TEST REPORT

FROM

SIEMIC

For

Hand Held Reader (HHR)

To

47 CFR 15.247 DSS

Test Report Serial No.:
SL05051108B2_FCC

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: Alvin Ilarina, Test Enginner

.....

Reviewed by: Leslie Bai, Lab Manager

Issue date: 25 July 2005

Equipment Details:
Manufacturer: GE Security

Industry Canada
Industrie Canada

Registration No. 783147 Registration No. 4842 Registration No. 2195

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the GE Security, Hand Held Reader (HHR) against the current 47 CFR 15.247 DSS. The Hand Held Reader (HHR) demonstrated compliance with the 47 CFR 15.247 DSS.

GE Security is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the Hand Held Reader (HHR) User Manual.

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

1 Technical Details

Purpose	Compliance testing of Hand Held Reader (HHR) with 47 CFR 15.247 DSS
Applicant / Client	GE Security 4001 Fairview Industrial Dr SE Salem, OR 97302
Manufacturer	GE Security
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	SL05051108B2_FCC
Date EUT received	17 May 2005
Standard applied	47 CFR 15.247 DSS
No of Units:	1
Equipment Category:	FHSS
Trade/Product Name:	Hand Held Reader (HHR)
Type/Model Name/No:	ATR20105/1 R1B
Technical Variants:	None
FCC ID No.	TCZ-ATT20105-1

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
47CFR Part 15, General Conditions		
15.207	Power Line Conducted Emissions	N/A
15.209, 15.205	Radiated Spurious Emissions	Pass
47CFR Part 15, §15.247		
15.247(a)1	Carrier Frequency Separation	Pass
15.247(a)1	20 dB Bandwidth	Pass
15.247(a)1	Number of Hopping Frequencies	Pass
15.247(a)1	Time of Occupancy	Pass
15.247(b)(1)	Power Output	Pass
15.247(c)	Conducted Spurious Emissions	Pass
15.247(c)	Radiated Spurious Emissions	Pass
ANSI C63.4: 2001		

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 Measurements, Examinations and Derived Results

3.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:
Hand Held Reader (HHR)	ATR20105/1 R1B	None

3.2 Test Results

3.2.1 Power Line Conducted Emissions

Requirement(s): 47 CFR §15.207

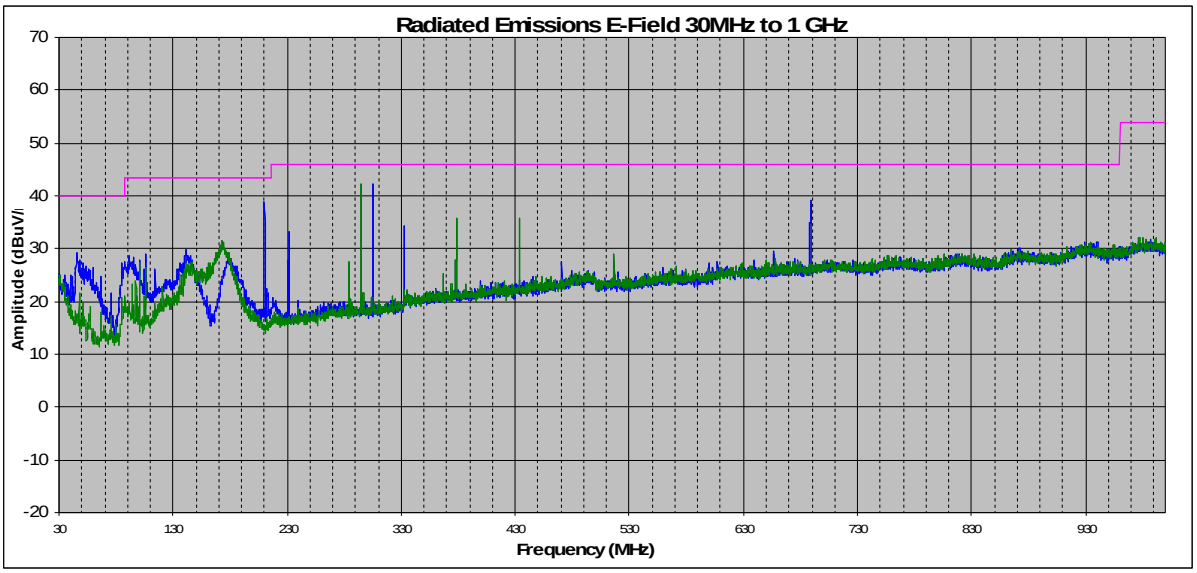
Results: Not Applicable – the equipment is battery powered.

