

Precor, Inc.

RFID Radio Module

Report No. PRCR0111

Report Prepared By



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

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EMC Test Report

Certificate of Test
Last Date of Test: July 29, 2009
Precor, Inc.
Model: RFID Radio Module

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Field Strength of Fundamental	FCC 15.225:2009	ANSI C63.4:2003	Pass
Field Strength of Spurious Emissions	FCC 15.225:2009	ANSI C63.4:2003	Pass
AC Powerline Conducted Emissions	FCC 15.207:2009	ANSI C63.4:2003	Pass
Frequency Stability	FCC 15.225:2009	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: 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 Fecteau, 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.

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

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*)



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, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294.*)



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



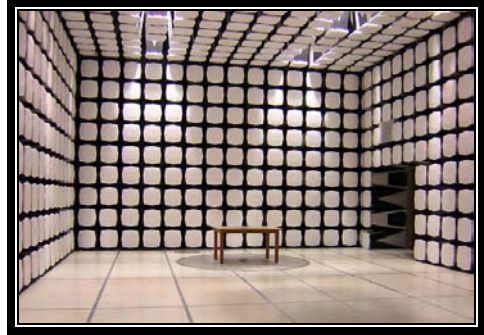
KCC: Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157*)



SCOPE

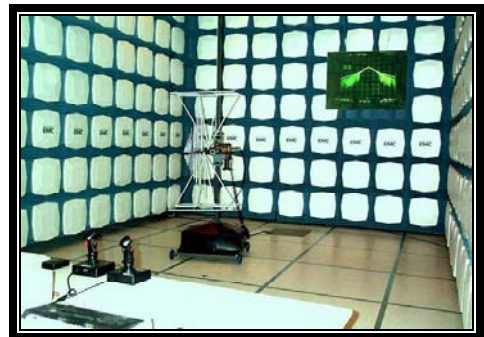
For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



**California – Orange County Facility
Labs OC01 – OC13**

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



**Oregon – Evergreen Facility
Labs EV01 – EV11**

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



**Washington – Sultan Facility
Labs SU01 – SU07**

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

Party Requesting the Test

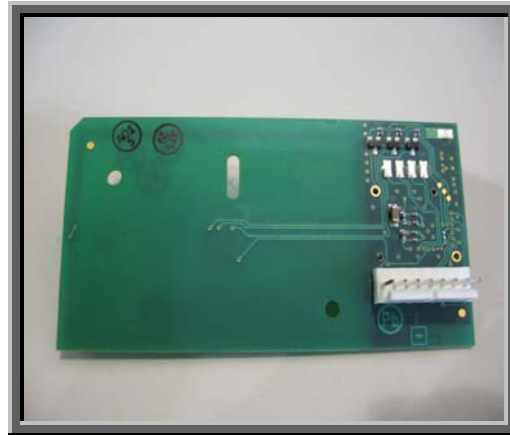
Company Name:	Precor, Inc.
Address:	PO Box 7202
City, State, Zip:	Woodinville, WA 98072-4002
Test Requested By:	James Minahan
Model:	RFID Radio Module
First Date of Test:	July 27, 2009
Last Date of Test:	July 29, 2009
Receipt Date of Samples:	July 27, 2009
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

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

RFID Radio Module

Testing Objective:

RFID radio seeking full modular approval under FCC 15.225

EUT Photo

CONFIGURATION 1 PRCR0111**Software/Firmware Running during test**

Description	Version
Hyper Terminal Script	Unknown

EUT

Description	Manufacturer	Model/Part Number	Serial Number
Atlas RFID Reader - RFID Radio Module	Precor, Inc.	300181-303	MPT-340704-0926-008

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Host	Precor, Inc.	Unknown	None
Power Adapter	XP Power	VEH60US12	0848-00045

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Host	No	0.1m	No	Atlas RFID Reader - RFID Radio Module	Host
Power	PA	1.2m	PA	Host	Power Adapter
AC Power	No	1.8m	No	Power Adapter	AC Mains

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

CONFIGURATION 2 PRCR0111**Software/Firmware Running during test**

Description	Version
Hyper Terminal Script	Unknown

EUT

Description	Manufacturer	Model/Part Number	Serial Number
Atlas RFID Reader - RFID Radio Module	Precor, Inc.	300181-303	MPT-340704-0926-008

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Host	Precor, Inc.	Unknown	None
DC Power supply	Topoward Electronic	TPS 2000	None

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Host	No	0.1m	No	Atlas RFID Reader - RFID Radio Module	Host
Power	PA	1.2m	PA	Host	Power Adapter
AC Power	No	1.8m	No	Power Adapter	AC Mains

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

Equipment modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	7/27/2009	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	7/28/2009	Field Strength of Out of Band 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.
3	7/28/2009	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/29/2009	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

MODES OF OPERATION

Transmitting in a default polling mode

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	10 kHz	Stop Frequency	30 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
Antenna, Loop	EMCO	6502	AOA	7/1/2009	24
EV01 Cables		Bilog Cables	EVA	7/10/2009	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

The antennas to be used with the EUT were tested. The EUT was transmitting and 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).

FIELD STRENGTH OF FUNDAMENTAL

EMC

EUT: RFID Radio Module	Work Order: PRCR0111
Serial Number: MPT-340704-0926-008	Date: 07/27/09
Customer: Precor, Inc.	Temperature: 24
Attendees: James Minihan, Nathan	Humidity: 42%
Project: None	Barometric Pres.: 30.05 in
Tested by: Rod Peloquin	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS	
FCC 15.225:2009	Test Method: ANSI C63.4:2003

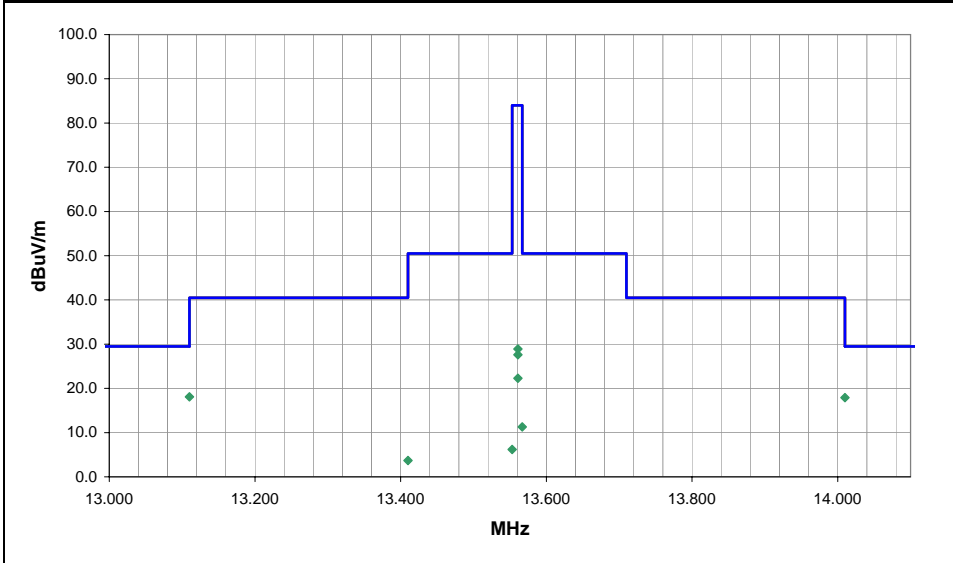
TEST PARAMETERS			
Antenna Height(s) (m)	2 - 4	Test Distance (m)	3

COMMENTS
Module extended from host:

