



**FCC 47 CFR PART 15 SUBPART C**

**TEST REPORT**

**For**

**NETGEAR RangeMax™ 240 Wireless USB 2.0 Adapter WPNT121**

**Model: WPNT121**

**Trade Name: NETGEAR**

*Issued to*

**Netgear, Inc.  
4500 Great America Parkway Santa Clara  
CA 95054 U.S.A.**

*Issued by*



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



---

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



# TABLE OF CONTENTS

- 1. TEST RESULT CERTIFICATION.....3**
- 2. EUT DESCRIPTION .....4**
- 3. TEST METHODOLOGY .....5**
  - 3.1 EUT CONFIGURATION .....5
  - 3.2 EUT EXERCISE.....5
  - 3.3 GENERAL TEST PROCEDURES.....5
  - 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS.....6
  - 3.5 DESCRIPTION OF TEST MODES .....7
- 4. INSTRUMENT CALIBRATION.....8**
  - 4.1 MEASURING INSTRUMENT CALIBRATION.....8
  - 4.2 MEASUREMENT EQUIPMENT USED.....8
- 5. FACILITIES AND ACCREDITATIONS .....9**
  - 5.1 FACILITIES .....9
  - 5.2 EQUIPMENT.....9
  - 5.3 TABLE OF ACCREDITATIONS AND LISTINGS.....10
- 6. SETUP OF EQUIPMENT UNDER TEST .....11**
  - 6.1 SETUP CONFIGURATION OF EUT.....11
  - 6.2 SUPPORT EQUIPMENT.....11
- 7. FCC PART 15.247 REQUIREMENTS.....12**
  - 7.1 6DB BANDWIDTH.....12
  - 7.2 PEAK POWER.....27
  - 7.3 AVERAGE POWER.....41
  - 7.4 BAND EDGES MEASUREMENT.....55
  - 7.5 PEAK POWER SPECTRAL DENSITY.....72
  - 7.6 SPURIOUS EMISSIONS .....86
  - 7.7 POWERLINE CONDUCTED EMISSIONS.....115
- APPENDIX 1 RADIO FREQUENCY EXPOSURE .....118**
- APPENDIX 2 PHOTOGRAPHS OF TEST SETUP .....119**



# 1. TEST RESULT CERTIFICATION

**Applicant:** Netgear, Inc.  
 4500 Great America Parkway Santa Clara  
 CA 95054 U.S.A.

**Equipment Under Test:** NETGEAR RangeMax™ 240 Wireless USB 2.0 Adapter  
 WPNT121

**Trade Name:** NETGEAR

**Model:** WPNT121

**Date of Test:** February 13 ~ March 3, 2006

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:

---

Gavin Lim  
 Section Manager  
 Compliance Certification Services Inc.

---

Amanda Wu  
 Section Manager  
 Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	NETGEAR RangeMax™ 240 Wireless USB 2.0 Adapter WPNT121
<b>Trade Name</b>	NETGEAR
<b>Model Number</b>	WPNT121
<b>Model Discrepancy</b>	N/A
<b>Power Supply</b>	Powered from host device.
<b>Frequency Range</b>	2412 ~ 2462 MHz
<b>Transmit Power</b>	IEEE 802.11b mode: 20.52dBm IEEE 802.11g mode: 20.37 dBm IEEE 802.11g MIMO mode: 20.78 dBm Channel Expansion – SIMO / MIMO mode: 20.61 dBm
<b>Modulation Technique</b>	IEEE 802.11b: DSSS (CCK; DQPSK; DBPSK) IEEE 802.11g: DSSS (CCK, DQPSK, DBPSK) + OFDM (QPSK, BPSK, 16-QAM, 64-QAM) IEEE802.11g Airgo True MIMO: OFDM (Proprietary MIMO modulation)
<b>Transmit Data Rate</b>	IEEE 802.11b: 1, 2, 5.5, 11 Mbps IEEE 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps Airgo True MIMO™ (20 MHz channel): 24, 36, 48, 72, 96, 108, 120, 126Mbps Airgo True MIMO™ plus ACE (40 MHz channel): 144, 168, 192, 216, 240 Mbps
<b>Number of Channels</b>	11 Channels
<b>Antenna Specification</b>	PCB Antenna / Gain: 1.96 dBi

**Remark:**

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **PY306100029** 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 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

#### **3.1 EUT CONFIGURATION**

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

#### **3.2 EUT EXERCISE**

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

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

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 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.



### 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
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

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



### **3.5 DESCRIPTION OF TEST MODES**

The EUT (model: WPNT121) had been tested under operating condition.

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

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

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

IEEE802.11b mode: Channel Low, Channel Mid and Channel High with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low, Channel Mid and Channel High with 6Mbps data rate were chosen for full testing.

IEEE802.11g MIMO mode: Channel Low, Channel Mid and Channel High with 72Mbps data rate were chosen for full testing.

Channel Expansion SIMO mode: After the preliminary test, the SIMO mode was found to eliminate the worst emissions and Channel Low, Channel Mid and Channel High with 12Mbps 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	MY43360131	01/10/2007

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	07/25/2006
Test Receiver	Rohde&Schwarz	ESCI	100064	06/28/2006
Switch Controller	TRC	Switch Controller	SC94050010	05/05/2006
4 Port Switch	TRC	4 Port Switch	SC94050020	05/05/2006
Horn-Antenna	TRC	HA-0502	06	06/02/2006
Horn-Antenna	TRC	HA-0801	04	05/05/2006
Horn-Antenna	TRC	HA-1201A	01	07/04/2006
Horn-Antenna	TRC	HA-1301A	01	07/04/2006
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/09/2007
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC: 965860 IC: IC 6106	09/26/2008
Test S/W	LABVIEW (V 6.1)			

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

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	ROHDE & SCHWARZ	ESHS30	828144/003	09/24/2006
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/11/2006
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	02/17/2007
Test S/W	LABVIEW (V 6.1)			

*Remark: The measurement uncertainty is less than +/- 2.81dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*





## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

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

No.199, 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, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

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

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

### 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	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, EIC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	 93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 3991-3, IC 3991-4) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 3991-3 IC 3991-4 IC 6106

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

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

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook PC	IBM	2672 (X31)	99PBTKB	WLAN: ANO20030400LEG Bluetooth: NO20020100MTN	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
2.	Wireless Pre-N Router (MIMO) (Remote)	BELKIN	F5D8230-4	N/A	SA3-AGN0901AP0100	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m

**Remark:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



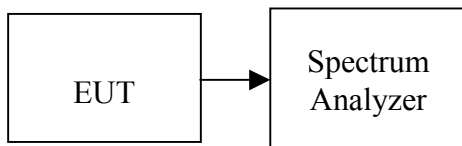
## 7. FCC PART 15.247 REQUIREMENTS

### 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 6dB bandwidth shall be at least 500 kHz.

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 100 kHz, VBW = RBW, Span = 50 MHz, Sweep = auto.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.



### TEST RESULTS

*No non-compliance noted*

#### Test Data

##### **Test mode: IEEE 802.11b mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	11.08	>500	PASS
Mid	2437	10.25		PASS
High	2462	11.17		PASS

##### **Test mode: IEEE 802.11b mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.17	>500	PASS
Mid	2437	12.08		PASS
High	2462	10.08		PASS

##### **Test mode: IEEE 802.11g mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.25	>500	PASS
Mid	2437	15.25		PASS
High	2462	15.25		PASS

##### **Test mode: IEEE 802.11g mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.33	>500	PASS
Mid	2437	15.42		PASS
High	2462	15.42		PASS



**Test mode: IEEE 802.11g MIMO mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.25	>500	PASS
Mid	2437	15.25		PASS
High	2462	15.25		PASS

**Test mode: IEEE 802.11g MIMO mode / Chain 1**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	15.42	>500	PASS
Mid	2437	15.50		PASS
High	2462	15.58		PASS

**Test mode: Channel Expansion – SIMO mode / Chain 0**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	30.13	>500	PASS
Mid	2447	30.13		PASS
High	2452	30.13		PASS

**Test mode: Channel Expansion – SIMO mode / Chain 1**

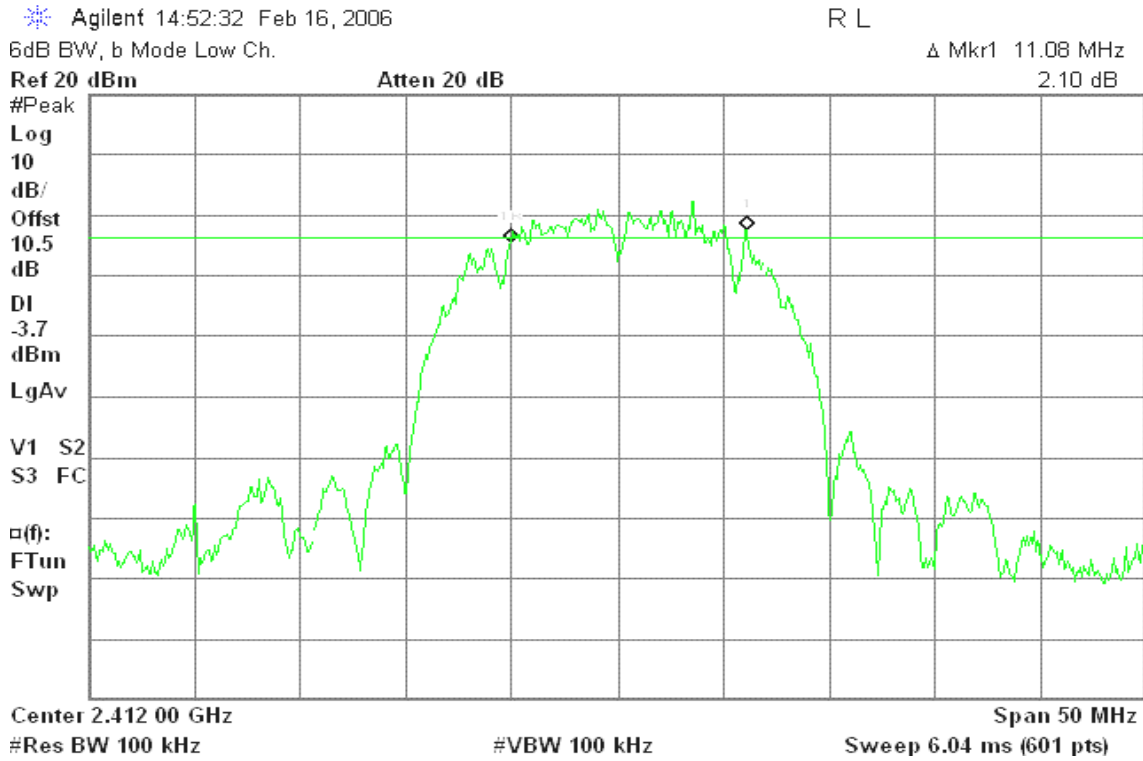
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	27.73	>500	PASS
Mid	2447	27.73		PASS
High	2452	27.87		PASS



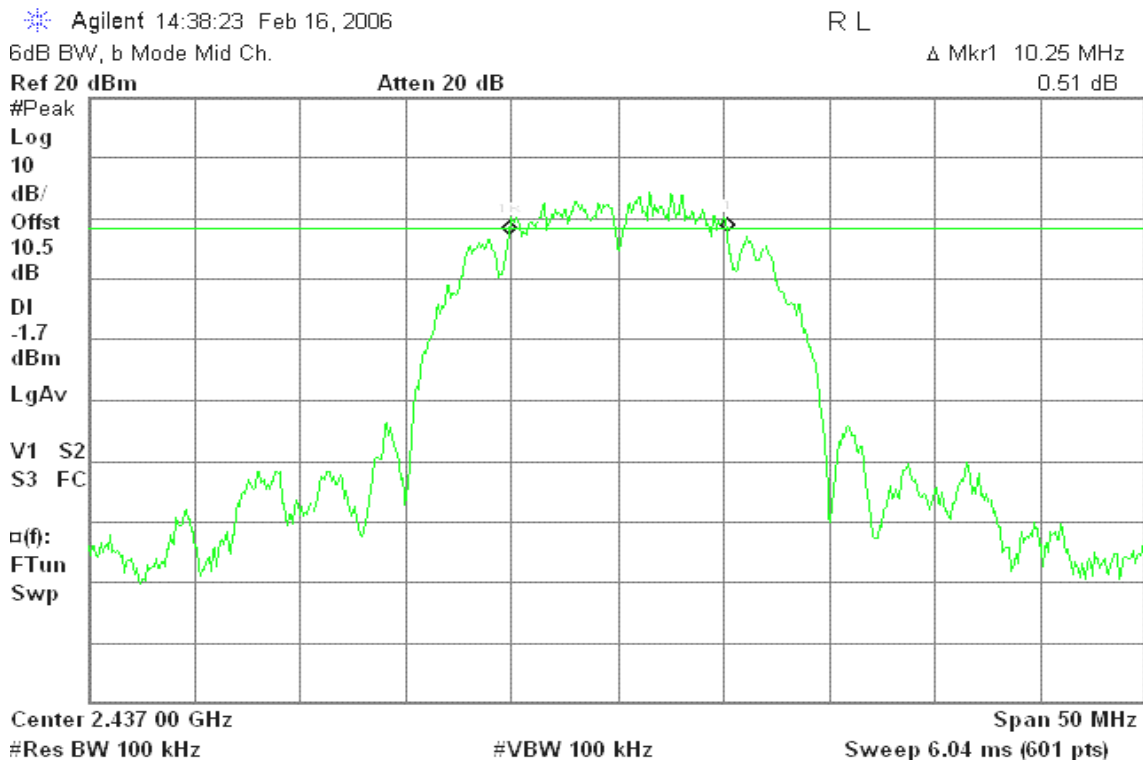
**Test Plot**

**IEEE 802.11b mode / Chain 0**

**6dB Bandwidth (CH Low)**



**6dB Bandwidth (CH Mid)**





### 6dB Bandwidth (CH High)

Agilent 15:00:56 Feb 16, 2006

R L

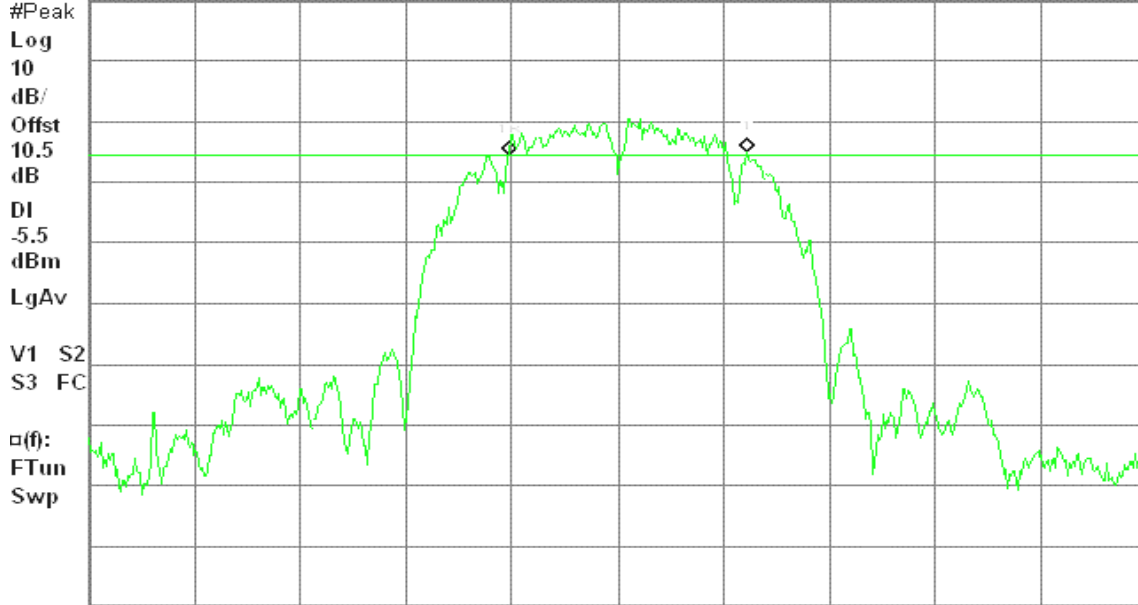
6dB BW, b Mode High Ch.

Δ Mkr1 11.17 MHz

Ref 20 dBm

Atten 20 dB

0.69 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### IEEE 802.11b mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent 19:15:07 Feb 16, 2006

R L

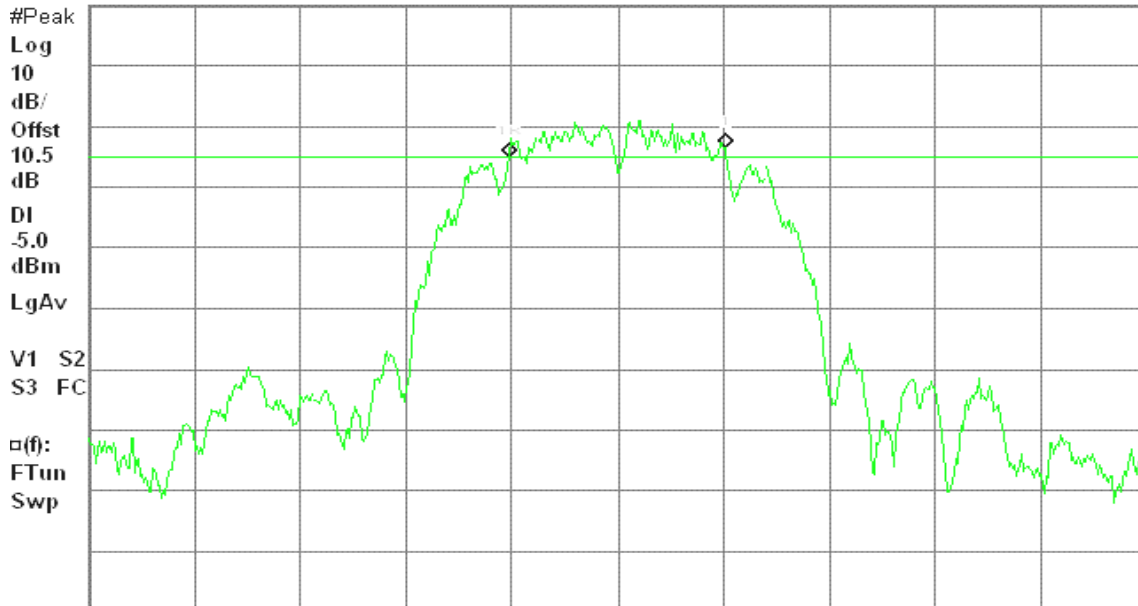
6dB BW, b Mode Low Ch.

Δ Mkr1 10.17 MHz

Ref 20 dBm

Atten 20 dB

1.51 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)





### 6dB Bandwidth (CH Mid)

Agilent 19:26:25 Feb 16, 2006

R L

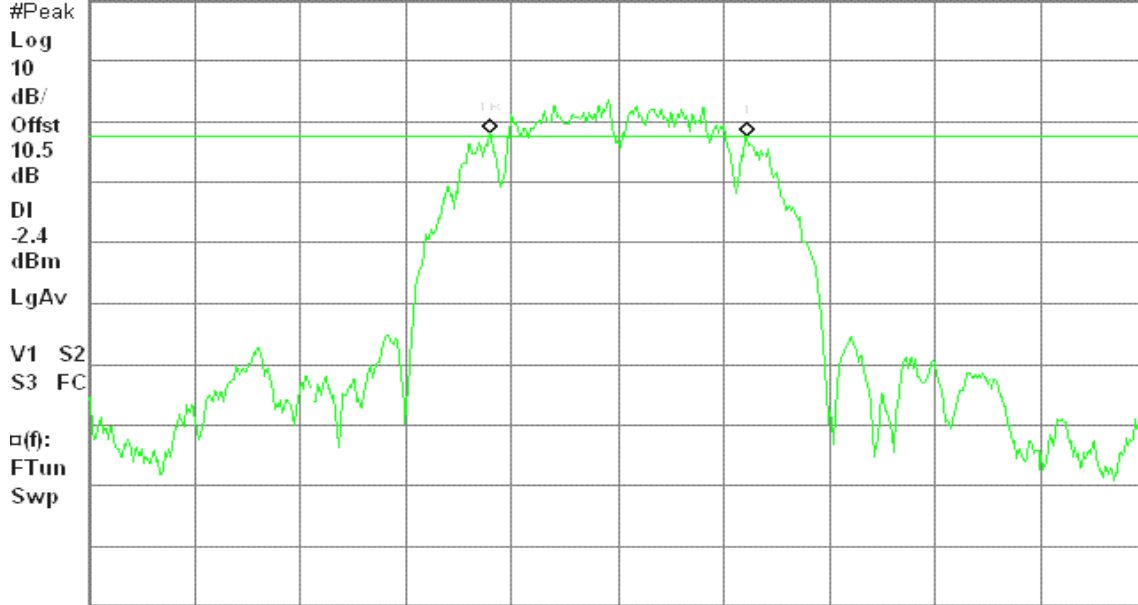
6dB BW, b Mode Mid Ch.

Δ Mkr1 12.08 MHz

Ref 20 dBm

Atten 20 dB

-0.33 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 19:35:37 Feb 16, 2006

R L

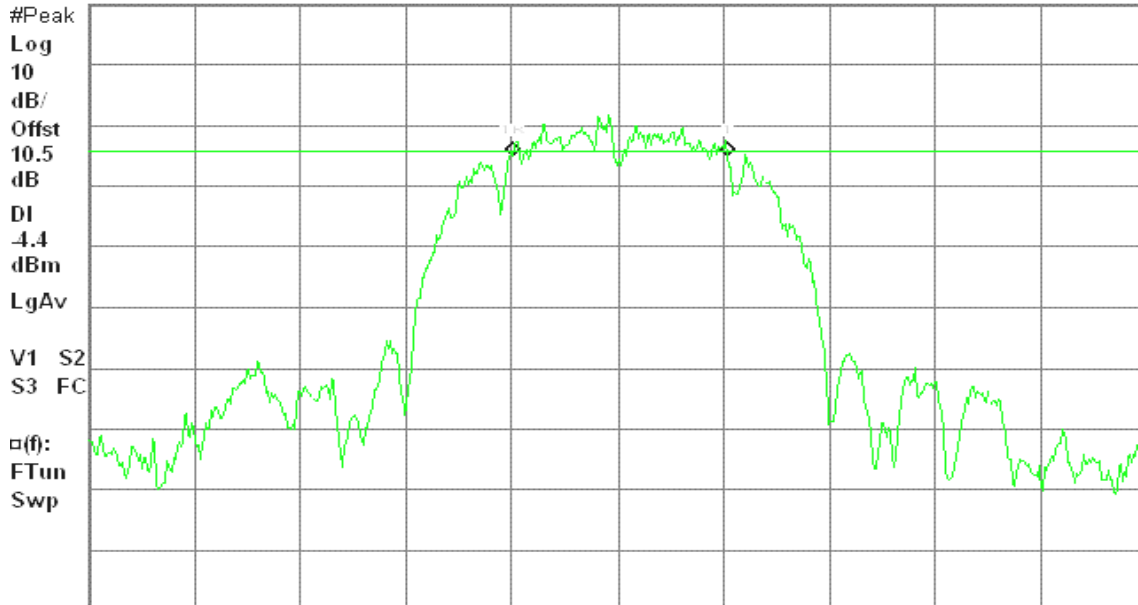
6dB BW, b Mode High Ch.

Δ Mkr1 10.08 MHz

Ref 20 dBm

Atten 20 dB

0.02 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### IEEE 802.11g mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 16:09:41 Feb 16, 2006

R L

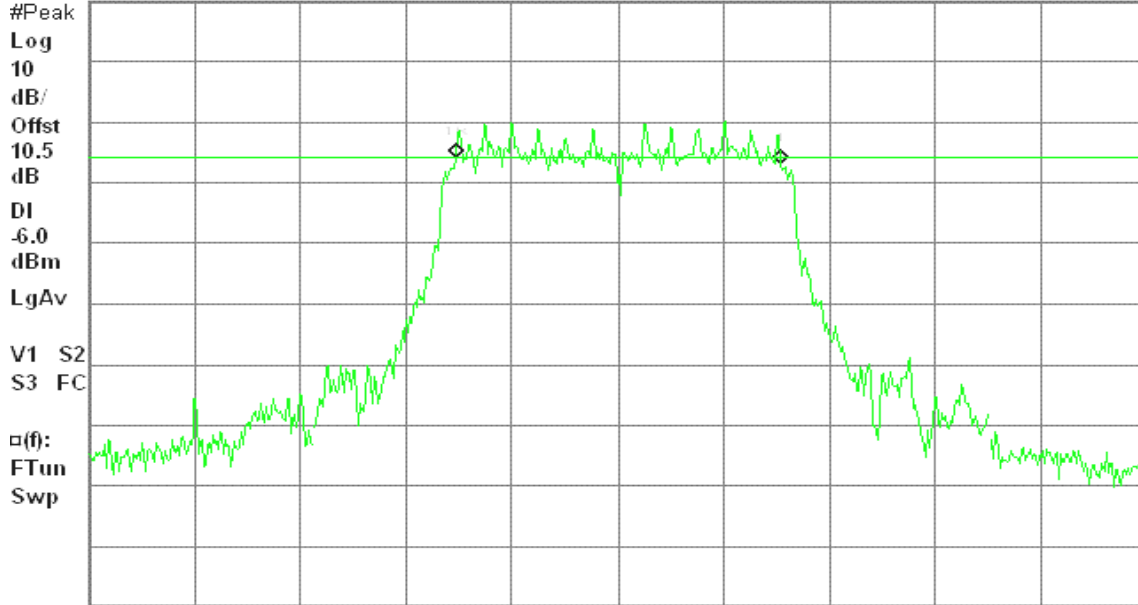
6dB BW, g Mode Low Ch.

Δ Mkr1 15.25 MHz

Ref 20 dBm

Atten 20 dB

-1.01 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 16:21:23 Feb 16, 2006

R L

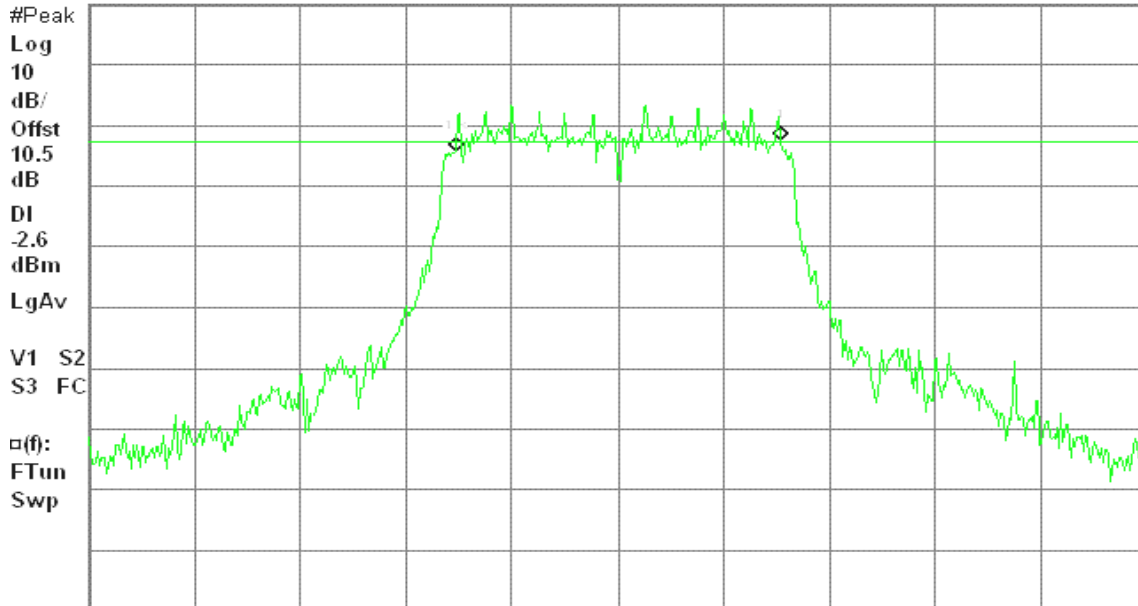
6dB BW, g Mode Mid Ch.

Δ Mkr1 15.25 MHz

Ref 20 dBm

Atten 20 dB

1.91 dB



Center 2.437 00 GHz

Span 50 MHz

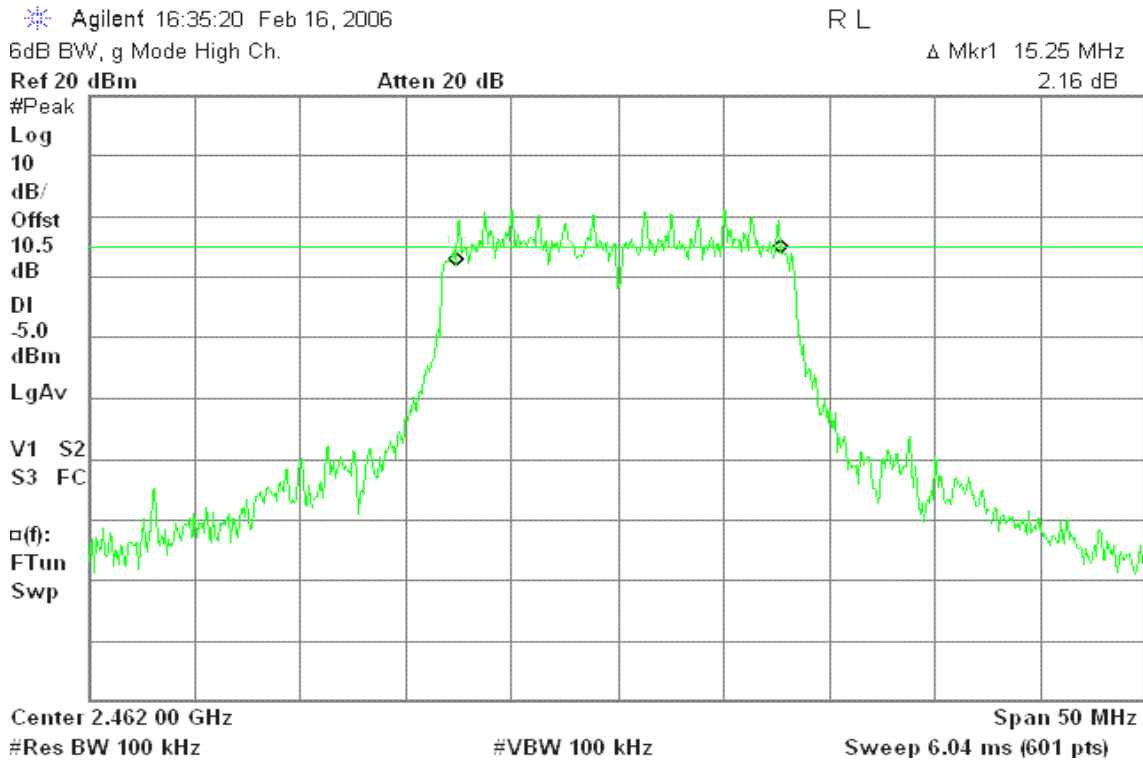
#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

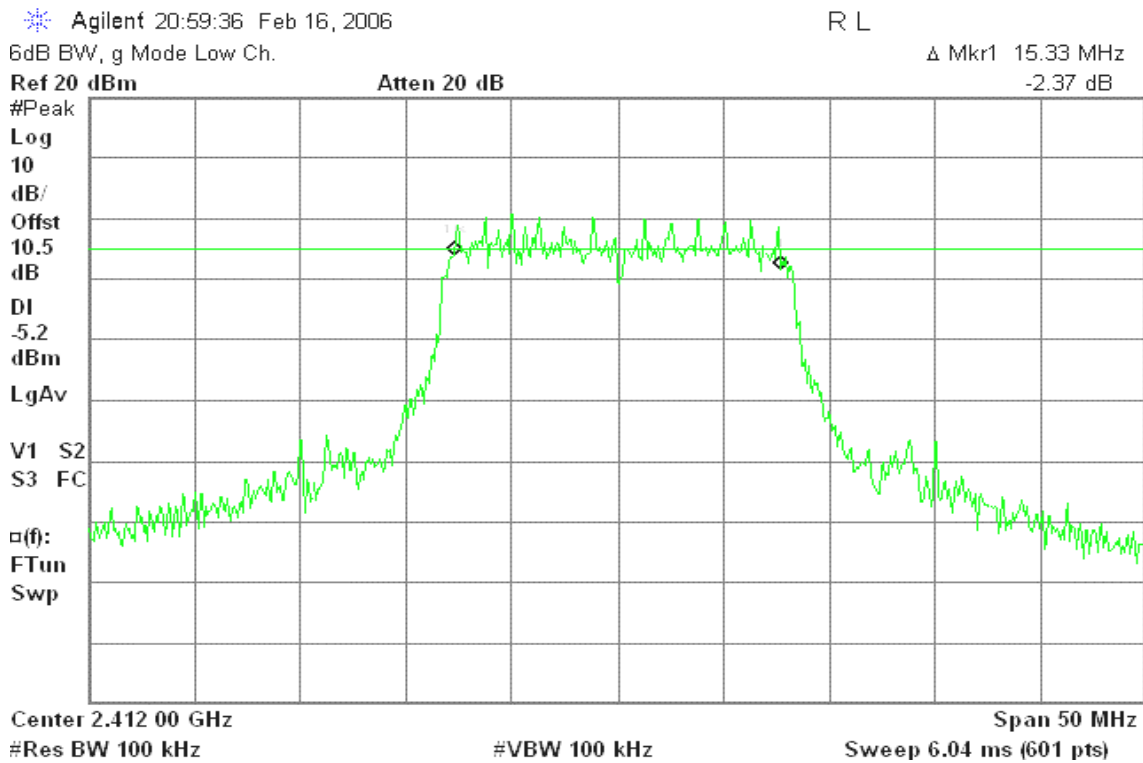


### 6dB Bandwidth (CH High)



### IEEE 802.11g mode / Chain 1

### 6dB Bandwidth (CH Low)





### 6dB Bandwidth (CH Mid)

Agilent 20:11:07 Feb 16, 2006

R L

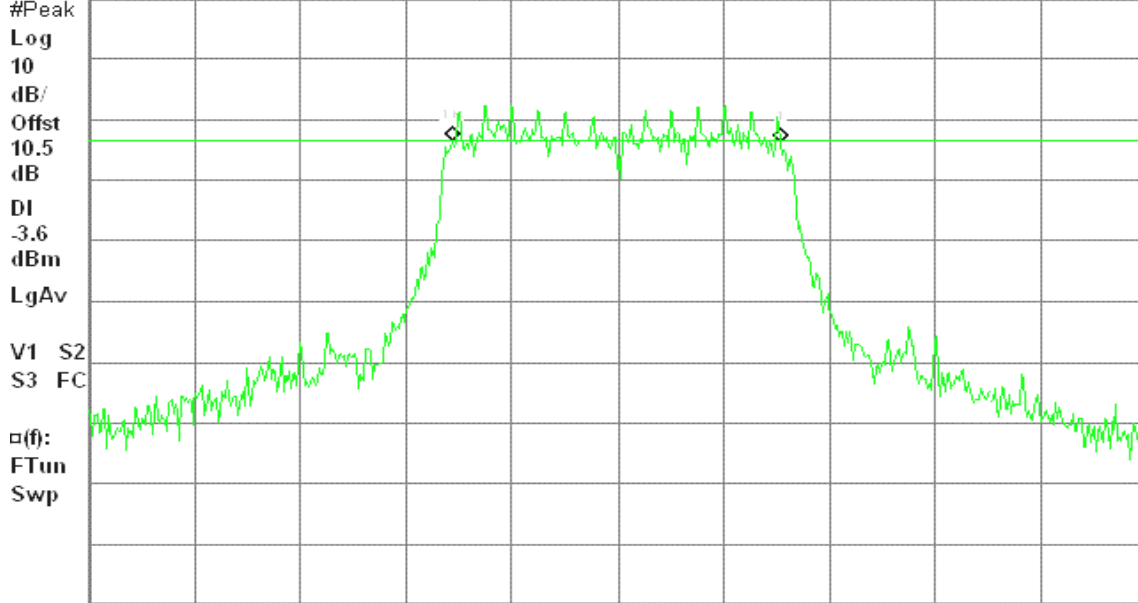
6dB BW, g Mode Mid Ch.

Δ Mkr1 15.42 MHz

Ref 20 dBm

Atten 20 dB

-0.09 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 20:20:59 Feb 16, 2006

R L

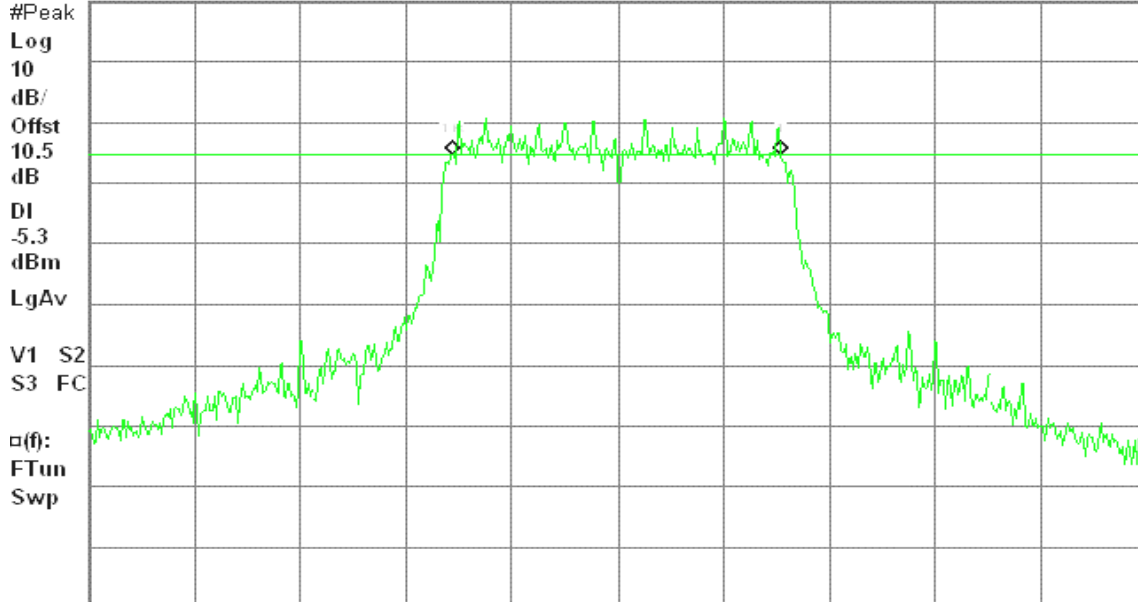
6dB BW, g Mode High Ch.

Δ Mkr1 15.42 MHz

Ref 20 dBm

Atten 20 dB

-0.16 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### IEEE 802.11g MIMO mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 17:38:32 Feb 16, 2006

R L

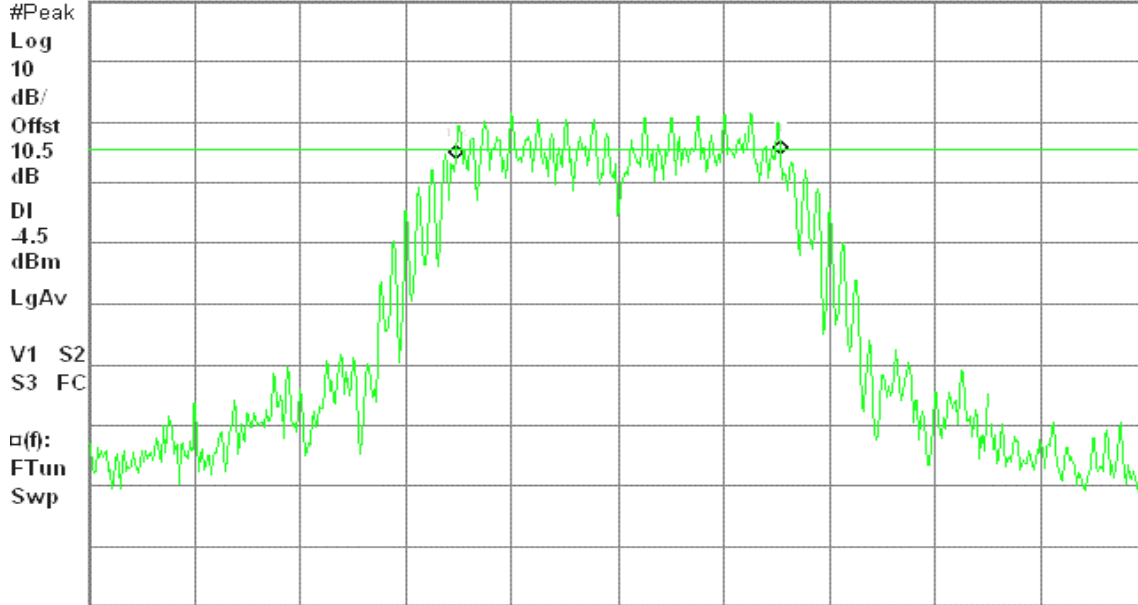
6dB BW, g Mode Low Ch.

Δ Mkr1 15.25 MHz

Ref 20 dBm

Atten 20 dB

0.75 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 17:45:42 Feb 16, 2006

R L

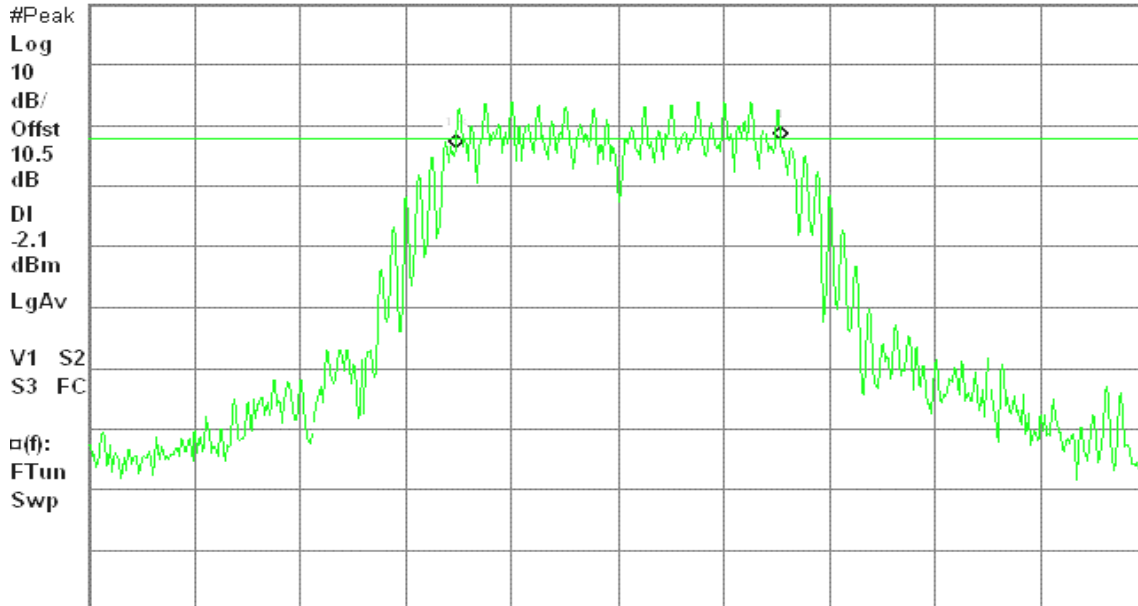
6dB BW, g Mode Mid Ch.

