

TEST REPORT  
FROM  
**SIEMIC**

For

SafeTLink Ethernet + FT1

To

47 CFR 90 Subpart Y

Test Report Serial No.:  
SL05091301-LPN-001

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: Kerwin Corpuz, Test Engineer

*Kerwin Corpuz*

.....  
.....  
.....  
.....  
.....

Reviewed by: Alvin Ilarina, Lab Manager

*Alvin Ilarina*

Issue date: 3 November 2005

**Equipment Details:**

Manufacturer: LPN Wireless, Inc.



Registration No. 783147



Industry Canada  
Industrie Canada

Registration No. 4842



Lab Code: KR0032



RTA No. D23/16V



Registration No. 2195

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## **Executive Summary**

The purpose of this test programme was to demonstrate compliance of the LPN Wireless, Inc., SafeTLink Ethernet + FT1 against the current 47 CFR 90 Subpart Y. The SafeTLink Ethernet + FT1 demonstrated compliance with the 47 CFR 90 Subpart Y.

LPN Wireless, Inc. is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the SafeTLink Ethernet + FT1 User Manual.

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



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## **1 Technical Details**

Purpose	Compliance testing of SafeTLink Ethernet + FT1 with 47 CFR 90 Subpart Y
Applicant / Client	LPN Wireless, Inc. 1301 Rand Street, Suite C Petaluma, CA 94954
Manufacturer	LPN Wireless, 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	SL05091301-LPN-001
Date EUT received	25 October 2005
Standard applied	47 CFR 90 Subpart Y
Dates of test (from – to)	25 October 2005 to 27 October 2005
No of Units:	1
Equipment Category:	TNB
Trade/Product Name:	SafeTLink Ethernet + FT1
Type/Model Name/No:	SafeTLink Ethernet + FT1
Technical Variants:	none
FCC ID No.	RXV-STL-ETH



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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).

<b>Test Standard</b>	<b>Description</b>	<b>Pass / Fail</b>
47 CFR Part 90, Subpart Y		
2.1046; 90.1215(a)	Peak Output Power	Pass
2.1046; 90.1215(a)	Peak Power Spectral Density	Pass
2.1049; 90.210(m)	Occupied Bandwidth; Emissions Mask	Pass
2.1051; 90.210(m)	Spurious Emissions at Antenna Terminals	Pass
2.1053; 90.210(m)	Radiated Spurious Emissions	Pass
2.1055(a)(1); 90.213	Frequency Stability; Temperature Variations	Pass
2.1055(d)(1); 90.213	Frequency Stability; Voltage Variations	Pass
TIA/EIA-603-A-2001		
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.*



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### **3 Measurements, Examinations and Derived Results**

#### **3.1 General observations**

Equipment serial number(s)		
Module:	Part number:	Serial number:
SafeTLink Ethernet + FT1	SafeTLink Ethernet + FT1	none



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### **3.2 Test Results**

#### **3.2.1 Peak Output Power**

**Requirement(s):** 47 CFR §2.1046 and §90.1215(a)

**Procedures:** The peak output power was measured using a peak power meter with a sensor capable of measuring the entire bandwidth of the signal.. The average power measurements were taken using a power meter with a sensor capable of measuring the entire bandwidth of the signal. The measurements were made for the 1MHz, 2MHz, and 5MHz bandwidths at the center frequency of the channel.

**Results:**

Frequency (MHz)	Channel Bandwidth (MHz)	Peak Power (dBm)	Peak Limit (dBm)	Average Power(dBm)
4942.5	5	23.3	27	18.3
4942.5	2	21.5	27	15.4
4942.5	1	19.5	20	13.3
4987.5	5	23.2	27	18.1
4987.5	2	21.3	27	15.1
4987.5	1	19.3	20	12.9

**Tested By:** Kerwinn Corpuz

**Date Tested:** 25 October 2005



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### 3.2.2 Peak Power Spectral Density

**Requirement(s):** 47 CFR §2.1046 and §90.1215(a)

**Procedures:** The peak power spectral density measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 1MHz, 2MHz, and 5MHz bandwidths at the center frequency of the channel.

