

Preco, Inc.

WZPV4015

Report No. PRCO0049

Report Prepared By



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

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EMC Test Report

Certificate of Test
Last Date of Test: December 9, 2009
Preco, Inc.
Model: WZPV4015

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Field Strength of Fundamental	FCC 15.249:2009	ANSI C63.4:2003	Pass
Field Strength of Spurious Emissions	FCC 15.249:2009	ANSI C63.4:2003	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: (503) 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-1).

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 United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 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).



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, 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)



SCOPE

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



Northwest EMC Locations



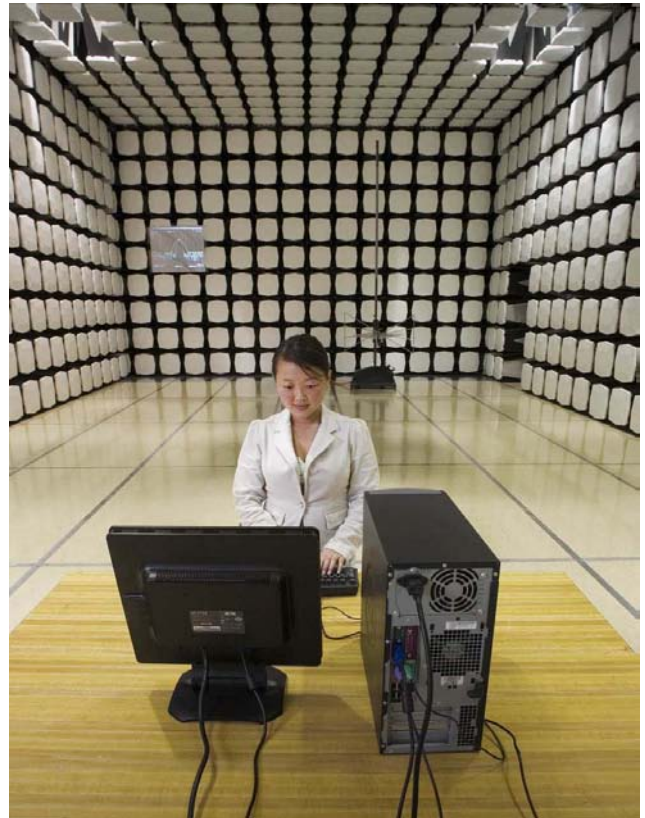
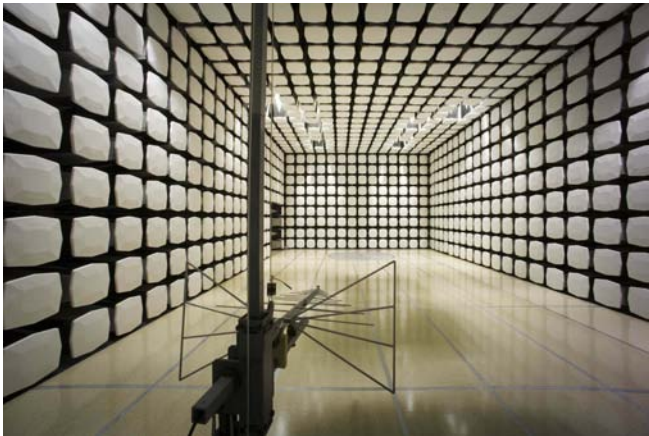
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

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:	Preco, Inc.
Address:	415 N. Maple Grove
City, State, Zip:	Boise, ID 83704-8241
Test Requested By:	John Fadgen
Model:	WZPV4015
First Date of Test:	November 18, 2009
Last Date of Test:	December 9, 2009
Receipt Date of Samples:	November 18, 2009
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test**Functional Description of the EUT (Equipment Under Test):**

5.725-5.875 GHz pulsed carrier

Testing Objective:

To demonstrate compliance with FCC 15.249 limits.

CONFIGURATION 1 PRC00049

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Antenna sensor assembly	Preco Electronics, Inc.	WZPV4015	Unit #1
Operator display unit	Preco Electronics, Inc.	Unknown	1210012D

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
13.8VDC Power Supply	Radio Shack	22-504	023976

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Interface cable	No	7.6m	No	Antenna sensor assembly	Operator display unit
+12 VDC cable	No	1.0m	No	Antenna sensor assembly	13.8VDC Power Supply
Ground cable	No	1.0m	No	Antenna sensor assembly	13.8VDC Power Supply
Auxiliary output cable	No	1.0m	No	Antenna sensor assembly	Unterminated

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	11/18/2009	Field Strength of Fundamental	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	12/9/2009	Field Strength of Spurious 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.

MODES OF OPERATION

Transmitting with pulsed modulated carrier. Pulse Width = 2/130.8 MHz, Pulse Rep

POWER SETTINGS INVESTIGATED

13.8 VDC

FREQUENCY RANGE INVESTIGATED

Start Frequency	5725 MHz	Stop Frequency	5875 MHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAV	12/11/2008	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	7/10/2009	13
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
EV01 Cables		Double Ridge Horn Cables	EVB	7/10/2009	13

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

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 antennas to be used with the EUT were tested. The EUT was transmitting and/or receiving while set at the lowest channel, a middle channel, and the highest 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 C63.4:2003).

To determine the "true peak level", the measurement procedure described by Andy Leimer of the FCC OET Laboratory (FCC Procedure for Pulsed Signals.txt, dated 11/16/99) was used. Per step (C), if the emission is viewed in pulse spectrum mode, the level of the fundamental emissions is measured using analyzer settings as listed in the Hewlett Packard Application Note 150-2 (Spectrum Analysis...Pulsed RF, Nov. 1971) such that a true pulse spectrum is obtained (RBW greater than PRF). The video bandwidth should be equal to, or greater than the RBW. The pulse repetition frequency (PRF) was measured to be 2 MHz; therefore a 3 MHz resolution bandwidth (RBW) and an 8 MHz video bandwidth (VBW) were used to measure the fundamental emission. A pulse desensitization factor in dB (calculated from Equation 10 in HP Note 150-2) is added to this measured level to obtain the "true peak level". The pulse width was measured to be 15.3 nS; therefore a 23.2 dB pulse desensitization factor was used ($k = 1.5$, $B = 3$ MHz).

The average level of the fundamental emission is the "true peak level" measured above minus the calculated duty cycle factor in dB. The duty cycle correction factor is calculated from Equation 4 in HP Note 150-2. The pulse width was measured to be 15.3 nS and the PRF = 2 MHz; therefore a 30.3 dB duty cycle correction factor was used.

The main lobe of the fundamental emission lies entirely within the specified frequency band.

