

TEST REPORT
FROM
SIEMIC

For
MP9320 2.8 UHF 4-Port RFID Reader
To
FCC Part 15.247, 15.207, 15.209, IC RSS-210

Test Report Serial No.:
SL05042907T-SCI-006

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 Engineer



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

Issue date: 24 June 2005

Equipment Details:

Manufacturer: SAMSys



Registration No. 783147



Registration No. 4842



Registration No. 2195

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Title: **SAMSys**
MP9320 2.8 UHF 4-Port RFID Reader
To: **FCC Part 15.247, 15.207, 15.209, IC RSS-210**

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MP9320 2.8 UHF 4-Port RFID Reader
To: **FCC Part 15.247, 15.207, 15.209, IC RSS-210**

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the SAMSys, MP9320 2.8 UHF 4-Port RFID Reader against the current FCC Part 15.247, 15.207, 15.209, IC RSS-210. The MP9320 2.8 UHF 4-Port RFID Reader demonstrated compliance with the FCC Part 15.247, 15.207, 15.209, IC RSS-210.

SAMSys is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the MP9320 2.8 UHF 4-Port RFID Reader User Manual.

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

Professional installation is required for this equipment.



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MP9320 2.8 UHF 4-Port RFID Reader
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1 Technical Details

Purpose	Compliance testing of MP9320 2.8 UHF 4-Port RFID Reader with FCC Part 15.247, 15.207, 15.209, IC RSS-210
Applicant / Client	SAMSys 2525 Meridian Parkway, Ste. 60 Durham, North Carolina 27713
Manufacturer	SAMSys
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	SL05042907T-SCI-006
Date EUT received	4 May 2005
Standard applied	FCC Part 15.247, 15.207, 15.209, IC RSS-210
No of Units:	1
Equipment Category:	DSS
Trade/Product Name:	MP9320 2.8 UHF 4-Port RFID Reader
Type/Model Name/No:	MP9320 2.8 UHF 4-Port RFID Reader
Technical Variants:	None
FCC ID No.	QRKH1469320



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	Pass
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.



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3 Measurements, Examinations and Derived Results

3.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:



3.2 Test Results

3.2.1 Power Line Conducted Emissions

Requirement(s): 47 CFR §15.207

Procedures: Conducted Emissions measurements were made with a spectrum analyzer and LISN.

Results:

Line Under Test	Result
Phase	Pass
Neutral	Pass

Line Under Test	FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
Phase	0.196	41.5	63.78	-22.28	33.1	53.78	-20.68
Phase	0.263	32.9	61.34	-28.44	31.2	51.34	-20.14
Phase	5.288	41.1	60	-18.9	43.3	50	-6.7
Phase	5.6	37.5	60	-22.5	42.3	50	-7.7
Phase	12.65	37.5	60	-22.5	38.5	50	-11.5
Phase	1.515	35.5	56	-20.5	36.4	46	-9.6

Line Under Test	FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
Neutral	0.185	41.7	64.26	-22.56	33	54.26	-21.26
Neutral	5.29	41.5	60	-18.5	43.5	50	-6.5
Neutral	5.7	39.1	60	-20.9	41.4	50	-8.6
Neutral	0.25	32.8	61.76	-28.96	30.5	51.76	-21.26
Neutral	12.1	39.4	60	-20.6	40.3	50	-9.7
Neutral	0.591	38.5	56	-17.5	40.1	46	-5.9

