

TEST REPORT

FROM



FOR

Paxar Americas, Inc.

RFID Printer

Model: 9855HF

TO

47 CFR 15.225:2006 & RSS-210 Issue 6:2005

Test Report Serial No.:
SL07051001-PAX-004

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:

A handwritten signature in black ink, appearing to read "Benjamin Jing", is written over a vertical red line.

.....
Tested by: Benjamin Jing, Test Engineer

A handwritten signature in black ink, appearing to read "Snell Leong", is written over a vertical red line.

.....
Reviewed by: Snell Leong, Reviewer

Issue date: 4 June 2007
Manufacturer: Paxar Americas, Inc.



Registration No. 783147



Industry Canada
Industrie Canada

Registration No. 4842



Lab Code: KR0032



電訊管理局

RTA No. D23/16V



Lab Code: US0160



BSMI Code: SL2-IN-E-1030R

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Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 2 of 28

www.siemic.com

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CONTENTS

EXECUTIVE SUMMARY	5
1 TECHNICAL DETAILS	6
2 TESTS REQUIRED	7
3 ANTENNA REQUIREMENT.....	8
4 MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS	9
5 TEST INSTRUMENTATION	19
APPENDIX A: EUT TEST CONDITIONS.....	20
APPENDIX B: TEST SET-UP PHOTOS	21
APPENDIX C: EXTERNAL PHOTOS	22
APPENDIX D: CIRCUIT/BLOCK DIAGRAMS.....	23
APPENDIX E: INTERNAL PHOTOS.....	24
APPENDIX F: PRODUCT DESCRIPTION.....	25
APPENDIX G: FCC LABEL LOCATION	26
APPENDIX H: USER MANUAL	27



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 4 of 28

www.siemic.com

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the Paxar Americas, Inc., RFID Printer, model 9855HF against the current 47 CFR 15.225:2006 & RSS-210 Issue 6:2005. The 9855HF demonstrated compliance with the 47 CFR 15.225:2006 & RSS-210 Issue 6:2005.

Paxar Americas, Inc. is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the 9855HF User Manual.

The equipment under test operating frequency is 13.56 MHz, its size is 44.5 cm X 33 cm X 29.5 cm, its weight is 10 kg .

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



FRONT



BACK

RFID Printer Sample



Title: Paxar Americas, Inc
FCCID: GU6-RFID-HF
To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404
Issue Date 4 June 2007
Page 6 of 28

www.siemic.com

1 Technical Details

Purpose	Compliance testing of 9855HF with 47 CFR 15.225:2006 & RSS-210 Issue 6:2005
Applicant / Client	Paxar Americas, Inc. 170 Monarch Lane. Miamisburg, OH 45342
Manufacturer	Paxar Americas, Inc. 170 Monarch Lane. Miamisburg, OH 45342
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	SL07051001-PAX-004
Date EUT received	28 May 2007
Standard applied	47 CFR 15.225:2006 & RSS-210 Issue 6:2005
Dates of test (from – to)	29 May 2007 to 4 June 2007
No of Units:	1
Equipment Category:	DXX
Trade/Product Name:	9855HF
Type/Model Name/No:	9855HF
Technical Variants:	
FCC ID No.	GU6-RFID-HF
IC ID No.	1502A-RFIDHF



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 15.225: 2006	RSS 210 Issue 6: 2005		
15.203		Antenna Requirement	Pass
15.207(a)	RSSGen(7.2.2)	Conducted Emissions Voltage	Pass
15.225(a)	RSS210(A2.6)	Limit in the band of 13.553 – 13.567 MHz	Pass
15.225(b)	RSS210(A2.6)	Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Pass
15.225(c)	RSS210(A2.6)	Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Pass
15.225(d)	RSS210(A2.6)	Limit outside the band of 13.110 – 14.010 MHz	Pass
15.225(e)	RSS210(A2.6)	Frequency Stability	Pass
15.209	RSS210(A8.5)	Radiated Emission Limits	Pass
ANSI C63.4: 2003 / RSS-Gen Issue 1: 2005			

