A Test Lab Techno Corp.

No.140-1, Chang-an St., Bade City, Tao-Yuan County 334, Taiwan (R.O.C.)
Tel：+886-3-2710188 / Fax：+886-3-2710190

Part 15 C Measurement Report

Report No.	：	**0707FR12**
Applicant	：	**Welltech Computer CO., LTD.**
Trade Mark	：	**WELLTECH**
Product Model	：	**WG-3512 (Model No. List see Section 1.1)**
Product Type	：	**Gateway**
FCC ID	：	**VJE-WG3512**
Dates of Test	：	**Jul. 11 ~ 15, 2007**
Test Specification	：	**Part 15 Subpart C (15.247)**
Location of Test Lab.	：	**Chang-an Lab.**

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full.

Country Huang 20070810
Measurement Center Manager

John Cheng 20070810
Testing Engineer

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2001. All test were conducted by *A Test Lab Techno Corp. No.140-1, Chang-an St., Bade City, Tao-Yuan County 334, Taiwan (R.O.C.)* Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is in compliance with Class B radiated and conducted emission limit of FCC Rules Part 15 Subpart C (15.247).

EUT	:	**Gateway**
Applicant	:	**Welltech Computer CO., LTD.** **13F-4, No.150, Jian-Yi Road, Chung-HO City 235, Taipei** **Taiwan, R.O.C.**
Model No	:	**WG-3512 / WellGate 3512 / WellGate 3512N / WG-3512N /** **WellGate 3511N / WG-3511N / WellGate 3501N / WG-3501N /** **RG-02 / Wi-Fi VoIP Gateway**
FCC ID	:	**VJE-WG3512**

Approved by : ***Country Huang*** ***Prepared by :*** ***John Cheng***

A Test Lab Techno Corp.
No.140-1, Chang-an St., Bade City,Tao-Yuan County 334, Taiwan (R.O.C.)
Tel：03-2710188 / Fax：03-2710190

Contents

1. GENERAL 5

1.1 Description of Equipment under Test (EUT) 5

1.2 Introduction 6

1.3 Summary of Tests 6

1.4 Description of Support Equipment 7

1.5 Configuration of System under Test 8

1.6 Test Procedure 9

1.7 General Test Condition 9

2. Conducted Emissions Requirements 10

2.1 General & Setup 10

2.2 Test Equipment List: 10

2.3 Test Configuration 11

2.4 Test condition 12

2.5 Conducted Emissions Limits 12

2.6 Measurement Data of Conducted Emissions 13

3. Radiated Emissions Requirements 19

3.1 Final radiation measurements were made on a three-meter 19

3.2 Test Equipment List: 21

3.3 Test Configuration 22

3.4 Test condition 24

3.5 Radiated Emissions Limits 24

3.6 Measurement Data of Radiated Emissions 25

4. Maximum Conducted Output Power Requirements 91

4.1 Test Condition & Setup 91

4.2 Test Instruments Configuration 91

4.3 Test Equipment List: 92

4.4 Test Result 92

4.5 Test Graphs 93

5. Minimum 6dB RF Bandwidth Requirements 97

5.1 Test Condition & Setup 97

5.2 Test Instruments Configuration 97

5.3 Test Equipment List: 97

5.4 Test Result 98

5.5 Test Graphs 99

Contents

6. Maximum Power Density Requirements 103

6.1 Test Condition & Setup 103

6.2 Test Instruments Configuration 103

6.3 Test Equipment List: 104

6.4 Test Result 104

6.5 Test Graphs 105

7. Out of Band Conducted Emissions Requirements 109

7.1 Test Condition & Setup 109

7.2 Test Instruments Configuration 109

7.3 Test Equipment List: 110

7.4 Test Result 110

7.5 Test Graphs 111

8. Band Edges Requirements 135

8.1 Test Condition & Setup: 135

8.2 Test Instruments Configuration 135

8.3 Test Equipment List: 136

8.4 Test Result 137

9. Antenna Requirements 147

9.1 Standard Applicable 147

9.2 Antenna Connector Construction 147

Appendix A - EUT Test SETUP 148

1. GENERAL

1.1 Description of Equipment under Test (EUT)

Applicant： **Welltech Computer CO., LTD.**
13F-4, No.150, Jian-Yi Road, Chung-HO City 235, Taipei , Taiwan, R.O.C.

Manufacturer	:	Welltech Computer CO., LTD.
Manufacturer Address	:	13F-4, No.150, Jian-Yi Road, Chung-HO City 235, Taipei , Taiwan, R.O.C.
Product Type	:	Gateway
Trade Name	:	WELLTECH
Model Name	:	WG-3512 (Series No. H07WR0033) / WellGate 3512 / WellGate 3512N / WG-3512N / WellGate 3511N / WG-3511N / WellGate 3501N / WG-3501N / RG-02 / Wi-Fi VoIP Gateway
FCC ID	:	VJE-WG3512
Input Rating	:	100 - 240VAC / 0.4A (AC Adapter)
Frequency of Channel	:	See Table 1
Type of Modulation	:	Direct Sequence Spread Spectrum
Type of Antenna	:	FixedType

During testing the EUT was operated at Tx or Rx mode for each emission measured. This was done in order to ensure that maximum emission levels were attained.

802.11b/g Mode	
CH	**Frequency**
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

Table 1. WLAN Frequency of Each Channel (Working Frequency)

1.2 Introduction

The following measurement report is submitted on behalf of **Welltech Computer CO., LTD.** In support of a Class B Digital Device certification in accordance with Part2 Subpart J and Part 15 Subpart A And B&C of the Commission's and Regulations.

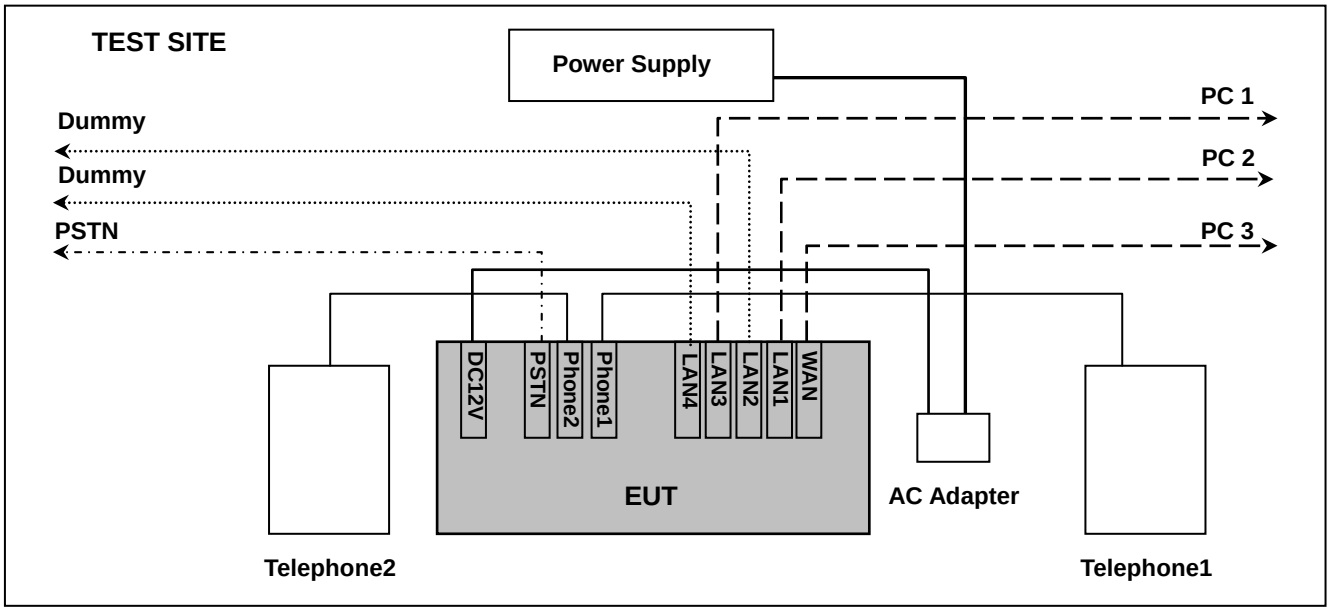
1.3 Summary of Tests

47 CFR Part 15 Subpart C			
Reference	**Test**	**Results**	**Note**
15.107	AC Power Conducted Emission	PASS	
15.247(c)	Transmitter Radiated Emissions	PASS	
15.247(b)	Max. Output Power	PASS	
15.247(a)(2)	6dB RF Bandwidth	PASS	
15.247(d)	Max. Power Density	PASS	
15.247(c)	Out of Band Conducted Spurious Emission	PASS	
15.247(c)	Band Edge Measurement	PASS	
15.203	Antenna Requirement	PASS	

1.4 Description of Support Equipment

Computer	**: DELL**
Model No.	**: PP49L**
Serial No.	**: UF230 A03**
FCC ID	**: E2KWM3945ABC**
Keyboard	**: DELL**
Model No.	**: SK-8115**
Serial No.	**: MY-0DJ325-71619-7113-1366**
FCC ID	**: FCC DOC**
Monitor	**: DELL**
Model No.	**: E177FPc**
Serial No.	**: CN-0FJ179-64180-6BT-4LYS**
FCC ID	**: FCC DOC**
Mouse	**: DELL**
Model No.	**: M056U0A**
Serial No.	**: F1F026E1**
FCC ID	**: FCC DOC**
Printer	**: EPSON**
Model No.	**: C60**
Serial No.	**: DR3K041323**
FCC ID	**: FCC DOC**

1.5 Configuration of System under Test



During EMI testing (LINK) the EUT (Gateway)'s Power port was connected to AC Adapter. EUT (Gateway)'s Telephone port1 & port2 connected to Telephone and PSTN connected to PSTN. EUT (Gateway)'s WAN port and LAN1 & LAN 3 port connected to PC1 & PC2 & PC3. EUT (Gateway)'s LAN2 & LAN4 port connected to Dummy Load.

1.6 Test Procedure

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4-2003 "Measurement of un-Intentional Radiators."

1.7 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions which the EUT was considered likely to encounter in normal use were investigated. The system's radiated and conducted emissions were investigated while the computer alternately transferred data to the EUT as well as to the monitor and printer. Using a test program which sent a continuous data and transferred data to and from the EUT was proven to worst case emissions. The system's physical layout and cabling was randomly arranged to ensure that maximum emission levels were attained.

2. Conducted Emissions Requirements

2.1 General & Setup:

The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 2.6.

2.2 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Advantest	R3132	160300103	Mar. 23, 2007	Mar. 23, 2008
Test Receiver	R&S	ESCI	100367	May. 23, 2007	May. 23, 2008
LISN	EMCO	3816/2 SH	00060110	Jun. 06, 2007	Jun. 06, 2008
LISN	EMCO	3816/2 SH	00060111	Jun. 13, 2007	Jun. 13, 2008
Transient Limiter	ELECTRO-METRICS	EM-7600	777	Jun. 26, 2007	Jun. 26, 2008

2.3 Test Configuration:

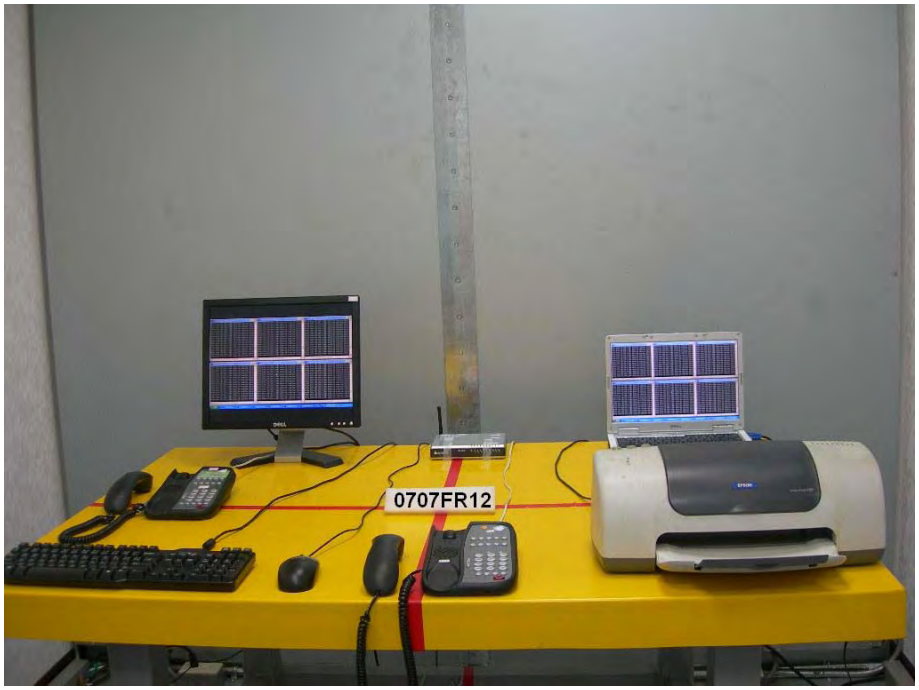


Figure 1. Front View of the Test Configuration

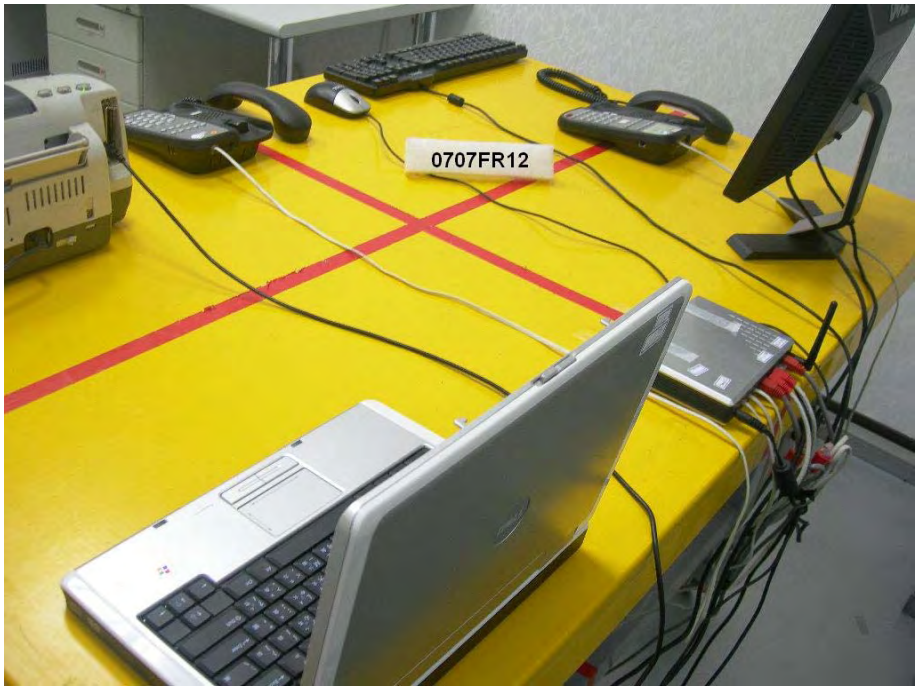


Figure 2. Rear View of the Test Configuration

2.4 Test condition:

EUT tested in accordance with the specifications given by the Manufacturer, and exercised in the most unfavorable manner.

2.5 Conducted Emissions Limits:

Frequency range (MHz)	Limits (dBuV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

2.6 Measurement Data of Conducted Emissions:

2.6.1 Conducted Emissions (Subpart C)

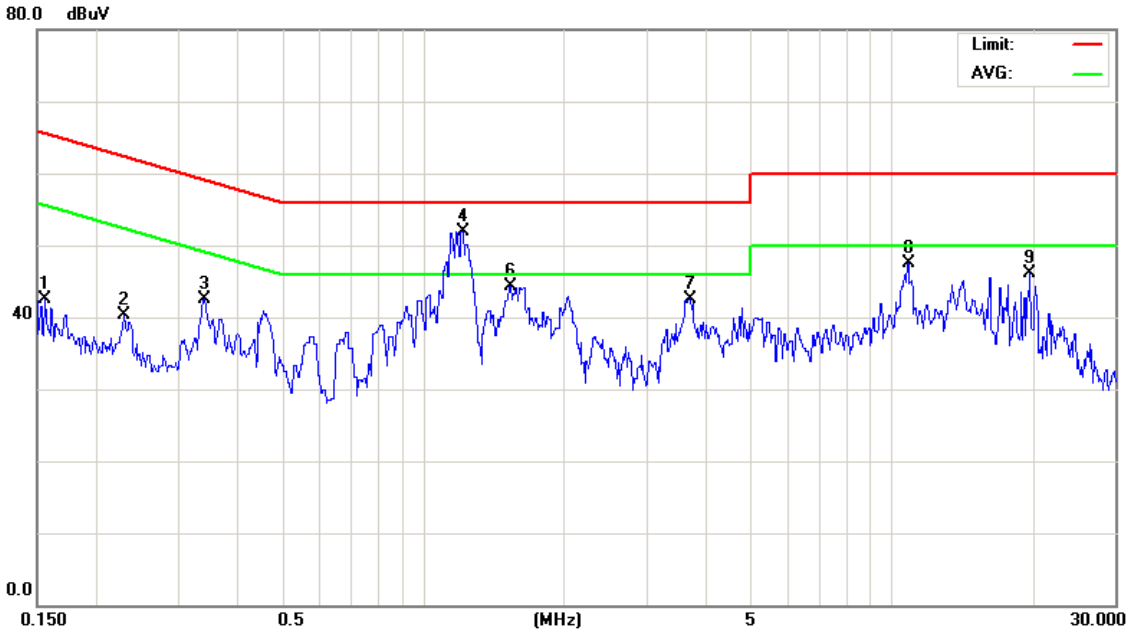
The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NATURAL conductor of the EUT power.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : AC Adapter _ 802.11b CH1 (2412MHz)
Test Date : 07/15/2007
Please refer to next pager of detail testing data.
Notes:

1. L1: One end & Ground L2: The other end & Ground
2. Height of table on which the EUT was placed: 0.8 m.
3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
4. The above test results are obtained under the normal condition.

Conducted Emission Measurement

File :WG3512(2007-07-11) Data :#1 Date: 2007/7/15 Time: 下午 07:13:07



Site site #1 Phase: *L1* Temperature: 26 ℃

Limit: CISPR22 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 55 %

EUT: VOIP

M/N: WG3512

Mode: 11b

Note: 2412

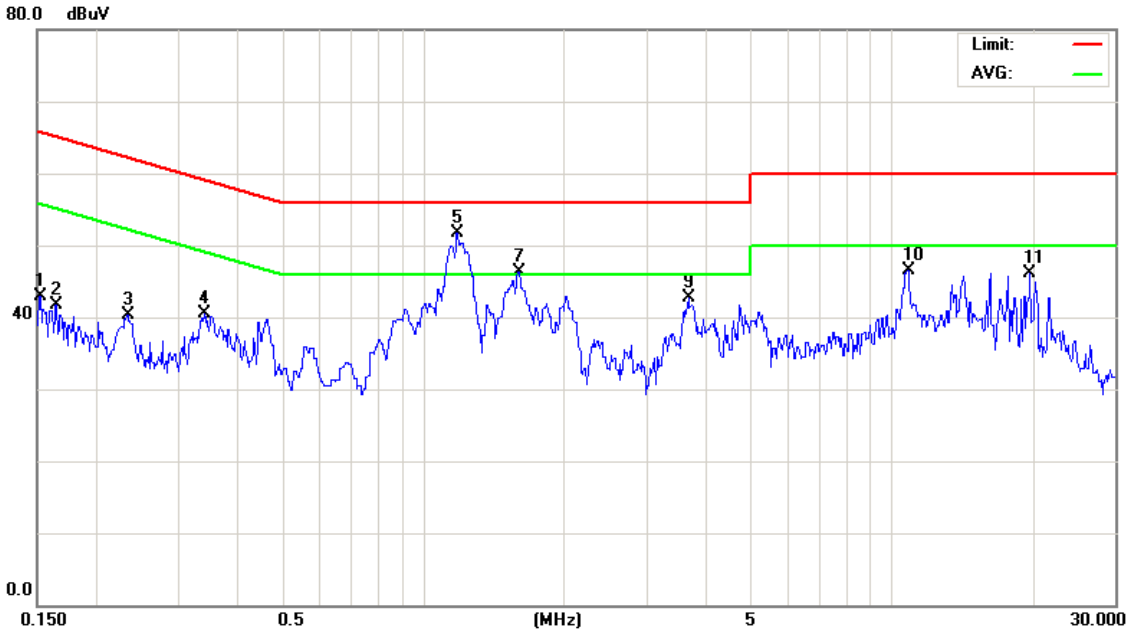
direct Spectrum

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1555	32.75	9.73	42.48	65.70	-23.22	peak	
2		0.2298	30.57	9.75	40.32	62.45	-22.13	peak	
3		0.3397	32.78	9.78	42.56	59.21	-16.65	peak	
4	*	1.2109	42.14	9.81	51.95	56.00	-4.05	peak	
5		1.2109	27.00	9.81	36.81	46.00	-9.19	AVG	
6		1.5350	34.44	9.81	44.25	56.00	-11.75	peak	
7		3.7040	32.54	9.94	42.48	56.00	-13.52	peak	
8		10.8000	37.46	10.07	47.53	60.00	-12.47	peak	
9		19.7000	35.90	10.26	46.16	60.00	-13.84	peak	

*:Maximum data x:Over limit !:over margin ●Reference Only

Conducted Emission Measurement

File :WG3512(2007-07-11) Data :#2 Date: 2007/7/15 Time: 下午 07:19:02



Site site #1 Phase: *L2* Temperature: 26 ℃

Limit: CISPR22 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 55 %

EUT: VOIP

M/N: WG3512

Mode: 11b

Note: 2412

direct Spectrum

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1521	33.23	9.73	42.96	65.88	-22.92	peak	
2		0.1647	31.95	9.73	41.68	65.22	-23.54	peak	
3		0.2333	30.64	9.75	40.39	62.33	-21.94	peak	
4		0.3404	30.68	9.78	40.46	59.19	-18.73	peak	
5	*	1.1840	41.98	9.80	51.78	56.00	-4.22	peak	
6		1.1840	27.65	9.80	37.45	46.00	-8.55	AVG	
7		1.5979	36.51	9.82	46.33	56.00	-9.67	peak	
8		1.5979	29.98	9.82	39.80	46.00	-6.20	AVG	
9		3.6770	32.77	9.94	42.71	56.00	-13.29	peak	
10		10.8000	36.41	10.07	46.48	60.00	-13.52	peak	
11		19.7000	35.84	10.26	46.10	60.00	-13.90	peak	

*:Maximum data x:Over limit !:over margin ●Reference Only

2.6.2 Conducted Emissions (Subpart C)

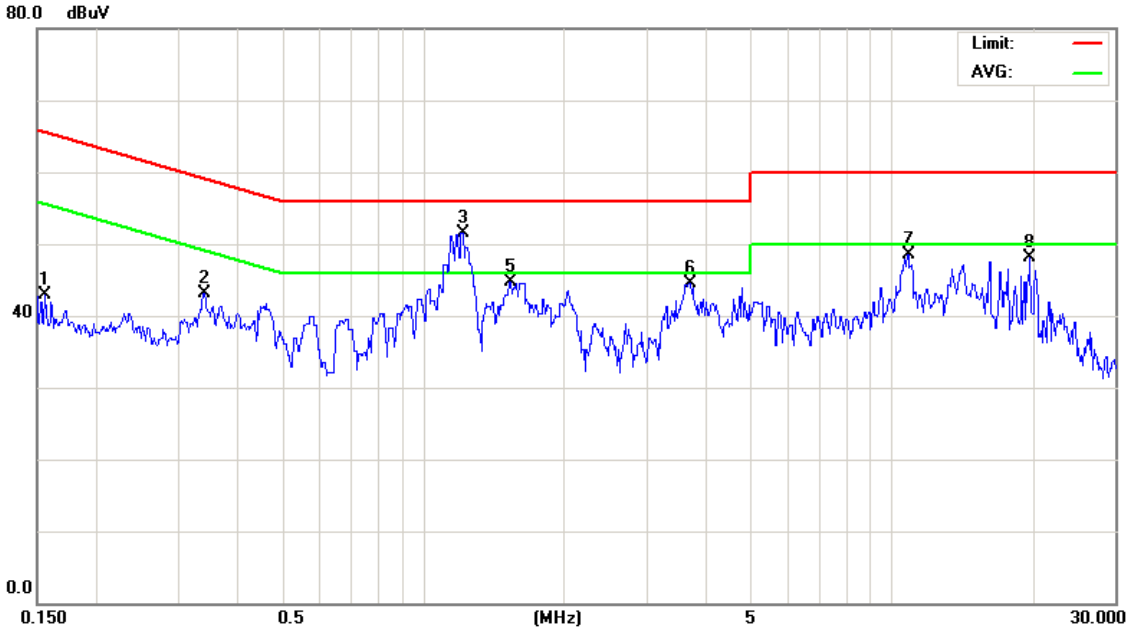
The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NATURAL conductor of the EUT power.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : AC Adapter _ 802.11g CH1 (2412MHz)
Test Date : 07/15/2007
Please refer to next pager of detail testing data.
Notes:

1. L1: One end & Ground L2: The other end & Ground
2. Height of table on which the EUT was placed: 0.8 m.
3. The Quasi-Peak Value have already met the Average Value Limit showed on above limits.
4. The above test results are obtained under the normal condition.

Conducted Emission Measurement

File :WG3512(2007-07-11) Data :#1 Date: 2007/7/15 Time: 下午 07:13:07



Site site #1 Phase: *L1* Temperature: 26 ℃

Limit: CISPR22 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 55 %

EUT: VOIP

M/N: WG3512

Mode: 11g

Note: 2412

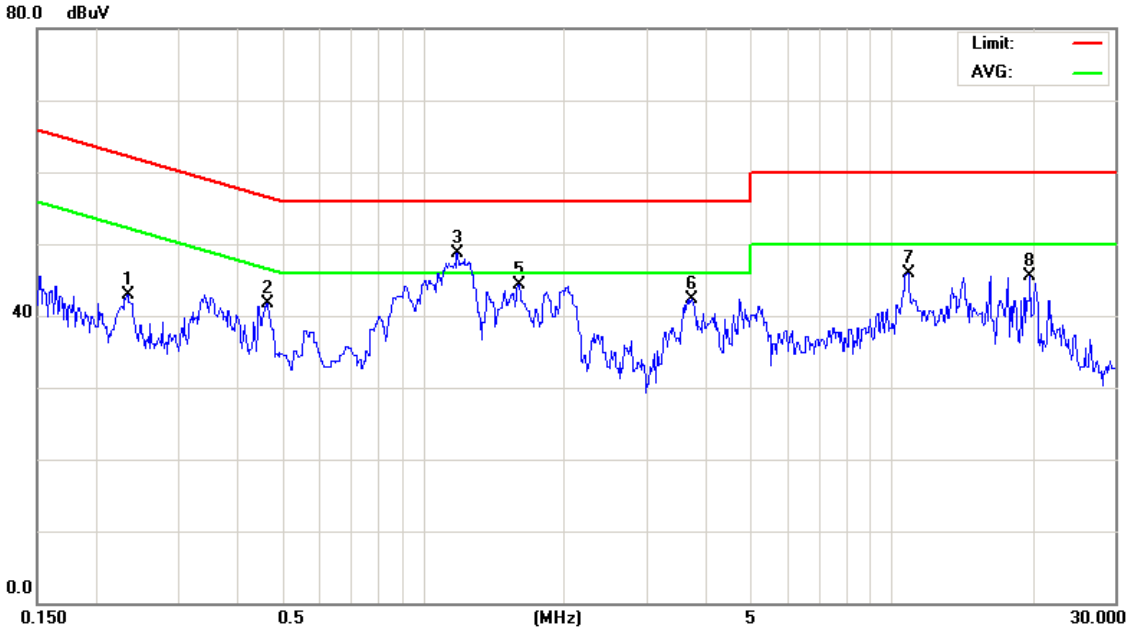
direct Spectrum

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1554	33.25	9.73	42.98	65.70	-22.72	peak	
2		0.3396	33.28	9.78	43.06	59.21	-16.15	peak	
3	*	1.2109	41.64	9.81	51.45	56.00	-4.55	peak	
4		1.2109	26.63	9.81	36.44	46.00	-9.56	AVG	
5		1.5342	34.94	9.81	44.75	56.00	-11.25	peak	
6		3.7038	34.54	9.94	44.48	56.00	-11.52	peak	
7		10.8000	38.46	10.07	48.53	60.00	-11.47	peak	
8		19.7000	37.90	10.26	48.16	60.00	-11.84	peak	

*:Maximum data x:Over limit !:over margin ●Reference Only

Conducted Emission Measurement

File :WG3512(2007-07-11) Data :#2 Date: 2007/7/15 Time: 下午 07:19:02



Site site #1 Phase: *L2* Temperature: 26 ℃

Limit: CISPR22 Class B Conduction(QP) Power: AC 110V/60Hz Humidity: 55 %

EUT: VOIP

M/N: WG3512

Mode: 11g

Note: 2412

direct Spectrum

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2333	33.14	9.75	42.89	62.33	-19.44	peak	
2		0.4642	31.84	9.78	41.62	56.62	-15.00	peak	
3	*	1.1834	38.98	9.80	48.78	56.00	-7.22	peak	
4		1.1834	27.29	9.80	37.09	46.00	-8.91	AVG	
5		1.5979	34.51	9.82	44.33	56.00	-11.67	peak	
6		3.7309	32.31	9.95	42.26	56.00	-13.74	peak	
7		10.8000	35.91	10.07	45.98	60.00	-14.02	peak	
8		19.7000	35.34	10.26	45.60	60.00	-14.40	peak	

*:Maximum data x:Over limit !:over margin ●Reference Only

3. Radiated Emissions Requirements

3.1 Final radiation measurements were made on a three-meter:

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 30 MHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on tree orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (mode VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro colts per meter (dBuV/m).
The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) Amplitude (dBuV/m) = FI (dBuV) +AF (dBuV) +CL (dBuV)-Gain (dB)

FI= Reading of the field intensity.
AF= Antenna factor.
CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) Actual Amplitude (dBuV/m) = Amplitude (dBuV)-Dis(dB)

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency :

Transmitter Output < +30dBm

(b) For spurious frequency :

Spurious emission limits = fundamental emission limit /10

3.2 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4408B	MY45107753	May. 28, 2007	May. 28, 2008
Pre Amplifier	Agilent	8449B	3008A02237	May. 28, 2007	May. 28, 2008
Pre Amplifier	Agilent	8447D	2944A10961	Jun. 09, 2007	Jun. 09, 2008
Test Receiver	R&S	ESCI	100367	May. 23, 2007	May. 23, 2008
Biconilog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	Jun. 26, 2007	Jun. 26, 2008
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	Jun. 26, 2007	Jun. 26, 2008
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	Jun. 09, 2007	Jun. 09, 2008
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120E	0899	Jun. 26, 2007	Jun. 26, 2008

3.3 Test Configuration:

Figure 3. Front View of the Test Configuration

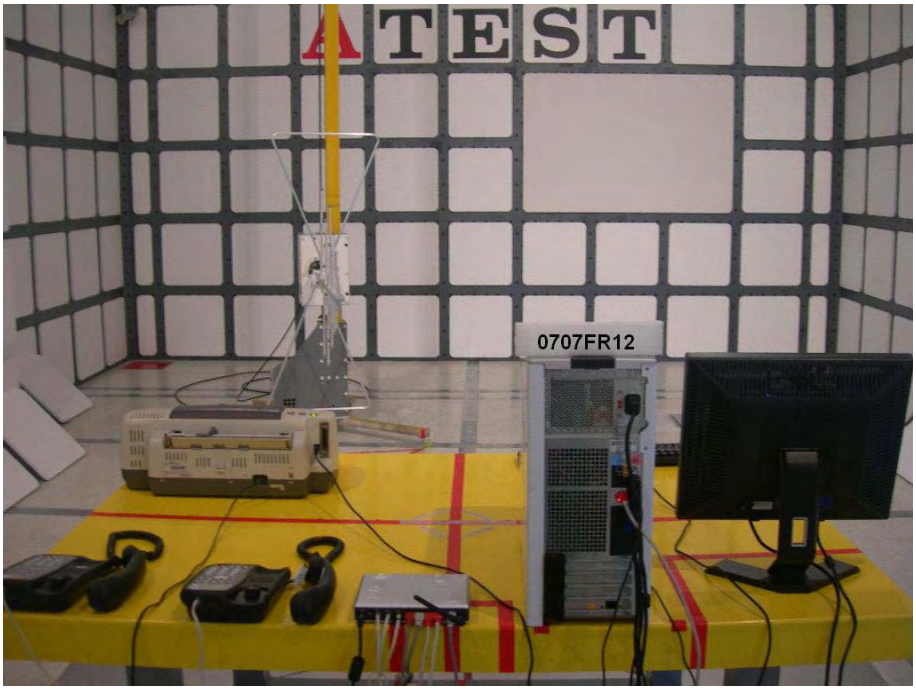


Figure 4. Rear View of the Test Configuration

Figure 5. Front View of the Test Configuration

Figure 6. Rear View of the Test Configuration

3.4 Test condition:

EUT tested in accordance with the specifications given by the manufacturer, and exercised in the most unfavorable manner.

3.5 Radiated Emissions Limits:

Frequency range (MHz)	Peak(dBuV)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54

3.6 Measurement Data of Radiated Emissions:

3.6.1 Open Field Radiated Emissions (Subpart C)

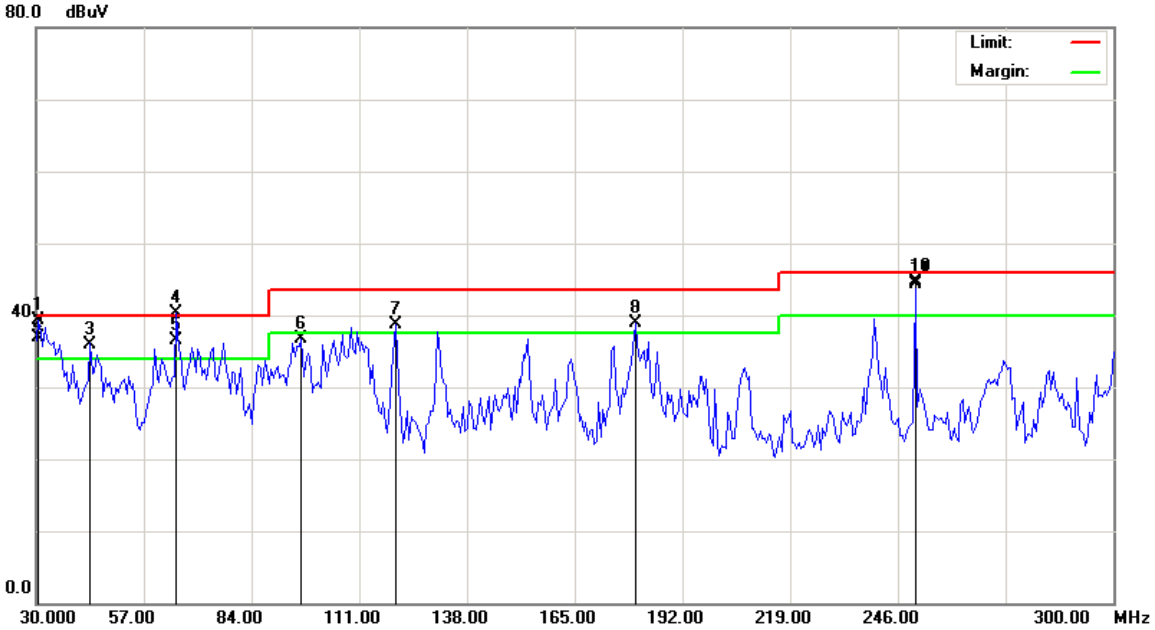
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11b CH1 2412.000 (Local Frequency: 2412.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#13 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U ; CH2412

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	52.70	-13.45	39.25	40.00	-0.75	peak			
2	!	30.5400	50.45	-13.45	37.00	40.00	-3.00	QP			
3	!	43.5000	47.85	-11.85	36.00	40.00	-4.00	peak			
4	*	65.1000	54.66	-14.39	40.27	40.00	0.27	peak			
5	!	65.1000	50.86	-14.39	36.47	40.00	-3.53	QP			
6		96.4200	48.67	-11.96	36.71	43.50	-6.79	peak			
7	!	120.1800	52.90	-14.23	38.67	43.50	-4.83	peak			
8	!	180.1200	53.16	-14.31	38.85	43.50	-4.65	peak			
9	!	180.1200	53.16	-14.31	38.85	43.50	-4.65	peak			
10	!	250.3200	55.58	-10.84	44.74	46.00	-1.26	peak			
11	!	250.3200	55.18	-10.84	44.34	46.00	-1.66	QP			

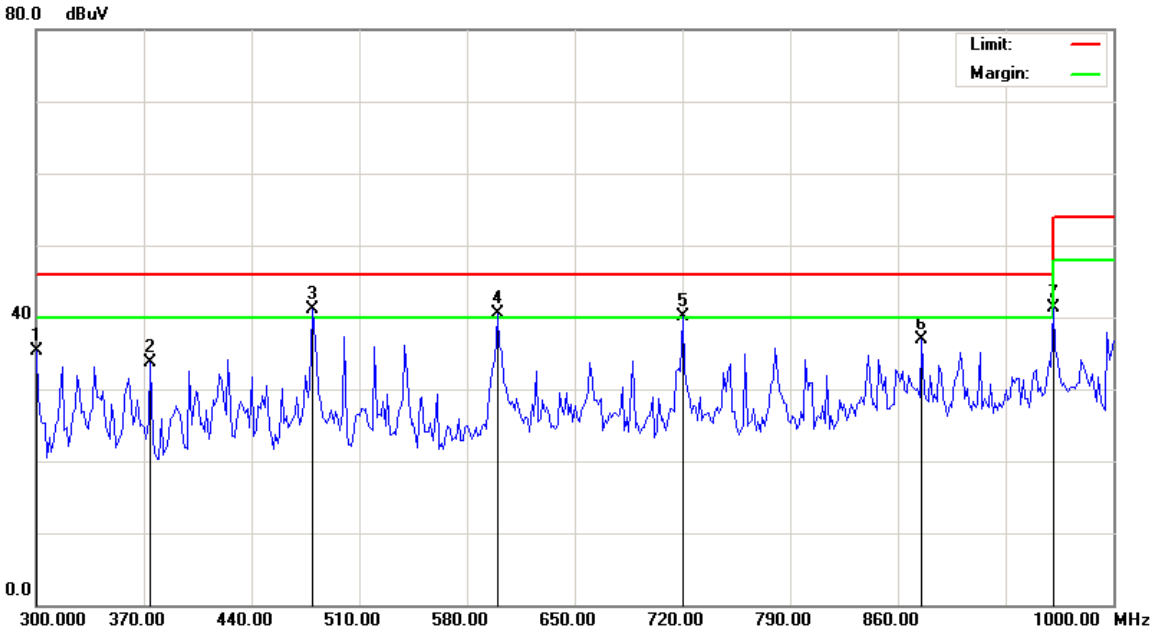
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Am lifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#14 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	45.36	-9.98	35.38	46.00	-10.62	peak			
2		374.2000	42.57	-8.93	33.64	46.00	-12.36	peak			
3	*	479.2000	48.68	-7.60	41.08	46.00	-4.92	peak			
4	!	599.6000	45.44	-4.91	40.53	46.00	-5.47	peak			
5	!	720.0000	43.59	-3.55	40.04	46.00	-5.96	peak			
6		875.4000	37.67	-0.80	36.87	46.00	-9.13	peak			
7		960.8000	40.91	0.48	41.39	54.00	-12.61	peak			

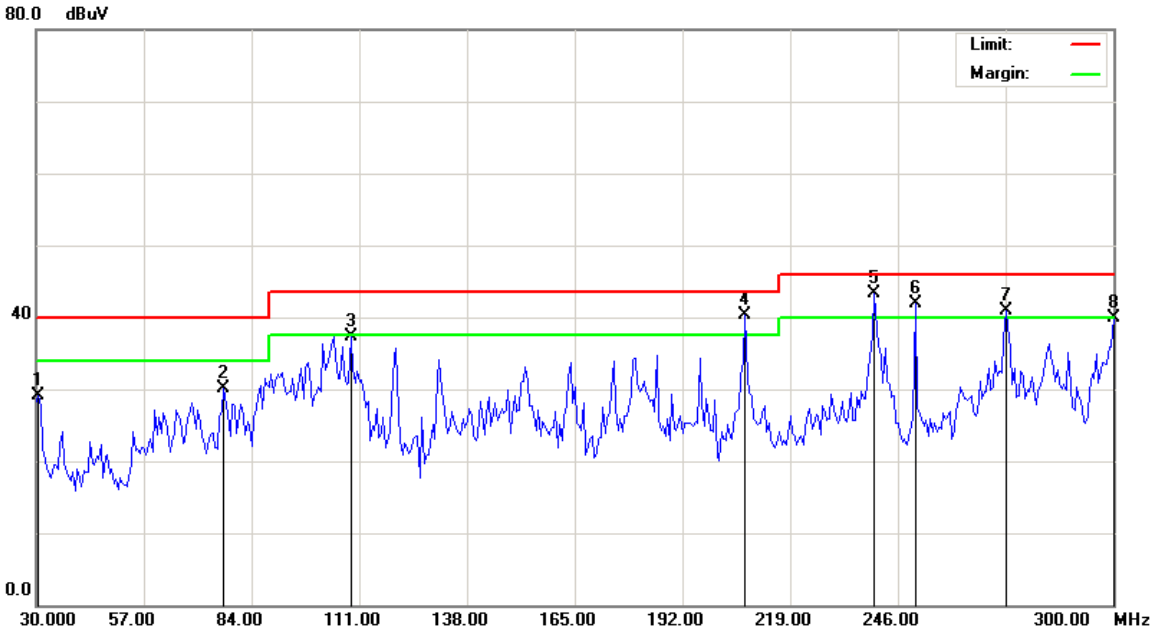
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#15 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		30.5400	42.51	-13.45	29.06	40.00	-10.94	peak			
2		76.9800	46.96	-16.92	30.04	40.00	-9.96	peak			
3		108.8400	49.79	-12.41	37.38	43.50	-6.12	peak			
4	!	207.6600	53.13	-12.91	40.22	43.50	-3.28	peak			
5	*	240.0600	54.78	-11.43	43.35	46.00	-2.65	peak			
6	!	250.3200	52.77	-10.84	41.93	46.00	-4.07	peak			
7	!	273.0000	51.72	-10.85	40.87	46.00	-5.13	peak			
8		300.0000	49.93	-9.98	39.95	46.00	-6.05	peak			

