



FCC 47 CFR PART 15 SUBPART C TEST REPORT

For

Connect N150 Wireless Router

Model No.: F7D5301 v3, F7D1301 v3

Trade Name: BELKIN

FCC ID: K7SF7D5301V3

**Test Report Number:
KS100824A01-RP**

Issued for

**Belkin International Inc.
12045 East Waterfront Drive, Playa Vista, CA 90094, USA**

Issued by:

Compliance Certification Services Inc.

Kun shan Laboratory

**No.10 Weiye Rd., Innovation park, Eco&Tec,
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Issued Date: September 9, 2010



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Revision History

Rev.	IssueDate	Revisions	Effect Page	Revised By
00	September 9, 2010	Initial Issue	ALL	Spring Zhou



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1. TEST RESULT CERTIFICATION

Product name: Connect N150 Wireless Router

Model Number: F7D5301 v3, F7D1301 v3

Trade Name: BELKIN

FCC ID: K7SF7D5301V3

Device Category: Production unit

Date of Test: From September 1, 2010 to September 8, 2010

Applicant: **Belkin International Inc.**
12045 East Waterfront Drive, Playa Vista, CA 90094, USA

Manufacturer: **SerComm Corporation**
8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan

APPLICABLE STANDARDS	
STANDARD	STANDARD
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Deviation from Applicable Standard	
None	

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:

Spring Zhou
RF Manager
Compliance Certification Service Inc.

Reviewed by:

Jeff Fang
RF Section Manager
Compliance Certification Service Inc.



2. EUT DESCRIPTION

Product name	Connect N150 Wireless Router
Model Number	F7D5301 v3, F7D1301 v3
Model Discrepancy	All the above models are identical except the model designation for different market.
Trade Name	BELKIN
FCC ID	K7SF7D5301V3
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz 2422 MHz ~ 2452 MHz
Maximum Output Power to Antenna	IEEE 802.11b mode: 19.12dBm IEEE 802.11g mode: 14.93dBm IEEE 802.11gn Standard-20 MHz Channel mode: 15.06dBm IEEE 802.11gn Wide-40 MHz Channel mode: 14.77 dBm (the EUT transmitting and receiving with one antennas simultaneously working at n mode)
Modulation Technique	IEEE 802.11b mode: DSSS (1, 2, 5.5 and 11 Mbps) IEEE 802.11g mode: OFDM (6, 9, 12, 18, 24, 36, 48 and 54 Mbps) IEEE 802.11n Standard-20 MHz Channel mode: OFDM (MCS 0~15) IEEE 802.11n Wide-40 MHz Channel mode: OFDM (MCS 0~15)
Number of Channels	IEEE 802.11b/g mode: 11 Channels IEEE 802.11n Standard-20 MHz Channel mode: 11 Channels IEEE 802.11n Wide-40 MHz Channel mode: 7 Channels
Antenna Specification	One antennas for 2.4GHz Gain 0.13dBi
Antenna designation	PCB antennas

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: K7SF7D5301V3 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
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

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

² Above 38.6

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



3.5 DESCRIPTION OF TEST MODES

The EUT transmitting and receiving with one antenna working at b/g/n mode, so one antenna working configuration was used for b/g/n mode testing in this report.

The worst-case data rates are determined to be as follows for each mode based on investigation by measuring the average power, peak power and PPSD across all data rates, bandwidths, and modulations.

The worst-case data rates:

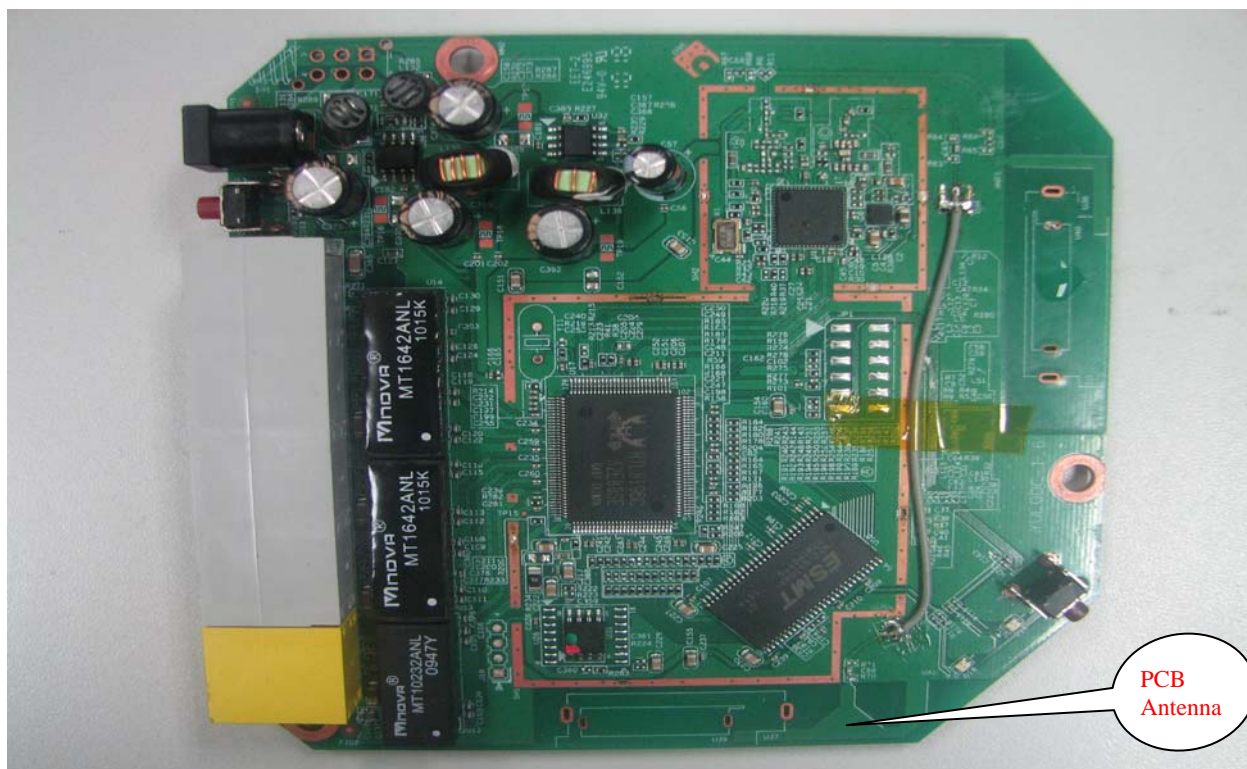
IEEE802.11b mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE802.11g mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

IEEE 802.11gn Standard-20 MHz Channel mode: Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS8 data rate were chosen for full testing.

IEEE 802.11gn Wide-40 MHz Channel mode: Channel Low (2422MHz), Channel Mid (2437MHz) and Channel High (2452MHz) with MCS8 data rate were chosen for full testing.

Then, the EUT configuration and cable configuration of the above highest emission mode was recorded for all final test items.





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.

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	MY44020154	11/12/2010
Peak and Avg Power Sensor	Agilent	E9327A	US40441788	09/11/2010
EPM-P Series Power Meter	Agilent	E4416A	QB41292714	09/11/2010

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	11/12/2010
Pre-Amplifier	Miteq	NSP4000-NF	870731	01/21/2011
Horn Antenna	Austriah	BBHA9120D	D267	05/09/2011
SHF-EHF Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170171	04/12/2011
Turn Table	CT	CT123	4162	N.C.R
Antenna Tower	CT	CTERG23	3253	N.C.R
Controller	CT	CT100	95635	N.C.R
Coax Switch	Anitsu	MP 598	M 80094	N/A
Site NSA	CCS Lab.	N/A	N/A	12/11/2010
ESPI3 EMI RECEIVER	R&S	ESPI3	101026	05/06/2011
Pre-Amplifier	MINI	ZFL-1000VH2	d041703	02/28/2011
Bilog Antenna	Sunol Sciences	JB1	A110204-2	11/22/2010
Loop Antenna	ARA	PLA-1030/B	1029	02/24/2011

Remark: The measurement uncertainty is less than $\pm 2.0065\text{dB}$ (30MHz ~ 1GHz), $\pm 3.0958\text{dB}$ (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV. The measurement uncertainty is less than $\pm 2.50\text{dB}$ (30MHz ~ 1GHz), $\pm 3.169\text{dB}$ (Above 1GHz)

Power Line Conducted Emission Test Site A				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	SCHAFFNER	SCR3501	343	04/22/2011
V (V-LISN)	Schwarzbeck	NNLK 8129	8129-143	04/11/2011
LISN (EUT)	FCC	FCC-LISN-50/25 0-50-2-02	SN:05012	04/11/2011
TRANSIENT LIMITER	SCHAFFNER	CFL9206	1710	04/06/2011

Remark: The measurement uncertainty is less than $\pm 2.81\text{dB}$, 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 CCS China Kunshan Lab at 10#Weiye Rd, Innovation Park Eco. & Tec. Development Zone Kunshan city JiangSu, (215300), CHINA.

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 LABORATORY ACCREDITATIONS AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: **2541.01** to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with Industry Canada, Certification and Engineering Bureau, **Site# 2324E-1** for 10m chamber 3/10m, **Site# 2324E-2** for 3m chamber 3m.

**5.4 TABLE OF ACCREDITATIONS AND LISTINGS**

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	47 CFR FCC Part 15/18 (using ANSI C63.4:2003); VCCI V3; CNS 13438; CNS 13439; CNS 13803; CISPR 11; EN 55011; CISPR 13; EN 55013; CISPR 22:2005; CISPR 22:1997 +A1 :2000+A2 :2002; EN 55022:2006; EN55022 :1998 +A1 :2001+A2 :2003; EN 61000-6-3 (excluding discontinuous interference); EN 61000-6-4; AS/NZS CISPR 22; CAN/CSA-CEI/IEC CISPR 22; EN 61000-3-2; EN 61000-3-3; EN550024; EN 61000-4-2; EN 61000-4-3; EN61000-4-4; EN 61000-4-5; EN 61000-4-6; IEC 61000-4-8; EN 61000-4-11; IEC61000-3-2; IEC61000-3-3; IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11; EN 300 220-3; EN 300 328; EN 300 330-2; EN 300 440-1; EN 300-440-2; EN 300 893; EN 301 489-01; EN 301 489-3; EN 301 489-07; EN 301 489-17; 47 CFR FCC Part 15, 22, 24	
USA	FCC	3/10 meter Sites to perform FCC Part 15/18 measurements	 93105, 90471
Japan	VCCI	3/10 meter Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-1600 C-1707

** 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	X31	NA	NA	NA	NA
2.	Notebook pc	DELL	4150	NA	NA	NA	NA

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.*



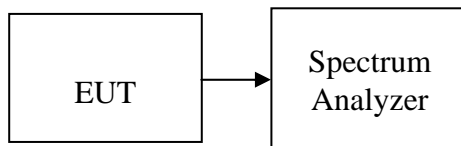
7. FCC PART 15.247 REQUIREMENTS

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

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the selected span. The VBW is set to 3 times the RBW. The sweep time is occupied.

**TEST RESULTS***No non-compliance noted***Test Data****IEEE 802.11b mode**

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.126	>500	PASS
Mid	2437	10.134		PASS
High	2462	10.111		PASS

IEEE 802.11g mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.604	>500	PASS
Mid	2437	16.614		PASS
High	2462	16.614		PASS

IEEE 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.851	>500	PASS
Mid	2437	17.849		PASS
High	2462	17.845		PASS

IEEE 802.11n Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.443	>500	PASS
Mid	2437	36.444		PASS
High	2452	36.408		PASS



Test Plot

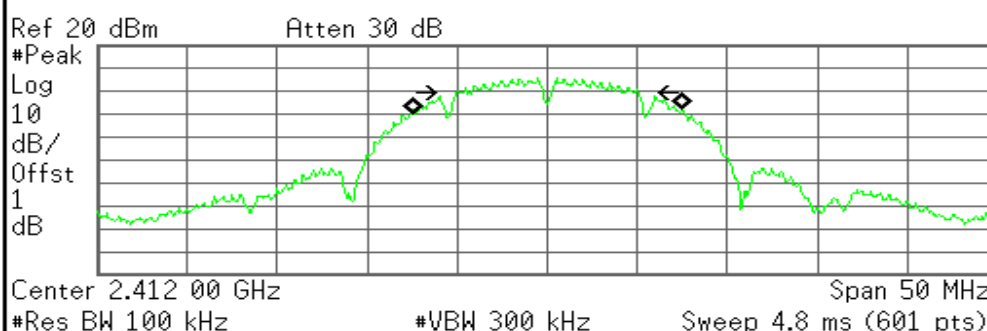
IEEE 802.11b MODE

6dB Bandwidth (CH Low)

Agilent

R L

Ch Freq	2.412 GHz	Trig	Free
Occupied Bandwidth			



Occupied Bandwidth	Occ BW % Pwr	99.00 %
14.8494 MHz	x dB	-6.00 dB
Transmit Freq Error	3.276 kHz	
x dB Bandwidth	10.126 MHz	

Freq/Channel

Center Freq
2.41200000 GHz

Start Freq
2.38700000 GHz

Stop Freq
2.43700000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

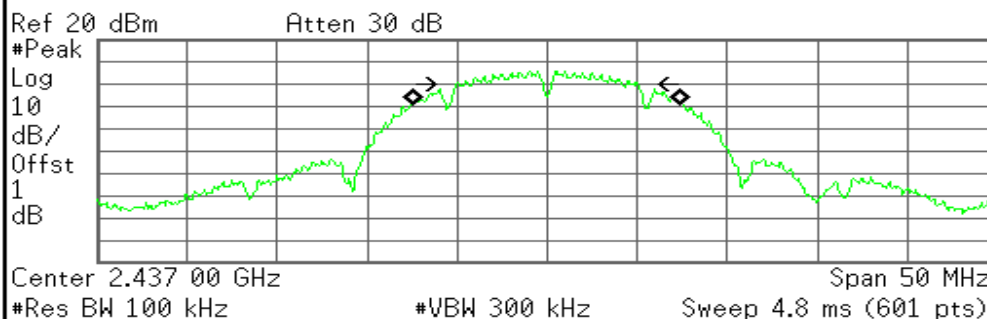
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6dB Bandwidth (CH Mid)

Agilent

R L

Ch Freq	2.437 GHz	Trig	Free
Occupied Bandwidth			



Occupied Bandwidth	Occ BW % Pwr	99.00 %
14.7801 MHz	x dB	-6.00 dB
Transmit Freq Error	-26.080 kHz	
x dB Bandwidth	10.134 MHz	

Freq/Channel

Center Freq
2.43700000 GHz

Start Freq
2.41200000 GHz

Stop Freq
2.46200000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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**6dB Bandwidth (CH High)**

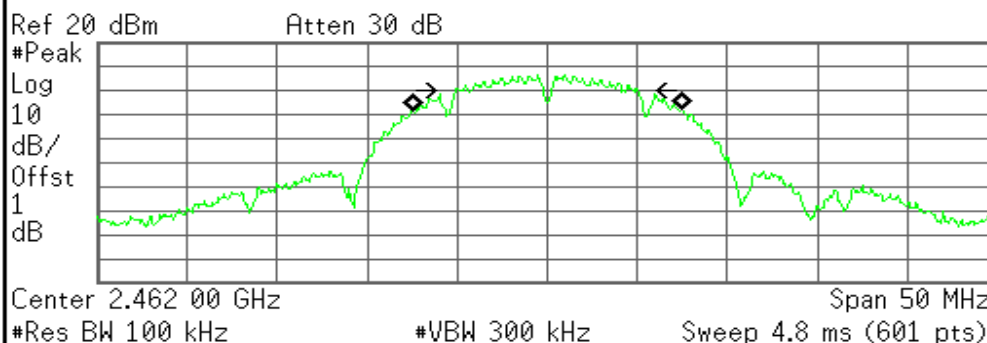
* Agilent

R L

Freq/Channel

Ch Freq	2.462 GHz	Trig	Free
Occupied Bandwidth			

Center Freq	2.46200000 GHz
Start Freq	2.43700000 GHz
Stop Freq	2.48700000 GHz
CF Step	5.00000000 MHz Auto Man
Freq Offset	0.00000000 Hz
Signal Track	On Off



Occupied Bandwidth	Occ BW % Pwr	99.00 %
14.8062 MHz	x dB	-6.00 dB
Transmit Freq Error	2.471 kHz	
x dB Bandwidth	10.111 MHz	

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IEEE 802.11g MODE**6dB Bandwidth (CH Low)**

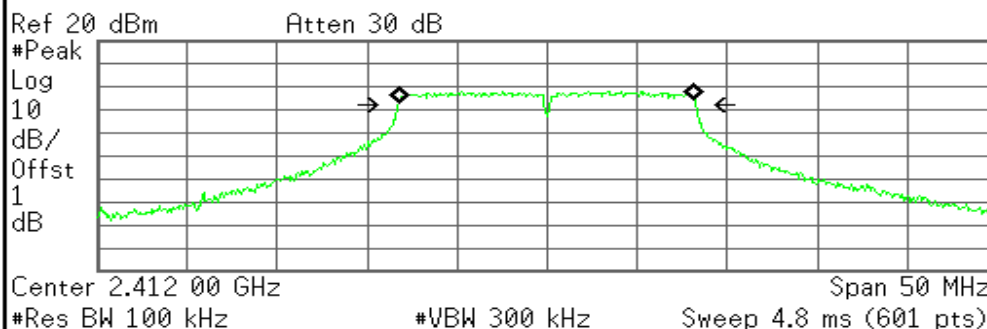
* Agilent

R T

Freq/Channel

Ch Freq	2.412 GHz	Trig	Free
Occupied Bandwidth			

Center Freq	2.41200000 GHz
Start Freq	2.38700000 GHz
Stop Freq	2.43700000 GHz
CF Step	5.00000000 MHz Auto Man
Freq Offset	0.00000000 Hz
Signal Track	On Off



Occupied Bandwidth	Occ BW % Pwr	99.00 %
16.4693 MHz	x dB	-6.00 dB
Transmit Freq Error	-31.326 kHz	
x dB Bandwidth	16.604 MHz	

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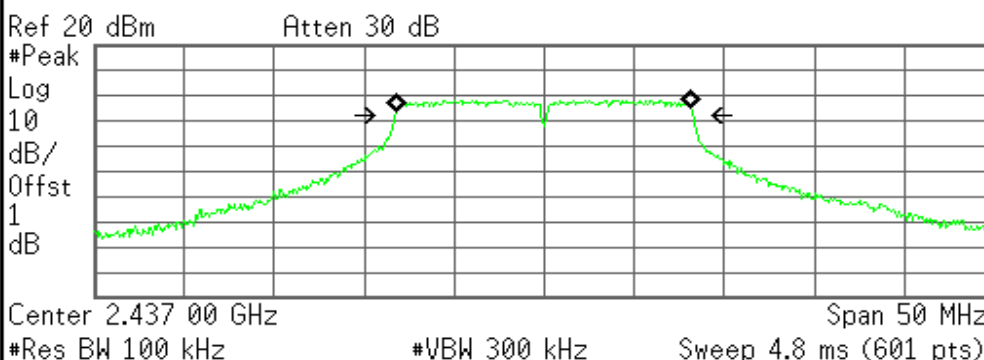
**6dB Bandwidth (CH Mid)**

Agilent

R L

Freq/Channel

Ch Freq 2.437 GHz	Trig Free
Occupied Bandwidth	

Center Freq
2.43700000 GHz**Start Freq**
2.41200000 GHz**Stop Freq**
2.46200000 GHz**CF Step**
5.00000000 MHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off**Occupied Bandwidth**
16.4728 MHz**Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** -31.575 kHz
x dB Bandwidth 16.614 MHz

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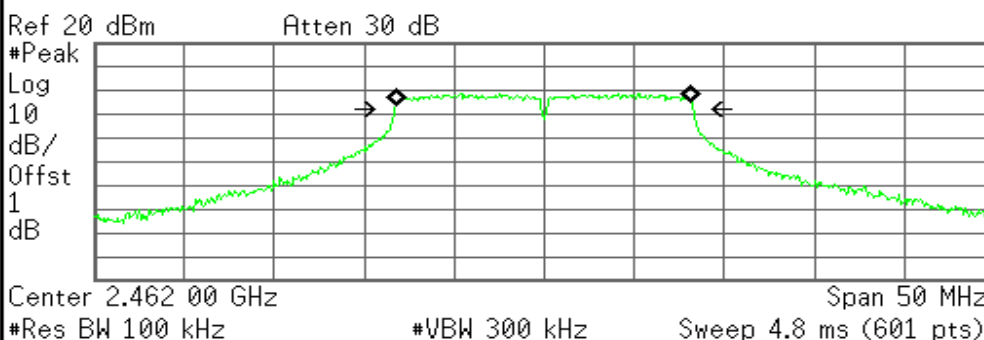
6dB Bandwidth (CH High)

Agilent

R L

Freq/Channel

Ch Freq 2.462 GHz	Trig Free
Occupied Bandwidth	

Center Freq
2.46200000 GHz**Start Freq**
2.43700000 GHz**Stop Freq**
2.48700000 GHz**CF Step**
5.00000000 MHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off**Occupied Bandwidth**
16.4728 MHz**Occ BW % Pwr** 99.00 %
x dB -6.00 dB**Transmit Freq Error** -29.304 kHz
x dB Bandwidth 16.614 MHz

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IEEE 802.11n Standard-20 MHz Channel mode

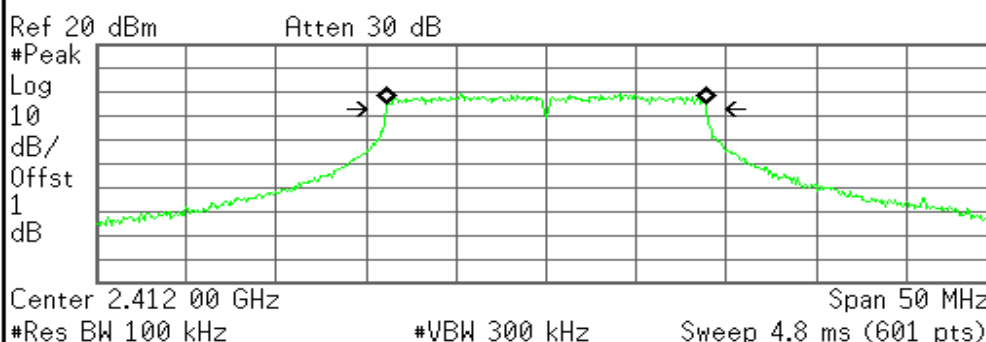
6dB Bandwidth (CH Low)

Agilent

R L

Freq/Channel

Ch Freq 2.412 GHz	Trig Free
Occupied Bandwidth	

Center Freq
2.41200000 GHzStart Freq
2.38700000 GHzStop Freq
2.43700000 GHzCF Step
5.00000000 MHz
Auto ManFreq Offset
0.00000000 HzSignal Track
On Off

Occupied Bandwidth

Occ BW % Pwr 99.00 %
x dB -6.00 dB

17.6691 MHz

Transmit Freq Error -5.724 kHz

x dB Bandwidth 17.851 MHz

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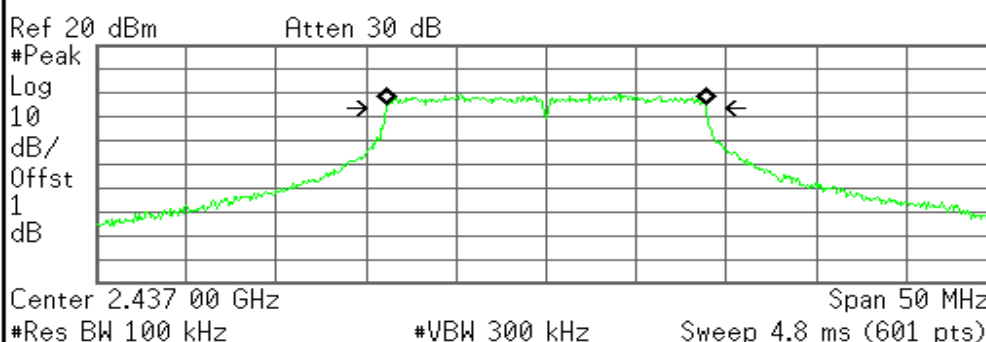
6dB Bandwidth (CH Mid)

Agilent

R T

Freq/Channel

Ch Freq 2.437 GHz	Trig Free
Occupied Bandwidth	

Center Freq
2.43700000 GHzStart Freq
2.41200000 GHzStop Freq
2.46200000 GHzCF Step
5.00000000 MHz
Auto ManFreq Offset
0.00000000 HzSignal Track
On Off

Occupied Bandwidth

Occ BW % Pwr 99.00 %
x dB -6.00 dB

17.6828 MHz

Transmit Freq Error -11.127 kHz

x dB Bandwidth 17.847 MHz

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**6dB Bandwidth (CH High)**

Agilent

R T

Freq/Channel

Ch Freq 2.462 GHz Trig Free

Occupied Bandwidth

Center Freq
2.46200000 GHz

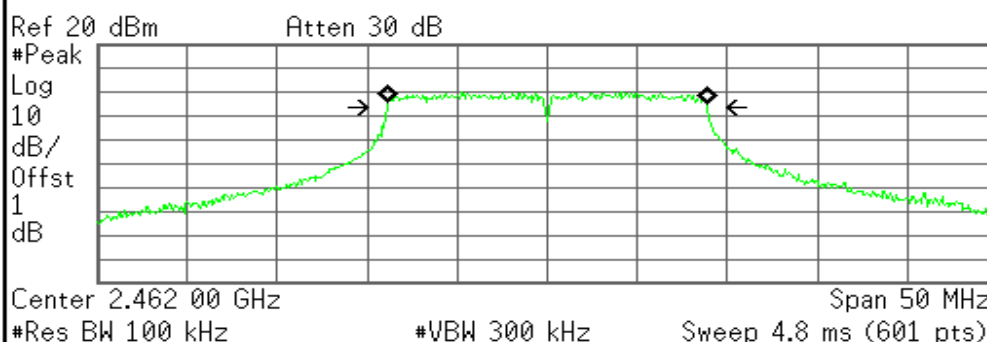
Start Freq
2.43700000 GHz

Stop Freq
2.48700000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

**Occupied Bandwidth**

Occ BW % Pwr 99.00 %

17.6734 MHz

x dB -6.00 dB

Transmit Freq Error -8.350 kHz

x dB Bandwidth 17.845 MHz

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IEEE 802.11n Wide-40 MHz Channel mode**6dB Bandwidth (CH Low)**

Agilent

R L

Freq/Channel

Ch Freq 2.422 GHz Trig Free

Occupied Bandwidth

Center Freq
2.42200000 GHz

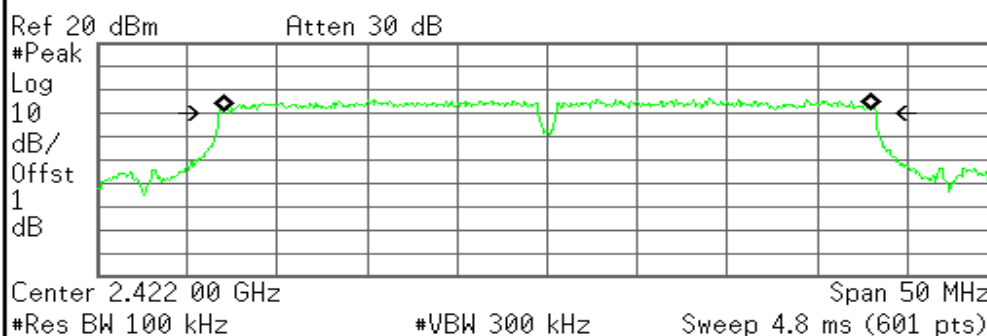
Start Freq
2.39700000 GHz

Stop Freq
2.44700000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

**Occupied Bandwidth**

Occ BW % Pwr 99.00 %

35.9924 MHz

x dB -6.00 dB

Transmit Freq Error 8.786 kHz

x dB Bandwidth 36.443 MHz

Copyright 2000-2009 Agilent Technologies



6dB Bandwidth (CH Mid)

Agilent

R T

Freq/Channel

Ch Freq 2.437 GHz Trig Free

Occupied Bandwidth

Center Freq
2.43700000 GHz

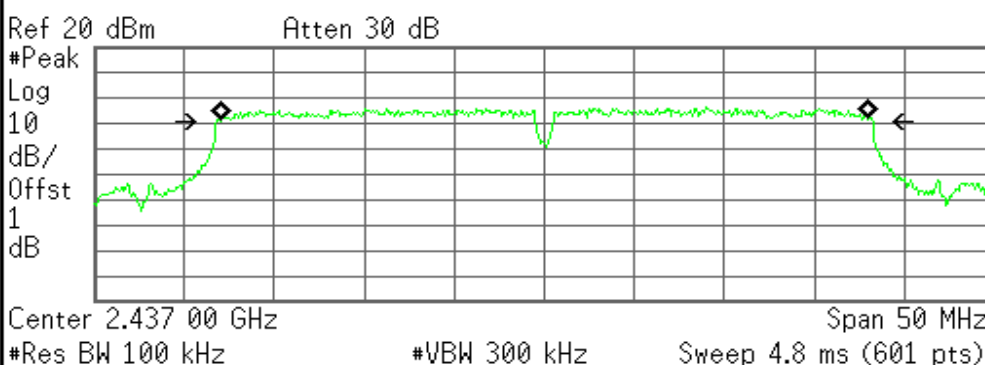
Start Freq
2.41200000 GHz

Stop Freq
2.46200000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off



Occupied Bandwidth
35.9699 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 17.217 kHz
x dB Bandwidth 36.444 MHz

Copyright 2000-2009 Agilent Technologies

6dB Bandwidth (CH High)

Agilent

R T

Freq/Channel

Ch Freq 2.452 GHz Trig Free

Occupied Bandwidth

Center Freq
2.45200000 GHz

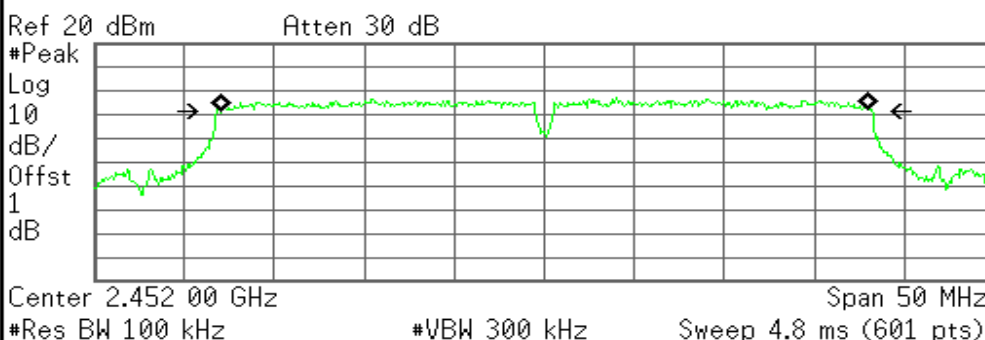
Start Freq
2.42700000 GHz

Stop Freq
2.47700000 GHz

CF Step
5.00000000 MHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off



Occupied Bandwidth
35.9683 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error 4.083 kHz
x dB Bandwidth 36.408 MHz

Copyright 2000-2009 Agilent Technologies



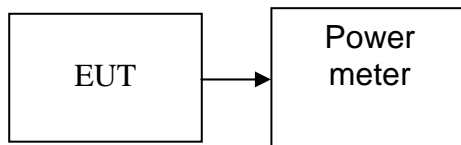
7.2 PEAK POWER

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 Power meter.



TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	18.85	0.0767	1.00	PASS
Mid	2437	18.99	0.0793		PASS
High	2462	19.12	0.0817		PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	14.46	0.0279	1.00	PASS
Mid	2437	14.65	0.0292		PASS
High	2462	14.93	0.0311		PASS

Test mode: IEEE 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2412	14.31	0.0270	1.00	PASS
Mid	2437	14.58	0.0287		PASS
High	2462	15.06	0.0321		PASS

Test mode: IEEE 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Result
Low	2422	14.22	0.0264	1.00	PASS
Mid	2437	14.45	0.0279		PASS
High	2452	14.77	0.0300		PASS

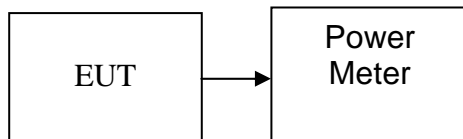


7.3 AVERAGE POWER

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the Power meter.



TEST RESULTS

No non-compliance noted

Test Data

Test mode: IEEE 802.11b mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	16.28
Mid	2437	16.44
High	2462	16.97

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	12.93
Mid	2437	13.20
High	2462	13.61

Test mode: IEEE 802.11gn Standard-20 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2412	12.78
Mid	2437	13.11
High	2462	13.72

Test mode: IEEE 802.11gn Wide-40 MHz Channel mode

Channel	Frequency (MHz)	Output Power (dBm)
Low	2422	12.52
Mid	2437	12.79
High	2452	12.94

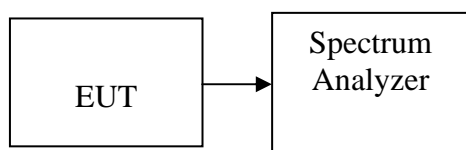


7.4 PEAK POWER SPECTRAL DENSITY

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)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-15.16	8.00	PASS
Mid	2437	-14.90	8.00	PASS
High	2462	-14.56	8.00	PASS

Test mode: IEEE 802.11g mode

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-16.23	8.00	PASS
Mid	2437	-16.04	8.00	PASS
High	2462	-15.90	8.00	PASS

Test mode: IEEE 802.11n Standard-20 MHz Channel mode

Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2412	-14.94	8.00	PASS
Mid	2437	-14.33	8.00	PASS
High	2462	-13.75	8.00	PASS

Test mode: IEEE 802.11n Wide-40 MHz Channel mode

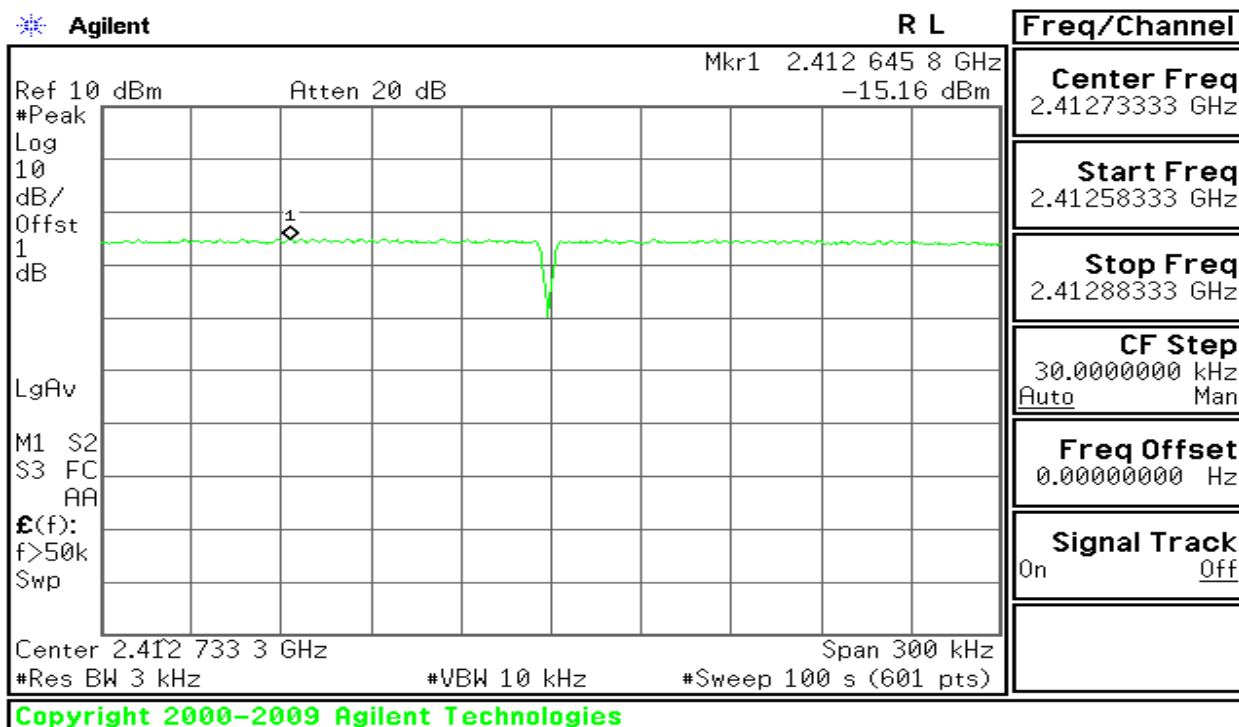
Channel	Frequency (MHz)	PPSD Total (dBm)	Limit (dBm)	Result
Low	2422	-16.49	8.00	PASS
Mid	2437	-16.46	8.00	PASS
High	2452	-16.40	8.00	PASS



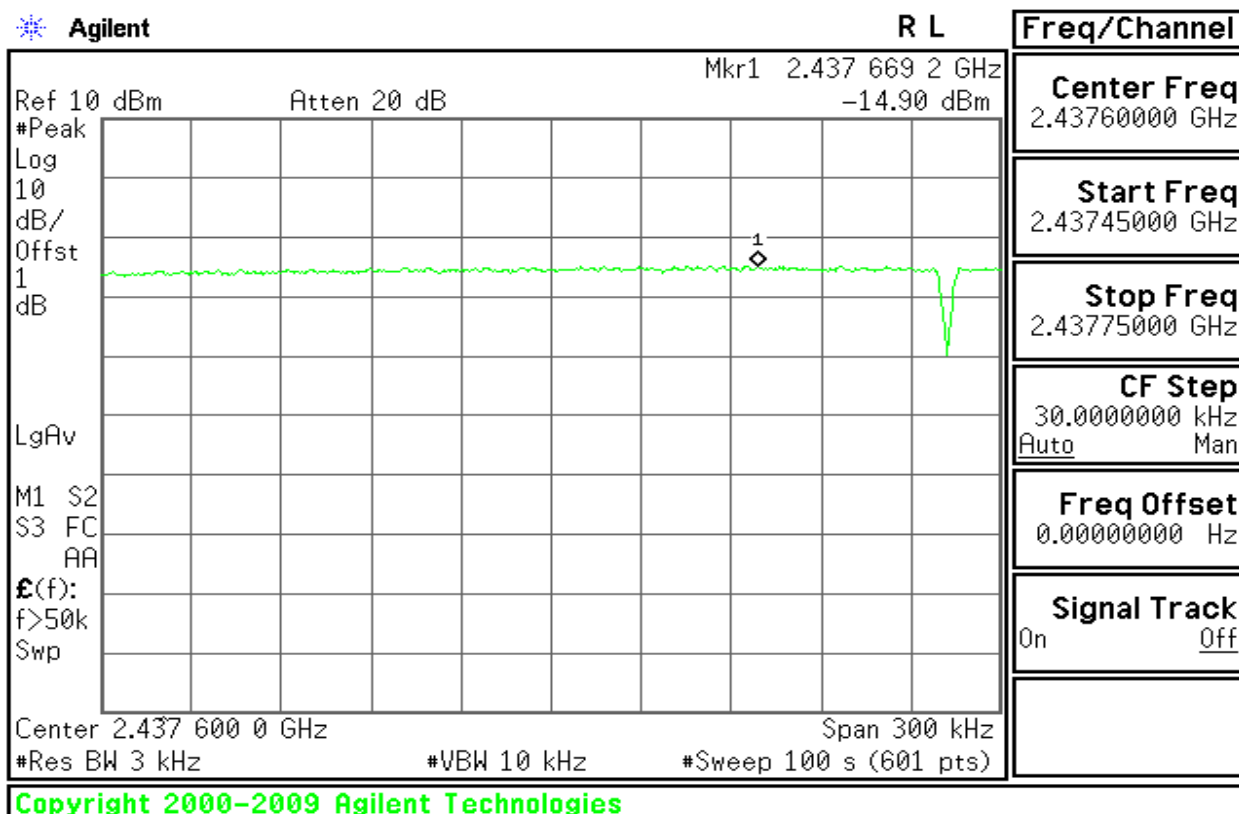
Test Plot

IEEE 802.11b mode

PPSD (CH Low)



PPSD (CH Mid)



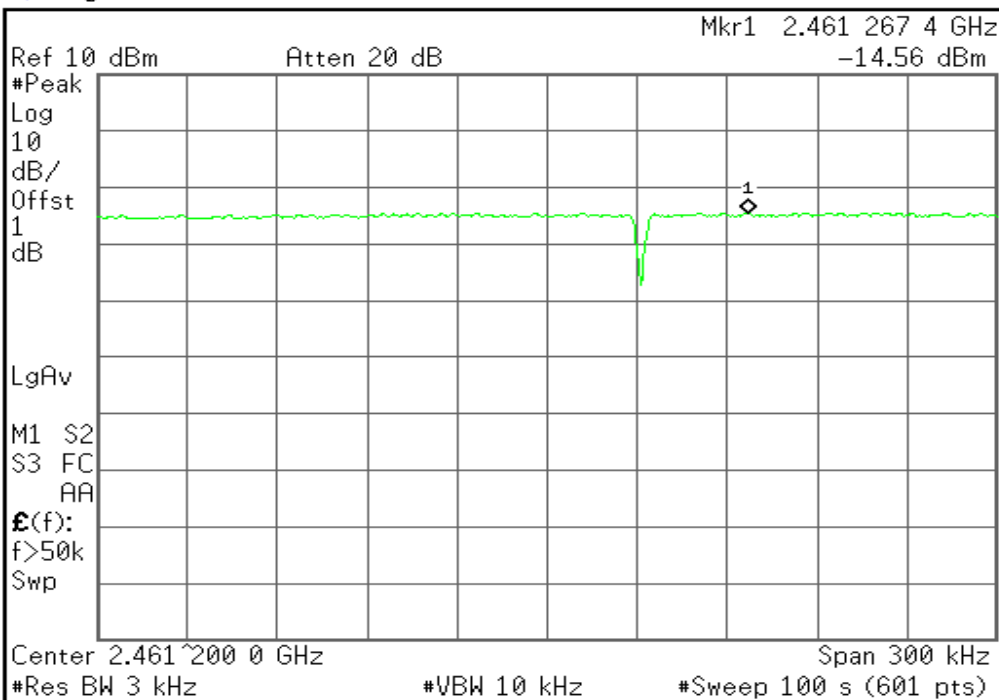


PPSD (CH High)

Agilent

R L

Freq/Channel



Center Freq
2.46120000 GHz

Start Freq
2.46105000 GHz

Stop Freq
2.46135000 GHz

CF Step
30.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

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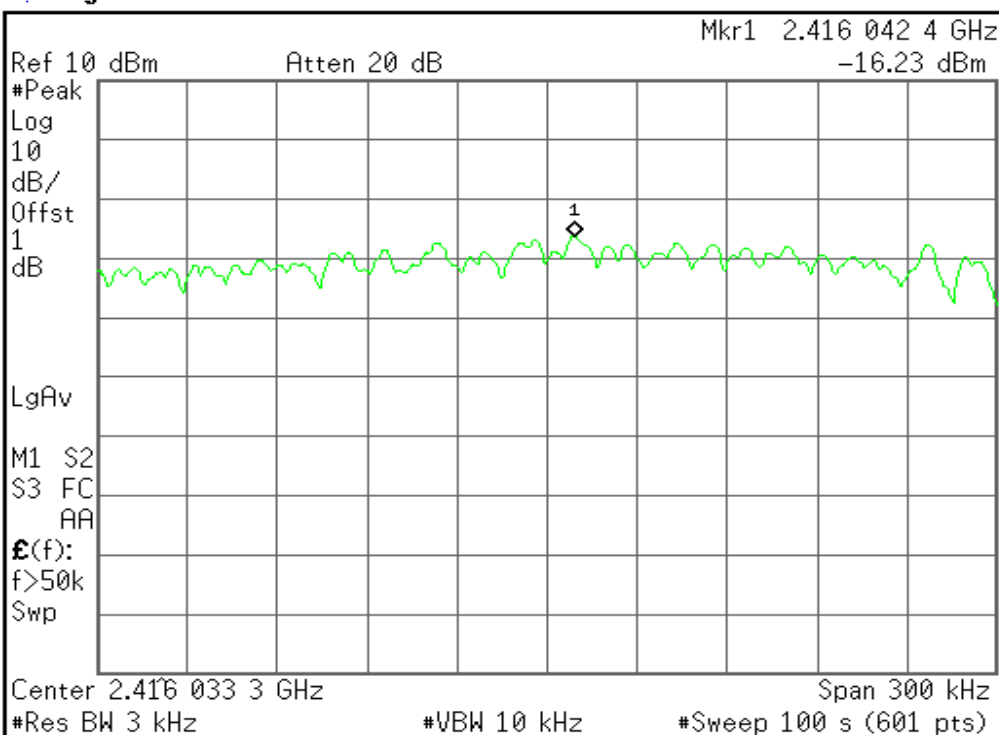
IEEE 802.11g mode

PPSD (CH Low)

Agilent

R L

Freq/Channel



Center Freq
2.41603333 GHz

Start Freq
2.41588333 GHz

Stop Freq
2.41618333 GHz

CF Step
30.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

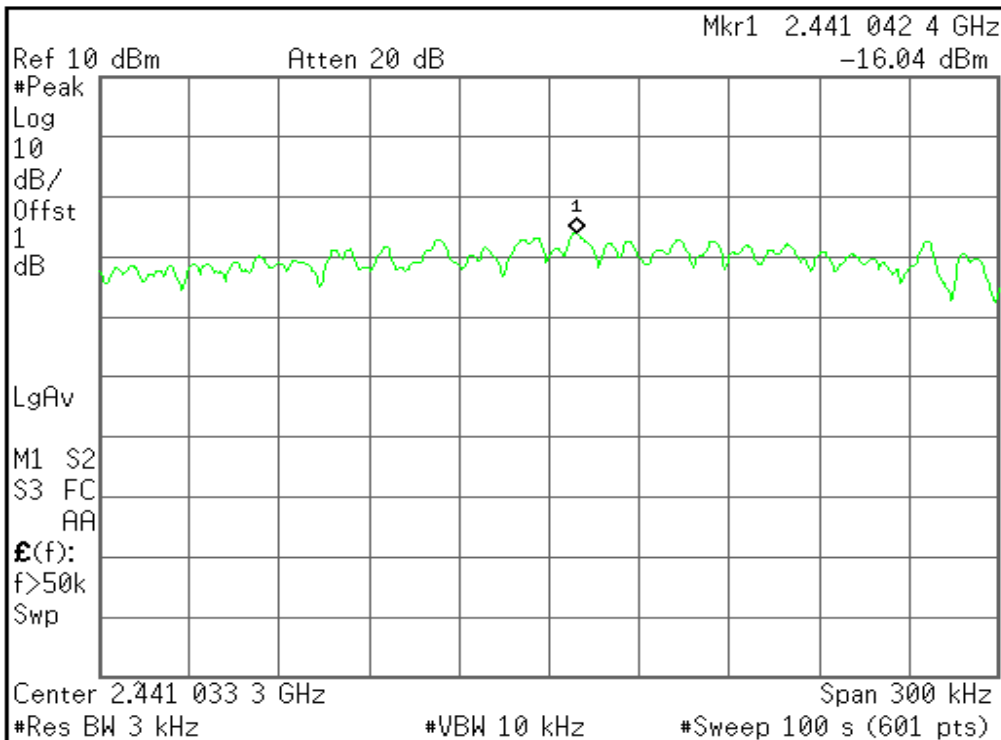
Copyright 2000-2009 Agilent Technologies

**PPSD (CH Mid)**

* Agilent

R L

Freq/Channel

**Center Freq**
2.44103333 GHz**Start Freq**
2.44088333 GHz**Stop Freq**
2.44118333 GHz**CF Step**
30.0000000 kHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off

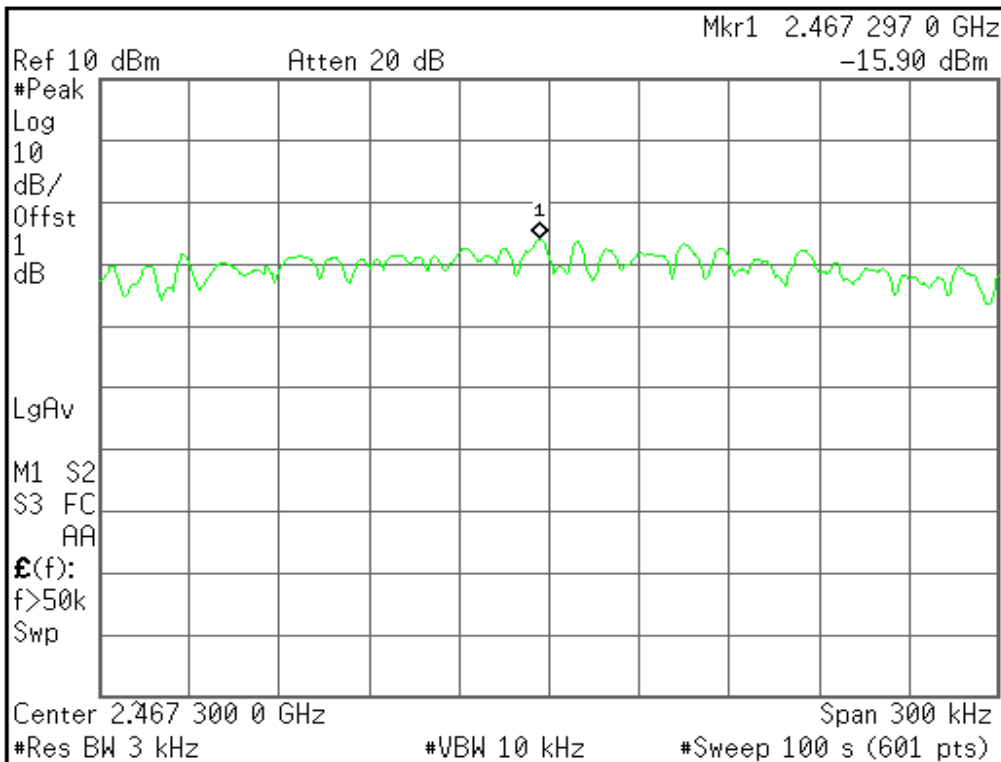
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PPSD (CH High)

* Agilent

R L

Freq/Channel

**Center Freq**
2.46730000 GHz**Start Freq**
2.46715000 GHz**Stop Freq**
2.46745000 GHz**CF Step**
30.0000000 kHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off

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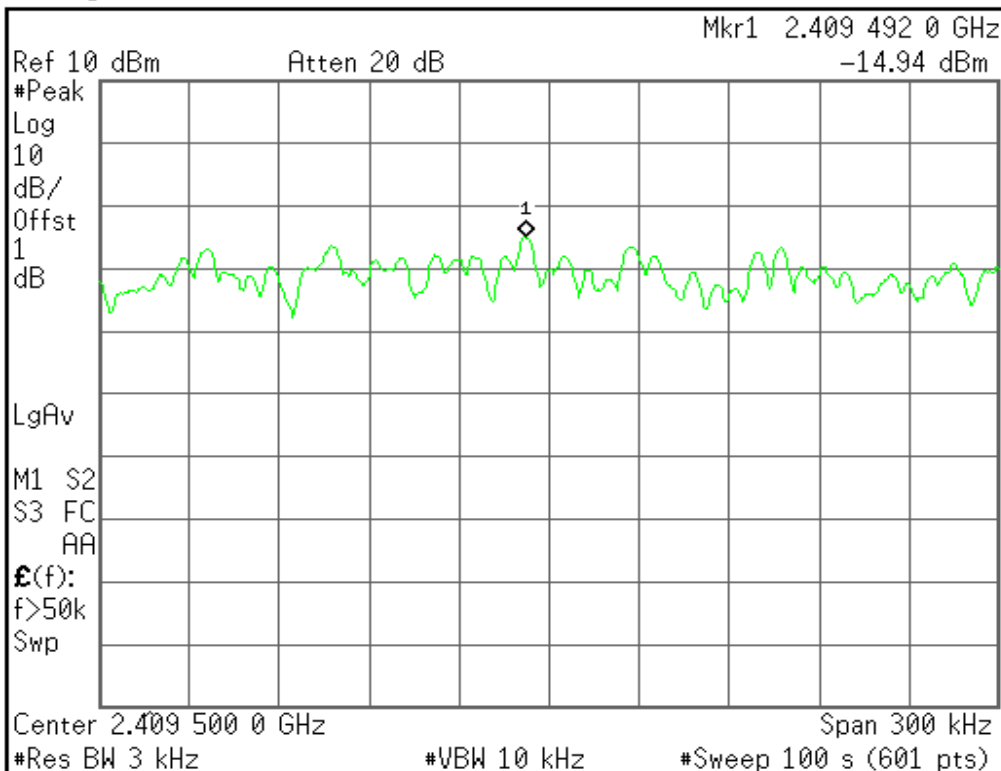
IEEE 802.11n Standard-20 MHz Channel mode

PPSD (CH Low)

Agilent

R L

Freq/Channel



Center Freq 2.40950000 GHz
Start Freq 2.40935000 GHz
Stop Freq 2.40965000 GHz
CF Step 30.0000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

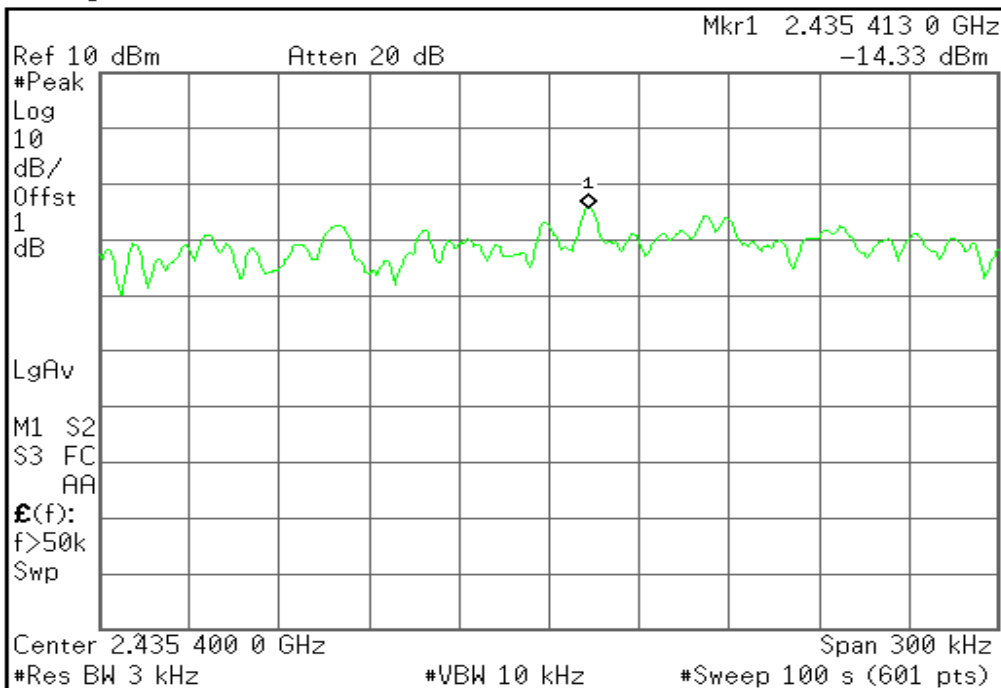
Copyright 2000-2009 Agilent Technologies

PPSD (CH Mid)

Agilent

R L

Freq/Channel



Center Freq 2.43540000 GHz
Start Freq 2.43525000 GHz
Stop Freq 2.43555000 GHz
CF Step 30.0000000 kHz Auto Man
Freq Offset 0.00000000 Hz
Signal Track On Off

