Wizard Control Systems, Inc. dba American Digital Technologies

WTX 915

EMC Test Report

Report No. AMDI0007

Report Prepared By

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

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NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: November 11, 2010

Wizard Control Systems, Inc. dba American Digital Technologies

Model: WTX 915

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Carrier Frequency Separation	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Dwell Time	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Number of Hopping Frequencies	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Occupied Bandwidth	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Output Power	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Band Edge Compliance	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Spurious Conducted Emissions	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Duty Cycle Correction	FCC 15.247:2010	ANSI C63.10:2009	**Pass**
Spurious Radiated Emissions	FCC 15.247:2010	ANSI C63.10:2009	**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.
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 (Site filing #2834D-2).

Approved By:

Don Facteau, IS Manager

NVLAP Lab Code: 200630-0

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.

NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0
NVLAP LAB CODE 200881-0

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-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.

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).

Accreditations and Authorizations

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, 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-1784, 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). 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

KCC

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

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

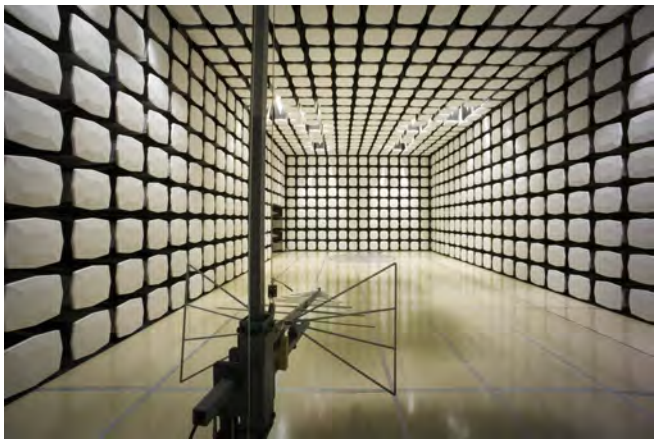
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

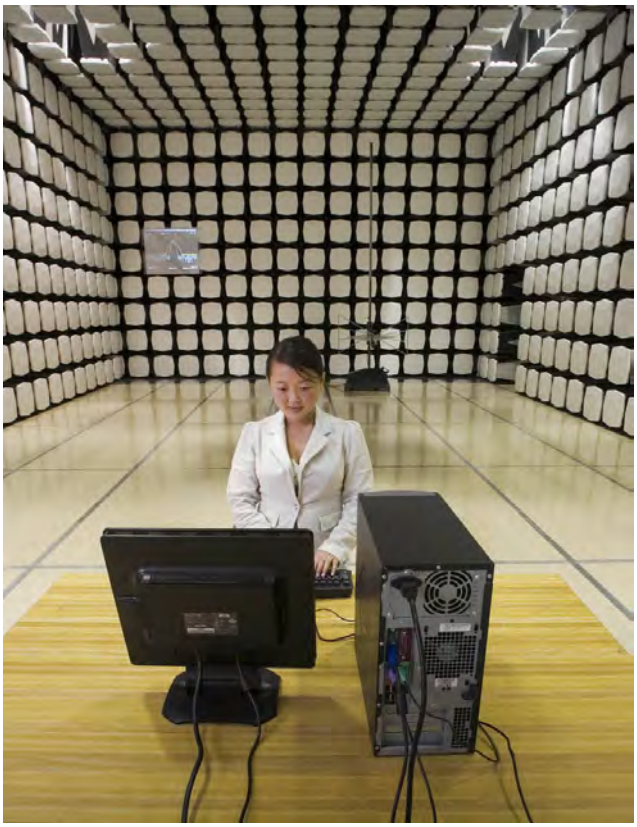
California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

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:	Wizard Control Systems, Inc. dba American Digital Technologies
Address:	PO Box 5245 4582 Salem-Dallas Hwy
City, State, Zip:	Salem, OR 97304
Test Requested By:	Aaron Montesano
Model:	WTX 915
First Date of Test:	November 10, 2010
Last Date of Test:	November 11, 2010
Receipt Date of Samples:	November 10, 2010
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
902-928 MHz radio. +20 dBm expected output power.

Testing Objective:
To demonstrate compliance to FCC 15.247 specifications.

CONFIGURATION 1 AMDI0007

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - Radiated	Wizard Control Systems, Inc. dba American Digital Technologies	WTX 915	None

CONFIGURATION 2 AMDI0007

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT – Direct Connection	Wizard Control Systems, Inc. dba American Digital Technologies	WTX 915	None

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	11/10/2010	Number of Hopping Frequencies	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	11/10/2010	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.
3	11/10/2010	Output Power	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	11/10/2010	Band Edge Compliance	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	11/10/2010	Spurious 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.
6	11/10/2010	Carrier Frequency Separation	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	11/10/2010	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.
8	11/11/2010	Dwell Time	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	11/11/2010	Duty Cycle Correction	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

CARRIER FREQUENCY SEPARATION

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	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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 carrier frequency separation was measured between each of 5 hopping channels in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The frequency hopping system must have a channel separation of at least 25 kHz or the 20 dB occupied bandwidth of the channels. This system uses an occupied bandwidth of 367 kHz, requiring a channel separation greater than that.

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CARRIER FREQUENCY SEPARATION

XMit 2010.01.14

EUT:	WTX 915			**Work Order:**	AMDI0007
Serial Number:	none			**Date:**	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			**Temperature:**	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			**Humidity:**	45%
Project:	None			**Barometric Pres.:**	29.65
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

Frequency hopping mode

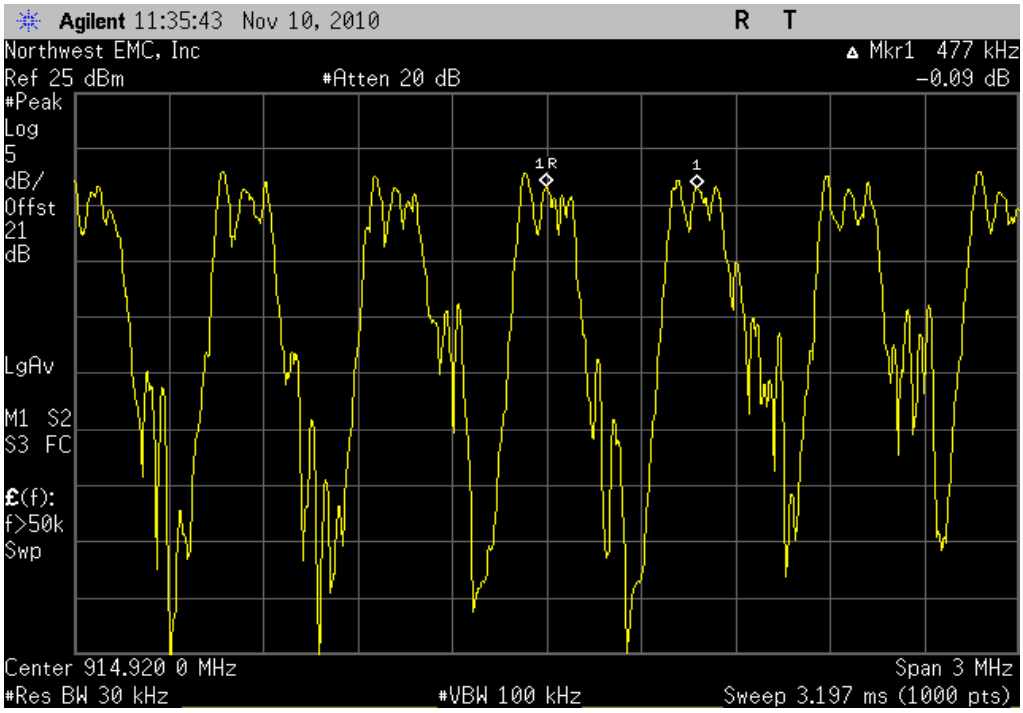
DEVIATIONS FROM TEST STANDARD

Configuration #	2	Signature

	Value	Limit	Results
CHANNEL SEPARATION	477 kHz	≥ 367 kHz	Pass

CARRIER FREQUENCY SEPARATION

CHANNEL SEPARATION					
Result:	Pass	**Value:**	477 kHz	**Limit:**	≥ 367 kHz



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	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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 Dwell time was calculated by using a direct connection between the EUT and the spectrum analyzer. The EUT was operated in a frequency hopping mode. The measurement was made in a zero span while centered on the middle channel.

