

Test of Proxim Tsunami MP.11 Model 954-R

To: FCC 47 CFR Part15.247 & IC RSS-210

Test Report Serial No.: PROX10-A2 Rev A



TEST REPORT

FROM



Test of Proxim Tsunami MP.11 Model 954-R

to

To FCC 47 CFR Part15.247 & IC RSS-210

Test Report Serial No.: PROX10-A2 Rev A

This report supersedes: None

Manufacturer: Proxim Wireless
2115 O'Nel Drive
San Jose
CA 95131 USA

Product Function: 802.11 a/b/g Wireless Access Point

Copy No: pdf **Issue Date:** 28th August 2007

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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CERTIFICATE #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 3 of 127

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TABLE OF CONTENTS

ACCREDITATION & LISTINGS.....	5
1. TEST RESULT CERTIFICATE	8
2. REFERENCES AND MEASUREMENT UNCERTAINTY	9
2.1. Normative References	9
2.2. Test and Uncertainty Procedures	9
3. PRODUCT DETAILS AND TEST CONFIGURATIONS	10
3.1. Technical Details	10
3.2. Scope of Test Program.....	11
3.3. Equipment Model(s) and Serial Number(s)	12
3.4. Antenna Details	12
3.5. Cabling and I/O Ports	12
3.6. Test Configurations.....	13
3.7. Equipment Modifications.....	14
3.8. Deviations from the Test Standard	14
3.9. Subcontracted Testing or Third Party Data	14
4. TEST SUMMARY	15
5. TEST RESULTS	17
5.1. Device Characteristics	17
5.1.1. <i>6 dB and 99 % Bandwidth</i>	17
5.1.2. <i>Peak Output Power</i>	23
5.1.3. <i>Peak Power Spectral Density</i>	26
5.1.4. <i>Maximum Permissible Exposure</i>	30
5.1.5. <i>Conducted Spurious Emissions</i>	31
5.1.6. <i>Radiated Emissions</i>	57
5.1.7. <i>AC Wireline Conducted Emissions (150 kHz – 30 MHz)</i>	123
6. PHOTOGRAPHS.....	124
6.1. Spurious Emissions >1 GHz.....	124
6.2. General Measurement Test Set-Up.....	125
7. TEST EQUIPMENT DETAILS.....	126

This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 5 of 127

ACCREDITATION & LISTINGS

MiCOM Labs, Inc. an accredited laboratory complies with the international standard BS EN ISO/IEC 17025. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; <http://www.a2la.org/scopepdf/2381-01.pdf>



THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

MICOM LABS
Pleasanton, CA

for technical competence in the field of

Electrical Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing.

Presented this 14th day of September 2005.



Peter Almy

President
For the Accreditation Council
Certificate Number 2381.01
Valid to: November 30, 2007

For tests or types of tests to which this accreditation applies,
please refer to the laboratory's Electrical Scope of Accreditation.

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 6 of 127

LISTINGS

MiCOM Labs test facilities are listed by the following organizations;

North America

United States of America

Federal Communications Commission (FCC) Listing #: 102167

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 7 of 127

DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	28th August 2007	First issue.

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 8 of 127

1. TEST RESULT CERTIFICATE

Manufacturer:	Proxim Wireless 2115 O'Nel Drive San Jose CA 95131 USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	Wireless Access Point	Telephone:	+1 925 462 0304
Model:	Tsunami MP.11 Model 954-R	Fax:	+1 925 462 0306
S/N:	05UT09560207		
Test Date(s):	14th to 25th June 2007	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part15.247 & IC RSS-210	EQUIPMENT COMPLIES

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.
2. Details of test methods used have been recorded and kept on file by the laboratory.
3. Test results apply only to the item(s) tested.

Approved & Released for MiCOM Labs, Inc. by:



CERTIFICATE #2381.01



 Graeme Grieve
 Quality Manager MiCOM Labs,



 Gordon Hurst
 President & CEO MiCOM Labs, Inc.

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2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 15.247	2007	Code of Federal Regulations
(ii)	Industry Canada RSS-210	Issue 7 June 2007	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands)
(iii)	Industry Canada RSS-Gen	Issue 2 June 2007	General Requirements and Information for the Certification of Radiocommunication Equipment.
(iv)	ANSI C63.4	2003	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
(v)	CISPR 22/ EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(vi)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(vii)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(viii)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(ix)	A2LA	14 th September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy

2.2. Test and Uncertainty Procedures

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 10 of 127

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description		
Purpose:	Test of the Proxim Tsunami MP.11 Model 954-R Model 954-R to FCC Part 15.247 and Industry Canada RSS-210 regulations		
Applicant:	As Manufacturer		
Manufacturer:	Proxim Wireless 2115 O'Nel Drive San Jose CA 95131 USA		
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA		
Test report reference number:	PROX10-A2 Rev A		
Date EUT received:	7 TH June 2006		
Standard(s) applied:	FCC 47 CFR Part15.247 & IC RSS-210		
Dates of test (from - to):	14th to 25th June 2007		
No of Units Tested:	1		
Type of Equipment:	802.11a/b/g Wireless Access Point		
Manufacturers Trade Name:	Tsunami MP-11		
Model:	954-R		
Location for use:	Outdoor		
Declared Frequency Range(s):	902 - 928 MHz		
Type of Modulation:	Per 802.11 – DSSS, CCK, OFDM		
Declared Nominal Output Power:	802.11b/g: +28 dBm		
EUT Modes of Operation:	802.11 b/g		
Transmit/Receive Operation:	Time Division Duplex		
Rated Input Voltage and Current:	12 Vdc, 1.5 A		
Operating Temperature Range:	Declared range 0 to +55°C		
ITU Emission Designator:	b mode	g mode	
	5 MHz	4M0W7D	8M5W7D
	10 MHz	8M2W7D	10M9W7D
Equipment Dimensions:	10.5" X 10.5" X 3.5"		
Weight:	6 lbs		
Primary function of equipment:	Wireless Access Point		

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3.2. Scope of Test Program

The scope of the test program was to test the Proxim Wireless Access Point in the frequency ranges 902 - 928 MHz for a permissive change against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications.

Proxim Wireless Wireless Access Point



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 12 of 127

3.3. Equipment Model(s) and Serial Number(s)

Type (EUT/Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	Wireless Access Point Tsunami MP.11	Proxim Wireless	954-R	05UT09560207
EUT	POE Power Supply	ITE	PW130	None
Support	Laptop PC	Dell	Latitude PPOIL	None

3.4. Antenna Details

Mfr	Gain (dBi)	Type	Model No.
Amphenol Antel Inc	12	Dipole	BCD-87010
Amphenol Antel Inc	19	Panel	RWA-80017
MTI Wireless Edge	12	Patch	MT-263006N

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. POE 10/100 Ethernet
2. Local maintenance terminal (RJ-11 cable)
3. N-Type connector

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3.6. Test Configurations

Testing was performed to determine the highest power level versus bit rate. 802.11b 1.375 MB/s and 6 MB/s for 802.11g were found to provide the highest power levels. These data rates were used to exercise the product throughout the entire test program.

Matrix of Channel test configurations.

Operational Mode (802.11)	Frequencies (MHz)
b, g	907.0
	912.0
	922.0

Matrix of Access Point Data Rate Configurations

Bandwidth (MHz)	'b' Mode Data Rate (Mb/s)	'g' Mode Data Rate (Mb/s)
5	1.375	6
10	1	6

Only worst case plots are provided for each test parameter are identified within this report. Plots not included are held on file by the test laboratory and available upon request with client permission.



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 14 of 127

3.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. None

3.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

3.9. Subcontracted Testing or Third Party Data

1. NONE

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4. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(a)(2) A8.2(1) 4.6	6 dB and 99 % Bandwidths	≥500 kHz	Conducted	Complies	5.1.1
15.247(b)(3) 15.31(e) A8.4(4)	Peak Output Power Voltage Variation	Shall not exceed 1W Variation of supply voltage 85 % -115 %	Conducted	Complies	5.1.2
15.247(e) A8.2	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	5.1.3
15.247(i) 5.5	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Conducted	Complies	5.1.4
15.247(d) 15.205 / 15.209 A8.5 2.2 4.9	Spurious Emissions (30MHz - 26 GHz b/g and 30 MHz – 40 GHz a)	The radiated emission in any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density	Conducted	Complies	5.1.5

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List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247**, **Industry Canada RSS-210**, and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(d) 15.205 / 15.209 A8.5 2.2 2.6 4.9	Radiated Emissions	Restricted Bands	Radiated	Complies	5.1.6
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	5.1.6.1
	Radiated Band Edge	Band edge results		Complies	5.1.6.1
Industry Canada only RSS-Gen §6	Receiver Radiated Spurious Emissions	Emissions above 1 GHz		Complies	5.1.6.2
15.205 / 15.209 2.2	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Permissive Change Previously Tested	5.1.6.3
15.207 7.2.2	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	Permissive Change Previously Tested	5.1.7

Note 1: Test results reported in this document relate only to the items tested

Note 2: The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

Note 3: Appendix A - Equipment Modifications highlights the equipment modifications that were required to bring the product into compliance with the above test matrix

5. TEST RESULTS

5.1. Device Characteristics

5.1.1. 6 dB and 99 % Bandwidth

FCC, Part 15 Subpart C §15.247(a)(2)

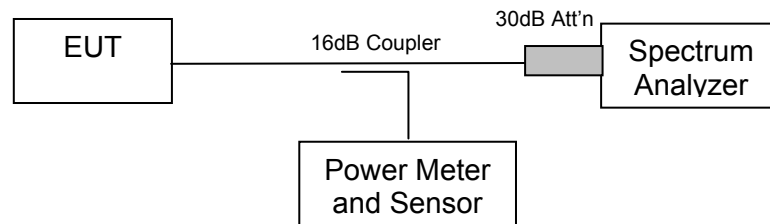
Industry Canada RSS-210 §A8.2

Industry Canada RSS-Gen §4.6

Test Procedure

The bandwidth at 6 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. The analyzer was set for a 6 dB resolution bandwidth filter during this measurement.

Test Measurement Set up



Measurement set up for 6 dB and 99 % bandwidth test



Measurement Results for 6 dB and 99 % Operational Bandwidth(s)

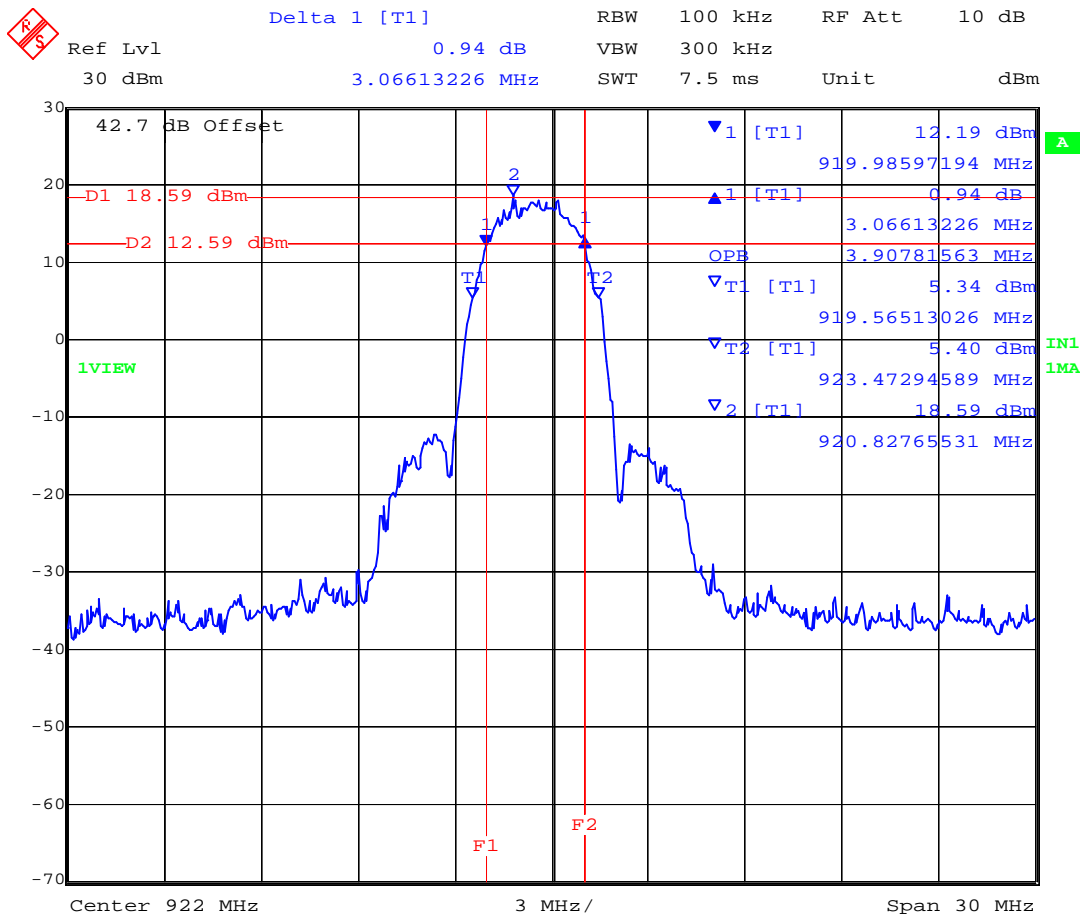
Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

TABLE OF RESULTS – 802.11b 5 MHz BW 1.375 Mb/s

Center Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Plot #	99 % BW (MHz)	99 % BW Plots
907.0	3.066	On File	3.908	On File
912.0	2.886	On File	3.908	On File
922.0	3.066	01	3.908	01

**Plot 01
922.0 MHz 802.11b 6 dB Bandwidth**



Date: 14.JUN.2007 20:13:44

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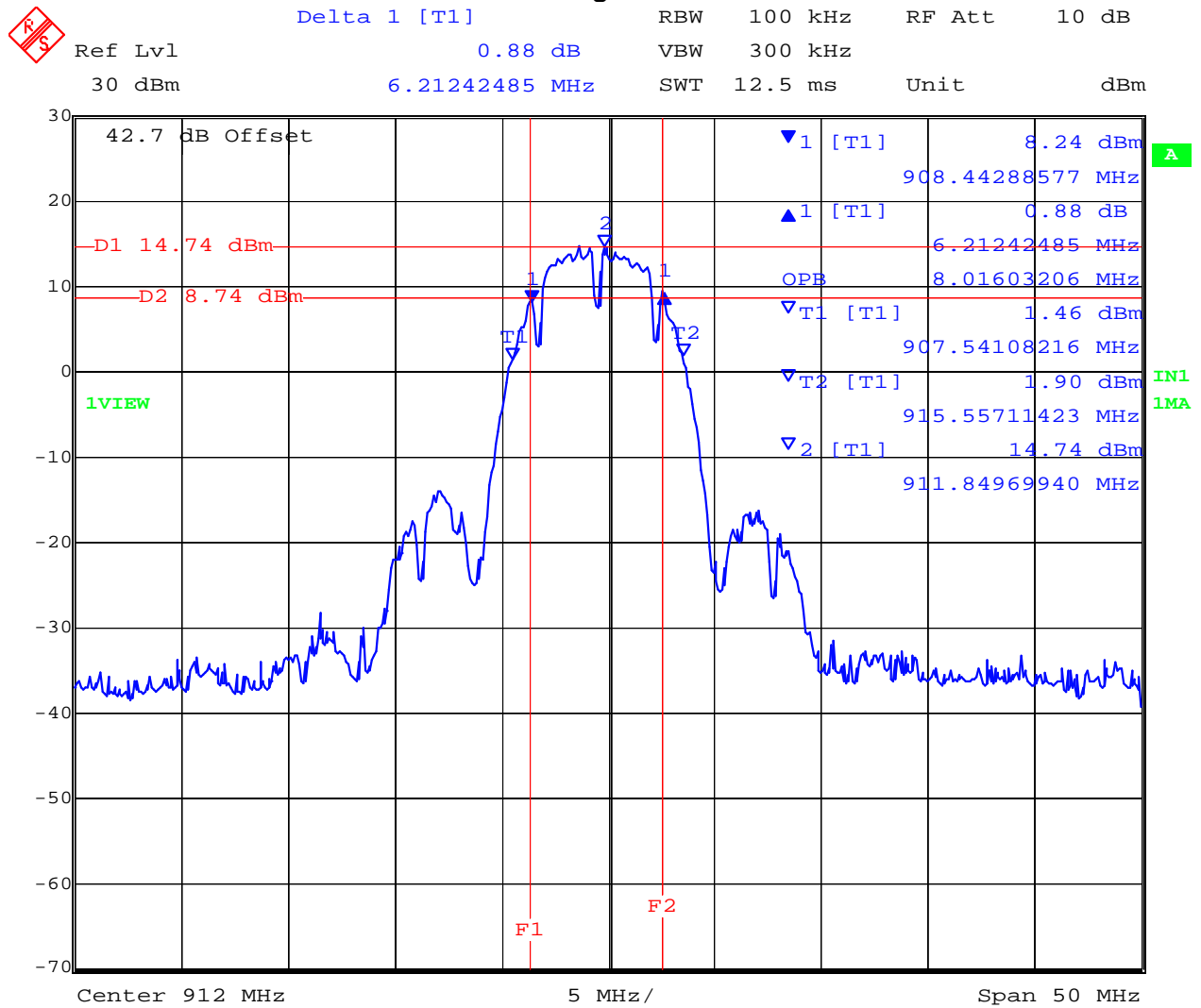


Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 19 of 127

TABLE OF RESULTS – 802.11g 5 MHz BW 6 Mb/s

Center Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Plot #	99 % BW (MHz)	99 % BW Plots
907.0	4.268	On File	8.417	On File
912.0	4.268	02	8.477	02
922.0	4.208	On File	7.635	On File

Plot 02
912 MHz 802.11g 6 dB Bandwidth



Date: 14.JUN.2007 19:51:23

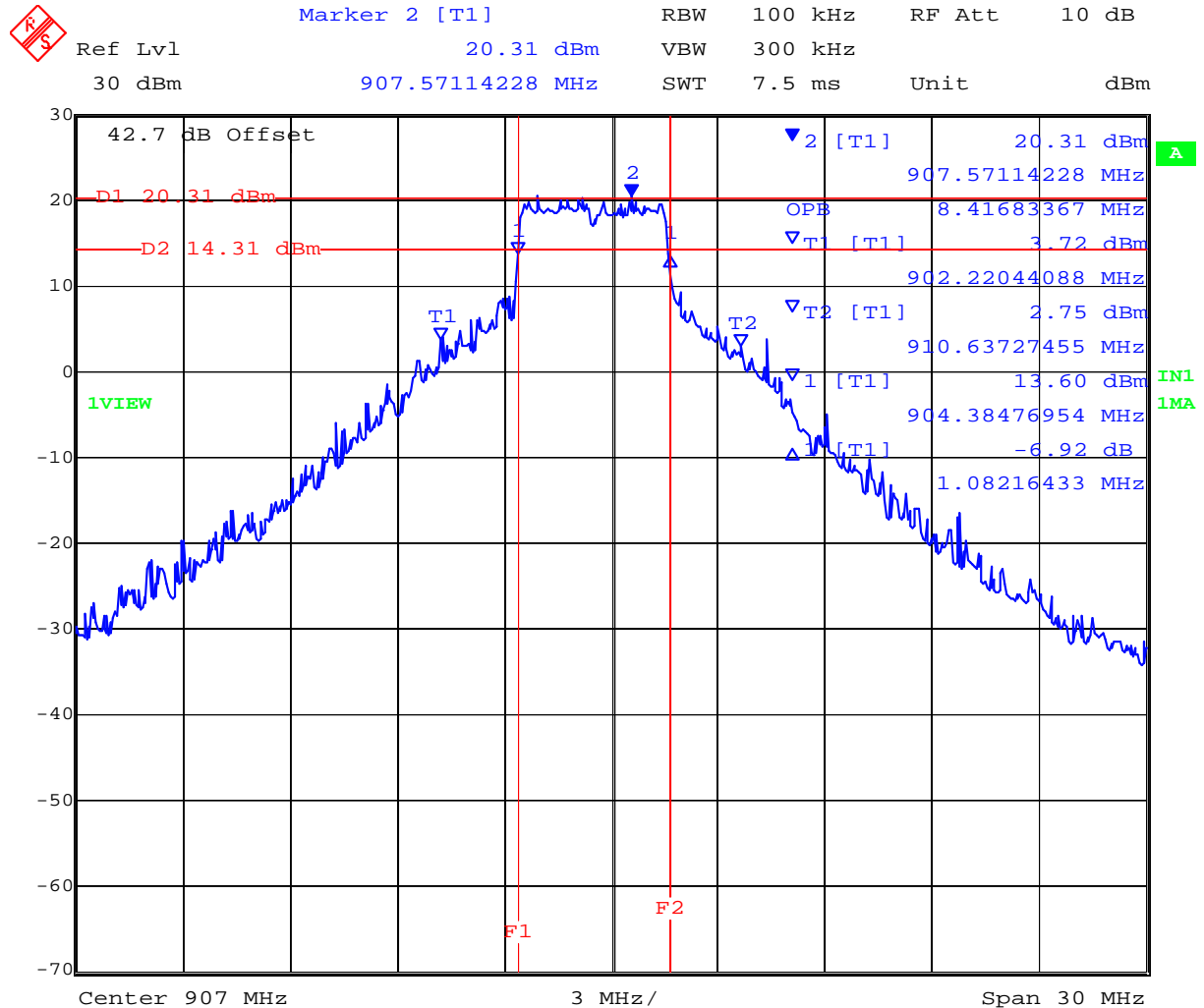
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TABLE OF RESULTS – 802.11b - 10 MHz BW 1 Mb/s

Center Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Plot #	99 % BW (MHz)	99 % BW Plots
907.0	6.513	03	8.116	03
912.0	6.212	On File	8.016	On File
922.0	6.333	On File	8.116	On File

Plot 03
907 MHz 802.11b 6 dB Bandwidth



Date: 14.JUN.2007 20:20:04

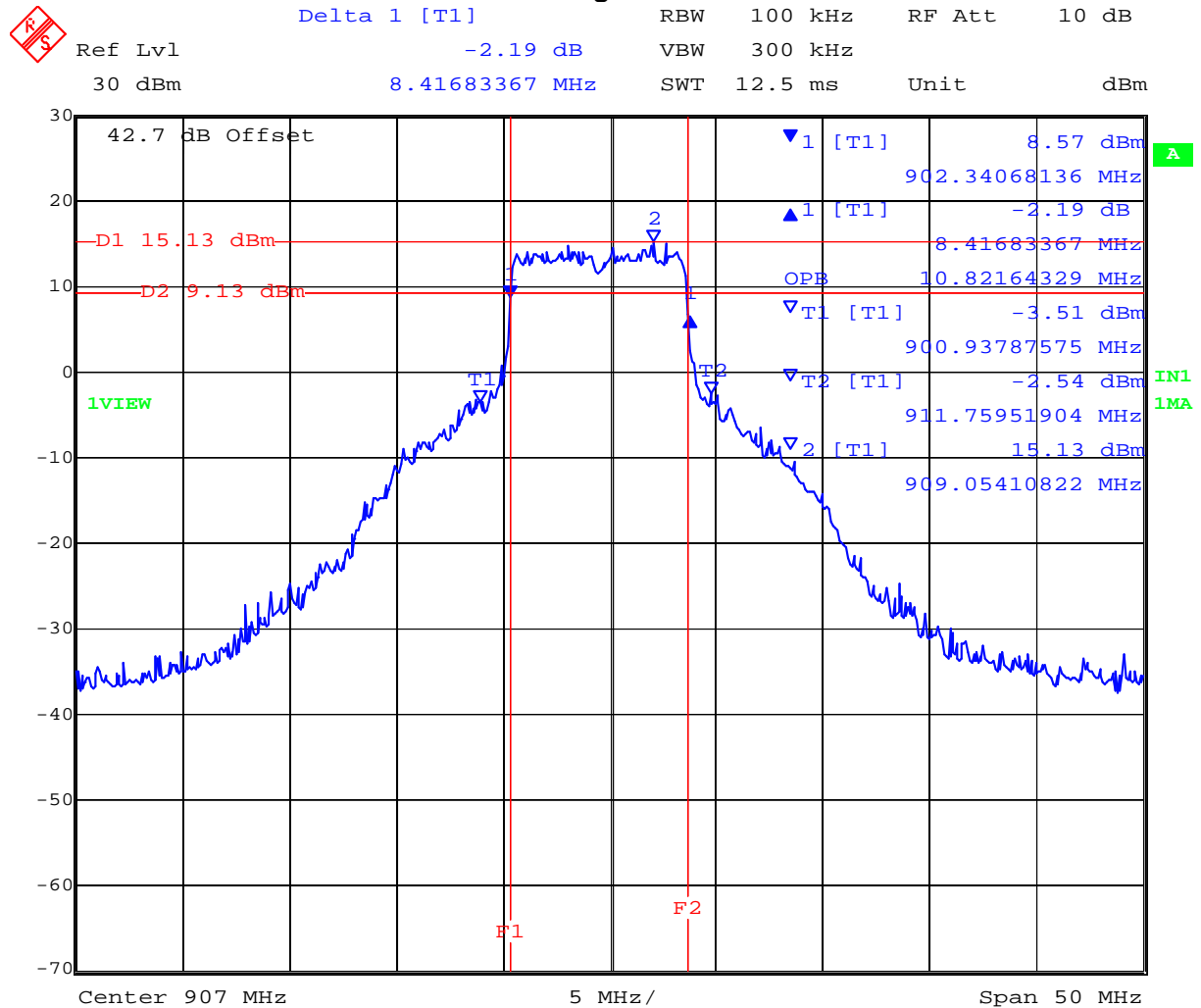
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TABLE OF RESULTS – 802.11g - 10 MHz BW 6 Mb/s

Center Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Plot #	99 % BW (MHz)	99 % BW Plots
907.0	8.417	04	10.822	04
912.0	8.327	On File	10.521	On File
922.0	8.317	On File	10.621	On File

Plot 04
907 MHz 802.11g 6 dB Bandwidth



Date: 14.JUN.2007 19:46:00

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Specification

Limits

§15.247 (a)(2) & RSS-210 §A8.2(1)

The minimum 6 dB bandwidth shall be at least 500 kHz.

§ IC RSS-Gen 4.6.1 Occupied Bandwidth When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

§ IC RSS-Gen 4.6.2 6 dB Bandwidth Where indicated, the 6 dB bandwidth is measured at the points when the spectral density of the signal is 6 dB down from the in-band spectral density of the modulated signal, with the transmitter modulated by a representative signal.

Laboratory Measurement Uncertainty for Spectrum Measurement

Measurement uncertainty	±2.81 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of RF Spectrum Mask'	0158, 0193, 0252, 0313, 0314, 0223, 0116, 0117

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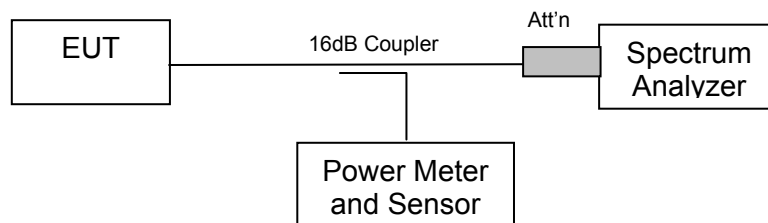
5.1.2. Peak Output Power

FCC, Part 15 Subpart C §15.247(b)(3 & 4), §15.31(e)
Industry Canada RSS-210 §A8.4(4)

Test Procedure

The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure peak power. The resolution filter bandwidth was set to 6 dB, peak detector selected and the analyzer built-in power function was used to measure peak power over the 99 % bandwidth.

Test Measurement Set up



Measurement set up for Transmitter Peak Output Power

Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

Antenna Gain - Maximum Allowable Power Level

Conducted Output power Limits

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Type	Gain (dBi)	Antenna Gain >6dBi (dB)	Power Reduction (dB)	Maximum Peak Conducted Power (dBm)
Patch	12	6	6	24
Dipole	12	6	6	24
Panel	19	13	13	17

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 24 of 127

TABLE OF RESULTS – 802.11b – 5 MHz BW 1.375 Mb/s

Center Frequency (MHz)	Peak Power (W)	Peak Power (dBm)
907.0	0.3236	+25.10
912.0	0.3148	+24.98
922.0	0.2985	+24.75

TABLE OF RESULTS – 802.11g – 5 MHz BW 6 Mb/s

Center Frequency (MHz)	Peak Power (W)	Peak Power (dBm)
907.0	0.2992	+24.76
912.0	0.2897	+24.62
922.0	0.3027	+24.81

TABLE OF RESULTS – 802.11b – 10 MHz BW 1 Mb/s

Center Frequency (MHz)	Peak Power (W)	Peak Power (dBm)
907.0	0.2698	+24.31
912.0	0.2600	+24.15
922.0	0.2704	+24.32

TABLE OF RESULTS – 802.11g – 10 MHz BW 6 Mb/s

Center Frequency (MHz)	Peak Power (W)	Peak Power (dBm)
907.0	0.2541	+24.05
912.0	0.249	+23.96
922.0	0.2570	+24.10

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Specification

Limits

§15.247 (b)(3) The maximum peak output power of the intentional radiator shall not exceed the following:

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1.0 watt.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.31 (e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

§ RSS-210 A8.4(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands the maximum peak conducted power shall not exceed 1 watt.