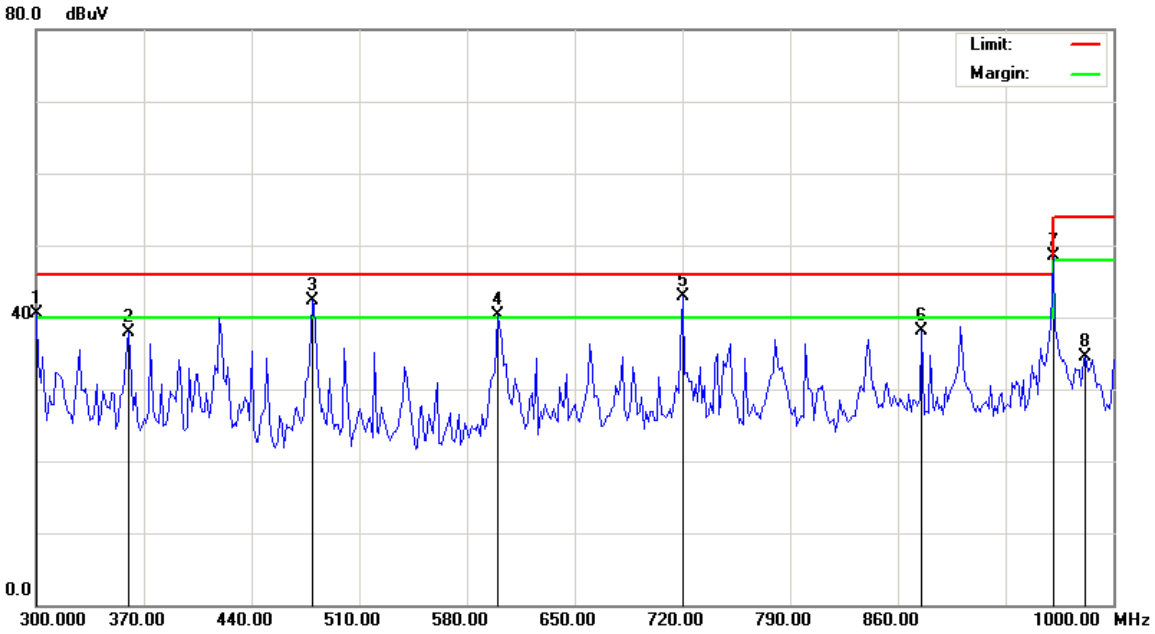
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#16 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	300.0000	50.53	-9.98	40.55	46.00	-5.45	peak			
2		360.2000	46.84	-8.98	37.86	46.00	-8.14	peak			
3	!	479.2000	49.89	-7.60	42.29	46.00	-3.71	peak			
4	!	599.6000	45.30	-4.91	40.39	46.00	-5.61	peak			
5	*	720.0000	46.44	-3.55	42.89	46.00	-3.11	peak			
6		875.4000	38.85	-0.80	38.05	46.00	-7.95	peak			
7	!	960.8000	48.06	0.48	48.54	54.00	-5.46	peak			
8		981.8000	34.06	0.48	34.54	54.00	-19.46	peak			

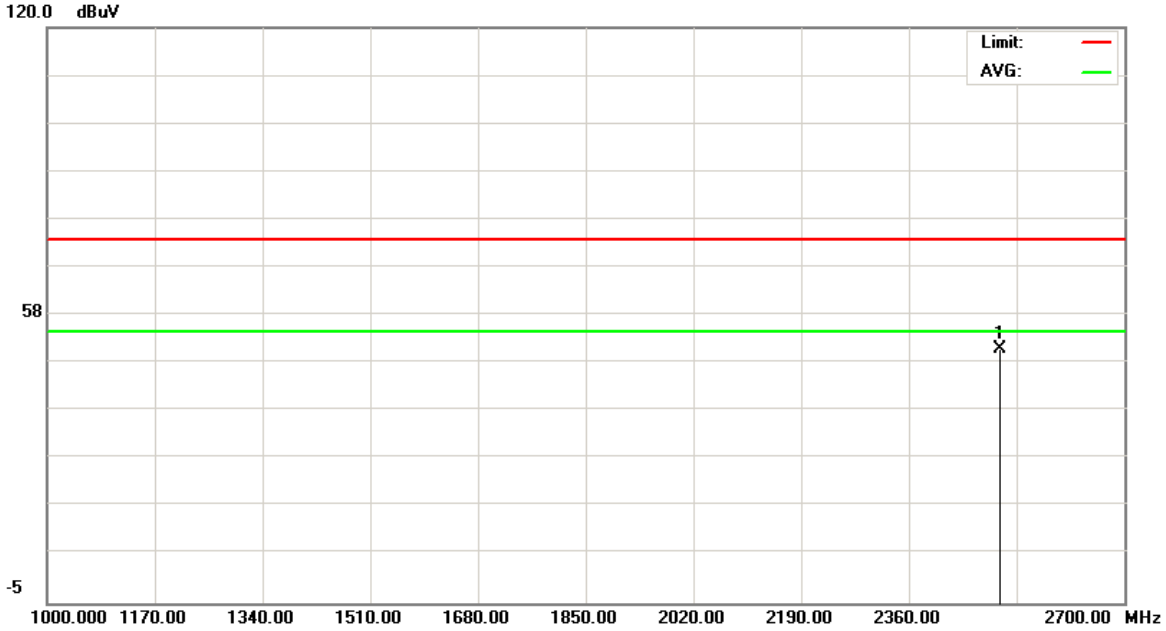
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#1 Date: 2007/07/12 Time: 11:29:29



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH01(2412MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

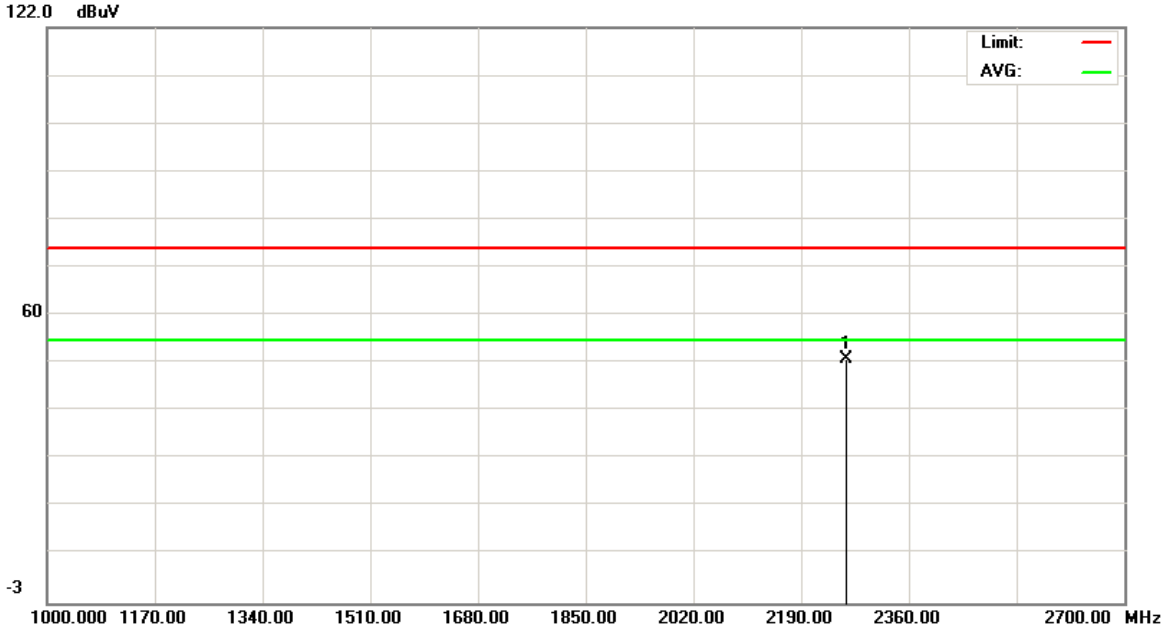
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2502.800	49.92	0.27	50.19	74.00	-23.81	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#3 Date: 2007/07/12 Time: 13:49:04



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH01(2412MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

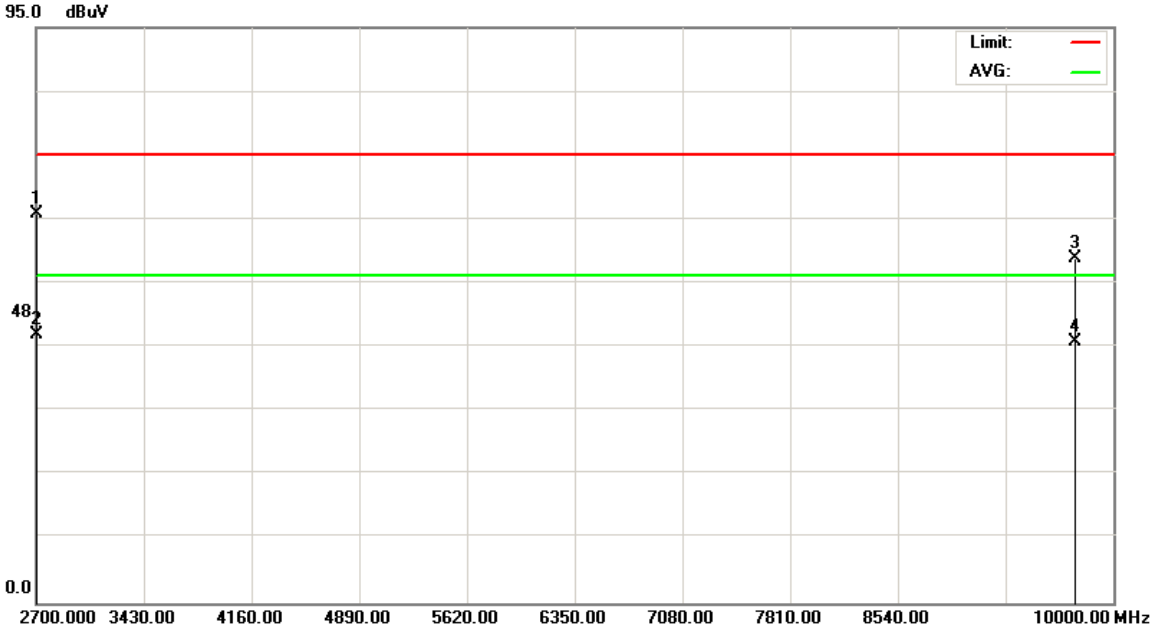
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2261.400	49.53	0.45	49.98	74.00	-24.02	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#5 Date: 2007/07/12 Time: 14:18:50



Site 966半電波暗室 Polarization: ***Vertical*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH01(2412MHz)

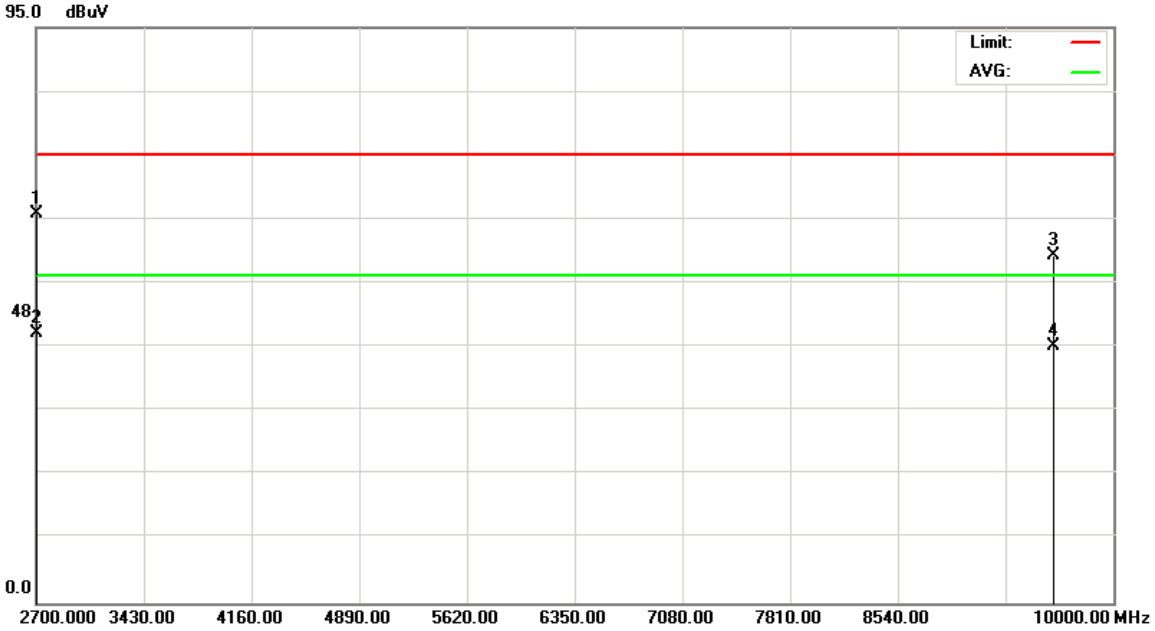
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.68	22.58	64.26	74.00	-9.74	peak			
2	*	2700.000	21.69	22.58	44.27	54.00	-9.73	AVG			
3		9744.500	39.20	17.69	56.89	74.00	-17.11	peak			
4		9744.500	25.36	17.69	43.05	54.00	-10.95	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#7 Date: 2007/07/12 Time: 14:52:22



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH01(2412MHz)

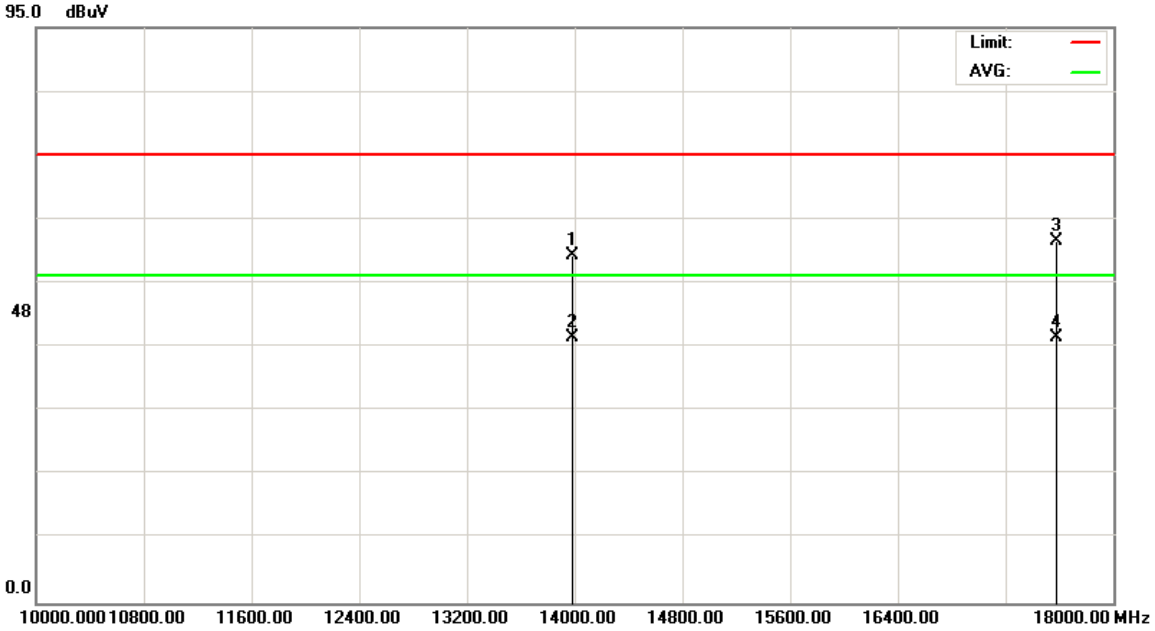
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.77	22.58	64.35	74.00	-9.65	peak			
2	*	2700.000	22.06	22.58	44.64	54.00	-9.36	AVG			
3		9598.500	39.99	17.41	57.40	74.00	-16.60	peak			
4		9598.500	24.97	17.41	42.38	54.00	-11.62	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#9 Date: 2007/07/12 Time: 15:46:46



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH01(2412MHz)

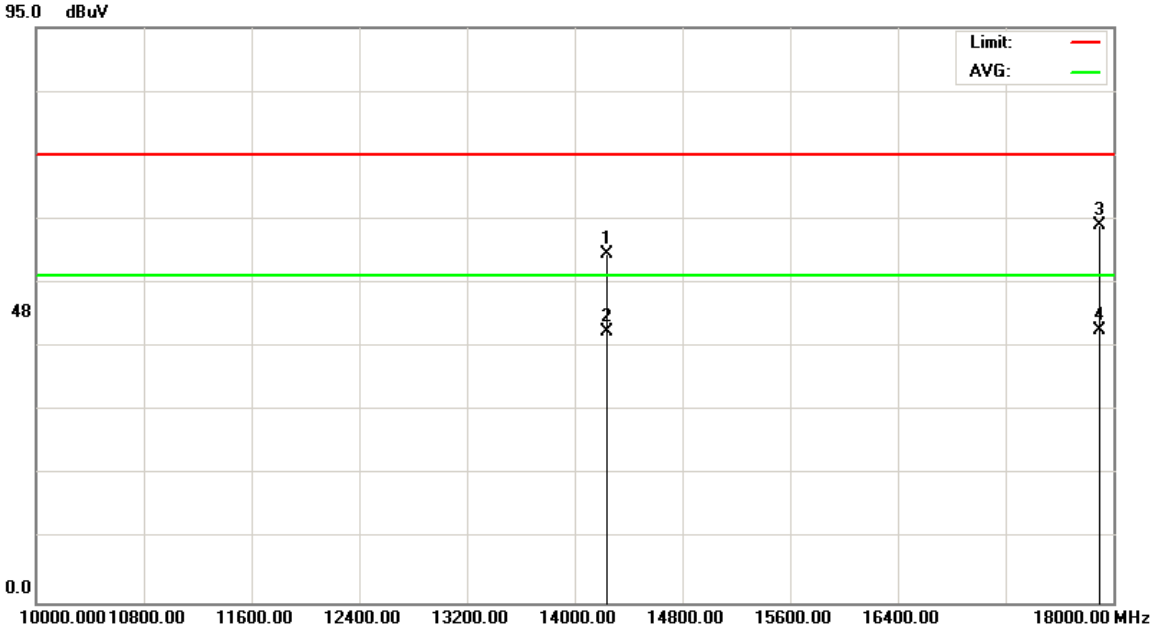
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		13980.00	38.69	18.62	57.31	74.00	-16.69	peak			
2	*	13980.00	25.31	18.62	43.93	54.00	-10.07	AVG			
3		17580.00	37.77	21.95	59.72	74.00	-14.28	peak			
4		17580.00	21.92	21.95	43.87	54.00	-10.13	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#11 Date: 2007/07/12 Time: 16:07:52



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH01(2412MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14240.00	38.84	18.71	57.55	74.00	-16.45	peak			
2		14240.00	26.07	18.71	44.78	54.00	-9.22	AVG			
3		17900.00	37.35	24.96	62.31	74.00	-11.69	peak			
4	*	17900.00	19.96	24.96	44.92	54.00	-9.08	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

3.6.2 Open Field Radiated Emissions (Subpart C)

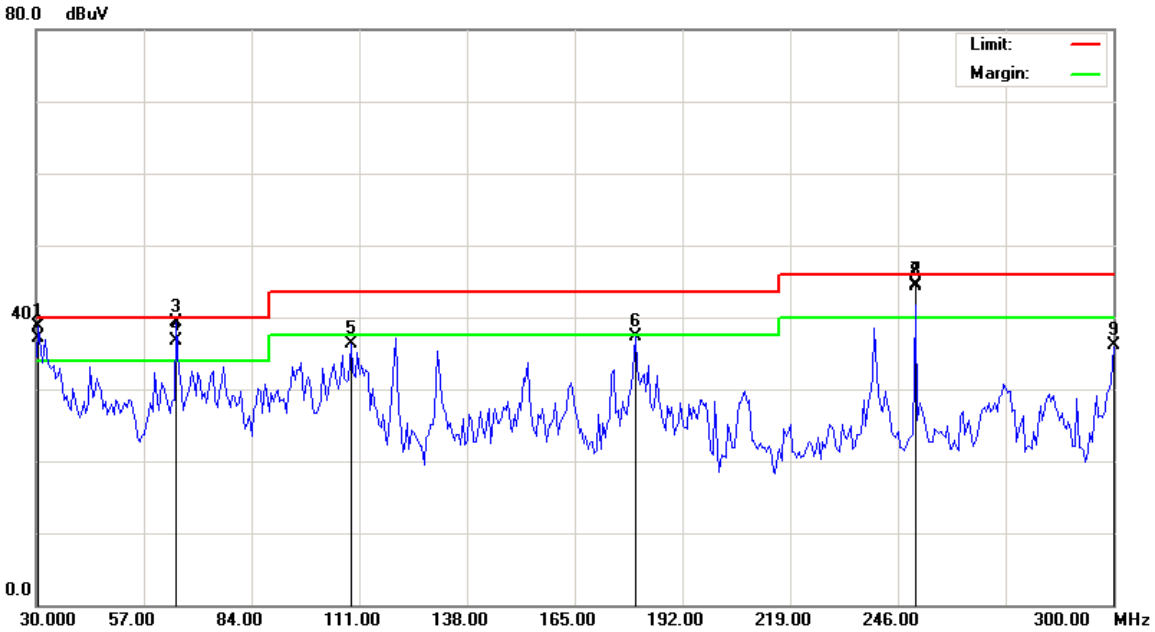
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11b CH6 2437.000 (Local Frequency: 2437.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#17 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	52.20	-13.45	38.75	40.00	-1.25	peak			
2	!	30.5400	50.63	-13.45	37.18	40.00	-2.82	QP			
3	*	65.1000	53.66	-14.39	39.27	40.00	-0.73	peak			
4	!	65.1000	51.13	-14.39	36.74	40.00	-3.26	QP			
5		108.8400	48.71	-12.41	36.30	43.50	-7.20	peak			
6		180.1200	51.66	-14.31	37.35	43.50	-6.15	peak			
7	!	250.3200	55.39	-10.84	44.55	46.00	-1.45	peak			
8	!	250.3200	55.17	-10.84	44.33	46.00	-1.67	QP			
9		300.0000	45.99	-9.98	36.01	46.00	-9.99	peak			

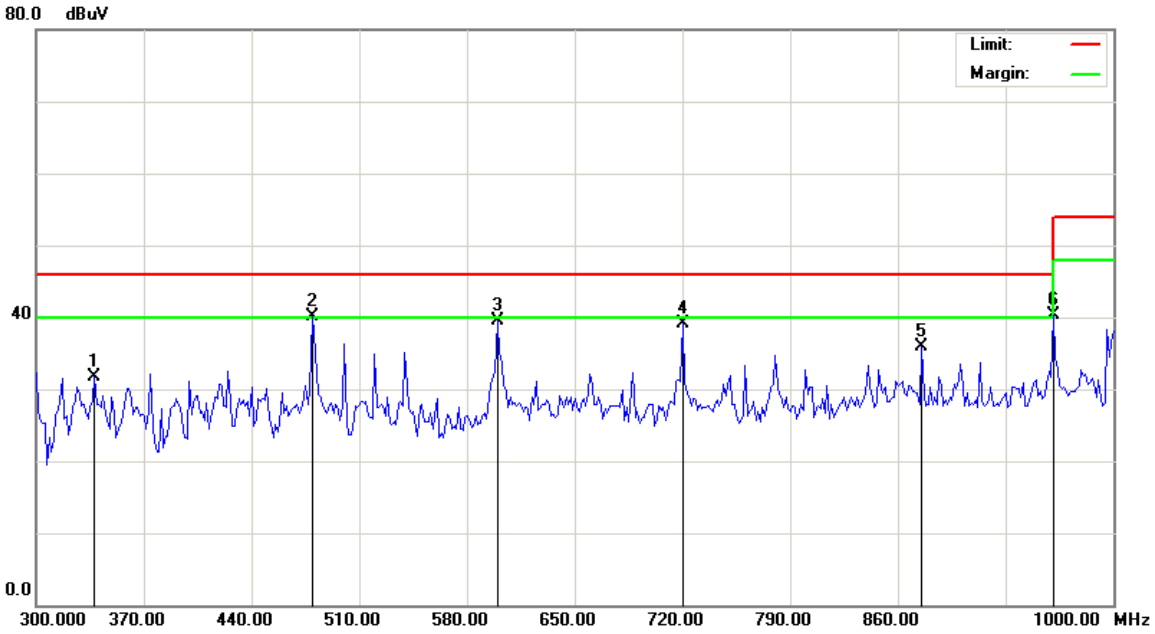
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#18 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		337.8000	40.75	-9.09	31.66	46.00	-14.34	peak			
2	*	479.2000	47.68	-7.60	40.08	46.00	-5.92	peak			
3		599.6000	44.43	-4.91	39.52	46.00	-6.48	peak			
4		720.0000	42.59	-3.55	39.04	46.00	-6.96	peak			
5		875.4000	36.67	-0.80	35.87	46.00	-10.13	peak			
6		960.8000	39.92	0.47	40.39	54.00	-13.61	peak			

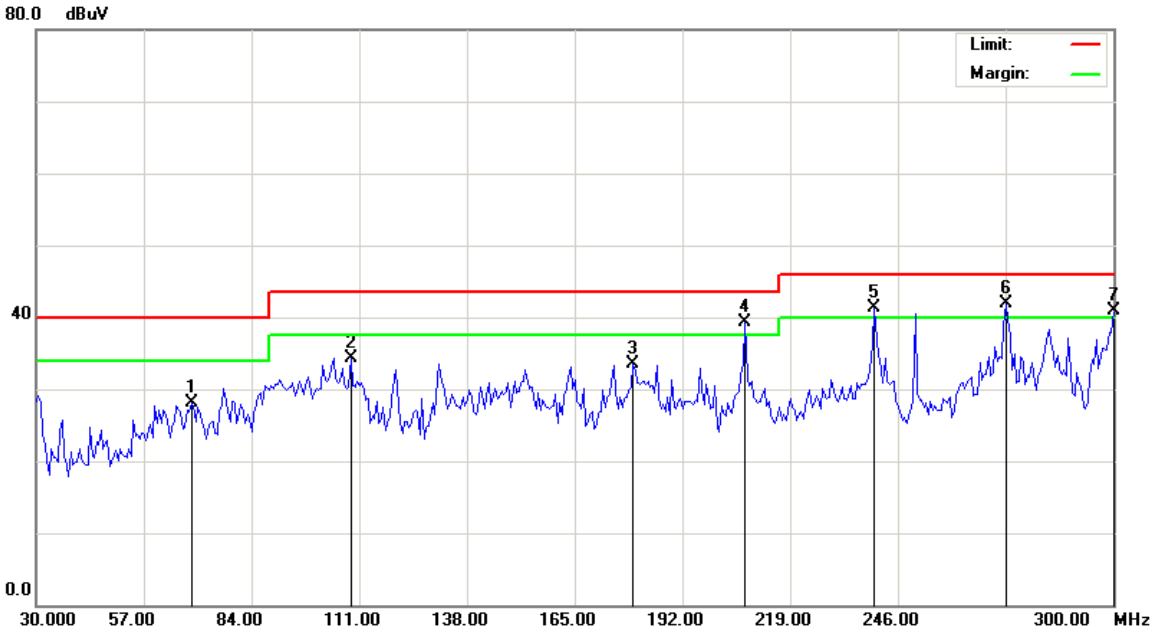
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Am lifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#19 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		68.8800	44.28	-16.08	28.20	40.00	-11.80	peak			
2		108.8400	46.79	-12.41	34.38	43.50	-9.12	peak			
3		179.5800	47.93	-14.35	33.58	43.50	-9.92	peak			
4	!	207.6600	52.13	-12.91	39.22	43.50	-4.28	peak			
5	!	240.0600	52.77	-11.43	41.34	46.00	-4.66	peak			
6	*	273.0000	52.72	-10.85	41.87	46.00	-4.13	peak			
7	!	300.0000	50.93	-9.98	40.95	46.00	-5.05	peak			

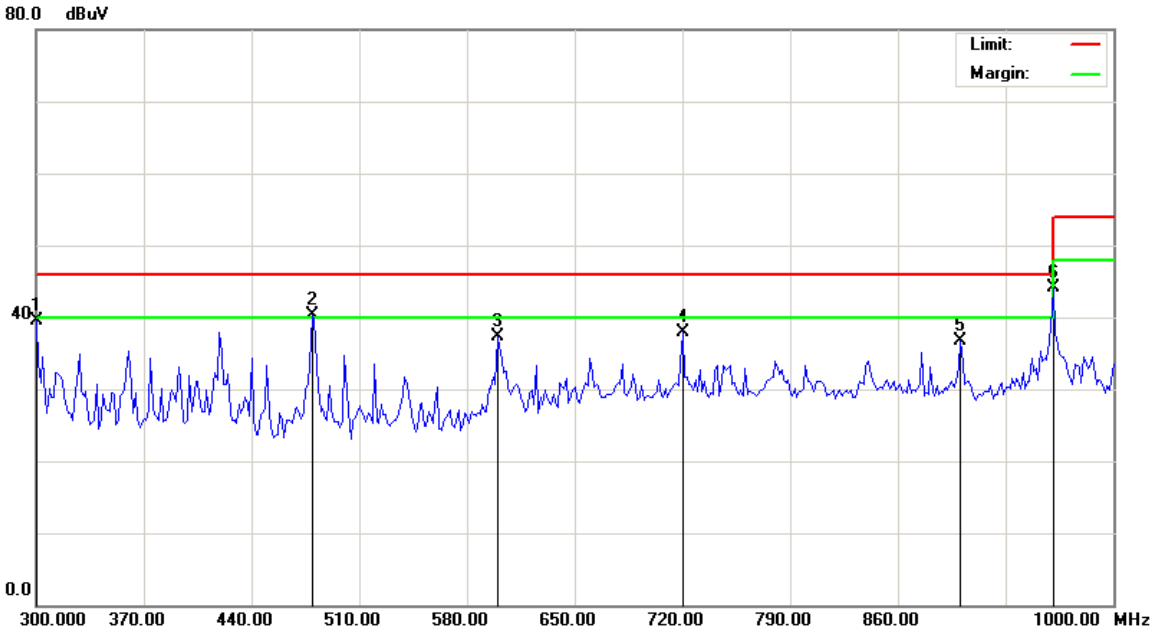
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#20 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	49.53	-9.98	39.55	46.00	-6.45	peak			
2	*	479.2000	47.89	-7.60	40.29	46.00	-5.71	peak			
3		599.6000	42.30	-4.91	37.39	46.00	-8.61	peak			
4		720.0000	41.44	-3.55	37.89	46.00	-8.11	peak			
5		900.6000	37.11	-0.36	36.75	46.00	-9.25	peak			
6		960.8000	43.57	0.47	44.04	54.00	-9.96	peak			

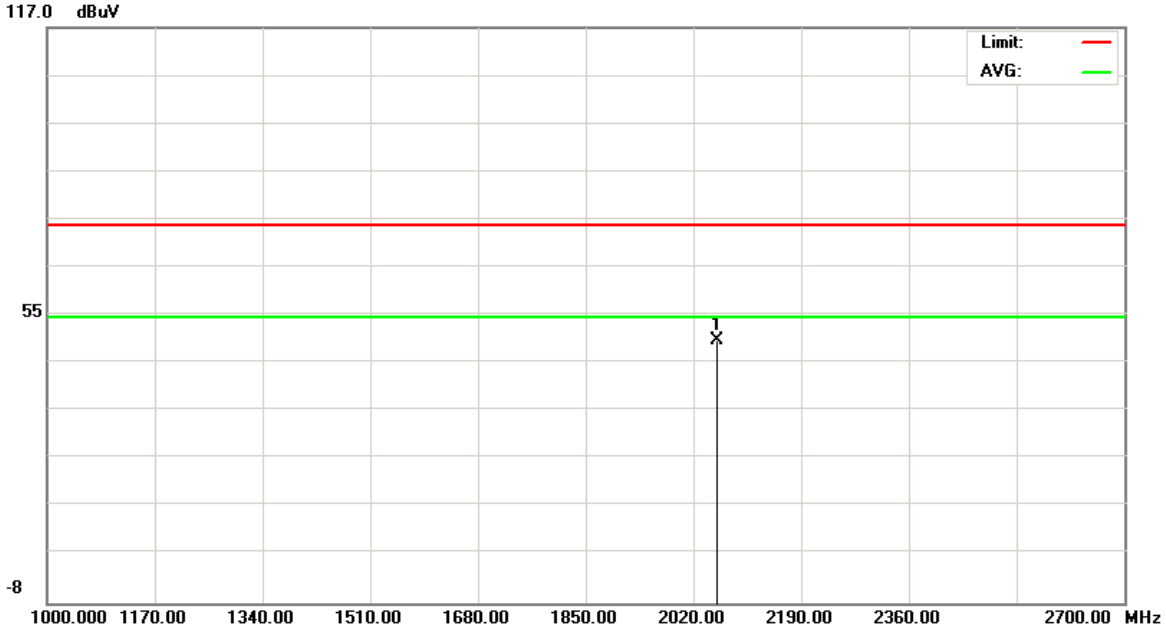
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#1 Date: 2007/07/12 Time: 11:39:05



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH06(2437MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

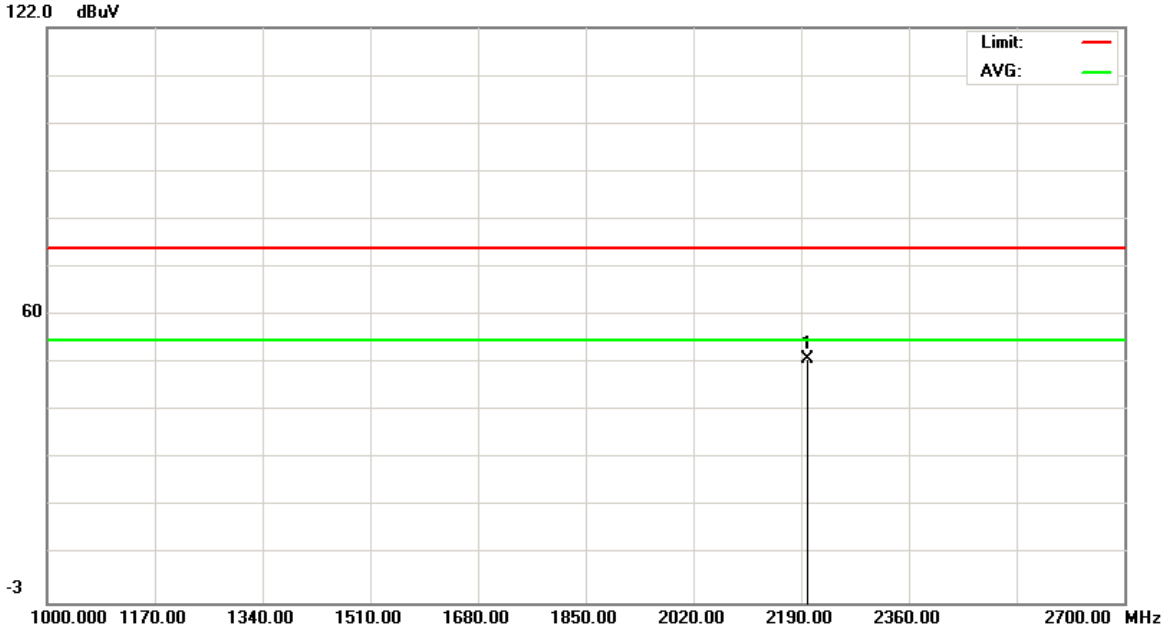
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2057.400	50.13	-1.22	48.91	74.00	-25.09	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#3 Date: 2007/07/12 Time: 13:53:17



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH06(2437MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

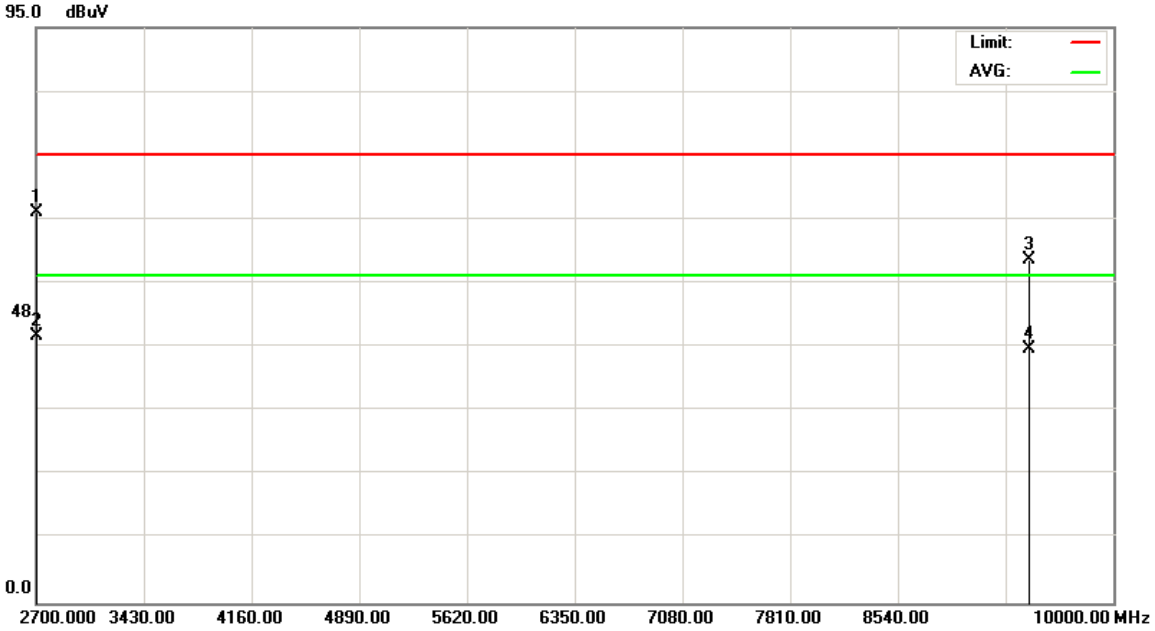
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2200.200	49.41	0.53	49.94	74.00	-24.06	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#5 Date: 2007/07/12 Time: 14:14:58



Site 966半電波暗室 Polarization: ***Vertical*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH06(2437MHz)

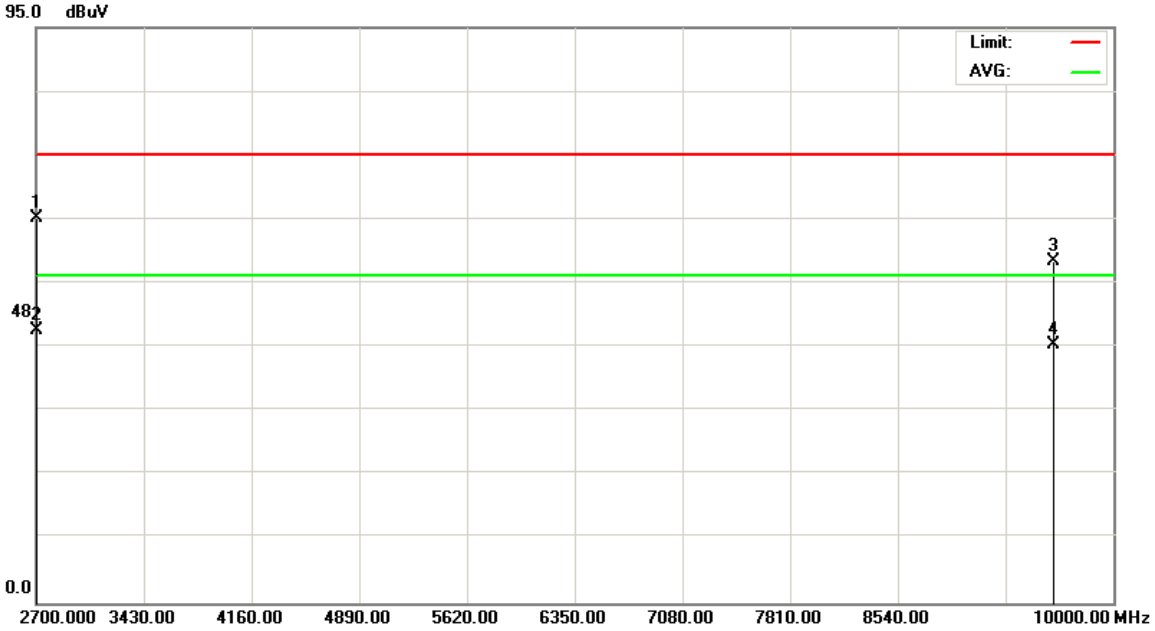
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2700.000	41.90	22.58	64.48	74.00	-9.52	peak			
2		2700.000	21.51	22.58	44.09	54.00	-9.91	AVG			
3		9434.250	39.73	17.03	56.76	74.00	-17.24	peak			
4		9434.250	24.95	17.03	41.98	54.00	-12.02	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#7 Date: 2007/07/12 Time: 14:56:12



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH06(2437MHz)

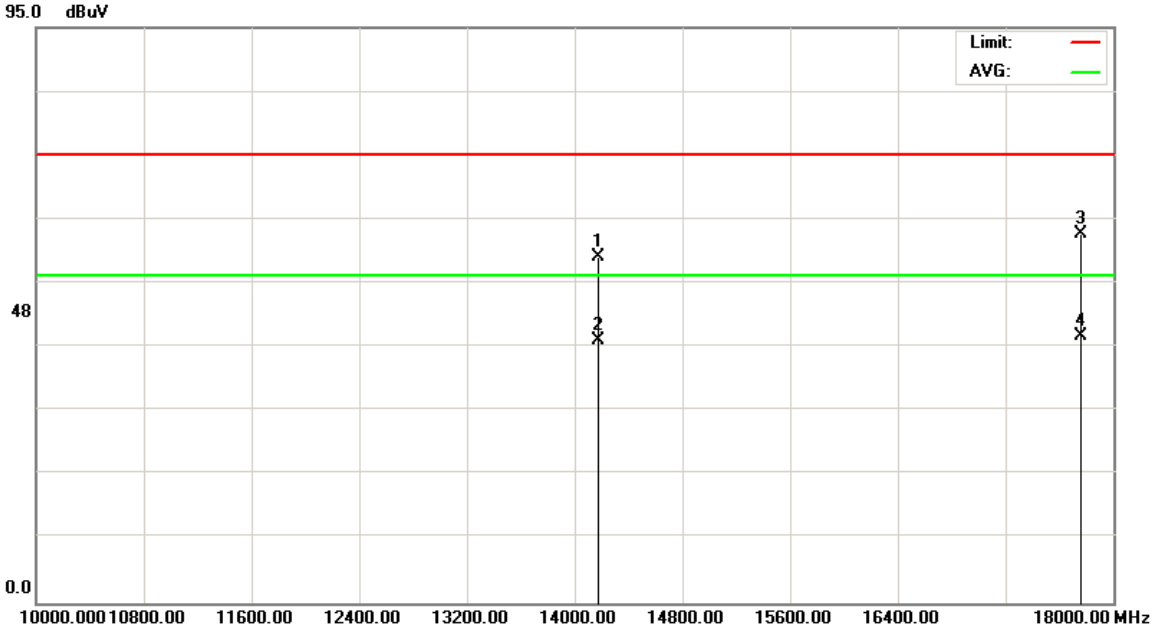
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	40.91	22.58	63.49	74.00	-10.51	peak			
2	*	2700.000	22.31	22.58	44.89	54.00	-9.11	AVG			
3		9598.500	39.08	17.41	56.49	74.00	-17.51	peak			
4		9598.500	25.29	17.41	42.70	54.00	-11.30	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#9 Date: 2007/07/12 Time: 15:50:40



