Janteq Corp.

BONDI TwinTX
Aviation Pack

EMC Test Report

Report No. JANQ0001

Report Prepared By

NORTHWEST EMC

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

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: August 2, 2011

Janteq Corp.

Model: BONDI TwinTX Aviation Pack

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Output Power	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Spurious Radiated Emissions	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Occupied Bandwidth	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Emission Mask	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Spurious Conducted Emissions	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Frequency Stability	FCC 74:2011	ANSI/TIA/EIA-603-C-2004	**Pass**

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

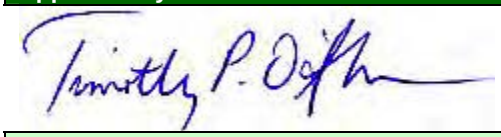
Test Facility

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

Northwest EMC, Inc.
41 Tesla Ave.
Irvine, CA 92618
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 (Site filing #2834B-1).

Approved By:



Tim O'Shea, Operations Manager

NVLAP®

NVLAP Lab Code: 200676-0

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

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

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

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 National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. 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.

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-Gen, Issue 2 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. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1)*

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.

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).

Accreditations and Authorizations

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, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).*

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 (US0017).

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

KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175)*

VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

SCOPE

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

Northwest EMC Locations

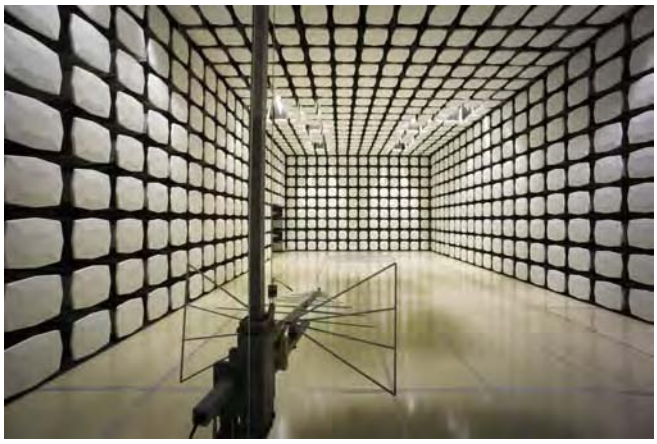
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

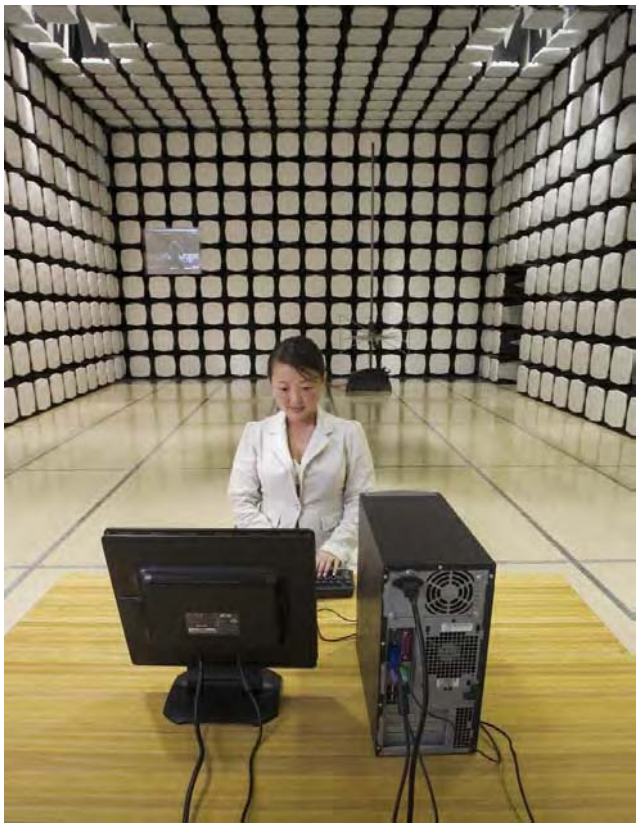
California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796





Party Requesting the Test

Company Name:	Janteq Corp.
Address:	9272 Jeronimo Rd. Suite 124
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Tom Chang
Model:	BONDI TwinTX Aviation Pack
First Date of Test:	7/25/2011
Last Date of Test:	8/2/2011
Receipt Date of Samples:	7/25/2011
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Digital HD Video COFDM Transmitter operating in the S-band of 2.0 - 2.7 GHz at 1, 2.5 and 5 W on twin TX outputs

Testing Objective:
To demonstrate compliance with the requirements of FCC Part 74

EUT Photo

CONFIGURATION 1 JANQ0001

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT	Janteq Corporation	BONDI TwinTX Aviation Pack	0

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Control	Jantec Corporation	N/A	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A
50 Ohm Termination (1)	Fairview Microwave	ST6NL-150	N/A
DC Power Supply	Hewlett Packard	6574A	US36340150

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Remote Control Cable	Yes	2.5m	Yes	Remote Control	EUT
DC Cable	Yes	0.8m	No	EUT	DC Power Supply
N Type Cable	Yes	0.5m	No	EUT	50 Ohm Termination
N Type Cable	Yes	0.5m	No	EUT	50 Ohm Termination
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	7/25/2011	Frequency Stability	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	7/26/2011	Output Power - Conducted	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	7/28/2011	Spurious 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.
4	7/29/2011	Occupied Bandwidth	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	7/29/2011	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.
6	8/2/2011	Output Power - Radiated	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	8/2/2011	Spurious Conducted Emissions	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
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Dual Directional Coupler	Amplifier Research	DC7144A	IRG	3/3/2011	24 mo

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

Per FCC Part 74, the emission mask was measured. The mean power of emissions shall be attenuated below the mean transmitter power (PMEAN) in accordance with the following schedule:

When using transmissions employing digital modulation techniques:

(i) For operating frequencies below 15 GHz, in any 4 kHz reference bandwidth (BREF), the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 250 percent of the authorized bandwidth: As specified by the following equation but in no event less than 50 decibels:

Then, a spectrum analyzer was used to measure the emission mask. A spectrum analyzer using a peak detector with no video filtering was used with a resolution bandwidth equal to approximately 1.0 percent of the emission bandwidth of the EUT.

NORTHWEST EMC

EMISSION MASK

XMit 2011.04.20

EUT:	BONDI TwinTX Aviation Pack			Work Order:	JANQ0001
Serial Number:	0			Date:	07/29/11
Customer:	Janteq Corp.			Temperature:	23.28°C
Attendees:	None			Humidity:	46%
Project:	None			Barometric Pres.:	1012
Tested by:	Jaemi Suh	Power:	28VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port A. Power Setting Set to Max.

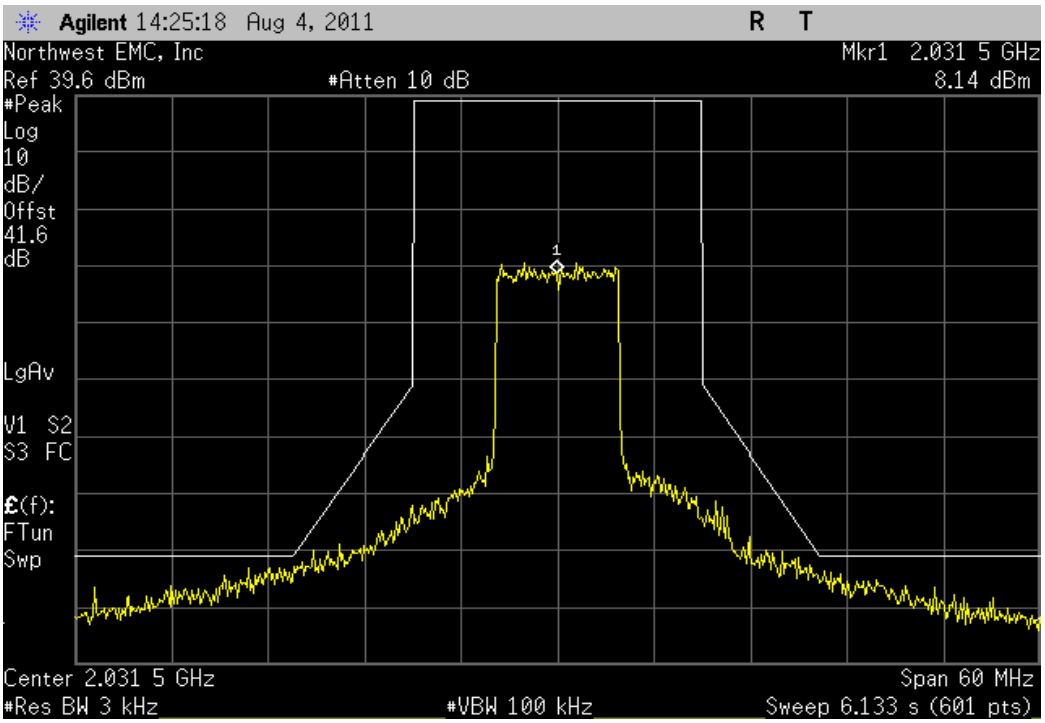
DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature

		Value	Limit	Result
QPSK				
	Low Channel 2031.5 MHz	See Graph	See Graph	Pass
	Mid Channel 2067.5 MHz	See Graph	See Graph	Pass
	High Channel 2103.5 MHz	See Graph	See Graph	Pass
16QAM				
	Low Channel 2031.5 MHz	See Graph	See Graph	Pass
	Mid Channel 2067.5 MHz	See Graph	See Graph	Pass
	High Channel 2103.5 MHz	See Graph	See Graph	Pass
64QAM				
	Low Channel 2031.5 MHz	See Graph	See Graph	Pass
	Mid Channel 2067.5 MHz	See Graph	See Graph	Pass
	High Channel 2103.5 MHz	See Graph	See Graph	Pass

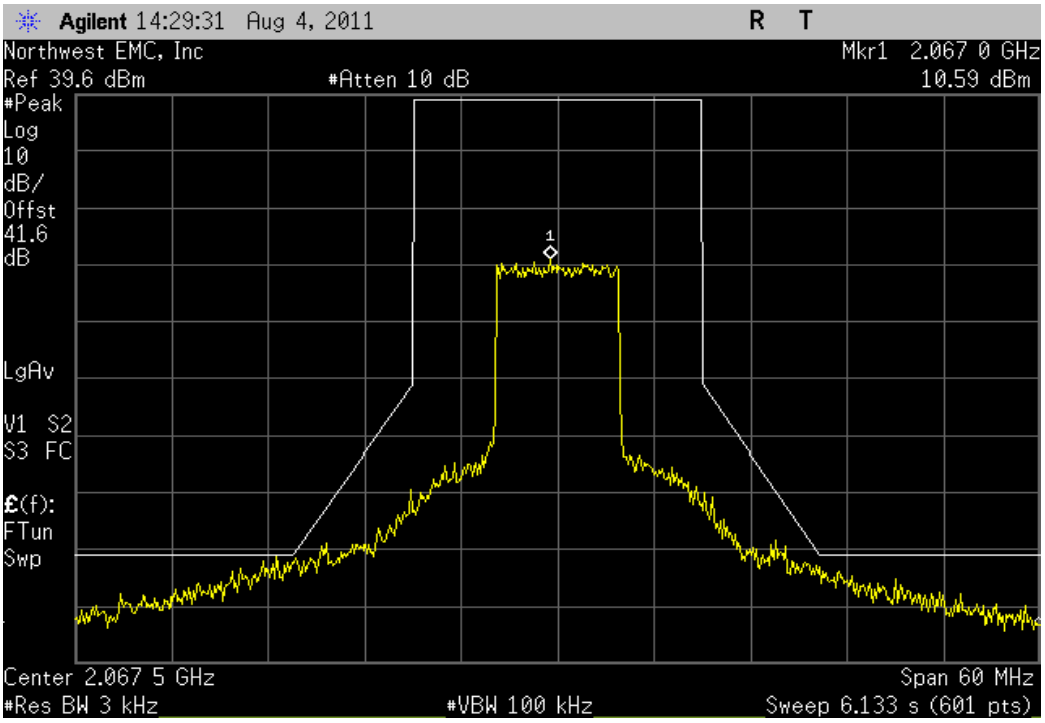
QPSK, Low Channel 2031.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



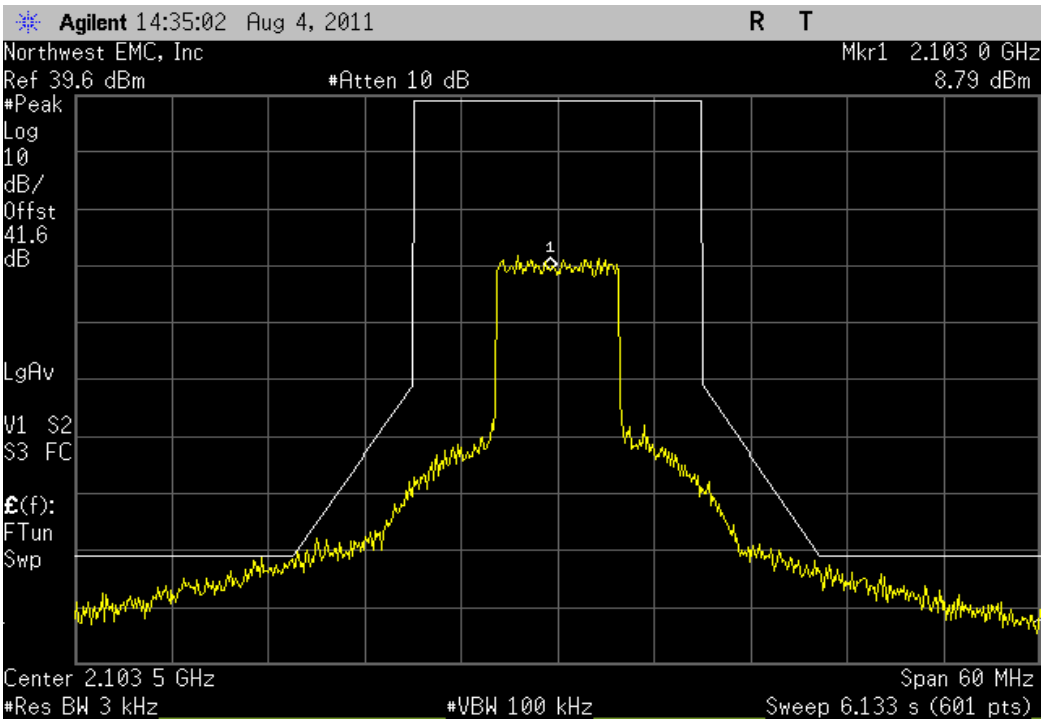
QPSK, Mid Channel 2067.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



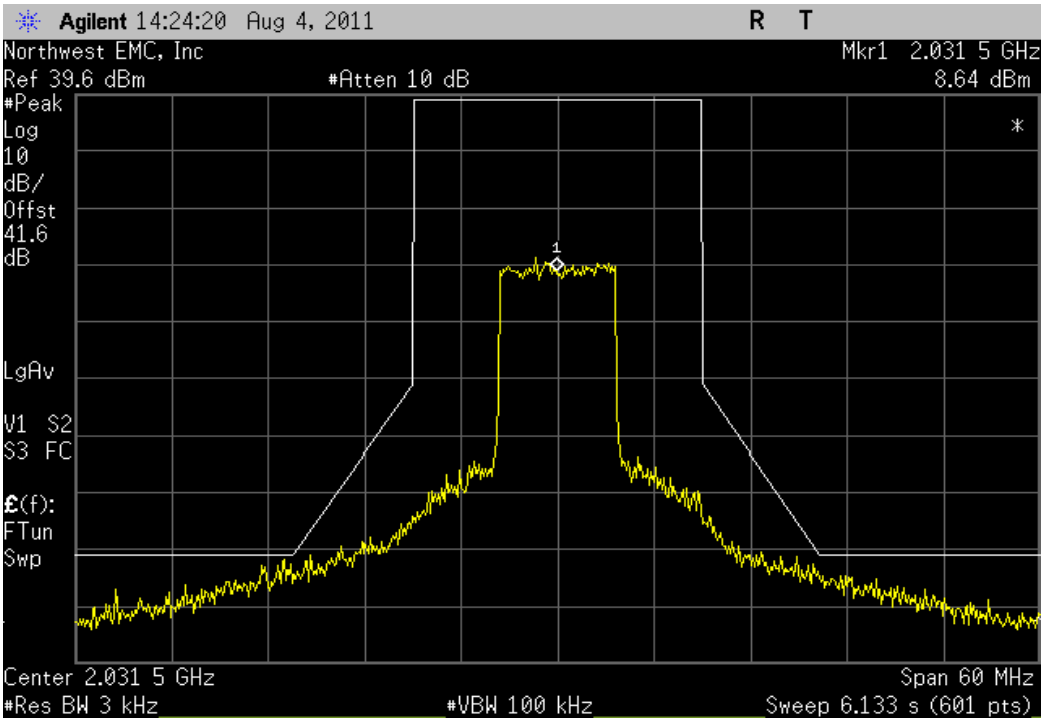
QPSK, High Channel 2103.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



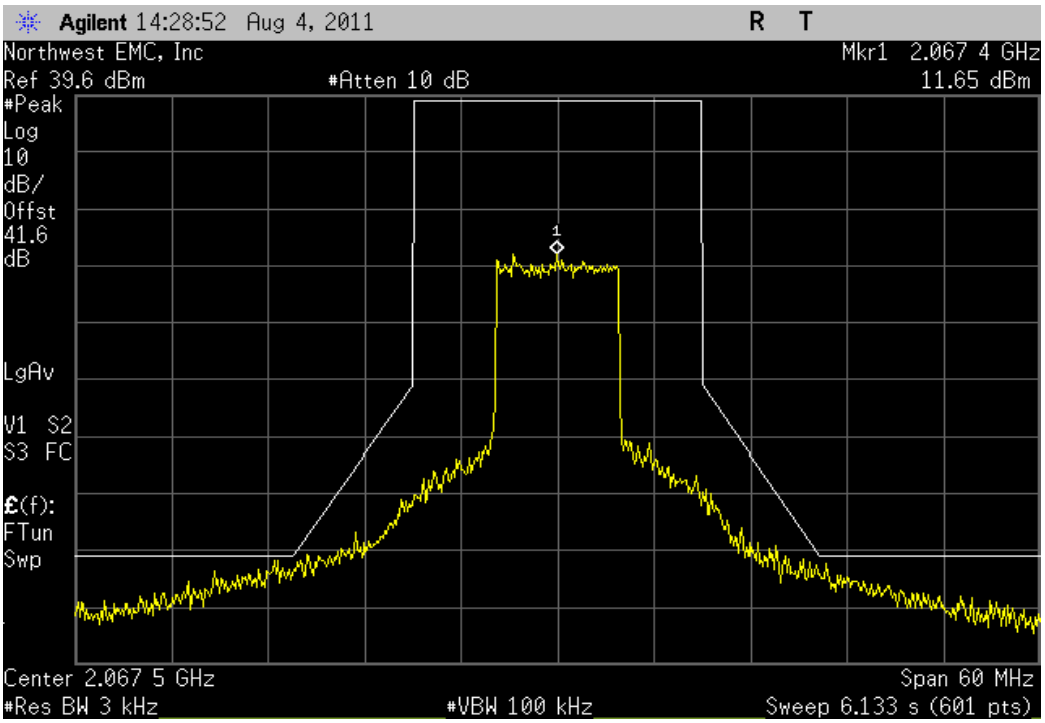
16QAM, Low Channel 2031.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



