

TEST REPORT

FROM



FOR

802.11b/g Module

Part Number: 126720

TO

47 CFR 15.247:2005 & RSS-210 Issue 6:2005

Class II Permissive Change

Test Report Serial No.:
SL06042703-PAX-009/C2PC

This report supersedes None

Remarks: Equipment complied with the specification ☒ [X]
Equipment did not comply with the specification ☐ []

This Test Report is Issued Under the Authority of:


.....
Tested by: Kerwinn Corpuz, Test Engineer


.....
Reviewed by: Leslie Bai, Lab Manager

Issue date: 26 July 2006
Manufacturer: Paxar Americas, Inc.



Registration No. 783147



Industry Canada
Industrie Canada

Registration No. 4842



Lab Code: KR0032



RTA No. D23/16V



NVLAP Lab Code: 200729-0

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Title: Paxar Americas, Inc.

FCCID: GU6CNWLG500

**To: 47 CFR 15.247:2005 & RSS-210 Issue
6:2005**

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the Paxar Americas, Inc., 802.11b/g Module, Part Number: 126720, against the current 47 CFR 15.247:2005 & RSS-210 Issue 6:2005, Class II Permissive Change. The 802.11b/g Module demonstrated compliance with the 47 CFR 15.247:2005 & RSS-210 Issue 6:2005.

Changes to the EUT are new digital board that controls the transmitter module and a surface mount type antenna with 2 dBi gain. The output power of the transmitter module has not change.

EUT Antenna Description: The metal radiator of the BlackChip is a partially self-resonant meander line structure which behaves similarly to a $\frac{1}{4}$ wavelength monopole antenna when it is adjacent to a counterpoise or ground plane. The self resonance of the meander line, combined with the dielectric loading of the low-loss plastic encapsulation, allows the part to be shorter than a traditional monopole. When designed with a proper transmission line feed structure and ground plane, the resulting antenna system achieves performance similar to a $\frac{1}{2}$ wavelength dipole.

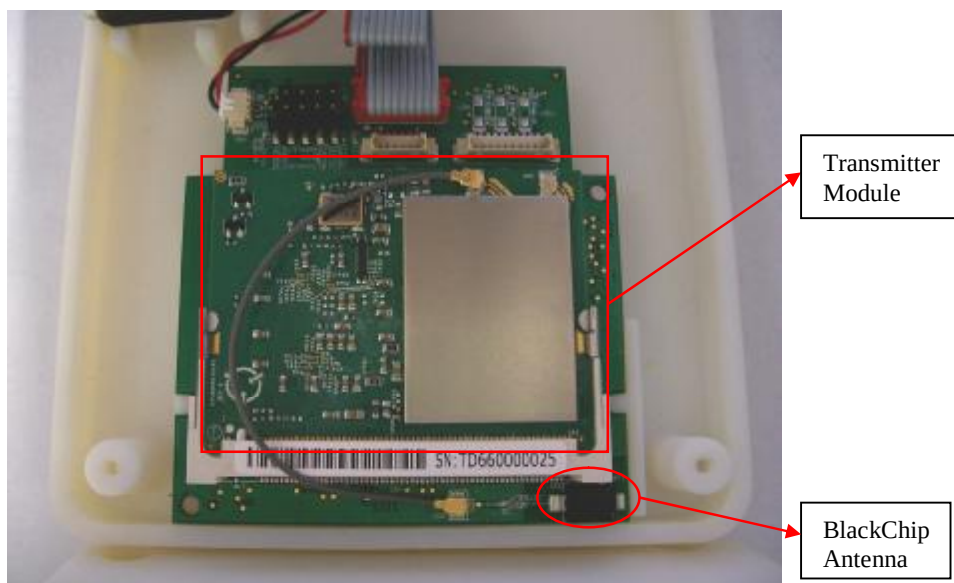
Paxar Americas, Inc. is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the 802.11b/g Module User Manual.

The equipment was tested with two modulations:

- 1) 802.11b with 11Mbps; typically bit rates of 1 to 11Mbps (worse case at 11Mbps).
- 2) 802.11g with 12Mbps; typically bit rates of 12 to 54Mbps (worse case at 12Mbps).

The equipment was tested with the following antenna:
Centurion, model BlackChip; 2 dBi antenna

The test has demonstrated that this unit complies with stipulated standards.