EUT: WZPV4015	Work Order: PRCO0049
Serial Number: Unit # 1	Date: 11/18/09
Customer: Preco, Inc.	Temperature: 22
Attendees: None	Humidity: 38%
Project: None	Barometric Pres.: 29.85
Tested by: Rod Peloquin	Power: 13.8 VDC
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

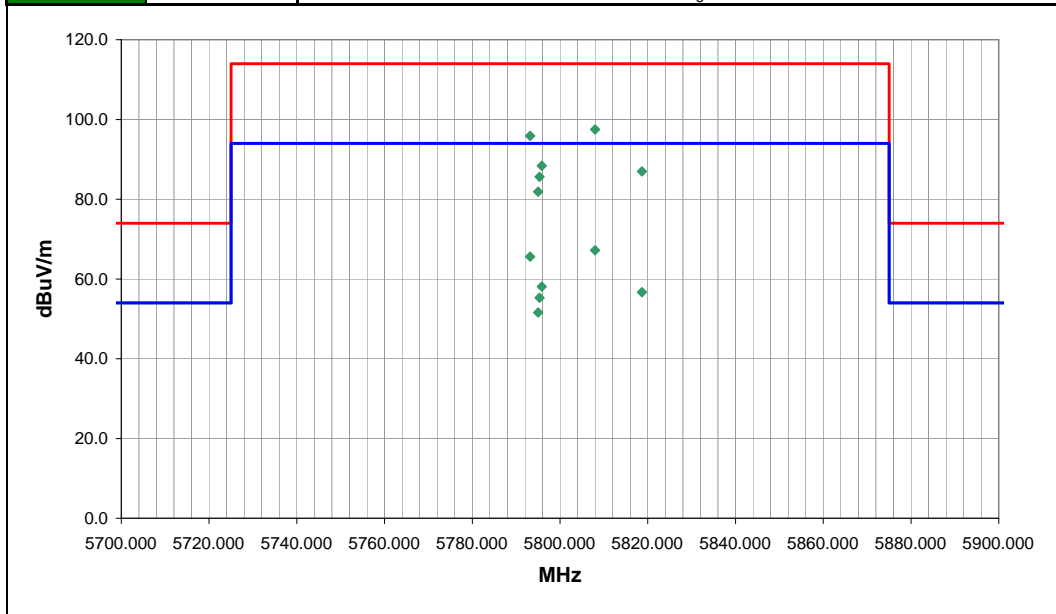
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
Pulsed Measurement Mode

EUT OPERATING MODES
Transmitting with pulsed modulated carrier. Pulse Width = 2/130.8 MHz, Pulse Rep

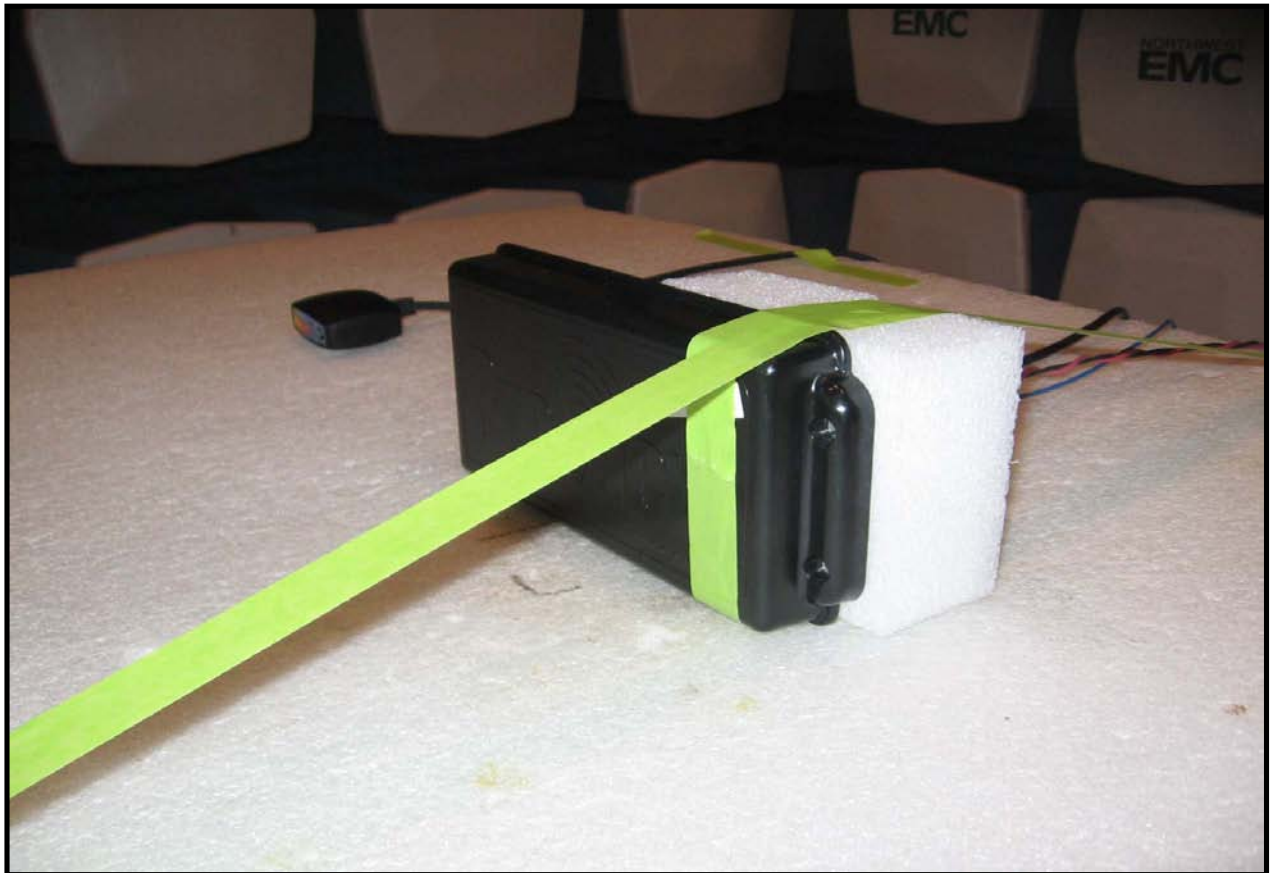
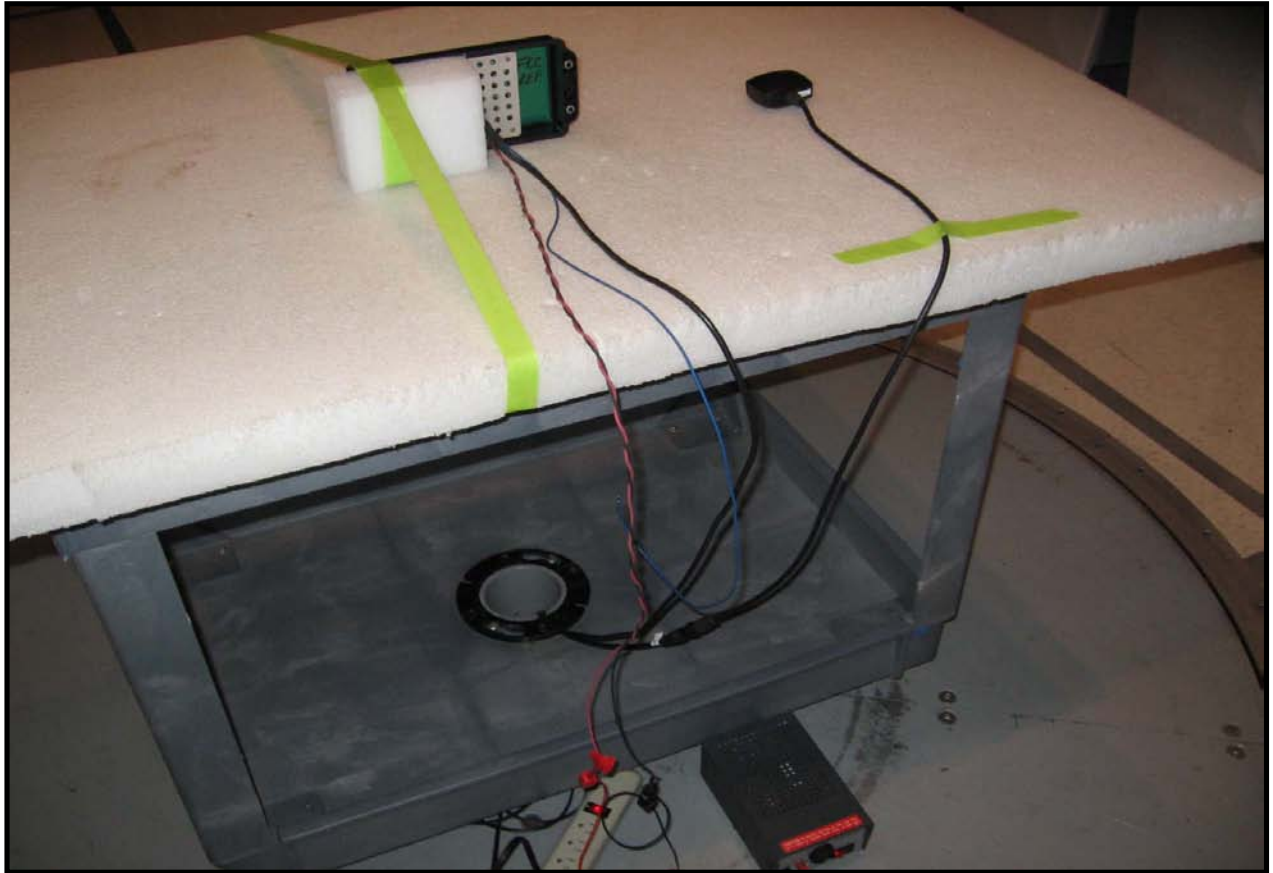
DEVIATIONS FROM TEST STANDARD
No deviations.

