FCC Test Report

Product Name ： Wireless N VDSL2 VoIP Combo WAN Gigabit IAD

Model No. ： VMG8324-B10A

FCC ID. ： I88VMG8324B10A

Applicant ： ZyXEL Communications Corporation

Address ： No. 2, Gongye E. 9th Road, Hsinchu Science Park Hsinchu, Taiwan

Date of Report ： 2013/08/01

Report No. ： 138094R-RFUSP42V01

Issued Date ： 2013/09/13

Report Version ： V1.0

FCC Test Report Certification

Issued Date : 2013/09/13
Report No. : 138094R-RFUSP42V01

QuieTek

Product Name	:	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD
Applicant	:	ZyXEL Communications Corporation
Address	:	No. 2, Gongye E. 9th Road, Hsinchu Science Park Hsinchu, Taiwan
Manufacturer	:	(1) WuXi MitraStar Technology Co. Ltd. (2) MitraStar Technology Corporation
Model No.	:	VMG8324-B10A
FCC ID.	:	I88VMG8324B10A
EUT Test Voltage	:	AC 100-240V, 50/60Hz
Trade Name	:	ZyXEL
Applicable Standard	:	FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2012 ANSI C63.4: 2009
Test Result	:	Complied

The test results relate only to the samples tested.
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Approved By : Roy Wang
(Roy Wang / Director)

Laboratory Information

We, **QuieTek Corporation**, are an independent RF 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 specified testing scopes:

Taiwan R.O.C.	**:**	**TAF, Accreditation Number: 1313**
USA	**:**	**FCC, Registration Number: 365520**
Canada	**:**	**IC, Submission No: 150981**

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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1. General Information

1.1. EUT Description

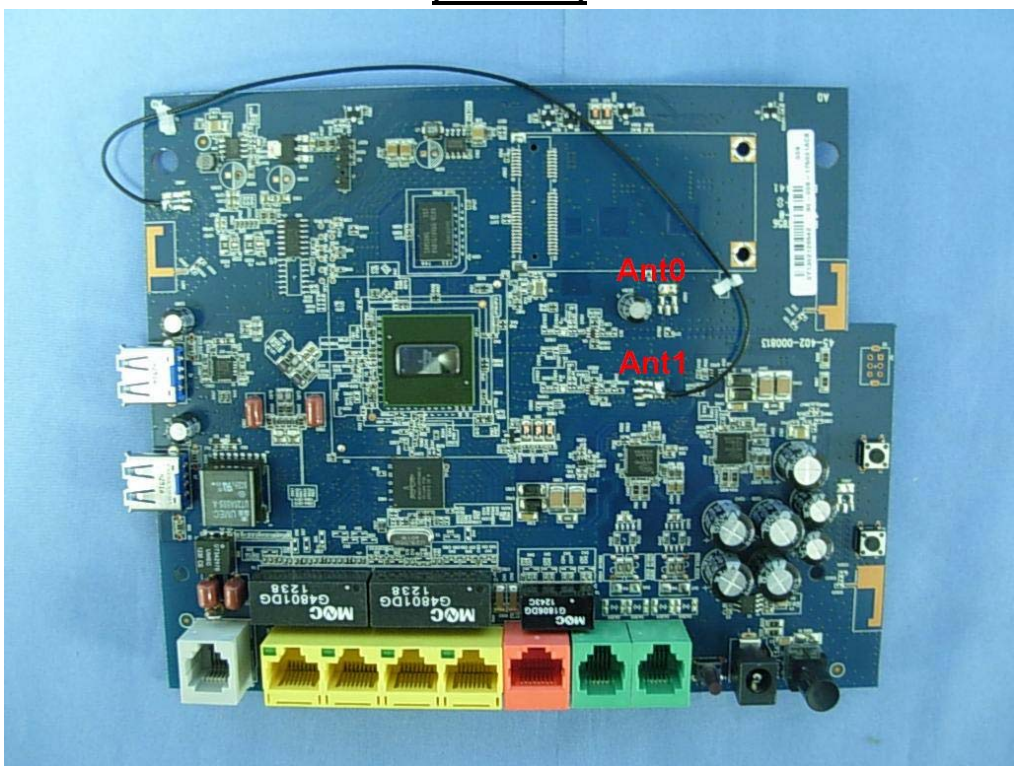
Product Name	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	
Product Type	WLAN (2TX, 2RX)	
Trade Name	ZyXEL	
Model No.	VMG8324-B10A	
Frequency Range/ Channel Number	IEEE 802.11b/g/ IEEE 802.11n (20MHz)	2412~2462MHz / 11 Channels
	IEEE 802.11n (40MHz)	2422~2452MHz / 7 Channels
Type of Modulation	IEEE 802.11b	Direct Sequence Spread Spectrum
	IEEE 802.11g/n	Orthogonal Frequency Division Multiplexing
Data Speed	IEEE 802.11b	1, 2, 5.5, 11Mbps
	IEEE 802.11g	6, 9, 18, 24, 36, 48,54Mbps
	IEEE 802.11n	Support a subset of the combination of GI, MCS 0~MCS 15 and bandwidth defined in 802.11n
Antenna Gain	Ant0: 2.9dBi, Ant1: 3.7dBi	
Antenna Type	Printing Antenna	

Component	
LAN Cable	Shielded, 2.0m
Telephone Cable	Non-Shielded, 2.0m
Power Adapter	AMIGO, AMS3-1201500FU I/P: 100-240V~ 50/60Hz 0.5A. O/P: 12V⎓1.5A Cable Out: Non-Shielded, 1.5m

ANT-TX / RX & Bandwidth

ANT-TX / RX	TX		RX	
Mode/ Channel Bandwidth	20MHz	40MHz	20MHz	40MHz
IEEE802.11b	✓		✓	
IEEE802.11g	✓		✓	
IEEE802.11n	✓	✓	✓	✓

(2TX / 2RX)



IEEE802.11n

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
0	BPSK	1/2	1	52	108	26	54	6.5	13.5	7.2	15.0
1	QPSK	1/2	2	104	216	52	108	13.0	27.0	14.4	30.0
2	QPSK	3/4	2	104	216	78	162	19.5	40.5	21.7	45.0
3	16-QAM	1/2	4	208	432	104	216	26.0	54.0	28.9	60.0
4	16-QAM	3/4	4	208	432	156	324	39.0	81.0	43.3	90.0
5	64-QAM	2/3	6	312	648	208	432	52.0	108.0	57.8	120.0
6	64-QAM	3/4	6	312	648	234	486	58.5	121.5	65.0	135.0
7	64-QAM	5/6	6	312	648	260	540	65.0	135.0	72.2	150.0
Note 1: Support of 400ns GI is optional on transmit and receive.											

Table 1 – MCS parameters for TX Antenna number = 1

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI	
								20MHz	40MHz	20MHz	40MHz
8	BPSK	1/2	1	104	216	52	108	13.0	27.0	14.4	30.0
9	QPSK	1/2	2	208	432	104	216	26.0	54.0	28.9	60.0
10	QPSK	3/4	2	208	432	156	324	39.0	81.0	43.3	90.0
11	16-QAM	1/2	4	416	864	208	432	52.0	108.0	57.8	120.0
12	16-QAM	3/4	4	416	864	312	648	78.0	162.0	86.7	180.0
13	64-QAM	2/3	6	624	1296	416	864	104.0	216.0	115.6	240.0
14	64-QAM	3/4	6	624	1296	468	972	117.0	243.0	130.0	270.0
15	64-QAM	5/6	6	624	1296	520	1080	130.0	270.0	144.4	300.0
Note 1: Support of 400ns GI is optional on transmit and receive.											

Table 2 – MCS parameters for TX Antenna number = 2

Symbol	Explanation
R	Code rate
N_{BPSC}	Number of coded bits per single carrier
N_{CBPS}	Number of coded bits per symbol
N_{DBPS}	Number of data bits per symbol
GI	guard interval

IEEE 802.11b/g & IEEE 802.11n (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
001	2412 MHz	002	2417 MHz	003	2422 MHz	004	2427 MHz
005	2432 MHz	006	2437 MHz	007	2442 MHz	008	2447 MHz
009	2452 MHz	010	2457 MHz	011	2462 MHz		

IEEE 802.11n (40MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
003	2422 MHz	004	2427 MHz	005	2432 MHz	006	2437 MHz
007	2442 MHz	008	2447 MHz	009	2452 MHz		

Note:

1. This device is a Wireless N VDSL2 VoIP Combo WAN Gigabit IAD including 2.4GHz 11b/g and 11n (2x2) transmitting and receiving function.
2. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.247.
3. Regards to the frequency band operation; the lowest、middle and highest frequency of channel were selected to perform the test, and then shown on this report.
4. This device is a composite device in accordance with Part 15 regulations. The receiving function receiving was tested and its test report number is 138094R-RFUSP37V02under Declaration of Conformity.

1.2. Operational Description

EUT is Wireless N VDSL2 VoIP Combo WAN Gigabit IAD includes wireless LAN function with 11 channels. This device provided maximum 300bps of transmitting speed. The device of RF carrier is CCK, DQPSK, DBPSK, BPSK, QPSK, 16-QAM and 64-QAM. The device adapts Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplex-ing (OFDM) modulation. The antenna is internal Printed Antenna.

This is a Wireless N VDSL2 VoIP Combo WAN Gigabit IAD. It allows your computer to connect to a wireless network and access to internet by Wi-Fi technical. Operation in 2.4GHz Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency Division Multiplex-ing (OFDM) radio transmission, the EUT transfers data at speeds up to 64/128-bit Wired Equivalent Protection (WEP) algorithm and the new industrial-strength WPA (Wi-Fi Protected AccessTM) security is used. In addition, its standard compliance ensures that it can communicate with any 802.11b/g/n network. The more details related operations, please refer to the user manual.

The transmitter oscillators which comprise the translational loop architecture are internal to the transceiver IC(Broadcom BCM63168) and are phase locked to a 3.2GHz reference signal derived from the 40 MHz crystal. The internal oscillator fractional-N phase lock loop operates on a fundamental frequency from 2412 MHz to 2462 MHz. The VMG8324-B10A is a 2x2 MIMO device for 2.4GHz. The VMG8324-B10A is a 2x2 MIMO device for 2.4GHz.

1.3. Test Mode

QuieTek has verified the construction and function in typical operation. The preliminary tests were performed in different data rate, and to find the worst condition, which was shown in this test report. The following table is the final test mode.

TX	Mode 1: Transmit

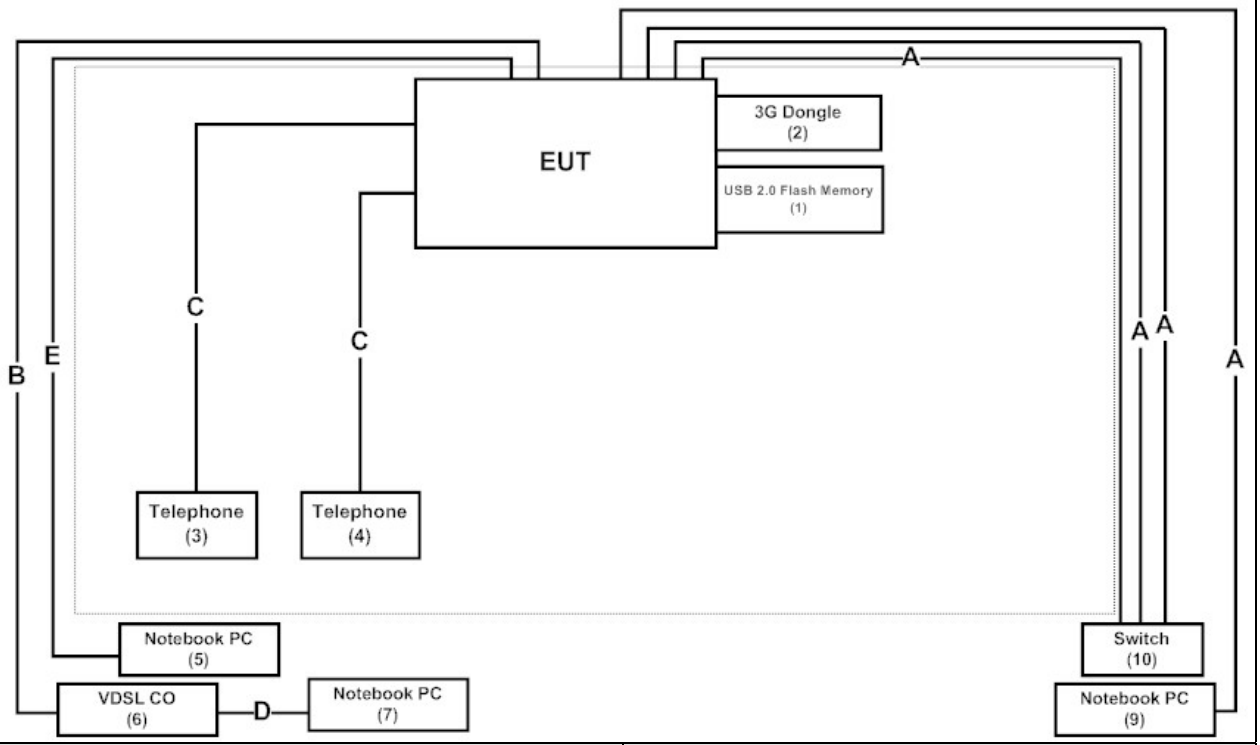
Test Items	Modulation	Antenna	Channel	Result
Conducted Emission	11n(40MHz)	0+1	6	Complies
Peak Power Output	b	0	1/ 6/ 11	Complies
	g	0	1/ 6/ 11	Complies
	11n(20MHz)	0+1	1/ 6/ 11	Complies
	11n(40MHz)	0+1	3/ 6/ 9	Complies
Radiated Emission	b	0	1/ 6/ 11	Complies
	g	0	1/ 6/ 11	Complies
	11n(20MHz)	0+1	1/ 6/ 11	Complies
	11n(40MHz)	0+1	3/ 6/ 9	Complies
RF antenna conducted test	b	0	1/ 11	Complies
	g	0	1/ 11	Complies
	11n(20MHz)	0/1	1/ 11	Complies
	11n(40MHz)	0/1	3/ 9	Complies
Radiated Emission Band Edge	b	0	1/ 11	Complies
	g	0	1/ 11	Complies
	11n(20MHz)	0+1	1/ 11	Complies
	11n(40MHz)	0+1	3/ 9	Complies
Occupied Bandwidth	b	0	1/ 6/ 11	Complies
	g	0	1/ 6/ 11	Complies
	11n(20MHz)	0/1	1/ 6/ 11	Complies
	11n(40MHz)	0/1	3/ 6/ 9	Complies
Power Density	b	0	1/ 6/ 11	Complies
	g	0	1/ 6/ 11	Complies
	11n(20MHz)	0+1	1/ 6/ 11	Complies
	11n(40MHz)	0+1	3/ 6/ 9	Complies

1.4. 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.	FCC ID	Power Cord
1	USB 2.0 Flash Memory	Apacer	AH223	N/A	DoC	--
2	3G Dongle	HUAWEI	E353 HSP+USB Stiek	N/A	DoC	--
3	Telephone	TENTEL	K-302	41230008000054	DoC	--
4	Telephone	TENTEL	K-302	50721005000552	DoC	--
5	Notebook PC	HP	110-3010TU	CNC03522LN	DoC	Non-Shielded, 1m
6	VDSL CO	ZyXEL	VES-1608FE-53 A	N/A	DoC	Non-Shielded, 1.8
7	Notebook PC	HP	NX6320	CNU62D1F5Y	DoC	Non-Shielded, 1.8m
8	Notebook PC	ASUS	A43S	C3N0BC173825113	DoC	Non-Shielded, 1.8m, one ferrite core bonded
9	Notebook PC	HP	110-3010TU	CNC0343H3R	DoC	Non-Shielded, 1m
10	Switch	D-Link	DGS1216T	F360298000076	DoC	Non-Shielded, 1.8m

1.5. Configuration of tested System

Connection Diagram


Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 10m, 4PCS
B	Telephone Cable	Non-Shielded, 10m
C	Telephone Cable	Non-Shielded, 2.0m, 2PCS
D	LAN Cable	Non-Shielded, 3m
E	LAN Cable	Non-Shielded, 10m, 1PCS

1.6. EUT Exercise Software

1	Test system is in accord with EUT user manual (refer to 1.5 configuration of tested system)
2	Turn on the power of all equipment.
3	Execute the telnet command to control the EUT.
4	Configure the test mode, the test channel, and the data rate.
5	Press “TX command” to start the continuous transmitting.
6	Verify that the EUT works properly.

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.207 Conducted Emission	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Peak Power Output	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Radiated Emission	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 RF antenna conducted test	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Band Edge	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Occupied Bandwidth	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.247 Power Density	15 - 35	25
Humidity (%RH)		25 - 75	45
Barometric pressure (mbar)		860 - 1060	950-1000

2. Conducted Emission

2.1. Test Equipment

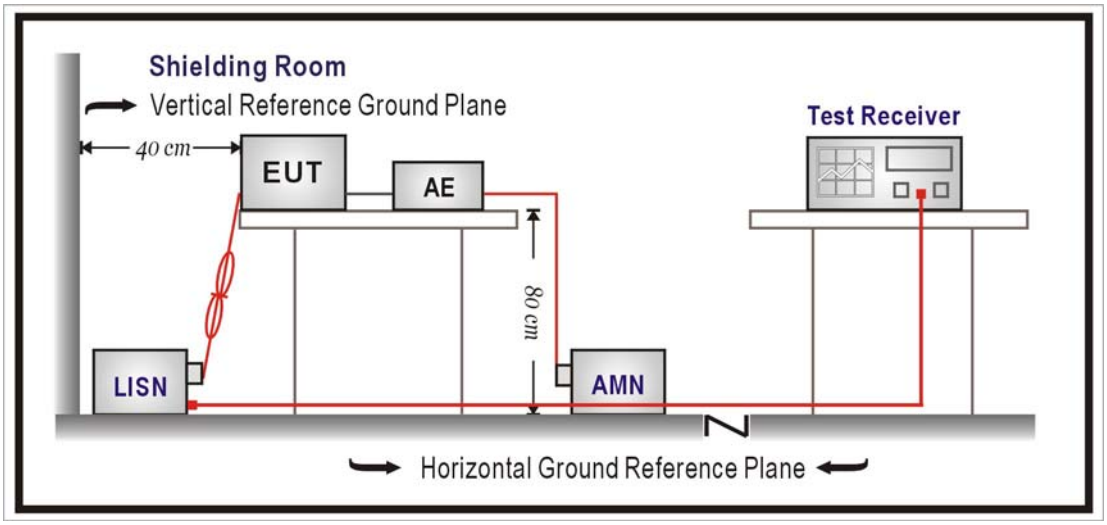
The following test equipments are used during the test:

Conducted Emission / SR2

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	2014/01/24
LISN	R&S	ENV216	100092	2014/08/08
Test Receiver	R&S	ESCS 30	825442/014	2014/07/30

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

2.2. Test Setup



2.3. Limits

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

Remarks: In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of KDB558074 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.

2.5. Test Specification

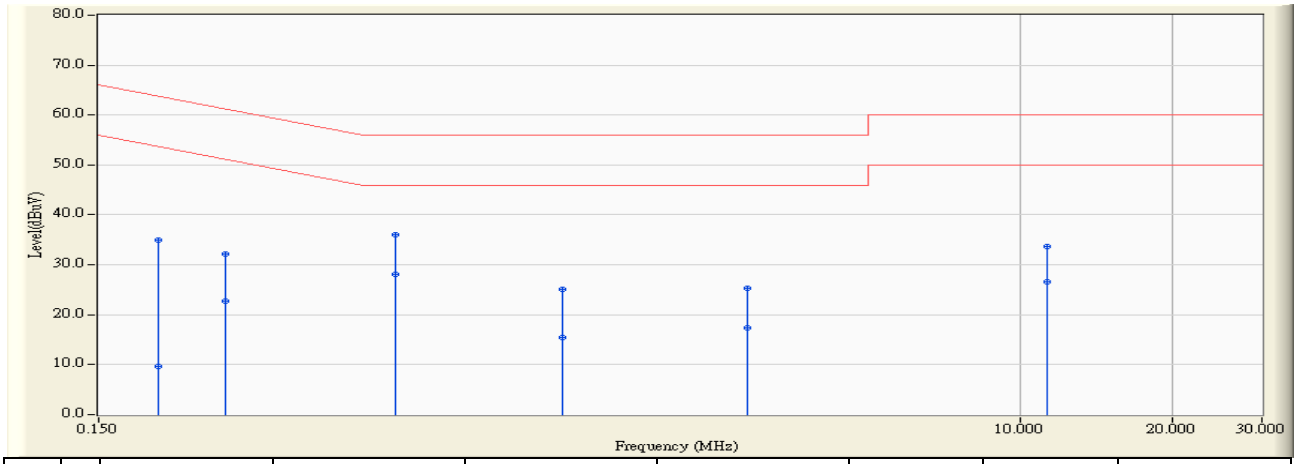
According to FCC Part 15 Subpart C Paragraph 15.207: 2012

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR2	**Time : 2013/09/11 - 18:57**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-3_0822 - Line1	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : mode1:Transmit_802.11n40MHz 2437MHz**

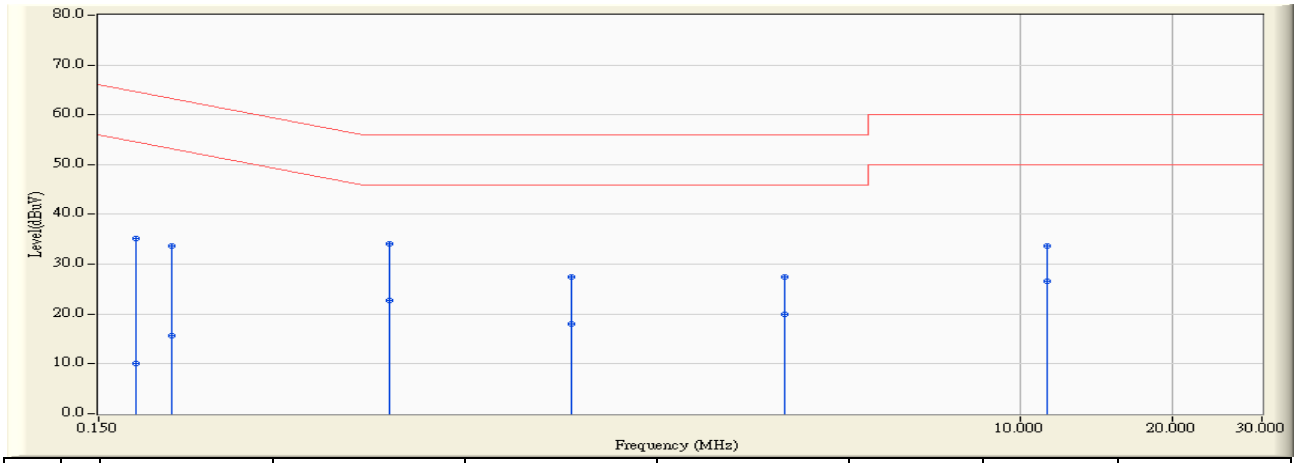


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.197	9.644	25.290	34.934	-28.807	63.741	QUASIPEAK
2		0.197	9.644	0.100	9.744	-43.997	53.741	AVERAGE
3		0.267	9.663	22.480	32.143	-29.062	61.205	QUASIPEAK
4		0.267	9.663	13.030	22.693	-28.512	51.205	AVERAGE
5		0.580	9.733	26.310	36.043	-19.957	56.000	QUASIPEAK
6	*	0.580	9.733	18.340	28.073	-17.927	46.000	AVERAGE
7		1.244	9.766	15.220	24.987	-31.013	56.000	QUASIPEAK
8		1.244	9.766	5.730	15.497	-30.503	46.000	AVERAGE
9		2.888	9.884	15.440	25.324	-30.676	56.000	QUASIPEAK
10		2.888	9.884	7.540	17.424	-28.576	46.000	AVERAGE
11		11.248	10.142	23.510	33.652	-26.348	60.000	QUASIPEAK
12		11.248	10.142	16.500	26.642	-23.358	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : SR2	**Time : 2013/09/11 - 19:11**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR2_LISN(16A)-3_0822 - Line2	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : mode1:Transmit_802.11n40MHz 2437MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.177	9.628	25.630	35.258	-29.352	64.609	QUASIPEAK
2		0.177	9.628	0.460	10.088	-44.522	54.609	AVERAGE
3		0.209	9.635	24.090	33.726	-29.535	63.261	QUASIPEAK
4		0.209	9.635	6.090	15.726	-37.535	53.261	AVERAGE
5	*	0.564	9.713	24.330	34.043	-21.957	56.000	QUASIPEAK
6		0.564	9.713	12.940	22.653	-23.347	46.000	AVERAGE
7		1.291	9.752	17.670	27.422	-28.578	56.000	QUASIPEAK
8		1.291	9.752	8.350	18.102	-27.898	46.000	AVERAGE
9		3.423	9.891	17.560	27.452	-28.548	56.000	QUASIPEAK
10		3.423	9.891	10.120	20.012	-25.988	46.000	AVERAGE
11		11.279	10.171	23.510	33.681	-26.319	60.000	QUASIPEAK
12		11.279	10.171	16.500	26.671	-23.329	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