EUT Sample



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1 Technical Details

Purpose	Compliance testing of 802.11b/g Module with 47 CFR 15.247:2005 & RSS-210 Issue 6:2005
Applicant / Client	Paxar Americas, Inc. 170 Monarch Lane Miamisburg, OH 45342
Manufacturer	Paxar Americas, Inc.
Laboratory performing the tests	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test location(s)	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test report reference number	SL06042703-PAX-009/C2PC
Date EUT received	14 July 2006
Standard applied	47 CFR 15.247:2005 & RSS-210 Issue 6:2005
Dates of test (from – to)	21 July 2006 to 26 July 2006
No of Units:	1
Equipment Category:	DSS
Trade/Product Name:	Monarch
Part Number:	126720
Technical Variants:	none
FCC ID No.	GU6CNWLG500
IC ID No.	1502A-CNWLG500

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2 Tests Required

The product was tested in accordance with the following specifications.

The test results recorded in this Test Report are exclusively referred to the tested sample(s).

Test Standard		Description	Pass / Fail
47 CFR Part 15.247: 2005	RSS 210 Issue6: 2005		
15.203		Antenna Requirement	Pass
15.209; 15.247(d)	RSS210(A8.5)	Radiated Spurious Emissions	Pass
ANSI C63.4: 2003			

Notes: Deviations to above standards are outlined in specific test sections if applicable.

Cable loss and external attenuation are compensated for in the measurement system when applicable.

** Equipment is a Direct Sequence Spread Spectrum System.*



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3 Antenna Requirement

Requirement(s): 47 CFR §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.

Antenna requirement must meet at least one of the following:

- a) Antenna must be permanently attached to the device.
- b) Antenna must use a unique type of connector to attach to the device.
- c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

The antenna is permanently attached to the device which meets the requirement.

- 1) Centurion, model BlackChip; 2 dBi surface mount type antenna



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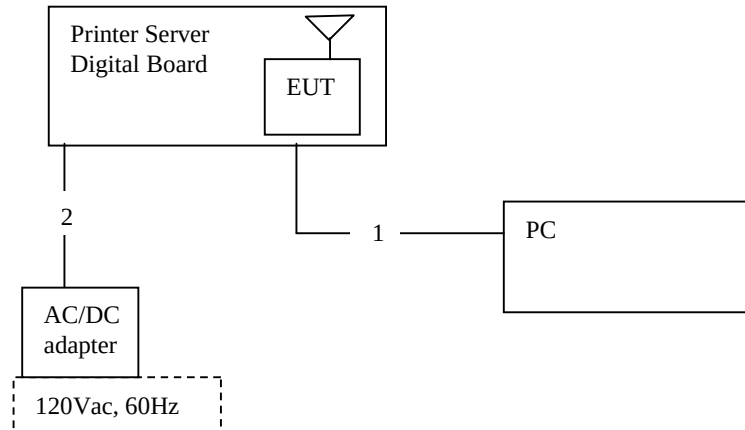
4 Measurements, Examinations and Derived Results

4.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:
Monarch	126720	C6100004705

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4.2 Test Configuration



EUT Cabling Information:

Cable #	Type of Cable	Connector Type	Length (m)	Shield (Y/N)	Remark
1	Data	DB9	2	No	Connected to PC
2	5VDC cord	Standard 2 prong	2	No	Connected to outlet

Support Equipment:

Type of Equipment	Manufacturer	Model
PC	COMPAQ	Presario 2100
AC/DC Adapter	CUI Inc.	EPA-121DA-05

