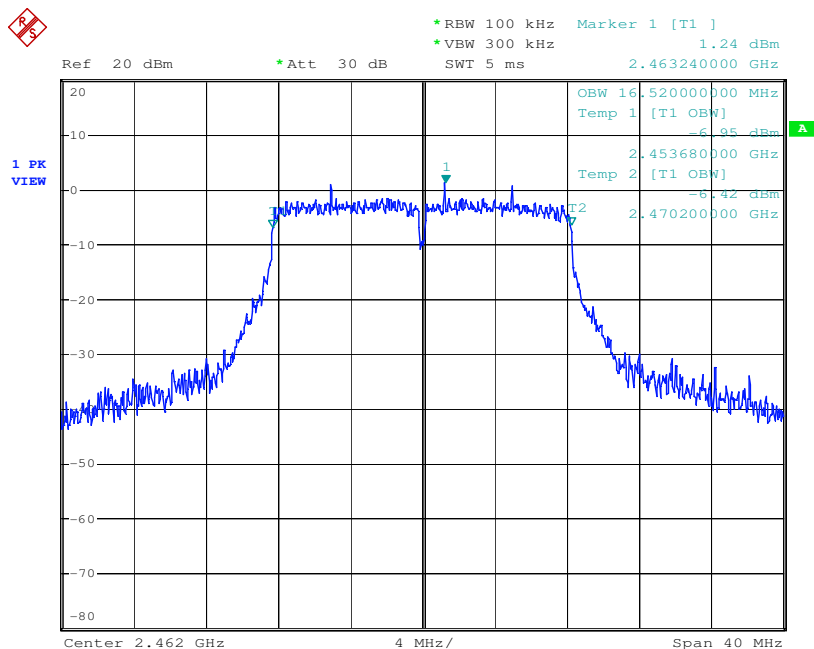
Test mode: 802.11g



Date: 1.JAN.2000 07:34:52

High Channel for Antenna A

Test mode: 802.11g

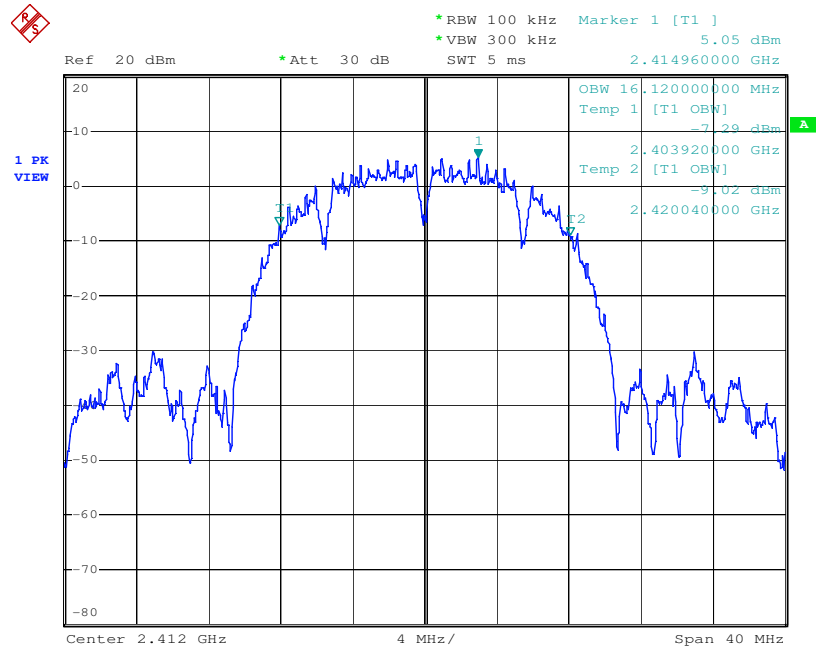


Date: 1.JAN.2000 07:38:06



Low Channel for Antenna B

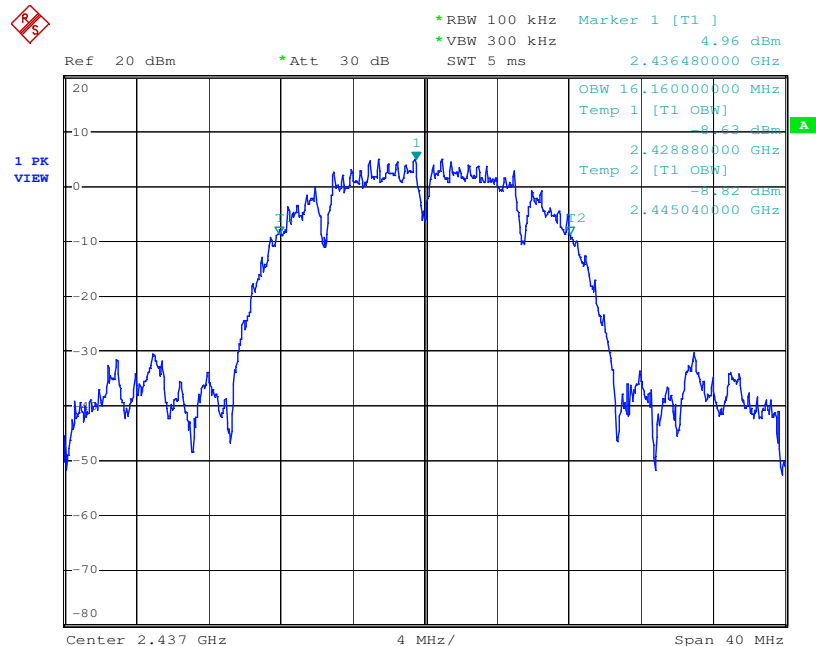
Test mode: 802.11b



Date: 1.JAN.2000 07:26:03

Middle Channel for Antenna B

