Interlogix Inc.

RCR-90

Test Report

August 7, 2003

Report No. ILGX0253

Report Prepared By:

1-888-EMI-CERT

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: August 20, 2003
Interlogix Inc.
Model : RCR-90

Emissions

Description	Pass	Fail
FCC Part 15.249 Radiated Spurious Emissions	☒	☐
FCC Part 15.249 Field Strength of Fundamental	☒	☐
FCC Part 15.207 Conducted Emissions	☒	☐

Modifications made to the product

- See the modifications page of the 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.

Approved By:

Don Facteau, IS Manager

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		

FCC: The Open Area Test Sites, 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.

TCB: 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: Accreditation has been granted to Northwest EMC, Inc. to perform the Electromagnetic Compatibility (EMC) tests described in the Scope of Accreditation. Assessment performed to ISO/IEC 17025. Certificate Number: 200629-0, Certificate Number: 200630-0.

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. (A2LA)

TÜV Product Service: Included in TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0302C

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

Accreditations and Authorizations

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

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

Industry Canada: Accredited by Industry Canada for performance of radiated measurements. Our open area test sites comply with RSP 100, Issue 7, section 3.3.

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 Nos. - Evergreen: C-1071 and R-1025, Trails End: C-694 and R-677, Sultan: C-905, R-871 and R-1172, North Sioux City C-1246, R-1185 and R-1217)*

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

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

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

	NVLAP	FCC	NIST	TUV PS	TUV Rheinland	Nemko	Technology International	Industry Canada	BSMI	VCCI	GOST	NATA
IEC 1000-4-2	✓			✓	✓	✓	✓					
IEC 1000-4-3	✓			✓	✓	✓	✓					
IEC 1000-4-4	✓			✓	✓	✓	✓					
IEC 1000-4-5	✓			✓	✓	✓	✓					
IEC 1000-4-6	✓			✓	✓	✓	✓					
IEC 1000-4-8	✓			✓	✓	✓	✓					
IEC 1000-4-11	✓			✓	✓	✓	✓					
IEC 1000-3-2	✓			✓	✓	✓	✓					
IEC 1000-3-3	✓			✓	✓	✓	✓					
AS/NZS 3548	✓											✓
CNS 13438	✓								✓			
ISO/IEC17025	✓			✓	✓	✓	✓		✓			
Radiated Emissions	✓			✓	✓	✓	✓	✓	✓	✓	✓	
Conducted Emissions	✓			✓	✓	✓	✓	✓	✓	✓	✓	
OATS Sites	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
Hillsboro 5-Meter Chamber (EV01)	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	
TCB for Licensed Transmitters		✓										
TCB for un-Licensed Transmitters		✓										
Cab for R&TTE			✓									
CAB for EMC			✓									

This chart represents only a partial NVLAP Scope, please reference http://ts.nist.gov/ts/htdocs/210/214/214.htm for the full NVLAP Scope of Accreditation

What is measurement uncertainty?

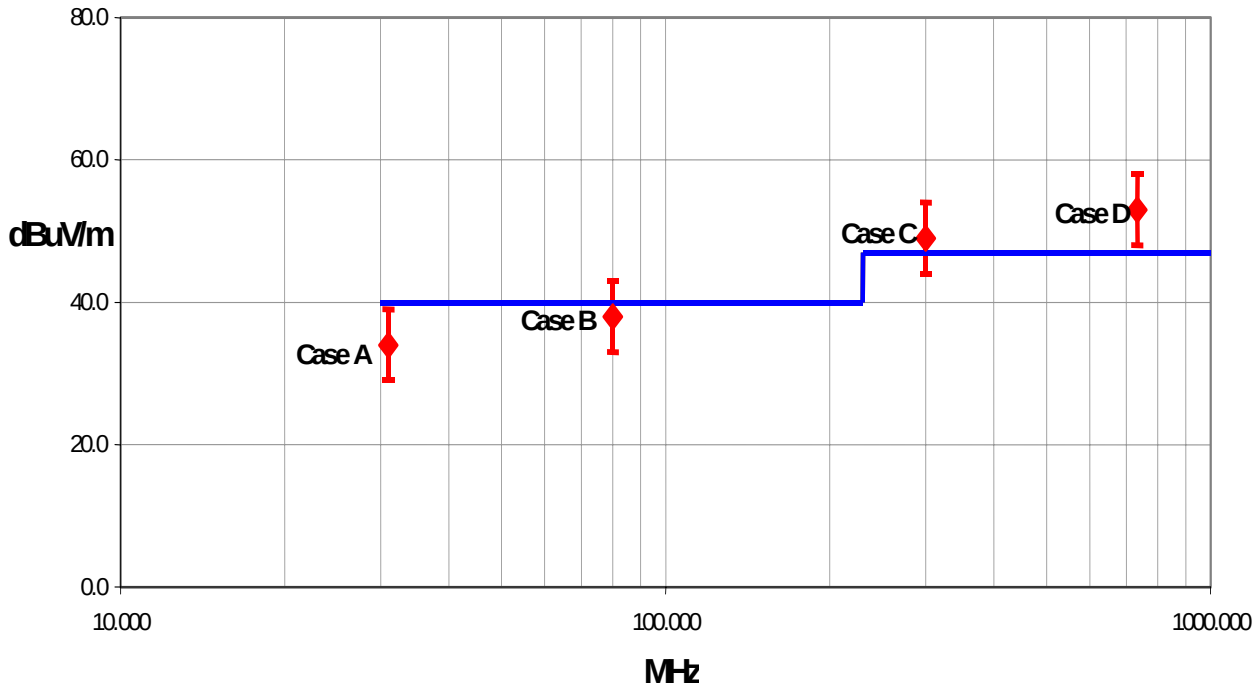
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following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

