FCC TEST REPORT

according to

FCC Rules and Regulations

Part 15 Subpart C

Applicant	SparkLAN Communications, Inc.		
Address	3FL., No.246, Sec. 1, Neihu Road., Neihu Chiu, Taipei, Taiwan 114, R.O.C.		
Equipment	Atheros superG router		
Model No.	WX-6615GS		
FCC ID	RYK-WX6615GS		
Trade Name	SparkLAN		

Laboratory Accreditation



- · The test result refers exclusively to the test presented test model / sample.,
- Without written approval of *Exclusive Certification Corp.* the test report shall not be reproduced except in full.
- The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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CERTIFICATE OF COMPLIANCE

according to

FCC Rules and Regulations

Part 15 Subpart C

Applicant	SparkLAN Communications, Inc.		
Address 3FL., No.246, Sec. 1, Neihu Road., Neihu Chi Taipei, Taiwan 114, R.O.C.			
Equipment Atheros superG router			
Model No.	WX-6615GS		
FCC ID	RYK-WX6615GS		

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4** The equipment was *passed* the test performed according to **FCC Rules** and Regulations Part 15 Subpart C (2003).

The test was carried out on May. 18, 2006 at Exclusive Certification Corp.

Signature

Anson Chou / Manager

1. Report of Measurements and Examinations

FCC Rule	. Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. Conducted Emission	Pass
15.209	. Radiated Emission	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak Output Power	Pass
15.247(c)	. 100kHz Bandwidth of Frequency Band Edges	Pass
15.247(d)	. Power Spectral Density	Pass
1.1307 1.1310 2.1091 2.1093	. RF Exposure Compliance	Pass

1.1 List of Measurements and Examinations

Test engineer: Jerry

2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Internet Access Features

- Shared Internet Access. All users on the LAN or WLAN can access the Internet through the Wireless Router, using only a single external IP Address. The local (invalid) IP Addresses are hidden from external sources. This process is called NAT (Network Address Translation).
- **DSL & Cable Modem Support.** The Wireless Router has a 10/100BaseT Ethernet port for connecting a DSL or Cable Modem. All popular DSL and Cable Modems are supported. SingTel RAS and Big Pond (Australia) login support is also included.
- **PPPoE, PPTP, SingTel RAS and Telstra Big Pond Support.** The Internet (WAN port) connection supports PPPoE (PPP over Ethernet), PPTP (Peer-to-Peer Tunneling Protocol),

SingTel RAS and Telstra Big Pond (Australia), as well as "Direct Connection" type services. Unnumbered IP with PPPoE is also supported.

• Fixed or Dynamic IP Address. On the Internet (WAN port) connection, the Wireless Router supports both Dynamic IP Address (IP Address is allocated on connection) and Fixed IP Address.

Advanced Internet Functions

- **Communication Applications.** Support for Internet communication applications, such as interactive Games, Telephony, and Conferencing applications, which are often difficult to use when behind a Firewall, is included.
- **Special Internet Applications.** Applications which use non-standard connections or port numbers are normally blocked by the Firewall. The ability to define and allow such applications

is provided, to enable such applications to be used normally.

- Virtual Servers. This feature allows Internet users to access Internet servers on your LAN. The required setup is quick and easy.
- **DDNS Support.** DDNS (Dynamic DNS) allows Internet users to connect to Virtual Servers on your LAN using a domain name, even if your IP address is not fixed.
- **Multi-DMZ.** For each WAN (Internet) IP address allocated to you, one (1) PC on your local LAN can be configured to allow unrestricted 2-way communication with Servers or individual users on the Internet. This provides the ability to run programs which are incompatible

with Firewalls

- URL Filter. Use the URL Filter to block access to undesirable Web sites by LAN users.
- Internet Access Log. See which Internet connections have been made.
- Access Control. Using the Access Control feature, you can assign LAN users to different groups, and determine which Internet services are available to each group.

• VPN Pass through Support. PCs with VPN (Virtual Private Networking) software using PPTP, L2TP and IPSec are transparently supported - no configuration is required.

Wireless Features

- **Standards Compliant.** The Wireless Router complies with the IEEE802.11g (DSSS) specifications for Wireless LANs.
- Supports 802.11b, 802.11g, and Super G Wireless Stations. The Atheros Super G feature provides for up to 108Mbps speeds with Atheros clients, while remaining backward
- compatible with the 802.11g and 802.11g standards.
- **Speeds to 104Mbps.** Atheros clients can connect at up to 108Mps, while 802.11g clients can connect at up to the 802.11g maximum of 54Mbps.
- **WPA-PSK support.** The WPA-PSK (Pre-shared Key) standard provides greater security for your Wireless clients than WEP.
- **WEP support.** Support for WEP (Wired Equivalent Privacy) is included. Key sizes of 64 Bit and 128 Bit are supported.

• Wireless MAC-level Access Control. The Wireless Access Control feature can check the MAC address (hardware address) of Wireless stations to ensure that only trusted Wireless Stations can access your LAN.

Simple Configuration. If the default settings are unsuitable, they can be changed quickly and easily.

- LAN Features
- **4-Port Switching Hub.** The Wireless Router incorporates a 4-port 10/100BaseT switching hub, making it easy to create or ext end your LAN.
- DHCP Server Support. Dynamic Host Configuration Protocol provides a dynamic IP address to PCs and other devices upon request. The Wireless Router can act as a DHCP Server for devices on your local LAN and WLAN.
- **Multi Segment LAN Support.** LANs containing one or more segments are supported, via the Wireless Router's RIP (Routing Information Protocol) support and built-in static routing table.

Configuration & Management

- Easy Setup. Use your WEB browser from anywhere on the LAN or WLAN for configuration.
- **Configuration File Upload/Download.** Save (download) the configuration data from the Wireless Router to your PC, and restore (upload) a previously-saved configuration file to the Wireless Router.
- **Remote Management.** The Wireless Router can be managed from any PC on your LAN. And, if the Internet connection exists, it can also (optionally) be configured via the Internet.
- **Network Diagnostics.** You can use the Wireless Router to perform a Ping or DNS lookup.
- **UPnP Support.** UPnP (Universal Plug and Play) allows automatic discovery and configuration

of the Wireless Router. UPnP is by supported by Windows ME, XP, or later.

Security Features

- **Password protected Configuration**. Optional password protection is provided to prevent unauthorized users from modifying the configuration data and settings.
- Wireless LAN Security. WPA-PSK and WEP (Wired Equivalent Privacy) are supported, as well as MAC-level Wireless access control to prevent unknown wireless stations from accessing your LAN.
- **NAT Protection.** An intrinsic side effect of NAT (Network Address Translation) technology is that by allowing all LAN users to share a single IP address, the location and even the existence of each PC is hidden. From the external viewpoint, there is no network, only a single device the Wireless Router.
- Stateful Inspection Firewall. All incoming data packets are monitored and all incoming server requests are filtered, thus protecting your network from malicious attacks from external sources.
- **Protection against DoS attacks.** DoS (Denial of Service) attacks can flood your Internet connection with invalid packets and connection requests, using so much bandwidth and so many resources that Internet access becomes unavailable. The Wireless Router incorporates protection against DoS attacks.

2.2 RF Specifications

Host/Radio Interface	AR2316			
Type of Modulation	CCK and OFDM			
Number of Channels	USA/Canada: 11 V European: 13		V	
	Japan: 13, 14	V	Other:	
Frequency Band	2.412~2.484GHZ			
Carrier Frequency of each channel	2.412,2.417,2.422,2	2.427	7,2.432,2.437,2	2.4
	42,2.447,2.452,2.45	7,2.	462,2.467,2.47	2,
	2.484(GHZ)			
Bandwidth of each channel	dwidth of each channel 16MHZ/802.11g,22MHZ/802.11b			
Maximum Output Power to Antenna	Output Power to Antenna 18dBm/802.11b, 14dBm/802.11g			
Antenna Type / Class and Gain	Dipole,GAIN=1.8dBi			
Function Type	Transmitter Transceiver v			V
Power Rating (DC/AC , Voltage)	DC12V,800mA			
Basic function of product	IEEE 802.11g/b Wireless Router			
Temperature Range (Operating)	Normal 0~40°			
remperature range (operating)				

2.3 Test Mode and Test Software

The following test mode and test software was performed for conduction and radiation test:

- 802.11b (CH01: 2412MHz) 802.11b (CH06: 2437MHz) 802.11b (CH11: 2462MHz)
- 802.11g (CH01: 2412MHz) 802.11g (CH06: 2437MHz) 802.11g (CH11: 2462MHz)
- 802.11 Super g (CH06: 2437MHz)
- An executive programs, "ART.exe" Application under WIN XP.
- Software Value Set:

802.11b (11Mbps):

CH1 :12.5, CH6:12.5, CH11:12.5

802.11g (54Mbps):

CH1:6.5, CH6:8.0, CH11:8.0

802.11 super g (108Mbps):

CH6:8.0

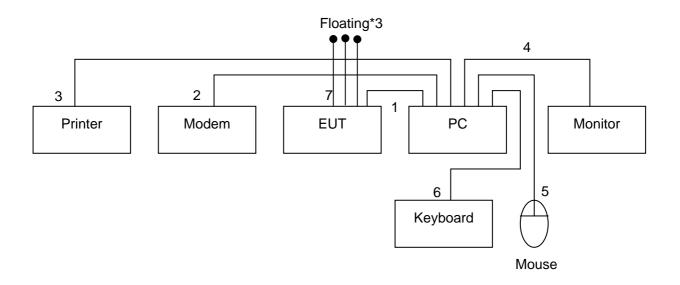
2.4 Description of Test System

Device	Manufacturer	Model No.	Description	
PC	IBM	IGV	Power Cable, Unshielding 1.8 m	
Monitor	SlimAGE	510A	Power Cable, Adapter Unshielding 1.8 m	
			Data Cable, VGA shielding 1.35 m	
Keyboard	IBM	KB-0225	Data Cable, PS2 shielding 1.85 m	
Mouse	IBM	MO28VO	Data Cable, USB shielding 1.85 m	
Modem	ACEXX	DM-1414	Power Cable, Adapter Unshielding 1.8 m	
			Data Cable, RS232 Unshielding 1.35 m	
Printer	HP	Desk Jet400	Power Cable, Adapter Unshielding 1.8 m	
			Data Cable, PRINT Shielding 1.6 m	

Use Cable:

Cable	Description	
RJ-45*3	Unshielding, 0.5m	
RJ-45*1	Unshielding, 1.5m	

2.5 Connection Diagram of Test System



- 1. The RJ45 cable is connected from PC to the EUT.
- 2. The I/O cable is connected from PC to the Modem.
- 3. The I/O cable is connected from PC to the Printer.
- 4. The I/O cable is connected from PC to the Monitor.
- 5. The I/O cable is connected from PC to the Mouse.
- 6. The I/O cable is connected from PC to the Keyboard.
- 7. There cables are floating.

