

# FCC CFR47 PART 15 SUBPART C CERTIFICATION TEST REPORT

# FOR

# 802.11 b/g MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP

## MODEL NUMBER: J07H069.02

# FCC ID: MCLJ07H06902

# **REPORT NUMBER: 02U1750-1**

# **ISSUE DATE: FEBRUARY 21, 2003**

Prepared for AMBIT MICROSYSTEMS, INC. 5F-1, 5 HSIN-AN ROAD, HSINCU SCIENCE-BASED INDUSTRAIL PARK, TAIWAN, R.O.C.

> Prepared by COMPLIANCE CERTIFICATION SERVICES 561F MONTEREY ROAD, MORGAN HILL, CA 95037, USA TEL: (408) 463-0885 FAX: (408) 463-0888

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# **1. TEST RESULT CERTIFICATION**

<b>COMPANY NAME:</b>	AMBIT MICROSYSTEMS
	5F-1, 5 HSIN-AN ROAD, HSINCU
	SCIENCE BASED INDUSTRIAL PARK, TAIWAN, R.O.C.
EUT DESCRIPTION:	802.11 B/G MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP
MODEL NAME:	J07H069.02
DATE TESTED:	DECEMBER 20, 2002 – FEBRUARY 21, 2003
<b></b>	
	APPLICABLE STANDARDS
STANDARE	D TEST RESULTS
FCC PART 15 SUB	PART C NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note**: This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Approved & Released For CCS By:

Tested By:

MH

MIKE HECKROTTE CHIEF ENGINEER COMPLIANCE CERTIFICATION SERVICES

1AL K

NEELESH RAJ EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

# 2. EUT DESCRIPTION

The J07H069.02 card is an 802.11b/g Mini-PCI module for the Agency Series PP2170 Laptop. The module is compatible with the IEEE 802.11g draft standard, and meets the mechanical specifications of the Type IIIA Mini-PCI form factor. The operational frequency range is:

2412 to 2462 MHz

It is based upon an Atheros Communications AR5001 three-chipset reference design. The three chips include the AR5111 integrated 5GHz CMOS radio transceiver, the AR2111 5GHz/2.4GHz integrated up/down-converter, and the AR5212 MAC/baseband processor.

The rated conducted output power of the transmitter when operating in 802.11b CCK mode is 20.64dbm. The rated conducted output power of the transmitter when operating in 802.11g OFDM mode is 21.92dbm. When the J07H069.02 module is installed in the Agency Series PP2170 laptop, each antenna port connector is attached to a stamped metal, PIFA antenna. These antennas are embedded in each side of the laptop display.

Peak antenna gain is 4.96 dBi.

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# 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, and 15.407.

# 4. FACILITIES AND ACCREDITATION

# 4.1. FACILITIES AND EQUIPMENT

The open area test sites and conducted measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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EUT: 802.11 b/g MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP FCC ID: MCLJ07H06902

# 4.2. TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	<b>FC</b>
Japan	VCCI	CISPR 22 Two OATS and one conducted Site	<b>VCCI</b> R-1014, R-619, C-640
Norway	NEMKO	EN50081-1, EN50081-2, EN50082-1, EN50082-2, IEC61000-6-1, IEC61000-6-2, EN50083-2, EN50091-2, EN50130-4, EN55011, EN55013, EN55014-1, EN55104, EN55015, EN61547, EN55022, EN55024, EN61000-3-2, EN61000-3-3, EN60945, EN61326-1	N <sub>ELA 117</sub>
Norway	NEMKO	EN60601-1-2 and IEC 60601-1-2, the Collateral Standards for Electro-Medical Products. MDD, 93/42/EEC, AIMD 90/385/EEC	N <sub>ELA-171</sub>
Taiwan	BSMI	CNS 13438	SL2-IN-E-1012
Canada	Industry Canada	RSS210 Low Power Transmitter and Receiver	Canada IC2324 A,B,C, and F

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# 5. CALIBRATION AND UNCERTAINTY 5.1. MEASURING INSTRUMENT CALIBRATION

The measurement instruments utilized to perform the tests documented in this report have been calibrated in accordance with the manufacturer's recommendations, and are traceable to national standards.

# 5.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Radiated Emission				
30MHz - 200 MHz	+/- 3.3dB			
200MHz - 1000MHz	+4.5/-2.9dB			
1000MHz - 2000MHz	+4.6/-2.2dB			
Power Line Conducted Emission				
150kHz – 30MHz	+/-2.9			

Any results falling within the above values are deemed to be marginal.

