

Radioframe Networks, Inc.

MC Series System

January 27, 2006

Report No. RAFN0059, Rev 01

Report Prepared By



www.nwemc.com
1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Issue Date: January 27, 2006
Radioframe Networks, Inc.
Model: MC Series System

Emissions				
Test Description	Specification	Test Method	Pass	Fail
Output Power	47 CFR 2.1046 & 90.217	TIA / EIA - 603	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Conducted Emissions	47 CFR 2.1051 & 90.691	TIA / EIA - 603	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Emission Mask	47 CFR 90.691	TIA / EIA - 603	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Modifications made to the product
See the Modifications section of this report

Test Facility

The measurements were made in-situ at the client's facility:

Approved By:

Greg Kiemel, Director of Engineering

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
01	Update output power test data	1/27/06	13 - 21

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



200629-0
200630-0
200676-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0401C.



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761.*)



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

What is measurement uncertainty?

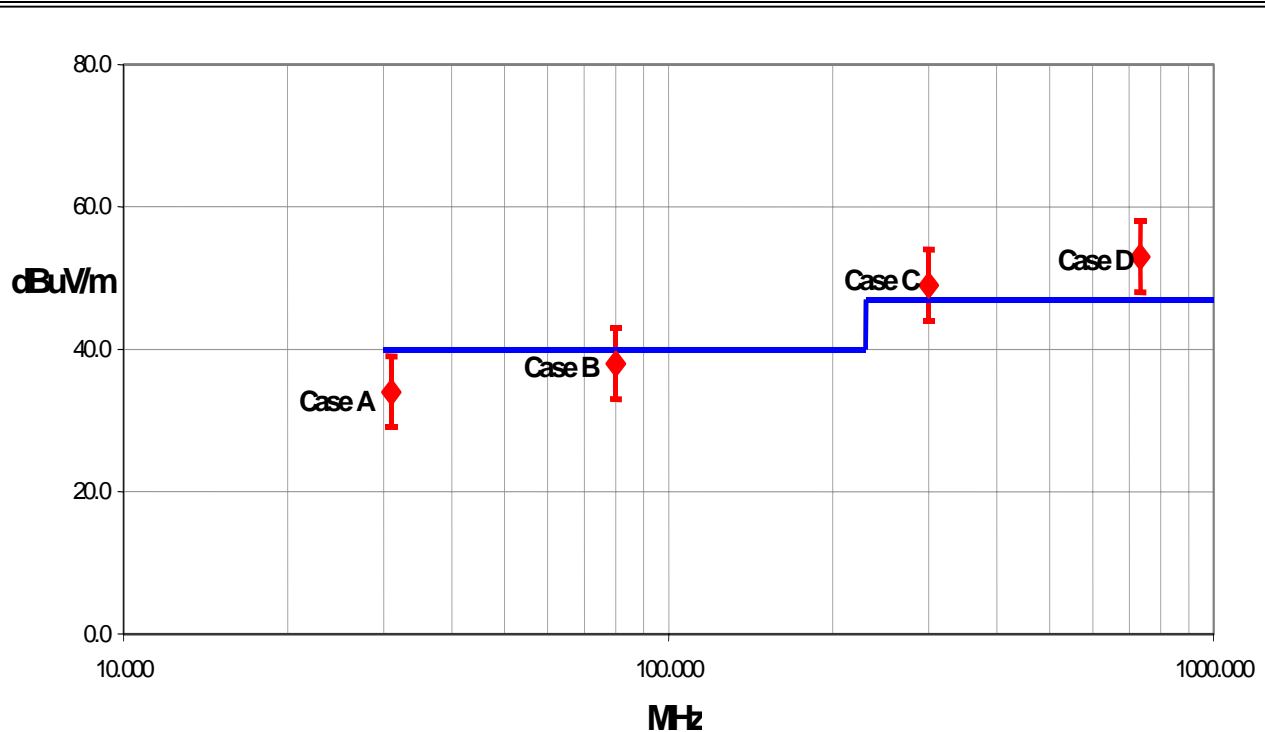
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- "ISO Guide to the Expression of Uncertainty in Measurements", October 1993
- "NIS81: The Treatment of Uncertainty in EMC Measurements", May 1994
- "IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques", December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and - measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
		- 3.77	- 3.73	- 2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29	+ 1.38	- 1.25	- 1.35
		- 1.25	- 1.35	- 2.51	- 2.70
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 2.57	+ 2.76	- 2.51	- 2.70
		- 2.51	- 2.70	- 2.51	- 2.70

Conducted Emissions

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.48
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.97

Radiated Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.11

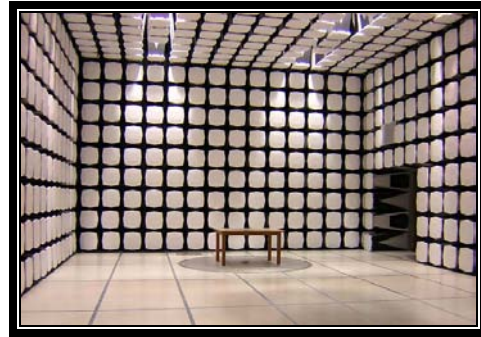
Conducted Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.10

Legend

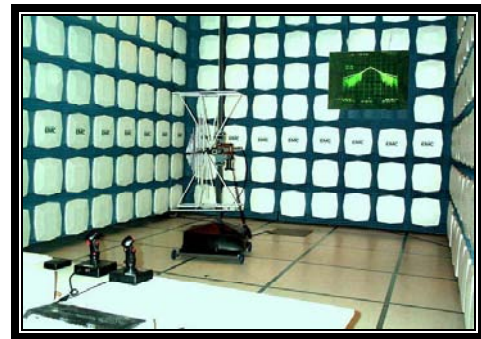
$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: k . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $k=3$ (CL of 99.7%) can be used. Please note that with a coverage factor of one, $u_c(y)$ yields a confidence level of only 68%.



**California – Orange County Facility
Labs OC01 – OC13**

41 Tesla Ave. Irvine, CA 92618
(888) 364-2378 Fax: (503) 844-3826



**Oregon – Evergreen Facility
Labs EV01 – EV10**

22975 NW Evergreen Pkwy. Suite 400 Hillsboro, OR 97124
(503) 844-4066 Fax: (503) 844-3826



**Washington – Sultan Facility
Labs SU01 – SU07**

14128 339th Ave. SE Sultan, WA 98294
(888) 364-2378

Party Requesting the Test

Company Name:	Radioframe Networks, Inc.
Address:	1120 112th Ave NE, Suite 600
City, State, Zip:	Bellevue, WA 98004
Test Requested By:	Dean Busch
Model:	MC Series System
First Date of Test:	October 13, 2005
Last Date of Test:	January 27, 2006
Receipt Date of Samples:	Tested in-situ at Radioframe Networks
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided.
I/O Ports:	Not Provided.

Functional Description of the EUT (Equipment Under Test):

Microcell cellular base station for iDEN radio.

Client Justification for EUT Selection:

The product is an engineering sample, representative of the final product.

Client Justification for Test Selection:

These tests satisfy the requirements for a Class 2 Permissive Change under FCC Part 90.

EUT Photo

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	10/14/2005	Occupied Bandwidth / Emission Mask	Configuration remained unchanged	No EMI suppression devices were added or modified during this test.	EUT remained at client facility following the test.
2	10/14/2005	Conducted Spurious Emissions	Configuration remained unchanged	No EMI suppression devices were added or modified during this test.	EUT remained at client facility following the test.
3	01/27/2006	Output Power	Configuration remained unchanged.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low (851.0125 MHz)
Mid (859.1625 MHz)
High (869.9875 MHz)

Output Power Setting(s) Investigated:

Lowest
Middle
Highest

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
iDEN Radio Base Station System	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	EUT	AC Mains

Measurement Equipment

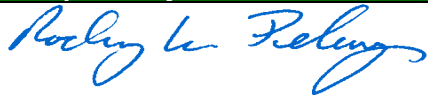
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo
Signal Generator	Agilent	8648B	TGI	07/19/2005	13 mo
30 dB 100W attenuator	Bird Electronic Corp.	100-SA-MFN-30	N/A	NCR	N/A

Test Description

Requirement: Per 47 CFR 2.1046 and 90.205, the conducted power output was measured at the RF output terminals after the tune-up procedure. The measured value, the value stated in the manual, and the value on Form 731 must agree.

Configuration: The peak measurement was made using a directional coupler between the RF output of the EUT and a spectrum analyzer. Prior to making the measurement, the test setup (including attenuator, spectrum analyzer and coaxial cable) was calibrated using the power meter and signal source.

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The lowest output power, the middle output power, and the highest output power was measured at each channel. The output power was varied by changing the TX Attenuator setting on the EUT's amplifier to the following settings: High Power 11 db, Mid power 29 dB, and Low Power 49 dB. Did not test total power in the band with all 20 blades transmitting or with 8 blades per sector. Rather, it was confirmed that the output power per channel is level across the band (+/- 1.5 dB). Therefore, for MPE estimates, a simple summation of the power in each channel will be sufficient.

Completed by:

EMC Rev BETA 01/30/01

Output Power

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 01/27/06
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Dean Bush	Tested by: Ethan Schoonover	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method: TIA/EIA-603	Year: Most Current

SAMPLE CALCULATIONS

COMMENTS

Tested in System configuration

EUT OPERATING MODES

With modulation

DEVIATIONS FROM TEST STANDARD

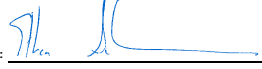
None

REQUIREMENTS

RESULTS

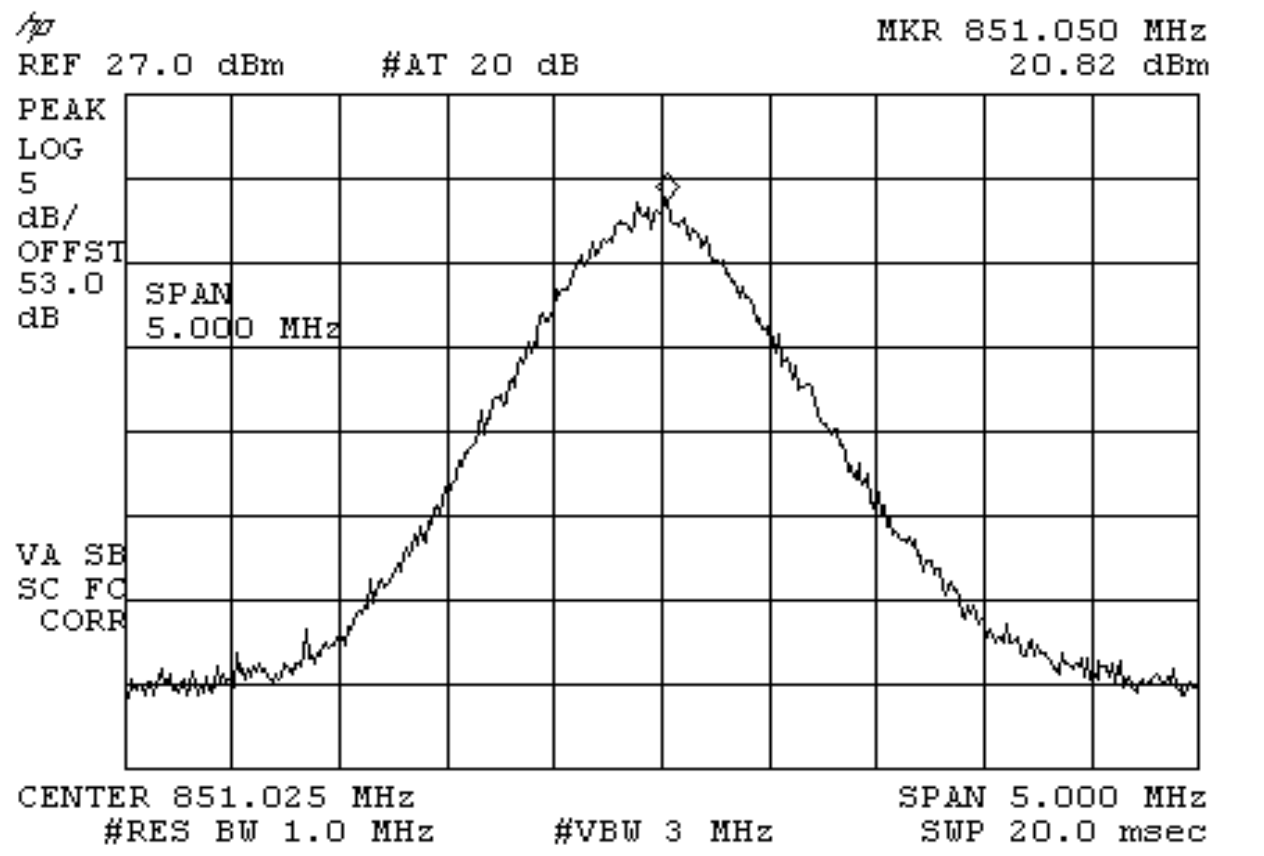
Pass AMPLITUDE 20.82 dBm

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Output Power - Low Channel, High Power



NORTHWEST
EMC Output Power Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1		Date: 01/27/06	
Customer: Radioframe Networks, Inc.		Temperature: 23° C	
Attendees: Dean Bush	Tested by: Ethan Schoonover	Humidity: 40%	
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site	

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method: TIA/EIA-603	Year: Most Current

SAMPLE CALCULATIONS			

COMMENTS

Tested in System configuration
EUT OPERATING MODES
 With modulation
DEVIATIONS FROM TEST STANDARD
 None
REQUIREMENTS

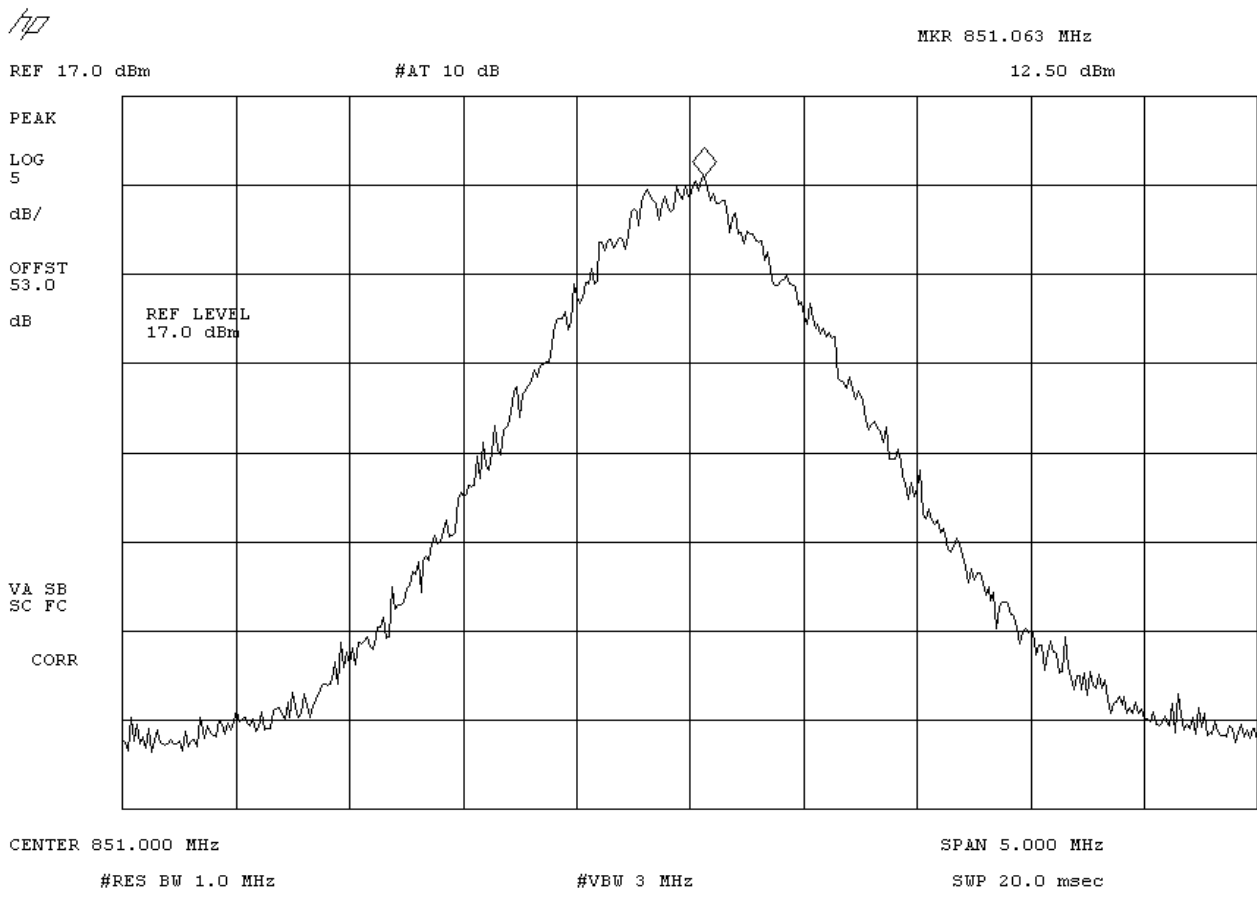
RESULTS	AMPLITUDE
Pass	12.5 dBm

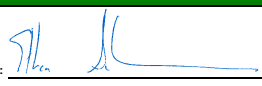
SIGNATURE

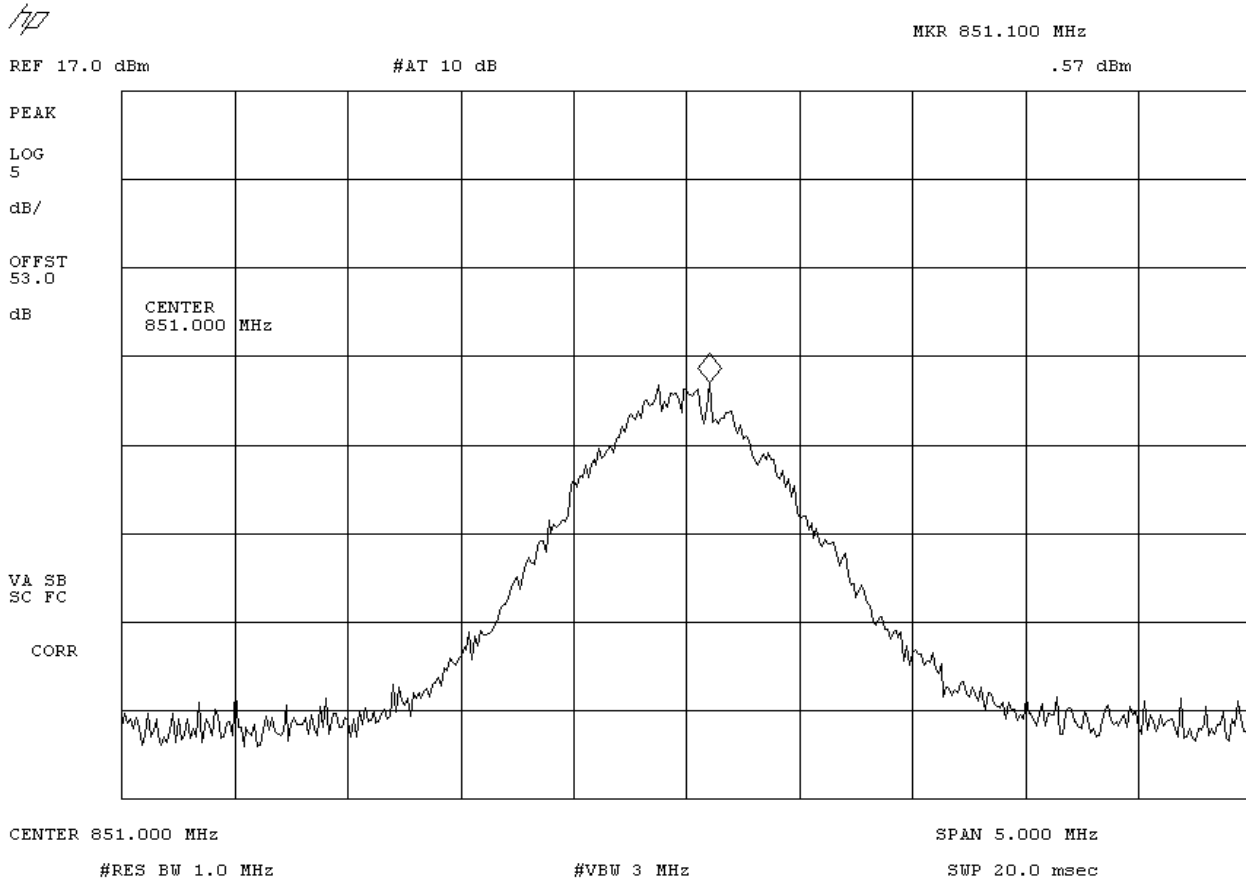
Tested By: 

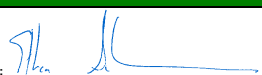
DESCRIPTION OF TEST

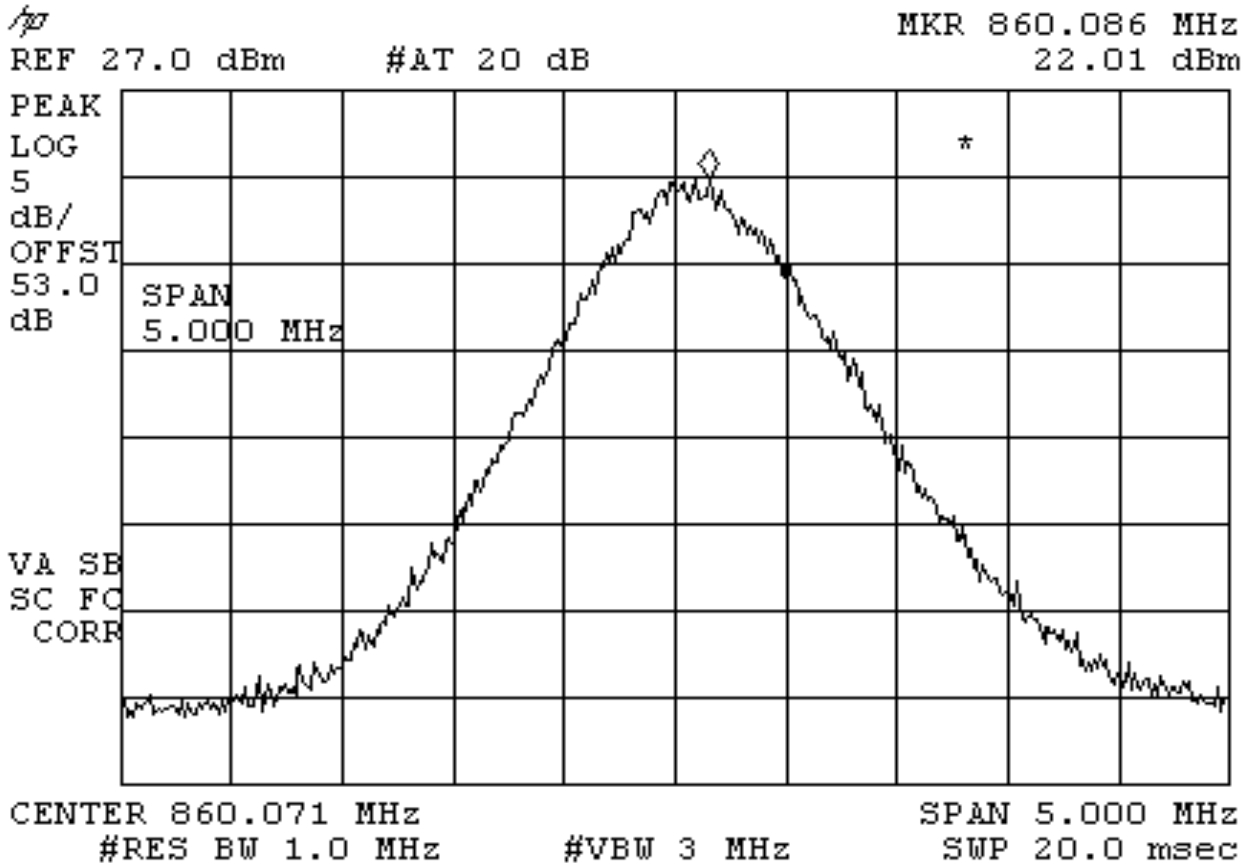
Output Power - Low Channel, Medium Power



NORTHWEST EMC		Output Power		Rev BETA 01/30/01	
EUT: MC Series System			Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1			Date: 01/27/06		
Customer: Radioframe Networks, Inc.			Temperature: 23° C		
Attendees: Dean Bush		Tested by: Ethan Schoonover		Humidity: 40%	
Customer Ref. No.: None		Power: -48 Vdc		Job Site: Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1046 & 90.217		Year: Most Current	Method: TIA/EIA-603		Year: Most Current
SAMPLE CALCULATIONS					
COMMENTS					
Tested in System configuration					
EUT OPERATING MODES					
With modulation					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
RESULTS					
Pass			AMPLITUDE 0.57 dBm		
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Output Power - Low Channel, Low Power					



NORTHWEST EMC		Output Power		Rev BETA 01/30/01	
EUT: MC Series System			Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1			Date: 01/27/06		
Customer: Radioframe Networks, Inc.			Temperature: 23° C		
Attendees: Dean Bush		Tested by: Ethan Schoonover		Humidity: 40%	
Customer Ref. No.: None		Power: -48 Vdc		Job Site: Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1046 & 90.217		Year: Most Current	Method: TIA/EIA-603		Year: Most Current
SAMPLE CALCULATIONS					
COMMENTS					
Tested in System configuration					
EUT OPERATING MODES					
With modulation					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
RESULTS					
Pass			AMPLITUDE 22.01 dBm		
SIGNATURE					
Tested By: 					
DESCRIPTION OF TEST					
Output Power - Medium Channel, High Power					



NORTHWEST EMC Rev BETA 01/30/01

Output Power

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 01/27/06
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Dean Bush	Tested by: Ethan Schoonover	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method: TIA/EIA-603	Year: Most Current

SAMPLE CALCULATIONS			

COMMENTS

Tested in System configuration

EUT OPERATING MODES

With modulation

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

RESULTS

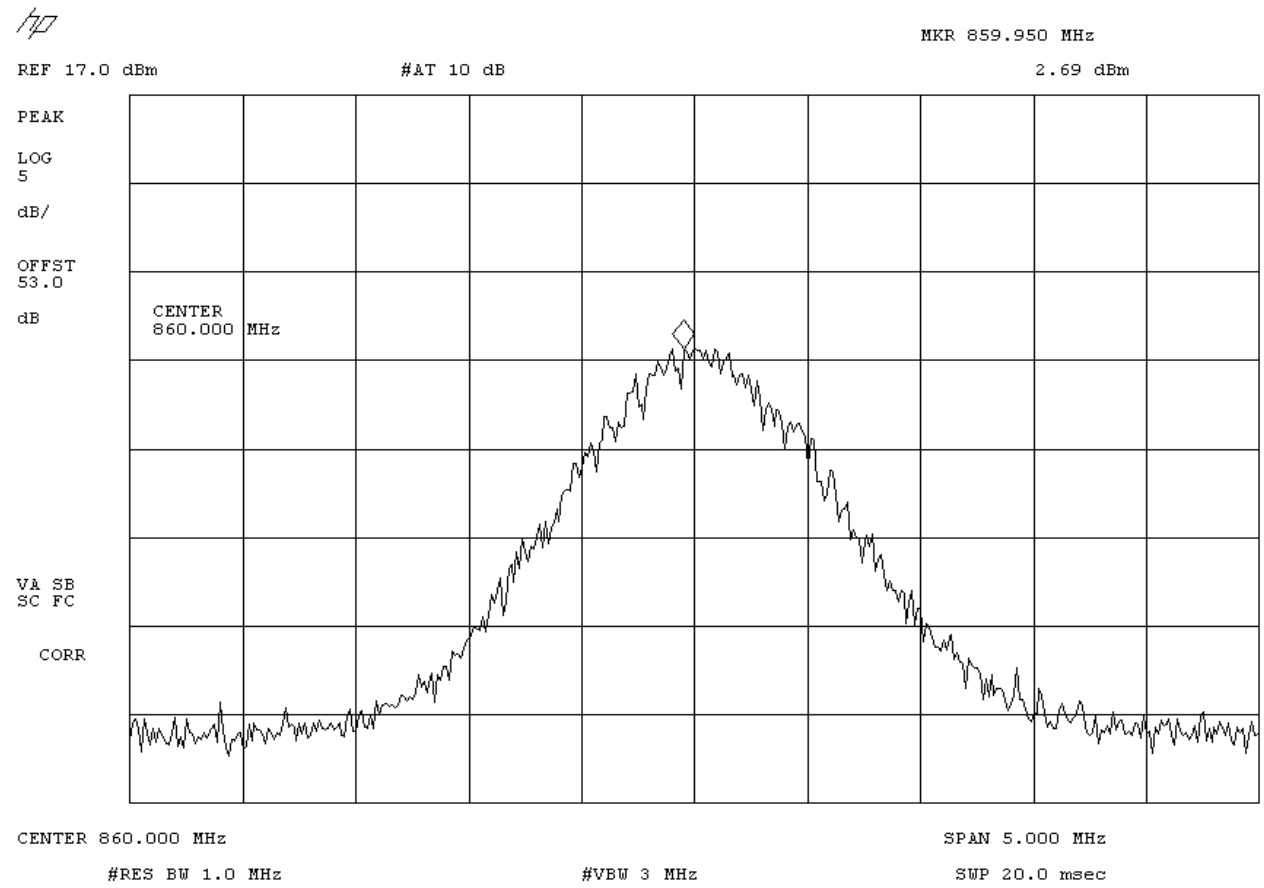
Pass AMPLITUDE
2.69 dBm

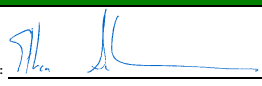
SIGNATURE

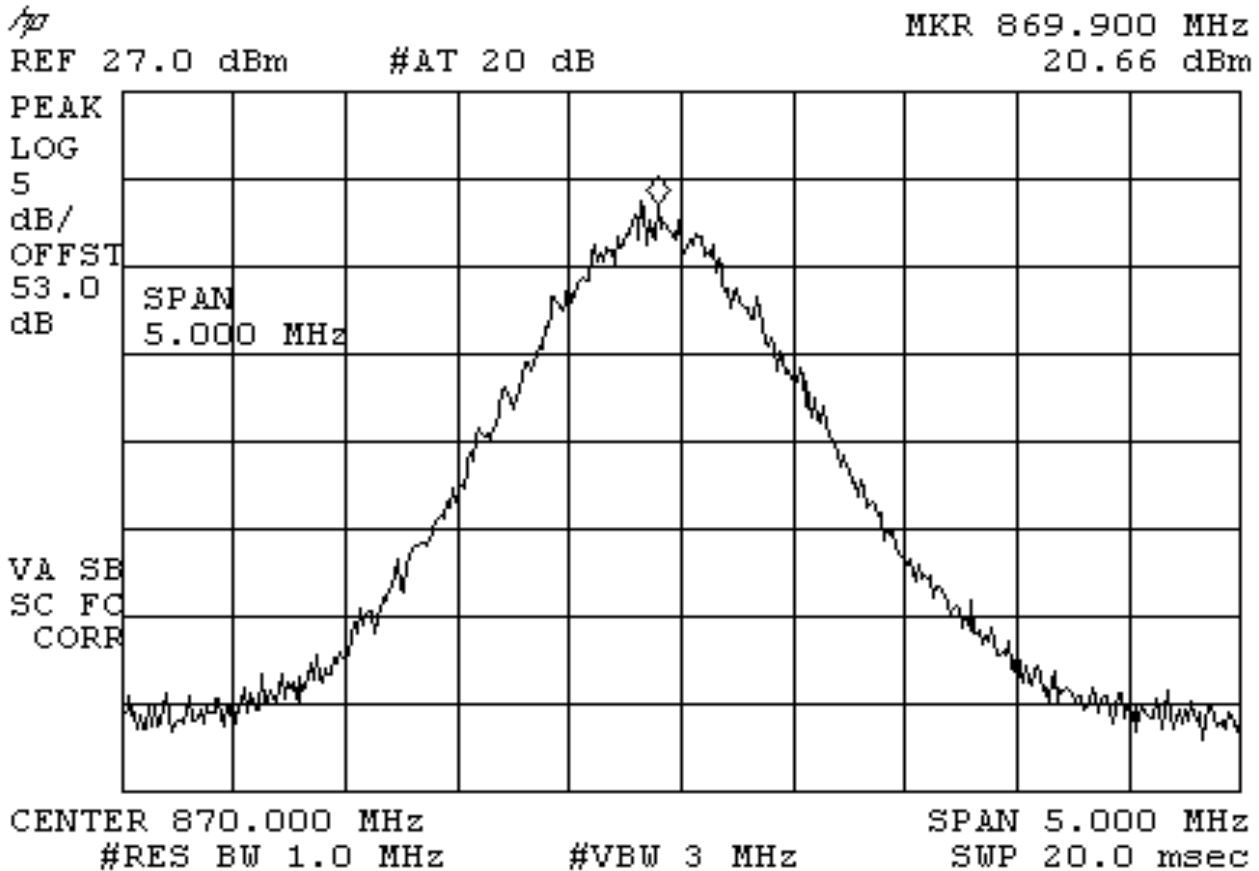
Tested By: _____

DESCRIPTION OF TEST

Output Power - Medium Channel, Low Power



NORTHWEST EMC		Output Power		Rev BETA 01/30/01
EUT: MC Series System		Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1		Date: 01/27/06		
Customer: Radioframe Networks, Inc.		Temperature: 23° C		
Attendees: Dean Bush		Tested by: Ethan Schoonover	Humidity: 40%	
Customer Ref. No.: None		Power: -48 Vdc	Job Site: Off-site	
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1046 & 90.217		Year: Most Current	Method: TIA/EIA-603	Year: Most Current
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System configuration				
EUT OPERATING MODES				
With modulation				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
RESULTS				
Pass		AMPLITUDE 20.66 dBm		
SIGNATURE				
Tested By: 				
DESCRIPTION OF TEST				
Output Power - High Channel, High Power				



