FCC Part15.247 Test Report

Product Name	:	ADSL2+ 4-port Wireless Router
Model No.	:	DSL-2640U, DSL-2730U, DSL-2730B, DSL-2640B
FCC ID	:	KA2DSL-2640U

Applicant	:	D-link Corporation
Address	:	NO. 289. Sinhu 3rd RD., Neihu District, Taipei City 114, Taiwan

Date of Receipt	:	Nov. 09, 2010
Test Date	:	Nov. 09, 2010 ~ Nov. 25, 2010
Issued Date	:	Dec. 01, 2010
Report No.	:	10BS008R-RF-US-P05V01
Report Version	:	V2.0

Test Report Certification

Issued Date : Dec. 01, 2010
Report No. : 10BS008R-RF-US-P05V01

QuieTek

Product Name	:	ADSL2+ 4-port Wireless Router
Applicant	:	D-link Corporation
Address	:	NO. 289. Sinhu 3rd RD., Neihu District, Taipei City 114, Taiwan
Manufacturer	:	D-link Corporation
Address	:	NO. 289. Sinhu 3rd RD., Neihu District, Taipei City 114, Taiwan
Model No.	:	DSL-2640U, DSL-2730U, DSL-2730B, DSL-2640B
FCC ID	:	KA2DSL-2640U
EUT Voltage	:	DC 12V, 0.5A
Trade Name	:	D-Link
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C: 2008; ANSI C63.4: 2009; ANSI C63.10: 2009
Test Result	:	Complied
Performed Location	:	Suzhou EMC Laboratory No.99 Hongye Rd., Suzhou Industrial Park Loufeng Hi-Tech Development Zone., Suzhou, China TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098 FCC Registration Number: 800392

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(Engineering Manager: Dream Cao)

Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	**:**	**BSMI, NCC, TAF**
Germany	**:**	**TUV Rheinland**
Norway	**:**	**Nemko, DNV**
USA	**:**	**FCC, NVLAP**
Japan	**:**	**VCCI**

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : http://www.quietek.com/tw/ctg/cts/accreditations.htm
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/
If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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NVLAP Lab Code : 200347-0

1313

LinKou Testing Laboratory :
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NVLAP Lab Code : 200743-0

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1. General Information

1.1. EUT Description

Product Name	ADSL2+ 4-port Wireless Router
Trade Name	D-Link
Model No.	DSL-2640U, DSL-2730U, DSL-2730B, DSL-2640B
FCC ID	KA2DSL-2640U
Working Voltage	DC 12V, 0.5A
Frequency Range	802.11b/g/n(20MHz): 2412 - 2462 MHz
Channel Number	802.11b/g/n(20MHz): 11
Type of Modulation	802.11b: DSSS
	802.11g/n: OFDM
Data Rate	802.11g: 6/9/12/18/24/36/48/54 Mbps
	802.11b: 1/2/5.5/11 Mbps
	802.11n: up to 65 Mbps
Channel Control	1*Tx + 1*Rx
Antenna Type	Monopole
Antenna Gain	3.0dBi
AC Adapter	Manufacturer: SHENZHEN FRECOM ELECTRONICS CO., LTD M/N: FPS005USC-120050 Input: 100-240V~50-60Hz, 300mA Output: 12V, 0.5A

Note: DSL-2730B is used for RF test. The hardware of model DSL-2640U and DSL-2730U are the same, including RJ11 Telecommunication port, RJ45 Network Port etc. The hardware of model DSL-2640B and DSL-2730B are the same, including RJ11 Telecommunication port, RJ45 Network Port etc. The difference between model DSL-2640B, DSL-2730B and DSL-2640U, DSL-2730U is the location of capacitances and capability, model DSL-2640B DSL-2730B has four capacitances with the location of C49, C50, C241, C242, the capability is 1000uF25V. Model DSL-2640U, DSL-2730U have two capacitances with the location of C49, C50, the capability is 470uF25V.

For 2.4GHz Band

802.11b/g/n(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz	04	2427 MHz
05	2432 MHz	06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz	N/A	N/A

1.2. Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit by 802.11b
Mode 2: Transmit by 802.11g
Mode 3: Transmit by 802.11n (20MHz)

Note:

1. Regards to the frequency band operation: the lowest、middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the receiver was measured and made a test report that the report number is 10BS008R-RF-US-P01V02.

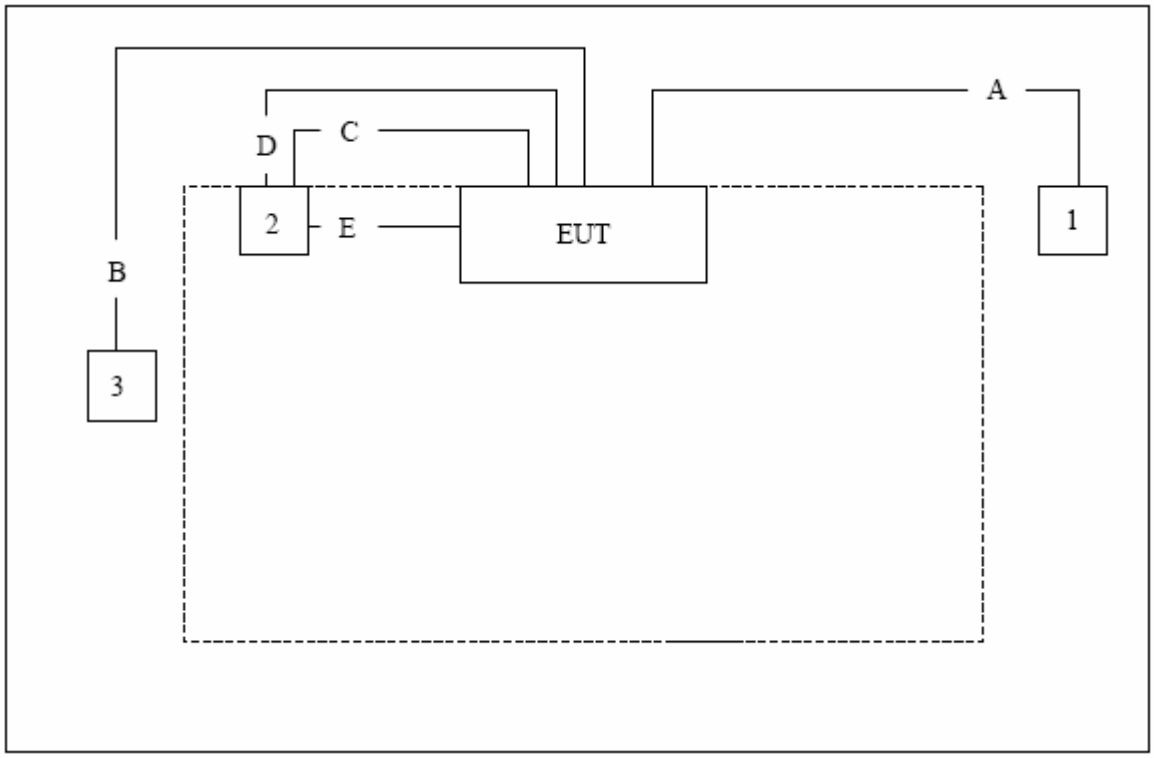
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	DELL	PP19L	JH097 A01	Power by adapter
2	Rounter	D-Link	DIR-605	PK11496006143	Non-Shielded, 1.8m
3	IP Express	ZyXEL	IES-1248-71	S523825530	Non-Shielded, 1.8m

1.4. Configuration of Tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, >10m
B	Telecom Cable	Non-Shielded, >10m
C	LAN Cable	Non-Shielded, 1.8m
D	LAN Cable	Non-Shielded, 1.8m
E	LAN Cable	Non-Shielded, 1.8m

1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above
2	Turn on the power of equipment.
3	Input the commands in The Notebook (1), make the EUT Transmit, start test.

2. Technical Test

2.1. Summary of Test Result

☒ No deviations from the test standards

☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.209	Yes	No
RF Antenna Conducted Spurious	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2008 15.247(d)	Yes	No
Operation Frequency Range of 20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2008 15.215(c)	Yes	No
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(a)(2)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(b)(3)	Yes	No
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2008 Section 15.247(e)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

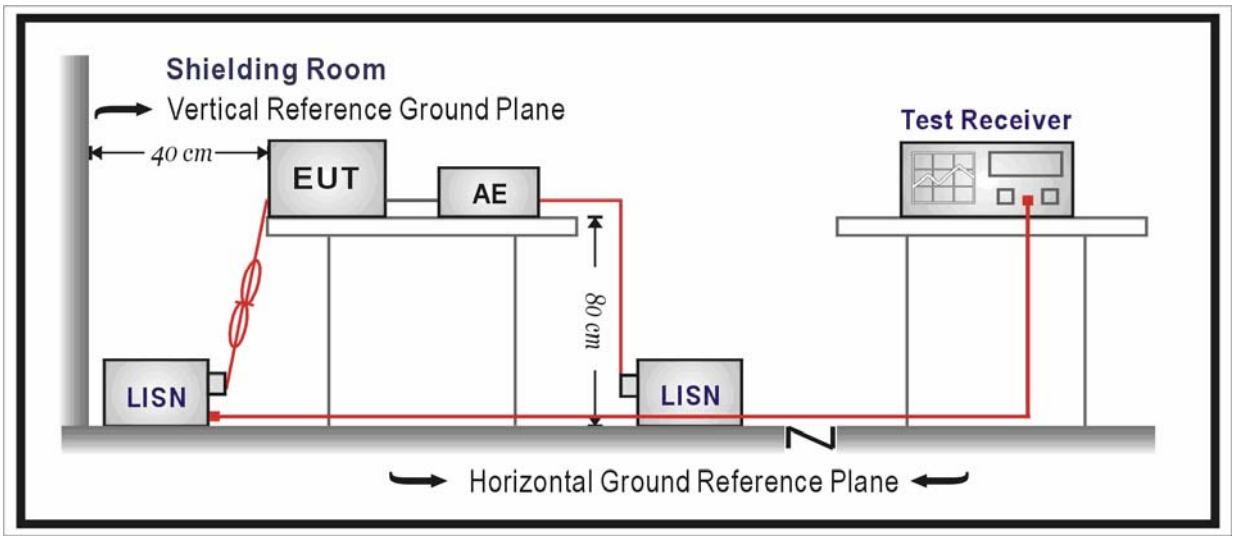
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100726	2011.04.23
Two-Line V-Network	R&S	ENV216	100043	2011.06.18
Two-Line V-Network	R&S	ENV216	100044	2011.09.07
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2011.05.05
50ohm Termination	SHX	TF2	07081401	2011.09.27
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2010.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.

The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

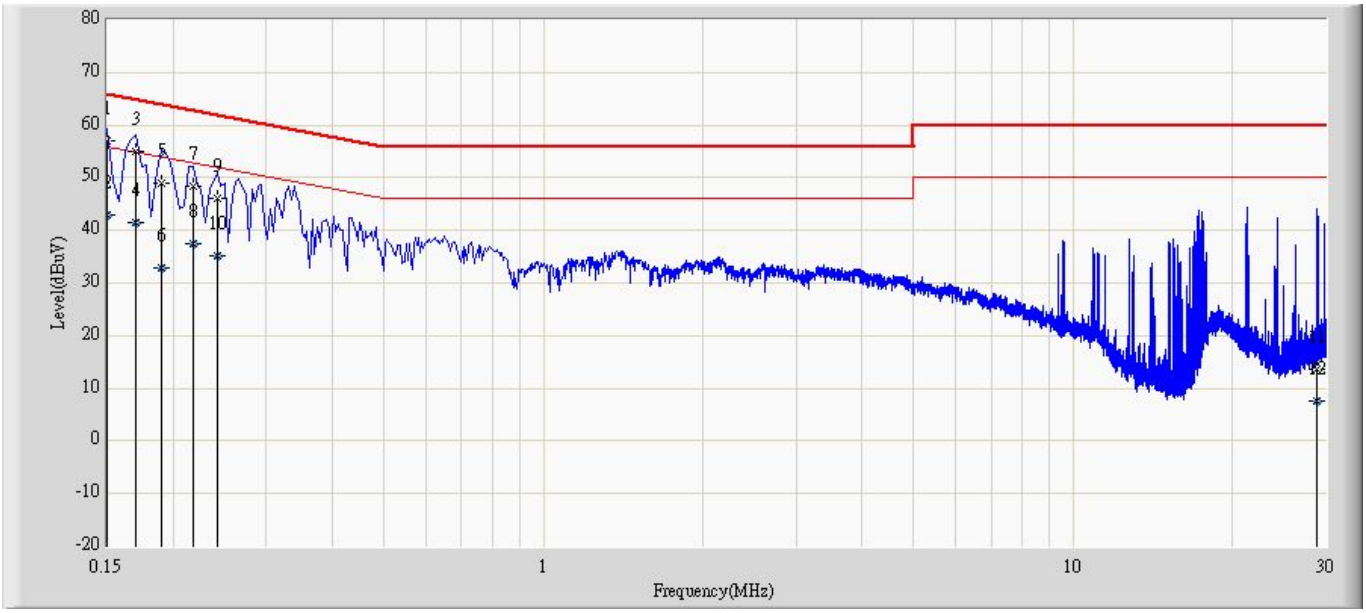
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

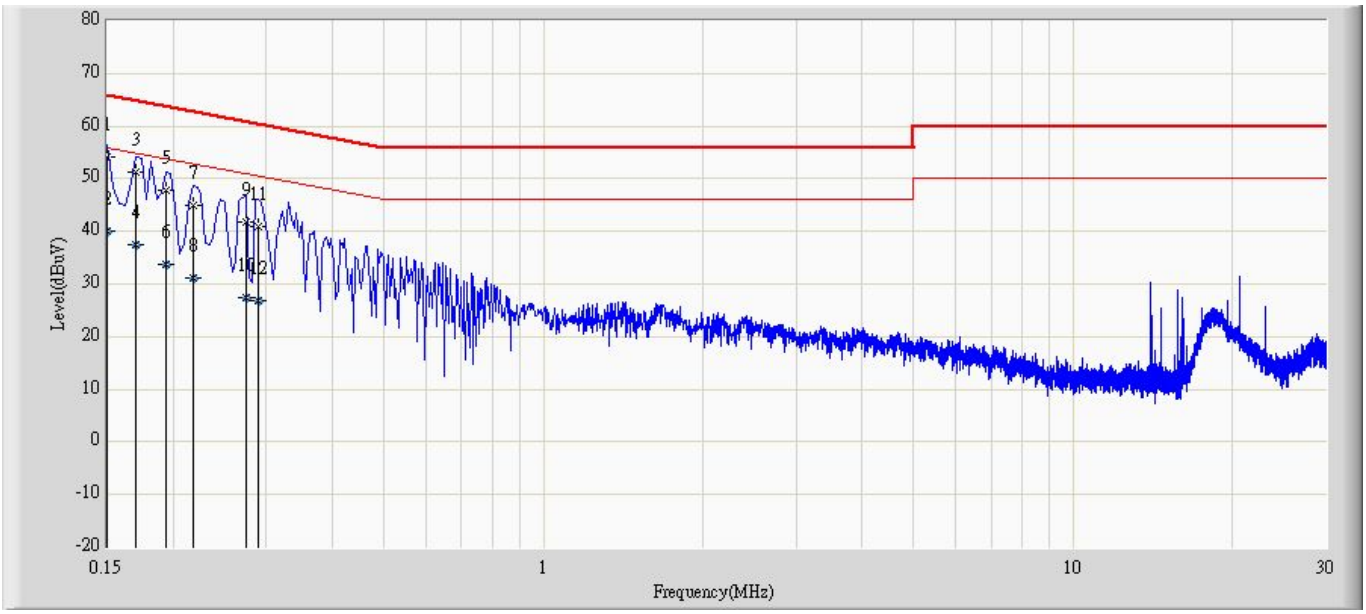
3.6. Test Result

Engineer: Steven	
Site: TR1	Time: 2010/11/24 - 16:12
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101043(0.009-30MHz)	Polarity: Neutral
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.150	57.087	47.346	-8.913	66.000	9.741	QP
2		0.150	42.977	33.235	-13.023	56.000	9.741	AV
3		0.170	54.911	45.189	-10.050	64.960	9.722	QP
4		0.170	41.600	31.878	-13.361	54.960	9.722	AV
5		0.190	49.060	39.385	-14.976	64.037	9.676	QP
6		0.190	32.918	23.243	-21.118	54.037	9.676	AV
7		0.218	48.440	38.788	-14.455	62.895	9.651	QP
8		0.218	37.538	27.886	-15.357	52.895	9.651	AV
9		0.242	46.013	36.362	-16.014	62.027	9.651	QP
10		0.242	35.286	25.635	-16.741	52.027	9.651	AV
11		28.886	13.710	3.127	-46.290	60.000	10.584	QP
12		28.886	7.727	-2.856	-42.273	50.000	10.584	AV

Engineer: Steven	
Site: TR1	Time: 2010/11/24 - 16:14
Limit: FCC_Part15.207_CE_AC Power_ClassB	Margin: 0
Probe: ENV216_101043(0.009-30MHz)	Polarity: Line
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.150	54.039	44.452	-11.961	66.000	9.588	QP
2		0.150	40.059	30.472	-15.941	56.000	9.588	AV
3		0.170	51.284	41.676	-13.677	64.960	9.608	QP
4		0.170	37.339	27.731	-17.621	54.960	9.608	AV
5		0.194	47.794	38.136	-16.069	63.864	9.658	QP
6		0.194	33.673	24.015	-20.190	53.864	9.658	AV
7		0.218	44.826	35.147	-18.069	62.895	9.679	QP
8		0.218	31.239	21.560	-21.655	52.895	9.679	AV
9		0.274	41.804	32.124	-19.192	60.996	9.680	QP
10		0.274	27.447	17.767	-23.549	50.996	9.680	AV
11		0.290	40.932	31.252	-19.593	60.524	9.680	QP
12		0.290	26.898	17.218	-23.626	50.524	9.680	AV

4. Radiated Emission

4.1. Test Equipment

☒Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100573	2011.04.23
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2011.10.18
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2011.05.05
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2011.01.14

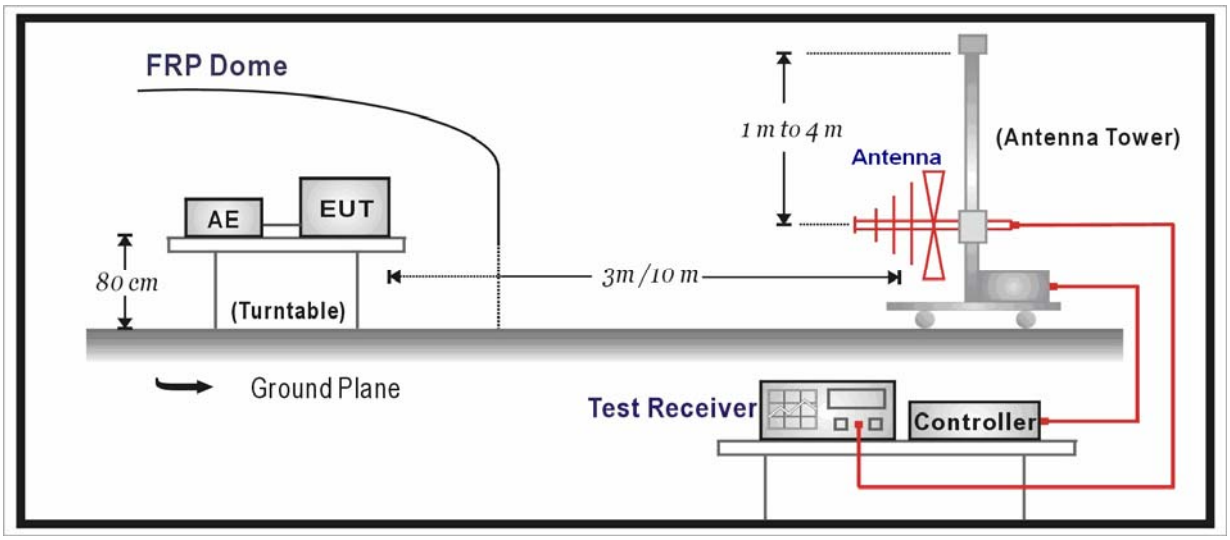
☒Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2011.04.23
EMI Test Receiver	R&S	ESCI	100906	2011.01.15
Preamplifier	Quietek	AP-180C	CHM-0602013	2011.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2011.05.05
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2011.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2011.06.11
High-Pass Filter	Wainwright	WHKX2.8/18G-12SS	SN1	2011.03.03
High-Pass Filter	Wainwright	WHKX7.0/18G-8SS	SN16	2011.03.03
Lowpass Filter	Wainwright	WLKS4500-9SS	SN2	2011.03.03
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2011.01.14

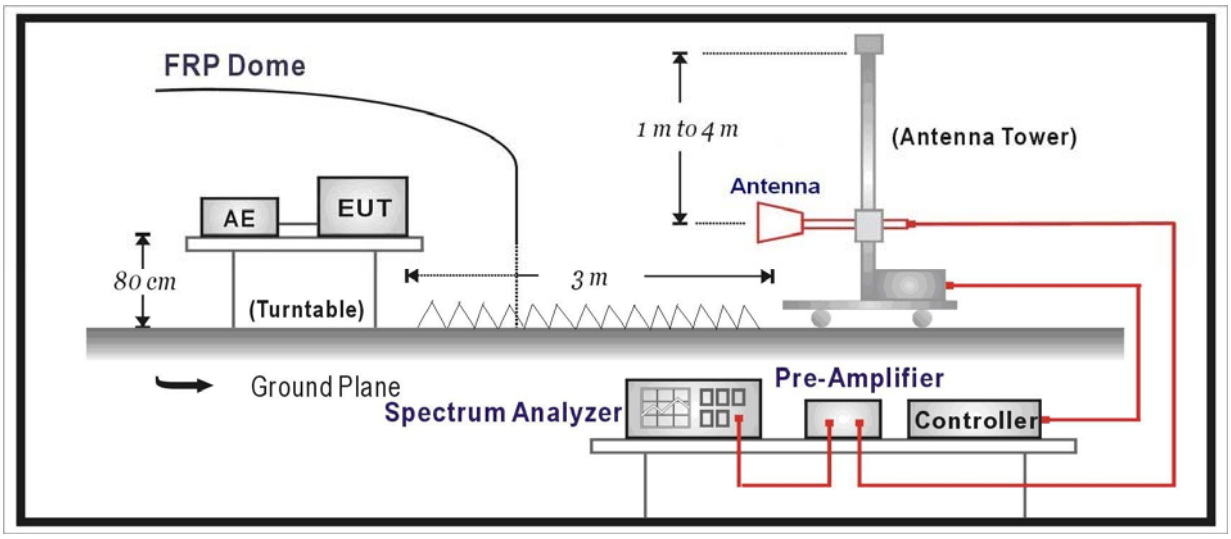
Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

