Test Report

Product Name ： Wireless Extender
Model No. ： BeamLink 5834, CT-5834, 5834, WL5538AP, WAP-5834
FCC ID. ： L9V-COMTREND5834

Applicant ： Comtrend Corporation
Address ： 3F-1, 10 Lane 609, Chung Hsin Road, Section 5,
San Chung City, Taipei County 24159, Taiwan

Date of Receipt ： 2010/06/17
Issued Date ： 2010/09/17
Report No. ： 106293R-RFUSP46V01
Report Version ： V1.0

Test Report Certification

Issued Date : 2010/09/17
Report No. : 106293R-RFUSP46V01

QuieTek

Product Name	：	Wireless Extender
Applicant	：	Comtrend Corporation
Address	：	3F-1, 10 Lane 609, Chung Hsin Road, Section 5, San Chung City, Taipei County 24159, Taiwan
Manufacturer	：	Ayecom Technology Co., Ltd
MODEL NO.	：	BeamLink 5834, CT-5834, 5834, WL5538AP, WAP-5834
FCC ID.	：	L9V-COMTREND5834
EUT Voltage	：	100-120V~50/60 Hz
Trade Name	：	BeamLink, Comtrend
Applicable Standard	：	FCC CFR Title 47 Part 15 Subpart C Section 15.407:2009
Test Result	：	Complied

The test results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

Documented By : Demi Chang
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REVIEWED BY : Ben Huang
(Ben Huang / Assistant Engineer)

Approved By : Roy Wang
(Roy Wang / Manager)

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1. General Information

1.1. EUT Description

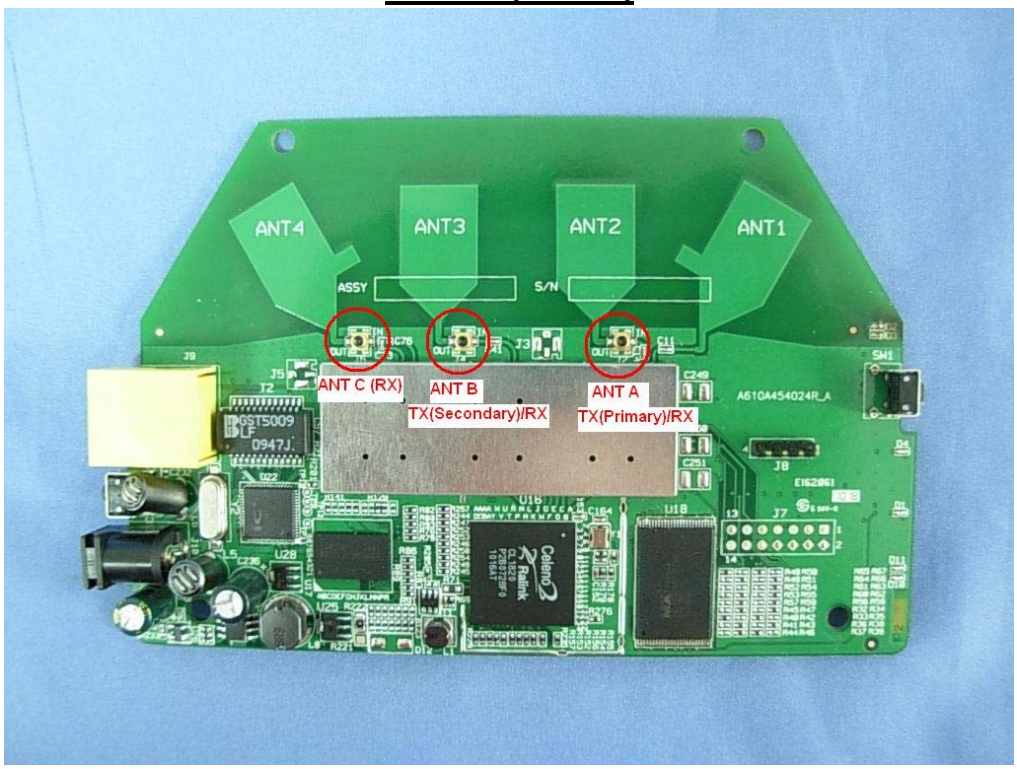
Product Name	Wireless Extender
Product Type	WLAN (1TX, 3RX)
Trade Name	BeamLink, Comtrend
Model No.	BeamLink 5834, CT-5834, 5834, WL5538AP, WAP-5834
Frequency Range - IEEE 802.11n (20MHz)	5180~5240MHz
Frequency Range- IEEE 802.11n (40MHz)	5190~5230MHz
Channel Number (IEEE 802.11b/g & IEEE 802.11n (20MHz))	4
Channel Number- IEEE 802.11n (40MHz)	2
Type of Modulation	Orthogonal Frequency Division Multiplexing (OFDM)
Data Speed (IEEE 802.11n)	Support a subset of the combination of GI, MCS 0~MCS 7 and bandwidth defined in 802.11n
Antenna Gain	2dBi
Channel Control	Auto
Antenna Type	Printed Antenna

Component	
LAN Cable	Non-Shielded, 1.0m
Power Adapter	DVE, DSA-12G-12 AUS 120120 I/P: 100-120V~50/60 Hz 0.3A O/P: 12V⎓1A Cable Out: Non-Shielded, 1.5m

ANT-TX / Rx & Bandwidth

ANT-TX / Rx	TX		Rx	
Mode/ Channel Bandwidth	20MHz	40MHz	20MHz	40MHz
IEEE802.11n	✓	✓	✓	✓

ANT A/B (TX / RX)



IEEE802.11n

MCS Index	Modulation	R	N_{BPSCS}	N_{CBPS}		N_{DBPS}		Data Rate(Mb/s)			
				20MHz	40MHz	20MHz	40MHz	800ns GI		400ns GI (Note1)	
								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

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 802.11n (20MHz)

Working Frequency of Each Channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz

IEEE 802.11n (40MHz)

Working Frequency of Each Channel			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

Note:

1. This device is a Wireless Extender including 5.8GHz 802.11n (1x3) transmitting and receiving function. Only one antenna port will be transmitted and three antenna ports will be received signals at once. The Software will change the output antenna port according to the received signals.
2. The preliminary tests were performed in different antenna ports, and the antenna A is worse than Antenna. The test data of antenna A was shown in this test report only.
3. The variation of model number is for different strategy of marketing.
4. These test results on a sample of the device are for the purpose of demonstrating Compliance with Part 15 Subpart C Paragraph 15.407.
5. 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.
6. This device is a composite device in accordance with Part 15 regulations. The receiving function receiving was tested and its test report number is 106293R-RFUSP37V02 under Declaration of Conformity.

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	Mode	Channel	Result
Conducted Emission	11n(40MHz)	38	Complies
26dB Bandwidth	11n(20MHz)	36/44/48	Complies
	11n(40MHz)	38/46	Complies
Peak Transmit Power	11n(20MHz)	36/44/48	Complies
	11n(40MHz)	38/46	Complies
Peak Power Spectrum Density	11n(20MHz)	36/44/48	Complies
	11n(40MHz)	38/46	Complies
Power Excursion	11n(20MHz)	36/44/48	Complies
	11n(40MHz)	38/46	Complies
Radiated Emission	11n(20MHz)	36/44/48	Complies
	11n(40MHz)	38/46	Complies
Band Edge	11n(20MHz)	36/48	Complies
	11n(40MHz)	38/46	Complies
Frequency Stability	11n(20MHz)	36/48	Complies
	11n(40MHz)	38/46	Complies

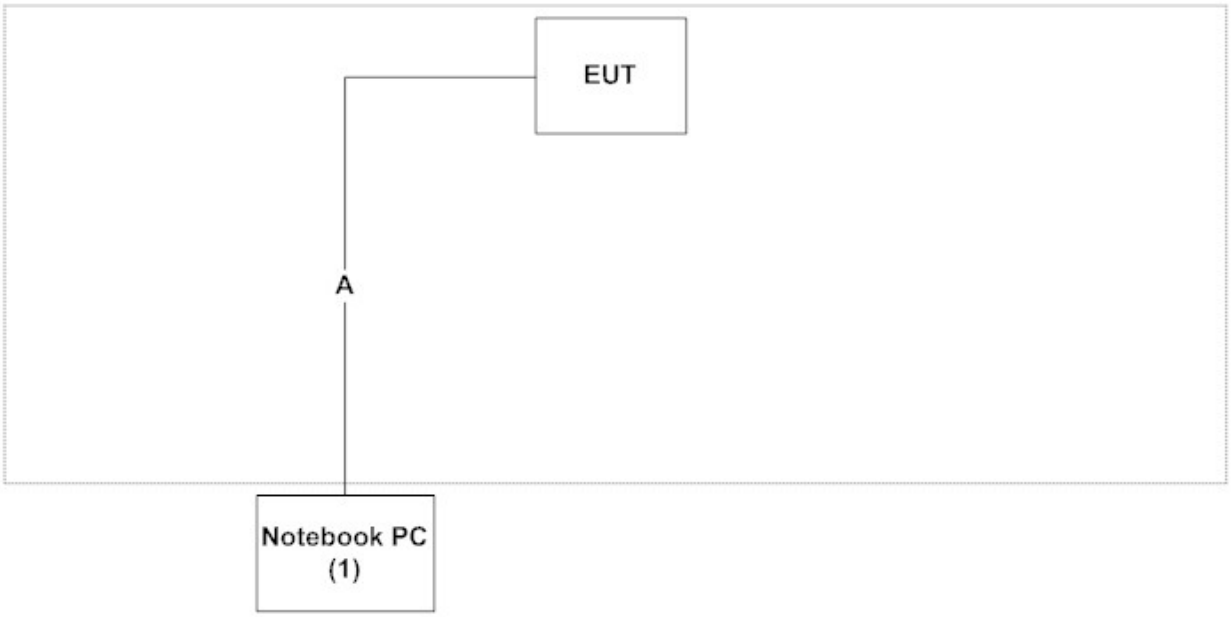
1.4. Tested System Details

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	Notebook PC	HP	HSTNN-146C	I8253S1X	DoC	Non-Shielded, 1.8m

1.5. Configuration of tested System

Connection Diagram



Signal Cable Type		Signal cable Description
A	LAN Cable	Non-Shielded, 3m

1.6. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.5.
2	Turn on the power of all equipment.
3	Boot the Notebook PC from Hard Disk.
4	Data will communicate by connecting to LAN port of Notebook PC.
5	The computer‘s monitor will show the transmitting and receiving characteristics when the communication is success.
6	Repeat the above procedure (4) to (5).

1.7. Test Facility

Ambient conditions in the laboratory:

Items	Test Item	Required (IEC 68-1)	Actual
Temperature (°C)	FCC PART 15 C 15.407 Conducted Emission	15 - 35	20
Humidity (%RH)		25 - 75	50
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 26dB Bandwidth	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Peak Transmit Power	15 - 35	25
Humidity (%RH)		25 - 75	65
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Peak Power Spectrum Density	15 - 35	24
Humidity (%RH)		25 - 75	49
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Power Excursion	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Radiated Emission	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Band Edge	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000
Temperature (°C)	FCC PART 15 C 15.407 Frequency Stability	15 - 35	25
Humidity (%RH)		25 - 75	48
Barometric pressure (mbar)		860 - 1060	950-1000

Site Description:

January 24, 2005 File on
Federal Communications Commission
Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 365520

Accredited by TAF
Accreditation Number: 1313
Effective through: December 27, 2010

Accredited by NVLAP
NVLAP Lab Code: 200347-0
Effective through: September 30, 2010

Site Name: Quietek Corporation
Site Address: No.75-1, Wang-Yeh Valley, Yung-Hsing,
Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
TEL : 886-3-592-8858 / FAX : 886-3-592-8859
E-Mail : service@quietek.com

2. Conducted Emission

2.1. Test Equipment

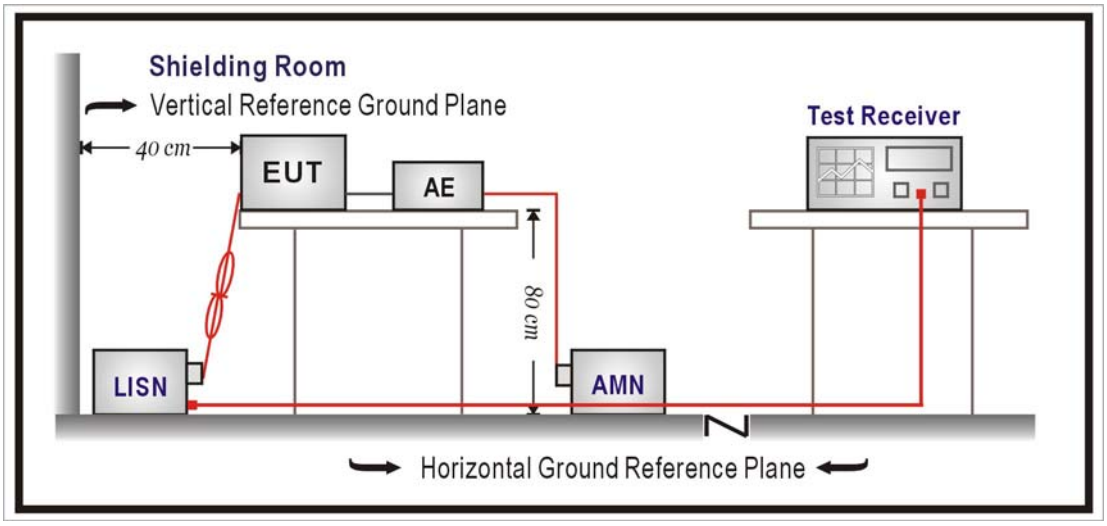
The following test equipments are used during the test:

Conducted Emission / SR3

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
LISN	R&S	ENV216	100096	2010/09/27
LISN	R&S	ESH3-Z5	836679/022	2011/05/30
Test Receiver	R&S	ESCS 30	825442/017	2011/02/04

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 and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

2.5. Test Specification

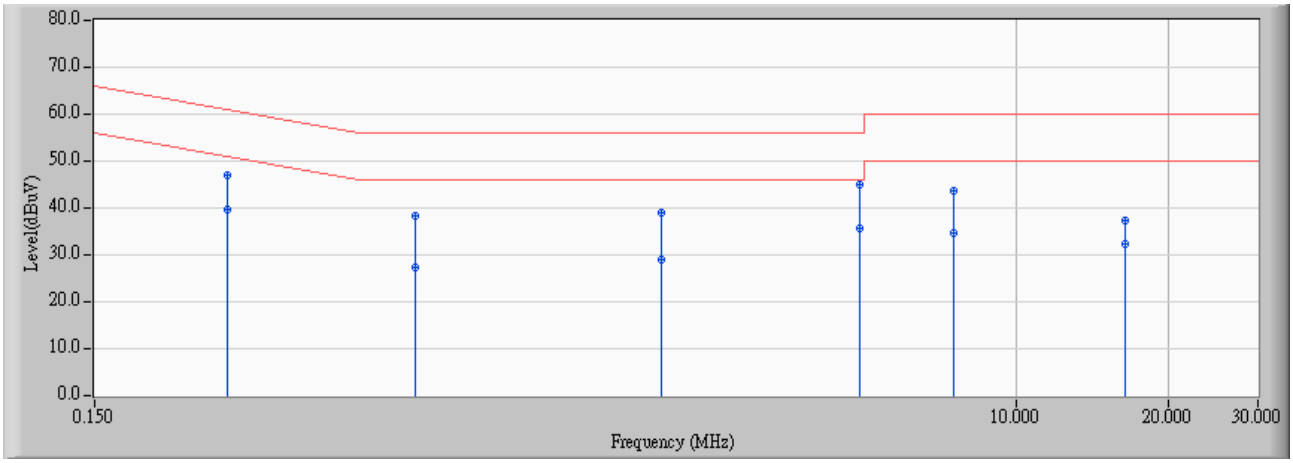
According to FCC Part 15 Subpart C Paragraph 15.207: 2009

2.6. Uncertainty

The measurement uncertainty is defined as ± 2.26 dB.

2.7. Test Result

Site : SR3	**Time : 2010/07/13 - 15:54**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR3_LISN(16A) - Line1	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190MHz(N-40M)**

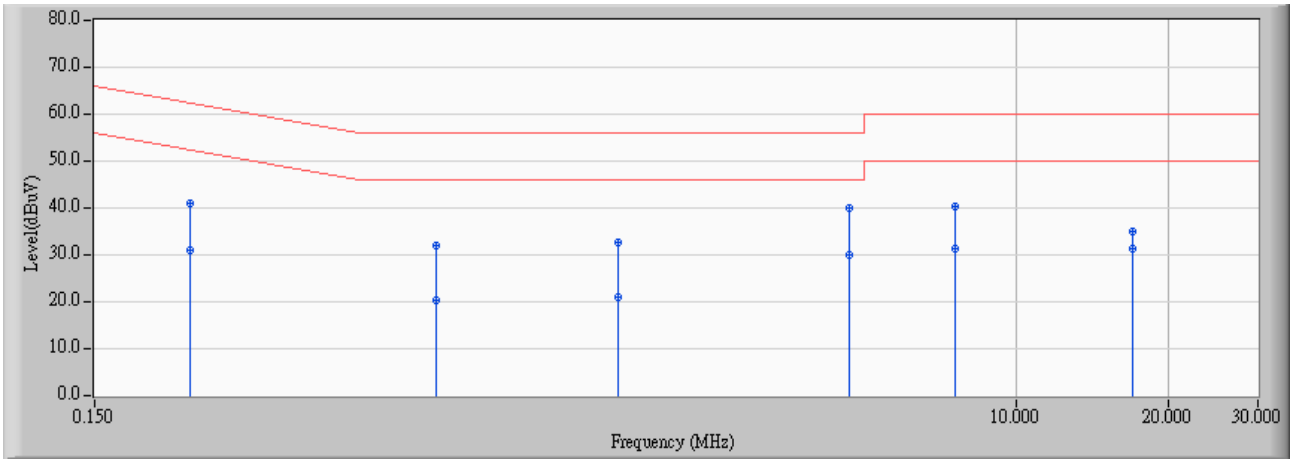


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.275	9.821	37.040	46.861	-14.105	60.966	QUASIPEAK
2		0.275	9.821	29.690	39.511	-11.455	50.966	AVERAGE
3		0.646	9.754	28.630	38.384	-17.616	56.000	QUASIPEAK
4		0.646	9.754	17.540	27.294	-18.706	46.000	AVERAGE
5		1.986	9.868	29.250	39.118	-16.882	56.000	QUASIPEAK
6		1.986	9.868	19.230	29.098	-16.902	46.000	AVERAGE
7		4.904	9.889	35.120	45.009	-10.991	56.000	QUASIPEAK
8	*	4.904	9.889	25.870	35.759	-10.241	46.000	AVERAGE
9		7.513	10.015	33.520	43.536	-16.464	60.000	QUASIPEAK
10		7.513	10.015	24.570	34.586	-15.414	50.000	AVERAGE
11		16.369	10.184	27.300	37.485	-22.515	60.000	QUASIPEAK
12		16.369	10.184	22.100	32.285	-17.715	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 : SR3	**Time : 2010/07/13 - 15:57**
Limit : CISPR_B_00M_QP	**Margin : 10**
Probe : SR3_LISN(16A) - Line2	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190MHz(N-40M)**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.232	9.835	31.210	41.045	-21.331	62.377	QUASIPEAK
2		0.232	9.835	21.160	30.995	-21.381	52.377	AVERAGE
3		0.709	9.755	22.130	31.885	-24.115	56.000	QUASIPEAK
4		0.709	9.755	10.620	20.375	-25.625	46.000	AVERAGE
5		1.627	9.829	22.750	32.579	-23.421	56.000	QUASIPEAK
6		1.627	9.829	11.330	21.159	-24.841	46.000	AVERAGE
7		4.662	9.900	30.200	40.100	-15.900	56.000	QUASIPEAK
8	*	4.662	9.900	20.220	30.120	-15.880	46.000	AVERAGE
9		7.556	10.045	30.380	40.426	-19.574	60.000	QUASIPEAK
10		7.556	10.045	21.160	31.206	-18.794	50.000	AVERAGE
11		16.993	10.320	24.640	34.960	-25.040	60.000	QUASIPEAK
12		16.993	10.320	20.950	31.270	-18.730	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. 26dB Bandwidth

3.1. Test Equipment

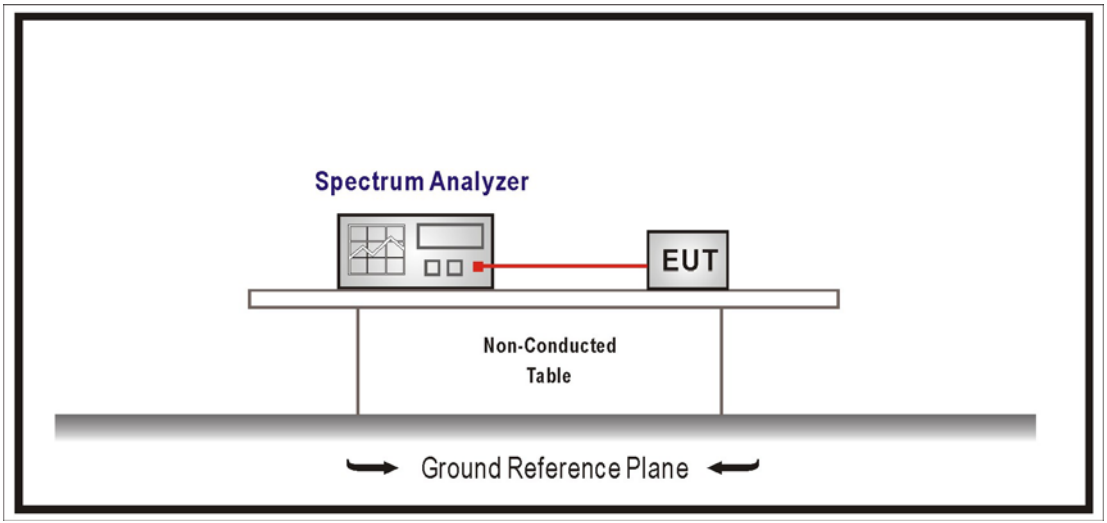
The following test equipments are used during the radiated emission tests:

26dB Bandwidth / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2010/11/1

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

3.2. Test Setup



3.3. Limits

No Required

3.4. Test Procedure

The EUT was tested according to FCC Public Notice DA 02-2138, AUGUST 2002.
Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

3.5. Uncertainty

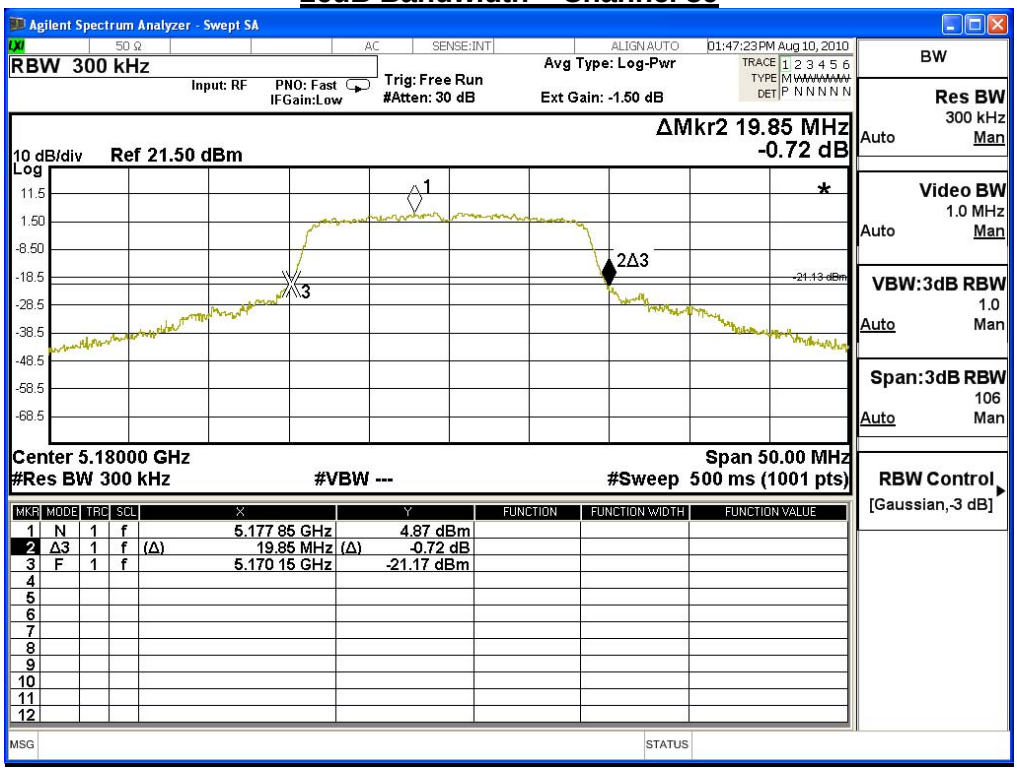
The measurement uncertainty is defined as ±150Hz

