



Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747

www.ul.com/emc
(631) 271-6200

Job Number:	957001
Project Number:	08ME06443
File Number:	MC15211
Date:	5 August 2008
Model:	VRF01 and VRE06
FCC ID:	QGH-VRSDC
Industry Canada ID:	2473A-VRSDC

Electromagnetic Compatibility Test Report

For

Leviton Mfg. Co. Inc.

Copyright © 2007 Underwriters Laboratories Inc.

Underwriters Laboratories Inc. authorizes the above-named company to reproduce this Report provided it is reproduced in its entirety.

Job Number: 957001 File Number: MC15211 Page 2 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.**
1285 Walt Whitman Rd.
Melville, NY 11747

Tests Performed For: **Leviton Mfg. Co. Inc.**
59-25 Little Neck Parkway
Little Neck, NY 11362-2591

Applicant Contact: **Mr. Parimal Patel**
Title: **Senior Electronics Engineer**
Phone: **(718) 281-6437**
Fax: **(718) 281-6419**
E-mail: **ppatel@leviton.com**

Test Report Date: **5 August 2008**

Product Type: **Dimmers**

Product standards: **FCC Part 15, Subpart C, 15.249, RSS-210, RSS-GEN**

Model Number: **VRF01 and VRE06**

Sample Serial Number: **Prototype**

EUT Category: **Periodic Low Power Transmitter**

Testing Start Date: **4 Jun 2008**

Date Testing Complete: **5 Aug 2008**

Overall Results: Compliant

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, NIST, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

Job Number:	957001	File Number:	MC15211	Page	3 of 64
Model Number:	VRF01 and VRE06				
Client Name:	Leviton Mfg. Co. Inc.				
FCC ID:	QGH-VRSDC				
Industry Canada ID:	2473A-VRSDC				

Report Directory

1.0	G E N E R A L - Product Description	4
1.1	Equipment Description	4
1.2	Equipment Marking Plate	4
1.3	Device Configuration During Test.....	5
1.3.1	Equipment Used During Test:.....	5
1.3.2	Input/Output Ports:.....	5
1.3.3	EUT Internal Operating Frequencies:	6
1.3.4	Power Interface:	6
1.4	Block Diagram:	7
1.5	EUT Configurations.....	8
1.6	EUT Operation Modes	8
2.0	Summary	9
2.1	Deviations from standard test methods.....	9
2.2	Device Modifications Necessary for Compliance	9
2.3	Reference Standards	9
2.4	Results Summary	10
3.0	Calibration of Equipment Used for Measurement	11
4.0	Emissions Test Results	11
4.1	Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS	12
4.2	Test Conditions and Results – Occupied Bandwidth.....	24
4.3	Test Conditions and Results – RADIATED EMISSIONS	30
4.4	Test Conditions and Results – RADIATED EMISSIONS	50
5.0	Fundamental Frequency and Spurious Emissions Measurement Limit Calculations:.....	62
	Appendix A.....	63
	Accreditations and Authorizations	63

Job Number: 957001 File Number: MC15211 Page 4 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
5 August 2008	Original	—	—

1.0 G E N E R A L - Product Description

1.1 Equipment Description

VRE06: Vizia RF + 600W Electronic Low Voltage Scene Capable Dimmer for single pole, 3-way or more applications, with LED locator and brightness display. White face assembled on device, ivory and almond faces included.

Vrf01: Vizia RF + 1.5A Scene Capable Quiet Fan Speed Control for single pole, 3-way or more applications, with LED locator and fan speed display. White face assembled on device, ivory and almond faces included.

Per FCC Part 2.1093 (C) this device is not required to undergo testing for radio-frequency radiation exposure.

Antenna description: It is a permanently attached to the RF circuit board and the transmit antenna type is a PCB trace antenna.

The transmitter circuitry is regulated and therefore frequency stability with varied input voltages was not required.

1.2 Equipment Marking Plate

Not Applicable

Job Number: 957001 File Number: MC15211 Page 5 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Dimmer	Leviton Mfg. Co. Inc.	VRE06	None
EUT	Dimmer	Leviton Mfg. Co. Inc.	VRF01	Leviton Mfg. Co. Inc.
AE	Load	Leviton	—	Incandescent Light fixture
Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)				

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	—	—	—	None
Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical I/O = Signal Input or Output Port (Not Involved in Process Control) TP = Telecommunication Ports					

Job Number: 957001 File Number: MC15211 Page 6 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

1.3.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
908.4	Fundamental Frequencies
32	Crystal

