# Measurement Report

Part 15 Subpart B & C (15.247)

Product	: Wireless-G Broadband Router
Applicant	: IOGEAR, Inc.
FCC ID	: QLEGWA504
Model No.	: GWA504
Report No.	: MLT0505P15001
Issue Date	: May 30, 2005

Test By

Max Light Technology Co.,Ltd.

*Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, Taiwan., R.O.C.* Tel: 886-2-2363-2447 Fax: 886-2-2363-2597

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# 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 *MLT(Max Light Technology Co.,Ltd) Room 5, 8F, No.125, Section 3 Roosevelt Road, Taipei, 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 B & C (15.247).

EUT	: Wireless-G Broadband Router
Applicant	: IOGEAR, Inc. 23 Hubble Drive ,Irvine ,CA 92618
Manufacturer	: Advance Multimedia Internet Technology Inc. NO.32,Hwan-Gong Rd. Yung Kang City, Tainan Hsien, Taiwan
Model No	: GWA504
FCC ID	: QLEGWA504

Prepared by : Country Huang Approved by : Reger Chen Country Huang



# I. GENERAL

# **1.1 Introduction**

The following measurement report is submitted on behalf of Advance Multimedia Internet Technology Inc. . 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.** 

# **1.2 Description of EUT**

EUT	: Wireless-G Broadband Router
Applicant	: IOGEAR, Inc. 23 Hubble Drive ,Irvine ,CA 92618
Manufacturer	: Advance Multimedia Internet Technology Inc. NO.32,Hwan-Gong Rd. Yung Kang City, Tainan Hsien, Taiwan
Model No	: GWA504
FCC ID	: QLEGWA504
Power Type	: Powered by AC Adapter (120V@60Hz-30W) Model No.: AM-0751500D
Frequency of Channe	I: See Next page
Type of Modulation	: Direct Sequence Spread Spectrum
Type of Antenna	: 1/4 DIOPLE Antenna

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.



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#### 802.11b & 802.11g Frequency of Each Channel (Working Frequency)

Channel No.	Frequency (MHz)
01	2412
02	2417
03	2422
04	2427
05	2432
06	2437
07	2442
08	2447
09	2452
10	2457
11	2462

# 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		

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# **1.4 Description of Support Equipment**

In order to construct the minimum system which required by the ANSI C63.4-2001, following equipments were used as the support units.

Computer	: HP
Model No.	: Biro
Serial No.	: 12HGS521
FCC ID	: FCC DOC
Computer	: IBM
Model No.	: 16W
Serial No.	: BNL345M
FCC ID	: FCC DOC
Keyboard	: IBM
Model No.	: KB-9930
Serial No.	: 09N5395
FCC ID	: FCC DOC
Monitor	: IBM
Model No.	: 10L6145 030
Serial No.	: 23-092079
FCC ID	: FCC DOC
Mouse	: IBM
Model No.	: 0180-05N
Serial No.	: 23-96142

: EMJMUSJJ

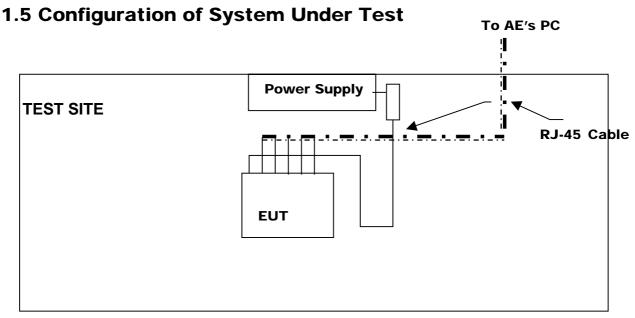
FCC ID



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During testing the EUT(Router) 's LAN / L1&L2&L3&L4 Ethernet port connected to the Remote Ethernet and WAN port connected to the Remote Ethernet. So there is need for additional Ethernet card.

# **1.6 Test Procedure**

All measurements contained in this report were performed according to the techniques described in Measurement procedure ANSI C63.4-2001 "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 was 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.

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# II. 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 backwall 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 3825/2 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:

- A. EMCO 3825/2 LISN (S/N:2654)
- B. EMCO 3825/2 LISN (S/N:2658)
- C. HP 8591EM 9KHZ-1.8GHz Spectrum Analyzer (S/N:73412A00110)
- D. R&S ESH3 Test Receiver (S/N:892108/025)
- E. Shielded Room (MLT-SR1)



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# 2.3 Test Configuration:



Front View of The Test Configuration



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**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	Limits (dBuV)	
(MHz)	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

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# 2.6 Measurement Data Of Conducted Emissions:

# 2.6.1 Conducted Emissions (Subpart B & C)

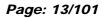
The following table show a summary of the highest emissions of power line conducted emissions to the HOT and NATURAL conductor of the EUT power.

Applicant	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH1)
Test Date	: 05/18/2005

Power Line Conducted Emissions (Class B)					
Conductor	Frequency	Frequency Quasi-Peak Limits Av			
	(MHz)	(dBuV)		(dBuV)	
	0.20	56.85	63.57	40.30	53.57
	0.38	53.01	58.09	38.70	48.09
	0.60	49.44	56	35.24	46
L1	9.97	39.14	60		50
	17.66	42.62	60		50
	23.14	42.86	60		50
	24.40	45.97	60		50
	0.18	56.00	64.21	40.15	54.21
	0.32	51.08	59.58	38.25	49.58
	0.45	47.83	56.71	37.96	46.71
L2	10.45	46.07	60		50
	12.00	47.00	60		50
	18.23	43.98	60		50
	24.40	44.86	60		50

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.





## 2.6.2 Conducted Emissions (Subpart B & 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH06)
Test Date	: 05/18/2005

Power Line Conducted Emissions (Class B)						
Conductor	Frequency Quasi-Peak Limits Average Lim					
	(MHz)	(dBuV)		(dBuV)		
	0.20	56.51	63.57	41.02	53.57	
	0.41	52.50	57.47	38.23	47.47	
	1.00	43.78	56		46	
L1	12.00	40.42	60		50	
	18.33	42.21	60		50	
	19.53	44.99	60		50	
	24.40	45.31	60		50	
	0.19	55.23	63.82	41.17	53.82	
	0.35	49.85	58.77	38.01	48.77	
	0.49	47.04	56.15	37.63	46.15	
L2	10.40	42.76	60		50	
	12.00	45.36	60		50	
	18.223	44.81	60		50	
	24.40	44.22	60		50	

1.L1: One end & Ground L2: The other end & Ground Notes : 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.

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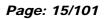
# 2.6.3 Conducted Emissions (Subpart B & C)

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.

: IOGEAR, Inc.
: GWA504
: Wireless-G Broadband Router
: 802.11b (CH11)
: 05/18/2005

Power Line Conducted Emissions (Class B)					
Conductor	Frequency Quasi-Peak		Limits	Average	Limits
	(MHz)	(dBuV)		(dBuV)	
	0.17	56.77	64.72	39.42	54.72
	0.29	54.09	60.41	37.21	50.41
	0.41	52.92	57.47	36.87	47.47
L1	1.00	43.84	56		46
	12.00	44.73	60		50
	23.14	42.89	60		50
	24.40	45.91	60		50
	0.21	54.47	63.17	40.23	53.17
	0.37	49.56	58.35	37.91	48.35
	9.91	43.11	60		50
L2	10.45	46.23	60		50
	12.00	47.75	60		50
	19.53	44.38	60		50
	24.40	44.55	60		50

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.





## 2.6.4 Conducted Emissions (Subpart B & 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.

band Router

Power Line Conducted Emissions (Class B)					
Conductor	Frequency Quasi-Pe		Limits	Average	Limits
	(MHz)	(dBuV)		(dBuV)	
	0.18	56.83	64.21	39.87	54.21
	0.28	54.34	60.82	38.05	50.82
	0.49	51.87	56.10	36.43	46.10
L1	0.96	43.89	56		46
	12.00	44.45	60		50
	18.223	42.75	60		50
	24.40	44.49	60		50
	0.18	55.73	64.49	40.28	54.49
	0.26	52.53	61.34	37.42	51.34
	0.42	48.59	57.33	36.63	47.33
L2	10.45	43.84	60		50
	12.00	47.34	60		50
	18.23	44.32	60		50
	24.40	44.83	60		50

1.L1: One end & Ground L2: The other end & Ground Notes : 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.

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# 2.6.5 Conducted Emissions (Subpart B & 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH06)
Test Date	: 05/18/2005

Power Line Conducted Emissions (Class B)					
Conductor	Frequency	Quasi-Peak	Limits	Average	Limits
	(MHz)	(dBuV)		(dBuV)	
	0.20	56.18	63.49	39.99	53.49
	0.32	53.49	59.48	38.05	49.48
	0.54	50.89	56	36.97	46
L1	0.98	43.98	56		46
	18.223	43.19	60		50
	19.53	45.26	60		50
	24.40	44.92	60		50
	0.19	55.28	63.95	41.09	53.95
	0.26	52.49	61.30	38.15	51.30
	0.42	48.61	57.33	37.02	47.33
L2	12.00	47.03	60		50
	18.23	44.70	60		50
	19.53	44.33	60		50
	24.40	44.38	60		50

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.

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### 2.6.6 Conducted Emissions (Subpart B & 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.

: IOGEAR, Inc.
: GWA504
: Wireless-G Broadband Router
: 802.11g (CH11)
: 05/18/2005

Power Line Conducted Emissions (Class B)					
Conductor	Frequency	Quasi-Peak	Limits	Average	Limits
	(MHz)	(dBuV)		(dBuV)	
	0.18	56.91	64.21	41.32	54.21
	0.34	53.46	59.18	37.49	49.18
	0.54	51.22	56	37.45	46
L1	1.04	43.89	56		46
	11.87	40.06	60		50
	18.23	42.72	60		50
	24.40	44.38	60		50
	0.19	55.37	63.91	39.77	53.91
	0.29	51.62	60.41	37.43	50.41
	0.42	48.65	57.43	35.88	47.43
L2	12.00	44.17	60		50
	18.223	45.12	60		50
	19.53	43.66	60		50
	24.40	43.80	60		50

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.