Note: When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60 degrees for H-plane and 90 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:
Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;
Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

802.11b

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2411.9	78.2	30.5	108.7	Fundamental	/	PK
	H	511.2	9.1	19.6	28.7	46	-17.3	QP
	H	702.9	7.3	21.8	29.1	46	-16.9	QP
	V	9644.5	41.2	11.1	52.3	54(Note)	-1.7	PK
	V	4825.0	54.7	2.9	57.6	74	-16.4	PK
	V	4825.0	39.6	2.9	42.5	54	-11.5	AV
	V	7239.0	40.9	10.4	51.3	54(Note)	-2.7	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK
6	V	2437.0	78.8	30.5	109.3	Fundamental	/	PK
	H	511.2	9.4	19.6	29.0	46	-17.0	QP
	H	702.9	7.5	21.8	29.3	46	-16.7	QP
	V	9746.5	42.5	11.1	53.6	54(Note)	-0.4	PK
	V	4876.0	52.2	2.9	55.1	74	-18.9	PK
	V	4876.0	37.3	2.9	40.2	54	-13.8	AV
	V	7307.0	40.3	10.4	50.7	54(Note)	-3.3	PK
	H	24000.0	59.1	-8.9	50.2	54(note)	-3.8	PK
11	V	2462.1	78.2	30.5	108.7	Fundamental	/	PK
	H	511.2	9.2	19.6	28.8	46	-17.2	QP
	H	702.9	7.2	21.8	29.0	46	-17.0	QP
	V	9848.5	42.5	11.1	53.6	54(Note)	-0.4	PK
	V	4927.0	47.8	2.9	50.7	54(Note)	-3.3	PK
	V	7383.5	40.0	10.4	50.4	54(Note)	-3.6	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK

802.11g

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2408.5	77.3	30.5	107.8	Fundamental	/	PK
	H	511.2	9.5	19.6	29.1	46	-16.9	QP
	H	702.9	7.4	21.8	29.2	46	-16.8	QP
	V	3524.5	45.9	-4.3	41.6	54(Note)	-12.4	PK
	V	4825.0	51.6	2.9	54.5	74	-19.5	PK
	V	4825.0	37.3	2.9	40.2	54	-13.8	AV
	V	7230.5	38.8	10.4	49.2	54(Note)	-4.8	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK
6	V	2434.5	76.3	30.5	106.8	Fundamental	/	PK
	H	511.2	9.4	19.6	29.0	46	-17.0	QP
	H	702.9	7.5	21.8	29.3	46	-16.7	QP
	V	3516.0	46.1	-4.3	41.8	54(Note)	-12.2	PK
	V	4867.5	46.1	2.9	49.0	54(Note)	-5.0	PK
	V	7502.5	39.7	8.5	48.2	54(Note)	-5.8	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK
11	V	2455.6	77.0	30.5	107.5	Fundamental	/	PK
	H	511.2	9.3	19.6	28.9	46	-17.1	QP
	H	702.9	7.3	21.8	29.1	46	-16.9	QP
	V	3516.0	46.1	-4.3	41.8	54(Note)	-12.2	PK
	V	4927.0	44.9	2.9	47.8	54(Note)	-6.2	PK
	V	7392.0	41.1	8.5	49.6	54(Note)	-4.4	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK

802.11n(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2406.2	73.7	30.5	104.2	Fundamental	/	PK
	H	511.2	9.8	19.6	29.4	46	-16.6	QP
	H	702.9	7.5	21.8	29.3	46	-16.7	QP
	V	3524.5	44.5	-4.3	40.2	54(Note)	-13.8	PK
	V	4816.5	44.4	2.9	47.3	54(Note)	-6.7	PK
	V	7502.5	40.0	8.5	48.5	54(Note)	-5.5	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK
6	V	2433.5	73.3	30.5	103.8	Fundamental	/	PK
	H	511.2	9.1	19.6	28.7	46	-17.3	QP
	H	702.9	7.3	21.8	29.1	46	-16.9	QP
	V	3524.5	45.8	-4.3	41.5	54(Note)	-12.5	PK
	V	4876.0	40.1	2.9	43.0	54(Note)	-11.0	PK
	V	7502.5	40.0	8.5	48.5	54(Note)	-5.5	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK
11	V	2463.5	75.1	30.5	105.6	Fundamental	/	PK
	H	511.2	9.1	19.6	28.7	46	-17.3	QP
	H	702.9	7.3	21.8	29.1	46	-16.9	QP
	V	3533.0	45.0	-4.3	40.7	54(Note)	-13.3	PK
	V	4927.0	41.7	2.9	44.6	54(Note)	-9.4	PK
	V	7502.5	40.0	8.5	48.5	54(Note)	-5.5	PK
	H	24000.0	59.1	-8.9	50.2	54(Note)	-3.8	PK

Note : This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

5. RF Antenna Conducted Spurious

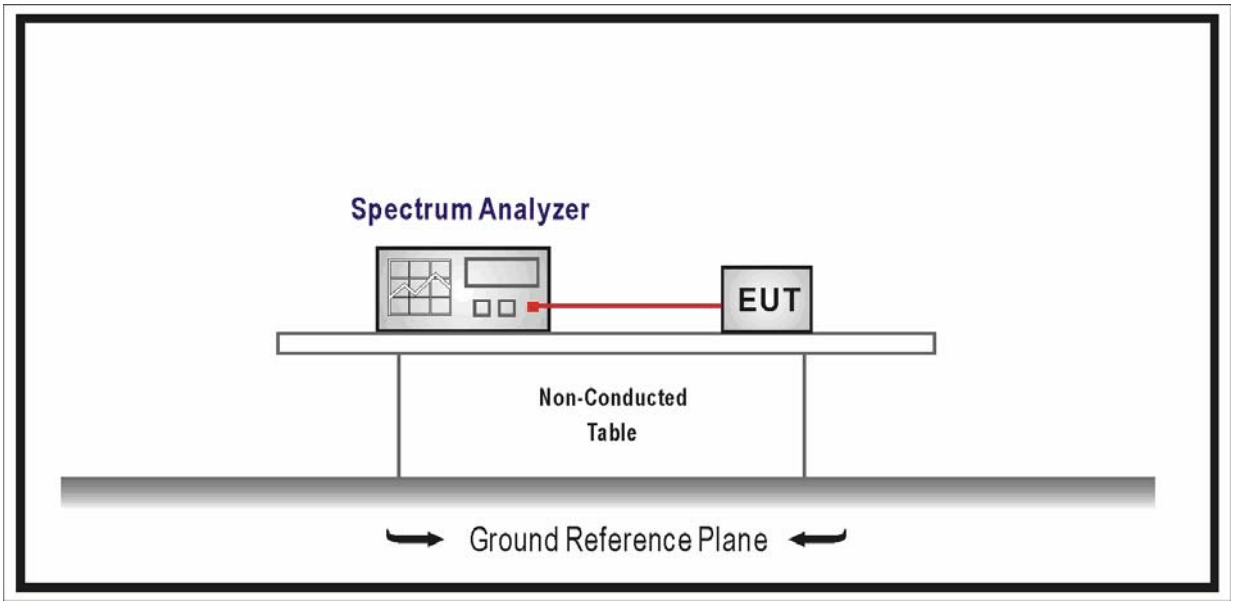
5.1. Test Equipment

RF Antenna Conducted Spurious / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2011.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

In any 100 kHz bandwidth outside the frequency band 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.

5.4. Test Procedure

The EUT was tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.
Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

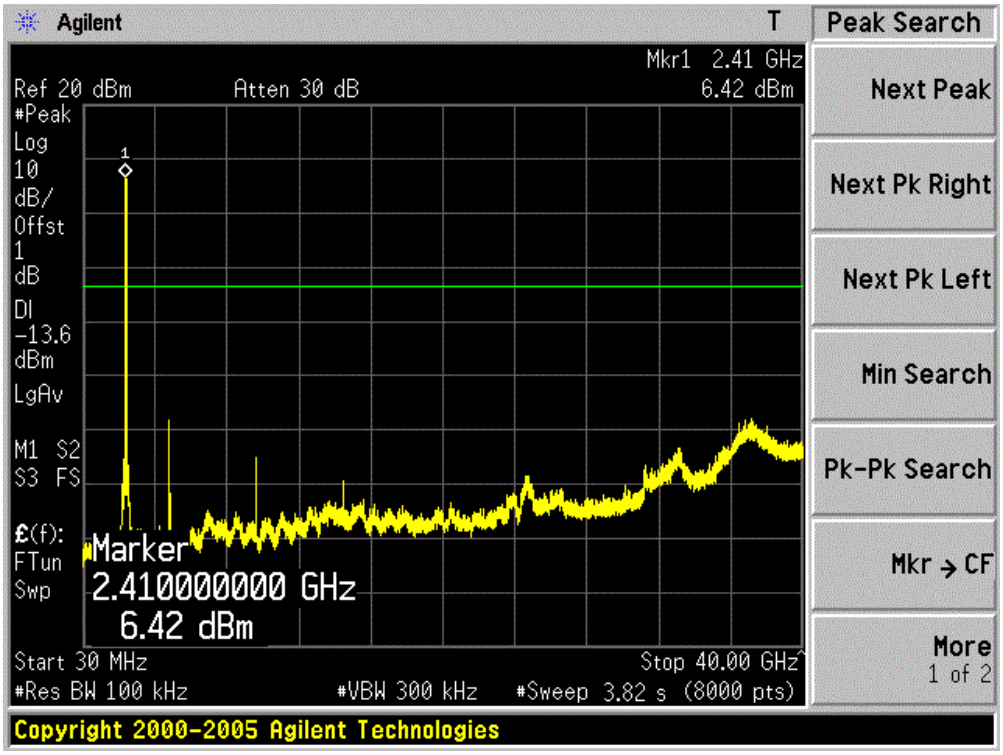
5.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

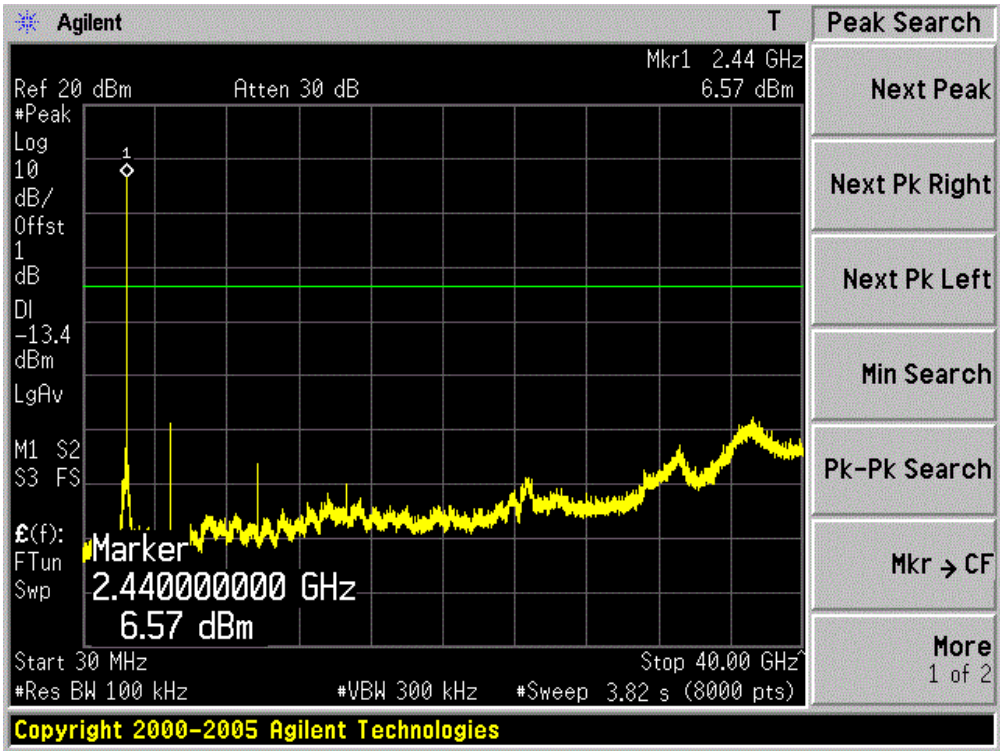
5.6. Test Result

Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

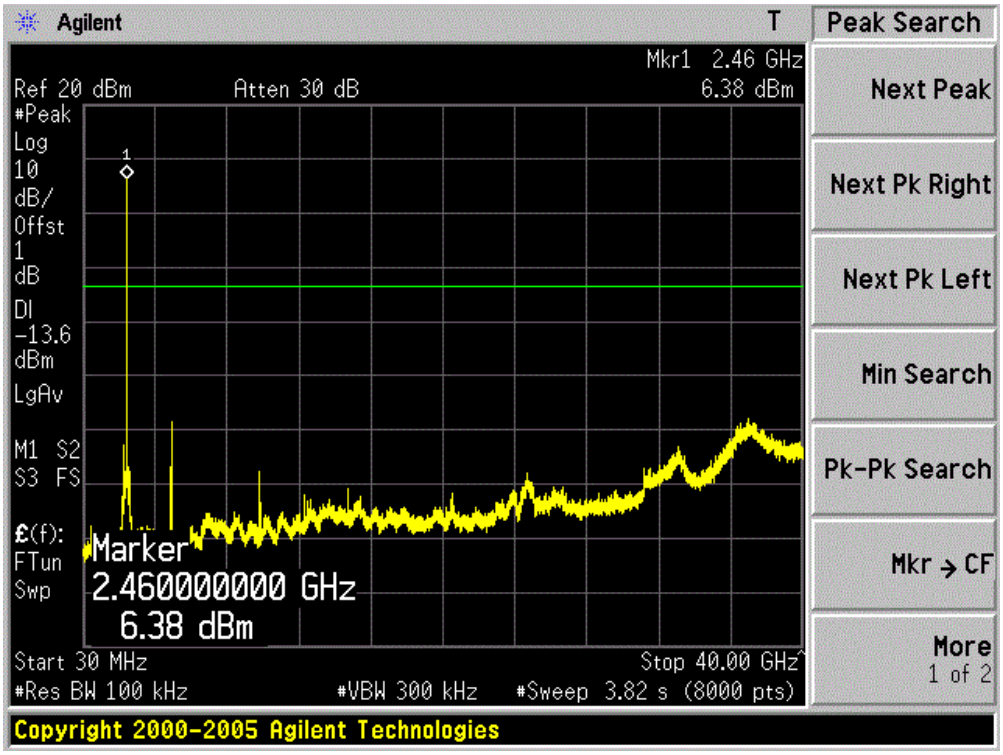
Channel 01 (2412MHz)



Channel 06 (2437MHz)

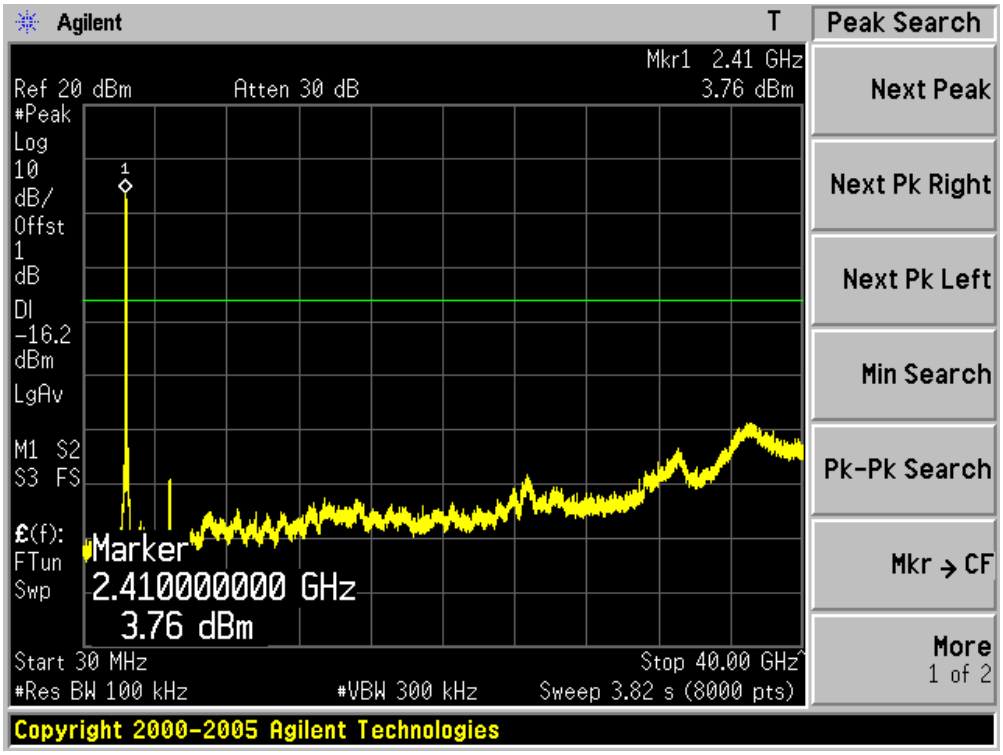


Channel 11 (2462MHz)

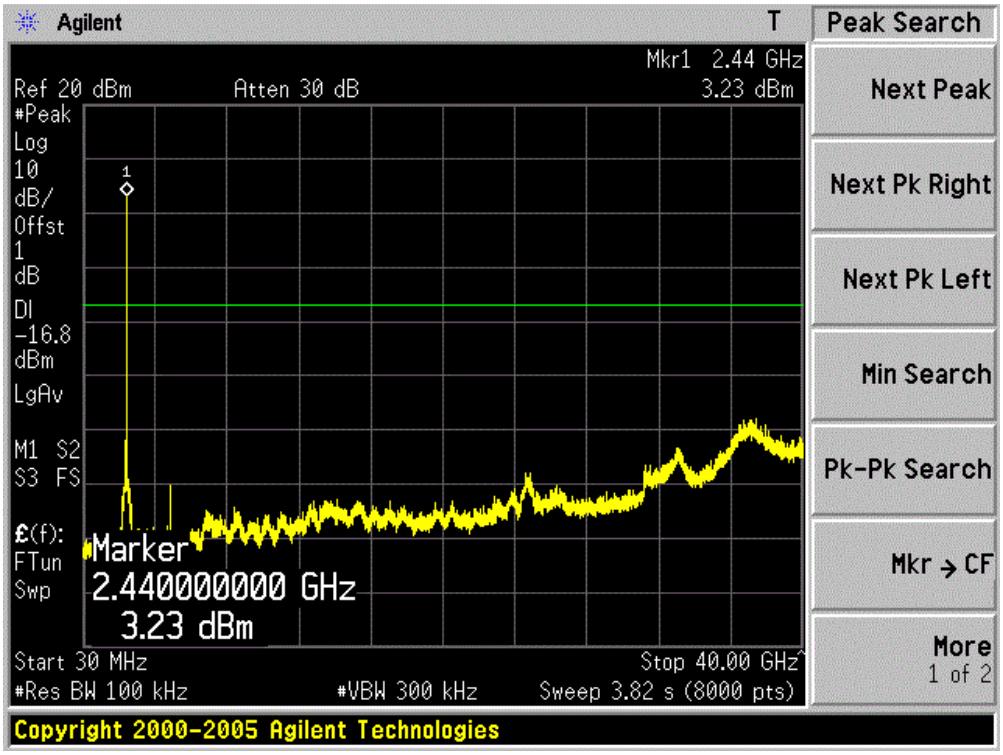


Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

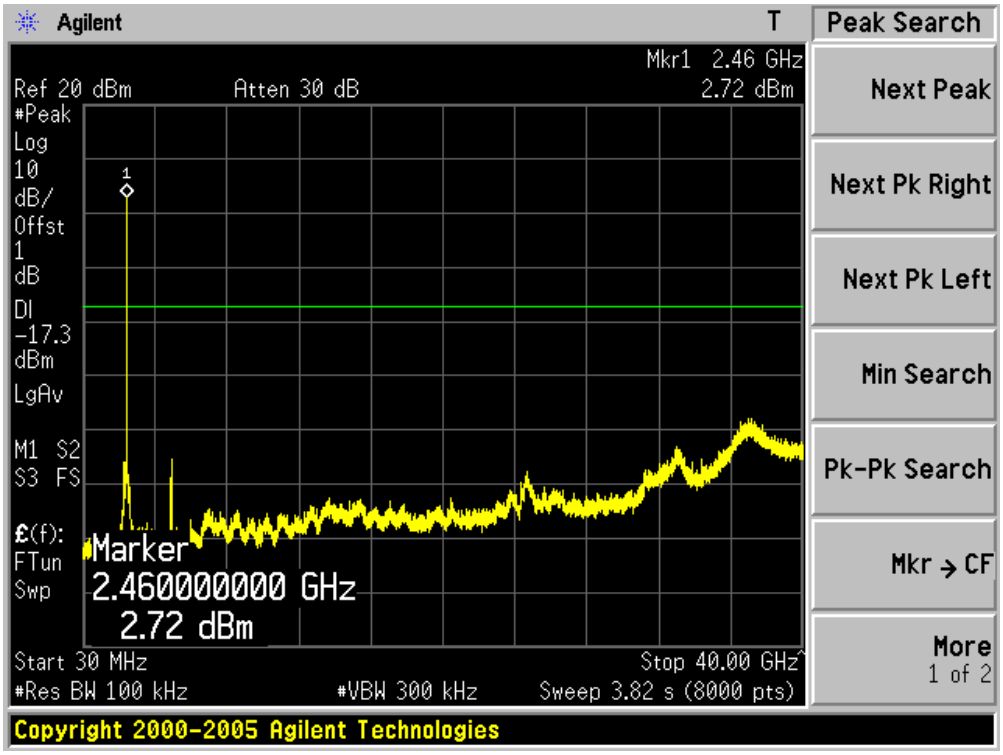
Channel 01 (2412MHz)