Copyright 2000-2009 Agilent Technologies

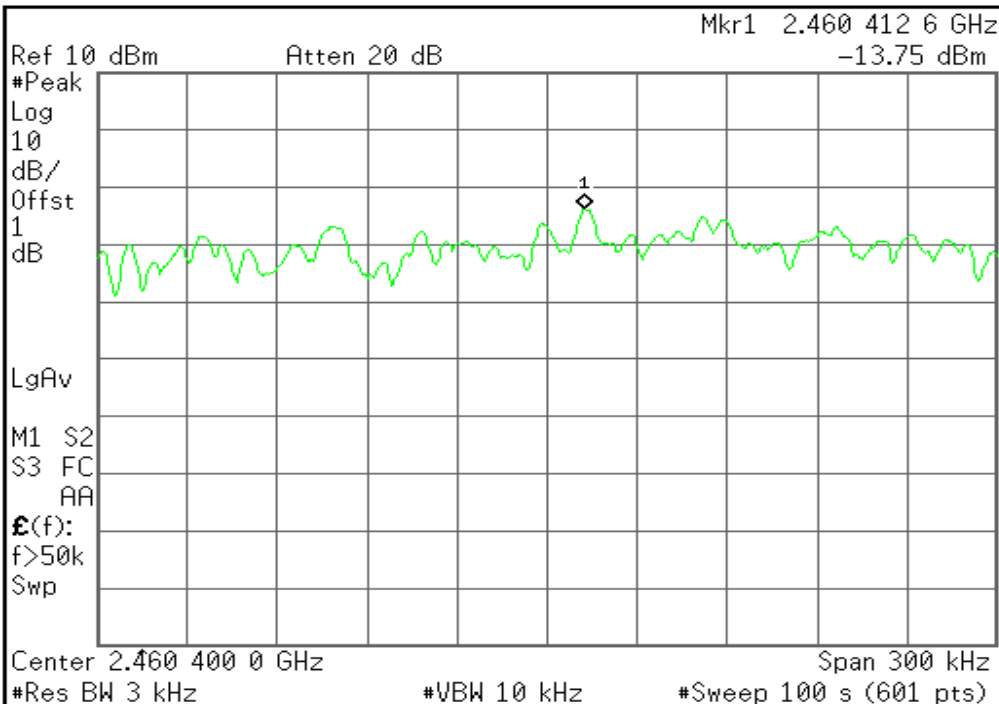


PPSD (CH High)

Agilent

R L

Freq/Channel



Center Freq
2.46040000 GHz

Start Freq
2.46025000 GHz

Stop Freq
2.46055000 GHz

CF Step
30.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

Copyright 2000-2009 Agilent Technologies

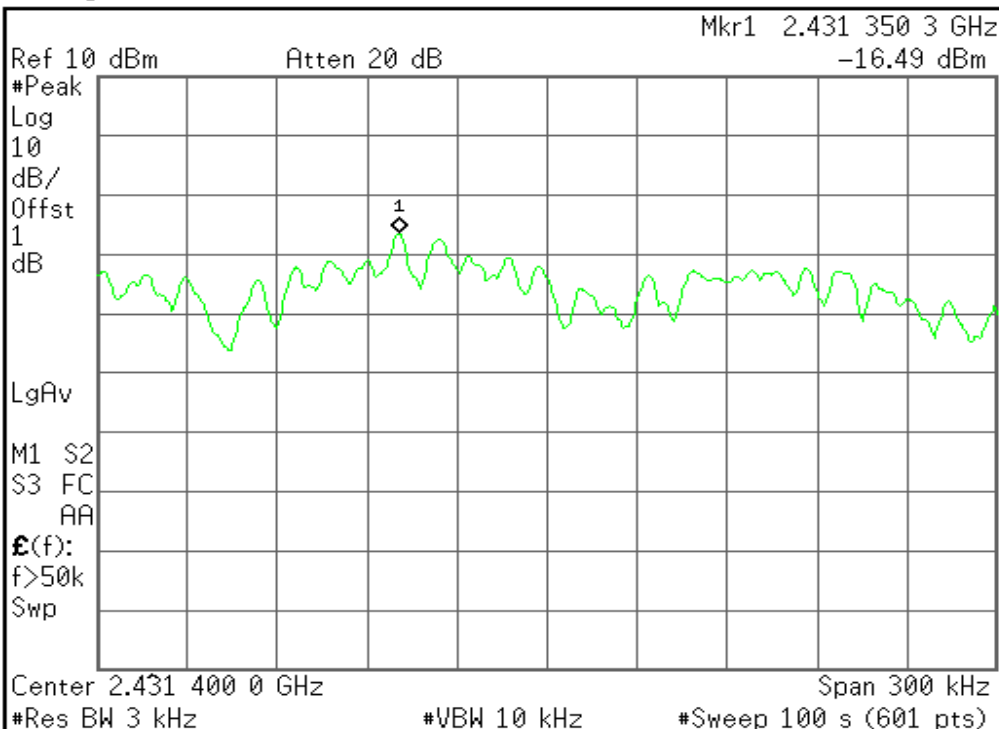
IEEE 802.11n Wide-40 MHz Channel mode

PPSD (CH Low)

Agilent

R L

Freq/Channel



Center Freq
2.43140000 GHz

Start Freq
2.43125000 GHz

Stop Freq
2.43155000 GHz

CF Step
30.0000000 kHz
Auto Man

Freq Offset
0.00000000 Hz

Signal Track
On Off

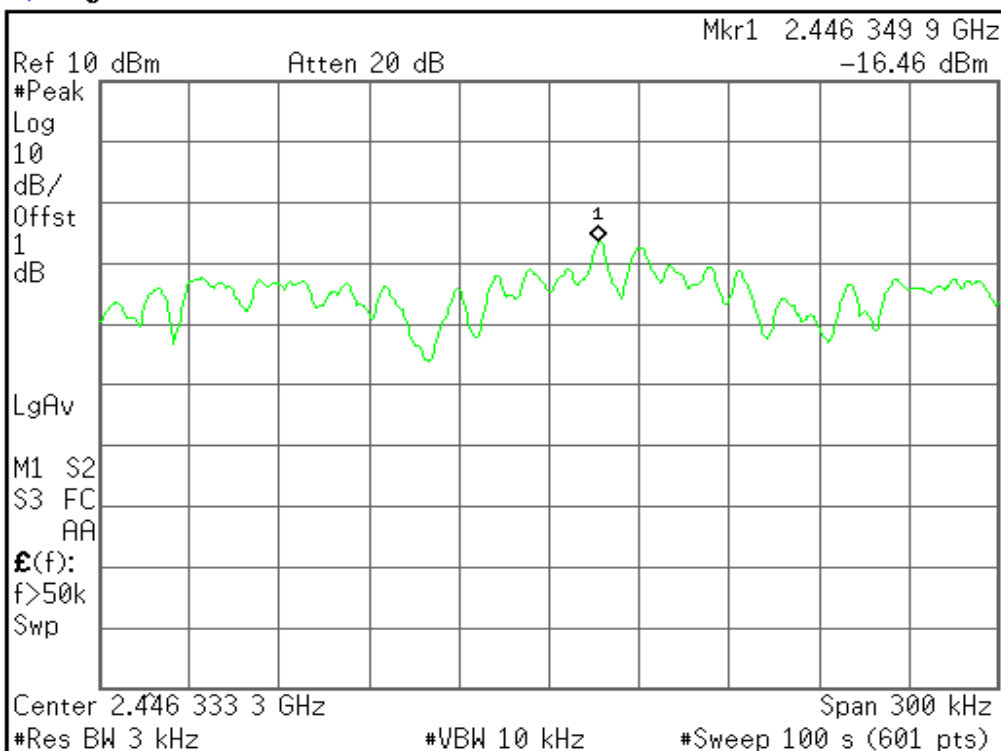
Copyright 2000-2009 Agilent Technologies

**PPSD (CH Mid)**

* Agilent

R L

Freq/Channel

**Center Freq**
2.44633333 GHz**Start Freq**
2.44618333 GHz**Stop Freq**
2.44648333 GHz**CF Step**
30.0000000 kHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off

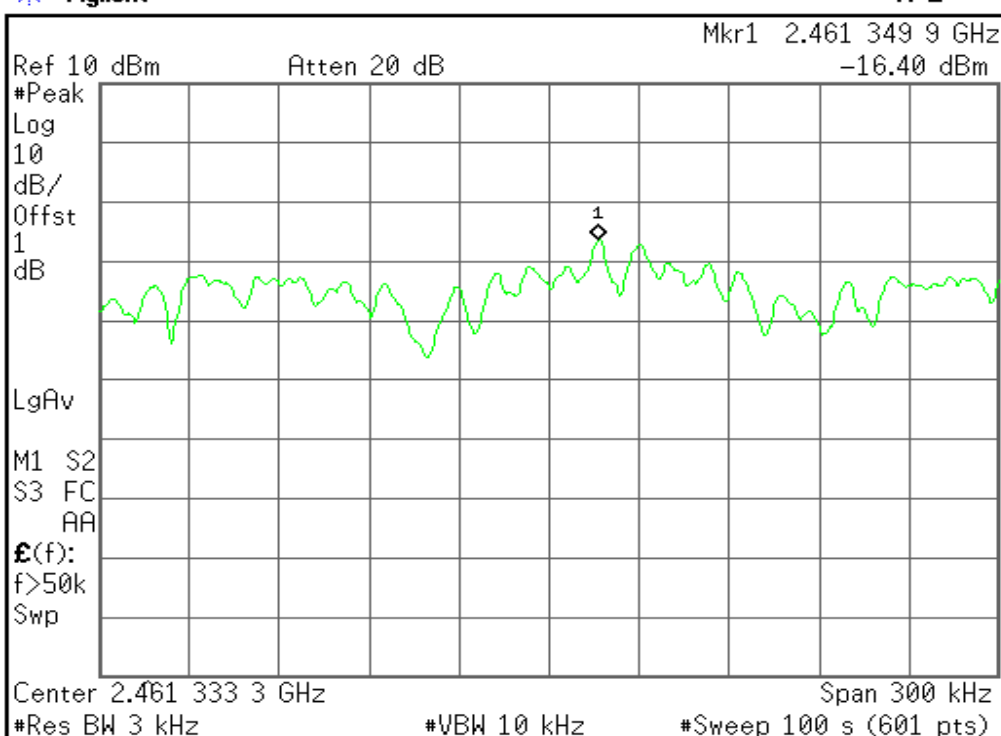
Copyright 2000–2009 Agilent Technologies

PPSD (CH High)

* Agilent

R L

Freq/Channel

**Center Freq**
2.46133333 GHz**Start Freq**
2.46118333 GHz**Stop Freq**
2.46148333 GHz**CF Step**
30.0000000 kHz
Auto Man**Freq Offset**
0.00000000 Hz**Signal Track**
On Off

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7.5 SPURIOUS EMISSIONS

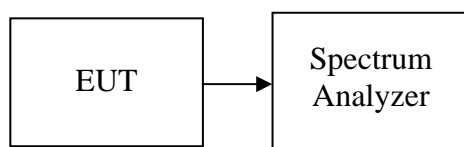
7.5.1 CONDUCTED MEASUREMENT

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)).

Conducted power was measured based on the use of RMS averaging over a time interval, therefore the required attenuation is 30 dB.

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 300 kHz.

Measurements are made over the 30MHz to 40GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

No non-compliance noted



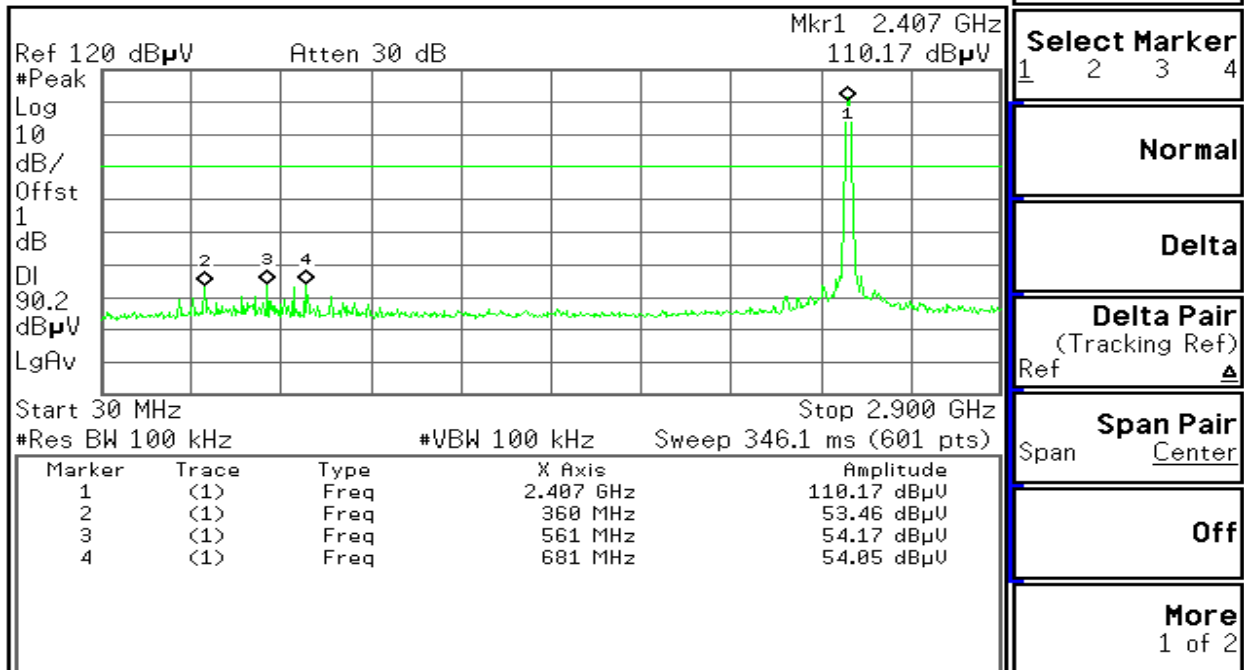
Test Plot

IEEE 802.11b mode

CH Low

Agilent

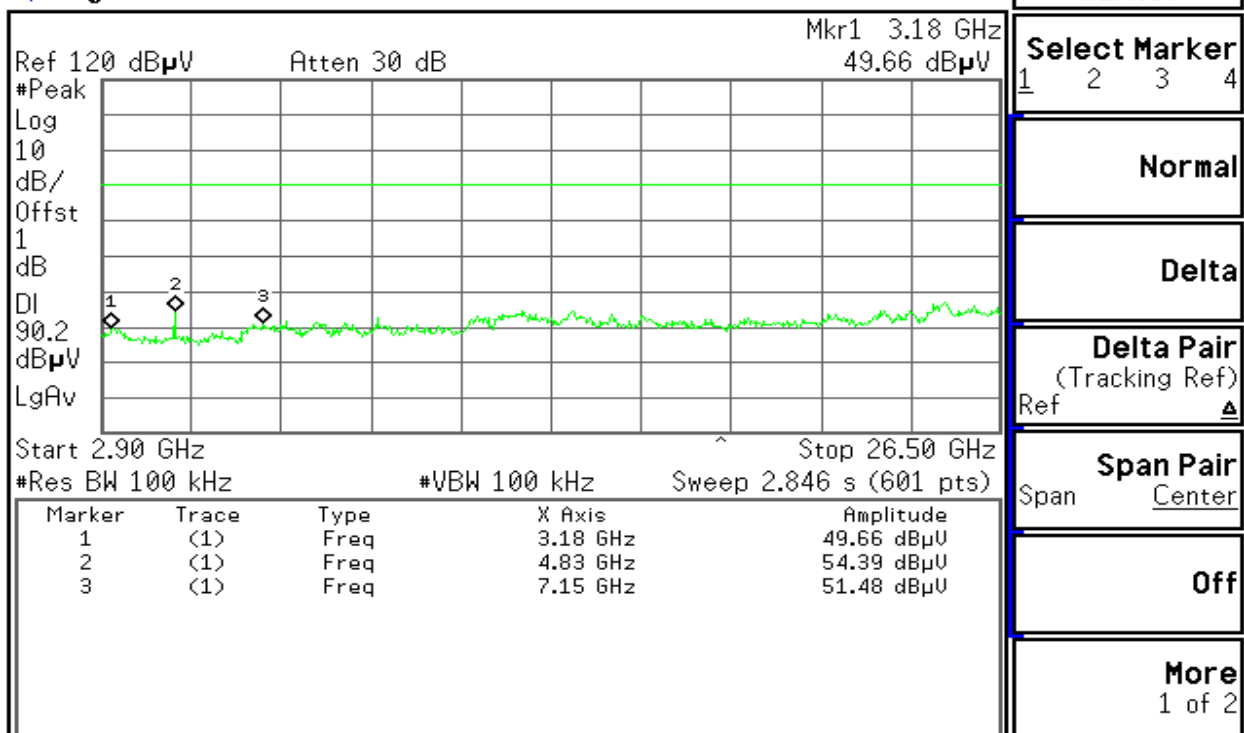
R L



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Agilent

R L



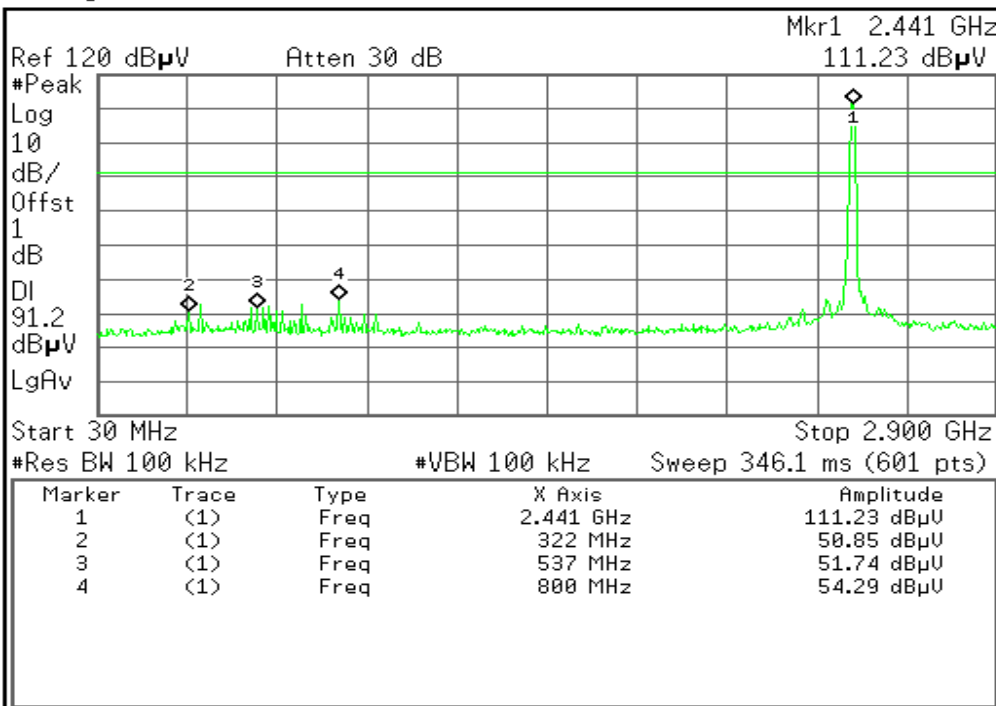
Copyright 2000-2009 Agilent Technologies



CH Mid

Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

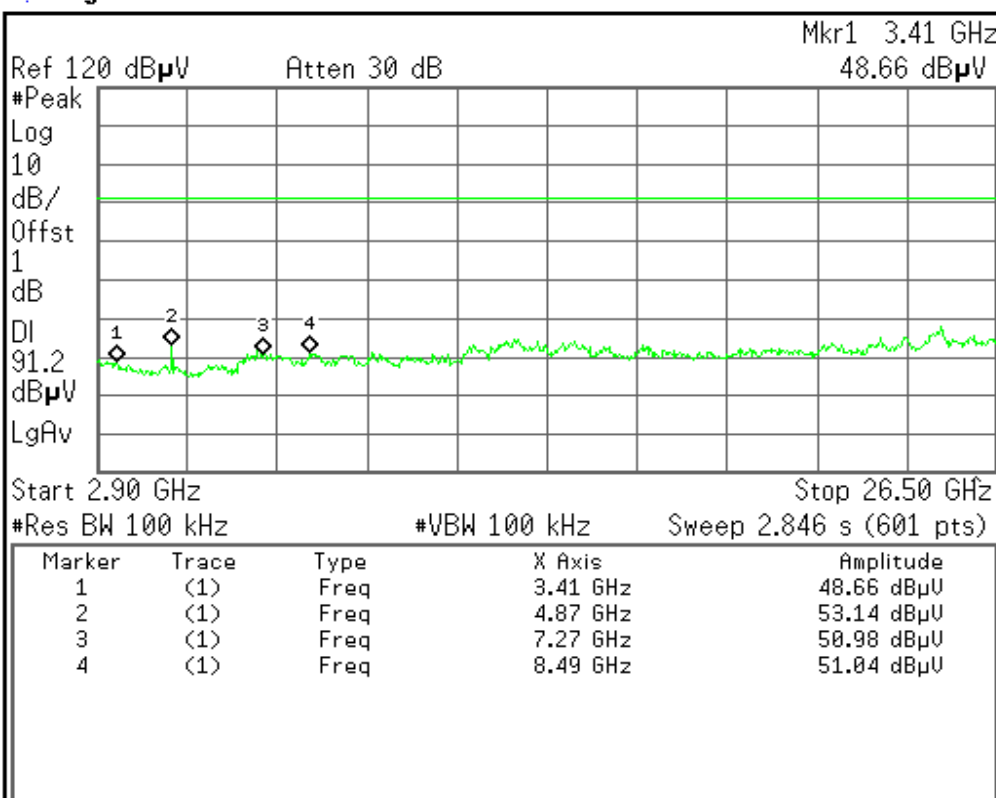
More

1 of 2

Copyright 2000-2009 Agilent Technologies

Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

1 of 2

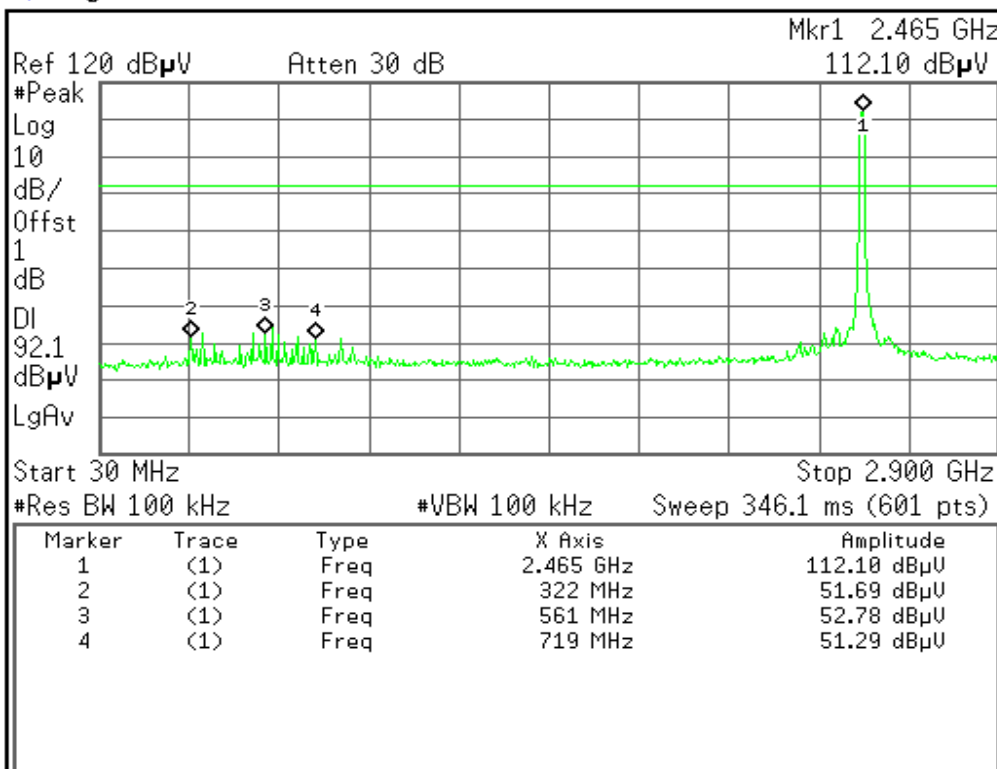
Copyright 2000-2009 Agilent Technologies



CH High

Agilent

R L

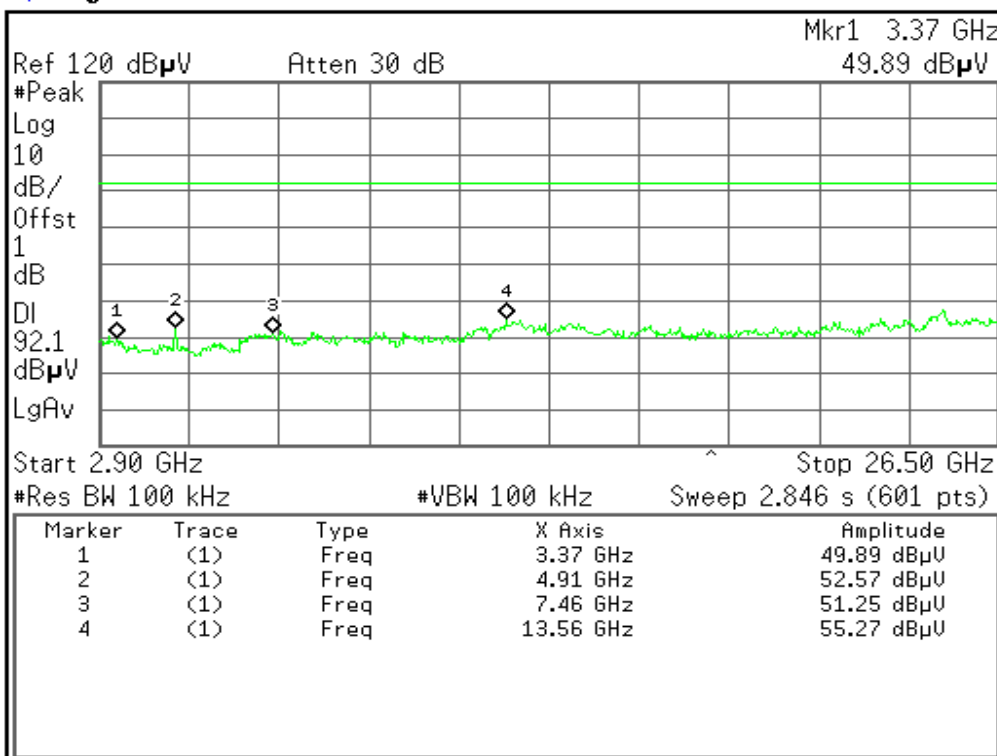


Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	▲		
Span Pair			
Span	Center		
Off			
More 1 of 2			

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Agilent

R L



Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	▲		
Span Pair			
Span	Center		
Off			
More 1 of 2			

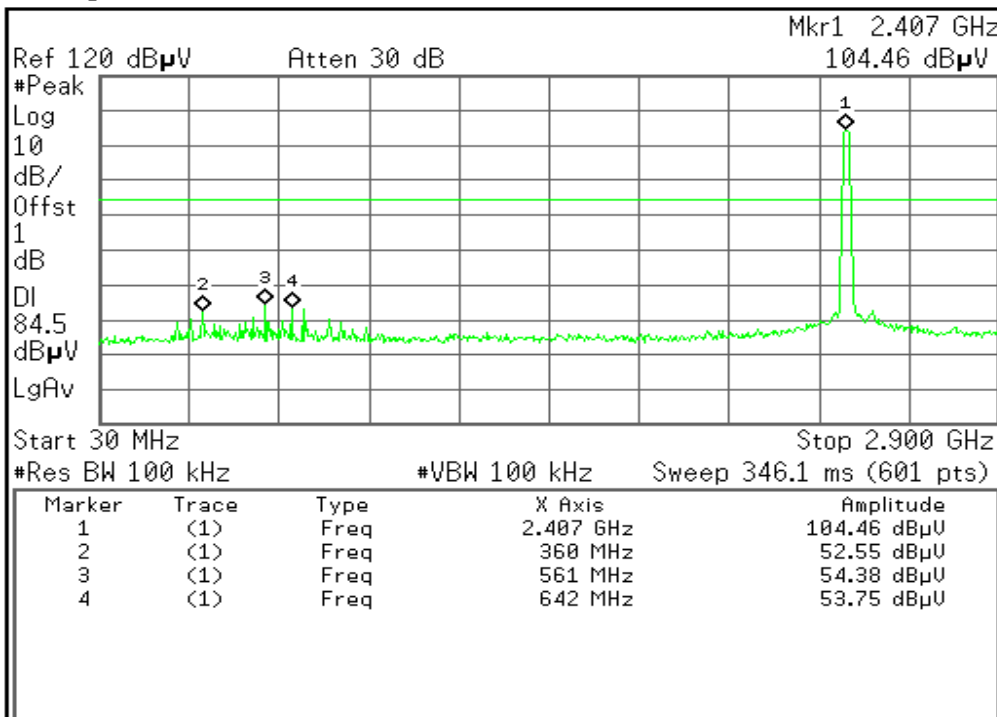
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**IEEE 802.11g mode****CH Low**