NORTHWEST EMC Rev BETA 01/30/01

Output Power

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 01/27/06
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Dean Bush	Tested by: Ethan Schoonover	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method: TIA/EIA-603	Year: Most Current

SAMPLE CALCULATIONS

COMMENTS

Tested in System configuration

EUT OPERATING MODES

With modulation

DEVIATIONS FROM TEST STANDARD


None

REQUIREMENTS

RESULTS

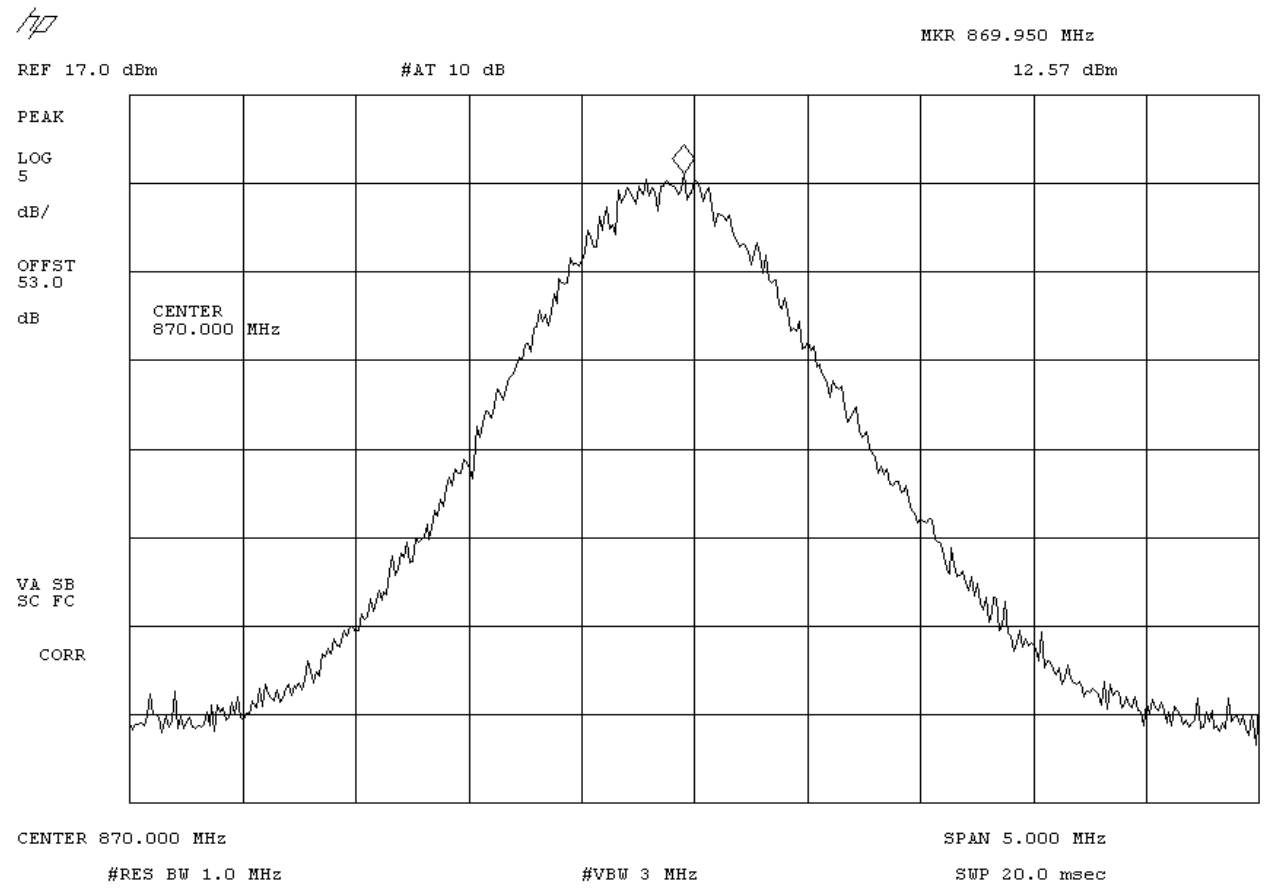
Pass AMPLITUDE
12.57 dBm

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Output Power - High Channel, Medium Power



EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 01/27/06
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Dean Bush	Tested by: Ethan Schoonover	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method: TIA/EIA-603	Year: Most Current

SAMPLE CALCULATIONS			

COMMENTS

Tested in System configuration

EUT OPERATING MODES

With modulation

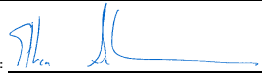
DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

RESULTS	
Pass	AMPLITUDE 0.39 dBm

SIGNATURE

Tested By: 

DESCRIPTION OF TEST

Output Power - High Channel, Low Power

hp

MKR 869.888 MHz

REF 17.0 dBm

#AT 10 dB

.39 dBm

PEAK

LOG

5

dB/

OFFST

53.0

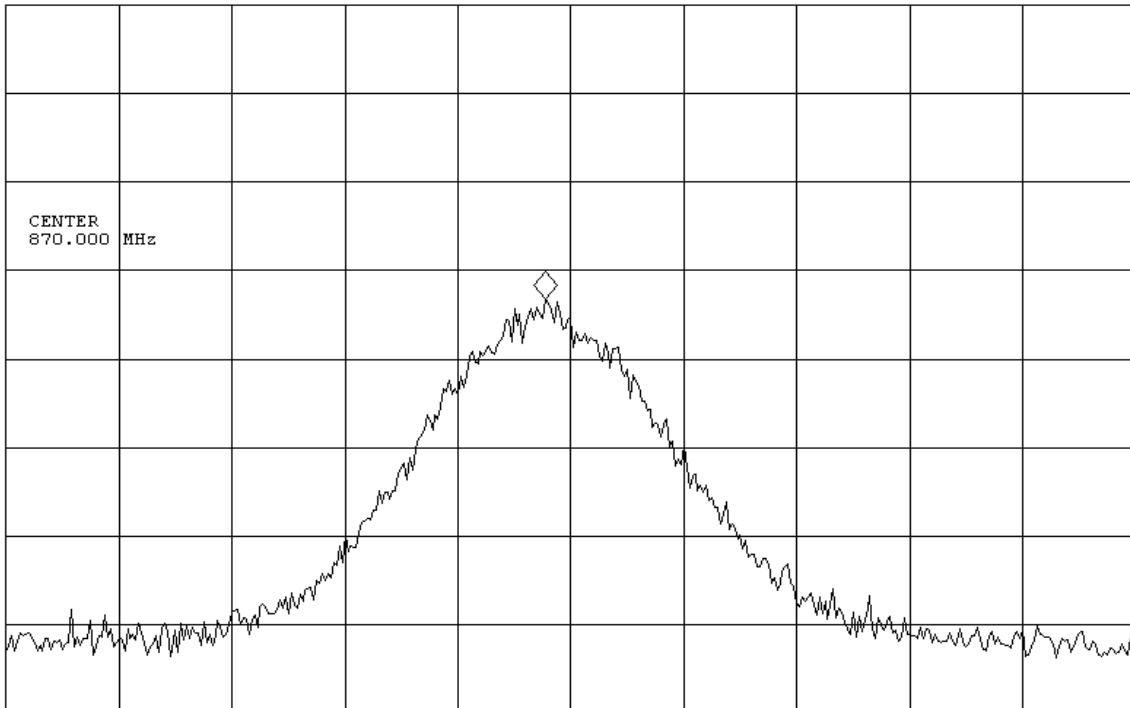
dB

CENTER
870.000 MHz

VA SB

SC FC

CORR



CENTER 870.000 MHz

SPAN 5.000 MHz

#RES BW 1.0 MHz

#VBW 3 MHz

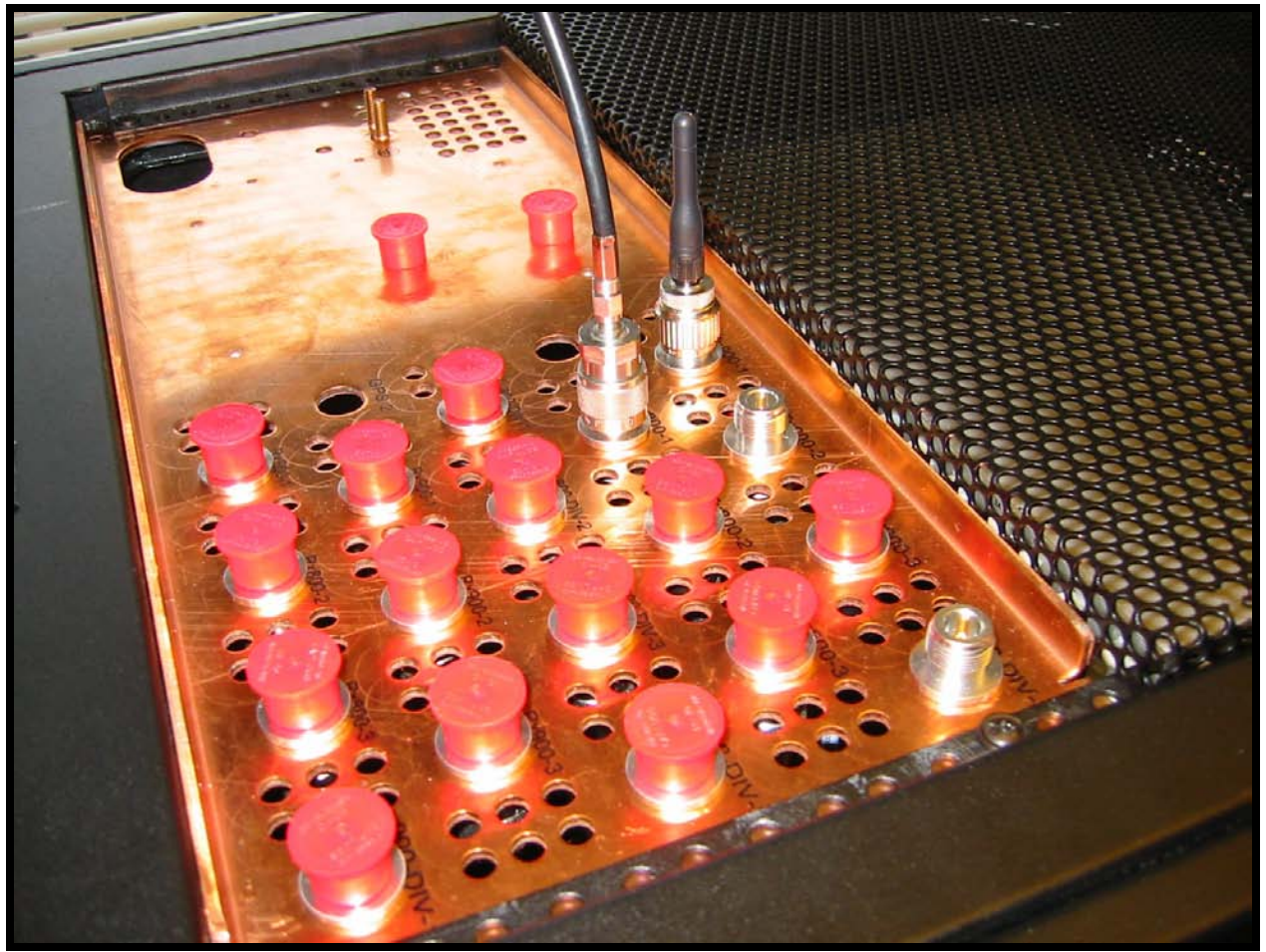
SWP 20.0 msec



Switched by the test setup
10/10/2010
10/10/2010
10/10/2010



NUENC







Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low (851.0125 MHz)

Mid (859.1625 MHz)

High (869.9875 MHz)

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Highest

Middle

Lowest

Power Input Settings Investigated:

120 VAC, 60 Hz.

Frequency Range Investigated

Start Frequency	30 MHz	Stop Frequency	10 GHz
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Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
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Description

The system was tested using standard operating production software to exercise the functions of the device during the testing.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
iDEN Radio Base Station System	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	EUT	AC Mains

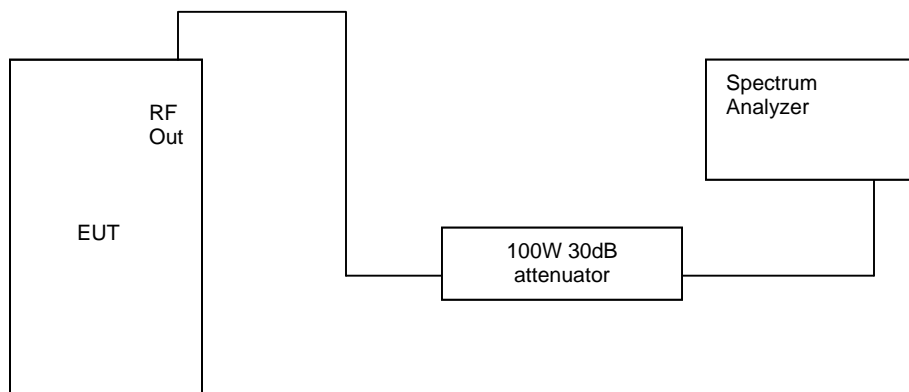
Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo
30 dB 100W attenuator	Bird Electronic Corp.	100-SA-MFN-30	N/A	NCR	N/A

Test Description

Requirement: Per 47 CFR 90.217(b), any emission appearing on a frequency 25 kHz or more removed from the assigned frequency must be attenuated at least 30 dB below the un-modulated carrier. Per 47 CFR 2.1051, the spurious emissions were measured at the RF output terminals with analyzer plots made for each modulation type.

Configuration: A spectrum analyzer was used to scan from 0 to 2 GHz. A 10kHz resolution bandwidth was used below 1GHz and 1MHz above 1GHz. No video filtering was employed. A 20dB external attenuator was used on the RF input of the spectrum analyzer.

Test Setup Diagram**Completed by:***Rocky Le Pellego*

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

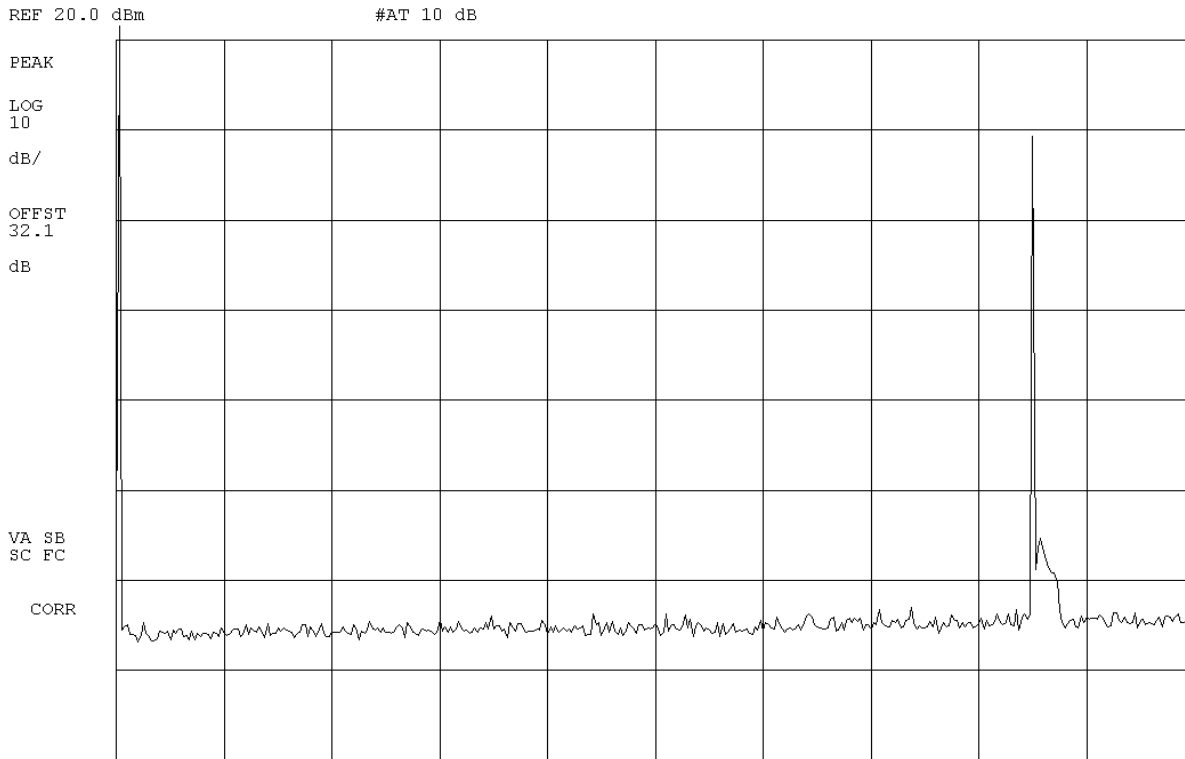
SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 0MHz-1GHz

11:16:07 OCT 14, 2005

HP



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 1GHz-2.8GHz

11:17:03 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

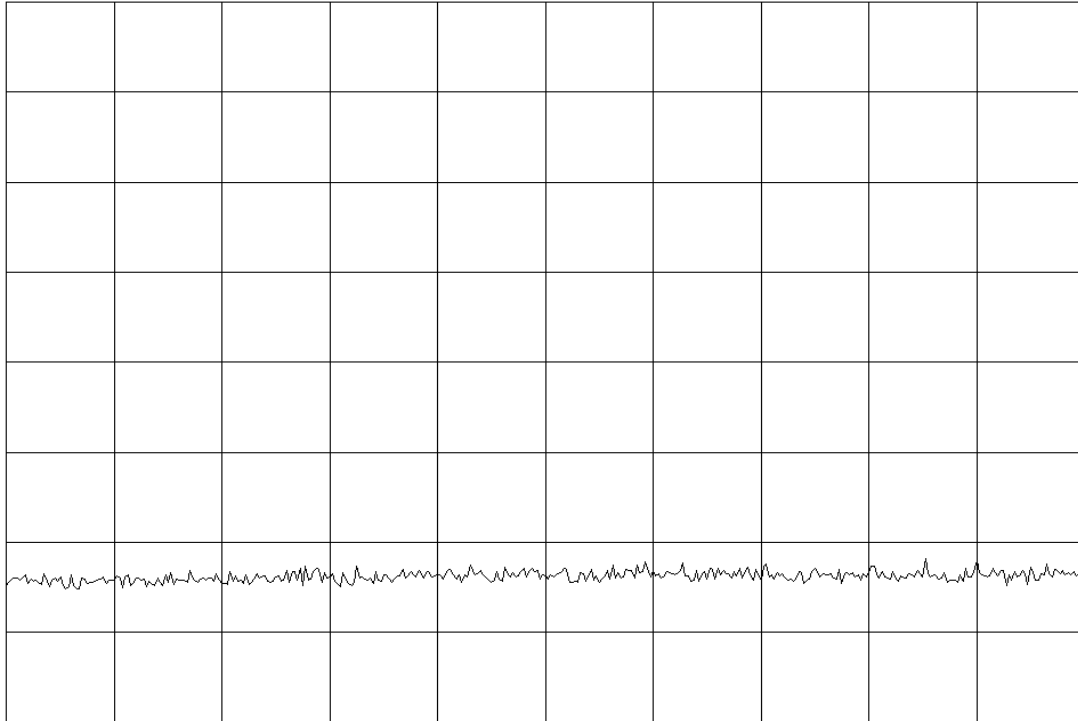
32.1

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 2.8GHz-4GHz

11:18:10 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

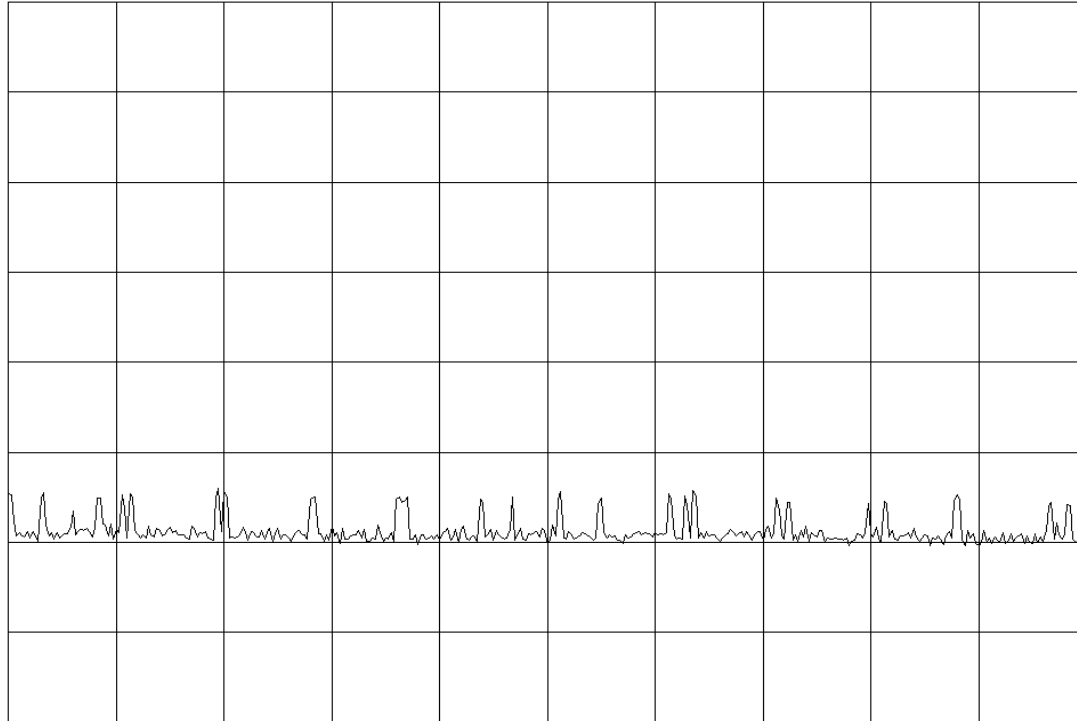
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Low Channel 4GHz-6.5GHz			

11:19:14 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

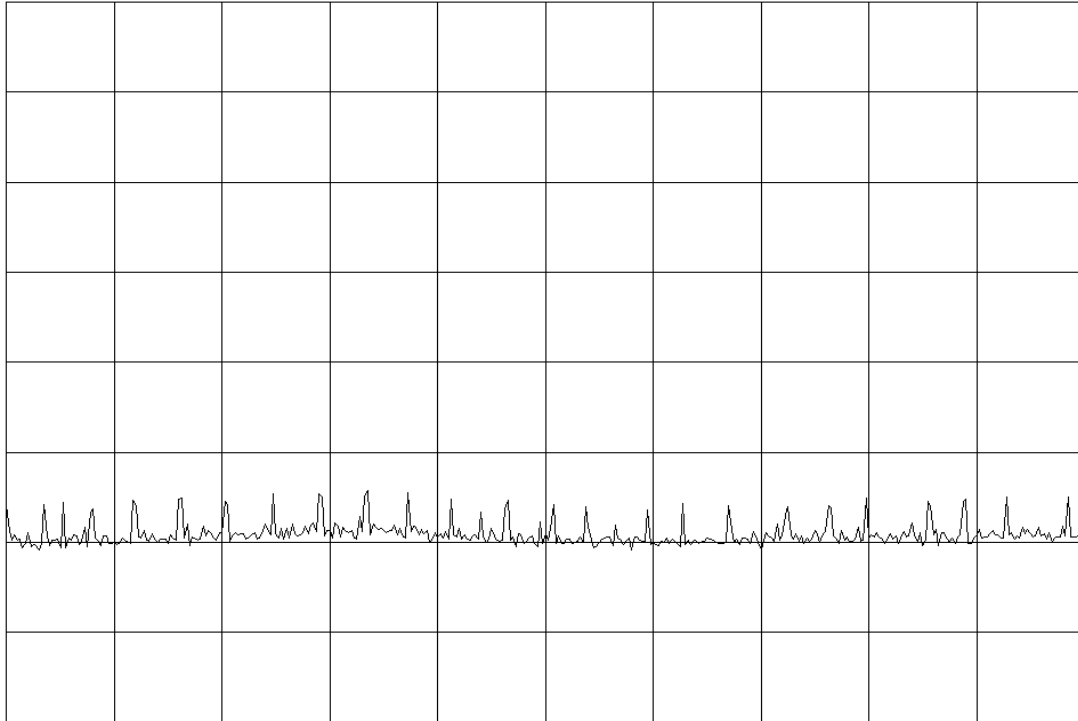
32.1

dB

VA SB

SC FC

CORR



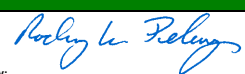
START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST EMC		Antenna Conducted Spurious Emissions		Rev BETA 01/30/01
EUT: MC Series System		Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1		Date: 10/14/05		
Customer: Radioframe Networks, Inc.		Temperature: 23° C		
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%		
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (approx. 13 dBm)				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Antenna Conducted Spurious Emissions - Low Channel 6.5GHz - 9GHz				