The requirement to be met is a dwell time of no greater than .4 seconds in a 10 second period. The radio operates on 50 channels with an occupied bandwidth of 437 kHz. The requirement for the 10 second period is met as the occupied bandwidth is greater than 250 kHz and less than 500 kHz

NORTHWEST EMC

DWELL TIME

XMit 2010.01.14

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/11/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			Temperature:	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

No Deviations

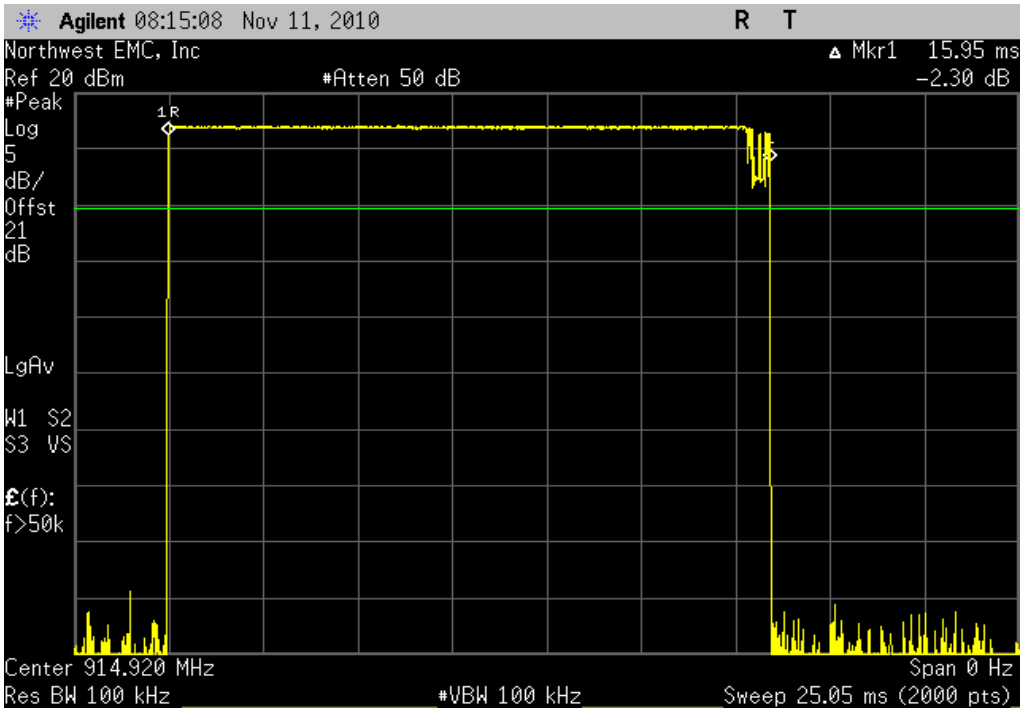
Configuration #	2	Signature

	Value	Limit	Results
Pulse Width	15.95 ms	.4 s in 10 s	.207 ms
Period	809 ms	.4 s in 10 s	.207 ms
10 Second Sweep	13 Pulses	.4 s in 10 s	.207 ms

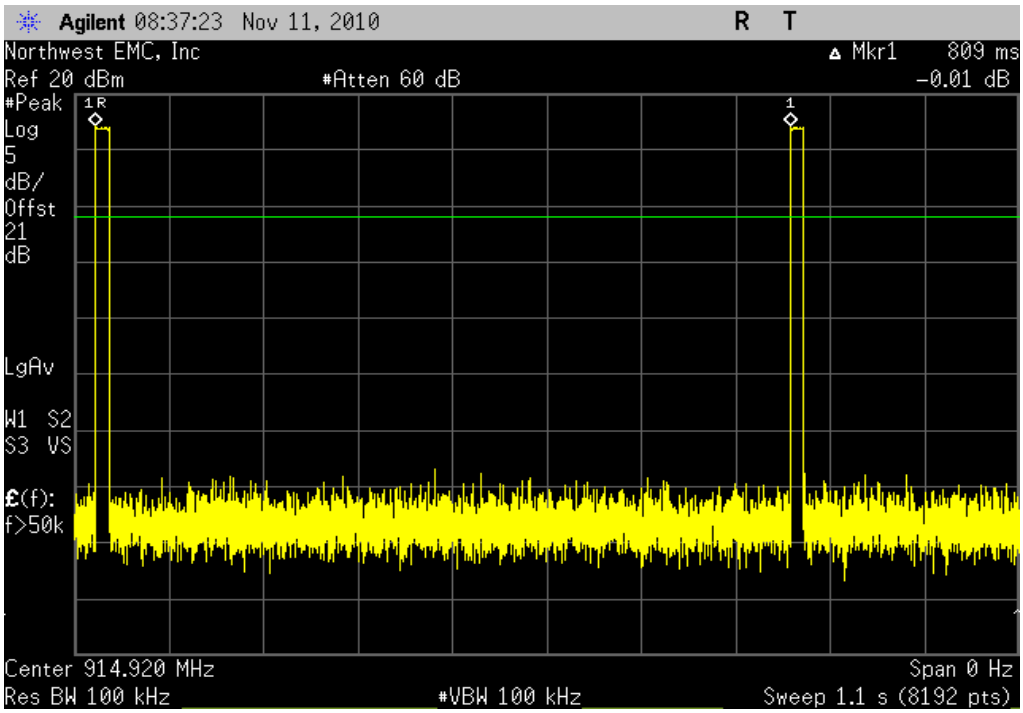
Dwell time = 13 transmissions x 15.95 ms = .207 s in 10 second period

DWELL TIME

Pulse Width					
Result:	.207 ms	**Value:**	15.95 ms	**Limit:**	.4 s in 10 s

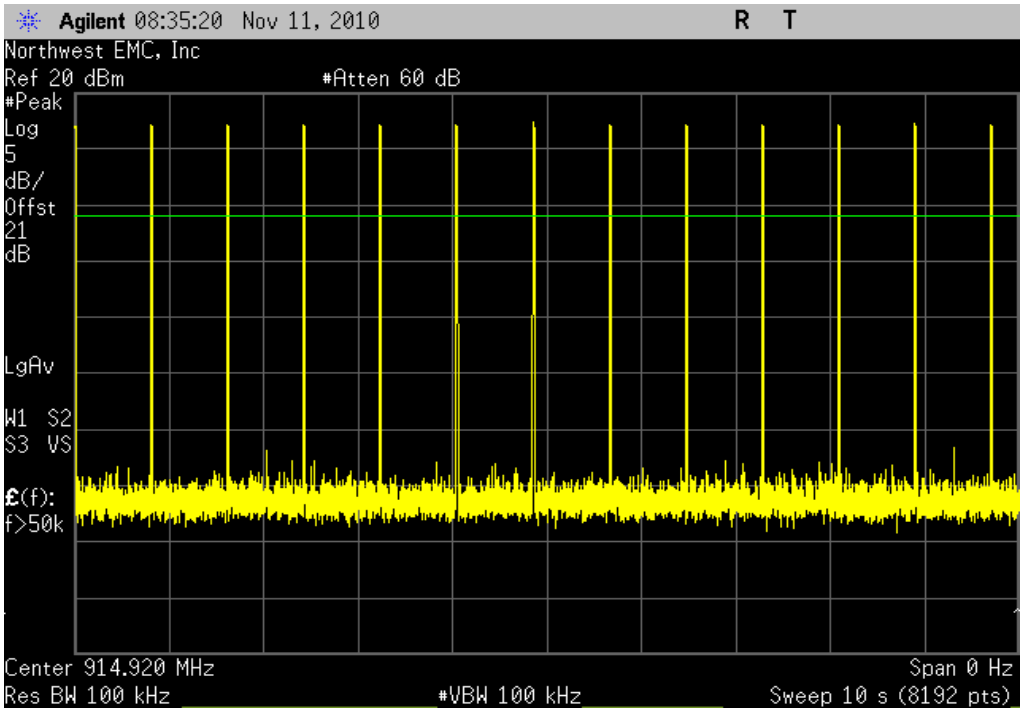


Period					
Result:	.207 ms	**Value:**	809 ms	**Limit:**	.4 s in 10 s



DWELL TIME

10 Second Sweep					
Result:	.207 ms	**Value:**	13 Pulses	**Limit:**	.4 s in 10 s



NUMBER OF HOPPING FREQUENCIES

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	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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 number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The system has a 20 dB occupied bandwidth greater than 250 kHz as noted elsewhere in the report. The system must therefore have at least 25 hopping channels

NORTHWEST EMC

NUMBER OF HOPPING FREQUENCIES

XMit 2010.01.14

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			Temperature:	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

None

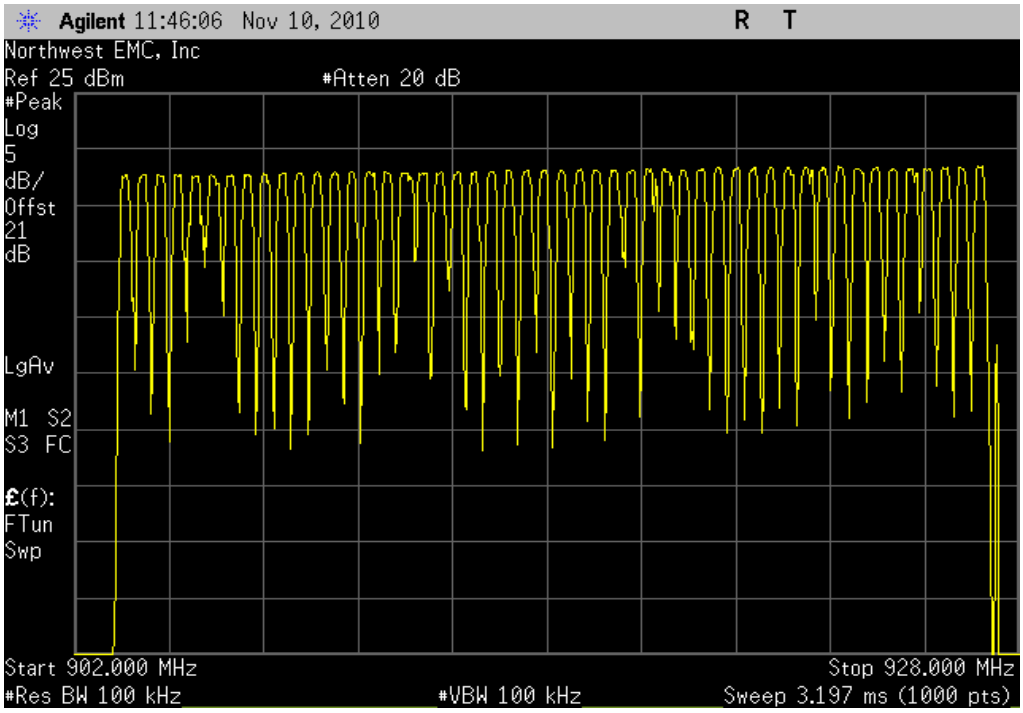
DEVIATIONS FROM TEST STANDARD

Configuration #	2	Signature

	Value	Limit	Results
NUMBER OF HOPPING FREQUENCIES	50	≥ 25	Pass

NUMBER OF HOPPING FREQUENCIES

NUMBER OF HOPPING FREQUENCIES					
Result:	Pass	**Value:**	50	**Limit:**	≥ 25



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
Spectrum Analyzer	Agilent	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13

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 at the 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 its maximum data rate in the normal hopping mode.