3.2.2 Radiated Spurious Emissions < 1 GHz

Requirement(s): 47 CFR §15.209

Procedures: Radiated emissions were measured according to ANSI C63.4. Equipment was tested in three orthogonal axis at hi mid and low with the worse case reported

Results:



Frequency	Azimuth	Measure	Antenna Polarity	Antenna Height	Raw Amplitude @ 3m	ACF	CBL loss	Corrected Amplitude @ 3m	Limit @3m	Delta
(MHz)	(degrees)	(Avg/QP)	(H/V)	(m)	(dBuV/m)	(dBm)	(dBm)	(dBuV/m)	(dBuV/m)	(dBuV/m)
52.79	0	qp	h	1	16.10	7.92	0.76	24.78	40.00	-15.21
57.21	0	qp	h	1	17.00	7.8	0.77	25.57	40.00	-14.42
97.69	30	qp	h	1	13.10	9.75	0.89	23.74	43.50	-19.75
100.31	0	qp	h	1	14.70	10.48	0.90	26.08	43.50	-17.41
169.18	0	qp	h	2	17.40	11.96	0.96	30.33	43.50	-13.17
46.06	0	qp	v	1	19.70	8.1	0.74	28.54	40.00	-11.45
56.19	0	qp	v	1	18.40	7.63	0.77	26.81	40.00	-13.19
87.11	0	qp	v	1	18.70	6.95	0.86	26.51	40.00	-13.48
145.39	0	qp	v	1	12.20	13.76	0.94	26.90	43.50	-16.59
174.91	0	qp	v	1	11.40	12.2	0.97	24.57	43.50	-18.93

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

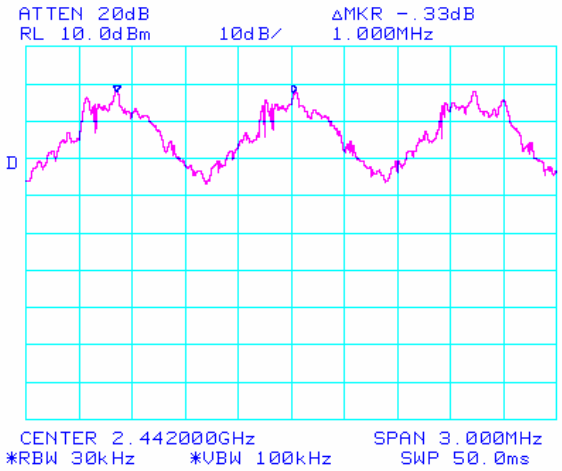
3.2.3 Carrier Frequency Separation

Requirement(s): 47 CFR §15.247(a)(1)

Procedures: The carrier frequency separation measurement was taken conducted using a spectrum analyzer.

Results:

Plot #	Carrier Frequency Separation (MHz)
1	1.0 MHz



Plot 1: Carrier Frequency Separation

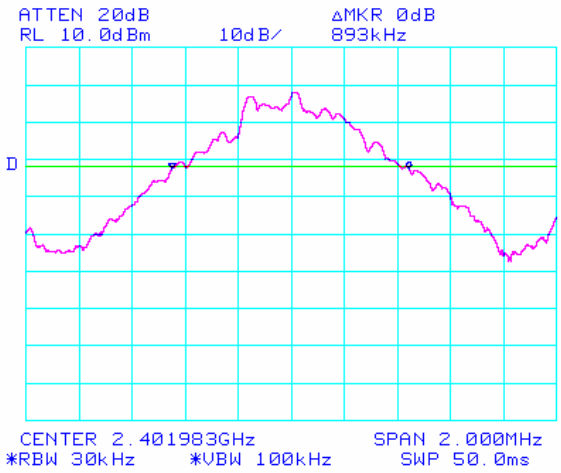
3.2.4 20dB Bandwidth

Requirement(s): 47 CFR §15.247(a)(1)