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REPORT NO: 02U1750-1DATE: 1EUT: 802.11 b/g MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP

**FCC ID:** MCLJ07H06902

# 5.3. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST AND MEASUREMENT EQUIPMENT LIST						
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due Date		
Spectrum Analyzer	HP	8566B	3014A06685	6/1/03		
Spectrum Display	HP	85662A	2152A03066	6/1/03		
Quasi-Peak Detector	HP	85650A	3145A01654	6/1/03		
Preamplifier	HP	8447D	2944A06833	8/22/03		
Log Periodic Antenna	EMCO	3146	9107-3163	3/30/03		
Biconical Antenna	Eaton	94455-1	1197	3/30/03		
Spectrum Analyzer	HP	8564E	3943A01643	7/22/03		
Spectrum Analyzer	HP	8593EM	3710A00205	6/11/03		
Preamplifier (1 - 26.5GHz)	HP	8449B	3008A00369	6/30/03		
Preamplifier (1 - 26.5GHz)	Miteq	NSP10023988	646456	4/26/03		
Horn Antenna (1 - 18GHz)	EMCO	3115	6717	2/4/04		
Horn Antenna (1 - 18GHz)	EMCO	3115	6739	2/4/04		
Horn Antenna (18 – 26.5GHz)	ARA	MWH 1826/B	1013	11/7/03		
High Pass Filter (4.57GHz)	FSY Microwave	FM-4570-9SS	003	N.C.R.		
High Pass Filter (7.600GHz)	FSY Microwave	FM-7600	N/A	N.C.R		
Harmonic Mixer	HP	11970A	3008A04190	10/14/05		
Spectrum Analyzer	HP	E4404B	ID 963805	3/25/03		
PSA Series Spectrum Analyzer	Aglient	E4446A	US42070220	1/13/04		
PSA Series Spectrum Analyzer	Aglient	E4440A	US42221737	9/24/03		

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# 6. SETUP OF EQUIPMENT UNDER TEST

#### SETUP INFORMATION FOR TRANSMITTER TESTS

#### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST						
Device Type Manufacturer Model Serial Number FCC ID						
Laptop HP SAPPHIRE J311500PV143 N/A						
AC Adapter	COMPAQ	PPP0009L	3102162204	N/A		

#### I/O CABLES

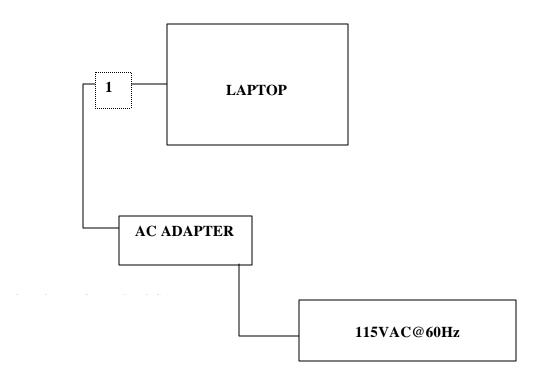
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	PWR	1	<sup>1</sup> / <sub>4</sub> DC PWR	Unshielded	1.86 m	N/A

#### TEST SETUP

The EUT was installed in the bottom internal slot of the laptop. The antennas are embedded in the laptop display.

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#### SETUP DIAGRAM FOR TRANSMITTER TESTS



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#### SETUP INFORMATION FOR DIGITAL DEVICE TESTS

#### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST						
Device Type Manufacturer Model Serial Number FCC ID						
LAPTOP	N/A					
AC ADAPTER	COMPAQ	3102162204	N/A			
MONITOR	DELL	828FI	BH68-3055OK-01	828-FI		
USB MOUSE	LOGITECH	M-VA34	LTC70500299	DZL211087		