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

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

How might measurement uncertainty be applied to test results?

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



Test Result Scenarios:
Case A: Product complies.
Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.
Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.
Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz		Value (dB)					
	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty ***U*** (level of confidence ≈ 95%)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 -2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

Radiated Emissions > 1 GHz	Value (dB)		
	Probability Distribution	Without High Pass Filter	With High Pass Filter
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty ***U*** (level of confidence ≈ 95%)	normal (k=2)	+ 2.57 - 2.51	+ 2.76 - -2.70

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

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

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

Legend

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

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

Northwest
EMC

Facilities

California

Orange County Facility

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

Oregon

Evergreen Facility

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

Oregon

Trails End Facility

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

South Dakota

North Sioux City Facility

745 N. Derby Lane
P.O. Box 217
North Sioux City, SD 57049
(605) 232-5267
FAX (605) 232-3873

Washington

Sultan Facility

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test

Company Name:	Interlogix Inc.
Address:	12345 SW Leveton Drive
City, State, Zip:	Tualatin, OR 97062
Test Requested By:	Fred Eggers, Feng Tang
Model:	RCR-90
First Date of Test:	08-05-2003
Last Date of Test:	08-06-2003
Receipt Date of Samples:	08-05-2003
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	5807.8 - 5807.8 MHz
I/O Ports:	Power

Functional Description of the EUT (Equipment Under Test):

Part 15 Low Power Communication Device Transmitter

Client Justification for EUT Selection:

Not Provided

Client Justification for Test Selection

Fulfill the requirements of an FCC Class II Permissive Change

Equipment modifications				
Item #	Test	Date	Modification	Note
1	Radiated Spurious Emissions	08-05-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
2	Radiated Spurious Emissions	08-05-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.
3	Conducted Emissions	08-06-2003	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.

Justification

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

Channels in Specified Band Investigated:
Single

Operating Modes Investigated:
Typical

Data Rates Investigated:
Typical

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
12VDC

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	RCR Build #32
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Interlogix Inc.	RCR-90	N/A
DC Power Supply	Energy One	XP-4	TPA

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	2.0m	No	EUT	DC Power Supply

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

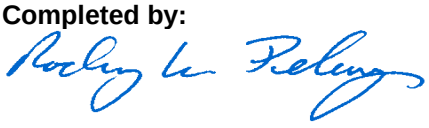
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	01/07/2003	12 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	01/07/2003	12 mo
Antenna, Horn	EMCO	3115	AHC	08/12/2002	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/06/2003	12 mo

Test Description

Requirement: The field strength of the fundamental emission shall comply with the limits, as defined in 47 CFR 15.249. Field strength limits are specified at a distance of 3 meters.

Configuration: The antennas to be used with the EUT were tested. The EUT was transmitting while set at the single channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:1992).