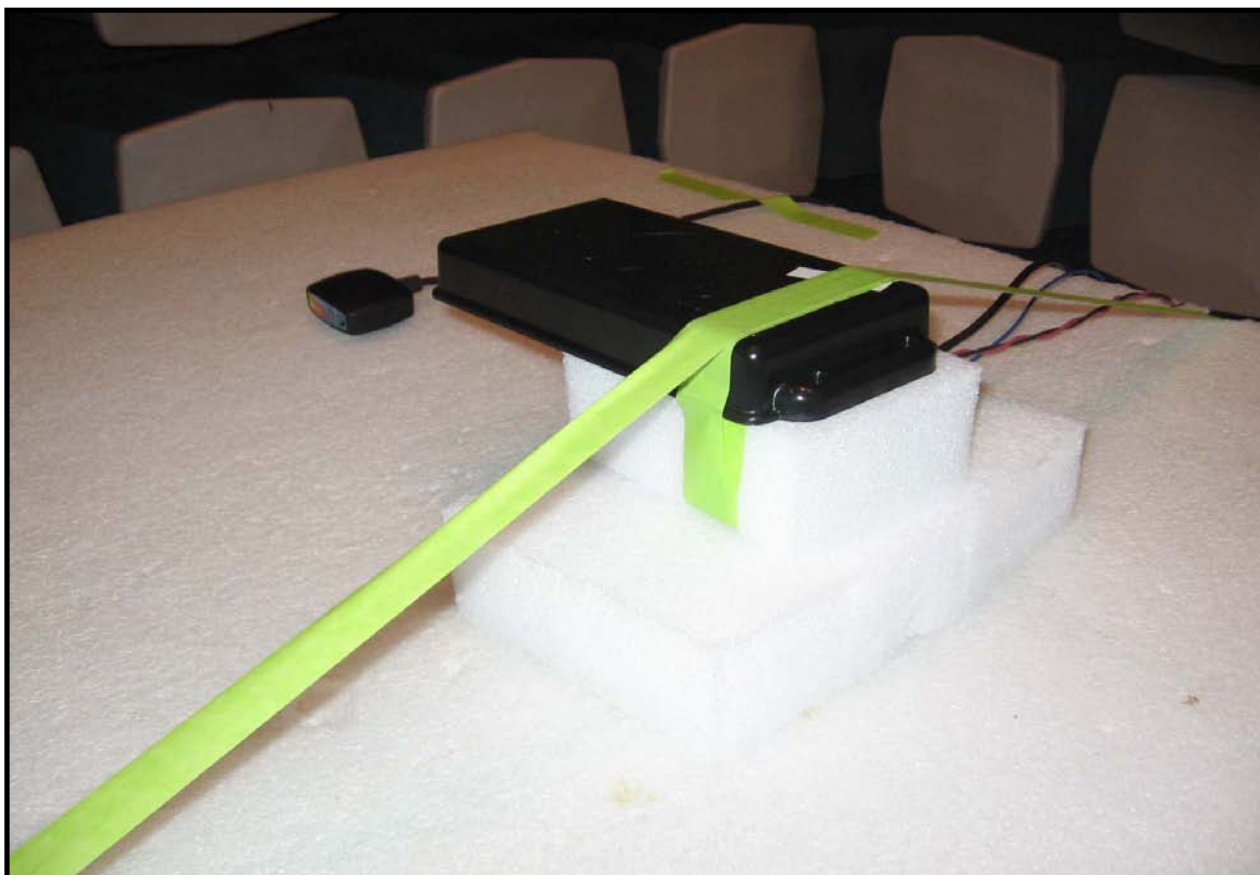
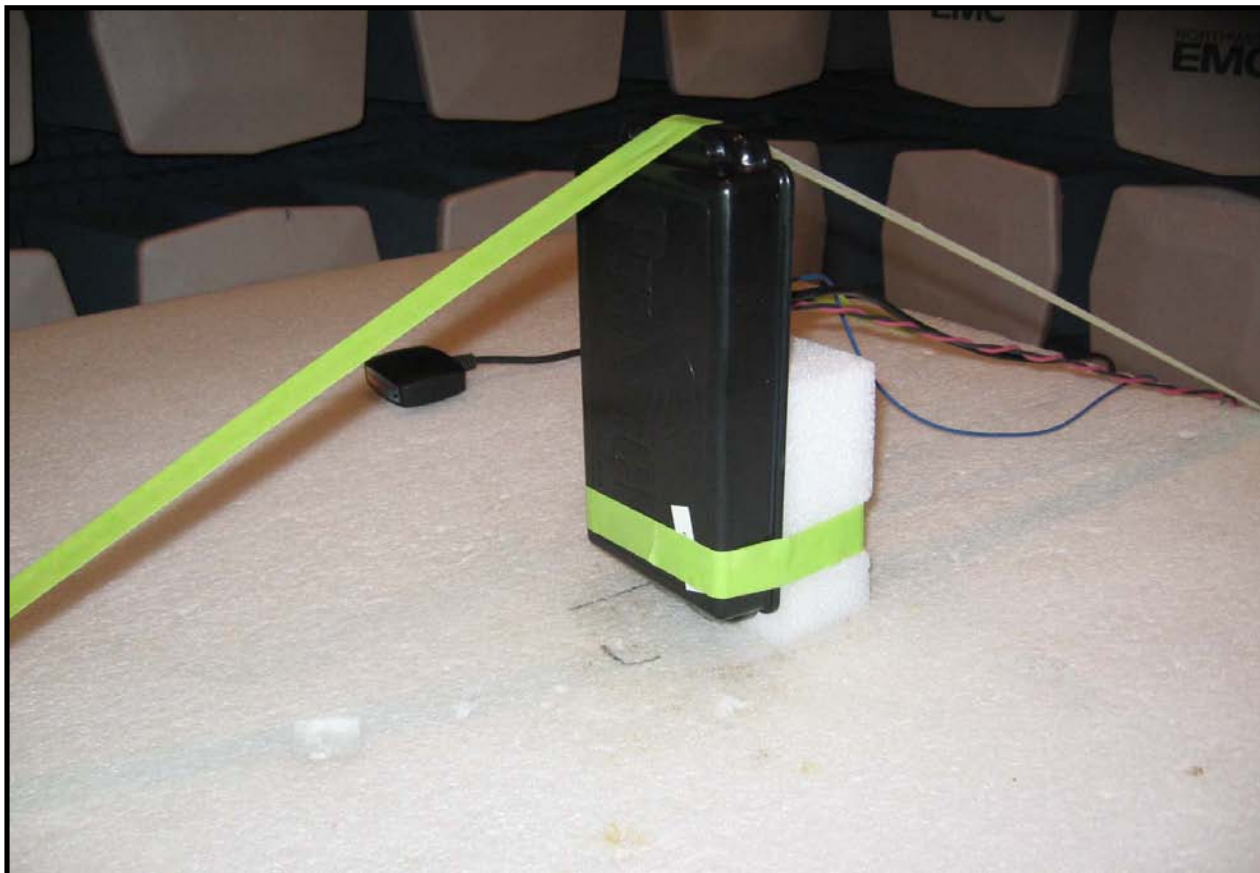
Run #	1	 Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Pulse Desense Factor (dB)	Duty Cycle Correction Factor (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
5808.000	62.7	11.6	15.0	1.0	23.2	0.0	H-Horn	PK	0.0	97.5	114.0	-16.5	EUT on end
5793.170	61.1	11.6	31.0	1.3	23.2	0.0	V-Horn	PK	0.0	95.9	114.0	-18.1	EUT in typical orientation
5795.830	53.6	11.6	290.0	1.9	23.2	0.0	H-Horn	PK	0.0	88.4	114.0	-25.6	EUT facing up
5808.000	62.7	11.6	15.0	1.0	23.2	30.3	H-Horn	AV	0.0	67.2	94.0	-26.8	EUT on end
5818.670	52.2	11.6	343.0	1.3	23.2	0.0	H-Horn	PK	0.0	87.0	114.0	-27.0	EUT in typical orientation
5795.330	50.8	11.6	8.0	1.2	23.2	0.0	V-Horn	PK	0.0	85.6	114.0	-28.4	EUT facing up
5793.170	61.1	11.6	31.0	1.3	23.2	30.3	V-Horn	AV	0.0	65.6	94.0	-28.4	EUT in typical orientation
5795.000	47.1	11.6	177.0	1.2	23.2	0.0	V-Horn	PK	0.0	81.9	114.0	-32.1	EUT on end
5795.830	53.6	11.6	290.0	1.9	23.2	30.3	H-Horn	AV	0.0	58.1	94.0	-35.9	EUT facing up
5818.670	52.2	11.6	343.0	1.3	23.2	30.3	H-Horn	AV	0.0	56.7	94.0	-37.3	EUT in typical orientation
5795.330	50.8	11.6	8.0	1.2	23.2	30.3	V-Horn	AV	0.0	55.3	94.0	-38.7	EUT facing up
5795.000	47.1	11.6	177.0	1.2	23.2	30.3	V-Horn	AV	0.0	51.6	94.0	-42.4	EUT on end







