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TEST REPORT #: 310306 LSR Job #: C-1036

Compliance Testing of:

Smart Receptacle

Test Date(s):

December 10th, 2010 to February 27th, 2011 and August 5th, 2011

Prepared For: Eaton Attn: Vince Ferri 170 Industry Drive Pittsburgh, PA 15275

> In accordance with: Federal Communications Commission (FCC) Part 15, Subpart C, Section 15.247 Industry Canada (IC) RSS 210 Annex 8 Digital Modulation Transmitters (DTS)

This Test Report is issued under the Authority of: Khairul Aidi Zainal, Senior EMC Engineer			
Signature:	Aufid	Da	te: 5/11/11
	surance by: Zainal, Senior	EMC Engineer	Project Engineer: Shane D. Rismeyer, EMC Engineer
Signature:	Applich	Date: 5/11/11	Signature: Contract Date: 5/1/11

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EXHIBIT 1. INTRODUCTION

<u> 1.1 - Scope</u>

References:	FCC Part 15, Subpart C, Section 15.247 and 15.209 FCC Part 2, Section 2.1043 paragraph (b)1. RSS GEN and RSS 210 Annex 8
Title:	 FCC : Telecommunication – Code of Federal Regulations, CFR 47, Part 15. IC : Low-power License-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment
Purpose of Test:	To gain FCC and IC Certification Authorization for Low- Power License-Exempt Transmitters.
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with American National Standards Institute ANSI C63.4 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
Environmental Classification:	Commercial, Industrial or Business Residential

<u>1.2 – Normative References</u>

Publication	Title
47 CFR, Parts 0-15 (FCC)	Code of Federal Regulations - Telecommunications
RSS 210 Annex 8	Low-power License-exempt Radio- communication Devices (All Frequency Bands): Category I Equipment
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
CISPR 16-1-1	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus.
CISPR 16-2-1	Specification for radio disturbance and immunity measuring apparatus and methods. Part 201: Conducted disturbance measurement.
FCC ET Docket No. 99-231	Amendment to FCC Part 15 of the Commission's Rules Regarding Spread Spectrum Devices.
FCC Procedures	Measurement of Digital Transmission Systems operating under Section 15.247.

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<u>1.3 - LS Research, LLC in Review</u>

As an EMC Testing Laboratory, our Accreditation and Assessments are recognized through the following:



TESTING CERT #1255.01 A2LA – American Association for Laboratory Accreditation

Accreditation based on ISO/IEC 17025: 2005 with Electrical (EMC) Scope of Accreditation A2LA Certificate Number: 1255.01



Federal Communications Commission (FCC) – USA

Listing of 3 Meter Semi-Anechoic Chamber based on Title 47 CFR – Part 2.948 FCC Registration Number: 90756

Industrie Industry Canada Canada



Industry Canada

On file, 3 Meter Semi-Anechoic Chamber based on RSS-212 – Issue 1 File Number: IC 3088-A On file, 3 and 10 Meter OATS based on RSS-212 – Issue 1 File Number: IC 3088



U. S. Conformity Assessment Body (CAB) Validation

Validated by the European Commission as a U. S. Competent Body operating under the U. S./EU, Mutual Recognition Agreement (MRA) operating under the European Union Electromagnetic Compatibility –Council Directive 2004/108/EC (formerly 89/336/EEC, Article 10.2).

Date of Validation: January 16, 2001

Validated by the European Commission as a U.S. Notified Body operating under the U.S. /EU, Mutual Recognition Agreement (MRA) operating under the European Union Telecommunication Equipment – Council Directive 99/5/EC, Annex V. Date of Validation: November 20, 2002 Notified Body Identification Number: 1243

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EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1 - Client Information

Manufacturer Name:	Eaton
Address:	170 Industry Drive
Contact Name:	Vince Ferri

<u>2.2 - Equipment Under Test (EUT) Information</u> The following information has been supplied by the applicant.

Product Name:	Smart Receptacle
Model Number:	6D32429G01
Serial Number:	N/A

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2.3 - EUT'S Technical Specifications

EUT Frequency Range (in MHz)	2405-2475 MHz
RF Power in Watts	
Minimum:	0.0533
Maximum:	0.0618
Conducted Output Power (in dBm)	17.91
Field Strength at 3 meters	113.76 dBµV/m
Occupied Bandwidth (99% BW)	2580 MHz
Type of Modulation	OQPSK
Emission Designator	2M58G1D
EIRP (in mW)	55.08
Transmitter Spurious (worst case) at 3 meters	33.52 dBµV/m
Receiver Spurious (worst case) at 3 meters	30.37 dBµV/m
Stepped (Y/N)	Y
Step Value:	5MHz
Frequency Tolerance %, Hz, ppm	+-40ppm
Microprocessor Model # (if applicable)	Ember EM2420
Antenna Information	
Detachable/non-detachable	Non-Detachable
Туре	Ceramic chip- surface mount
Gain (in dBi)	-0.5
EUT will be operated under FCC Rule Part(s)	15.247
EUT will be operated under RSS Rule Part(s)	210
Modular Filing	🗌 Yes 🛛 No
Portable or Mobile?	Mobile

RF Technical Information:

Type of		SAR Evaluation: Device Used in the Vicinity of the Human Head
Evaluation		SAR Evaluation: Body-worn Device
(check one)	X	RF Evaluation

If <u>RF Evaluation</u> checked above, test engineer to complete the following:

Evaluated against exposure limits: 🛛 General Public Use	Controlled Use
Duty Cycle used in evaluation: 100 %	
Standard used for evaluation: OET 65	
Measurement Distance: 20cm	
RF Value: 0.003219 \Box V/m \Box A/m \boxtimes W/m ²	
🗌 Measured 🛛 🗌 Computed 🛛 🖂 Calculat	ted

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EXHIBIT 3. EUT OPERATING CONDITIONS & CONFIGURATIONS DURING TESTS

3.1 - Climate Test Conditions

Temperature:	23°C
Humidity:	35%
Pressure:	755mmHg

3.2 - Applicability & Summary of EMC Emission Test Results

FCC and IC Paragraph	Test Requirements	Compliance (Yes/No)
FCC : 15.207 IC : RSS GEN sect. 7.2.2	Power Line Conducted Emissions Measurements	Yes
FCC : 15.247(a)(2) IC : RSS 210 A8.2(a)	6 dB Bandwidth of a Digital Modulation System	Yes
IC : RSS GEN section 4.6.1	20 dB Bandwidth	Yes
FCC : 15.247(b) & 1.1310 IC : RSS 210 A8.4	Maximum Output Power	Yes
FCC : 15.247(i), 1.1307, 1.1310, 2.1091 & 2.1093 IC : RSS 102	RF Exposure Limit	Yes
FCC :15.247(c) IC : RSS 210 A8.5	RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	Yes
FCC : 15.247(d) IC : RSS 210 A8.2(b)	Transmitted Power Spectral Density of a Digital Modulation System	Yes
FCC : 15.247(c), 15.209 & Transmitter Radiated Emissions Yes IC : RSS 210 A8.2(b), Section 2.2, 2.6 and 2.7 Yes		
The digital circuit portion of the EUT has been tested and verified to comply with FCC Part 15, Subpart B, Class B Digital Devices (RSS GEN and RSS 210 of IC) and the associated Radio Receiver has also been tested and found to comply with Part 15, Subpart B – Radio Receivers (RSS GEN and RSS 210 of IC). The Receiver Test Report is available upon request.		

3.3 - Modifications Incorporated In the EUT for Compliance Purposes

In order for the EUT to pass radiated spurious emissions the power level will be set to 254 for all channels.

3.4 - Deviations & Exclusions from Test Specifications

🖂 None

Yes (explain below

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EXHIBIT 4. DECLARATION OF CONFORMITY

The EUT was found to MEET the requirements as described within the specification of FCC Title 47, CFR Part 15.247, and Industry Canada RSS-210 for a Digital Spread Spectrum (DTS) Transmitter.

Note: If some emissions are seen to be within 3 dB of their respective limits; as these levels are within the tolerances of the test equipment and site employed, there is a possibility that this unit, or a similar unit selected out of production may not meet the required limit specification if tested by another agency.

LS Research, LLC certifies that the data contained herein was taken under conditions that meet or exceed the requirements of the test specifications. The results in this Test Report apply only to the item(s) tested on the above-specified dates. Any modifications made to the EUT subsequent to the indicated test date(s) will invalidate the data herein, and void this certification.

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EXHIBIT 5. RADIATED EMISSIONS TEST

<u>5.1 - Test Setup</u>

The test setup was assembled in accordance with Title 47, CFR FCC Part 15, RSS GEN and ANSI C63.4. The EUT was placed on an 80cm high non-conductive pedestal, centered on a flush mounted 2-meter diameter turntable inside a 3 meter Semi-Anechoic, FCC listed Chamber. The EUT was operated in continuous transmit mode with modulation, using power as provided by 115VAC. The unit has the capability to operate on 25 channels, controllable via laptop PC through an RS-232 connection.

