



Leviton Manufacturing Company
WSCOM-03W

Report #: LEVT0047 Rev. 1



Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Last Date of Test: May 14, 2012
Leviton Manufacturing Company
Model: WSCOM-03W

Emissions

Test Description	Specification	Test Method	Pass/Fail
Occupied Bandwidth	FCC 15.231:2012	ANSI C63.10:2009	Pass
Field Strength of Fundamental	FCC 15.231:2012	ANSI C63.10:2009	Pass
Duty Cycle	FCC 15.231:2012	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.231:2012	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2012	ANSI C63.10:2009	Pass

Deviations From Test Standards

None

Approved By:

Don Facteau, IS Manager



NVLAP Lab Code: 200630-0

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).

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 History

Revision Number	Description	Date	Page Number
00	None		
01	Commissioning Tool (under EUT Description) changed to LevNet RF USB computer link	5-15-2012	8
01	Updated the last date of testing throughout report	5-15-2012	2, 7, 9
01	Replaced Spurious Radiated Emissions data	5-15-2012	19-21

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 National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. 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.

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, 2834B-3, Brooklyn Park: 2834E-1*)

CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).

VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, T-1659, and G-548, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634*).

BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175*)

VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

SCOPE

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



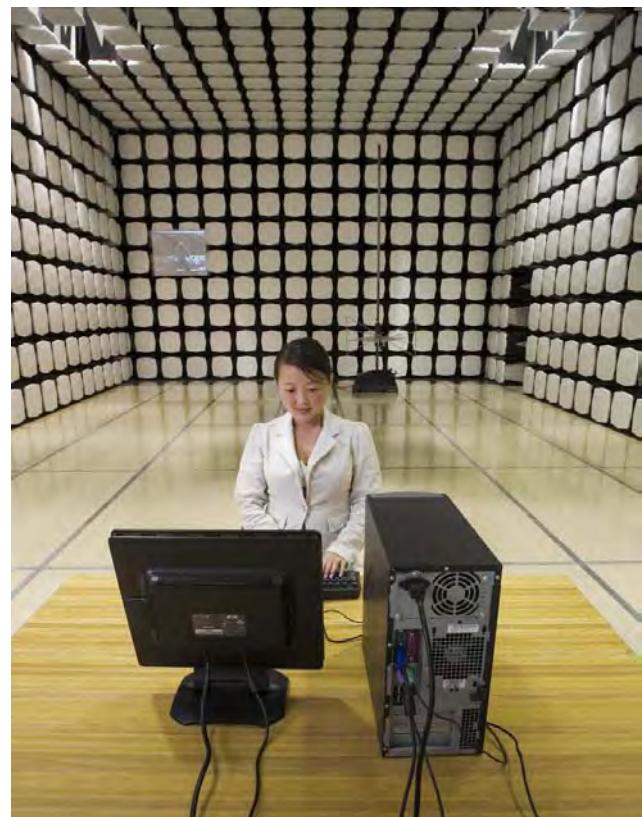
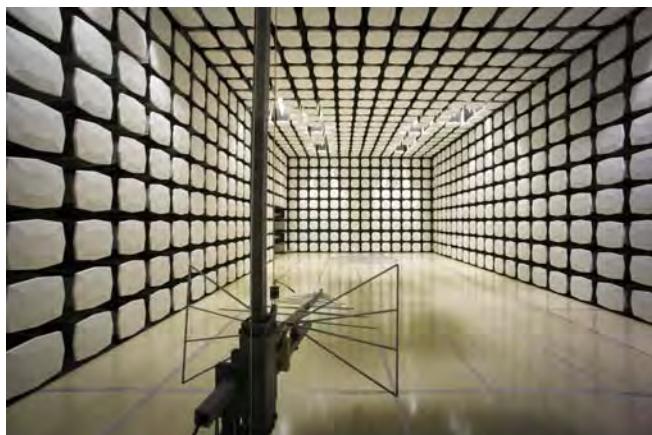
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Washington
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Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



Product Description

Client and Equipment Under Test (EUT) Information

Company Name:	Leviton Manufacturing Company
Address:	20497 SW Teton Avenue
City, State, Zip:	Tualatin, OR 97062
Test Requested By:	Dan Wright
Model:	WSCOM-03W
First Date of Test:	February 15, 2012
Last Date of Test:	May 14, 2012
Receipt Date of Samples:	February 15, 2012
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Low Power transceiver operating at 315 MHz.

Testing Objective:

To demonstrate compliance to FCC 15.231 specifications

Configurations

Configuration 1 LEVT0047

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
LevNet RF USB computer link	Leviton Manufacturing Company	WSCOM-03W	B 7.0dB

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Battery pack	Unknown	Unknown	None

Configuration 2 LEVT0047

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
LevNet RF USB computer link	Leviton Manufacturing Company	WSCOM-03W	B 7.0dB

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Antenna	Wellshow	AR026WSG2519N	None
Laptop PC	Hewlett Packard	ProBook 6460b	CNU1491FM2
AC Adapter	Hewlett Packard	Unknown	Unknown

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Ethernet Switch	D-Link	DGS-1005D	DR8V259001633

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.2m	No	AC Adapter	AC Mains
DC Power	PA	0.8m	PA	AC Adapter	Laptop PC
Ethernet Cable	No	2.0m	No	Laptop PC	Ethernet Switch

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

Configuration 3 LEVT0047

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
LevNet RF USB computer link	Leviton Manufacturing Company	WSCOM-03W	B 7.0dB

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Antenna	Wellshow	AR026WSG2519N	None
Battery pack	Unknown	Unknown	None

Modifications

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2/15/2012	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	2/15/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	2/15/2012	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	2/15/2012	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
5	5/14/2012	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

MEASUREMENT UNCERTAINTY

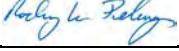
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