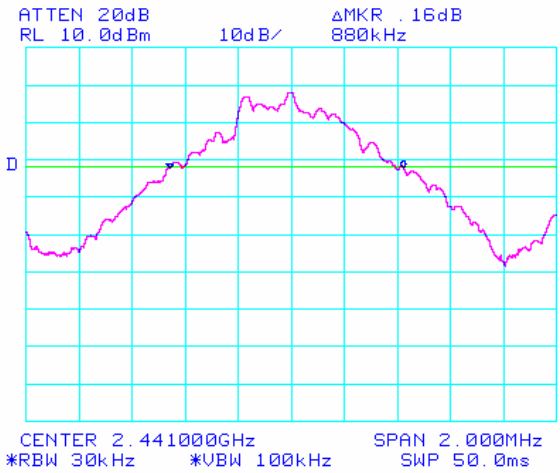
Procedures: The 20dB bandwidths were measured conducted using a spectrum analyzer for the low, mid, and hi channels.

Results:

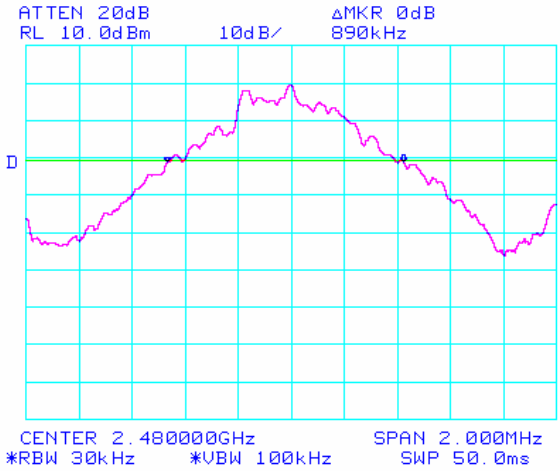
Plot #	Channel	Channel Bandwidth (MHz)
2	Low	0.893
3	Mid	0.880
4	Hi	0.890



Plot 1: 20dB Bandwidth Low



Plot 2: 20dB Bandwidth Mid



Plot 3: 20dB Bandwidth Hi

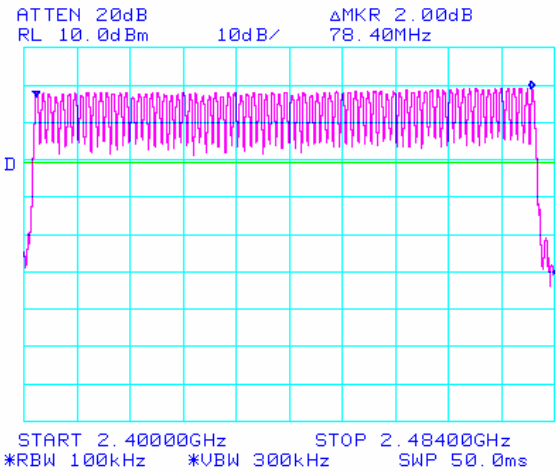
3.2.5 Number of Hopping Frequencies

Requirement(s): 47 CFR §15.247(a)(1)

Procedures: The number of hopping channels was measured conducted with a spectrum analyzer.

Results:

Plot #	Number of Hopping Channels
4	78



Plot 4: Number of Hopping Channels

3.2.6 Time of Occupancy

Requirement(s): 47 CFR §15.247(a)1

Time of occupancy shall not be greater than 0.4 seconds within a period of 0.4 second multiplied by the number of hopping channels (78) = 31.2 seconds

Procedures: The time of occupancy was measured conducted with a spectrum analyzer.