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

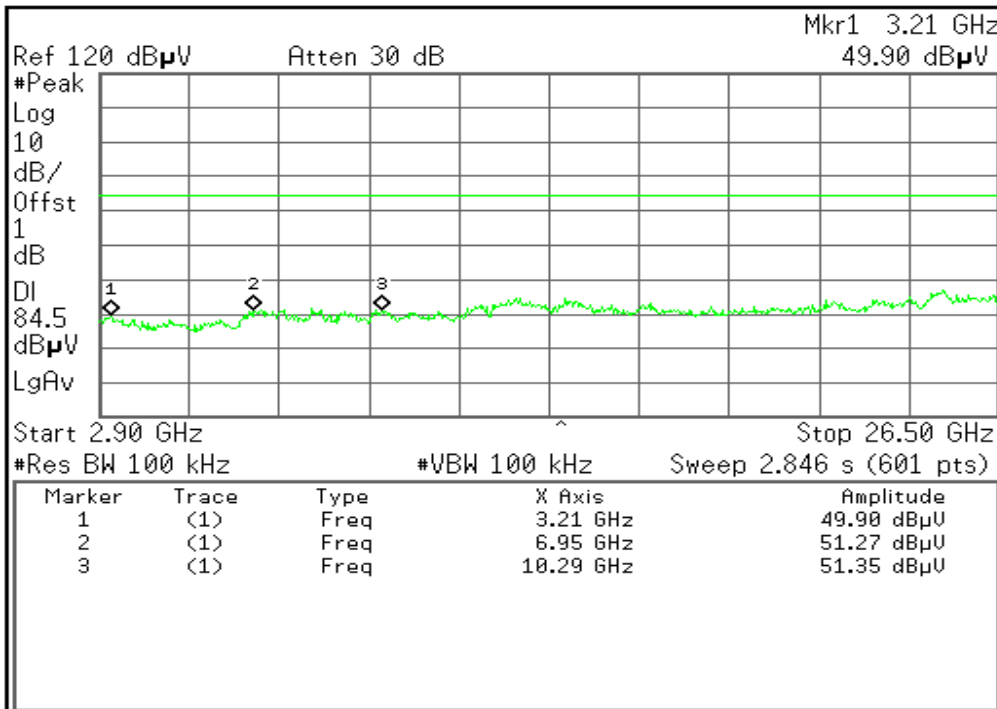
1 of 2

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Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

1 of 2

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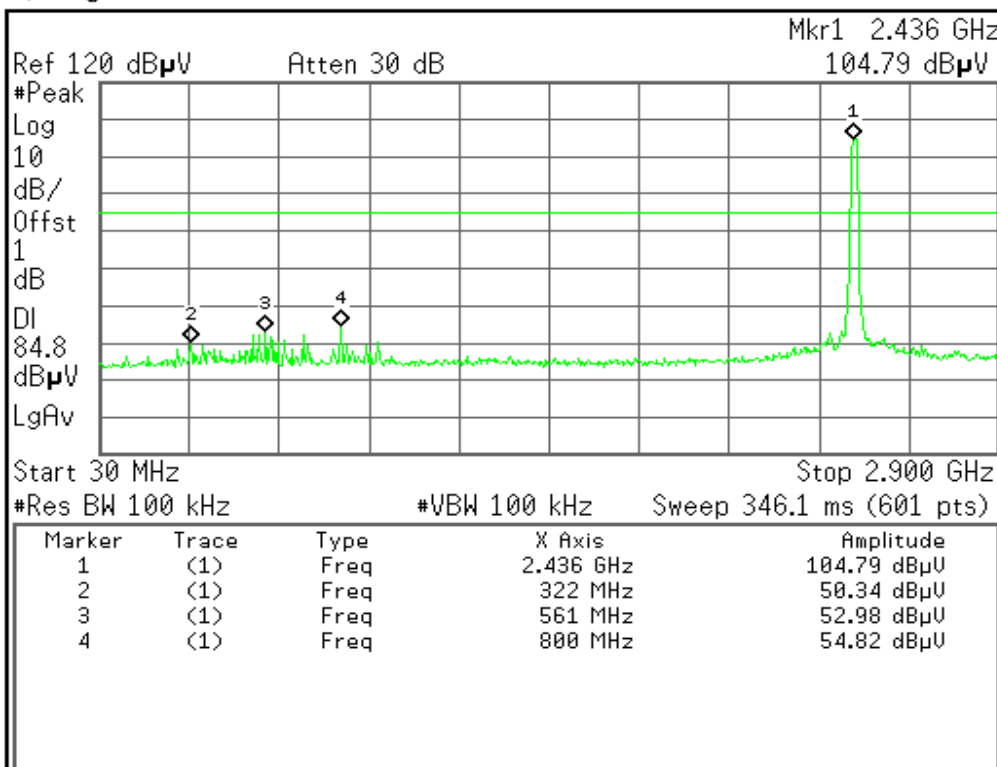


CH Mid

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

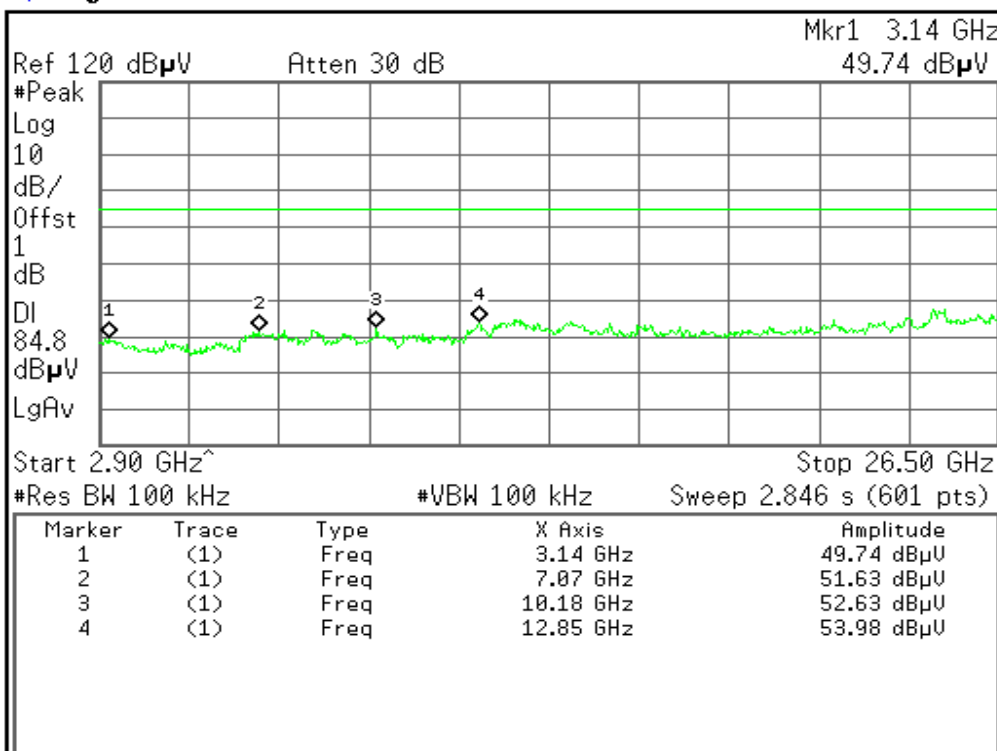
1 of 2

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Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

1 of 2

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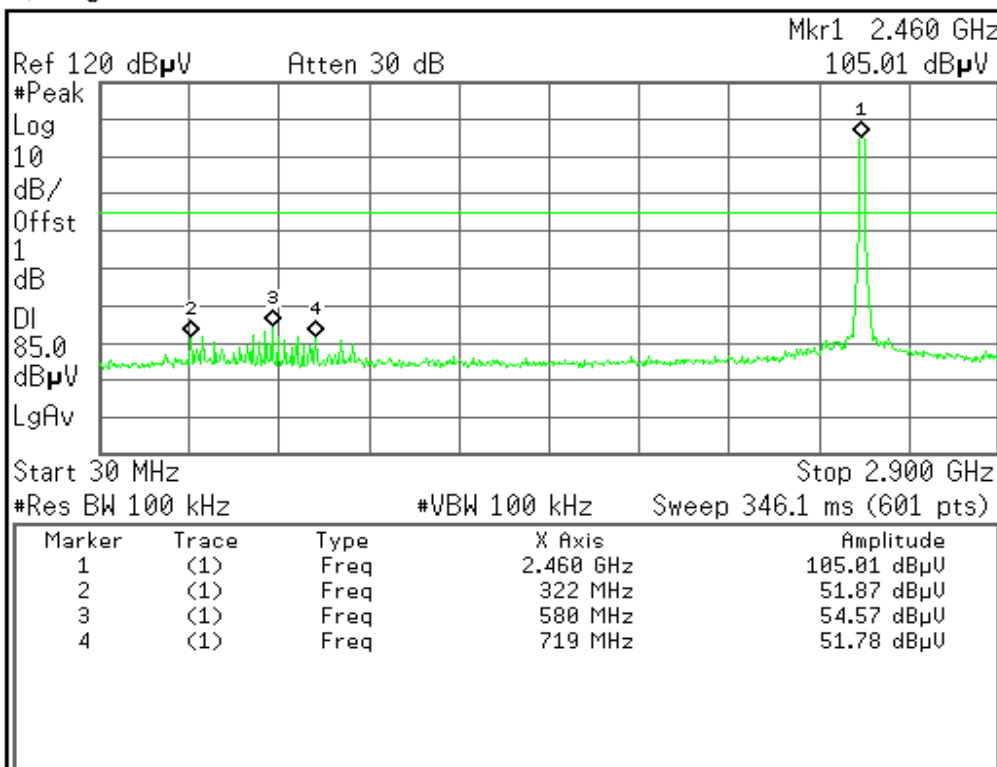


CH High

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

▲

Span Pair

Span

Center

Off

More

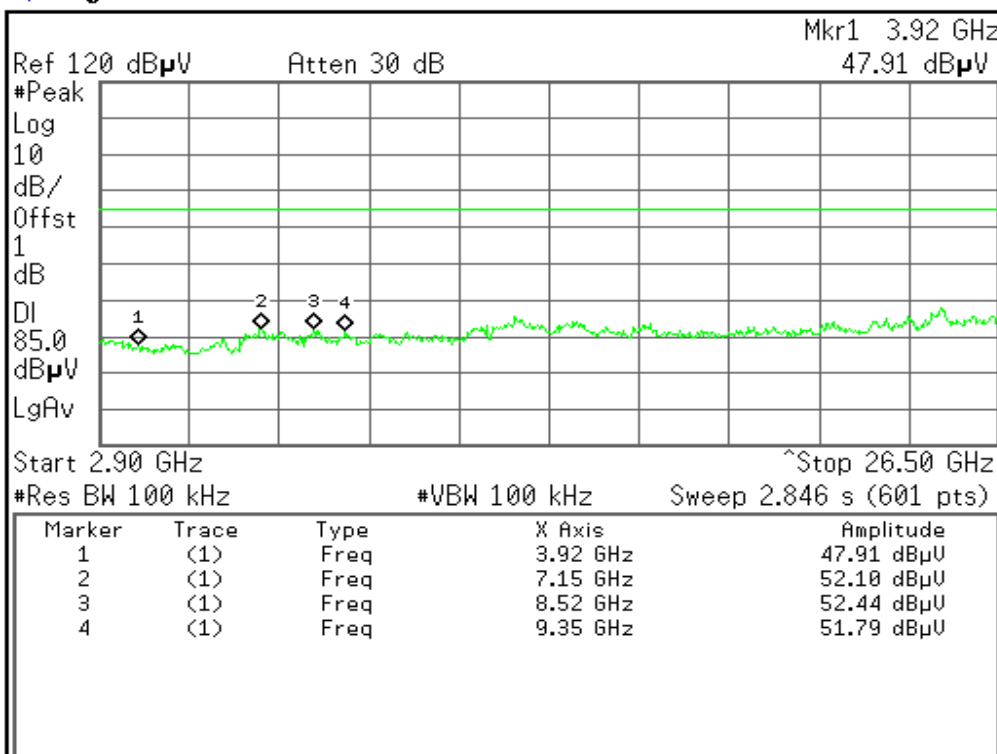
1 of 2

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Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

▲

Span Pair

Span

Center

Off

More

1 of 2

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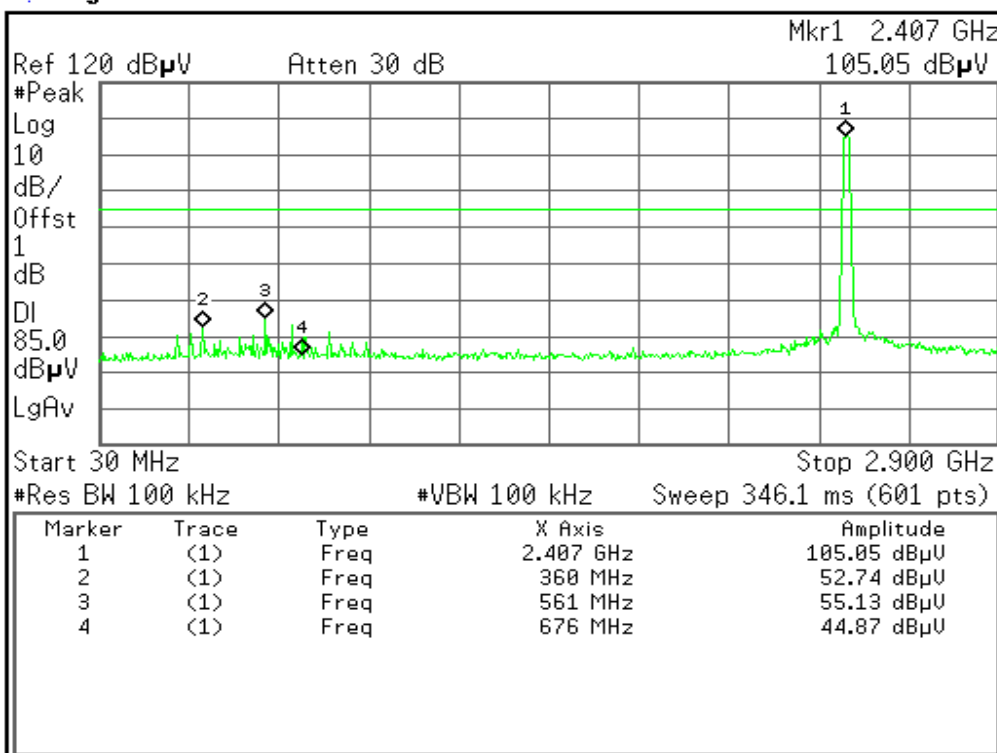


IEEE 802.11n Standard-20 MHz Channel mode

CH Low

Agilent

R L

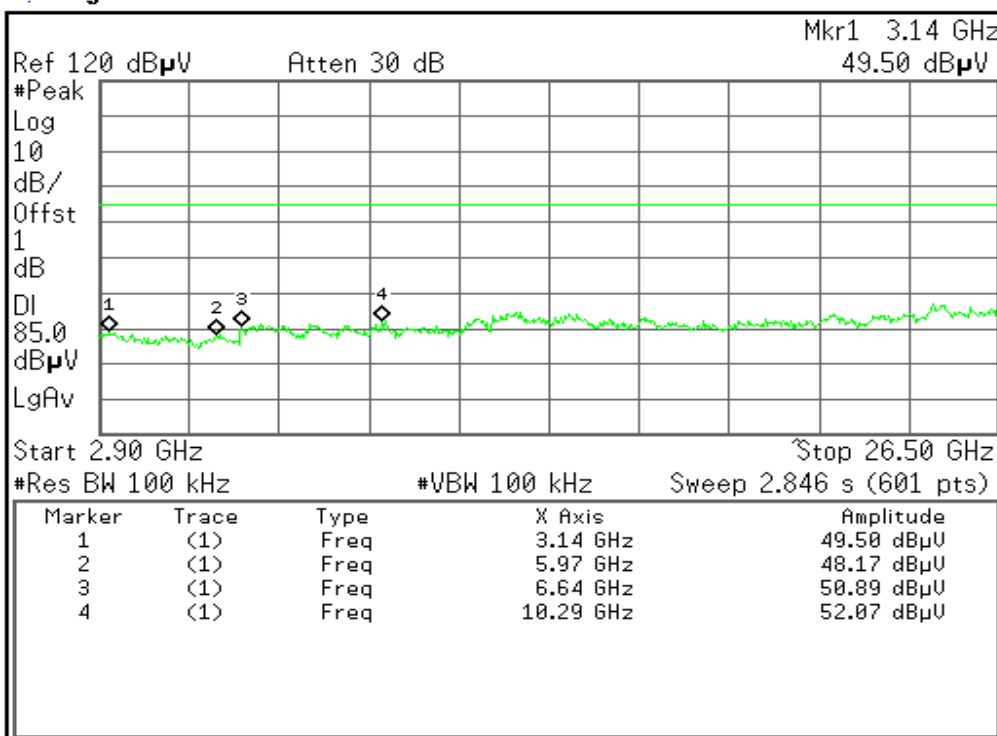


Marker
Select Marker 1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref) Ref ▲
Span Pair Span Center
Off
More 1 of 2

Copyright 2000-2009 Agilent Technologies

Agilent

R L



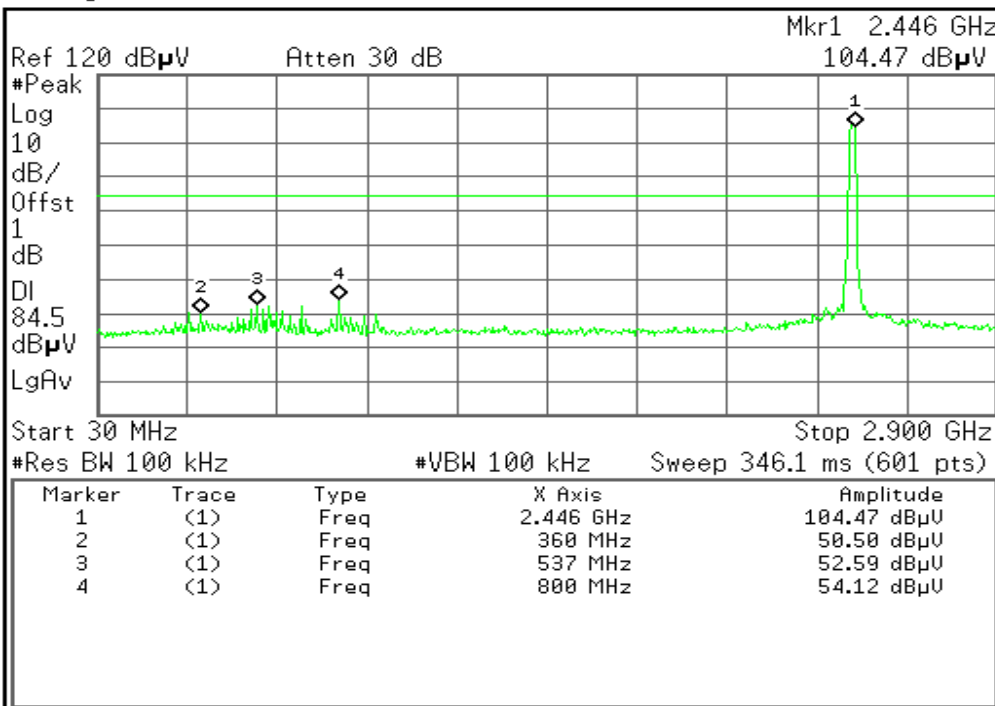
Marker
Select Marker 1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref) Ref ▲
Span Pair Span Center
Off
More 1 of 2

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**CH Mid**

Agilent

R L

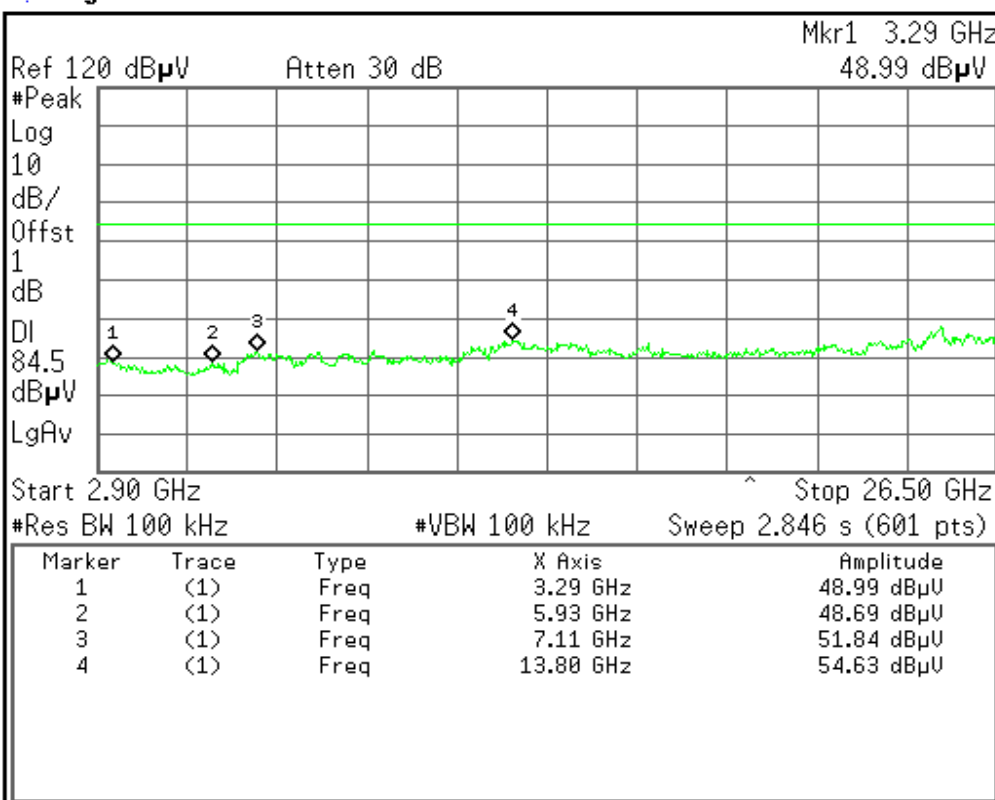


Marker			
Select Marker			
1	2	3	4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref			
Span Pair			
Center			
Off			
More			
1 of 2			

Copyright 2000-2009 Agilent Technologies

Agilent

R L



Marker			
Select Marker			
1	2	3	4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref			
Span Pair			
Center			
Off			
More			
1 of 2			