Completed by:



NORTHWEST EMC

OATS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/05/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Fred Eggers, Feng Tang			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.94
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.249	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

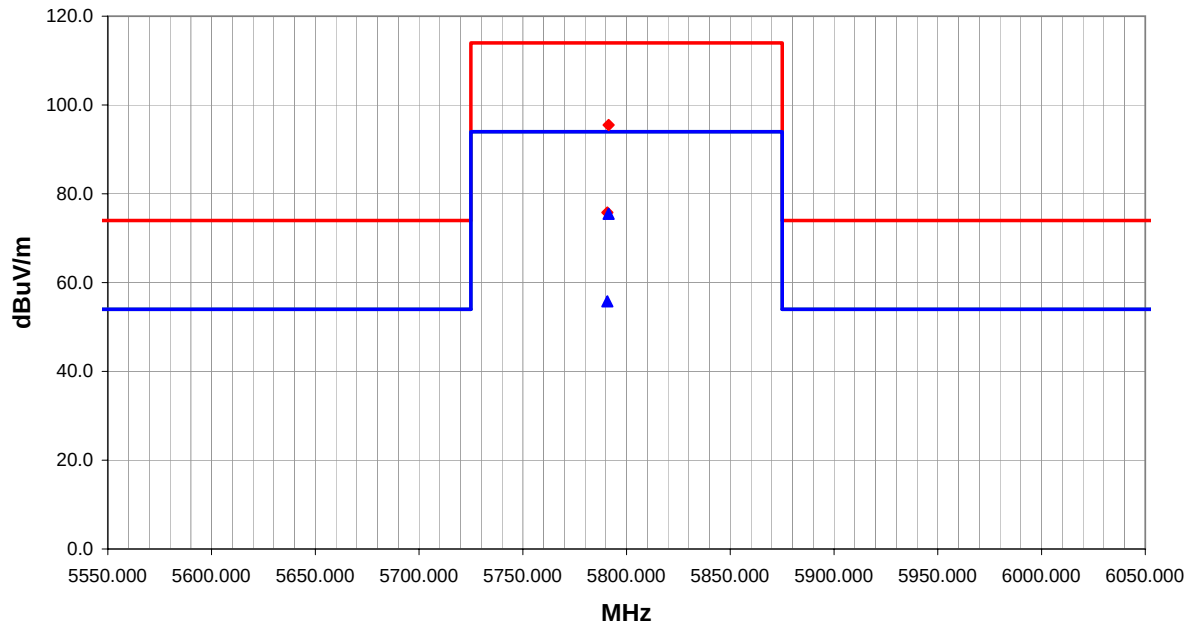
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	2

Other

Tested By:



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)
5791.380	86.4	9.1	322.0	1.3	20.0	0.0	V-Horn	AV	0.0	75.5	94.0	-18.5
5790.780	66.7	9.1	47.0	1.4	20.0	0.0	H-Horn	AV	0.0	55.8	94.0	-38.2
5791.380	86.4	9.1	322.0	1.3	0.0	0.0	V-Horn	PK	0.0	95.5	114.0	-18.5
5790.780	66.7	9.1	47.0	1.4	0.0	0.0	H-Horn	PK	0.0	75.8	114.0	-38.2

Justification

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

Channels in Specified Band Investigated:
Single

Operating Modes Investigated:
Typical

Data Rates Investigated:
Typical

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
12VDC

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	RCR Build #32
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Interlogix Inc.	RCR-90	N/A
DC Power Supply	Energy One	XP-4	TPA

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	2.0m	No	EUT	DC Power Supply

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	01/07/2003	12 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	01/07/2003	12 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	01/06/2003	12 mo
Antenna, Biconilog	EMCO	3141	AXE	12/31/2001	36 mo
Antenna, Horn	EMCO	3115	AHC	08/12/2002	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/06/2003	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	07/09/2002	15 mo
Antenna, Horn	EMCO	3160-08	AHK	06/20/2003	12 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	01/17/2000	39 mo
Pre-Amplifier	Miteq	JS4-26004000-40-8P	APV	06/26/2000	36 mo
Antenna, Horn	EMCO	3160-09	AHG	01/15/2000	39 mo
Antenna, Horn	EMCO	3160-10	AHI	01/15/2000	39 mo

Test Description

Requirement: The field strength of harmonics and spurious radiated emissions shall comply with the limits as defined in 47 CFR 15.249. Field strength limits are specified at a distance of 3 meters. Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Sec. 15.209, whichever is the lesser attenuation. As shown in Sec. 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified in Sec. 15.249 by more than 20 dB under any condition of modulation.

Configuration: The antennas to be used with the EUT were tested. The EUT was transmitting while set at the single channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:1992). A preamp was used for this test in order to provide sufficient measurement sensitivity.