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0193, 0252, 0313, 0314, 0223, 0116, 0117

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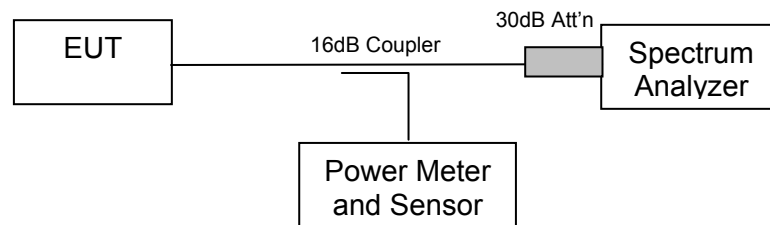
5.1.3. Peak Power Spectral Density

FCC, Part 15 Subpart C §15.247(e)
Industry Canada RSS-210 §A8.2

Test Procedure

The transmitter output was connected to a spectrum analyzer and the maximum level in a 3 kHz bandwidth was measured. A peak value was found over the full emission bandwidth and the frequency span reduced to obtain enhanced resolution. Sweep time \geq span / 3 kHz with video averaging turned off. The Peak Power Spectral Density is the highest level found across the emission in a 3 kHz resolution bandwidth.

Test Measurement Set up



Measurement set up for Peak Power Spectral Density

Measurement Results for Peak Power Spectral Density

Ambient conditions.

Temperature: 17 to 23 °C

Relative humidity: 31 to 57 %

Pressure: 999 to 1012 mbar

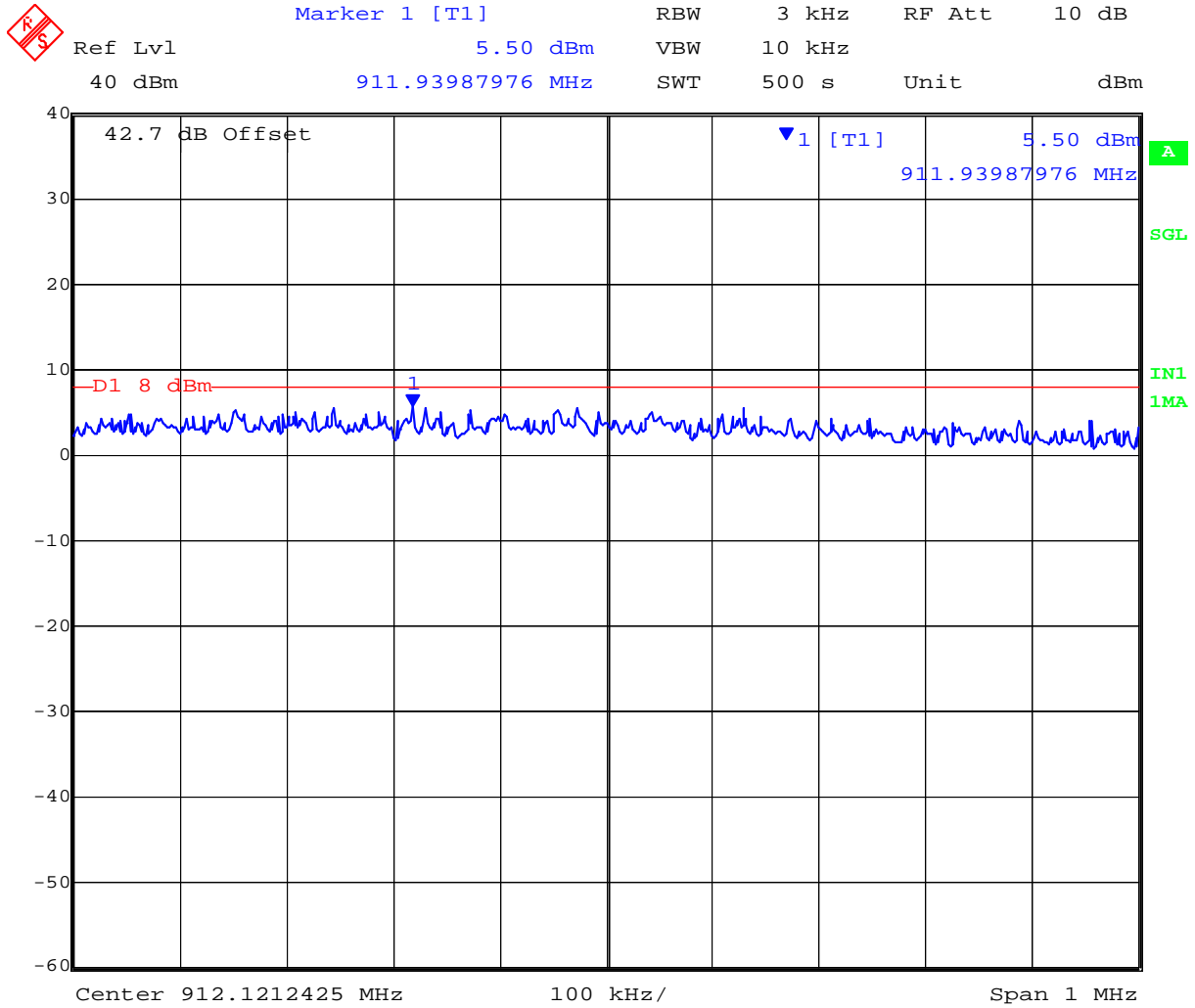


Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 27 of 127

TABLE OF RESULTS – 802.11b – 1.375 Mb/s 5 MHz Bandwidth

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)	Plot #
907.0	907.250501	+5.22	+8	-2.78	On File
912.0	911.939879	+5.50	+8	-2.50	09
922.0	920.865731	+5.25	+8	-2.75	On File

Plot 09
912.0 MHz 802.11b Peak Power Spectral Density



Date: 14.JUN.2007 22:27:02

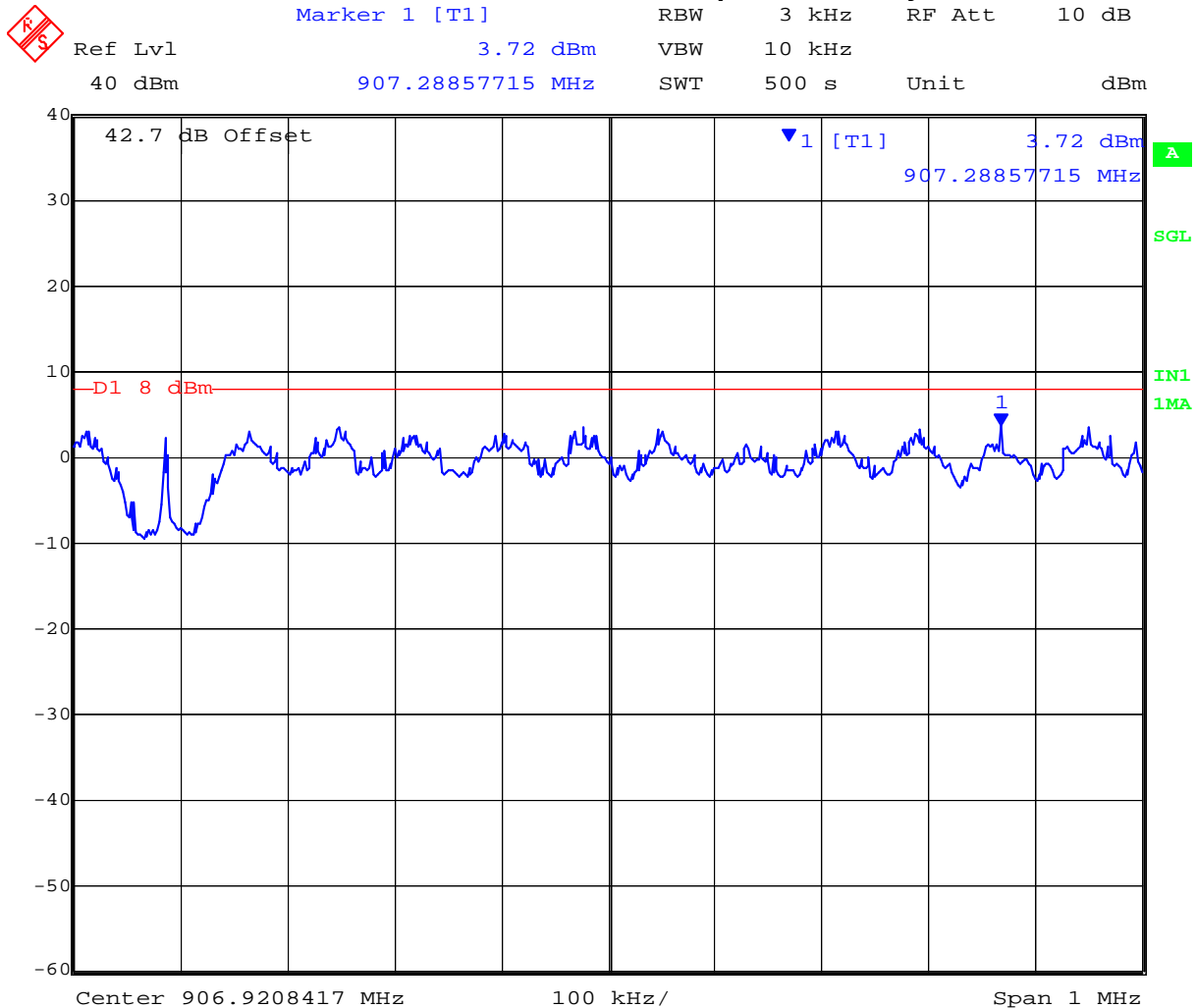
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TABLE OF RESULTS – 802.11g – 6 Mb/s 5 MHz Bandwidth

Center Frequency (MHz)	Peak Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dBm)	Plot #
907.0	907.28857715	+3.72	+8	-4.28	10
912.0	910.48096192	+3.58	+8	-4.42	On File
922.0	920.88577154	+3.73	+8	-4.27	On File

Plot 10
907 MHz 802.11b Peak Power Spectral Density



Date: 14.JUN.2007 22:00:44

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 29 of 127

Specification
Peak Power Spectral Density Limits

§15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission

RSS-210 §A8.2(2) The transmitter power spectral density (into the antenna) shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

Laboratory Measurement Uncertainty for Spectral Density

Measurement uncertainty	±1.33 dB
-------------------------	----------

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0193, 0252, 0313, 0314, 0223, 0116, 0117

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5.1.4. Maximum Permissible Exposure

FCC, Part 15 Subpart C §15.247(i)
Industry Canada RSS-Gen §5.5

Calculations for Maximum Permissible Exposure Levels

Power Density = Pd (mW/cm²) = EIRP/(4πd²)

EIRP = P * G

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

Numeric Gain = 10 ^ (G (dBi)/10)

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm²

Freq. Band (GHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance @ 1mW/cm ² Limit (cm)
902-928	12	15.85	24	251.19	17.8
902-928	19	79.44	17	50.12	17.8

Specification

Maximum Permissible Exposure Limits

§15.247(i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission’s guidelines.

Limit S = 1mW / cm² from 1.310 Table 1

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

RSS-Gen §5.5 Before equipment certification is granted, the applicable requirements of RSS-102 shall be met.

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33 dB
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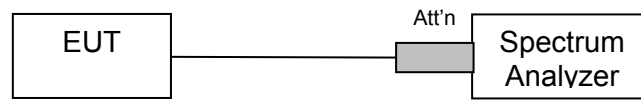
5.1.5. Conducted Spurious Emissions

FCC, Part 15 Subpart C §15.247(d); 15.205; 15.209
Industry Canada RSS-210 §A8.5, §2.2
Industry Canada RSS-Gen 4.9

Test Procedure

Conducted emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Emissions at the band edge were measured and recorded. Measurements were made while EUT was operating in transmit mode of operation at the appropriate center frequency.

Test Measurement Set up



Band-edge measurement test configuration

Measurement Results of Conducted Spurious Emissions

Ambient conditions.

Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar



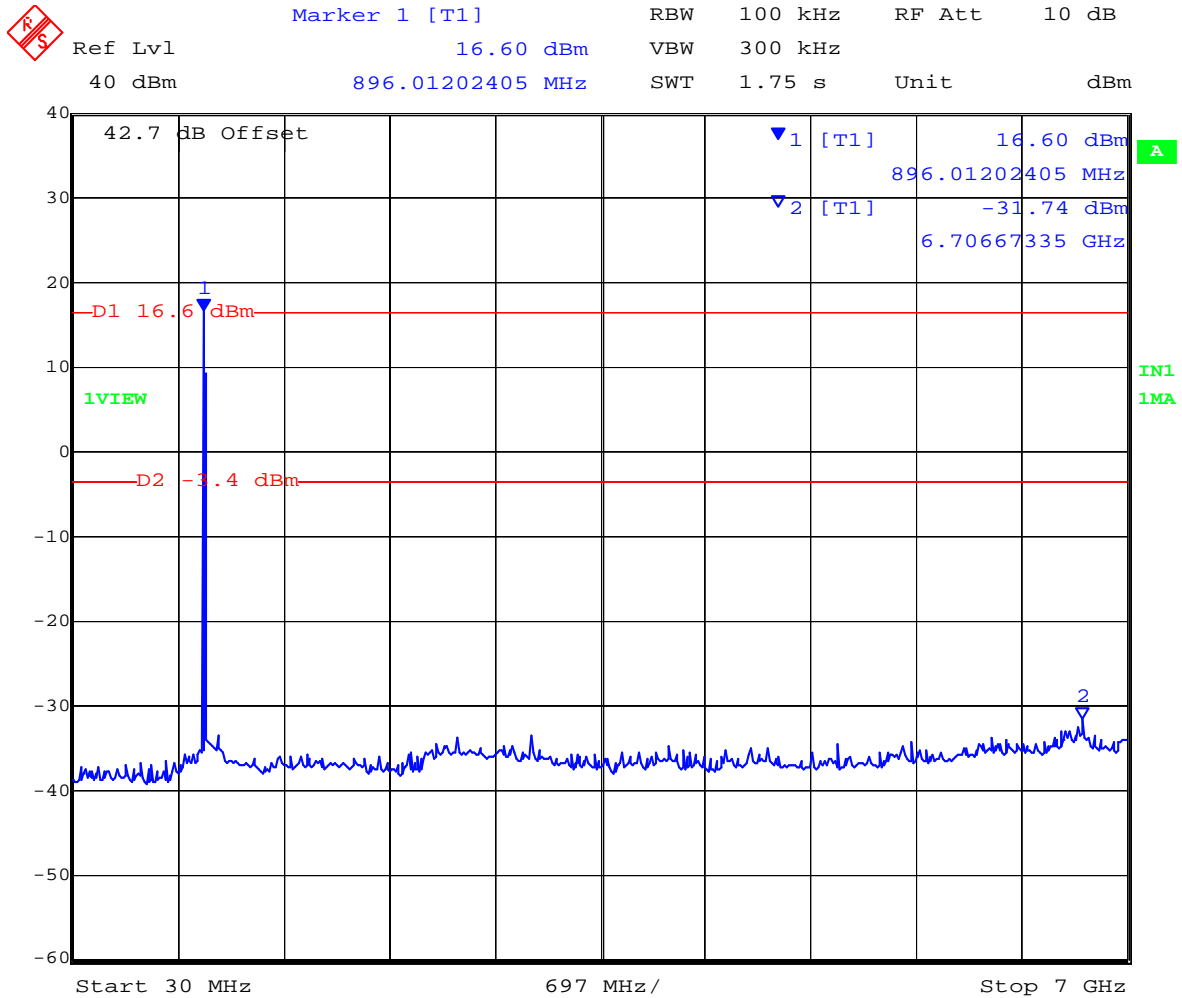
Spurious Emissions (30 - 10,000 MHz)

TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
907.0	30	7,000	-31.74	-3.40	11	-28.34
907.0	7,000	10,000	-39.67	-3.40	12	-36.27

Plot 11 802.11b – 1.375 Mbit/s

907.0 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz



Date: 15.JUN.2007 11:46:36

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Spurious Emissions (30 - 10,000 MHz)

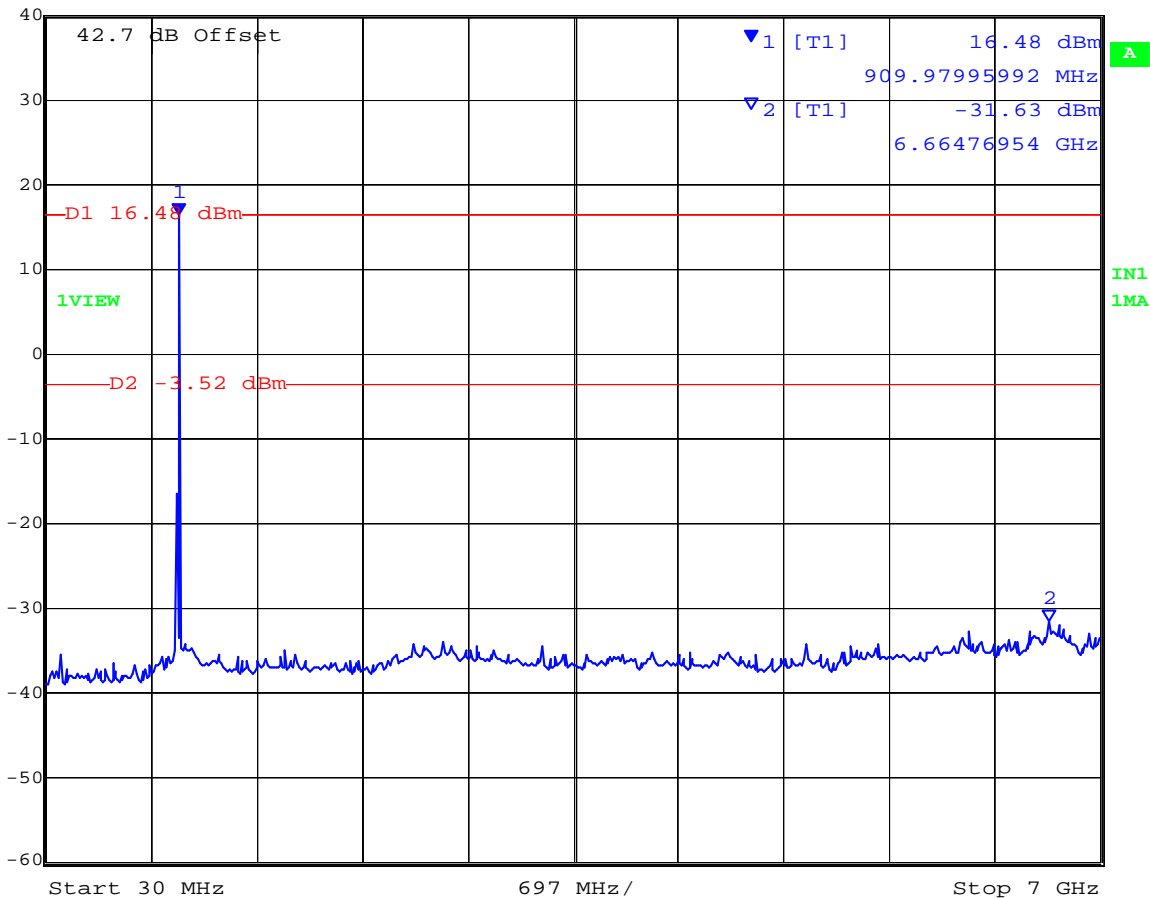
TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
912	30	7,000	-31.63	-3.52	13	-28.11
912	7,000	10,000	-38.83	-3.52	14	-35.31

Plot 13 802.11b – 1.375 Mbit/s

912 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 16.48 dBm VBW 300 kHz
 40 dBm 909.97995992 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:47:43

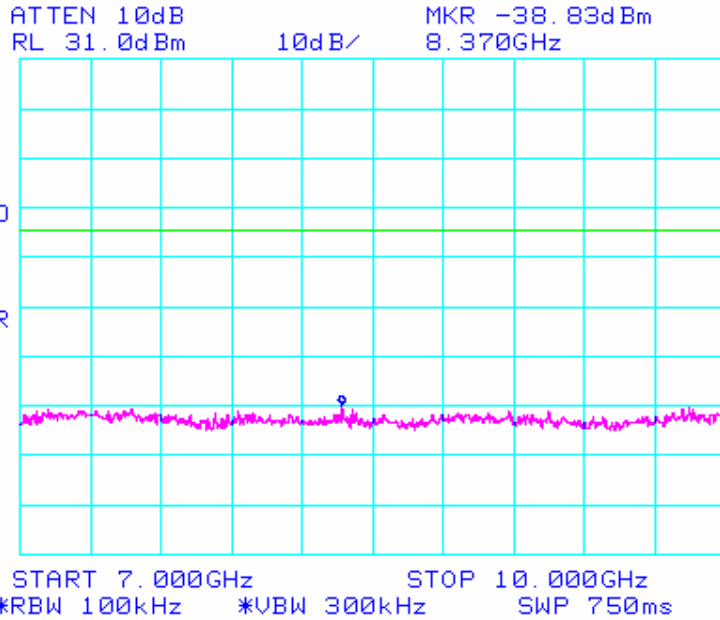
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 35 of 127

Plot 14 802.11b – 1.375 Mbit/s

912 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Spurious Emissions (30 - 10,000 MHz)

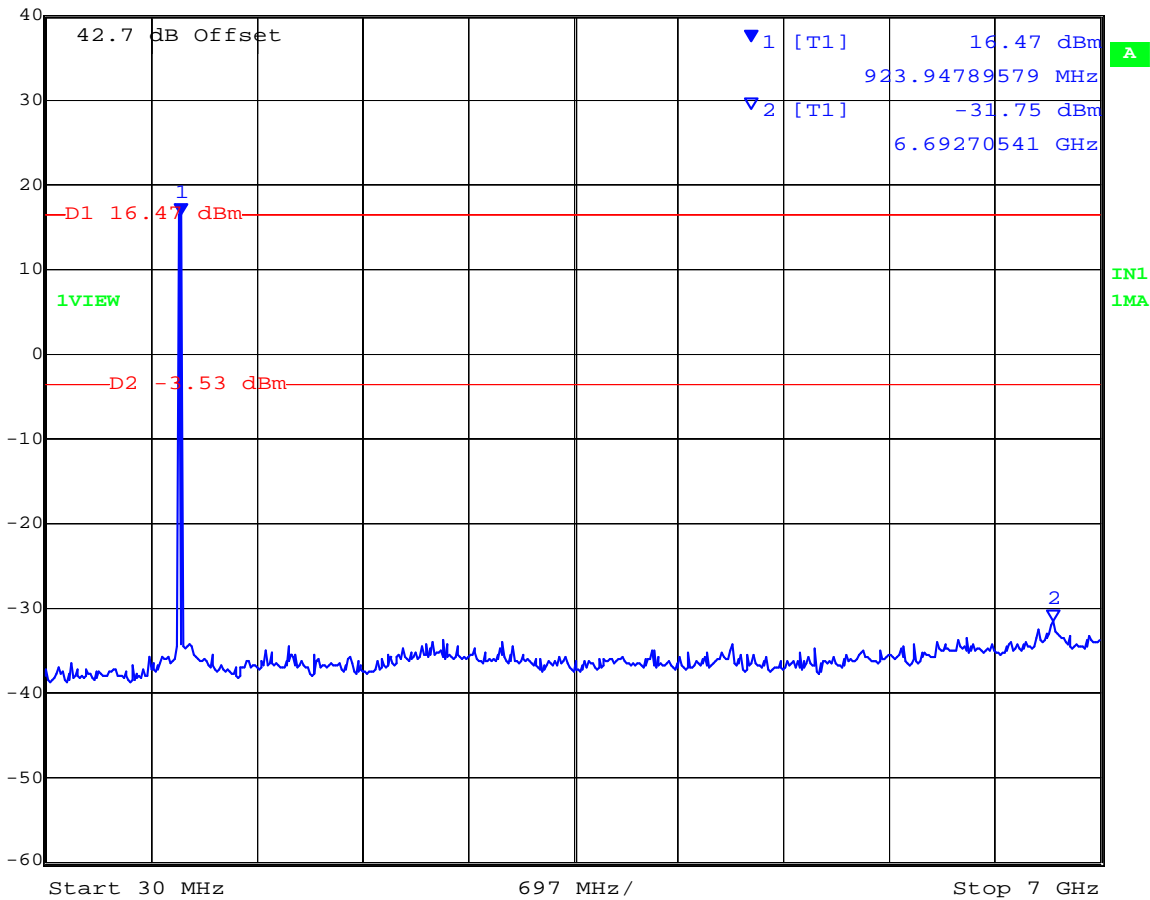
TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
922	30	7,000	-31.75	-3.53	15	-28.22
922	7,000	10,000	-39.50	-3.53	16	-35.97

Plot 15 802.11b – 1.375 Mbit/s

922 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 16.47 dBm VBW 300 kHz
 40 dBm 923.94789579 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:51:05

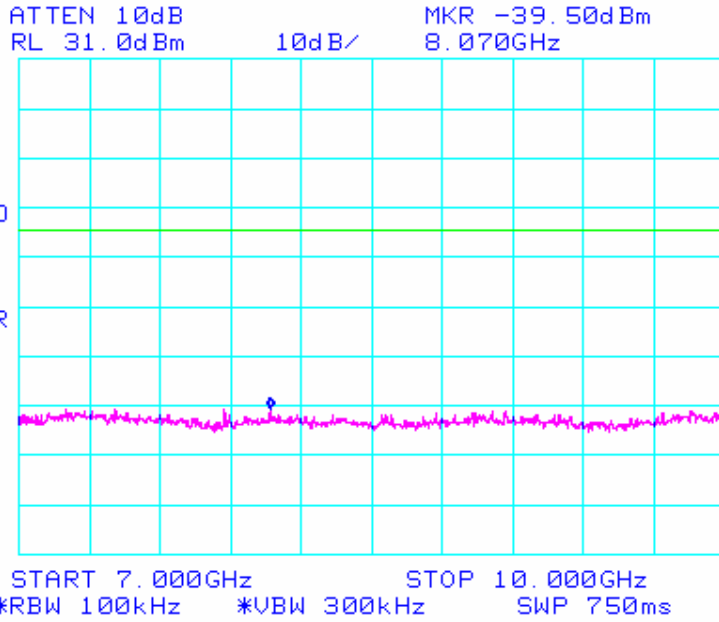
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 37 of 127

Plot 16 802.11b – 1.375 Mbit/s

922 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Spurious Emissions (30 - 10,000 MHz)