3. Peak Power Output

3.1. Test Equipment

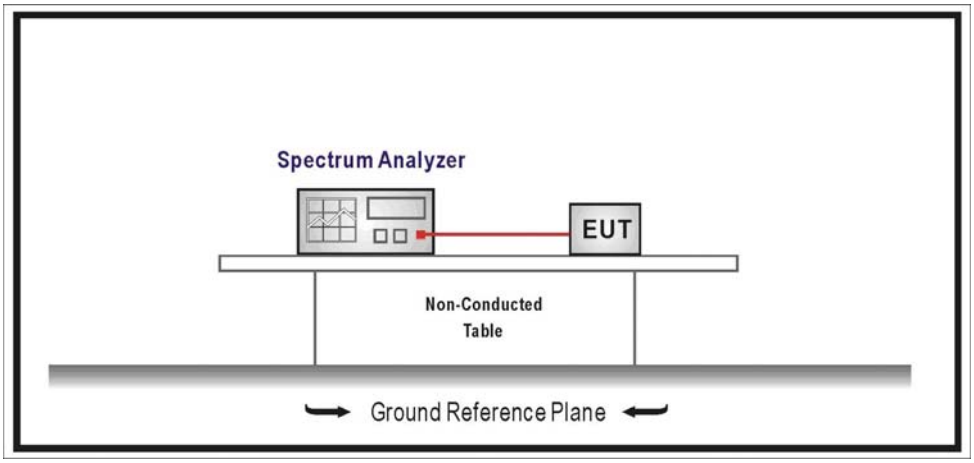
The following test equipments are used during the test:

Peak Power / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2014/08/05

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

3.2. Test Setup



3.3. Test procedures

The EUT was tested according to DTS test procedure section 9.1.2 of KDB558074 v03r01 measurement to FCC 47CFR 15.247 requirements. Set the RBW=1MHz, Set the VBW≧ 3xRBW, Sweep Time=Auto, Set Peak Detector.

3.4. Limits

The maximum peak power shall be less 1 Watt.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

3.6. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB.

3.7. Test Result

Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

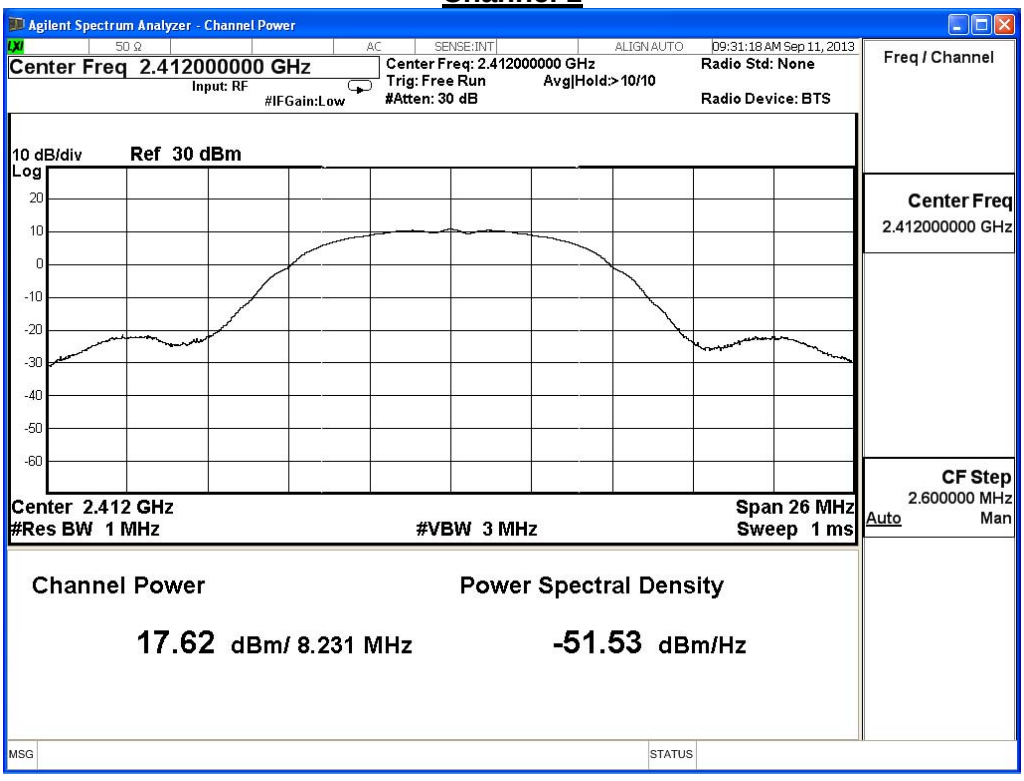
IEEE 802.11b				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	17.62	≦30	Pass
6	2437	19.16	≦30	Pass
11	2462	16.97	≦30	Pass

The worst emission of data rate is 1Mbps.

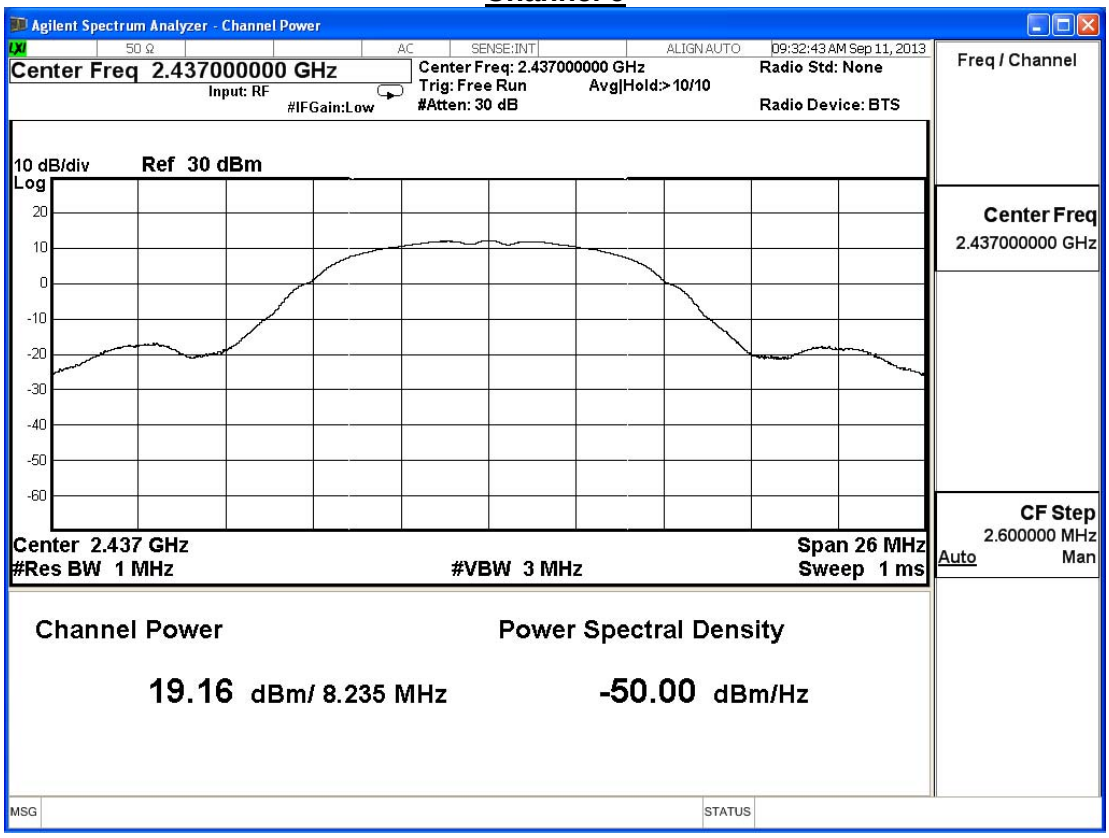
Peak Power Output Value(dBm)						
Channel No.	Frequency (MHz)	Data Rate (Mbps)				Required Limit
		1	2	5.5	11	
1	2412	17.62	--	--	--	1 Watt=30dBm
6	2437	19.16	19.06	18.82	18.71	1 Watt=30dBm
11	2462	16.97	--	--	--	1 Watt=30dBm

Note: Measure Level =Reading value + cable loss

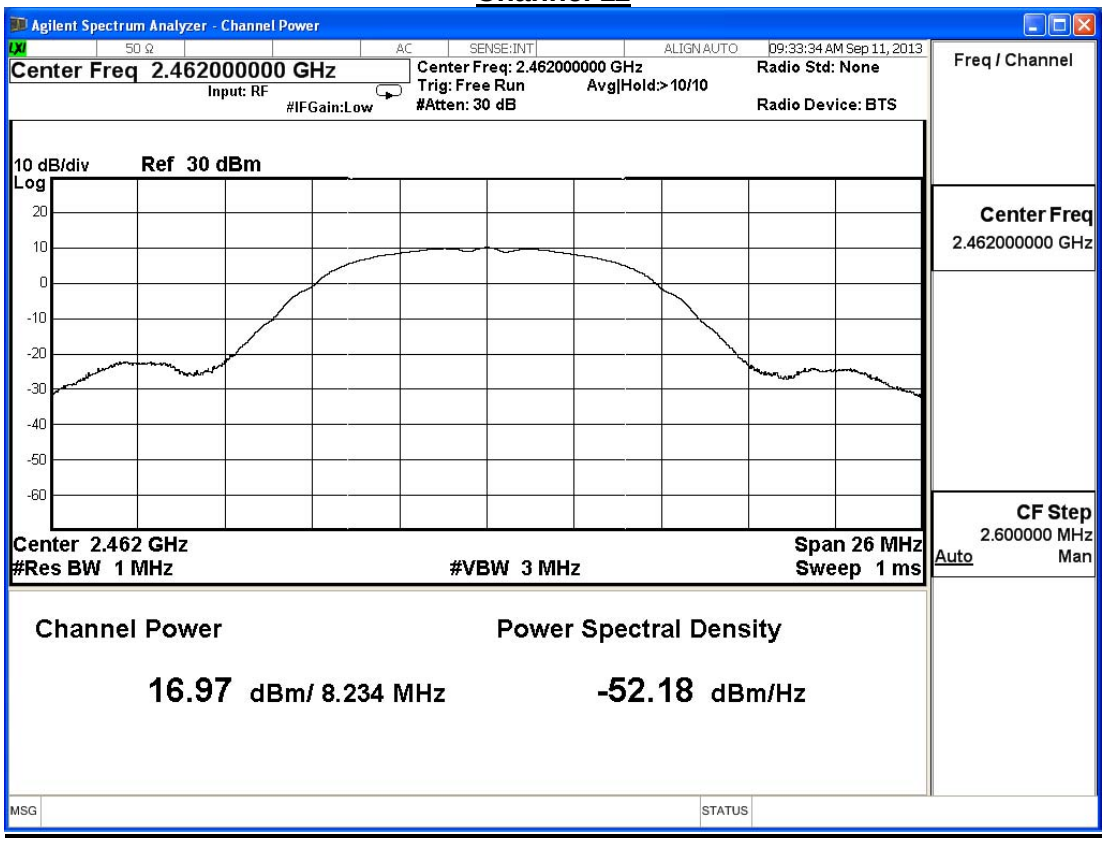
Channel 1



Channel 6



Channel 11



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

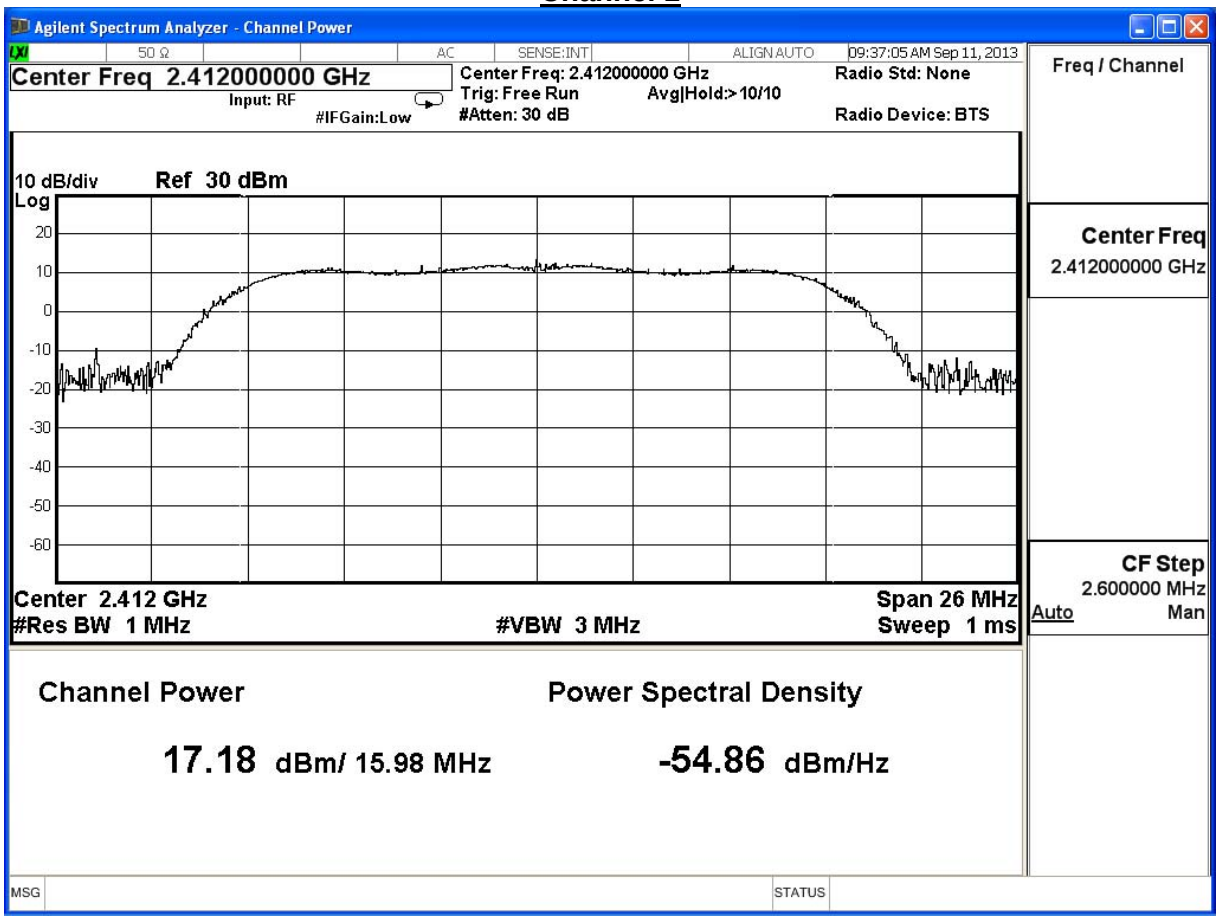
IEEE 802.11g				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	17.18	≦30	Pass
6	2437	21.68	≦30	Pass
11	2462	15.36	≦30	Pass

The worst emission of data rate is 6Mbps.

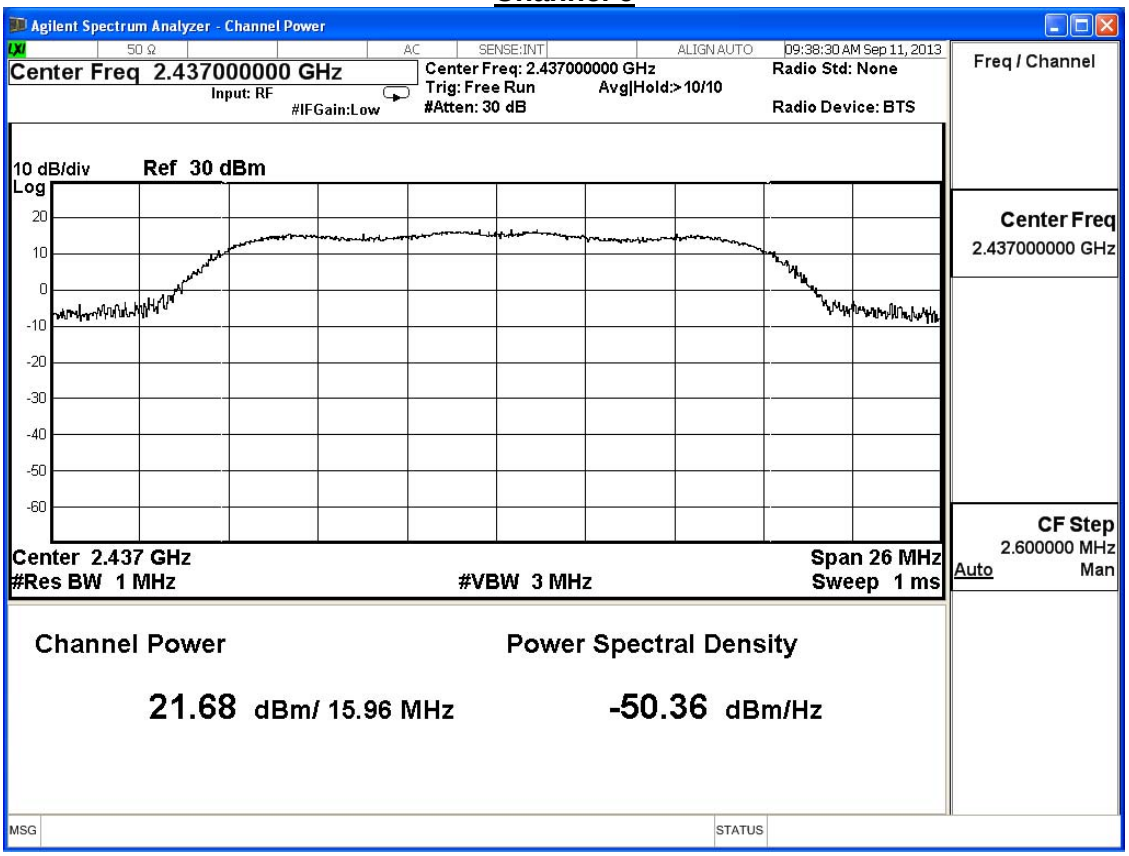
Peak Power Output (dBm)									
Channel No	Frequency (MHz)	Data Rate							Required Limit
		6	12	18	24	36	48	54	
1	2412	17.18	--	--	--	--	--	--	1 Watt=30dBm
6	2437	21.68	21.48	21.26	21.00	20.88	20.77	20.53	1 Watt=30dBm
11	2462	15.36	--	--	--	--	--	--	1 Watt=30dBm

