FCC PART 15 SUBPART C

EMI MEASUREMENT AND TEST REPORT

For

OTC Wireless, Inc

48507 Milmont Drive
Fremont, CA 94538

FCC ID: MKZWEA11G03682

2003-08-13

This Report Concerns:	**Equipment Type:**
☒ Original Report	802.11g Wireless Ethernet Adapter

Test Engineer:	Ling Zhang /
Report No.:	R0307211
Test Date:	2003-07-24
Reviewed By:	Ming Jing /
Prepared By:	Bay Area Compliance Laboratory Corporation (BACL) 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *OTC Wireless, Inc's*, model: *ACR-201-G, ASR-102-G,* or the "EUT" as referred to in this report is an 802.11g Wireless Ethernet Adapter which measures approximately 7"L x 2.25"W x 0.95"H. The EUT provides the following features:

- No driver on the host device is required for radio operation
- Radio Operation is independent of the operating system on computer of any connecting device, as long as the device has a properly supported Ethernet port.
- Industry standard IEEE 802.11b-compliant wireless interface; Interoperable with AP and Client radios from other vendors (WiFi Certified)
- The IP Bridging Mode, when enabled, allows the sharing of the Station Radio by multiple computers
- Ethernet (802.3 compliant) host interface to enable true Plug & Play
- Maximum 54 Mbps data rate and automatic selection of lower data rates in degraded RF environment
- Integrated omni-directional-antenna to provide best tradeoff between link-quality and mobility
- Remote network management achievable through Web browser-based configuration tool run from any OS platforms
- Remote firmware/software upgrade can be achievable from any OS platforms

** The test data gathered is from typical production samples provided by the manufacturer.*

1.2 Objective

This type approval report is prepared on behalf of. *OTC Wireless, Inc* in accordance with Part 2, Subpart J, Part 15, Subparts A and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-1992, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz and FCC97114 for Direct Sequence SS.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method – 47 CFR Part – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8568B	Panel 2408A00105 Display 2403A06544	2004-05-01
HP	Spectrum Analyzer	8564E	29190A00242	2003-12-06
HP	Amplifier	8447E	1937A01054	2004-05-01
HP	Quasi-Peak Adapter	85650A	2521A00718	2004-05-01
Com-Power	Biconical Antenna	AB-100	14012	2004-05-01
Com-Power	LISN	LI-200	12005	2004-03-28
Com-Power	LISN	LI-200	12008	2004-03-28
Com-Power	Log Periodic Antenna	AL-100	16091	2004-05-01
Com-Power	Log Periodic Antenna	AB-900	15049	2004-05-01
Rohde & Schwarz	EMI Test Receiver	ESPI	1147 8007 07	2003-12-03

*** Statement of Traceability: Bay Area Compliance Laboratory Corp.** certifies that all calibration has been performed using suitable standards traceable to the NIST.

1.7 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Compaq	Notebook PC	1456VQLIN	2V0CDZ8ZC5X1	DOC
HP	Printer	2225C	N/A	DOC
EVEREX	Modem	Evercom24E	N/A	E3E5UVEN-945

1.8 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shielded Serial Cable	2.0	Serial Port/Notebook PC	Modem
RJ-45 Cable	2.0	RJ-45 Port/Notebook PC	EUT
Shielded Printer Cable	2.0	Parallel Port/Notebook PC	Printer

1.9 Power Supply Information

Manufacturer	Description	Model	Serial Number	FCC ID
AK II Power Supply	AC Adapter	91-55855	N/A	DOC
DELTA	AC Adapter	APP-10SB	BWW0315006901	DOC

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The host system was configured for testing in a typical fashion (as normally used by a typical user).

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The test software, provided by the customer, is started the Windows 2000 terminal program under the Windows 2000 operating system. Once loaded, the program sequentially exercises each system component, and the Prism Test Utility icon appears in the PC screen. Select the channel to be tested, select the 11 Mbps, and click the "Continuous TX" button for transmitting the RF power.

Repeat above steps for other channel to be tested.

2.3 Special Accessories

As shown in section 2.7, all interface cables used for compliance testing are shielded. The host pc and the peripherals featured shielded metal connectors.