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.*



3 Antenna Requirement

Requirement(s): 47 CFR §15.203

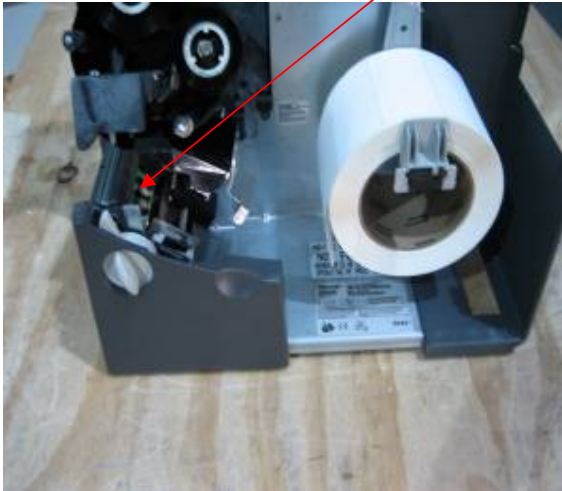
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

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 uses a unique type of connector to attach to the device.

Antenna





Title: Paxar Americas, Inc
FCCID: GU6-RFID-HF
To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404
Issue Date 4 June 2007
Page 9 of 28

www.siemic.com

4 Measurements, Examinations and Derived Results

4.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:
9855HF	9855HF	9267169



4.2 Test Results

4.2.1 Conducted Emissions Voltage

Requirement(s): 47 CFR §15.207 & RSS-Gen Issue 1(7.2.2)

Procedures:

The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table. The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. All other supporting equipment were powered separately from another mains.

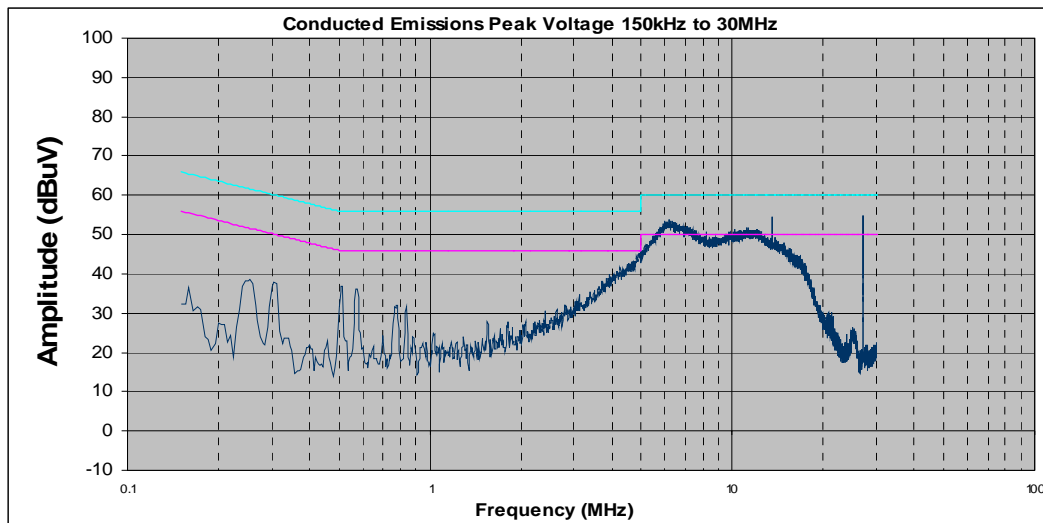
The EUT was switched on and allowed to warm up to its normal operating condition. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver. High peaks, relative to the limit line, were then selected. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Quasi-peak and Average measurements were made. The procedure was then repeated for the PHASE line.