Copyright 2000-2009 Agilent Technologies

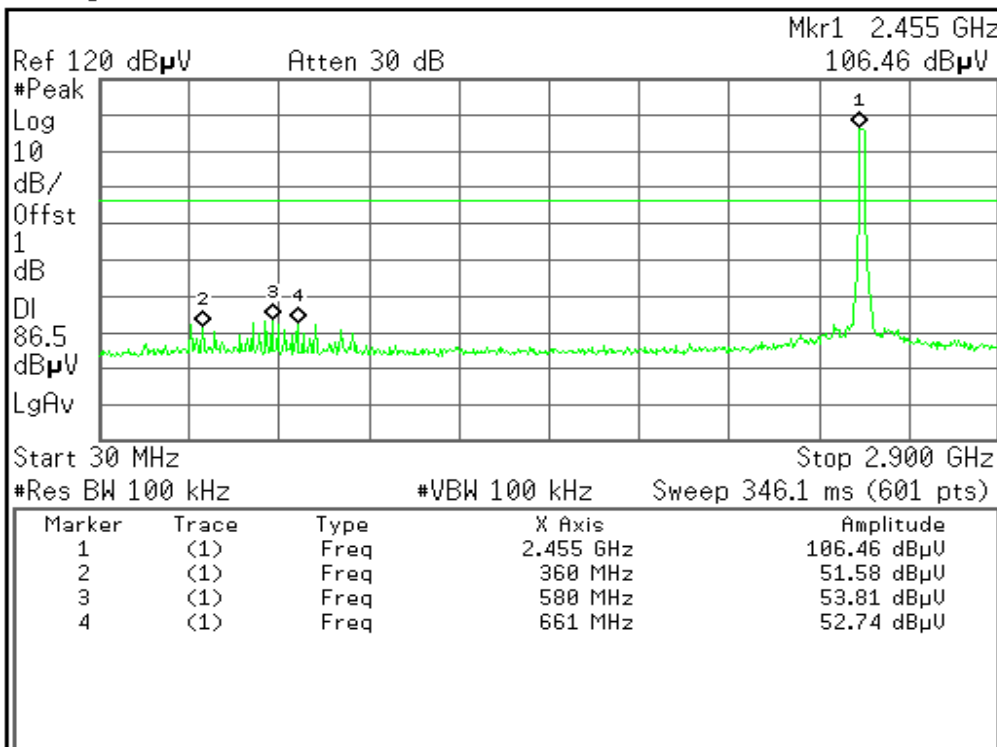


CH High

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Center

Off

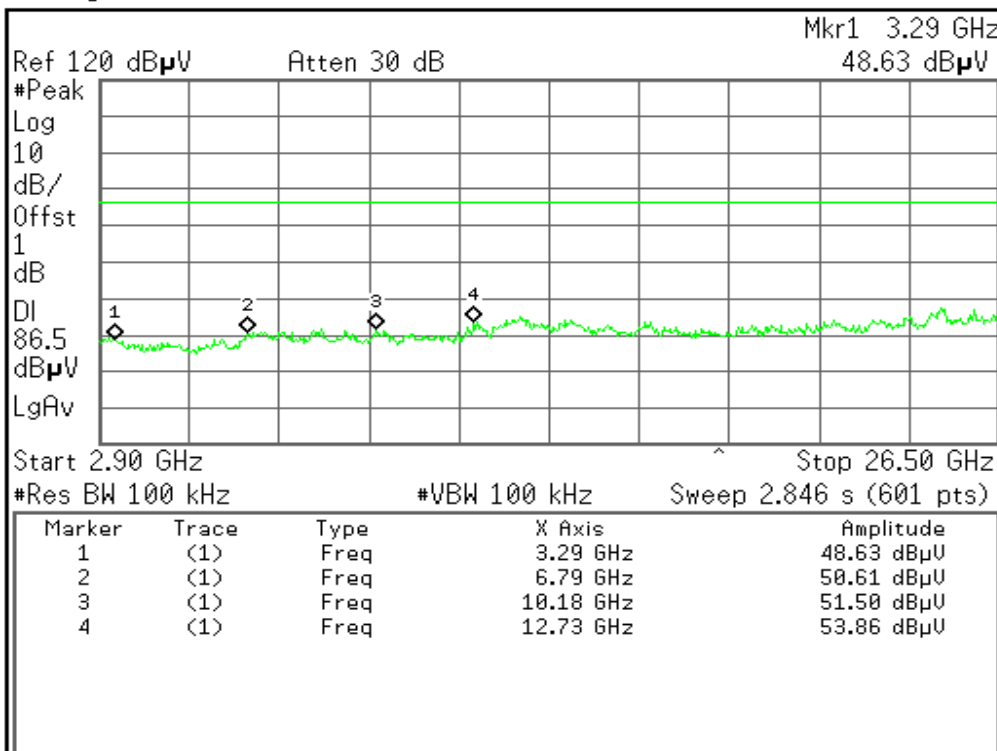
More
1 of 2

Copyright 2000-2009 Agilent Technologies

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Center

Off

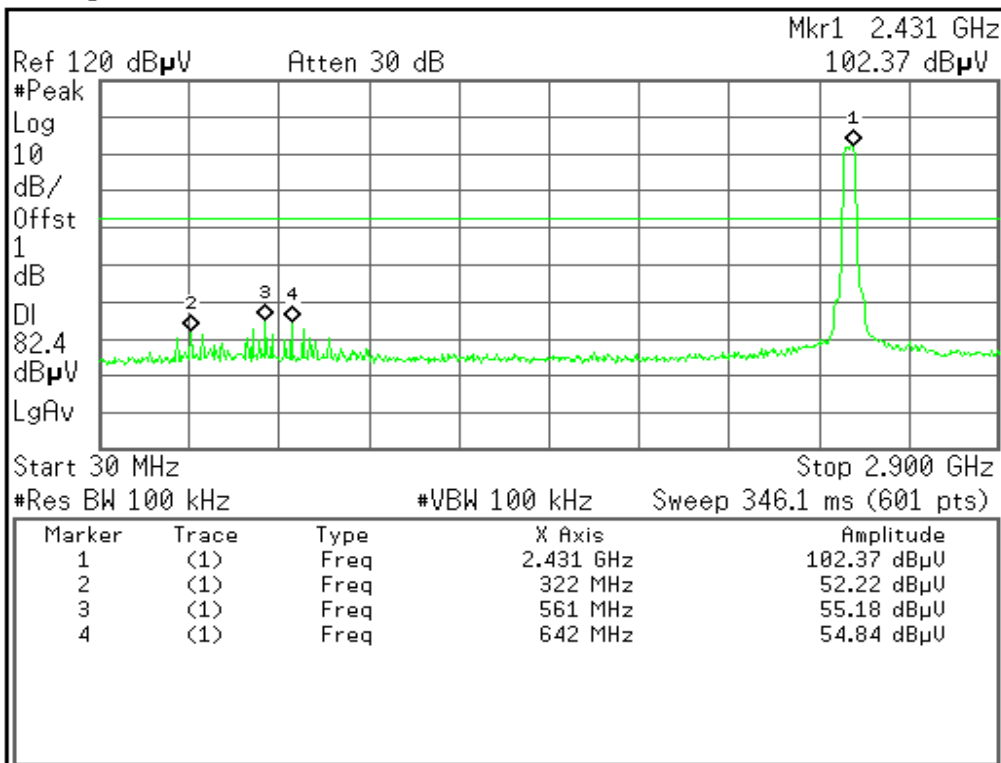
More
1 of 2

Copyright 2000-2009 Agilent Technologies

**IEEE 802.11n Wide-40 MHz Channel mode****CH Low**

* Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)Ref Δ Span Pair
Center

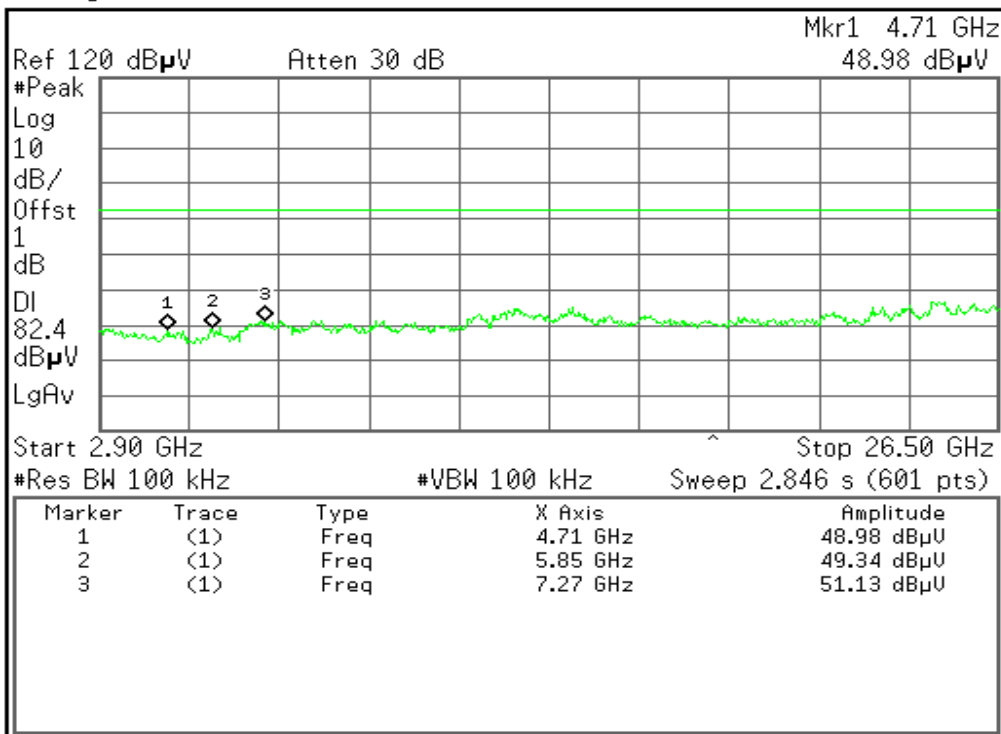
Off

More
1 of 2

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* Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)Ref Δ Span Pair
Center

Off

More
1 of 2

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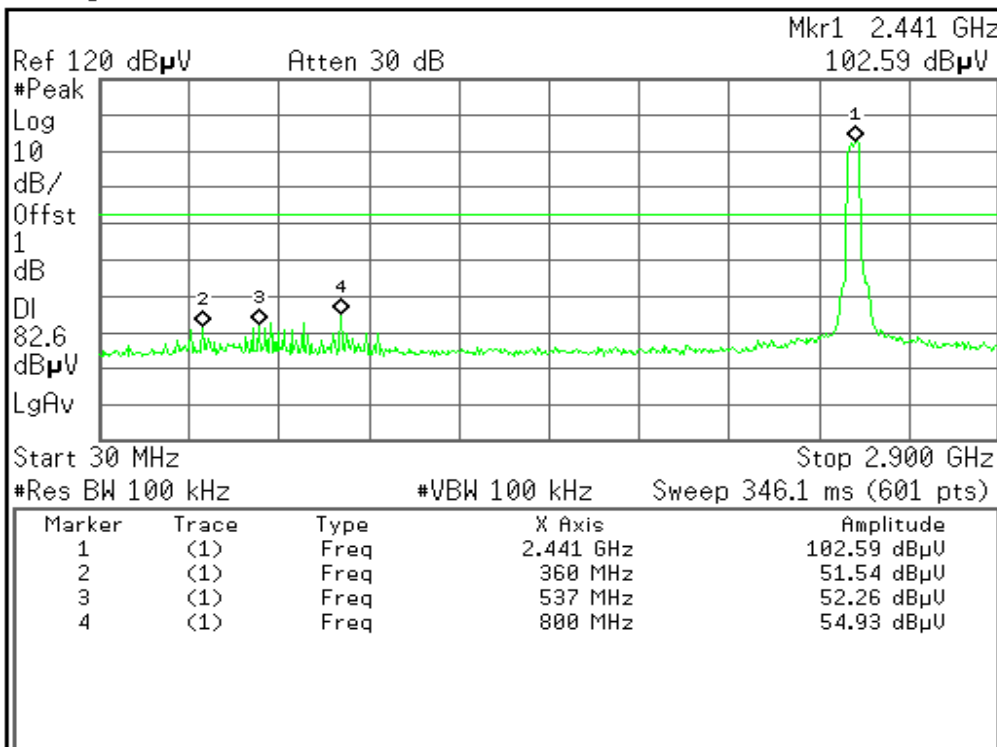


CH Mid

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

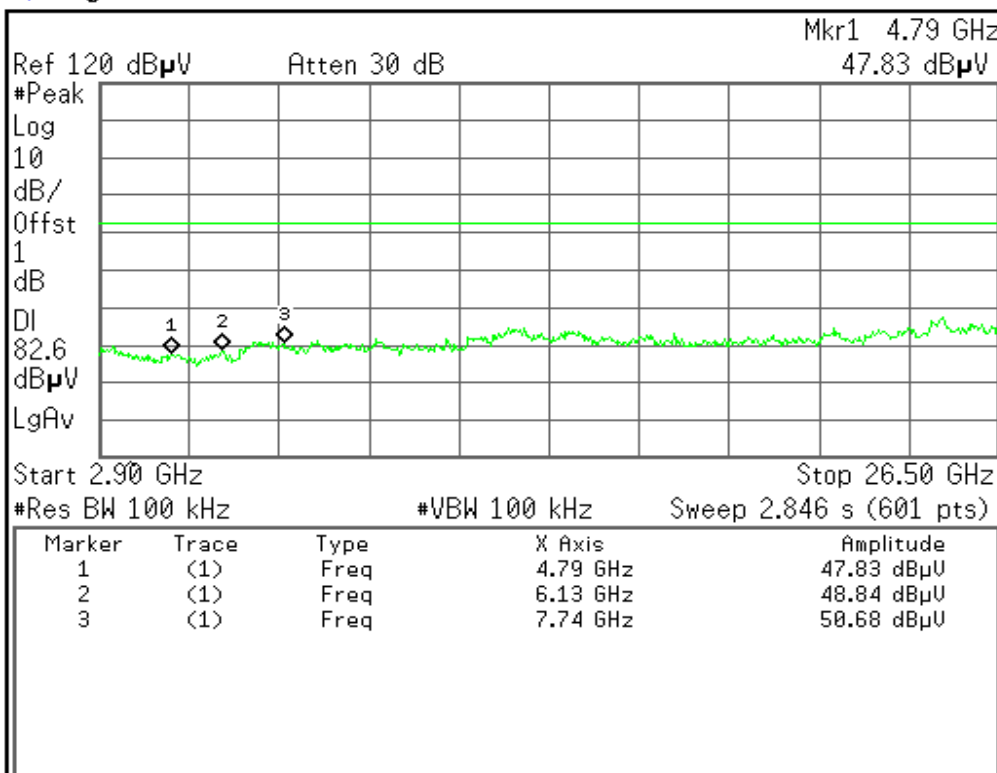
1 of 2

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Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

Span Pair

Span Center

Off

More

1 of 2

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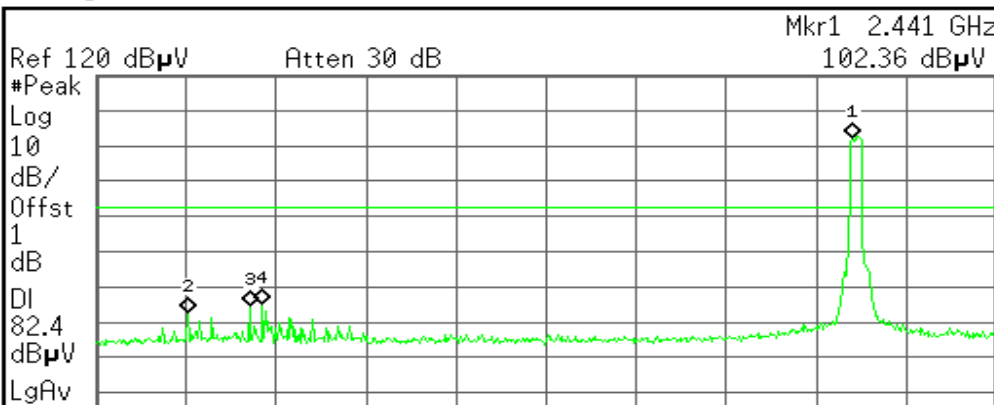


CH High

Agilent

R L

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ

Span Pair
Span Center

Off

More
1 of 2

Start 30 MHz Stop 2.900 GHz
#Res BW 100 kHz #VBW 100 kHz Sweep 346.1 ms (601 pts)

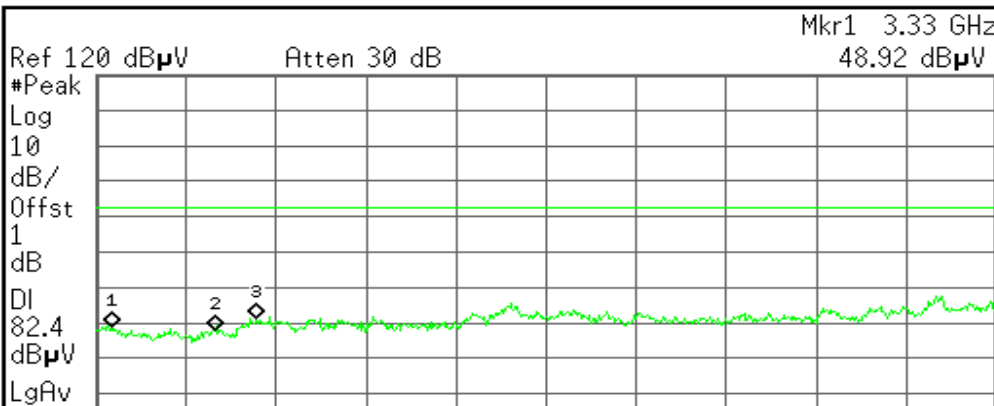
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.441 GHz	102.36 dB μ V
2	(1)	Freq	322 MHz	52.57 dB μ V
3	(1)	Freq	518 MHz	54.80 dB μ V
4	(1)	Freq	561 MHz	55.01 dB μ V

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Agilent

R L

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ

Span Pair
Span Center

Off

More
1 of 2

Start 2.90 GHz Stop 26.50 GHz
#Res BW 100 kHz #VBW 100 kHz Sweep 2.846 s (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	3.33 GHz	48.92 dB μ V
2	(1)	Freq	6.01 GHz	48.03 dB μ V
3	(1)	Freq	7.11 GHz	51.22 dB μ V

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7.5.2 RADIATED EMISSIONS

LIMIT

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

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

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

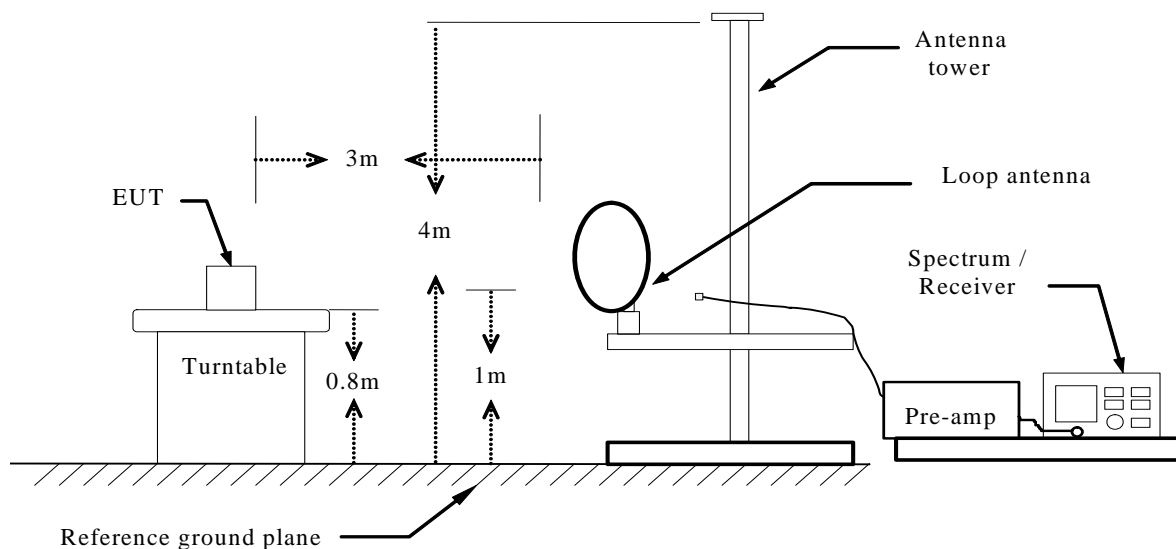
2. In the emission table above, the tighter limit applies at the band edges.

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

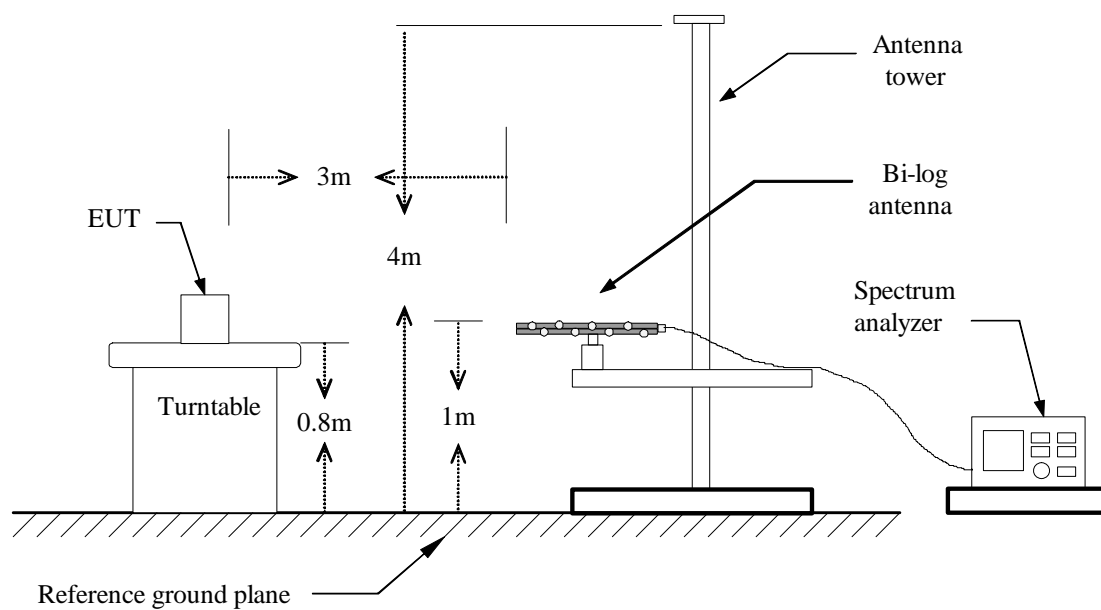


Test Configuration

Below 30MHz

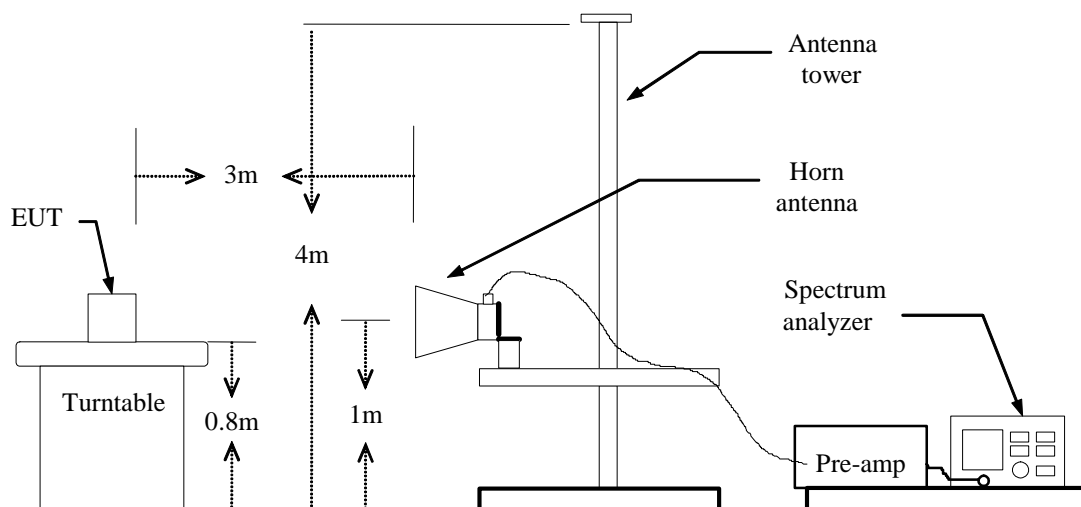


Below 1 GHz





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

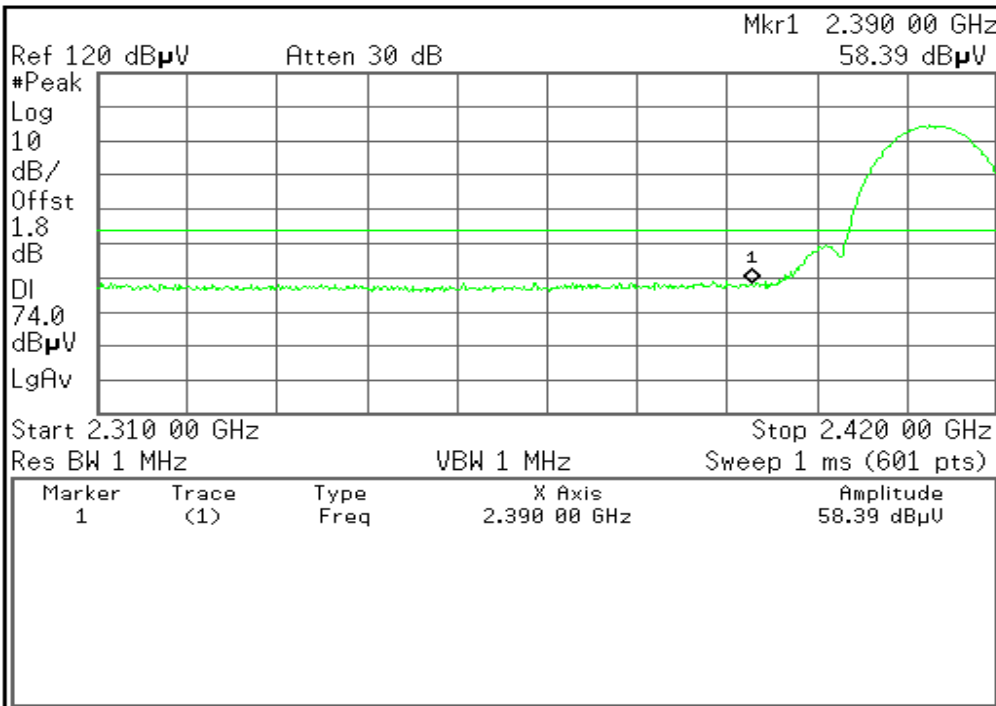
RESTRICTED BANDEDGE (b Mode, Low Channel, Horizontal)

PEAK

Agilent

R L

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Center

Off

More
1 of 2

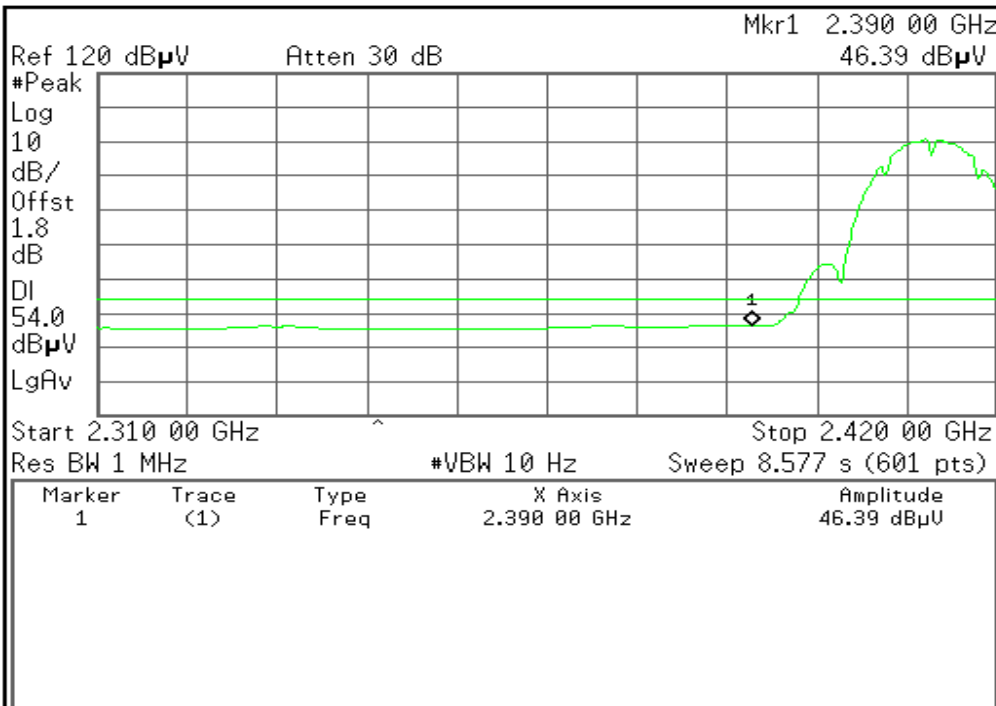
Copyright 2000-2008 Agilent Technologies

AVG

Agilent

R L

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Center

Off

More
1 of 2

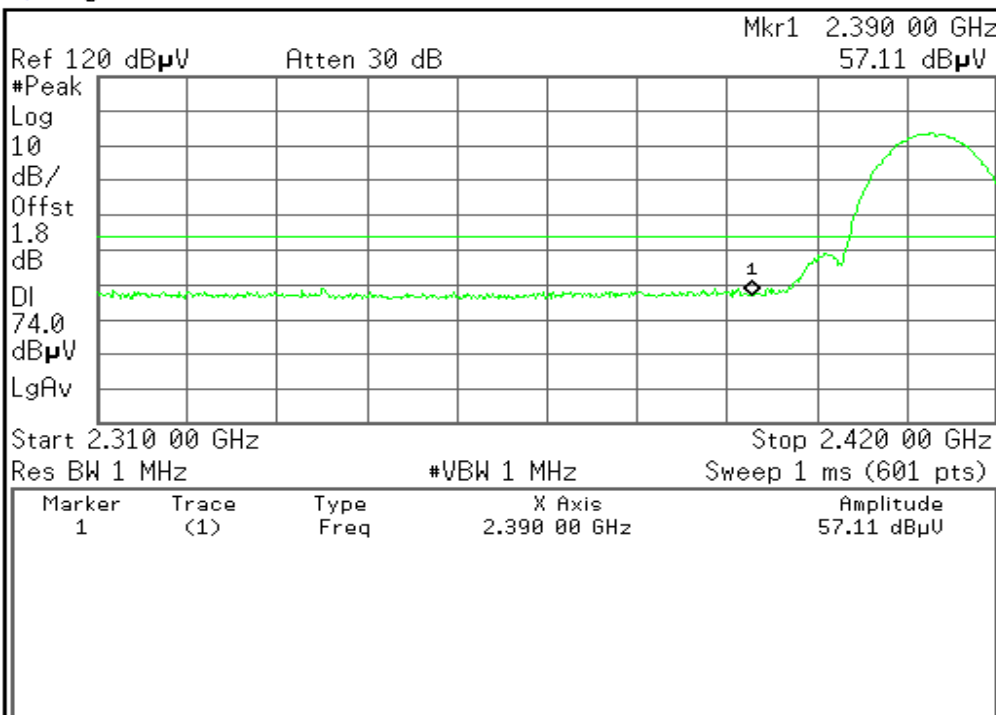
Copyright 2000-2008 Agilent Technologies