#### I/O CABLES

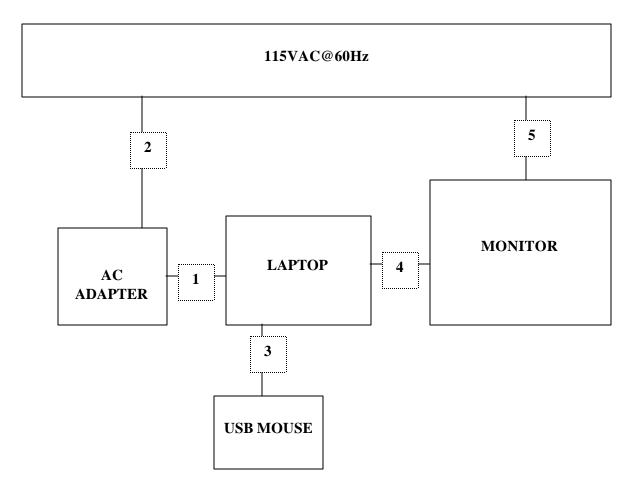
Cable	Port	# of	Connector	Cable	Cable	Remarks
No.		Identical	Туре	Туре	Length	
		Ports				
1	PWR	1	<sup>1</sup> / <sub>4</sub> DC PWR	UNSHIELDED	1.8M	N/A
2	PWR	1	AC PWR	UNSHIELDED	1.8M	N/A
3	USB	2	USB	SHIELDED	1.8M	N/A
4	VIDEO	1	DB-15	SHIELDED	1.8M	FERRITE ON BOTH ENDS
5	PWR	1	AC PWR	UNSHIELDED	1.8M	N/A

#### TEST SETUP

The EUT was installed in the bottom internal slot of the laptop. The antennas are embedded in the laptop display.

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#### SETUP DIAGRAM FOR DIGITAL DEVICE TESTS



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# 7. APPLICABLE RULES

## §15.247 (a)- BANDWIDTH

(2) For direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### <u>§15.247 (b)- POWER OUTPUT</u>

The maximum peak output power of the intentional radiator shall not exceed the following:

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

(4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### §15.247 (b)- RADIO FREQUENCY EXPOSURE

(5) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See \$1.1307(b)(1) of this chapter.

#### §15.247 (c)- SPURIOUS EMISSIONS

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in \$15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in \$15.205(a), must also comply with the radiated emission limits specified in \$15.209(a) (see \$15.205(c)).

#### §15.247 (d)- PEAK POWER SPECTRAL DENSITY

(d) For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

(f) The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

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#### §15.205- RESTRICTED BANDS OF OPERATIONS

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41			

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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#### §15.207- CONDUCTED LIMITS

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted L	imit (dBuV)
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Decreases with the logarithm of the frequency.

#### §15.209- RADIATED EMISSION LIMITS

(a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency	Field Strength	Measurement Distance	
(MHz)	(microvolts/meter)	(meters)	
30 - 88	100 **	3	
88 - 216	150 **	3	
216 - 960	200 **	3	
Above 960	500	3	

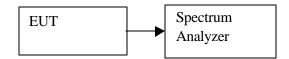
\*\* Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

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# 8. TEST SETUP, PROCEDURE AND RESULT 8.1. 6 dB BANDWIDTH

#### TEST SETUP



#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 100 kHz. The sweep time is coupled.

#### **RESULTS**

No non-compliance noted:

#### 2.4 GHz Band (b)

Channel	Frequency	В	Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	12000	500	11500
Middle	2437	12050	500	11550
High	2462	12050	500	11550

#### 2.4 GHz Normal Band (g)

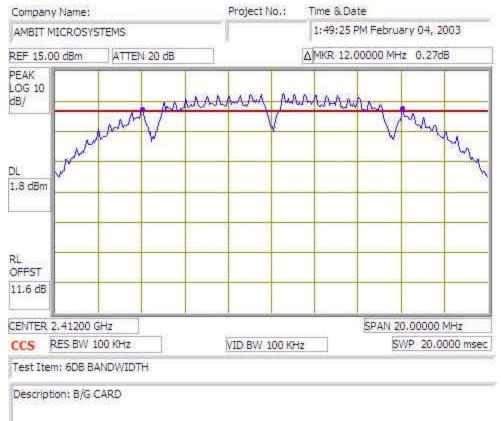
Channel	Frequency	В	Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Low	2412	16600	500	16100
Middle	2437	16400	500	15900
High	2462	16600	500	16100

#### 2.4 GHz Turbo Band (g)

Channel	Frequency	В	Limit	Margin
	(MHz)	(kHz)	(kHz)	(kHz)
Middle	2437	36250	500	35750

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#### 6 DB BANDWIDTH (2.4 GHZ b BAND)