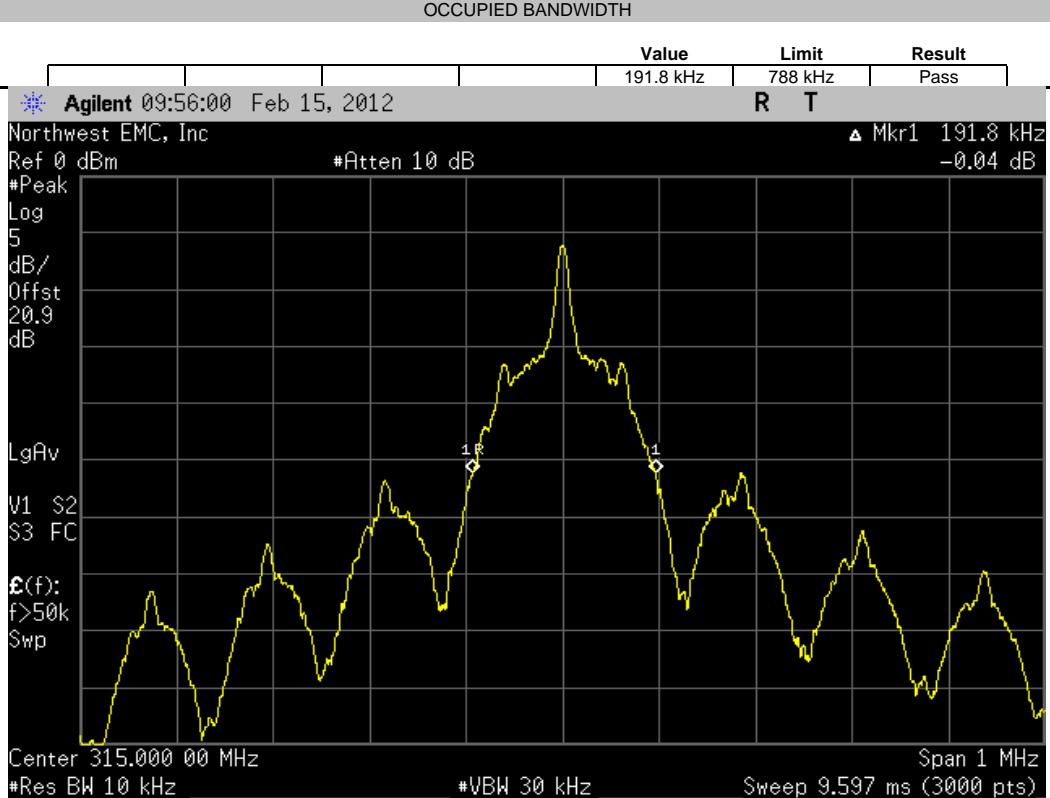
TEST DESCRIPTION

The occupied bandwidth is required to be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate.

OCCUPIED BANDWIDTH

EUT: WSCOM-03W	Work Order: LEVT0047			
Serial Number: B 7.0 dB	Date: 02/15/12			
Customer: Leviton Manufacturing Company	Temperature: 22.3°C			
Attendees: Dan Wright, Jason Betournay	Humidity: 38%			
Project: None	Barometric Pres.: 30.05			
Tested by: Rod Peloquin	Job Site: EV06			
TEST SPECIFICATIONS				
FCC 15.231:2012	TEST METHOD			
	ANSI C63.10:2009			
COMMENTS				
None				
DEVIATIONS FROM TEST STANDARD				
No deviations				
Configuration #	1			
Signature 				
		Value	Limit	Result
OCCUPIED BANDWIDTH		191.8 kHz	788 kHz	Pass



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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting with modulation 100% duty cycle

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LEVTO047 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	314 MHz	Stop Frequency	316 MHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	2/7/2012	12
Antenna, Biconilog	EMCO	3142	AXJ	5/17/2011	12
EV01 Cables	N/A	Bilog Cables	EVA	6/28/2011	12

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The single, integral antenna to be used with the EUT was tested. The EUT was configured for a modulated operation with 100% duty cycle, at its single transmit frequency. Evaluation testing showed the modulated carrier and an unmodulated carrier had the same maximum field strength. 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 C63.10:2009).

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" = $N1L1 + N2L2 + \dots$

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 = $(N1L1 + N2L2 + \dots)/100\text{mS}$ 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 Pulses = 1.311 mSec

Number of Pulses = 3

Duty Cycle = $20 \log [((3)(1.311))/100] = -28.1 \text{ dB}$

The duty cycle correction factor of -28.1 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.

EUT: WSCOM-03W	Work Order: LEVT0047
Serial Number: 87.0 dB	Date: 02/15/12
Customer: Leviton Manufacturing Company	Temperature: 22.3°C
Attendees: Dan Wright, Jason Betournay	Humidity: 38%
Project: None	Barometric Pres.: 30.05
Tested by: Rod Peloquin	Job Site: EV11

TEST SPECIFICATIONS

FCC 15.231:2012

TEST METHOD

ANSI C63.10:2009

TEST PARAMETERS

Antenna Height(s) (m) 1 - 4

Test Distance (m)

3

COMMENTS

None

EUT OPERATING MODES

Transmitting with modulation 100% duty cycle

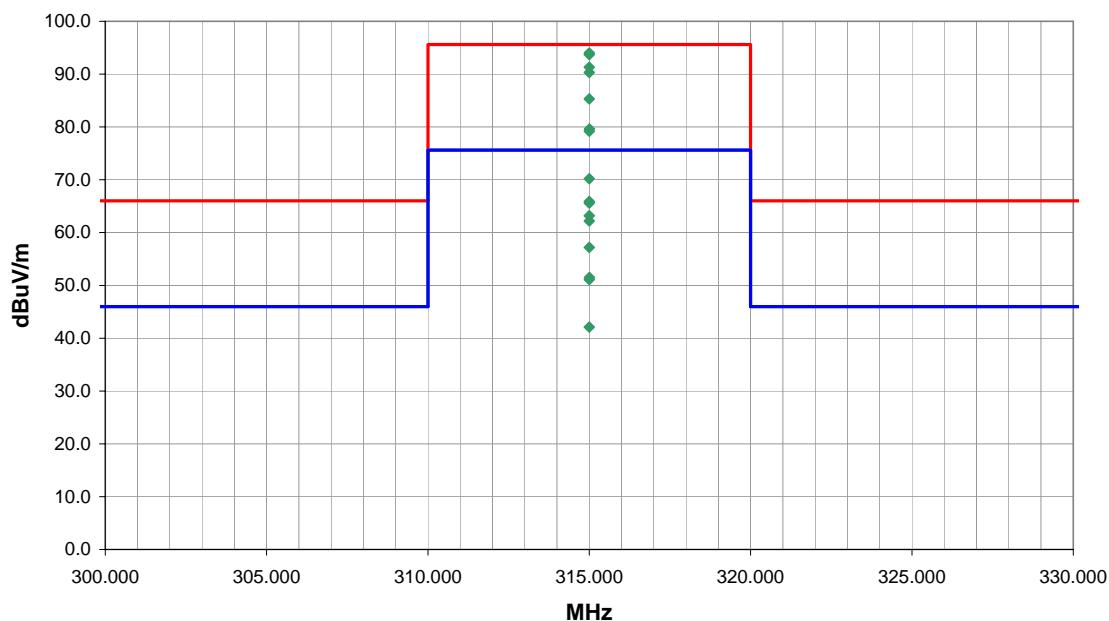
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	3
Results	Pass