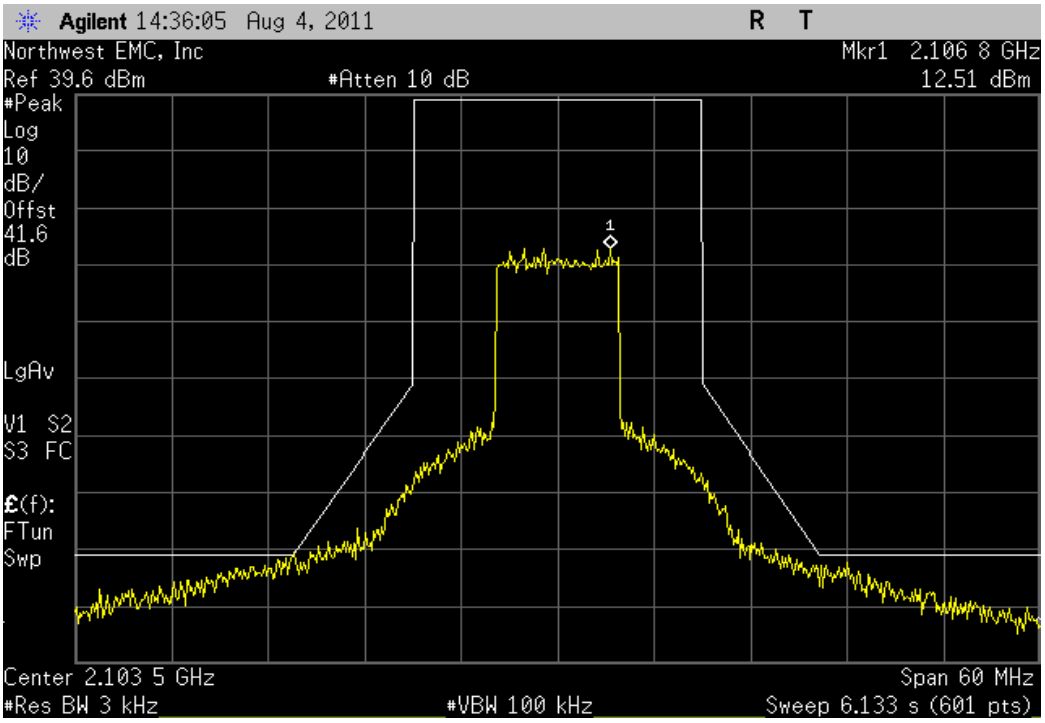
16QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



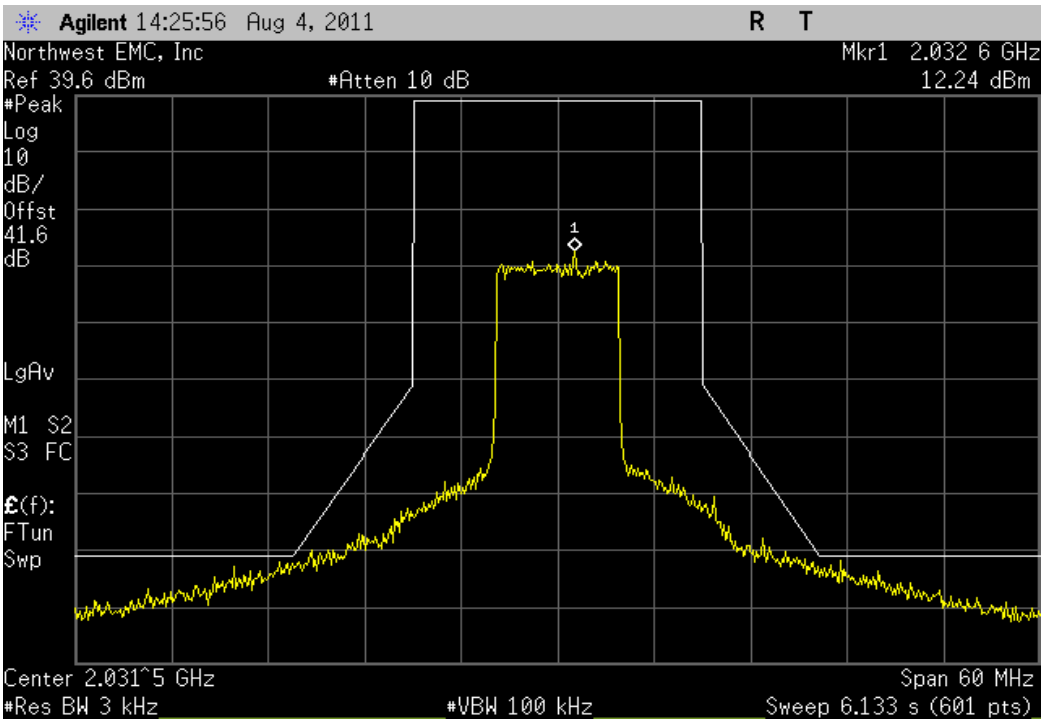
16QAM, High Channel 2103.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



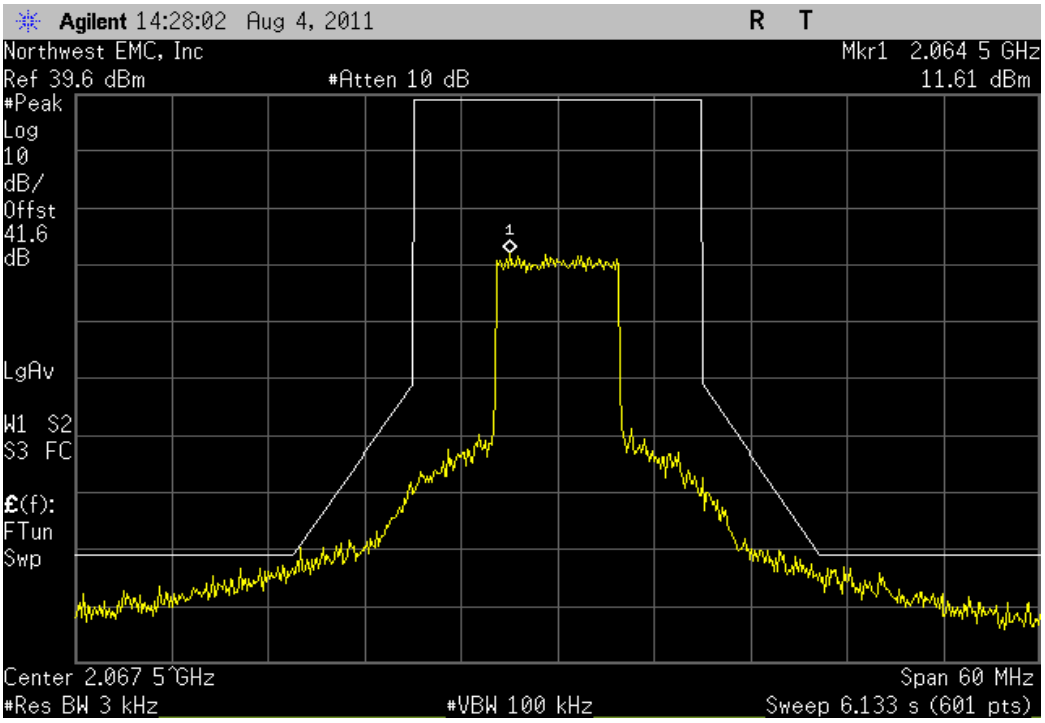
64QAM, Low Channel 2031.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



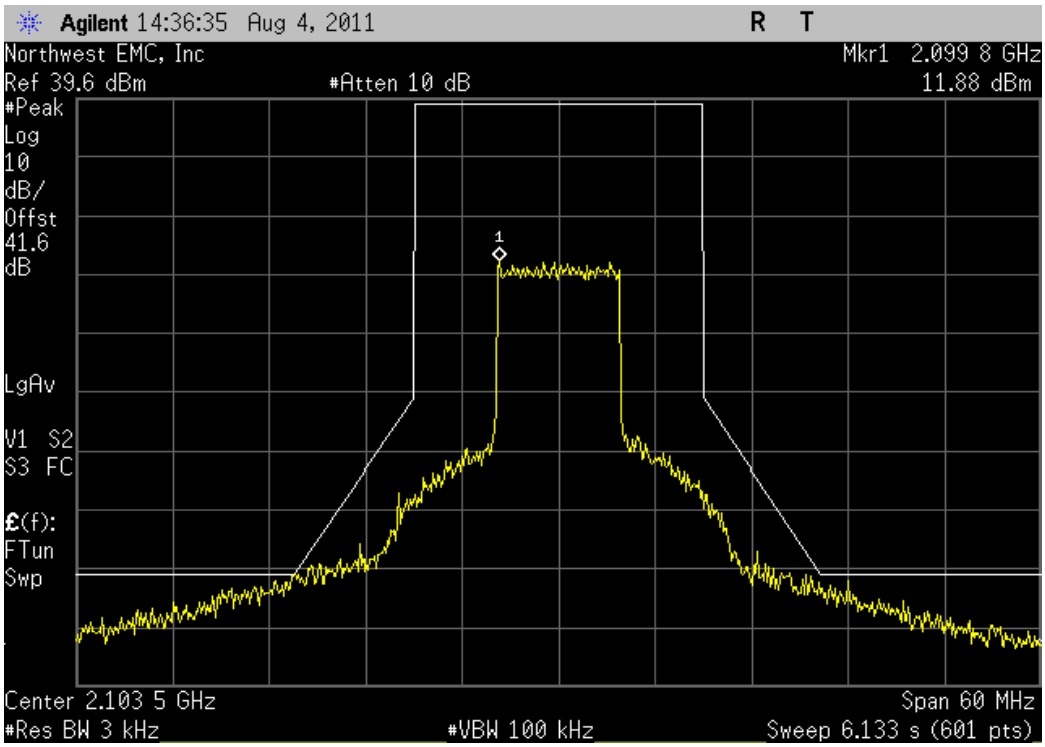
64QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				See Graph	See Graph	Pass



64QAM, High Channel 2103.5 MHz

					Value	Limit	Result
					See Graph	See Graph	Pass



OUTPUT POWER - CONDUCTED

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
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12
Dual Directional Coupler	Amplifier Research	DC7144A	IRG	3/3/2011	24 mo

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate.

NORTHWEST EMC

OUTPUT POWER - CONDUCTED

XMit 2011.04.20

EUT:	BONDI TwinTX Aviation Pack			Work Order:	JANQ0001
Serial Number:	0			Date:	07/29/11
Customer:	Janteq Corp.			Temperature:	23.28°C
Attendees:	None			Humidity:	46%
Project:	None			Barometric Pres.:	1012
Tested by:	Jaemi Suh	Power:	28VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Power Setting Set to Max.

DEVIATIONS FROM TEST STANDARD

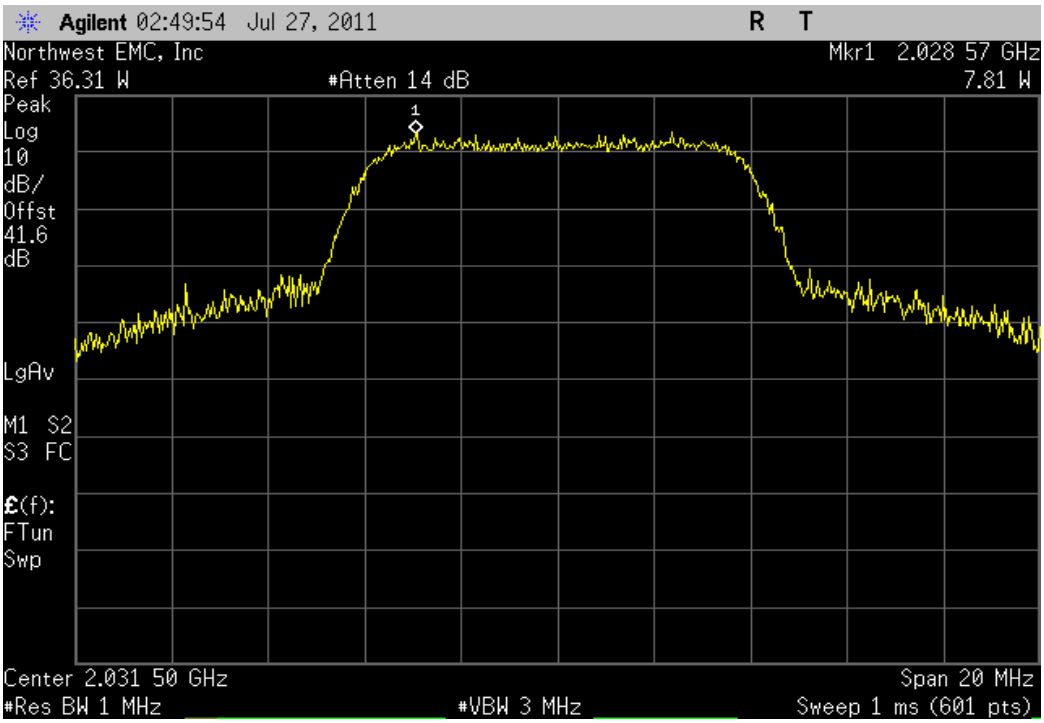
Configuration #	1	Signature

			Value	Limit	Result
Port A					
	QPSK				
		Low Channel 2031.5 MHz	7.81 W	12 W	Pass
		Mid Channel 2067.5 MHz	9.32 W	12 W	Pass
		High Channel 2103.5 MHz	7.55 W	12 W	Pass
	16QAM				
		Low Channel 2031.5 MHz	9.27 W	12 W	Pass
		Mid Channel 2067.5 MHz	8.67 W	12 W	Pass
		High Channel 2103.5 MHz	8.45 W	12 W	Pass
	64QAM				
		Low Channel 2031.5 MHz	7.18 W	12 W	Pass
		Mid Channel 2067.5 MHz	8.97 W	12 W	Pass
		High Channel 2103.5 MHz	8.29 W	12 W	Pass
Port B					
	QPSK				
		Low Channel 2031.5 MHz	6.00 W	12 W	Pass
		Mid Channel 2067.5 MHz	9.00 W	12 W	Pass
		High Channel 2103.5 MHz	8.20 W	12 W	Pass
	16QAM				
		Low Channel 2031.5 MHz	5.83 W	12 W	Pass
		Mid Channel 2067.5 MHz	9.18 W	12 W	Pass
		High Channel 2103.5 MHz	7.33 W	12 W	Pass
	64QAM				
		Low Channel 2031.5 MHz	6.18 W	12 W	Pass
		Mid Channel 2067.5 MHz	7.26 W	12 W	Pass
		High Channel 2103.5 MHz	6.32 W	12 W	Pass