2.6 General Information of Test

Test Site:	Exclusive Certification Corp. 4F-2, No. 28, Lane 78, Xing-Ai Rd. Nei-hu, Taipei City 114 Taiwan R.O.C.
Test Site Location (OATS1-SD):	No.68-1, Shihbachongsi, shihding Township, Taipei City 223, Taiwan, R.O.C.
Registration Number:	632249
Test Voltage:	AC 120V/ 60Hz
Test in Compliance with:	ANSI C63.4-2003 FCC Part 15 Subpart C
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 24620MHz
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.

2.7 History of this test report

ORIGINAL.

3. Antenna Requirements

3.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 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 FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

3.2 Antenna Construction and Directional Gain

Antenna type: Reverse SMA, Dipole Antenna Antenna Gain: 1.8dBi.

4. Test of Conducted Emission

4.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

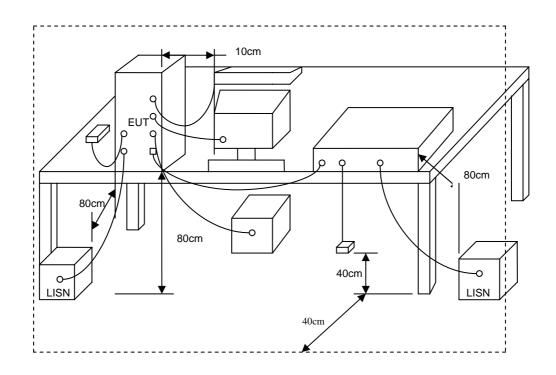
Frequency (MHz)	Quasi Peak (dB µ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

4.2 Test Procedures

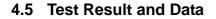
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

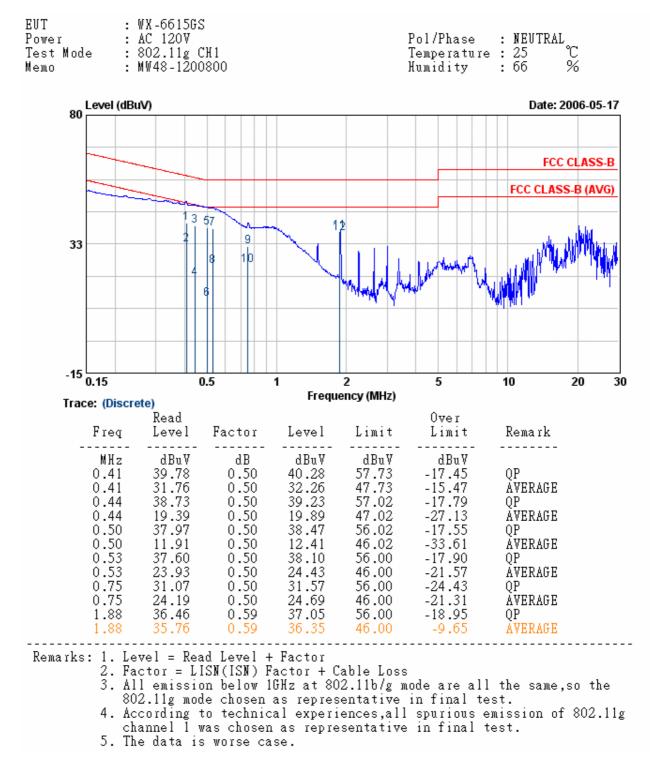
4.3 Typical Test Setup

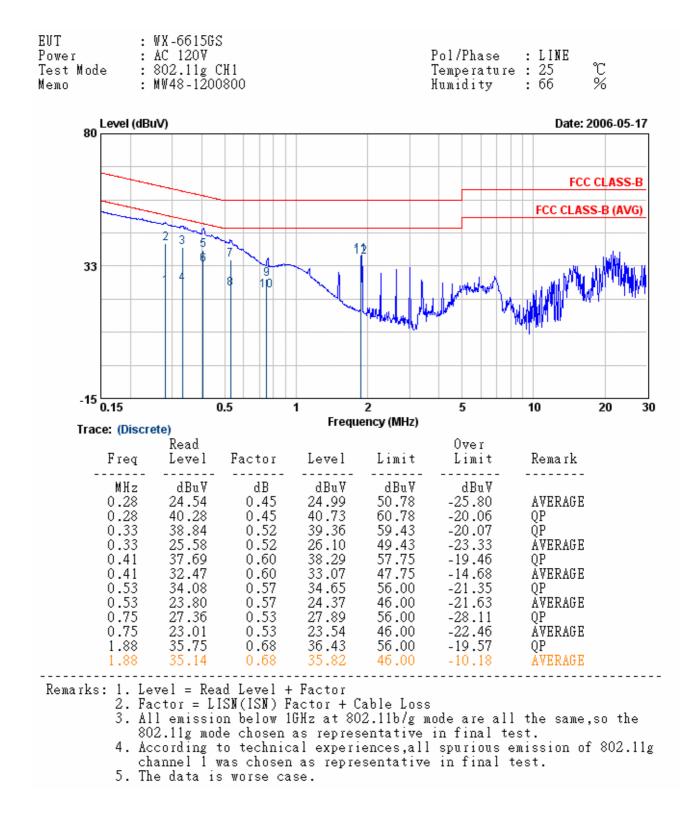


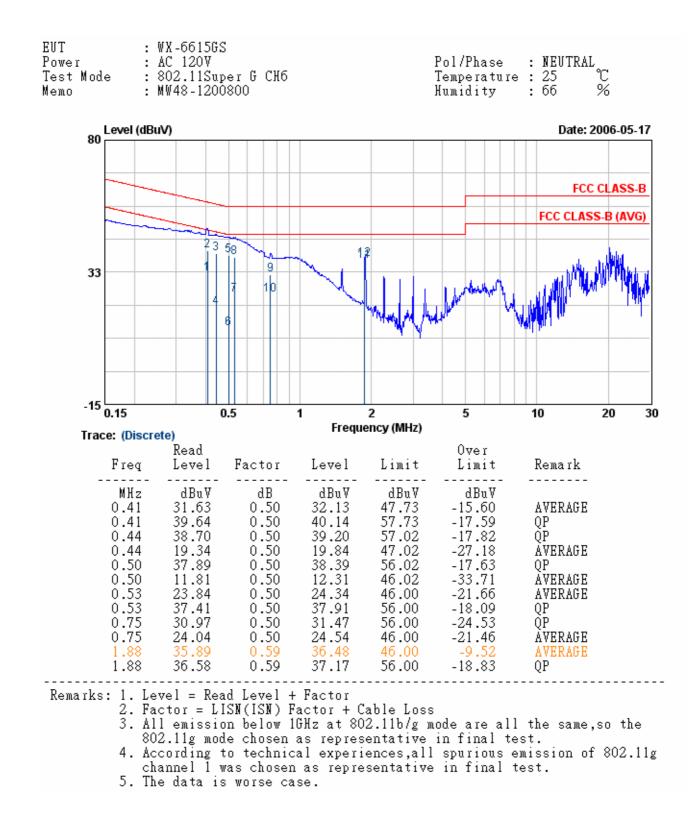
4.4 Measurement equipment

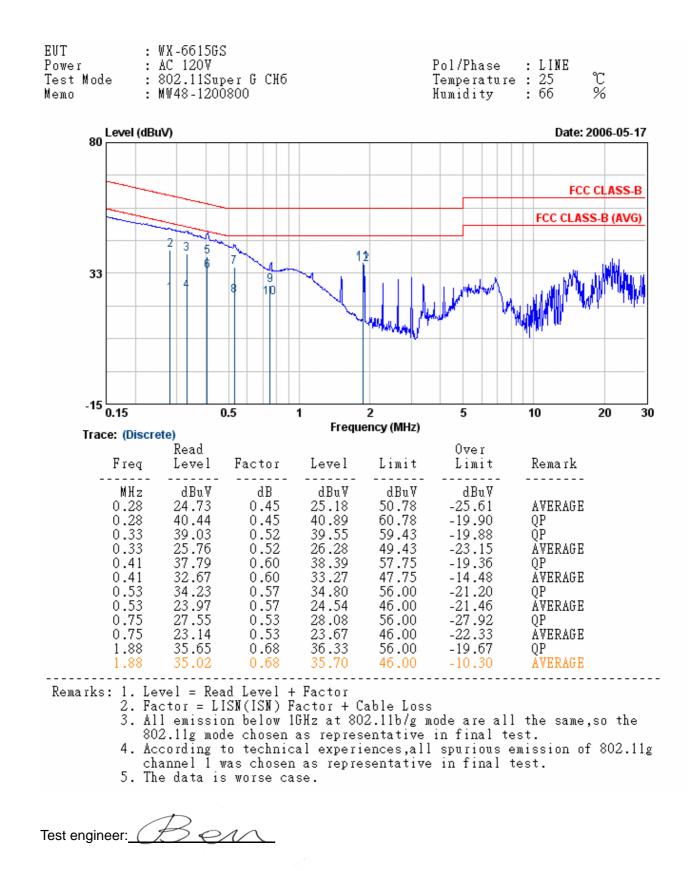
Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date
Receiver	SCR3501	Schaffner	437	2006/11/03
LISN	NNB-2/16Z	MESS TEC	02/10191	2007/03/30
LISN	NNB-2/16Z	ROLF HEINE	03/10058	2007/04/26











4.6 Test Photographs



Front View

Rear View

5. Test of Radiated Emission

5.1 Test Limit

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency	Distance	Radiated	Radiated
(MHz)	Meters	(µ V / M)	(dB µ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

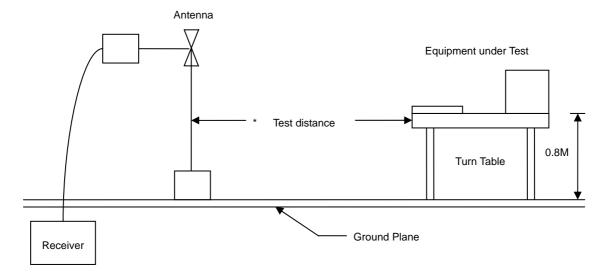
For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the above table.

Frequency (MHz)	Distance Meters	Radiated (dB µ V/ M)
30-230	10	30
230-1000	10	37

5.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. 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.