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 with pulsed modulated carrier. Pulse Width = 15.3 nS, Pulse Rep = 2 MHz

POWER SETTINGS INVESTIGATED

13.8 VDC

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAY	12/11/2008	13
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	24
Pre-Amplifier	Miteq	AM-1616-1000	AOL	7/10/2009	13
EV01 Cables		Bilog Cables	EVA	7/10/2009	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	7/10/2009	13
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
EV01 Cables		Double Ridge Horn Cables	EVB	7/10/2009	13
Antenna, Horn	ETS	3160-07	AHU	NCR	0
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	7/10/2009	13
Antenna, Horn	ETS	3160-08	AHV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	7/10/2009	13
EV01 Cables		Standard Gain Horns Cables	EVF	11/13/2008	16
Antenna, Horn	ETS Lindgren	3160-09	AIV	NCR	0
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	5/19/2009	13
Cable	ESM Cable Corp.	KMKM-72	EVY	11/3/2009	13
Antenna, Horn	ETS	3160-10	AIC	NCR	0
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVN	9/30/2009	13
26-40GHz Cable		TTBJ141-KMKM-72	EVX	9/30/2009	13

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

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 antenna to be used with the EUT was tested. The EUT was configured for continuous modulated operation at its single transmit frequency.

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 C63.4:2003). Preamps were used for this test in order to provide sufficient measurement sensitivity.