Note: Measure Level =Reading value + cable loss

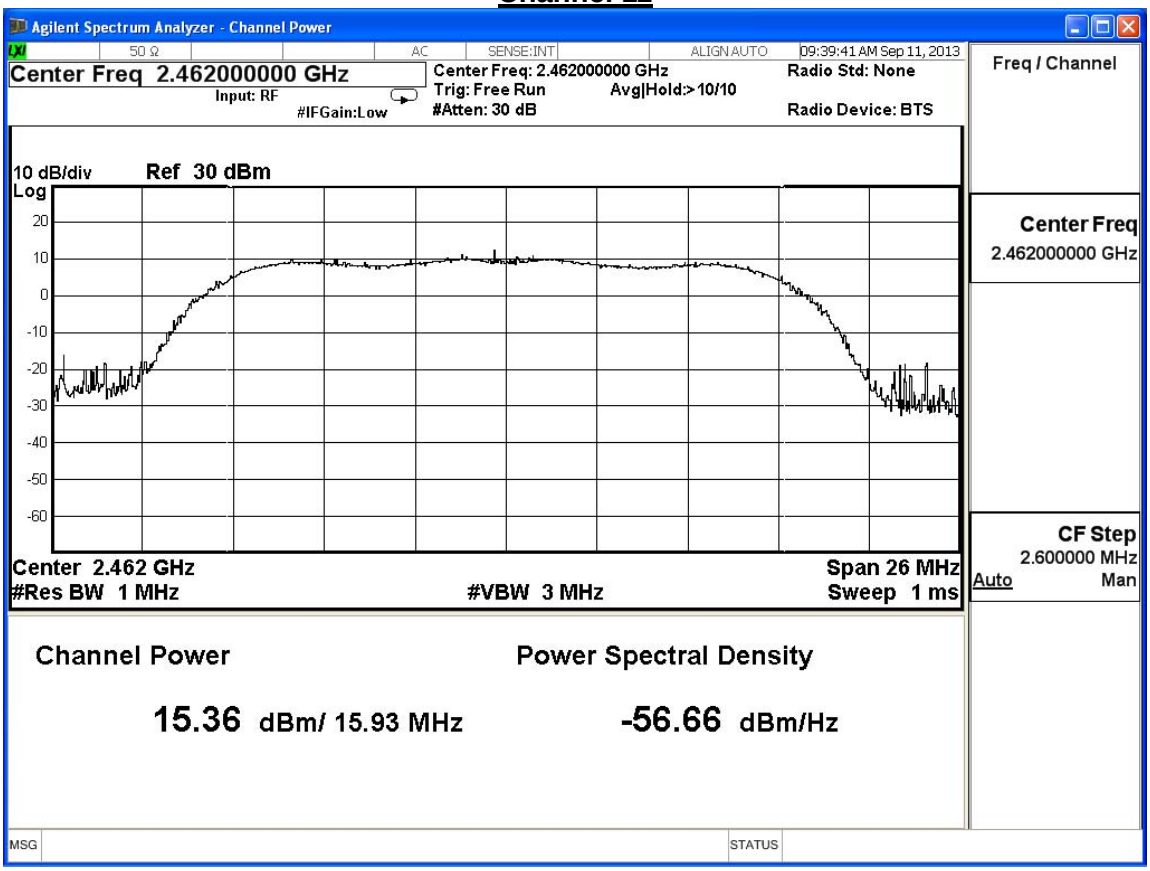
Channel 1



Channel 6



Channel 11



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

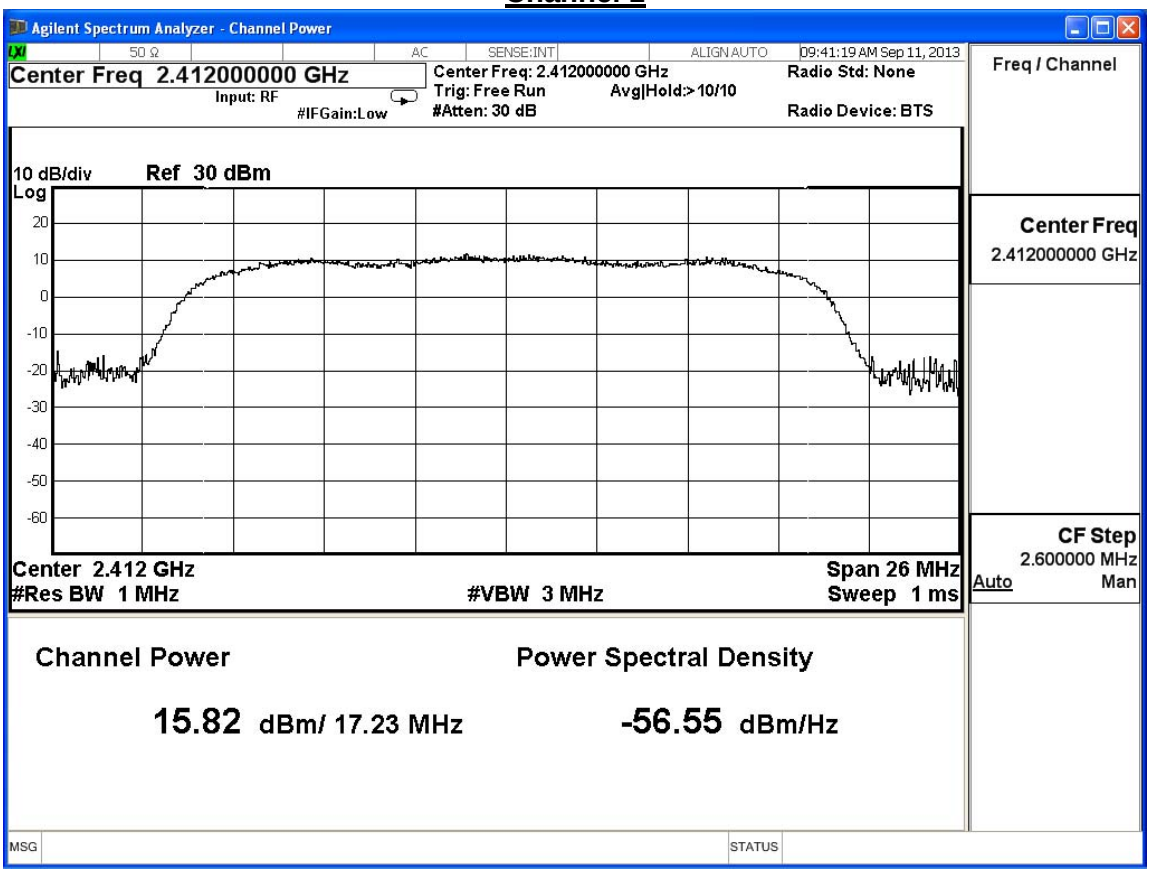
IEEE 802.11n 20MHz ANT0				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	15.82	≦29.29	Pass
6	2437	21.33	≦29.29	Pass
11	2462	15.57	≦29.29	Pass

The worst emission of data rate is 19.5Mbps.

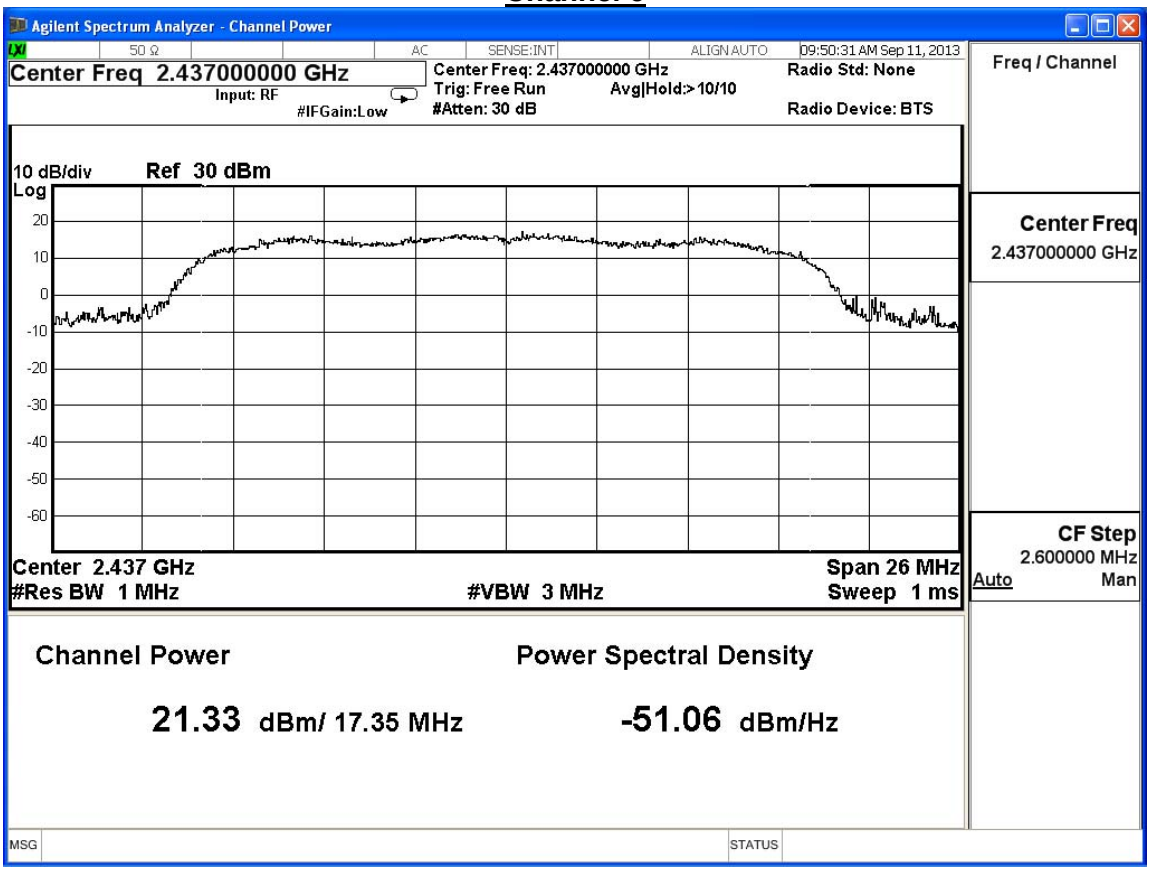
Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
1	2412	15.82	--	--	--	--	--	--	--	29.29dBm
6	2437	21.33	21.09	20.99	20.77	20.51	20.39	20.27	20.16	29.29dBm
11	2462	15.57	--	--	--	--	--	--	--	29.29dBm

Note:
Measure Level =Reading value + cable loss
Directional Gain = 10log(Ant) + Max Gain = 6.71dBi
Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

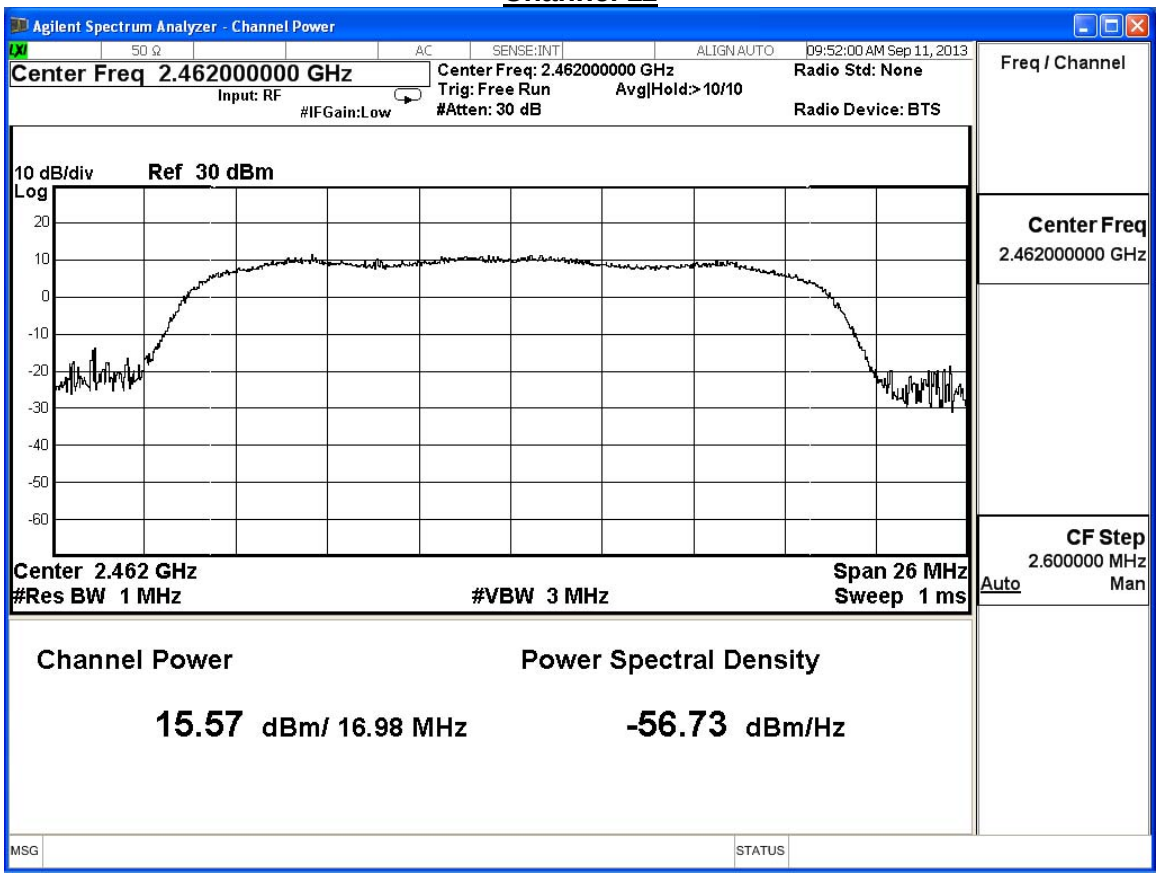
Channel 1



Channel 6



Channel 11



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

IEEE 802.11n 20MHz ANT1

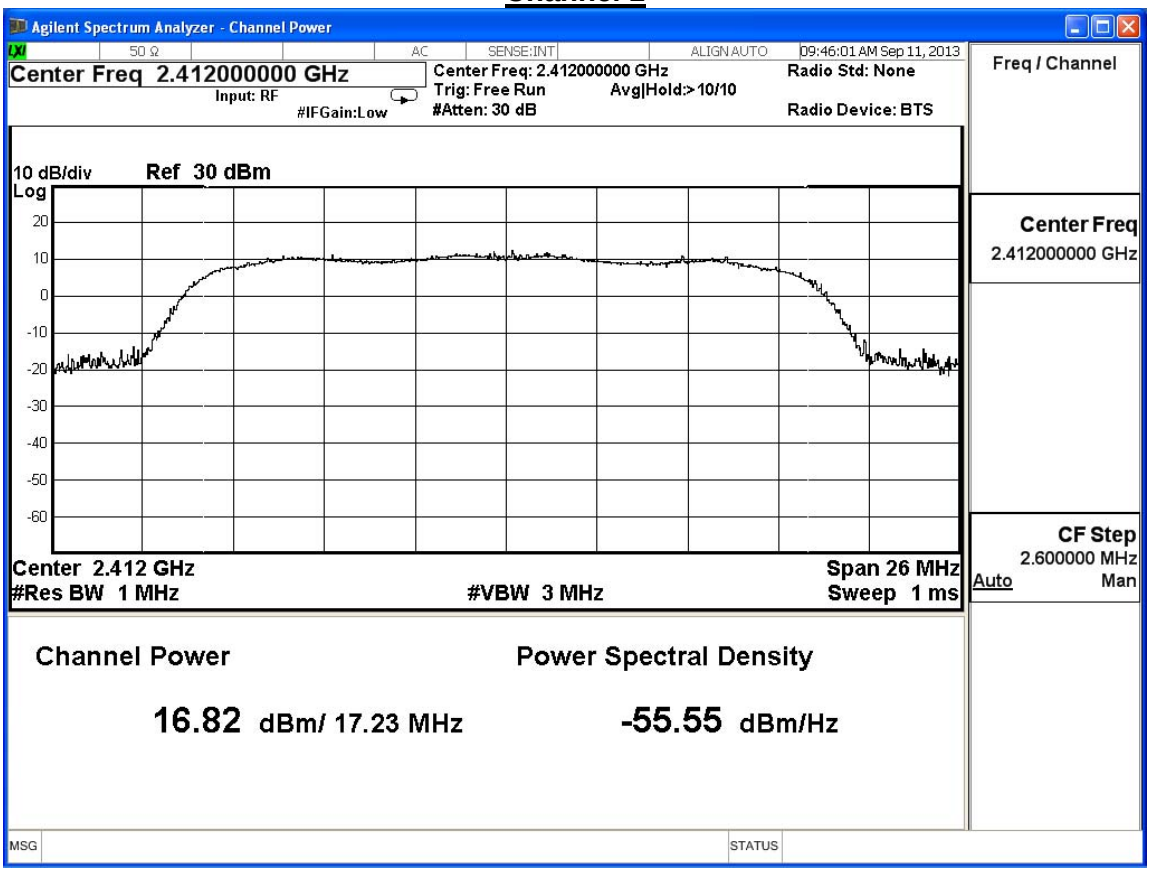
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	16.82	≦29.29	Pass
6	2437	22.60	≦29.29	Pass
11	2462	17.07	≦29.29	Pass

The worst emission of data rate is 19.5 Mbps.

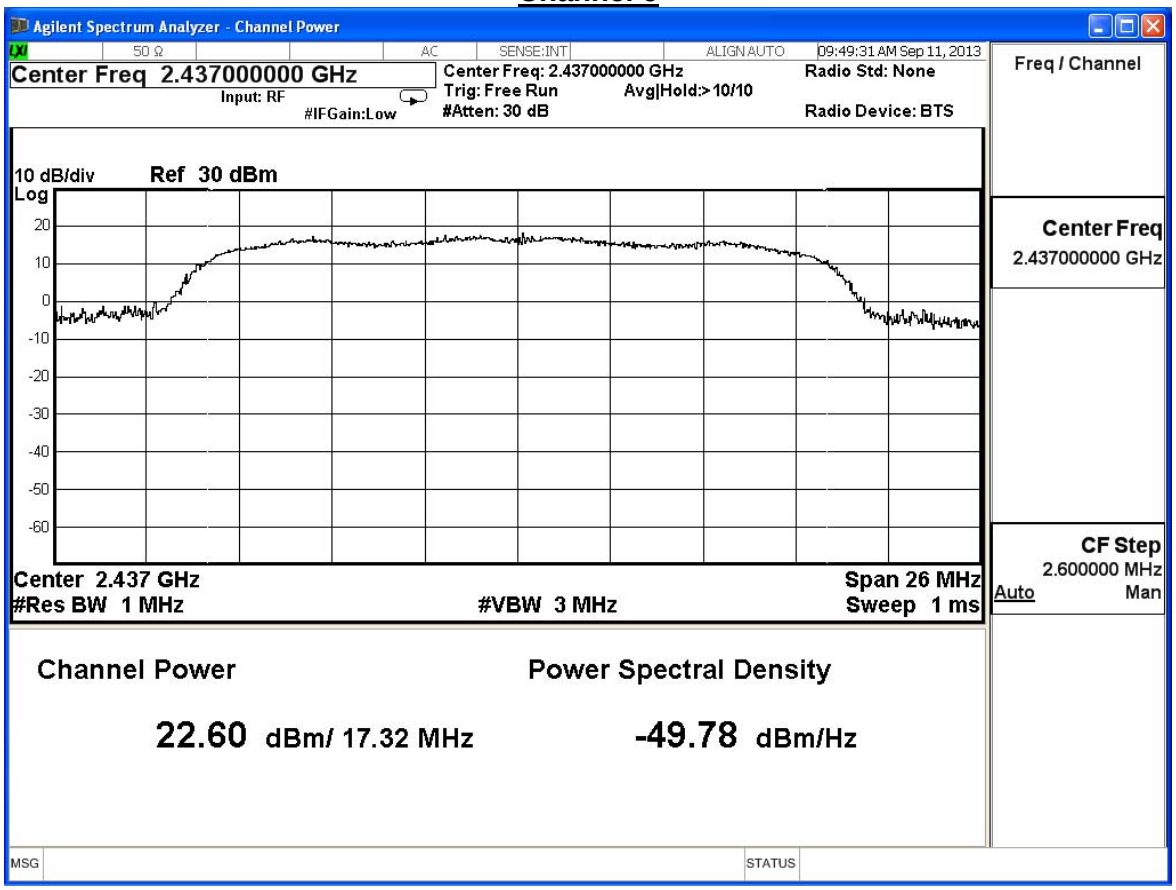
Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
1	2412	16.82	--	--	--	--	--	--	--	29.29dBm
6	2437	22.6	22.50	22.26	22.16	22.04	21.80	21.56	21.43	29.29dBm
11	2462	17.07	--	--	--	--	--	--	--	29.29dBm

Note:
Measure Level =Reading value + cable loss
Directional Gain = 10log(Ant) + Max Gain = 6.71dBi
Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

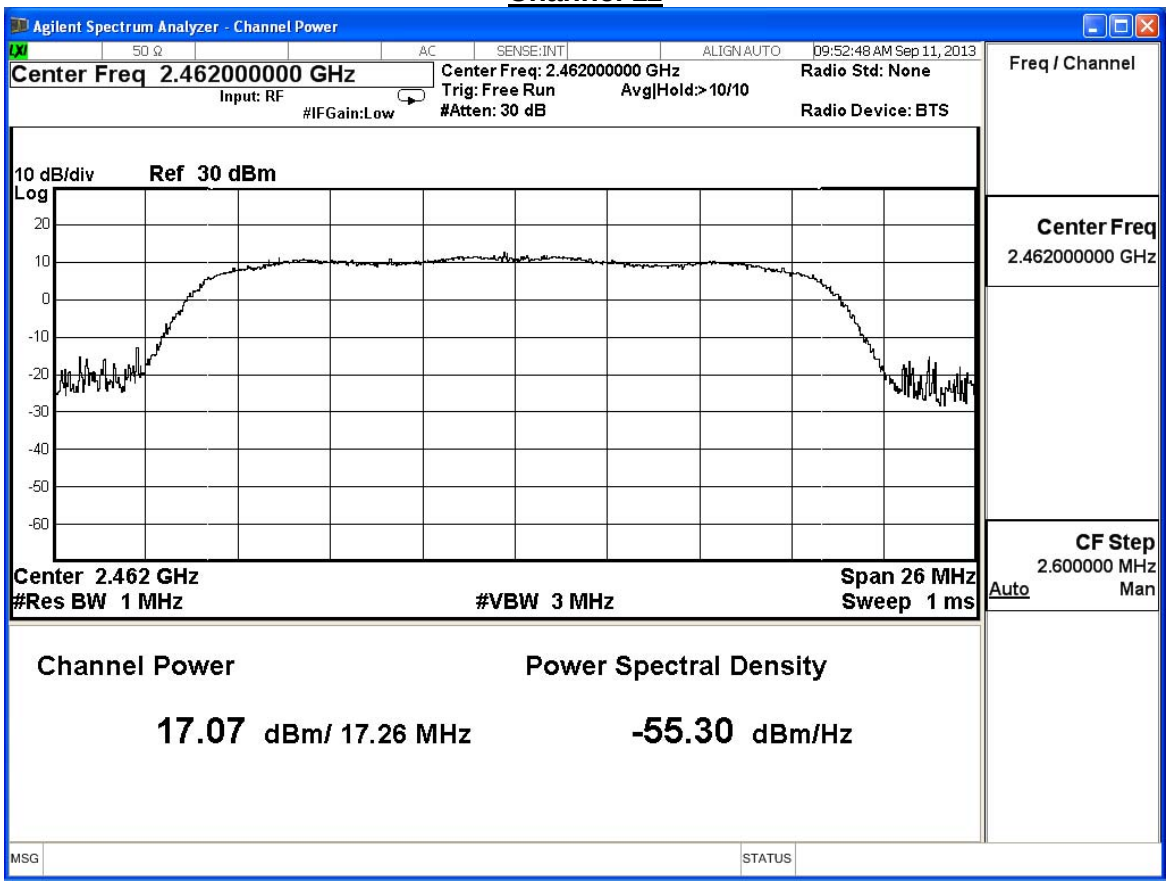
Channel 1



Channel 6



Channel 11



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

IEEE 802.11n 20MHz ANT0+1				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
1	2412	19.36	≦29.29	Pass
6	2437	25.02	≦29.29	Pass
11	2462	19.39	≦29.29	Pass

The worst emission of data rate is 19.5Mbps.

Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		19.5	39	58.5	78	117	156	175.5	195	
1	2412	19.36	--	--	--	--	--	--	--	29.29dBm
6	2437	25.02	24.86	24.68	24.53	24.35	24.16	23.97	23.85	29.29dBm
11	2462	19.39	--	--	--	--	--	--	--	29.29dBm

Note:

Measure Level =Reading value + cable loss

Directional Gain = 10log(Ant) + Max Gain = 6.71dBi

Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

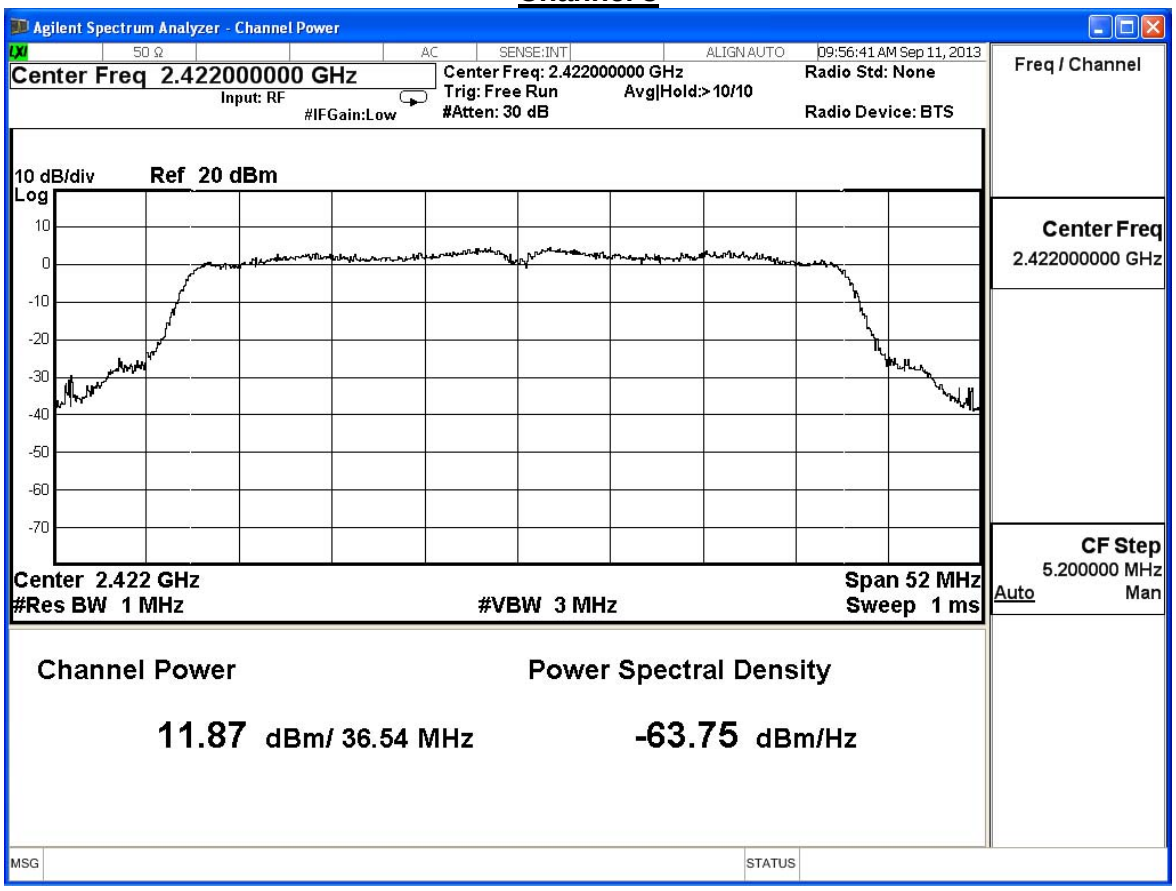
IEEE 802.11n 40MHz ANT0				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	11.87	≦29.29	Pass
6	2437	13.19	≦29.29	Pass
9	2452	10.15	≦29.29	Pass

The worst emission of data rate is 40.5Mbps.

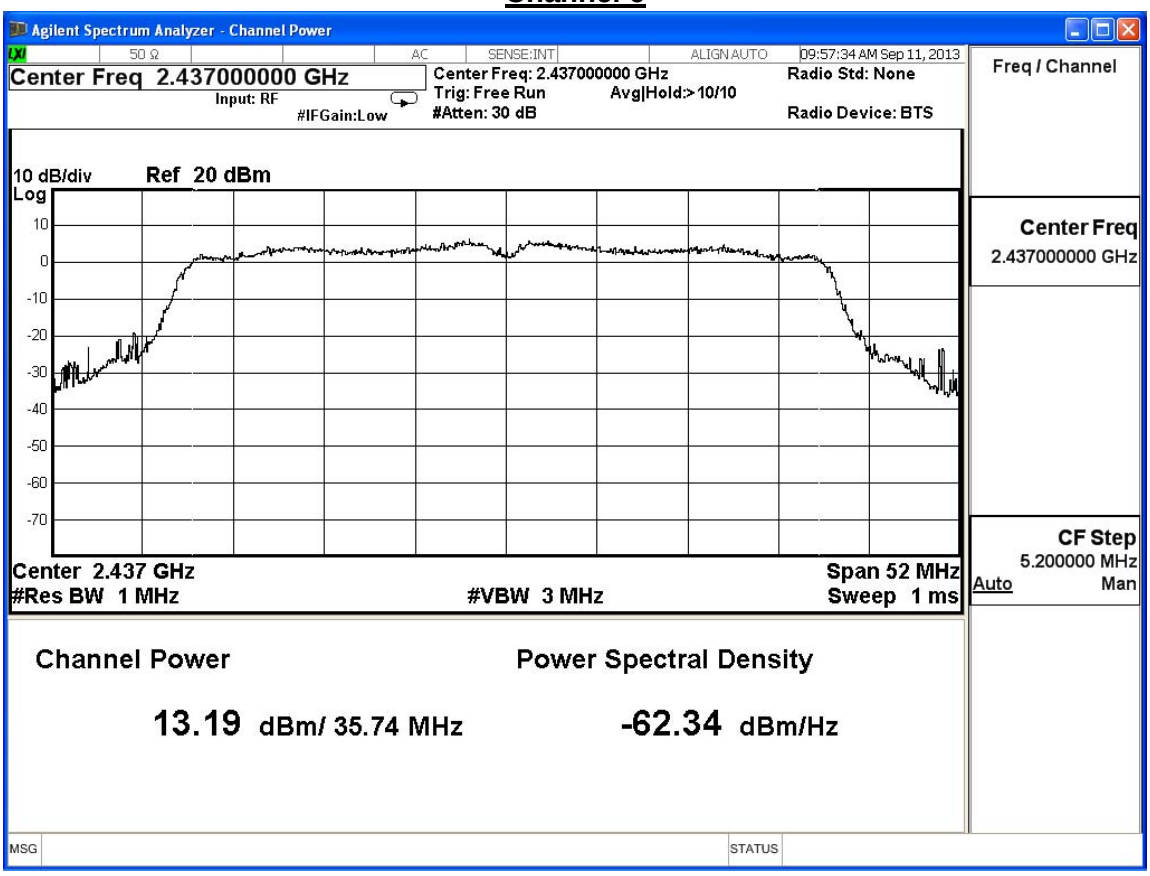
Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
3	2422	11.87	--	--	--	--	--	--	--	29.29dBm
6	2437	13.19	13.09	12.98	12.88	12.68	12.56	12.43	12.31	29.29dBm
9	2452	10.15	--	--	--	--	--	--	--	29.29dBm

Note:
Measure Level =Reading value + cable loss
Directional Gain = 10log(Ant) + Max Gain = 6.71dBi
Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

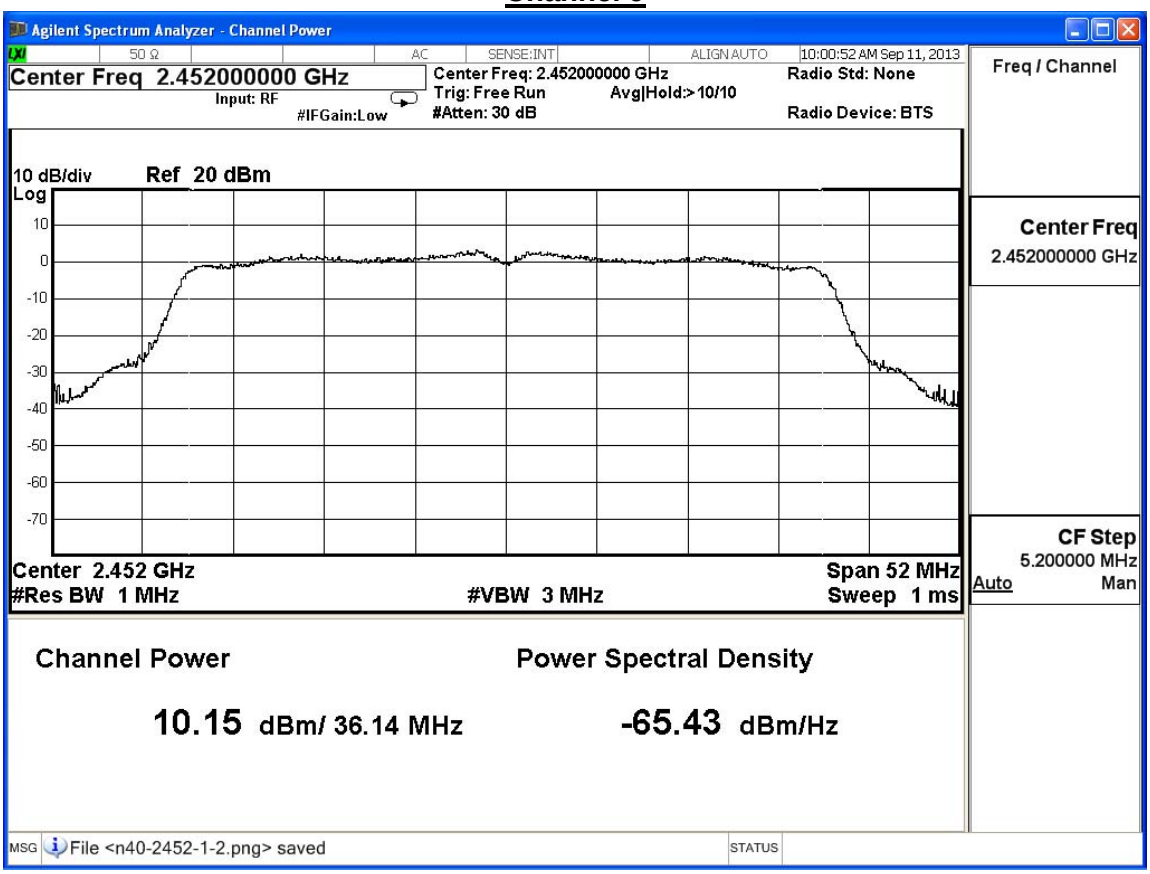
Channel 3



Channel 6



Channel 9



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

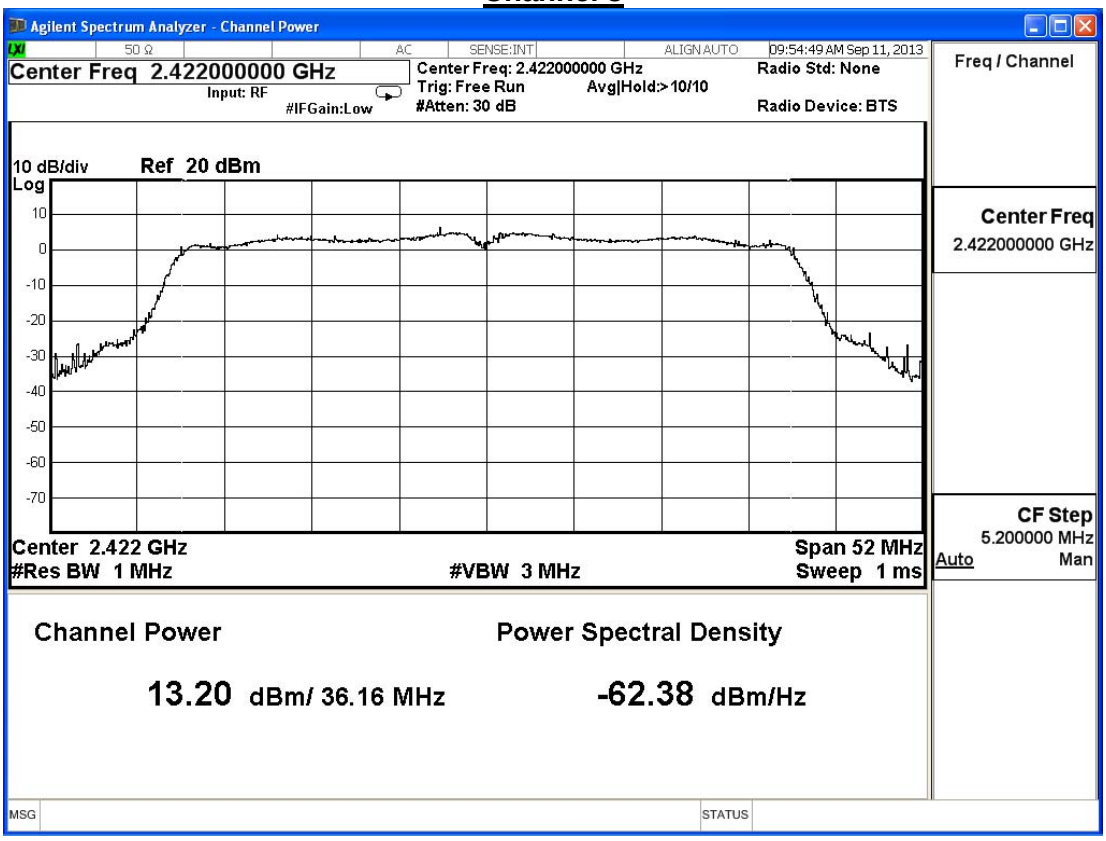
IEEE 802.11n 40MHz ANT1				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	13.20	≦29.29	Pass
6	2437	14.49	≦29.29	Pass
9	2452	11.67	≦29.29	Pass

The worst emission of data rate is 40.5Mbps.

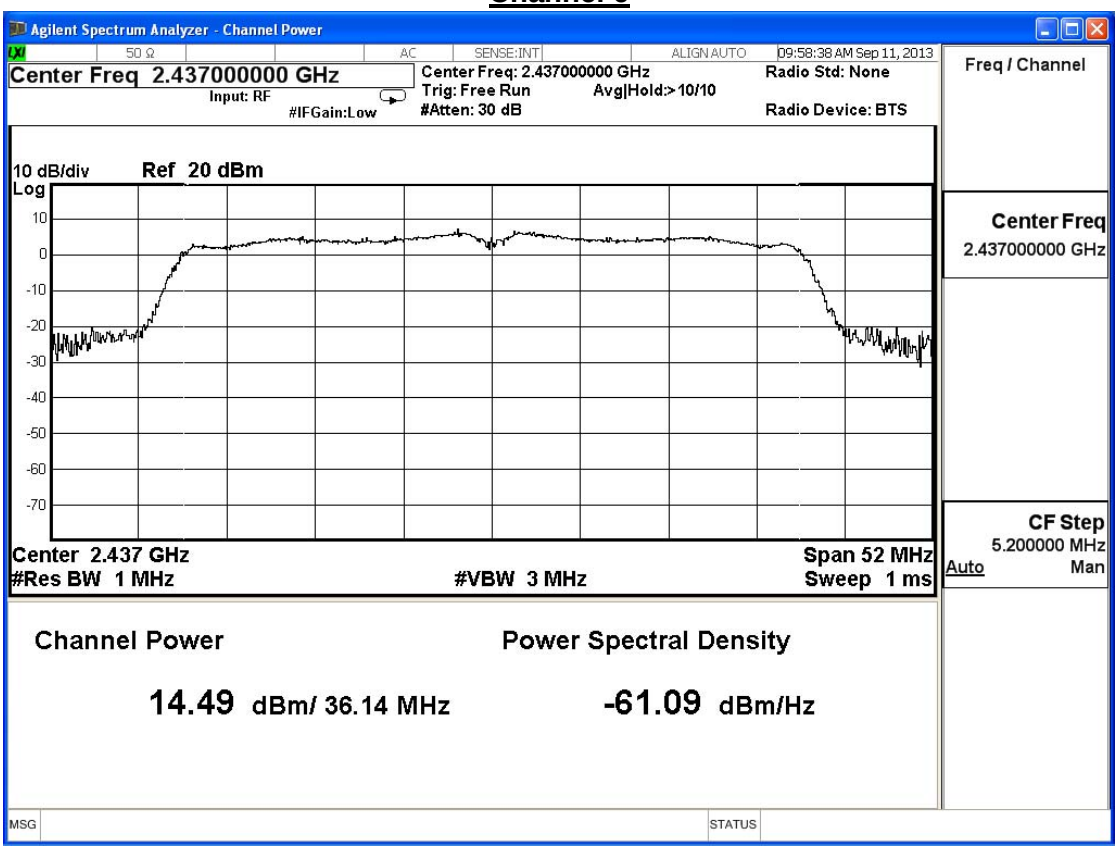
Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
3	2422	13.20	--	--	--	--	--	--	--	29.29dBm
6	2437	14.49	14.29	14.19	13.93	13.83	13.59	13.47	13.35	29.29dBm
9	2452	11.67	--	--	--	--	--	--	--	29.29dBm

Note:
Measure Level =Reading value + cable loss
Directional Gain = 10log(Ant) + Max Gain = 6.71dBi
Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

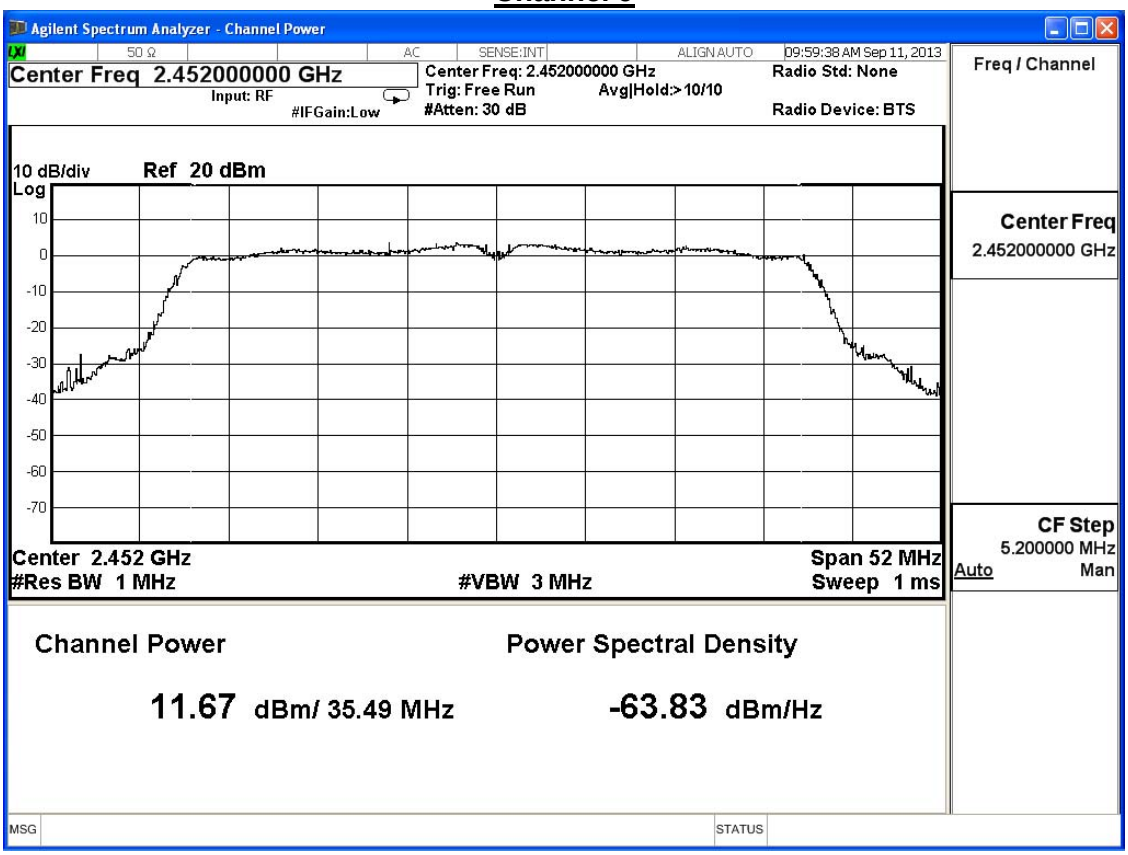
Channel 3



Channel 6



Channel 9



Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	Peak Power Output		
Test Mode	Mode 1: Transmit		
Date of Test	2013/09/11	Test Site	SR7

IEEE 802.11n 40MHz ANT0+1				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
3	2422	15.60	≦29.29	Pass
6	2437	16.90	≦29.29	Pass
9	2452	13.99	≦29.29	Pass

The worst emission of data rate is 40.5Mbps.

Peak Power Output (dBm)										
MCS Index		8	9	10	11	12	13	14	15	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		40.5	81.0	121.5	162.0	243.0	324.0	364.5	405.0	
3	2422	15.60	--	--	--	--	--	--	--	29.29dBm
6	2437	16.90	16.74	16.64	16.45	16.30	16.12	15.99	15.87	29.29dBm
9	2452	13.99	--	--	--	--	--	--	--	29.29dBm

Note:

Measure Level =Reading value + cable loss

Directional Gain = 10log(Ant) + Max Gain = 6.71dBi

Limit = 30dBm – (6.71dBi – 6dB) = 29.29dBm

4. Radiated Emission

4.1. Test Equipment

The following test equipments are used during the test:

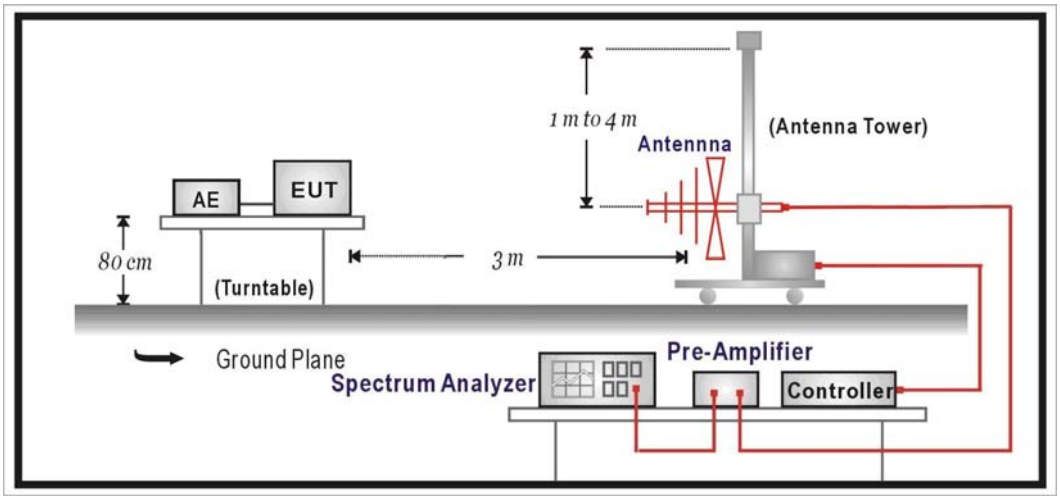
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895(CB1)	2014/08/14
Double Ridged Guide Horn Antenna	Schwarzback	BBHA 9120	D743	2014/02/17
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2014/06/09
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2014/02/19
Spectrum Analyzer	Agilent	E4440A	MY46187335	2014/01/27
k Type Cable	Huber Suhner	Sucoflex 102	25623/2	2014/02/21

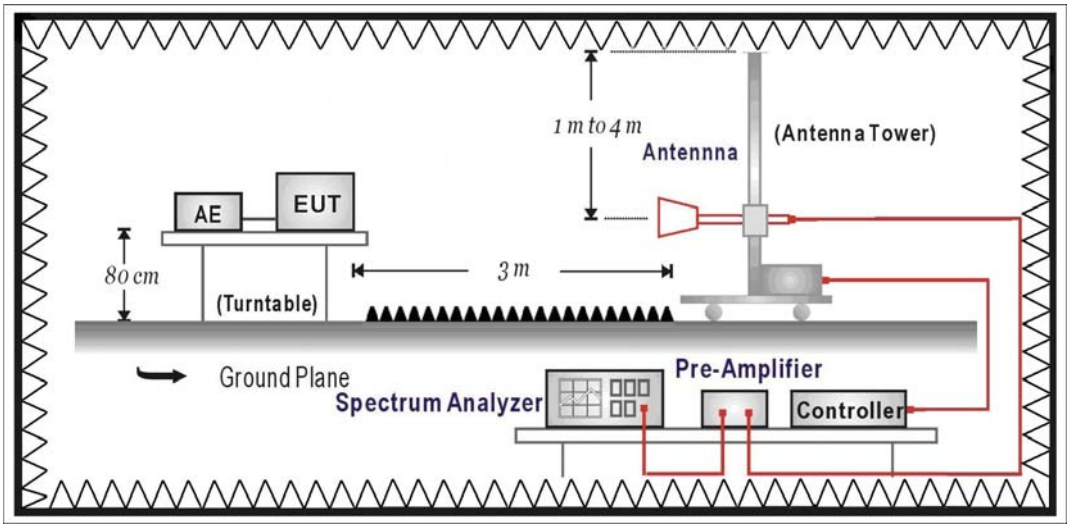
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	dBuV/m	dBuV/m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks: 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 DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4: 2009 on radiated measurement.
On any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit. The bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