11:20:19 OCT 14, 2005

hp

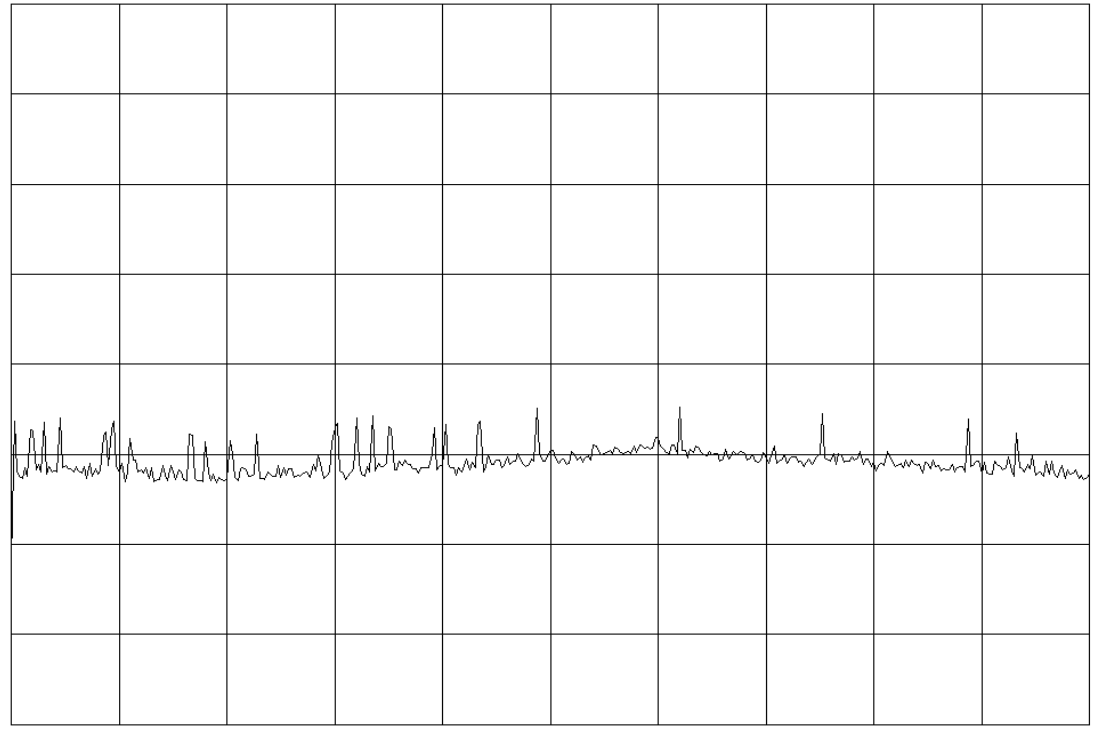
REF 20.0 dBm

#AT 10 dB

PEAK
LOG
10
dB/
OFFST
32.1
dB

VA SB
SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

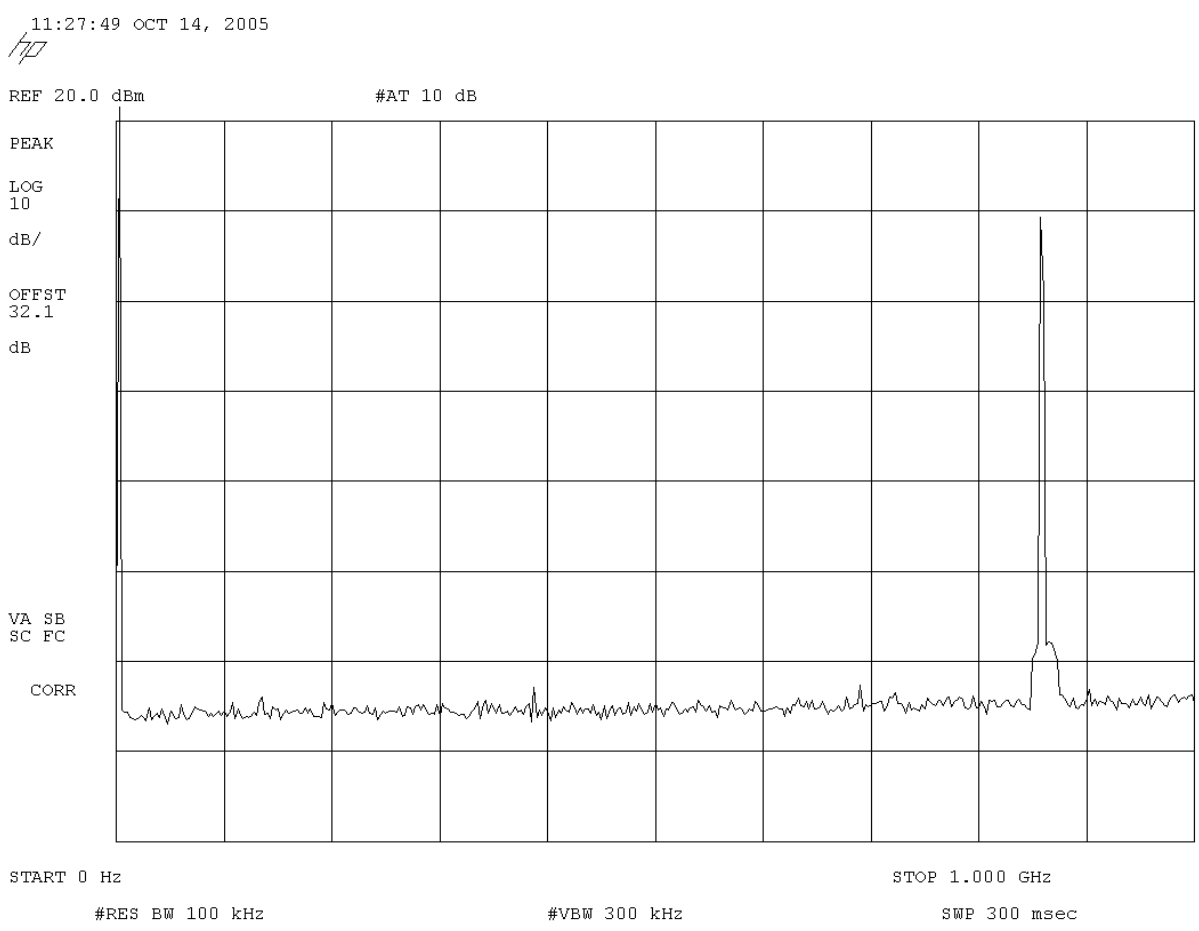
REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 0MHz-1GHz



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 1GHz-2.8GHz			

11:28:37 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

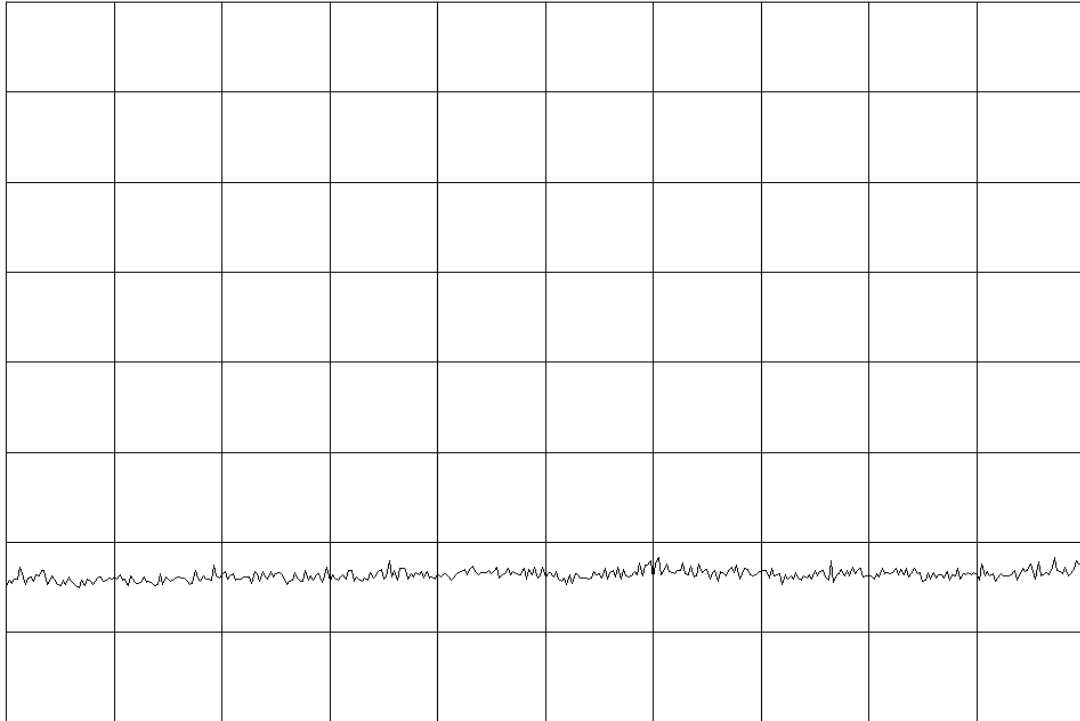
32.1

dB

VA SB

SC FC

CORR



START 1.000 GHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 2.8GHz-4GHz			

11:29:54 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

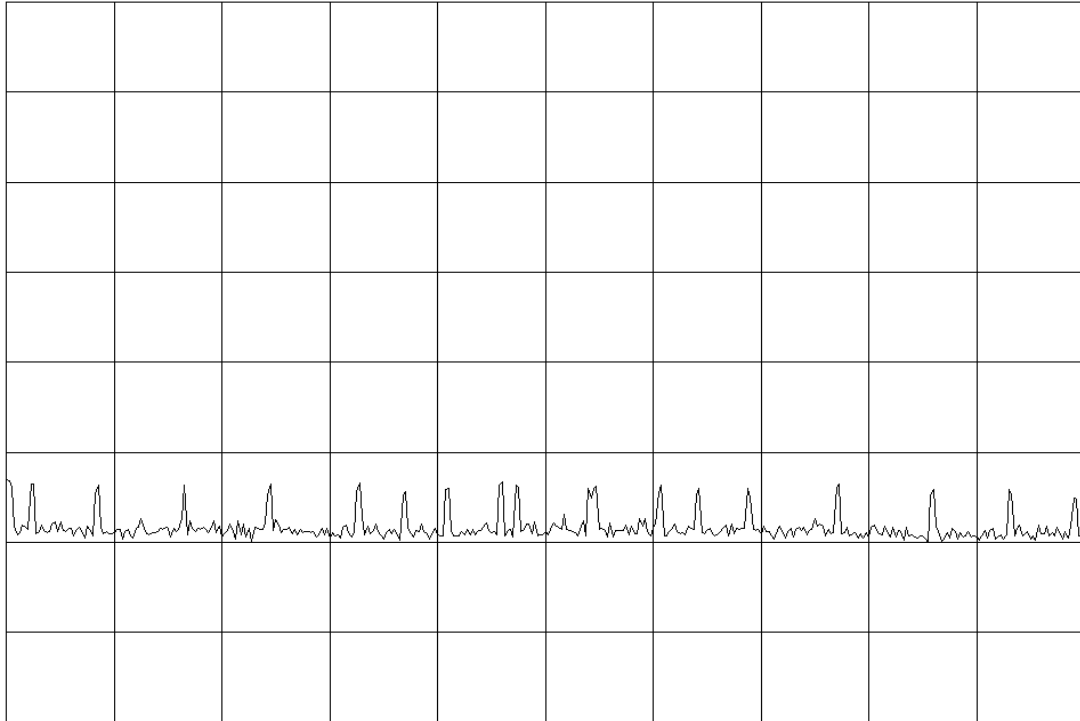
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 4GHz - 6.5GHz			

11:30:47 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

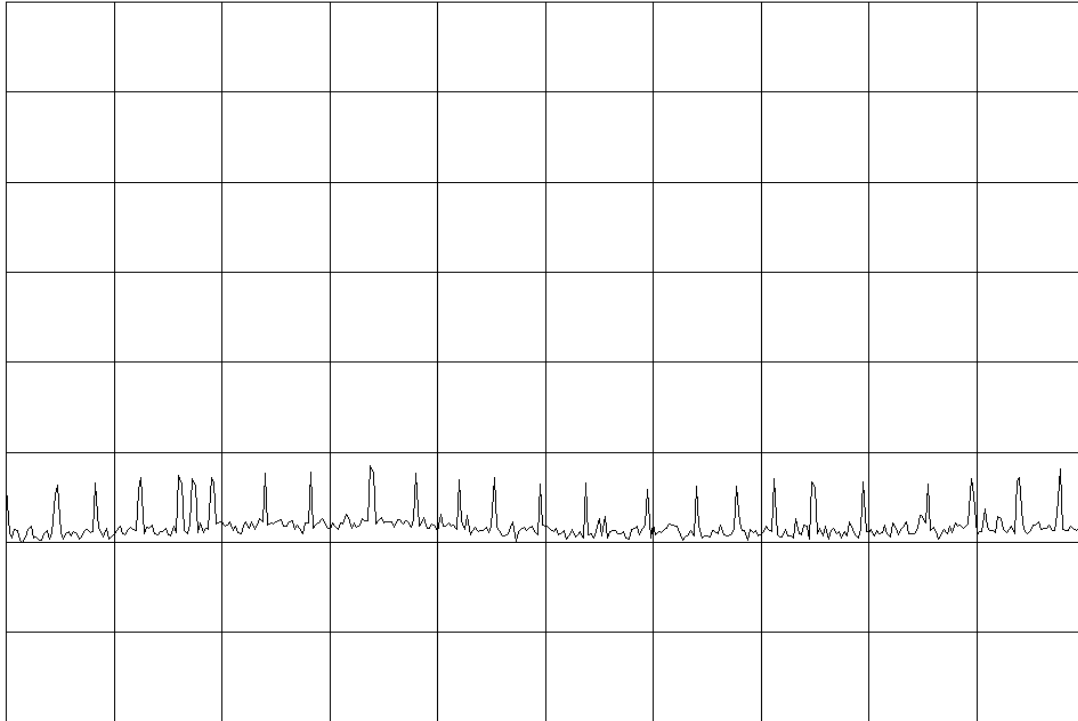
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
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Rod Peloquin
Tested By: _____

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-9GHz			

11:31:45 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

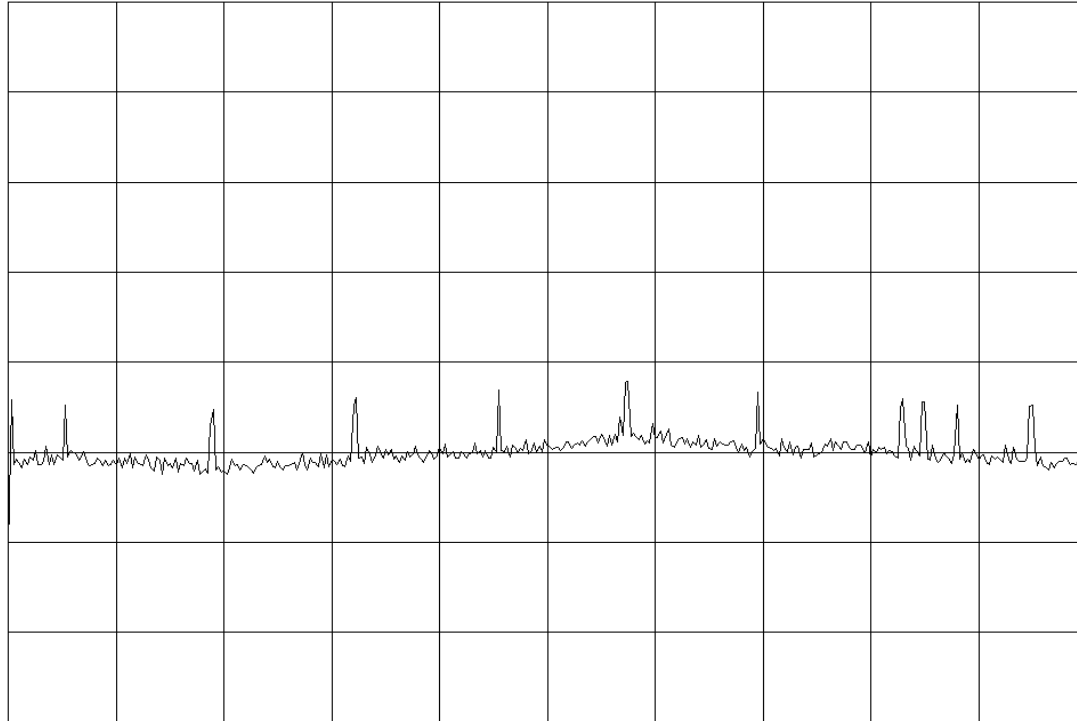
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 1GHz-2.8GHz

11:44:48 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

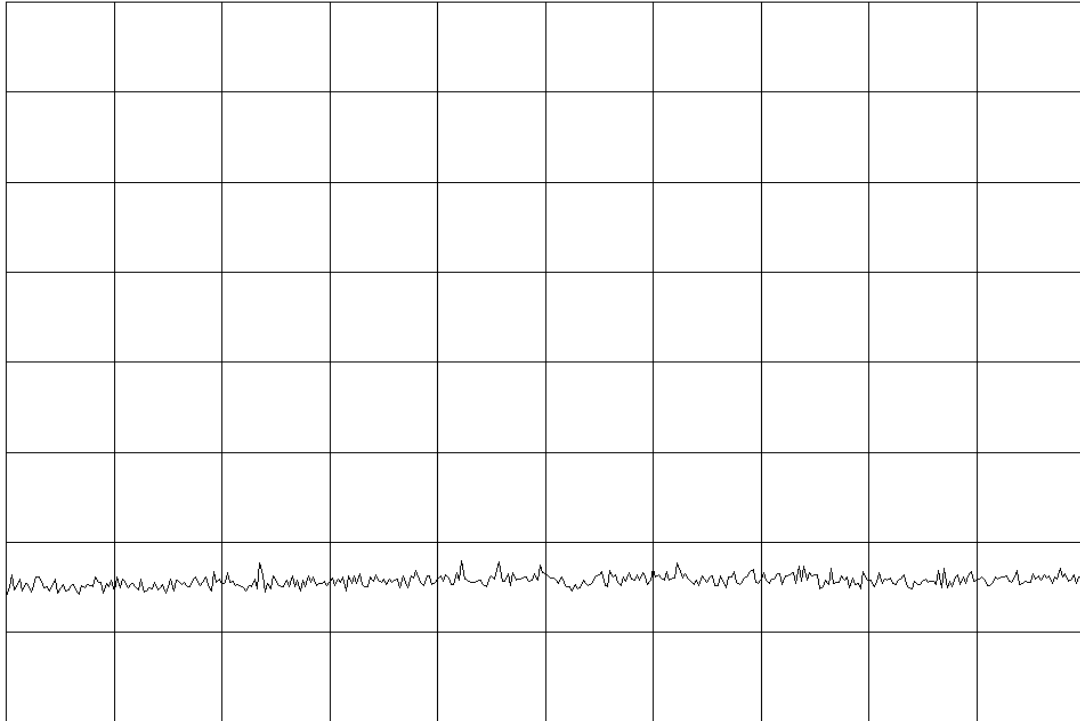
32.1

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 13 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 2.8GHz-4GHz			

11:45:33 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

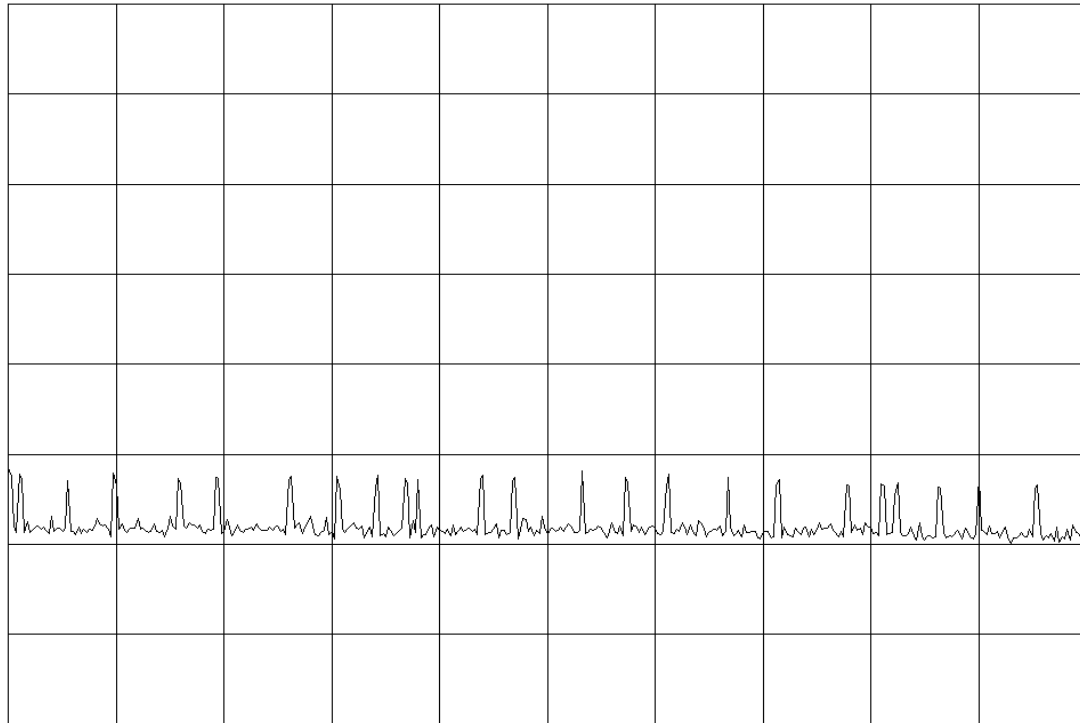
32.1

dB

VA SB

SC FC

CORR



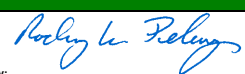
START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST EMC		Antenna Conducted Spurious Emissions		Rev BETA 01/30/01
EUT: MC Series System		Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1		Date: 10/14/05		
Customer: Radioframe Networks, Inc.		Temperature: 23° C		
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%		
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (approx. 13 dBm)				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Antenna Conducted Spurious Emissions - High Channel 4GHz-6.5GHz				

11:46:11 OCT 14, 2005

hp

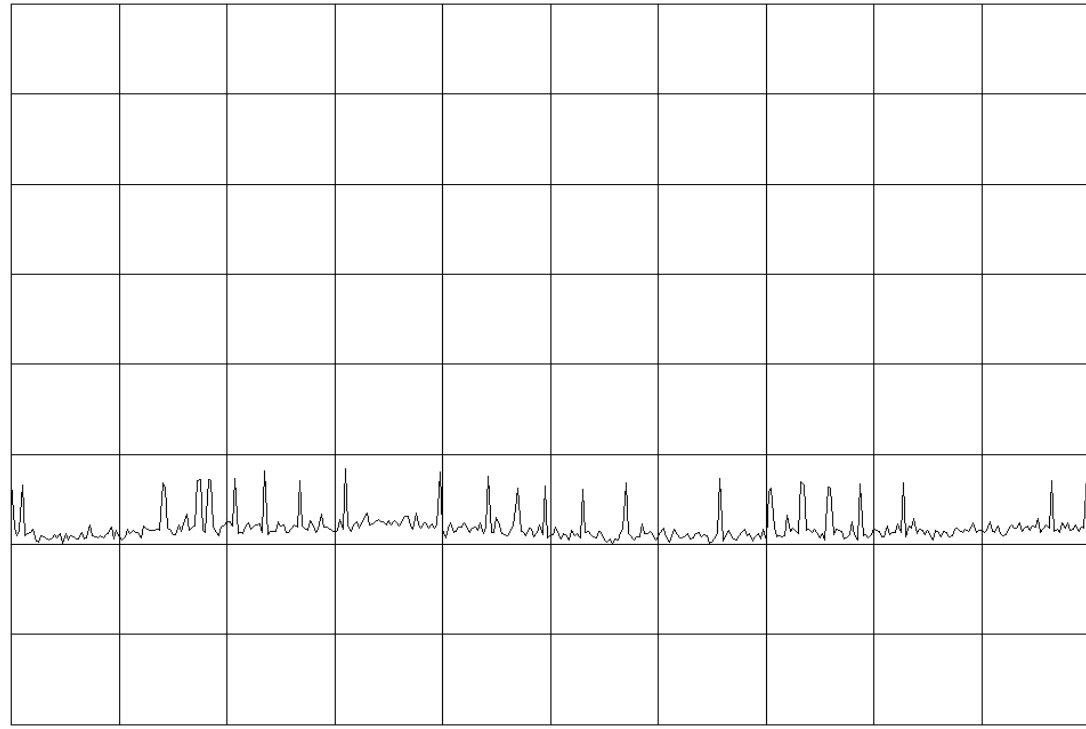
REF 20.0 dBm

#AT 10 dB

PEAK
LOG
10
dB/
OFFST
32.1
dB

VA SB
SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 13 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 6.5GHz-9GHz

11:46:54 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

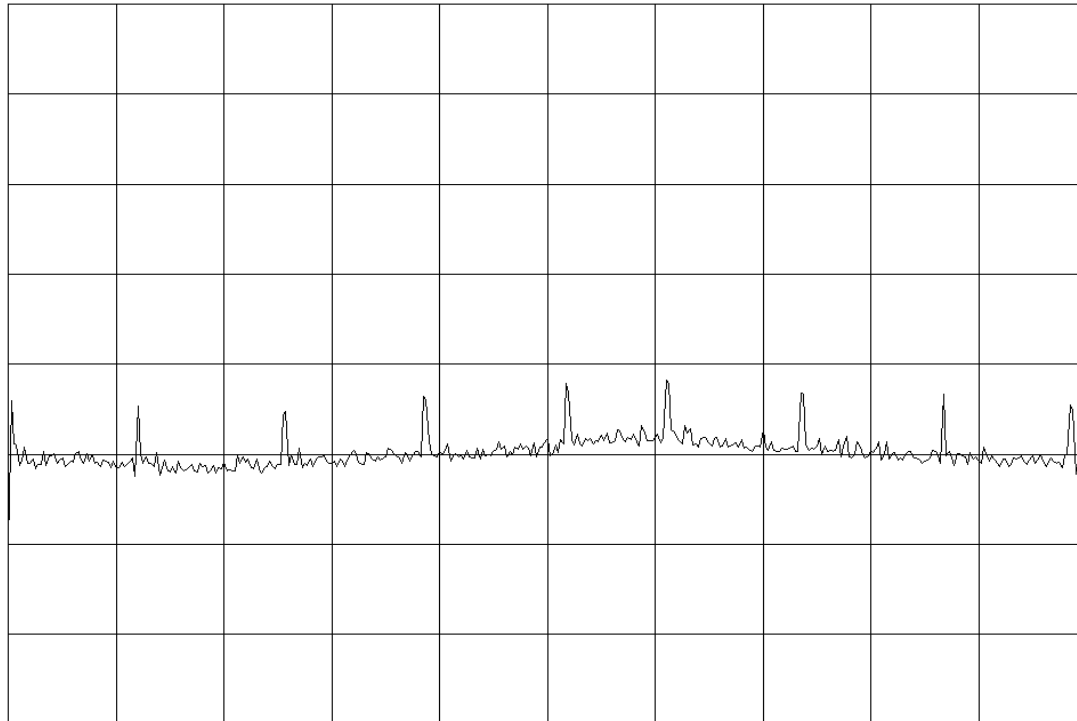
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 1GHz-2.8GHz

12:00:11 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

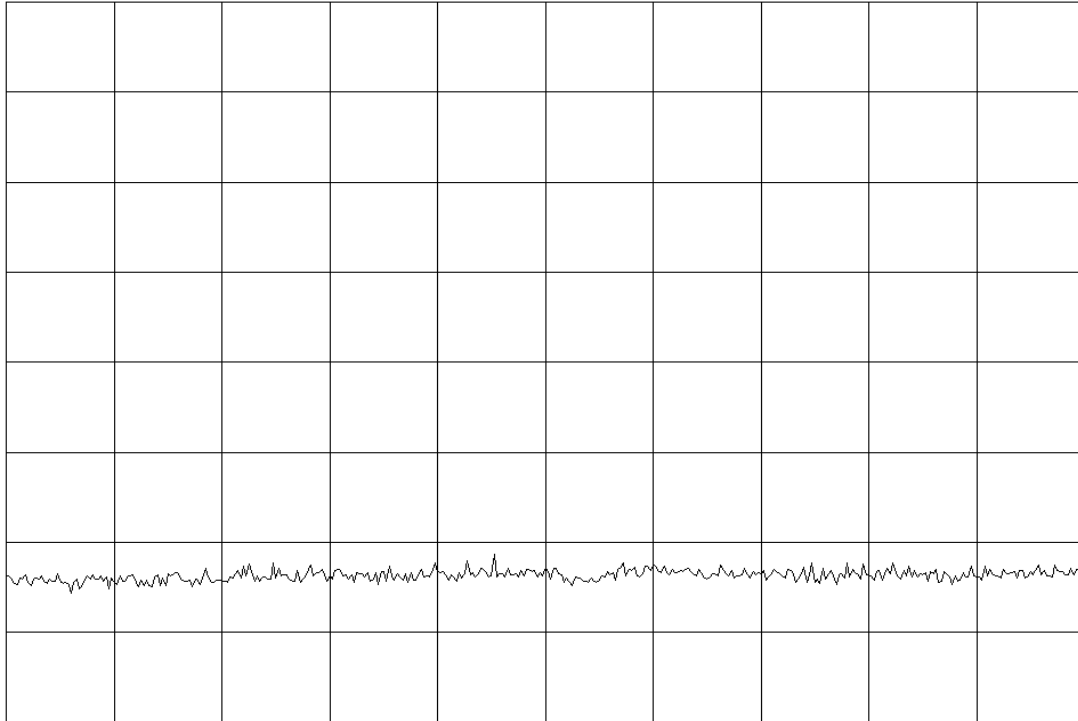
32.1

dB

MA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 2.8GHz-4GHz

12:00:44 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

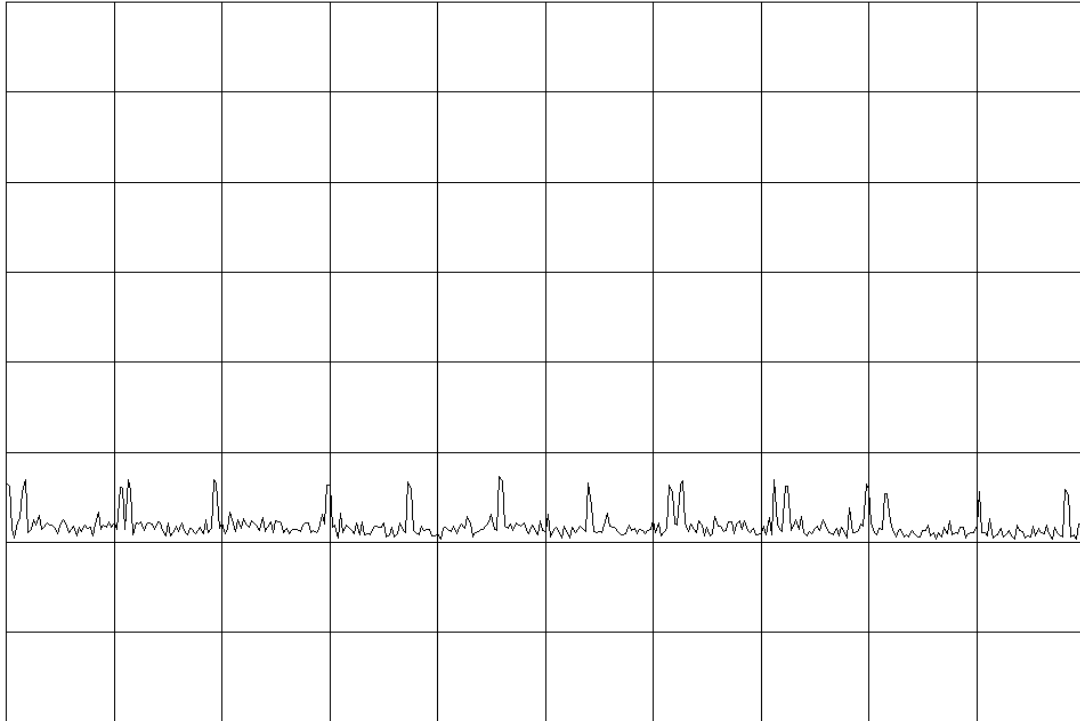
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