Results:

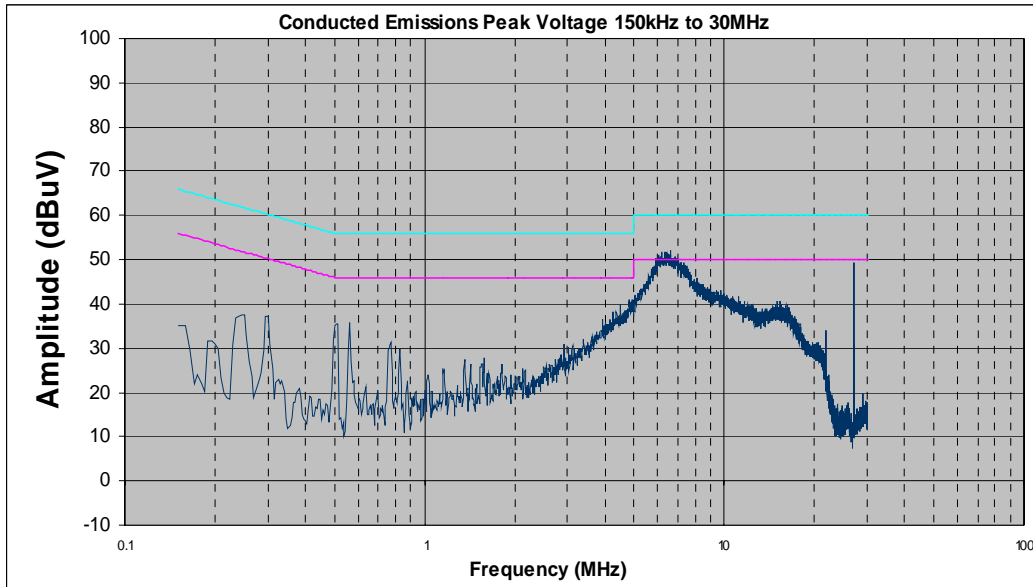
Note –

Quasi-Peak Limit

Average Limit



Neutral Line Plot at 120Vac, 60Hz



Phase Line Plot at 120Vac, 60Hz

LINE	FREQ (MHz)	Corrected Amplitude (dB μ V) QP	Limit (dB μ V) QP	Margin (dB) QP	Corrected Amplitude (dB μ V) AVG	Limit (dB μ V) AVG	Margin (dB) AVG
Neutral	6.21	45.44	60	-14.56	40.83	50	-9.17
Neutral	6.68	44.73	60	-15.27	41.62	50	-8.38
Neutral	11.54	41.25	60	-18.75	35.74	50	-14.26
Neutral	12.57	40.91	60	-19.09	36.15	50	-13.85
Neutral	13.56	40.02	60	-19.98	36.24	50	-13.76
Neutral	27.12	28.67	60	-31.33	27.49	50	-22.51
Phase	6.21	45.81	60	-14.19	41.35	50	-8.65
Phase	6.68	44.32	60	-15.68	42.21	50	-7.79
Phase	13.56	39.85	60	-20.15	35.74	50	-14.26
Phase	15.23	37.42	60	-22.58	36.15	50	-13.85
Phase	16.49	36.63	60	-23.37	34.77	50	-15.23
Phase	27.12	26.54	60	-33.46	24.92	50	-25.08

Conducted Emission Table

Note: PK = peak; QP = quasi-peak; AVG = average detector.