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH06(2437MHz)

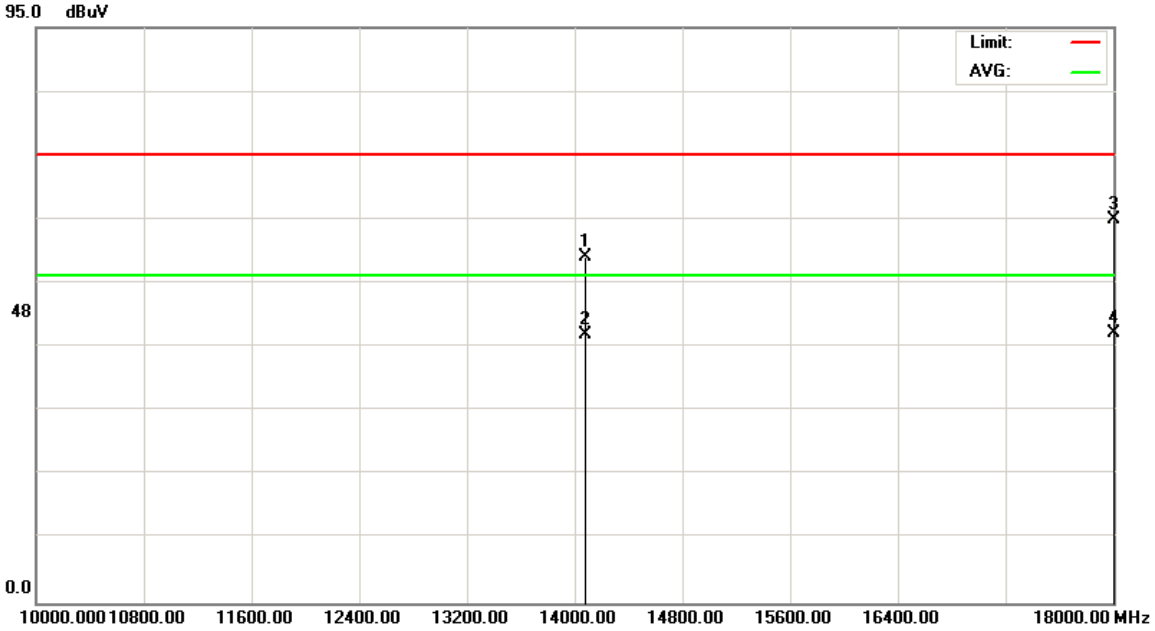
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14180.00	38.19	18.85	57.04	74.00	-16.96	peak			
2		14180.00	24.39	18.85	43.24	54.00	-10.76	AVG			
3		17760.00	37.78	23.05	60.83	74.00	-13.17	peak			
4	*	17760.00	21.08	23.05	44.13	54.00	-9.87	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#11 Date: 2007/07/12 Time: 16:02:36



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH06(2437MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14080.00	38.39	18.81	57.20	74.00	-16.80	peak			
2		14080.00	25.52	18.81	44.33	54.00	-9.67	AVG			
3		18000.00	37.77	25.57	63.34	74.00	-10.66	peak			
4	*	18000.00	19.08	25.57	44.65	54.00	-9.35	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

3.6.3 Open Field Radiated Emissions (Subpart C)

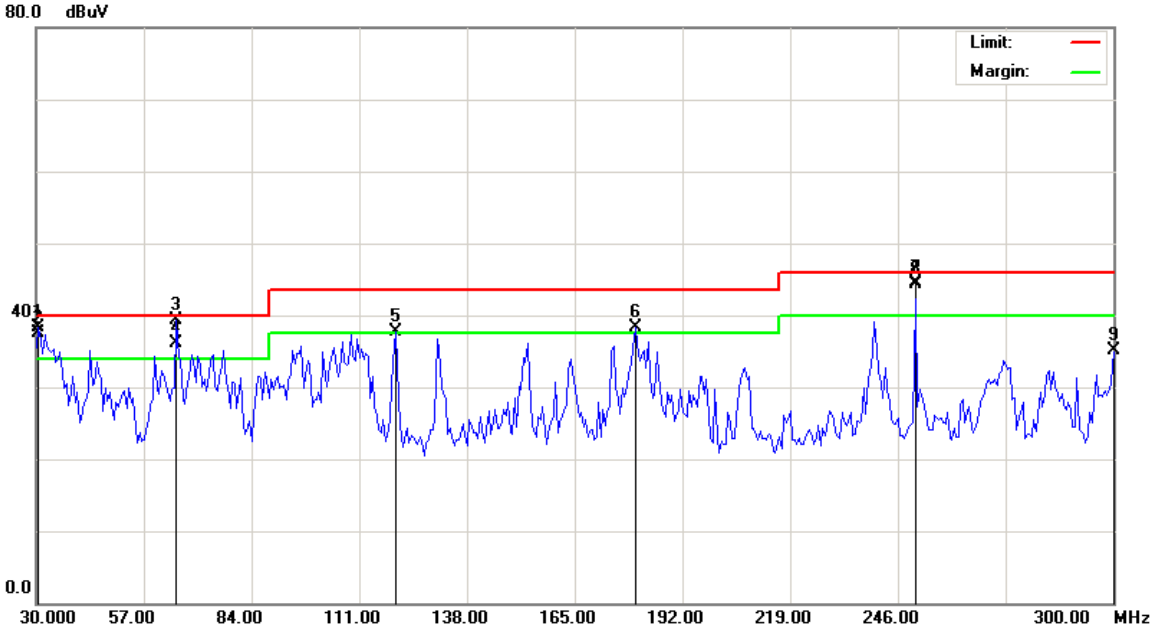
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11b CH11 2462.000 (Local Frequency: 2462.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#21 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	51.70	-13.45	38.25	40.00	-1.75	peak			
2	!	30.5400	50.86	-13.45	37.41	40.00	-2.59	QP			
3	*	65.1000	53.66	-14.39	39.27	40.00	-0.73	peak			
4	!	65.1000	50.53	-14.39	36.14	40.00	-3.86	QP			
5	!	120.1800	51.89	-14.23	37.66	43.50	-5.84	peak			
6	!	180.1200	52.66	-14.31	38.35	43.50	-5.15	peak			
7	!	250.3200	55.35	-10.84	44.51	46.00	-1.49	peak			
8	!	250.3200	55.14	-10.84	44.30	46.00	-1.70	QP			
9		300.0000	44.99	-9.98	35.01	46.00	-10.99	peak			

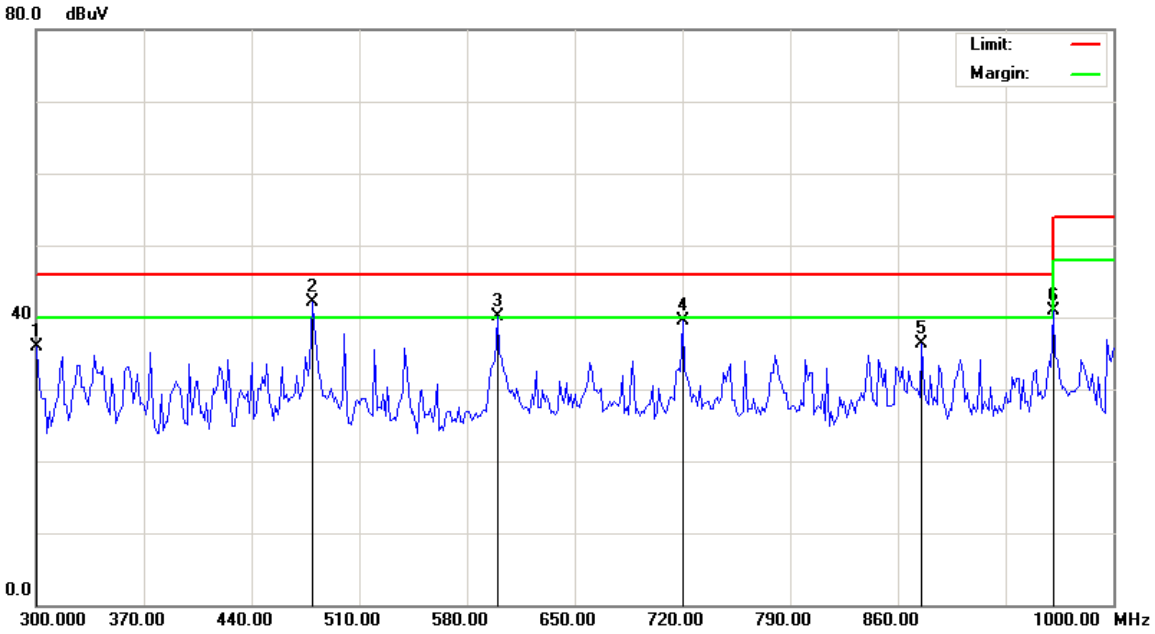
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#22 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	45.86	-9.98	35.88	46.00	-10.12	peak			
2	*	479.2000	49.68	-7.60	42.08	46.00	-3.92	peak			
3	!	599.6000	44.93	-4.91	40.02	46.00	-5.98	peak			
4		720.0000	43.09	-3.55	39.54	46.00	-6.46	peak			
5		875.4000	37.17	-0.80	36.37	46.00	-9.63	peak			
6		960.8000	40.42	0.47	40.89	54.00	-13.11	peak			

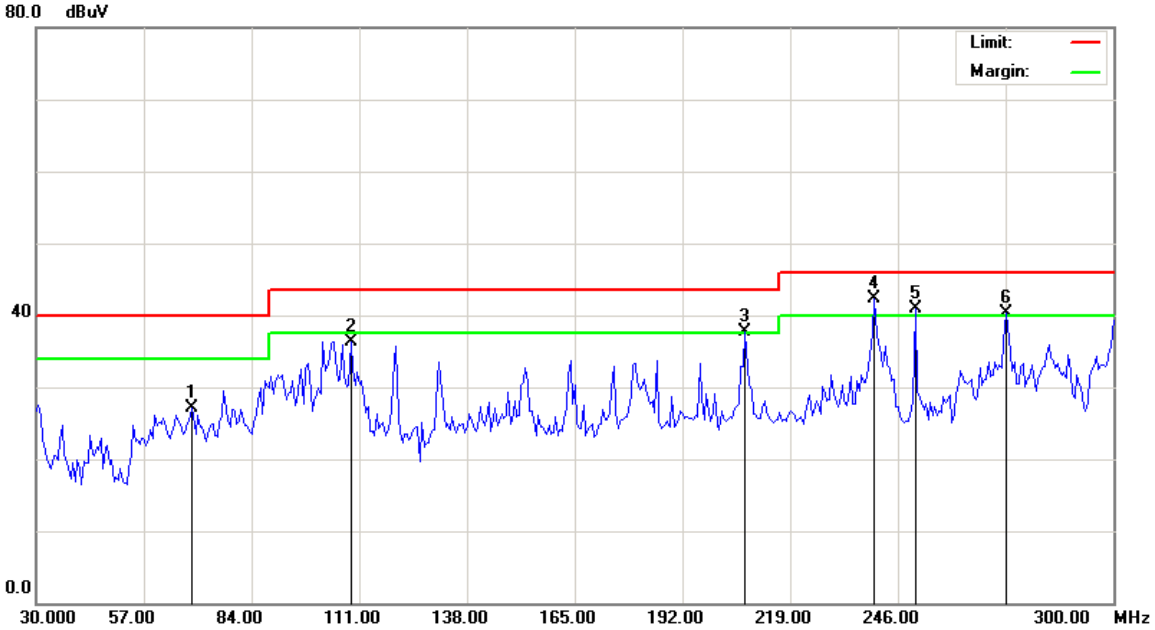
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#23 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		68.8800	43.28	-16.08	27.20	40.00	-12.80	peak			
2		108.8400	48.79	-12.41	36.38	43.50	-7.12	peak			
3	!	207.6600	50.63	-12.91	37.72	43.50	-5.78	peak			
4	*	240.0600	53.77	-11.43	42.34	46.00	-3.66	peak			
5	!	250.3200	51.76	-10.84	40.92	46.00	-5.08	peak			
6	!	273.0000	51.22	-10.85	40.37	46.00	-5.63	peak			

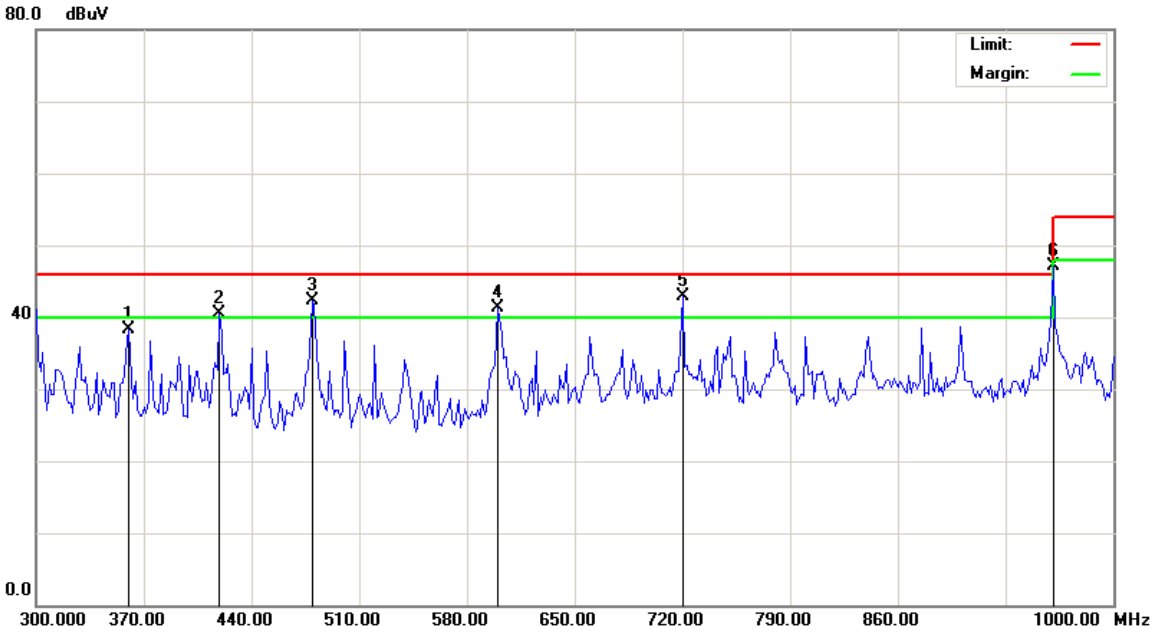
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11b)(2007-07-10) Data :#24 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		360.2000	47.34	-8.98	38.36	46.00	-7.64	peak			
2	!	419.0000	48.56	-8.12	40.44	46.00	-5.56	peak			
3	!	479.2000	49.89	-7.60	42.29	46.00	-3.71	peak			
4	!	599.6000	46.30	-4.91	41.39	46.00	-4.61	peak			
5	*	720.0000	46.44	-3.55	42.89	46.00	-3.11	peak			
6		960.8000	46.57	0.47	47.04	54.00	-6.96	peak			

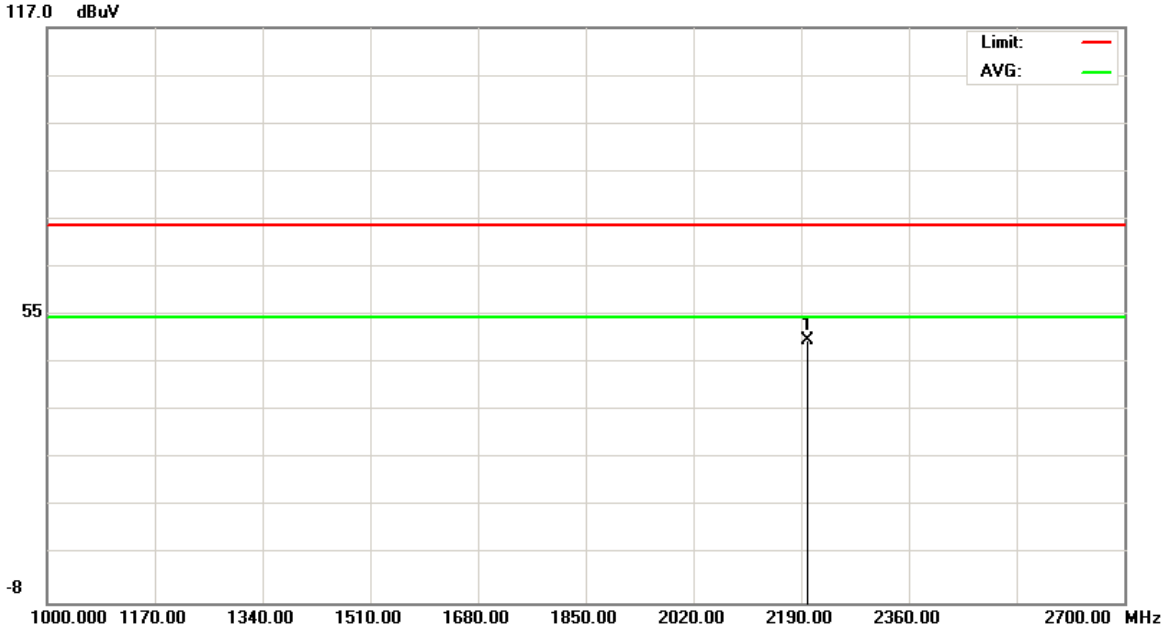
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#1 Date: 2007/07/12 Time: 11:43:42



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH11(2462MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

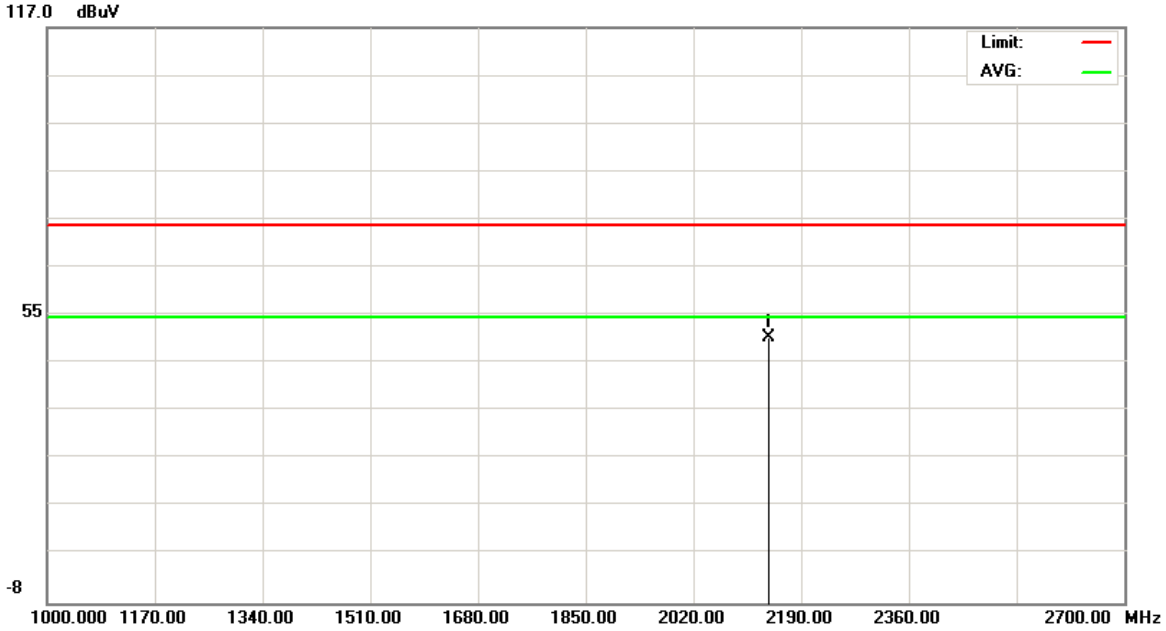
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2200.200	48.59	0.53	49.12	74.00	-24.88	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#3 Date: 2007/07/12 Time: 13:57:41



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b
Note: CH11(2462MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

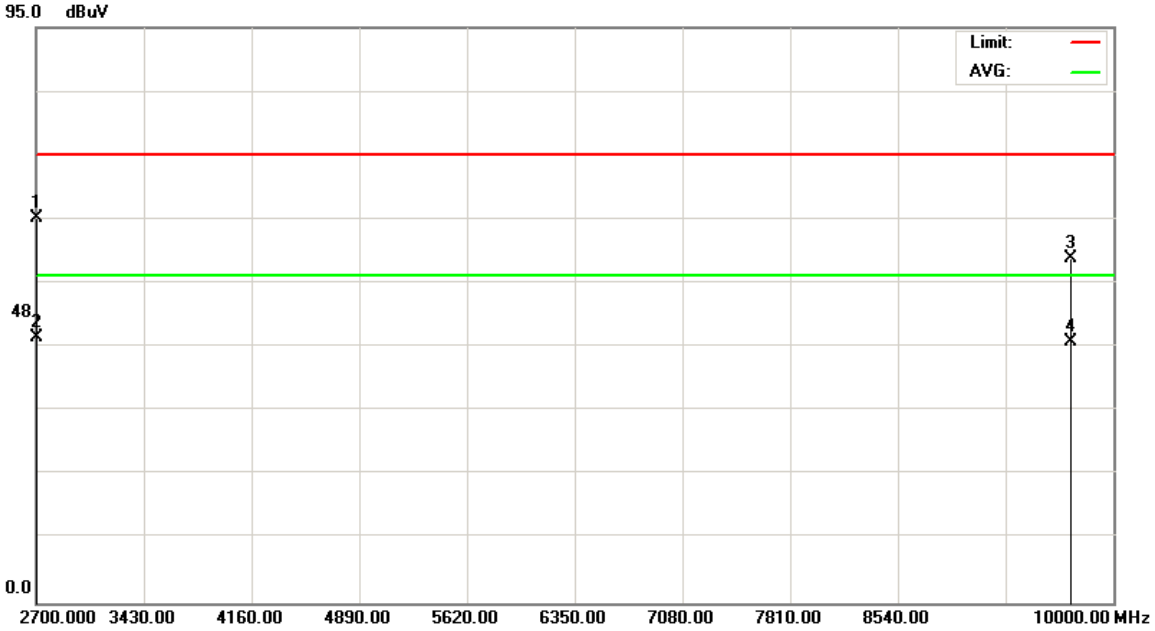
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2139.000	49.86	-0.12	49.74	74.00	-24.26	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#5 Date: 2007/07/12 Time: 14:08:01



Site 966半電波暗室 Polarization: ***Vertical*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH11(2462MHz)

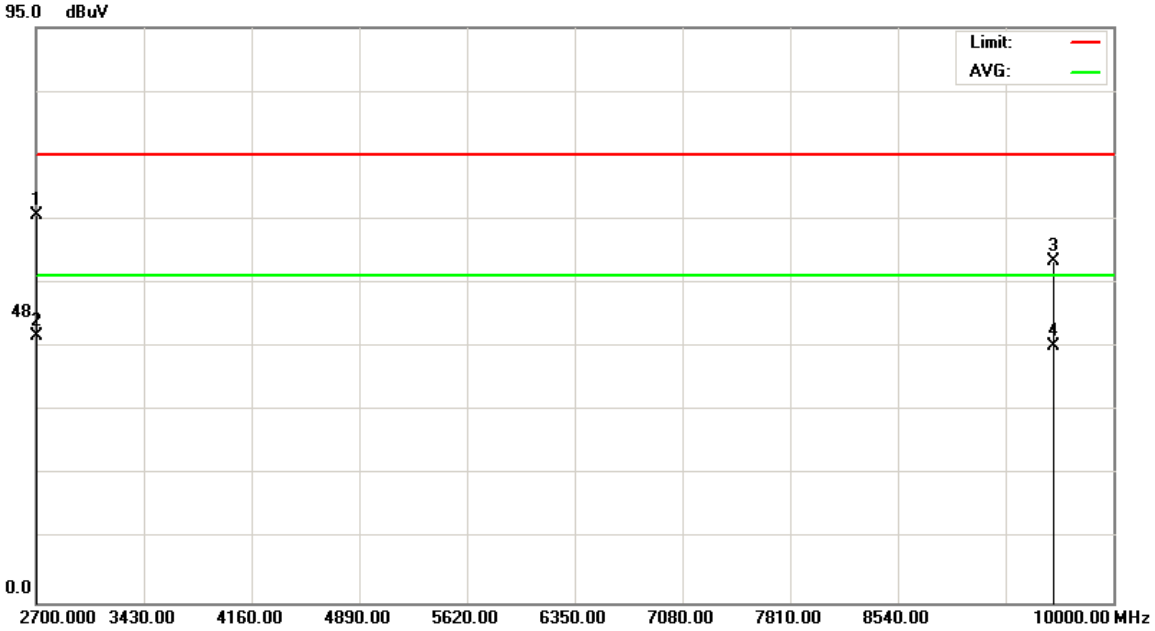
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.03	22.58	63.61	74.00	-10.39	peak			
2	*	2700.000	21.33	22.58	43.91	54.00	-10.09	AVG			
3		9708.000	39.29	17.49	56.78	74.00	-17.22	peak			
4		9708.000	25.63	17.49	43.12	54.00	-10.88	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#7 Date: 2007/07/12 Time: 15:00:13



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11b

Note: CH11(2462MHz)

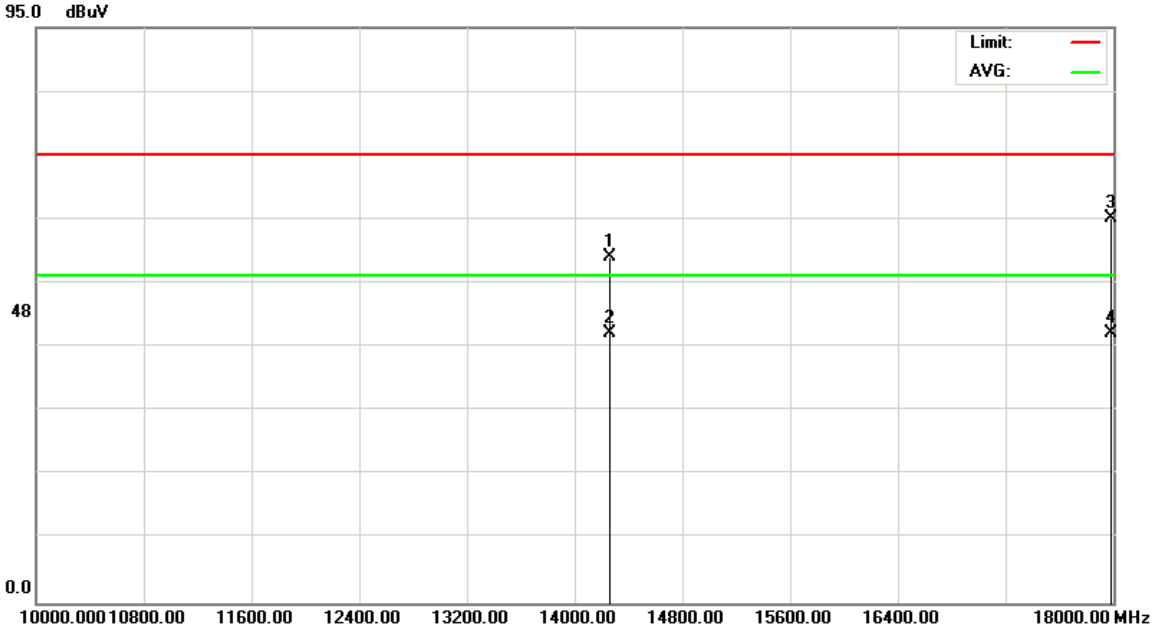
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.52	22.58	64.10	74.00	-9.90	peak			
2	*	2700.000	21.59	22.58	44.17	54.00	-9.83	AVG			
3		9598.500	39.03	17.41	56.44	74.00	-17.56	peak			
4		9598.500	24.95	17.41	42.36	54.00	-11.64	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#9 Date: 2007/07/12 Time: 15:54:58



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH11(2462MHz)

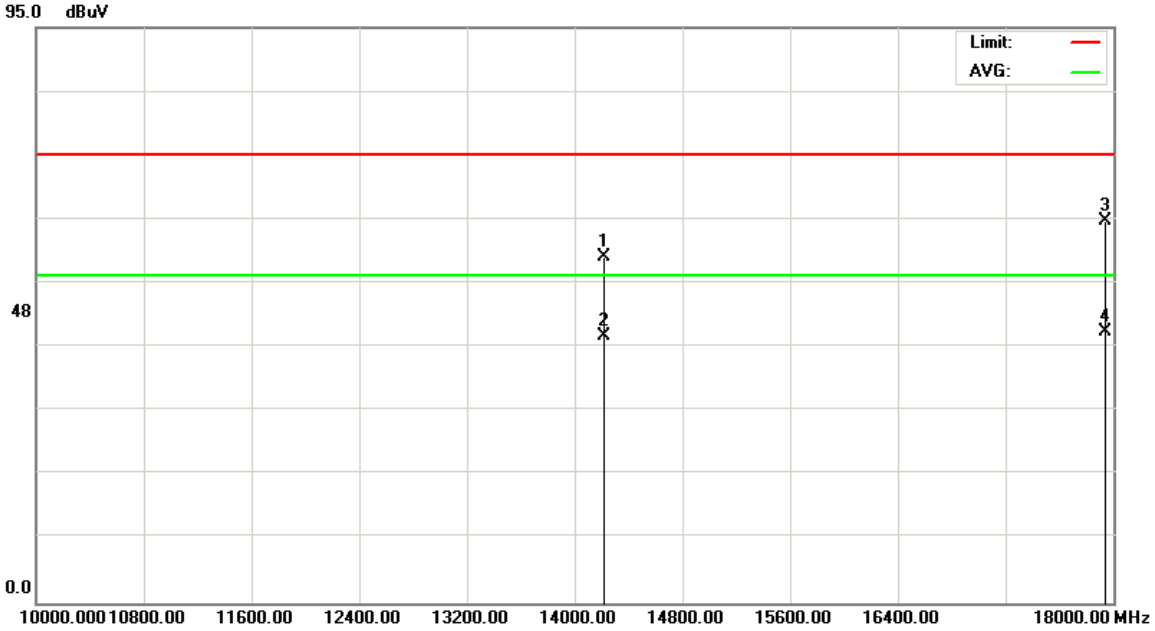
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14260.00	38.51	18.66	57.17	74.00	-16.83	peak			
2		14260.00	25.97	18.66	44.63	54.00	-9.37	AVG			
3		17980.00	38.28	25.21	63.49	74.00	-10.51	peak			
4	*	17980.00	19.43	25.21	44.64	54.00	-9.36	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#11 Date: 2007/07/12 Time: 15:58:37



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11b

Note: CH11(2462MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14220.00	38.24	18.78	57.02	74.00	-16.98	peak			
2		14220.00	25.32	18.78	44.10	54.00	-9.90	AVG			
3		17940.00	38.27	24.71	62.98	74.00	-11.02	peak			
4	*	17940.00	20.09	24.71	44.80	54.00	-9.20	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

3.6.4 Open Field Radiated Emissions (Subpart C)

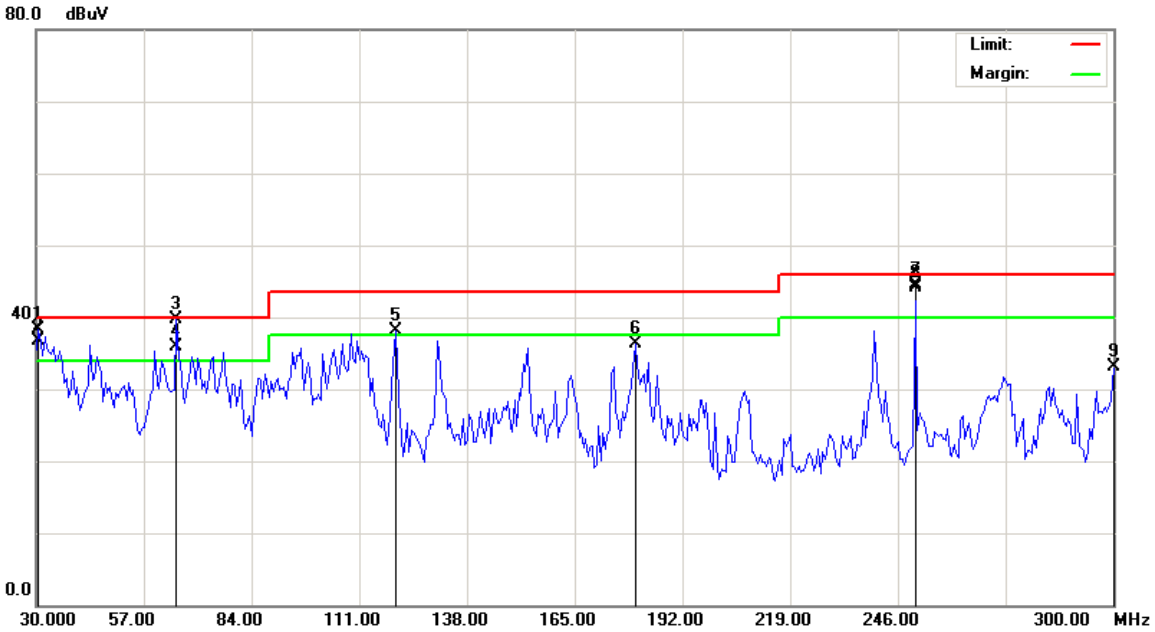
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11g CH1 2412.000 (Local Frequency: 2412.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#13 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U ; CH2412

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	51.70	-13.45	38.25	40.00	-1.75	peak			
2	!	30.5400	50.12	-13.45	36.67	40.00	-3.33	QP			
3	*	65.1000	54.16	-14.39	39.77	40.00	-0.23	peak			
4	!	65.1000	50.32	-14.39	35.93	40.00	-4.07	QP			
5	!	120.1800	52.39	-14.23	38.16	43.50	-5.34	peak			
6		180.1200	50.66	-14.31	36.35	43.50	-7.15	peak			
7	!	250.3200	55.27	-10.84	44.43	46.00	-1.57	peak			
8	!	250.3200	55.03	-10.84	44.19	46.00	-1.81	QP			
9		300.0000	42.99	-9.98	33.01	46.00	-12.99	peak			

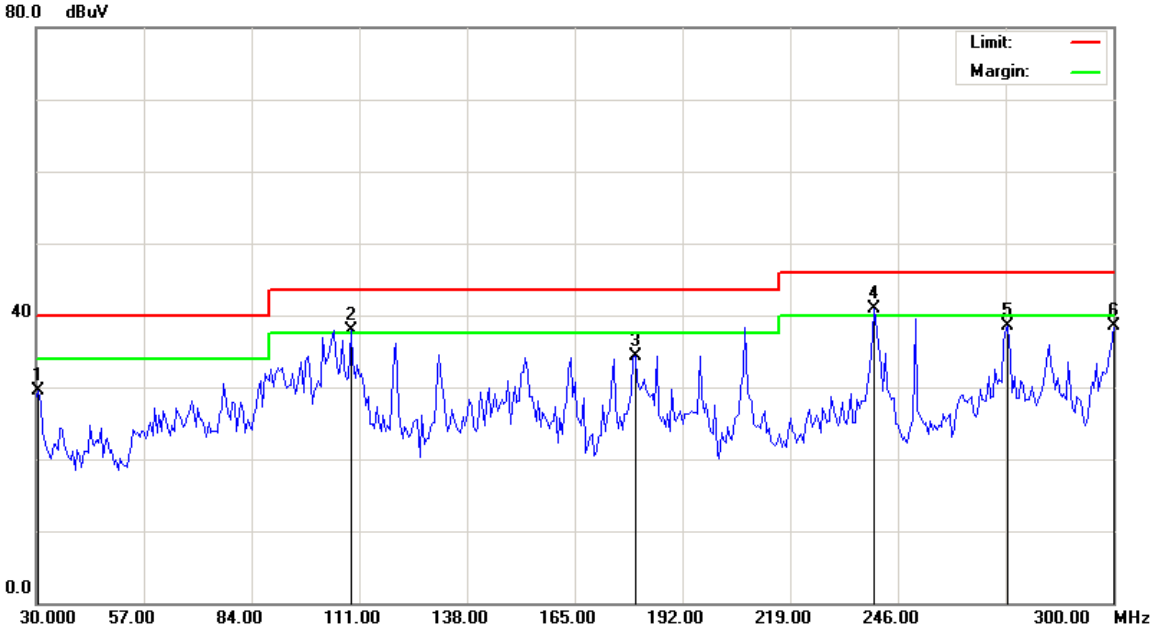
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#15 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		30.5400	43.01	-13.45	29.56	40.00	-10.44	peak			
2	!	108.8400	50.29	-12.41	37.88	43.50	-5.62	peak			
3		180.1200	48.58	-14.31	34.27	43.50	-9.23	peak			
4	*	240.0600	52.27	-11.43	40.84	46.00	-5.16	peak			
5		273.5400	49.26	-10.83	38.43	46.00	-7.57	peak			
6		300.0000	48.43	-9.98	38.45	46.00	-7.55	peak			

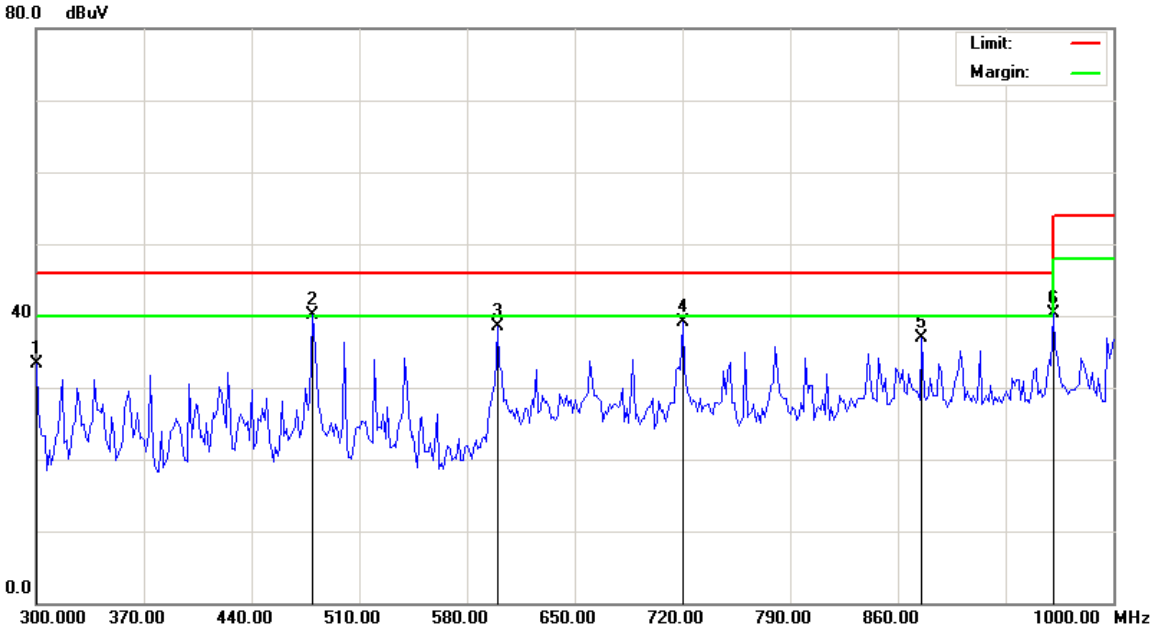
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#14 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	43.36	-9.98	33.38	46.00	-12.62	peak			
2	*	479.2000	47.68	-7.60	40.08	46.00	-5.92	peak			
3		599.6000	43.43	-4.91	38.52	46.00	-7.48	peak			
4		720.0000	42.59	-3.55	39.04	46.00	-6.96	peak			
5		875.4000	37.67	-0.80	36.87	46.00	-9.13	peak			
6		960.8000	39.92	0.47	40.39	54.00	-13.61	peak			

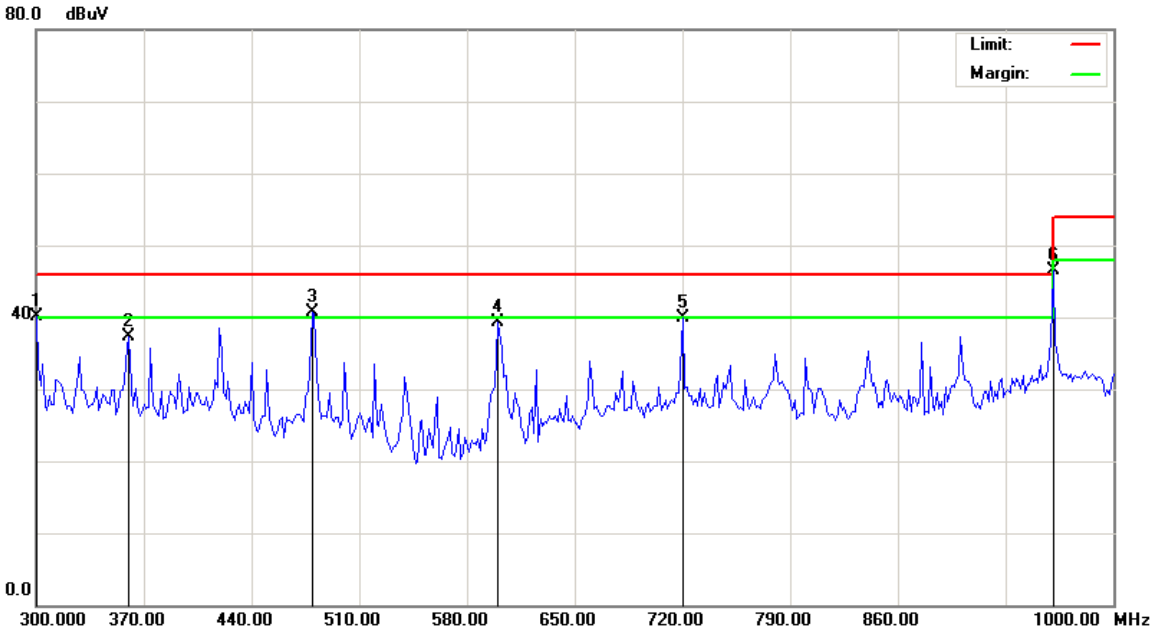
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#16 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2412