Channel 06 (2437MHz)

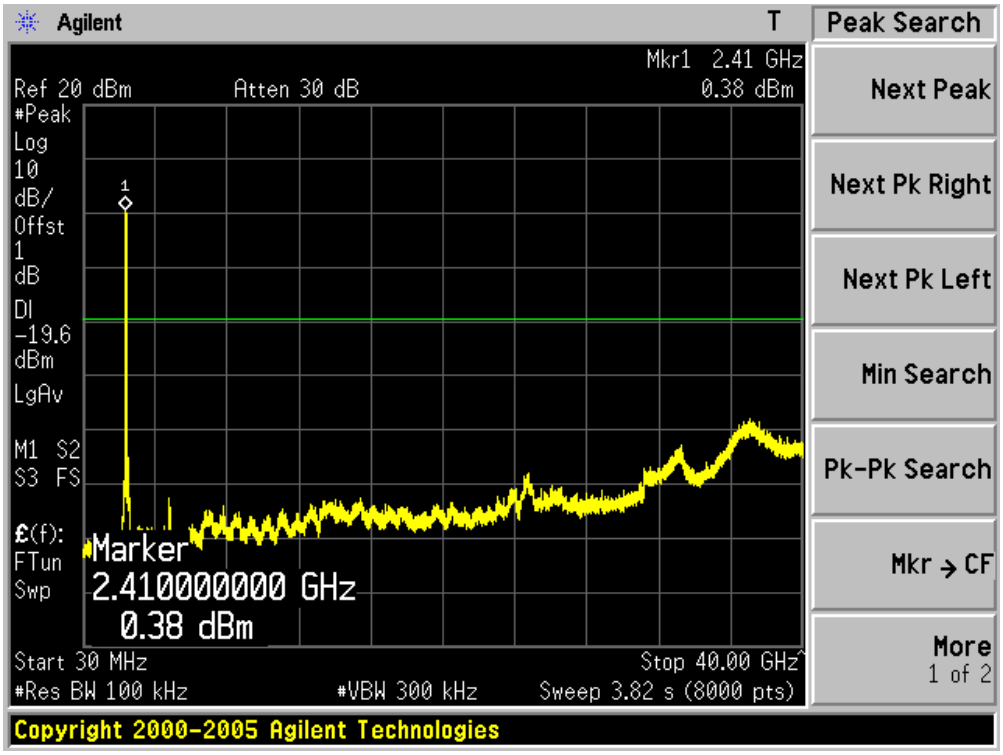


Channel 11 (2462MHz)

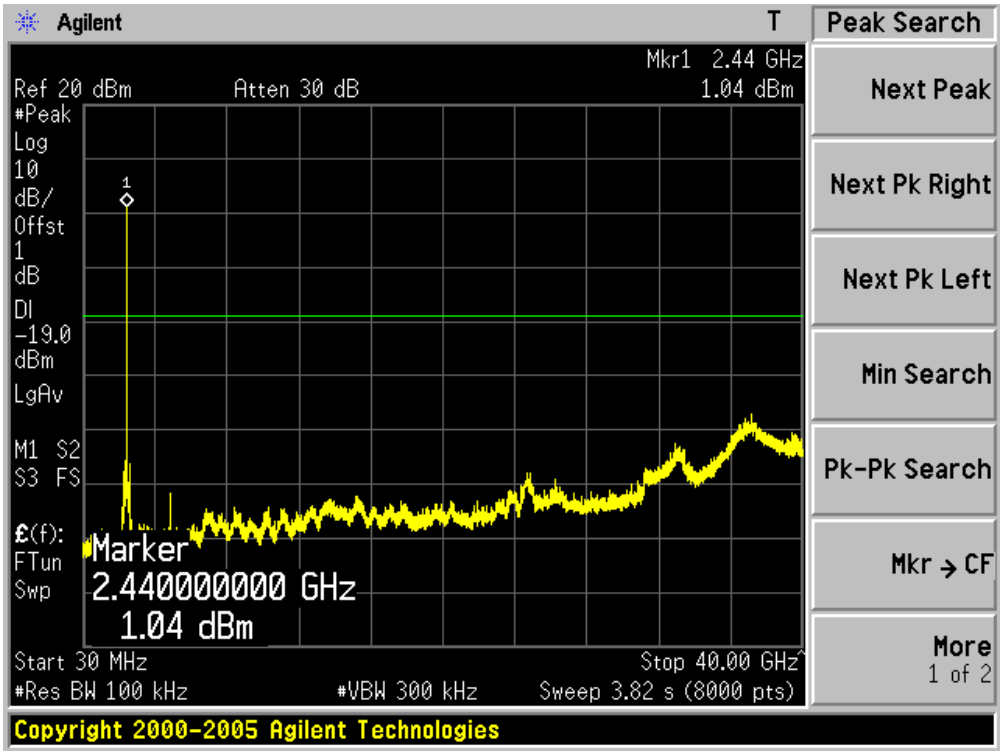


Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

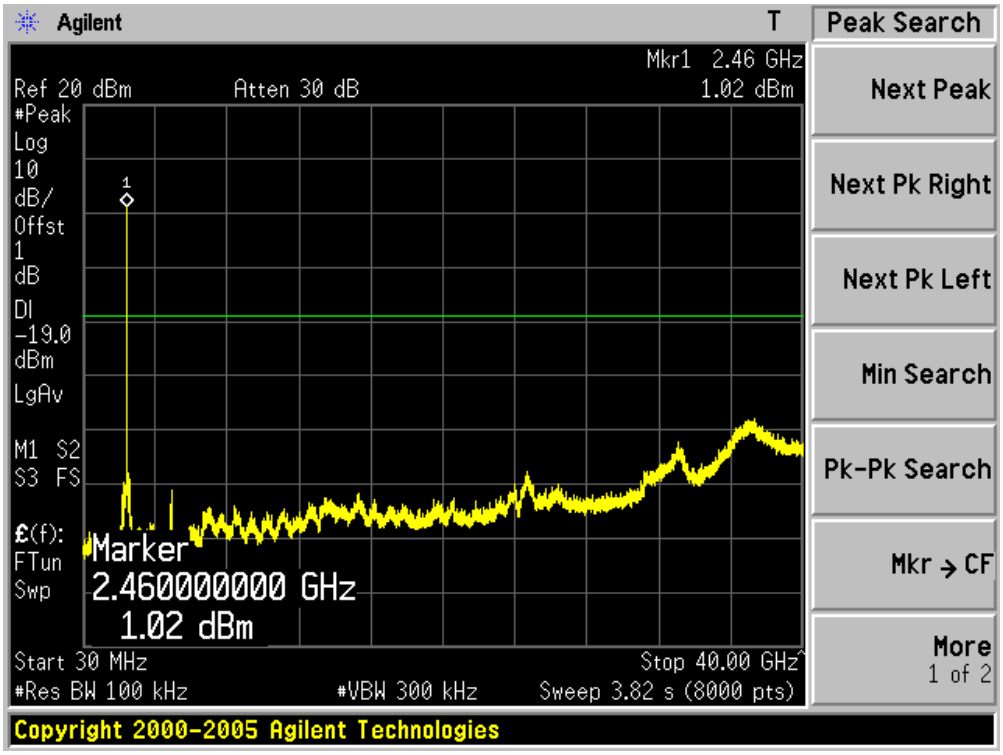
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



6. Radiated Emission Band Edge

6.1. Test Equipment

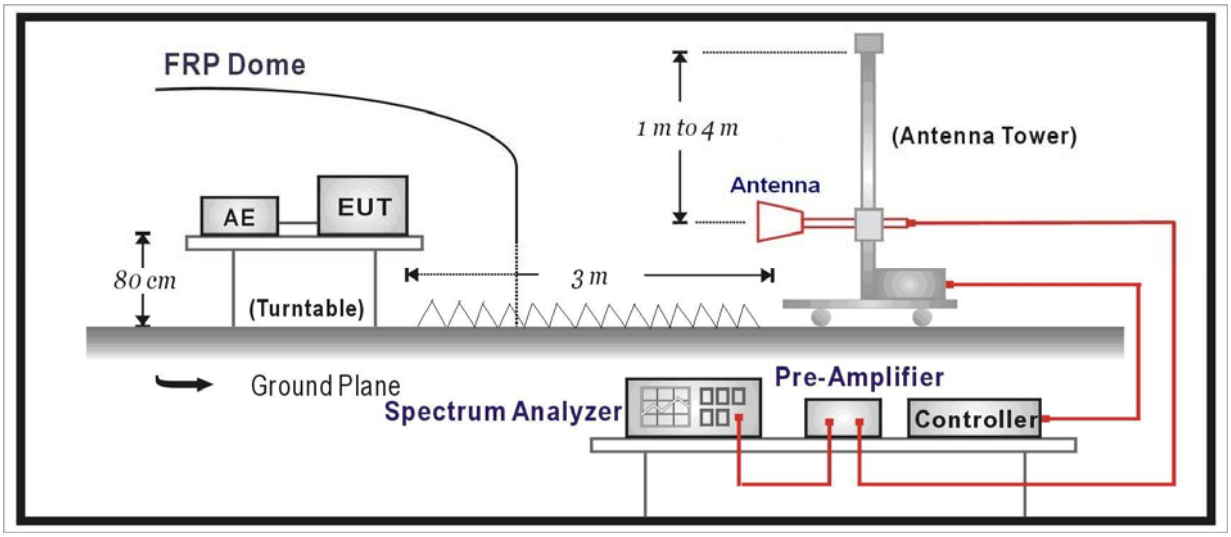
☒Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2011.04.23
EMI Test Receiver	R&S	ESCI	100573	2011.04.23
Preamplifier	Quietek	AP-025C	CHM-0511006	2011.05.05
Preamplifier	Quietek	AP-180C	CHM-0602013	2011.05.05
Bilog Type Antenna	Schaffner	CBL6112B	2932	2011.10.18
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2011.06.11
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2011.05.05
Temperature/Humidity Meter	zhicheng	ZC1-2	AC5-TH	2011.01.14

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Note 2: The test instruments marked with “X” are used to measure the final test results.

6.2. Test Setup



6.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

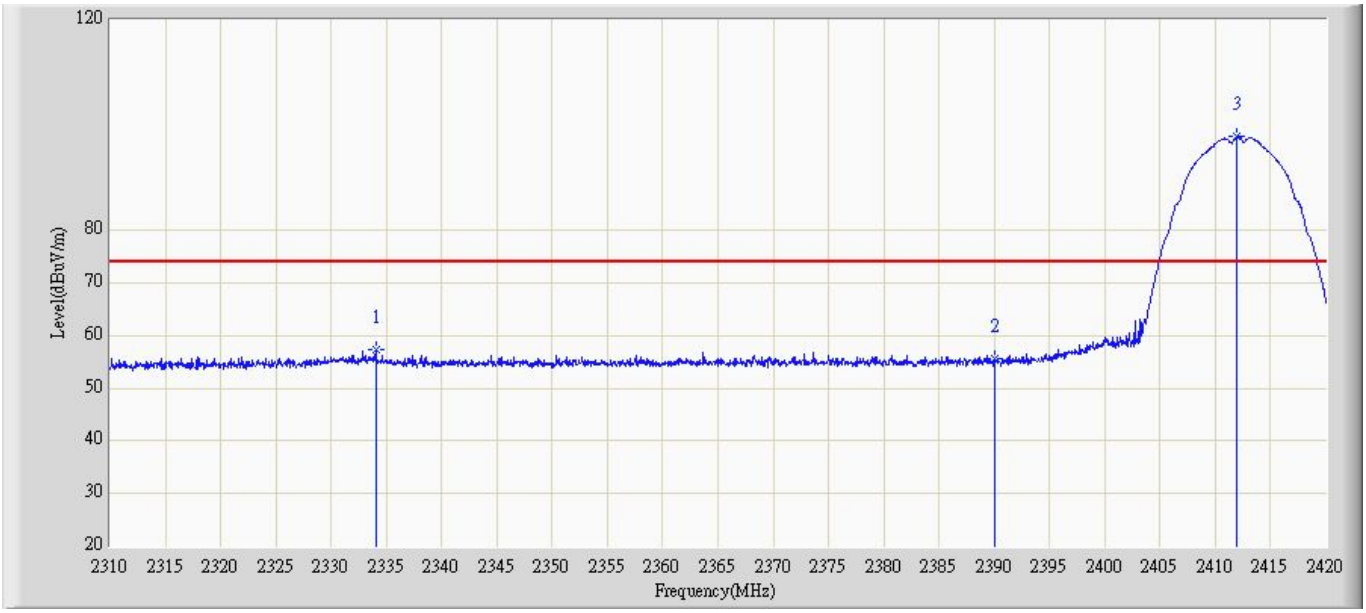
6.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

6.6. Test Result

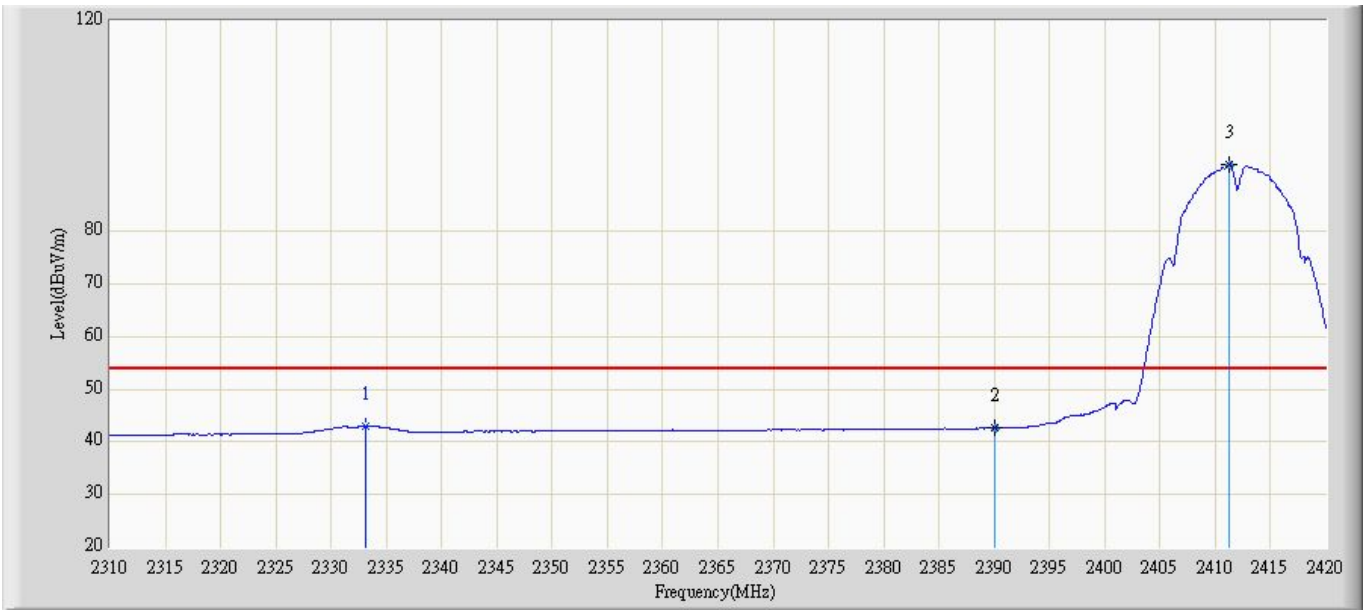
Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;
Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 14:45
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412Mhz by 802.11b	



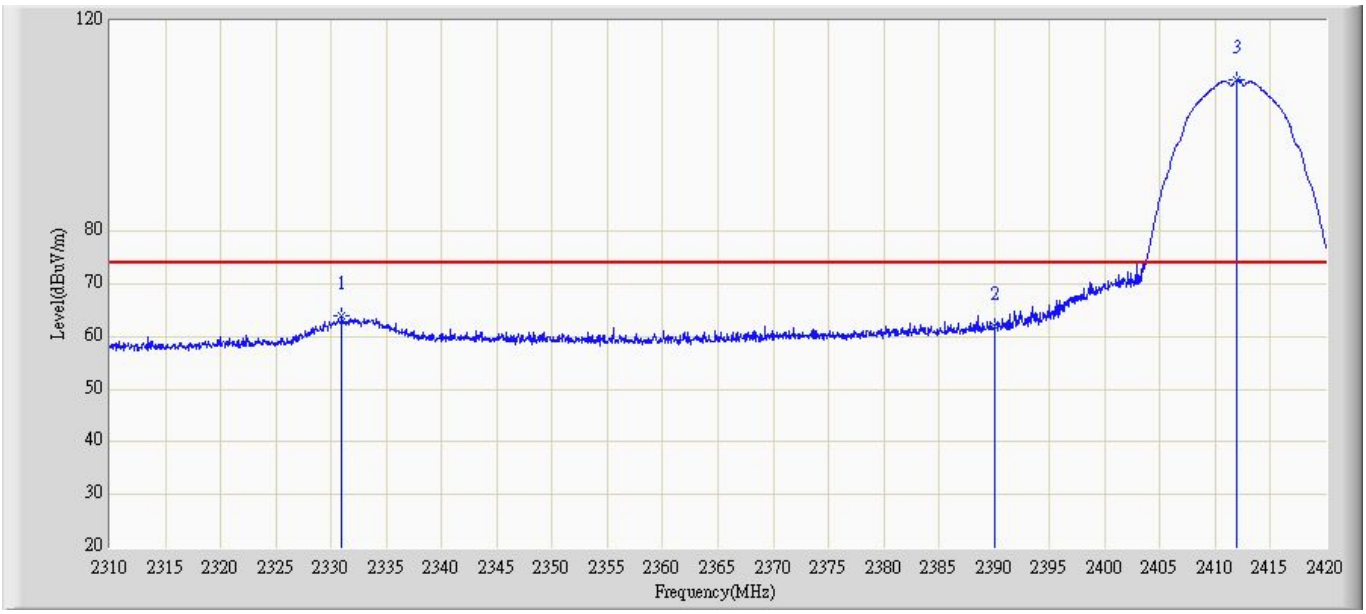
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2334.035	57.401	27.049	-16.599	74.000	30.353	PK
2		2390.000	55.526	24.971	-18.474	74.000	30.555	PK
3	*	2411.970	97.913	67.357	N/A	N/A	30.555	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 14:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412Mhz by 802.11b	



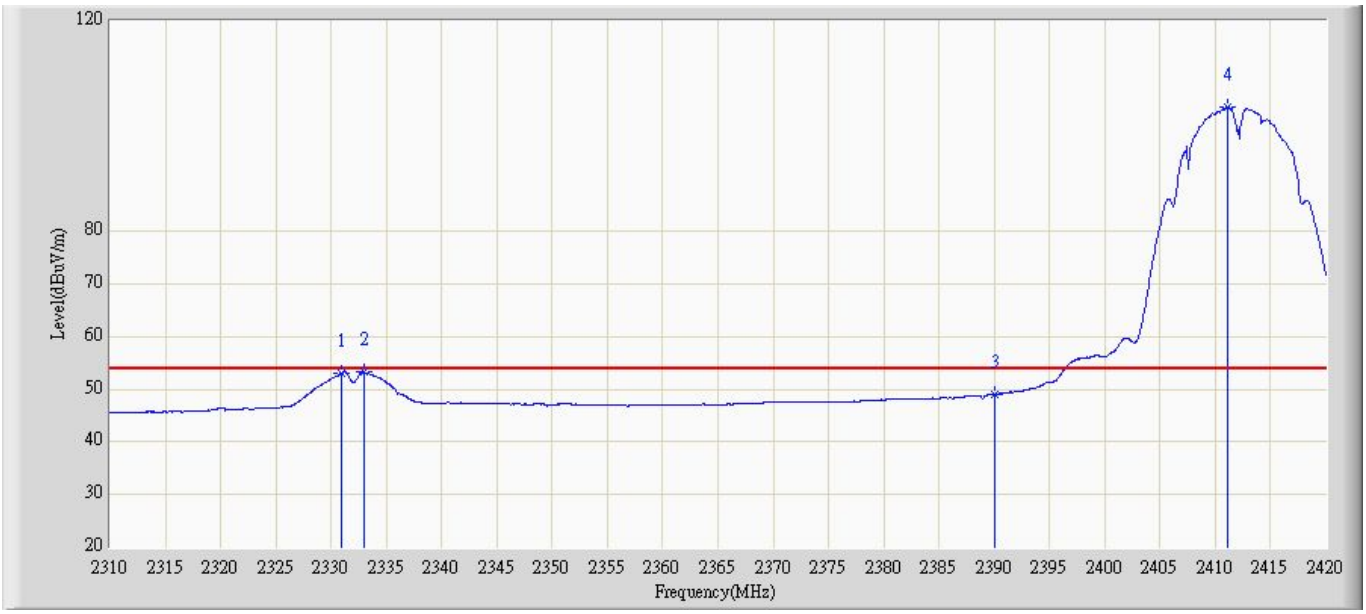
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2333.155	43.124	12.780	-10.876	54.000	30.344	AV
2		2390.000	42.664	12.109	-11.336	74.000	30.555	AV
3	*	2411.310	92.639	62.083	N/A	N/A	30.556	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 14:59
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412Mhz by 802.11b	