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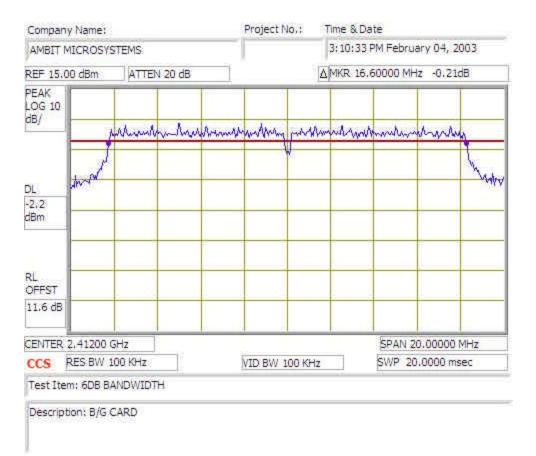
Company Name:	Project No.:	Time & Date		
AMBIT MICROSYSTEMS		1:52:22 PM February 04, 2003		
REF 15.00 dBm ATTEN 20 dB	1	△MKR 12.05000 MHz -0.03dB		
PEAK LOG 10 dB/	mary	many man		
dB/ DL 1.7 dBm		man Many		
RL OFFST				
11.6 dB				
CENTER 2.43700 GHz		SPAN 20.00000 MHz		
CCS RES BW 100 KHz	VID BW 100 K	Hz SWP 20,0000 msec		
Test Item: 6DB BANDWIDTH				
Description: B/G CARD				

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Company Name:	Project No.: Time & Date
AMBIT MICROSYSTEMS	1:54:11 PM February 04, 2003
REF 15.00 dBm ATTEN 20 dB	AMKR 12.05000 MHz 0.09dB
PEAK LOG 10 dB/	many making
DL 0.9 dBm	Marine Mari
RL OFFST	
11.6 dB	
CENTER 2,46200 GHz	SPAN 20.00000 MHz
CCS RES BW 100 KHz	VID BW 100 KHz SWP 20,0000 msec
Test Item: 6DB BANDWIDTH	
Description: B/G CARD	

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#### 6 DB BANDWIDTH (2.4 GHZ g BAND, NORMAL MODE)



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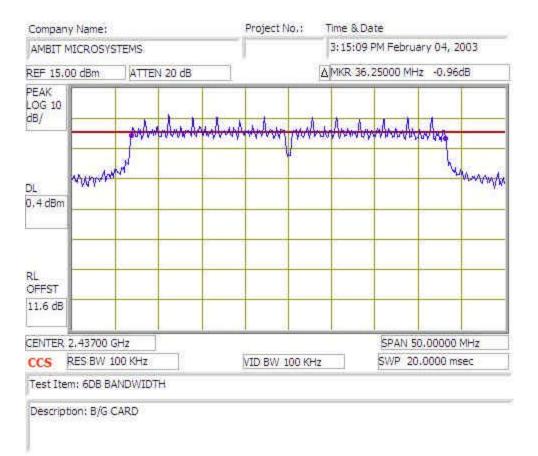
Compar	ny Name:				Project No.: Time & Date				
AMBIT	MICROSYS	TEMS			3:12:55 PM February 04				, 2003
REF 15.	00 dBm	ATTEN	20 dB			AMKR 16	5,40000 MHz 0,54dB		
PEAK LOG 10 dB/		whiteen the	unterm	hours	underen me	housenmen	Innton	represent.	
	MANN			11-5-8-11-0	V				han
DL 1,7 dBm									
RL OFFST									
11.6 dB									
CENTER	2,43700 G	Hz			<u></u>		SPAN 2	0.00000	MHz
CCS	CS RES BW 100 KHz		VID BW 100 K	Hz	SWP 20	SWP 20.0000 msec			
Test Ib	em: 6DB BA	NDWIDT	4						
Descrip	tion: B/G C	ARD							

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Compan	y Name:				Project No.: Time & Date					
AMBIT	MICROSY	STEMS			1		3:17:02 PM February 04, 2003			2003
REF 15.00 dBm			1		4	AMKR 16.60000 MHz -0.43dB			dB	
PEAK LOG 10 dB/										
		hann	nunlina	Mryn	winding	shafter	on Amora	MUMM	uturturt	t
DL -2,8 dBm	w. M			-						humon y
RL OFFST										
11.6 dB										
CENTER	2,46200	GHz			1			SPAN :	20.00000	MHz
CCS	S RES BW 100 KHz		VID BW 100	) KHz		SWP 2	0.0000 m	sec		
Test Ite	m: 6DB B	ANDWIDT	н							
Descrip	tion: B/G	CARD								

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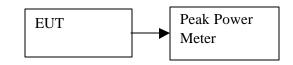
#### 6 DB BANDWIDTH (2.4 GHZ g BAND, TURBO MODE)



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#### 8.2. **PEAK POWER**

#### **TEST SETUP**



#### **TEST PROCEDURE**

The transmitter output is connected to the power meter. The power meter is set to read peak power.