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# III. Radiated Emissions Requirements

# 3.1 General Configuration:

Prior to open-field testing, the EUT was placed in a shielded enclosure and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT 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, directivity, and frequency. The exact system configuration which produced the highest emissions was noted so it could be reproduced later during the open-field tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

# 3.2 General Configuration:

Final radiation measurements were made on a three-meter, open-field test site. 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, 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.

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The field strength below 1 GHz was measured by EMCO Biconilog Antenna (mode 3142) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 - 40 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 microvlt (dBuV) into field intensity in microvolts pre meter(uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in microcolts 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.



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(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:

- (1) For fundamental frequency : Transmitter Output < +30dBm
- (2) For spurious frequency : Spurious emission limits = fundamental emission limit /10

# **3.3 Test Equipment List:**

- A. HP 8591EM 9KHz-1.8GHz Spectrum Analyzer (S/N:73412A00230)
- **B. HP 8447D Pre Amplifier (S/N:2944A08954)**
- C. EMCO 3142 26MHz~2000MHz Biconilog Antenna (S/N:1184)
- D. R&S ESVP 20MHz~1300MHz Test Receiver (S/N:881121/01)
- E. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291)
- F. HP 8449B 1GHZ~26.5GHZ PRE Amplifier (S/N:1982901A91)
- G. SCHWARZBECK BBHA 9120D 1GHz~18GHz Horn Antenna (S/N:141S3)
- H. SCHWARZBECK BBHA 9170 15GHz~40GHz Horn Antenna (S/N:192S5)



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# 3.4 Test Configuration:



Front View of The Test Configuration



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**Rear View of The Test Configuration** 

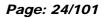


# 3.5 Test condition:

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

# **3.6 Radiated Emissions Limits:**

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





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# **3.7 Measurement Data Of Radiated Emissions:**

3.7.1 Open Field Radiated Emissions (Subpart B)

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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH01)
Test Date	: 05/17/2005

Radiated Emissions (HORIZONTAL)					
Frequency	Amplitude	Ant.	Table	Limits(Class B)	Margin
(MHz)	(dBuV/m)	(m)	(Degree)	(dBuV/m)	(dB)
100.01	34.15	2.1	120	43.5	-9.35
108.40	33.52	2	220	43.5	-9.98
111.40	32.89	1.6	310	43.5	-10.61
125.00	32.61	1.2	300	43.5	-10.89
240.00	40.22	2	160	46	-5.78
300.01	43.43	1.3	210	46	-2.57
375.00	42.57	1.2	320	46	-3.43
417.50	40.10	1. 1	310	46	-5.90
480.02	40.78	1.5	310	46	-5.22
500.00	43.02	1.3	300	46	-2.98
625.00	40.79	1	200	46	-5.21

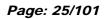
# Notes : 1. Margin= Amplitude - Limits

2.Distance of Measurement : 3 Meter (30-1000MHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

# 5.Amplitude= Reading Amplitude -Amplifier gain+Cable loss +Antenna factor





#### 3.7.2 Open Field Radiated Emissions (Subpart B)

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

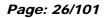
Applicant	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH01)
Test Date	: 05/17/2005

Radiated Emissions (VERTICAL)								
Frequency	Amplitude	mplitude Ant. Table Limits(Class B) Marg						
(MHz)	(dBuV/m)	(m)	(Degree)	(dBuV/m)	(dB)			
60.20	35.92	1	260	40	-4.08			
100.00	38.30	1.5	330	43.5	-5.20			
111.63	37.83	1.5	180	43.5	-5.67			
125.00	36.25	1	190	43.5	-7.25			
142.09	37.30	1.5	200	43.5	-6.20			
151.59	38.57	2	310	43.5	-4.93			
167.00	35.90	1	380	43.5	-7.60			
300.00	41.73	2	310	46	-4.27			
500.01	41.61	1.5	330	46	-4.39			
755.81	41.45	1.5	220	46	-4.55			
901.30	42.11	1	180	46	-3.89			

*Notes : 1.*Margin= Amplitude - Limits

2.Distance of Measurement : 3 Meter (30-1000MHz)

- 3. Height of table for EUT placed: 0.8 Meter.
- 4.ANT= Antenna height.
- 5.Amplitude= Reading Amplitude Amplifier gain+Cable loss +Antenna factor





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MEASUREMENT REPORT

### 3.7.3 Open Field Radiated Emissions (Subpart B)

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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH01)
Test Date	: 05/17/2005

Radiated Emissions (HORIZONTAL)								
Frequency	Amplitude	mplitude Ant. Table Limits(Class B) Margin						
(MHz)	(dBuV/m)	(m)	(Degree)	(dBuV/m)	(dB)			
100.00	34.23	1.5	240	43.5	-9.27			
108.45	33.77	1	250	43.5	-9.73			
151.48	33.16	2	240	43.5	-10.34			
161.38	33.99	1.5	310	43.5	-9.51			
240.00	40.22	1	360	46	-5.78			
300.00	43.51	1.5	150	46	-2.49			
375.00	42.42	1	300	46	-3.58			
417.51	40.01	2	340	46	-5.99			
500.00	42.82	1	300	46	-3.18			
625.00	40.26	1.5	280	46	-5.74			
645.00	41.02	1	260	46	-4.98			

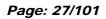
#### Notes : 1. Margin= Amplitude - Limits

2.Distance of Measurement : 3 Meter (30-1000MHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Amplitude= Reading Amplitude -Amplifier gain+Cable loss +Antenna factor





#### 3.7.4 Open Field Radiated Emissions (Subpart B)

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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH01)
Test Date	: 05/17/2005

Radiated Emissions (VERTICAL)								
Frequency	Amplitude	mplitude Ant. Table Limits(Class B) Margin						
(MHz)	(dBuV/m)	(m)	(Degree)	(dBuV/m)	(dB)			
60.25	35.85	1	280	40	-4.15			
100.01	38.28	1	250	43.5	-5.22			
111.62	37.80	2	300	43.5	-5.70			
125.02	36.11	2	150	43.5	-7.39			
142.11	37.42	1.5	270	43.5	-6.08			
151.59	38.59	1.5	210	43.5	-4.91			
167.02	35.92	1	380	43.5	-7.58			
300.01	41.56	1.5	310	46	-4.44			
500.00	41.80	2	350	46	-4.20			
755.80	41.41	1	180	46	-4.59			
901.30	42.03	11.5	220	46	-3.97			

*Notes : 1.*Margin= Amplitude - Limits

2.Distance of Measurement : 3 Meter (30-1000MHz)

- 3. Height of table for EUT placed: 0.8 Meter.
- 4.ANT= Antenna height.
- 5.Amplitude= Reading Amplitude Amplifier gain+Cable loss +Antenna factor

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# 3.7.5 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH01)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	47.99 PK	1	280	0	9.54	38.45	74.00	-35.55
4176.5	32.15 PK	1	300	0	9.54	22.61	74.00	-51.39
7315.0	39.89 PK	1	250	0	9.54	30.35	74.00	-43.65
9312.0	40.58 PK	1.1	200	0	9.54	31.04	74.00	-42.96
10582.5	42.36 PK	1	260	0	9.54	32.82	74.00	-41.18
12524.0	43.66 PK	1	300	0	9.54	34.12	74.00	-39.88
14538.0	46.52 PK	1	220	0	9.54	36.98	74.00	-37.02

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

**5.Duty= Duty cycle correction factor.** 

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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### 3.7.6 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH01)
Test Date	: 05/20/2005

	Radiated Emissions (VERTICAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	47.25 PK	1	240	0	9.54	37.71	74.00	-36.29
3772.5	40.21 PK	1	150	0	9.54	30.67	74.00	-43.33
4120.5	35.01 PK	1	200	0	9.54	25.47	74.00	-48.53
8837.0	39.55 PK	1	280	0	9.54	30.01	74.00	-43.99
10611.0	42.40 PK	1	320	0	9.54	32.86	74.00	-41.14
11508.0	41.52 PK	1	180	0	9.54	31.98	74.00	-42.02
14037.0	46.02 PK	1	200	0	9.54	36.48	74.00	-37.52

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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#### 3.7.7 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH06)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	48.21 PK	1	300	0	9.54	38.67	74.00	-35.33
4638.0	34.52 PK	1	280	0	9.54	24.98	74.00	-49.02
7258.5	39.64 PK	1	200	0	9.54	30.10	74.00	-43.90
9708.5	43.57 PK	1	310	0	9.54	34.03	74.00	-39.97
10856.5	43.20 PK	1	300	0	9.54	33.66	74.00	-40.34
13696.0	45.52 PK	1	240	0	9.54	35.98	74.00	-38.02
16257.0	44.27 PK	1	120	0	9.54	34.73	74.00	-39.27

*Notes : 1.*Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss +Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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### 3.7.8 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH06)
Test Date	: 05/20/2005

Radiated Emissions (VERTICAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	45.88 PK	1.2	200	0	9.54	36.34	74.00	-37.66
3759.0	38.76 PK	1	280	0	9.54	29.22	74.00	-44.78
7162.0	39.88 PK	1	340	0	9.54	30.34	74.00	-43.66
9054.0	40.11 PK	1	140	0	9.54	30.57	74.00	-43.43
11394.0	42.08 PK	1	270	0	9.54	32.54	74.00	-41.46
13480.0	43.75 PK	1	180	0	9.54	34.21	74.00	-39.79
16138.0	44.16 PK	1.1	300	0	9.54	34.62	74.00	-39.38