3.6. Test Result

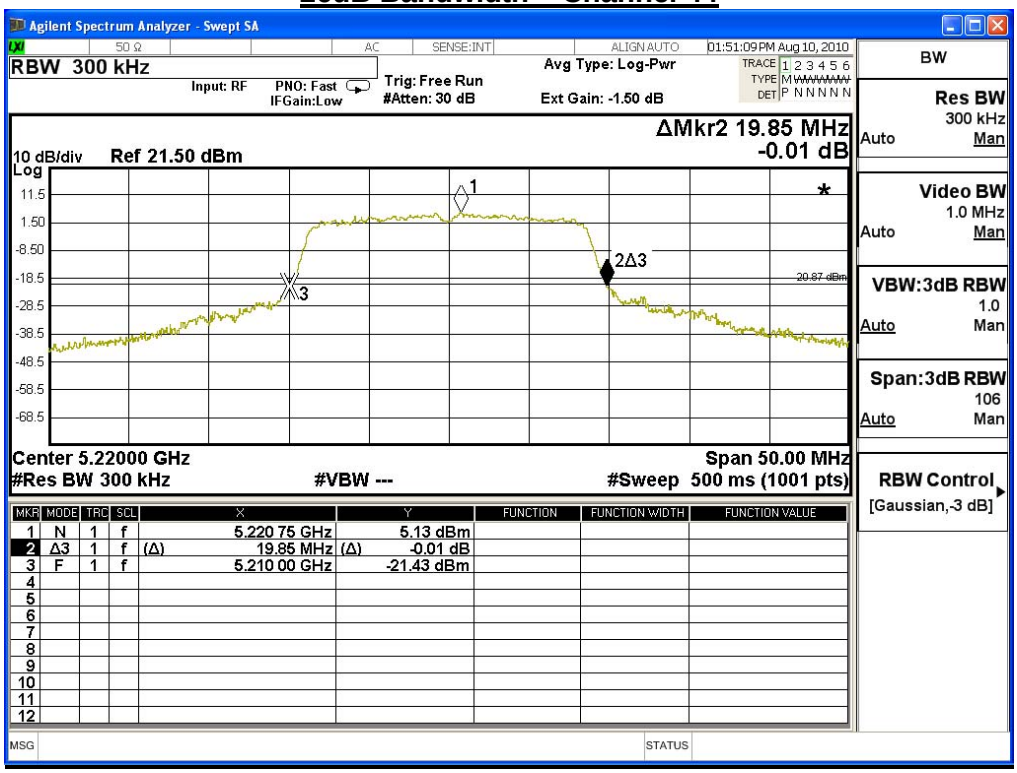
Product	Wireless Extender		
Test Item	26dB Bandwidth		
Test Mode	Transmit		
Date of Test	2010/08/10	Test Site	No.7 Sheilding Room

IEEE 802.11n(20MHz)				
Channel No.	Frequency (MHz)	26dB BW (MHz)	Required Limit (MHz)	Result
36	5180	19.85	--	NA
44	5220	19.85	--	NA
48	5240	19.85	--	NA

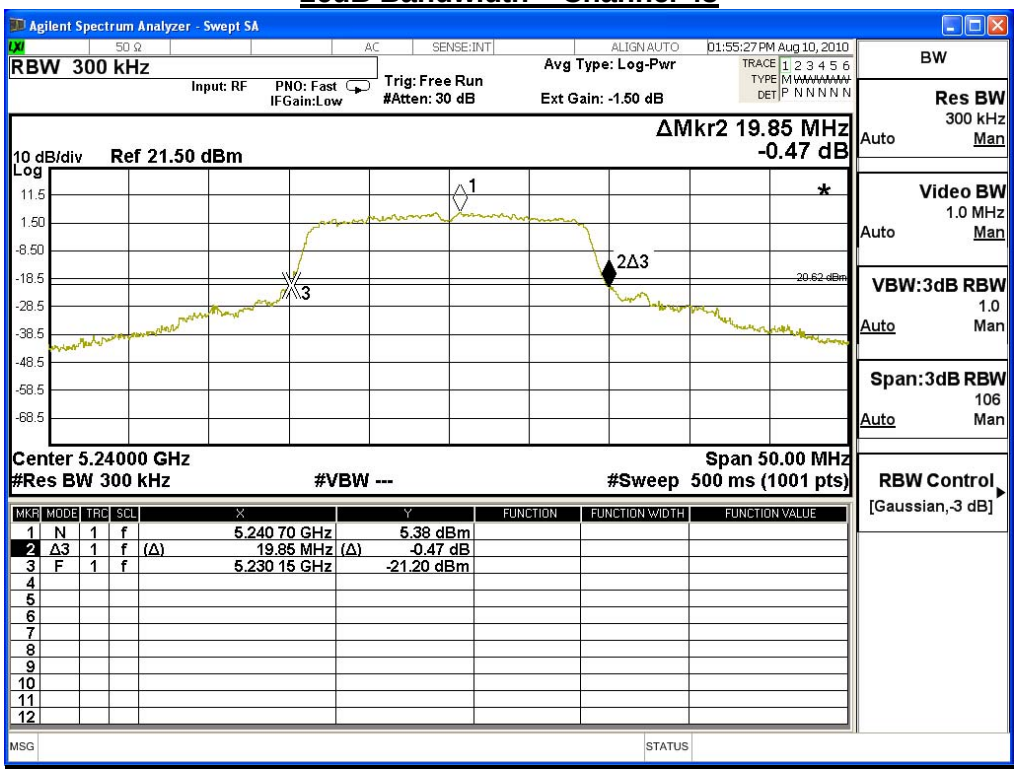
26dB Bandwidth – Channel 36



26dB Bandwidth – Channel 44



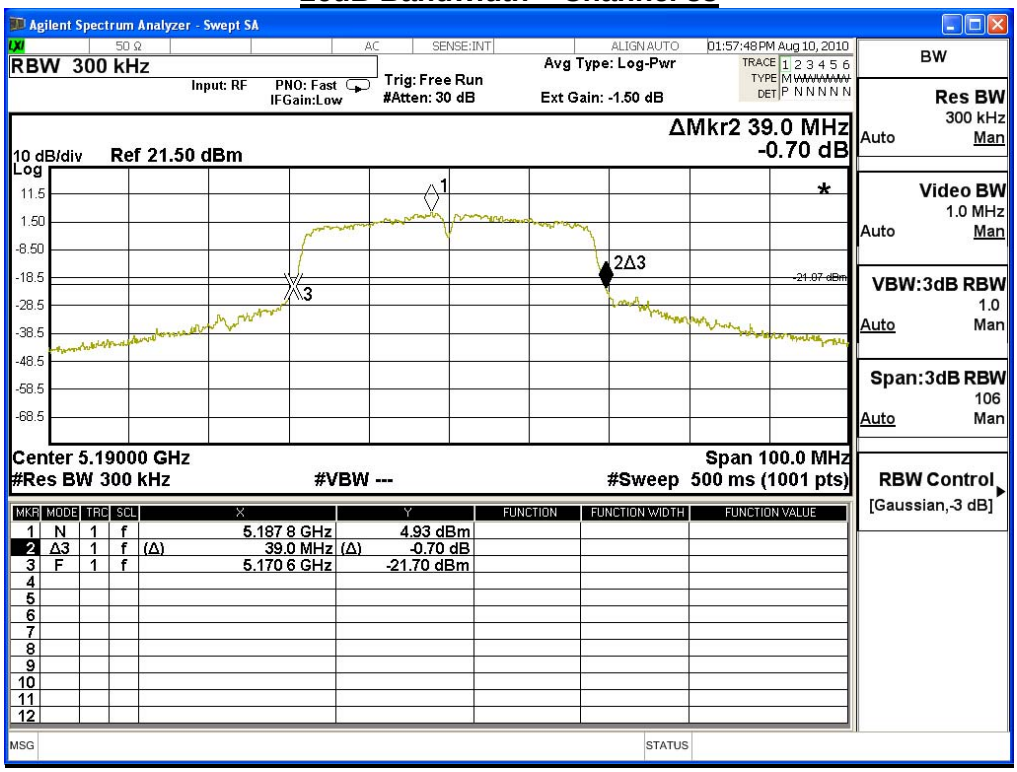
26dB Bandwidth – Channel 48



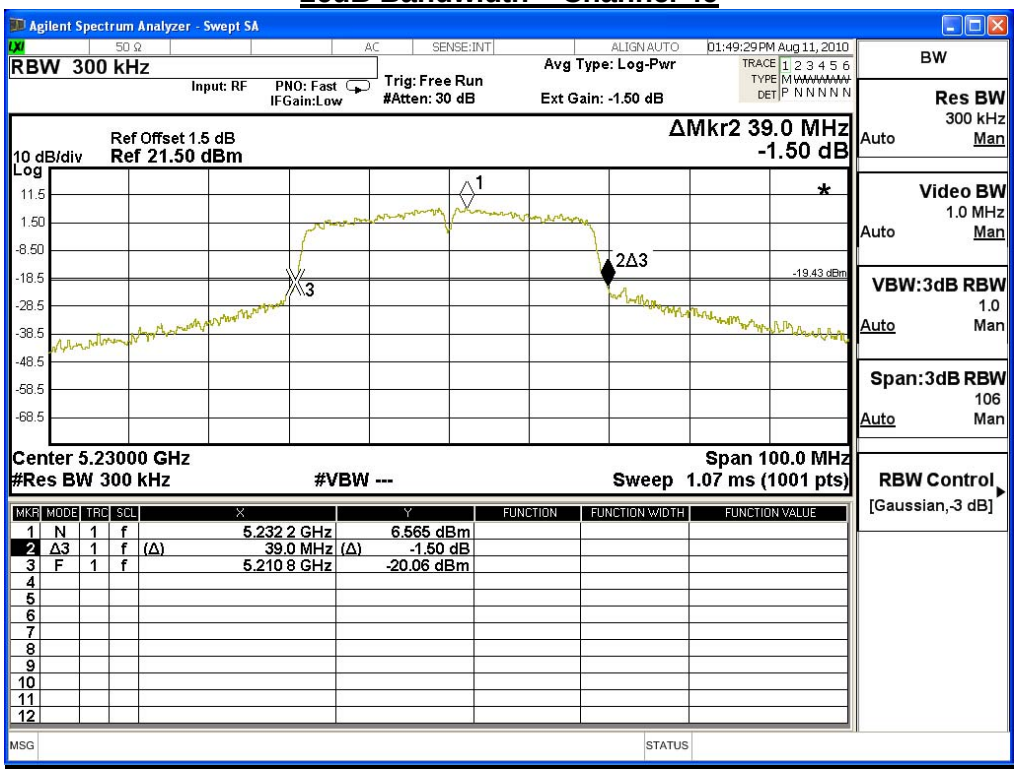
Product	Wireless Extender		
Test Item	26dB Bandwidth		
Test Mode	Transmit		
Date of Test	2010/08/10	Test Site	No.7 Sheilding Room

IEEE 802.11n(40MHz)				
Channel No.	Frequency (MHz)	26dB BW (MHz)	Required Limit (MHz)	Result
38	5190	39	--	NA
46	5230	39	--	NA

26dB Bandwidth – Channel 38



26dB Bandwidth – Channel 46



4. Peak Transmit Power

4.1. Test Equipment

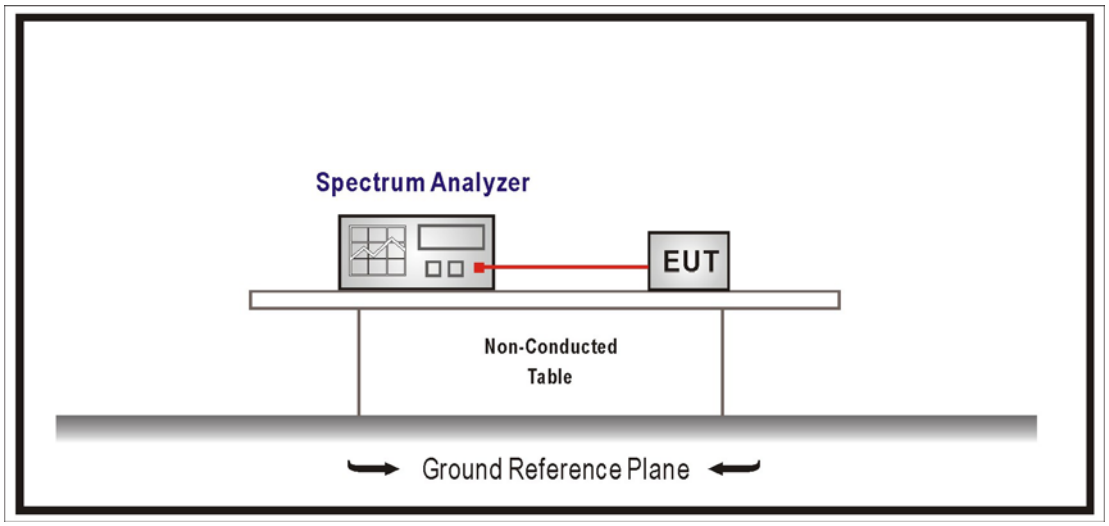
The following test equipments are used during the radiated emission tests:

Peak Transmit Output / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2010/11/01

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

4.2. Test Setup



4.3. Limits

1. For the band 5.15-5.25 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 50 mW or 4 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
2. For the band 5.25-5.35 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.825 GHz, the peak transmit power over the frequency band of operation shall not exceed the lesser of 1W or 17 dBm + 10log B, where B is the 26dB emission bandwidth in MHz. If transmitting antenna of directional gain greater than 6 dBi are used, the peak transmit power shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

4.4. Test Procedure

The EUT was setup to ANSI C63.4, 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements. The Method #1 of the Peak conducted transmit output power was used.

Set RBW=1MHz, VBW=3MHz with sample detector and trace average 100 traces in power averaging mode. Set span to encompass the entire emission bandwidth (EBW) of the signal. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

4.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

4.6. Test Result

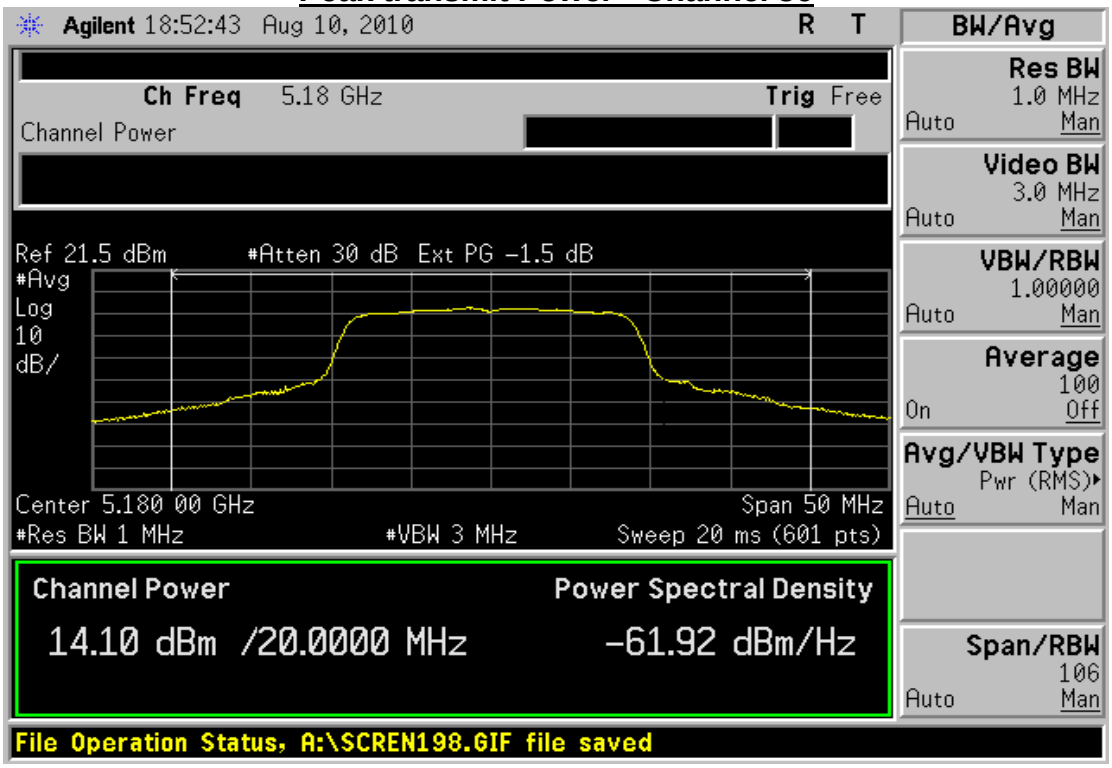
Product	WIRELESS EXTENDER		
Test Item	Peak Transmit Output		
Test Mode	Transmit		
Date of Test	2010/08/09	Test Site	No.7 Sheilding Room

IEEE 802.11n(20MHz)						
Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
36	5180	19.85	14.10	≤ 17	≤ 16.97	Pass
44	5220	19.85	14.19	≤ 17	≤ 16.97	Pass
48	5240	19.85	14.02	≤ 17	≤ 16.97	Pass

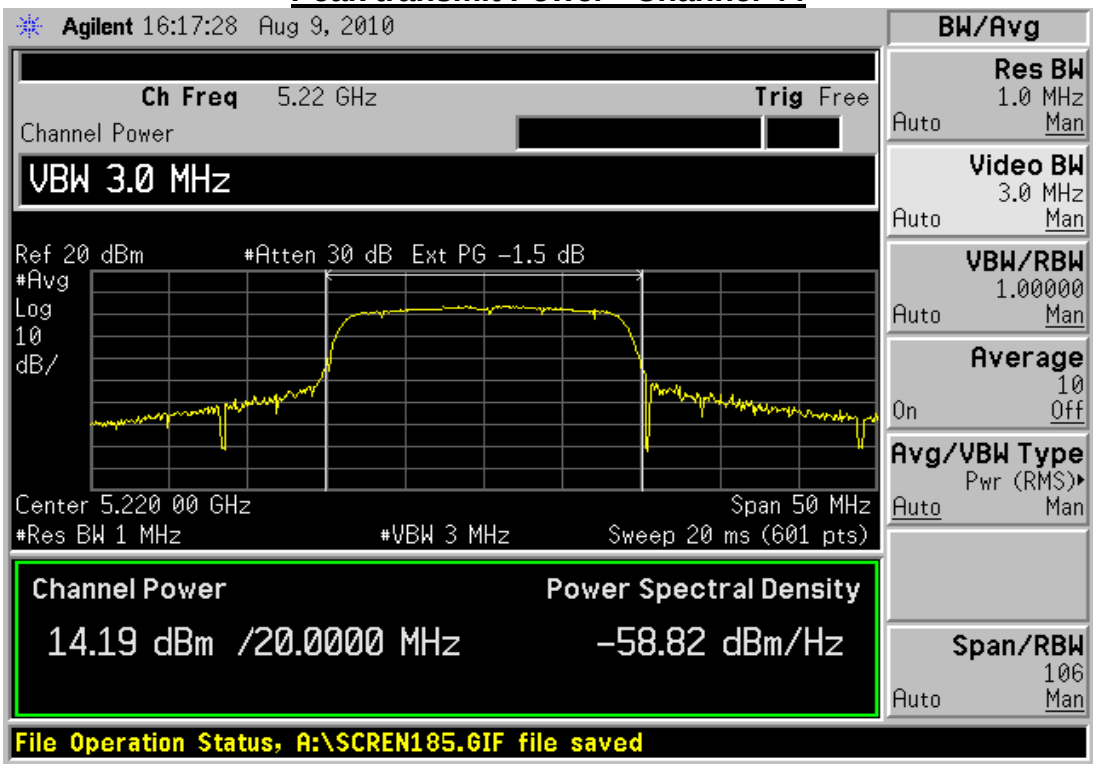
The worst emission of data rate is 6.5 Mbps.

Peak Power Output (dBm)										
MCS Index		0	1	2	3	4	5	6	7	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		6.5	13	19.5	26	39	52	58.5	65	
36	5180	14.10	13.77	12.03	11.98	10.07	9.85	8.06	7.88	≦17
44	5220	14.19	13.94	12.29	12.04	10.16	10.08	8.05	7.80	≦17
48	5240	14.02	13.95	12.02	11.85	9.78	9.56	7.58	7.38	≦17

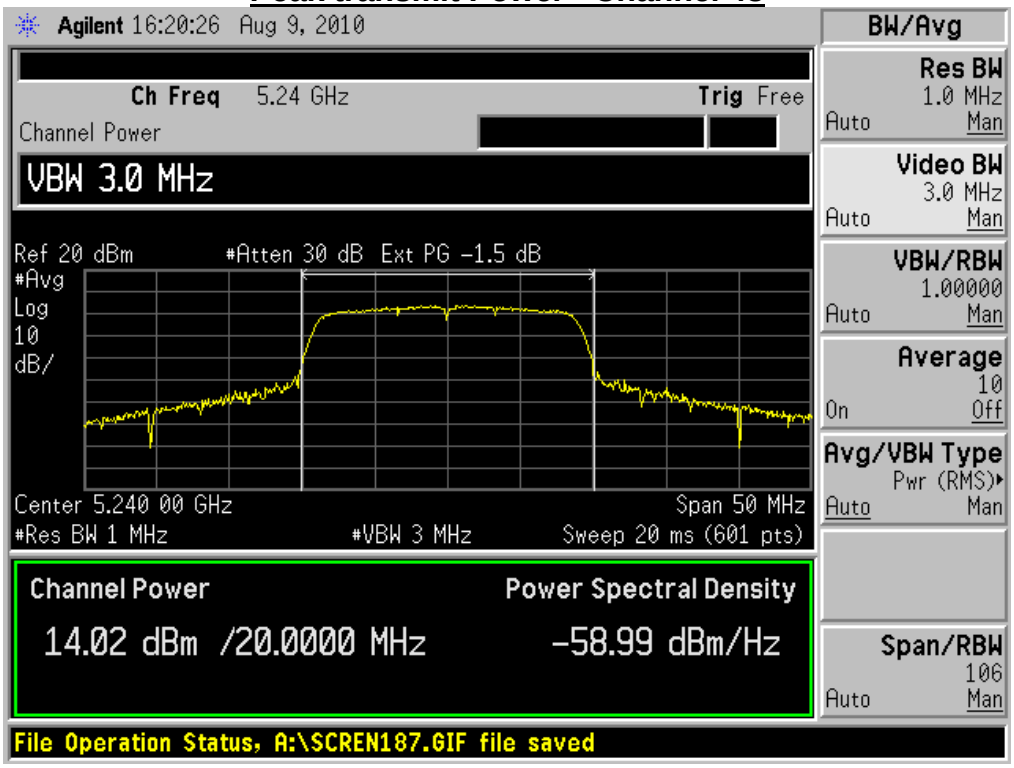
Peak transmit Power - Channel 36



Peak transmit Power - Channel 44



Peak transmit Power - Channel 48



Product	WIRELESS EXTENDER		
Test Item	Peak Transmit Output		
Test Mode	Transmit		
Date of Test	2010/08/05	Test Site	No.7 Sheilding Room