Bandwidths Used for Measurements

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were made using the bandwidths and detectors specified. No video filter was used.			

Completed by:

NORTHWEST EMC

OATS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/05/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Fred Eggers, Feng Tang			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.95
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.249	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

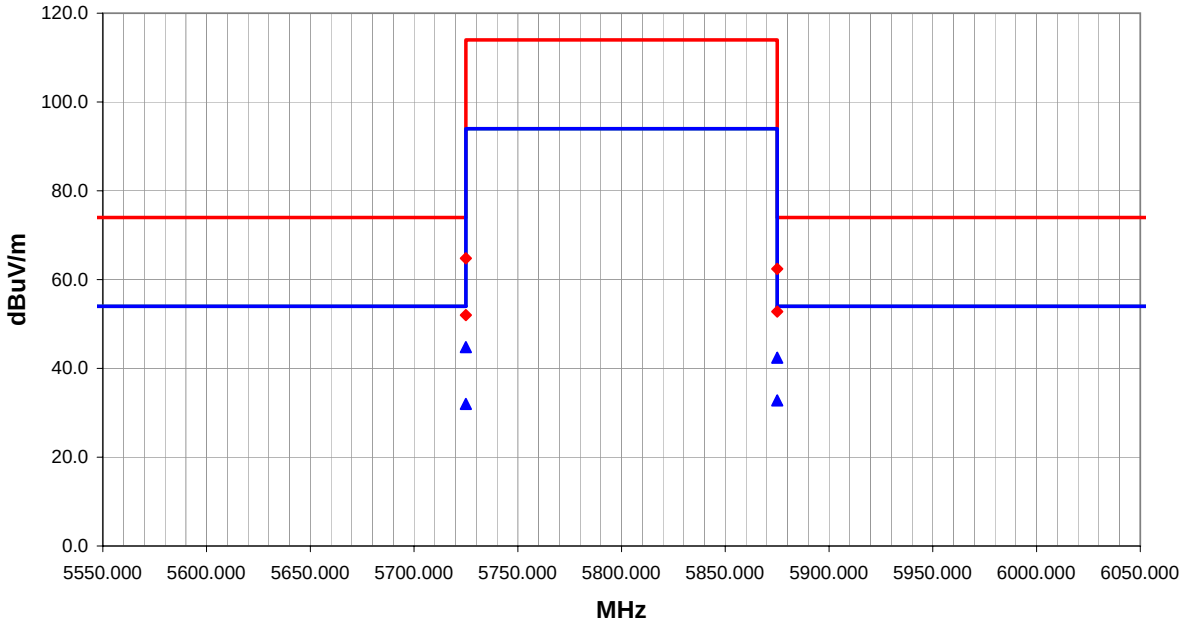
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	4

Other

Tested By:



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)
5725.000	55.9	8.9	20.0	1.3	20.0	0.0	V-Horn	AV	0.0	44.8	54.0	-9.2
5875.000	53.0	9.4	28.0	1.2	20.0	0.0	V-Horn	AV	0.0	42.4	54.0	-11.6
5875.000	43.4	9.4	276.0	1.5	20.0	0.0	H-Horn	AV	0.0	32.8	54.0	-21.2
5725.000	43.1	8.9	34.0	1.1	20.0	0.0	H-Horn	AV	0.0	32.0	54.0	-22.0
5725.000	55.9	8.9	20.0	1.3	0.0	0.0	V-Horn	PK	0.0	64.8	74.0	-9.2
5875.000	53.0	9.4	28.0	1.2	0.0	0.0	V-Horn	PK	0.0	62.4	74.0	-11.6
5875.000	43.4	9.4	276.0	1.5	0.0	0.0	H-Horn	PK	0.0	52.8	74.0	-21.2
5725.000	43.1	8.9	34.0	1.1	0.0	0.0	H-Horn	PK	0.0	52.0	74.0	-22.0

NORTHWEST EMC

OATS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/05/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Fred Eggers, Feng Tang			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.95
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.249	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