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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# 3.7.9 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH11)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)	
1398.0	47.52 PK	1	150	0	9.54	37.98	74.00	-36.02	
4048.0	34.24 PK	1	360	0	9.54	24.70	74.00	-49.30	
6755.0	38.65 PK	1	200	0	9.54	29.11	74.00	-44.89	
8864.0	40.02 PK	1	100	0	9.54	30.48	74.00	-43.52	
10872.5	42.13 PK	1.2	290	0	9.54	32.59	74.00	-41.41	
13392.0	45.08 PK	1	300	0	9.54	35.54	74.00	-38.46	
16605.0	45.88 PK	1	270	0	9.54	36.34	74.00	-37.66	

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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## 3.7.10 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11b (CH11)
Test Date	: 05/20/2005

Radiated Emissions (VERTICAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	47.22 PK	1	200	0	9.54	37.68	74.00	-36.32
3759.0	39.66 PK	1	290	0	9.54	30.12	74.00	-43.88
4175.5	38.22 PK	1	250	0	9.54	28.68	74.00	-45.32
8809.0	42.51 PK	1.1	300	0	9.54	32.97	74.00	-41.03
10619.0	42.51 PK	1	140	0	9.54	32.97	74.00	-41.03
14127.0	45.14 PK	1	180	0	9.54	35.60	74.00	-38.40
16310.0	45.08 PK	1	300	0	9.54	35.54	74.00	-38.46

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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# 3.7.11 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH01)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)	
1398.0	48.32 PK	1	250	0	9.54	38.78	74.00	-35.22	
3759.5	30.52 PK	1.2	300	0	9.54	20.98	74.00	-53.02	
7272.5	39.68 PK	1	140	0	9.54	30.14	74.00	-43.86	
9861.0	42.55 PK	1	280	0	9.54	33.01	74.00	-40.99	
12525.0	43.12 PK	1.1	360	0	9.54	33.58	74.00	-40.42	
15430.5	45.22 PK	1	120	0	9.54	35.68	74.00	-38.32	
16138.0	45.69 PK	1	280	0	9.54	36.15	74.00	-37.85	

*Notes : 1.*Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

**5.Duty= Duty cycle correction factor.** 

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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### 3.7.12 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH01)
Test Date	: 05/20/2005

Radiated Emissions (VERTICAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	47.01 PK	1	290	0	9.54	37.47	74.00	-36.53
3759.0	38.41 PK	1	360	0	9.54	28.87	74.00	-45.13
4830.0	37.42 PK	1	280	0	9.54	27.88	74.00	-46.12
8995.0	42.52 PK	1	320	0	9.54	32.98	74.00	-41.02
10881.0	42.08 PK	1	240	0	9.54	32.54	74.00	-41.46
12785.5	41.69 PK	1	330	0	9.54	32.15	74.00	-41.85
14835.0	44.27 PK	1	160	0	9.54	34.73	74.00	-39.27

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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# 3.7.13 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH06)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)								
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)	
1398.0	48.41 PK	1	300	0	9.54	38.87	74.00	-35.13	
4128.0	35.20 PK	1	150	0	9.54	25.66	74.00	-48.34	
6716.5	39.68 PK	1.2	250	0	9.54	30.14	74.00	-43.86	
8692.0	42.70 PK	1	240	0	9.54	33.16	74.00	-40.84	
10642.5	42.57 PK	1	360	0	9.54	33.03	74.00	-40.97	
13690.5	45.27 PK	1	300	0	9.54	35.73	74.00	-38.27	
16464.5	45.91 PK	1	280	0	9.54	36.37	74.00	-37.63	

*Notes : 1.*Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

**5.Duty= Duty cycle correction factor.** 

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

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# 3.7.14 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH06)
Test Date	: 05/20/2005

	Radiated Emissions (VERTICAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	48.55 PK	1	320	0	9.54	39.01	74.00	-34.99
3759.0	38.44 PK	1	270	0	9.54	28.90	74.00	-45.10
7240.0	39.55 PK	1	300	0	9.54	30.01	74.00	-43.99
8743.0	40.51 PK	1.1	140	0	9.54	30.97	74.00	-43.03
10915.0	42.11 PK	1	200	0	9.54	32.57	74.00	-41.43
14047.0	45.26 PK	1	280	0	9.54	35.72	74.00	-38.28
16282.0	44.79 PK	1	200	0	9.54	35.25	74.00	-38.75

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

9. The other emission levels were very low against the limit.

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# 3.7.15 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH11)
Test Date	: 05/20/2005

	Radiated Emissions (HORIZONTAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	47.66 PK	1	220	0	9.54	38.12	74.00	-35.88
4180.0	35.24 PK	1.1	360	0	9.54	25.70	74.00	-48.30
7243.5	37.89 PK	1	290	0	9.54	28.35	74.00	-45.65
8825.5	41.15 PK	1	140	0	9.54	31.61	74.00	-42.39
10627.0	42.15 PK	1	200	0	9.54	32.61	74.00	-41.39
14325.0	44.18 PK	1	250	0	9.54	34.64	74.00	-39.36
16319.0	45.23 PK	1	170	0	9.54	35.69	74.00	-38.31

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

9. The other emission levels were very low against the limit.

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# 3.7.16 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	: IOGEAR, Inc.
Model No	: GWA504
EUT	: Wireless-G Broadband Router
Test Mode	: 802.11g (CH11)
Test Date	: 05/20/2005

	Radiated Emissions (VERTICAL)							
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1398.0	46.25 PK	1	200	0	9.54	36.71	74.00	-37.29
3759.0	37.78 PK	1	220	0	9.54	28.24	74.00	-45.76
7710.5	39.55 PK	1.2	140	0	9.54	30.01	74.00	-43.99
8802.5	41.22 PK	1	290	0	9.54	31.68	74.00	-42.32
10645.5	42.03 PK	1	360	0	9.54	32.49	74.00	-41.51
13589.5	45.61 PK	1	320	0	9.54	36.07	74.00	-37.93
16558.0	46.27 PK	1	300	0	9.54	36.73	74.00	-37.27

Notes : 1.Margin= Amplitude - Limits

2.Distance of Measurement : 1 Meter (1G-26.5GHz)

3. Height of table for EUT placed: 0.8 Meter.

4.ANT= Antenna height.

5.Duty= Duty cycle correction factor.

6.Dis= Distance extrapolation factor.

7.Amplitude= Reading Amplitude - Amplifier gain+Cable loss

+Antenna factor

(Auto calculate in spectrum analyzer)

8.Actual Amp= Amplitude - Duty - Dis.

9. The other emission levels were very low against the limit.

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MAX LIGHT

**MEASUREMENT REPORT** 

# IV. 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 TDD mode. A RJ-45 port from a computer to 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.

# Spectrum Analyzer

# **4.2 Test Instruments Configuration:**



MAX LIGHT MEASUREMENT REPORT

# 4.3 Test Equipment List:

A. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291)

- B. HP 8449B 1GHZ~26.5GHZ PRE Amplifier (S/N:1982901A91)
- C. Shielded Room (MLT-SR1)

# 4.4 Test Result:

## 802.11b

Frequency (MHz)	Output(dBm)	Required Limit
2412	10.67	<30dBm
2437	10.28	<30dBm
2462	10.54	<30dBm

## 802.11g

Frequency (MHz)	Output(dBm)	Required Limit
2412	6.55	<30dBm
2437	6.21	<30dBm
2462	6.51	<30dBm

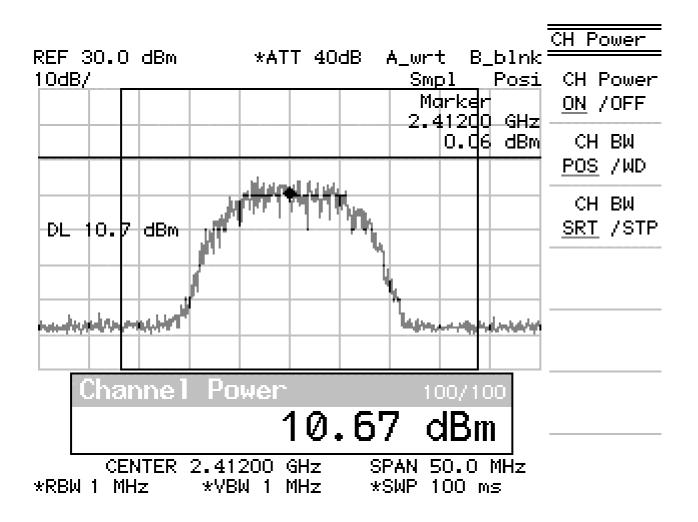
Note :Test Graphs See next page.



**MEASUREMENT REPORT** 

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#### 802.11b (2412MHz)

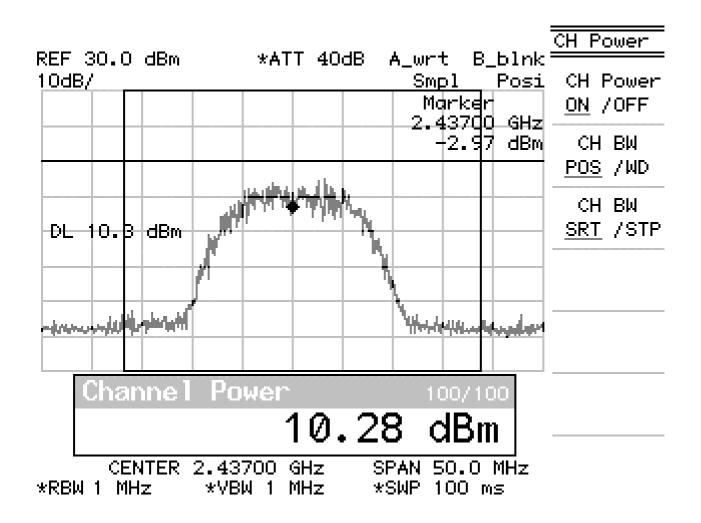




**MEASUREMENT REPORT** 

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## 802.11b (2437MHz)