The applicable limits apply at a 3 meter distance. Measurements above 4 GHz were performed at a 1.0 meter separation distance. The calculations to determine these limits are detailed in the following pages. Please refer to Appendix A for a complete list of test equipment. The test sample was operated on one of three (3) standard channels: low (2405 MHz), middle (2440 MHz) and high (2480 MHz) to comply with FCC Part 15.35. The channels and operating modes were changed using a PC.

5.2 - Test Procedure

Radiated RF measurements were performed on the EUT in 3 meter Semi-Anechoic and Compact Semi-Anechoic FCC listed Chambers. The frequency range from 30 MHz to 25000 MHz was scanned and investigated. The radiated RF emission levels were manually noted at the various fixed degree settings of azimuth on the turntable and antenna height. For the lower frequency ranges the EUT was placed on a non-conductive pedestal in the 3 meter Semi-Anechoic Chamber with the antenna mast placed so that the separation distance between the antenna and EUT was 3 meters. A Biconical Antenna was used to measure emissions from 30 MHz to 300 MHz, a Log Periodic Antenna was used to measure emissions from 300 MHz to 1000 MHz, a Double-Ridged Waveguide Horn Antenna was used from 1 GHz to 4 GHz in the 3 meter Semi-Anechoic Chamber. The remaining measurements were taken in the Compact Semi-Anechoic Chamber at a separation distance of 1 meter. The Double-Ridged Waveguide Horn Antenna used from 4 GHz to 18 GHz and a Standard Gain Horn Antenna was used from 18 GHz to 25 GHz. The maximum radiated RF emissions were found by raising and lowering the antenna between 1 and 4 meters in height, using both horizontal and vertical antenna polarities.

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5.3 - Test Equipment Utilized

A list of the test equipment and antennas utilized for the Radiated Emissions test can be found in Appendix A. This list includes calibration information and equipment descriptions. The Agilent E4445A EMI Receiver was operated with a resolution bandwidth of 120 kHz for measurements below 1 GHz (video bandwidth of 300 kHz), and a bandwidth of 1 MHz for measurements above 1 GHz (video bandwidth of 1 MHz). From 4 GHz to 25 GHz, an Agilent E4446A Spectrum Analyzer was used.

5.4 - Test Results

The EUT was found to **MEET** the Radiated Emissions requirements of Title 47 CFR, FCC Part 15.247 and Canada RSS-210 for a DTS transmitter. The frequencies with significant RF signal strength were recorded and plotted as shown in the Data Charts and Graphs.

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5.5 - Calculation of Radiated Emissions Limits

The maximum peak output power of an intentional radiator in the 2400-2483.5 MHz band, as specified in Title 47 CFR 15.247 (b)(3) and RSS 210 A8.4 is 1 Watt. The harmonic and spurious RF emissions, as measured in any 100 kHz bandwidth, as specified in 15.247 (d) and RSS 210 A8.2 (b), shall be at least 20 dB below the measured power of the desired signal, and must also meet the requirements described in 15.205(c) for FCC and section 2.2, 2.6 and 2.7 of RSS 210 for IC.

The following table depicts the general radiated emission limits above 30 MHz. These limits are obtained from Title 47 CFR, Part 15.209, for radiated emissions measurements. These limits were applied to any signals found in the 15.205 restricted bands. The mentioned limits correspond to those limits listed in RSS 210 section 2.7.

Frequency (MHz)	3 m Limit μV/m	3 m Limit (dBμV/m)	1 m Limit (dBµV/m)
30-88	100	40.0	-
88-216	150	43.5	-
216-960	200	46.0	-
960-24,000	500	54.0	63.5

Sample conversion of field strength (μ V/m to dB μ V/m):

 $dB\mu V/m = 20 \log_{10} (100) = 40 dB\mu V/m$ (from 30-88 MHz) For measurements made at 1.0 meter, a 9.5 dB correction has been invoked.

> 960 MHz to 10,000 MHz 500 μ V/m or 54.0 dB μ V/m at 3 meters 54.0 + 9.5 = 63.5 dB μ V/m at 1 meter

For measurements made at 0.3 meter, a 20 dB correction has been invoked.

960 MHz to 10,000 MHz 500 μ V/m or 54.0 dB μ V/m at 3 meters 54.0 + 20 = 74 dB μ V/m at 0.3 meters

Reported data is the raw data corrected for all applicable factors such as antenna factors, cable loss, etc.

Sample reported data:

Raw Data + Antenna Factor + Cable Factor = Reported Data

 $78.15 \text{ dB}\mu\text{V/m} + 28.52 \text{ dB} + 4.93 \text{ dB} = 111.6 \text{ dB}\mu\text{V/m}$

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5.6 - Radiated Emissions Test Data Chart

Manufacturer:	Eato	Eaton					
Date(s) of Test:	12/1	0/10-2/10/11					
Test Engineer(s):	Sha	ne Rismeyer					
Voltage:	115	VAC					
Operation Mode:	Moc	lulated					
Environmental		perature: 20 – 25° C					
Conditions in the Lab:	Rela	ative Humidity: 30 – 60 %					
EUT Power:	X	X Single Phase 115VAC 3 Phase VAC					
LUI FOWEI.		Battery		Other:			
EUT Placement:	x	80cm non-conductive		10cm Spacer	s		
LOT Flacement.	^	table					
EUT Test Location:	x	3 Meter Semi-Anechoic		3/10m OATS			
	~	FCC Listed Chamber					
Measurement:		Pre-Compliance		Preliminary	Χ	Final	
Detectors Used:	X	Peak	X	Quasi-Peak	Χ	Average	

The following table depicts the level of significant spurious radiated RF emissions found:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (degrees)	Measured EFI (dBμV/m)	Limit (dBµV/m)	Margin (dB)
184.0	H/Flat	1.60	250	29.59	43.5	13.9
192.0	H/Flat	1.60	65	33.02	43.5	10.5
120.0	H/Flat	1.75	0	31.15	43.5	12.4
72.0	V/Flat	1.03	0	33.52	40.0	6.5
96.0	V/Flat	1.00	160	31.78	43.5	11.7

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RADIATED EMISSIONS DATA CHART (continued)

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 11:

Frequency (MHz)	Ant./EUT Polarity	Height (meters)	Azimuth (degrees)	Measured EFI (dBμV/m)	Limit (dBµV/m)	Margin (dB)
2405.0	Horizontal/Flat	104.0	340	111.6	125.2	13.60
4811.1	Horizontal/Vertical	106.7	42.2	54.883	63.5	8.62
7216.7	Horizontal/Vertical	106.7	101.7	52.566	63.5	10.93
9622.2	Vertical/Flat	98.5	162.3	51.476	63.5	12.024

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 18:

Frequency (MHz)	Ant./EUT Polarity	Height (cm)	Azimuth (degrees)	Measured EFI (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2440.0	Horizontal/Flat	100.0	324	112.2	125.2	13.00
4881.0	Horizontal/Vertical	113.3	42.4	61.351	63.5	2.15
7321.5	Horizontal/Vertical	108.5	94.8	56.660	63.5	6.84
9758.2	Vertical/Flat	100.6	158.6	49.60	63.5	13.90

The following table depicts the level of significant radiated RF fundamental and harmonic emissions seen on Channel 25:

Frequency (MHz)	Ant./EUT Polarity	Height (cm)	Azimuth (degrees)	Measured EFI (dBμV/m)	Limit (dBµV/m)	Margin (dB)
2475.0	Horizontal/Flat	100.0	210.0	113.76	125.2	11.36
7426.5	Horizontal/Vertical	104.6	96.3	60.77	63.5	2.73
4951.1	Vertical/Side	108.3	72.8	60.89	63.5	2.61
9902.1	Horizontal/Side	100.0	139.0	51.28	63.5	12.22
12372.8	Horizontal/Side	108.0	63.9	49.01	63.5	14.49

Notes:

1) A Quasi-Peak Detector was used in measurements below 1 GHz, and a Peak as well as an Average Detector was used in measurements above 1 GHz. The peak detector was used to ensure the peak emissions did not exceed 20 dB above the limits.

2) Measurements above 4 GHz were made at 1 meters of separation from the EUT.

3) For measurements of the fundamental power, because of spectral bandwidth, the receiver was set to RBW=VBW=3 MHz.

4) A relaxation of the limit is invoked based on the average duty factor of the transmitter on-airtime. Justification appears in Appendix D. The measurements have been recalculated and reduced by 21.34 dB as justified by the averaging factor.

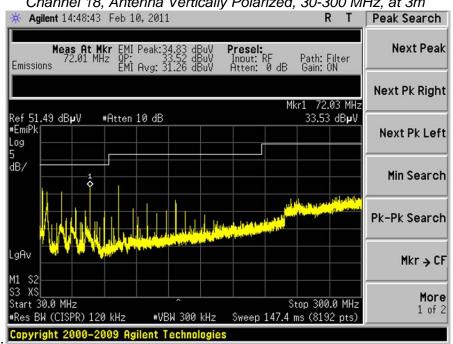
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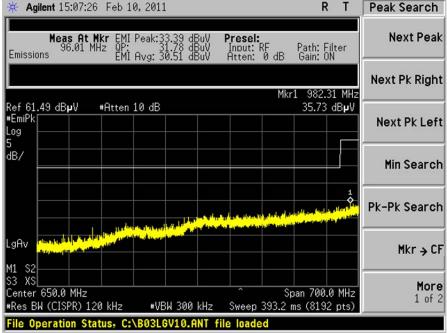
5.7 - Screen Captures - Radiated Emissions Test

These screen captures represent Peak Emissions.