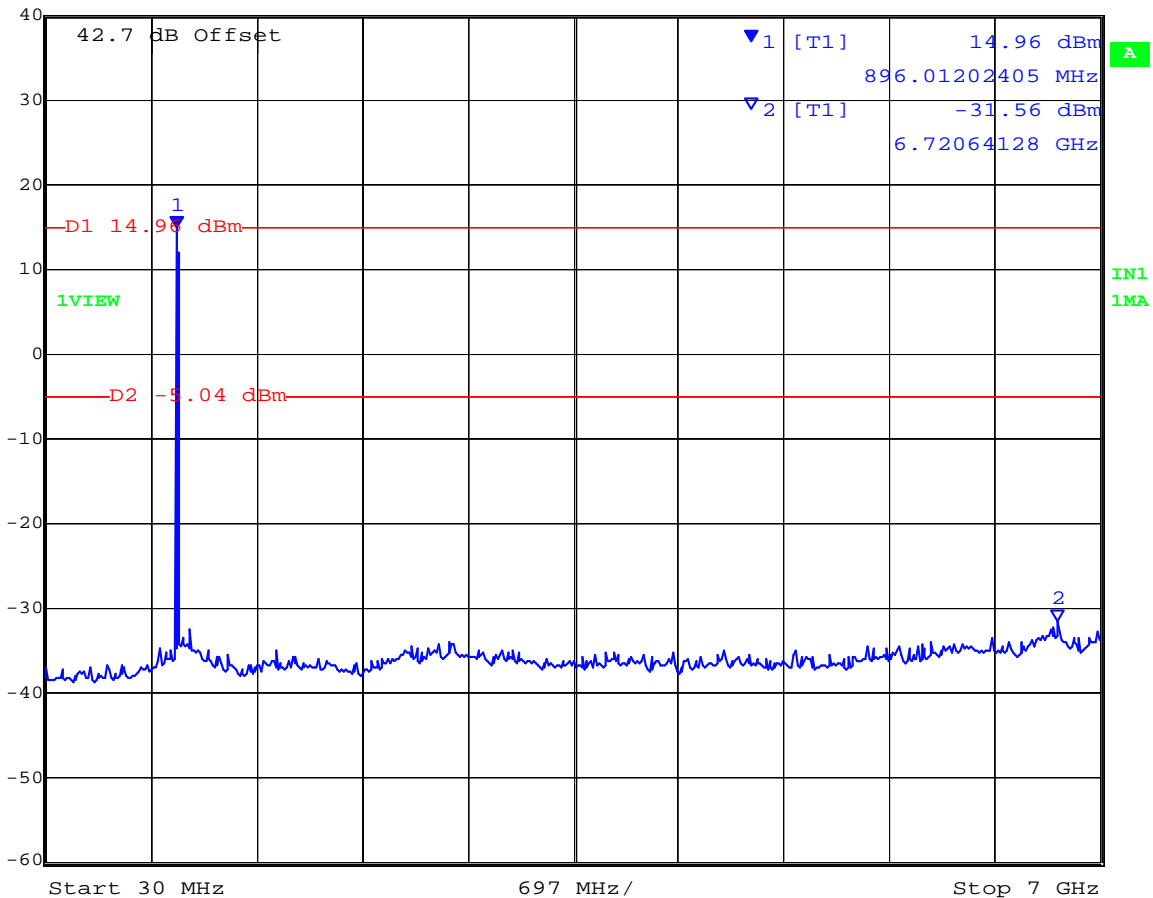
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
907	30	7,000	-31.56	-5.04	17	-26.52
907	7,000	10,000	-39.17	-5.04	18	-34.13

Plot 17 802.11g – 6 Mbit/s

907.0 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 14.96 dBm VBW 300 kHz
 40 dBm 896.01202405 MHz SWT 1.75 s Unit dBm



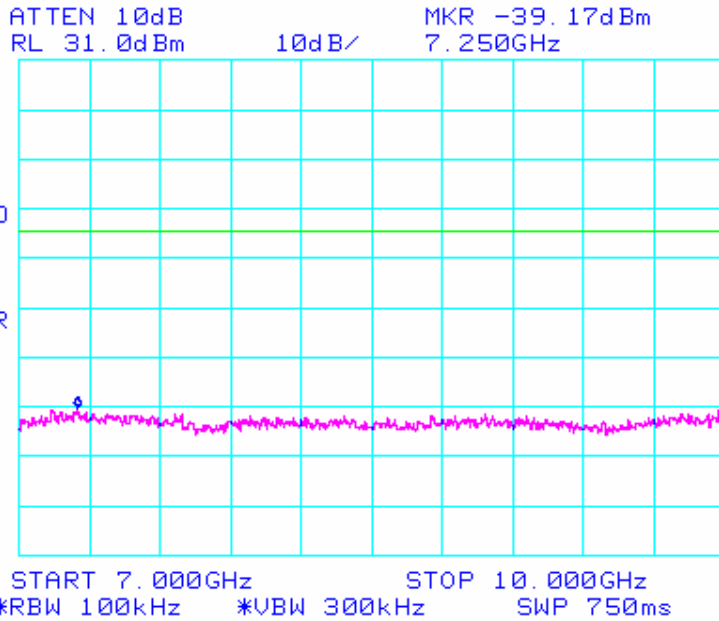
Date: 15.JUN.2007 11:43:50

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Plot 18 802.11g – 6 Mbit/s

907.0 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Spurious Emissions (30 - 10,000 MHz)

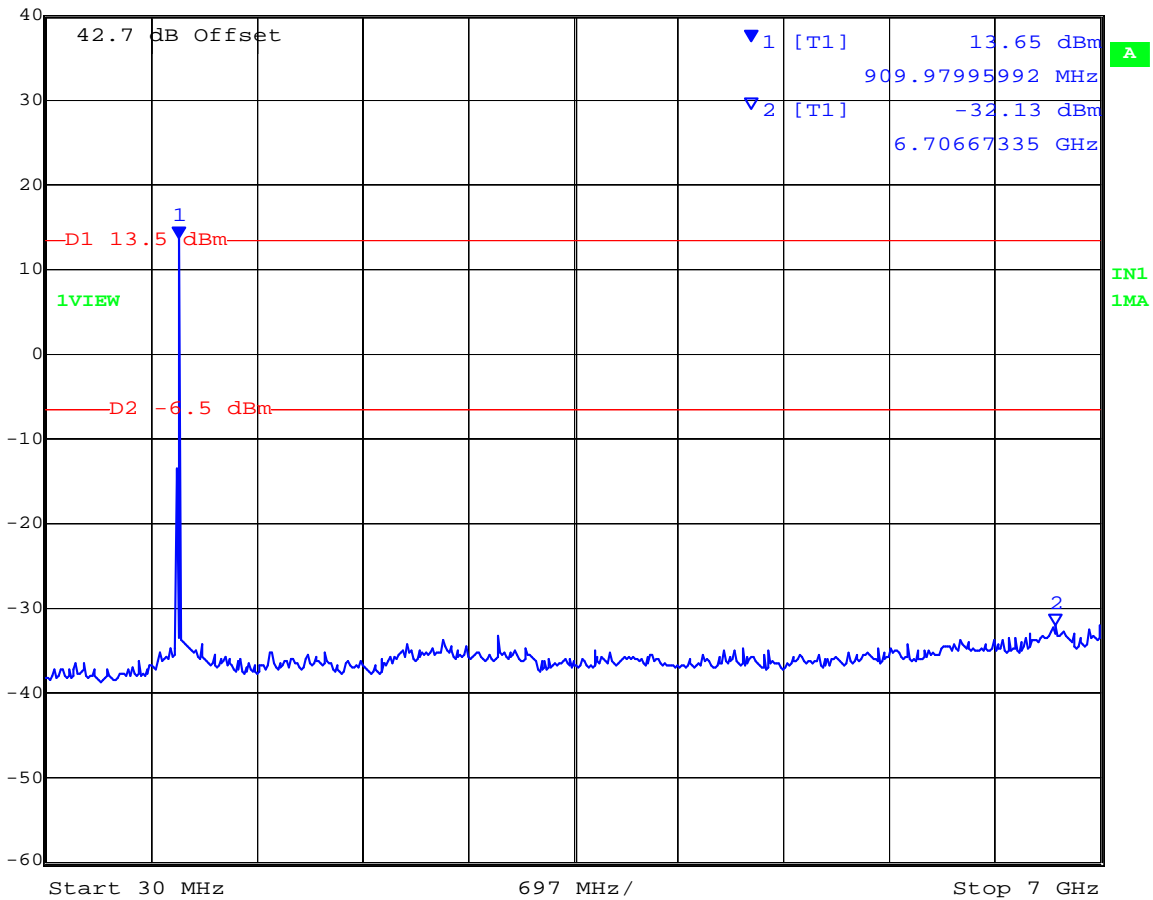
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
912	30	7,000	-32.13	-6.50	19	-25.63
912	7,000	10,000	-37.67	-6.50	20	-31.17

Plot 19 802.11g – 6 Mbit/s

912 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz


 Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 13.65 dBm VBW 300 kHz
 40 dBm 909.97995992 MHz SWT 1.75 s Unit dBm



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Spurious Emissions (30 - 10,000 MHz)

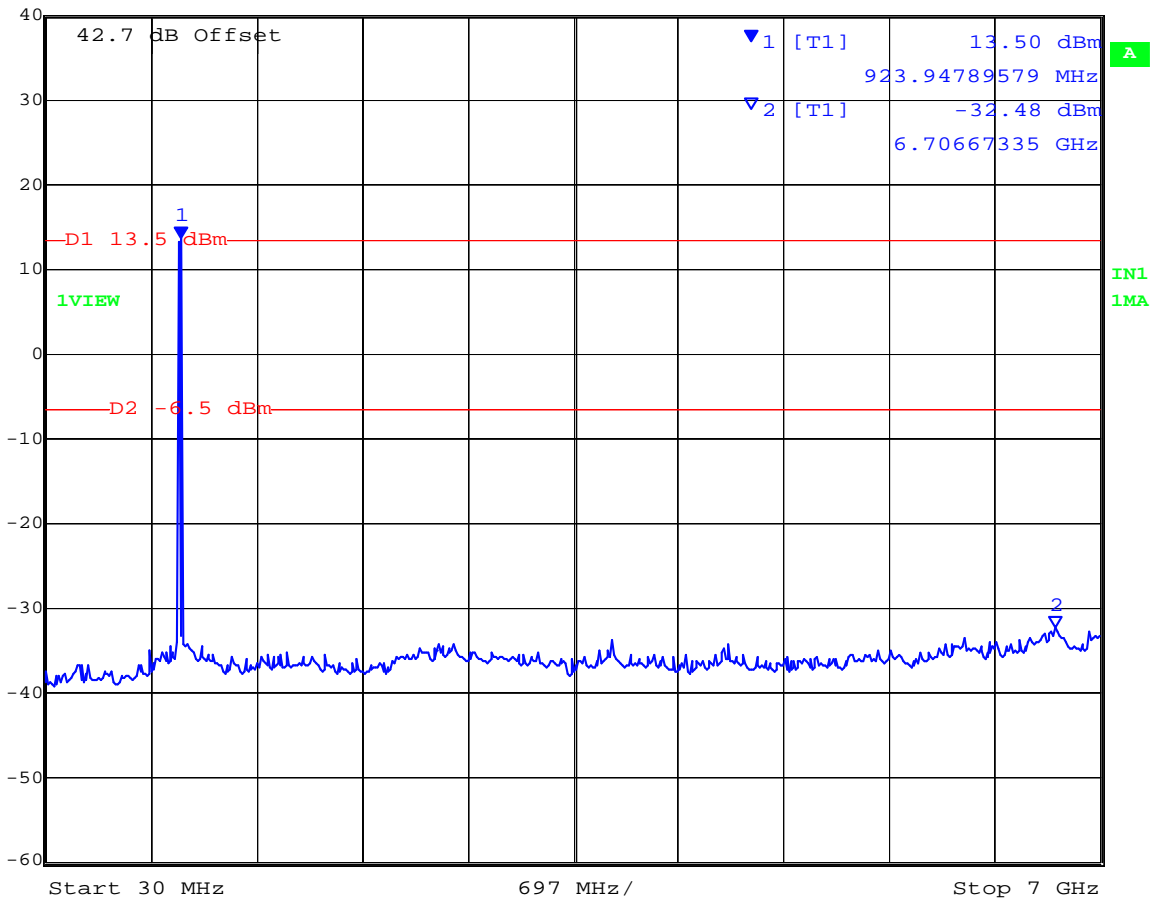
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 5 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
922	30	7,000	-39.50	-6.50	19	-33.00
922	7,000	10,000	-32.45	-6.50	20	-25.95

Plot 19 802.11g – 6 Mbit/s

922 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 13.50 dBm VBW 300 kHz
 40 dBm 923.94789579 MHz SWT 1.75 s Unit dBm



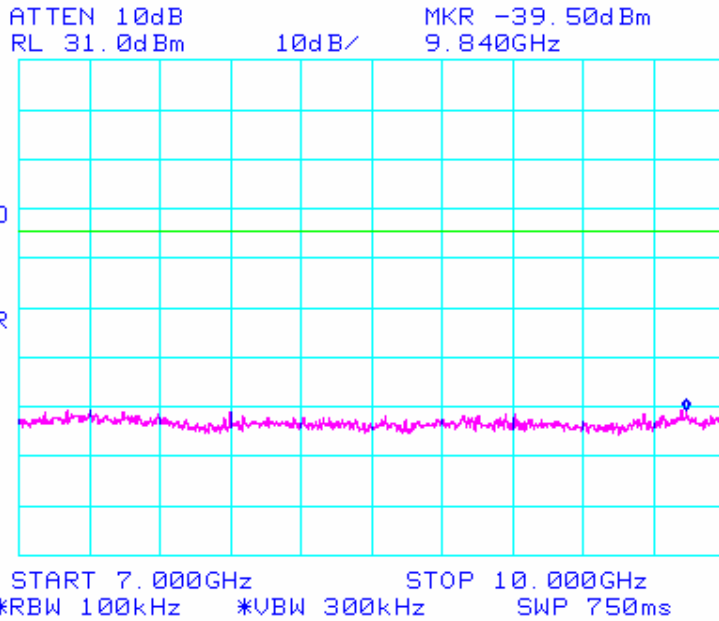
Date: 15.JUN.2007 11:41:43

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Plot 20 802.11g – 6 Mbit/s

922 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Spurious Emissions (30 - 10,000 MHz)

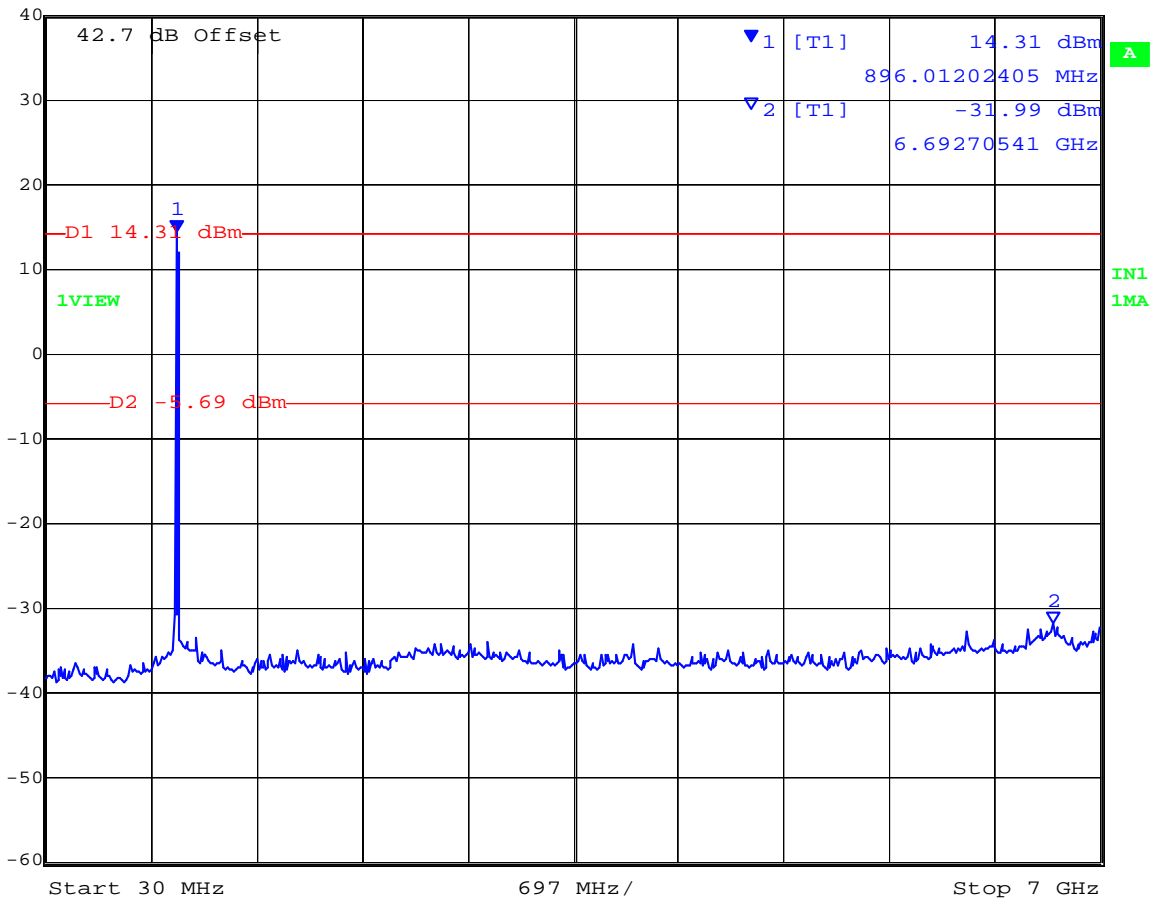
TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
907.0	30	7,000	-31.99	-5.69	21	-26.30
907.0	7,000	10,000	-39.00	-5.69	22	-33.31

Plot 21 802.11b – 1.375 Mbit/s

907.0 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 14.31 dBm VBW 300 kHz
 40 dBm 896.01202405 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:59:23

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Spurious Emissions (30 - 10,000 MHz)

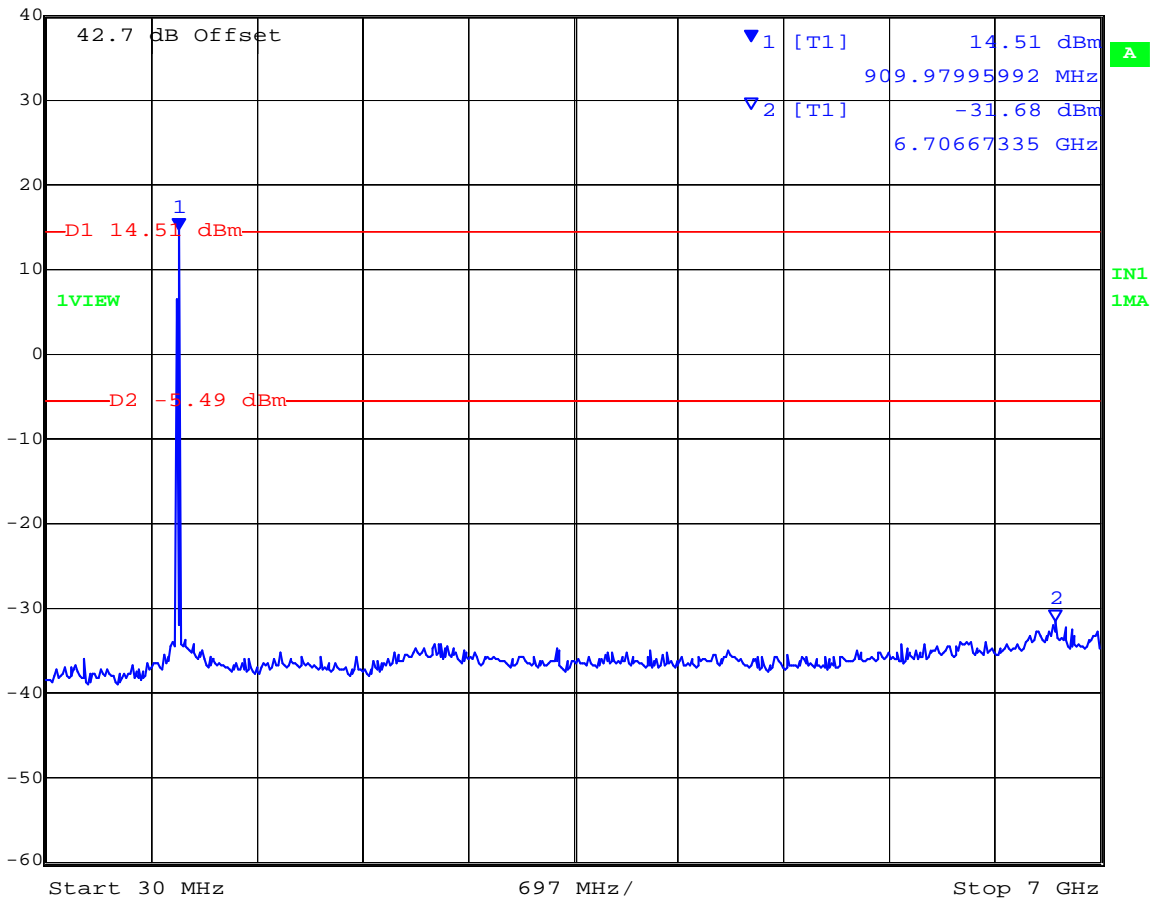
TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
912	30	7,000	-31.68	-5.49	23	-26.19
912	7,000	10,000	-39.33	-5.49	24	-33.84

Plot 23 802.11b – 1.375 Mbit/s

912 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 14.51 dBm VBW 300 kHz
 40 dBm 909.97995992 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:58:16

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Spurious Emissions (30 - 10,000 MHz)

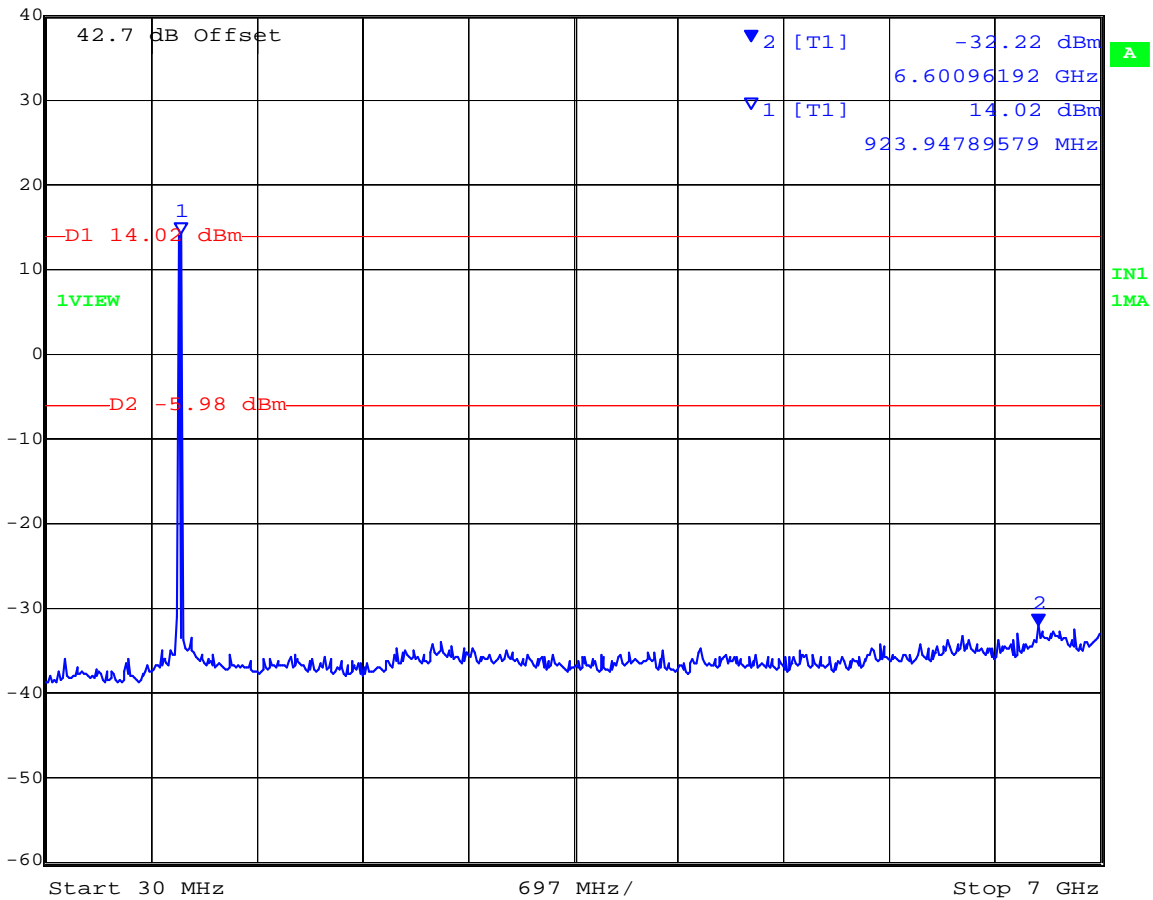
TABLE OF RESULTS – 802.11b – 1.375 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
922	30	7,000	-32.22	-5.98	25	-26.24
922	7,000	10,000	-39.17	-5.98	26	-33.19

Plot 25 802.11b – 1.375 Mbit/s

922 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 2 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl -32.22 dBm VBW 300 kHz
 40 dBm 6.60096192 GHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:56:49

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Spurious Emissions (30 - 10,000 MHz)

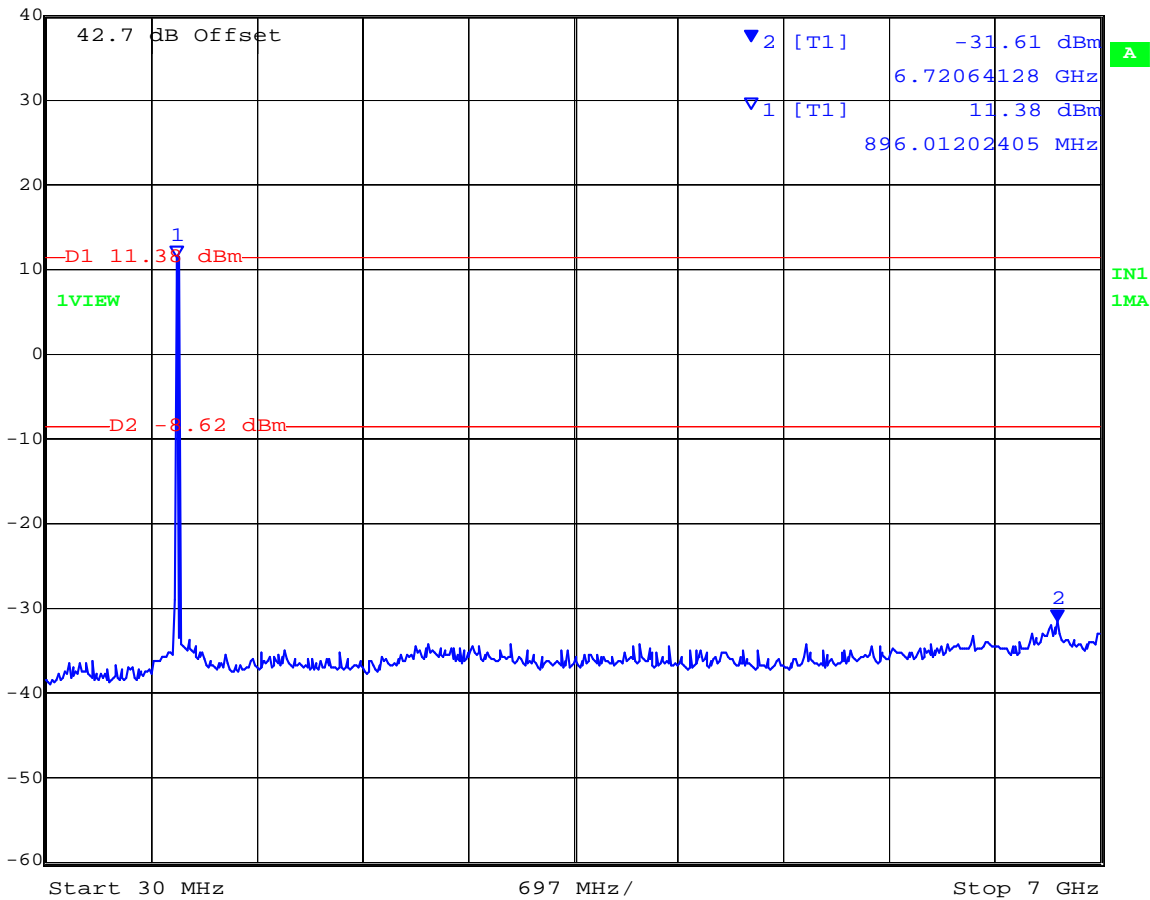
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
907	30	7,000	-31.61	-8.62	27	-22.99
907	7,000	10,000	-38.83	-8.62	28	-30.21

Plot 27 802.11g – 6 Mbit/s

907.0 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 2 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl -31.61 dBm VBW 300 kHz
 40 dBm 6.72064128 GHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:33:43

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Spurious Emissions (30 - 10,000 MHz)