Harmonic Emissions

To determine the "true peak level" of harmonic emissions, the measurement procedure described by Andy Leimer of the FCC OET Laboratory (FCC Procedure for Pulsed Signals.txt, dated 11/16/99) was used. Per step (C), if the harmonic emissions are viewed in pulse spectrum mode, the level of the harmonic emissions are measured using analyzer settings as listed in the Hewlett Packard Application Note 150-2 (*Spectrum Analysis...Pulsed RF*, Nov. 1971) such that a true pulse spectrum is obtained (RBW greater than PRF). The video bandwidth should be equal to, or greater than the RBW. The pulse repetition frequency (PRF) of the fundamental emission was measured to be 2 MHz; therefore a 3 MHz resolution bandwidth (RBW) and a 8 MHz video bandwidth (VBW) were used to measure the harmonic emissions. A pulse desensitization factor in dB (calculated from Equation 10 in HP Note 150-2) is added to the measured levels to obtain the "true peak levels". The pulse width was measured to be 15.3 nS; therefore a 23.2 dB pulse desensitization factor was used (k = 1.5, B = 3 MHz).

The average levels of the harmonic emissions are the "true peak levels" measured above minus the calculated duty cycle factor in dB. The duty cycle correction factor is calculated from Equation 4 in HP Note 150-2. The pulse width was measured to be 15.3 nS and the PRF = 2 MHz; therefore a 30.3 dB duty cycle correction factor was used.

Spurious Emissions

The peak level of spurious emissions were measured with a 1 MHz resolution bandwidth and a 3 MHz video bandwidth. No pulse desensitization factor was added to these levels.

The average level of spurious emissions were measured with a 1 MHz resolution bandwidth and a 10 Hz video bandwidth. No pulse desensitization factor was added to these levels.

EUT: WZPV4015		Work Order: PRCO0049	
Serial Number: Unit #1	Date: 12/08/09		Temperature: 22
Customer: Preco, Inc.	Humidity: 38%		Barometric Pres.: 29.85
Attendees: None	Project: None		Job Site: EV01
Tested by: Rod Peloquin	Power: 13.8 VDC		

TEST SPECIFICATIONS		Test Method	
FCC 15.249:2009		ANSI C63.4:2003	

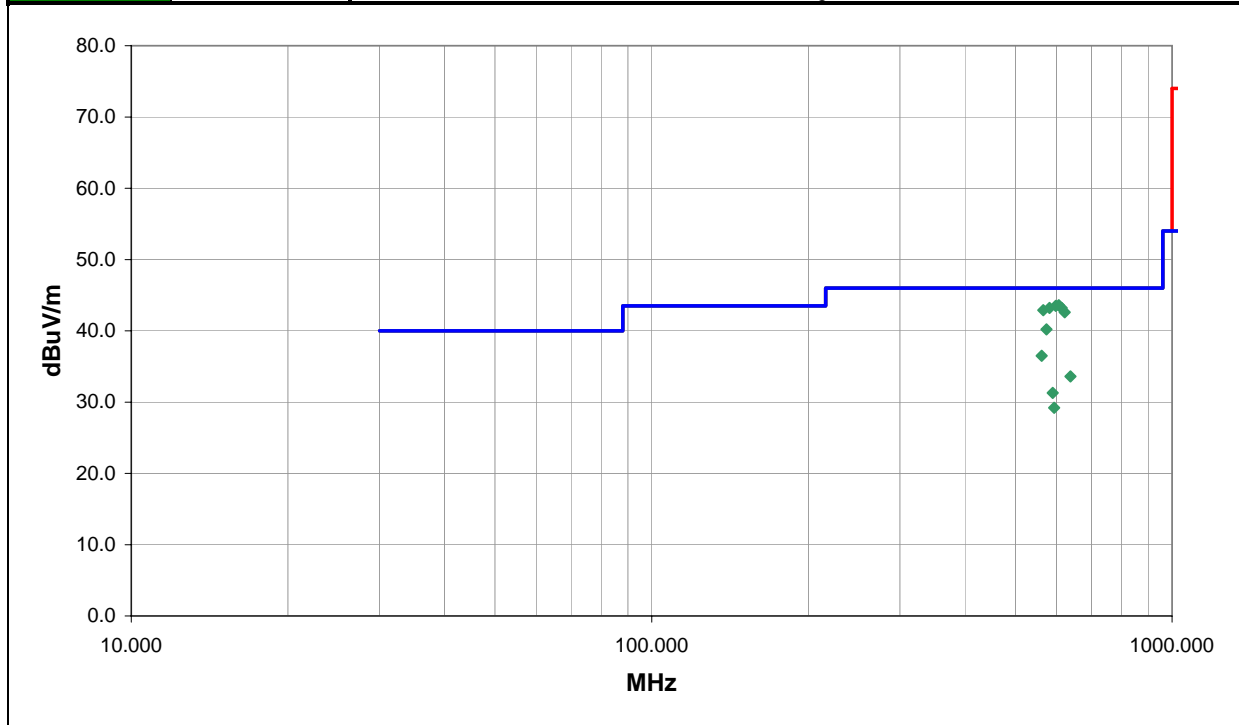
TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS
Modified unit returned from Customer

EUT OPERATING MODES
Transmitting with pulse modulated carrier. Pulse Width = 15.3 nS, Pulse Rep = 2 MHz

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	8	<i>Rod Peloquin</i> Signature
Configuration #	1	
Results	Pass	



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)
605.652	35.5	8.1	185.0	1.5	3.0	0.0	H-Bilog	QP	0.0	43.6	46.0	-2.4
597.629	35.6	7.9	195.0	1.5	3.0	0.0	H-Bilog	QP	0.0	43.5	46.0	-2.5
613.674	34.8	8.4	184.0	1.5	3.0	0.0	H-Bilog	QP	0.0	43.2	46.0	-2.8
581.586	35.6	7.6	185.0	1.5	3.0	0.0	H-Bilog	QP	0.0	43.2	46.0	-2.8
565.542	35.7	7.2	187.0	1.5	3.0	0.0	H-Bilog	QP	0.0	42.9	46.0	-3.1
621.695	33.8	8.8	180.0	1.5	3.0	0.0	H-Bilog	QP	0.0	42.6	46.0	-3.4
573.565	32.8	7.4	232.0	1.7	3.0	0.0	H-Bilog	QP	0.0	40.2	46.0	-5.8
561.532	29.4	7.1	181.0	1.0	3.0	0.0	H-Bilog	QP	0.0	36.5	46.0	-9.5
637.740	24.9	8.7	130.0	1.4	3.0	0.0	H-Bilog	QP	0.0	33.6	46.0	-12.4
589.608	23.5	7.8	177.0	1.0	3.0	0.0	H-Bilog	QP	0.0	31.3	46.0	-14.7
593.620	21.4	7.8	186.0	1.0	3.0	0.0	H-Bilog	QP	0.0	29.2	46.0	-16.8

EUT: WZPV4015	Work Order: PRCO0049
Serial Number: Unit #1	Date: 12/08/09
Customer: Preco, Inc.	Temperature: 22
Attendees: None	Humidity: 38%
Project: None	Barometric Pres.: 29.85
Tested by: Rod Peloquin	Power: 13.8 VDC
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