5.3 Typical Test Setup



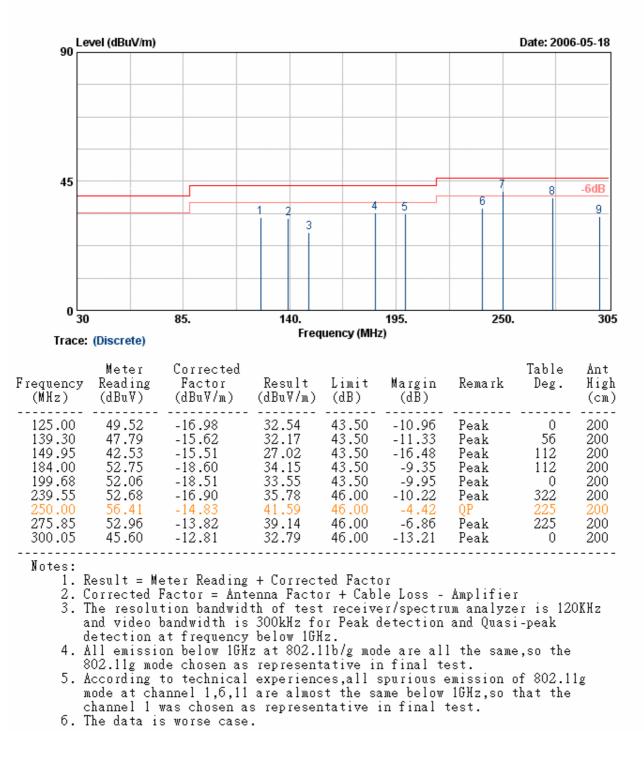
5.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date
EMI Receiver	8546A	HP	3807A00454	2007/05/11
Spectrum Analyzer	FSP40	R&S	10047	2007/01/16
Horn Antenna	3115	EMCO	31589	2007/02/12
Horn Antenna	3116	EMCO	31970	2007/02/09
Bilog Antenna	CBL6112B	Schaffner	2840	2007/04/19
Amplifier	8449B	Agilent	3008A01954	2007/01/08
Amplifier	8447D	Agilent	2944A10531	2006/08/09

5.5 Test Result and Data

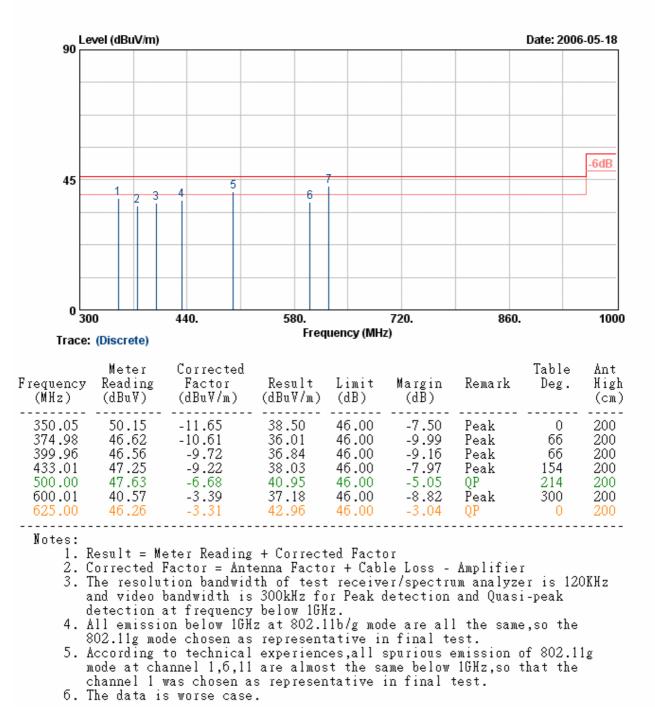
: WX-6615GS
: AC 120V
: Transmit/Receive
: 1
: 802.11g
:54 Mbps
: MW48-1200800

Pol/Phase	:	HORIZON	ITAL
Temperature	•	27	C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



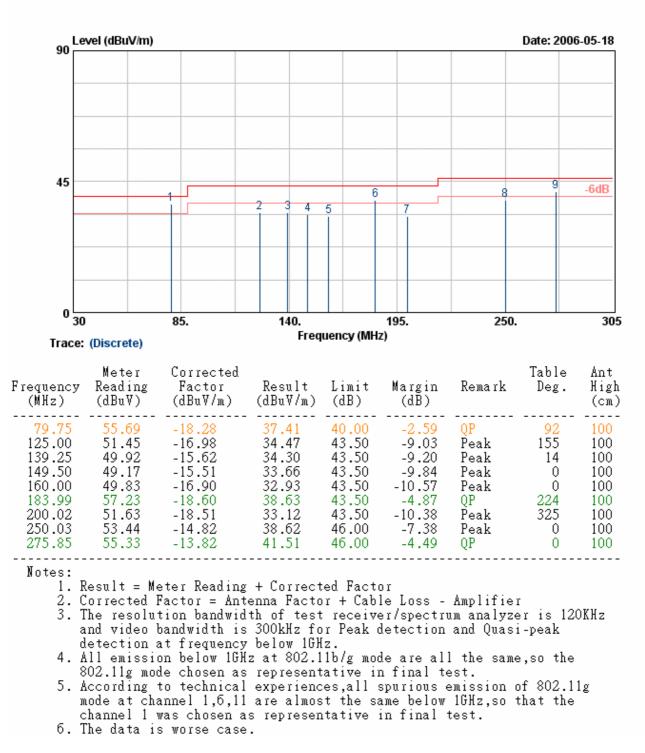
EVT	:	₩X-6615GS
		AC 120V
		Transmit/Receive
Operation Channel		
Modulation Type	:	802.11g
		54 Mbps
Memo	:	₩₩48-1200800

Pol/Phase	:	HORIZO	NTAL
Temperature	:	27	°C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



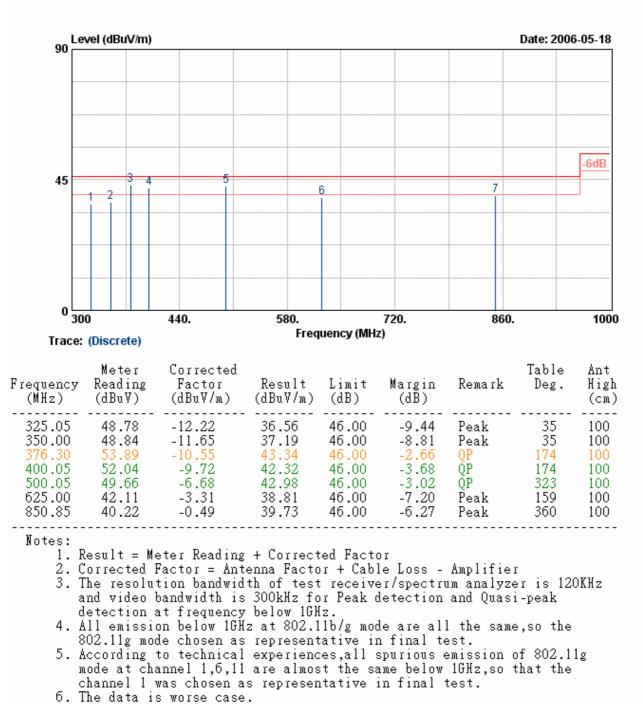
Power : A Test Mode : T Operation Channel: 1 Modulation Type : 8 Rate : 5	
---	--

Pol/Phase	:	VERTIC	AL
Temperature	•	27	Ċ
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



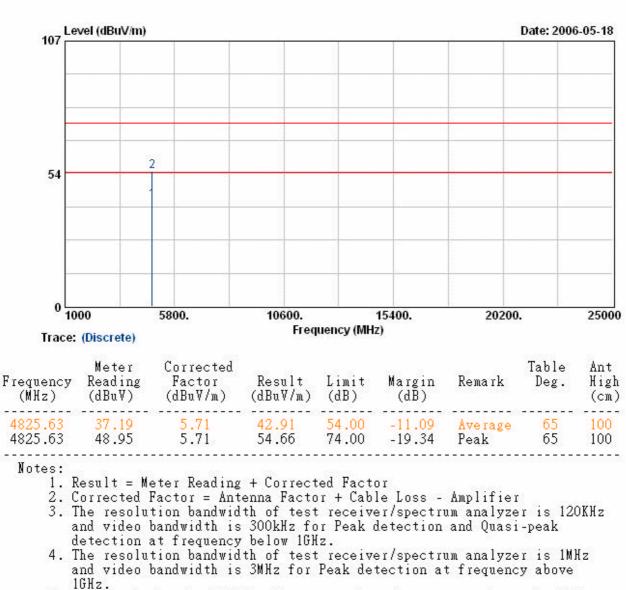
EVT	:	₩X-6615GS
Power		AC 120V
Test Mode		Transmit/Receive
Operation Channel		
Modulation Type		
Rate		54 Mbps
Memo	:	MW48-1200800

Pol/Phase	:	VERTIC	AL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric	Pressure:	1012	hPa



EVT	: WX-6615GS
Power	: AC 120V
Test Mode	: Transmit/Receive
Operation Channel	
Modulation Type	: 802.11b
	:11 Mbps
Memo	: MW48-1200800

	:	HORIZO	DNTAL
Temperature	:	27	°C
	:	70	%
Atmospheric Pressure	:	1012	hPa

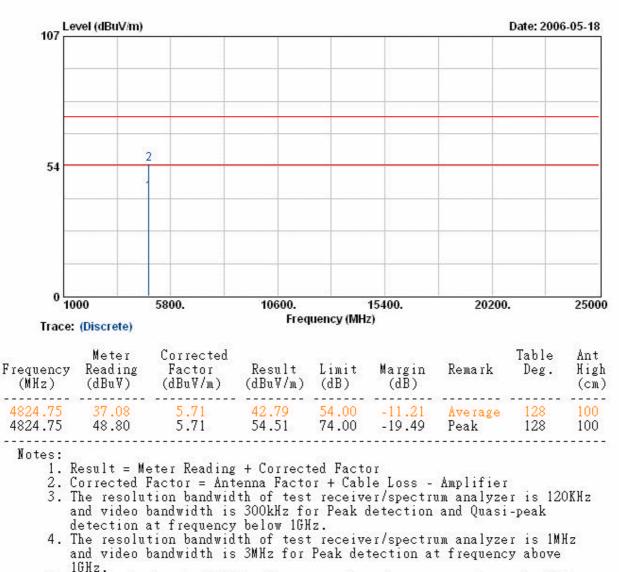


 The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.