#### Results:

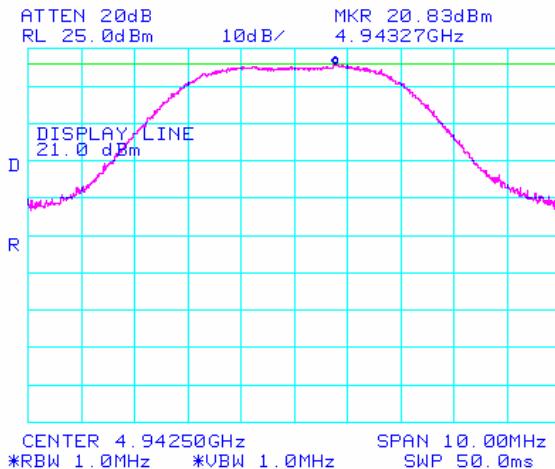
Plot #	Frequency (MHz)	Channel Bandwidth (MHz)	PPSD (dBm)	Limit (dBm)
1	4942.5	5	20.83	21
2	4942.5	2	20.33	21
3	4942.5	1	19.7	21
4	4987.5	5	20.83	21
5	4987.5	2	20.33	21
6	4987.5	1	19.7	21



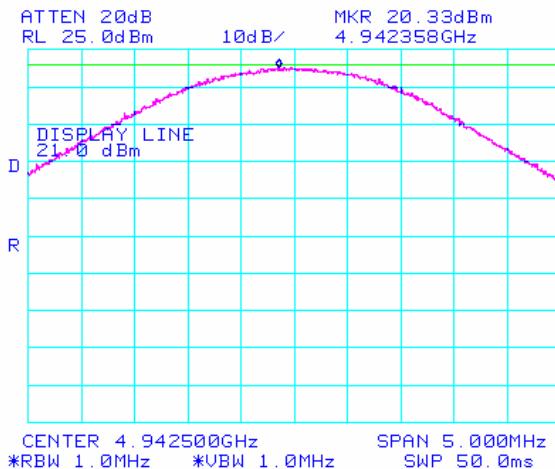
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**Plot 1: Peak Power Spectral Density 4942.5MHz 5MHz Bandwidth**



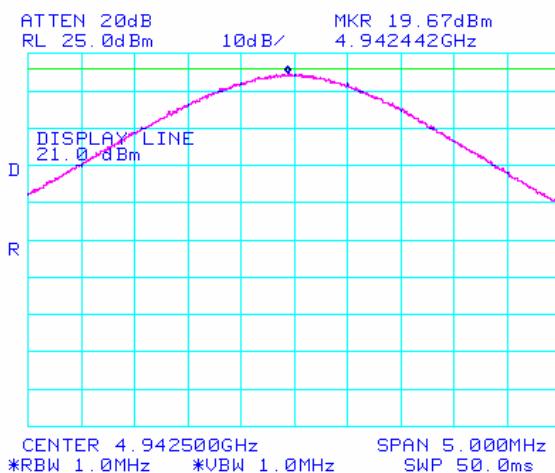
**Plot 2: Peak Power Spectral Density 4942.5MHz 2MHz Bandwidth**



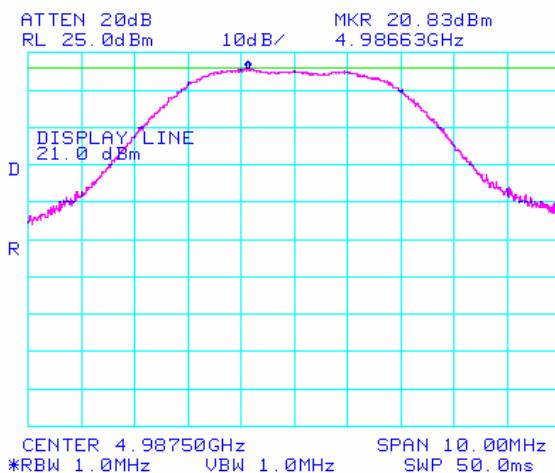
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**Plot 3: Peak Power Spectral Density 4942.5MHz 1MHz Bandwidth**



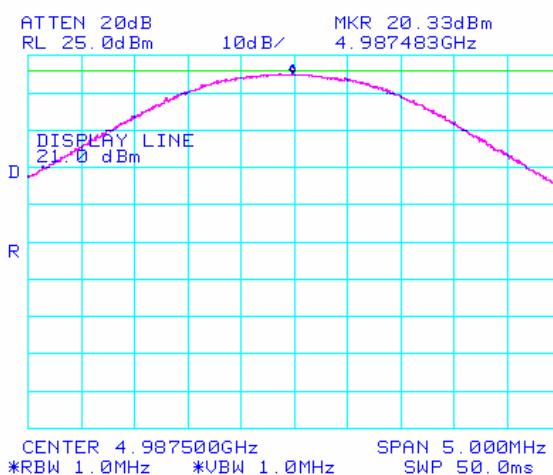
**Plot 4: Peak Power Spectral Density 4987.5MHz 5MHz Bandwidth**