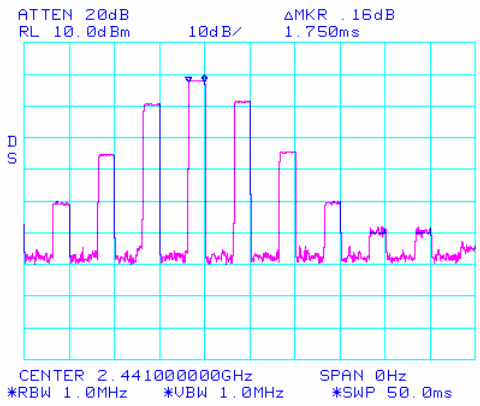
Results:

Plot #	Time of Occupancy (ms)
5 and 6	275.8

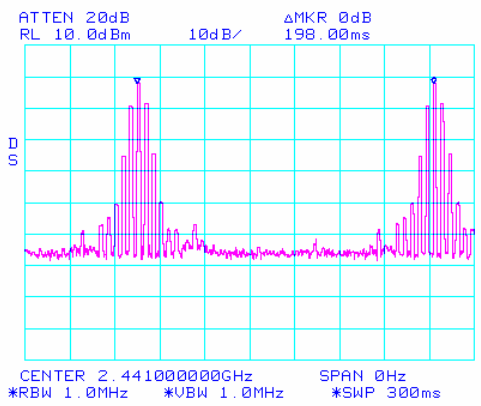
Time of occupancy per period = 1.75 ms

Number of periods per 31.2 seconds = 31.2 seconds/ 0.198 seconds = 157.6 periods

Time of occupancy = 1.75ms * 157.6 = 275.8ms



Plot 5: Time of occupancy (1 of 2)



Plot 6: Time of occupancy (2 of 2)

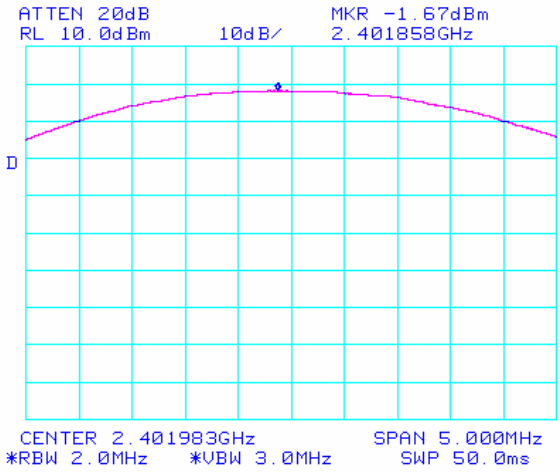
3.2.7 Peak Output Power

Requirement(s): 47 CFR §15.247(b)(1)

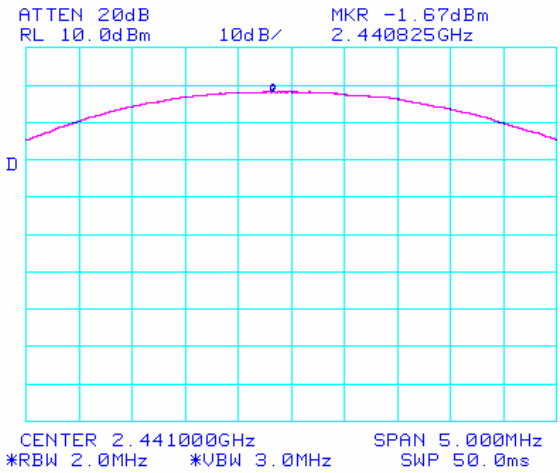
Procedures: The peak output power was measured conducted using a spectrum analyzer for the low, mid, and hi channels.