6. The other emissions is too low to be measured.

EVT	÷	WX-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel	:	1
Modulation Type	:	802.11b
		11 Mbps
Memo	:	MW48-1200800

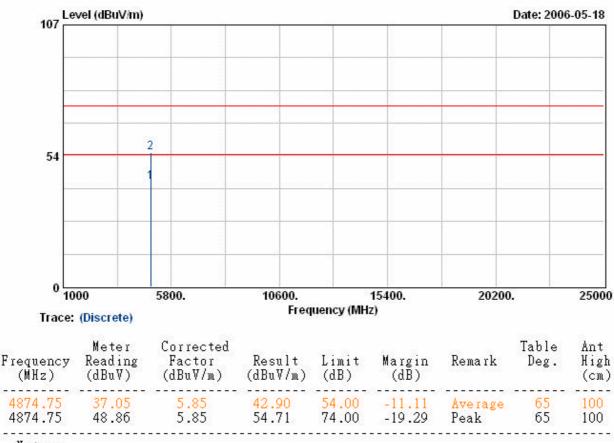
Pol/Phase	:	VERTIC	CAL
Temperature	:	27	°C
Humidity	Star 20 (1980)	70	%
Atmospheric	Pressure:	1012	hPa



- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

EUT	:	WX-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel	:	б
Modulation Type	:	802.11b
		11 Mbps
Memo	:	MW48-1200800
Memo	•	MW48-1200800

Pol/Phase	:	HORIZO	ONTAL
Temperature	:	27	°C
Humidity		70	%
Atmospheric	Pressure:	1012	hPa

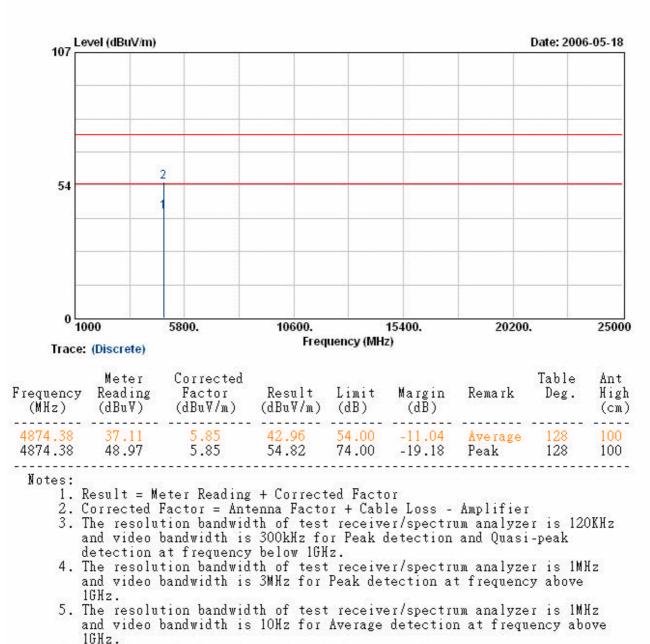


Notes:

- 1. Result = Meter Reading + Corrected Factor
- 2. Corrected Factor = Antenna Factor + Cable Loss Amplifier
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 16Hz.
- 4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

•	₩X-6615GS
:	AC 120V
	Transmit/Receive
	б
•	802.11b
	11 Mbps
:	MW48-1200800

Pol/Phase :		VERTIC	CAL
Temperature :		27	°C
	100	70	%
Atmospheric Pressure:		1012	hPa



6. The other emissions is too low to be measured.

EVT	:	WX-6615GS
Power	:	AC 120V
Test Mode		Transmit/Receive
Operation Channel	:	11
Modulation Type		
	•	11 Mbps
Memo	:	MW48-1200800

Pol/Phase	:	HORIZO	NTAL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric Pressure	:	1012	hPa

54		2						
1972 A.		• • • • • • • • • • • • • • • • • • •				(annonconcorrection) (annanna Sana	
	000 : (Discrete)	5800.	10600. Freq	uency (MH	15400. z)	20200	•	2500
7requency (MHz)	Meter Reading (dBu∀)	Corrected Factor (dBuV/m)	Result (dBu∀/m)	Limit (dB)	Margin (dB)	Rema rk	Table Deg.	Ant Higl (cm
<mark>4924.00</mark> 4924.00	37.02 48.86	<mark>5.99</mark> 5.99	<mark>43.00</mark> 54.84	54.00 74.00	-11.00 -19.16	<mark>Average</mark> Peak	<mark>65</mark> 65	100 100
2. (3. 4.	Corrected 1 The resolu and video 1 detection a The resolu and video 1 16Hz.	eter Reading Factor = Ant tion bandwid bandwidth is at frequency tion bandwid bandwidth is tion bandwid	enna Facto th of test 300kHz fo below 1GH th of test 3MHz for	r + Cab receive r Peak o z. receive Peak de	le Loss – er/spectro detection er/spectro tection a	um analyze and Quasi um analyze t frequenc	r is 12 -peak r is 1M y above	Нz

- and video bandwidth is 10Hz for Average detection at frequency above 1GHz. 6. The other emissions is too low to be measured.

EVT	: WX-6615GS
Power	: AC 120V
Test Mode	: Transmit/Receive
Operation Channel	: 11
Modulation Type	
Rate	:11 Mbps
Memo	: MW48-1200800

Pol/Phase	:	VERTIC	AL
rompore vero	:	27	°C
nonical vy	•	70	%
Atmospheric Pressure	:	1012	hPa

54		2						
	000 : (Discrete)	5800.	10600. Freq	uency (MH:	15400. z)	20200		2500
Frequency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Remark	Table Deg.	Ant High (cm)
<mark>4924.00</mark> 4924.00		<mark>5.99</mark> 5.99	<mark>43.10</mark> 54.90	<mark>54.00</mark> 74.00	-10.90 -19.10	<mark>Average</mark> Peak	128 128	100 100
2. (3. 4.	Corrected The resolu and video detection The resolu	eter Reading Factor = Ant tion bandwid bandwidth is at frequency tion bandwid bandwidth is	enna Facto th of test 300kHz fo below 1GH th of test	r + Cab receive r Peak o z. receive	le Loss – er/spectro detection er/spectro	um analyze and Quasi um analyze	er is 12 peak er is 1M	

and video bandwidth is 10Hz for Average detection at frequency above 1GHz.

δ. The other emissions is too low to be measured.

EVT	:	WX-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel	:	1
Modulation Type	:	802.11g
Rate		54 Mbps
Memo	:	MW48-1200800

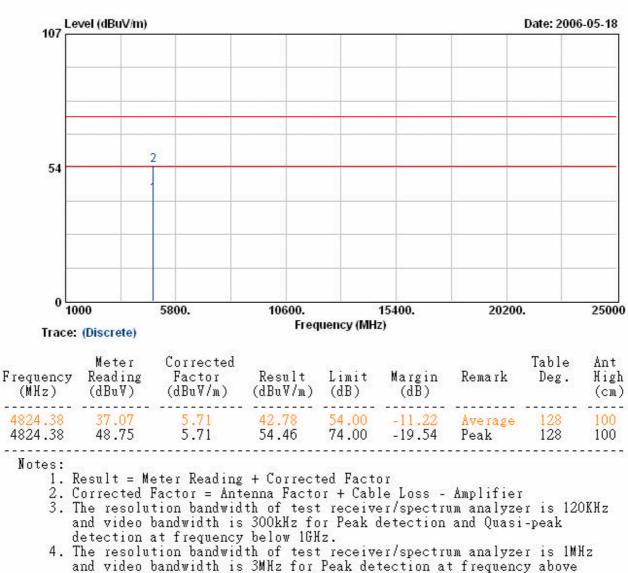
Pol/Phase	:	HORIZO	DNTAL
Temperature	:	27	°C
Humidity		70	%
Atmospheric	Pressure:	1012	hPa

54		2						
					·····			
0.44)00 (Discrete)	5800.	10600. Freq	uency (MH:	15400. z)	20200		2500
		Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Rema rk	Table Deg.	Ant Hig (cm
<mark>4823.38</mark> 4823.38	<mark>37 .21</mark> 48 .77	<mark>5.71</mark> 5.71	<mark>42.91</mark> 54.48	<mark>54.00</mark> 74.00	-11.09 -19.52	<mark>Average</mark> Peak		100 100
2. (3.] 4.]	Corrected The resolu and video detection The resolu and video UGHz.	eter Reading Factor = Ant tion bandwid bandwidth is at frequency tion bandwid bandwidth is	enna Facto th of test 300kHz fo below 1GH th of test	r + Cab receive r Peak o z. receive Peak de	le Loss - er/spectro detection er/spectro tection a	um analyze and Quasi um analyze t frequenc	r is 120 -peak r is 1MJ y above	łz

- and video bandwidth is 10Hz for Average detection at frequency above 1GHz. 6. The other emissions is too low to be measured.

ЕЛД	:	WX-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel	:	1
Modulation Type	:	802.11g
		54 Mbps
Memo	:	MW48-1200800

Pol/Phase :		VERTIC	CAL
Temperature :		27	°C
		70	%
Atmospheric Pressure:	i.	1012	hPa



- 16Hz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

EVT	: WX-6615GS
Power	: AC 120V
Test Mode	: Transmit/Receive
Operation Channel	
Modulation Type	: 802.11g
	:54 Mbps
Memo	: MW48-1200800

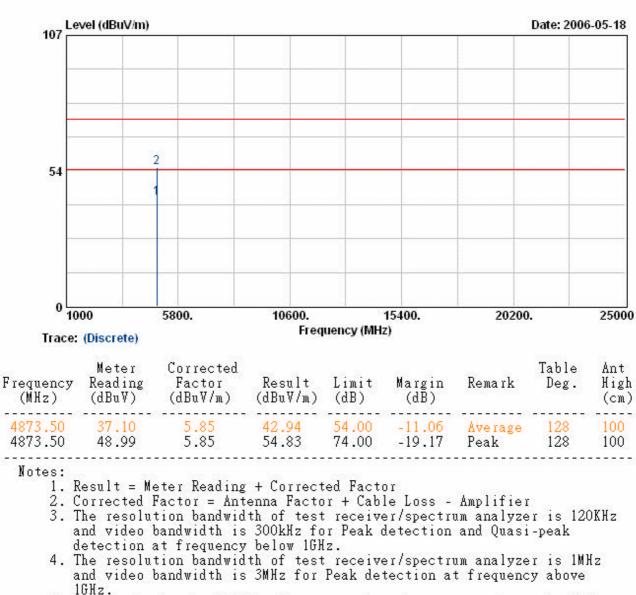
Pol/Phase	:	HORIZO	NTAL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric P	ressure:	1012	hPa

-					ldad (*, ddddadddddd 25			
54 -		2						
02	000 e: (Discrete)	5800.	10600. Freq	uency (MH:	15400. z)	20200		250
requency (MHz)	Meter Reading (dBuV)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit (dB)	Margin (dB)	Rema rk	Table Deg.	Ant Hig (cm
<mark>4873.88</mark> 4873.88	<mark>37.05</mark> 48.86	<mark>5.85</mark> 5.85	<mark>42.89</mark> 54.70	<mark>54.00</mark> 74.00	-11.11 -19.30	<mark>Average</mark> Peak	<mark>65</mark> 65	100 100
2. 3.	Corrected The resolu and video detection The resolu	eter Reading Factor = Ant tion bandwid bandwidth is at frequency tion bandwid bandwidth is	enna Facto th of test 300kHz fo below 1GH th of test	r + Cab receive Peak d z. receive	le Loss – er/spectro detection er/spectro	ım analyze and Quasi ım analyze	er is 124 -peak er is 1M1	

and video bandwidth is 10Hz for Average detection at frequency above 1GHz. 6. The other emissions is too low to be measured.

