Leviton Manufacturing Company

Wireless PIR Ceiling Sensor (000-WSC15-I0W)

Report No. LEVT0011.1

Report Prepared By

NORTHWEST EMC

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

EMC Test Report

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: October 15, 2008
Leviton Manufacturing Company
Model: Wireless PIR Ceiling Sensor (000-WSC15-I0W)

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Spurious Radiated Emissions	FCC 15.231:2007	ANSI C63.4: 2003	**Pass**
Spurious Radiated Emissions	FCC 15.205:2007	ANSI C63.4:2003	**Pass**
Field Strength of Fundamental	FCC 15.231:2007	ANSI C63.4: 2003	**Pass**
AC Powerline Conducted Emissions	FCC 15.207:2007	ANSI C63.4: 2003	**Pass**
Occupied Bandwidth	FCC 15.231:2007	ANSI C63.4: 2003	**Pass**
Duty Cycle	FCC 15.231:2007	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:
Ethan Schoonover, Sultan Lab 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		

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.

TÜV Product Service: Included in TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0604C.

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

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).*

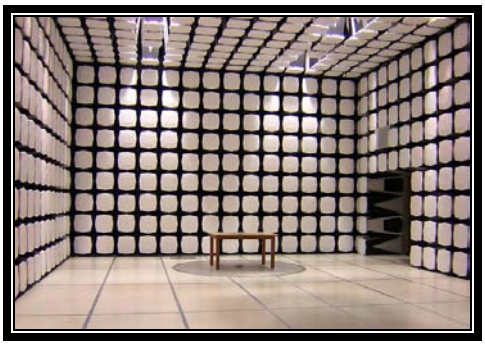
BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017). License No.SL2-IN-E-1017.

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

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

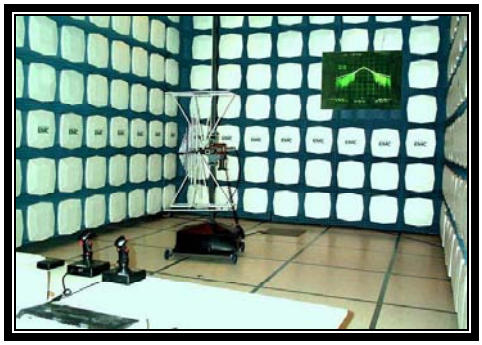
SCOPE

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:	Leviton Manufacturing Company
Address:	20497 SW Teton Avenue
City, State, Zip:	Tualatin, OR 97062
Test Requested By:	Dan Wright
Model:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)
First Date of Test:	October 14, 2008
Last Date of Test:	October 15, 2008
Receipt Date of Samples:	October 14, 2008
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
Occ Sensor

Testing Objective:
TCB Certification under FCC 15.231

CONFIGURATION 1 LEVT0011

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wireless PIR Ceiling Sensor (typical)	Leviton Manufacturing Company	000-WSC15-I0W	Unit 05

CONFIGURATION 4 LEVT0011

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wireless PIR Ceiling Sensor (CW)	Leviton Manufacturing Company	000-WSC15-I0W	Unit 04

CONFIGURATION 6 LEVT0011

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wireless PIR Ceiling Sensor (CW)	Leviton Manufacturing Company	000-WSC15-I0W	Unit 04
Power Supply	CUI Stack	DV-51AAT	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Power	PA	2.0m	PA	Wireless PIR Ceiling Sensor (CW)	Power Supply
AC Power	PA	2.0m	PA	Power Supply	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	10/14/2008	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	10/14/2008	Duty Cycle	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	10/14/2008	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.
4	10/15/2008	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	10/15/2008	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was complete.

SPURIOUS RADIATED EMISSIONS

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

MODES OF OPERATION

Transmitting CW

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	3200 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2007	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	5/19/2008	13
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	24
EV01 Cables		Bilog Cables	EVA	5/19/2008	13
High Pass Filter 1.2 - 18 GHz	Micro-Tronics	HPM50108	HFV	5/21/2008	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/19/2008	13
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
EV01 Cables		Double Ridge Horn Cables	EVB	5/19/2008	13

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The single, integral antenna to be used with the EUT was tested. The EUT was configured for un-modulated, CW operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.4:1992).

A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

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

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

Where “On time” = N1L1 +N2L2 +….

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

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

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

Period = 100 mSec

Pulsewidth of Pulse = 1.201 mSec

Number of Pulses = 5

Duty Cycle = ((5)(1.201 ms)) / 100 ms = 0.06

Duty Cycle Correction = 20 log [((5)(1.201 ms)) / 100] = -24.4 dB

The duty cycle correction factor of –24.4 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz for measurements at or below 1GHz. Above 1GHz, a resolution bandwidth of 1MHz and a video bandwidth of 3MHz was used.

The field strength of the spurious emissions meet the limits as defined in 47 CFR 15.231(b). The spurious emissions also meet the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions. Further, spurious emissions meet the provisions of 15.205 using the measurement instrumentation specified in that section.

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)	Work Order:	LEVT0011
Serial Number:	Unit 4	Date:	10/15/08
Customer:	Leviton Manufacturing Company	Temperature:	23°C
Attendees:	None	Humidity:	28%
Project:	None	Barometric Pres.:	30.46 in
Tested by:	Rod Peloquin	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.231(b):2007	ANSI C63.4:2003
FCC 15.205:2007	ANSI C63.4:2003