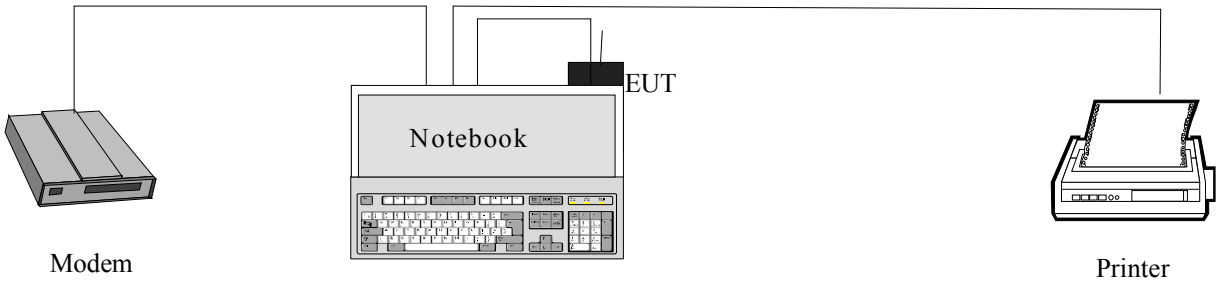
2.4 Schematics / Block Diagram

Please refer to Appendix A.

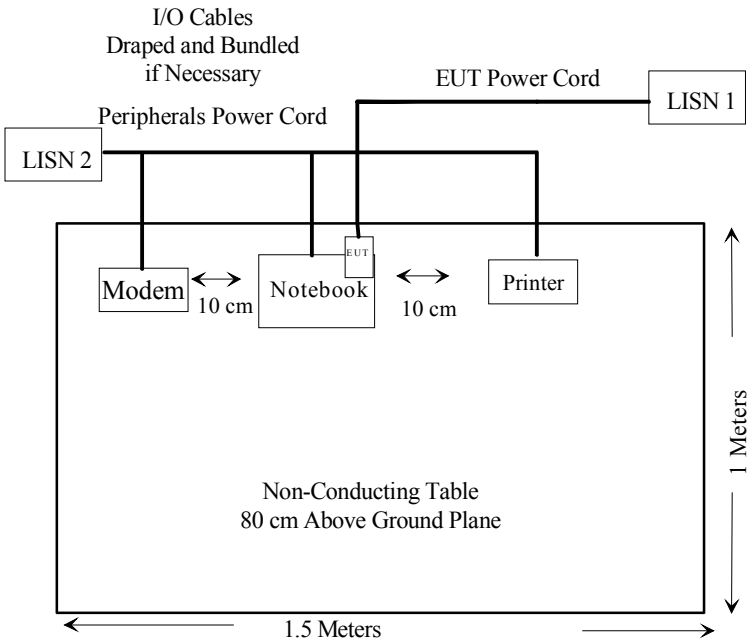
2.5 Equipment Modifications

No modifications were made by BACL to ensure the EUT to comply with the applicable limits and requirements.

2.6 Configuration of Test System



2.7 Test Setup Block Diagram



3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT	REFERENCE
§15.203	Antenna Requirement	Compliant	Section 9
§ 15.205	Restricted Bands	Compliant	Section 10
§15.207 (a)	Conducted Emission	Compliant	Section 11
§15.209 (a)	Radiated Emission	Compliant	Section 10
§15.209 (a)	Spurious Emission	Compliant	Section 6
§15.247 (a) (2)	6 dB Bandwidth	Compliant	Section 5
§15.247 (b) (3)	Maximum Peak Output Power	Compliant	Section 4
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edge	Compliant	Section 8
§15.247 (d)	Peak Power Spectral Density	Compliant	Section 7

4 - CONDUCTED OUTPUT POWER MEASUREMENT

4.1 Standard Applicable

According to §15.247(b) (3), for systems using digital modulation in 2400-2483.5 MHz: 1 Watt

4.2 Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Spectrum Analyzer.
3. The peak power will be obtained by adding the bandwidth correction factor, 10log(BW 6dB / RBW) to the peak power reading at RBW = 2.0 MHz of the spectrum analyzer.