EUT		WX-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel	:	б
Modulation Type	•	802.11g
Rate		54 Mbps
Memo	:	MW48-1200800

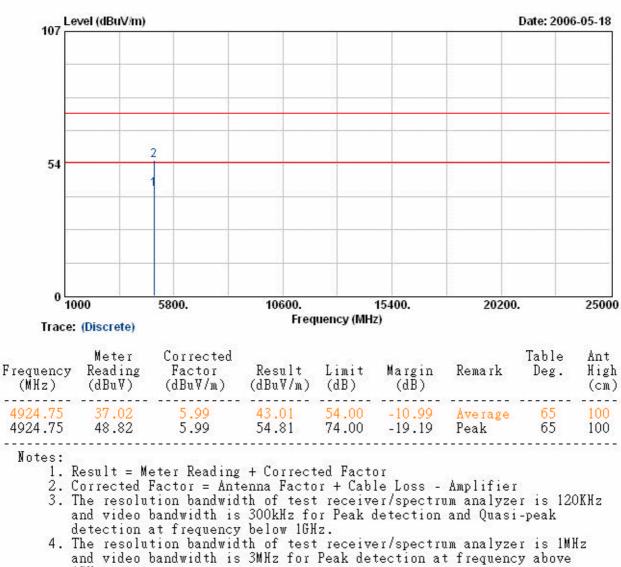
Pol/Phase	:	VERTIC	AL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric Pressure	:	1012	hPa



- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

EVT	: WX-6615GS
Power	: AC 120V
	: Transmit/Receive
Operation Channel	
Modulation Type	
Rate	:54 Mbps
Memo	: M₩48-1200800

Pol/Phase	:	HORIZO	NTAL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric Pressure	:	1012	hPa



- and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

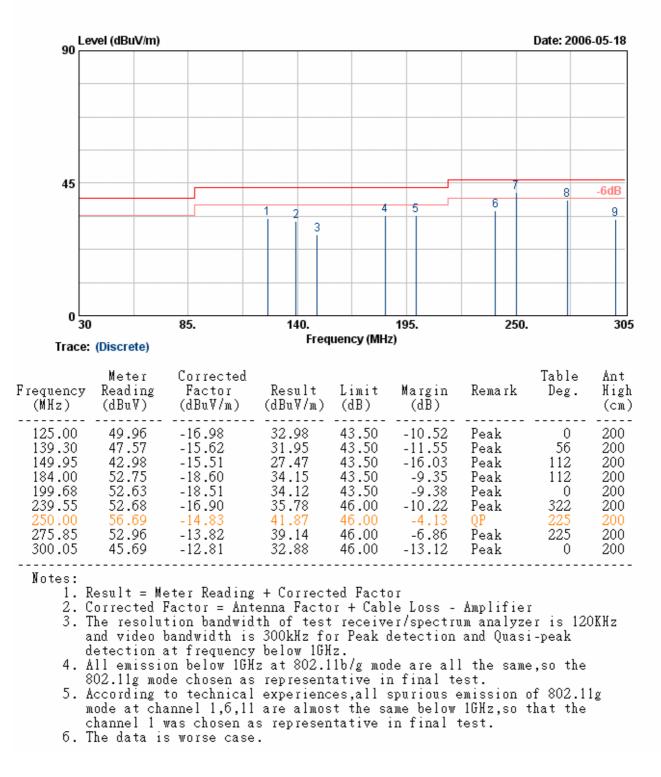
EVT	: WX-6615GS
	: AC 120V
	: Transmit/Receive
Operation Channel	
Modulation Type	
	:54 Mbps
Memo	: M₩48-1200800

Pol/Phase	:	VERTIC	CAL
Temperature	:	27	°C
Humidity	:	70	%
Atmospheric Pressul	e:	1012	hPa

54		2						
56,65 								
					······			
	000	5800.	10600. Erea	uency (MH)	15400.	20200	•	2500
	(Discrete) Meter Reading (dBu∀)	Corrected Factor (dBuV/m)	Result (dBuV/m)	Limit	Margin (dB)	Remark	Table Deg.	Ant Higl (cm
<mark>4924 .25</mark> 4924 .25	37.11 48.91	<mark>5.99</mark> 5.99	43.10 54.89	<mark>54.00</mark> 74.00		<mark>Average</mark> Peak	128 128	100 100
2. (3. 5 4. 5	Corrected 1 The resolut and video 1 detection a The resolut	eter Reading Factor = Ant tion bandwid bandwidth is at frequency tion bandwid bandwidth is	enna Facto th of test 300kHz fo below 1GH th of test	r + Cab receive r Peak o z. receive	le Loss – er/spectr detection er/spectr	um analyze and Quasi um analyze	r is 12 -peak r is 1M	

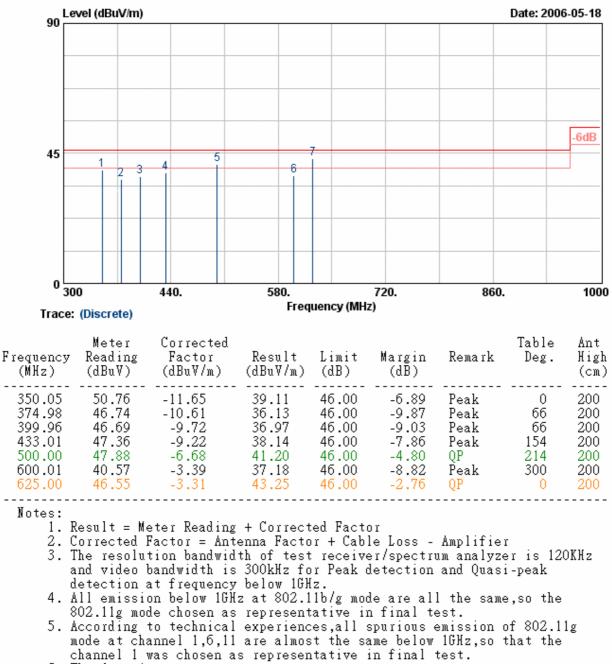
EVT	:	WX-6615GS
Power		AC 120V
Test Mode		Transmit/Receive
Operation Channel		
Modulation Type		
Rate		108 Mbps
Memo	:	MW48-1200800

Pol/Phase	:	HORIZO	
Temperature	:	27	°C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



EUT	:	WX-6615GS
		AC 120V
		Transmit/Receive
Operation Channel		
Modulation Type		
		108 Mbps
Memo	:	MW48-1200800

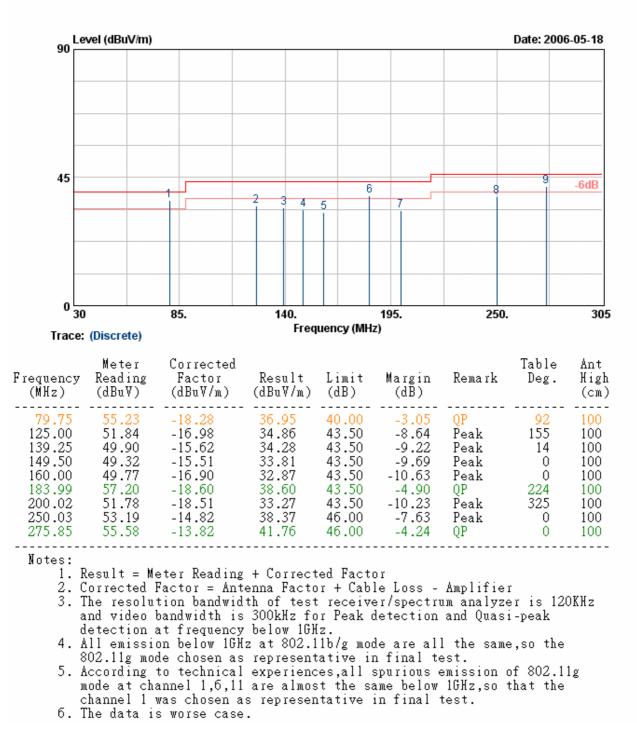
Pol/Phase	:	HORIZON	ITAL
Temperature	:	27	°C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



б. The data is worse case.

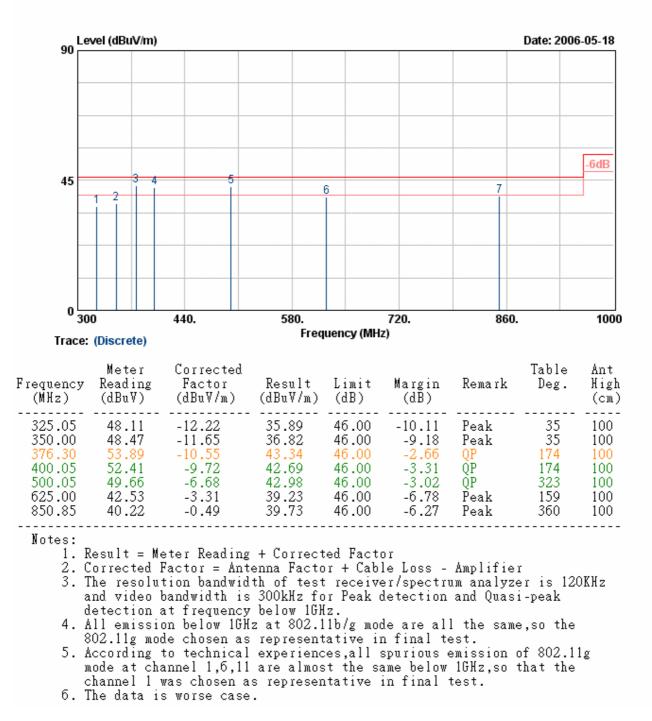
EVT	:	₩X-6615GS
Power	:	AC 120V
Test Mode	:	Transmit/Receive
Operation Channel		
Modulation Type		
Rate		108 Mbps
Memo	:	MW48-1200800