TEST PARAMETERS

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

COMMENTS

None

EUT OPERATING MODES

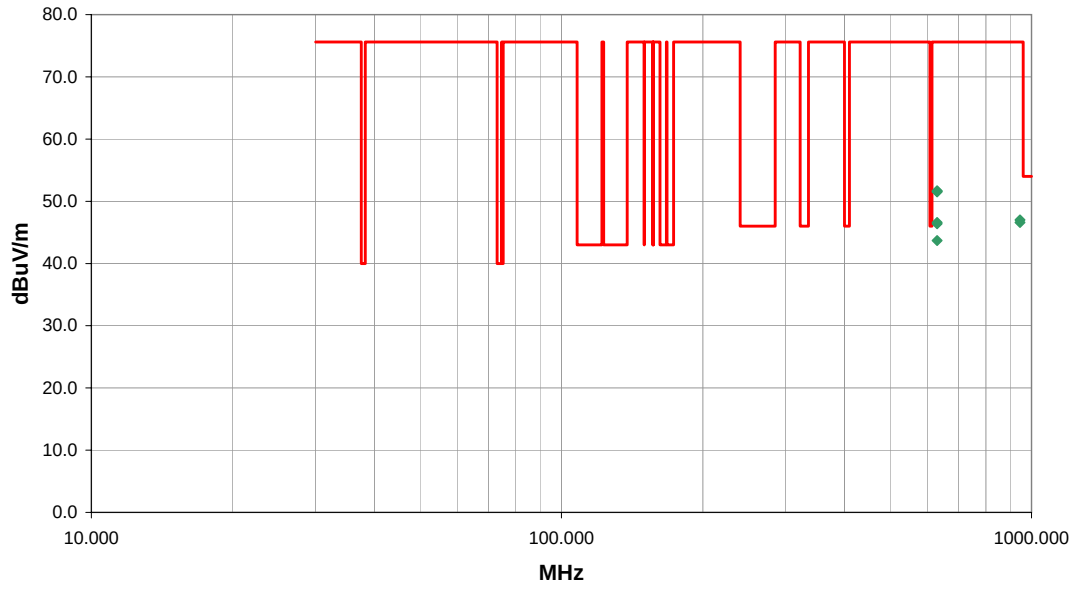
Transmitting CW

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3
Configuration #	4
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
629.962	32.9	8.8	347.0	1.0	0.0	10.0	V-Bilog	PK	0.0	51.7	75.6	-23.9	EUT vertical
629.970	32.8	8.8	83.0	1.4	0.0	10.0	H-Bilog	PK	0.0	51.6	75.6	-24.0	EUT on side
629.962	32.7	8.8	93.0	1.4	0.0	10.0	H-Bilog	PK	0.0	51.5	75.6	-24.1	EUT horizontal
944.954	24.8	12.2	283.0	1.2	0.0	10.0	V-Bilog	PK	0.0	47.0	75.6	-28.6	EUT vertical
629.959	27.8	8.8	155.0	1.2	0.0	10.0	V-Bilog	PK	0.0	46.6	75.6	-29.0	EUT horizontal
944.967	24.4	12.2	78.0	1.6	0.0	10.0	H-Bilog	PK	0.0	46.6	75.6	-29.0	EUT on side
629.925	27.6	8.8	159.0	1.2	0.0	10.0	V-Bilog	PK	0.0	46.4	75.6	-29.2	EUT on side
629.990	24.9	8.8	76.0	1.5	0.0	10.0	H-Bilog	PK	0.0	43.7	75.6	-31.9	EUT vertical

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS DATA SHEET

PSA 2007.07.21
EMI 2008.7.3

EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)	Work Order:	LEVT0011
Serial Number:	Unit 4	Date:	10/15/08
Customer:	Leviton Manufacturing Company	Temperature:	23°C
Attendees:	None	Humidity:	28%
Project:	None	Barometric Pres.:	30.46 in
Tested by:	Rod Peloquin	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.231(b):2007	ANSI C63.4:2003
FCC 15.205:2007	ANSI C63.4:2003

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

COMMENTS

None

EUT OPERATING MODES

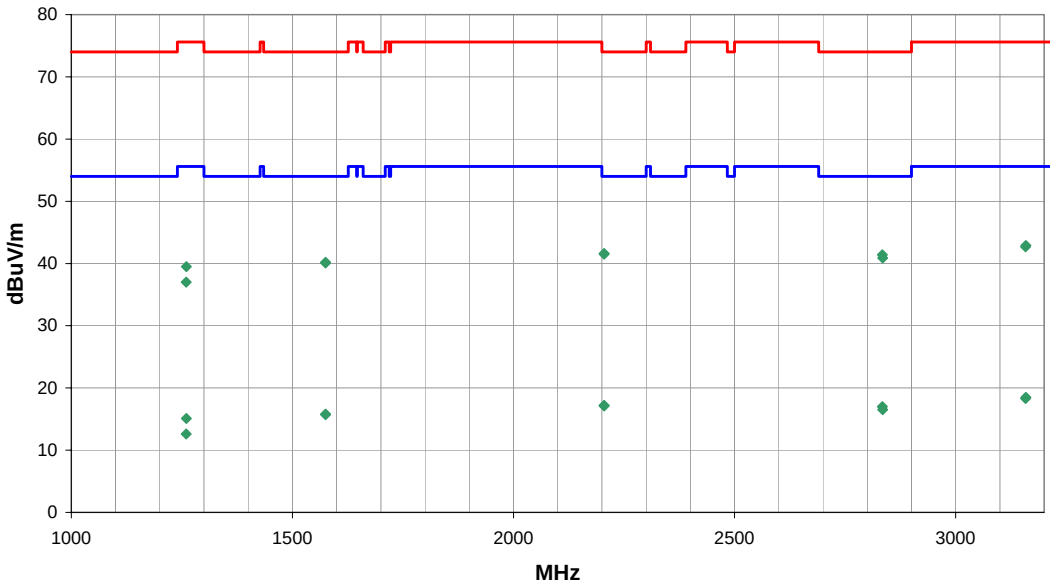
Transmitting CW

DEVIATIONS FROM TEST STANDARD

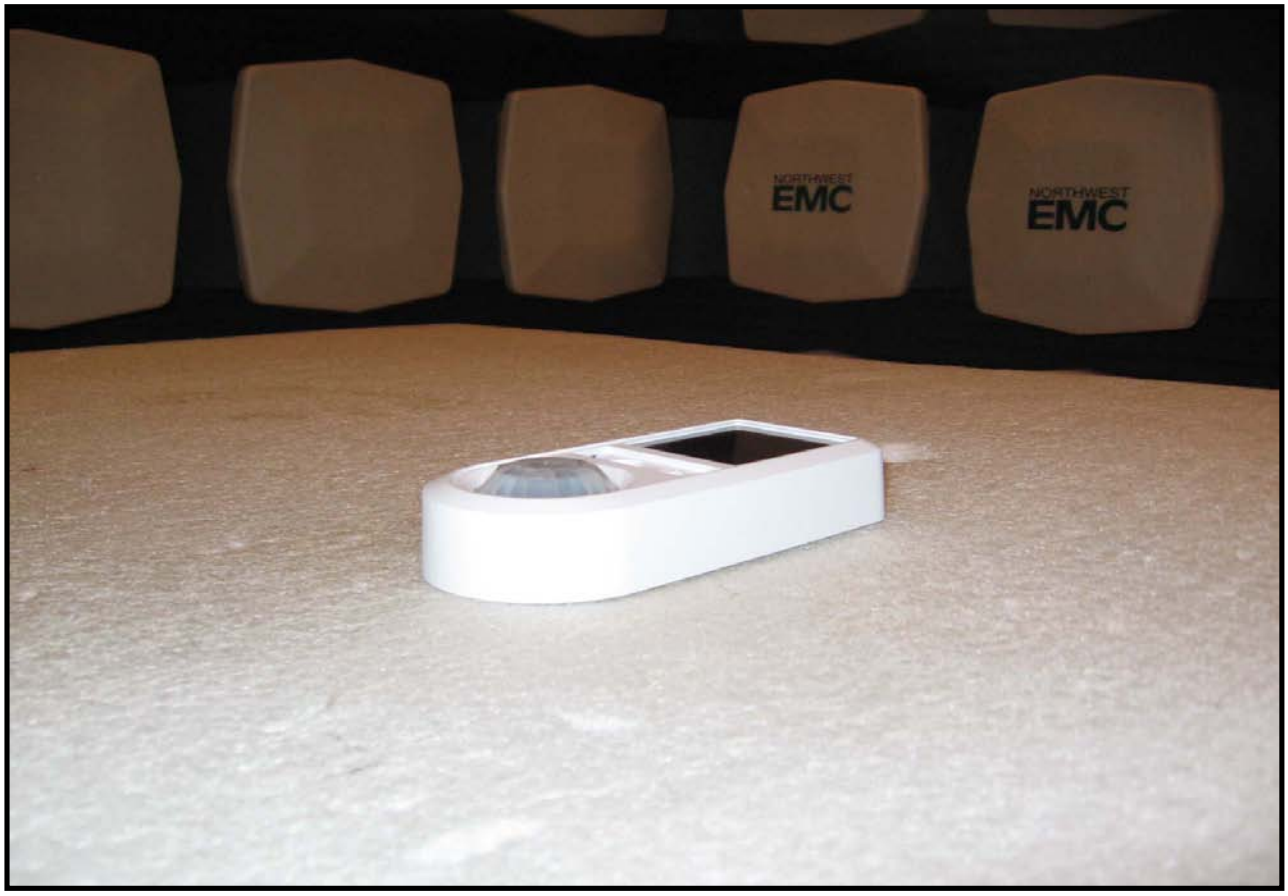
No deviations.