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4.3 Test Results

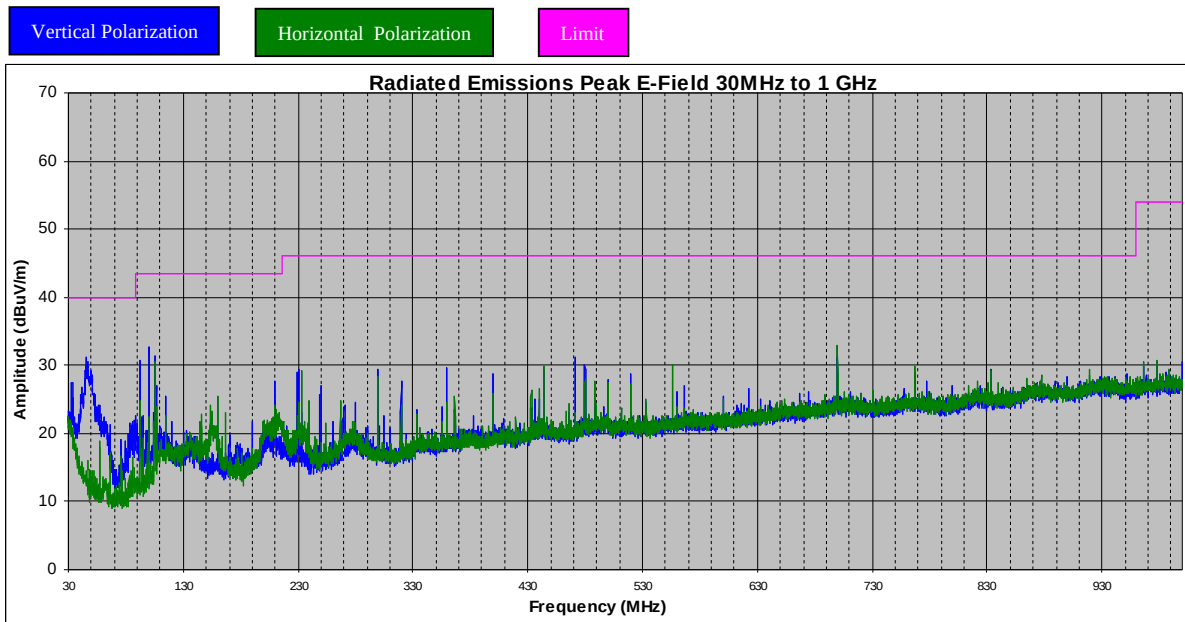
4.3.1 Radiated Spurious Emissions < 1 GHz

Requirement(s): 47 CFR §15.205; 47 CFR §15.209; 47 CFR §15.247(d) & RSS-210 (A8.5)

Limit = as specified in 15.247(d)

Procedures: Radiated emissions were measured according to ANSI C63.4 at 3 meter distance. The device was tested with two protocols at low, mid and high with the worse case protocol (802.11b, 11Mbps) reported. Spectrum analyzer setting: RBW = 100kHz; VBW = approximately 3 times RBW.

Sample Calculation: Corrected Amplitude = Raw Amplitude + ACF + Cable Loss

Results: Mid channel of 802.11b

Radiated Emissions Plot

Frequency	Detector	Antenna Polarization	Raw Amplitude @ 3m	ACF	Cable Loss	PreAmp Gain	Corrected Amplitude @ 3m	Limit @3m	Delta
(MHz)	(Avg/QP/PK)	(H/V)	(dBuV/m)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)
46.10	peak	V	22.23	8.10	0.75	0.00	31.08	40.00	-8.92
105.563	peak	V	19.20	12.21	0.91	0.00	32.32	46.00	-13.68

Radiated Emissions Data

Tested By: Kerwinn Corpuz**Date Tested:** 26 July 2006

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4.3.2 Radiated Spurious Emissions > 1 GHz

Requirement(s): 47 CFR §15.205; 47 CFR §15.209; 47 CFR §15.247(d) & RSS-210 (A8.5)

Limit = as specified in 15.247(d)

Procedures: Equipment was setup in a semi-anechoic chamber. The device was tested with two protocols at low, mid and high with the worse case protocol (802.11b, 11Mbps) reported. Spectrum analyzer setting: at peak measurement, RBW = VBW = 1MHz; at average measurement, RBW = 1MHz, VBW = 10Hz.

Sample Calculation:

EUT Field Strength = Raw Amplitude – Amplifier Gain(dB) + Antenna Factor(dB) + Cable Loss(dB) + Filter Attenuation(dB, if used)

Limit = Fundamental Field Strength – 20 dB. Measured Fundamental Field Strength = 117.2 dBμV/m

Results: **$f_o = 2.412$ GHz (Low)**

Frequency	Azimuth	Detector	Antenna Polarization	Antenna Height	Raw Amplitude @ 1m	Pre Amp	ACF	Cable Loss	Corrected Amplitude @ 1m	Limit	Delta
(GHz)	(degrees)	(Pk/Avg)	(v/h)	(m)	(dBμV/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
4.824	-	-	-	-	-	-	-	-	-	-	-
7.236	-	-	-	-	-	-	-	-	-	-	-
9.648	250	Pk	v	1.0	53.80	32.50	38.59	4.45	64.33	98.40	-34.07
9.648	205	Pk	h	1.1	50.70	32.50	38.63	4.45	61.27	98.40	-37.13