4.3 Test Equipment

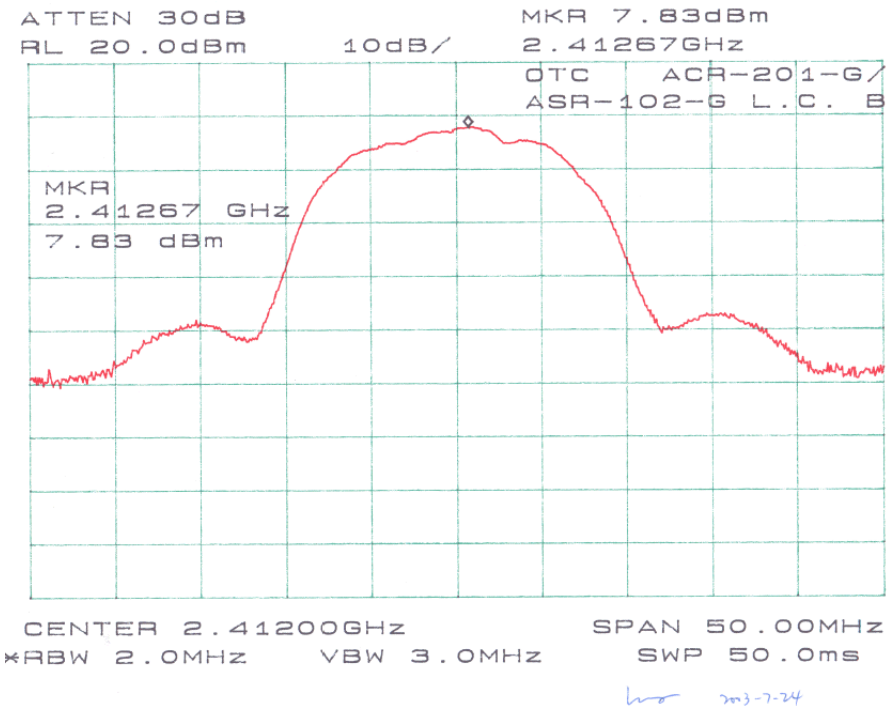
Manufacturer	Model No.	Serial No.	Calibration Due Date
HP	8564E	Spectrum Analyzer	2003-12-06

4.4 Measurement Result

	Frequency (MHz)	Peak Output Power (dBm)	Correction Factor (dBm)	Corrected Factor (dBm)	Output Power (W)	Standard (W)	Result
802.11b	2412	7.83	8.04	15.87	0.039	≤ 1 W	Compliant
	2438	8.17	8.04	16.21	0.042	≤ 1 W	Compliant
	2462	7.83	8.04	15.87	0.039	≤ 1 W	Compliant
802.11g	2408	5.50	9.12	14.62	0.029	≤ 1 W	Compliant
	2433	5.00	9.12	14.12	0.026	≤ 1 W	Compliant
	2458	4.50	9.12	13.62	0.023	≤ 1 W	Compliant

Note:

802.11b: Correction Factor = 10 log (BW6dB/RBW) = 10 log (12.75/2.0) = 8.04 dBm
802.11g: Correction Factor = 10 log (BW6dB/RBW) = 10 log (16.33/2.0) = 9.12 dBm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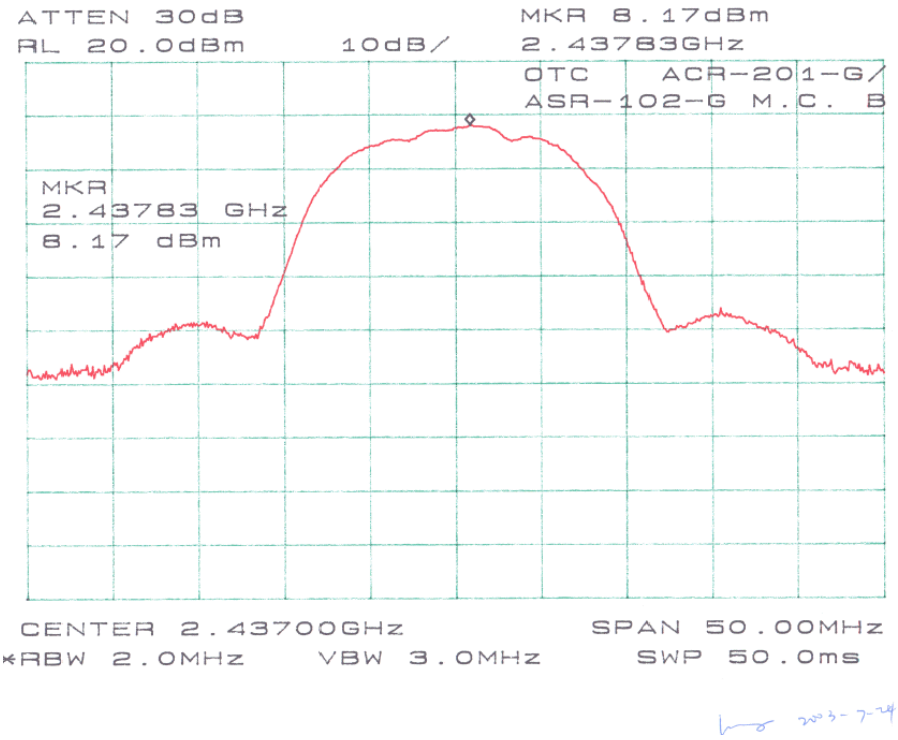
RL 20.0dBm
10dB/
MKR 7.83dBm
2.41267GHz
OTC ACR-201-G/
ASR-102-G L.C. B
MKR
2.41267 GHz
7.83 dBm
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7-24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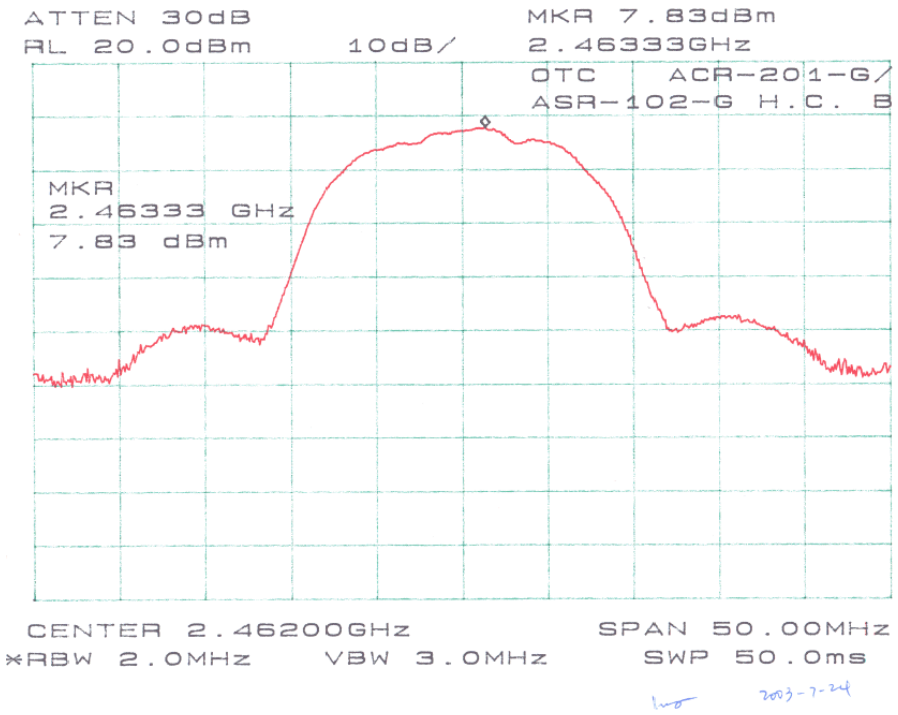
10dB/
MKR 8.17dBm
2.43783GHz
OTC ACR-201-G/
ASR-102-G M.C. B
MKR
2.43783 GHz
8.17 dBm