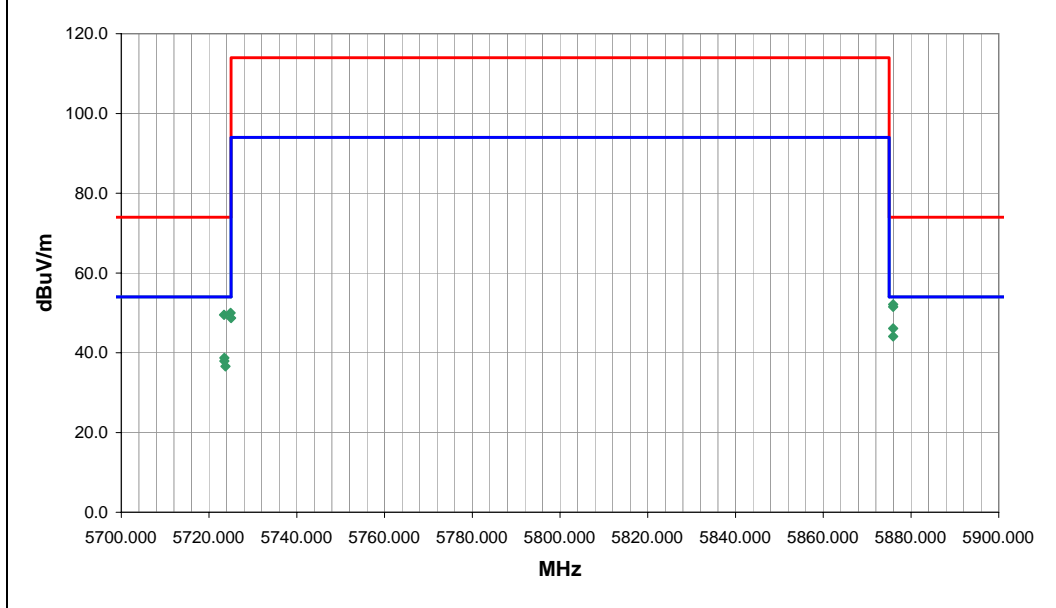
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
Modified unit returned from Customer

EUT OPERATING MODES
Transmitting with pulse modulated carrier. Pulse Width = 15.3 nS, Pulse Rep = 2 MHz

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	7	 Signature
Configuration #	1	
Results	Pass	



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)	Comments
5875.920	34.4	11.7	15.0	1.0	3.0	0.0	H-Horn	AV	0.0	46.1	54.0	-7.9	EUT on end
5875.943	32.4	11.7	353.0	1.4	3.0	0.0	V-Horn	AV	0.0	44.1	54.0	-9.9	EUT in typical orientation
5723.477	27.0	11.7	18.0	1.0	3.0	0.0	H-Horn	AV	0.0	38.7	54.0	-15.3	EUT on end
5723.480	26.2	11.7	33.0	1.1	3.0	0.0	V-Horn	AV	0.0	37.9	54.0	-16.1	EUT in typical orientation
5723.727	24.9	11.7	42.0	1.1	3.0	0.0	V-Horn	AV	0.0	36.6	54.0	-17.4	EUT in typical orientation
5875.933	40.4	11.7	15.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.1	74.0	-21.9	EUT on end
5875.930	39.8	11.7	353.0	1.4	3.0	0.0	V-Horn	PK	0.0	51.5	74.0	-22.5	EUT in typical orientation
5724.903	38.3	11.7	33.0	1.1	3.0	0.0	V-Horn	PK	0.0	50.0	74.0	-24.0	EUT in typical orientation
5723.420	37.8	11.7	18.0	1.0	3.0	0.0	H-Horn	PK	0.0	49.5	74.0	-24.5	EUT on end
5725.000	37.0	11.7	42.0	1.1	3.0	0.0	V-Horn	PK	0.0	48.7	74.0	-25.3	EUT in typical orientation

EUT: WZPV4015	Work Order: PRC00049
Serial Number: Unit #1	Date: 12/08/09
Customer: Preco, Inc.	Temperature: 22
Attendees: None	Humidity: 38%
Project: None	Barometric Pres.: 29.85
Tested by: Rod Peloquin	Power: 13.8 VDC
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

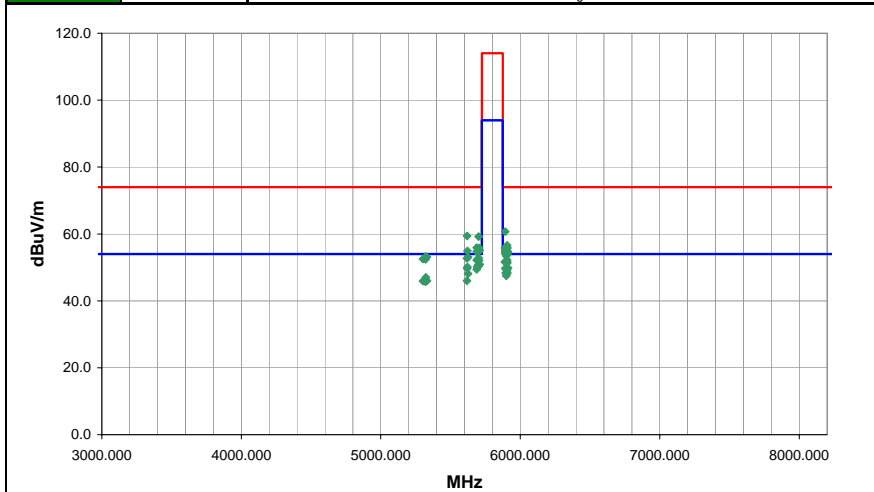
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
Modified unit returned from Customer

EUT OPERATING MODES
Transmitting with pulse modulated carrier. Pulse Width = 15.3 nS. Pulse Rep = 2 MHz

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	7	Signature <i>Rod Peloquin</i>
Configuration #	1	
Results	Pass	