OUTPUT POWER - CONDUCTED

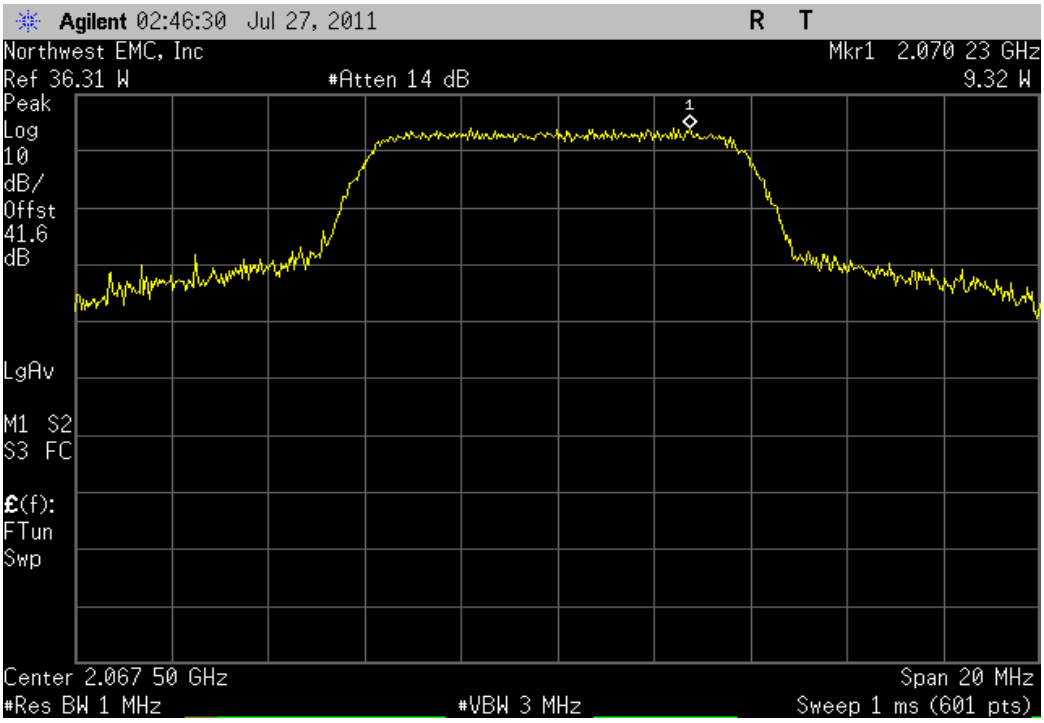
Port A, QPSK, Low Channel 2031.5 MHz

					Value	Limit	Result
					7.81 W	12 W	Pass



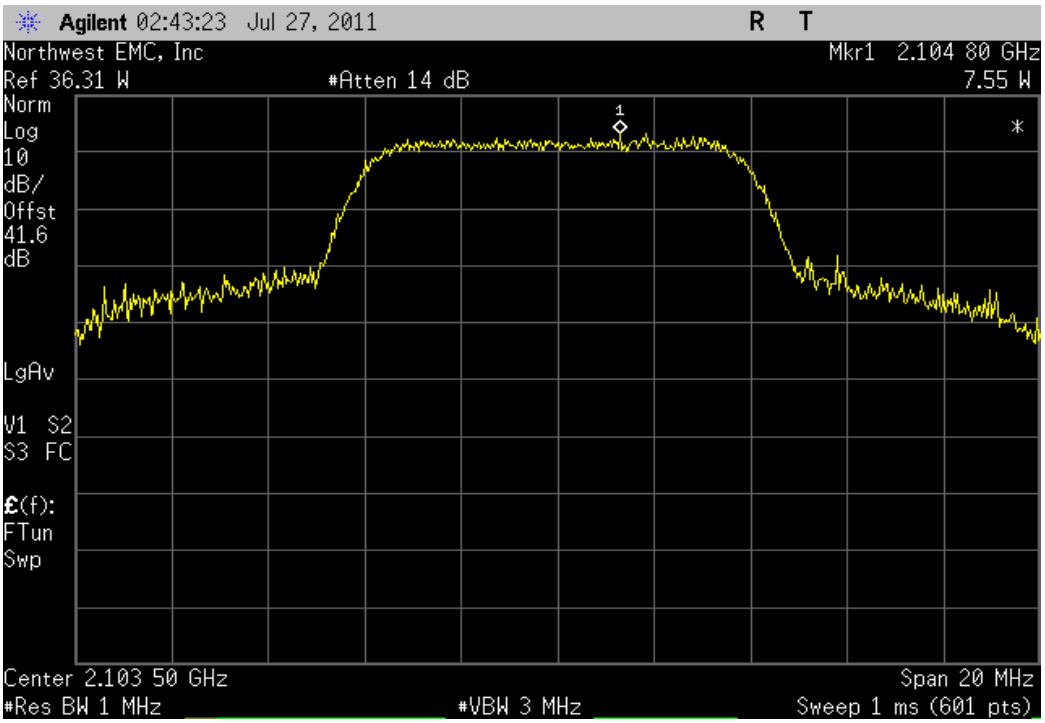
Port A, QPSK, Mid Channel 2067.5 MHz

					Value	Limit	Result
					9.32 W	12 W	Pass



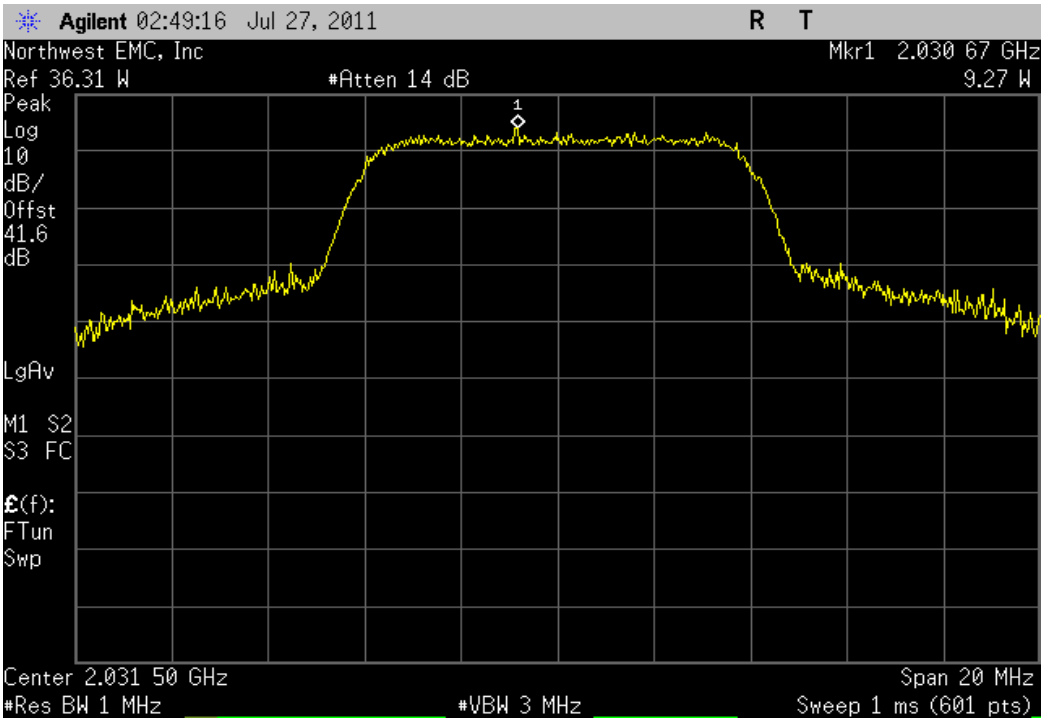
Port A, QPSK, High Channel 2103.5 MHz

					Value	Limit	Result
					7.55 W	12 W	Pass



Port A, 16QAM, Low Channel 2031.5 MHz

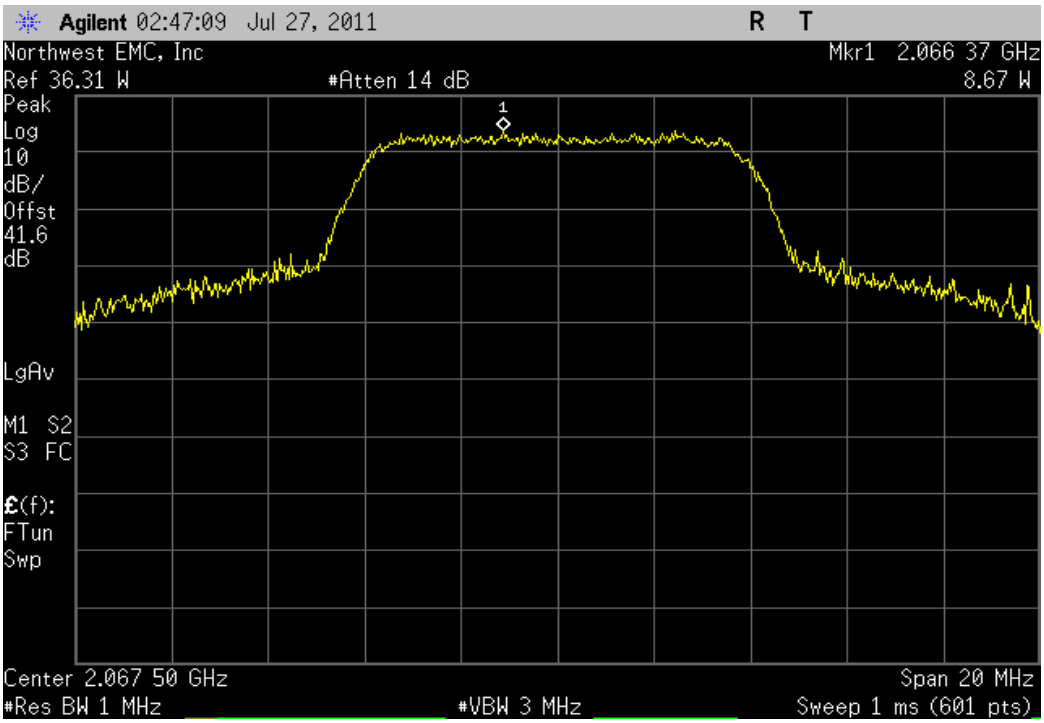
					Value	Limit	Result
					9.27 W	12 W	Pass



OUTPUT POWER - CONDUCTED

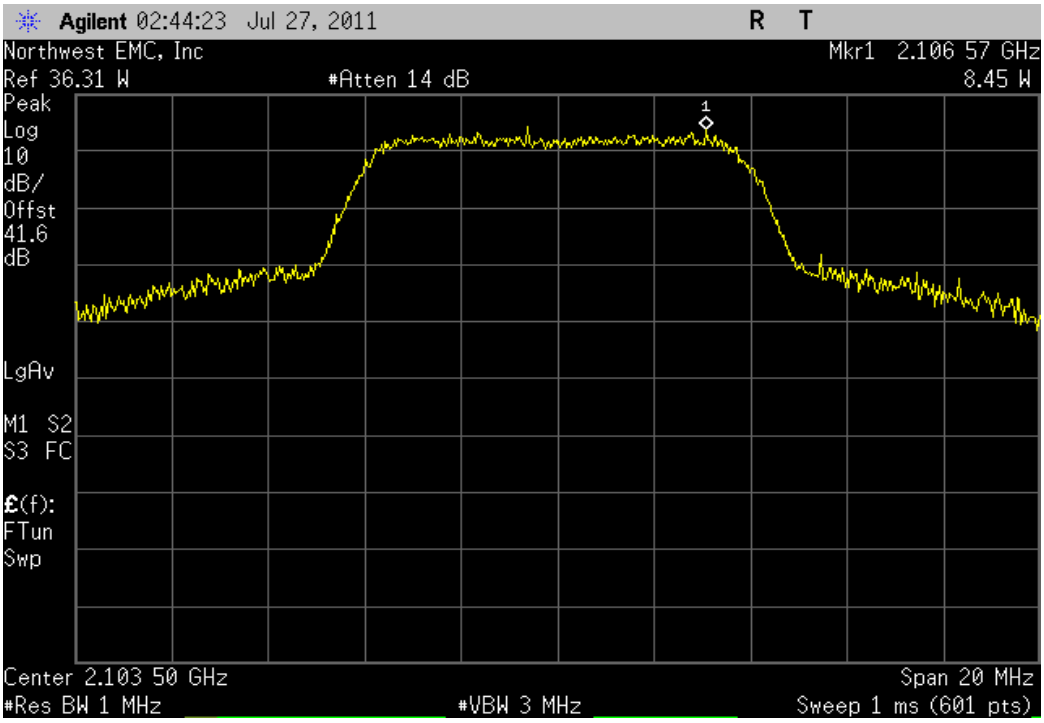
Port A, 16QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				8.67 W	12 W	Pass



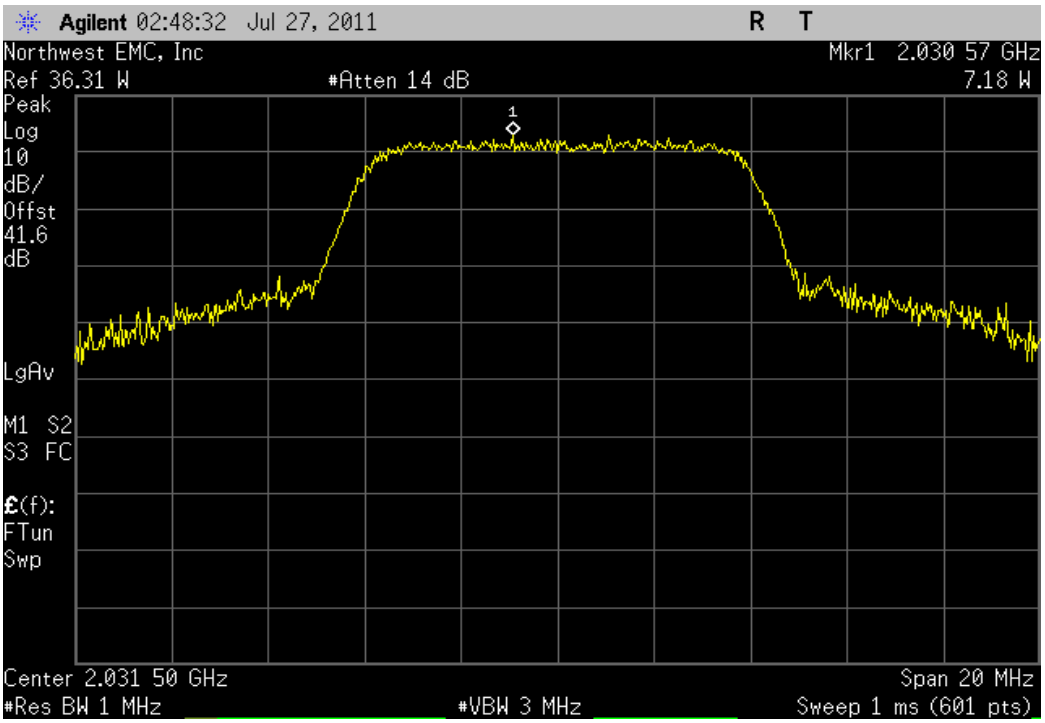
Port A, 16QAM, High Channel 2103.5 MHz

				Value	Limit	Result
				8.45 W	12 W	Pass



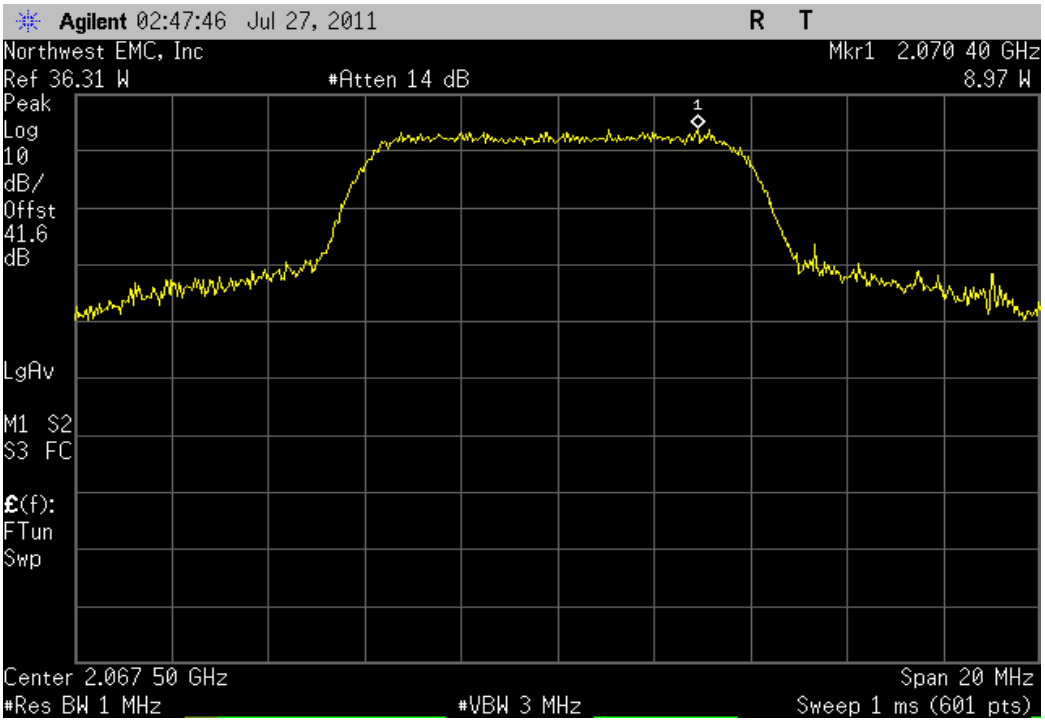
Port A, 64QAM, Low Channel 2031.5 MHz

				Value	Limit	Result
				7.18 W	12 W	Pass



Port A, 64QAM, Mid Channel 2067.5 MHz

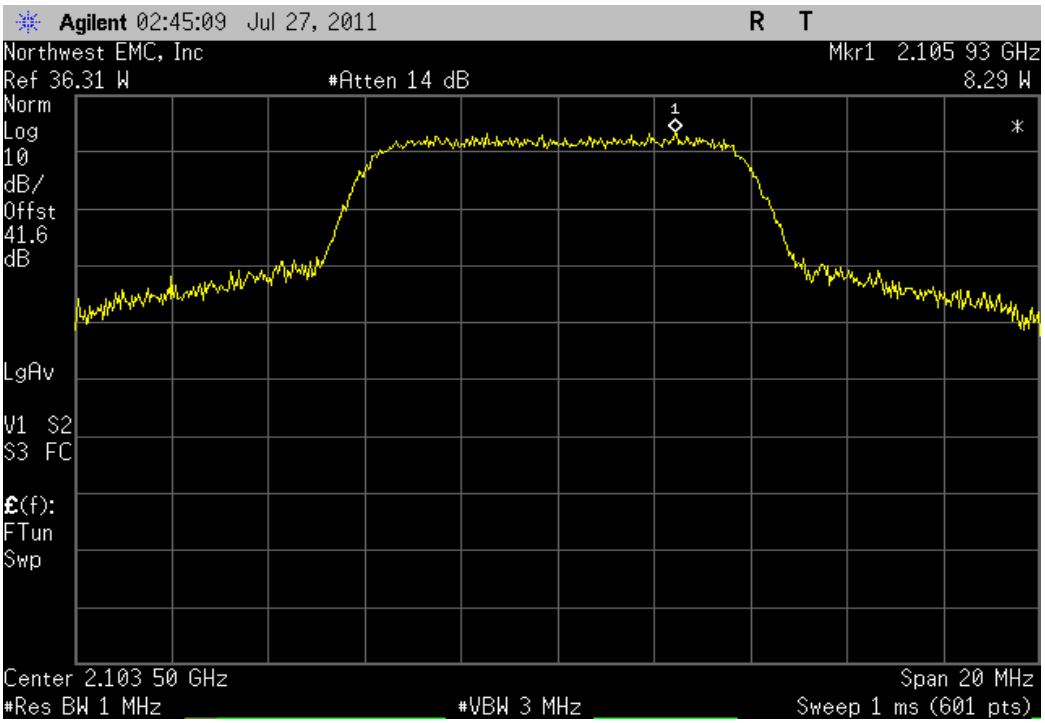
				Value	Limit	Result
				8.97 W	12 W	Pass



OUTPUT POWER - CONDUCTED

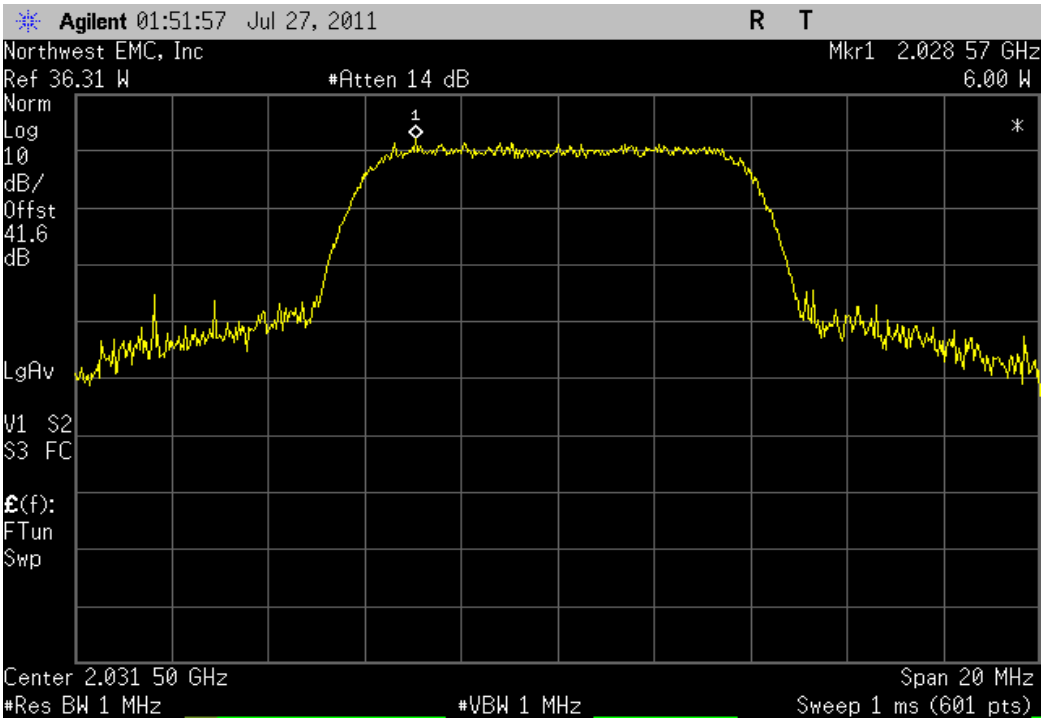
Port A, 64QAM, High Channel 2103.5 MHz

					Value	Limit	Result
					8.29 W	12 W	Pass



Port B, QPSK, Low Channel 2031.5 MHz

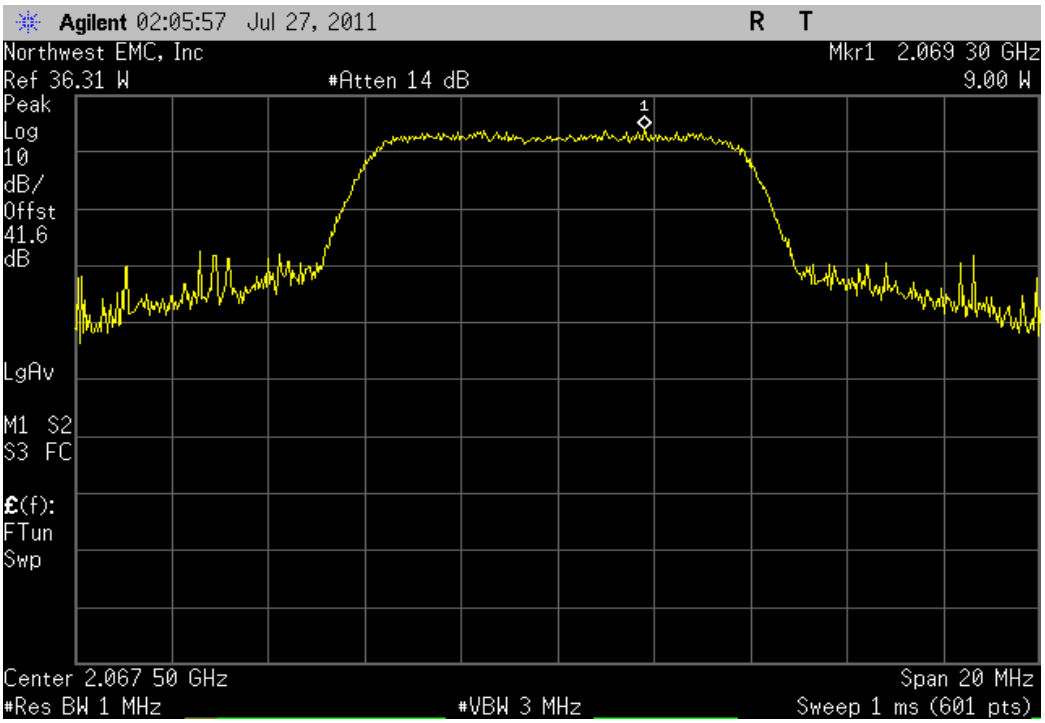
					Value	Limit	Result
					6.00 W	12 W	Pass