To support the Dwell Time requirement in a 10 second period, the occupied bandwidth of the channel must be greater than 250 kHz. A frequency hopping system in this rule part must always have an occupied bandwidth less than 500 kHz.

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2010.01.14

EUT:	WTX 915			**Work Order:**	AMDI0007
Serial Number:	none			**Date:**	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			**Temperature:**	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			**Humidity:**	45%
Project:	None			**Barometric Pres.:**	29.65
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

Hopping mode

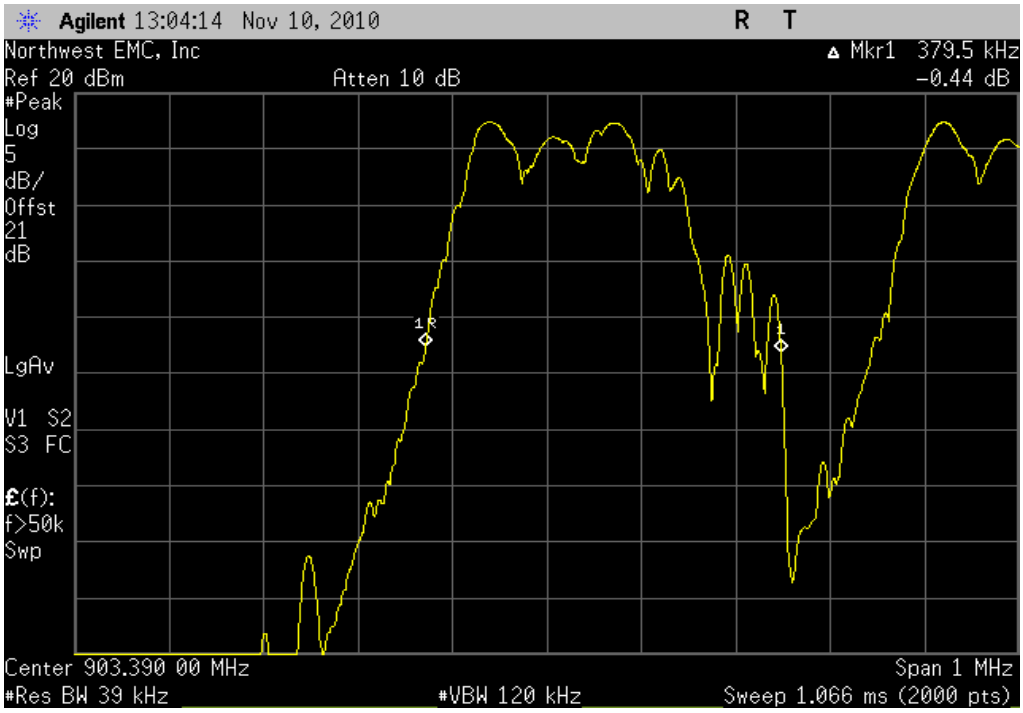
DEVIATIONS FROM TEST STANDARD

No Deviations

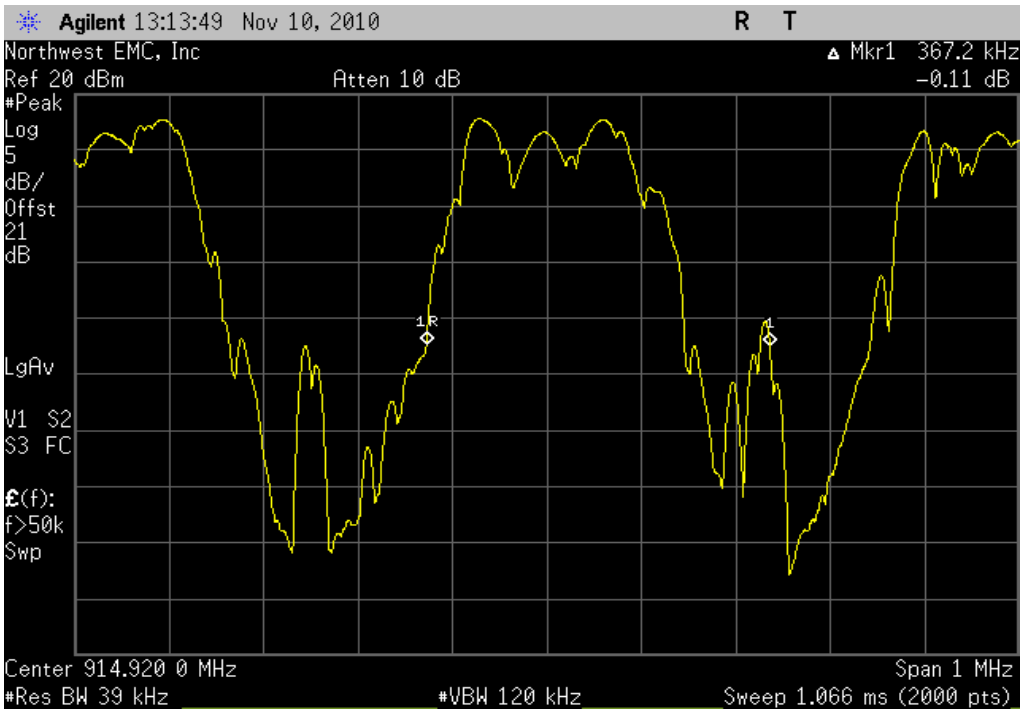
Configuration #	2	Signature

	Value	Limit	Results
Low Channel	380 kHz	≥ 250 kHz, ≤ 500 kHz	Pass
Mid Channel	367 kHz	≥ 250 kHz, ≤ 500 kHz	Pass
High Channel	336 kHz	≥ 250 kHz, ≤ 500 kHz	Pass

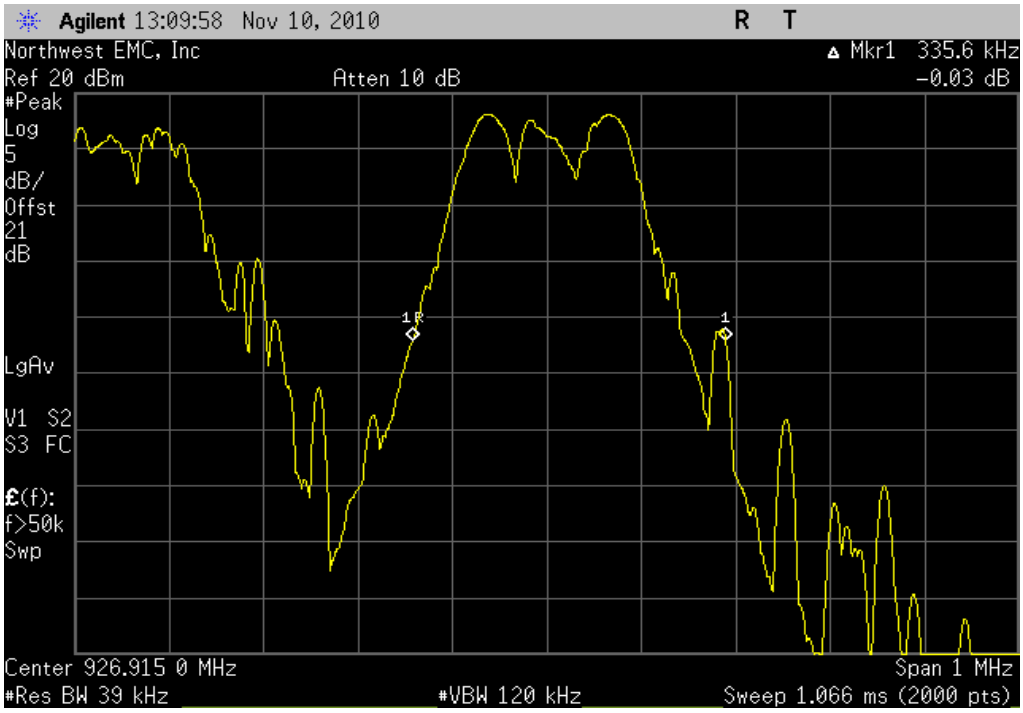
Low Channel					
Result:	Pass	**Value:**	380 kHz	**Limit:**	≥ 250 kHz, ≤ 500 kHz



Mid Channel					
Result:	Pass	**Value:**	367 kHz	**Limit:**	≥ 250 kHz, ≤ 500 kHz



High Channel					
Result:	Pass	**Value:**	336 kHz	**Limit:**	≥ 250 kHz, ≤ 500 kHz



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	E4440A	AFD	6/1/2009	24
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
Power Meter	Gigatronics	8651A	SPM	1/7/2010	13
Power Sensor	Gigatronics	80701A	SPL	1/7/2010	13
Attenuator, 6 dB, 'SMA'	N/A	93459 3330A-6	AUF	4/1/2010	13
Signal Generator	Agilent	E8257D	TGX	12/10/2008	24

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 in a no hop mode.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