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)	Comments
5701.434	41.0	11.8	28.0	1.1	3.0	0.0	H-Horn	AV	0.0	52.8	54.0	-1.2	EUT on end
5687.395	40.4	11.8	29.0	1.1	3.0	0.0	H-Horn	AV	0.0	52.2	54.0	-1.8	EUT on end
5905.942	40.3	11.9	26.0	1.0	3.0	0.0	H-Horn	AV	0.0	52.2	54.0	-1.8	EUT on end
5705.464	40.3	11.8	27.0	1.1	3.0	0.0	H-Horn	AV	0.0	52.1	54.0	-1.9	EUT on end
5901.963	40.0	11.9	25.0	1.0	3.0	0.0	H-Horn	AV	0.0	51.9	54.0	-2.1	EUT on end
5891.955	39.9	11.8	25.0	1.0	3.0	0.0	H-Horn	AV	0.0	51.7	54.0	-2.3	EUT on end
5889.927	39.8	11.8	25.0	1.0	3.0	0.0	H-Horn	AV	0.0	51.6	54.0	-2.4	EUT on end
5907.988	39.5	11.9	20.0	1.0	3.0	0.0	H-Horn	AV	0.0	51.4	54.0	-2.6	EUT on end
5709.484	39.2	11.7	26.0	1.1	3.0	0.0	H-Horn	AV	0.0	50.9	54.0	-3.1	EUT on end
5699.401	39.0	11.8	28.0	1.0	3.0	0.0	H-Horn	AV	0.0	50.8	54.0	-3.2	EUT on end
5701.506	38.6	11.8	29.0	1.1	3.0	0.0	V-Horn	AV	0.0	50.4	54.0	-3.6	EUT in typical orientation
5691.475	38.4	11.8	28.0	1.1	3.0	0.0	V-Horn	AV	0.0	50.2	54.0	-3.8	EUT in typical orientation
5621.225	38.2	11.9	29.0	1.1	3.0	0.0	H-Horn	AV	0.0	50.1	54.0	-3.9	EUT on end
5912.029	37.9	11.9	23.0	1.1	3.0	0.0	H-Horn	AV	0.0	49.8	54.0	-4.2	EUT on end
5892.013	37.9	11.8	40.0	1.3	3.0	0.0	V-Horn	AV	0.0	49.7	54.0	-4.3	EUT in typical orientation
5619.224	37.8	11.9	32.0	1.1	3.0	0.0	H-Horn	AV	0.0	49.7	54.0	-4.3	EUT on end
5687.481	37.6	11.8	38.0	1.2	3.0	0.0	V-Horn	AV	0.0	49.4	54.0	-4.6	EUT in typical orientation
5904.038	37.1	11.9	357.0	1.0	3.0	0.0	V-Horn	AV	0.0	49.0	54.0	-5.0	EUT in typical orientation
5895.953	36.4	11.9	360.0	1.0	3.0	0.0	H-Horn	AV	0.0	48.3	54.0	-5.7	EUT on end
5908.059	36.4	11.9	358.0	1.0	3.0	0.0	V-Horn	AV	0.0	48.3	54.0	-5.7	EUT in typical orientation
5625.298	36.3	11.8	35.0	1.0	3.0	0.0	V-Horn	AV	0.0	48.1	54.0	-5.9	EUT in typical orientation
5900.005	35.6	11.9	346.0	1.0	3.0	0.0	V-Horn	AV	0.0	47.5	54.0	-6.5	EUT in typical orientation
5322.433	35.5	11.5	53.0	1.2	3.0	0.0	H-Horn	AV	0.0	47.0	54.0	-7.0	EUT on end
5330.453	34.4	11.6	39.0	1.2	3.0	0.0	H-Horn	AV	0.0	46.0	54.0	-8.0	EUT on end
5617.258	34.1	11.9	38.0	1.2	3.0	0.0	V-Horn	AV	0.0	46.0	54.0	-8.0	EUT in typical orientation
5302.398	34.5	11.4	15.0	1.1	3.0	0.0	V-Horn	AV	0.0	45.9	54.0	-8.1	EUT in typical orientation
5320.458	34.3	11.4	42.0	1.3	3.0	0.0	V-Horn	AV	0.0	45.7	54.0	-8.3	EUT in typical orientation
5892.018	48.9	11.8	25.0	1.0	3.0	0.0	H-Horn	PK	0.0	60.7	74.0	-13.3	EUT on end
5619.101	47.5	11.9	32.0	1.1	3.0	0.0	H-Horn	PK	0.0	59.4	74.0	-14.6	EUT on end
5701.038	47.4	11.8	28.0	1.1	3.0	0.0	H-Horn	PK	0.0	59.2	74.0	-14.8	EUT on end
5905.959	44.7	11.9	26.0	1.0	3.0	0.0	H-Horn	PK	0.0	56.6	74.0	-17.4	EUT on end
5687.545	44.1	11.8	29.0	1.1	3.0	0.0	H-Horn	PK	0.0	55.9	74.0	-18.1	EUT on end
5889.994	44.0	11.8	25.0	1.0	3.0	0.0	H-Horn	PK	0.0	55.8	74.0	-18.2	EUT on end
5901.960	43.9	11.9	25.0	1.0	3.0	0.0	H-Horn	PK	0.0	55.8	74.0	-18.2	EUT on end
5908.148	43.9	11.9	20.0	1.0	3.0	0.0	H-Horn	PK	0.0	55.8	74.0	-18.2	EUT on end
5705.544	44.0	11.8	27.0	1.1	3.0	0.0	H-Horn	PK	0.0	55.8	74.0	-18.2	EUT on end
5709.367	43.4	11.7	26.0	1.1	3.0	0.0	H-Horn	PK	0.0	55.1	74.0	-18.9	EUT on end
5699.337	43.2	11.8	28.0	1.0	3.0	0.0	H-Horn	PK	0.0	55.0	74.0	-19.0	EUT on end
5621.182	43.0	11.9	29.0	1.1	3.0	0.0	H-Horn	PK	0.0	54.9	74.0	-19.1	EUT on end
5891.910	43.0	11.8	40.0	1.3	3.0	0.0	V-Horn	PK	0.0	54.8	74.0	-19.2	EUT in typical orientation
5687.481	42.9	11.8	38.0	1.2	3.0	0.0	V-Horn	PK	0.0	54.7	74.0	-19.3	EUT in typical orientation
5691.468	42.9	11.8	28.0	1.1	3.0	0.0	V-Horn	PK	0.0	54.7	74.0	-19.3	EUT in typical orientation
5701.516	42.9	11.8	29.0	1.1	3.0	0.0	V-Horn	PK	0.0	54.7	74.0	-19.3	EUT in typical orientation
5911.876	42.8	11.9	23.0	1.1	3.0	0.0	H-Horn	PK	0.0	54.7	74.0	-19.3	EUT on end
5904.008	42.6	11.9	357.0	1.0	3.0	0.0	V-Horn	PK	0.0	54.5	74.0	-19.5	EUT in typical orientation
5895.863	42.2	11.9	360.0	1.0	3.0	0.0	H-Horn	PK	0.0	54.1	74.0	-19.9	EUT on end
5908.042	42.0	11.9	358.0	1.0	3.0	0.0	V-Horn	PK	0.0	53.9	74.0	-20.1	EUT in typical orientation
5899.998	41.5	11.9	346.0	1.0	3.0	0.0	V-Horn	PK	0.0	53.4	74.0	-20.6	EUT in typical orientation
5322.560	41.8	11.5	53.0	1.2	3.0	0.0	H-Horn	PK	0.0	53.3	74.0	-20.7	EUT on end
5625.298	41.3	11.8	35.0	1.0	3.0	0.0	V-Horn	PK	0.0	53.1	74.0	-20.9	EUT in typical orientation
5330.300	41.5	11.6	39.0	1.2	3.0	0.0	H-Horn	PK	0.0	53.1	74.0	-20.9	EUT on end
5617.244	40.8	11.9	38.0	1.2	3.0	0.0	V-Horn	PK	0.0	52.7	74.0	-21.3	EUT in typical orientation
5302.185	41.1	11.4	15.0	1.1	3.0	0.0	V-Horn	PK	0.0	52.5	74.0	-21.5	EUT in typical orientation
5320.295	41.0	11.4	42.0	1.3	3.0	0.0	V-Horn	PK	0.0	52.4	74.0	-21.6	EUT in typical orientation