4.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

4.6. Uncertainty

The measurement uncertainty

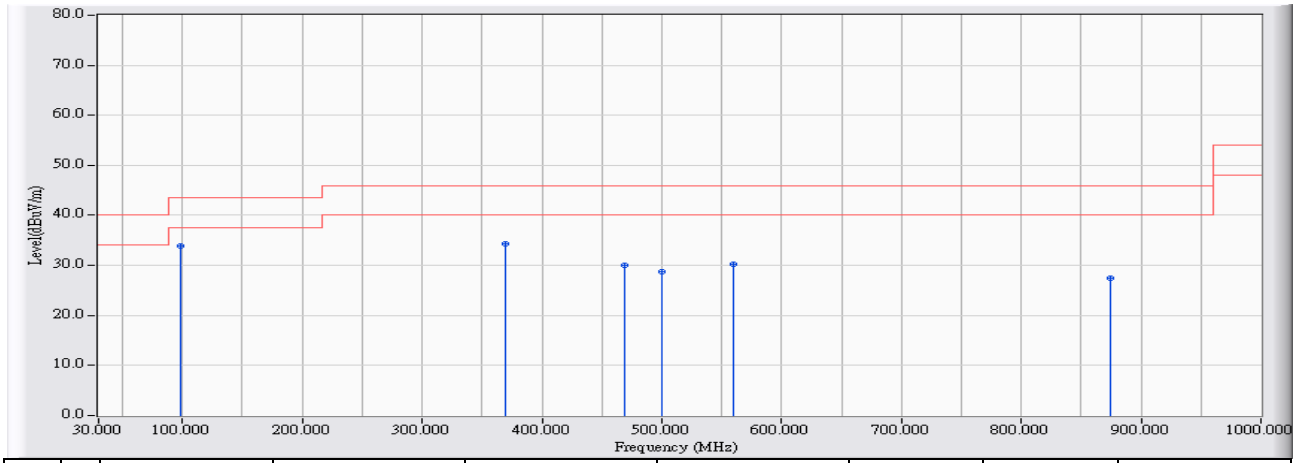
30MHz～1GHz as ±3.43dB

1GHz～26.5Ghz as ±3.65dB

4.7. Test Result

30MHz-1GHz Spurious

Site : CB1	**Time : 2013/09/09 - 09:57**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.211b 2437MHz**

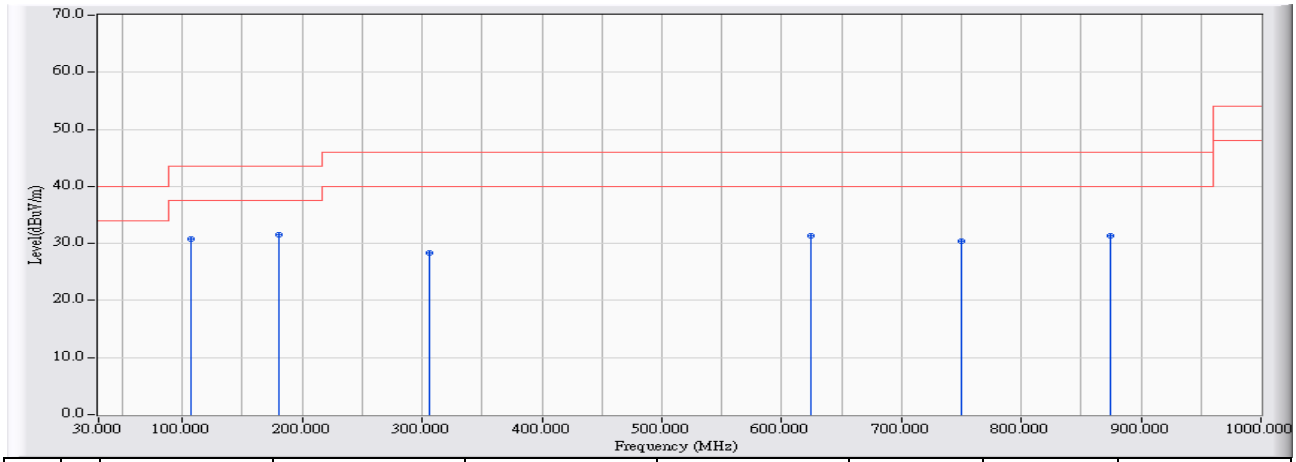


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	98.870	-23.444	57.238	33.794	-9.706	43.500	QUASIPEAK
2		369.500	-18.184	52.584	34.399	-11.601	46.000	QUASIPEAK
3		469.410	-16.058	46.145	30.086	-15.914	46.000	QUASIPEAK
4		500.450	-15.462	44.186	28.724	-17.276	46.000	QUASIPEAK
5		559.620	-15.377	45.598	30.221	-15.779	46.000	QUASIPEAK
6		874.870	-13.068	40.519	27.451	-18.549	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:01**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.211b 2437MHz**

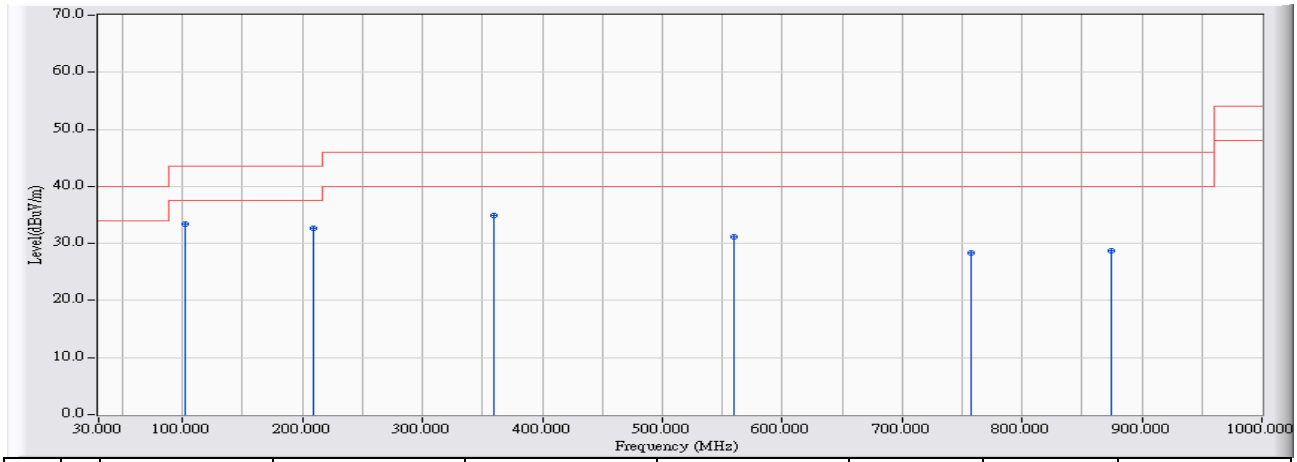


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		106.630	-22.846	53.693	30.847	-12.653	43.500	QUASIPEAK
2	*	180.350	-24.683	56.282	31.598	-11.902	43.500	QUASIPEAK
3		305.480	-19.807	48.058	28.252	-17.748	46.000	QUASIPEAK
4		624.610	-15.161	46.556	31.395	-14.605	46.000	QUASIPEAK
5		749.740	-13.992	44.372	30.380	-15.620	46.000	QUASIPEAK
6		874.870	-13.068	44.422	31.354	-14.646	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/13 - 08:54**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.211g 2437MHz**

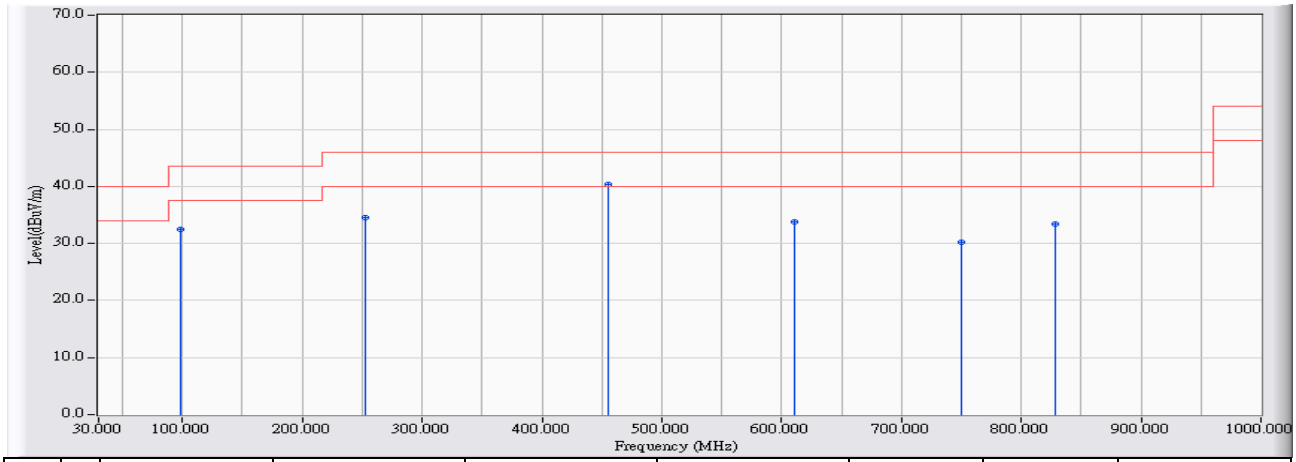


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	101.780	-23.088	56.530	33.442	-10.058	43.500	QUASIPEAK
2		209.450	-23.979	56.643	32.664	-10.836	43.500	QUASIPEAK
3		359.800	-18.430	53.245	34.815	-11.185	46.000	QUASIPEAK
4		559.620	-15.377	46.533	31.156	-14.844	46.000	QUASIPEAK
5		757.500	-13.886	42.210	28.324	-17.676	46.000	QUASIPEAK
6		874.870	-13.068	41.819	28.751	-17.249	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:11**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.211g 2437MHz**

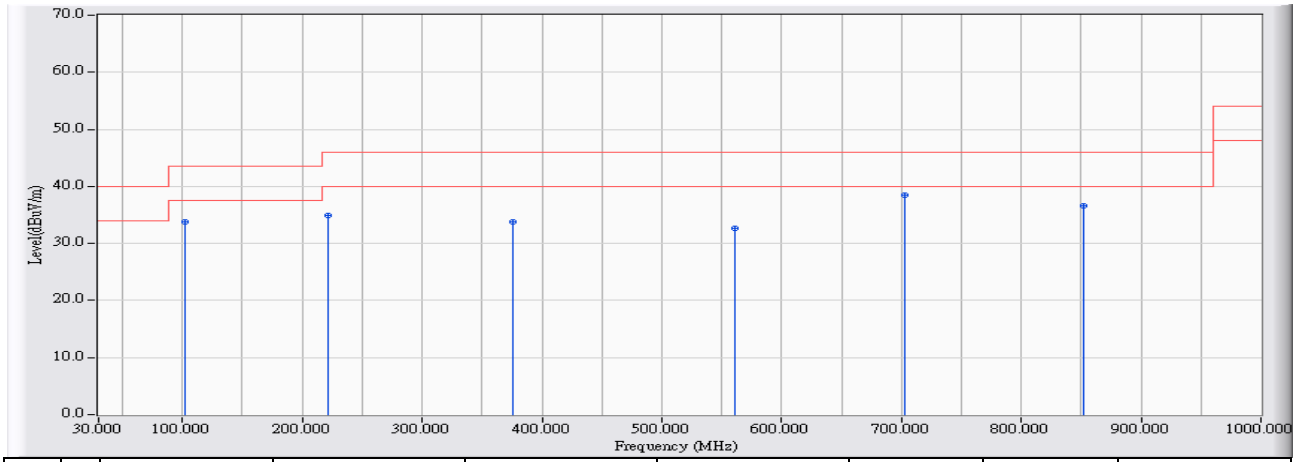


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		98.870	-23.444	55.927	32.483	-11.017	43.500	QUASIPEAK
2		253.100	-20.503	54.969	34.466	-11.534	46.000	QUASIPEAK
3	*	454.860	-16.343	56.605	40.262	-5.738	46.000	QUASIPEAK
4		611.030	-15.248	49.058	33.810	-12.190	46.000	QUASIPEAK
5		749.740	-13.992	44.212	30.220	-15.780	46.000	QUASIPEAK
6		828.310	-13.213	46.676	33.463	-12.537	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:15**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

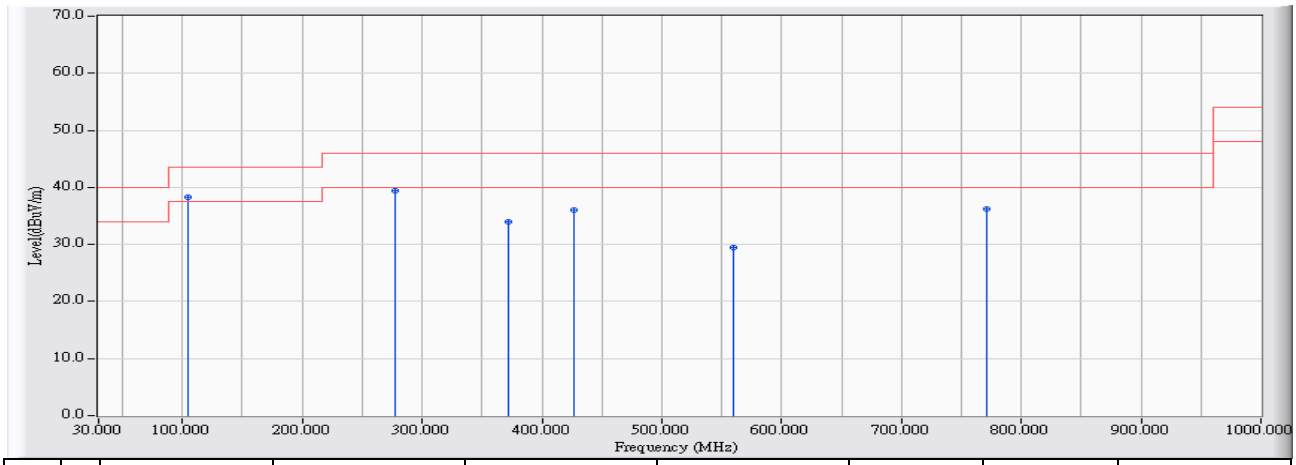


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		101.780	-23.088	56.861	33.773	-9.727	43.500	QUASIPEAK
2		222.060	-22.910	57.812	34.902	-11.098	46.000	QUASIPEAK
3		375.320	-18.037	51.855	33.818	-12.182	46.000	QUASIPEAK
4		560.590	-15.376	47.962	32.586	-13.414	46.000	QUASIPEAK
5	*	703.180	-14.633	53.115	38.482	-7.518	46.000	QUASIPEAK
6		851.590	-13.140	49.815	36.675	-9.325	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:19**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

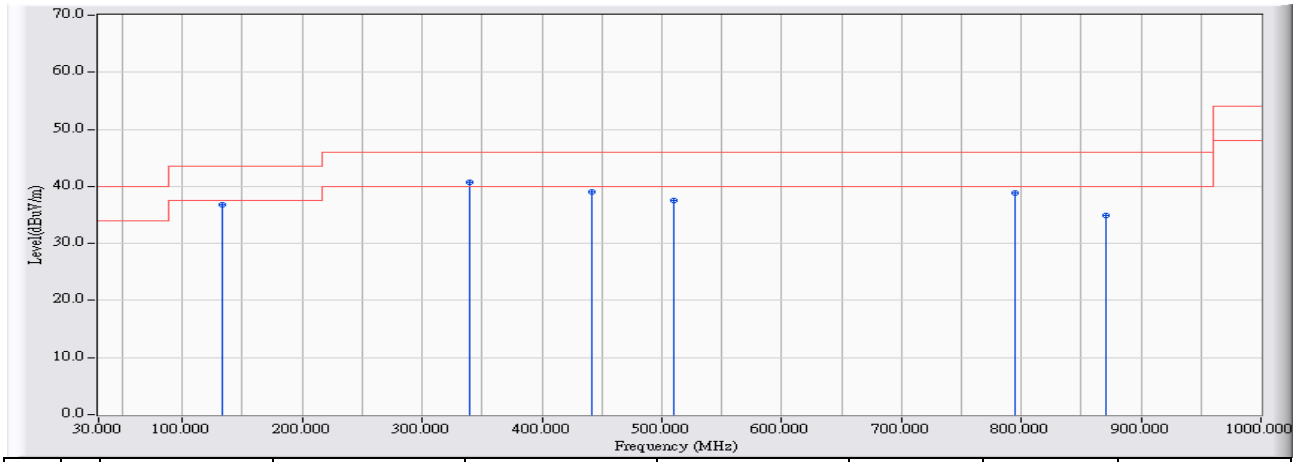


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	104.690	-22.943	61.254	38.311	-5.189	43.500	QUASIPEAK
2		277.350	-20.214	59.609	39.395	-6.605	46.000	QUASIPEAK
3		371.440	-18.136	52.111	33.975	-12.025	46.000	QUASIPEAK
4		426.730	-16.892	52.956	36.065	-9.935	46.000	QUASIPEAK
5		559.620	-15.377	44.776	29.399	-16.601	46.000	QUASIPEAK
6		771.080	-13.699	50.009	36.310	-9.690	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:24**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - HORIZONTAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40MHz 2437MHz**

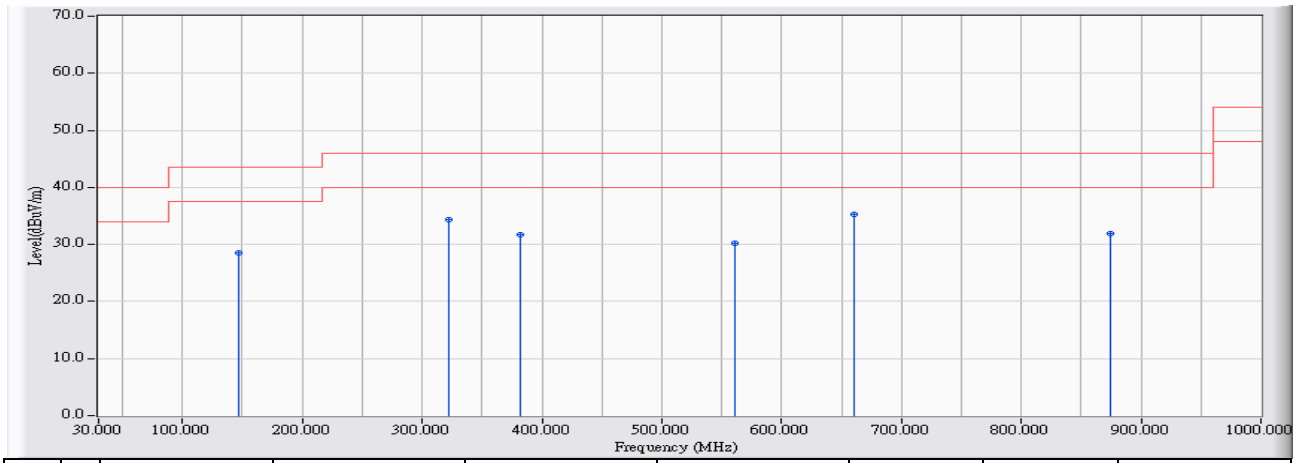


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		132.820	-22.606	59.326	36.721	-6.779	43.500	QUASIPEAK
2	*	339.430	-18.947	59.683	40.737	-5.263	46.000	QUASIPEAK
3		441.280	-16.608	55.578	38.970	-7.030	46.000	QUASIPEAK
4		510.150	-15.448	52.977	37.529	-8.471	46.000	QUASIPEAK
5		794.360	-13.378	52.267	38.888	-7.112	46.000	QUASIPEAK
6		870.990	-13.079	47.917	34.837	-11.163	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Site : CB1	**Time : 2013/09/09 - 10:28**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_EFS_30-1G-2_1011 - VERTICAL	**Power : AC 120V/60Hz110V**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40MHz 2437MHz**



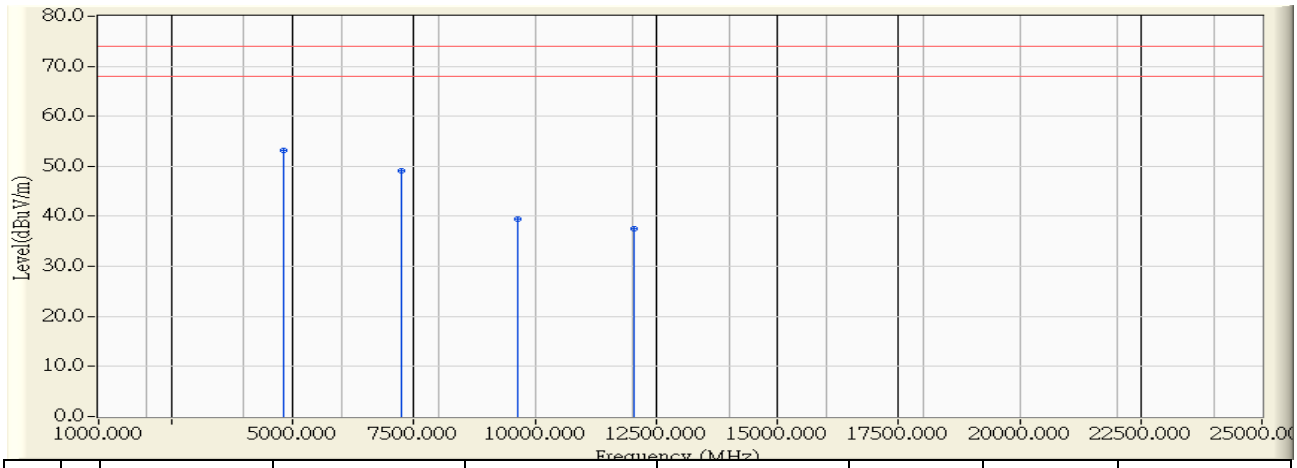
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		147.370	-23.203	51.664	28.461	-15.039	43.500	QUASIPEAK
2		321.970	-19.388	53.678	34.289	-11.711	46.000	QUASIPEAK
3		382.110	-17.865	49.621	31.756	-14.244	46.000	QUASIPEAK
4		560.590	-15.376	45.562	30.186	-15.814	46.000	QUASIPEAK
5	*	660.500	-14.930	50.190	35.260	-10.740	46.000	QUASIPEAK
6		874.870	-13.068	44.896	31.829	-14.172	46.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor.