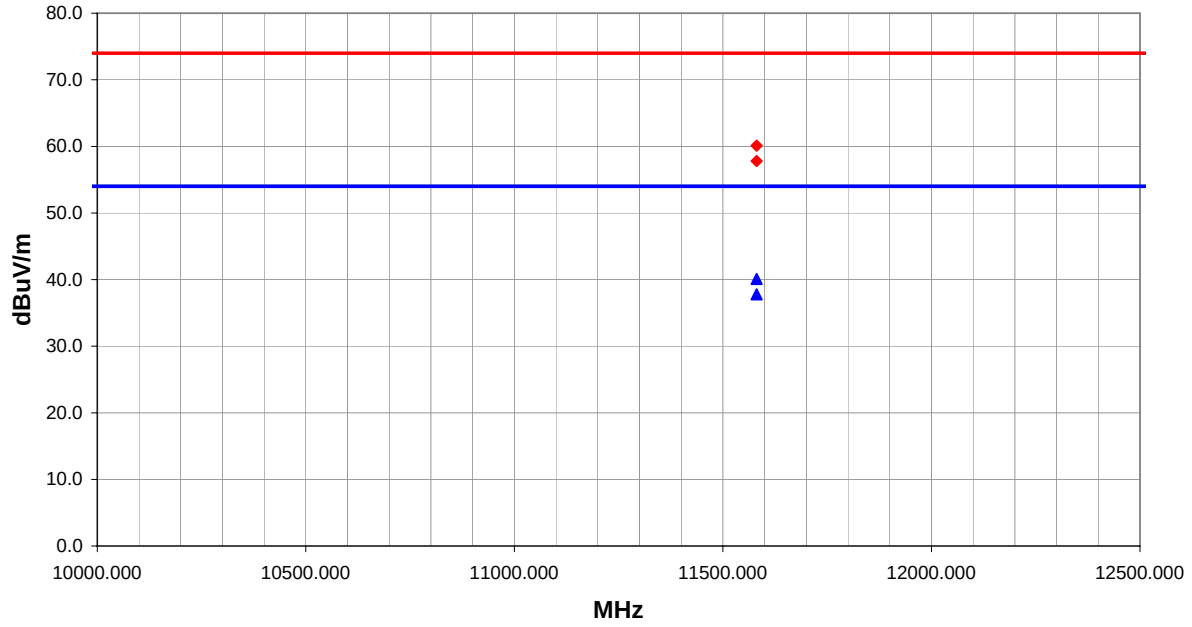
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Pass	7

Other

Tested By:



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)
11580.940	40.0	20.1	8.0	1.3	20.0	0.0	V-Horn	AV	0.0	40.1	54.0	-13.9
11580.940	37.7	20.1	310.0	1.3	20.0	0.0	H-Horn	AV	0.0	37.8	54.0	-16.2
11580.940	40.0	20.1	8.0	1.3	0.0	0.0	V-Horn	PK	0.0	60.1	74.0	-13.9
11580.940	37.7	20.1	310.0	1.3	0.0	0.0	H-Horn	PK	0.0	57.8	74.0	-16.2

NORTHWEST EMC

OATS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/05/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Fred Eggers, Feng Tang			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.95
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.249	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

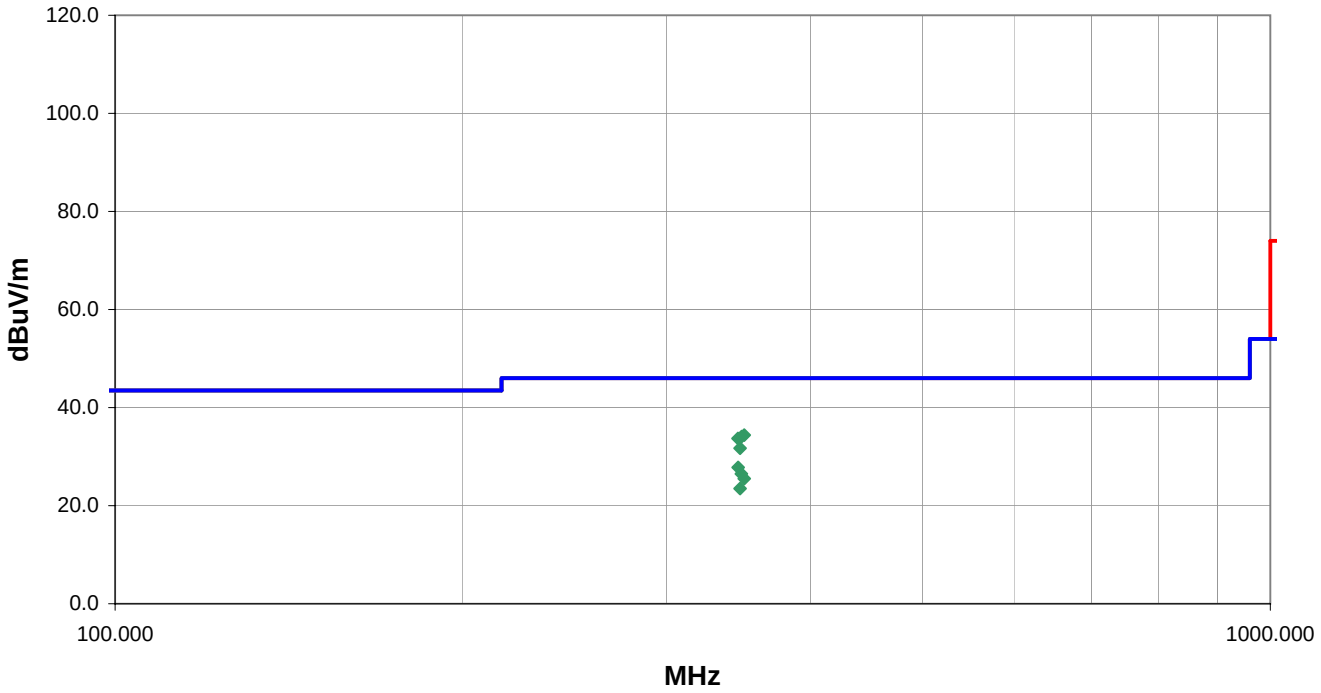
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Run #
Evaluation	9