NORTHWEST EMC

OUTPUT POWER

XMit 2010.01.14

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			Temperature:	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

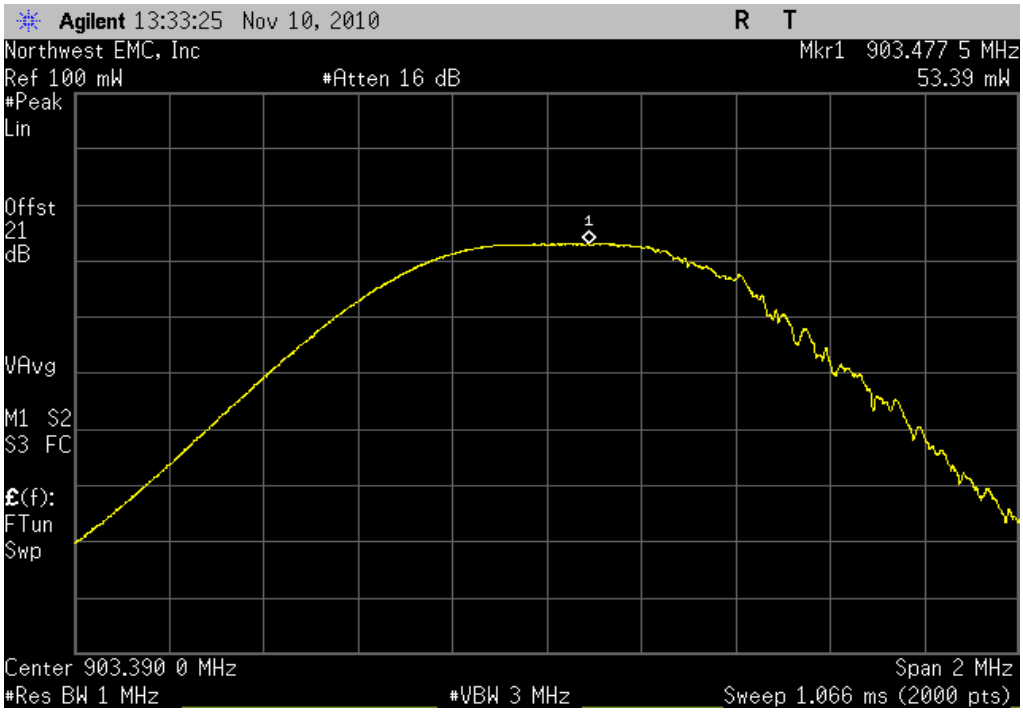
No Deviations

Configuration #	2	Signature

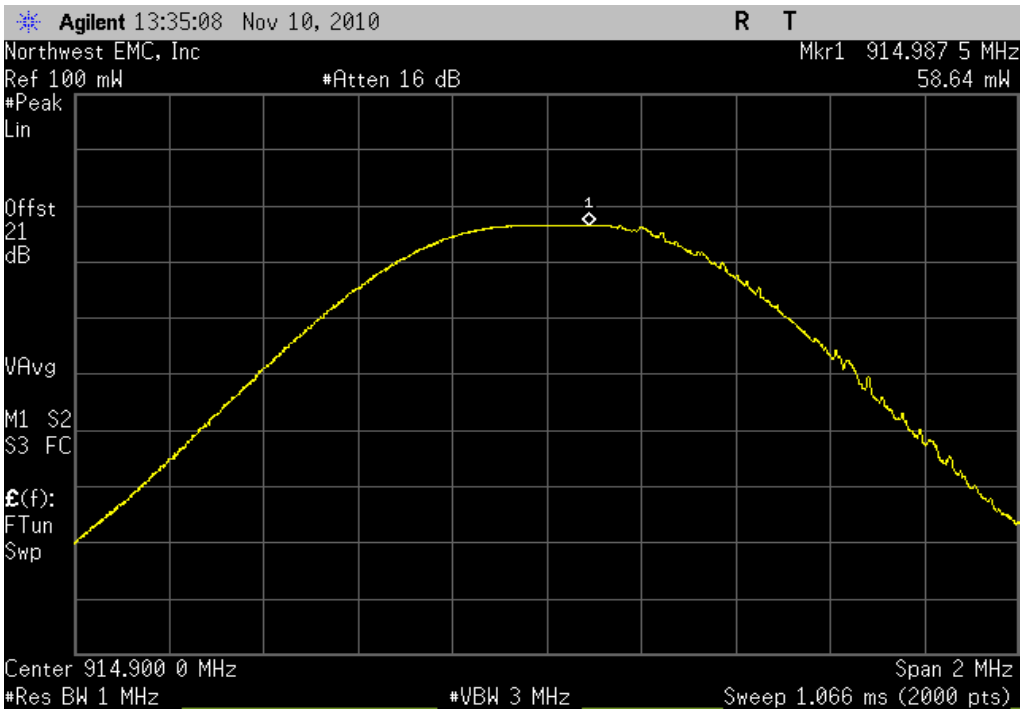
	Value	Limit	Results
Low Channel	53.4 mW	1 W	Pass
Mid Channel	58.6 mW	1 W	Pass
High Channel	63.1 mW	1 W	Pass

OUTPUT POWER

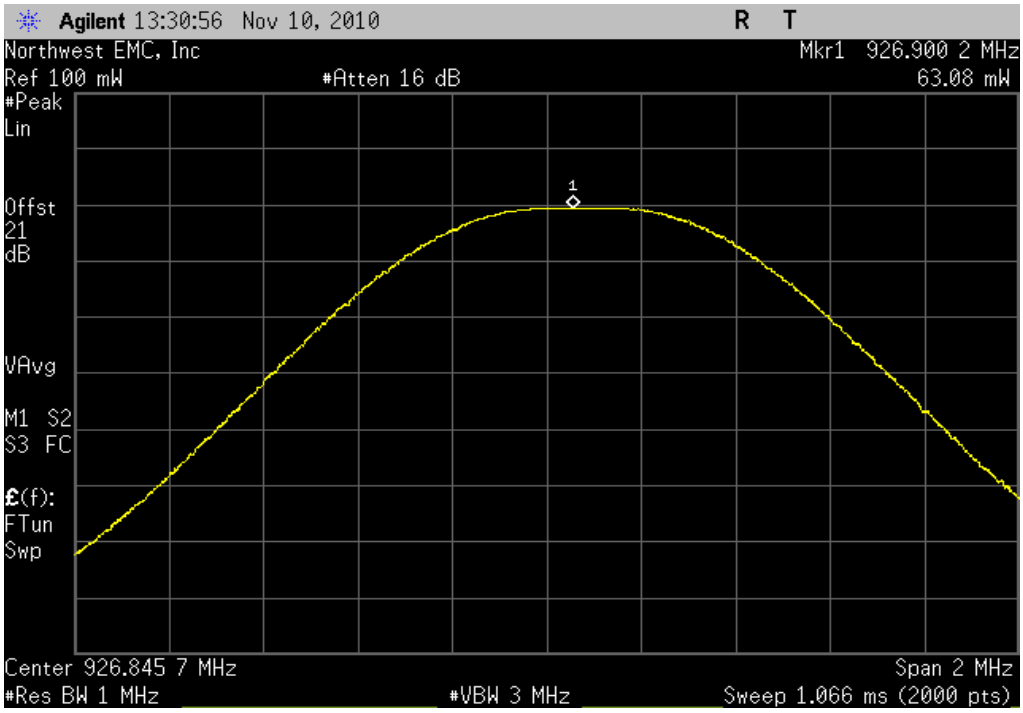
Low Channel					
Result:	Pass	**Value:**	53.4 mW	**Limit:**	1 W



Mid Channel					
Result:	Pass	**Value:**	58.6 mW	**Limit:**	1 W



High Channel					
Result:	Pass	**Value:**	63.1 mW	**Limit:**	1 W



BAND EDGE COMPLIANCE

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	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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 at the edges of the authorized band were measured with the EUT set to low 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 its maximum data rate in a no hop mode. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 5 MHz below the band edge to 5 MHz above the band edge.

NORTHWEST EMC

BAND EDGE COMPLIANCE

XMit 2010.01.14

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			Temperature:	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