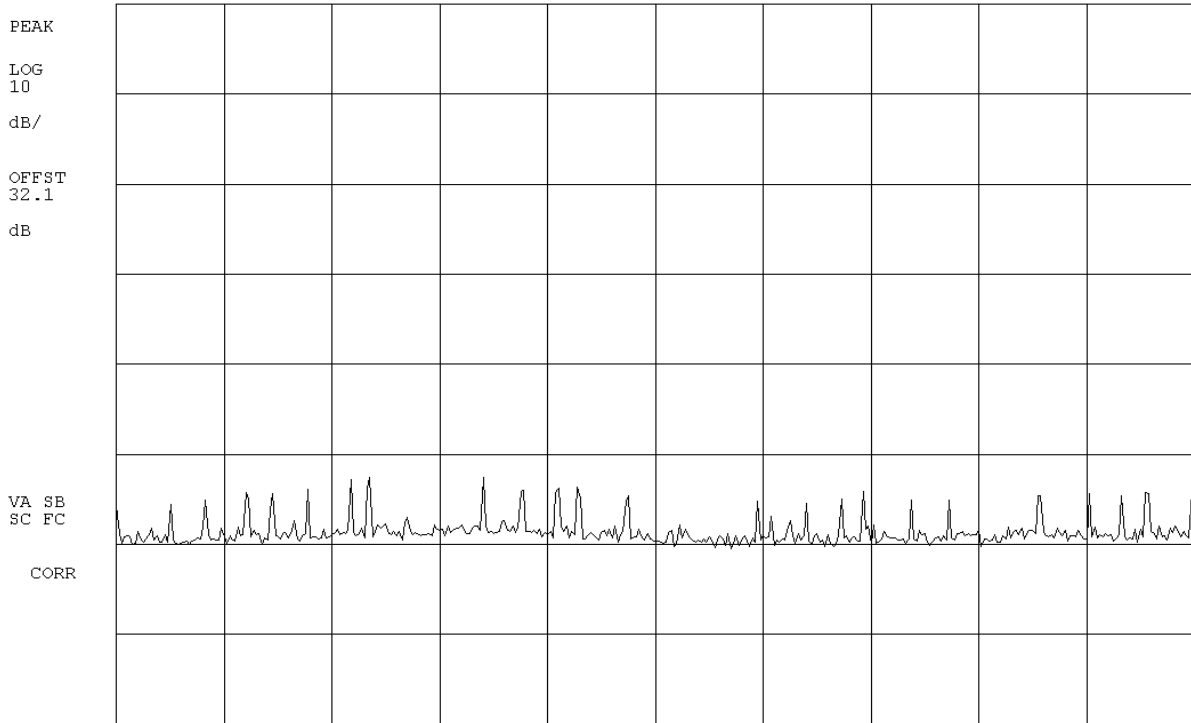
DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 4GHz-6.5GHz

12:01:23 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at lowest output power level (approx. 9 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Low Channel 6.5GHz - 9GHz			

12:02:14 OCT 14, 2005

hp

REF 20.0 dBm

#AT 10 dB

PEAK

LOG
10

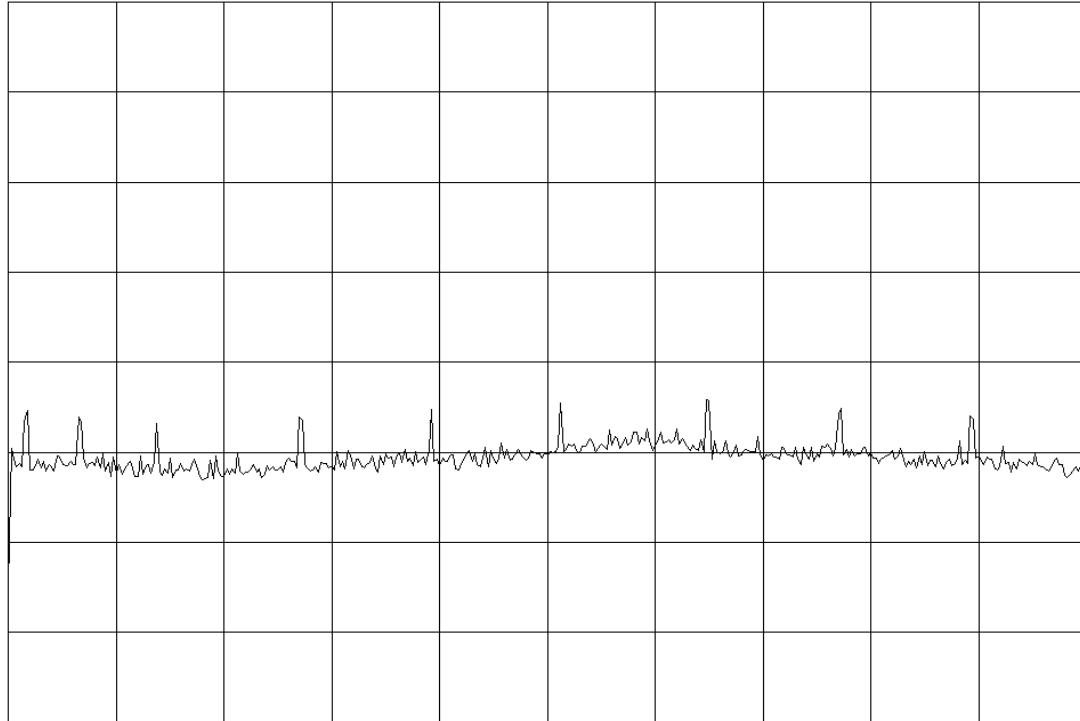
dB/

OFFST
32.1

dB

VA SB
SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at lowest output power level (approx. 9 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 1GHz-2.8GHz			

12:08:06 OCT 14, 2005

RP

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

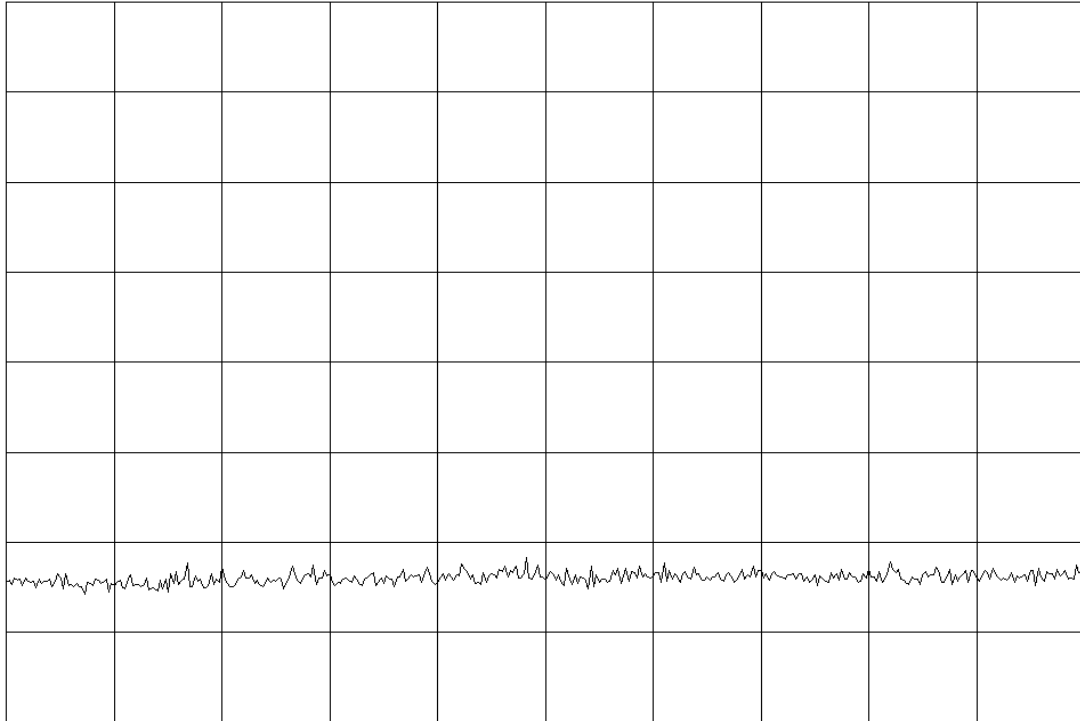
32.1

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 2.8GHz-4GHz

12:08:40 OCT 14, 2005

hp

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

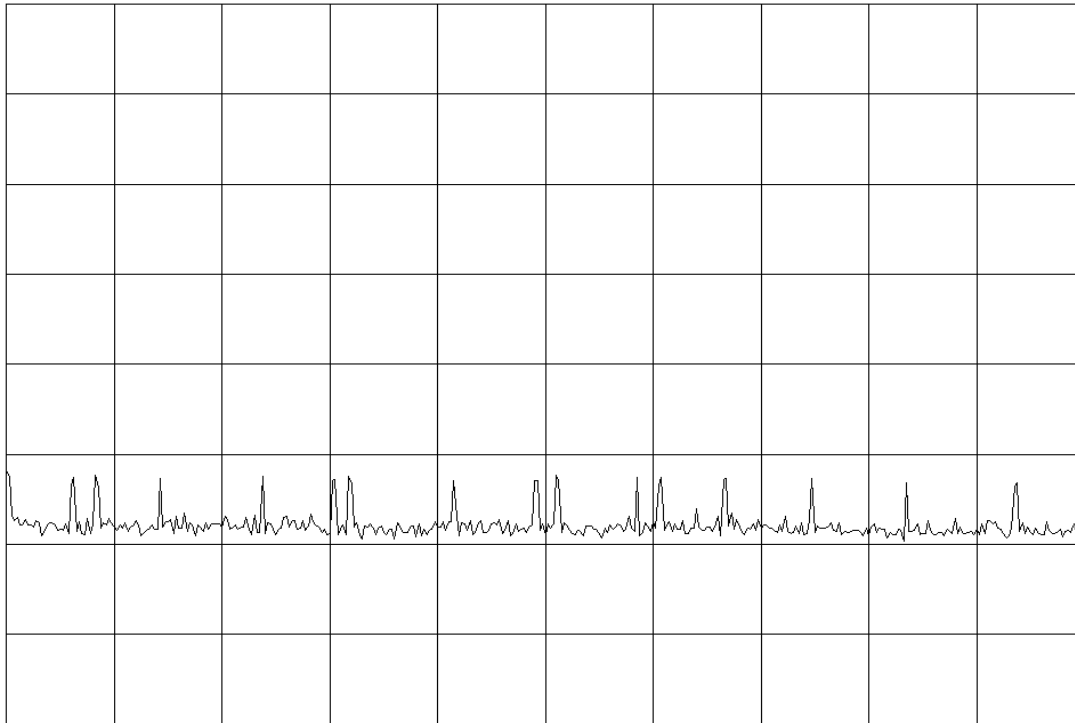
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1		Date: 10/14/05	
Customer: Radioframe Networks, Inc.		Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%	
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site	

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at lowest output power level (approx. 9 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

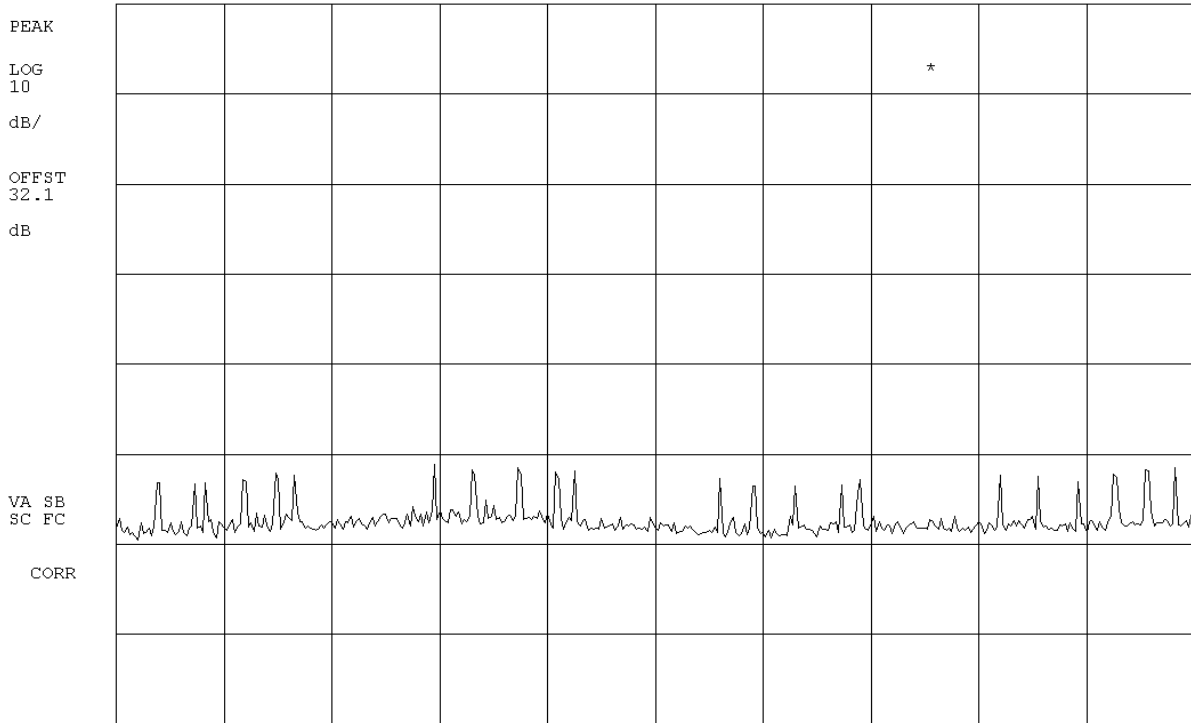
DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Mid Channel 4GHz - 6.5GHz			

12:10:02 OCT 14, 2005

hp

REF 20.0 dBm

AT 10 dB



START 4.013 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 746 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-9GHz

12:10:45 OCT 14, 2005

RP

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

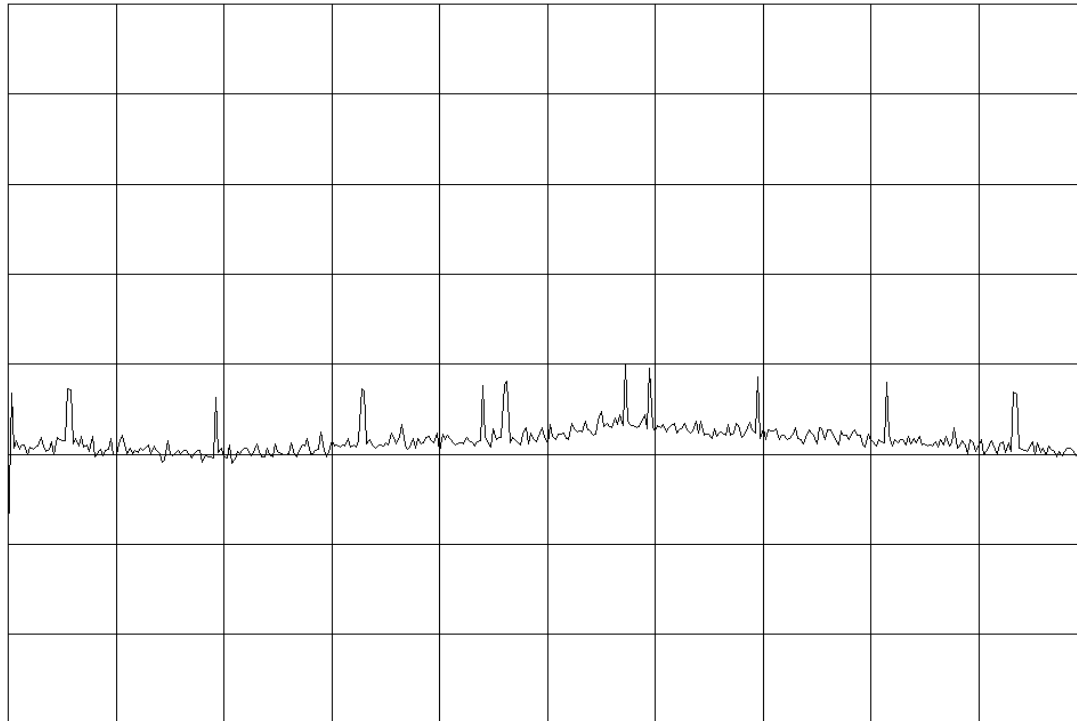
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at lowest output power level (approx. 9 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 1GHz-2.8GHz			

12:17:01 OCT 14, 2005

hp

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

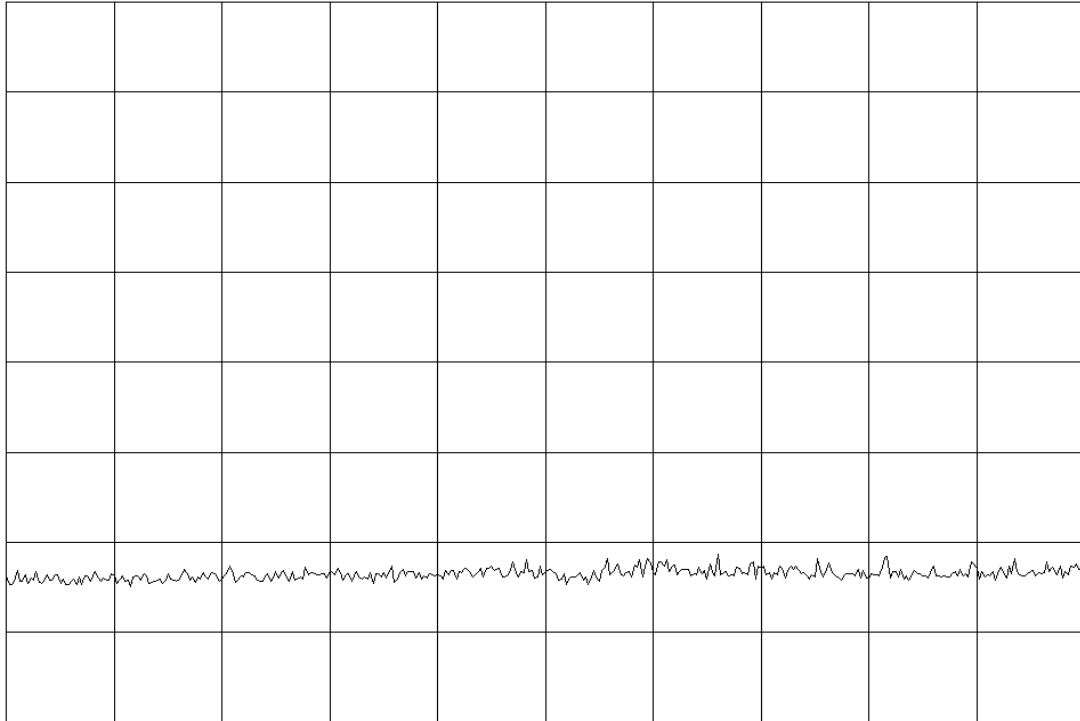
32.1

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at lowest output power level (approx. 9 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 2.8GHz-4GHz			

12:18:13 OCT 14, 2005

RP

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

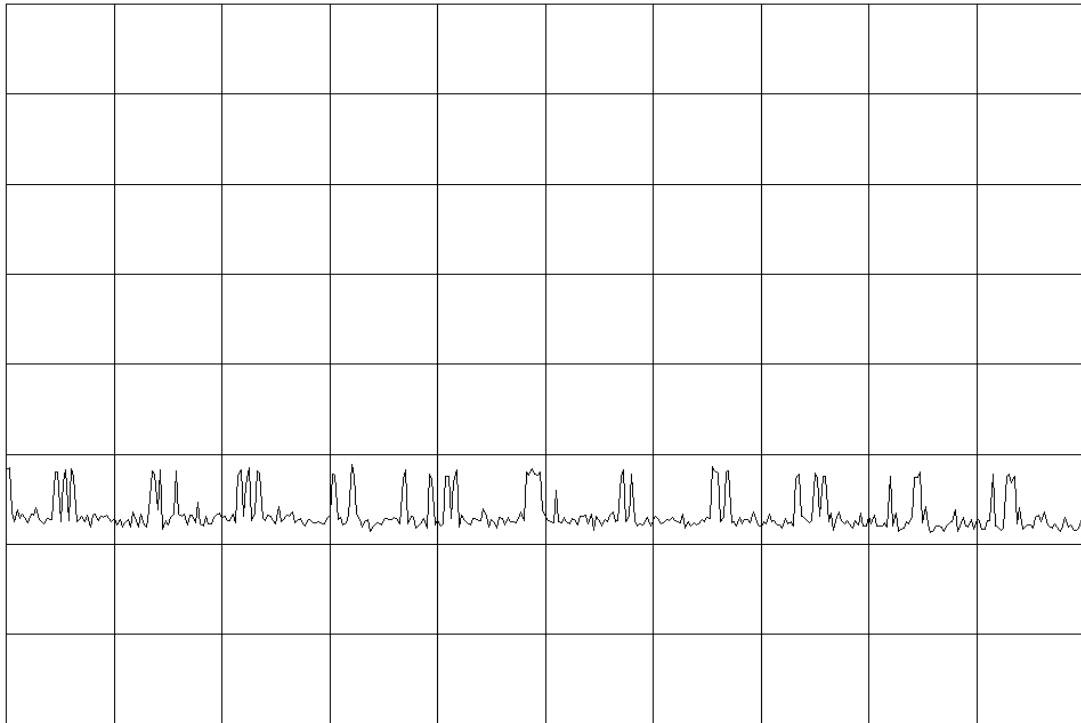
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 4GHz-6.5GHz

12:19:08 OCT 14, 2005

hp

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

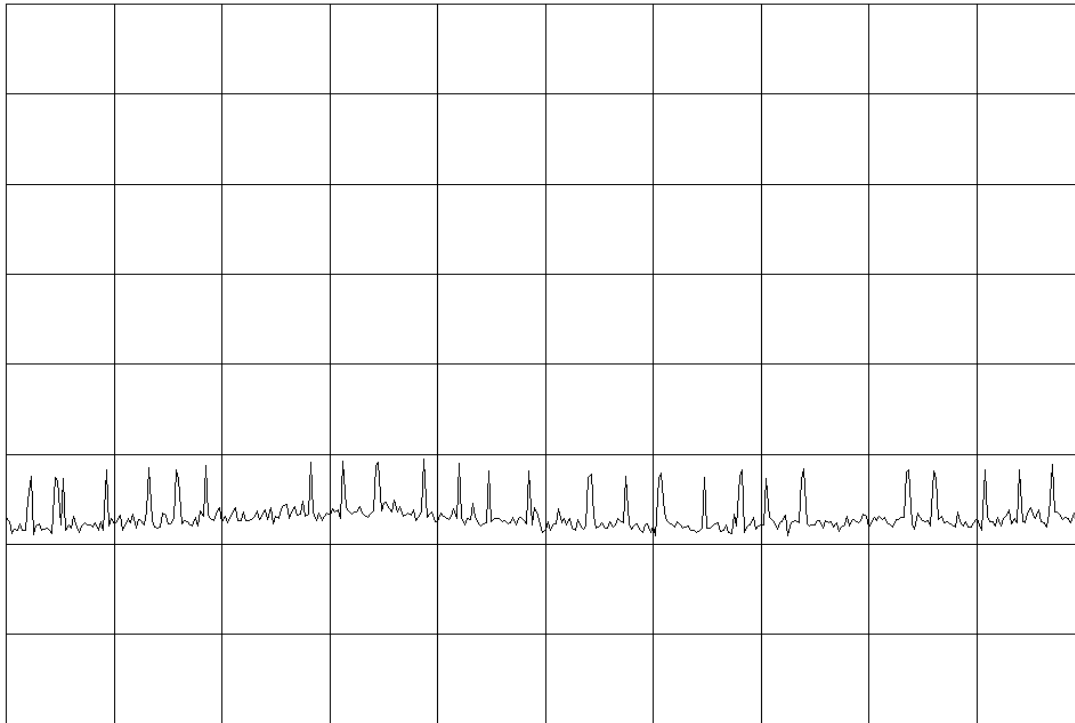
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at lowest output power level (approx. 9 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 6.5GHz-9GHz

12:20:03 OCT 14, 2005

hp

REF 20.0 dBm

AT 10 dB

PEAK

LOG

10

dB/

OFFST

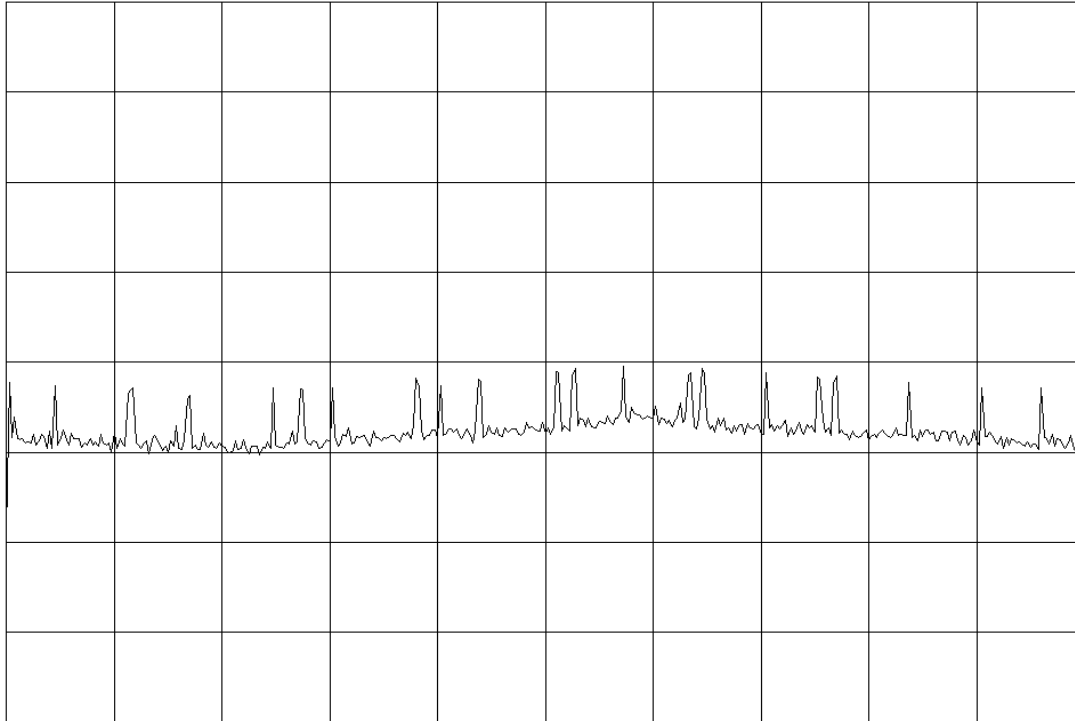
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

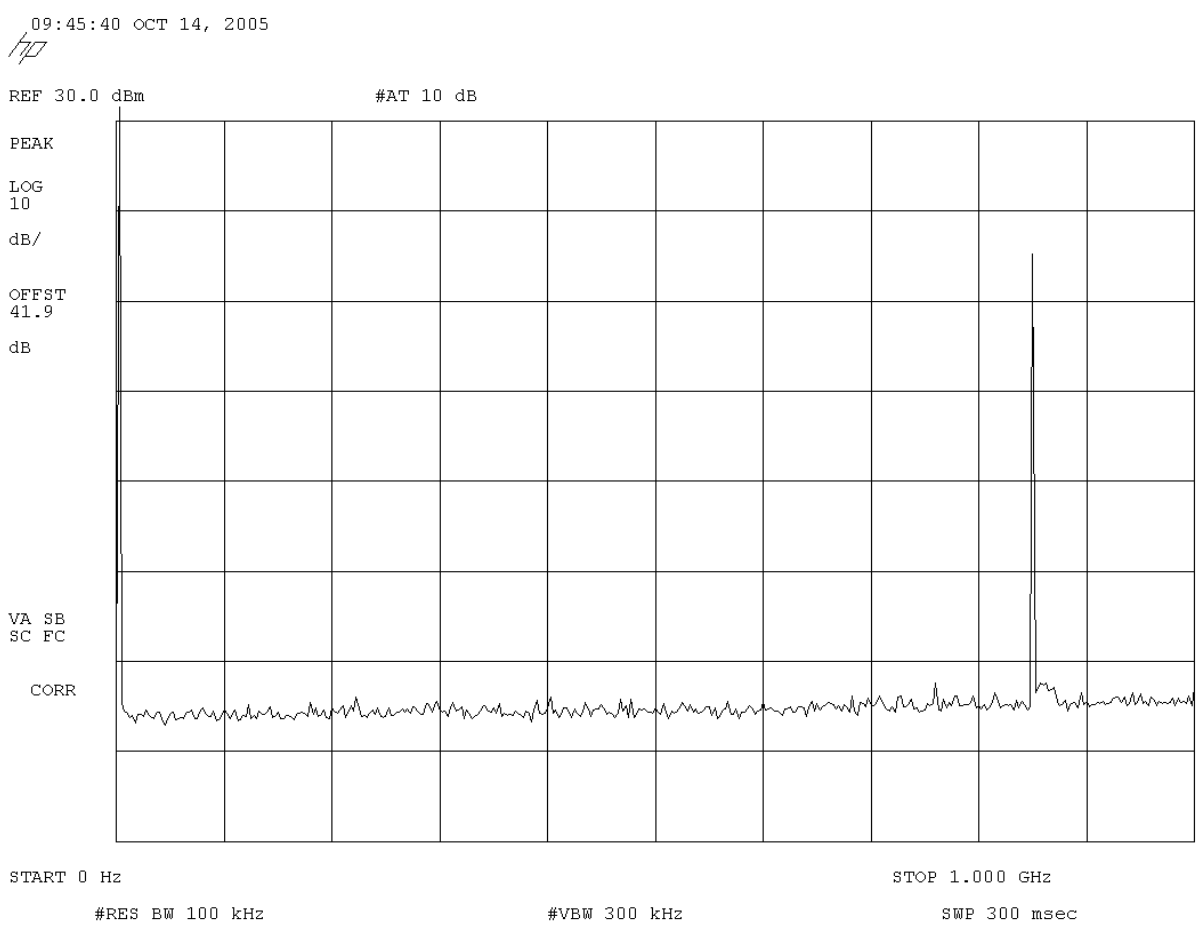
REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 0MHz-1GHz



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES

With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD

None

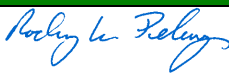
REQUIREMENTS

Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS

Pass

SIGNATURE

Tested By: 