Tested By: Benjamin Jing

Date Tested: 30 May 2007



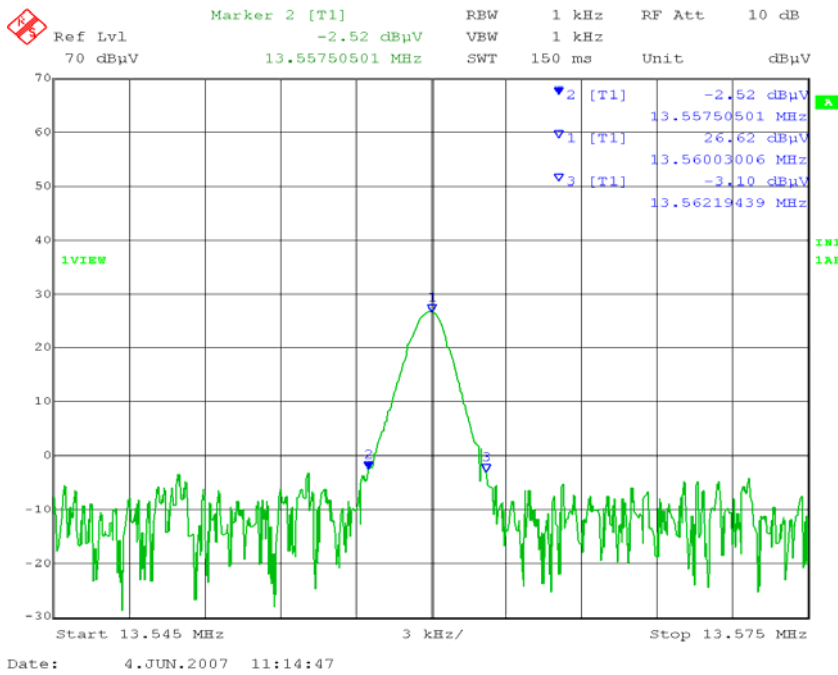
4.2.2 Occupied Bandwidth

Requirement(s):

Procedures: The 99% bandwidth was measured radiated emissions using a spectrum analyzer.

Results:

Measured 99% occupied bandwidth: 4.69 kHz



Tested By: Benjamin Jing

Date Tested: 30 May 2007



4.2.3 Radiated Emissions within the Band of 13.110 – 14.010 MHz

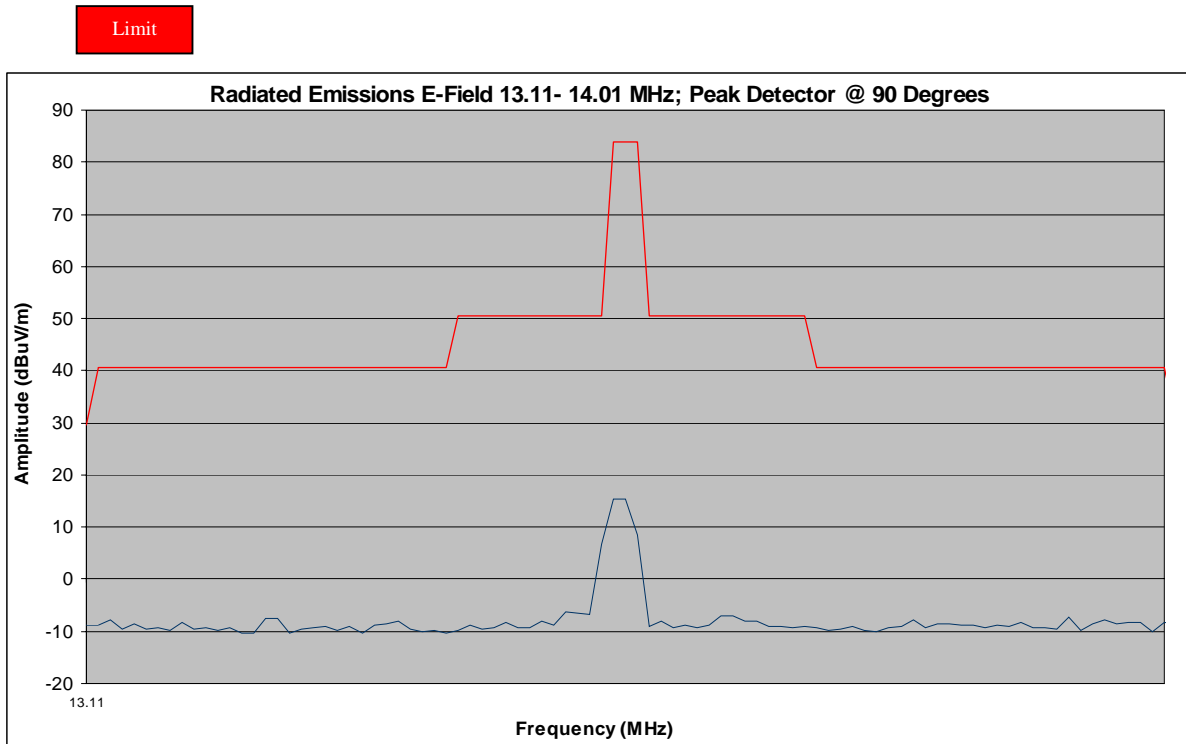
Requirement(s): 47 CFR §15.225(a) – (c) & RSS-210 (A2.6)

Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz.