Other

Tested By:



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
350.382	40.6	-6.2	217.0	1.0	3.0	0.0	H-Bilog	QP	0.0	34.4	46.0	-11.6
348.666	40.3	-6.2	230.0	1.0	3.0	0.0	H-Bilog	QP	0.0	34.1	46.0	-11.9
346.140	40.0	-6.3	238.0	1.0	3.0	0.0	H-Bilog	QP	0.0	33.7	46.0	-12.3
347.564	38.0	-6.3	216.0	1.1	3.0	0.0	H-Bilog	QP	0.0	31.7	46.0	-14.3
346.206	34.1	-6.3	174.0	3.1	3.0	0.0	V-Bilog	QP	0.0	27.8	46.0	-18.2
348.368	32.7	-6.2	182.0	3.2	3.0	0.0	V-Bilog	QP	0.0	26.5	46.0	-19.5
350.422	31.7	-6.2	37.0	1.9	3.0	0.0	V-Bilog	QP	0.0	25.5	46.0	-20.5
347.547	29.8	-6.3	57.0	2.2	3.0	0.0	V-Bilog	QP	0.0	23.5	46.0	-22.5

Justification

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

Channels in Specified Band Investigated:
Single

Operating Modes Investigated:
Typical

Data Rates Investigated:
Typical

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
12VDC

Software\Firmware Applied During Test

Exercise software	Standard Production Software	Version	RCR Build #32
Description			
The system was tested using standard operating production software to exercise the functions of the device during the testing.			

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
EUT	Interlogix Inc.	RCR-90	N/A
AC Power Adapter	CUI Stack	DV-1280	N/A

Cables

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

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

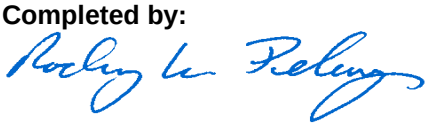
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	01/07/2003	12 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	01/07/2003	12 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	01/07/2003	12 mo
High Pass Filter	TTE	H97-100k-50-720B	HFC	01/02/2003	12 mo
LISN	Solar	9252-50-R-24-BNC	LIN	12/12/2002	12 mo

Test Description

Requirement: Per 47 15.207(d), if the EUT is connected to the AC power line indirectly, obtaining its power from another device that is connected to the AC power line, then it should be tested to demonstrate compliance with the conducted limits of 15.207.

Configuration: The EUT will be powered from a DC power source for an alarm system. Therefore, the measurements were made on an AC power adapter used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at single channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.4-1992.