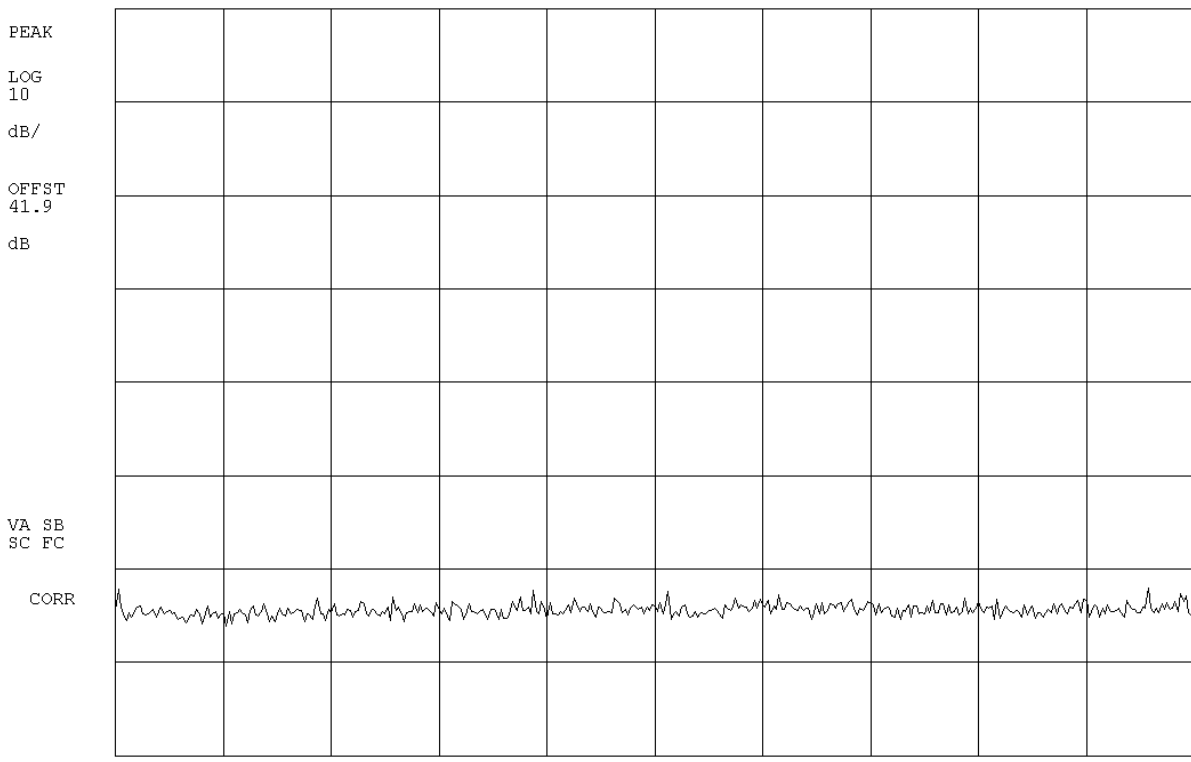
DESCRIPTION OF TEST

Antenna Conducted Spurious Emissions - Low Channel 1GHz-2.8GHz

09:46:23 OCT 14, 2005

hp

REF 30.0 dBm #AT 10 dB



START 999 MHz STOP 2.800 GHz
#RES BW 100 kHz #VBW 300 kHz SWP 540 msec

Antenna Conducted Spurious Emissions

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Low Channel 2.8GHz-4GHz			

09:47:52 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

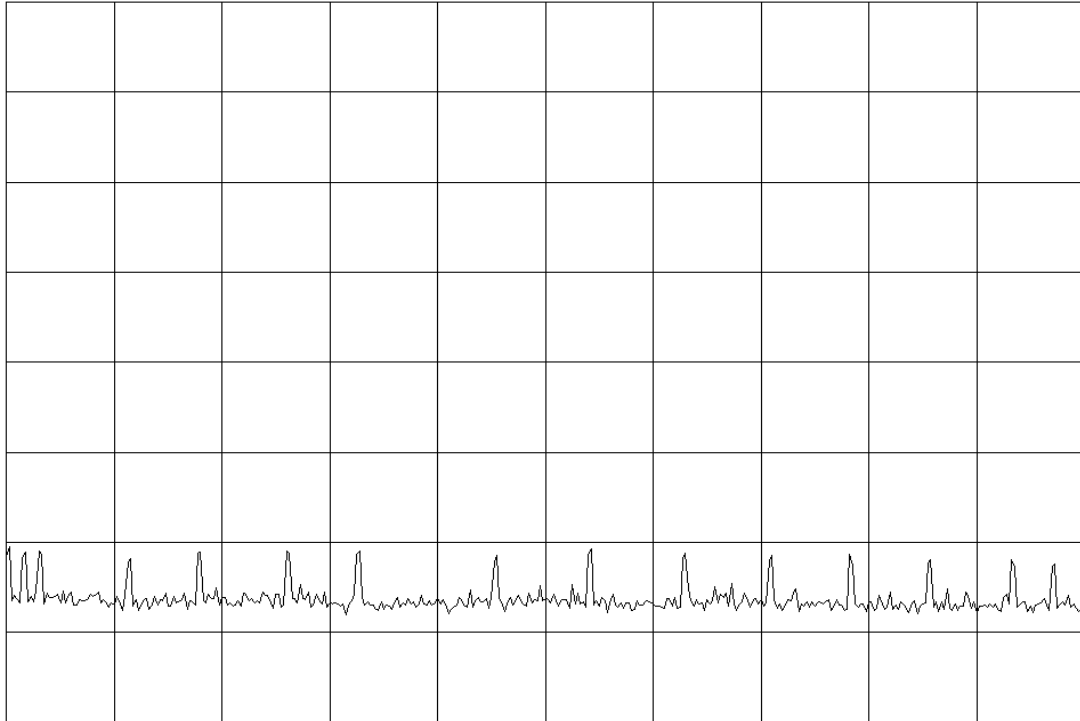
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Low Channel 4GHz-6.5GHz			

09:48:35 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

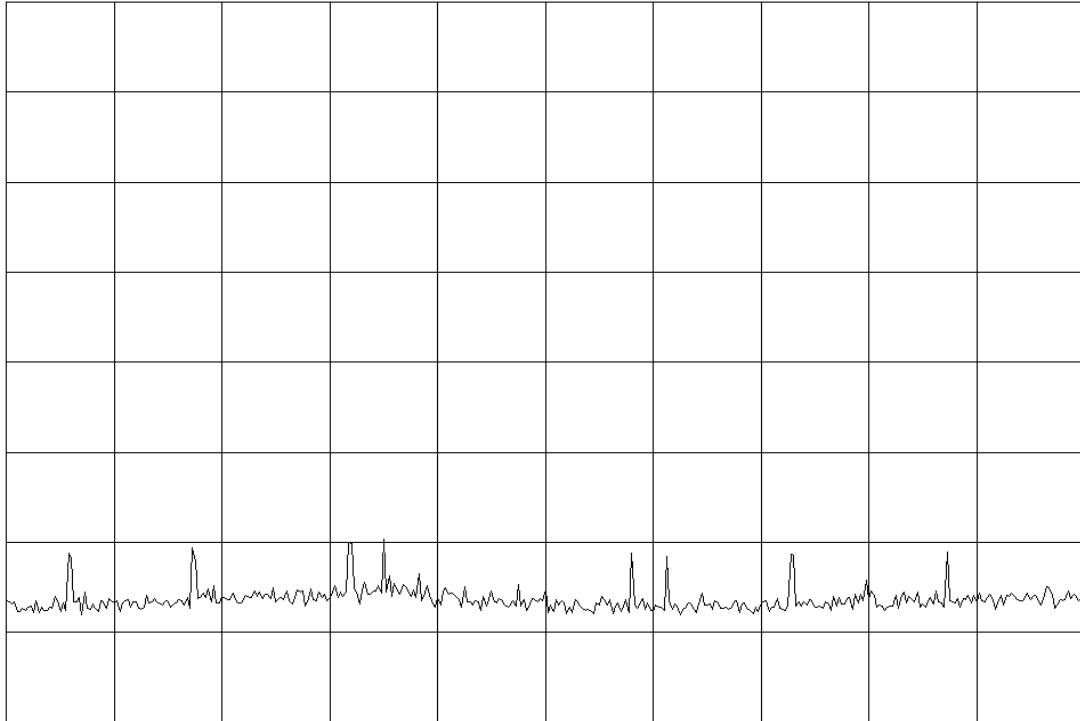
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

Antenna Conducted Spurious Emissions

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Low Channel 6.5GHz - 9GHz

09:49:12 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

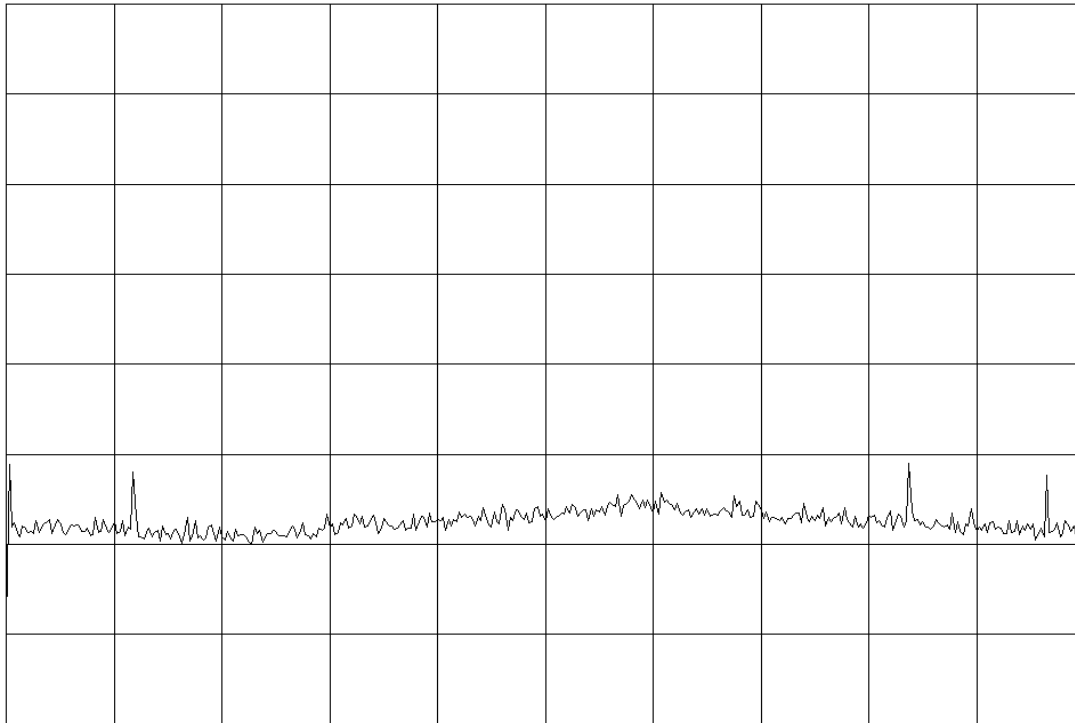
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

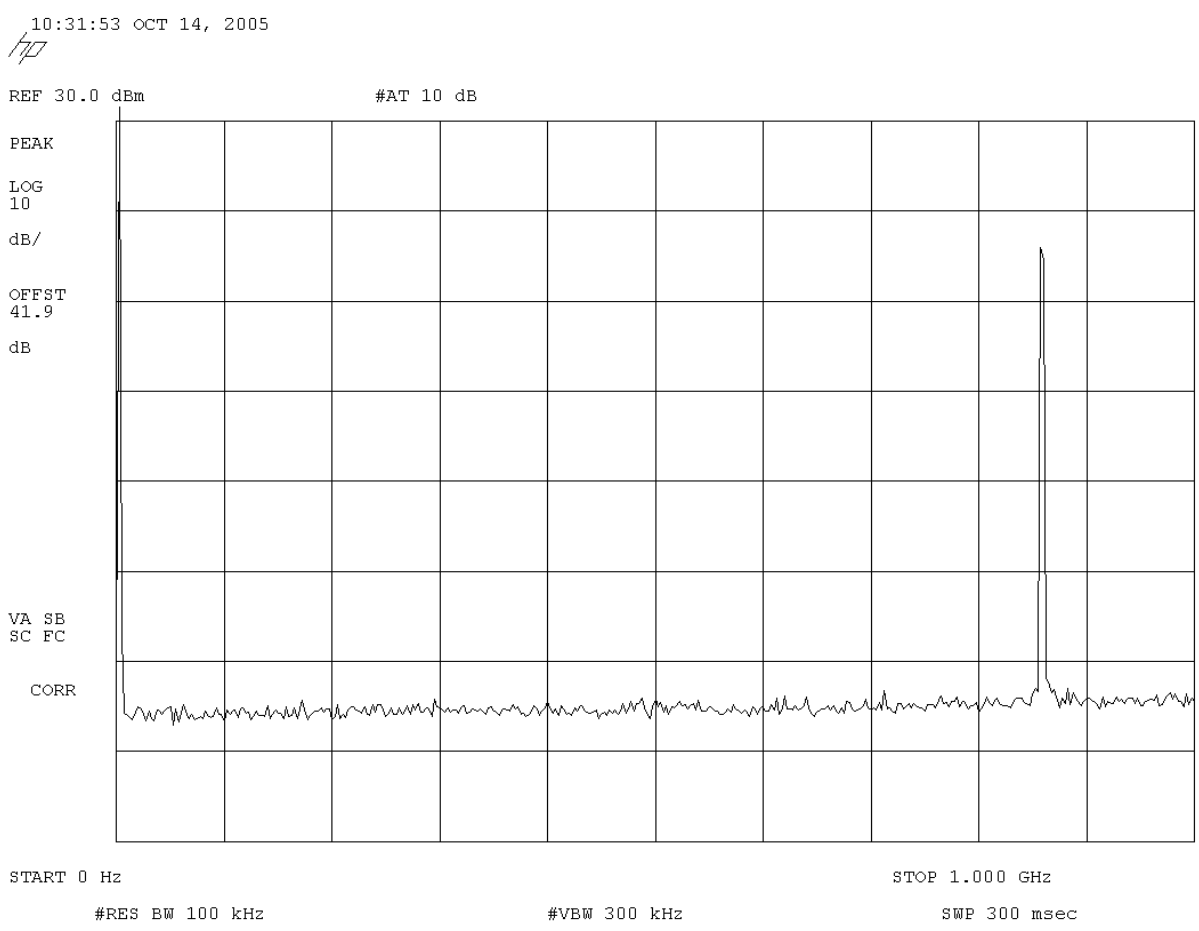
REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 0MHz-1GHz



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 1GHz-2.8GHz

10:32:58 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

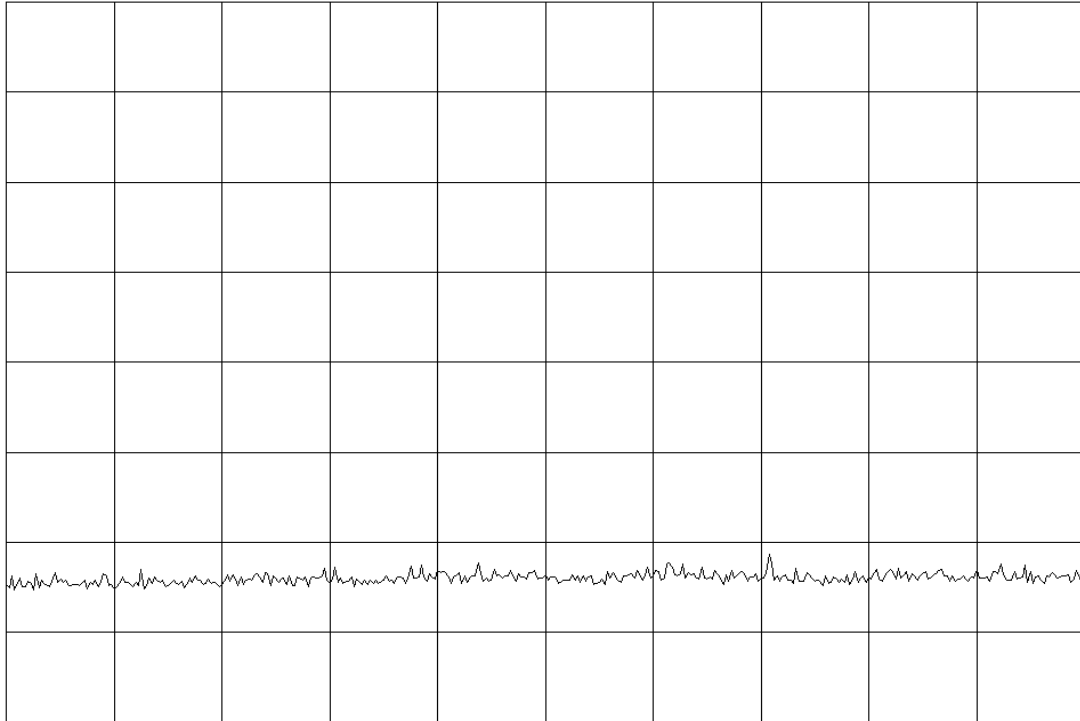
41.9

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 2.8GHz-4GHz

10:35:01 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

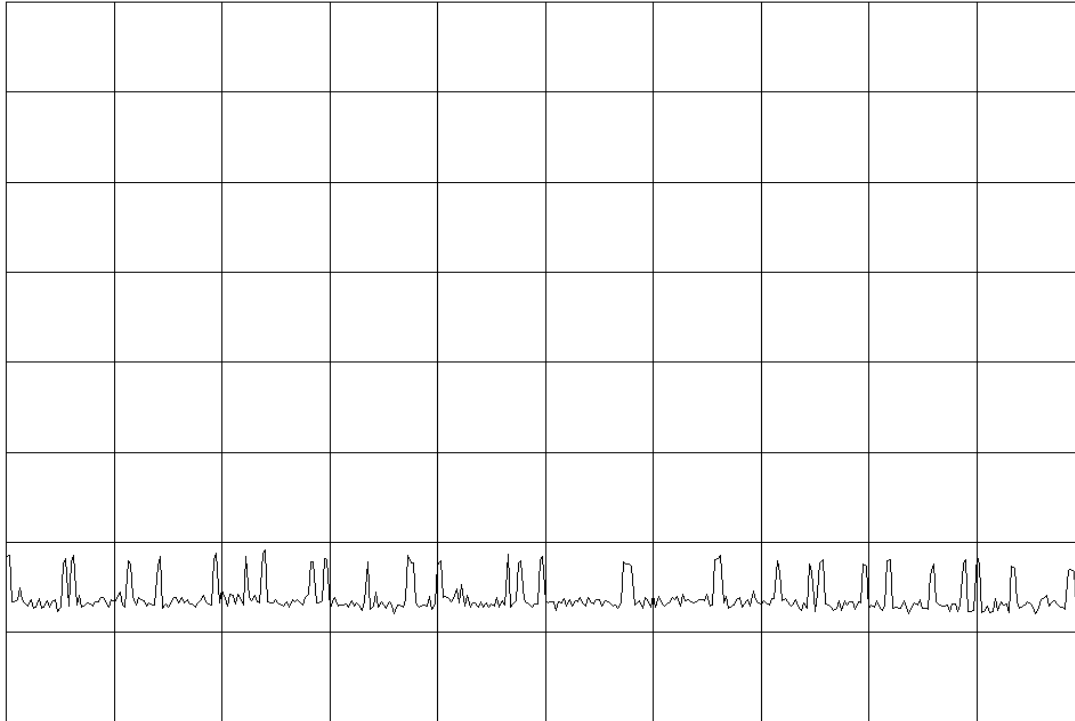
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 4GHz - 6.5GHz

10:36:26 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

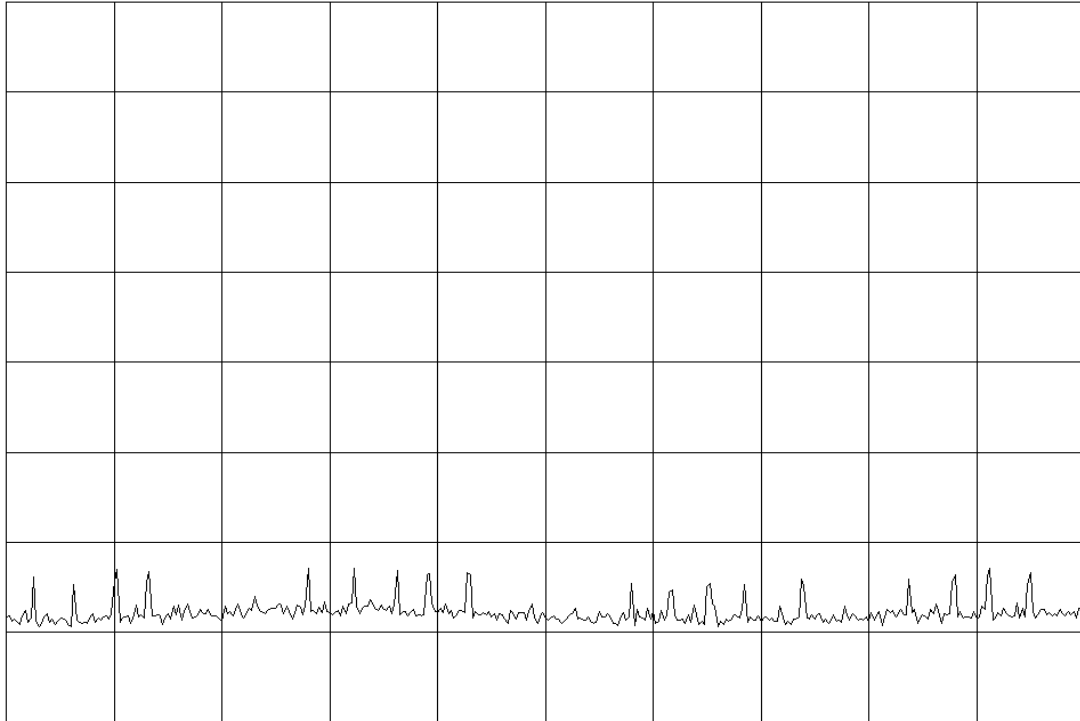
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-9GHz

10:37:20 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

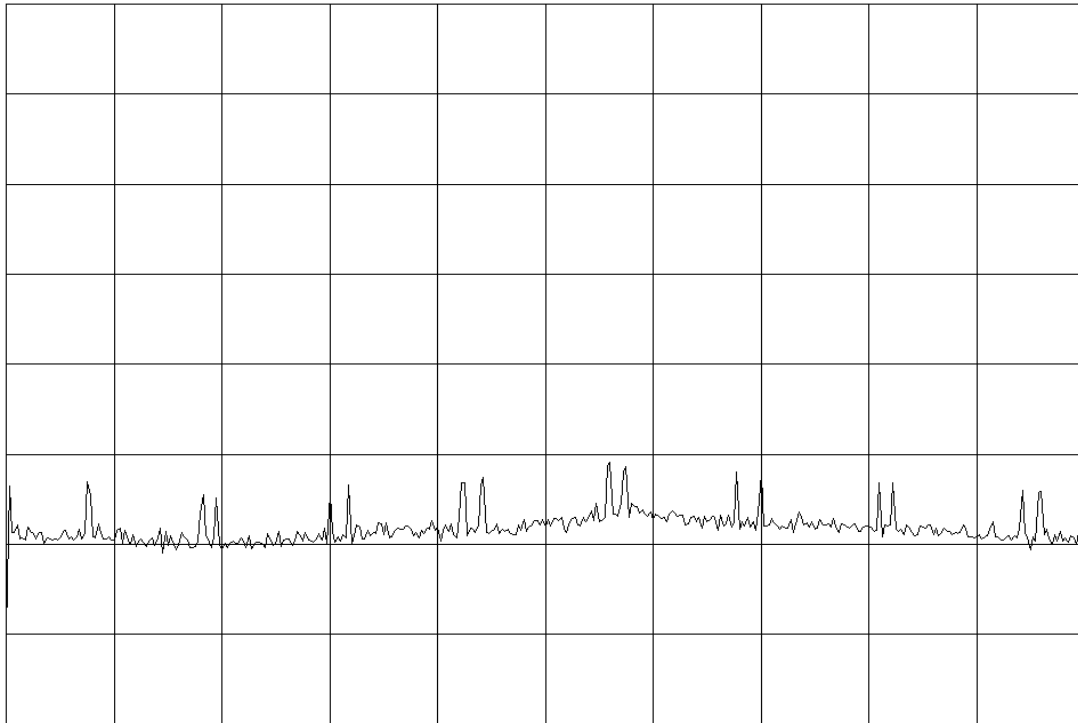
32.1

dB

VA SB

SC FC

CORR



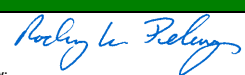
START 6.500 GHz

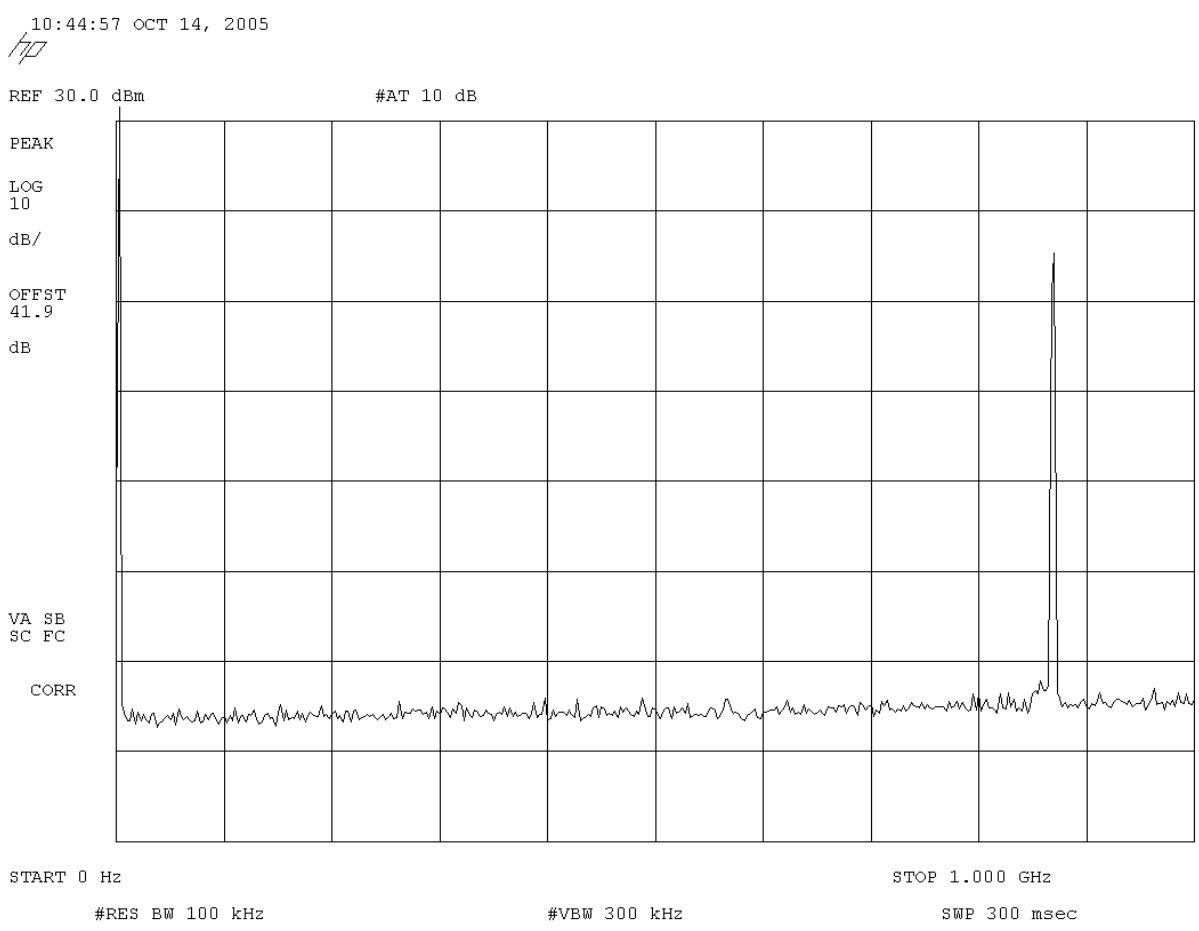
STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST EMC		Antenna Conducted Spurious Emissions		Rev BETA 01/30/01
EUT: MC Series System		Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1		Date: 10/14/05		
Customer: Radioframe Networks, Inc.		Temperature: 23° C		
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%		
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (approx. 20 dBm)				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Antenna Conducted Spurious Emissions - High Channel 0MHz-1GHz				



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - High Channel 1GHz-2.8GHz			

10:45:37 OCT 14, 2005

RP

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

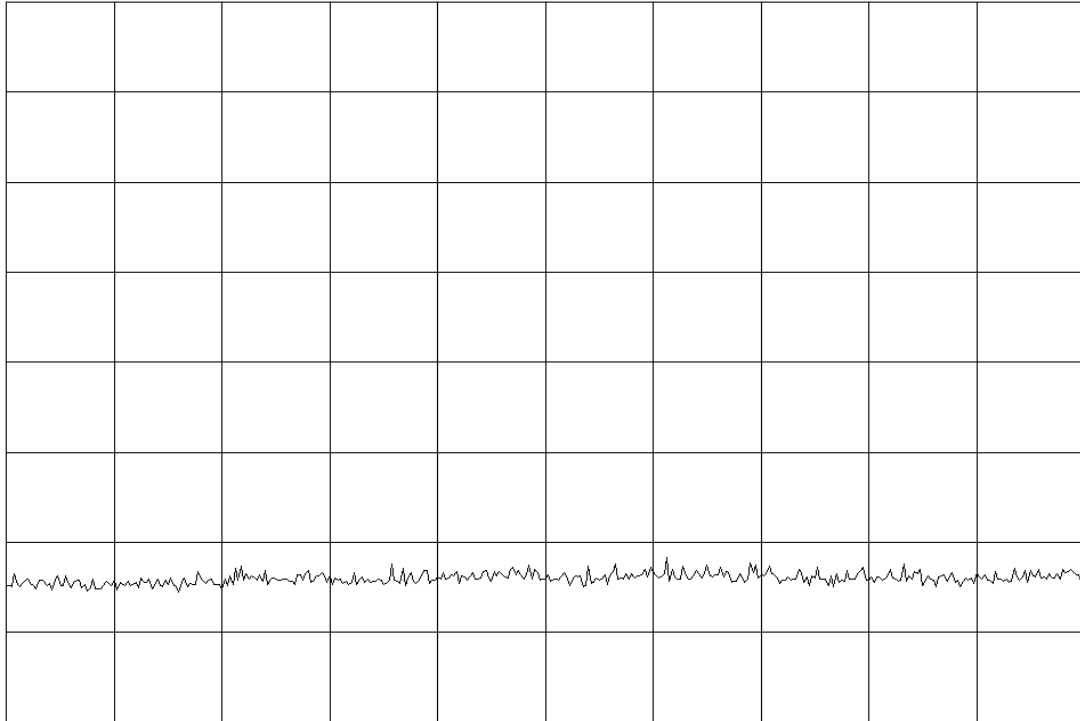
41.9

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 2.8GHz-4GHz

10:47:38 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

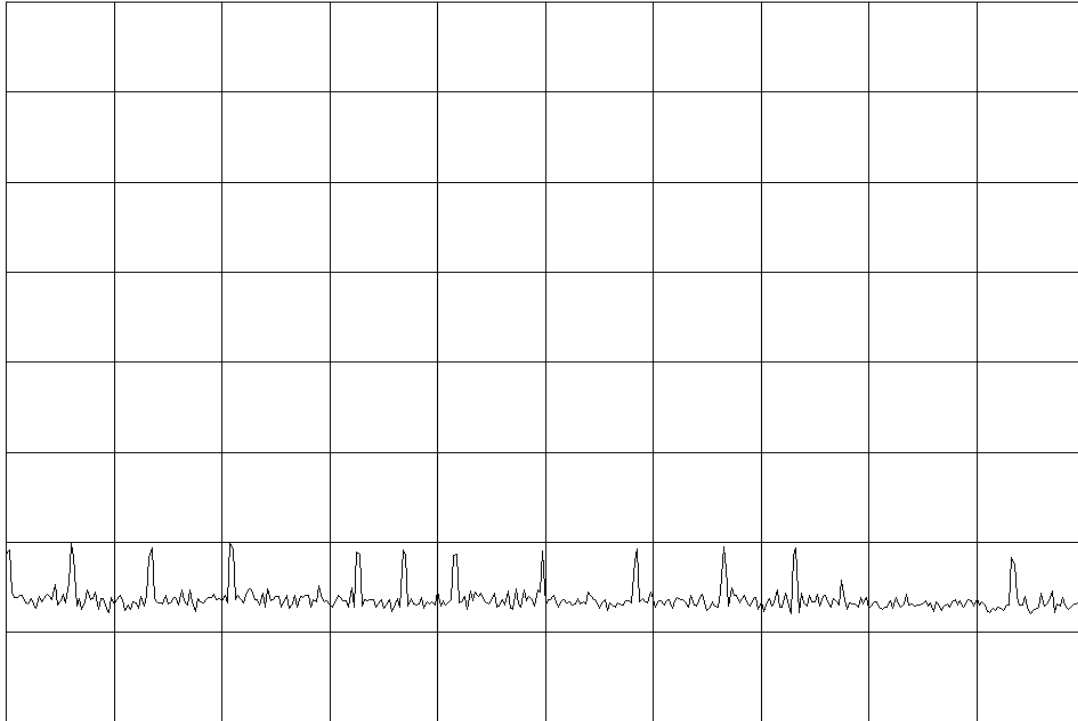
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 4GHz-6.5GHz