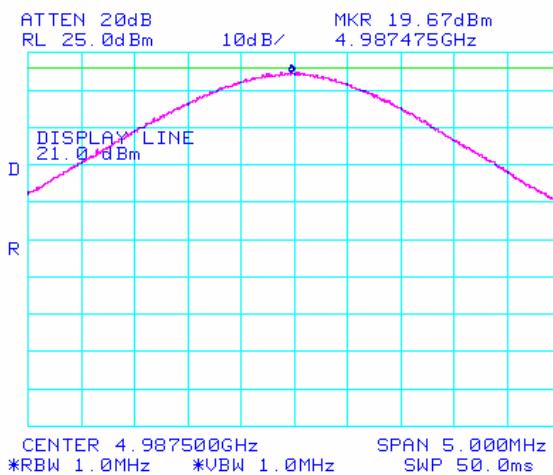
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**Plot 5: Peak Power Spectral Density 4987.5MHz 2MHz Bandwidth**



**Plot 6: Peak Power Spectral Density 4987.5MHz 1MHz Bandwidth**

**Tested By:** Kerwinn Corpuz

**Date Tested:** 25 October 2005



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### 3.2.3 Occupied Bandwidth; Emission Mask

**Requirement(s):** 47 CFR §2.1049 and §90.210(m)

**Procedures:** The Emission Masks were measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 1MHz, 2MHz, and 5MHz bandwidths at the center frequency of the channel.

**Results:**

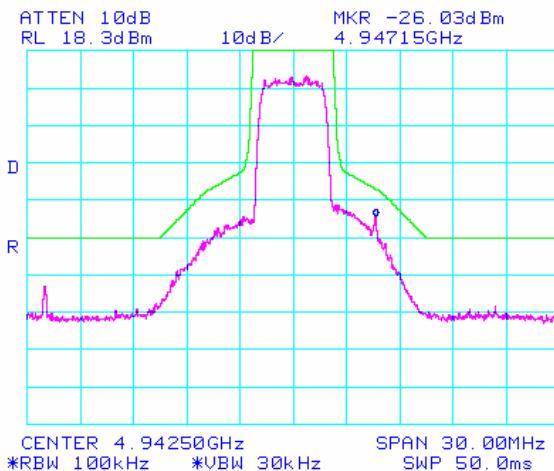
Plot #	Frequency (MHz)	Channel Bandwidth (MHz)	Pass/Fail
7	4942.5	5	Pass
8	4942.5	2	Pass
9	4942.5	1	Pass
10	4987.5	5	Pass
11	4987.5	2	Pass
12	4987.5	1	Pass



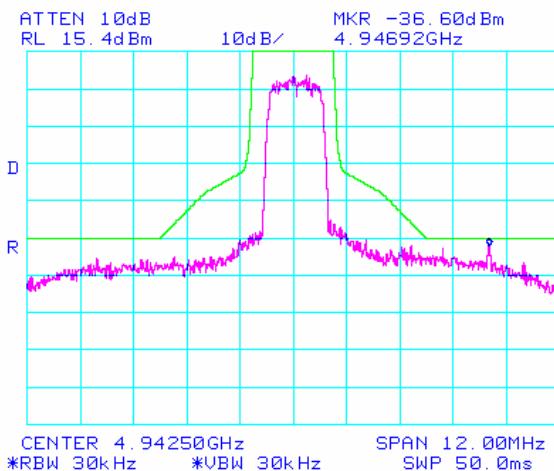
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**Plot 7: Emission Mask M – 4942.5MHz 5MHz Bandwidth**



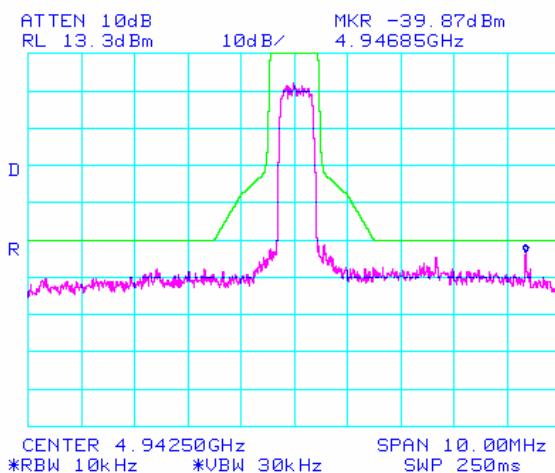
**Plot 8: Emission Mask M – 4942.5MHz 2MHz Bandwidth**