Signature

Rod Peloquin



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
314.999	72.3	21.7	70.0	1.1	0.0	0.0	H-Bilog	PK	0.0	94.0	95.6	-1.6	EUT on side, Ant horz
314.999	72.0	21.7	90.0	1.0	0.0	0.0	H-Bilog	PK	0.0	93.7	95.6	-1.9	EUT horz, Ant horz
315.000	69.6	21.7	247.0	1.0	0.0	0.0	H-Bilog	PK	0.0	91.3	95.6	-4.3	EUT horz, Ant vert
314.999	68.6	21.7	108.0	1.8	0.0	0.0	V-Bilog	PK	0.0	90.3	95.6	-5.3	EUT vert, Ant vert
314.999	72.3	21.7	70.0	1.1	28.1	0.0	H-Bilog	AV	0.0	65.9	75.6	-9.7	EUT on side, Ant horz
314.999	72.0	21.7	90.0	1.0	28.1	0.0	H-Bilog	AV	0.0	65.6	75.6	-10.0	EUT horz, Ant horz
314.998	63.6	21.7	341.0	1.7	0.0	0.0	V-Bilog	PK	0.0	85.3	95.6	-10.3	EUT horz, Ant vert
315.000	69.6	21.7	247.0	1.0	28.1	0.0	H-Bilog	AV	0.0	63.2	75.6	-12.4	EUT horz, Ant vert
314.999	68.6	21.7	108.0	1.8	28.1	0.0	V-Bilog	AV	0.0	62.2	75.6	-13.4	EUT vert, Ant vert
315.003	57.9	21.7	354.0	1.3	0.0	0.0	V-Bilog	PK	0.0	79.6	95.6	-16.0	EUT horz, Ant horz.
314.999	57.5	21.7	145.0	1.2	0.0	0.0	V-Bilog	PK	0.0	79.2	95.6	-16.4	EUT on side, Ant horz.
314.998	63.6	21.7	341.0	1.7	28.1	0.0	V-Bilog	AV	0.0	57.2	75.6	-18.4	EUT horz, Ant vert
315.003	57.9	21.7	354.0	1.3	28.1	0.0	V-Bilog	AV	0.0	51.5	75.6	-24.1	EUT horz, Ant horz.
314.999	57.5	21.7	145.0	1.2	28.1	0.0	V-Bilog	AV	0.0	51.1	75.6	-24.5	EUT on side, Ant horz
314.999	48.5	21.7	360.0	1.3	0.0	0.0	H-Bilog	PK	0.0	70.2	95.6	-25.4	EUT vert, Ant vert
314.999	48.5	21.7	360.0	1.3	28.1	0.0	H-Bilog	AV	0.0	42.1	75.6	-33.5	EUT vert, Ant vert

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	E4440A	AFD	7/5/2011	12
40GHz DC Block	Miteq	DCB4000	AMD	8/12/2011	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	8/2/2011	12
EV06 Direct Connect Cable	ESM Cable Corp.	TT	ECA	NCR	0

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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" = $N1L1 + N2L2 + \dots$

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 = $(N1L1 + N2L2 + \dots)/100\text{mS}$ 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= 1.311 mSec

Number of Pulses = 3

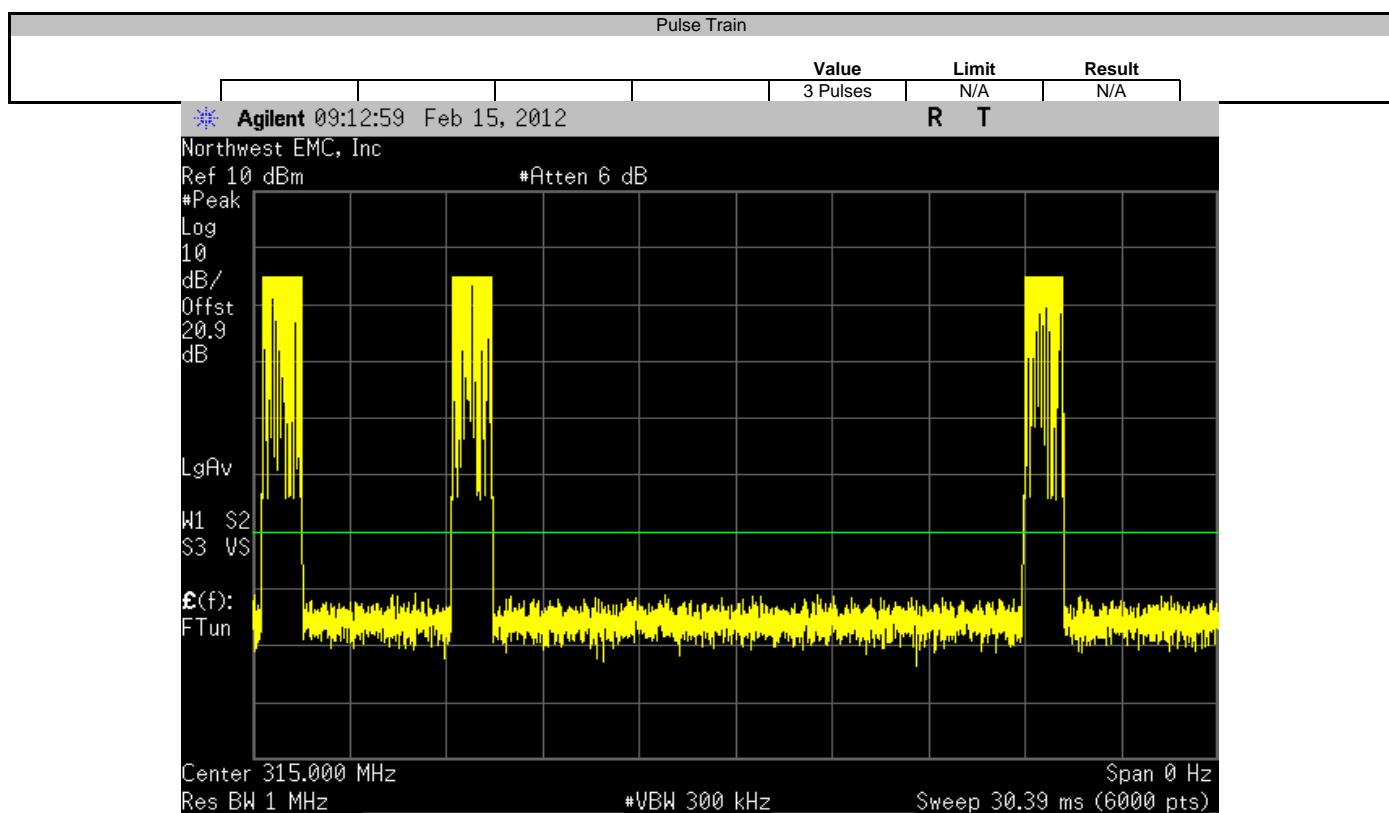
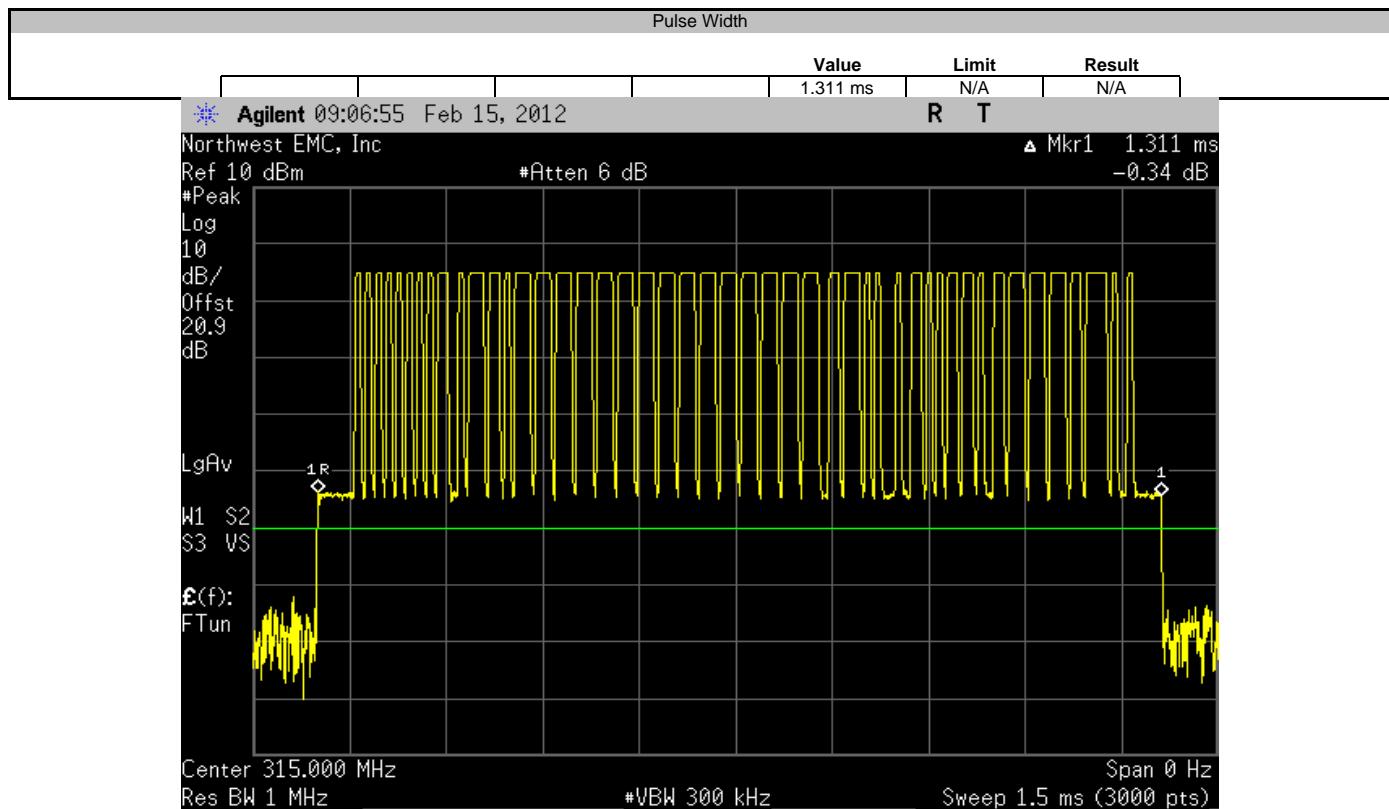
Duty Cycle = $20 \log [(3)(1.311)/100] = -28.1 \text{ dB}$