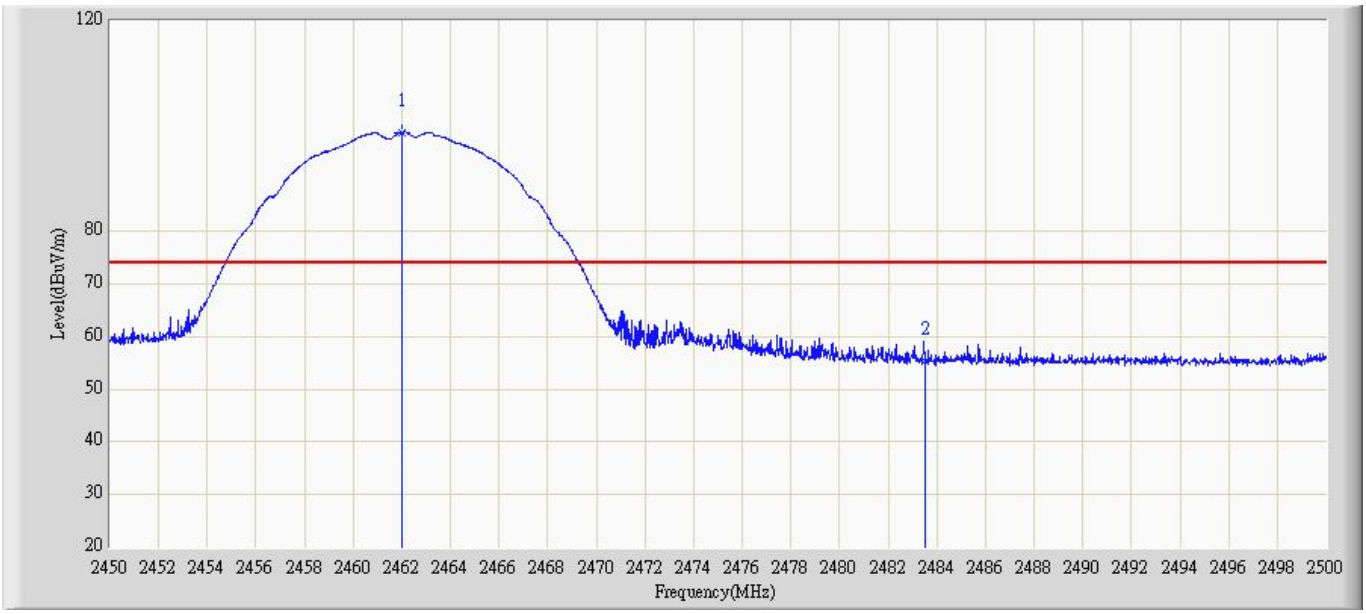
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2330.955	63.834	33.511	-10.166	74.000	30.323	PK
2		2390.000	61.963	31.408	-12.037	74.000	30.555	PK
3	*	2411.860	108.723	78.167	N/A	N/A	30.555	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 15:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2412Mhz by 802.11b	



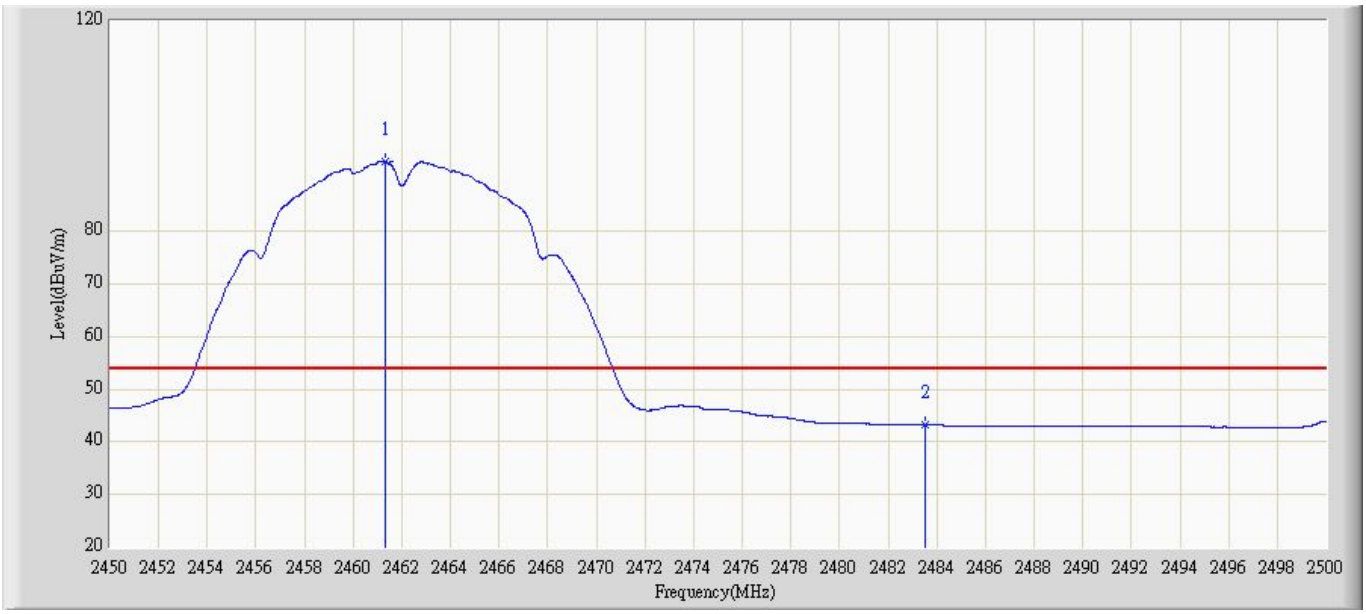
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2330.955	53.128	22.805	-0.872	54.000	30.323	AV
2		2332.990	53.204	22.862	-0.796	54.000	30.343	AV
3		2390.000	49.042	18.487	-4.958	54.000	30.555	AV
4	*	2411.145	103.702	73.146	N/A	N/A	30.556	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 15:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462Mhz by 802.11b	



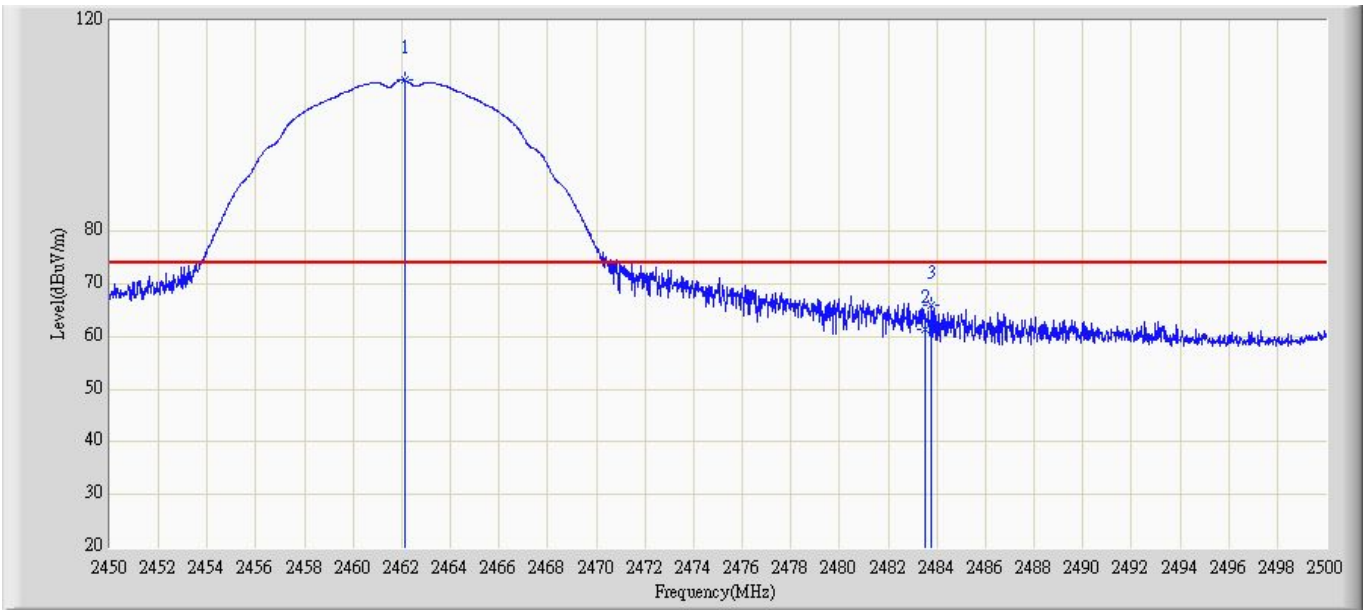
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.025	98.857	68.419	N/A	N/A	30.438	PK
2		2483.500	55.215	24.893	-18.785	74.000	30.321	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 15:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462Mhz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2461.325	93.235	62.793	N/A	N/A	30.442	AV
2		2483.500	43.238	12.916	-10.762	54.000	30.321	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 15:18
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462Mhz by 802.11b	

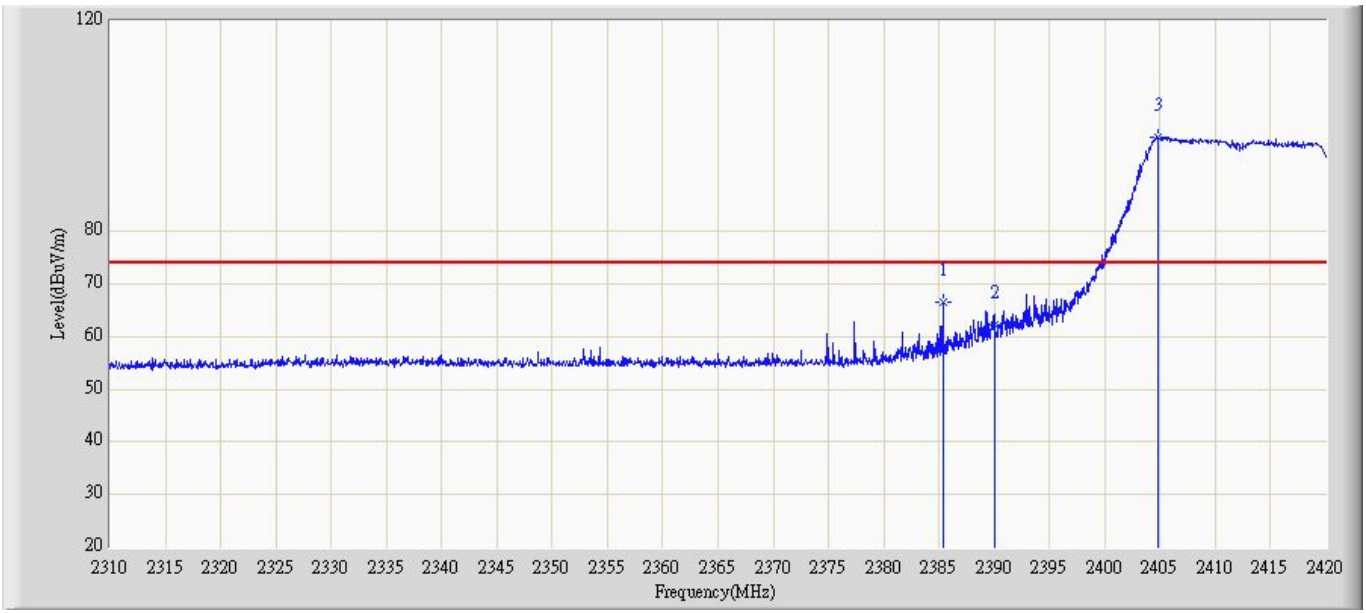


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.100	108.712	78.274	N/A	N/A	30.437	PK
2		2483.500	61.431	31.109	-12.569	74.000	30.321	PK
3		2483.750	65.907	35.586	-8.093	74.000	30.320	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/16 - 15:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 2462Mhz by 802.11b	

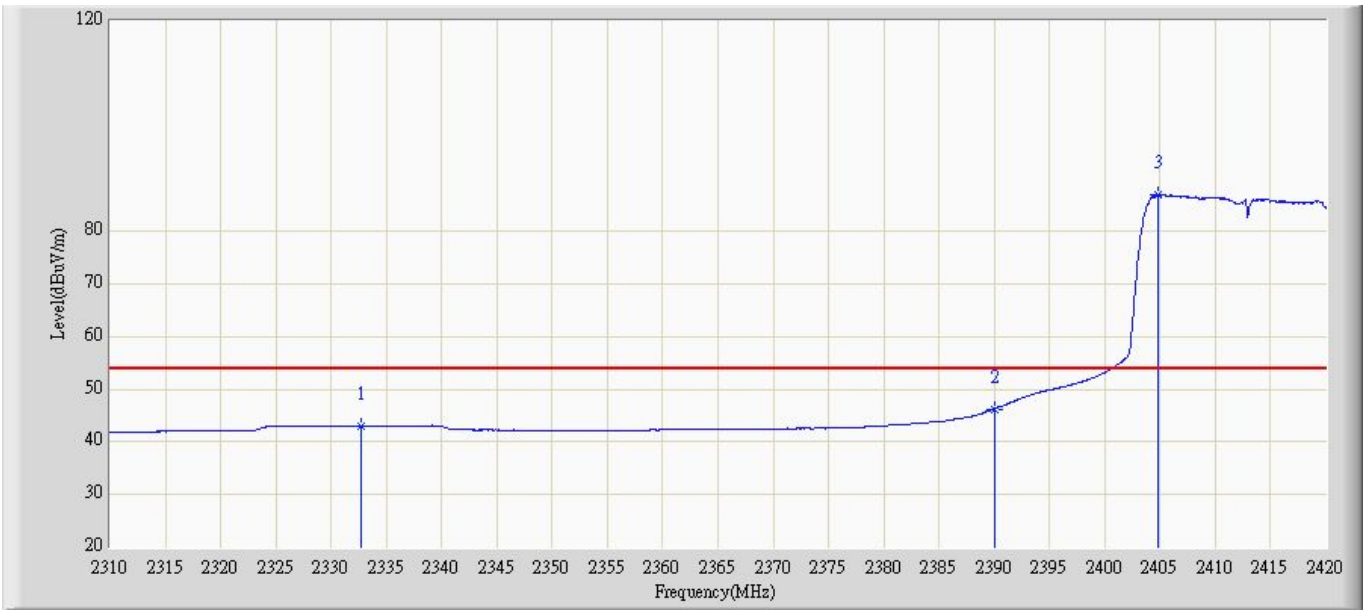
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2461.250	103.704	73.262	N/A	N/A	30.442	AV
2		2483.500	46.666	16.344	-7.334	54.000	30.321	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 18:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by802.11g	



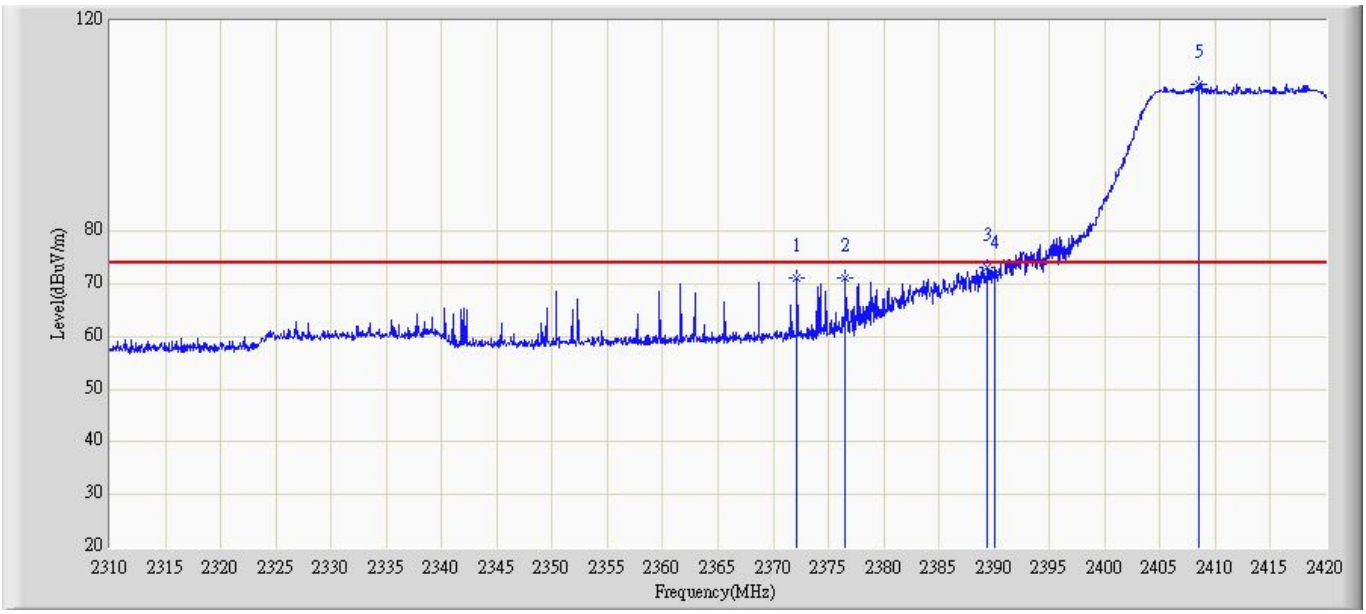
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2385.350	66.569	36.024	-7.431	74.000	30.545	PK
2		2390.000	62.273	31.718	-11.727	74.000	30.555	PK
3	*	2404.820	97.796	67.237	N/A	N/A	30.559	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 19:05
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by802.11g	



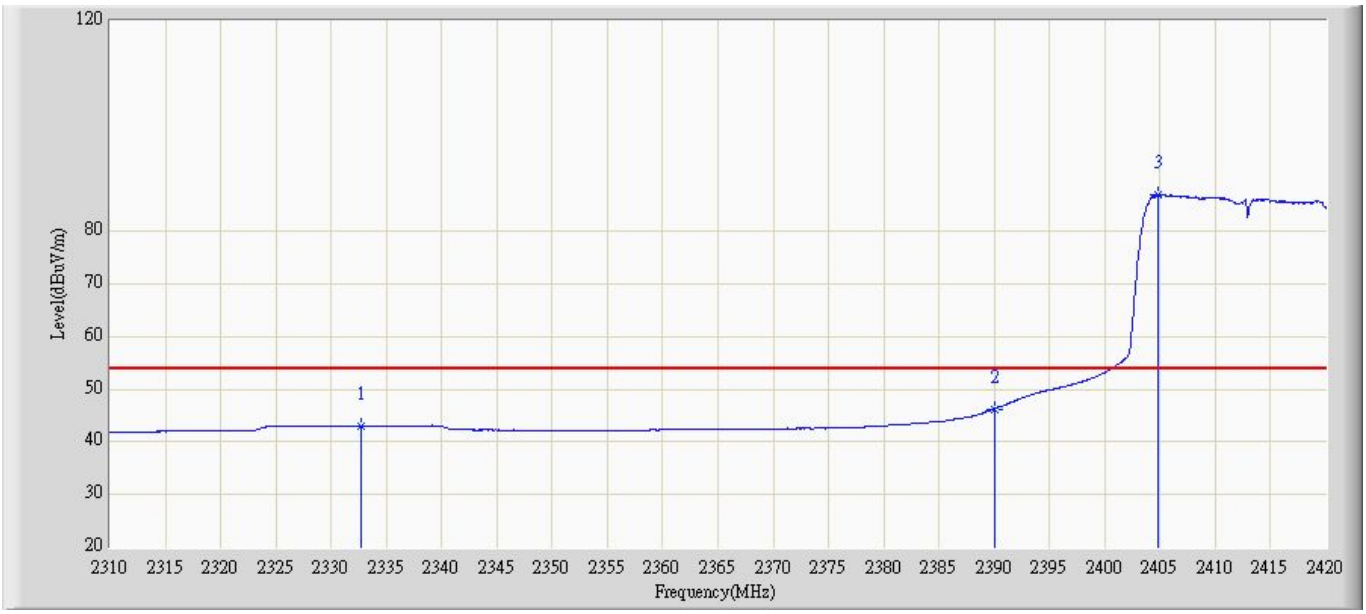
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2332.660	43.043	12.704	-10.957	54.000	30.340	AV
2		2390.000	46.255	15.700	-7.745	54.000	30.555	AV
3	*	2404.765	86.988	56.429	N/A	N/A	30.559	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/26 - 19:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by802.11g	



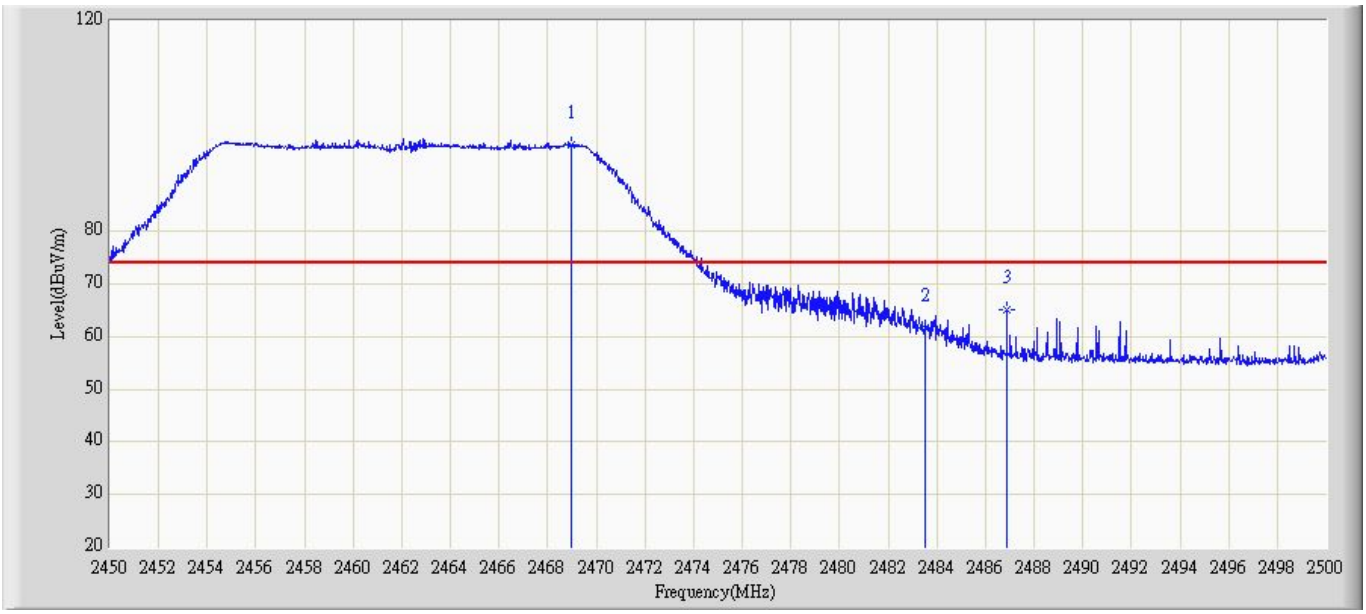
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2372.150	71.271	40.757	-2.729	74.000	30.513	PK
2		2376.550	71.027	40.501	-2.973	74.000	30.526	PK
3		2389.420	73.045	42.491	-0.955	74.000	30.554	PK
4		2390.000	71.865	41.310	-2.135	74.000	30.555	PK
5	*	2408.505	107.841	77.284	N/A	N/A	30.557	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 19:05
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2412MHz by802.11g	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2332.660	43.043	12.704	-10.957	54.000	30.340	AV
2		2390.000	46.255	15.700	-7.745	54.000	30.555	AV
3	*	2404.765	86.988	56.429	N/A	N/A	30.559	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 20:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by802.11g	