Test mode: 802.11b



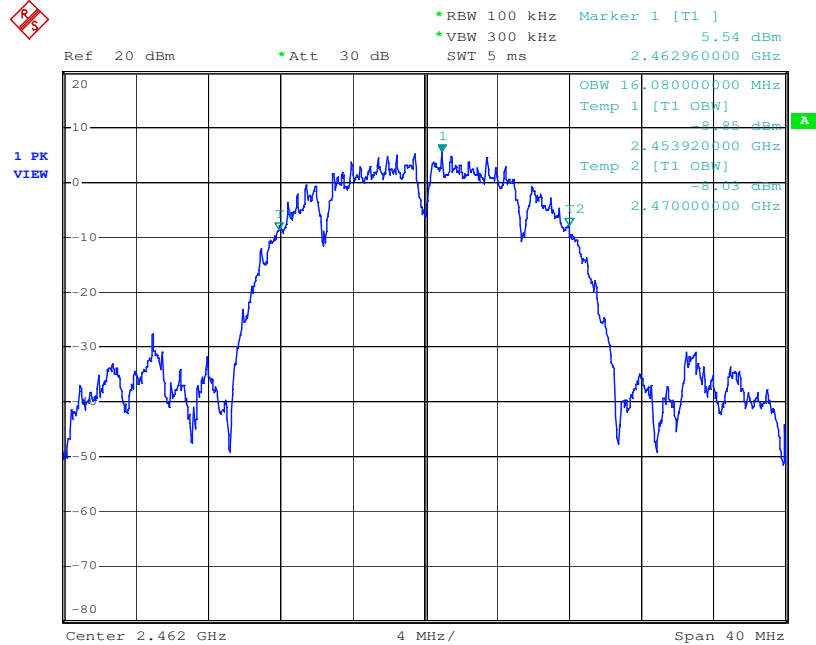
Date: 1.JAN.2000 07:27:28





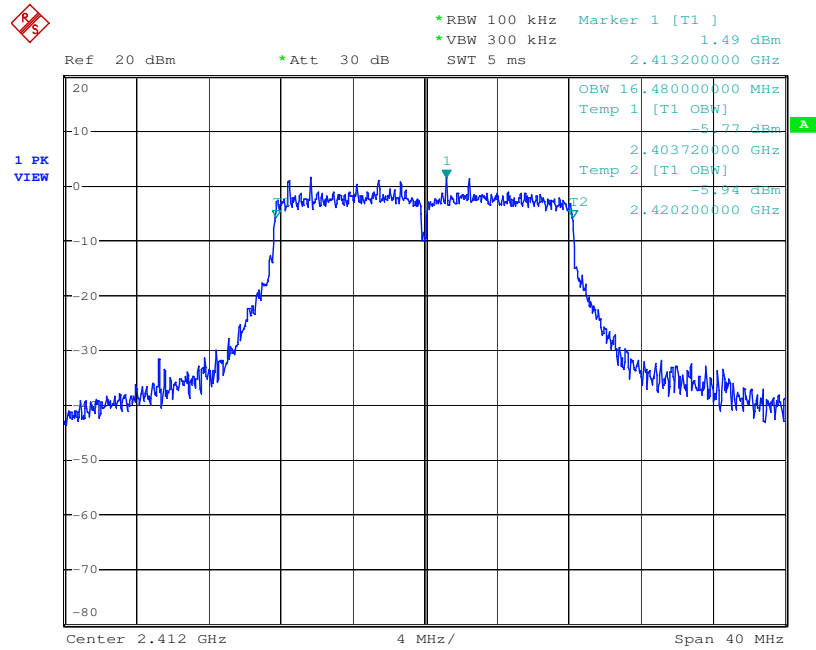
High Channel for Antenna B

Test mode: 802.11b



Low Channel for Antenna B

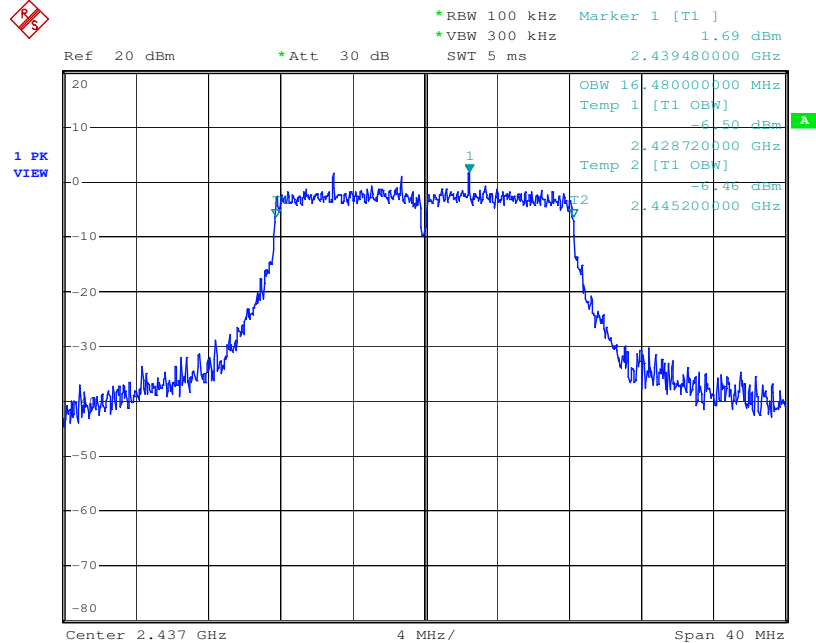
Test mode: 802.11g





Middle Channel for Antenna B

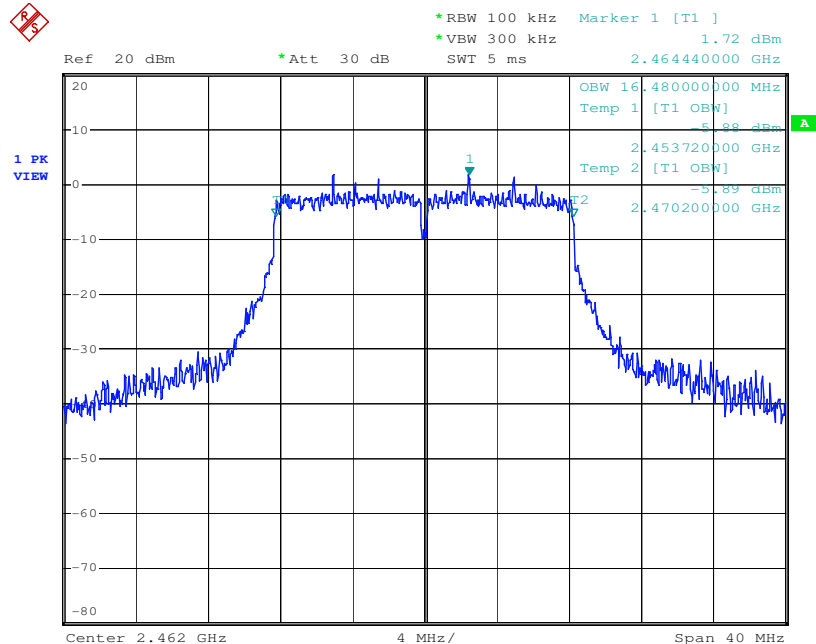
Test mode: 802.11g



Date: 1.JAN.2000 07:20:12

High Channel for Antenna B

Test mode: 802.11g



Date: 1.JAN.2000 07:21:32



## **8 Test Setup Photographs**

Refer to the < Appendix D Aera\_Test Setup photos>.

## **9 EUT Constructional Details**

Refer to the < Appendix B Aera\_External Photos > & < Appendix C Aera\_Internal Photos >.

## ***End of Report***