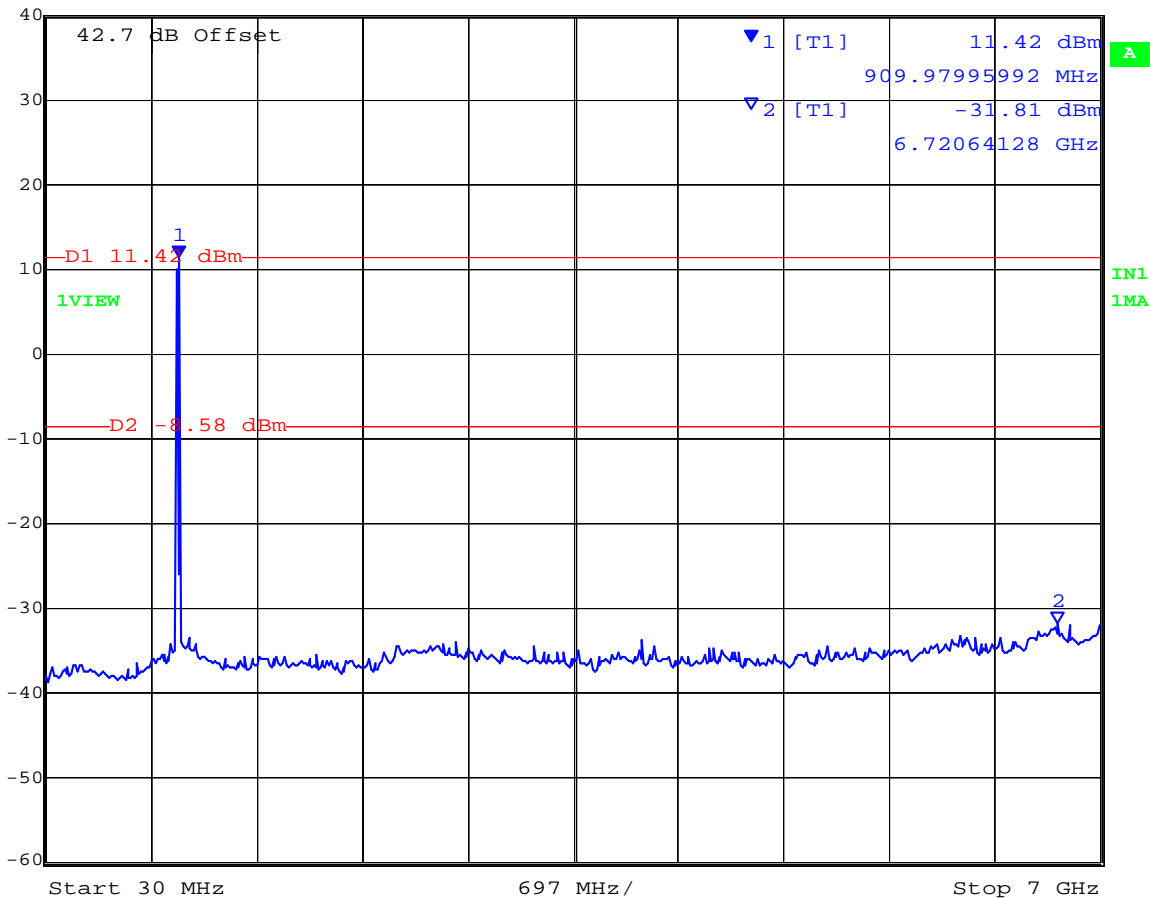
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
912	30	7,000	-31.81	-8.58	29	-23.23
912	7,000	10,000	-39.00	-8.58	30	-30.42

Plot 29 802.11g – 6 Mbit/s

912 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 11.42 dBm VBW 300 kHz
 40 dBm 909.97995992 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:35:48

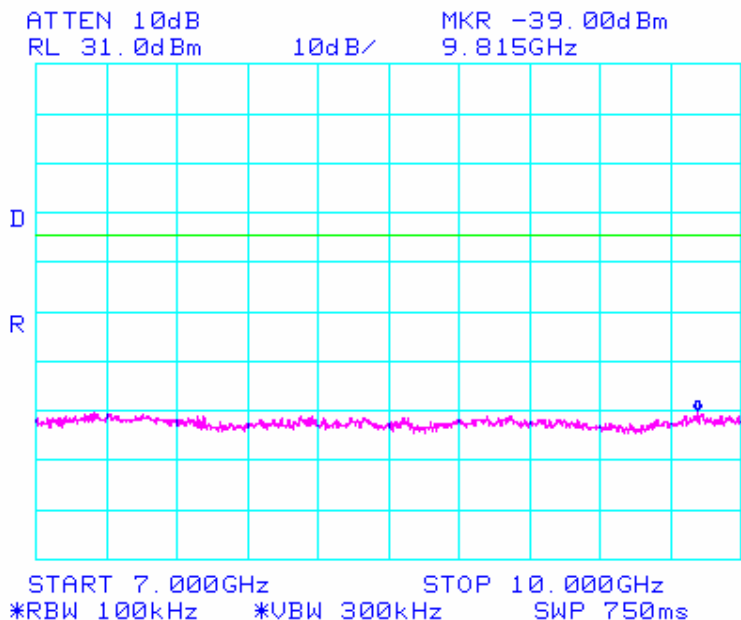
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 53 of 127

Plot 30 802.11g – 6 Mbit/s

912 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Spurious Emissions (30 - 10,000 MHz)

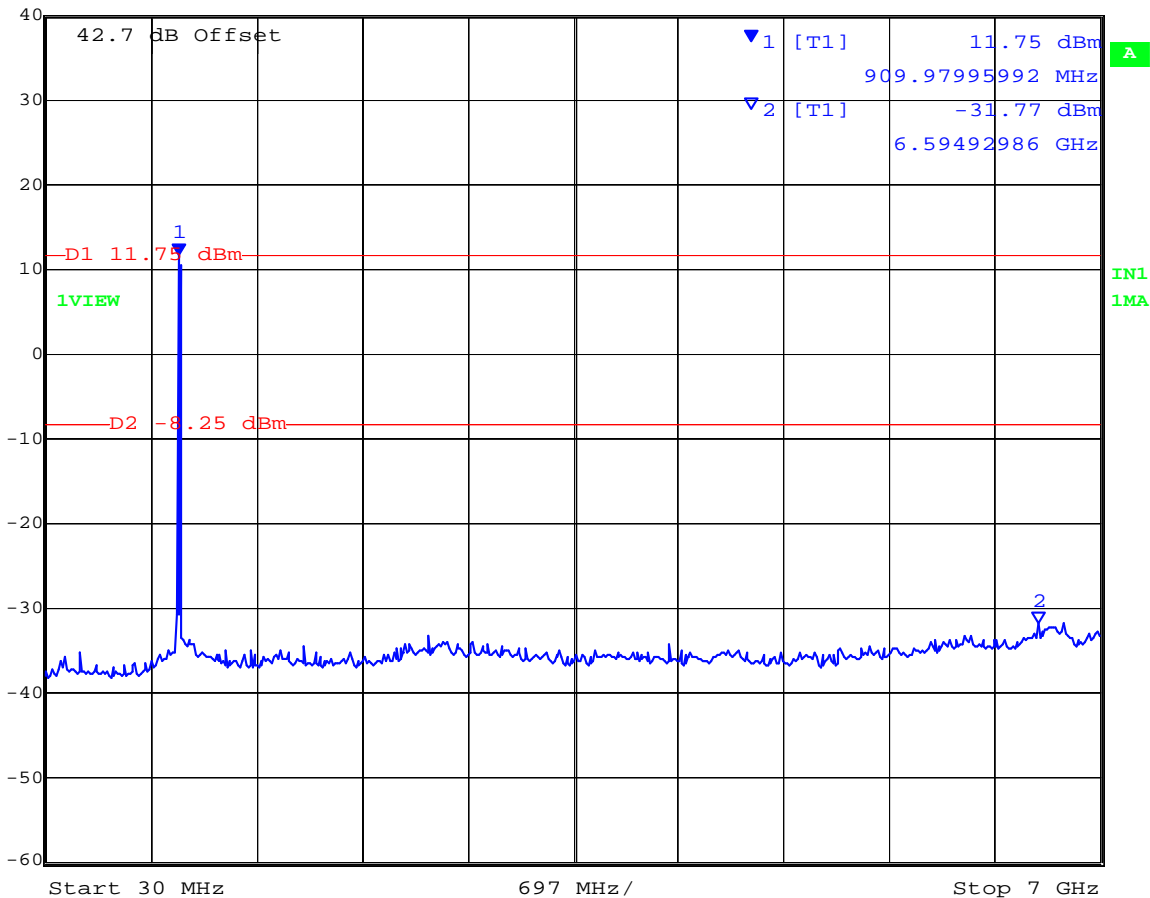
TABLE OF RESULTS – 802.11g – 6 Mbit/s , 10 MHz BW

Channel Centre Frequency (MHz)	Start Frequency (MHz)	Stop Frequency (MHz)	Maximum Emission Observed (dBm)	Limit (dBm)	Plot #	Margin (dB)
922	30	7,000	-31.77	-8.25	31	-23.52
922	7,000	10,000	-39.33	-8.25	32	-31.08

Plot 31 802.11g – 6 Mbit/s

922 MHz Conducted Spurious Emissions 30 MHz to 7,000 MHz

Marker 1 [T1] RBW 100 kHz RF Att 10 dB
 Ref Lvl 11.75 dBm VBW 300 kHz
 40 dBm 909.97995992 MHz SWT 1.75 s Unit dBm



Date: 15.JUN.2007 11:38:34

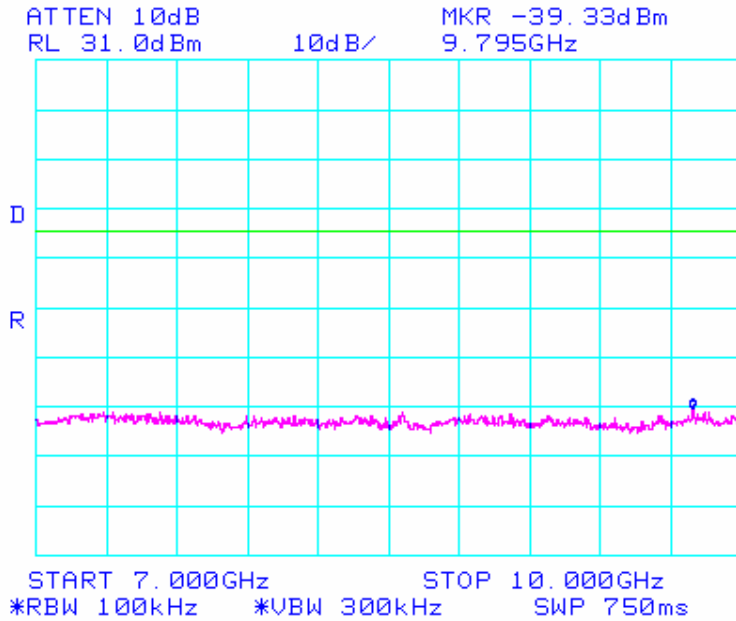
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 55 of 127

Plot 32 802.11g – 6 Mbit/s

922 MHz Conducted Spurious Emissions 7,000 MHz to 10,000 MHz



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 56 of 127

Specification

Limits Band-Edge

Lower Limit Band-edge	Upper Limit Band-edge	Limit below highest level of desired power
2,400 MHz	2,483.5 MHz	≥ 20 dB

§15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

§15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

RSS-Gen §4.9

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0088, 0158, 0193, 0252, 0313, 0314, 0223, 0116, 0117.

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5.1.6. Radiated Emissions

5.1.6.1. Transmitter Radiated Spurious Emissions (above 1 GHz)

FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209

Industry Canada RSS-210 §A8.5, §2.2, §2.6

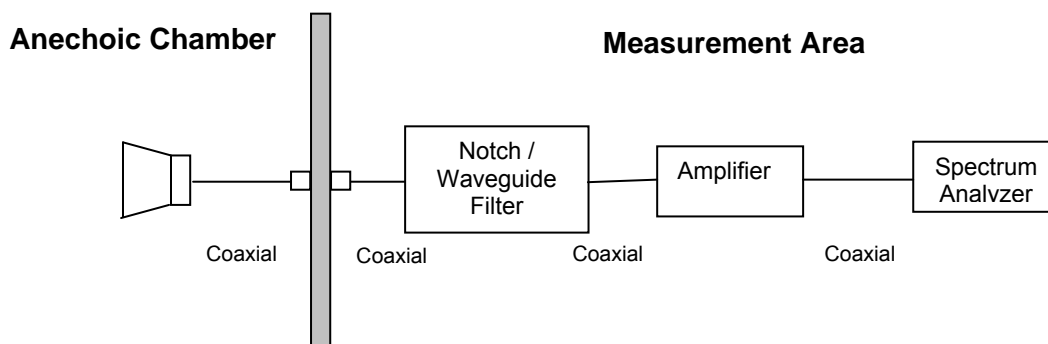
Industry Canada RSS-Gen §4.9

Test Procedure

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 58 of 127

For example:

Given receiver input reading of 51.5 dB μ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 59 of 127

12dBi Dipole Antenna BCD-87010

Radiated Spurious Emissions above 1 GHz

Ambient conditions.

Temperature: 17 to 23°C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

12dBi Dipole Antenna BCD-87010

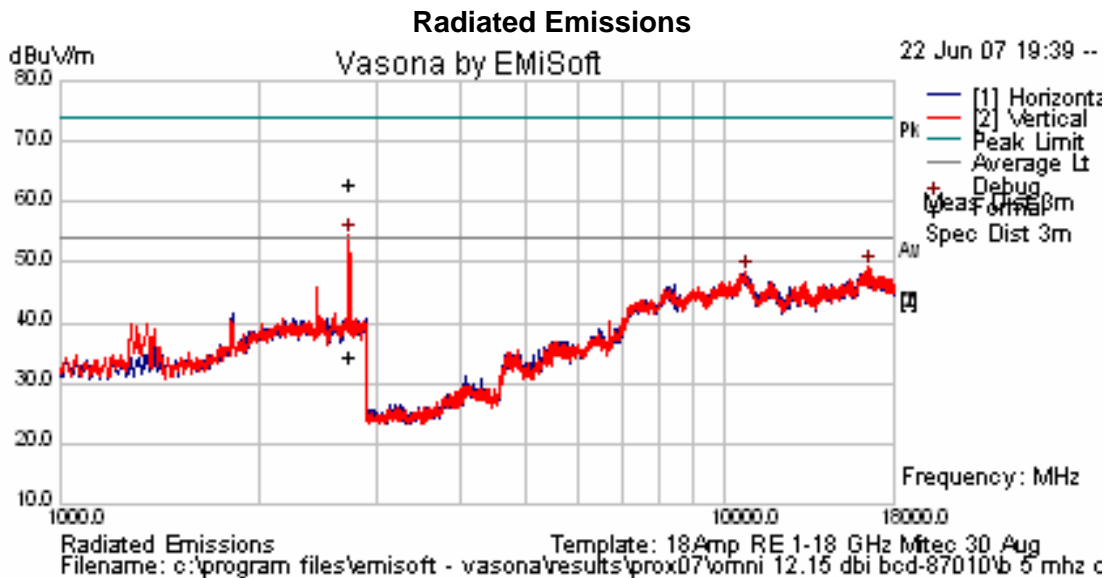
Test Setup b 5 MHz CS, Ch 907 MHz, 1.5 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dBμV)	Correction Factor (dB)	Corrected Peak Field Strength (dBμV/m)	Peak Limit (dBμV/m)	Margin (dB)
2722.400	V	69.25	-8.16	61.09	74	-12.91

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dBμV)	Correction Factor (dB)	Corrected Average Field Strength (dBμV/m)	Average Limit (dBμV/m)	Margin (dB)
2722.400	V	40.27	-8.16	32.11	54	-21.89



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12dBi Dipole Antenna BCD-87010
 Test Setup b 10 MHz CS, Ch 907 MHz, 1.5 Mbit/s, 100% Duty Cycle

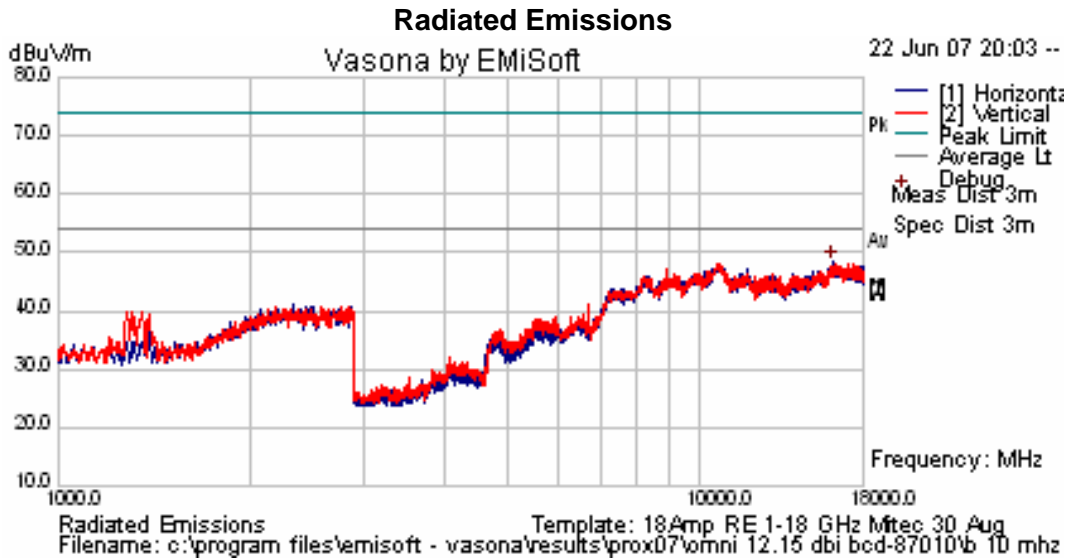
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)



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12dBi Dipole Antenna BCD-87010
 Test Setup b 10 MHz CS, Ch 912 MHz, 1 Mbit/s, 100% Duty Cycle

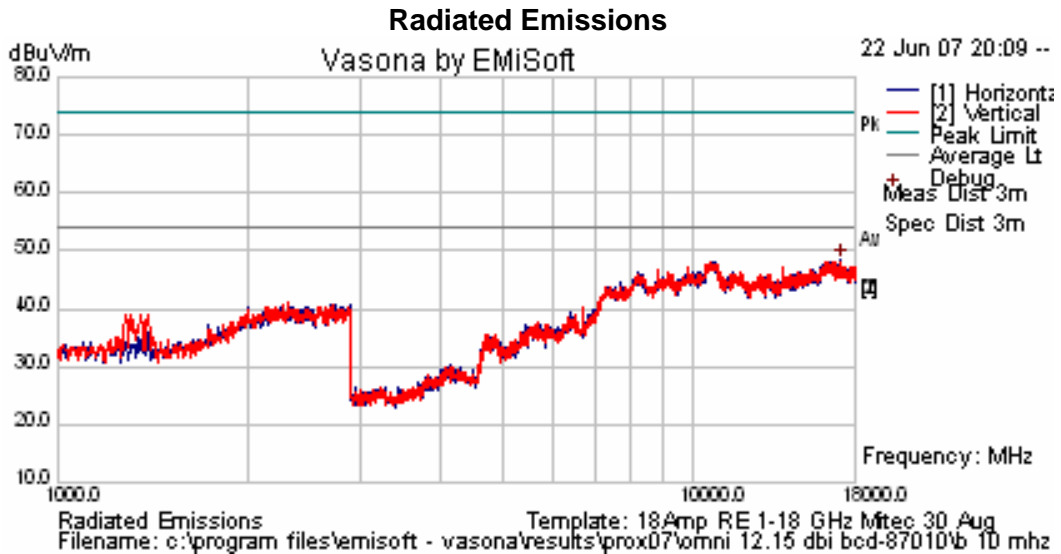
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)



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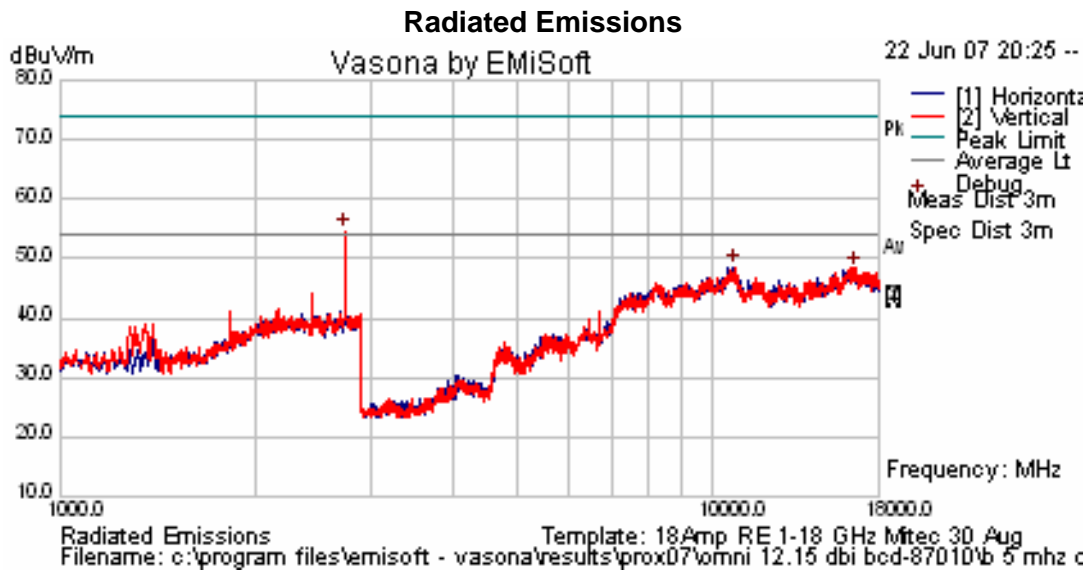
12dBi Dipole Antenna BCD-87010
 Test Setup b 5 MHz CS, Ch 912 MHz, 1.5 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
2741.667	V	62.84	-8.15	54.69	74	-19.31

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
2741.667	V	47.47	-8.15	39.32	54	-14.68



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12dBi Dipole Antenna BCD-87010
 Test Setup b 5 MHz CS, Ch 922 MHz, 1.5 Mbit/s, 100% Duty Cycle

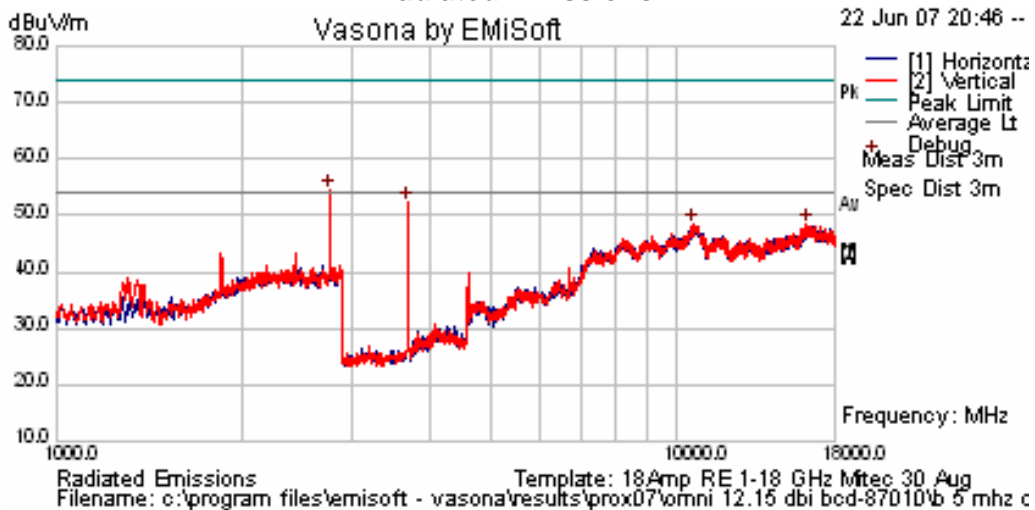
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
2770.167	V	62.67	-8.13	54.54	74	-19.46
3690.500	V	59.84	-7.55	52.29	74	-21.71
10620.000	H	42.50	+6.02	48.52	74	-25.48
16191.670	V	38.50	+10.04	48.54	74	-25.46

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
2770.167	V	47.70	-8.13	39.57	54	-14.43
3690.500	V	43.98	-7.55	36.43	54	-17.57
10620.000	H	40.15	+6.02	46.17	54	-7.83
16191.670	V	37.23	+10.04	47.27	54	-6.73

Radiated Emissions



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 64 of 127

12dBi Dipole Antenna BCD-87010
 Test Setup b 10 MHz CS, Ch 922 MHz, 1.5 Mbit/s, 100% Duty Cycle

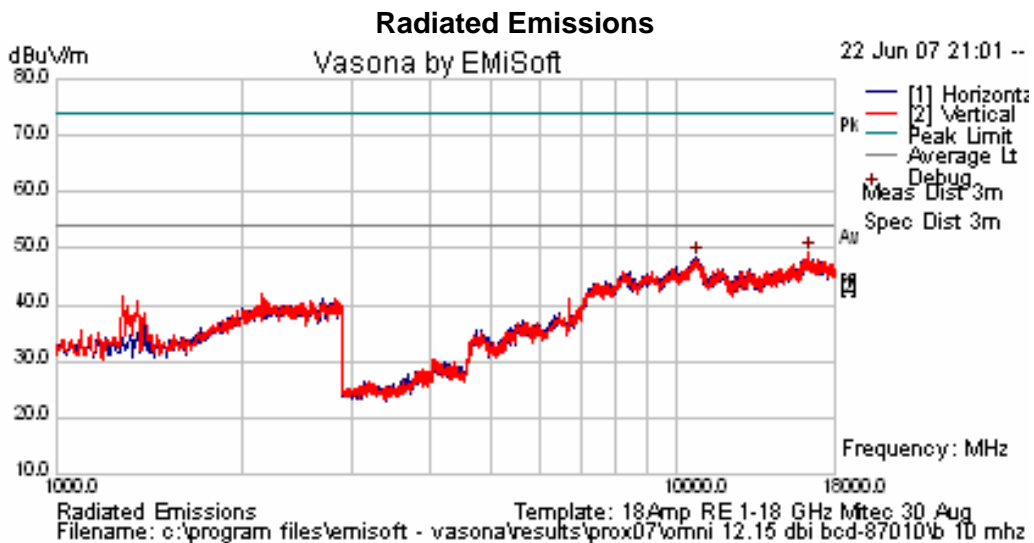
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)



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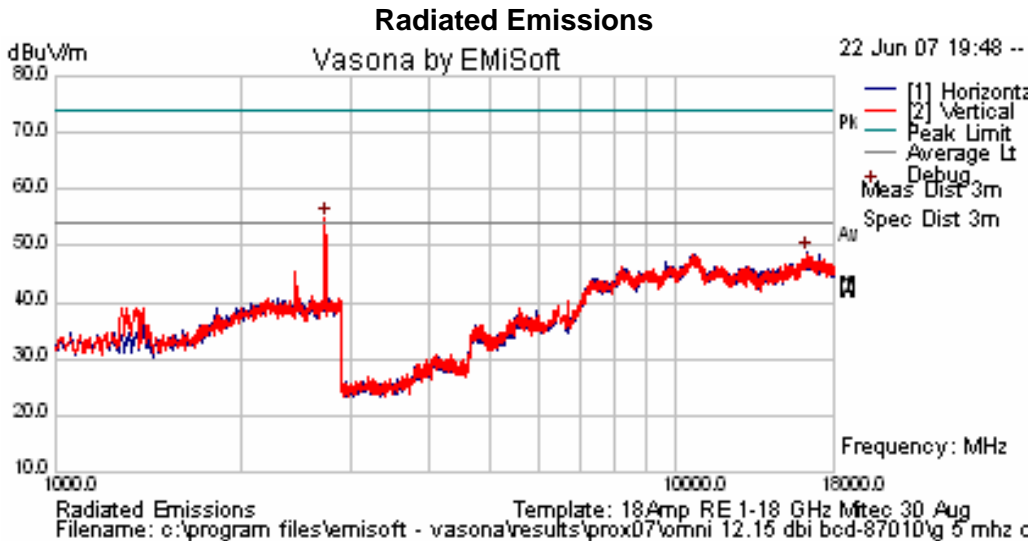
12dBi Dipole Antenna BCD-87010
 Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
2725.833	V	63.00	-8.16	54.84	74	-19.16

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
2725.833	V	46.95	-8.16	38.79	54	-15.21



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 66 of 127

12dBi Dipole Antenna BCD-87010
 Test Setup g 10 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