Results:

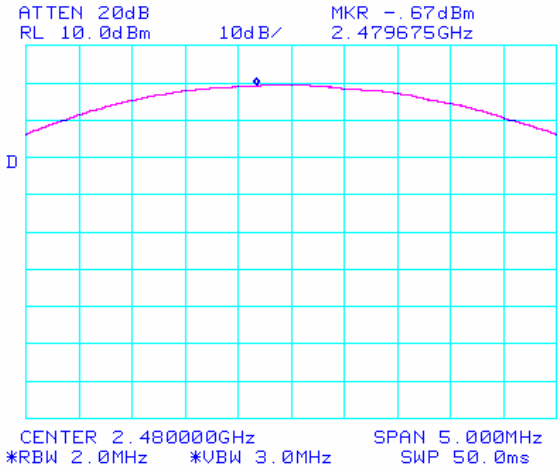
Plot #	Channel	Peak Power (dBm)
7	Low	-1.67
8	Mid	-1.67
9	Hi	-0.67



Plot 7: Peak Power Low



Plot 8: Peak Power Mid



Plot 9: Peak Power Hi

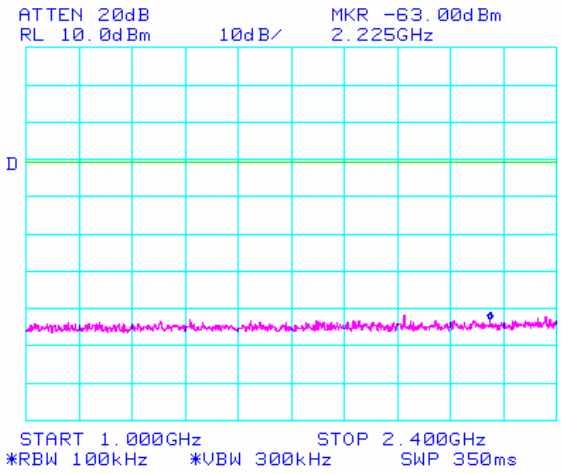
3.2.8 Conducted Spurious Emissions

Requirement(s): 47 CFR §15.247(c)

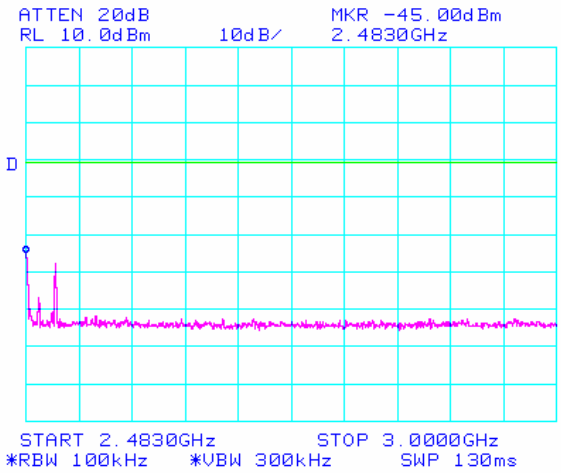
Procedures: The conducted spurious emissions were measured conducted using a spectrum analyzer for the low, mid, and hi channels.

Results:

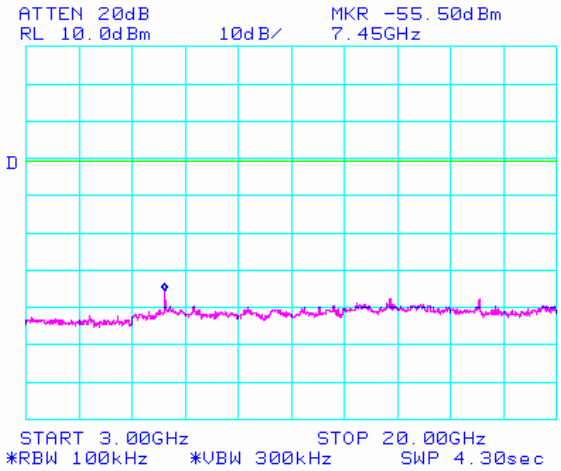
Plots #	Channel	Pass/Fail
10 to 13	Hi	Pass
14 to 17	Mid	Pass
18 to 22	Low	Pass