Above 1GHz Spurious

Site : CB1	**Time : 2013/09/10 - 13:12**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2412MHz**

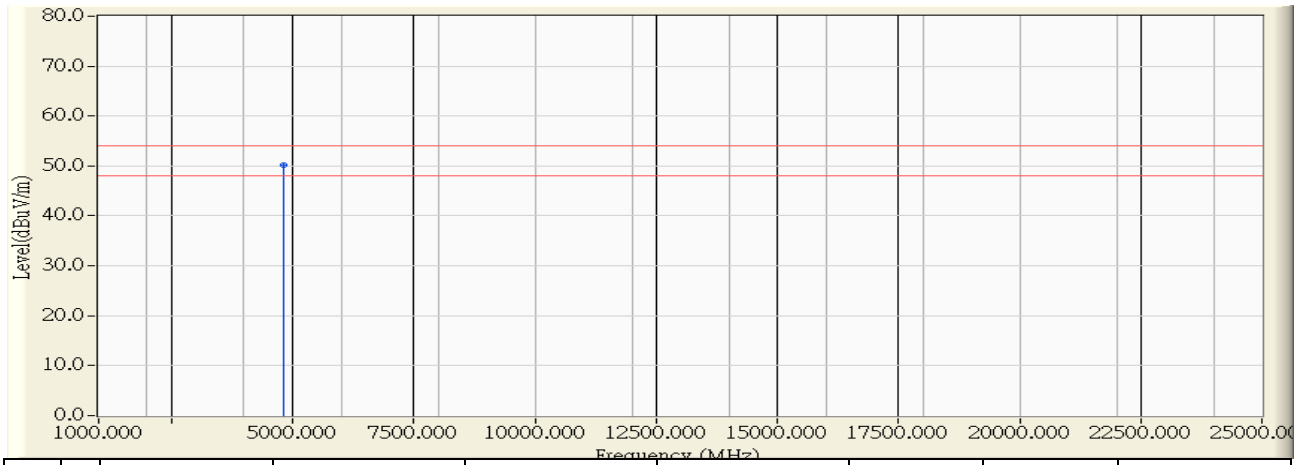


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4824.000	-0.617	53.880	53.263	-20.737	74.000	PEAK
2		7236.000	5.445	43.600	49.045	-24.955	74.000	PEAK
3		9648.000	9.226	30.144	39.370	-34.630	74.000	PEAK
4		12060.000	11.115	26.465	37.580	-36.420	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:13**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2412MHz**

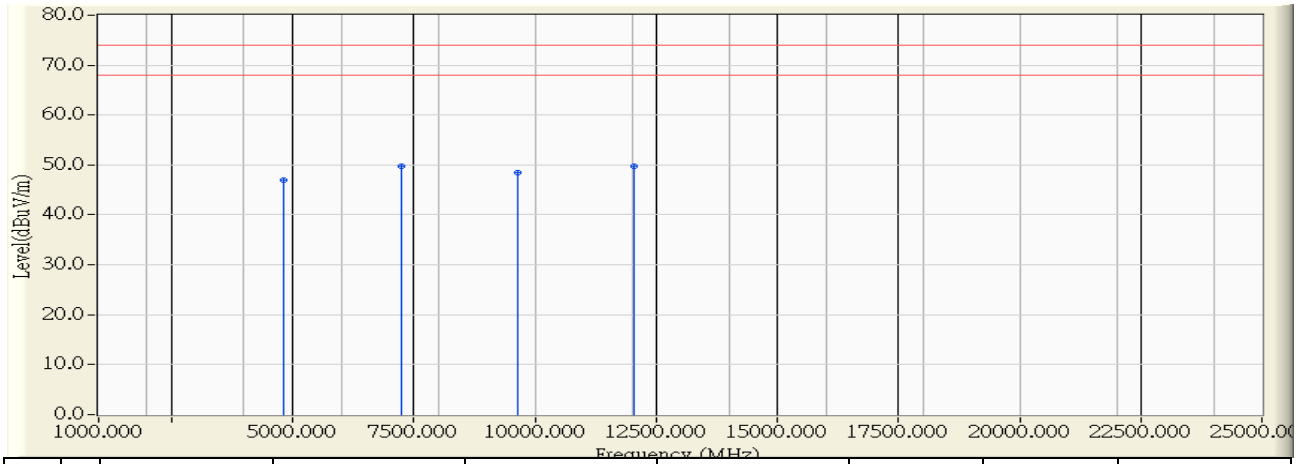


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4824.000	-0.617	50.710	50.093	-3.907	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:22**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2412MHz**

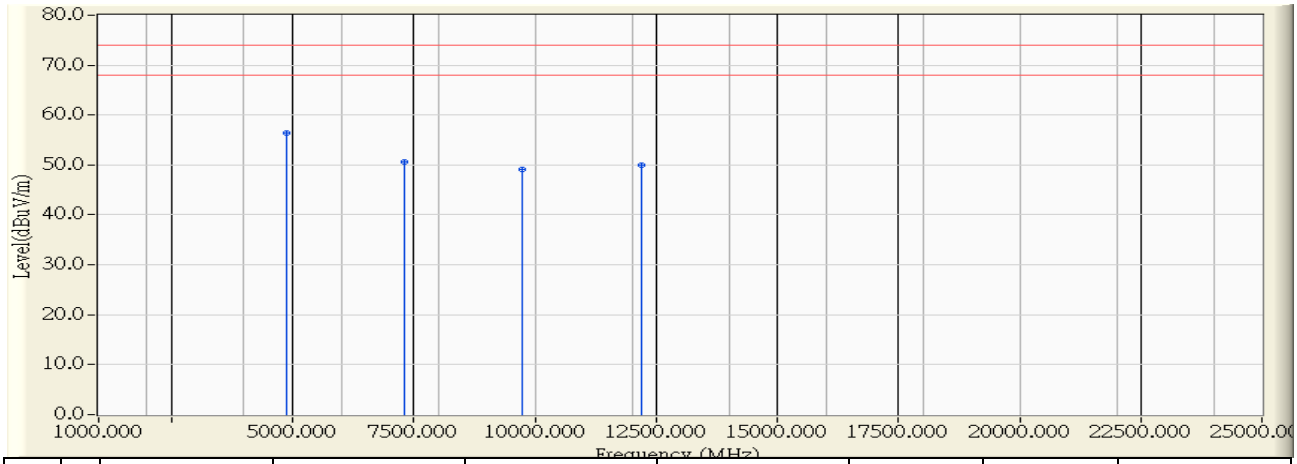


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-0.617	47.670	47.053	-26.947	74.000	PEAK
2	*	7236.000	5.445	44.420	49.865	-24.135	74.000	PEAK
3		9648.000	9.226	39.300	48.526	-25.474	74.000	PEAK
4		12060.000	11.115	38.650	49.765	-24.235	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:28**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2437MHz**

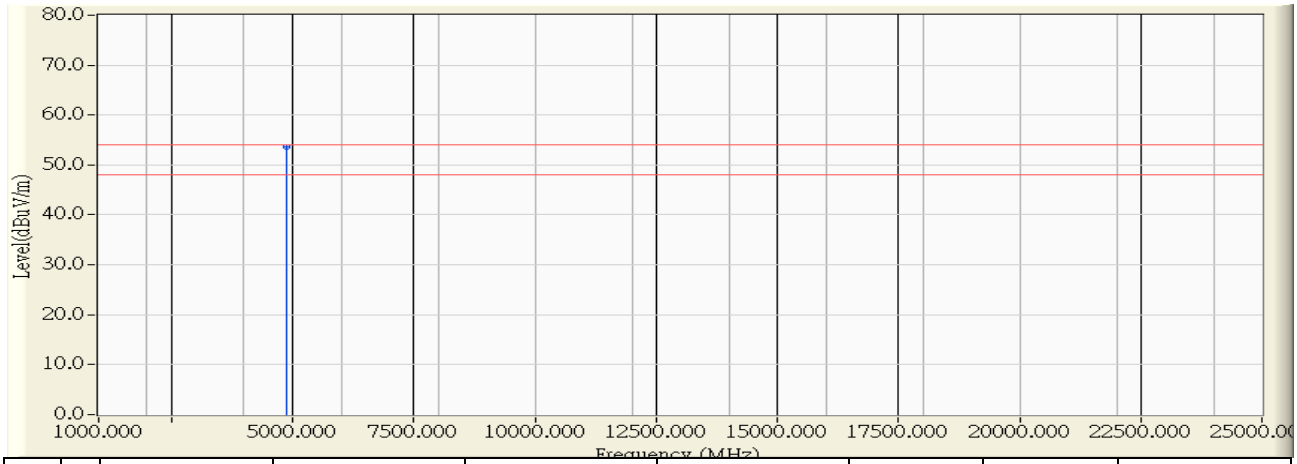


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	56.970	56.475	-17.525	74.000	PEAK
2		7311.000	5.608	45.080	50.687	-23.313	74.000	PEAK
3		9748.000	9.873	39.310	49.183	-24.817	74.000	PEAK
4		12185.000	11.058	38.940	49.998	-24.002	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:33**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2437MHz**

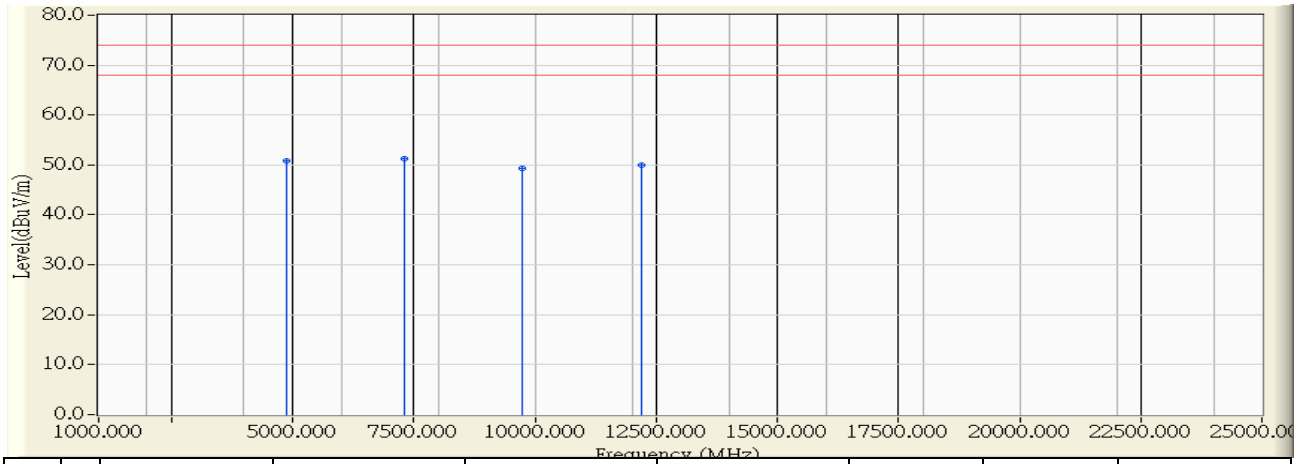


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	54.130	53.635	-0.365	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:39**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2437MHz**

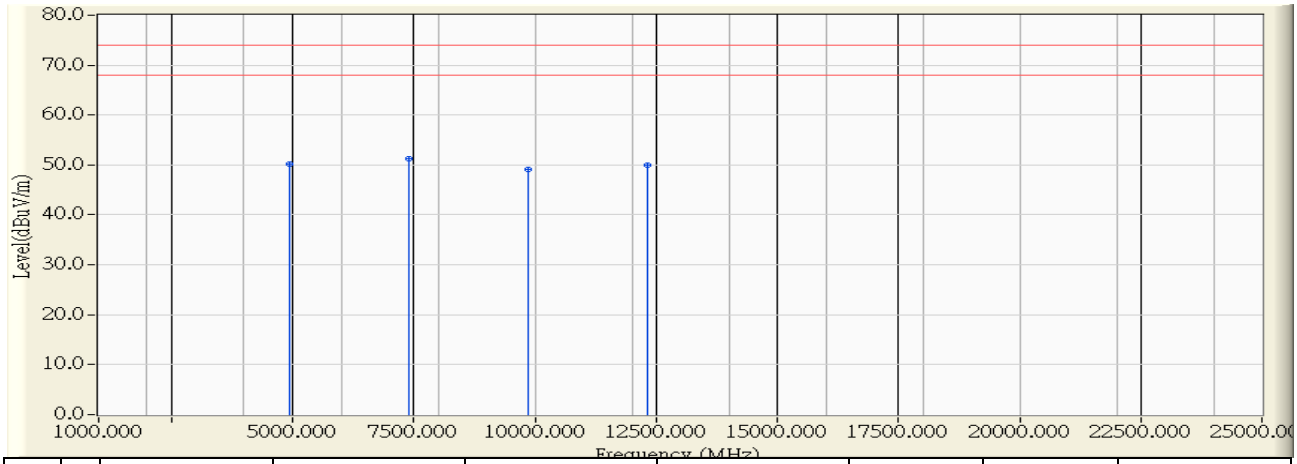


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-0.495	51.310	50.815	-23.185	74.000	PEAK
2	*	7311.000	5.608	45.750	51.357	-22.643	74.000	PEAK
3		9748.000	9.873	39.460	49.333	-24.667	74.000	PEAK
4		12185.000	11.058	38.920	49.978	-24.022	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:43**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2462MHz**

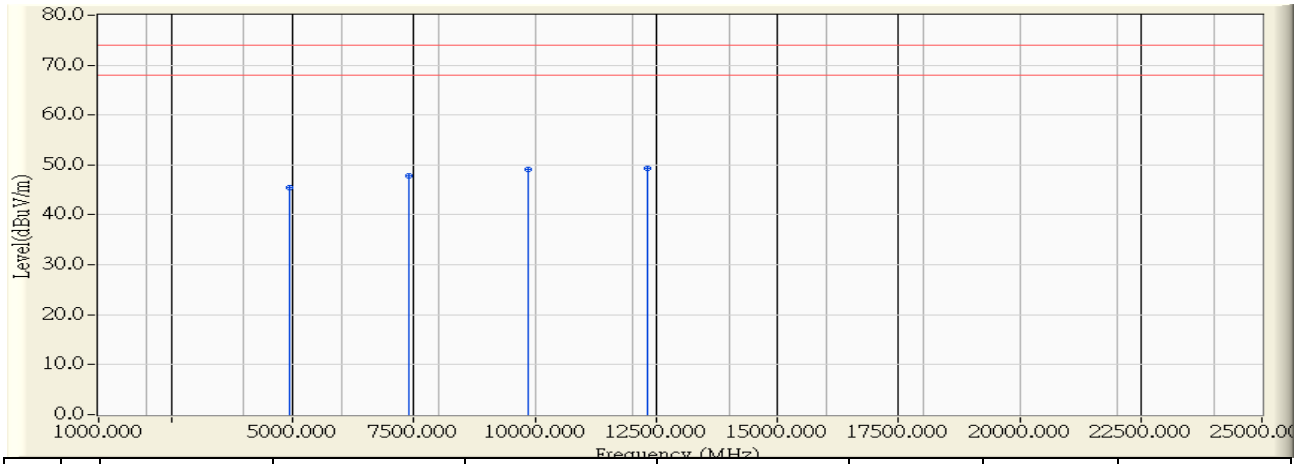


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-0.373	50.530	50.157	-23.843	74.000	PEAK
2	*	7386.000	5.770	45.390	51.160	-22.840	74.000	PEAK
3		9848.000	10.521	38.600	49.121	-24.879	74.000	PEAK
4		12310.000	11.001	38.890	49.891	-24.109	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:46**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11b 2462MHz**

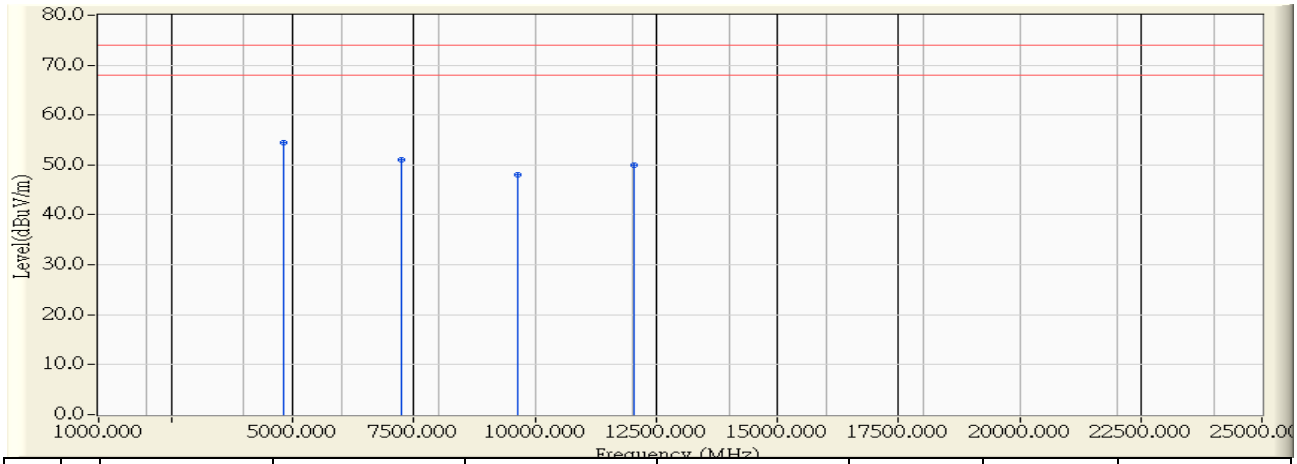


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-0.373	45.910	45.537	-28.463	74.000	PEAK
2		7386.000	5.770	41.970	47.740	-26.260	74.000	PEAK
3		9848.000	10.521	38.580	49.101	-24.899	74.000	PEAK
4	*	12310.000	11.001	38.290	49.291	-24.709	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:48**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2412MHz**

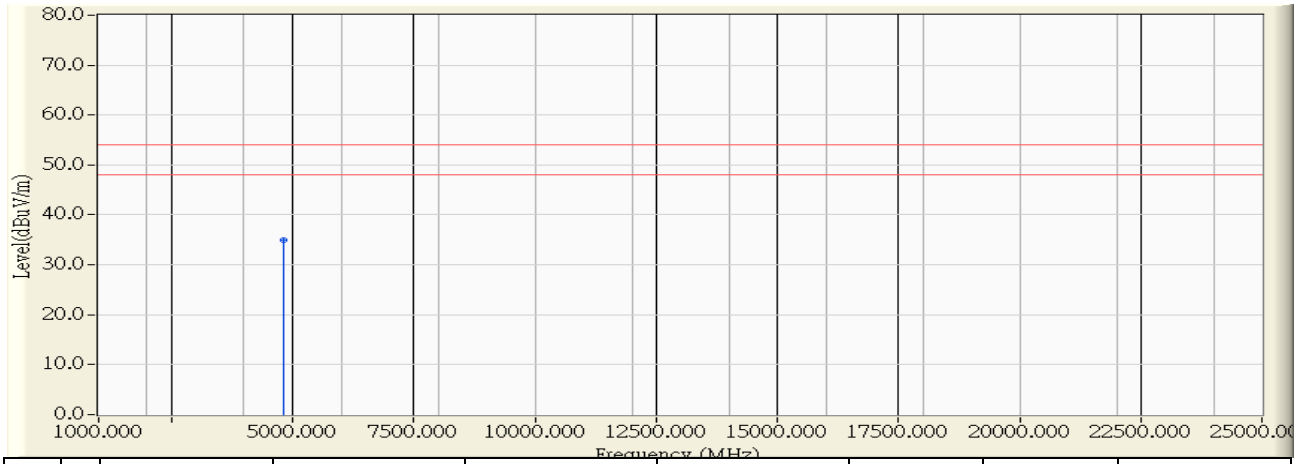


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4824.000	-0.617	55.180	54.563	-19.437	74.000	PEAK
2		7236.000	5.445	45.690	51.135	-22.865	74.000	PEAK
3		9648.000	9.226	38.789	48.015	-25.985	74.000	PEAK
4		12060.000	11.115	38.780	49.895	-24.105	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:51**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2412MHz**

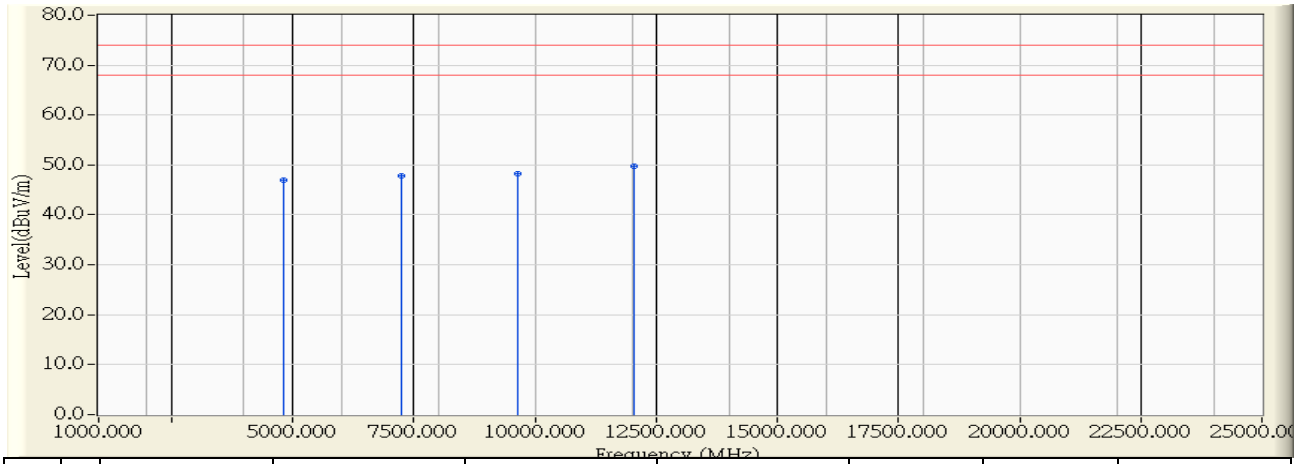


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4824.000	-0.617	35.557	34.940	-19.060	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 13:57**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2412MHz**

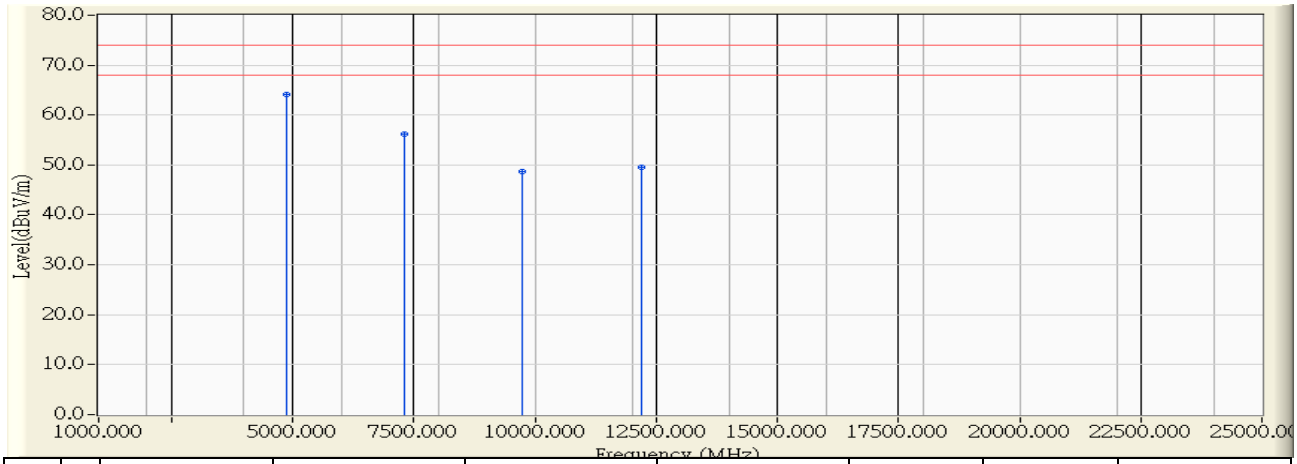


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-0.617	47.480	46.863	-27.137	74.000	PEAK
2		7236.000	5.445	42.320	47.765	-26.235	74.000	PEAK
3		9648.000	9.226	39.000	48.226	-25.774	74.000	PEAK
4	*	12060.000	11.115	38.720	49.835	-24.165	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:01**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2437MHz**