Δ Mkr1 15.25 MHz

Ref 20 dBm

Atten 20 dB

1.38 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH High)

Agilent 17:53:37 Feb 16, 2006

R L

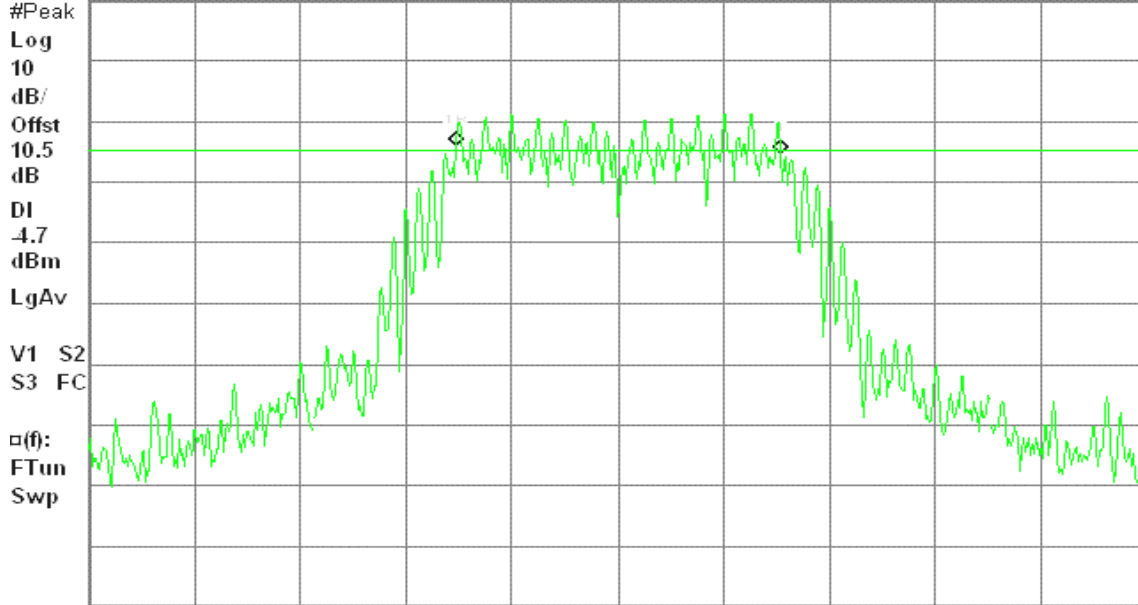
6dB BW, g Mode High Ch.

Δ Mkr1 15.25 MHz

Ref 20 dBm

Atten 20 dB

-1.15 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### IEEE 802.11g MIMO mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent 21:15:00 Feb 16, 2006

R L

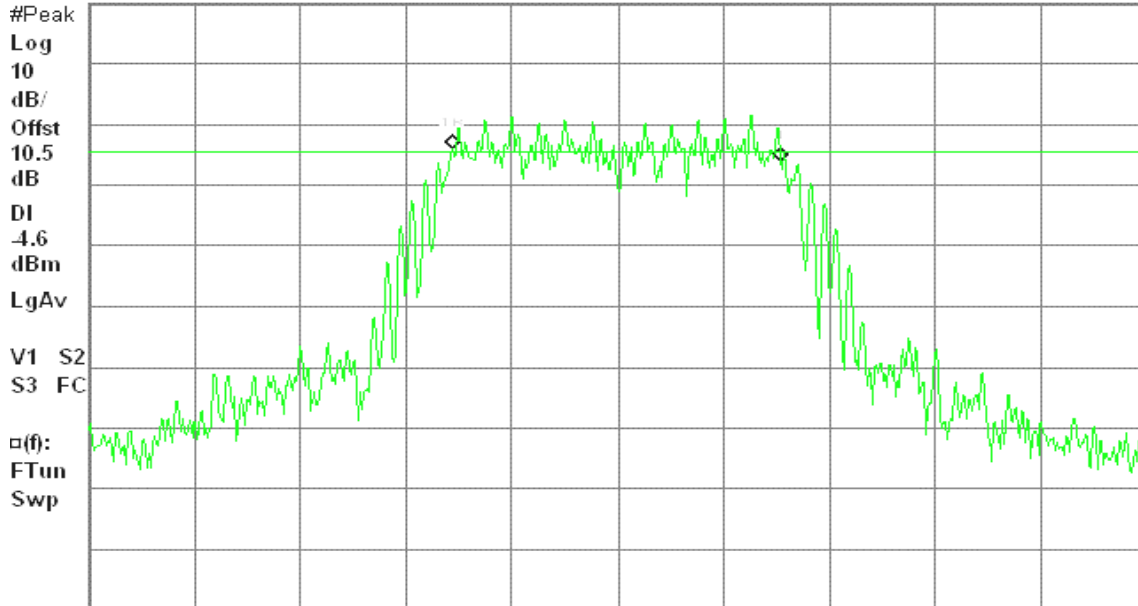
6dB BW, g Mode Low Ch.

Δ Mkr1 15.42 MHz

Ref 20 dBm

Atten 20 dB

-2.06 dB



Center 2.412 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### 6dB Bandwidth (CH Mid)

Agilent 21:21:02 Feb 16, 2006

R L

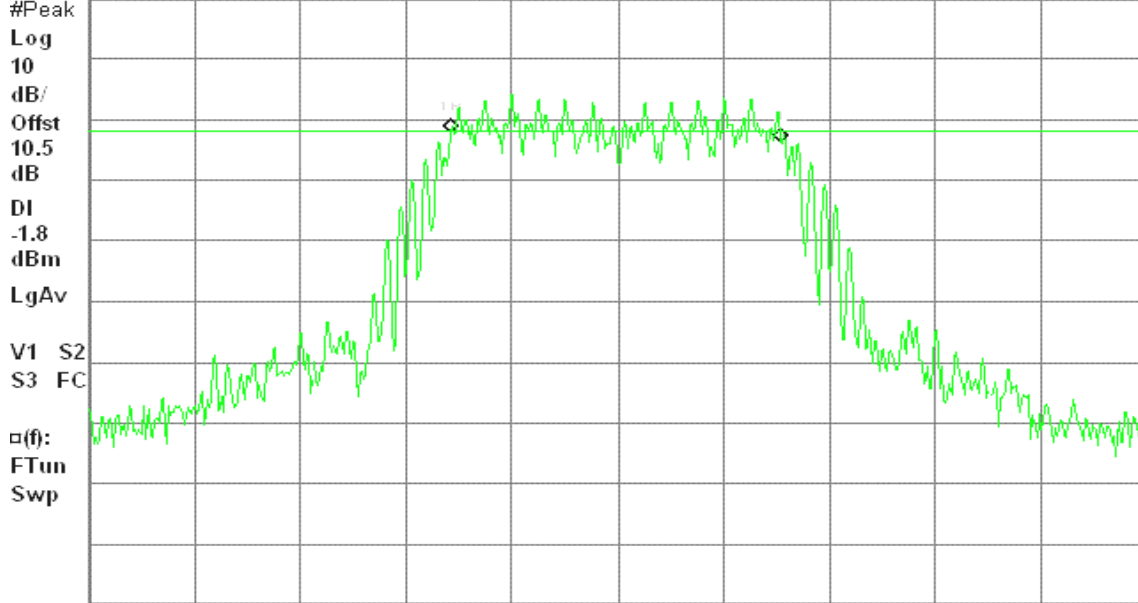
6dB BW, g Mode Mid Ch.

Δ Mkr1 15.50 MHz

Ref 20 dBm

Atten 20 dB

-1.70 dB



Center 2.437 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 21:27:54 Feb 16, 2006

R L

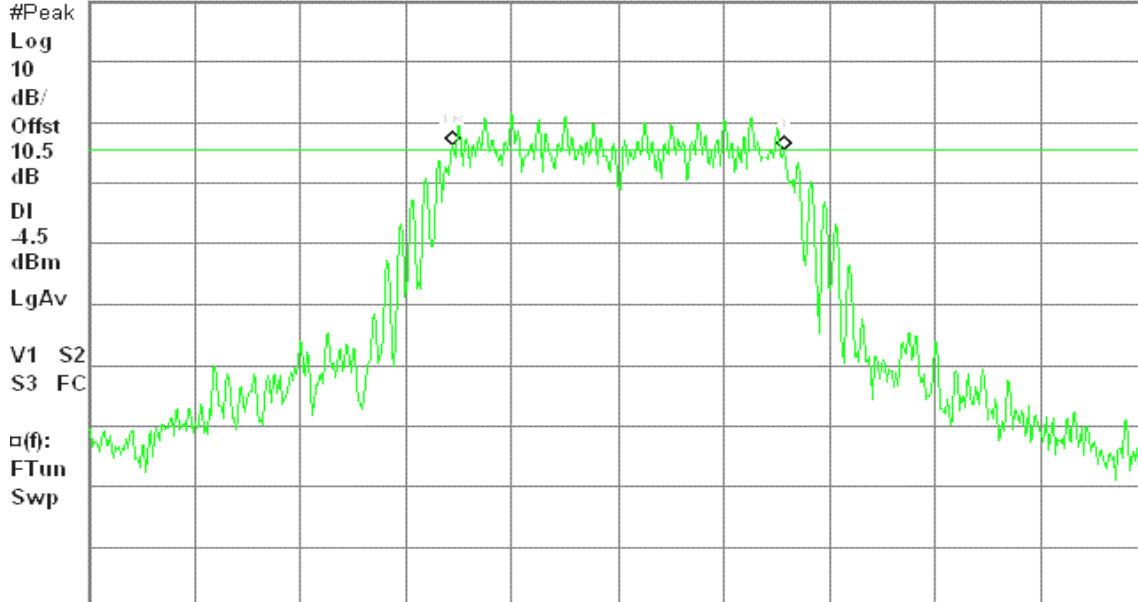
6dB BW, g Mode High Ch.

Δ Mkr1 15.58 MHz

Ref 20 dBm

Atten 20 dB

-0.56 dB



Center 2.462 00 GHz

Span 50 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 6.04 ms (601 pts)



### Channel Expansion – SIMO mode / Chain 0

#### 6dB Bandwidth (CH Low)

Agilent 18:45:37 Feb 16, 2006

R L

6dB BW, g Mode Low Ch.

Δ Mkr1 30.13 MHz

Ref 20 dBm

Atten 20 dB

-1.33 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-6.1

dBm

LgAv

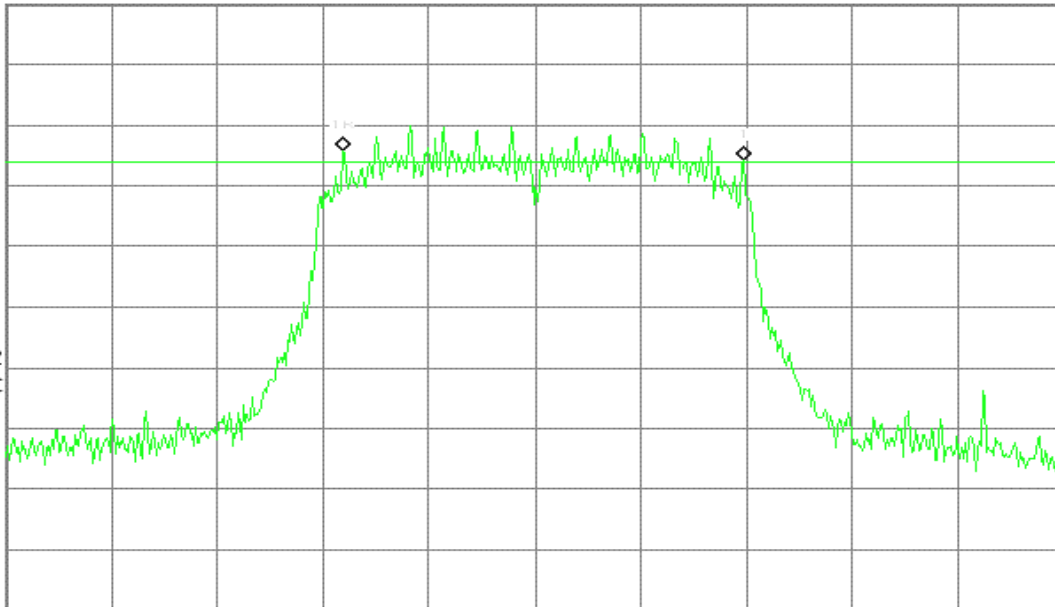
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.422 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)

#### 6dB Bandwidth (CH Mid)

Agilent 18:53:36 Feb 16, 2006

R T

6dB BW, g Mode Mid Ch.

Δ Mkr1 30.13 MHz

Ref 20 dBm

Atten 20 dB

-0.55 dB

#Peak

Log

10

dB/

Offst

10.5

dB

DI

-3.4

dBm

LgAv

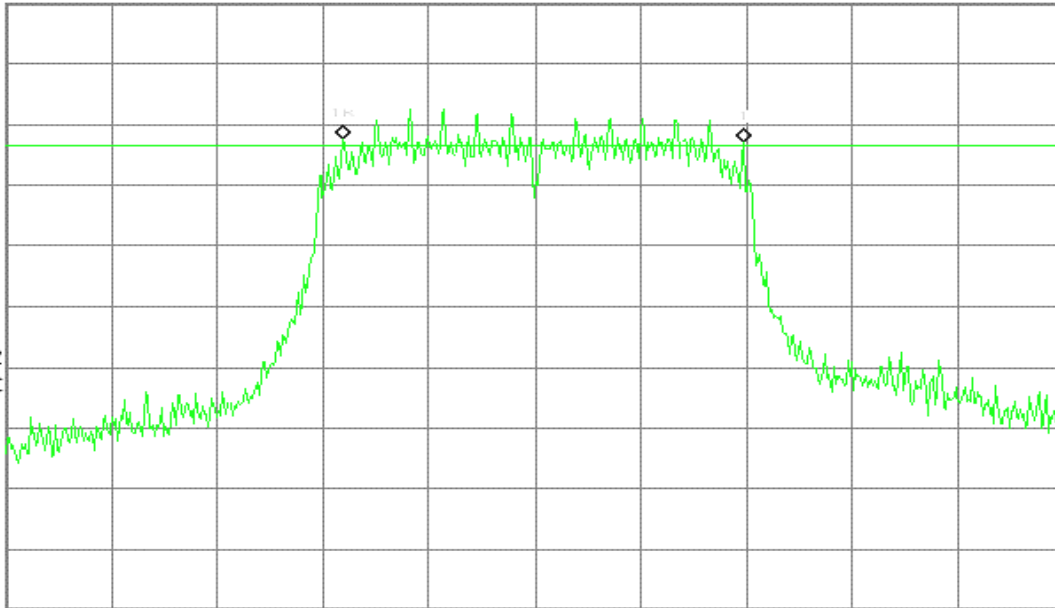
V1 S2

S3 FC

□(f):

FTun

Swp



Center 2.447 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)





### 6dB Bandwidth (CH High)

Agilent 19:00:37 Feb 16, 2006

R L

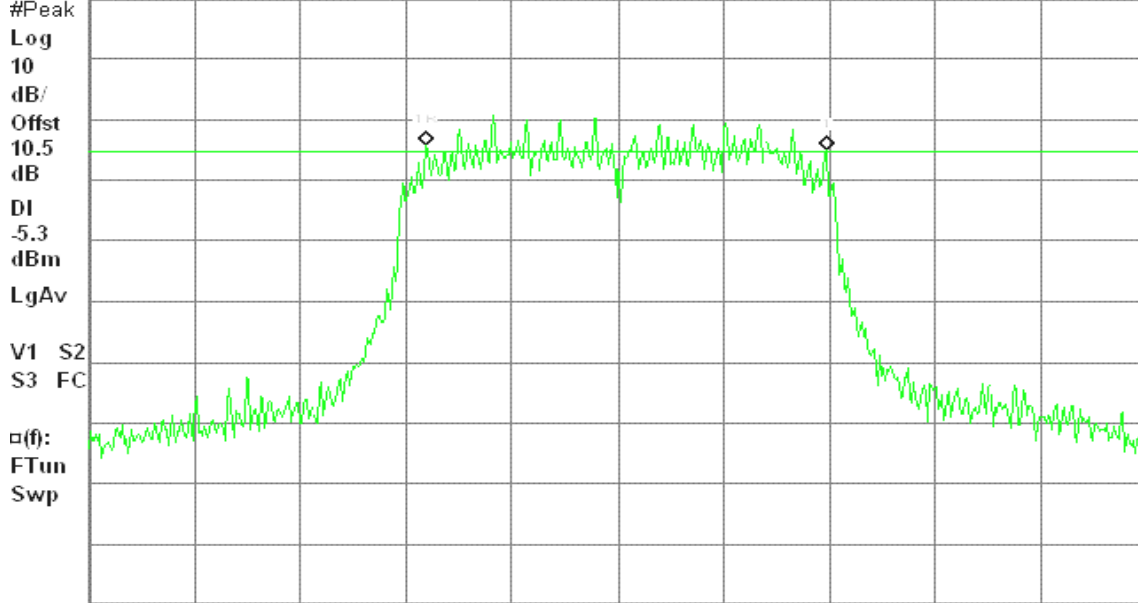
6dB BW, g Mode High Ch.

Δ Mkr1 30.13 MHz

Ref 20 dBm

Atten 20 dB

-0.65 dB



Center 2.452 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)

### Channel Expansion – SIMO mode / Chain 1

### 6dB Bandwidth (CH Low)

Agilent 21:35:34 Feb 16, 2006

R L

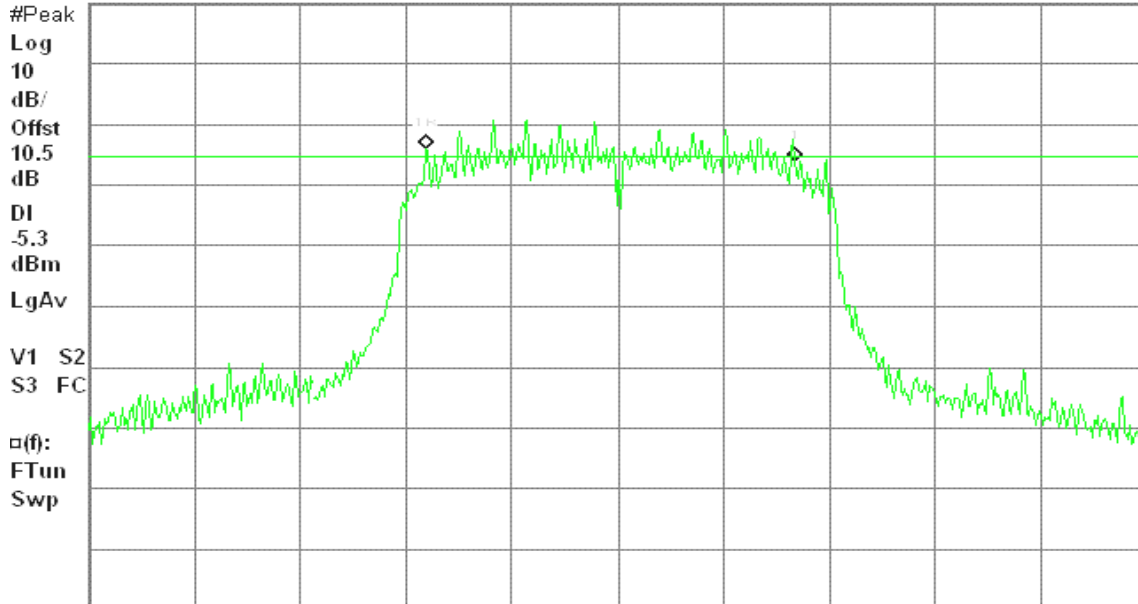
6dB BW, g Mode Low Ch.

Δ Mkr1 27.73 MHz

Ref 20 dBm

Atten 20 dB

-2.02 dB



Center 2.422 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)



### 6dB Bandwidth (CH Mid)

Agilent 21:42:11 Feb 16, 2006

R L

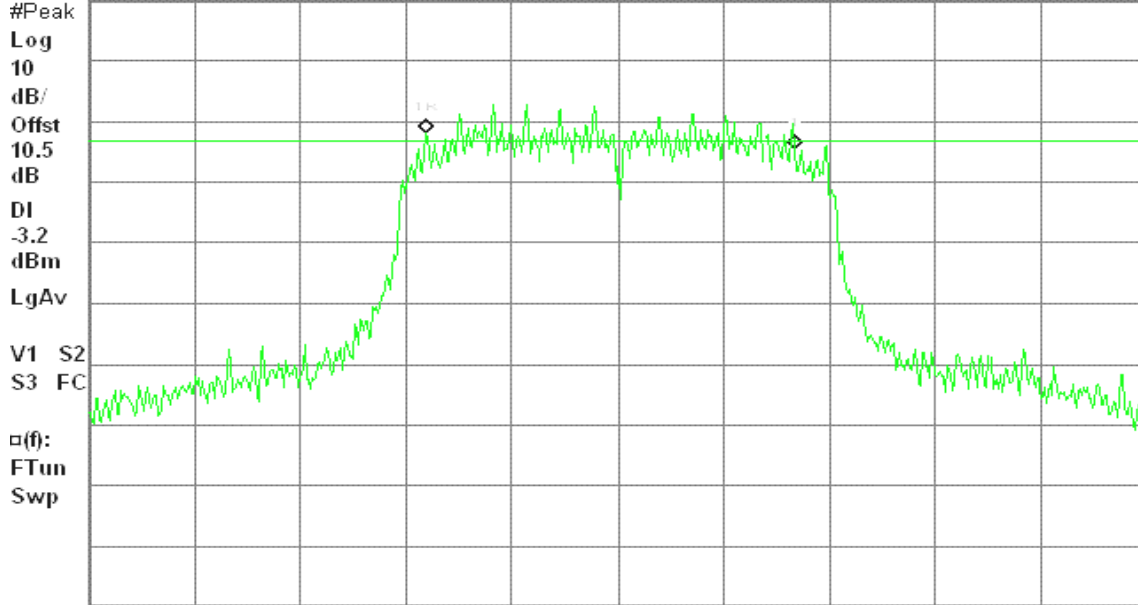
6dB BW, g Mode Mid Ch.

Δ Mkr1 27.73 MHz

Ref 20 dBm

Atten 20 dB

-2.40 dB



Center 2.447 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)

### 6dB Bandwidth (CH High)

Agilent 21:48:11 Feb 16, 2006

R L

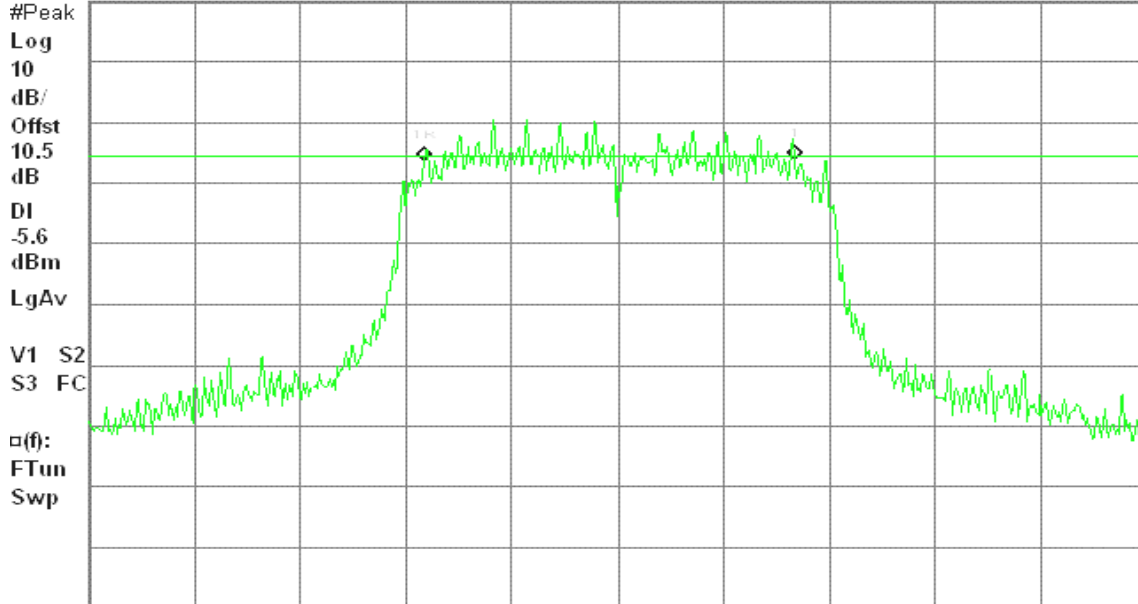
6dB BW, g Mode High Ch.

Δ Mkr1 27.87 MHz

Ref 20 dBm

Atten 20 dB

0.17 dB



Center 2.452 00 GHz

Span 80 MHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 9.68 ms (601 pts)



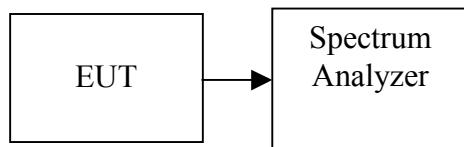
## 7.2 PEAK POWER

### LIMIT

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

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

### Test Configuration



### TEST PROCEDURE

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



### TEST RESULTS

*No non-compliance noted*

#### Test Data

##### **Test mode: IEEE 802.11b mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.21	15.05	18.14	0.06516	1.00	PASS
Mid	2437	17.68	17.34	20.52	0.11272		PASS
High	2462	15.04	15.44	18.25	0.06683		PASS

##### **Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.51	15.53	18.53	0.07129	1.00	PASS
Mid	2437	17.70	16.99	20.37	0.10889		PASS
High	2462	15.48	14.33	17.95	0.06237		PASS

##### **Test mode: IEEE 802.11g MIMO mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	15.48	15.28	18.39	0.06902	1.00	PASS
Mid	2437	17.78	17.76	20.78	0.11967		PASS
High	2462	15.48	14.33	17.95	0.06237		PASS

##### **Test mode: Channel Expansion – SIMO mode**

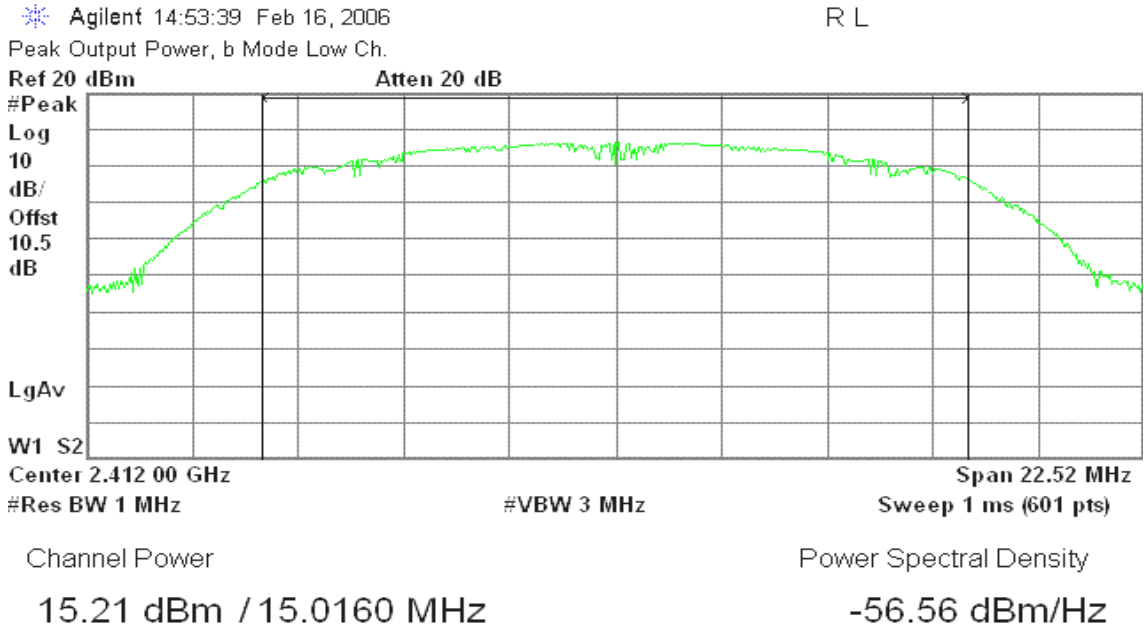
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	15.28	15.75	18.53	0.07129	1.00	PASS
Mid	2447	17.56	17.64	20.61	0.11508		PASS
High	2452	15.51	15.60	18.57	0.07194		PASS



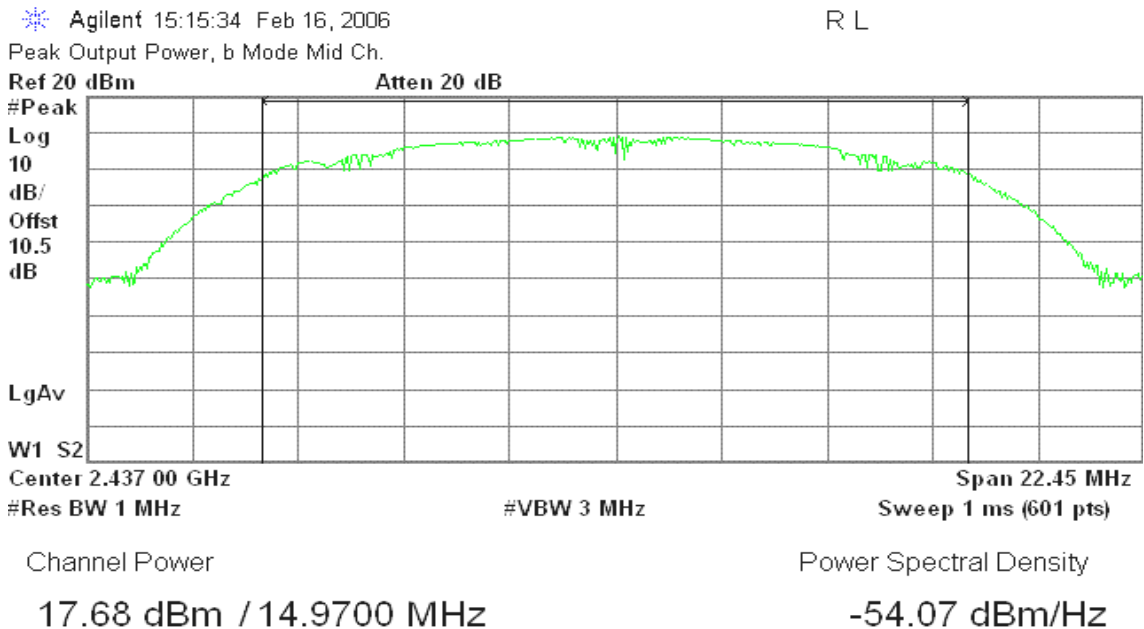
**Test Plot**

**IEEE 802.11b mode / Chain 0**

**Peak Power (CH Low)**



**Peak Power (CH Mid)**





### Peak Power (CH High)

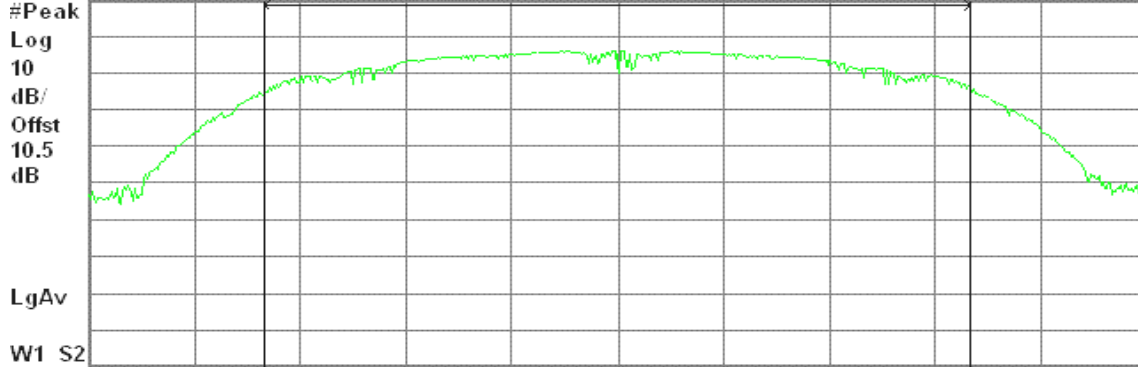
Agilent 15:02:23 Feb 16, 2006

R L

Peak Output Power, b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 22.48 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.04 dBm / 14.9880 MHz

-56.72 dBm/Hz

### IEEE 802.11b mode / Chain 1

#### Peak Power (CH Low)

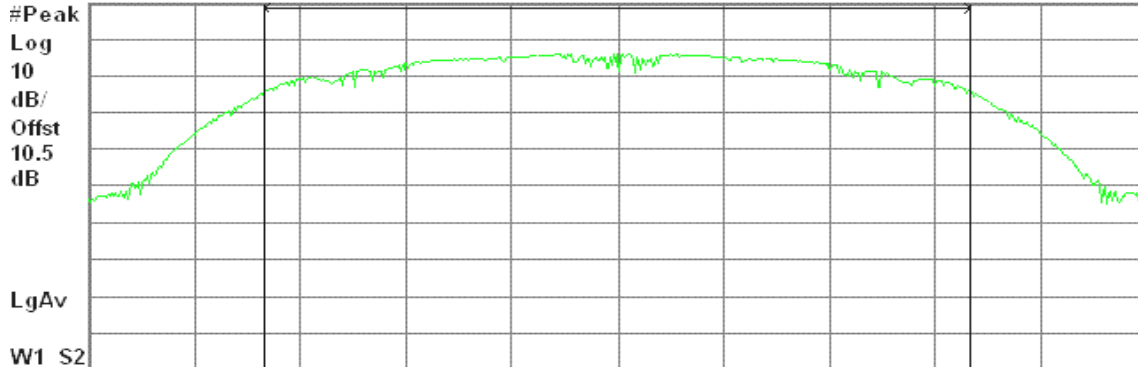
Agilent 19:16:10 Feb 16, 2006

R L

Peak Output Power, b Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 22.45 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.05 dBm / 14.9650 MHz

-56.70 dBm/Hz



### Peak Power (CH Mid)

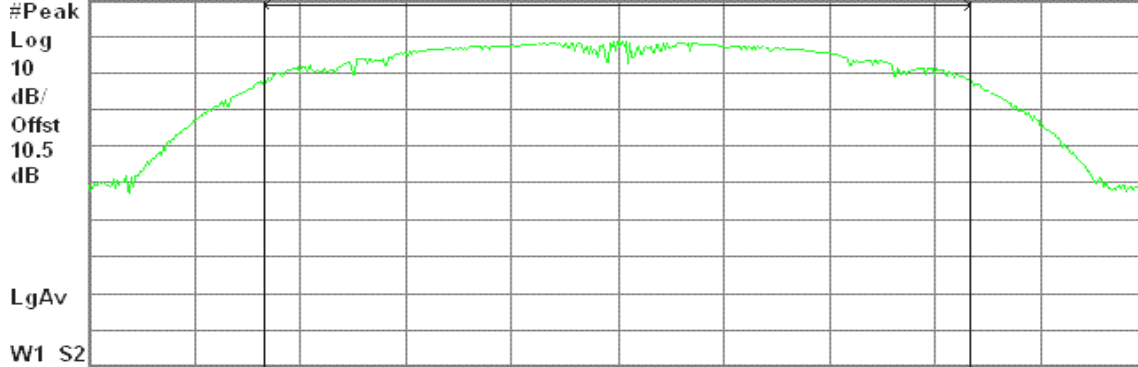
Agilent 19:27:26 Feb 16, 2006

R L

Peak Output Power, b Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 22.47 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

17.34 dBm / 14.9820 MHz

-54.41 dBm/Hz

### Peak Power (CH High)

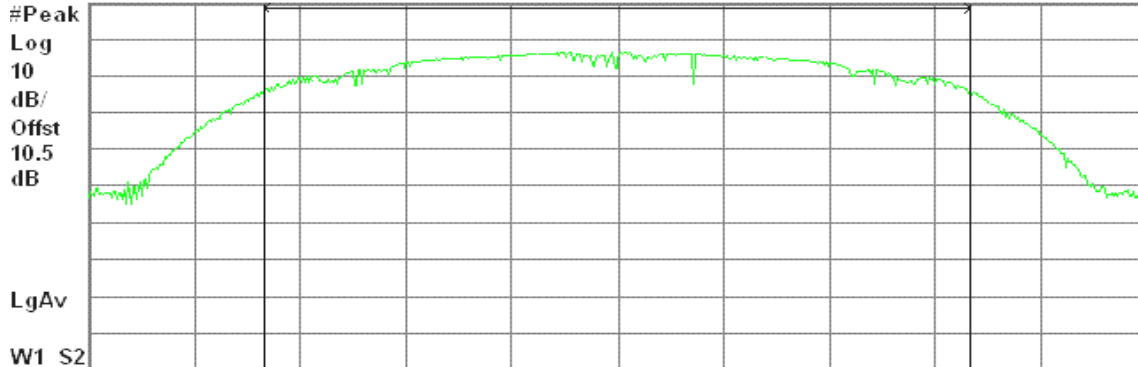
Agilent 21:10:19 Feb 16, 2006

R L

Peak Output Power, b Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 22.48 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.44 dBm / 14.9900 MHz

-56.32 dBm/Hz







### Peak Power (CH High)

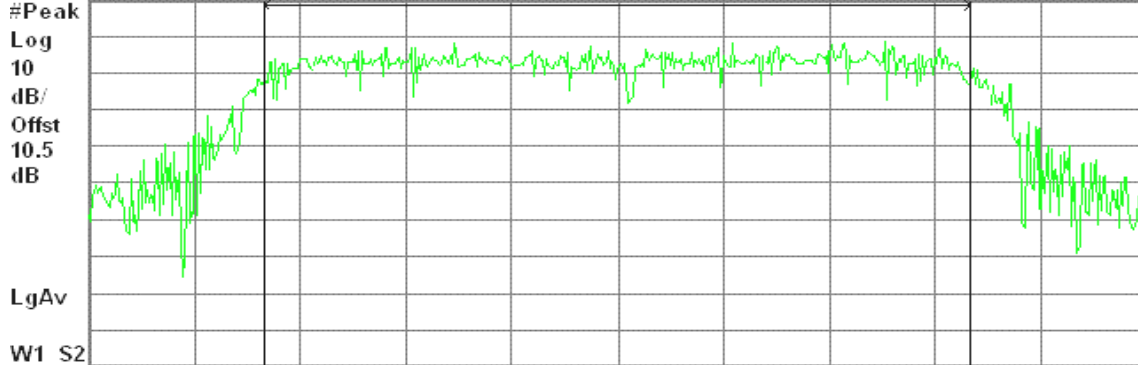
Agilent 16:36:22 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

15.48 dBm / 16.2630 MHz

Power Spectral Density

-56.63 dBm/Hz

### IEEE 802.11g mode / Chain 1

#### Peak Power (CH Low)

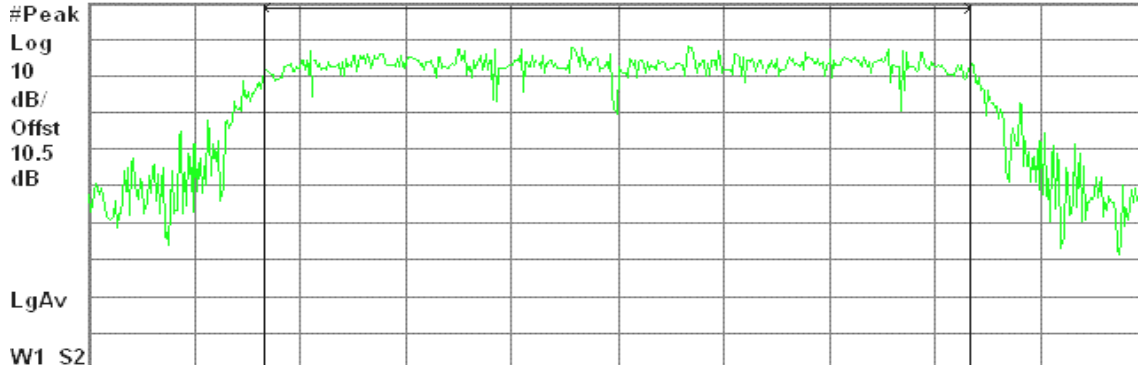
Agilent 21:00:32 Feb 16, 2006

R L

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

15.53 dBm / 16.2850 MHz

Power Spectral Density

-56.59 dBm/Hz



### Peak Power (CH Mid)

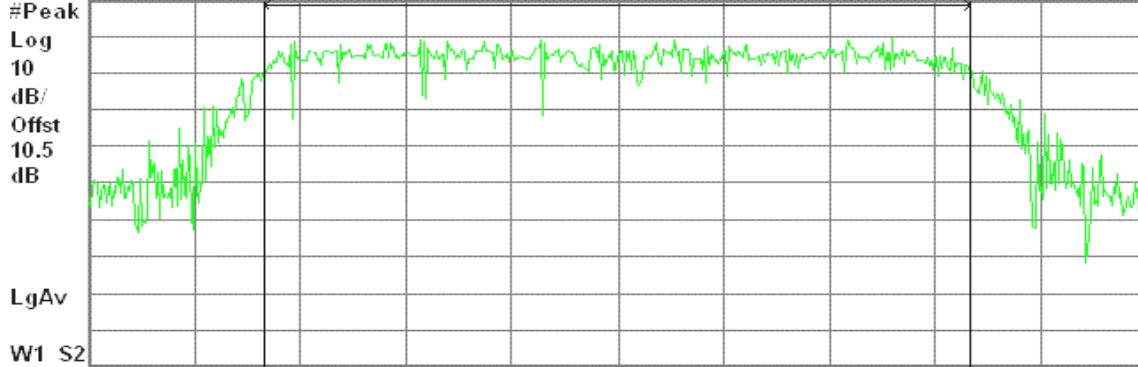
Agilent 20:12:01 Feb 16, 2006

R L

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 24.4 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

16.99 dBm / 16.2660 MHz

-55.12 dBm/Hz

### Peak Power (CH High)

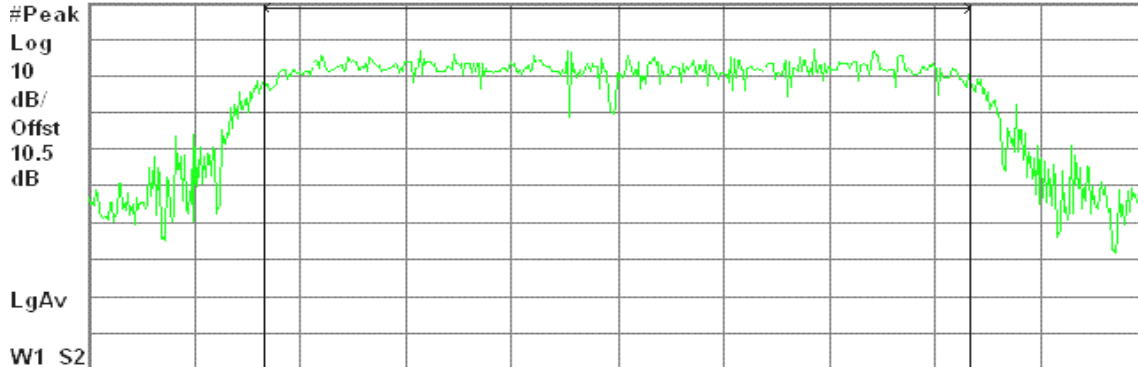
Agilent 20:23:47 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 24.43 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.33 dBm / 16.2860 MHz

-57.79 dBm/Hz

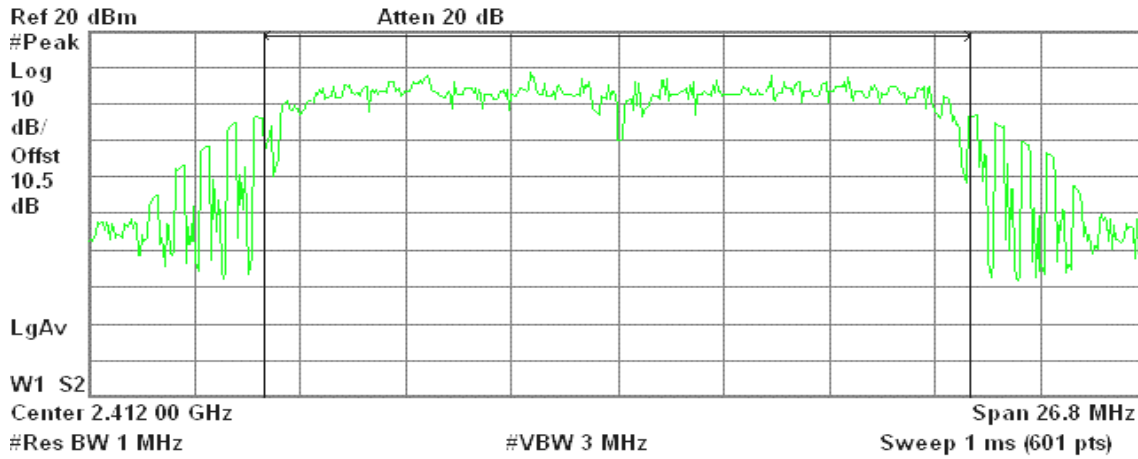


**IEEE 802.11g MIMO mode / Chain 0**

**Peak Power (CH Low)**

Agilent 17:39:17 Feb 16, 2006  
Peak Output Power, g Mode Low Ch.