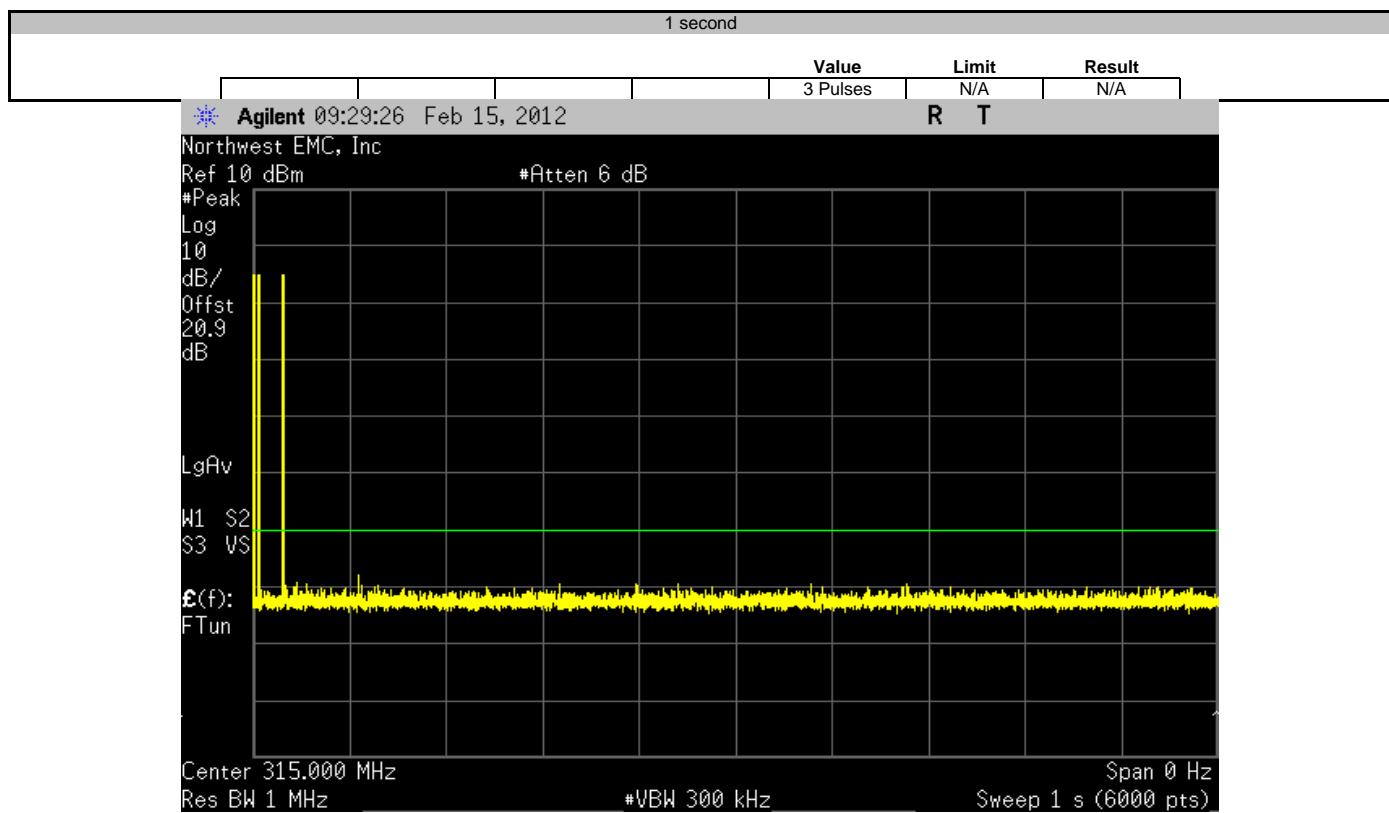
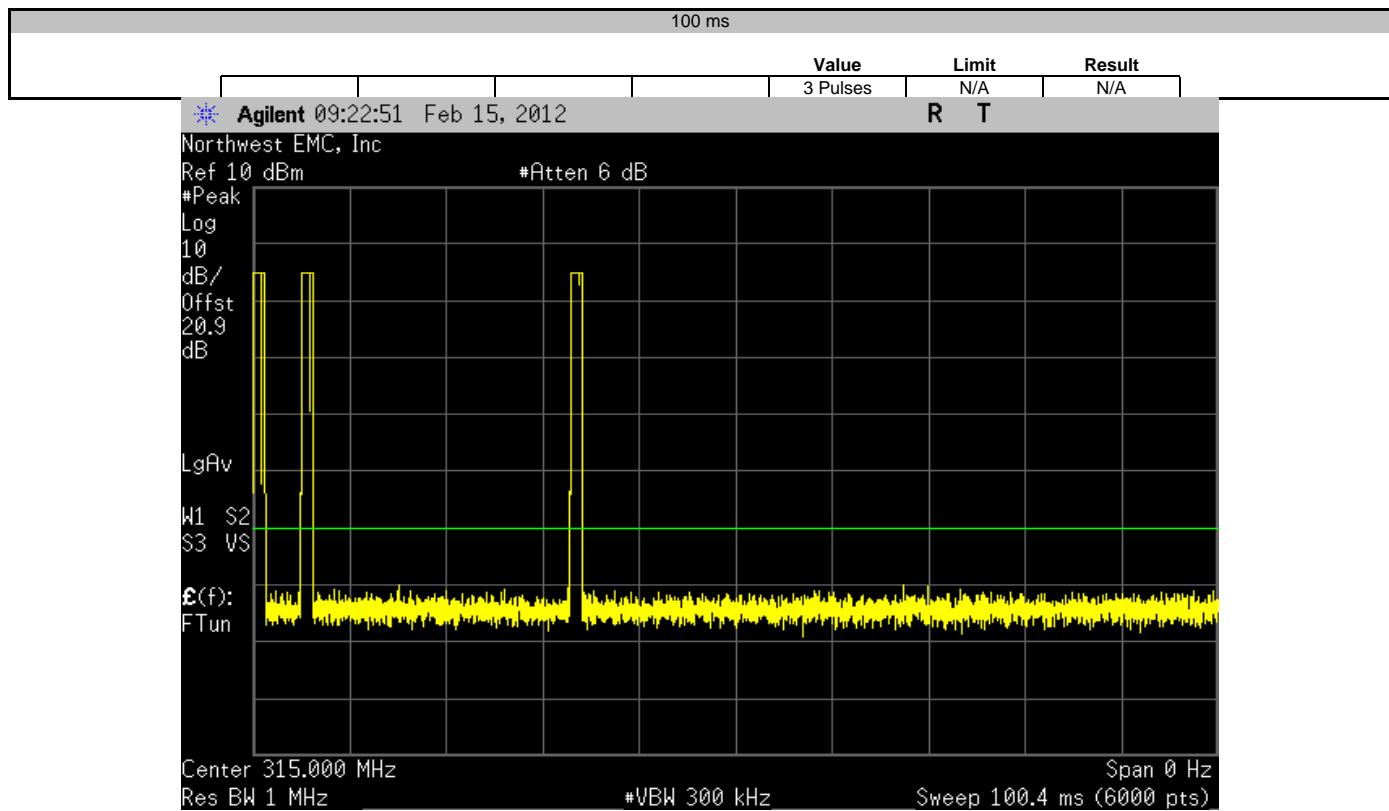
The duty cycle correction factor of -28.1 dB was added to the peak readings to mathematically derive the average levels. Peak measurements were made with a resolution bandwidth of 100kHz and a video bandwidth of 300kHz.