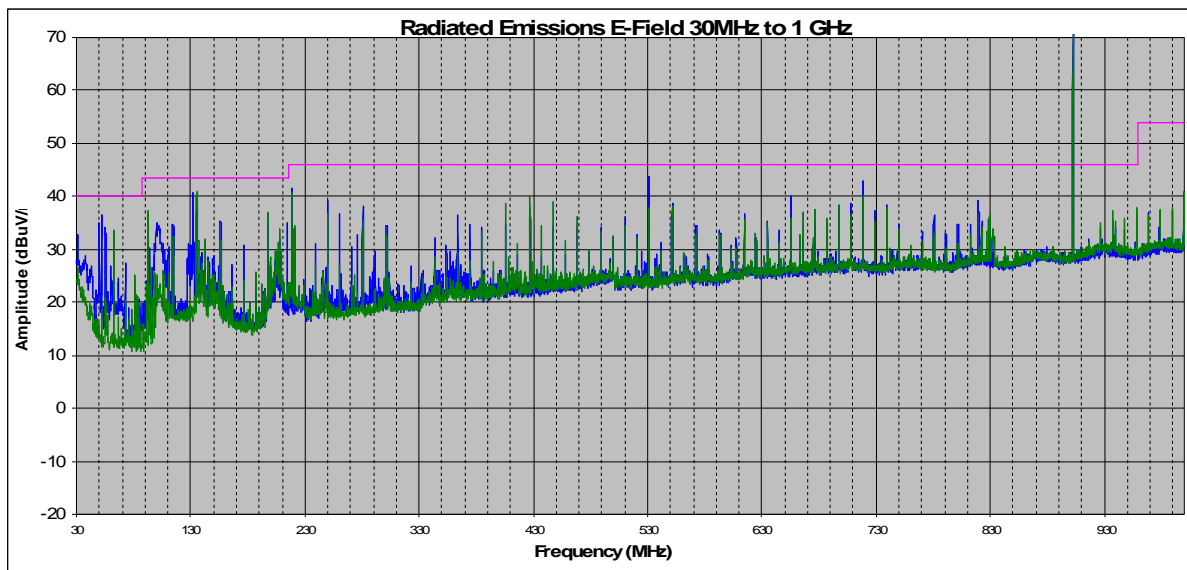


3.2.2 Radiated Spurious Emissions < 1 GHz

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)
218.86	280	qp	h	1.47	29.20	11.366	1.0943	41.66	46.00	-4.34
135.44	90	qp	h	2.12	25.20	13.965	0.9354	40.10	43.50	-3.40
133.48	115	qp	v	1.84	7.00	14.791	0.9335	22.72	43.50	-20.78
92.27	225	qp	h	1.99	16.70	8.4546	0.8779	26.03	43.50	-17.47
197.52	110	qp	h	1.46	23.80	12.854	0.9975	37.65	43.50	-5.85
718.00	70	qp	h	1.53	18.60	22.3	2.4062	43.31	46.00	-2.69