**RESTRICTED BANDEDGE (b Mode, Low Channel, Vertical)****PEAK**

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
RefSpan Pair
Center

Off

More
1 of 2

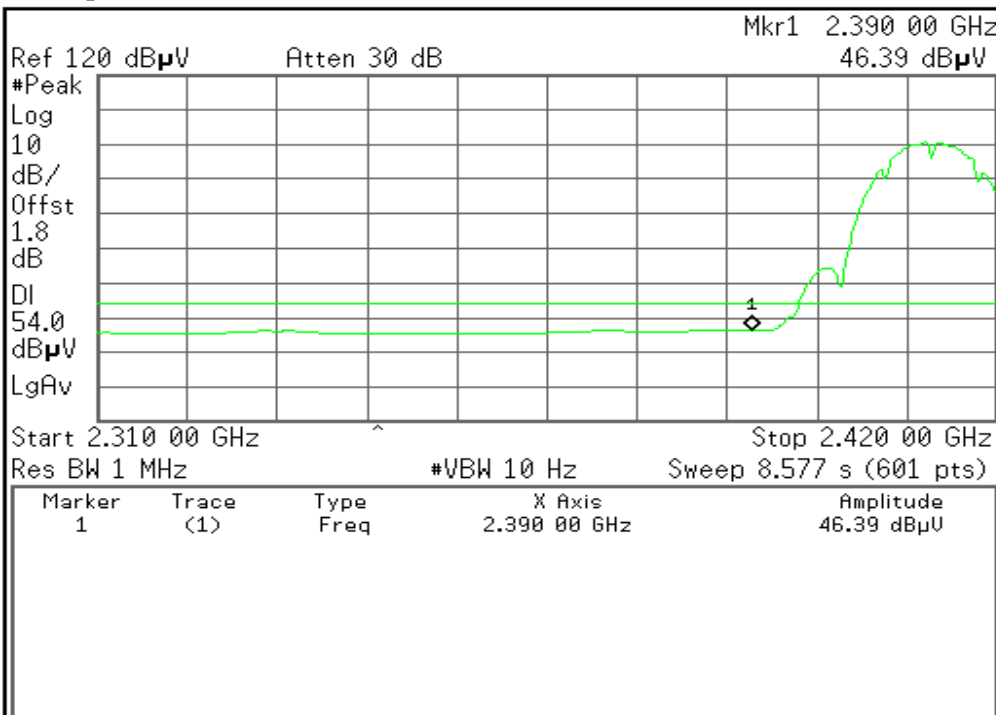
Copyright 2000–2008 Agilent Technologies

AVG

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
RefSpan Pair
Center

Off

More
1 of 2

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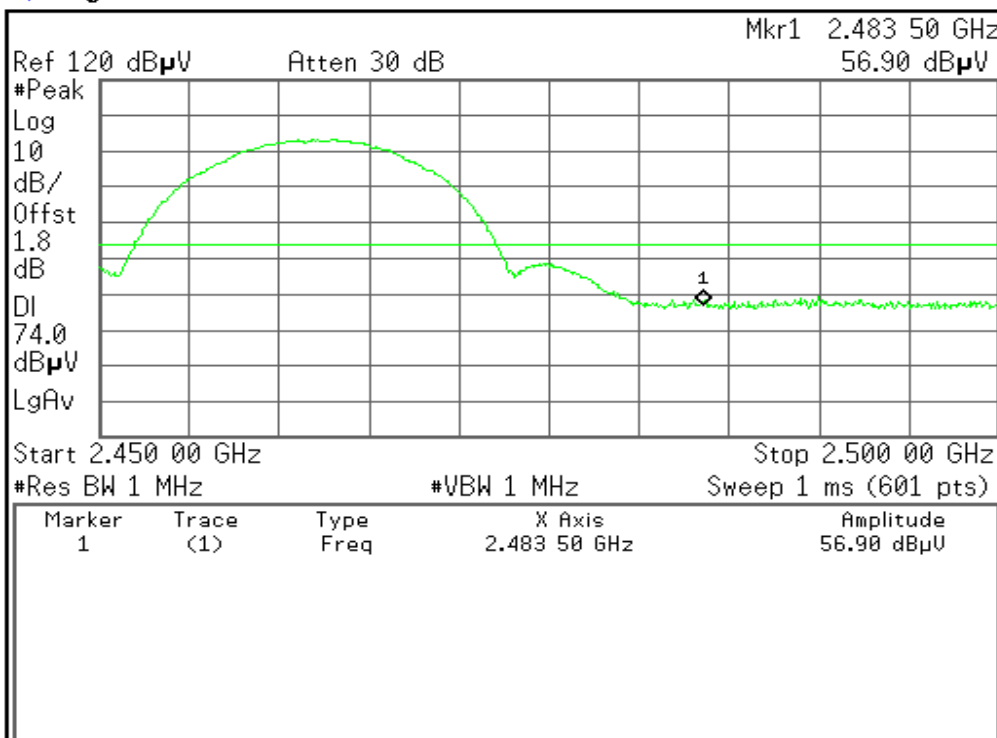


RESTRICTED BANDEDGE (b Mode, High Channel, Horizontal)

PEAK

Agilent

R L



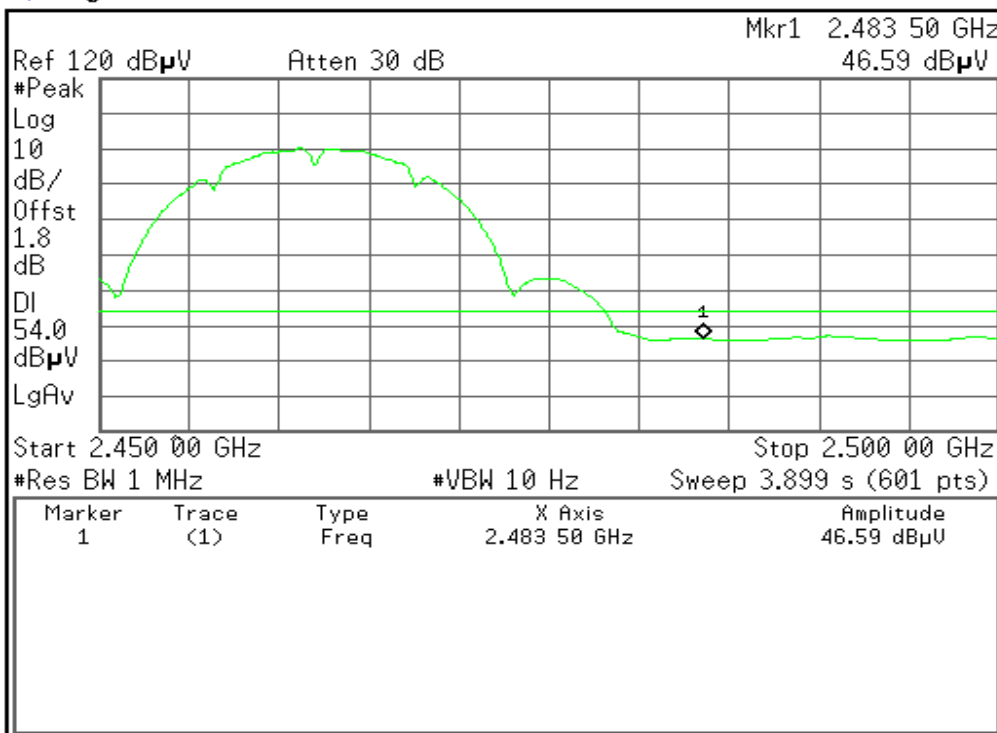
Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	▲		
Span Pair			
Span	Center		
Off			
More 1 of 2			

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AVG

Agilent

R L



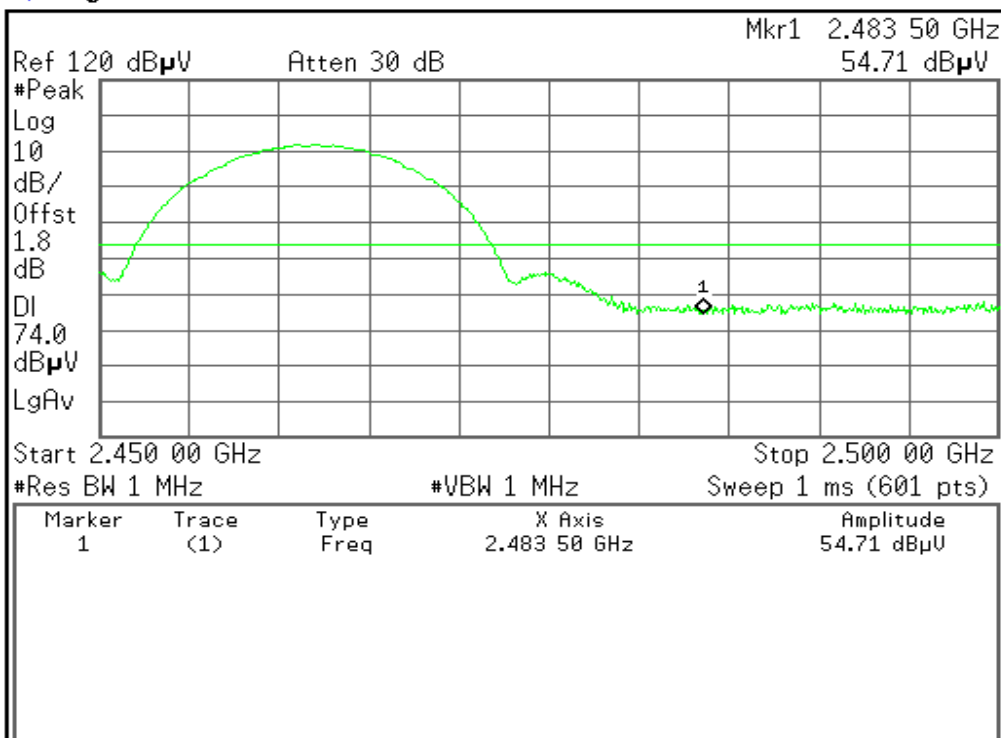
Marker			
Select Marker	1	2	3 4
Normal			
Delta			
Delta Pair (Tracking Ref)			
Ref	▲		
Span Pair			
Span	Center		
Off			
More 1 of 2			

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**RESTRICTED BANDEDGE (b Mode, High Channel, Vertical)****PEAK**

* Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

▲

Span Pair

Span

Center

Off

More

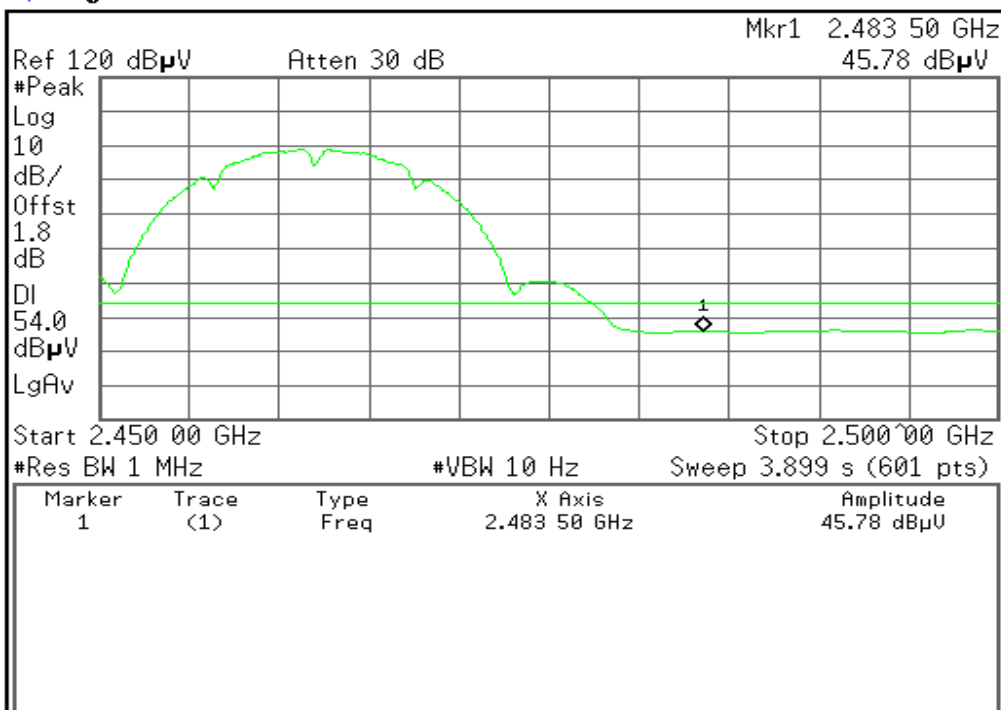
1 of 2

Copyright 2000–2008 Agilent Technologies

AVG

* Agilent

R L



Marker

Select Marker

1 2 3 4

Normal

Delta

Delta Pair

(Tracking Ref)

Ref

▲

Span Pair

Span

Center

Off

More

1 of 2

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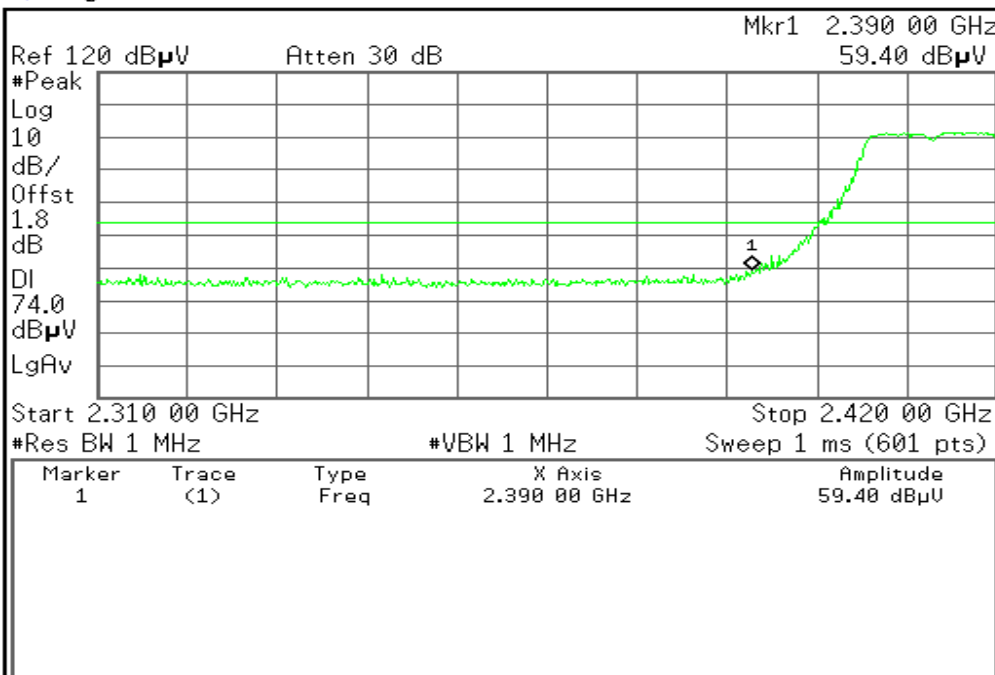
RESTRICTED BANDEDGE (g Mode, Low Channel, Horizontal)

PEAK

Agilent

R L

Marker



Select Marker

1	2	3	4
---	---	---	---

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

More 1 of 2

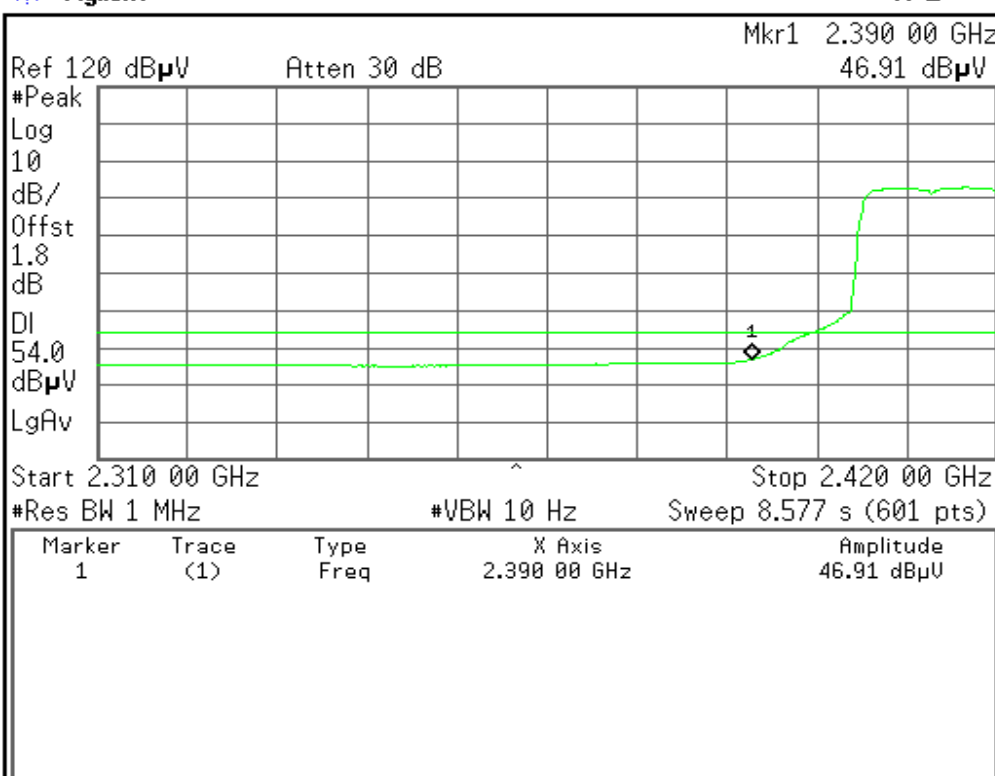
Copyright 2000-2008 Agilent Technologies

AVG

Agilent

R L

Marker



Select Marker

1	2	3	4
---	---	---	---

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

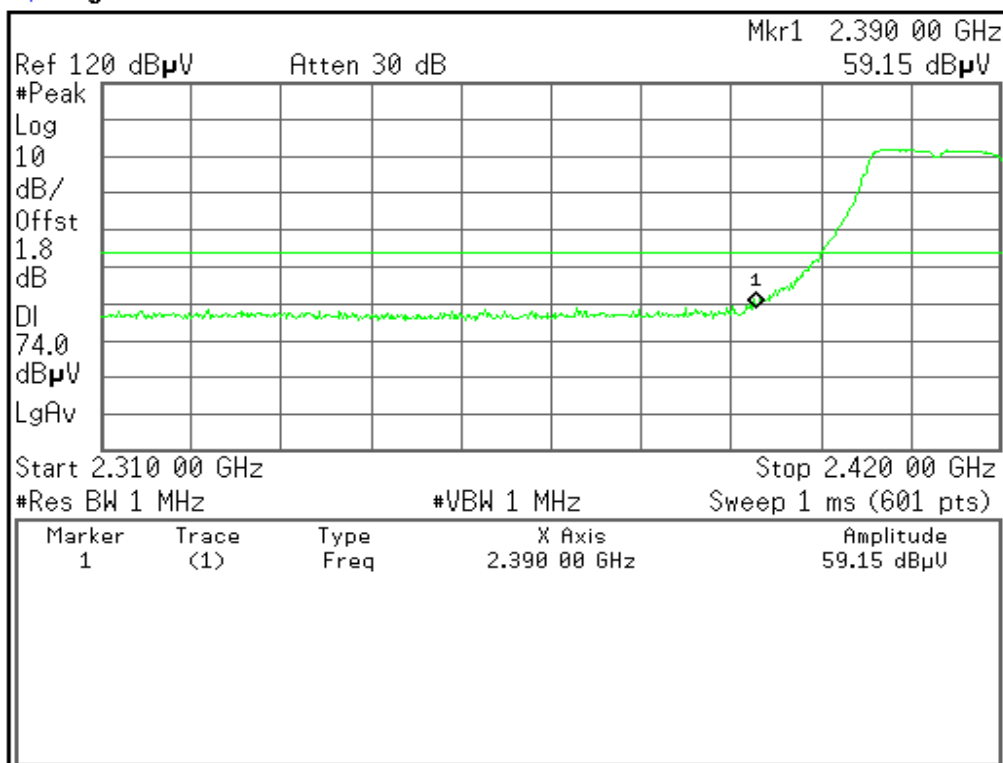
More 1 of 2

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**RESTRICTED BANDEDGE (g Mode, Low Channel, Vertical)****PEAK**

* Agilent

R T

**Marker****Select Marker**

1 2 3 4

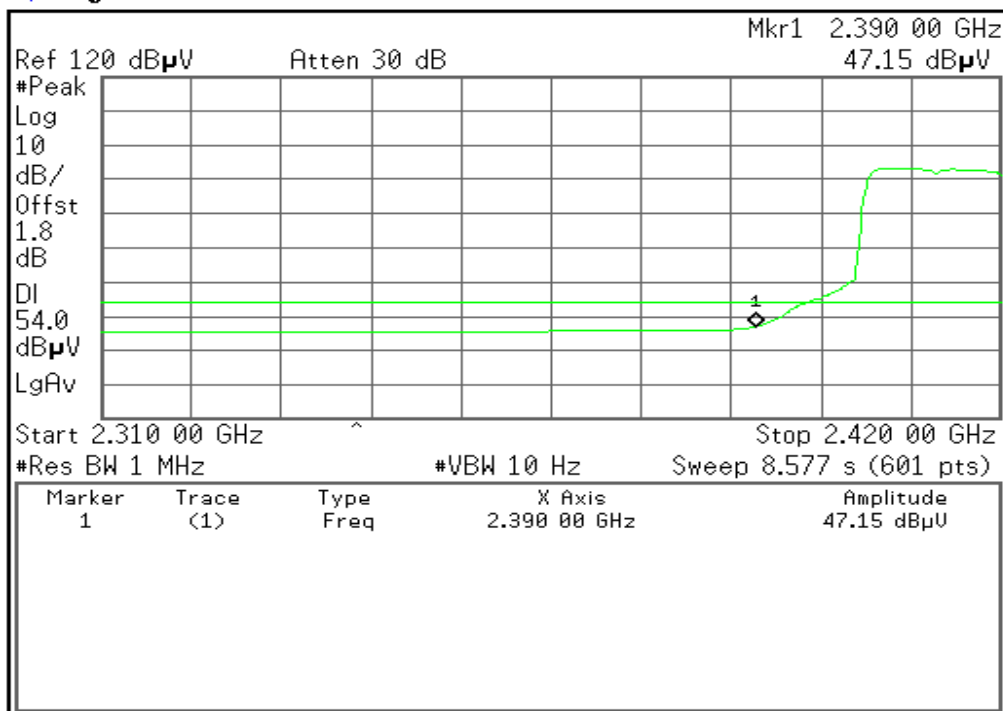
Normal**Delta****Delta Pair**
(Tracking Ref)
Ref Δ **Span Pair**
Span Center**Off****More**
1 of 2

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AVG

* Agilent

R L

**Marker****Select Marker**

1 2 3 4

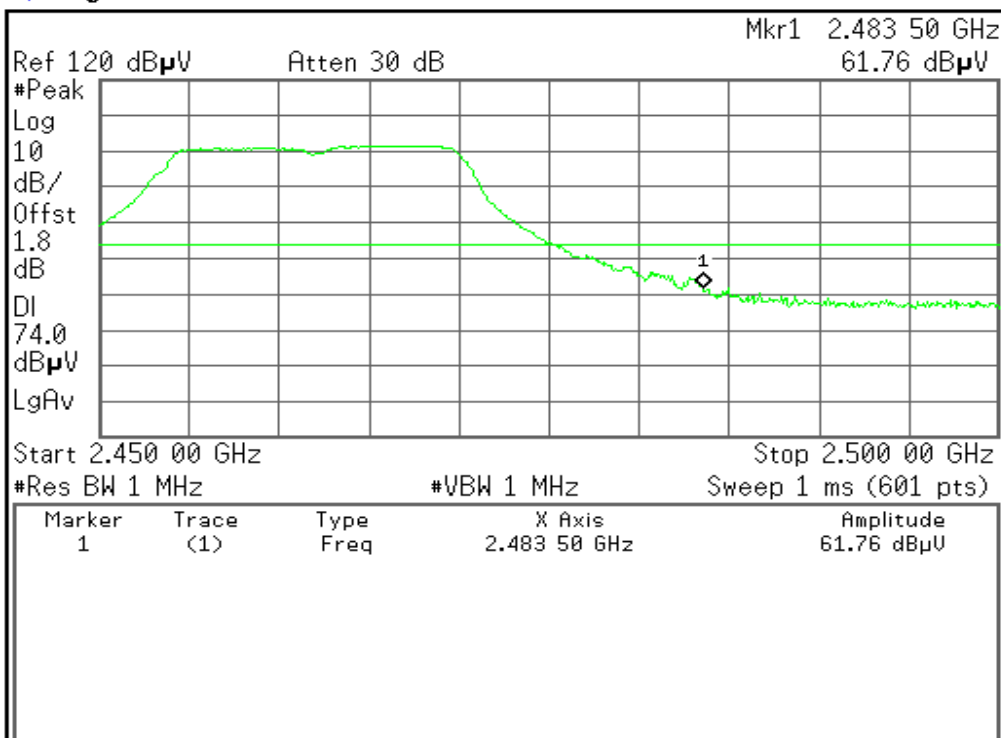
Normal**Delta****Delta Pair**
(Tracking Ref)
Ref Δ **Span Pair**
Span Center**Off****More**
1 of 2

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**RESTRICTED BANDEDGE (g Mode, High Channel, Horizontal)****PEAK**

* Agilent

R L



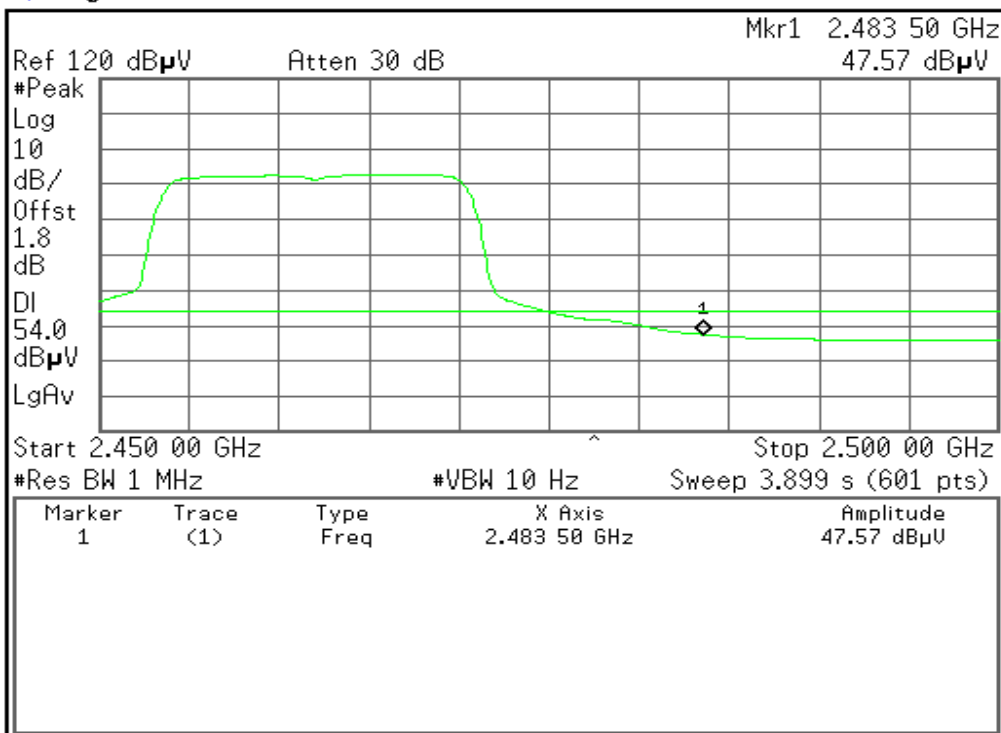
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Center
Off
More 1 of 2

Copyright 2000-2008 Agilent Technologies

AVG

* Agilent

R L



Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Center
Off
More 1 of 2

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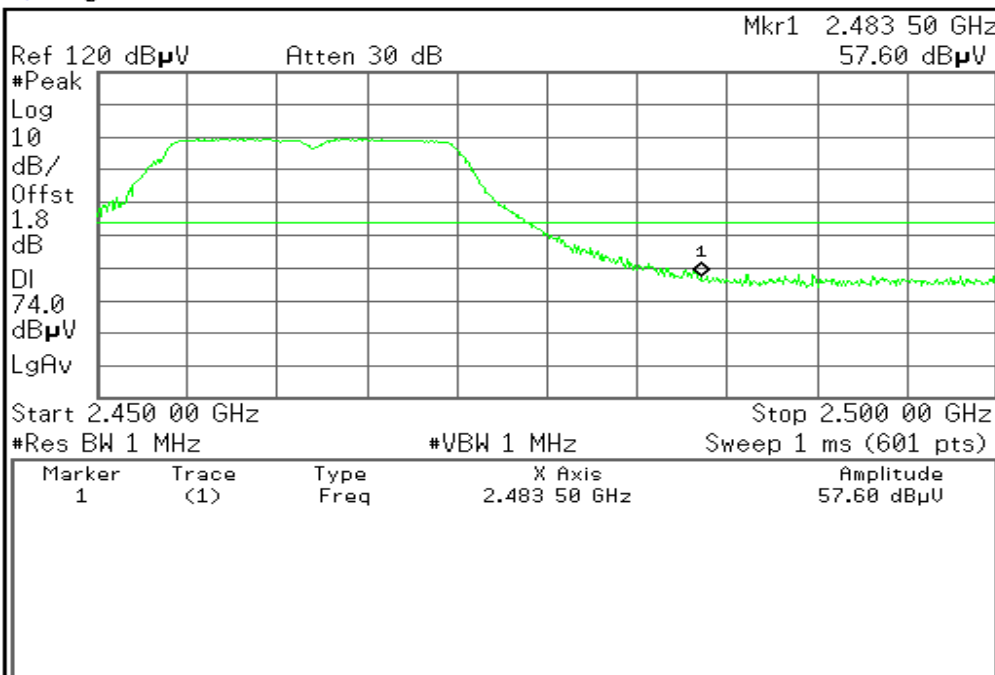
RESTRICTED BANDEDGE (g Mode, High Channel, Vertical)