CENTER 2.43700GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7-24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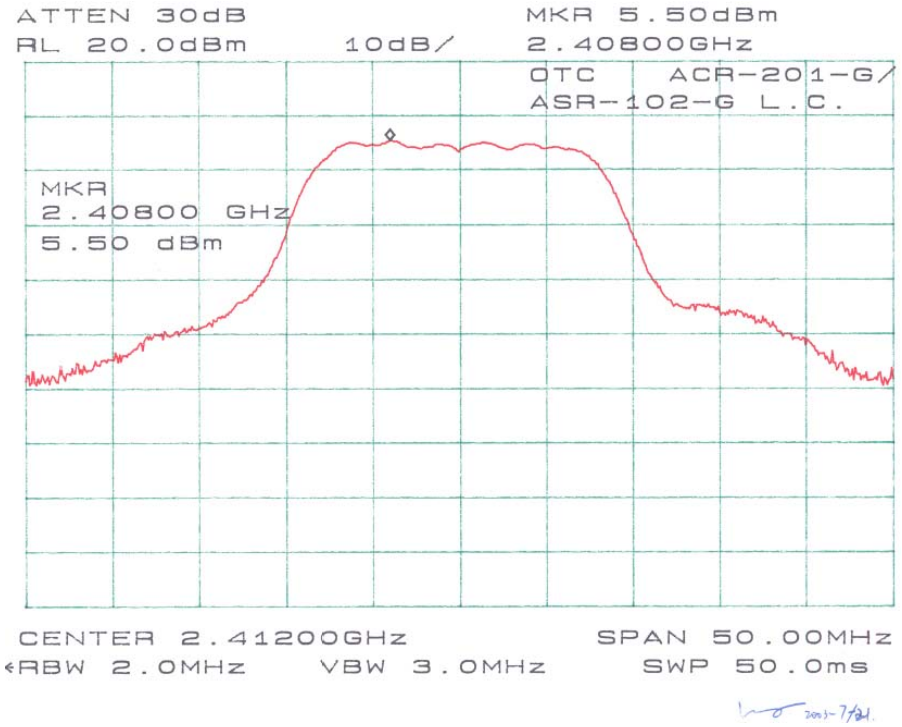
10dB/
MKR 7.83dBm
2.46333GHz
OTC ACR-201-G/
ASR-102-G H.C. B
MKR
2.46333 GHz
7.83 dBm
CENTER 2.46200GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7-24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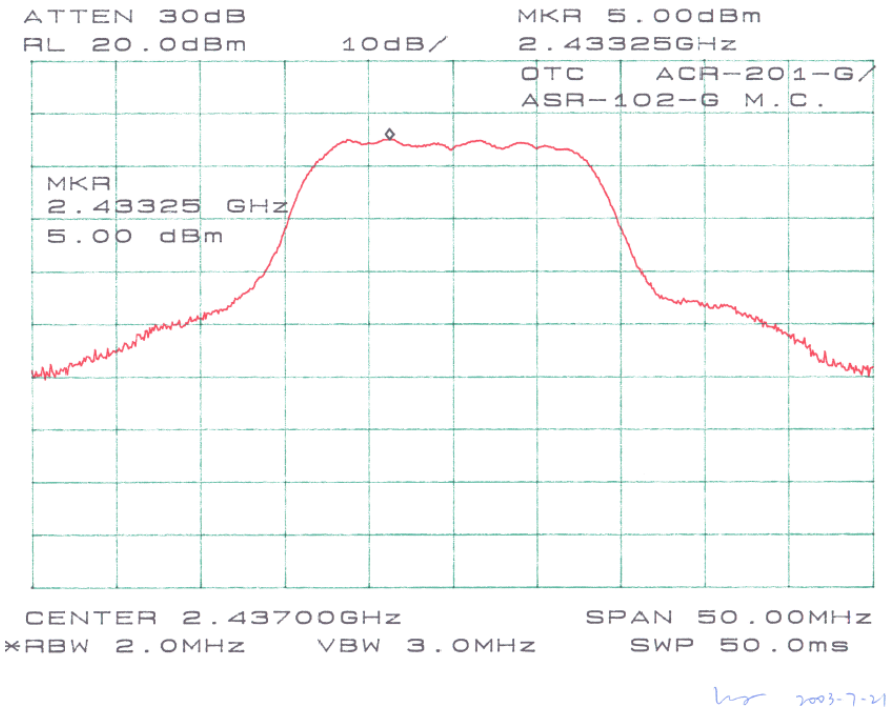
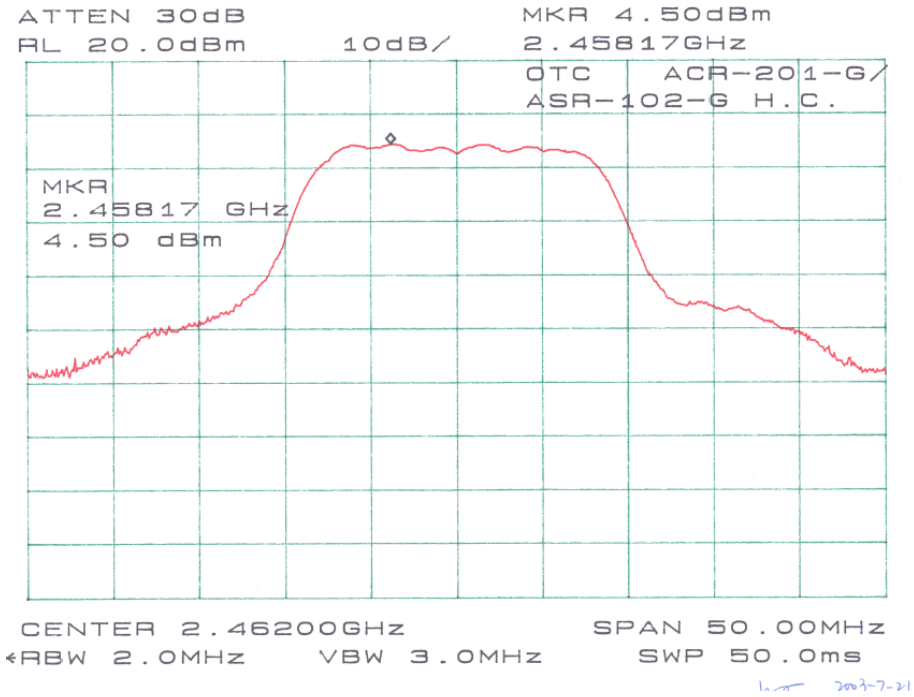
RL 20.0dBm
10dB/
MKR 5.50dBm
2.40800GHz
OTC ACR-201-G/
ASR-102-G L.C.
MKR
2.40800 GHz
5.50 dBm
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7/24.