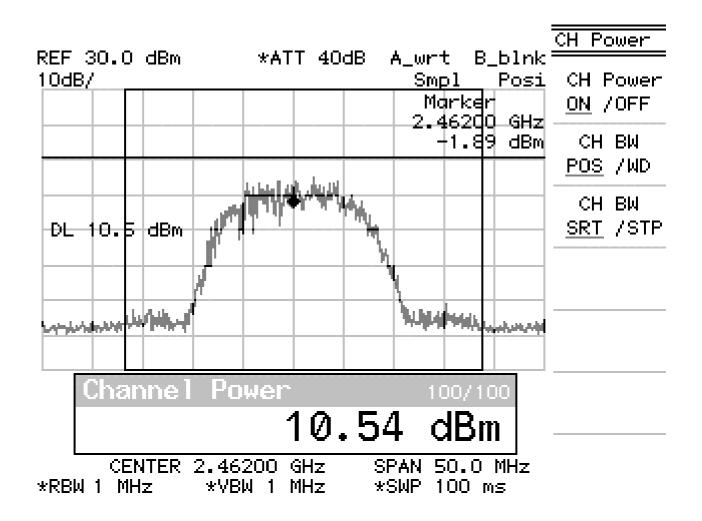




**MEASUREMENT REPORT** 

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## 802.11b (2462MHz)

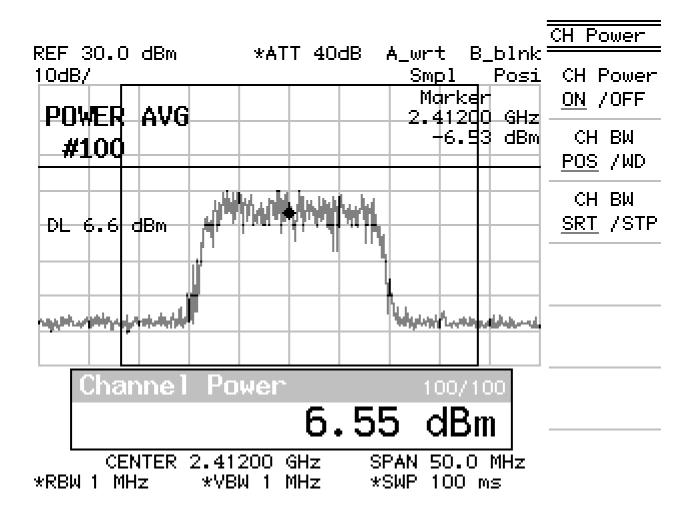




**MEASUREMENT REPORT** 

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# 802.11g (2412MHz)

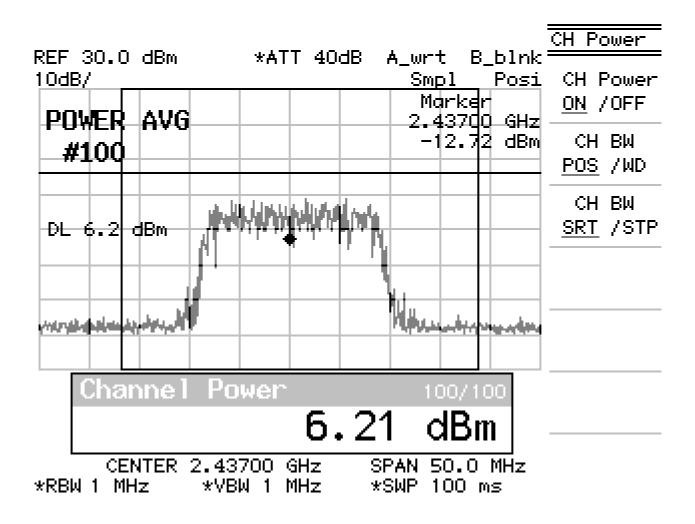




**MEASUREMENT REPORT** 

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# 802.11g (2437MHz)

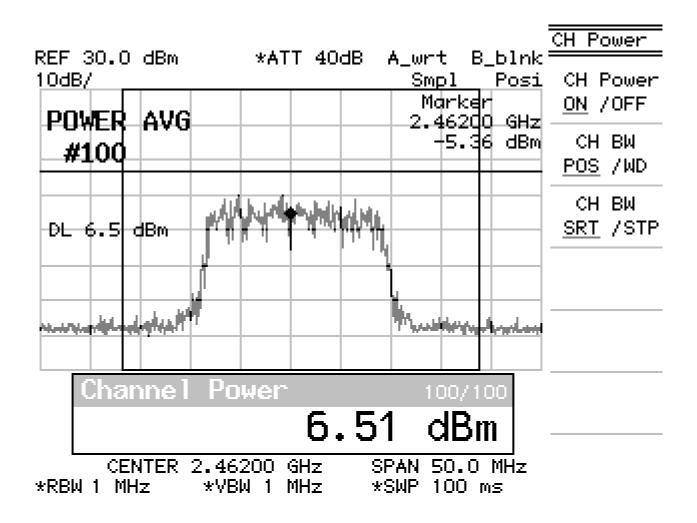


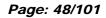


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# 802.11g (2462MHz)







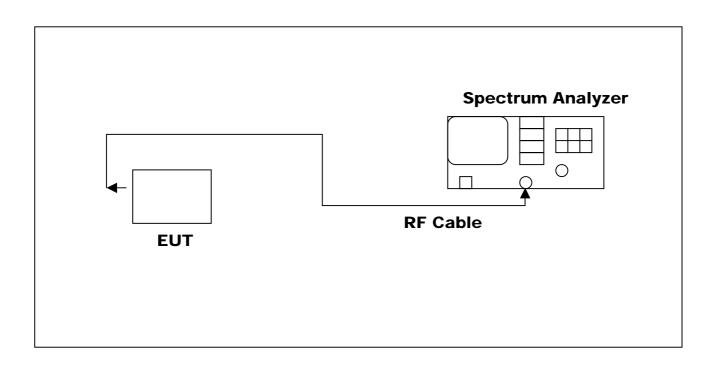
**MEASUREMENT REPORT** 

V. 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:**





MAX LIGHT MEASUREMENT REPORT

# 5.3 Test Equipment List:

# A. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291)

- B. HP 8449B 1GHz-26.5GHz Pre Amplifier (S/N:1982901A91)
- C. Shielded Room (MLT-SR1)

# 5.4 Test Result:

# 802.11b

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	<b>Required Limit</b>
2412	11.1	>500KHz
2437	11.9	>500KHz
2462	11.6	>500KHz

#### 802.11g

Frequency (MHz)	Min. 6dB Bandwidth (MHz)	<b>Required Limit</b>
2412	16.8	>500KHz
2437	16.8	>500KHz
2462	16.8	>500KHz

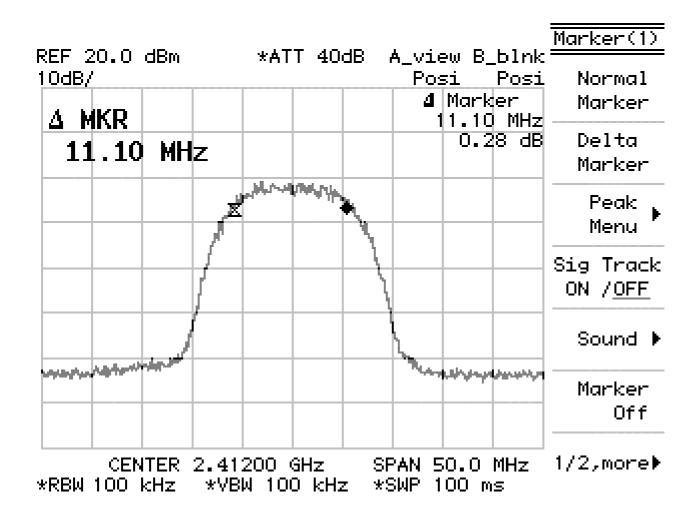
Note : Test Graphs See next page.



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# 802.11b (2412MHz)

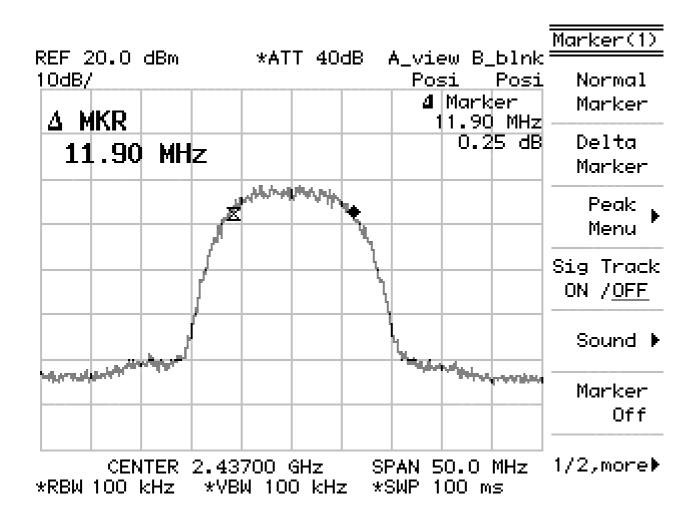




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## 802.11b (2437MHz)

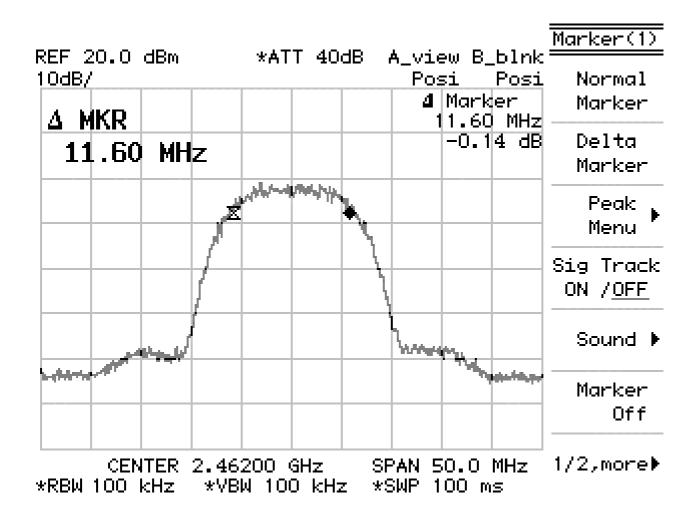




MEASUREMENT REPORT

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## 802.11b (2462MHz)