Run #	4
Configuration #	4
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2204.810	40.7	0.9	94.0	1.0	0.0	0.0	H-Horn	PK	0.0	41.6	74.0	-32.4	EUT horizontal
2204.926	40.6	0.9	9.0	1.0	0.0	0.0	V-Horn	PK	0.0	41.5	74.0	-32.5	EUT vertical
2834.291	38.1	3.3	41.0	1.0	0.0	0.0	H-Horn	PK	0.0	41.4	74.0	-32.6	EUT horizontal
3158.660	37.4	5.5	360.0	3.3	0.0	0.0	H-Horn	PK	0.0	42.9	75.6	-32.7	EUT horizontal
3158.130	37.2	5.5	265.0	1.0	0.0	0.0	V-Horn	PK	0.0	42.7	75.6	-32.9	EUT vertical
2835.081	37.6	3.3	-1.0	1.3	0.0	0.0	V-Horn	PK	0.0	40.9	74.0	-33.1	EUT vertical
1574.922	42.6	-2.4	15.0	1.0	0.0	0.0	V-Horn	PK	0.0	40.2	74.0	-33.8	EUT vertical
1575.005	42.5	-2.4	100.0	1.0	0.0	0.0	H-Horn	PK	0.0	40.1	74.0	-33.9	EUT horizontal
1259.994	42.8	-3.3	8.0	1.4	0.0	0.0	V-Horn	PK	0.0	39.5	75.6	-36.1	EUT vertical
2204.810	40.7	0.9	94.0	1.0	24.4	0.0	H-Horn	AV	0.0	17.2	54.0	-36.8	EUT horizontal
2204.926	40.6	0.9	9.0	1.0	24.4	0.0	V-Horn	AV	0.0	17.1	54.0	-36.9	EUT vertical
2834.291	38.1	3.3	41.0	1.0	24.4	0.0	H-Horn	AV	0.0	17.0	54.0	-37.0	EUT horizontal
3158.660	37.4	5.5	360.0	3.3	24.4	0.0	H-Horn	AV	0.0	18.5	55.6	-37.1	EUT horizontal
3158.130	37.2	5.5	265.0	1.0	24.4	0.0	V-Horn	AV	0.0	18.3	55.6	-37.3	EUT vertical
2835.081	37.6	3.3	-1.0	1.3	24.4	0.0	V-Horn	AV	0.0	16.5	54.0	-37.5	EUT vertical
1574.922	42.6	-2.4	15.0	1.0	24.4	0.0	V-Horn	AV	0.0	15.8	54.0	-38.2	EUT vertical
1575.005	42.5	-2.4	100.0	1.0	24.4	0.0	H-Horn	AV	0.0	15.7	54.0	-38.3	EUT horizontal
1259.887	40.3	-3.3	110.0	1.0	0.0	0.0	H-Horn	PK	0.0	37.0	75.6	-38.6	EUT horizontal
1259.994	42.8	-3.3	8.0	1.4	24.4	0.0	V-Horn	AV	0.0	15.1	55.6	-40.5	EUT vertical
1259.887	40.3	-3.3	110.0	1.0	24.4	0.0	H-Horn	AV	0.0	12.6	55.6	-43.0	EUT horizontal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Spurious Radiated Emissions

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.

MODES OF OPERATION

Transmitting CW

POWER SETTINGS INVESTIGATED

120V/60Hz

CONFIGURATIONS INVESTIGATED

LEVT0011 - 6

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARH	8/28/2008	12 mo
EV07 Cables		Conducted Cables	EVG	5/2/2008	13 mo
Attenuator	Coaxicom	66702 2910-20	ATO	6/30/2008	13 mo
High Pass Filter	T.T.E.	7766	HFG	2/5/2008	13 mo
LISN	Solar	9252-50-R-24-BNC	LIR	1/4/2008	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

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is 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.

NORTHWEST
EMC

PSA-ESCI 2008.07.07
Version 2008.3.31

AC POWERLINE CONDUCTED EMISSIONS

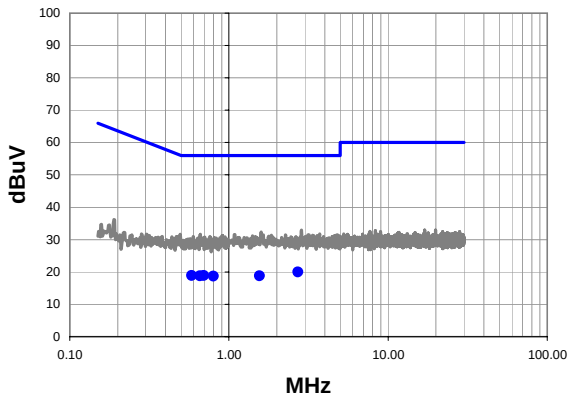
Work Order:	LEVT0011	**Date:**	10/15/08		
Project:	None	**Temperature:**	21		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	Unit 04	**Barometric Pres.:**	1024.7	**Tested by:**	Jennifer Herrett

EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)
Configuration:	6 - OCC Sensor with DC Supply
Customer:	Leviton Manufacturing Company
Attendees:	Dan Wright
EUT Power:	120V/60Hz
Operating Mode:	Transmitting CW
Deviations:	No deviations.
Comments:	None

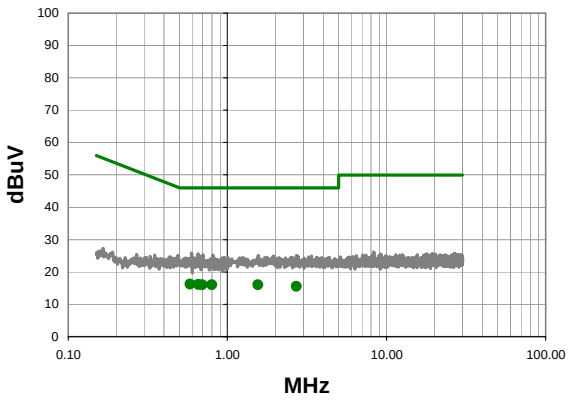
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2007		ANSI C63.4:2003

Run #	9	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

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)
2.716	-0.6	20.6	20.0	56.0	-36.0
0.583	-1.9	20.8	18.9	56.0	-37.1
0.697	-1.9	20.8	18.9	56.0	-37.1
0.659	-2.0	20.8	18.8	56.0	-37.2
1.560	-1.8	20.6	18.8	56.0	-37.2
0.798	-2.0	20.7	18.7	56.0	-37.3

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.583	-4.6	20.8	16.2	46.0	-29.8
0.659	-4.7	20.8	16.1	46.0	-29.9
0.697	-4.7	20.8	16.1	46.0	-29.9
0.798	-4.7	20.7	16.0	46.0	-30.0
1.560	-4.6	20.6	16.0	46.0	-30.0
2.716	-5.1	20.6	15.5	46.0	-30.5