10:49:11 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

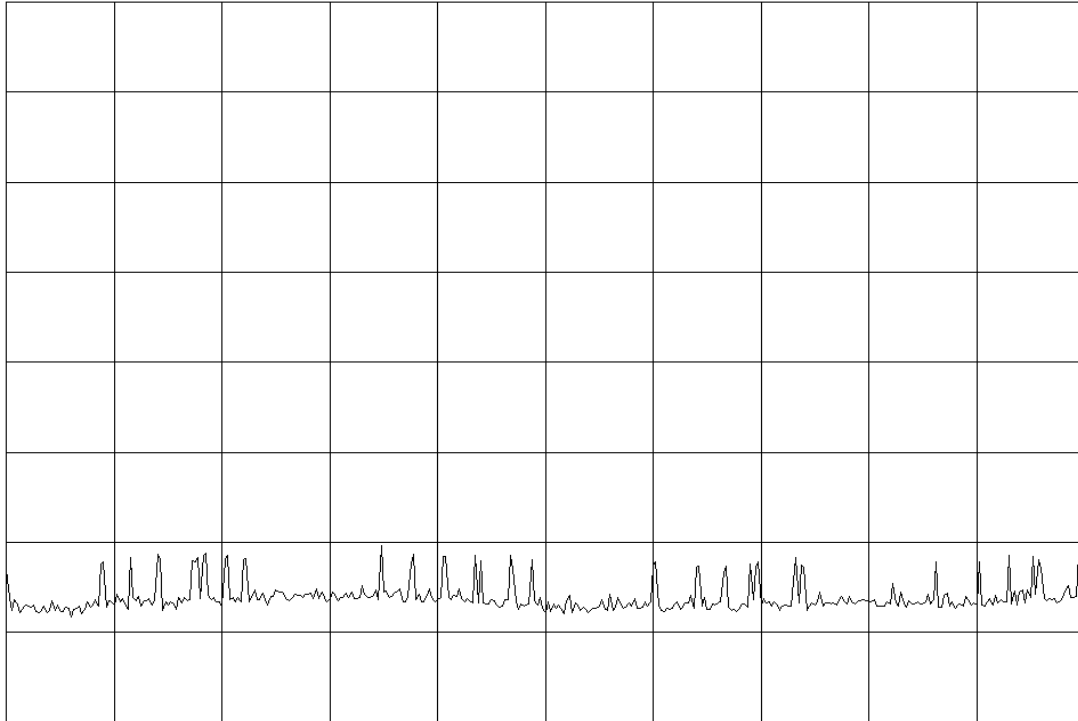
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - High Channel 6.5GHz-9GHz

10:50:47 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

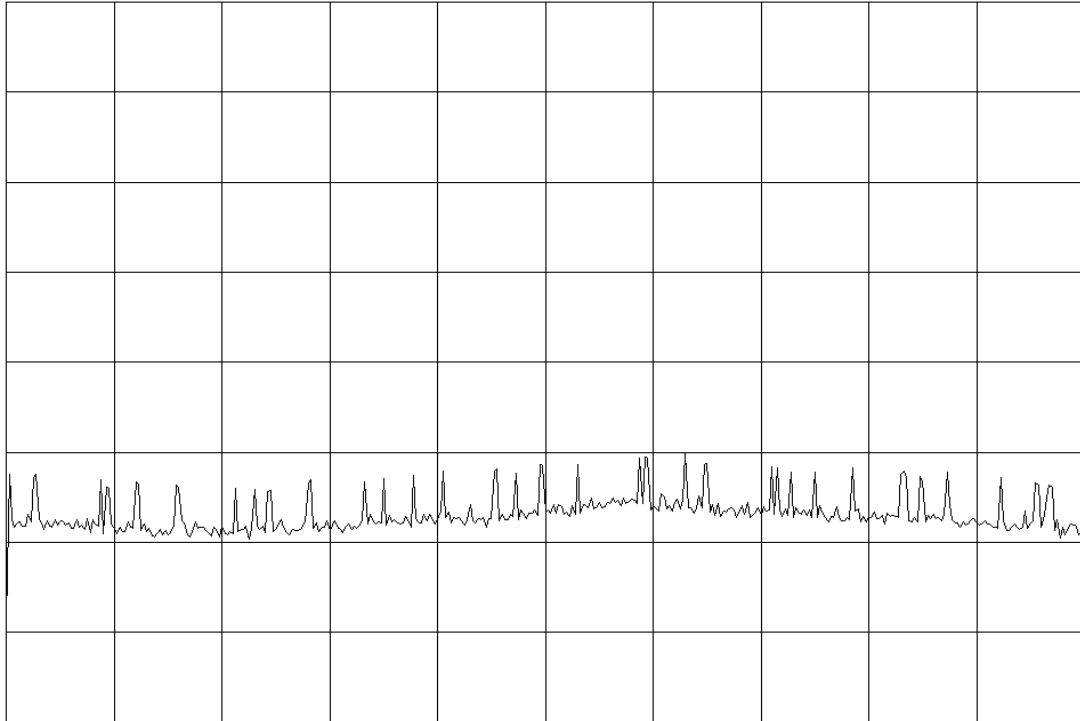
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Three Signal IM Test, In Band

09:21:50 OCT 14, 2005

HP

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

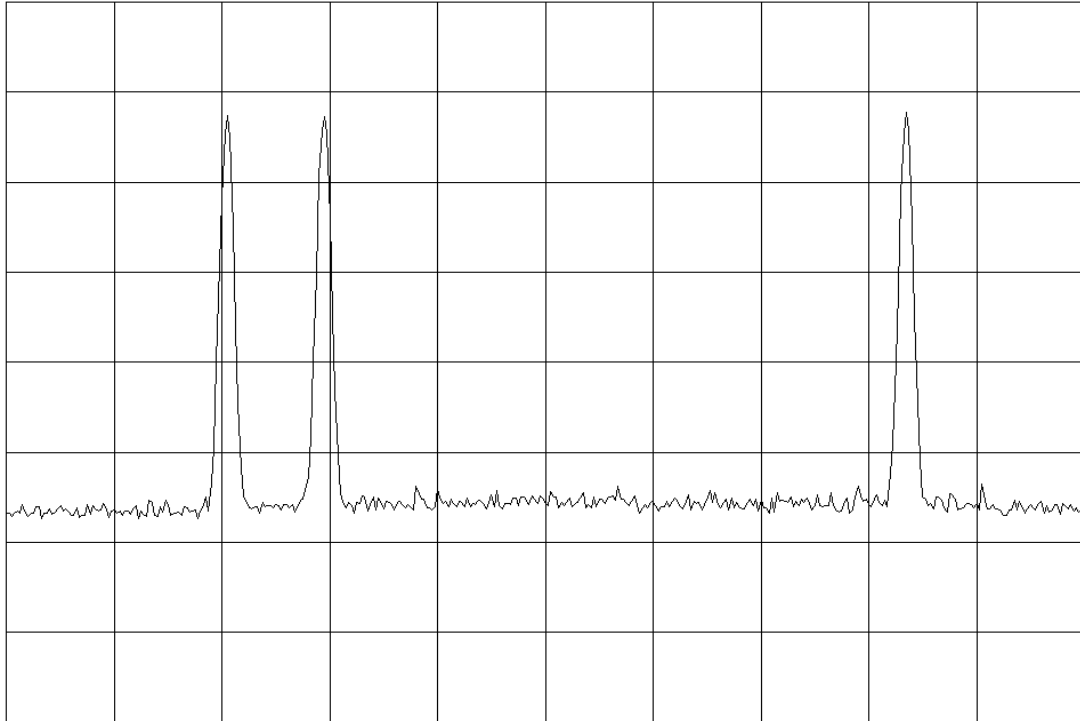
52.3

dB

MA SB

SC FC

CORR



START 845.00 MHz

STOP 875.00 MHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 20.0 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

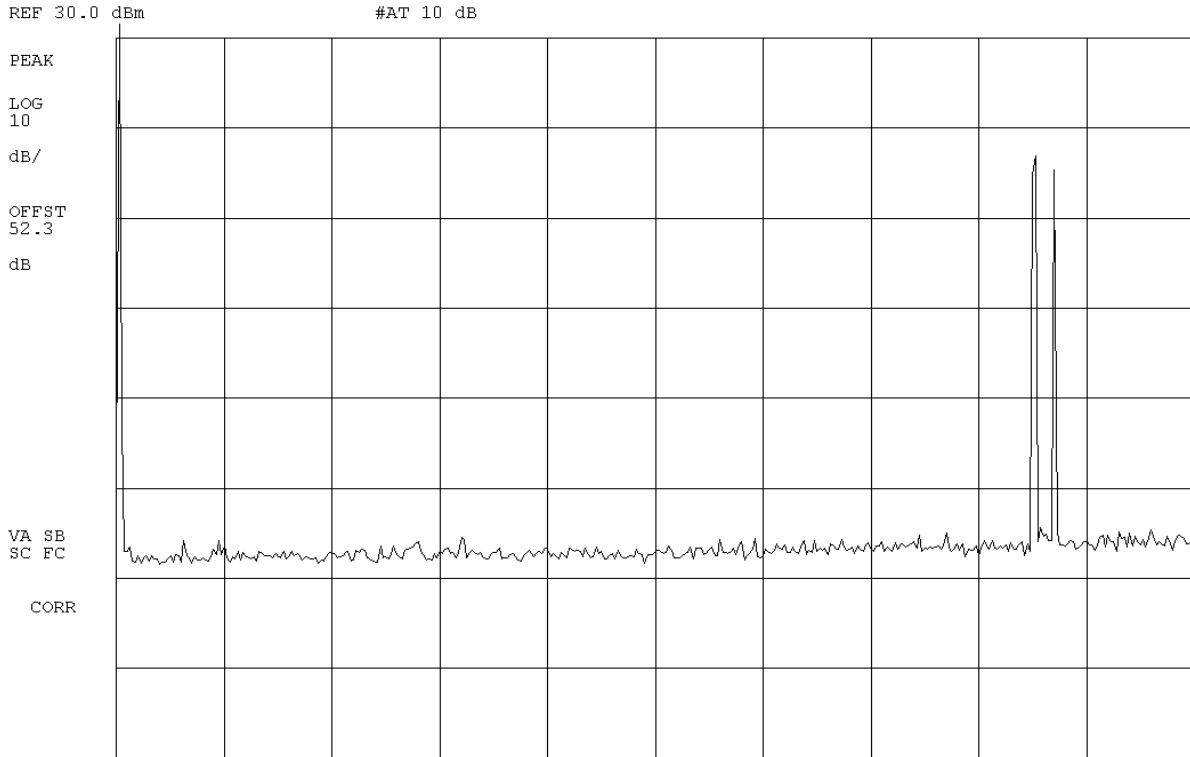
SIGNATURE			
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Rod Peloquin
Tested By: _____

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Three Signal IM Test, 0MHz-1GHz			

09:22:43 OCT 14, 2005

HP




START 0 Hz

STOP 1.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 300 msec

NORTHWEST EMC		Antenna Conducted Spurious Emissions		Rev BETA 01/30/01
EUT: MC Series System		Work Order: RAFN0054		
Serial Number: Engineering Production Unit #1		Date: 10/14/05		
Customer: Radioframe Networks, Inc.		Temperature: 23° C		
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%		
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site		
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001	
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (approx. 20 dBm)				
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.				
RESULTS				
Pass				
SIGNATURE				
 Tested By: _____				
DESCRIPTION OF TEST				
Antenna Conducted Spurious Emissions - Three Signal IM Test, 1GHz-2.8GHz				

09:25:09 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

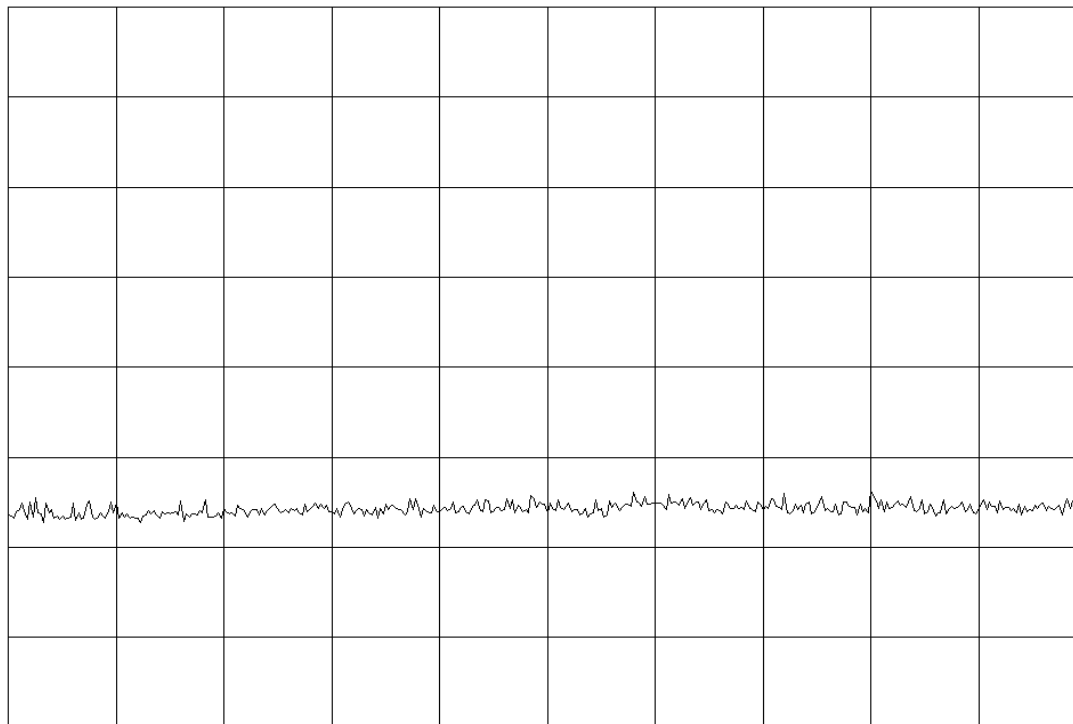
52.3

dB

VA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Three Signal IM Test, 2.8GHz-4GHz

09:26:34 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

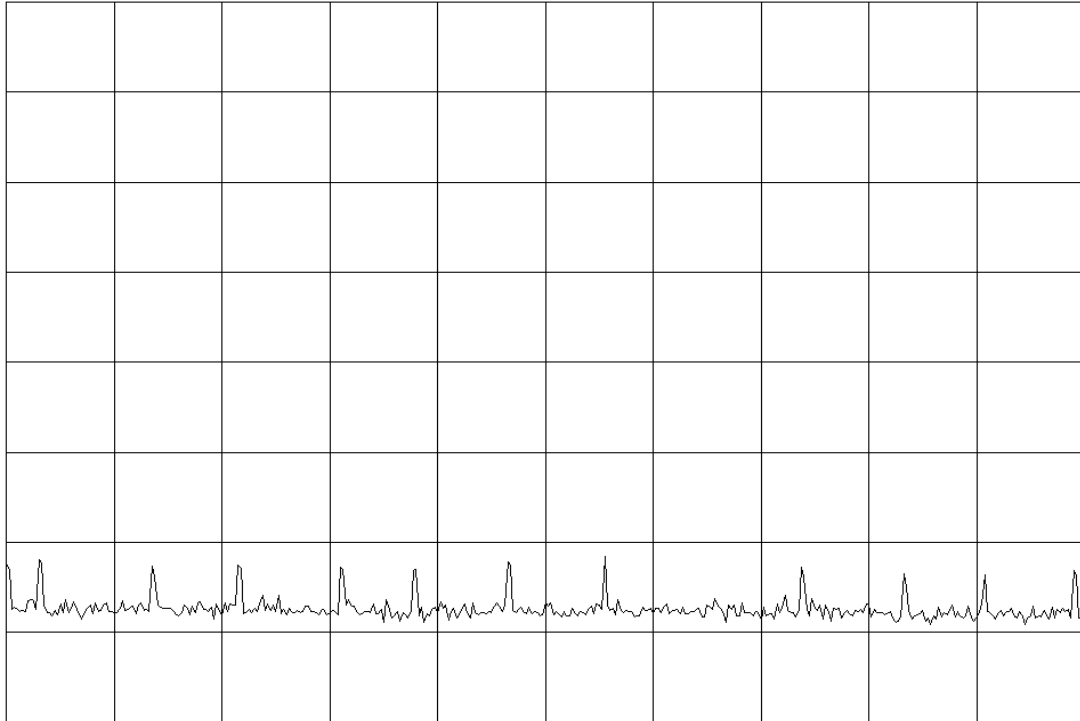
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

Antenna Conducted Spurious Emissions

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23° C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - Three Signal IM Test, 4GHz-6.5GHz			

09:31:07 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

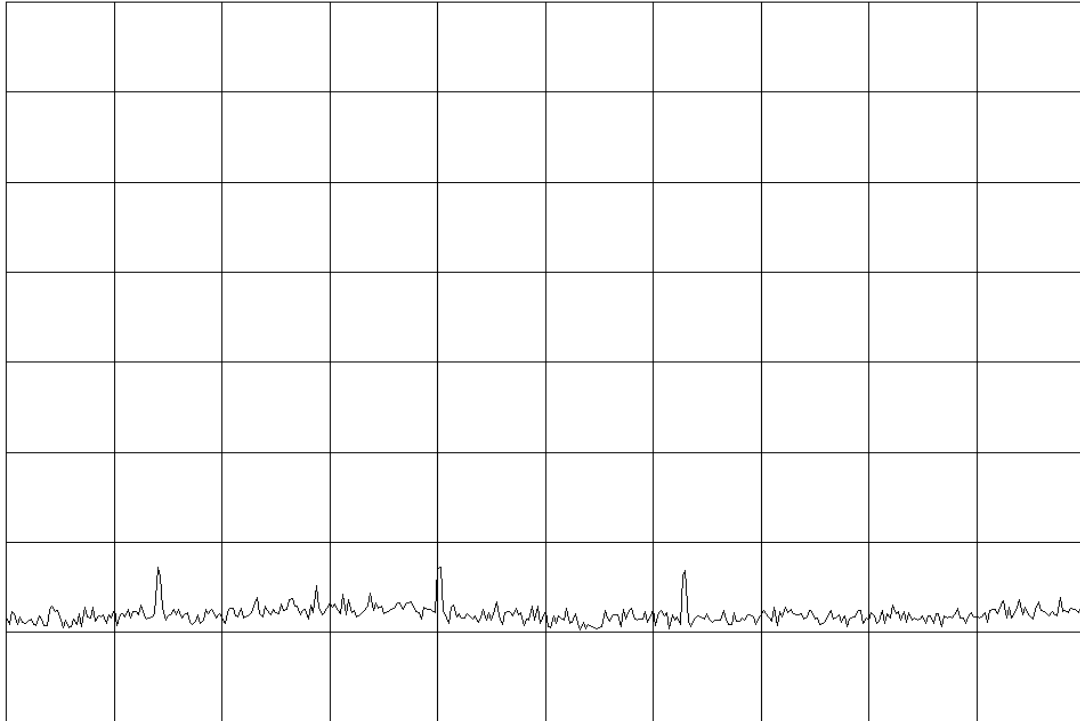
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23° C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - Three Signal IM Test, 6.5GHz-9GHz

09:31:43 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG
10

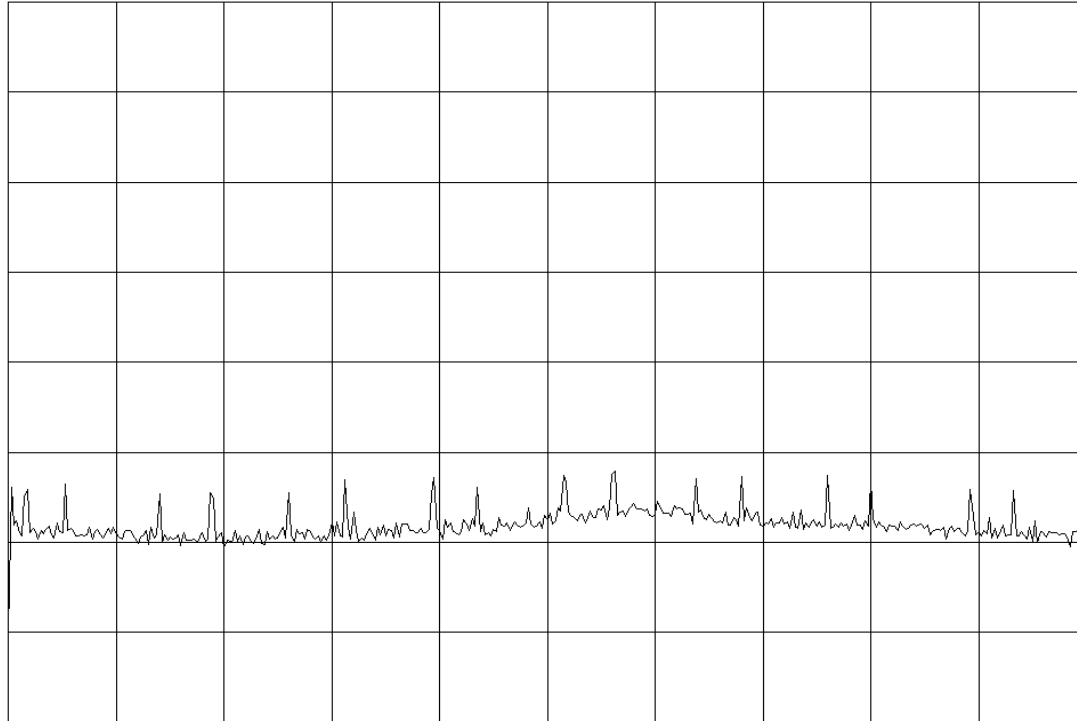
dB/

OFFST
32.1

dB

VA SB
SC FC

CORR



START 6.500 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/13/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
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Rod Peloquin
Tested By: _____

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - 20 Signal IM Test, In Band			

17:19:36 OCT 13, 2005

RP

REF 30.0 dBm

#AT 20 dB

PEAK

LOG

10

dB/

OFFST

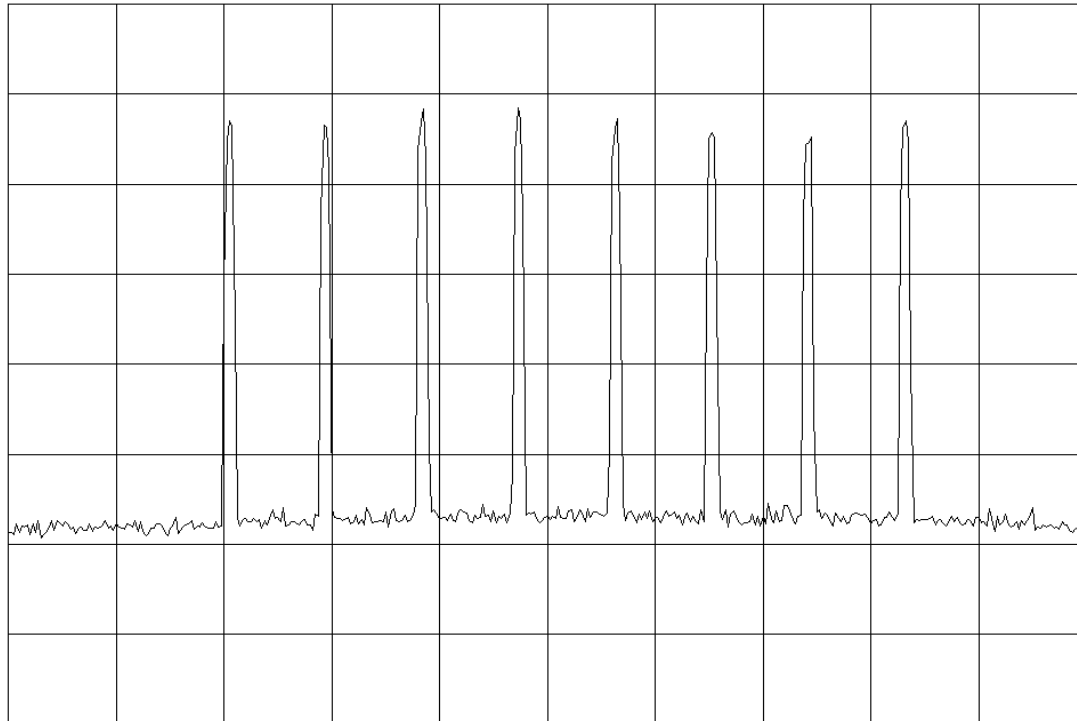
53.1

dB

VA SB

SC FC

CORR



START 845.00 MHz

STOP 875.00 MHz

#RES BW 10 kHz

#VBW 30 kHz

SWP 900 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/13/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

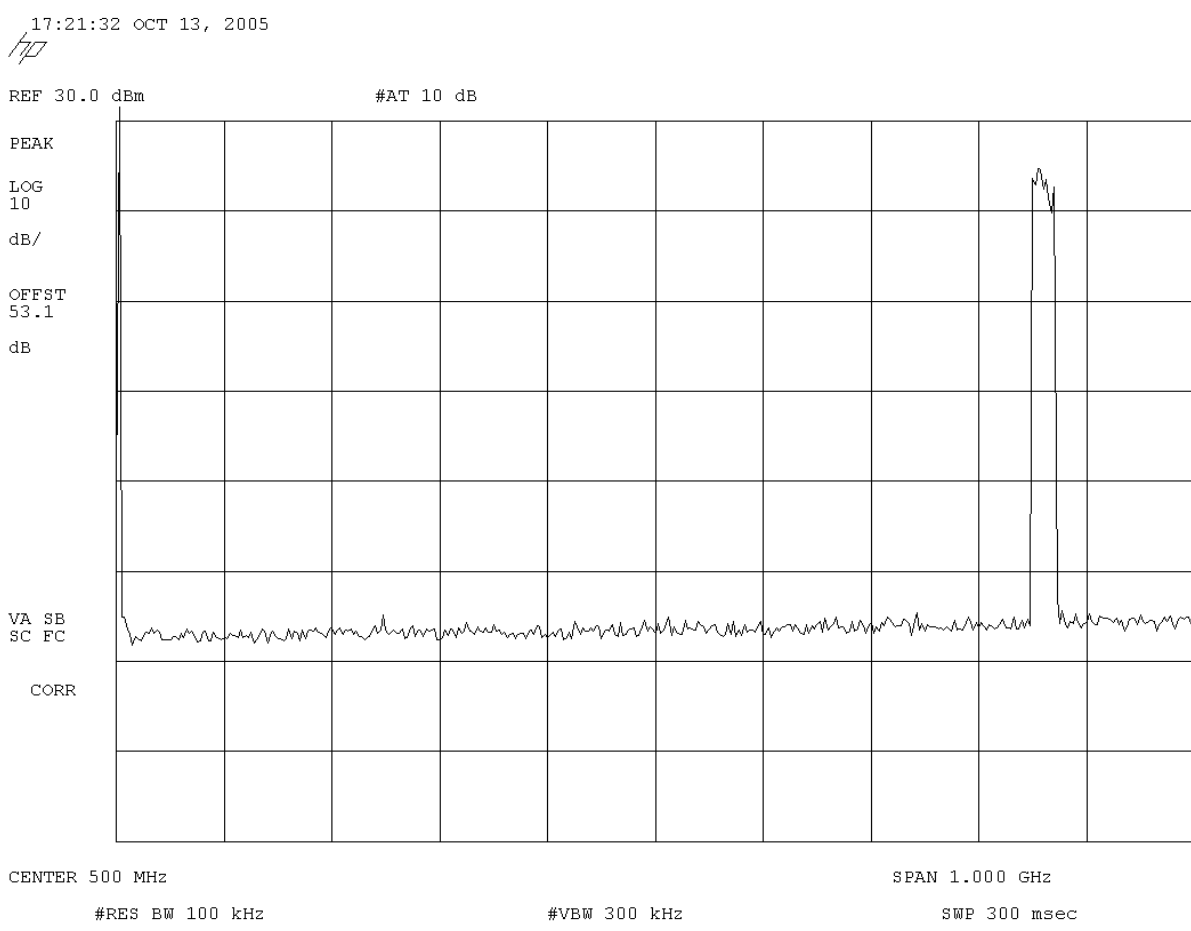
REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 0MHz-1GHz



