Radioframe Networks, Inc.

MCRB

July 19, 2006

Report No. RAFN0063.1

Report Prepared By

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

EMC Test Report

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: July 19, 2006
Radioframe Networks, Inc.
Model: MCRB

Emissions				
Test Description	**Specification**	**Test Method**	**Pass**	**Fail**
Radiated Emissions	FCC 15.109:2006	ANSI C63.4:2003	☒	☐
Conducted Emissions	FCC 15.107:2006	ANSI C63.4:2003	☒	☐
Frequency Stability	FCC 90.213:2005	ANSI/TIA/EIA-603:2002	☒	☐
Output Power	FCC 90.691:2005	ANSI/TIA/EIA-603:2002	☒	☐
Emission Mask	FCC 90.691:2005	ANSI/TIA/EIA-603:2002	☒	☐
Spurious Conducted Emissions-Receive	FCC 15.111:2006	ANSI C63.4:2003	☒	☐
Spurious Conducted Emissions-Transmit	FCC 90.691:2005	ANSI/TIA/EIA-603:2002	☒	☐
Spurious Radiated Emissions	FCC 90.691:2005	ANSI/TIA/EIA-603:2002	☒	☐

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

Test Facilities

The measurement facility used to collect the data is located at:

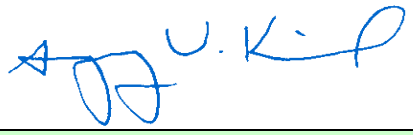
Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124
Phone: (503) 844-4066
Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Additional antenna port direct connect measurements were made in-situ at the client's facility:

Radioframe Networks, Inc.
9461 Willows Road NE, Suite 100
Redmond, WA 98052

Approved By:



Greg Kiemel, Director of Engineering

Revision Number	Description	Date	Page Number
00	None		

Accreditations and Authorizations

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 accredited 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.

NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 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 TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV'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).

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).

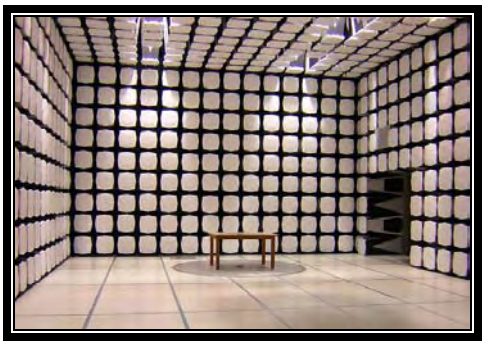
VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, and R-2318, Irvine: C-2094 and R-1943, 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

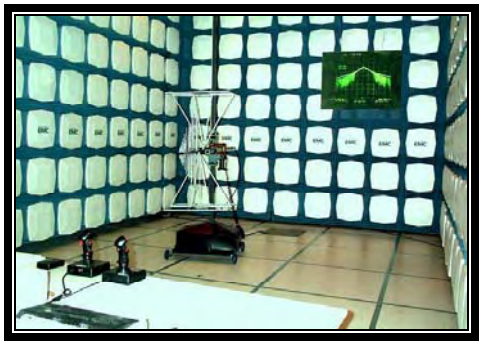
SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/scope.asp



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 – EV11

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:	9461 Willows Road NE, Suite 100
City, State, Zip:	Redmond, WA 98052
Test Requested By:	Dean Busch
Model:	MCRB
First Date of Test:	May 18, 2006
Last Date of Test:	June 29, 2006
Receipt Date of Samples:	May 18, 2006
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
The Multi-Channel Radio Blade (MCRB) transceiver duplicates the RF functions of up to 6 simultaneously operational iDEN radio transceivers. The blades are installed in a standard 7-foot-tall, 19- inch-wide rack.

Testing Objective:
To meet the EMC requirements for certification under FCC Part 90.691

CONFIGURATION 1

Software/Firmware Running during test	
Description	**Version**
VxWorks	RFN_14.0.225
Software Script	idencric.gz

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT- Multi-Channel RadioBlades (MCRB)	Radioframe Networks, Inc.	176-0860-00	Various
MC-15 SERIES DUAL BAND SYSTEM (3 SECTOR)	Radioframe Networks, Inc.	176-7970-xx	Unknown

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Site Simulator	Radioframe Networks, Inc.	N/a	N/a
Site Controller	Motorola, Inc.	CCN1008N	CAF030LTC4
GPS Antenna	Hewlett-Packard	8532A	901
DC Power Supply	Sorensen	DCR 60-45B	0144

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	8.0	No	MC-15 SERIES DUAL BAND SYSTEM	DC Supply
BNC	Yes	30.0	No	ERTM	Site Simulator
BNC	Yes	30.0	No	Site Controller	Site Simulator
BNC	Yes	3.0	No	GPS Antenna	Site Controller
Ethernet	No	3.0	No	Site Controller	ERTM
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	5/18/2006	Spurious Conducted Limits Xmit Mode	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	5/19/2006	Spurious Emissions at Antenna Terminals	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	5/19/2006	Field Strength of Spurious radiation	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	5/19/2006	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	5/23/2006	RF Power Output	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	5/23/2006	Emission Mask	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	5/23/2006	Spurious Conducted Limits Receive Mode	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	6/29/2006	Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
9	6/29/2006	3 Tone Inter Mod	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

Configuration: The peak measurement was made using a direct connection 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

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 byincumbents 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 flexbility 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 flexibile 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;

NORTHWEST EMC

EMISSION MASK

XMit 2006.03.01

EUT:	MCRB			**Work Order:**	RAFN0062
Serial Number:	Various			**Date:**	05/18/06
Customer:	Radioframe Networks, Inc.			**Temperature:**	23°C
Attendees:	Dean Busch			**Humidity:**	34%
Project:	None			**Barometric Pres.:**	29.99
Tested by:	Rod Peloquin	**Power:**	-48Vdc	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

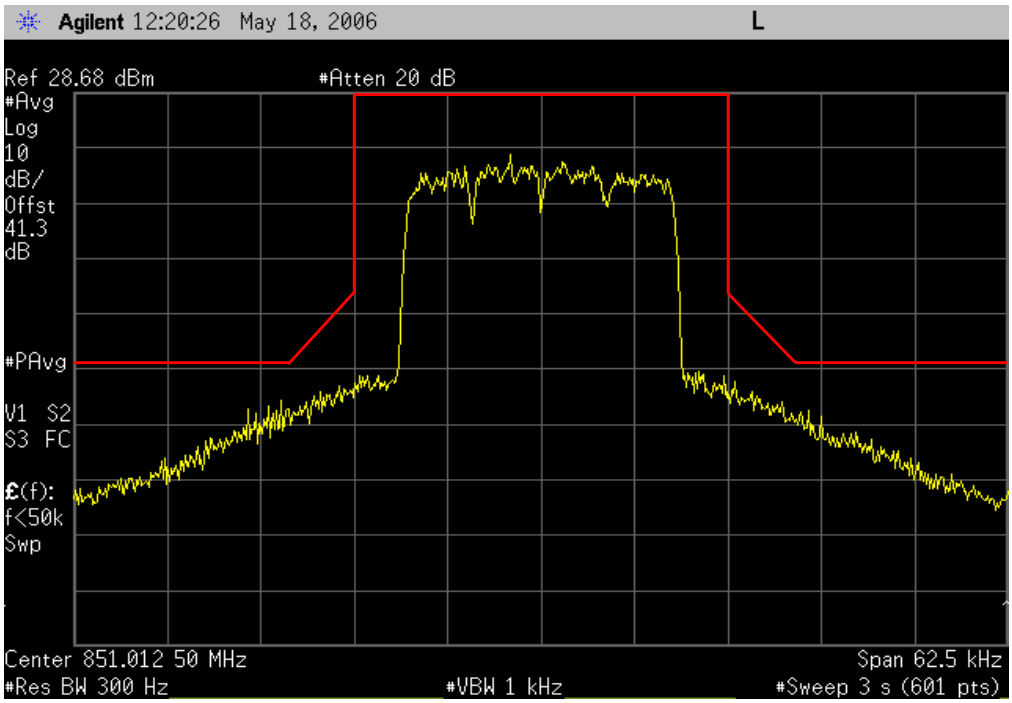
800MHz Band

DEVIATIONS FROM TEST STANDARD

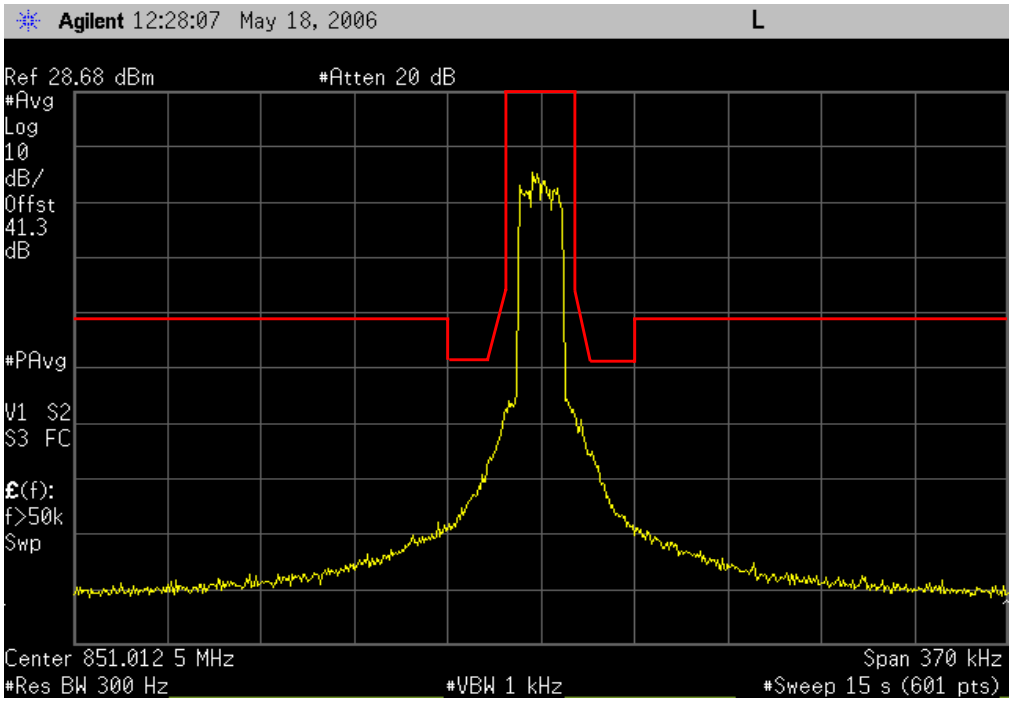
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass

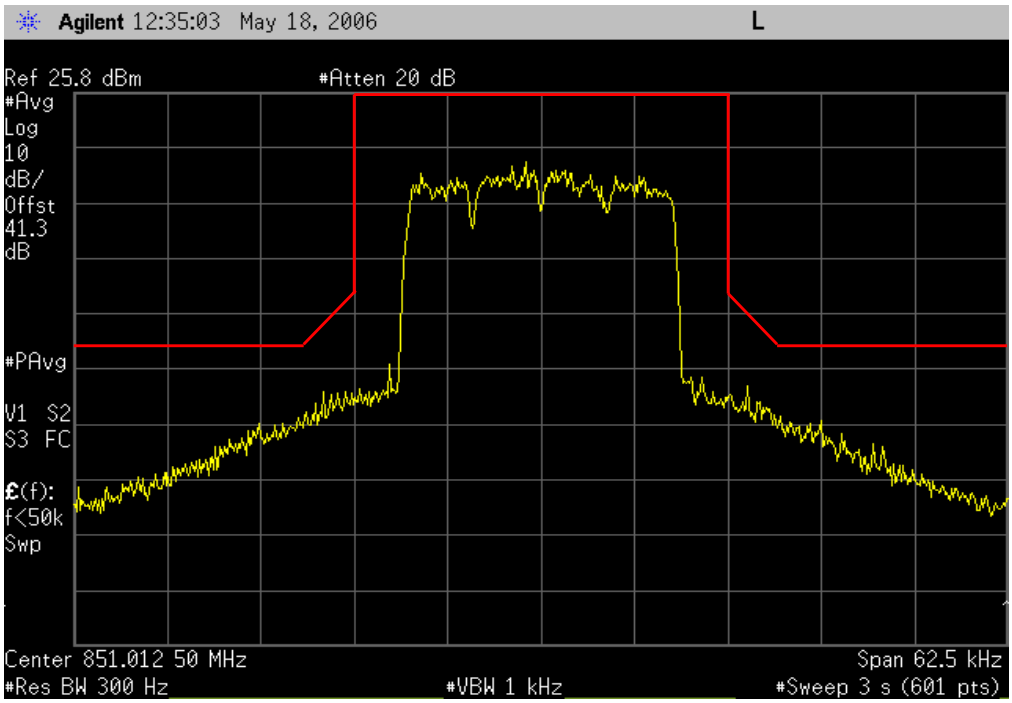
Low Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



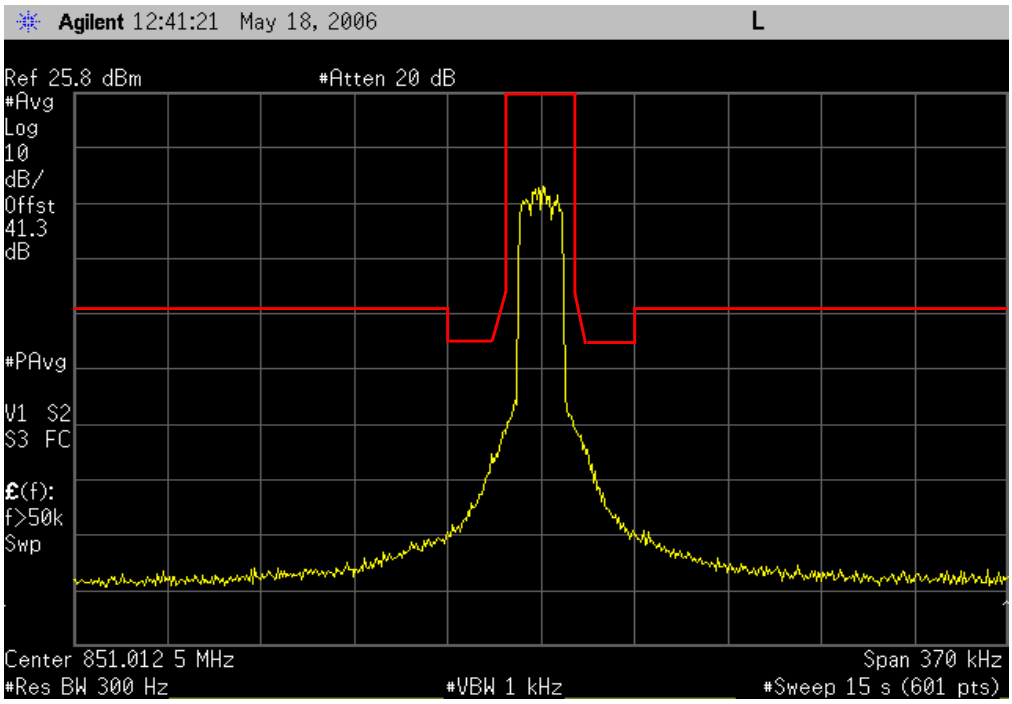
Low Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



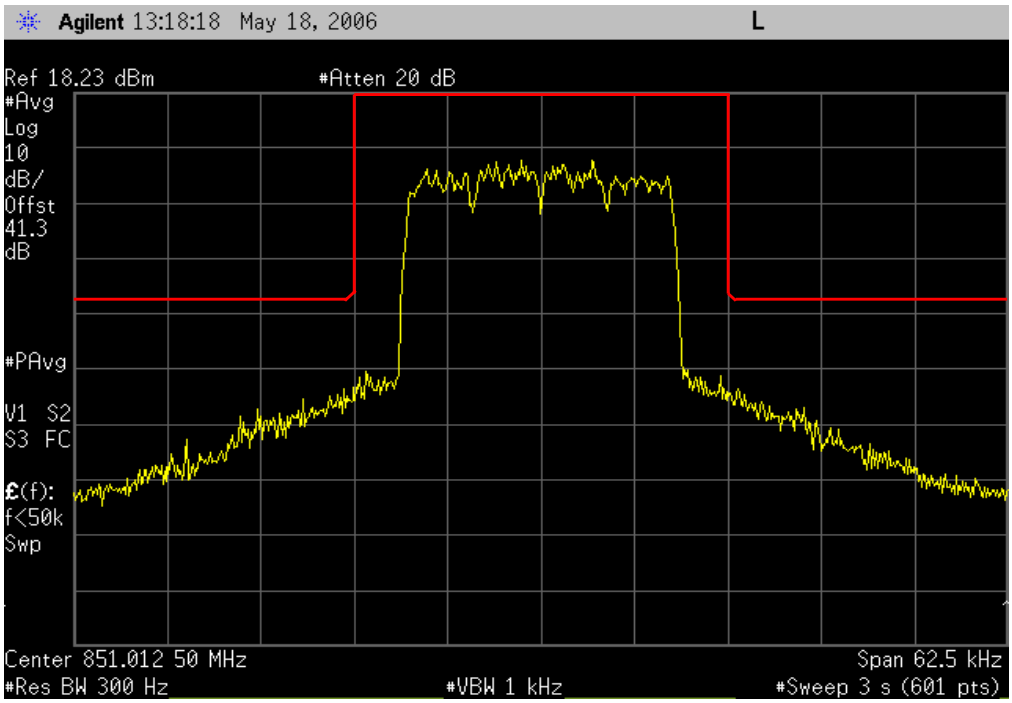
Low Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



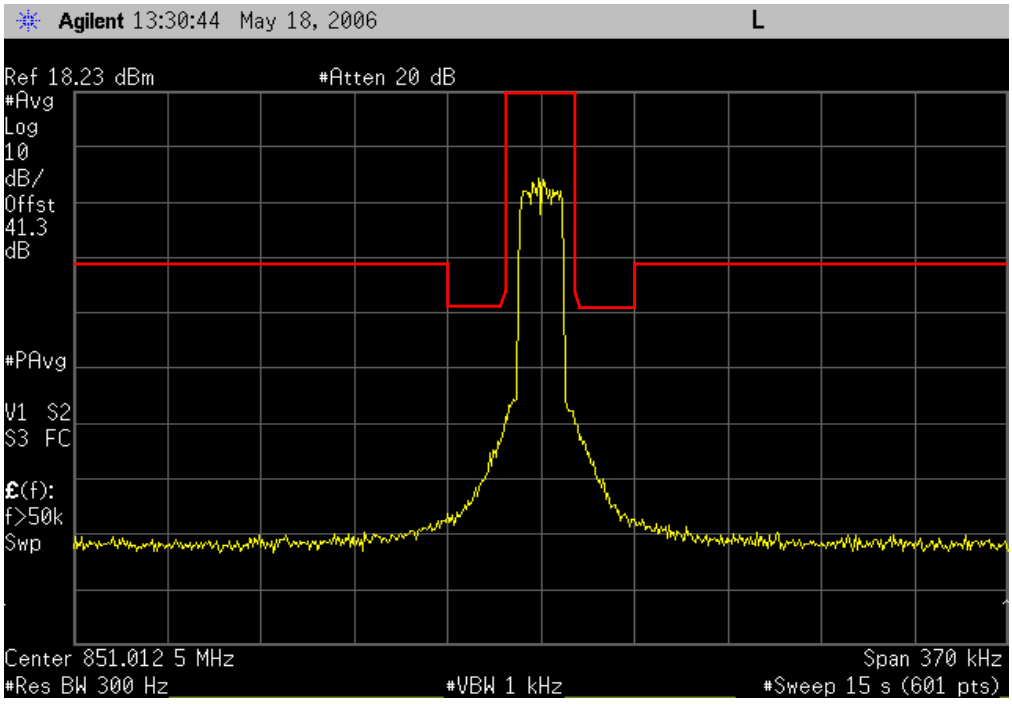
Low Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



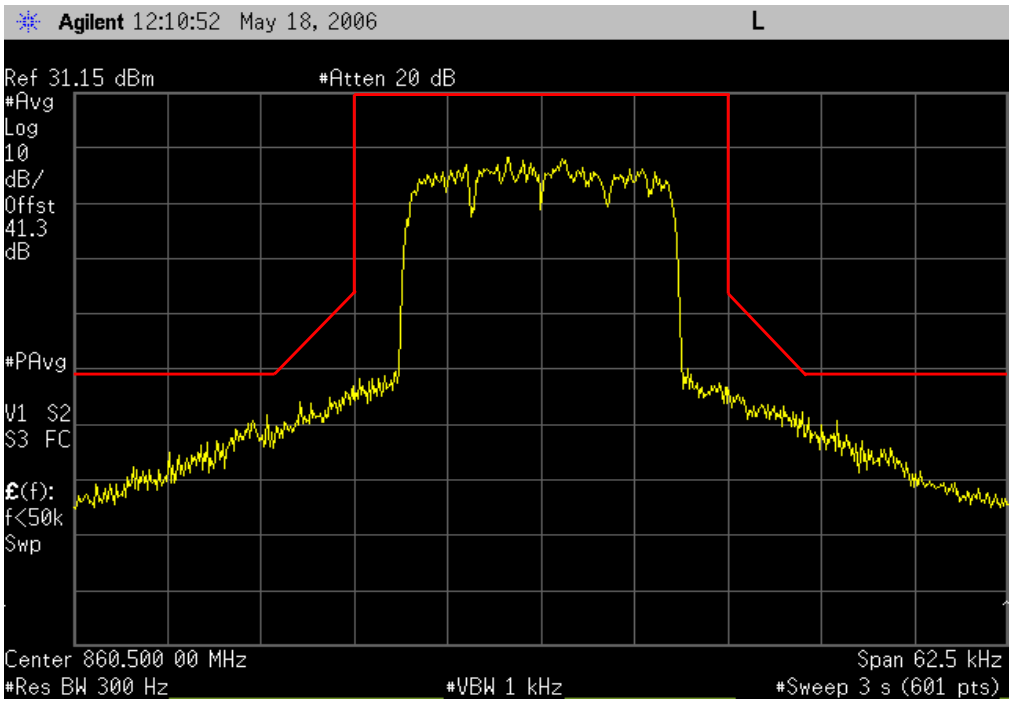
Low Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



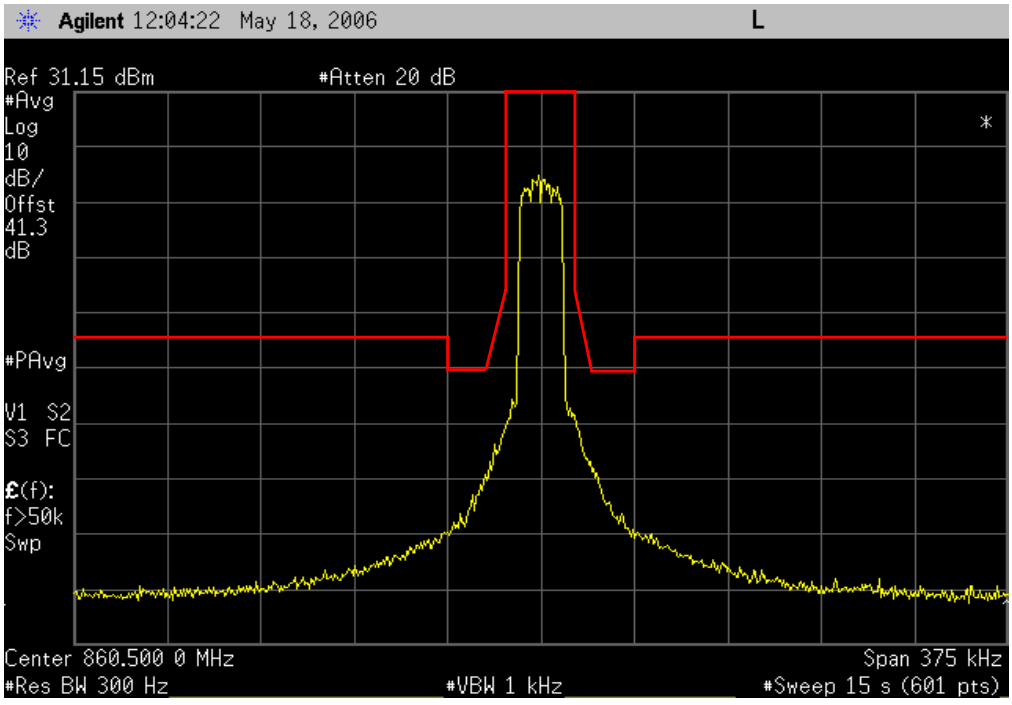
Low Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



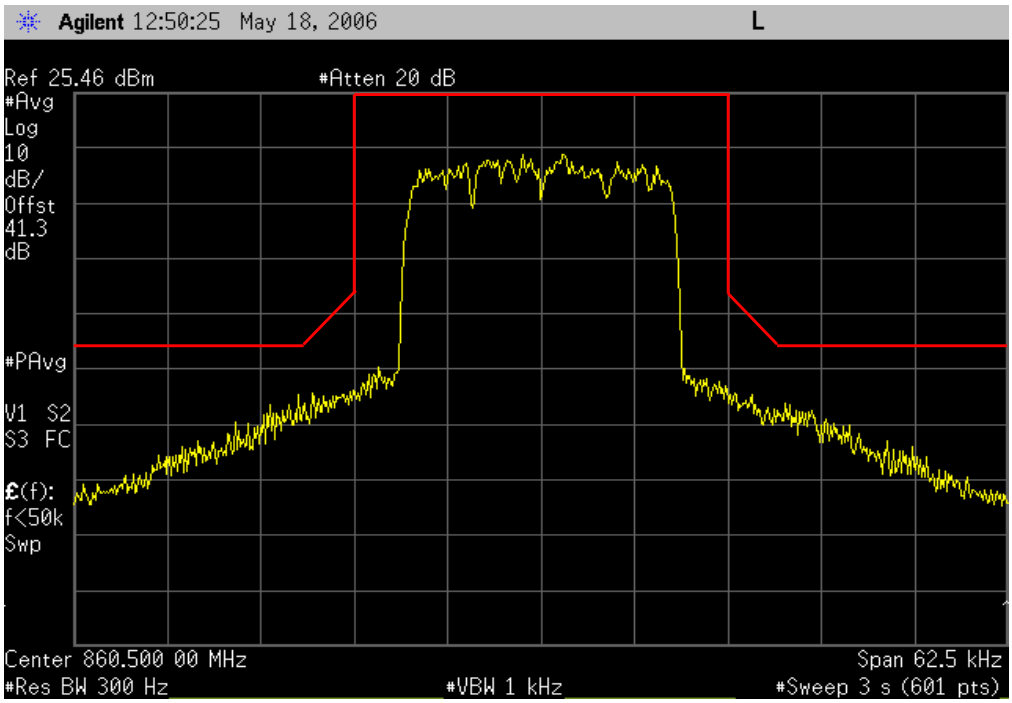
Mid Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



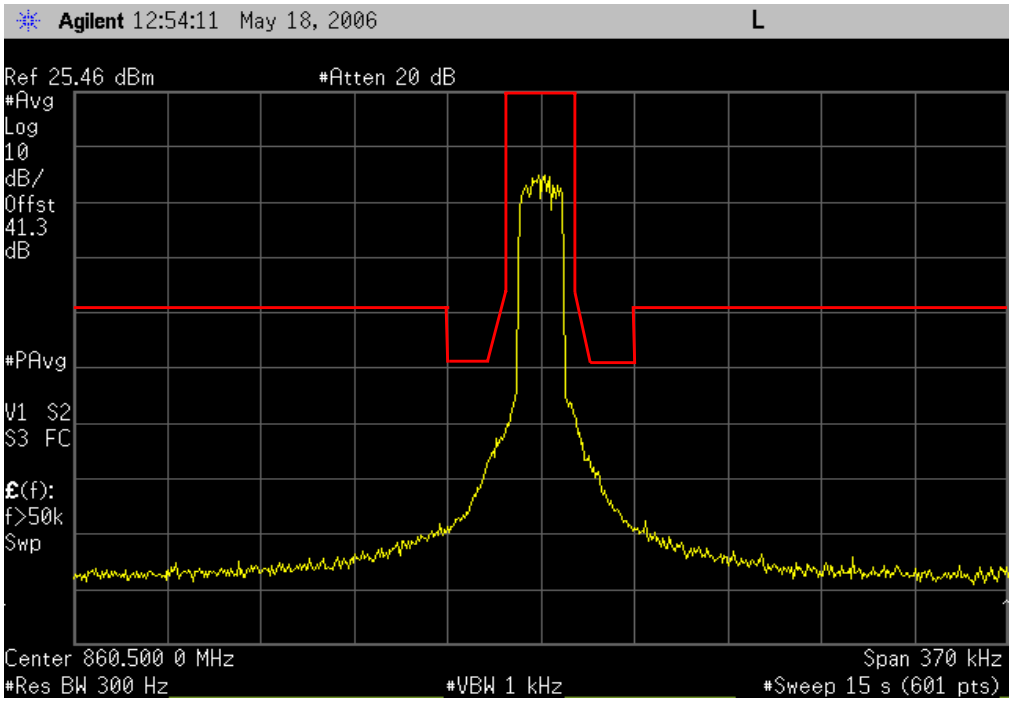
Mid Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



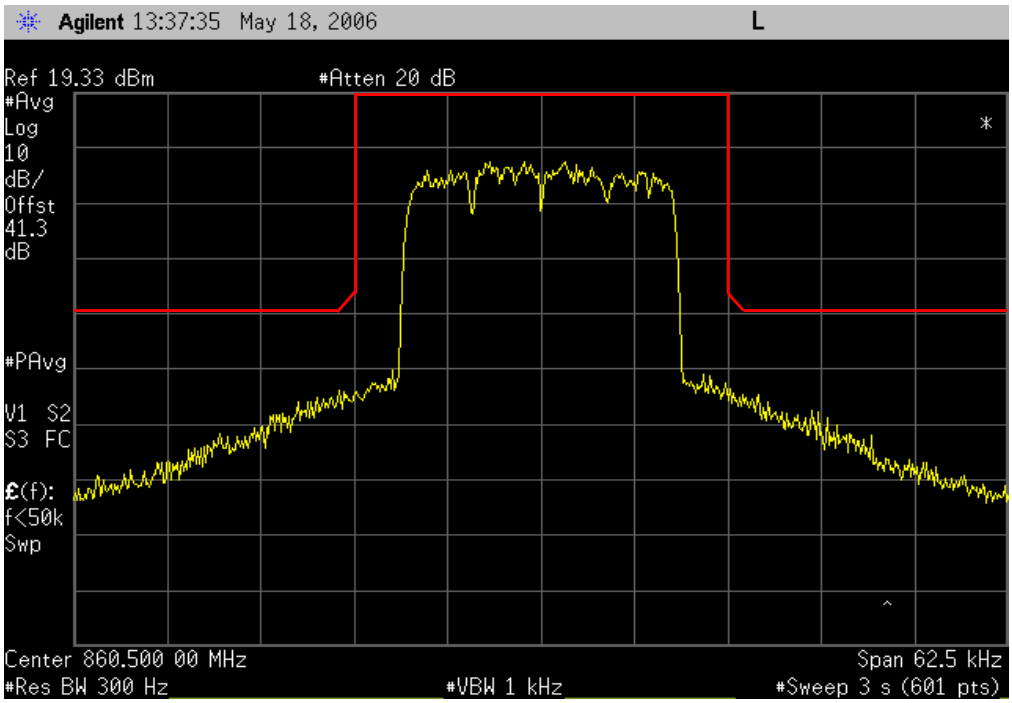
Mid Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



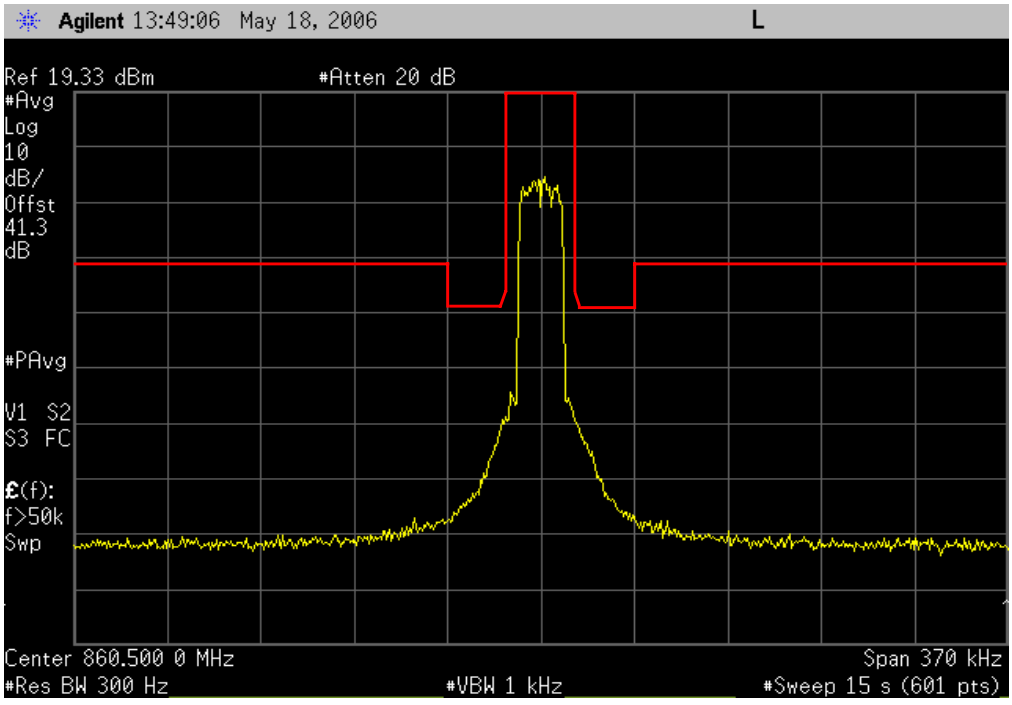
Mid Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



Mid Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

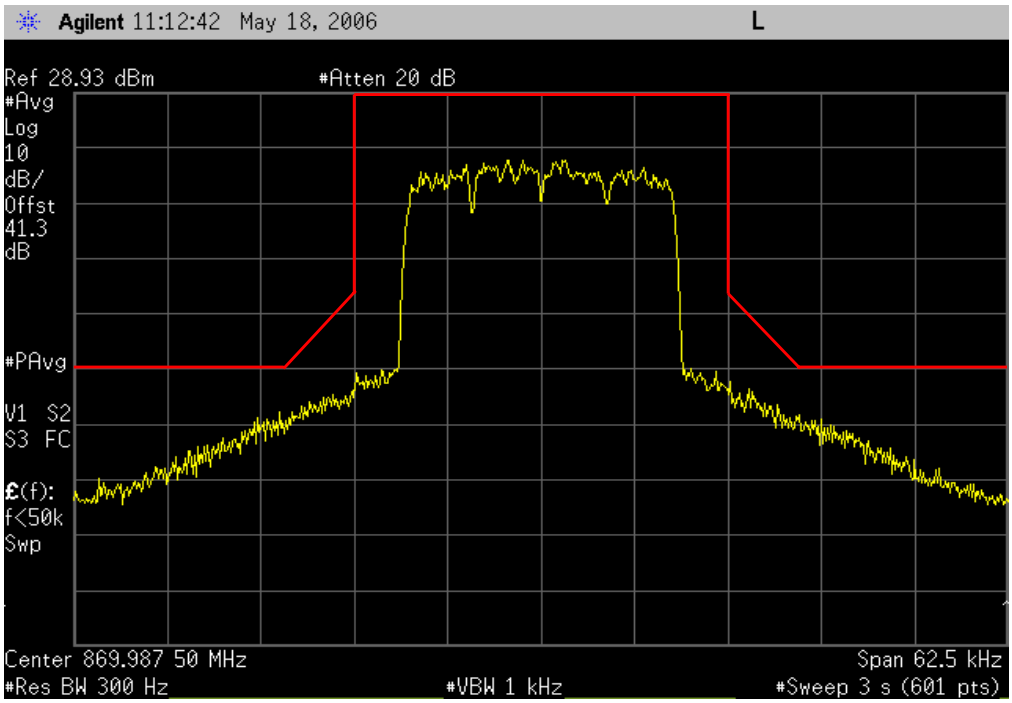


Mid Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

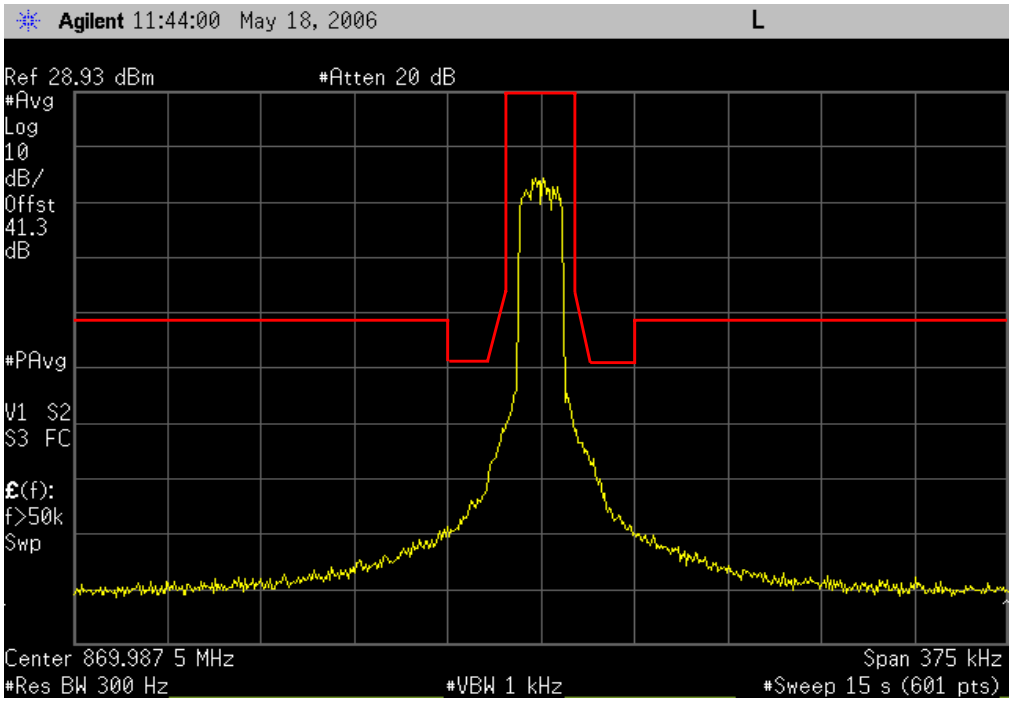


EMISSION MASK

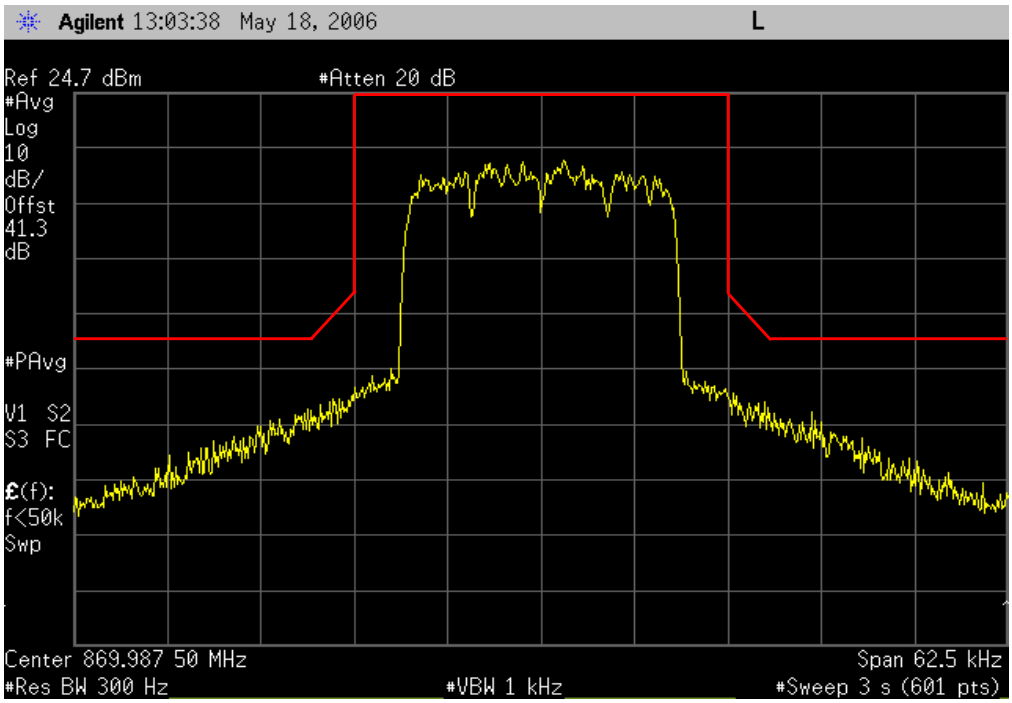
High Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



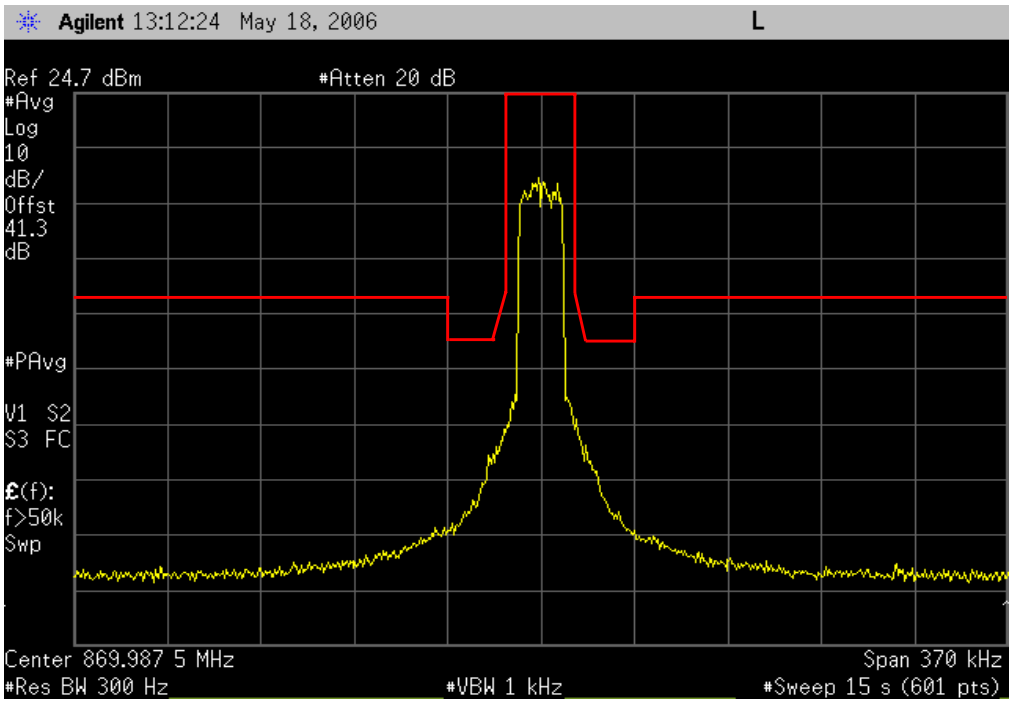
High Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



High Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

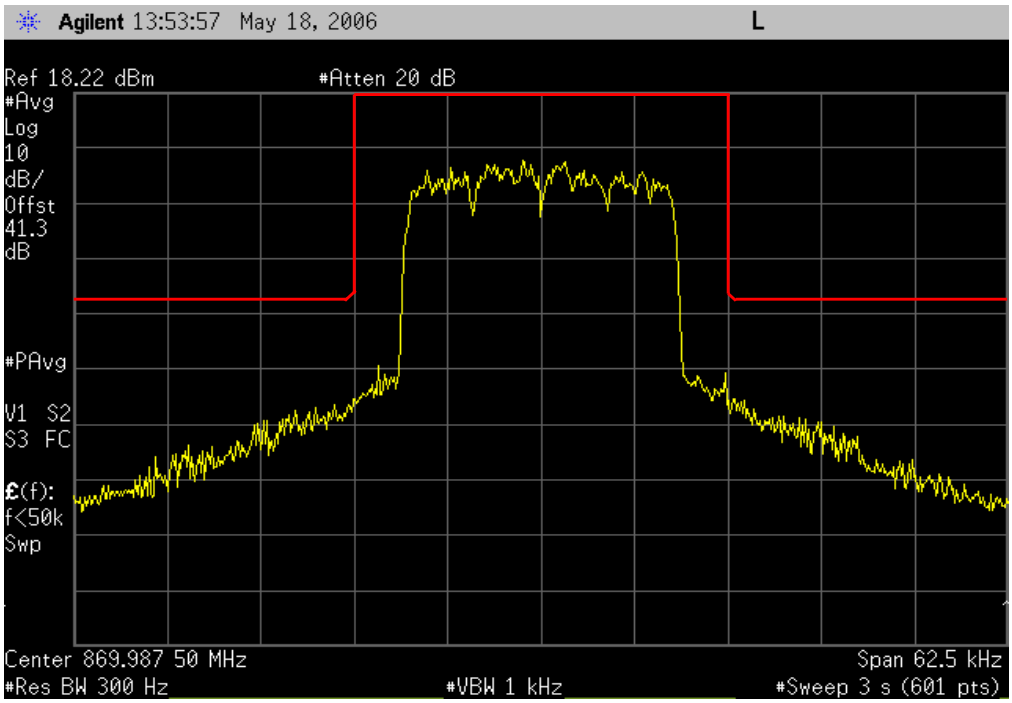


High Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

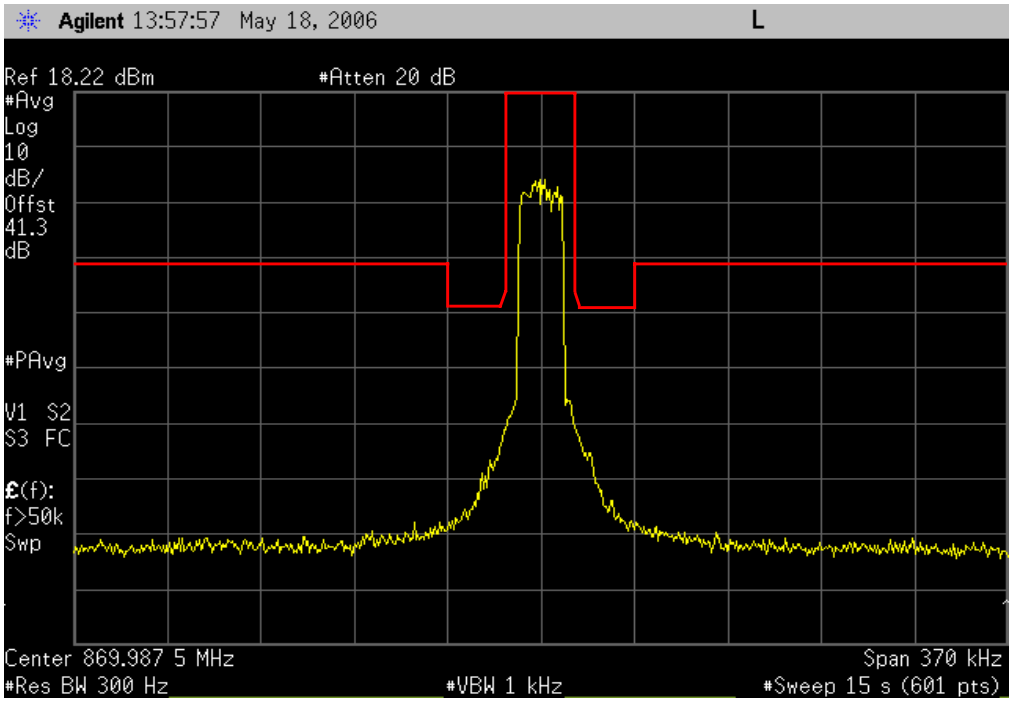


EMISSION MASK

High Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



High Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



EMISSION MASK

Frequency	Output Power	Power (P)	Attenuation for the range 12.5 kHz to 37.5 kHz from fc (dBc)				Attenuation >37.5 kHz from fc (dBc)	
(MHz)	(dBm)	Watts	50 + (10*log P)	116*log(f/6.1) f = 12.5 kHz	116*log(f/6.1) f = 37.5 kHz	80	43 + (10*log P)	80
851.0125	28.68	7.38E-01	48.7	36.14	91.49	80	41.7	80
	25.80	3.80E-01	45.8	36.14	91.49	80	38.8	80
	18.23	6.65E-02	38.2	36.14	91.49	80	31.2	80
860.5	31.15	1.30E+00	51.2	36.14	91.49	80	44.2	80
	25.46	3.52E-01	45.5	36.14	91.49	80	38.5	80
	19.33	8.57E-02	39.3	36.14	91.49	80	32.3	80
869.9875	28.93	7.82E-01	48.9	36.14	91.49	80	41.9	80
	24.70	2.95E-01	44.7	36.14	91.49	80	37.7	80
	18.22	6.64E-02	38.2	36.14	91.49	80	31.2	80

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

Configuration: The peak measurement was made using a direct connection 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

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 flexbility 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 flexibile 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;

NORTHWEST EMC

EMISSION MASK

XMit 2006.03.01

EUT:	MCRB			**Work Order:**	RAFN0062
Serial Number:	Various			**Date:**	05/23/06
Customer:	Radioframe Networks, Inc.			**Temperature:**	22°C
Attendees:	Dean Busch			**Humidity:**	43%
Project:	None			**Barometric Pres.:**	29.93
Tested by:	Rod Peloquin	**Power:**	-48Vdc	**Job Site:**	EV01

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

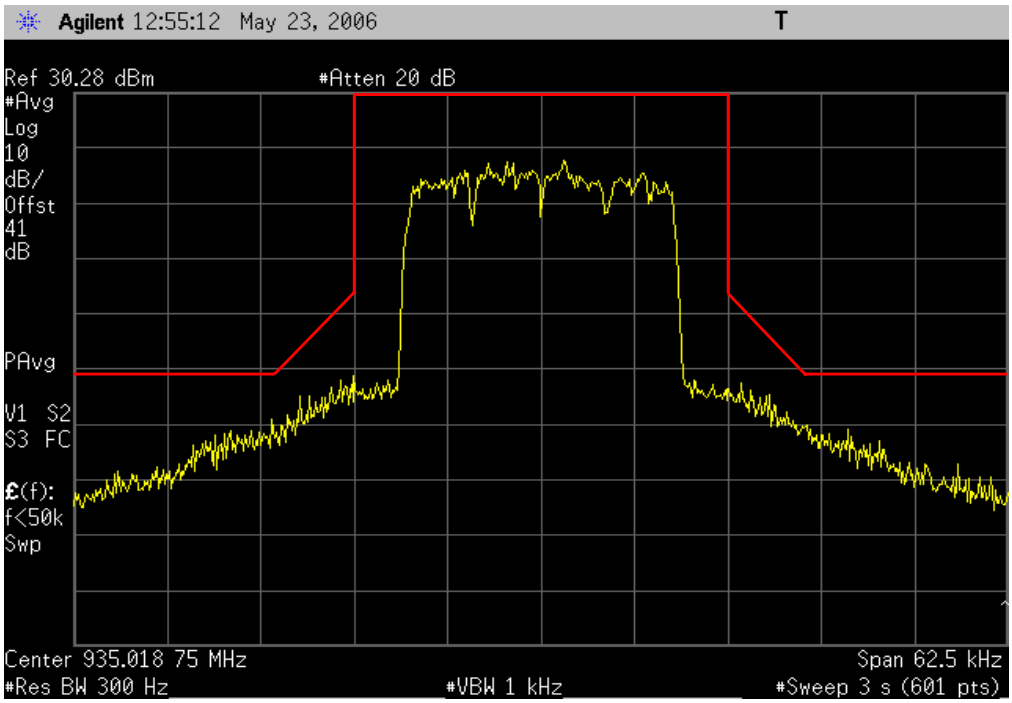
900MHz Band

DEVIATIONS FROM TEST STANDARD

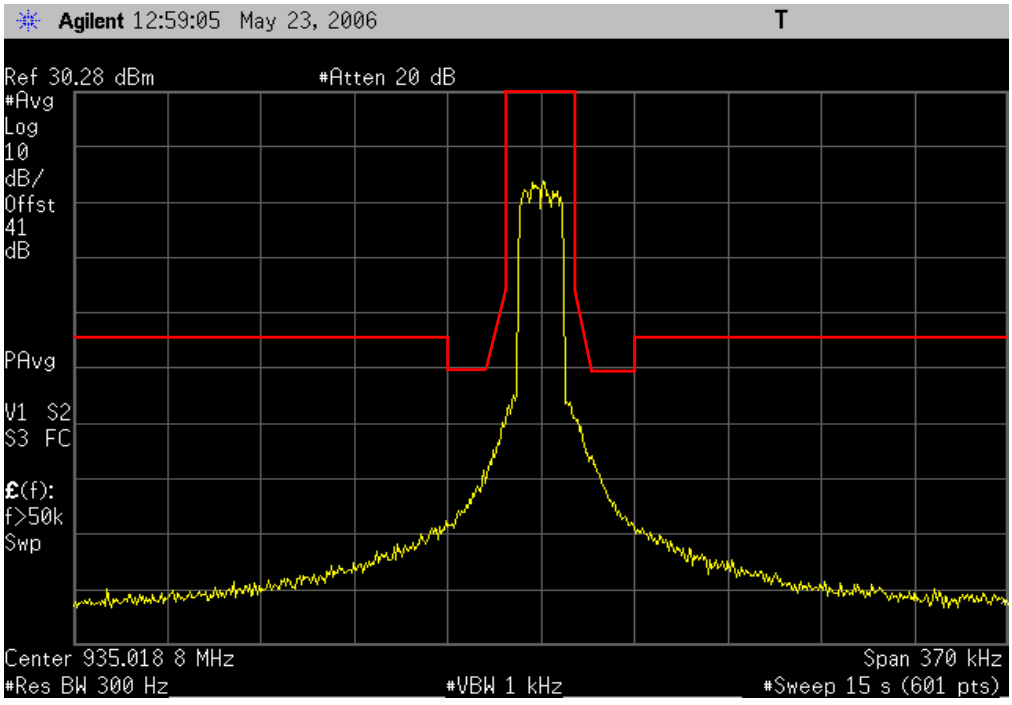
Configuration #	1	Signature 

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
Low Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
Mid Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, High Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, High Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Mid Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Mid Power, > 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Low Power, < 37.5 kHz Fc	N/A	See Table	Pass
High Channel, Low Power, > 37.5 kHz Fc	N/A	See Table	Pass

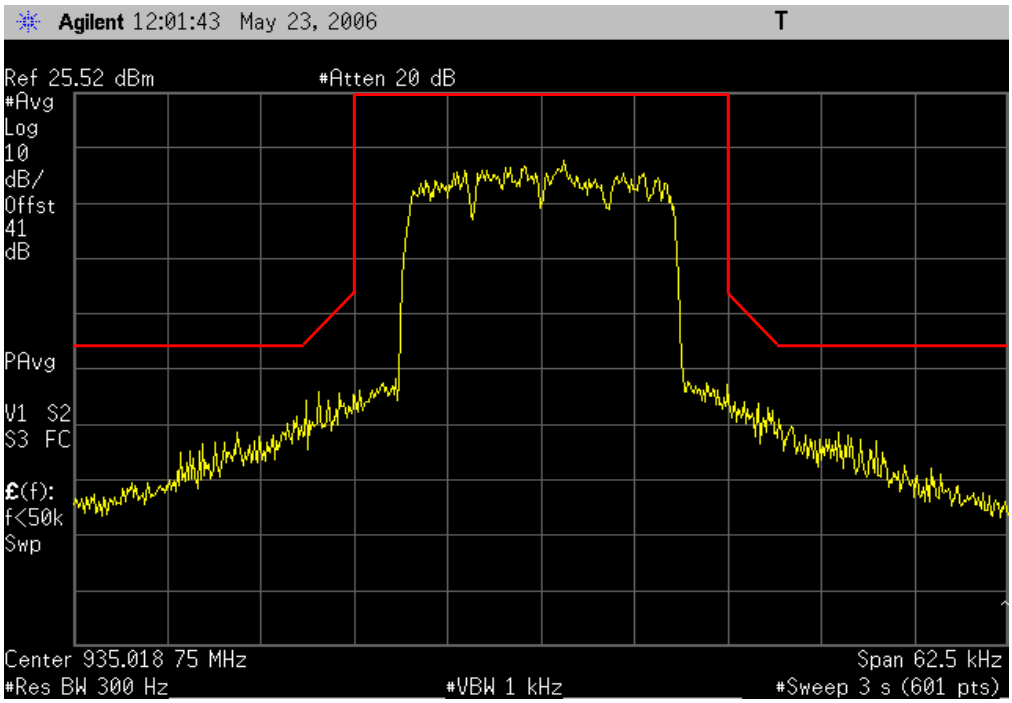
Low Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



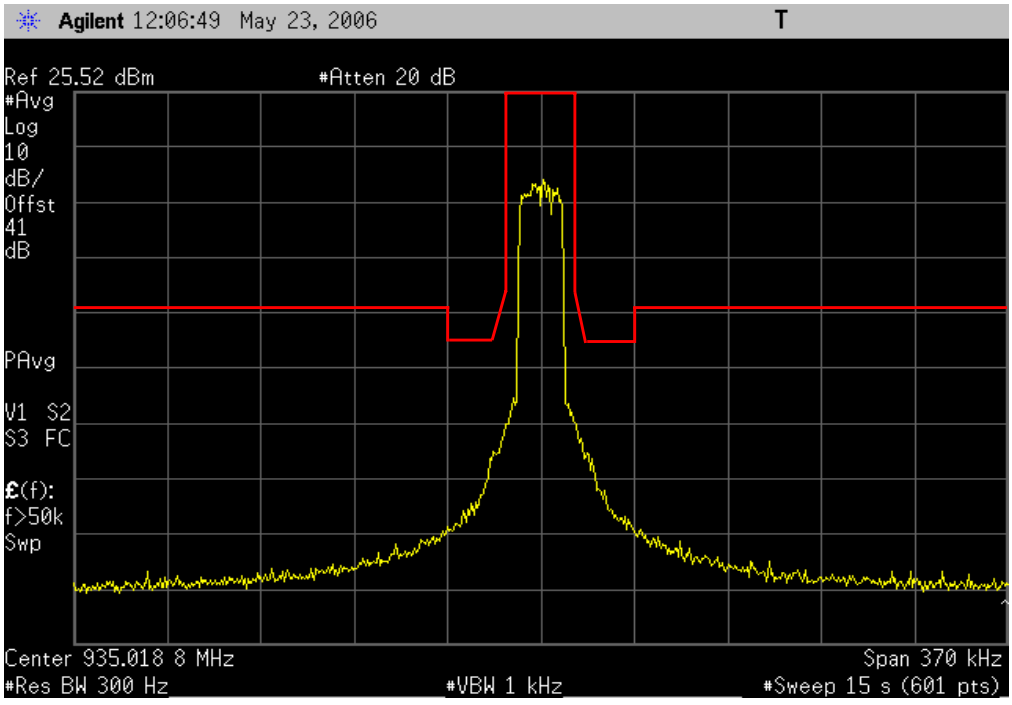
Low Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



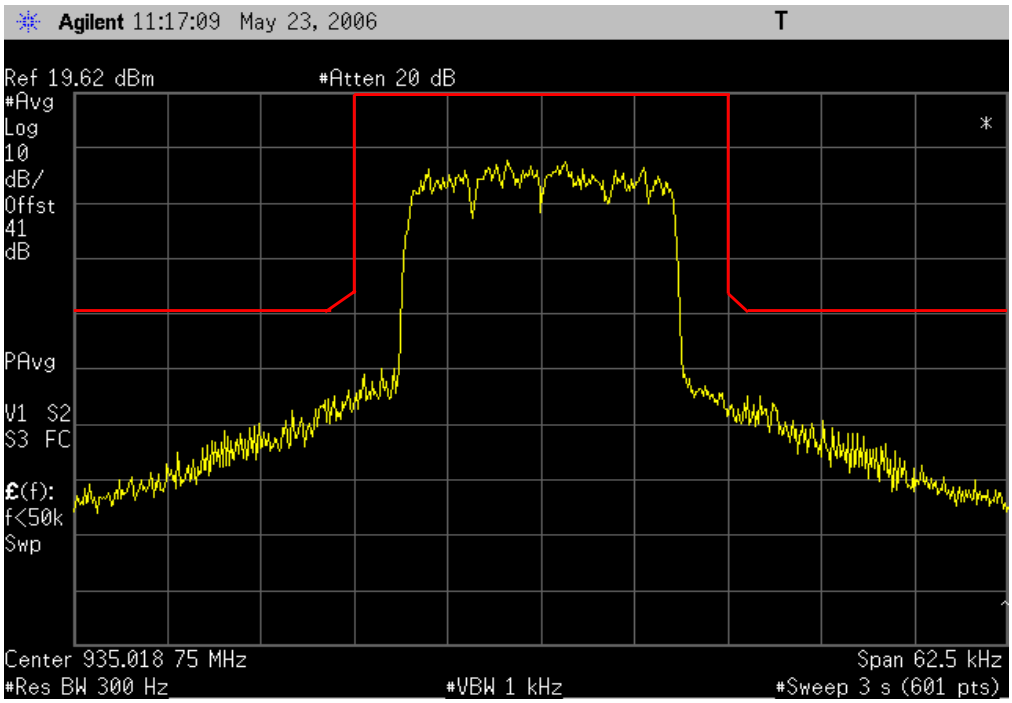
Low Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



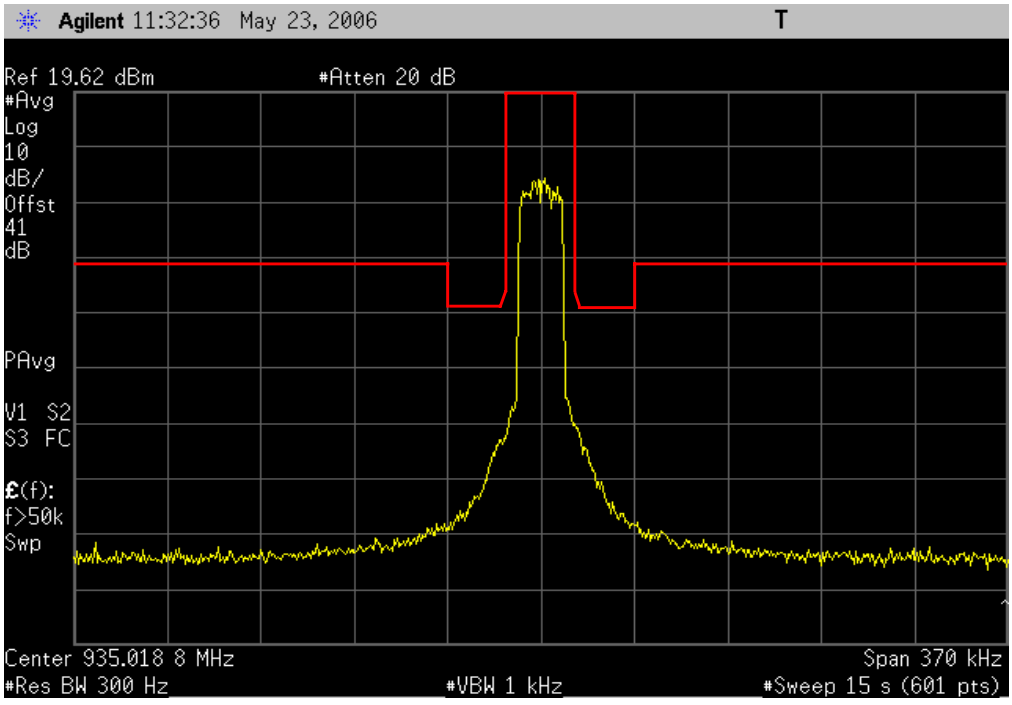
Low Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