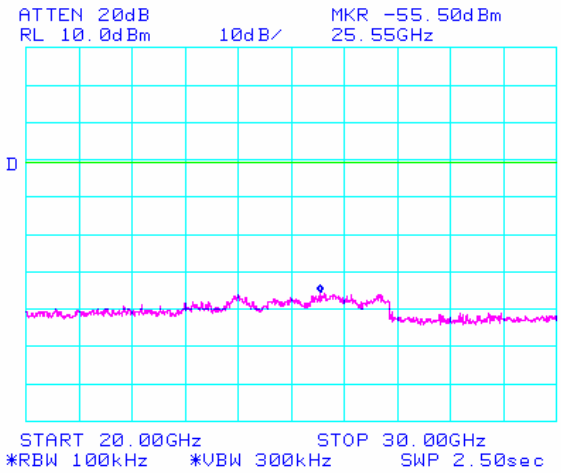
Plot 10: Conducted Spurious Emissions Hi (1/4)



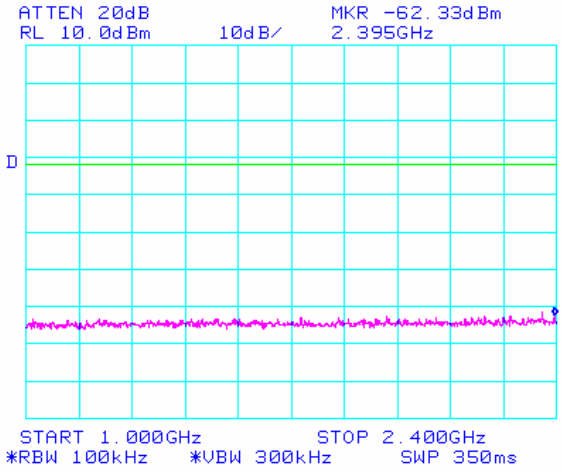
Plot 11: Conducted Spurious Emissions Hi (2/4)



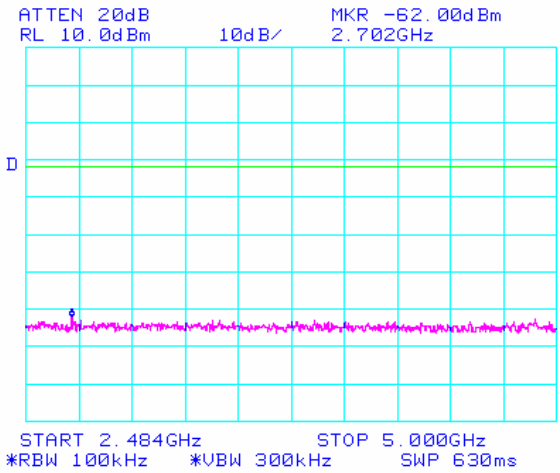
Plot 12: Conducted Spurious Emissions Hi (3/4)



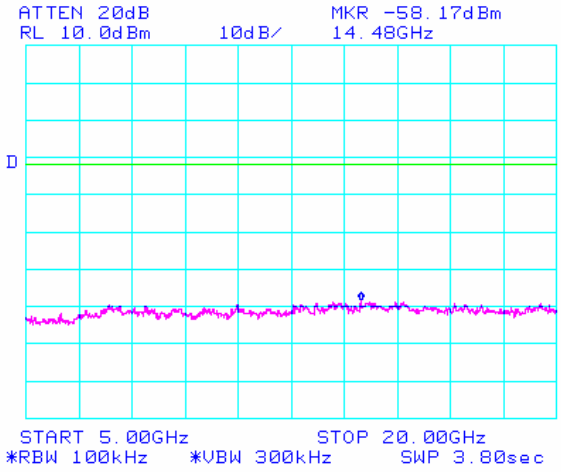
Plot 13: Conducted Spurious Emissions Hi (4/4)