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 5.00dBm
2.43325GHz
OTC ACR-201-G/
ASR-102-G M.C.
MKR
2.43325 GHz
5.00 dBm
CENTER 2.43700GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7-21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RL 20.0dBm
10dB/
MKR 4.50dBm
2.45817GHz
OTC ACR-201-G/
ASR-102-G H.C.
MKR
2.45817 GHz
4.50 dBm
CENTER 2.46200GHz
SPAN 50.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms
2003-7-21

5 – 6 DB BANDWIDTH

5.1 Standard Applicable

According to §15.247(a)(2), for systems using digital modulation techniques operate in 2400 – 2483.5MHz, the minimum 6dB bandwidth shall be at least 500 kHz.

5.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

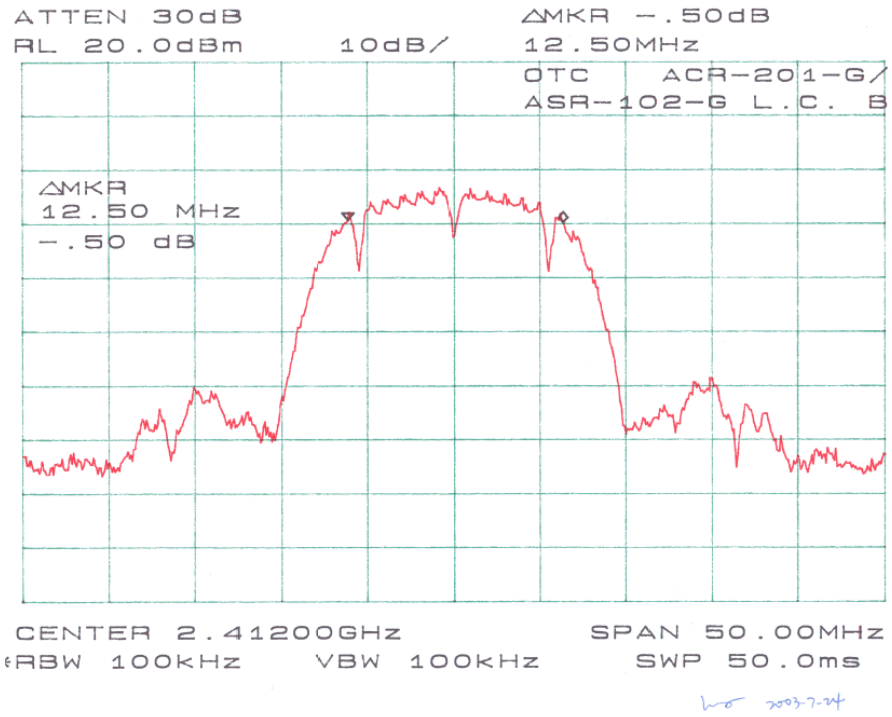
5.3 Test Equipment

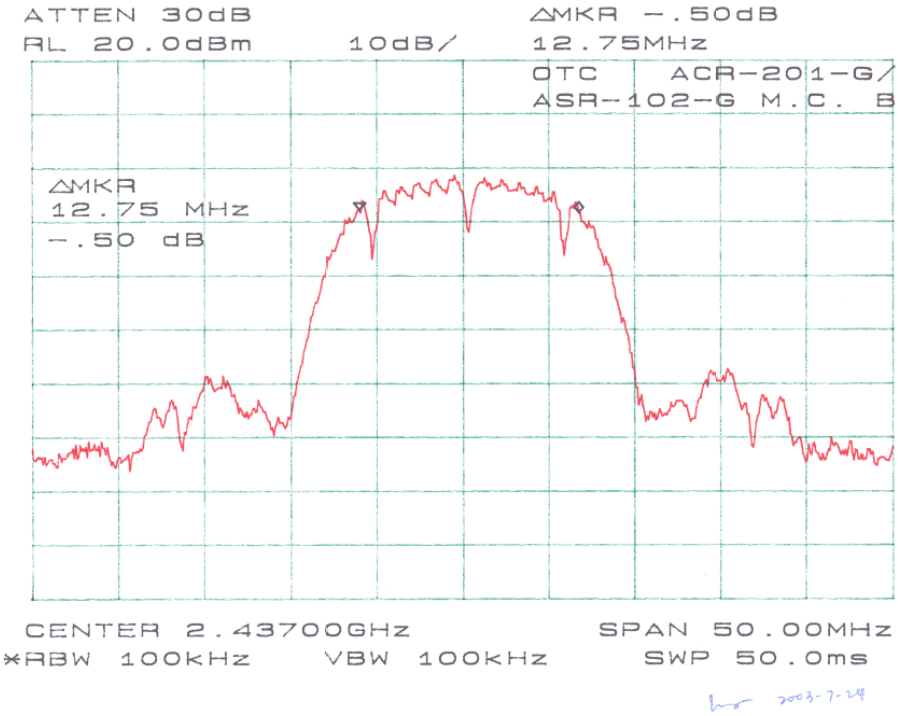
Manufacturer	Model No.	Serial No.	Calibration Due Date
HP	8564E	Spectrum Analyzer	2003-12-06

5.4 Measurement Result

Please refer to following pages for plots of 6 dB Bandwidth.