EUT OPERATING MODES
Transmitting in a default polling mode

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	1	 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
13.110	6.6	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	0.9	18.1	29.5	-11.4	Par to EUT, EUT on side
14.010	6.4	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	0.9	17.9	29.5	-11.6	Par to EUT, EUT on side
13.410	12.5	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	21.2	3.7	40.5	-36.8	Par to EUT, EUT on side
13.567	44.4	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	45.5	11.3	50.5	-39.2	Par to EUT, EUT on side
13.553	38.9	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	45.1	6.2	50.5	-44.3	Par to EUT, EUT on side
13.710	14.3	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	31.1	-4.4	40.5	-44.9	Par to EUT, EUT on side
13.561	55.7	12.4	253.0	2.1	3.0	0.0	oop/Active I	QP	39.2	28.9	84.0	-55.1	Perp to EUT / Par to Gnd, EUT on side
13.561	55.8	12.4	163.0	2.0	3.0	0.0	oop/Active	QP	40.6	27.6	84.0	-56.4	Perp to EUT / Perp to Gnd, EUT on side
13.561	55.9	12.4	76.0	2.0	3.0	0.0	oop/Active	QP	46.0	22.3	84.0	-61.7	Par to EUT, EUT on side

EUT: RFID Radio Module	Work Order: PRCR0111
Serial Number: MPT-340704-0926-008	Date: 07/27/09
Customer: Precor, Inc.	Temperature: 24
Attendees: James Minihan, Nathan	Humidity: 42%
Project: None	Barometric Pres.: 30.05 in
Tested by: Rod Peloquin	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2009	ANSI C63.4:2003

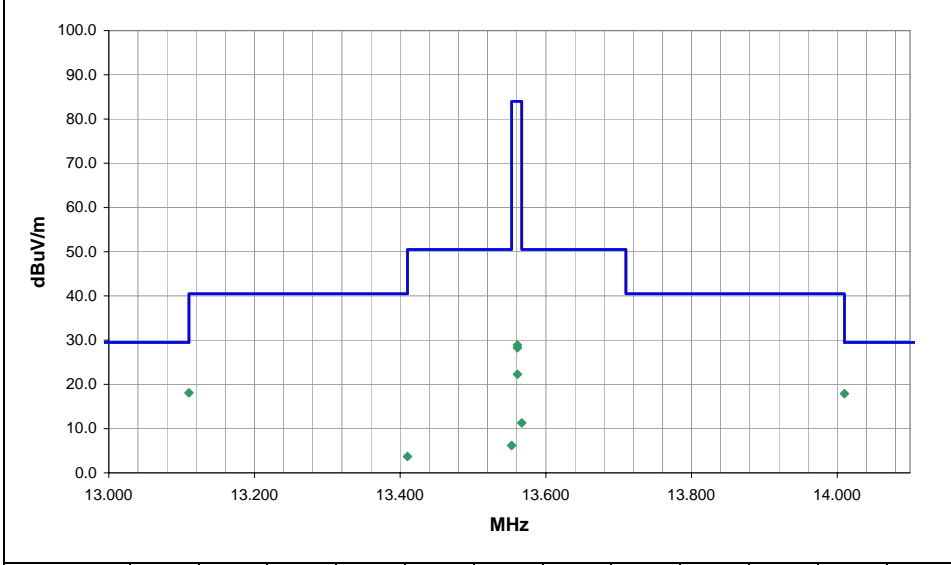
TEST PARAMETERS	
Antenna Height(s) (m)	2 - 4
Test Distance (m)	5

COMMENTS
Module extended from host:

EUT OPERATING MODES
Transmitting in a default polling mode

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	2	 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
13.110	6.4	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	0.7	18.1	29.5	-11.4	Par to EUT, EUT on side
14.010	6.2	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	0.7	17.9	29.5	-11.6	Par to EUT, EUT on side
13.410	7.8	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	16.5	3.7	40.5	-36.8	Par to EUT, EUT on side
13.567	34.3	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	35.4	11.3	50.5	-39.2	Par to EUT, EUT on side
13.553	28.9	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	35.1	6.2	50.5	-44.3	Par to EUT, EUT on side
13.710	7.4	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	31.1	-11.3	40.5	-51.8	Par to EUT, EUT on side
13.561	47.0	12.4	288.0	2.0	5.0	0.0	oop/Active	QP	30.5	28.9	84.0	-55.1	Perp to EUT / Par to Gnd, EUT on side
13.561	47.5	12.4	161.0	2.0	5.0	0.0	oop/Active	QP	31.6	28.3	84.0	-55.7	Perp to EUT / Perp to Gnd, EUT on side
13.561	45.7	12.4	257.0	2.0	5.0	0.0	oop/Active	QP	35.8	22.3	84.0	-61.7	Par to EUT, EUT on side