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	300.0000	50.03	-9.98	40.05	46.00	-5.95	peak			
2		360.2000	46.34	-8.98	37.36	46.00	-8.64	peak			
3	*	479.2000	48.39	-7.60	40.79	46.00	-5.21	peak			
4		599.6000	44.30	-4.91	39.39	46.00	-6.61	peak			
5		720.0000	43.44	-3.55	39.89	46.00	-6.11	peak			
6		960.8000	46.07	0.47	46.54	54.00	-7.46	peak			

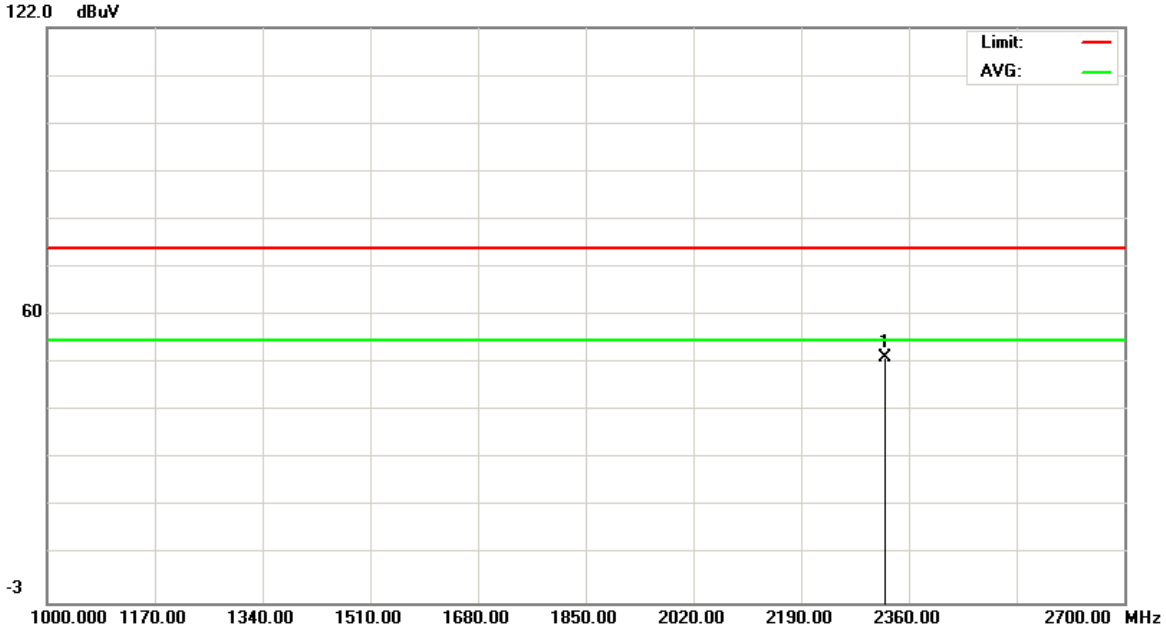
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#1 Date: 2007/07/12 Time: 12:26:45



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH01(2412MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

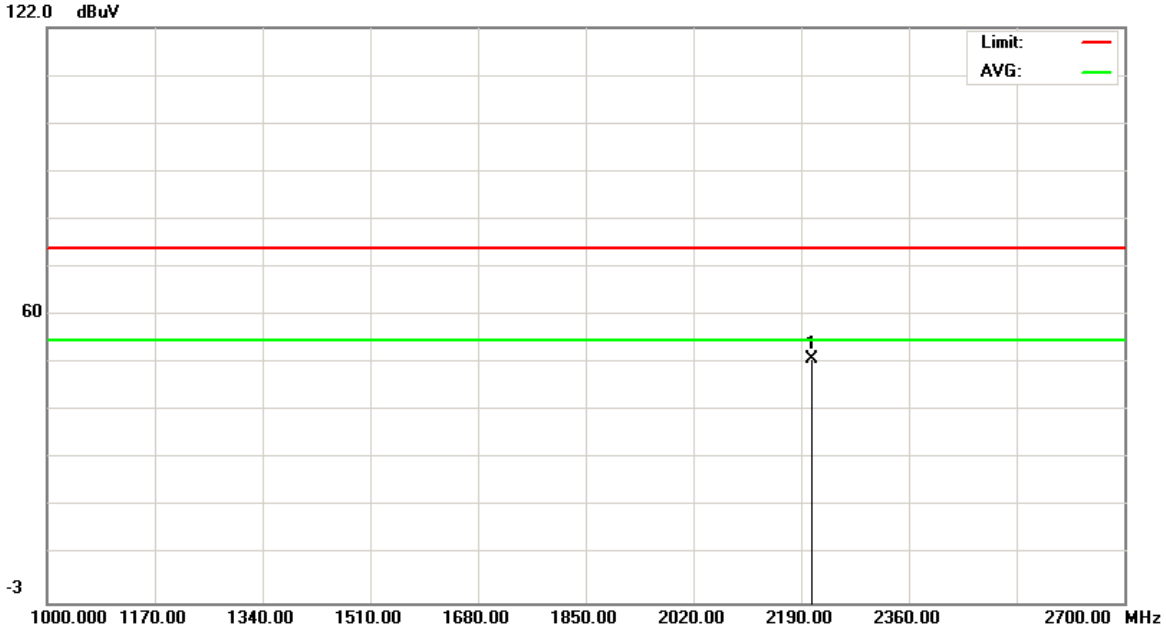
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2322.600	50.06	0.27	50.33	74.00	-23.67	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#3 Date: 2007/07/12 Time: 13:44:09



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH01(2412MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

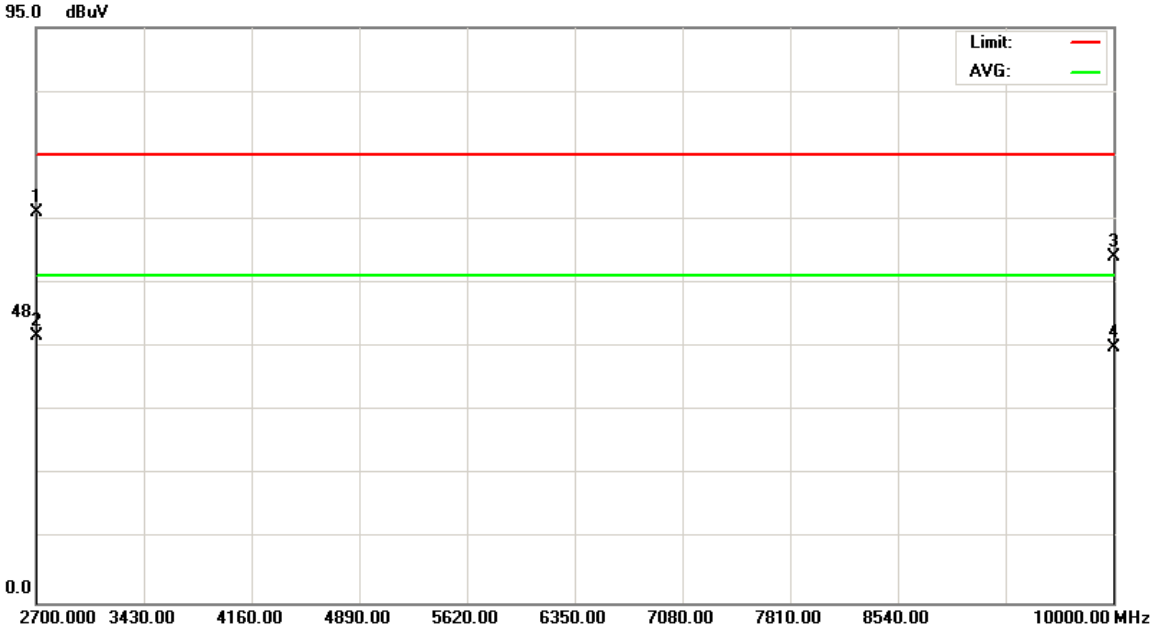
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2207.000	49.58	0.45	50.03	74.00	-23.97	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#5 Date: 2007/07/12 Time: 14:25:03



Site 966半電波暗室 Polarization: ***Vertical*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH01(2412MHz)

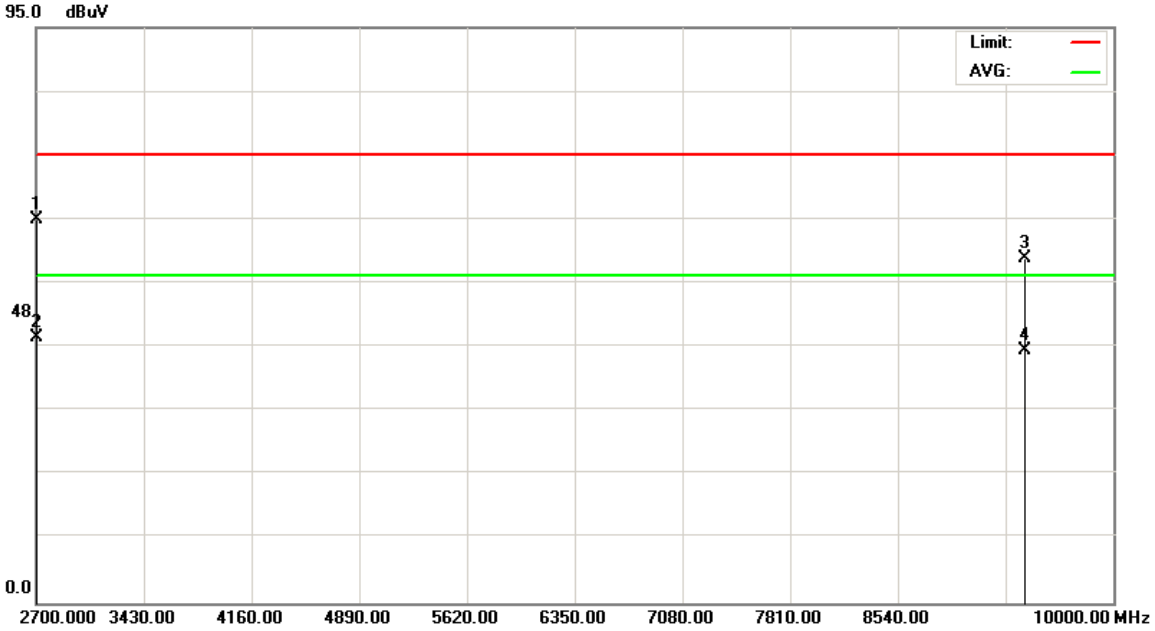
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2700.000	42.01	22.58	64.59	74.00	-9.41	peak			
2		2700.000	21.58	22.58	44.16	54.00	-9.84	AVG			
3		10000.00	39.22	17.94	57.16	74.00	-16.84	peak			
4		10000.00	24.31	17.94	42.25	54.00	-11.75	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#7 Date: 2007/07/12 Time: 14:46:09



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH01(2412MHz)

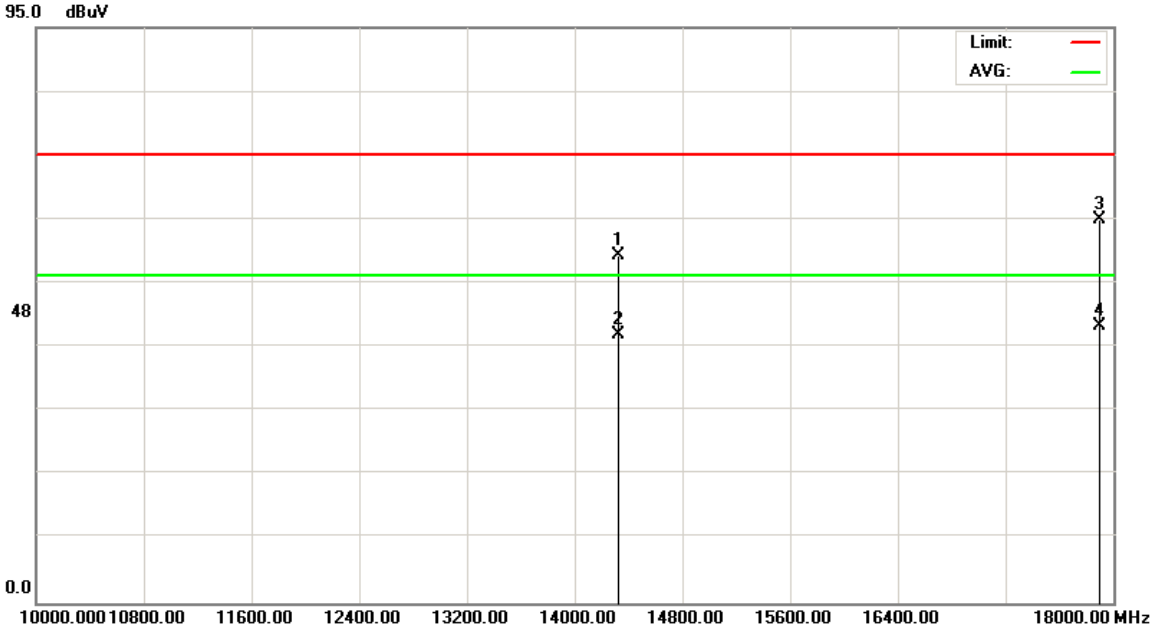
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	40.69	22.58	63.27	74.00	-10.73	peak			
2	*	2700.000	21.19	22.58	43.77	54.00	-10.23	AVG			
3		9397.750	39.74	17.07	56.81	74.00	-17.19	peak			
4		9397.750	24.69	17.07	41.76	54.00	-12.24	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#9 Date: 2007/07/12 Time: 15:31:01



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH01(2412MHz)

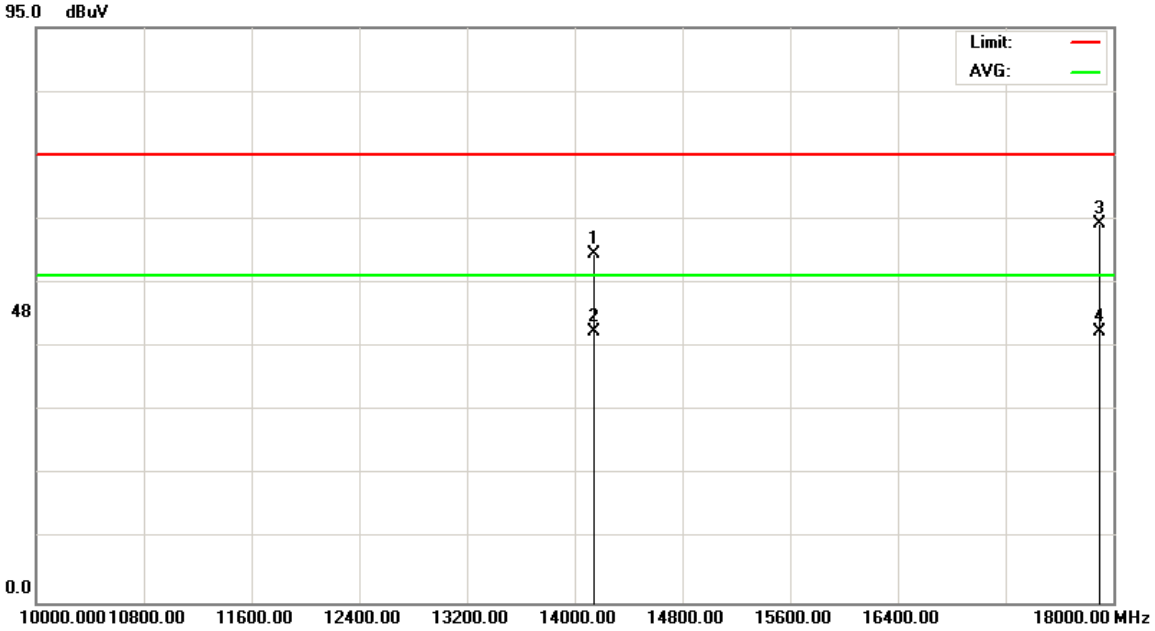
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14320.00	38.68	18.57	57.25	74.00	-16.75	peak			
2		14320.00	25.69	18.57	44.26	54.00	-9.74	AVG			
3		17900.00	38.32	24.96	63.28	74.00	-10.72	peak			
4	*	17900.00	20.71	24.96	45.67	54.00	-8.33	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2412) Data :#11 Date: 2007/07/12 Time: 16:13:00



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH01(2412MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14140.00	38.83	18.84	57.67	74.00	-16.33	peak			
2	*	14140.00	25.95	18.84	44.79	54.00	-9.21	AVG			
3		17900.00	37.72	24.96	62.68	74.00	-11.32	peak			
4		17900.00	19.83	24.96	44.79	54.00	-9.21	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

3.6.5 Open Field Radiated Emissions (Subpart C)

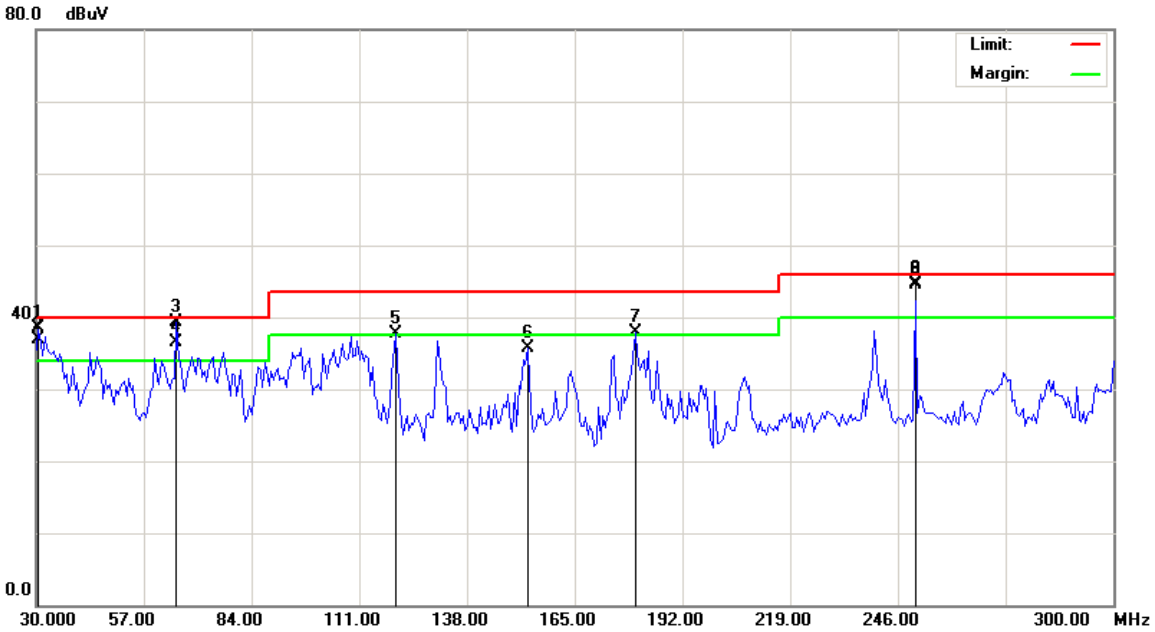
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11g CH6 2437.000 (Local Frequency: 2437.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#17 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	51.93	-13.45	38.48	40.00	-1.52	peak			
2	!	30.5400	50.37	-13.45	36.92	40.00	-3.08	QP			
3	*	65.1000	53.66	-14.39	39.27	40.00	-0.73	peak			
4	!	65.1000	50.93	-14.39	36.54	40.00	-3.46	QP			
5	!	120.1800	51.89	-14.23	37.66	43.50	-5.84	peak			
6		153.1200	51.61	-15.94	35.67	43.50	-7.83	peak			
7	!	180.1200	52.16	-14.31	37.85	43.50	-5.65	peak			
8	!	250.3200	55.63	-10.84	44.79	46.00	-1.21	peak			
9	!	250.3200	55.32	-10.84	44.48	46.00	-1.52	QP			

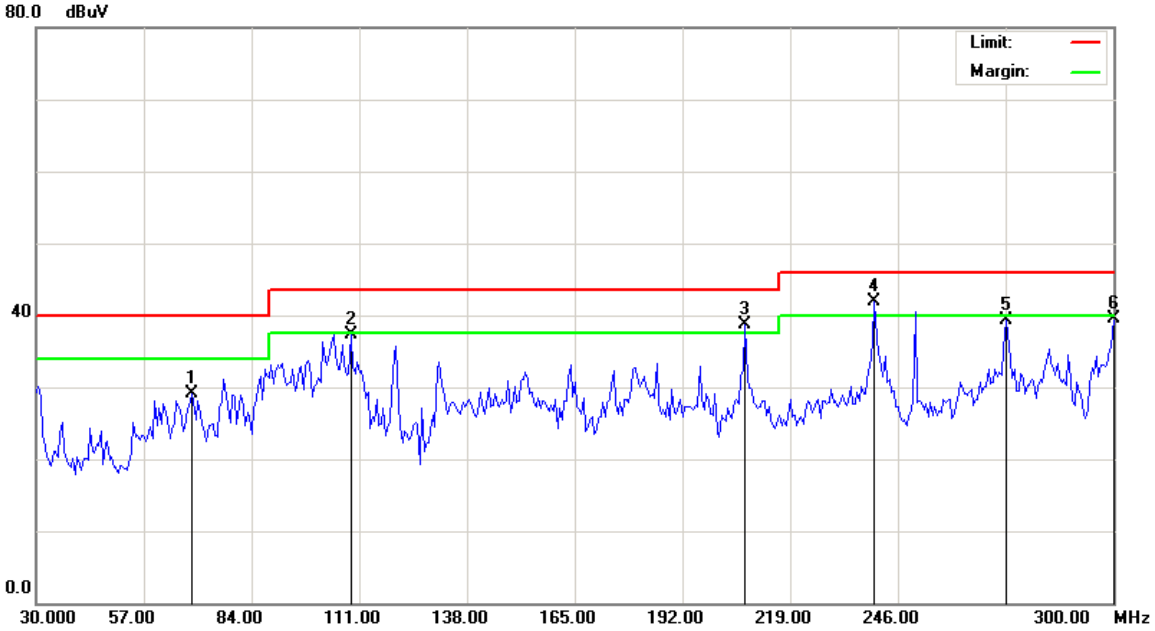
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#19 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		68.8800	45.28	-16.08	29.20	40.00	-10.80	peak			
2		108.8400	49.79	-12.41	37.38	43.50	-6.12	peak			
3	!	207.6600	51.63	-12.91	38.72	43.50	-4.78	peak			
4	*	240.0600	53.27	-11.43	41.84	46.00	-4.16	peak			
5		273.0000	50.22	-10.85	39.37	46.00	-6.63	peak			
6		300.0000	49.43	-9.98	39.45	46.00	-6.55	peak			

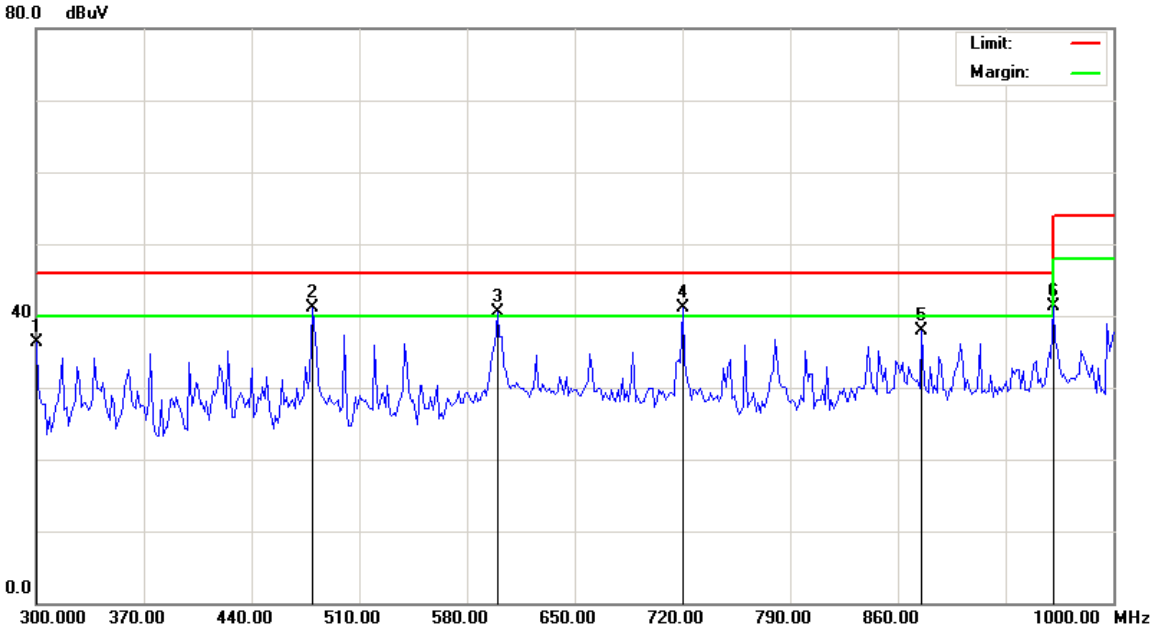
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#18 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	46.36	-9.98	36.38	46.00	-9.62	peak			
2	*	479.2000	48.68	-7.60	41.08	46.00	-4.92	peak			
3	!	599.6000	45.43	-4.91	40.52	46.00	-5.48	peak			
4	!	720.0000	44.59	-3.55	41.04	46.00	-4.96	peak			
5		875.4000	38.67	-0.80	37.87	46.00	-8.13	peak			
6		960.8000	40.91	0.48	41.39	54.00	-12.61	peak			

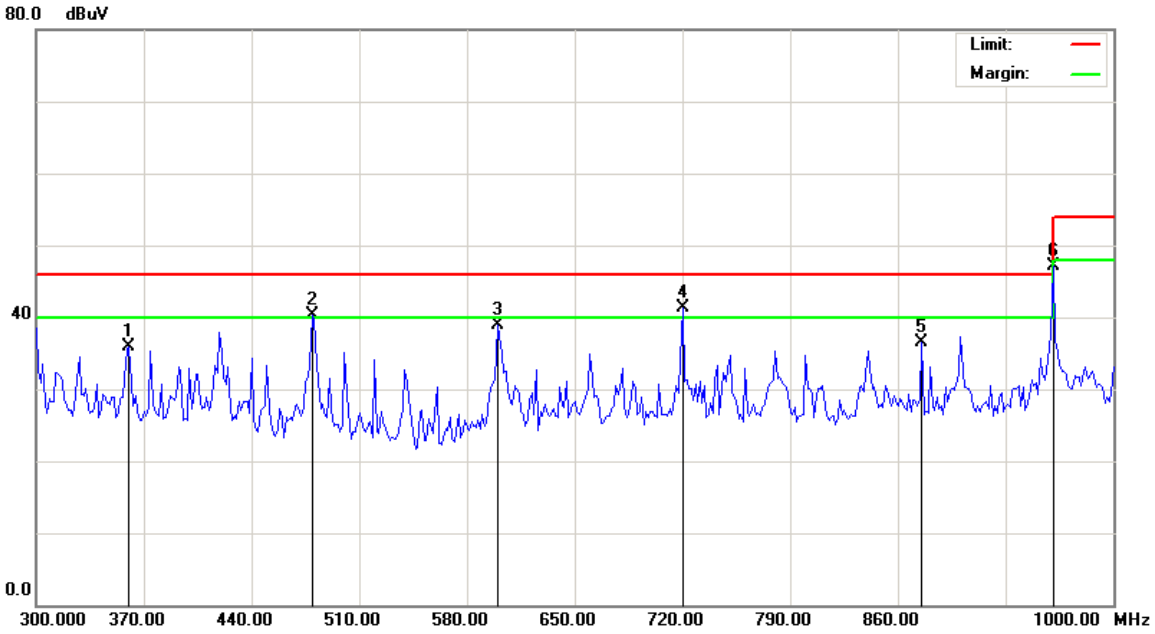
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#20 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2437

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		360.2000	44.84	-8.98	35.86	46.00	-10.14	peak			
2	!	479.2000	47.89	-7.60	40.29	46.00	-5.71	peak			
3		599.6000	43.80	-4.91	38.89	46.00	-7.11	peak			
4	*	720.0000	44.94	-3.55	41.39	46.00	-4.61	peak			
5		875.4000	37.35	-0.80	36.55	46.00	-9.45	peak			
6		960.8000	46.56	0.48	47.04	54.00	-6.96	peak			

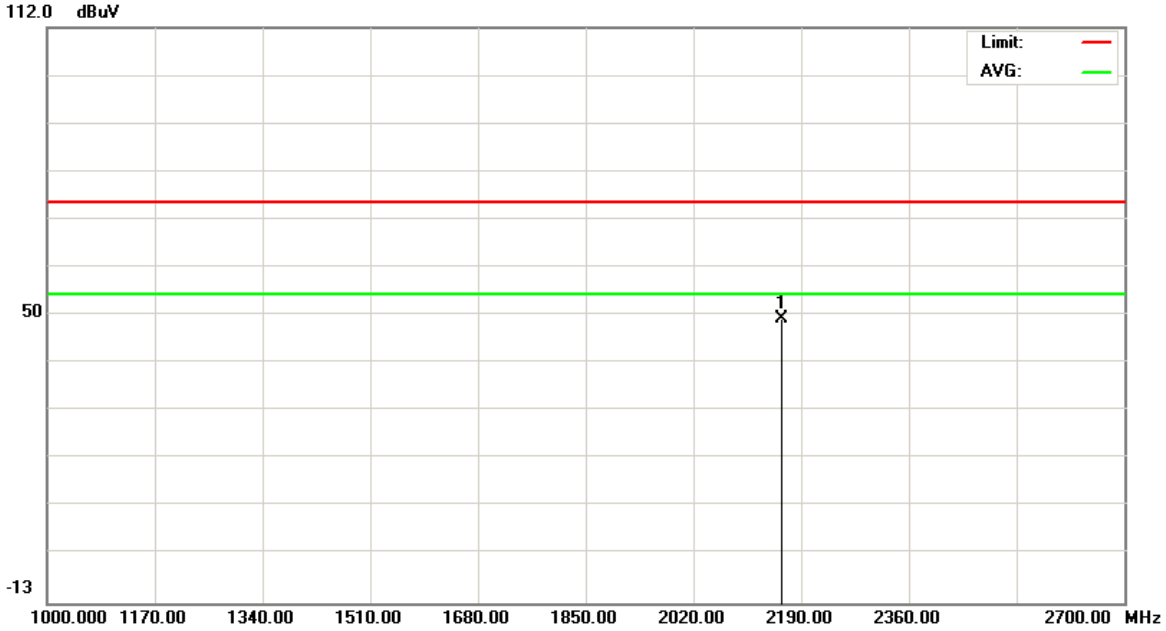
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#1 Date: 2007/07/12 Time: 12:20:34



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH06(2437MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

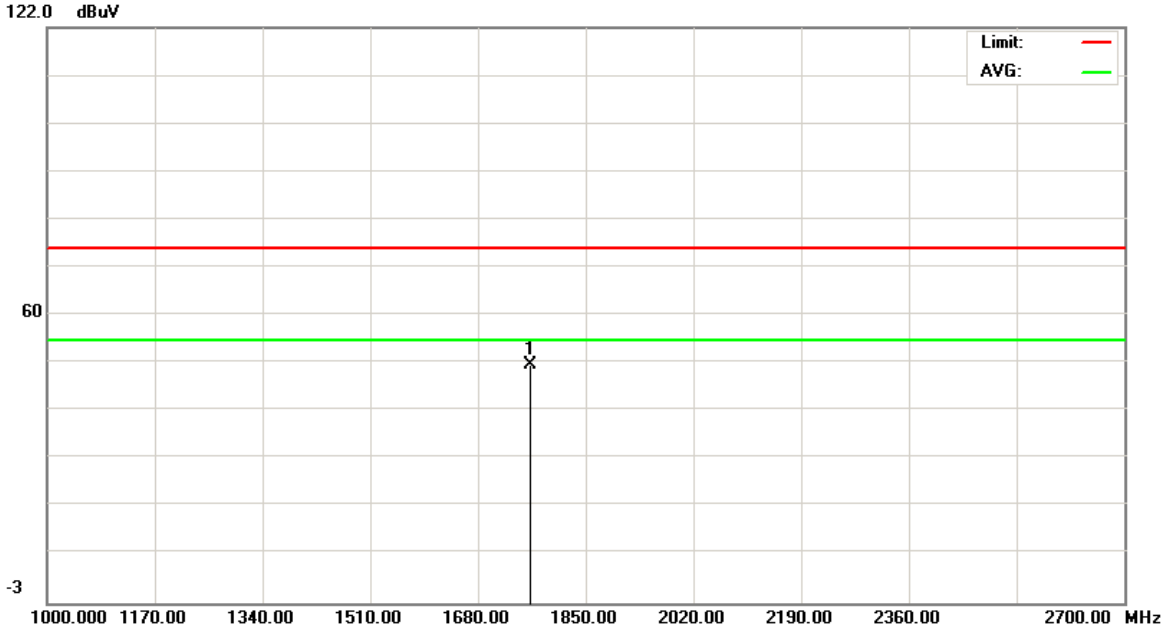
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2159.400	48.64	0.00	48.64	74.00	-25.36	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#3 Date: 2007/07/12 Time: 13:38:47



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH06(2437MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

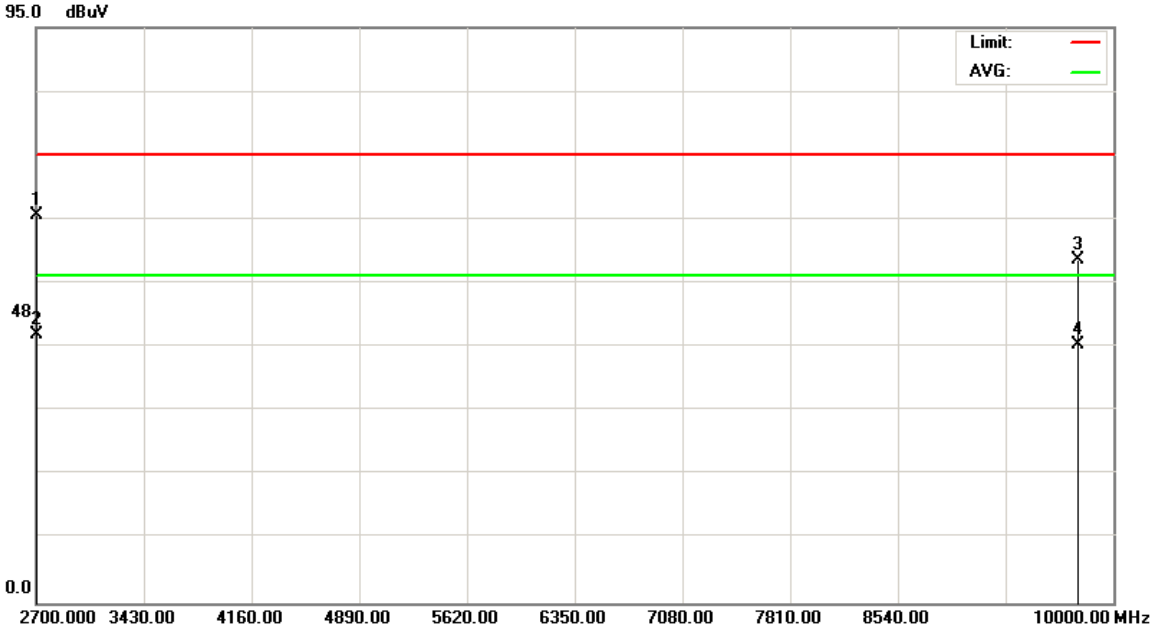
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	1761.600	52.03	-3.37	48.66	74.00	-25.34	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#5 Date: 2007/07/12 Time: 14:29:04



Site 966半電波暗室 Polarization: ***Vertical*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH06(2437MHz)

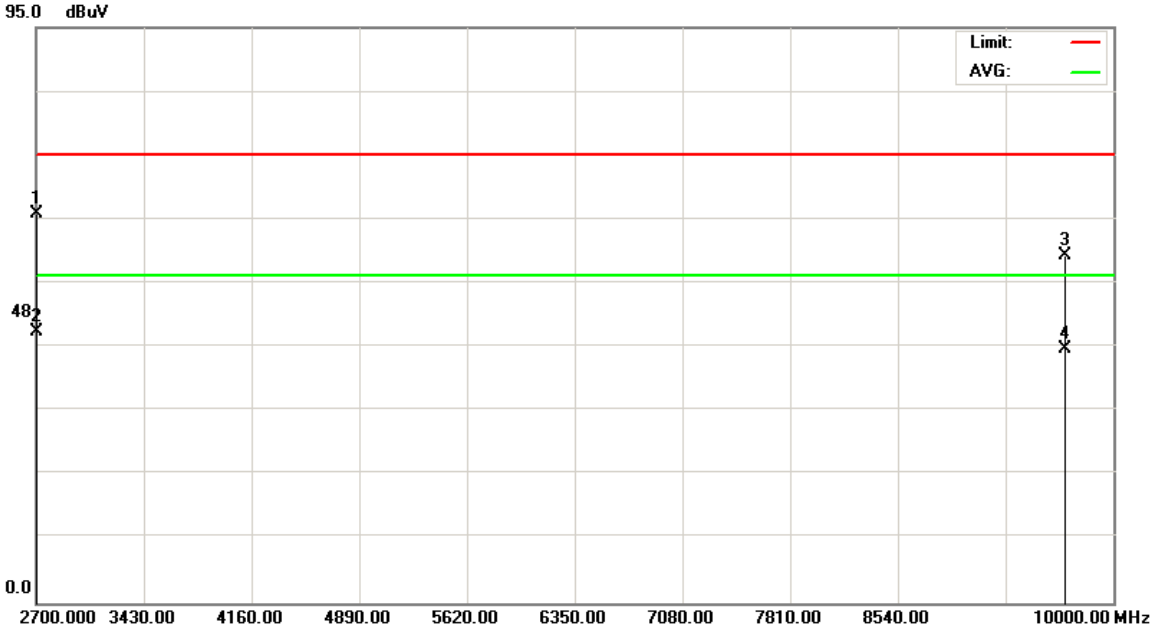
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.36	22.58	63.94	74.00	-10.06	peak			
2	*	2700.000	21.72	22.58	44.30	54.00	-9.70	AVG			
3		9762.750	38.85	17.70	56.55	74.00	-17.45	peak			
4		9762.750	24.87	17.70	42.57	54.00	-11.43	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#7 Date: 2007/07/12 Time: 14:41:56



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH06(2437MHz)

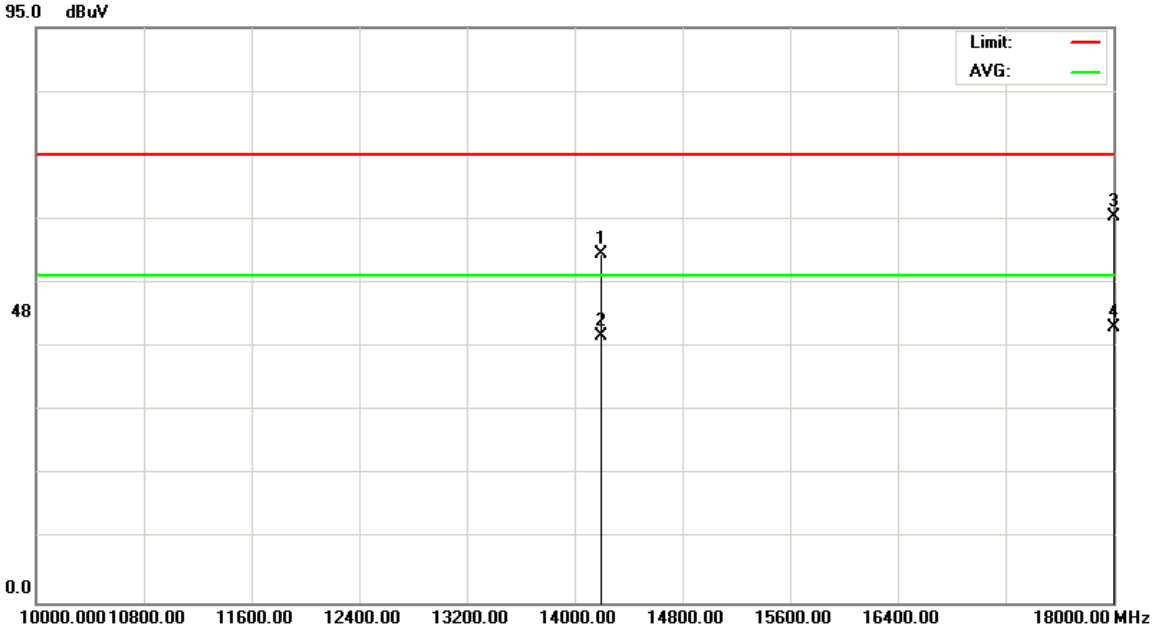
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.62	22.58	64.20	74.00	-9.80	peak			
2	*	2700.000	22.18	22.58	44.76	54.00	-9.24	AVG			
3		9671.500	40.17	17.15	57.32	74.00	-16.68	peak			
4		9671.500	24.69	17.15	41.84	54.00	-12.16	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#9 Date: 2007/07/12 Time: 15:34:53



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH06(2437MHz)