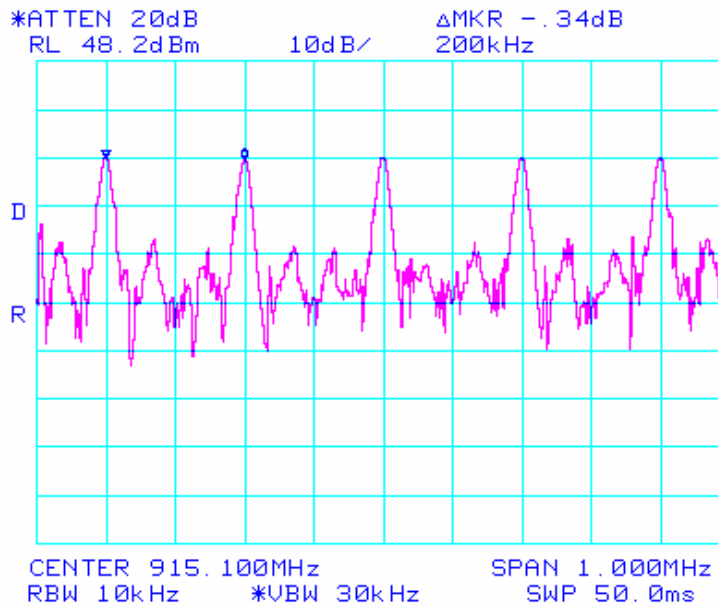
3.2.3 Carrier Frequency Separation

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	0.200



Plot 1: Carrier Frequency Separation



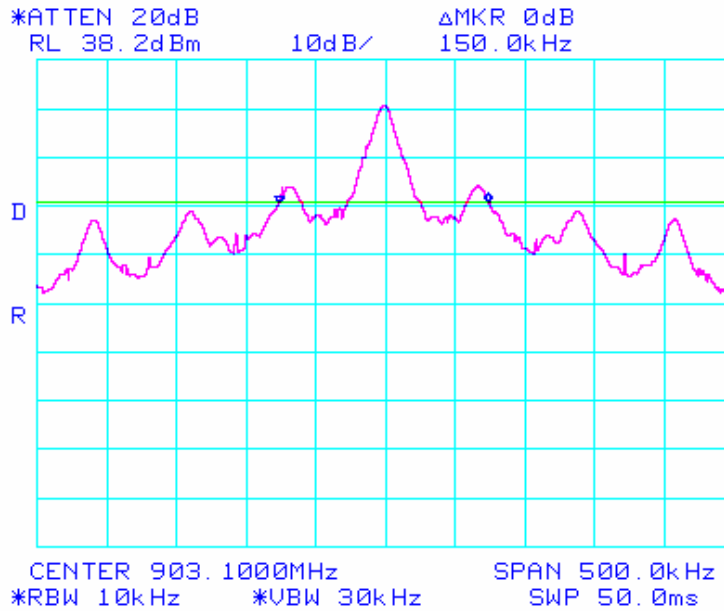
3.2.4 20dB Bandwidth

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	0.150
3	Mid	0.150
4	Hi	0.150



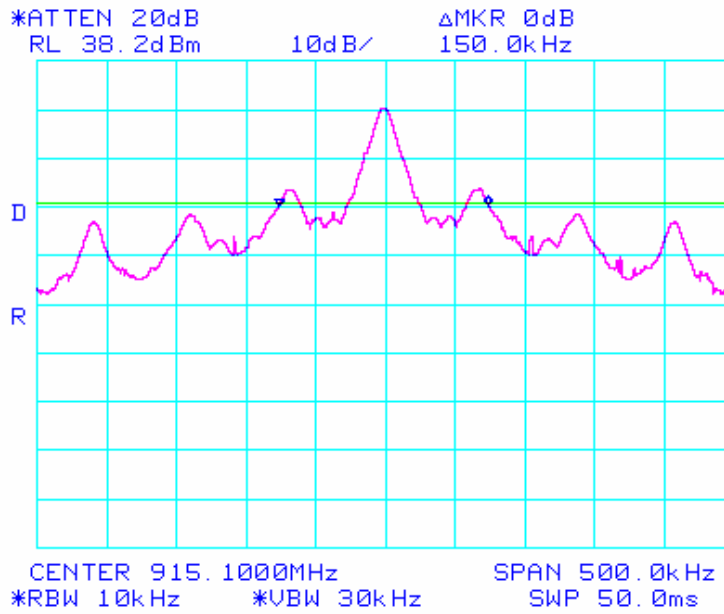
Plot 1: 20dB Bandwidth Low



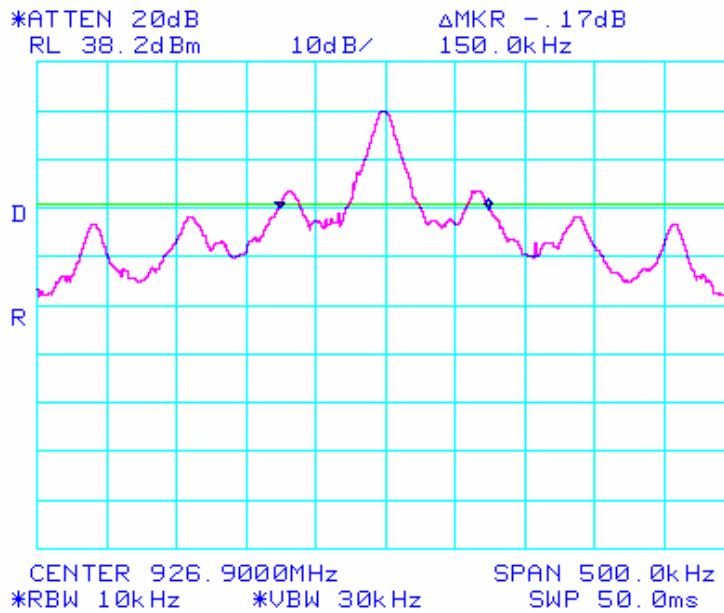
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Plot 2: 20dB Bandwidth Mid