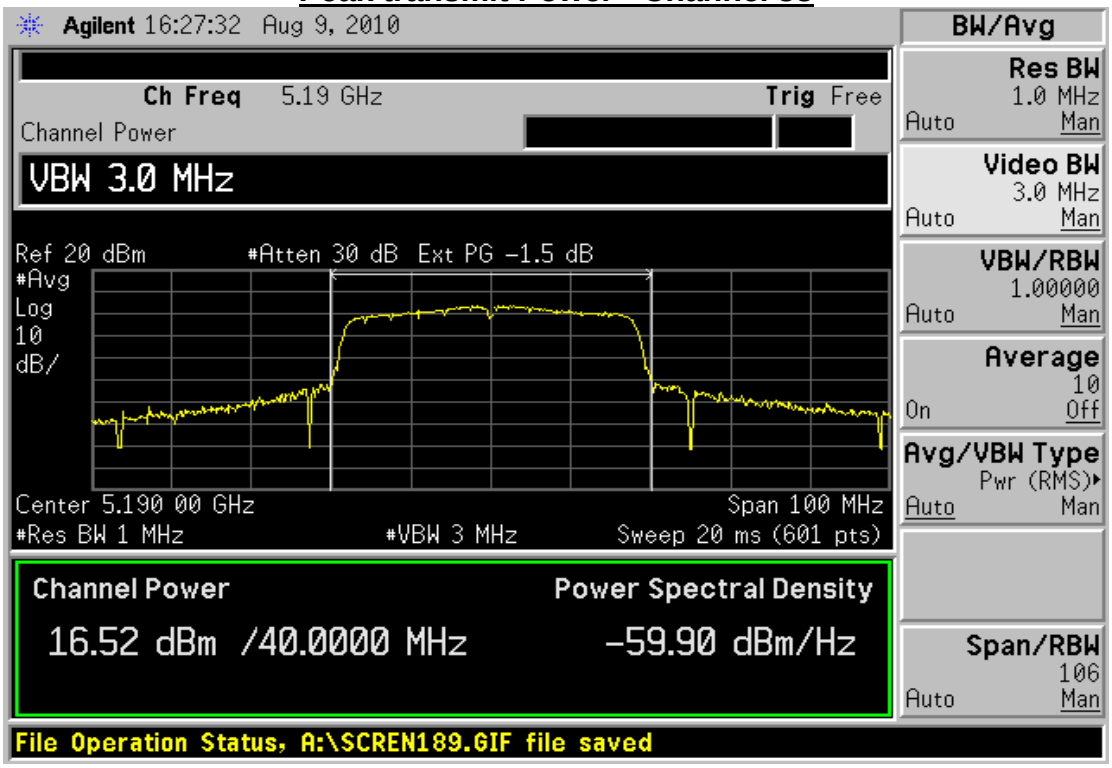
IEEE 802.11n(40MHz)

Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	Output Power (dBm)	Required Limit		Result
				Fixed Limit (dBm)	4+10logB Limit (dBm)	
38	5190	39	16.52	≤ 17	≤ 19.91	Pass
46	5230	39	16.58	≤ 17	≤ 19.91	Pass

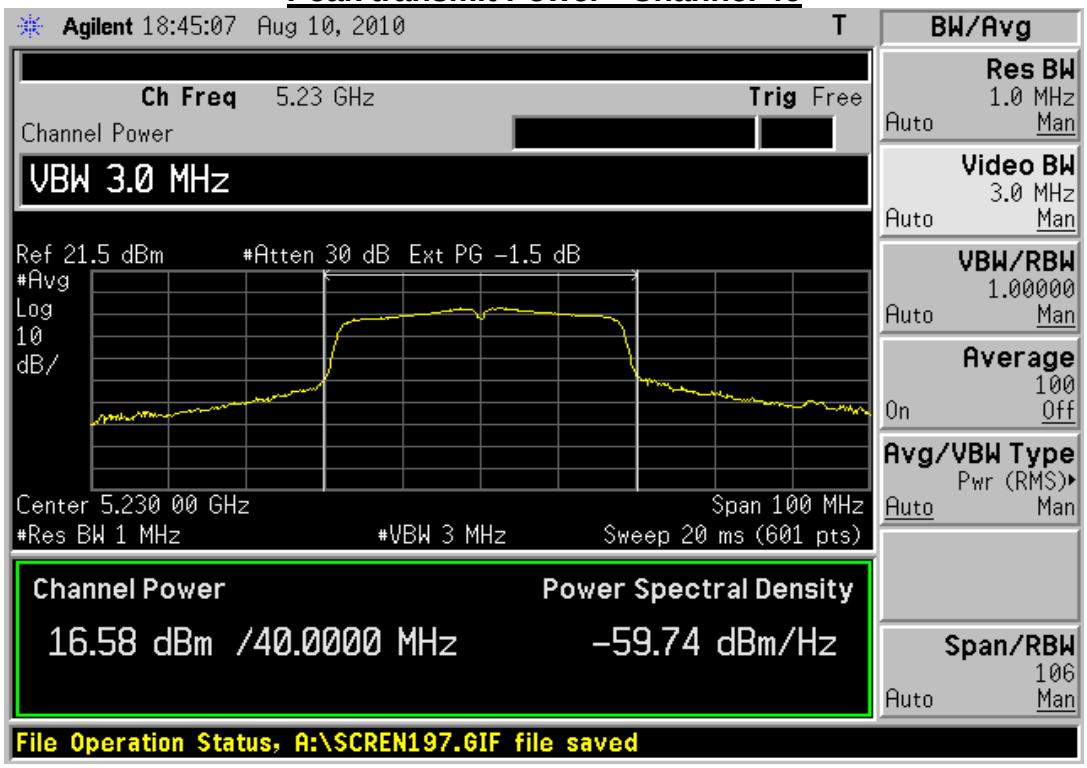
The worst emission of data rate is 0 Mbps.

Peak Power Output (dBm)										
MCS Index		0	1	2	3	4	5	6	7	Required Limit
Channel No	Frequency (MHz)	Data Rate								
		13.5	27	40.5	54	81	108	121.5	135	
39	5190	16.52	15.89	13.79	13.23	12.77	12.02	10.87	9.01	≦17
46	5230	16.58	15.99	14.11	13.17	12.65	11.79	10.34	9.54	≦17

Peak transmit Power - Channel 38



Peak transmit Power - Channel 46



5. Peak Power Spectrum Density

5.1. Test Equipment

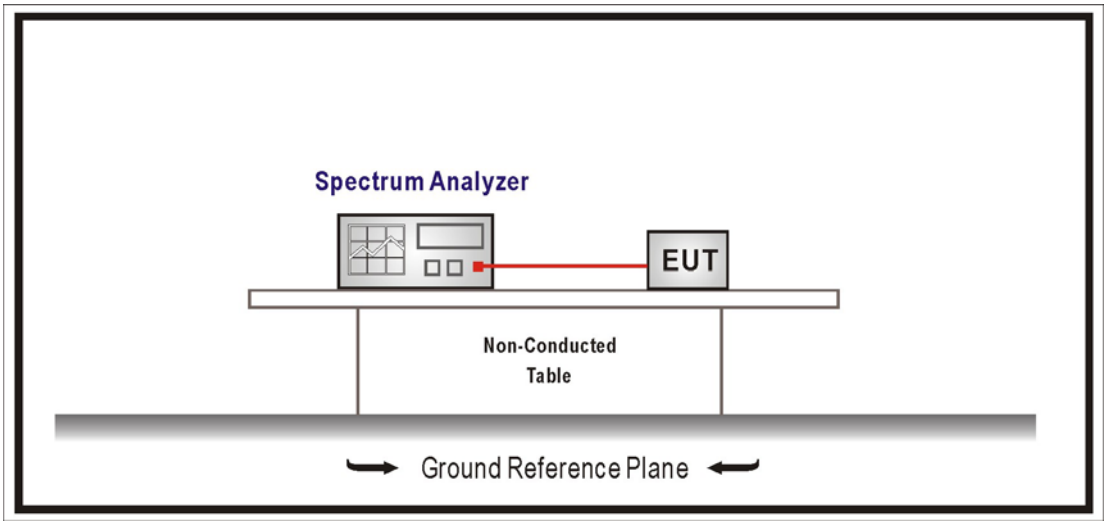
The following test equipments are used during the radiated emission tests:

Peak Power Spectrum Density / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2010/11/01

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

5.2. Test Setup



5.3. Limits

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
2. For the band 5.25-5.35 GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.

5.4. Test Procedure

The EUT was setup to ANSI C63.4: 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements. The Method #2 of the Peak power spectral density (PPSD) was used.

Set RBW=1MHz, VBW=3MHz with sample detector. The PPSD is the highest level found across the emission in any 1-MHz band after 100 sweeps of averaging.

5.5. Uncertainty

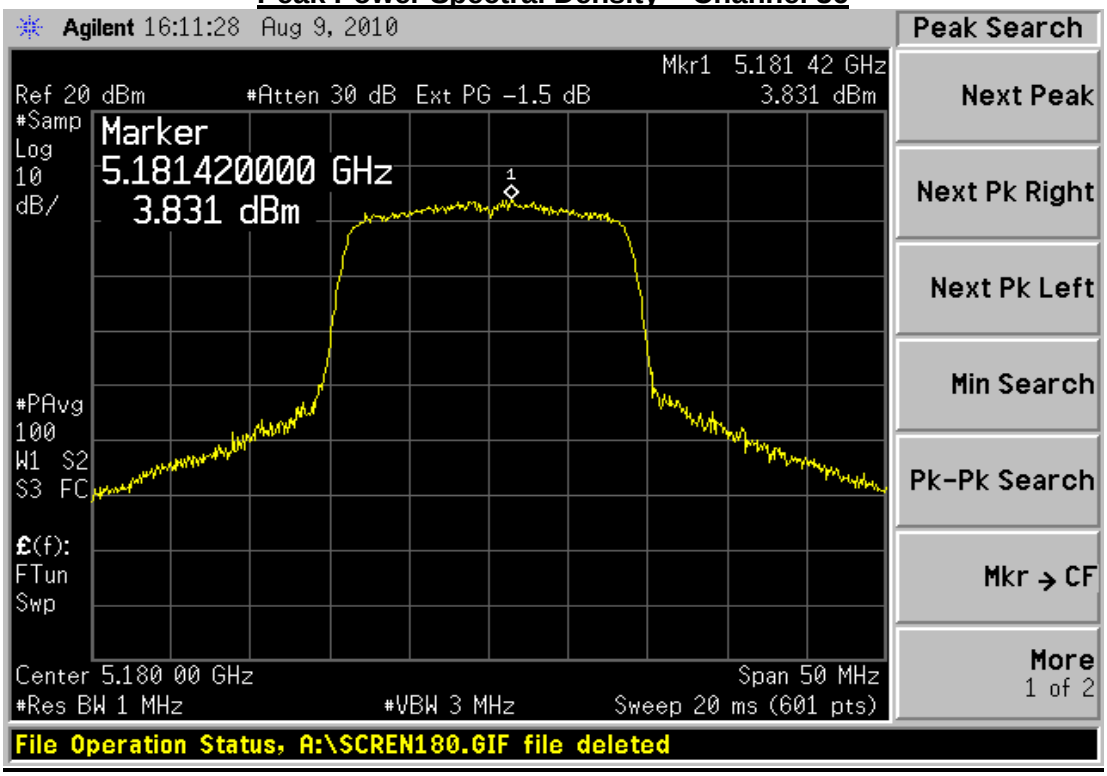
The measurement uncertainty is defined as ± 1.27 dB

5.6. Test Result

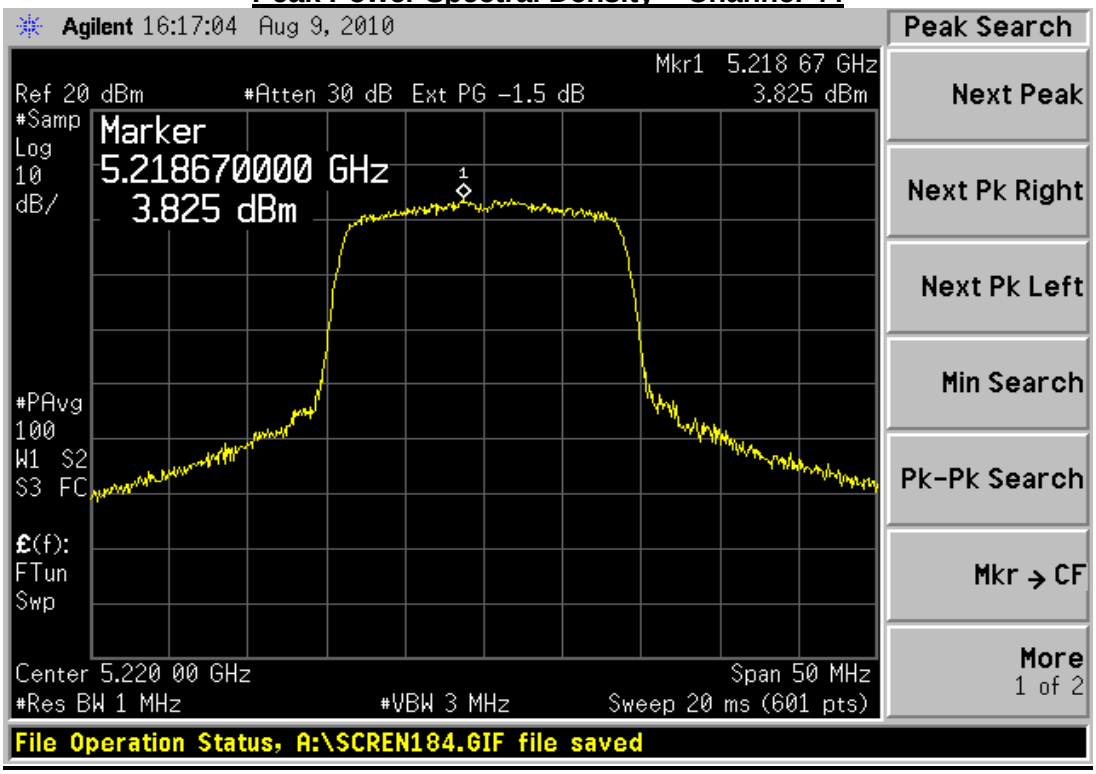
Product	Wireless Extender		
Test Item	Peak Power Spectral Density		
Test Mode	Transmit		
Date of Test	2010/08/09	Test Site	No.7 Sheilding Room

IEEE 802.11n(20MHz)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Required Limit (dBm)	Result
36	5180	3.831	≤ 4	Pass
44	5220	3.825	≤ 4	Pass
48	5240	3.816	≤ 4	Pass

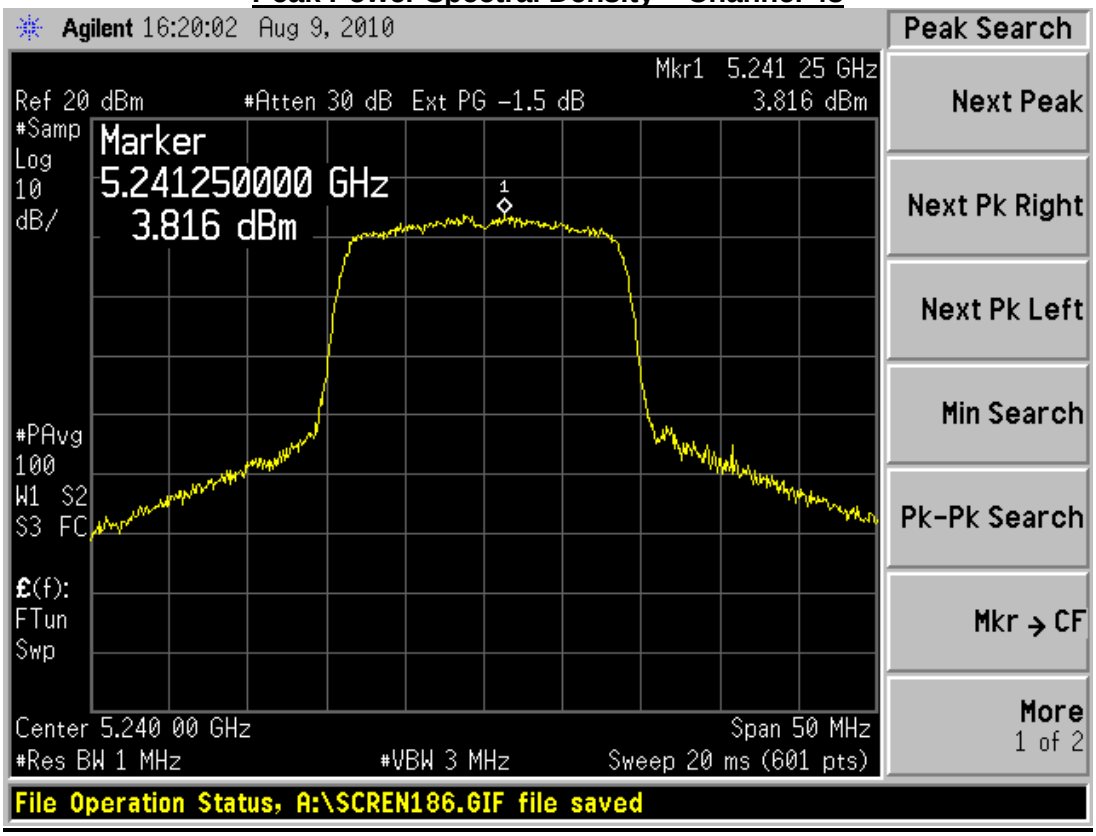
Peak Power Spectral Density – Channel 36



Peak Power Spectral Density – Channel 44



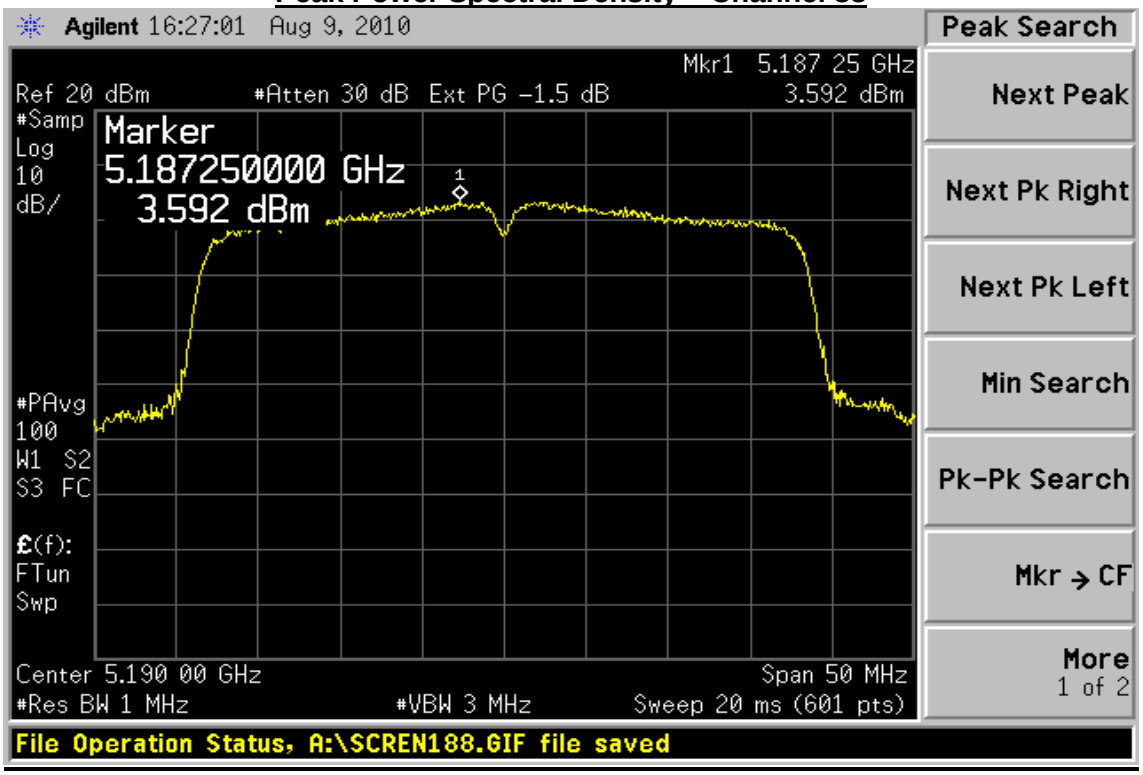
Peak Power Spectral Density – Channel 48



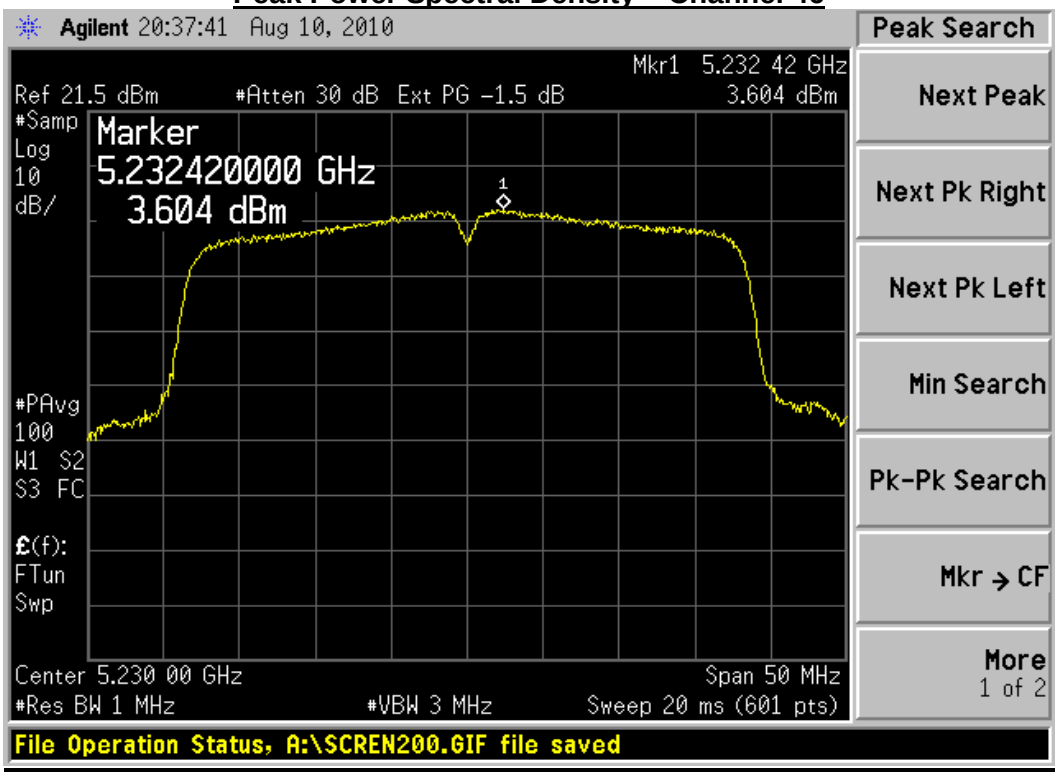
Product	Wireless Extender		
Test Item	Peak Power Spectral Density		
Test Mode	Transmit		
Date of Test	2010/08/09	Test Site	No.7 Sheilding Room

IEEE 802.11n(40MHz)				
Channel No.	Frequency (MHz)	Measure Level (dBm)	Required Limit (dBm)	Result
38	5190	3.592	≤ 4	Pass
46	5230	3.604	≤ 4	Pass

Peak Power Spectral Density – Channel 38



Peak Power Spectral Density – Channel 46



6. Peak Excursion

6.1. Test Equipment

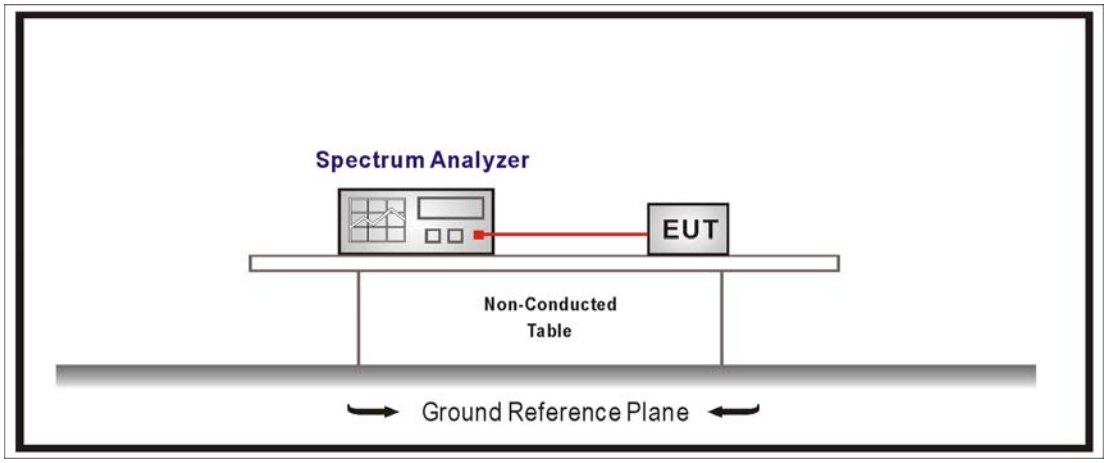
The following test equipments are used during the radiated emission tests:

Peak Excursion / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2010/11/01

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

6.2. Test Setup



6.3. Limits

The ratio of the peak excursion of the modulation envelope (measured suing a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

6.4. Test Procedure

The EUT was setup to ANSI C63.4: 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.
1st Trace:
Set RBW = 1MHz, VBW = 3MHz with peak detector and max-hold settings.
2nd Trace:
Set RBW = 1MHz, VBW = 3MHz with sample detector and trace average 100 traces in power averaging mode.