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.

DUTY CYCLE

EUT: WSCOM-03W		Work Order: LEVT0047															
Serial Number: B 7.0 dB		Date: 02/15/12															
Customer: Leviton Manufacturing Company		Temperature: 22.3°C															
Attendees: Dan Wright, Jason Betournay		Humidity: 38%															
Project: None		Barometric Pres.: 30.05															
Tested by: Rod Peloquin	Power: 5 VDC	Job Site: EV06															
TEST SPECIFICATIONS		TEST METHOD															
FCC 15.231:2012		ANSI C63.10:2009															
COMMENTS																	
None																	
DEVIATIONS FROM TEST STANDARD																	
No deviations																	
Configuration #	1	Signature: 															
<table border="1"> <thead> <tr> <th>Value</th> <th>Limit</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>1.311 ms</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>3 Pulses</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>3 Pulses</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>3 Pulses</td> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>			Value	Limit	Result	1.311 ms	N/A	N/A	3 Pulses	N/A	N/A	3 Pulses	N/A	N/A	3 Pulses	N/A	N/A
Value	Limit	Result															
1.311 ms	N/A	N/A															
3 Pulses	N/A	N/A															
3 Pulses	N/A	N/A															
3 Pulses	N/A	N/A															
Pulse Width Pulse Train 100 ms 1 second																	





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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting with modulation

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LEVTO047 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 3.2 GHz

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	AAQ	2/7/2012	12
Pre-Amplifier	Miteq	AM-1616-1000	AOL	6/28/2011	12
Antenna, Biconilog	EMCO	3141	AXG	4/10/2012	12
EV01 Cables	N/A	Bilog Cables	EVA	6/28/2011	12
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	6/28/2011	12
Antenna, Horn	ETS	3115	AIZ	1/24/2011	24
EV01 Cables	N/A	Double Ridge Horn Cables	EVB	6/28/2011	12

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

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 C63.10:2009).

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" = $N1L1 + N2L2 + \dots$

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 = $(N1L1 + N2L2 + \dots)/100\text{mS}$ 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 Type 1 Pulse = 0.780 mSec
 Pulsewidth of Type 2 Pulse = 0.183 mSec
 Pulsewidth of Type 3 Pulse = 0.087mSec
 Number of Type 1 Pulses = 2
 Number of Type 2 Pulses = 14
 Number of Type 3 Pulses = 18

Duty Cycle = $20 \log [((2)(0.780) + (14)(0.183) + (18)(0.087))/100] = -24.9 \text{ dB}$

The duty cycle correction factor of -24.9 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.