Completed by:



NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/06/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Drop off			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.95
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.207 Class B	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

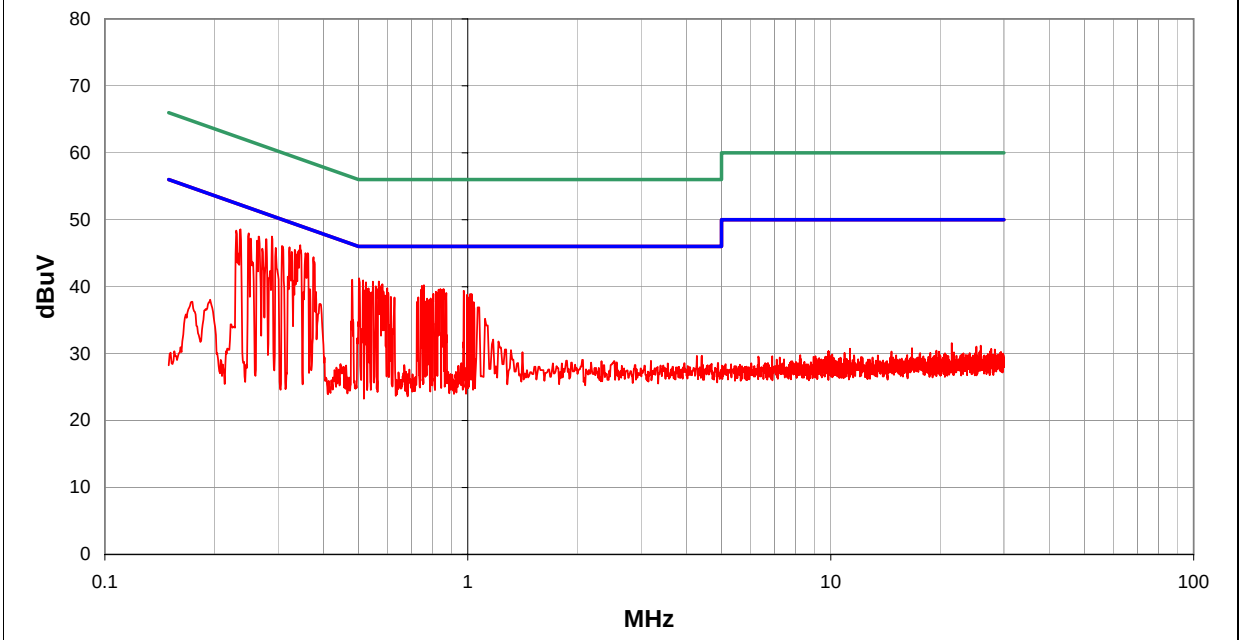
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Line	Run #
Pass	L1	1

Other

Tested By:



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.345	26.0			0.0	0.2	20.0				46.2	49.1	-2.9
0.289	27.3			0.0	0.2	20.0				47.5	50.6	-3.1
0.236	28.4			0.0	0.2	20.0				48.6	52.2	-3.7
0.362	24.8			0.0	0.2	20.0				45.0	48.7	-3.7
0.323	25.7			0.0	0.2	20.0				45.9	49.6	-3.7
0.266	27.3			0.0	0.2	20.0				47.5	51.2	-3.8
0.279	26.9			0.0	0.2	20.0				47.1	50.9	-3.8
0.357	24.8			0.0	0.2	20.0				45.0	48.8	-3.8
0.249	27.8			0.0	0.2	20.0				48.0	51.8	-3.8
0.342	25.1			0.0	0.2	20.0				45.3	49.2	-3.9
0.334	25.3			0.0	0.2	20.0				45.5	49.4	-3.9
0.308	25.9			0.0	0.2	20.0				46.1	50.0	-3.9
0.376	24.2			0.0	0.2	20.0				44.4	48.4	-4.0
0.230	28.2			0.0	0.2	20.0				48.4	52.4	-4.1
0.327	25.0			0.0	0.2	20.0				45.2	49.5	-4.3
0.263	26.7			0.0	0.2	20.0				46.9	51.4	-4.5
0.336	24.6			0.0	0.2	20.0				44.8	49.3	-4.5
0.253	27.0			0.0	0.2	20.0				47.2	51.7	-4.5
0.296	25.6			0.0	0.2	20.0				45.8	50.4	-4.6
0.502	21.0			0.0	0.2	20.0				41.2	46.0	-4.8

NORTHWEST EMC

CONDUCTED EMISSIONS DATA SHEET

REV df3.11 06/23/2003

EUT:	RCR-90			Work Order:	ILGX0253
Serial Number:	N/A			Date:	08/06/03
Customer:	Interlogix Inc.			Temperature:	75
Attendees:	Drop off			Humidity:	40%
Cust. Ref. No.:				Barometric Pressure	29.95
Tested by:	Rod Peloquin	Power:	12VDC	Job Site:	EV01

TEST SPECIFICATIONS

Specification:	FCC 15.207 Class B	Year:	2003
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