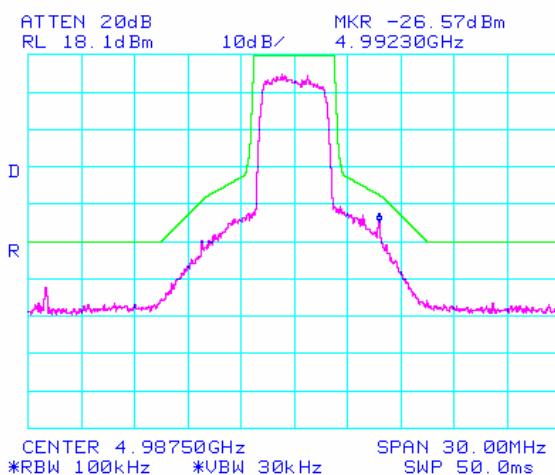
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**Plot 9: Emission Mask M – 4942.5MHz 1MHz Bandwidth**



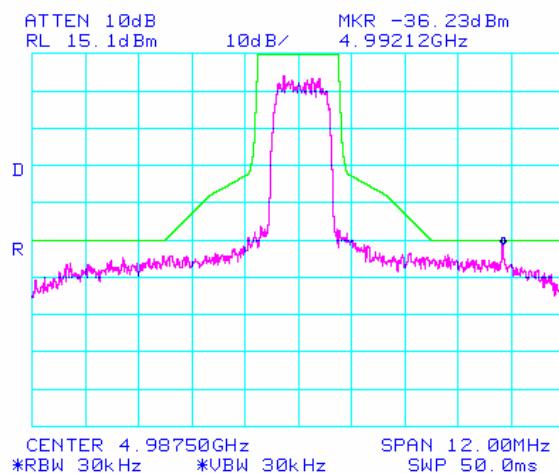
**Plot 10: Emission Mask M – 4987.5MHz 5MHz Bandwidth**



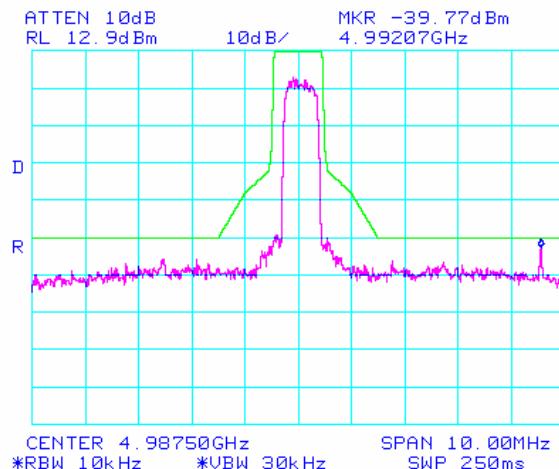
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**Plot 11: Emission Mask M – 4987.5MHz 2MHz Bandwidth**



**Plot 12: Emission Mask M – 4987.5MHz 1MHz Bandwidth**

**Tested By:** Kerwinn Corpuz

**Date Tested:** 26 October 2005



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### 3.2.4 Spurious Emissions at Antenna Terminals

**Requirement(s):** 47 CFR §2.1051 and §90.210(m)

**Procedures:** The spurious emissions at the antenna terminal as measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 1MHz, 2MHz, and 5MHz bandwidths at the center frequency of the channel.

The spurious limit was determined by:

Measured Average Output Power of EUT – 50 dBm/MHz

#### Results:

Plots #	Frequency (MHz)	Channel Bandwidth (MHz)	Pass/Fail
13 to 14	4942.5	5	Pass*
15 to 16	4942.5	2	Pass*
17 to 19	4942.5	1	Pass*
20 to 21	4987.5	5	Pass*
22 to 23	4987.5	2	Pass*
24 to 26	4987.5	1	Pass*

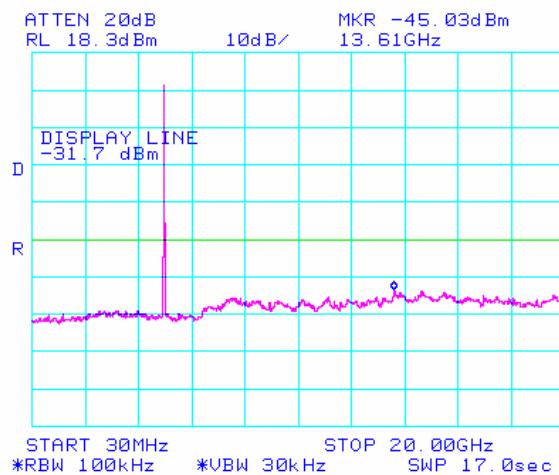
\* Note: Emission above the limit is the fundamental.