OUTPUT POWER - CONDUCTED

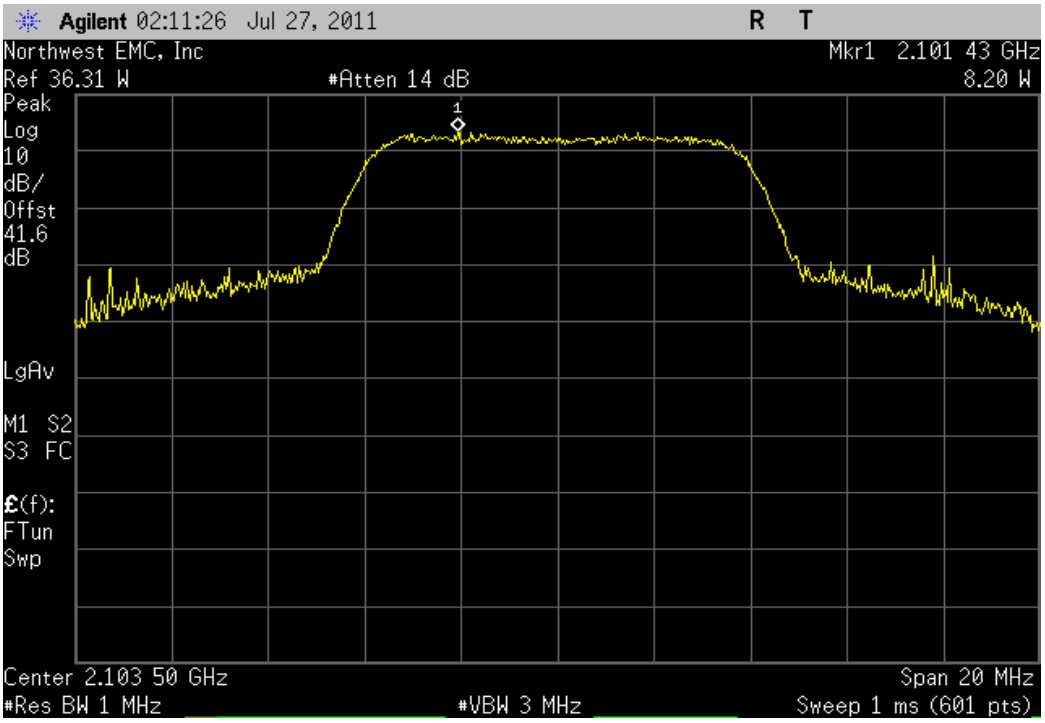
Port B, QPSK, Mid Channel 2067.5 MHz

					Value	Limit	Result
					9.00 W	12 W	Pass



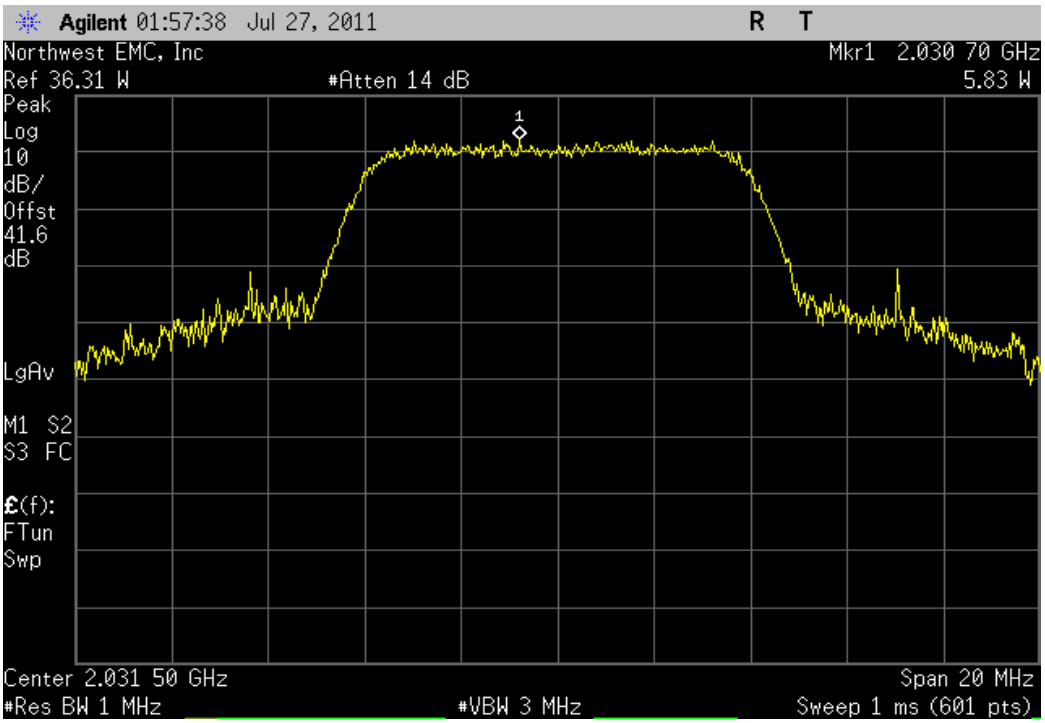
Port B, QPSK, High Channel 2103.5 MHz

					Value	Limit	Result
					8.20 W	12 W	Pass



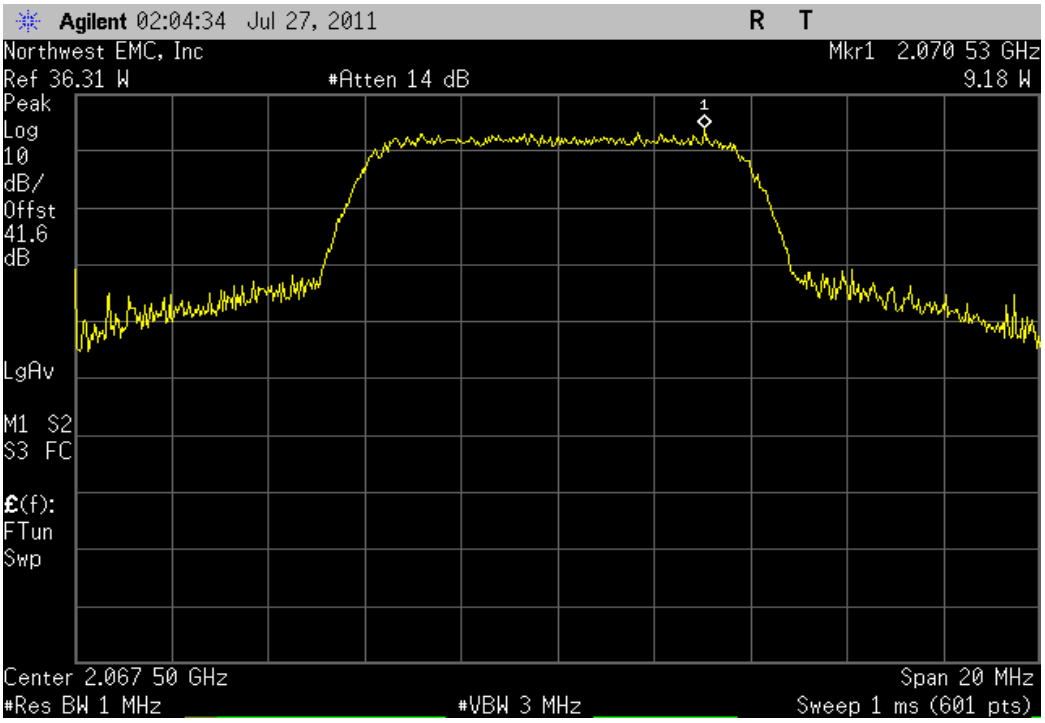
Port B, 16QAM, Low Channel 2031.5 MHz

					Value	Limit	Result
					5.83 W	12 W	Pass



Port B, 16QAM, Mid Channel 2067.5 MHz

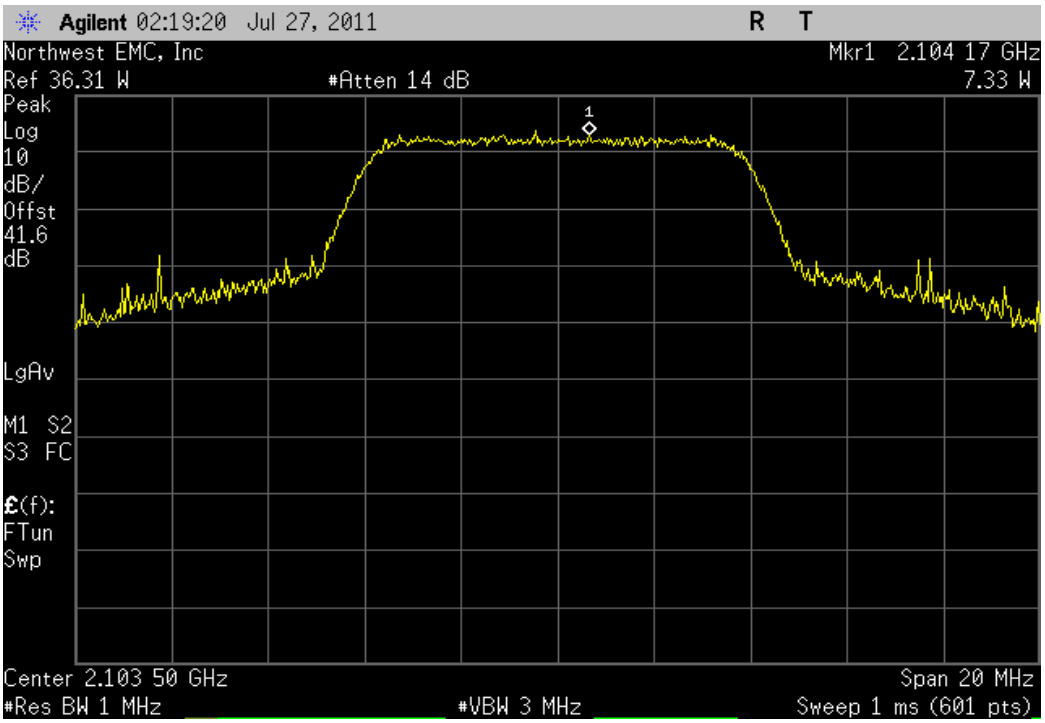
					Value	Limit	Result
					9.18 W	12 W	Pass



OUTPUT POWER - CONDUCTED

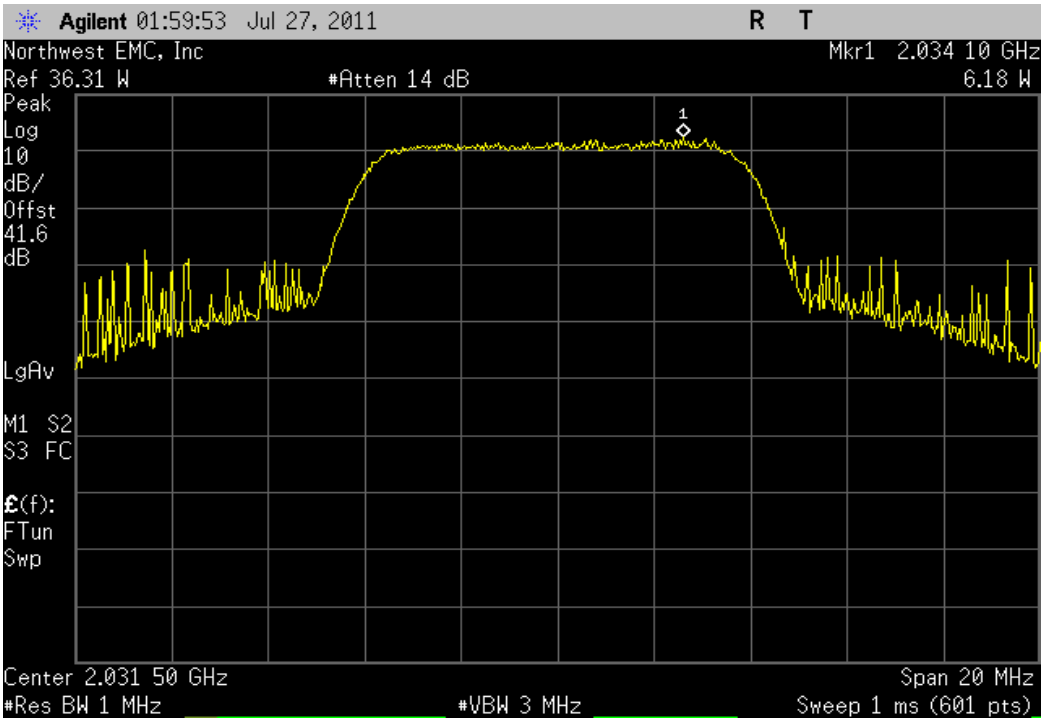
Port B, 16QAM, High Channel 2103.5 MHz

					Value	Limit	Result
					7.33 W	12 W	Pass



Port B, 64QAM, Low Channel 2031.5 MHz

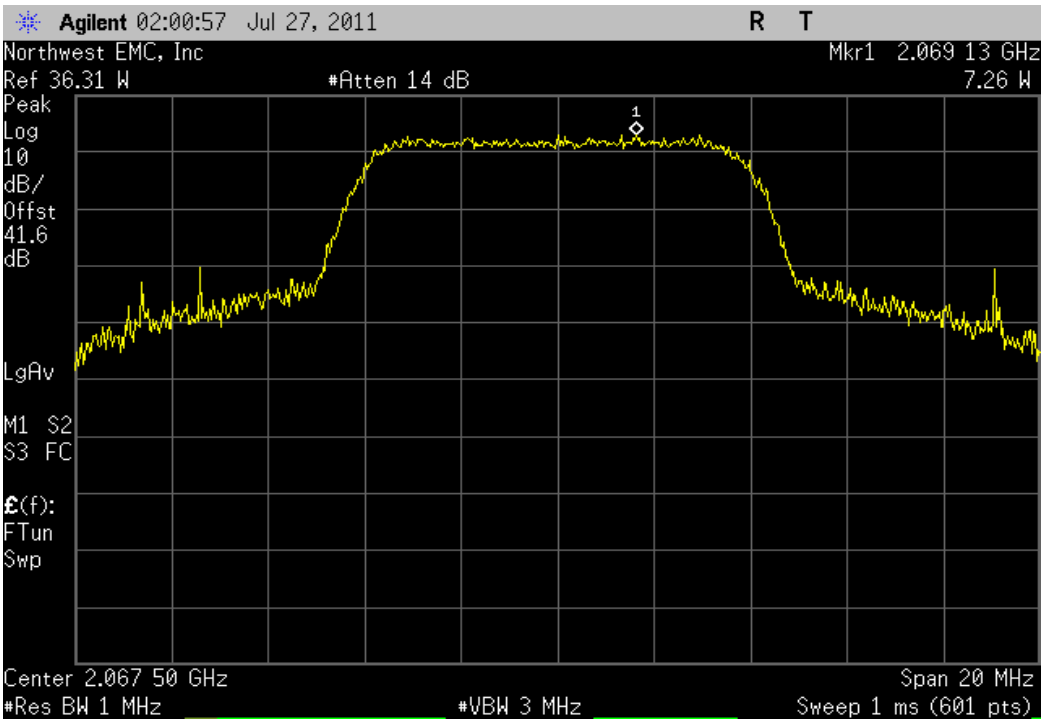
					Value	Limit	Result
					6.18 W	12 W	Pass



OUTPUT POWER - CONDUCTED

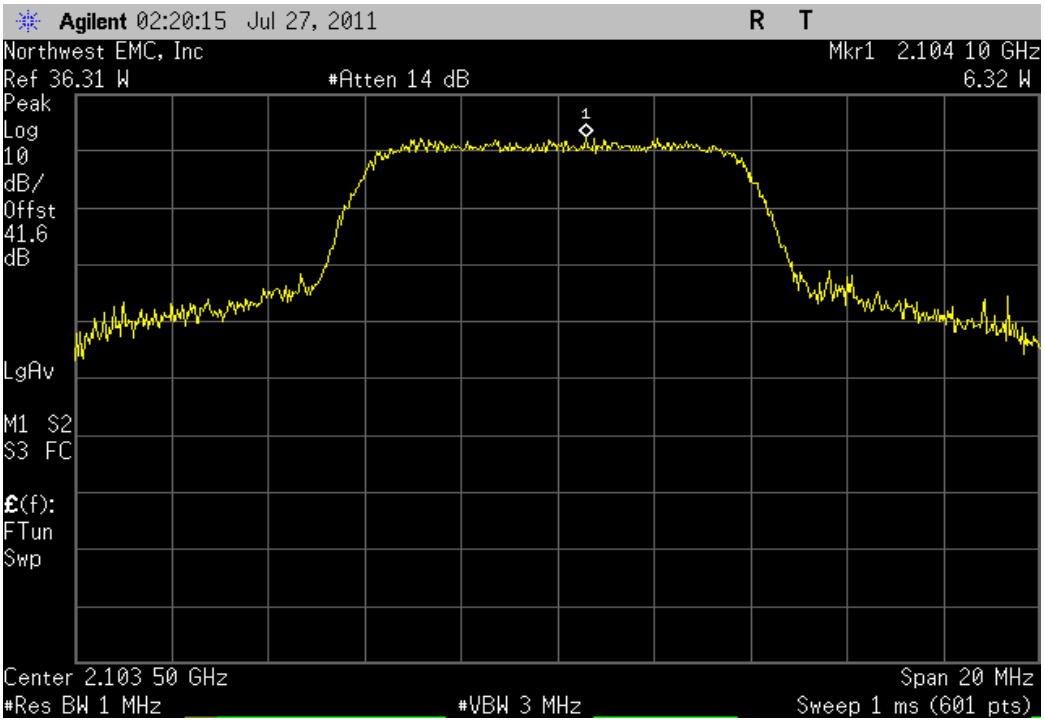
Port B, 64QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				7.26 W	12 W	Pass



Port B, 64QAM, High Channel 2103.5 MHz

				Value	Limit	Result
				6.32 W	12 W	Pass



FREQUENCY STABILITY

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
MultiMeter	Fluke	79 III	MMD	1/26/2011	24
Power Sensor	Agilent	E4412A	SQE	4/21/2010	24
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Chamber, Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPHS-32-3.5-SCT/AC	TBE	6/8/2010	24
Spectrum Analyzer	Agilent	E4446A	AAY	1/11/2011	12
Dual Directional Coupler	Amplifier Research	DC7144A	IRG	3/3/2011	24 mo

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT. Measurements were made at the mid channel of each band to determine frequency stability. If the frequency variation is less than 100 ppm, the EUT will meet the requirement of FCC Part 74 that the emissions are maintained within the band of operation.

NORTHWEST EMC

FREQUENCY STABILITY

XMit 2010.07.29

EUT:	BONDI TwinTX Aviation Pack			Work Order:	JANQ0001
Serial Number:	0			Date:	07/25/11
Customer:	Janteq Corporation			Temperature:	22.86°C
Attendees:	Tom Chang			Humidity:	52%
Project:	None			Barometric Pres.:	1012.2
Tested by:	Jaemi Suh	Power:	28 VDC	Job Site:	OC13

TEST SPECIFICATIONS	TEST METHOD
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Transmitting at low, mid and high channels. Port A. Power Setting set to Max.