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

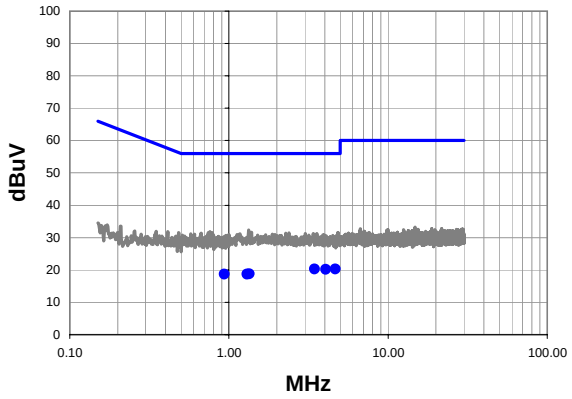
PSA-ESCI 2008.07.07
Version 2008.3.31

Work Order:	LEVT0011	**Date:**	10/15/08		
Project:	None	**Temperature:**	21		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	Unit 04	**Barometric Pres.:**	1024.7	**Tested by:**	Jennifer Herrett
EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)				
Configuration:	6 - OCC Sensor with DC Supply				
Customer:	Leviton Manufacturing Company				
Attendees:	Dan Wright				
EUT Power:	120V/60Hz				
Operating Mode:	Transmitting CW				
Deviations:	No deviations.				
Comments:	None				

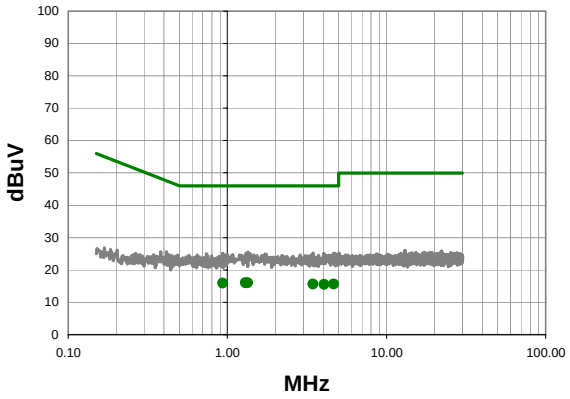
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2007		ANSI C63.4:2003

Run #	10	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit

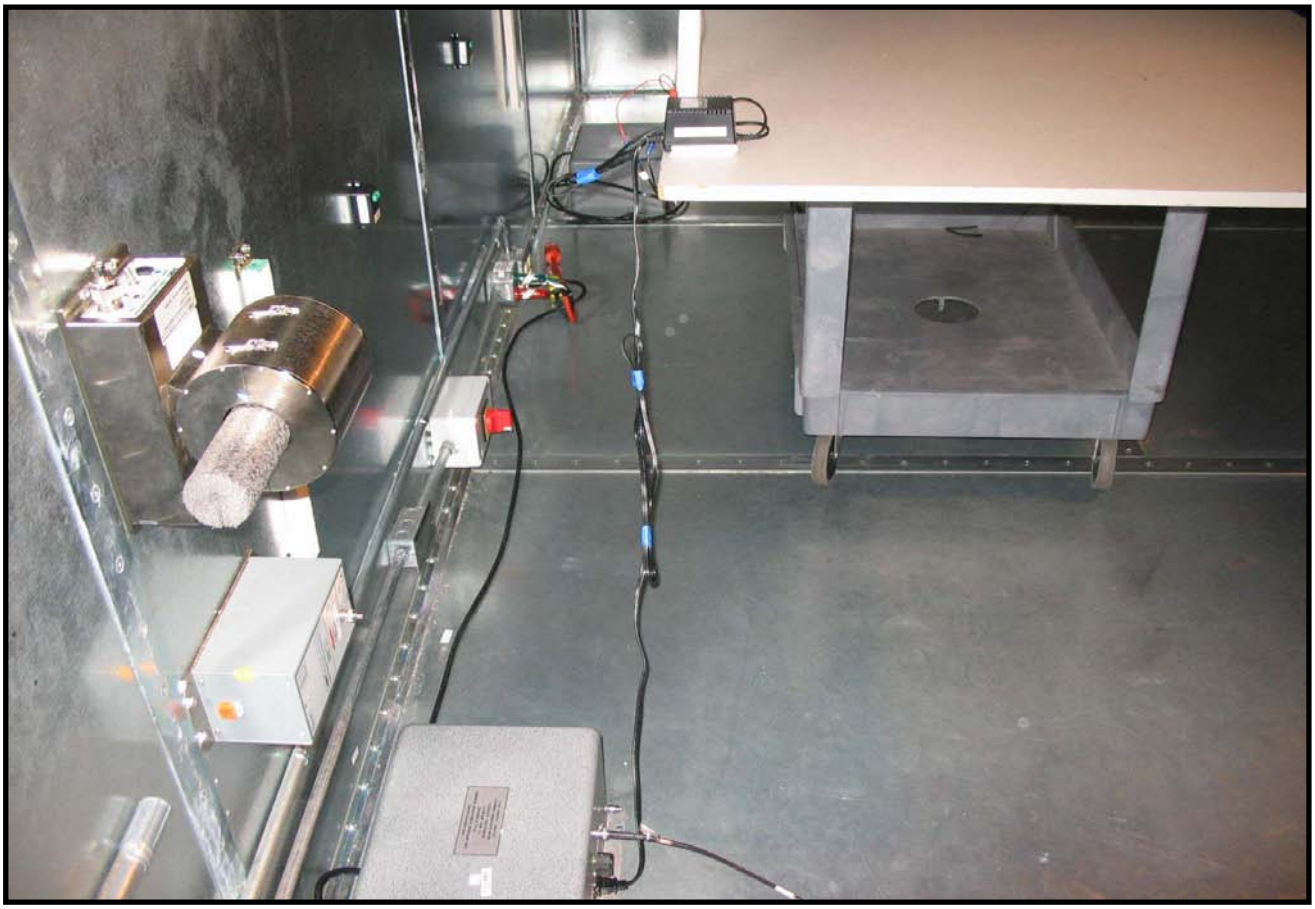


Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
3.448	-0.3	20.6	20.3	56.0	-35.7
4.660	-0.4	20.6	20.2	56.0	-35.8
4.060	-0.5	20.6	20.1	56.0	-35.9
1.344	-1.8	20.6	18.8	56.0	-37.2
0.935	-1.9	20.6	18.7	56.0	-37.3
1.300	-1.9	20.6	18.7	56.0	-37.3

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
1.344	-4.6	20.6	16.0	46.0	-30.0
1.300	-4.6	20.6	16.0	46.0	-30.0
0.935	-4.7	20.6	15.9	46.0	-30.1
4.660	-5.0	20.6	15.6	46.0	-30.4
3.448	-5.0	20.6	15.6	46.0	-30.4
4.060	-5.1	20.6	15.5	46.0	-30.5



OCCUPIED BANDWIDTH

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4407B	AAU	12/7/2007	13
Near Field Probe	EMCO	7405	IPD	NCR	0

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The occupied bandwidth is required to be no wider that 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

The measurement was made using near field probe near the integral antenna of the EUT to the input of the spectrum analyzer. The EUT was transmitting at its maximum data rate.