R L



Channel Power

15.48 dBm / 17.8690 MHz

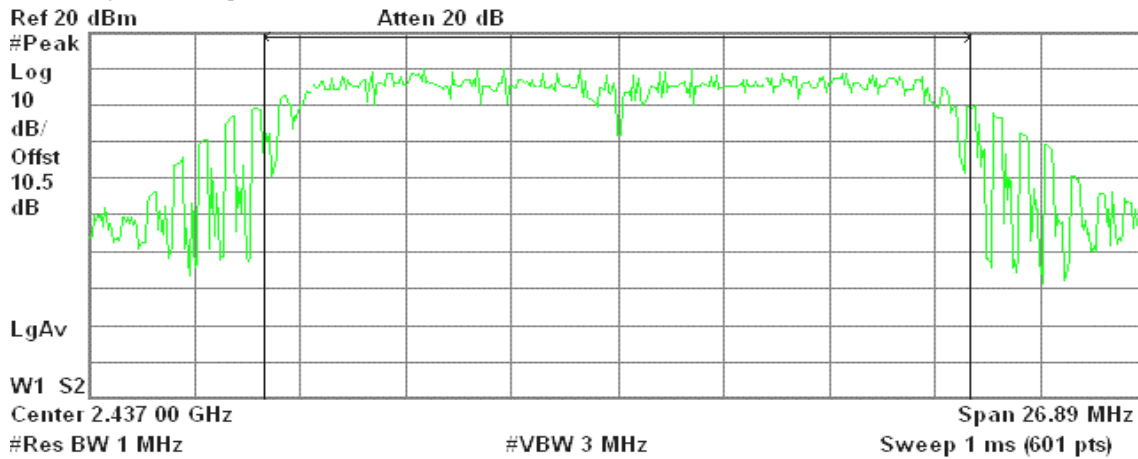
Power Spectral Density

-57.04 dBm/Hz

**Peak Power (CH Mid)**

Agilent 17:46:41 Feb 16, 2006  
Peak Output Power, g Mode Mid Ch.

R L



Channel Power

17.78 dBm / 17.9250 MHz

Power Spectral Density

-54.76 dBm/Hz



### Peak Power (CH High)

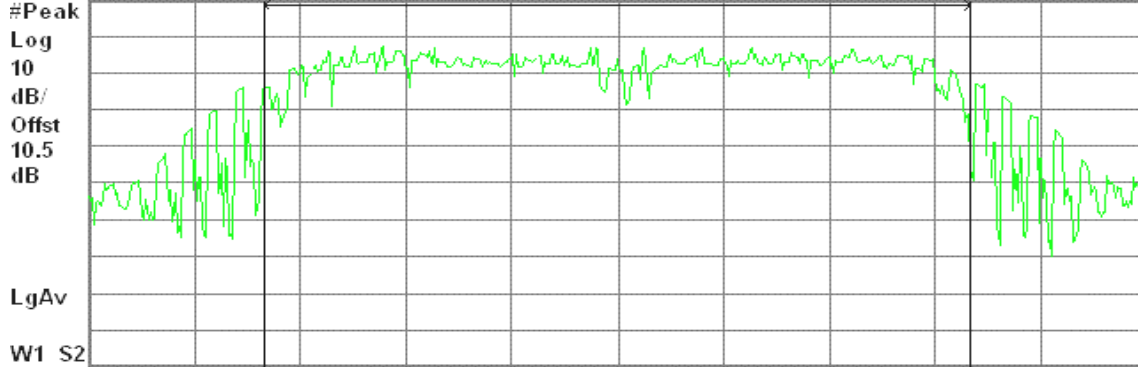
Agilent 17:54:21 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 26.88 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.36 dBm / 17.9180 MHz

-57.17 dBm/Hz

### IEEE 802.11g MIMO mode / Chain 1

#### Peak Power (CH Low)

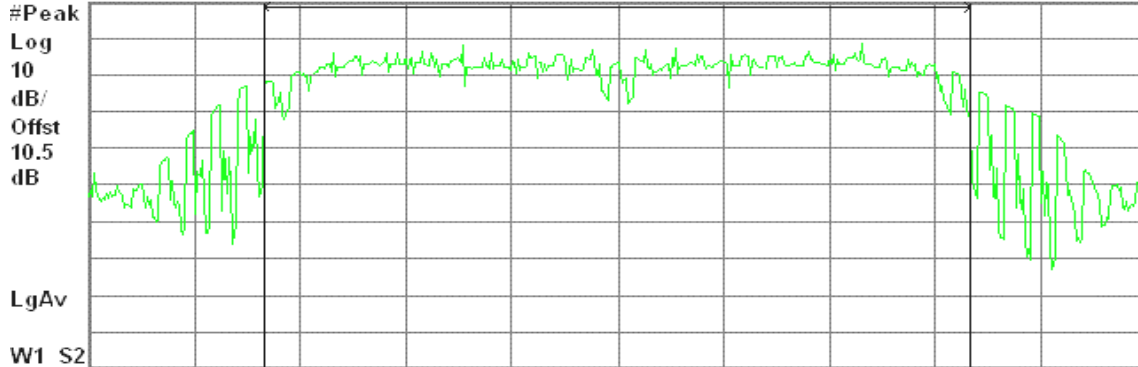
Agilent 21:15:49 Feb 16, 2006

R L

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.412 00 GHz

Span 26.97 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.28 dBm / 17.9790 MHz

-57.27 dBm/Hz



### Peak Power (CH Mid)

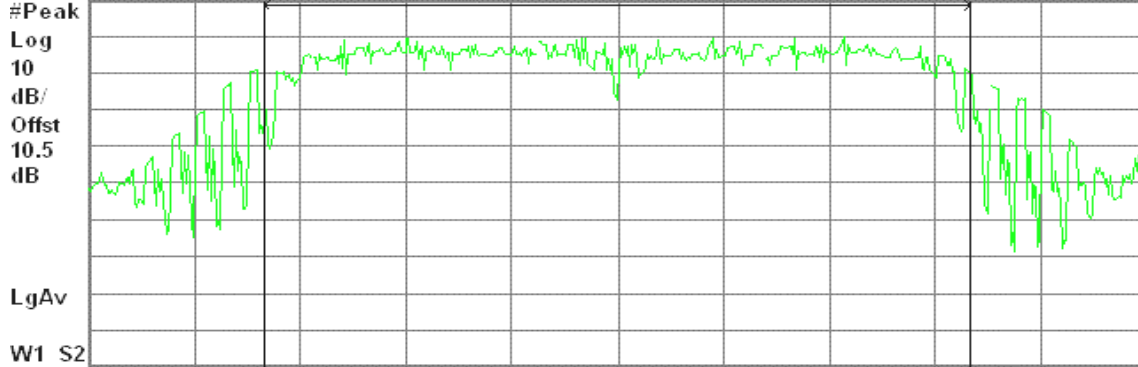
Agilent 21:22:44 Feb 16, 2006

R L

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.437 00 GHz

Span 26.94 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

17.76 dBm / 17.9610 MHz

-54.78 dBm/Hz

### Peak Power (CH High)

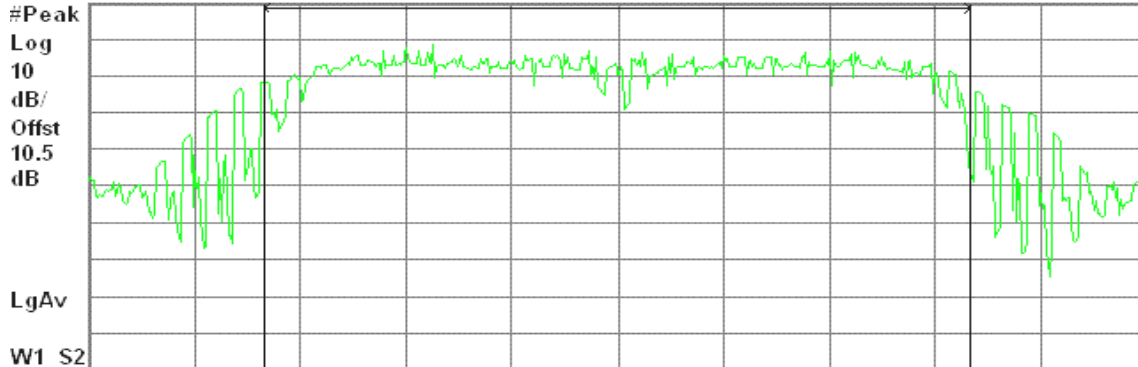
Agilent 21:28:39 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.462 00 GHz

Span 26.97 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.28 dBm / 17.9780 MHz

-57.27 dBm/Hz



### Channel Expansion – SIMO mode / Chain 0

#### Peak Power (CH Low)

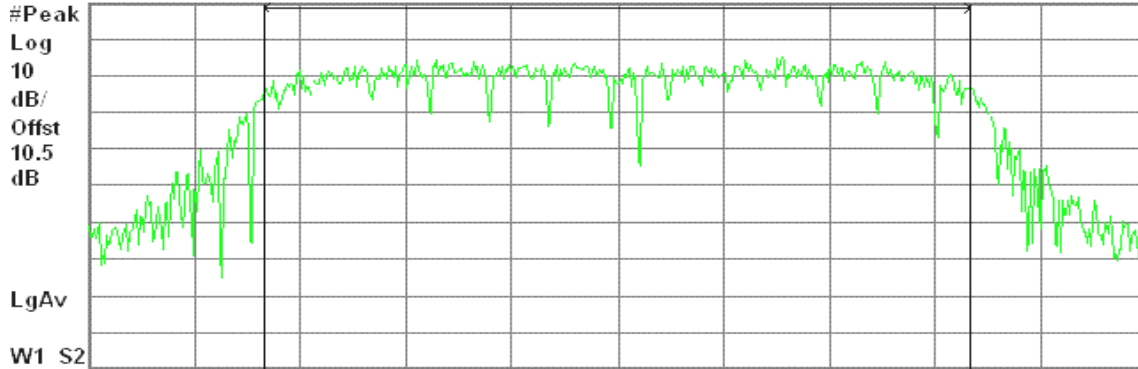
Agilent 18:46:35 Feb 16, 2006

R L

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

15.28 dBm / 31.6350 MHz

Power Spectral Density

-59.73 dBm/Hz

#### Peak Power (CH Mid)

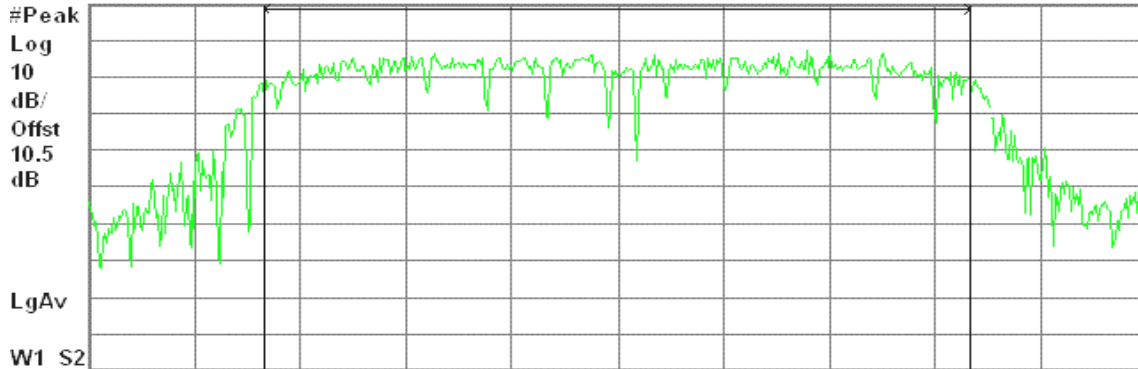
Agilent 18:54:14 Feb 16, 2006

R L

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Channel Power

17.56 dBm / 31.6380 MHz

Power Spectral Density

-57.44 dBm/Hz



### Peak Power (CH High)

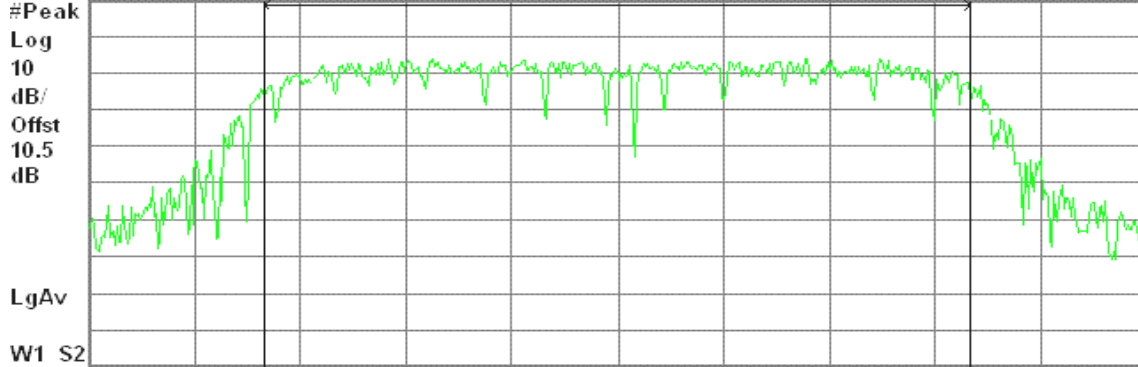
Agilent 19:03:18 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.452 00 GHz

Span 47.53 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.51 dBm / 31.6860 MHz

-59.50 dBm/Hz

### Channel Expansion – SIMO mode / Chain 1

#### Peak Power (CH Low)

Agilent 21:36:49 Feb 16, 2006

R L

Peak Output Power, g Mode Low Ch.

Ref 20 dBm

Atten 20 dB



Center 2.422 00 GHz

Span 47.46 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.75 dBm / 31.6370 MHz

-59.25 dBm/Hz



### Peak Power (CH Mid)

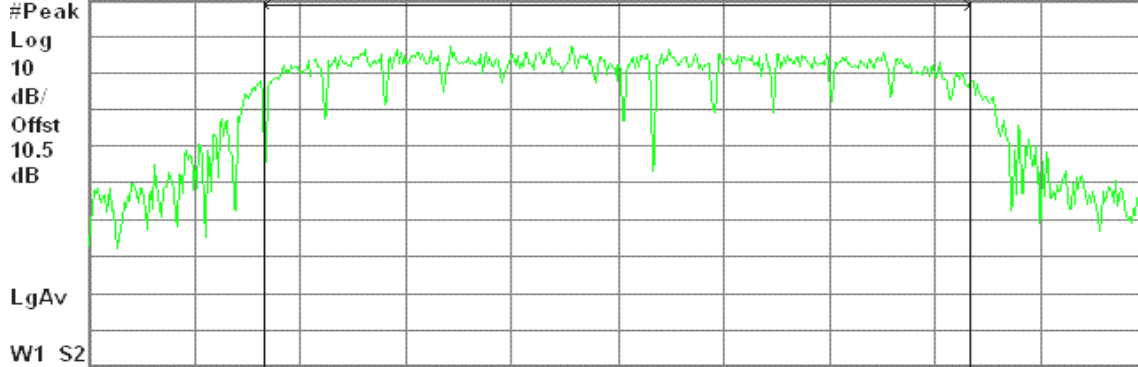
Agilent 21:43:17 Feb 16, 2006

R L

Peak Output Power, g Mode Mid Ch.

Ref 20 dBm

Atten 20 dB



Center 2.447 00 GHz

Span 47.49 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

17.64 dBm / 31.6610 MHz

-57.36 dBm/Hz

### Peak Power (CH High)

Agilent 21:48:50 Feb 16, 2006

R L

Peak Output Power, g Mode High Ch.

Ref 20 dBm

Atten 20 dB



Center 2.452 00 GHz

Span 47.39 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.60 dBm / 31.5920 MHz

-59.39 dBm/Hz



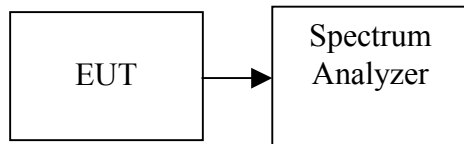


## 7.3 AVERAGE POWER

### 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)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)
Low	2412	12.59	12.44	15.53	0.03573
Mid	2437	14.95	14.76	17.87	0.06124
High	2462	12.30	12.73	15.53	0.03573

**Test mode: IEEE 802.11g mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)
Low	2412	11.88	12.02	14.96	0.03133
Mid	2437	14.56	13.24	16.96	0.04966
High	2462	11.99	11.24	14.64	0.02911

**Test mode: IEEE 802.11g MIMO mode**

Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)
Low	2412	12.48	12.55	15.53	0.03573
Mid	2437	15.27	14.64	17.98	0.06281
High	2462	12.14	12.19	15.18	0.03296

**Test mode: Channel Expansion – SIMO mode**

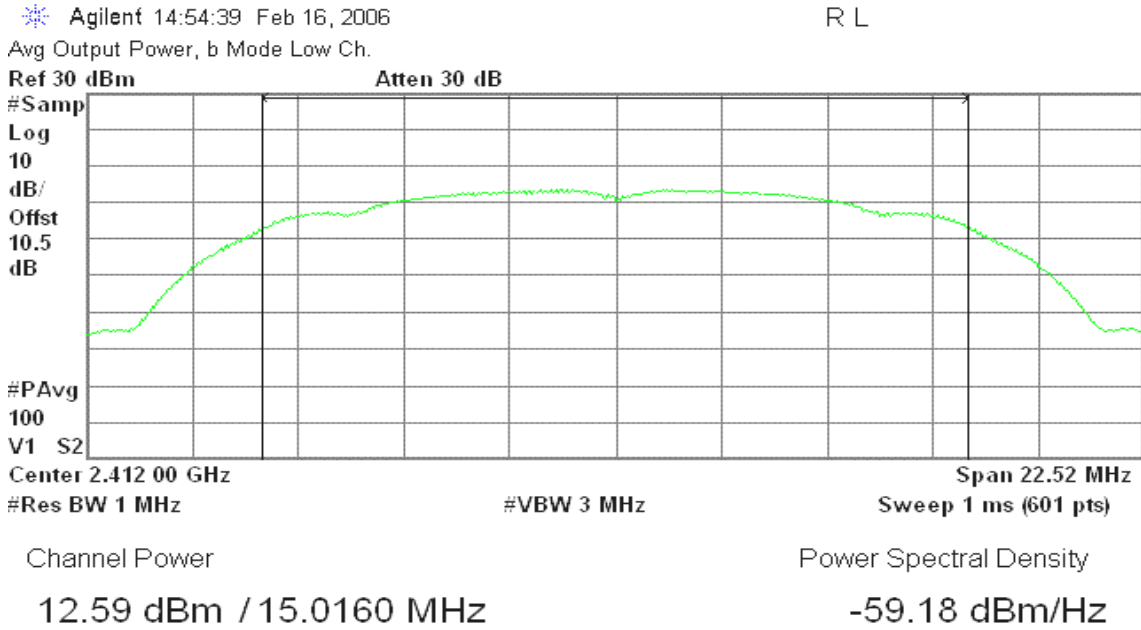
Channel	Frequency (MHz)	Chain 0 Output Power (dBm)	Chain 1 Output Power (dBm)	Output Power (dBm)	Output Power (W)
Low	2422	12.04	12.63	15.36	0.03436
Mid	2447	14.67	14.65	17.67	0.05848
High	2452	12.05	11.89	14.98	0.03148



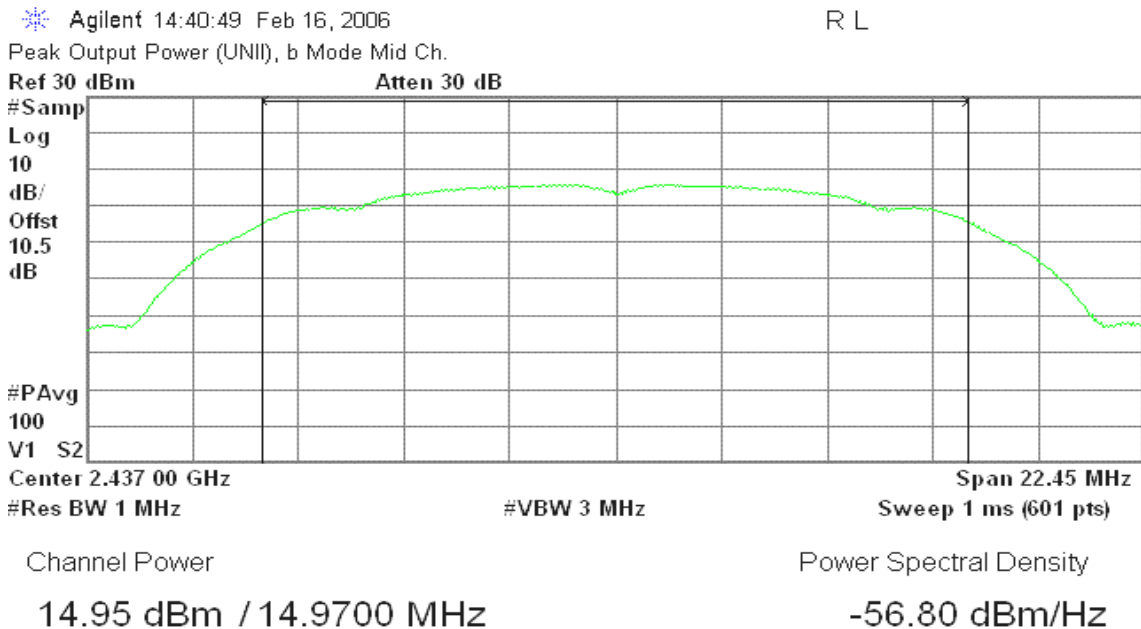
**Test Plot**

**IEEE 802.11b mode / Chain 0**

**Average Power (CH Low)**



**Average Power (CH Mid)**





### Average Power (CH High)

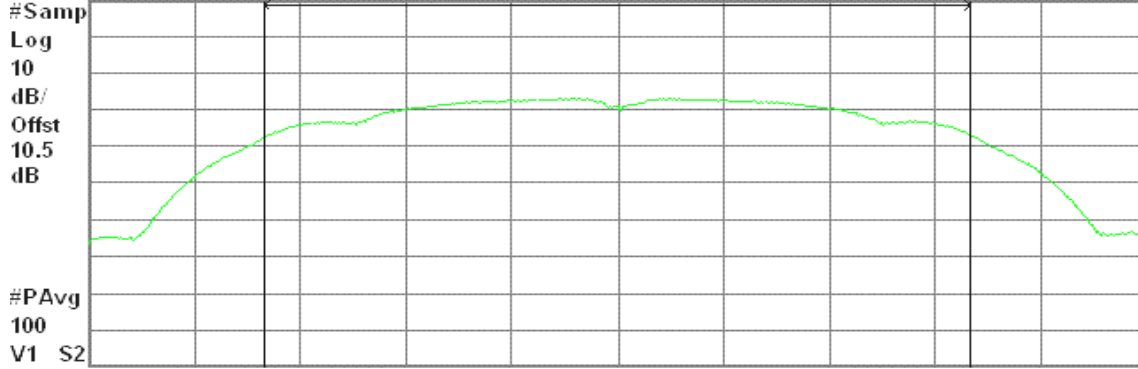
Agilent 15:03:11 Feb 16, 2006

R L

Avg Output Power, b Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 22.48 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.30 dBm / 14.9880 MHz

-59.46 dBm/Hz

### IEEE 802.11b mode / Chain 1

#### Average Power (CH Low)

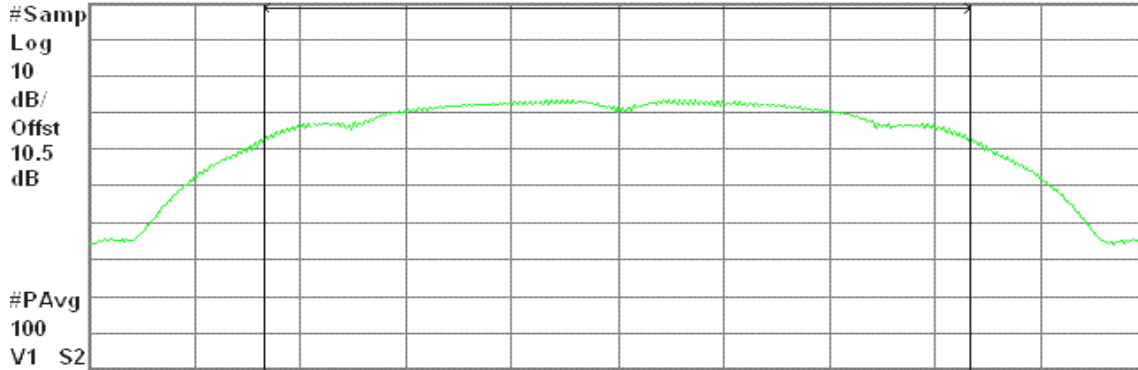
Agilent 19:16:49 Feb 16, 2006

R L

Avg Output Power, b Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 22.45 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.44 dBm / 14.9650 MHz

-59.31 dBm/Hz



### Average Power (CH Mid)

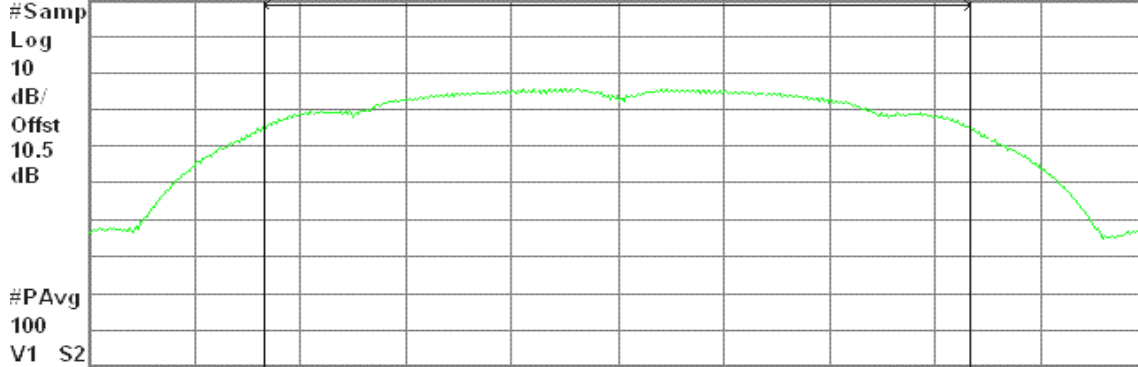
Agilent 19:28:03 Feb 16, 2006

R L

Avg Output Power, b Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 22.47 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.76 dBm / 14.9820 MHz

-57.00 dBm/Hz

### Average Power (CH High)

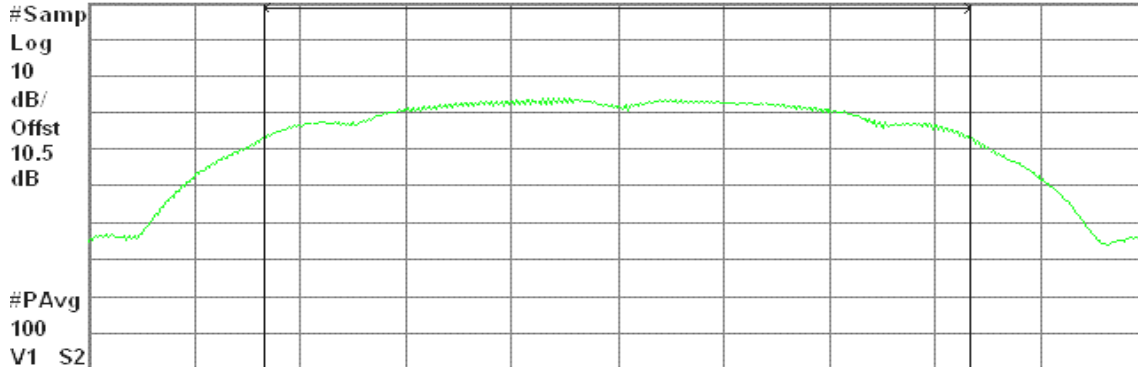
Agilent 21:10:47 Feb 16, 2006

R L

Avg Output Power, b Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 22.48 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.73 dBm / 14.9900 MHz

-59.03 dBm/Hz



### IEEE 802.11g mode / Chain 0

#### Average Power (CH Low)

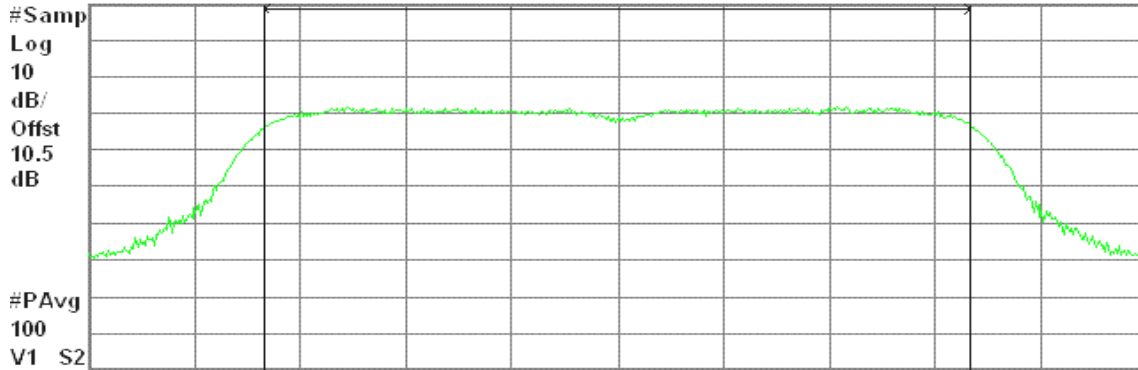
Agilent 16:13:27 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 24.36 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.88 dBm / 16.2390 MHz

-60.22 dBm/Hz

#### Average Power (CH Mid)

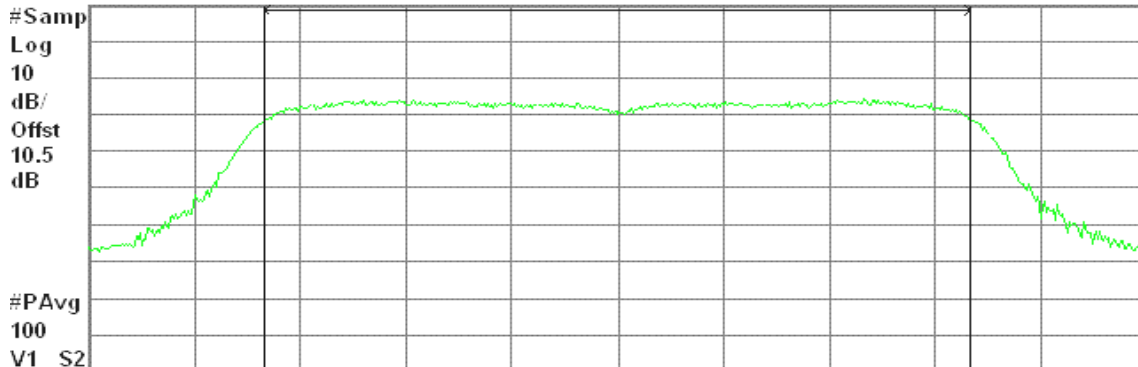
Agilent 16:23:30 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 24.4 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.56 dBm / 16.2670 MHz

-57.55 dBm/Hz



### Average Power (CH High)

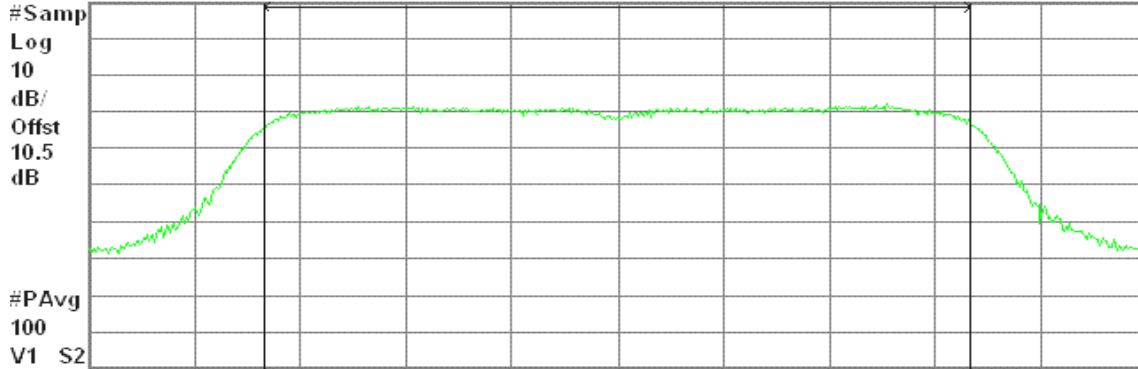
Agilent 16:37:03 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 24.39 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.99 dBm / 16.2630 MHz

-60.12 dBm/Hz

### IEEE 802.11g mode / Chain 1

#### Average Power (CH Low)

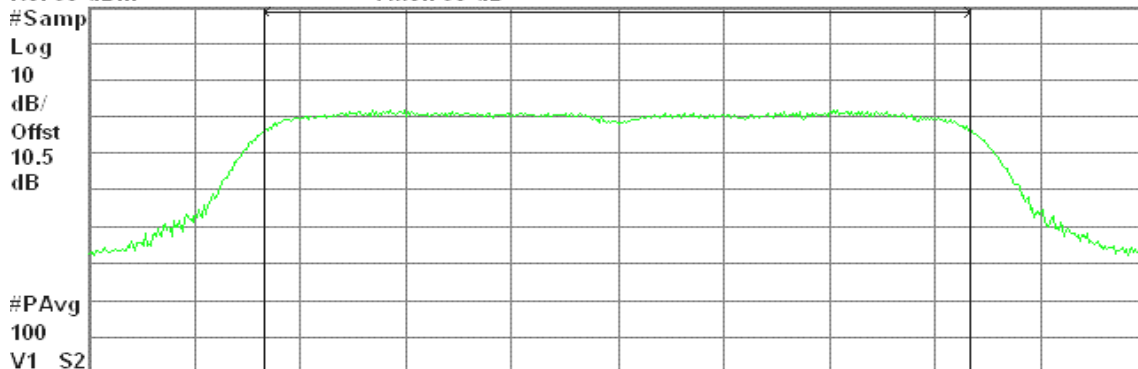
Agilent 21:01:07 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 24.43 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.02 dBm / 16.2850 MHz

-60.10 dBm/Hz



### Average Power (CH Mid)

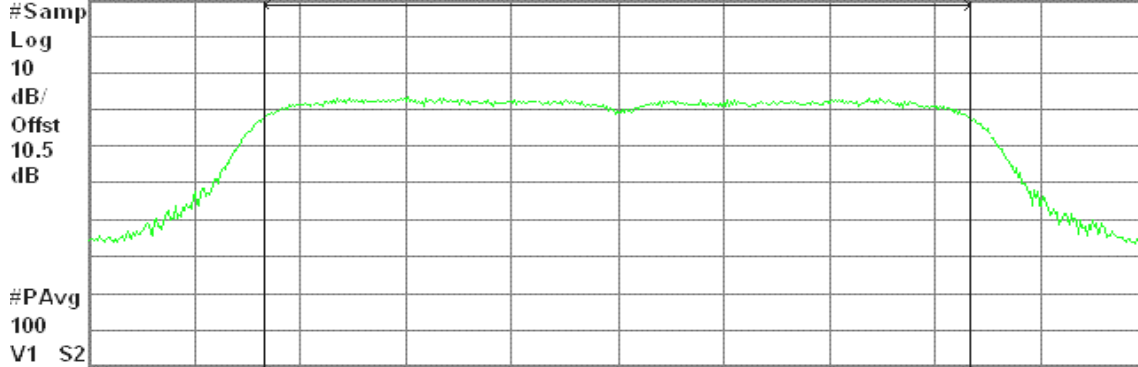
Agilent 20:12:45 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 24.4 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

13.24 dBm / 16.2660 MHz

-58.87 dBm/Hz

### Average Power (CH High)

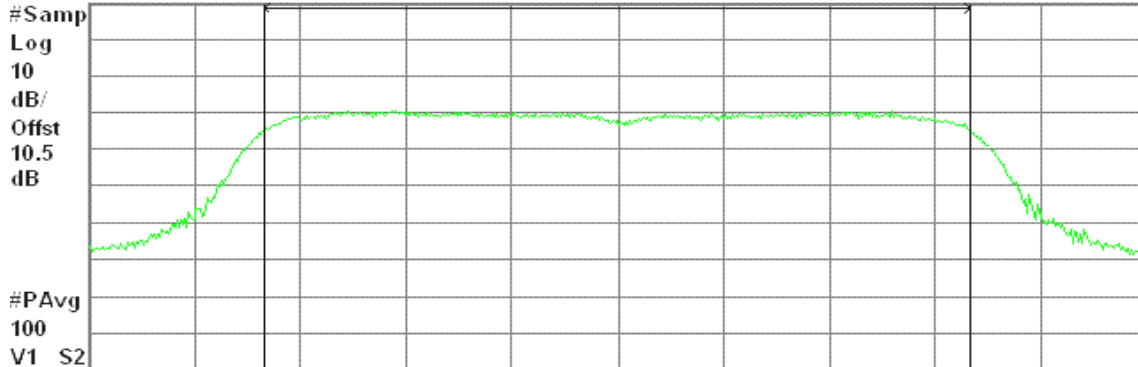
Agilent 20:24:49 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 24.43 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.24 dBm / 16.2860 MHz

-60.88 dBm/Hz





### IEEE 802.11g MIMO mode / Chain 0

#### Average Power (CH Low)

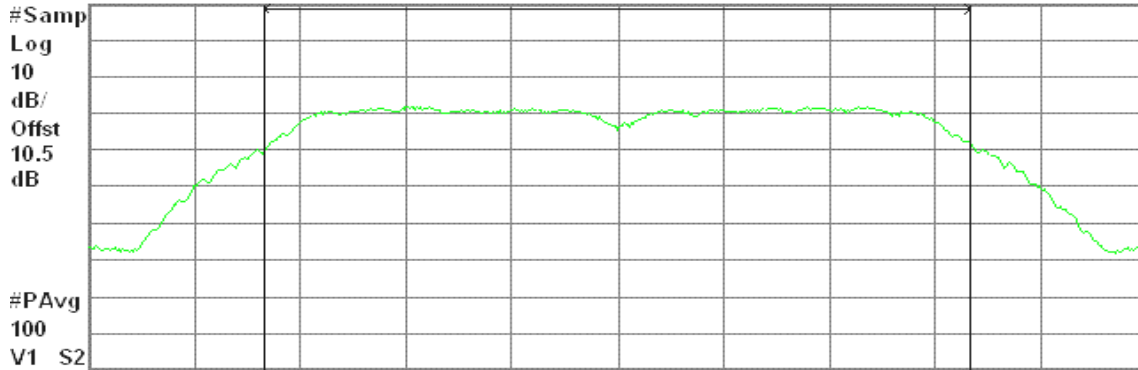
Agilent 17:39:48 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 26.8 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.48 dBm / 17.8690 MHz

-60.04 dBm/Hz

#### Average Power (CH Mid)

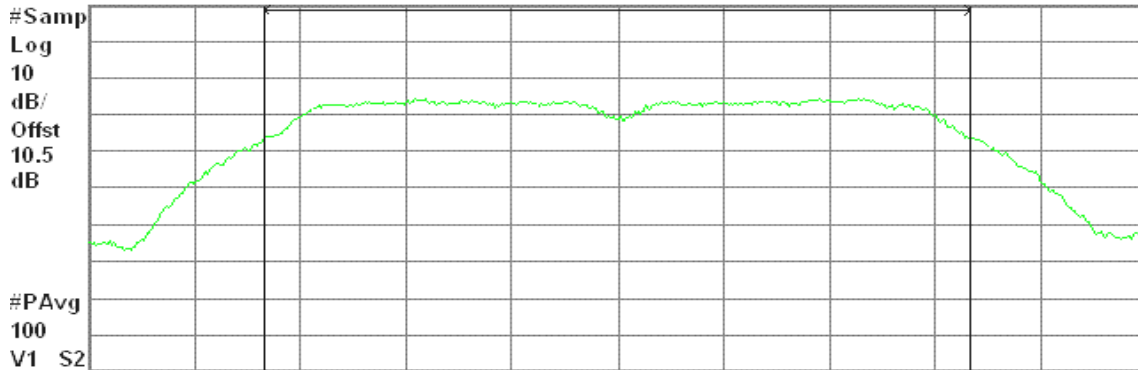
Agilent 17:47:12 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 26.89 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

15.27 dBm / 17.9250 MHz

-57.26 dBm/Hz



### Average Power (CH High)

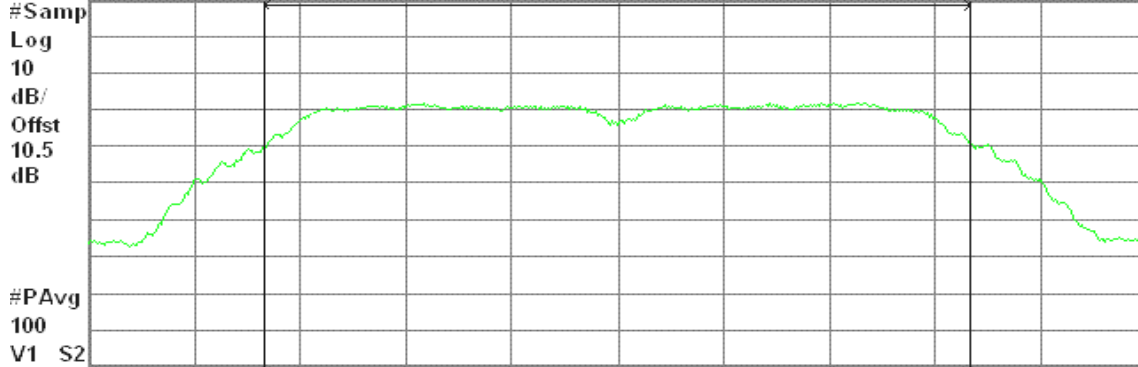
Agilent 17:54:54 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 26.88 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.14 dBm / 17.9180 MHz

-60.39 dBm/Hz

### IEEE 802.11g MIMO mode / Chain 1

#### Average Power (CH Low)

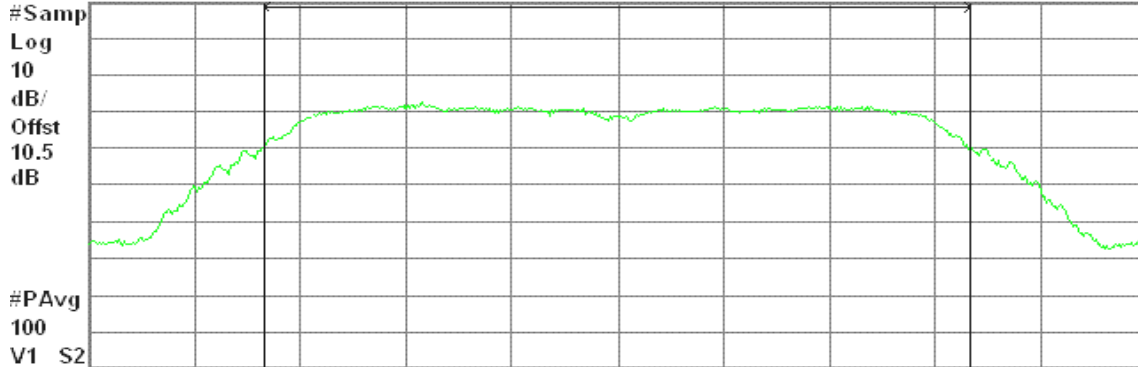
Agilent 21:16:15 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.412 00 GHz

Span 26.97 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.55 dBm / 17.9790 MHz

-60.00 dBm/Hz



### Average Power (CH Mid)

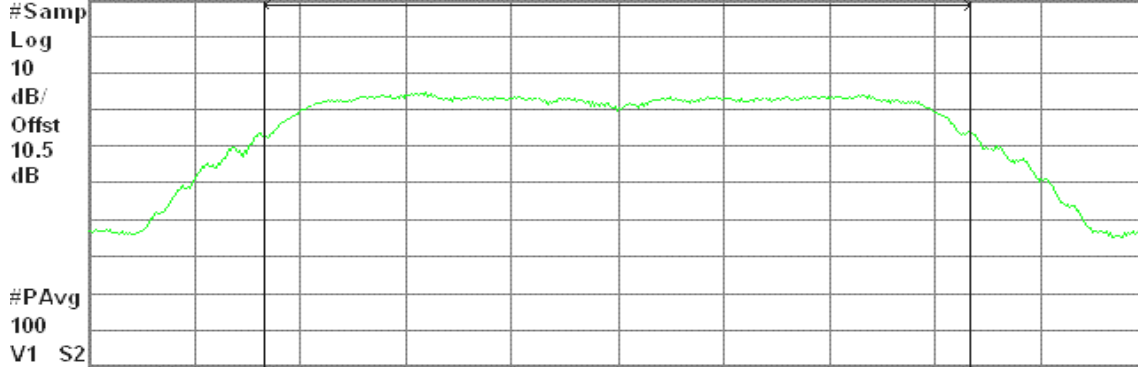
Agilent 21:23:11 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.437 00 GHz