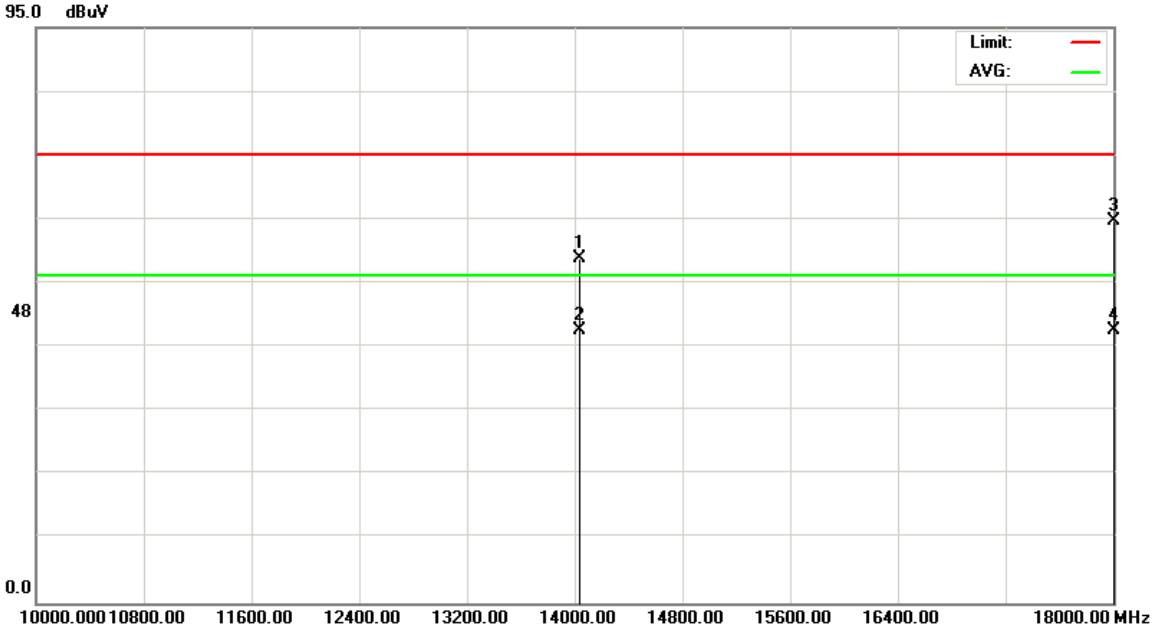
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14200.00	38.69	18.86	57.55	74.00	-16.45	peak			
2		14200.00	25.17	18.86	44.03	54.00	-9.97	AVG			
3		18000.00	38.17	25.57	63.74	74.00	-10.26	peak			
4	*	18000.00	19.83	25.57	45.40	54.00	-8.60	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2437) Data :#11 Date: 2007/07/12 Time: 16:17:05



Site 966半電波暗室 Polarization: *Horizontal* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH06(2437MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14040.00	38.31	18.66	56.97	74.00	-17.03	peak			
2		14040.00	26.28	18.66	44.94	54.00	-9.06	AVG			
3		18000.00	37.59	25.57	63.16	74.00	-10.84	peak			
4	*	18000.00	19.52	25.57	45.09	54.00	-8.91	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

3.6.6 Open Field Radiated Emissions (Subpart C)

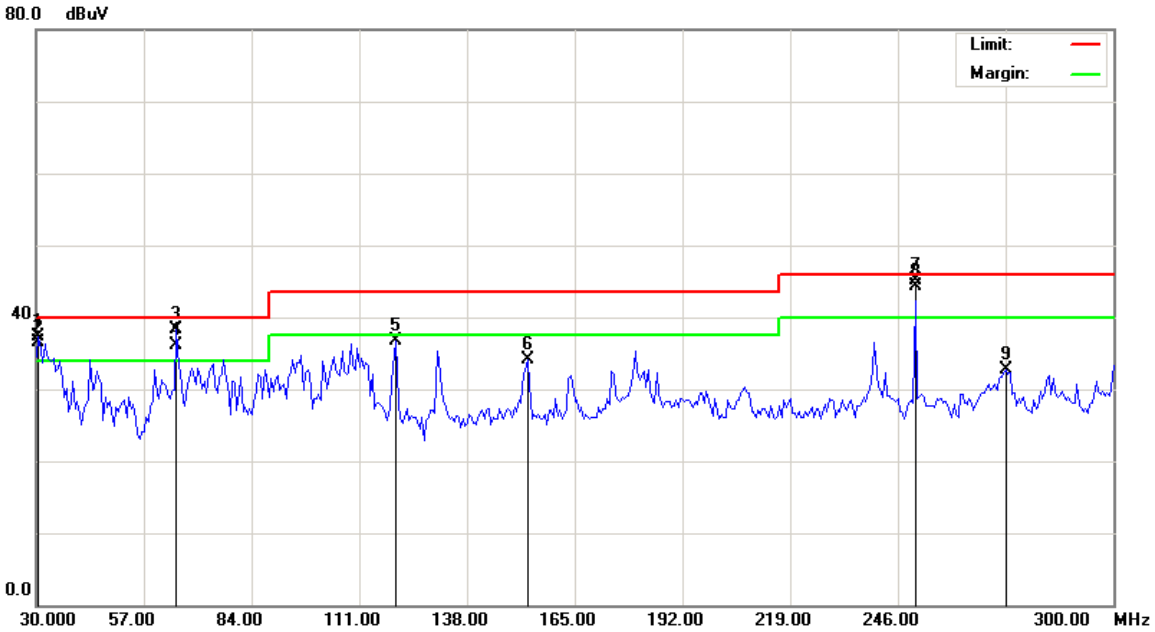
The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

Applicant : Welltech Computer CO., LTD.
Model No : WG-3512
EUT : Gateway
Test Mode : 802.11g CH11 2462.000 (Local Frequency: 2462.000 MHz)
Test Date : 07/11 ~ 07/12/2007
Please refer to next pager of detail testing data.
Notes:

1. Margin= Amplitude - Limits
2. Distance of Measurement: 3 Meter (30-1000MHz) & (1-10GHz), 1 Meter (10-26.5GHz)
3. Height of table for EUT placed: 0.8 Meter.
4. ANT= Antenna height.
5. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
6. The EUT was worst case on X axis after pretest on X & Y & Z axis setting.
7. The testing data only show below 18GHz's data because measure data above 18GHz was only ambit noise.
8. All frequencies from 30MHz to 26.5GHz have been tested

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#21 Date: 2007/07/11 Time: 15:20:09



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	!	30.5400	50.70	-13.45	37.25	40.00	-2.75	peak			
2	!	30.5400	49.98	-13.45	36.53	40.00	-3.47	QP			
3	!	65.1000	52.66	-14.39	38.27	40.00	-1.73	peak			
4	!	65.1000	50.58	-14.39	36.19	40.00	-3.81	QP			
5		120.1800	50.89	-14.23	36.66	43.50	-6.84	peak			
6		153.1200	50.11	-15.94	34.17	43.50	-9.33	peak			
7	*	250.3200	55.89	-10.84	45.05	46.00	-0.95	peak			
8	!	250.3200	55.08	-10.84	44.24	46.00	-1.76	QP			
9		273.0000	43.46	-10.85	32.61	46.00	-13.39	peak			

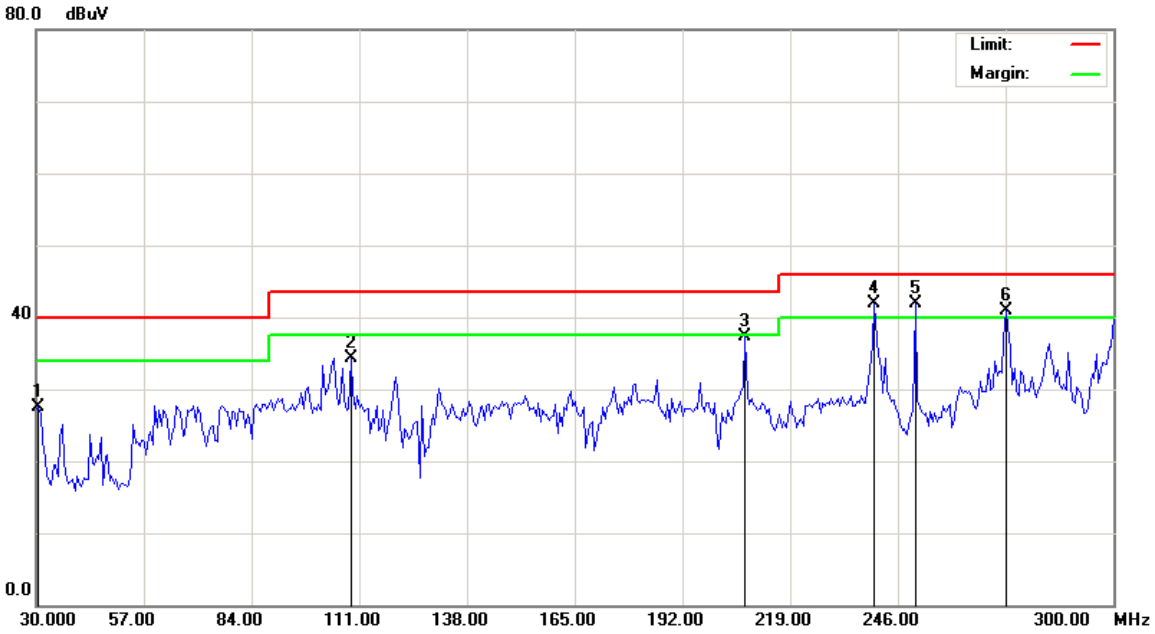
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#23 Date: 2007/07/11 Time: 15:28:42



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		30.5400	41.01	-13.45	27.56	40.00	-12.44	peak			
2		108.8400	46.79	-12.41	34.38	43.50	-9.12	peak			
3		207.6600	50.13	-12.91	37.22	43.50	-6.28	peak			
4	!	240.0600	53.27	-11.43	41.84	46.00	-4.16	peak			
5	*	250.3200	52.76	-10.84	41.92	46.00	-4.08	peak			
6	!	273.0000	51.72	-10.85	40.87	46.00	-5.13	peak			

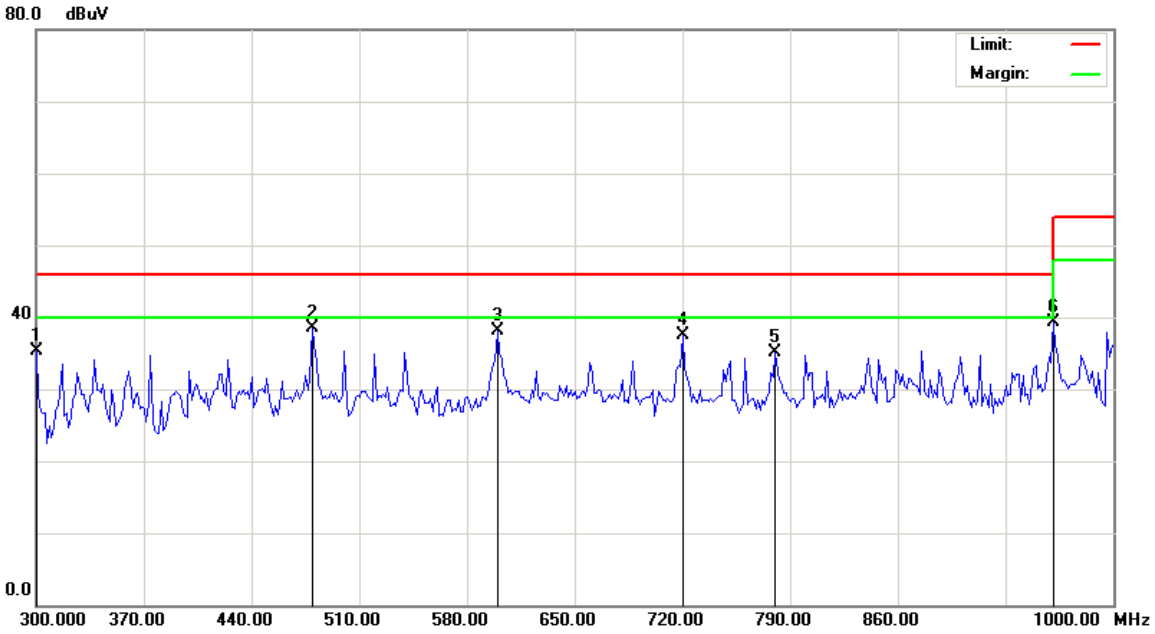
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#22 Date: 2007/07/11 Time: 15:24:25



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		300.0000	45.36	-9.98	35.38	46.00	-10.62	peak			
2	*	479.2000	46.18	-7.60	38.58	46.00	-7.42	peak			
3		599.6000	42.93	-4.91	38.02	46.00	-7.98	peak			
4		720.0000	41.09	-3.55	37.54	46.00	-8.46	peak			
5		780.2000	37.56	-2.36	35.20	46.00	-10.80	peak			
6		960.8000	38.91	0.48	39.39	54.00	-14.61	peak			

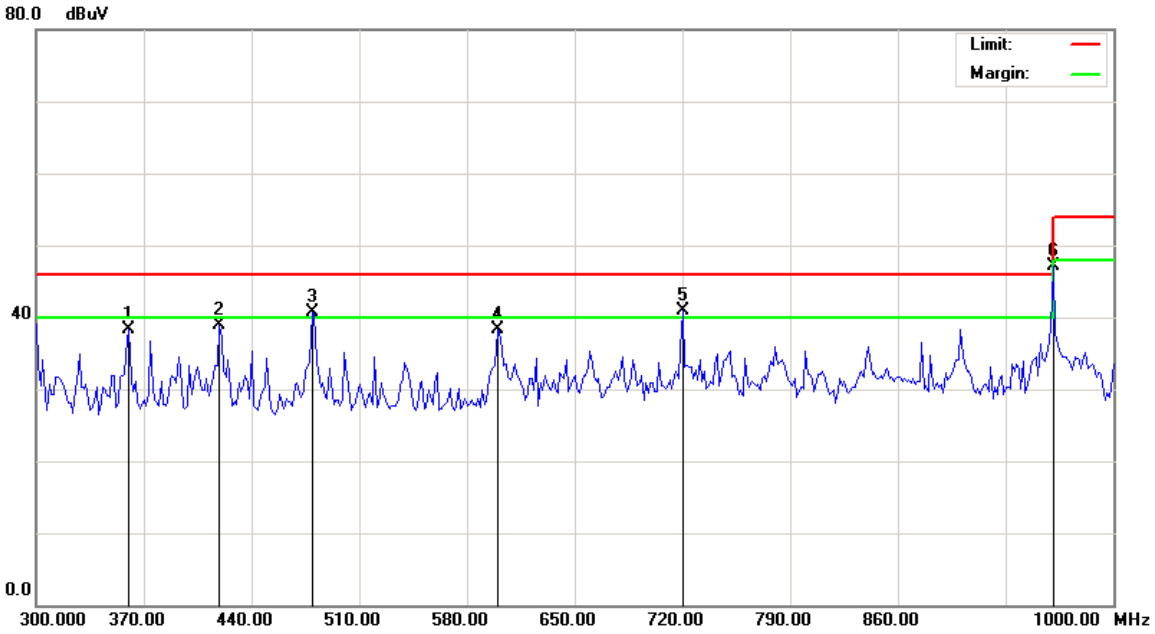
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(11g)(2007-07-10) Data :#24 Date: 2007/07/11 Time: 15:32:58



Site site #1
Limit: FCC Class B 3M Radiation
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: Adapter model : PA1020-120U; CH2462

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m RBW: 120 KHz
VBW: 300 KHz

Temperature: 22 ℃
Humidity: 60 %
Sweep Time: 500 ms

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		360.2000	47.34	-8.98	38.36	46.00	-7.64	peak			
2		419.0000	47.06	-8.12	38.94	46.00	-7.06	peak			
3	!	479.2000	48.39	-7.60	40.79	46.00	-5.21	peak			
4		599.6000	43.30	-4.91	38.39	46.00	-7.61	peak			
5	*	720.0000	44.44	-3.55	40.89	46.00	-5.11	peak			
6		960.8000	46.56	0.48	47.04	54.00	-6.96	peak			

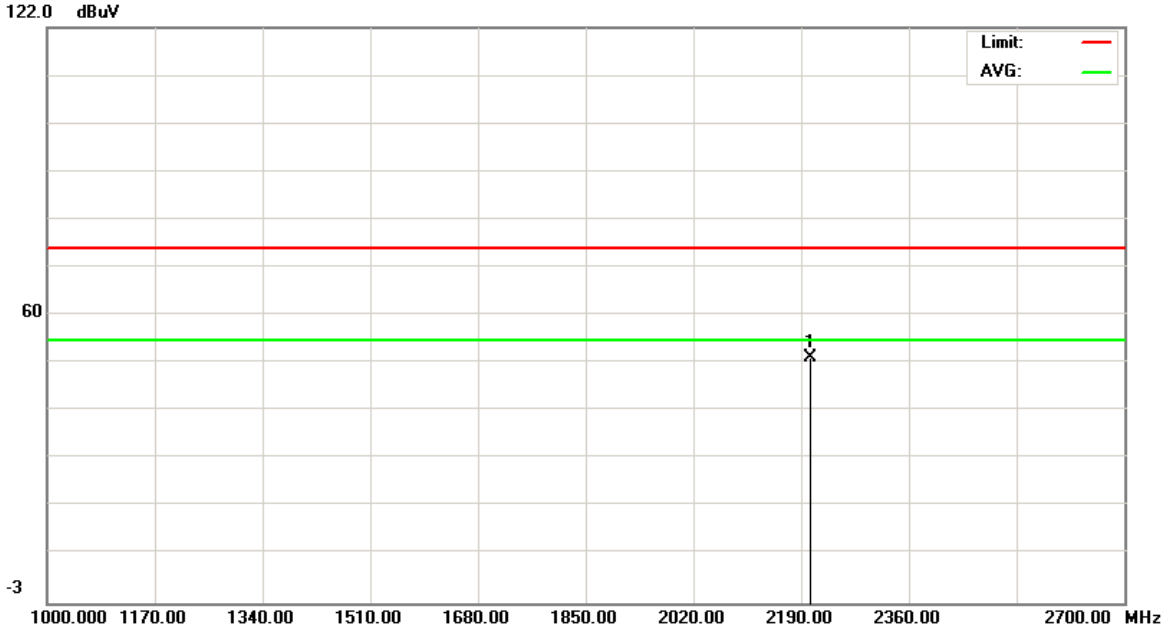
*:Maximum data x:Over limit !:over margin ●Reference Only

Receiver:
Antenna: VULB 9163(25M ~4G)
Amplifier:

Spectrum Analyzer: ESCI
Engineer Signature:

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#1 Date: 2007/07/12 Time: 12:32:15



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH11(2462MHz)

Polarization: ***Vertical***
Power:
Distance: 3m

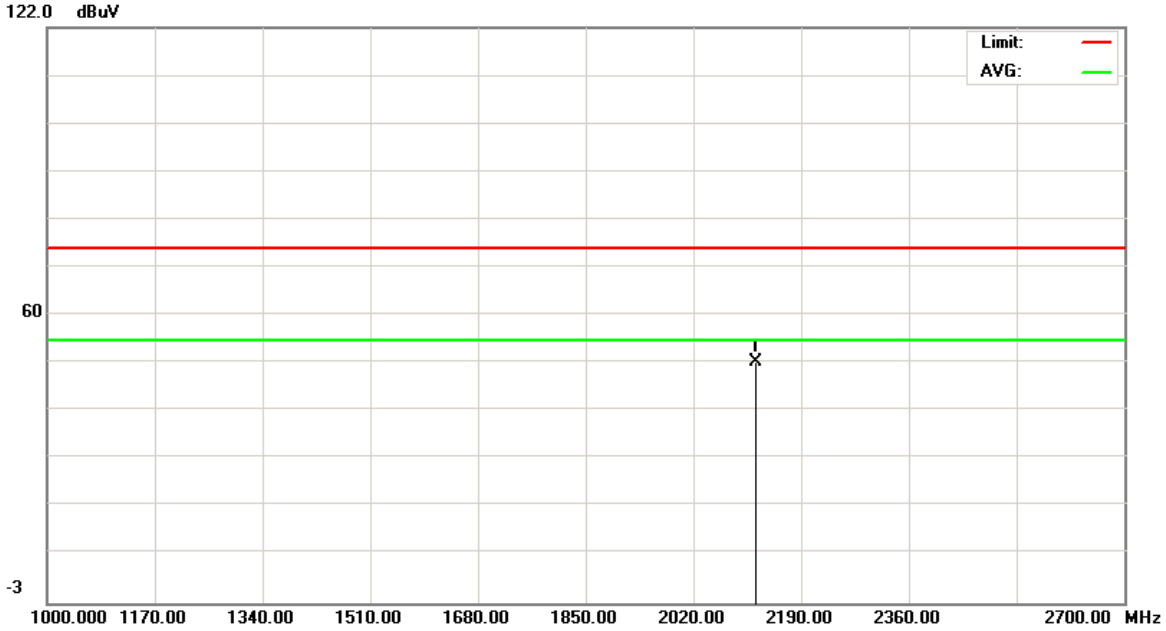
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2203.600	49.70	0.49	50.19	74.00	-23.81	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#3 Date: 2007/07/12 Time: 13:34:15



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g
Note: CH11(2462MHz)

Polarization: ***Horizontal***
Power:
Distance: 3m

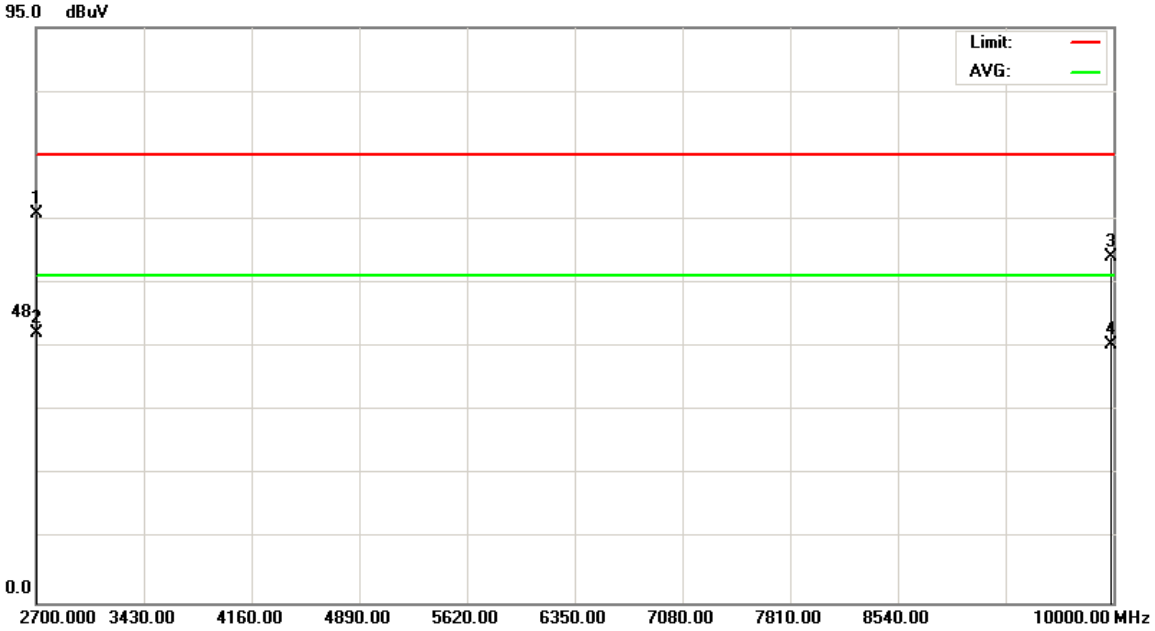
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2118.600	49.83	-0.36	49.47	74.00	-24.53	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#5 Date: 2007/07/12 Time: 14:33:23



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH11(2462MHz)

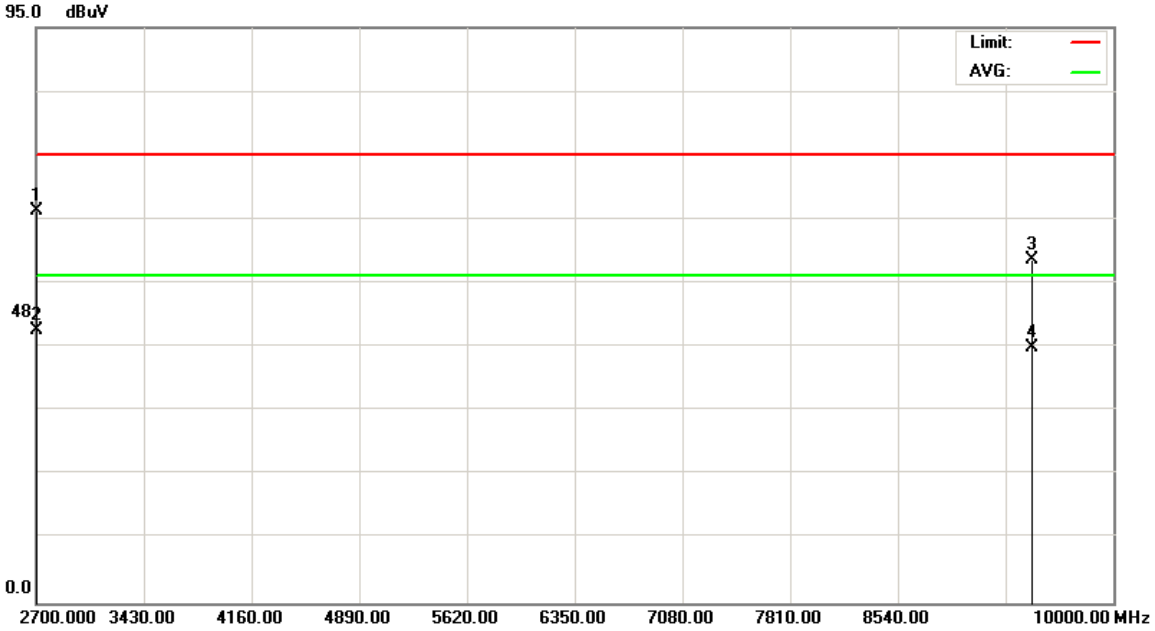
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	41.77	22.58	64.35	74.00	-9.65	peak			
2	*	2700.000	22.05	22.58	44.63	54.00	-9.37	AVG			
3		9981.750	39.17	17.88	57.05	74.00	-16.95	peak			
4		9981.750	24.64	17.88	42.52	54.00	-11.48	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#7 Date: 2007/07/12 Time: 14:37:40



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 3m

M/N: WG-3512

Mode: 11g

Note: CH11(2462MHz)

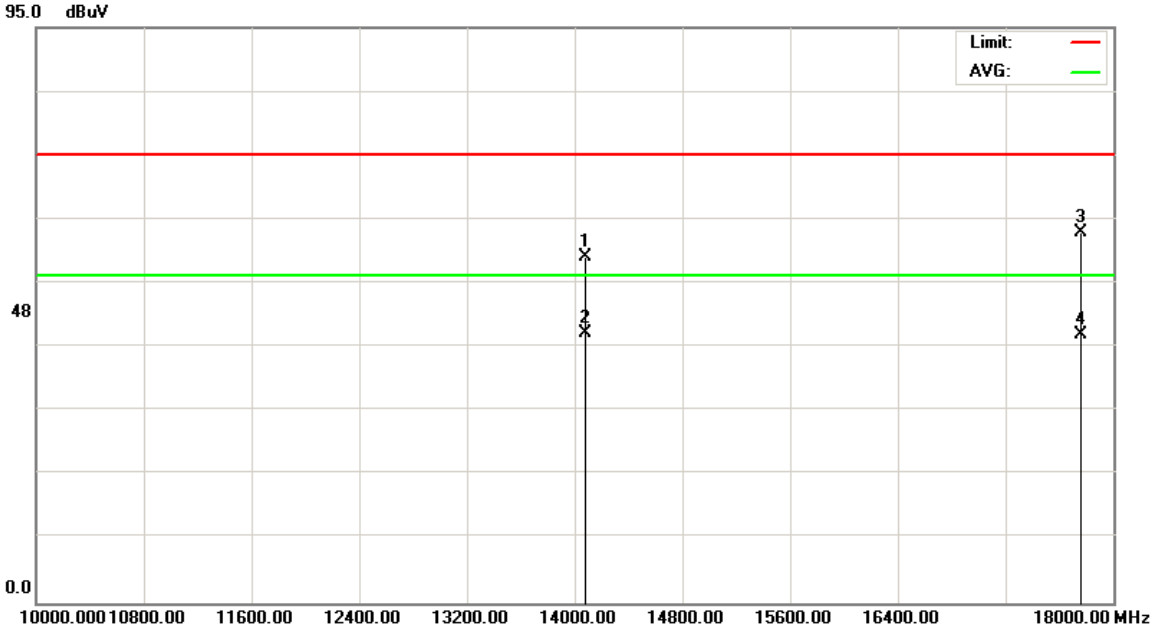
2.7G-10G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2700.000	42.04	22.58	64.62	74.00	-9.38	peak			
2	*	2700.000	22.38	22.58	44.96	54.00	-9.04	AVG			
3		9452.500	39.68	17.00	56.68	74.00	-17.32	peak			
4		9452.500	25.09	17.00	42.09	54.00	-11.91	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#9 Date: 2007/07/12 Time: 15:39:24



Site 966半電波暗室 Polarization: *Vertical* Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH11(2462MHz)

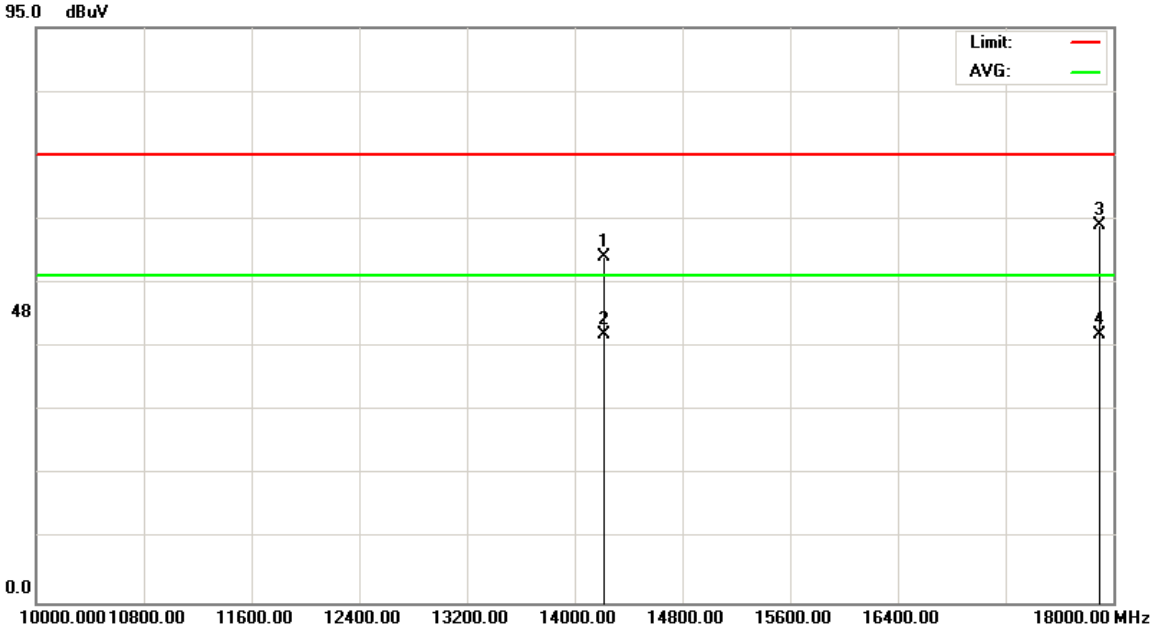
10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14080.00	38.32	18.81	57.13	74.00	-16.87	peak			
2	*	14080.00	25.81	18.81	44.62	54.00	-9.38	AVG			
3		17760.00	37.99	23.05	61.04	74.00	-12.96	peak			
4		17760.00	21.35	23.05	44.40	54.00	-9.60	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(CH2462) Data :#11 Date: 2007/07/12 Time: 16:21:26



Site 966半電波暗室 Polarization: ***Horizontal*** Temperature: 22 ℃

Limit: FCC part 15 (PK) Power: Humidity: 60 %

EUT: VOIP Distance: 1m

M/N: WG-3512

Mode: 11g

Note: CH11(2462MHz)

10G - 18G PK Scan Att:0 ; REF:95 ; Range:95(EUT Power Lever:255)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		14220.00	38.41	18.78	57.19	74.00	-16.81	peak			
2	*	14220.00	25.61	18.78	44.39	54.00	-9.61	AVG			
3		17900.00	37.34	24.96	62.30	74.00	-11.70	peak			
4		17900.00	19.24	24.96	44.20	54.00	-9.80	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

4. Maximum Conducted Output Power Requirements

4.1 Test Condition & Setup:

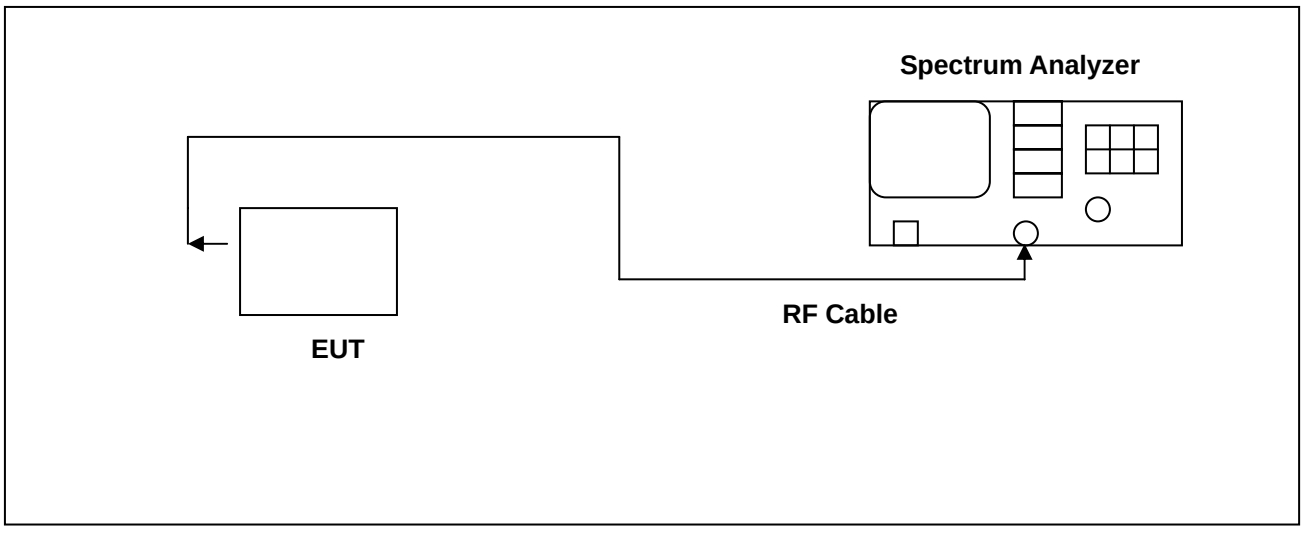
The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to spectrum analyzer. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the spectrum Analyzer, for prevent the spectrum analyzer input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

4.2 Test Instruments Configuration:



4.3 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4445A	MY45300744	Nov. 11, 2006	Nov. 11, 2007

4.4 Test Result:

802.11b

Frequency (MHz)	Output (dBm)	Required Limit
2412	16.44	<30dBm
2437	16.45	<30dBm
2462	16.90	<30dBm

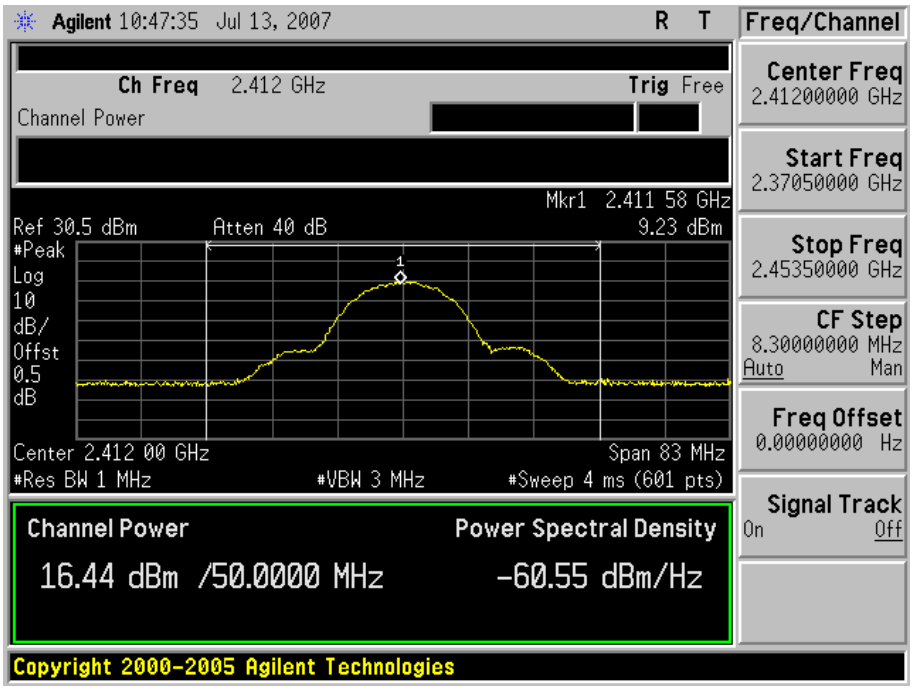
802.11g

Frequency (MHz)	Output (dBm)	Required Limit
2412	13.49	<30dBm
2437	13.80	<30dBm
2462	13.95	<30dBm

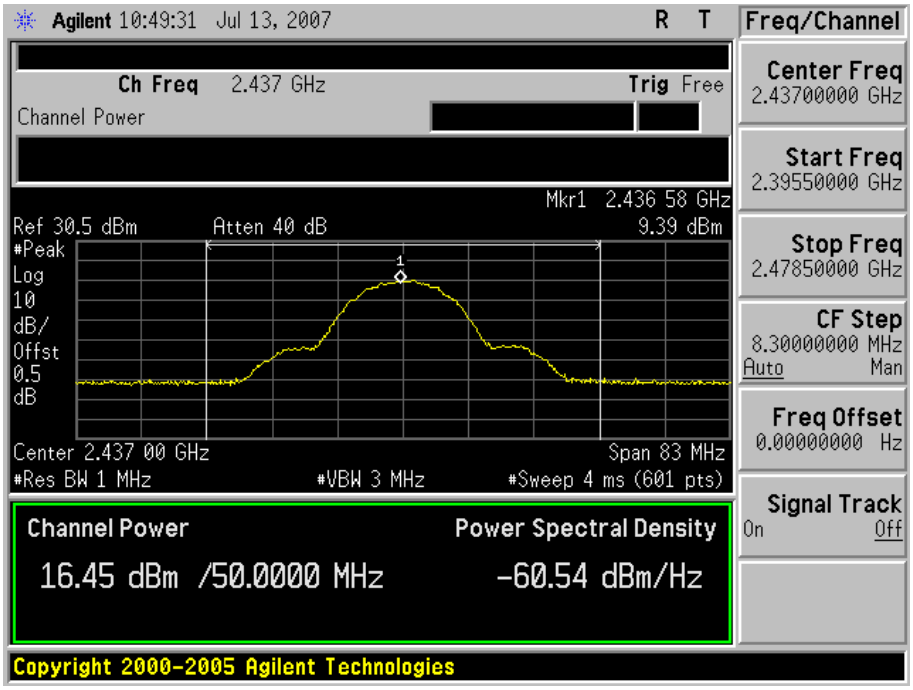
Note: Test Graphs See next page.