Note: 4.824 GHz and 7.236 GHz measured noise floor including 5th harmonic and up. **$f_o = 2.437$ GHz (Mid)**

Frequency	Azimuth	Detector	Antenna Polarization	Antenna Height	Raw Amplitude @ 1m	Pre Amp	ACF	Cable Loss	Corrected Amplitude @ 1m	Limit	Delta
(GHz)	(degrees)	(Pk/Avg)	(v/h)	(m)	(dBμV/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
4.874	-	-	-	-	-	-	-	-	-	-	-
7.311	-	-	-	-	-	-	-	-	-	-	-
9.748	240	Pk	v	1.0	53.8	32.41	38.79	4.60	64.78	98.4	-33.62
9.748	200	Pk	h	1.1	51	32.41	38.83	4.60	62.02	98.4	-36.38

Note: 4.874 GHz and 7.311 GHz measured noise floor including 5th harmonic and up.

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6:2005****Serial# SL06042703-PAX-009/C2PC****Issue Date 26 July 2006****Page 13 of 22** **$f_o = 2.462$ GHz (High)**

Frequency	Azimuth	Detector	Antenna Polarization	Antenna Height	Raw Amplitude @ 1m	Pre Amp	ACF	Cable Loss	Corrected Amplitude @ 1m	Limit	Delta
(GHz)	(degrees)	(Pk/Avg)	(v/h)	(m)	(dB μ V/m)	(dB)	(dB)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
4.924	-	-	-	-	-	-	-	-	-	-	-
7.386	-	-	-	-	-	-	-	-	-	-	-
9.848	200	Pk	v	1.0	53.9	32.34	38.99	4.77	65.33	98.4	-33.07
9.848	225	Pk	h	1.1	51.9	32.34	39.02	4.77	63.36	98.4	-35.04

Note: 4.924 GHz and 7.386 GHz measured noise floor including 5th harmonic and up.

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5 TEST INSTRUMENTATION

5.1 TEST INSTRUMENTATION

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	Hewlett Packard	8568B	04/26/2007
Quasi-Peak Adapter	Hewlett Packard	85650A	04/26/2007
RF Pre-Selector	Hewlett Packard	85685A	04/26/2007
Spectrum Analyzer	Hewlett Packard	8564E	12/29/2006
EMI Receiver	Rohde & Schwarz	ESIB 40	02/07/2007
Power Meter	Hewlett Packard	437B	04/25/2007
Power Sensor	Hewlett Packard	8485A	04/25/2007
Bilog Antenna	Sunol Sciences	JB1	03/18/07
Antenna	Emco	3115	07/12/2007
Antenna	Emco	3115	See Note1
Signal Generator	Wiltron	68169B	04/26/2007
Chamber	Lingren	3m	08/21/2006
Pre-Amplifier	Hewlett Packard	8449	07/19/2006
DMM	Fluke	73III	07/04/2006
Variac	KRM	AEEC-2090	See Note1
Environment Chamber	TestEquity	1007H	10/27/2006
DMM	Fluke	51II	See Note1
HPF	Lorch	4HPD-X4000-3R	See Note1
HPF	Lorch	4HPD-X6000-3R	See Note1

Note1: Functional Verification

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APPENDIX A: EUT TEST CONDITIONS

The following is the description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Cable Description
Compaq Laptop	1. Serial cable 2. AC/DC adapter

EUT Description	: 802.11b/g Module
Model No	: Monarch
Serial No	: none

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
	The EUT was controlled via PC to enter test modes necessary to complete the testing.



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APPENDIX B: EXTERNAL PHOTOS

See Attachment



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APPENDIX C: CIRCUIT/BLOCK DIAGRAMS

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APPENDIX D: INTERNAL PHOTOS

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APPENDIX E: PRODUCT DESCRIPTION

Detail description of this product is shown in the User's Guide.



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APPENDIX F: FCC LABEL LOCATION

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APPENDIX G: USER MANUAL

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