Span 26.94 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.64 dBm / 17.9610 MHz

-57.91 dBm/Hz

### Average Power (CH High)

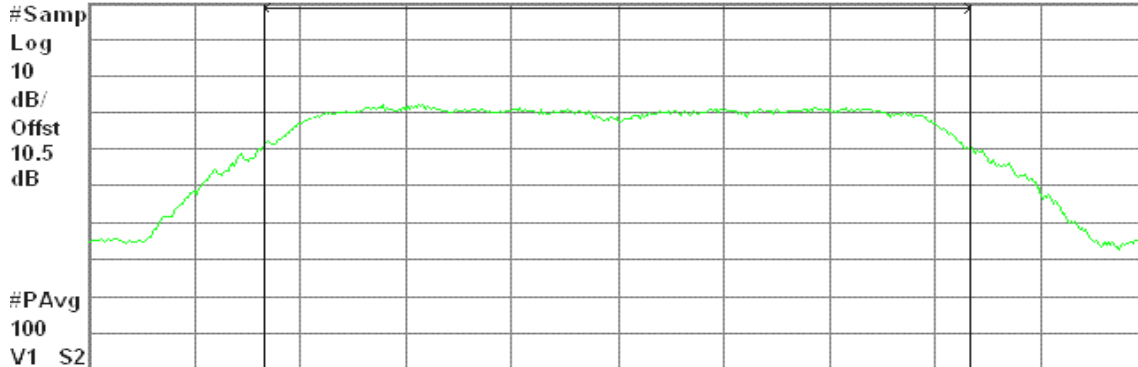
Agilent 21:29:09 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.462 00 GHz

Span 26.97 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.19 dBm / 17.9780 MHz

-60.36 dBm/Hz



### Channel Expansion – SIMO mode / Chain 0

#### Average Power (CH Low)

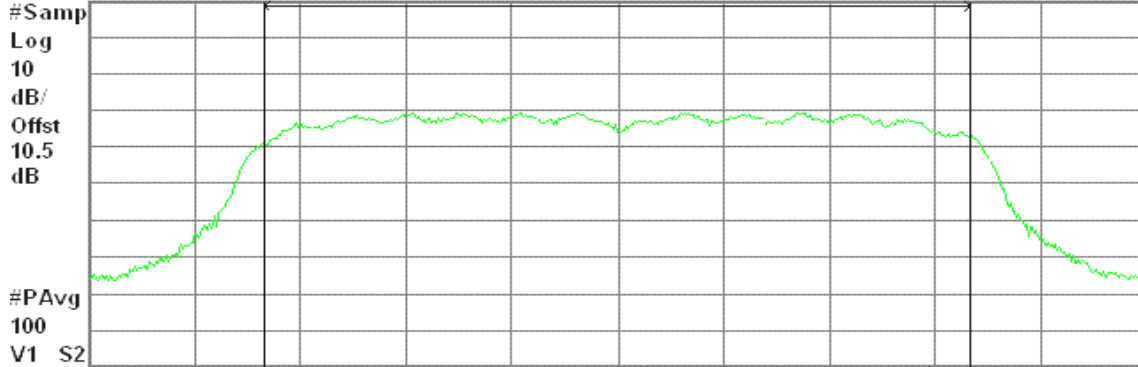
Agilent 18:47:04 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.422 00 GHz

Span 47.45 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.04 dBm / 31.6350 MHz

-62.97 dBm/Hz

#### Average Power (CH Mid)

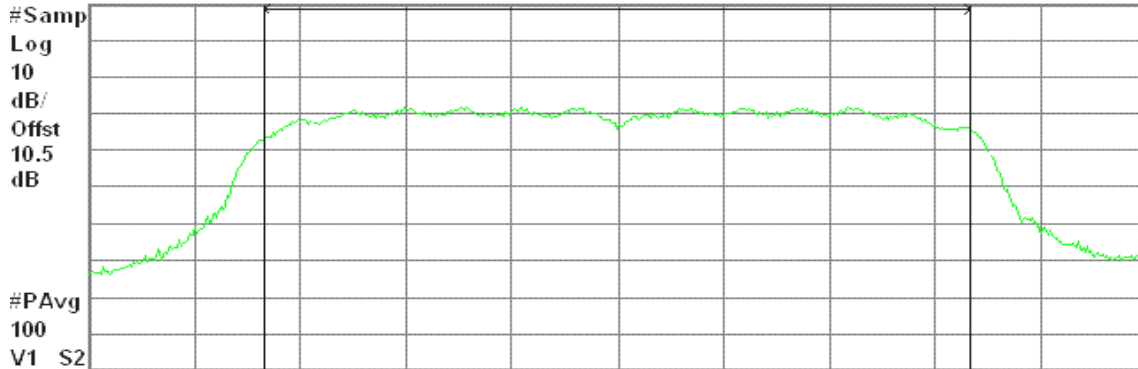
Agilent 18:54:44 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.447 00 GHz

Span 47.46 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.67 dBm / 31.6380 MHz

-60.34 dBm/Hz



### Average Power (CH High)

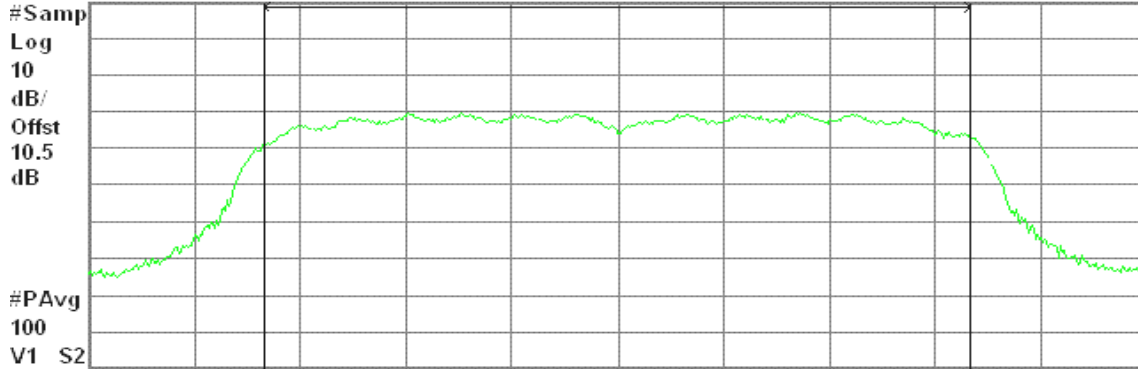
Agilent 19:03:46 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.452 00 GHz

Span 47.53 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.05 dBm / 31.6860 MHz

-62.96 dBm/Hz

### Channel Expansion – SIMO mode / Chain 1

#### Average Power (CH Low)

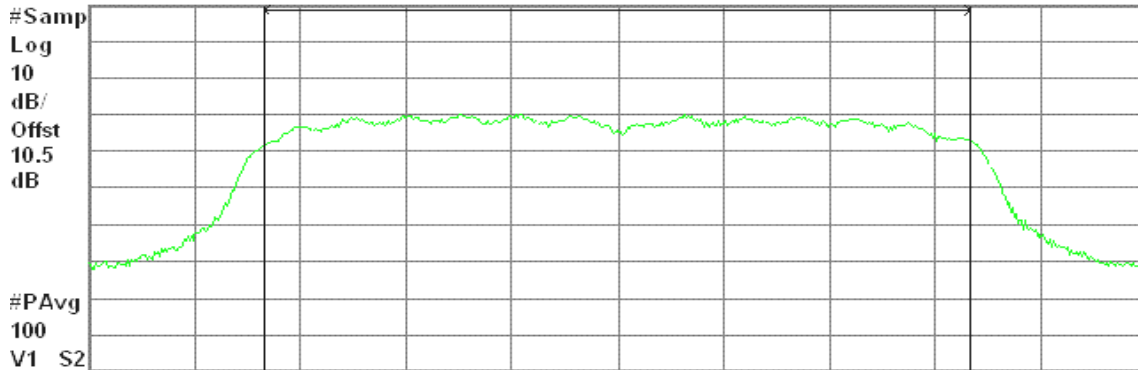
Agilent 21:37:15 Feb 16, 2006

R L

Avg Output Power, g Mode Low Ch.

Ref 30 dBm

Atten 30 dB



Center 2.422 00 GHz

Span 47.46 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

12.63 dBm / 31.6370 MHz

-62.38 dBm/Hz



### Average Power (CH Mid)

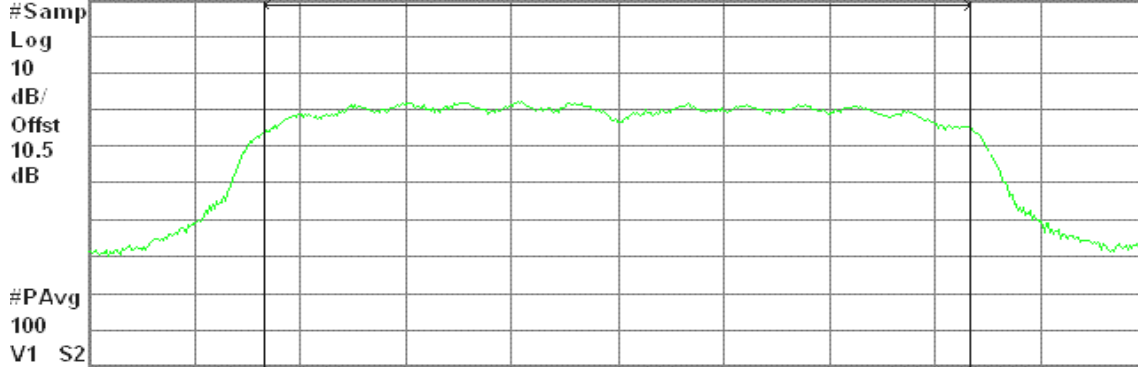
Agilent 21:43:44 Feb 16, 2006

R L

Avg Output Power, g Mode Mid Ch.

Ref 30 dBm

Atten 30 dB



Center 2.447 00 GHz

Span 47.49 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

14.65 dBm / 31.6610 MHz

-60.35 dBm/Hz

### Average Power (CH High)

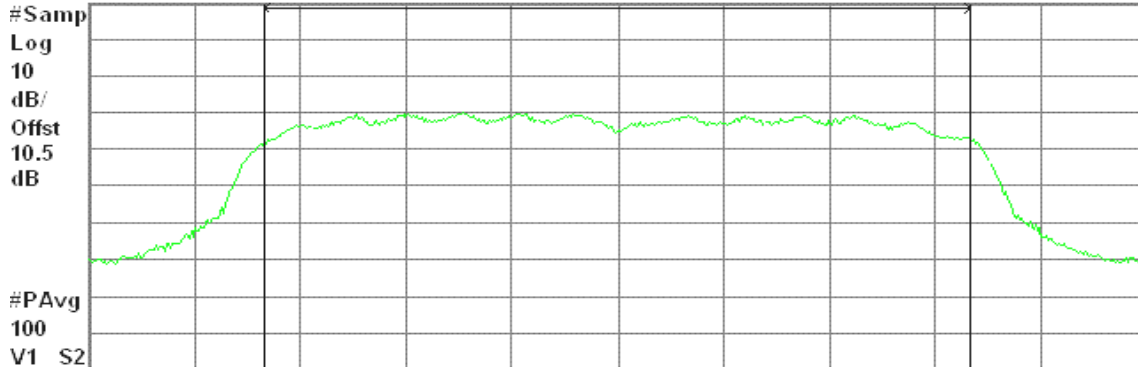
Agilent 21:49:16 Feb 16, 2006

R L

Avg Output Power, g Mode High Ch.

Ref 30 dBm

Atten 30 dB



Center 2.452 00 GHz

Span 47.39 MHz

#Res BW 1 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Channel Power

Power Spectral Density

11.89 dBm / 31.5920 MHz

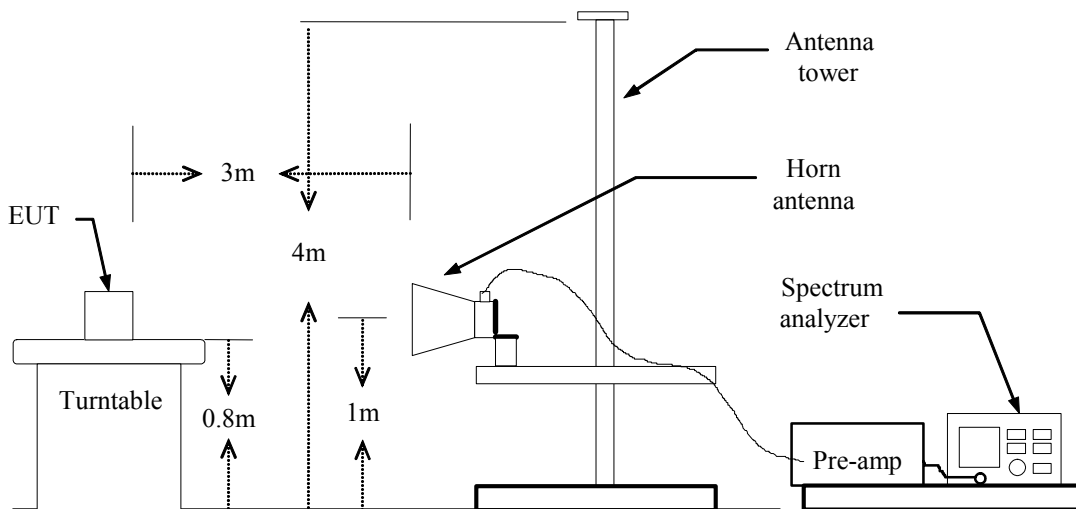
-63.10 dBm/Hz

## 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.



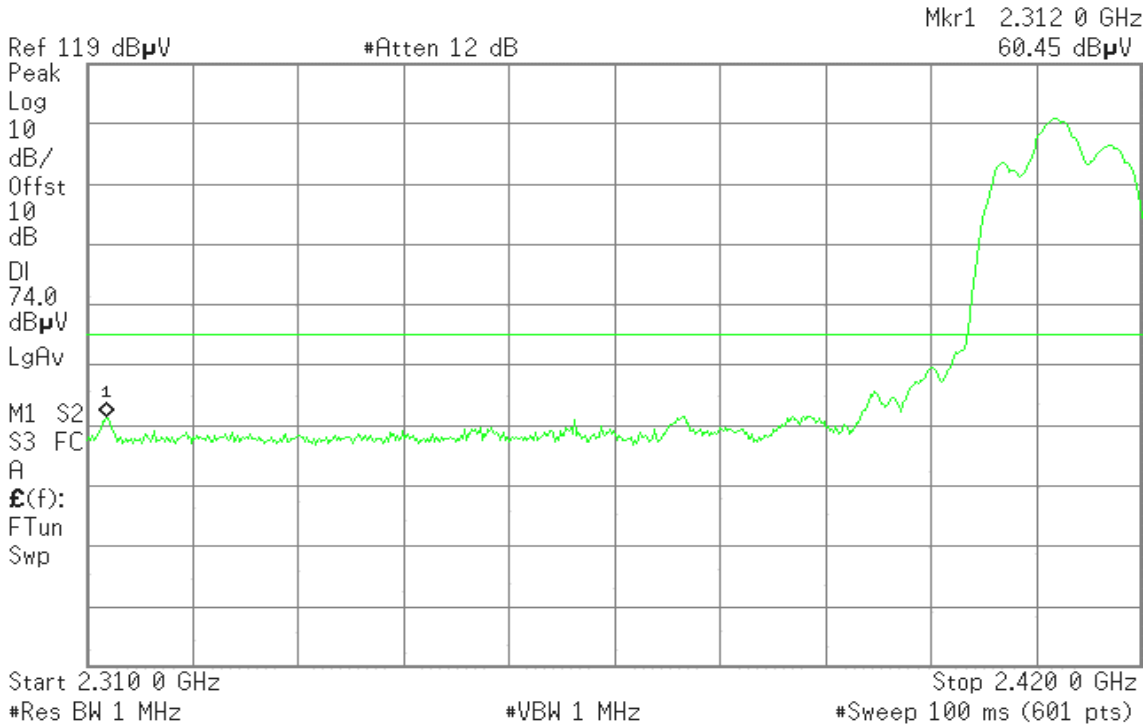
**Band Edges (IEEE 802.11b mode (Chain 0 + Chain 1) / CH Low)**

**Detector mode: Peak**

**Polarity: Vertical**

Agilent

T

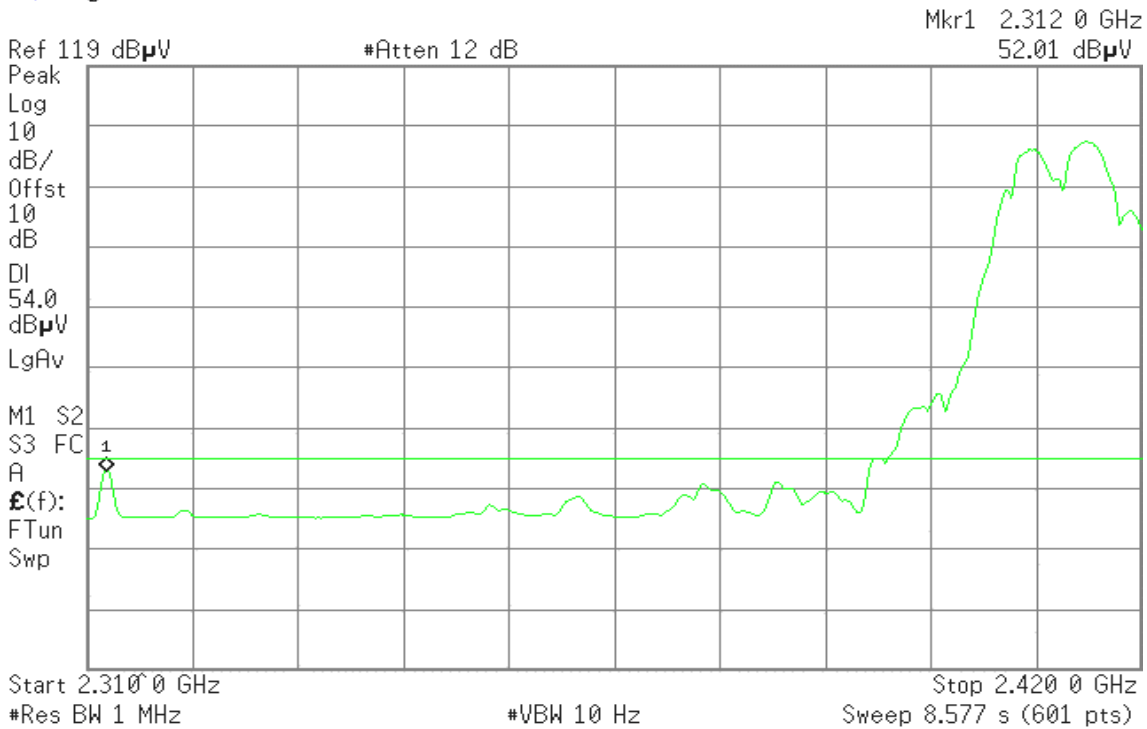


**Detector mode: Average**

**Polarity: Vertical**

Agilent

T







Detector mode: Peak

Polarity: Horizontal

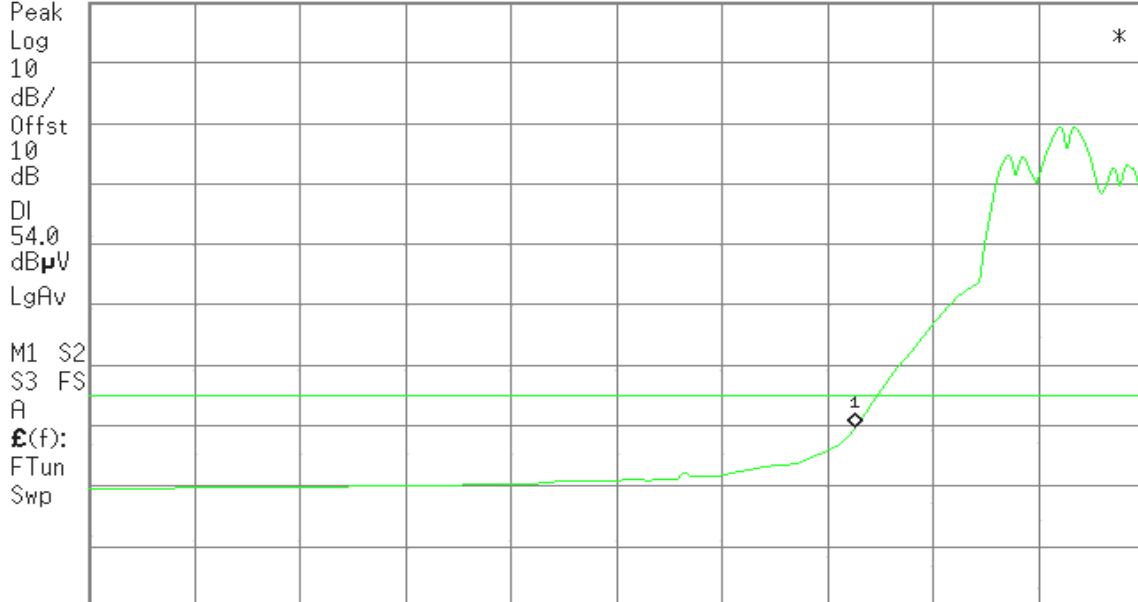
Agilent

T

Mkr1 2.390 0 GHz  
48.64 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

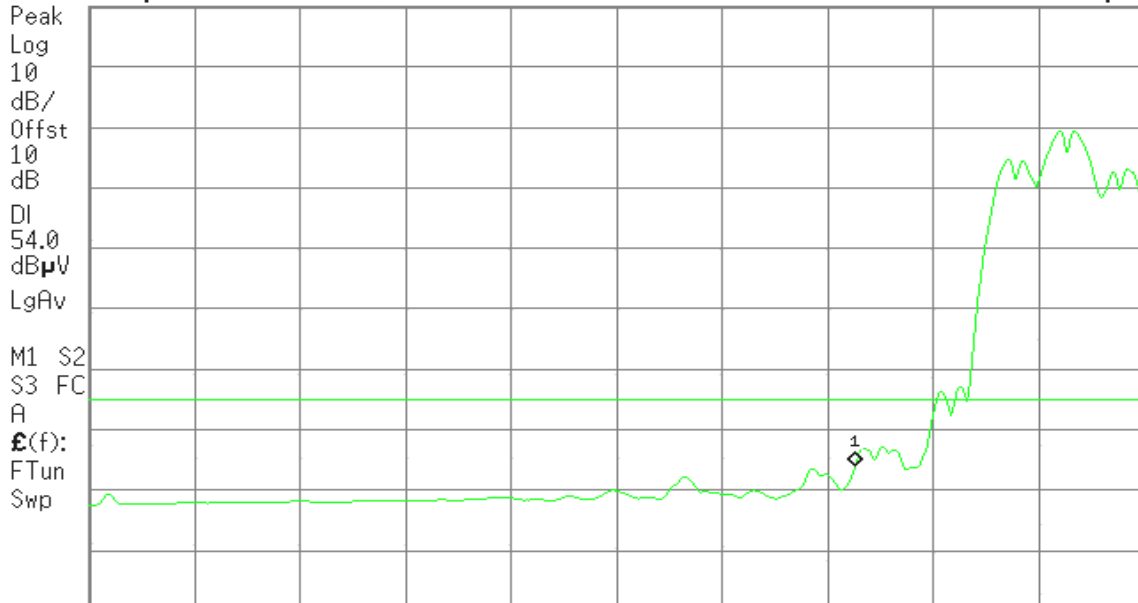
Agilent

T

Mkr1 2.390 0 GHz  
42.88 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.310 0 GHz

Stop 2.420 0 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 8.577 s (601 pts)



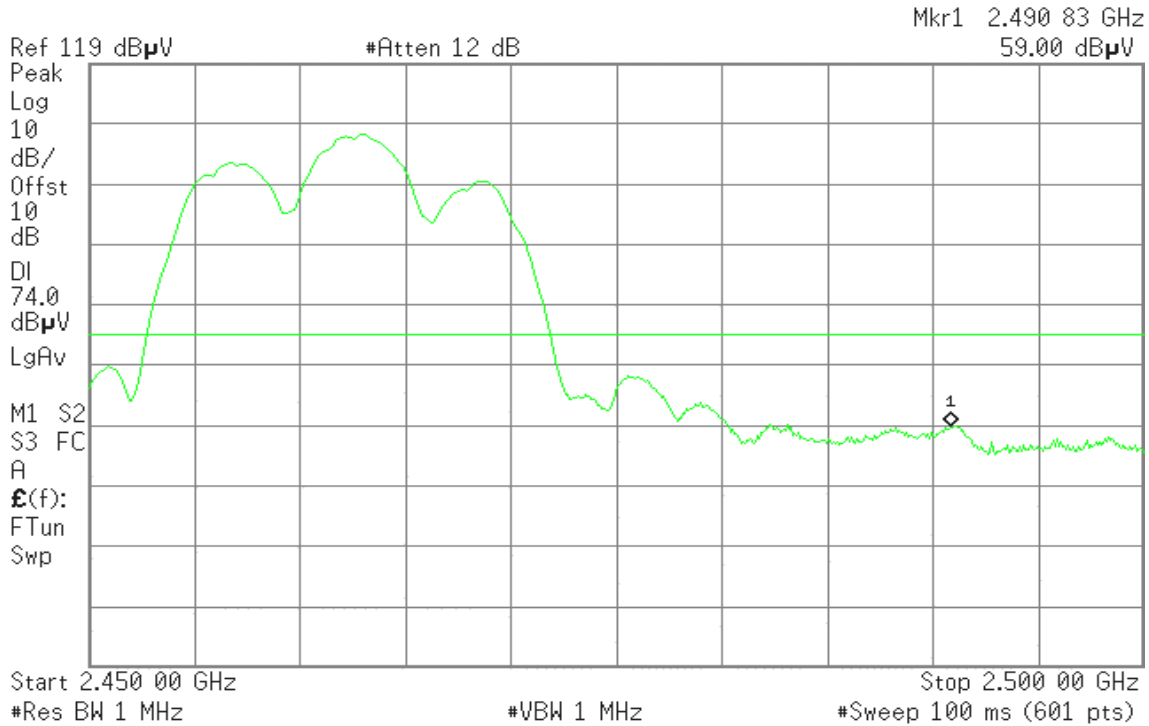
### Band Edges (IEEE 802.11b mode (Chain 0 + Chain 1) / CH High)

Detector mode: Peak

Polarity: Vertical

Agilent

T

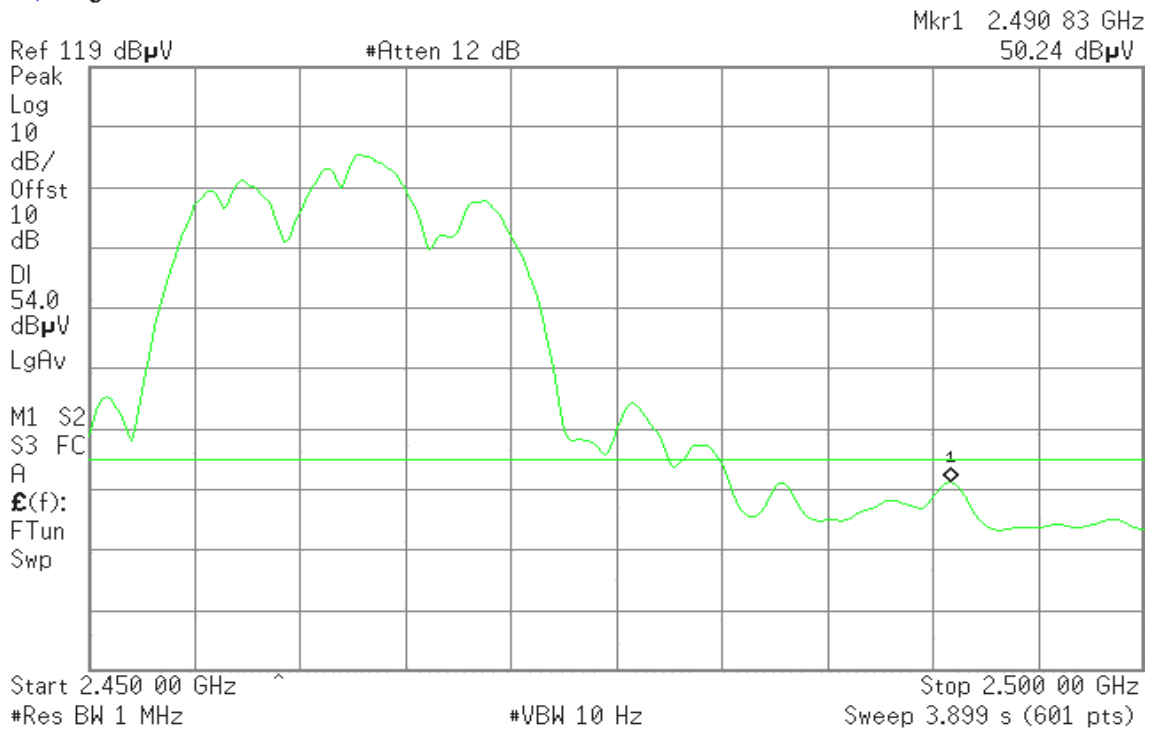


Detector mode: Average

Polarity: Vertical

Agilent

T





Detector mode: Peak

Polarity: Horizontal

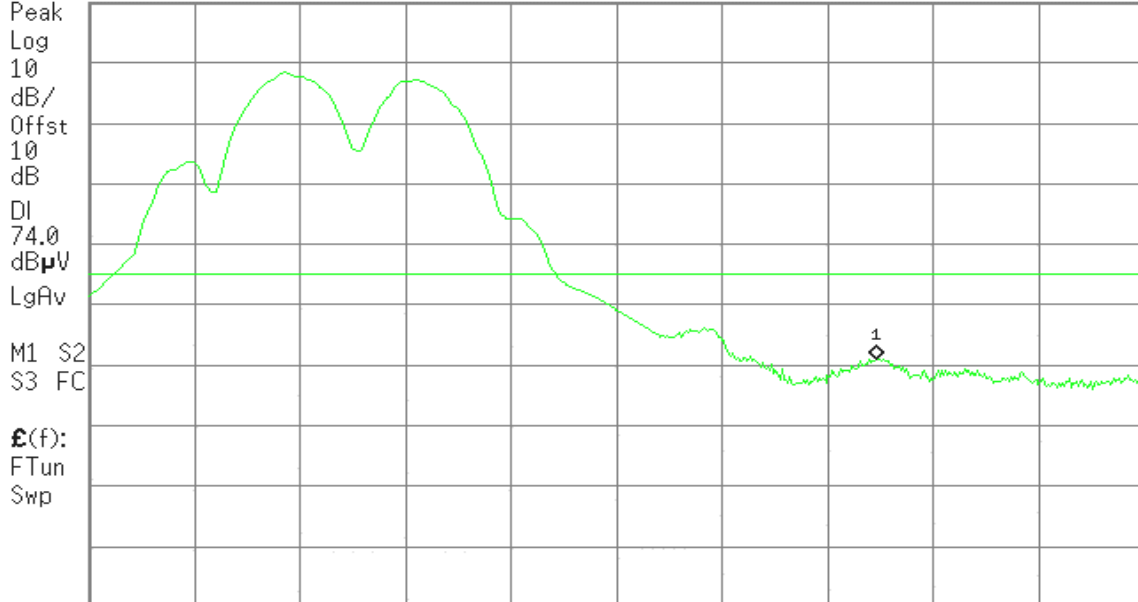
Agilent

T

Mkr1 2.487 33 GHz  
59.93 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

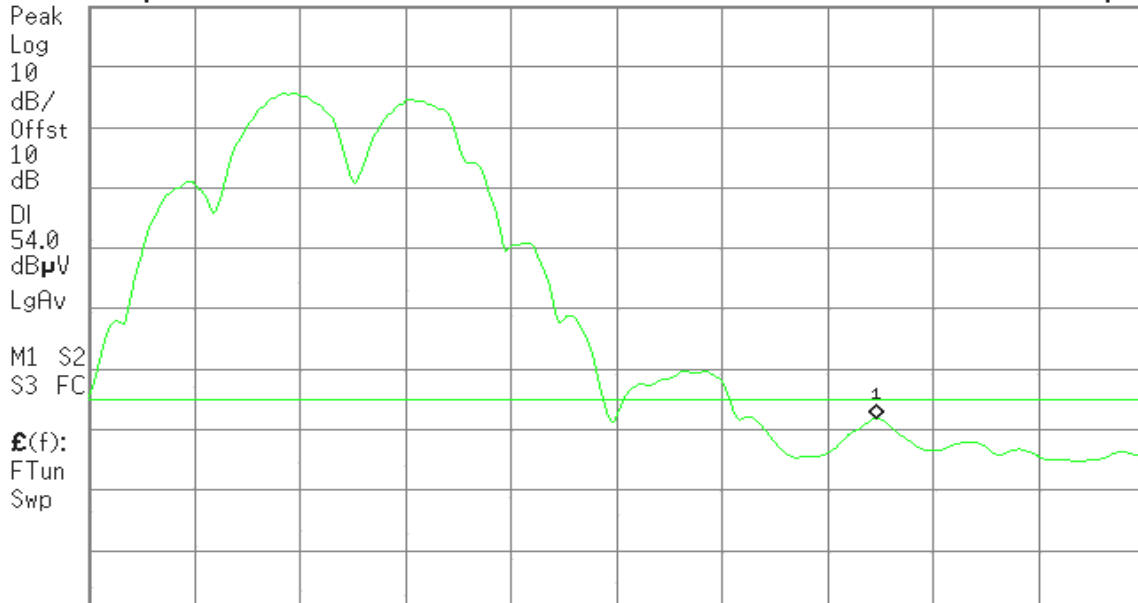
Agilent

T

Mkr1 2.487 33 GHz  
50.81 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.899 s (601 pts)



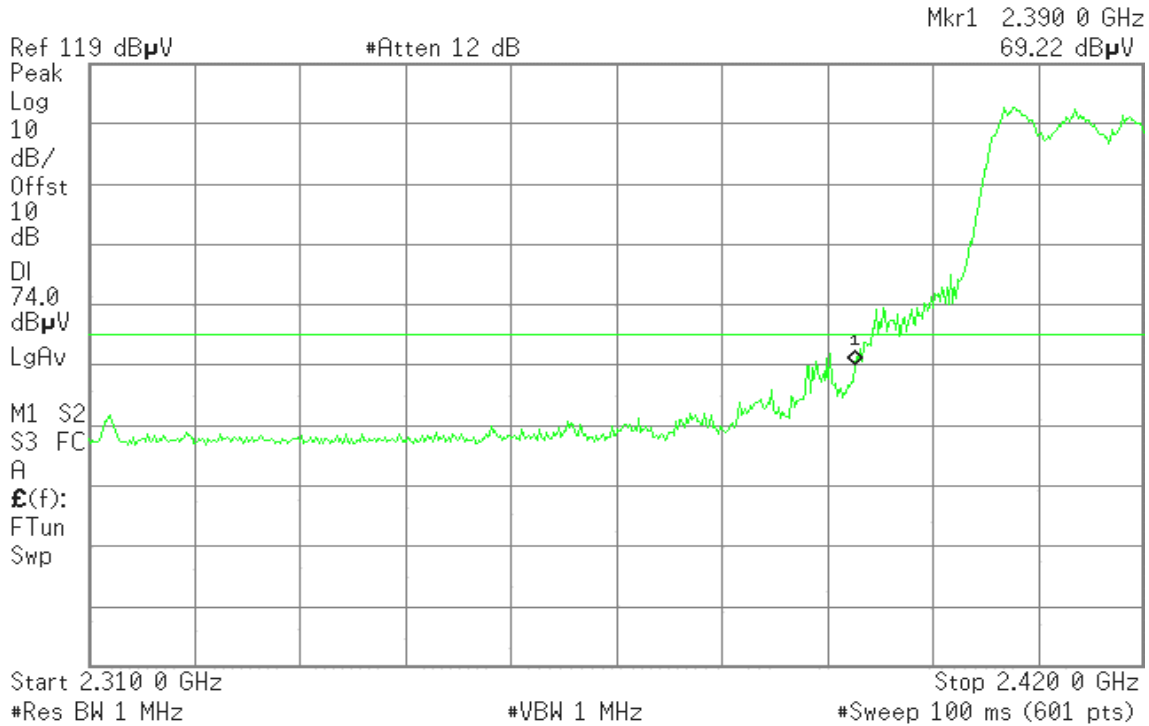
### Band Edges (IEEE 802.11g mode (Chain 0 + Chain 1) / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent

T



Detector mode: Average

Polarity: Vertical

Agilent

T



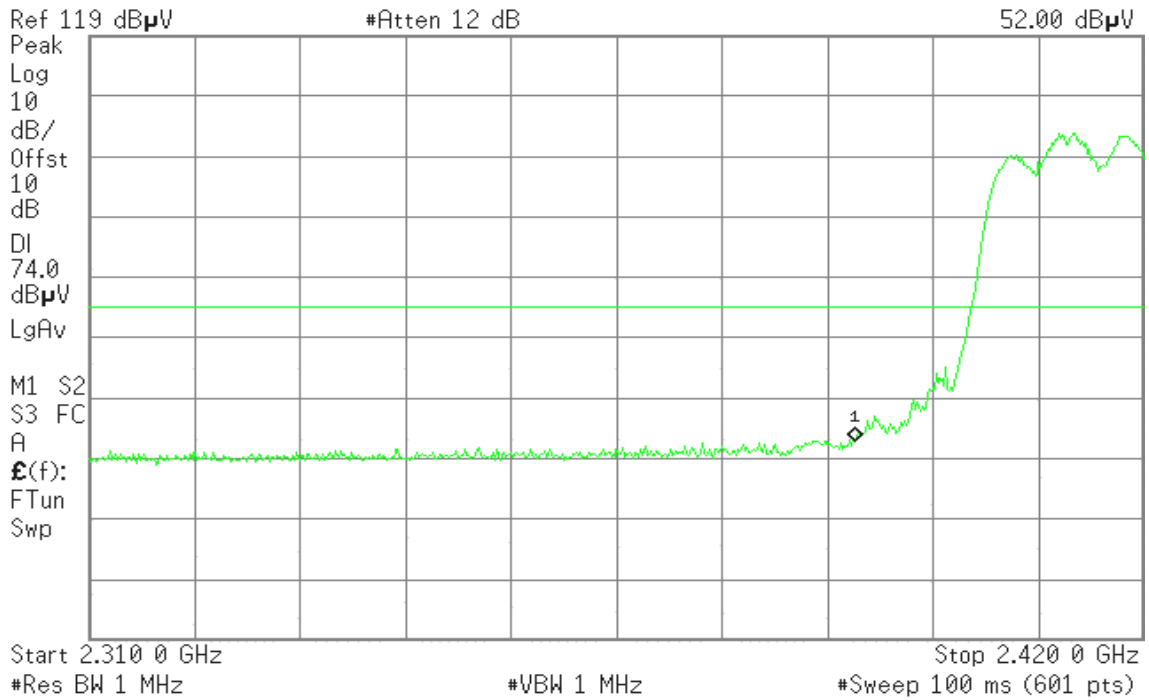


Detector mode: Peak

Polarity: Horizontal

Agilent

T

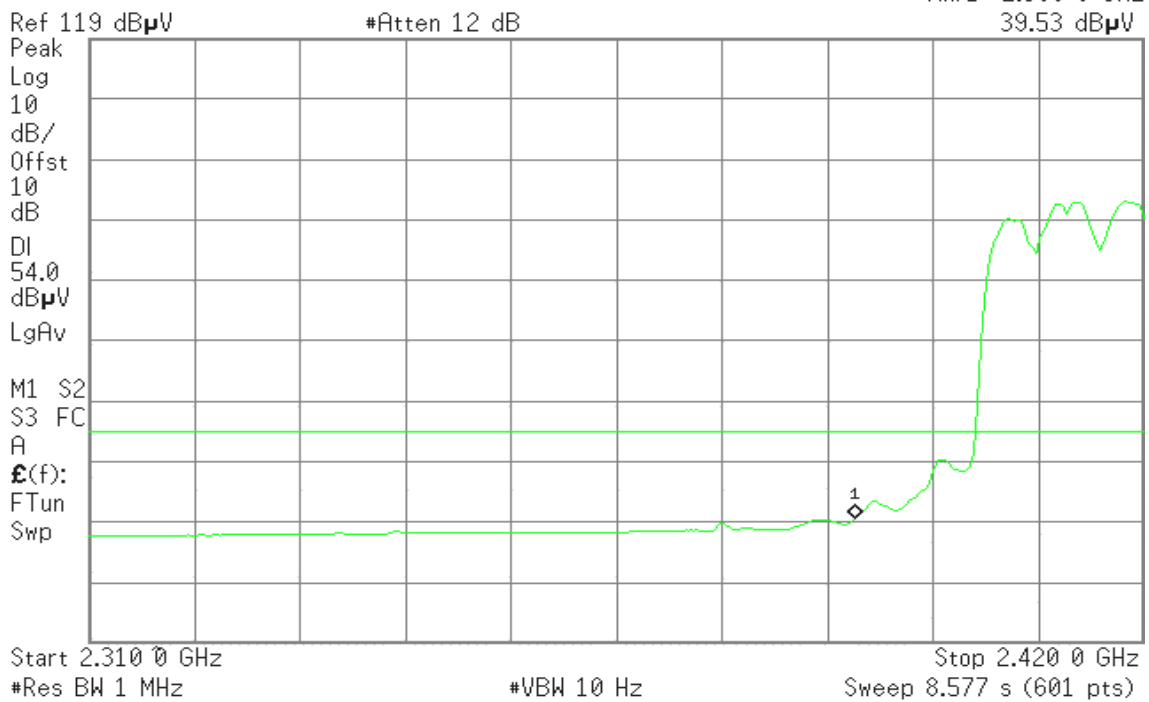


Detector mode: Average

Polarity: Horizontal

Agilent

T





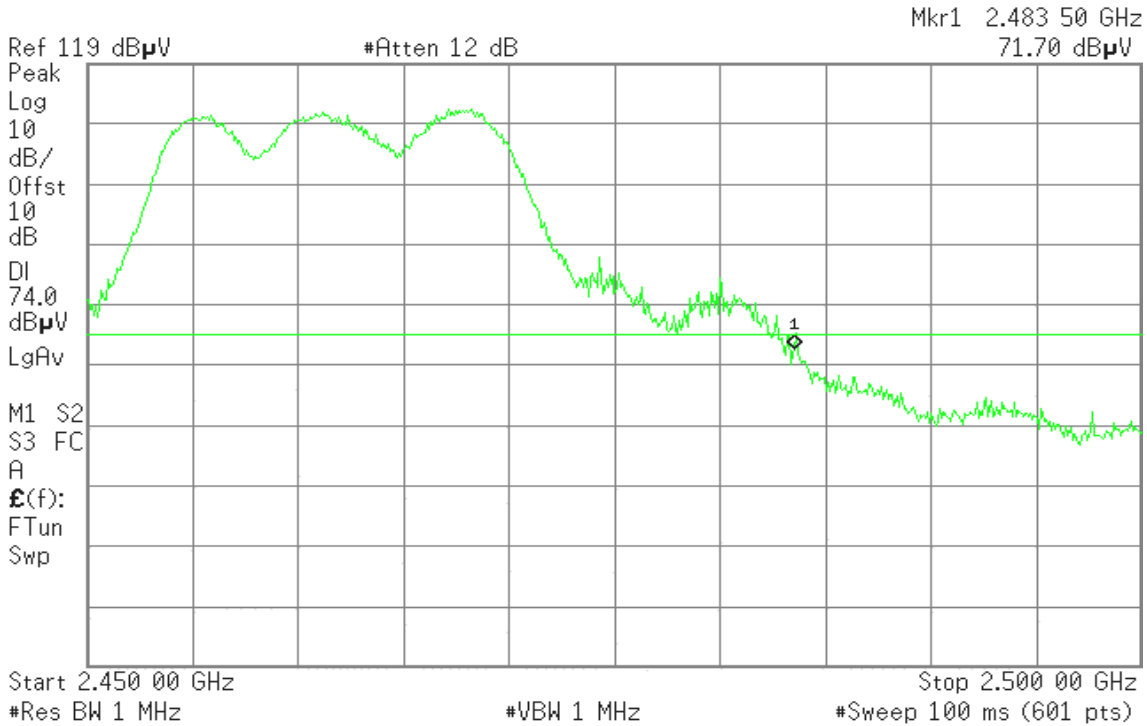
### Band Edges (IEEE 802.11g mode (Chain 0 + Chain 1) / CH High)