Plot 3: 20dB Bandwidth Hi



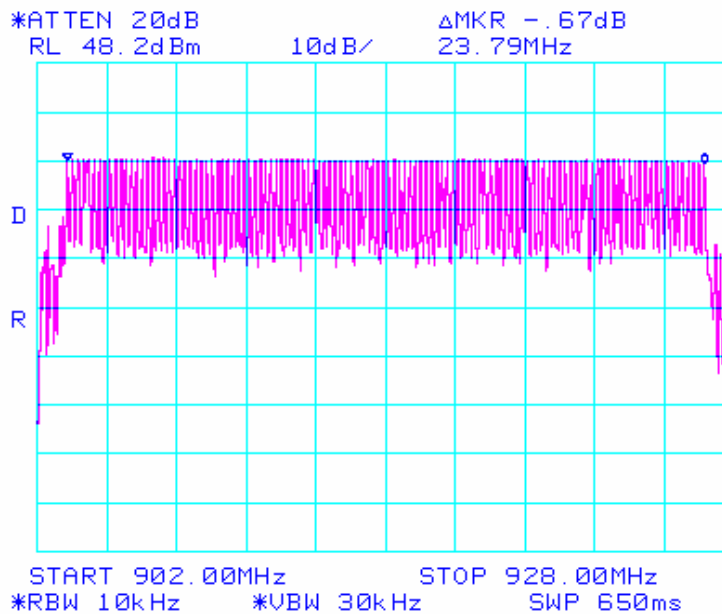
3.2.5 Number of Hopping Frequencies

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	200



Plot 4: Number of Hopping Channels



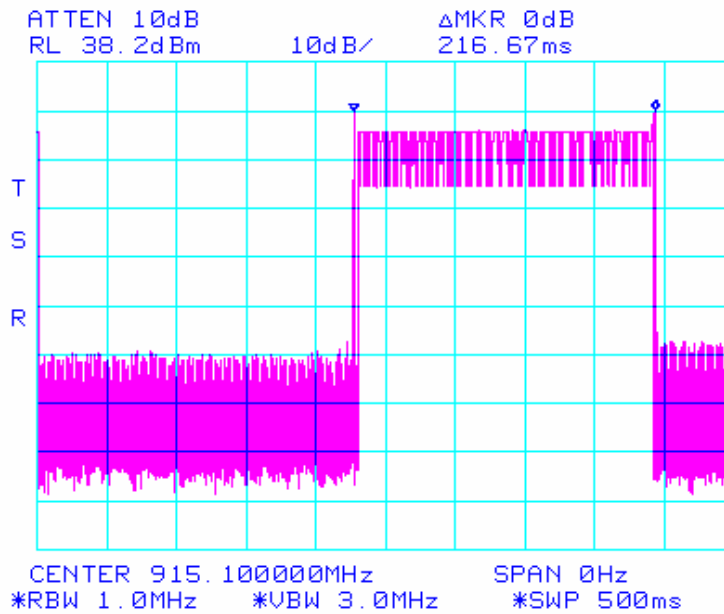
3.2.6 Time of Occupancy

Requirement(s): 47 CFR §15.247(a)(1)

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

Results:

Plot #	Time of Occupancy (ms)
5	216.67



Plot 5: Time of occupancy



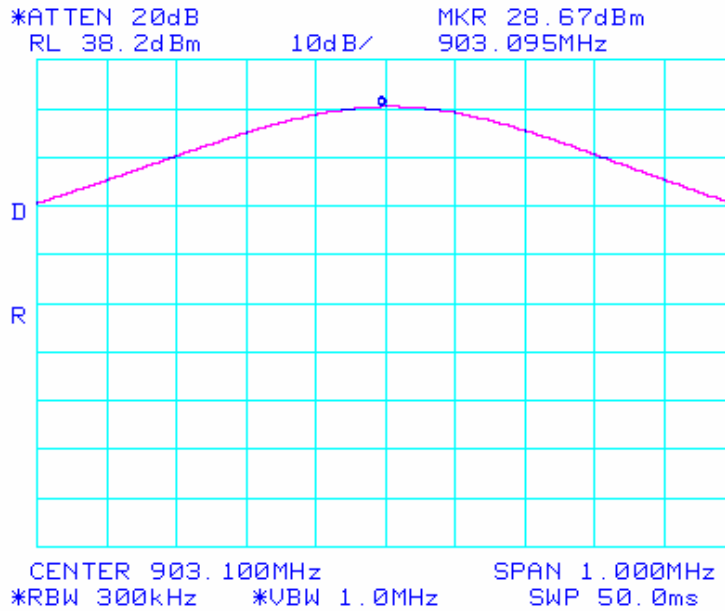
3.2.7 Peak Output Power

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)
9	Low	28.7
10	Mid	28.3
11	Hi	28.0



Plot 9: Peak Power Low



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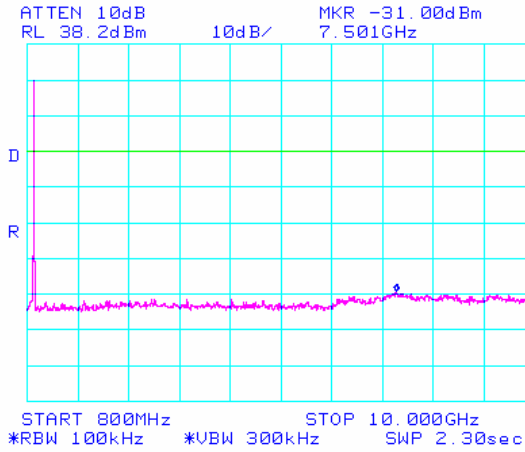
3.2.8 Conducted Spurious Emissions

Requirement(s): 47 CFR §15.247(c)

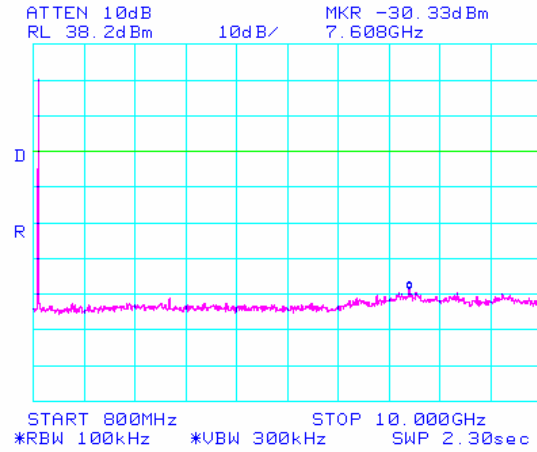
Procedures: The conducted spurious emissions were measured conducted using a spectrum analyzer for the low, mid, and hi channels.