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2007.06.13

EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)			**Work Order:**	LEVT0011
Serial Number:	Unit 5			**Date:**	10/14/08
Customer:	Leviton Manufacturing Company			**Temperature:**	23°C
Attendees:	Dan Wright			**Humidity:**	28%
Project:	None			**Barometric Pres.:**	30.46 in
Tested by:	Rod Peloquin	**Power:**	Battery	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.231:2007	ANSI C63.4:2003

COMMENTS

Manually triggered with typical data rate

DEVIATIONS FROM TEST STANDARD

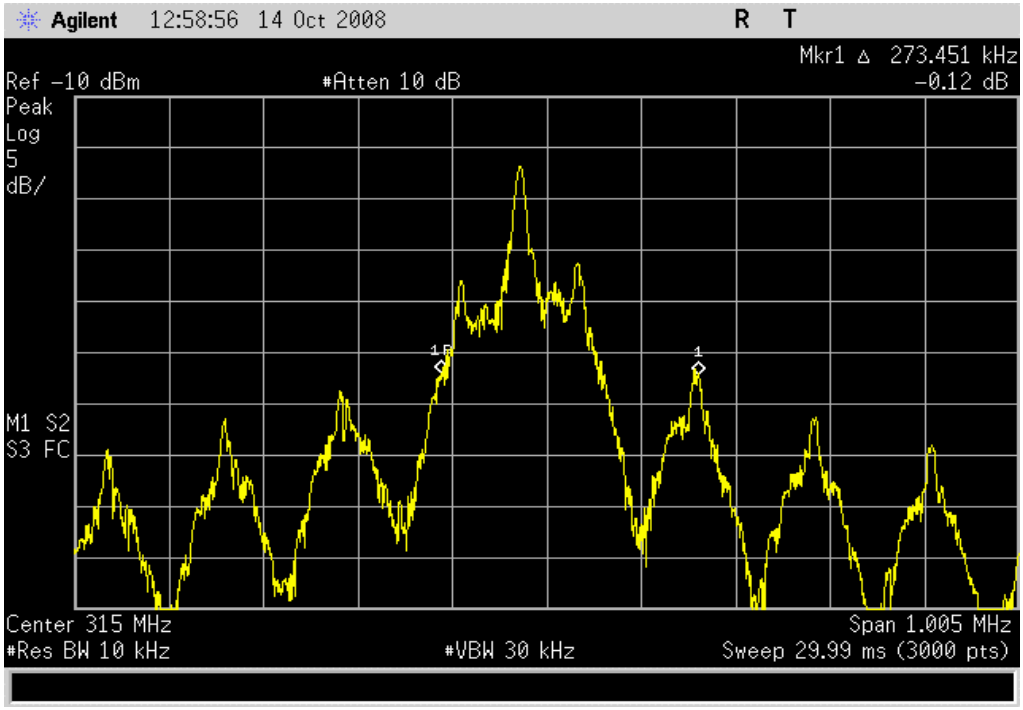
No Deviations

Configuration #	1	Signature

	Value	Limit	Results
20 dB occupied bandwidth	273.5 kHz	788 kHz	Pass

OCCUPIED BANDWIDTH

20 dB occupied bandwidth					
Result:	Pass	**Value:**	273.5 kHz	**Limit:**	788 kHz



OCCUPIED BANDWIDTH

FIELD STRENGTH OF FUNDAMENTAL

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 CW

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	314 MHz	Stop Frequency	316 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2007	13
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

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was configured for continuous modulated operation at its single transmit frequency. The field strength of the transmit frequency was maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.4:1992).

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

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

Where “On time” = N1L1 +N2L2 +….

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

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

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

Period = 100 mSec

Pulsewidth of Pulse = 1.201 mSec

Number of Pulses = 5

Duty Cycle = ((5)(1.201 ms)) / 100 ms = 0.06

Duty Cycle Correction = 20 log [((5)(1.201 ms)) / 100] = -24.4 dB

The duty cycle correction factor of –24.4 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

The field strength of the fundamental (transmit) frequency meets the limits as defined in 47 CFR 15.231(b). It also meets the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions.

NORTHWEST EMC

FIELD STRENGTH OF FUNDAMENTAL

PSA 2007.07.21
EMI 2008.7.3

EUT:	Wireless PIR Ceiling Sensor (000-WSC15-I0W)			Work Order:	LEVT0011
Serial Number:	Unit 4			Date:	10/14/08
Customer:	Leviton Manufacturing Company			Temperature:	23°C
Attendees:	Dan Wright			Humidity:	28%
Project:	None			Barometric Pres.:	30.46 in
Tested by:	Rod Peloquin	Power:	battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.231(e):2007	ANSI C63.4:2003