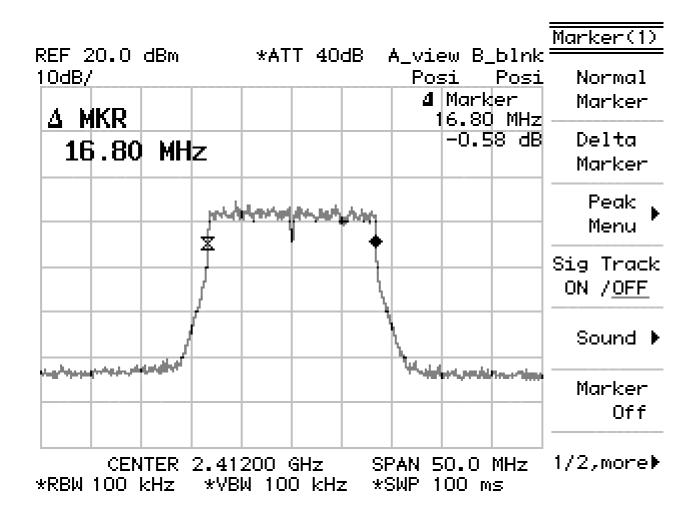




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# 802.11g (2412MHz)

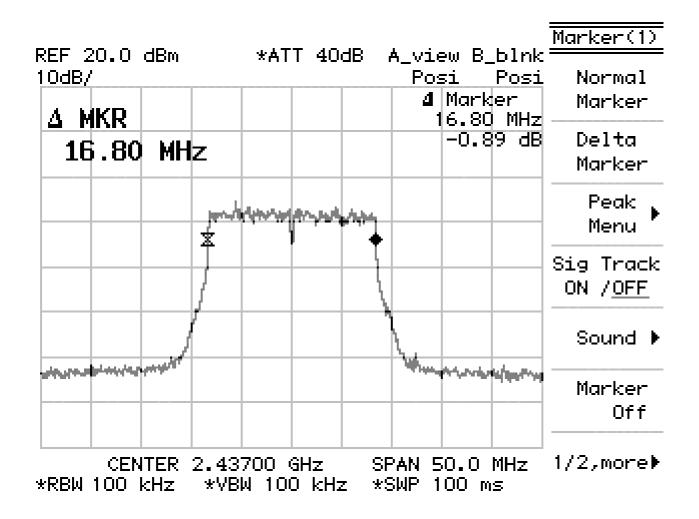




MEASUREMENT REPORT

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# 802.11g (2437MHz)

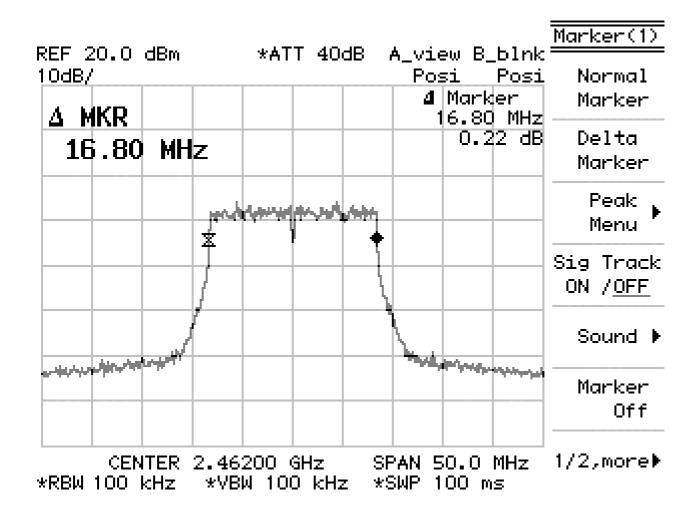




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# 802.11g (2462MHz)



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**MAX LIGHT** MEASUREMENT REPORT

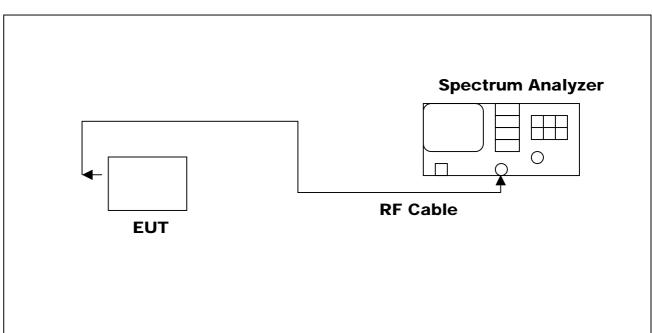
# VI. Maximum Power Density Requirements

# 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 passband. 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:**



MAX LIGHT MEASUREMENT REPORT

# 6.3 Test Equipment List:

# A. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291)

B. HP 8449B 1GHz-26.5GHz Pre Amplifier (S/N:1982901A91)

E. Shielded Room (MLT-SR1)

# 6.4 Test Result:

## 802.11b

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-13.81	<8dBm
2437	-14.50	<8dBm
2462	-14.06	<8dBm

## 802.11g

Frequency (MHz)	Power Density (dBm)	Required Limit
2412	-20.83	<8dBm
2437	-21.44	<8dBm
2462	-20.86	<8dBm

Note :

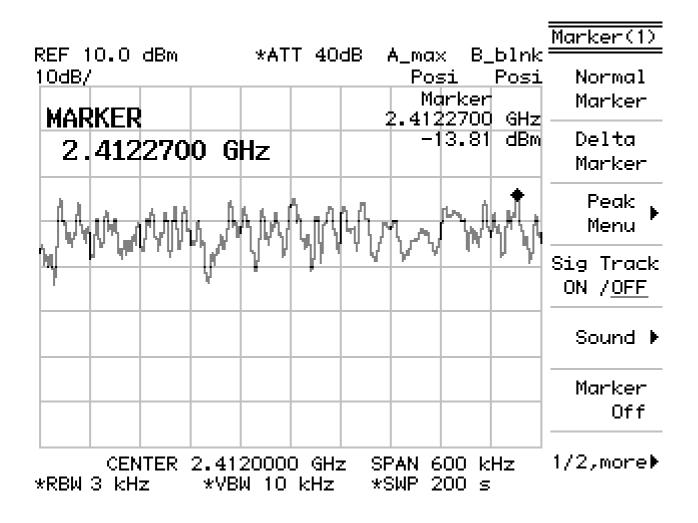
- 1. Frequency Span= 600 kHz
- 2. Sweep Time = Frequency Span/3 kHz=200secs
- 3. Test Graphs See next page.



**MEASUREMENT REPORT** 

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#### 802.11b (2412MHz)

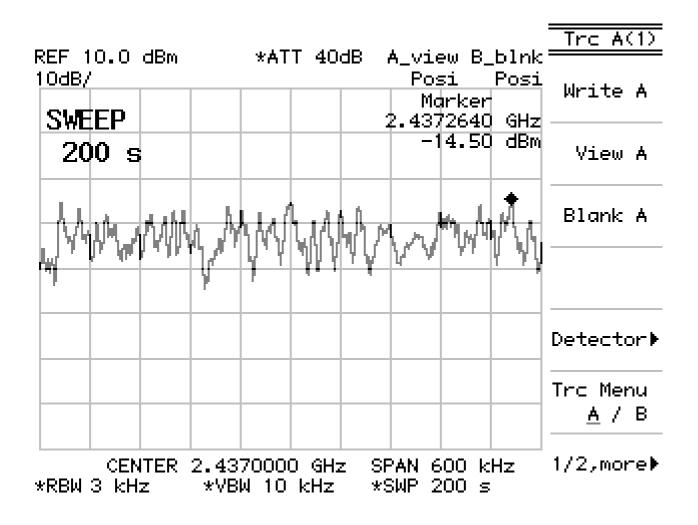




**MEASUREMENT REPORT** 

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#### 802.11b (2437MHz)

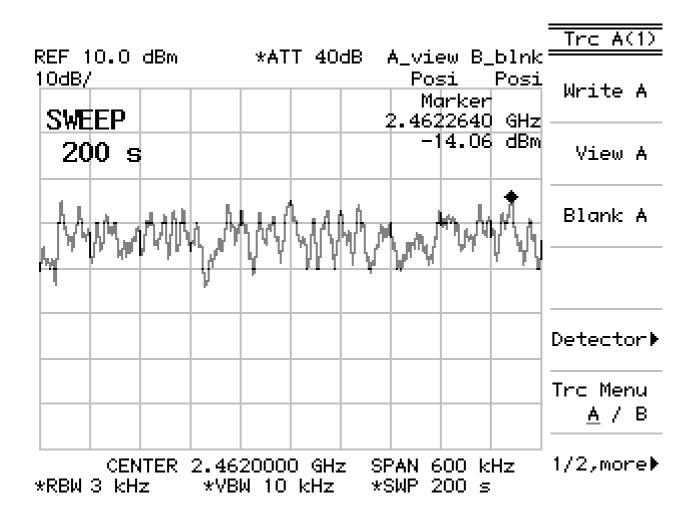




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## 802.11b (2462MHz)

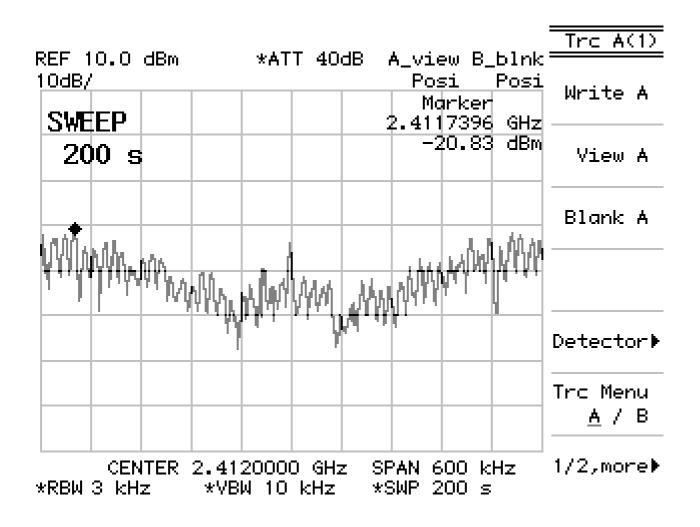




MEASUREMENT REPORT

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## 802.11g (2412MHz)