Peak

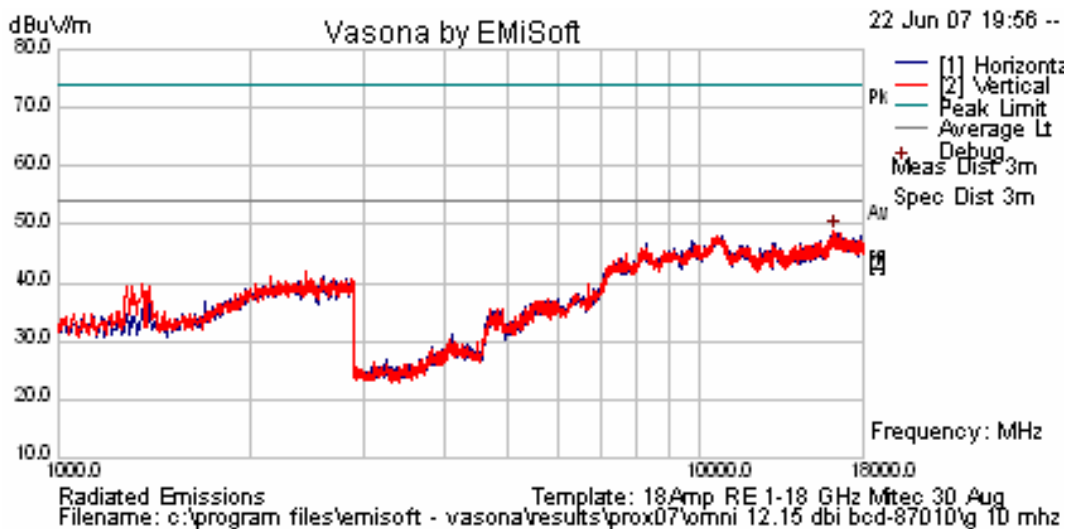
Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)

Radiated Emissions



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 67 of 127

12dBi Dipole Antenna BCD-87010
 Test Setup g 10 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

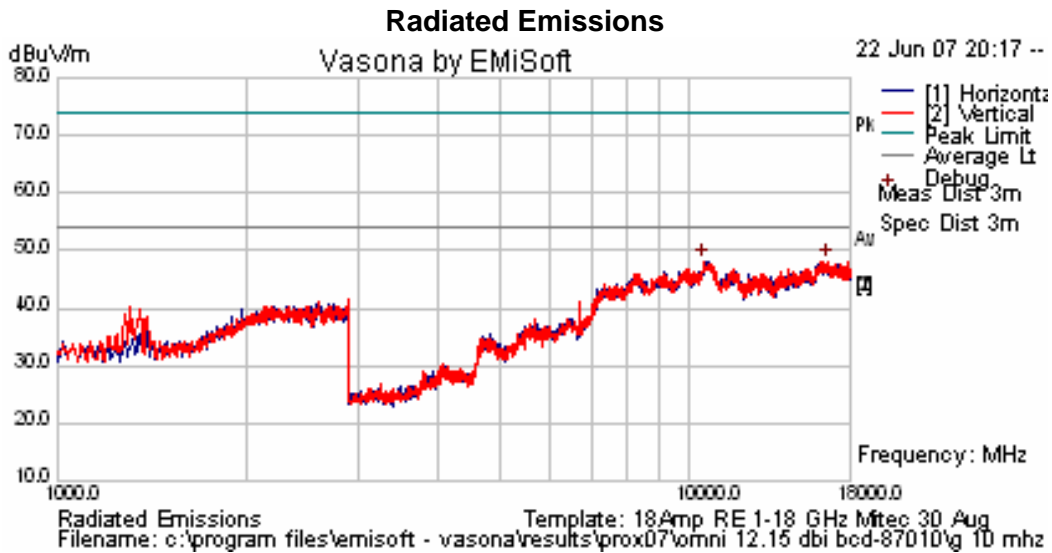
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 68 of 127

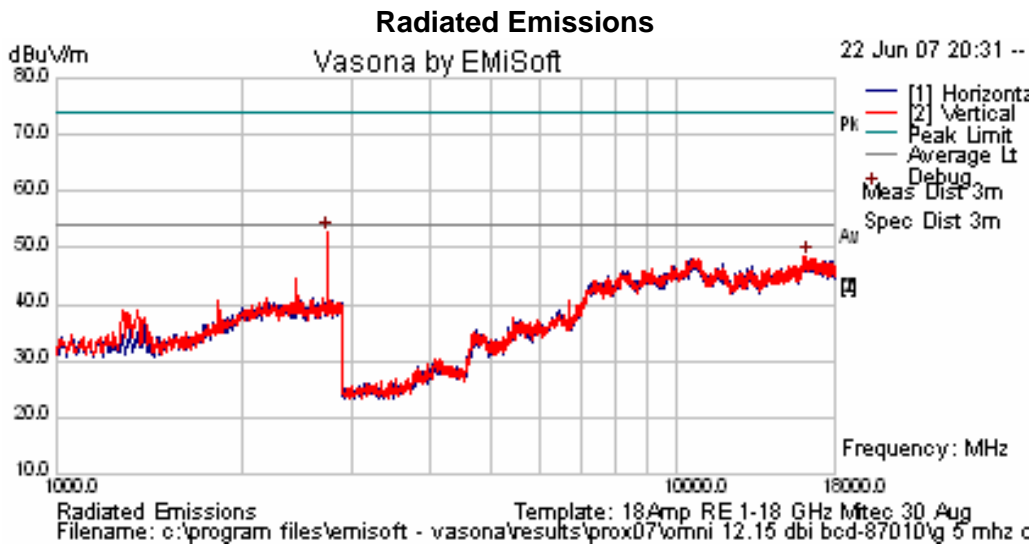
12dBi Dipole Antenna BCD-87010
 Test Setup g 5 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
2744.833	V	60.84	-8.14	52.70	74	-21.30

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
2744.833	V	48.37	-8.14	40.23	54	-13.77



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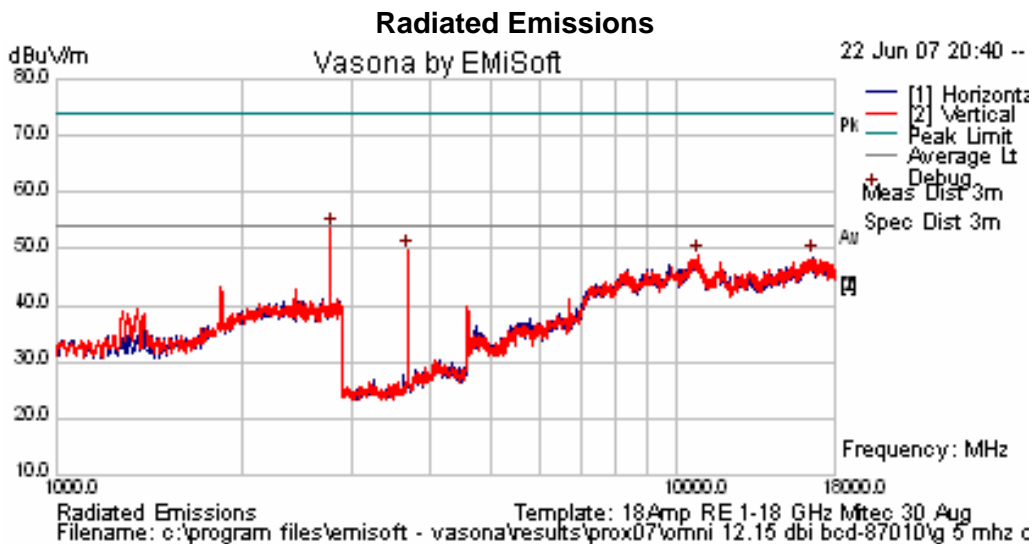
12dBi Dipole Antenna BCD-87010
 Test Setup g 5 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
2770.167	V	62.91	-8.13	54.78	74	-19.22
3690.500	V	56.77	-7.55	49.22	74	-24.78
10620.000	H	43.15	+6.02	49.17	74	-24.83
16191.670	V	38.21	+10.04	48.25	74	-25.75

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
2770.167	V	47.7	-8.13	39.57	54	-14.43
3690.500	V	43.98	-7.55	36.43	54	-17.57
10620.000	H	40.15	+6.02	46.17	54	-7.83
16191.670	V	37.23	+10.04	47.27	54	-6.73



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12dBi Dipole Antenna BCD-87010
 Test Setup g 10 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

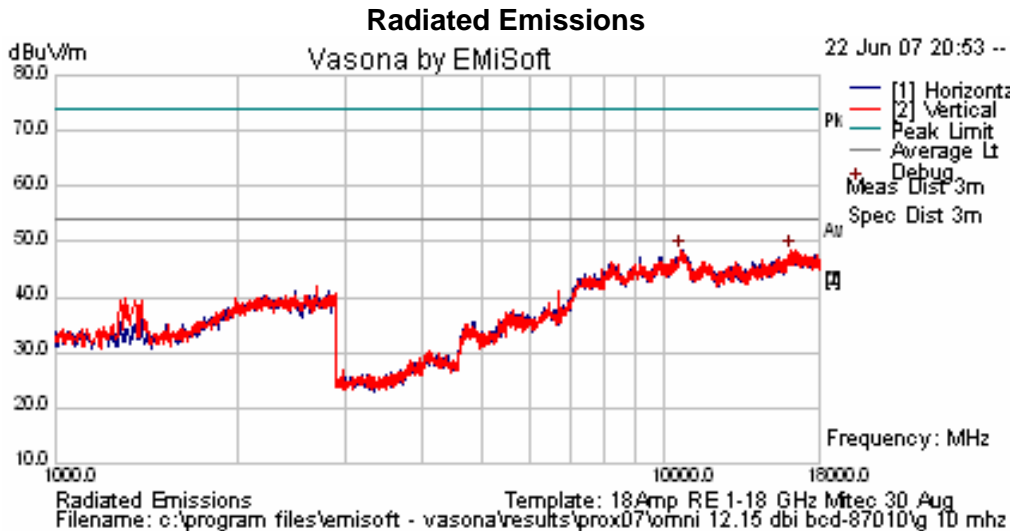
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

All peak emissions were found to be below the average limit (54 dB μ V/m)



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 71 of 127

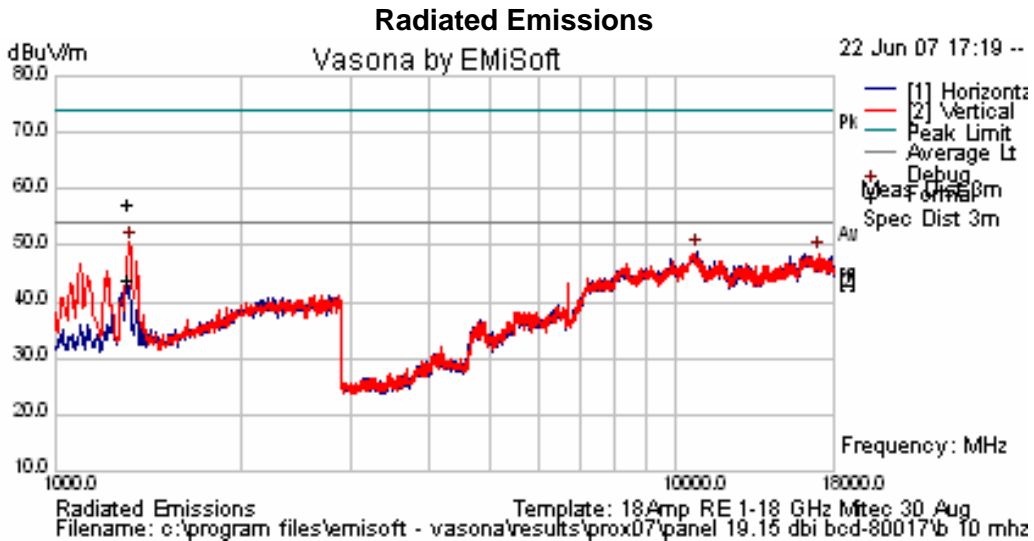
19dBi Panel Antenna RWA-80017
 Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1314.623	V	68.54	-13.41	55.13	74	-18.87

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1314.623	V	55.13	-13.41	41.72	54	-12.28



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19dBi Panel Antenna RWA-80017
 Test Setup b 5 MHz CS, Ch 907 MHz, 1.375 Mbit/s, 100% Duty Cycle

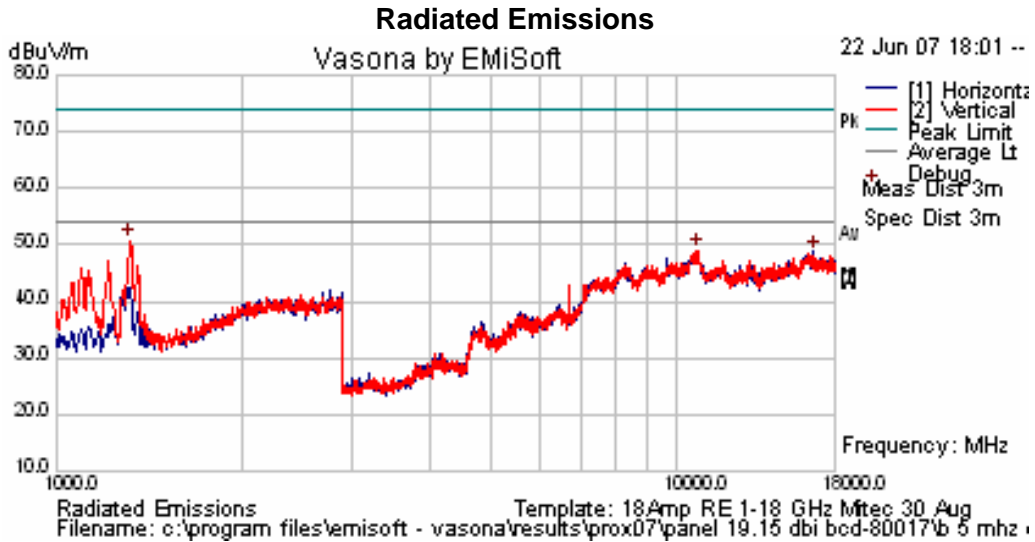
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup b 5 MHz CS, Ch 912 MHz, 1.375 Mbit/s, 100% Duty Cycle

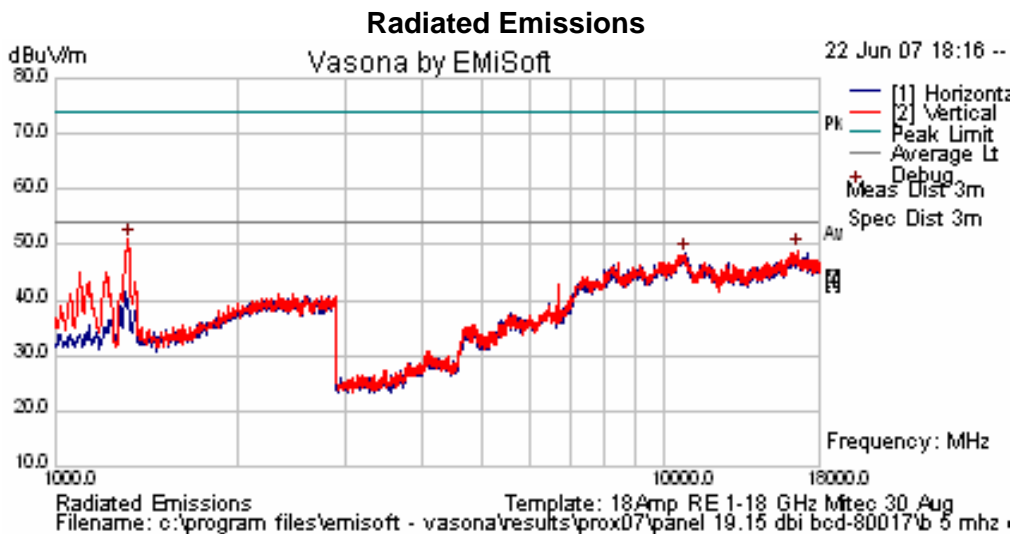
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup b 10 MHz CS, Ch 912 MHz, 1 Mbit/s, 100% Duty Cycle

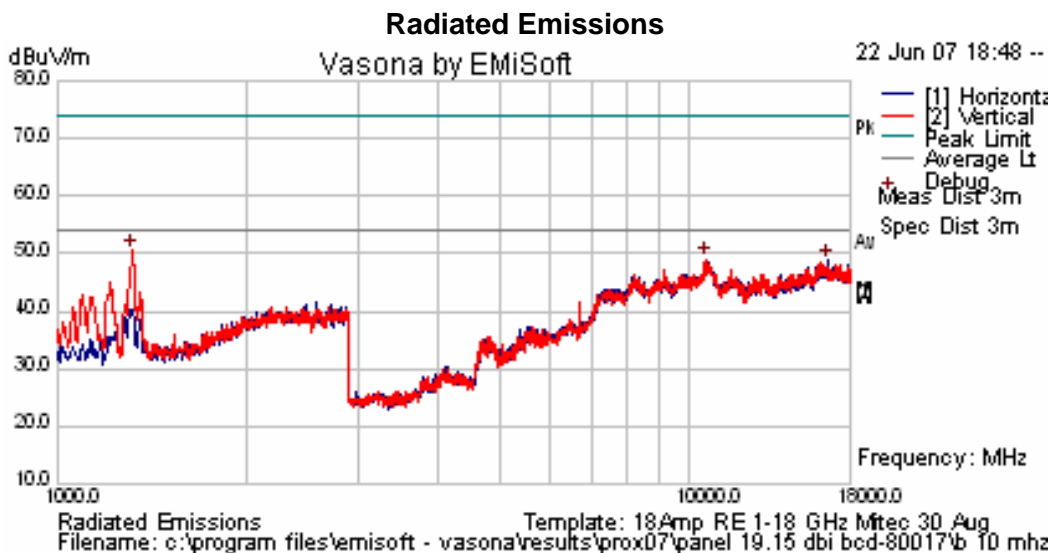
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup b 10 MHz CS, Ch 922 MHz, 1 Mbit/s, 100% Duty Cycle

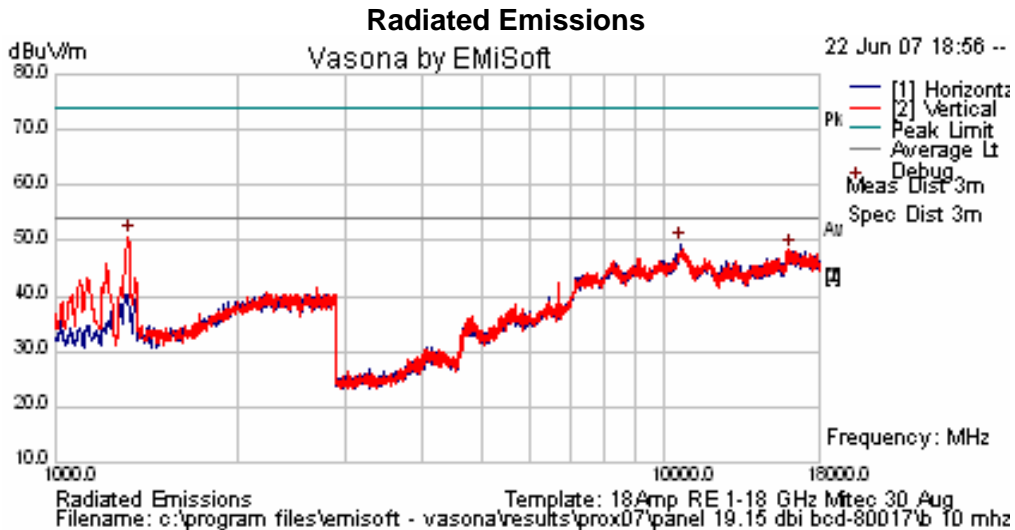
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 76 of 127

19dBi Panel Antenna RWA-80017
 Test Setup b 5 MHz CS, Ch 922 MHz, 1.5 Mbit/s, 100% Duty Cycle

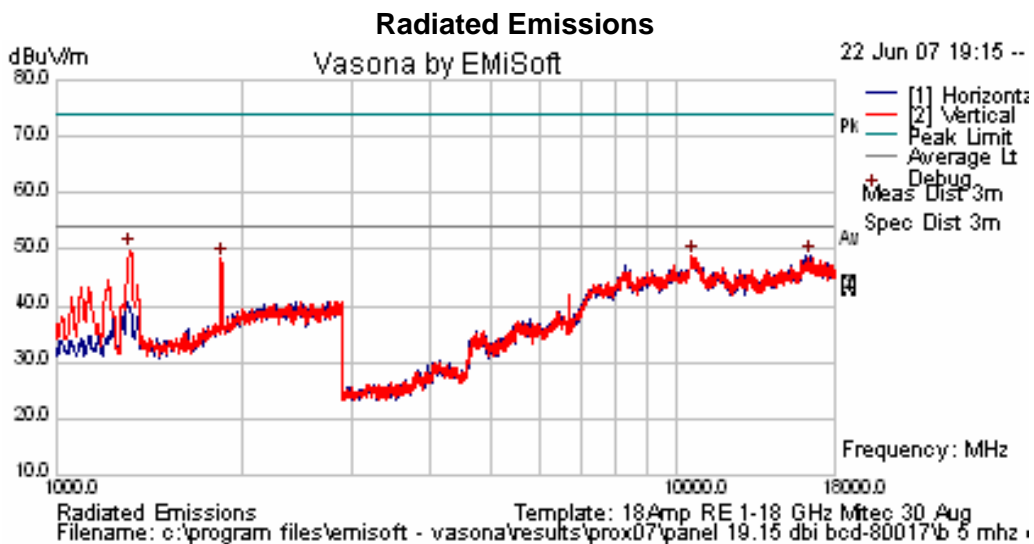
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1845.5	V	58.17	-9.84	48.33	74	-25.67

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1845.5	V	47.34	-9.84	37.50	54	-16.50

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 77 of 127

19dBi Panel Antenna RWA-80017
 Test Setup g 10 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

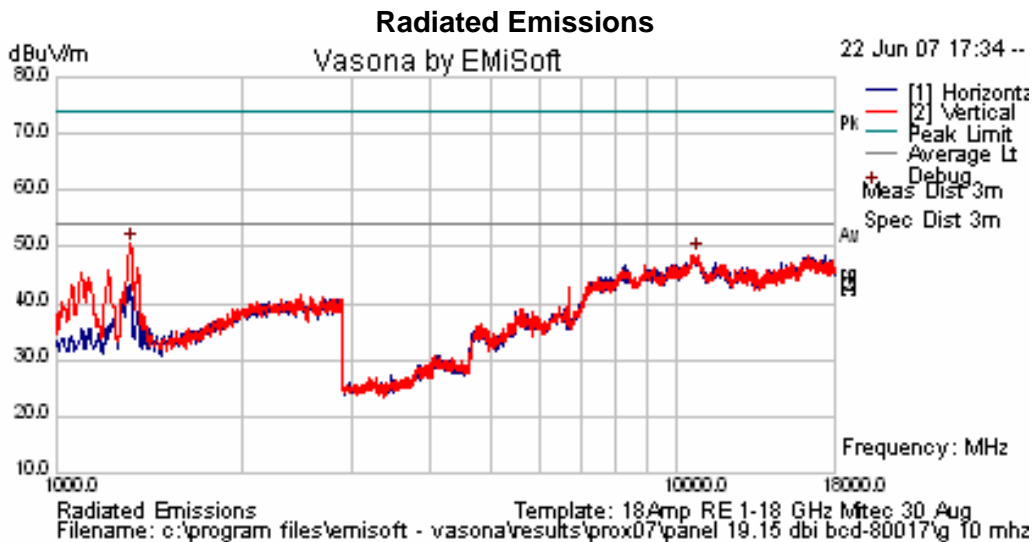
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

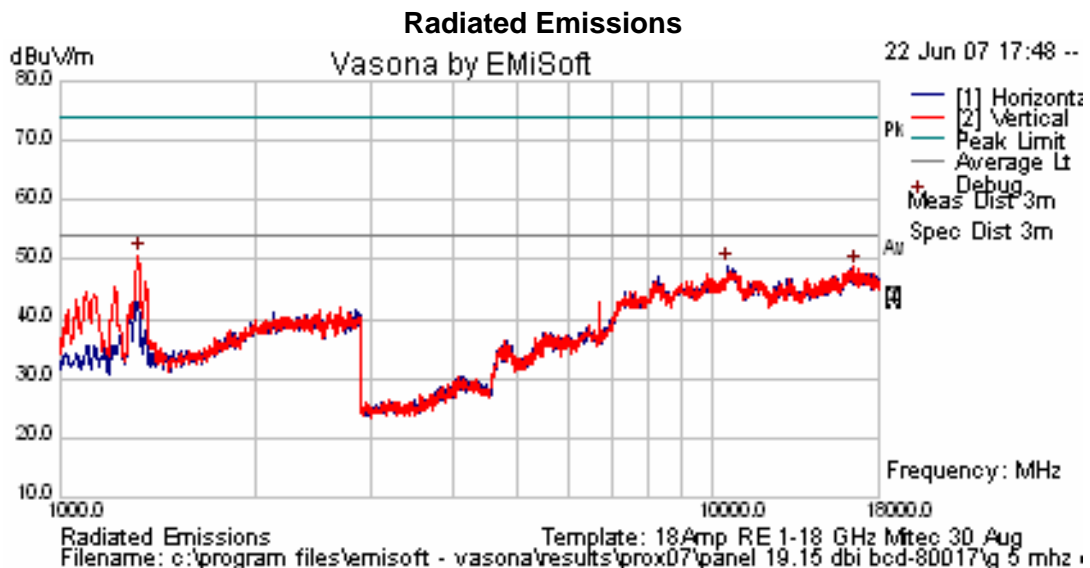
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 79 of 127

19dBi Panel Antenna RWA-80017
 Test Setup g 5 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

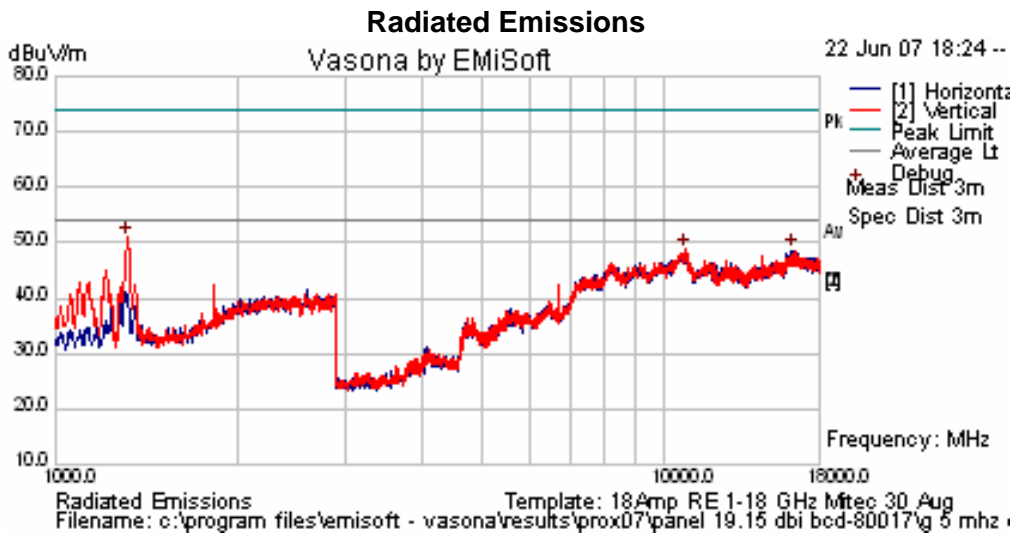
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup g 10 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

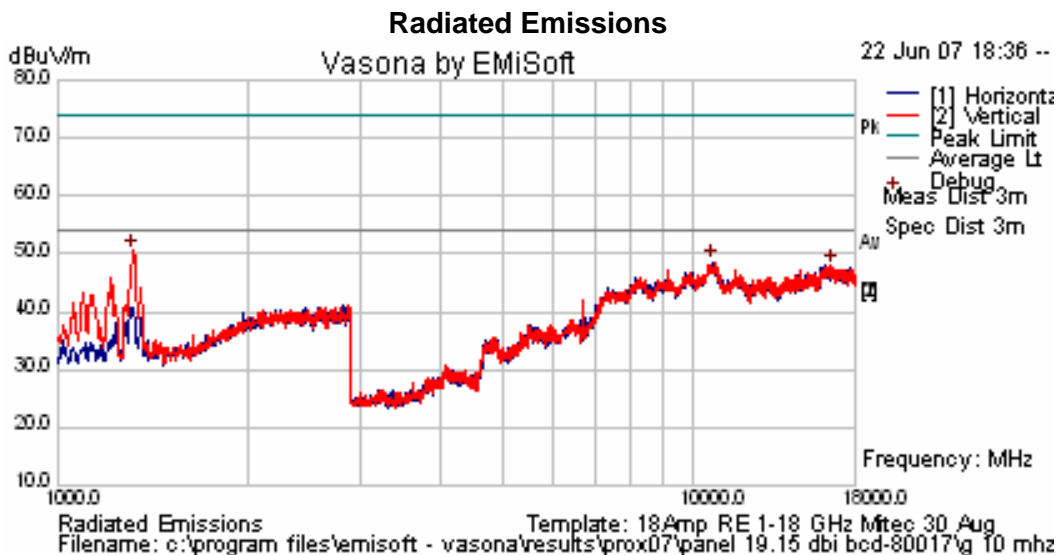
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 81 of 127