6.5. Uncertainty

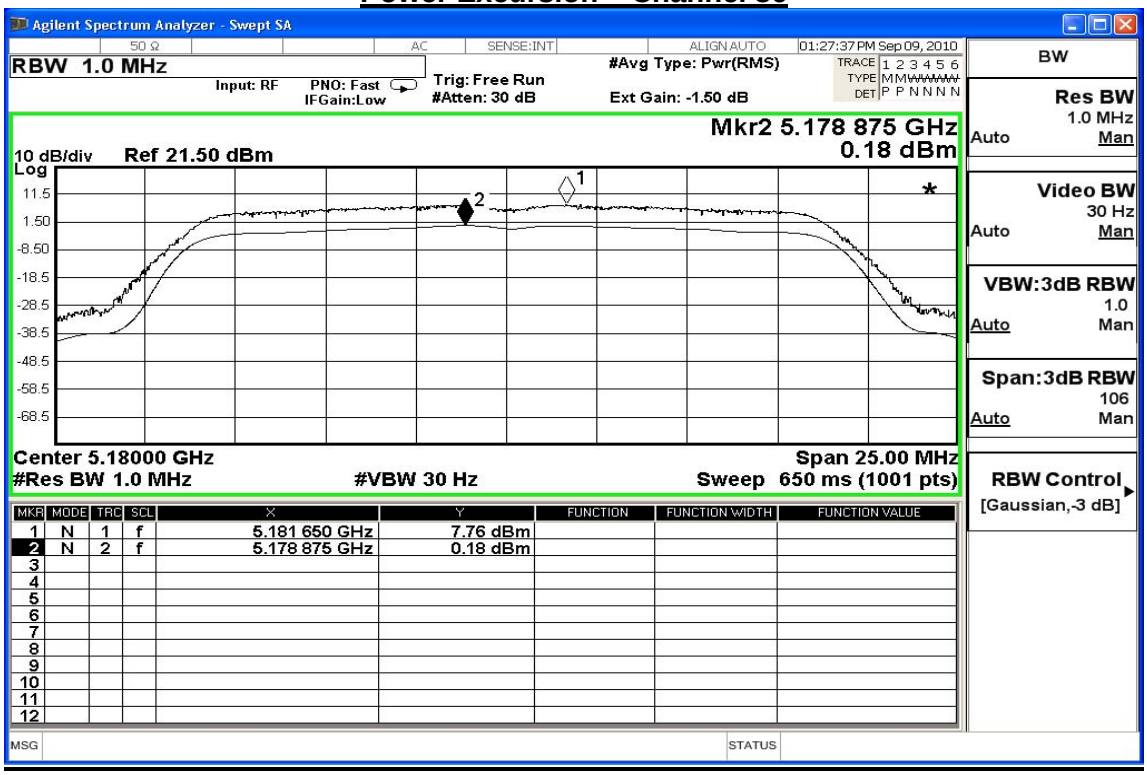
The measurement uncertainty is defined as ± 1.27 dB

6.6. Test Result

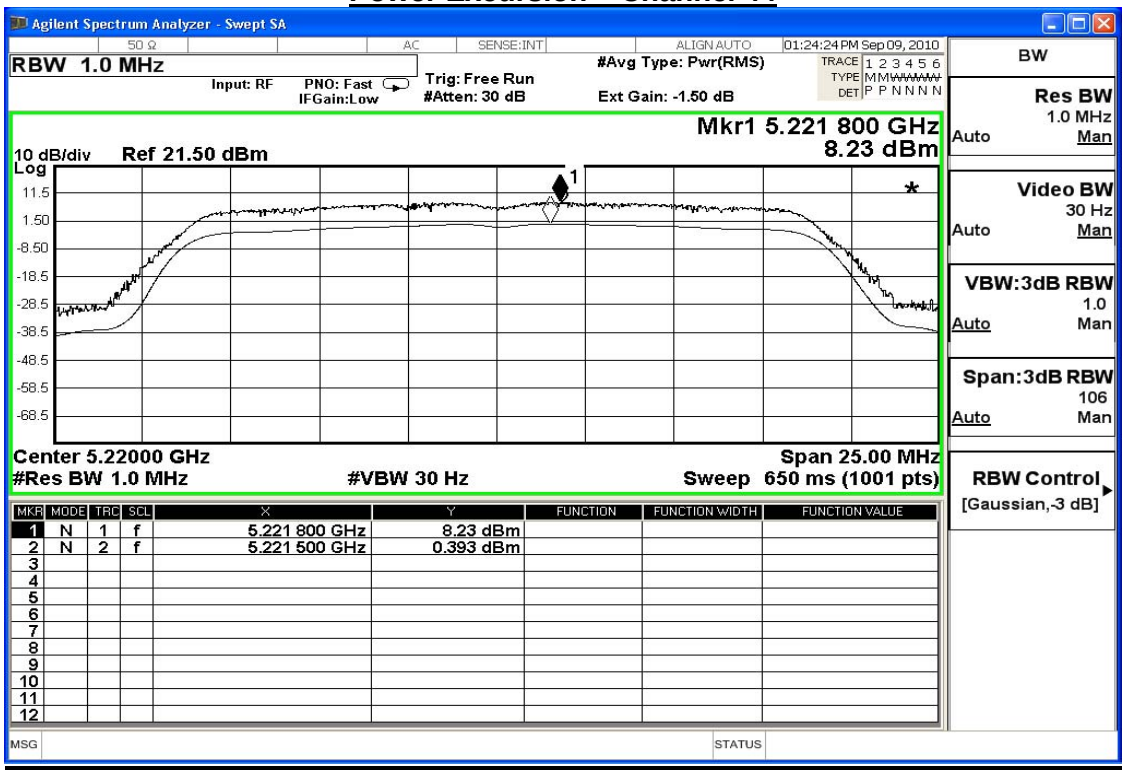
Product	Wireless Extender		
Test Item	Power Excursion		
Test Mode	Transmit		
Date of Test	2010/08/13	Test Site	No.7 Sheilding Room

IEEE 802.11n_20M (ANT.A)				
Channel No.	Frequency (MHz)	Measure Level (dB)	Required Limit (dB)	Result
36	5180	7.58	≤ 13	Pass
44	5220	7.837	≤ 13	Pass
48	5240	7.89	≤ 13	Pass

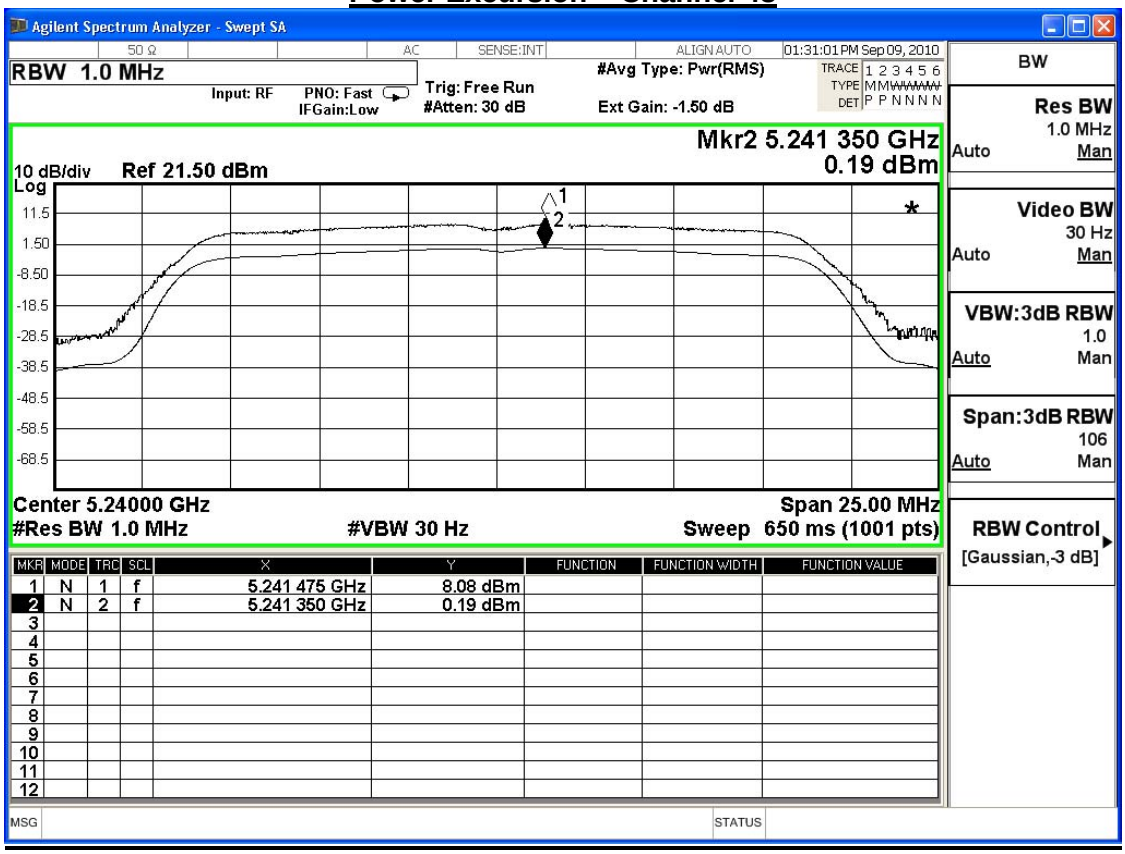
Power Excursion – Channel 36



Power Excursion – Channel 44



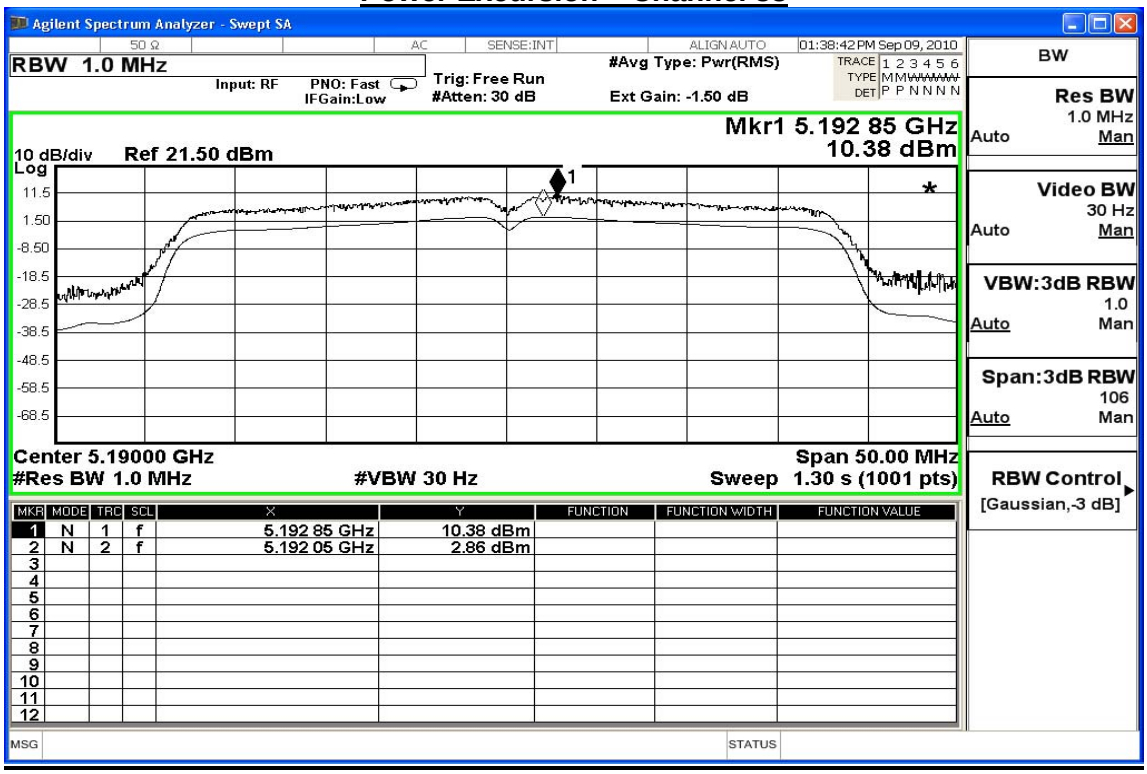
Power Excursion – Channel 48



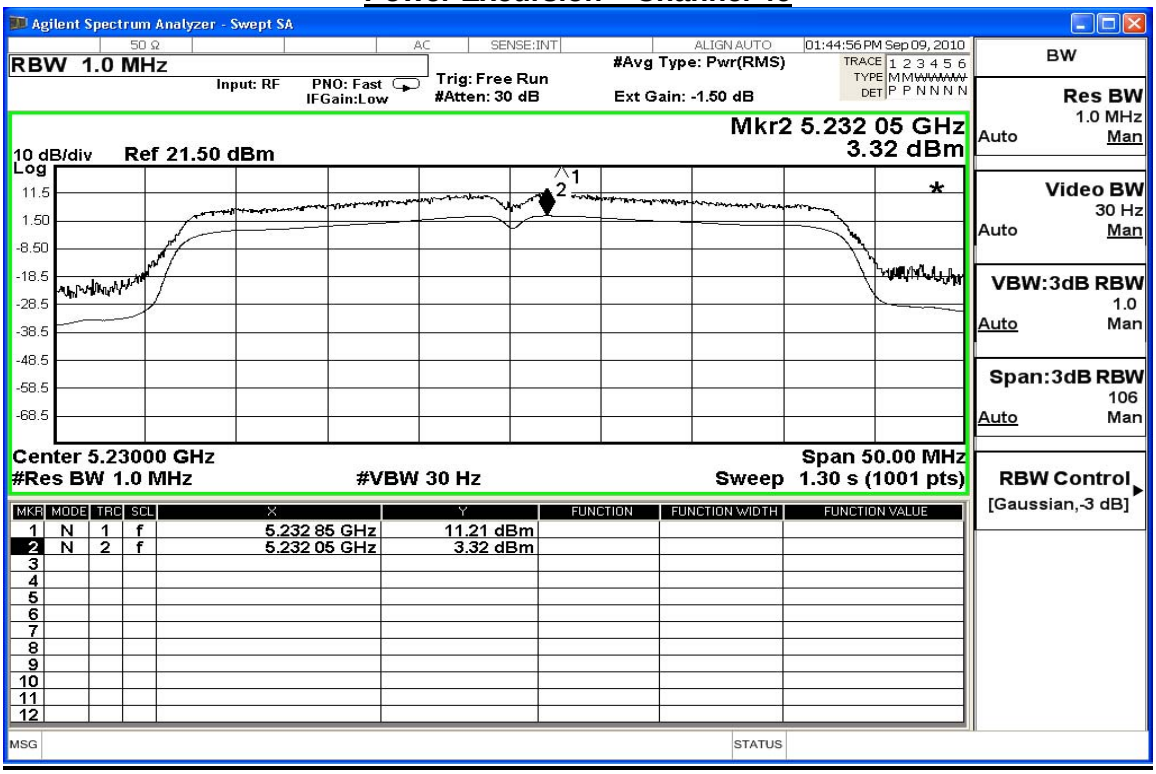
Product	Wireless Extender		
Test Item	Power Excursion		
Test Mode	Transmit		
Date of Test	2010/08/13	Test Site	No.7 Sheilding Room

IEEE 802.11n(40MHz)				
Channel No.	Frequency (MHz)	Measure Level (dB)	Required Limit (dB)	Result
38	5190	7.52	≤ 13	Pass
46	5230	7.89	≤ 13	Pass

Power Excursion – Channel 38



Power Excursion – Channel 46



7. Radiated Emission

7.1. Test Equipment

The following test equipment are used during the radiated emission test:

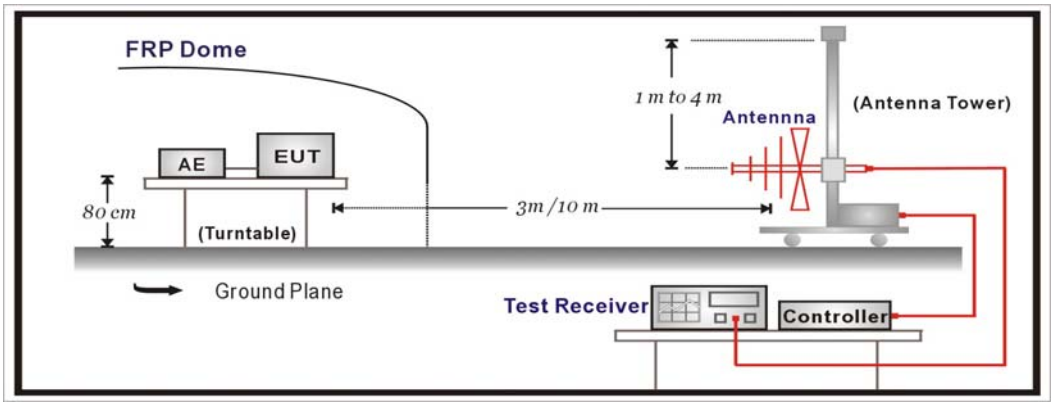
Radiated Emission / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Bilog Antenna	SCHAFFNER	CBL6112B	2895	2011/08/13
Horn Antenna	Schwarzback	BBHA 9120D	743	2011/03/14
Pre-Amplifier	MITEQ	AMF-4D-005180-24-10P	888003	2010/12/03
Pre-Amplifier	QuieTek	AP-025C	CHM-0706049	2011/03/25
Spectrum Analyzer	Agilent	E4440A	MY46187335	2011/01/14
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2011/04/07

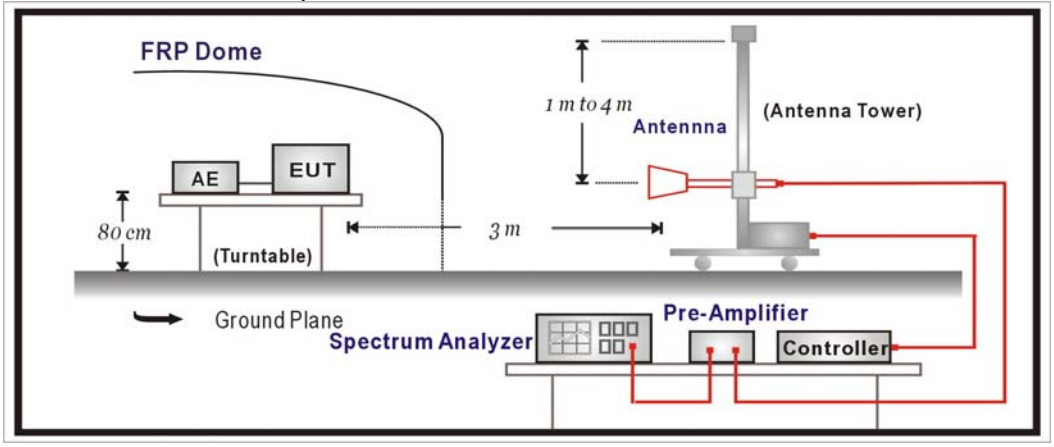
Note: 1. All equipments that need to calibrate are with calibration period of 1 year.

7.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



7.3. Limits

➢ **General Radiated Emission Limits**

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section. Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remark:

1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ **Unwanted Emission out of the restricted bands Limits**

FCC Part 15 Subpart C Paragraph 15.407(b) Limits		
Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (dBuV/m@3m)
5150~5250	-27	68.3
5250~5350	-27	68.3
5470~5725	-27	68.3
5725~5825	-27 (Note1)	68.3
	-17 (Note2)	78.3

Remark:

1. For frequencies more than 10 MHz above or below the band edges.
2. For frequency range from the band edges to 10 MHz above or below the band edges.
3. uV/m = $\frac{1000000\sqrt{30 \times EIRP}}{3}$, RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

7.4. Test Procedure

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 EUT was positioned such that the distance from antenna to the EUT was 3 meters.
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: 2003on radiated measurement.
The additional latch filter below 1GHz was used to measure the level of harmonics radiated emission during field dtrength of harmonics measurement.
The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 KHz, above 1GHz are 1 MHz.
The frequency range from 30MHz to 10th harminics is checked.