Pol/Phase	:	VERTICA	۱L
Temperature	:	27	°C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



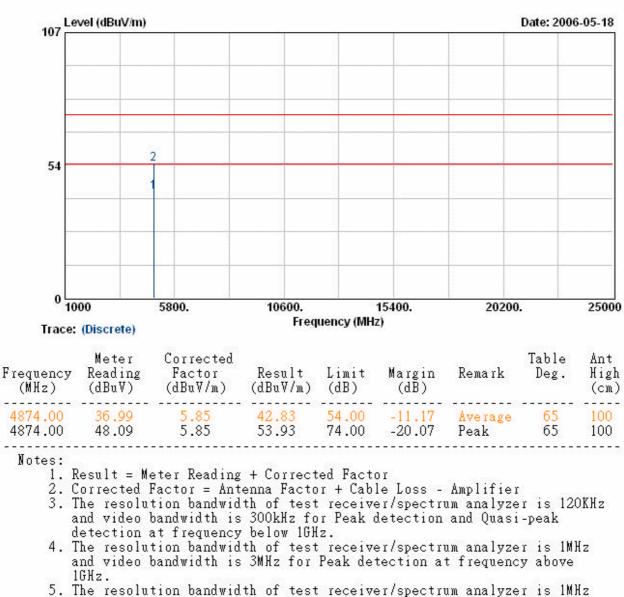
EUT	:	WX-6615GS
	•	AC 120V
		Transmit/Receive
Operation Channel:		
Modulation Type		
		108 Mbps
Memo	:	M₩48-1200800

Pol/Phase	:	VERTIC:	AL
Temperature	•	27	C
Humidity	•	70	%
Atmospheric	Pressure:	1012	hPa



ЕЛД	: WX-6615GS
Power	: AC 120V
Test Mode	: Transmit/Receive
Operation Channel	:б
Modulation Type	
	:108 Mbps
Memo	: M₩48-1200800

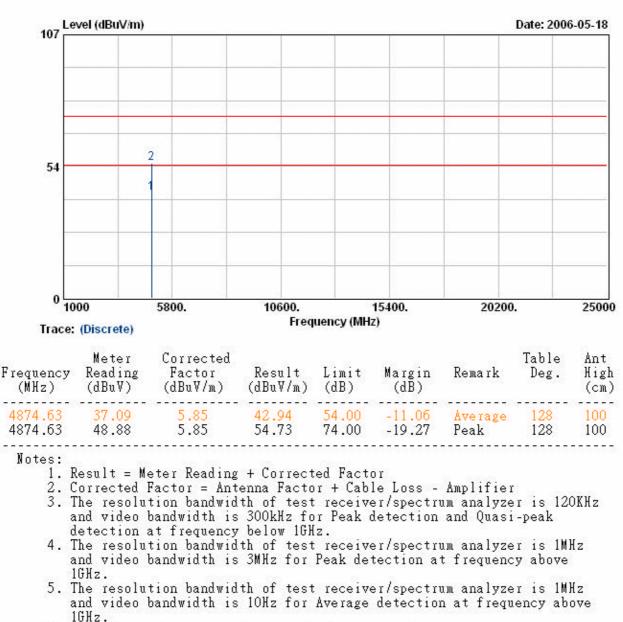
Pol/Phase	:	HORIZO	NTAL
romportavero	:	27	°C
110,111,012,0)		70	%
Atmospheric Pressure	:	1012	hPa



- The resolution bandwidth of test receiver/spectrum analyzer is IMHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
- 6. The other emissions is too low to be measured.

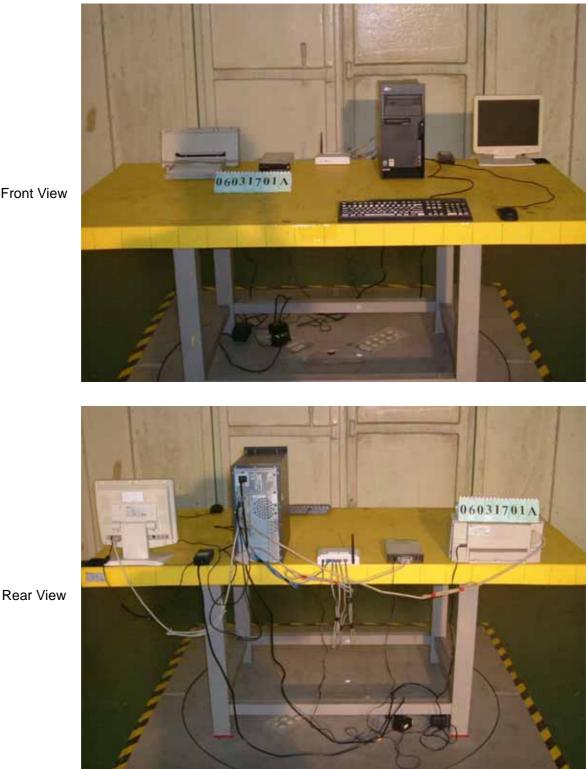
Power : AC 120V
Test Mode : Transmit/Receive
Operation Channel: 6
Modulation Type : 802.11Super G
Rate : 108 Mbps
Memo : MW48-1200800

Pol/Phase	:	VERTIC	AL
Temperature	:	27	°C
Humidity	1	70	%
Atmospheric	Pressure:	1012	hPa

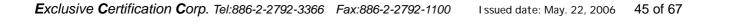


б. The other emissions is too low to be measured.

5.6 Test Photographs



Front View



6. 6dB Bandwidth Measurement Data

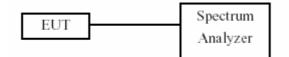
6.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

6.2 Test Procedures

- a. The transmitter output was connected to the spectrum analyzer.
- b. Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
- c. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

6.3 Test Setup Layout



6.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date.
Spectrum Analyzer	FSP40	R&S	100047	2007/01/16

6.5 Test Result and Data

(1) Modulation Standard: IEEE 802.11b (11Mbps)

Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
01	2412	11.3
06	2437	11.7
11	2462	11.3

(2) Modulation Standard: IEEE 802.11g (54Mbps)

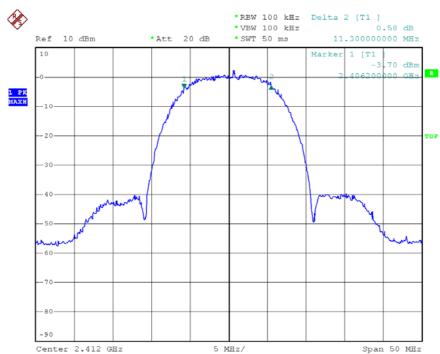
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
01	2412	16.5
06	2437	16.5
11	2462	16.5

(3) Modulation Standard: IEEE 802.11 Super g (108Mbps)

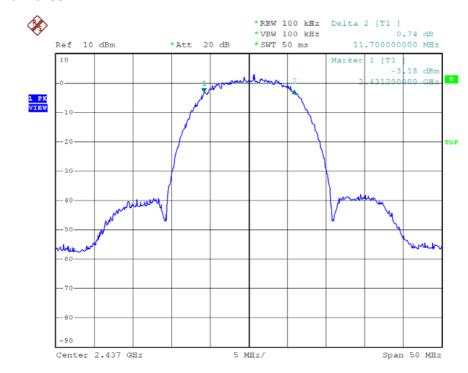
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency	6dB Bandwidth
	(MHz)	(MHz)
06	2437	33.4



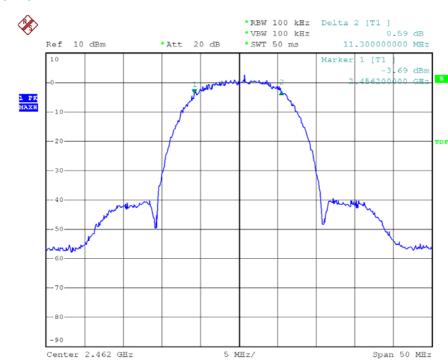
Modulation Standard: 802.11b (11Mbps) Channel: 01

Date: 16.MAY.2006 13:40:02



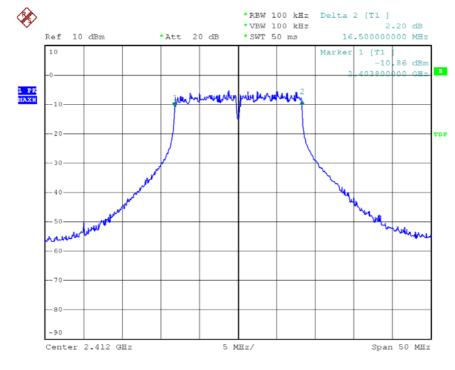
Channel:06

Date: 16.MAY.2006 13:42:02



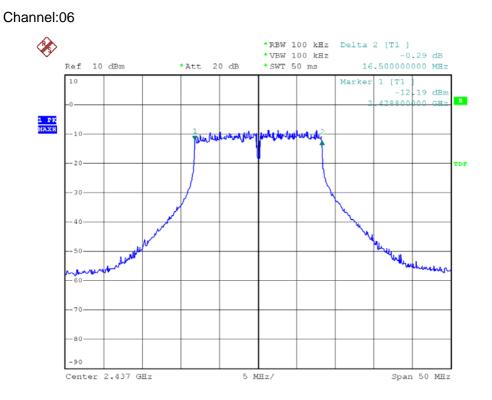
Channel:11

Modulation Standard:802.11g (54Mbps) Channel:01

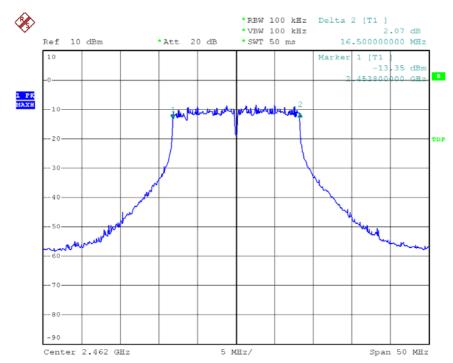


Date: 16.MAY.2006 13:49:34

Date: 16.MAY.2006 13:44:18

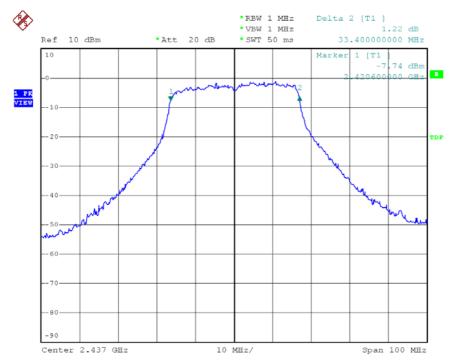


Date: 16.MAY.2006 13:48:14



Channel:11

Date: 16.MAY.2006 13:46:36



Modulation Standard:802.11 Super g (108Mbps) Channel:06

Date: 16.MAY.2006 16:40:51

7. Maximum Peak Output Power

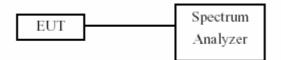
7.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