19dBi Panel Antenna RWA-80017
 Test Setup g 10 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

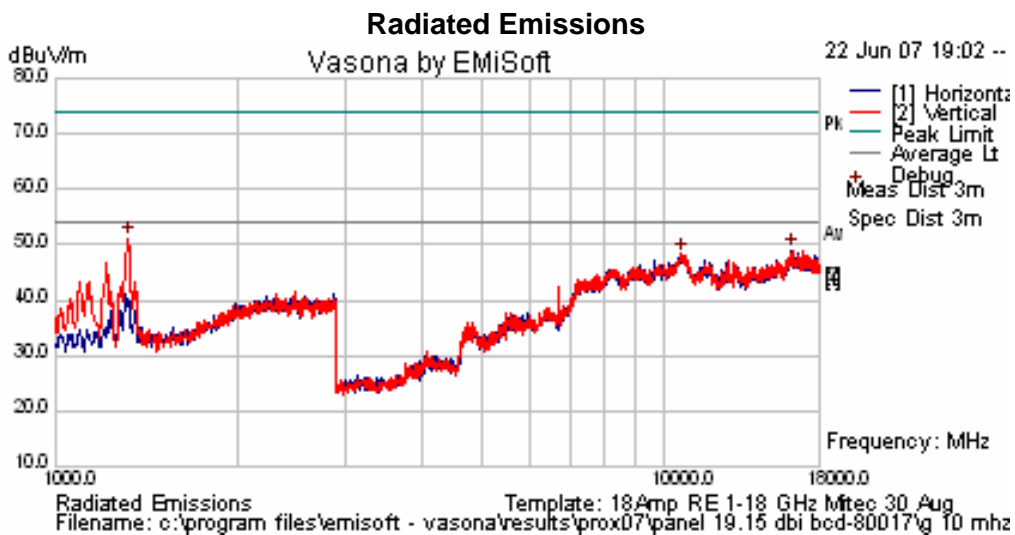
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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19dBi Panel Antenna RWA-80017
 Test Setup g 5 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

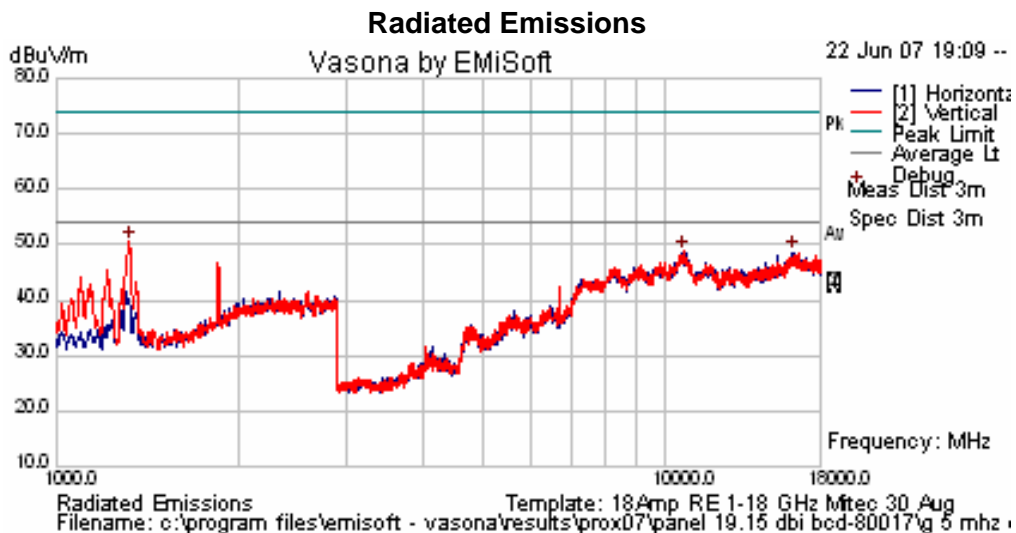
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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12dBi Patch Antenna MT-263006N
 Test Setup b 5 MHz CS, Ch 907 MHz, 1.5 Mbit/s, 100% Duty Cycle

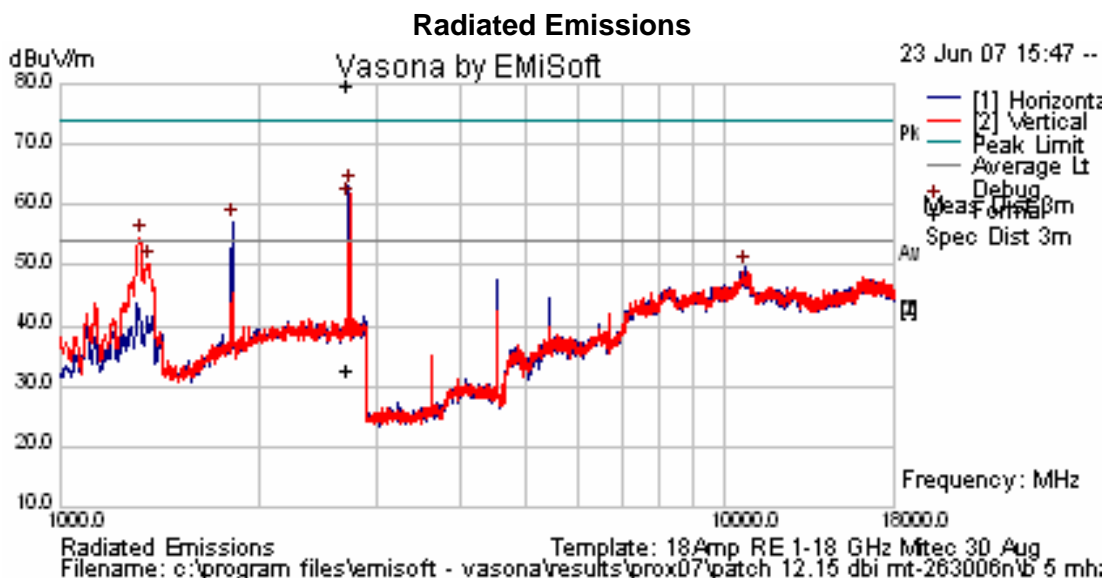
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1820.167	H	67.34	-10.04	57.30	74	-16.70
2717.075	H	86.15	-8.17	77.98	74	-3.98

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1820.167	H	50.91	-10.04	40.87	54	-13.13
2717.075	H	38.63	-8.17	30.46	54	-23.54

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 84 of 127

12dBi Patch Antenna MT-263006N
 Test Setup b 10 MHz CS, Ch 907 MHz, 1 Mbit/s, 100% Duty Cycle

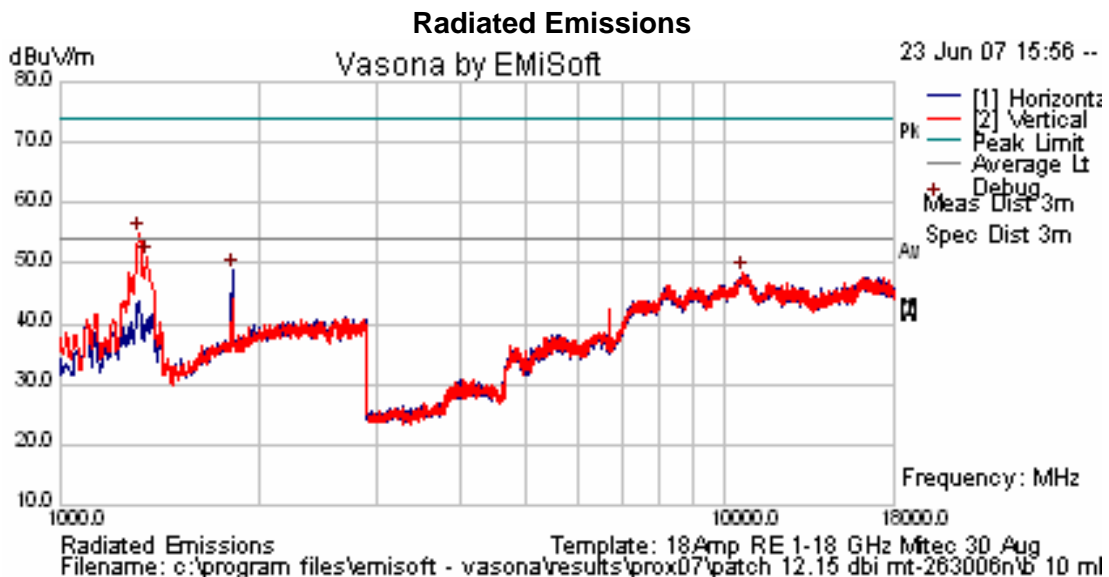
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1817.000	H	58.84	-10.06	48.78	74	-25.22

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1817.000	H	50.29	-10.06	40.23	54	-13.77

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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12dBi Patch Antenna MT-263006N
 Test Setup b 10 MHz CS, Ch 912 MHz, 1 Mbit/s, 100% Duty Cycle

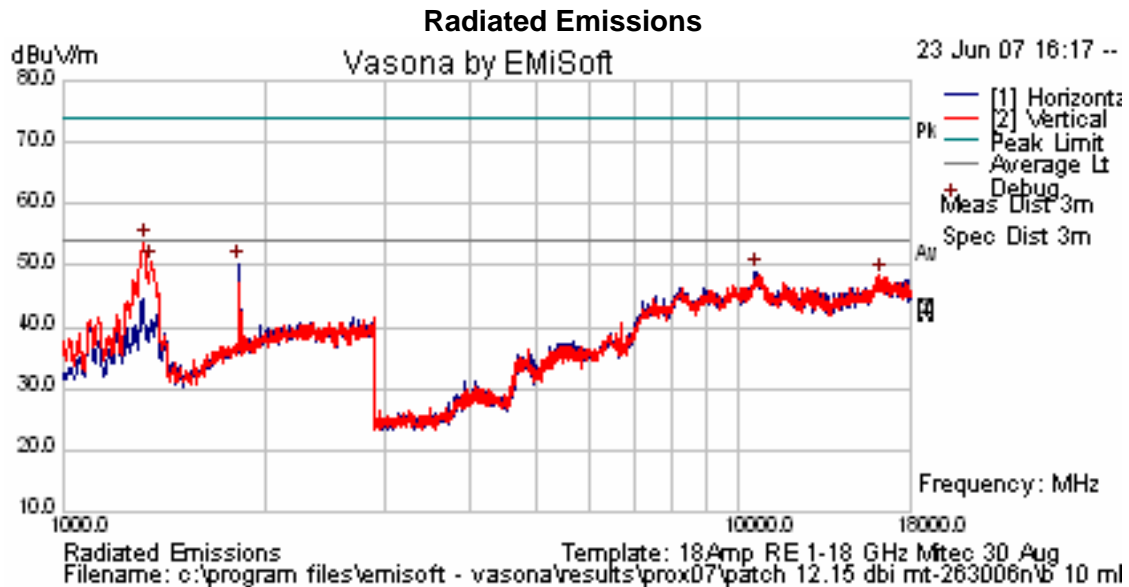
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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12dBi Patch Antenna MT-263006N
 Test Setup b 5 MHz CS, Ch 912 MHz, 1 Mbit/s, 100% Duty Cycle

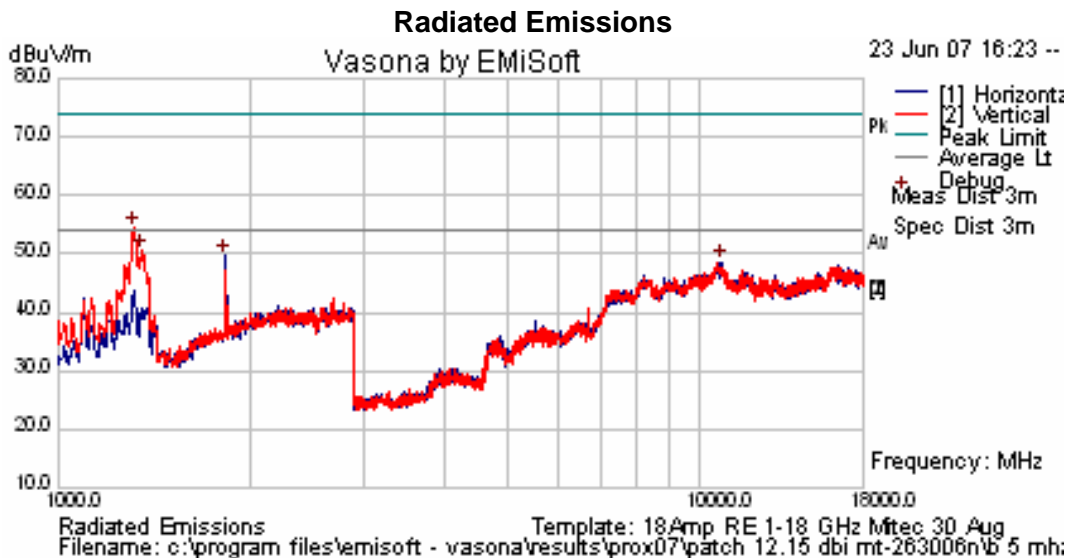
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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12dBi Patch Antenna MT-263006N
 Test Setup b 5 MHz CS, Ch 922 MHz, 1.5 Mbit/s, 100% Duty Cycle

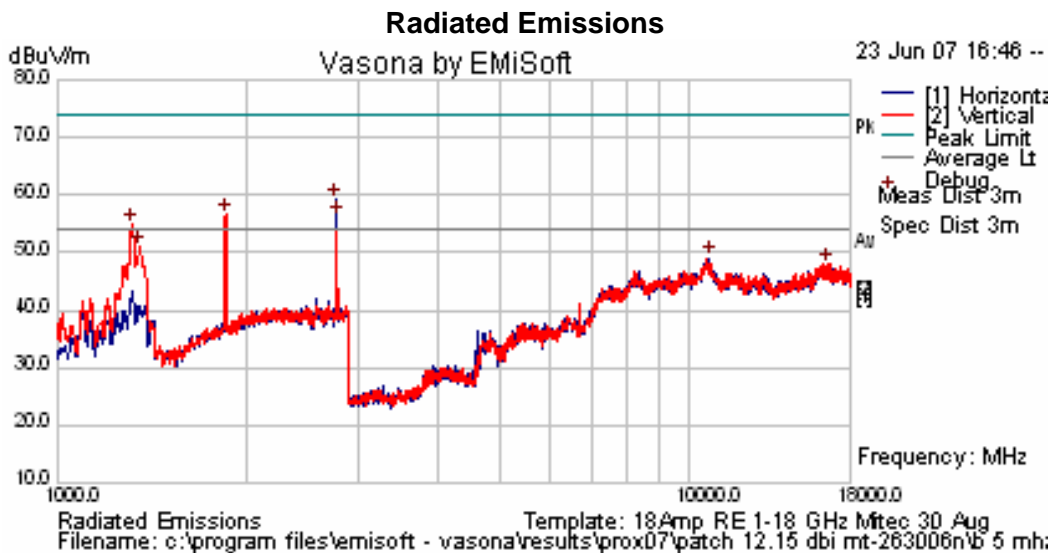
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1848.667	V	65.98	-9.81	56.17	74	-17.83
2763.833	H	67.46	-8.14	59.32	74	-14.68

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1848.667	V	50.44	-9.81	40.63	54	-13.37
2763.833	H	48.11	-8.14	39.97	54	-14.03

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 88 of 127

12dBi Patch Antenna MT-263006N
 Test Setup b 10 MHz CS, Ch 922 MHz, 1.5 Mbit/s, 100% Duty Cycle

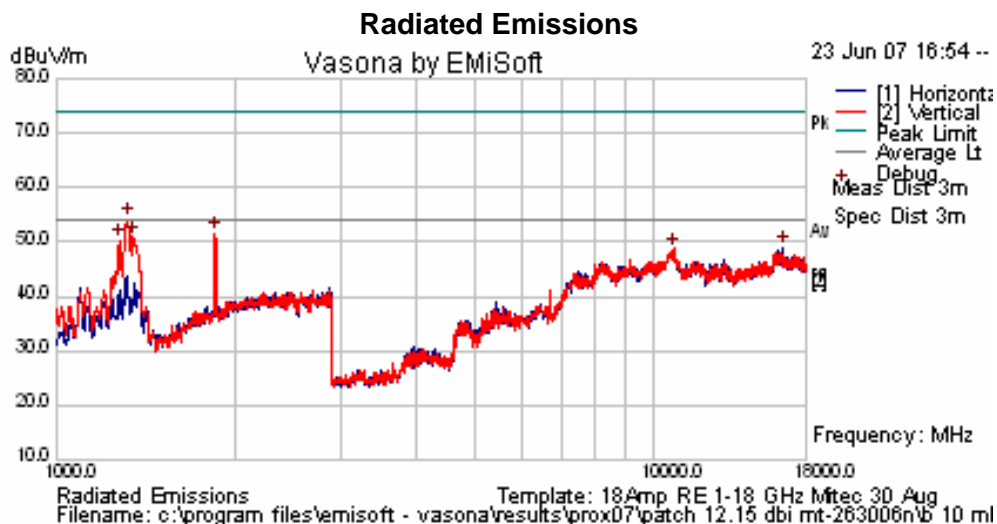
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1845.500	V	61.50	-9.84	51.66	74	-22.34

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1845.500	V	48.11	-9.84	38.27	54	-15.73

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup b 10 MHz CS, Ch 907 MHz, 2.75 Mbit/s on page 74 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 89 of 127

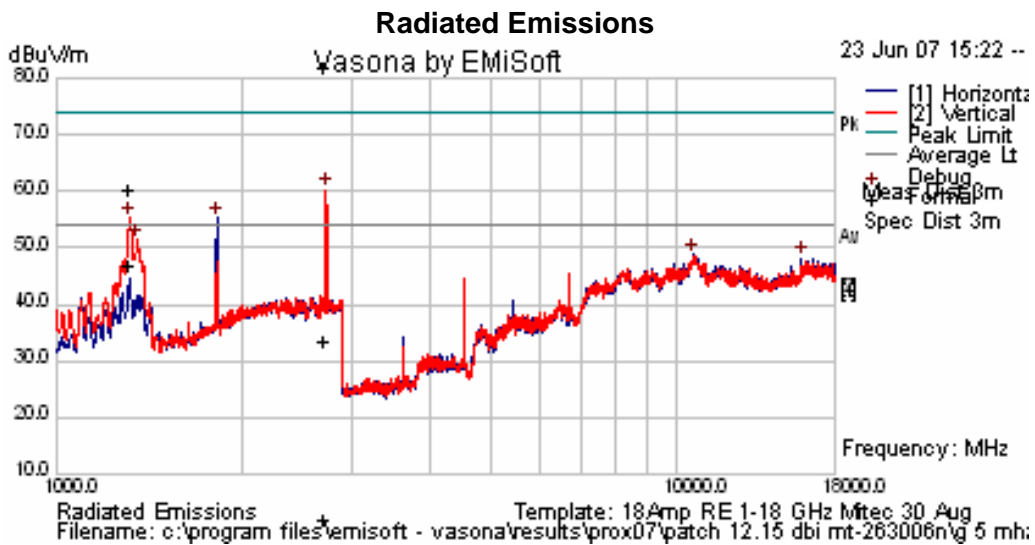
12dBi Patch Antenna MT-263006N
 Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1314.267	V	68.84	-13.40	55.44	74	-18.56
1820.167	H	65.34	-10.04	55.30	74	-18.70
2719.083	V	68.50	-8.16	60.34	74	-13.66

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1314.267	V	58.32	-13.40	44.92	54	-9.08
1820.167	H	51.77	-10.04	41.73	54	-12.27
2719.083	V	48.43	-8.16	40.27	54	-13.73



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 90 of 127

12dBi Patch Antenna MT-263006N
 Test Setup g 10 MHz CS, Ch 907 MHz, 6 Mbit/s, 100% Duty Cycle

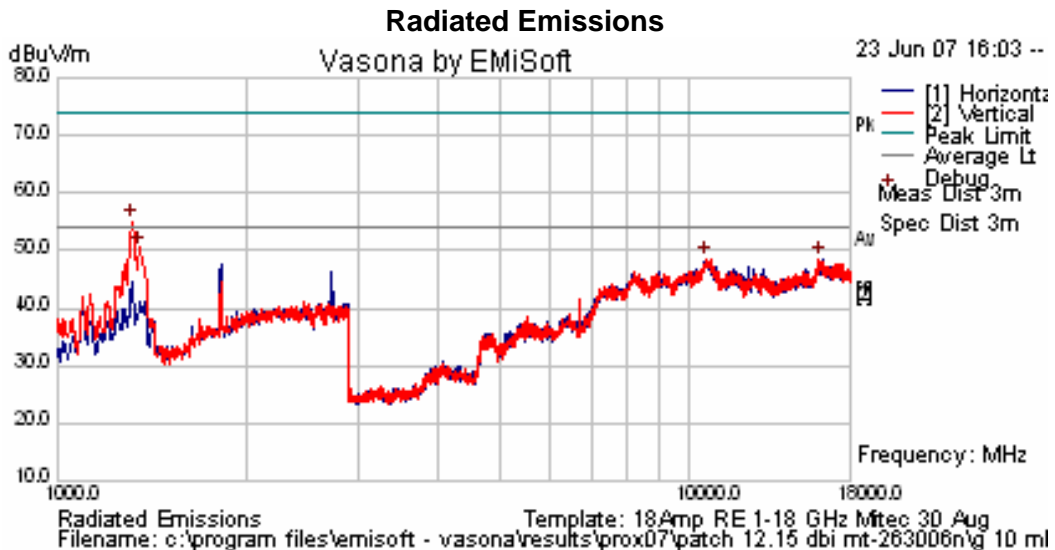
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s on page 92 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 91 of 127

12dBi Patch Antenna MT-263006N
 Test Setup g 10 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

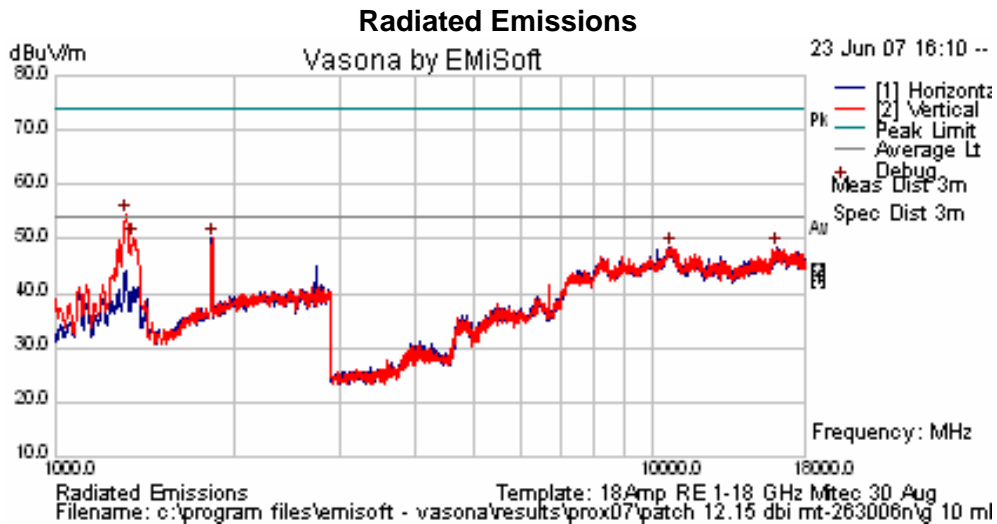
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
					74	

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
					54	

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s on page 92 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 92 of 127

12dBi Patch Antenna MT-263006N
 Test Setup g 5 MHz CS, Ch 912 MHz, 6 Mbit/s, 100% Duty Cycle

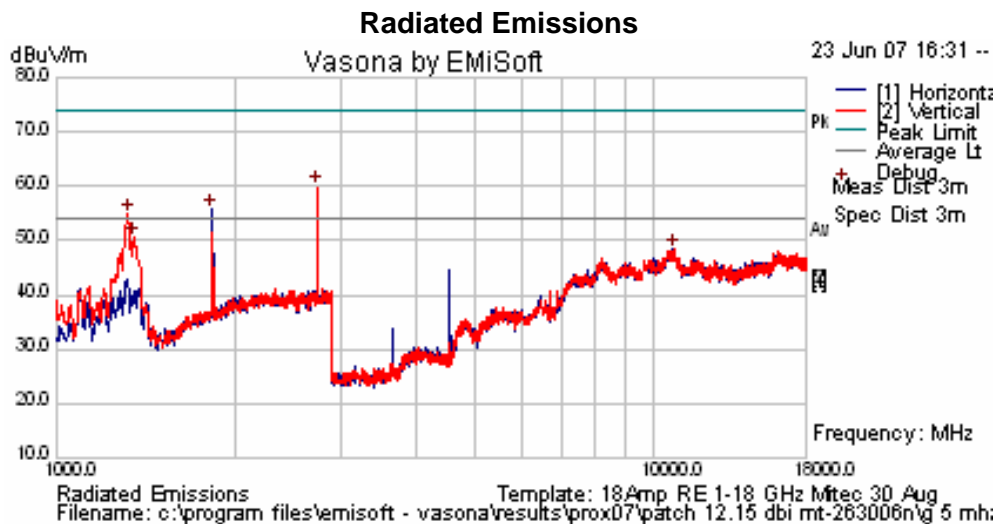
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1823.333	H	65.84	-10.01	55.83	74	-18.17
2741.667	V	68.00	-9.15	59.85	74	-14.15

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1823.333	H	50.80	-10.01	40.79	54	-13.21
2741.667	V	49.78	-9.15	40.63	54	-13.37

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s on page 92 of this report.



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12dBi Patch Antenna MT-263006N
 Test Setup g 5 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

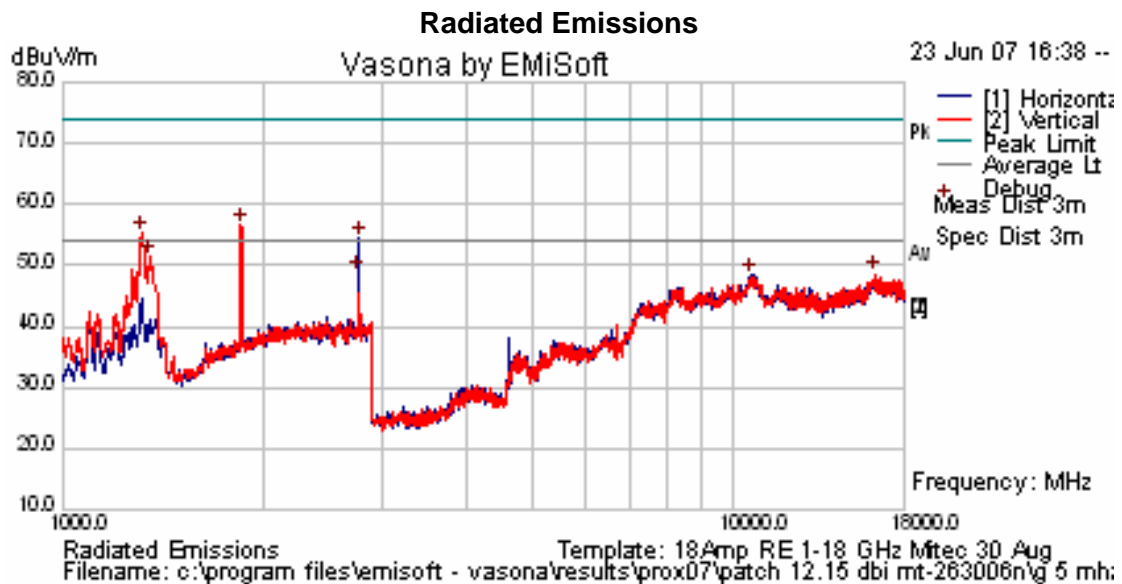
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1845.500	V	66.50	-9.84	56.66	74	-17.34
2773.333	H	62.67	-8.13	54.54	74	-19.46

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1845.500	V	52.41	-9.84	42.57	54	-11.43
2773.333	H	48.28	-8.13	40.15	54	-13.85

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s on page 92 of this report.