The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dBμV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

Results: Loop Antenna Positioned at 0 degrees



Radiated Emissions Plot

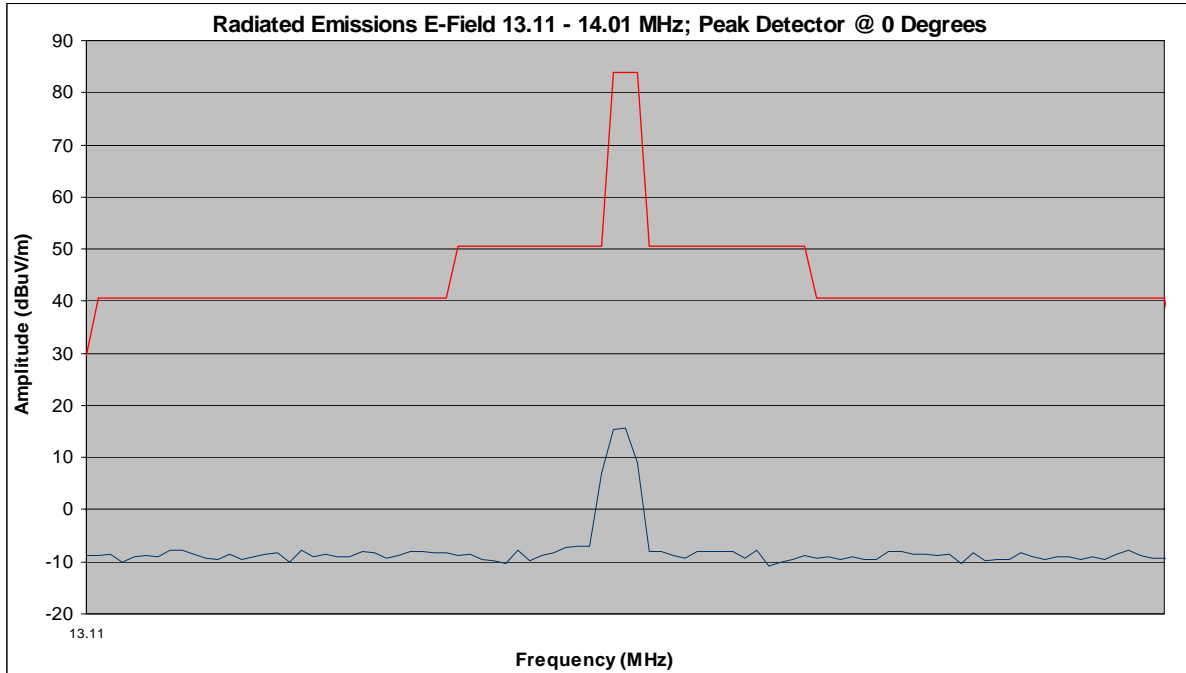
Frequency	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 3m	Limit @ 30m	Margin
(MHz)	(dBμV/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)
13.56	19.8	35.62	0.28	40	15.7	84	-68.3

Radiated Emissions Table



Results: Loop Antenna Positioned at 90 degrees

Limit



Radiated Emissions Plot

Frequency	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 3m	Limit @ 30m	Margin
(MHz)	(dB μ V/m)	(dB)	(dB)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)
13.56	19.4	35.62	0.28	40	15.3	84	-68.7