Channel 18, Antenna Vertically Polarized, 300-1000 MHz, at 3m 🔆 Agilent 15:07:26 Feb 10, 2011 R T



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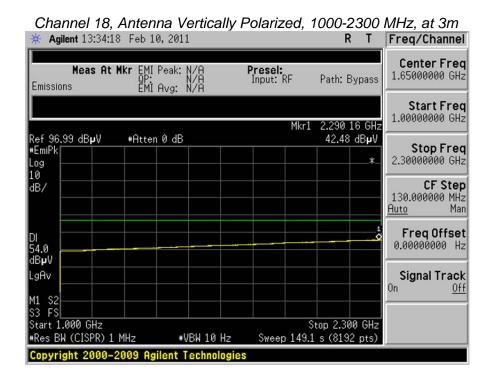
Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
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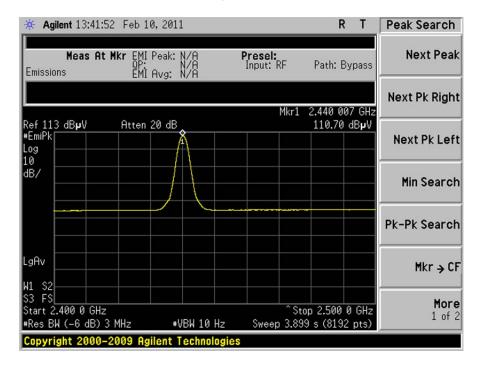
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Screen Captures - Radiated Emissions Testing (continued)



Channel 18, Antenna Vertically Polarized, 2400-2500 MHz, at 3m

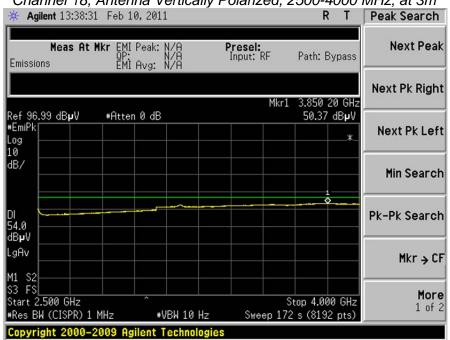


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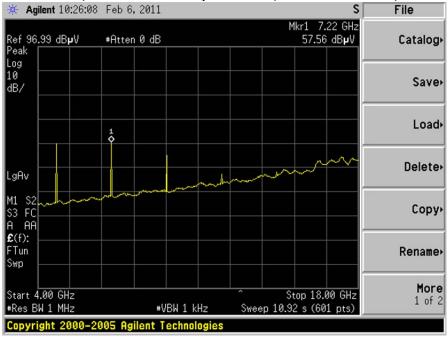
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Screen Captures - Radiated Emissions Testing (continued)





Channel 18, Antenna Vertically Polarized, 4000-18000 MHz, at 1m



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Screen Captures - Radiated Emissions Testing (continued)

Peak Search	S	Feb 6, 2011	Agilent 15:19:48
Next Peak	Mkr1 21.640 GHz 42.86 dBµV	#Atten 0 dB	96.99 dBµV
Next Pk Right			
Next Pk Left			
Min Search			, martine
Pk-Pk Search			52
Mkr → CF		0000 GHz	
More 1 of 2	Span 7 GHz Sweep 5.458 s (601 pts)	*VBk	er 21.500 GHz BW 1 MHz
	saved	us, A:\SCREN0	Operation State

Channel 18, Antenna Vertically Polarized, 18000-25000 MHz, at 1m Agilent 15:19:48 Feb 6, 2011 S Peak Search

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5.8 - Receive Mode Testing

Per the requirements of RSS-210, the EUT was placed in continuous receive mode and the radiated spurious emissions were measured and compared to the limits stated in RSS-Gen Section 4.10.

The test setup, procedure, and equipment utilized were identical to that described in sections 5.1, 5.2, and 5.3 of this document.

Measurement data and screen captures from the receive tests are presented below:

Frequency (MHz)	Height (m)	Azimuth (degree)	Quasi Peak Reading (dBµV/m)	Quasi Peak Limit (dBµV/m)	Margin (dB)	Antenna Polarity
298.6	1.00	0	25.71	46.0	20.29	V
984.1	1.00	0	30.37	54.0	23.63	V

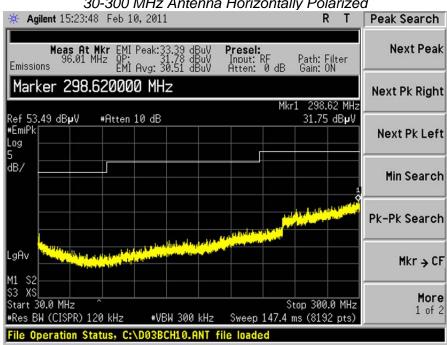
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EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

5.9 - Screen Captures - Radiated Emissions Testing - Receive Mode

These screen captures represent Peak Emissions.



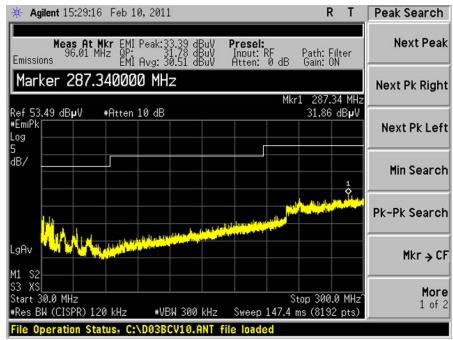
30-300 MHz Antenna Horizontally Polarized

30-300 MHz Antenna Vertically Polarized

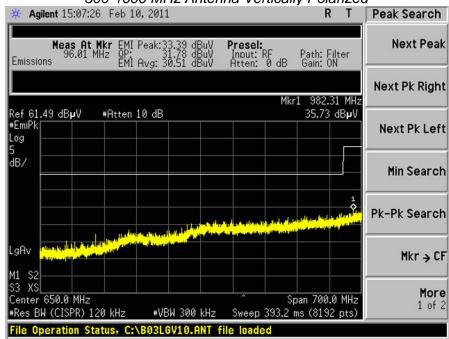
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Screen Captures - Radiated Emissions Testing – Receive Mode (continued)



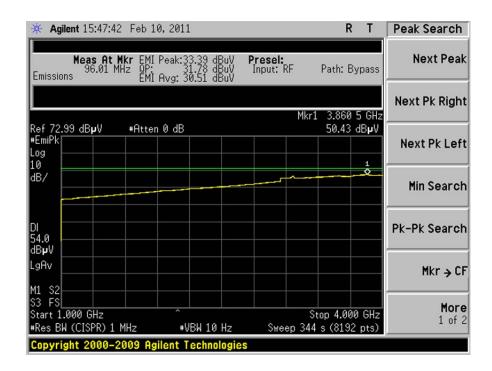
300-1000 MHz Antenna Vertically Polarized

1-4 GHz Antenna Horizontally Polarized

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Screen Captures - Radiated Emissions Testing – Receive Mode (continued)



4-18 GHz Antenna Horizontally Polarized

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dB	S Mkr1 20.637 GHz 41.73 dBµV	Peak Search Next Peak
dB		Next Peak
		Next Pk Right
		Next Pk Lef
1 \$		Min Search
		Pk-Pk Search
;Нz		Mkr→Cf
#VBW1kHz Swe	Span 7 GHz eep 5.458 s (601 pts)	More 1 of 2
	Hz	Hz

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EXHIBIT 6. CONDUCTED EMISSIONS TEST, AC POWER LINE

6.1 - Test Setup

The test area and setup are in accordance with ANSI C63.4and with Title 47 CFR, FCC Part 15, Industry Canada RSS-210 and RSS GEN. The EUT was placed on a non-conductive wooden table, with a height of 80 cm above the reference ground plane. The EUT's power cable was plugged into a 50 Ω (ohm), 50/250 μ H Line Impedance Stabilization Network (LISN). The AC power supply of 120V was provided inside the 3 Meter Semi-Anechoic Chamber via an appropriate broadband EMI Filter, and then to the LISN line input. Final readings were then taken and recorded. After the EUT was setup and connected to the LISN, the RF Sampling Port of the LISN was connected to a 10 dB Attenuator-Limiter, and then to the HP 8546A EMI Receiver. The EMCO LISN used has the ability to terminate the unused port with a 50 Ω (ohm) load when switched to either L1 (line) or L2 (neutral).