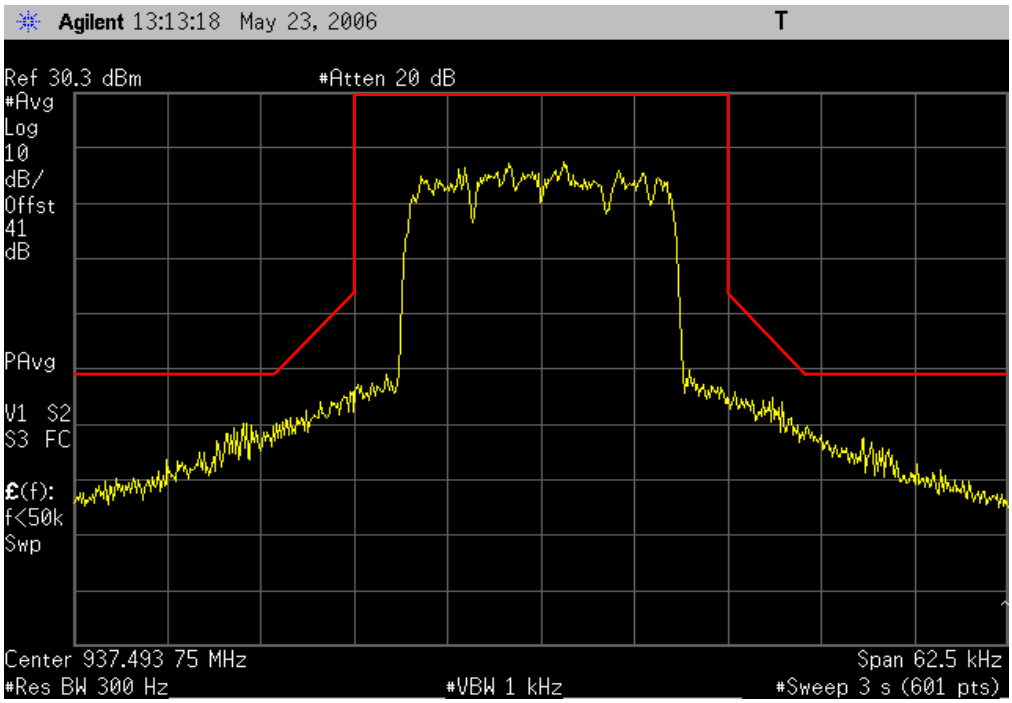
Low Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



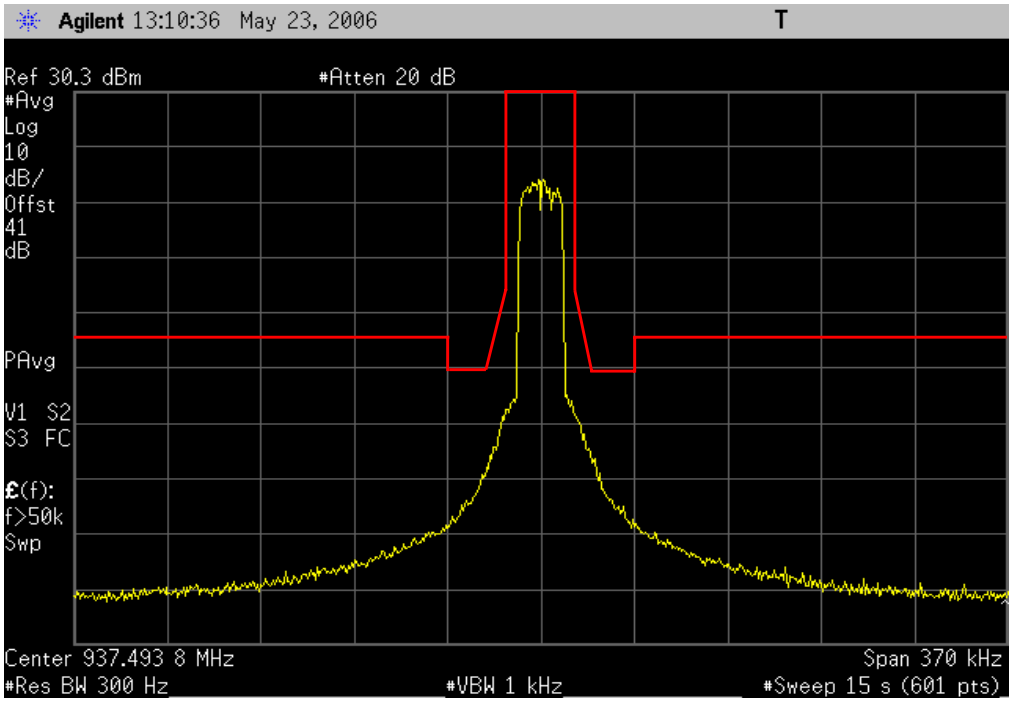
Low Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



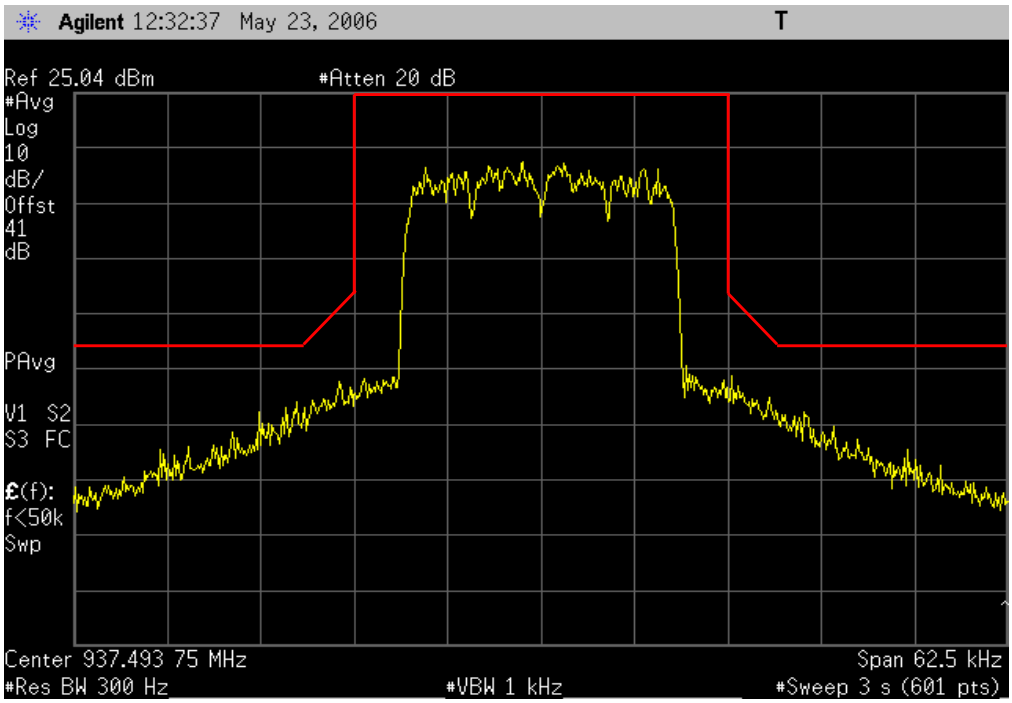
Mid Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



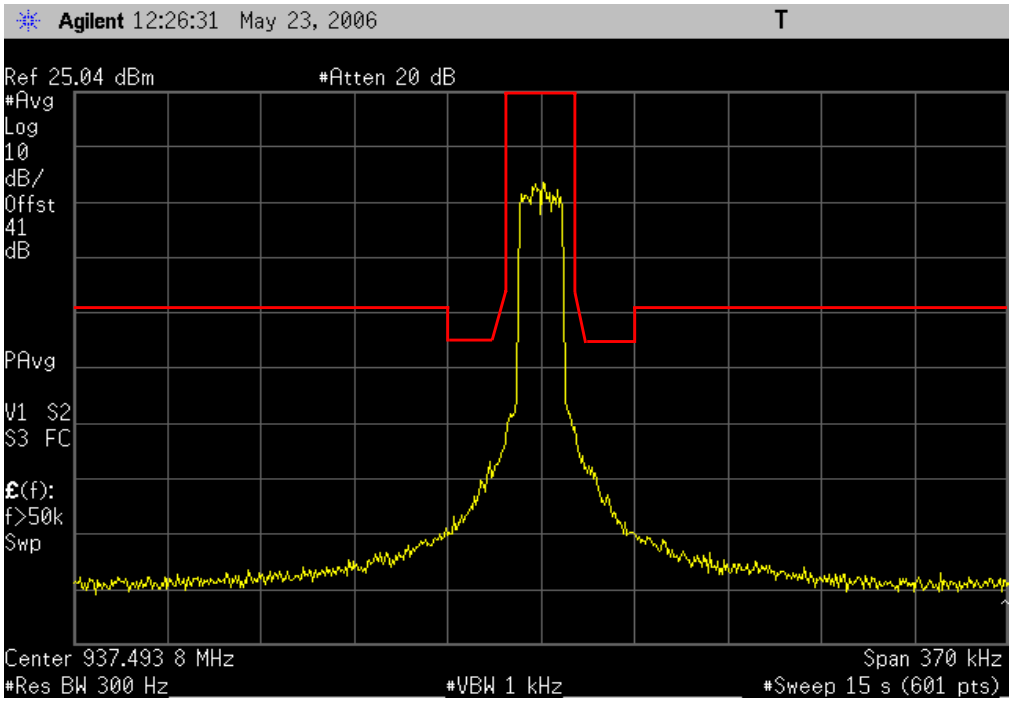
Mid Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



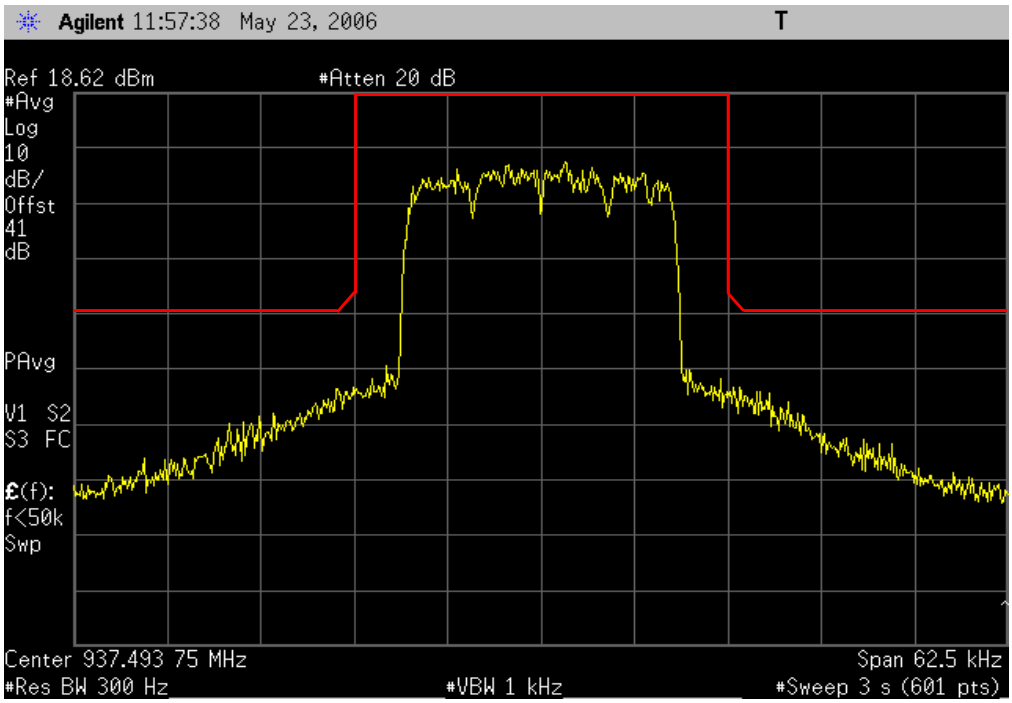
Mid Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



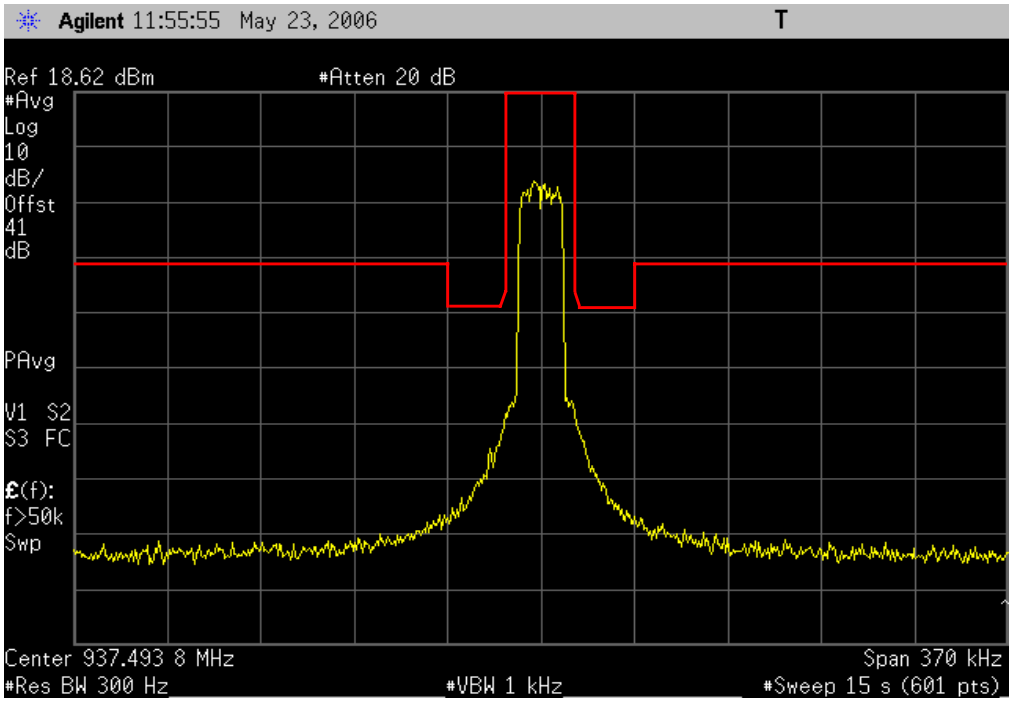
Mid Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



Mid Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

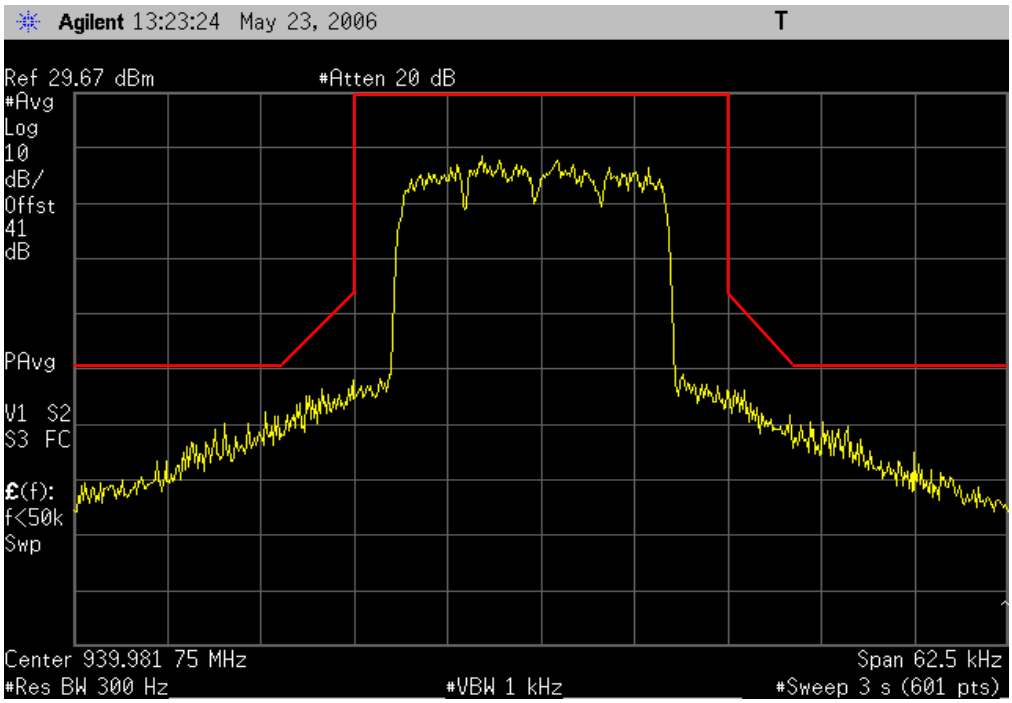


Mid Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

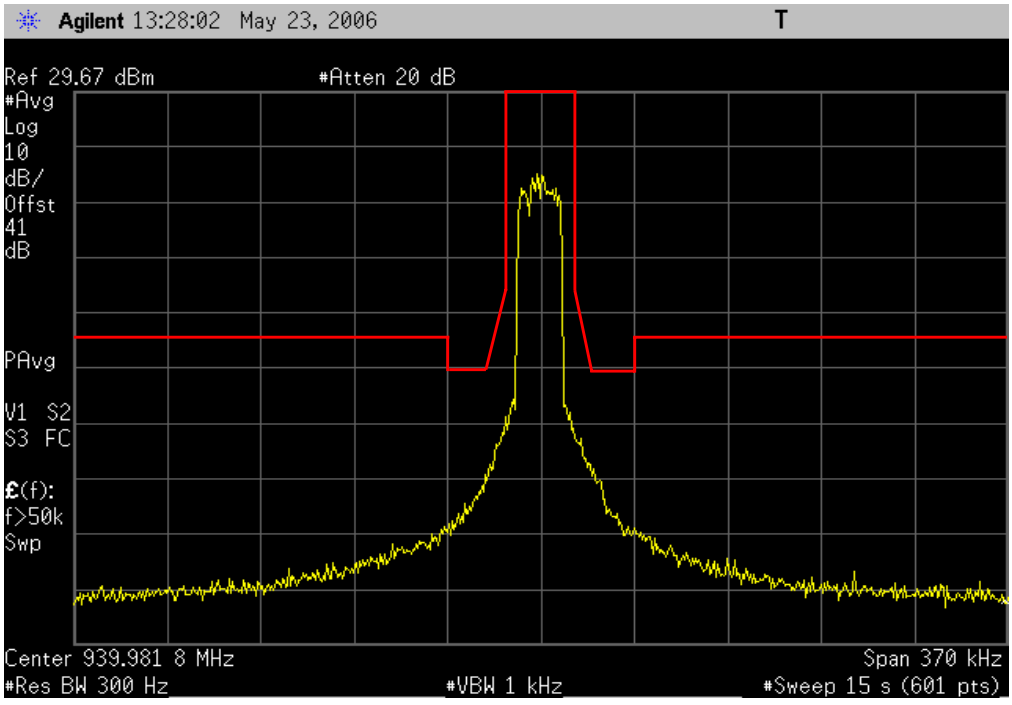


EMISSION MASK

High Channel, High Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

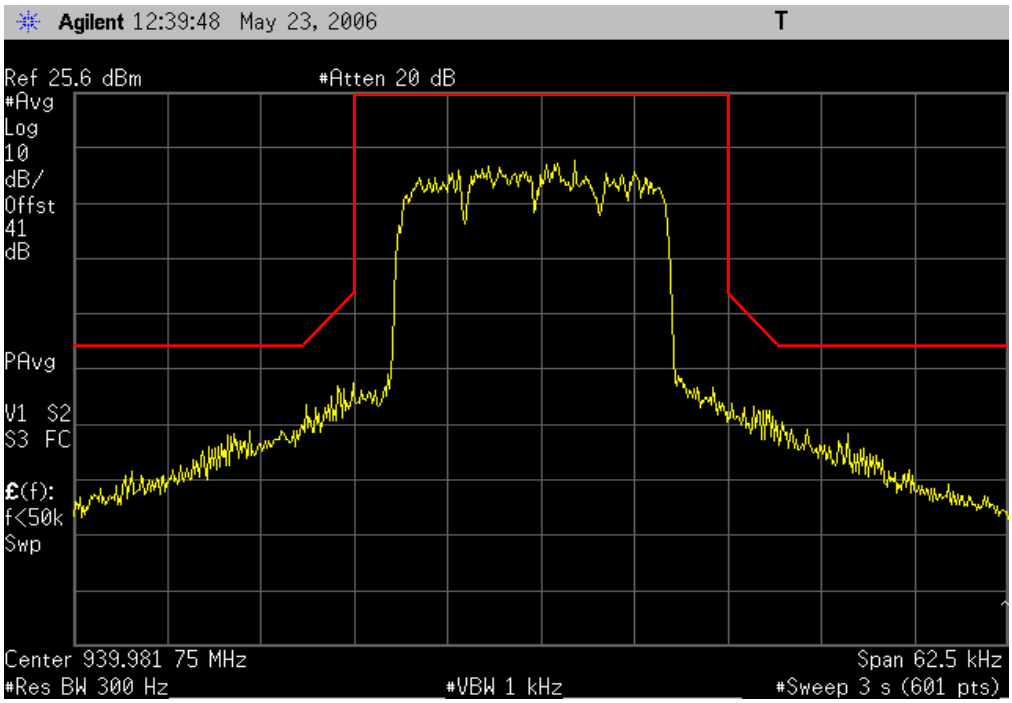


High Channel, High Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

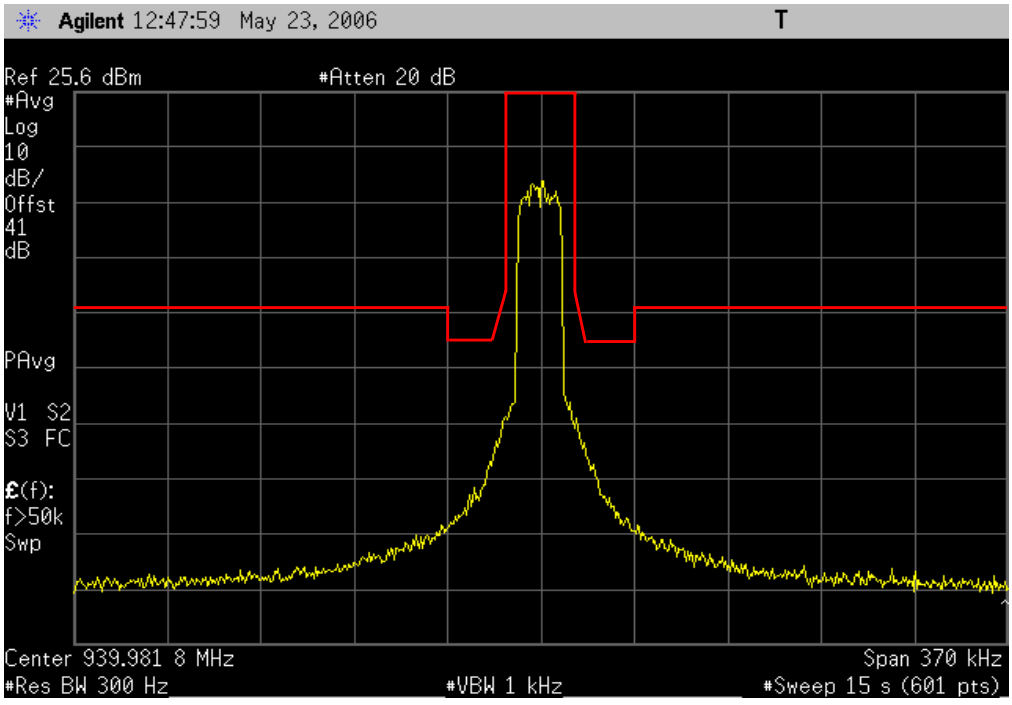


EMISSION MASK

High Channel, Mid Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

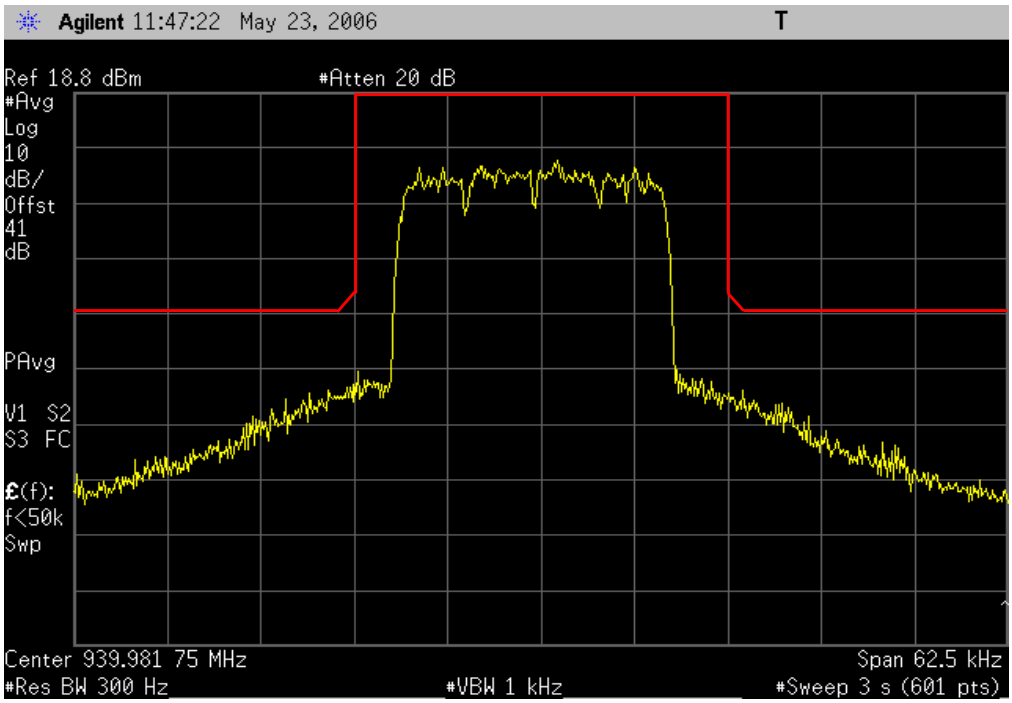


High Channel, Mid Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table

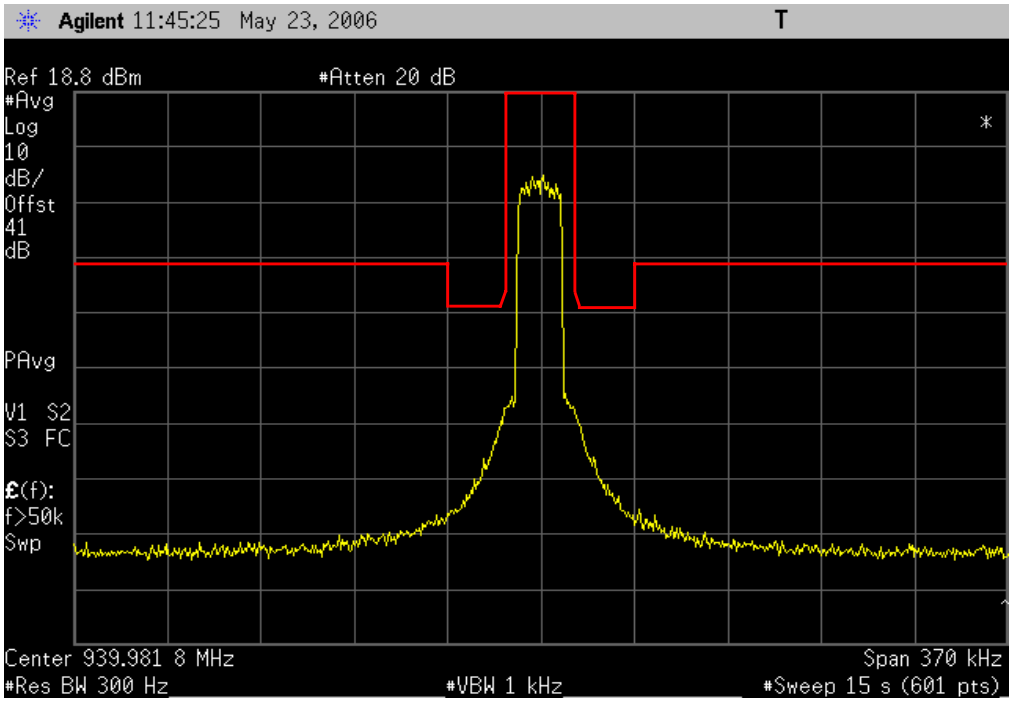


EMISSION MASK

High Channel, Low Power, < 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



High Channel, Low Power, > 37.5 kHz Fc					
Result:	Pass	**Value:**	N/A	**Limit:**	See Table



EMISSION MASK

Frequency	Output Power	Power (P)	Attenuation for the range 12.5 kHz to 37.5 kHz from fc (dBc)				Attenuation >37.5 kHz from fc (dBc)	
				116*log(f/6.1)		80		
(MHz)	(dBm)	Watts	50 + (10*log P)	f = 12.5 kHz	f = 37.5 kHz		43 + (10*log P)	80
935.01875	30.28	1.07E+00	50.3	36.14	91.49	80	43.3	80
	25.52	3.56E-01	45.5	36.14	91.49	80	38.5	80
	19.62	9.16E-02	39.6	36.14	91.49	80	32.6	80
937.49375	30.30	1.07E+00	50.3	36.14	91.49	80	43.3	80
	25.04	3.19E-01	45.0	36.14	91.49	80	38.0	80
	18.62	7.28E-02	38.6	36.14	91.49	80	31.6	80
939.98175	29.67	9.27E-01	49.7	36.14	91.49	80	42.7	80
	25.60	3.63E-01	45.6	36.14	91.49	80	38.6	80
	18.80	7.59E-02	38.8	36.14	91.49	80	31.8	80

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies within the allowable band, and at all three power levels. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer with an RMS average detector.

NORTHWEST EMC

OUTPUT POWER

XMit 2006.03.01

EUT:	MCRB			**Work Order:**	RAFN0062
Serial Number:	Various			**Date:**	05/18/06
Customer:	Radioframe Networks, Inc.			**Temperature:**	23°C
Attendees:	Dean Busch			**Humidity:**	37%
Project:	None			**Barometric Pres.:**	29.99
Tested by:	Rod Peloquin	**Power:**	-48Vdc	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

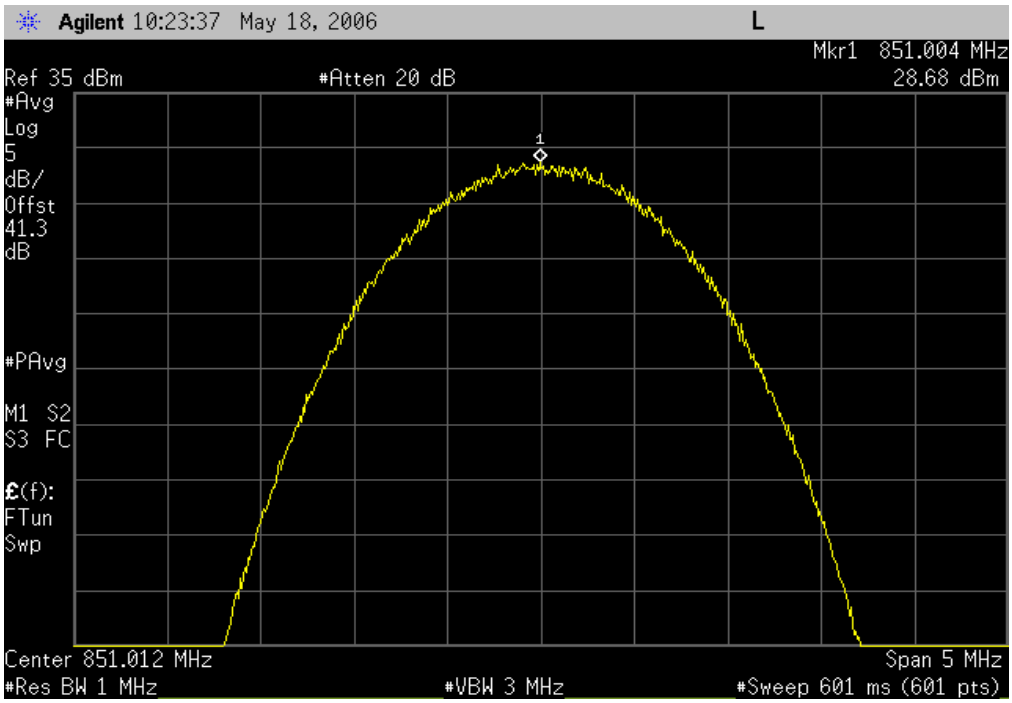
800MHz Band

DEVIATIONS FROM TEST STANDARD

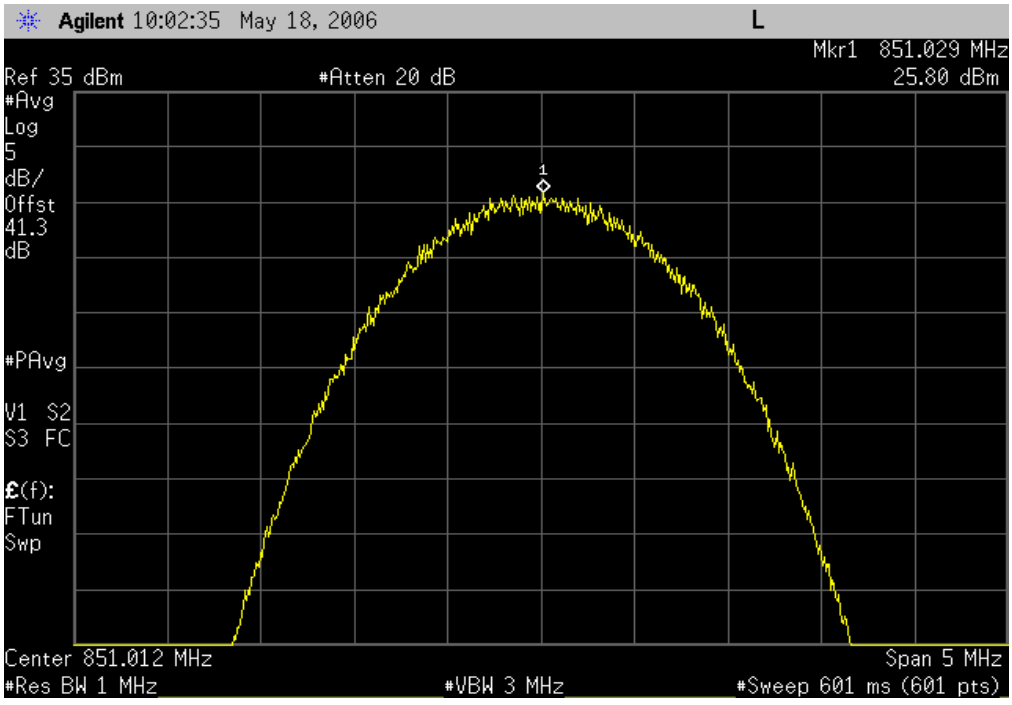
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, High Power	28.68 dBm		Pass
Low Channel, Mid Power	25.80 dBm		Pass
Low Channel, Low Power	18.23 dBm		Pass
Mid Channel, High Power	31.15 dBm		Pass
Mid Channel, Mid Power	25.46 dBm		Pass
Mid Channel, Low Power	19.33 dBm		Pass
High Channel, High Power	28.93 dBm		Pass
High Channel, Mid Power	24.70 dBm		Pass
High Channel, Low Power	18.22 dBm		Pass

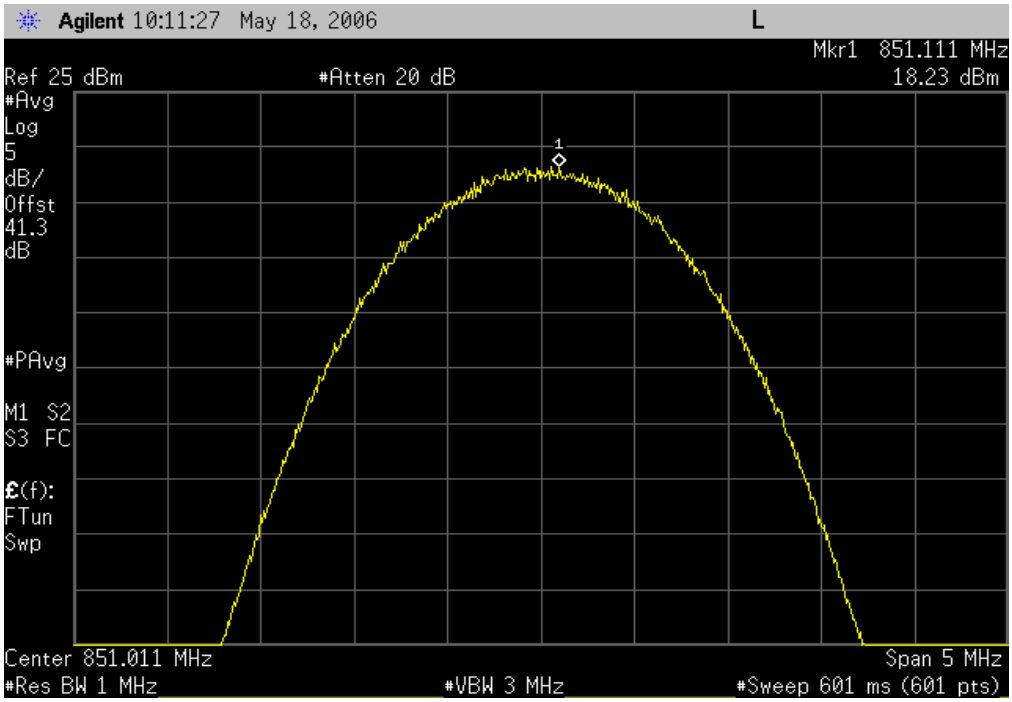
Low Channel, High Power					
Result:	Pass	**Value:**	28.68 dBm	**Limit:**	



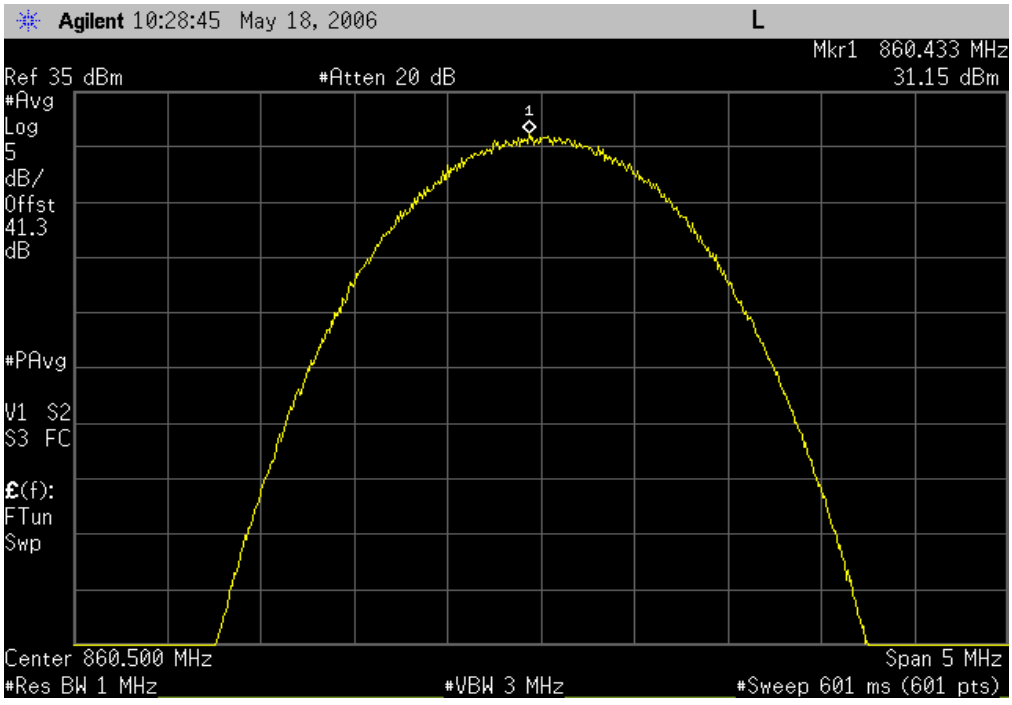
Low Channel, Mid Power					
Result:	Pass	**Value:**	25.80 dBm	**Limit:**	



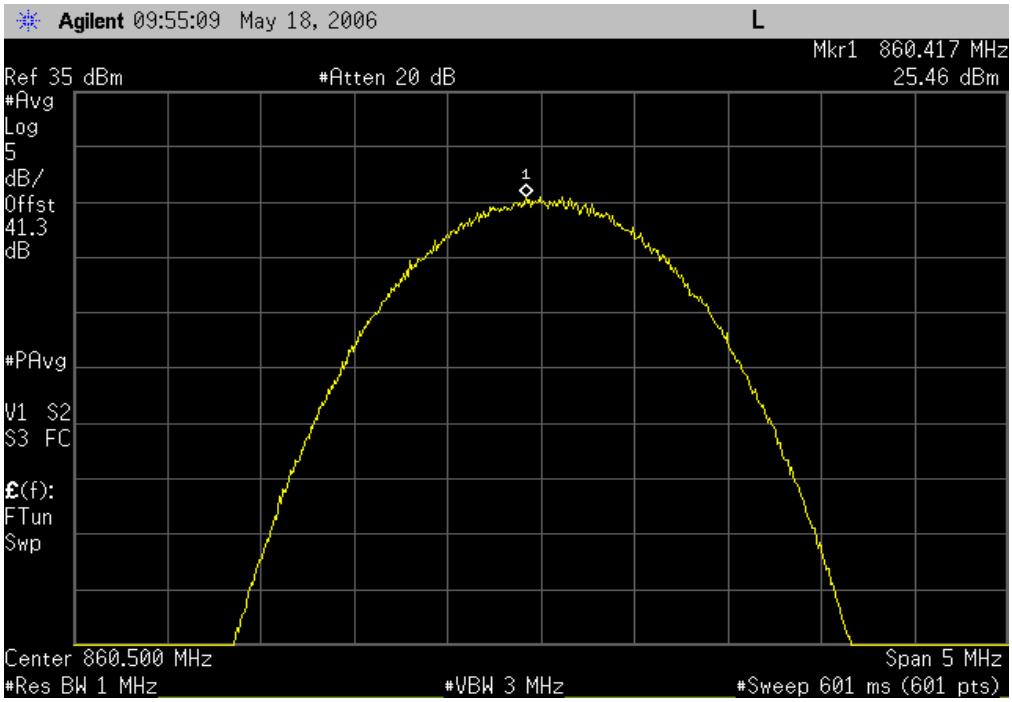
Low Channel, Low Power					
Result:	Pass	**Value:**	18.23 dBm	**Limit:**	



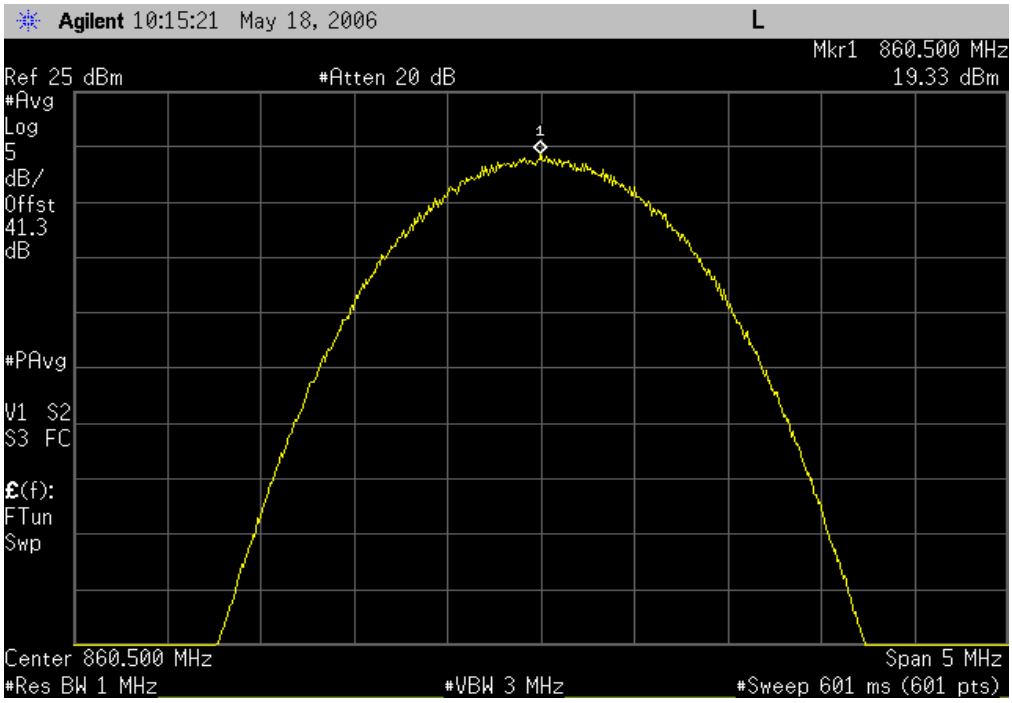
Mid Channel, High Power					
Result:	Pass	**Value:**	31.15 dBm	**Limit:**	



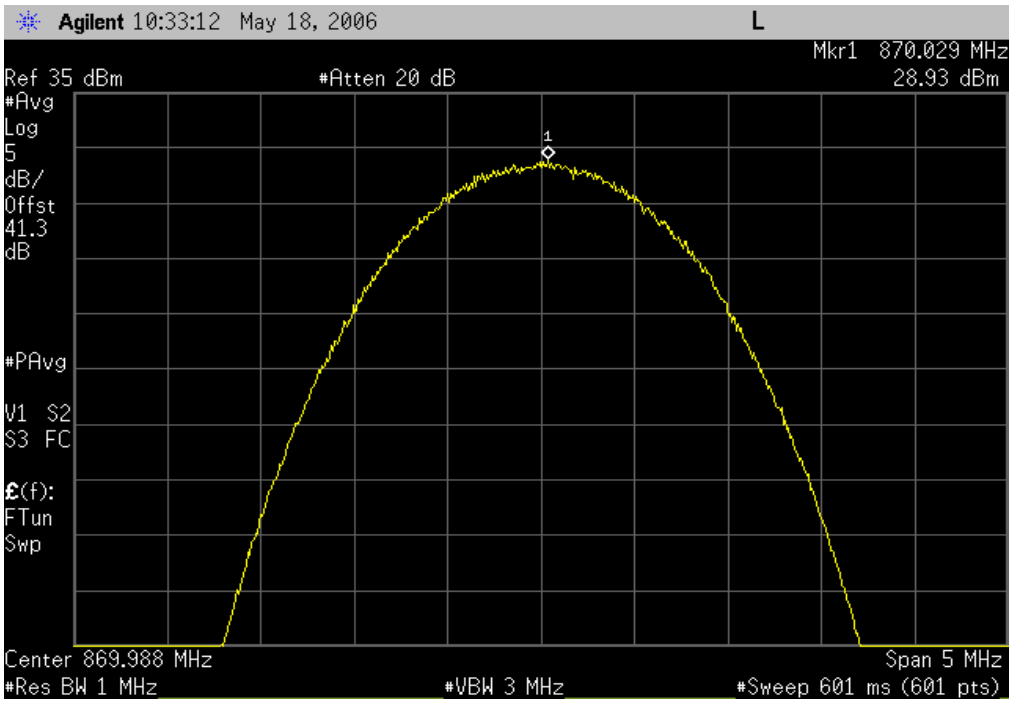
Mid Channel, Mid Power					
Result:	Pass	**Value:**	25.46 dBm	**Limit:**	



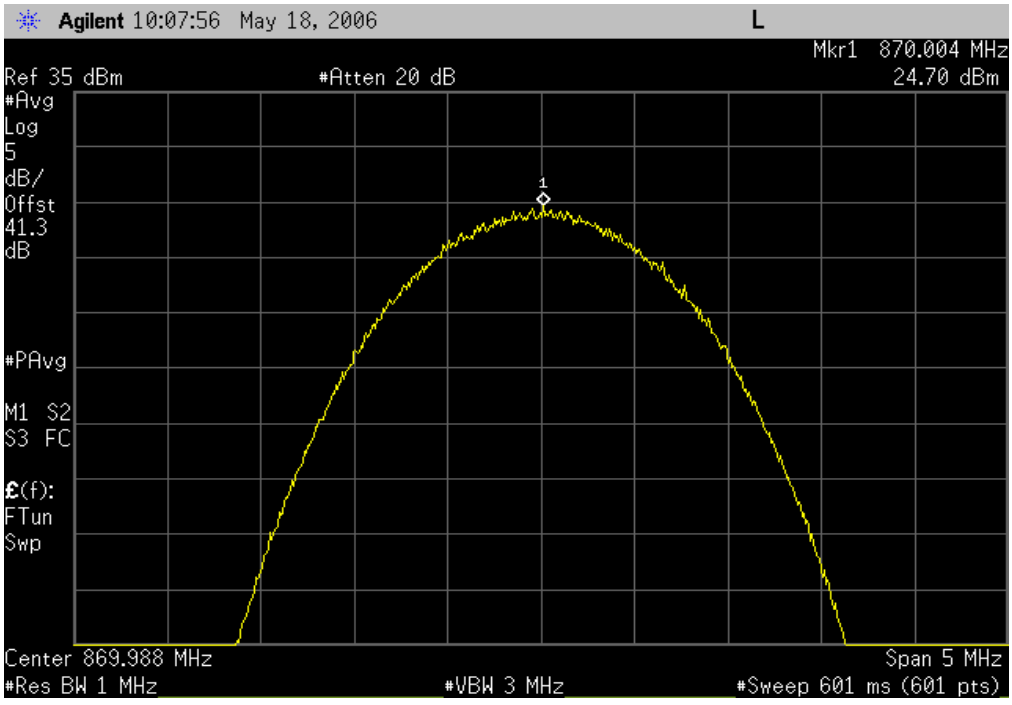
Mid Channel, Low Power					
Result:	Pass	**Value:**	19.33 dBm	**Limit:**	



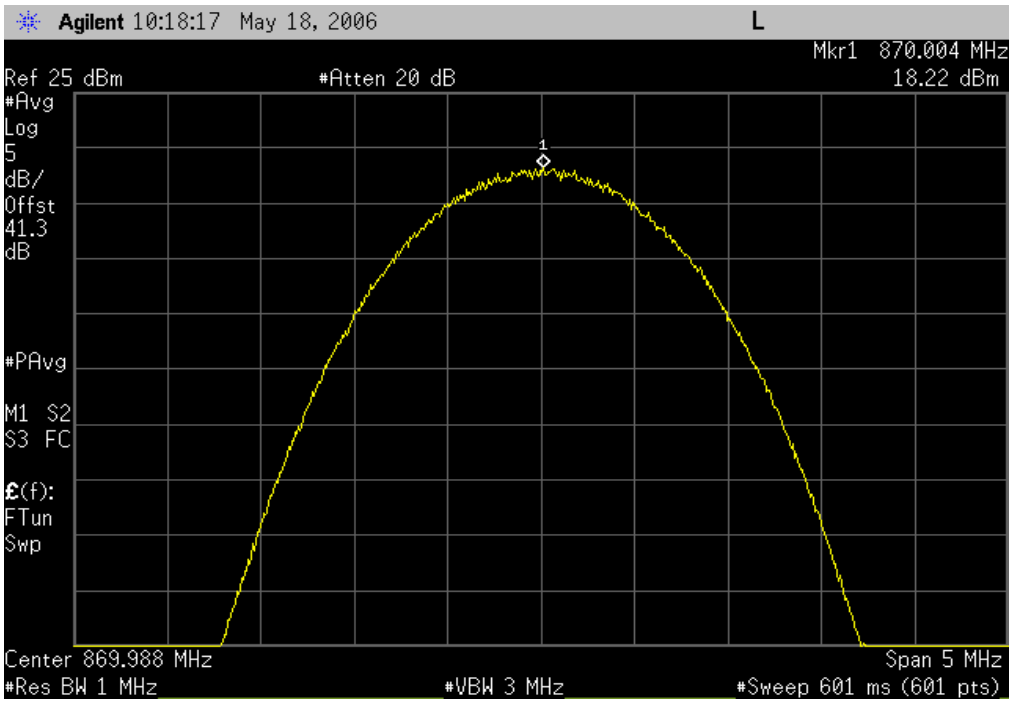
High Channel, High Power					
Result:	Pass	**Value:**	28.93 dBm	**Limit:**	



High Channel, Mid Power					
Result:	Pass	**Value:**	24.70 dBm	**Limit:**	



High Channel, Low Power					
Result:	Pass	**Value:**	18.22 dBm	**Limit:**	



OUTPUT POWER

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Attenuator	Weinschel Corp	54A-10	RBK	NCR	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies within the allowable band, and at all three power levels. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer with an RMS average detector.

NORTHWEST EMC

OUTPUT POWER

XMit 2006.03.01

EUT:	MCRB			**Work Order:**	RAFN0062
Serial Number:	Various			**Date:**	05/23/06
Customer:	Radioframe Networks, Inc.			**Temperature:**	22°C
Attendees:	Dean Busch			**Humidity:**	43%
Project:	None			**Barometric Pres.:**	29.93
Tested by:	Rod Peloquin	**Power:**	-48Vdc	**Job Site:**	EV01

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

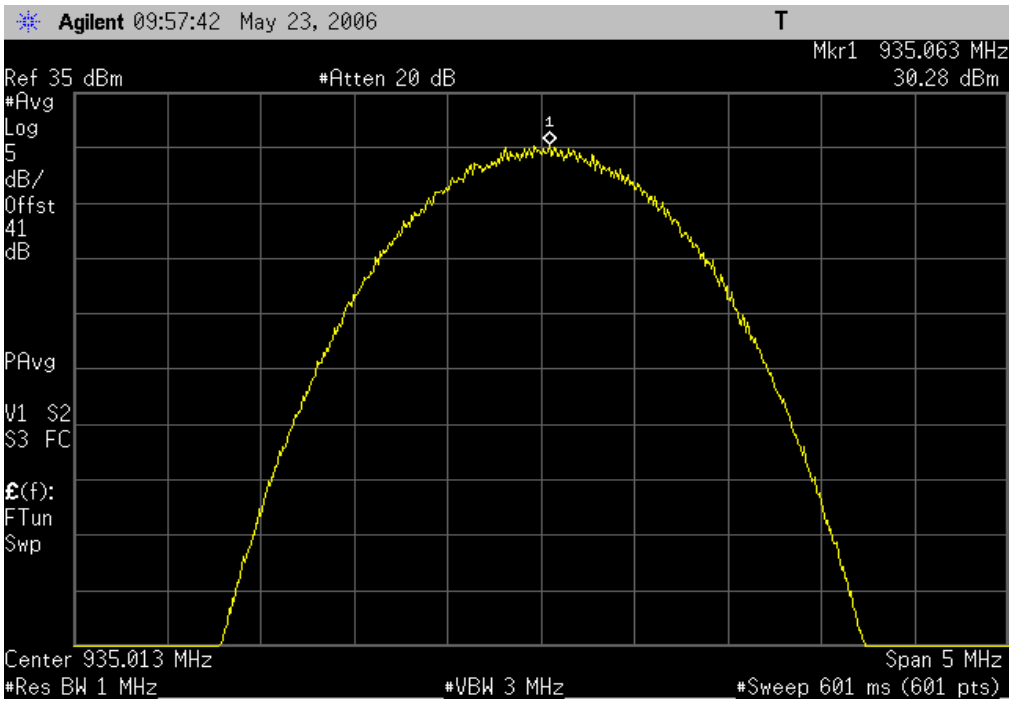
900MHz Band

DEVIATIONS FROM TEST STANDARD

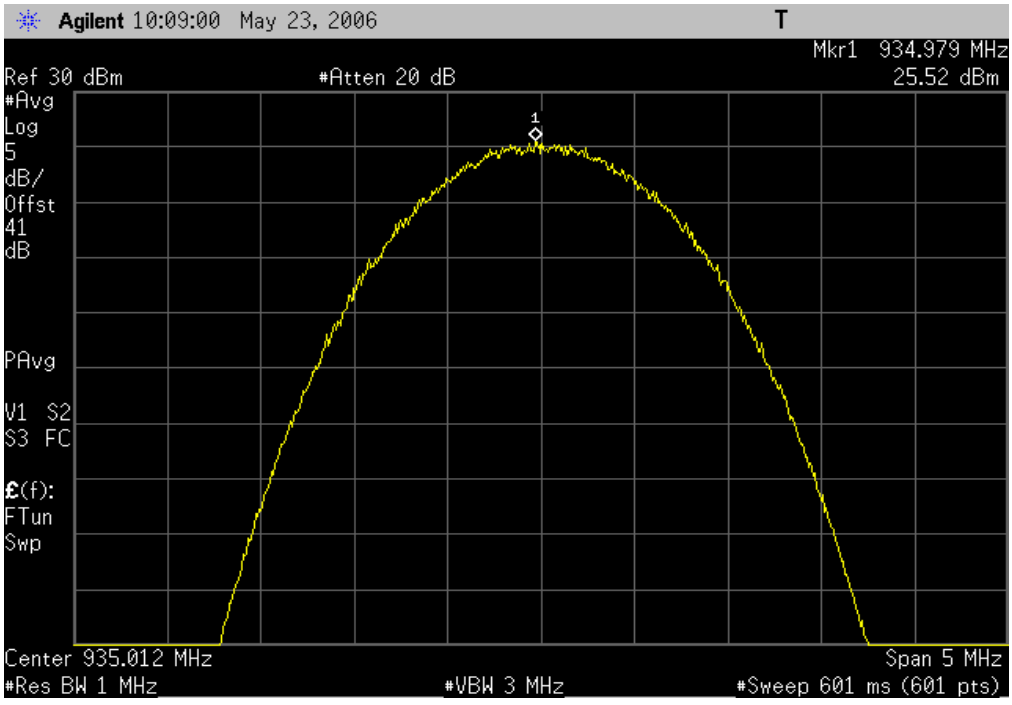
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, High Power	30.28 dBm		Pass
Low Channel, Mid Power	25.52 dBm		Pass
Low Channel, Low Power	19.62 dBm		Pass
Mid Channel, High Power	30.30 dBm		Pass
Mid Channel, Mid Power	25.04 dBm		Pass
Mid Channel, Low Power	18.62 dBm		Pass
High Channel, High Power	29.67 dBm		Pass
High Channel, Mid Power	25.60 dBm		Pass
High Channel, Low Power	18.80 dBm		Pass

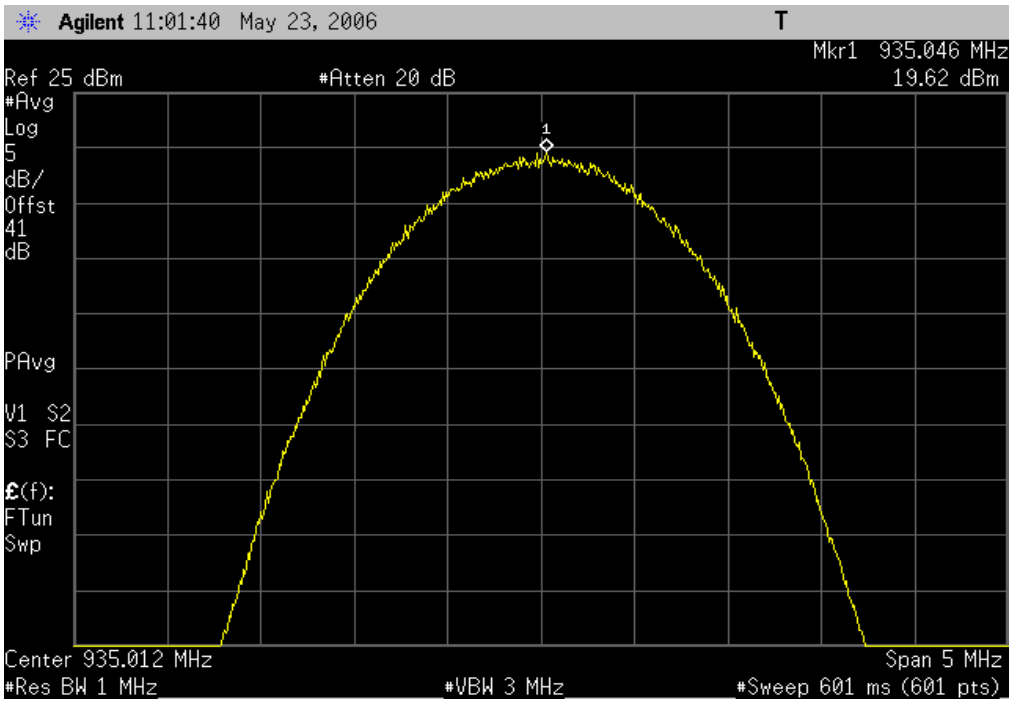
Low Channel, High Power					
Result:	Pass	**Value:**	30.28 dBm	**Limit:**	



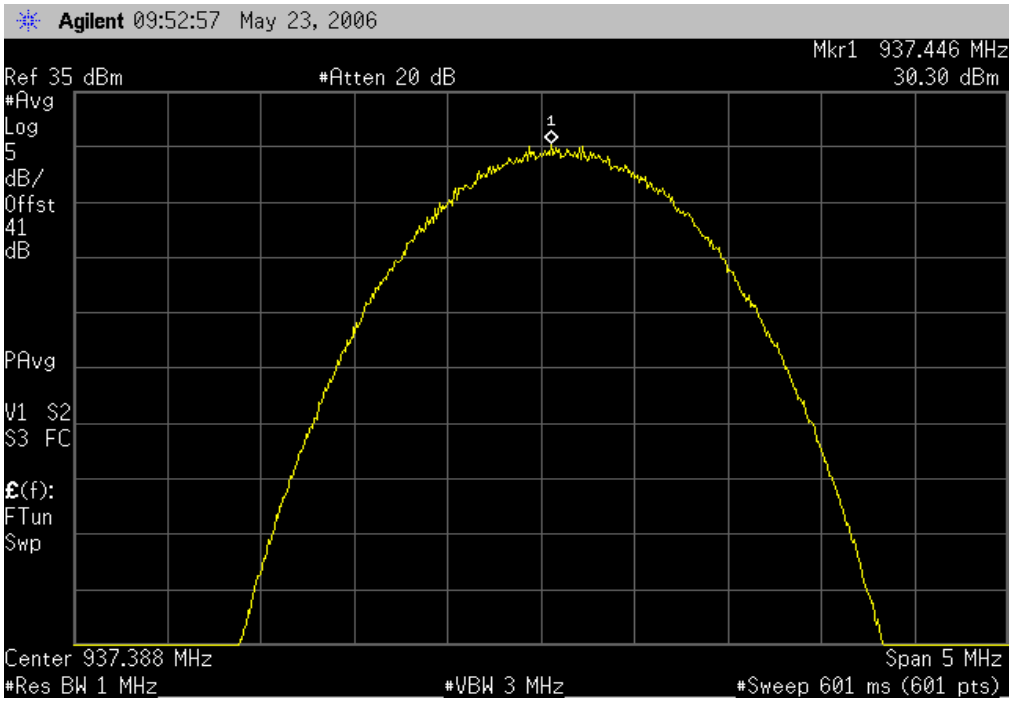
Low Channel, Mid Power					
Result:	Pass	**Value:**	25.52 dBm	**Limit:**	



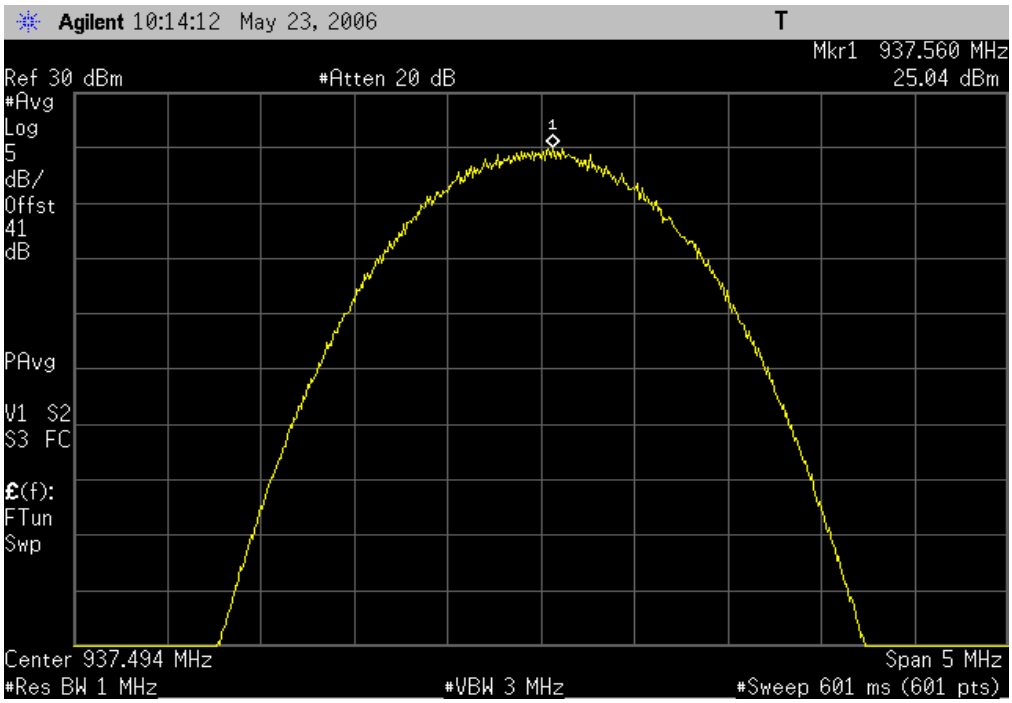
Low Channel, Low Power					
Result:	Pass	**Value:**	19.62 dBm	**Limit:**	