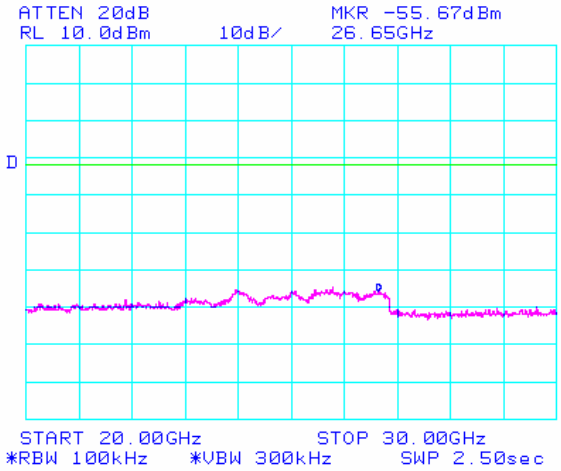
Plot 14: Conducted Spurious Emissions Mid (1/4)



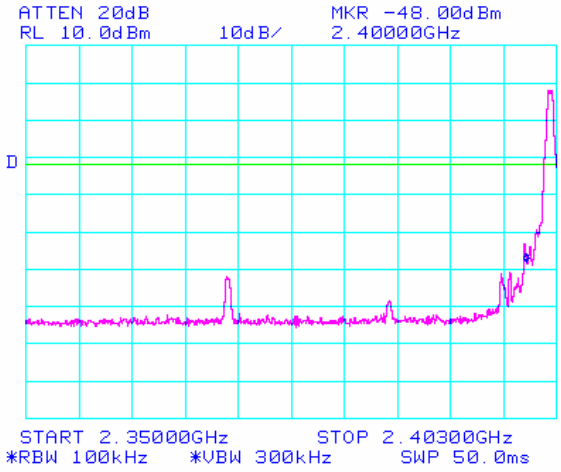
Plot 15: Conducted Spurious Emissions Mid (2/4)



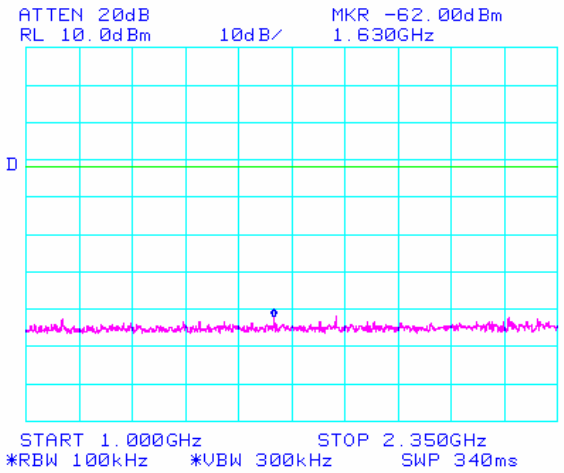
Plot 16: Conducted Spurious Emissions Mid (3/4)



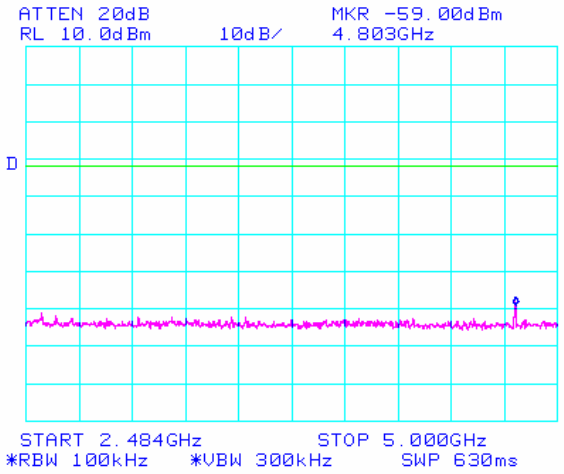
Plot 17: Conducted Spurious Emissions Mid (4/4)



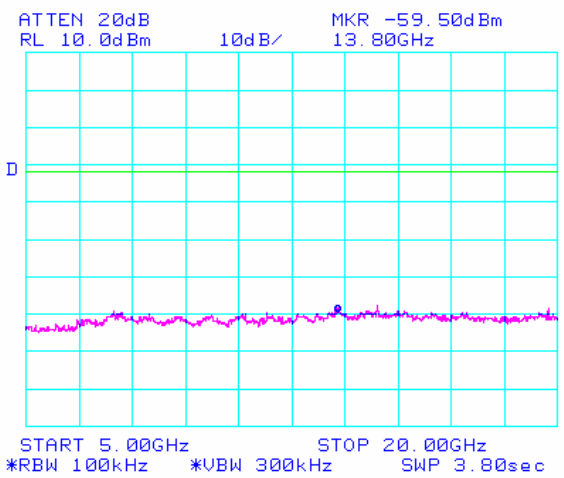
Plot 18: Conducted Spurious Emissions Low (1/5)