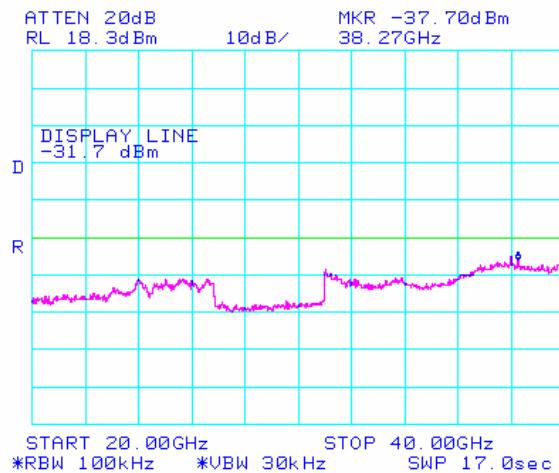
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**Plot 13: Conducted Spurious Emissions – 4942.5MHz 5MHz Bandwidth**



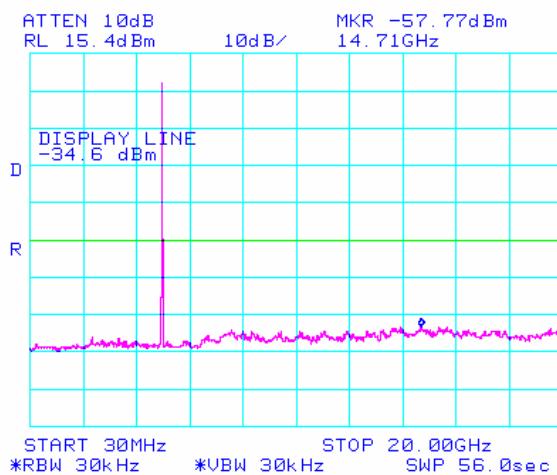
**Plot 14: Conducted Spurious Emissions – 4942.5MHz 5MHz Bandwidth**



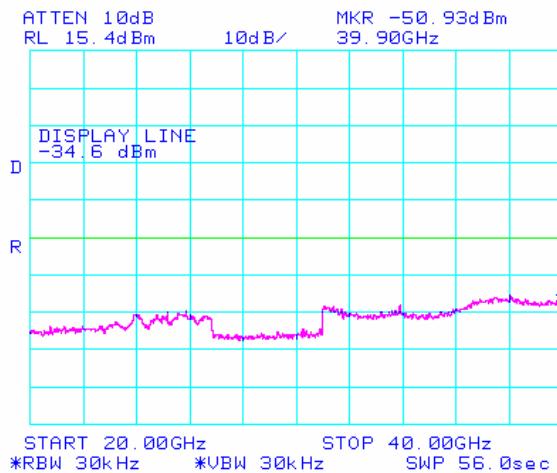
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**Plot 15: Conducted Spurious Emissions – 4942.5MHz 2MHz Bandwidth**



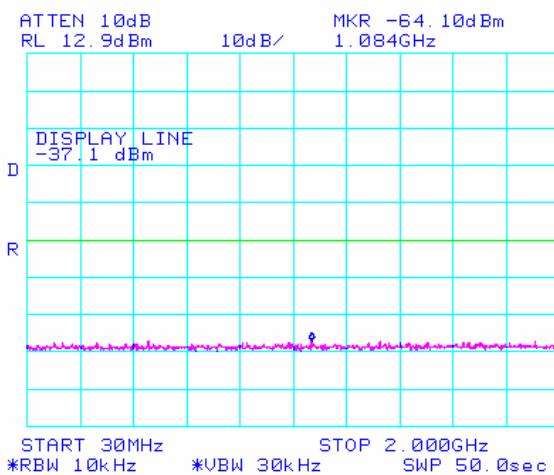
**Plot 16: Conducted Spurious Emissions – 4942.5MHz 2MHz Bandwidth**