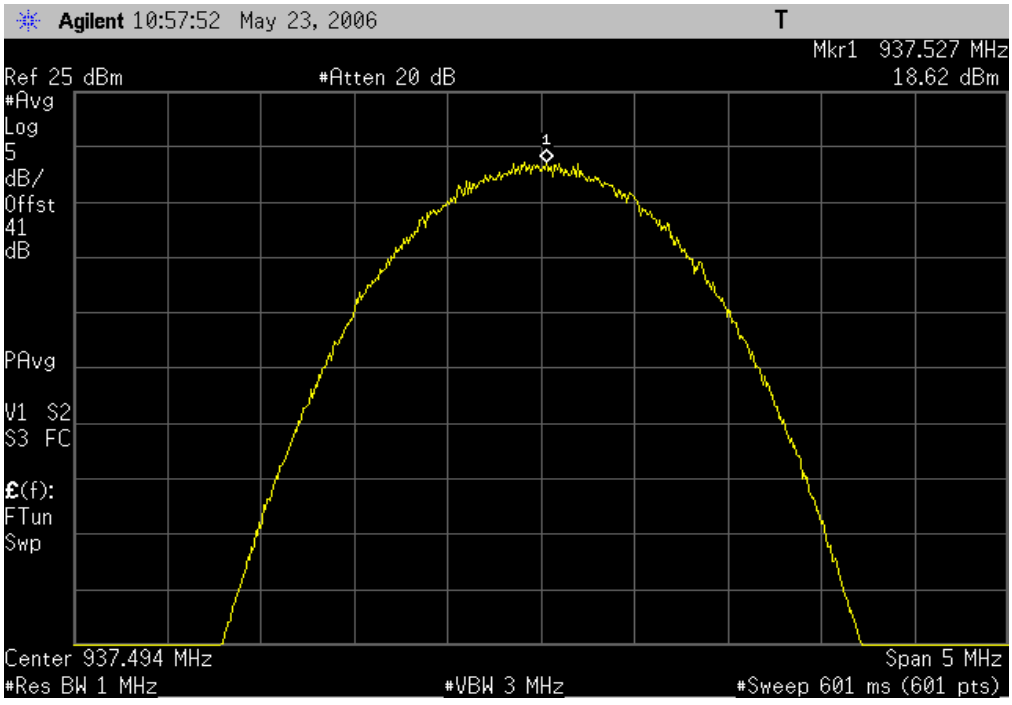
Mid Channel, High Power					
Result:	Pass	**Value:**	30.30 dBm	**Limit:**	



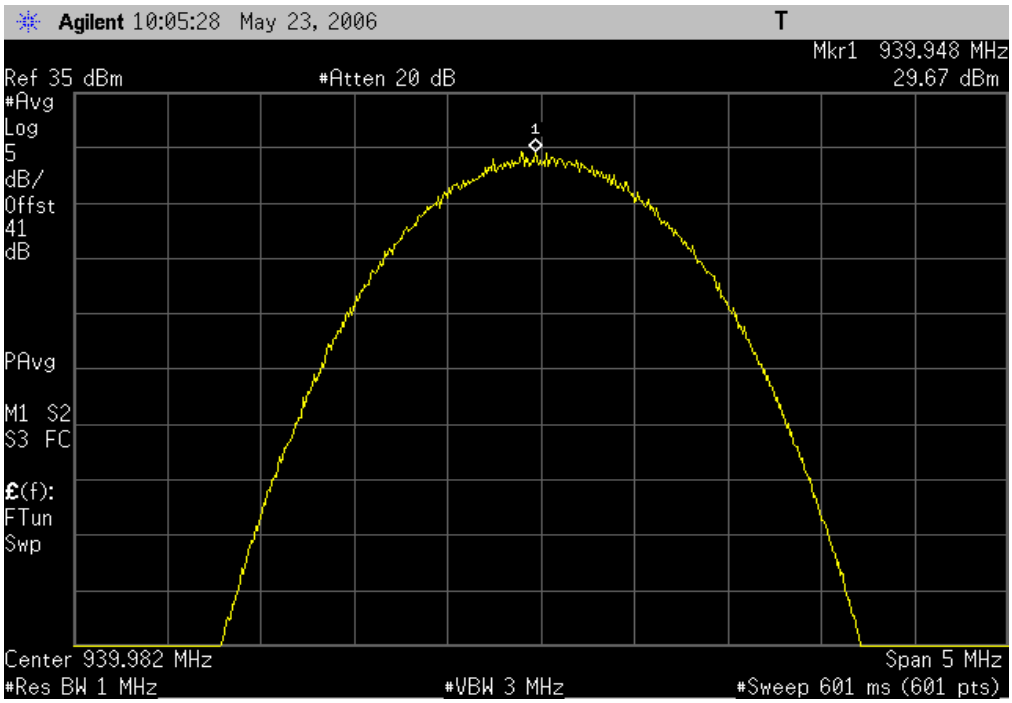
Mid Channel, Mid Power					
Result:	Pass	**Value:**	25.04 dBm	**Limit:**	



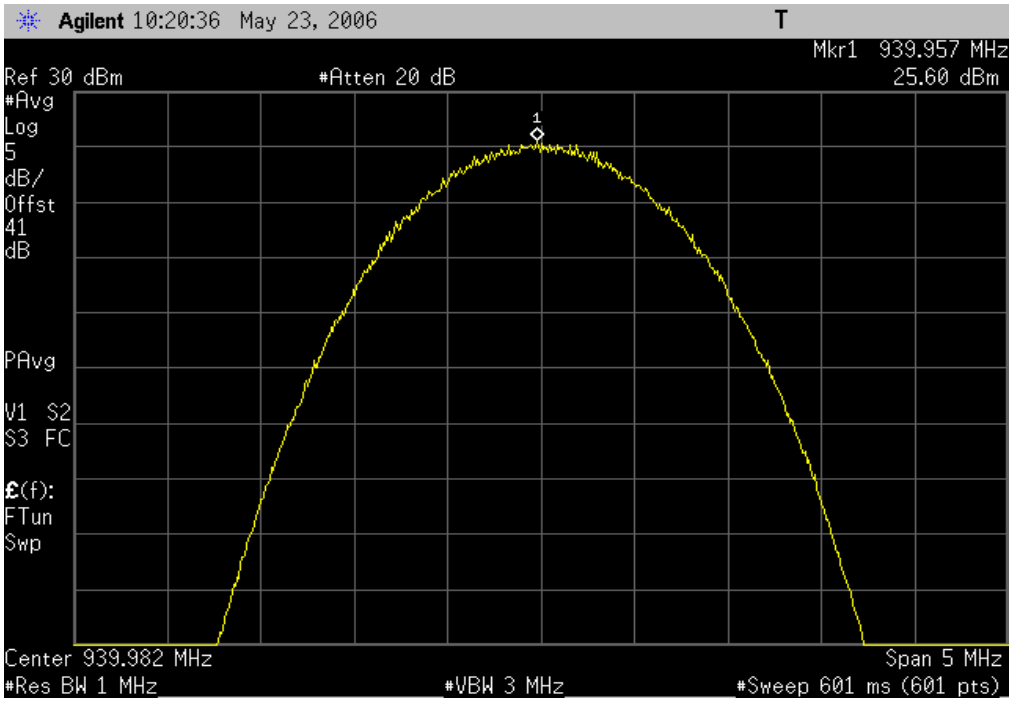
Mid Channel, Low Power					
Result:	Pass	**Value:**	18.62 dBm	**Limit:**	



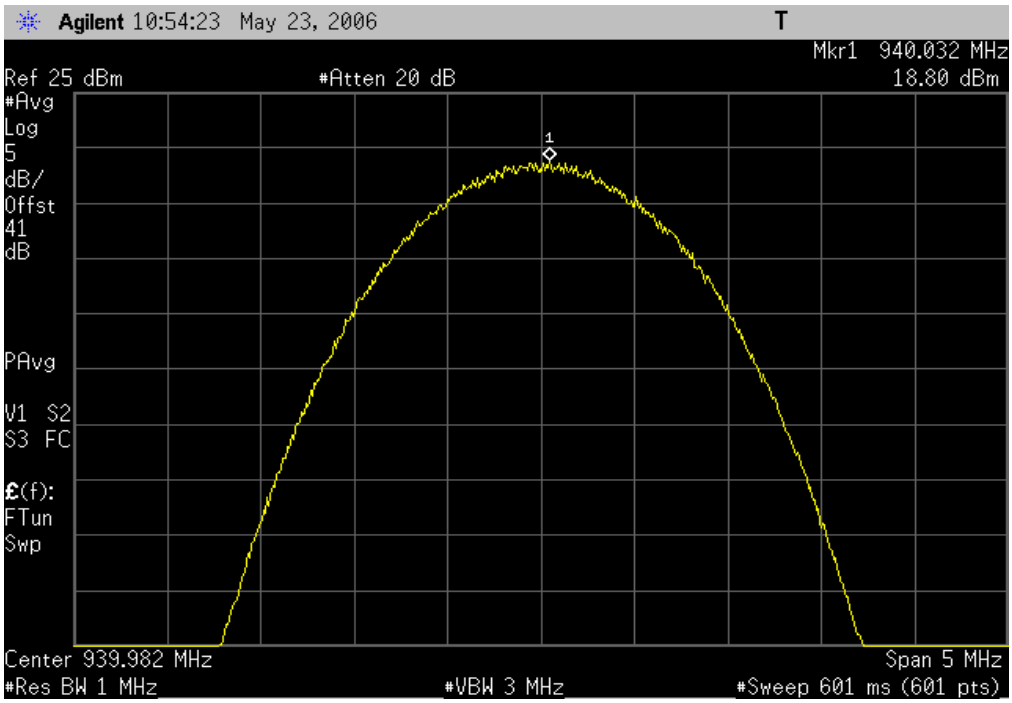
High Channel, High Power					
Result:	Pass	**Value:**	29.67 dBm	**Limit:**	



High Channel, Mid Power					
Result:	Pass	**Value:**	25.60 dBm	**Limit:**	



High Channel, Low Power					
Result:	Pass	**Value:**	18.80 dBm	**Limit:**	



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:
Single channels within the center of the allowable 800MHz and 900MHz bands

Operating Modes Investigated:
Typical

Data Rates Investigated:
96 kBps at 64-QAM

Output Power Setting(s) Investigated:
Maximum ~ 14 dBm

Power Input Settings Investigated:
-48Vdc

Software\Firmware Applied During Test			
Exercise software	Vx Works	**Version**	N/A
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**
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110148
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110160
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110151
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110146
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110173
EUT- Multi-Channel RadioBlade (MCRB	Radioframe Networks, Inc.	176-0860-00	14106110174
MC-15 SERIES DUAL BAND SYSTEM (3 SE	Radioframe Networks, Inc.	176-7970-xx	14106050325
FRU, DUAL BAND RF SHELF	Radioframe Networks, Inc.	176-0970-xx	14105510109
FRU, DUAL BAND RF SHELF	Radioframe Networks, Inc.	176-0970-xx	14105510110
FRU, DUAL BAND RF SHELF	Radioframe Networks, Inc.	176-0970-xx	14105510113
RadioBlade Shelf (RBS)	Radioframe Networks, Inc.	176-0535-xx	14106030127
MC-15 BTS Interface Chassis (BIC)	Radioframe Networks, Inc.	176-0900-xx	14106050474
MC Common RadioFrame Interface Card	Radioframe Networks, Inc.	176-7540-xx	041053919XV
MC Common RadioFrame Interface Card	Radioframe Networks, Inc.	176-7540-xx	041053919W3
Base Processing Card (BPC)	Radioframe Networks, Inc.	176-7570-xx	04105411HGM
Base Processing Card (BPC)	Radioframe Networks, Inc.	176-7570-xx	04105401GP1
Base Processing Card (BPC)	Radioframe Networks, Inc.	176-7570-xx	04105421JKZ
MC-15 Airlink Interface Chassis (AI	Radioframe Networks, Inc.	176-0800-xx	14106050522
BPC W/ LC SPAM	Radioframe Networks, Inc.	176-7565-xx	04105411HC0
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
BPC W/ LC SPAM	Radioframe Networks, Inc.	176-7565-xx	04105411HJX
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
BPC W/ LC SPAM	Radioframe Networks, Inc.	176-7565-xx	04105411HLH
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
SPAM	Radioframe Networks, Inc.	176-7510-xx	Unknown
Ethernet Rear Transition Module (ER	Radioframe Networks, Inc.	176-7562-xx	14105320204
Ethernet Rear Transition Module (ER	Radioframe Networks, Inc.	176-7562-xx	14105320203
Coaxial RMII Transceiver Card (CRTC	Radioframe Networks, Inc.	176-0820-xx	14105480250

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Site Simulator	Radioframe Networks, Inc.	N/a	N/a
Site Controller	Motorola, Inc.	CCN1008N	CAF030LTC4
GPS Antenna	Hewlett-Packard	8532A	901
DC Power Supply	Electronic Measurements, Inc.	EMS 60-33	20K11738

Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	8.0	No	MC-15 SERIES DUAL BAND SYSTEM	DC Supply
BNC	Yes	30.0	No	ERTM	Site Simulator
BNC	Yes	30.0	No	Site Controller	Site Simulator
BNC	Yes	3.0	No	GPS Antenna	Site Controller
Ethernet	No	3.0	No	Site Controller	ERTM

Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	01/25/2006	13 mo
Multimeter	Tektronix	DMM912	MMH	12/08/2005	13 mo
DC Power Supply	Sorensen	DCR60-45B	TPB	NCR	NA
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	08/24/2005	12 mo
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	08/24/2005	12 mo

Test Description

Requirement: Per 47 CFR 15.255, the frequency stability shall be measured with variation of ambient temperature and primary supply voltage. A spectrum analyzer or frequency counter can be used to measure the frequency stability. If using a spectrum analyzer, it must have a precision frequency reference that exceeds the stability requirement of the transmitter. A temperature / humidity chamber is required.

Configuration:

Variation of Supply Voltage

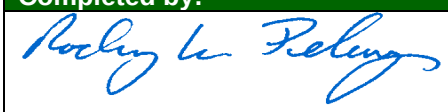
The primary supply voltage was varied from 85% to 115% of nominal. The EUT can only be operated from the public AC mains, so an DC lab supply was used to vary the supply voltage from 115% to 85% -48V DC.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-20° to +50° C) and at 10°C intervals.

Measurements were made at the single transmit frequency. The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Completed by:



NORTHWEST EMC

FREQUENCY STABILITY

Rev BETA 01/30/01

EUT:	MCRB			Work Order:	RAFN0060
Serial Number:	Various			Date:	03/21/06
Customer:	Radioframe Networks, Inc.			Temperature:	21°C
Attendees:	Dean Busch	Tested by:	Rod Pelqouin	Humidity:	32%
Customer Ref. No.:	None	Power:	-48 Vdc	Job Site:	Off-site

TEST SPECIFICATIONS

Specification:	47 CFR 2.1055, 90.213	Year:	2005	Method:	TIA/EIA - 603	Year:	2002

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Transmitting mid band

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Minimum frequency stability of 1 part per million (ppm) for variations of temperature and supply voltage (DC)

RESULTS	MINIMUM FREQUENCY STABILITY
Pass	0.3 ppm

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Frequency Stability

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 48 Vdc)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	860.55000	860.550037	0.04	1
40	860.55000	860.550062	0.07	1
30	860.55000	860.550037	0.04	1
20	860.55000	860.550037	0.04	1
10	860.55000	860.550250	0.29	1
0	860.55000	860.550037	0.04	1
-10	860.55000	860.550049	0.06	1
-20	860.55000	860.550049	0.06	1
-30	860.55000	860.550049	0.06	1

Frequency Stability with Variation of Primary Supply Voltage (Ambient Temperature = 20°C)

Voltage (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
55.2 (115%)	860.55000	860.550062	0.07	1
52.8 (110%)	860.55000	860.550037	0.04	1
50.4 (105%)	860.55000	860.550050	0.06	1
48 (100%)	860.55000	860.550037	0.04	1
45.6 (95%)	860.55000	860.550050	0.06	1
43.2 (90%)	860.55000	860.550000	0.00	1
40.8 (85%)	860.55000	860.55000	0.00	1

NORTHWEST EMC

FREQUENCY STABILITY

Rev BETA 01/30/01

EUT:	MCRB			Work Order:	RAFN0060
Serial Number:	Various			Date:	03/21/06
Customer:	Radioframe Networks, Inc.			Temperature:	21°C
Attendees:	Dean Busch	Tested by:	Rod Pelqouin	Humidity:	32%
Customer Ref. No.:	None	Power:	-48 Vdc	Job Site:	EV06 & EV09

TEST SPECIFICATIONS

Specification:	47 CFR 2.1055, 90.213	Year: 2005	Method: TIA/EIA - 603	Year:	2002

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Transmitting mid 900MHz band

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Minimum frequency stability of 1 part per million (ppm) for variations of temperature and supply voltage (DC)

RESULTS	MINIMUM FREQUENCY STABILITY
Pass	0.05 ppm

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Frequency Stability

Frequency Stability with Variation of Ambient Temperature (Primary Supply = -48 Vdc)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	937.46875	937.468775	0.03	1
40	937.46875	937.468800	0.05	1
30	937.46875	937.468800	0.05	1
20	937.46875	937.468787	0.04	1
10	937.46875	937.468763	0.01	1
0	937.46875	937.468787	0.04	1
-10	937.46875	937.468763	0.01	1
-20	937.46875	937.468763	0.01	1
-30	937.46875	937.468775	0.03	1

Frequency Stability with Variation of Primary Supply Voltage (Ambient Temperature = 20°C)

Voltage (Vdc)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
55.2 (115%)	937.46875	937.468738	0.01	1
52.8 (110%)	937.46875	937.468763	0.01	1
50.4 (105%)	937.46875	937.468763	0.01	1
48 (100%)	937.46875	937.468775	0.03	1
45.6 (95%)	937.46875	937.468775	0.03	1
43.2 (90%)	937.46875	937.468775	0.03	1
40.8 (85%)	937.46875	937.468775	0.03	N/A

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antenna power conducted emissions were measured with the EUT set in receive mode. The measurements were made using a direct connection between each of the RF outputs of the EUT and the spectrum analyzer. The spectrum was scanned throughout the specified frequency range.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/23/06
Customer:	Radioframe Networks, Inc.			Temperature:	24°C
Attendees:	Dean Busch			Humidity:	41%
Project:	None			Barometric Pres.:	29.93
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.111: 2006	ANSI C63.4 2003

COMMENTS

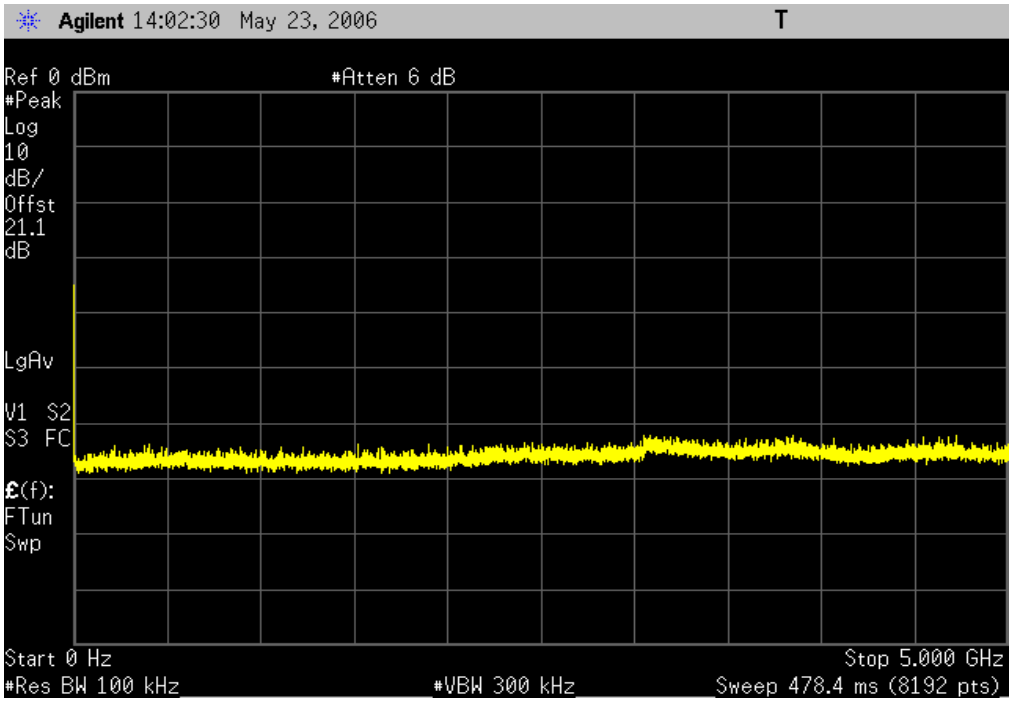
800MHz Band

DEVIATIONS FROM TEST STANDARD

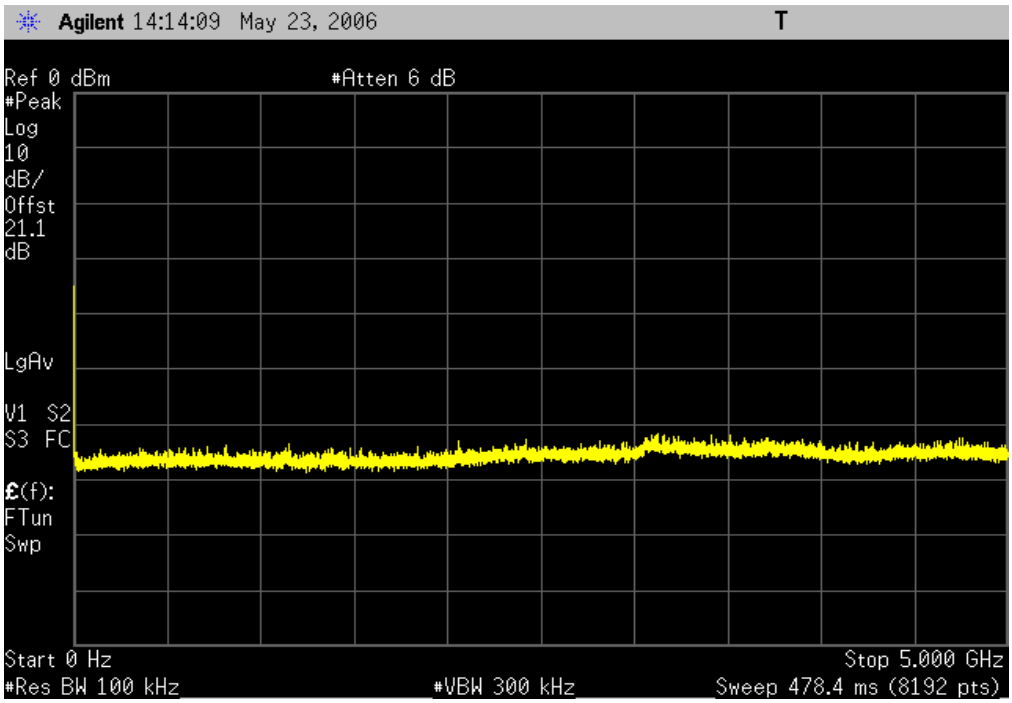
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
RX1 port	< -60 dBm	≤ -57 dBm	Pass
RX2 port	< -60 dBm	≤ -57 dBm	Pass
RX3 port	< -60 dBm	≤ -57 dBm	Pass

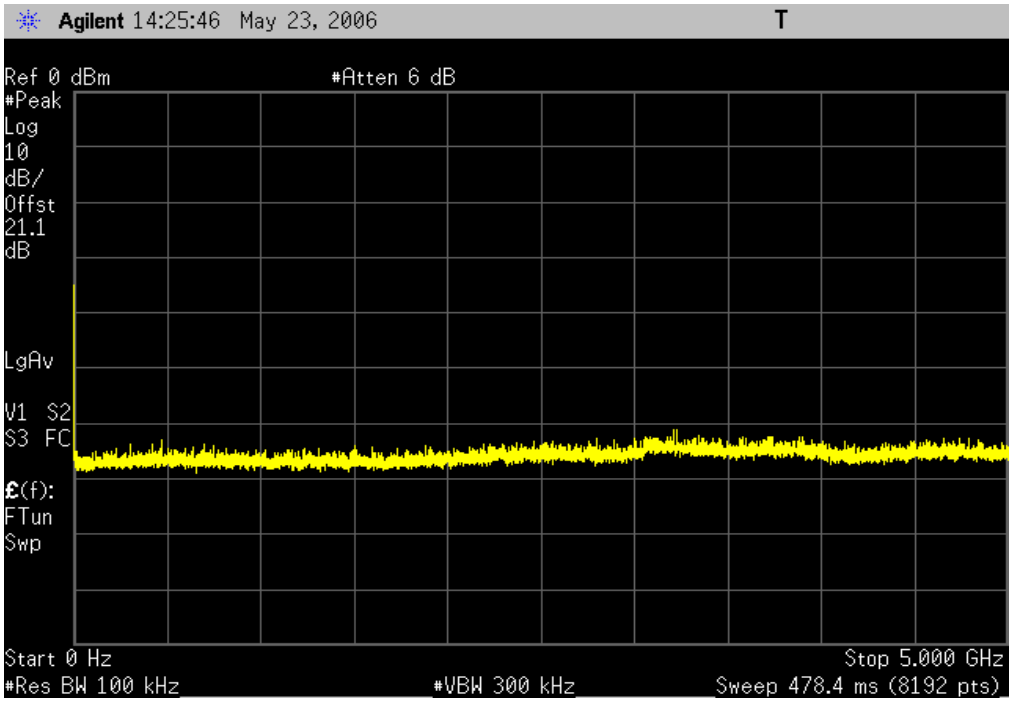
RX1 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



RX2 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



RX3 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Pre-Amplifier	Amplifier Research	LN1000	APB	7/10/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 9 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/18/06
Customer:	Radioframe Networks, Inc.			Temperature:	24°C
Attendees:	Dean Busch			Humidity:	35%
Project:	None			Barometric Pres.:	29.99
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

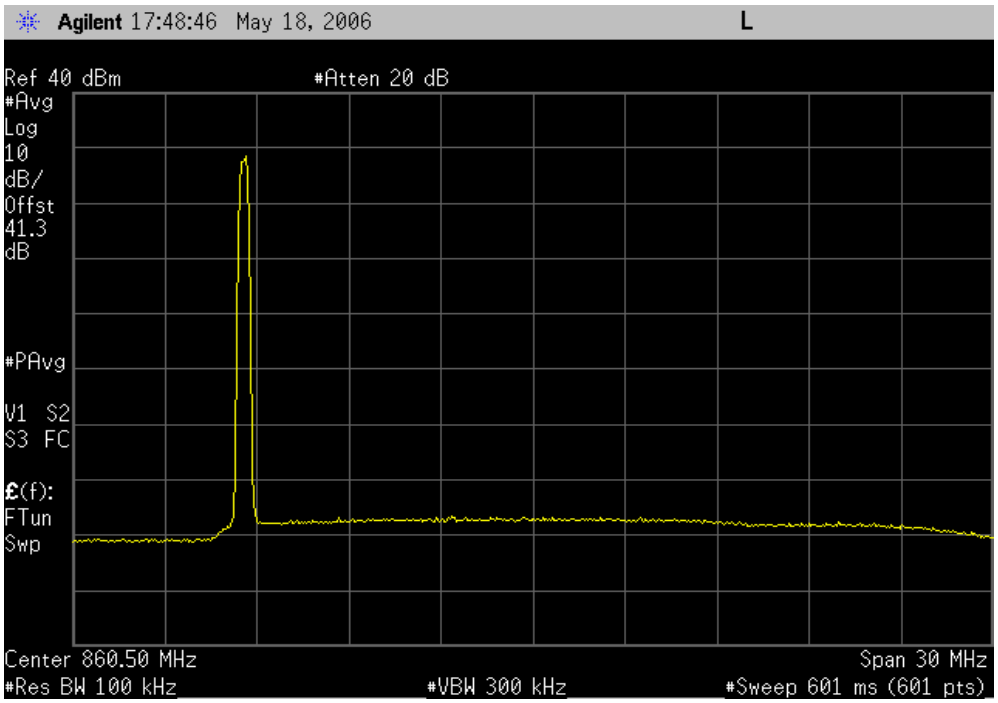
800MHz Band, High Power Level

DEVIATIONS FROM TEST STANDARD

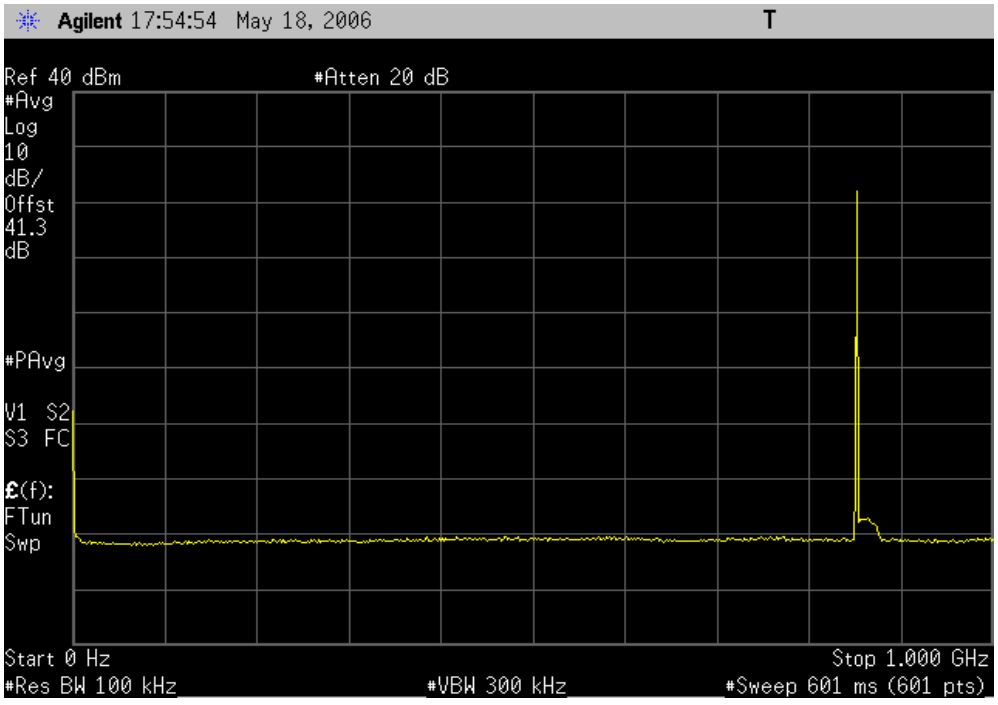
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, In Band	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
12 Channel Intermods, In Band, Lower group			

Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

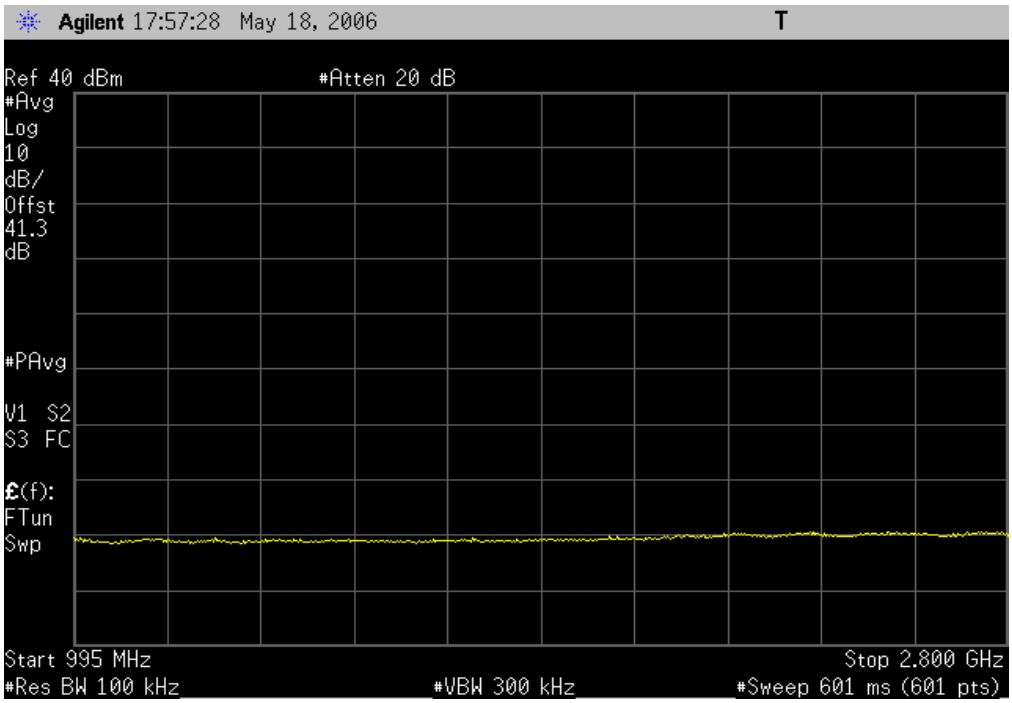


Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

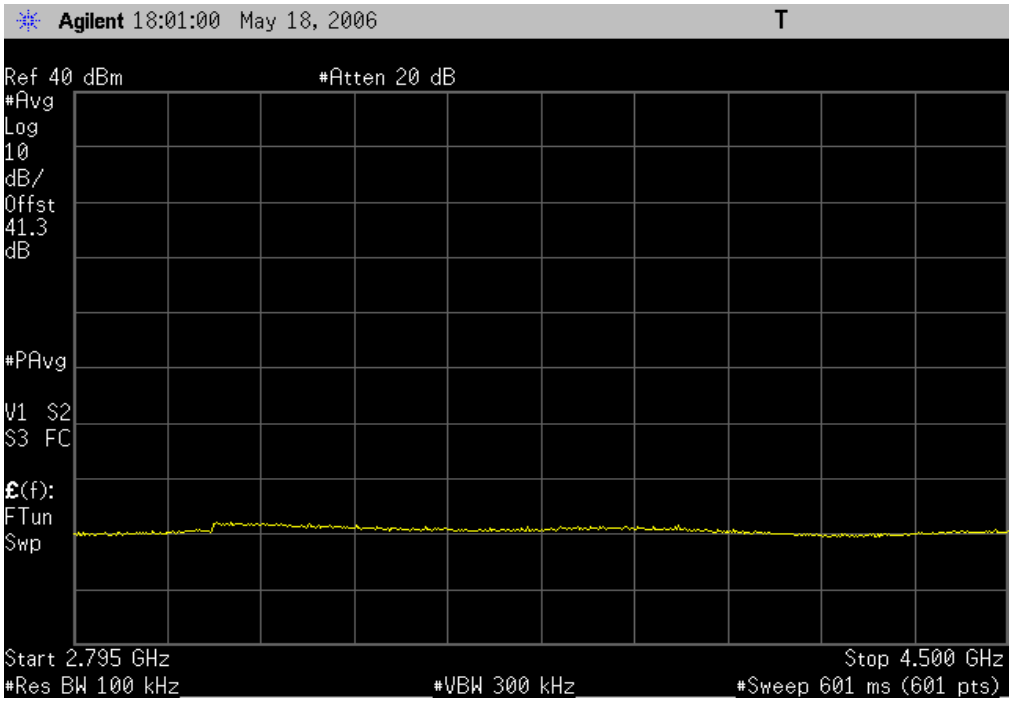


Spurious Emissions at Antenna Terminals

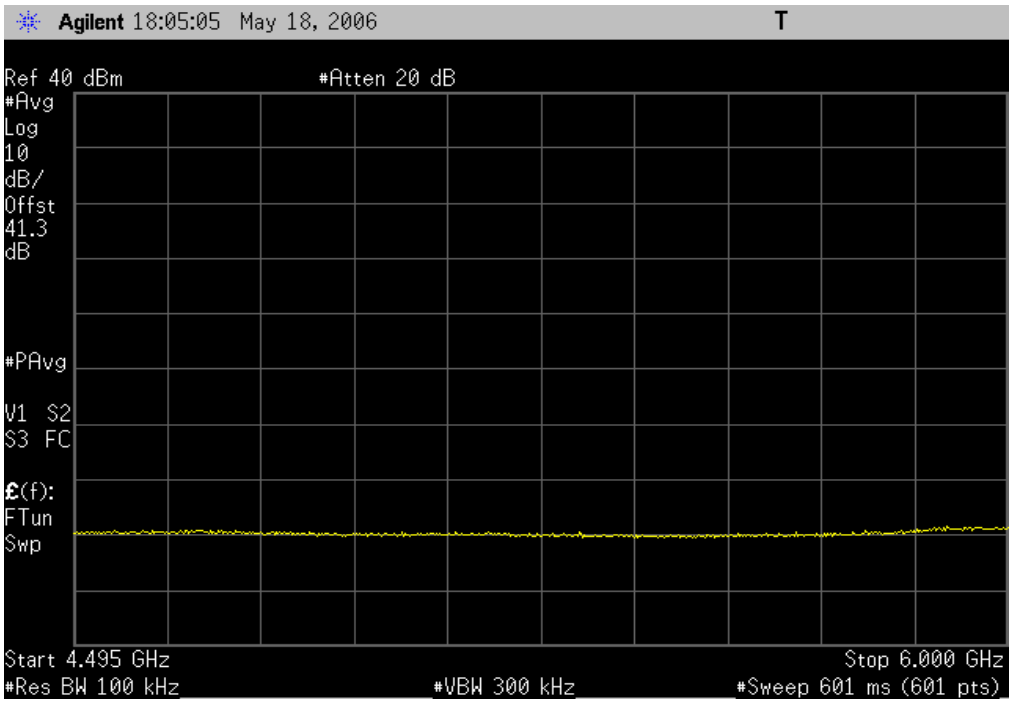
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



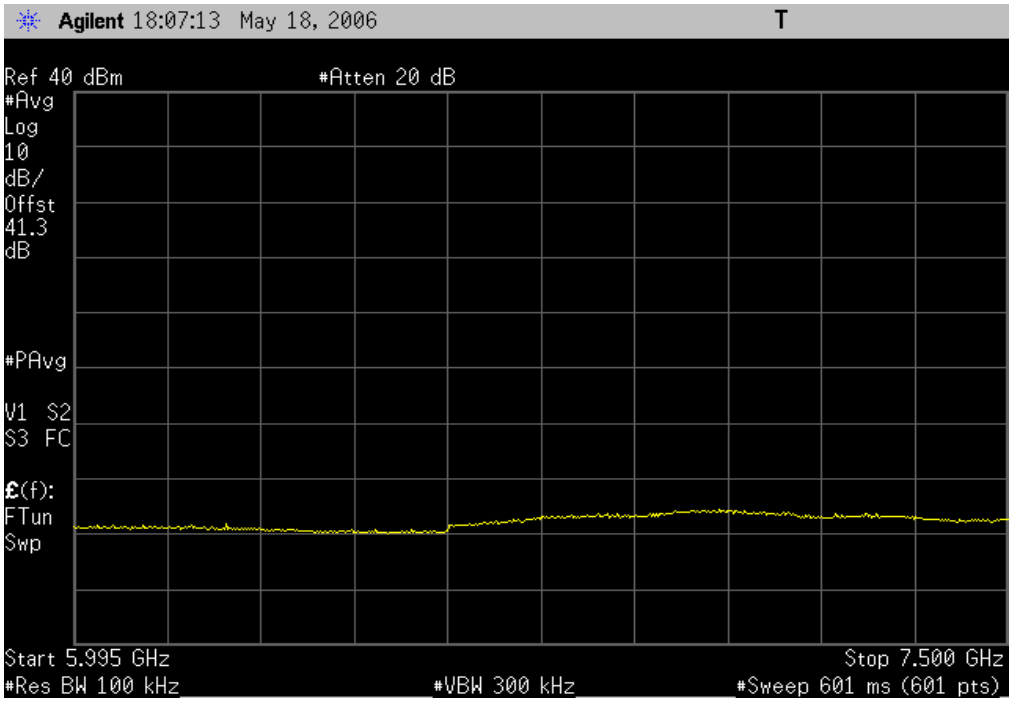
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



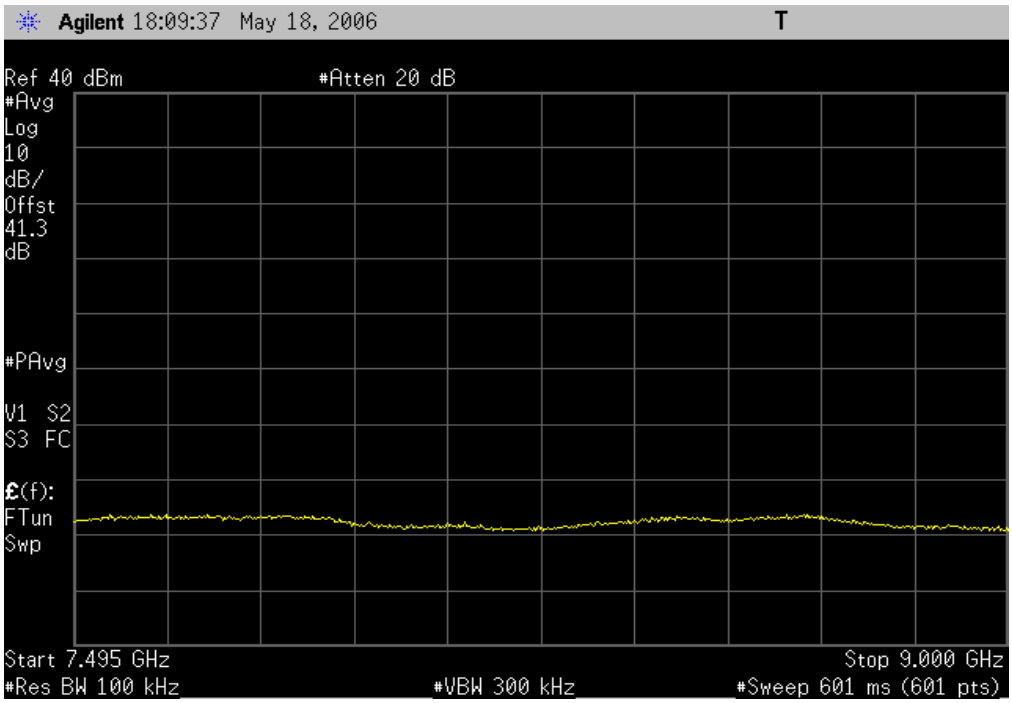
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



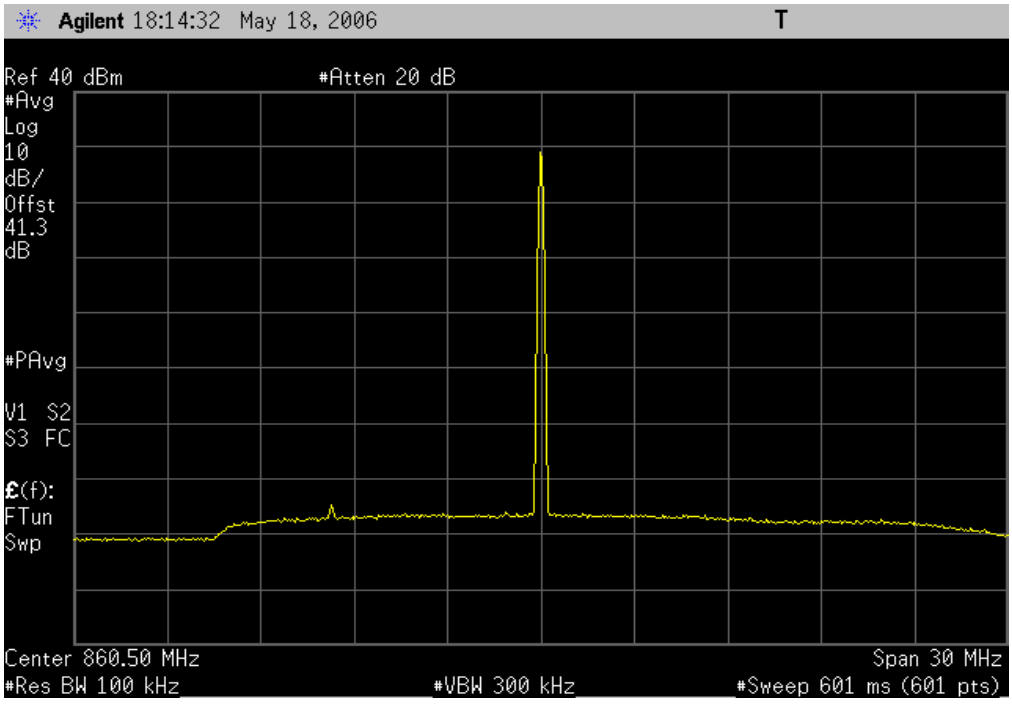
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Low Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

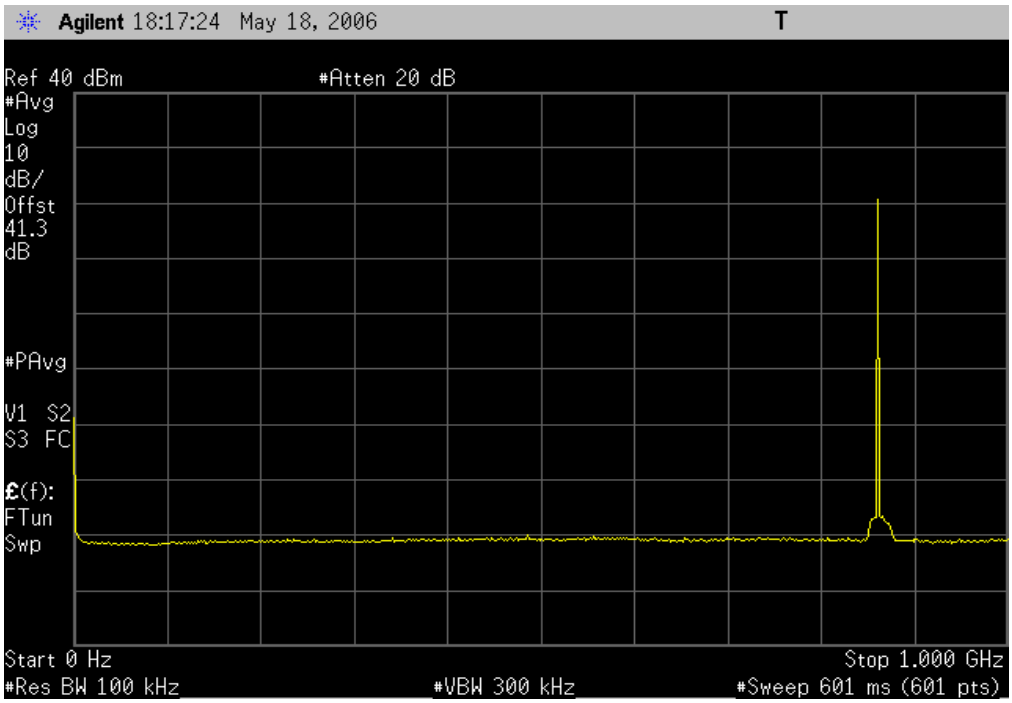


Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

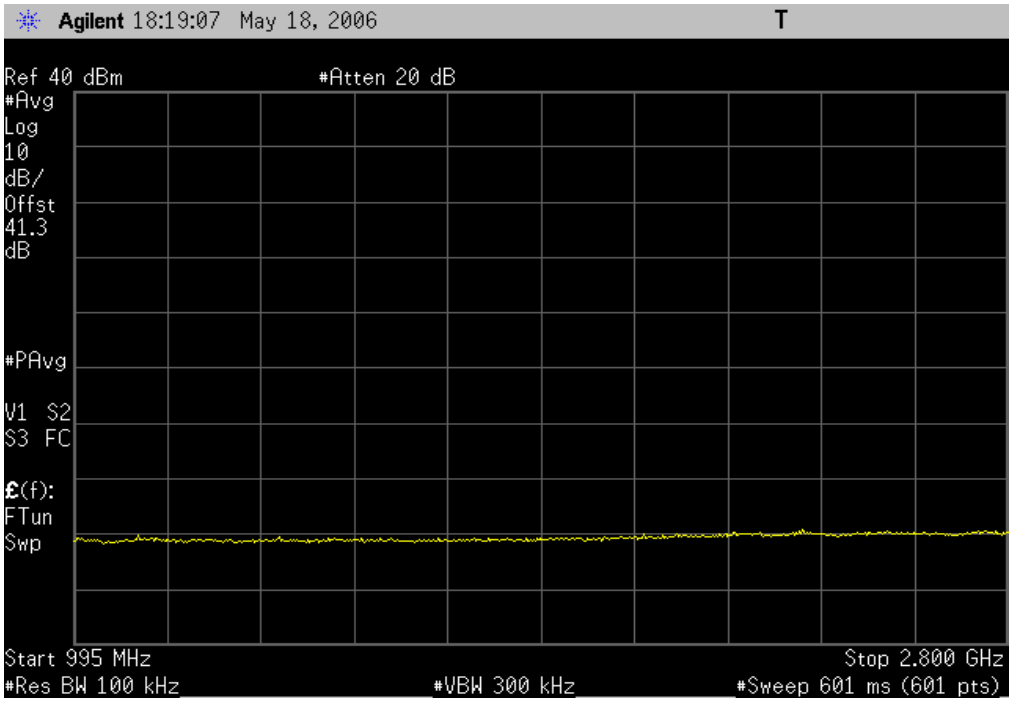


Spurious Emissions at Antenna Terminals

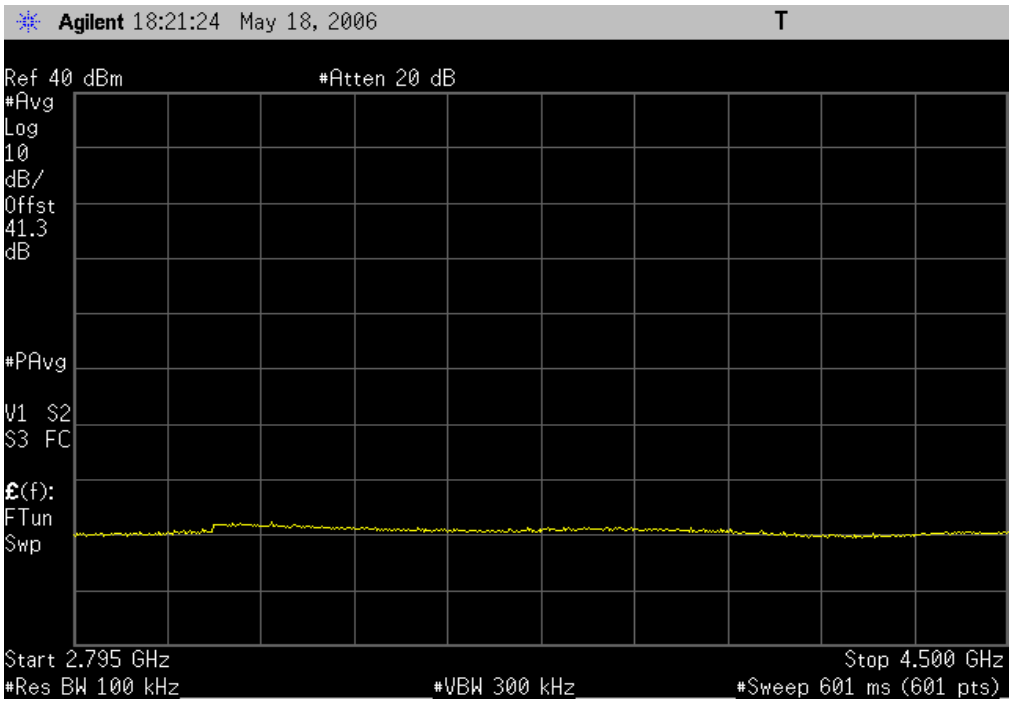
Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



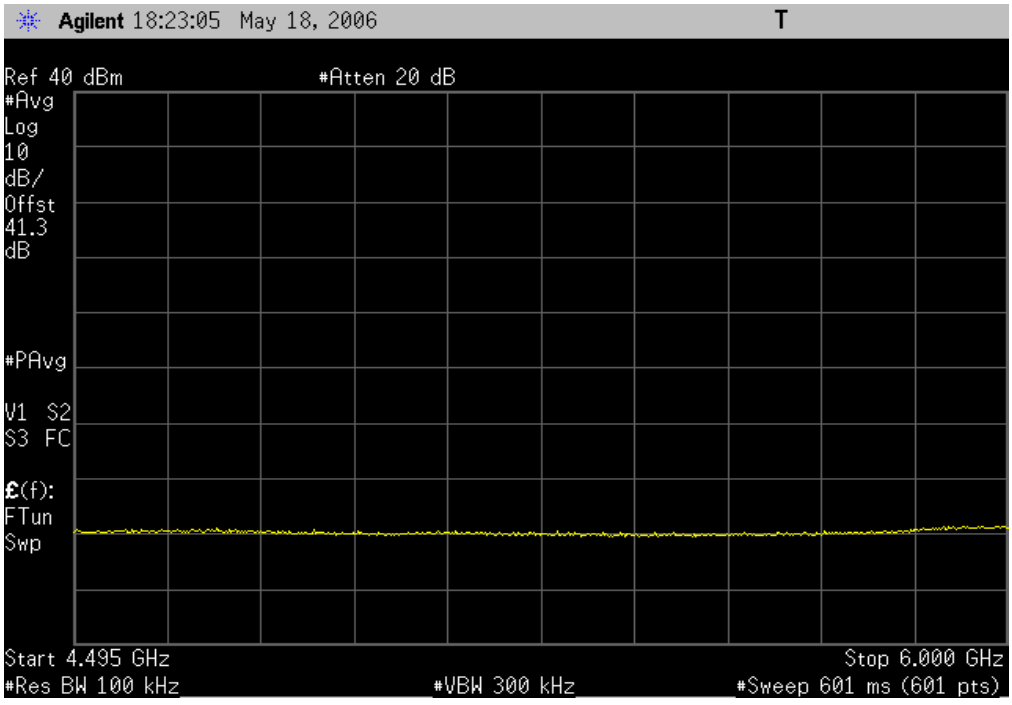
Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



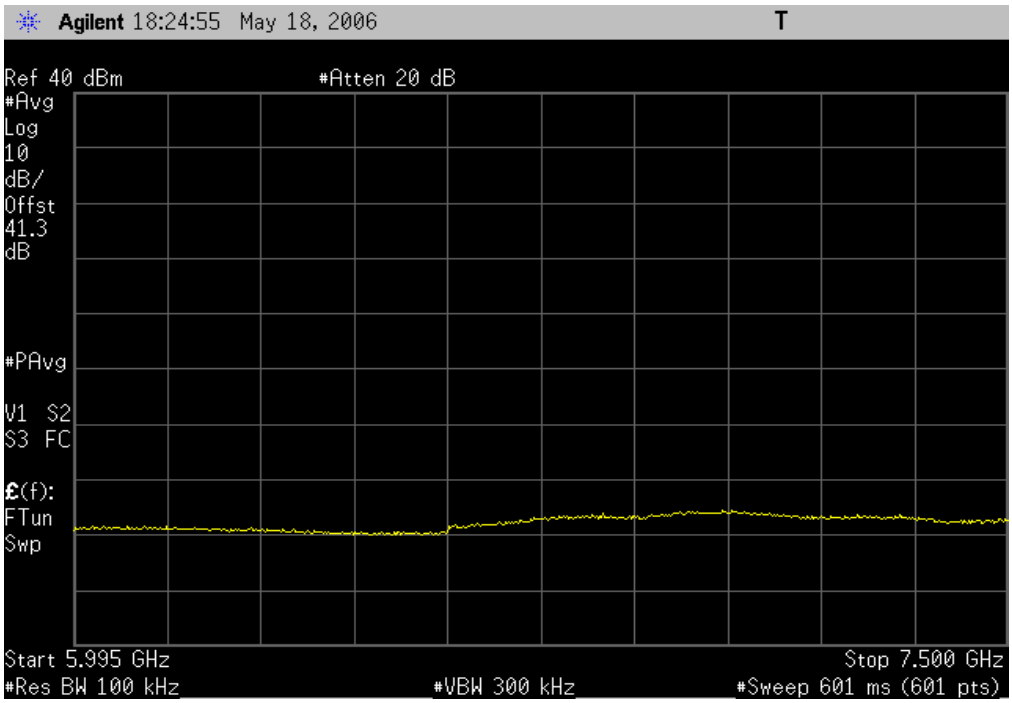
Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



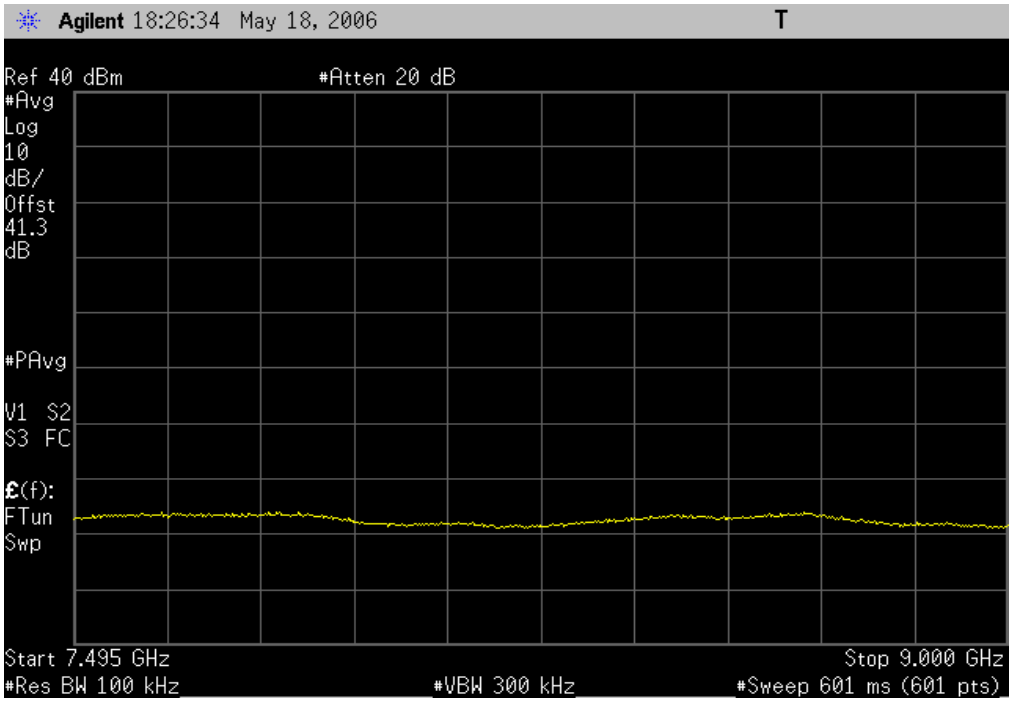
Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

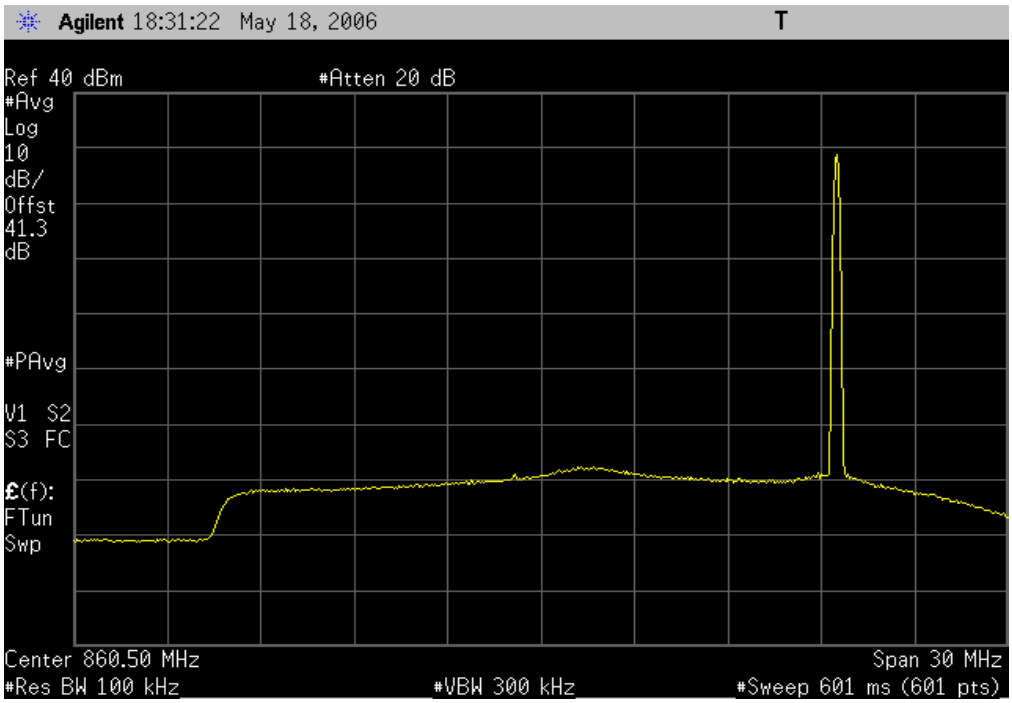


Mid Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

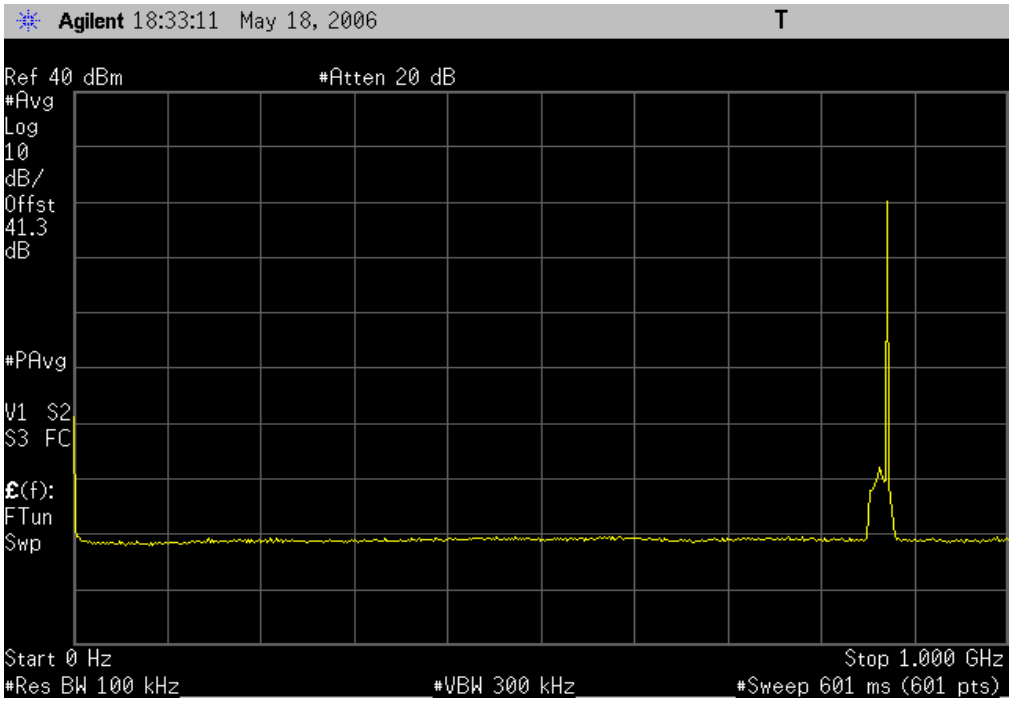


Spurious Emissions at Antenna Terminals

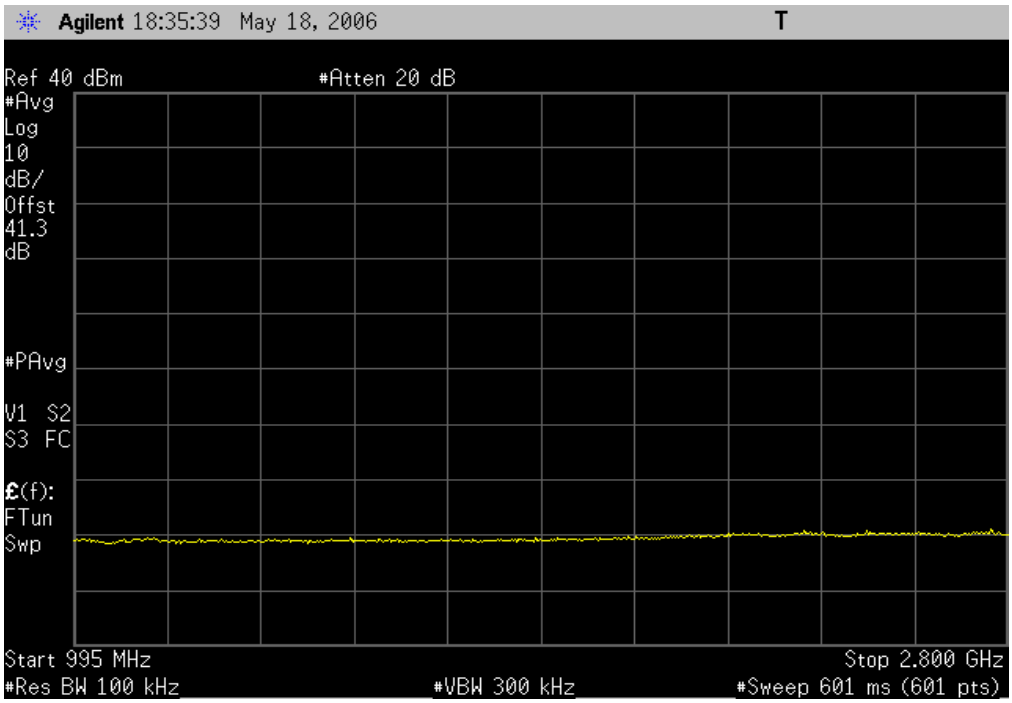
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