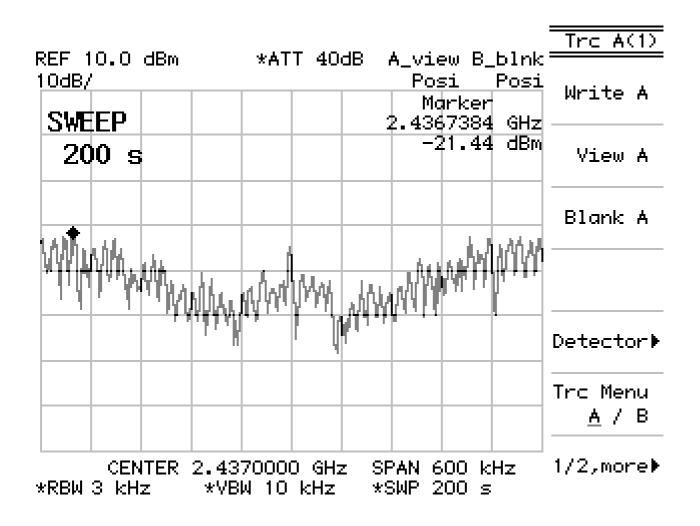




MEASUREMENT REPORT

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## 802.11g (2437MHz)

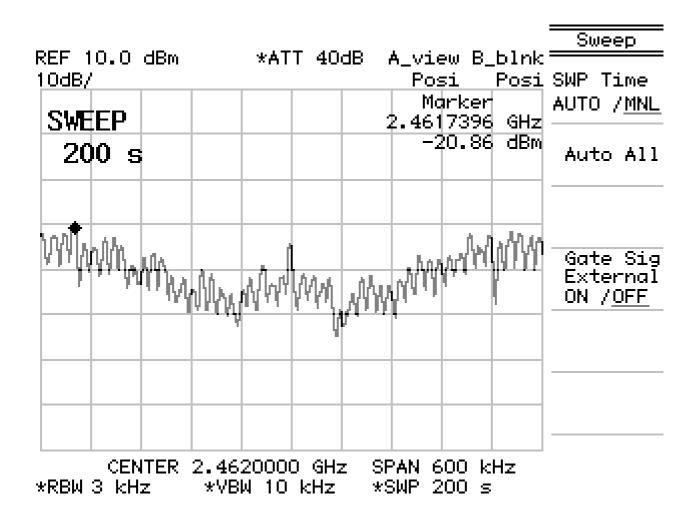




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## 802.11g (2462MHz)



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MAX LIGHT

**MEASUREMENT REPORT** 

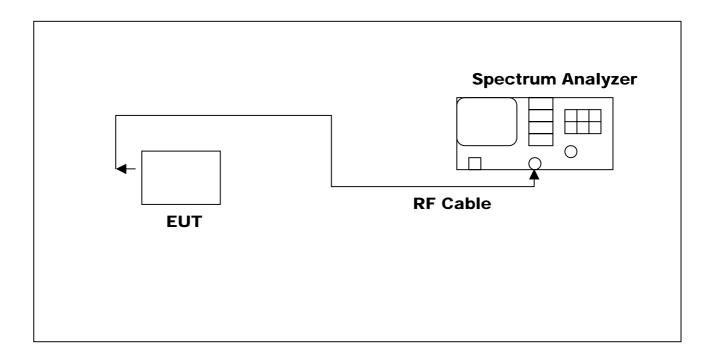
# VII. Out of Band Conducted Emissions Requirements

# 7.1 Test Condition & Setup :

In any 100 kHz bandwidth outside the EUT passband, 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 passband. the test was performed at 3 channels (Channel 1, 6,11)

# 7.2 Test Instruments Configuration:





MAX LIGHT MEASUREMENT REPORT

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# 7.3 Test Equipment List:

A. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291) **B.** Shielded Room (MLT-SR1)

# 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.



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# 802.11b (CH01) (1 of 5)

🔆 Agil	lent O	9:48:10	May 2	7,2005					F		Trace	View
Ref 30 Peak Log	dBm	ŧ	¥Atten⊸	40 dB					4kr1 85 -35.91		1	Trace 2 <u>3</u>
10 dB/											Cle	ear Write
												Max Hold
												Min Hold
V1 S2 S3 FC AA	hand the second s	www	<u></u>		um m	·····	www.			man		View
												Blank
Start 30 #Res B <sup>1</sup>	) MHz W 100 k	Hz		#VE	3W 100	kHz	Swe	ep 125	-	1 GHz pts)		More 1 of 2



# 802.11b (CH01) (2 of 5)

🔆 Agil	lent 09	9:46:58 May	27,2005					F		Peak Search
Ref 30 Peak Log	dBm	#Atter	n 40 dB				Mk	rr1 1.99 -34.68		, Meas Tools ∙
10 dB/										Next Peak
										Next Pk Right
							<u> </u>			Next Pk Left
V1 S2 S3 FC AA		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mmum.m	mann	Mariana ang sang sang sang sang sang sang sa	y have	lohn	der namede de la constante de la c	mm	Min Search
										Pk-Pk Search
Start 1 #Res B	GHz W 100 kł	1z	#VB	W 100	kHz	Sweep	o 180.4 i	Stop 2. ms (401		More 1 of 2



**MEASUREMENT REPORT** 

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#### Agilent 09:45:41 May 27, 2005 R Т Marker Mkr2 2.4248 GHz Ref 30 dBm #Atten 40 dB -38.42 dBm Select Marker Peak 2 <u>3</u> <u>4</u> Log 10 dB/ Normal Ŷ MM Delta Delta Pair (Tracking Ref) Ref <u>Delta</u> V1 S2 <sup>2</sup> Q Span Pair **S3 FC** Span Center AA Off More Start 2.4 GHz Stop 2.5 GHz 1 of 2 #Res BW 100 kHz Sweep 12.88 ms (401 pts) #VBW 100 kHz

## 802.11b (CH01) (3 of 5)



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# 802.11b (CH01) (4 of 5)

🔆 Agil	ent C	9:44:13	May 2	7,2005					R Ikr1 3.08	 Trac	e/View
Ref 30 Peak Log	dBm	i	#Atten 4	40 dB					-34.17	 1	Trace <u>2 3</u>
10 dB/										 С	lear Write
											Max Hold
	1										Min Hold
V1 S2 S3 FC AA	~^^	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				www.	mm	m	 	View
											Blank
Start 2. #Res B <sup>1</sup>		Hz		#VE	3W 100	kHz	Sweep	o 966.3 i	Stop 10 ms (401 p		More 1 of 2



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# 802.11b (CH01) (5 of 5)

🔆 Agil	ent O	9:43:08	May 2	7,2005					F		Trac	e/View
Ref 30 Peak	dBm	#	#Atten 4	40 dB				Mk	ar1 24.4 -33.39		1	Trace <u>2 3</u>
Log 10 dB/											C	lear Write
												Max Hold
										1		Min Hold
V1 S2 S3 FC AA		~~~~	www	·····	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	and a start of the	man	yhan	 //		View
												Blank
Start 10 #Res B		Hz		#VE	3W 100	kHz	Swe	ep 1.933	Stop 2 3 s (401			More 1 of 2



# 802.11b (CH06) (1 of 5)

🔆 Agil	ent 09	:37:50 May (	27,2005				F		Peak Search
Ref 30 ( Peak Log	dBm	#Atten	40 dB			M	1kr1 66 -35.56		Meas Tools •
10 dB/									Next Peak
									Next Pk Right
									Next Pk Left
V1 S2 S3 FC AA	www.h	water of the second second	www.www.ww	umonda		uhumh	many	mm	Min Search
									Pk-Pk Search
Start 30 #Res B\	) MHz W 100 kH	z	#VBW	100 kHz	Swe	ep 125 r	-	1 GHz pts)	More 1 of 2



# 802.11b (CH06) (2 of 5)

🔆 Agile	<b>ent</b> 09:	38:40 May 2	7,2005					Т	Peak Search
Ref 30 c Peak Log	:IBm	#Atten 4	40 dB			Mk	r1 2.064 G -34.29 dB		, Meas Tools ∙
10 dB/									Next Peak
-									Next Pk Right
-						1			Next Pk Left
V1 S2 S3 FC AA	mmu	MANNA	served	un de la compañsión de la compañs	Angeneration	n han	m. Maria	****	Min Search
-									Pk-Pk Search
Start 1 ( #Res B)	GHz N 100 kH	z	#VBW	100 kHz	Sweej	o 180.4 i	Stop 2.4 G ms (401 pts)		More 1 of 2



**MEASUREMENT REPORT** 

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#### Agilent 09:39:32 May 27, 2005 R Т Marker Mkr2 2.4498 GHz Ref 30 dBm #Atten 40 dB -37.23 dBm Select Marker Peak 2 <u>3</u> <u>4</u> Log 10 dB/ Normal ı hum Delta Delta Pair (Tracking Ref) Ref <u>Delta</u> Ŷ V1 S2 Span Pair **S3 FC** 40 Span Center AA Off More Start 2.4 GHz Stop 2.5 GHz 1 of 2 #Res BW 100 kHz Sweep 12.88 ms (401 pts) #VBW 100 kHz

#### 802.11b (CH06) (3 of 5)



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#### 802.11b (CH06) (4 of 5)