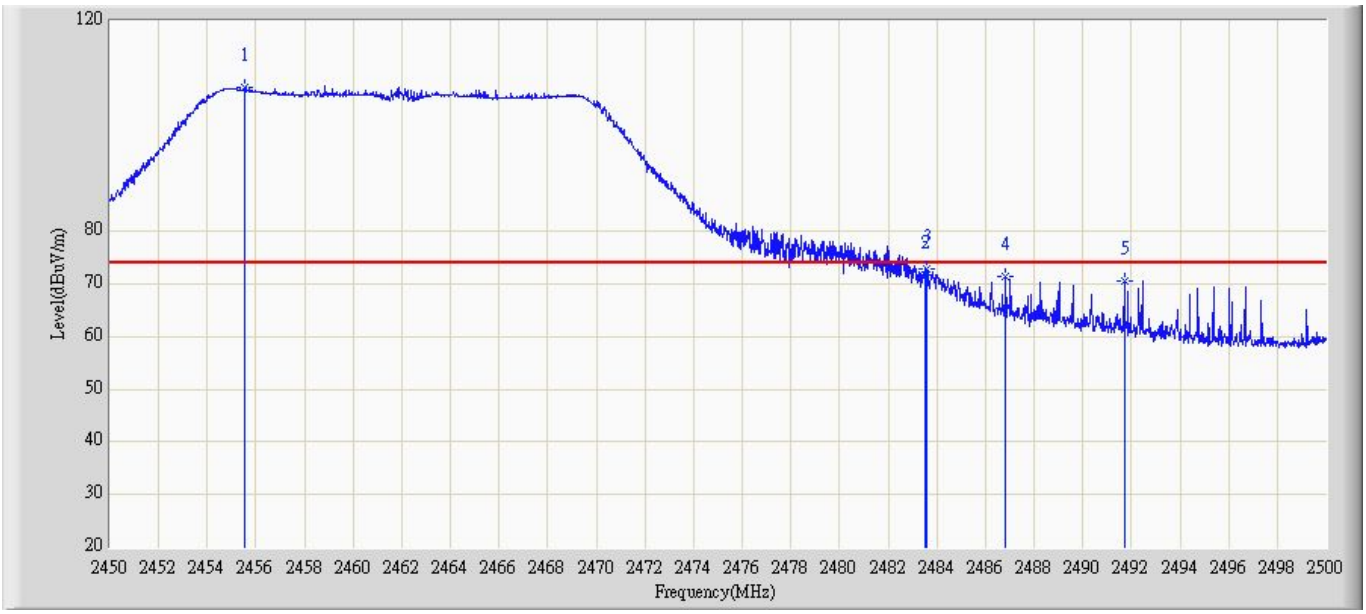


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2468.975	96.558	66.160	N/A	N/A	30.398	PK
2		2483.500	61.783	31.461	-12.217	74.000	30.321	PK
3		2486.875	65.070	34.762	-8.930	74.000	30.309	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 20:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by802.11g	

No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2454.975	82.926	52.448	N/A	N/A	30.478	AV
2		2483.500	44.248	13.926	-9.752	54.000	30.321	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/26 - 19:28
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by802.11g	

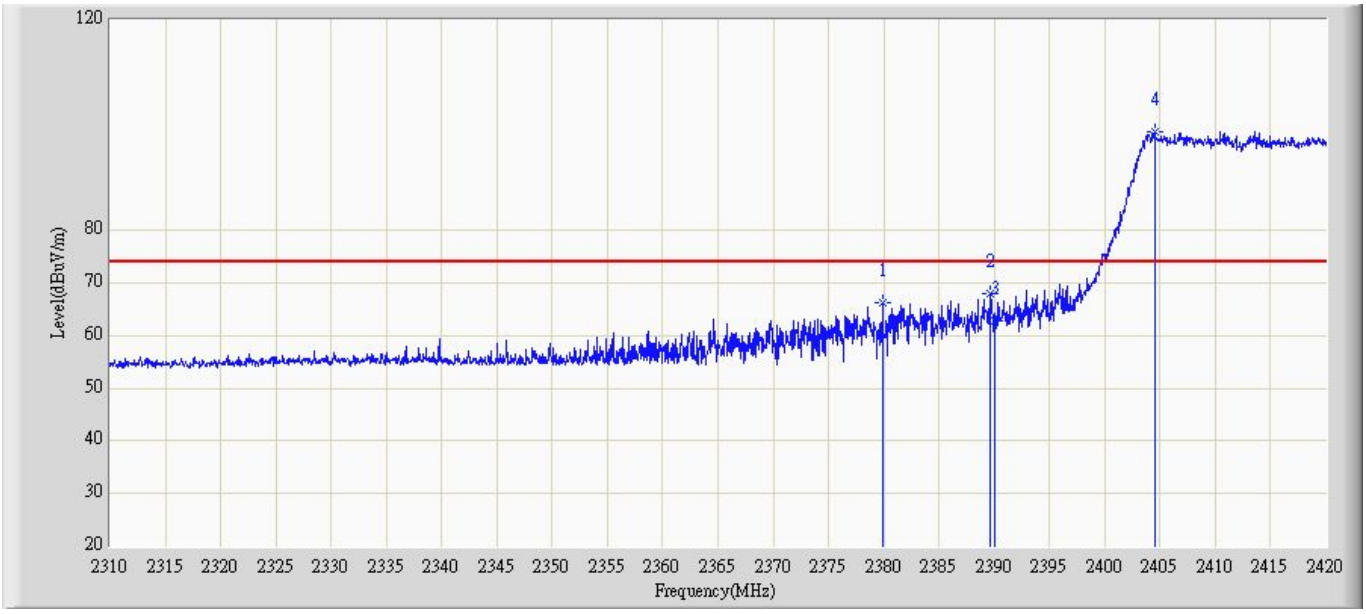


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2455.550	107.488	77.013	N/A	N/A	30.475	PK
2		2483.500	71.647	41.326	-2.353	74.000	30.321	PK
3		2483.575	72.825	42.503	-1.175	74.000	30.321	PK
4		2486.825	71.504	41.196	-2.496	74.000	30.309	PK
5		2491.700	70.487	40.198	-3.513	74.000	30.289	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 20:28
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 2:Transmit at 2462MHz by802.11g	

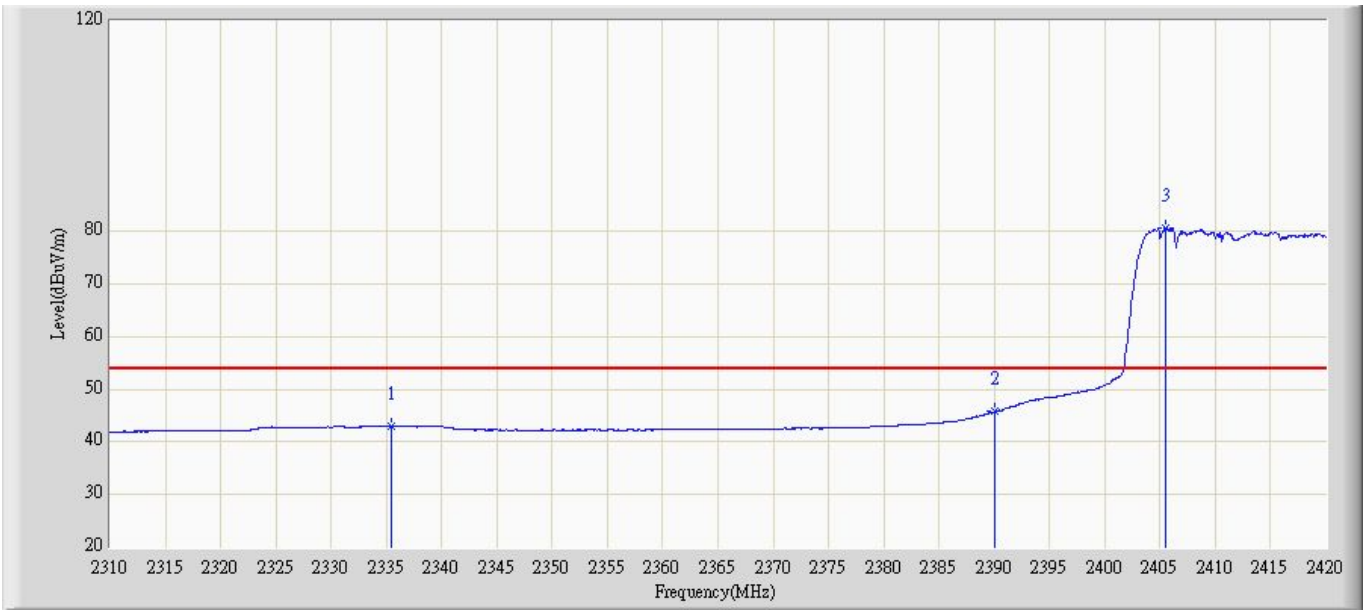
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2454.975	93.178	62.700	N/A	N/A	30.478	AV
2		2483.500	51.226	20.904	-2.774	54.000	30.321	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 20:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by802.11n(20MHz)	



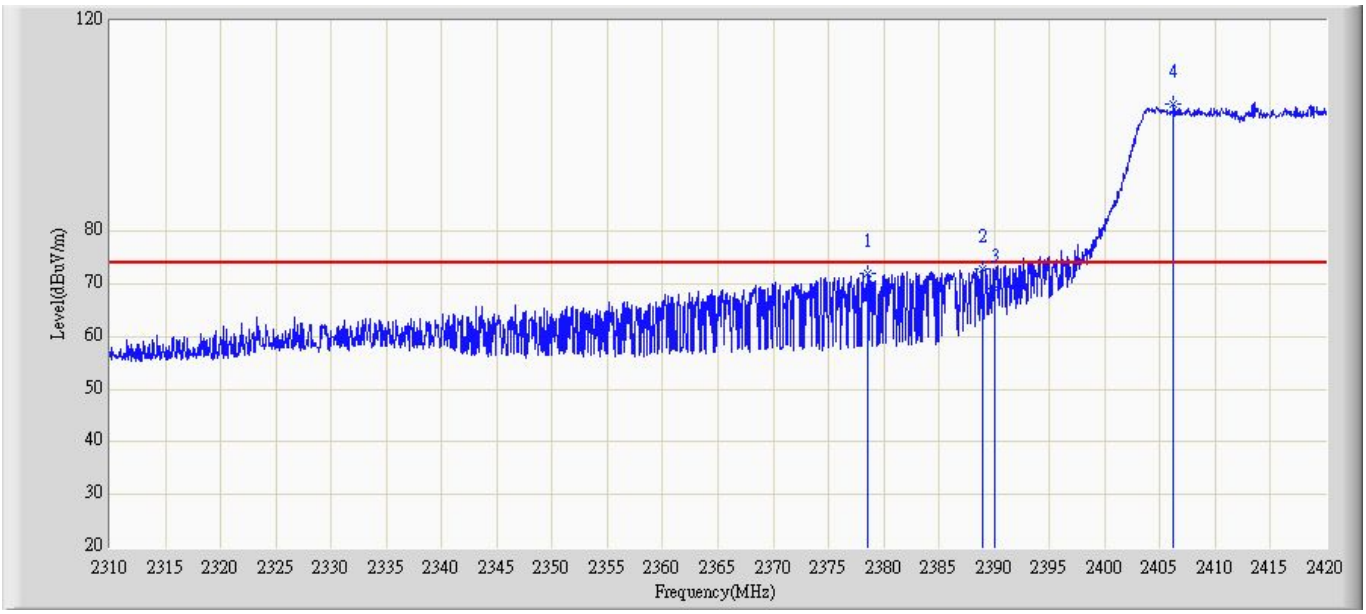
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2379.905	66.162	35.629	-7.838	74.000	30.533	PK
2		2389.695	67.899	37.344	-6.101	74.000	30.555	PK
3		2390.000	62.950	32.395	-11.050	74.000	30.555	PK
4	*	2404.545	98.816	68.257	N/A	N/A	30.559	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 20:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by802.11n(20MHz)	



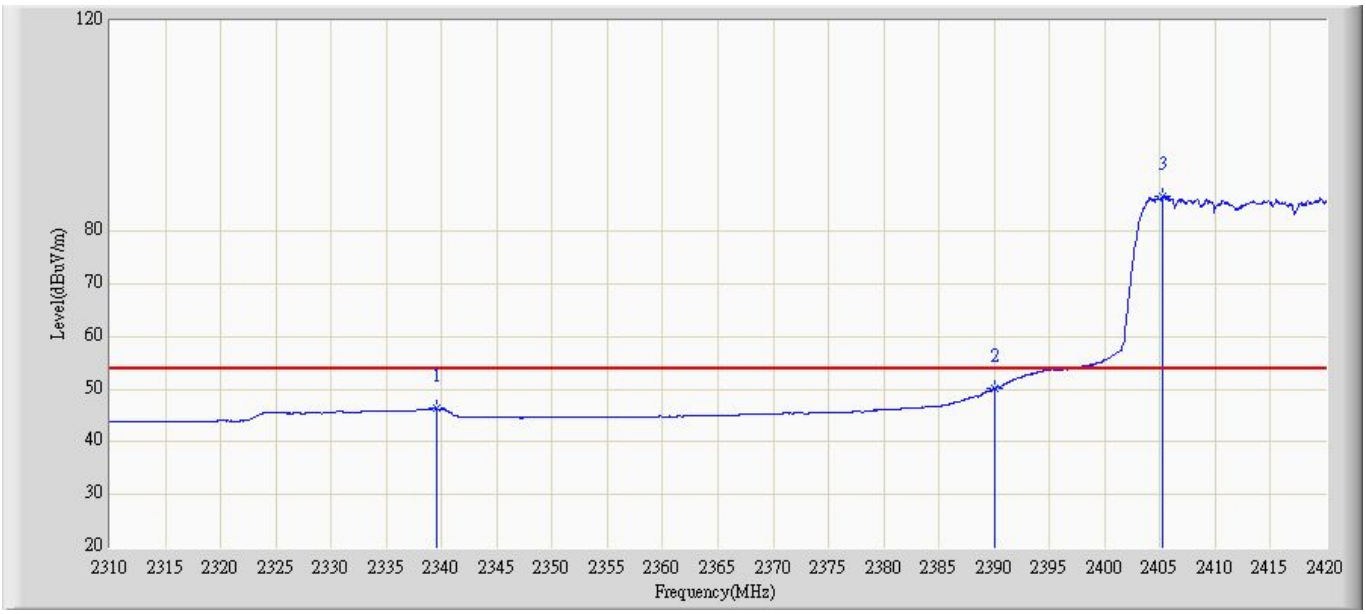
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2335.410	42.938	12.572	-11.062	54.000	30.366	AV
2		2390.000	45.764	15.209	-8.236	54.000	30.555	AV
3	*	2405.480	80.721	50.162	N/A	N/A	30.558	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/26 - 19:33
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by802.11n(20MHz)	



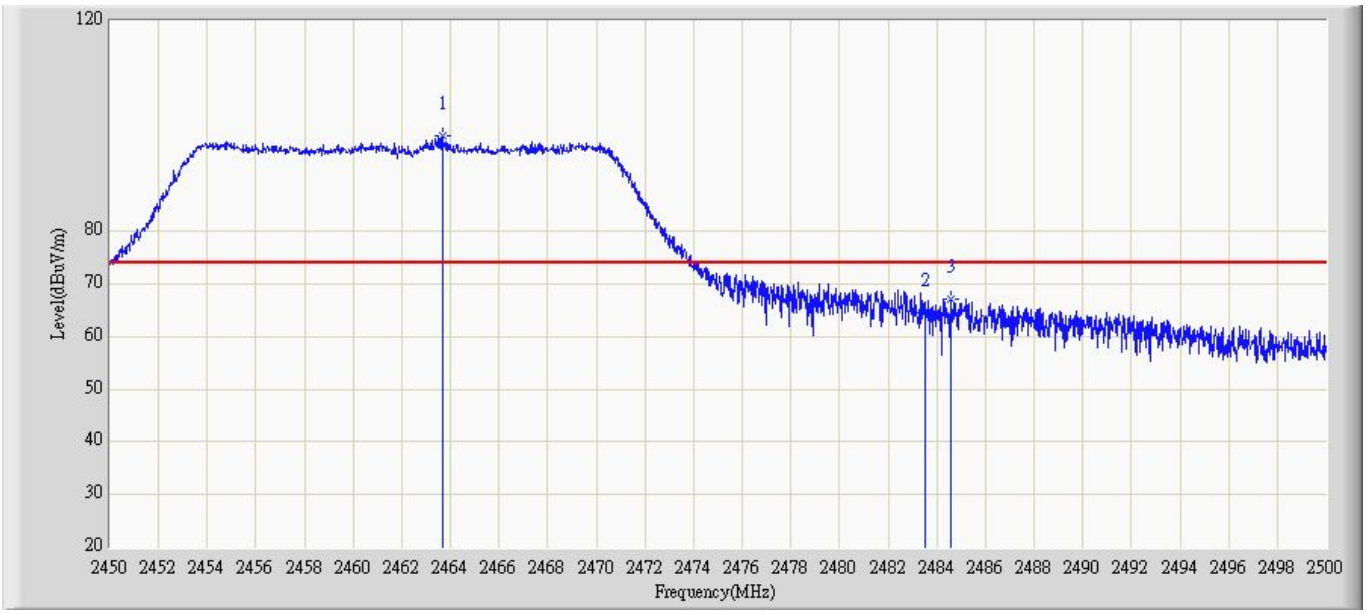
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2378.530	72.107	41.576	-1.893	74.000	30.531	PK
2		2388.925	72.803	42.250	-1.197	74.000	30.553	PK
3		2390.000	69.019	38.464	-4.981	74.000	30.555	PK
4	*	2406.195	104.234	73.675	N/A	N/A	30.559	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 21:34
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2412MHz by802.11n(20MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2339.535	46.344	15.939	-7.656	54.000	30.405	AV
2		2390.000	50.091	19.536	-3.909	54.000	30.555	AV
3	*	2405.205	86.661	56.102	N/A	N/A	30.559	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 21:35
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by802.11n(20MHz)	

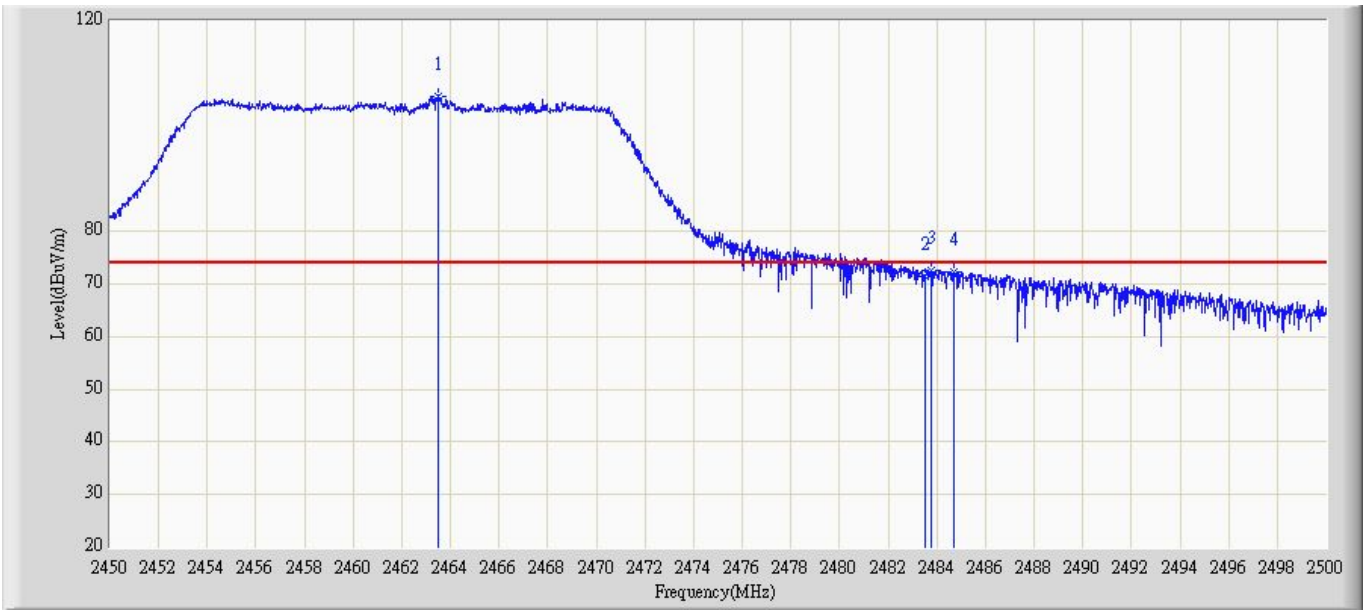


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.675	98.172	67.743	N/A	N/A	30.428	PK
2		2483.500	64.462	34.140	-9.538	74.000	30.321	PK
3		2484.550	67.047	36.729	-6.953	74.000	30.317	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 21:38
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Horizontal
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by802.11n(20MHz)	

No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2454.600	78.938	48.458	N/A	N/A	30.481	AV
2		2483.500	43.885	13.563	-10.115	54.000	30.321	AV