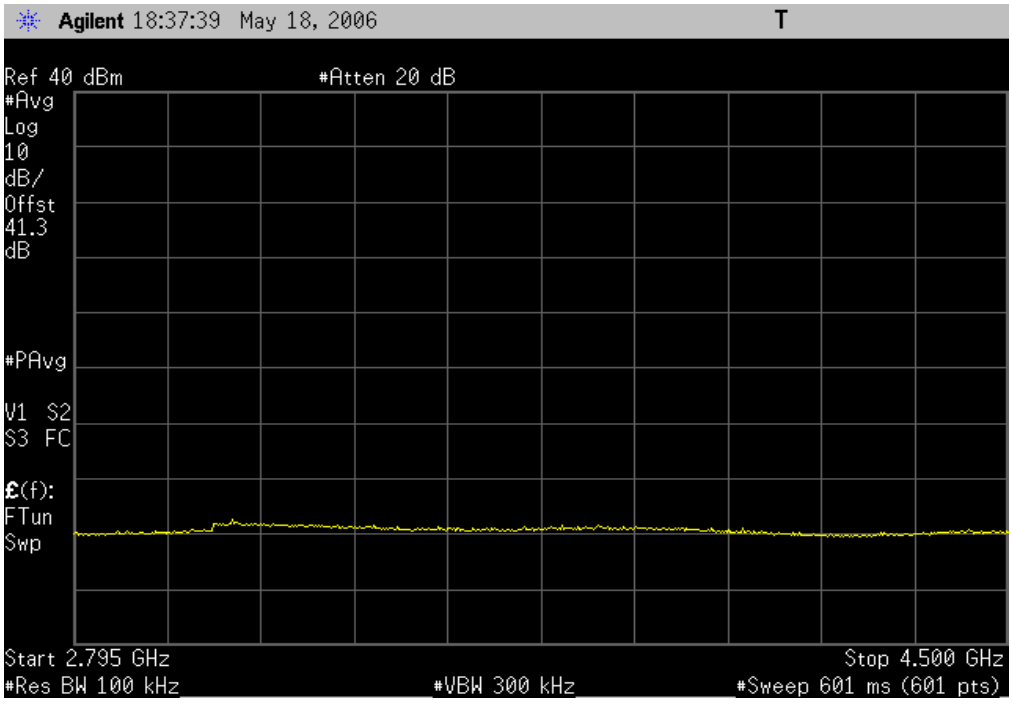
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



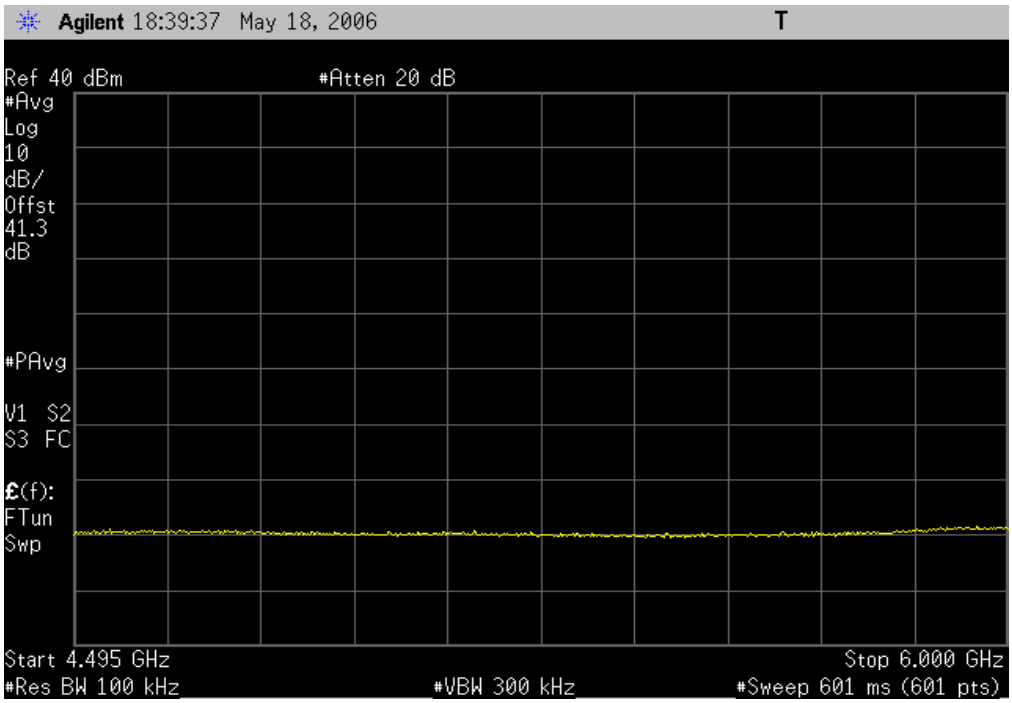
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



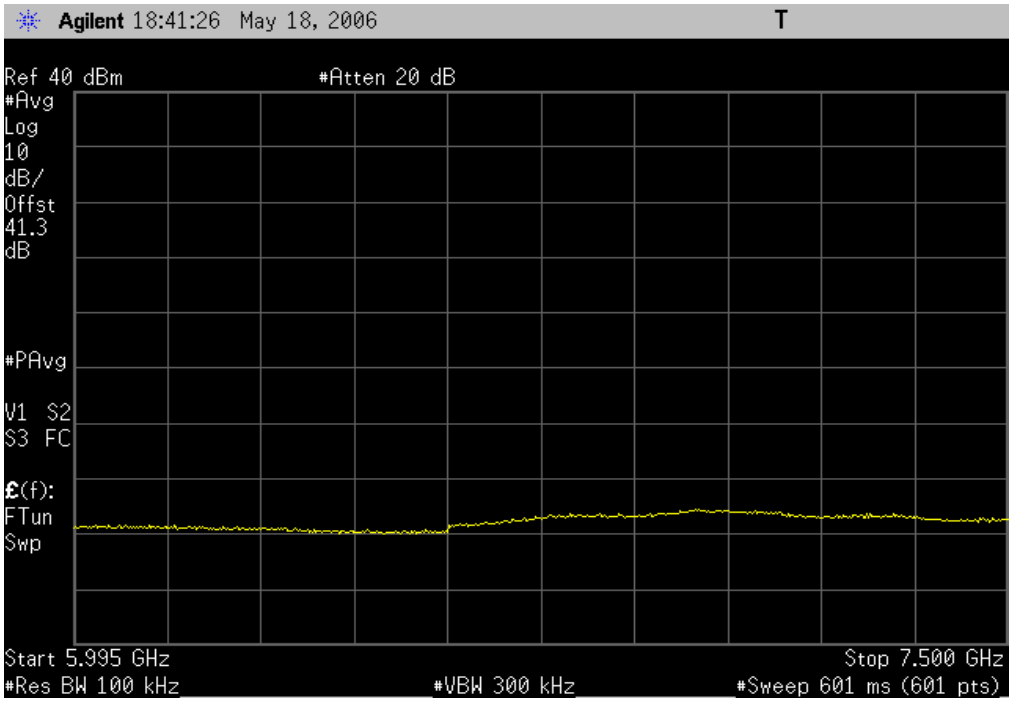
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



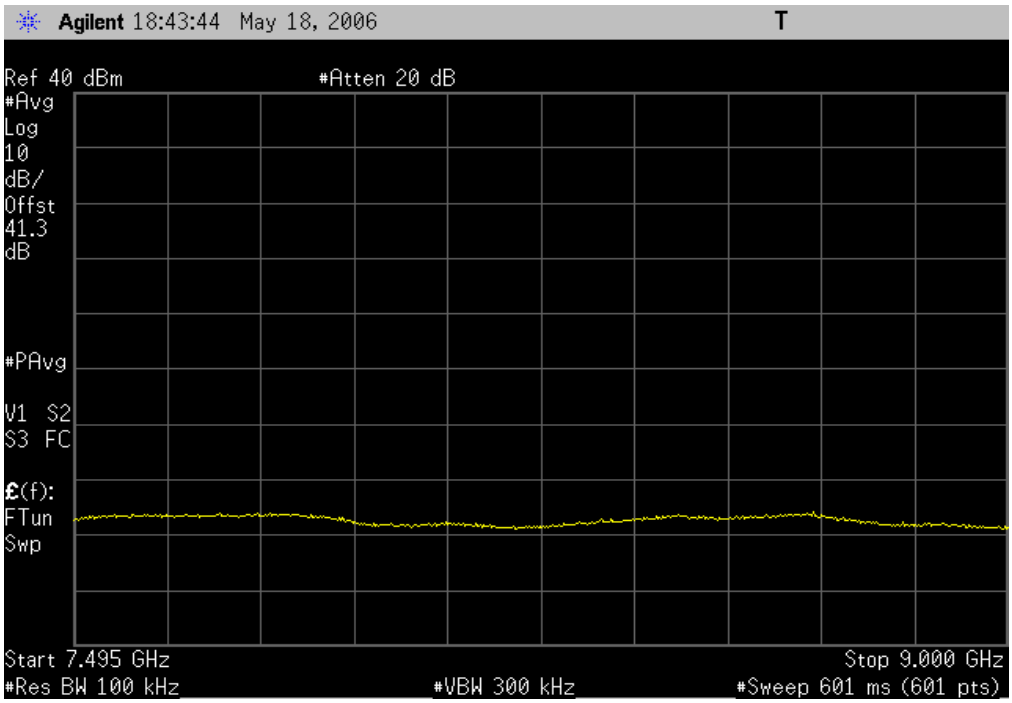
High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



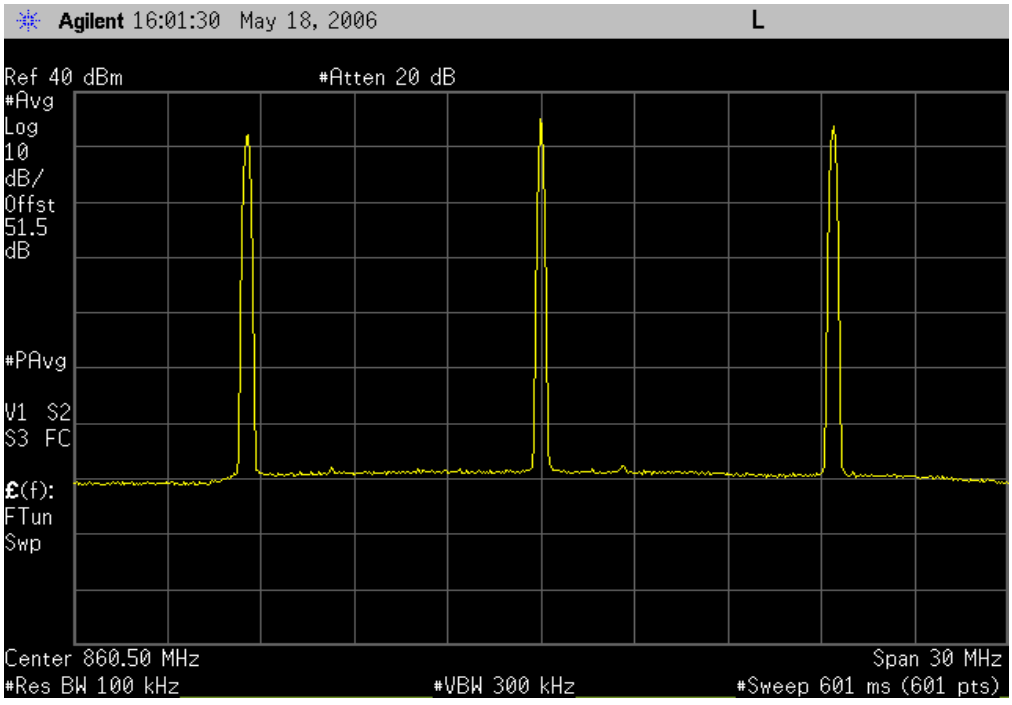
High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



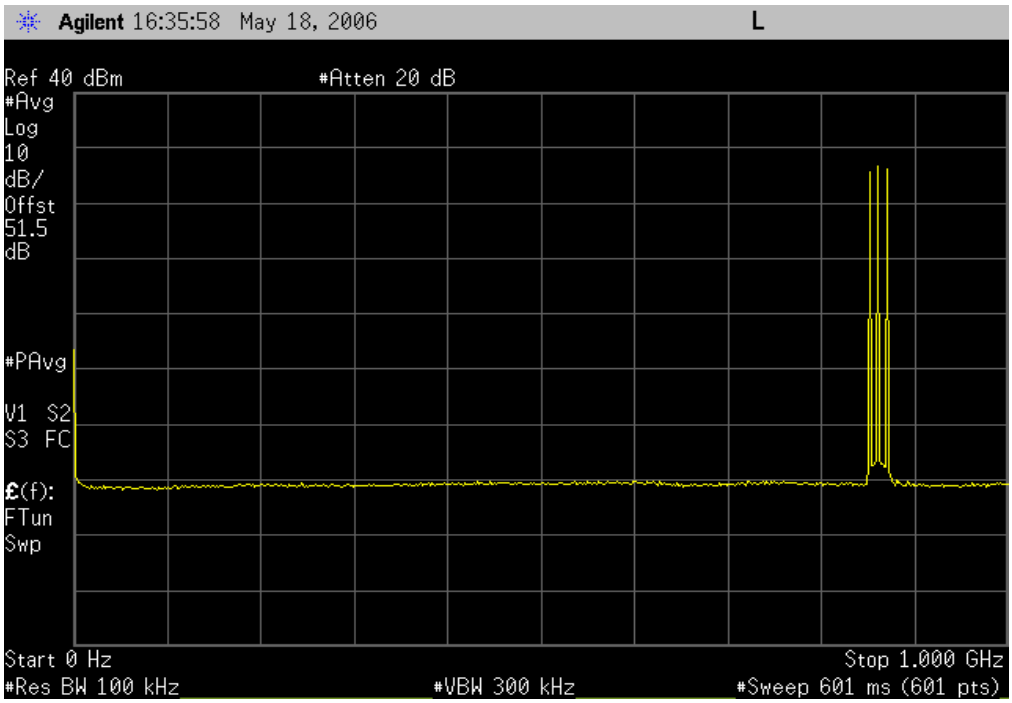
High Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



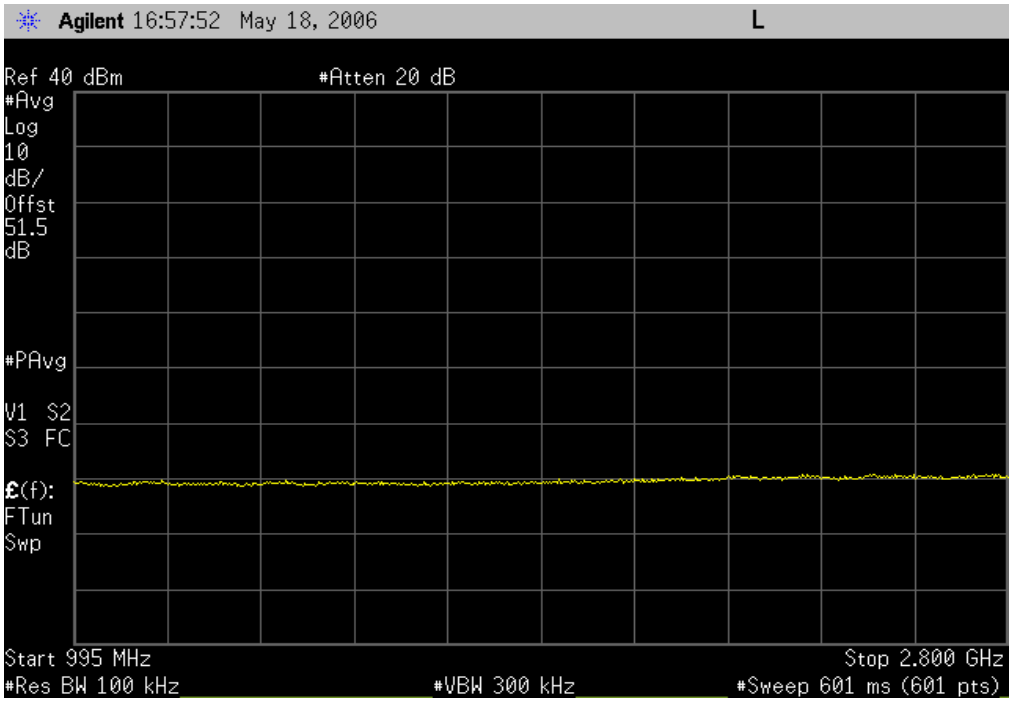
12 Channel Intermods, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



12 Channel Intermods, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

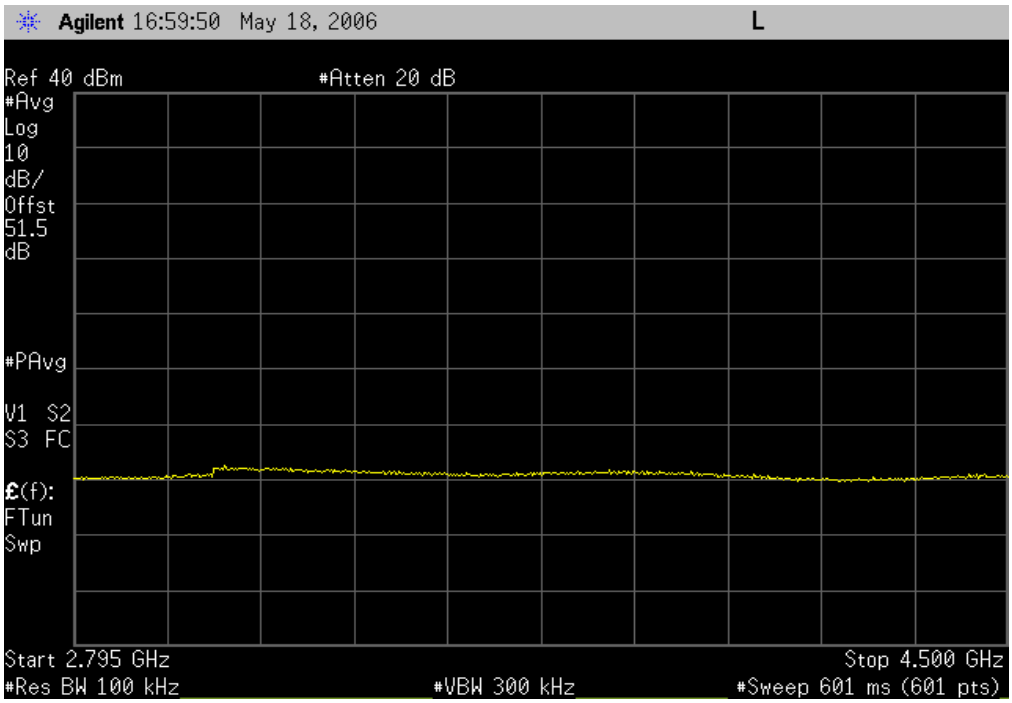


12 Channel Intermods, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

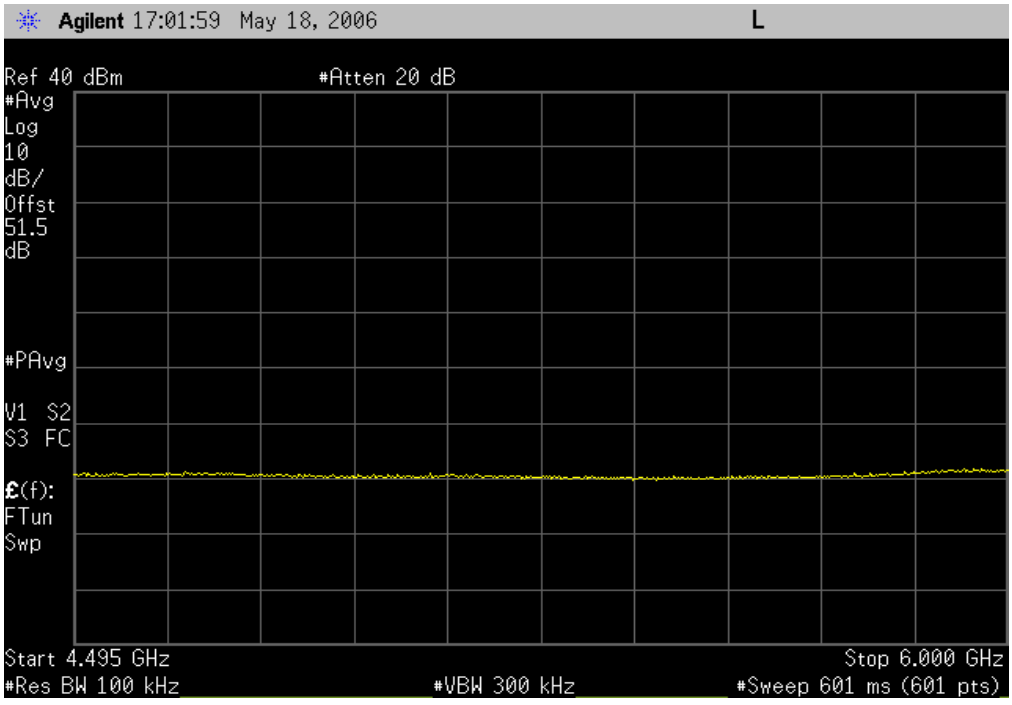


Spurious Emissions at Antenna Terminals

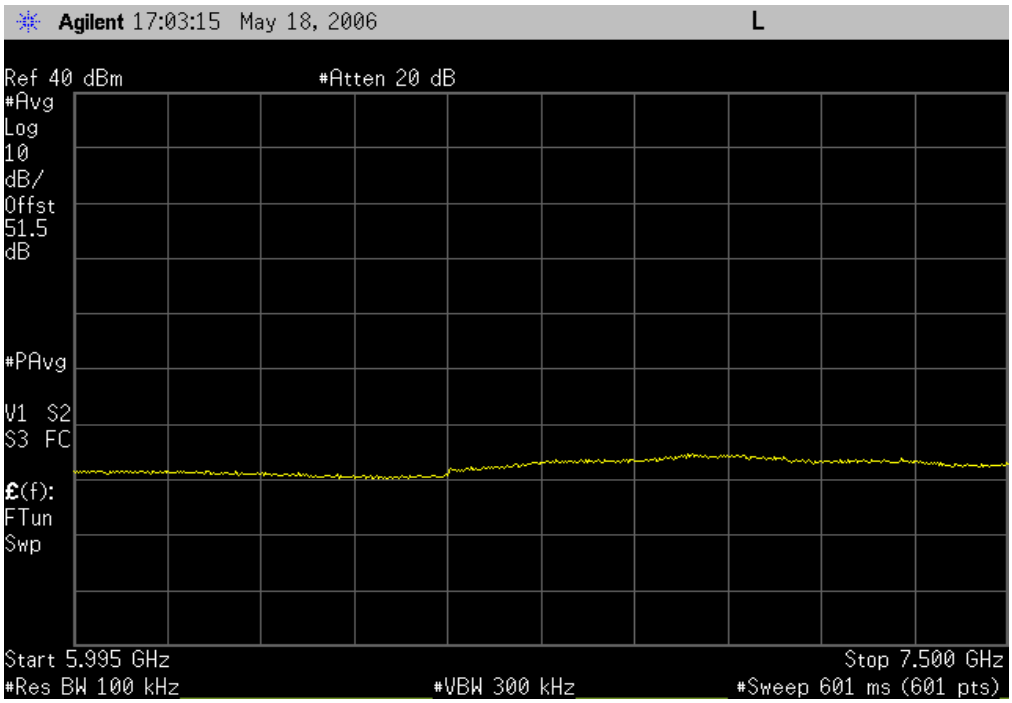
12 Channel Intermods, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



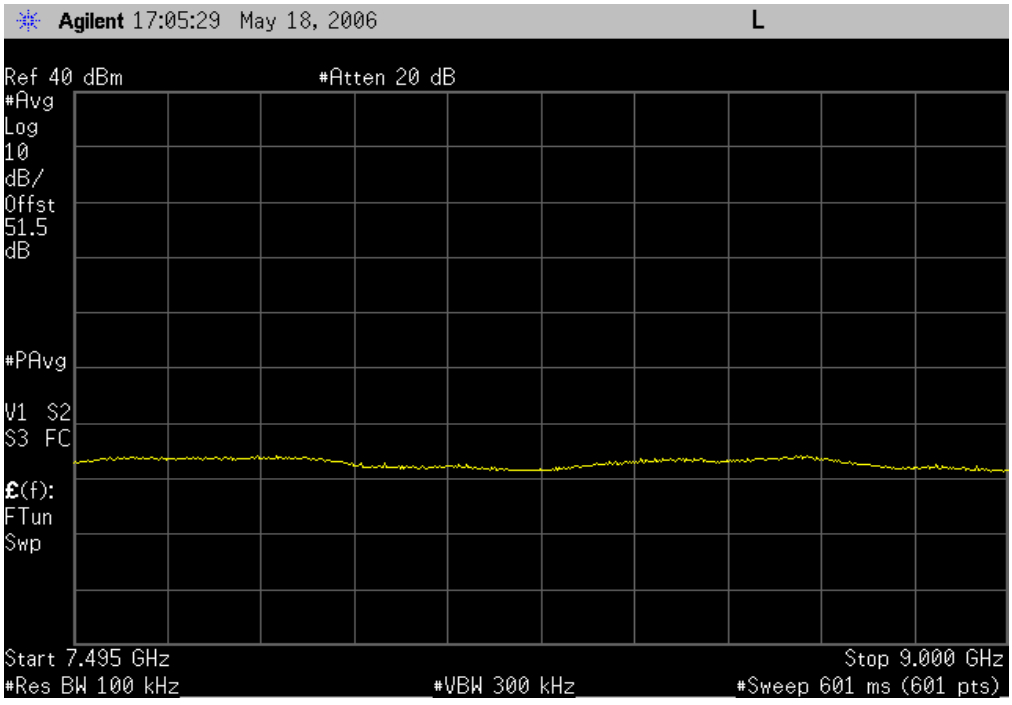
12 Channel Intermods, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



12 Channel Intermods, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



12 Channel Intermods, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Pre-Amplifier	Amplifier Research	LN1000	APB	7/10/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 9 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/18/06
Customer:	Radioframe Networks, Inc.			Temperature:	24°C
Attendees:	Dean Busch			Humidity:	35%
Project:	None			Barometric Pres.:	29.99
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

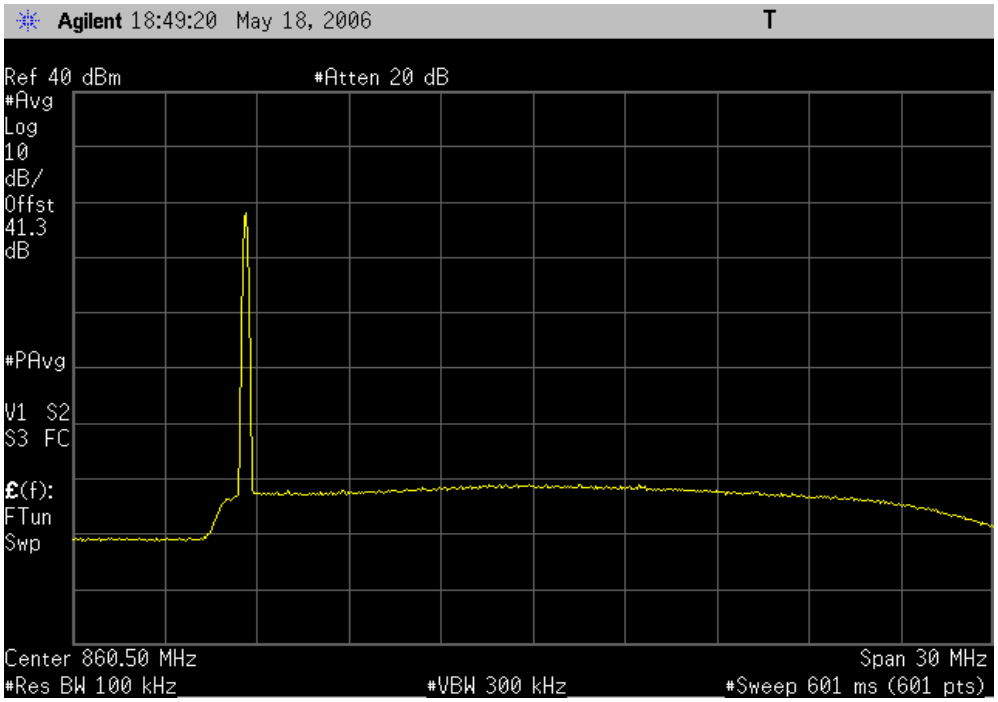
800MHz Band, Low Power Level

DEVIATIONS FROM TEST STANDARD

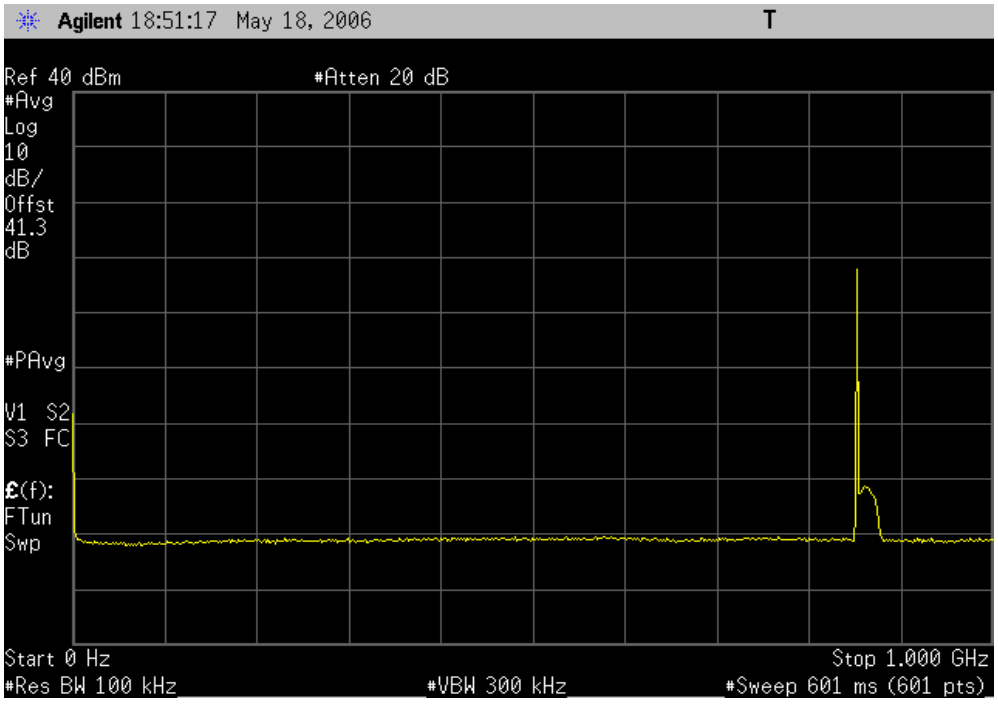
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495MHz-9.0GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495MHz-9.0GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495MHz-9.0GHz	< -30 dBm	≤ -13 dBm	Pass

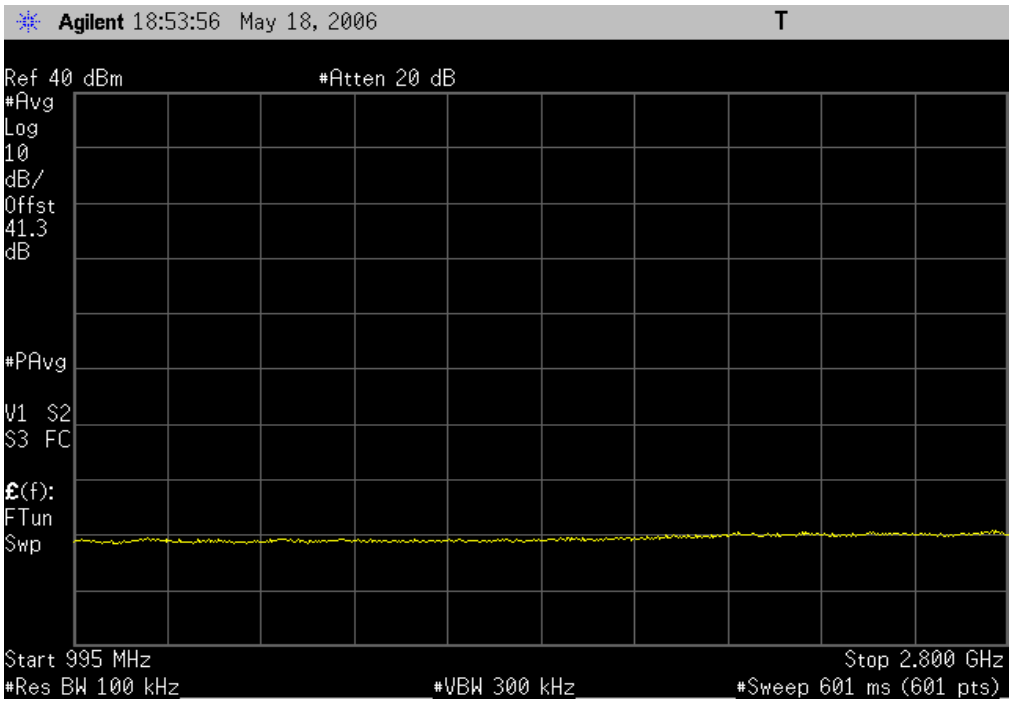
Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



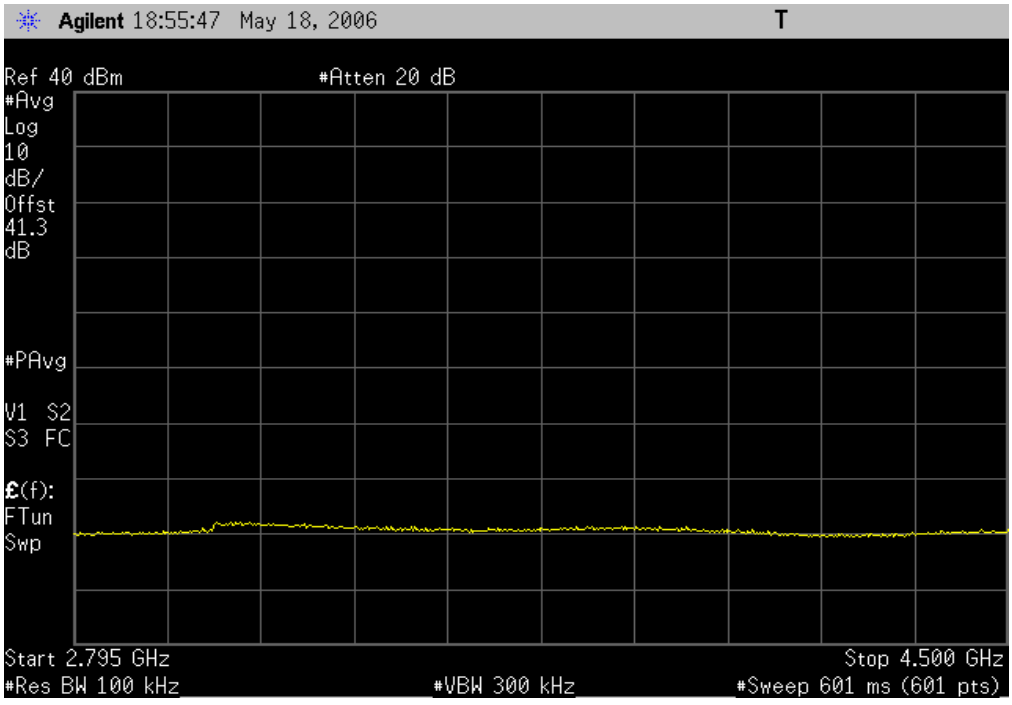
Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



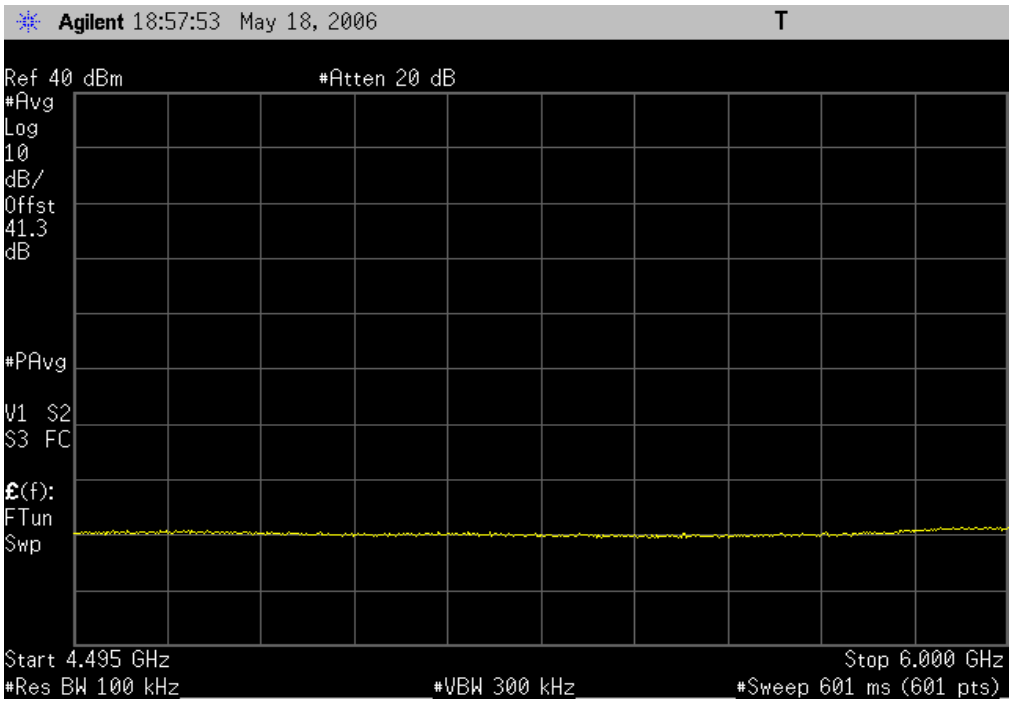
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



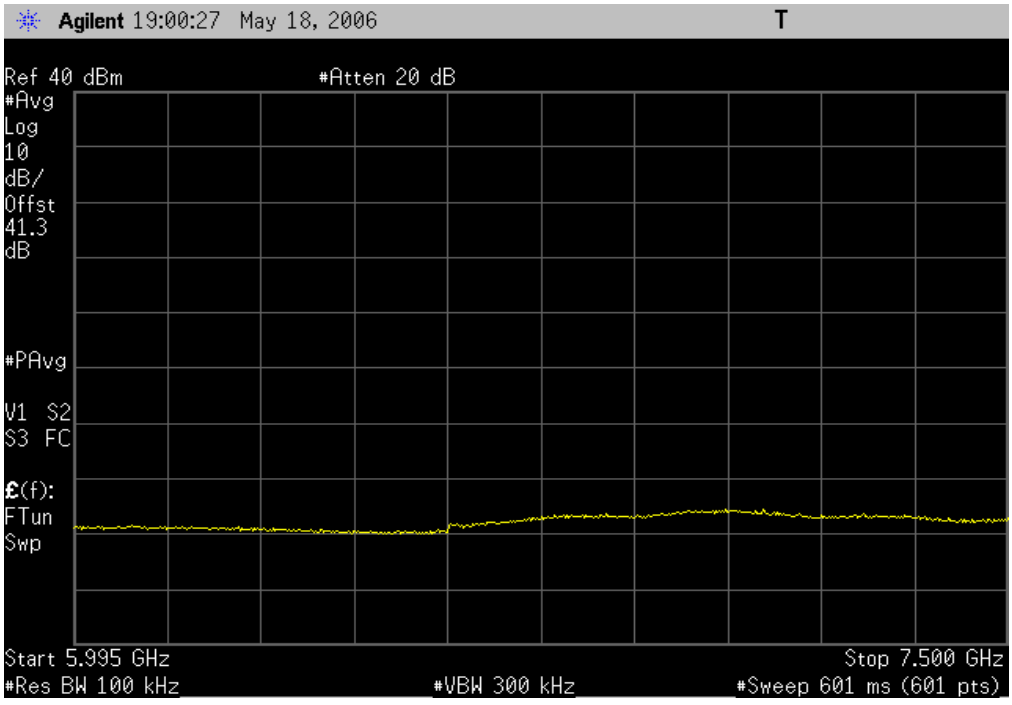
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



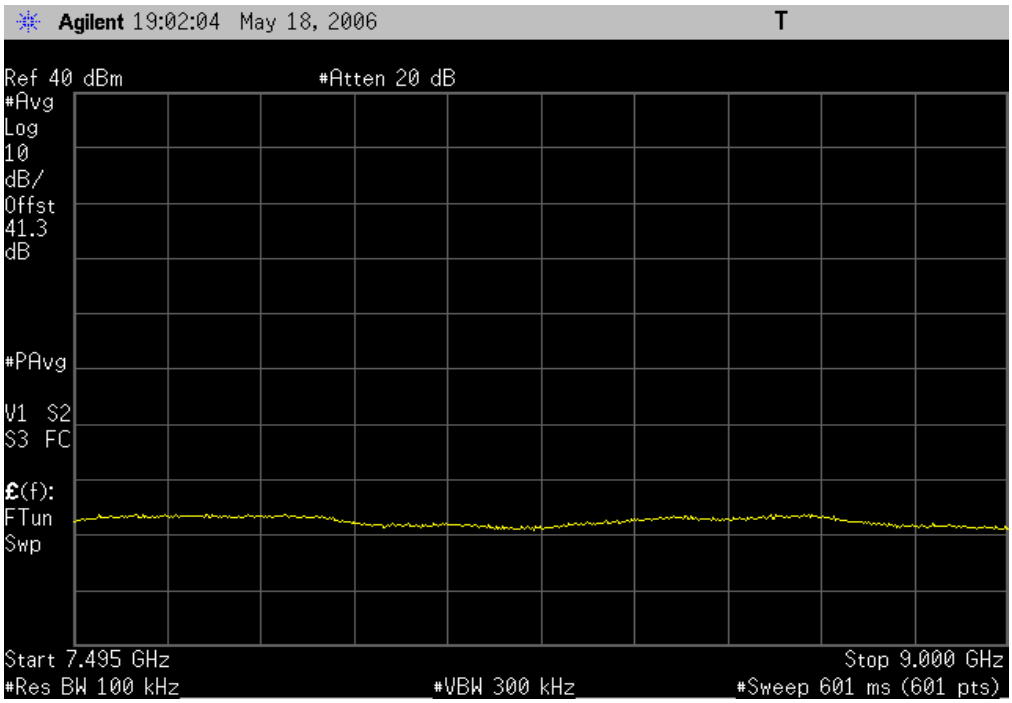
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



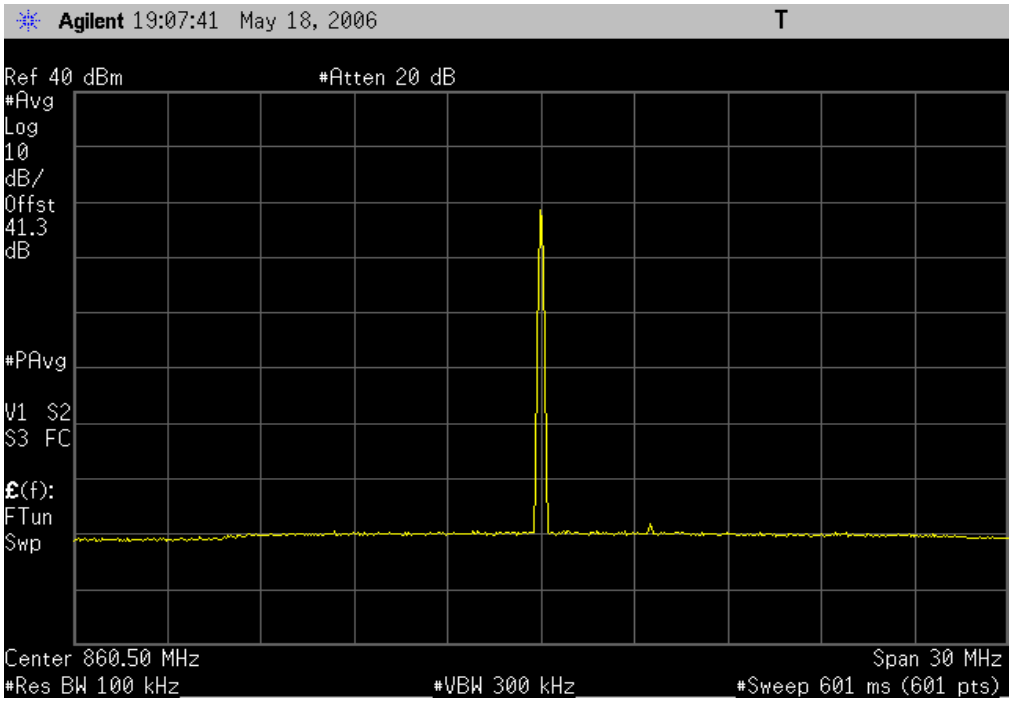
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



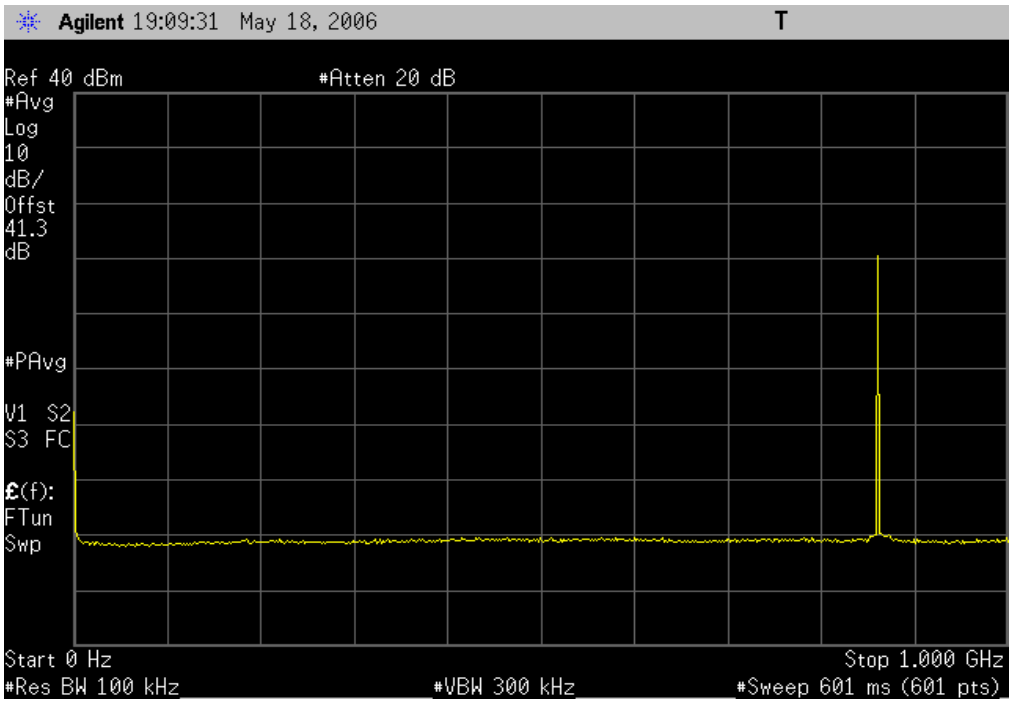
Low Channel, 7.495MHz-9.0GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



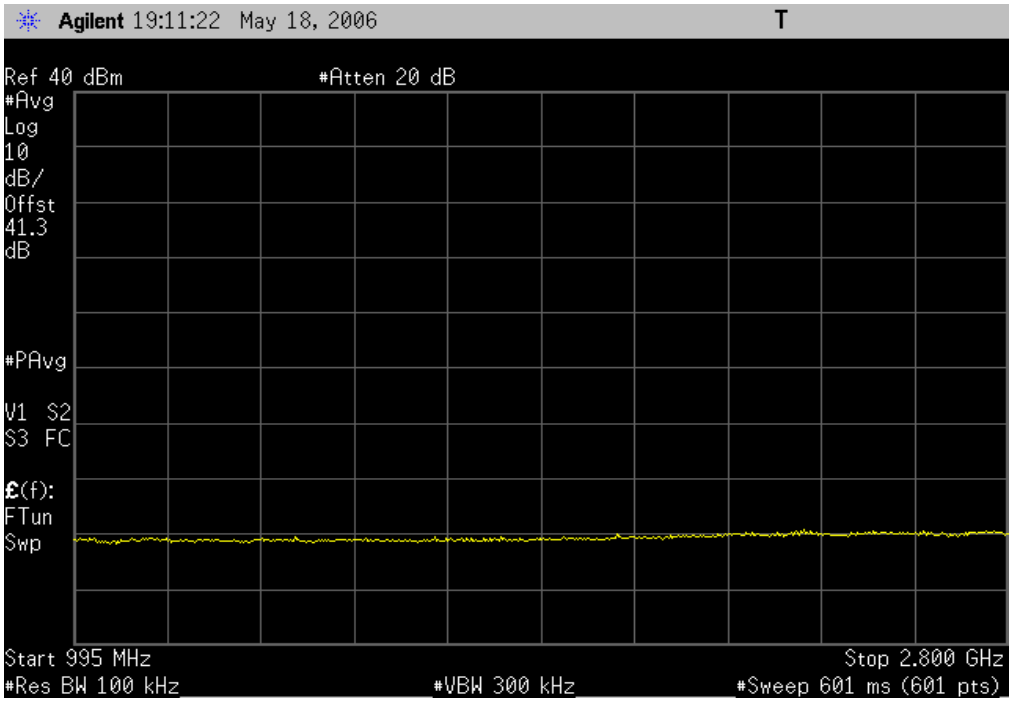
Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



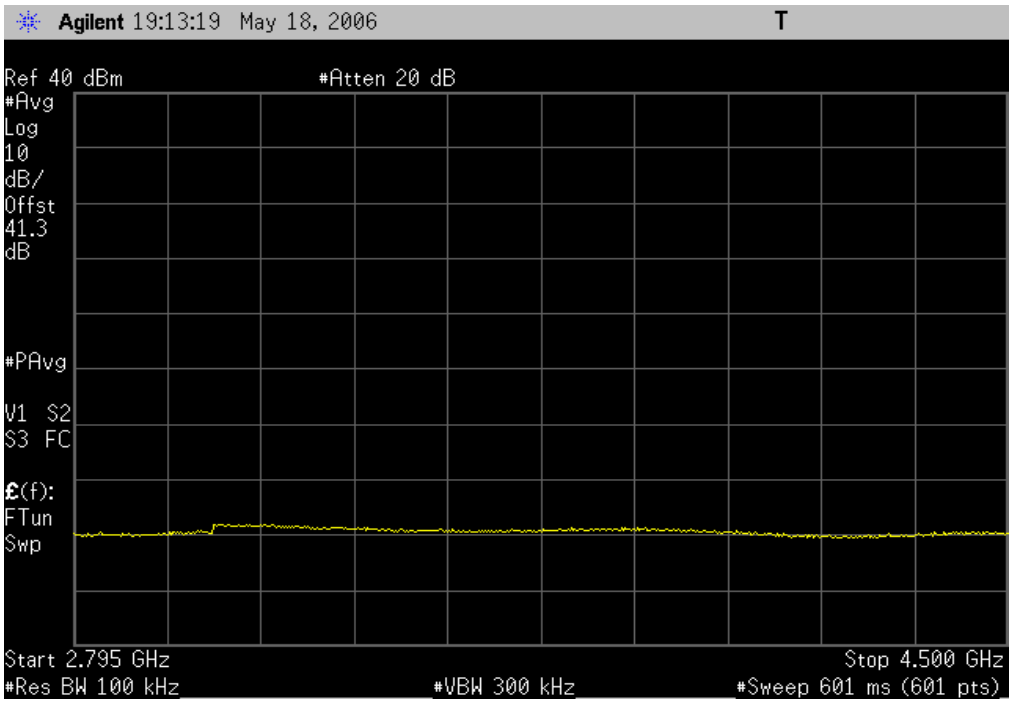
Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



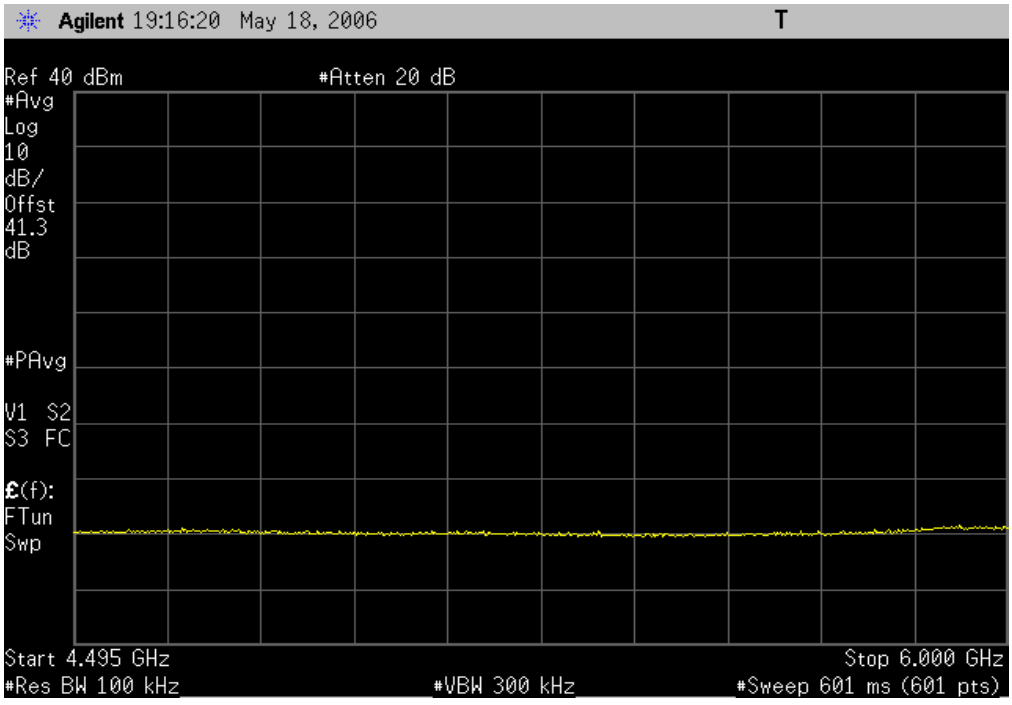
Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



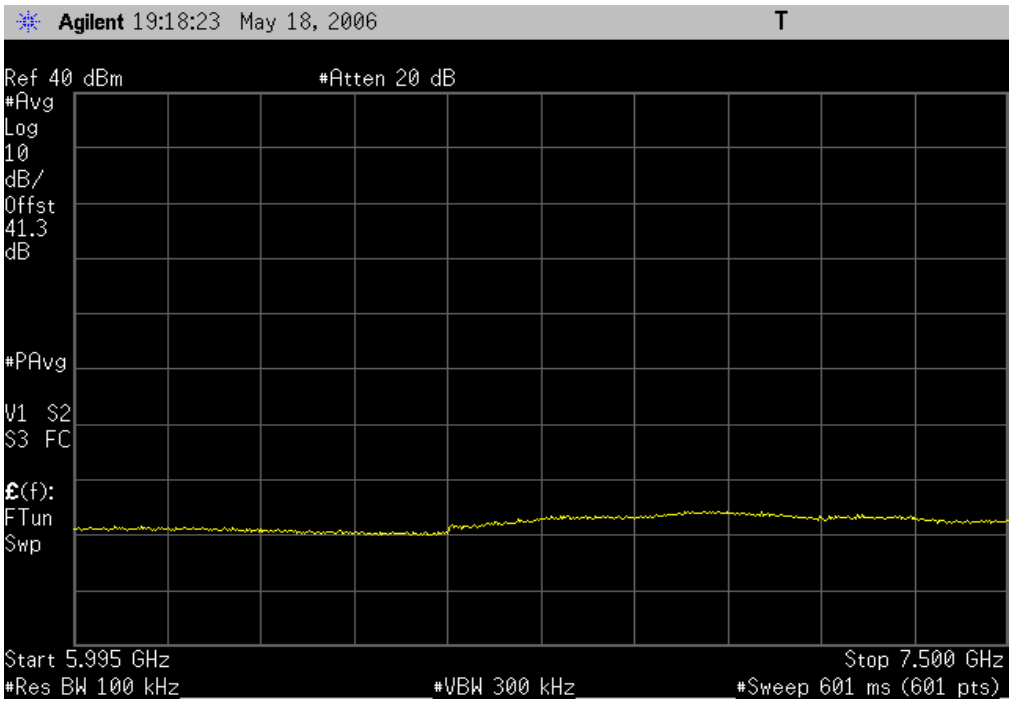
Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



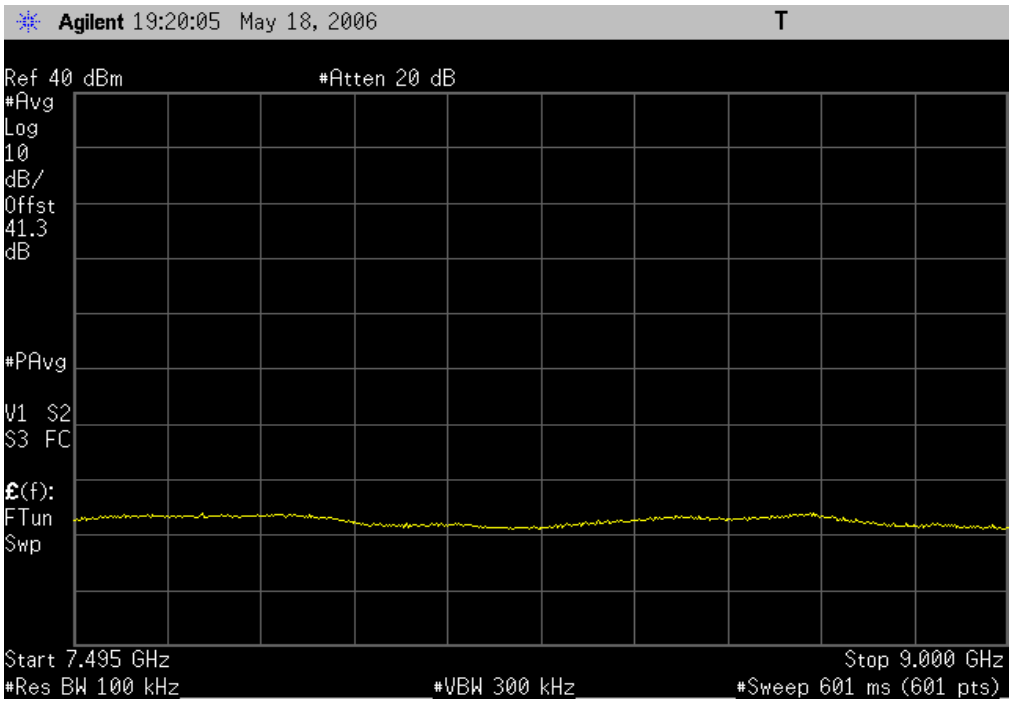
Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



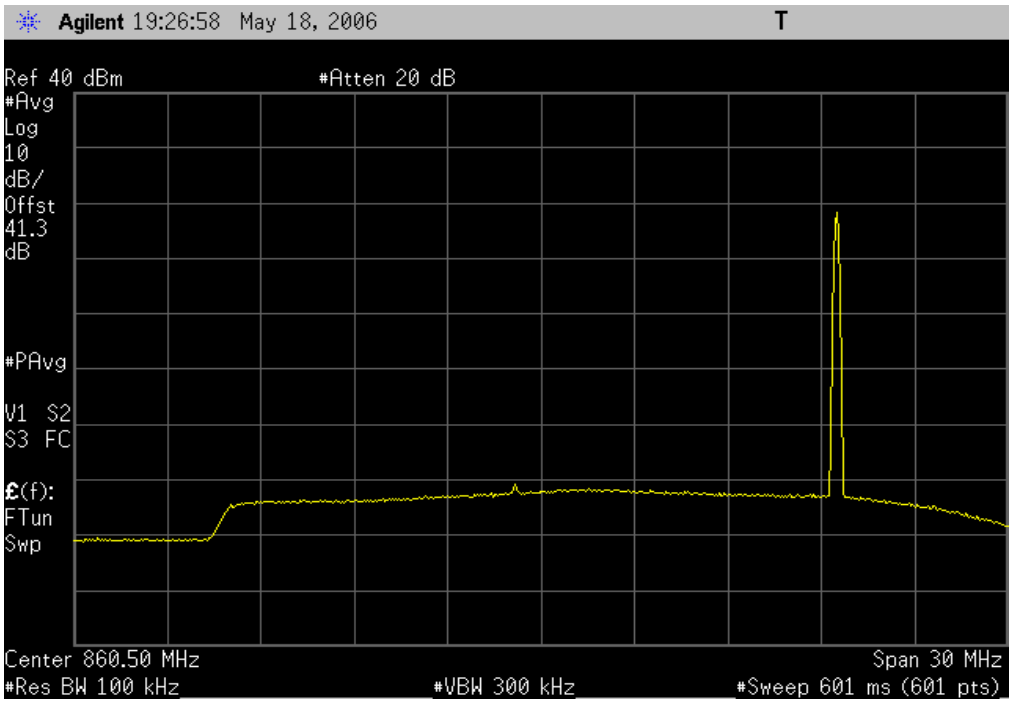
Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



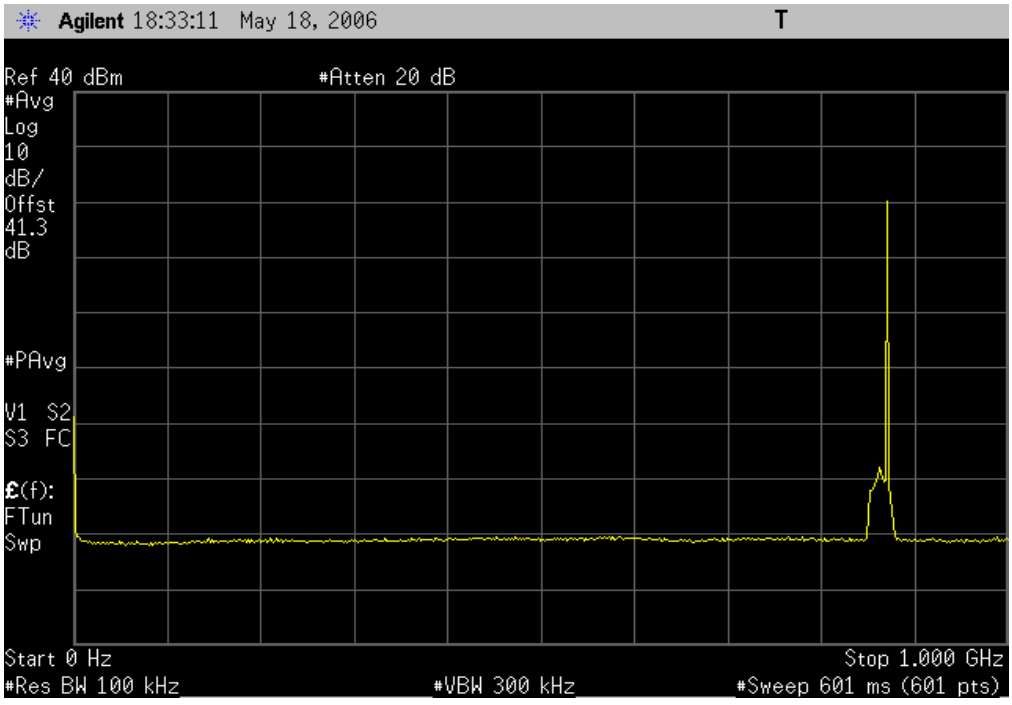
Mid Channel, 7.495MHz-9.0GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