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 1GHz-2.8GHz			

08:56:01 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

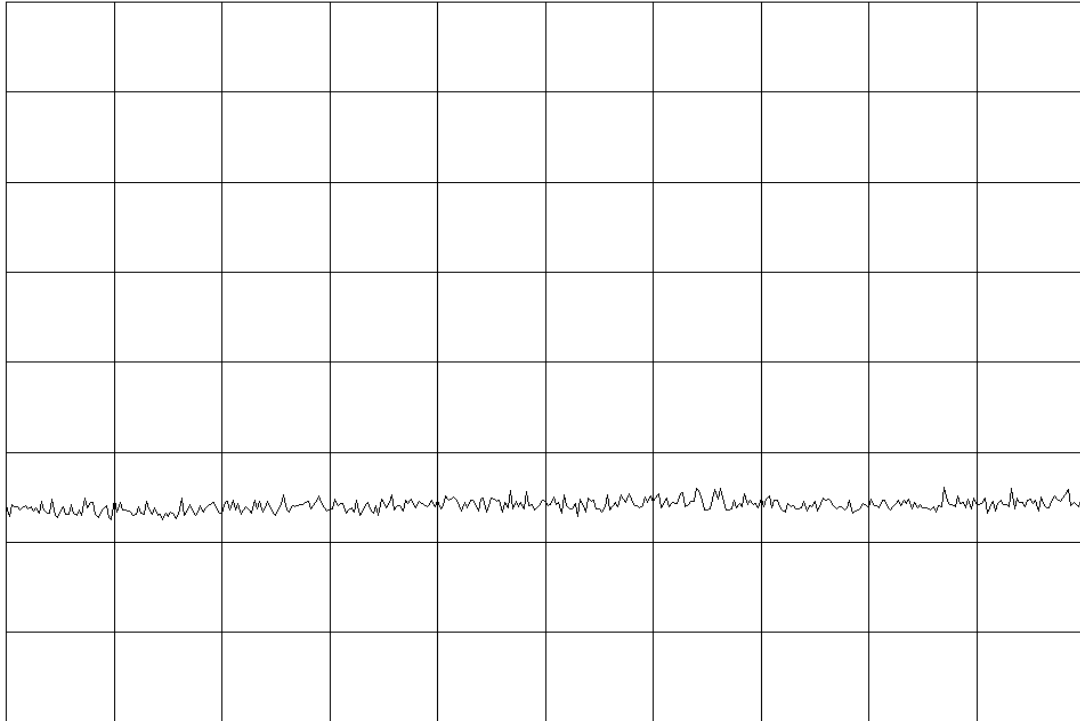
52.3

dB

MA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 2.8GHz-4GHz

08:52:59 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

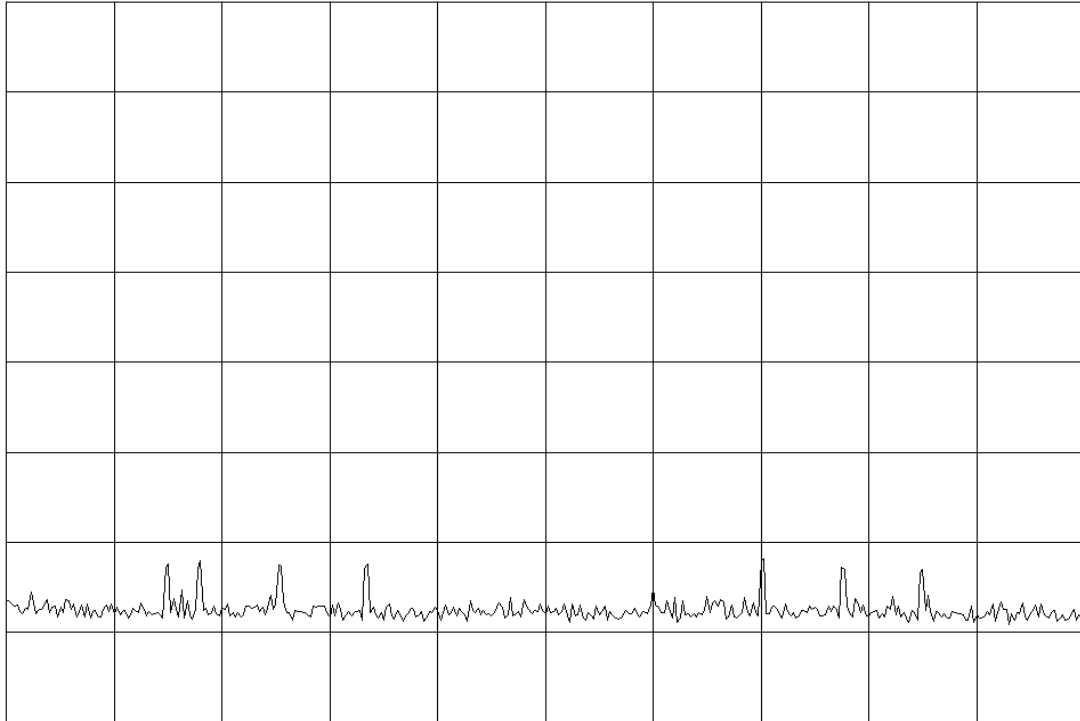
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 4GHz-6.5GHz

08:51:14 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

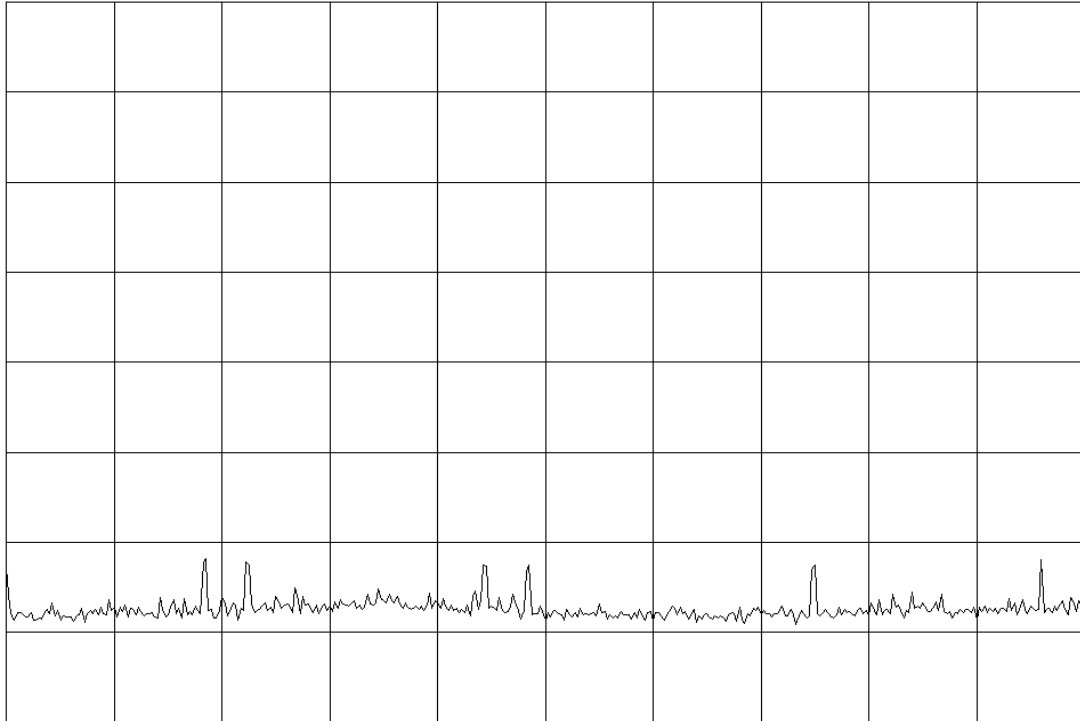
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 6.5GHz-9GHz

08:48:11 OCT 14, 2005

RP

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

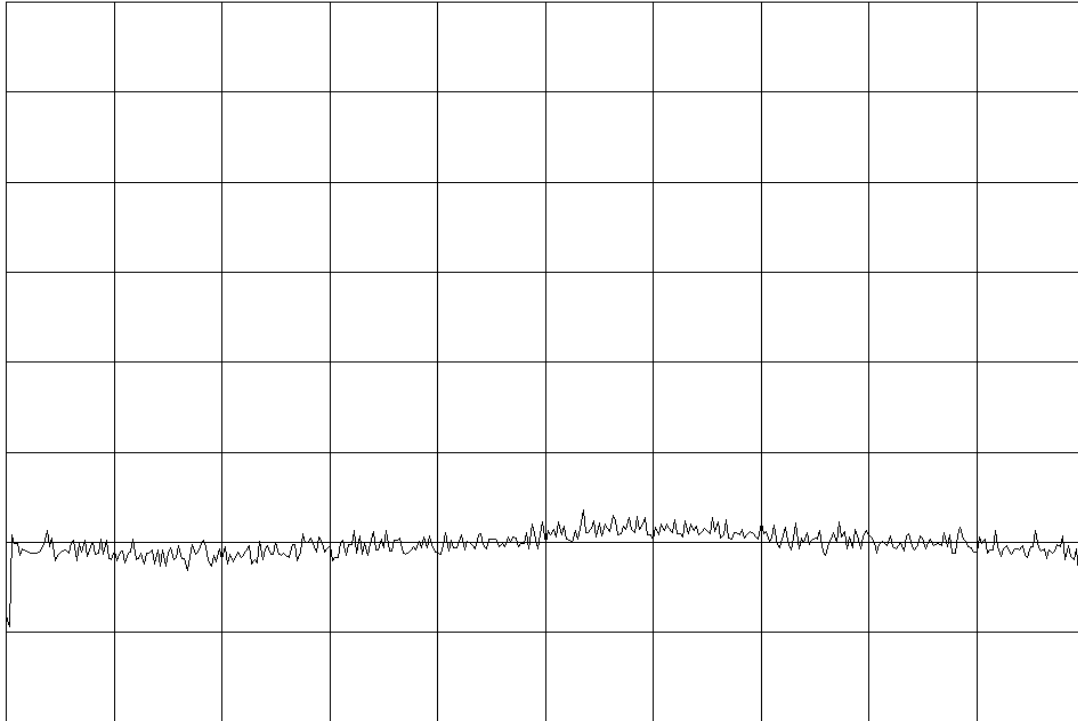
32.1

dB

WA SB

SC FS

CORR



START 6.499 GHz

STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
			
Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - 8 Signal IM Test, In Band			

09:05:28 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

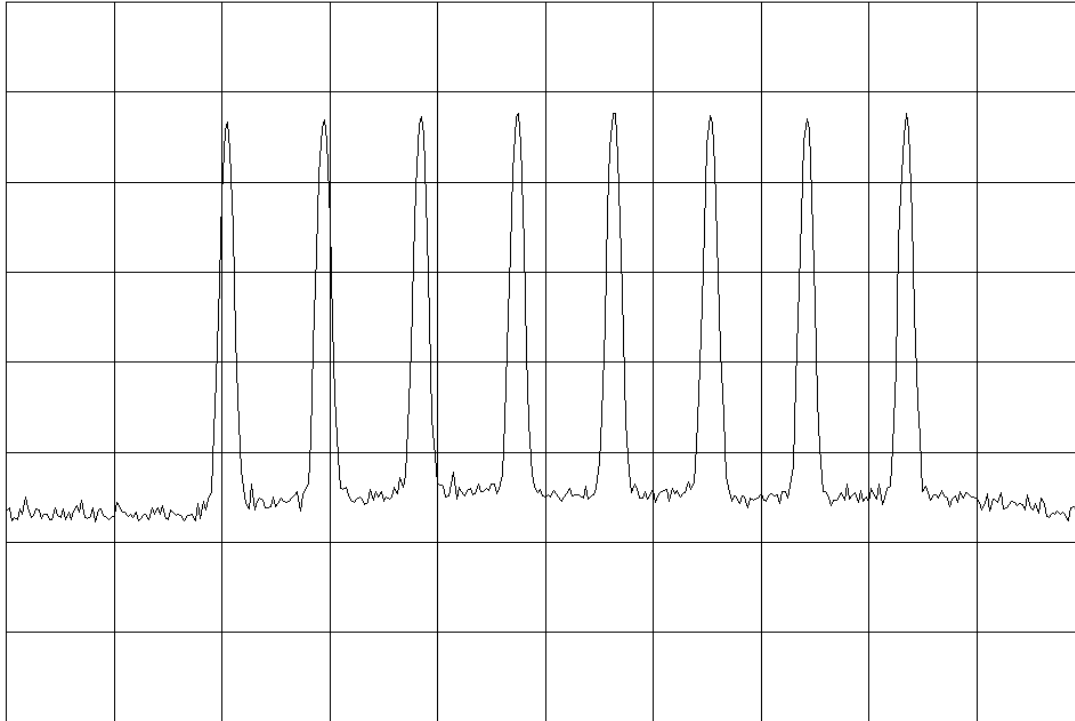
52.3

dB

MA SB

SC FC

CORR



START 845.00 MHz

STOP 875.00 MHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 20.0 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

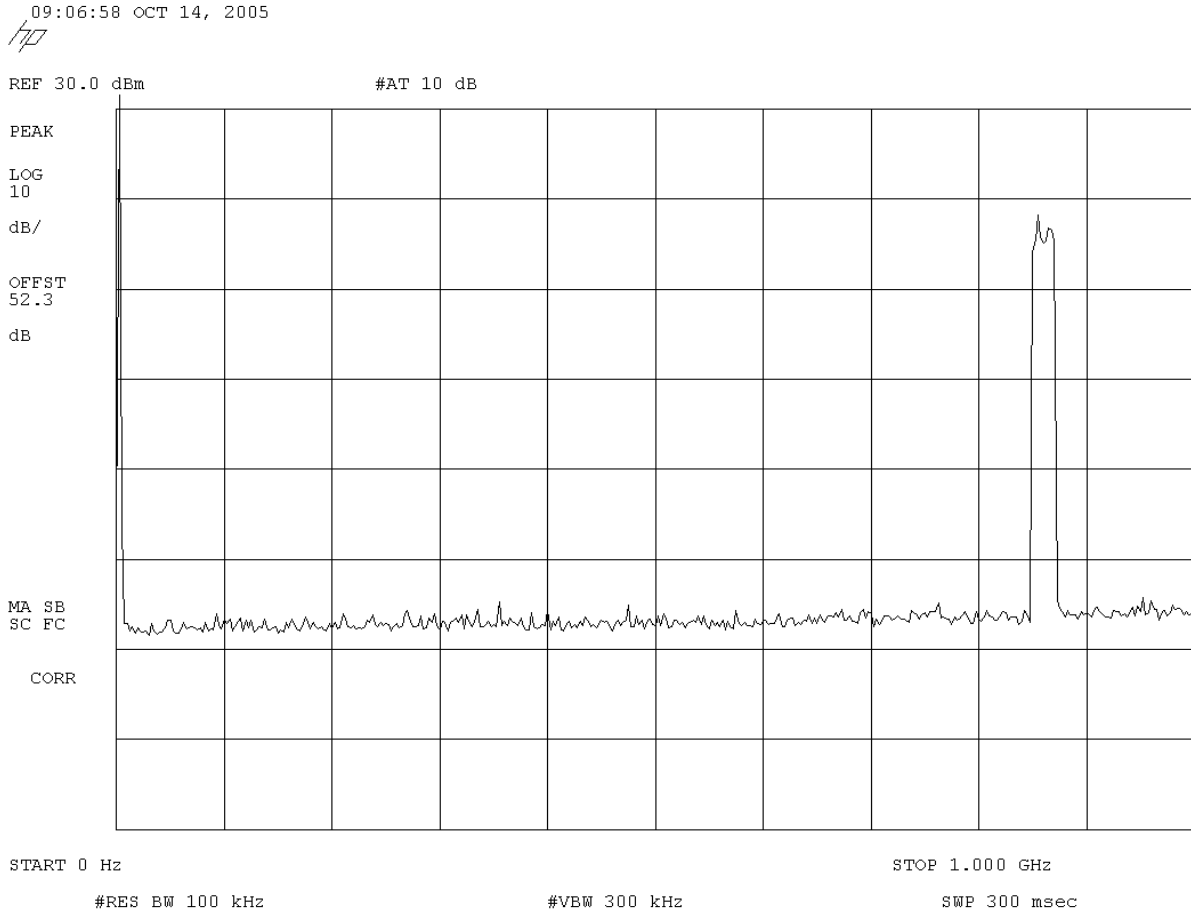
REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 0MHz-1GHz



NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054	
Serial Number: Engineering Production Unit #1	Date: 10/14/05	
Customer: Radioframe Networks, Inc.	Temperature: 23 C	
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 1GHz-2.8GHz

09:08:44 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

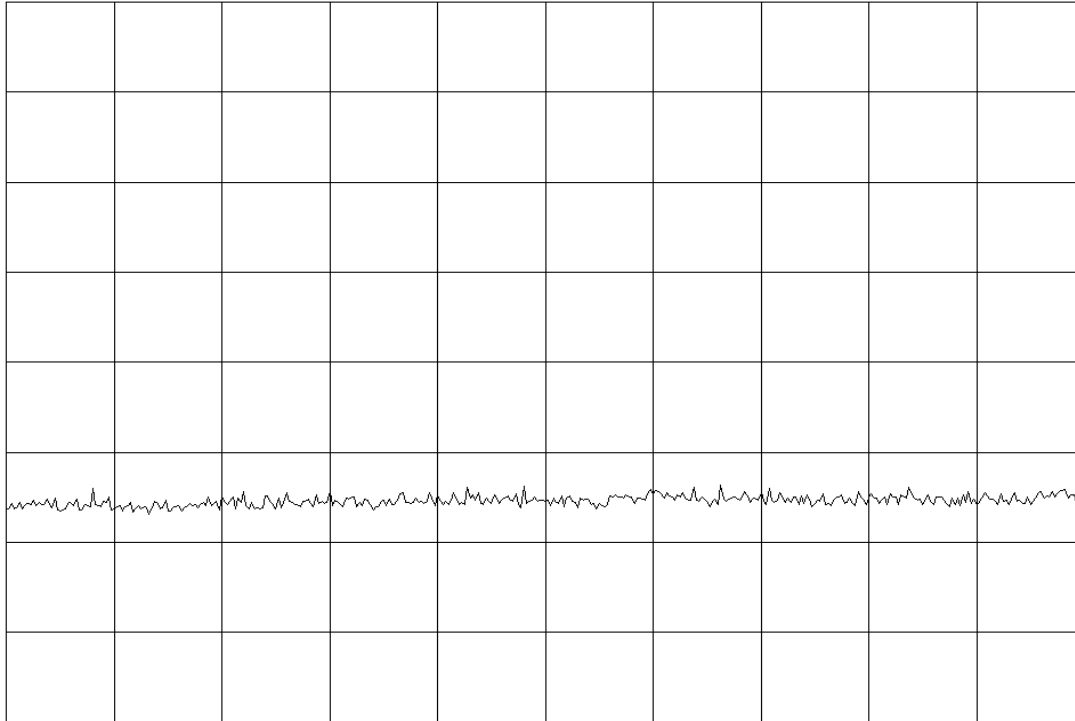
52.3

dB

MA SB

SC FC

CORR



START 999 MHz

STOP 2.800 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 540 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 2.8GHz-4GHz

09:12:07 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

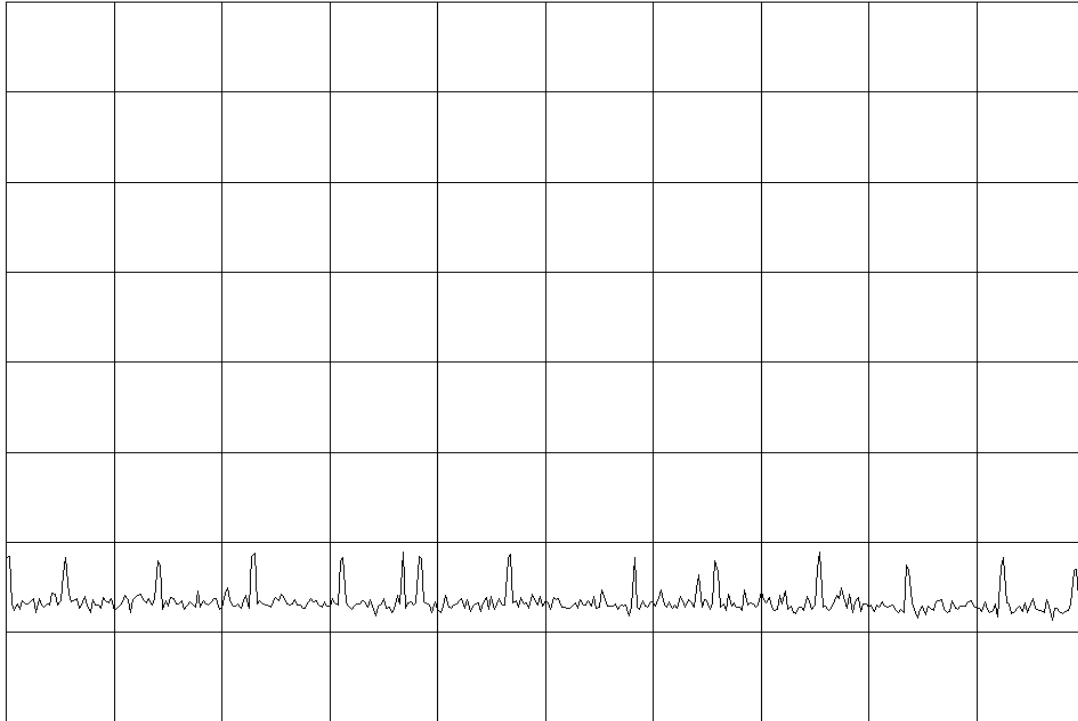
32.1

dB

VA SB

SC FC

CORR



START 2.799 GHz

STOP 4.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 360 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System	Work Order: RAFN0054
Serial Number: Engineering Production Unit #1	Date: 10/14/05
Customer: Radioframe Networks, Inc.	Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin
Customer Ref. No.: None	Power: -48 Vdc
	Humidity: 40%
	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS

COMMENTS
Tested in System Configuration

EUT OPERATING MODES
With modulation at highest output power level (approx. 20 dBm)

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.

RESULTS
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 4GHz-6.5GHz

09:17:19 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

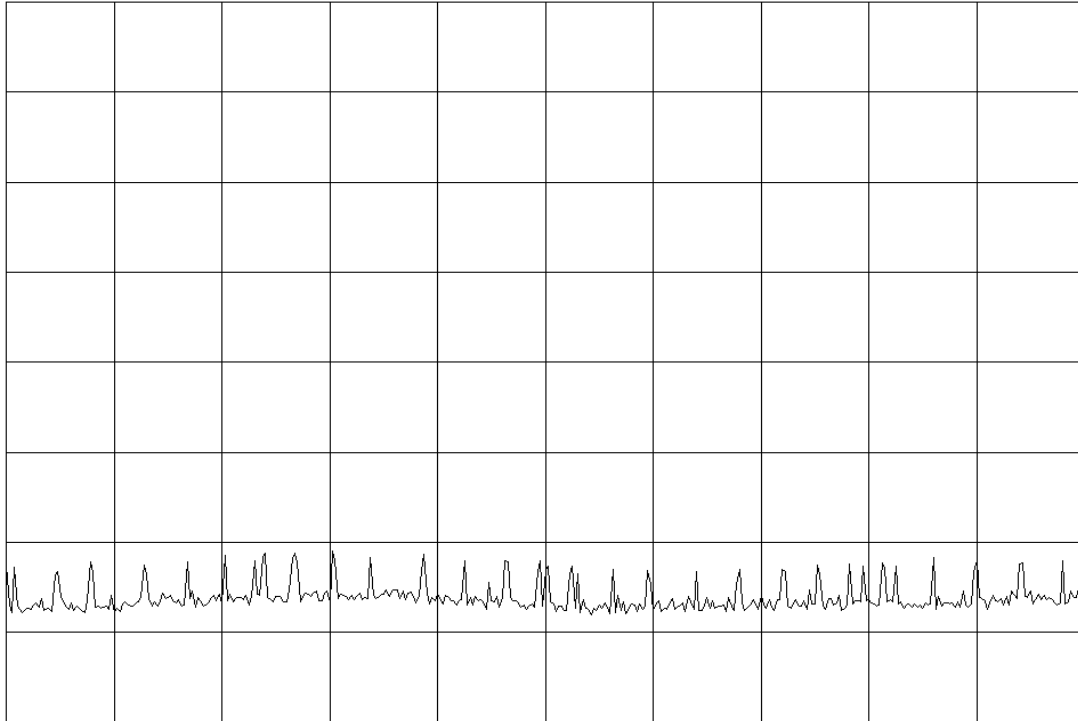
32.1

dB

VA SB

SC FC

CORR



START 4.000 GHz

STOP 6.500 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec

NORTHWEST
EMC

Antenna Conducted Spurious Emissions

Rev BETA
01/30/01

EUT: MC Series System		Work Order: RAFN0054
Serial Number: Engineering Production Unit #1		Date: 10/14/05
Customer: Radioframe Networks, Inc.		Temperature: 23 C
Attendees: Neil Ross	Tested by: Rod Peloquin	Humidity: 40%
Customer Ref. No.: None	Power: -48 Vdc	Job Site: Off-site

TEST SPECIFICATIONS			
Specification: 47 CFR 2.1051 & 90.691	Year: Most Current	Method: TIA / EIA - 603	Year: 2001

SAMPLE CALCULATIONS			

COMMENTS			
Tested in System Configuration			

EUT OPERATING MODES			
With modulation at highest output power level (approx. 20 dBm)			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any out of band spurious emission must be attenuated below the limit of -13 dBm.			

RESULTS			
Pass			

SIGNATURE			
 Tested By: _____			

DESCRIPTION OF TEST			
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 6.5GHz-9GHz			

09:15:58 OCT 14, 2005

hp

REF 30.0 dBm

#AT 10 dB

PEAK

LOG

10

dB/

OFFST

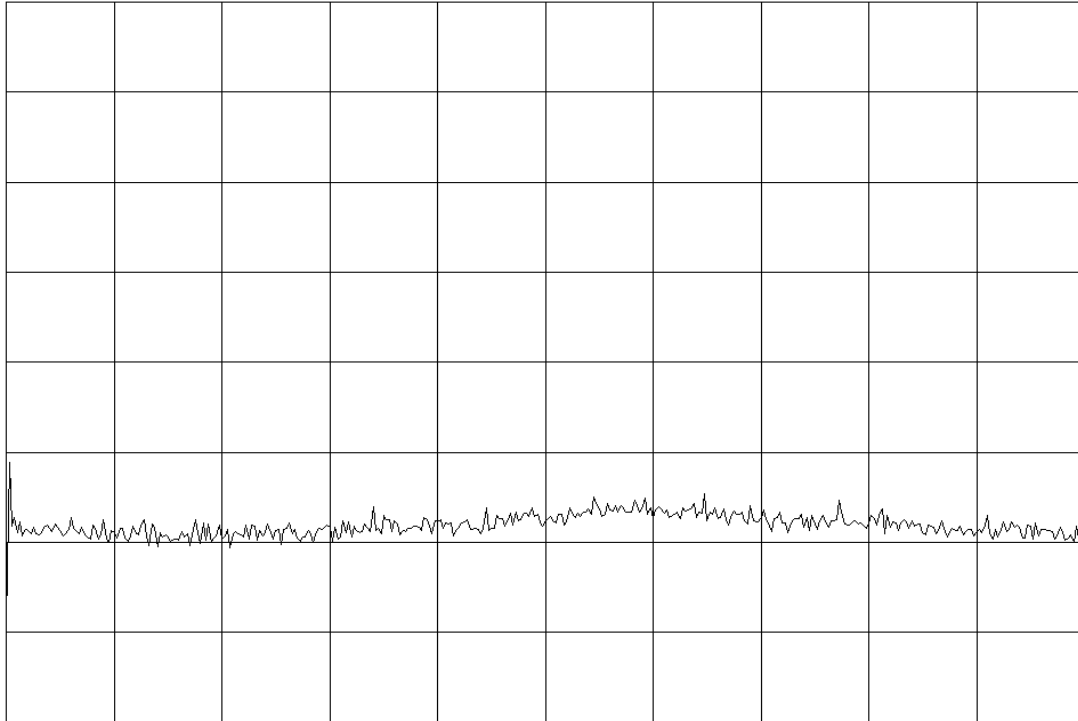
32.1

dB

VA SB

SC FC

CORR



START 6.500 GHz

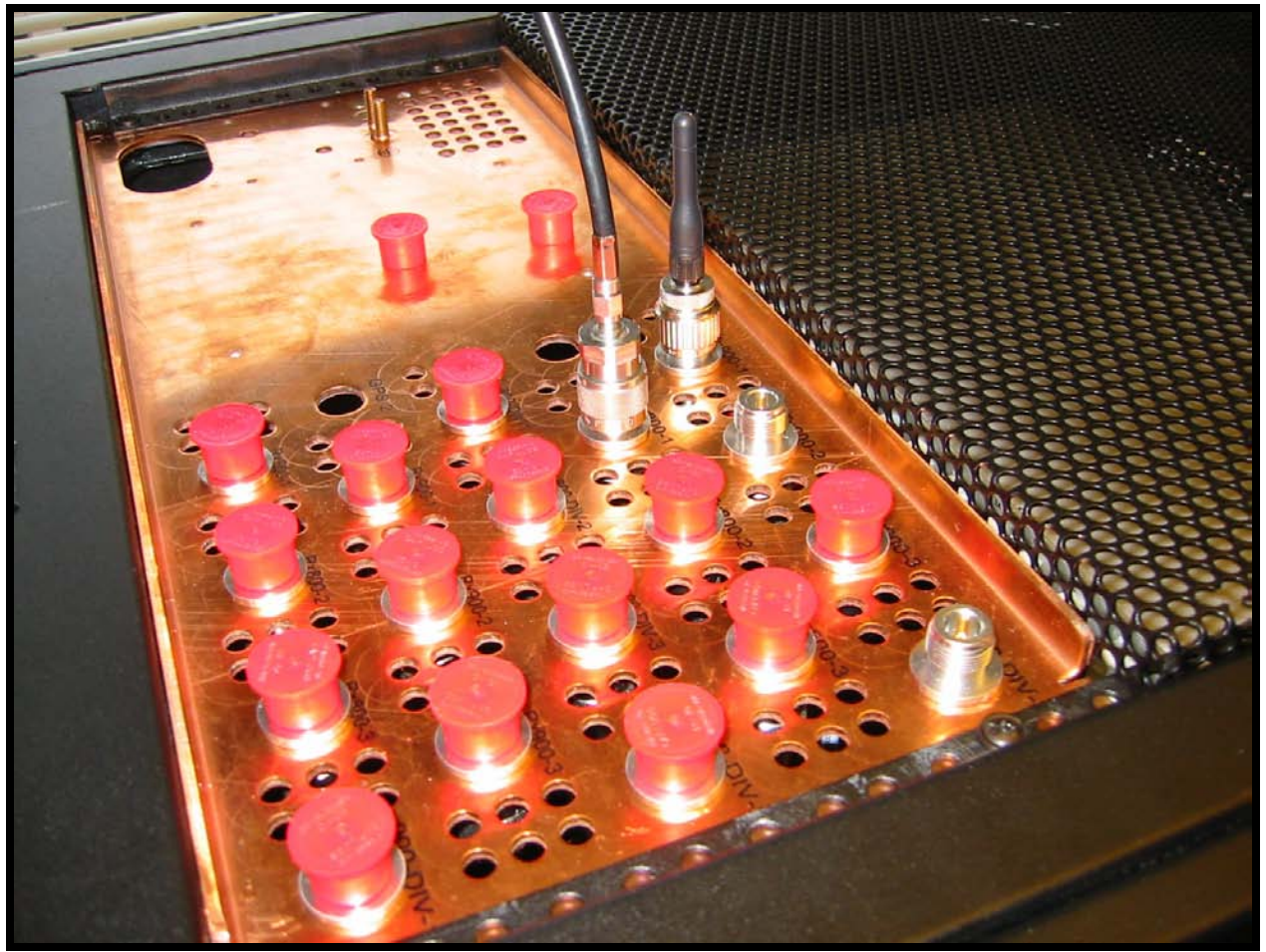
STOP 9.000 GHz

#RES BW 100 kHz

#VBW 300 kHz

SWP 750 msec









Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low (851.0125 MHz)

Mid (859.1625 MHz)

High (869.9875 MHz)

Data Rates Investigated:

Typical

Output Power Setting(s) Investigated:

Highest

Power Input Settings Investigated:

120 VAC, 60 Hz.

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	Unknown
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
iDEN Radio Base Station System	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	EUT	AC Mains

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo
30 dB 100W attenuator	Bird Electronic Corp.	100-SA-MFN-30	N/A	NCR	N/A

Test Description

Requirement: Per 47 CFR 90.691, "The emission limits are as follows: (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. (2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz."