DEVIATIONS FROM TEST STANDARD

Configuration #	2	Signature

Low Channel, 5150 MHz - 5250 MHz Band

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

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
32.2 (115%)	2031.500000	2031.487000	0.001	0.005
31.9 (110%)	2031.500000	2031.455000	0.002	0.005
29.4 (105%)	2031.500000	2031.482500	0.001	0.005
28 (100%)	2031.500000	2031.487000	0.001	0.005
26.6 (95%)	2031.500000	2031.483000	0.001	0.005
25.2 (90%)	2031.500000	2031.502500	0.000	0.005
23.8 (85%)	2031.500000	2031.480000	0.001	0.005

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 28 VDC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
50	2031.500000	2031.477500	0.001	0.005
40	2031.500000	2031.510000	0.000	0.005
30	2031.500000	2031.472500	0.001	0.005
20	2031.500000	2031.477500	0.001	0.005
10	2031.500000	2031.512500	-0.001	0.005
0	2031.500000	2031.432500	0.003	0.005
-10	2031.500000	2031.495000	0.000	0.005
-20	2031.500000	2031.512500	-0.001	0.005
-30	2031.500000	2031.537000	-0.002	0.005

Mid Channel, 2.0675 MHz

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

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
32.2 (115%)	2067.500000	2067.470000	0.001	0.005
31.9 (110%)	2067.500000	2067.505000	0.000	0.005
29.4 (105%)	2067.500000	2067.532500	-0.002	0.005
28 (100%)	2067.500000	2067.512500	-0.001	0.005
26.6 (95%)	2067.500000	2067.490000	0.000	0.005
25.2 (90%)	2067.500000	2067.512500	-0.001	0.005
23.8 (85%)	2067.500000	2067.470000	0.001	0.005

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 28 VDC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
50	2067.500000	2067.492500	0.000	0.005
40	2067.500000	2067.495000	0.000	0.005
30	2067.500000	2067.485000	0.001	0.005
20	2067.500000	2067.512500	-0.001	0.005
10	2067.500000	2067.452500	0.002	0.005
0	2067.500000	2067.500000	0.000	0.005
-10	2067.500000	2067.507600	0.000	0.005
-20	2067.500000	2067.467500	0.002	0.005
-30	2067.500000	2067.467000	0.002	0.005

High Channel, 2.1035 GHz

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

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
32.2 (115%)	2103.500000	2103.492500	0.000	0.005
31.9 (110%)	2103.500000	2103.500000	0.000	0.005
29.4 (105%)	2103.500000	2103.492500	0.000	0.005
28 (100%)	2103.500000	2103.487500	0.001	0.005
26.6 (95%)	2103.500000	2103.502000	0.000	0.005
25.2 (90%)	2103.500000	2103.492000	0.000	0.005
23.8 (85%)	2103.500000	2103.469500	0.001	0.005

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 28 VDC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
50	2103.500000	2103.497500	0.000	0.005
40	2103.500000	2103.515000	-0.001	0.005
30	2103.500000	2103.497500	0.000	0.005
20	2103.500000	2103.487500	0.001	0.005
10	2103.500000	2103.502500	0.000	0.005
0	2103.500000	2103.477500	0.001	0.005
-10	2103.500000	2103.552500	-0.002	0.005
-20	2103.500000	2103.477500	0.001	0.005
-30	2103.500000	2103.489500	0.000	0.005

SPURIOUS 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Dual Directional Coupler	Amplifier Research	DC7144A	IRG	3/3/2011	24 mo

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

NORTHWEST EMC

SPURIOUS CONDUCTED EMISSIONS

XMit 2011.04.20

EUT:	BONDI TwinTX Aviation Pack			Work Order:	JANQ0001
Serial Number:	0			Date:	08/02/11
Customer:	Janteq Corp.			Temperature:	23.28°C
Attendees:	None			Humidity:	46%
Project:	None			Barometric Pres.:	1012
Tested by:	Jaemi Suh	Power:	28VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port A. Modulation: 16QAM. Power Setting Set to Max.

DEVIATIONS FROM TEST STANDARD

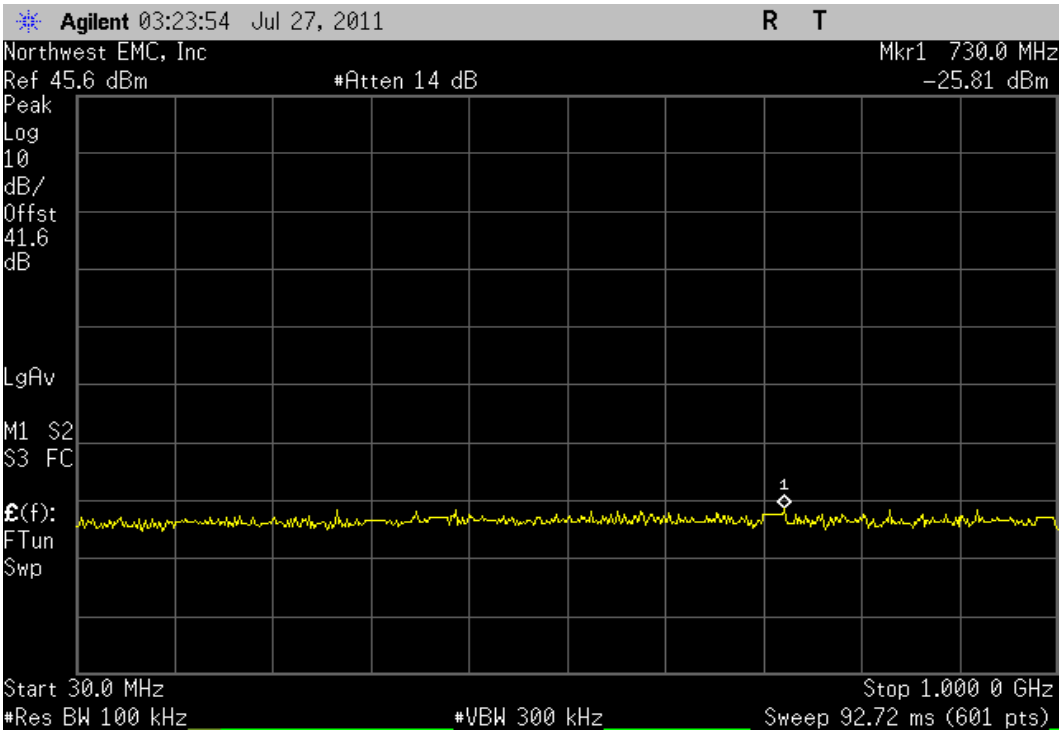
Configuration #	1	Signature

		Value	Limit	Result
Low Channel				
	30 MHz - 1 GHz	-25.81 dBm	-13 dBm	Pass
	1 GHz - 12.75 GHz	-52.57 dBm	-13 dBm	Pass
	12.75 GHz - 26 GHz	-31.32 dBm	-13 dBm	Pass
Mid Channel				
	30 MHz - 1 GHz	-25.81 dBm	-13 dBm	Pass
	1 GHz - 12.75 GHz	-51.01 dBm	-13 dBm	Pass
	12.75 GHz - 26 GHz	-17.35 dBm	-13 dBm	Pass
High Channel				
	30 MHz - 1 GHz	-36.64 dBm	-13 dBm	Pass
	1 GHz - 12.75 GHz	-51.92 dBm	-13 dBm	Pass
	12.75 GHz - 26 GHz	-14.16 dBm	-13 dBm	Pass

SPURIOUS CONDUCTED EMISSIONS

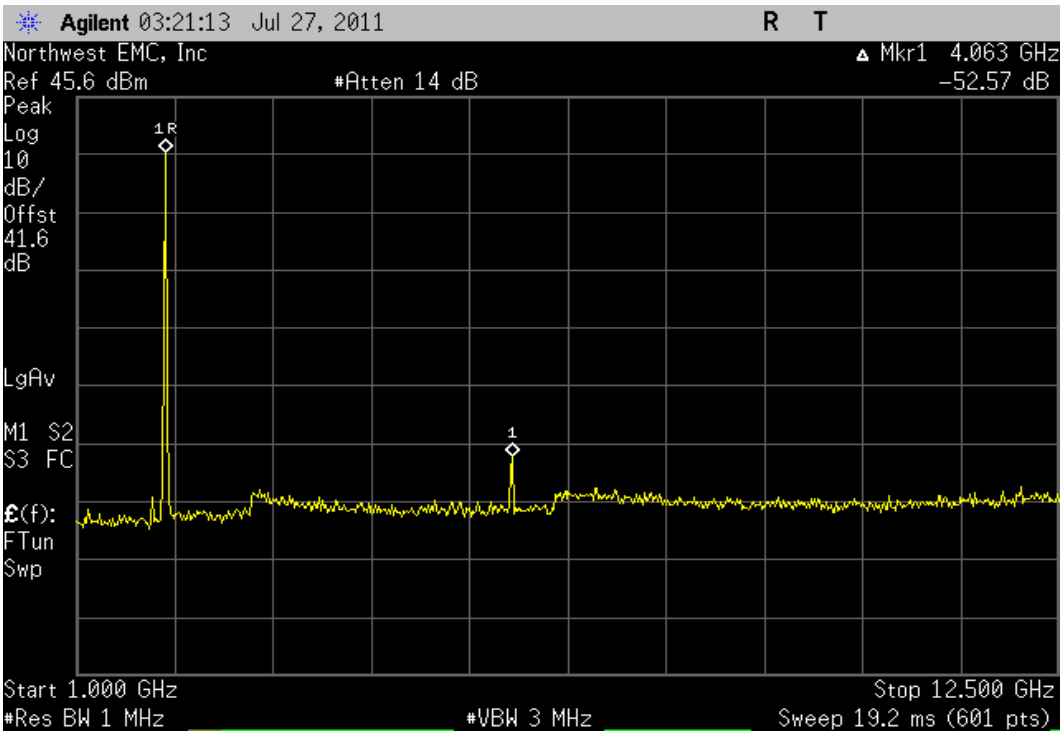
Low Channel, 30 MHz - 1 GHz

				Value	Limit	Result
				-25.81 dBm	-13 dBm	Pass



Low Channel, 1 GHz - 12.75 GHz

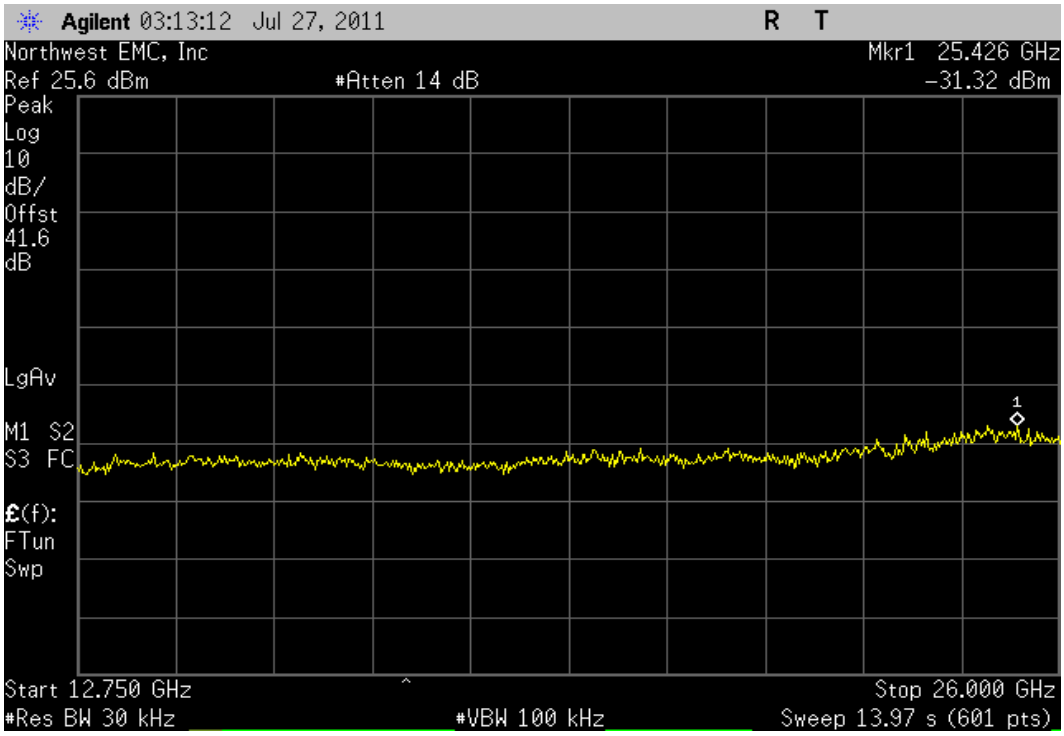
				Value	Limit	Result
				-52.57 dBm	-13 dBm	Pass



SPURIOUS CONDUCTED EMISSIONS

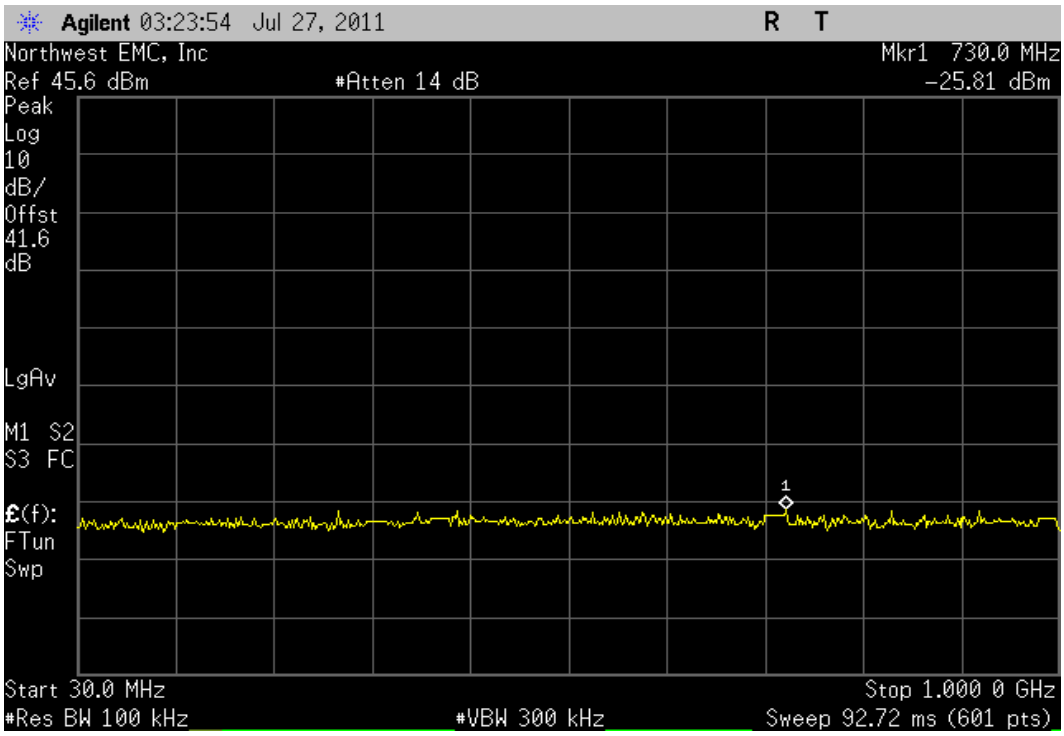
Low Channel, 12.75 GHz - 26 GHz

				Value	Limit	Result
				-31.32 dBm	-13 dBm	Pass



Mid Channel, 30 MHz - 1 GHz

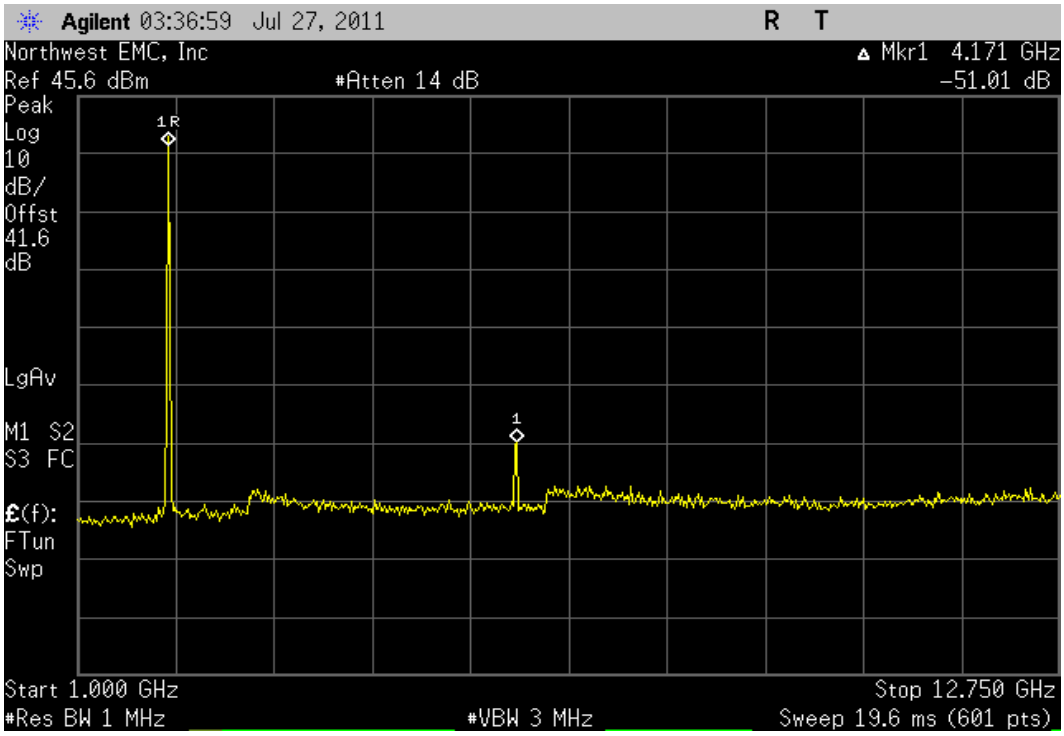
				Value	Limit	Result
				-25.81 dBm	-13 dBm	Pass