🔆 Agi	lent	09:40:20	6 May 2	7,2005					R	T	Trace	/View
Ref 30 Peak Log	dBm		#Atten	40 dB					-35.21 d		1	Trace <u>2 3</u>
10 dB/											Cle	ear Write
												Max Hold
		1										Min Hold
V1 S2 S3 FC AA	www	- Sum	mm	manda.	mpuhun	month	www.www	many	with man	<u>n</u> wh		View
												Blank
Start 2. #Res B		kHz		#VE	3W 100	kHz	Sweej	p 966.3 i	Stop 10 ms (401 pt			More 1 of 2



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#### 802.11b (CH06) (5 of 5)

🔆 Agil	lent I	09:41:17	May 2	7,2005					F		Trac	e/View
Ref 30 Peak	dBm		#Atten 4	l0 dB				Mk	ar1 24.4 -33.17		1	Trace <u>2 3</u>
Log 10 dB/											- C	lear Write
												Max Hold
										1		Min Hold
V1 S2 S3 FC AA		mente	an a	hum	www.w	m	have	num	www.rvii	in tu		View
												Blank
Start 10 #Res B		kHz		#VE	3W 100	kHz	Swe	ep 1.933	Stop 2 3 s (401			More 1 of 2



#### 802.11b (CH11)(1 of 5)

🔆 Agi	lent O	9:35:56	May 2	27,2005				-		<del>к т</del>	Peak Search
Ref 30 Peak Log	dBm	#	Atten	40 dB					Mkr1 65 -35.43	6 MHz dBm	Meas Tools •
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC AA	union doine	an a	unante	han	m	mah-ma	- Ž.	whenth	Mariana	man	Min Search
											Pk-Pk Search
Start 31 #Res B	0 MHz W 100 k	Hz		#VE	3W 100	kHz	Swe	ep 125	-	1 GHz pts)	More 1 of 2



#### 802.11b (CH11)(2 of 5)

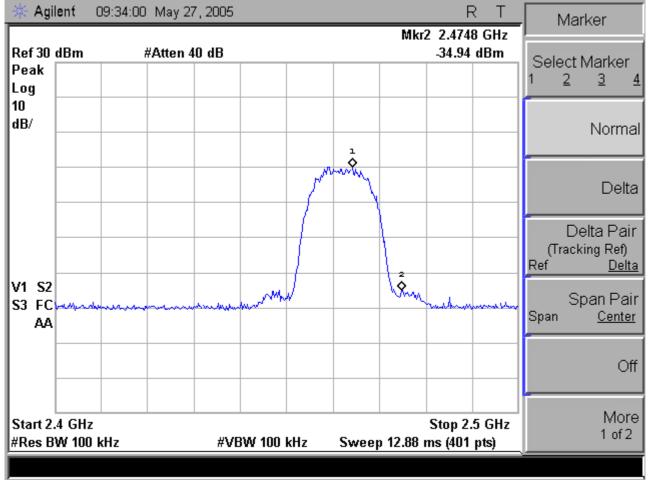
₩А	gilent	09:34:55	May 27, 2005			R	Т	Peak Search
Ref 3 Peak Log	0 dBm	#.	Atten 40 dB			Mkr1 2.369 -35.33 d		Meas Tools •
10 dB/								Next Peak
								Next Pk Right
								Next Pk Left
V1 S S3 F A	C mm	mman	hannan					Min Search
								Pk-Pk Search
	1 GHz BW 100	kHz	#V	BW 100 kHz	Sweep 1	Stop 2.4 80.4 ms (401 p		More 1 of 2



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#### 802.11b (CH11)(3 of 5)





#### 802.11b (CH11)(4 of 5)

🔆 Agilent	09:32:38 May 27	7, 2005		R T	Trace/View
Ref 30 dBm	#Atten 4	0 dB	<b>ا</b>	Mkr1 3.10 GHz -35.27 dBm	, Trace
Peak Log					1 2 3
10 dB/					Clear Write
					Max Hold
					Min Hold
	2	*	and the second sec		View
					Blank
Start 2.5 GHz #Res BW 100		#VBW 100 kHz	Sweep 966.3	Stop 10 GHz ms (401 pts)	More 1 of 2



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### 802.11b (CH11)(5 of 5)

∦: А	gilent	09:31:18	8 May 2	7,2005						R T	Trace	e/View
	0 dBm		#Atten 4	40 dB				MK	r1 24.3 -33.07			Trace
Peak Log	¢										<u>1</u>	<u>2</u> <u>3</u>
10 dB/											С	lear Write
												Max Hold
										1		Min Hold
V1 S S3 F A	S2 ∺C <sup>~~~~</sup> ∖A	m	m		manda	m	wound	www	www.www.	~~~		View
												Blank
	: 10 GHz : BW 10			#VE	3W 100	kHz	Swe	ep 1.933	-	25 GHz pts)		More 1 of 2



### 802.11g (CH01) (1 of 5)

🔆 Ag	gilent (	9:03:04	May 2	7,2005				_		R T	Peak Search
Ref 30 Peak Log	) dBm		#Atten 4	40 dB					4kr1 86 -36.01		Meas Tools ►
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC A4	C		~~~		u-h-m-shvi		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	menun	*****	unn	Min Search
											Pk-Pk Search
	30 MHz BW 100 I	(Hz		#VE	3W 100	kHz	Swe	ep 125	-	1 GHz pts)	More 1 of 2



### 802.11g (CH01) (2 of 5)

🔆 Ag	ilent (	9:04:54	May 2	7,2005						RΤ	Peak Search
Ref 30 Peak Log	dBm		#Atten	40 dB				Mk	ar1 2.04 -35.46		Meas Tools •
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC AA	man	www	m		mm	g. Marrie	and the second	* *			Min Search
											Pk-Pk Search
Start 1 #Res E	GHz 3W 100	dHz		#VE	3W 100	kHz	Swee	p 180.4 i	Stop 2 ms (401		More 1 of 2



**MEASUREMENT REPORT** 

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#### Agilent 09:06:04 May 27, 2005 R T Trace/View Mkr2 2.4448 GHz Ref 30 dBm #Atten 40 dB -38.21 dBm Trace Peak 2 <u>3</u> 1 Log 10 dB/ Clear Write ٦ Max Hold Min Hold V1 S2 م م S3 FC View AA Blank More Stop 2.5 GHz Start 2.4 GHz 1 of 2 #Res BW 100 kHz Sweep 12.88 ms (401 pts) #VBW 100 kHz

### 802.11g (CH01) (3 of 5)



### 802.11g (CH01) (4 of 5)

🔆 Agi	ilent (	)9:06:52	2 May 2	7,2005				-		R T	Peak Search
Ref 30 Peak Log	dBm		#Atten	40 dB				IVI	kr1 2.9 -35.66		Meas Tools ►
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC AA		www.w	here was a	www.	-	mm	um	ut www.	whenty	under "un	Min Search
											Pk-Pk Search
Start 2 #Res B	.5 GHz 3W 100 I	dlz		#VE	3W 100	kHz	Sweej	p 966.3 i	-	0 GHz pts)	More 1 of 2



### 802.11g (CH01) (5 of 5)

🔆 A 🤃	_	09:07:35							F	_	Peak Search
Ref 30 Peak Log	) dBm	#	Atten 40	) dB				Mk	rr1 24.5 -34.09		Meas Tools •
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 F( A/	2 Cwmw 4	namenta	m	~~~~~	mp.Mr.	m	Josephane and the second	mm	raha	m X	Min Search
											Pk-Pk Search
	10 GHz BW 100	kHz		#VB	W 100	kHz	Swee	ep 1.933	Stop 2 s (401		More 1 of 2



### 802.11g (CH06) (1 of 5)

🔆 Agi	ilent	09:22:30	) May 2	7,2005				-		R T	Peak Search
Ref 30 Peak Log	dBm		#Atten -	40 dB				h		30 MHz 3 dBm	Meas Tools •
10 dB/											Next Peak
											Next Pk Right
									_		Next Pk Left
V1 S2 S3 FC AA	man	<u>www.</u>		n heren	han ga an the	umad	an war	www.	Ling	and an an and and an	Min Search
											Pk-Pk Search
Start 3 #Res B	0 MHz 3W 100	kHz		#VE	3W 100	kHz	Swe	ep 125 i	-	1 GHz Ipts)	More 1 of 2



### 802.11g (CH06) (2 of 5)

🔆 Agi	lent (	9:21:16	May 2	7,2005					F		Peak Search
Ref 30 Peak Log	dBm	1	#Atten 4	40 dB				Mk	rr1 2.06 -35.56		, Meas Tools ∙
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC AA	um	town	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		minim	h.m.	mm	- Min	~~~~~	www	Min Search
											Pk-Pk Search
Start 1 #Res B	GHz W 100 k	Hz		#VE	3W 100	kHz	Sweep	o 180.4 i	Stop 2. ms (401		More 1 of 2



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#### Agilent 09:19:44 May 27, 2005 R Т Marker Mkr2 2.4553 GHz Ref 30 dBm #Atten 40 dB -38.06 dBm Select Marker Peak 2 <u>3</u> <u>4</u> Log 10 dB/ Normal 1 S.m. Delta NA Delta Pair (Tracking Ref) Ref <u>Delta</u> V1 S2 $\hat{\hat{\mathbf{Q}}}$ Span Pair **S3 FC** Span Center AA Off More Start 2.4 GHz Stop 2.5 GHz 1 of 2 #Res BW 100 kHz Sweep 12.88 ms (401 pts) #VBW 100 kHz

#### 802.11g (CH06) (3 of 5)



#### 802.11g (CH06) (4 of 5)

🔆 Agil	lent (	09:17:48	May 2	7,2005					F		Peak Search
Ref 30 Peak Log	dBm		#Atten -	40 dB				M	kr1 3.1 -34.69		Meas Tools •
10 dB/											Next Peak
											Next Pk Right
	1										Next Pk Left
V1 S2 S3 FC AA	~~^¢	m	n	nt served and	hommen and a second	man	nam da	nyenterese	m	wontan	Min Search
											Pk-Pk Search
Start 2. #Res B		(Hz		#VE	3W 100	kHz	Sweep	o 966.3 i	Stop 1 ns (401		More 1 of 2