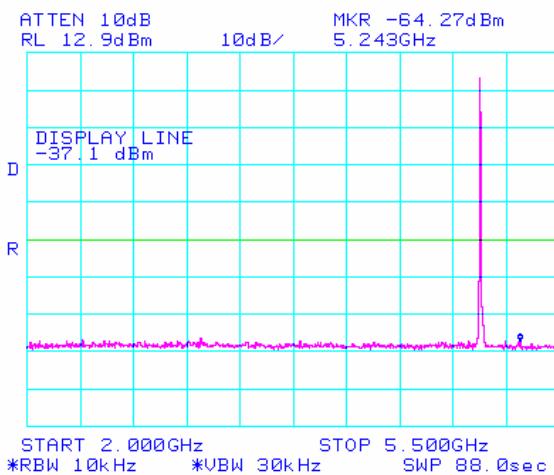
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**Plot 17: Conducted Spurious Emissions – 4942.5MHz 1MHz Bandwidth**



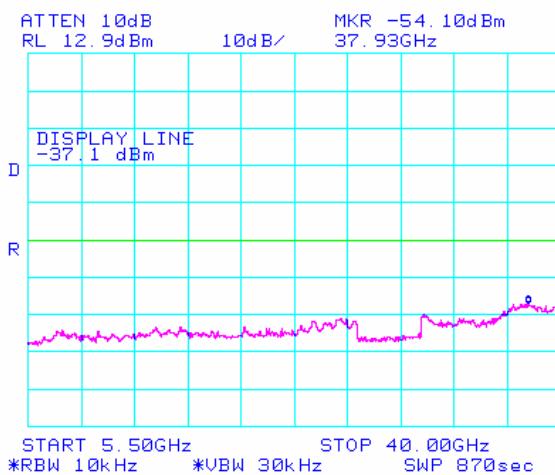
**Plot 18: Conducted Spurious Emissions – 4942.5MHz 1MHz Bandwidth**



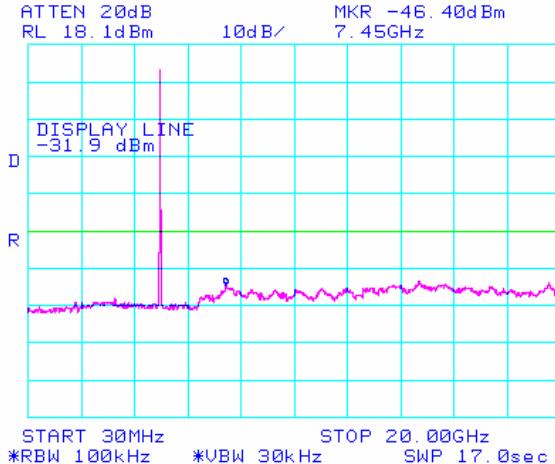
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**Plot 19: Conducted Spurious Emissions – 4942.5MHz 1MHz Bandwidth**



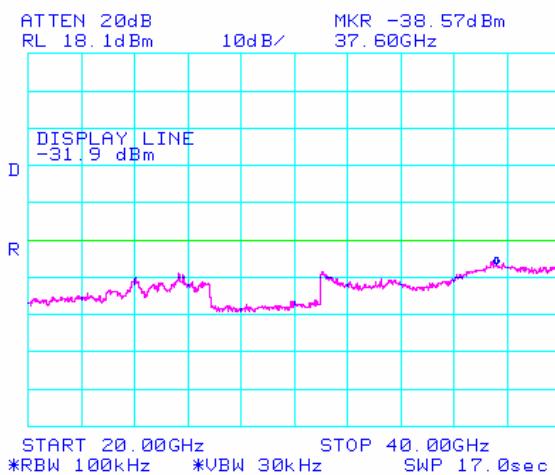
**Plot 20: Conducted Spurious Emissions – 4987.5MHz 5MHz Bandwidth**



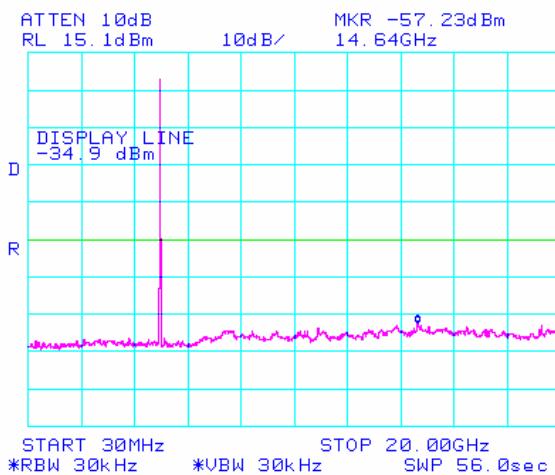
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**Plot 21: Conducted Spurious Emissions – 4987.5MHz 5MHz Bandwidth**