SPURIOUS CONDUCTED EMISSIONS

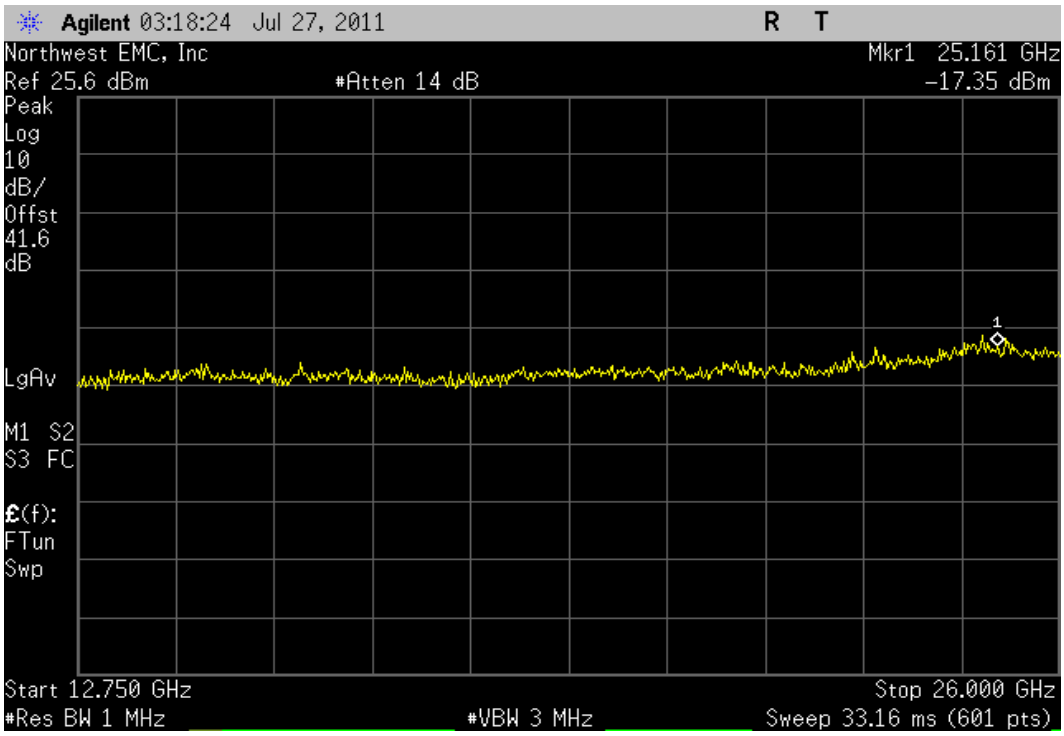
Mid Channel, 1 GHz - 12.75 GHz

				Value	Limit	Result
				-51.01 dBm	-13 dBm	Pass



Mid Channel, 12.75 GHz - 26 GHz

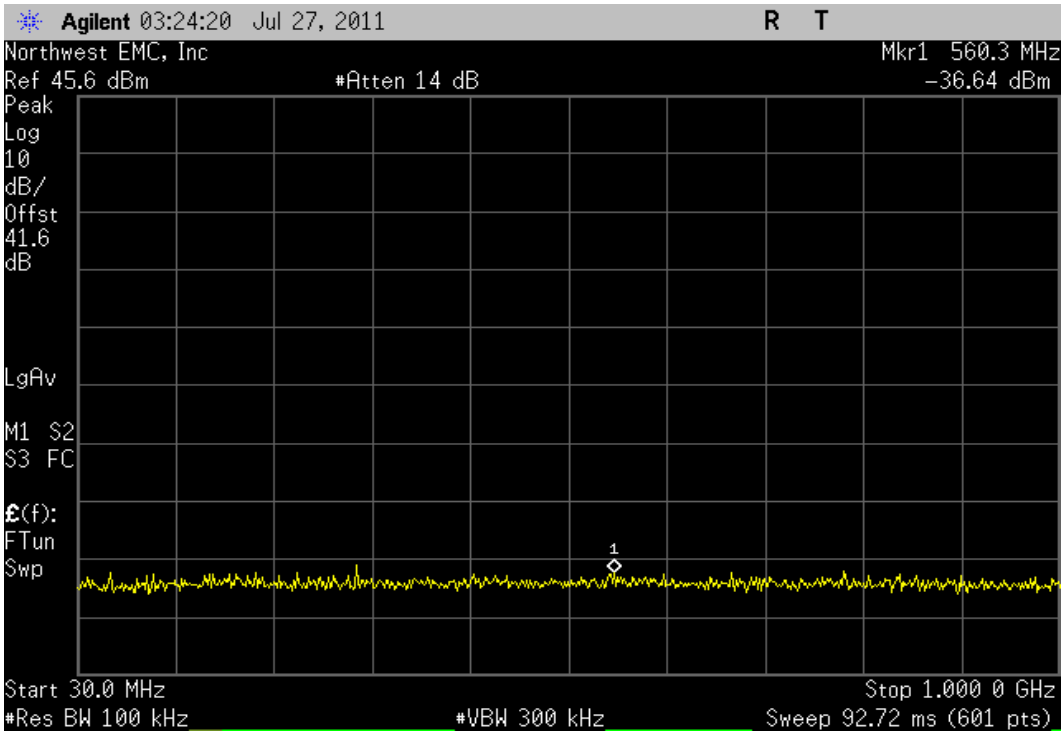
				Value	Limit	Result
				-17.35 dBm	-13 dBm	Pass



SPURIOUS CONDUCTED EMISSIONS

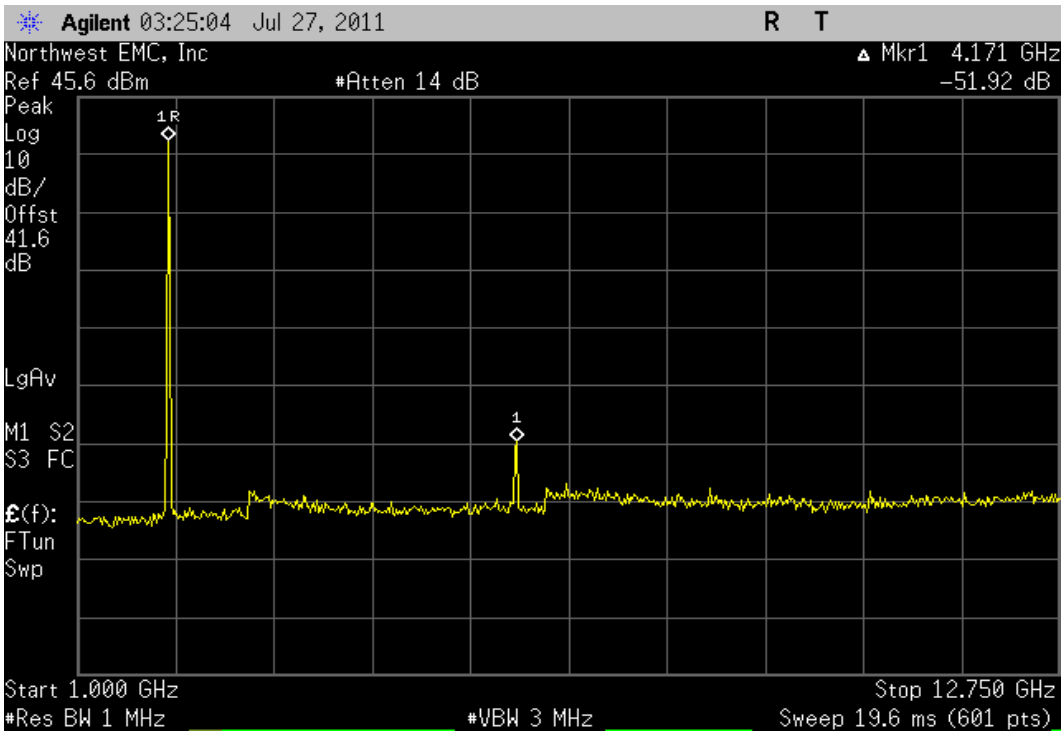
High Channel, 30 MHz - 1 GHz

				Value	Limit	Result
				-36.64 dBm	-13 dBm	Pass



High Channel, 1 GHz - 12.75 GHz

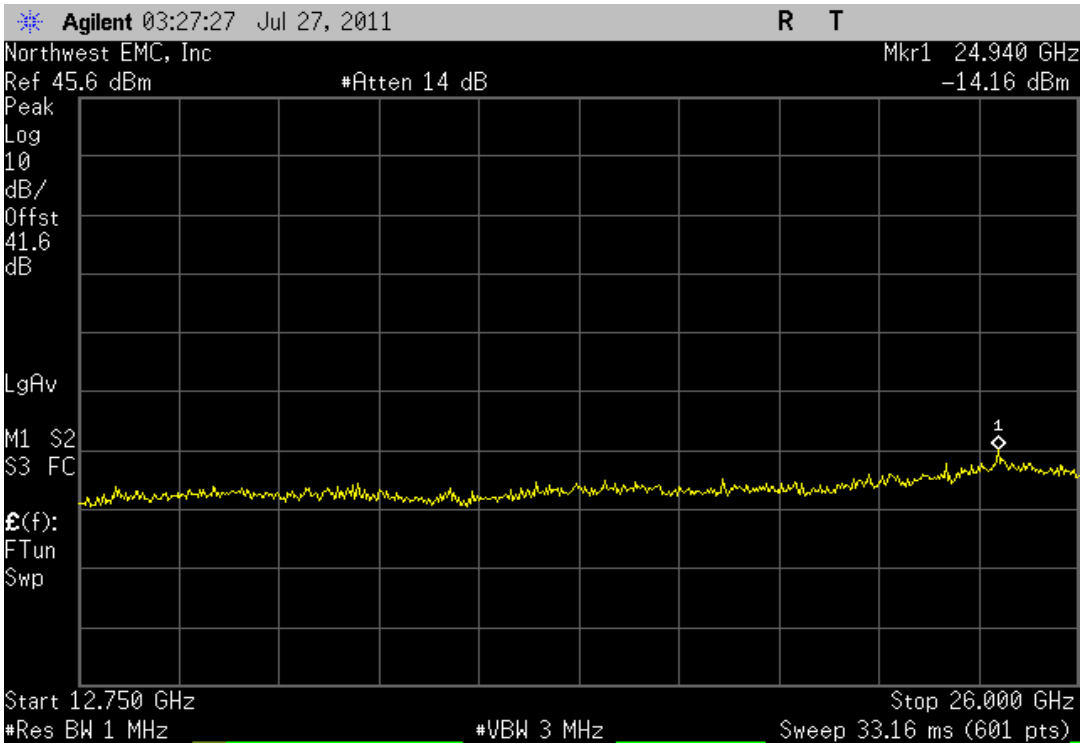
				Value	Limit	Result
				-51.92 dBm	-13 dBm	Pass



SPURIOUS CONDUCTED EMISSIONS

High Channel, 12.75 GHz - 26 GHz

				Value	Limit	Result
				-14.16 dBm	-13 dBm	Pass



SPURIOUS 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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION
Low channel.
Mid channel.
High channel

MODULATIONS INVESTIGATED
QPSK
16QAM
64QAM

WORST CASE MODULATION
QPSK

AXIS INVESTIGATED
X-Axis
Y-Axis

POWER SETTINGS INVESTIGATED
28VDC

CONFIGURATIONS INVESTIGATED
JANQ0001 - 1

FREQUENCY RANGE INVESTIGATED			
Start Frequency	30 MHz	Stop Frequency	26 GHz

CLOCKS AND OSCILLATORS
None Provided

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
.5-1GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFR	11/30/2010	24 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	4/29/2011	12 mo
Antenna, Horn	EMCO	3160-09	AHN	NCR	0 mo
OC floating Cable	N/A	18-26GHz RE Cables	OCK	4/29/2011	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOF	11/17/2010	12 mo
Antenna, Horn	ETS	3160-08	AHT	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	11/17/2010	12 mo
Antenna, Horn	ETS	3160-07	AHR	NCR	0 mo
OC 10 Cables	N/A	12-18GHz RE Cables	OCO	6/24/2011	12 mo
Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6/24/2011	12 mo
Antenna, Horn	EMCO	3115	AHB	3/8/2011	24 mo
OC10 Cables	N/A	1-8GHz RE Cables	OCJ	6/10/2011	12 mo
Antenna, Biconilog	EMCO	3142	AXB	3/28/2011	12 mo
OC10 Cables	N/A	10kHz-1GHz RE Cables	OCH	6/24/2011	12 mo
Pre-Amplifier	Miteq	AM-1064-9079	AOO	6/28/2011	12 mo
Spectrum Analyzer	Agilent	E4446A	AAY	1/11/2011	12 mo

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and orientation in horizontal and vertical plane, and manipulating the EUT in both vertical and horizontal planes (per ANSI/TIA/EIA-603-C-2004).

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

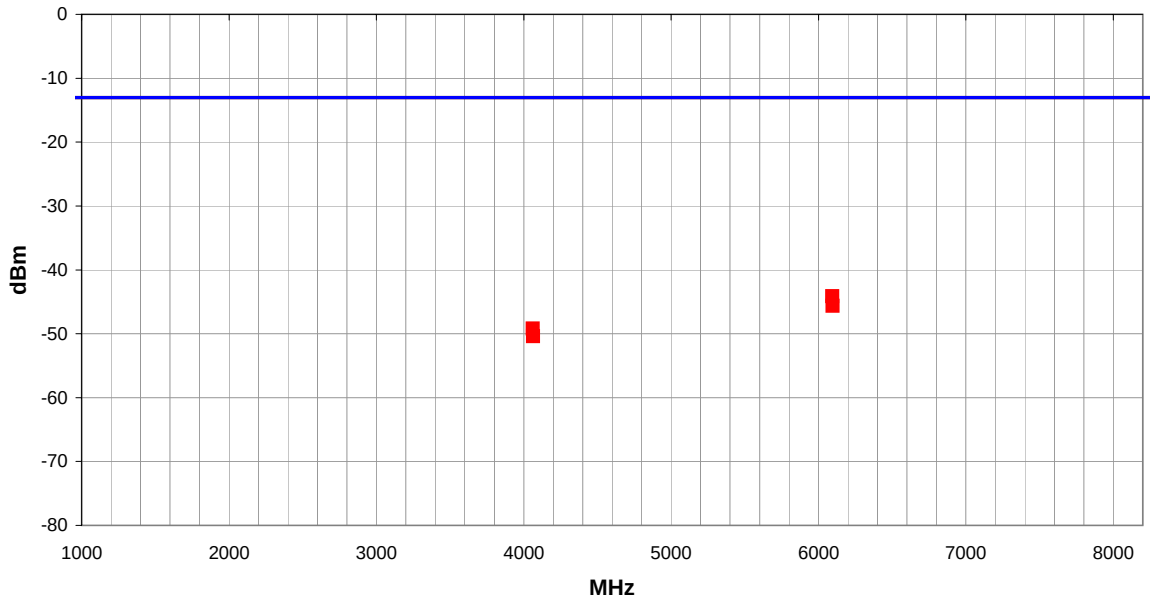
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Low channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	13	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
6093.767			1.0	216.0			Vert	PK	3.85E-08	-44.1	-13.0	-31.1
6095.867			1.0	174.0			Horz	PK	2.73E-08	-45.6	-13.0	-32.6
4061.827			1.0	79.0			Vert	PK	1.20E-08	-49.2	-13.0	-36.2
4064.253			2.2	156.0			Horz	PK	9.10E-09	-50.4	-13.0	-37.4

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

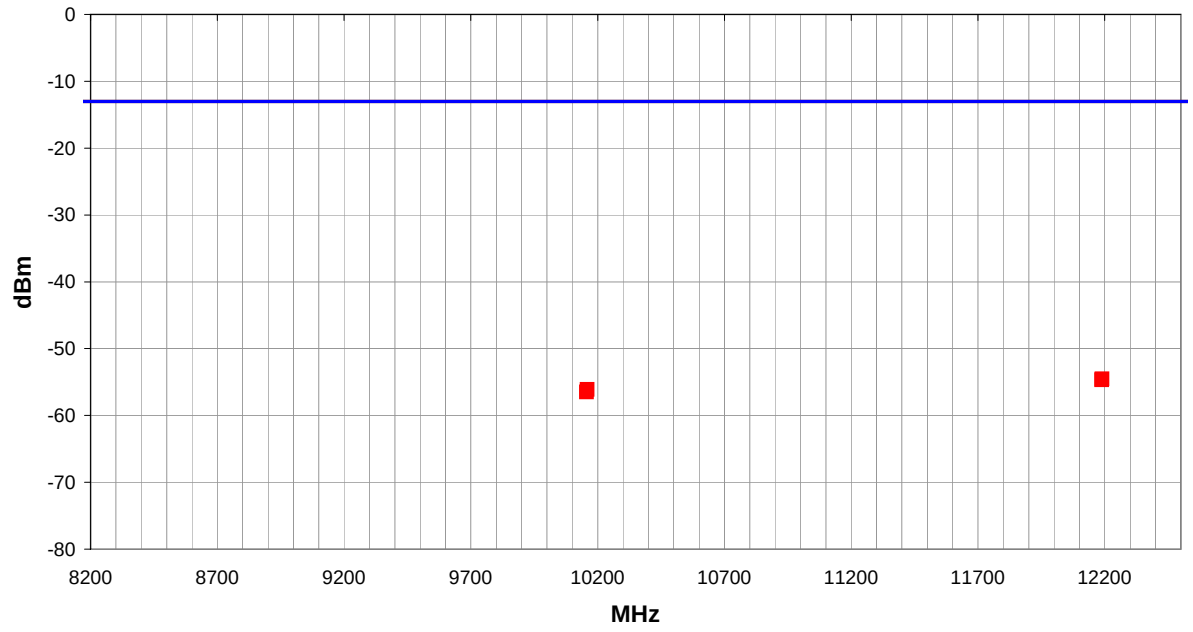
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Low channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	14	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
12189.630			1.0	25.0			Horz	PK	3.51E-09	-54.6	-13.0	-41.6
12188.710			1.0	129.0			Vert	PK	3.42E-09	-54.7	-13.0	-41.7
10158.510			1.0	82.0			Horz	PK	2.46E-09	-56.1	-13.0	-43.1
10155.660			1.0	83.0			Vert	PK	2.24E-09	-56.5	-13.0	-43.5

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

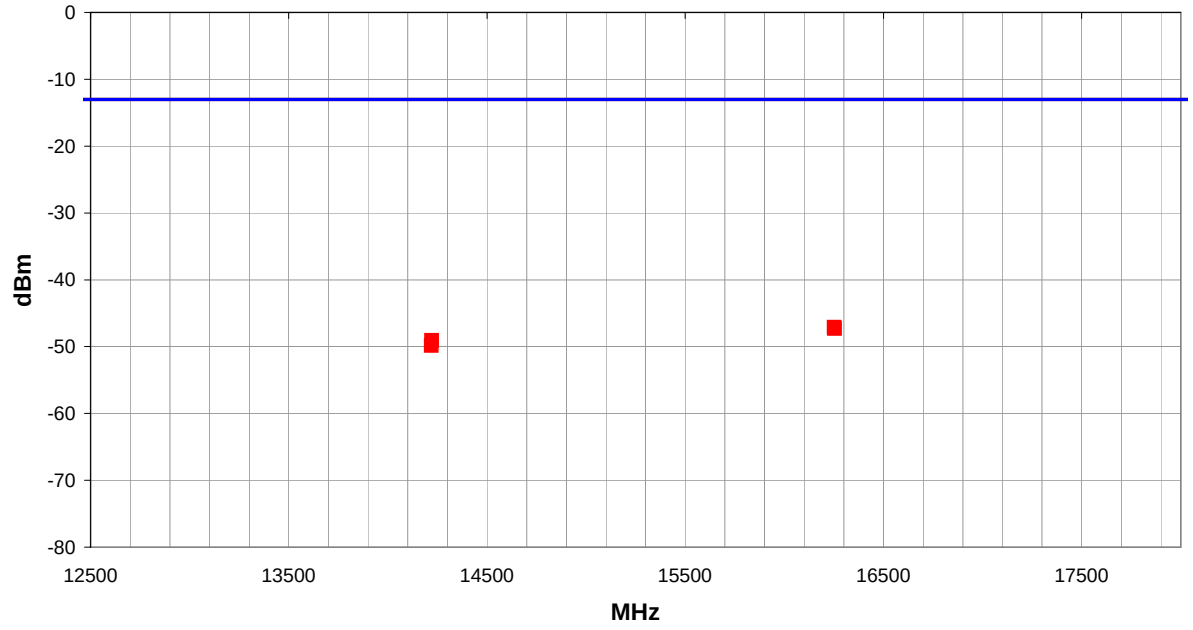
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Low channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	15	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
16252.180			1.0	10.0			Vert	PK	1.94E-08	-47.1	-13.0	-34.1
16252.790			1.0	335.0			Horz	PK	1.86E-08	-47.3	-13.0	-34.3
14221.050			3.4	125.0			Horz	PK	1.24E-08	-49.1	-13.0	-36.1
14219.730			3.0	76.0			Vert	PK	1.03E-08	-49.9	-13.0	-36.9