6.2 - Test Procedure

The EUT was investigated in continuous modulated transmit mode for this portion of the testing. The appropriate frequency range and bandwidths were selected on the EMI Receiver, and measurements were made. The bandwidth used for these measurements is 9 kHz, as specified in CISPR 16-1, Section 1, Table 1, for Quasi-Peak and Average detectors in the frequency range of 150 kHz to 30 MHz. Final readings were then taken and recorded.

6.3 - Test Equipment Utilized

A list of the test equipment and accessories utilized for the Conducted Emissions test is provided in Appendix A.

6.4 - Test Results

The EUT was found to **MEET** the Conducted Emission requirements of FCC Part 15.207 Conducted Emissions for an Intentional Radiator. See the Data Charts and Graphs for more details of the test results.

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6.5 - FCC Limits of Conducted Emissions at the AC Mains Ports

The follow table represents the limits for Conducted Emissions Class B taken from CFR 15.207:

Frequency Range (MHz)	Quasi-Peak Limit (dBµV)	Average Limit (dBµV)		
0.150 -0.50 *	66-56	56-46		
0.5 - 5.0	56	46		
5.0 – 30	60	50		
* The limit decreases linearly with the logarithm of the frequency in this range.				

Sample calculation for the limits in the 0.15 to 0.5 MHz:

Limit = -19.12 (Log₁₀ (F [MHz] / 0.15 [MHz])) + 66.0 dBµV

For a frequency of 200 kHz for example:

Quasi-Peak Limit (F=200 kHz) = -19.12 (Log₁₀ (0.2[MHz] / 0.15 [MHz])) + 66.0 dBµV

Quasi-Peak Limit (F=200 kHz) = 63.6 dBµV

Average Limit (F=200 kHz) = -19.12 (LOG₁₀ (0.2[MHz]/0.15[MHz])) + 56.0 dBµV

Average Limit (F = 200 kHz) = 53.6 dB μ V

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<u>6.6 – Conducted Emissions Test Data Chart</u>

Frequency Range inspected: 150 KHz to 30 MHz Test Standard: FCC 15.207 Class B IC RSS GEN 7.2.2

Manufacturer:	Eat	Eaton				
Date(s) of Test:	2/14	4/11				
Test Engineer:	Sha	ane Rismeyer				
Voltage:	115	VAC				
Operation Mode:	Moo	dulated				
Environmental	Ton	Temperature: 20 – 25° C				
Conditions in the				4		
Lab:	Relative Humidity: 30 – 60 %					
Test Location:	Χ	Chamber			Chamber	
EUT Placed On:	Χ	40cm from Vertica	l Grou	und Plane		10cm Spacers
LUT Flaced Off.	Χ	K 80cm above Ground Plane Other:				Other:
Measurements:		Pre-Compliance Preliminary X				Final
Detector Used:	Χ	Peak	Χ	Quasi-Peak	Χ	Average

		QUASI-PEAK			AVERAGE			
Frequency (MHz)	Line	Reading (dBµV)	Limit (dBµ V)	Margin (dB)	Reading (dBµV)	Limit (dBµ V)	Margin (dB)	
0.478	L2	42.750	56.376	13.626	33.180	46.376	13.196	
0.668	L2	37.320	56.000	18.680	25.850	46.000	20.150	
0.875	L2	37.850	56.000	18.150	28.050	46.000	17.950	
1.000	L2	40.810	56.000	15.190	32.300	46.000	13.700	
1.290	L2	41.970	56.000	14.030	32.110	46.000	13.890	
16.000	L2	42.900	60.000	17.100	39.960	50.000	10.040	
16.000	L1	48.290	60.000	11.710	47.050	50.000	2.950	
24.000	L1	41.480	60.000	18.520	39.550	50.000	10.450	

Notes:

1) All other emissions were better than 20 dB below the limits.

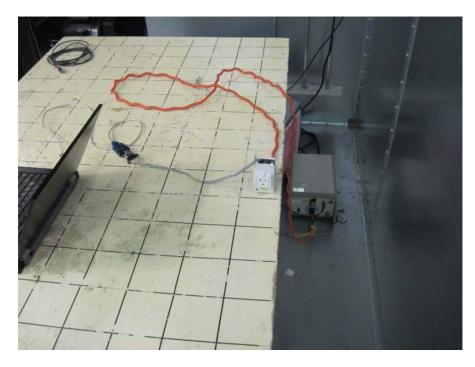
2) The EUT exhibited similar emissions in transmit and receive modes, and across the Low, Middle and High channels tested.

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<u>6.7 - Test Setup Photo(s) – Conducted Emissions Test</u>



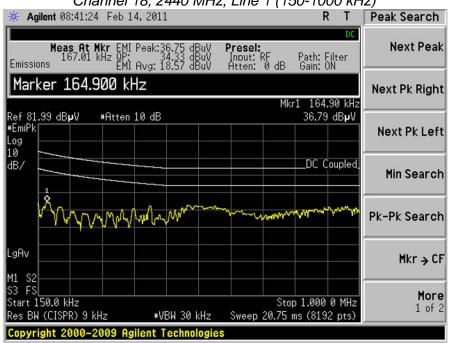
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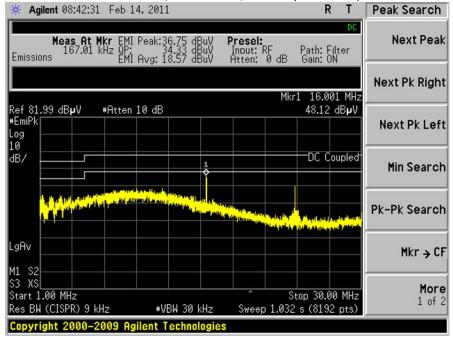
6.8 - Screen Captures - Conducted Emissions Test

These screen captures represent Peak Emissions. For conducted emission measurements, both a Quasi-Peak detector function and an Average detector function are utilized.



Channel 18, 2440 MHz, Line 1 (150-1000 kHz)

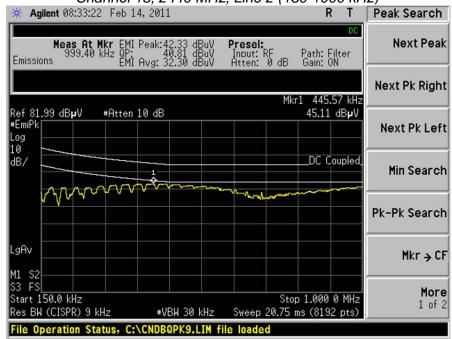
Channel 18, 2440 MHz, Line 1 (1-30MHz)



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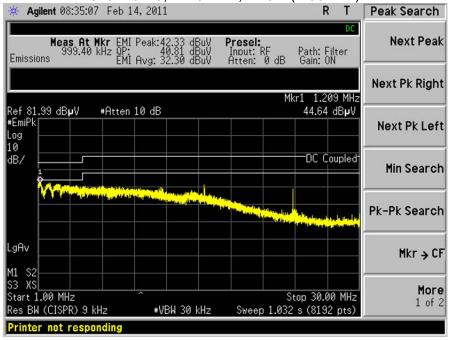
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Channel 18, 2440 MHz, Line 2 (150-1000 kHz)

Channel 18, 2440 MHz, Line 2 (1-30MHz)



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EXHIBIT 7. OCCUPIED BANDWIDTH

<u> 7.1 - Limits</u>

For a Digital Modulation System, the 6 dB bandwidth shall be at least 500 kHz.

7.2 - Method of Measurements

Refer to ANSI C63.4 (2003) and FCC Procedures (2007) for Digital Transmission Systems operating under 15.247.

The transmitter output was connected to the Spectrum Analyzer. The bandwidth of the fundamental frequency was measured with the Spectrum Analyzer using 30 kHz RBW and VBW=300 kHz.

The bandwidth requirement found in FCC Part 15.247(a)(2) and RSS 210 A8.2(a) requires a minimum -6dBc occupied bandwidth of 500 kHz. In addition, Industry Canada (IC RSS GEN 4.6.1) requires the measurement of the -20dBc occupied bandwidth. For this portion of the tests, a direct measurement of the transmitted signal was performed at the antenna port of the EUT, via a cable connection to the Agilent E4445A spectrum analyzer. An attenuator was placed in series with the cable to protect the spectrum analyzer. The loss from the cable and the attenuator were added on the analyzer as gain offset settings, thereby allowing direct measurements, without the need for any further corrections. An Agilent E4445A spectrum analyzer was used with the resolution bandwidth set to 100 kHz for this portion of the tests. The EUT was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used in peak-hold mode while measurements were made, as presented in the chart below.

From this data, the closest measurement (6 dB bandwidth) when compared to the specified limit, is 1336 kHz, which is above the minimum of 500 kHz.

7.3 - Test Equipment List

A complete list of test equipment that was used for this test can be found in Appendix A.