7.2 Test Procedures

The antenna port(RF output) of the EUT was connected to the input(RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

7.3 Test Setup Layout



7.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date.
Spectrum Analyzer	FSP40	R&S	100047	2007/01/16

7.5 Test Result and Data

(1) Modulation Standard: IEEE 802.11b (11Mbps)

Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
01	2412	17.91	61.8
06	2437	18.44	69.8
11	2462	17.83	60.7

(2) Modulation Standard: IEEE 802.11g (54Mbps)

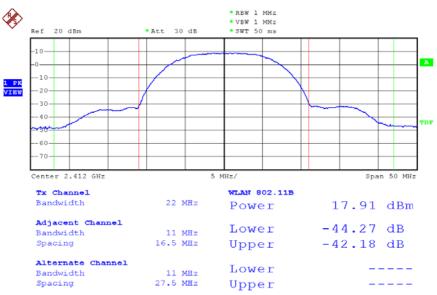
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
01	2412	14.05	25.4
06	2437	13.14	20.6
11	2462	13.13	20.6

(3) Modulation Standard: IEEE 802.11 Super g (108Mbps)

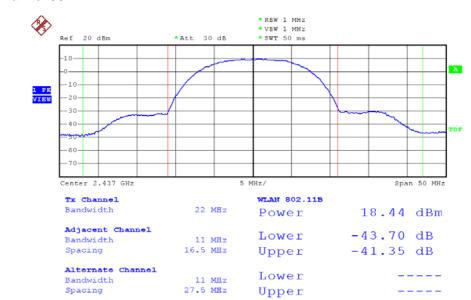
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
06	2437	13.72	23.6



Modulation Standard: 802.11b (11Mbps) Channel: 01

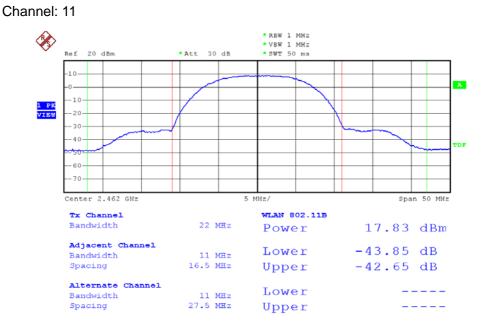
Date: 16.MAY.2006 13:21:29



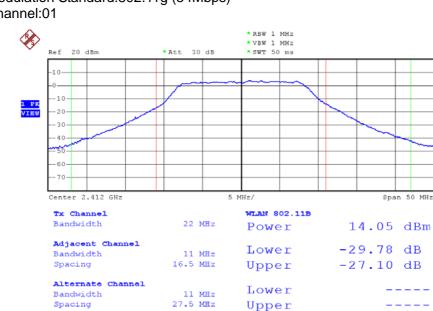
Channel:06

Date: 16.MAY.2006 13:25:00

А

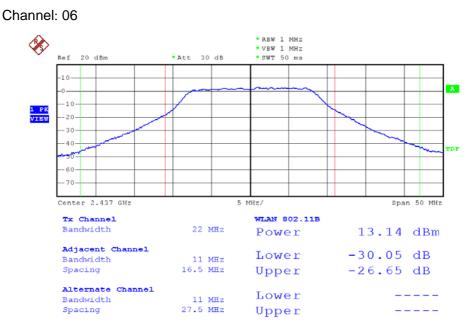


Date: 16.MAY.2006 13:27:13

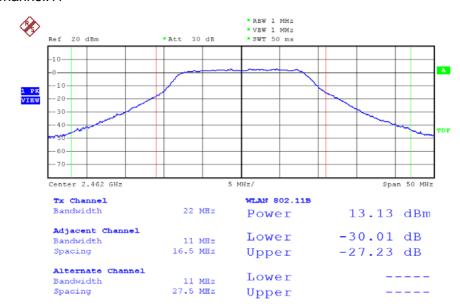


Modulation Standard:802.11g (54Mbps) Channel:01

Date: 16.MAY.2006 16:25:31

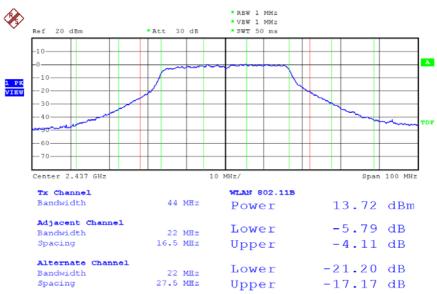


Date: 19.MAY.2006 17:28:58



Channel:11

Date: 19.MAY.2006 17:31:20



Modulation Standard:802.11 Super g (108Mbps) Channel:06

Date: 16.MAY.2006 16:36:49

8. Band Edges Measurement

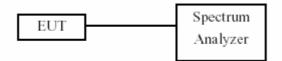
8.1 Test Limit

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

8.2 Test Procedure :

- 1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
- 2.Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- 3. The band edges was measured and recorded.

8.3 Test Setup Layout



8.4 Measurement equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date.
Spectrum Analyzer	FSP40	R&S	100047	2007/01/16

8.5 Test Result and Data

(1) Modulation Standard: IEEE 802.11b (11Mbps)

Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

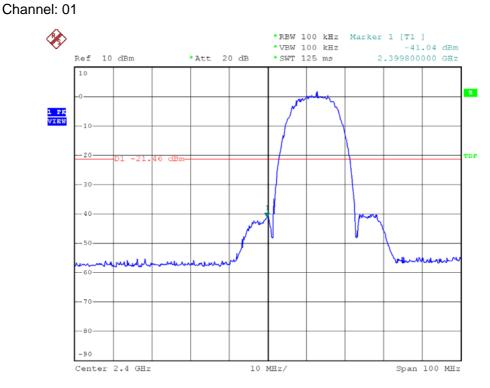
Channel	Frequency	maximum value in frequency	maximum value is
Channel		(MHz)	(dBm)
01	2412	2399.8	-41.04
11	2462	2484.5	-55.00

(2) Modulation Standard: IEEE 802.11g (54Mbps)

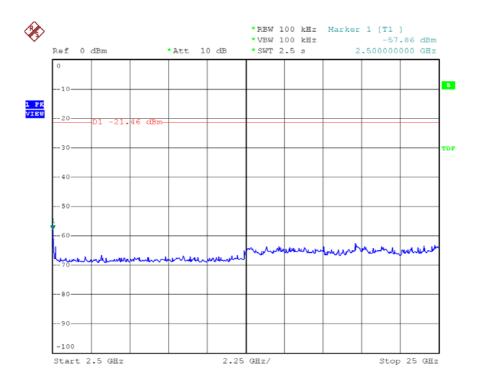
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency	maximum value in frequency	maximum value is
Channel		(MHz)	(dBm)
01	2412	2399.8	-37.33
11	2462	2484.9	-55.41

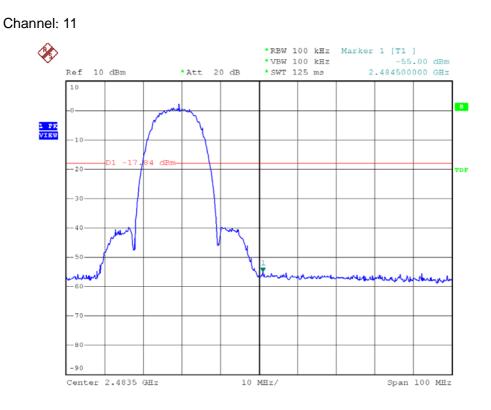
Modulation Standard: 802.11b (11Mbps)



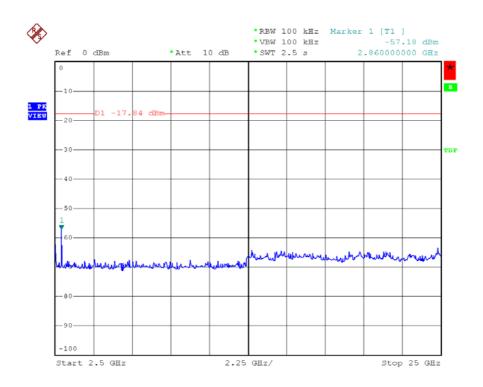
Date: 16.MAY.2006 14:04:50



Date: 16.MAY.2006 14:06:23



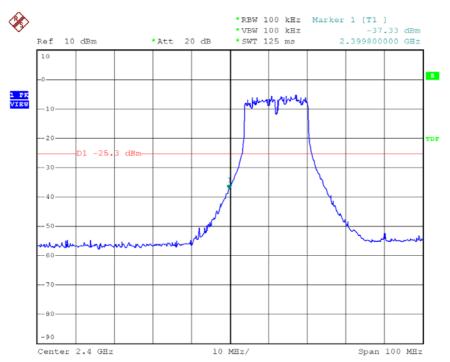
Date: 16.MAY.2006 15:03:40



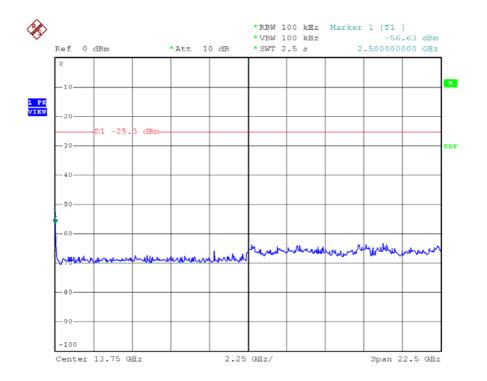
Date: 16.MAY.2006 15:05:58

Modulation Standard: 802.11g (54Mbps)