Radiated Emissions Table

Tested By: Benjamin Jing

Date Tested: 30 May 2007



4.2.4 Radiated Emissions < 30 MHz (outside 13.110 – 14.010 MHz)

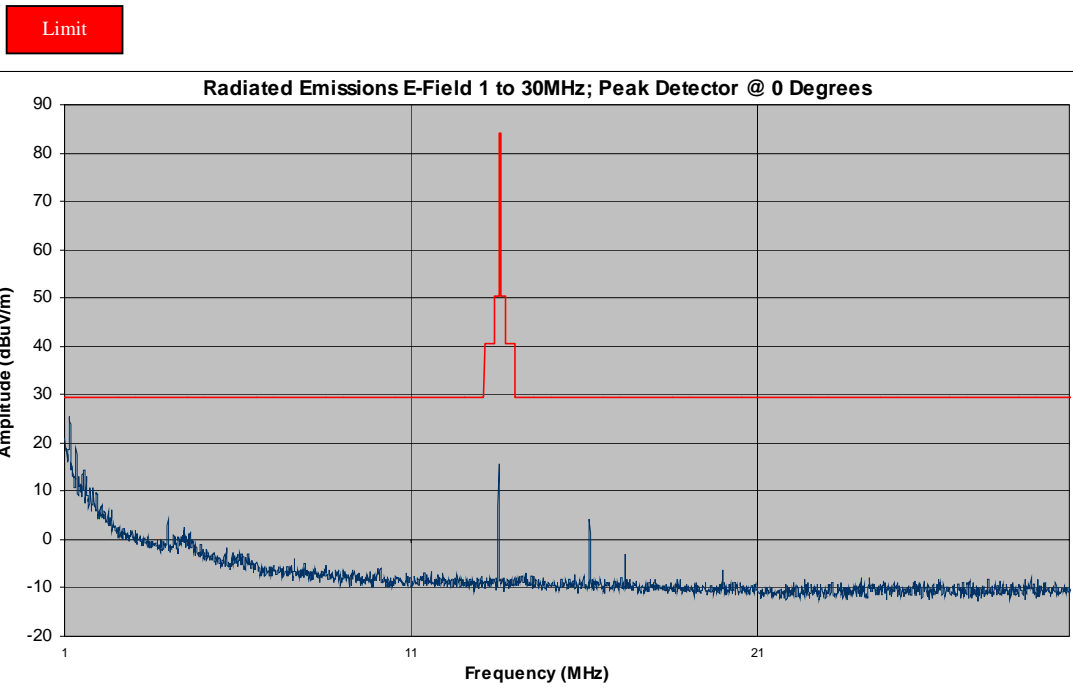
Requirement(s): 47 CFR §15.209; 47 CFR §15.225(d) & RSS-210 (A2.6)

Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power. The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz.

The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dBμV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

Results: Loop Antenna Positioned at 0 degrees



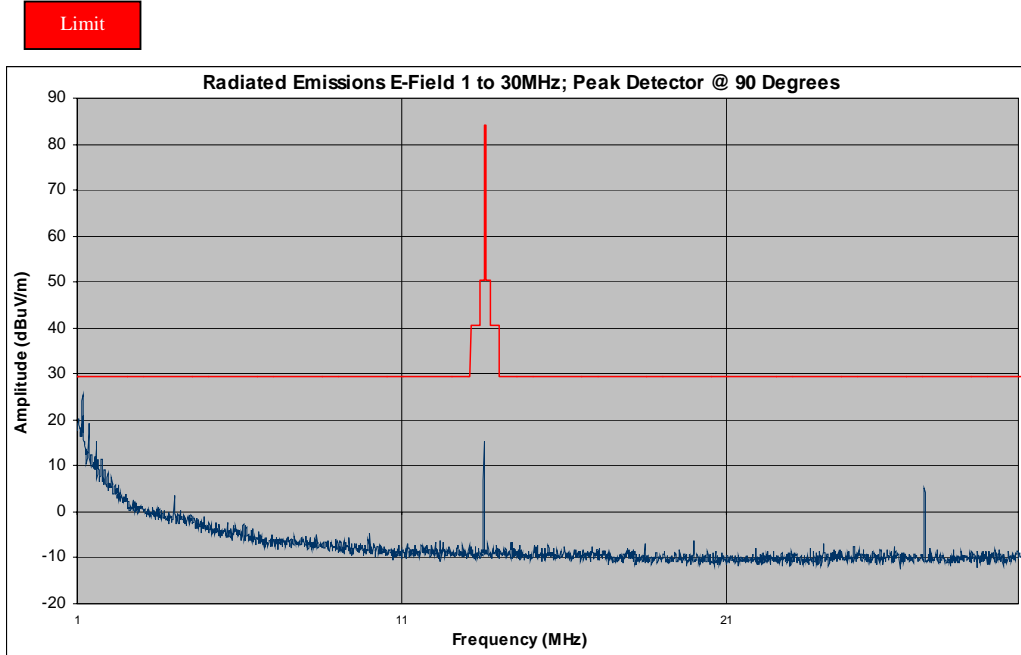
Radiated Emissions Plot

Frequency	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 3m	Limit @ 30m	Margin
(MHz)	(dBμV/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)
1.74	5.05	60.22	0.25	40	25.52	29.54	-4.02
1.85	2.71	55.96	0.26	40	18.93	29.54	-10.61