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

COMMENTS

None

EUT OPERATING MODES

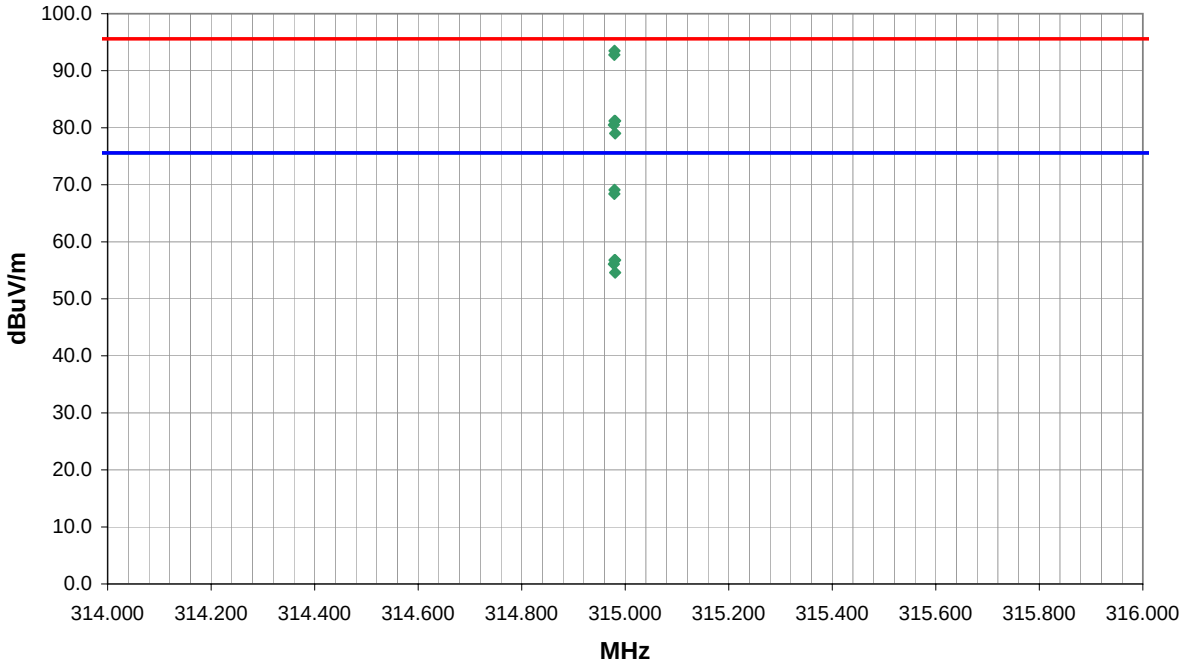
Transmitting CW

DEVIATIONS FROM TEST STANDARD

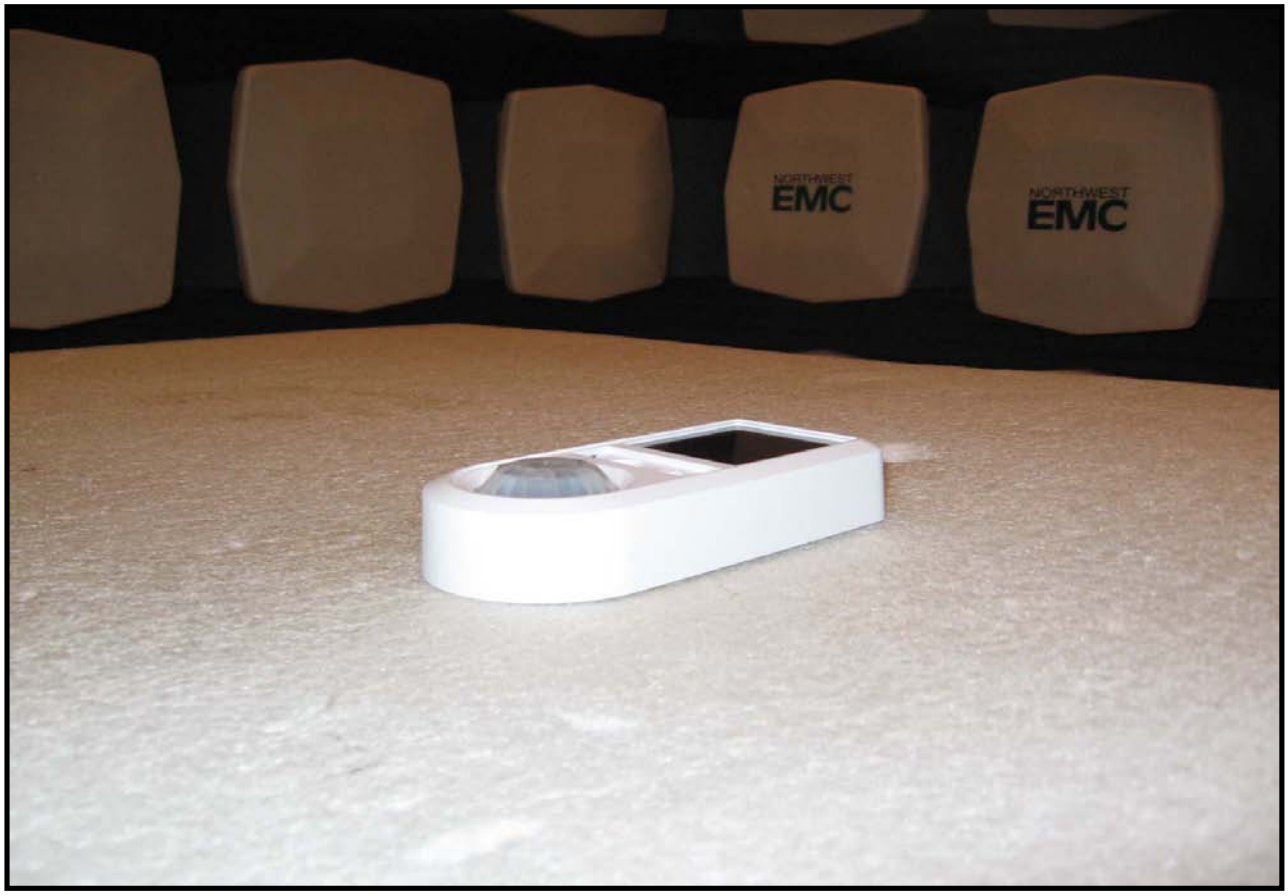
No deviations.

Run #	1
Configuration #	1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
314.979	72.2	21.3	78.0	1.1	0.0	0.0	H-Bilog	PK	0.0	93.5	95.6	-2.1
314.979	71.5	21.3	100.0	1.2	0.0	0.0	H-Bilog	PK	0.0	92.8	95.6	-2.8
314.979	72.2	21.3	78.0	1.1	24.4	0.0	H-Bilog	AV	0.0	69.1	75.6	-6.5
314.979	71.5	21.3	100.0	1.2	24.4	0.0	H-Bilog	AV	0.0	68.4	75.6	-7.2
314.979	59.9	21.3	178.0	3.3	0.0	0.0	V-Bilog	PK	0.0	81.2	95.6	-14.4
314.980	59.9	21.3	184.0	3.3	0.0	0.0	V-Bilog	PK	0.0	81.2	95.6	-14.4
314.978	59.2	21.3	287.0	1.1	0.0	0.0	H-Bilog	PK	0.0	80.5	95.6	-15.1
314.980	57.7	21.3	106.0	3.3	0.0	0.0	V-Bilog	PK	0.0	79.0	95.6	-16.6
314.979	59.9	21.3	178.0	3.3	24.4	0.0	V-Bilog	AV	0.0	56.8	75.6	-18.8
314.980	59.9	21.3	184.0	3.3	24.4	0.0	V-Bilog	AV	0.0	56.8	75.6	-18.8
314.978	59.2	21.3	287.0	1.1	24.4	0.0	H-Bilog	AV	0.0	56.1	75.6	-19.5
314.980	57.7	21.3	106.0	3.3	24.4	0.0	V-Bilog	AV	0.0	54.6	75.6	-21.0


NORTHWEST
EMC
NORTHWEST
EMC

Field Strength of Fundamental

DUTY CYCLE

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	E4407B	AAU	12/7/2007	13
Near Field Probe	EMCO	7405	IPD	NCR	0

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

For software controlled or pre-programmed devices, the manufacturer shall declare the duty cycle class or classes for the equipment under test. For manually operated or event dependant devices, with or without software controlled functions, the manufacturer shall declare whether the device once triggered, follows a pre-programmed cycle, or whether the transmission is constant until the trigger is released or manually reset. The manufacturer shall also give a description of the application for the device and include a typical usage pattern. The typical usage pattern as declared by the manufacturer shall be used to determine the duty cycle and hence the duty class.

Where an acknowledgement is required, the additional transmitter on-time shall be included and declared by the manufacturer.

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

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

Where “On time” = N1L1 +N2L2 +….

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

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

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

Period = 100 mSec

Pulsewidth of Pulse = 1.201 mSec

Number of Pulses = 5

Duty Cycle = ((5)(1.201 ms)) / 100 ms] = 0.06

The duty cycle correction factor will be calculated from this information and added to the peak readings to mathematically derive the average levels.

NORTHWEST EMC

DUTY CYCLE

XMit 2007.06.13

EUT:	**Wireless PIR Ceiling Sensor (000-WSC15-I0W)**			**Work Order:**	**LEVT0011**
Serial Number:	**Unit 5**			**Date:**	**10/14/08**
Customer:	**Leviton Manufacturing Company**			**Temperature:**	**23°C**
Attendees:	**Dan Wright**			**Humidity:**	**28%**
Project:	**None**			**Barometric Pres.:**	**30.46 in**
Tested by:	**Rod Peloquin**	**Power:**	**Battery**	**Job Site:**	**EV06**