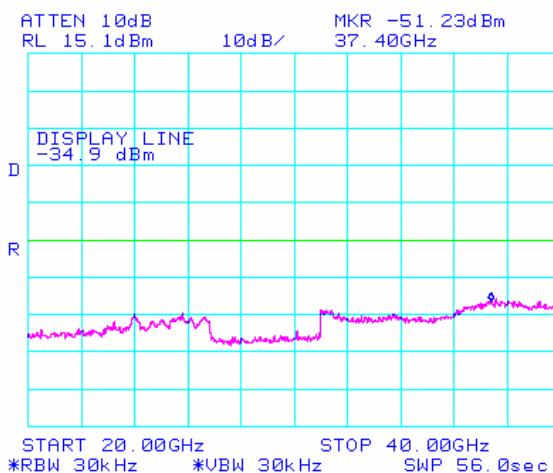
**Plot 22: Conducted Spurious Emissions – 4987.5MHz 2MHz Bandwidth**



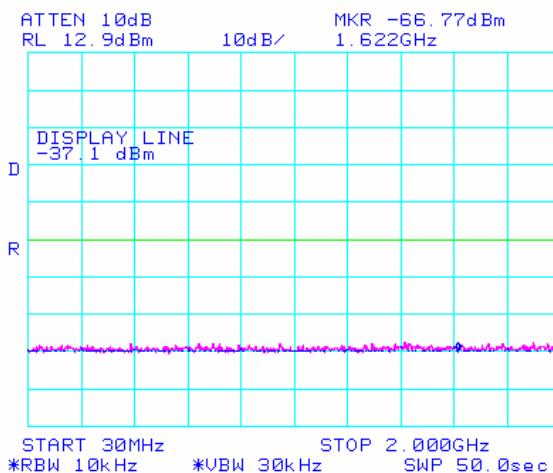
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**Plot 23: Conducted Spurious Emissions – 4987.5MHz 2MHz Bandwidth**



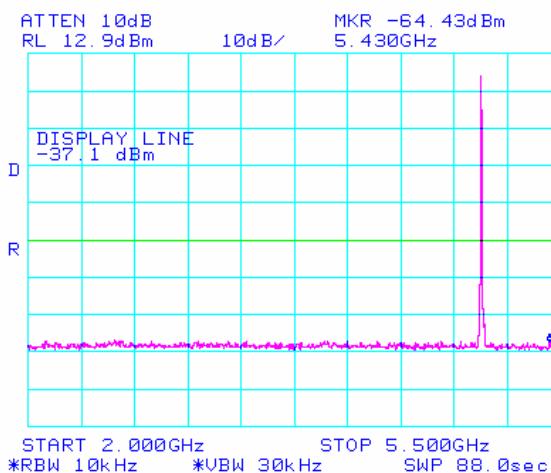
**Plot 24: Conducted Spurious Emissions – 4987.5MHz 1MHz Bandwidth**



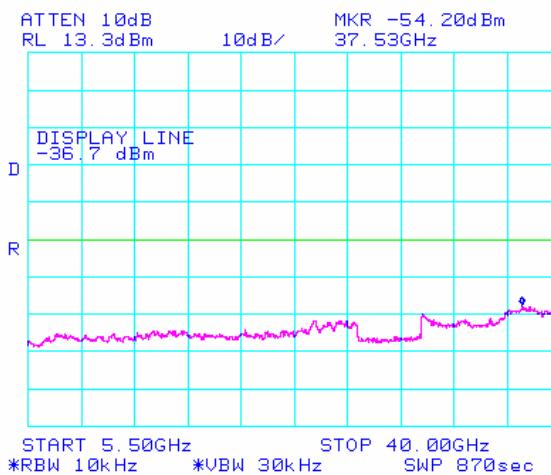
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**Plot 25: Conducted Spurious Emissions – 4987.5MHz 1MHz Bandwidth**



**Plot 26: Conducted Spurious Emissions – 4987.5MHz 1MHz Bandwidth**

**Tested By:** Kerwinn Corpuz

**Date Tested:** 26 October 2005



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### 3.2.5 Radiated Spurious Emissions

**Requirement(s):** 47 CFR §2.1053 and §90.210(m)

**Procedures:** The radiated spurious emissions were measured using signal substitution. Any spurious emission amplitude was recorded. The emission amplitude was then reproduced with another antenna and signal generator. The output power at the substitution antenna was then measured with a power meter. This reading was then added with the antenna gain to determine the EIRP of the spurious emission. The measurements were made for the 1MHz, 2MHz, and 5MHz bandwidths at the center frequency of the channel.