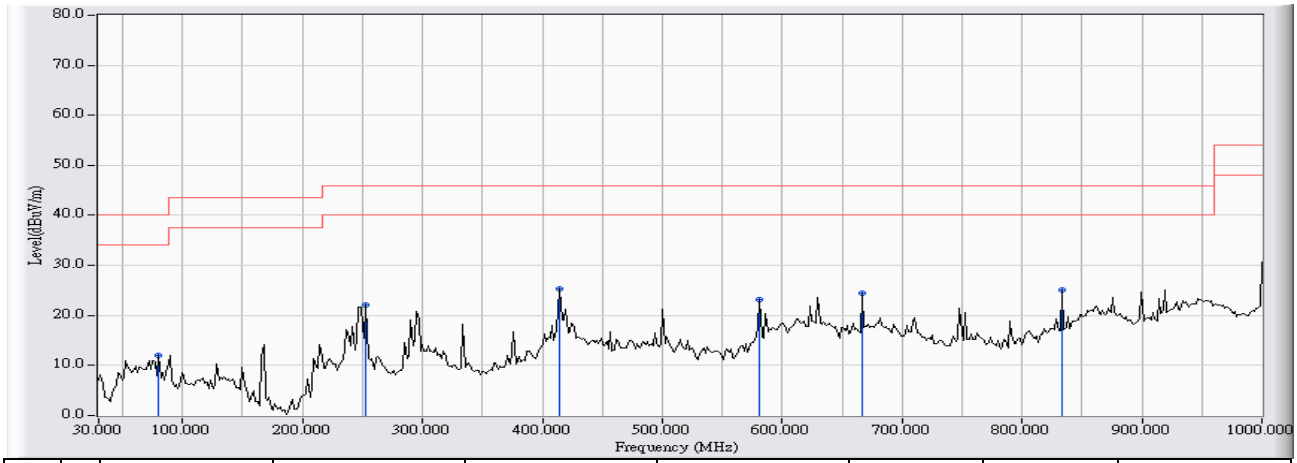
7.5. Uncertainty

The measurement uncertainty
30MHz～1GHz as ±3.43dB
1GHz～26.5Ghz as ±3.65dB

7.6. Test Result

30MHz-1GHz Spurious

Site : CB1	**Time : 2010/07/07 - 13:42**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30-1G(2009) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5220MHz(N-20M)**

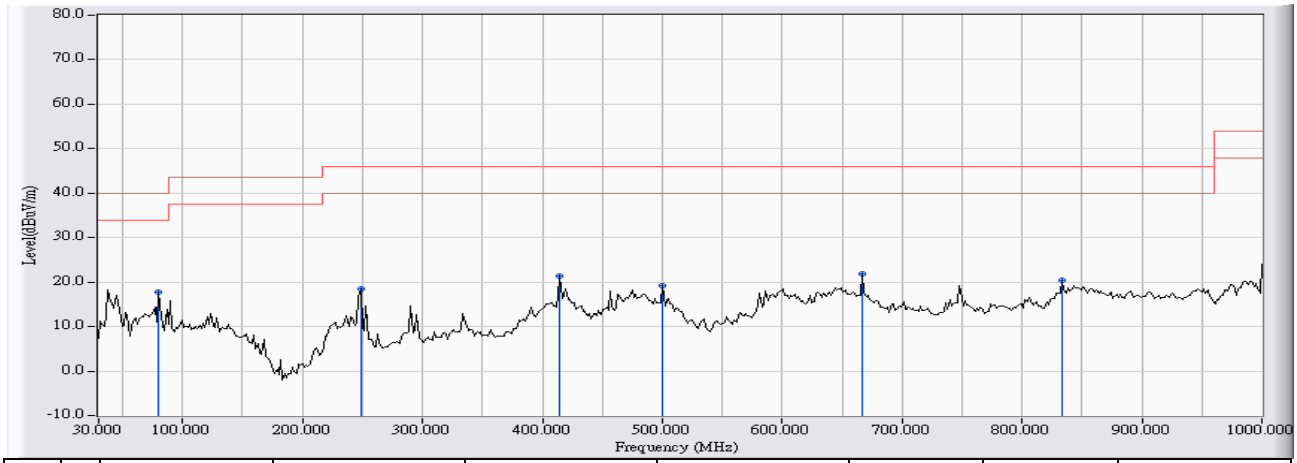


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		80.117	-16.141	28.062	11.921	-28.079	40.000	QUASIPEAK
2		253.100	-12.866	34.923	22.057	-23.943	46.000	QUASIPEAK
3	*	414.767	-4.821	30.145	25.324	-20.676	46.000	QUASIPEAK
4		581.283	-5.896	29.083	23.187	-22.813	46.000	QUASIPEAK
5		666.967	-3.698	28.100	24.402	-21.598	46.000	QUASIPEAK
6		833.483	-3.793	28.850	25.057	-20.943	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 : 2010/07/07 - 13:46**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30-1G(2009) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5220MHz(N-20M)**

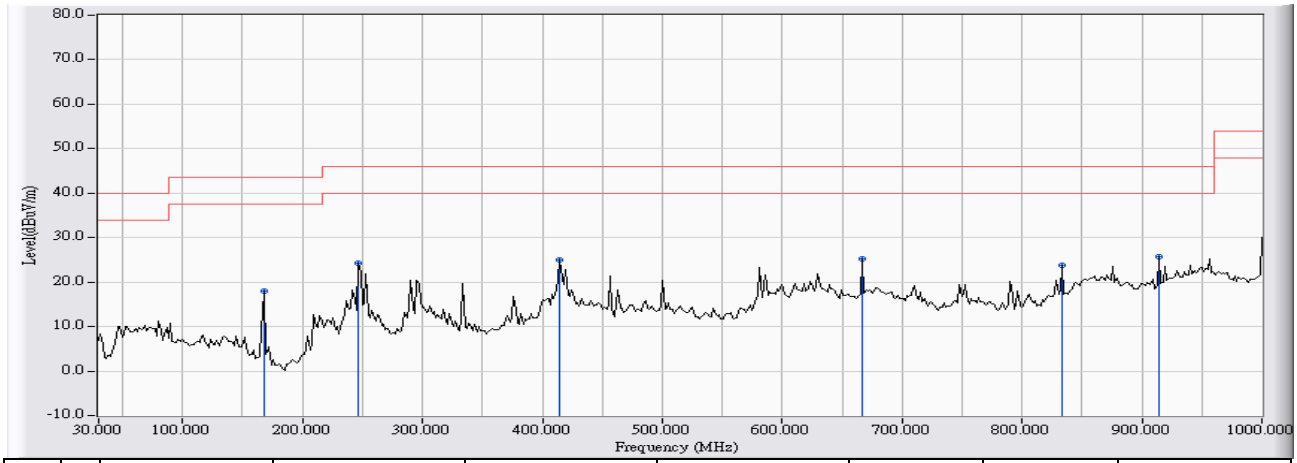


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	80.117	-14.657	32.349	17.692	-22.308	40.000	QUASIPEAK
2		248.250	-13.862	32.311	18.449	-27.551	46.000	QUASIPEAK
3		414.767	-4.836	26.112	21.275	-24.725	46.000	QUASIPEAK
4		500.450	-6.839	26.070	19.232	-26.768	46.000	QUASIPEAK
5		666.967	-3.707	25.621	21.914	-24.086	46.000	QUASIPEAK
6		833.483	-3.182	23.543	20.361	-25.639	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 : 2010/07/07 - 14:00**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30-1G(2009) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190MHz(N-40M)**

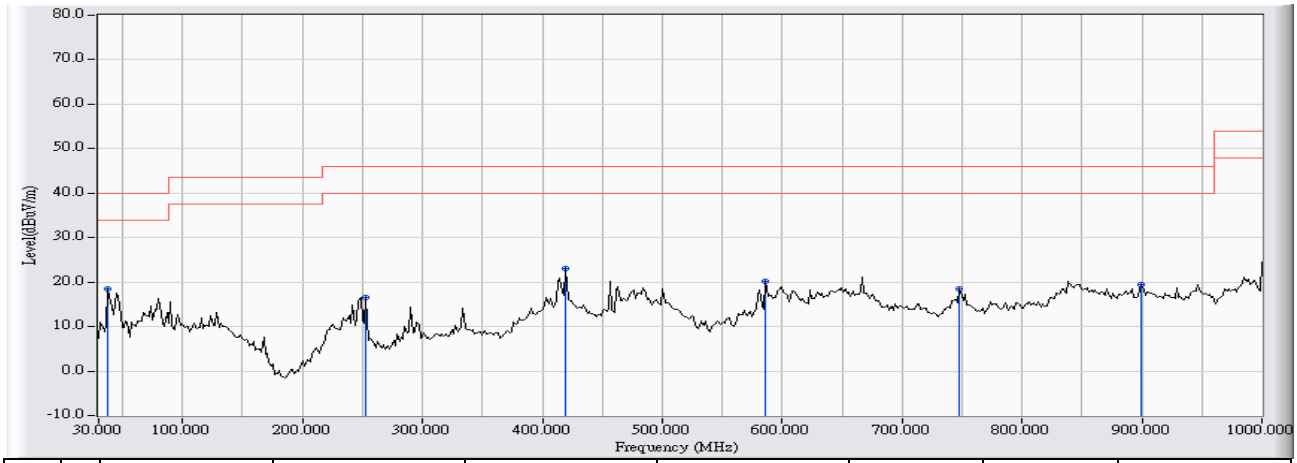


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		167.417	-20.178	38.184	18.006	-25.494	43.500	QUASIPEAK
2		246.633	-13.541	37.687	24.146	-21.854	46.000	QUASIPEAK
3		414.767	-4.821	29.822	25.001	-20.999	46.000	QUASIPEAK
4		666.967	-3.698	28.918	25.220	-20.780	46.000	QUASIPEAK
5		833.483	-3.793	27.485	23.692	-22.308	46.000	QUASIPEAK
6	*	914.317	-1.737	27.390	25.653	-20.347	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 : 2010/07/07 - 14:03**
Limit : FCC_CLASS_B_03M_QP	**Margin : 6**
Probe : CB1_FCC_30-1G(2009) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190MHz(N-40M)**



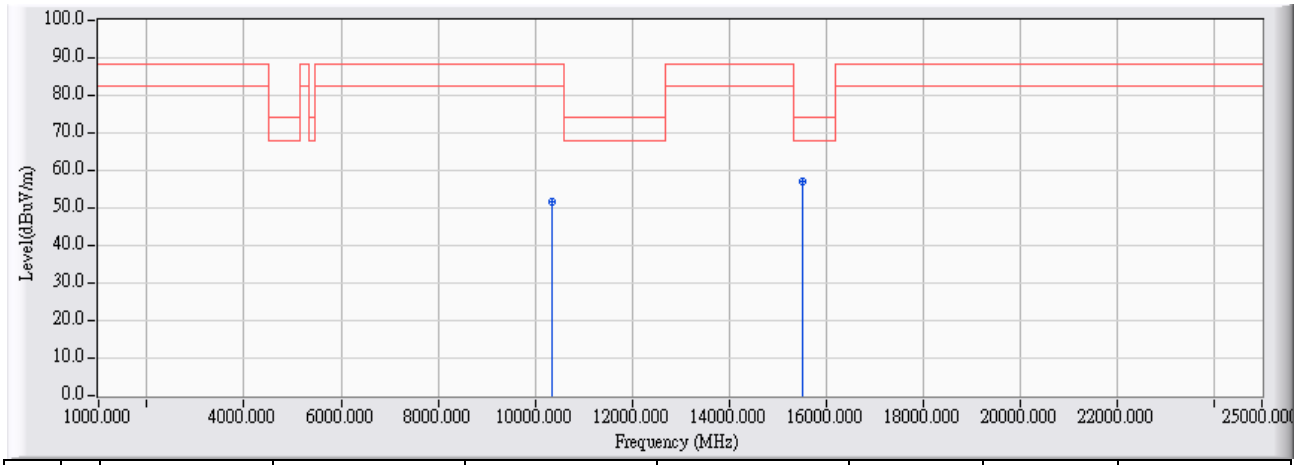
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	38.083	-10.585	29.089	18.504	-21.496	40.000	QUASIPEAK
2		253.100	-14.644	31.297	16.653	-29.347	46.000	QUASIPEAK
3		419.617	-5.114	28.237	23.123	-22.877	46.000	QUASIPEAK
4		586.133	-5.849	26.040	20.191	-25.809	46.000	QUASIPEAK
5		747.800	-5.637	24.174	18.538	-27.462	46.000	QUASIPEAK
6		899.767	-3.980	23.455	19.475	-26.525	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.

Harmonic & Spurious:

Site : CB1	**Time : 2010/08/10 - 15:09**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

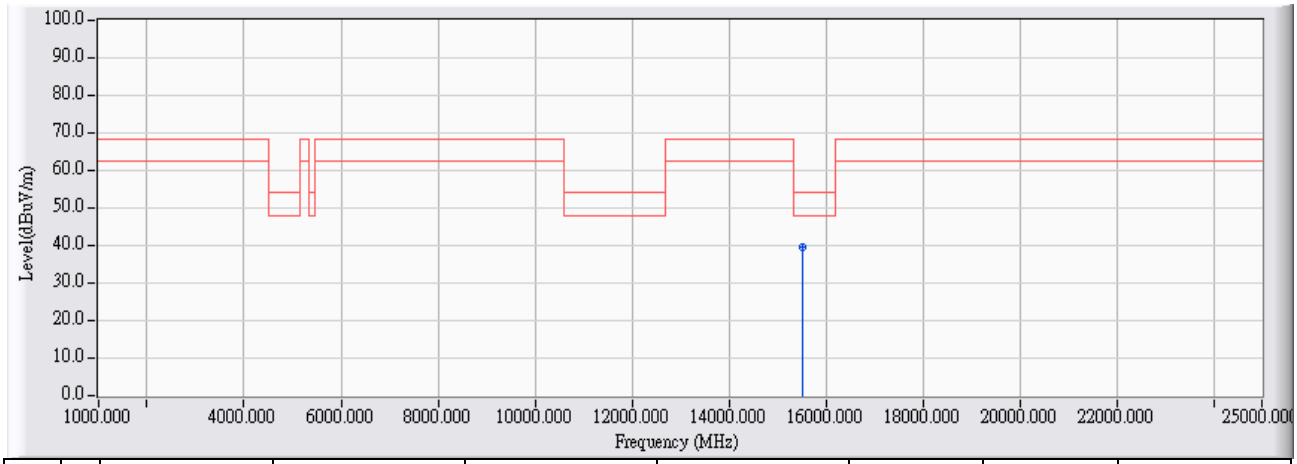


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10359.170	9.433	42.430	51.863	-36.437	88.300	PEAK
2	*	15535.580	11.552	45.460	57.012	-16.988	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:09**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

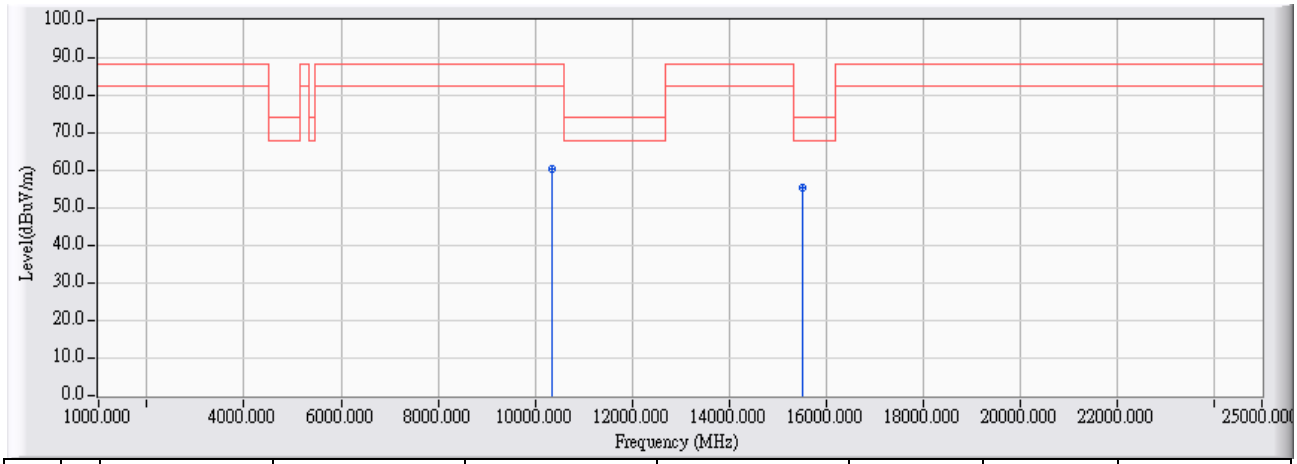


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	15538.000	11.602	28.110	39.712	-14.288	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:12**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

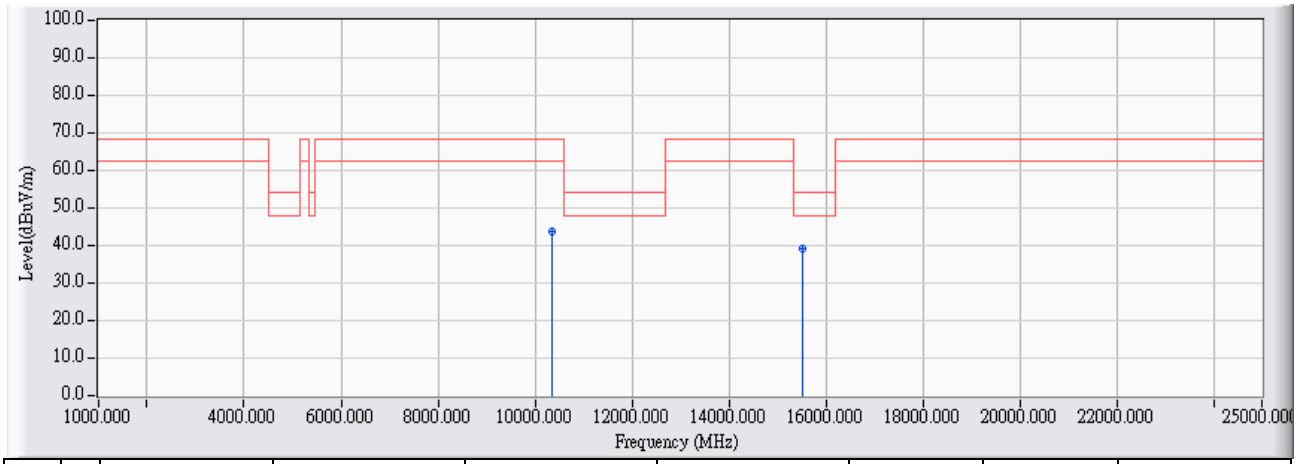


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10358.170	9.945	50.400	60.345	-27.955	88.300	PEAK
2	*	15536.000	11.647	43.720	55.367	-18.633	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:13**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

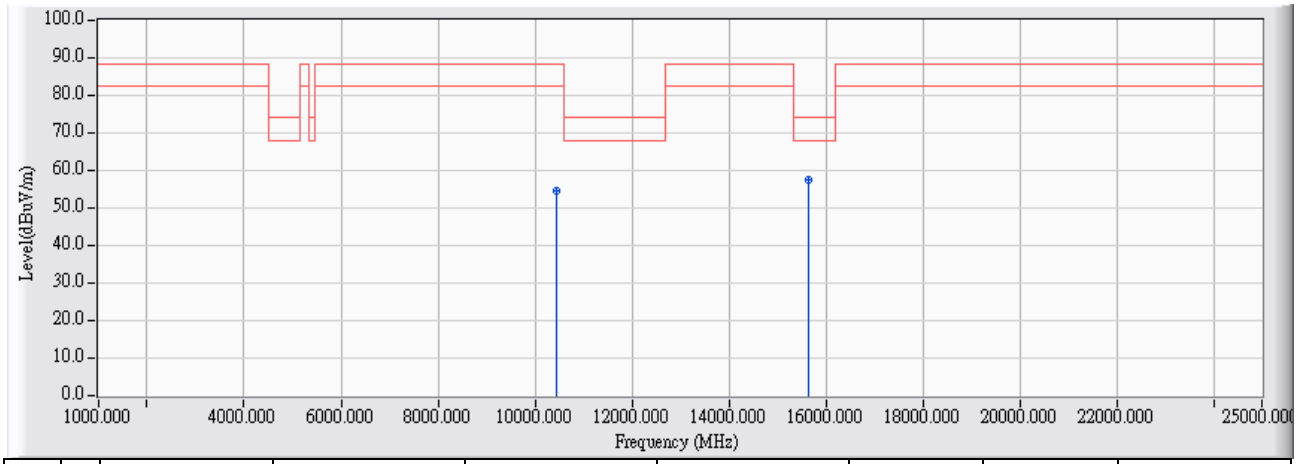


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10359.170	9.937	33.840	43.777	-24.523	68.300	AVERAGE
2	*	15536.170	11.651	27.440	39.091	-14.909	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:26**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5220_802.11n(20MHz)**

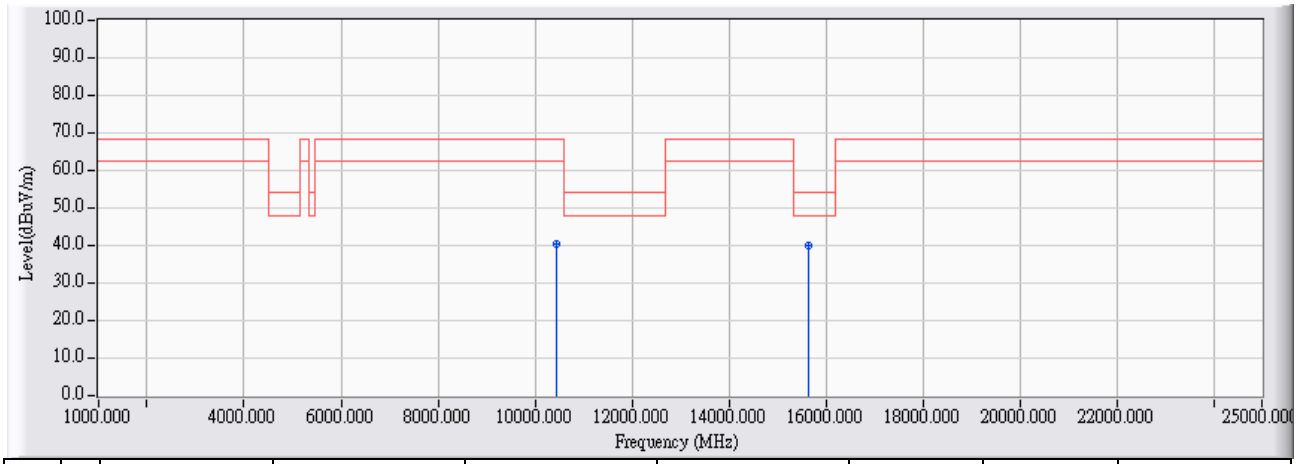


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10438.080	9.388	45.190	54.578	-33.722	88.300	PEAK
2	*	15657.830	11.486	46.010	57.496	-16.504	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:27**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5220_802.11n(20MHz)**

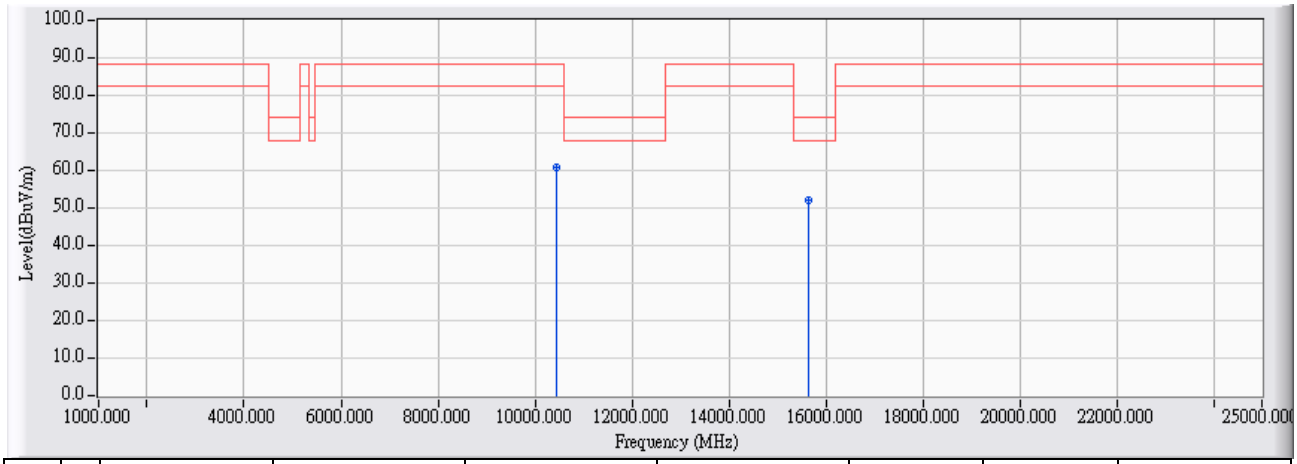


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10440.000	9.390	30.880	40.270	-28.030	68.300	AVERAGE
2	*	15657.920	11.487	28.650	40.137	-13.863	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:34**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5220_802.11n(20MHz)**

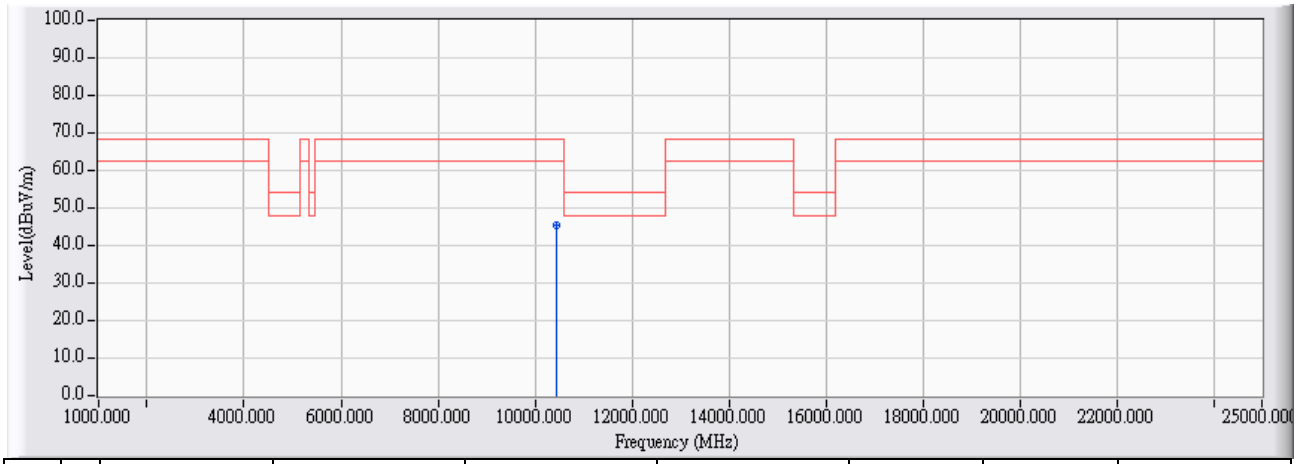


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10439.000	9.871	50.760	60.631	-27.669	88.300	PEAK
2	*	15661.080	11.577	40.430	52.007	-21.993	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 15:34**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit5220_802.11n(20MHz)**