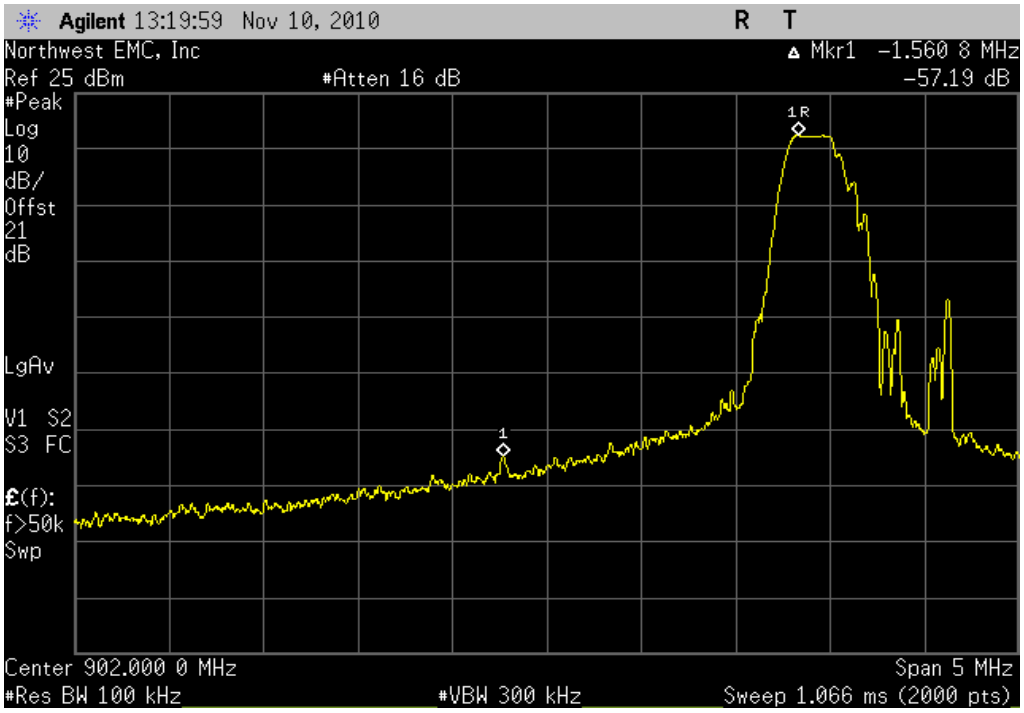
No Deviations

Configuration #	2	Signature

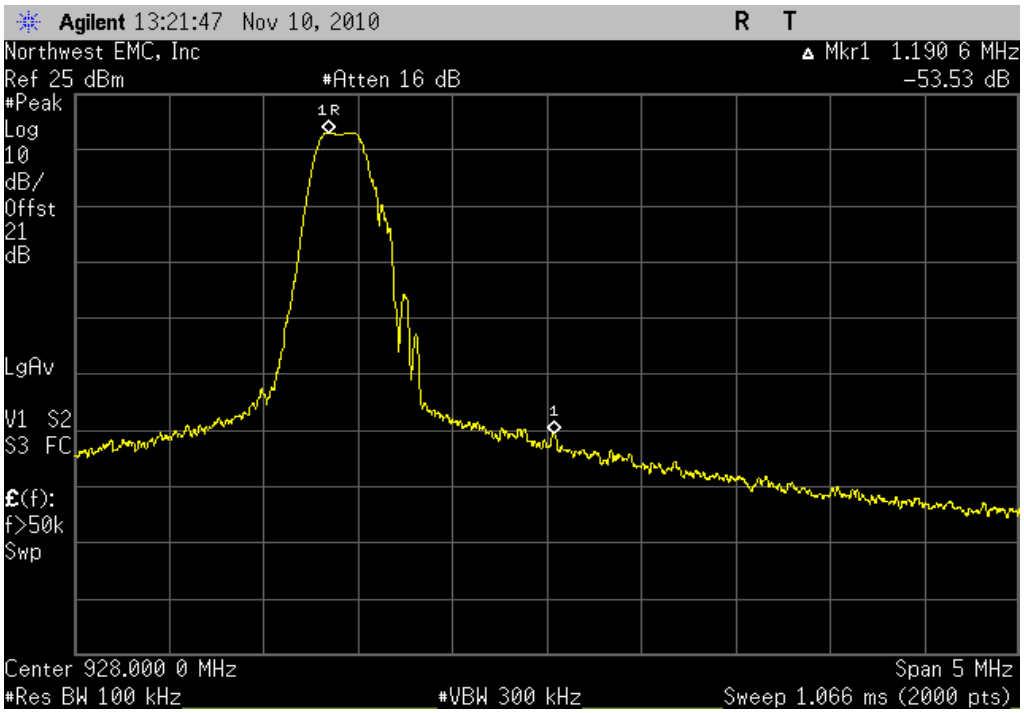
	Value	Limit	Results
Low Channel	-57.2 dBc	≤ -20 dBc	Pass
High Channel	-53.5 dBc	≤ -20 dBc	Pass

BAND EDGE COMPLIANCE

Low Channel					
Result:	Pass	**Value:**	-57.2 dBc	**Limit:**	≤ -20 dBc



High Channel					
Result:	Pass	**Value:**	-53.5 dBc	**Limit:**	≤ -20 dBc



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
Spectrum Analyzer	Agilent	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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 in a no hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency.

NORTHWEST EMC

SPURIOUS CONDUCTED EMISSIONS

XMit 2010.01.14

EUT:	WTX 915			**Work Order:**	AMDI0007
Serial Number:	none			**Date:**	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			**Temperature:**	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			**Humidity:**	45%
Project:	None			**Barometric Pres.:**	29.65
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

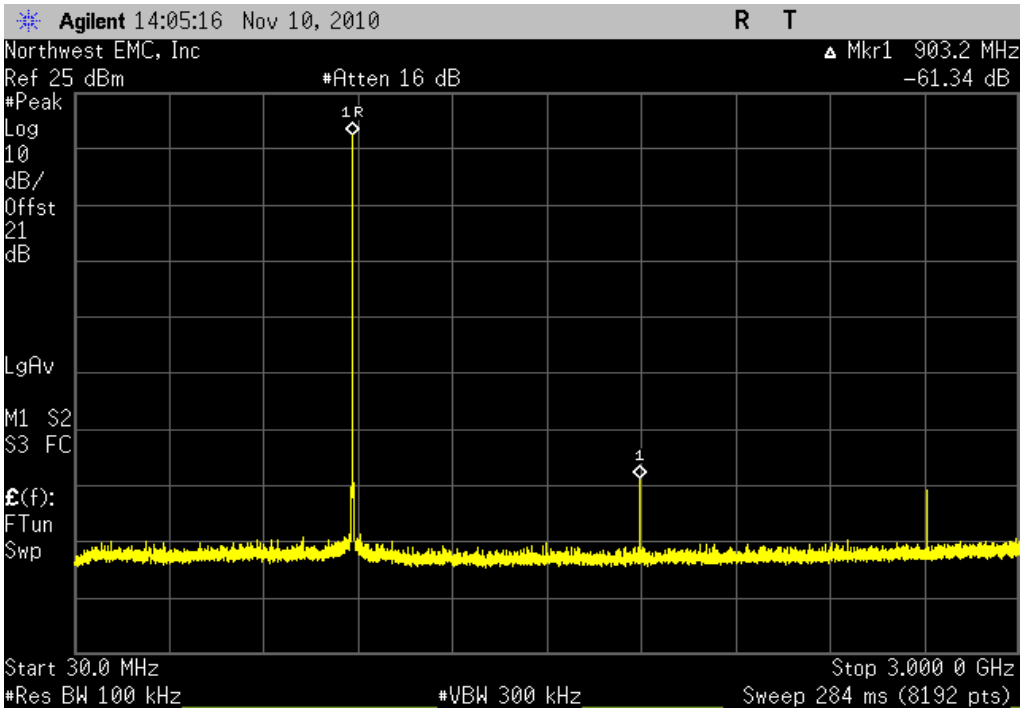
No Deviations

Configuration #	2	Signature

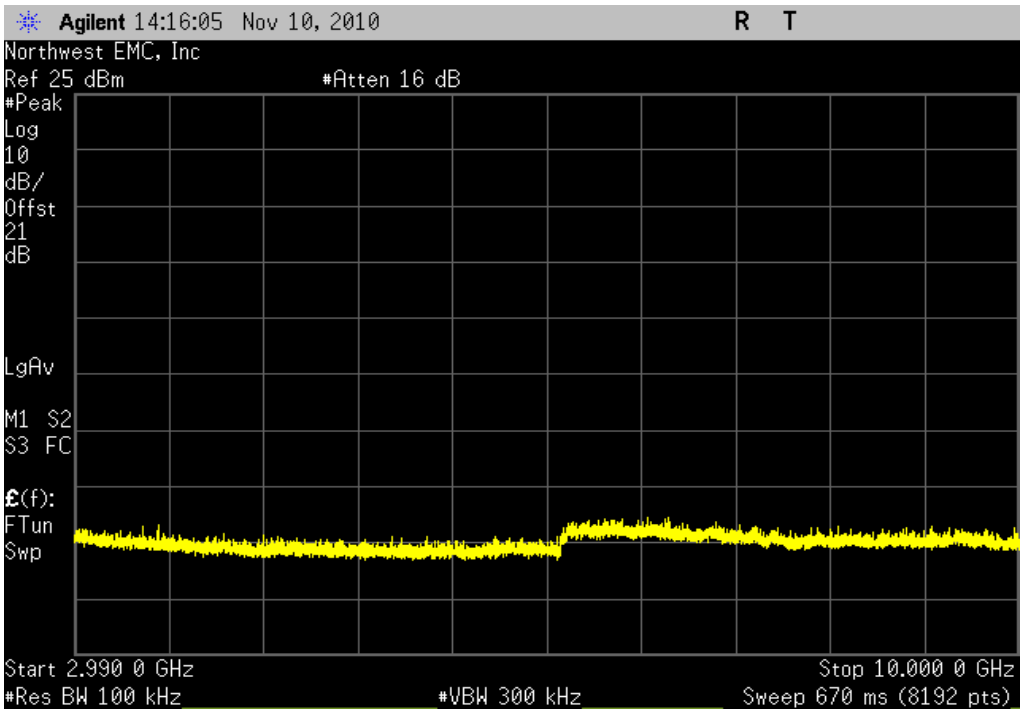
		Value	Limit	Results
Low Channel				
	0 - 3 GHz	-61.3 dBc	≤ -20 dBc	Pass
	2.99 GHz - 10 GHz	< -65 dBc	≤ -20 dBc	Pass
Mid Channel				
	0 - 3 GHz	-61.5 dBc	≤ -20 dBc	Pass
	2.99 GHz - 10 GHz	< -65 dBc	≤ -20 dBc	Pass
High Channel				
	0 - 3 GHz	-62.6 dBc	≤ -20 dBc	Pass
	2.99 GHz - 10 GHz	< -65 dBc	≤ -20 dBc	Pass