7.4 - Test Data

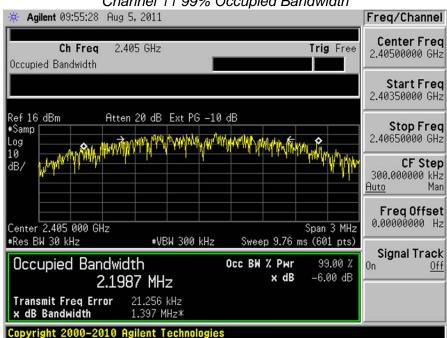
Channel	Center Frequency (MHz)	Measured -6 dBc OBW (kHz)	Minimum -6 dBc Limit (kHz)	Measured 99% OBW (kHz)
Low	2405	1397	500	2199
Middle	2440	1462	500	2209
High	2475	1336	500	2237

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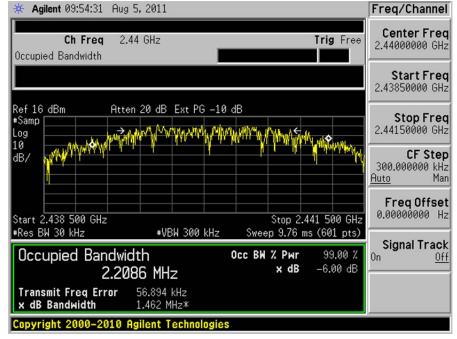
Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

7.5 - Screen Captures - Occupied Bandwidth



Channel 11 99% Occupied Bandwidth

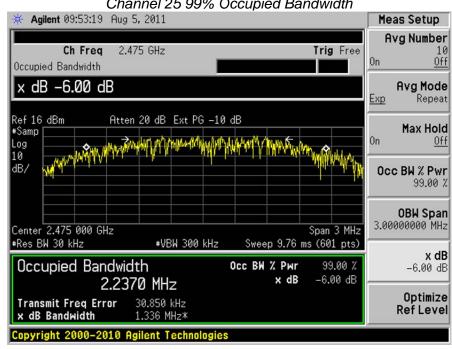
Channel 18 99% Occupied Bandwidth



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Channel 25 99% Occupied Bandwidth

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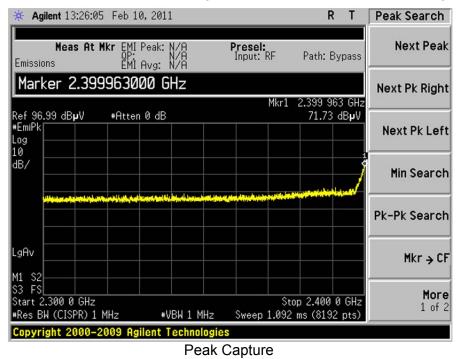
EXHIBIT 8. BAND EDGE MEASUREMENTS

8.1 - Method of Measurements

FCC 15.209(b) and 15.247(d) require a measurement of spurious emission levels to be at least 20 dB lower than the fundamental emission level, in particular at the Band-Edges where the intentional radiator operates. Also, RSS 210 requires that unwanted emissions meet limits listed in tables 2 and 3 of the same standard and also to the limits in the applicable annex. The following screen captures demonstrate compliance of the intentional radiator at the 2400-2483.5 MHz Band-Edges. The EUT was operated in continuous transmit mode with continuous modulation, with internally generated data as the modulating source. The EUT was operated at the lowest channel for the investigation of the lower Band-Edge, and at the highest channel for the investigation of the higher Band-Edge.

The Lower Band-Edge limit, in this case, would be -20 dBc with respect to the fundamental level of 111.6 dB μ V/m at 3m or 91.6 dB μ V/m.

The Upper Band-Edge limit, in this case, would be + 54 dB μ V/m at 3m.

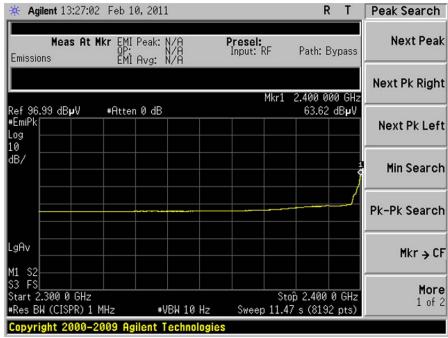


Screen Captures Demonstrating Compliance at the Lower Band-Edge

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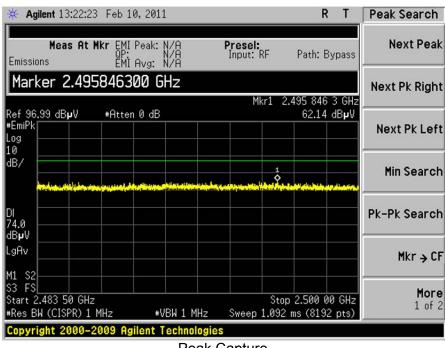
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Average Capture

Screen Captures Demonstrating Compliance at the Higher Band-Edge



Peak Capture

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Peak Search	Т	R				1	10,201	03 Feb	t 13:28:0	🗱 Agilent
Next Peal	ypass	Path: By	RF	Presel: Input:		N/A N/A N/A	I Peak: I Avg:	Mkr EM	Meas At	M Emissions
Next Pk Righ		00 415	1			•				
		90 415 90 48.03 (IKF1 2.	I*			en 0 dB	#Att	dB u V	ef 96.99
Next Pk Lef										EmiPk og Ø
Min Search										IB/
						1				
Pk-Pk Search						\$ 				1 14.0
Mkr → C										BµV gAv
Marri										11 S2 3 FS
		2.500 00 s (8192		Swee) Hz	VBW 10	**			tart 2.483 Res BW (C

Average Capture

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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

EXHIBIT 9. POWER OUTPUT (CONDUCTED): 15.247(b)

9.1 - Method of Measurements

The conducted RF output power of the EUT was measured at the antenna port using a short RF cable. The EUT was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used with resolution and video bandwidths set to 3 MHz, and a span of 20 MHz, with measurements from a peak detector presented in the chart below.

Reported data is the raw data corrected for all applicable factors such as antenna factors, cable loss, etc.

Sample reported data:

Raw Data + Cable Factor = Reported Data

16.58 dBm + 0.58 dB = 17.16 dBm

9.2 - Test Equipment List

A complete list of test equipment that was used for this test can be found in Appendix A.

9.3 - Test Data

CHANNEL	CENTER FREQ (MHz)	LIMIT (dBm)	MEASURED POWER (dBm)	MARGIN (dB)
11	2405	+30 dBm	17.27	12.73
18	2440	+30 dBm	17.55	12.44
25	2475	+30 dBm	17.91	12.09

Transmitter Channel	Freq. (MHz)	Peak Power at Antenna Terminal (dBm)	Calculated EIRP (dBm) ⁽¹⁾	EIRP Limit (dBm)	Margin (dB)
Lowest	2405	17.27	16.77	36.0	19.23
Middle	2445	17.55	17.05	36.0	18.95
Highest	2475	17.91	17.41	36.0	18.59

⁽¹⁾ EIRP Calculation:

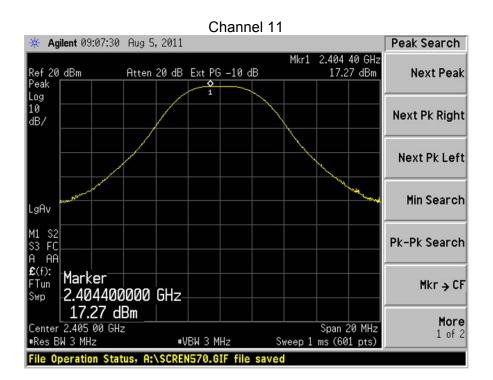
EIRP = (Peak power at antenna terminal in dBm) + (EUT Antenna gain in dBi)

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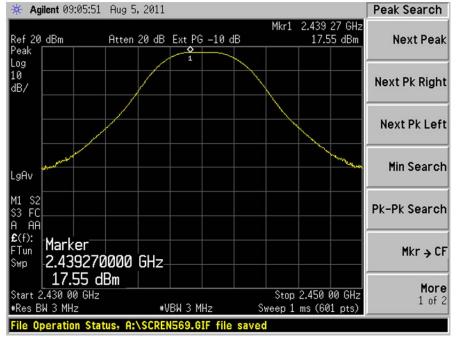
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9.4 - Screen Captures - Power Output (Conducted)



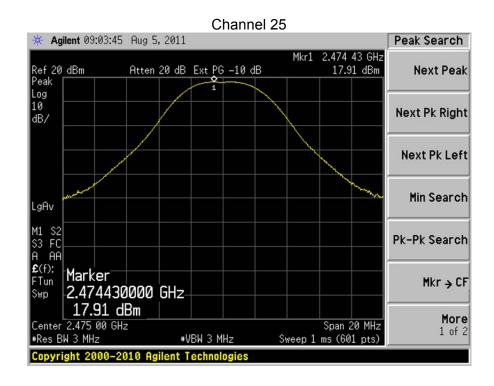
Channel 18



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EXHIBIT 10. POWER SPECTRAL DENSITY: 15.247(e)

<u> 10.1 - Limits</u>

For digitally modulate systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

In accordance with FCC Part 15.247(e) and RSS 210 A8.2(b), the peak power spectral density should not exceed +8 dBm in any 3 kHz band. This measurement was performed along with the conducted power output readings performed as described in previous sections. The peak output frequency for each representative frequency was scanned, with a narrow bandwidth, and reduced sweep, and a power density measurement was performed. The highest density was found to be no greater than 3.58 dBm, which is under the allowable limit by 4.42 dB.