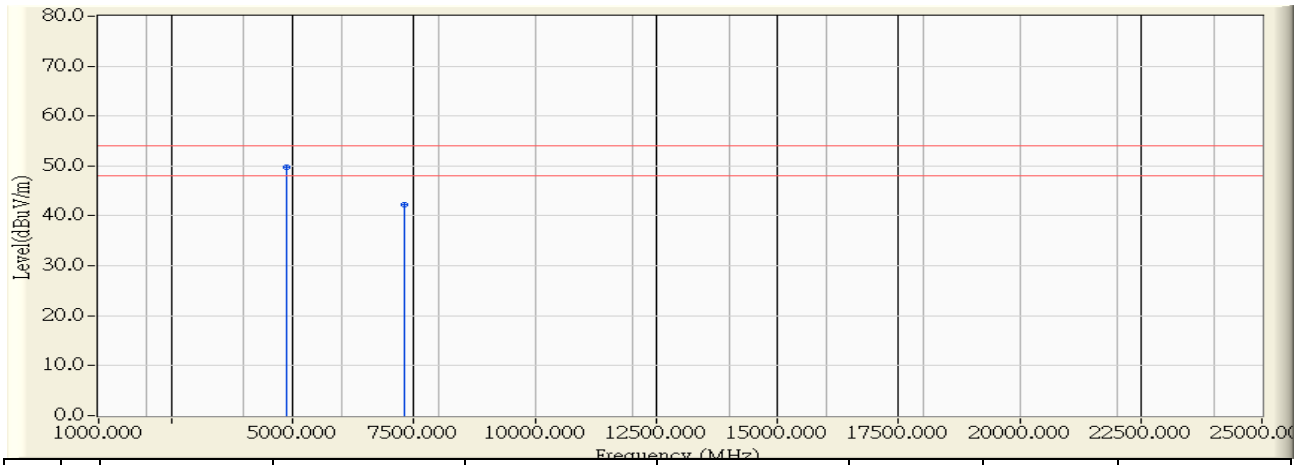


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	64.690	64.195	-9.805	74.000	PEAK
2		7311.000	5.608	50.610	56.217	-17.783	74.000	PEAK
3		9748.000	9.873	38.830	48.703	-25.297	74.000	PEAK
4		12185.000	11.058	38.430	49.488	-24.512	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:05**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2437MHz**

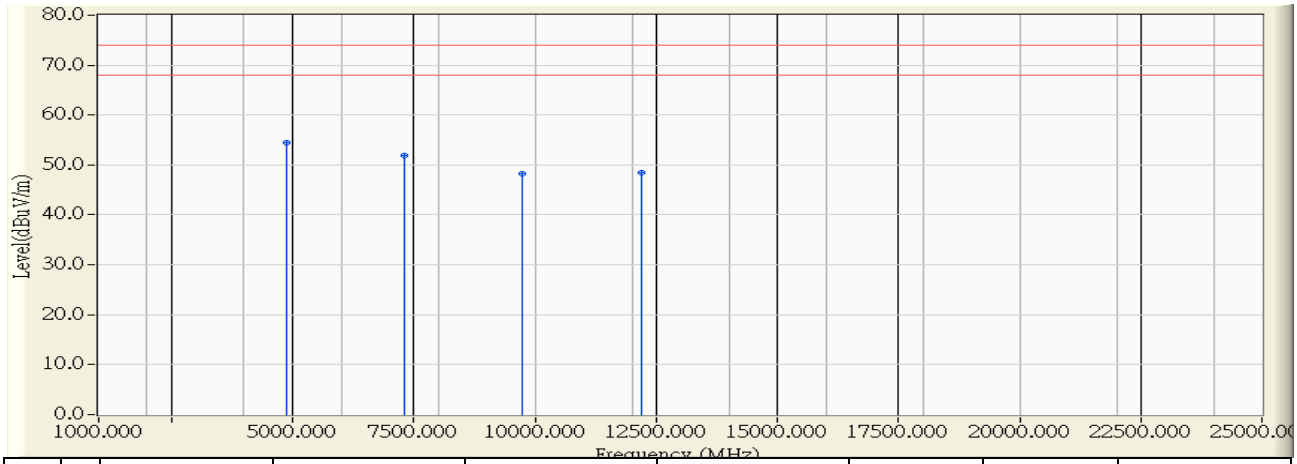


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	50.289	49.794	-4.206	54.000	AVERAGE
2		7311.000	5.608	36.690	42.297	-11.703	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:11**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2437MHz**

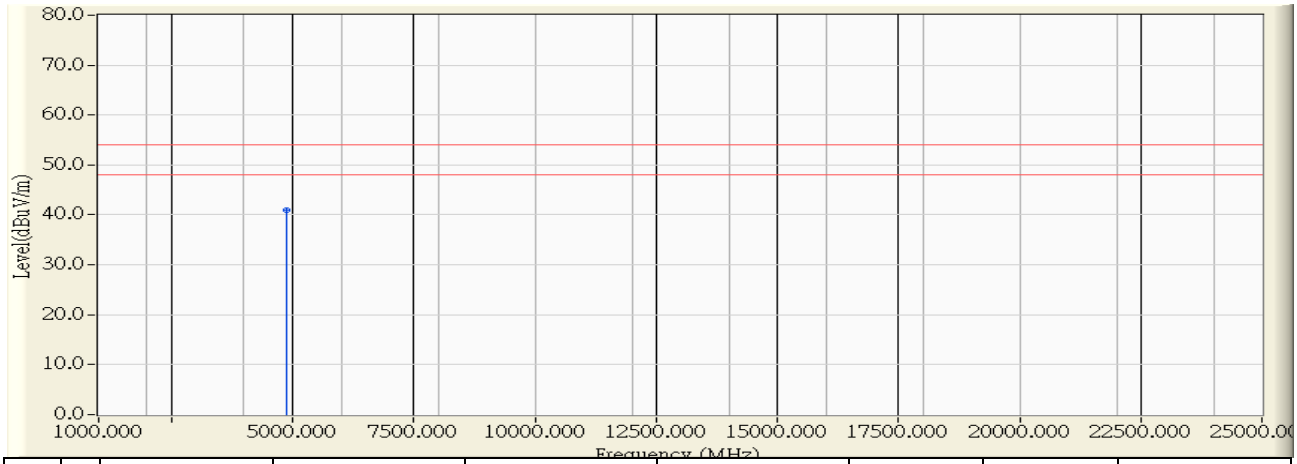


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	54.870	54.375	-19.625	74.000	PEAK
2		7311.000	5.608	46.360	51.967	-22.033	74.000	PEAK
3		9748.000	9.873	38.330	48.203	-25.797	74.000	PEAK
4		12185.000	11.058	37.310	48.368	-25.632	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:13**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2437MHz**

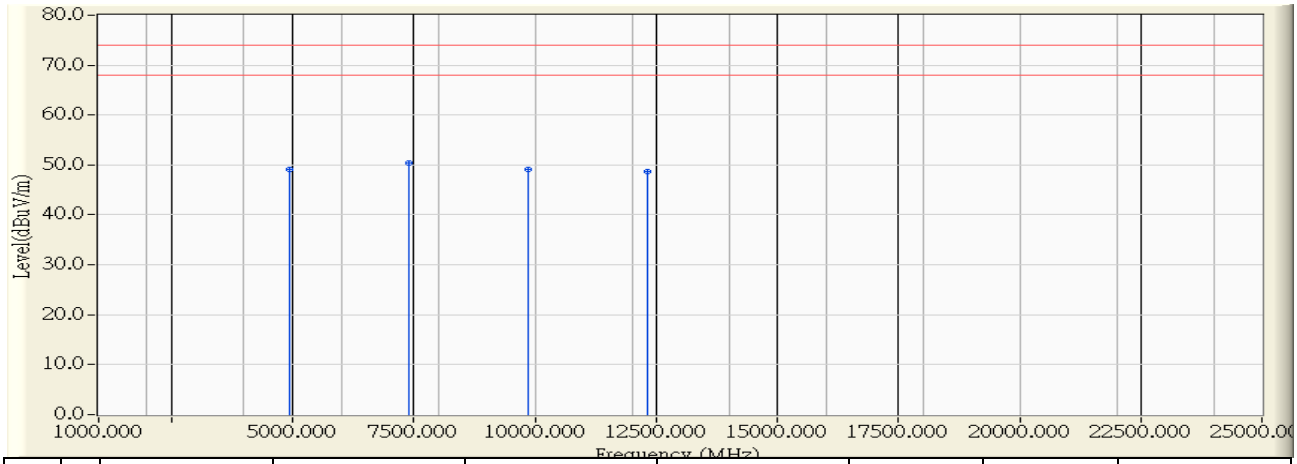


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	41.490	40.995	-13.005	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:18**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2462MHz**

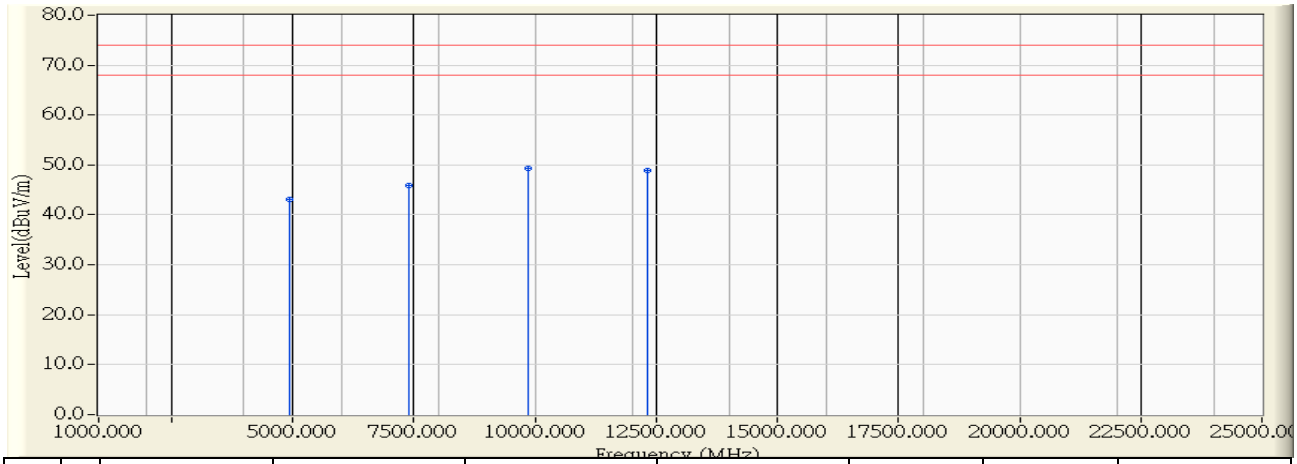


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-0.373	49.496	49.123	-24.877	74.000	PEAK
2	*	7386.000	5.770	44.580	50.350	-23.650	74.000	PEAK
3		9848.000	10.521	38.700	49.221	-24.779	74.000	PEAK
4		12310.000	11.001	37.750	48.751	-25.249	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:21**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11g 2462MHz**

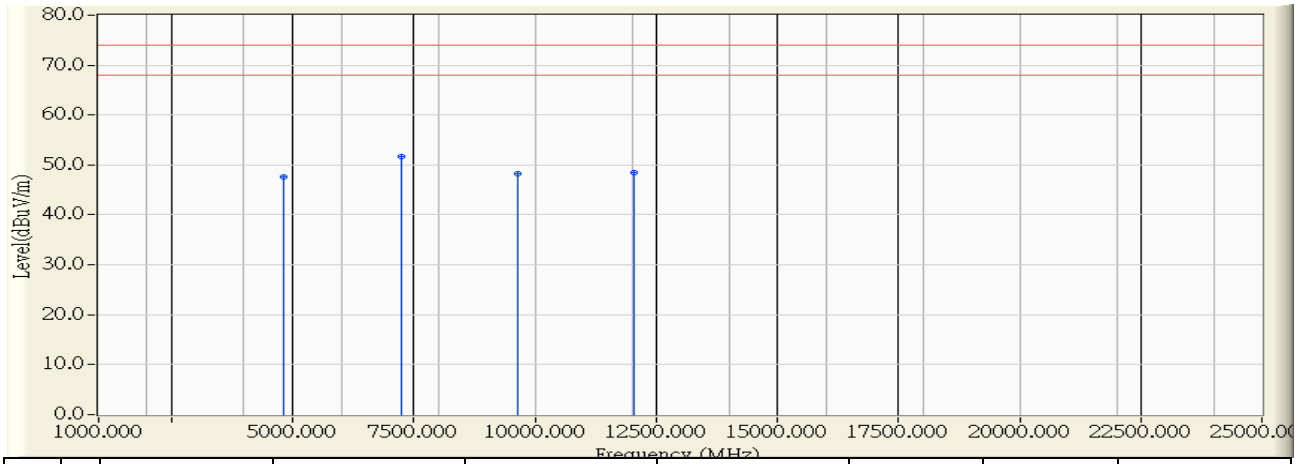


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-0.373	43.530	43.157	-30.843	74.000	PEAK
2		7386.000	5.770	40.080	45.850	-28.150	74.000	PEAK
3	*	9848.000	10.521	38.910	49.431	-24.569	74.000	PEAK
4		12310.000	11.001	37.820	48.821	-25.179	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:25**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2412MHz**

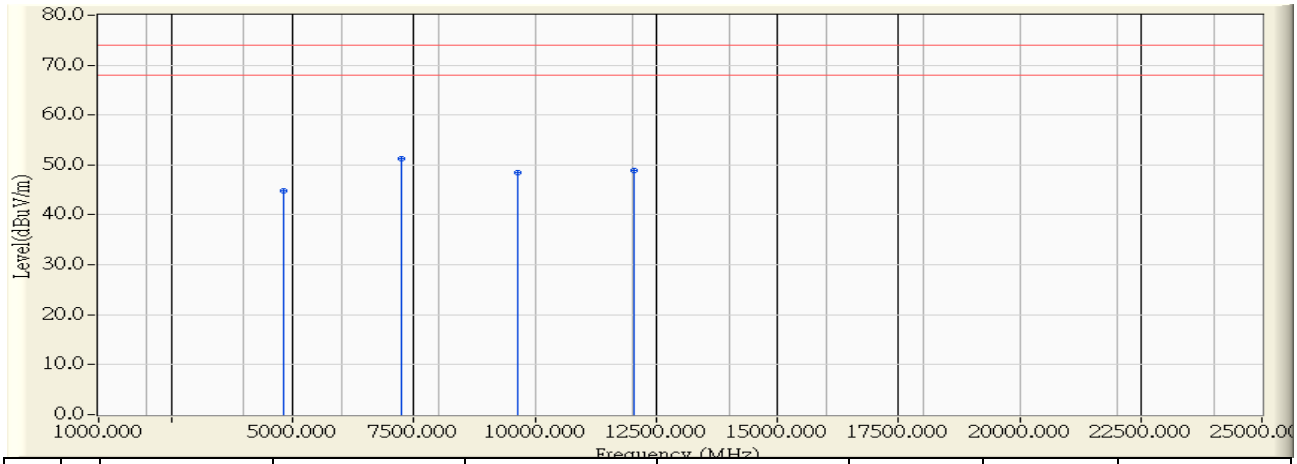


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-0.617	48.220	47.603	-26.397	74.000	PEAK
2	*	7236.000	5.445	46.270	51.715	-22.285	74.000	PEAK
3		9648.000	9.226	38.950	48.176	-25.824	74.000	PEAK
4		12060.000	11.115	37.430	48.545	-25.455	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:29**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2412MHz**

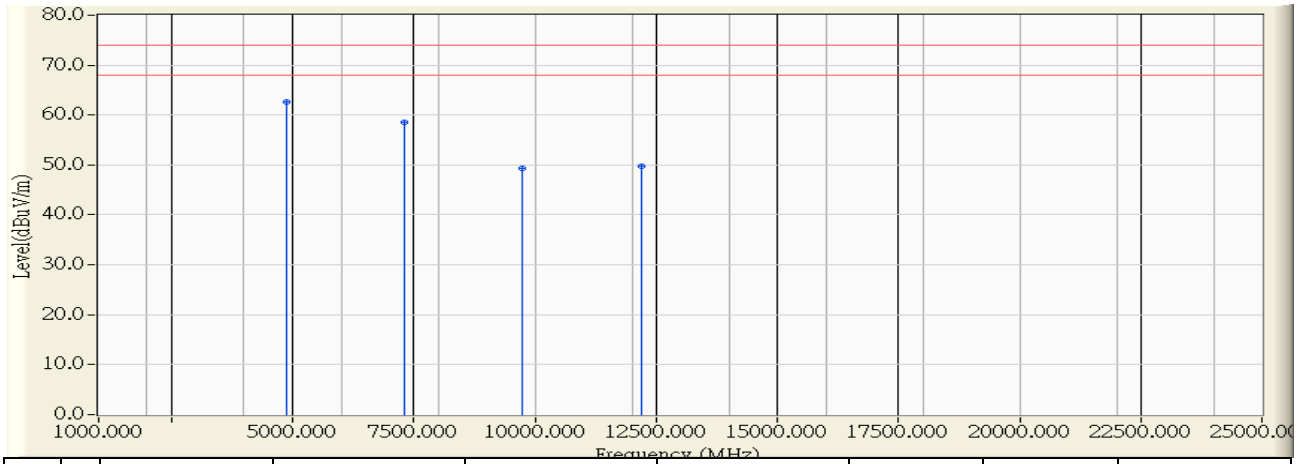


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4824.000	-0.617	45.450	44.833	-29.167	74.000	PEAK
2	*	7236.000	5.445	45.920	51.365	-22.635	74.000	PEAK
3		9648.000	9.226	39.170	48.396	-25.604	74.000	PEAK
4		12060.000	11.115	37.840	48.955	-25.045	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:33**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

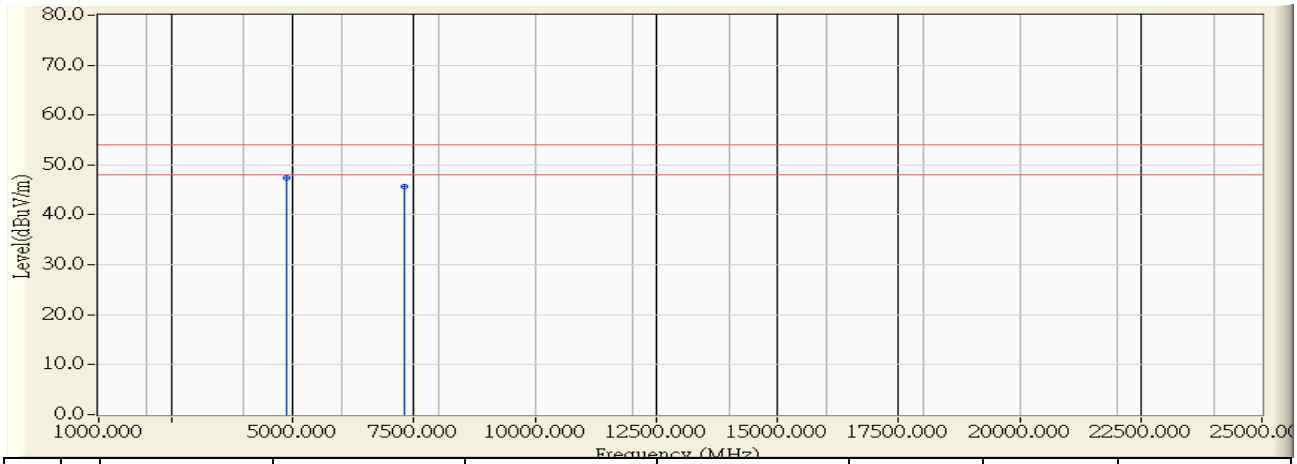


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	63.120	62.625	-11.375	74.000	PEAK
2		7311.000	5.608	52.940	58.547	-15.453	74.000	PEAK
3		9748.000	9.873	39.380	49.253	-24.747	74.000	PEAK
4		12185.000	11.058	38.740	49.798	-24.202	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:34**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

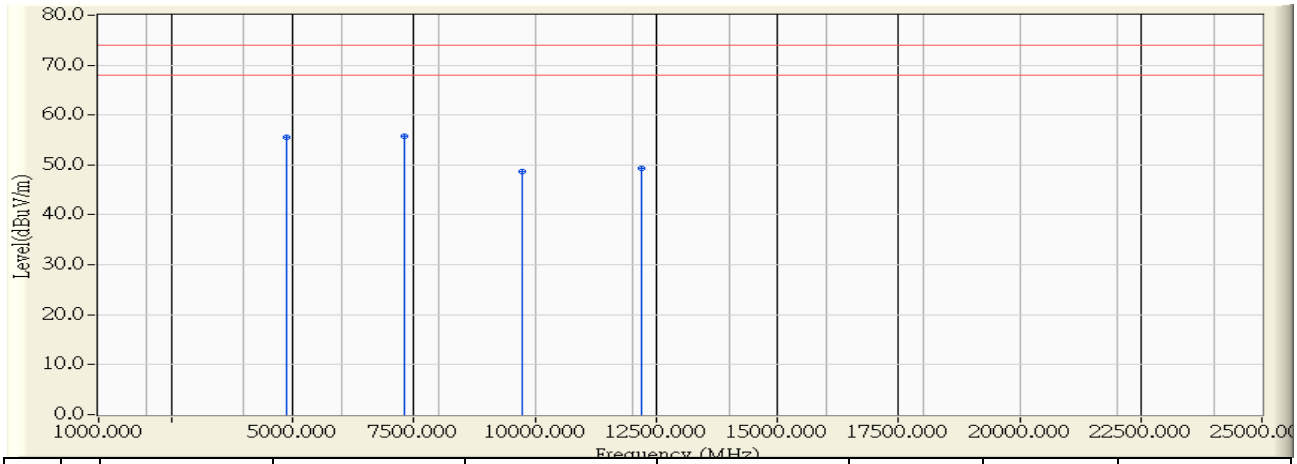


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4874.000	-0.495	47.938	47.443	-6.557	54.000	AVERAGE
2		7311.000	5.608	40.060	45.667	-8.333	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:42**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