Radiated Emissions Table



Results: Loop Antenna Positioned at 90 degrees



Radiated Emissions Plot

Frequency	Raw Amplitude @ 3m	Antenna Factor	Cable Loss	Distance Correction Factor	Corrected Amplitude @ 3m	Limit @ 30m	Margin
(MHz)	(dBμV/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dBμV/m)
1.74	0.86	60.22	0.25	40	21.33	29.54	-8.21
1.85	4.20	55.96	0.26	40	20.42	29.54	-9.12

Radiated Emissions Table

Tested By: Benjamin Jing

Date Tested: 30 May 2007



4.2.5 Radiated Emissions > 30 MHz

Requirement(s): 47 CFR §15.209; 47 CFR §15.225(d) & RSS-210 (A2.6)

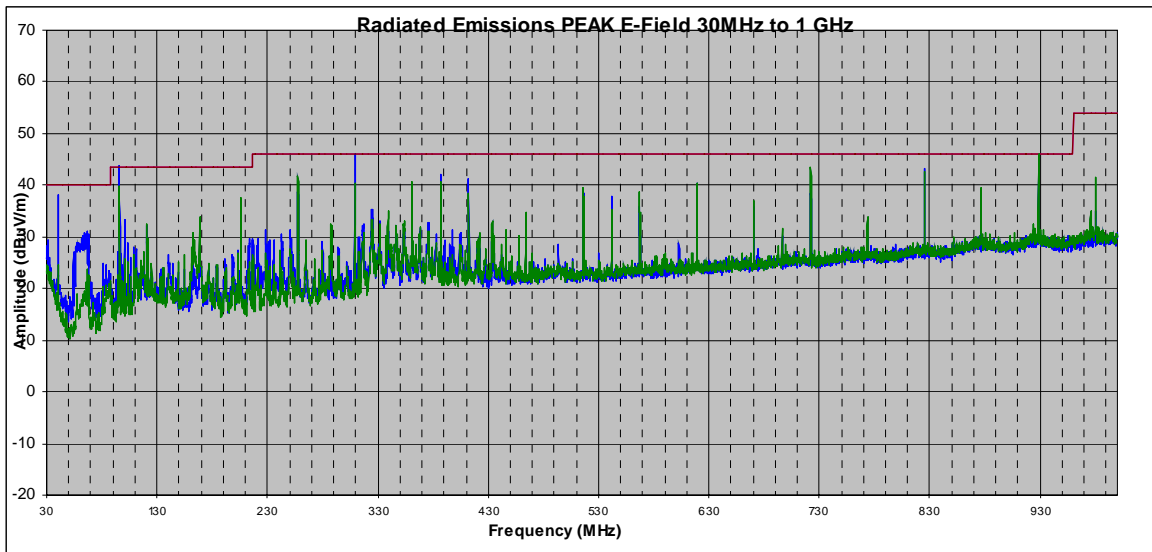
Procedures: Radiated emissions were measured according to ANSI C63.4. The EUT was set to transmit at the highest output power.

The limit is converted from microvolts/meter to decibel microvolts/meter.

Sample Calculation: Corrected Amplitude = Raw Amplitude(dBuV/m) + ACF(dB) + Cable Loss(dB)

Results:

Vertical Polarization Horizontal Polarization Limit



Radiated Emissions Plot

Frequency (MHz)	Azimuth (degrees)	Measure (Avg/QP)	Antenna Polarity (H/V)	Antenna Height (m)	Raw Amplitude @ 3m (dBuV/m)	ACF (dBm)	CBL loss (dBm)	Corrected Amplitude @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dBuV/m)
722.29	180	QP	H	1.8	15.90	20.4	2	38.3	46	-7.70
825.41	270	QP	H	1.9	17.80	21.8	2.2	41.8	46	-4.20
928.89	290	QP	H	1.9	19.50	22.5	2.4	44.4	46	-1.60
40.67	180	QP	V	1.1	24.90	12.7	0.7	38.3	40	-1.70
94.41	270	QP	V	1.0	26.20	7.3	0.7	34.2	43.5	-9.30
311.50	300	QP	V	1.3	26.10	13.8	1.5	41.4	46	-4.60