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

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

COMMENTS

EUT OPERATING MODES

Pulsed RF

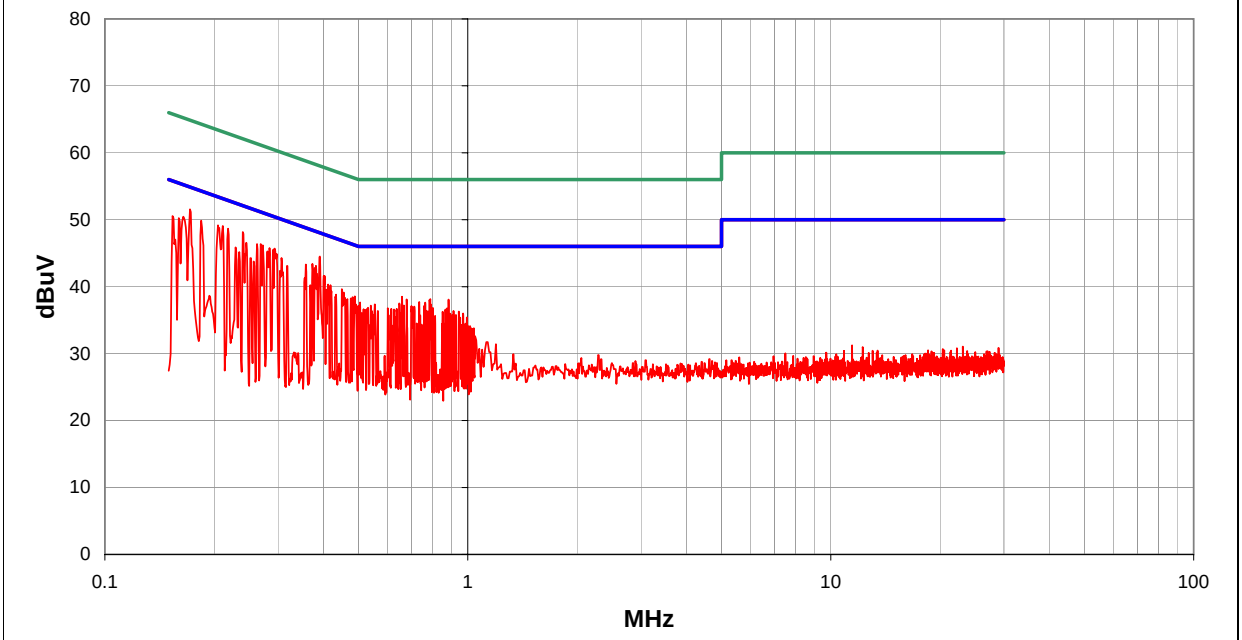
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Line	Run #
Pass	N	2

Other

Tested By:



Freq (MHz)	Amplitude (dBuV)			Transducer (dB)	Cable (dB)	External Attenuation (dB)		Detector (blank equal peaks [PK] from scan)		Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.172	31.4			0.0	0.1	20.0				51.5	54.9	-3.3
0.391	24.3			0.0	0.2	20.0				44.5	48.0	-3.5
0.240	28.0			0.0	0.2	20.0				48.2	52.1	-3.9
0.211	28.9			0.0	0.2	20.0				49.1	53.2	-4.1
0.218	28.5			0.0	0.2	20.0				48.7	52.9	-4.2
0.205	29.0			0.0	0.2	20.0				49.2	53.4	-4.3
0.184	29.7			0.0	0.2	20.0				49.9	54.3	-4.4
0.294	25.5			0.0	0.2	20.0				45.7	50.4	-4.7
0.269	26.2			0.0	0.2	20.0				46.4	51.2	-4.8
0.164	30.3			0.0	0.1	20.0				50.4	55.2	-4.8
0.272	26.0			0.0	0.2	20.0				46.2	51.0	-4.9
0.284	25.6			0.0	0.2	20.0				45.8	50.7	-4.9
0.263	26.2			0.0	0.2	20.0				46.4	51.4	-5.0
0.373	23.2			0.0	0.2	20.0				43.4	48.4	-5.0
0.290	25.3			0.0	0.2	20.0				45.5	50.5	-5.0
0.381	22.9			0.0	0.2	20.0				43.1	48.3	-5.1
0.160	30.1			0.0	0.1	20.0				50.2	55.5	-5.2
0.154	30.4			0.0	0.1	20.0				50.5	55.8	-5.3
0.245	26.4			0.0	0.2	20.0				46.6	51.9	-5.3
0.358	23.1			0.0	0.2	20.0				43.3	48.8	-5.5