Engineer: Steven	
Site: AC5	Time: 2010/11/26 - 20:36
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by802.11n(20MHz)	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.475	105.642	75.213	N/A	N/A	30.429	PK
2		2483.500	71.423	41.102	-2.577	74.000	30.321	PK
3		2483.775	72.711	42.390	-1.289	74.000	30.320	PK
4		2484.725	72.394	42.077	-1.606	74.000	30.316	PK

Engineer: Steven	
Site: AC5	Time: 2010/11/18 - 21:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: BBHA9120D-499(1-18GHz)	Polarity: Vertical
EUT: ADSL2+ 4-port Wireless Router	Power: AC 120V/60Hz
Note: Mode 3:Transmit at 2462MHz by802.11n(20MHz)	

No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2455.675	86.657	56.183	N/A	N/A	30.474	AV
2		2483.500	48.241	17.919	-5.759	54.000	30.321	AV

7. Operation Frequency Range of 20dB Bandwidth

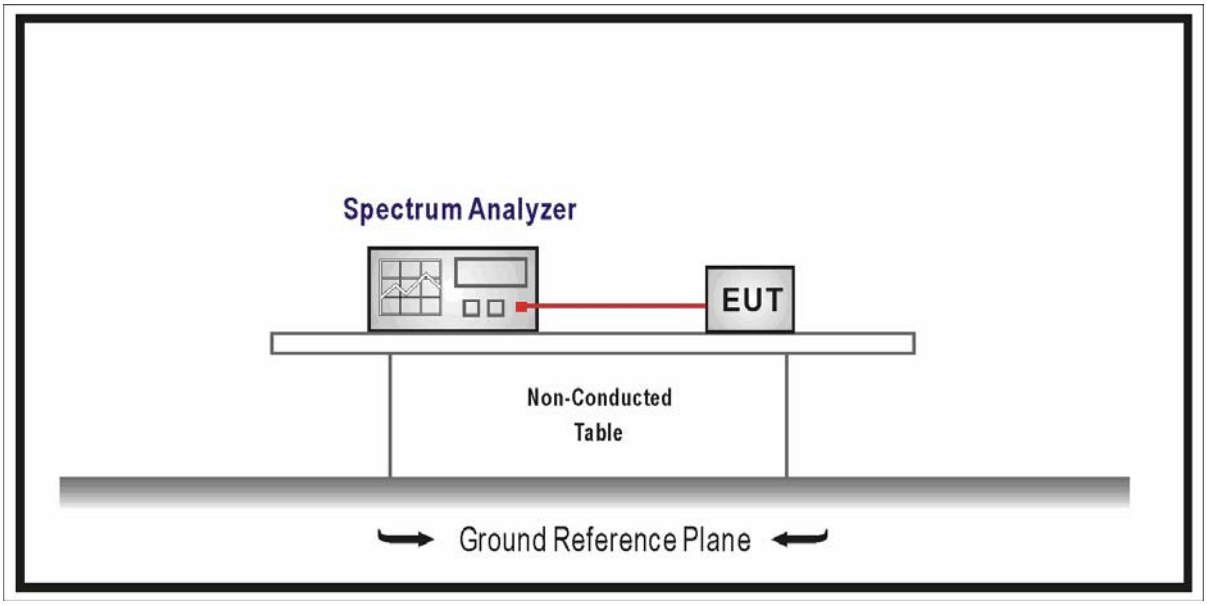
7.1. Test Equipment

Operation Frequency Range of 20dB Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2011.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

20 dB bandwidth of the emission is contained within the operation frequency band.

7.4. Test Procedure

The EUT was tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

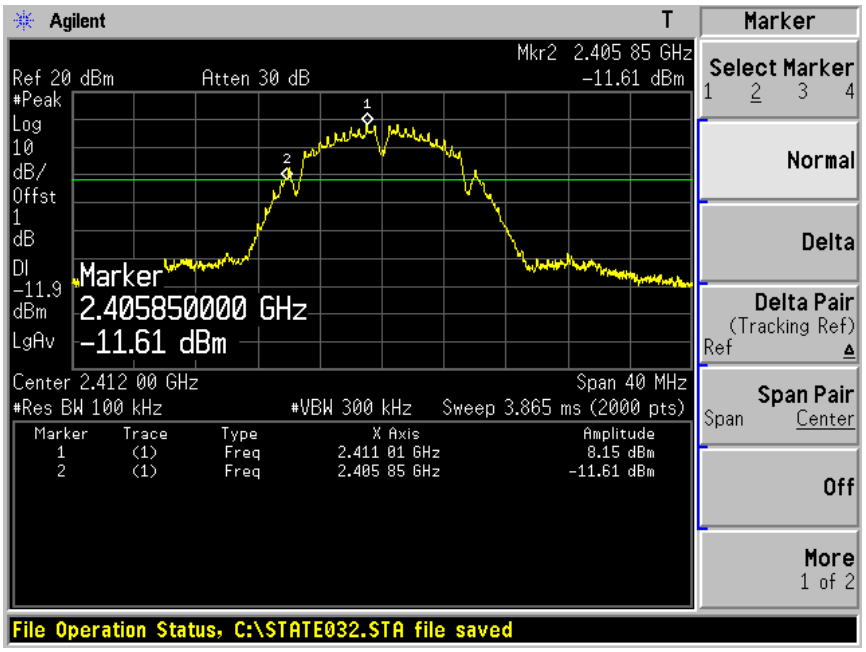
7.5. Uncertainty

The measurement uncertainty is defined as ± 1 kHz

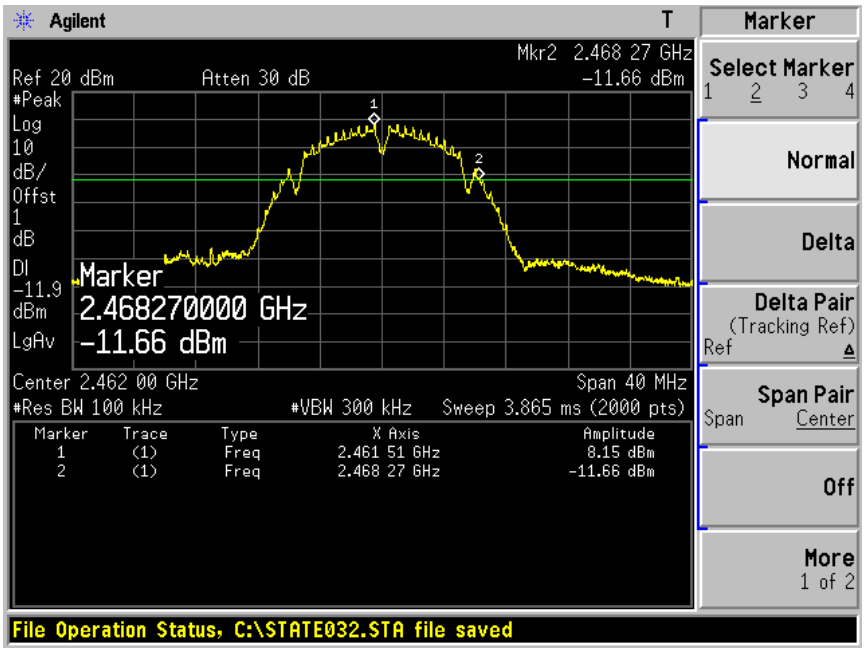
7.6. Test Result

Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel 01 (2412MHz)

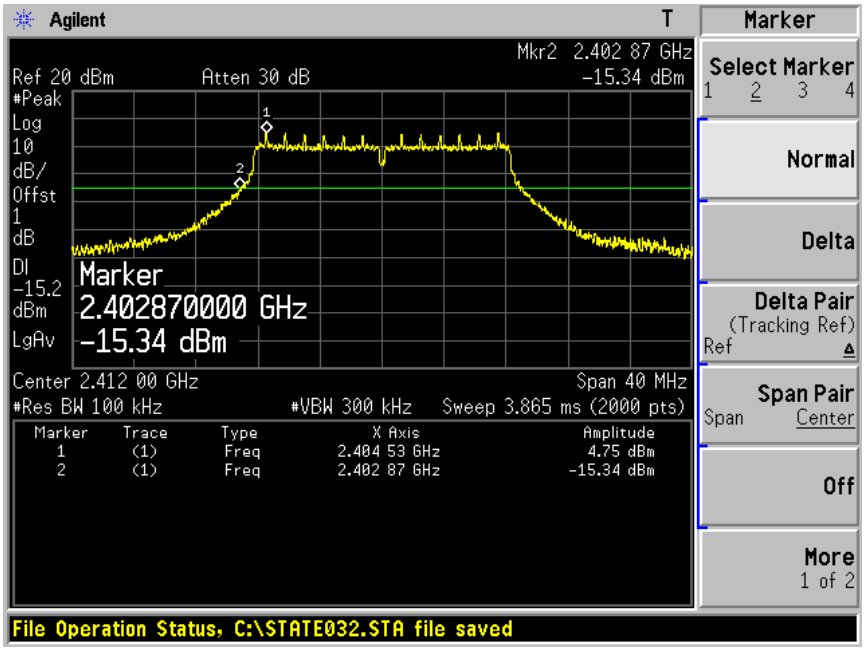


Channel 11 (2462MHz)

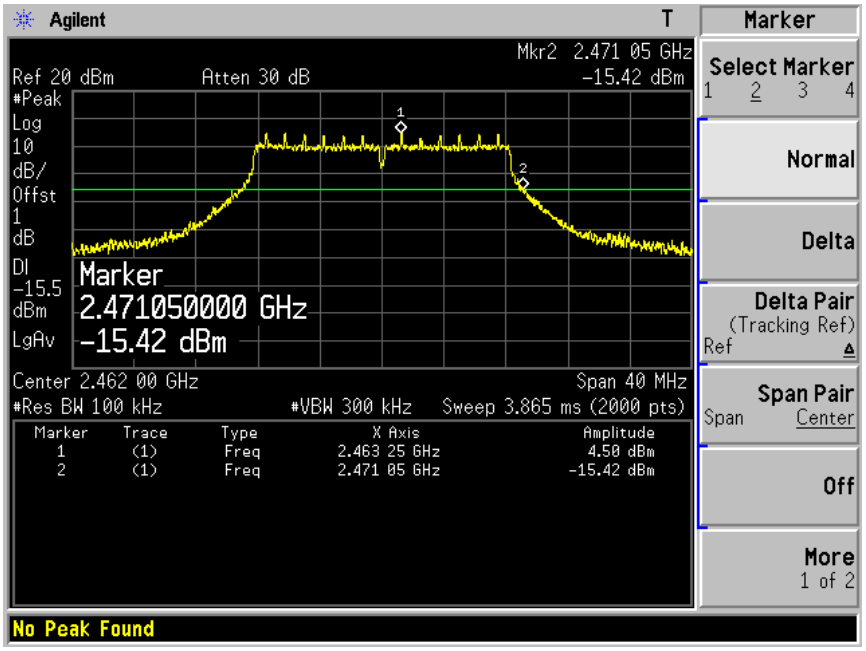


Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel 01 (2412MHz)

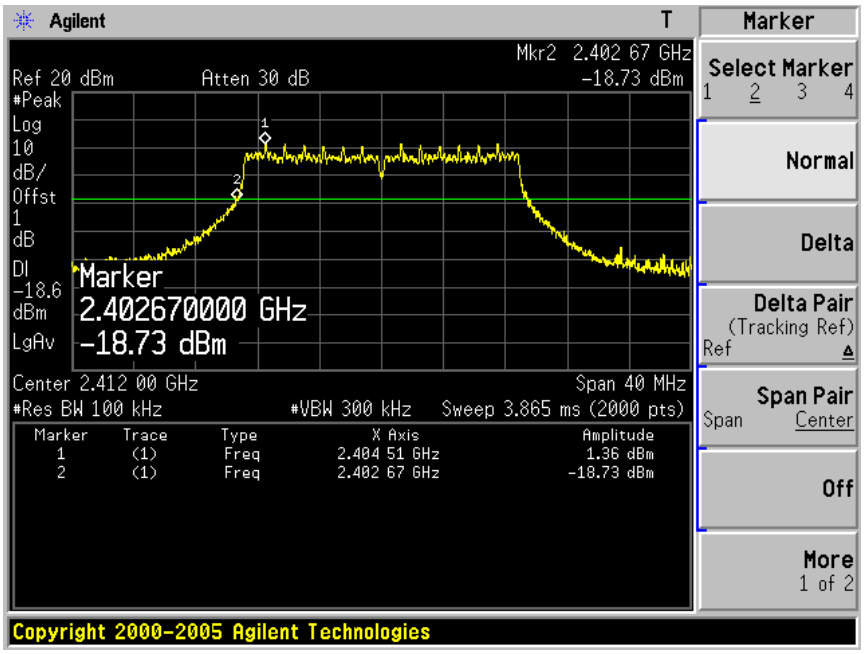


Channel 11 (2462MHz)

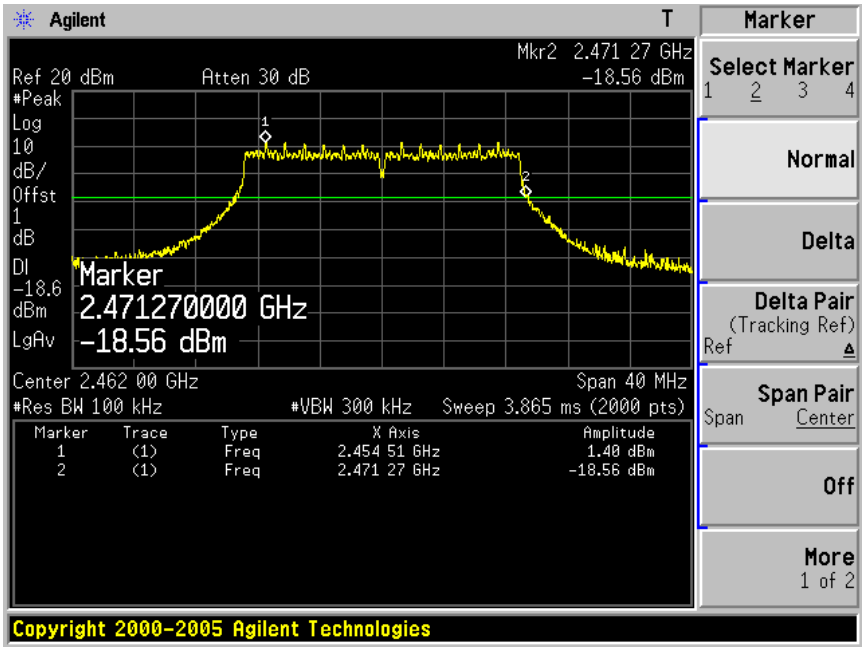


Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

Channel 01 (2412MHz)



Channel 11 (2462MHz)



8. Occupied Bandwidth

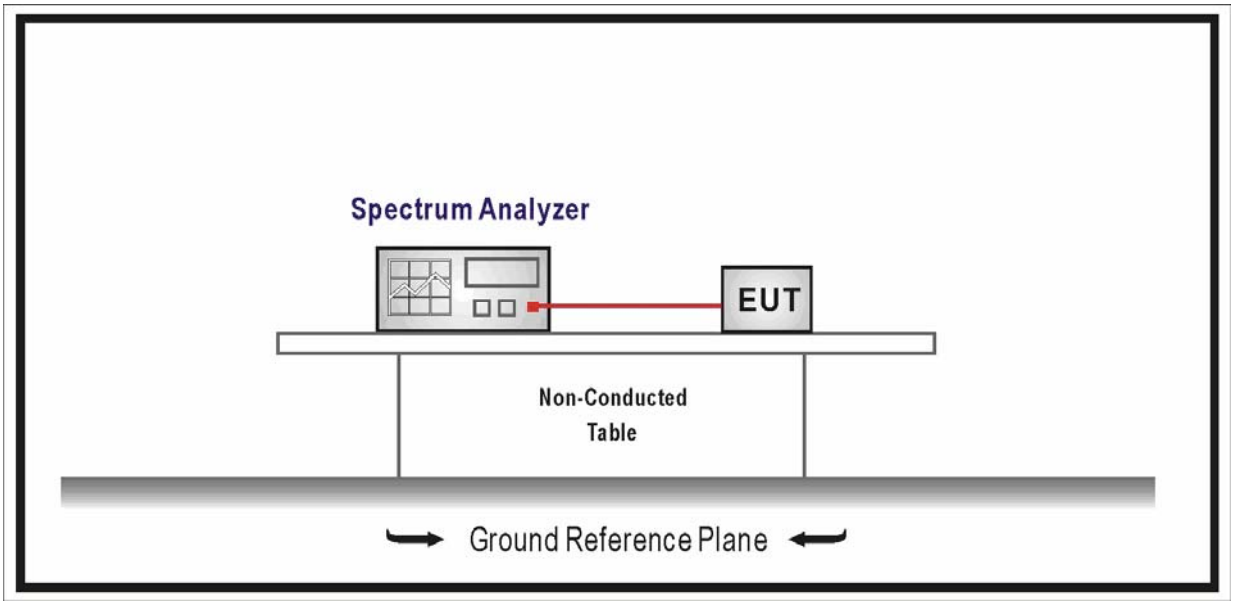
8.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2011.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

The minimum 6 dB bandwidth shall be at least 500 kHz.

8.4. Test Procedure

The EUT was tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

8.5. Uncertainty

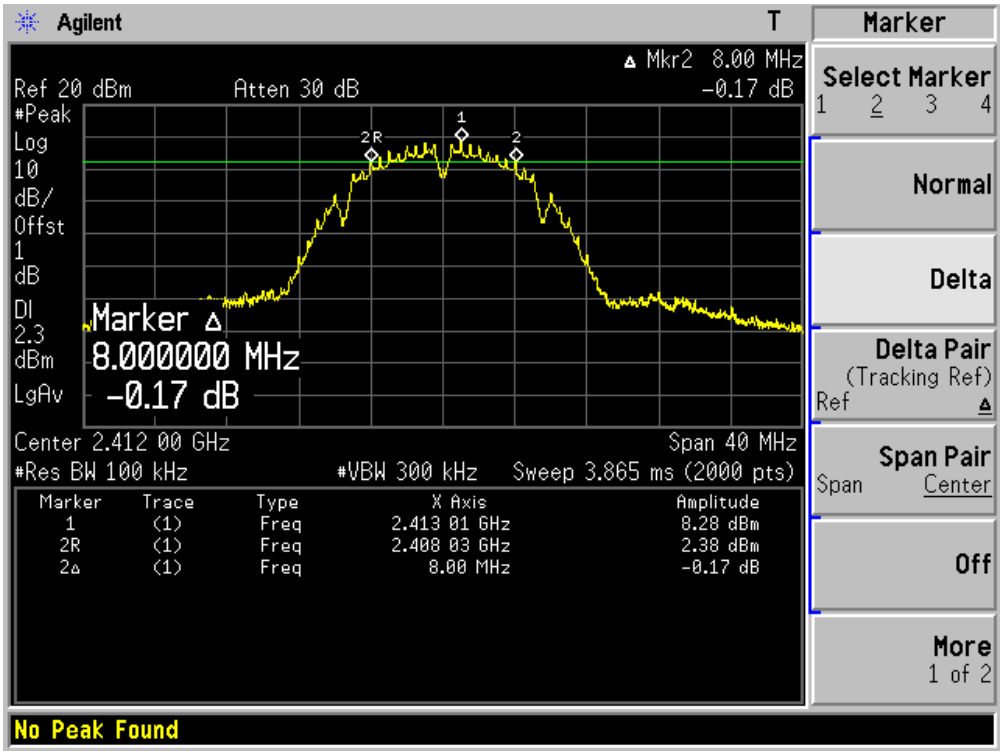
The measurement uncertainty is defined as ± 1 kHz

8.6. Test Result

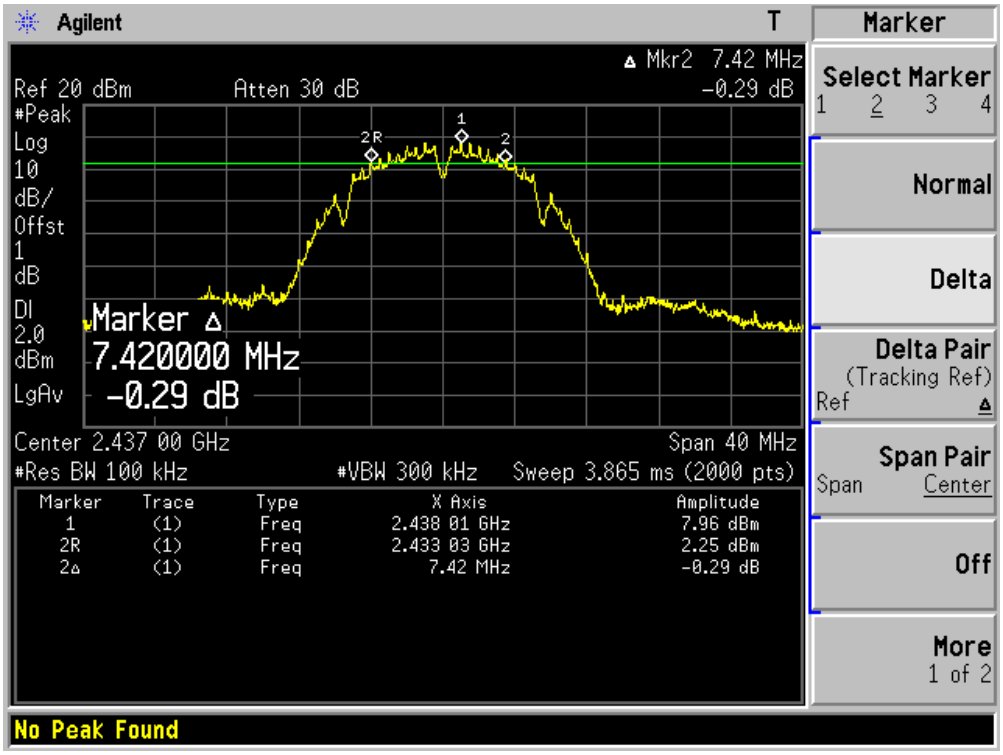
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	8000	500	Pass
06	2437	7420	500	Pass
11	2462	7000	500	Pass