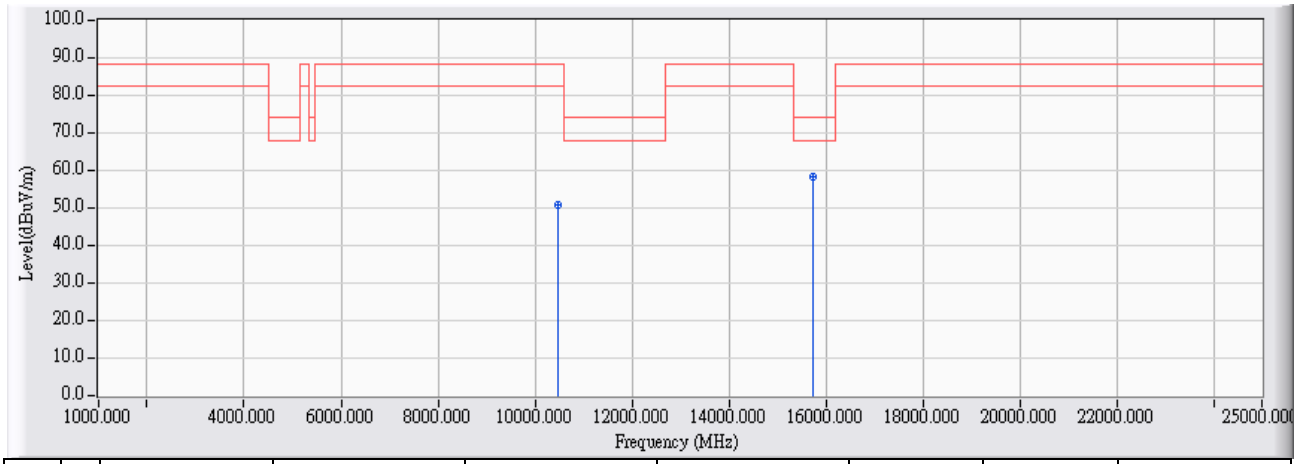


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10439.170	9.870	35.520	45.391	-22.909	68.300	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:02**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

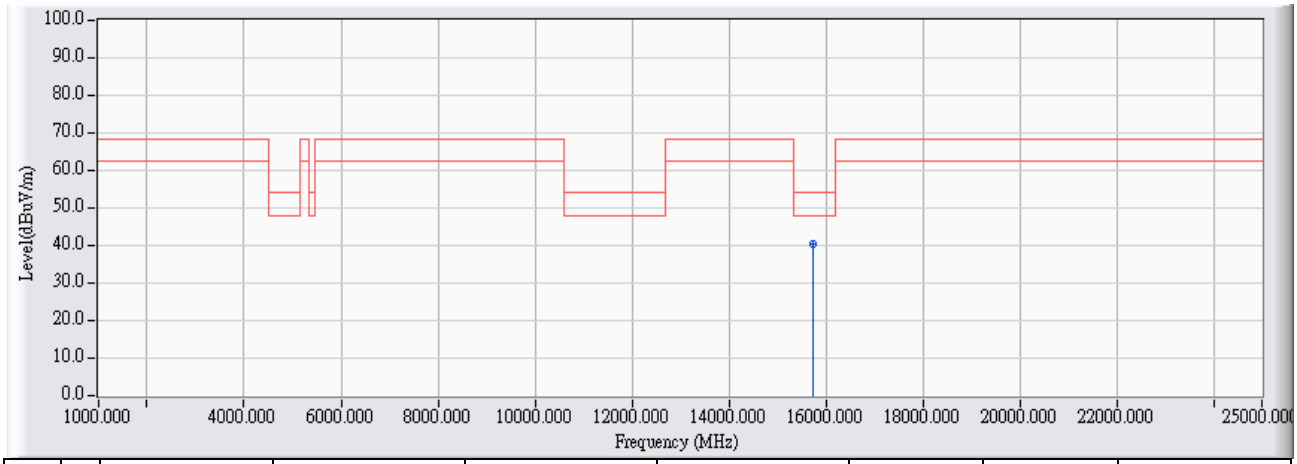


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10482.500	9.511	41.470	50.980	-37.320	88.300	PEAK
2	*	15726.580	11.507	46.690	58.197	-15.803	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:02**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

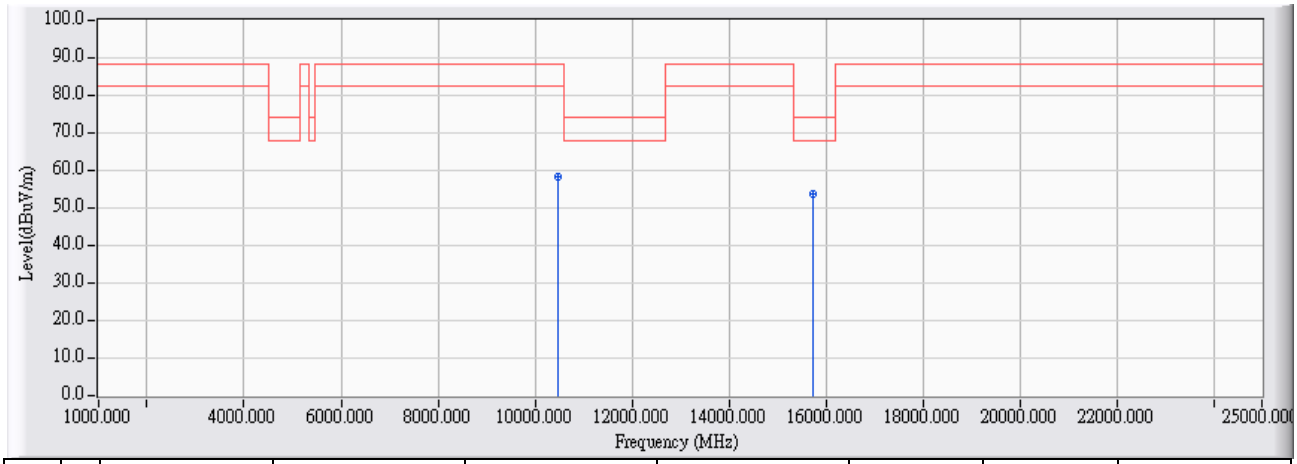


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	15723.500	11.530	28.700	40.231	-13.769	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:06**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

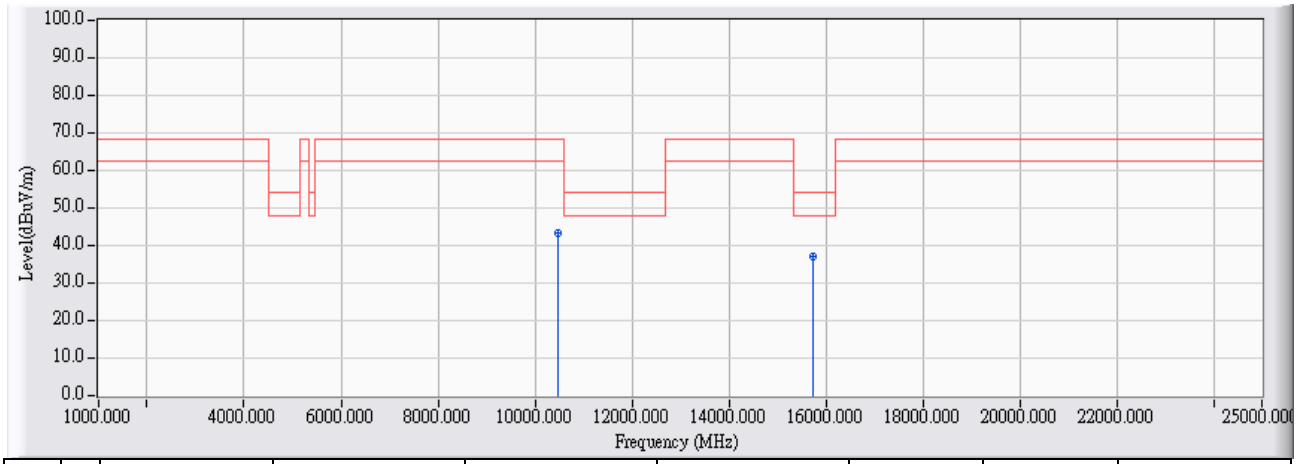


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10477.830	9.890	48.560	58.450	-29.850	88.300	PEAK
2	*	15726.330	11.572	42.380	53.952	-20.048	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:07**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

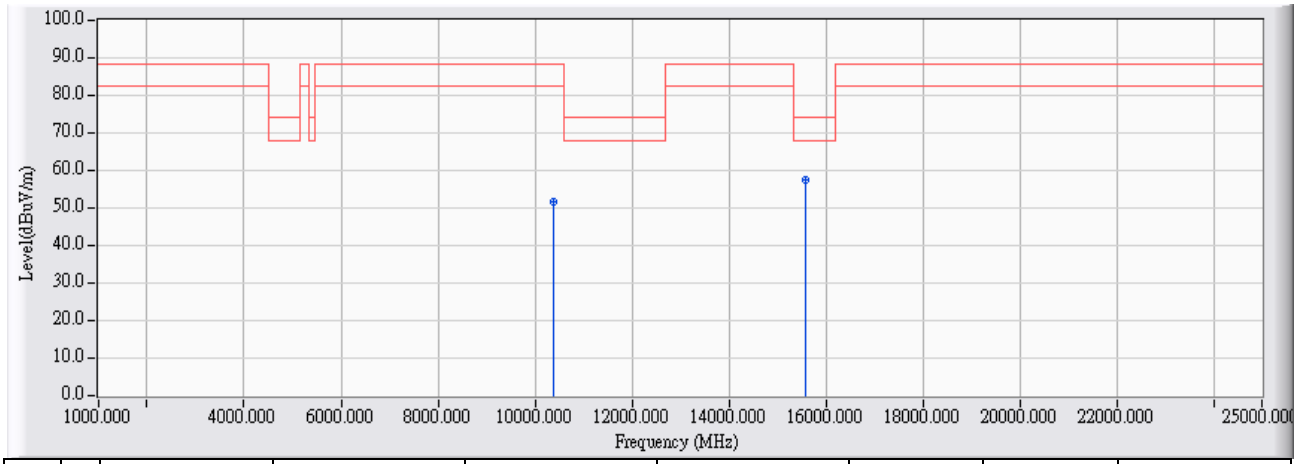


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10479.750	9.893	33.510	43.403	-24.897	68.300	AVERAGE
2	*	15723.330	11.598	25.680	37.278	-16.722	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:26**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

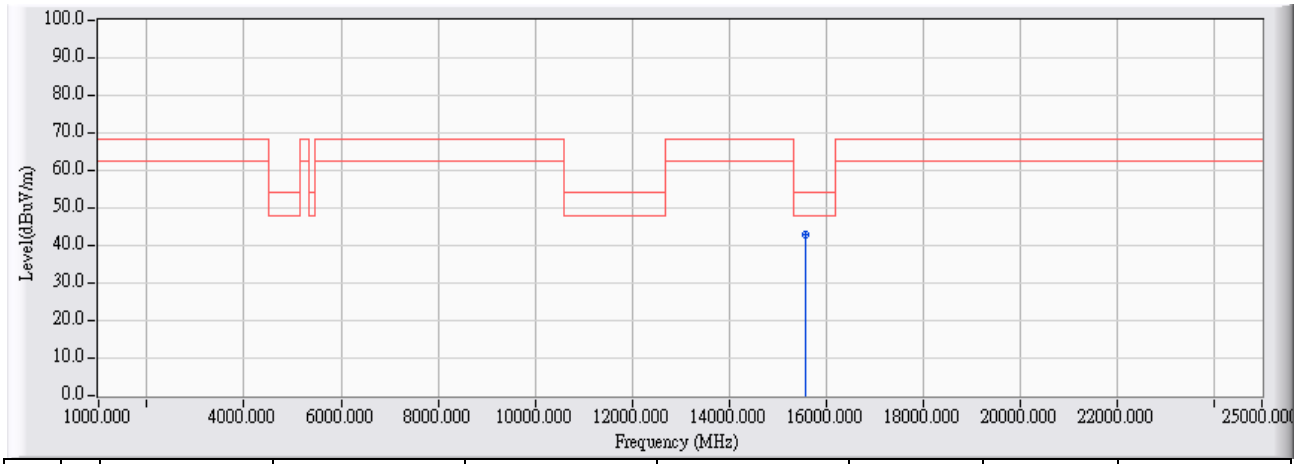


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10387.500	9.313	42.510	51.823	-36.477	88.300	PEAK
2	*	15585.300	12.479	44.970	57.449	-16.551	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:27**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**



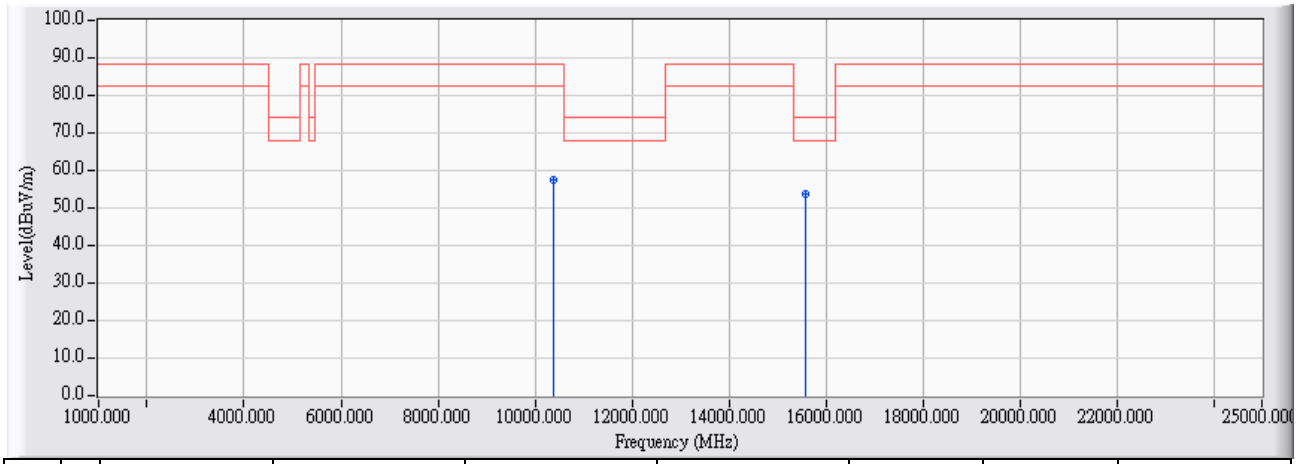
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	15583.420	12.469	30.240	42.710	-11.290	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

B

Site : CB1	**Time : 2010/08/10 - 16:30**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

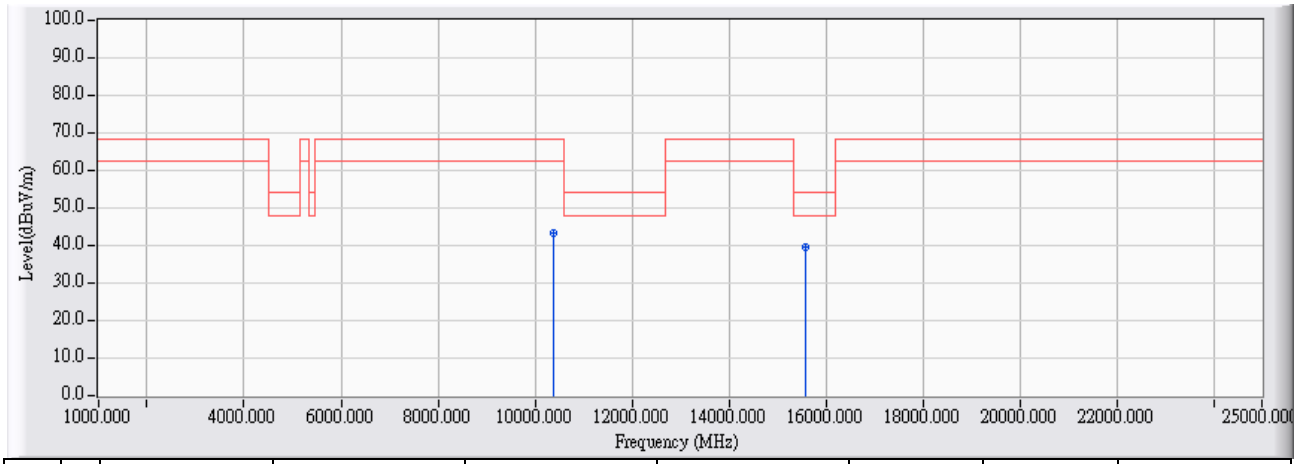


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10380.500	9.843	47.640	57.483	-30.817	88.300	PEAK
2	*	15577.000	12.520	41.080	53.600	-20.400	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:31**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

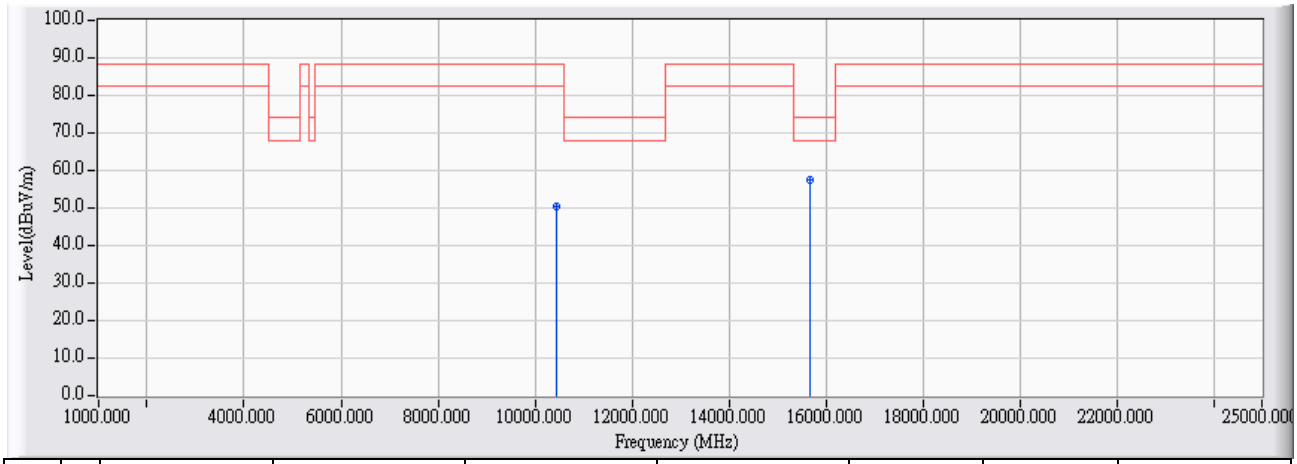


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10388.080	9.851	33.510	43.361	-24.939	68.300	AVERAGE
2	*	15583.670	12.552	27.070	39.622	-14.378	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:48**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

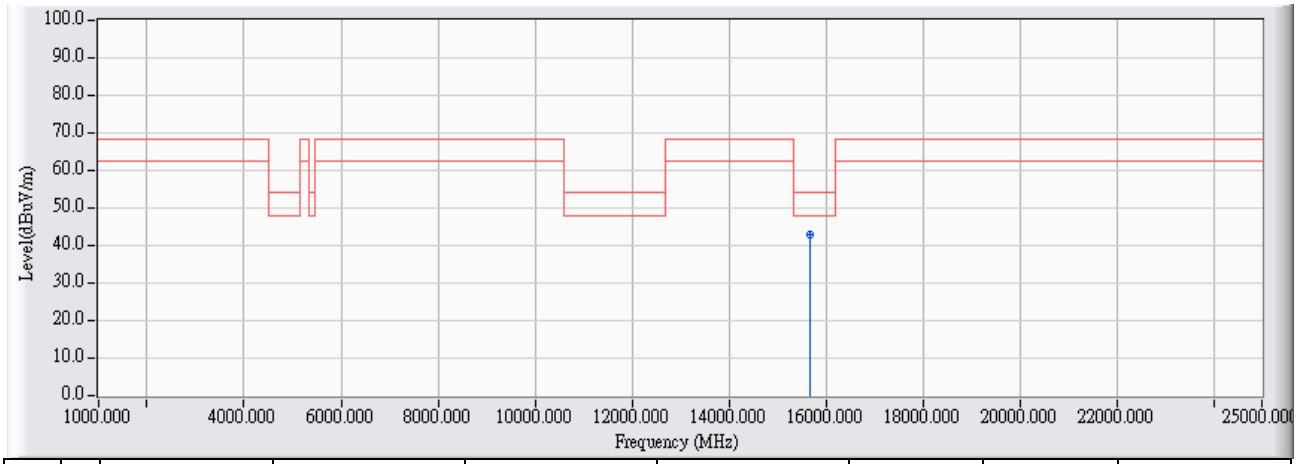


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10460.750	9.431	40.980	50.412	-37.888	88.300	PEAK
2	*	15691.830	11.541	45.780	57.321	-16.679	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:49**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

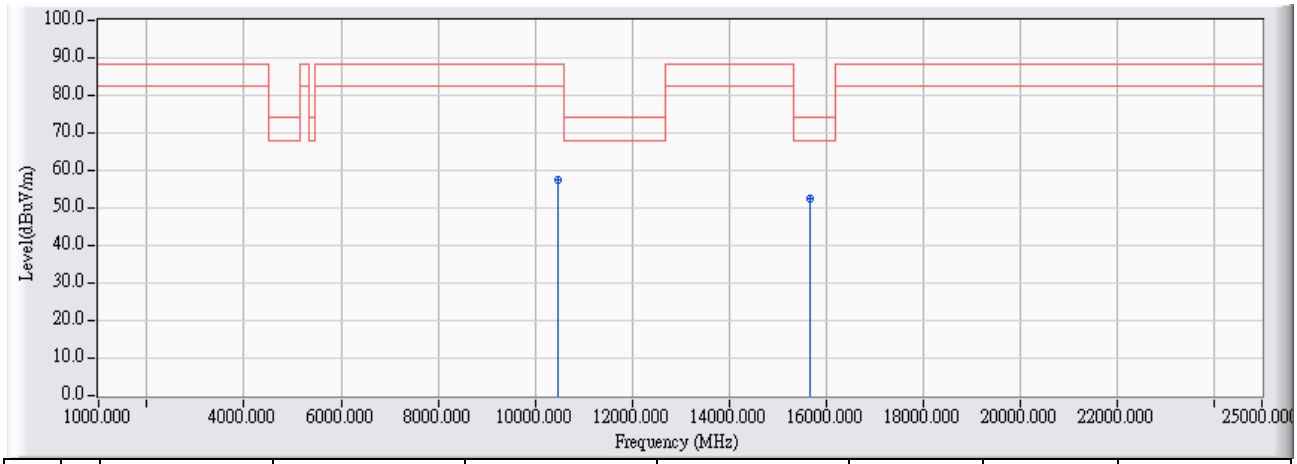


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	15691.770	11.541	31.280	42.821	-11.179	54.000	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:53**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

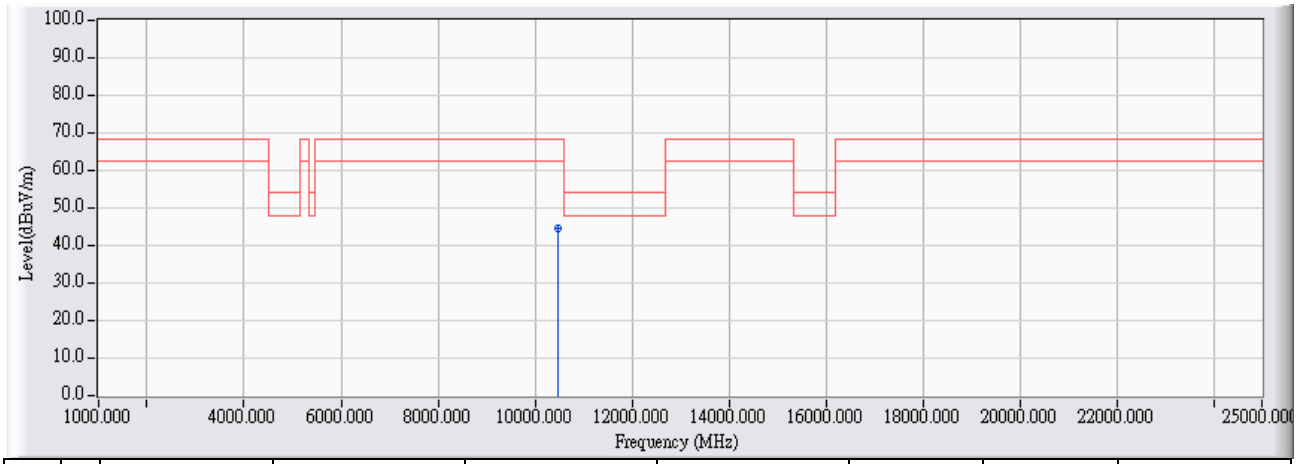


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10461.660	9.864	47.520	57.384	-30.916	88.300	PEAK
2	*	15689.370	11.614	40.910	52.524	-21.476	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

Site : CB1	**Time : 2010/08/10 - 16:54**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2009-11) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	#	10461.540	9.864	34.590	44.454	-23.846	68.300	AVERAGE

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the too weak instrument of signal is unable to test.
5. " # ", means the frequency is out of the restricted band.
6. Measurement Level = Reading Level + Correct Factor.
7. The average measurement was not performed when the peak measured data under the limit of average detection.