SPURIOUS CONDUCTED EMISSIONS

Low Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	-61.3 dBc	**Limit:**	≤ -20 dBc

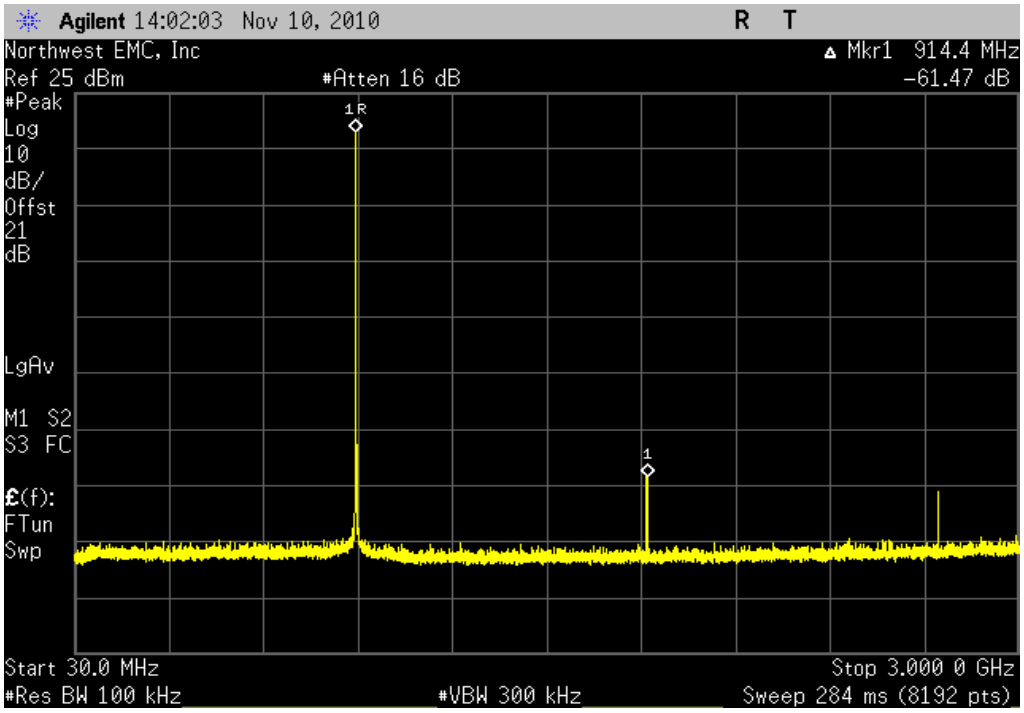


Low Channel, 2.99 GHz - 10 GHz					
Result:	Pass	**Value:**	< -65 dBc	**Limit:**	≤ -20 dBc

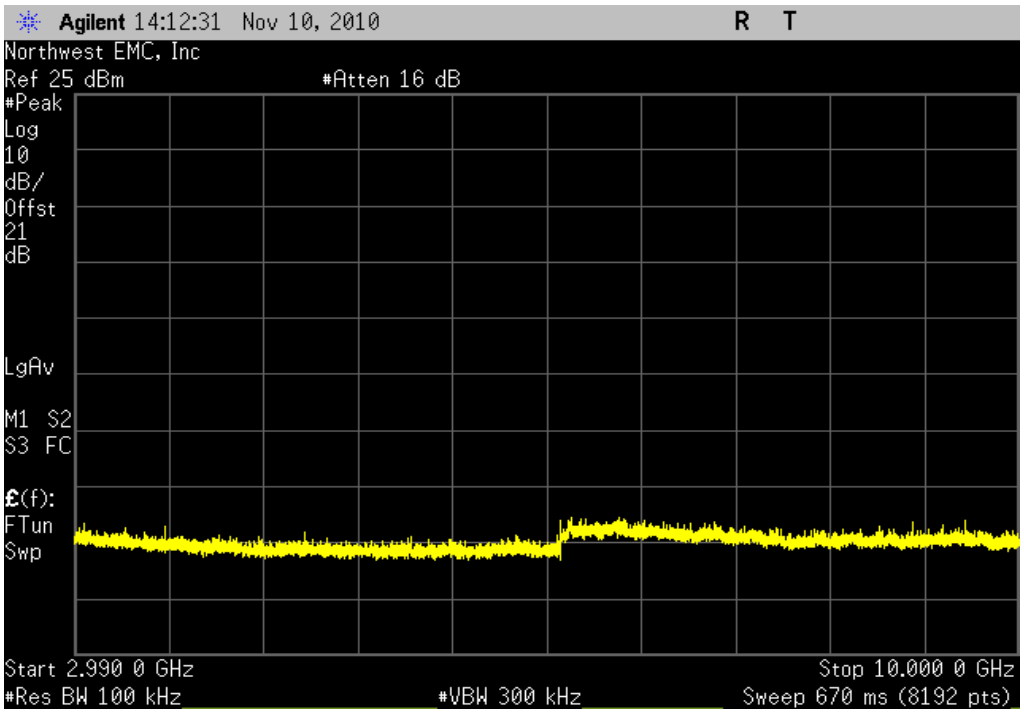


SPURIOUS CONDUCTED EMISSIONS

Mid Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	-61.5 dBc	**Limit:**	≤ -20 dBc

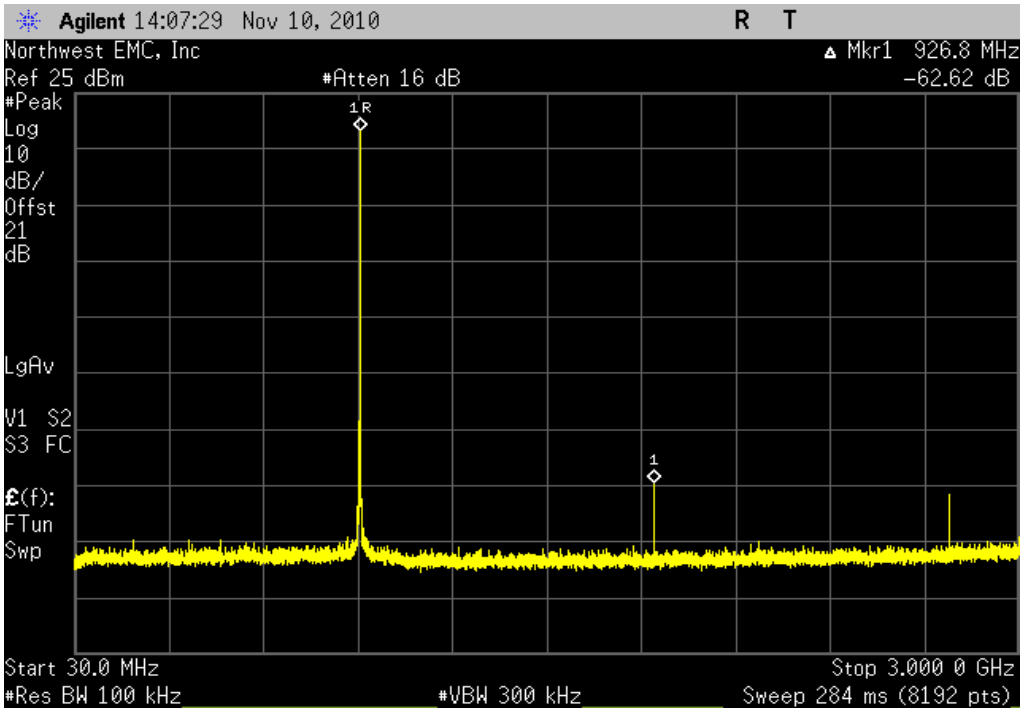


Mid Channel, 2.99 GHz - 10 GHz					
Result:	Pass	**Value:**	< -65 dBc	**Limit:**	≤ -20 dBc

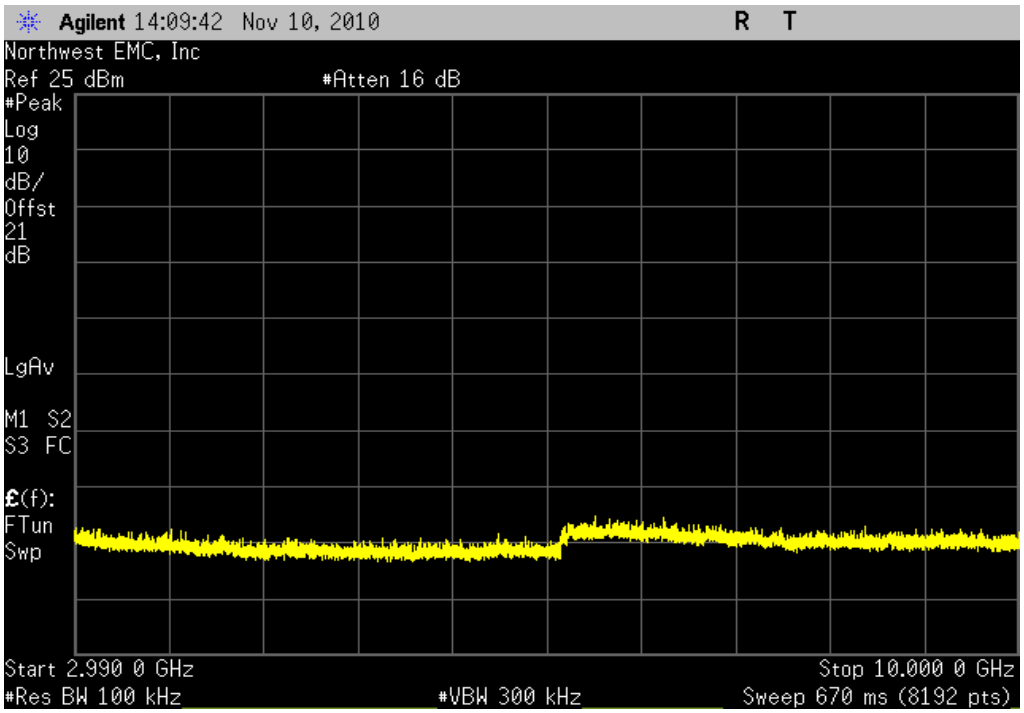


SPURIOUS CONDUCTED EMISSIONS

High Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	-62.6 dBc	**Limit:**	≤ -20 dBc



High Channel, 2.99 GHz - 10 GHz					
Result:	Pass	**Value:**	< -65 dBc	**Limit:**	≤ -20 dBc



DUTY CYCLE CORRECTION

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	E4440A	AFD	6/1/2009	24
40GHz DC Block	Miteq	DCB4000	AMD	8/5/2010	13
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/6/2010	13
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

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

To derive average emission measurements, a duty cycle correction factor per 15.35(c) was utilized:

Duty Cycle = On time/100 milliseconds (or the period, whichever is less)

Where “On time” = N1L1 +N2L2 +….