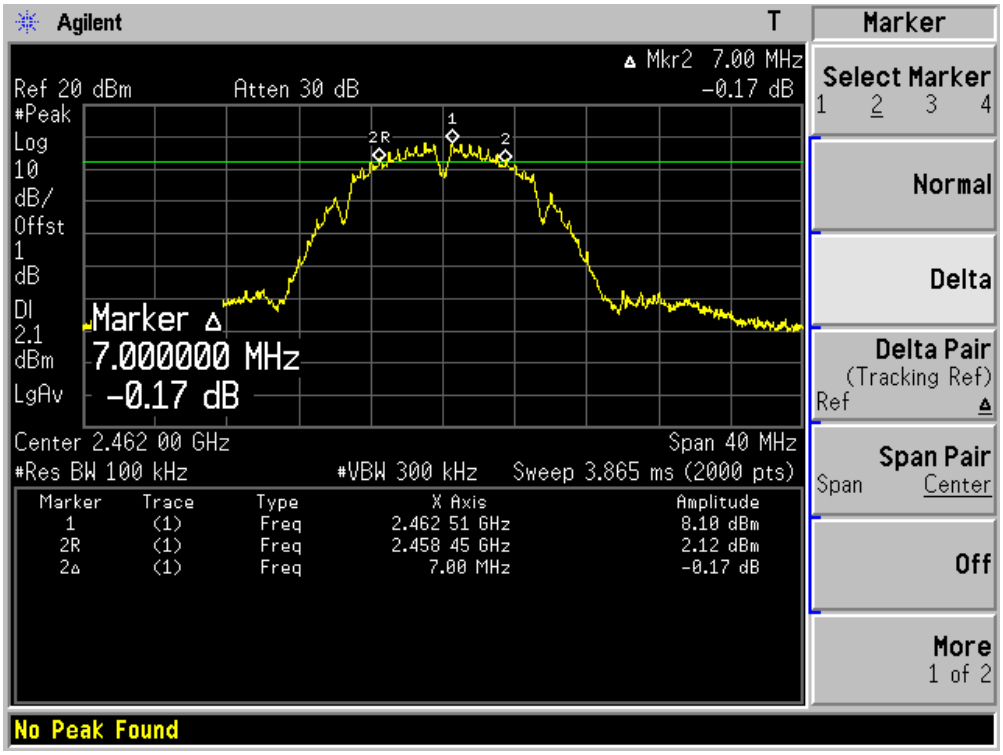
Channel 01 (2412MHz)



Channel 06 (2437MHz)



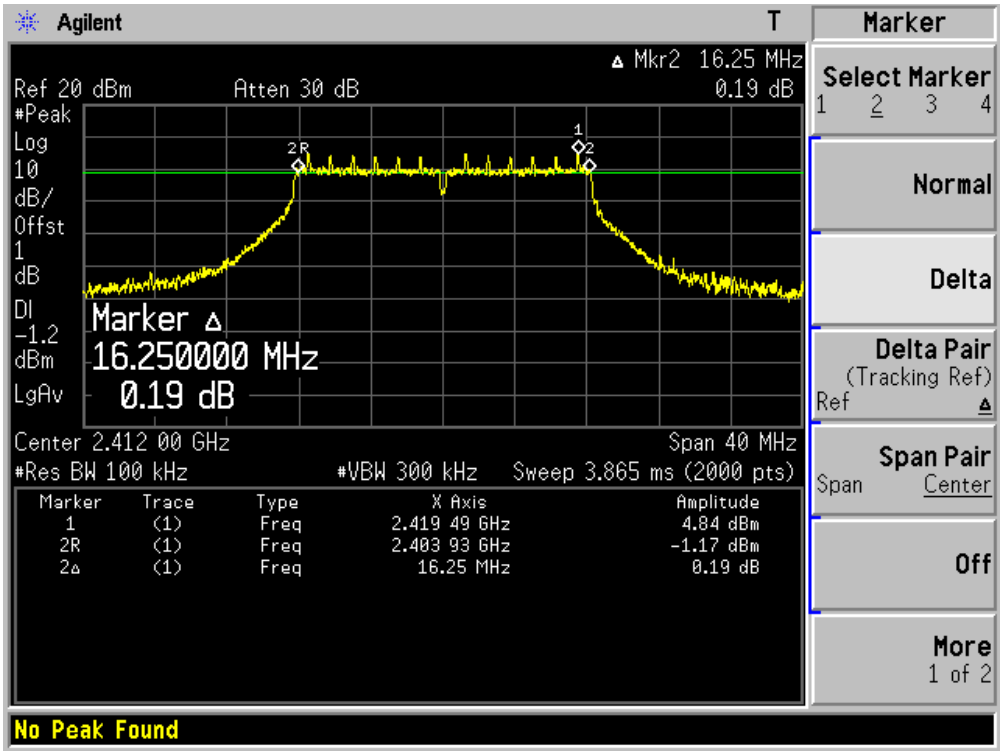
Channel 11 (2462MHz)



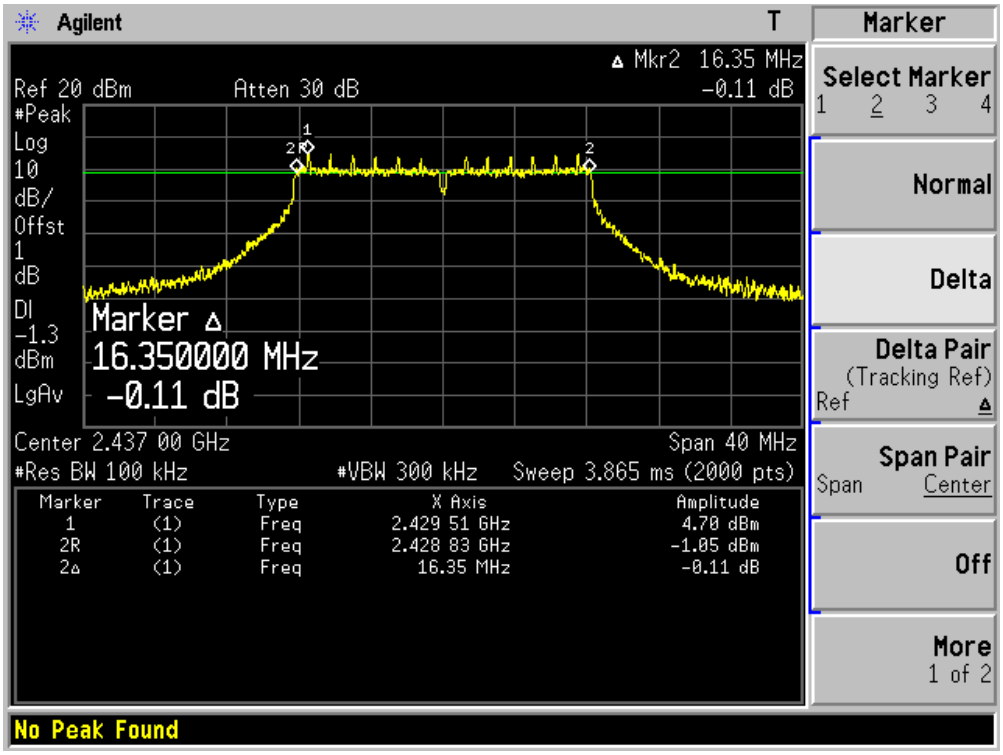
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	16250	500	Pass
06	2437	16350	500	Pass
11	2462	16350	500	Pass

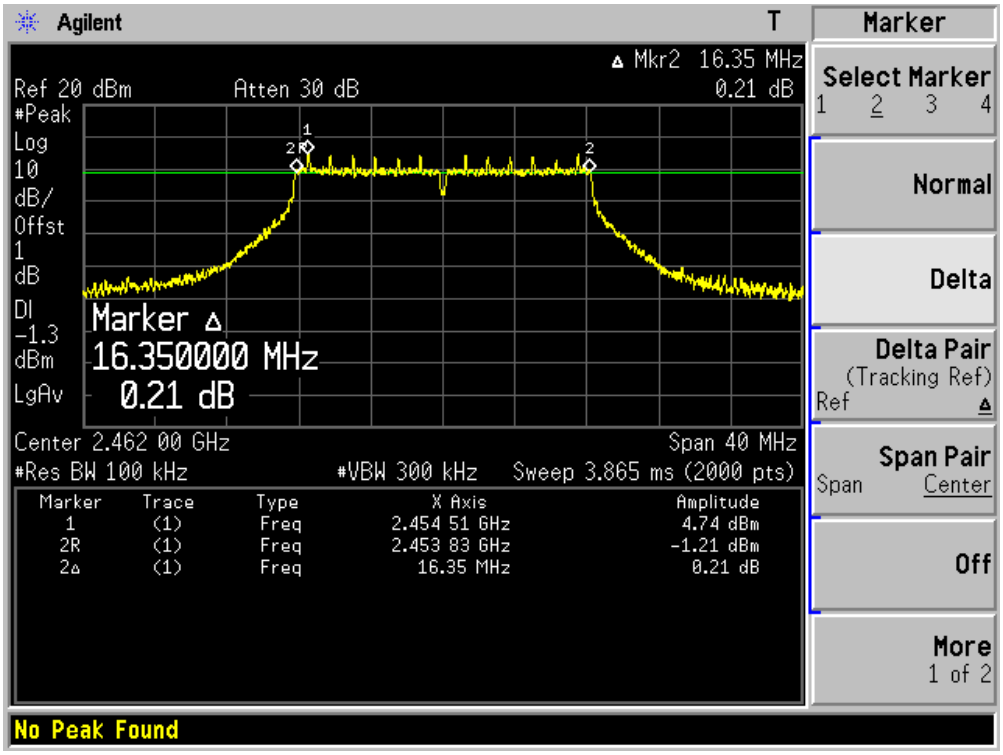
Channel 01 (2412MHz)



Channel 06 (2437MHz)



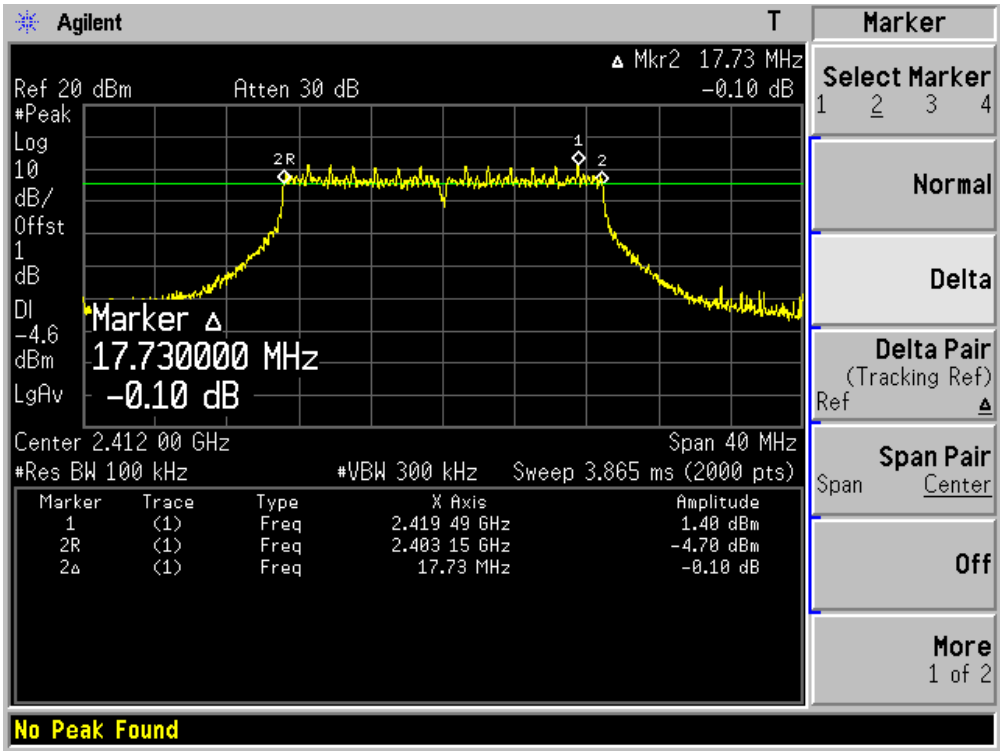
Channel 11 (2462MHz)



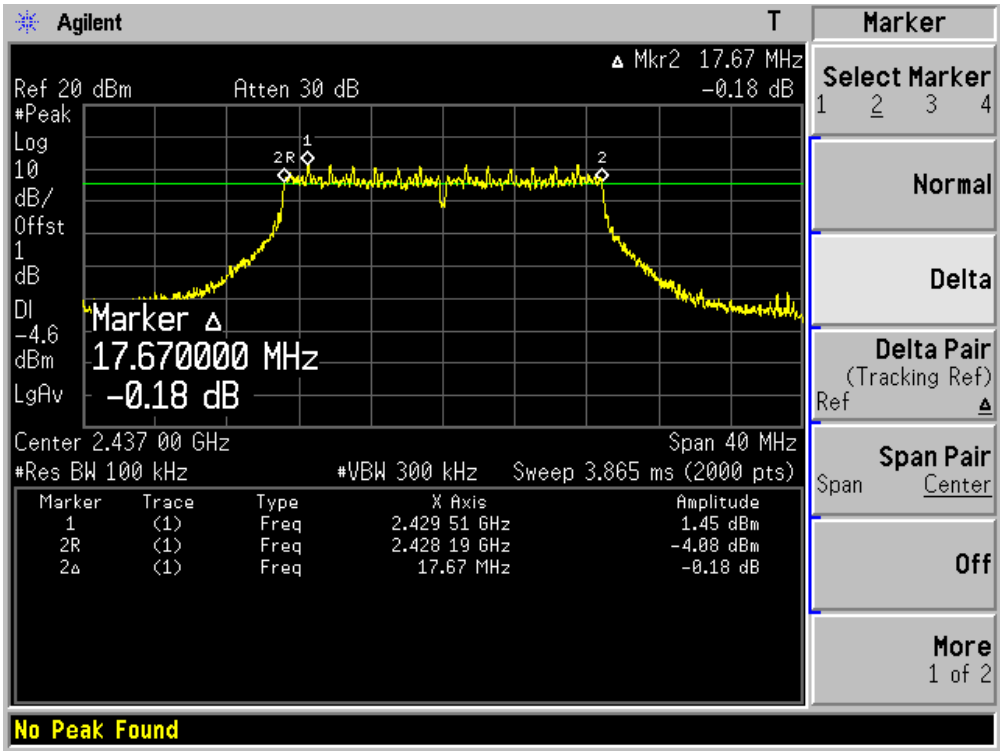
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

Channel No.	Frequency (MHz)	Occupied Bandwidth (kHz)	Limit (kHz)	Result
01	2412	17730	500	Pass
06	2437	17670	500	Pass
11	2462	17710	500	Pass

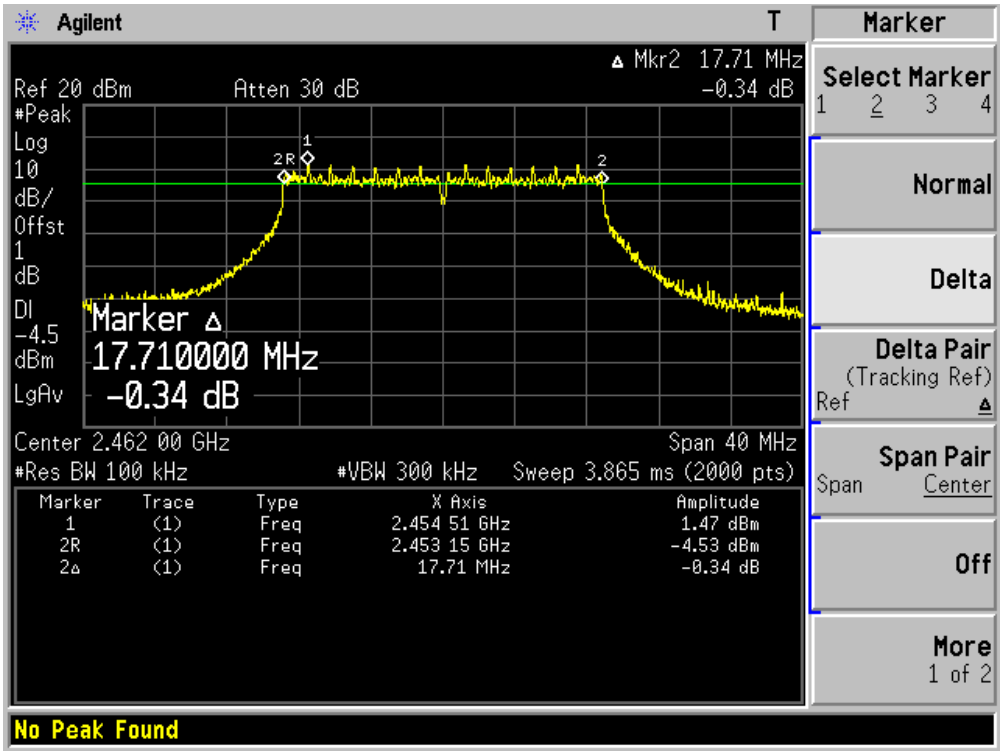
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



9. Power Output

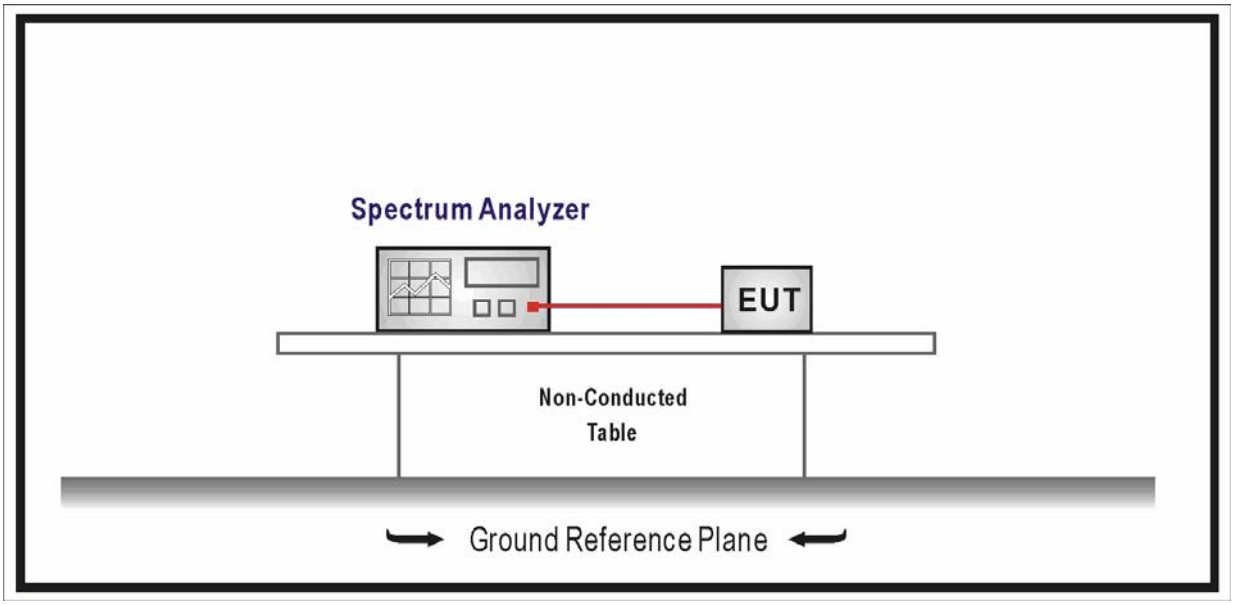
9.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2011.01.12
Power Sensor	Anritsu	MA2411B	0846014	2011.01.12
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2011.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

The maximum peak power shall be less 1 Watt (30dBm).

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

The EUT was tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.

Use the wideband power meter to test peak power and record the result.

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

9.6. Test Result

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (blue marker) for final test of each channel.