#### LIMIT

The maximum antenna gain = 4.96 dBi, therefore the limit is 30 dBm.

#### RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11.6 dB (including 10 dB pad and 1.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### 2.4 GHz b Band

Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	20.64	30	-9.36
Middle	2437	20.35	30	-9.65
High	2462	19.46	30	-10.54

#### 2.4 GHz g Band Normal Mode

Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	21.36	30	-8.64
Middle	2437	21.92	30	-8.08
High	2462	21.25	30	-8.75

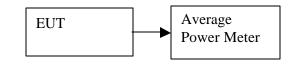
#### 2.4 GHz g Band Turbo Mode

Channel	Frequency	Peak Power	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Middle	2437	21.64	30	-8.36

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## 8.3. AVERAGE POWER

#### TEST SETUP



#### TEST PROCEDURE

The transmitter output is connected to the power meter. The power meter is set to read average power.

#### <u>LIMIT</u>

None, reporting only.

#### **RESULTS**

No non-compliance noted:

The cable assembly insertion loss of 11.6 dB (including 10 dB pad and 1.6 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

#### 2.4 GHz b Band

Channel	Frequency	Average Power
	(MHz)	(dBm)
Low	2412	18.00
Middle	2437	17.84
High	2462	17.23

#### 2.4 GHz g Band Normal Mode

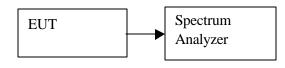
Channel	Frequency	Average Power
	(MHz)	(dBm)
Low	2412	15.28
Middle	2437	17.84
High	2462	14.32

#### 2.4 GHz g Band Turbo Mode

Channel	Frequency	Average Power
	(MHz)	(dBm)
Middle	2437	18

# 8.4. PEAK POWER SPECTRAL DENSITY

#### TEST SETUP



#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer, the maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW >= 3 kHz, sweep time = span / 3 kHz, and video averaging is turned off. The PPSD is the highest level found across the emission in any 3 kHz band.

#### **RESULTS**

No non-compliance noted:

2.4 GHz b Band

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-4.05	8	-12.05
Middle	2437	-4.25	8	-12.25
High	2462	-4.60	8	-12.60

#### 2.4 GHz g Band Normal Mode

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Low	2412	-9.14	8	-17.14
Middle	2437	-5.80	8	-13.8
High	2462	-9.12	8	-17.12

#### 2.4 GHz g Band Turbo Mode

Channel	Frequency	PPSD	Limit	Margin
	(MHz)	(dBm)	(dBm)	(dB)
Middle	2437	-10.85	8	-18.85

#### PPSD (2.4 GHZ b BAND)

Compar	ny Name:				Project No.:	Time & D	Date					
AMBIT	MICROSYST	TEMS				2:56:05	2:56:05 PM February 04, 2003					
REF 15.	00 dBm	ATTEN	1 20 dB	Ť		MKR 2.4	1120 GH2	-4,05 d	Bm			
PEAK LOG 10 dB/												
	roman	Amaria	mon	Marking and	unnun	mon	home	munt	m			
DL												
11.6 dB			-						-			
CENTER	2,41115 G	Hz					SPAN 3	100.00000	) KHz			
CCS	RES BW 3 KHz				VID BW 10 KH:	ž.	SWP 100.00 sec					
Test Ite	em: PEAK P	OWER S	PECTRAL	DENSI	TY.		41					
Descrip	tion: B/G C	ARD										

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Company Name:	Project No.:	Time & Date	te			
AMBIT MICROSYSTEMS		2:09:10 PM February 04, 2003				
REF 15.00 dBm		MKR 2,4374	8 GHz -4.25 dBm			
PEAK LOG 10 dB/						
monor	monther	www	mmm			
DL						
RL OFFST						
11.6 dB						
CENTER 2.43750 GHz		S	PAN 300,00000 KHz			
CCS RES BW 3 KHz	VID BW 10 KHz		SWP 100.00 sec			