Detector mode: Peak

Polarity: Vertical

Agilent

T

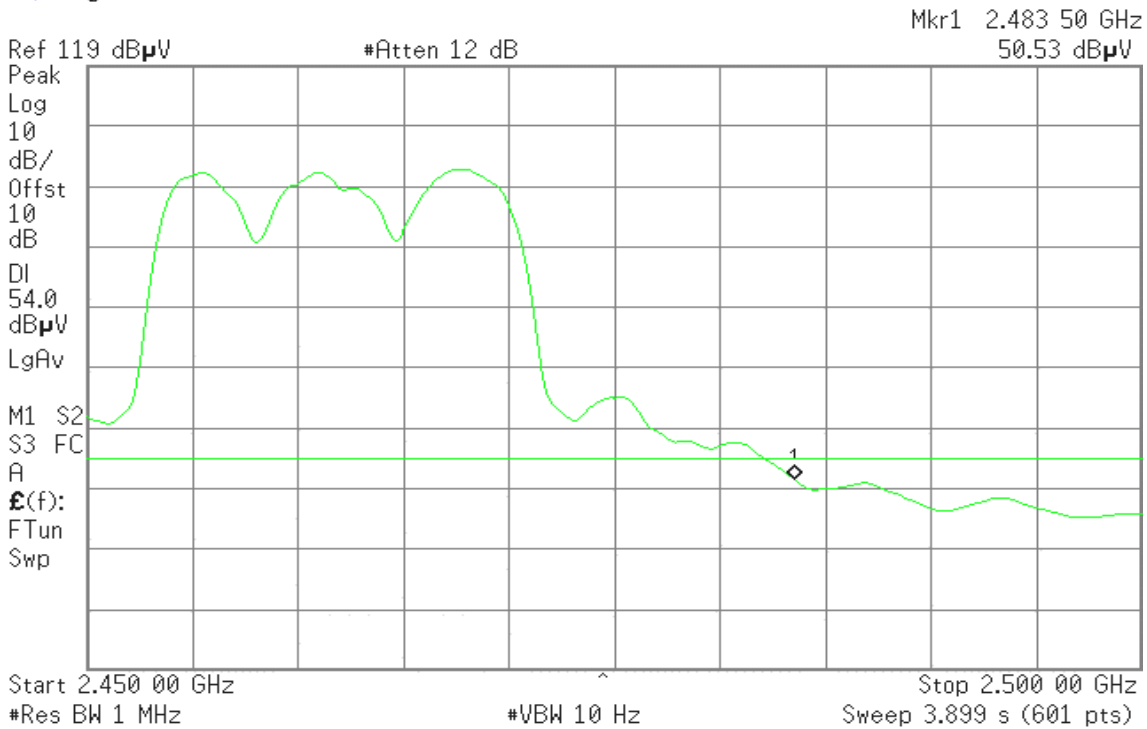


Detector mode: Average

Polarity: Vertical

Agilent

T





Detector mode: Peak

Polarity: Horizontal

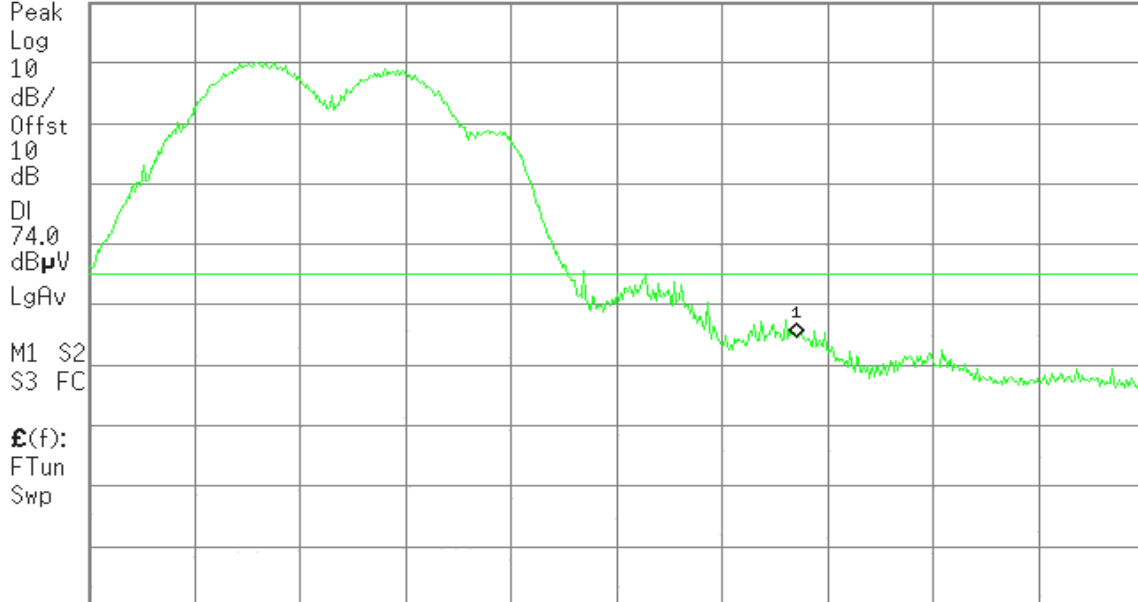
Agilent

T

Mkr1 2.483 50 GHz  
63.53 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

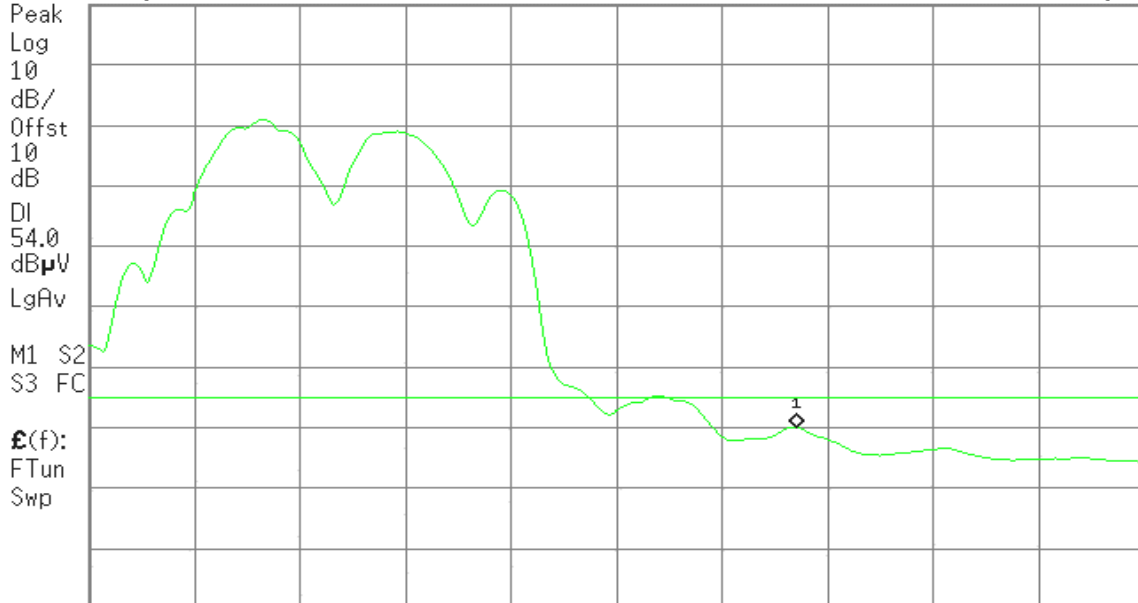
Agilent

T

Mkr1 2.483 50 GHz  
49.09 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.500 00 GHz

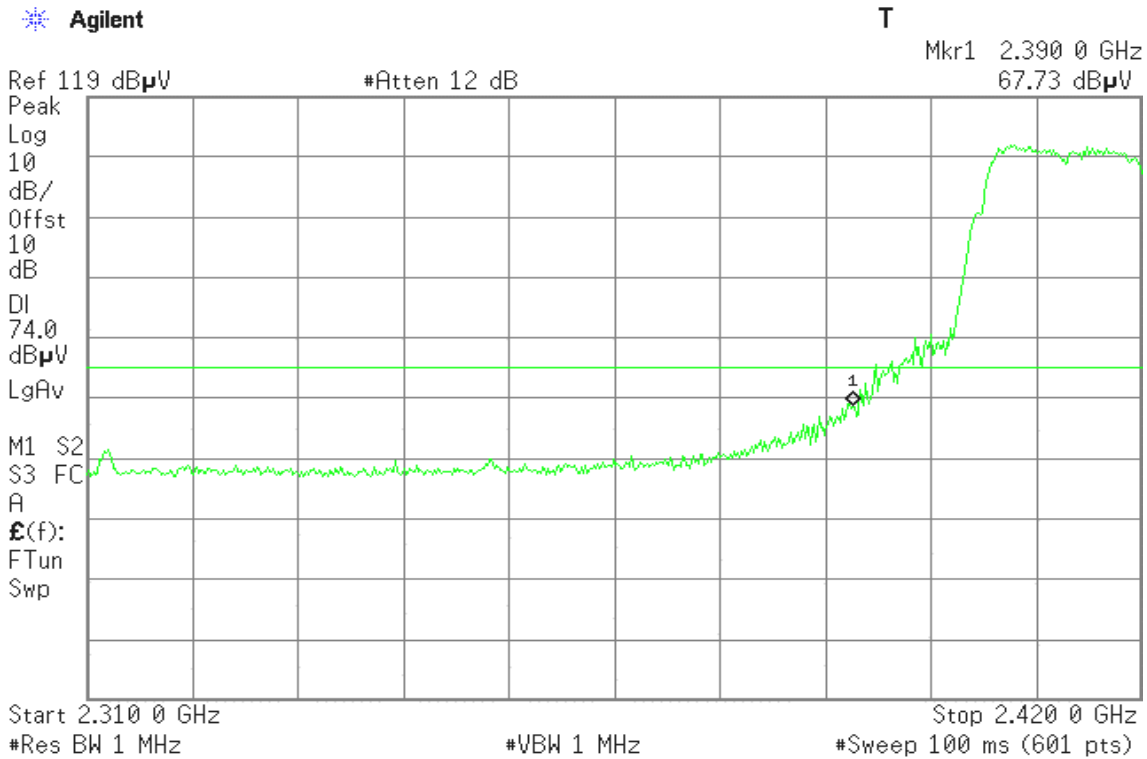
Sweep 3.899 s (601 pts)



### Band Edges (IEEE 802.11g MIMO mode (Chain 0 + Chain 1) / CH Low)

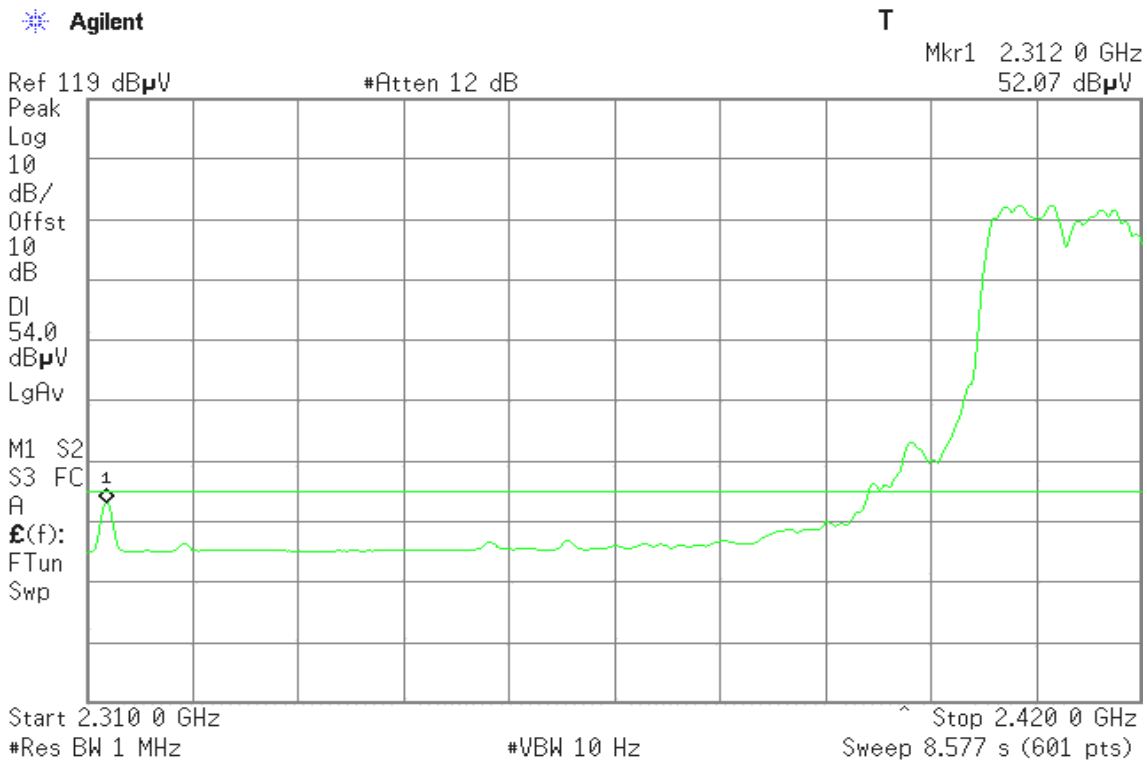
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





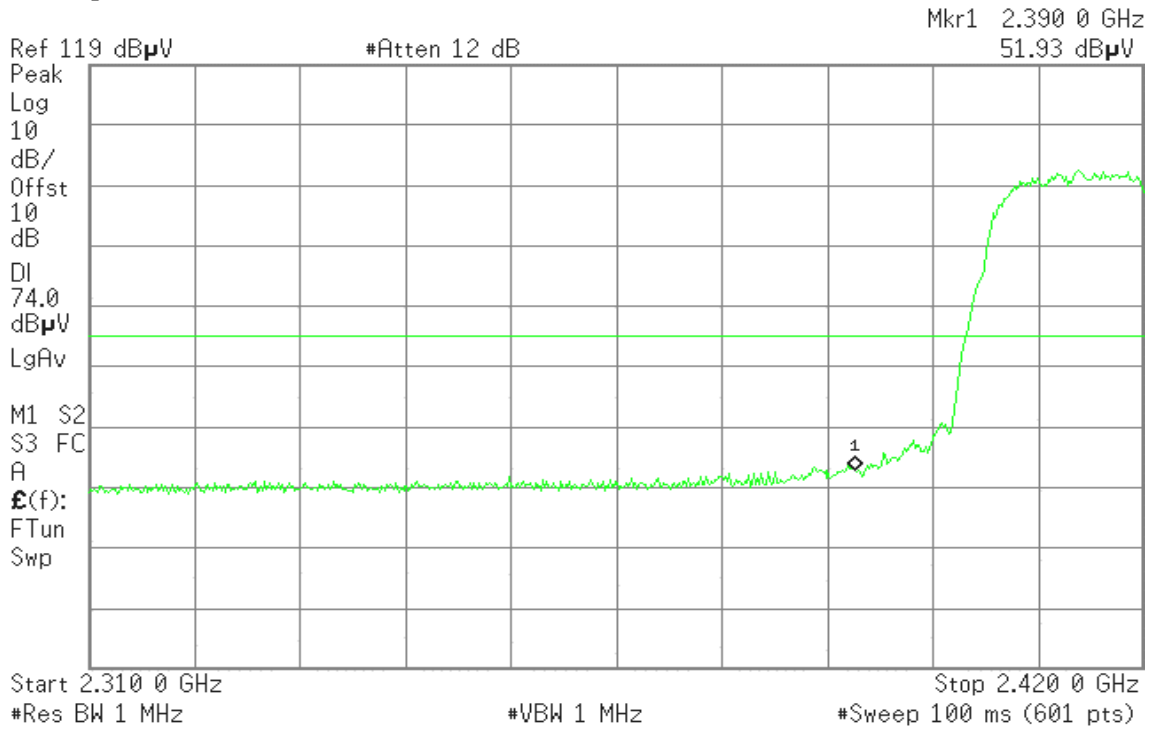


Detector mode: Peak

Polarity: Horizontal

Agilent

T

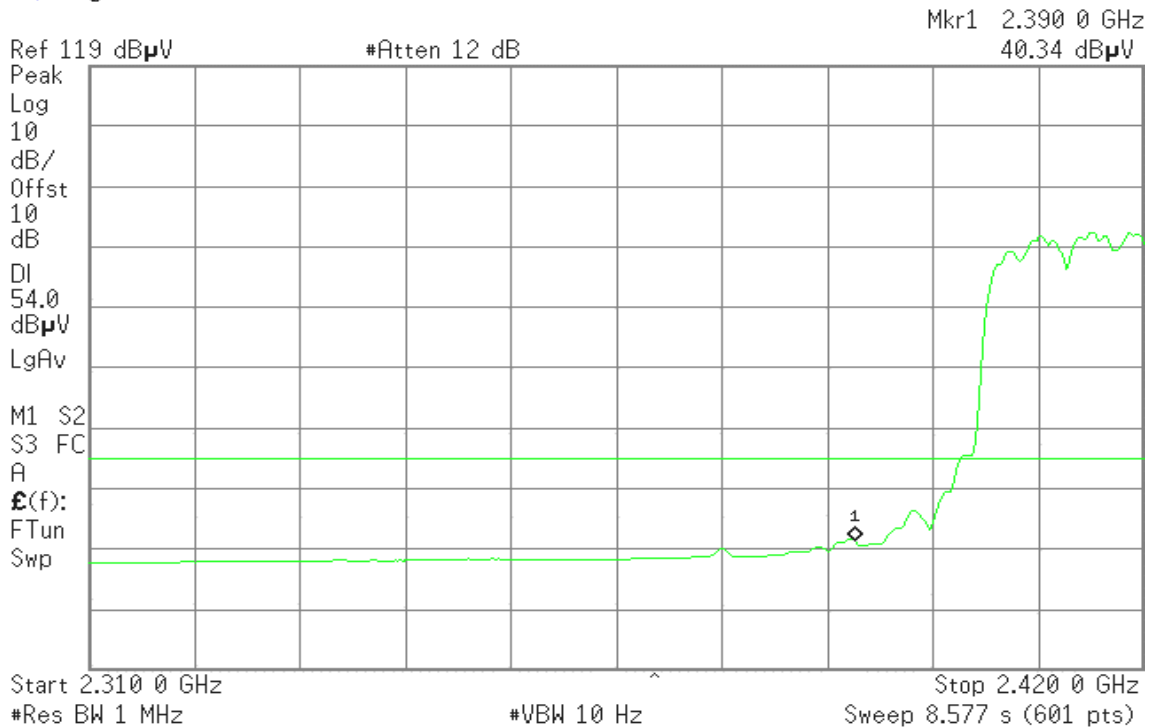


Detector mode: Average

Polarity: Horizontal

Agilent

T





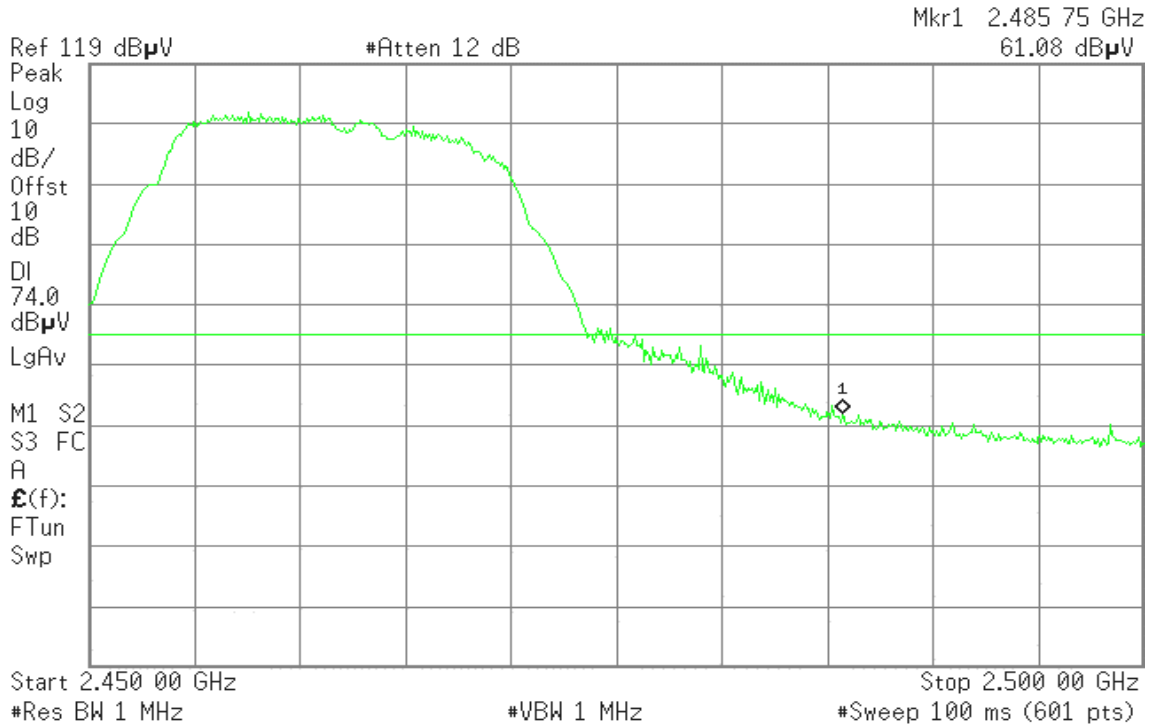
### Band Edges (IEEE 802.11g MIMO mode (Chain 0 + Chain 1) / CH High)

Detector mode: Peak

Polarity: Vertical

Agilent

T

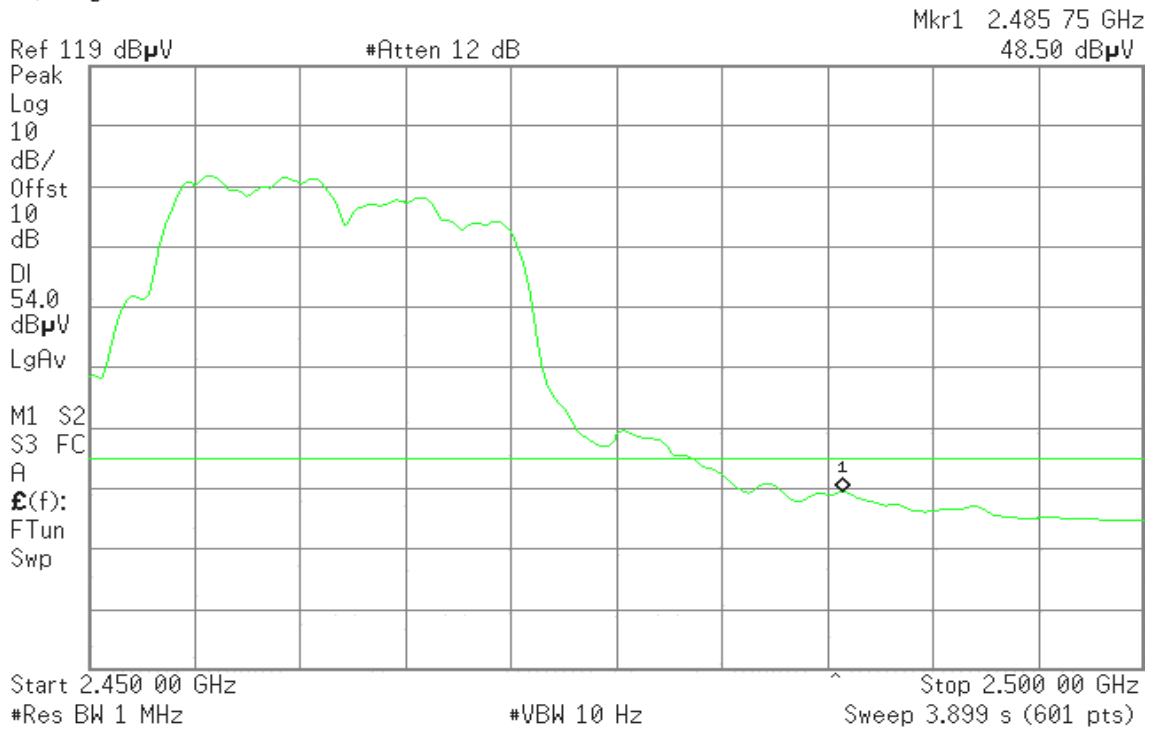


Detector mode: Average

Polarity: Vertical

Agilent

T





Detector mode: Peak

Polarity: Horizontal

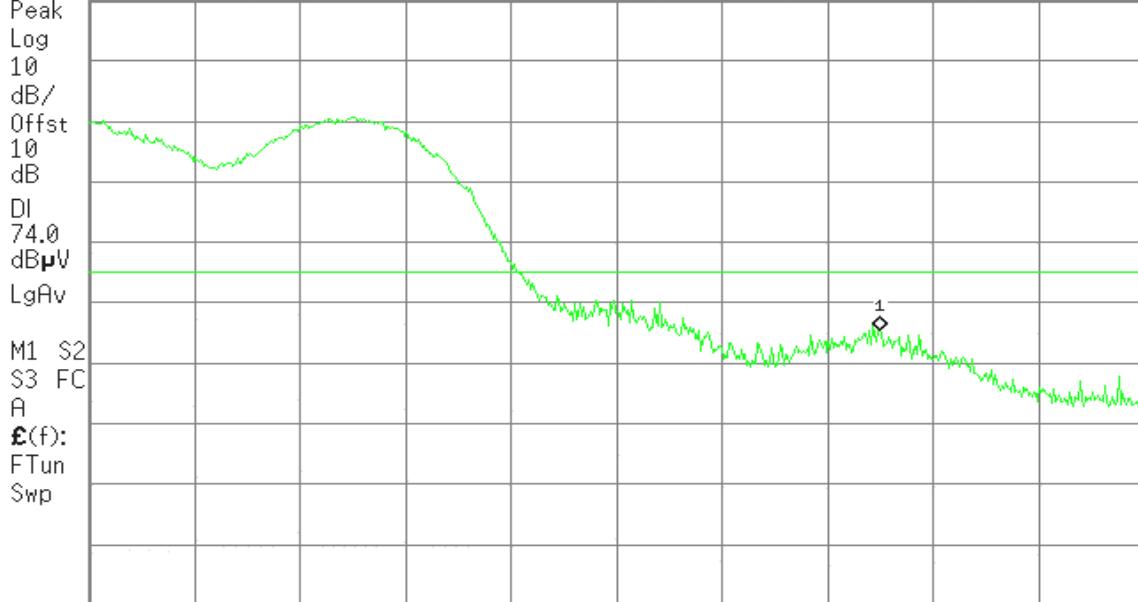
Agilent

T

Mkr1 2.487 50 GHz  
64.51 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

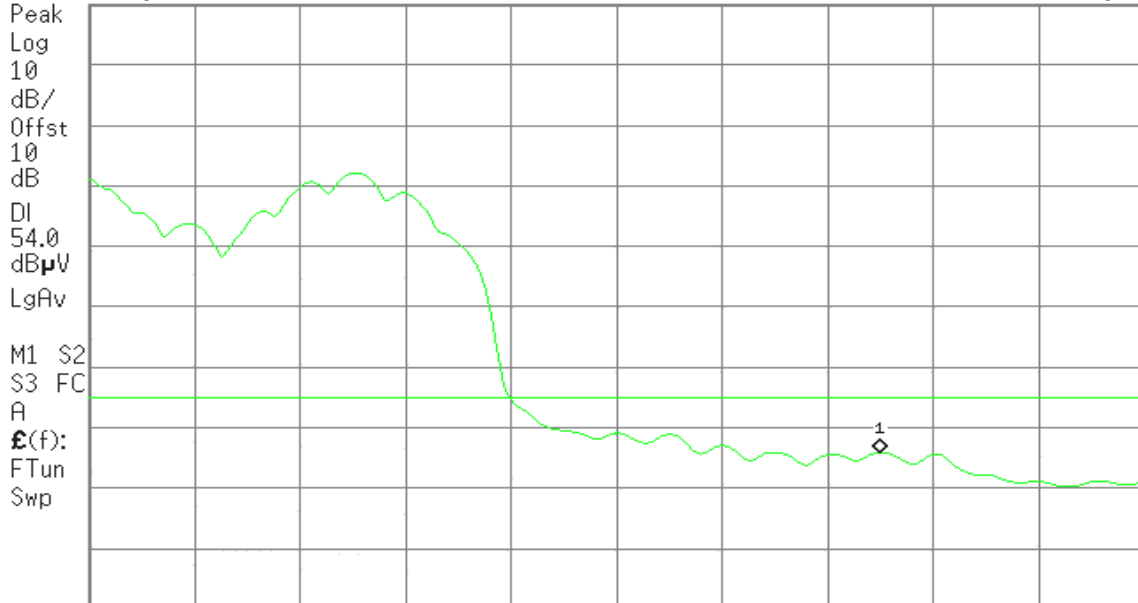
Agilent

T

Mkr1 2.487 50 GHz  
44.90 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Sweep 3.899 s (601 pts)



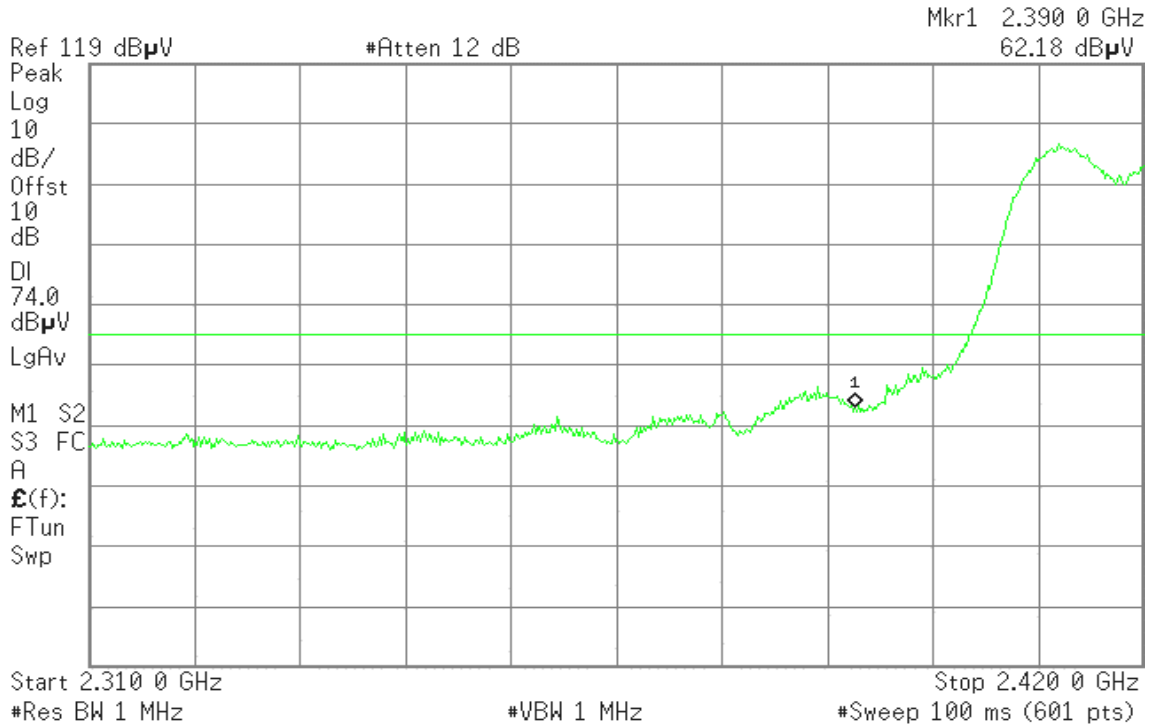
### Band Edges (Channel Expansion – SIMO mode (Chain 0 + Chain 1) / CH Low)

Detector mode: Peak

Polarity: Vertical

Agilent

T

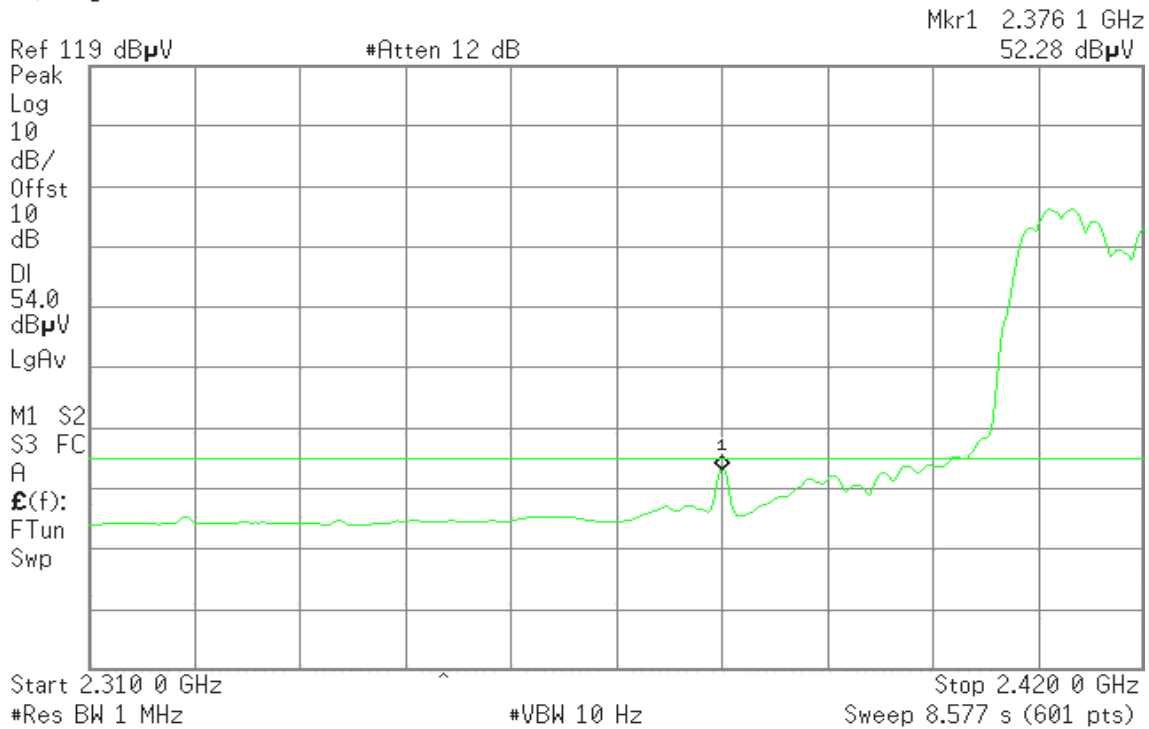


Detector mode: Average

Polarity: Vertical

Agilent

T





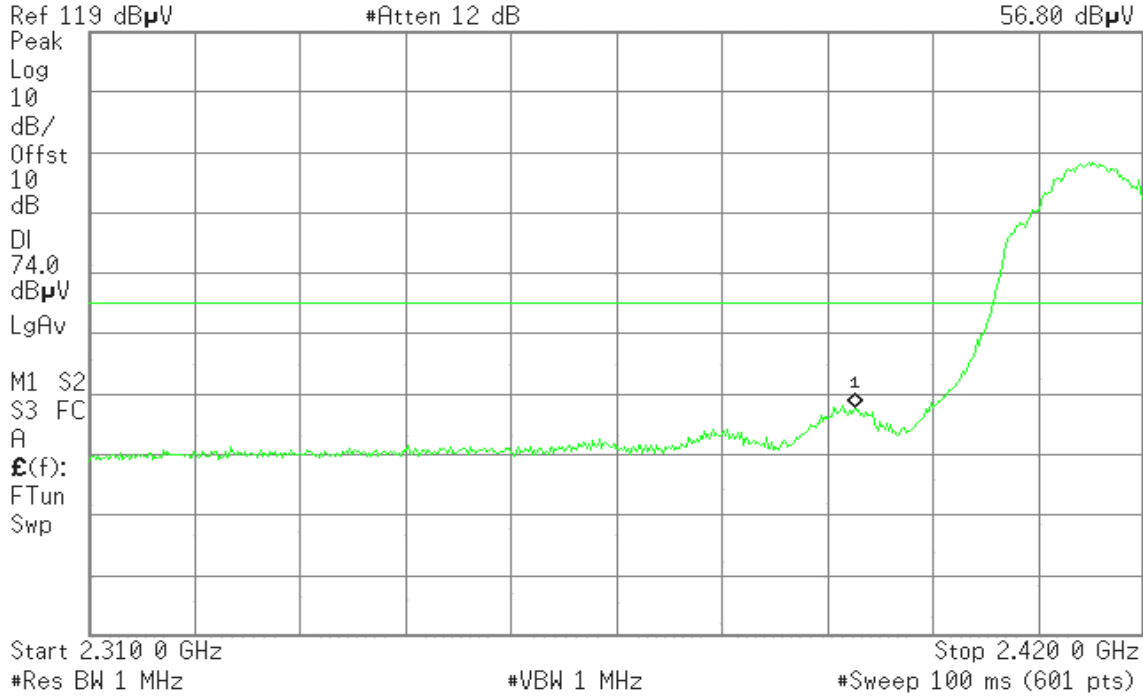
Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
56.80 dBμV



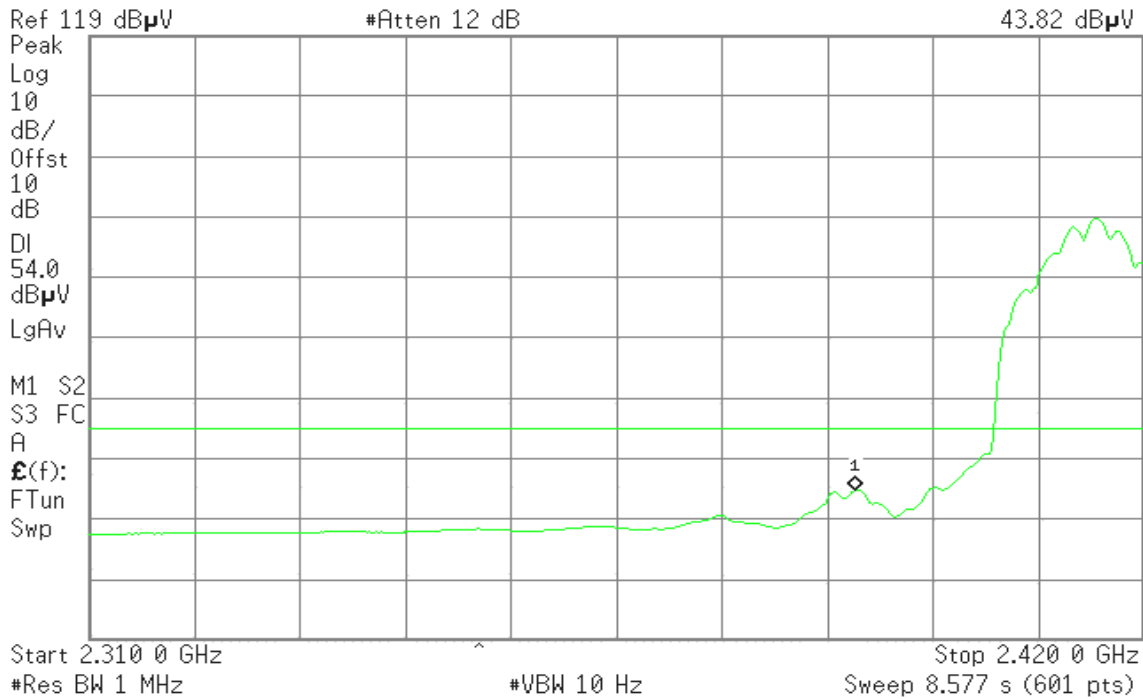
Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 0 GHz  
43.82 dBμV





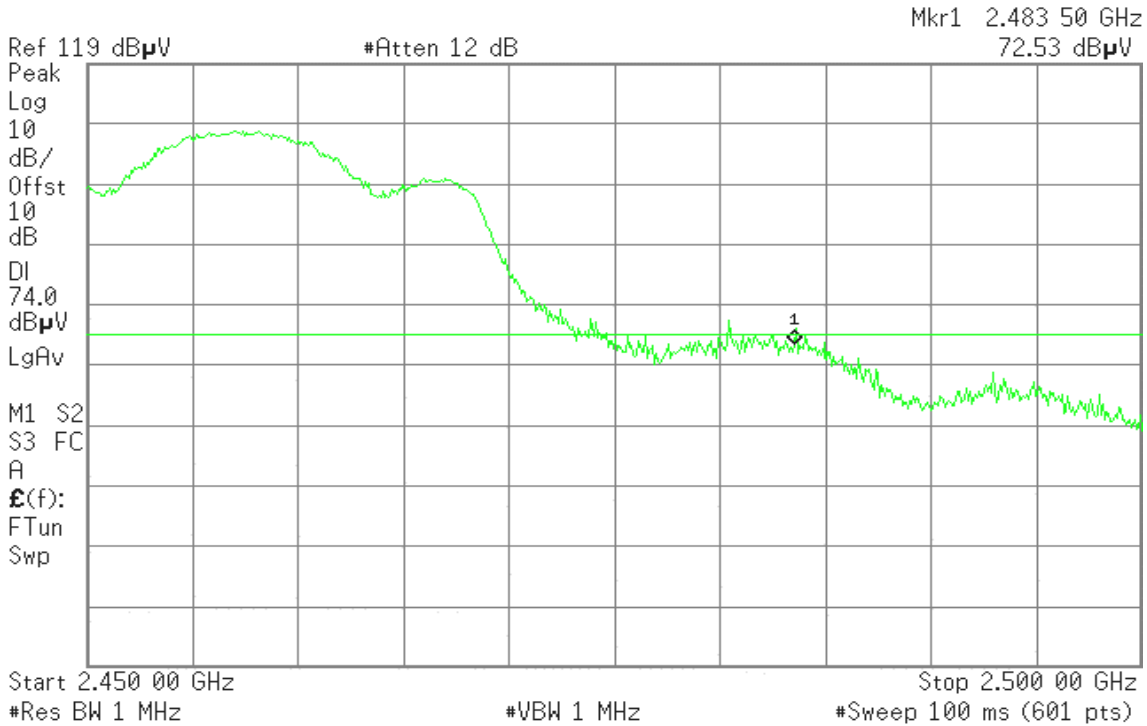
### Band Edges (Channel Expansion – SIMO mode (Chain 0 + Chain 1) / CH High)

Detector mode: Peak

Polarity: Vertical

Agilent

T

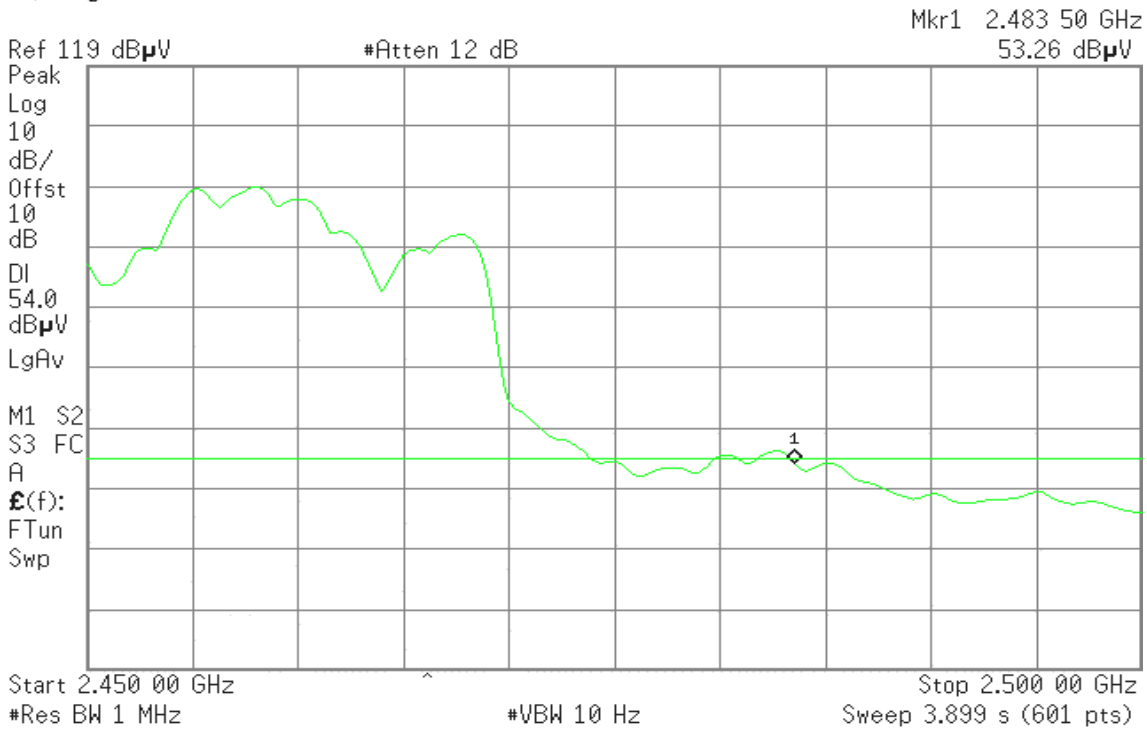


Detector mode: Average

Polarity: Vertical

Agilent

T





Detector mode: Peak

Polarity: Horizontal

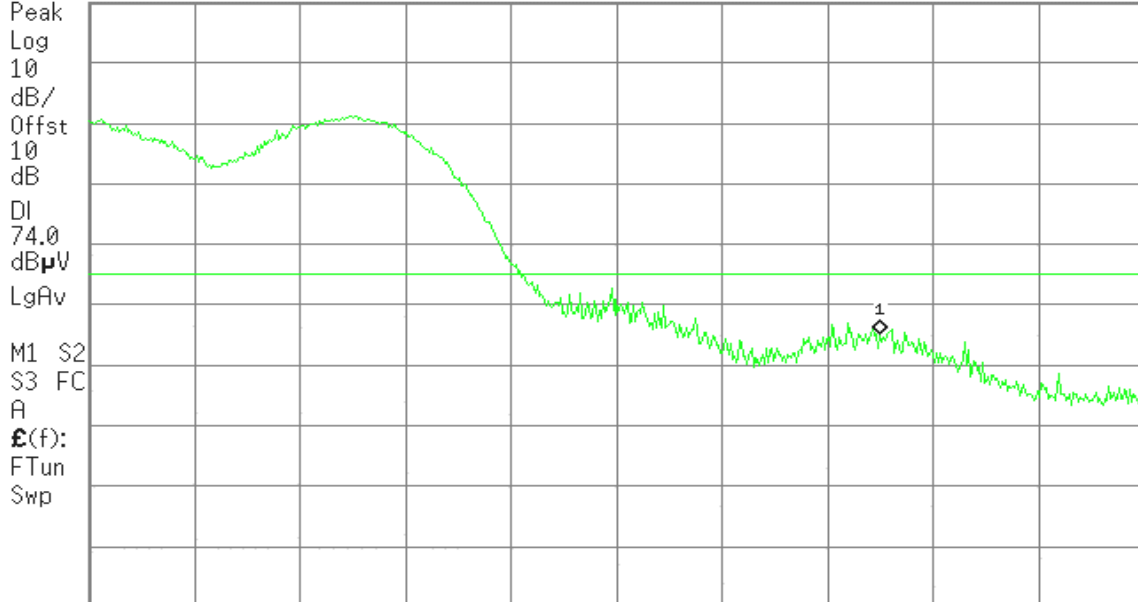
Agilent

T

Mkr1 2.487 50 GHz  
64.22 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

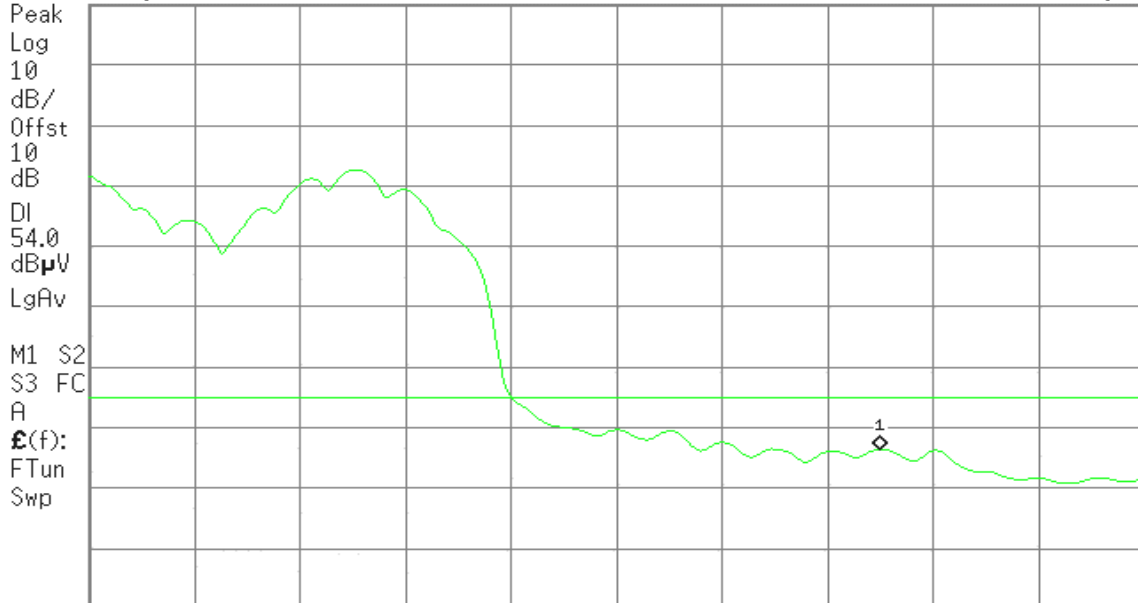
Agilent

T

Mkr1 2.487 50 GHz  
45.41 dBμV

Ref 119 dBμV

#Atten 12 dB



Start 2.450 00 GHz

Stop 2.500 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

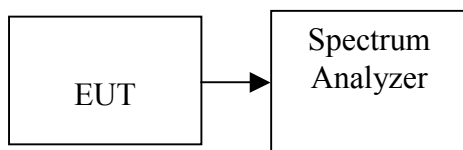
Sweep 3.899 s (601 pts)

## 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 = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 100 s
3. Record the max reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.