MCS Index for 802.11n	Spatial Streams	Data Rate (Mbps)						
		802.11b	802.11g	802.11a	20MHz Bandwidth		40MHz Bandwidth	
					800ns GI	400ns GI	800ns GI	400ns GI
0	1	1	6	---	6.5	7.2	---	---
1	1	2	9	---	13.0	14.4	---	---
2	1	5.5	12	---	19.5	21.7	---	---
3	1	11	18	---	26.0	28.9	---	---
4	1	---	24	---	39.0	43.3	---	---
5	1	---	36	---	52.0	57.8	---	---
6	1	---	48	---	58.5	65.0	---	---
7	1	---	54	---	65.0	72.2	---	---

Power output at various data rates:

Test Mode	Frequency (MHz)	Channel	Data Rate	Peak Power (dBm)
802.11b	2437	6	1	21.02
			2	19.56
			5.5	19.49
			11	19.02
802.11g	2437	6	6	18.65
			9	17.81
			12	17.42
			18	17.23
			24	16.93
			36	16.72
			48	16.45
			54	16.23
802.11n (20M)	2437	6	6.5	17.27
			13.0	16.87
			19.5	16.45
			26.0	16.06
			39.0	15.79
			52.0	15.54
			58.5	15.31
			65.0	15.08

Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Power Output
Test Site	:	TR-8

Test Mode	Channel No.	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Result
802.11b	01	2412	20.76	30	Pass
	06	2437	21.02	30	Pass
	11	2462	20.96	30	Pass
802.11g	01	2412	18.68	30	Pass
	06	2437	18.65	30	Pass
	11	2462	18.77	30	Pass
802.11n(20M)	01	2412	17.33	30	Pass
	06	2437	17.27	30	Pass
	11	2462	17.40	30	Pass

10. Power Spectral Density

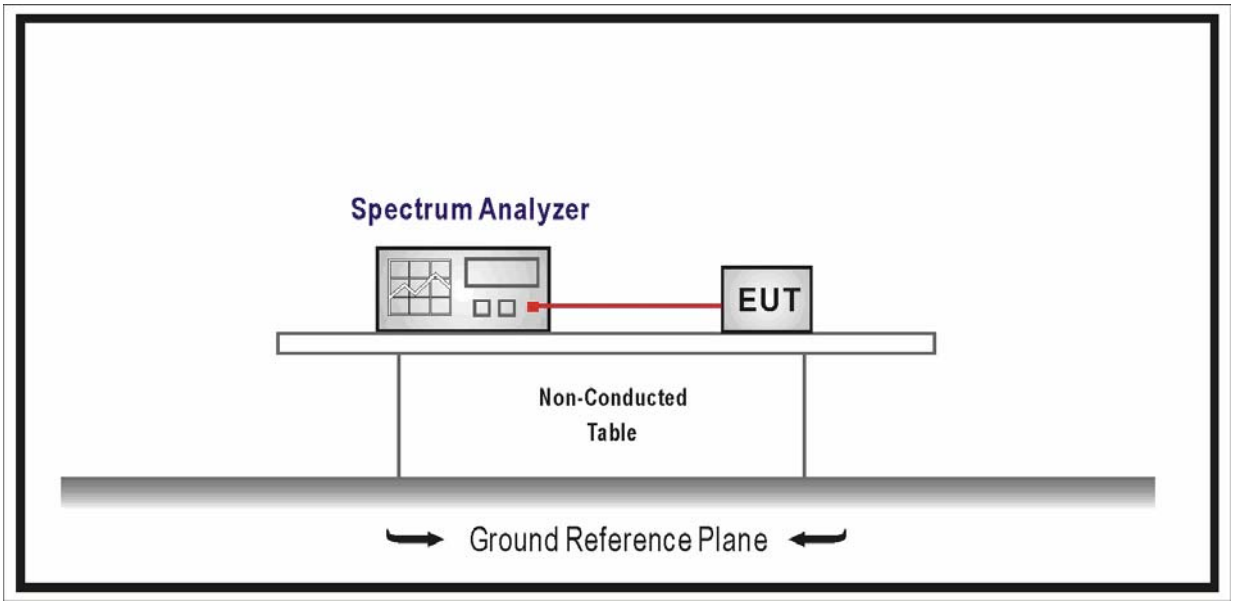
10.1. Test Equipment

Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2011.04.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2011.01.14

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiated to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

10.4. Test Procedure

The EUT was tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements.
Set RBW= 3 kHz, Set VBW≧ 10 kHz, Sweep time=100s, Set detector=Peak detector.

10.5. Uncertainty

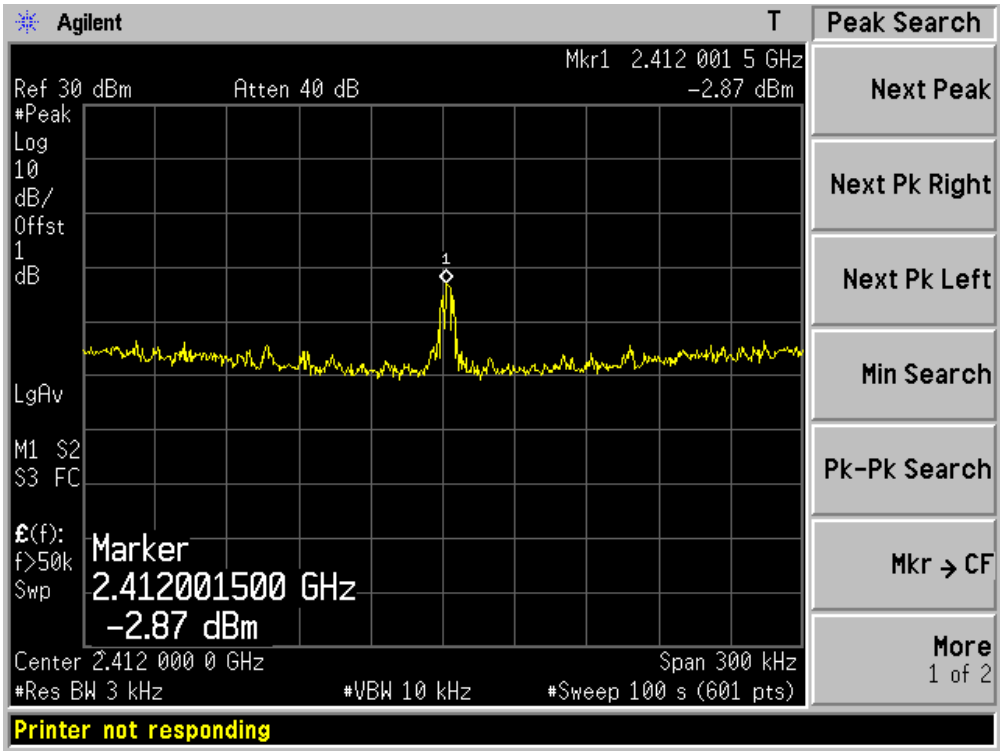
The measurement uncertainty is defined as ± 1.27 dB

10.6. Test Result

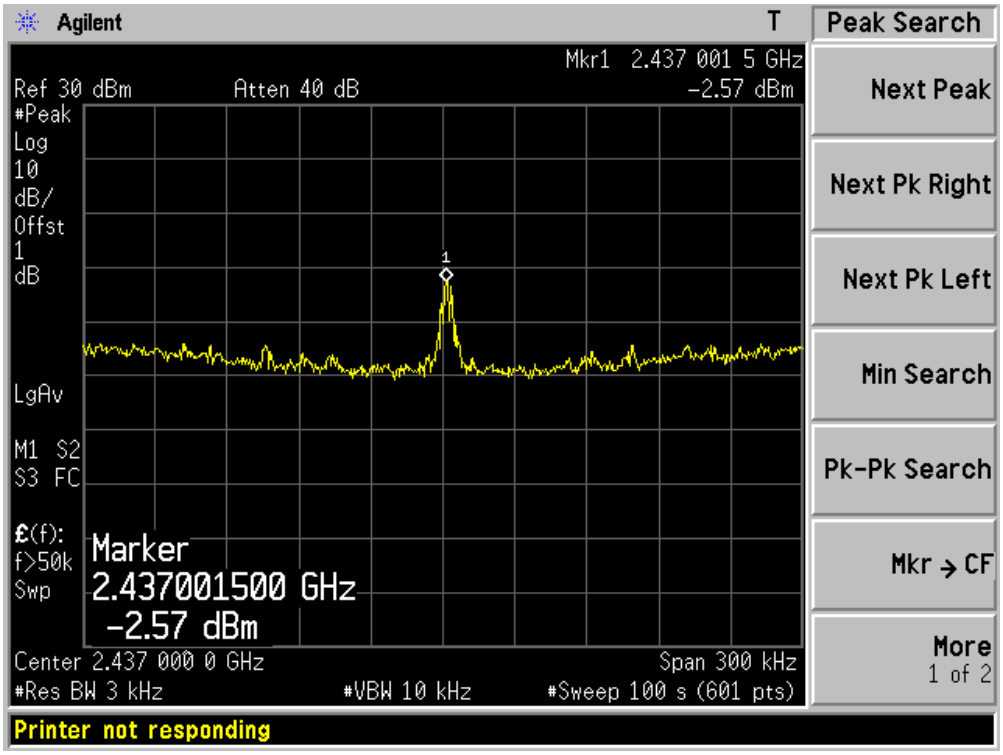
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm)	Result
01	2412	-2.87	8	Pass
06	2437	-2.57	8	Pass
11	2462	-2.87	8	Pass

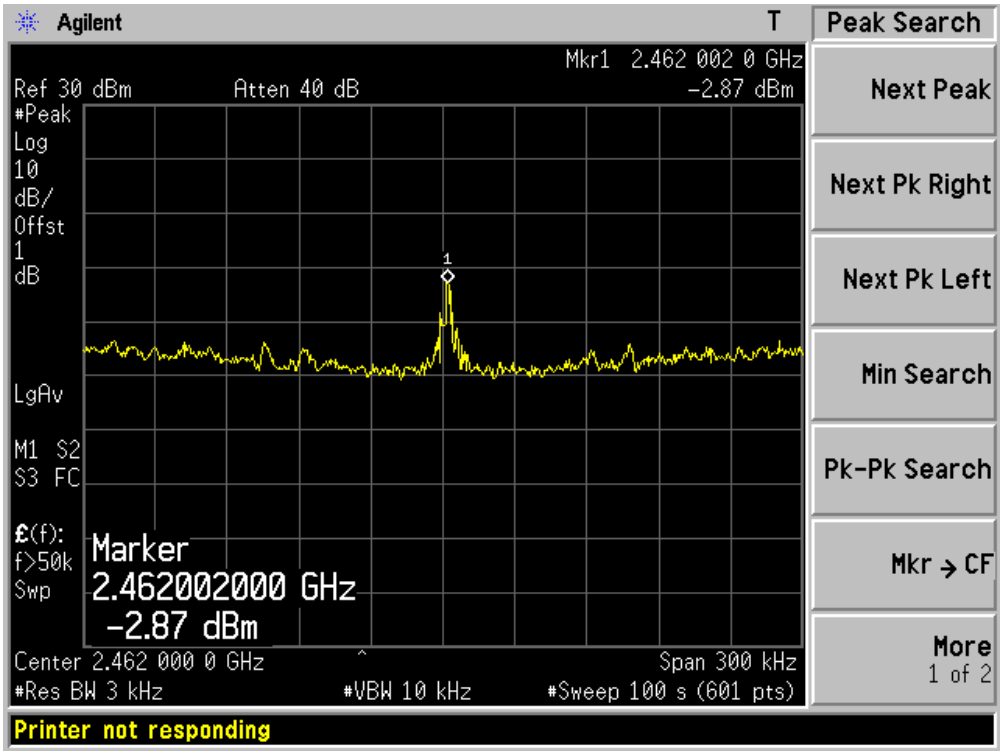
Channel 01 (2412MHz)



Channel 06 (2437MHz)



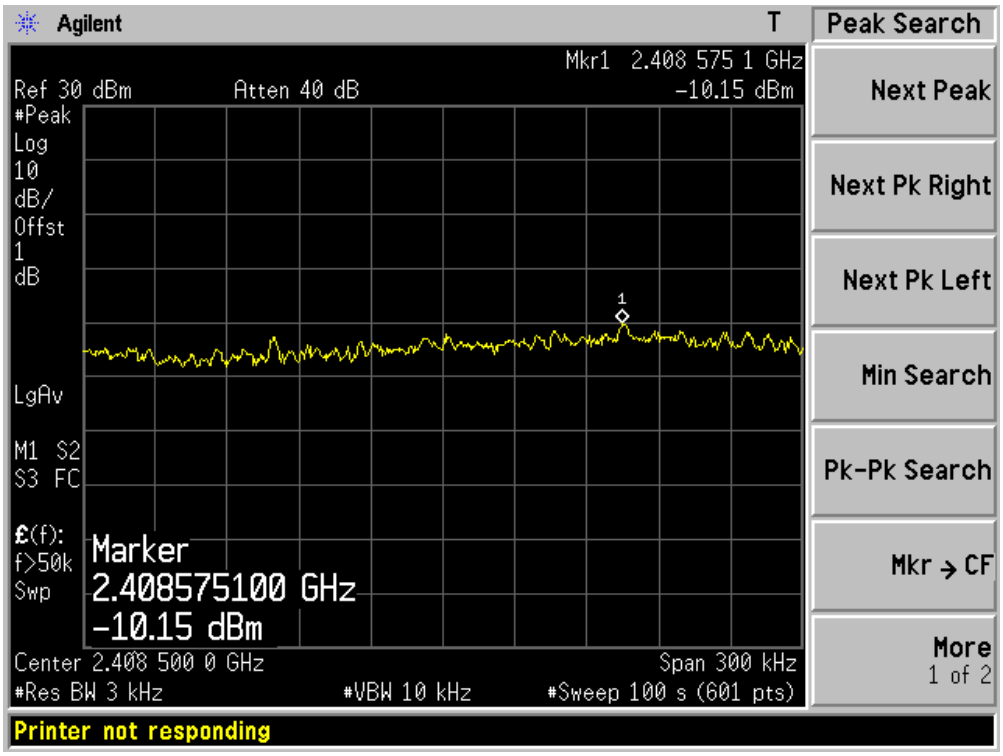
Channel 11 (2462MHz)



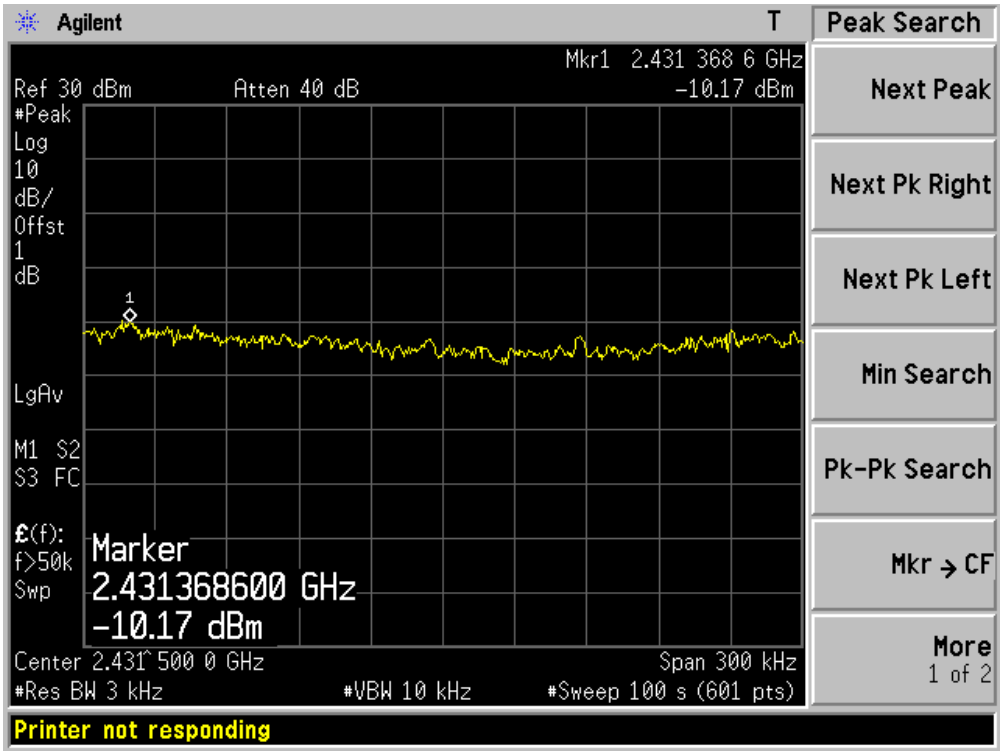
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm)	Result
01	2412	-10.15	8	Pass
06	2437	-10.17	8	Pass
11	2462	-11.17	8	Pass

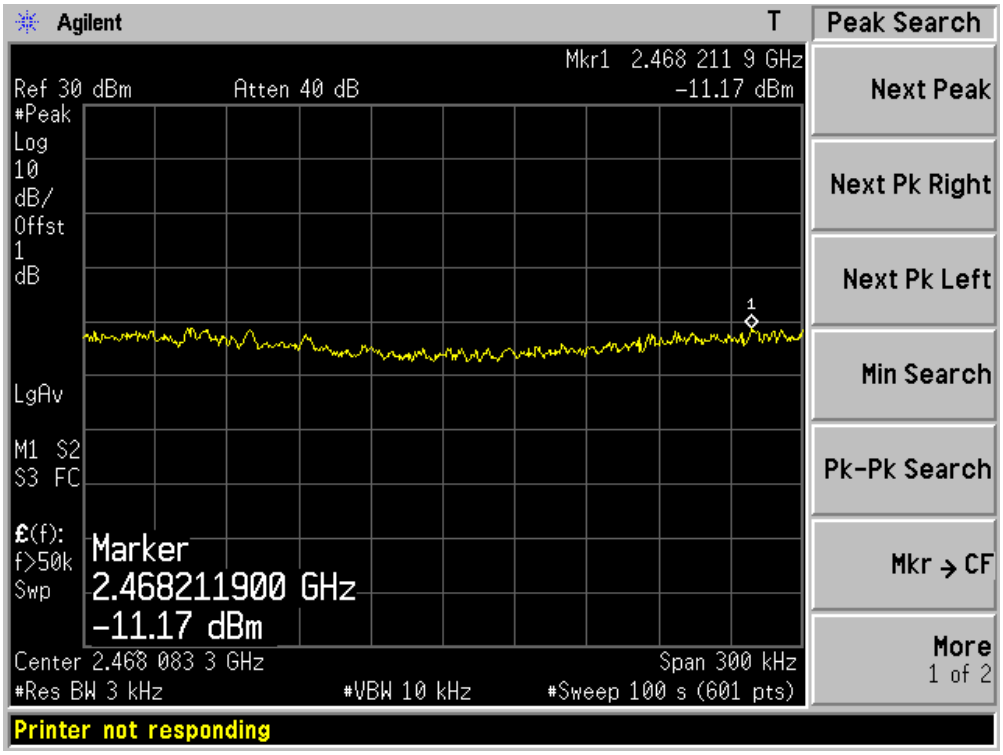
Channel 01 (2412MHz)



Channel 06 (2437MHz)



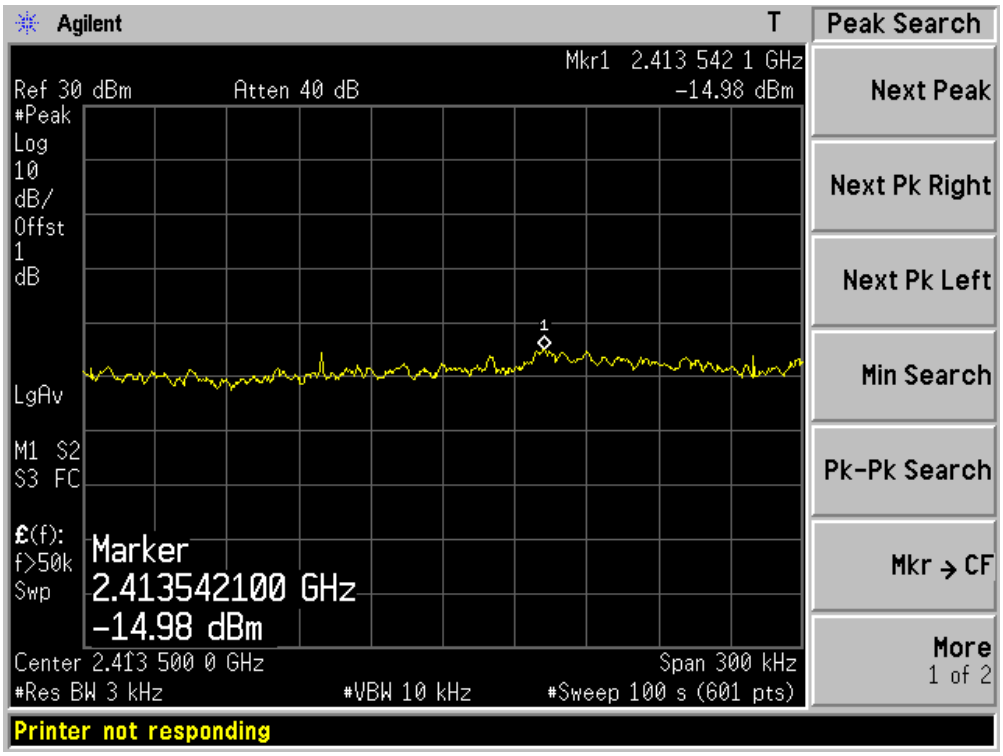
Channel 11 (2462MHz)



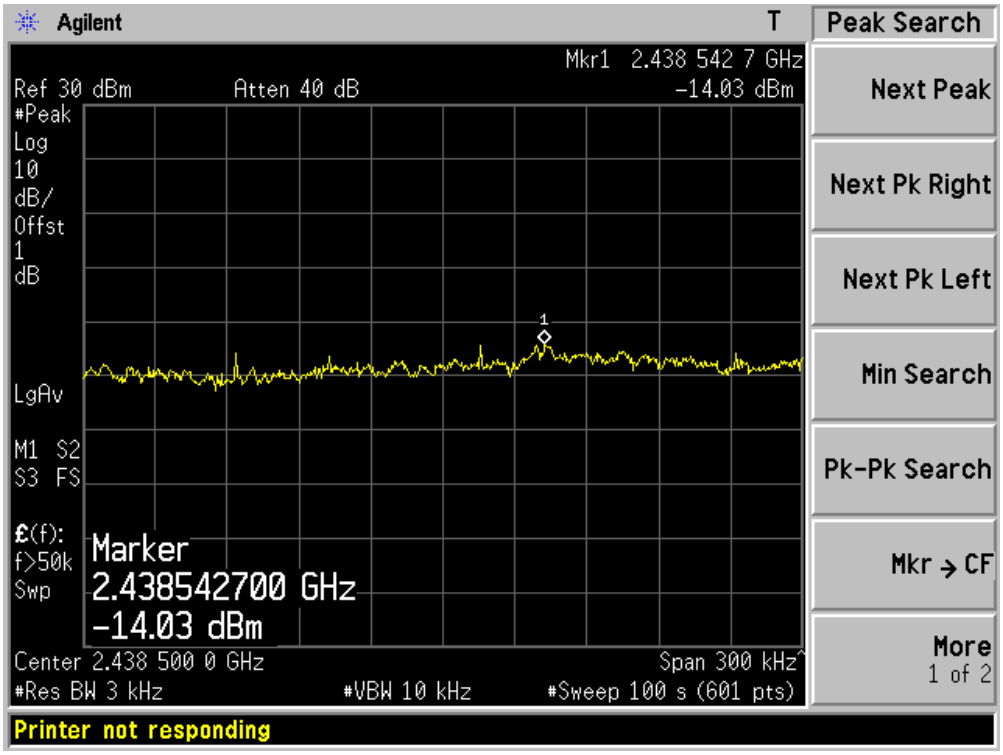
Product	:	ADSL2+ 4-port Wireless Router
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n (20MHz)

Channel No.	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm)	Result
01	2412	-14.98	8	Pass
06	2437	-14.03	8	Pass
11	2462	-14.28	8	Pass

Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)