8. Band Edge

8.1. Test Equipment

The following test equipments are used during the band edge tests:

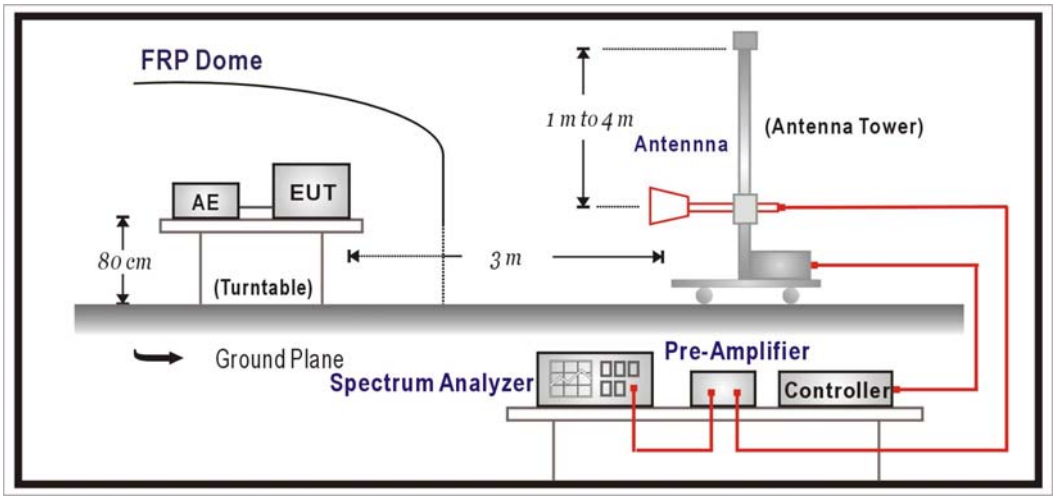
Radiated Emission Band Edge / CB1

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Horn Antenna	Schwarzback	BBHA 9120D	743	2011/03/14
Spectrum Analyzer	Agilent	E4440A	MY46187335	2011/01/14
Coaxial Cable	Huber+Suhner AG	Sucoflex 102	25623/2	2011/04/07

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

8.2. Test Setup

RF Radiated Measurement:



8.3. Limits

➢ **General Radiated Emission Limits**

The provisions of Section 15.205 of this part apply to intentional radiators operating under this section. Radiated emissions which fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209:

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remark:

4. RF Voltage (dBuV) = 20 log RF Voltage (uV)
5. In the Above Table, the tighter limit applies at the band edges.
6. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

➢ **Unwanted Emission out of the restricted bands Limits**

FCC Part 15 Subpart C Paragraph 15.407(b) Limits		
Frequency (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (dBuV/m@3m)
5150~5250	-27	68.3
5250~5350	-27	68.3
5470~5725	-27	68.3
5725~5825	-27 (Note1)	68.3
	-17 (Note2)	78.3

Remark:

4. For frequencies more than 10 MHz above or below the band edges.
5. For frequency range from the band edges to 10 MHz above or below the band edges.
6. uV/m = $\frac{1000000\sqrt{30 \times EIRP}}{3}$, RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

8.4. Test Procedure

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 EUT was positioned such that the distance from antenna to the EUT was 3 meters.

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: 2003on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 KHz, above 1GHz are 1 MHz.

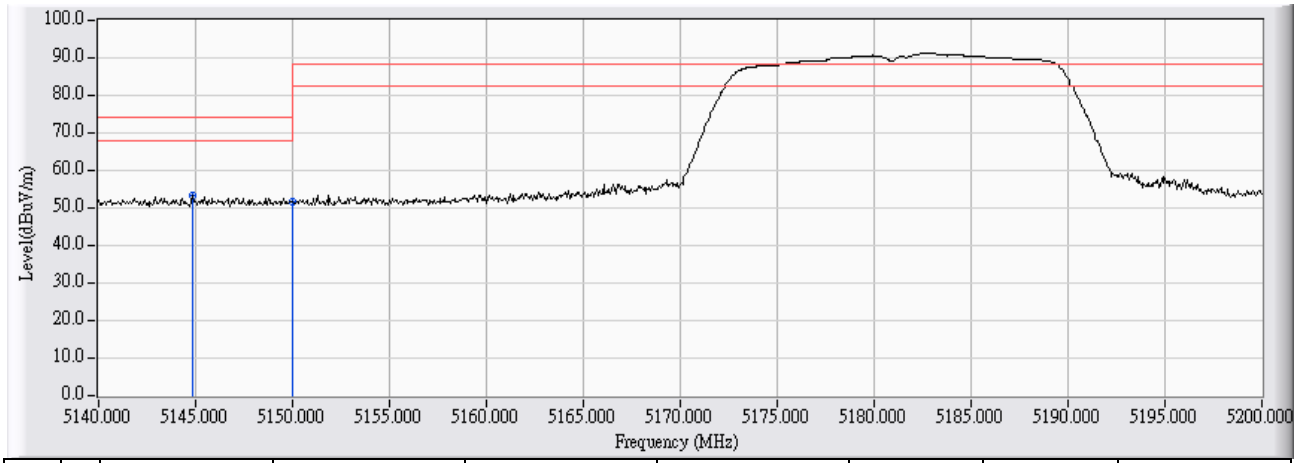
8.5. Uncertainty

The measurement uncertainty is defined as ± 3.65dB

8.6. Test Result

Radiated is defined as

Site : CB1	**Time : 2010/08/13 - 19:12**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

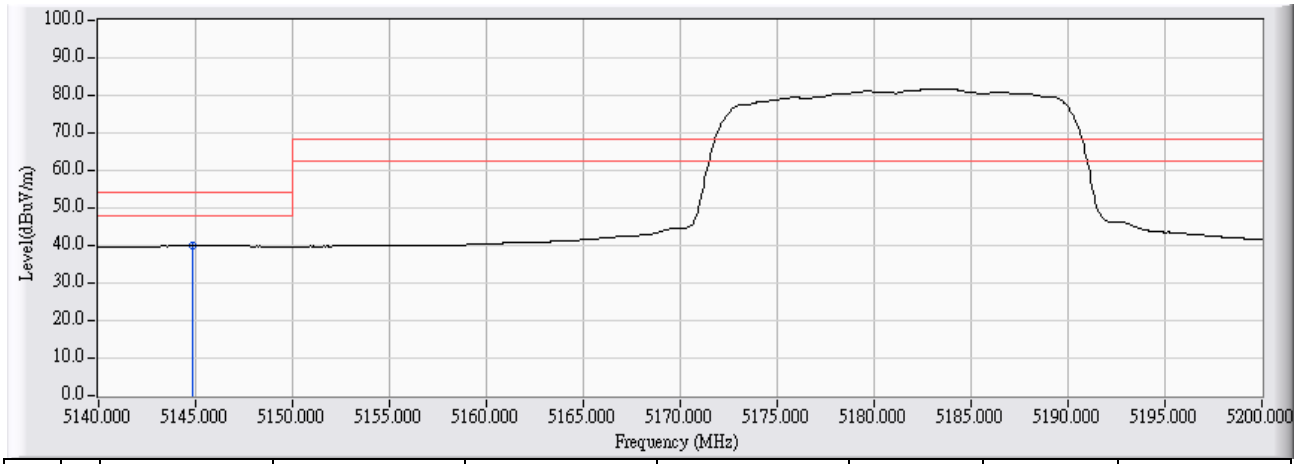


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5144.860	4.112	49.138	53.251	-20.749	74.000	PEAK
2		5150.000	4.119	47.745	51.864	-22.136	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:12**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

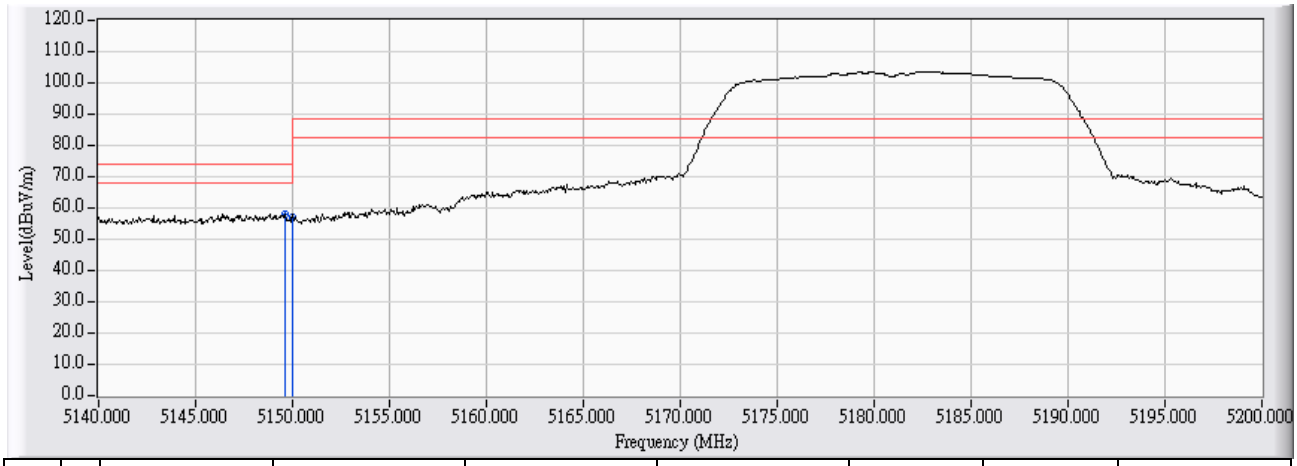


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5144.860	4.112	35.768	39.881	-14.119	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:16**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

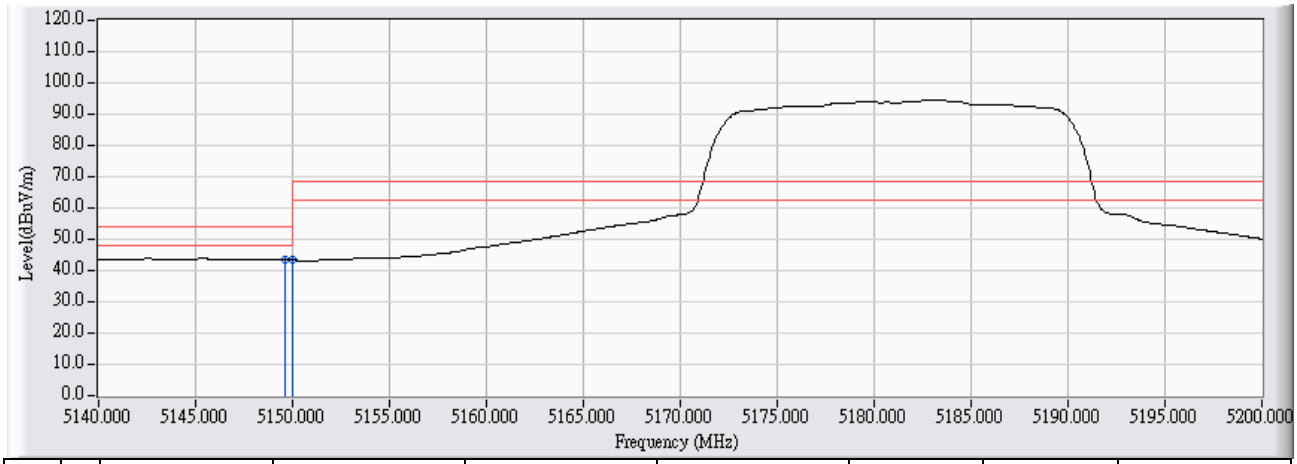


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5149.600	6.036	51.815	57.850	-16.150	74.000	PEAK
2	*	5150.000	6.036	51.204	57.240	-16.760	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:16**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5180_802.11n(20MHz)**

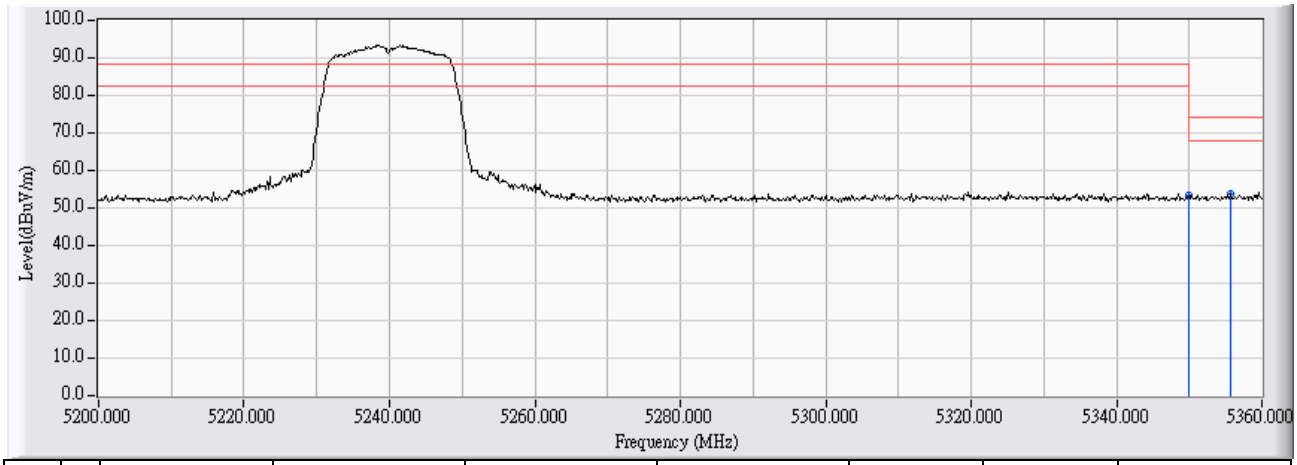


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5149.600	6.036	37.464	43.499	-10.501	54.000	AVERAGE
2		5150.000	6.036	37.312	43.348	-10.652	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:29**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

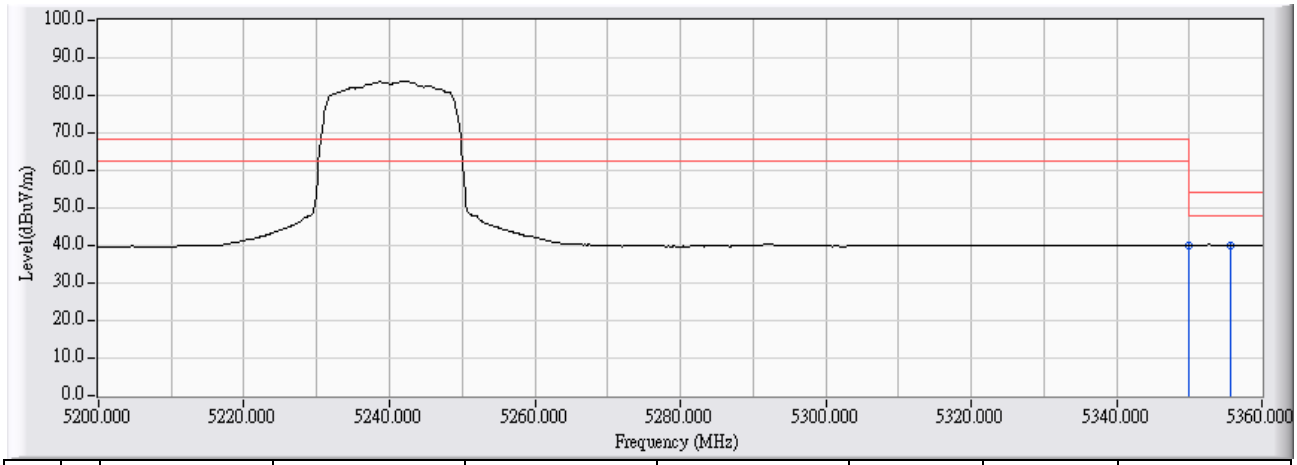


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	4.437	48.866	53.303	-14.997	74.000	PEAK
2	*	5355.680	4.444	49.300	53.744	-20.256	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 – 19:30**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

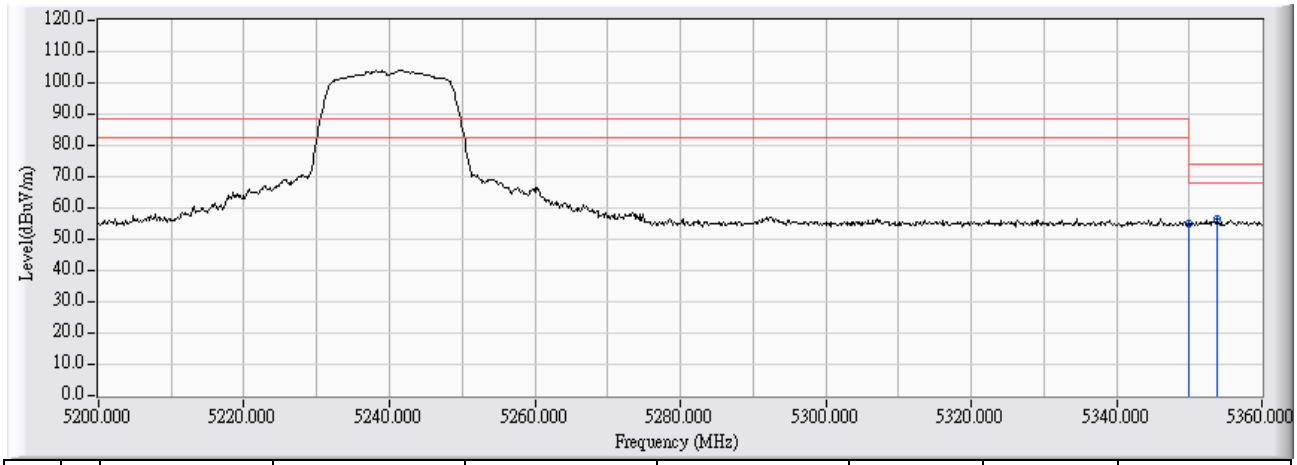


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	4.437	35.563	40.000	-14.000	54.000	AVERAGE
2	*	5355.680	4.444	35.603	40.047	-13.953	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:33**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

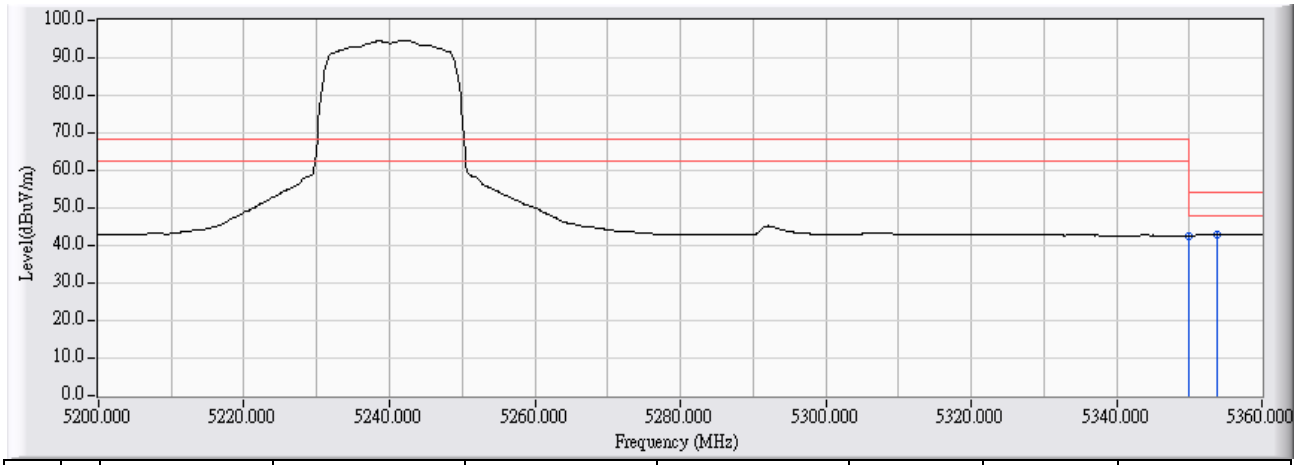


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	6.530	48.382	54.912	-13.388	74.000	PEAK
2	*	5353.760	6.539	49.753	56.292	-17.708	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 19:34**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5240_802.11n(20MHz)**

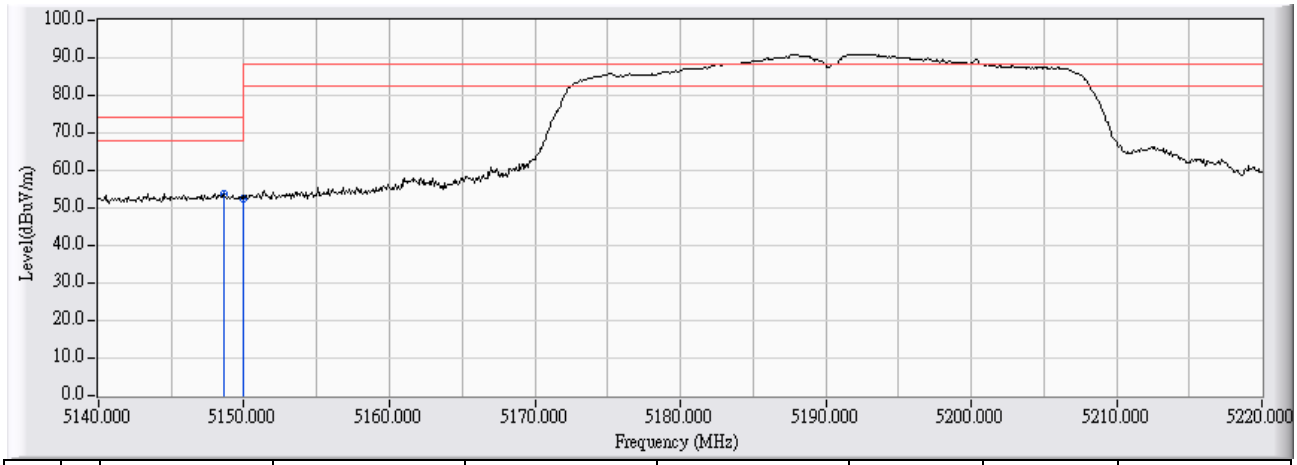


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	6.530	36.067	42.597	-11.403	54.000	AVERAGE
2	*	5353.760	6.539	36.425	42.964	-11.036	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:02**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

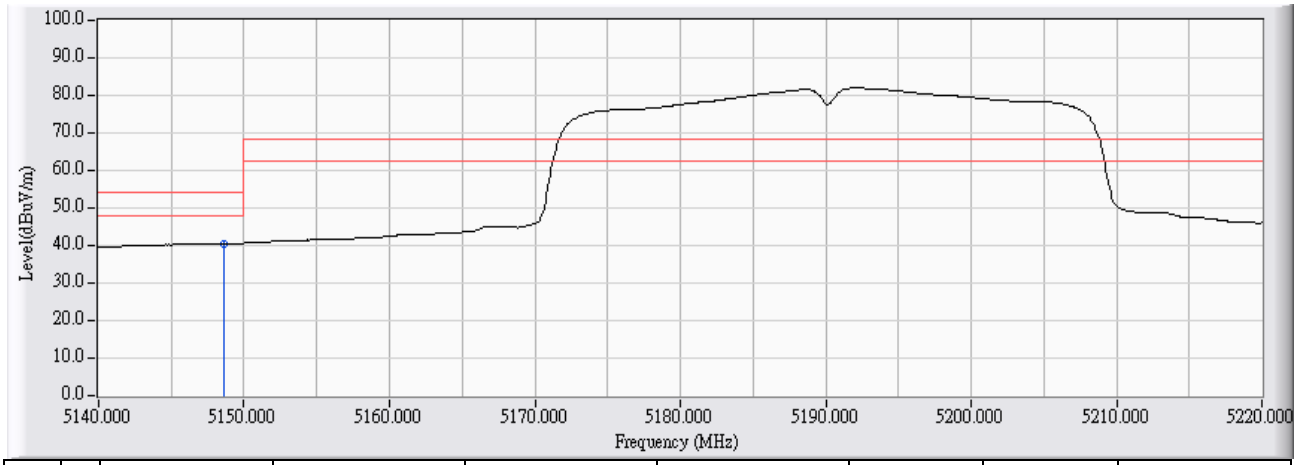


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5148.640	4.117	49.709	53.826	-20.174	74.000	PEAK
2		5150.000	4.119	48.509	52.628	-21.372	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:03**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