4.5 Test Graphs

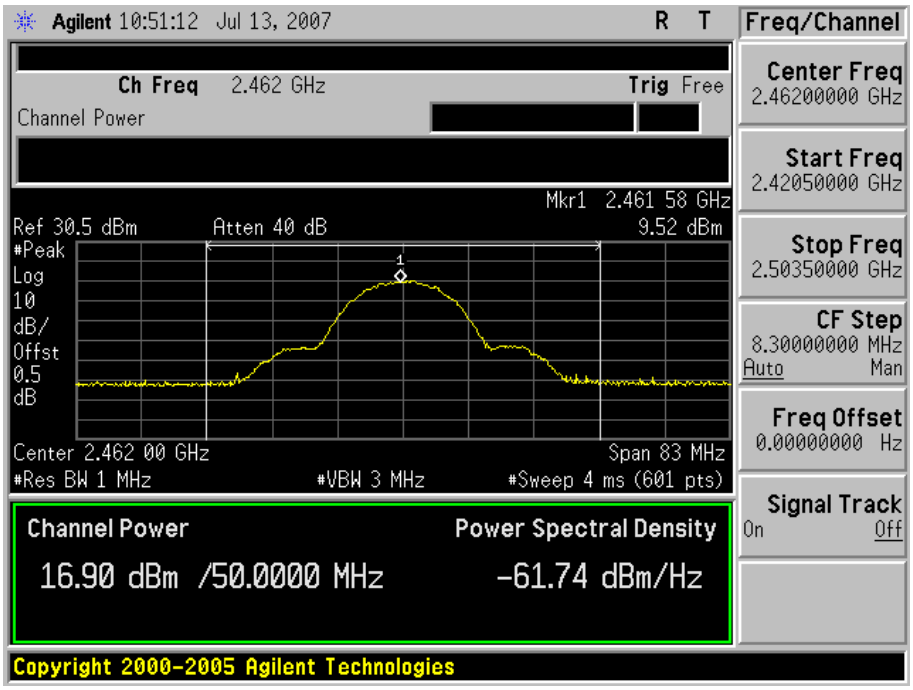
802.11b CH1 (2412MHz)



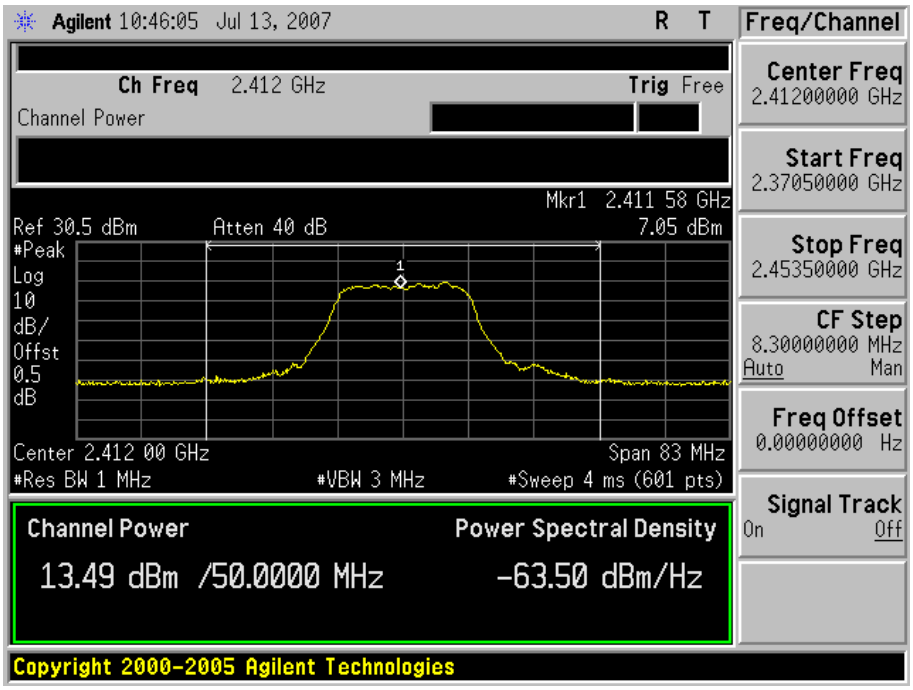
802.11b CH6 (2437MHz)



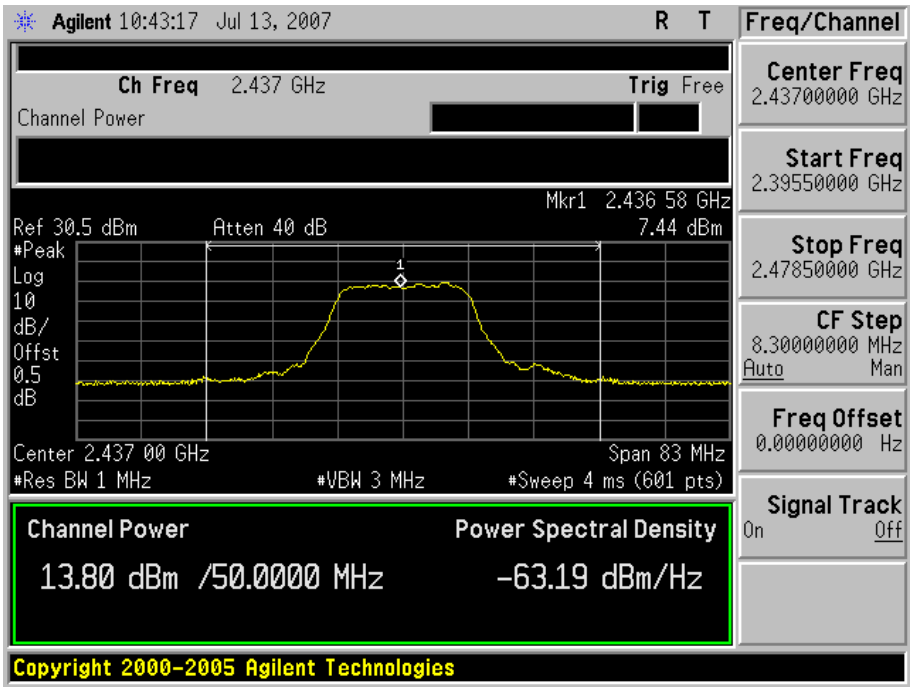
802.11b CH11 (2462MHz)



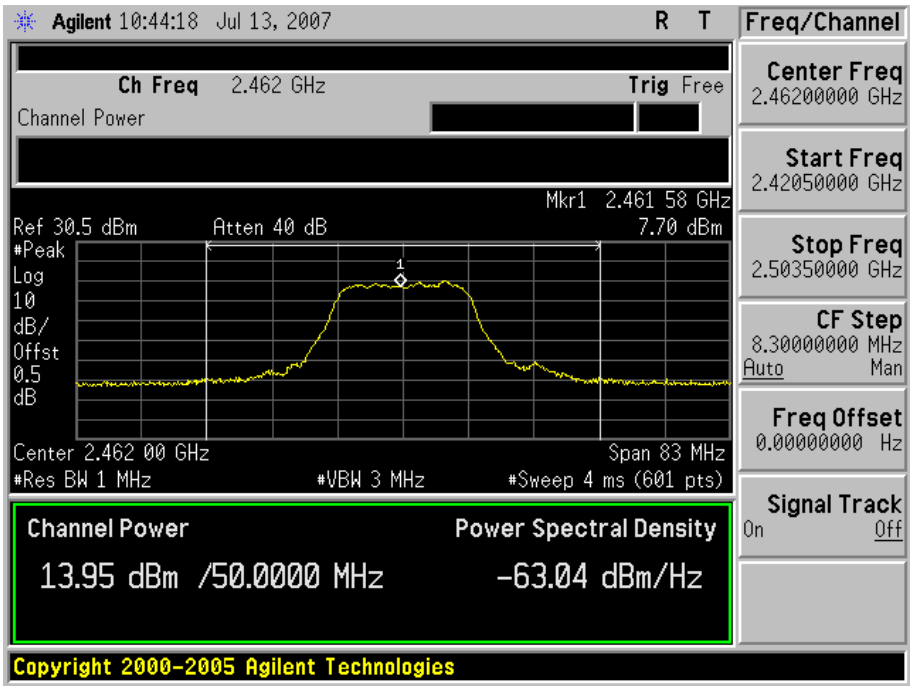
802.11g CH1 (2412MHz)



802.11g CH6 (2437MHz)



802.11g CH11 (2462MHz)

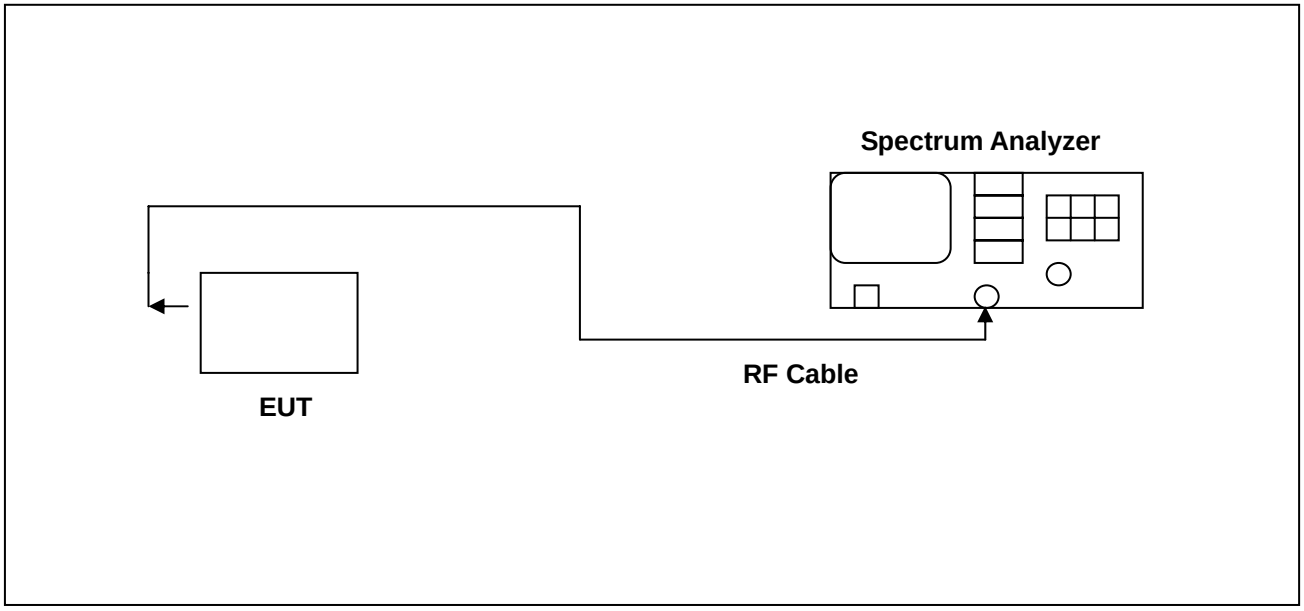


5. Minimum 6dB RF Bandwidth Requirements

5.1 Test Condition & Setup:

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.
The test was performed at 3 channels (Channel 1, 6, 11)

5.2 Test Instruments Configuration:



5.3 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4445A	MY45300744	Nov. 11, 2006	Nov. 11, 2007

5.4 Test Result:

802.11b

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	9.92	> 500 KHz
2437	8.75	> 500 KHz
2462	9.08	> 500 KHz

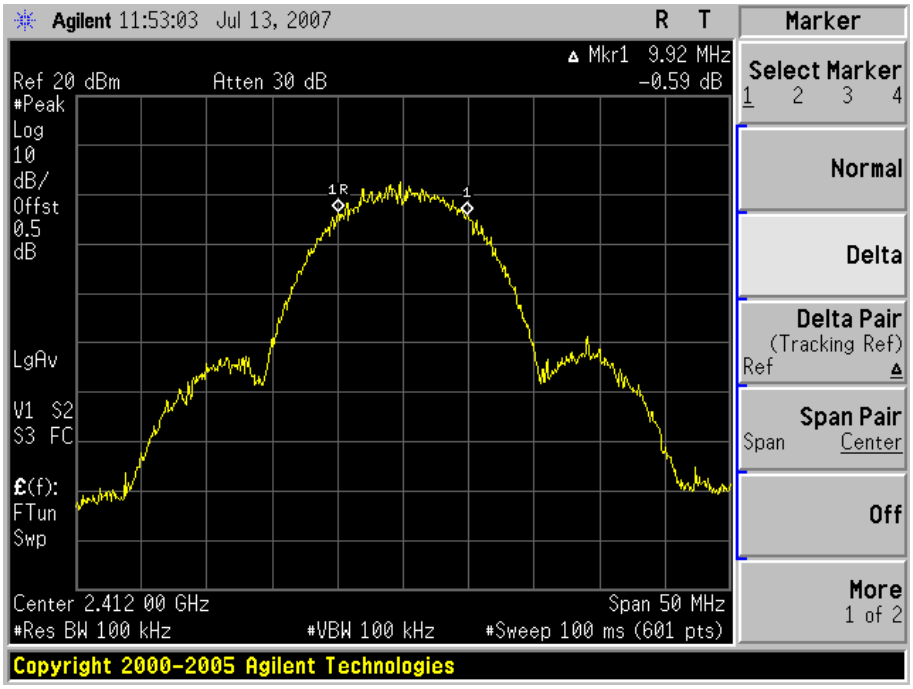
802.11g

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	Required Limit
2412	16.08	> 500 KHz
2437	16.08	> 500 KHz
2462	16.08	> 500 KHz

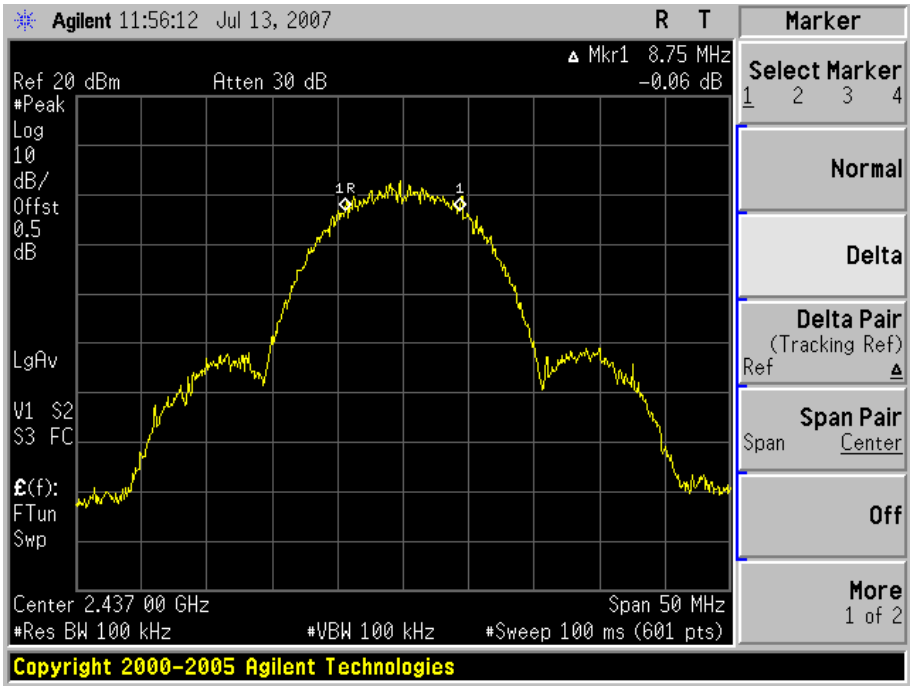
Note: Test Graphs See next page.

5.5 Test Graphs

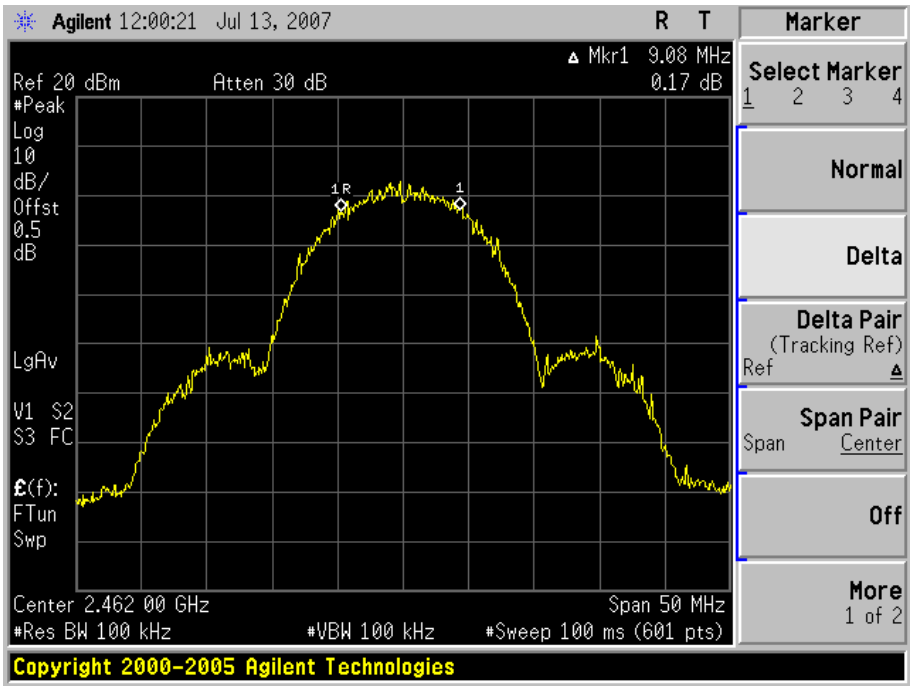
802.11b (2412MHz)



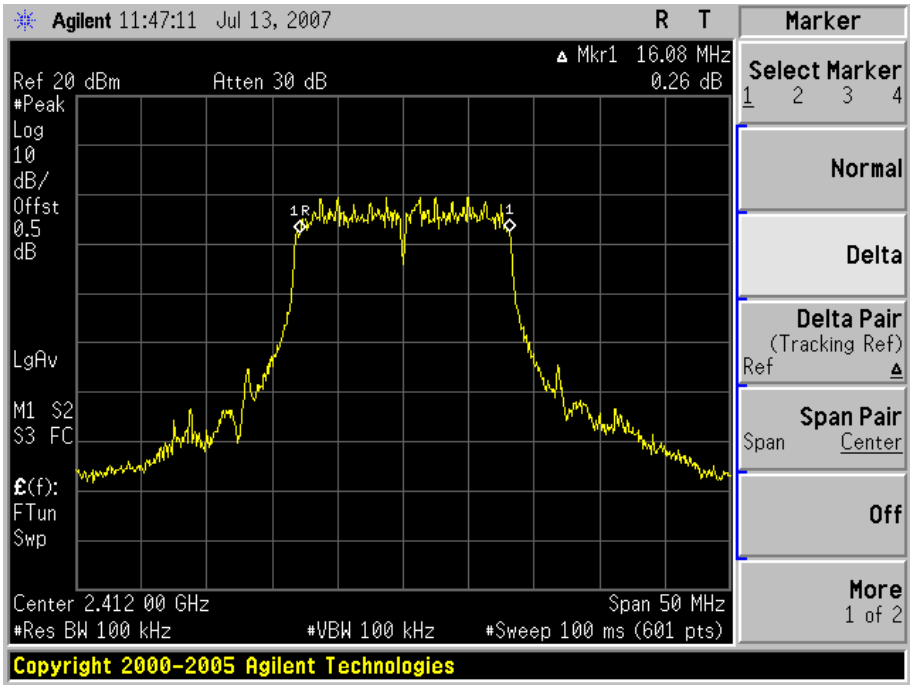
802.11b (2437MHz)



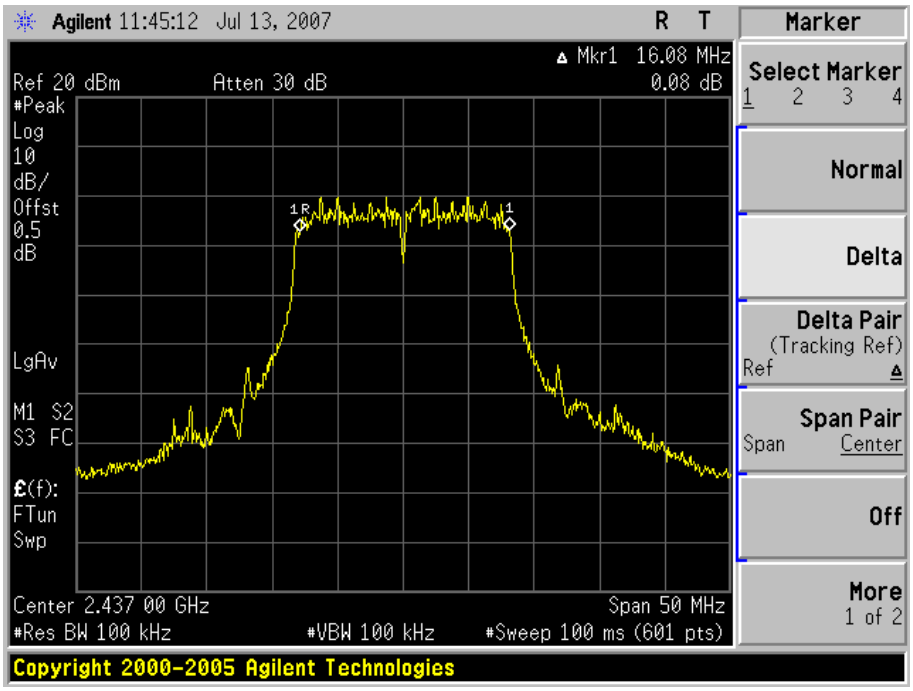
802.11b (2462MHz)



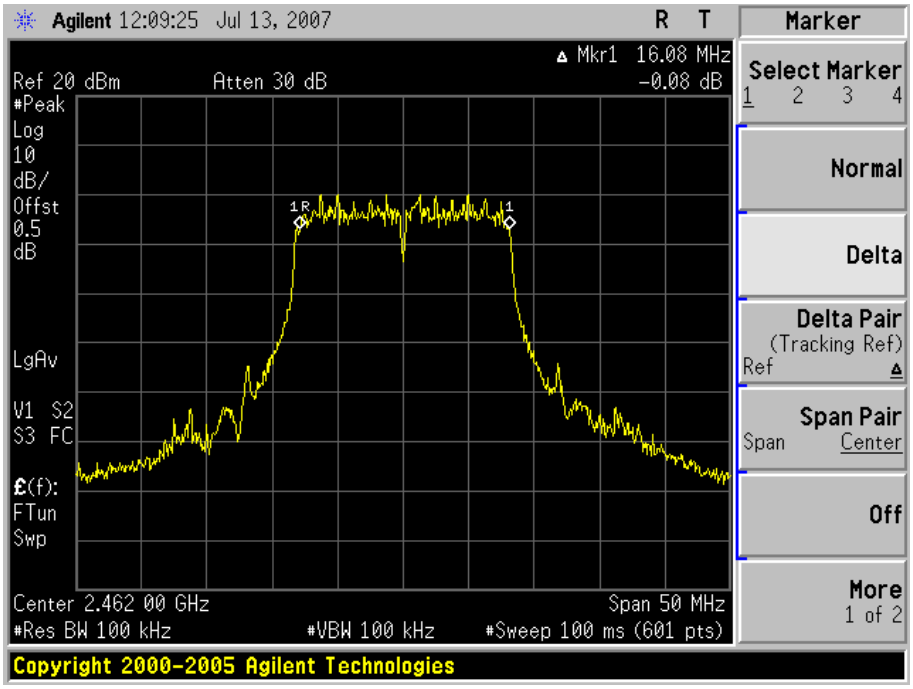
802.11g (2412MHz)



802.11g (2437MHz)



802.11g (2462MHz)



6. Maximum Power Density Requirements

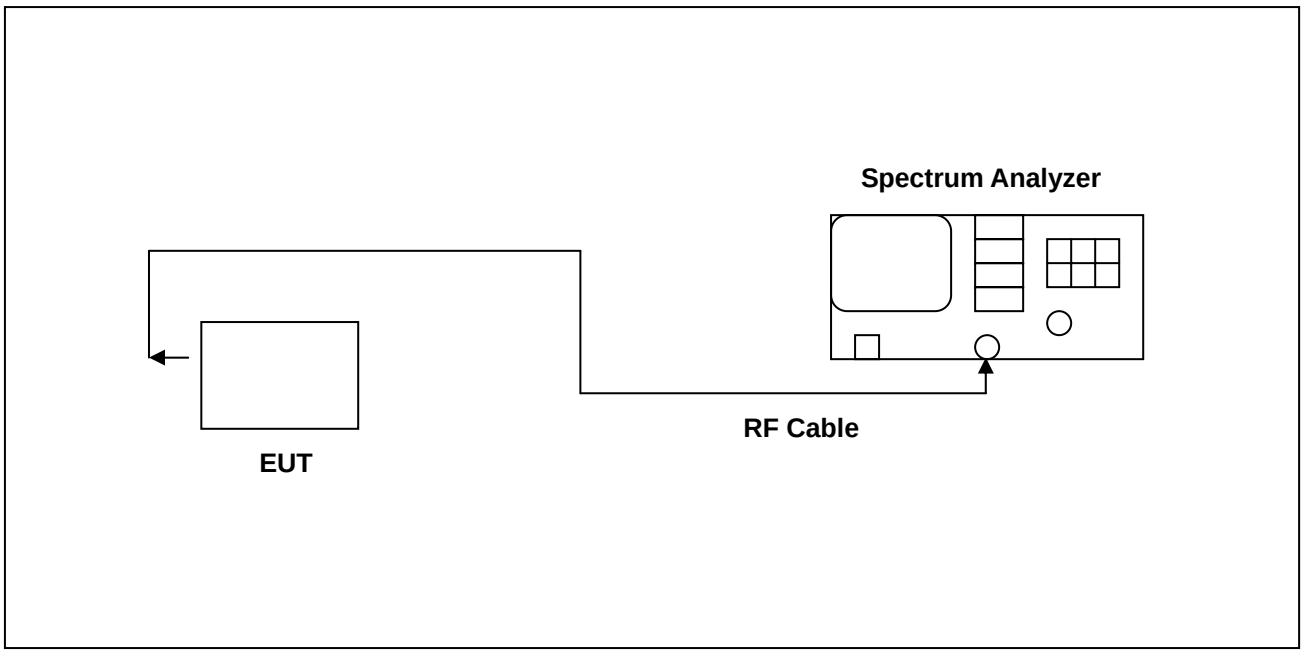
6.1 Test Condition & Setup:

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output pass band. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

SWEEP TIME (SEC) = (Fstop, kHz - Fstart, kHz)/3 kHz

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

6.2 Test Instruments Configuration:



6.3 *Test Equipment List:*

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4445A	MY45300744	Nov. 11, 2006	Nov. 11, 2007

6.4 *Test Result:*

802.11b

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-12.34	<8dBm
2437	-11.88	<8dBm
2462	-11.89	<8dBm

802.11g

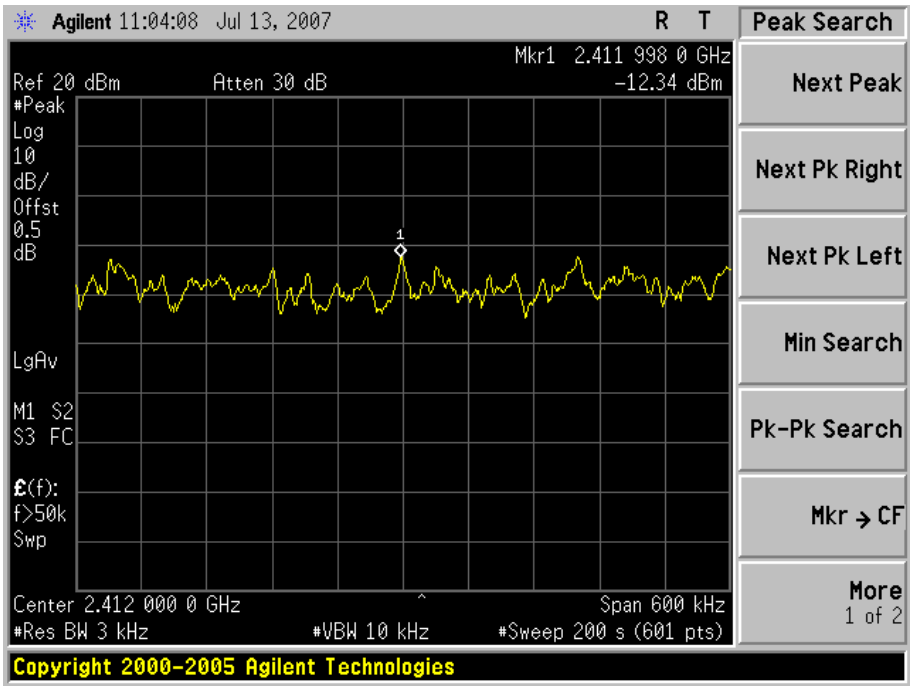
Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-17.62	<8dBm
2437	-17.07	<8dBm
2462	-16.87	<8dBm

Note:

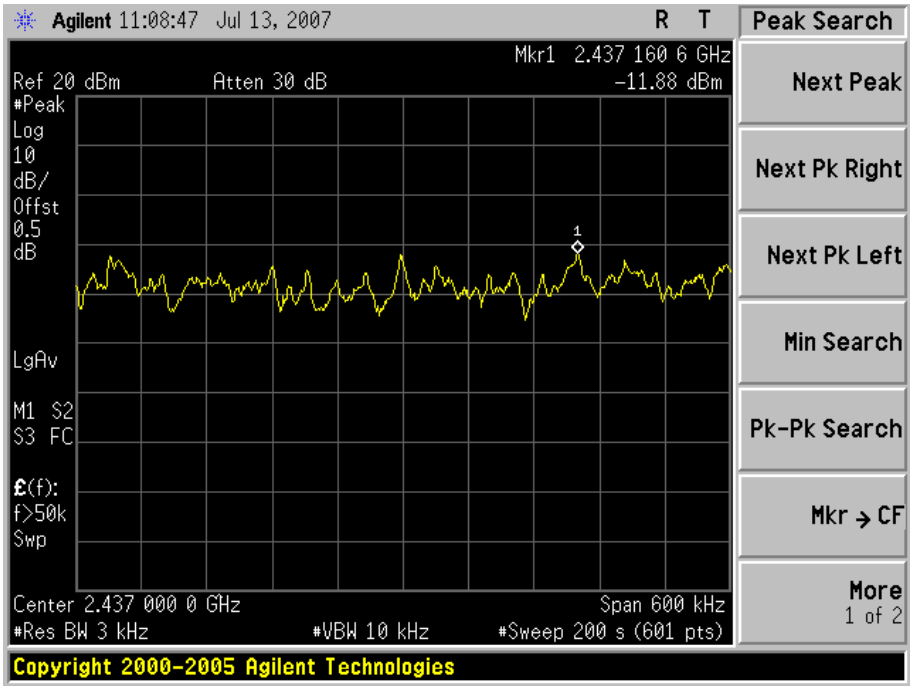
1. Frequency Span= 600 kHz
2. Sweep Time = Frequency Span/3 kHz=200secs
3. Test Graphs See next page.

6.5 ***Test Graphs***

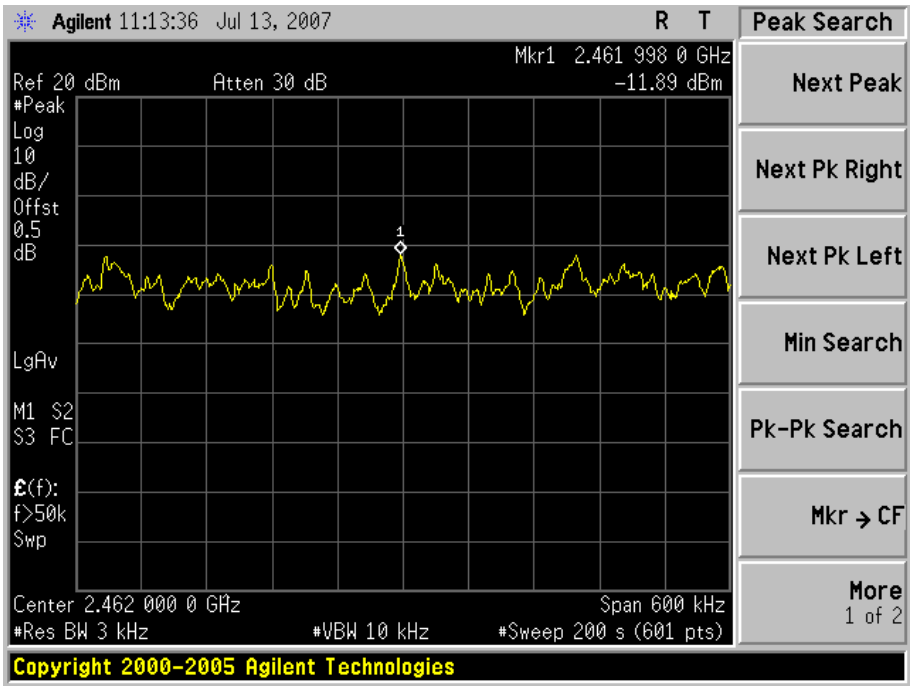
802.11b (2412MHz)



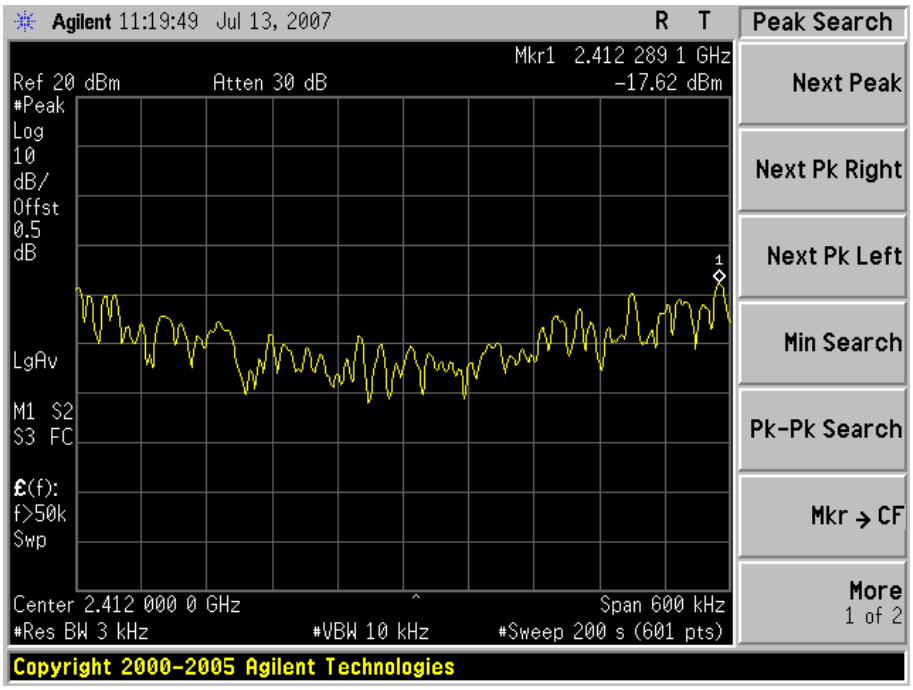
802.11b (2437MHz)



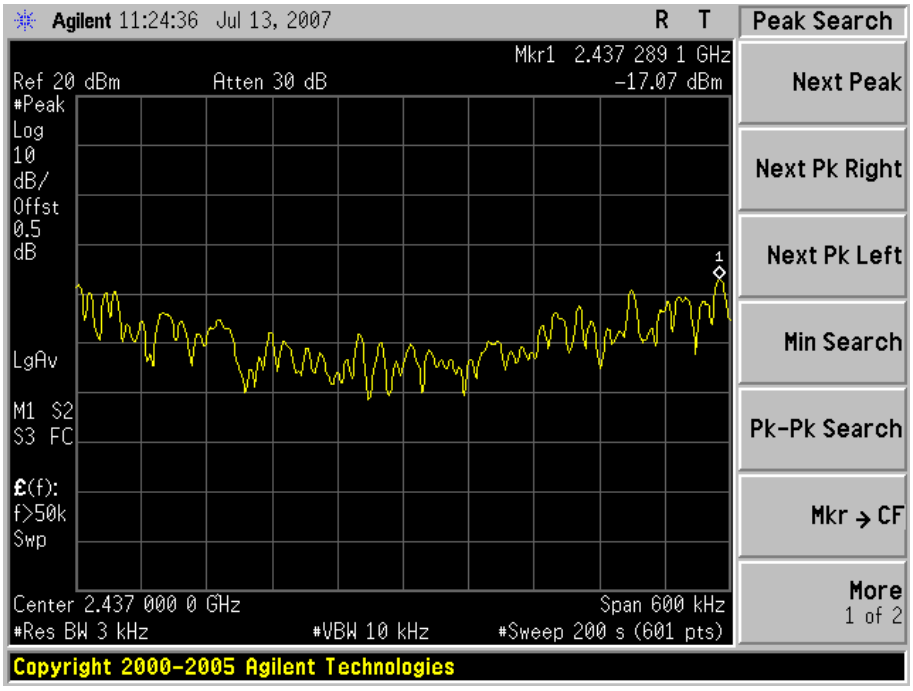
802.11b (2462MHz)



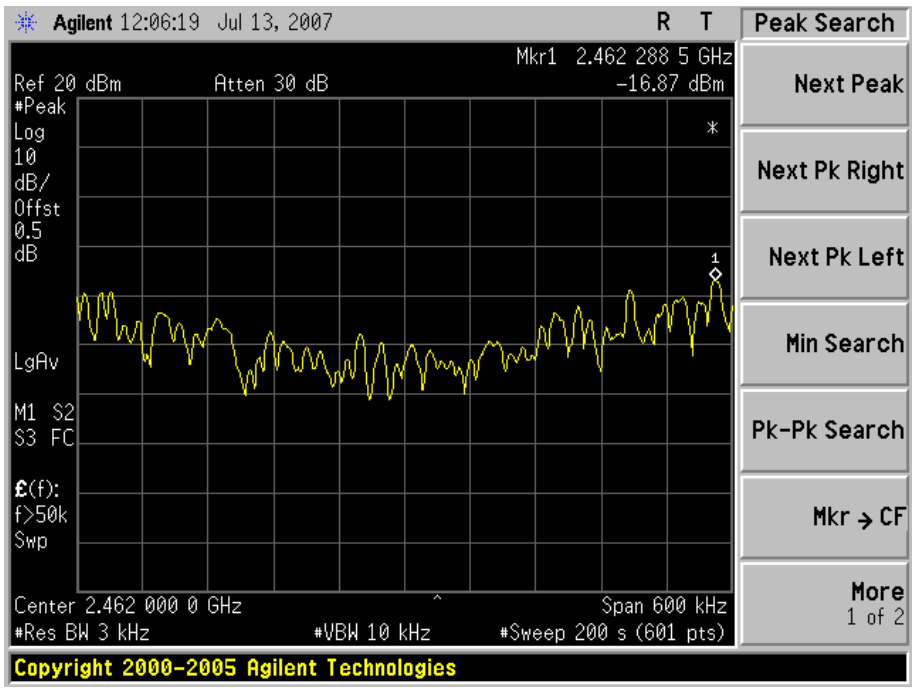
802.11g (2412MHz)



802.11g (2437MHz)



802.11g (2462MHz)



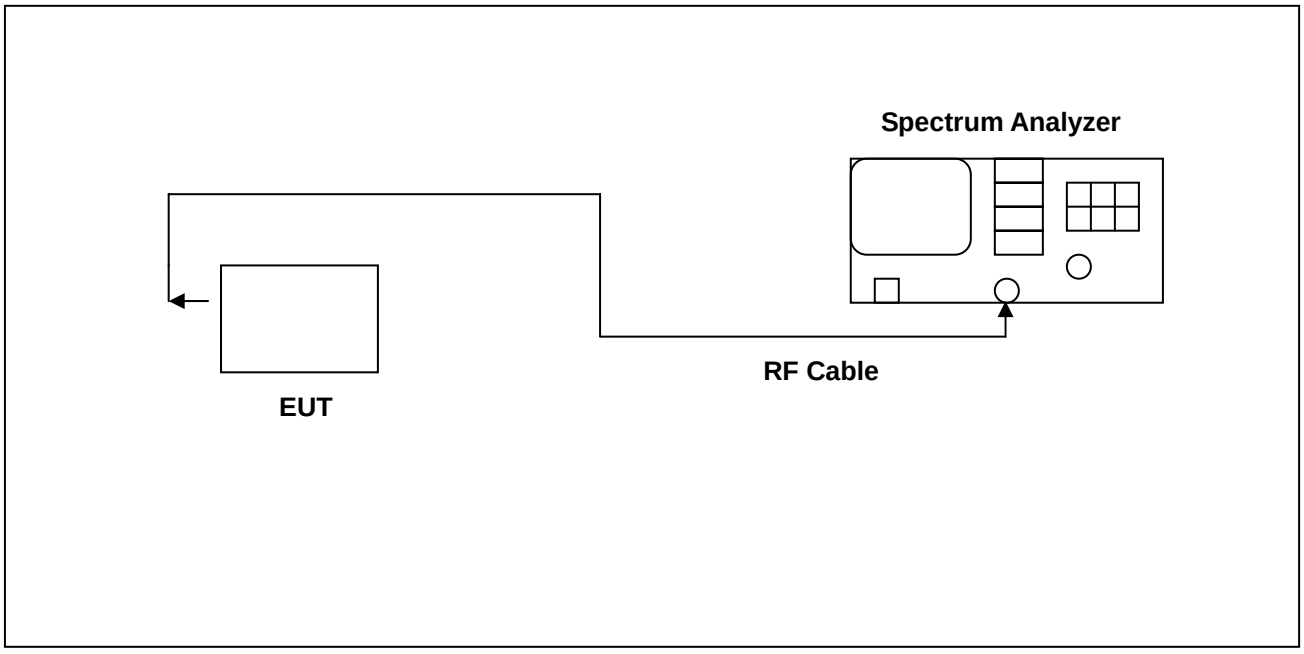
7. Out of Band Conducted Emissions Requirements

7.1 Test Condition & Setup:

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 1, 6, 11)

7.2 Test Instruments Configuration:



7.3 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4445A	MY45300744	Nov. 11, 2006	Nov. 11, 2007

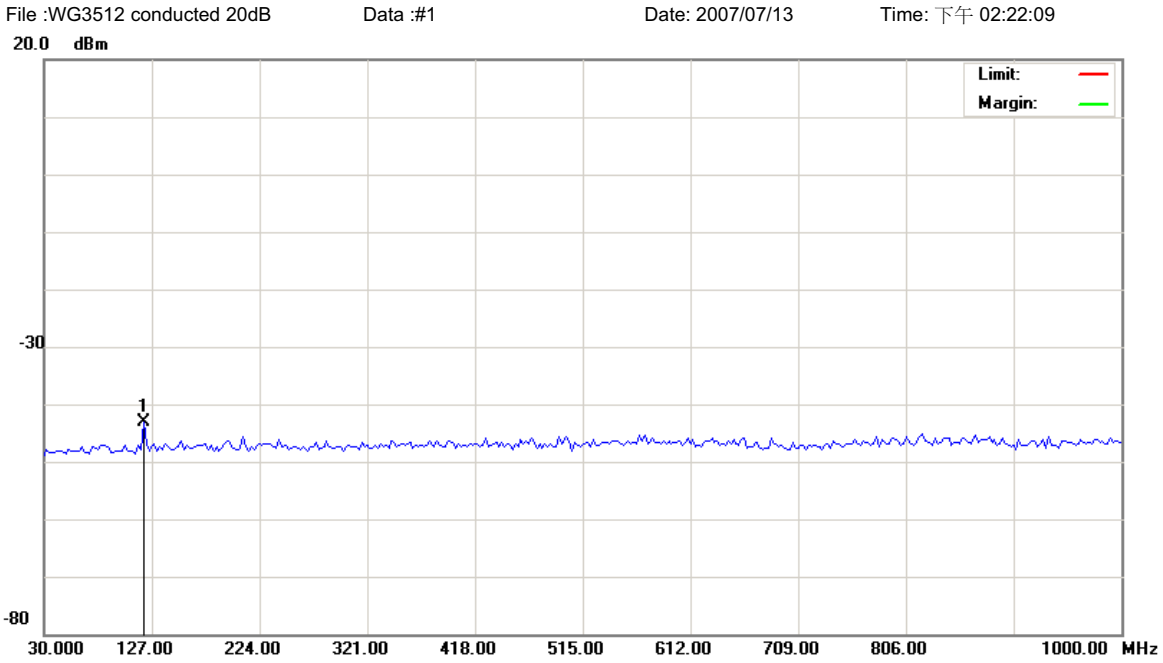
7.4 Test Result:

Refer to attached data sheets. Data shows out of band emissions are suppressed well below the -20 dBc minimum required by the Rules.

Note: Test Graphs See next page.