	Frequency (MHz)	Measured (MHz)	Standard (kHz)	Result
802.11b	2412	12.50	≥ 500	Compliant
	2437	12.75	≥ 500	Compliant
	2462	12.50	≥ 500	Compliant
802.11g	2412	16.17	≥ 500	Compliant
	2437	16.33	≥ 500	Compliant
	2462	16.25	≥ 500	Compliant


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.50dB
12.50MHz
OTC ACR-201-G/
ASR-102-G L.C. B
ΔMKR
12.50 MHz
-.50 dB
CENTER 2.41200GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
2003-7-24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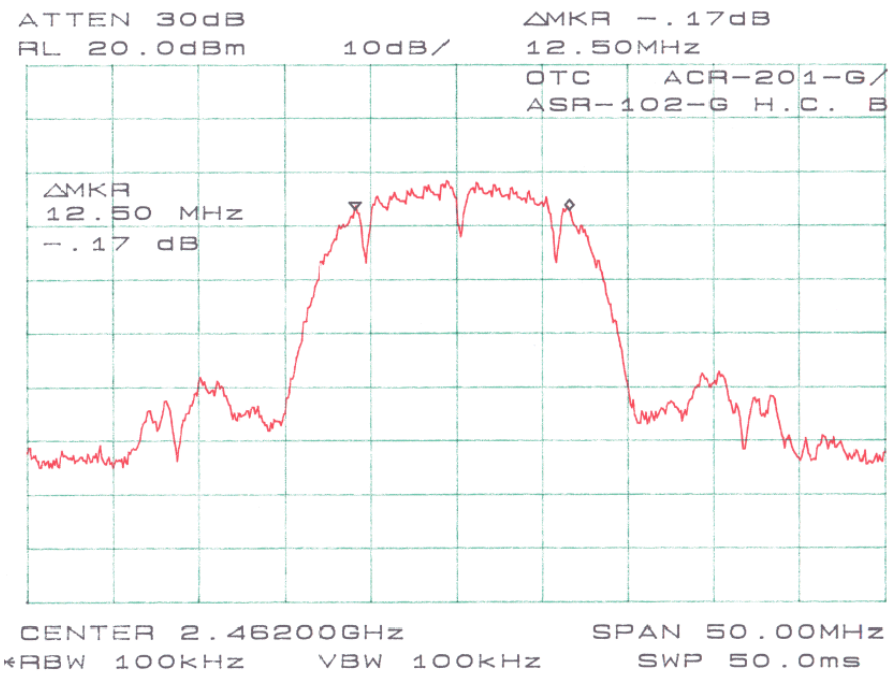
10dB/
ΔMKR -.50dB
12.75MHz
OTC ACR-201-G/
ASR-102-G M.C. B
ΔMKR
12.75 MHz
-.50 dB
CENTER 2.43700GHz
SPAN 50.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms
2003-7-24



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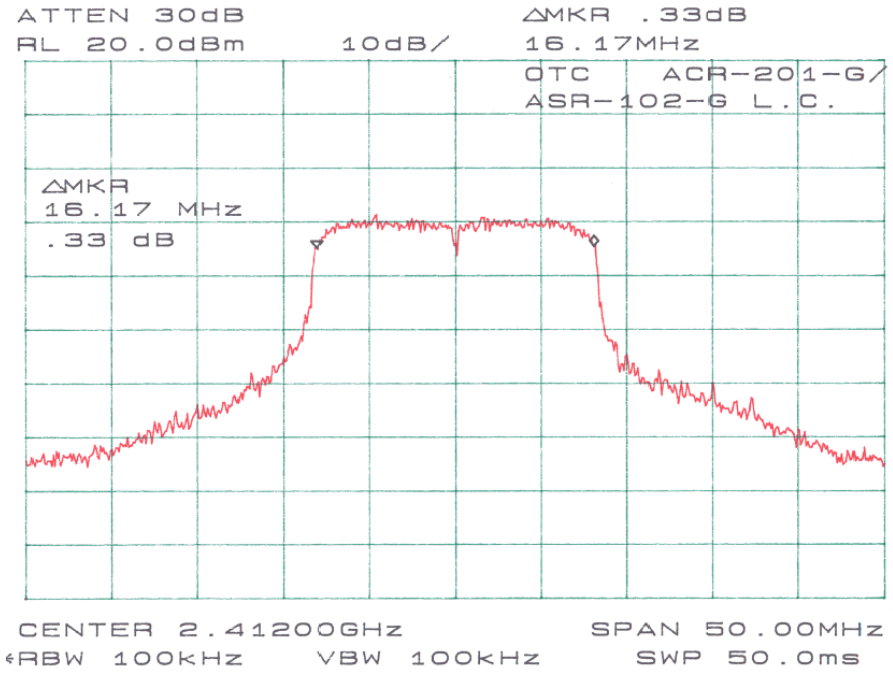