PEAK

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Span Center

Off

More
1 of 2

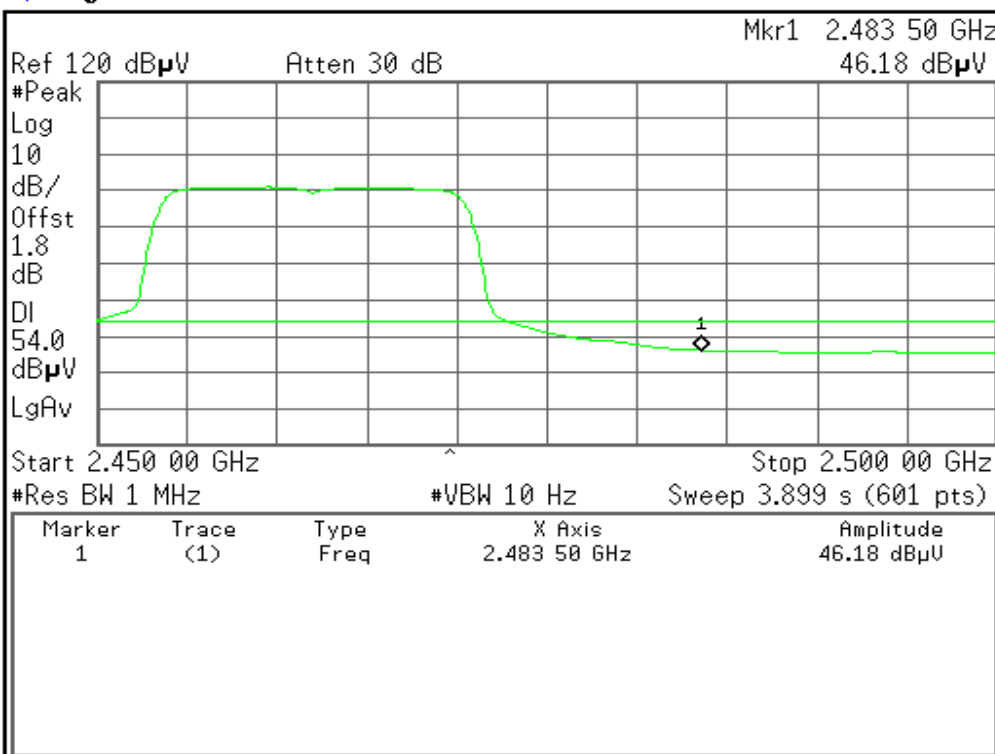
Copyright 2000-2008 Agilent Technologies

AVG

Agilent

R L

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref

Span Pair
Span Center

Off

More
1 of 2

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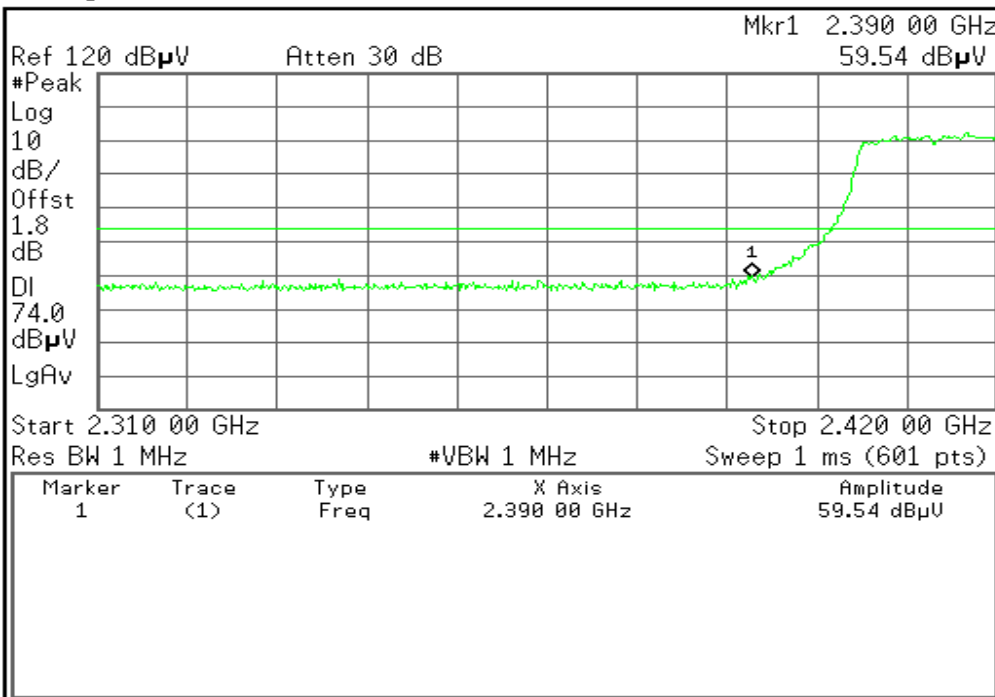
RESTRICTED BANDEDGE (IEEE 802.11n Standard-20 MHz Channel mode, Low Channel, Horizontal)

PEAK

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

More 1 of 2

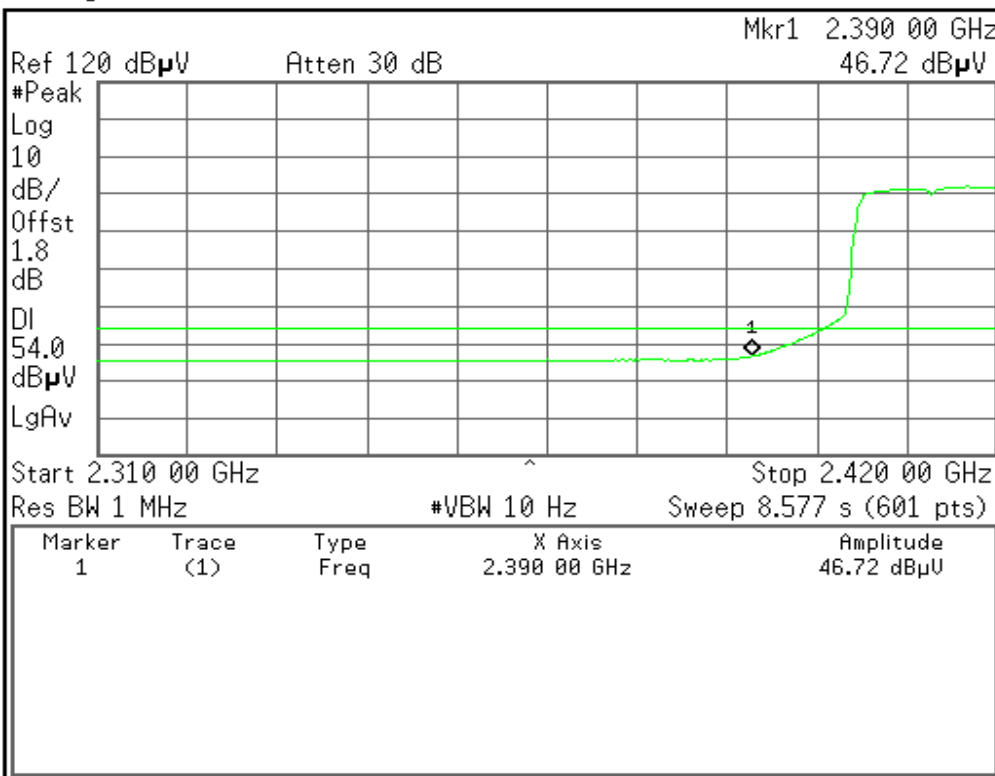
Copyright 2000-2009 Agilent Technologies

AVG

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

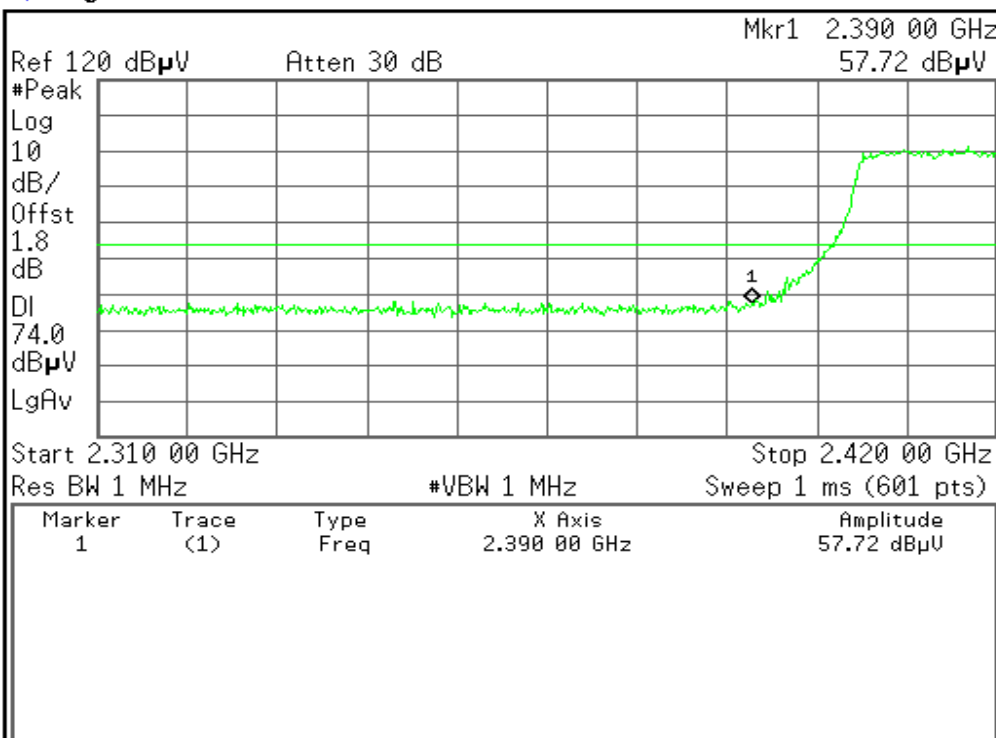
More 1 of 2

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**RESTRICTED BANDEDGE** (IEEE 802.11n Standard-20 MHz Channel mode, Low Channel, Vertical)**PEAK**

* Agilent

R T



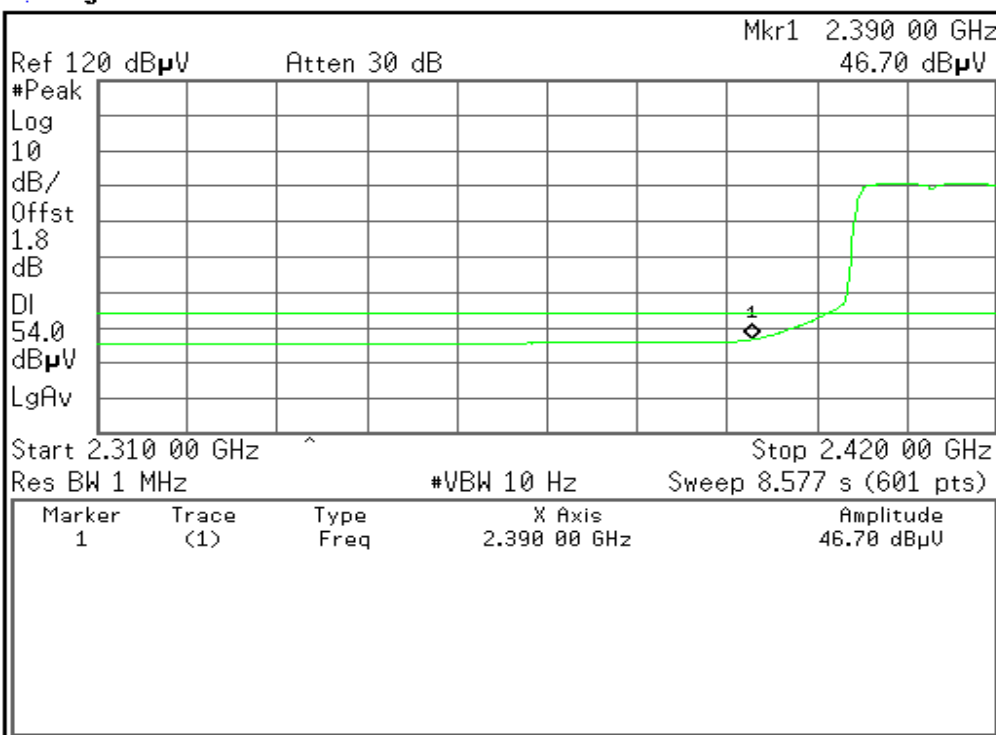
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Center
Off
More
1 of 2

Copyright 2000-2009 Agilent Technologies

AVG

* Agilent

R T



Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Center
Off
More
1 of 2

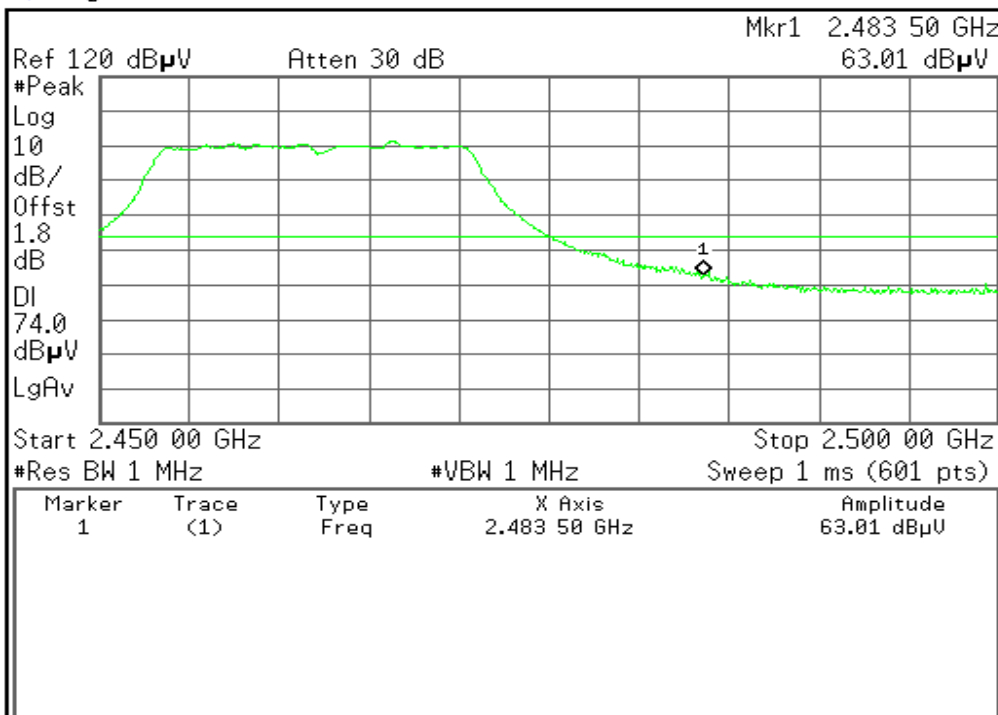
Copyright 2000-2009 Agilent Technologies

**RESTRICTED BANDEDGE** (IEEE 802.11n Standard-20 MHz Channel mode, High Channel, Horizontal)**PEAK**

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ Span Pair
Center

Off

More
1 of 2

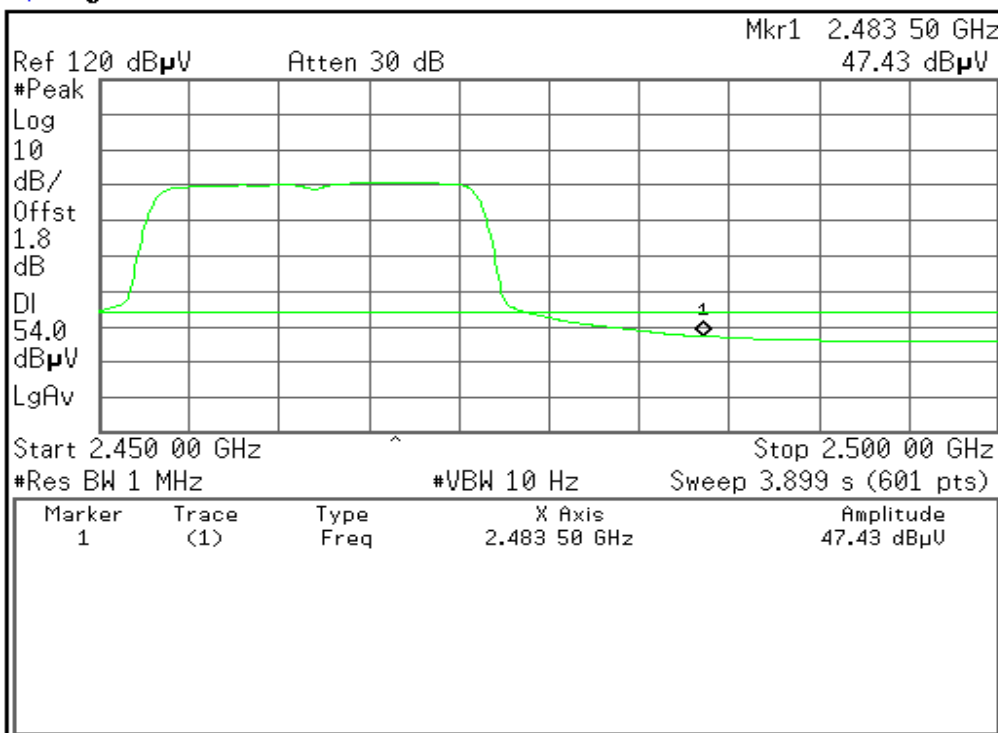
Copyright 2000-2009 Agilent Technologies

AVG

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Δ Span Pair
Center

Off

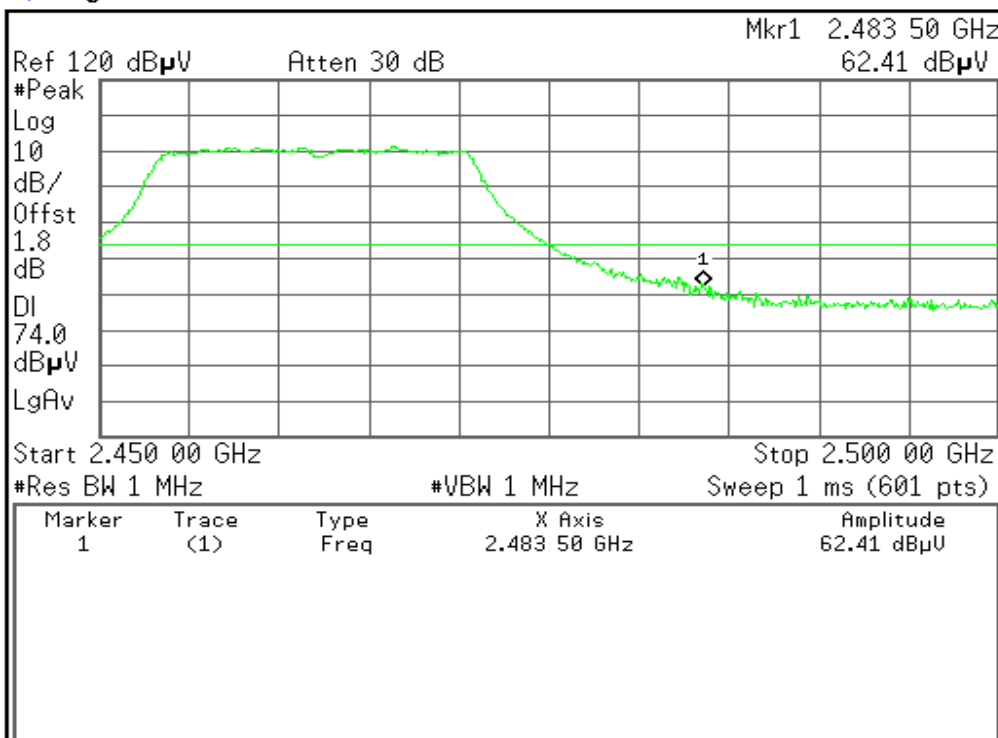
More
1 of 2

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**RESTRICTED BANDEDGE** (IEEE 802.11n Standard-20 MHz Channel mode, High Channel, Vertical)**PEAK**

* Agilent

R T



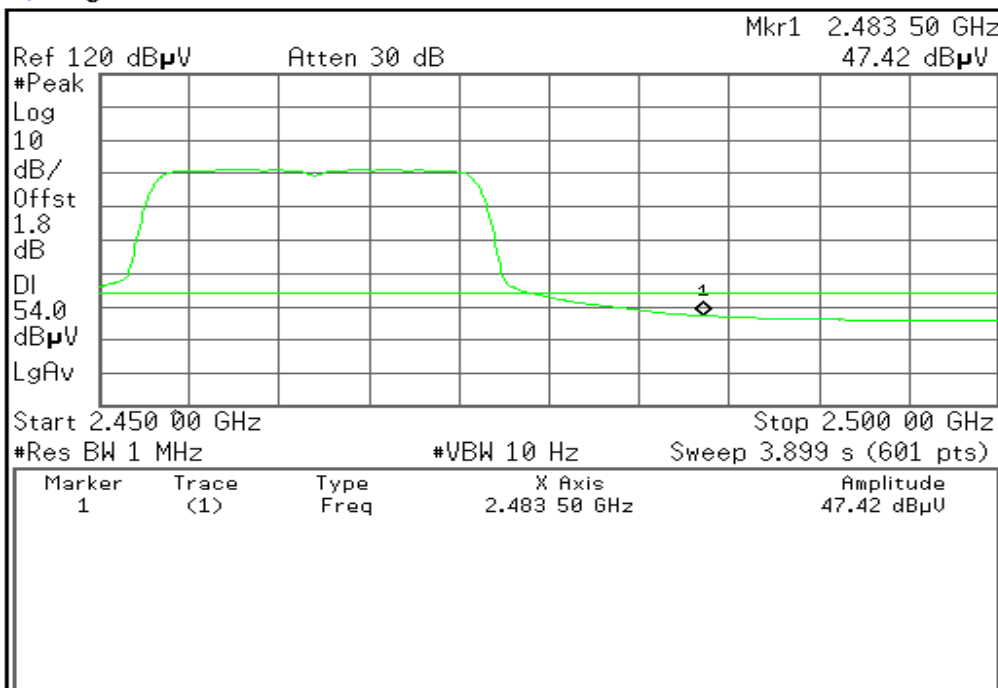
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Span Center
Off
More 1 of 2

Copyright 2000–2009 Agilent Technologies

AVG

* Agilent

R T



Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Span Center
Off
More 1 of 2

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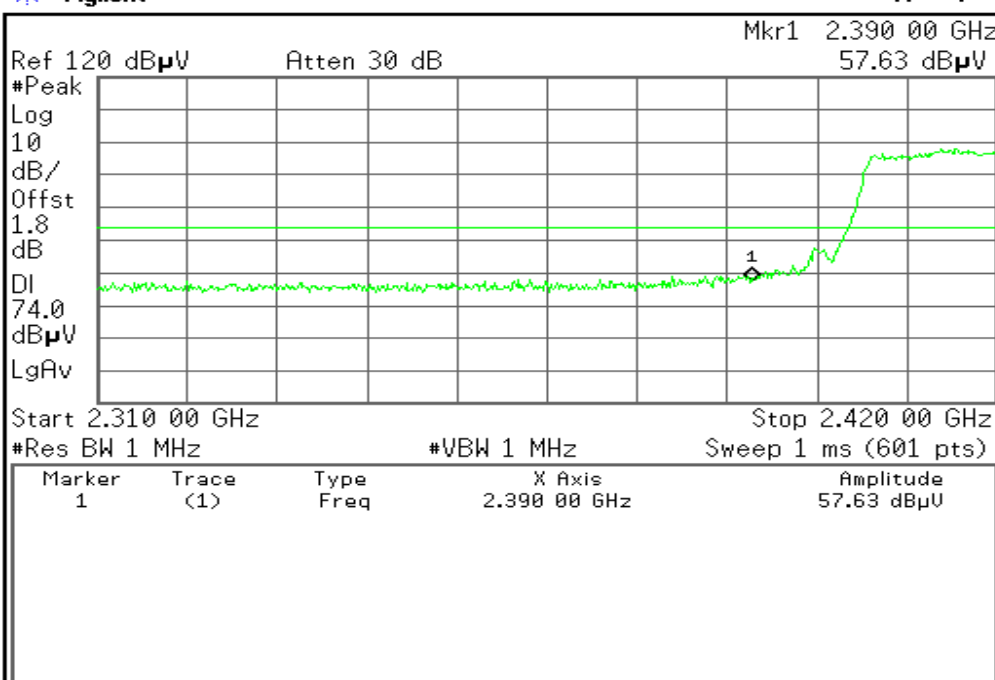
RESTRICTED BANDEDGE (IEEE 802.11n Wide -40 MHz Channel mode, Low Channel, Horizontal)

PEAK

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

More 1 of 2

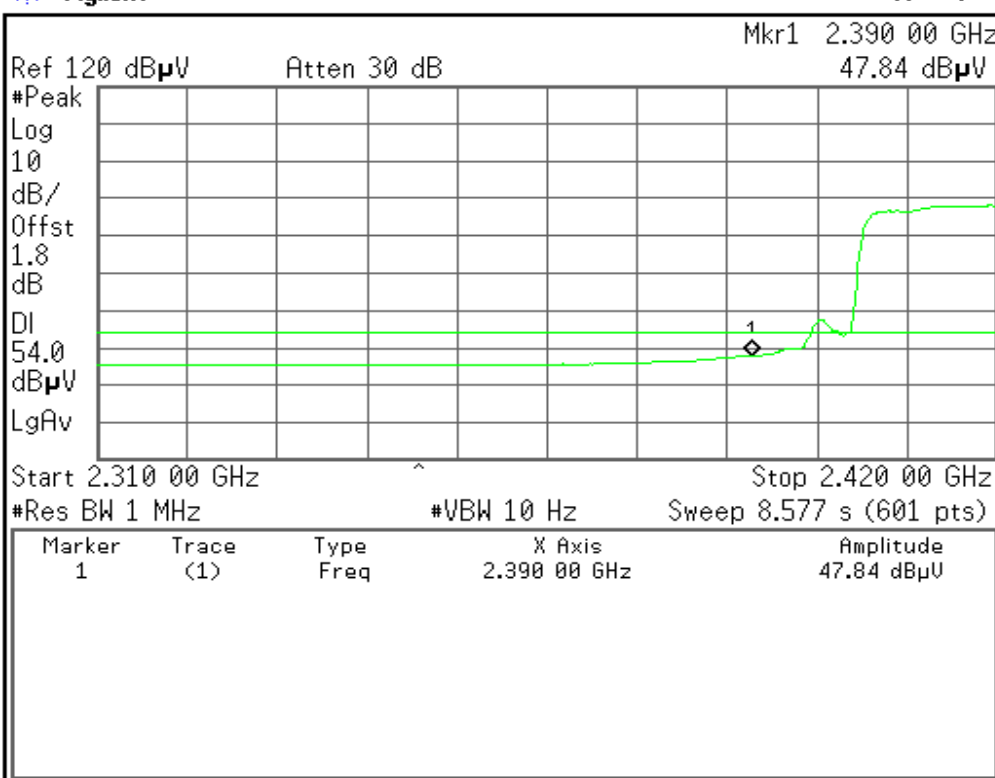
Copyright 2000-2009 Agilent Technologies