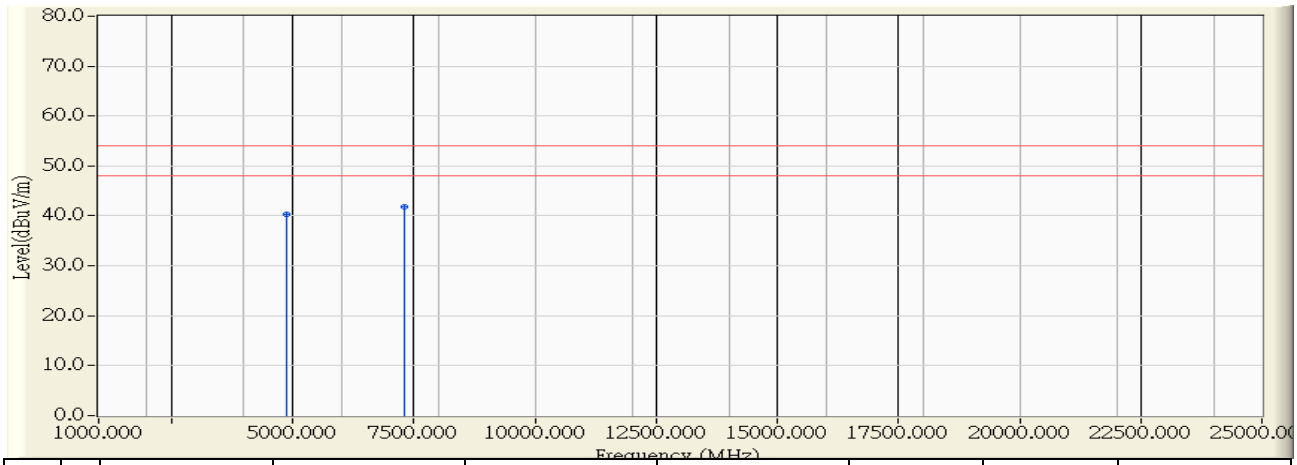


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-0.495	55.950	55.455	-18.545	74.000	PEAK
2	*	7311.000	5.608	50.230	55.837	-18.163	74.000	PEAK
3		9748.000	9.873	38.880	48.753	-25.247	74.000	PEAK
4		12185.000	11.058	38.300	49.358	-24.642	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:42**
Limit : FCC_SpartC_15.247_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2437MHz**

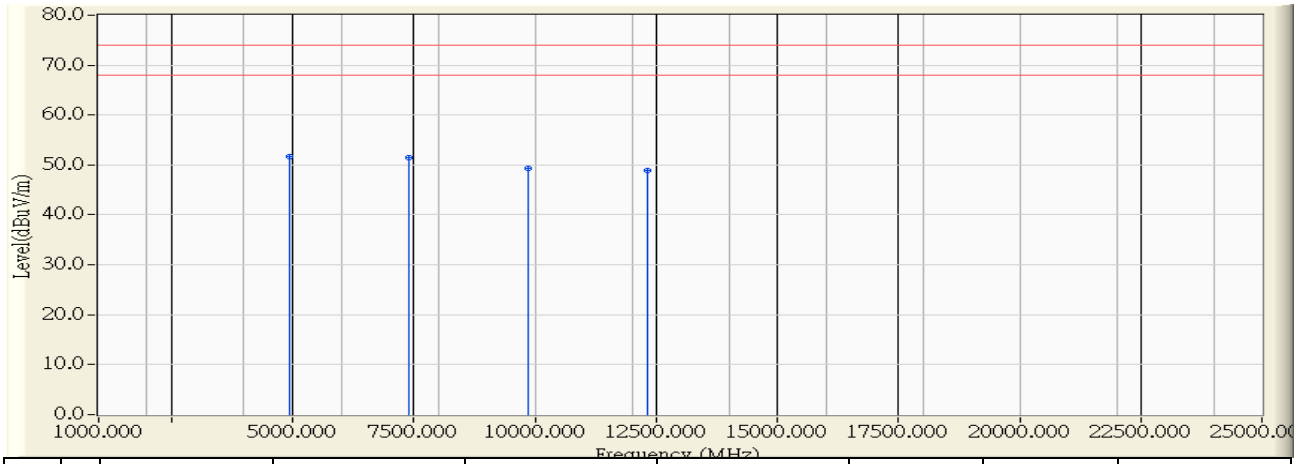


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-0.495	40.720	40.225	-13.775	54.000	AVERAGE
2	*	7311.000	5.608	36.170	41.777	-12.223	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:47**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2462MHz**

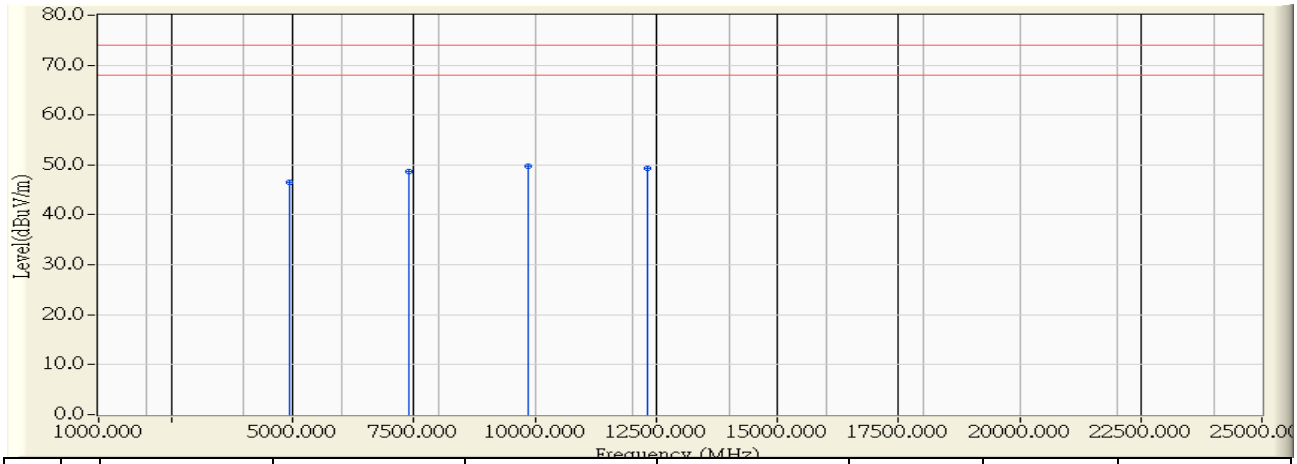


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	4924.000	-0.373	52.040	51.667	-22.333	74.000	PEAK
2		7386.000	5.770	45.710	51.480	-22.520	74.000	PEAK
3		9848.000	10.521	38.710	49.231	-24.769	74.000	PEAK
4		12310.000	11.001	37.800	48.801	-25.199	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:50**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n20MHz 2462MHz**

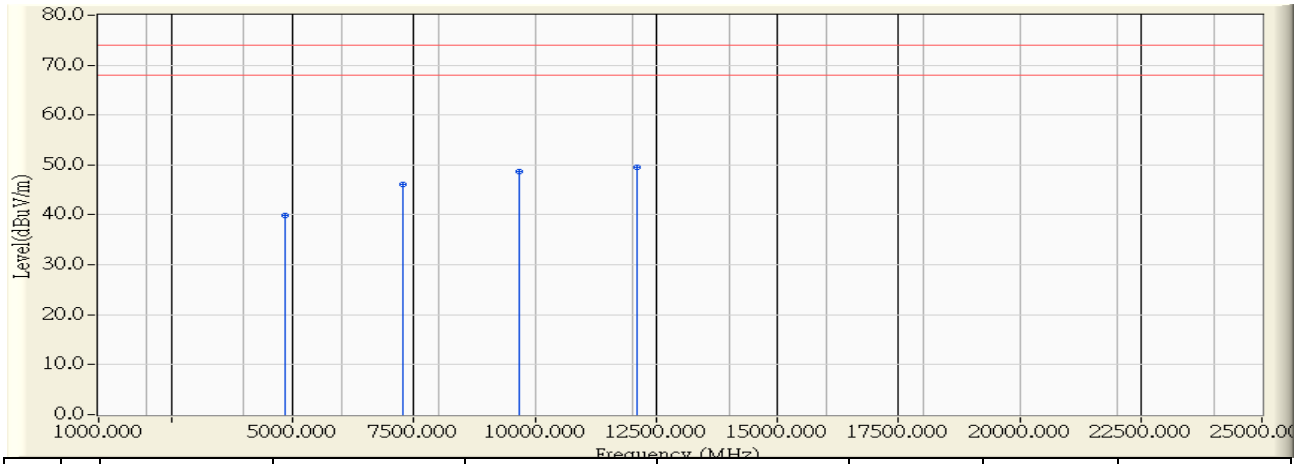


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4924.000	-0.373	46.990	46.617	-27.383	74.000	PEAK
2		7386.000	5.770	42.820	48.590	-25.410	74.000	PEAK
3	*	9848.000	10.521	39.160	49.681	-24.319	74.000	PEAK
4		12310.000	11.001	38.320	49.321	-24.679	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:53**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40MHz 2422MHz**

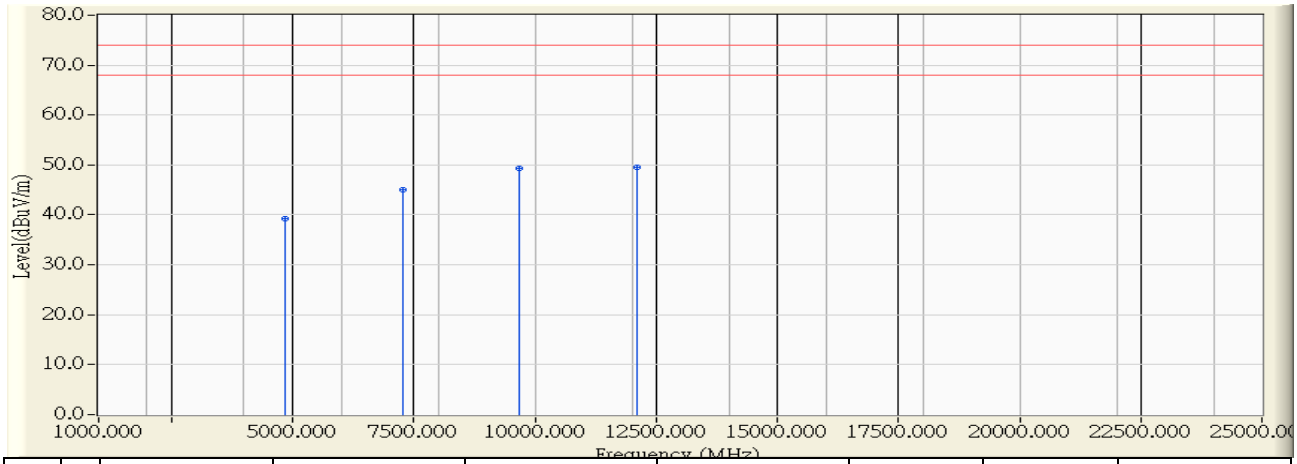


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4844.000	-0.568	40.410	39.842	-34.158	74.000	PEAK
2		7266.000	5.510	40.540	46.050	-27.950	74.000	PEAK
3		9688.000	9.485	39.290	48.775	-25.225	74.000	PEAK
4	*	12110.000	11.093	38.500	49.593	-24.407	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:56**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40MHz 2422MHz**

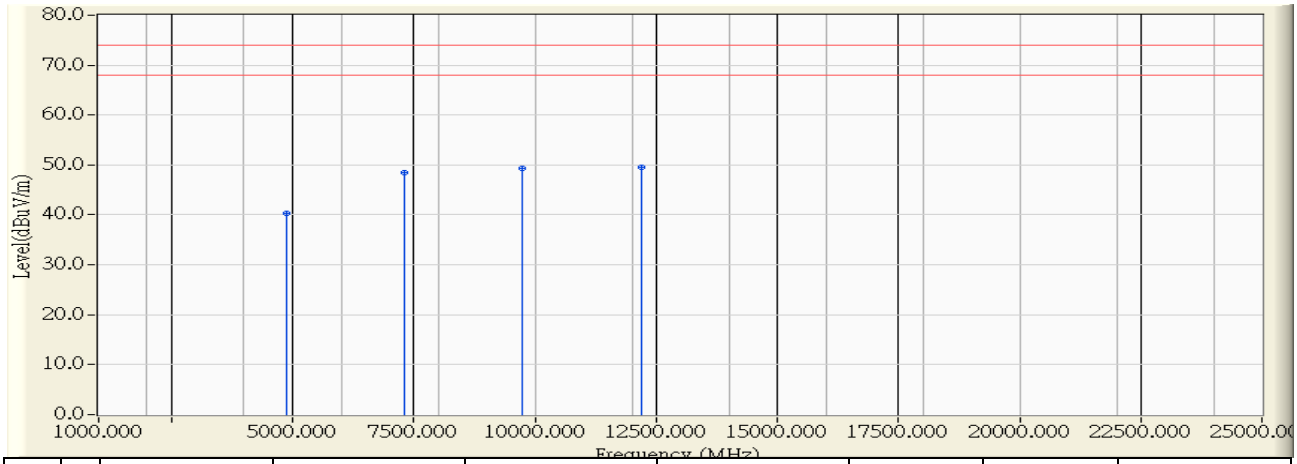


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4844.000	-0.568	39.870	39.302	-34.698	74.000	PEAK
2		7266.000	5.510	39.430	44.940	-29.060	74.000	PEAK
3		9688.000	9.485	39.760	49.245	-24.755	74.000	PEAK
4	*	12110.000	11.093	38.530	49.623	-24.377	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 14:58**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40 2437MHz**

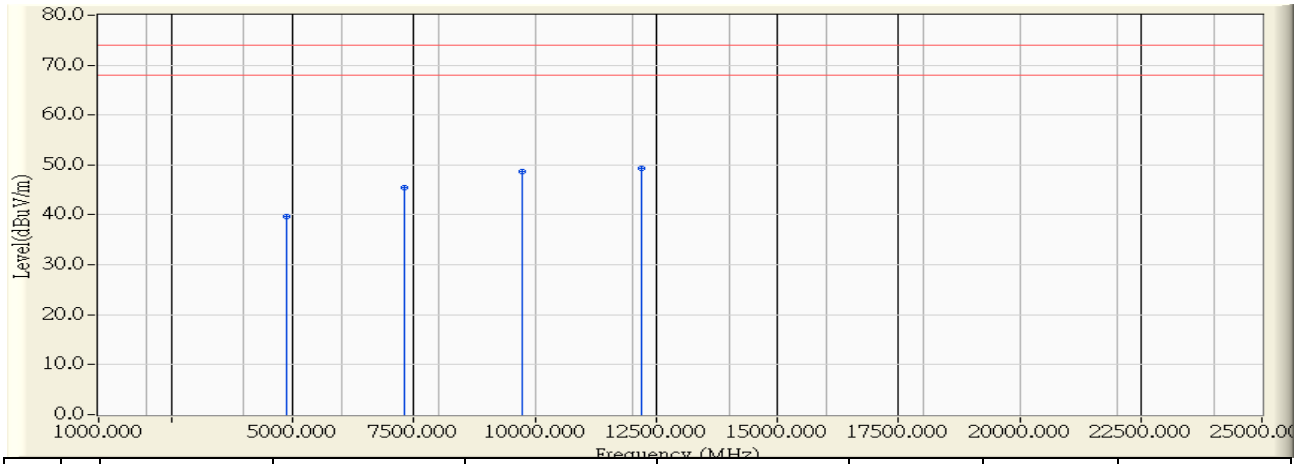


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-0.495	40.840	40.345	-33.655	74.000	PEAK
2		7311.000	5.608	42.910	48.517	-25.483	74.000	PEAK
3		9748.000	9.873	39.360	49.233	-24.767	74.000	PEAK
4	*	12185.000	11.058	38.480	49.538	-24.462	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 15:01**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40 2437MHz**

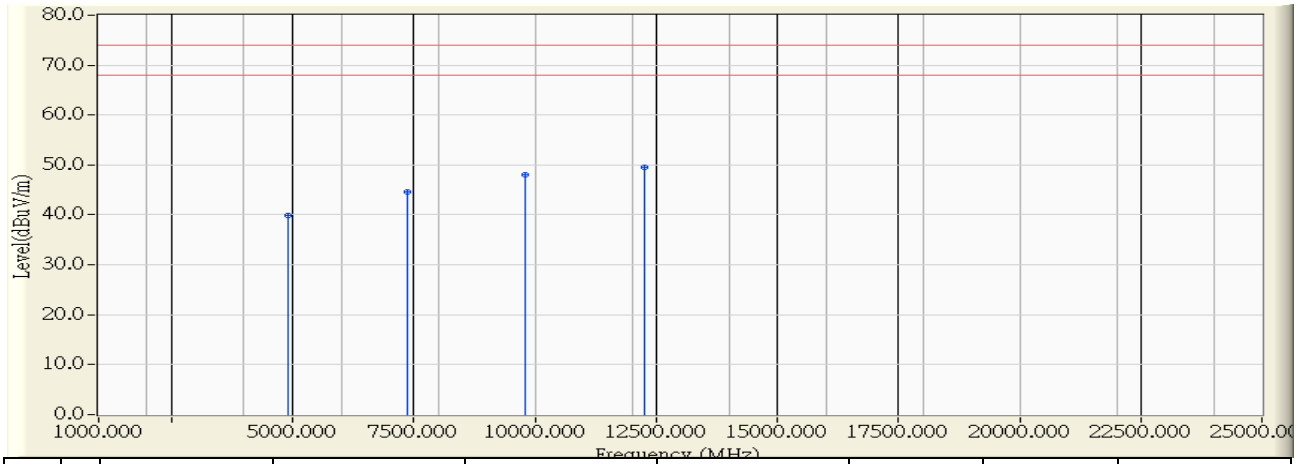


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4874.000	-0.495	40.070	39.575	-34.425	74.000	PEAK
2		7311.000	5.608	39.880	45.487	-28.513	74.000	PEAK
3		9748.000	9.873	38.760	48.633	-25.367	74.000	PEAK
4	*	12185.000	11.058	38.190	49.248	-24.752	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 15:04**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : 802.11n40MHz 2452MHz**

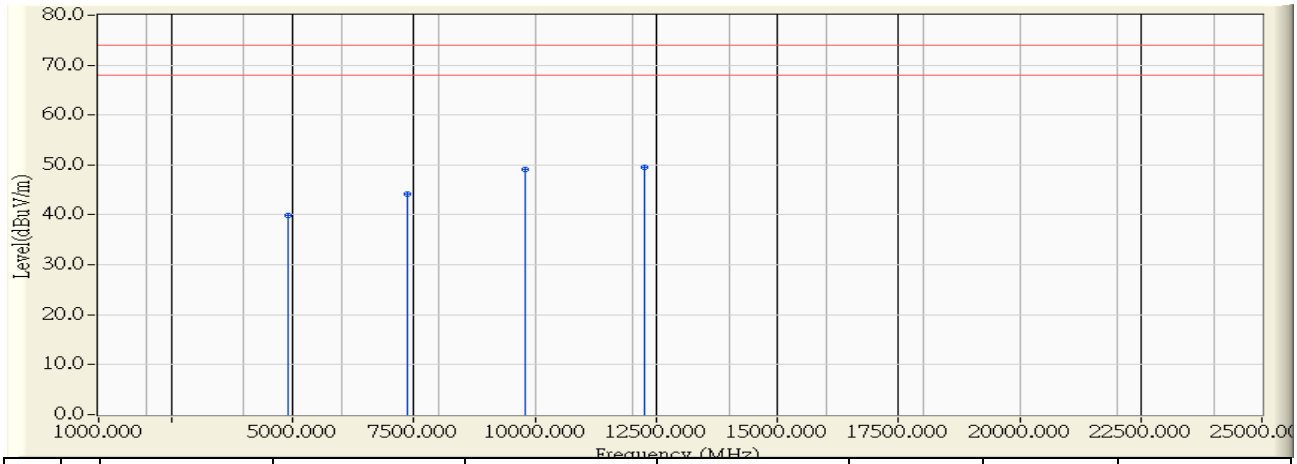


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4904.000	-0.421	40.340	39.919	-34.081	74.000	PEAK
2		7356.000	5.705	39.010	44.715	-29.285	74.000	PEAK
3		9808.000	10.262	37.800	48.062	-25.938	74.000	PEAK
4	*	12260.000	11.024	38.580	49.604	-24.396	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

Site : CB1	**Time : 2013/09/10 - 15:06**
Limit : FCC_SpartC_15.247_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G-1_0901 - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless N VDSL2 VoIP Combo WAN Gigabit IAD	**Note : Mode1:Transmit_802.11n40MHz 2452MHz**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4904.000	-0.421	40.380	39.959	-34.041	74.000	PEAK
2		7356.000	5.705	38.460	44.165	-29.835	74.000	PEAK
3		9808.000	10.262	38.860	49.122	-24.878	74.000	PEAK
4	*	12260.000	11.024	38.450	49.474	-24.526	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. “ * ”, means this data is the worst emission level.
5. Measurement Level = Reading Level + Correct Factor.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The Emission above 18GHz were not included is because their levels are too low.

5. RF antenna conducted test

5.1. Test Equipment

The following test equipments are used during the test:

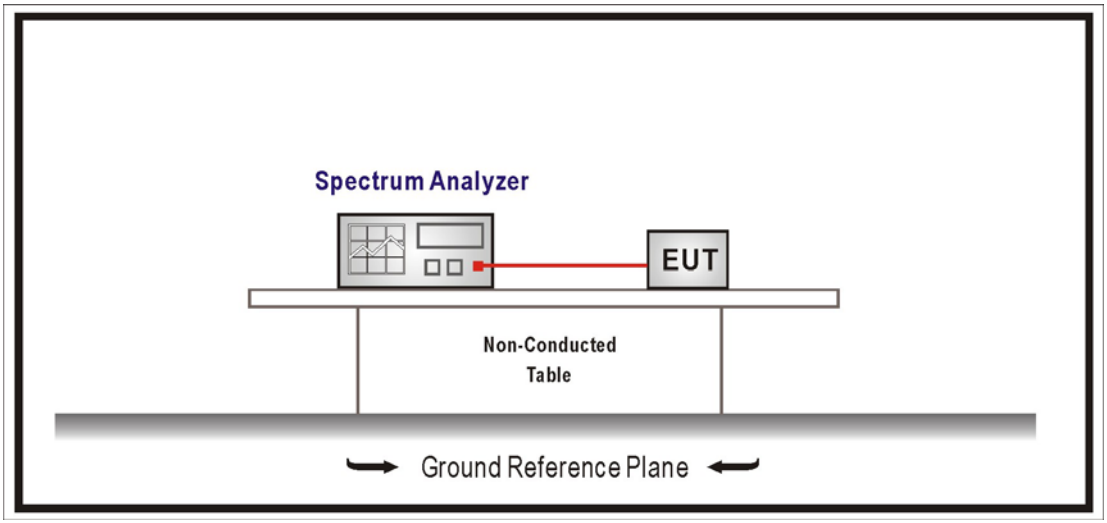
RF antenna conducted test / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A-EXA	US47140172	2014/08/05

Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

5.2. Test Setup

RF Antenna Conducted Measurement:



5.3. Limits

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 an RF conducted or radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

5.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of KDB558074 v03r01 for compliance to FCC 47CFR 15.247 requirements
Set RBW = 100 kHz, Set VBW≧3xRBW, scan up through 10th harmonic.

5.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.247: 2012

5.6. Uncertainty

Conducted is defined as ± 1.27dB

5.7. Test Result

Product	Wireless N VDSL2 VoIP Combo WAN Gigabit IAD		
Test Item	RF antenna conducted test		
Test Mode	Mode 1: Transmit		
Date of Test	2013/11/06	Test Site	SR7

IEEE 802.11b, Antenna Gain: 2.9dBi, Duty Cycle: 1				
Channel No.	Frequency (MHz)	Measure Level (dBc)	Limit (dBc)	Result
1	2412	39.73	≧20	Pass
11	2462	59.33	≧20	Pass

Channel 01 (2412MHz)