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 94 of 127

12dBi Patch Antenna MT-263006N
 Test Setup g 10 MHz CS, Ch 922 MHz, 6 Mbit/s, 100% Duty Cycle

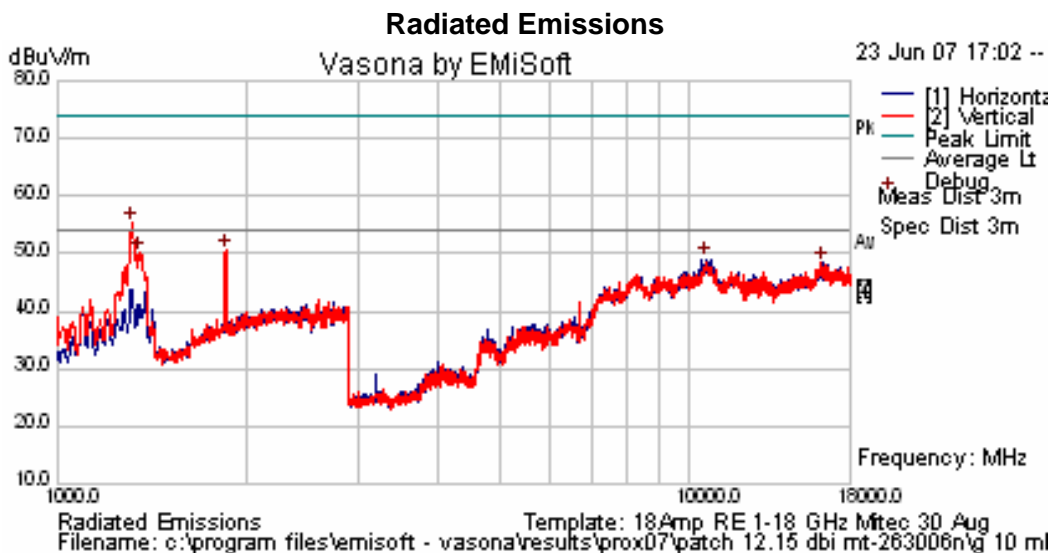
Peak

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Peak Field Strength (dB μ V/m)	Peak Limit (dB μ V/m)	Margin (dB)
1848.667	V	60.34	-9.81	50.53	74	-23.47

Average

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V)	Correction Factor (dB)	Corrected Average Field Strength (dB μ V/m)	Average Limit (dB μ V/m)	Margin (dB)
1848.667	V	48.57	-9.81	38.76	54	-15.24

The same 1315 MHz emission was observed during this scan as measured and characterized in the previous scan for Test Setup g 5 MHz CS, Ch 907 MHz, 6 Mbit/s on page 92 of this report.



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12dBi Dipole Antenna BCD-87010

Band Edge - Restricted Bands Test Results

TABLE OF RESULTS – 802.11b – 5 MHz BW 1.375 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	35.18	46	-10.82

TABLE OF RESULTS – 802.11g – 5 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	50.26	54	-3.76

TABLE OF RESULTS – 802.11b – 10 MHz BW 1 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	34.23	46	-11.77

TABLE OF RESULTS – 802.11g – 10 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	49.19	54	-4.81

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19dBi Panel Antenna RWA-80017

Band Edge - Restricted Bands Test Results

TABLE OF RESULTS – 802.11b – 5 MHz BW 1.375 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	37.23	46	-8.77

TABLE OF RESULTS – 802.11g – 5 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	52.17	54	-1.83

TABLE OF RESULTS – 802.11b – 10 MHz BW 1 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	36.78	46	-9.22

TABLE OF RESULTS – 802.11g – 10 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	51.46	54	-2.54

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12dBi Patch Antenna MT-263006N

Band Edge - Restricted Bands Test Results

TABLE OF RESULTS – 802.11b – 5 MHz BW 1.375 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	36.48	46	-9.52

TABLE OF RESULTS – 802.11g – 5 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	51.36	54	-2.64

TABLE OF RESULTS – 802.11b – 10 MHz BW 1 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
907.0	614.0	35.23	46	-10.77

TABLE OF RESULTS – 802.11g – 10 MHz BW 6 Mb/s, 100 % Duty Cycle

Tx Freq. (MHz)	Restricted Band Edge Frequency (MHz)	QP Measured (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)
922.0	960.0	50.15	54	-3.85



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 98 of 127

Specification Limits

FCC §15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

FCC §15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

IC RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

IC RSS-Gen §4.9

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

FCC §15.205 (a) Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

FCC §15.205 (a) Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

FCC §15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 99 of 127

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

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5.1.6.2. Receiver Radiated Spurious Emissions (above 1 GHz)

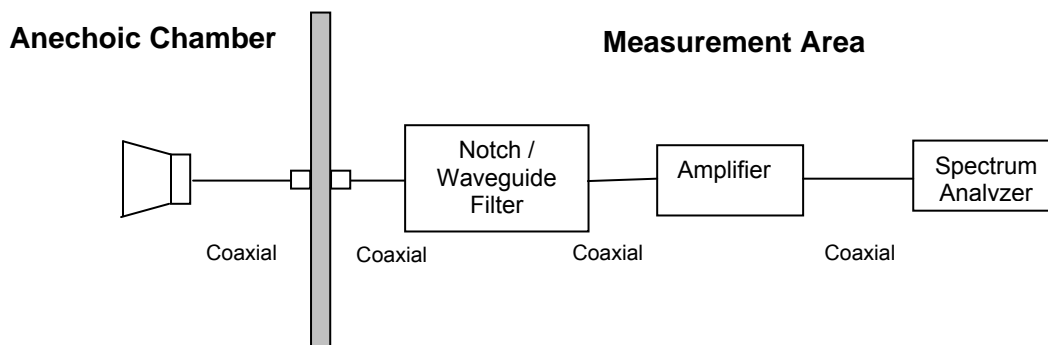
Industry Canada RSS-Gen §6

Test Procedure

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Notch Filter Loss or Waveguide Loss



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 101 of 127

For example:

Given receiver input reading of 51.5 dB μ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 102 of 127

Receiver Radiated Spurious Emissions above 1 GHz

12dBi Dipole Antenna BCD-87010

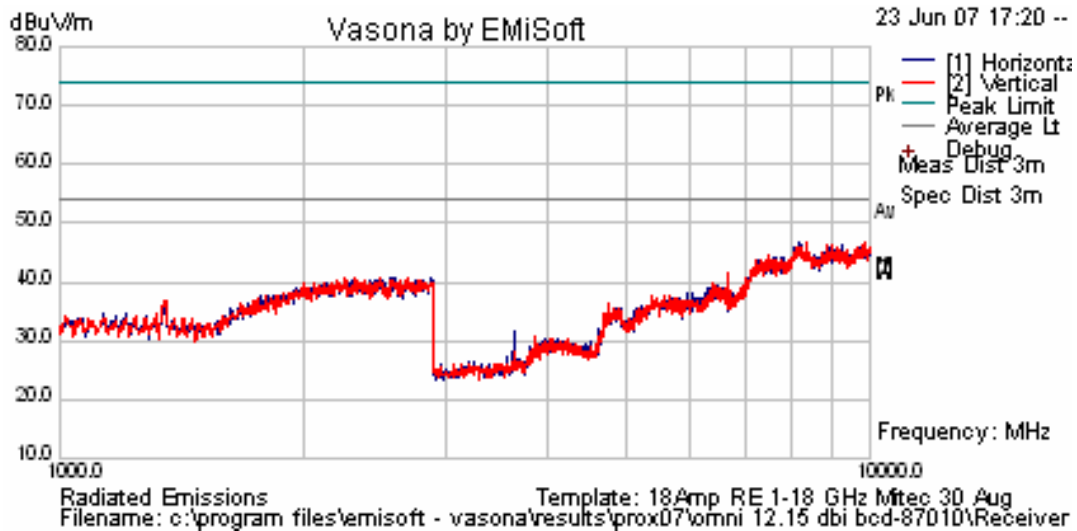
Test Setup - Ch 912 MHz

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)

All peak emissions were found to be below the average limit (54 dB μ V/m)

Radiated Emissions



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 103 of 127

Receiver Radiated Spurious Emissions above 1 GHz

19dBi Panel Antenna RWA-80017

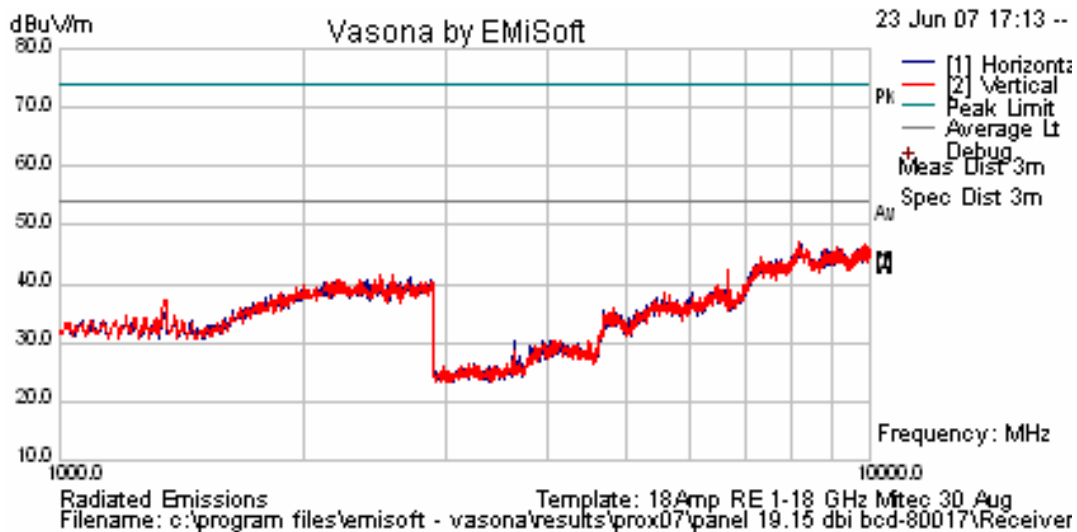
Test Setup – Ch 912 MHz

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)

All peak emissions were found to be below the average limit (54 dB μ V/m)

Radiated Emissions



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 104 of 127

Receiver Radiated Spurious Emissions above 1 GHz

12dBi Patch Antenna MT-263006N

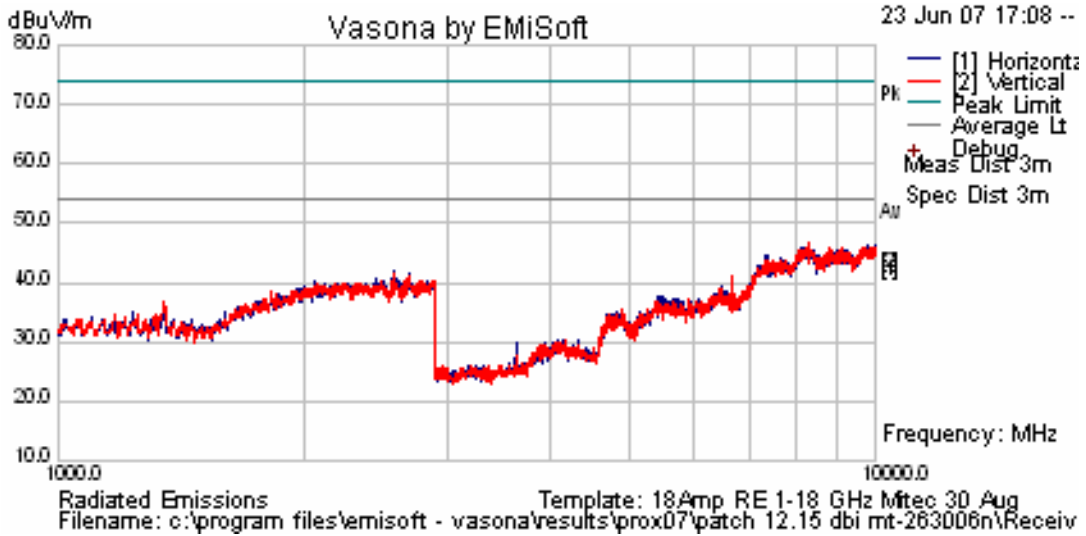
Test Setup – Ch 912 MHz

TABLE OF RESULTS –

Freq. (MHz)	Pol. (H/V)	Raw Reading (dB μ V/m)	Correction Factor (dB)	Corrected Field Strength (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)

All peak emissions were found to be below the average limit (54 dB μ V/m)

Radiated Emissions



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 105 of 127

Specification

Receiver Radiated Spurious Emissions

Industry Canada RSS-Gen §4.9,

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

RSS-Gen §6

The following receiver spurious emission limits shall be complied with;

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Field Strength ($\text{dB}\mu\text{V}/\text{m}$)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

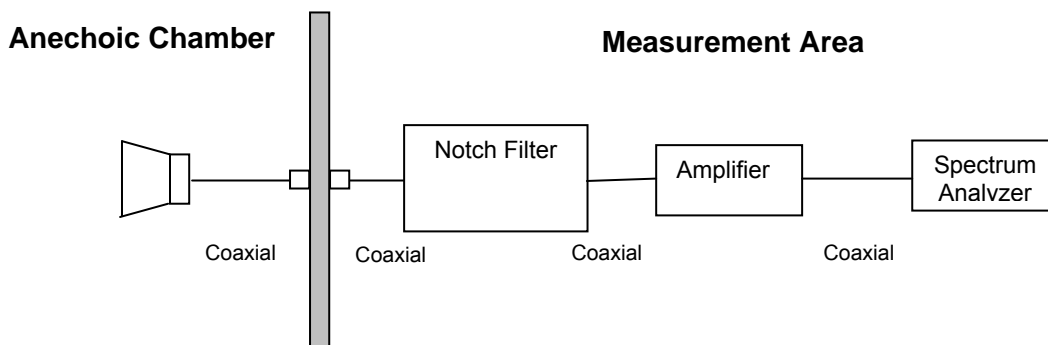
This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

5.1.6.2.1. Peak Field Strength Measurements

Test Procedure

Radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized with a spectrum analyzer in peak hold mode.

Test Measurement Set up



Measurement set up for Radiated Emission Test

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

$$FS = R + AF + CORR - FO$$

where: FS = Field Strength

R = Measured Spectrum analyzer Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain

FO = Distance Falloff Factor

NFL = Band-stop Filter Loss or Waveguide Loss



Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 107 of 127

For example:

Given receiver input reading of 51.5 dB μ V; Antenna Factor of 8.5 dB; Cable Loss of 1.3 dB; Falloff Factor of 0 dB, an Amplifier Gain of 26 dB and Notch Filter Loss of 1 dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 \text{ dB}\mu\text{V/m}$$

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu\text{V/m}))}$$

$$40 \text{ dB}\mu\text{V/m} = 100 \mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250 \mu\text{V/m}$$

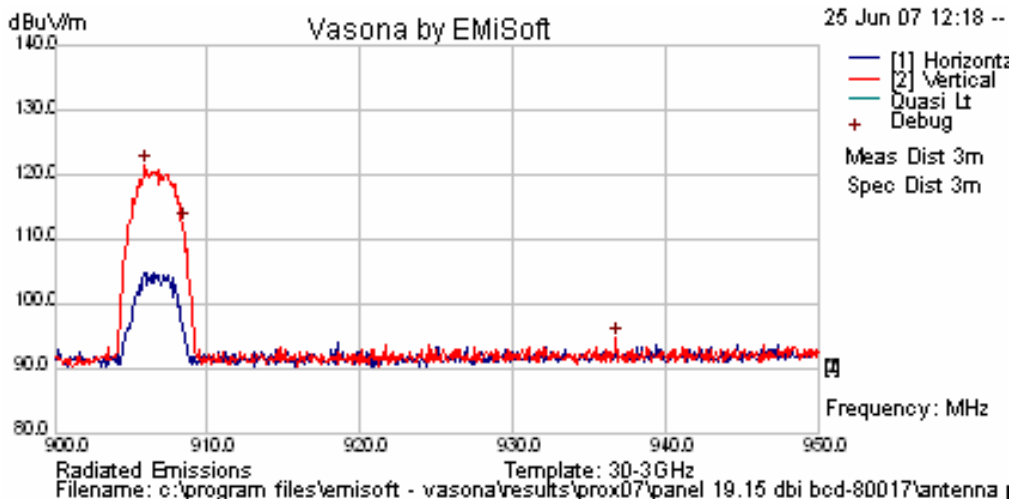
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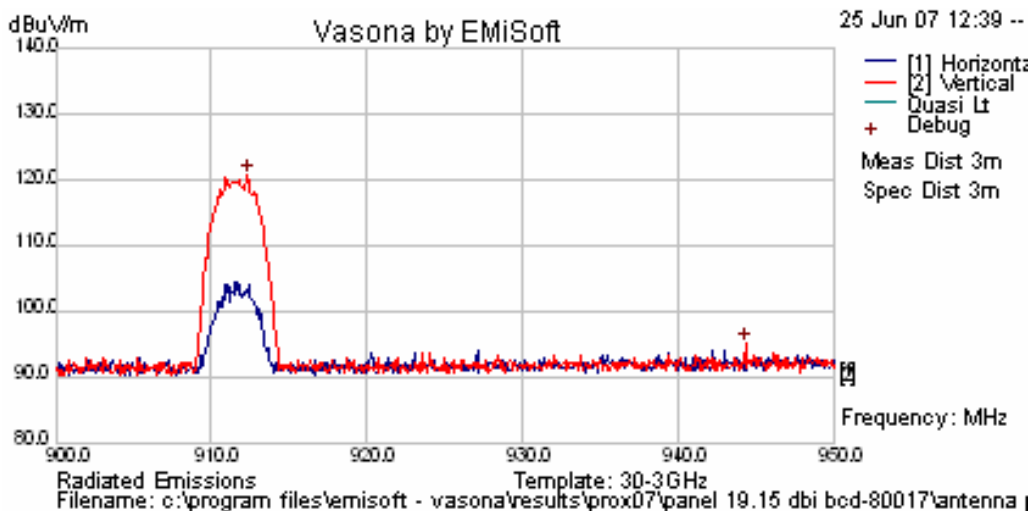
12dBi Patch Antenna MT-263006N 802.11b Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 121.54 dB μ V/m



Channel 912 Peak Emission = 120.61 dB μ V/m

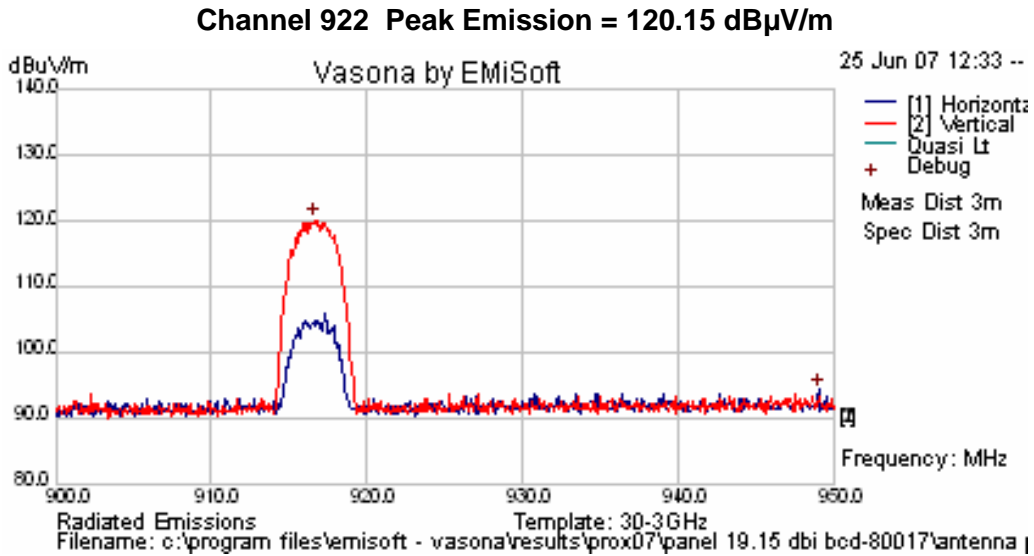


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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 109 of 127

12dBi Patch Antenna MT-263006N 802.11b Mode



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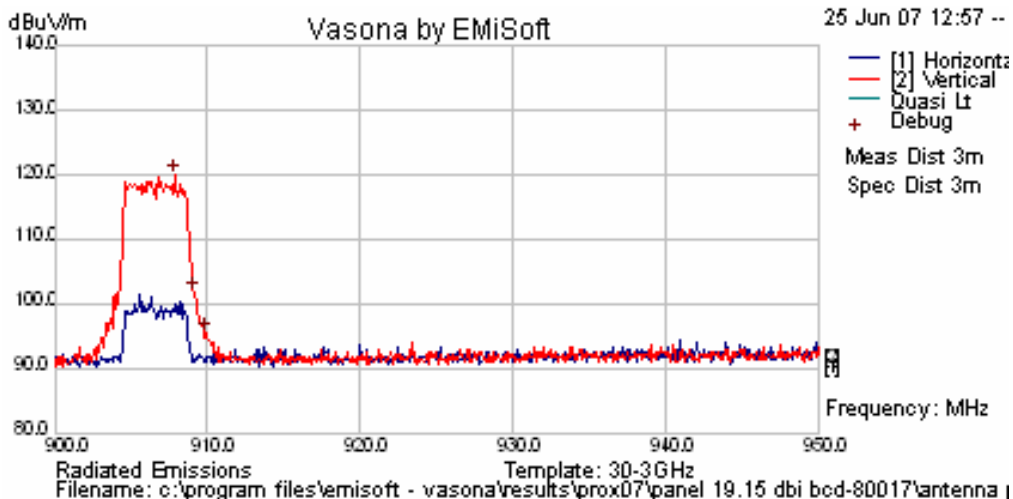


Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 110 of 127

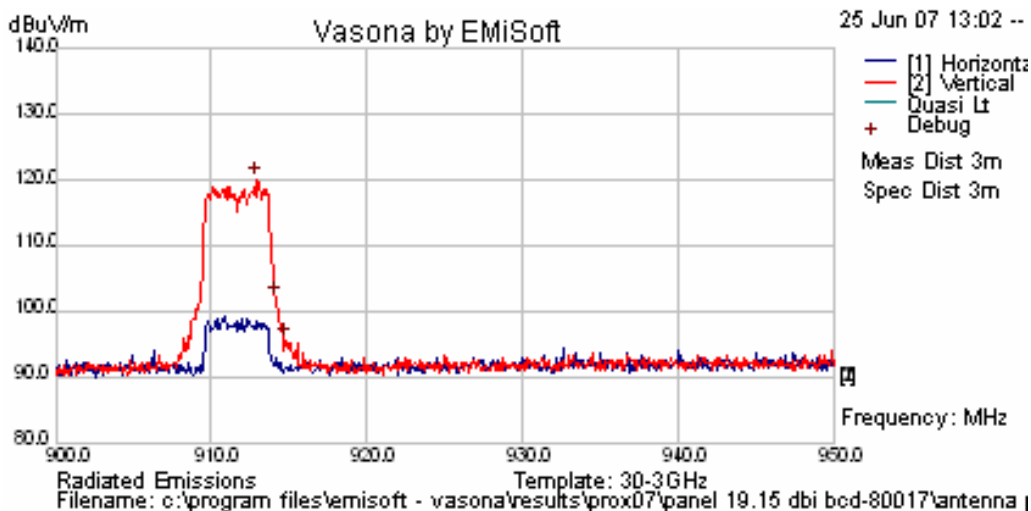
12dBi Patch Antenna MT-263006N 802.11g Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 120.05 dB μ V/m



Channel 912 Peak Emission = 120.12 dB μ V/m

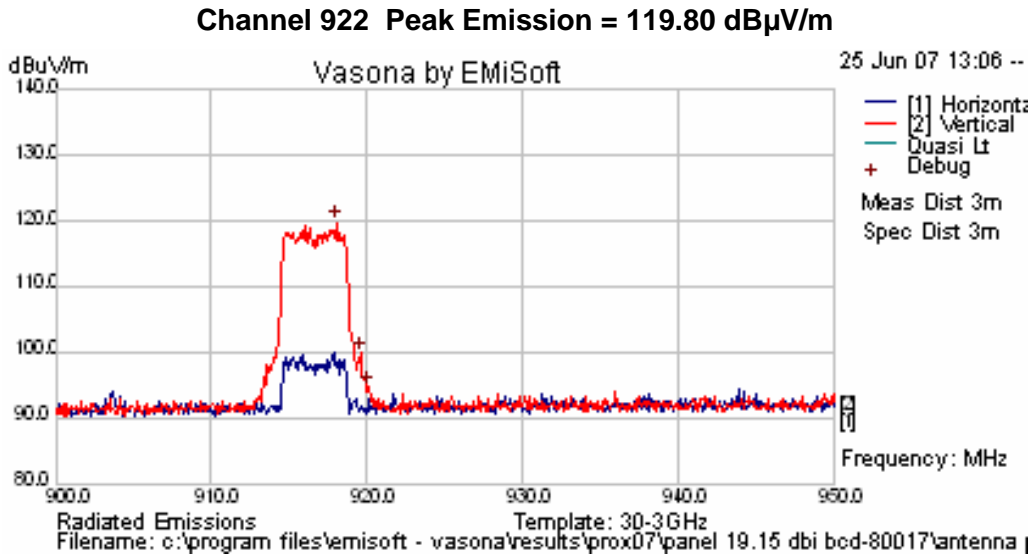


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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 111 of 127

12dBi Patch Antenna MT-263006N 802.11g Mode



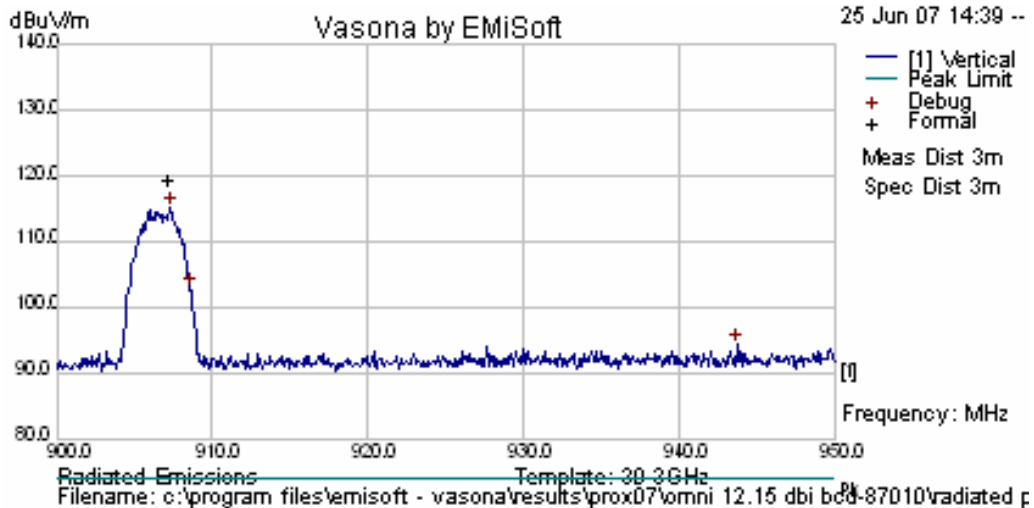
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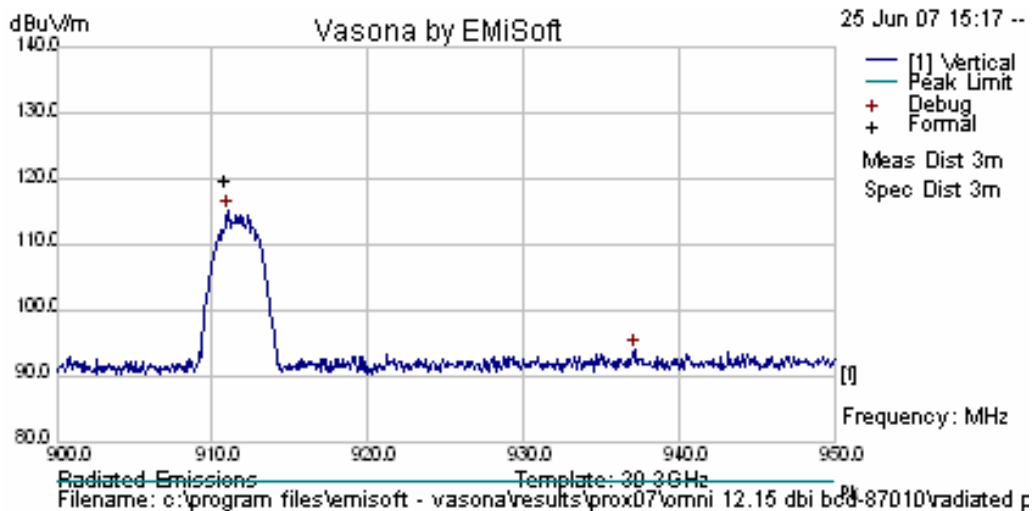
12dBi Dipole Antenna BCD-87010 - 802.11b Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 117.72 dB μ V/m