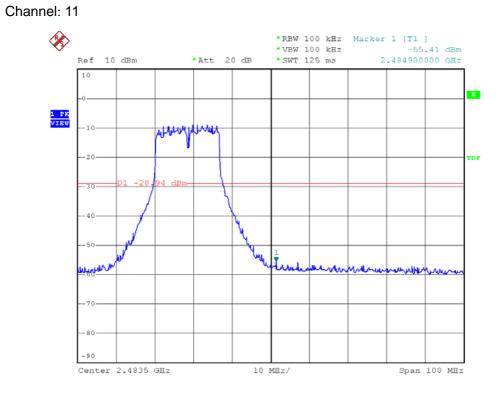
Channel: 01



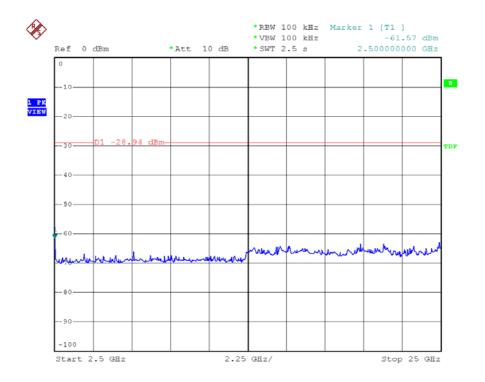
Date: 16.MAY.2006 14:50:56



Date: 16.MAY.2006 14:52:10







Date: 16.MAY.2006 14:46:18

8.6 Restrict band emission Measurement Data

Modulation Standard: IEEE 802.11b (11Mbps)

Test Date: May. 18, 2006 Temperature: 27°C Humidity: 70% Atmospheric pressure: 1012 hPa

a) Channel 1

Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Result (dBuV/m) Remark		@3m V/m)	Margin (dB)	Table (Deg.)	Ant High
()		5				Peak	Ave.		(3)	(m)	
2366.814	Н	50.23	-0.83	49.40	Peak	74	54	-24.60	65	1.1	
2319.894	Н	38.09	-0.98	37.11	Ave	74	54	-16.89	65	1.1	
2386.398	V	52.32	-0.76	51.56	Peak	74	54	-22.44	128	1.0	
2319.894	V	41.97	-0.98	40.99	Ave	74	54	-13.01	128	1.0	

b) Channel 11

Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark		@3m V/m)	Margin (dB)	Table (Deg.)	Ant High
((Peak	Ave.	()	(= - 9-)	(m)
2496.446	Н	50.47	-0.41	50.06	Peak	74	54	-23.94	65	1.1
2492.362	Н	38.05	-0.42	37.63	Ave	74	54	-16.37	65	1.1
2486.966	V	52.79	-0.44	52.35	Peak	74	54	-21.65	128	1.0
2486.852	V	39.68	-0.44	39.24	Ave	74	54	-14.76	128	1.0

Modulation Standard: 802.11g (6Mbps)

Test Date: May. 18, 2006 Temperature: 27°C Humidity: 70% Atmospheric pressure: 1012 hPa

a) Channel 1

Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit((dBu)		Margin (dB)	Table (Deg.)	Ant High
()		j		(Peak	Ave.	()	(= - 9-)	(m)
2313.468	Н	50.77	-1.00	49.77	Peak	74	54	-24.23	65	1.1
2319.894	Н	38.94	-0.98	37.96	Ave	74	54	-16.04	65	1.1
2389.968	V	57.24	-0.75	56.49	Peak	74	54	-17.51	128	1.0
2319.894	V	44.57	-0.98	43.59	Ave	74	54	-10.41	128	1.0

c) Channel 11

Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Result (dBuV/m)		@3m V/m)	Margin (dB)	Table (Deg.)	Ant High
()		5				Peak	Ave.		(3)	(m)	
2489.322	Н	49.93	-0.43	49.50	Peak	74	54	-24.50	65	1.1	
2491.906	Н	38.02	-0.43	37.59	Ave	74	54	-16.41	65	1.1	
2483.546	V	52.31	-0.45	51.86	Peak	74	54	-22.14	128	1.0	
2483.508	V	40.17	-0.45	39.72	Ave	74	54	-14.28	128	1.0	

Notes:

1. Result = Meter Reading + Factor

2. Factor = Antenna Factor + Cable Loss – Amplifier

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth

is 3 MHz for Peak detection at frequency above 1GHz.

4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz

9. Power Spectral Density

9.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

9.2 Test Procedures

- a. The transmitter output was connected to spectrum analyzer.
- b. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=span/3KHz.
- c. The power spectral density was measured and recorded.
- d. The Sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

9.3 Test Setup Layout :



9.4 List of Measuring Equipment Used

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Valid Date.
Spectrum Analyzer	FSP40	R&S	100047	2007/01/16

9.5 Test Result and Data

(1) Modulation Standard: IEEE 802.11b (11Mbps)

Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

	Channel	Frequency	Maximum Power Density of 3 kHz Bandwidth (dBm)
	01	2412	-8.86
ſ	06	2437	-11.80
	11	2462	-12.52

(2) Modulation Standard: IEEE 802.11g (54Mbps)

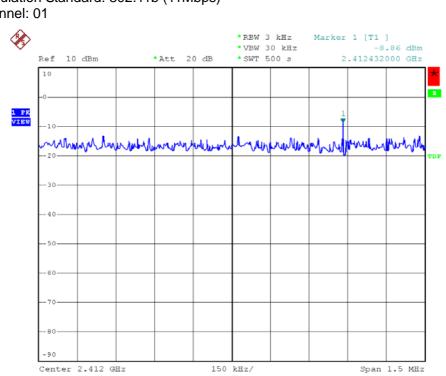
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency	Maximum Power Density of 3 kHz Bandwidth (dBm)
01	2412	-19.06
06	2437	-22.63
11	2462	-22.01

(3) Modulation Standard: IEEE 802.11g (54Mbps)

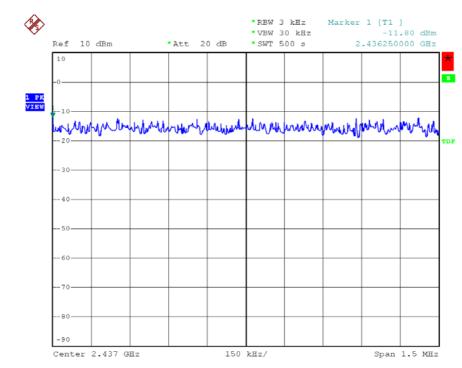
Test Date: May. 16, 2006 Temperature: 25°C Humidity: 70% Atmospheric pressure: 1011 hPa

Channel	Frequency	Maximum Power Density of 3 kHz Bandwidth (dBm)
06	2437	-25.22



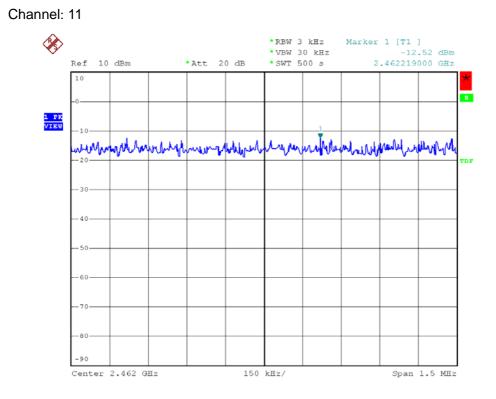
Modulation Standard: 802.11b (11Mbps) Channel: 01

Date: 16.MAY.2006 15:18:01



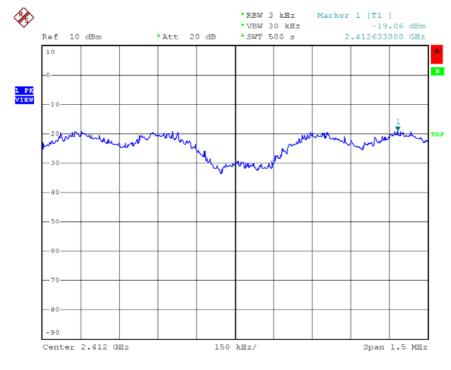
Channel:06

Date: 16.MAY.2006 15:26:36

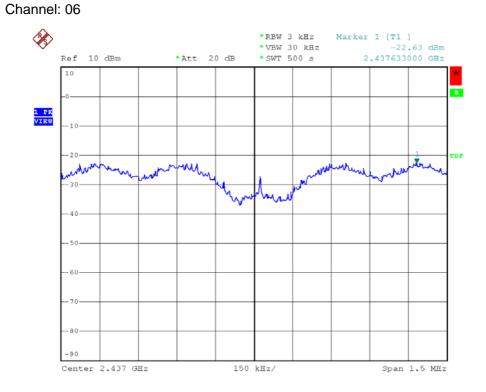


Date: 16.MAY.2006 15:35:36

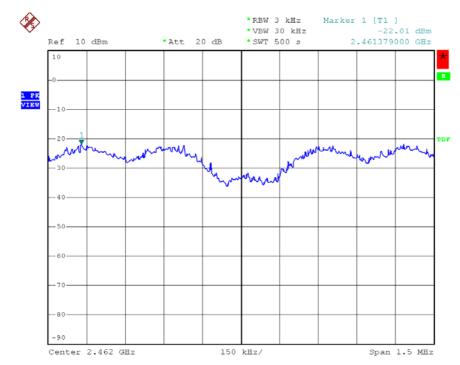
Modulation Standard:802.11g (54Mbps) Channel:01



Date: 16.MAY.2006 16:06:37

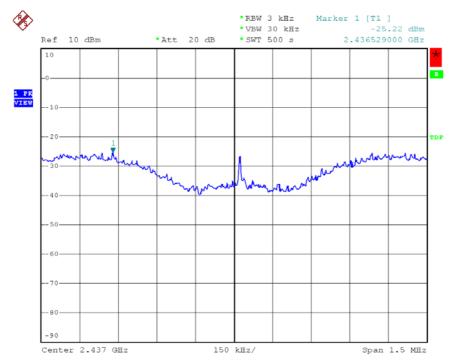


Date: 16.MAY.2006 15:54:51



Channel:11

Date: 16.MAY.2006 15:45:37



Modulation Standard:802.11 Super g (108Mbps) Channel:06

Date: 16.MAY.2006 16:54:06

10. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 - 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 - 5.250
0.49500 - 0.505**	16.69475 – 16.69525	608.0 - 614.0	5.350 - 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 - 1240.0	7.250 – 7.750
4.12500 - 4.12800	25.50000 - 25.67000	1300.0 – 1427.0	8.025 - 8.500
4.17725 – 4.17775	37.50000 - 38.25000	1435.0 – 1626.5	9.000 - 9.200
4.20725 – 4.20775	73.00000 - 74.60000	1645.5 – 1646.5	9.300 - 9.500
6.21500 - 6.21800	74.80000 - 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 - 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 - 138.00000	2200.0 - 2300.0	14.470 – 14.500
8.29100 - 8.29400	149.90000 - 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 - 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 - 8.38675	156.70000 - 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 - 8.41475	162.01250 – 167.17000	3260.0 - 3267.0	23.600 - 24.000
12.29000 - 12.29300	167.72000 - 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 - 285.00000	3345.8 – 3358.0	36.430 - 36.500
12.57675 – 12.57725	322.00000 - 335.40000	3600.0 - 4400.0	Above 38.6
13.36000 - 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

10.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.