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

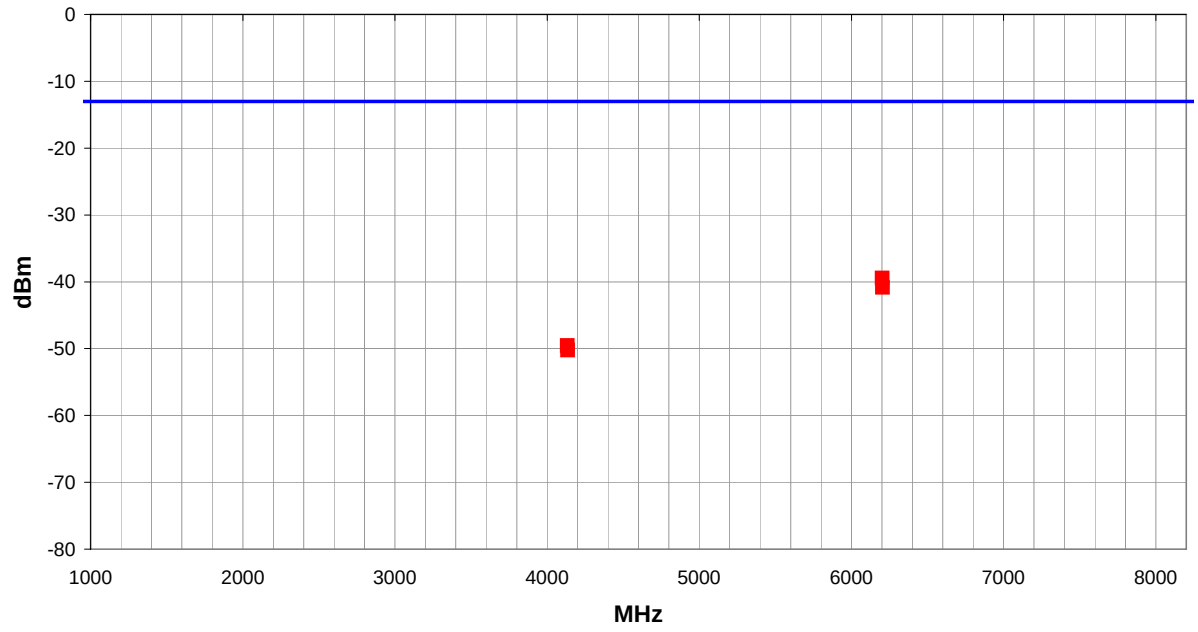
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Mid channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	16	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
6202.167			1.0	191.0			Horz	PK	1.13E-07	-39.5	-13.0	-26.5
6203.900			1.0	294.0			Vert	PK	8.21E-08	-40.9	-13.0	-27.9
4134.047			1.0	110.0			Horz	PK	1.11E-08	-49.6	-13.0	-36.6
4136.220			3.9	359.0			Vert	PK	9.45E-09	-50.2	-13.0	-37.2

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

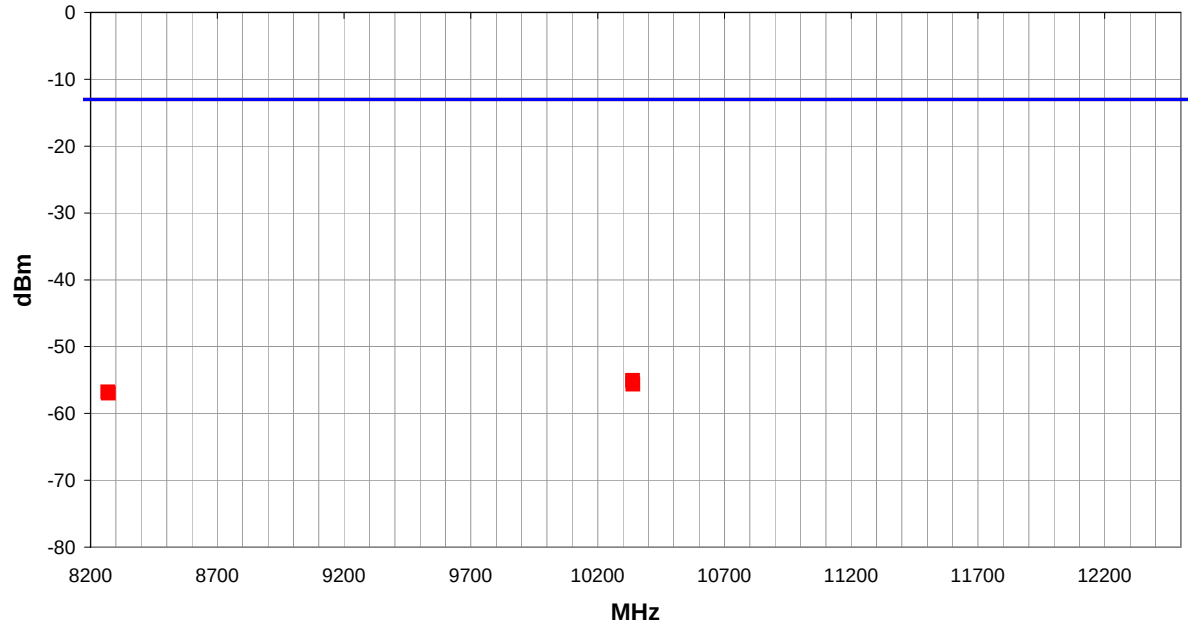
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Mid channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	17	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
10337.710			1.0	138.0			Horz	PK	3.12E-09	-55.1	-13.0	-42.1
10338.770			1.0	9.0			Vert	PK	2.72E-09	-55.7	-13.0	-42.7
8268.360			1.0	281.0			Horz	PK	2.11E-09	-56.8	-13.0	-43.8
8270.367			1.0	44.0			Vert	PK	2.02E-09	-57.0	-13.0	-44.0

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

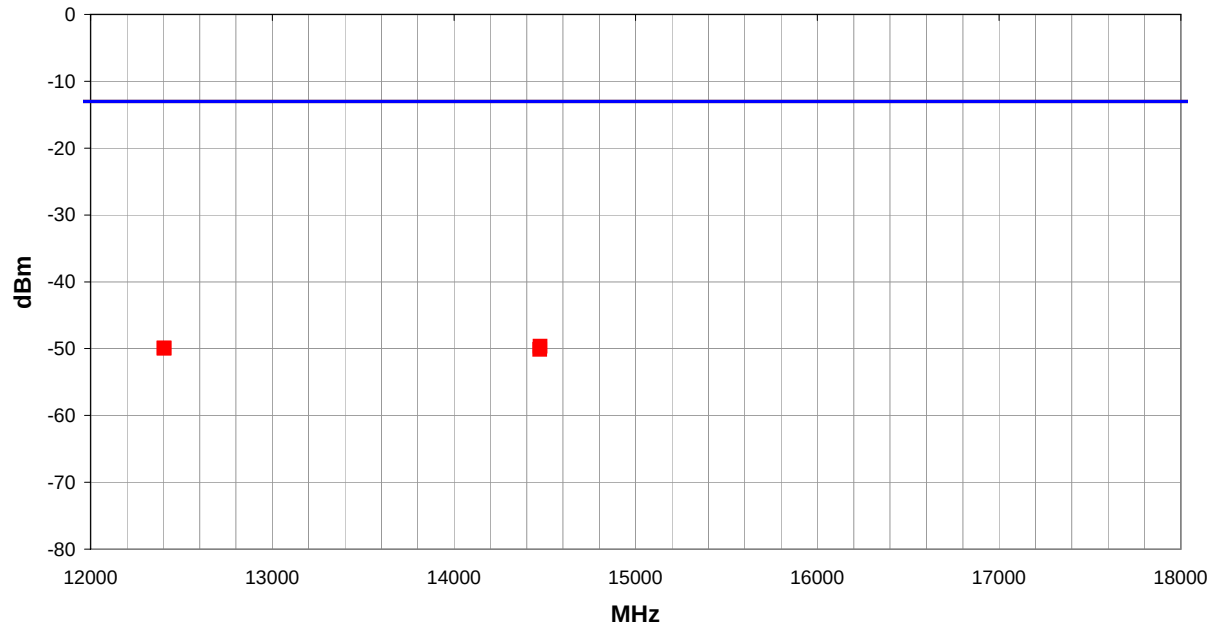
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Mid channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	18	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
14473.900			2.4	110.0			Vert	PK	1.09E-08	-49.6	-13.0	-36.6
12405.520			1.0	85.0			Horz	PK	1.01E-08	-49.9	-13.0	-36.9
12404.850			1.0	267.0			Vert	PK	1.01E-08	-49.9	-13.0	-36.9
14472.970			1.0	172.0			Horz	PK	9.70E-09	-50.1	-13.0	-37.1

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

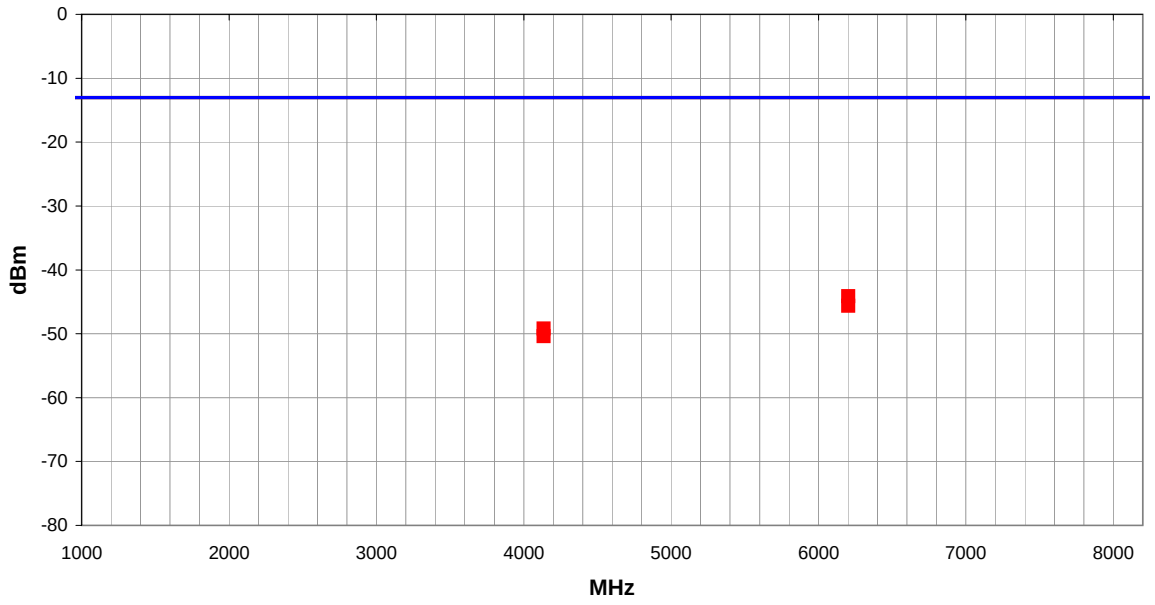
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	Low channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	19	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
6203.413			1.0	216.0			Vert	PK	3.85E-08	-44.1	-13.0	-31.1
6202.131			1.0	174.0			Horz	PK	2.73E-08	-45.6	-13.0	-32.6
4136.327			1.0	79.0			Vert	PK	1.20E-08	-49.2	-13.0	-36.2
4135.355			2.2	156.0			Horz	PK	9.10E-09	-50.4	-13.0	-37.4

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

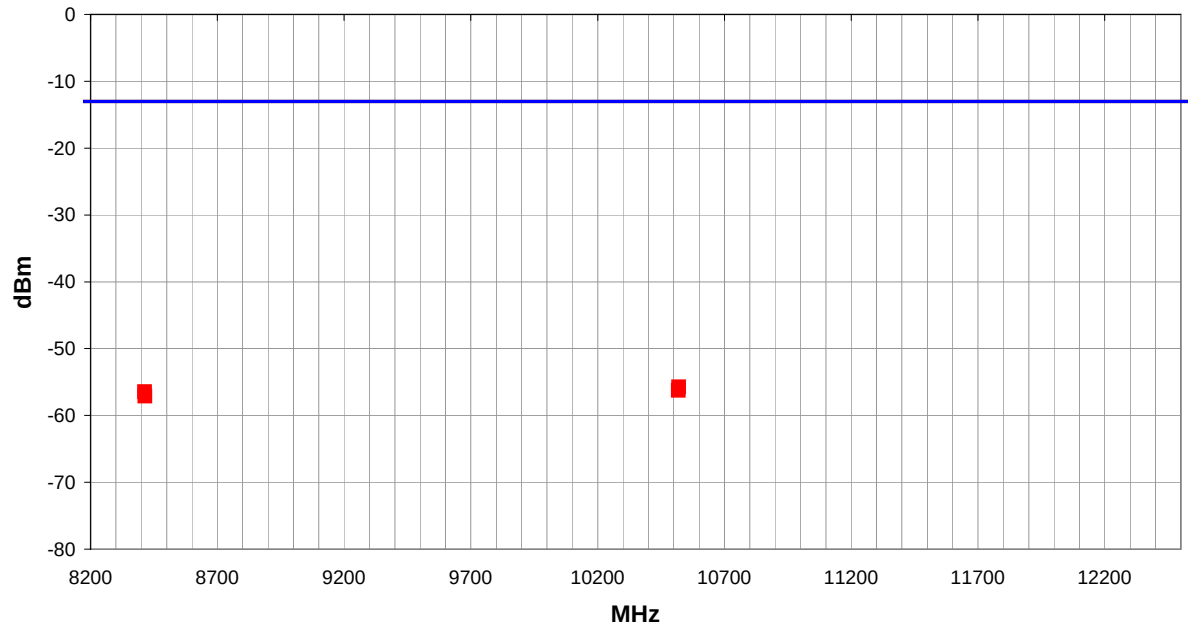
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	High channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	20	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
10519.210			1.0	101.0			Horz	PK	2.66E-09	-55.7	-13.0	-42.7
10518.810			1.0	124.0			Vert	PK	2.37E-09	-56.2	-13.0	-43.2
8413.420			1.0	71.0			Horz	PK	2.27E-09	-56.4	-13.0	-43.4
8414.180			1.0	152.0			Vert	PK	1.93E-09	-57.1	-13.0	-44.1

NORTHWEST

EMC SPURIOUS RADIATED EMISSIONS

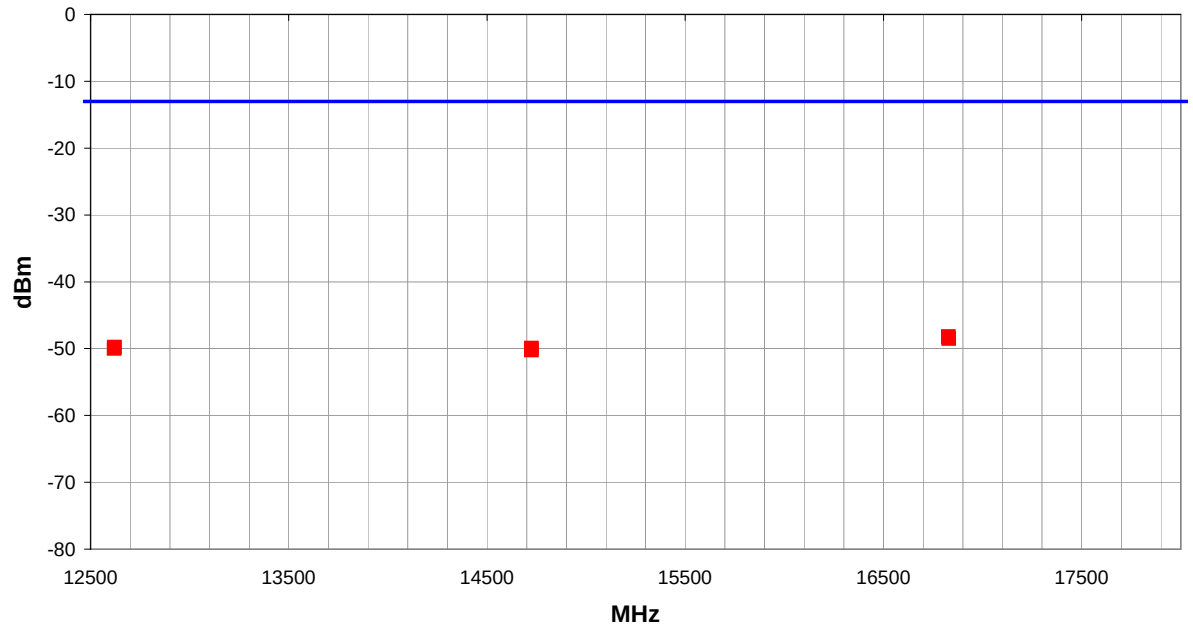
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

Work Order:	JANQ0001	**Date:**	07/28/11		
Project:	None	**Temperature:**	23.48		
Job Site:	OC10	**Humidity:**	42.48%		
Serial Number:	0	**Barometric Pres.:**	1013.3	**Tested by:**	Jaemi Suh

EUT:	BONDI TwinTX Aviation Pack
Configuration:	1
Customer:	Janteq Corp.
Attendees:	None
EUT Power:	28VDC
Operating Mode:	High channel. QPSK Modulation.
Deviations:	None
Comments:	None

Test Specifications	**Test Method**
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

Run #	21	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)			Antenna Height (meters)	Azimuth (degrees)			Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)
16827.880			1.0	337.0			Horz	PK	1.51E-08	-48.2	-13.0	-35.2
16829.270			1.0	113.0			Vert	PK	1.41E-08	-48.5	-13.0	-35.5
12620.960			1.0	255.0			Vert	PK	1.05E-08	-49.8	-13.0	-36.8
14725.270			1.0	355.0			Horz	PK	1.02E-08	-49.9	-13.0	-36.9
12619.970			1.0	266.0			Horz	PK	1.01E-08	-50.0	-13.0	-37.0
14724.750			1.0	318.0			Vert	PK	9.49E-09	-50.2	-13.0	-37.2

OCCUPIED BANDWIDTH

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
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Dual Directional Coupler	Amplifier Research	DC7144A	IRG	3/3/2011	24 mo

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at data rates: QPSK, 16QAM, 64QAM

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2011.04.20

EUT:	BONDI TwinTX Aviation Pack			Work Order:	JANQ0001
Serial Number:	0			Date:	07/29/11
Customer:	Janteq Corp.			Temperature:	23.28°C
Attendees:	None			Humidity:	46%
Project:	None			Barometric Pres.:	1012
Tested by:	Jaemi Suh	Power:	28VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 74:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port A. Power setting set to Max.