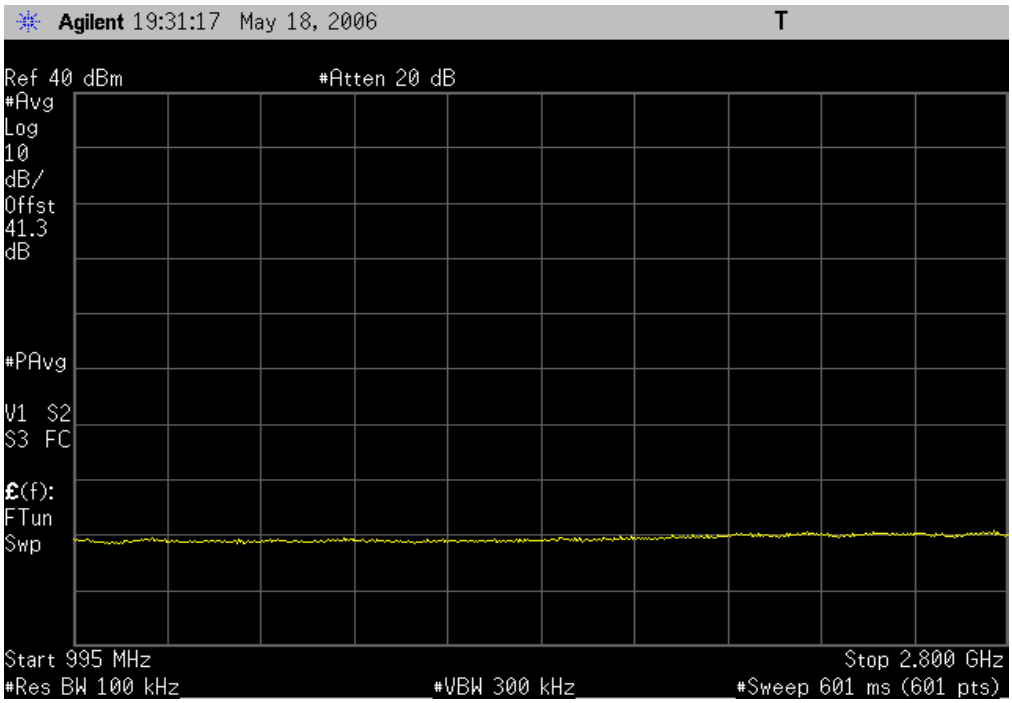
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



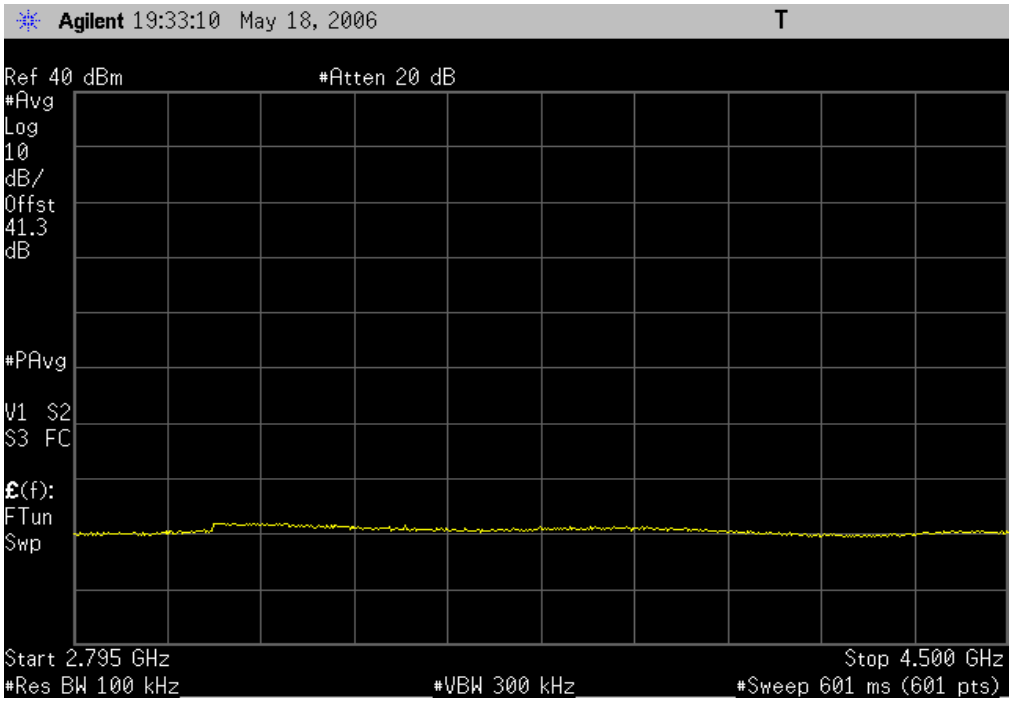
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



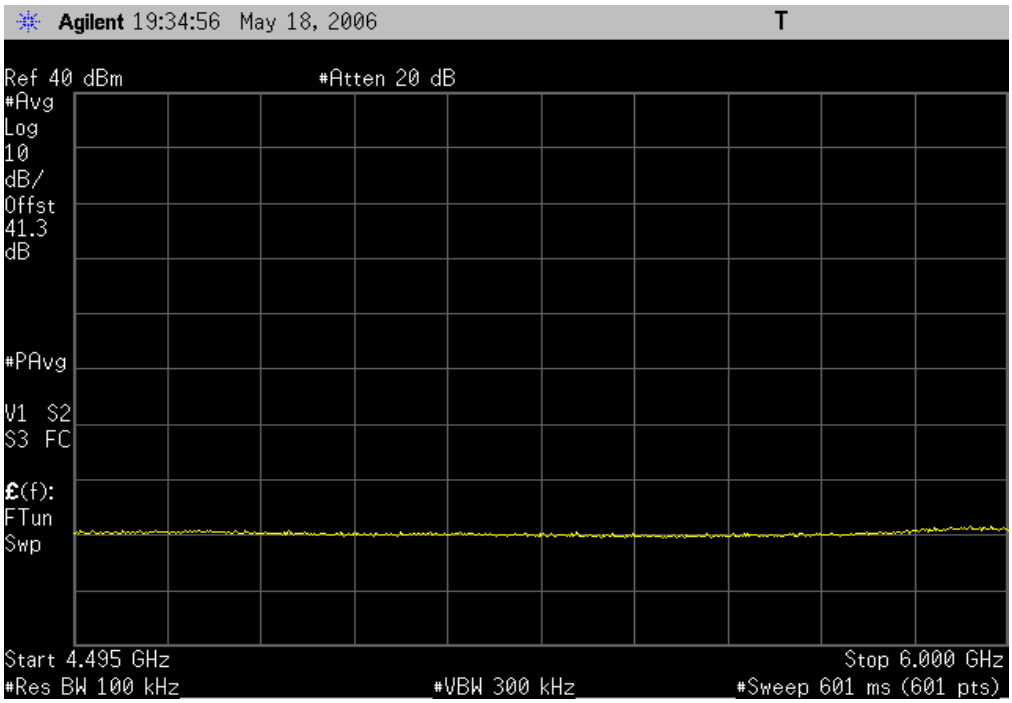
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



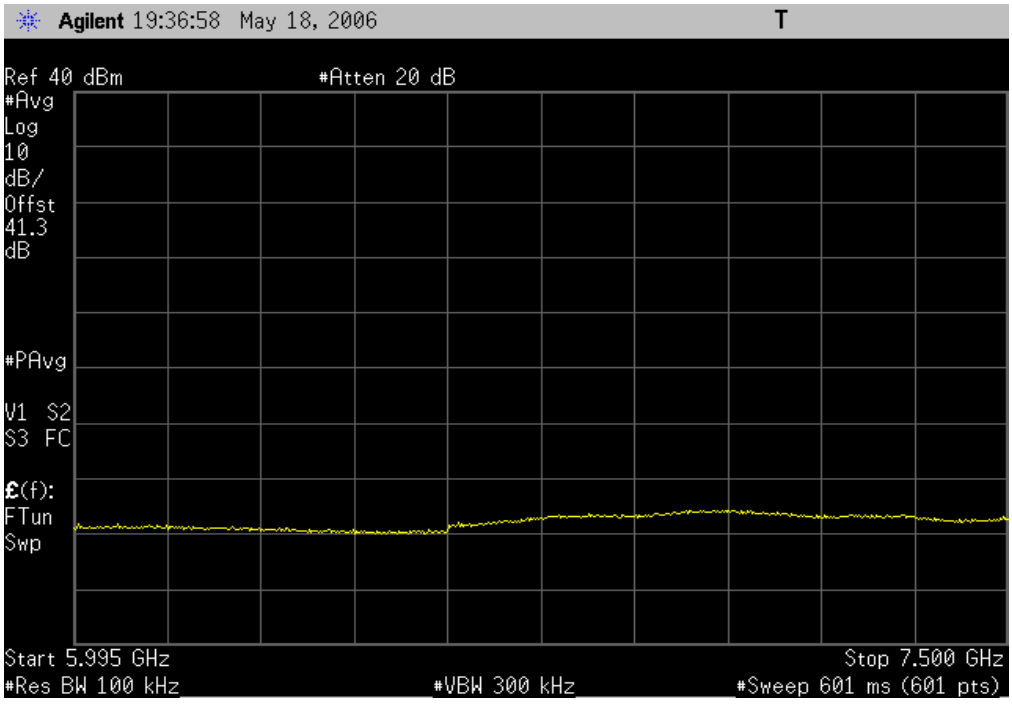
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



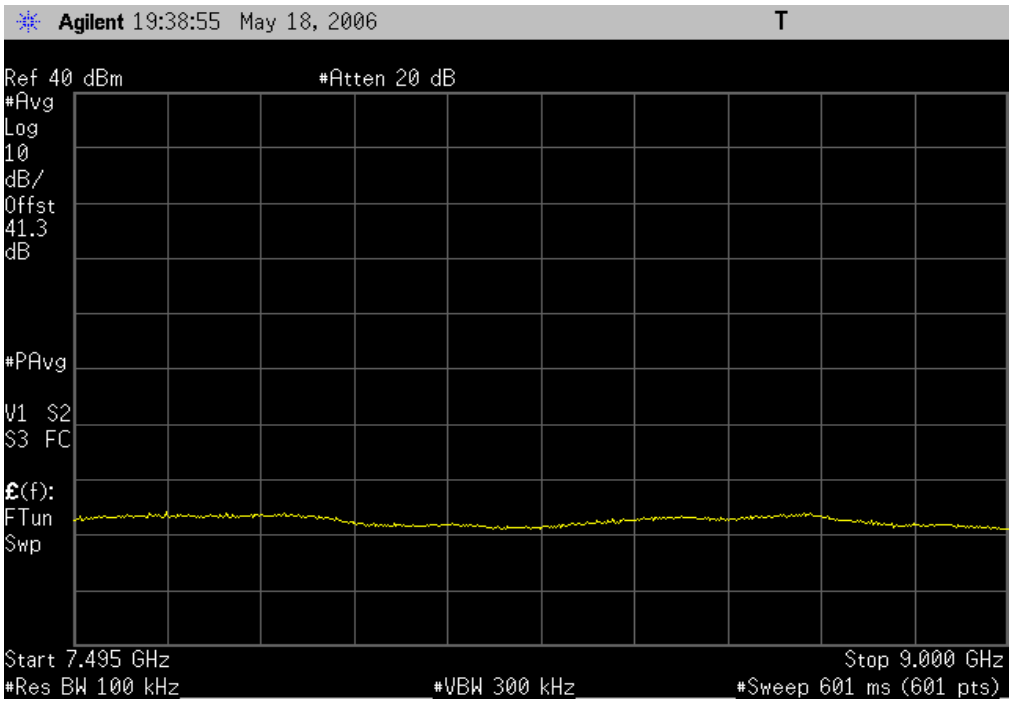
High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 7.495MHz-9.0GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Pre-Amplifier	Amplifier Research	LN1000	APB	7/10/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 9 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/18/06
Customer:	Radioframe Networks, Inc.			Temperature:	24°C
Attendees:	Dean Busch			Humidity:	35%
Project:	None			Barometric Pres.:	29.99
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

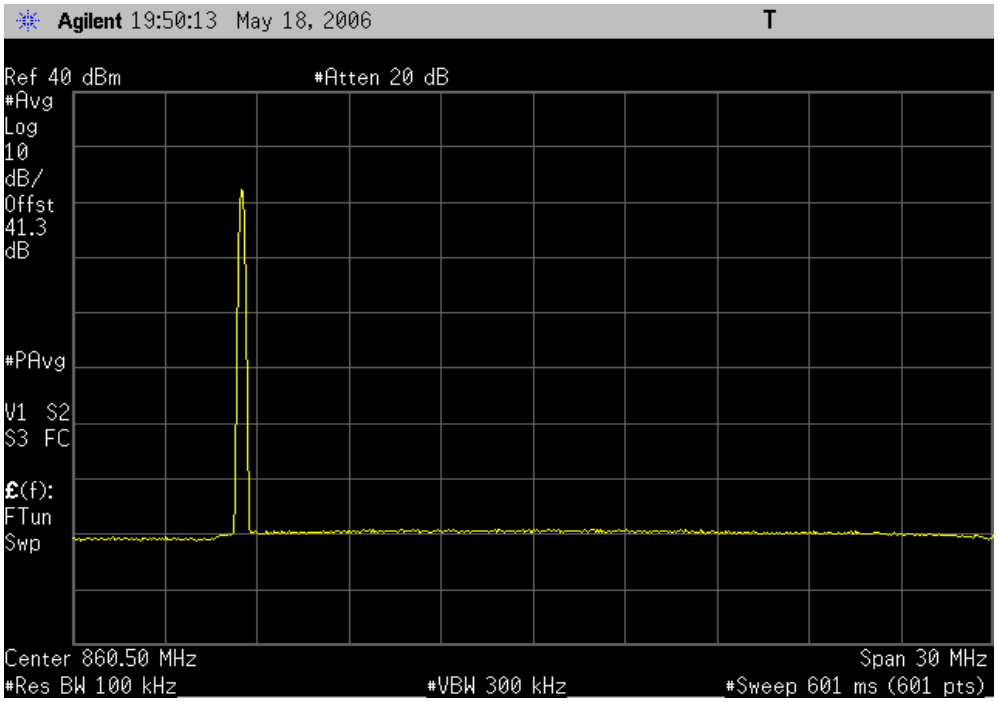
800MHz Band, Mid Power Level

DEVIATIONS FROM TEST STANDARD

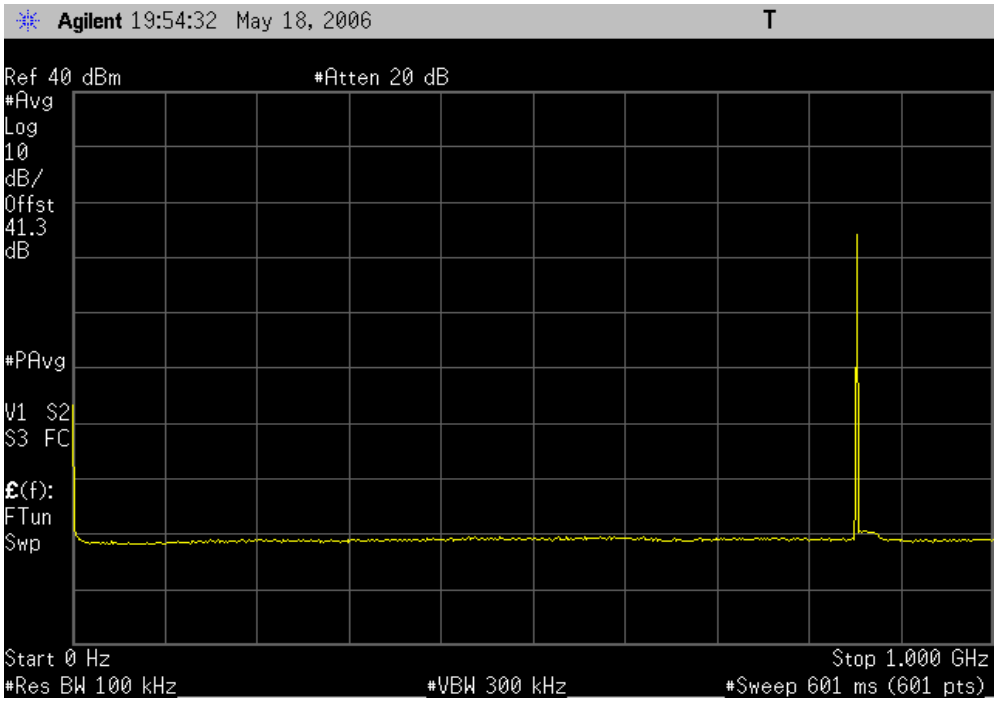
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495GHz-9GHz	< -30 dBm	≤ -13 dBm	Pass

Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

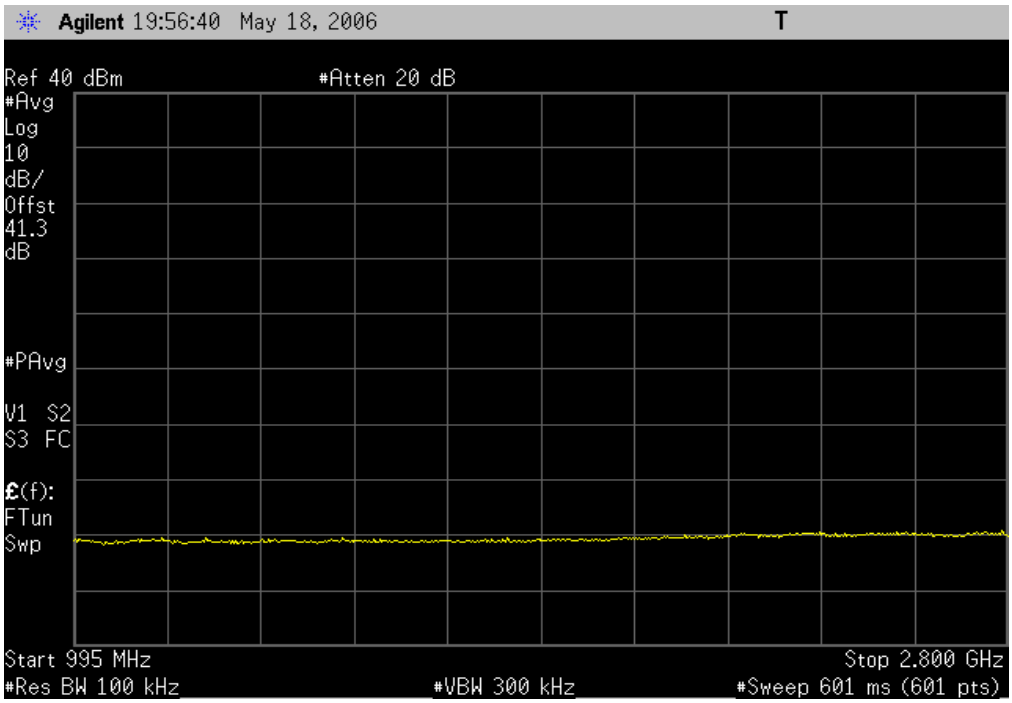


Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

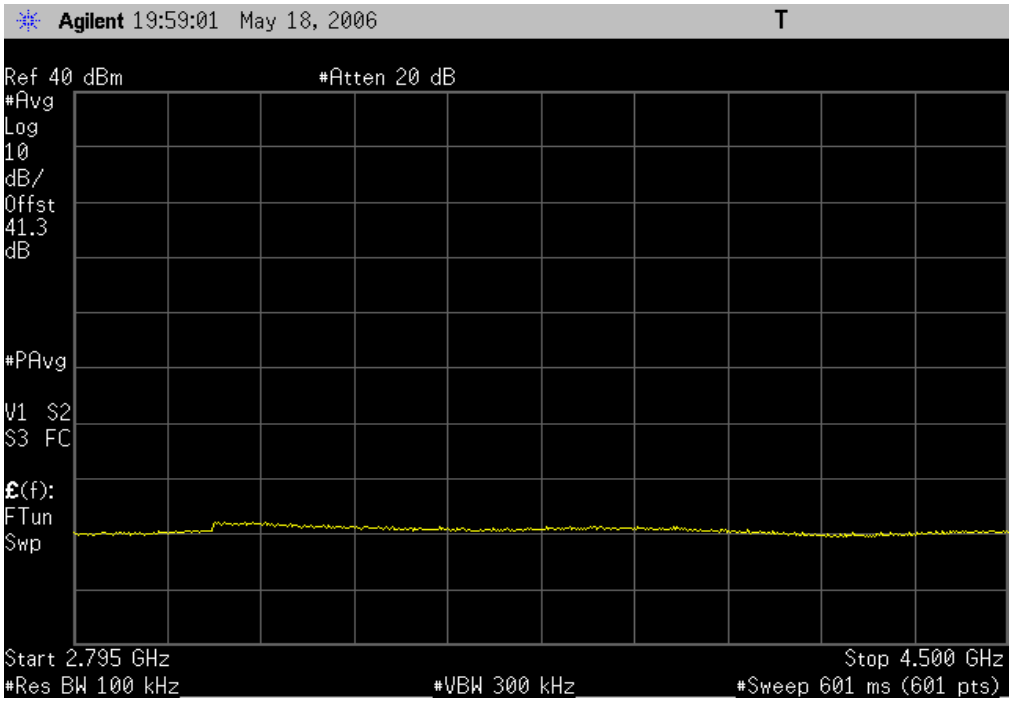


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

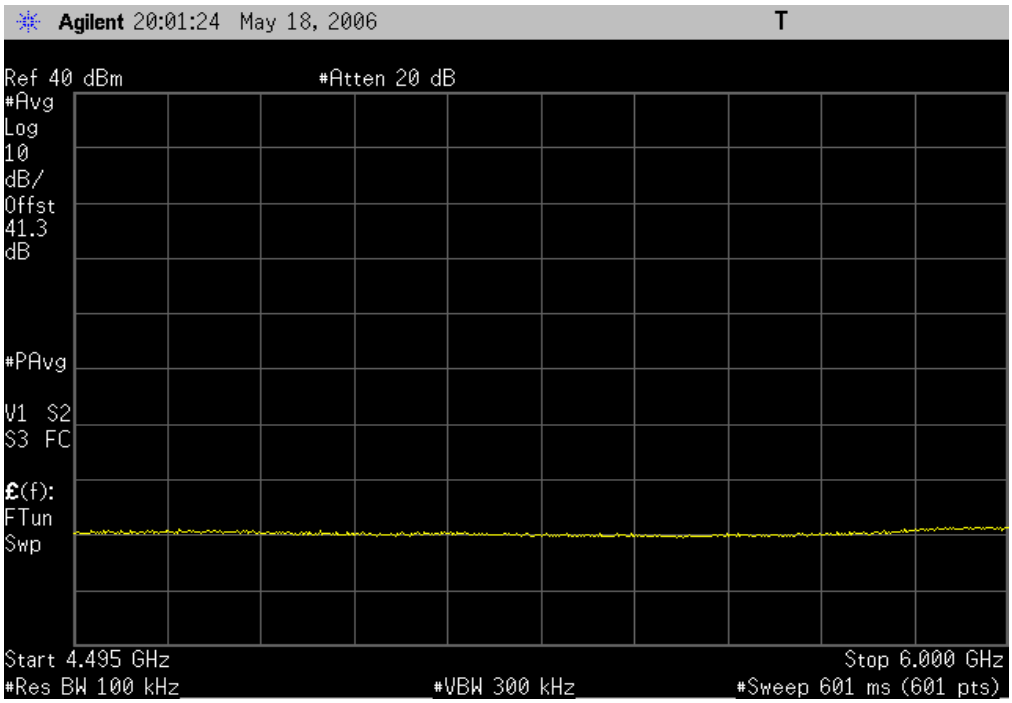
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



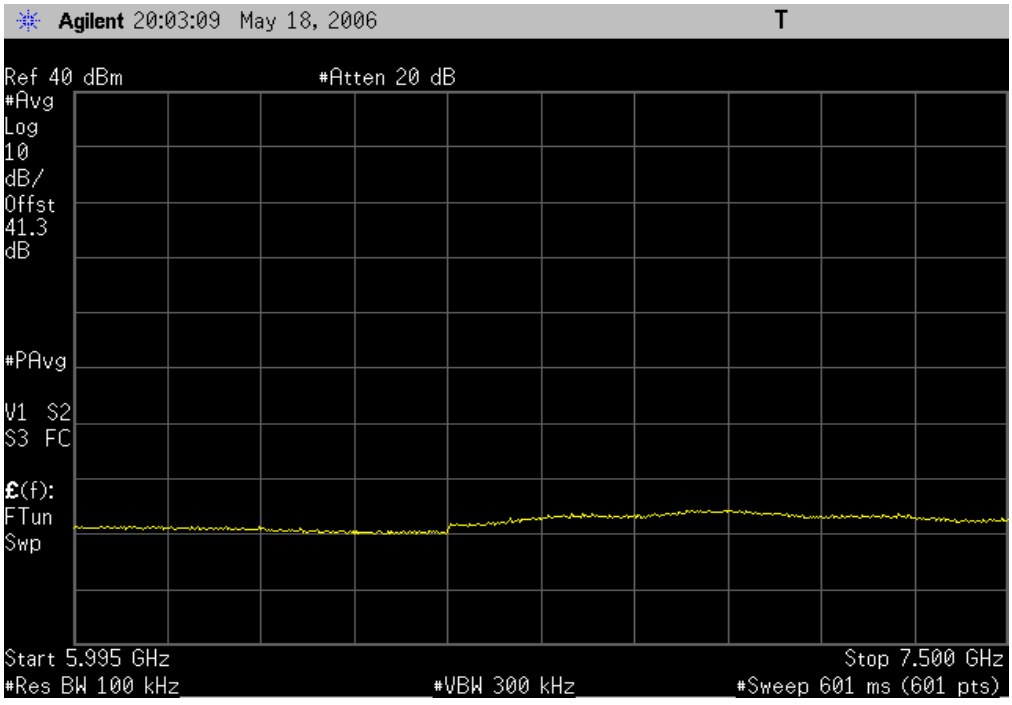
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



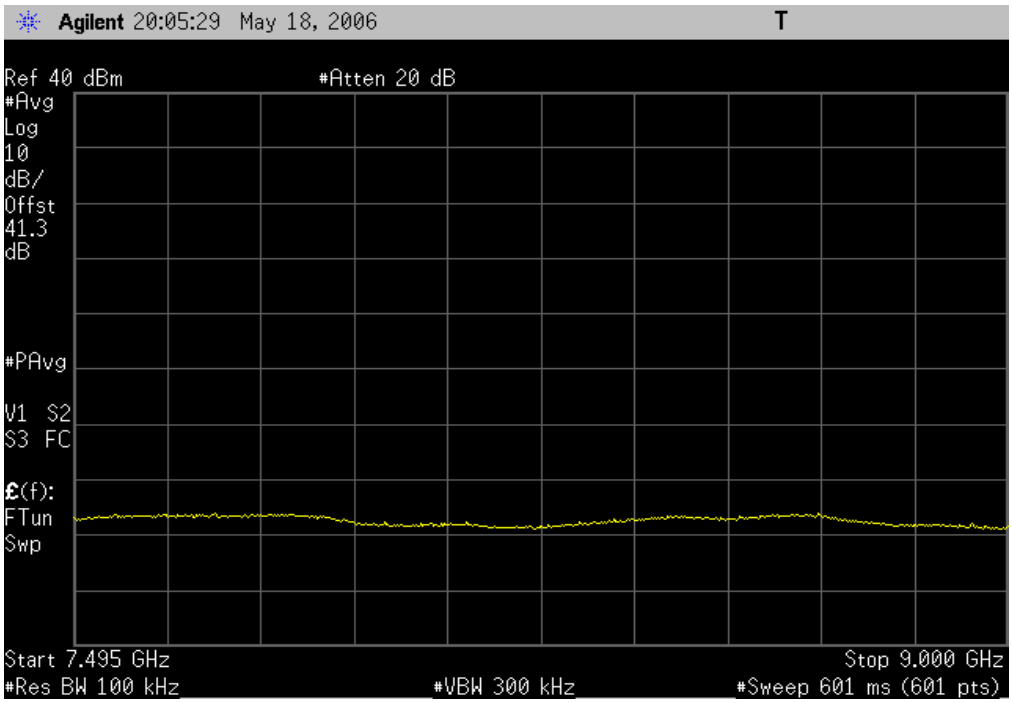
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



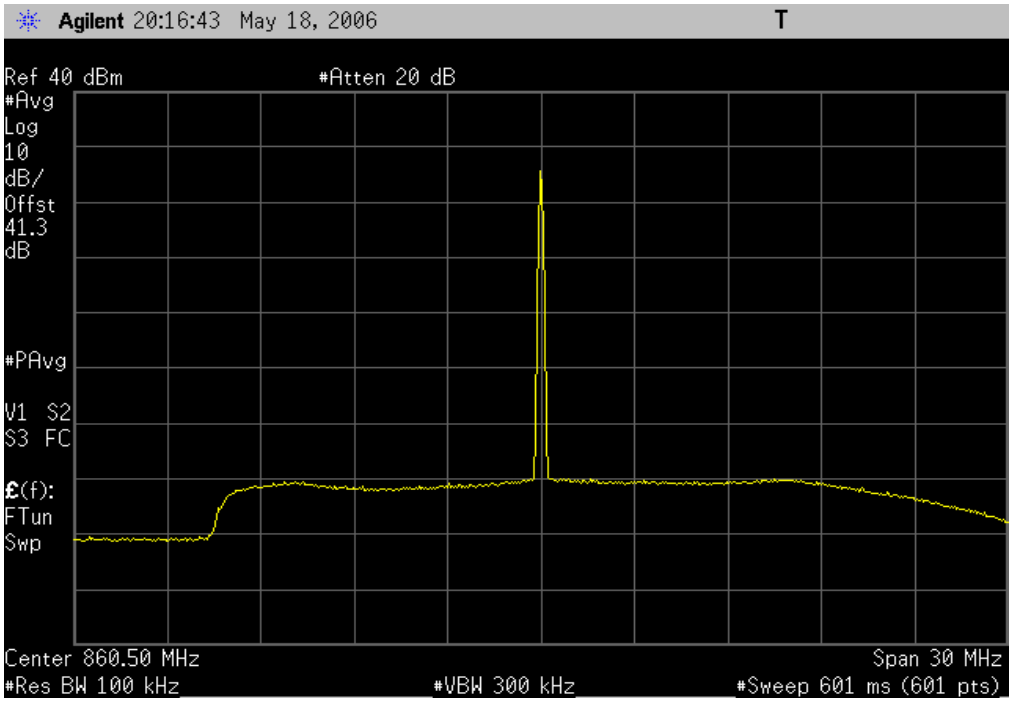
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Low Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

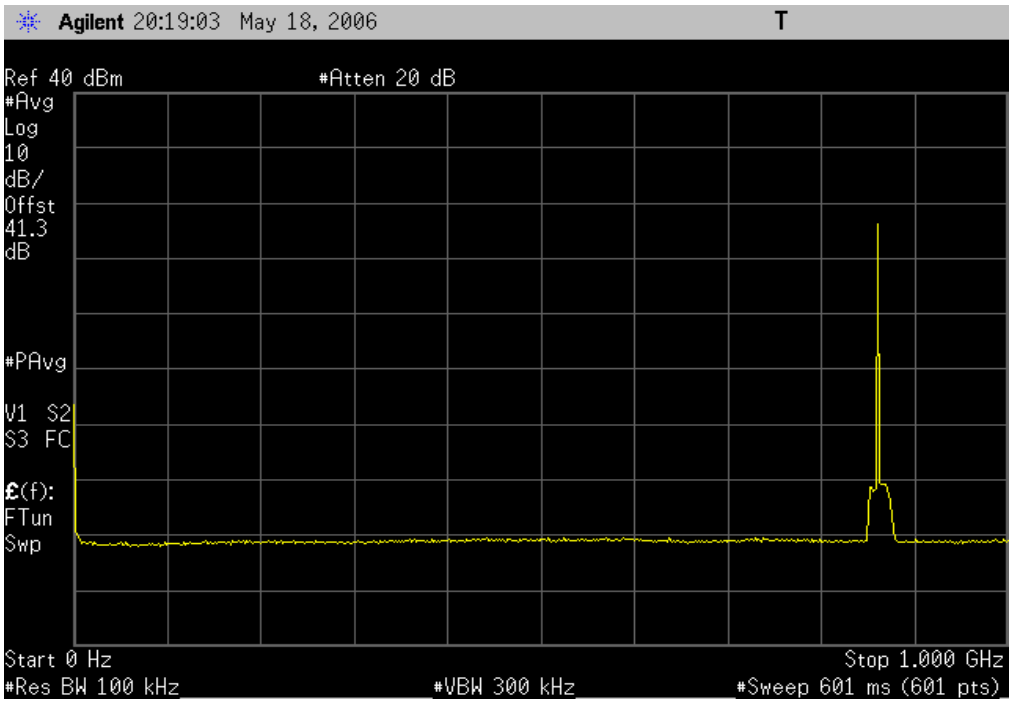


Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

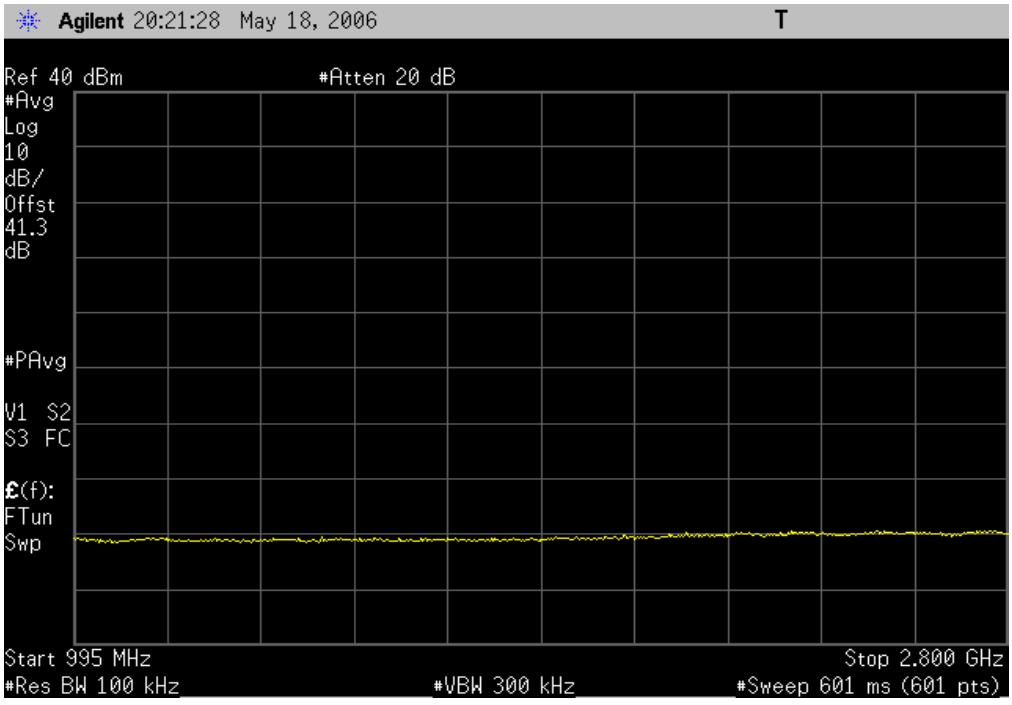


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

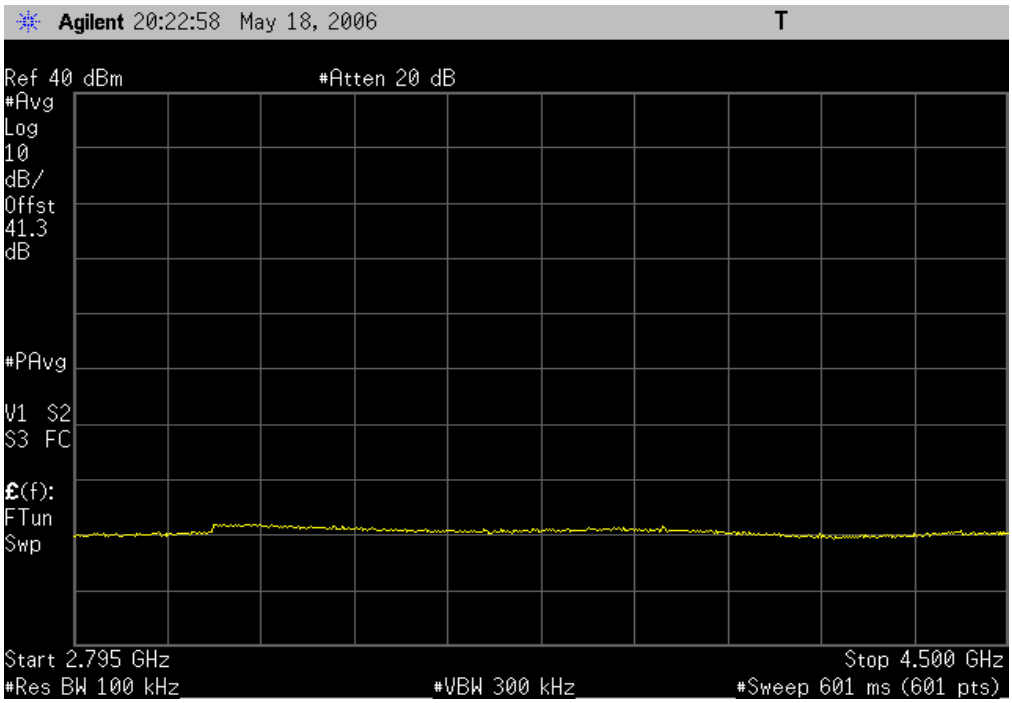


Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

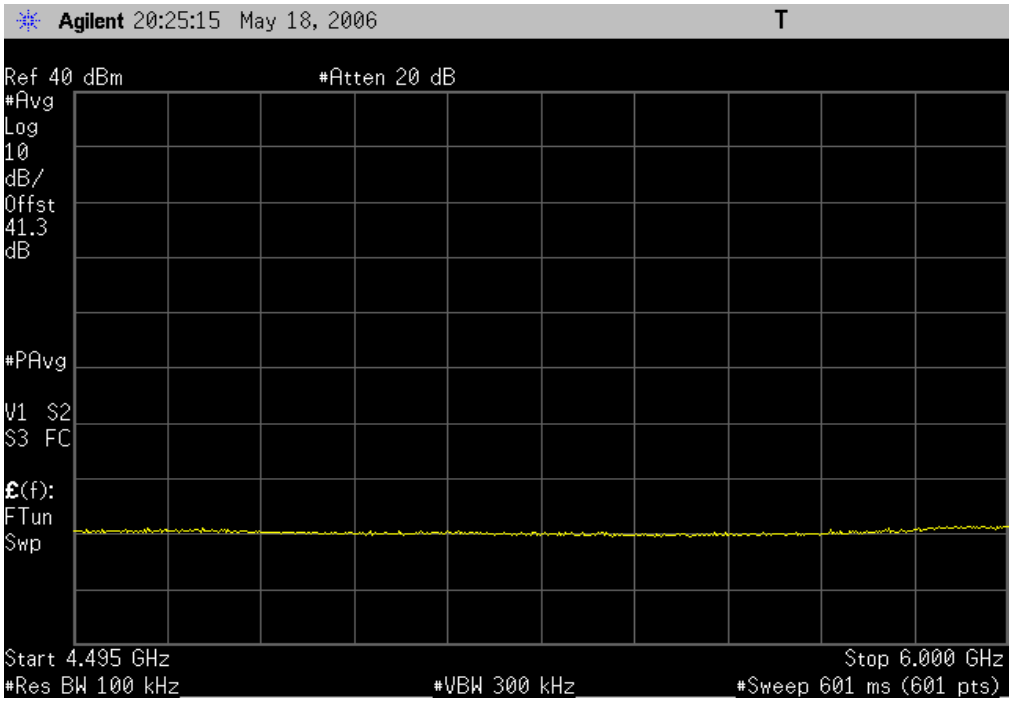


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

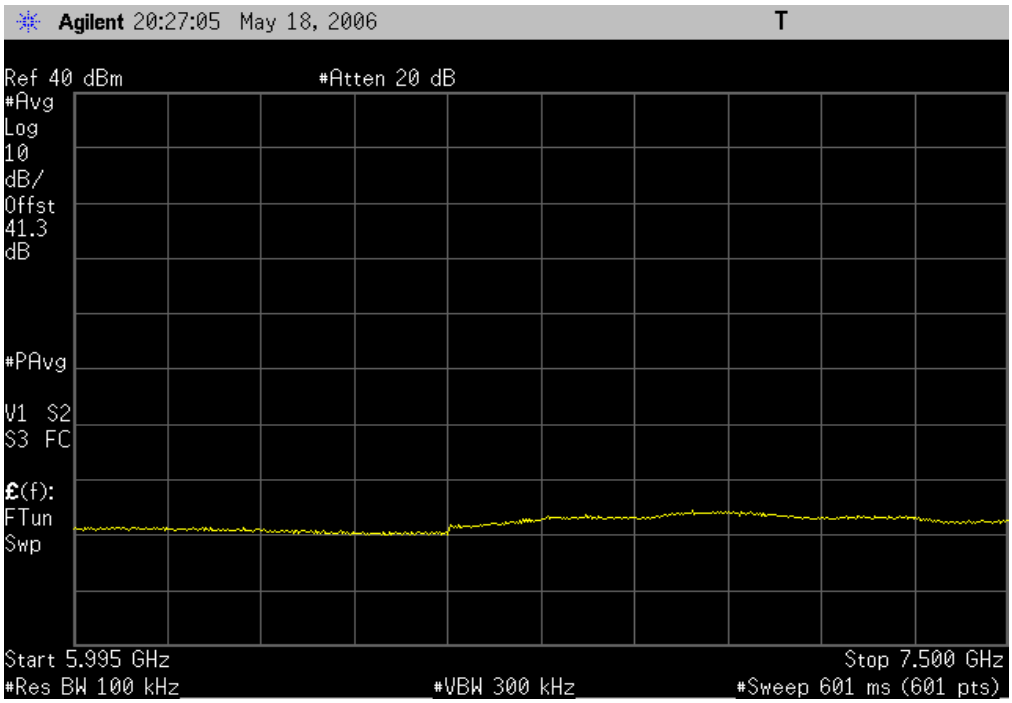


Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

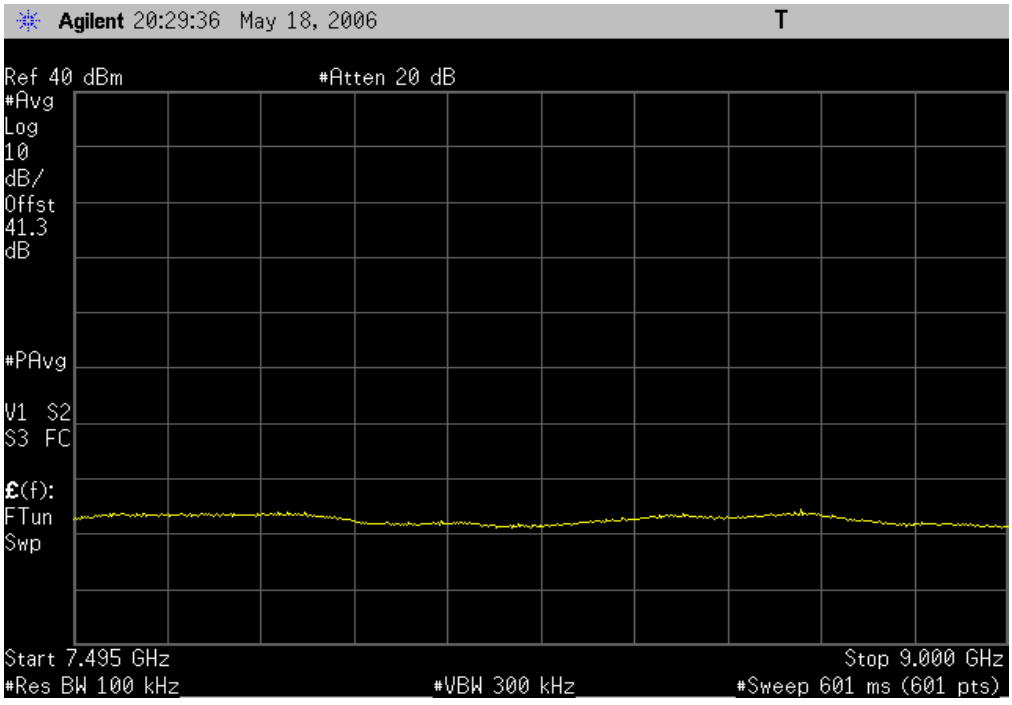


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

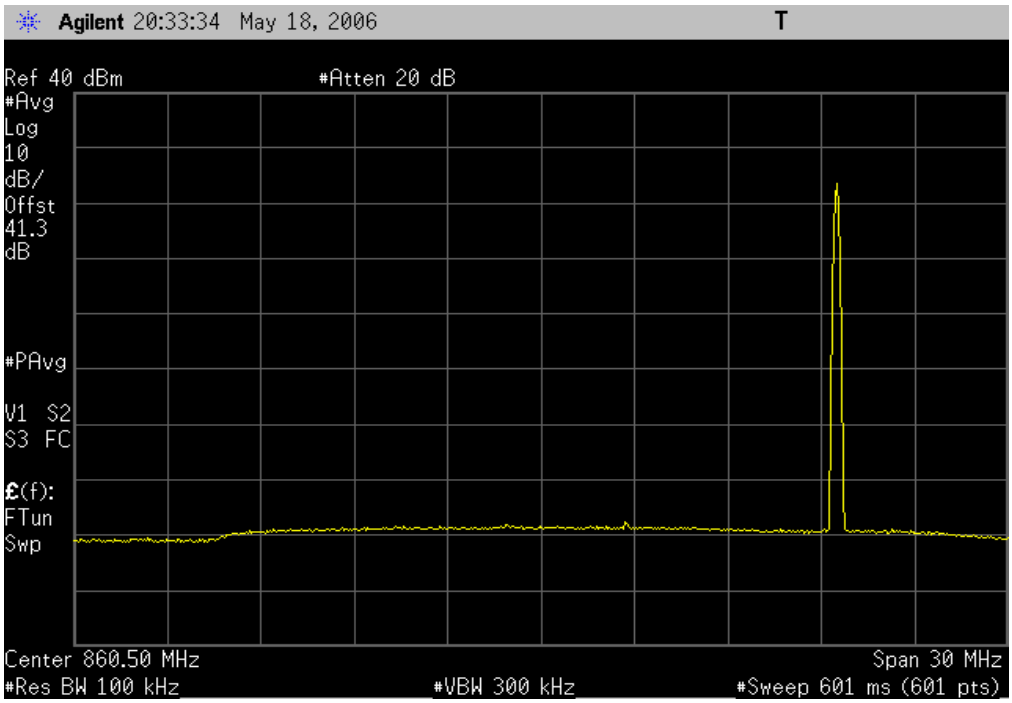
Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



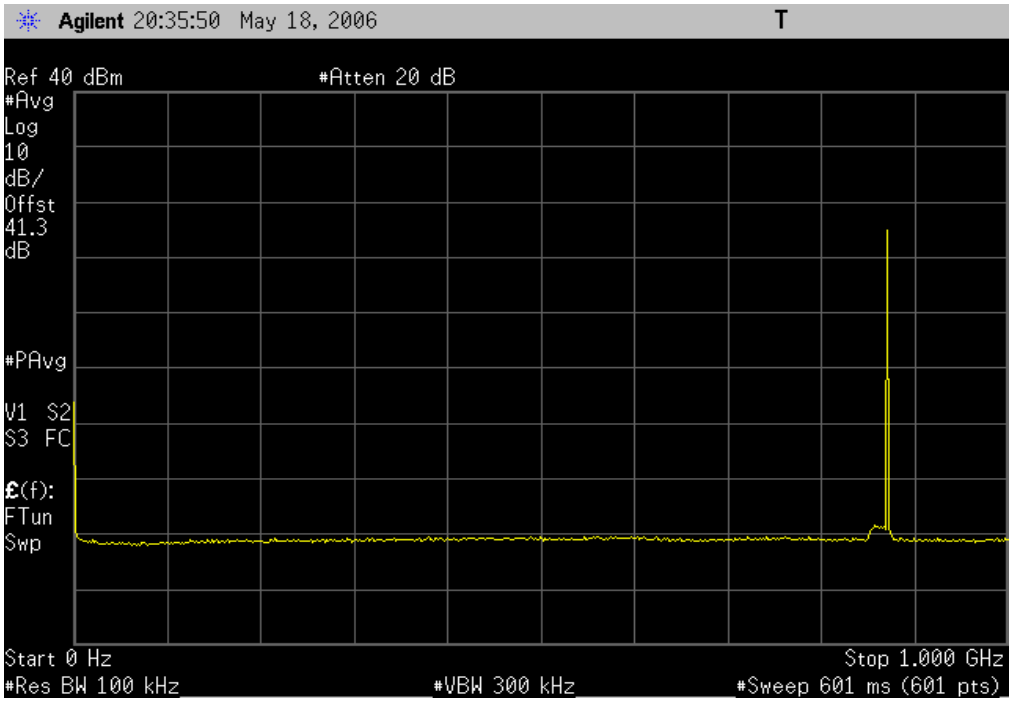
Mid Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



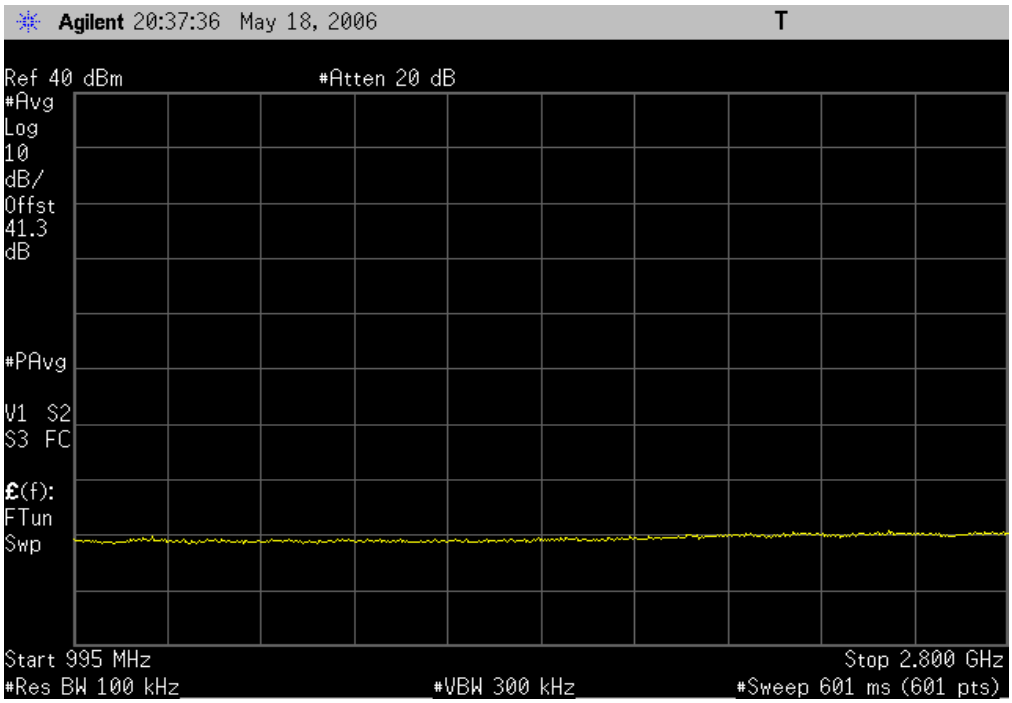
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



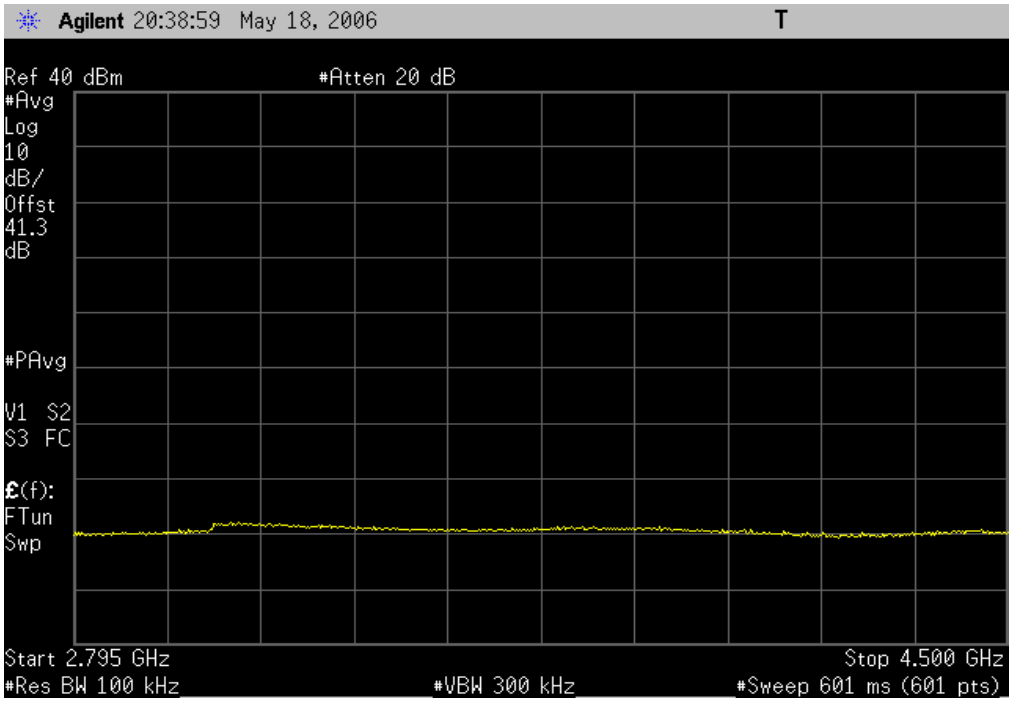
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



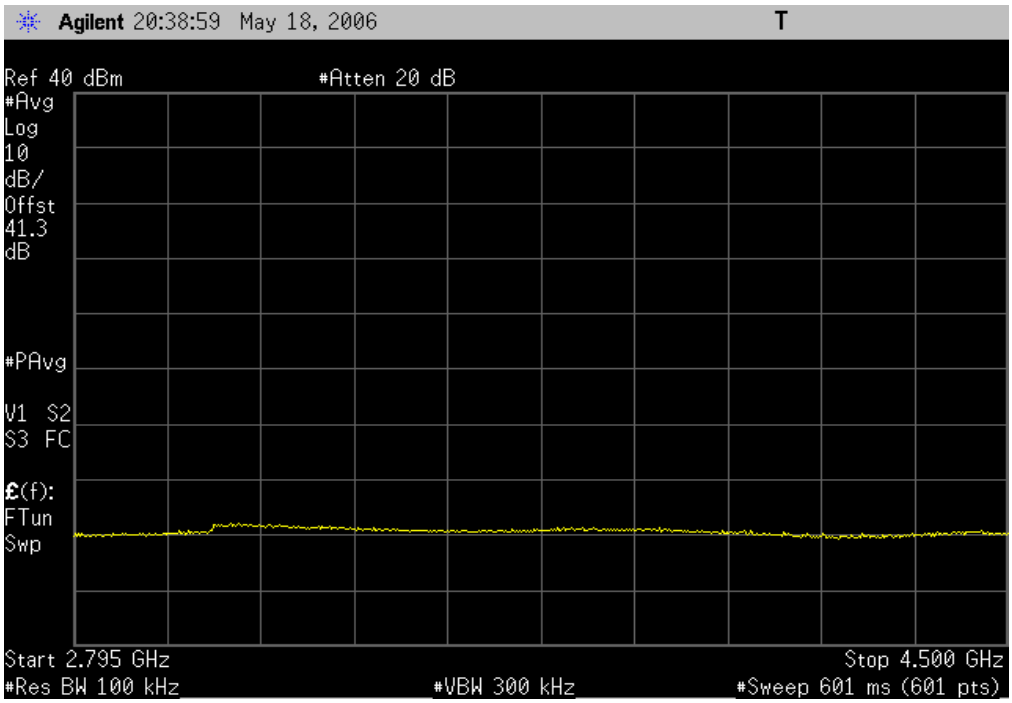
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



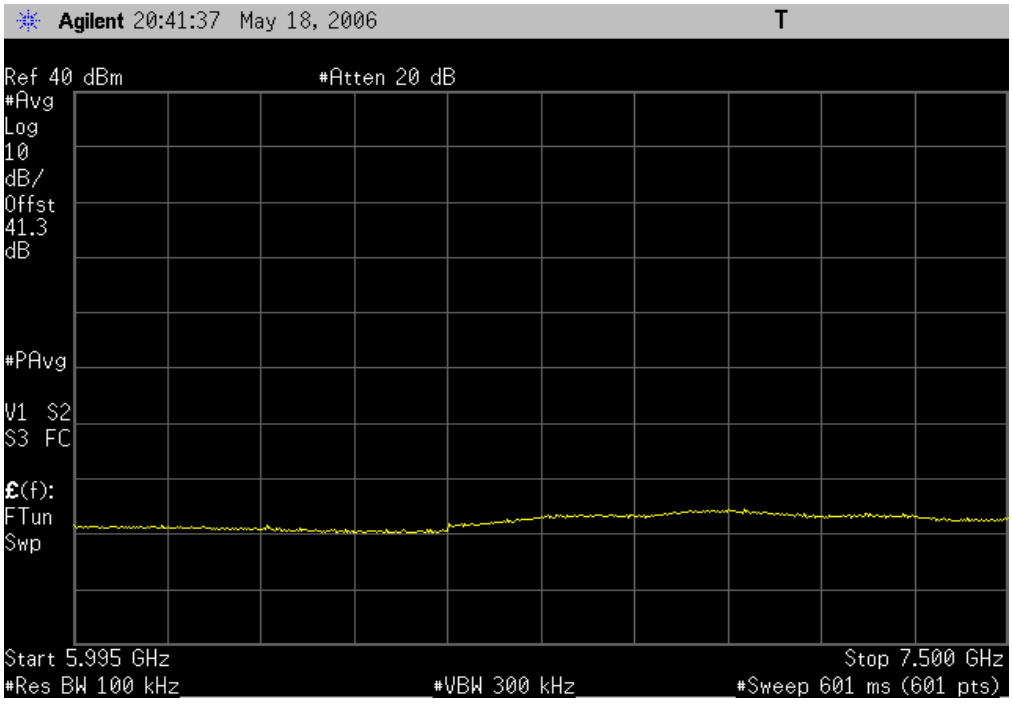
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



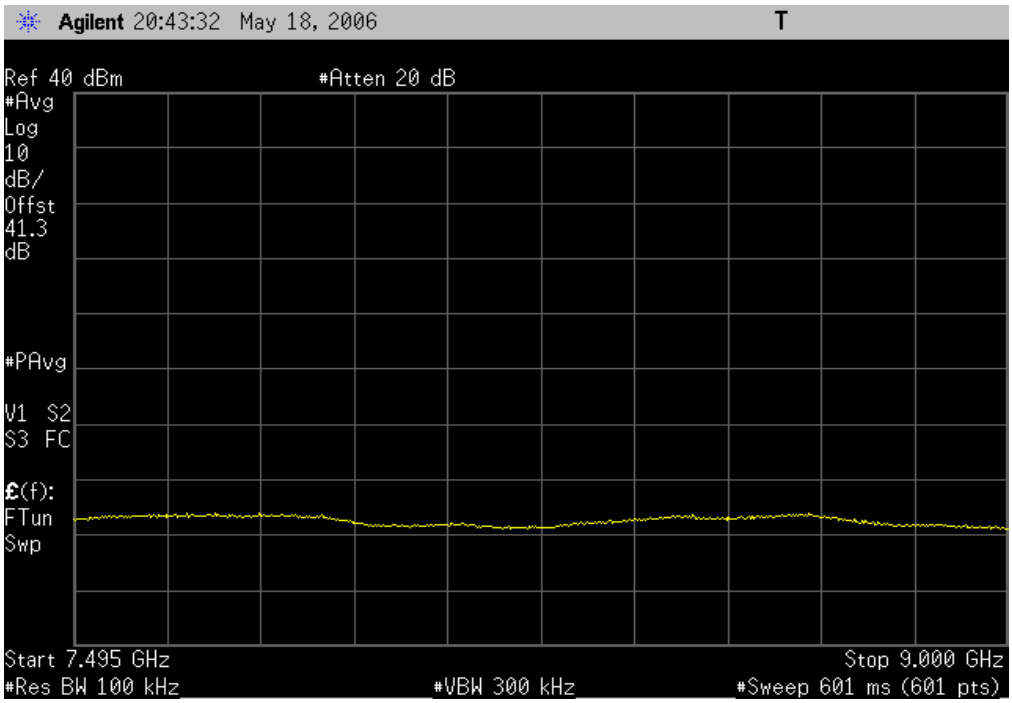
High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 7.495GHz-9GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antenna power conducted emissions were measured with the EUT set in receive mode. The measurements were made using a direct connection between each of the RF outputs of the EUT and the spectrum analyzer. The spectrum was scanned throughout the specified frequency range.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/23/06
Customer:	Radioframe Networks, Inc.			Temperature:	24°C
Attendees:	Dean Busch			Humidity:	41%
Project:	None			Barometric Pres.:	29.93
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.111:2006	ANSI C63.4 2003

COMMENTS

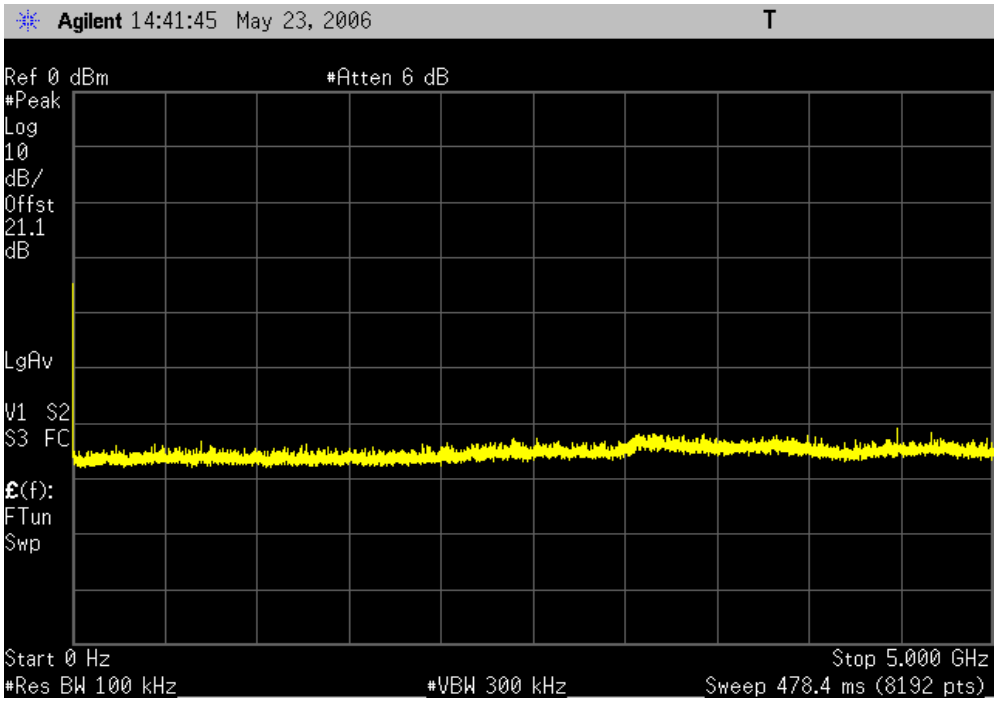
900MHz Band

DEVIATIONS FROM TEST STANDARD

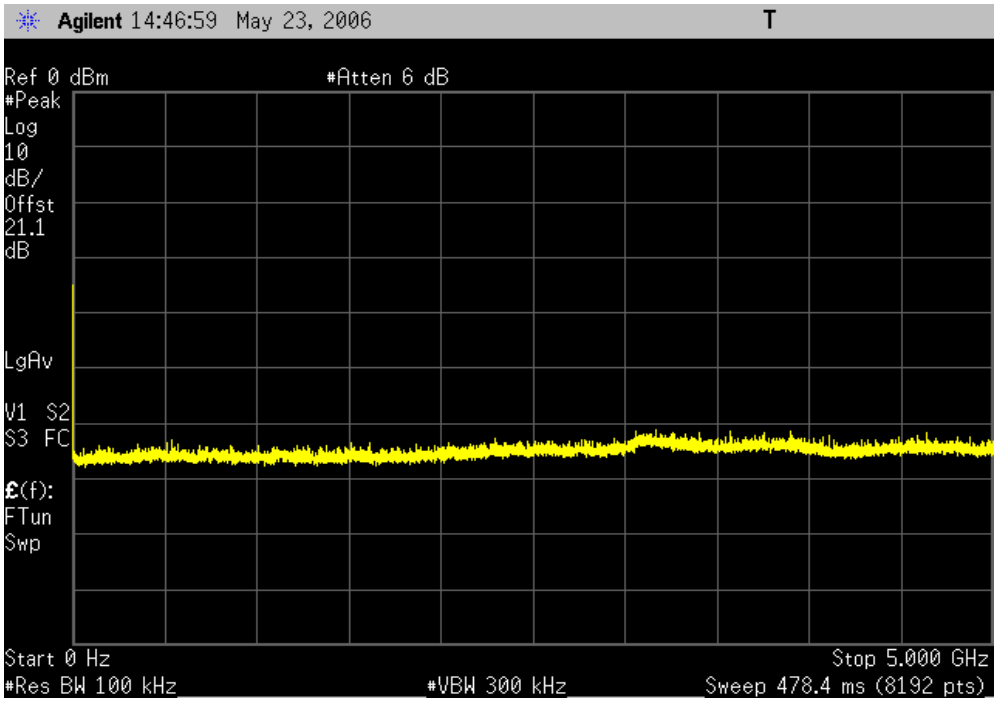
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
RX1 port	< -60 dBm	≤ -57 dBm	Pass
RX2 port	< -60 dBm	≤ -57 dBm	Pass
RX3 port	< -60 dBm	≤ -57 dBm	Pass