TEST SPECIFICATIONS	Test Method
FCC 15.231:2007	ANSI C63.4:2003

COMMENTS

Duty cycle = (1.201 ms x 5)/100 ms = (6.005/100) = .06005

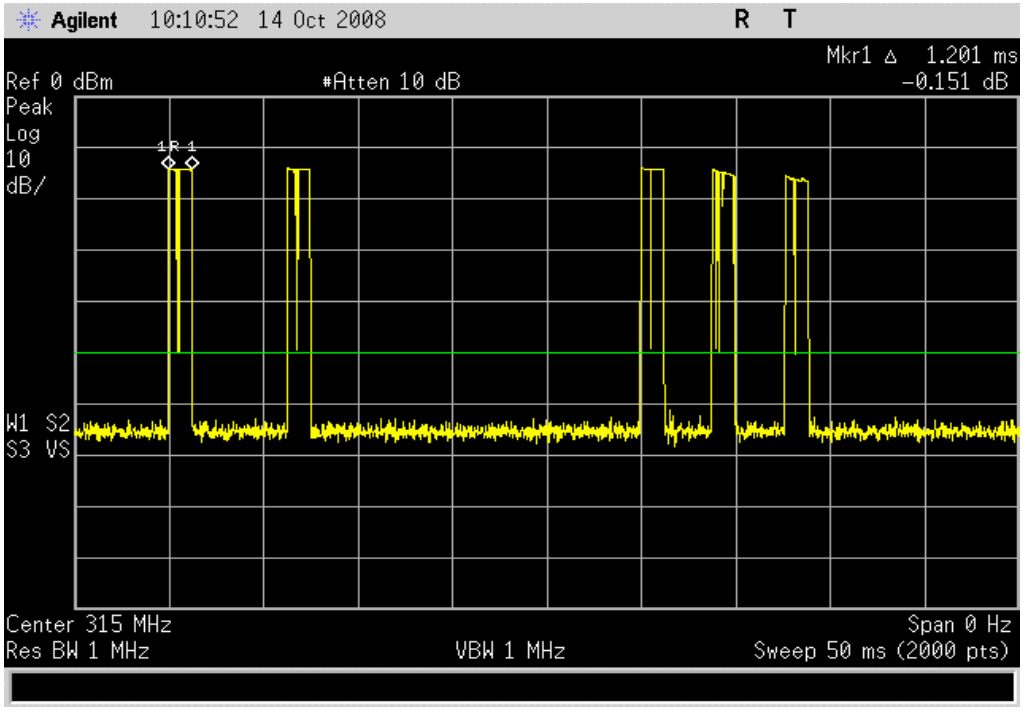
DEVIATIONS FROM TEST STANDARD

No Deviations

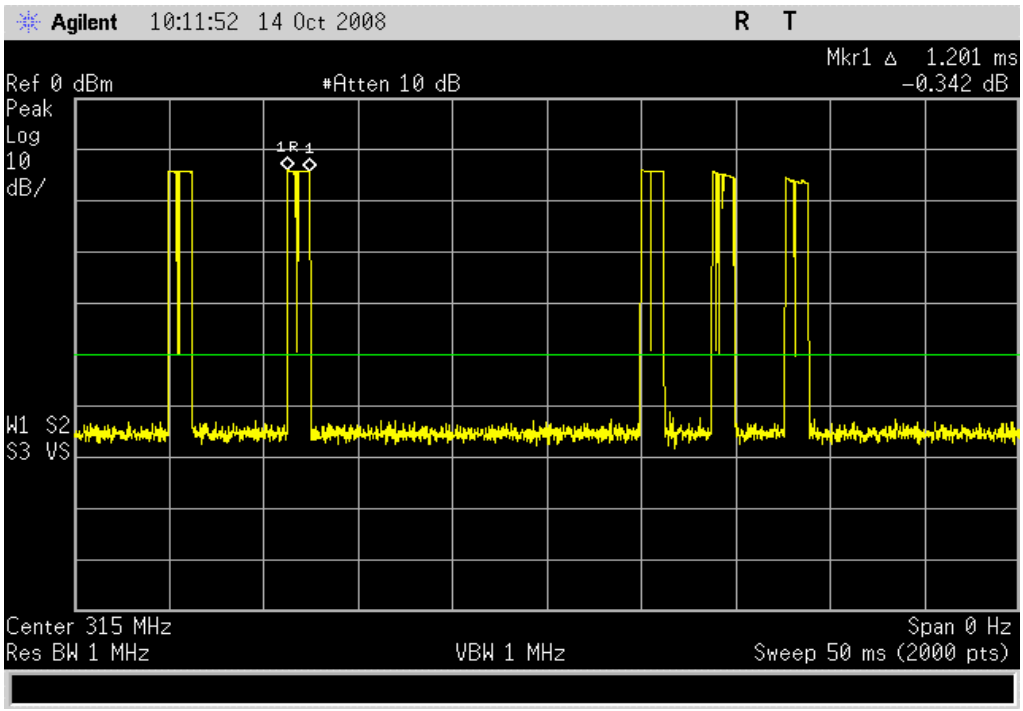
Configuration #	**1**	*Signature*

	Value	Limit	Results
Pulse Width 1	1.201 ms	N/A	N/A
Pulse Width 2	1.201 ms	N/A	N/A
Pulse Width 3	1.201 ms	N/A	N/A
Pulse Width 4	1.201 ms	N/A	N/A
Pulse Width 5	1.201 ms	N/A	N/A
Period 100ms	N/A	N/A	N/A
Period 200ms	N/A	N/A	N/A

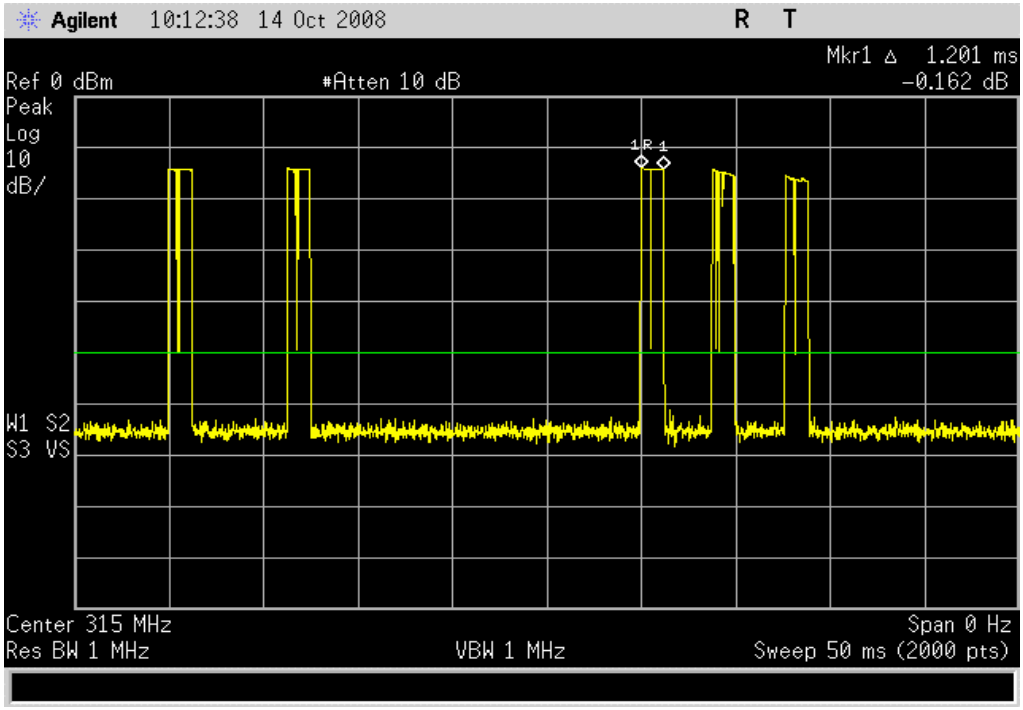
Pulse Width 1					
Result:	N/A	**Value:**	1.201 ms	**Limit:**	N/A