10.2 - Test Equipment List

A complete list of test equipment can be found in Appendix A.

<u> 10.3 - Test Data</u>

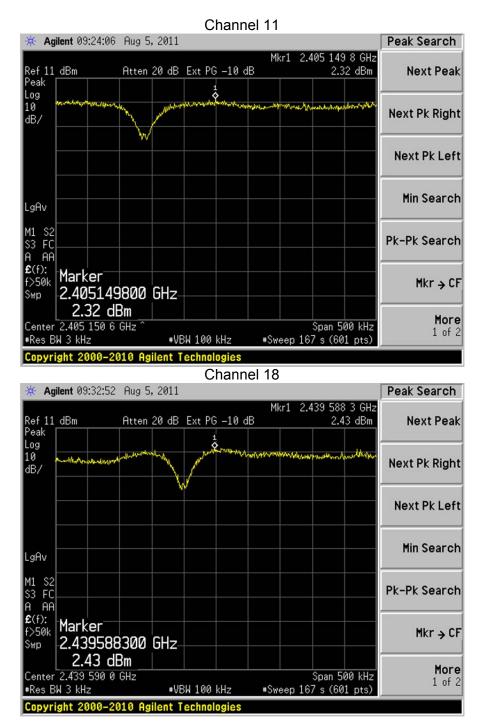
Channel	Center Frequency (MHz)	Power Measurement (dBm/3kHz)	Limit (dBm)	Margin (dB)
11	2405	2.32	+8.0	5.68
18	2440	2.43	+8.0	5.57
25	2475	3.04	+8.0	4.96

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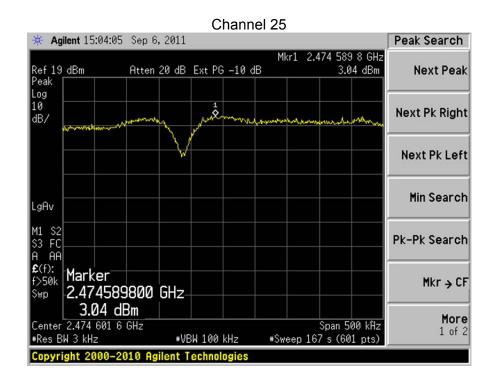
<u>10.4 - Screen Captures – Power Spectral Density</u></u>



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EXHIBIT 11. SPURIOUS CONDUCTED EMISSIONS: 15.247(d)

<u> 11.1 - Limits</u>

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 db below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

Remarks:

Applies to harmonics/spurious emissions that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209.

The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

MHz	MHz	MHz	GHz
0.090 – 0.110	162.0125 – 167.17	2310 – 2390	9.3 – 9.5
0.49 – 0.51	167.72 – 173.2	2483.5 – 2500	10.6 – 12.7
2.1735 – 2.1905	240 – 285	2655 – 2900	13.25 – 13.4
8.362 - 8.366	322 - 335.4	3260 - 3267	14.47 – 14.5
13.36 – 13.41	399.9 - 410	3332 – 3339	14.35 – 16.2
25.5 - 25.67	608 – 614	3345.8 – 3358	17.7 – 21.4
37.5 – 38.25	960 – 1240	3600 – 4400	22.01 – 23.12
73 – 75.4	1300 – 1427	4500 – 5250	23.6 - 24.0
108 – 121.94	1435 – 1626.5	5350 – 5460	31.2 – 31.8
123 – 138	1660 – 1710	7250 – 7750	36.43 - 36.5
149.9 – 150.05	1718.8 – 1722.2	8025 – 8500	Above 38.6
156.7 – 156.9	2200 – 2300	9000 - 9200	

FCC 47 CFR 15.205(a) - Restricted Frequency Bands

FCC 47 CFR 15.209(a) Field Strength Limits within Restricted Frequency Bands

Frequency (MHz)	Field Strength Limits (microvolts/m)	Distance (Meters)
0.009 – 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 – 30.0	30	30
30 - 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

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<u>11.2 – Conducted Harmonic and Spurious RF Measurements</u>

FCC Part 15.247(d) and IC RSS 210 A8.5 both require a measurement of conducted harmonic and spurious RF emission levels, as reference to the carrier level when measured in a 100 kHz bandwidth. For this test, the spurious and harmonic RF emissions from the EUT were measured at the EUT antenna port using a short RF cable. An Agilent E4445A spectrum analyzer was used with the resolution bandwidth set to 100 kHz for this portion of the tests. The unit was configured to run in a continuous transmit mode, while being supplied with typical data as a modulation source. The spectrum analyzer was used with measurements from a peak detector presented in the chart below. Screen captures were acquired and any noticeable spurious and harmonic signals were identified and measured.

No significant emissions could be noted within -50 dBc of the fundamental level for this product.

Frequency (MHz)	Channel	Level (dBm)
444	11	-50.24
846	11	-49.22
480	18	-51.81
540	25	-55.36

Frequency	Channel 11	Channel 18	Channel 25
Fundamental	+ 14.34 (dBm)	+ 14.60 (dBm)	+ 14.65 (dBm)
2 nd Harmonic	- 56.68 (dBm)	- 62.12 (dBm)	- 51.78 (dBm)
3 rd Harmonic	- 38.13 (dBm)	- 40.87 (dBm)	- 45.13 (dBm)
4 th Harmonic	- 57.60 (dBm)	- 57.09 (dBm)	- 55.23 (dBm)
5 th Harmonic	- 65.32 (dBm)	- 65.17 (dBm)	- 64.54 (dBm)
6 th Harmonic	- 63.86 (dBm)	Note (1)	Note (1)
7 th Harmonic	Note (1)	Note (1)	Note (1)
8 th Harmonic	Note (1)	Note (1)	Note (1)
9 th Harmonic	Note (1)	Note (1)	Note (1)
10 th Harmonic	Note (1)	Note (1)	Note (1)

Note 1): Measurement at system noise floor.

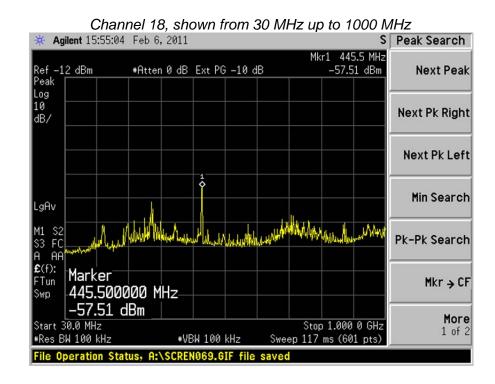
<u>11.3 - Test Equipment List</u>

A complete list of test equipment that was used for this test can be found in Appendix A.

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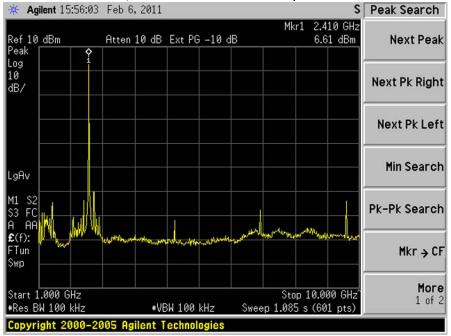
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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036



<u>11.4 - Screen Captures – Spurious Radiated Emissions</u>

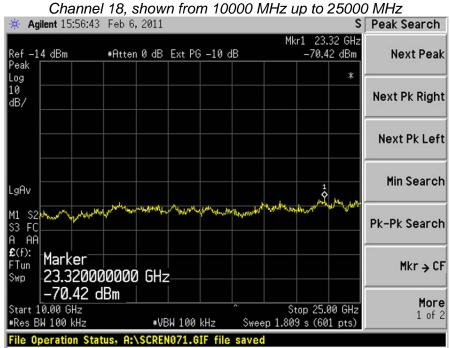




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EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036



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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

<u> APPENDIX A – Test Equipment List</u>

	ipment Calibration		Type Test	: Conducted Emiss	sions		Job #:	C-1036	
	y: Shane Rismeyer		Customer:				Quote #:		
Asset #	Description		Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status	
EE 960013	EMI Receiver		HP	8546A System	3617A00320;3448A		10/29/2011	Active Calibration	
EE 960014	EMI Receiver-filter section		HP	85460A	3448A00296	10/29/2010	10/29/2011	Active Calibration	
AA 960072	Transient Limiter		HP	11947A	3107A02515	10/8/2010	10/8/2011	Active Calibration	
AA 960008	LISN		EMCO	3816/2NM	9701-1057	1/4/2011	1/4/2012	Active Calibration	
		Project Engineer	Ere In	in		Quality Assurance	Auf de		
Wireles	SEARCH LLC SProduct Development ipment Calibration : 30-Nov-2010		Tupe Tect	: Power Spectral	Density		Job #	: C-1036	
					Densky		_ 000 #		
Prepared By	: Shane Rismeyer		Customer :	Eaton			Quote #	E 310306	
Asset #	Description		Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status	
AA 960143 EE 960073	Phaseflex Spectrum Analyzer		Gore Agilent	EKD01D01048.0 E4446A	5546519 US45300564	9/22/2011 9/22/2010	9/22/2012 9/22/2011	Active Calibration Active Calibration	
		Project Engineer	Ere In	in the second se	_	Quality Assuranc	fife.		
Wireles	SEARCH LLC s Product Development pment Calibration								
	: 30-Nov-2010		Type Test	Conducted Powe	er Output		Job # :	C-1036	
Date							Quote #:	310306	
	: Shane Rismeyer		Customer :	Eaton					
	: Shane Rismeyer Description		Customer : Manufacturer	Eaton Model #	Serial #	Cal Date		Equipment Status	
Prepared By					Serial # 5546519 US45300564	Cal Date 9/22/2011 9/22/2010		Equipment Status Active Calibration Active Calibration	

Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

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	Date	: <u>30-Nov-2010</u>	Type Tes	t: Occupied Band	width (6dB & 20d	IB)	Job 4	#: <u>C-1036</u>	-
	Prepared By	: Shane Rismeyer	Customer :	Eaton			Quote	#:_310306	-
No.	Asset #	Description	Manufacturer	Model #	Serial #	Cal Date	Cal Due Date	Equipment Status	
1 2	AA 960143 EE 960073	Phaseflex Spectrum Analyzer	Gore Agilent	EKD01D01048.0 E4446A	5546519 US45300564	9/22/2011 9/22/2010	9/22/2012 9/22/2011	Active Calibration Active Calibration	
-		Project Engin	eer: Ere H	2 million		Quality Assuran	ce: Aufich		
		SEARCH LLC							
2	Wireles	s Product Development pment Calibration							
2	Wireles Equi	s Product Development	Type Test	Radiated Emissi	ons		Job#	<u>C-1036</u>	
2	Wireles Equi	s Product Development pment Calibration	Type Test Customer :		ons		_	: <u>C-1036</u> : <u>310306</u>	
No.	Wireles Equi	s Product Development pment Calibration : <u>30-Nov-2010</u>			Ons Serial #	Cal Date	_		
	Wireles Equi Date Prepared By	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer	Customer :	Eaton		Cal Date 9/22/2010	Quote #	: 310306	
1 2	Wireles Equi Date Prepared By Asset # EE 960073 AA 960144	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer Description	Customer : Manufacturer	Eaton Model #	Serial #		Quote #	: 310306 Equipment Status	
1 2 3	Wireles Equi Date Prepared By Asset # EE 360073 AA 360144 EE 360158	s Product Development pment Calibration 30-Nov-2010 Shane Rismeyer Description Spectrum Analyzer Phaseflex RF Preselecter	Customer : Manufacturer Agilent Gore Agilent	Eaton Model # E4446A EKD01D010720 N9039A	Serial # US45300564 5800373 MY46520110	9/22/2010 6/4/2010 6/7/2010	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011	310306 Equipment Status Active Calibration Active Calibration Active Calibration	
1 2 3 4	Asset # Equination of the second seco	s Product Development pment Calibration : 30-Nov-2010 : Shane Plismeyer Description Spectrum Analyzer Phasellex RF Preselecter 314-13.2614 Spectrum Analyzer	Customer : Manufacturer Agilent Gore Agilent Agilent	Eaton Model # E4446A EKD01D010720 N9039A E4445A	Serial # US45300564 5800373 MY46520110 MY48250225	9/22/2010 6/4/2010 6/7/2010 6/7/2010	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011 6/7/2011	Equipment Status Calibration Active Calibration Active Calibration Active Calibration	
1 2 3 4 5	Wireles Equi Date Prepared By Asset # EE 960073 AA 960144 EE 960158 EE 960157 EE 960157 EE 960130	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer Description Spectrum Analyzer Phaseflex RF Preselecter 3Hz-13.2GHz Spectrum Analyzer Multi-Device Controller	Customer : Manufacturer Agilent Gore Agilent Agilent ETS	Eaton Model # E4446A EKD01D010720 N3033A E4445A 2090	Serial # US45300564 5800373 MY4652010 MY48250225 45968	9/22/2010 6/4/2010 6/7/2010 6/7/2010 XXX	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011 6/7/2011 XXX	310306 Equipment Status Active Calibration Active Calibration Active Calibration Active Calibration Calibration Cal Not Required	
1 2 3 4 5 6	Wireles Equi Date: Prepared By Asset # EE 960073 AA 96014 EE 960158 EE 960157 EE 960150 AA 960078	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer Description Spectrum Analgzer Phaseliex RF Preselecter 3Hs-12.2GHz Spectrum Analgzer Multi-Device Controller Log Periodic Antenna	Customer : Manufacturer Agilent Gore Agilent Agilent ETS EMCO	Eaton Model # E4446A EKD01D010720 N9039A E4445A 2090 93146	Serial # US45300564 5800373 MY4652010 MY4825025 45968 9701-4855	9/22/2010 6/4/2010 6/7/2010 6/7/2010 XXX 10/19/2010	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011 6/7/2011 XXX 10/19/2011	310306 Equipment Status Active Calibration Active Calibration Active Calibration Cal Not Required Active Calibration	
1 2 3 4 5 6 7	Wireles Equi Date Prepared By Asset # EE 960073 AA 960178 EE 960157 EE 960157 EE 960157 EE 960157 AA 960078 AA 960078	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer Description Spectrum Analyzer Phaseflex RF Preselecter 314-13.261k Spectrum Analyzer Multi-Device Controller Log Periodic Antenna Bicon Antenna	Customer : Manufacturer Agilent Gore Agilent Agilent ETS EMCO ETS	Eaton Model # E4446A EKD01D010720 N9039A E4445A 2090 93146 3110B	Serial # US45300564 5800373 MY4652010 MY48250225 45968 9701-4855 0003-3346	9/22/2010 6/4/2010 6/7/2010 6/7/2010 XXX 10/19/2010 10/19/2010	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011 6/7/2011 10/19/2011 10/19/2011	310306 Equipment Status Active Calibration Active Calibration Active Calibration Cal Not Required Active Calibration Active Calibration Active Calibration	
1 2 3 4 5 6 7 8	Wireles Equi Date Prepared By EE 960073 AA 960144 EE 960157 EE 960157 EE 960157 EE 960157 EE 960150 AA 960078 AA 960078	s Product Development pment Calibration 30-Nov-2010 Shane Rismeyer Description Spectrum Analyzer Phaseflex RF Preselecter 31b-132.0ftx Spectrum Analyzer Multi-Device Controller Log Periodic Antenna Bicon Antenna Double Ridge Horn Antenna	Customer : Manufacturer Agilent Agilent Agilent ETS EMCO ETS EMCO	Eaton Model # E4446A EKD0ID010720 N9039A E4445A 2090 33146 3110B 3115	Serial # US45300564 5800373 MY46520110 MY48250225 45968 9701-4855 0003-3346 9311-4138	9/22/2010 6/4/2010 6/7/2010 6/7/2010 XXX 10/19/2010 10/19/2010 11/9/2010	Quote # Cal Due Date 9/22/2011 6/7/2011 6/7/2011 6/7/2011 0/19/2011 10/19/2011 10/19/2011	310306 Equipment Status Active Calibration Active Calibration Active Calibration Call Not Required Active Calibration Active Calibration Active Calibration Active Calibration	
1 2 4 5 6 7 8 9	Wireles Equi Date Prepared By Asset # EE 960073 AA 960178 EE 960157 EE 960157 EE 960157 EE 960157 AA 960078 AA 960078	s Product Development pment Calibration : 30-Nov-2010 : Shane Rismeyer Description Spectrum Analyzer Phaseflex RF Preselecter 314-13.261k Spectrum Analyzer Multi-Device Controller Log Periodic Antenna Bicon Antenna	Customer : Manufacturer Agilent Gore Agilent Agilent ETS EMCO ETS	Eaton Model # E4446A EKD01D010720 N9039A E4445A 2090 93146 3110B	Serial # US45300564 5800373 MY4652010 MY48250225 45968 9701-4855 0003-3346	9/22/2010 6/4/2010 6/7/2010 6/7/2010 XXX 10/19/2010 10/19/2010	Quote # Cal Due Date 9/22/2011 6/4/2011 6/7/2011 6/7/2011 10/19/2011 10/19/2011	310306 Equipment Status Active Calibration Active Calibration Active Calibration Cal Not Required Active Calibration Active Calibration Active Calibration	

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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