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon the measured fall-off

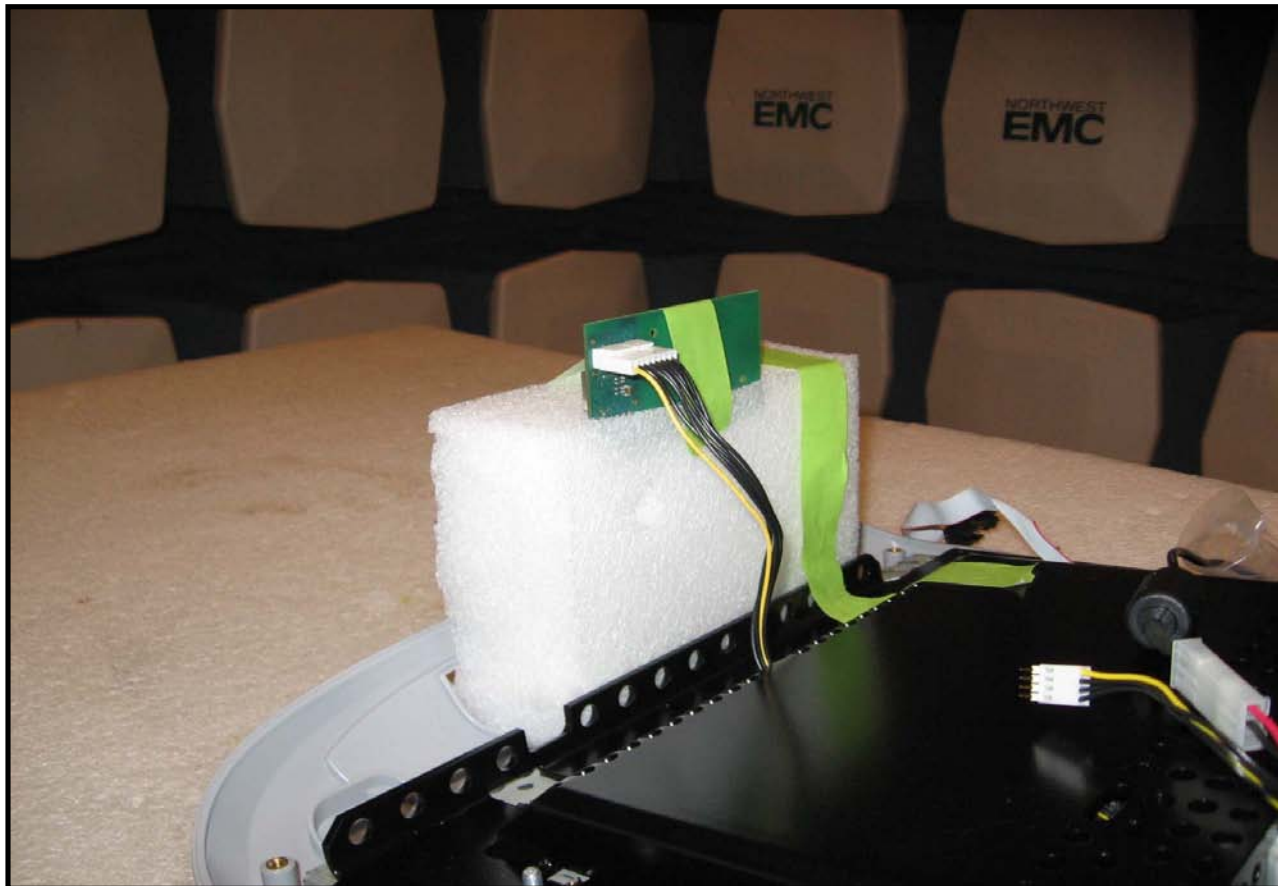
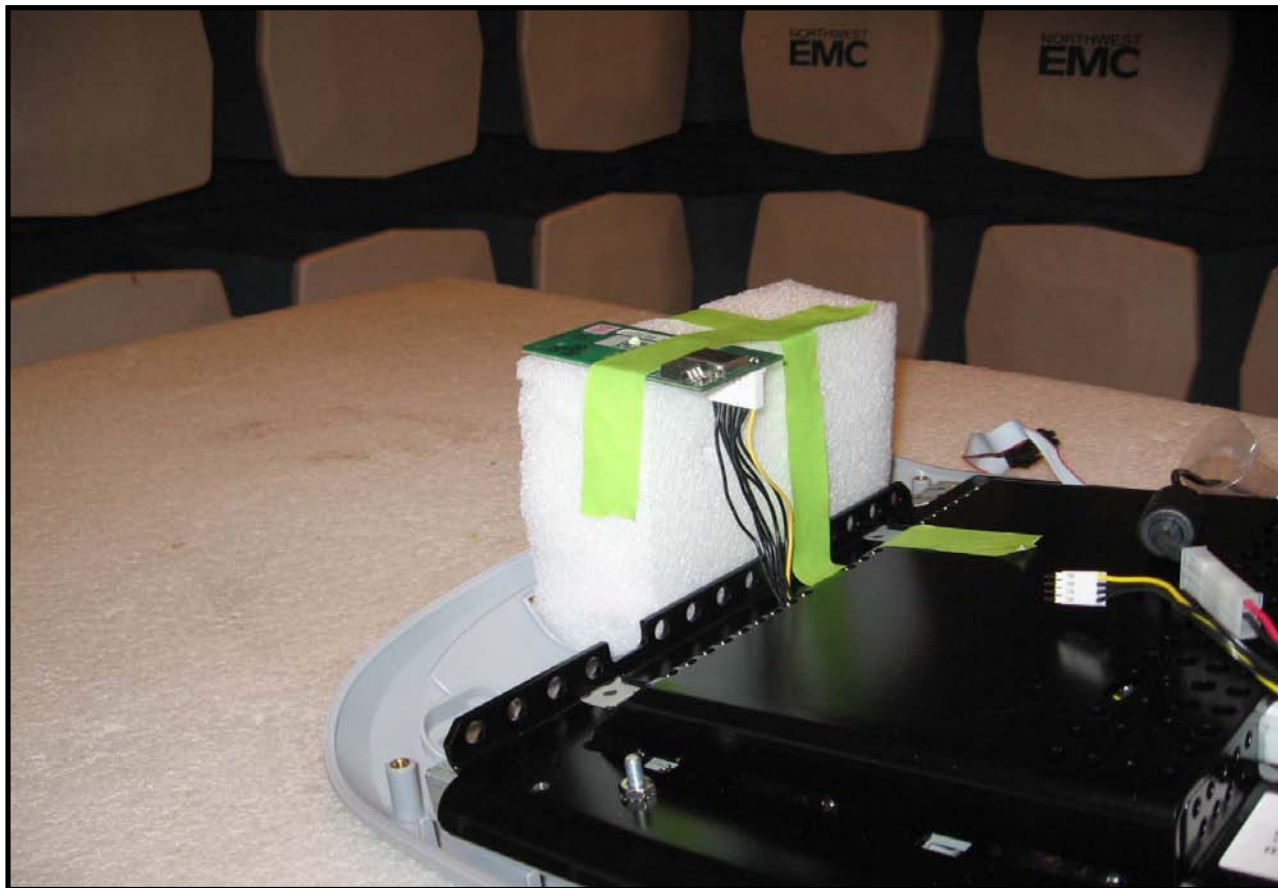
EUT: RFID Radio Module
S/N: MPT-340704-0926-008
Date: 7/27/2009
Job Number: PRCR0110

Frequency (MHz)	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
13.110	Par/EUT	3	19.0	0.2	0.9	30.0	0.9
	Par/EUT	5	18.8				0.7
13.410	Par/EUT	3	24.9	4.7	21.2	30.0	21.2
	Par/EUT	5	20.2				16.5
13.553	Par/EUT	3	51.3	10.0	45.1	30.0	45.1
	Par/EUT	5	41.3				35.1
13.561	Par/EUT	3	68.3	10.2	46.0	30.0	46.0
	Par/EUT	5	58.1				35.8
13.561	Perp/EUT, Par /Gnd	3	68.1	8.7	39.2	30.0	39.2
	Perp/EUT, Par /Gnd	5	59.4				30.5
13.561	Perp/EUT, Perp /Gnd	3	68.2	9.0	40.6	30.0	40.6
	Perp/EUT, Perp /Gnd	5	59.2				31.6
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.561	Par/EUT	3		0.0	0.0	30.0	0.0
	Par/EUT	5					0.0
13.567	Par/EUT	3	56.8	10.1	45.5	30.0	45.5
	Par/EUT	5	46.7				35.4
13.710	Par/EUT	3	26.7	6.9	31.1	30.0	31.1
	Par/EUT	5	19.8				24.2
14.100	Par/EUT	3	18.8	0.2	0.9	30.0	0.9
	Par/EUT	5	18.6				0.7

EUT on side

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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 in a default polling mode

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	10kHz	Stop Frequency	1000MHz
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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
Pre-Amplifier	Miteq	AM-1616-1000	AOL	7/10/2009	13
EV01 Cables		Bilog Cables	EVA	7/10/2009	13
Antenna, Loop	EMCO	6502	AOA	7/1/2009	24
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	24

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 receiving while set at the channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

EUT: RFID Radio Module	Work Order: PRCR0111
Serial Number:	Date: 07/27/09
Customer: Precor, Inc.	Temperature: 24
Attendees: None	Humidity: 42%
Project: None	Barometric Pres.: 30.05 in
Tested by: Rod Peloquin	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2009	ANSI C63.4:2003

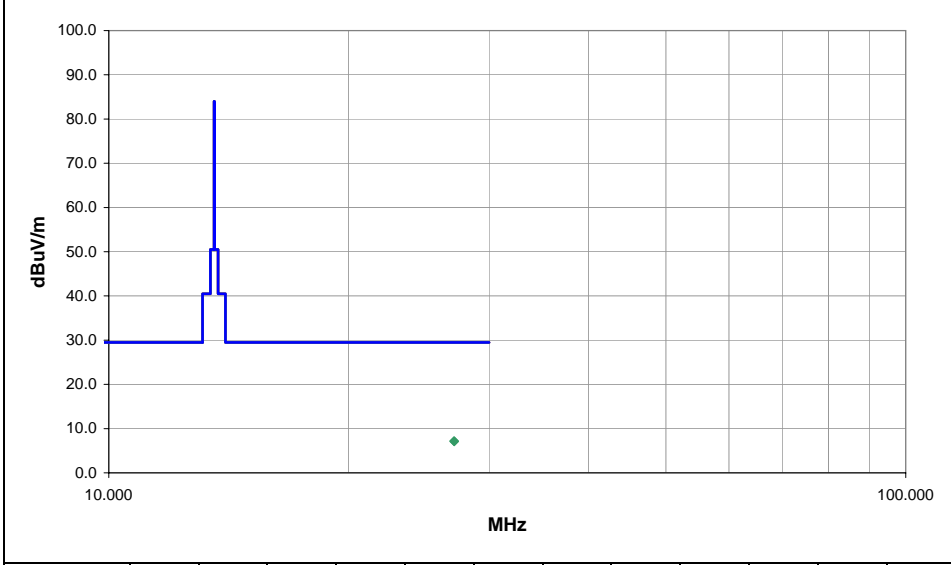
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
Module extended from host:

EUT OPERATING MODES
Transmitting in a default polling mode

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	3	 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
27.121	6.3	10.8	71.0	3.5	3.0	0.0	oop/Active	QP	9.9	7.2	29.5	-22.3	Perp to EUT / Par to Gnd, EUT on side
27.132	6.2	10.8	31.0	3.5	3.0	0.0	oop/Active	QP	9.9	7.1	29.5	-22.4	Perp to EUT / Perp to Gnd, EUT on side
27.107	6.0	10.8	84.0	2.0	3.0	0.0	oop/Active	QP	22.5	-5.7	29.5	-35.2	Par to EUT, EUT on side

EUT: RFID Radio Module	Work Order: PRCR0111
Serial Number:	Date: 07/27/09
Customer: Precor, Inc.	Temperature: 24
Attendees: James Minihan, Nathan Zuber	Humidity: 42%
Project: None	Barometric Pres.: 30.05 in
Tested by: Rod Peloquin	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS	
FCC 15.225:2009	Test Method: ANSI C63.4:2003

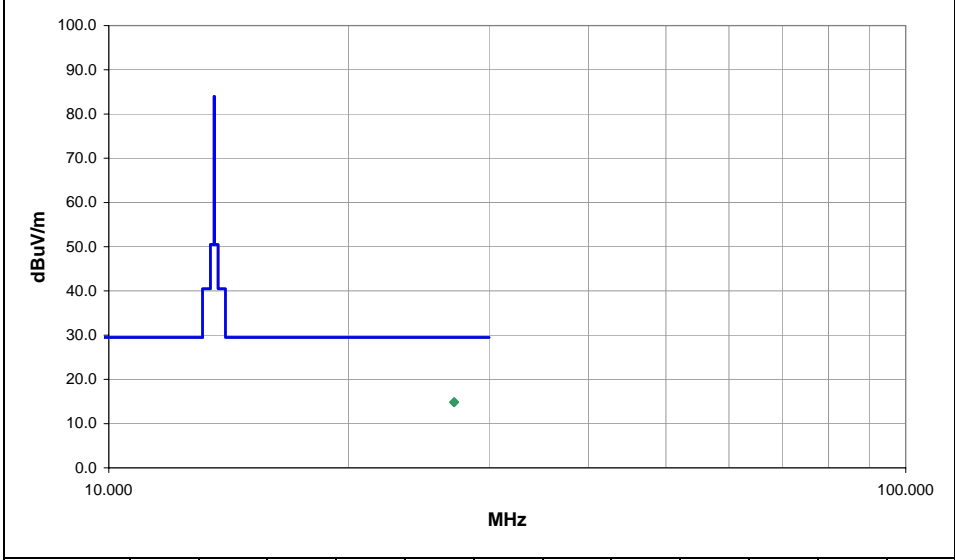
TEST PARAMETERS	
Antenna Height(s) (m): 2 - 4	Test Distance (m): 5

COMMENTS
Module extended from host:

EUT OPERATING MODES
Transmitting in a default polling mode

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	4	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
27.130	4.1	10.8	348.0	2.0	5.0	0.0	oop/Active	QP	7.7	14.9	29.5	-14.6	Perp to EUT / Par to Gnd, EUT on side
27.111	4.0	10.8	311.0	3.1	5.0	0.0	oop/Active	QP	7.7	14.8	29.5	-14.7	Perp to EUT / Perp to Gnd, EUT on side
27.125	4.0	10.8	360.0	3.1	5.0	0.0	oop/Active	QP	17.5	14.8	29.5	-14.7	Par to EUT, EUT on side

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon the measured fall-off

EUT: RFID Radio Module

S/N:

Date: 7/27/2009

Job Number: PRCR0110

Frequency (MHz)	Loop Antenna Polarity	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
27.110	Par/EUT	3	19.8	5.0	22.5	30.0	22.5
	Par/EUT	5	14.8				17.5
27.110	Perp/EUT, Par /Gnd	3	17.1	2.2	9.9	30.0	9.9
	Perp/EUT, Par /Gnd	5	14.9				7.7
27.110	Perp/EUT, Perp /Gnd	3	17.0	2.2	9.9	30.0	9.9
	Perp/EUT, Perp /Gnd	5	14.8				7.7

EUT on side

EUT: RFID Radio Module	Work Order: PRCR0111
Serial Number: MPT-340704-0926-008	Date: 07/28/09
Customer: Precor, Inc.	Temperature: 25
Attendees: None	Humidity: 45%
Project: None	Barometric Pres.: 29.90 in
Tested by: Jennifer Herrett	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.225:2009	ANSI C63.4:2003

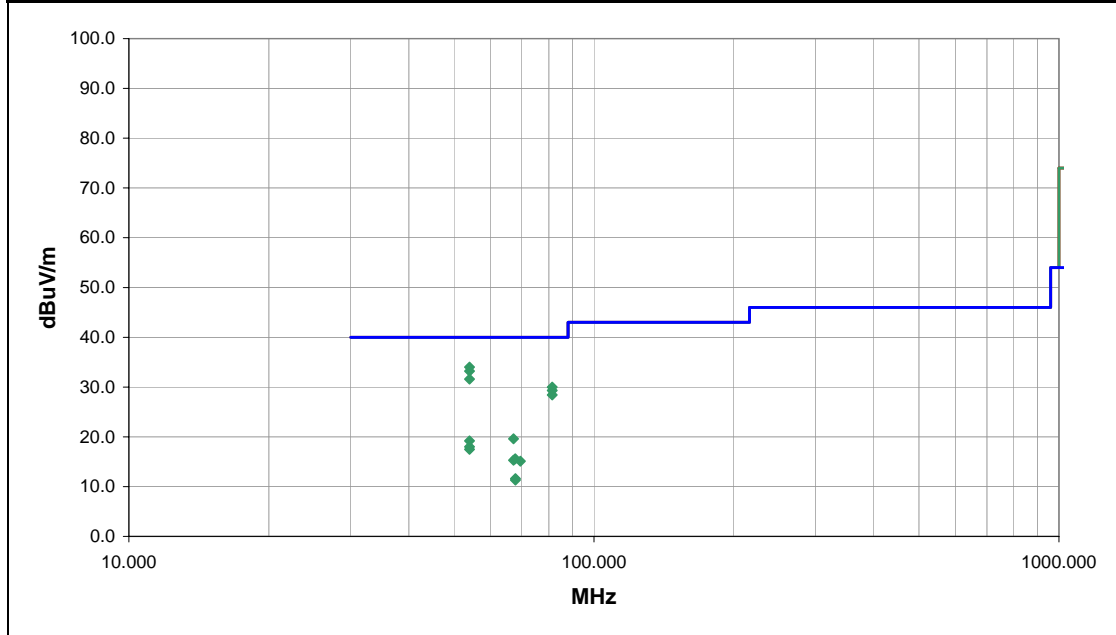
TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 3