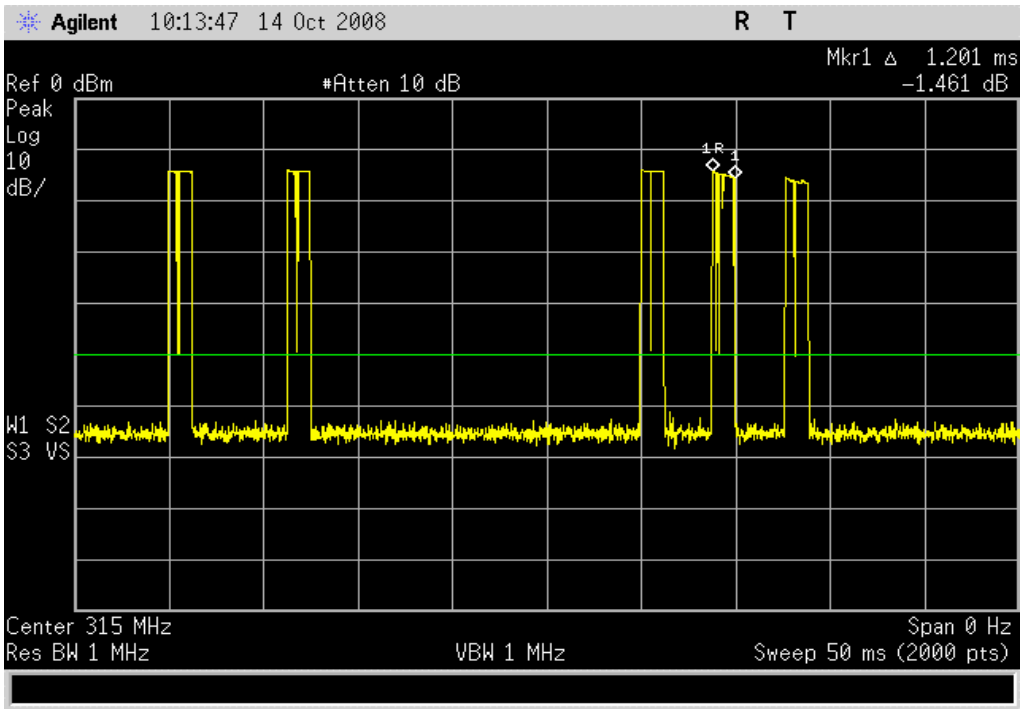
Pulse Width 2					
Result:	N/A	**Value:**	1.201 ms	**Limit:**	N/A



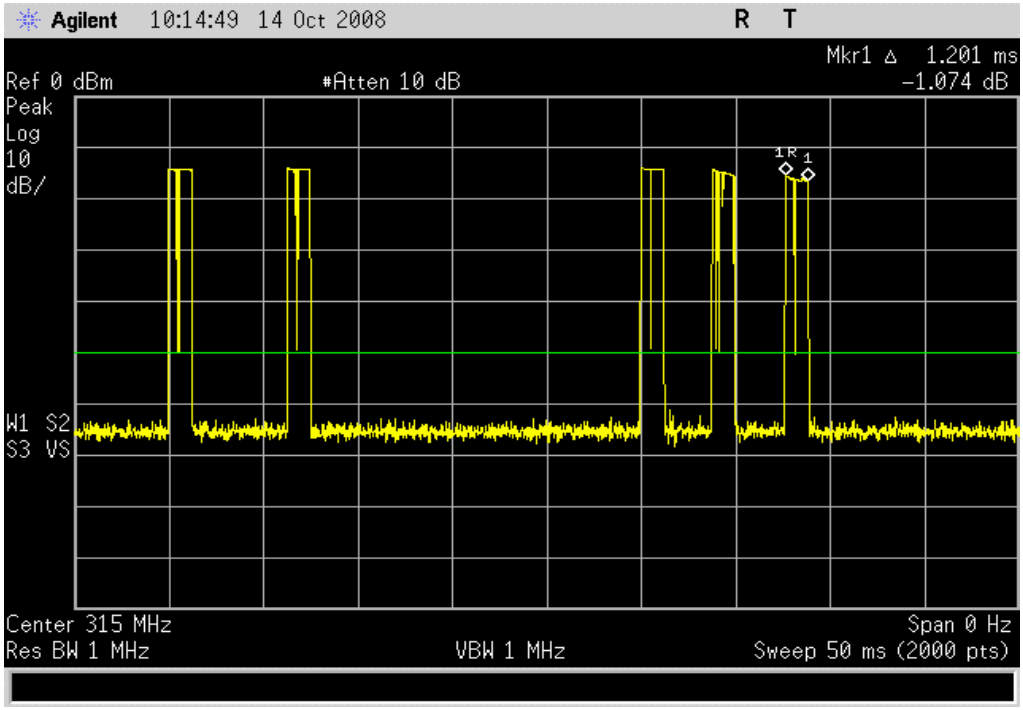
Pulse Width 3					
Result:	N/A	**Value:**	1.201 ms	**Limit:**	N/A



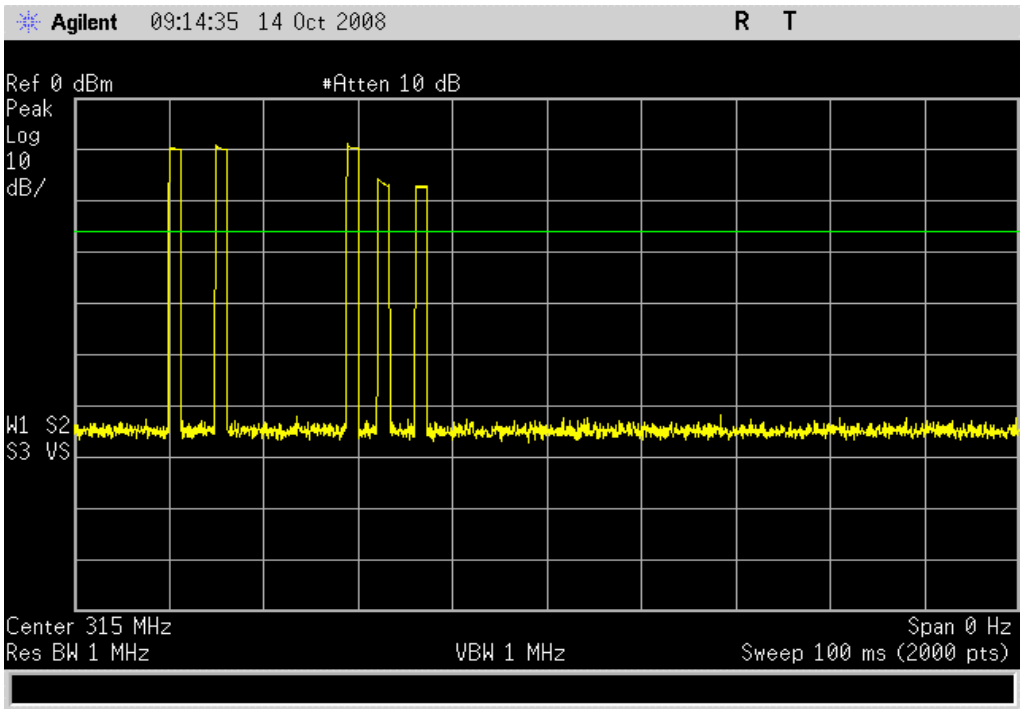
Pulse Width 4					
Result:	N/A	**Value:**	1.201 ms	**Limit:**	N/A



Pulse Width 5					
Result:	N/A	**Value:**	1.201 ms	**Limit:**	N/A



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



Period 200ms		
Result: N/A	**Value:** N/A	**Limit:** N/A