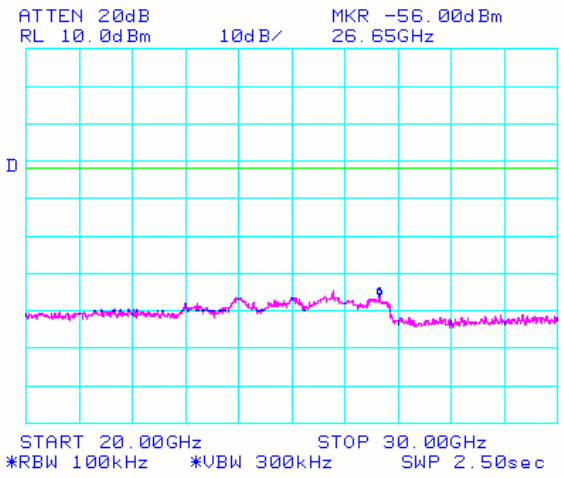
Plot 19: Conducted Spurious Emissions Low (2/5)



Plot 20: Conducted Spurious Emissions Low (3/5)



Plot 21: Conducted Spurious Emissions Low (4/5)



Plot 22: Conducted Spurious Emissions Low (5/5)

3.2.9 Radiated Spurious Emissions > 1 GHz

Requirement(s): 47 CFR §15.247(c)

Procedures: Equipment was setup in a semi-anechoic chamber. For measurements above 1 GHz an average measurement was taken with a 1MHz resolution bandwidth was used.

Results:

Channel	Frequency (GHz)	Detector	Azimuth (Degrees)	Antenna Polarity (H/V)	Height (m)	EUT Field Strength Final Amp. (dBuV/m)	FS Limit @ 3m (dBuV/m)	Margin (dBuV/m)
hi	4.96	Pk	0	**H/V**	noise floor			
hi	7.44	Pk	0	**H/V**	noise floor			
hi	9.92	Pk	0	**H/V**	noise floor			
lo	1.8	Pk	0	**H/V**	noise floor			
lo	1.8	Pk	0	**H/V**	noise floor			
lo	2.7	Pk	0	**H/V**	noise floor			
mid	1.83	Pk	0	**H/V**	noise floor			
mid	1.83	Pk	0	**H/V**	noise floor			
mid	2.74	Pk	0	**H/V**	noise floor			

Sample Calculation:

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

4 TEST INSTRUMENTATION

4.1 TEST INSTRUMENTATION

Instrument	Manufacturer	Model
Spectrum Analyzer	HP	8564E
Power Meter	HP	437B
Power Sensor	HP	8485A
Antenna	Emco	3115
Antenna	Emco	3115
Signal Generator	Wiltron	68169B
Chamber	Lingren	3m
Pre-Amplifier	HP	8449
DMM	Fluke	73III
Variac	KRM	AEEC-2090
Chamber	Tenney	TTRS
DMM	Fluke	51II

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
PC Laptop Custom Test Fixture	None

EUT Description	:	Hand Held Reader (HHR)
Model No	:	Hand Held Reader (HHR)

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

Test	Description Of Operation
	The EUT was controlled and monitored via custom programming box.

APPENDIX B: External Photos

See Attachment

APPENDIX C: CIRCUIT/BLOCK DIAGRAMS

See Attachment

APPENDIX D: Internal Photos

See Attachment

APPENDIX F: PRODUCT DESCRIPTION

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

APPENDIX H: FCC LABEL LOCATION

See Attachment

APPENDIX I: USER MANUAL

See Attachment