FCC Interpretation Regarding Emission Mask and 90.691

-----Original Message-----

From: Andrew Leimer [mailto:ALEIMER@fcc.gov] Sent: Wednesday, May 14, 2003 12:21 PM
To: rwacs@att.net
Subject: Re: Part 90 rules

Hello Dean,

How are you doing? I have not heard from you in a while! The following explanation is from the archives. The basic question was if emissions mask g would ever be used. I hope it answers your question:

I found that footnote 3 was added to Section 90.210 as a result of the First R&O, Eighth R&O and 2nd FNPRM in PR Docket 93-144 (FCC 95-501), adopted 12/15/95. Footnote 3 initially said "Equipment in this band licensed to EA systems shall comply with the emission mask provisions of Section 90.691." Note here that this R&O dealt principally with the upper 200 MHz SMR channels which were auctioned in contiguous segments/blocks. Consequently, providing more flexibility in the emission mask that required protection of the "outer" channels in those blocks and to any interior channels in those blocks used by incumbents made sense.

When the Commission subsequently dealt with auctioning the lower 80 channels (non-contiguous channels in each block) and the General Category channels (contiguously allocated channels by block for auction purposes but originally allocated on a single channel basis for site-specific licensing purposes), the consideration of emission mask caused footnote 3 to be modified as it exists today. Specifically, the Second R&O in PR Docket 93-144 (FCC 97-223), adopted 6/23/97 @ para 80 reasons that applying the same emission mask standards to the lower 230 channels (lower 80 channels and 150 General Category channels) as to the upper 200 channels facilitates the use of common equipment and the combining of all such channels. It further states that Section 90.691 (the emission mask) would apply to "outer" channels used by a licensee "that create out-of-band emissions that affect another licensee".

The MO&O on reconsideration of the 800 MHz 1st R&O (FCC 97-224, adopted 6/23/97) at para 76 agreed with Erricson's recommendation to expand the emission mask provision of Section 90.691 to "non-EA 800 MHz Part 90 CMRS systems". The decision was based ostensibly on extending the flexibility of the 90.691 emission mask to incumbent licensees (non-EA licensees or non-auction winners) and to those non-SMR channels used by CMRS operators. The paragraph closes by stating that neither Ericsson or Motorola believe that such relaxation will increase the amount of interference to adjacent channel licensees.

You'll note that there is some similarity between emission mask G (applicable to equipment without audio low pass filters) under Section 90.210 and the emission mask required by Section 90.691. It is my interpretation that footnote 3 under Section 90.210 (the applicability of the emission mask under Section 90.691) was intended principally for Part 90 CMRS systems in the 800 MHz band to provide flexibility and consistency to those operators. As Section 90.210 is written, however, I don't see how we could legally prevent any 800 MHz licensee from using the more flexible emission mask under Section 90.691.

Bottom line: As the rule is written, it is possible that the "G" mask would never be used by 800 MHz licensees.

>>> Dean Busch 05/14/03 01:22PM >>>
Andy;

I hope you can help me with this or at least point me in the right direction.

I have a client that has an EA based radio system that is currently using licensed transmitters with an output of 100mW in the 851 - 866 MHz range. The system is approved under 90.691. If the manufacturer raises the power level to 5 watts per channel output will they need to meet the emissions mask of 90.210 (g) or do they still fall under 90.691.

Thanks

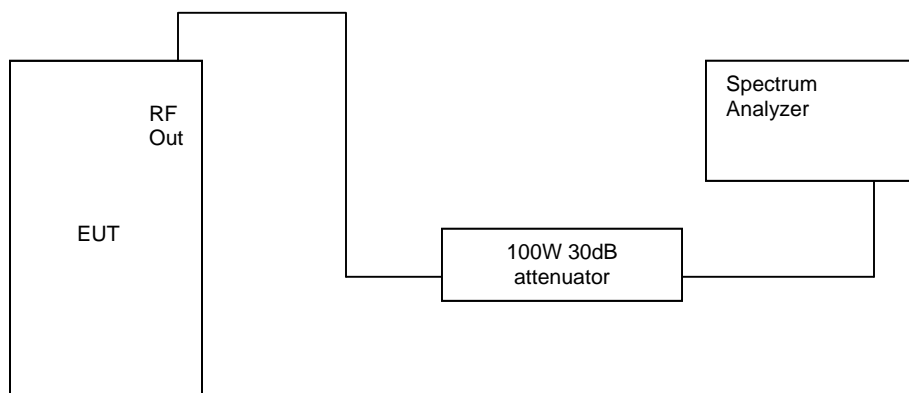
Dean Busch
Radiowave Compliance Services, Inc.

Configuration: The peak measurement was made using a directional coupler between the RF output of the EUT and a spectrum analyzer. The occupied bandwidth / emission mask was measured with the EUT set to low, medium, and high transmit frequencies. At each channel, measurements were made at the highest output settings. The output power is varied by changing the TX Attenuator setting on the EUT's amplifier to the following settings: High Power 11 db, Mid power 29 dB, and Low Power 49 dB.

See emission mask table below. It was concluded that testing at lower power levels was unnecessary since the general limit is -13 dBm. Clearly the high power configuration is worse case.


Channel	Output Power (dBm)	Power (P) Watts	In-band Attenuation (dBc)			Out Of Band (dBc)
			$50 + (10 \cdot \log P)$			
Low	20.49	1.12E-01	40.49	36.14	80	33.49
	0.14	1.03E-03	20.14	36.14	80	13.14
	-19.96	1.01E-05	0.04	36.14	80	-6.96
Mid	22.2	1.66E-01	42.2	36.14	80	35.2
	3.05	2.02E-03	23.05	36.14	80	16.05
	-18.3	1.48E-05	1.7	36.14	80	-5.3
High	20.65	1.16E-01	40.65	36.14	80	33.65
	0.85	1.22E-03	20.85	36.14	80	13.85
	-19.15	1.22E-05	0.85	36.14	80	-6.15

Test Setup Diagram



Completed by:

Rocky Le Felings

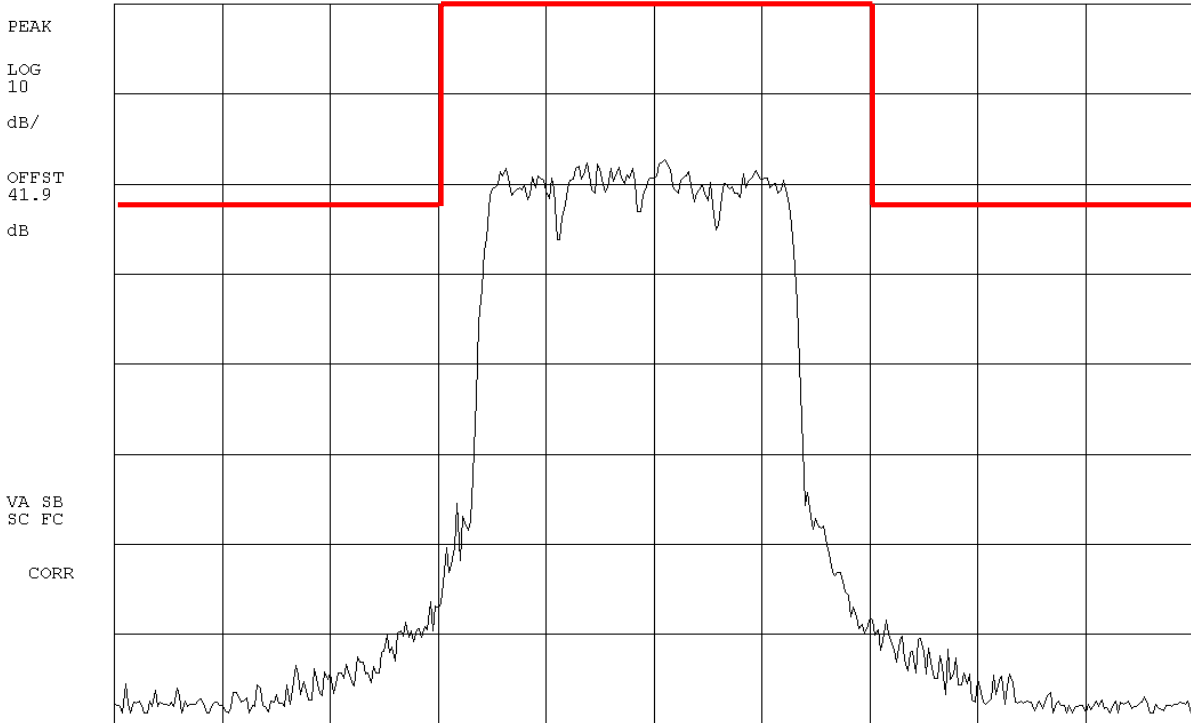
NORTHWEST EMC		EMISSIONS DATA SHEET		Rev BETA 01/30/01	
EUT:	MC Series System	Work Order:	RAFN0054		
Serial Number:	Engineering Production Unit #1	Date:	10/14/05		
Customer:	Radioframe Networks, Inc.	Temperature:	23° C		
Attendees:	Neil Ross	Tested by:	Rod Peloquin	Humidity:	40%
Customer Ref. No.:	None	Power:	120VAC/60Hz	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification:	47 CFR 90.691	Year:	Most Current	Method:	TIA / EIA - 603
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by 16 QAM.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 19.37 dBm					
RESULTS					
AMPLITUDE					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Emission Mask for EA-based Systems: Lowest Channel @ Highest Output Power					

10:12:08 OCT 14, 2005

RP

REF 19.4 dBm

#AT 20 dB



CENTER 851.01250 MHz

SPAN 63.00 kHz

#RES BW 300 Hz

#VBW 1 kHz

SWP 2.10 sec

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	MC Series System	Work Order:	RAFNO054
Serial Number:	Engineering Production Unit #1	Date:	10/14/05
Customer:	Radioframe Networks, Inc.	Temperature:	23° C
Attendees:	Neil Ross	Tested by:	Rod Peloquin
Customer Ref. No.:	None	Power:	120VAC/60Hz
		Humidity:	40%
		Job Site:	Off-site

TEST SPECIFICATIONS			
Specification:	47 CFR 90.691	Year:	Most Current
		Method:	TIA / EIA - 603
		Year:	Most Current

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by 16 QAM.

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 19.37 dBm

RESULTS AMPLITUDE
Pass

SIGNATURE

Tested By: _____

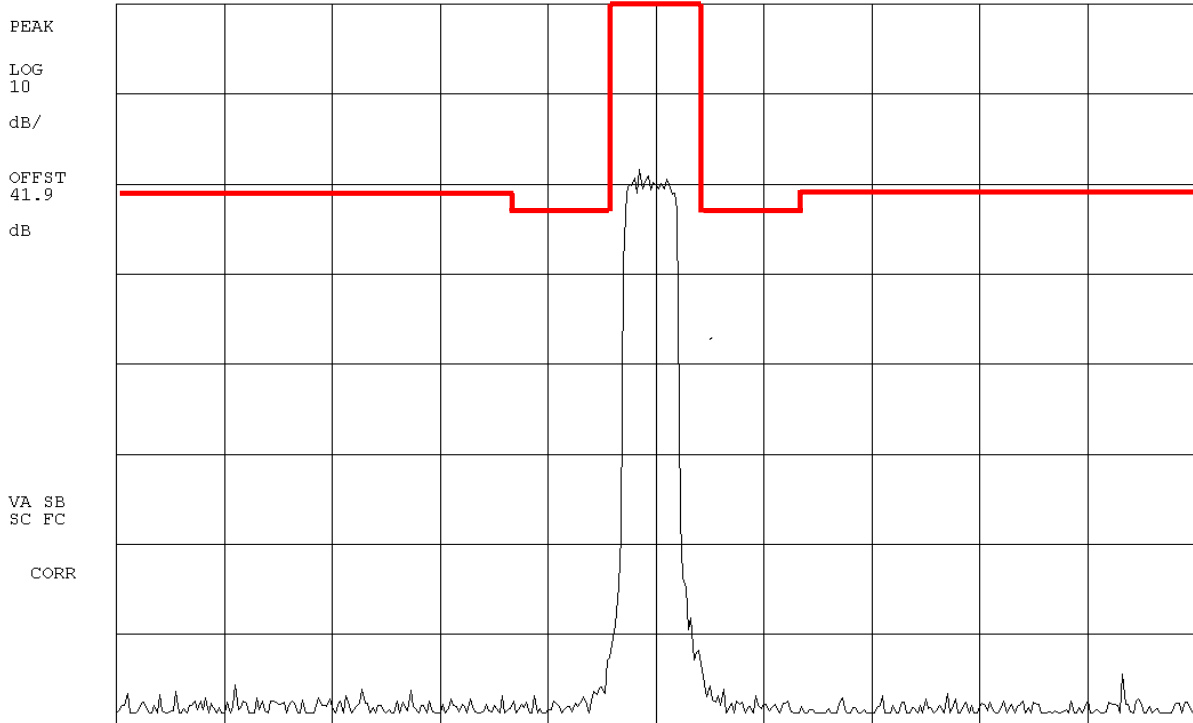
DESCRIPTION OF TEST
Emission Mask for EA-based Systems: Lowest Channel @ Highest Output Power

10:15:44 OCT 14, 2005

RP

REF 19.4 dBm

#AT 20 dB



CENTER 851.0125 MHz

SPAN 370.0 kHz

#RES BW 300 Hz

#VBW 1 kHz

SWP 12.3 sec

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	MC Series System	Work Order:	RAFNO054
Serial Number:	Engineering Production Unit #1	Date:	10/14/05
Customer:	Radioframe Networks, Inc.	Temperature:	23° C
Attendees:	Neil Ross	Tested by:	Rod Peloquin
Customer Ref. No.:	None	Power:	120VAC/60Hz
		Humidity:	40%
		Job Site:	Off-site

TEST SPECIFICATIONS			
Specification:	47 CFR 90.691	Year:	Most Current
		Method:	TIA / EIA - 603
		Year:	Most Current

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by 16 QAM.

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 19.33 dBm

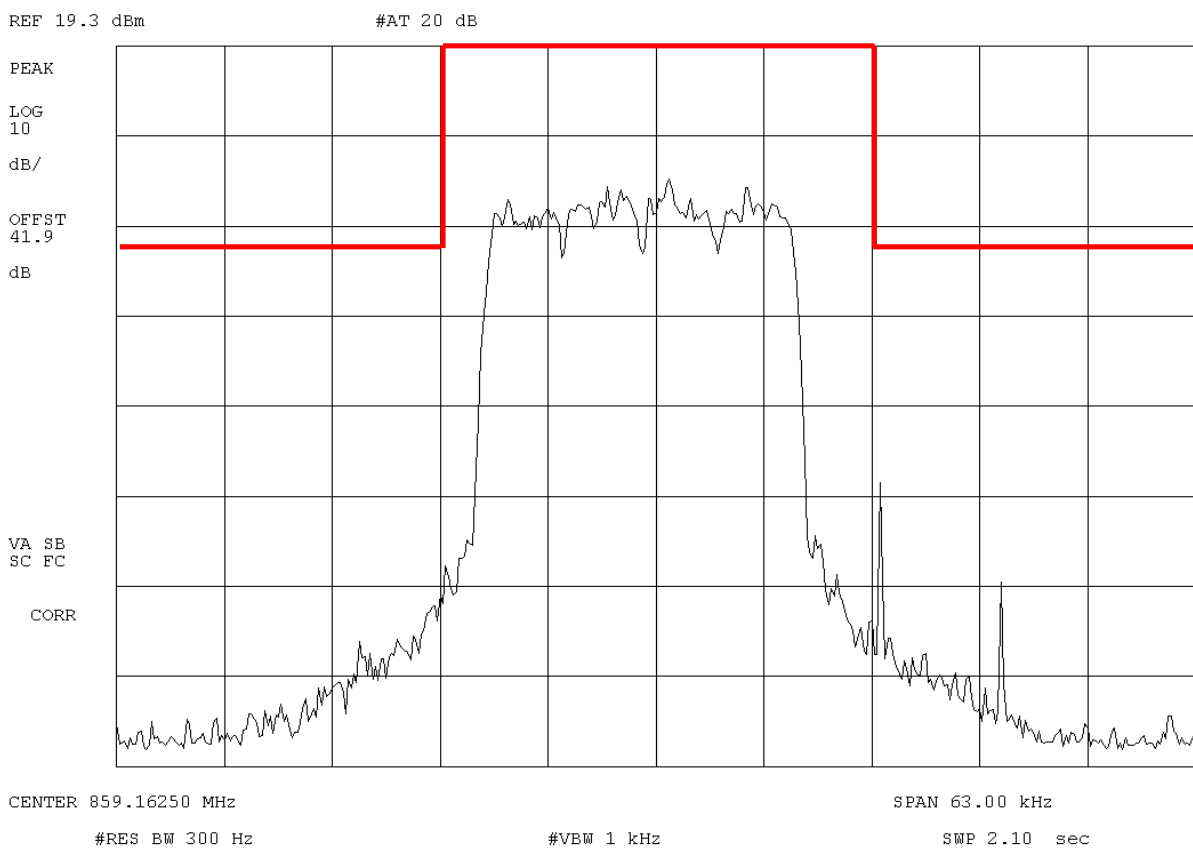
RESULTS AMPLITUDE
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Emission Mask for EA-based Systems: Middle Channel @ Highest Output Power

10:25:23 OCT 14, 2005
RP



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	MC Series System	Work Order:	RAFNO054
Serial Number:	Engineering Production Unit #1	Date:	10/14/05
Customer:	Radioframe Networks, Inc.	Temperature:	23° C
Attendees:	Neil Ross	Tested by:	Rod Peloquin
Customer Ref. No.:	None	Power:	120VAC/60Hz
		Humidity:	40%
		Job Site:	Off-site

TEST SPECIFICATIONS			
Specification:	47 CFR 90.691	Year:	Most Current
		Method:	TIA / EIA - 603
		Year:	Most Current

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES
Modulated by 16 QAM.

DEVIATIONS FROM TEST STANDARD
None

REQUIREMENTS
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 19.33 dBm

RESULTS
AMPLITUDE

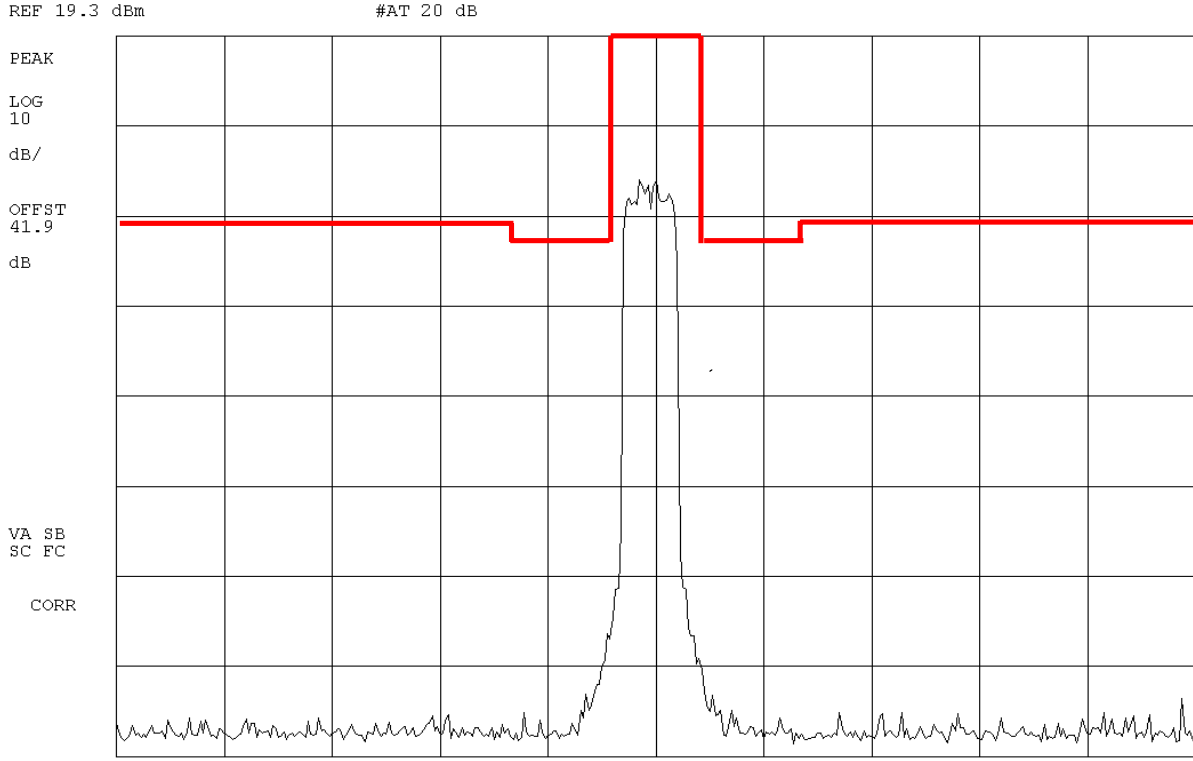
Pass

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST
Emission Mask for EA-based Systems: Middle Channel @ Highest Output Power

10:29:37 OCT 14, 2005
RP



CENTER 859.1625 MHz SPAN 370.0 kHz
#RES BW 300 Hz #VBW 1 kHz SWP 12.3 sec

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	MC Series System	Work Order:	RAFNO054
Serial Number:	Engineering Production Unit #1	Date:	10/14/05
Customer:	Radioframe Networks, Inc.	Temperature:	23° C
Attendees:	Neil Ross	Tested by:	Rod Peloquin
Customer Ref. No.:	None	Power:	120VAC/60Hz
		Humidity:	40%
		Job Site:	Off-site

TEST SPECIFICATIONS			
Specification:	47 CFR 90.691	Year:	Most Current
		Method:	TIA / EIA - 603
		Year:	Most Current

SAMPLE CALCULATIONS			

COMMENTS			

EUT OPERATING MODES			
Modulated by 16 QAM.			

DEVIATIONS FROM TEST STANDARD			
None			

REQUIREMENTS			
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 18.5 dBm			

RESULTS			
AMPLITUDE			

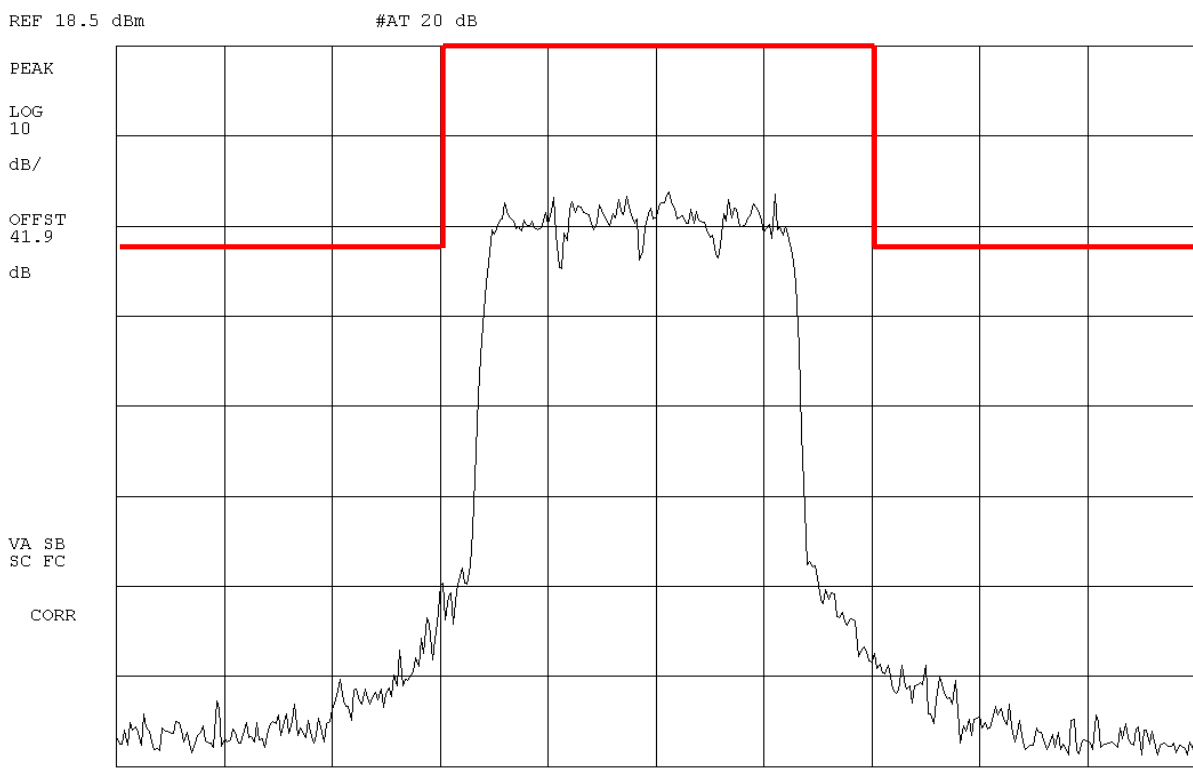
Pass

SIGNATURE


Tested By: _____

DESCRIPTION OF TEST
Emission Mask for EA-based Systems: Highest Channel @ Highest Output Power

10:56:31 OCT 14, 2005
RP



CENTER 869.98750 MHz SPAN 63.00 kHz
#RES BW 300 Hz #VBW 1 kHz SWP 2.10 sec

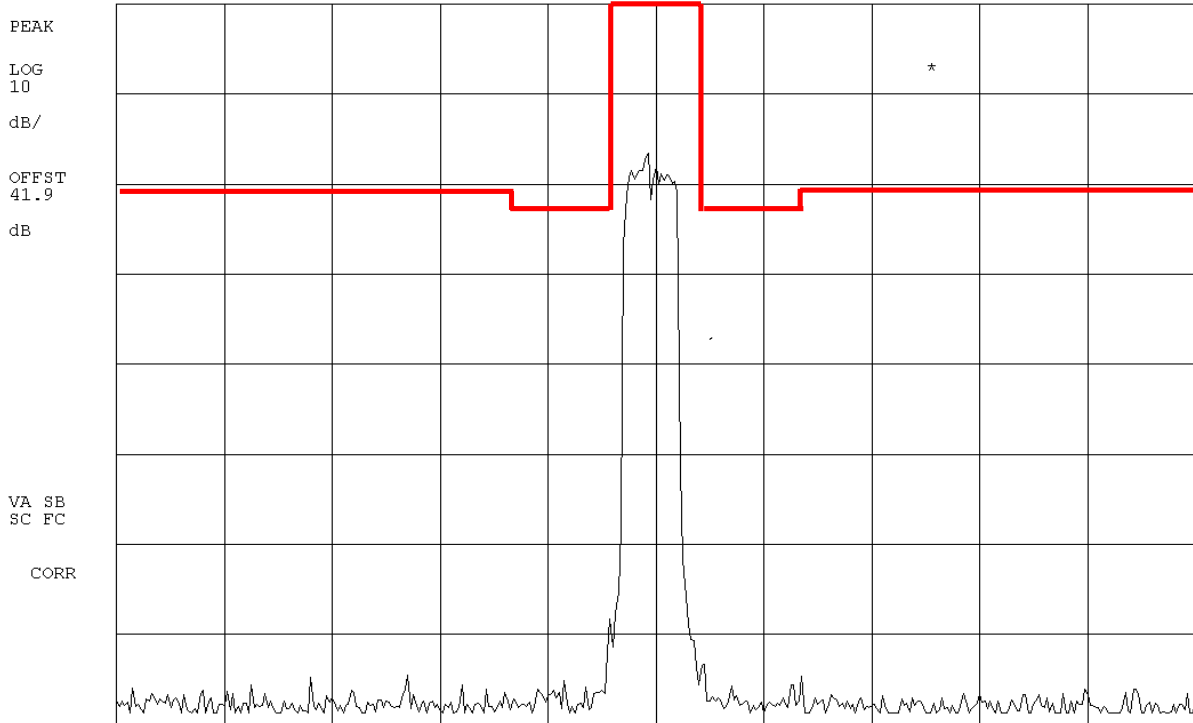
NORTHWEST EMC EMISSIONS DATA SHEET				Rev BETA 01/30/01	
EUT:	MC Series System	Work Order:	RAFN0054		
Serial Number:	Engineering Production Unit #1	Date:	10/14/05		
Customer:	Radioframe Networks, Inc.	Temperature:	23° C		
Attendees:	Neil Ross	Tested by:	Rod Peloquin	Humidity:	40%
Customer Ref. No.:	None	Power:	120VAC/60Hz	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification:	47 CFR 90.691	Year:	Most Current	Method:	TIA / EIA - 603
SAMPLE CALCULATIONS					
COMMENTS					
EUT OPERATING MODES					
Modulated by 16 QAM.					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Maximum level of any spurious emission must be attenuated below the specified emission mask. 0 dB reference is 18.5 dBm					
RESULTS					
AMPLITUDE					
Pass					
SIGNATURE					
 Tested By: _____					
DESCRIPTION OF TEST					
Emission Mask for EA-based Systems: Highest Channel @ Highest Output Power					

10:58:47 OCT 14, 2005

RP

REF 18.5 dBm

#AT 20 dB



CENTER 869.9875 MHz

SPAN 371.9 kHz

#RES BW 300 Hz

#VBW 1 kHz

SWP 12.4 sec



Switched by the test setup
10/10/2010 10:00 AM
10/10/2010 10:00 AM
10/10/2010 10:00 AM



NUENC