Results:

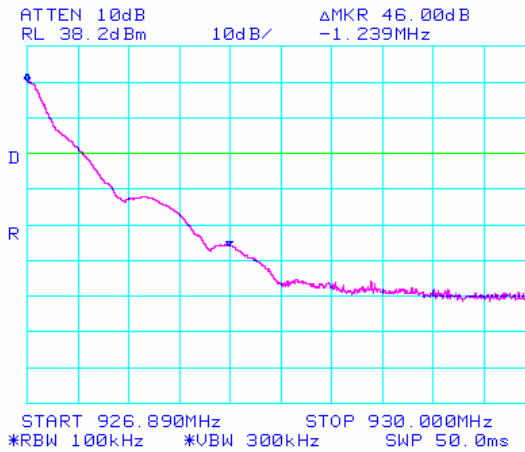
Plots #	Channel	Pass/Fail
11 to 14	Hi	Pass
15 to 16	Mid	Pass
17 to 20	Low	Pass



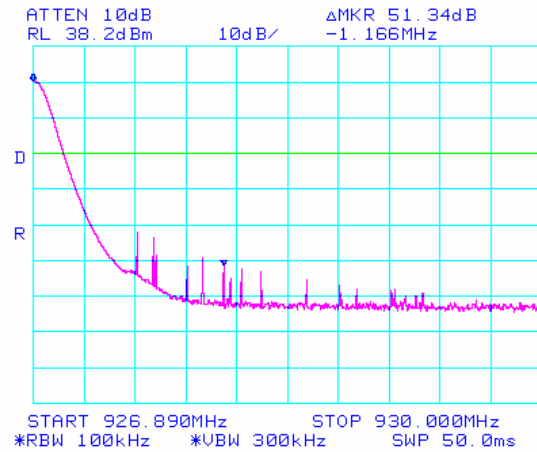
**Plot 11: Conducted Spurious Emissions
Hi (Modulated)**



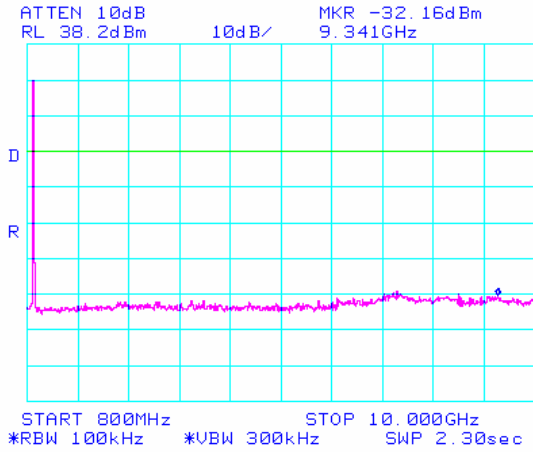
**Plot 12: Conducted Spurious Emissions
Hi (Not Modulated)**



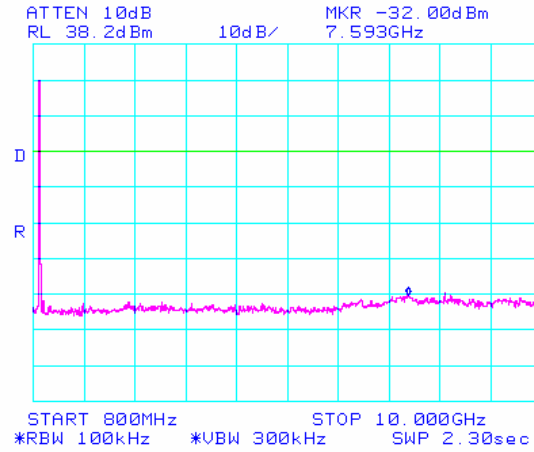
**Plot 13: Conducted Spurious Emissions
Hi (Modulated)**



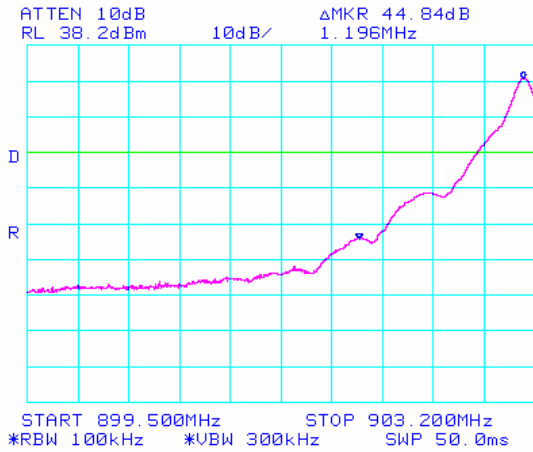
**Plot 14: Conducted Spurious Emissions
Hi (Not Modulated)**