COMMENTS
Module extended from host

EUT OPERATING MODES
Transmitting in a default polling mode

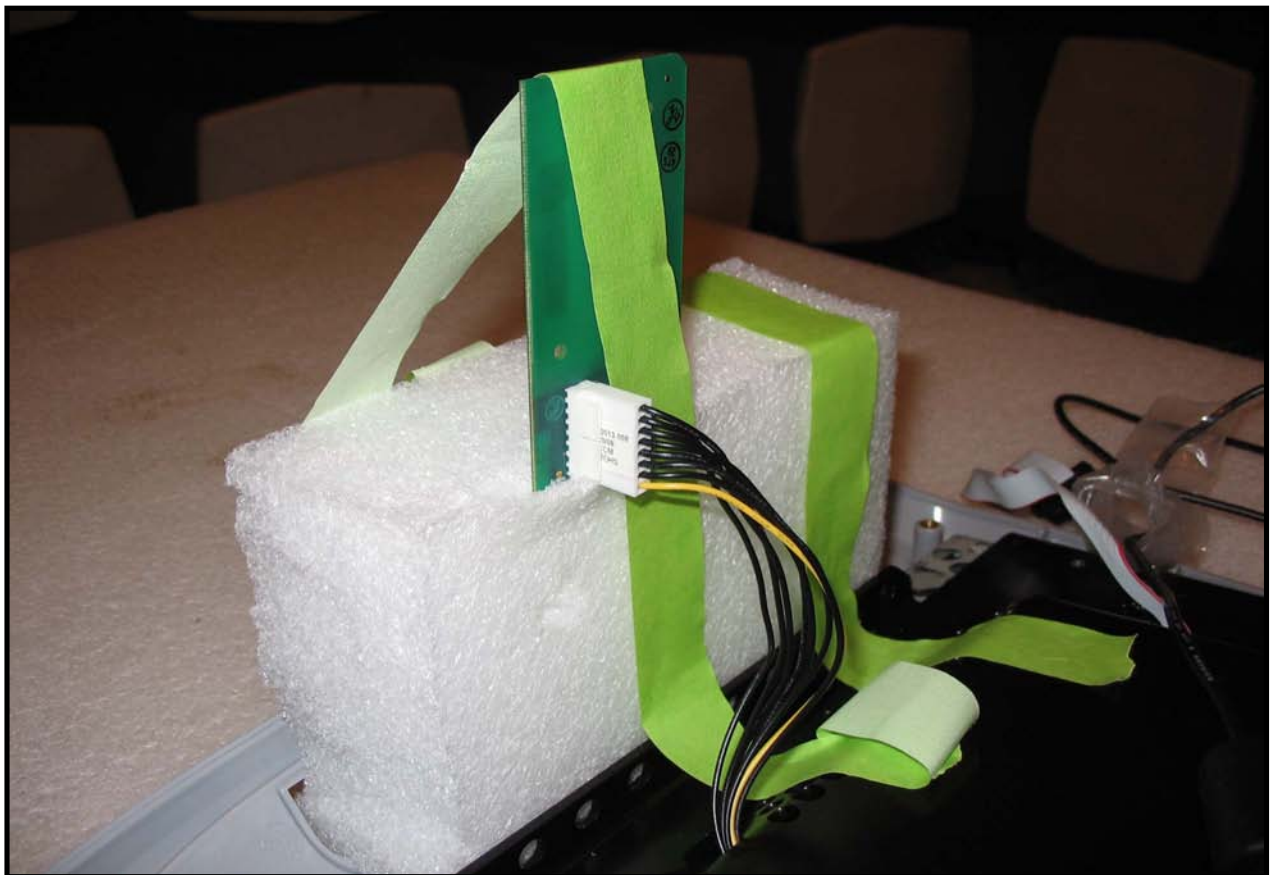
DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	5	<i>Jennifer Herrett</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)	Comments
54.009	38.6	-4.6	360.0	1.0	3.0	0.0	V-Bilog	QP	0.0	34.0	40.0	-6.0	EUT vertical.
54.009	37.8	-4.6	10.0	1.0	3.0	0.0	V-Bilog	QP	0.0	33.2	40.0	-6.8	EUT on side.
54.008	36.2	-4.6	338.0	1.0	3.0	0.0	V-Bilog	QP	0.0	31.6	40.0	-8.4	EUT horizontal.
81.361	36.7	-6.7	170.0	1.0	3.0	0.0	V-Bilog	QP	0.0	30.0	40.0	-10.0	EUT horizontal.
81.371	36.0	-6.7	175.0	2.3	3.0	0.0	H-Bilog	QP	0.0	29.3	40.0	-10.7	EUT horizontal.
81.371	35.1	-6.7	188.0	2.3	3.0	0.0	H-Bilog	QP	0.0	28.4	40.0	-11.6	EUT vertical.
67.138	26.1	-6.5	-1.0	1.7	3.0	0.0	V-Bilog	QP	0.0	19.6	40.0	-20.4	EUT horizontal.





Field Strength of Out of Band 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 in a default polling mode, with antenna connected
 Transmitting in a default polling mode, with antenna dis-connected

POWER SETTINGS INVESTIGATED

12.5 VDC

CONFIGURATIONS INVESTIGATED

PRCR0111 - 2

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
High Pass Filter	TTE	H97-100K-50-720B	HFX	5/27/2009	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	7/21/2009	13 mo
EV07 Cables		Conducted Cables	EVG	6/1/2009	13 mo
LISN	Solar	9252-50-R-24-BNC	LIR	2/4/2009	13 mo

MEASUREMENT BANDWIDTHS

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

Measurements were made using the 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. 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

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. Per FCC KDB Publication #174176, for devices transmitting below 30 MHz that have permanent non-detachable antennas, the FCC will accept measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

EMC

AC POWERLINE CONDUCTED EMISSIONS

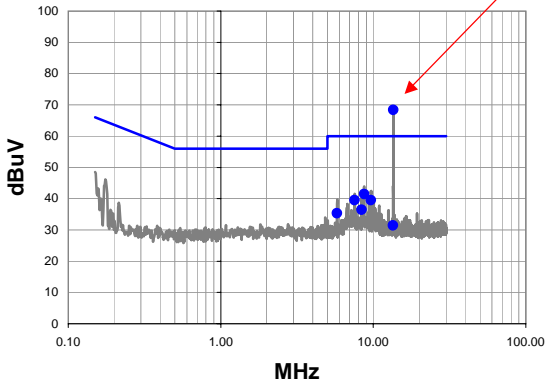
Work Order:	PRCR0111	Date:	07/29/09	
Project:	None	Temperature:	24.3	
Job Site:	EV07	Humidity:	44.4	Tested by: Kyle Holgate
Serial Number:	MPT-340704-0926-008	Barometric Pres.:	1007	
EUT:	RFID Radio Module			
Configuration:	2 - CE			
Customer:	Precor, Inc.			
Attendees:	None			
EUT Power:	12.5 VDC			
Operating Mode:	Transmitting in a default polling mode			
Deviations:	No deviations.			
Comments:	Radio module connected			

Test Specifications FCC 15.207:2009	Test Method ANSI C63.4:2003
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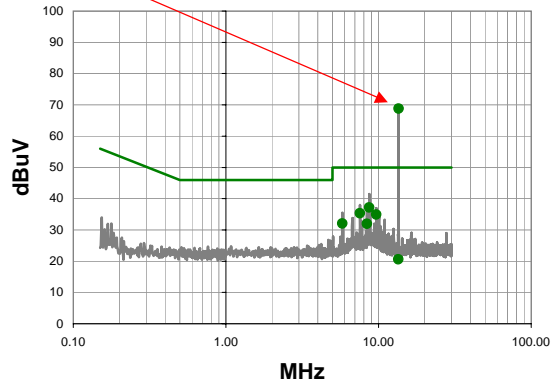
Run #	8	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Transmit Frequency. Re-tested with antenna disconnected. See additional data

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	47.8	20.6	68.4	60.0	8.4
8.700	20.9	20.5	41.4	60.0	-18.6
9.670	19.0	20.5	39.5	60.0	-20.5
7.562	19.0	20.5	39.5	60.0	-20.5
8.388	15.9	20.5	36.4	60.0	-23.6
5.792	14.8	20.5	35.3	60.0	-24.7
13.498	10.8	20.6	31.4	60.0	-28.6

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	48.2	20.6	68.8	50.0	18.8
8.700	16.6	20.5	37.1	50.0	-12.9
7.562	14.8	20.5	35.3	50.0	-14.7
9.670	14.4	20.5	34.9	50.0	-15.1
5.792	11.6	20.5	32.1	50.0	-17.9
8.388	11.4	20.5	31.9	50.0	-18.1
13.498	0.0	20.6	20.6	50.0	-29.4