SPURIOUS RADIATED EMISSIONS

PSA 2012.04.05
EMI 2008.1.9

EUT: WSCOM-03W	Work Order: LEVT0059
Serial Number: B 7.0 dB	Date: 05/14/12
Customer: Leviton Manufacturing Company	Temperature: 24°C
Attendees: Dan Wright	Humidity: 38%
Project: None	Barometric Pres.: 29.98
Tested by: Rod Peloquin	Job Site: EV01

TEST SPECIFICATIONS

TEST SPECIFICATIONS		Test Method
FCC 15.231(b):2012		ANSI C63.10:2009

TEST PARAMETERS

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

None

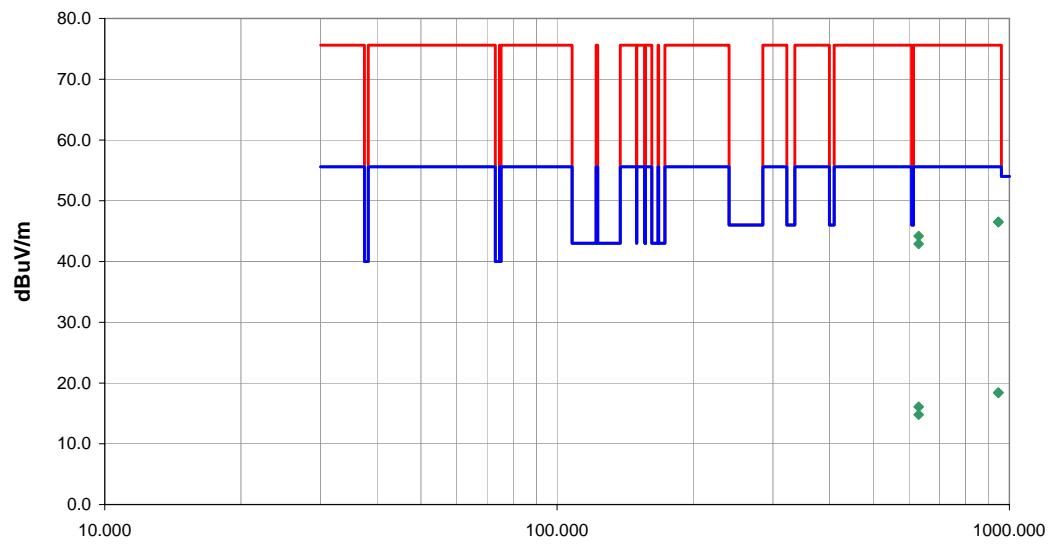
EUT OPERATING MODES

Transmitting with modulation

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2	
Configuration #	1	
Results	Pass	



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
945.057	23.6	12.9	345.0	2.1	0.0	10.0	V-Bilog	PK	0.0	46.5	75.6	-29.1	EUT horz, Ant. vert
945.085	23.6	12.9	250.0	1.0	0.0	10.0	H-Bilog	PK	0.0	46.5	75.6	-29.1	EUT on side, Ant. horz
629.979	26.1	8.1	251.0	1.0	0.0	10.0	V-Bilog	PK	0.0	44.2	75.6	-31.4	EUT horz, Ant. vert
629.979	24.8	8.1	250.0	1.0	0.0	10.0	H-Bilog	PK	0.0	42.9	75.6	-32.7	EUT on side, Ant. horz
945.057	23.6	12.9	345.0	2.1	28.1	10.0	V-Bilog	AV	0.0	18.4	55.6	-37.2	EUT horz, Ant. vert
945.085	23.6	12.9	250.0	1.0	28.1	10.0	H-Bilog	AV	0.0	18.4	55.6	-37.2	EUT on side, Ant. horz
629.979	26.1	8.1	251.0	1.0	28.1	10.0	V-Bilog	AV	0.0	16.1	55.6	-39.5	EUT horz, Ant. vert
629.979	24.8	8.1	250.0	1.0	28.1	10.0	H-Bilog	AV	0.0	14.8	55.6	-40.8	EUT on side, Ant. horz



SPURIOUS RADIATED EMISSIONS

PSA 2012.04.05
EMI 2008.1.9

EUT: WSCOM-03W	Work Order: LEVT0059
Serial Number: B 7.0 dB	Date: 05/14/12
Customer: Leviton Manufacturing Company	Temperature: 24°C
Attendees: Dan Wright	Humidity: 38%
Project: None	Barometric Pres.: 29.98
Tested by: Rod Peloquin	Power: 120VAC/60Hz
	Job Site: EV01