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Compan	y Name:				Project No.:	Time & Da	Time & Date			
AMBIT N	MICROSY:	STEMS			1	2:14:27 PM February 04, 2003				
REF 15.0	00 dBm	ATTE	N 20 dB	Ť		MKR 2.4	1126 GH:	z -4,60 d	Bm	
PEAK LOG 10 dB/										
	mm	m	Amound	am	www.	unum	imm	mm	m	
DL						_				
RL OFFST										
11.6 dB			-						-	
CENTER 2,41115 GHz						SPAN 300,00000 KHz				
CCC .	RES BW 3	3 KHz			VID BW 10 KHz			SWP 100.00 sec		

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Compa	iny Name:				Project No.:	Time & Date					
AMBIT	MICROSYS	TEMS				3:28:53	3:28:53 PM February 04, 2003				
REF 15	.00 dBm	ATTE	1 20 dB	1		MKR 2.	41481 GHz	-9,14	dBm		
PEAK LOG 10 dB/											
DL	mm	mm	nn	m	ument	natra	rownas	s.	hmm		
RL OFFST											
11.6 df			-	-					-		
CENTER	2,414850	5Hz					SPAN 3	00,0000	0 KHz		
ccs	RES BW 3	KHz			VID BW 10 KHz	4 Ú	SWP 10	0.00 se	<b>C</b> (		
Test It	tem: PEAK P	OWER S	PECTRAL DI	ENSI	ΓY.		40				
Descri	ption: B/G (	CARD									

#### PPSD (2.4 GHZ g BAND, NORMAL MODE)

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Compan	y Name:				Project No.: Time & Date						
AMBIT N	MICROSYS	TEMS				3:34:22 PM February 04, 2003					
REF 15.0	00 dBm	ATTE	N 20 dB	Ť		MKR 2.4	13224 GHz	-5.80 d	Bm		
PEAK LOG 10 dB/											
	min	Mart	min		min	n	min	hun	n		
DL						-					
RL OFFST											
11.6 dB			-								
CENTER	2.43235 G	iHz					SPAN 3	00,00000	) KHz		
-	RES BW 3 KHz				VID BW 10 KH	SWP 100.00 sec					

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Compan	y Name:				Project No.:	Time & D	Time & Date				
AMBIT	ICROSYS	TEMS			1	3:22:57	3:22:57 PM February 04, 2003				
REF 15.(	00 dBm	ATTE	N 20 dB	Ť		MKR 2.4	16347 GHz -9, 12 dBm				
PEAK LOG 10 dB/											
DL	Ander	condut V	ım	uni	unin	mm	hann	meder	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
RL OFFST											
11.6 dB									-		
CENTER	2.46355 G	Hz	51				SPAN 2	300,00000	) KHz		
ccs	RES BW 3 KHz				VID BW 10 KH	SWP 100,00 sec					

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#### PPSD (2.4 GHZ g BAND, TURBO MODE)

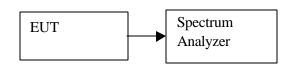
Compan	y Name:				Project /	No.:	Time & Date				
AMBIT N	AICROSYS	TEMS					3:40:50 PM February 04, 2003				
REF 15.0	0 dBm	ATTE	1 20 dB	Î			MKR 2,4	3410 GH	-10.85	dBm	
PEAK LOG 10 dB/		-	-						-		
DL	martha	www	un har	mar	m	ann	-	n	m	wa.wy	
RL OFFST	-										
11.6 dB			-							-	
CENTER	2,43398 0	5Hz						SPAN 300,00000 KHz			
CCS	RES BW 3	KHz			VID BW	10 KHz	ú	SWP 100.00 sec			
Test Ite	m: PEAK P	OWER S	PECTRAL	DENSIT	TY.			40			

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# 8.5. SPURIOUS EMISSIONS

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

#### TEST SETUP



#### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz.