Channel 912 Peak Emission = 118.14 dB μ V/m



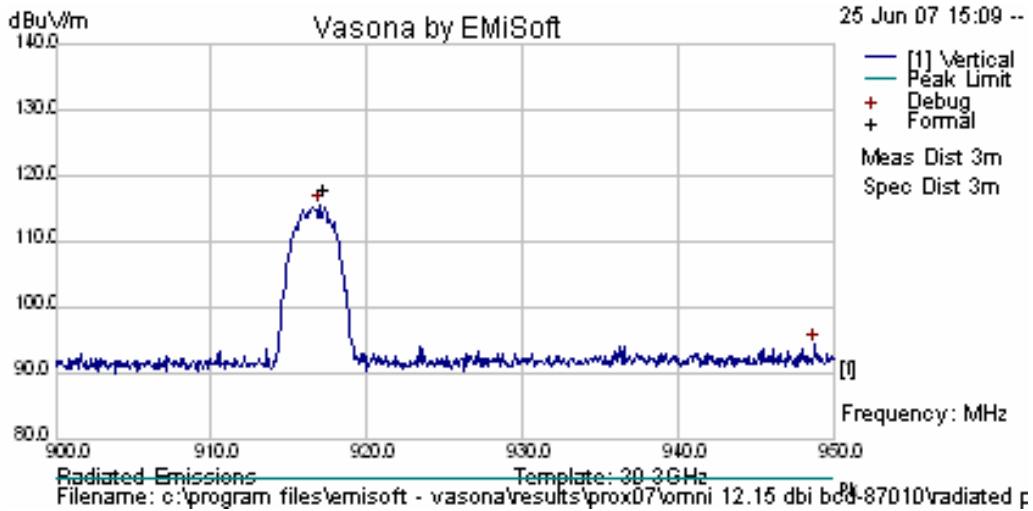
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 113 of 127

12dBi Dipole Antenna BCD-87010 - 802.11b Mode

Channel 922 Peak Emission = 116.22 dB μ V/m



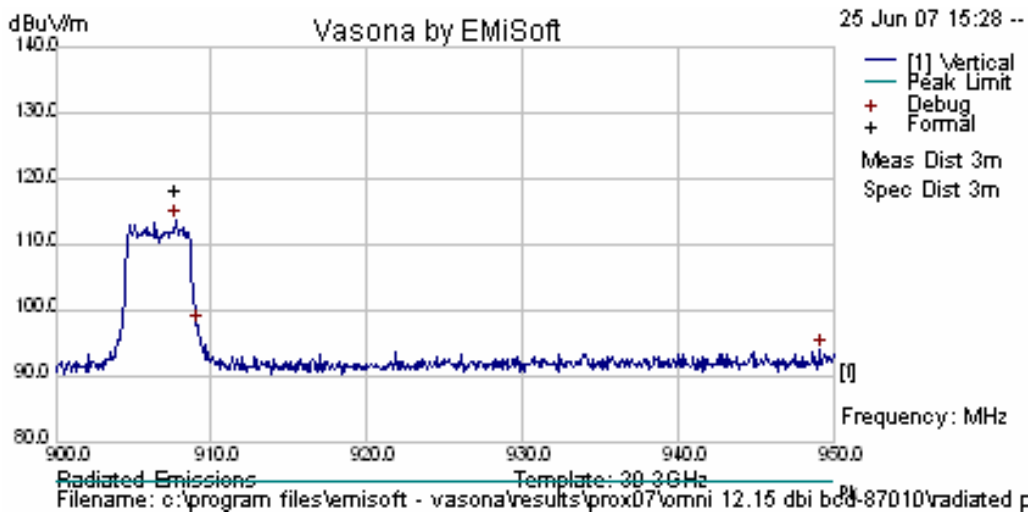
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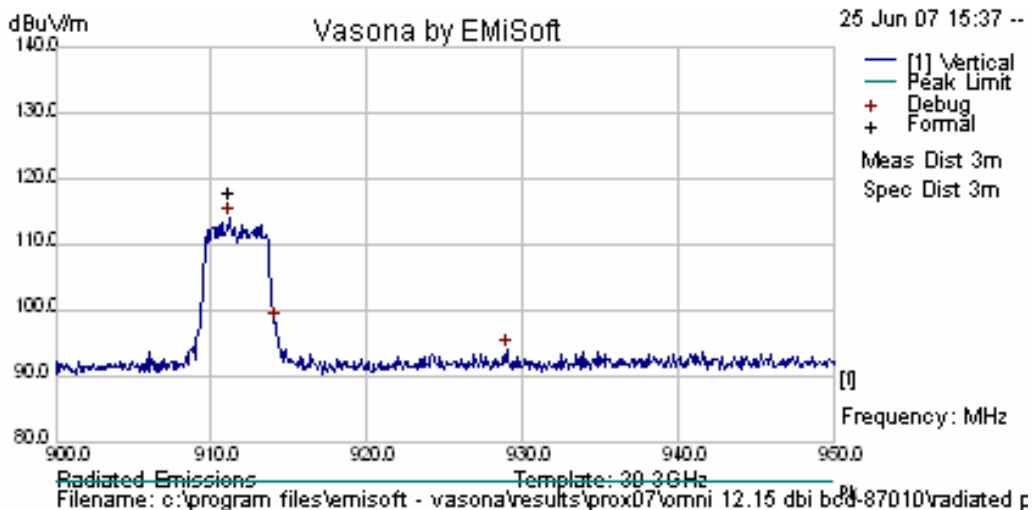
12dBi Dipole Antenna BCD-87010 - 802.11g Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 116.68 dB μ V/m



Channel 912 Peak Emission = 116.32 dB μ V/m



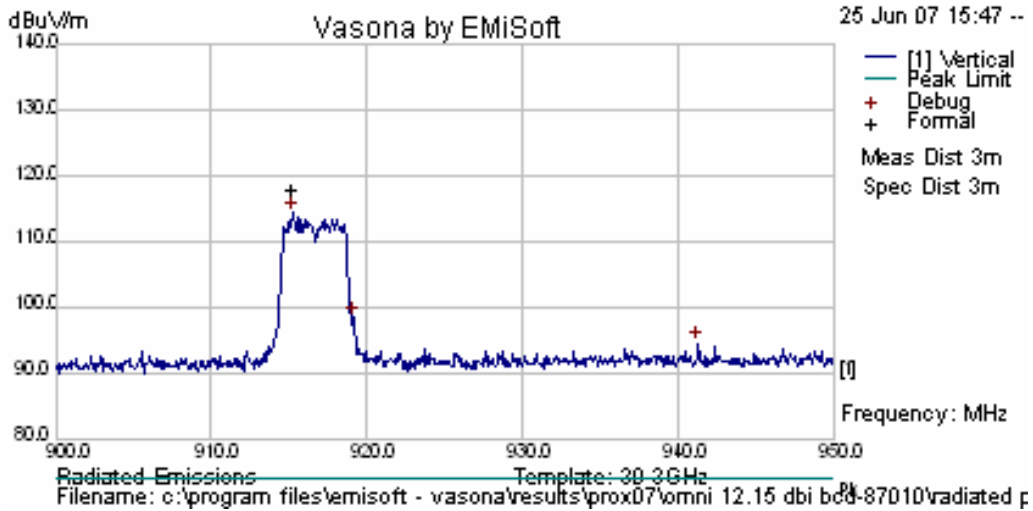
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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 115 of 127

12dBi Dipole Antenna BCD-87010 - 802.11g Mode

Channel 922 Peak Emission = 116.21 dB μ V/m



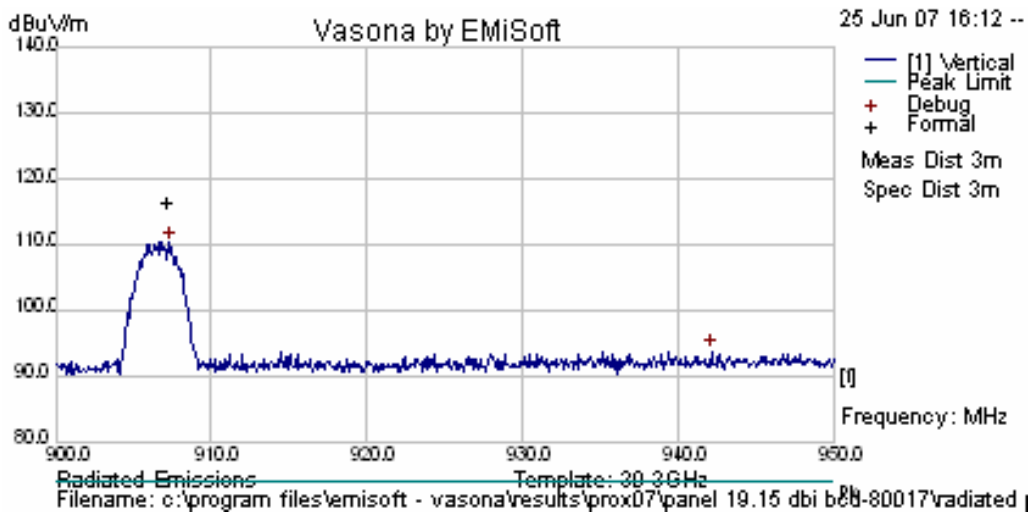
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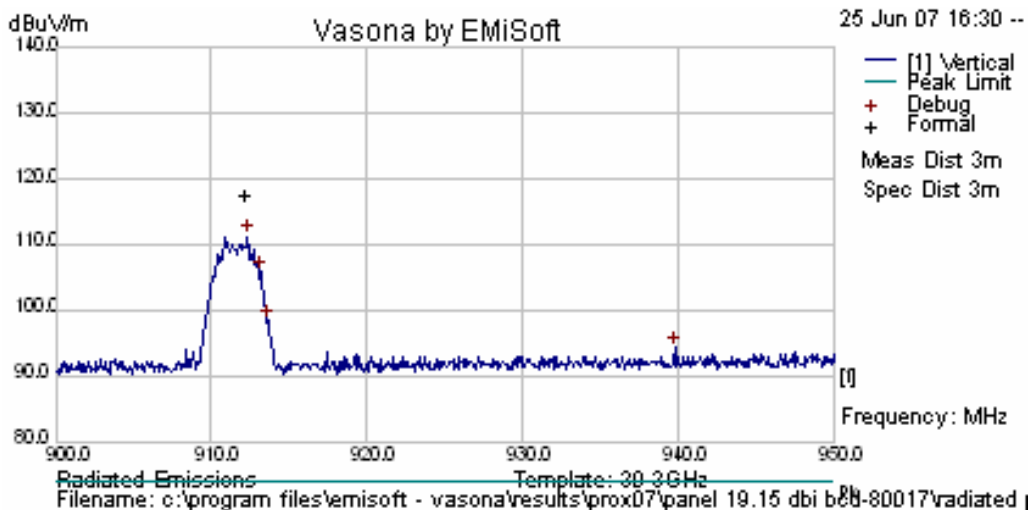
19dBi Panel Antenna RWA-80017 - 802.11b Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 114.88 dB μ V/m



Channel 912 Peak Emission = 115.66 dB μ V/m

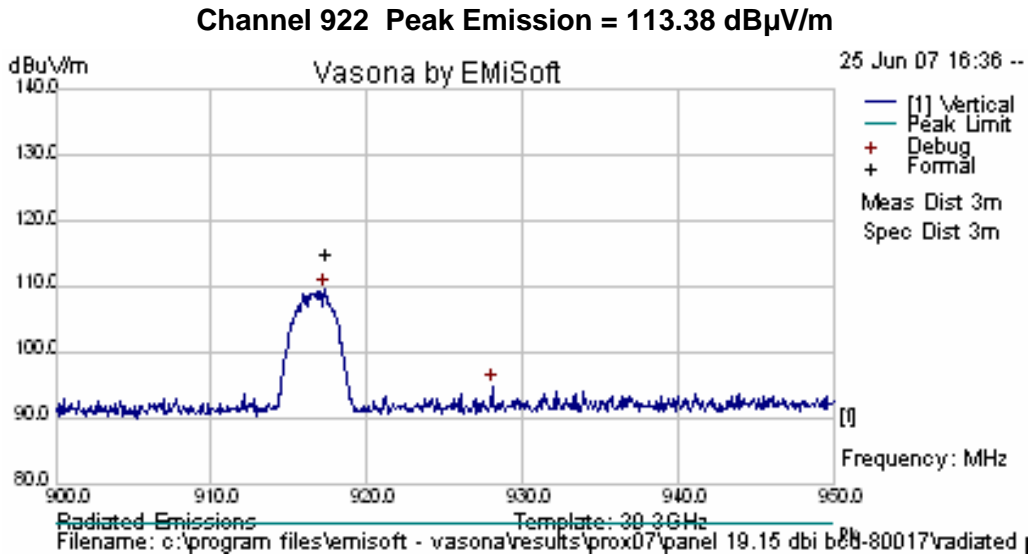


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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 117 of 127

19dBi Panel Antenna RWA-80017 - 802.11b Mode



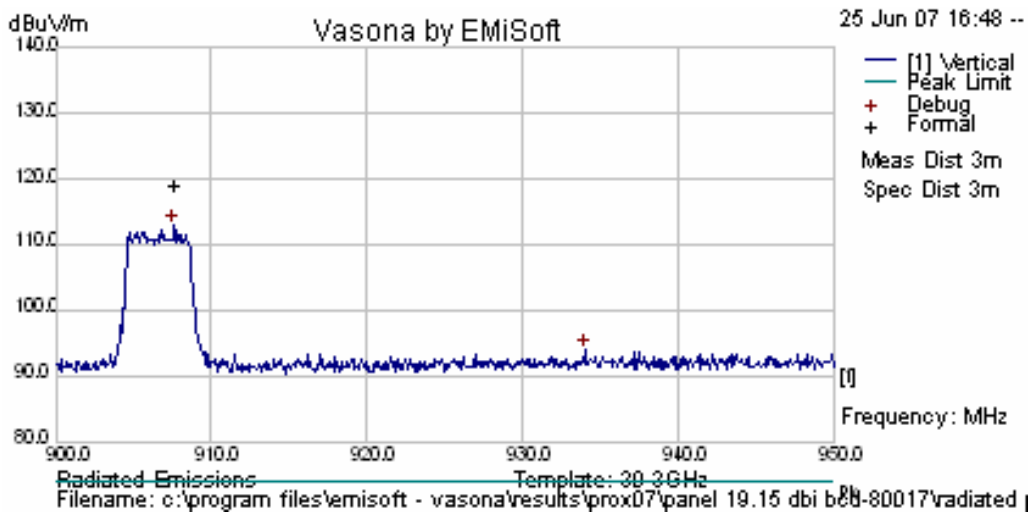
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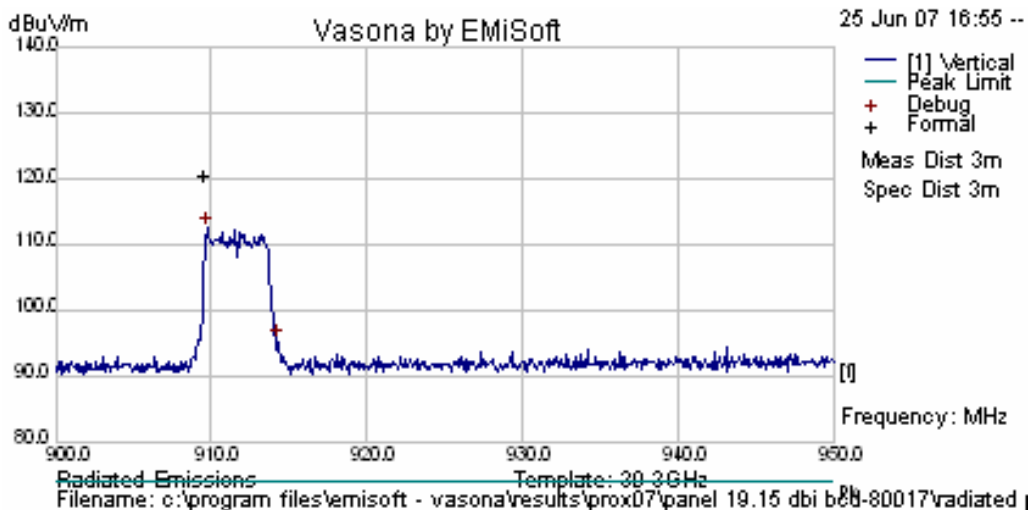
19dBi Panel Antenna RWA-80017 - 802.11g Mode

Peak Field Strength Measurements

Channel 907 - Peak Emission = 117.44 dB μ V/m



Channel 912 Peak Emission = 118.71 dB μ V/m

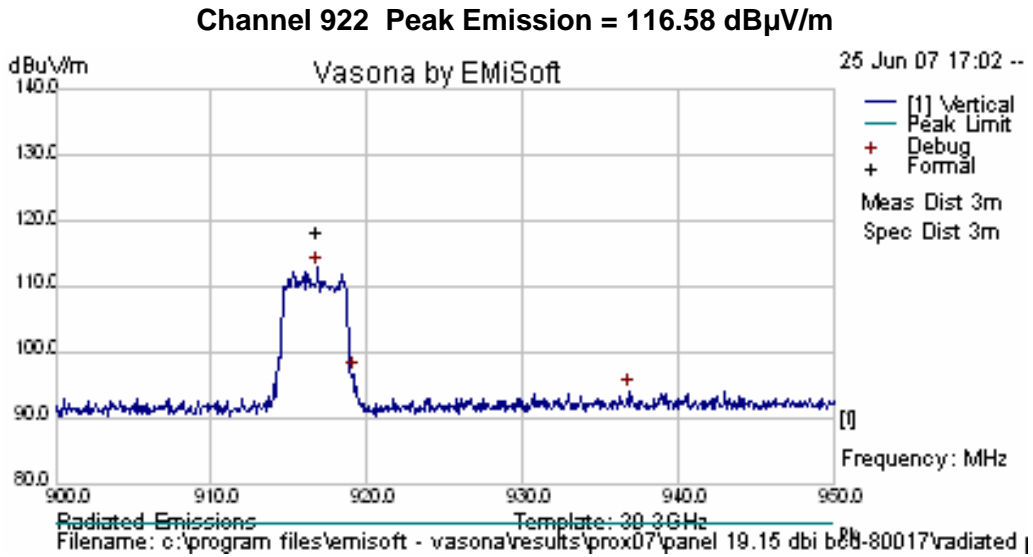


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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 119 of 127

19dBi Panel Antenna RWA-80017 - 802.11g Mode



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 120 of 127

Specification Limits

FCC §15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

FCC §15.247(d)

If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

IC RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

IC RSS-Gen §4.9

The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate or carrier frequency), or from 30 MHz, whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

FCC §15.205 (a) Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

FCC §15.205 (a) Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

FCC §15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 121 of 127

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Field Strength ($\text{dB}\mu\text{V/m}$)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
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Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 122 of 127

5.1.6.3. Radiated Spurious Emissions (30M-1 GHz)

FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-210 §2.2

Permissive Change. - This characteristic of the radio was tested and reported on previously.

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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 123 of 127

5.1.7. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

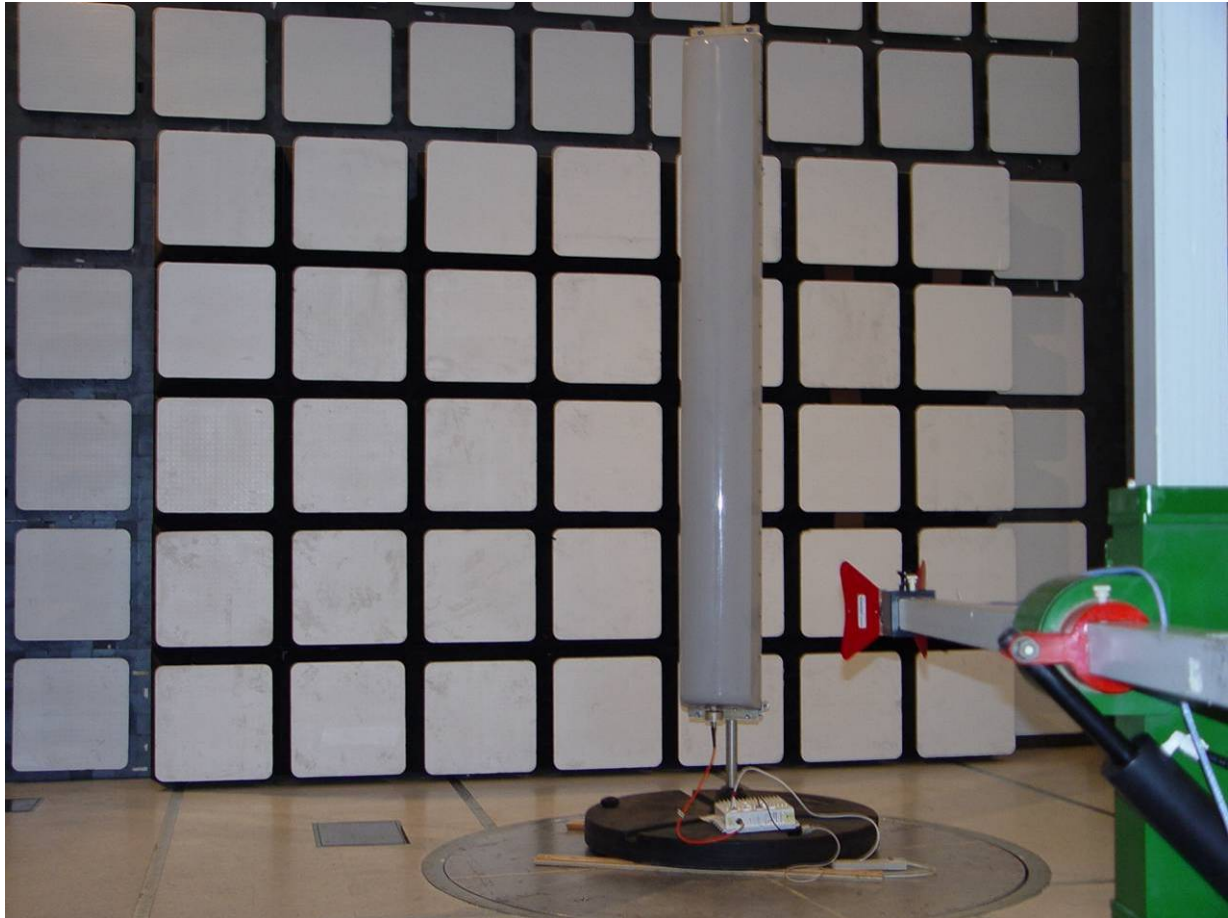
FCC, Part 15 Subpart C §15.207
Industry Canada RSS-Gen §7.2.2

Permissive Change. - This characteristic of the radio was tested and reported on previously.

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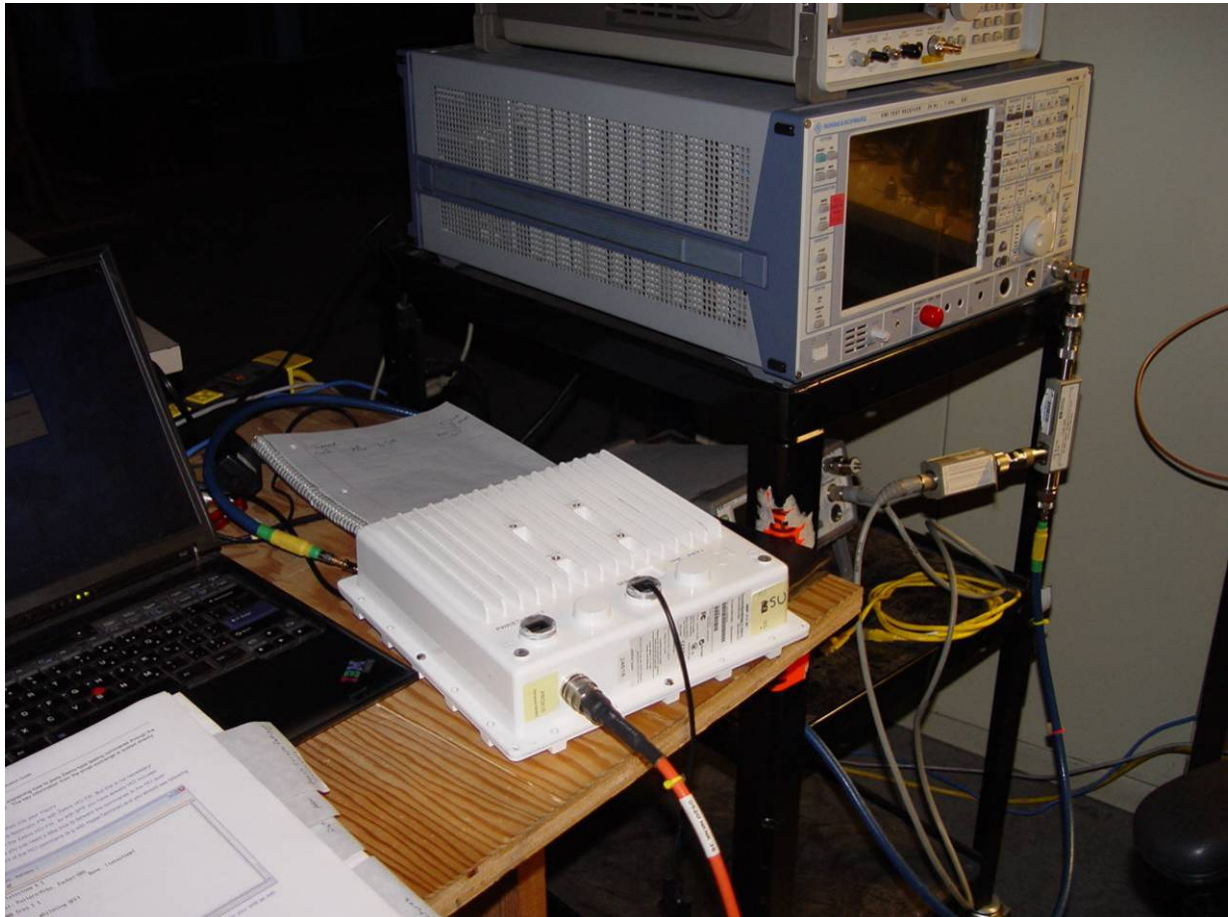
6. PHOTOGRAPHS

6.1. Spurious Emissions >1 GHz



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6.2. General Measurement Test Set-Up



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Title: Proxim Tsunami MP.11 Model 954-R
To: FCC 47 CFR Part15.247 & IC RSS-210
Serial #: PROX10-A2 Rev A
Issue Date: 28th August 2007
Page: 126 of 127

7. TEST EQUIPMENT DETAILS

Asset #	Instrument	Manufacturer	Part #	Serial #
0088	Spectrum Analyzer	Hewlett Packard	8564E	3410A00141
0134	Amplifier	Com Power	PA 122	181910
0158	Barometer /Thermometer	Control Co.	4196	E2846
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007
0252	SMA Cable	Megaphase	Sucoflex 104	None
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001
0313	Coupler	Hewlett Packard	86205A	3140A01285
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623
0223	Power Meter	Hewlett Packard	EPM-442A	US37480256
0116	Power Sensor	Hewlett Packard	8485A	3318A19694
0117	Power Sensor	Hewlett Packard	8487D	3318A00371
0184	Pulse Limiter	Rhode & Schwartz	ESH3Z2	357.8810.52
0190	LISN	Rhode & Schwartz	ESH3Z5	836679/006
0293	BNC Cable	Megaphase	1689 1GVT4	15F50B001
0301	5.6 GHz Notch Filter	Micro-Tronics	RBC50704	001
0302	5.25 GHz Notch Filter	Micro-Tronics	BRC50703	002
0303	5.8 GHz Notch Filter	Micro-Tronics	BRC50705	003
0304	2.4GHzHz Notch Filter	Micro-Tronics	--	001
0307	BNC Cable	Megaphase	1689 1GVT4	15F50B002
0335	1-18GHz Horn Antenna	ETS- Lindgren	3117	00066580
0337	Amplifier	MiCOM Labs	--	--
0338	Antenna	Sunol Sciences	JB-3	A052907

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