APPENDIX B – Test Standards: CURRENT PUBLICATION DATES RADIO

STANDARD # DATE Am. 1 Am. 2 ANSI C63.4 2009 IEC 61000-44 2004-07 2010-10 ANSI C63.10 2009 IEC 61000-44 2004-07 2010-10 CISPR 11 2007-05 IEC 61000-45 2008-10 IEC 61000-45 2008-10 CISPR 14-1 2005-11 2008-11 2008-05 IEC 61000-45 2008-03 IEC 61000-45 2008-00 CISPR 14-1 2005 2004-04 2006-07 IEC 61000-41 2006-06 IEC 61000-41 2006-06 IEC 61000-41 2006-06 IEC 61000-41 2008-06 IEC 61000-41 2007-06 IEC 61000-41 IEC 61000-41 2007-06 IEC 61000-41 IEC 61000-41 IEC 61000-41 2007-06 IEC 61000-41					-				
ANSI C63.10 2009 Image: constraint of the second s	STANDARD #	DATE	Am. 1	Am. 2		STANDARD #	DATE	Am. 1	Am. 2
CISPR 11 2009-05 2009-12 P CISPR 12 2007-05 2008-10 IEC 61000-4.8 2008-00 CISPR 14-1 2005-11 2008-05 IEC 61000-4.1 2004-03 IEC 61000-4.1 2004-03 CISPR 16-1-2 Note 1 2010-01 IEC 61000-4.1 2006-06 IEC 61000-4.1 2006-06 CISPR 22 2006-09 IEC 61000-4.1 2007-06 IEC 61000-4.1 2007-06 EN 55014-1 2006 IEC 61000-4.1 2007-06 IEC 61000-4.1 2007-06 EN 55014-1 2006 IEC 61000-4.1 2007-06 IEC 6100-4.1 2007-06 EN 61000-4.2 2006-05 IEC 61000-4.3 2007-05 IEC 61000-4.3 2007-06 EN 61000-4.2 2006-05 IEC 61000-4.3 2007-06 IEC 6100-10 IEC 61000-1	ANSI C63.4	2009				IEC 61000-4-4	2004-07	2010-10	
CISPR 12 2007-05 IEC 61000-4-8 2009-09 CISPR 14-1 2005-11 2008-11 2008-01 IEC 61000-4-11 2004-03 CISPR 15-1 Note 1 2010-01 IEC 61000-5-11 2005-03 IEC 61000-5-12 2005-03 CISPR 15-1 Note 1 2003 2004-04 2006-07 ISO 14982 1998-07 IEC 61000-5-11 2006 CISPR 24 1997-09 2001-07 2002-10 RSS GEN 2007-06 IEC 81000-41 2006 EN 55014-1 2006 IEC 81000-5-13 2007-06 IEC 81000-5-13 IEC 81000-5-13 IEC 81000-5-14 IEC 81000-5-14 IEC 81000-5-14 IEC 81000-5-14 IEC 8100-5-2 IEC 81000-5-2 IEC 81000-5-2 IEC 81000-5-2 IEC 81000-5-2 IEC 81000-4-4 IEC 81000-4-4 IEC 81000-4-4 IEC 81000-4-11 IEC 81000-4-1	ANSI C63.10	2009				IEC 61000-4-5	2005-11		
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CLSPR 14-2 2001-11 2008-05 CISPR 15-1-1 Note 1 2010-01 2006-06 2006-06 CISPR 22 2008-09 2001-07 2002-10 EC 61328-11 2007 CISPR 24 1997-09 2001-07 2002-10 RSS ELP 2007-06 2007-06 EN 55014 2006 2007 2002-10 RSS ELP 2007-06 2007-06 EN 55022 2006-05 2007-03 2002-10 RSS 119 2007-06 EN 61000-3.2 2006-05 2008-05 2008-05 RSS 213 2009-12 2007-06 EN 61000-4.3 2006-07 2008-05 2007-06 2007-06 2007-06 2007-06 2007-06 2007-06 2007-06 2001-0 RSS 213 2002-11 RSS 243 2005-11 2006-05 2006-12 2007-06 2007-12 2001-0 2007-06 2007-12 2001-0 2007-06 2007-12 2001-0 2007-12 2001-0 2001-0 2001-12 2001-12 2001-12 2001-12 2001-12 2001-12 <	CISPR 12	2007-05				IEC 61000-4-8	2009-09		
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EN 55011 2007-05 RSS 119 2007-06 EN 55014-2 1997 EN 55022 2006 2007 EN 55022 2006 2007 EN 55022 2006 2007 EN 5003-2 2006-05 EN 61000-32 2008-05 EN 61000-42 2009-05 EN 61000-43 2006-07 2008-05 EN 61000-43 2006-12 EN 61000-44 2004 EN 61000-45 2006-12 EN 61000-46 2009-05 EN 61000-47 2006-12 EN 61000-48 1994 2001 EN 61000-6-1 2007-02 EN 61000-6-2 2007-02 FCC Public Notice DA 00-1407 2000 FCC Public Notice DA 00-1407 2000 FCC Public Notice DA 00-1407 2000 ICES 001 2006-08 ICES 001 2006-08 <t< td=""><td>CISPR 22</td><td>2008-09</td><td></td><td></td><td></td><td>MIL Std. 461E</td><td>1999-08</td><td></td><td></td></t<>	CISPR 22	2008-09				MIL Std. 461E	1999-08		
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EN 61000-3-3 2008-12 Image: constraint of the second	EN 60601-1-2	2007-03				RSS 136	2002-10		
EN 61000-4-2 2009-05 M RSS 213 2005-12 M EN 61000-4-3 2006-07 2008-05 RSS 243 2005-11 M EN 61000-4-4 2004 M RSS 213 2005-12 M EN 61000-4-5 2006-07 2008-05 M M M M EN 61000-4-6 2009-05 M M M M M M EN 61000-4-8 1994 2001 M M M M M EN 61000-6-1 2007-02 M M M M M M M EN 61000-6-2 2007-02 M M M M M M FCC 47 CFR, Parts 0-15, 18, 2008 M M M M M FCC Public Notice DA 00-1407 2000 M M M M M FCC Procedures 2007 M M M M M M ICES 003 2004-02	EN 61000-3-2	2006-05				RSS 137	2009-02		
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FCC Public Notice DA 00-1407 2000 Image: Constant of the second sec	EN 61000-6-4	2007-02			1				
FCC ET Docket # 99-231 2002 Image: Constraint of the second	FCC 47 CFR, Parts 0-15, 18,	2008			1				
FCC Procedures 2007 Image: Constraint of the system o	FCC Public Notice DA 00-1407	2000							
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ICES 002 2009-08 Image: marked state stat	FCC Procedures	2007							
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	IEC 61000-4-3	2008-04							
					1	Note 1: Test	not on LSR So	cope of Accredit	ation.

Updated on 02-03-10 P=Project FD= Final Draft

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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

APPENDIX C - Uncertainty Statement

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level, using a coverage factor of k=2.

Measurement Type	Particular Configuration	Uncertainty Values
Radiated Emissions	3 – Meter chamber, Biconical Antenna	4.24 dB
Radiated Emissions	3-Meter Chamber, Log Periodic Antenna	4.8 dB
Radiated Emissions	10-Meter OATS, Biconical Antenna	4.18 dB
Radiated Emissions	10-Meter OATS, Log Periodic Antenna	3.92 dB
Conducted Emissions	Shielded Room/EMCO LISN	1.60 dB
Radiated Immunity	3 Volts/Meter in 3-Meter Chamber	1.128 Volts/Meter
Conducted Immunity	3 Volts level	1.0 V

Table of Expanded Uncertainty Values, (K=2) for Specified Measurements

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Prepared For: Eaton	Model Number: 6D32429G01	Report #: 310306
EUT: Smart Receptacle	Serial Number: N/A	LSR Job #: C-1036

APPENDIX D - Justifications of Average Duty Factor Calculations

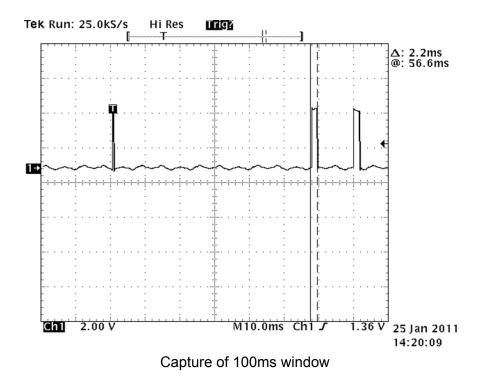
Average (Relaxation) Factor Average Factor = 20* Log₁₀ (EUT On-time over Transmission Cycle)

The three transmit packets occupy 6 ms of time, and the transmit cycle is 70 ms. Therefore, the relaxation factor allowance is calculated as:

Average Factor = 20* Log₁₀ (6ms / 70 ms) = -21.34 dB

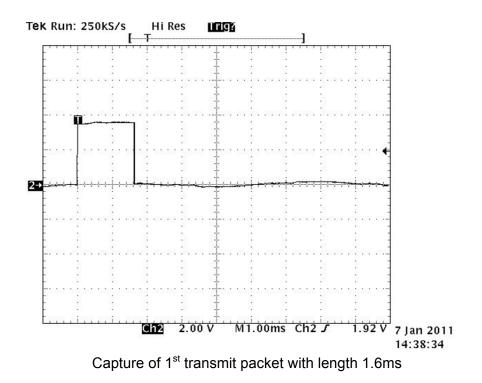
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A relaxation factor of -21.34 dB would be allowable for this product.



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