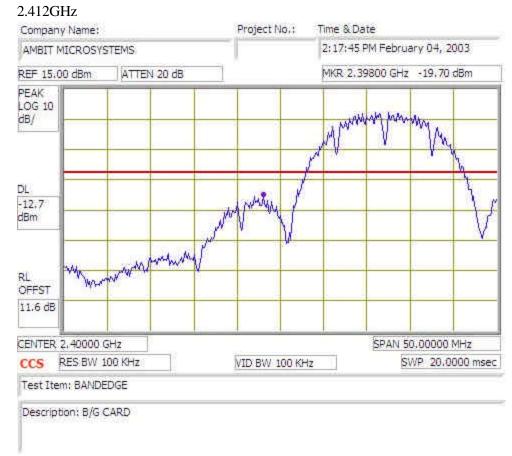
Measurements are made over the 30 MHz to 26.5 GHz range with the transmitter set to the lowest, middle, and highest channels within the 2.4 GHz band.

#### **RESULTS**

No non-compliance noted:

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#### CONDUCTED SPURIOUS EMISSIONS (2.4 GHZ b BAND)



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DATE: FEBRUARY 21, 2003

Compa	iny Name:				Project No.:	Time 8	Date				
AMBIT	MICROSYS	TEMS				2:19:	2:19:53 PM February 04, 2003				
REF 15	.00 dBm	ATTEN	1 20 dB	Ť		MKR	1.65900 GHz	-37,6	2 dBm		
PEAK LOG 10 dB/								i.			
DL -12,7 dBm											
RL OFFST 11.6 dB		mlim	m Joseph	~~~	manan	hner	a www.N	A	horizon		
Contract and the second	START 30.00000 MHz						STOP 2.90000 GHz				
ccs	RES BW 10	00 KHz			VID BW 100 KH	z	S	WP 86	1,0000		
Test I	tem: SPURIC	US LOW	6								
Descri	ption: B/G C	ARD									

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Compa	ny Name:				Project N	0,:	Time & Date					
AMBIT	MICROSYSTE	EMS			1		2:21:15	003				
REF 15	.00 dBm	ATTE	1 20 dB	1			MKR 22.96000 GHz -34.54 dBm					
PEAK LOG 10 dB/			-									
DL -12,7 dBm		_										
RL OFFST 11.6 dE	- Imalys	J		and the	nudhou	4	-www.	produce	un an	an a		
START	2.90000 GHz	1				-		STOP 2	6.50000	GHz		
ccs	RES BW 100 KHz				VID BW 100 KHz			SWP 7.08 sec				
-	em: SPURIOL ption: B/G CA		t.									

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#### REPORT NO: 02U1750-1

# EUT: 802.11 b/g MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP FCC ID: MCLJ07H06902 2.437GHz

Compa	iny Name:			Project No.:	Time & Da	ate					
AMBIT	MICROSYST	TEMS		-	2:23:22 PM February 04, 2003						
REF 15	.00 dBm	ATTEN	20 dB	1	MKR 2.4	MKR 2.43800 GHz 7.60 dBm					
PEAK LOG 10 dB/				werehoused pillings	WW .		-				
			J.	Nr. V	Aut 1						
DL -12.4 dBm		m	My /			Jul M	Myny				
RL OFFST	mm		¥.			¥.		Lunn			
11.6 dE	3										
CENTER	2.43700 Gł	-lz				SPAN 5	50.00000	MHz			
ccs	RES BW 10	0 KHz		VID BW 100 KH	VID BW 100 KHz			SWP 20,0000 msec			
Test It	tem: REFERE	NCE	- 1.)								
Descri	ption: B/G C	ARD									

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		Project No.:	Time & D	& Date				
EMS			2:25:12	2:25:12 PM February 04, 2003				
ATTEN 20 c	JB		MKR 1.7	MKR 1.70900 GHz -37.08 dBm				
				1				
milines	man	www.childowene	June	mm	moren			
Hz 0 KHz		VID BW 100 KH	00 GHz 61.0000					
	ATTEN 20 c			EMS 2:25:12	EMS 2:25:12 PM February 0 ATTEN 20 dB MKR 1.70900 GHz -37 MKR 1.70900 GHz -37 ATTEN 20 dB STOP 2.9000			

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Compa	ny Name:				Project No.:	TI	Time & Date					
AMBIT	MICROSYS	TEMS				2	2:30;13 PM February 04, 2003					
REF 15	.00 dBm	ATTE	N 20 dB	Ĩ		ħ	MKR 23.02000 GHz -34.79 dBm					
PEAK LOG 10 dB/								-				
DL -12.4 dBm												
RL OFFST 11.6 dE	though a	n web	Jun	m	innahu	m	minn	proposit				
OT IDT	2 00000 01							CTOD 3	c. 50000	Clin		
CCS RESIBW 100 KHz					VID BW 100 KHz			STOP 26.50000 GHz SWP 7.08 sec				
Test It	em: SPURIC	OUS MID	DLE									
Descri	otion: B/G C	ARD										