### 802.11g (CH06) (5 of 5)

₩А	gilent	09:15:53	8 May 27	7,2005					F	_	Trac	e/View
Ref 3 Peak Log	0 dBm		#Atten 4	0 dB				MK	rr1 24.5 -34.84		, <u>1</u>	Trace 2 <u>3</u>
10 dB/											С	lear Write
												Max Hold
										<b>1</b>		Min Hold
	2 C A	mante		mm	mi men	www	man	www.whyen	n der dart	~~~ <b>&amp;</b> ~		View
												Blank
	10 GHz BW 100			#VE	3W 100	kHz	Swe	ep 1.933	Stop 2 s (401			More 1 of 2



## 802.11g (CH11)(1 of 5)

🔆 Agil	ent Os	9:23:47	May 2	7,2005					F		Trace	e/View
Ref 30 Peak Log	dBm	#	/Atten	40 dB				n	Akr1 83 -37.15		1	Trace 2 <u>3</u>
10 dB/											CI	ear Write
												Max Hold
												Min Hold
V1 S2 S3 FC AA	and the second	une Alleuru de		har	www.	ward	ant and the second second		n <sup>1</sup>	- and the second se		View
												Blank
Start 30 #Res B <sup>1</sup>	) MHz W 100 ki	Hz		#VE	3W 100	kHz	Swe	ep 125 i	-	1 GHz pts)		More 1 of 2



### 802.11g (CH11)(2 of 5)

🔆 Agi	lent 09	9:24:52	May 27	7,2005					F		Peak Search
Ref 30 Peak Log	dBm		/Atten 4	0 dB				Mk	r1 2.35 -35.81		Meas Tools •
10 dB/											Next Peak
											Next Pk Right
											Next Pk Left
V1 S2 S3 FC AA	mm		m	h	www.	Margadia		www	unan	<sup>1</sup>	Min Search
											Pk-Pk Search
Start 1 #Res B	GHz W 100 kl	Hz		#VE	W 100	kHz	Sweej	o 180.4 i	Stop 2. ns (401		More 1 of 2



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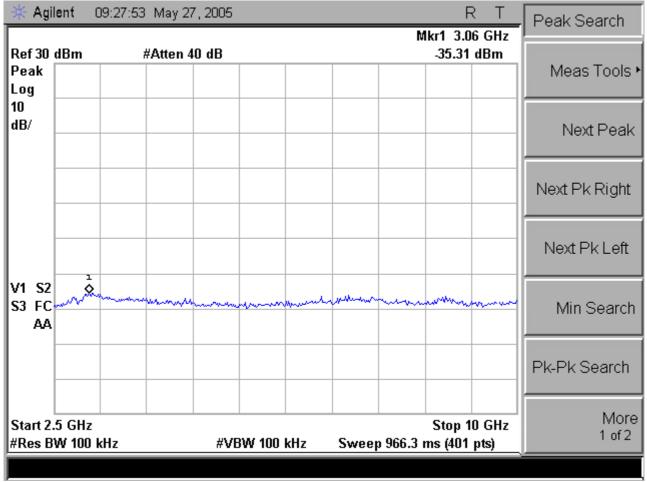
#### 802.11g (CH11)(3 of 5)

🔆 Agil	<b>ent</b> 09:2	6:31 May 27 , 2005		RT	Marker
Ref 30 d Peak Log	dBm	#Atten 40 dB		Mkr2 2.4773 GH: -36.65 dBm	
10 dB/					- Normal
			p. Ingra	My -	Delta
					Delta Pair (Tracking Ref) Ref <u>Delta</u>
V1 S2 S3 FC AA	elaber alleratur		m	2 martine	Span Pair Span <u>Center</u>
					Off
Start 2.4 #Res B\	4 GHz W 100 kHz	#VI	3W 100 kHz Swe	Stop 2.5 GH ep 12.88 ms (401 pts)	Z More 1 of 2



MEASUREMENT REPORT

#### 802.11g (CH11)(4 of 5)





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#### 802.11g (CH11)(5 of 5)

🔆 Agilent	09:29:06	May 27	7,2005						<u> </u>	Trace/	View
Ref 30 dBm	ì	#Atten 4	0 dB				Mk	r1 24.4 -32.61			Trace
Peak Log										1	<u>11ace</u> 2 <u>3</u>
10 dB/										Cle	ar Write
										N	1ax Hold
									1		Vin Hold
V1 S2 S3 FC AA	und	Jan Marine	and the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- marken	San seguration	u.h.m	der-	~~~		View
											Blank
Start 10 GHz #Res BW 100			#VE	3W 100	kHz	Swee	ep 1.933		5 GHz pts)		More 1 of 2

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MAX LIGHT

**MEASUREMENT REPORT** 

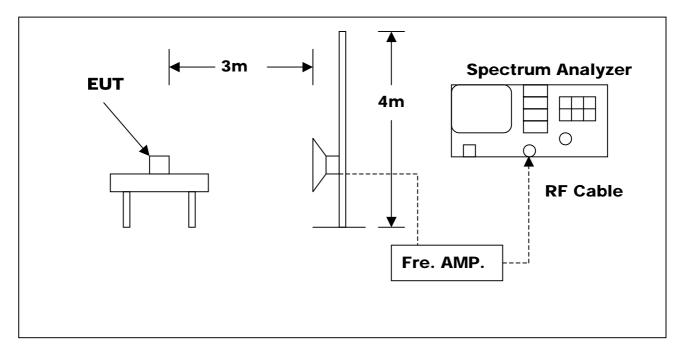
# VIII. Band Edges Requirements

## 8.1 Test Condition & Setup :

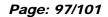
The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz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





**MEASUREMENT REPORT** 

## **8.3 Test Equipment List:**

- A. Agilent E4407B 9KHz-26.5GHz Spectrum Analyzer (S/N:A872JS02291)
- B. HP 8449B 1GHz-26.5GHz Pre Amplifier (S/N:1982901A91)

C. SCHWARZBECK BBHA 9120D Biconilog Antenna (S/N:141S3)

## 8.4 Test Result: (802.11b)

	Radiat	ed I	Emissio	ons (H	HORIZ	ZONTAL)	CH01	
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.69	58.29(PK)	1.2	210	0	9.54	48.75	74.00	-25.25
2389.69	48.97(AV)	1.2	210	0	9.54	39.43	54.00	-14.57
	Radi	atec	<b>Emiss</b>	sions	(VER	TICAL) C	H01	
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.69	59.66(PK)	1.2	320	0	9.54	50.12	74.00	-23.88
2389.69	50.31(AV)	1.2	320	0	9.54	40.77	54.00	-13.23

	Radiated Emissions (HORIZONTAL) CH11											
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)				
2483.57	57.79(PK)	1.1	350	0	9.54	48.25	74.00	-25.75				
2483.57	49.75(AV)	1.1	350	0	9.54	40.21	54.00	-13.79				
	Radia	atec	l Emiss	sions	(VER	TICAL) C	H11					
Frequency	Amplitude	Ant.	Table	Duty	Dist	Actual Amp	Limit	Margin				
(MHz)	(dBuV/m)	(m)	(Degree)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)				
2483.57	58.68(PK)	1.1	140	0	9.54	49.14	74.00	-24.86				
2483.57	50.74(AV)	1.1	140	0	9.54	41.20	54.00	-12.80				

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.



**MAX LIGHT** MEASUREMENT REPORT

## 8.5 Test Result: (802.11g)

	Radia	ted	Emissi	ons (	HORI	ZONTAL)	CH1						
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)					
2389.89	53.11(PK)	1.2	320	0	9.54	43.57	74.00	-30.43					
2389.89	46.03(AV)	1.2	320	0	9.54	36.49	54.00	-17.51					
	Radi	iate	d Emis	sions	(VEF	RTICAL) (	CH1						
Frequency (MHz)													
2389.89	54.41(PK)	1.2	270	0	9.54	44.87	74.00	-29.13					
2389.89	47.14(AV)	1.2	270	0	9.54	37.60	54.00	-16.40					

	Radiated Emissions (HORIZONTAL) CH11												
Frequency (MHz)	Amplitude (dBuV/m)	Ant. (m)	Table (Degree)	Duty (dB)	Dist (dB)	Actual Amp (dBuV/m)	Limit (dBuV/m)	Margin (dB)					
2483.52	53.09(PK)	1	200	0	9.54	43.55	74.00	-30.45					
2483.52	45.21(AV)	1	200	0	9.54	35.67	54.00	-18.33					
	Radia	ated	l Emiss	sions	(VER	TICAL) C	H11						
Frequency (MHz)													
2483.52	53.97(PK)	1	290	0	9.54	44.43	74.00	-29.57					
2483.52	46.09(AV)	1	290	0	9.54	36.55	54.00	-17.45					

Notes : 1.Margin= Amplitude - Limits

2. Height of table for EUT placed: 0.8 Meter.

**3.ANT= Antenna height.** 

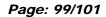
4.Duty= Duty cycle correction factor.

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.





MEASUREMENT REPORT

# IX. 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 1/4 DIOPLE antenna with R.P. SMA Plug connector. And the maximum Gain of this antenna is only <u>1.8dBi</u>.

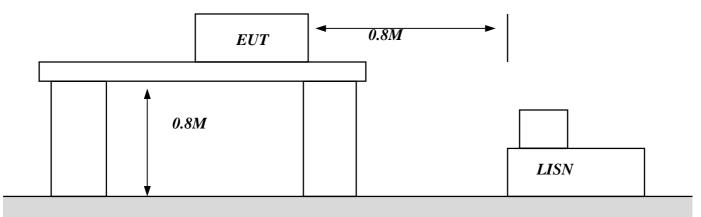


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Appendix I- EUT Test SETUP

## **MEASUREMENT OF POWER LINE CONDUCTED RFI VOLTAGE**



Metal floor surfaced with 30mm of insulating material



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Appendix I- EUT Test SETUP

## **MEASUREMENT OF RADIATED EMISSION**