Where N1 is the number of type 1 pulses, L1 is length of type 1 pulses, N2 is the number of type 2 pulses, L2 is the length of type 2 pulses, etc.

Therefore, Duty Cycle = (N1L1 +N2L2 +…)/100mS or T, whichever is less, where T is the period of the pulse train.

The measured values for the EUT’s pulse train are as follows:

Period = 100 mSec

Pulsewidth of Pulse= 15.95 mSec

Number of Pulses = 1

Duty Cycle = 20 log [(15.95)/100]= -15.9 dB

NORTHWEST EMC

DUTY CYCLE CORRECTION

XMit 2010.01.14

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/11/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologiess			Temperature:	22°C
Attendees:	Aaron Montesano, Aaron Yarnell			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

COMMENTS

Frequency Hopping mode

DEVIATIONS FROM TEST STANDARD

No Deviations

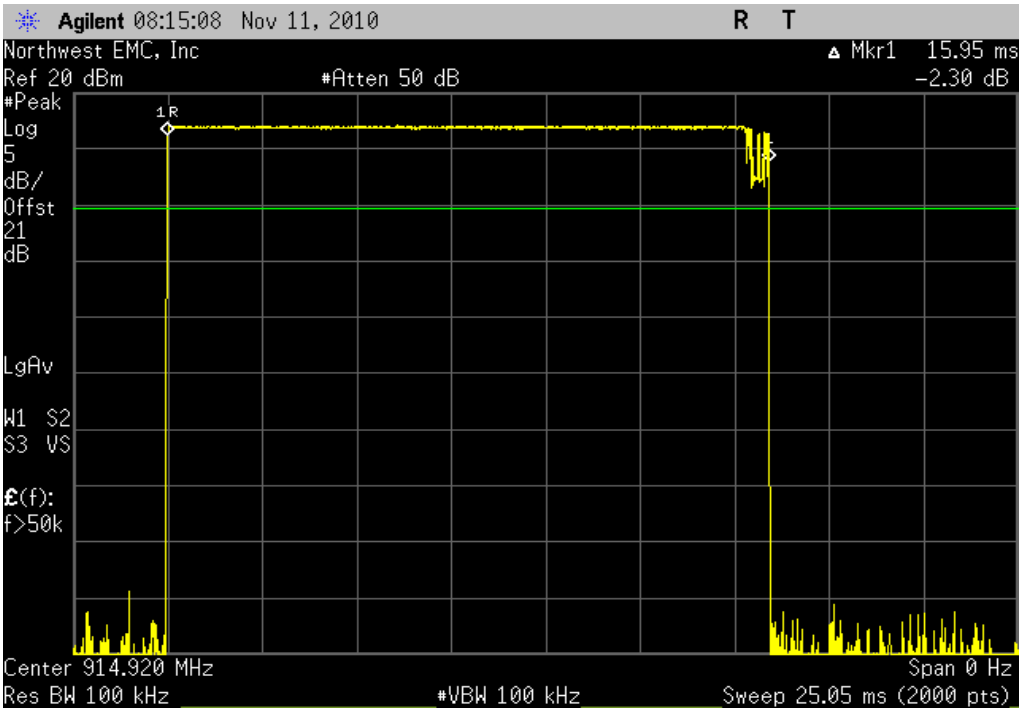
Configuration #	2	Signature

	Value	Limit	Results
Pulse Width	15.95	N/A	0.1595
100ms Period	100	N/A	0.1595

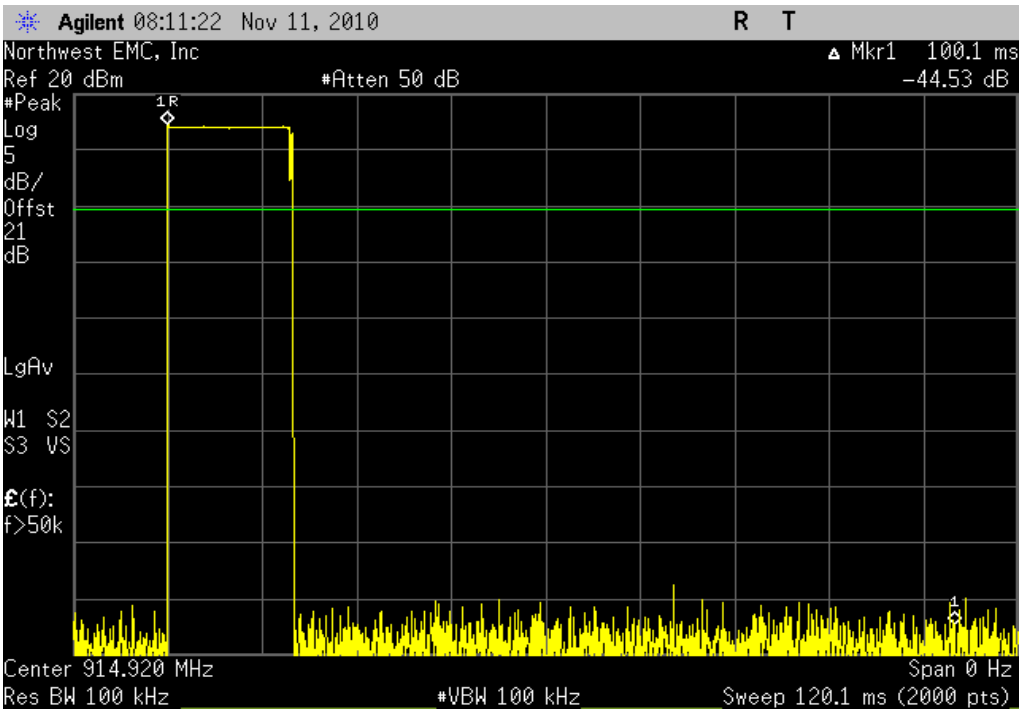
20 * LOG (15.95/100) = -15.9 dB

DUTY CYCLE CORRECTION

Pulse Width					
Result:	0.160	**Value:**	15.95 ms	**Limit:**	N/A



100ms Period					
Result:	0.160	**Value:**	100 ms	**Limit:**	N/A



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.

MODES OF OPERATION
Transmitting Low channel.
Transmitting Mid channel.
Transmitting High channel.

POWER SETTINGS INVESTIGATED
3 VDC

FREQUENCY RANGE INVESTIGATED			
Start Frequency	30 MHz	Stop Frequency	12500 MHz

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	Micro-Tronics	50108	HGF	1/18/2010	13
Attenuator	Pasternack	PE7005-20	AUN	7/14/2010	13
.5-1 GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFT	1/8/2010	13
Antenna, Horn	ETS	3160.07	AHZ	9/8/2010	24
Antenna, Horn	ETS	3115	AIB	9/8/2010	24
Antenna, Biconilog	EMCO	3141	AXG	2/15/2010	13
EV12 Cables	N/A	Standard Gain Horn Cables	EVU	7/14/2010	13
EV12 Cables	N/A	Double Ridge Horn Cables	EVT	10/23/2009	13
EV12 Cables	N/A	Bilog Cables	EVS	7/14/2010	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVH	7/14/2010	13
Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	7/14/2010	13
Pre-Amplifier	Miteq	AM-1616-1000	AVM	7/14/2010	13
Spectrum Analyzer	Agilent	E4440A	AAX	5/14/2010	12

MEASUREMENT BANDWIDTHS				
	Frequency Range	**Peak Data**	**Quasi-Peak Data**	**Average Data**
	(MHz)	**(kHz)**	**(kHz)**	**(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

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. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

NORTHWEST EMC

Spurious Radiated Emissions

PSA 2008.07.21
EMI 2008.1.9

EUT:	WTX 915			Work Order:	AMDI0007
Serial Number:	none			Date:	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies			Temperature:	22°C
Attendees:	Aaron Montesano			Humidity:	45%
Project:	None			Barometric Pres.:	29.65
Tested by:	Ethan Schoonover	Power:	3 VDC	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