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#### REPORT NO: 02U1750-1

# EUT: 802.11 b/g MINI PCI CARD WITH AGENCY SERIES PP2170 LAPTOP **FCC ID:** MCLJ07H06902 2.462GHz

Compa	ny Name:				Project I	No.:	Time & Da	Date					
AMBIT	MICROSYST	TEMS					2:33:36 PM February 04, 2003						
REF 15	.00 dBm	ATTE	N 20 dB	1			MKR 2.4	MKR 2,48750 GHz -39,52 dBm					
PEAK LOG 10 dB/			m	WHHIN .									
DL -13.1 dBm		m	ρ '	- 12	1mm								
RL OFFST	Juhny					harry	Mound	www	United	white			
11.0 00													
CENTER	2.48350 G	Hz	-					SPAN 1	00,0000	) MHz			
ccs	RES BW 10	0 KHz			VID BW	100 KHz		S	WP 30.0	000 msec			
Test It	em: BANDED	OGE	10		and the second second								
Descrip	otion: B/G C	ARD											

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Compar	ny Name:				Project No.:						
AMBIT	MICROSYS	TEMS				2:34:54	2:34:54 PM February 04, 2003				
REF 15.	00 dBm	ATTE	V 20 dB	1		MKR 1.75900 GHz -38.79 dBm					
PEAK LOG 10 dB/								1			
DL -13.1 dBm											
RL OFFST 11.6 dB	Normana	carabo	mburtur	and	ana	mhun.	manth	<i>b</i>	him	unidate	
START :	30.00000 N	IHz				1	STOP 2	.9000	0 GH	z	
CCS	RES BW 100 KHz				VID BW 100 KH	łz 🛛	SWP 861,0000				
Test Ite	em: SPURIC	OUS HIG	4								
Descrip	tion: B/G C	ARD									

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Compa	ny Name:				Project N	0,:	Time & Date					
AMBIT	MICROSYST	TEMS					2:36:55 P	003				
REF 15	.00 dBm	ATTEN	1 20 dB	Ť			MKR 22.96000 GHz -33.98 dBm					
PEAK LOG 10 dB/								-				
DL -13.1 dBm												
RL OFFST 11.6 dE	June br	and the	vt-rthy	www	when	mant		jonense	and the second	Jood Swedd W		
START	2.90000 GHz	2						STOP 2	6.50000	GHz		
CCS	RES BW 100 KHz				VID BW 100 KHz			SWP 7.08 sec				
Test It	em: SPURIO	US HIGH	1									
Descrip	ption: B/G C	ARD										

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#### CONDUCTED SPURIOUS EMISSIONS (2.4 GHZ g BAND)

2.4120 Compa	GHz ny Name:				Project No.:	1	Time & Da	ate			
providences into	MICROSYS	TEMS			1		3:44:27 PM February 04, 2003				
REF 15	.00 dBm	ATTE	N 20 dB			z -19,47	dBm				
PEAK LOG 10 dB/								ļ.,	1		
						1	plance	mp	hintran	t	
DL -16,4 dBm	-			horthit	Part and	et.				Marrie W	
RL OFFST	www	My	had a happe		and a state of the						
11.6 dE	3		-								
CENTER	2,40000 0	3Hz						SPAN	50.00000	MHz	
ccs	RES BW 1	VID BW 100 KHz			SWP 20.0000 msec						
Test It	em: BANDE	DGE									
Descrip	otion: B/G (	CARD									

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Compan	y Name:				Project No.:	t No.: Time & Date					
AMBIT	MICROSYS	TEMS			1		3:46:51 PM February 04, 2003				
REF 15.	00 dBm	ATTEN	1 20 dB	1			MKR 1.65200 GHz -49.70 dBm				
PEAK LOG 10 dB/						_			10		
DL -16.4 dBm											
RL OFFST 11.6 dB	myudpudte	workste	man	mar			ugan an a	nent	A	hanna	
START 3	0.00000 M							STOP 2.		GHz	
CCS	RES BW 100 KHz				VID BW 100 KHz			SWP 861.0000 msec			
	m: SPURIC										

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