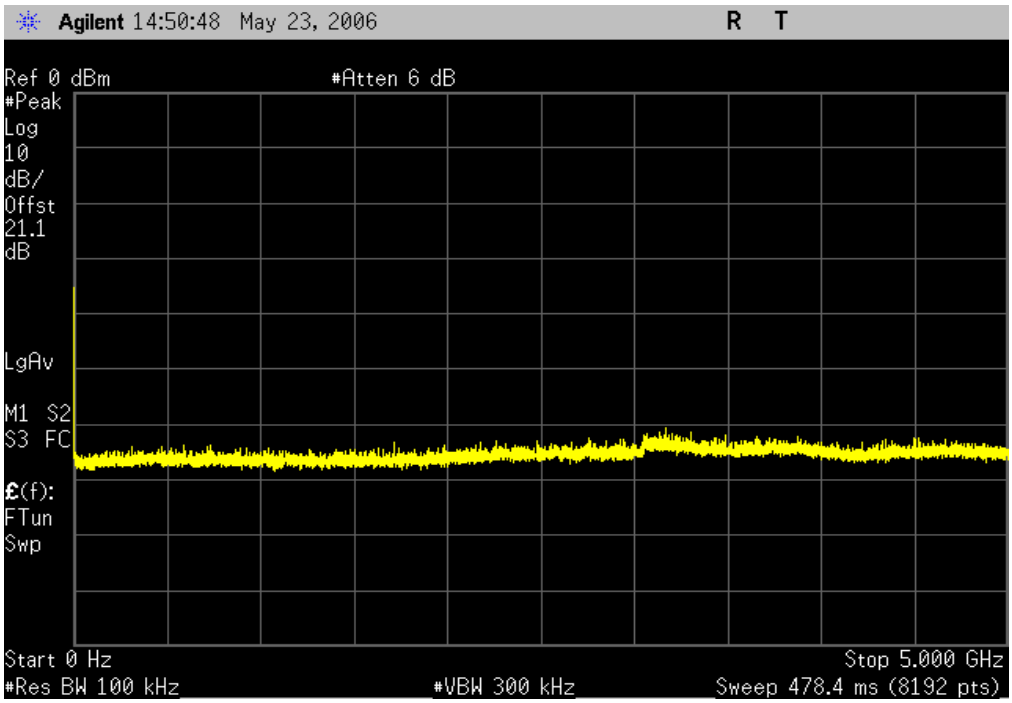
RX1 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



RX2 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



RX3 port					
Result:	Pass	**Value:**	< -60 dBm	**Limit:**	≤ -57 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 10 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	Dean Busch			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

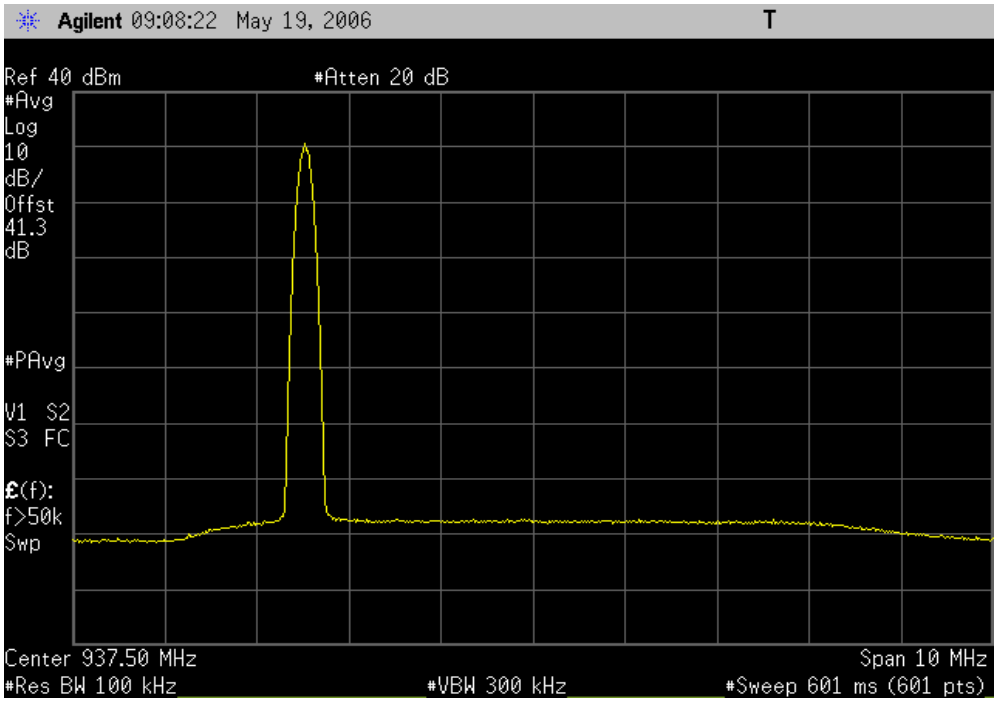
900MHz Band, High Power Level

DEVIATIONS FROM TEST STANDARD

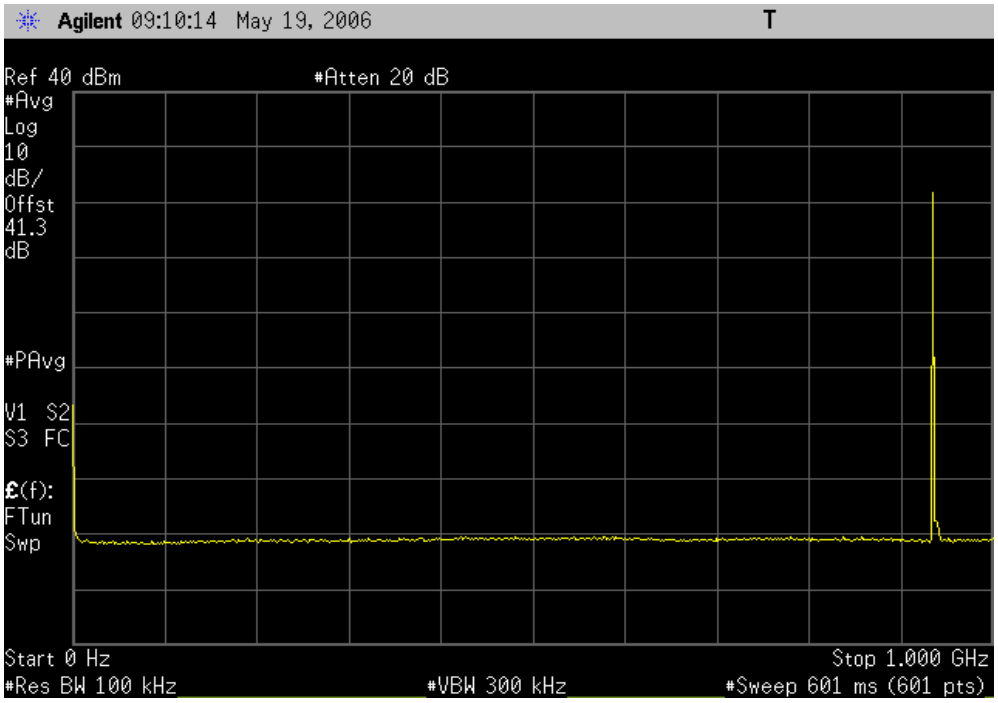
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, In Band	-22.4 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
9 Channel Intermods, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass

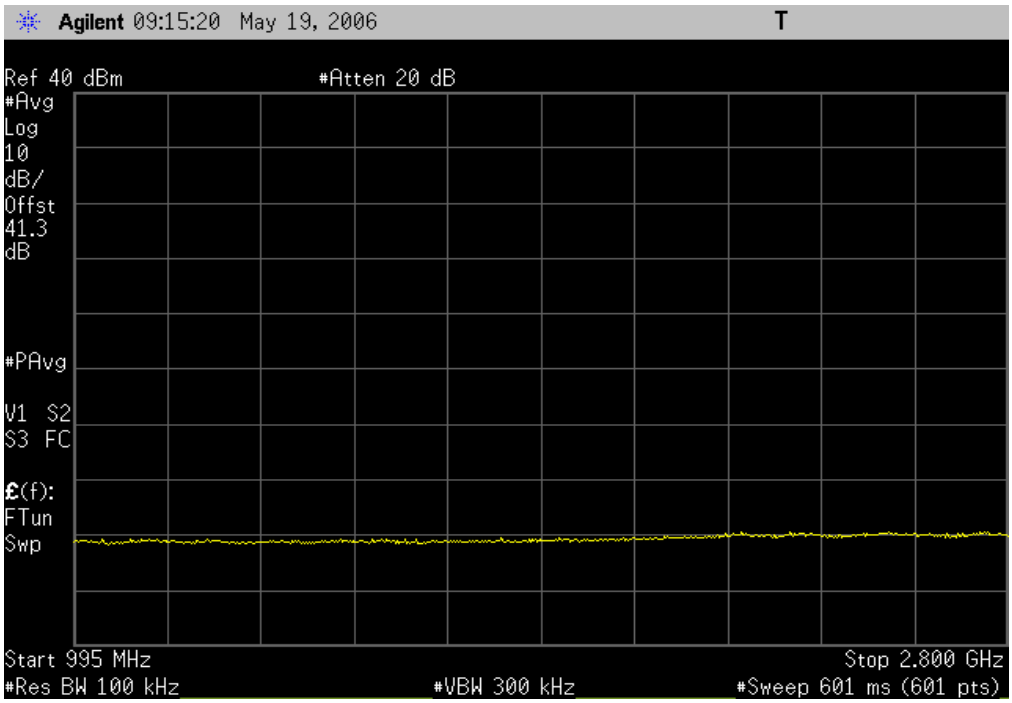
Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



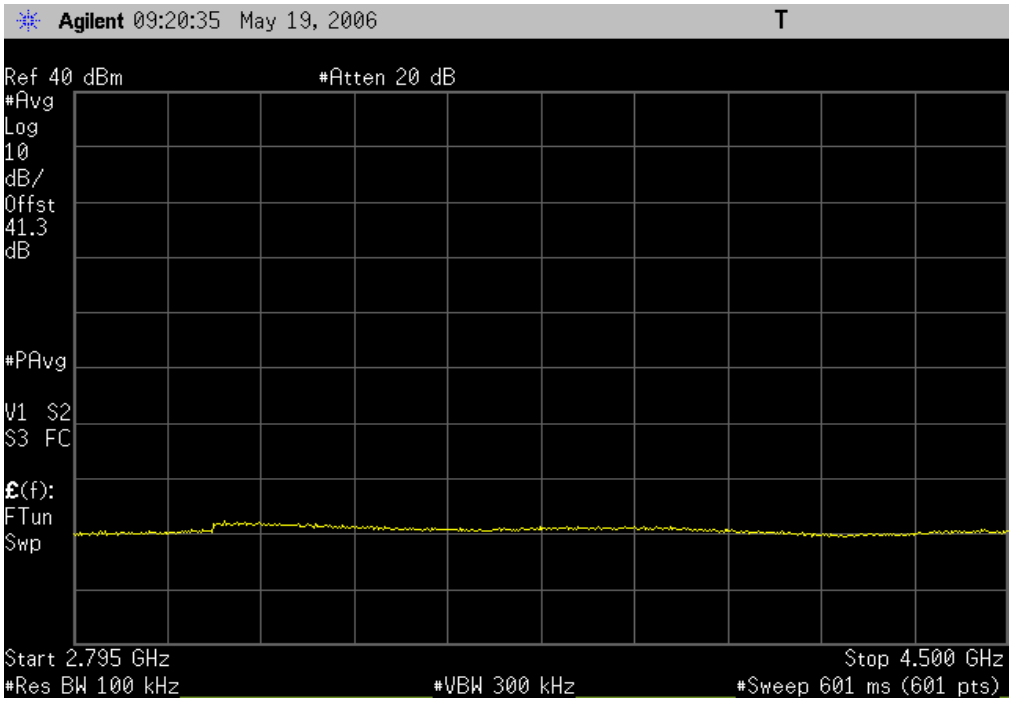
Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



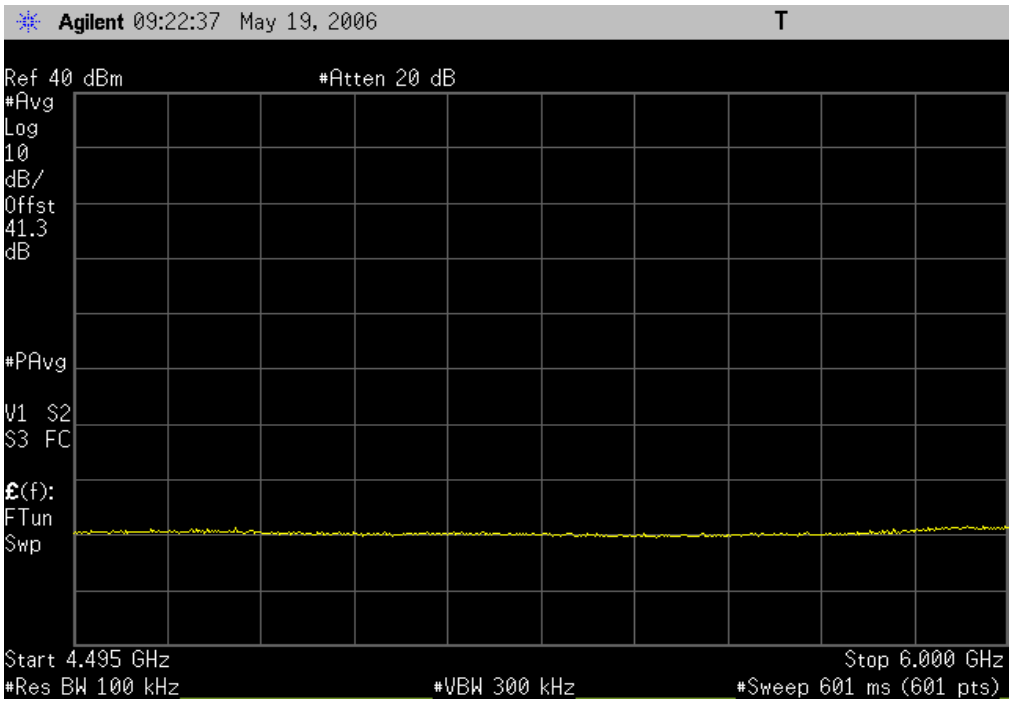
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



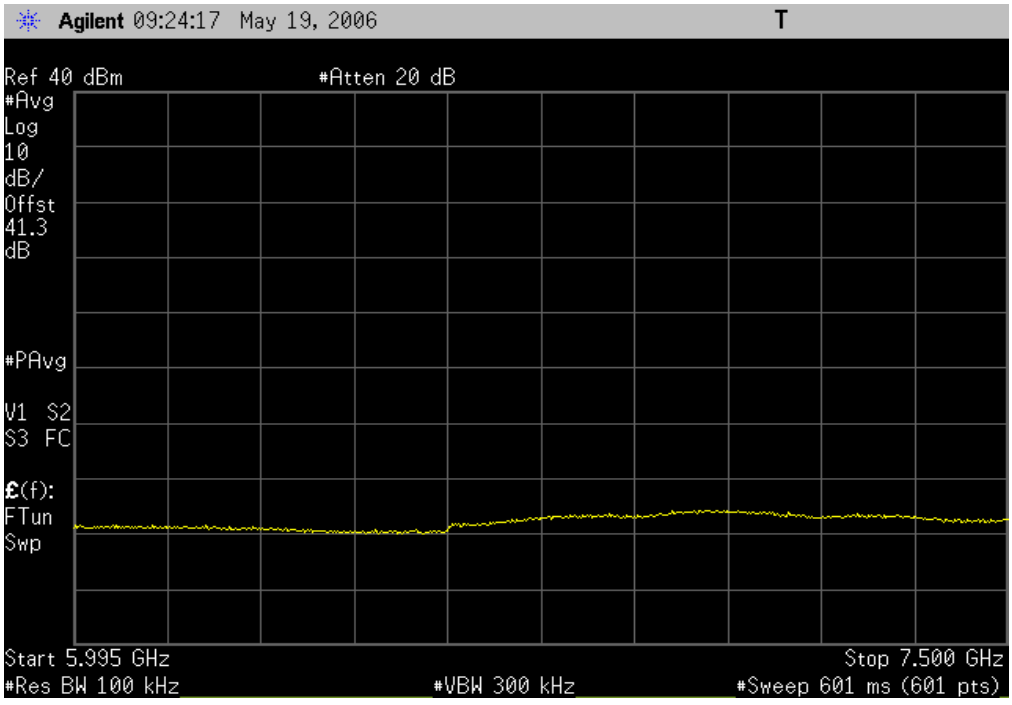
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



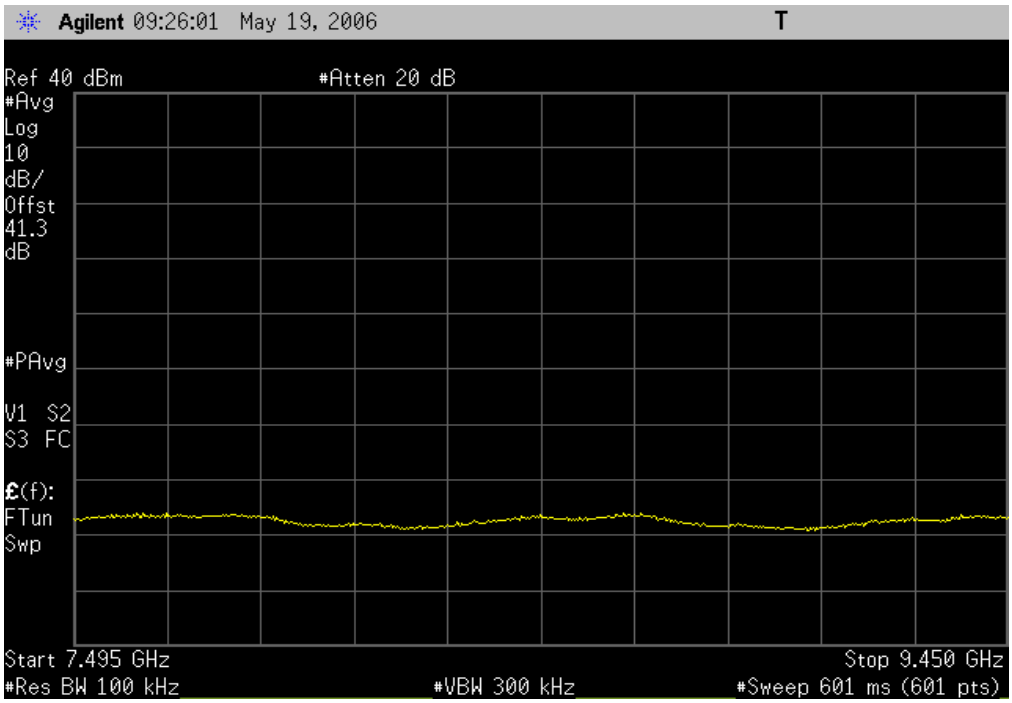
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



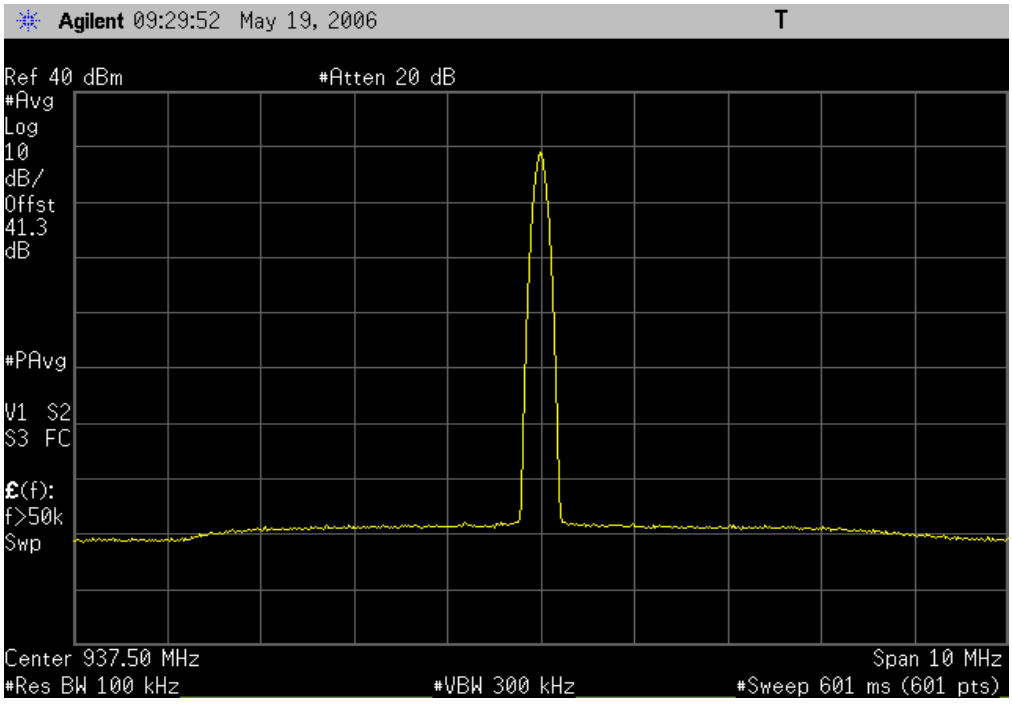
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



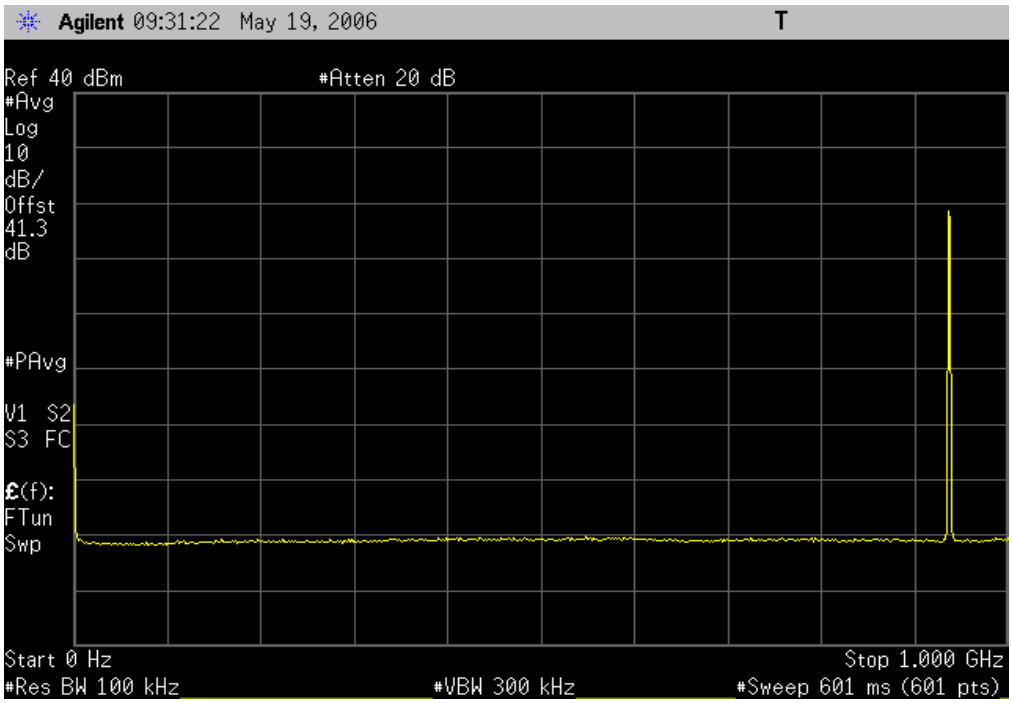
Low Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



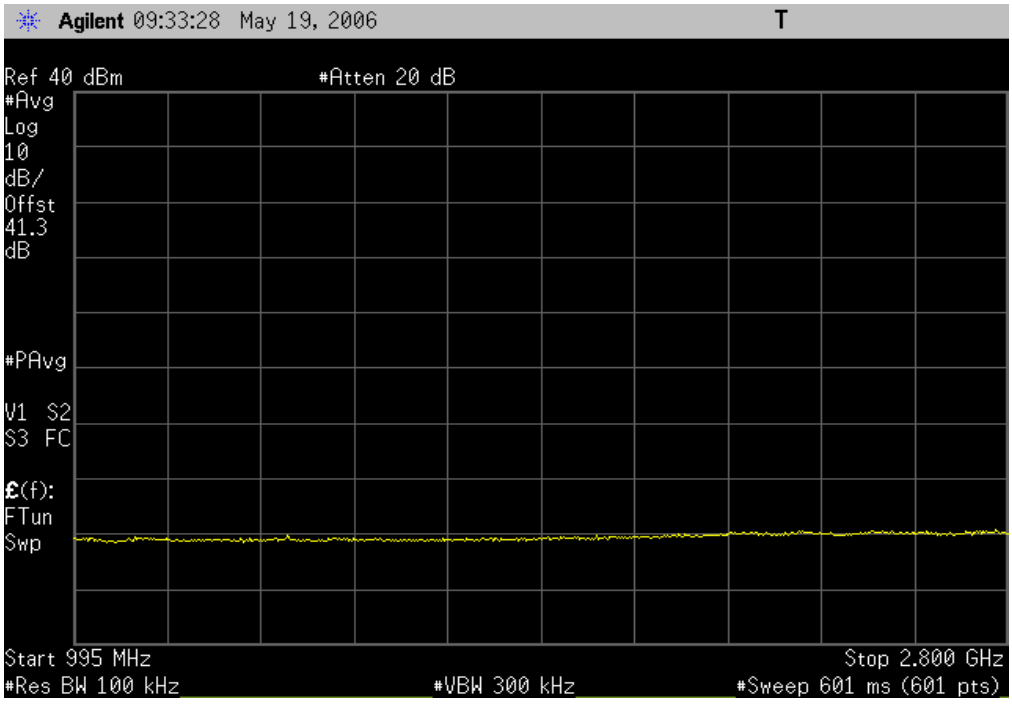
Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



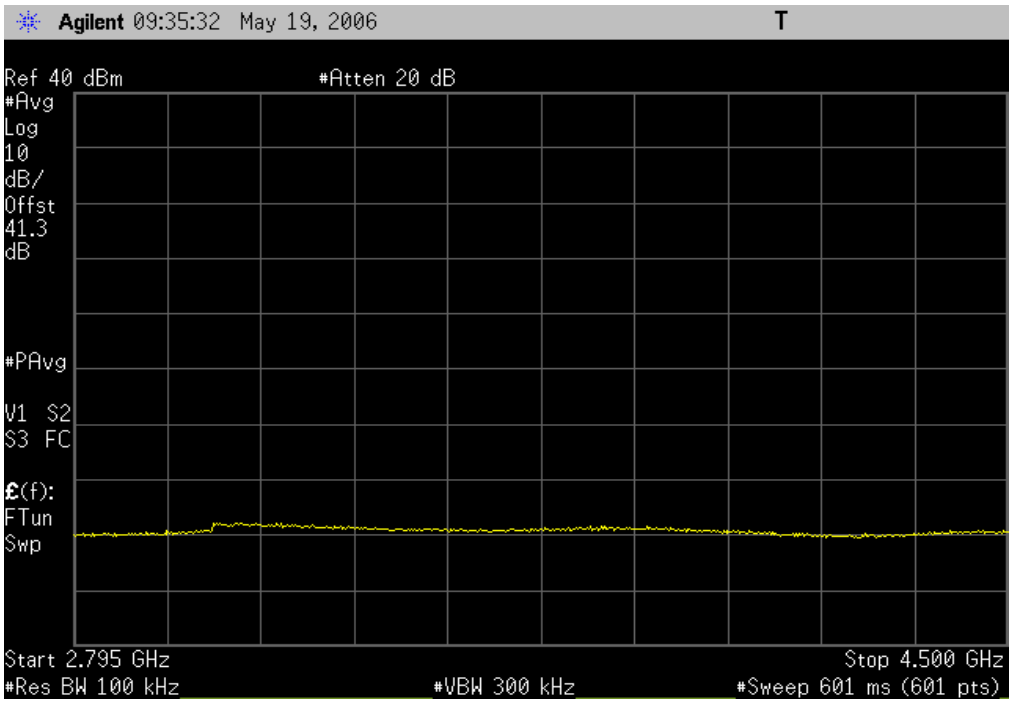
Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



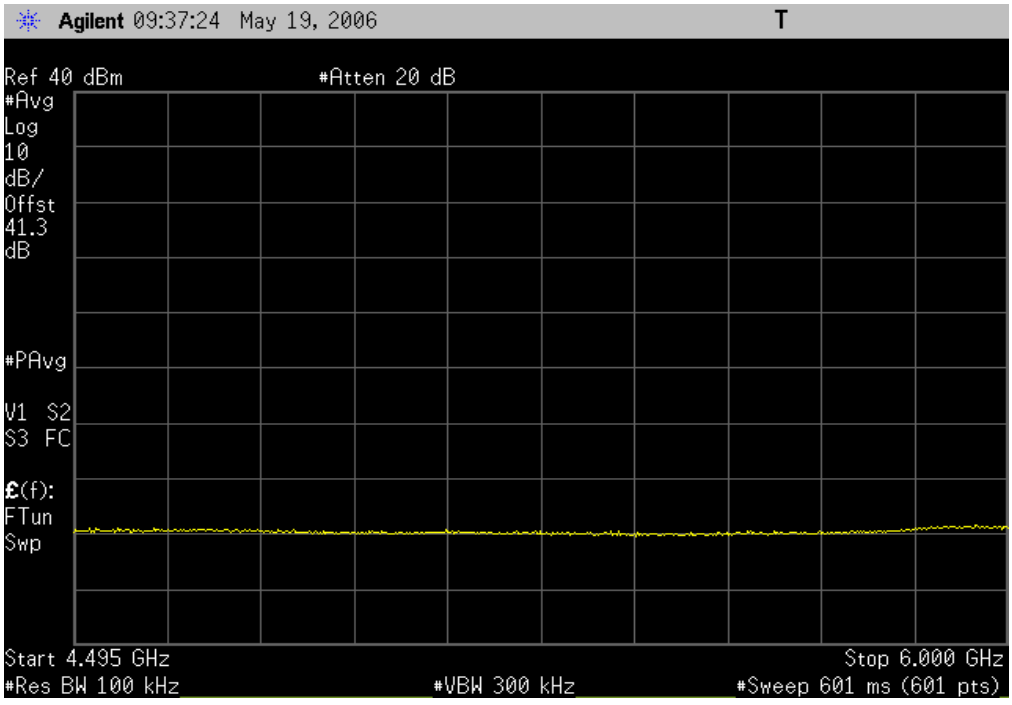
Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



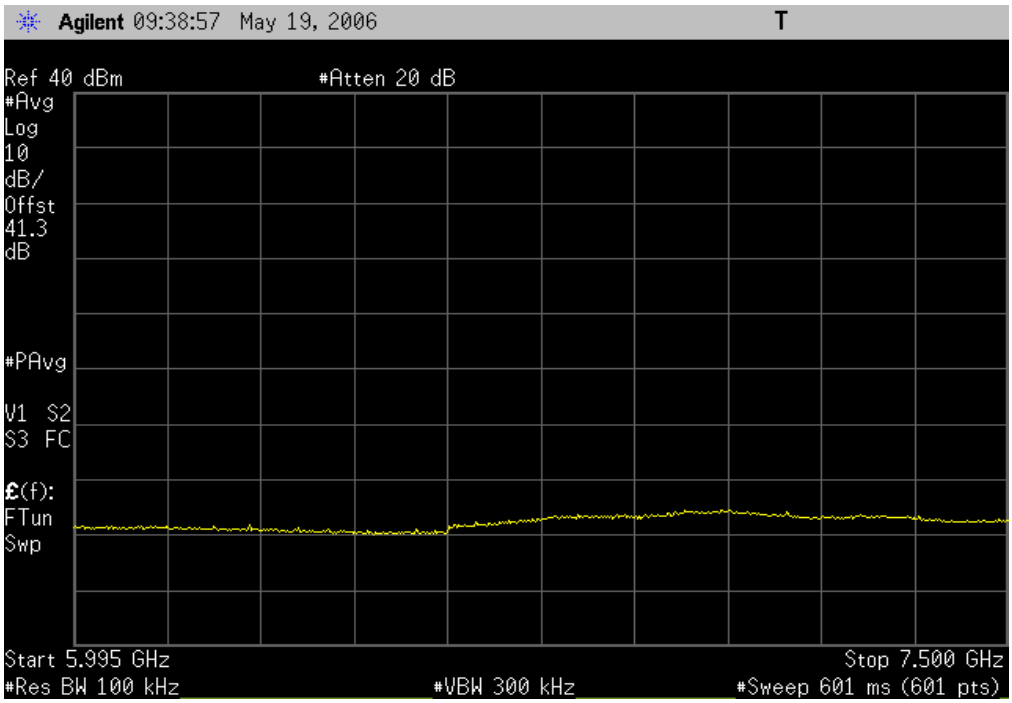
Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



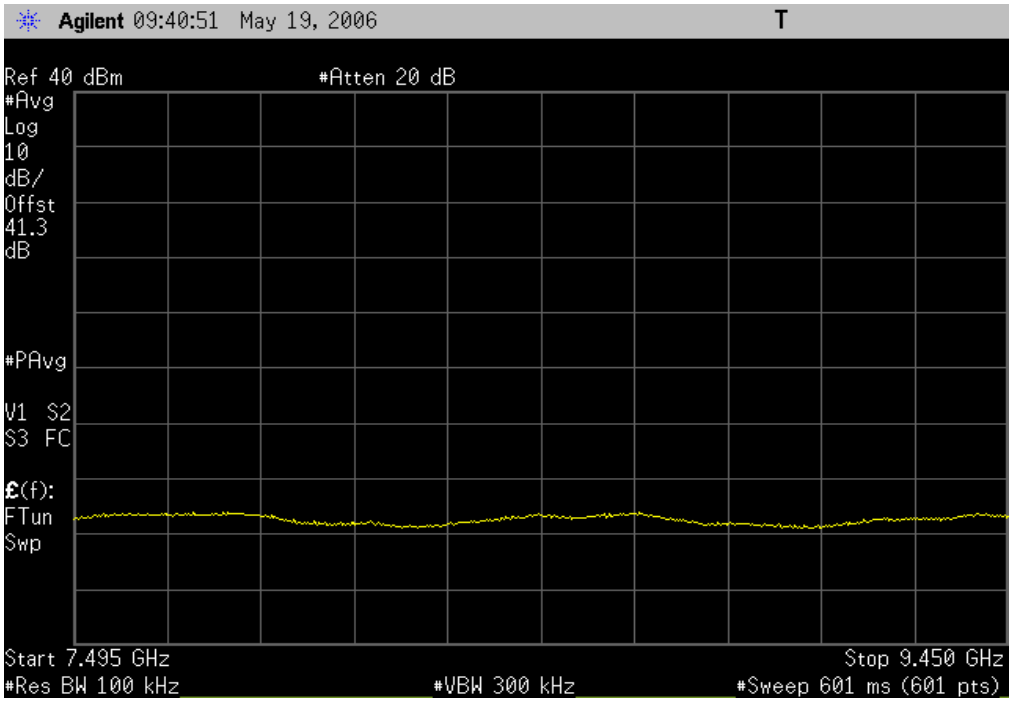
Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



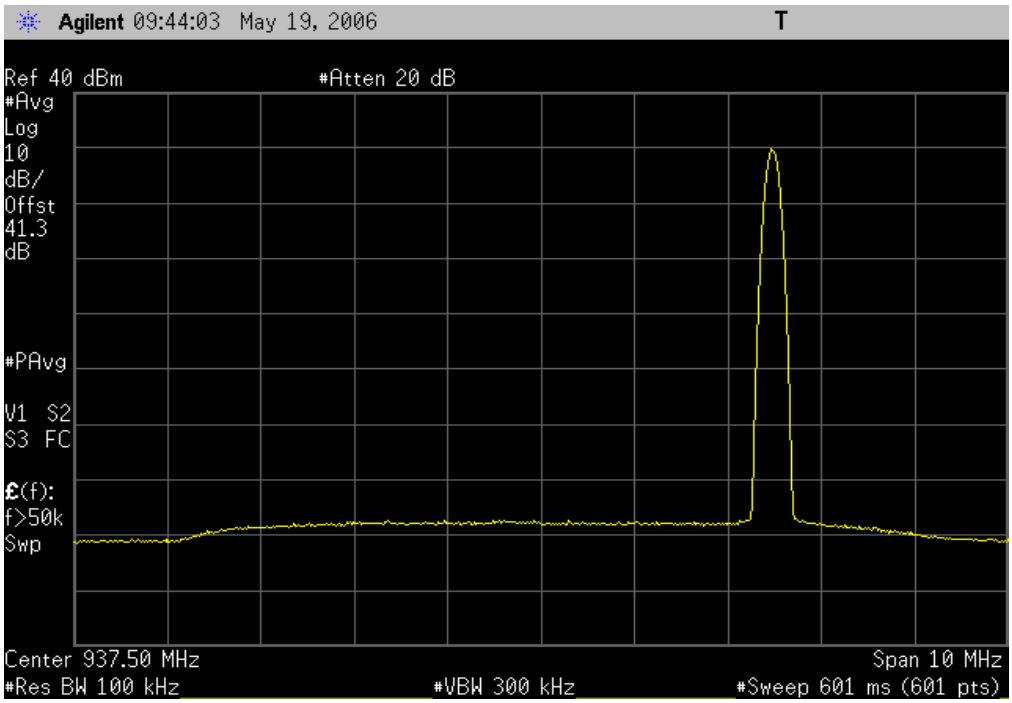
Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



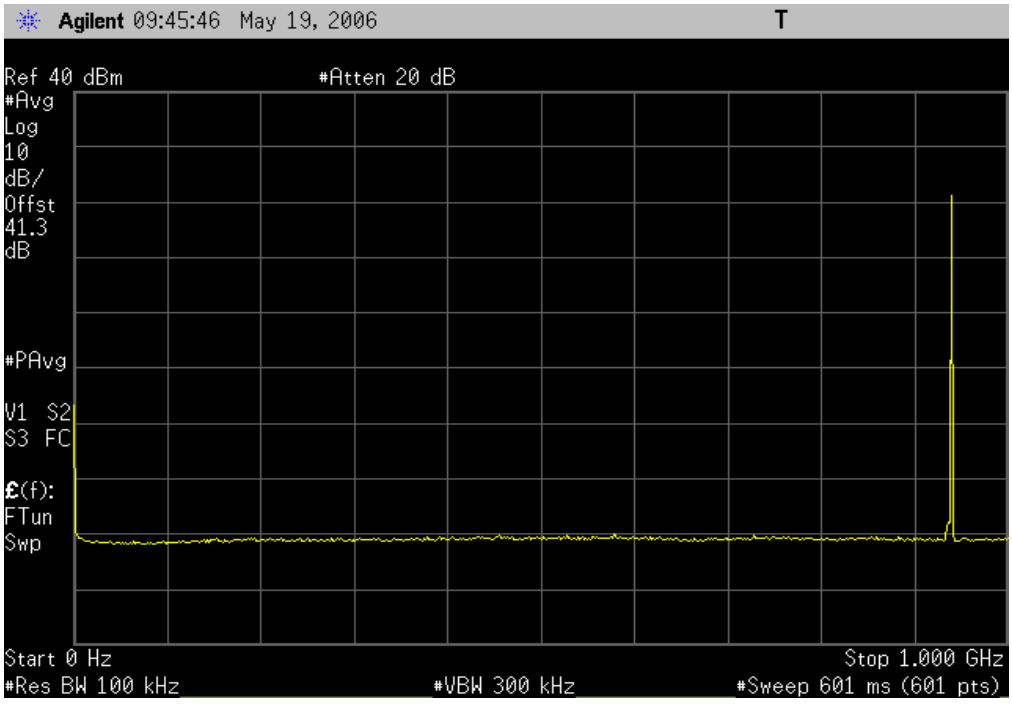
Mid Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



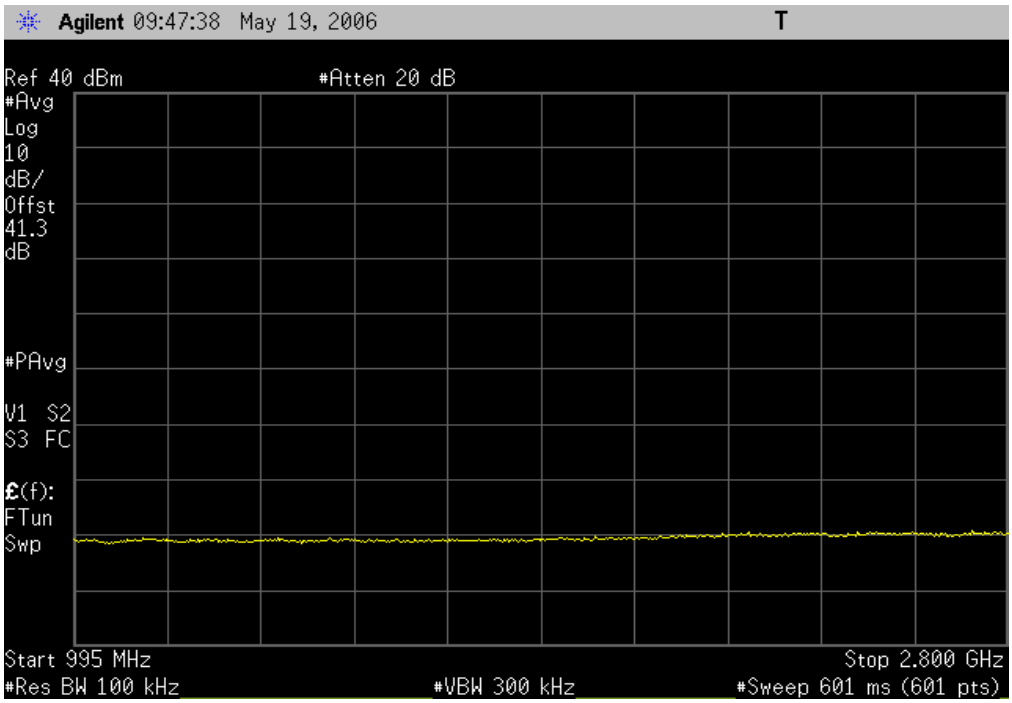
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



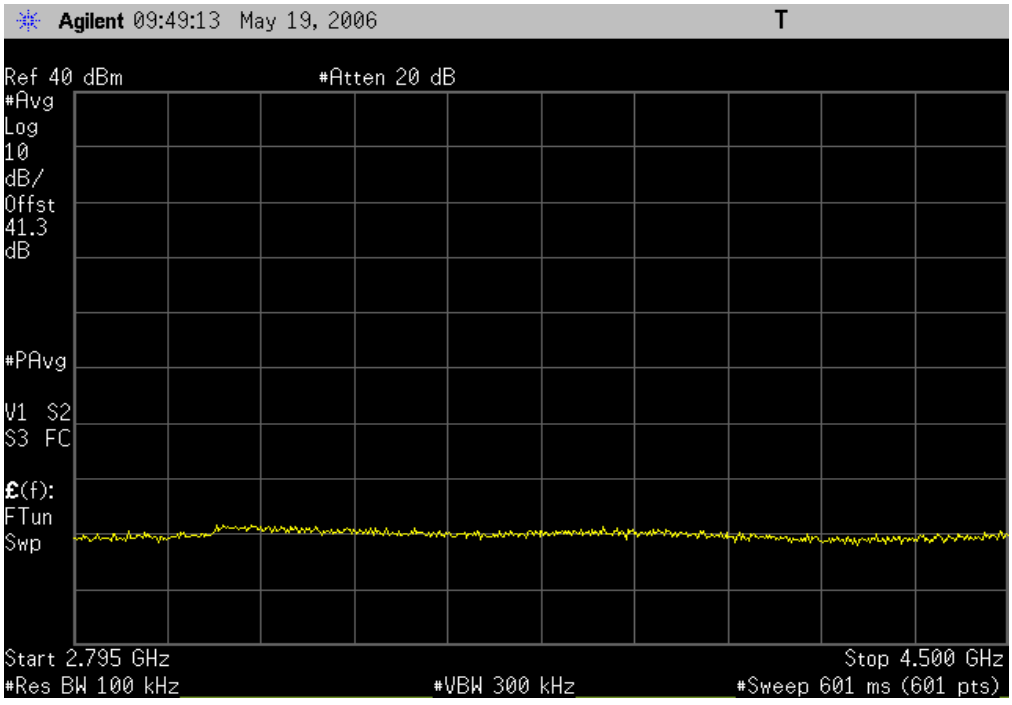
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



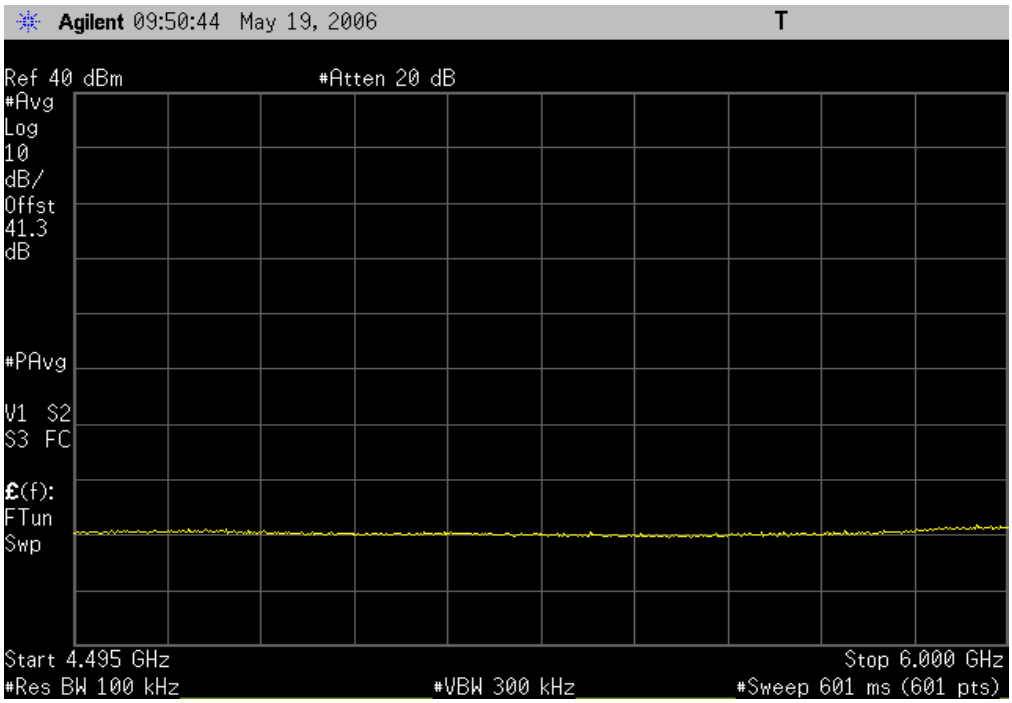
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



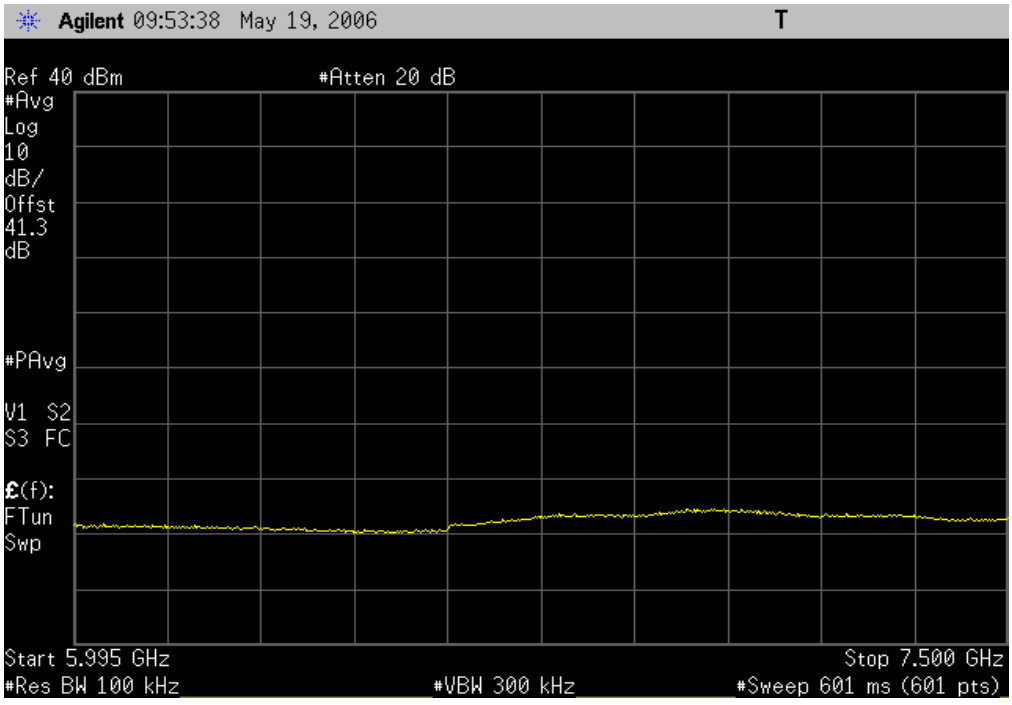
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

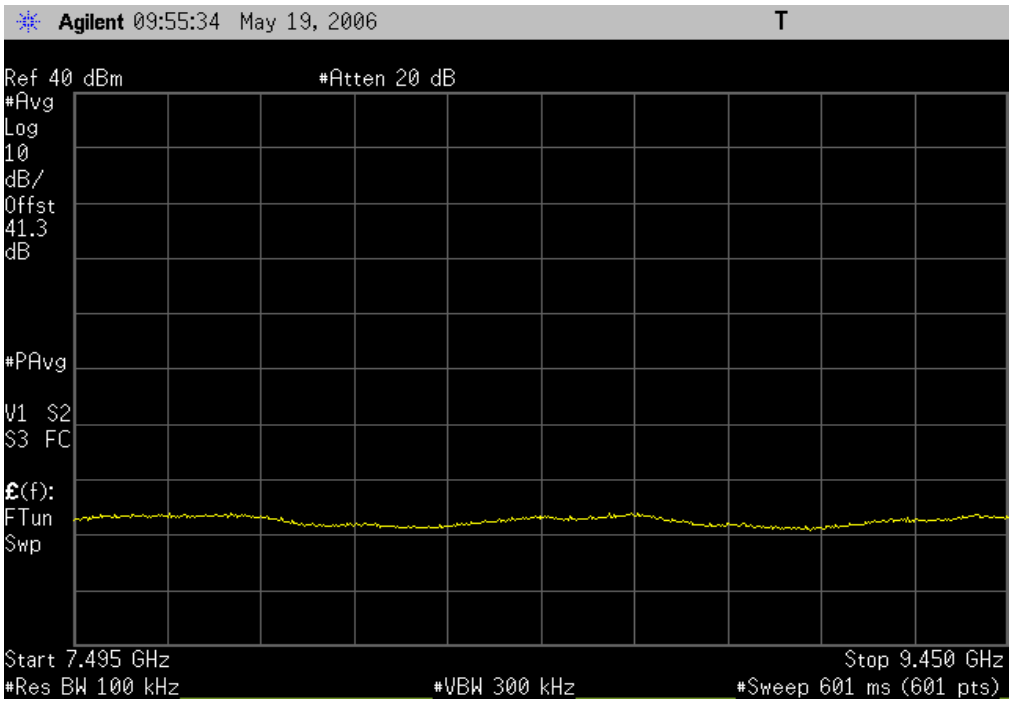


High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

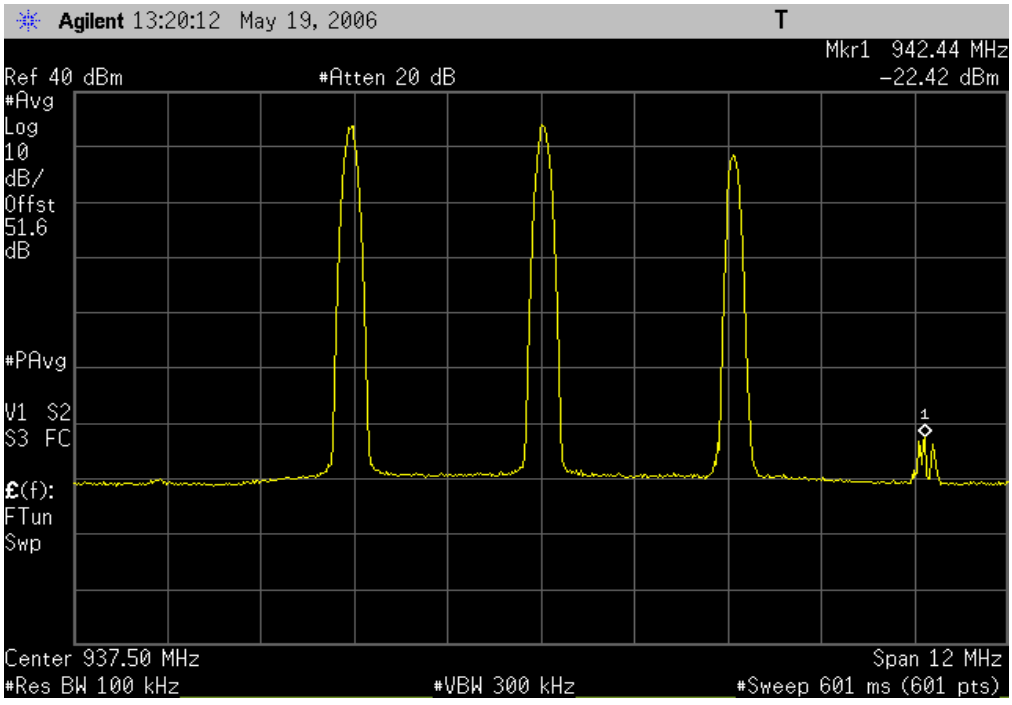


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

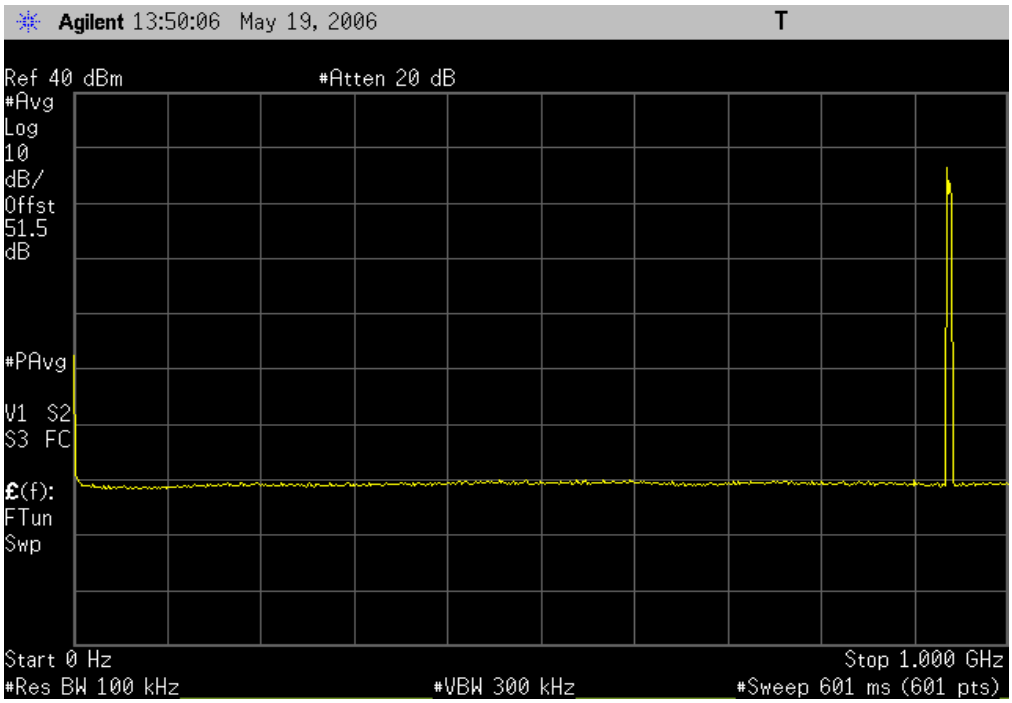
High Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



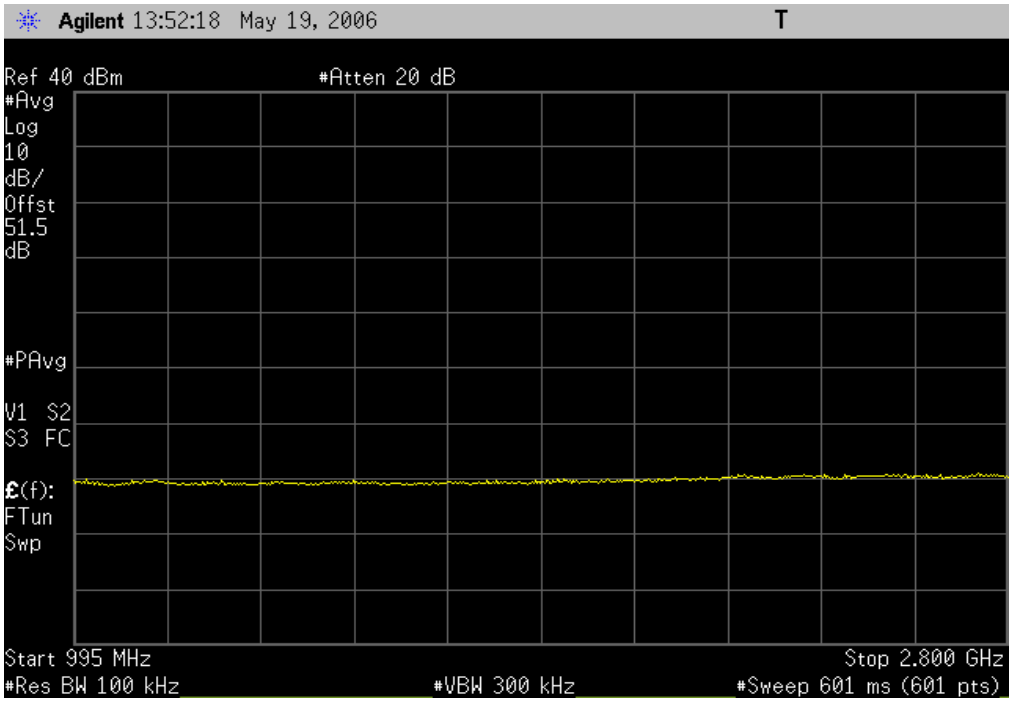
9 Channel Intermods, In Band					
Result:	Pass	**Value:**	-22.4 dBm	**Limit:**	≤ -13 dBm



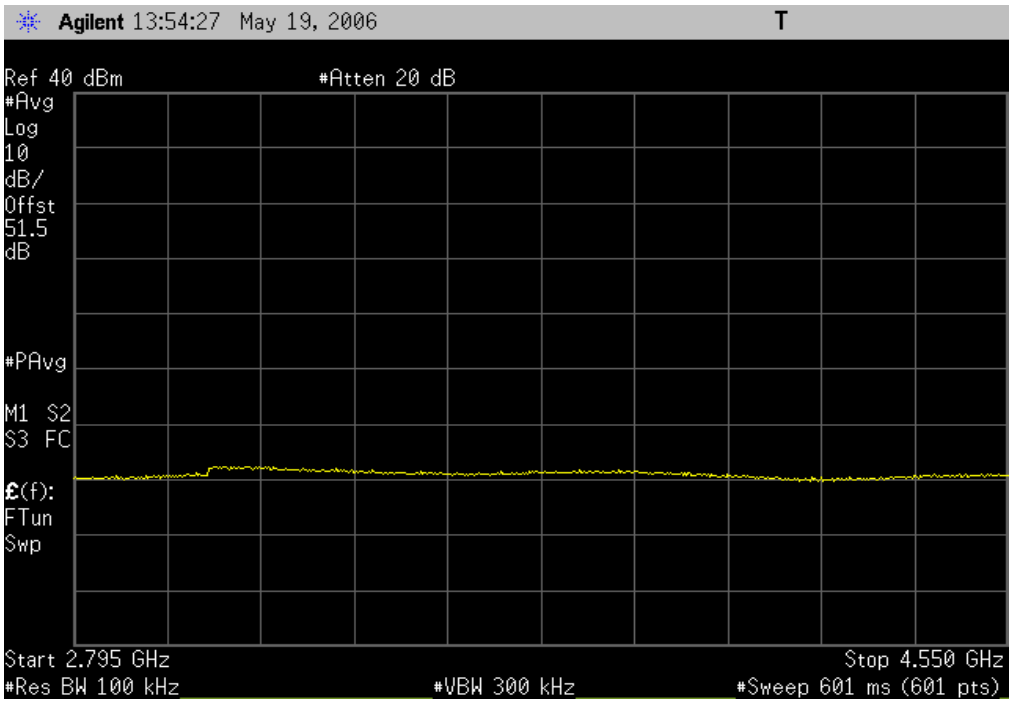
9 Channel Intermods, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



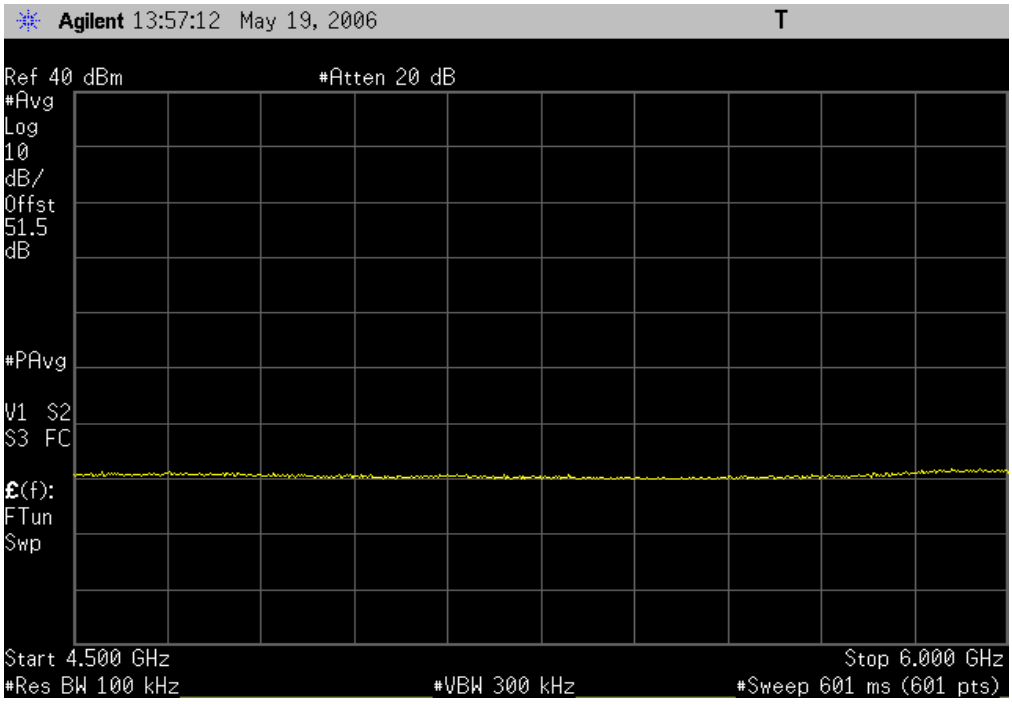
9 Channel Intermods, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