7.5 Test Graphs

7.5.1 802.11b Test Graphs



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2412
direct Spectrum

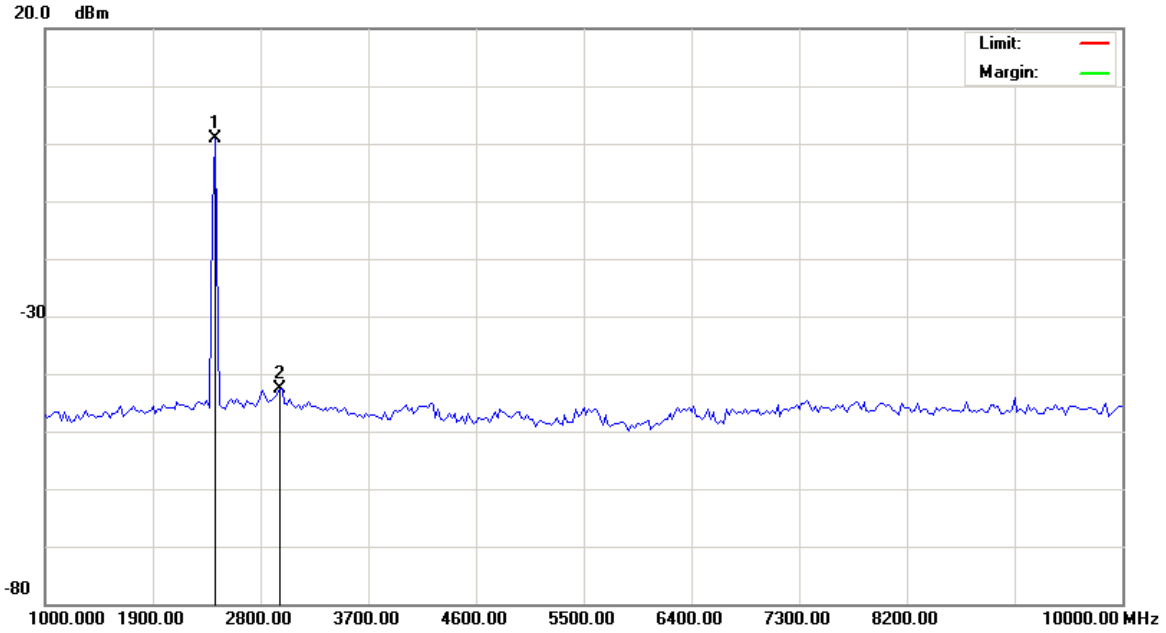
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	119.7250	-43.05	0.00	-43.05			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#2 Date: 2007/07/13 Time: 下午 02:22:22



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2412
direct Spectrum

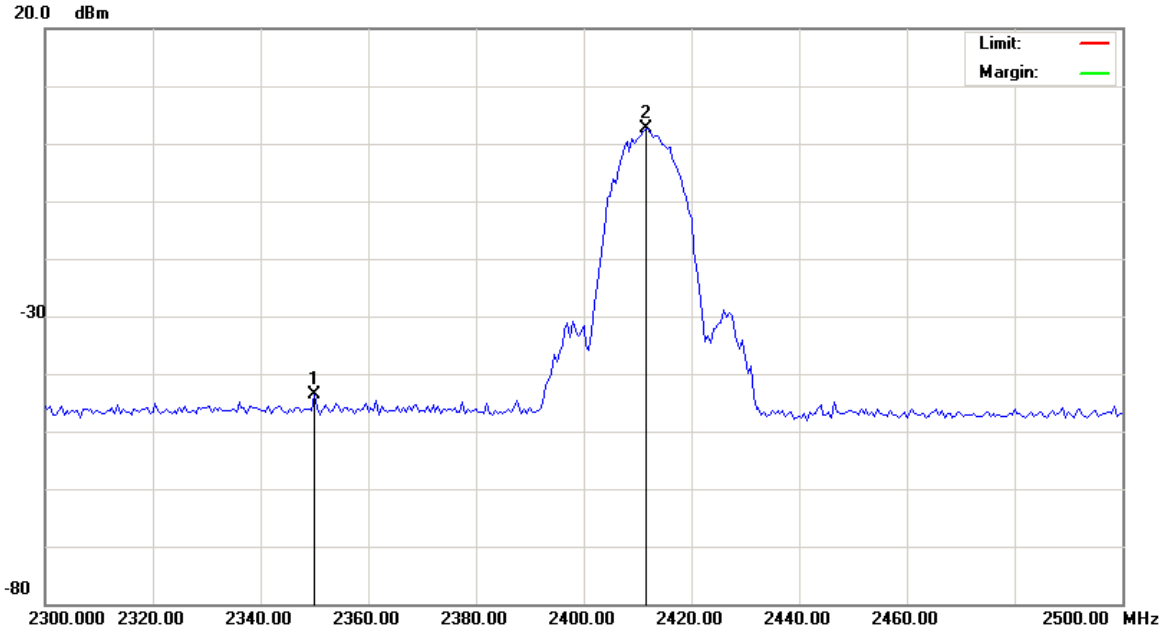
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2417.500	0.88	0.00	0.88			peak			
2		2957.500	-42.58	0.00	-42.58			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#3 Date: 2007/07/13 Time: 下午 02:22:35



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2412
direct Spectrum

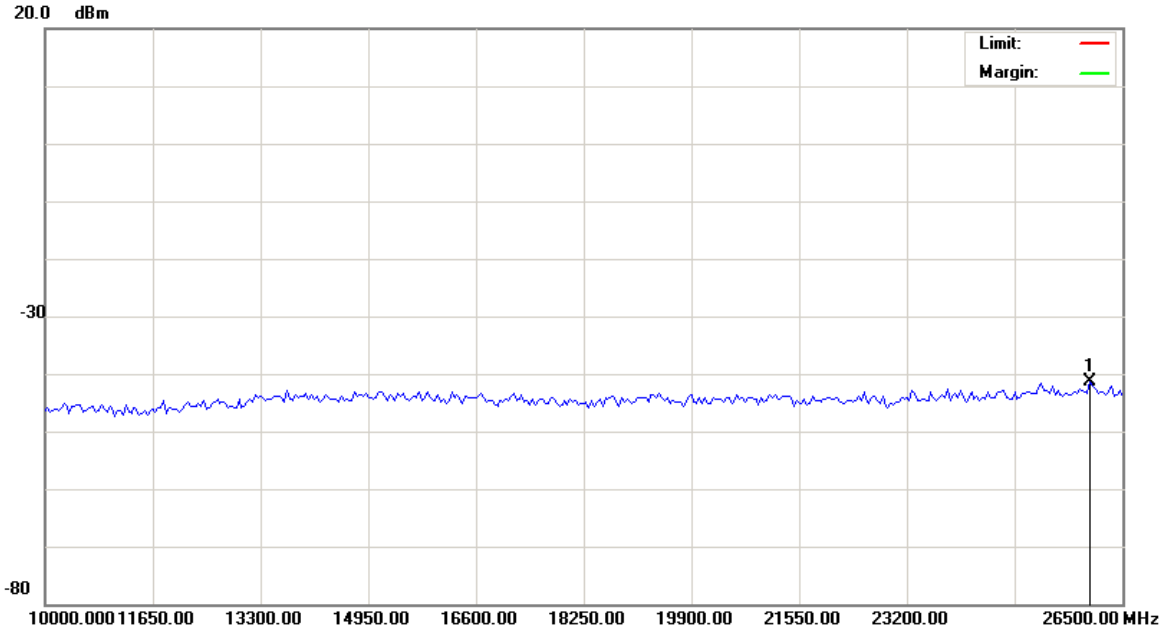
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2350.000	-43.74	0.00	-43.74			peak			
2	*	2411.500	2.73	0.00	2.73			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#4 Date: 2007/07/13 Time: 下午 02:22:49



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2412
direct Spectrum

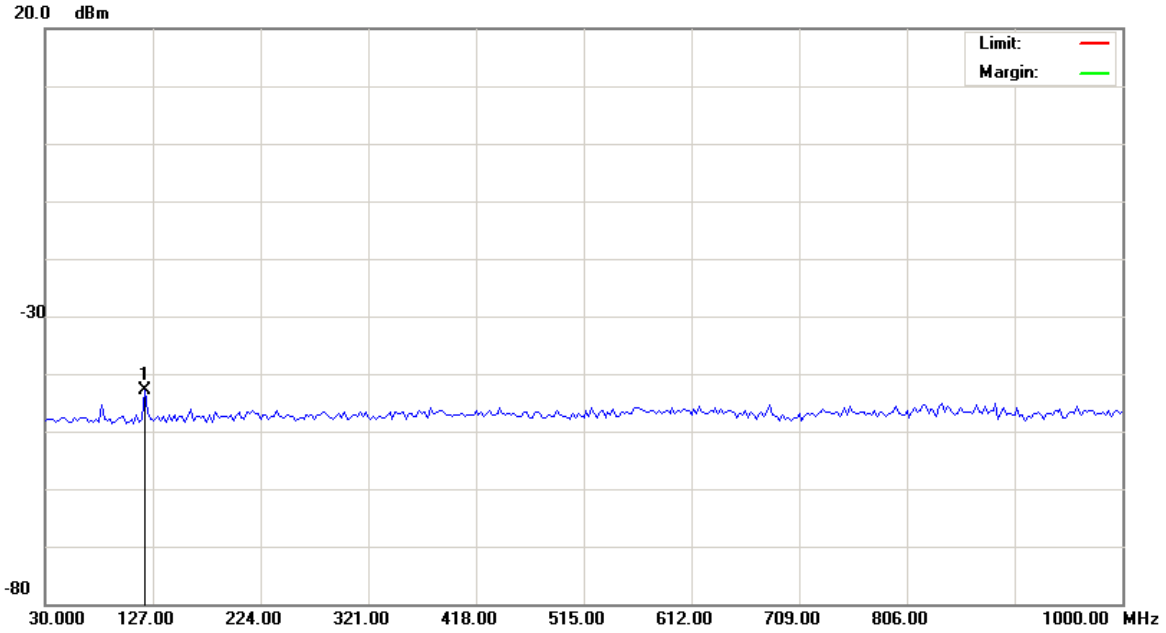
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	26005.00	-41.39	0.00	-41.39			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#5 Date: 2007/07/13 Time: 下午 02:23:36



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2437
direct Spectrum

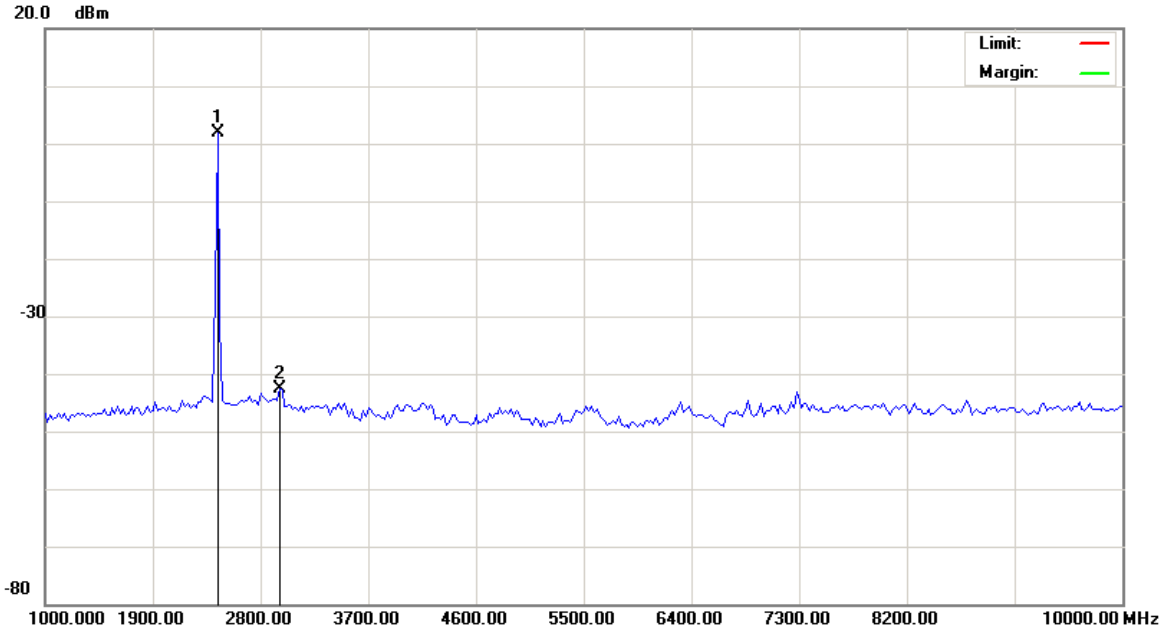
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	119.7250	-42.82	0.00	-42.82			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#6 Date: 2007/07/13 Time: 下午 02:23:49



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2437
direct Spectrum

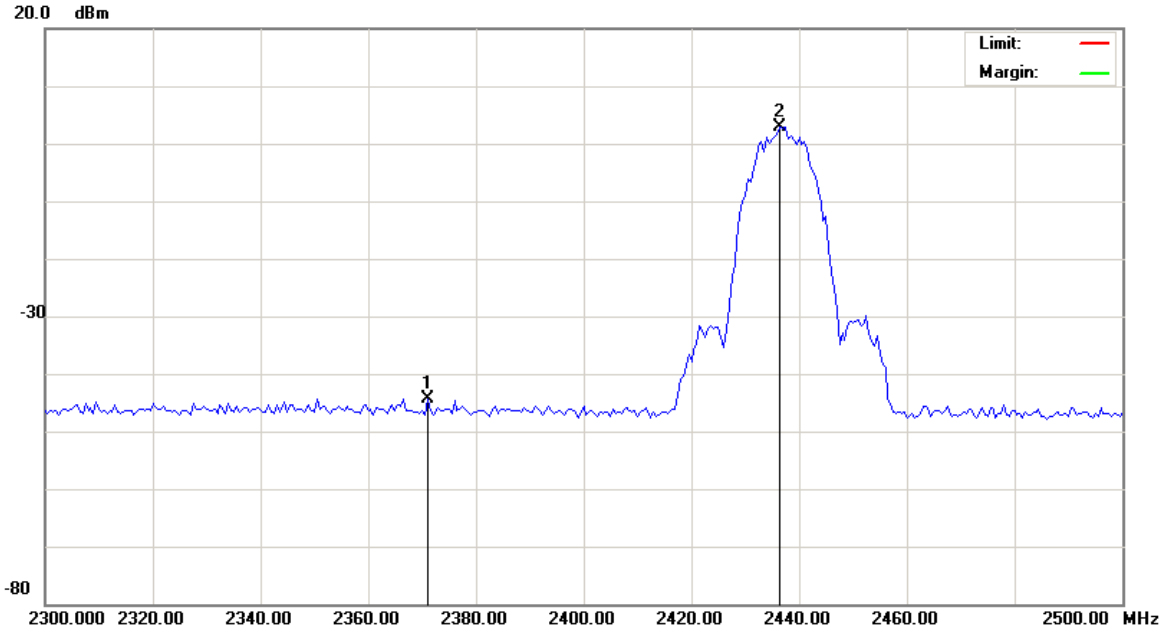
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2440.000	1.95	0.00	1.95			peak			
2		2957.500	-42.68	0.00	-42.68			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#7 Date: 2007/07/13 Time: 下午 02:24:02



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2437
direct Spectrum

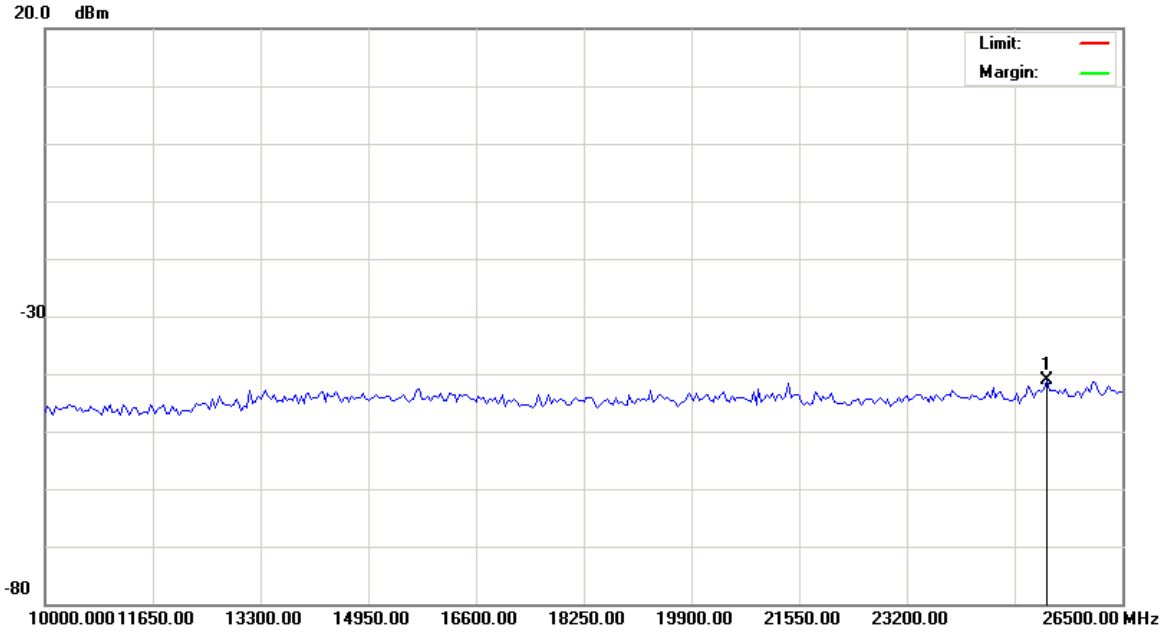
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2371.000	-44.40	0.00	-44.40			peak			
2	*	2436.500	2.88	0.00	2.88			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#8 Date: 2007/07/13 Time: 下午 02:24:15



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2437
direct Spectrum

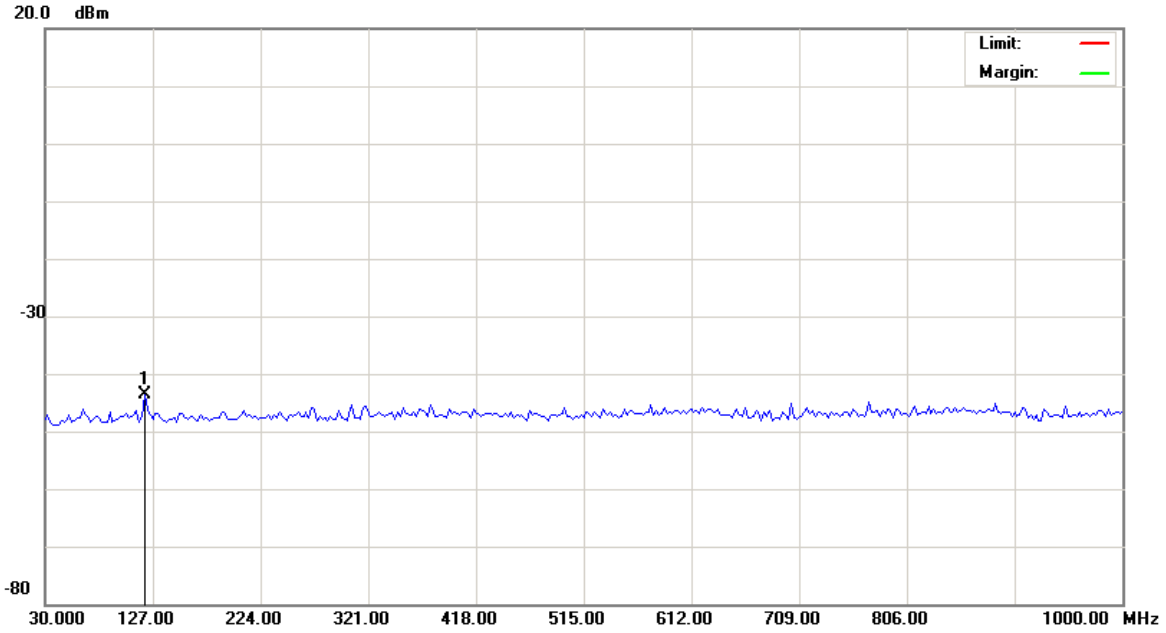
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	25345.00	-41.09	0.00	-41.09			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#9 Date: 2007/07/13 Time: 下午 02:25:23



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2462
direct Spectrum

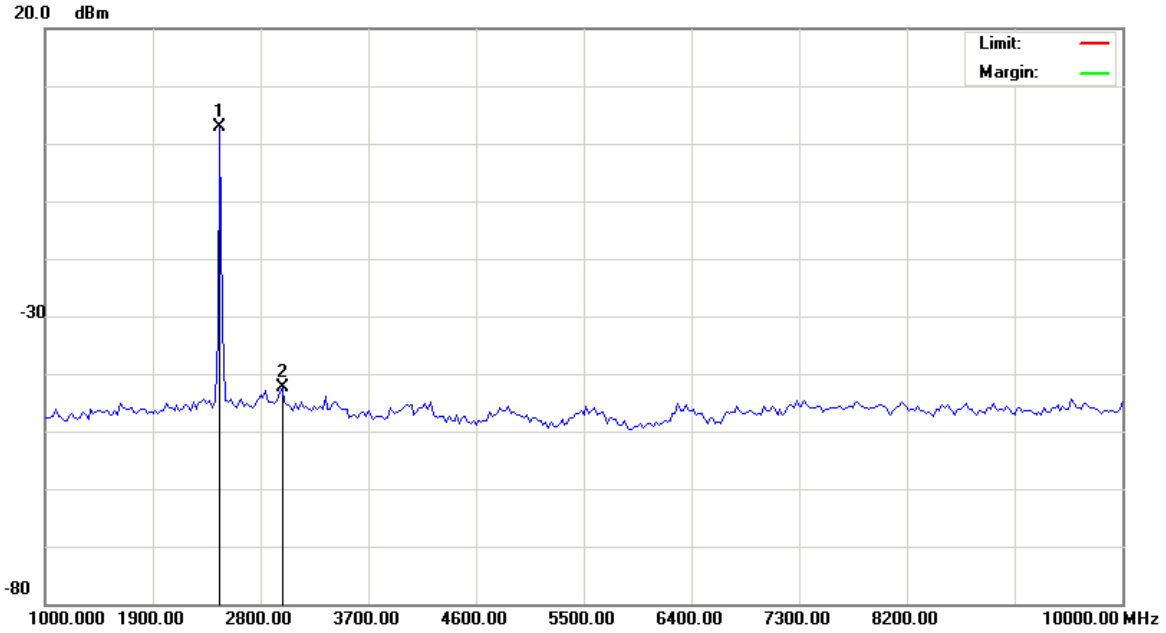
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	119.7250	-43.50	0.00	-43.50			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#10 Date: 2007/07/13 Time: 下午 02:25:36



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2462
direct Spectrum

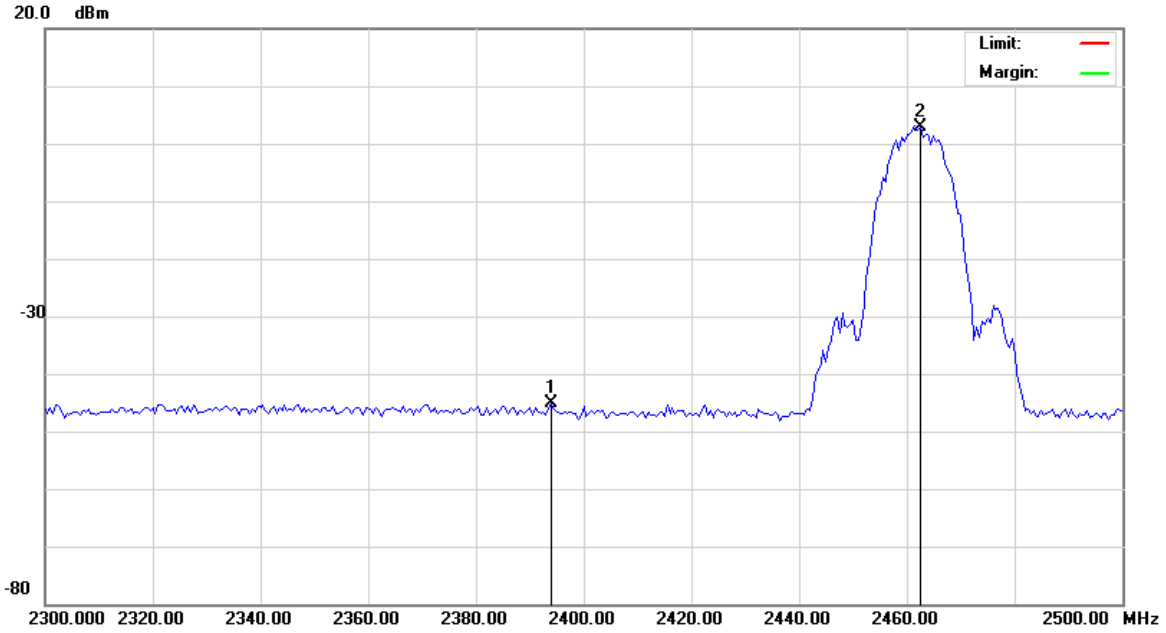
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2462.500	2.89	0.00	2.89			peak			
2		2980.000	-42.31	0.00	-42.31			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#11 Date: 2007/07/13 Time: 下午 02:25:49



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2462
direct Spectrum

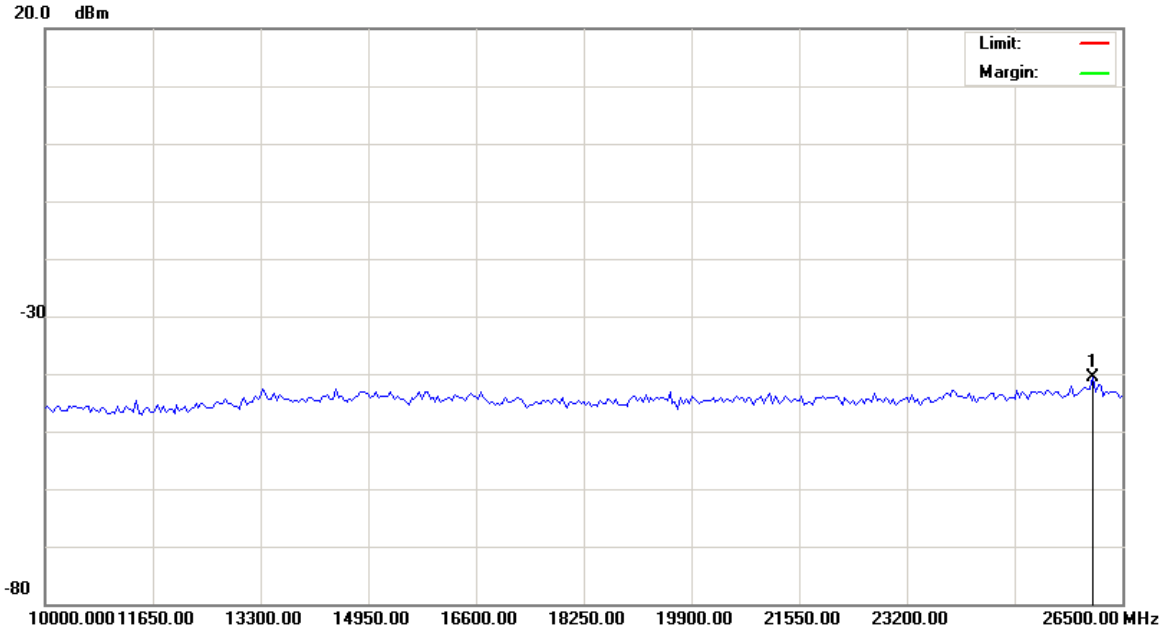
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2394.000	-45.15	0.00	-45.15			peak			
2	*	2462.500	2.99	0.00	2.99			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#12 Date: 2007/07/13 Time: 下午 02:26:03



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11b
Note: CH2462
direct Spectrum

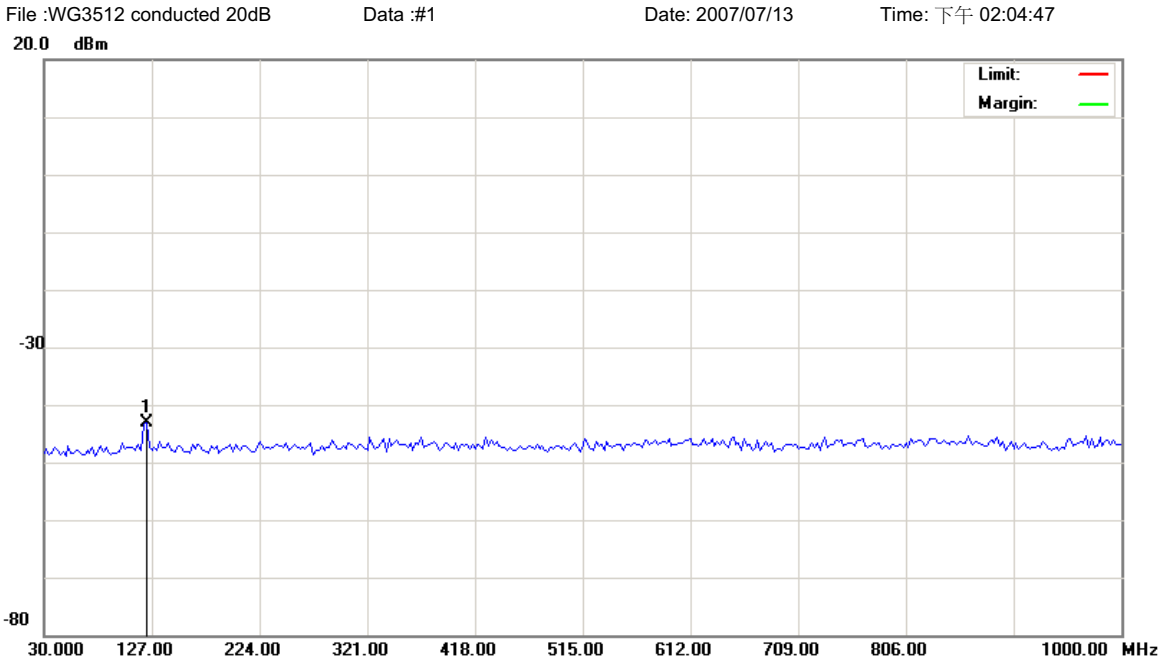
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	26046.25	-40.53	0.00	-40.53			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

7.5.2 802.11g Test Graphs



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH2412
direct Spectrum

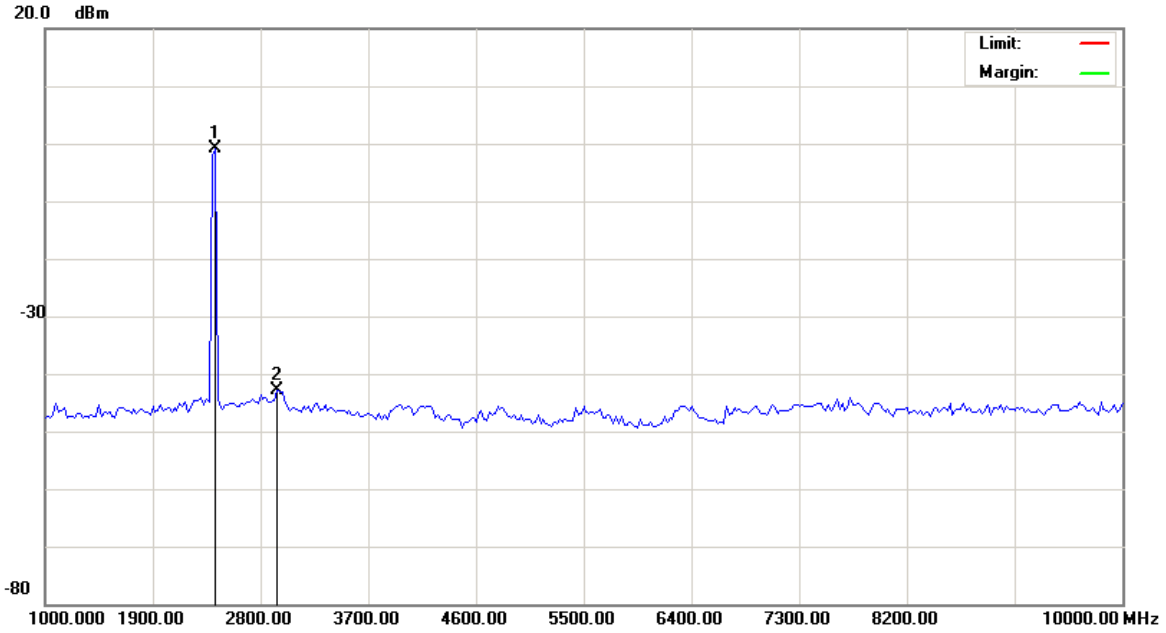
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	122.1500	-43.16	0.00	-43.16			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#2 Date: 2007/07/13 Time: 下午 02:05:00



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH2412
direct Spectrum

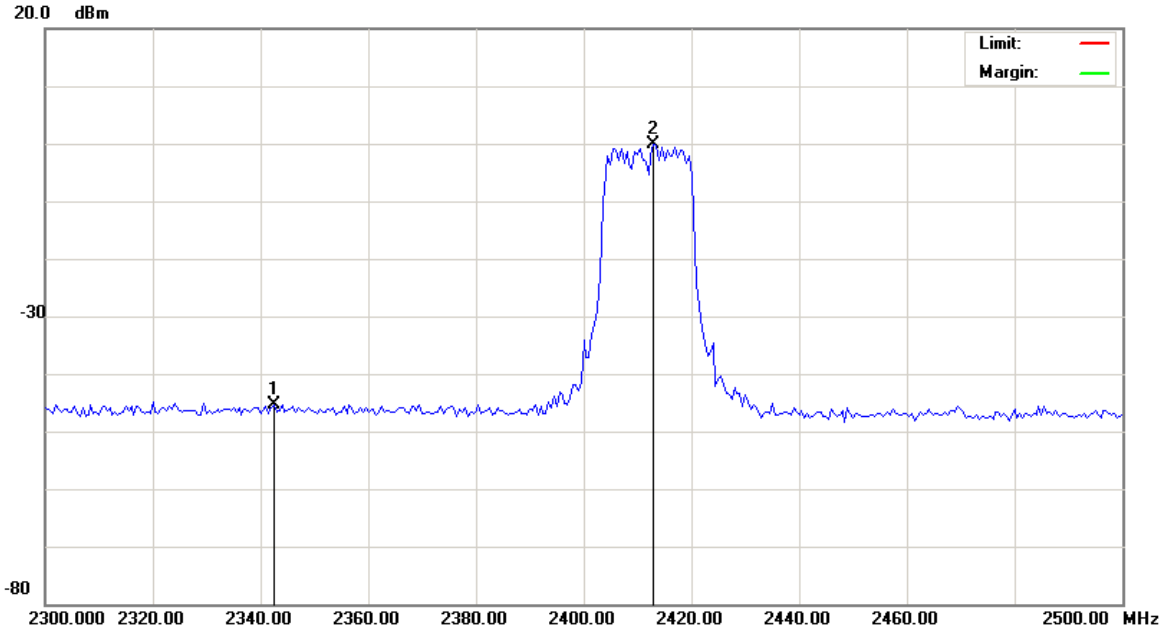
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2417.500	-0.82	0.00	-0.82			peak			
2		2935.000	-42.88	0.00	-42.88			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#3 Date: 2007/07/13 Time: 下午 02:05:12

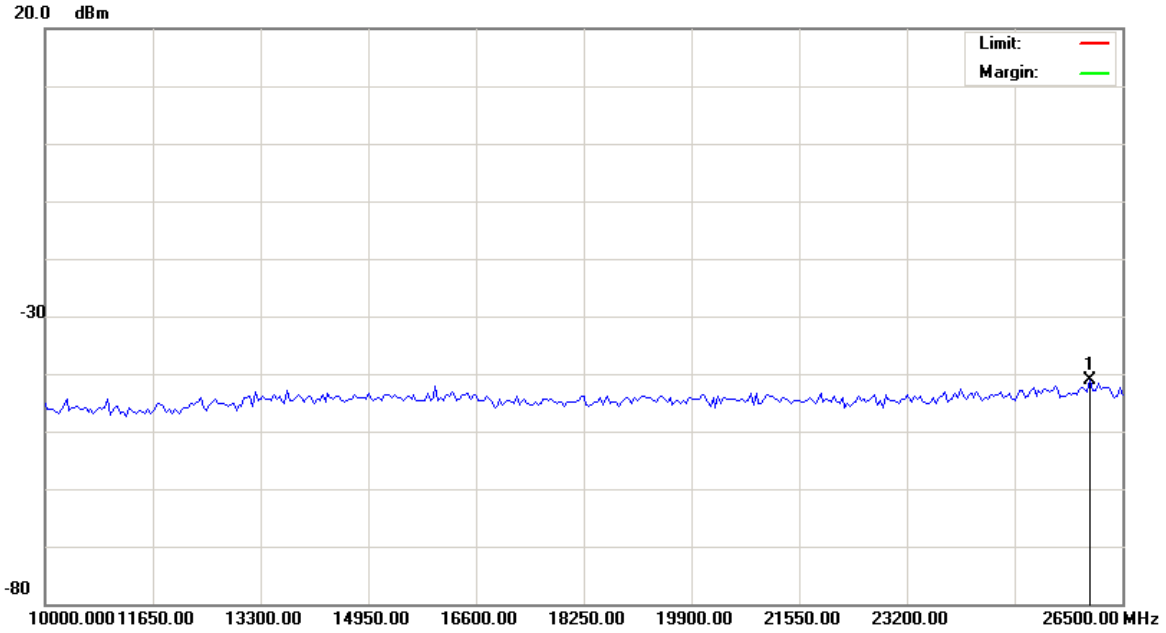


Site site #1	Polarization:	Temperature:	26 ℃
Limit:	Power: AC 110V/60Hz	Humidity:	55 %
EUT: VOIP	Distance:		
M/N: WG3512			
Mode: 11g			
Note: CH2412			
direct Spectrum			

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2342.500	-45.34	0.00	-45.34			peak			
2	*	2413.000	-0.16	0.00	-0.16			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#4 Date: 2007/07/13 Time: 下午 02:05:25



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH2412
direct Spectrum

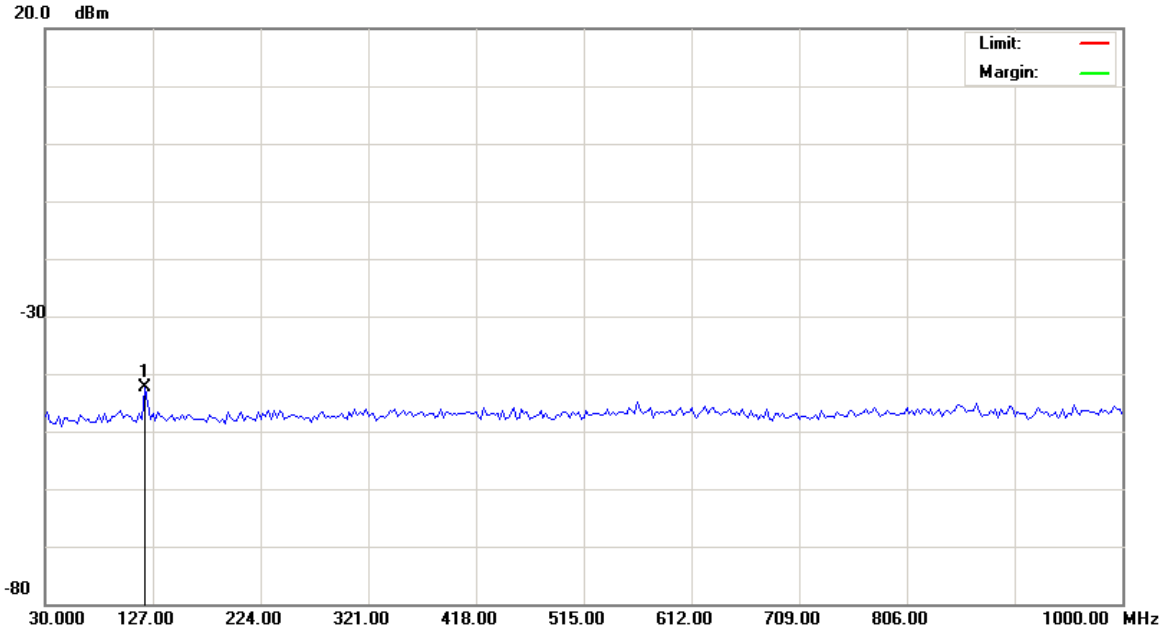
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	26005.00	-41.13	0.00	-41.13			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#5 Date: 2007/07/13 Time: 下午 02:10:37



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24347
direct Spectrum

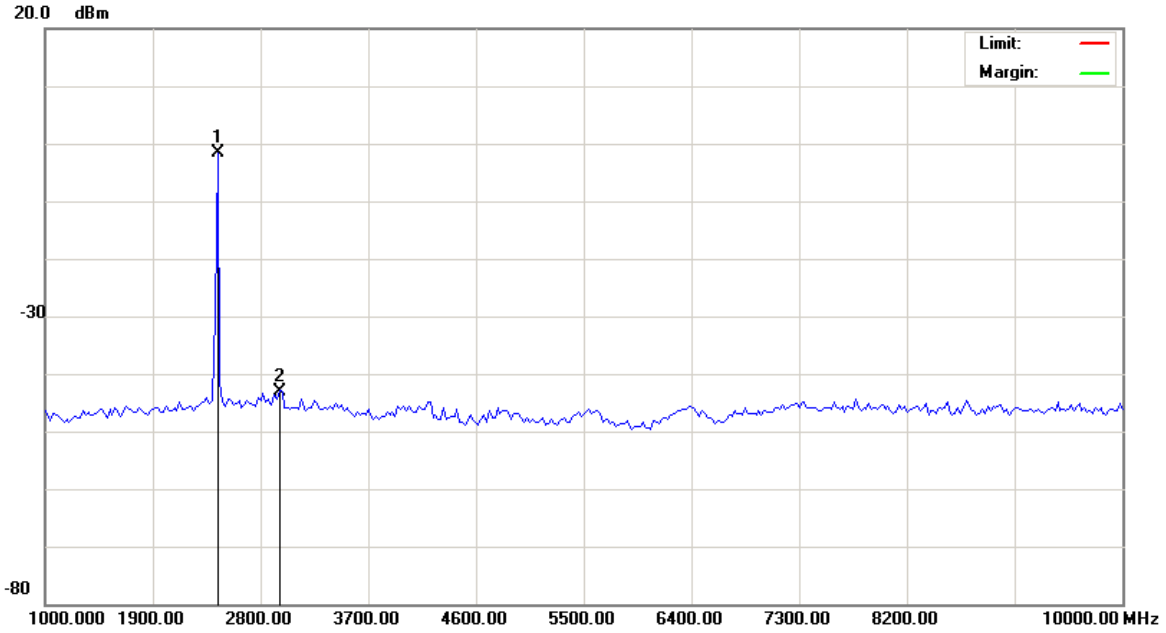
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	119.7250	-42.35	0.00	-42.35			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#6 Date: 2007/07/13 Time: 下午 02:10:50