### TEST RESULTS

No non-compliance noted

#### Test Data

##### Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (W)	Result
Low	2412	-9.56	-11.82	-7.53	8.00	PASS
Mid	2437	-7.16	-7.85	-4.48		PASS
High	2462	-9.85	-10.42	-7.12		PASS

##### Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (W)	Result
Low	2412	-6.62	-6.65	-3.62	8.00	PASS
Mid	2437	-4.06	-5.14	-1.56		PASS
High	2462	-6.77	-8.19	-4.41		PASS

##### Test mode: IEEE 802.11g MIMO mode

Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (W)	Result
Low	2412	-1.19	-4.09	0.61	8.00	PASS
Mid	2437	1.26	-1.61	3.07		PASS
High	2462	-1.08	-4.08	0.68		PASS

##### Test mode: Channel Expansion – SIMO mode

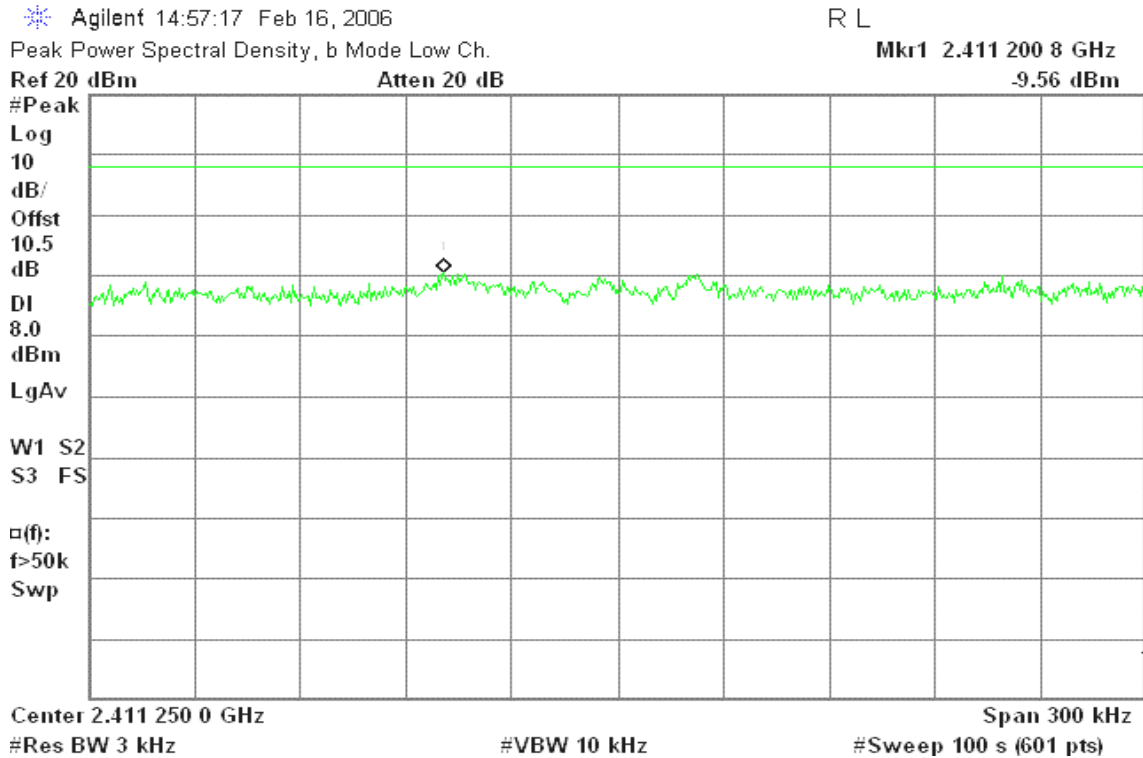
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	PPSD (dBm)	Limit (W)	Result
Low	2422	-7.30	-6.14	-3.67	8.00	PASS
Mid	2447	-5.24	-4.38	-1.78		PASS
High	2452	-7.17	-6.79	-3.97		PASS



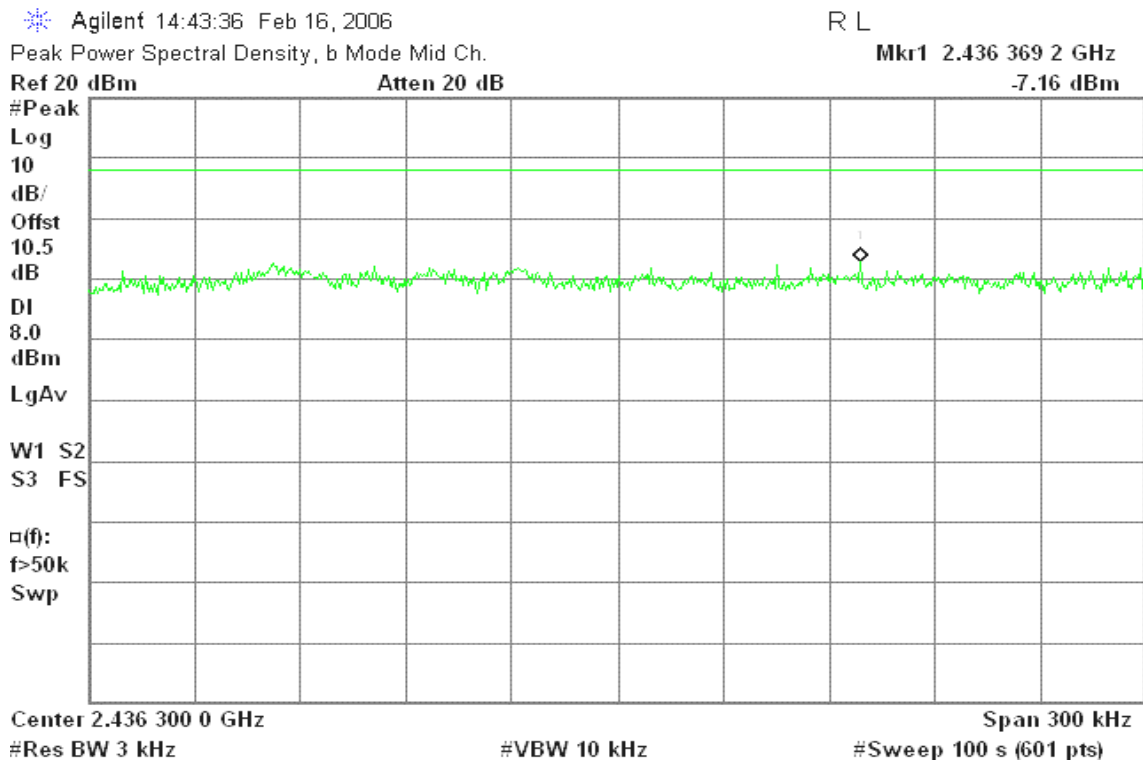
Test Plot

IEEE 802.11b mode / Chain 0

PPSD (CH Low)



PPSD (CH Mid)





### PPSD (CH High)

Agilent 15:05:49 Feb 16, 2006

R L

Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.462 873 1 GHz

Ref 20 dBm

Atten 20 dB

-9.85 dBm

#Peak

Log

10

dB/

Offst

10.5

dB

Dl

8.0

dBm

LgAv

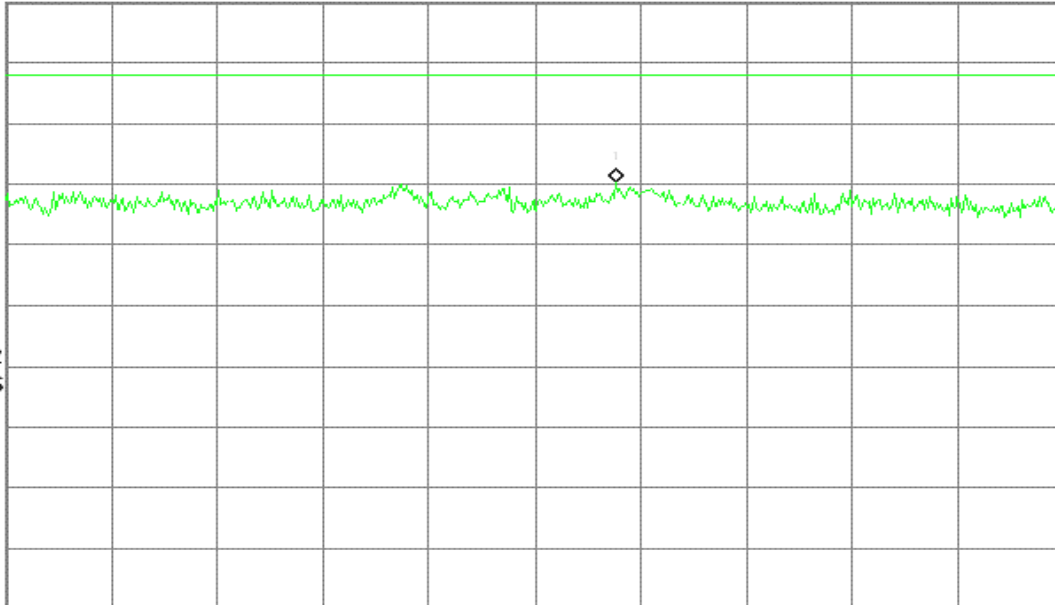
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.462 850 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### IEEE 802.11b mode / Chain 1

### PPSD (CH Low)

Agilent 19:19:13 Feb 16, 2006

R L

Peak Power Spectral Density, b Mode Low Ch.

Mkr1 2.414 202 0 GHz

Ref 20 dBm

Atten 20 dB

-11.82 dBm

#Peak

Log

10

dB/

Offst

10.5

dB

Dl

8.0

dBm

LgAv

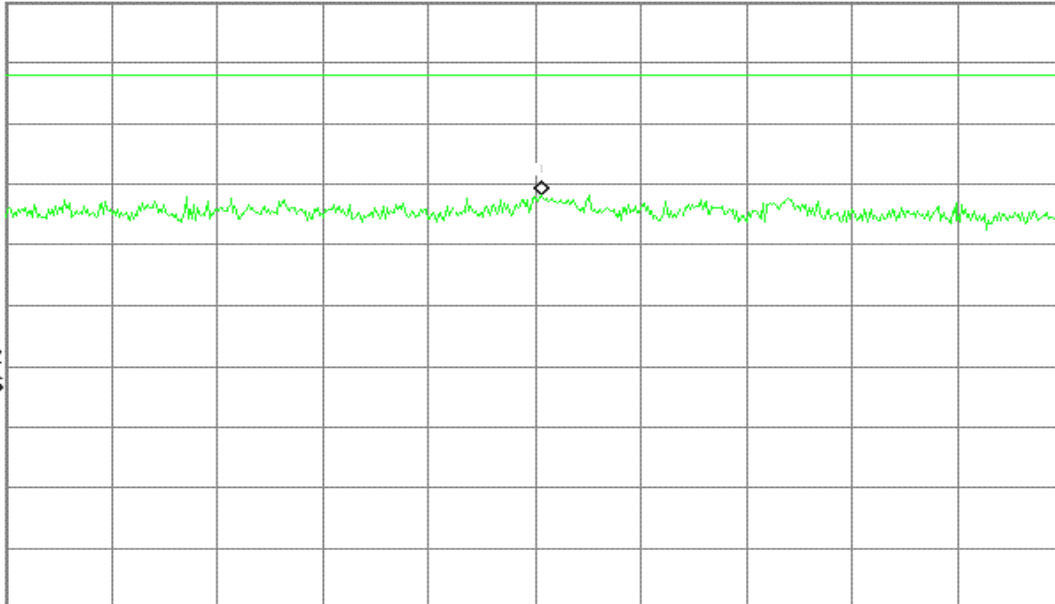
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.414 200 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 19:30:26 Feb 16, 2006

R L

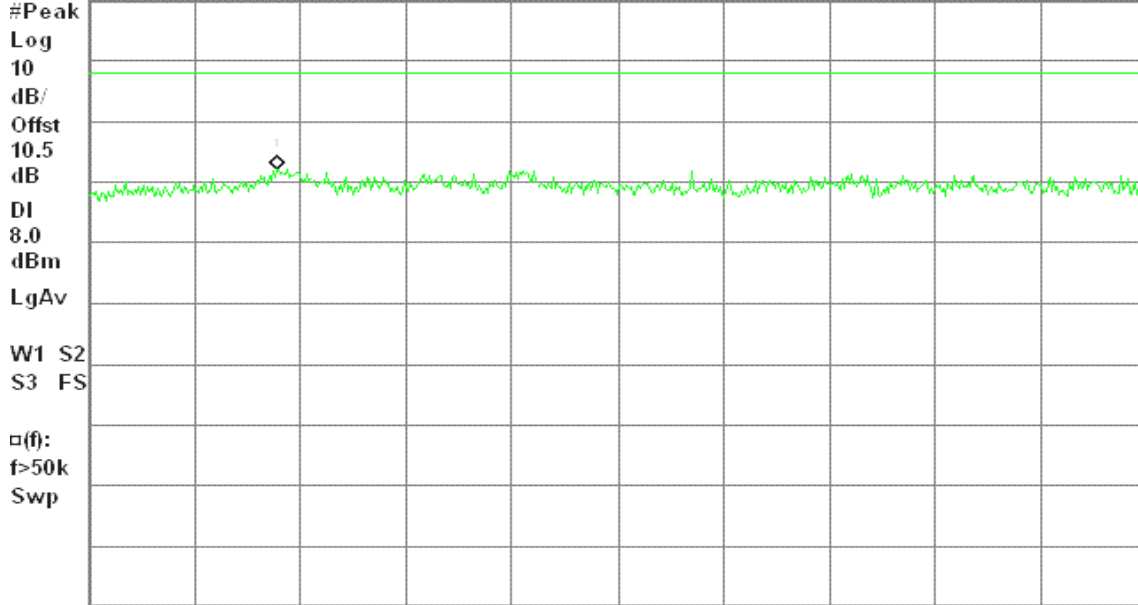
Peak Power Spectral Density, b Mode Mid Ch.

Mkr1 2.436 202 8 GHz

Ref 20 dBm

Atten 20 dB

-7.85 dBm



Center 2.436 300 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 19:39:46 Feb 16, 2006

R L

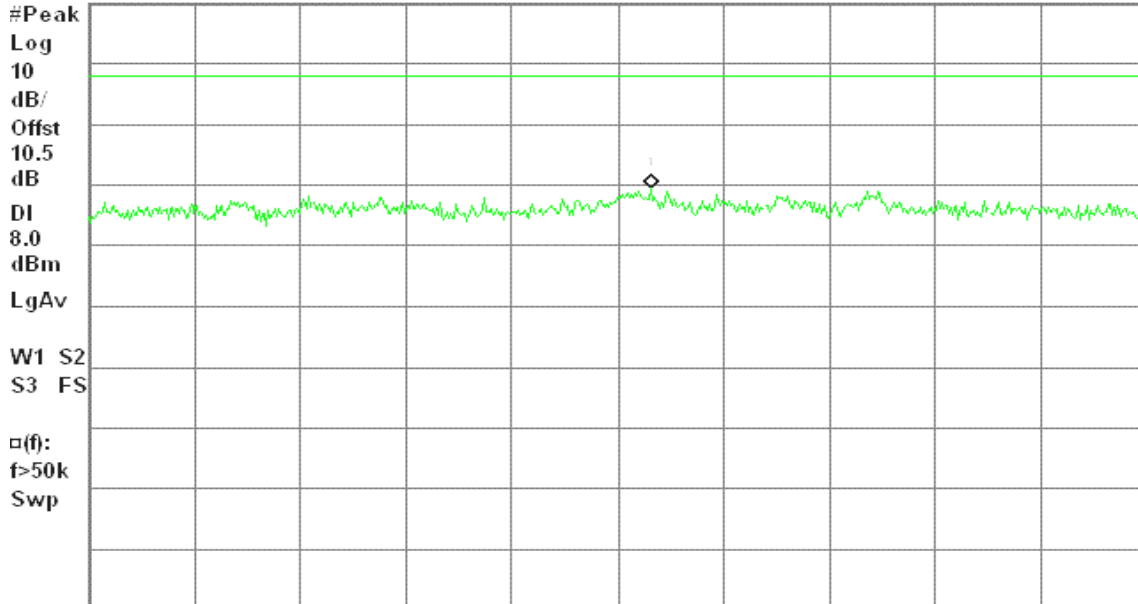
Peak Power Spectral Density, b Mode High Ch.

Mkr1 2.460 209 5 GHz

Ref 20 dBm

Atten 20 dB

-10.42 dBm



Center 2.460 200 0 GHz

Span 300 kHz

#Res BW 3 kHz

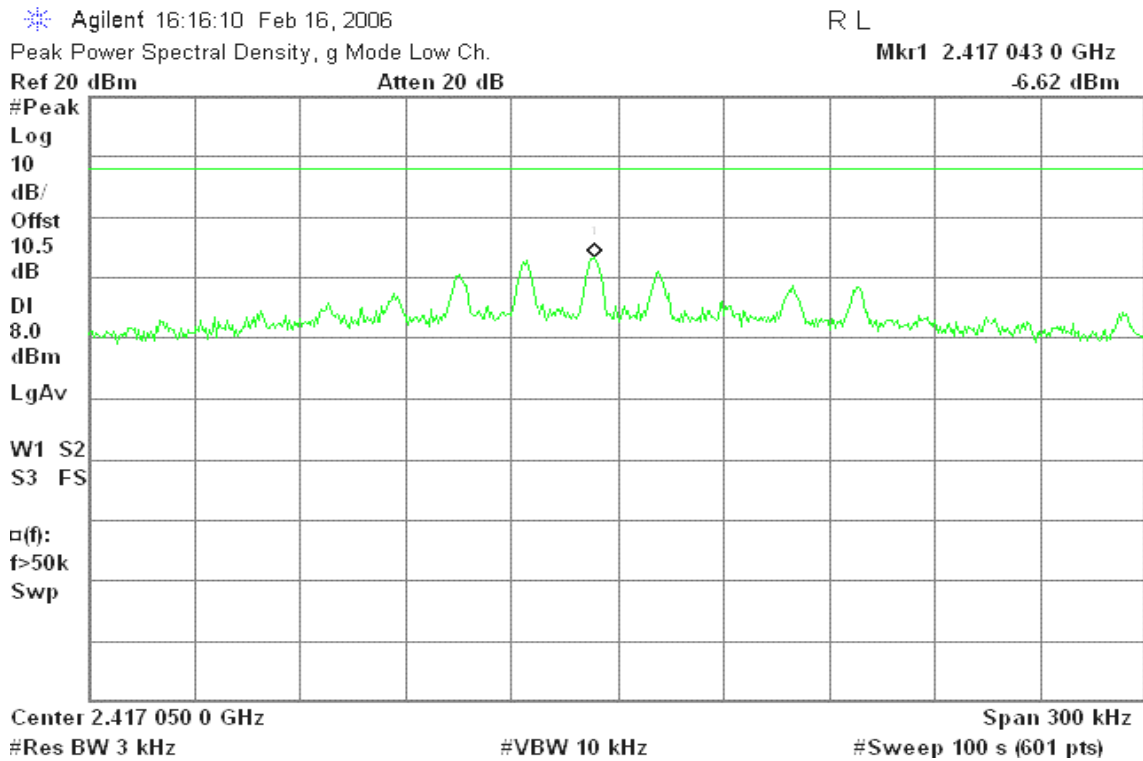
#VBW 10 kHz

#Sweep 100 s (601 pts)

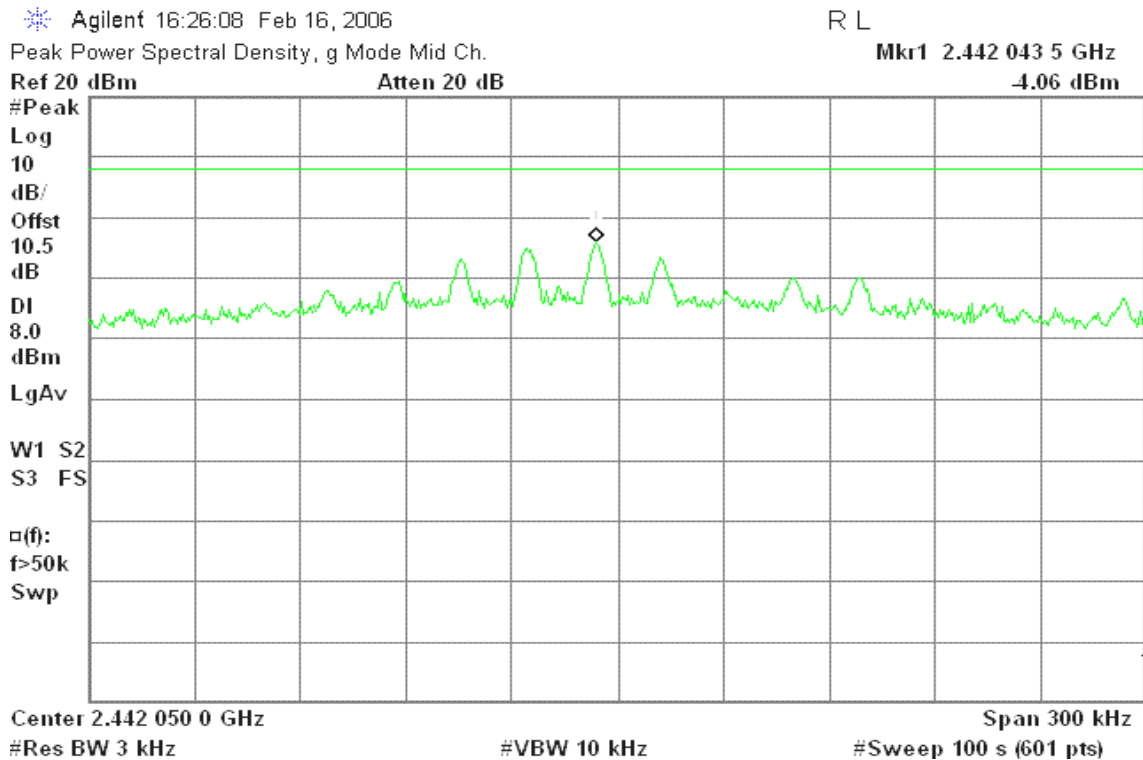


### IEEE 802.11g mode / Chain 0

#### PPSD (CH Low)



#### PPSD (CH Mid)





### PPSD (CH High)

Agilent 16:39:25 Feb 16, 2006

R L

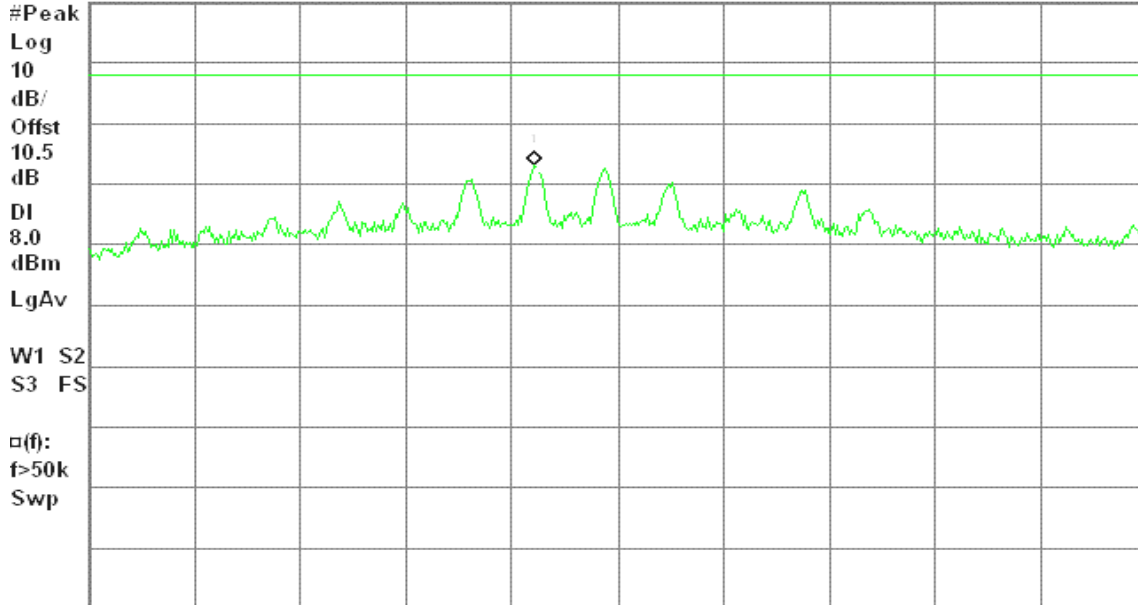
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.455 776 4 GHz

Ref 20 dBm

Atten 20 dB

-6.77 dBm



Center 2.455 800 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### IEEE 802.11g mode / Chain 1

### PPSD (CH Low)

Agilent 21:03:51 Feb 16, 2006

R L

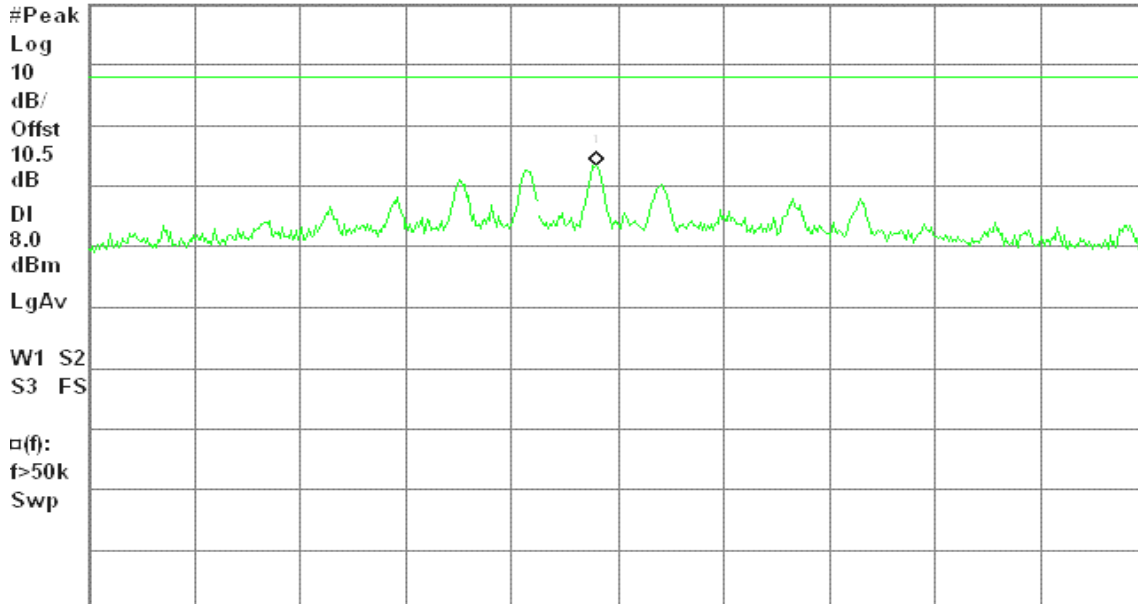
Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.417 043 5 GHz

Ref 20 dBm

Atten 20 dB

-6.65 dBm



Center 2.417 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 20:15:05 Feb 16, 2006

R L

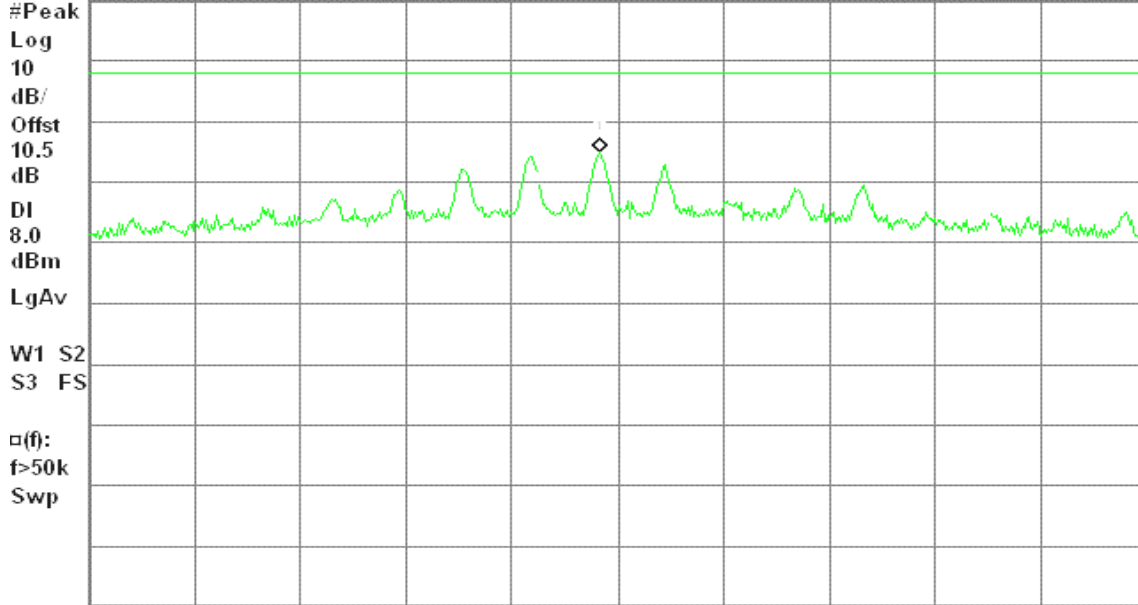
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.442 044 5 GHz

Ref 20 dBm

Atten 20 dB

-5.14 dBm



Center 2.442 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 20:27:20 Feb 16, 2006

R L

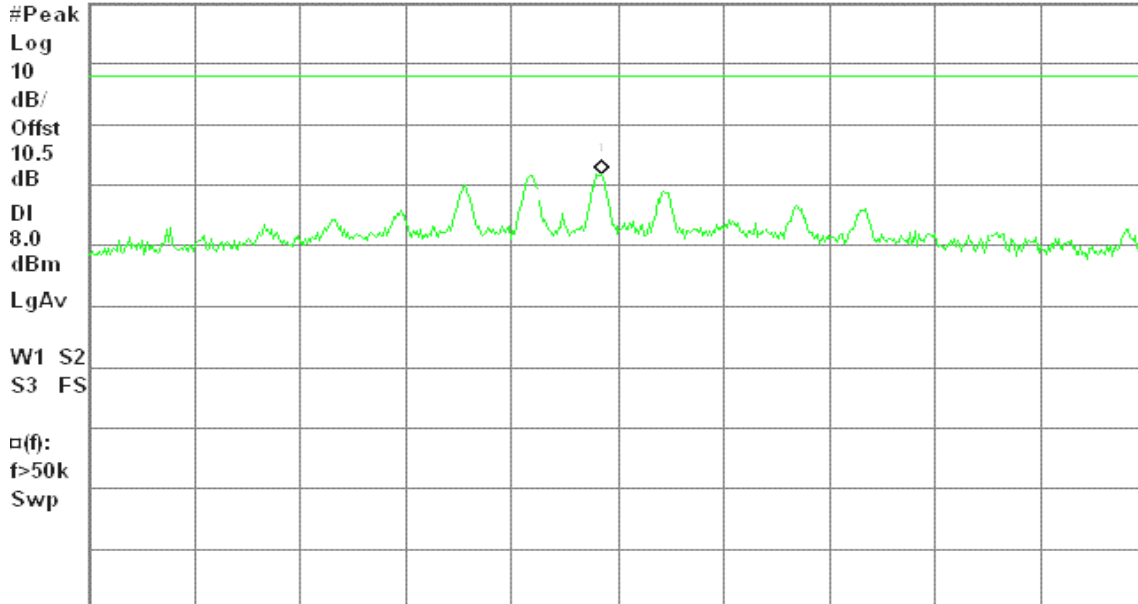
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.467 045 0 GHz

Ref 20 dBm

Atten 20 dB

-8.19 dBm



Center 2.467 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

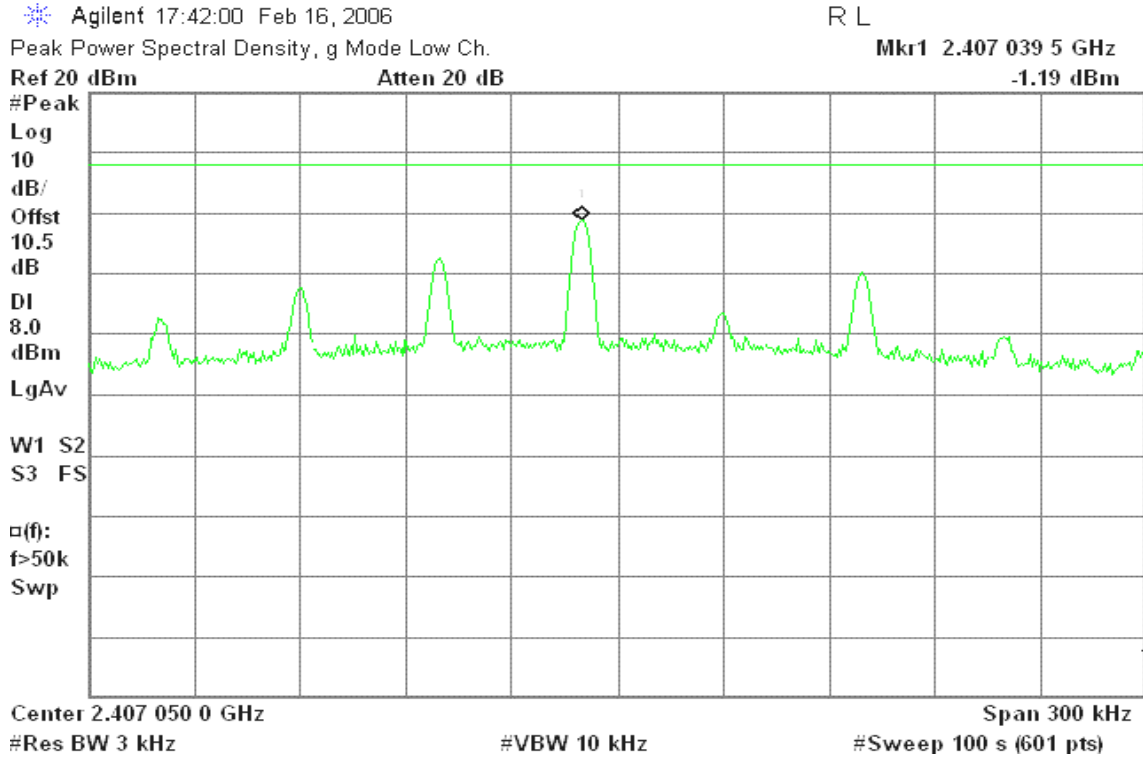
#VBW 10 kHz

#Sweep 100 s (601 pts)

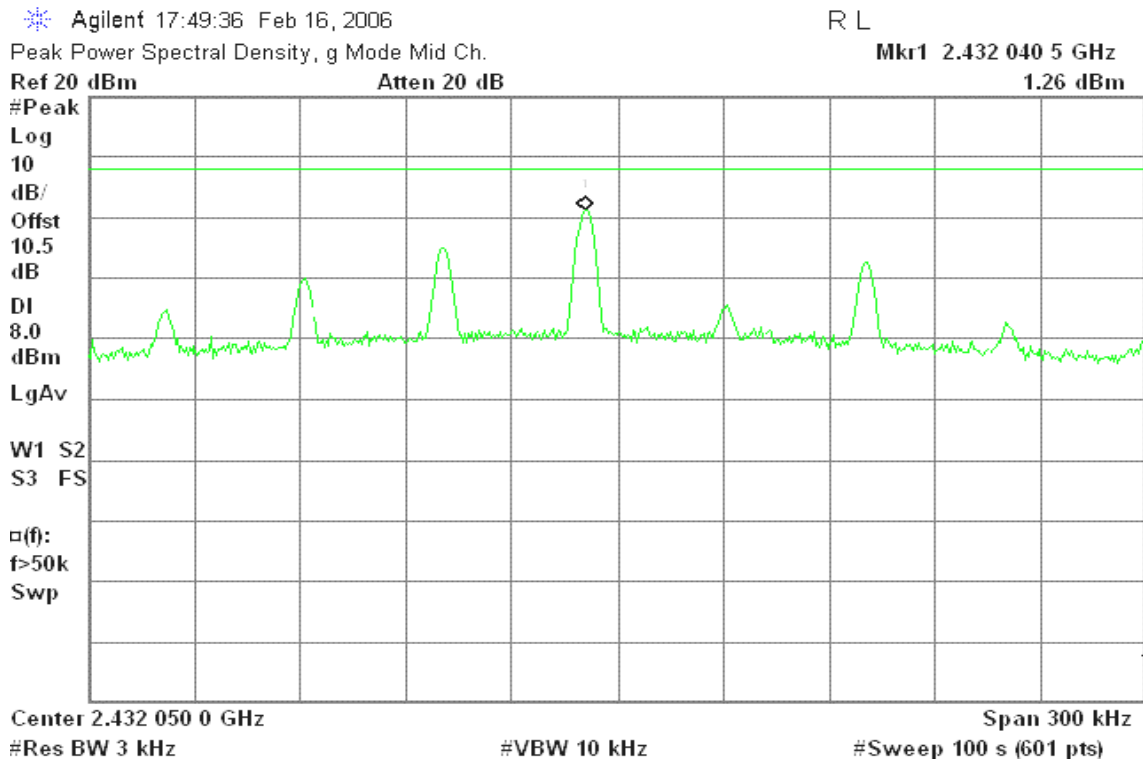


### IEEE 802.11g MIMO mode / Chain 0

#### PPSD (CH Low)



#### PPSD (CH Mid)







### PPSD (CH High)

Agilent 17:57:40 Feb 16, 2006

R L

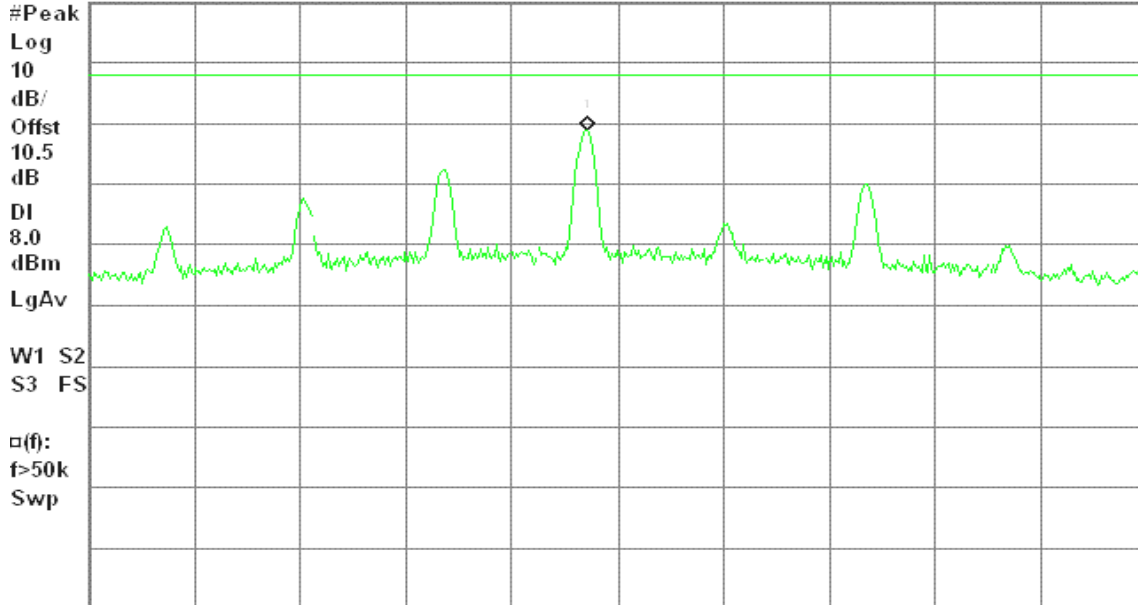
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.457 041 0 GHz