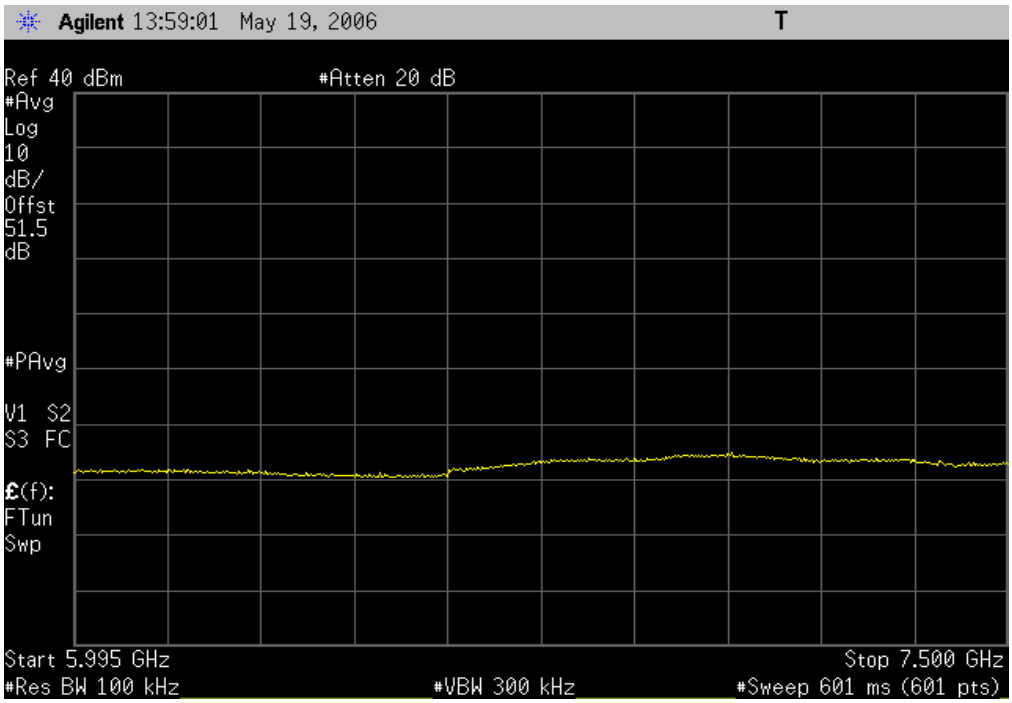
9 Channel Intermods, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



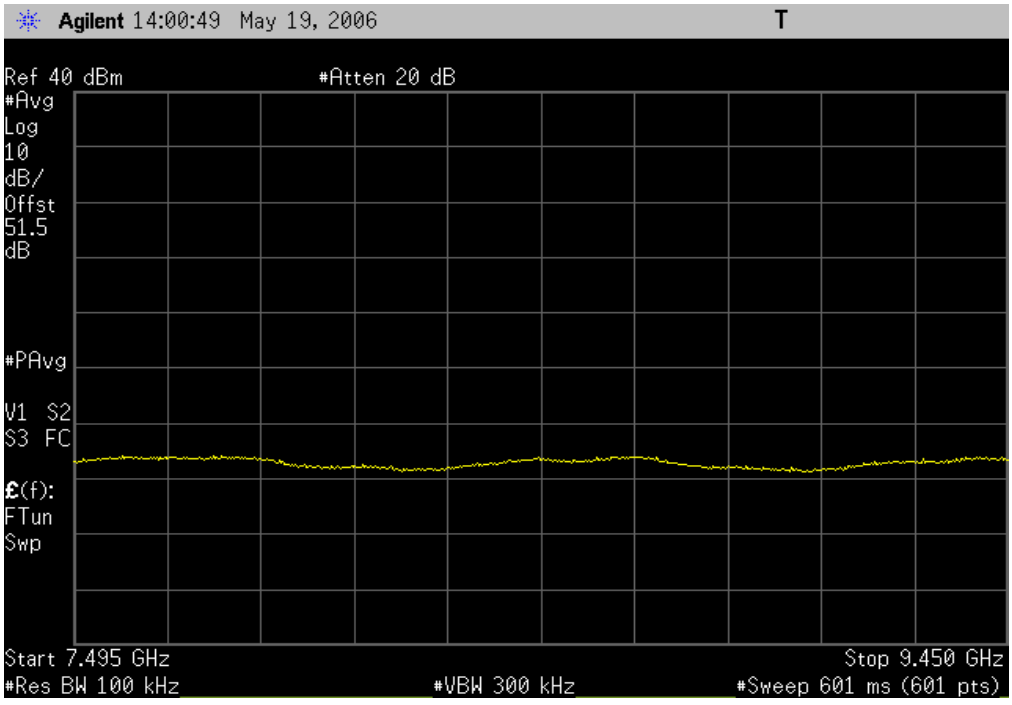
9 Channel Intermods, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



9 Channel Intermods, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



9 Channel Intermods, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 10 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	Dean Busch			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

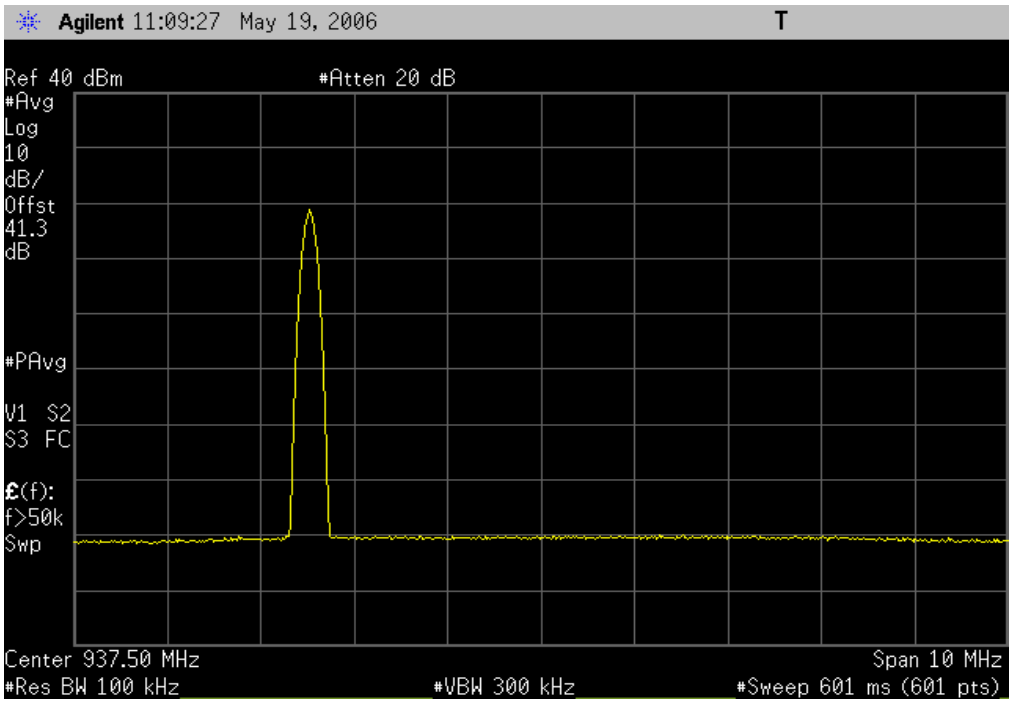
900MHz Band, High Power Level

DEVIATIONS FROM TEST STANDARD

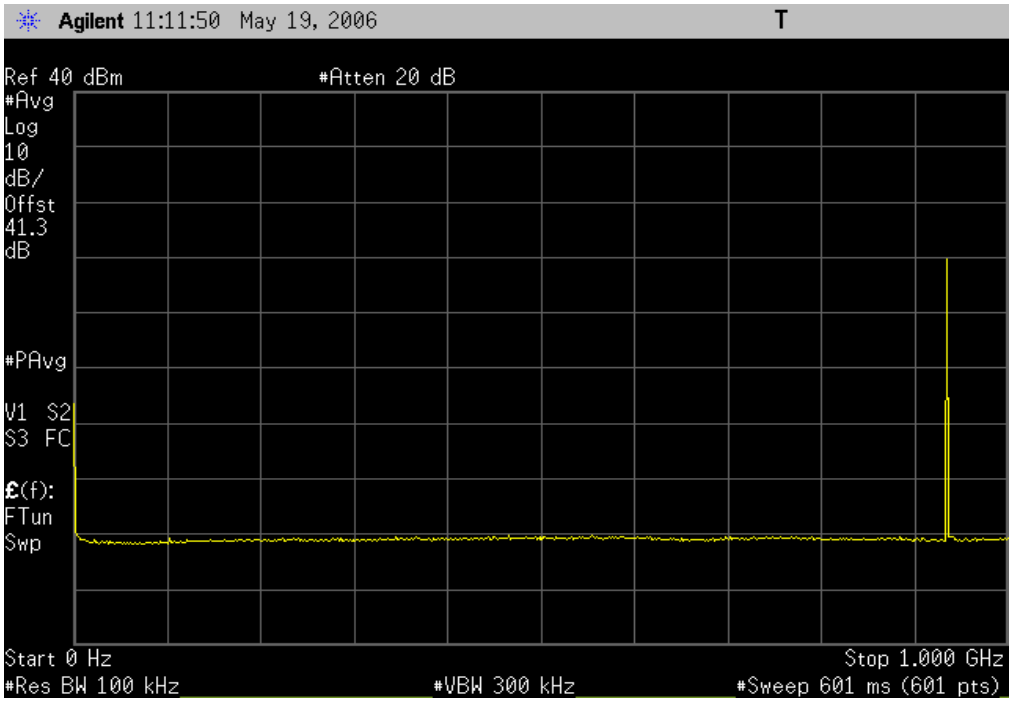
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass

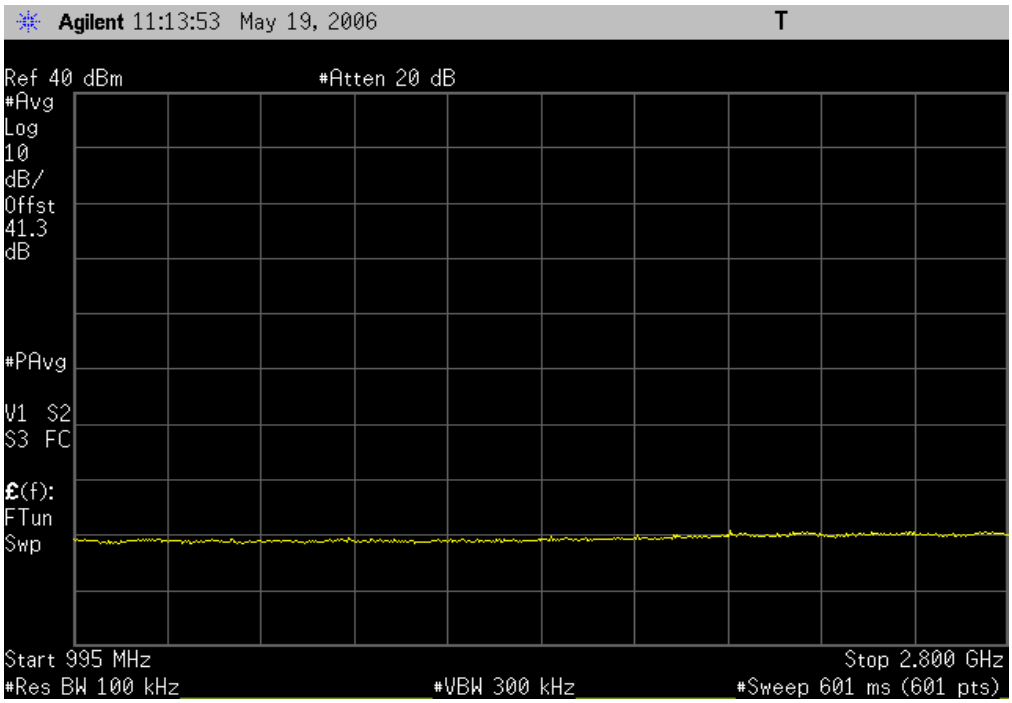
Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



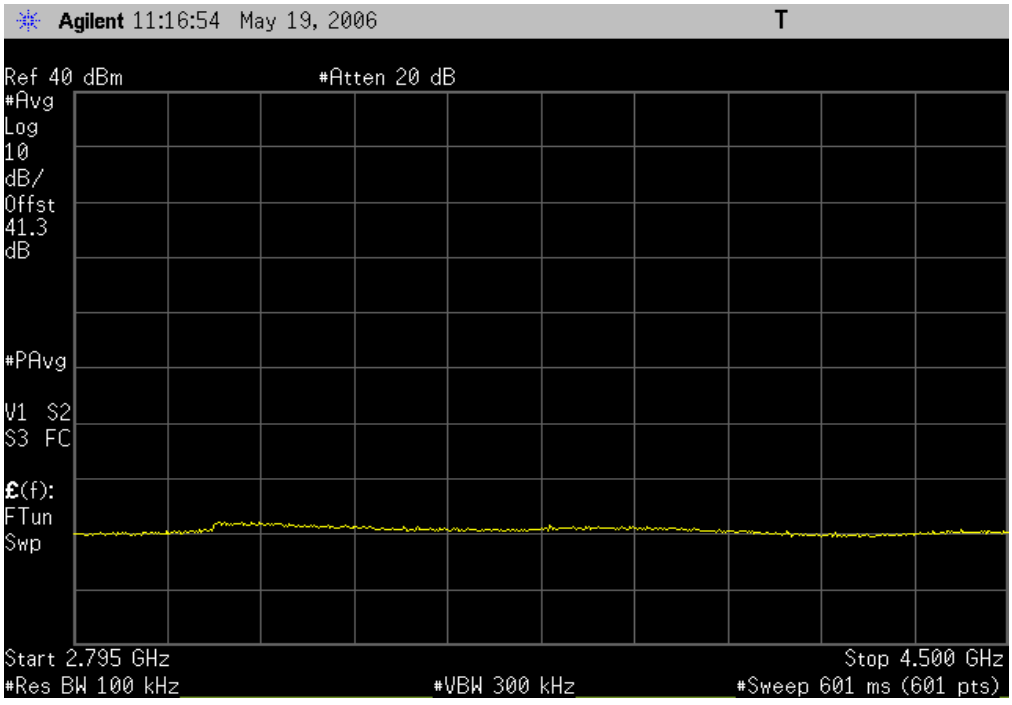
Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



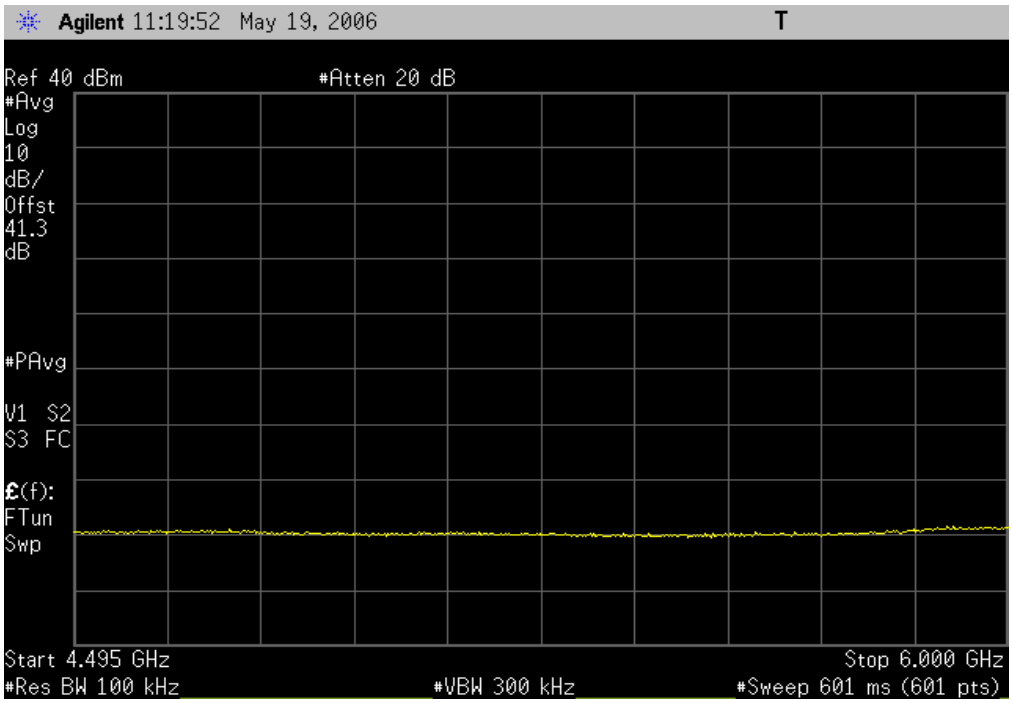
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



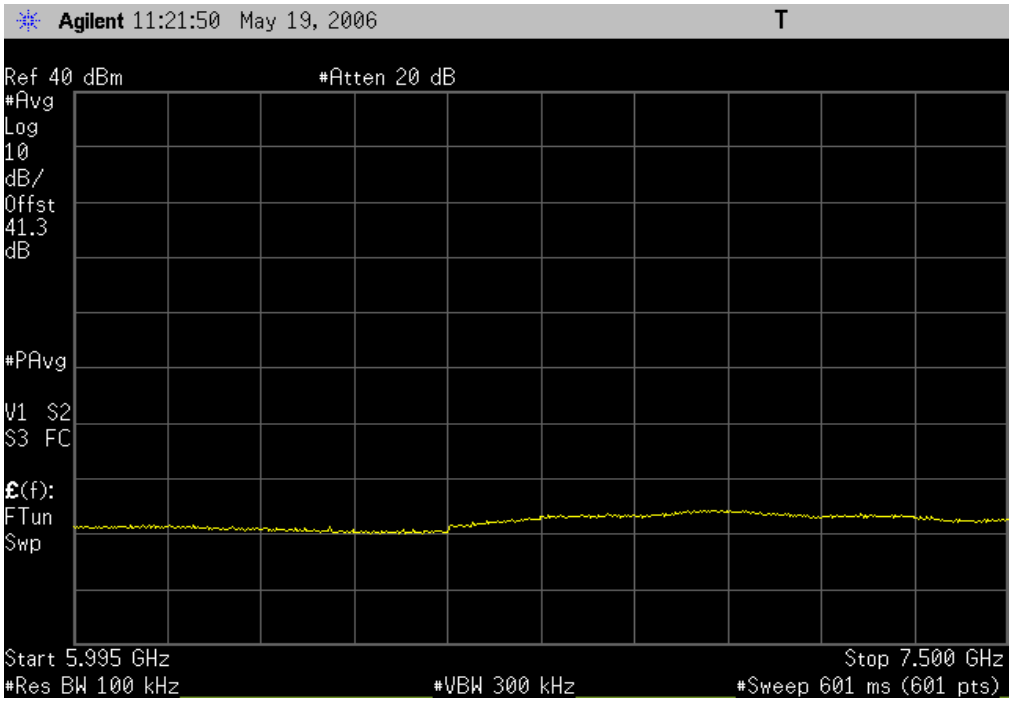
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



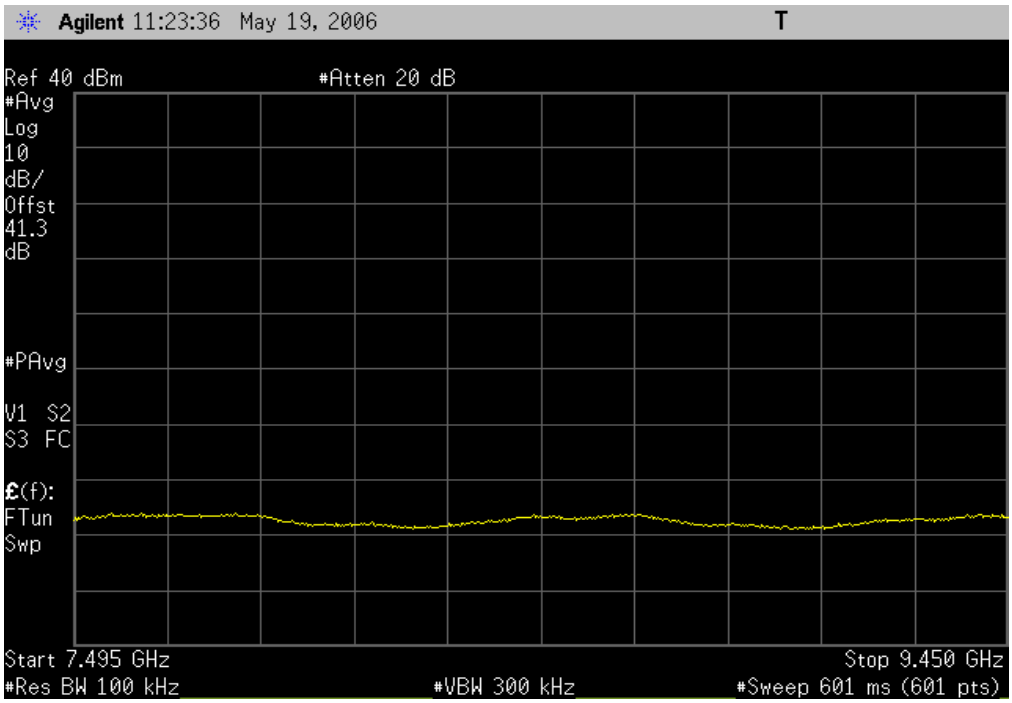
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



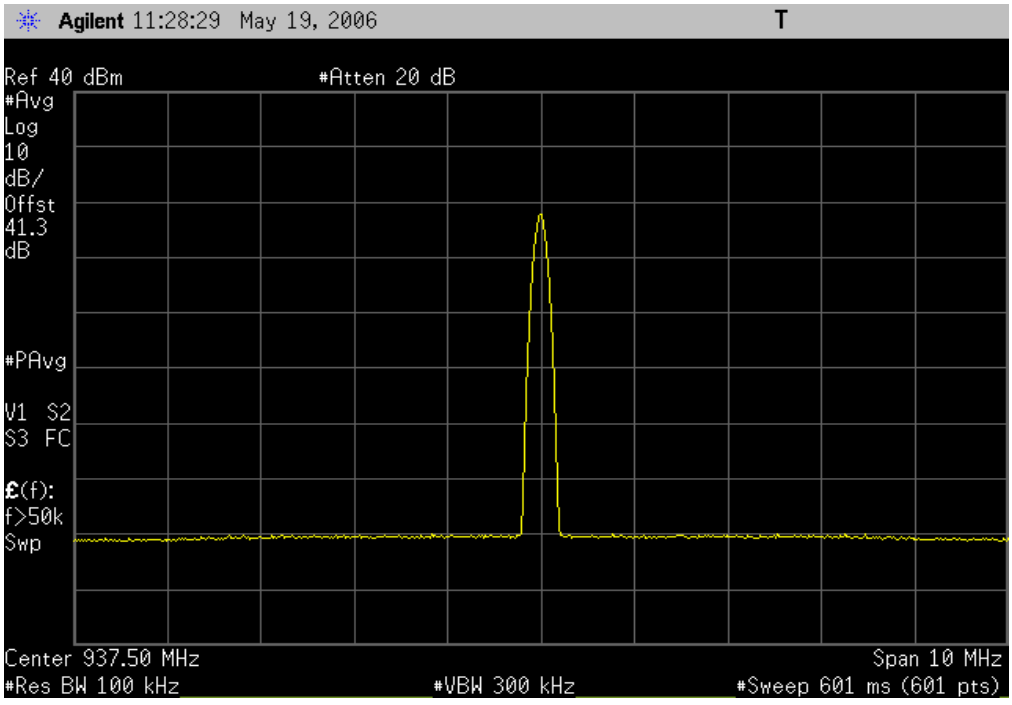
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Low Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

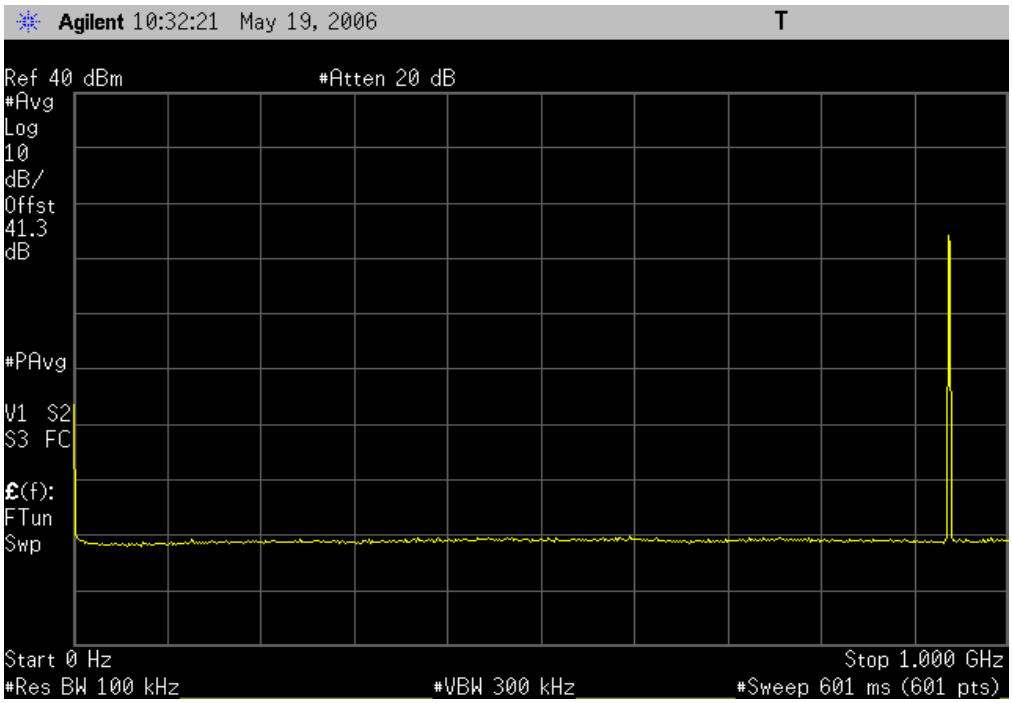


Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

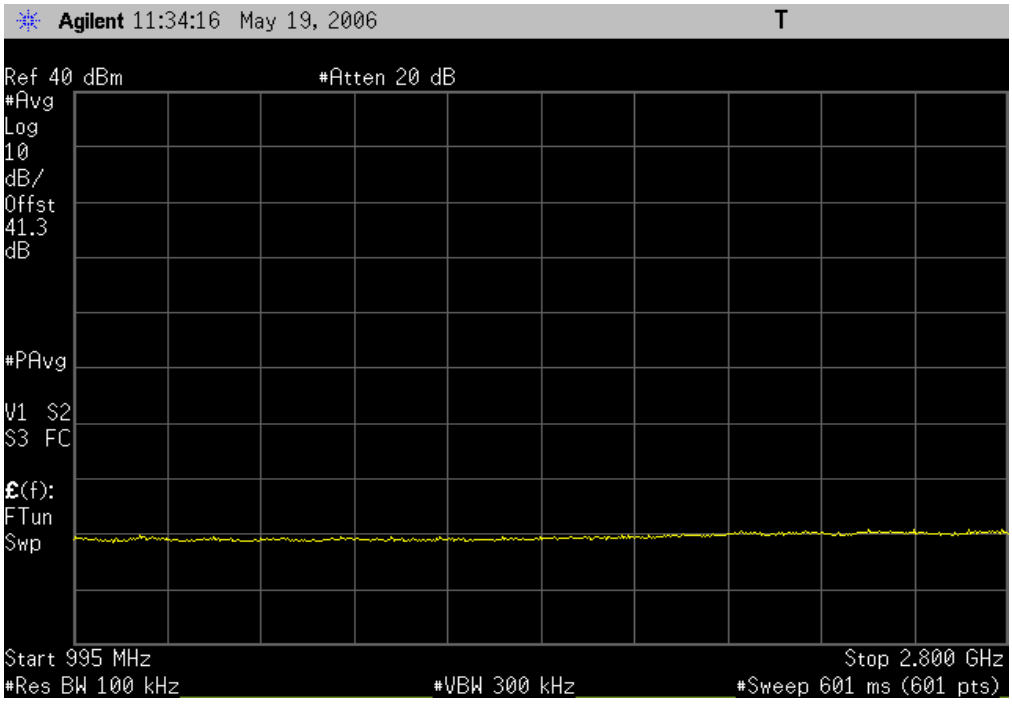


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

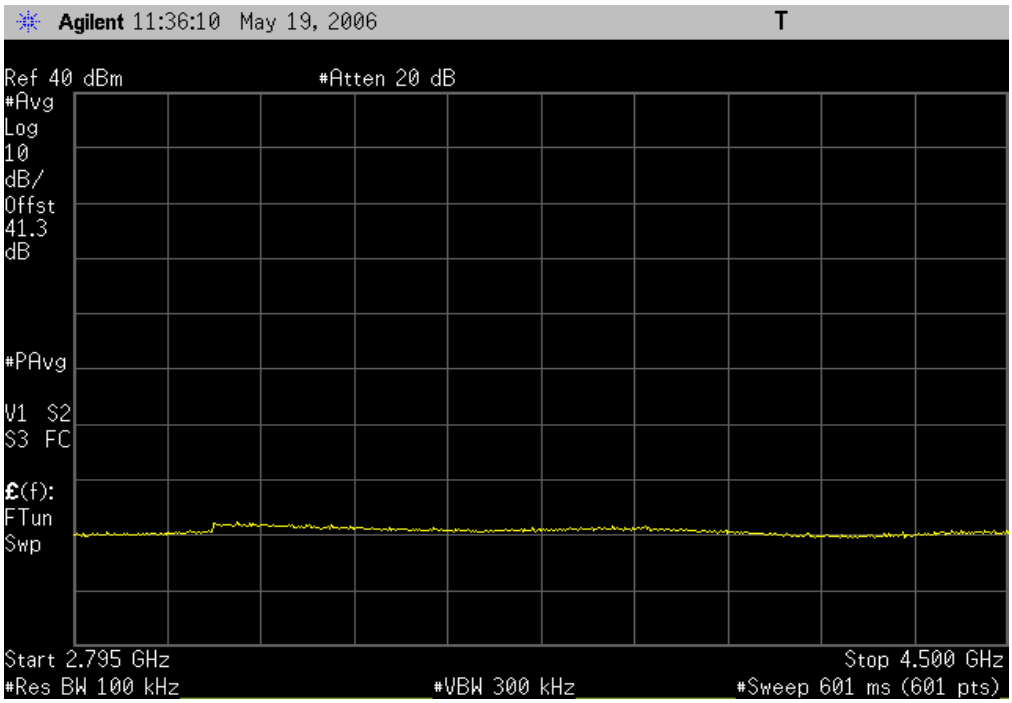


Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

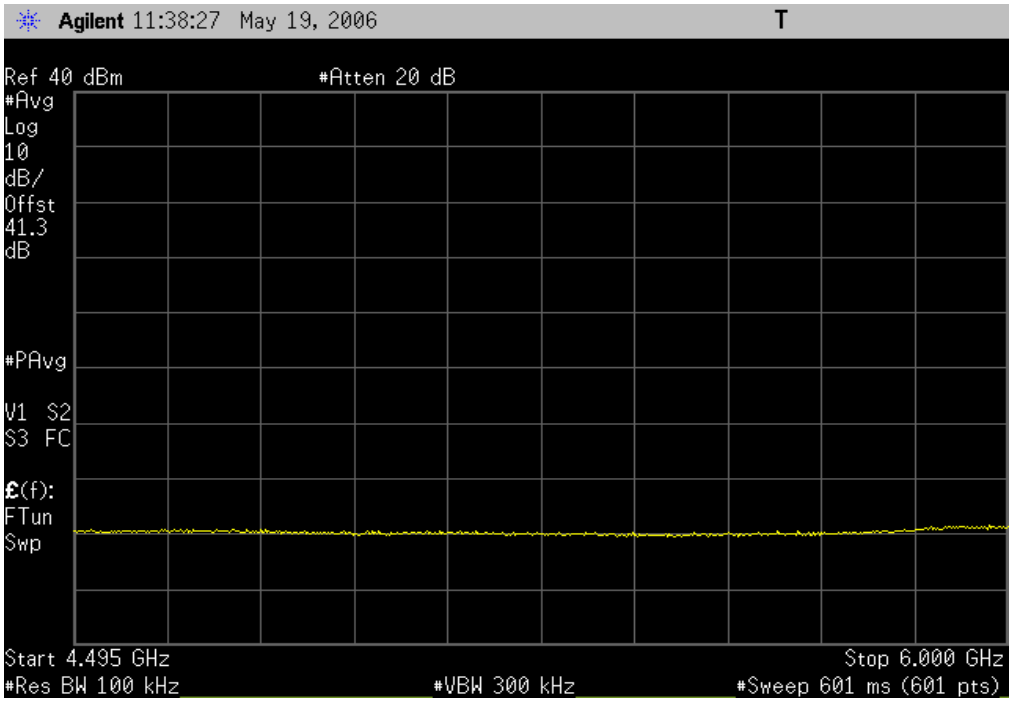


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

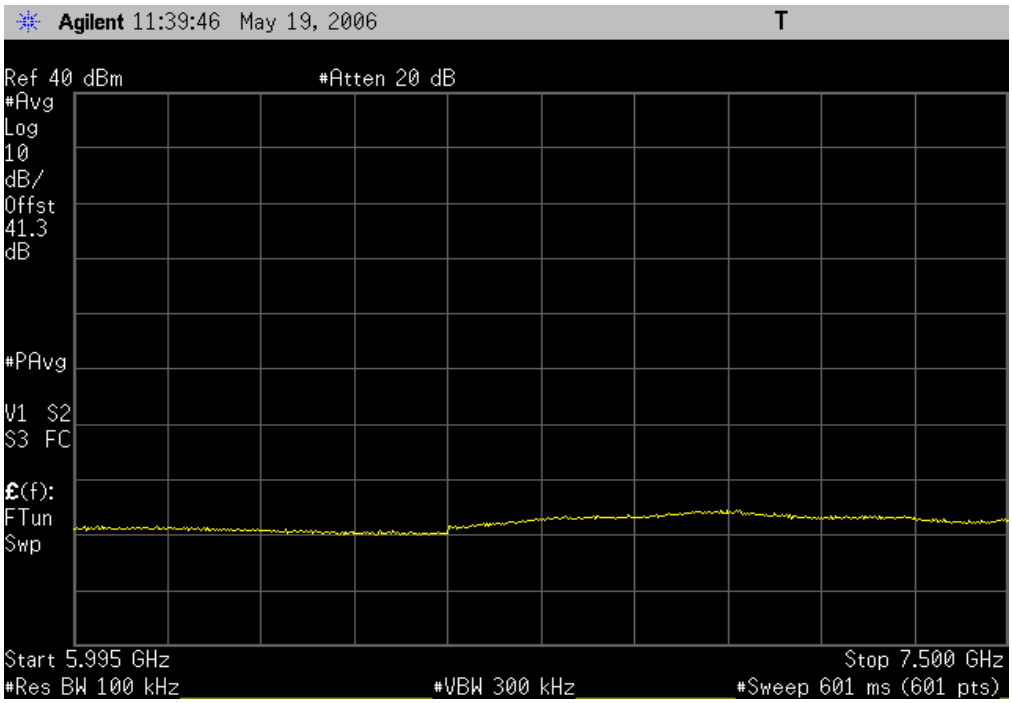
Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



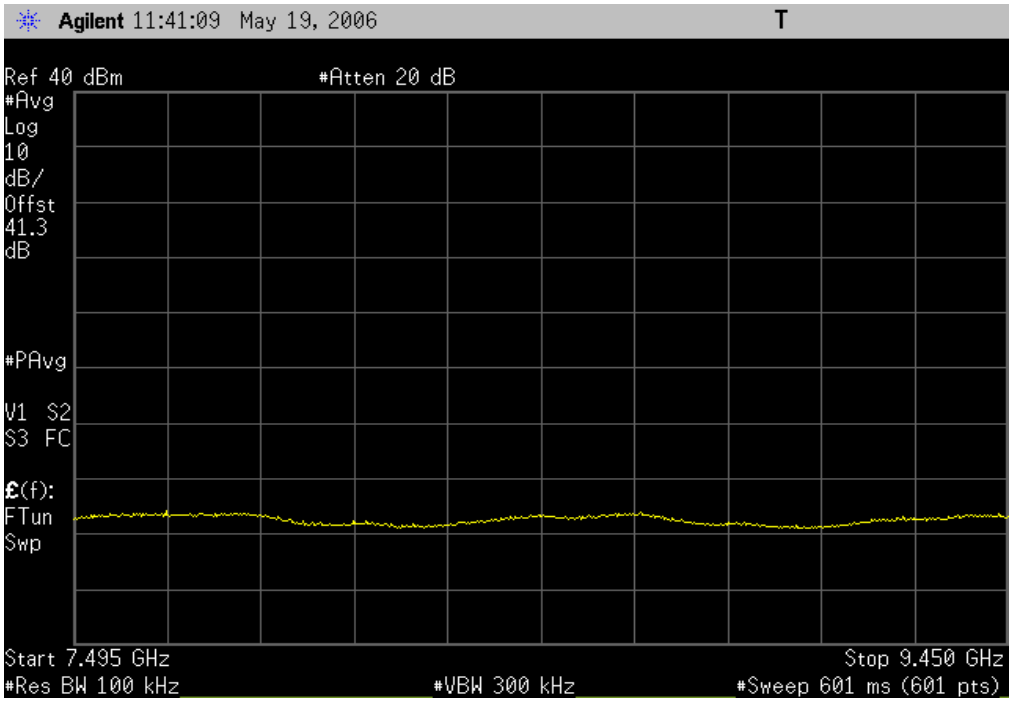
Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

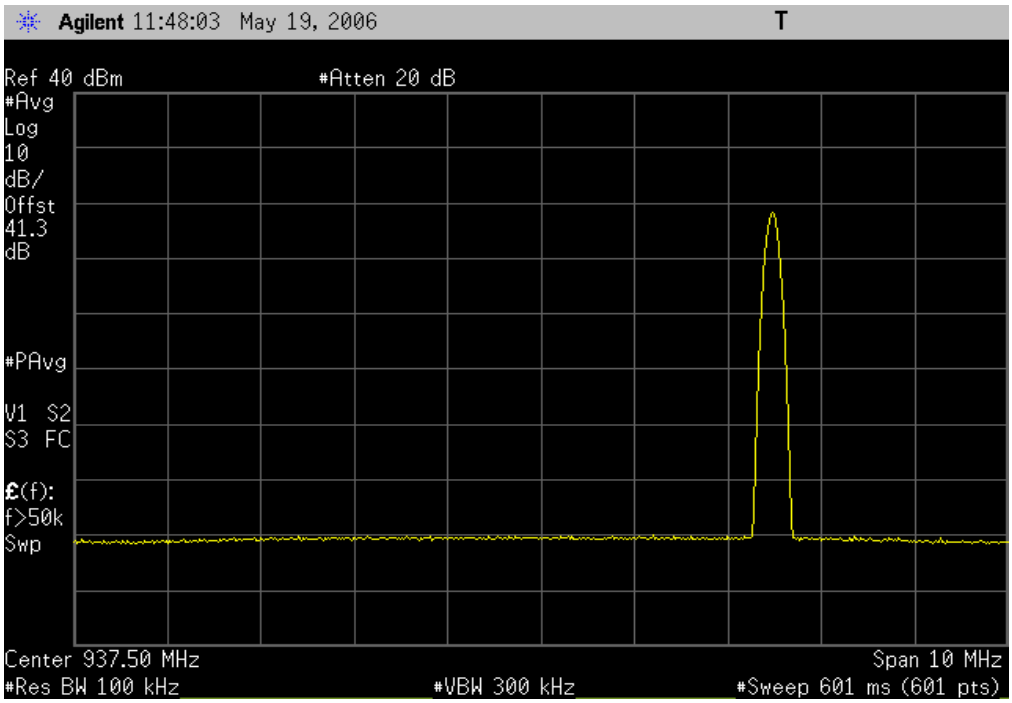


Mid Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

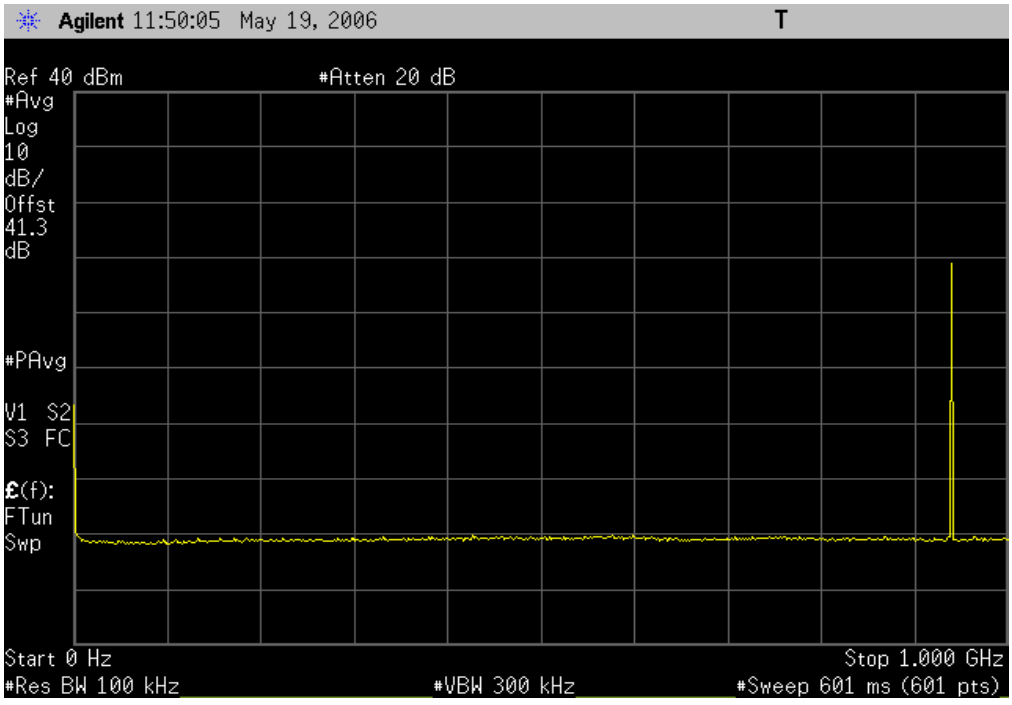


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

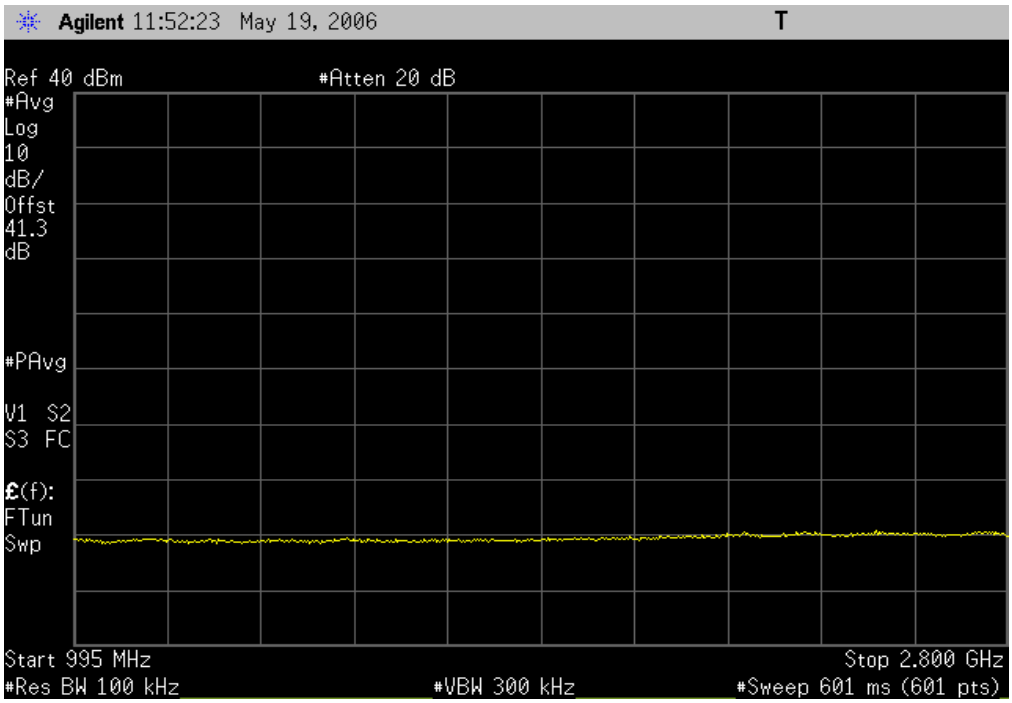
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



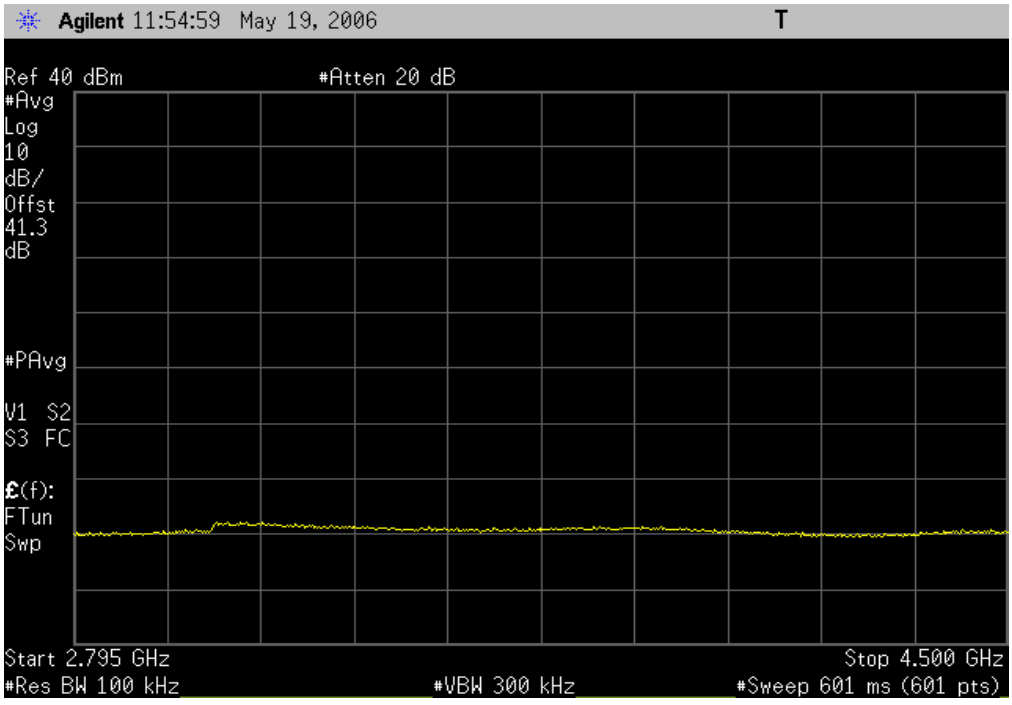
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



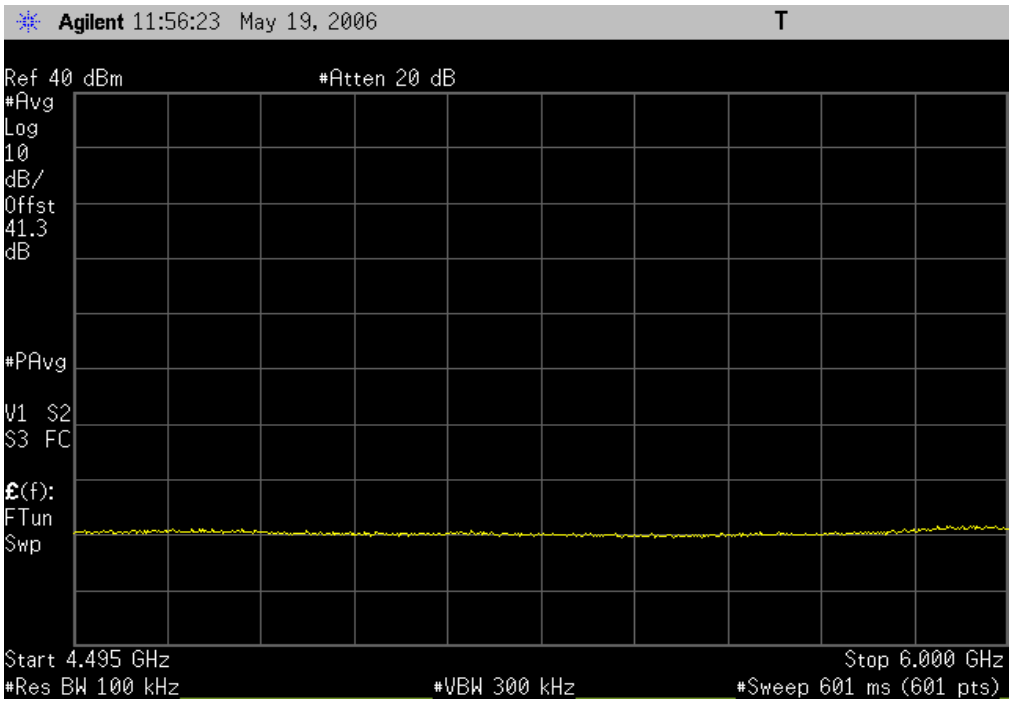
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



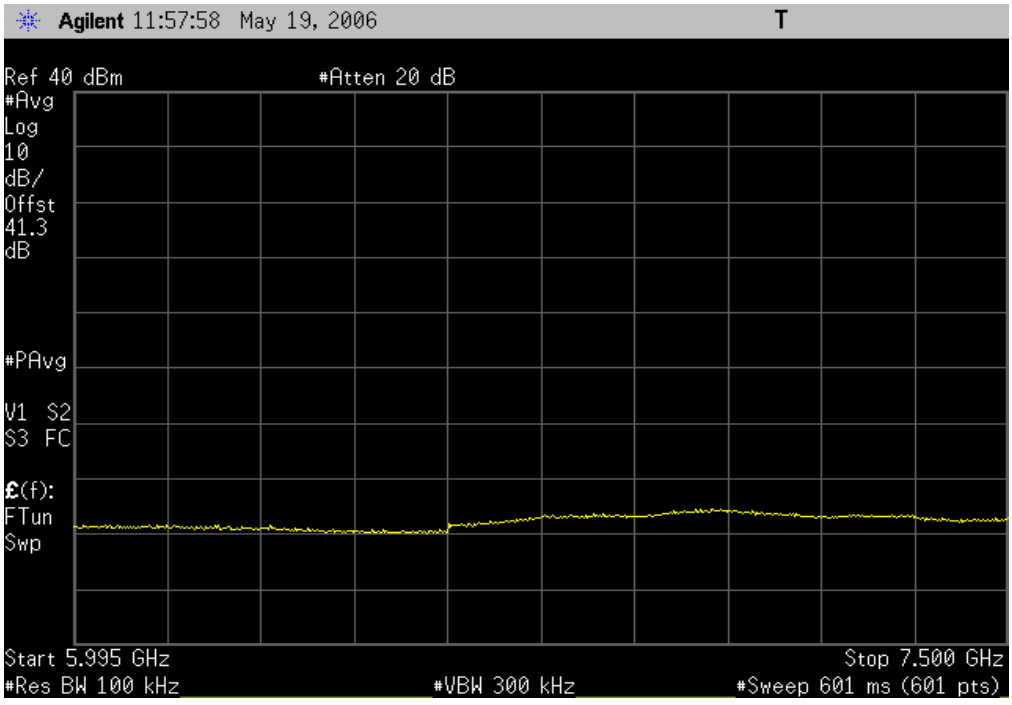
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



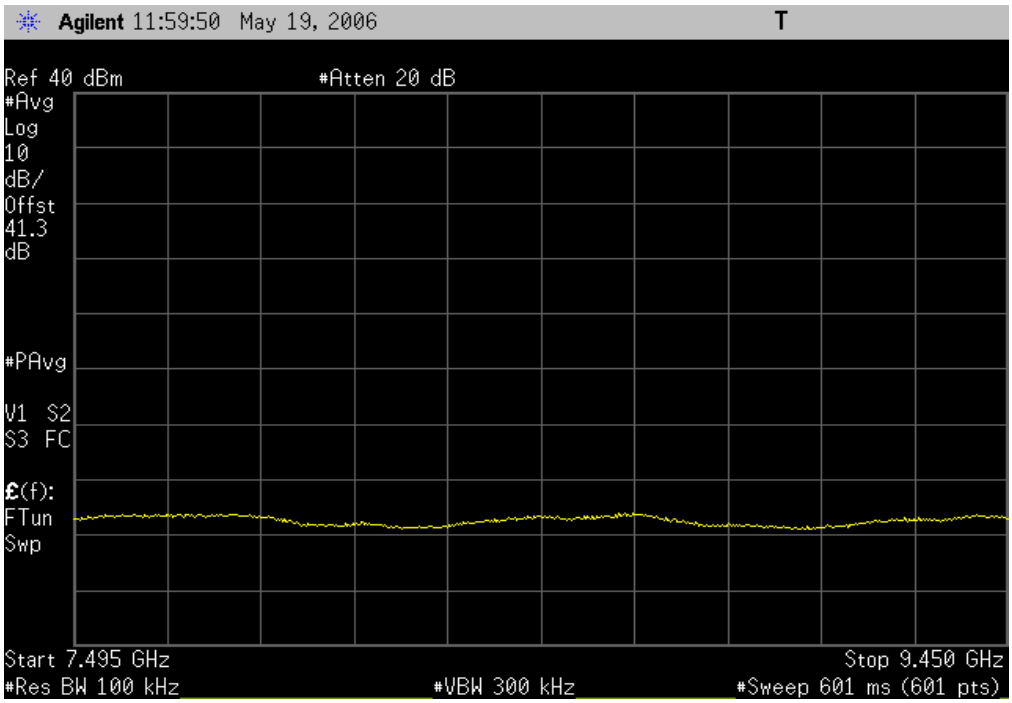
High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



< -30 dBm ≤ -13 dBm

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	1/27/2006	13
Power Meter	Hewlett Packard	E4418A	SPA	7/23/2004	24
Power Sensor	Hewlett-Packard	8481H	SPB	7/23/2004	24

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

A spectrum analyzer was used to scan from 0 to 10 GHz. A 100kHz resolution bandwidth was used. No video filtering was employed. A 30dB external attenuator was used on the RF input of the spectrum analyzer.

NORTHWEST EMC

SPURIOUS EMISSIONS AT ANTENNA TERMINALS

XMit 2006.03.01

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	Dean Busch			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Rod Peloquin	Power:	-48Vdc	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

COMMENTS

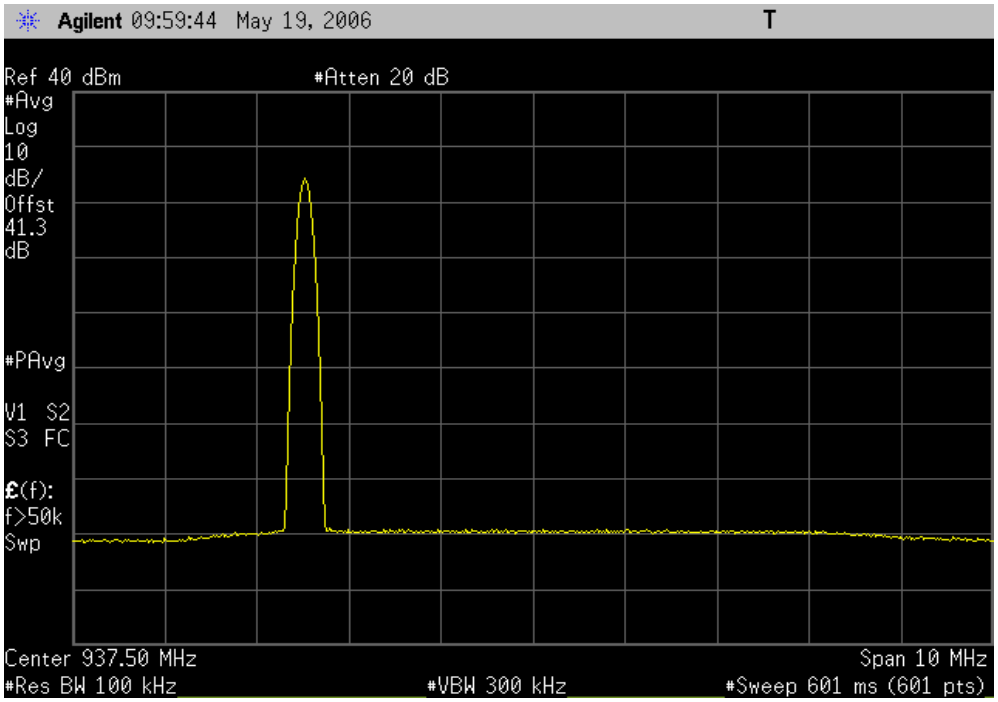
900MHz Band, High Power Level

DEVIATIONS FROM TEST STANDARD

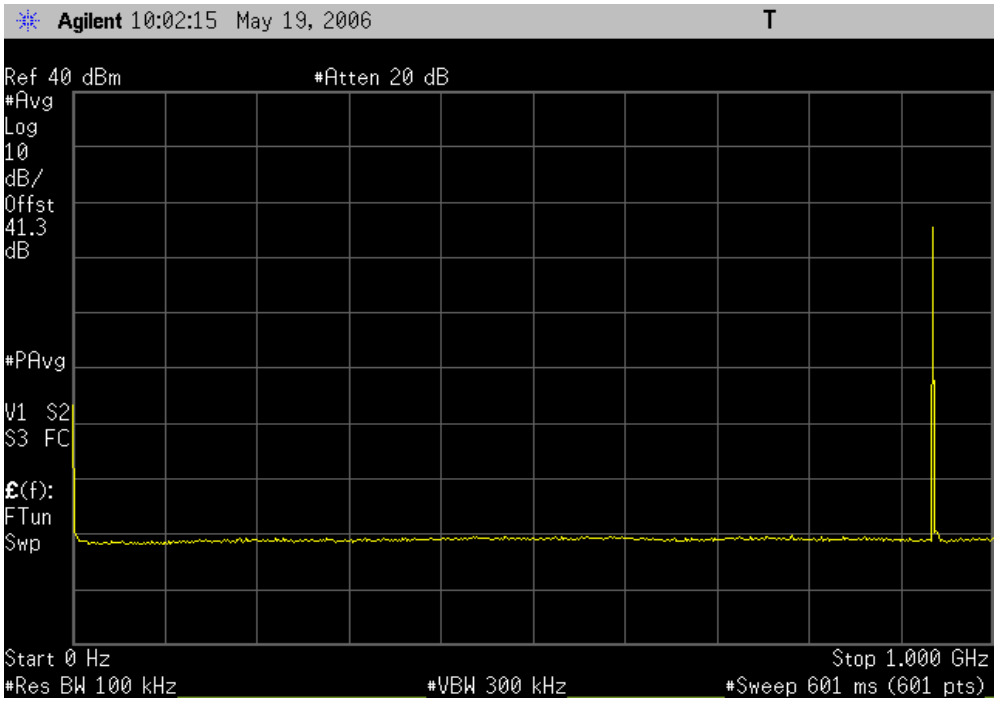
Configuration #	1	Signature

Modes of Operation and Test Conditions	Value	Limit	Result
Low Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Low Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
Mid Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, In Band	< -30 dBm	≤ -13 dBm	Pass
High Channel, 0-1GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 995MHz-2.8GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 2.795GHz-4.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 4.495GHz-6GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 5.995GHz-7.5GHz	< -30 dBm	≤ -13 dBm	Pass
High Channel, 7.495GHz-9.45GHz	< -30 dBm	≤ -13 dBm	Pass

Low Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

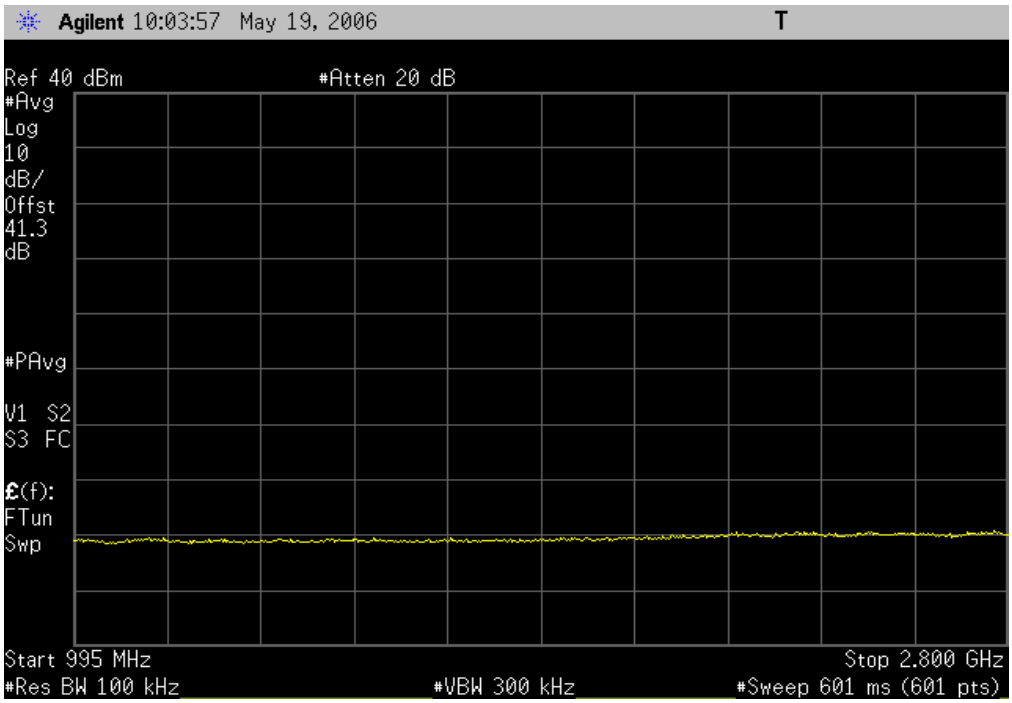


Low Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

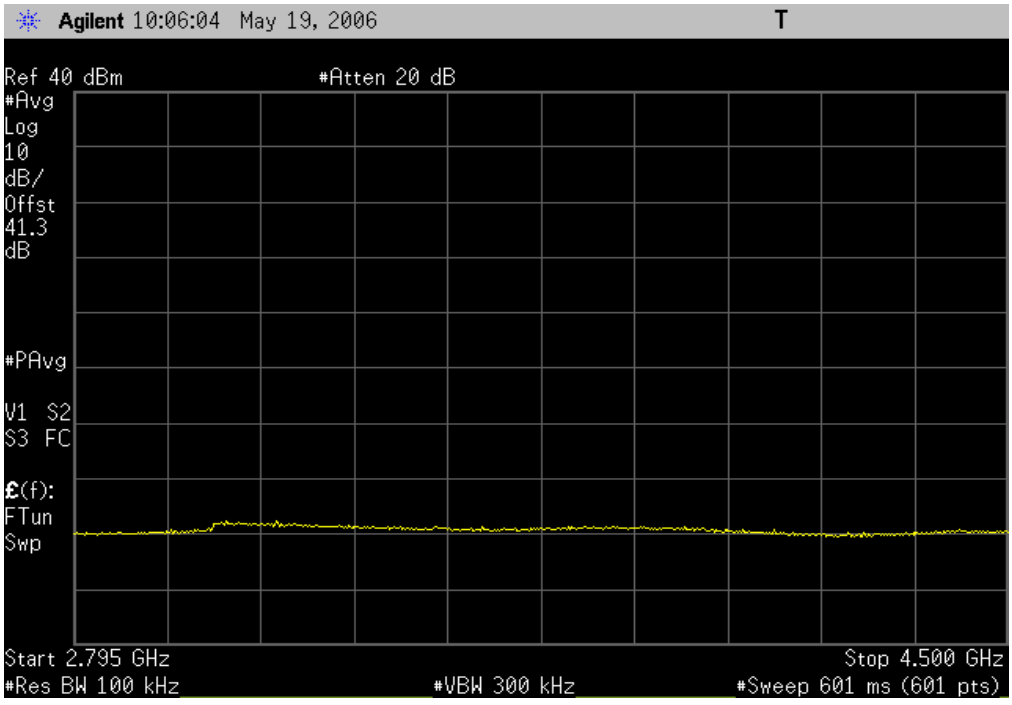


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

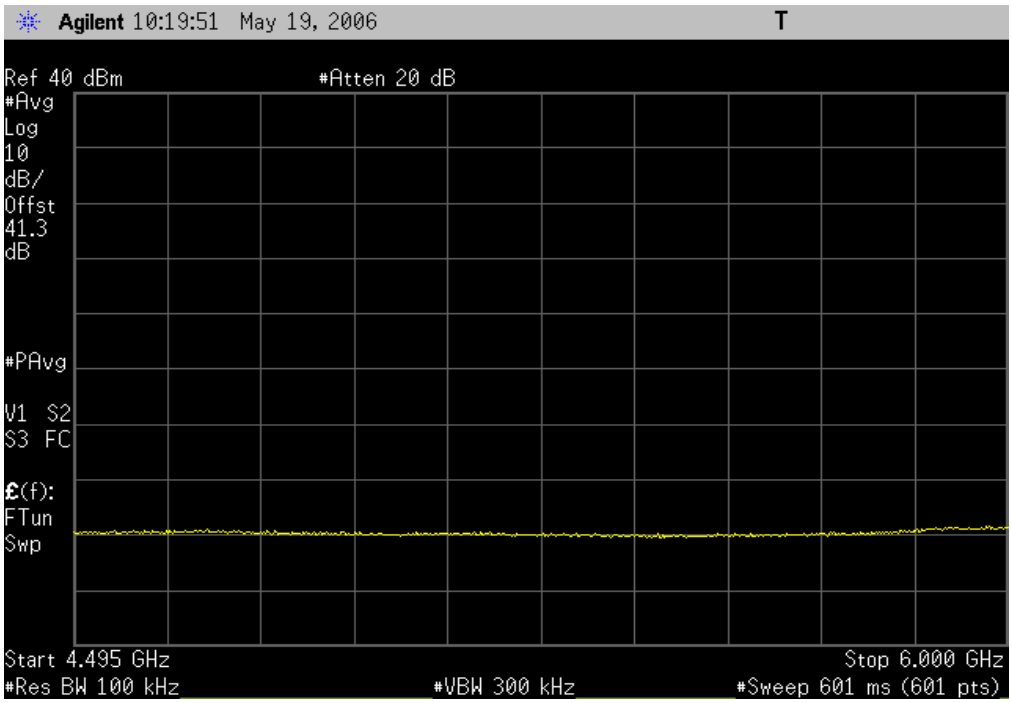
Low Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