EMC

AC POWERLINE CONDUCTED EMISSIONS

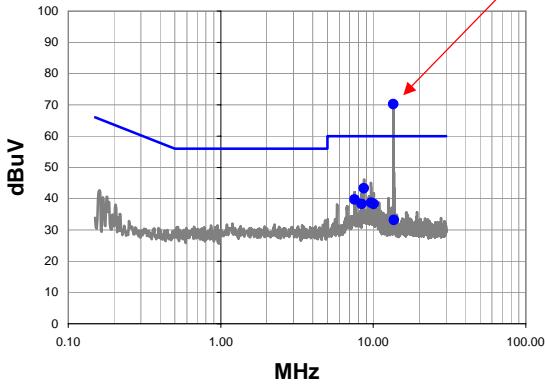
Work Order:	PRCR0111	Date:	07/29/09	
Project:	None	Temperature:	24.3	
Job Site:	EV07	Humidity:	44.4	Tested by: Kyle Holgate
Serial Number:	MPT-340704-0926-008	Barometric Pres.:	1007	
EUT:	RFID Radio Module			
Configuration:	2 - CE			
Customer:	Precor, Inc.			
Attendees:	None			
EUT Power:	12.5 VDC			
Operating Mode:	Transmitting in a default polling mode			
Deviations:	No deviations.			
Comments:	Radio module connected			

Test Specifications FCC 15.207:2009	Test Method ANSI C63.4:2003
-----------------------------------------------	---------------------------------------

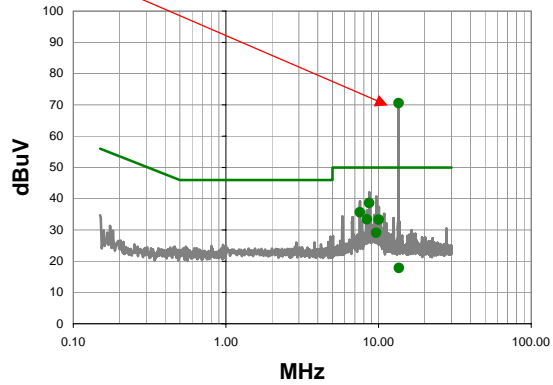
Run #	10	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Transmit Frequency. Re-tested with antenna disconnected. See additional data

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	49.6	20.6	70.2	60.0	10.2
8.698	22.8	20.5	43.3	60.0	-16.7
7.546	19.2	20.5	39.7	60.0	-20.3
9.686	18.2	20.5	38.7	60.0	-21.3
8.394	17.8	20.5	38.3	60.0	-21.7
10.062	17.7	20.5	38.2	60.0	-21.8
13.636	12.6	20.6	33.2	60.0	-26.8

Average Data - vs - Average Limit

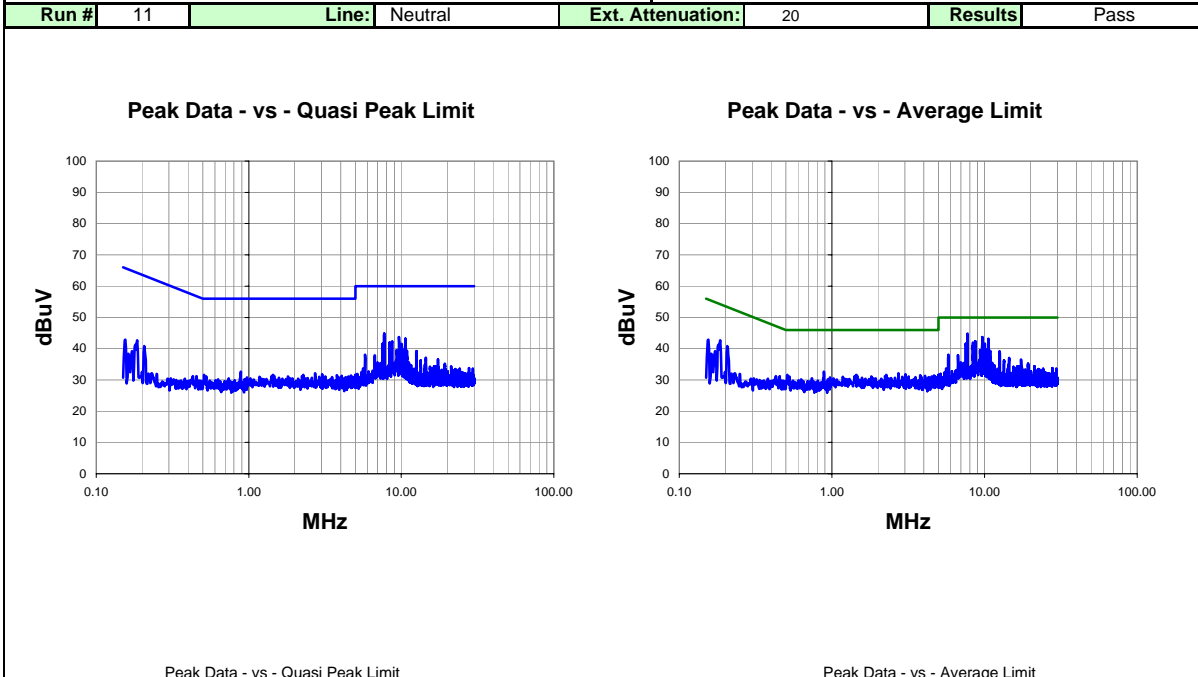
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
13.560	50.0	20.6	70.6	50.0	20.6
8.698	18.1	20.5	38.6	50.0	-11.4
7.546	15.1	20.5	35.6	50.0	-14.4
8.394	12.9	20.5	33.4	50.0	-16.6
10.062	12.7	20.5	33.2	50.0	-16.8
9.686	8.5	20.5	29.0	50.0	-21.0
13.636	-2.8	20.6	17.8	50.0	-32.2

EMC

AC POWERLINE CONDUCTED EMISSIONS

Work Order:	PRCR0111	Date:	07/29/09	
Project:	None	Temperature:	24.3	
Job Site:	EV07	Humidity:	44.4	Tested by: Kyle Holgate
Serial Number:	MPT-340704-0926-008	Barometric Pres.:	1007	
EUT:	RFID Radio Module			
Configuration:	2 - CE			
Customer:	Precor, Inc.			
Attendees:	None			
EUT Power:	12.5 VDC			
Operating Mode:	Transmitting in a default polling mode			
Deviations:	No deviations.			
Comments:	Radio module connected, Antenna disconnected.			


Test Specifications FCC 15.207:2009	Test Method ANSI C63.4:2003						
Run #	11	Line:	Neutral	Ext. Attenuation:	20	Results	Pass