Ref 20 dBm

Atten 20 dB

-1.08 dBm



Center 2.457 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### IEEE 802.11g MIMO mode / Chain 1

### PPSD (CH Low)

Agilent 21:18:27 Feb 16, 2006

R L

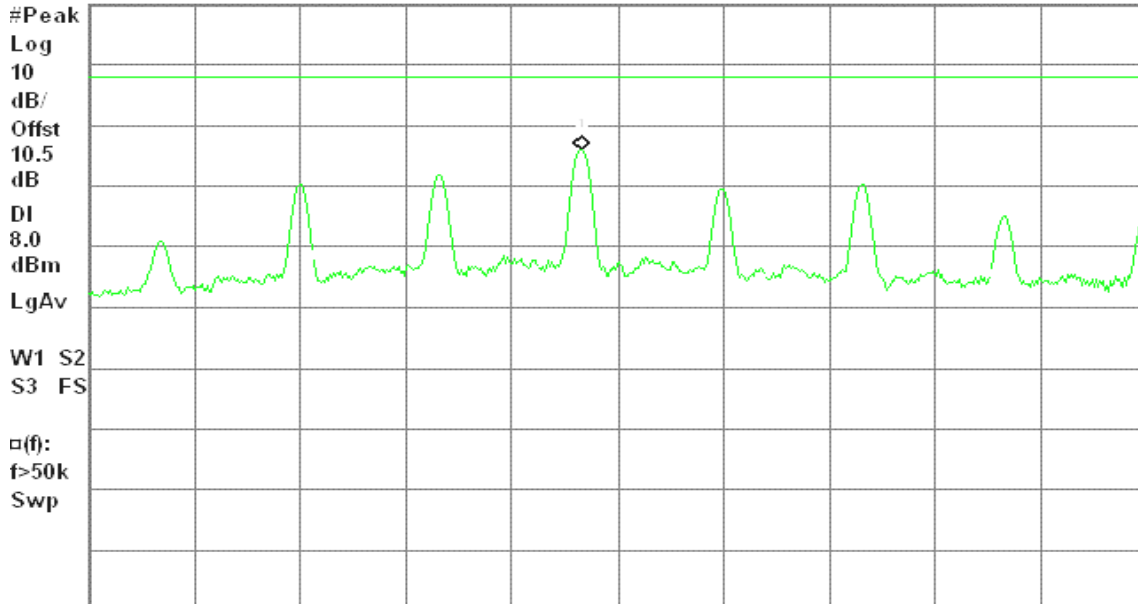
Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.407 039 5 GHz

Ref 20 dBm

Atten 20 dB

-4.09 dBm



Center 2.407 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 21:25:25 Feb 16, 2006

R L

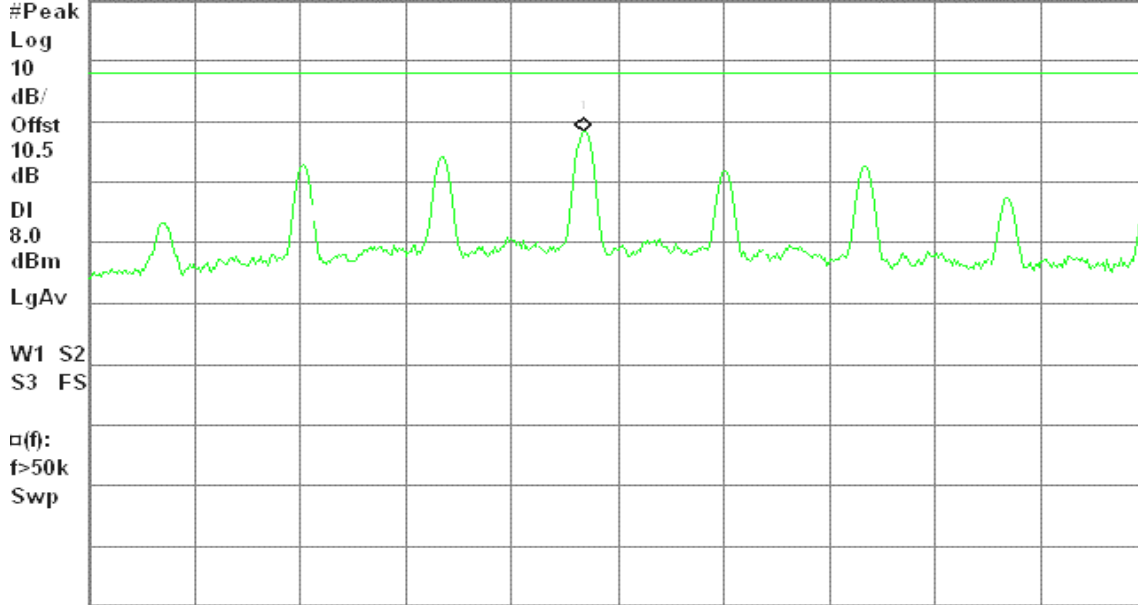
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.432 040 0 GHz

Ref 20 dBm

Atten 20 dB

-1.61 dBm



Center 2.432 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 21:31:18 Feb 16, 2006

R L

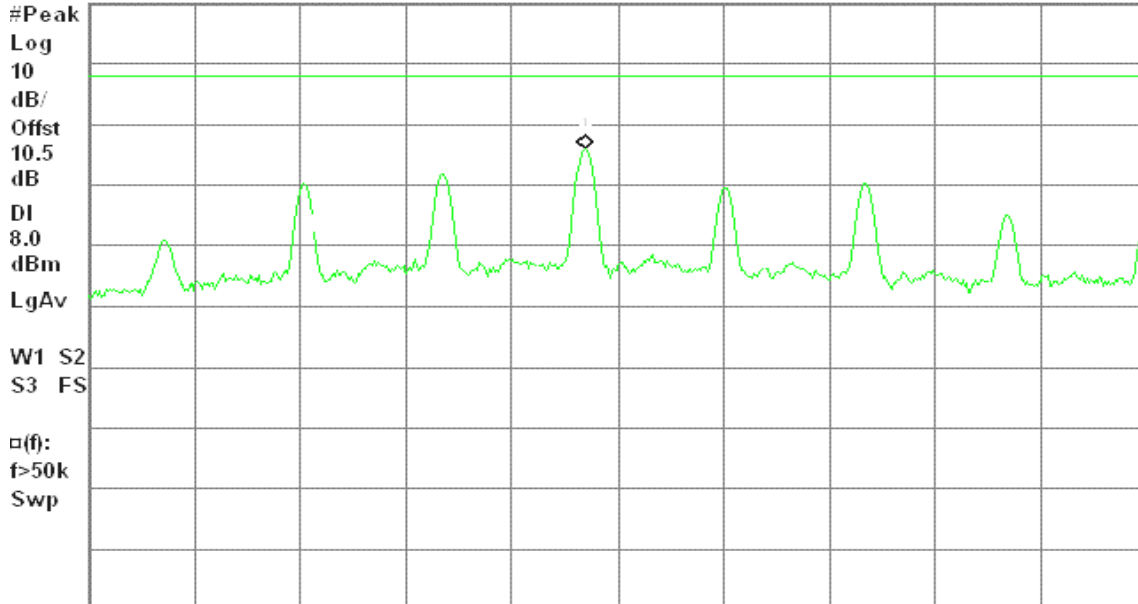
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.457 040 5 GHz

Ref 20 dBm

Atten 20 dB

-4.08 dBm



Center 2.457 050 0 GHz

Span 300 kHz

#Res BW 3 kHz

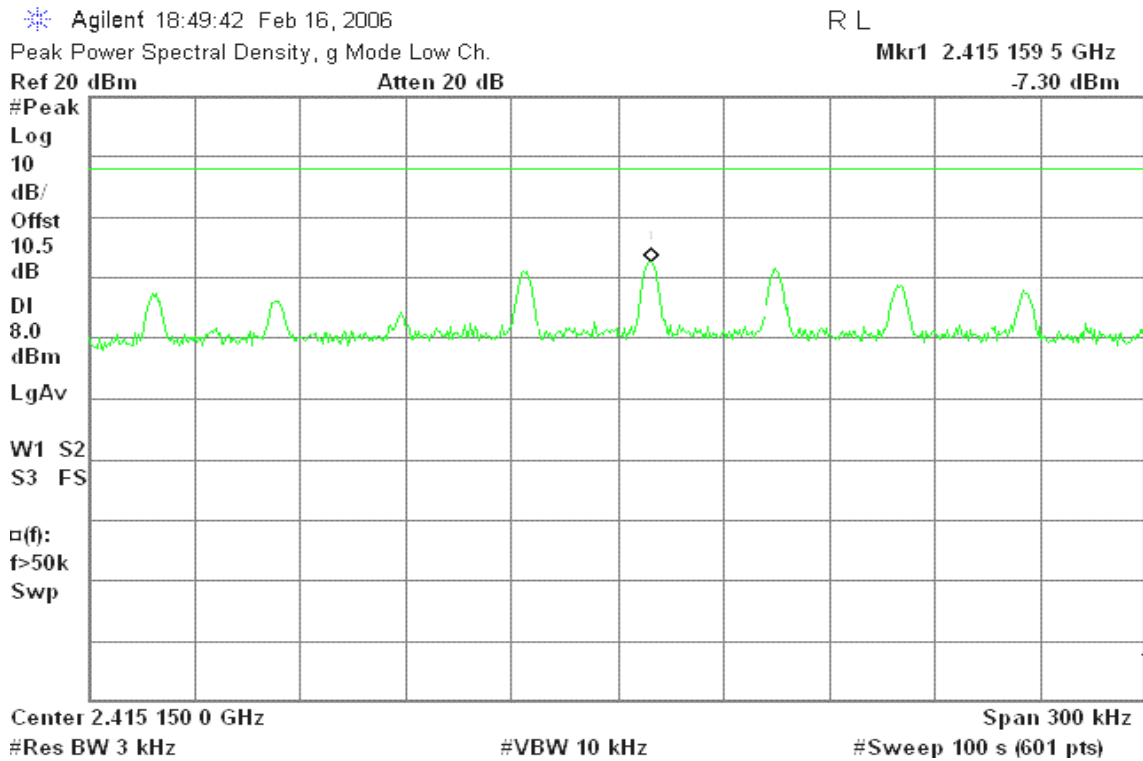
#VBW 10 kHz

#Sweep 100 s (601 pts)

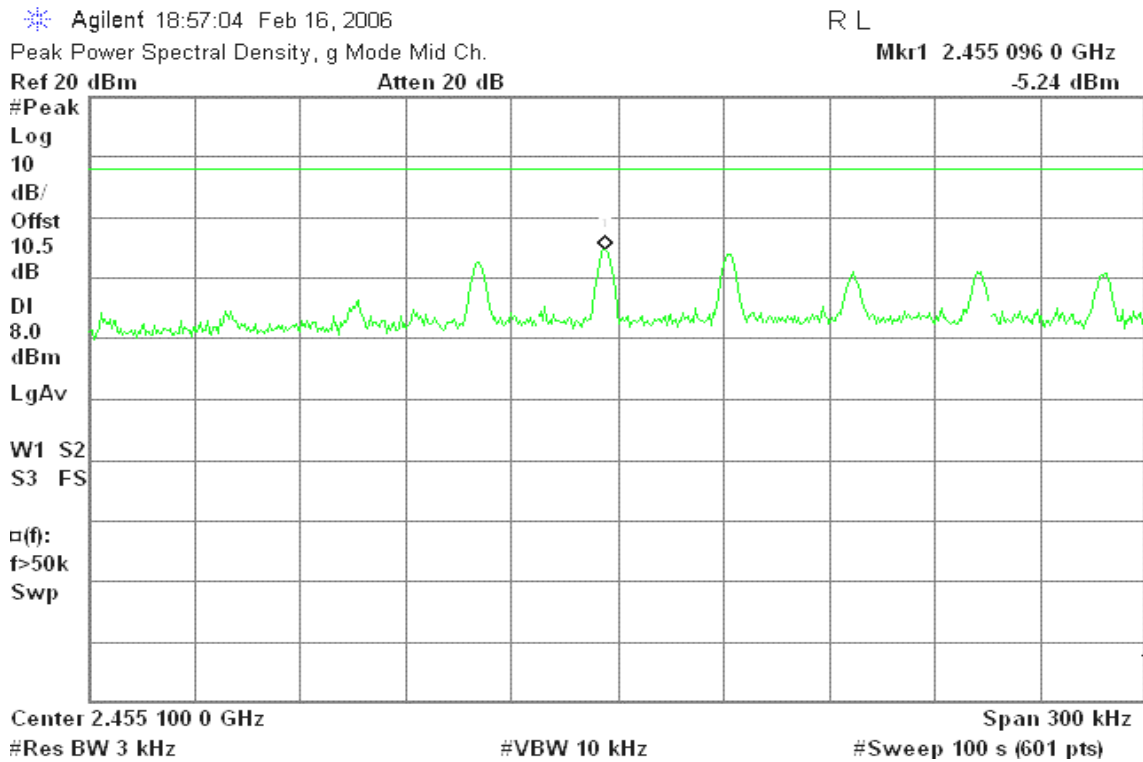


### Channel Expansion – SIMO mode / Chain 0

#### PPSD (CH Low)



#### PPSD (CH Mid)





### PPSD (CH High)

Agilent 19:05:56 Feb 16, 2006

R L

Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.445 160 0 GHz

Ref 20 dBm

Atten 20 dB

-7.17 dBm

#Peak

Log

10

dB/

Offst

10.5

dB

DI

8.0

dBm

LgAv

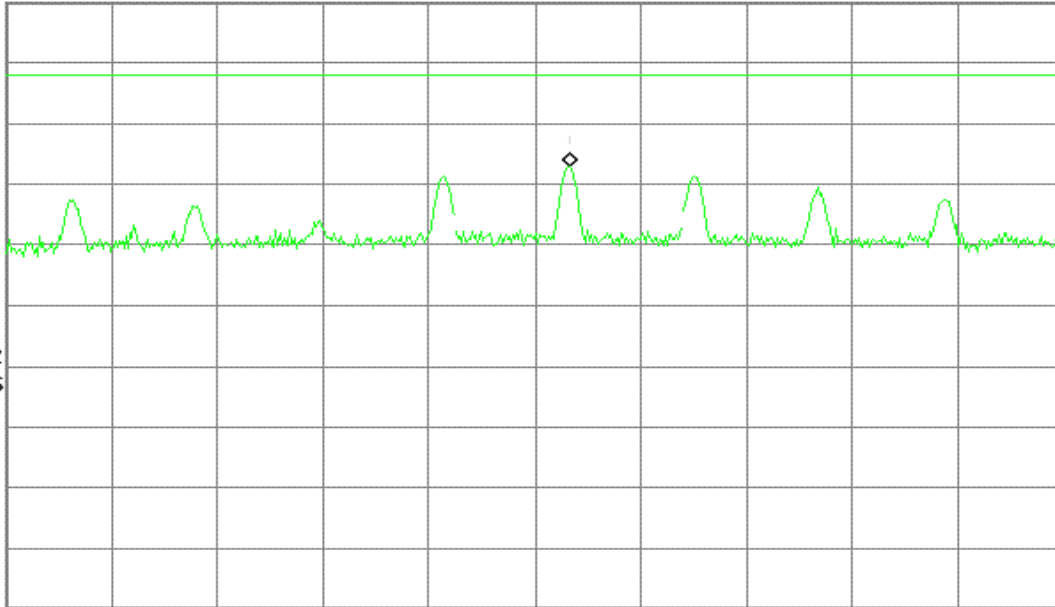
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.445 150 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### Channel Expansion – SIMO mode / Chain 1

### PPSD (CH Low)

Agilent 21:39:29 Feb 16, 2006

R L

Peak Power Spectral Density, g Mode Low Ch.

Mkr1 2.420 162 6 GHz

Ref 20 dBm

Atten 20 dB

-6.14 dBm

#Peak

Log

10

dB/

Offst

10.5

dB

DI

8.0

dBm

LgAv

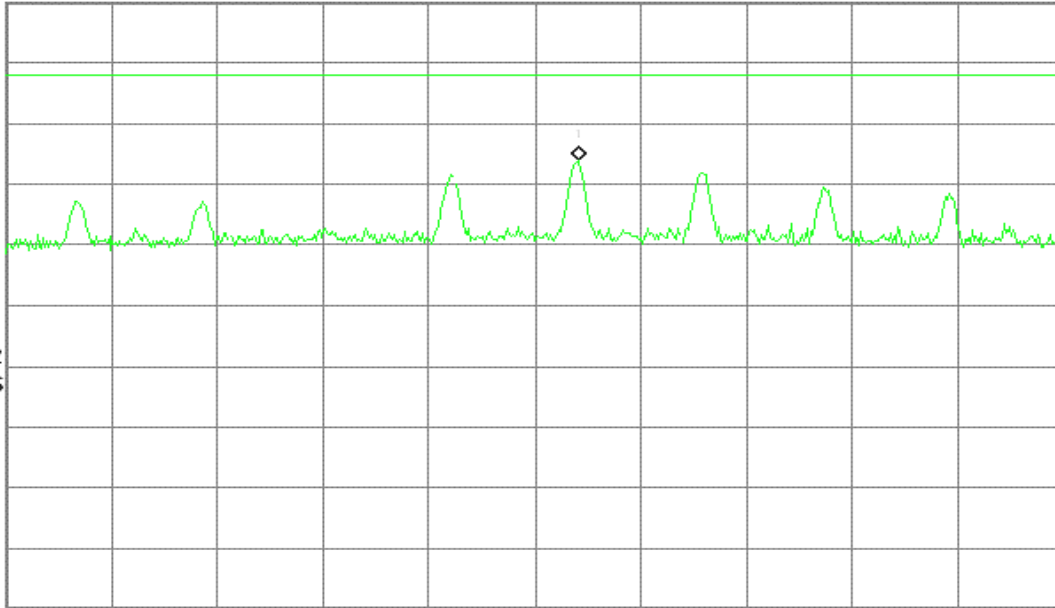
W1 S2

S3 FS

□(f):

f>50k

Swp



Center 2.420 150 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



### PPSD (CH Mid)

Agilent 21:45:53 Feb 16, 2006

R L

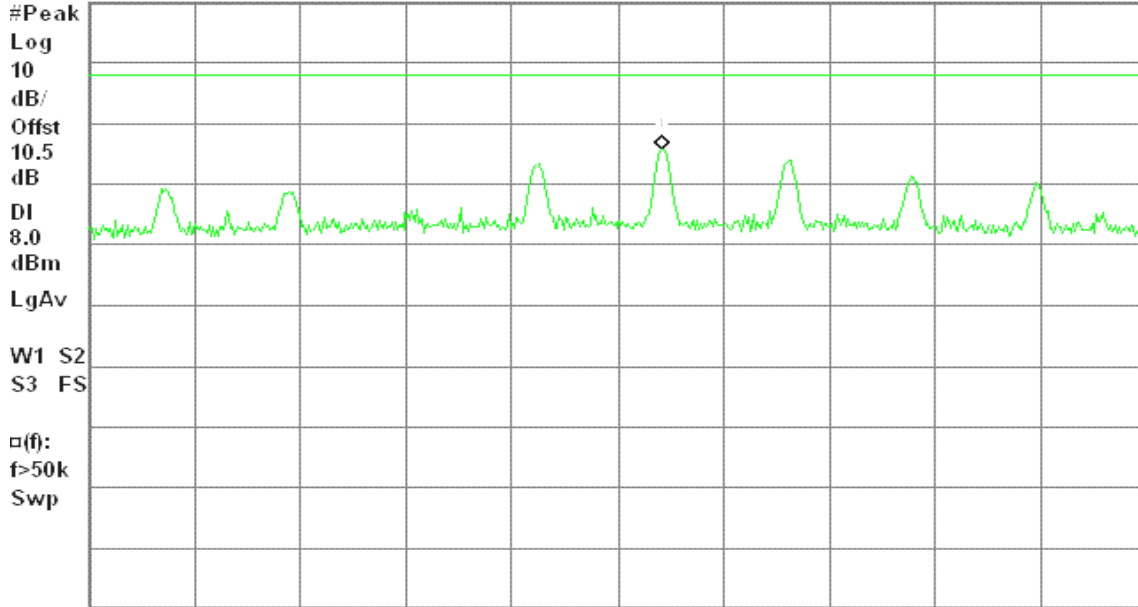
Peak Power Spectral Density, g Mode Mid Ch.

Mkr1 2.445 162 5 GHz

Ref 20 dBm

Atten 20 dB

-4.38 dBm



Center 2.445 150 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)

### PPSD (CH High)

Agilent 21:51:24 Feb 16, 2006

R L

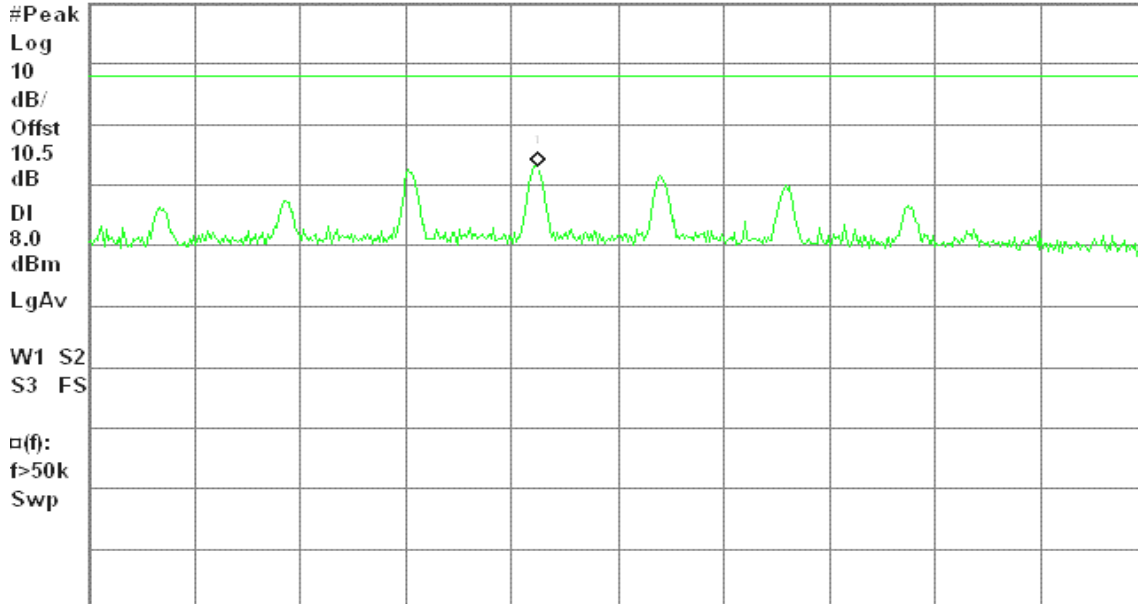
Peak Power Spectral Density, g Mode High Ch.

Mkr1 2.442 677 4 GHz

Ref 20 dBm

Atten 20 dB

-6.79 dBm



Center 2.442 700 0 GHz

Span 300 kHz

#Res BW 3 kHz

#VBW 10 kHz

#Sweep 100 s (601 pts)



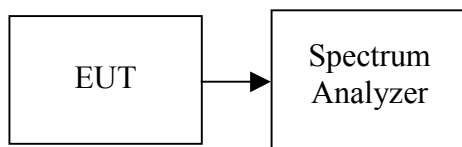
## 7.6 SPURIOUS EMISSIONS

### 7.6.1 Conducted Measurement

#### LIMIT

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

#### Test Configuration



#### TEST PROCEDURE

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

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

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

#### TEST RESULTS

*No non-compliance noted*



**Test Plot**

**IEEE 802.11b mode / Chain 0**

**CH Low**

Agilent 14:59:12 Feb 16, 2006

L

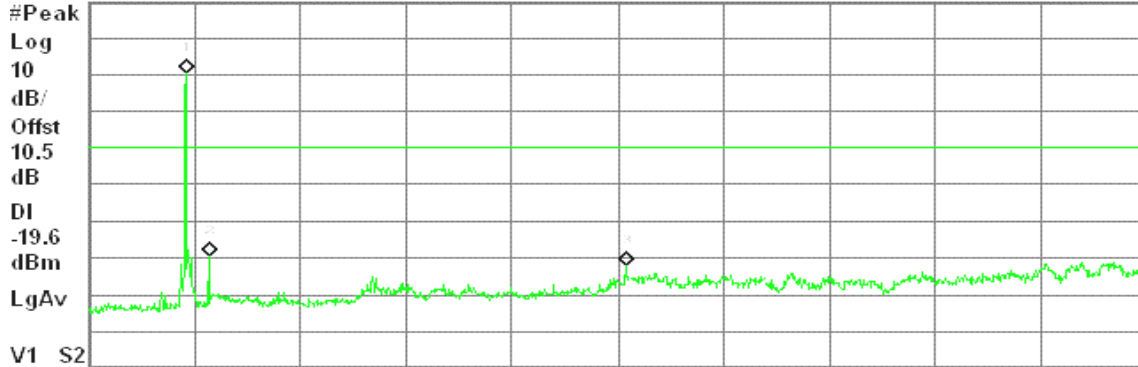
Spurious, b Mode Low Ch.

Mkr3 13.20 GHz

Ref 20 dBm

Atten 20 dB

-52.31 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	0.38 dBm
2	(1)	Freq	2.99 GHz	-49.80 dBm
3	(1)	Freq	13.20 GHz	-52.31 dBm

**CH Mid**

Agilent 14:47:02 Feb 16, 2006

L

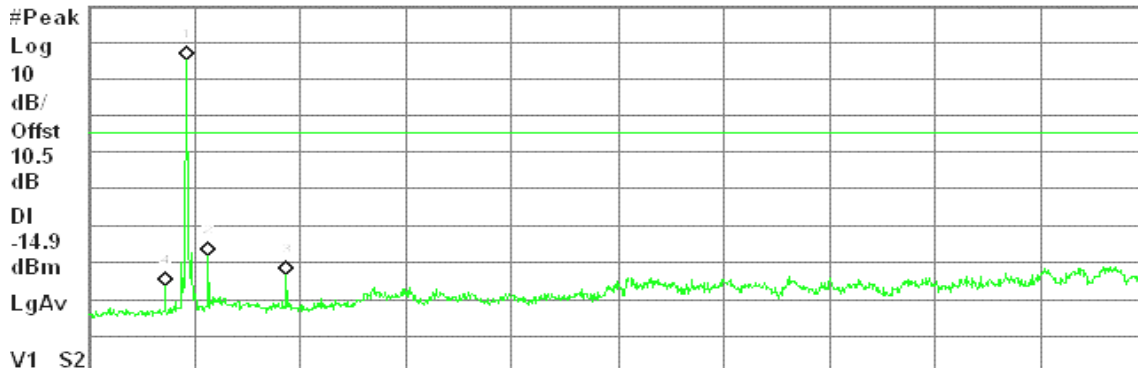
Spurious, b Mode Mid Ch.

Mkr4 1.90 GHz

Ref 20 dBm

Atten 20 dB

-56.79 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	5.15 dBm
2	(1)	Freq	2.96 GHz	-48.38 dBm
3	(1)	Freq	4.89 GHz	-53.71 dBm
4	(1)	Freq	1.90 GHz	-56.79 dBm



### CH High

Agilent 15:08:14 Feb 16, 2006

R T

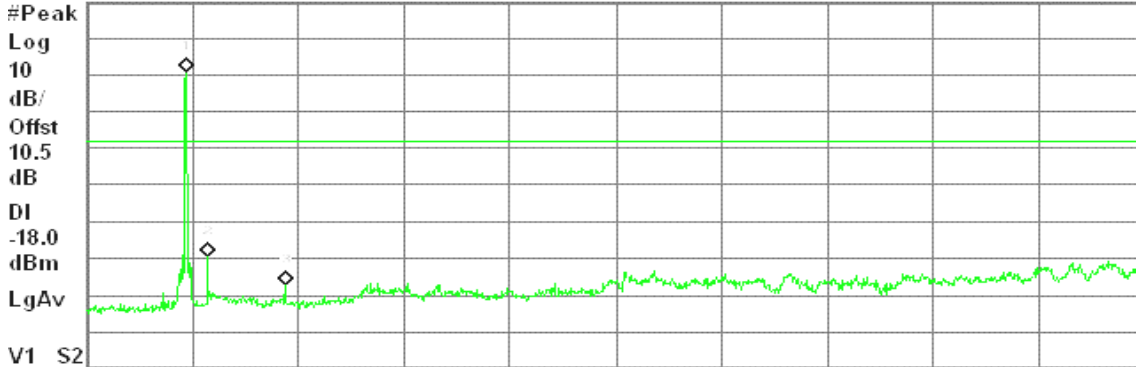
Spurious, b Mode High Ch.

Mkr3 4.91 GHz

Ref 20 dBm

Atten 20 dB

-57.66 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	0.74 dBm
2	(1)	Freq	2.99 GHz	-49.55 dBm
3	(1)	Freq	4.91 GHz	-57.66 dBm

### IEEE 802.11b mode / Chain 1

#### CH Low

Agilent 19:21:04 Feb 16, 2006

L

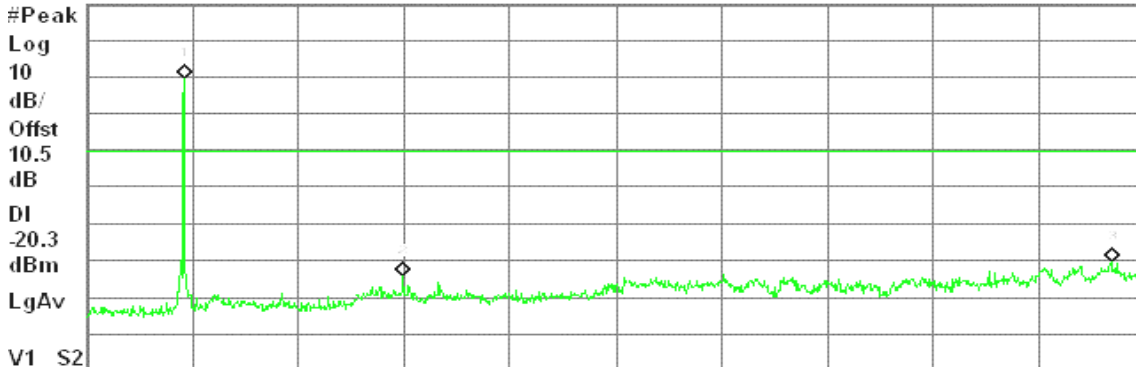
Spurious, b Mode Low Ch.

Mkr3 25.19 GHz

Ref 20 dBm

Atten 20 dB

-50.51 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	-0.30 dBm
2	(1)	Freq	7.82 GHz	-54.35 dBm
3	(1)	Freq	25.19 GHz	-50.51 dBm





### CH Mid

Agilent 19:32:14 Feb 16, 2006

L

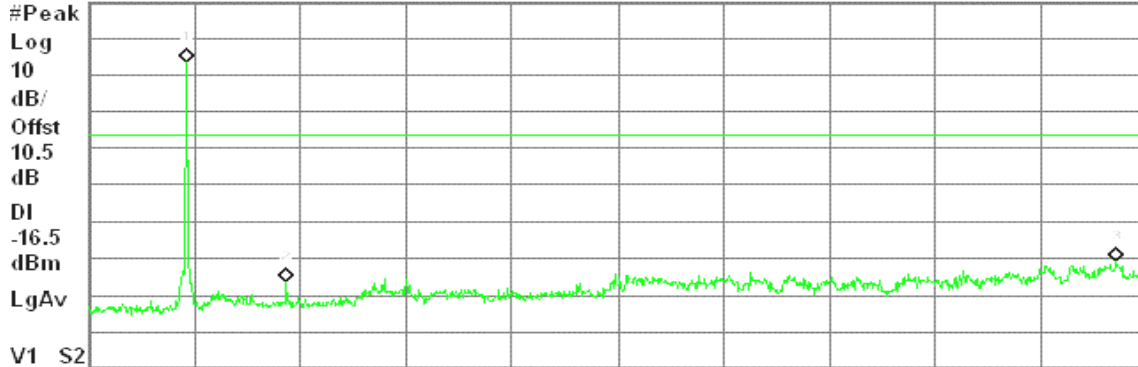
Spurious, b Mode Mid Ch.

Mkr3 25.27 GHz

Ref 20 dBm

Atten 20 dB

-50.82 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.46 GHz	3.48 dBm
2	(1)	Freq	4.89 GHz	-56.58 dBm
3	(1)	Freq	25.27 GHz	-50.82 dBm

### CH High

Agilent 19:41:35 Feb 16, 2006

L

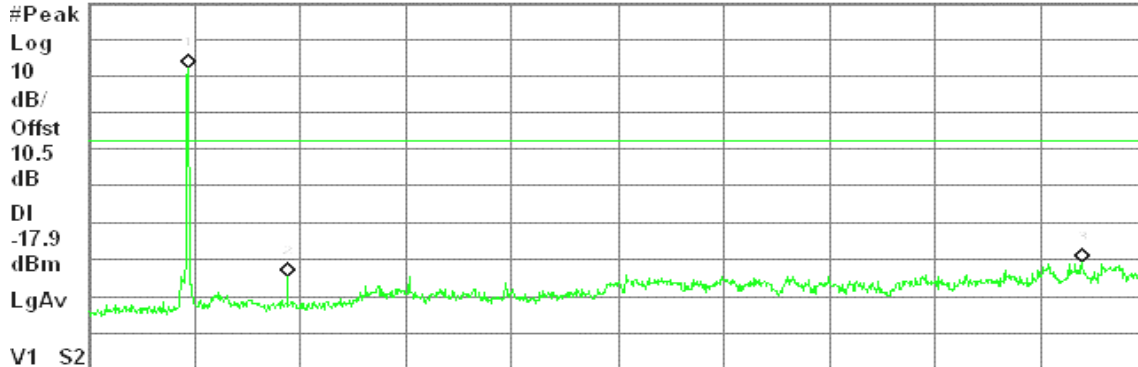
Spurious, b Mode High Ch.

Mkr3 24.42 GHz

Ref 20 dBm

Atten 20 dB

-51.05 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	2.14 dBm
2	(1)	Freq	4.91 GHz	-54.81 dBm
3	(1)	Freq	24.42 GHz	-51.05 dBm



IEEE 802.11g mode / Chain 0

CH Low

Agilent 16:18:56 Feb 16, 2006

L

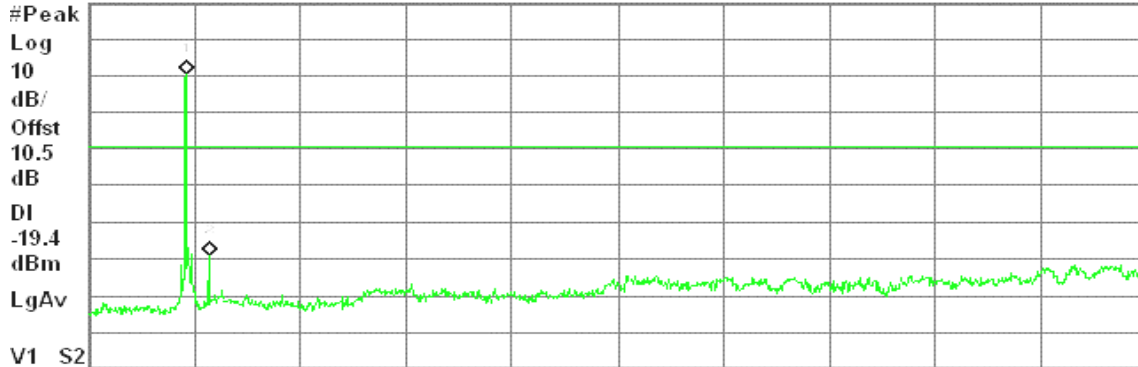
Spurious, g Mode Low Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-49.29 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	0.57 dBm
2	(1)	Freq	2.99 GHz	-49.29 dBm

CH Mid

Agilent 16:28:40 Feb 16, 2006

L

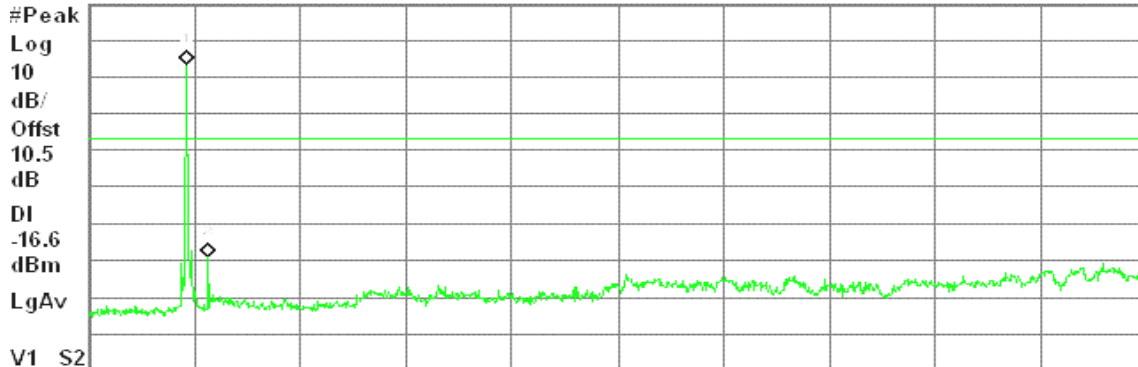
Spurious, g Mode Mid Ch.

Mkr2 2.96 GHz

Ref 20 dBm

Atten 20 dB

-49.40 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	3.34 dBm
2	(1)	Freq	2.96 GHz	-49.40 dBm



### CH High

Agilent 16:41:49 Feb 16, 2006

L

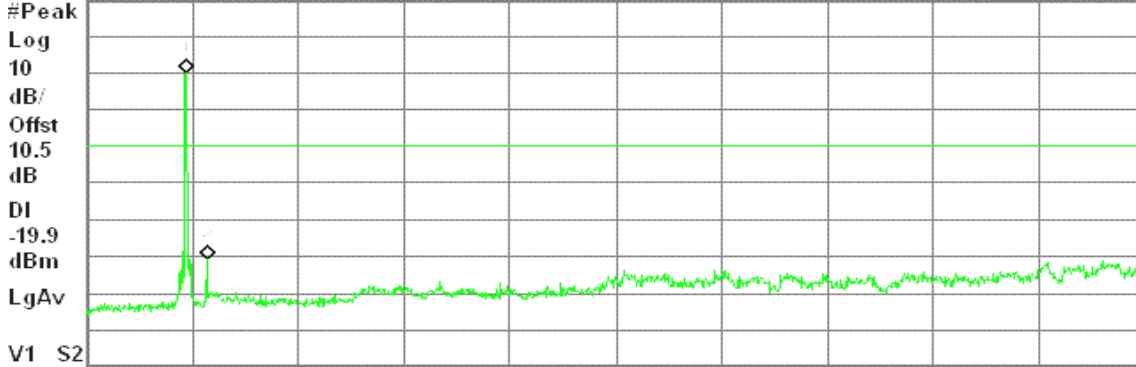
Spurious, g Mode High Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-50.93 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	0.08 dBm
2	(1)	Freq	2.99 GHz	-50.93 dBm

### IEEE 802.11g mode / Chain 1

#### CH Low

Agilent 21:05:47 Feb 16, 2006

L

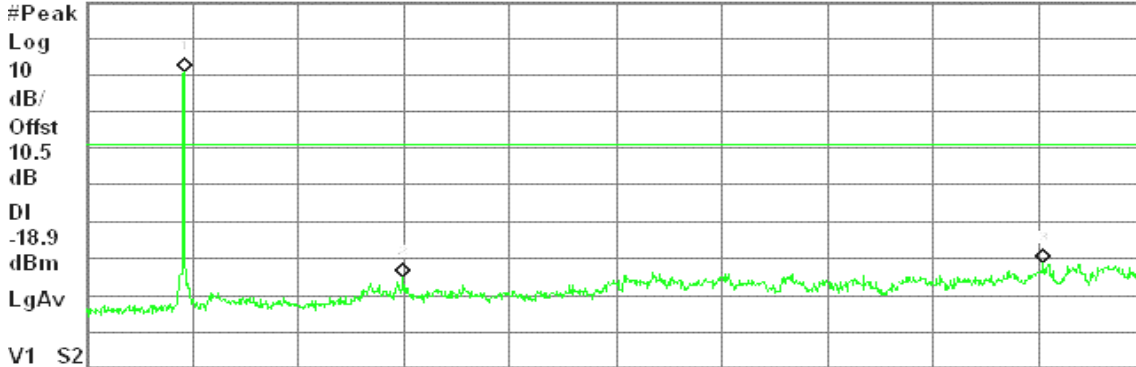
Spurious, g Mode Low Ch.

Mkr3 23.53 GHz

Ref 20 dBm

Atten 20 dB

-51.45 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	1.15 dBm
2	(1)	Freq	7.82 GHz	-55.43 dBm
3	(1)	Freq	23.53 GHz	-51.45 dBm



### CH Mid

Agilent 20:18:42 Feb 16, 2006

L

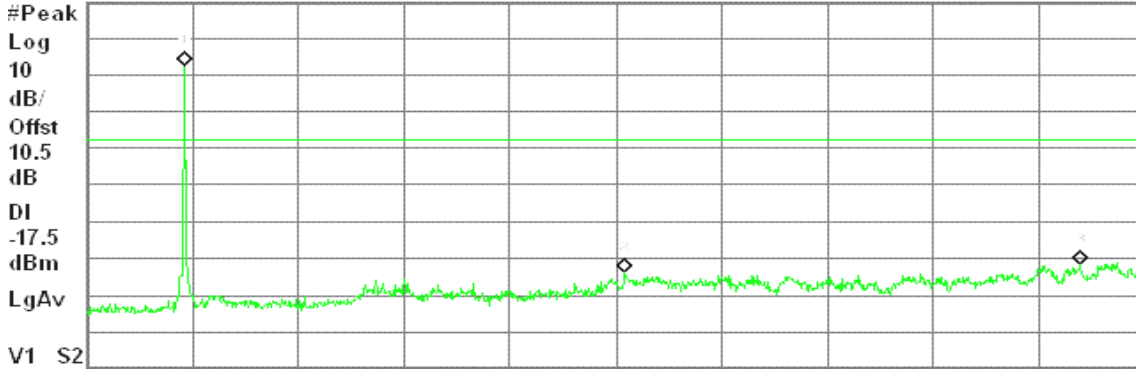
Spurious, g Mode Mid Ch.