Radiated Emissions Table

Tested By: Benjamin Jing

Date Tested: 30 May 2007



4.2.6 Frequency Stability

Requirement(s): 47 CFR §15.225(e) & RSS-210 (A2.6)

Procedures: Frequency Stability was measured according to 47 CFR §2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.

Limit: $\pm 0.01\%$ of 13.56 MHz = 1356 Hz

Results:

Frequency versus Temperature

Reference Frequency: measured 13.559985 MHz at 20°C

Temperature (Celsius)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Drift (%)
50	13.559903	-82	-0.00061
40	13.560029	44	0.00032
30	13.560008	23	0.00017
20	Reference		
10	13.559967	-18	-0.00013
0	13.559931	-54	-0.00039
-10	13.559852	-133	-0.00098
-20	13.559891	-94	-0.00069
-30	13.559903	-82	-0.00061

Frequency versus Voltage

Reference Frequency: measured 13.560843 MHz at 20°C with 120 Vac / 60 Hz

Measured Voltage $\pm 15\%$ of nominal (AC)	Measured Freq. (MHz)	Freq. Drift (Hz)	Freq. Drift (%)
138	13.559972	-13	-0.00009
102	13.559976	-9	-0.00006

Tested By: Benjamin Jing

Date Tested: 30 May 2007



5 TEST INSTRUMENTATION

5.1 TEST INSTRUMENTATION

Instrument	Manufacturer	Model	CAL Due Date
Spectrum Analyzer	HP	8568B	04/26/2008
Quasi-Peak Adapter	HP	85650A	04/26/2008
RF Pre-Selector	HP	85685A	04/26/2008
Spectrum Analyzer	HP	8564E	05/01/2008
EMI Receiver	Rohde&Schwarz	ESIB 40	02/07/2008
Biconlog Antenna	Sunol Sciences, Inc.	JB1	09/11/2008
Loop Antenna	ETS-Lingren	6512	05/13/2008
Near Field Probe	Chase	MFP9150	See Note
Chamber	Lingren	3m	08/21/2007
DMM	Fluke	73III	07/04/2007
Variac	KRM	AEEC-2090	See Note
Environment Chamber	TestEquity	1007H	01/24/2009
DMM	Fluke	73III	05/01/2008

Note: Functional Verification



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
9855HF	1. AC Power

EUT Description	: RFID Printer
Model No	: 9855HF
Serial No	: 9267196

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

Test	Description Of Operation
	The EUT was set to transmitting mode by PC with Paxar's software.



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 21 of 28

www.siemac.com

APPENDIX B: TEST SET-UP PHOTOS

See Attachment



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 22 of 28

www.siemac.com

APPENDIX C: EXTERNAL PHOTOS

See Attachment



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 23 of 28

www.siemic.com

APPENDIX D: CIRCUIT/BLOCK DIAGRAMS

See Attachment



Title: Paxar Americas, Inc
FCCID: GU6-RFID-HF
To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404
Issue Date 4 June 2007
Page 24 of 28

www.siemac.com

APPENDIX E: INTERNAL PHOTOS

See Attachment



Title: Paxar Americas, Inc
FCCID: GU6-RFID-HF
To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404
Issue Date 4 June 2007
Page 25 of 28

www.siemic.com

APPENDIX F: PRODUCT DESCRIPTION

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



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 26 of 28

www.siemic.com

APPENDIX G: FCC LABEL LOCATION

See Attachment



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 27 of 28

www.siemac.com

APPENDIX H: USER MANUAL

See Attachment



Title: Paxar Americas, Inc

FCCID: GU6-RFID-HF

To: 47 CFR 15.225:2006 & RSS-210 Issue
6:2005

Serial# SL07051001-PAX-00404

Issue Date 4 June 2007

Page 28 of 28

www.siemic.com

END OF REPORT