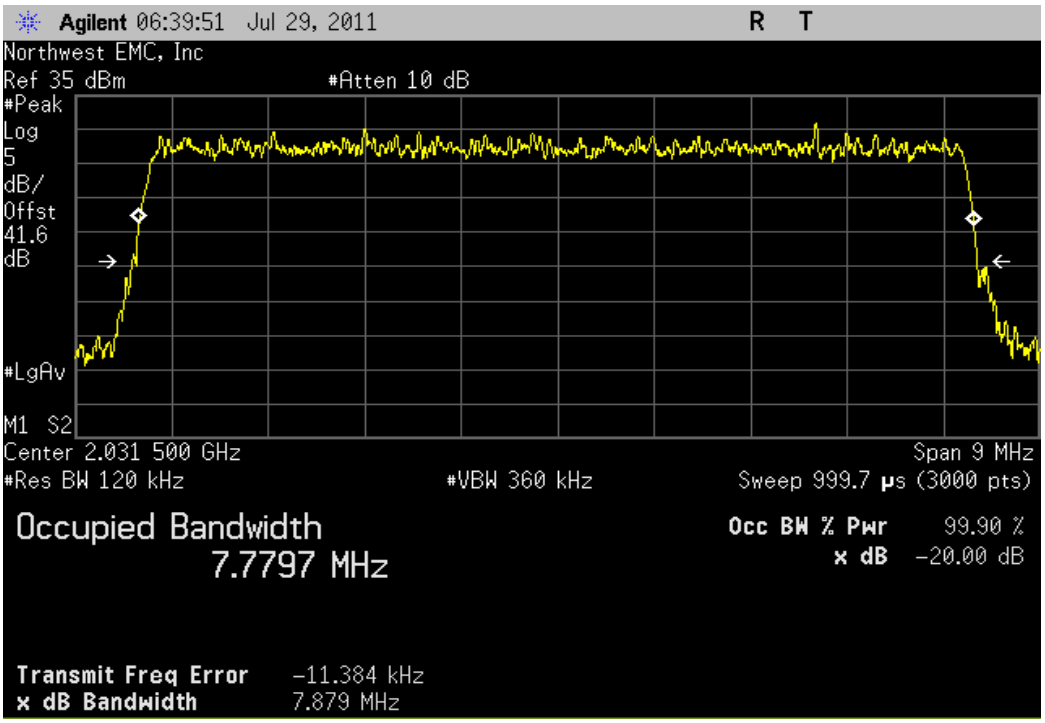
DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature

		Value	Limit	Result
QPSK				
	Low Channel 2031.5 MHz	7.7797 MHz	18 MHz	Pass
	Mid Channel 2067.5 MHz	7.8109 MHz	18 MHz	Pass
	High Channel 2103.5 MHz	7.7998 MHz	18 MHz	Pass
16QAM				
	Low Channel 2031.5 MHz	7.7938 MHz	18 MHz	Pass
	Mid Channel 2067.5 MHz	7.9112 MHz	18 MHz	Pass
	High Channel 2103.5 MHz	7.7823 MHz	18 MHz	Pass
64QAM				
	Low Channel 2031.5 MHz	7.7879 MHz	18 MHz	Pass
	Mid Channel 2067.5 MHz	7.8639 MHz	18 MHz	Pass
	High Channel 2103.5 MHz	7.7823 MHz	18 MHz	Pass

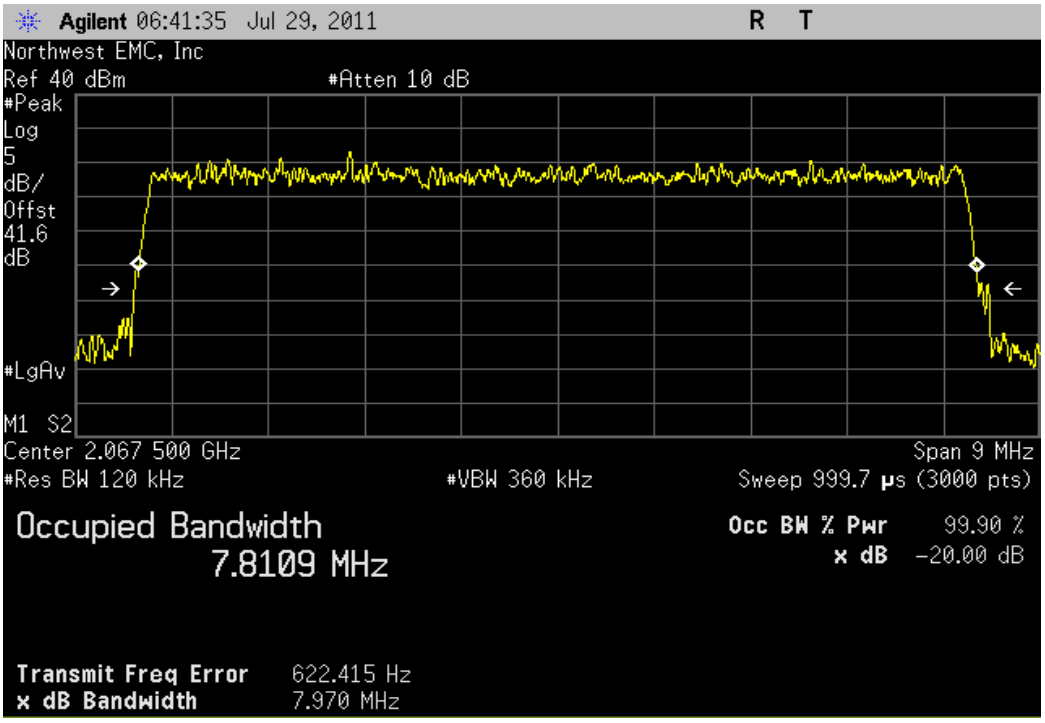
QPSK, Low Channel 2031.5 MHz

				Value	Limit	Result
				7.7797 MHz	18 MHz	Pass



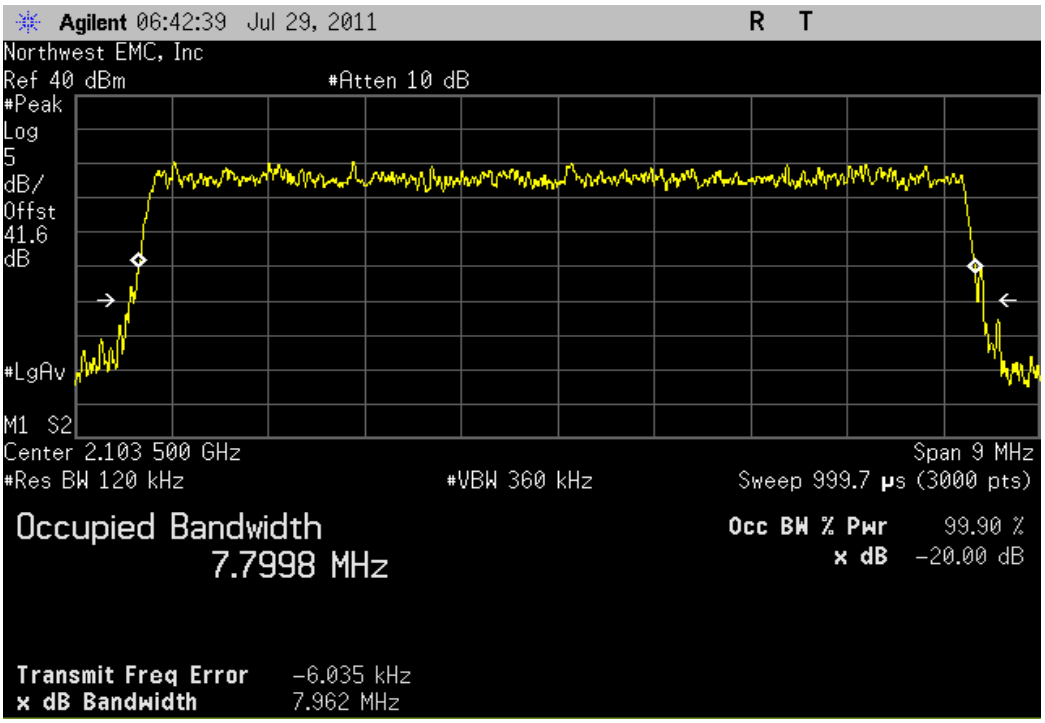
QPSK, Mid Channel 2067.5 MHz

				Value	Limit	Result
				7.8109 MHz	18 MHz	Pass



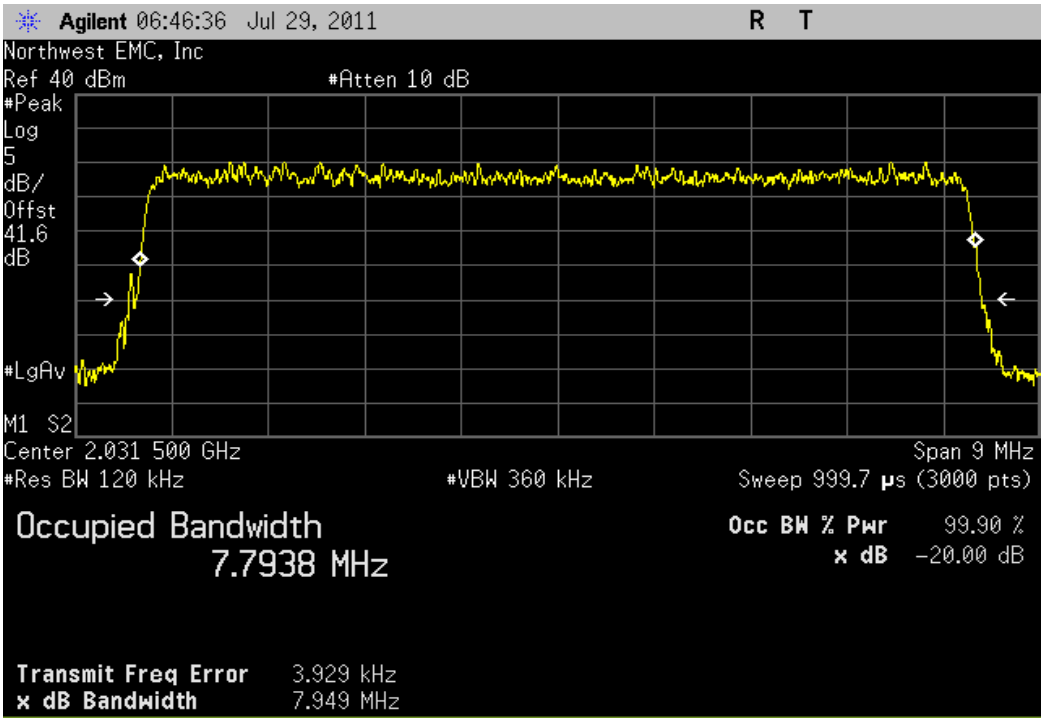
QPSK, High Channel 2103.5 MHz

				Value	Limit	Result
				7.7998 MHz	18 MHz	Pass



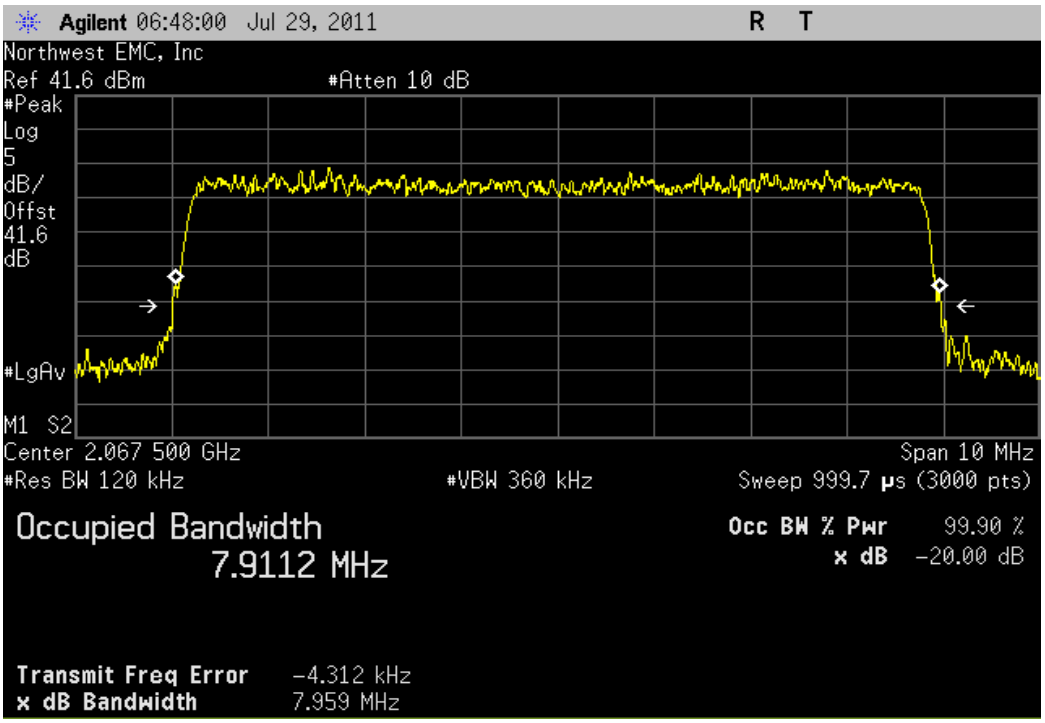
16QAM, Low Channel 2031.5 MHz

				Value	Limit	Result
				7.7938 MHz	18 MHz	Pass



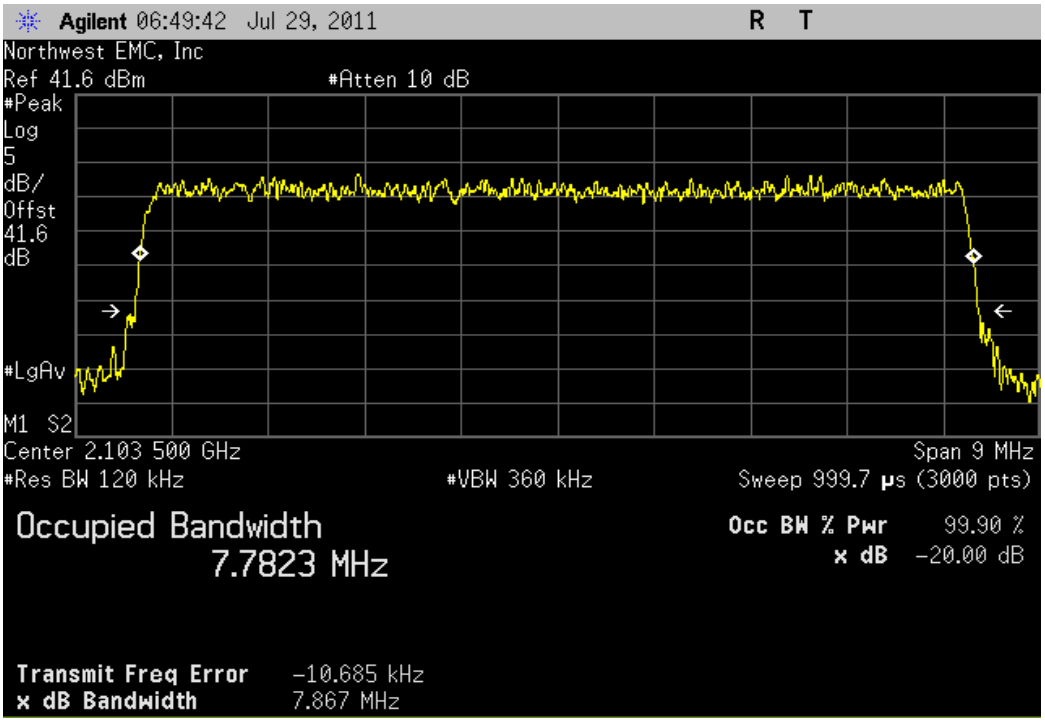
16QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				7.9112 MHz	18 MHz	Pass



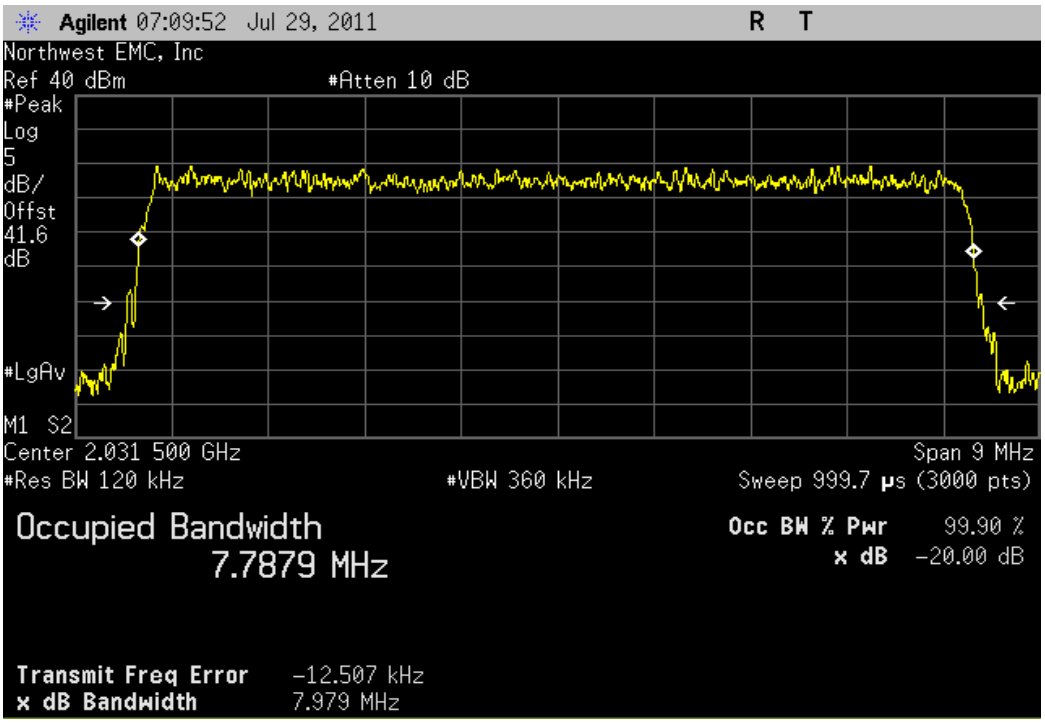
16QAM, High Channel 2103.5 MHz

				Value	Limit	Result
				7.7823 MHz	18 MHz	Pass



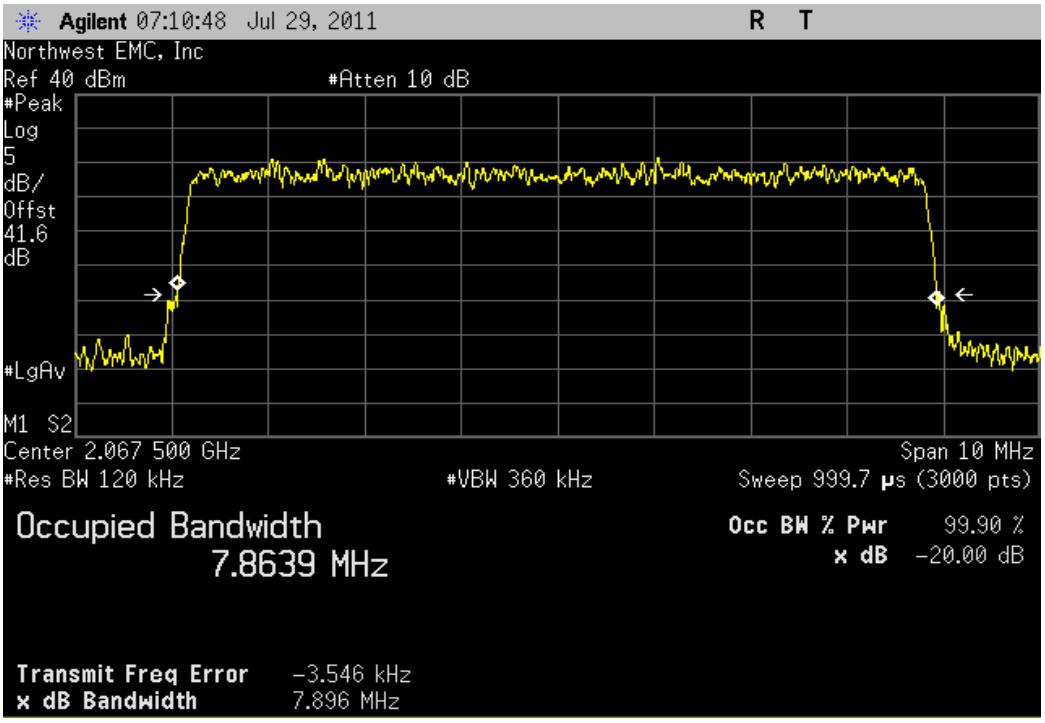
64QAM, Low Channel 2031.5 MHz

				Value	Limit	Result
				7.7879 MHz	18 MHz	Pass



64QAM, Mid Channel 2067.5 MHz

				Value	Limit	Result
				7.8639 MHz	18 MHz	Pass



64QAM, High Channel 2103.5 MHz

				Value	Limit	Result
				7.7823 MHz	18 MHz	Pass