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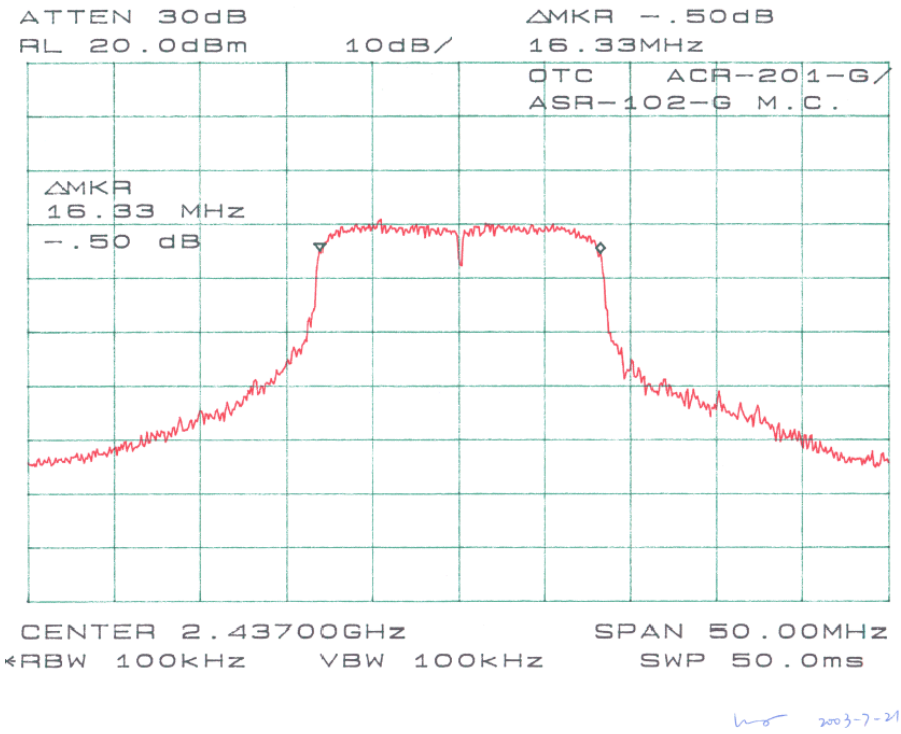

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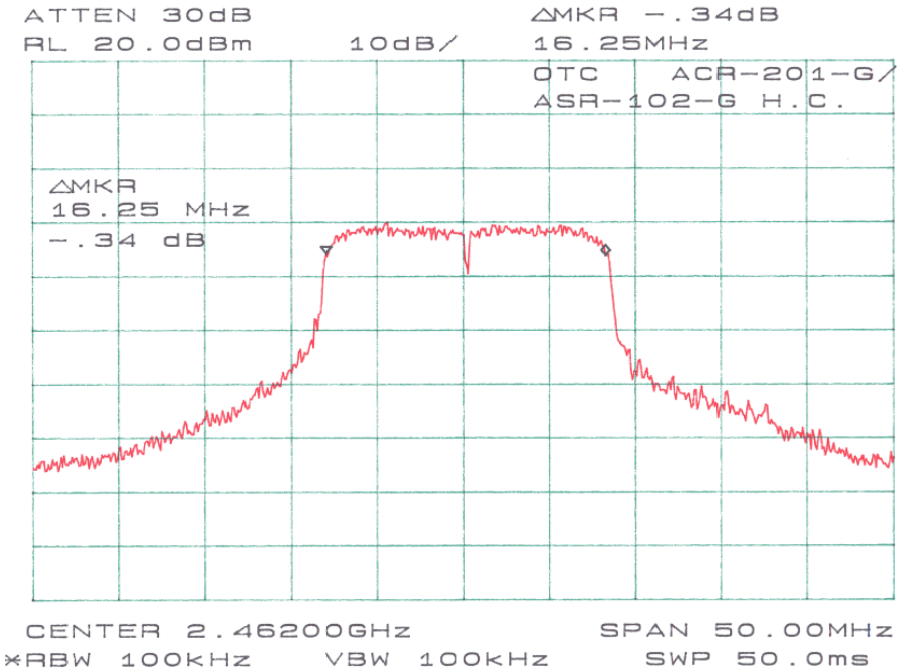

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