Mkr3 24.42 GHz

Ref 20 dBm

Atten 20 dB

-52.03 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.46 GHz	2.47 dBm
2	(1)	Freq	13.22 GHz	-54.04 dBm
3	(1)	Freq	24.42 GHz	-52.03 dBm

### CH High

Agilent 20:29:50 Feb 16, 2006

L

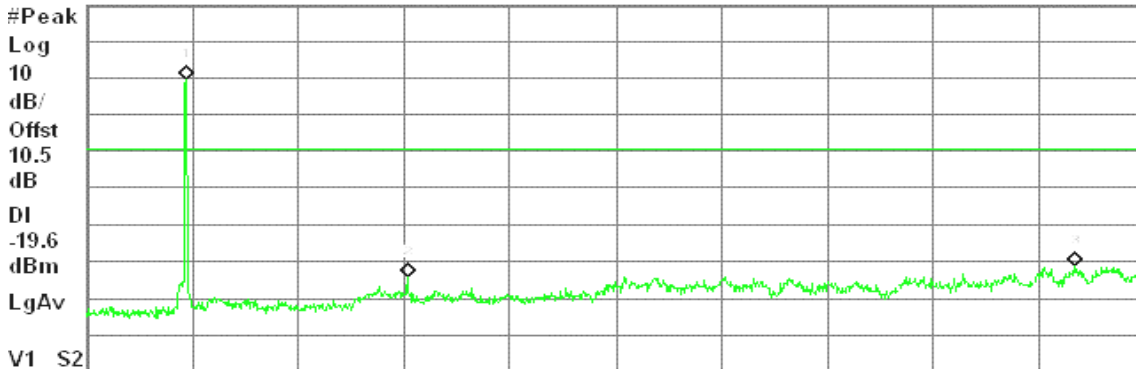
Spurious, g Mode High Ch.

Mkr3 24.29 GHz

Ref 20 dBm

Atten 20 dB

-51.47 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	-0.41 dBm
2	(1)	Freq	7.92 GHz	-54.59 dBm
3	(1)	Freq	24.29 GHz	-51.47 dBm



### IEEE 802.11g MIMO mode / Chain 0

#### CH Low

Agilent 17:43:22 Feb 16, 2006

L

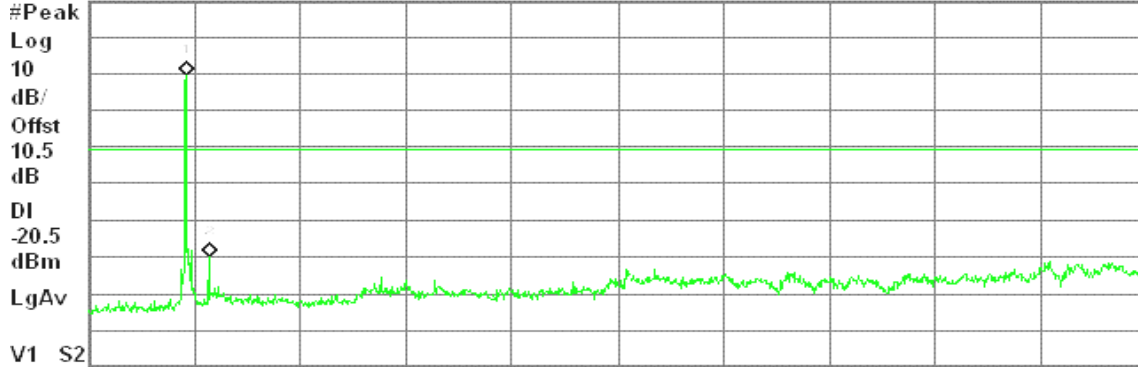
Spurious, g Mode Low Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-50.12 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	-0.55 dBm
2	(1)	Freq	2.99 GHz	-50.12 dBm

#### CH Mid

Agilent 17:50:43 Feb 16, 2006

L

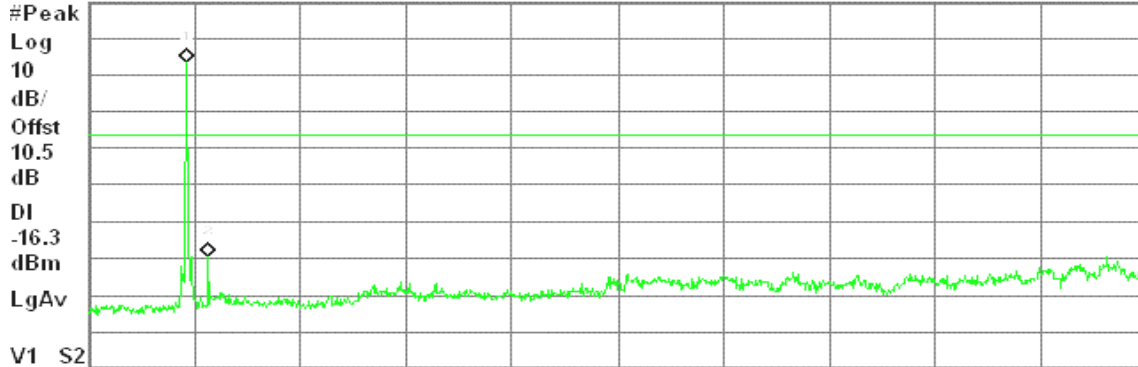
Spurious, g Mode Mid Ch.

Mkr2 2.96 GHz

Ref 20 dBm

Atten 20 dB

-49.83 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	3.72 dBm
2	(1)	Freq	2.96 GHz	-49.83 dBm



### CH High

Agilent 17:58:39 Feb 16, 2006

L

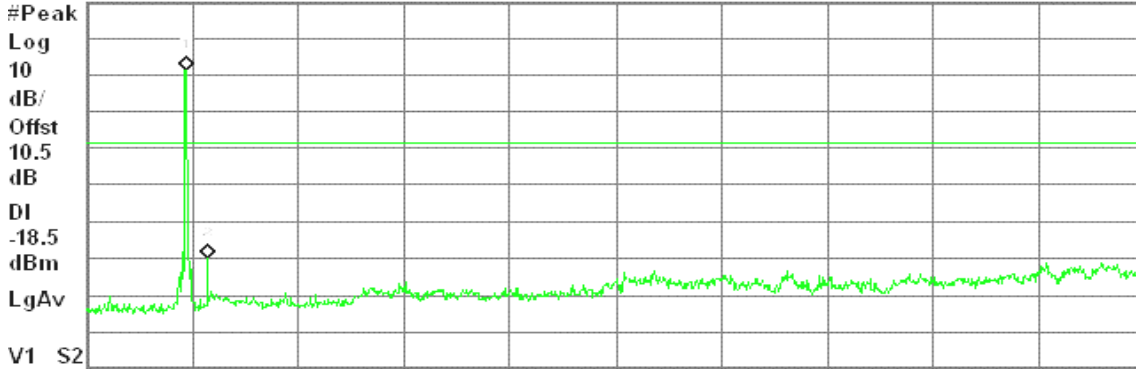
Spurious, g Mode High Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-50.14 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.47 GHz	1.48 dBm
2	(1)	Freq	2.99 GHz	-50.14 dBm

### IEEE 802.11g MIMO mode / Chain 1

#### CH Low

Agilent 21:19:28 Feb 16, 2006

L

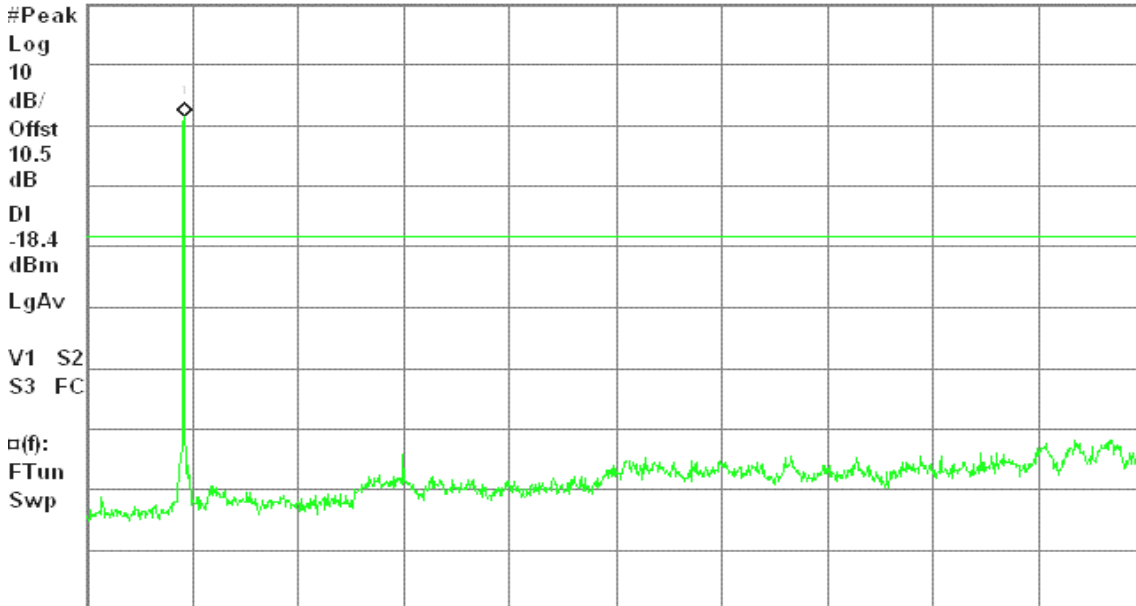
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

1.58 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### CH Mid

Agilent 21:26:07 Feb 16, 2006

L

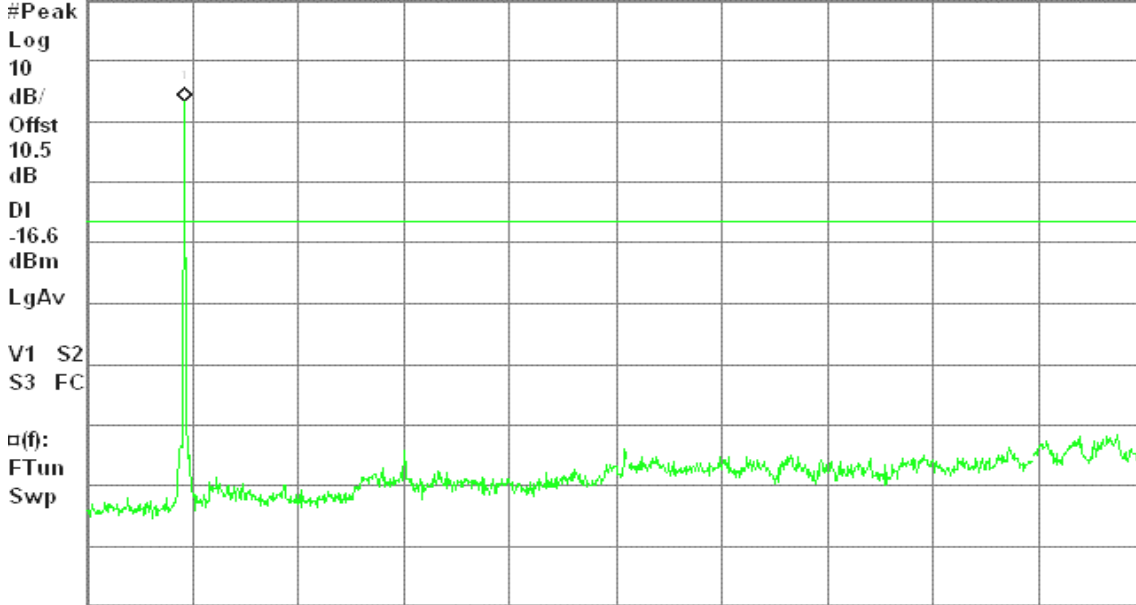
Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

3.41 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

### CH High

Agilent 21:32:06 Feb 16, 2006

T

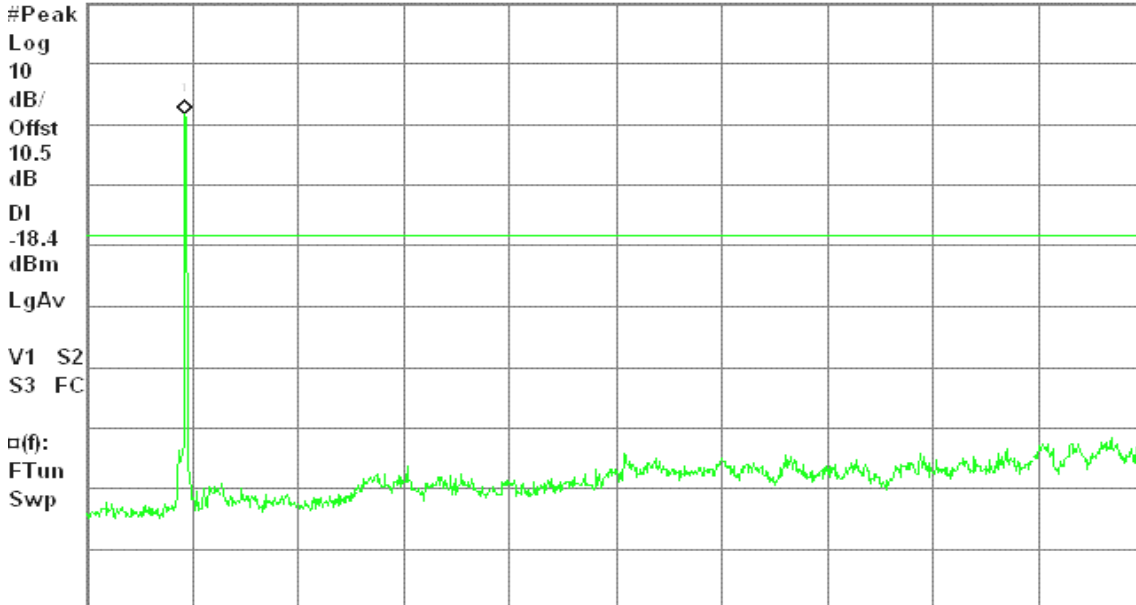
Spurious, g Mode High Ch.

Mkr1 2.45 GHz

Ref 20 dBm

Atten 20 dB

1.60 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



### Channel Expansion – SIMO mode / Chain 0

#### CH Low

Agilent 18:50:44 Feb 16, 2006

L

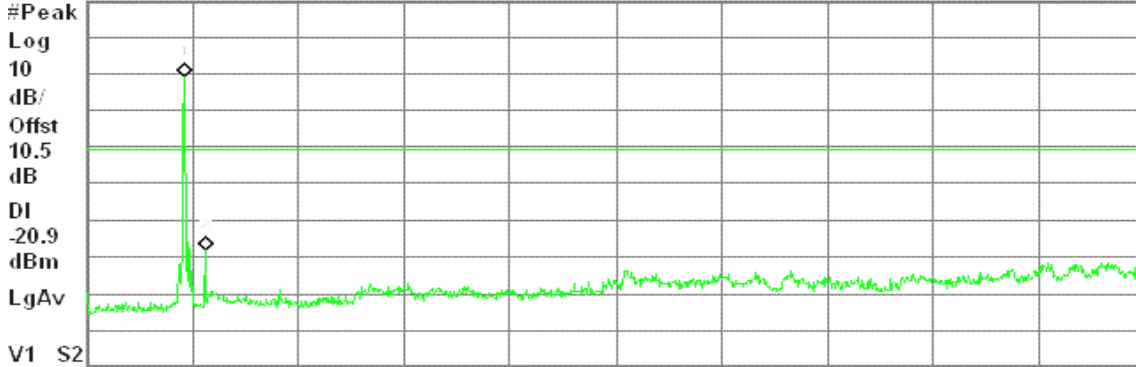
Spurious, g Mode Low Ch.

Mkr2 2.94 GHz

Ref 20 dBm

Atten 20 dB

-48.23 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.42 GHz	-0.85 dBm
2	(1)	Freq	2.94 GHz	-48.23 dBm

#### CH Mid

Agilent 18:57:58 Feb 16, 2006

L

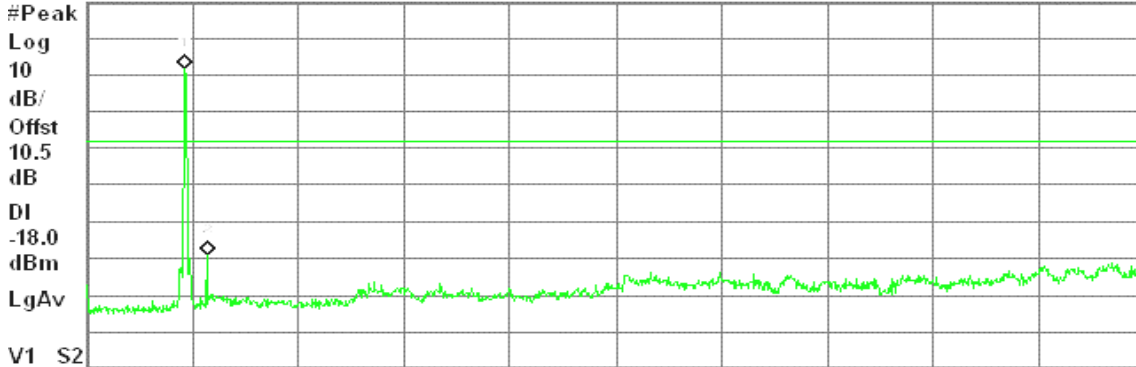
Spurious, g Mode Mid Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-49.20 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	2.00 dBm
2	(1)	Freq	2.99 GHz	-49.20 dBm





### CH High

Agilent 19:06:51 Feb 16, 2006

L

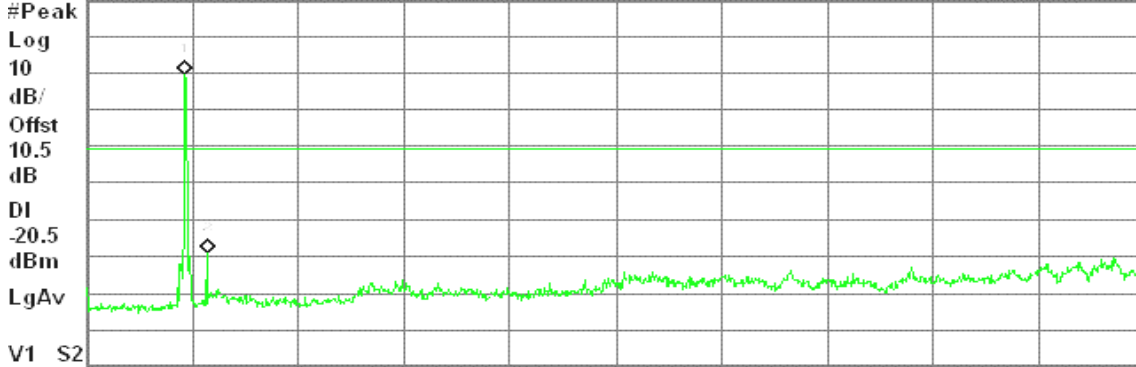
Spurious, g Mode High Ch.

Mkr2 2.99 GHz

Ref 20 dBm

Atten 20 dB

-49.44 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.46 GHz	-0.54 dBm
2	(1)	Freq	2.99 GHz	-49.44 dBm

### Channel Expansion – SIMO mode / Chain 1

#### CH Low

Agilent 21:40:53 Feb 16, 2006

L

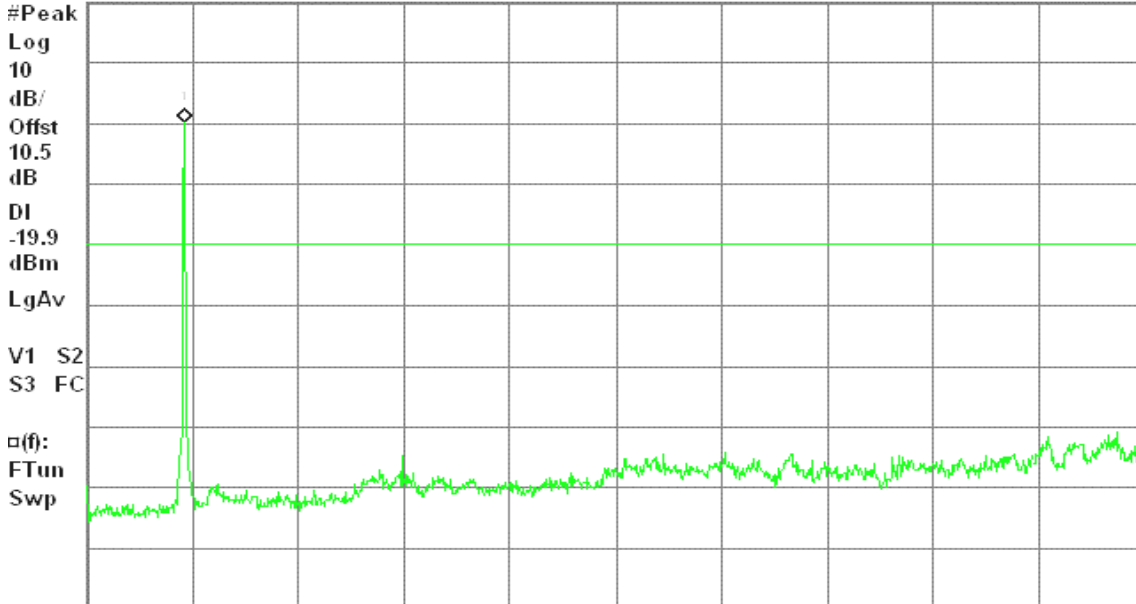
Spurious, g Mode Low Ch.

Mkr1 2.42 GHz

Ref 20 dBm

Atten 20 dB

0.15 dBm



Center 13.02 GHz

Span 25.97 GHz

#Res BW 100 kHz

#VBW 100 kHz

Sweep 3.131 s (1001 pts)



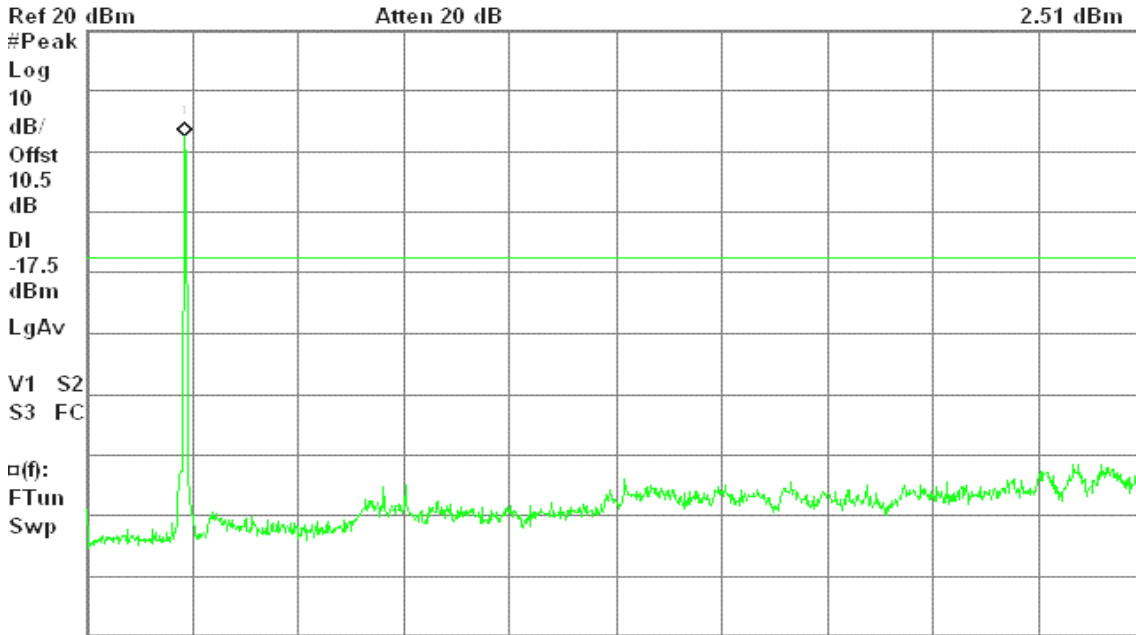
### CH Mid

Agilent 21:46:44 Feb 16, 2006

L

Spurious, g Mode Mid Ch.

Mkr1 2.45 GHz  
2.51 dBm



Center 13.02 GHz      Span 25.97 GHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 3.131 s (1001 pts)

### CH High

Agilent 21:52:32 Feb 16, 2006

L

Spurious, g Mode High Ch.

Mkr2 7.90 GHz  
-53.94 dBm



Center 13.02 GHz      Span 25.97 GHz  
#Res BW 100 kHz      #VBW 100 kHz      Sweep 3.131 s (1001 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.45 GHz	0.33 dBm
2	(1)	Freq	7.90 GHz	-53.94 dBm



### 7.7 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

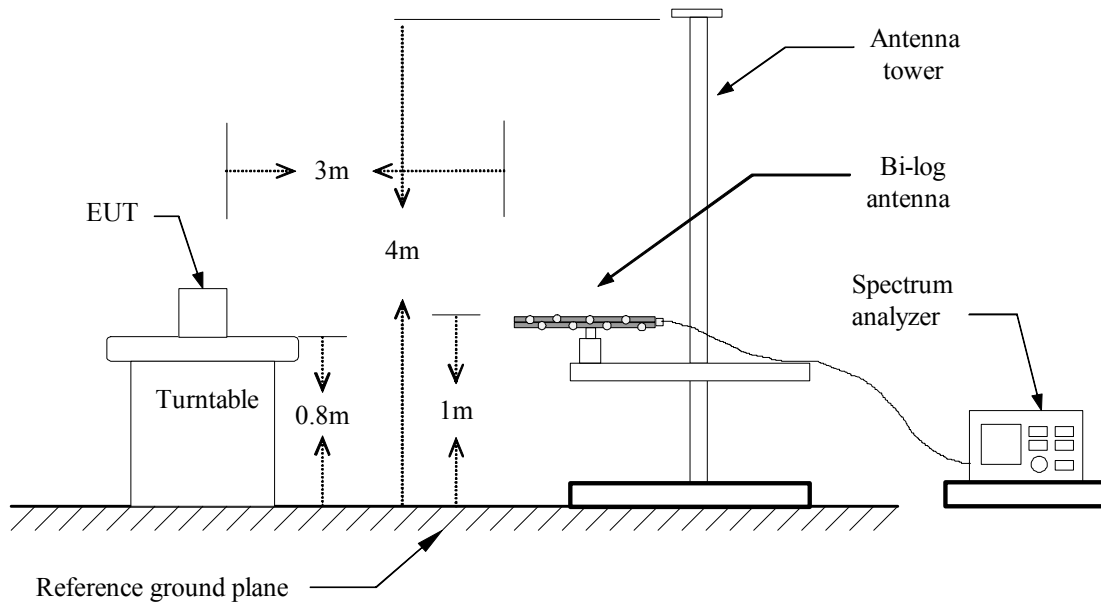
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections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

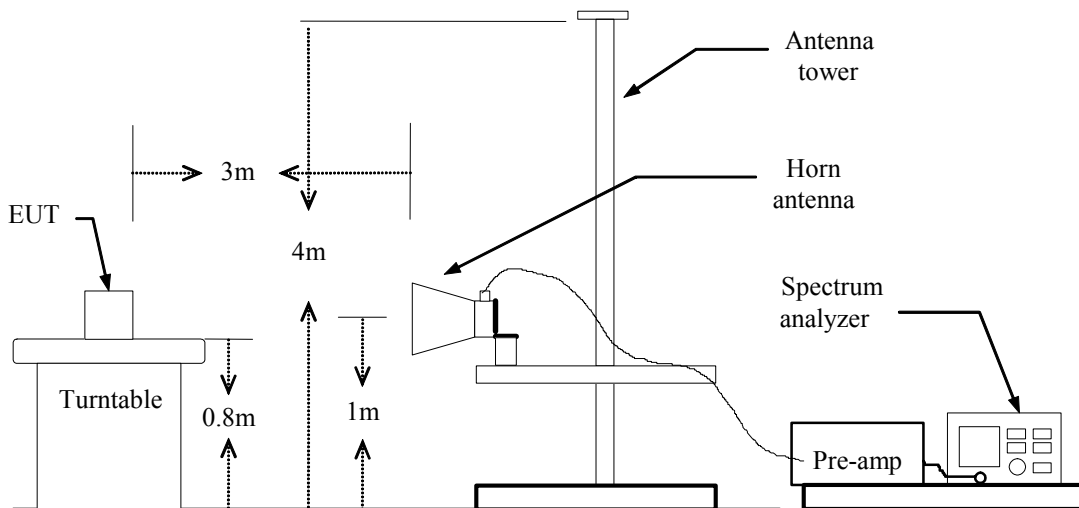
Frequency (MHz)	Field Strength (µV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

### 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

#### Below 1GHz

Operation Mode: Normal Link

Test Date: February 21, 2006

Temperature: 20°C

Tested by: James Yu

Humidity: 62% RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
54.25	V	64.31	-26.35	37.96	40.00	-2.04	Peak
249.87	V	53.15	-20.52	32.63	46.00	-13.37	Peak
498.83	V	45.27	-13.44	31.83	46.00	-14.17	Peak
565.12	V	44.06	-12.52	31.54	46.00	-14.46	Peak
799.53	V	40.92	-9.32	31.60	46.00	-14.40	Peak
N/A							
152.87	H	53.94	-20.56	33.38	43.50	-10.12	Peak
241.78	H	61.63	-20.44	41.19	46.00	-4.81	Peak
288.67	H	51.75	-18.81	32.94	46.00	-13.06	Peak
498.83	H	43.40	-13.44	29.97	46.00	-16.03	Peak
N/A							

**Remark:**

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



**Above 1 GHz**

**Operation Mode:** TX / IEEE 802.11b (Chain 0+ Chain 1) / CH Low **Test Date:** February 14, 2006

**Temperature:** 25°C

**Tested by:** James Yu

**Humidity:** 57 % RH

**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1264.00	V	58.43	---	-14.39	44.04	---	74.00	54.00	-9.96	Peak
2324.00	V	64.14	57.41	-10.50	53.64	46.91	74.00	54.00	-0.36	Average
4825.00	V	51.76	---	-7.80	43.97	---	74.00	54.00	-10.03	Peak
7235.00	V	48.50	---	-5.70	42.80	---	74.00	54.00	-11.20	Peak
N/A										
1264.00	H	58.87	---	-14.39	44.48	---	74.00	54.00	-9.52	Peak
N/A										

**Remark:**

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



Operation Mode: TX / IEEE 802.11b (Chain 0+ Chain 1) / CH Mid Test Date: February 14, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1272.00	V	57.68	---	-14.37	43.31	---	74.00	54.00	-10.69	Peak
2320.00	V	68.16	60.33	-10.50	57.66	49.83	74.00	54.00	-4.17	Average
4875.00	V	51.58	---	-7.79	43.79	---	74.00	54.00	-10.21	Peak
7310.00	V	50.59	---	-5.64	44.95	---	74.00	54.00	-9.05	Peak
N/A										
1266.00	H	57.72	---	-14.38	43.34	---	74.00	54.00	-10.66	Peak
N/A										

Remark:

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





Operation Mode: TX / IEEE 802.11b (Chain 0+ Chain 1) / CH High Test Date: February 14, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1270.00	V	58.72	---	-14.38	44.34	---	74.00	54.00	-9.66	Peak
2360.00	V	67.34	56.54	-10.45	56.89	46.09	74.00	54.00	-7.91	Average
4925.00	V	50.88	---	-7.78	43.10	---	74.00	54.00	-10.90	Peak
7385.00	V	48.82	---	-5.59	43.23	---	74.00	54.00	-10.77	Peak
N/A										
1270.00	H	58.07	---	-14.38	43.69	---	74.00	54.00	-10.31	Peak
7390.00	H	49.70	---	-5.58	44.11	---	74.00	54.00	-9.89	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g (Chain 0+ Chain 1) / CH Low Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1270.00	V	54.63	---	-6.91	47.72	---	74.00	54.00	-6.28	Peak
2296.67	V	66.00	57.58	-5.38	60.62	52.20	74.00	54.00	-1.80	Average
2536.67	V	65.64	55.08	-4.79	60.85	50.29	74.00	54.00	-3.71	Average
N/A										
4833.33	H	44.21	---	0.67	44.88	---	74.00	54.00	-9.12	Peak
7233.33	H	42.22	---	6.28	48.50	---	74.00	54.00	-5.50	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g (Chain 0+ Chain 1) / CH Mid Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1256.67	V	54.28	---	-6.90	47.38	---	74.00	54.00	-6.62	Peak
2336.67	V	65.15	56.13	-5.28	59.87	50.85	74.00	54.00	-3.15	Average
2496.67	V	63.16	53.81	-4.89	58.27	48.92	74.00	54.00	-5.08	Average
N/A										
1256.67	H	54.02	---	-6.90	47.12	---	74.00	54.00	-6.88	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g (Chain 0+ Chain 1) / CH High Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1243.33	V	54.93	---	-6.90	48.04	---	74.00	54.00	-5.96	Peak
2343.33	V	65.82	56.88	-5.27	60.55	51.61	74.00	54.00	-2.39	Average
2503.33	V	64.63	54.73	-4.87	59.76	49.86	74.00	54.00	-4.14	Average
N/A										
1270.00	H	54.32	---	-6.91	47.41	---	74.00	54.00	-6.59	Peak
4925.00	H	43.17	---	0.99	44.16	---	74.00	54.00	-9.84	Peak
7375.00	H	44.61	---	5.53	50.14	---	74.00	54.00	-3.86	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g MIMO (Chain 0+ Chain 1) / CH Low

Test Date: February 14, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1258.00	V	57.60	---	-14.40	43.20	---	74.00	54.00	-10.80	Peak
2364.00	V	69.31	61.45	-10.44	58.87	51.01	74.00	54.00	-2.99	Average
N/A										
1332.00	H	59.79	---	-14.25	45.54	---	74.00	54.00	-8.46	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g MIMO (Chain 0+ Chain 1) / CH Mid

Test Date: February 14, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1264.00	V	57.66	---	-14.39	43.27	---	74.00	54.00	-10.73	Peak
2384.00	V	68.59	61.01	-10.42	58.17	50.59	74.00	54.00	-3.41	Average
N/A										
1248.00	H	58.01	---	-14.42	43.59	---	74.00	54.00	-10.41	Peak
N/A										

Remark:

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



Operation Mode: TX / IEEE 802.11g MIMO (Chain 0+ Chain 1) / CH High

Test Date: February 14, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1246.00	V	58.66	---	-14.42	44.23	---	74.00	54.00	-9.77	Peak
2344.00	V	66.86	58.91	-10.47	56.39	48.44	74.00	54.00	-5.56	Average
N/A										
1270.00	H	58.52	---	-14.38	44.15	---	74.00	54.00	-9.85	Peak
N/A										

Remark:

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



Operation Mode: TX / Channel Expansion – SIMO mode  
(Chain 0+ Chain 1) / CH Low

Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1254.00	V	58.55	---	-14.41	44.14	---	74.00	54.00	-9.86	Peak
2358.00	V	66.67	60.17	-10.45	56.22	49.72	74.00	54.00	-4.28	Average
N/A										
1260.00	H	57.51	---	-14.40	43.11	---	74.00	54.00	-10.89	Peak
N/A										

Remark:

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





Operation Mode: TX / Channel Expansion – SIMO mode  
(Chain 0+ Chain 1) / CH Mid

Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1246.00	V	59.00	---	-14.42	44.58	---	74.00	54.00	-9.42	Peak
2336.00	V	65.21	58.01	-10.48	54.73	47.53	74.00	54.00	-6.47	Average
2496.00	V	69.01	58.52	-10.28	58.73	48.24	74.00	54.00	-5.76	Average
9766.67	V	66.20	---	-24.78	41.43	---	74.00	54.00	-12.57	Peak
N/A										
1258.00	H	57.47	---	-14.40	43.07	---	74.00	54.00	-10.93	Peak
N/A										

Remark:

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



Operation Mode: TX / Channel Expansion – SIMO mode  
(Chain 0+ Chain 1) / CH High

Test Date: February 13, 2006

Temperature: 25°C

Tested by: James Yu

Humidity: 57 % RH

Polarity: Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (Peak) (dBuV)	Reading (Average) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Result (Average) (dBuV/m)	Limit (Peak) (dBuV/m)	Limit (Average) (dBuV/m)	Margin (dB)	Remark
1264.00	V	56.90	---	-14.39	42.52	---	74.00	54.00	-11.48	Peak
2336.00	V	67.96	57.99	-10.48	57.48	47.51	74.00	54.00	-6.49	Average
N/A										
1254.00	H	58.07	---	-14.41	43.66	---	74.00	54.00	-10.34	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).



## 7.8 POWERLINE CONDUCTED EMISSIONS

### LIMIT

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

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

\* Decreases with the logarithm of the frequency.

### Test Configuration

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

### TEST PROCEDURE

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

**TEST RESULTS**

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

**Test Data**

**Operation Mode:** Normal Link                      **Test Date:** March 3, 2006  
**Temperature:** 25°C                                      **Tested by:** Ivan Tsai  
**Humidity:** 55% RH

Frequency (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.192	44.760	40.730	0.116	44.876	40.846	63.950	53.950	-19.074	-13.104	L1
0.254	36.690	32.620	0.100	36.790	32.720	61.625	51.625	-24.835	-18.905	L1
0.381	30.400	28.150	0.100	30.500	28.250	58.258	48.258	-27.758	-20.008	L1
6.050	11.080	7.450	0.305	11.385	7.755	60.000	50.000	-48.615	-42.245	L1
14.080	21.100	19.190	0.782	21.882	19.972	60.000	50.000	-38.118	-30.028	L1
24.791	33.020	29.930	1.200	34.220	31.130	60.000	50.000	-25.780	-18.870	L1
0.191	44.470	40.470	0.118	44.588	40.588	63.993	53.993	-19.405	-13.405	L2
0.258	30.890	27.610	0.100	30.990	27.710	61.496	51.496	-30.506	-23.786	L2
0.568	27.600	27.410	0.100	27.700	27.510	56.000	46.000	-28.300	-18.490	L2
1.331	21.830	21.190	0.100	21.930	21.290	56.000	46.000	-34.070	-24.710	L2
6.296	18.580	15.990	0.330	18.910	16.320	60.000	50.000	-41.090	-33.680	L2
24.791	31.440	28.230	1.200	32.640	29.430	60.000	50.000	-27.360	-20.570	L2

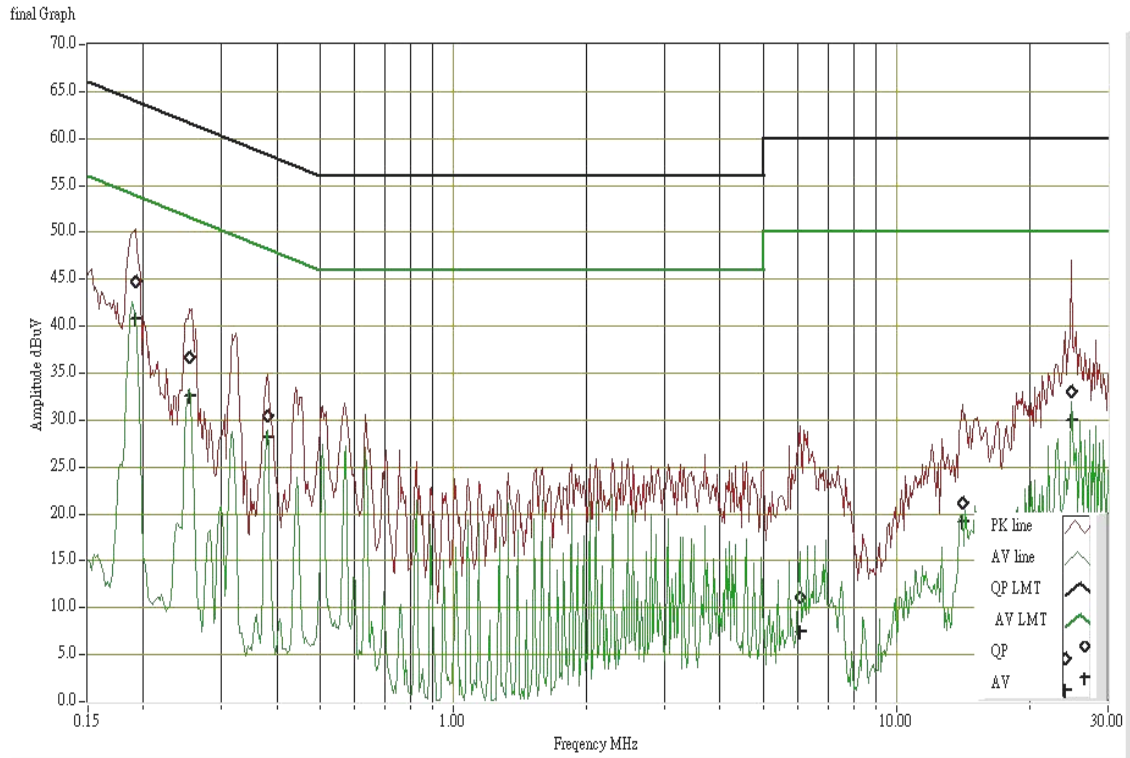
***Remark:***

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

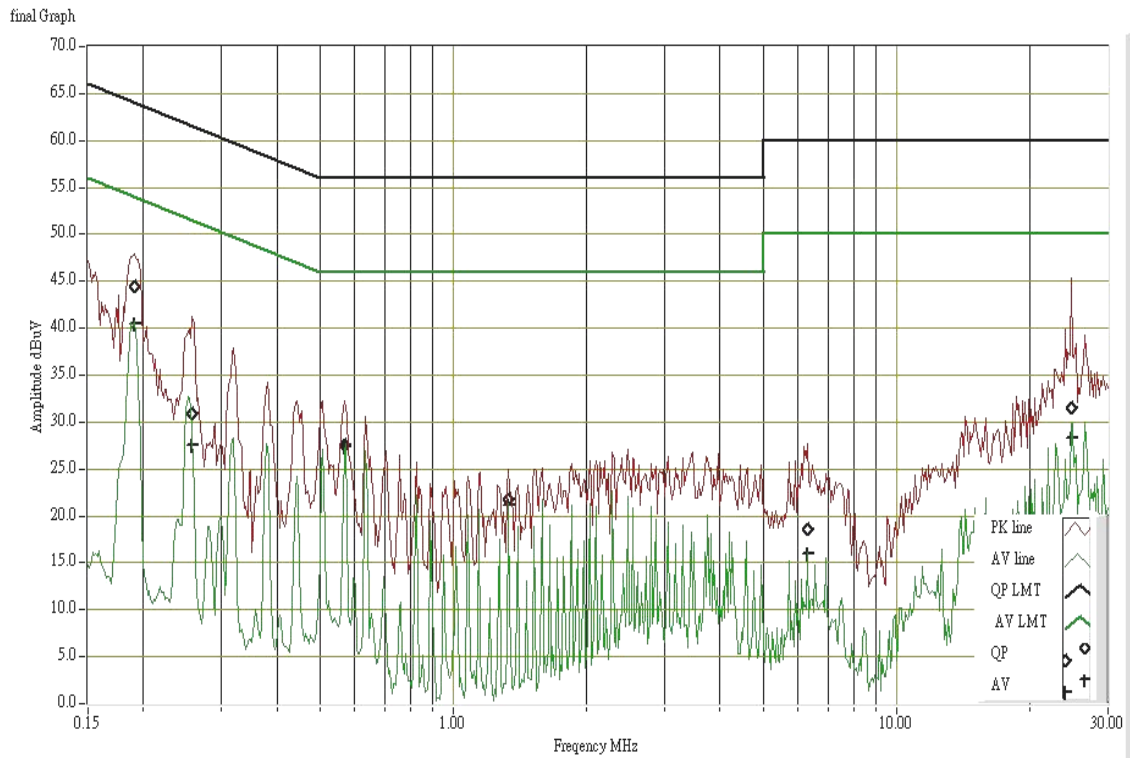


### Test Plots

#### Conducted emissions (Line 1)



#### Conducted emissions (Line 2)





## APPENDIX 1 RADIO FREQUENCY EXPOSURE

### LIMIT

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

### EUT Specification

<b>EUT</b>	NETGEAR RangeMax™ 240 Wireless USB 2.0 Adapter WPNT121
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
<b>Device category</b>	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	IEEE 802.11b: 20.52 dBm (112.72mW) IEEE 802.11g: 20.37 dBm (108.89mW) IEEE 802.11g MIMO Mode: 20.78dBm (119.67mW) Channel Expansion – SIMO mode: 20.61dBm (115.08mW)
<b>Antenna gain (Max)</b>	1.96 dBi (Numeric gain: 1.57)
<b>Evaluation applied</b>	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation* <input type="checkbox"/> N/A

#### **Remark:**

1. The maximum output power is 20.78dBm (119.67mW) at 2437MHz (with 1.57 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm<sup>2</sup> even if the calculation indicates that the power density would be larger.

### TEST RESULTS

No non-compliance noted.

**Remark:** Please refer to the separated SAR report.