TEST SPECIFICATIONS

FCC 15.231(b):2012

Test Method

ANSI C63.10:2009

TEST PARAMETERS

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

None

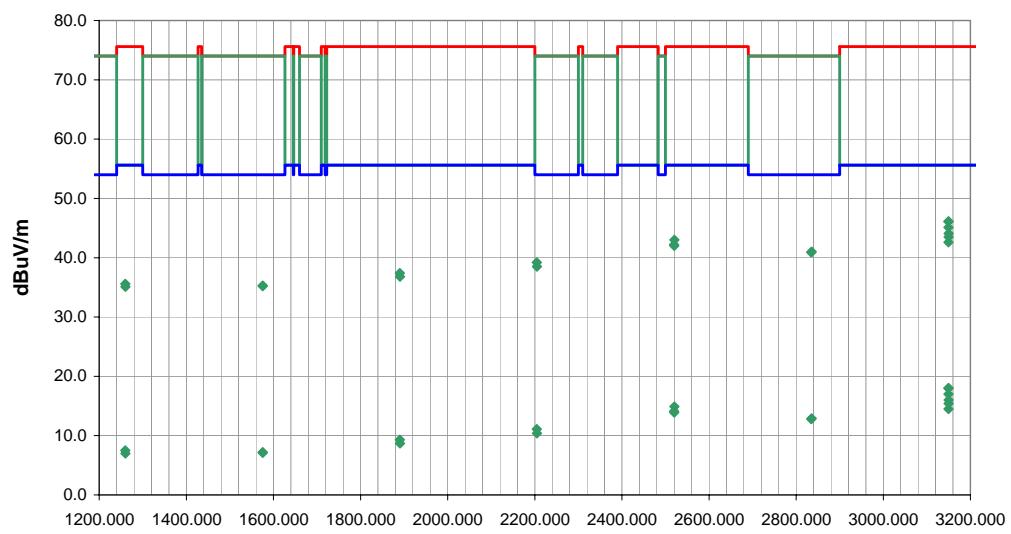
EUT OPERATING MODES

Transmitting with modulation

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3	Configuration #	1	Results	Pass	<i>Rod Peloquin</i>
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Duty Cycle Correction Factor	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted (dB)	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
3149.780	41.6	4.5	21.0	1.0	0.0	0.0	V-Horn	PK	0.0	46.1	75.6	-29.5	EUT horz, Ant. vert
3149.852	41.6	4.5	218.0	1.0	0.0	0.0	V-Horn	PK	0.0	46.1	75.6	-29.5	EUT vert, Ant. vert
3149.738	40.6	4.5	61.0	1.3	0.0	0.0	H-Horn	PK	0.0	45.1	75.6	-30.5	EUT on side, Ant. horz
3150.042	39.6	4.5	144.0	1.3	0.0	0.0	H-Horn	PK	0.0	44.1	75.6	-31.5	EUT horz, Ant. vert
3150.046	39.0	4.5	180.0	1.7	0.0	0.0	V-Horn	PK	0.0	43.5	75.6	-32.1	EUT on side, Ant. horz
2520.348	40.5	2.5	136.0	1.0	0.0	0.0	H-Horn	PK	0.0	43.0	75.6	-32.6	EUT on side, Ant. horz
2835.548	37.3	3.7	360.0	1.3	0.0	0.0	H-Horn	PK	0.0	41.0	74.0	-33.0	EUT on side, Ant. horz
3149.712	38.1	4.5	70.0	1.3	0.0	0.0	H-Horn	PK	0.0	42.6	75.6	-33.0	EUT vert, Ant. vert
2834.592	37.2	3.7	81.0	1.0	0.0	0.0	V-Horn	PK	0.0	40.9	74.0	-33.1	EUT horz, Ant. vert
2519.582	39.7	2.5	189.0	1.0	0.0	0.0	V-Horn	PK	0.0	42.2	75.6	-33.4	EUT on side, Ant. horz
2520.164	39.5	2.5	174.0	1.0	0.0	0.0	V-Horn	PK	0.0	42.0	75.6	-33.6	EUT horz, Ant. vert
2204.648	37.1	2.1	246.0	1.0	0.0	0.0	H-Horn	PK	0.0	39.2	74.0	-34.8	EUT on side, Ant. horz
2204.870	36.4	2.1	114.0	1.0	0.0	0.0	V-Horn	PK	0.0	38.5	74.0	-35.5	EUT horz, Ant. vert
3149.780	41.6	4.5	21.0	1.0	28.1	0.0	V-Horn	AV	0.0	18.0	55.6	-37.6	EUT horz, Ant. vert
3149.852	41.6	4.5	218.0	1.0	28.1	0.0	V-Horn	AV	0.0	18.0	55.6	-37.6	EUT vert, Ant. vert
1890.280	37.9	-0.5	245.0	1.0	0.0	0.0	H-Horn	PK	0.0	37.4	75.6	-38.2	EUT on side, Ant. horz
3149.738	40.6	4.5	61.0	1.3	28.1	0.0	H-Horn	AV	0.0	17.0	55.6	-38.6	EUT on side, Ant. horz
1575.476	37.1	-1.8	350.0	1.3	0.0	0.0	H-Horn	PK	0.0	35.3	74.0	-38.7	EUT on side, Ant. horz
1575.536	37.0	-1.8	140.0	1.0	0.0	0.0	V-Horn	PK	0.0	35.2	74.0	-38.8	EUT horz, Ant. vert
1890.578	37.3	-0.5	196.0	1.0	0.0	0.0	V-Horn	PK	0.0	36.8	75.6	-38.8	EUT horz, Ant. vert
3150.042	39.6	4.5	144.0	1.3	28.1	0.0	H-Horn	AV	0.0	16.0	55.6	-39.6	EUT horz, Ant. vert
1259.805	38.1	-2.5	62.0	1.0	0.0	0.0	V-Horn	PK	0.0	35.6	75.6	-40.0	EUT horz, Ant. vert
3150.046	39.0	4.5	180.0	1.7	28.1	0.0	V-Horn	AV	0.0	15.4	55.6	-40.2	EUT on side, Ant. horz
1260.322	37.6	-2.5	274.0	1.0	0.0	0.0	H-Horn	PK	0.0	35.1	75.6	-40.5	EUT on side, Ant. horz
2520.348	40.5	2.5	136.0	1.0	28.1	0.0	H-Horn	AV	0.0	14.9	55.6	-40.7	EUT on side, Ant. horz
2835.548	37.3	3.7	360.0	1.3	28.1	0.0	H-Horn	AV	0.0	12.9	54.0	-41.1	EUT on side, Ant. horz
3149.712	38.1	4.5	70.0	1.3	28.1	0.0	H-Horn	AV	0.0	14.5	55.6	-41.1	EUT vert, Ant. vert

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
2834.592	37.2	3.7	81.0	1.0	28.1	0.0	V-Horn	AV	0.0	12.8	54.0	-41.2	EUT horz, Ant. vert
2519.582	39.7	2.5	189.0	1.0	28.1	0.0	V-Horn	AV	0.0	14.1	55.6	-41.5	EUT on side, Ant. horz
2520.164	39.5	2.5	174.0	1.0	28.1	0.0	V-Horn	AV	0.0	13.9	55.6	-41.7	EUT horz, Ant. vert
2204.648	37.1	2.1	246.0	1.0	28.1	0.0	H-Horn	AV	0.0	11.1	54.0	-42.9	EUT on side, Ant. horz
2204.870	36.4	2.1	114.0	1.0	28.1	0.0	V-Horn	AV	0.0	10.4	54.0	-43.6	EUT horz, Ant. vert
1890.280	37.9	-0.5	245.0	1.0	28.1	0.0	H-Horn	AV	0.0	9.3	55.6	-46.3	EUT on side, Ant. horz
1575.476	37.1	-1.8	350.0	1.3	28.1	0.0	H-Horn	AV	0.0	7.2	54.0	-46.8	EUT on side, Ant. horz
1575.536	37.0	-1.8	140.0	1.0	28.1	0.0	V-Horn	AV	0.0	7.1	54.0	-46.9	EUT horz, Ant. vert
1890.578	37.3	-0.5	196.0	1.0	28.1	0.0	V-Horn	AV	0.0	8.7	55.6	-46.9	EUT horz, Ant. vert
1259.805	38.1	-2.5	62.0	1.0	28.1	0.0	V-Horn	AV	0.0	7.5	55.6	-48.1	EUT horz, Ant. vert
1260.322	37.6	-2.5	274.0	1.0	28.1	0.0	H-Horn	AV	0.0	7.0	55.6	-48.6	EUT on side, Ant. horz

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 100% duty cycle with modulation