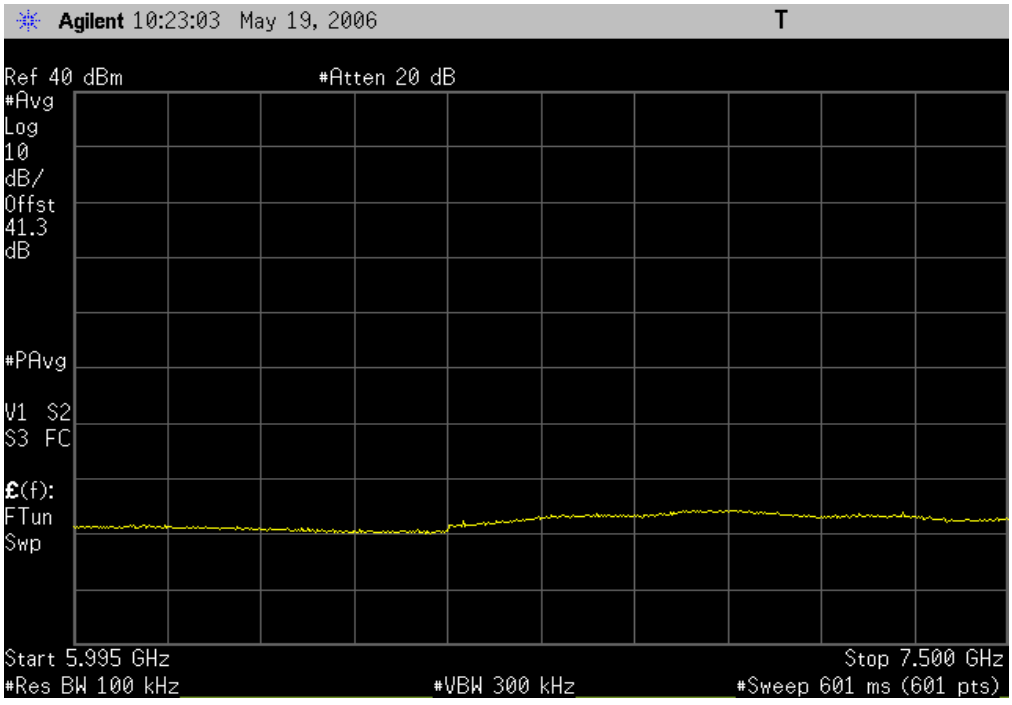
Low Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



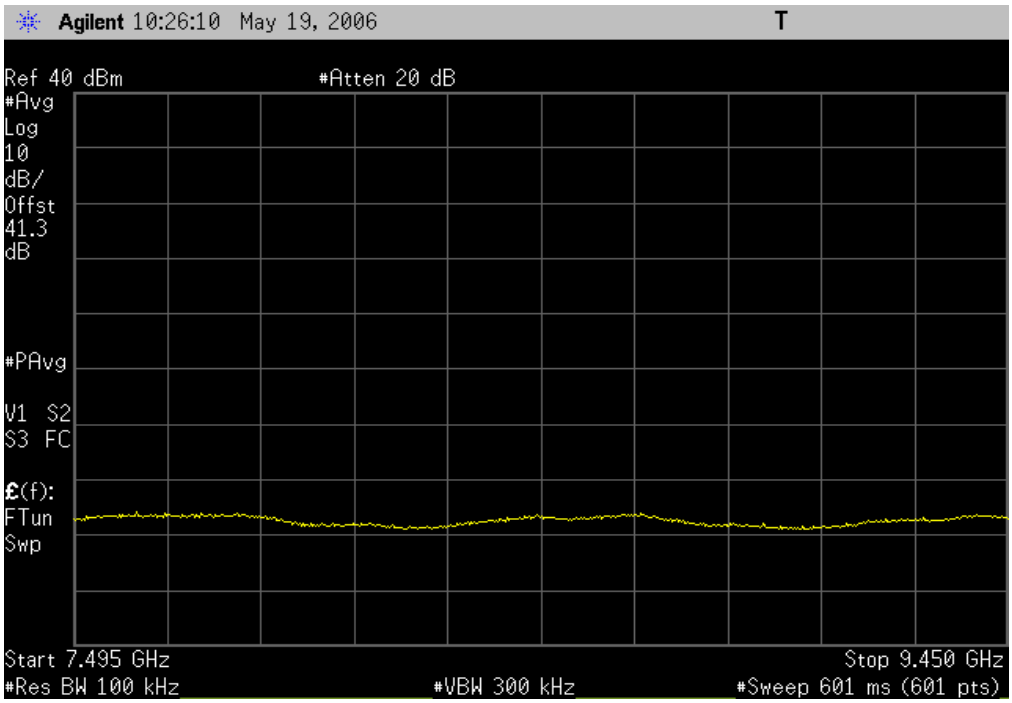
Low Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



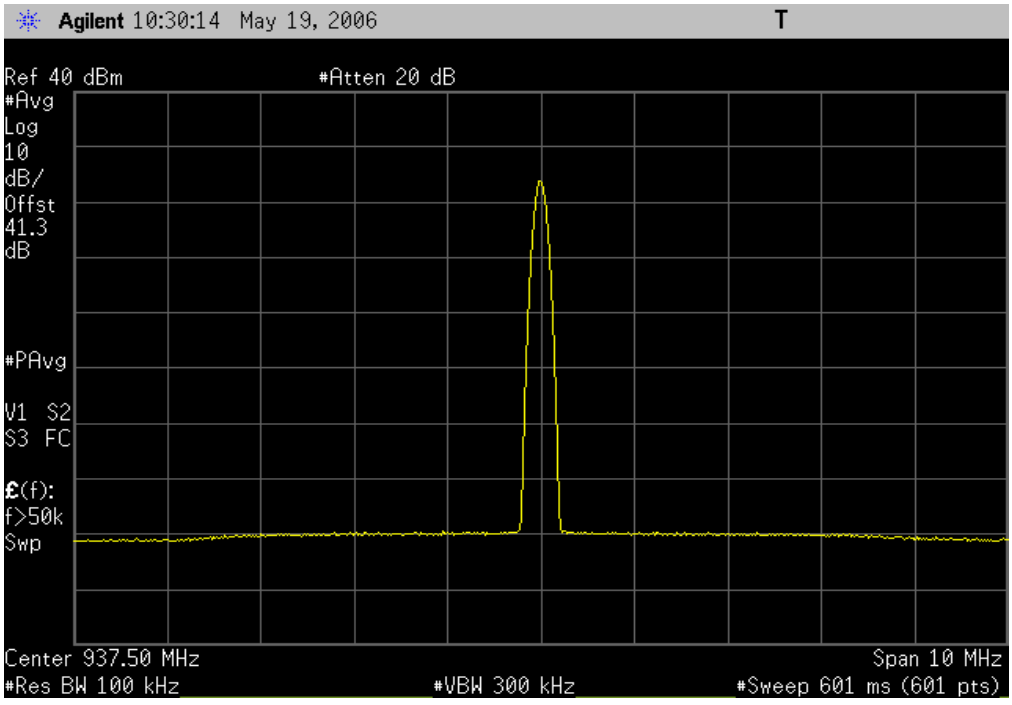
Low Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Low Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

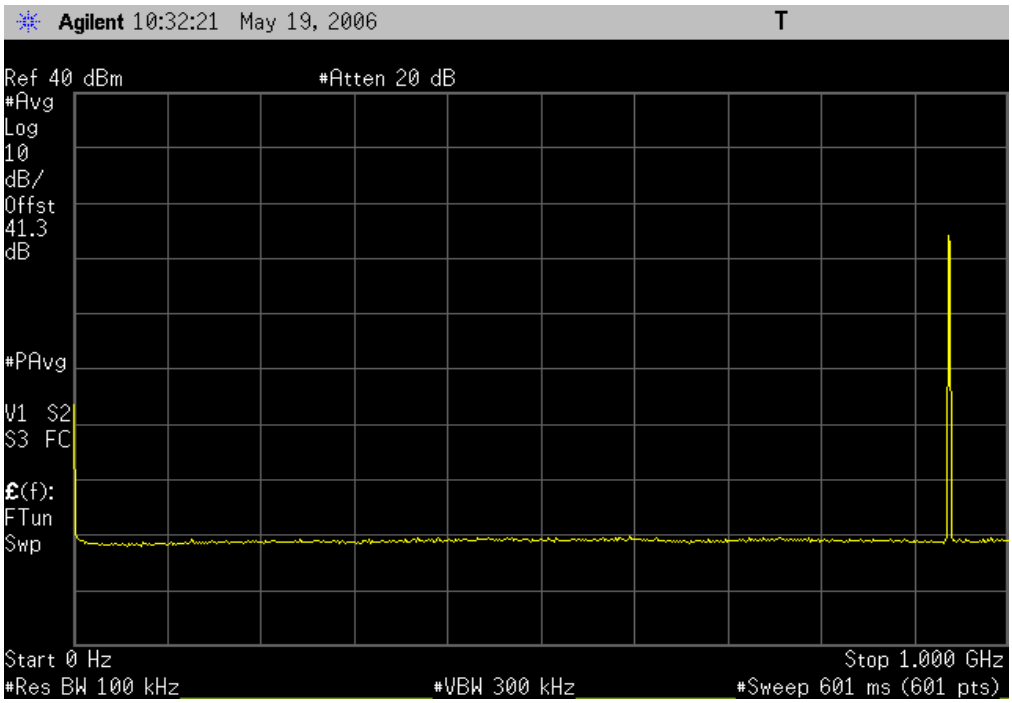


Mid Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

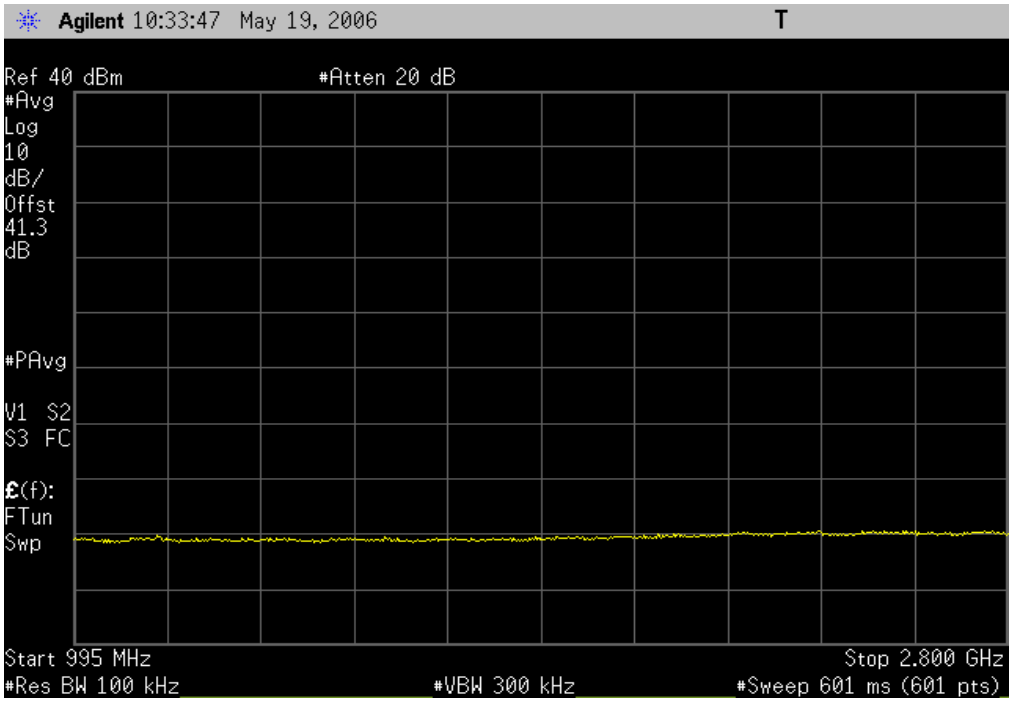


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

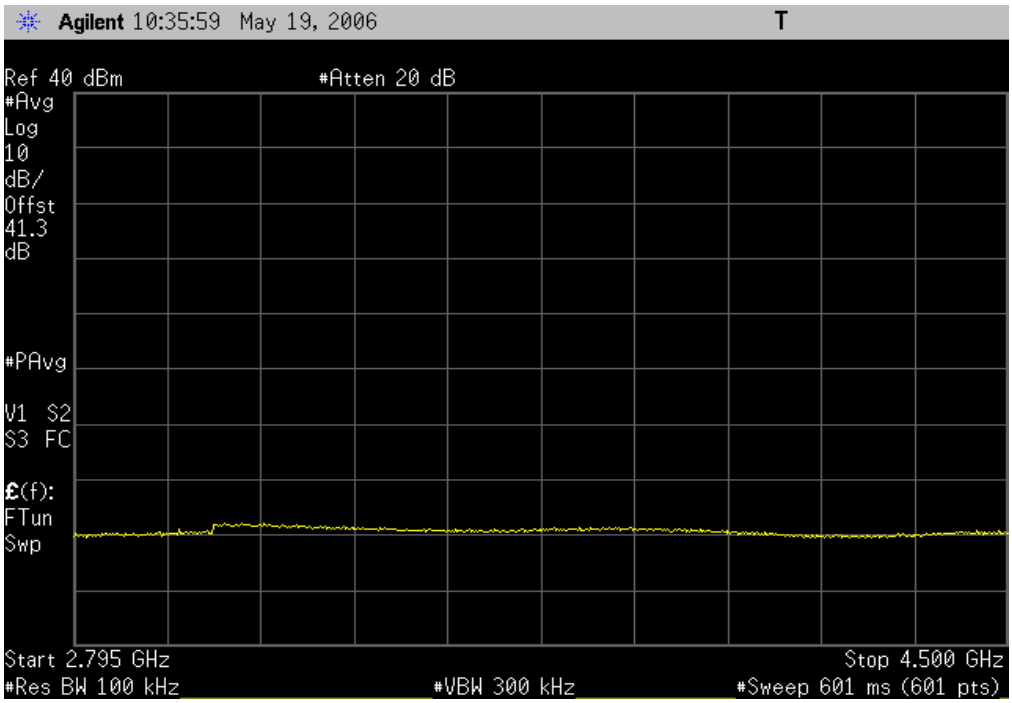
Mid Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



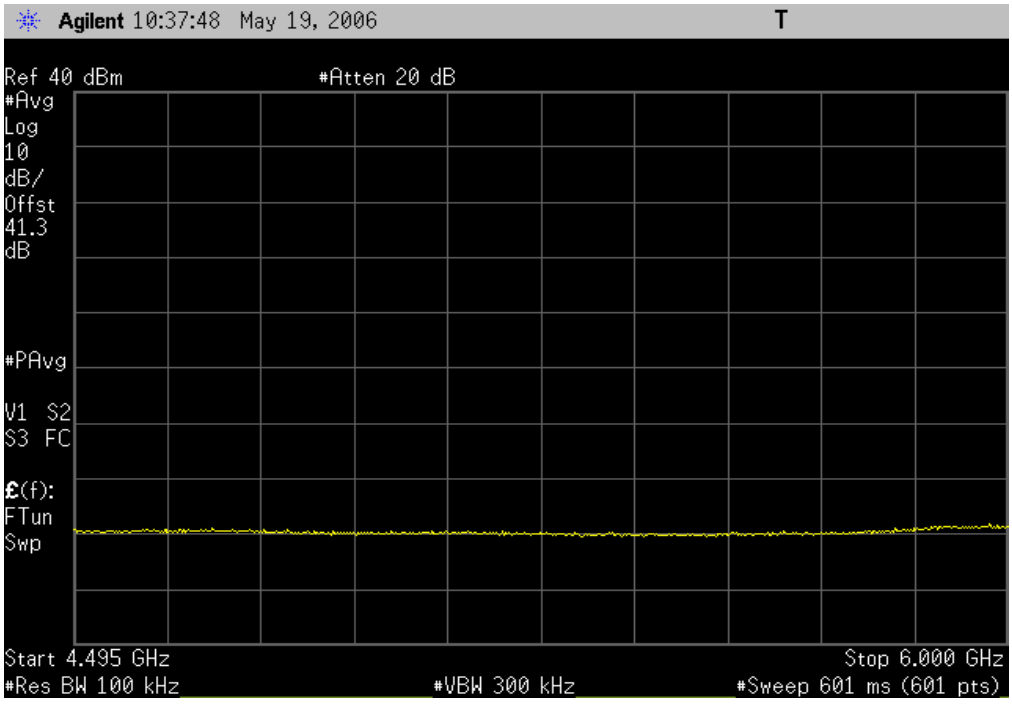
Mid Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



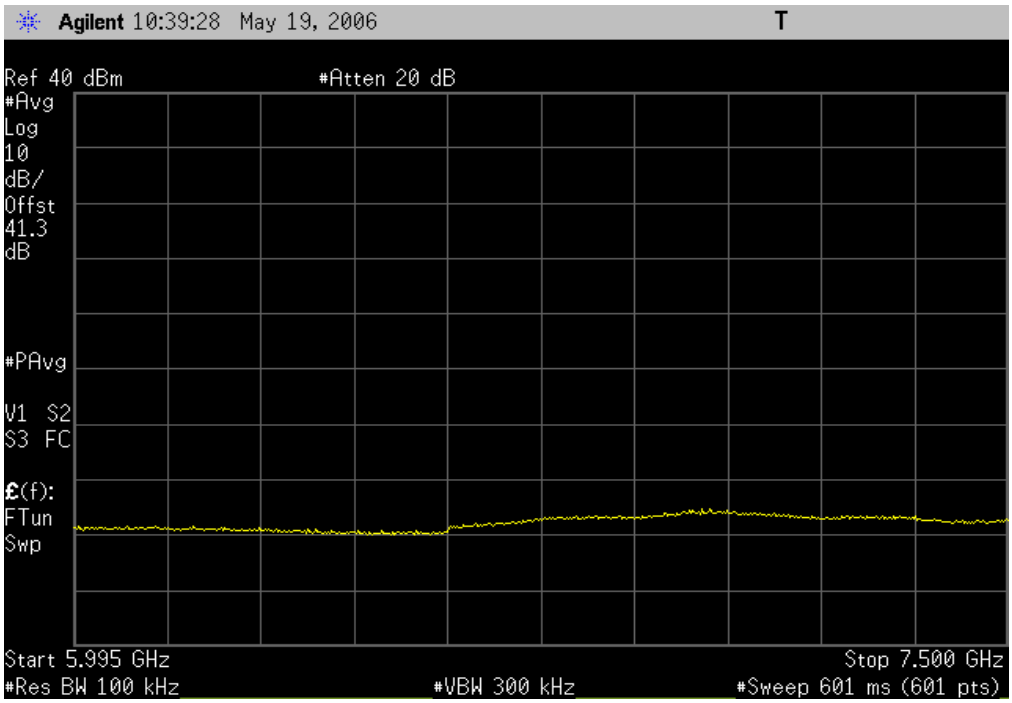
Mid Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



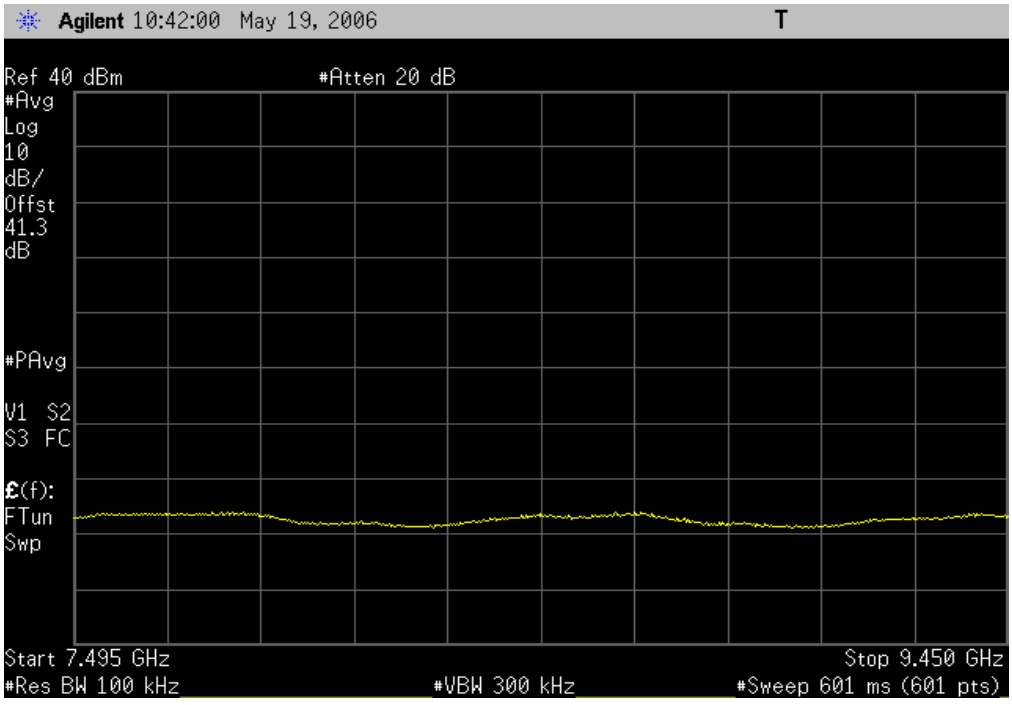
Mid Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



Mid Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

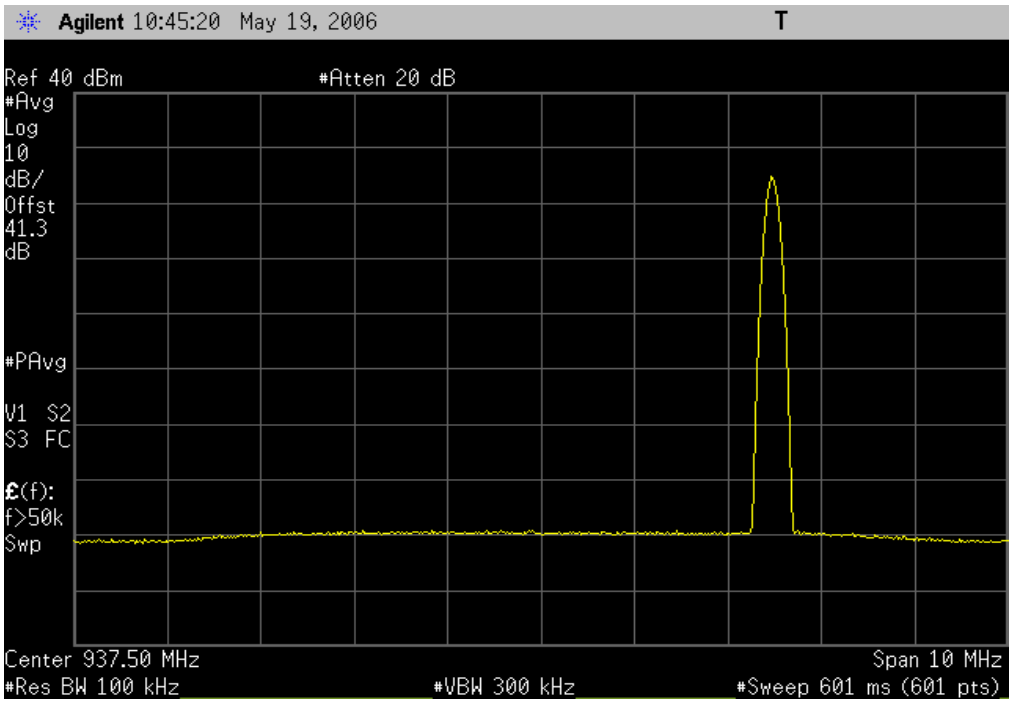


Mid Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm

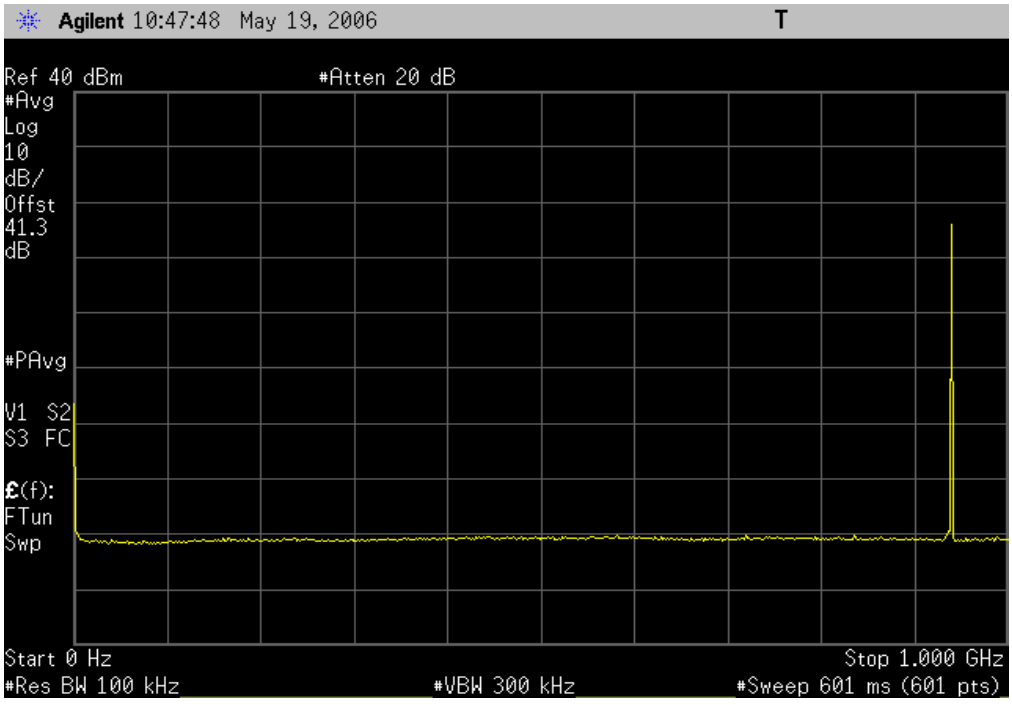


SPURIOUS EMISSIONS AT ANTENNA TERMINALS

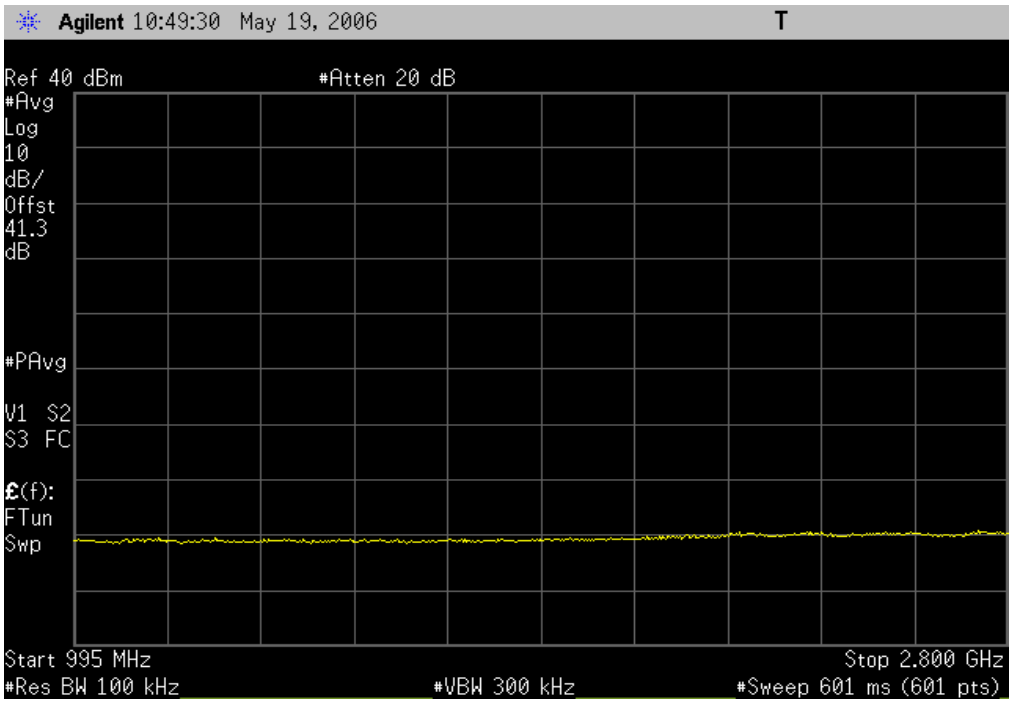
High Channel, In Band					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



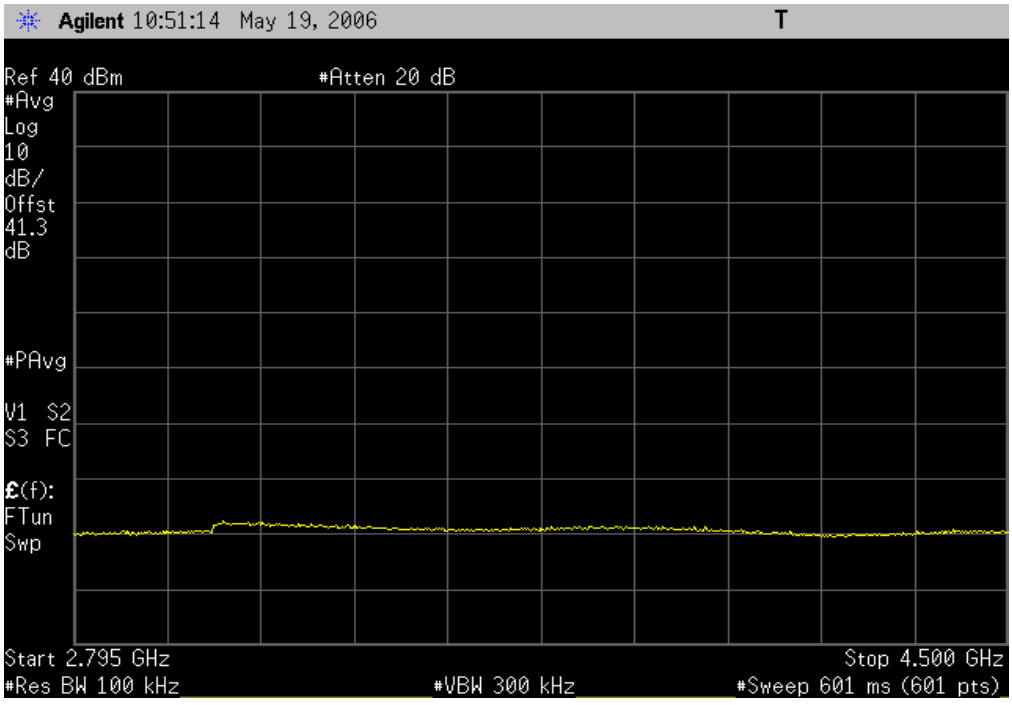
High Channel, 0-1GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



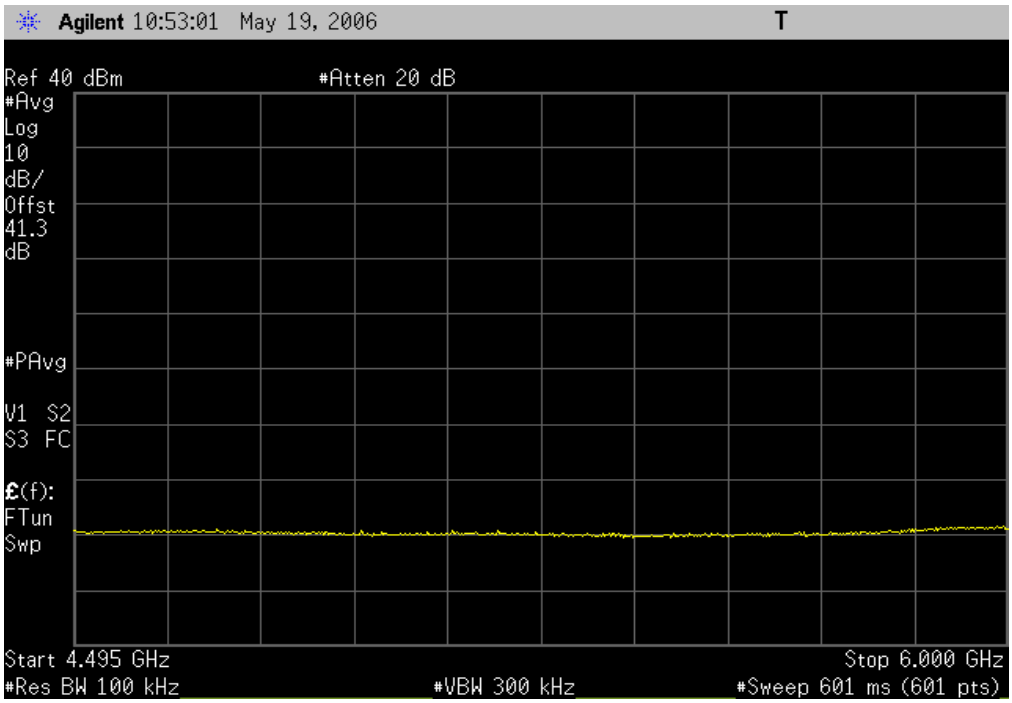
High Channel, 995MHz-2.8GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



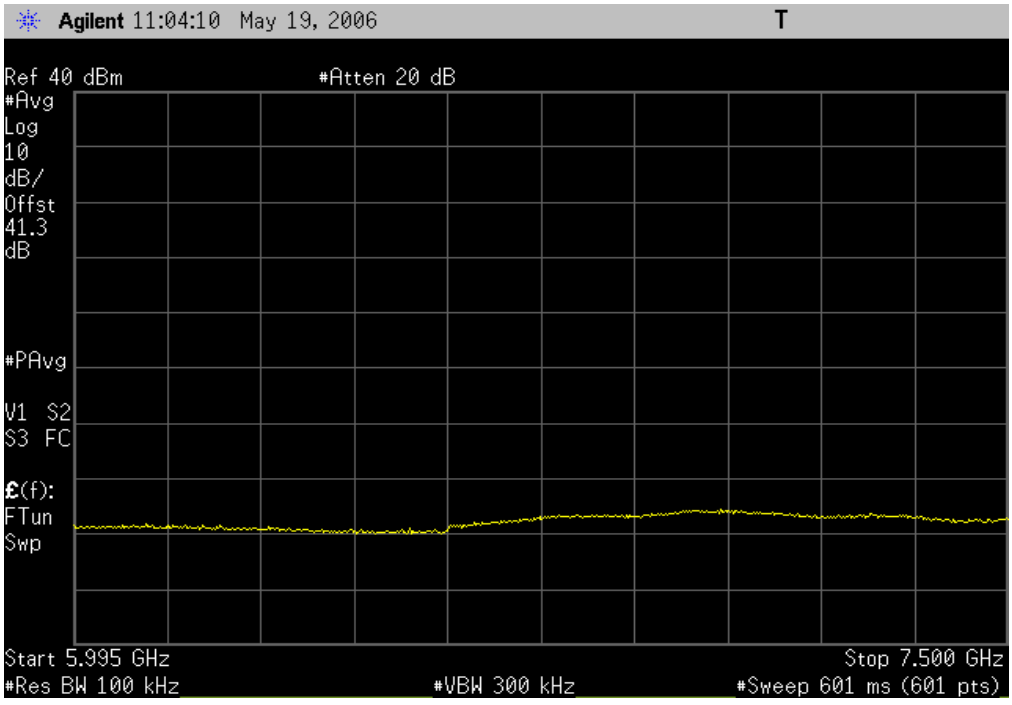
High Channel, 2.795GHz-4.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



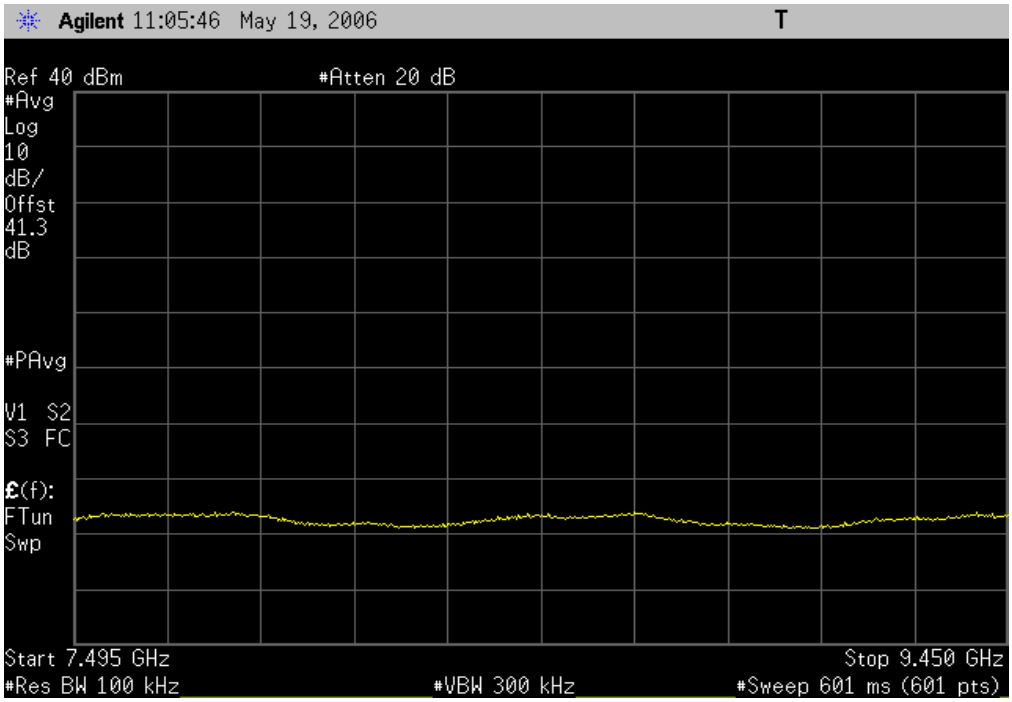
High Channel, 4.495GHz-6GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 5.995GHz-7.5GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



High Channel, 7.495GHz-9.45GHz					
Result:	Pass	**Value:**	< -30 dBm	**Limit:**	≤ -13 dBm



NORTHWEST EMC

Field Strength of Spurious Radiation

PSA 2006.04.25

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting typical sector configuration, 800 and 900MHz bands

POWER SETTINGS INVESTIGATED

-48Vdc

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	10 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
High Pass Filter 1.2 - 18 GHz	Micro-Tronics	HPM50108	HFV	9/28/2005	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	8/2/2005	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	1/4/2006	13
Antenna, Horn	EMCO	3115	AHC	8/30/2005	12
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Per 2.1053 and 90.691, the Field Strength of Spurious Radiation was measured in the far-field at an FCC Listed OATS up to 10 GHz. Spectrum analyzer, signal generator, and linearly polarized antennas were used to measure radiated harmonics and spurious emissions. The orientation of the EUT and measurement antenna were manipulated to maximize the level of emissions. The EUT was configured to transmit at the highest output power into a dummy load at low, mid, and high frequencies for both the 800MHz and 900MHz bands.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the dipole antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

For the purposes of preliminary measurements, the field strength of the spurious emissions can be measured and compared with a 3 meter limit. The 3 meter limit was calculated to be 82.5 dBuV/m at 3 meters. The final measurements must be made utilizing the substitution method described above.

NORTHWEST EMC

Field Strength of Spurious Radiation

PSA 2006.04.25
EMI 2006.4.26

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	None			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Holly Ashkannejhad	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

Transmitting typical sector configuration, 800 and 900MHz bands

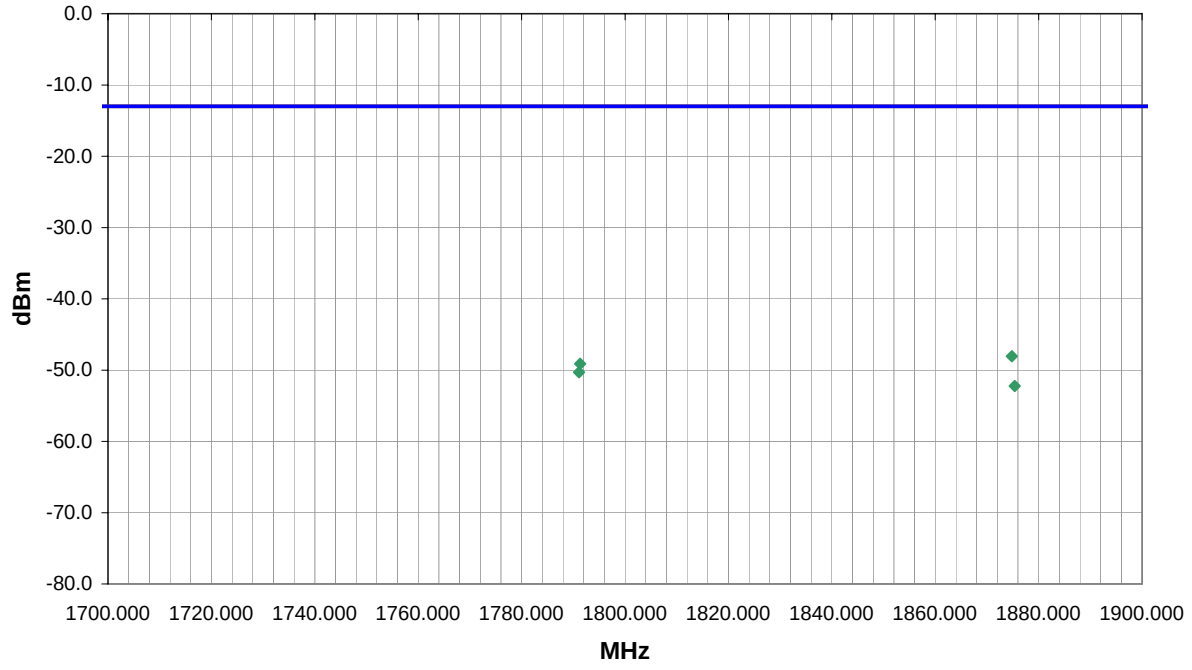
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0

Signature Holly Ashkannejhad



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
1874.809			280.0	1.2			H-Horn	PK	1.56E-08	-48.1	-13.0	-35.1
1791.108			183.0	1.2			H-Horn	PK	9.34E-09	-50.3	-13.0	-37.3
1791.315			52.0	2.7			V-Horn	PK	1.23E-08	-49.1	-13.0	-36.1
1875.379			302.0	1.9			V-Horn	PK	5.98E-09	-52.2	-13.0	-39.2

NORTHWEST EMC

Field Strength of Spurious Radiation

PSA 2006.04.25
EMI 2006.4.26

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	Dean Busch			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Holly Ashkannejhad	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

Transmitting typical sector configuration, 800 and 900MHz bands

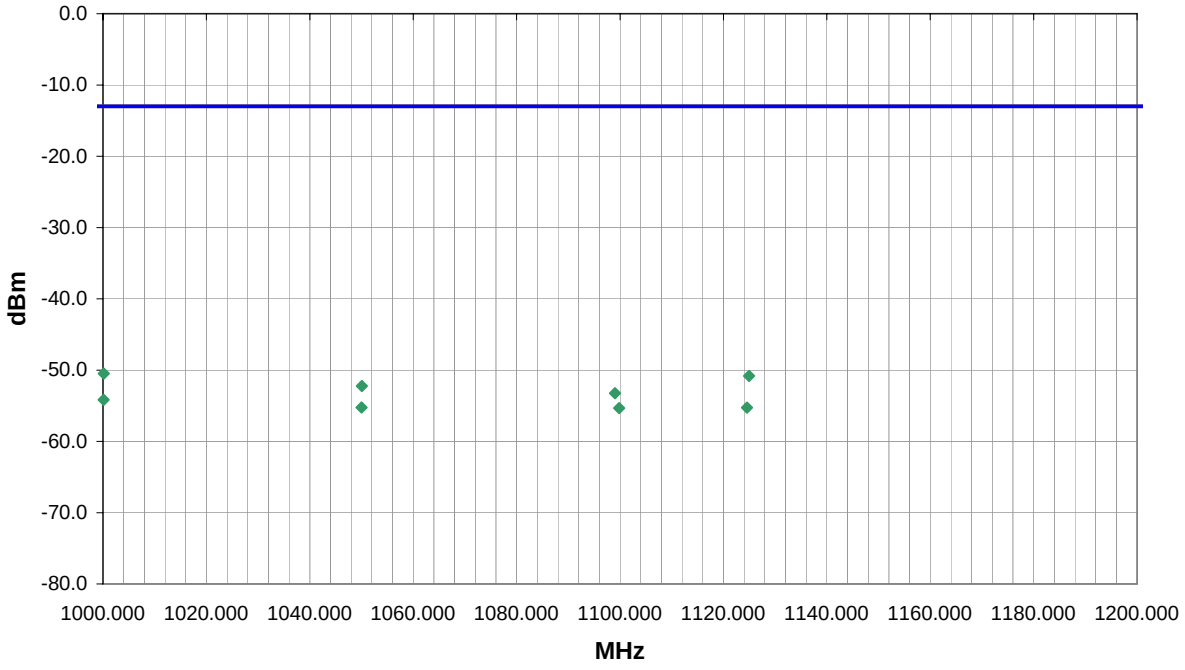
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0

Signature Holly Ashkannejhad



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
1000.165			184.0	1.0			V-Horn	PK	8.93E-09	-50.5	-13.0	-37.5
1124.965			317.0	1.0			V-Horn	PK	8.29E-09	-50.8	-13.0	-37.8
1000.115			360.0	1.7			H-Horn	PK	3.83E-09	-54.2	-13.0	-41.2
1124.564			17.0	1.2			H-Horn	PK	2.98E-09	-55.3	-13.0	-42.3
1099.841			95.0	1.2			H-Horn	PK	2.94E-09	-55.3	-13.0	-42.3
1050.008			75.0	1.1			H-Horn	PK	2.99E-09	-55.2	-13.0	-42.2
1050.081			37.0	1.0			V-Horn	PK	5.99E-09	-52.2	-13.0	-39.2
1099.035			360.0	1.0			V-Horn	PK	4.73E-09	-53.3	-13.0	-40.3

NORTHWEST EMC

Field Strength of Spurious Radiation

PSA 2006.04.25
EMI 2006.4.26

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	Dean Busch			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Holly Ashkannejhad	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 90.691:2005	ANSI/TIA/EIA-603-B:2002

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	0

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

Transmitting typical sector configuration, 800 and 900MHz bands

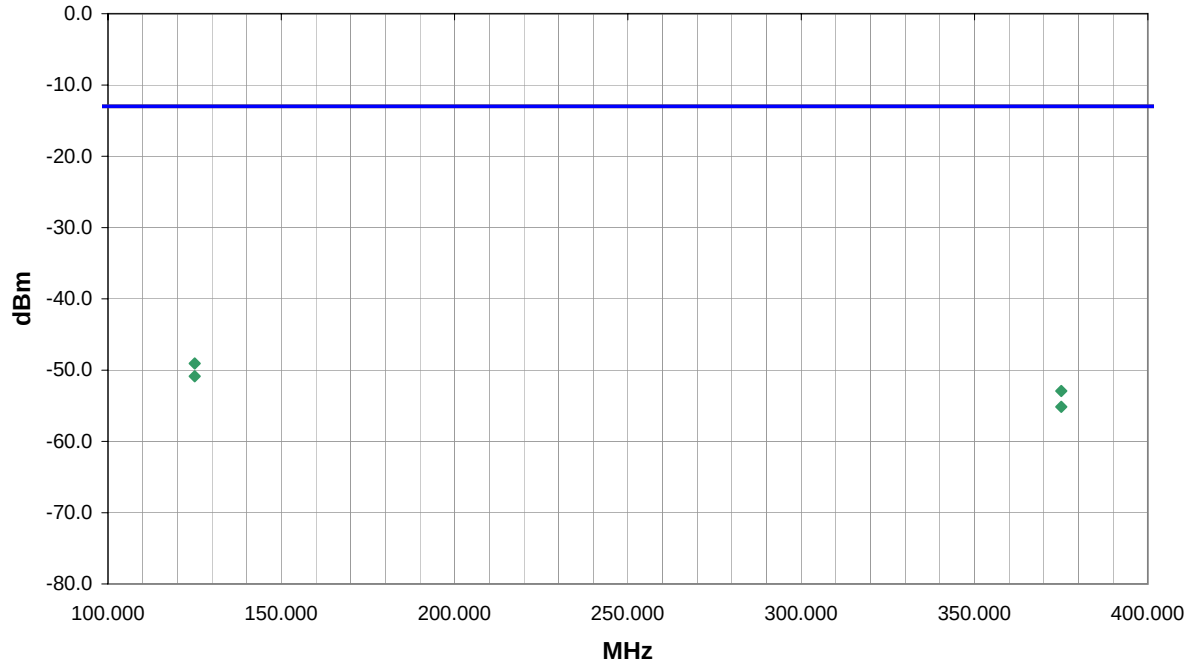
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0

Signature Holly Ashkannejhad



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
125.002			215.0	1.6			H-Bilog	PK	8.18E-09	-50.9	-13.0	-37.9
124.998			7.0	1.0			V-Bilog	PK	1.24E-08	-49.1	-13.0	-36.1
375.012			169.0	1.3			V-Bilog	PK	5.08E-09	-52.9	-13.0	-39.9
375.040			71.0	1.4			H-Bilog	PK	3.06E-09	-55.1	-13.0	-42.1

RADIATED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Receive mode typical sector configuration, 800 and 900MHz bands

POWER SETTINGS INVESTIGATED

-48Vdc

FREQUENCY RANGE INVESTIGATED

Start Frequency	1 GHz	Stop Frequency	5 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	4/4/2006	12
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	8/2/2005	13
Antenna, Horn	EMCO	3115	AHC	8/30/2005	12

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

NORTHWEST EMC

RADIATED EMISSIONS DATA SHEET

PSA 2006.04.25
EMI 2006.4.26

EUT:	MCRB			Work Order:	RAFN0062
Serial Number:	Various			Date:	05/19/06
Customer:	Radioframe Networks, Inc.			Temperature:	23°C
Attendees:	None			Humidity:	34%
Project:	None			Barometric Pres.:	29.89
Tested by:	Holly Ashkannejhad	Power:	-48Vdc	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.109:2006	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

Receive mode typical sector configuration, 800 and 900MHz bands

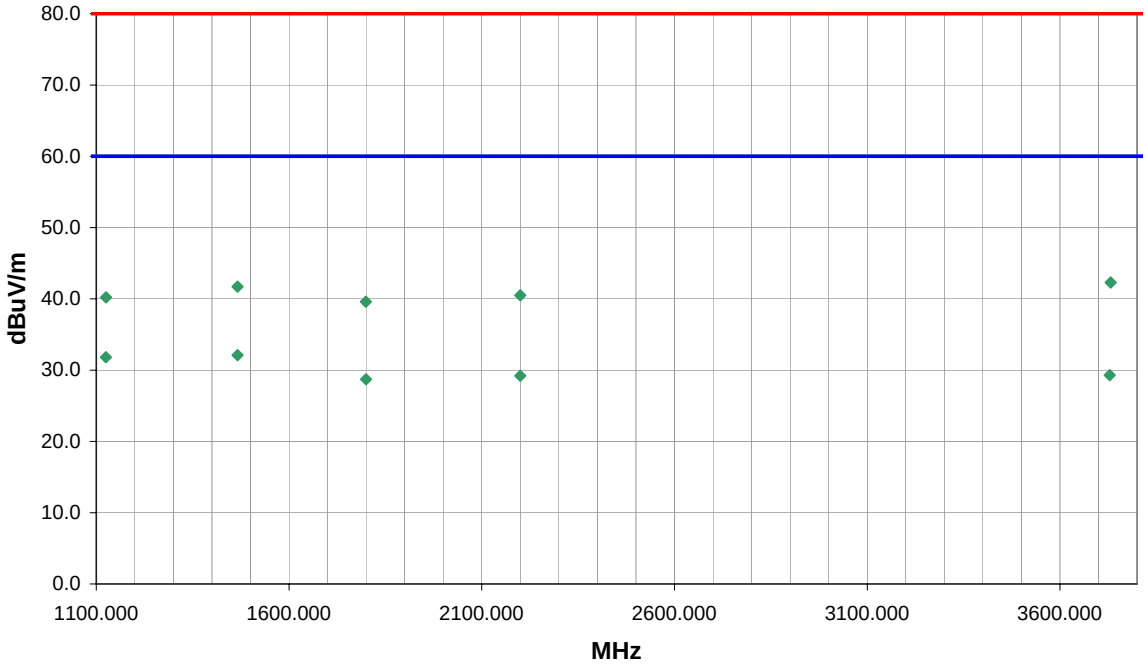
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0

Signature Holly Ashkannejhad



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
1466.541	35.6	-3.5	266.0	1.2	3.0	0.0	H-Horn	AV	0.0	32.1	60.0	-27.9
1125.050	36.6	-4.8	22.0	1.2	3.0	0.0	H-Horn	AV	0.0	31.8	60.0	-28.2
3729.053	24.6	4.7	155.0	1.2	3.0	0.0	H-Horn	AV	0.0	29.3	60.0	-30.7
2199.747	29.4	-0.2	107.0	1.2	3.0	0.0	H-Horn	AV	0.0	29.2	60.0	-30.8
1799.796	30.5	-1.8	228.0	1.2	3.0	0.0	H-Horn	AV	0.0	28.7	60.0	-31.3
3731.483	37.6	4.7	155.0	1.2	3.0	0.0	H-Horn	PK	0.0	42.3	80.0	-37.7
1466.692	45.2	-3.5	266.0	1.2	3.0	0.0	H-Horn	PK	0.0	41.7	80.0	-38.3
2199.969	40.7	-0.2	107.0	1.2	3.0	0.0	H-Horn	PK	0.0	40.5	80.0	-39.5
1125.157	45.2	-5.0	22.0	1.2	3.0	0.0	H-Horn	PK	0.0	40.2	80.0	-39.8
1799.479	41.4	-1.8	228.0	1.2	3.0	0.0	H-Horn	PK	0.0	39.6	80.0	-40.4

CONDUCTED EMISSIONS

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Receive mode typical sector configuration, 800 and 900MHz bands.

POWER SETTINGS INVESTIGATED

-48V DC

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Hewlett-Packard	8593EM	AAM	12/8/2005	13
LISN	Solar	9252-50-R-24-BNC	LIM	1/9/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

ACQ-2006.05.30
EMI 2006.4.13

EUT:	MCRB			Work Order:	RAFN0063
Serial Number:	Various			Date:	06/29/06
Customer:	Radoframe Networks, Inc.			Temperature:	23C
Attendees:	Dean Bush			Humidity:	41%
Project:	None			Barometric Pres.:	29.92
Tested by:	Ethan Schoonover	Power:	-48V DC	Job Site:	Offsite

TEST SPECIFICATIONS	Test Method
FCC 15.107:2006	ANSI C63.4:2003

TEST PARAMETERS	
Cable or Line Tested	Negative

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

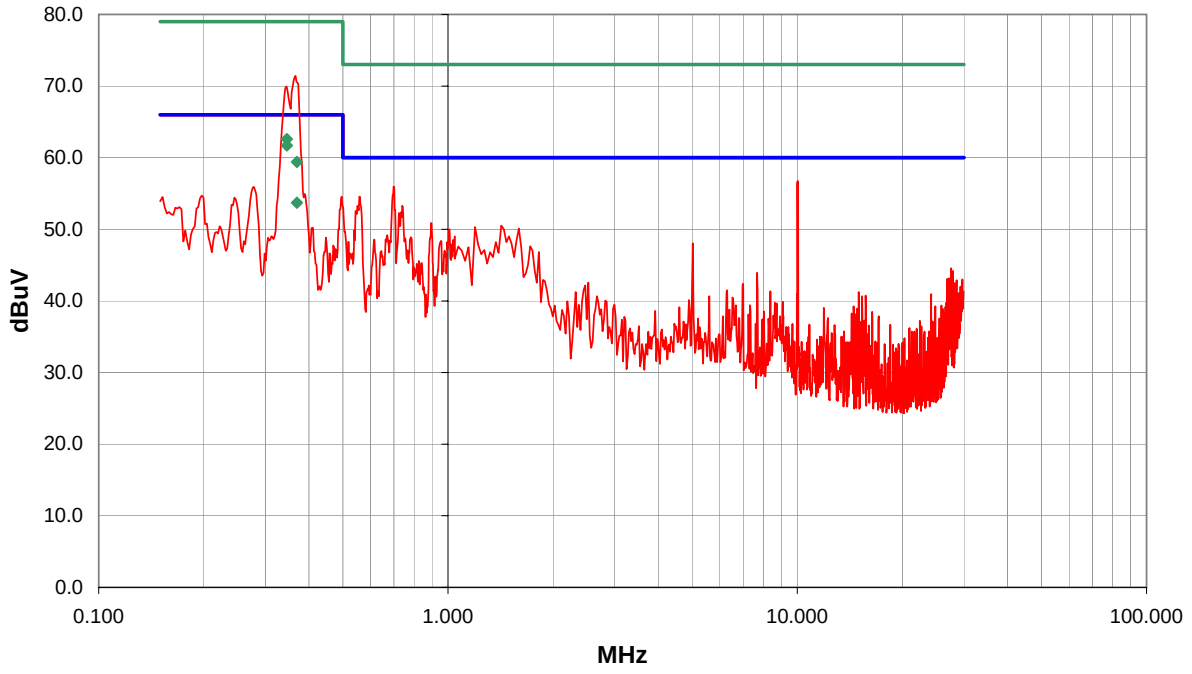
Receive mode typical sector configuration, 800 and 900MHz bands.

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.346	41.7			0.0	0.0	20.0		AV		61.7	66.0	-4.3
0.369	33.7			0.0	0.0	20.0		AV		53.7	66.0	-12.3
0.346	42.6			0.0	0.0	20.0		QP		62.6	79.0	-16.4
0.369	39.4			0.0	0.0	20.0		QP		59.4	79.0	-19.6
10.050	36.3			0.0	0.4	20.0				56.7	60.0	-3.3
10.020	36.3			0.0	0.4	20.0				56.7	60.0	-3.3
0.699	35.9			0.0	0.1	20.0				56.0	60.0	-4.0
0.559	34.5			0.0	0.1	20.0				54.6	60.0	-5.4
0.740	33.2			0.0	0.1	20.0				53.3	60.0	-6.7
0.895	30.8			0.0	0.1	20.0				50.9	60.0	-9.1
1.420	30.4			0.0	0.1	20.0				50.5	60.0	-9.5
1.195	30.2			0.0	0.1	20.0				50.3	60.0	-9.7
1.595	30.0			0.0	0.1	20.0				50.1	60.0	-9.9
1.010	29.9			0.0	0.1	20.0				50.0	60.0	-10.0
0.278	35.9			0.0	0.0	20.0				55.9	66.0	-10.1
0.670	29.1			0.0	0.1	20.0				49.2	60.0	-10.8
1.045	28.9			0.0	0.1	20.0				49.0	60.0	-11.0
0.785	28.8			0.0	0.1	20.0				48.9	60.0	-11.1
0.197	34.7			0.0	0.0	20.0				54.7	66.0	-11.3

NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

ACQ-2006.05.30
EMI 2006.4.13

EUT:	MCRB			Work Order:	RAFN0063
Serial Number:	Various			Date:	06/29/06
Customer:	Radoframe Networks, Inc.			Temperature:	23C
Attendees:	Dean Bush			Humidity:	41%
Project:	None			Barometric Pres.:	29.92
Tested by:	Ethan Schoonover	Power:	-48V DC	Job Site:	Offsite

TEST SPECIFICATIONS	Test Method
FCC 15.107:2006	ANSI C63.4:2003

TEST PARAMETERS	
Cable or Line Tested	Positive

COMMENTS

Antenna ports terminated.

EUT OPERATING MODES

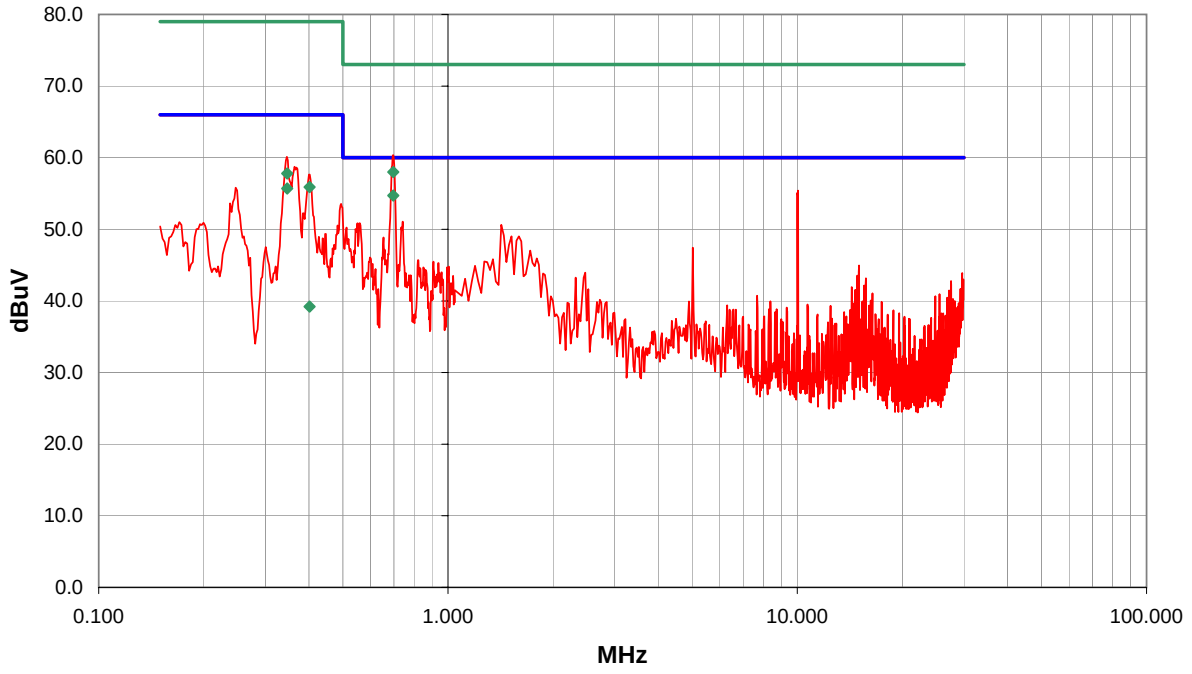
Receive mode typical sector configuration, 800 and 900MHz bands.

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.697	34.7			0.0	0.0	20.0		AV		54.7	60.0	-5.3
0.346	35.7			0.0	0.0	20.0		AV		55.7	66.0	-10.3
0.697	38.0			0.0	0.0	20.0		QP		58.0	73.0	-15.0
0.346	37.8			0.0	0.0	20.0		QP		57.8	79.0	-21.2
0.402	35.9			0.0	0.0	20.0		QP		55.9	79.0	-23.1
0.402	19.2			0.0	0.0	20.0		AV		39.2	66.0	-26.8
10.050	35.0			0.0	0.4	20.0				55.4	60.0	-4.6
10.000	34.7			0.0	0.4	20.0				55.1	60.0	-4.9
0.346	40.1			0.0	0.0	20.0				60.1	66.0	-5.9
0.364	38.7			0.0	0.0	20.0				58.7	66.0	-7.3
0.402	37.6			0.0	0.0	20.0				57.6	66.0	-8.4
0.742	31.0			0.0	0.1	20.0				51.1	60.0	-8.9
0.559	30.8			0.0	0.1	20.0				50.9	60.0	-9.1
0.550	30.8			0.0	0.1	20.0				50.9	60.0	-9.1
1.420	30.5			0.0	0.1	20.0				50.6	60.0	-9.4
0.512	30.2			0.0	0.0	20.0				50.2	60.0	-9.8
0.247	35.8			0.0	0.0	20.0				55.8	66.0	-10.2
1.595	28.9			0.0	0.1	20.0				49.0	60.0	-11.0
1.520	28.9			0.0	0.1	20.0				49.0	60.0	-11.0