EUT: WZPV4015	Work Order: PRC00049
Serial Number: Unit #1	Date: 12/01/09
Customer: Preco, Inc.	Temperature: 22
Attendees: None	Humidity: 38%
Project: None	Barometric Pres.: 29.85
Tested by: Rod Peloquin	Power: 13.8 VDC
	Job Site: EV01

TEST SPECIFICATIONS	
FCC 15.249:2009	Test Method ANSI C63.4:2003

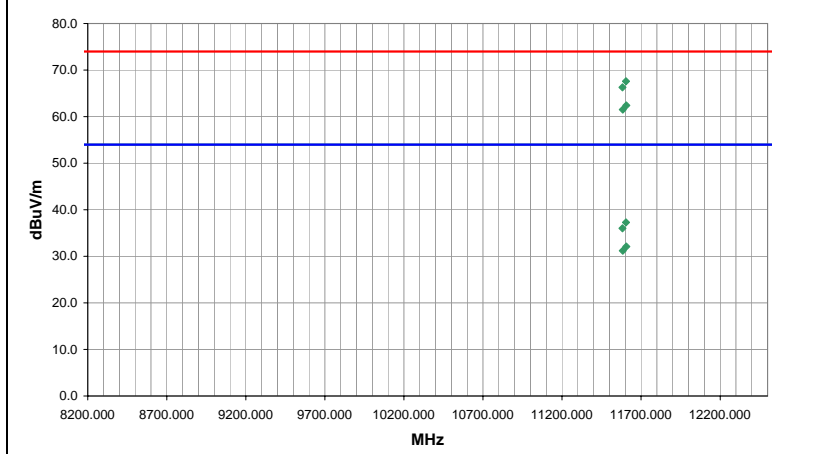
TEST PARAMETERS	
Antenna Height(s) (m)	1 - 4
Test Distance (m)	3

COMMENTS
 Modified unit returned from Customer

EUT OPERATING MODES
 Transmitting with pulse modulated carrier. Pulse Width = 15.3 nS, Pulse Rep = 2 MHz

DEVIATIONS FROM TEST STANDARD
 No deviations.

Run #	6	 Signature
Configuration #	1	
Results	Pass	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Pulse Desense Factor (dB)	Duty Cycle Correction Factor (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
11604.670	43.5	-6.2	41.0	1.0	30.3	0.0	H-Horn	PK	0.0	67.6	74.0	-6.4	Line Spectrum Mode, 100 kHz RBW, EUT on end
11582.500	42.2	-6.2	222.0	1.0	30.3	0.0	H-Horn	PK	0.0	66.3	74.0	-7.7	Line Spectrum Mode, 100 kHz RBW, EUT typical orientation
11606.670	38.3	-6.2	351.0	1.0	30.3	0.0	V-Horn	PK	0.0	62.4	74.0	-11.6	Line Spectrum Mode, 100 kHz RBW, EUT on end
11584.500	37.4	-6.2	10.0	1.0	30.3	0.0	V-Horn	PK	0.0	61.5	74.0	-12.5	Line Spectrum Mode, 100 kHz RBW, EUT typical orientation
11604.670	43.5	-6.2	41.0	1.0	0.0	0.0	H-Horn	AV	0.0	37.3	54.0	-16.7	Line Spectrum Mode, 100 kHz RBW, EUT on end
11582.500	42.2	-6.2	222.0	1.0	0.0	0.0	H-Horn	AV	0.0	36.0	54.0	-18.0	Line Spectrum Mode, 100 kHz RBW, EUT typical orientation
11606.670	38.3	-6.2	351.0	1.0	0.0	0.0	V-Horn	AV	0.0	32.1	54.0	-21.9	Line Spectrum Mode, 100 kHz RBW, EUT on end
11584.500	37.4	-6.2	10.0	1.0	0.0	0.0	V-Horn	AV	0.0	31.2	54.0	-22.8	Line Spectrum Mode, 100 kHz RBW, EUT typical orientation

EUT: IW2PV4015	Work Order: PRC00049
Serial Number: Unit #1	Date: 12/09/09
Customer: Preco, Inc.	Temperature: 22
Attendees: None	Humidity: 38%
Project: None	Barometric Pres.: 29.85
Tested by: Rod Peloquin	Power: 13.8 VDC
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.249:2009	ANSI C63.4:2003

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

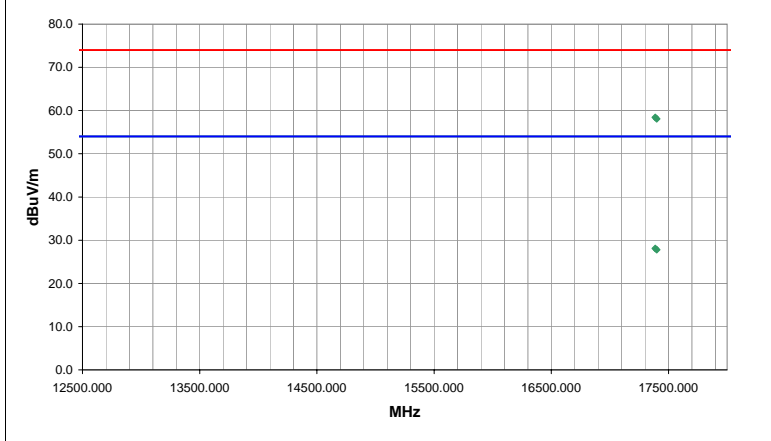
COMMENTS
None

EUT OPERATING MODES
Transmitting with pulse modulated carrier. Pulse Width = 15.3 nS, Pulse Rep = 2 MHz

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	11
Configuration #	1
Results	Pass

Signature *Rod Peloquin*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Pulse Desense Factor (dB)	Duty Cycle Correction Factor (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
17387.330	19.2	8.9	148.0	1.1	30.3	0.0	V-Horn	PK	0.0	58.4	74.0	-15.6	Line spectrum mode, 100 kHz RBW, EUT typical orientation
17399.320	18.9	8.9	161.0	1.0	30.3	0.0	H-Horn	PK	0.0	58.1	74.0	-15.9	Line spectrum mode, 100 kHz RBW, EUT on end
17387.330	19.2	8.9	148.0	1.1	0.0	0.0	V-Horn	AV	0.0	28.1	54.0	-25.9	Line spectrum mode, 100 kHz RBW, EUT typical orientation
17399.320	18.9	8.9	161.0	1.0	0.0	0.0	H-Horn	AV	0.0	27.8	54.0	-26.2	Line spectrum mode, 100 kHz RBW, EUT on end