AVG

Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair (Tracking Ref) Ref Δ

Span Pair Center

Off

More 1 of 2

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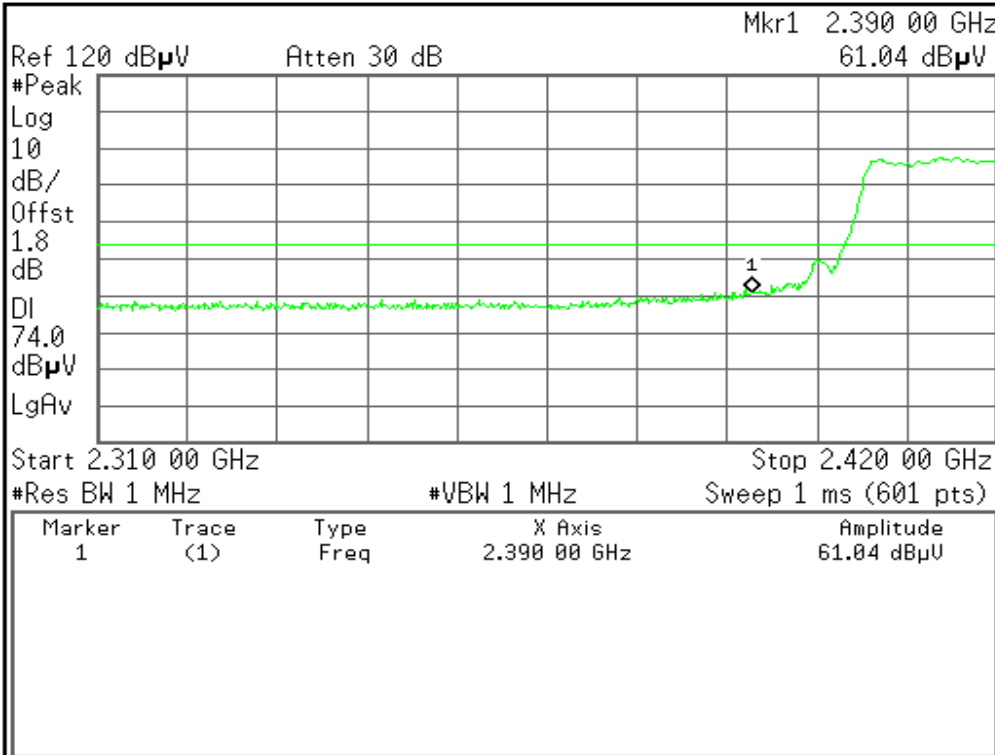
RESTRICTED BANDEDGE (IEEE 802.11n Wide -40 MHz Channel mode, Low Channel, Vertical)

PEAK

Agilent

R T

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref ▲

Span Pair
Span Center

Off

More
1 of 2

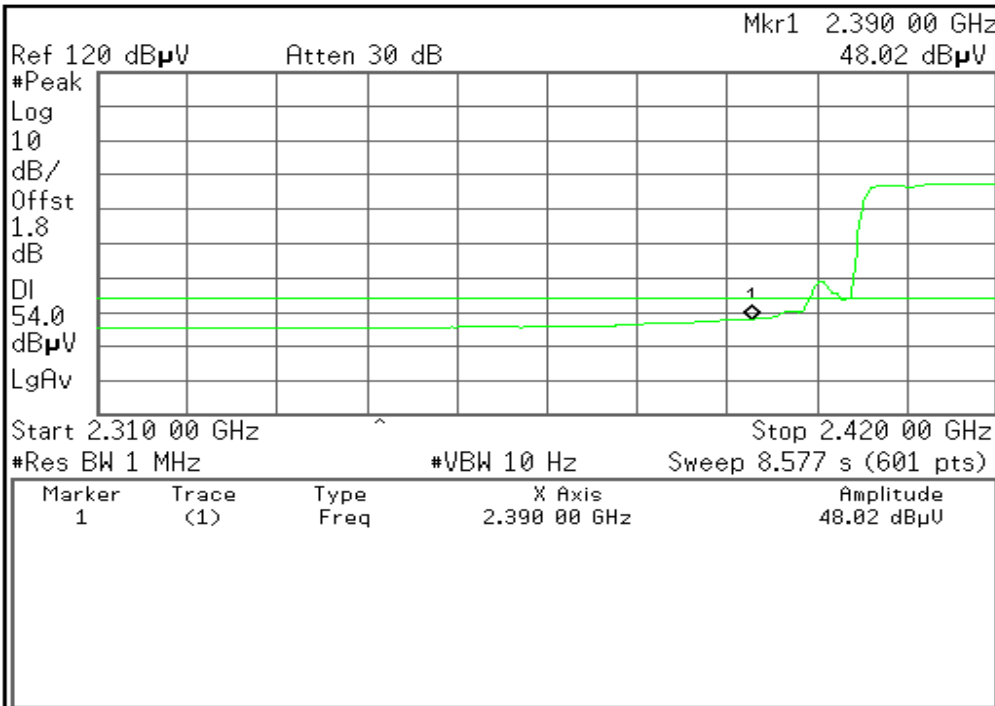
Copyright 2000–2009 Agilent Technologies

AVG

Agilent

R T

Marker



Select Marker
1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref ▲

Span Pair
Span Center

Off

More
1 of 2

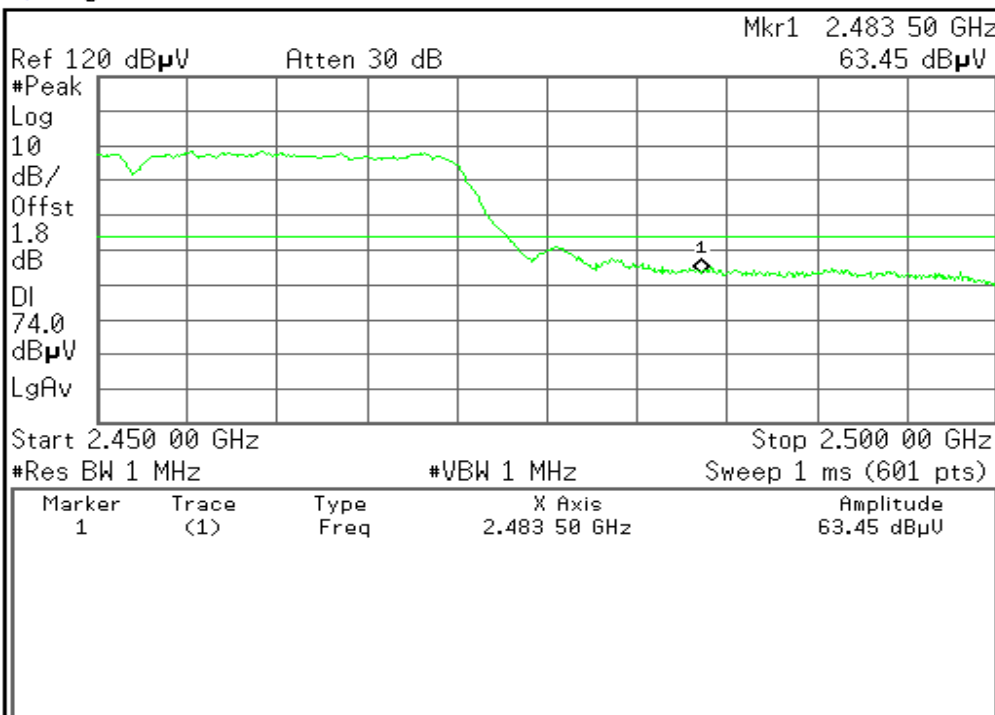
Copyright 2000–2009 Agilent Technologies

**RESTRICTED BANDEDGE (IEEE 802.11n Wide -40 MHz Channel mode, High Channel, Horizontal)****PEAK**

* Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Span Pair
Center

Off

More
1 of 2

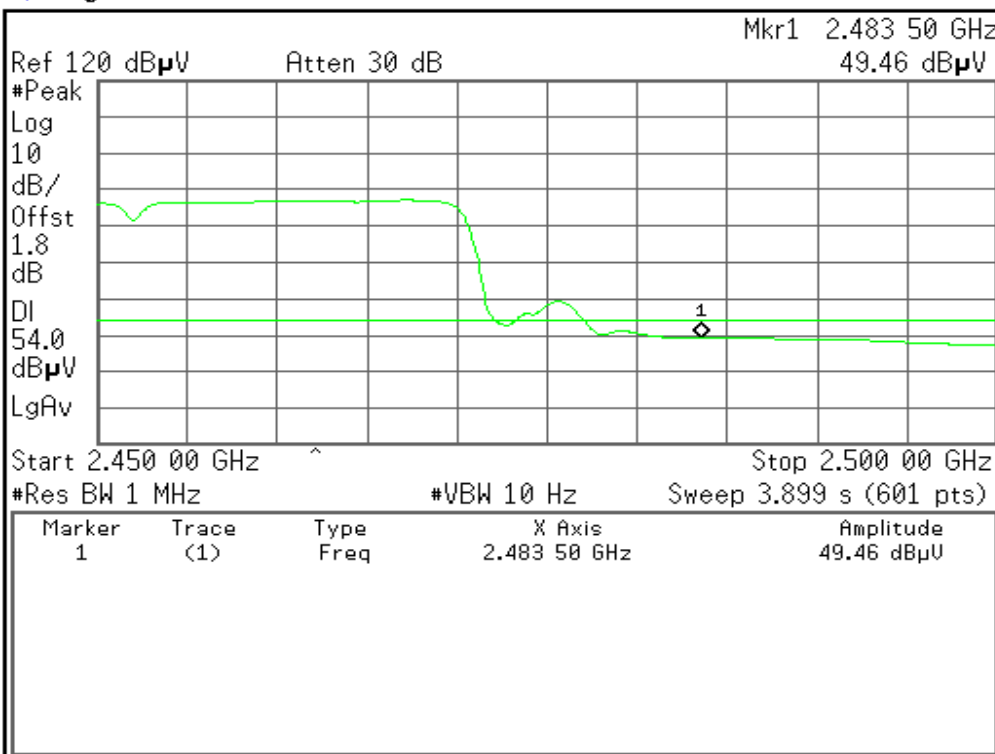
Copyright 2000-2009 Agilent Technologies

AVG

* Agilent

R T

Marker



Select Marker

1 2 3 4

Normal

Delta

Delta Pair
(Tracking Ref)
Ref Span Pair
Center

Off

More
1 of 2

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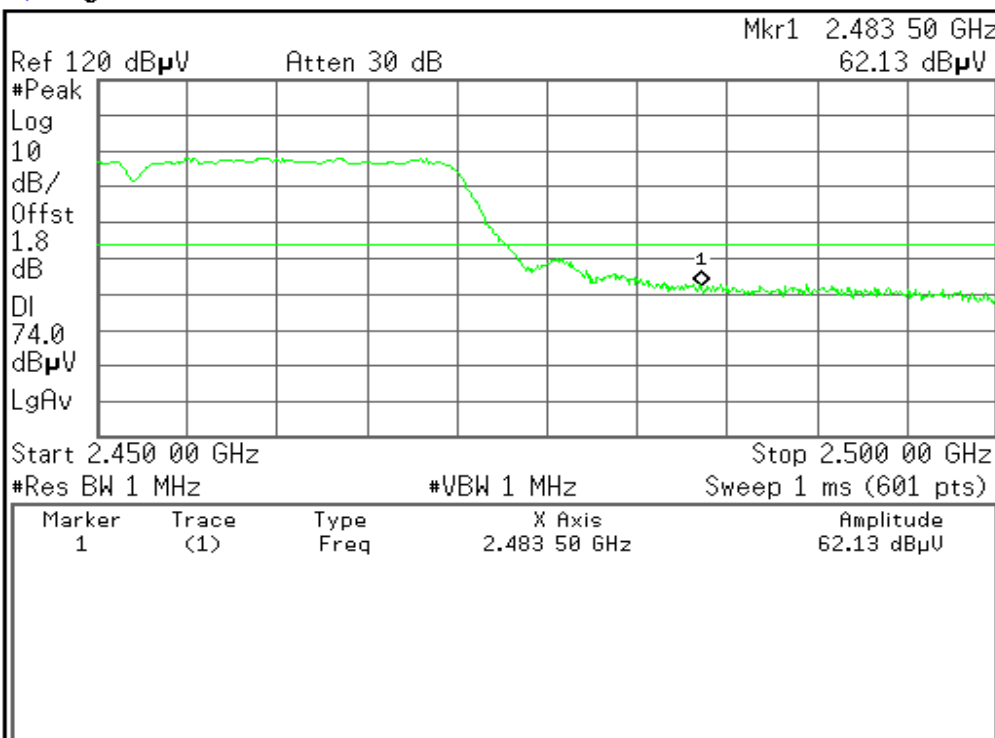


RESTRICTED BANDEDGE (IEEE 802.11n Wide -40 MHz Channel mode, High Channel, Vertical)

PEAK

Agilent

R T



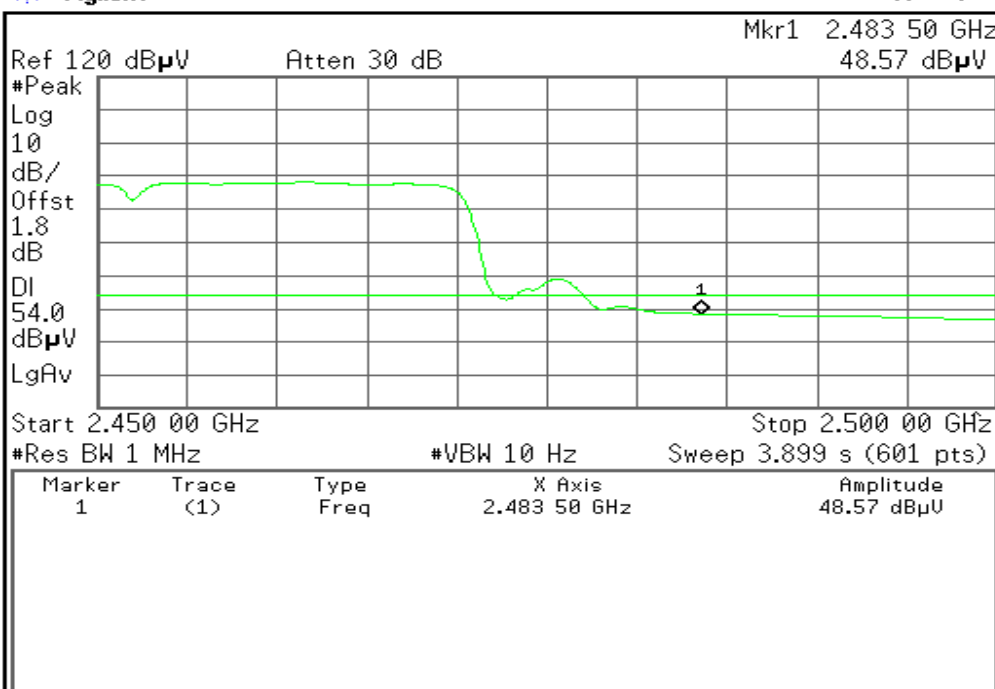
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Span Center
Off
More 1 of 2

Copyright 2000-2009 Agilent Technologies

AVG

Agilent

R T



Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair (Tracking Ref)
Ref
Span Pair
Span Center
Off
More 1 of 2

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**Below 1GHz****Operation Mode:** Normal Link**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50% RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
34.32	V	Peak	38.88	-0.94	37.94	40.0	-2.06
47.85	V	Peak	46.47	-9.8	36.67	40.0	-3.33
125.23	V	Peak	38.94	-4.99	33.95	43.5	-9.55
326.65	V	Peak	32.76	-3.26	29.5	46.0	-16.5
447.29	V	Peak	34.15	-0.10	34.05	46.0	-11.95
490.78	V	Peak	31.71	0.96	32.67	46.0	-13.33
33.25	H	Peak	30.07	-0.24	29.83	40.0	-10.17
143.62	H	Peak	36.13	-5.67	30.46	43.5	-13.04
250.76	H	Peak	45.34	-5.59	39.75	46.0	-6.25
305.61	H	Peak	35.81	-3.83	31.98	46.0	-14.02
326.65	H	Peak	38.43	-3.26	35.17	46.0	-10.83
447.29	H	Peak	35.3	-0.10	35.2	46.0	-10.8

Remark:

1. Measuring frequencies from 9 KHz to the 1GHz, No emission found between lowest internal used/generated frequency to 30 MHz.
2. Radiated emissions measured in frequency range from 9 KHz to 1000MHz were made with an instrument using Peak detector mode.
3. 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.
4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

**Above 1 GHz****Operation Mode:** TX / IEEE 802.11b / CH Low**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4825.00	V	42.56	29.88	10.93	53.49	40.81	74	54	-13.19	average
7233.34	V	41.99	28.51	18.51	60.50	47.02	74	54	-6.98	average
4825.00	H	42.16	28.78	10.93	53.09	39.71	74	54	-14.29	average
7234.13	H	41.32	26.58	18.51	59.83	45.09	74	54	-8.91	average

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. $\text{Margin (dB)} = \text{Remark result (dBuV/m)} - \text{Average limit (dBuV/m)}$.

**Operation Mode:** TX / IEEE 802.11b / CH Mid**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4874.23	V	41.46	29.57	11.02	52.48	40.59	74	54	-13.41	average
7313.32	V	40.62	26.15	18.58	59.20	44.73	74	54	-9.27	average
4875.33	H	40.12	29.58	11.02	51.14	40.6	74	54	-13.4	average
0.26	H	39.64	25.64	18.58	58.22	44.22	74	54	-9.78	average

Remark:

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

**Operation Mode:** TX / IEEE 802.11b / CH High**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4925.34	V	42.51	29.64	11.14	53.65	40.78	74	54	-13.22	average
7384.65	V	40.55	26.35	18.64	59.19	44.99	74	54	-9.01	average
4925.00	H	41.82	29.77	11.14	52.96	40.91	74	54	-13.09	average
7385.11	H	40.61	25.89	18.64	59.25	44.53	74	54	-9.47	average

Remark:

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

**Operation Mode:** TX / IEEE 802.11g / CH Low**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4825.00	V	42.03	29.65	10.93	52.96	40.58	74	54	-13.42	average
7233.13	V	39.88	26.14	18.51	58.39	44.65	74	54	-9.35	average
4825.00	H	41.55	29.16	10.93	52.48	40.09	74	54	-13.91	average
7233.33	H	39.62	25.47	18.51	58.13	43.98	74	54	-10.02	average

Remark:

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

Operation Mode: TX / IEEE 802.11g / CH Mid

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 50 % RH

Polarity: Ver. / Hor.

[illegible]

Remark:

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

Operation Mode: TX / IEEE 802.11g / CH High

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 40 % RH

Polarity: Ver. / Hor.

[illegible]

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 802.11gn Standard-20 MHz
Channel mode / CH Low

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 50 % RH

Polarity: Ver. / Hor.

[illegible]

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 802.11gn Standard-20 MHz
Channel mode / CH Mid**Test Date:** August 2, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4874.33	V	41.65	29.89	11.02	52.67	40.91	74	54	-13.09	average
7311.25	V	39.64	26.15	18.58	58.22	44.73	74	54	-9.27	average
4875.00	H	41.67	29.85	11.02	52.69	40.87	74	54	-13.13	average
7312.23	H	39.12	25.67	18.58	57.70	44.25	74	54	-9.75	average

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 802.11gn Standard-20 MHz
Channel mode / CH High

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 50 % RH

Polarity: Ver. / Hor.

[illegible]

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 802.11gn Wide-40 MHz Channel
mode / CH Low

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 50 % RH

Polarity: Ver. / Hor.

[illegible]

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 802.11gn Wide-40 MHz Channel
mode / CH Mid

Test Date: September 7,
2010

Temperature: 23°C

Tested by:Jeson Wang

Humidity: 50 % RH

Polarity: Ver. / Hor.

[illegible]

Remark:

7. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
8. Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
9. Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
10. 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.
11. 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.
12. Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).

**Operation Mode:** TX / IEEE 802.11gn Wide-40 MHz Channel mode / CH High**Test Date:** September 7, 2010**Temperature:** 23°C**Tested by:** Jeson Wang**Humidity:** 50 % RH**Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
4906.13	V	42.15	31.88	11.11	53.26	42.99	74	54	-11.01	average
7355.25	V	40.51	25.45	18.62	59.13	44.07	74	54	-9.93	average
4905.28	H	41.32	31.06	11.11	52.43	42.17	74	54	-11.83	average
7356.24	H	39.52	24.54	18.62	58.14	43.16	74	54	-10.84	average

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).



7.6 POWERLINE CONDUCTED EMISSIONS

LIMIT

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

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

* Decreases with the logarithm of the frequency.

Test Configuration

See test photographs attached in Appendix 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:** September 7, 2010
Temperature: 23°C **Tested by:** Jeson Wang
Humidity: 50% RH

Freq. (MHz)	Q.P. Raw reading (dBuV)	AVG Raw reading (dBuV)	Correction factor(dB)	Q.P. Amptd. (dBuV)	AVG Amptd. (dBuV)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Q.P. Margin (dB)	AVG Margin (dB)	Line/Neutral
0.201	38.24	27.55	10.11	48.35	37.66	64.52	54.52	-16.17	-16.86	Line
0.275	39.49	28.50	10.23	49.72	38.73	62.41	52.41	-12.69	-13.68	Line
0.323	31.90	20.06	10.30	42.20	30.36	61.03	51.03	-18.83	-20.67	Line
0.471	33.72	17.91	10.70	44.42	28.61	56.80	46.80	-12.38	-18.19	Line
0.605	30.43	18.67	10.88	41.31	29.55	56.00	46.00	-14.69	-16.45	Line
0.782	32.60	14.56	10.98	43.58	25.54	56.00	46.00	-12.42	-20.46	Line
0.201	44.12	26.72	10.18	54.30	36.90	64.52	54.52	-10.22	-17.62	Neutral
0.283	39.18	24.51	10.16	49.34	34.67	62.19	52.19	-12.85	-17.52	Neutral
0.320	32.92	17.71	10.15	43.07	27.86	61.14	51.14	-18.07	-23.28	Neutral
0.401	33.60	19.22	10.13	43.73	29.35	58.81	48.81	-15.08	-19.46	Neutral
0.605	32.26	15.95	10.14	42.40	26.09	56.00	46.00	-13.60	-19.91	Neutral
1.389	26.28	10.89	10.35	36.63	21.24	56.00	46.00	-19.37	-24.76	Neutral

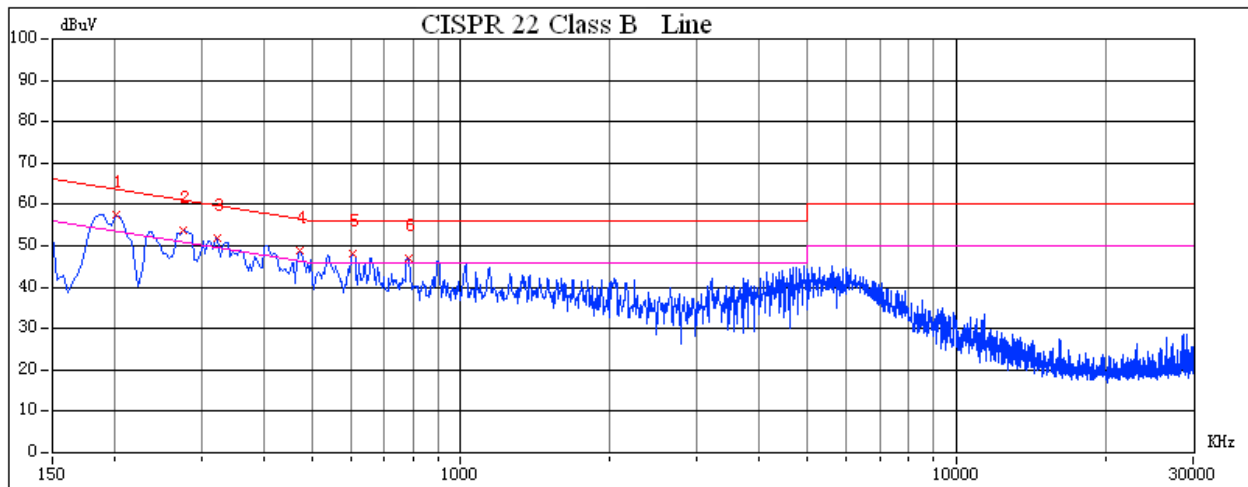
Remark:

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)

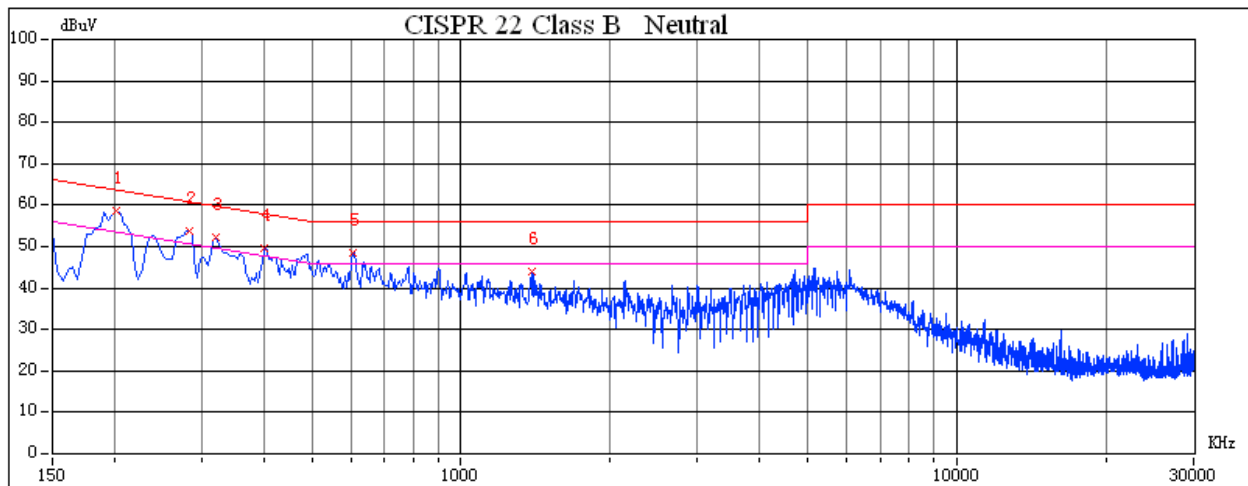


Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)





8 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

EUT	Connect N150 Wireless Router
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz, 2.422GHz ~ 2.452GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input type="checkbox"/> Others
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure ($S = 5\text{mW}/\text{cm}^2$) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure ($S=1\text{mW}/\text{cm}^2$)
Antenna diversity	<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
Max. output power	IEEE 802.11b mode: 19.12dBm(81.66mW) IEEE 802.11g mode: 14.93dBm(31.12mW) IEEE 802.11gn Standard-20 MHz Channel mode: 15.06 dBm (32.06mW) IEEE 802.11gn Wide-40 MHz Channel mode: 14.77 dBm (29.99mW)
Antenna gain (Max)	Gain 0.13dBi(1.03)(2.4GHz)
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A

Remark:

1. The maximum output power is 19.12dBm (81.66mW) at 2462MHz (with 1.03 numeric antenna gain.)
2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.
3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.

TEST RESULTS

No non-compliance noted.



Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

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

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

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

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²



IEEE 802.11b:

EUT output power = 81.66mW

Numeric Antenna gain = 1.03

→ Power density = 0.0167 mW / cm²

IEEE 802.11g:

EUT output power = 31.12mW

Numeric Antenna gain = 1.03

→ Power density = 0.0064 mW / cm²

IEEE 802.11gn Standard-20 MHz Channel mode

EUT output power = 32.06mW

Numeric Antenna gain = 1.03

→ Power density = 0.0066 mW / cm²

IEEE 802.11gn Wide-40 MHz Channel mode

EUT output power = 29.99mW

Numeric Antenna gain = 1.03

→ Power density = 0.0061 mW / cm²

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)