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24347
direct Spectrum

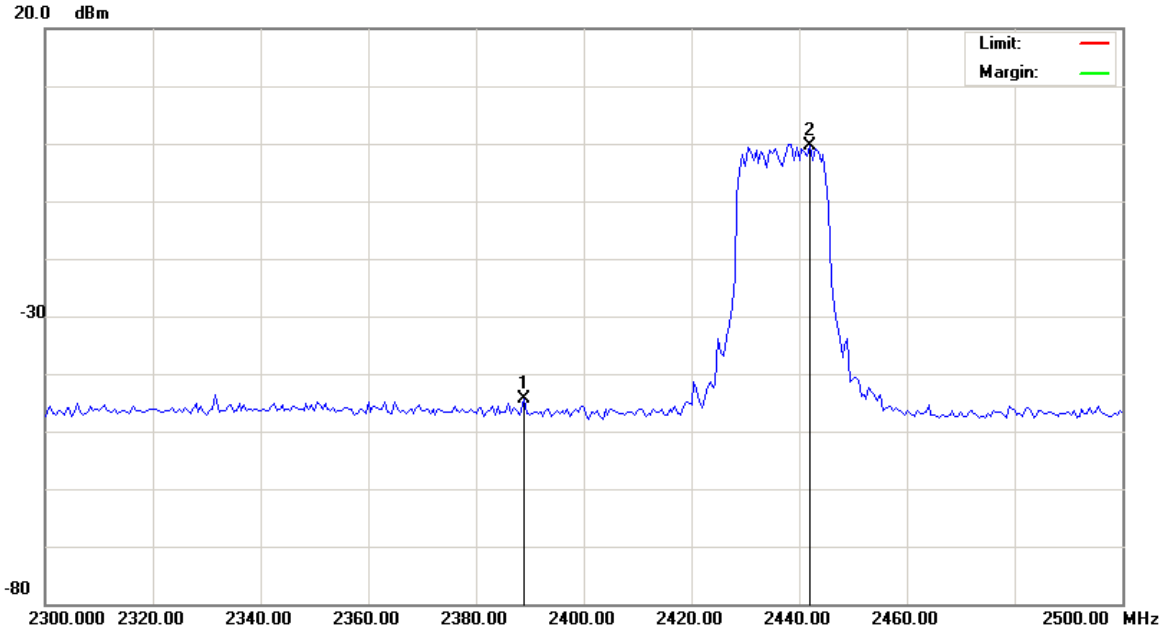
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2440.000	-1.62	0.00	-1.62			peak			
2		2957.500	-43.00	0.00	-43.00			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#7 Date: 2007/07/13 Time: 下午 02:11:02



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24347
direct Spectrum

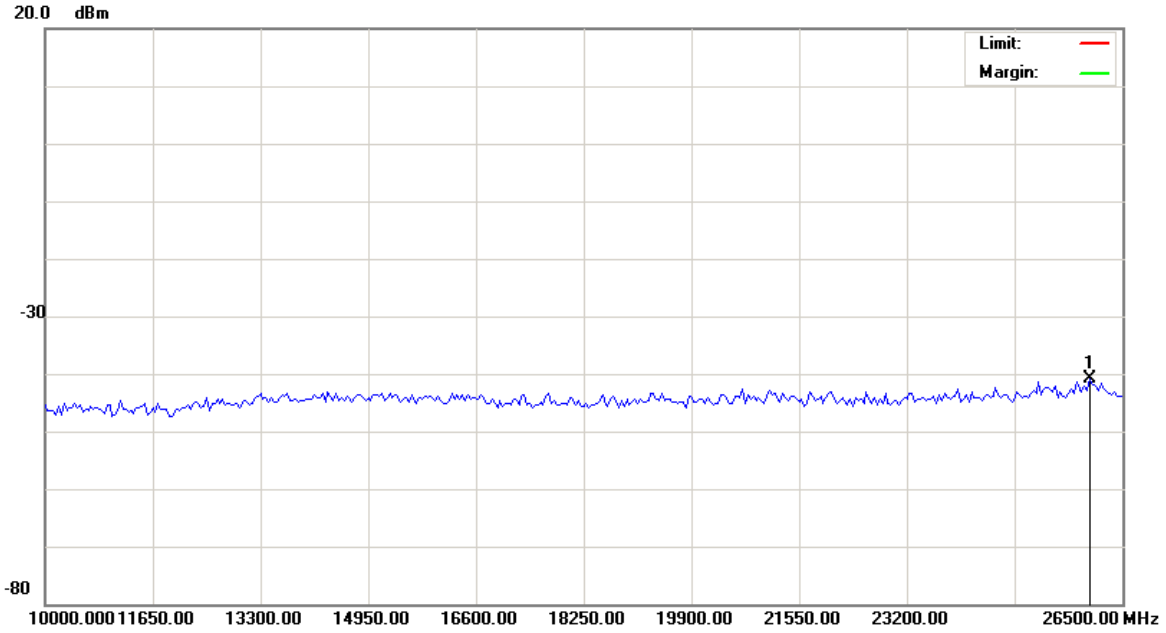
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2389.000	-44.34	0.00	-44.34			peak			
2	*	2442.000	-0.47	0.00	-0.47			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#8 Date: 2007/07/13 Time: 下午 02:11:15



Site site #1 Polarization: Temperature: 26 ℃

Limit: Power: AC 110V/60Hz Humidity: 55 %

EUT: VOIP Distance:

M/N: WG3512

Mode: 11g

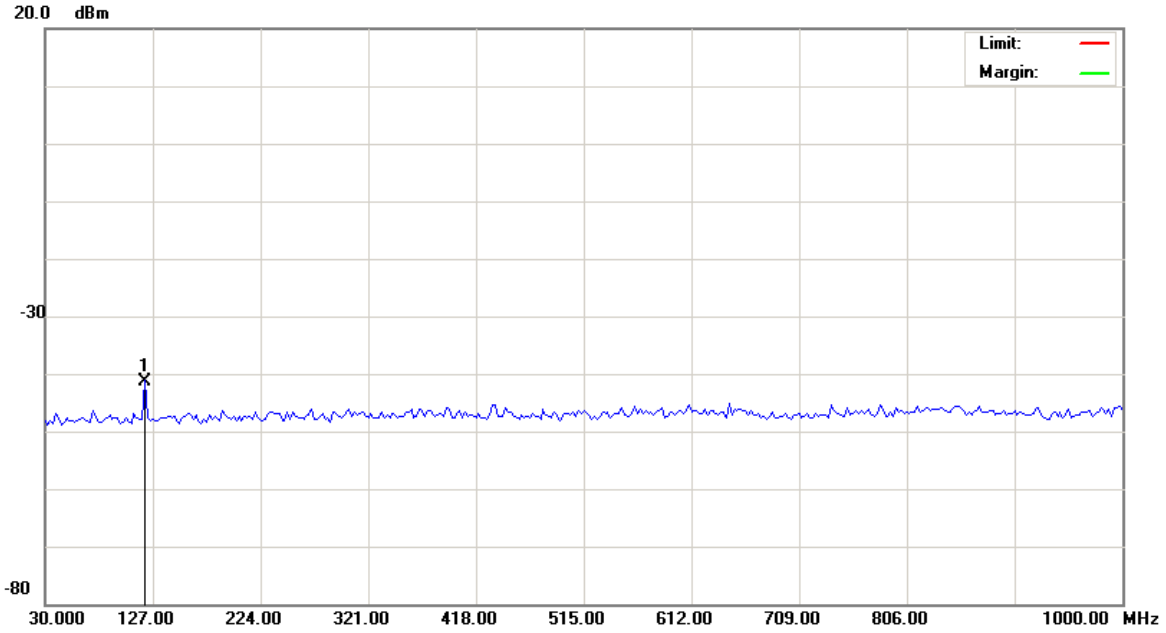
Note: CH24347

direct Spectrum

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	26005.00	-40.96	0.00	-40.96			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#9 Date: 2007/07/13 Time: 下午 02:13:32



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24362
direct Spectrum

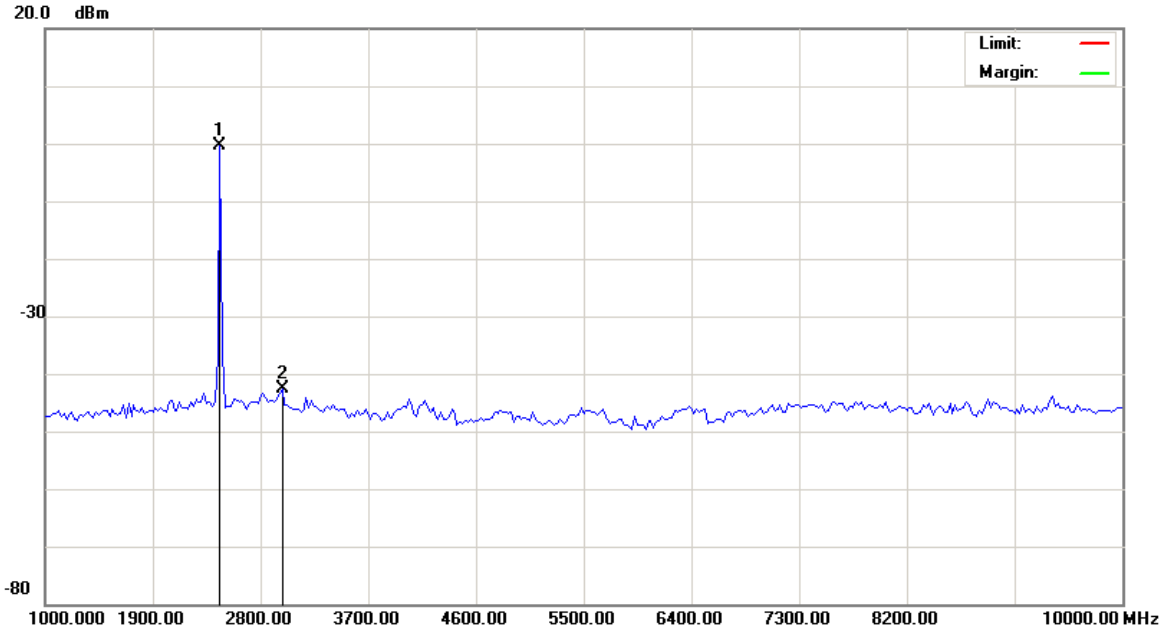
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	119.7250	-41.25	0.00	-41.25			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#10 Date: 2007/07/13 Time: 下午 02:13:45



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24362
direct Spectrum

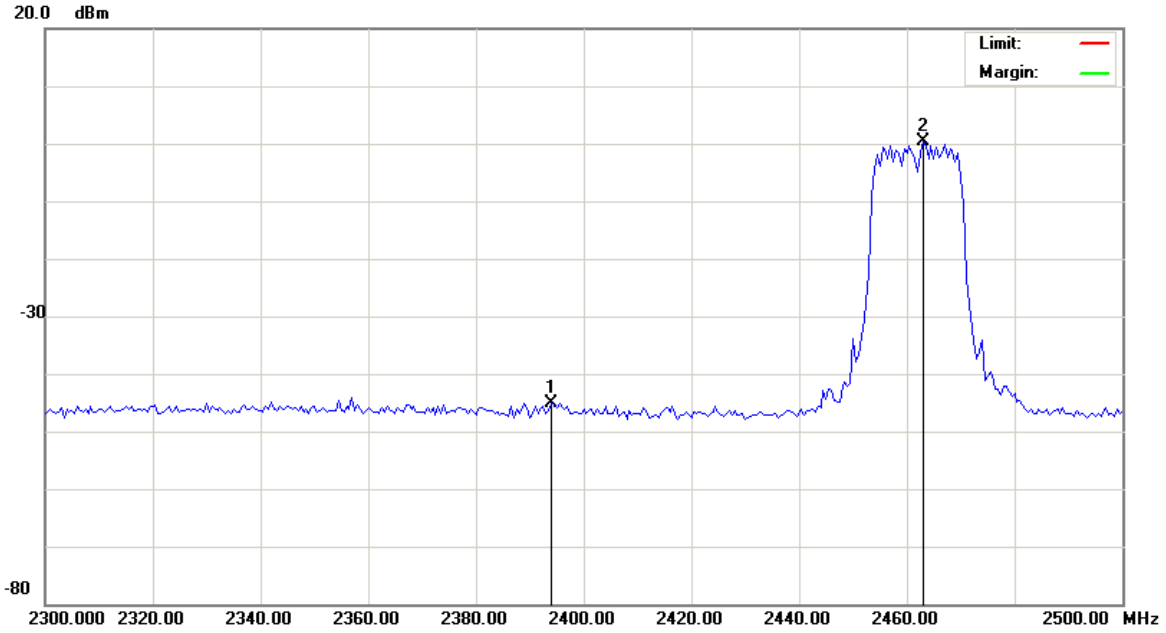
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	2462.500	-0.32	0.00	-0.32			peak			
2		2980.000	-42.56	0.00	-42.56			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#11 Date: 2007/07/13 Time: 下午 02:13:58



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24362
direct Spectrum

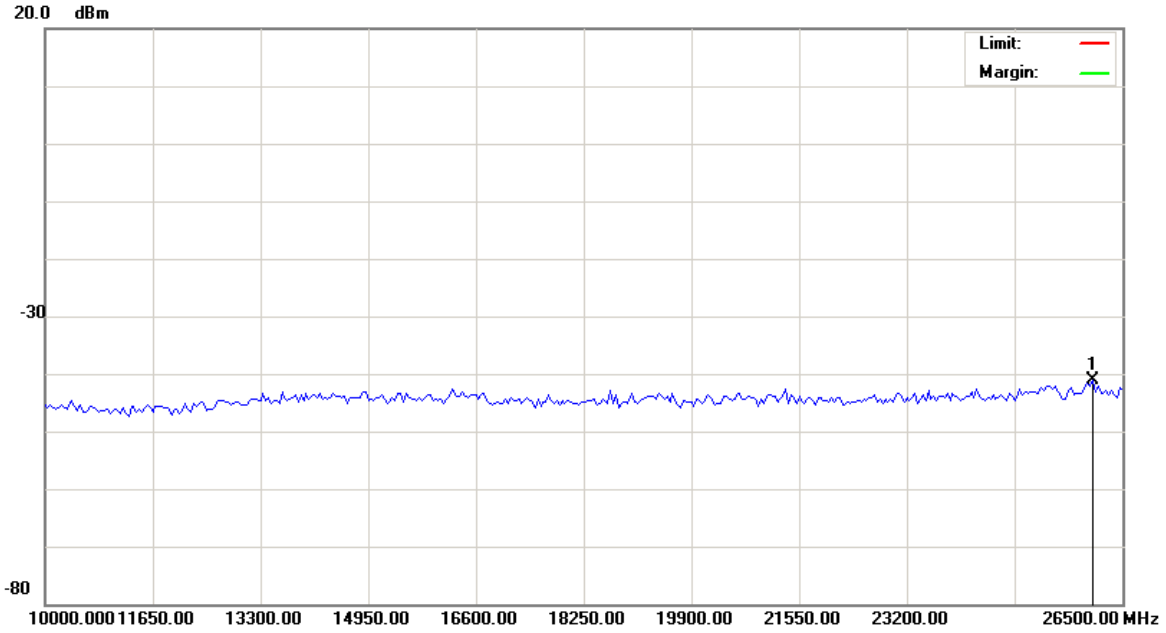
Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1		2394.000	-45.10	0.00	-45.10			peak			
2	*	2463.000	0.28	0.00	0.28			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

File :WG3512 conducted 20dB Data :#12 Date: 2007/07/13 Time: 下午 02:14:10



Site site #1
Limit:
EUT: VOIP
M/N: WG3512
Mode: 11g
Note: CH24362
direct Spectrum

Polarization:
Power: AC 110V/60Hz
Distance:

Temperature: 26 ℃
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBm	dB	dBm	dBm	dB	Detector	cm	degree	Comment
1	*	26046.25	-41.14	0.00	-41.14			peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

8. Band Edges Requirements

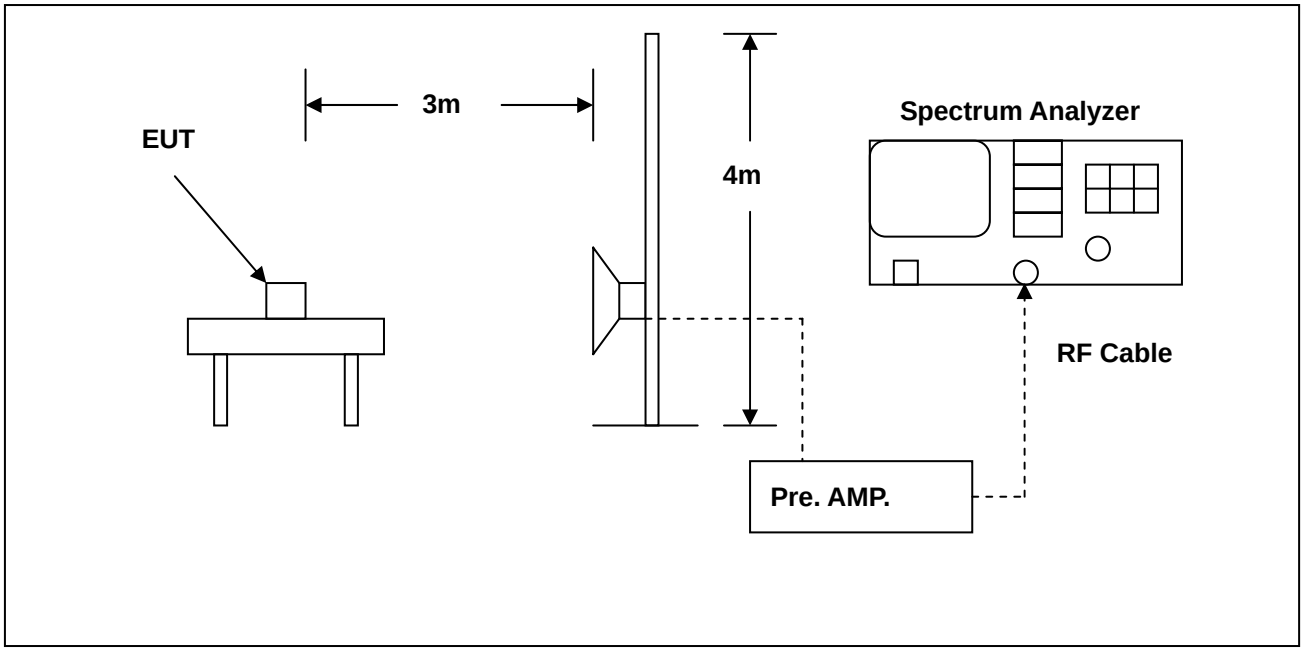
8.1 Test Condition & Setup:

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

8.2 Test Instruments Configuration:



8.3 Test Equipment List:

Describe	Manufacturer	Model	Serial Number	Calibration	
				Cal. Date	Due Date
Spectrum Analyzer	Agilent	E4408B	MY45107753	May. 28, 2007	May. 28, 2008
Pre Amplifier	Agilent	8449B	3008A02237	May. 28, 2007	May. 28, 2008
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	Jun. 26, 2007	Jun. 26, 2008

8.4 Test Result:

Applicant	: Welltech Computer CO., LTD.
Model No	: WG-3512
EUT	: Gateway
Test Mode	: 802.11b Low CH & High CH
Test Date	: 07/11/2007

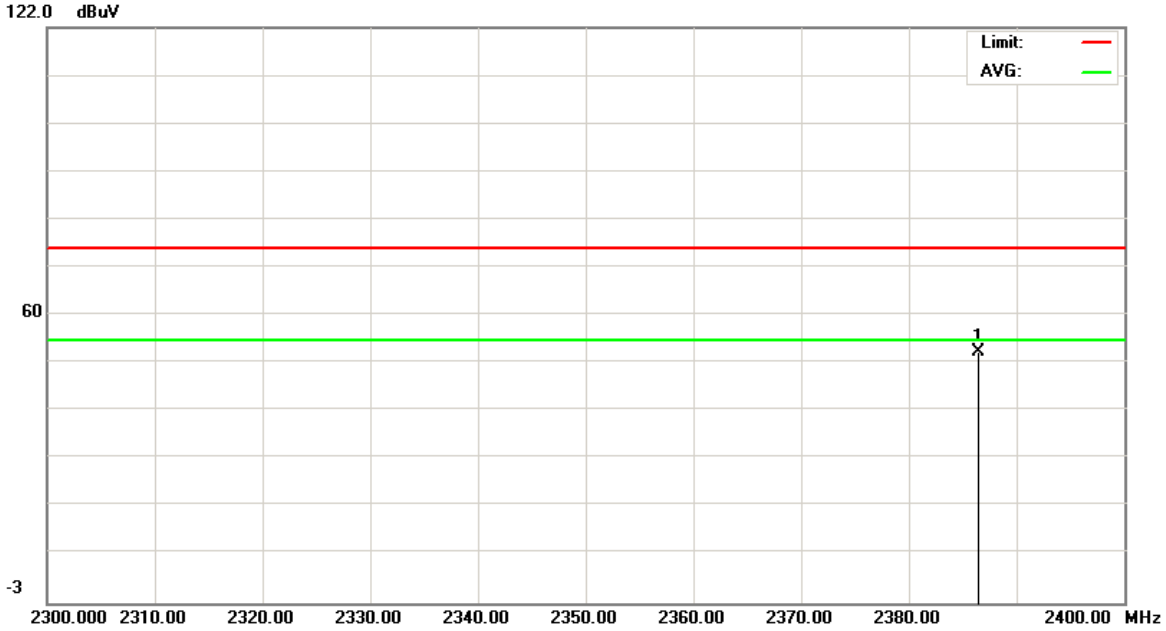
Test Graphs See next page.

Notes:

1. Margin= Amplitude - Limits
2. Height of table for EUT placed: 0.8 Meter.
3. ANT= Antenna height.
4. Duty= Duty cycle correction factor.
5. Dis= Distance extrapolation factor.
6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
7. Actual Amp= Amplitude – Duty – Dis.

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#1 Date: 11/7/2007 Time: 20:14:40



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b bandedge
Note: 2412

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m

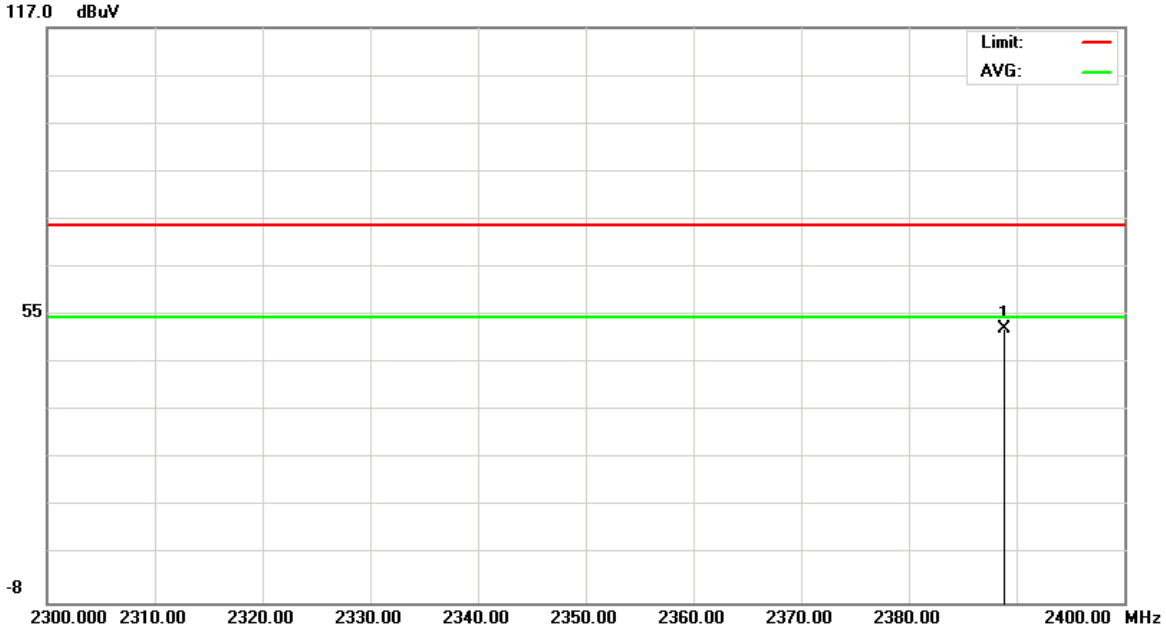
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2386.400	51.37	0.16	51.53	74.00	-22.47	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#5 Date: 11/7/2007 Time: 20:32:41



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b bandedge
Note: 2412

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m

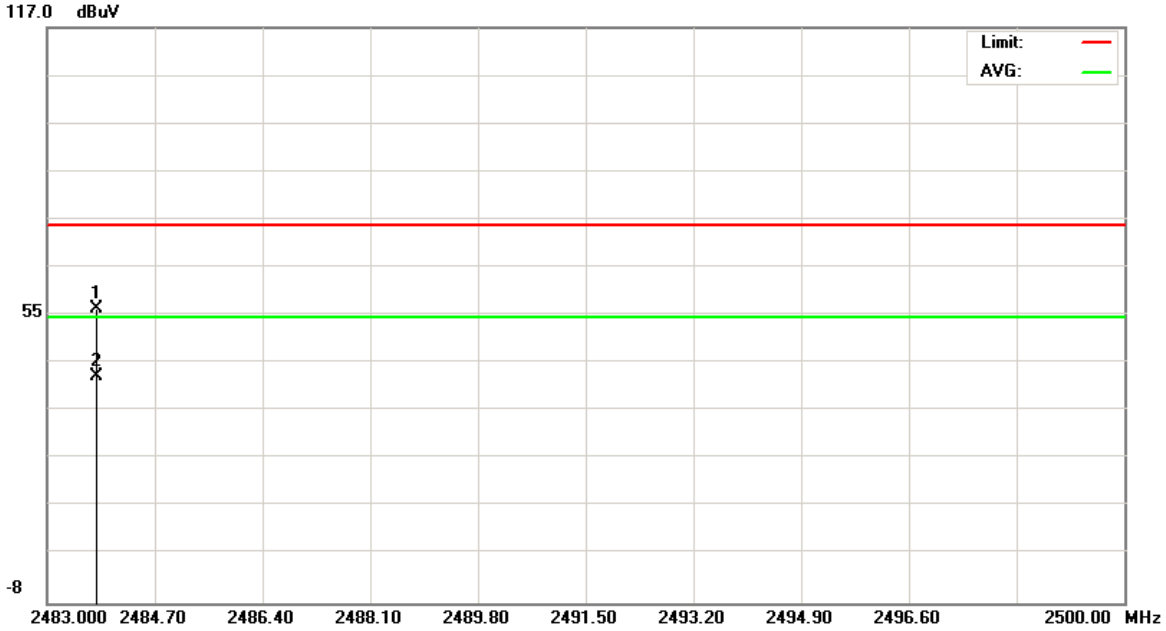
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1	*	2388.800	51.22	0.16	51.38	74.00	-22.62	peak			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#3 Date: 11/7/2007 Time: 20:20:33



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b bandedge
Note: 2462

Polarization: ***Vertical***
Power: AC 110V/60Hz
Distance: 3m

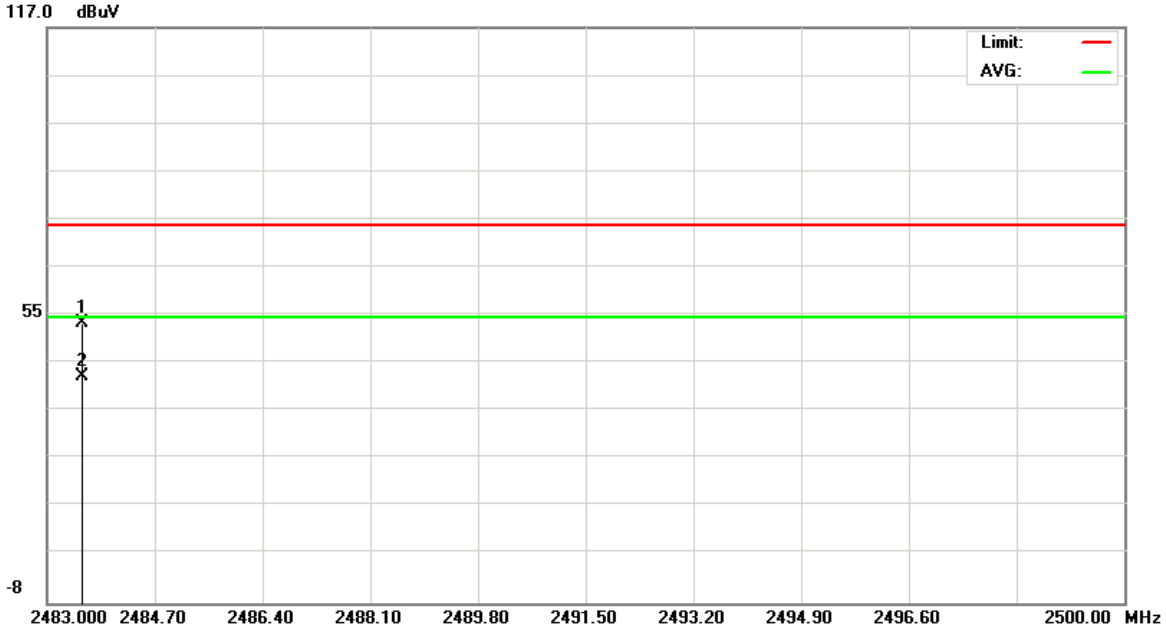
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2483.782	55.79	0.25	56.04	74.00	-17.96	peak			
2	*	2483.782	40.96	0.25	41.21	54.00	-12.79	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#7 Date: 11/7/2007 Time: 20:41:04



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11b bandedge
Note: 2462

Polarization: ***Horizontal***
Power: AC 110V/60Hz
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2483.544	52.48	0.25	52.73	74.00	-21.27	peak			
2	*	2483.544	41.11	0.25	41.36	54.00	-12.64	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Applicant	: Welltech Computer CO., LTD.
Model No	: WG-3512
EUT	: Gateway
Test Mode	: 802.11g Low CH & High CH
Test Date	: 07/11/2007

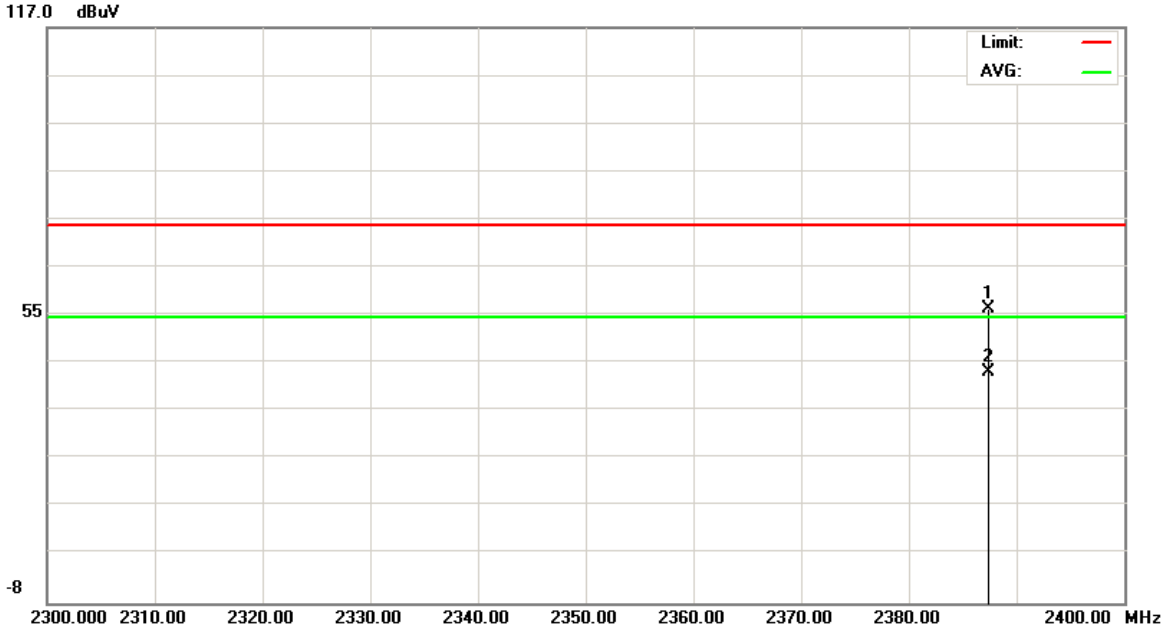
Test Graphs See next page.

Notes:

1. Margin= Amplitude - Limits
2. Height of table for EUT placed: 0.8 Meter.
3. ANT= Antenna height.
4. Duty= Duty cycle correction factor.
5. Dis= Distance extrapolation factor.
6. Amplitude= Reading Amplitude – Amplifier gain + Cable loss + Antenna factor
   (Auto calculate in spectrum analyzer)
7. Actual Amp= Amplitude – Duty – Dis.

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#1 Date: 2007/07/11 Time: 22:02:30



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g bandedge
Note: 2412

Polarization: ***Vertical***
Power:
Distance: 3m

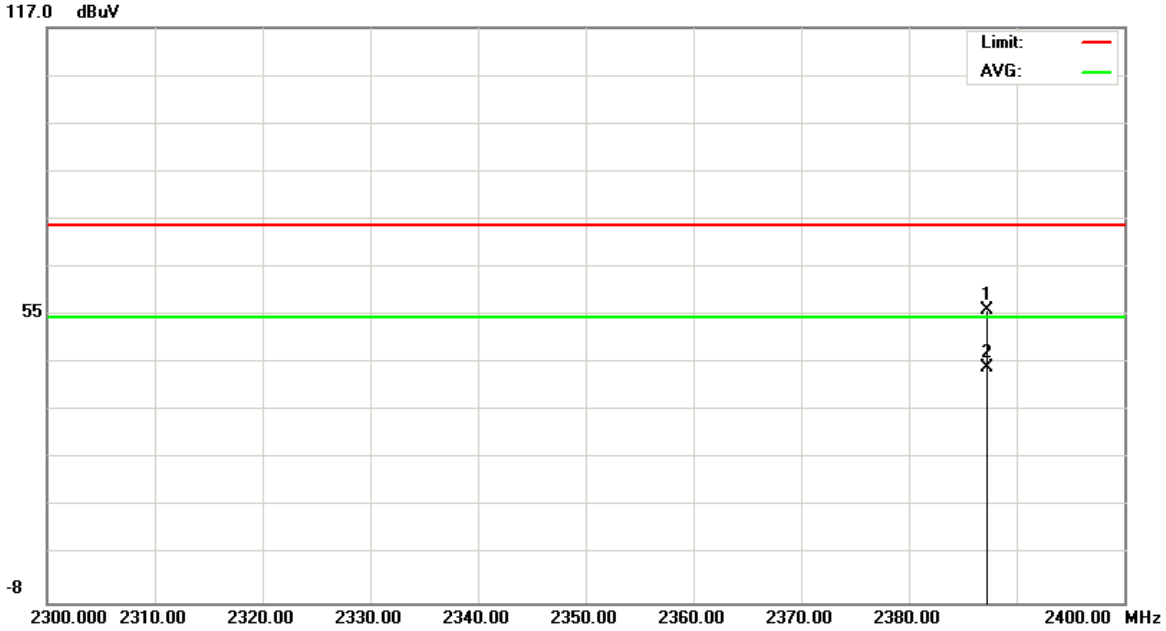
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2387.400	55.81	0.16	55.97	74.00	-18.03	peak			
2	*	2387.400	41.96	0.16	42.12	54.00	-11.88	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#5 Date: 2007/07/11 Time: 22:11:22



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g bandedge
Note: 2462

Polarization: ***Horizontal***
Power:
Distance: 3m

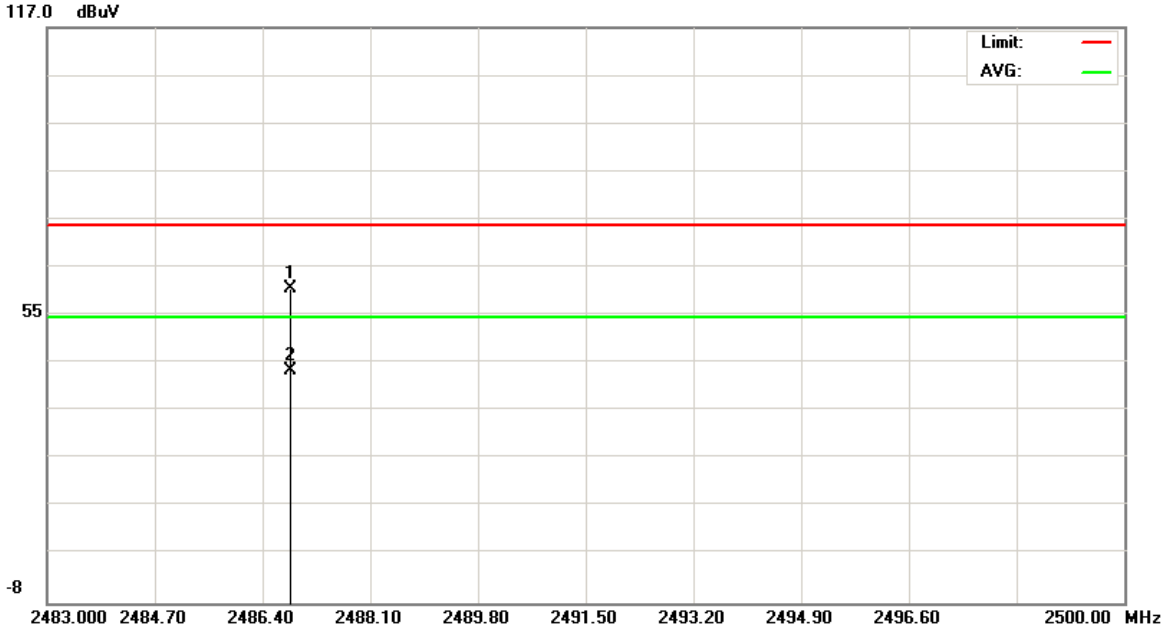
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2387.200	55.44	0.16	55.60	74.00	-18.40	peak			
2	*	2387.200	42.96	0.16	43.12	54.00	-10.88	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#3 Date: 2007/07/11 Time: 22:06:30



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g bandedge
Note: 2412

Polarization: ***Vertical***
Power:
Distance: 3m

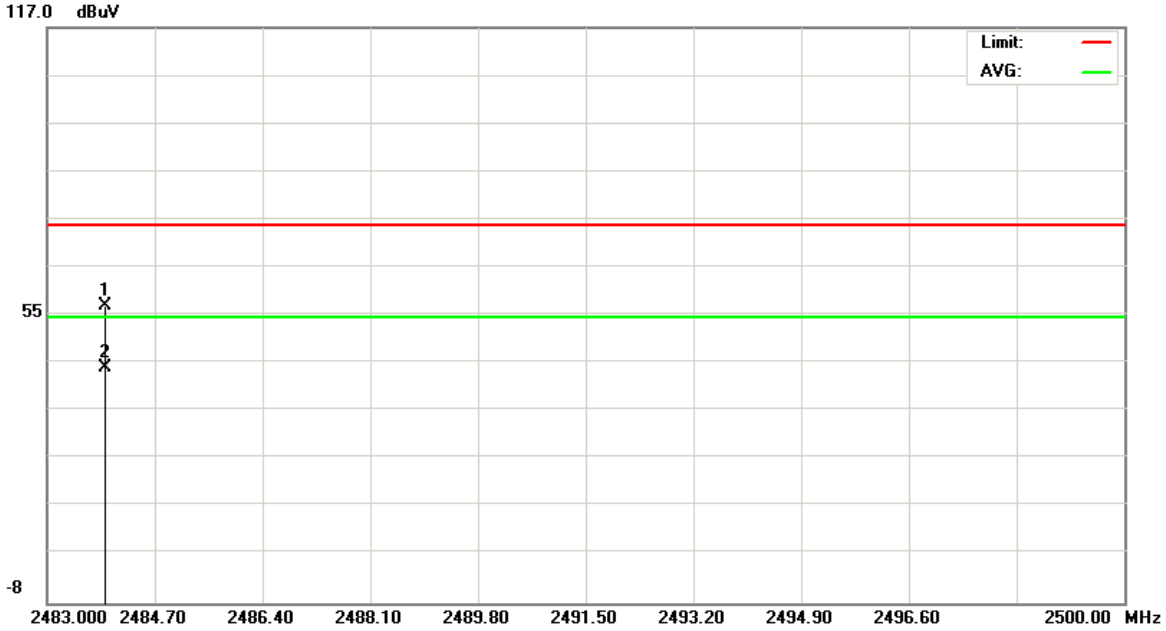
Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2486.842	60.01	0.25	60.26	74.00	-13.74	peak			
2	*	2486.842	42.16	0.25	42.41	54.00	-11.59	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

Radiated Emission Measurement

File :WG-3512(bandedge) Data :#7 Date: 2007/07/11 Time: 22:15:11



Site 966半電波暗室
Limit: FCC part 15 (PK)
EUT: VOIP
M/N: WG-3512
Mode: 11g bandedge
Note: 2462

Polarization: ***Horizontal***
Power:
Distance: 3m

Temperature: 22 ℃
Humidity: 60 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	cm	degree	Comment
1		2483.918	56.24	0.25	56.49	74.00	-17.51	peak			
2	*	2483.918	42.96	0.25	43.21	54.00	-10.79	AVG			

*:Maximum data x:Over limit !:over margin ●Reference Only

9. Antenna Requirements

9.1 Standard Applicable:

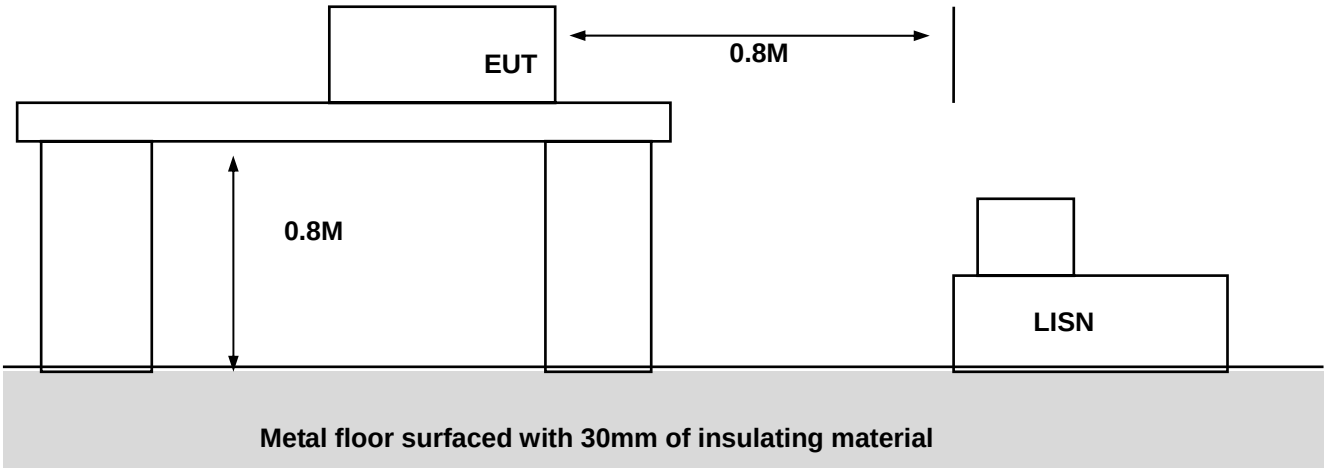
For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 Antenna Connector Construction

The antenna used in this product is external Whip antenna. And the maximum Gain of this antenna is only **2** dBi.

Appendix A - EUT Test SETUP

MEASUREMENT OF POWER LINE CONDUCTED RFI VOLTAGE



MEASUREMENT OF RADIATED EMISSION