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

COMMENTS

None

EUT OPERATING MODES

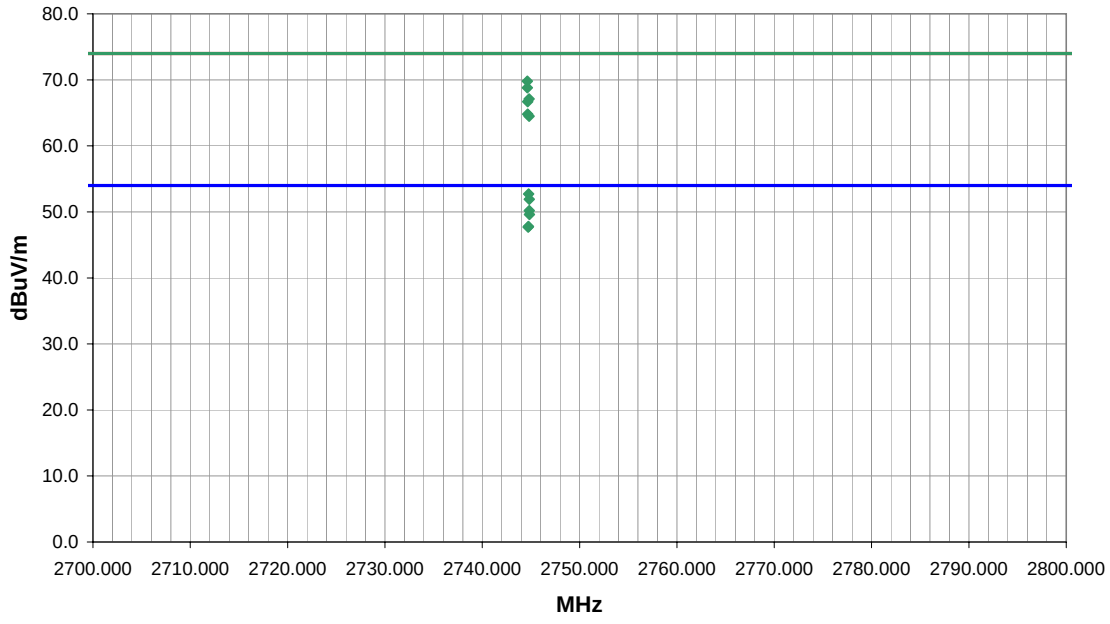
Transmitting,

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2744.767	67.5	1.1	237.0	1.0	15.9	0.0	H-Horn	AV	0.0	52.7	54.0	-1.3	EUT Flat
2744.833	66.7	1.1	47.0	1.0	15.9	0.0	H-Horn	AV	0.0	51.9	54.0	-2.1	EUT Vert
2744.833	65.0	1.1	306.0	1.1	15.9	0.0	V-Horn	AV	0.0	50.2	54.0	-3.8	EUT Flat
2744.627	68.7	1.1	237.0	1.0	0.0	0.0	H-Horn	PK	0.0	69.8	74.0	-4.2	EUT Flat
2744.847	64.4	1.1	294.0	1.5	15.9	0.0	V-Horn	AV	0.0	49.6	54.0	-4.4	EUT Horz
2744.640	67.7	1.1	47.0	1.0	0.0	0.0	H-Horn	PK	0.0	68.8	74.0	-5.2	EUT Vert
2744.747	62.6	1.1	205.0	1.6	15.9	0.0	V-Horn	AV	0.0	47.8	54.0	-6.2	EUT Vert
2744.720	62.5	1.1	128.0	1.0	15.9	0.0	H-Horn	AV	0.0	47.7	54.0	-6.3	EUT Horz
2744.807	66.0	1.1	306.0	1.1	0.0	0.0	V-Horn	PK	0.0	67.1	74.0	-6.9	EUT Flat
2744.673	65.6	1.1	294.0	1.5	0.0	0.0	V-Horn	PK	0.0	66.7	74.0	-7.3	EUT Horz
2744.660	63.7	1.1	128.0	1.0	0.0	0.0	H-Horn	PK	0.0	64.8	74.0	-9.2	EUT Horz
2744.820	63.4	1.1	205.0	1.6	0.0	0.0	V-Horn	PK	0.0	64.5	74.0	-9.5	EUT Vert

NORTHWEST EMC

Spurious Radiated Emissions

PSA 2008.07.21
EMI 2008.1.9

EUT:	WTX 915	Work Order:	AMDI0007
Serial Number:	none	Date:	11/10/10
Customer:	Wizard Control Systems, Inc. dba American Digital Technologies	Temperature:	22°C
Attendees:	Aaron Montesano	Humidity:	45%
Project:	None	Barometric Pres.:	29.65
Tested by:	Ethan Schoonover	Power: 3 VDC	Job Site: EV12

TEST SPECIFICATIONS	Test Method
FCC 15.247:2010	ANSI C63.10:2009

TEST PARAMETERS

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

COMMENTS

None

EUT OPERATING MODES

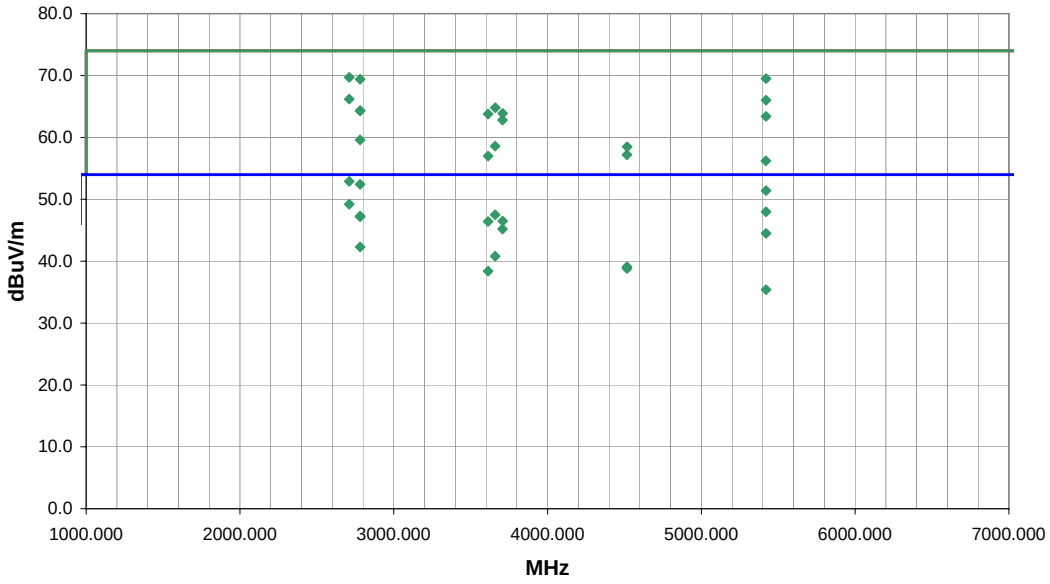
Transmitting

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2710.300	67.9	0.9	229.0	1.0	15.9	0.0	H-Horn	AV	0.0	52.9	54.0	-1.1	EUT flat on table.
2780.853	67.0	1.3	229.0	1.0	15.9	0.0	H-Horn	AV	0.0	52.4	54.0	-1.6	EUT flat on table.
5420.480	55.7	11.6	304.0	1.0	15.9	0.0	H-Horn	AV	0.0	51.4	54.0	-2.6	EUT Vert.
2710.113	68.8	0.9	229.0	1.0	0.0	0.0	H-Horn	PK	0.0	69.7	74.0	-4.3	EUT flat on table.
5420.320	57.9	11.6	304.0	1.0	0.0	0.0	H-Horn	PK	0.0	69.5	74.0	-4.5	EUT Vert.
2780.880	68.1	1.3	229.0	1.0	0.0	0.0	H-Horn	PK	0.0	69.4	74.0	-4.6	EUT flat on table.
2710.293	64.2	0.9	276.0	1.0	15.9	0.0	V-Horn	AV	0.0	49.2	54.0	-4.8	EUT flat on table.
5420.473	52.3	11.6	163.0	1.0	15.9	0.0	H-Horn	AV	0.0	48.0	54.0	-6.0	EUT flat on table.
3659.727	57.7	5.7	325.0	1.0	15.9	0.0	H-Horn	AV	0.0	47.5	54.0	-6.5	EUT Vert.
2780.847	61.9	1.3	314.0	1.0	15.9	0.0	V-Horn	AV	0.0	47.3	54.0	-6.7	EUT flat on table.
2780.840	61.8	1.3	145.0	1.0	15.9	0.0	H-Horn	AV	0.0	47.2	54.0	-6.8	EUT Vert.
3707.673	56.5	5.9	0.0	1.5	15.9	0.0	H-Horn	AV	0.0	46.5	54.0	-7.5	EUT Vert.
3613.593	56.8	5.5	324.0	1.0	15.9	0.0	H-Horn	AV	0.0	46.4	54.0	-7.6	EUT Vert.
2710.407	65.3	0.9	276.0	1.0	0.0	0.0	V-Horn	PK	0.0	66.2	74.0	-7.8	EUT flat on table.
5420.667	54.4	11.6	163.0	1.0	0.0	0.0	H-Horn	PK	0.0	66.0	74.0	-8.0	EUT flat on table.
3707.633	55.2	5.9	327.0	1.0	15.9	0.0	V-Horn	AV	0.0	45.2	54.0	-8.8	EUT Vert.
3659.840	59.1	5.7	325.0	1.0	0.0	0.0	H-Horn	PK	0.0	64.8	74.0	-9.2	EUT Vert.
5420.473	48.8	11.6	236.0	1.3	15.9	0.0	V-Horn	AV	0.0	44.5	54.0	-9.5	EUT Vert.
2780.800	63.0	1.3	314.0	1.0	0.0	0.0	V-Horn	PK	0.0	64.3	74.0	-9.7	EUT flat on table.
2780.933	63.0	1.3	145.0	1.0	0.0	0.0	H-Horn	PK	0.0	64.3	74.0	-9.7	EUT Vert.