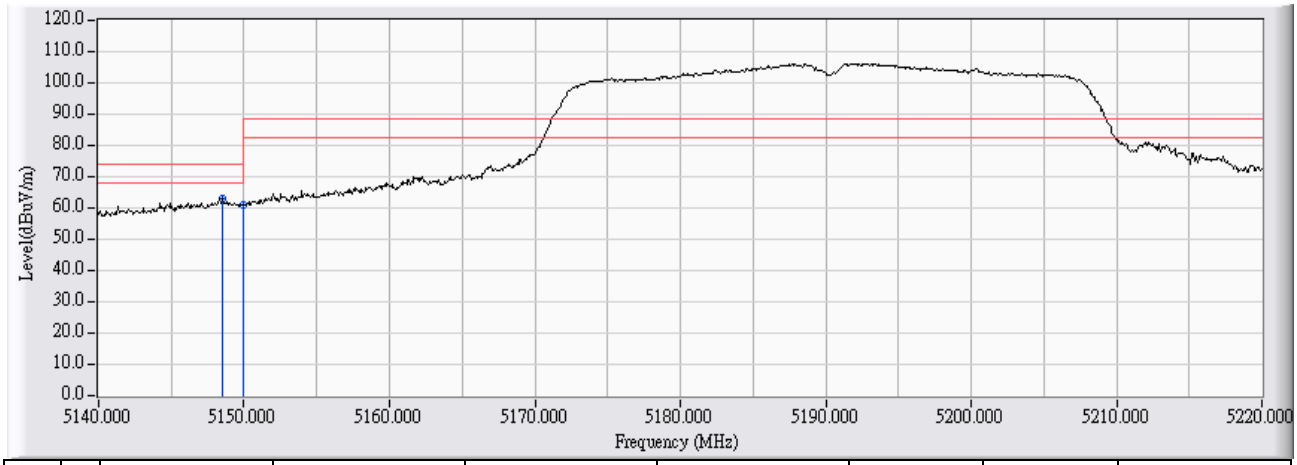


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5148.640	4.117	36.403	40.520	-13.480	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:07**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

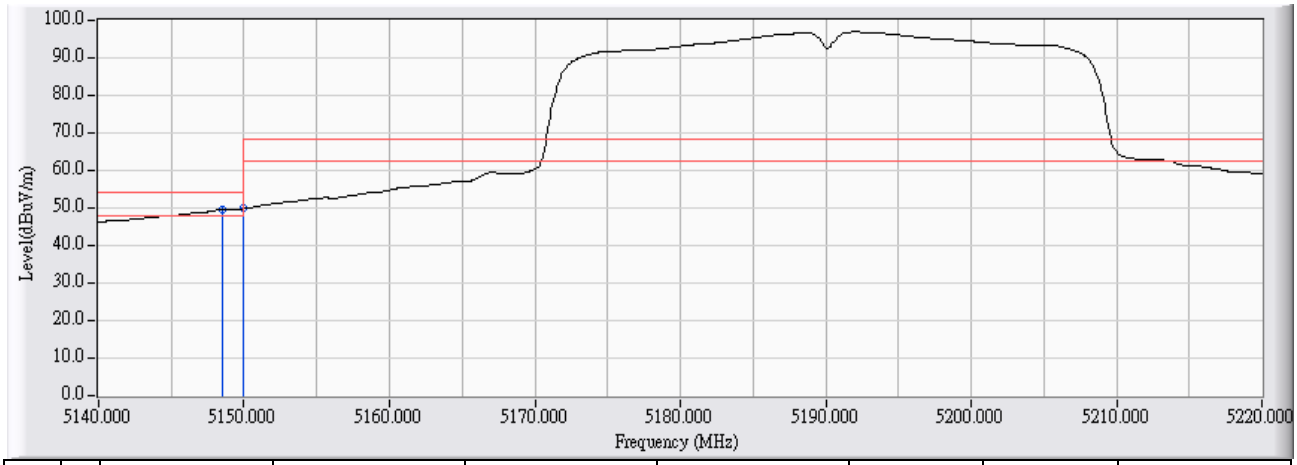


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5148.560	6.033	57.121	63.154	-10.846	74.000	PEAK
2		5150.000	6.036	55.149	61.185	-12.815	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:08**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5190_802.11n(40MHz)**

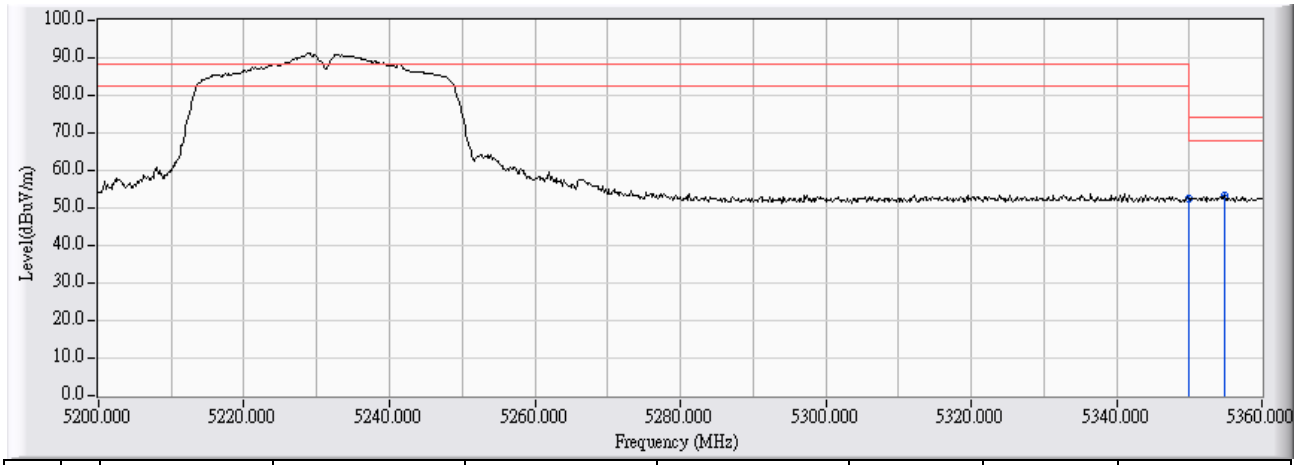


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5148.560	6.033	43.437	49.470	-4.530	54.000	AVERAGE
2	*	5150.000	6.036	43.774	49.810	-4.190	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:15**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

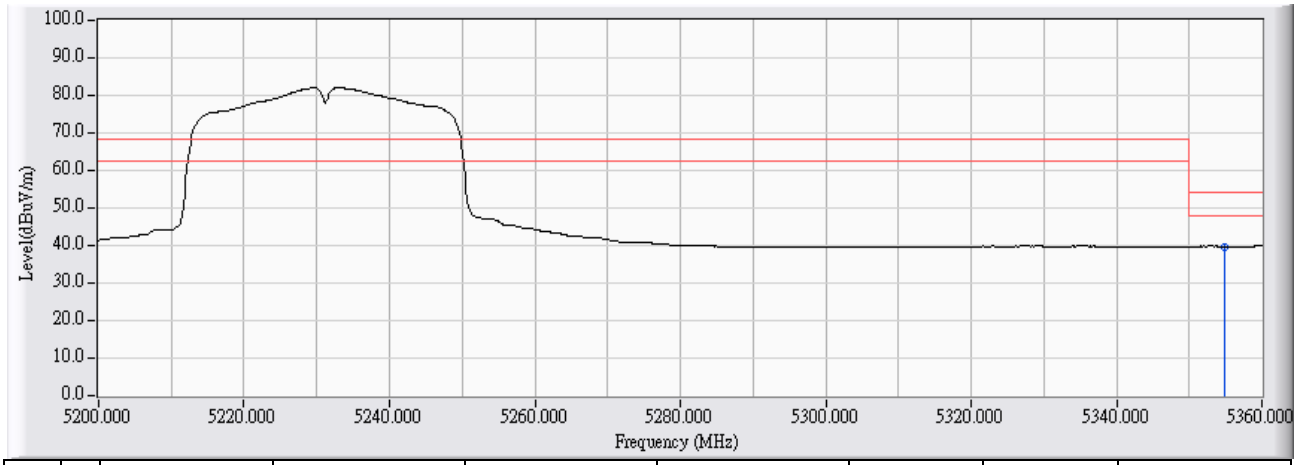


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	4.437	48.027	52.464	-15.836	74.000	PEAK
2	*	5354.880	4.443	49.058	53.502	-20.498	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:16**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - HORIZONTAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

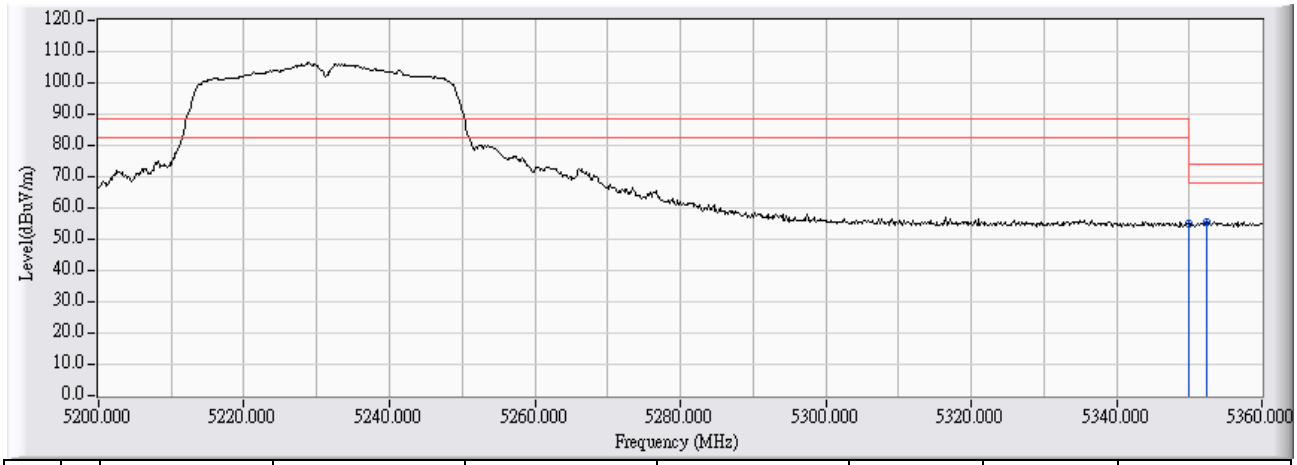


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	5354.880	4.443	35.308	39.752	-14.248	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:20**
Limit : FCC_SpartE_15.407_H_03M_PK	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**

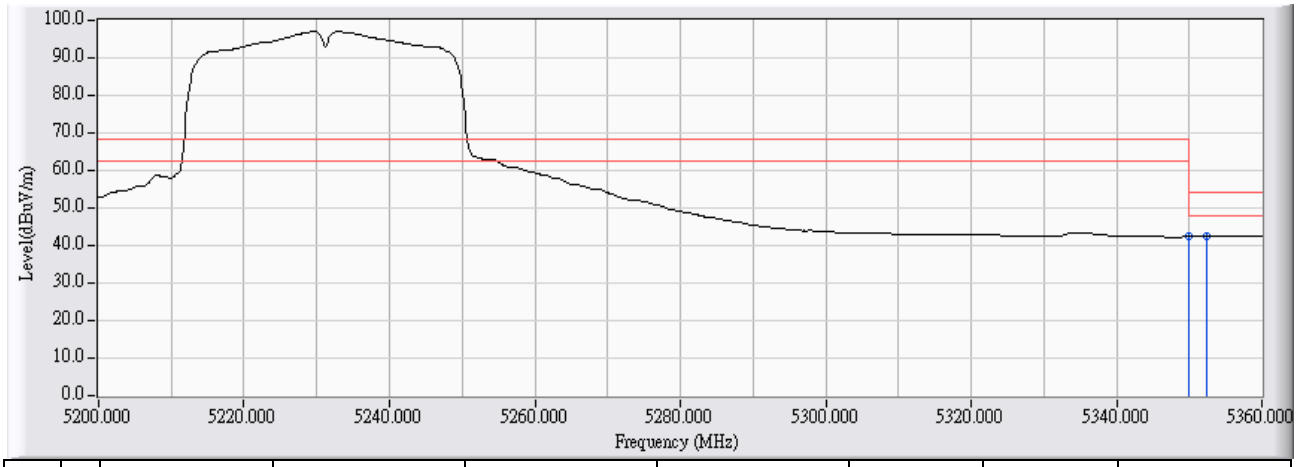


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	6.530	48.666	55.196	-13.104	74.000	PEAK
2	*	5352.320	6.535	48.886	55.422	-18.578	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 1MHz, 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.

Site : CB1	**Time : 2010/08/13 - 20:21**
Limit : FCC_SpartE_15.407_H_03M_AV	**Margin : 6**
Probe : CB1_FCC_EFS_1-18G(2010-07) - VERTICAL	**Power : AC 120V/60Hz**
EUT : Wireless Extender	**Note : Mode 1: Transmit-5230_802.11n(40MHz)**



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		5350.000	6.530	35.782	42.312	-11.688	54.000	AVERAGE
2	*	5352.320	6.535	35.939	42.475	-11.525	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 = 1MHz, 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.

9. Frequency Stability

9.1. Test Equipment

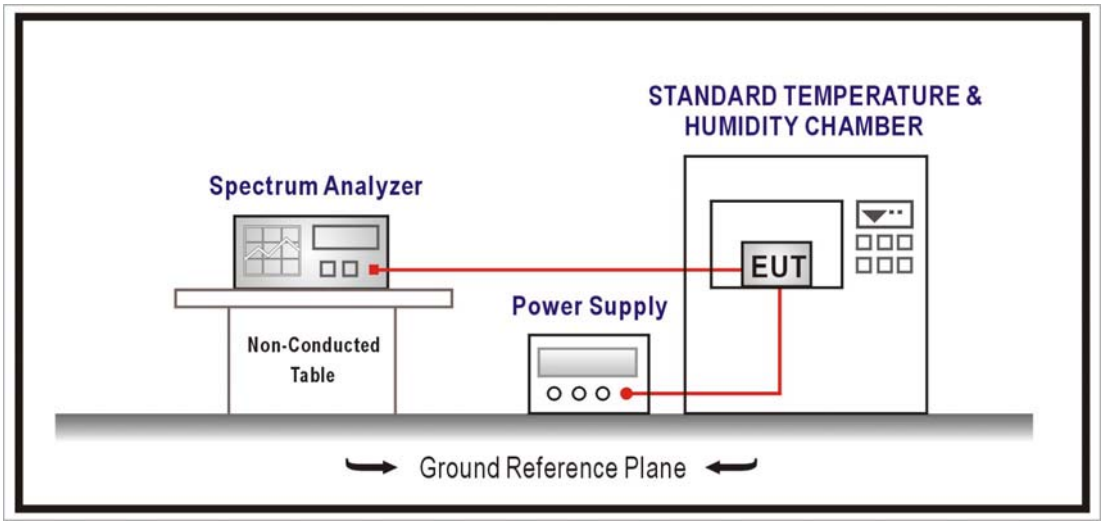
The following test equipments are used during the radiated emission tests:

Frequency Stability / SR7

Instrument	Manufacturer	Model No.	Serial No	Next Cal. Date
Spectrum Analyzer	Agilent	N9010A	US47140172	2010/11/01
STANDARD TEMPERATURE & HUMIDITY CHAMBER	WIT	TH-1S-B	1082101	2011/02/03

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

9.2. Test Setup



9.3. Limits

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified

9.4. Test Procedure

The EUT was setup to ANSI C63.4: 2003; tested to DTS test procedure of Aug 2002 DA 02-2138 for compliance to FCC 47CFR Subpart E requirements.

9.5. Uncertainty

The measurement uncertainty is defined as ± 150 Hz

9.6. Test Result

Product	Wireless Extender		
Test Item	Frequency Stability		
Test Mode	Transmit - 802.11n(20MHz) - 5180MHz		
Date of Test	2010/08/11	Test Site	No.7 Sheilding Room

Startup

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5180.7620	147.1019	Pass
-10		5180.0391	7.5546	Pass
0		5180.2671	51.5680	Pass
10		5180.4184	80.7770	Pass
20		5180.7210	139.1814	Pass
30		5180.8350	161.1909	Pass
40		5180.7170	138.4158	Pass
50		5180.0753	14.5362	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5180.7614	146.9876	Pass
	120	5180.3758	72.5553	Pass
	138	5180.1500	28.9575	Pass

2 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5180.7335	141.6102	Pass
-10		5180.0290	5.5971	Pass
0		5180.8758	169.0795	Pass
10		5180.5237	101.1013	Pass
20		5180.4289	82.8074	Pass
30		5180.5153	99.4736	Pass
40		5180.5274	101.8215	Pass
50		5180.7963	153.7201	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5180.6470	124.9013	Pass
	120	5180.0855	16.5039	Pass
	138	5180.3350	64.6706	Pass

5 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5180.6013	116.0719	Pass
-10		5180.0673	12.9862	Pass
0		5180.3528	68.1155	Pass
10		5180.1426	27.5237	Pass
20		5180.4308	83.1691	Pass
30		5180.7034	135.8009	Pass
40		5180.7966	153.7834	Pass
50		5180.0580	11.1925	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5180.0825	15.9206	Pass
	120	5180.2621	50.5945	Pass
	138	5180.6077	117.3181	Pass

10 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5180.7345	141.7948	Pass
-10		5180.0033	0.6387	Pass
0		5180.6830	131.8565	Pass
10		5180.1932	37.2898	Pass
20		5180.8263	159.5265	Pass
30		5180.4216	81.3810	Pass
40		5180.8276	159.7599	Pass
50		5180.6877	132.7559	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5180.8594	165.9014	Pass
	120	5180.0866	16.7162	Pass
	138	5180.5443	105.0764	Pass

Product	Wireless Extender		
Test Item	Frequency Stability		
Test Mode	Transmit - 802.11n(20MHz) - 5240MHz		
Date of Test	2010/08/11	Test Site	No.7 Sheilding Room

Startup

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.2831	54.0256	Pass
-10		5240.2642	50.4244	Pass
0		5240.3848	73.4339	Pass
10		5240.1070	20.4130	Pass
20		5240.1577	30.0982	Pass
30		5240.4437	84.6823	Pass
40		5240.6754	128.8941	Pass
50		5240.4490	85.6952	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.3646	69.5760	Pass
	120	5240.0338	6.4459	Pass
	138	5240.6152	117.4021	Pass

2 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.3397	64.8348	Pass
-10		5240.5148	98.2422	Pass
0		5240.8519	162.5812	Pass
10		5240.8260	157.6257	Pass
20		5240.7258	138.5056	Pass
30		5240.6696	127.7805	Pass
40		5240.0219	4.1856	Pass
50		5240.6168	117.7188	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.6497	123.9859	Pass
	120	5240.7616	145.3393	Pass
	138	5240.1164	22.2214	Pass

5 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.3983	76.0164	Pass
-10		5240.4389	83.7626	Pass
0		5240.5607	107.0126	Pass
10		5240.1379	26.3207	Pass
20		5240.7148	136.4203	Pass
30		5240.0058	1.1115	Pass
40		5240.1238	23.6179	Pass
50		5240.7771	148.3080	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.1471	28.0728	Pass
	120	5240.4822	92.0174	Pass
	138	5240.1363	26.0186	Pass

10 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.6936	132.3577	Pass
-10		5240.7566	144.3841	Pass
0		5240.8976	171.2896	Pass
10		5240.2202	42.0198	Pass
20		5240.5291	100.9729	Pass
30		5240.8532	162.8286	Pass
40		5240.3879	74.0361	Pass
50		5240.3905	74.5172	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.2153	41.0790	Pass
	120	5240.6332	120.8347	Pass
	138	5240.0857	16.3558	Pass

Product	Wireless Extender		
Test Item	Frequency Stability		
Test Mode	Transmit - 802.11n_40M - 5190MHz		
Date of Test	2010/08/11	Test Site	No.7 Sheilding Room

Startup

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5190.1279	24.6445	Pass
-10		5190.3122	60.1456	Pass
0		5190.7818	150.6316	Pass
10		5190.8326	160.4148	Pass
20		5190.8769	168.9511	Pass
30		5190.6789	130.8068	Pass
40		5190.5362	103.3227	Pass
50		5190.1773	34.1684	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5190.5493	105.8463	Pass
	120	5190.5853	112.7723	Pass
	138	5190.2441	47.0421	Pass

2 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5190.6703	129.1448	Pass
-10		5190.7746	149.2423	Pass
0		5190.0468	9.0234	Pass
10		5190.3723	71.7421	Pass
20		5190.6771	130.4650	Pass
30		5190.3480	67.0585	Pass
40		5190.6900	132.9416	Pass
50		5190.6521	125.6496	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5190.6418	123.6660	Pass
	120	5190.3511	67.6531	Pass
	138	5190.2982	57.4657	Pass

5 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5190.6541	126.0354	Pass
-10		5190.6176	118.9984	Pass
0		5190.1360	26.2013	Pass
10		5190.4325	83.3380	Pass
20		5190.7730	148.9411	Pass
30		5190.7563	145.7140	Pass
40		5190.8638	166.4398	Pass
50		5190.7373	142.0571	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5190.1532	29.5195	Pass
	120	5190.4183	80.6063	Pass
	138	5190.6327	121.9013	Pass

10 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5190.3538	68.1630	Pass
-10		5190.5235	100.8576	Pass
0		5190.1311	25.2621	Pass
10		5190.1723	33.1964	Pass
20		5190.4371	84.2287	Pass
30		5190.7315	140.9477	Pass
40		5190.8485	163.4954	Pass
50		5190.1963	37.8281	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5190.3960	76.3059	Pass
	120	5190.0508	9.7857	Pass
	138	5190.5947	114.5825	Pass

Product	Wireless Extender		
Test Item	Frequency Stability		
Test Mode	Transmit - 802.11n_40M - 5230MHz		
Date of Test	2010/08/11	Test Site	No.7 Sheilding Room

Startup

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5230.8992	171.9306	Pass
-10		5230.0082	1.5691	Pass
0		5230.6826	130.5202	Pass
10		5230.6683	127.7759	Pass
20		5230.3179	60.7809	Pass
30		5230.0198	3.7925	Pass
40		5230.0796	15.2165	Pass
50		5230.8507	162.6590	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5230.6083	116.3056	Pass
	120	5230.7914	151.3269	Pass
	138	5230.3436	65.6898	Pass

2 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.0199	3.7995	Pass
-10		5240.4074	77.7447	Pass
0		5240.3430	65.4512	Pass
10		5240.0378	7.2176	Pass
20		5240.8969	171.1559	Pass
30		5240.1150	21.9377	Pass
40		5240.0667	12.7347	Pass
50		5240.5927	113.1107	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.8996	171.6789	Pass
	120	5240.5158	98.4267	Pass
	138	5240.6722	128.2878	Pass

5 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.7531	143.7297	Pass
-10		5240.7203	137.4699	Pass
0		5240.0868	16.5716	Pass
10		5240.3115	59.4556	Pass
20		5240.4022	76.7462	Pass
30		5240.6865	131.0055	Pass
40		5240.6180	117.9310	Pass
50		5240.8667	165.4056	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.0191	3.6356	Pass
	120	5240.5080	96.9476	Pass
	138	5240.7707	147.0828	Pass

10 Minute

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
-20	120	5240.1600	30.5349	Pass
-10		5240.4570	87.2052	Pass
0		5240.5087	97.0861	Pass
10		5240.5047	96.3231	Pass
20		5240.8483	161.8944	Pass
30		5240.5156	98.4026	Pass
40		5240.8233	157.1204	Pass
50		5240.7078	135.0839	Pass

Temperature Interval (°C)	AC Voltage (V)	Frequency (MHz)	Deviation (ppm)	Result
25	102	5240.1999	38.1492	Pass
	120	5240.4042	77.1339	Pass
	138	5240.8827	168.4603	Pass