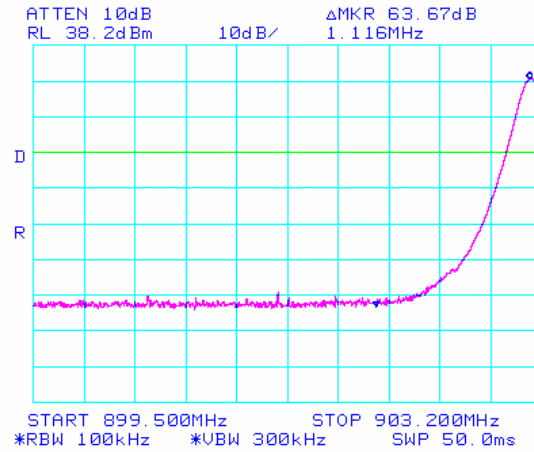
Plot 17: Conducted Spurious Emissions Low (Modulated)



Plot 18: Conducted Spurious Emissions Low (Not Modulated)



Plot 19: Conducted Spurious Emissions Low (Modulated)



Plot 20: Conducted Spurious Emissions Low (Not Modulated)



3.2.9 Radiated Spurious Emissions > 1 GHz (Restricted Bands)

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	1.87	pk	180	V	noise floor			
hi	1.87	pk	180	H	noise floor			
hi	2.78	avg	180	H	1	50	54	-4
hi	2.78	avg	180	V	1	48.8	54	-5.2
hi	2.78	pk	180	H	1	53.8	74	-20.2
hi	2.78	pk	180	V	1	54.7	74	-19.3
hi	1.87	pk	180	V	noise floor			
hi	1.87	pk	180	H	noise floor			
lo	1.8	pk	180	V	1	38.23	54	-15.77
lo	1.8	pk	180	H	1	36.7	54	-17.3
lo	2.7	avg	180	H	1	47.4	54	-6.6
lo	2.7	avg	180	V	1	53	54	-1
lo	2.7	pk	180	H	1	51.3	74	-22.7
lo	2.7	pk	180	V	1	55.3	74	-18.7
lo	1.8	pk	180	V	1	38.23	54	-15.77
lo	1.8	pk	180	H	1	36.7	54	-17.3
mid	1.83	pk	180	V	1	39.9	54	-14.1
mid	1.83	pk	180	H	noise floor			
mid	2.74	avg	180	H	1	43.5	54	-10.5
mid	2.74	avg	180	V	1	49	54	-5
mid	2.74	pk	180	H	1	48.5	74	-25.5
mid	2.74	pk	180	V	1	53.8	74	-20.2
mid	1.83	pk	180	V	1	39.9	54	-14.1
mid	1.83	pk	180	H	noise floor			

Sample Calculation:

$$\text{EUT Field Strength} = \text{Antenna Factor(dB)} + \text{Cable Loss(dB)} - \text{Amplifier Gain(dB)} + \text{Filter Attenuation(dB, if used)}$$



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	1. Power cord 2. Ethernet

EUT Description	: MP9320 2.8 UHF 4-Port RFID Reader
Model No	: MP9320 2.8 UHF 4-Port RFID Reader

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

Test	Description Of Operation
	The EUT was controlled and monitored via serial port interface by a PC running a radio test program.



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APPENDIX B: External Photos

See Attachment



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APPENDIX C: CIRCUIT/BLOCK DIAGRAMS

See Attachment



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APPENDIX D: Internal Photos

See Attachment



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APPENDIX F: PRODUCT DESCRIPTION

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



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APPENDIX H: FCC LABEL LOCATION

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APPENDIX I: USER MANUAL

See Attachment