Peak Data - vs - Quasi Peak Limit						Peak Data - vs - Average Limit					
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)	Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
7.730	24.3	20.5	44.8	60.0	-15.2	7.730	24.3	20.5	44.8	50.0	-5.2
9.660	23.2	20.5	43.7	60.0	-16.3	9.660	23.2	20.5	43.7	50.0	-6.3
10.620	22.7	20.5	43.2	60.0	-16.8	10.620	22.7	20.5	43.2	50.0	-6.8
8.700	21.9	20.5	42.4	60.0	-17.6	8.700	21.9	20.5	42.4	50.0	-7.6
8.390	21.5	20.5	42.0	60.0	-18.0	8.390	21.5	20.5	42.0	50.0	-8.0
7.530	21.1	20.5	41.6	60.0	-18.4	7.530	21.1	20.5	41.6	50.0	-8.4
10.050	21.0	20.5	41.5	60.0	-18.5	10.050	21.0	20.5	41.5	50.0	-8.5
10.280	19.1	20.5	39.6	60.0	-20.4	10.280	19.1	20.5	39.6	50.0	-10.4
9.340	19.0	20.5	39.5	60.0	-20.5	9.340	19.0	20.5	39.5	50.0	-10.5
10.890	18.8	20.5	39.3	60.0	-20.7	10.890	18.8	20.5	39.3	50.0	-10.7
12.570	18.6	20.6	39.2	60.0	-20.8	12.570	18.6	20.6	39.2	50.0	-10.8
0.186	21.4	21.3	42.7	64.2	-21.6	0.186	21.4	21.3	42.7	54.2	-11.6
5.790	17.6	20.5	38.1	60.0	-21.9	5.790	17.6	20.5	38.1	50.0	-11.9
6.700	17.4	20.4	37.8	60.0	-22.2	6.700	17.4	20.4	37.8	50.0	-12.2
0.206	19.7	21.1	40.8	63.4	-22.6	0.206	19.7	21.1	40.8	53.4	-12.6
0.155	21.3	21.6	42.9	65.7	-22.8	0.155	21.3	21.6	42.9	55.7	-12.8
14.470	16.5	20.6	37.1	60.0	-22.9	14.470	16.5	20.6	37.1	50.0	-12.9
0.886	12.3	20.4	32.7	56.0	-23.3	0.886	12.3	20.4	32.7	46.0	-13.3
17.370	15.9	20.6	36.5	60.0	-23.5	17.370	15.9	20.6	36.5	50.0	-13.5
9.440	15.9	20.5	36.4	60.0	-23.6	9.440	15.9	20.5	36.4	50.0	-13.6

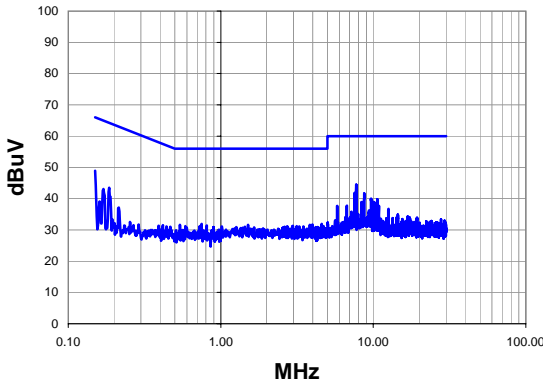
EMC

AC POWERLINE CONDUCTED EMISSIONS

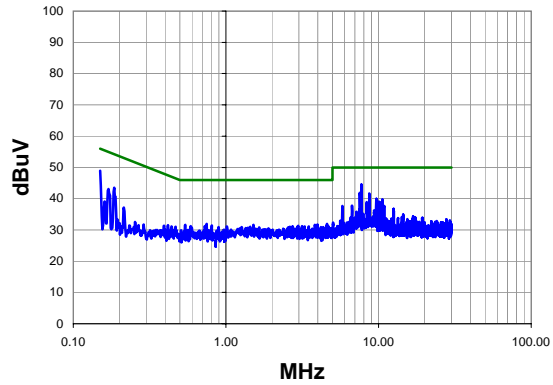
Work Order:	PRCR0111	Date:	07/29/09	
Project:	None	Temperature:	24.3	
Job Site:	EV07	Humidity:	44.4	Tested by: Kyle Holgate
Serial Number:	MPT-340704-0926-008	Barometric Pres.:	1007	
EUT:	RFID Radio Module			
Configuration:	2 - CE			
Customer:	Precor, Inc.			
Attendees:	None			
EUT Power:	12.5 VDC			
Operating Mode:	Transmitting in a default polling mode			
Deviations:	No deviations.			
Comments:	Radio module connected, Antenna disconnected.			

Test Specifications FCC 15.207:2009	Test Method ANSI C63.4:2003		
Run # 12	Line: High Line	Ext. Attenuation: 20	Results Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit

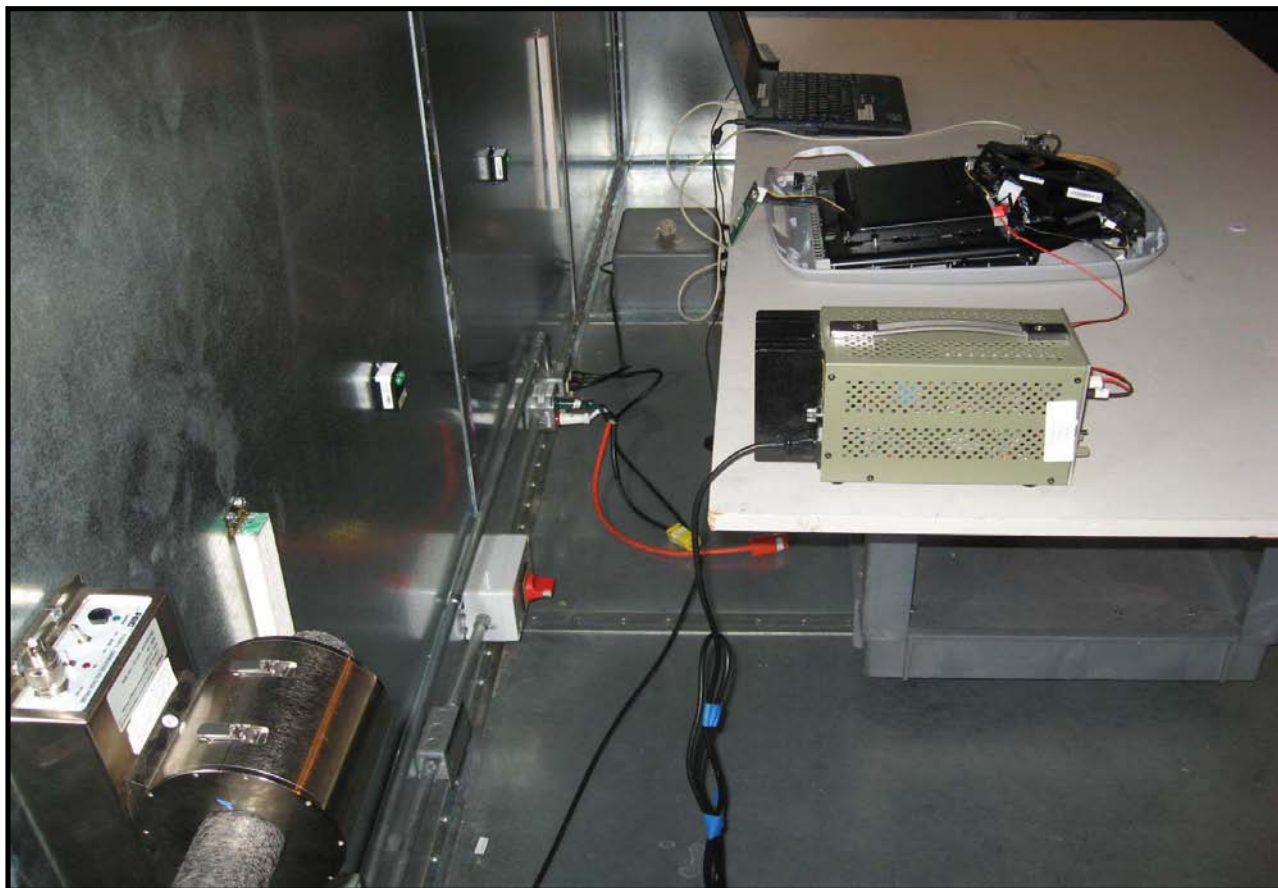


Peak Data - vs - Quasi Peak Limit

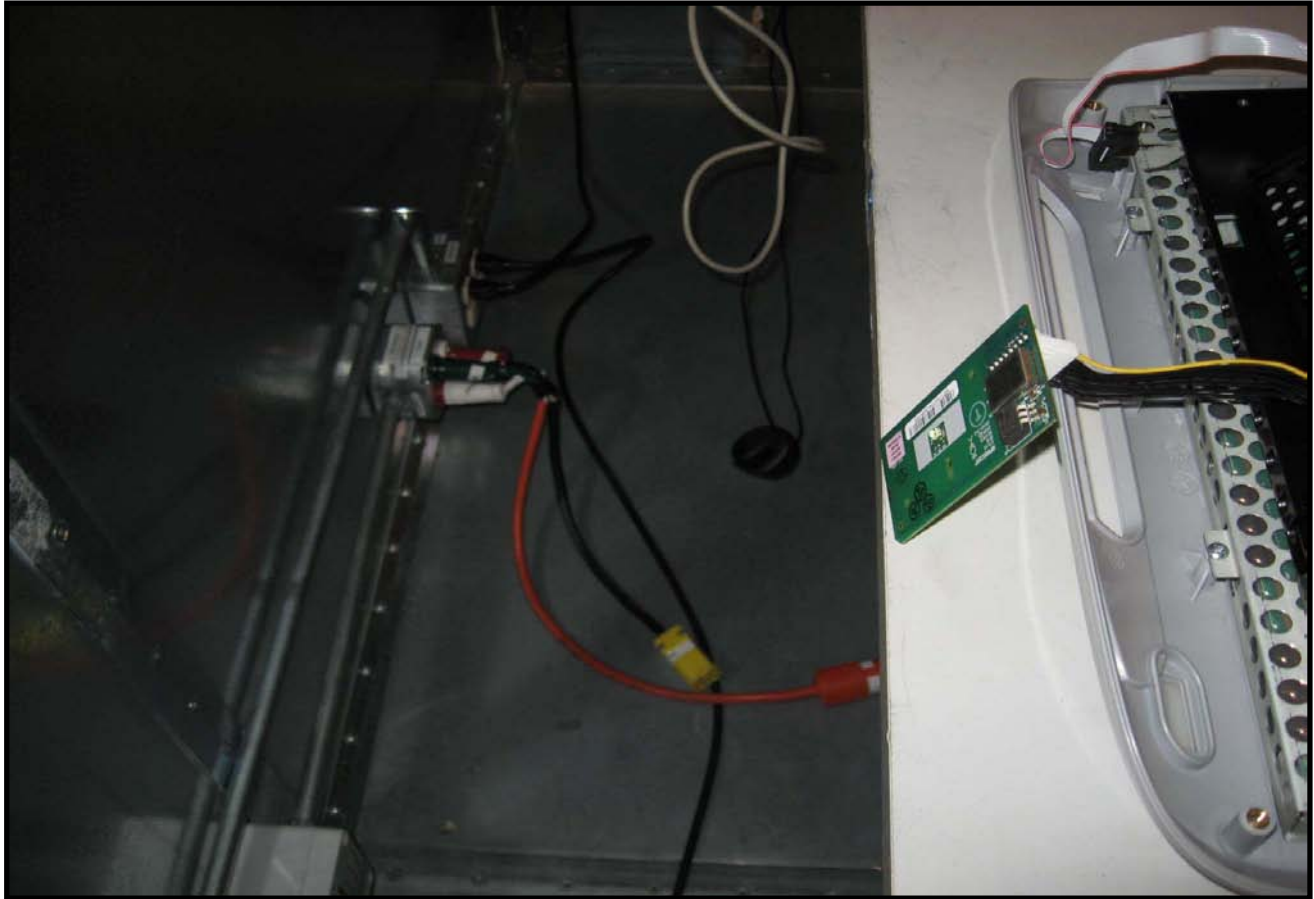
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
7.720	24.0	20.5	44.5	60.0	-15.5
0.150	27.3	21.7	49.0	66.0	-17.0
7.530	21.4	20.5	41.9	60.0	-18.1
8.710	21.1	20.5	41.6	60.0	-18.4
9.680	19.4	20.5	39.9	60.0	-20.1
10.620	19.3	20.5	39.8	60.0	-20.2
0.186	22.2	21.3	43.5	64.2	-20.8
10.050	18.5	20.5	39.0	60.0	-21.0
8.380	18.4	20.5	38.9	60.0	-21.1
10.300	18.2	20.5	38.7	60.0	-21.3
0.170	21.7	21.4	43.1	64.9	-21.9
6.710	17.3	20.4	37.7	60.0	-22.3
5.800	17.2	20.5	37.7	60.0	-22.3
10.890	17.1	20.5	37.6	60.0	-22.4
12.560	16.2	20.6	36.8	60.0	-23.2
7.500	16.0	20.5	36.5	60.0	-23.5
9.360	15.7	20.5	36.2	60.0	-23.8
0.748	11.6	20.4	32.0	56.0	-24.0
4.592	11.6	20.4	32.0	56.0	-24.1
8.600	15.4	20.5	35.9	60.0	-24.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
7.720	24.0	20.5	44.5	50.0	-5.5
0.150	27.3	21.7	49.0	56.0	-7.0
7.530	21.4	20.5	41.9	50.0	-8.1
8.710	21.1	20.5	41.6	50.0	-8.4
9.680	19.4	20.5	39.9	50.0	-10.1
10.620	19.3	20.5	39.8	50.0	-10.2
0.186	22.2	21.3	43.5	54.2	-10.8
10.050	18.5	20.5	39.0	50.0	-11.0
8.380	18.4	20.5	38.9	50.0	-11.1
10.300	18.2	20.5	38.7	50.0	-11.3
0.170	21.7	21.4	43.1	54.9	-11.9
6.710	17.3	20.4	37.7	50.0	-12.3
5.800	17.2	20.5	37.7	50.0	-12.3
10.890	17.1	20.5	37.6	50.0	-12.4
12.560	16.2	20.6	36.8	50.0	-13.2
7.500	16.0	20.5	36.5	50.0	-13.5
9.360	15.7	20.5	36.2	50.0	-13.8
0.748	11.6	20.4	32.0	46.0	-14.0
4.592	11.6	20.4	32.0	46.0	-14.1
8.600	15.4	20.5	35.9	50.0	-14.1



AC Powerline 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	13
Near Field Probe	EMCO	7405	IPD	NCR	0
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	7/23/2008	24
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	7/23/2008	24
AC Power Source	Instek	APS-9050	TPK	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

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal. The EUT can only be operated from the public AC mains, so an AC lab supply was used to vary the supply voltage from 115% to 85% of 120 V, 60 Hz.


Variation of Ambient Temperature

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

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

EMC

FREQUENCY STABILITY

EUT:	RFID Radio Module	Work Order:	PRCR0111
Serial Number:	MPT-340704-0926-008	Date:	07/28/09
Customer:	Precor, Inc.	Temperature:	24°C
Attendees:	None	Humidity:	42%
Project:	None	Barometric Pres.:	30.05 in
Tested by:	Rod Peloquin	Power:	120VAC/60Hz
		Job Site:	EV01
TEST SPECIFICATIONS		Test Method	
FCC 15.225:2009		ANSI C63.4:2003	
COMMENTS			
Module extended from host:			
DEVIATIONS FROM TEST STANDARD			
No Deviations			
Configuration #	1	 Signature	
		Value	Limit
RESULTS			
			Results

FREQUENCY STABILITY

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

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
138 (115%)	13.560702	13.560702	0.00	n/a
120 (100%)	13.560702	13.560702	0.00	n/a
102 (85%)	13.560702	13.560702	0.00	n/a

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 120 VAC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	13.560702	13.560557	10.69	n/a
40	13.560702	13.560588	8.41	n/a
30	13.560702	13.560661	3.02	n/a
20	13.560702	13.560702	0.00	n/a
10	13.560702	13.560764	4.57	n/a
0	13.560702	13.560833	9.66	n/a
-10	13.560702	13.560876	12.83	n/a
-20	13.560702	13.560887	13.64	n/a
-30	13.560702	13.560879	13.05	n/a