The spurious limit was determined by:

Measured Average Output Power of EUT – 50 dBm/MHz

#### Results:

Transmit at 4942.5											
EBW	Frequency	Polarization	Azimuth	Power Meter	Antenna Gain	EIRP	Limit	Margin			
(MHz)	(MHz)	V/H	(degrees)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)			
5	9885	V/H	Noise Floor								
5	14827.5	V/H	Noise Floor								
5	24712.5	V/H	Noise Floor								
2	9885	V/H	Noise Floor								
2	14827.5	V/H	Noise Floor								
2	24712.5	V/H	Noise Floor								
1	9885	V/H	Noise Floor								
1	14827.5	V/H	Noise Floor								
1	24712.5	V/H	Noise Floor								

**Notes:**

NF = Noise Floor  
EIRP = Power Meter reading + Antenna Gain  
Margin = EIRP – Limit



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Transmit at 4987.5													
EBW	Frequency	Polarization	Azimuth	Power Meter	Antenna Gain	EIRP	Limit	Margin					
(MHz)	(MHz)	V/H	(degrees)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)					
5	9975	V/H	Noise Floor										
5	14962.5	V/H	Noise Floor										
5	19950	V/H	Noise Floor										
2	9975	V/H	Noise Floor										
2	14962.5	V/H	Noise Floor										
2	19950	V/H	Noise Floor										
1	9975	V/H	Noise Floor										
1	14962.5	V/H	Noise Floor										
1	19950	V/H	Noise Floor										
<b>Notes:</b>													
NF = Noise Floor													
EIRP = Power Meter reading + Antenna Gain													
Margin = EIRP – Limit													

Tested By: Alvin Ilarina

Date Tested: 26 October 2005



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### 3.2.6 Frequency Stability; Temperature Variations

**Requirement(s):** 47 CFR §2.1055(a)(1) and §90.213

**Procedure:** The frequency stability was measured at the antenna terminal using a spectrum analyzer. The measurements were made at the 5MHz bandwidths using the frequency counter function of the spectrum analyzer. The temperature was varied from -30°C to +50°C at 10°C increments with suitable time allowed for temperature stability between measurements.

**Results:**

Temperature (°C)	Frequency (GHz)	ppm
+50	4942.508108	0.29
+40	4942.507601	0.18
+30	4942.507145	0.09
+20	4942.506667	0
+10	4942.505192	0.30
0	4942.504185	0.5
-10	4942.503577	0.62
-20	4942.501248	1.09
-30	4942.500035	1.34

**Tested By:** Kerwinn Corpuz

**Date Tested:** 27 October 2005



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### 3.2.7 Frequency Stability: Voltage Variations

**Requirement(s):** 47 CFR §2.1055(d)(1) and §90.213

**Procedures:** The frequency stability was measured at the antenna terminal using a spectrum analyzer. The measurements were made at the 5MHz bandwidth using the frequency counter function of the spectrum analyzer. The voltage was varied from +/- 15% of the nominal.

#### Results:

Voltage (VDC)	Frequency (GHz)	ppm
55.2	4942.506667	0
48	4942.506667	0
40.8	4942.506679	0.002

**Tested By:** Kerwinn Corpuz

**Date Tested:** 27 October 2005



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## 4 TEST INSTRUMENTATION

## 4.1 TEST INSTRUMENTATION



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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
PC Laptop	1. Power cord 2. Ethernet

<b>EUT Description</b> : SafeTLink Ethernet + F1
<b>Model No</b> : SafeTLink Ethernet + F1
<b>Serial No</b> : none

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

Test	Description Of Operation
	The EUT was controlled and monitored via Ethernet by a PC running a radio test program. The data rate was set at maximum at each bandwidth to simulate worse case conditions during the equipment operation.



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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**

See Attachment



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## **APPENDIX I: USER MANUAL**

See Attachment