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

LEVT0047 - 2

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARH	3/30/2011	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HFX	2/9/2011	24 mo
Attenuator	Coaxicom	66702 2910-20	RBR	8/3/2011	12 mo
LISN	Solar	9252-50-R-24-BNC	LIN	5/9/2011	12 mo
LISN	Solar	9252-50-R-24-BNC	LIR	11/4/2011	12 mo
EV07 Cables	N/A	Conducted Cables	EVG	6/17/2011	12 mo

MEASUREMENT BANDWIDTHS

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

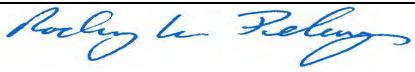
Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

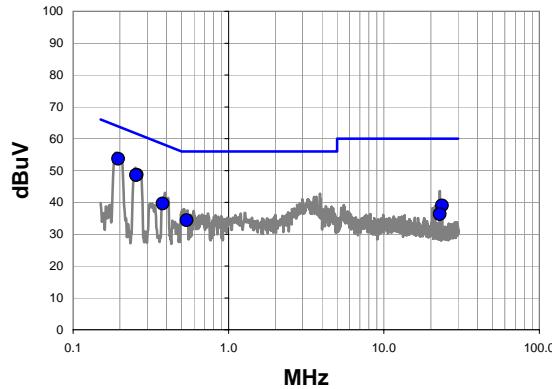
A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

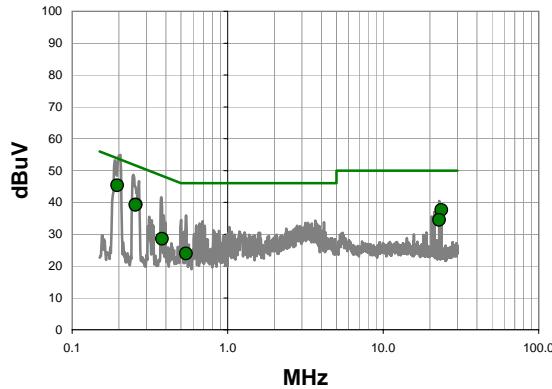
The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

Work Order:	LEVT0047	Date:	02/15/12				
Project:	None	Temperature:	22.5 °C				
Job Site:	EV11	Humidity:	38.5% RH				
Serial Number:	B 7.0 dB	Barometric Pres.:	1020.5 mbar	Tested by: Rod Peloquin			
EUT:	WSCOM-03W						
Configuration:	2						
Customer:	Leviton Manufacturing Company						
Attendees:	Dan Wright, Jason Betournay						
EUT Power:	120VAC/60Hz						
Operating Mode:	Transmitting 100% duty cycle with modulation						
Deviations:	No deviations						
Comments:	None						
Test Specifications		Test Method					
FCC 15.207:2012		ANSI C63.10:2009					
Run #	1	Line:	High Line	Ext. Attenuation:	20	Results	Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit

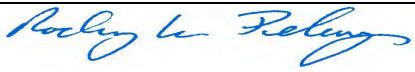


Quasi Peak Data - vs - Quasi Peak Limit

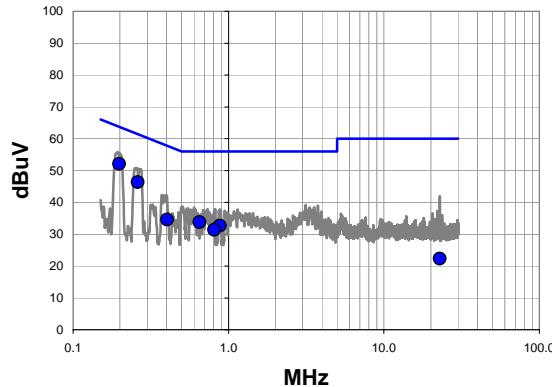
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.195	33.6	20.1	53.7	63.8	-10.1
0.257	28.5	20.1	48.6	61.5	-12.9
0.255	28.4	20.1	48.5	61.6	-13.1
0.378	19.5	20.1	39.6	58.3	-18.7
23.672	18.1	20.9	39.0	60.0	-21.0
0.539	14.3	20.1	34.4	56.0	-21.6
22.878	15.4	20.9	36.3	60.0	-23.7

Average Data - vs - Average Limit

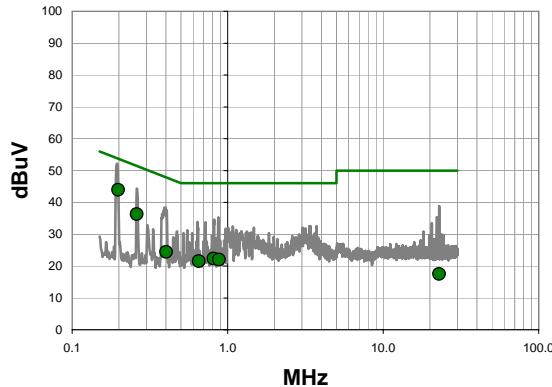
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.195	25.2	20.1	45.3	53.8	-8.5
0.257	19.2	20.1	39.3	51.5	-12.2
0.255	19.1	20.1	39.2	51.6	-12.4
23.672	16.7	20.9	37.6	50.0	-12.4
22.878	13.6	20.9	34.5	50.0	-15.5
0.378	8.4	20.1	28.5	48.3	-19.8
0.539	3.8	20.1	23.9	46.0	-22.1

Work Order:	LEVT0047	Date:	02/15/12				
Project:	None	Temperature:	22.5 °C				
Job Site:	EV11	Humidity:	38.5% RH				
Serial Number:	B 7.0 dB	Barometric Pres.:	1020.5 mbar	Tested by: Rod Peloquin			
EUT:	WSCOM-03W						
Configuration:	2						
Customer:	Leviton Manufacturing Company						
Attendees:	Dan Wright, Jason Betournay						
EUT Power:	120VAC/60Hz						
Operating Mode:	Transmitting 100% duty cycle with modulation						
Deviations:	No deviations						
Comments:	None						
Test Specifications		Test Method					
FCC 15.207:2012		ANSI C63.10:2009					
Run #	2	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)
0.198	32.0	20.1	52.1	63.7	-11.6
0.261	26.2	20.1	46.3	61.4	-15.1
0.652	13.7	20.1	33.8	56.0	-22.2
0.403	14.5	20.1	34.6	57.8	-23.2
0.880	12.6	20.1	32.7	56.0	-23.3
0.810	11.3	20.1	31.4	56.0	-24.6
22.932	1.4	20.9	22.3	60.0	-37.7

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.198	23.8	20.1	43.9	53.7	-9.8
0.261	16.2	20.1	36.3	51.4	-15.1
0.403	4.3	20.1	24.4	47.8	-23.4
0.810	2.2	20.1	22.3	46.0	-23.7
0.880	1.9	20.1	22.0	46.0	-24.0
0.652	1.4	20.1	21.5	46.0	-24.5
22.932	-3.4	20.9	17.5	50.0	-32.5