1.3.4 Power Interface:

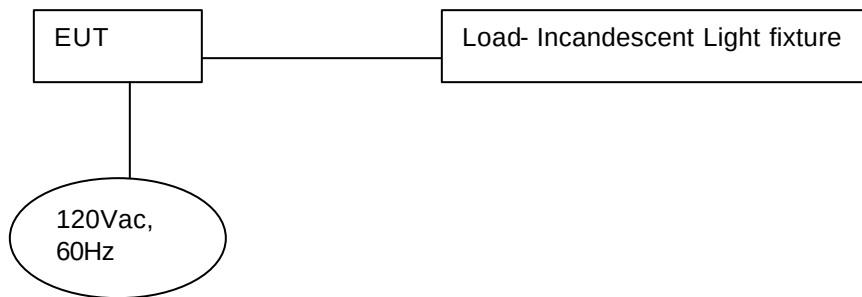
Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120Vac	—	—	60Hz	Single Phase	None

Job Number: 957001 File Number: MC15211
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Page 7 of 64

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



Job Number: 957001 File Number: MC15211 Page 8 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

1.5 EUT Configurations

Mode #	Description
1	The EUT (equipment under test) was set to transmit at its maximum allowable power rating at the fundamental frequency of 908.42MHz.

1.6 EUT Operation Modes

Mode #	Description
1	Continuous transmit
2	Transmit normal operation
3	Standby (receive)

Job Number:	957001	File Number:	MC15211	Page	9 of 64
Model Number:	VRF01 and VRE06				
Client Name:	Leviton Mfg. Co. Inc.				
FCC ID:	QGH-VRSDC				
Industry Canada ID:	2473A-VRSDC				

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
CFR 47	FCC Part 15, Subpart C, 15.31, 15.35, 15.207 & 15.209, & 15.249	2007
CFR 47	FCC Part 15, Subpart B, Class B Radio Frequency Devices	2007
ICES-003, Issue 4	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard: Digital Apparatus	2003
RSS- 210, Issue 7	Low-power License-exempt Radio communications Devices (All Frequency Bands): Category I Equipment sets out certification requirements for low-power license- exempt radio communication devices that are Category I equipment.	2007
RSS-GEN, Issue 2	General Requirements and Information for the Certification of Radio communication equipment.	2007

Job Number:	957001	File Number:	MC15211	Page	10 of 64
Model Number:	VRF01 and VRE06				
Client Name:	Leviton Mfg. Co. Inc.				
FCC ID:	QGH-VRSDC				
Industry Canada ID:	2473A-VRSDC				

2.4 Results Summary

This product is considered Class B

Requirement – Test	Result
Conducted Emissions - Unintentional	Compliant
Radiated Emissions - Unintentional	Compliant
Conducted Emissions	Compliant
General Radiated Emissions	Compliant
Spurious Radiated Emissions	Compliant
Fundamental Radiated Emissions	Compliant
Occupied Bandwidth	Compliant

Test Engineer:



Joe Danisi (Ext.23055)
Lead Engineering Associate
International EMC Services
Conformity Assessment Services -

Reviewer:



Bob DeLisi (Ext.22452)
Senior Staff Engineer
International EMC Services
Conformity Assessment Services

Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 Emissions Test Results

The emissions tests were performed according to following regulations:

----- United States -----

FCC Part 15, Subpart C, 15.207, 15.209, & 15.249.	Code of Federal Regulations, Part 15, and Subpart C, Radio Frequency Devices: 2007.
FCC Part 15, Subpart B, 15.107 & 15.109	Code of Federal Regulations, Part 15, and Subpart B, Radio Frequency Devices: 2007.

----- Industry Canada -----

Radio Standards Specification 210, Issue 7	Low-power License-exempt Radio communications Devices (All Frequency Bands): Category I Equipment sets out certification requirements for low-power license- exempt radio communication devices that are Category I equipment. 2007
RSS-GEN, Issue 2	General Requirements and Information for the Certification of Radio communication Equipment.
ICES-003, Issue 4	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard: Digital Apparatus. 2004

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150
-------------------------	------------	----------------------	---------	---------------------------	-----------

Job Number: 957001 File Number: MC15211 Page 12 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

Test Description	Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.	
Basic Standard	FCC Part 15, Subpart C, 15.207, RSS-210	
UL LPG	80-EM-S0026	
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains
Limits - Class B		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Supplementary information: None		

Table 1 Conducted Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	2
Supplementary information: Normal Operation, which is transmitting as intended was deemed worst-case emissions.		

Table 2 Conducted Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Conducted Emissions – GP 1			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
LISN	EMCO	3825/2R	ME5-790
Switch Driver	HP	11713A	44397
RF Switch Box	UL	4	44404
Measurement Software	UL	Version 9.3	44736
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734

Job Number: 957001 File Number: MC15211 Page 13 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 1 Test Setup for Conducted Emissions



Figure 2 Conducted Emissions Graph

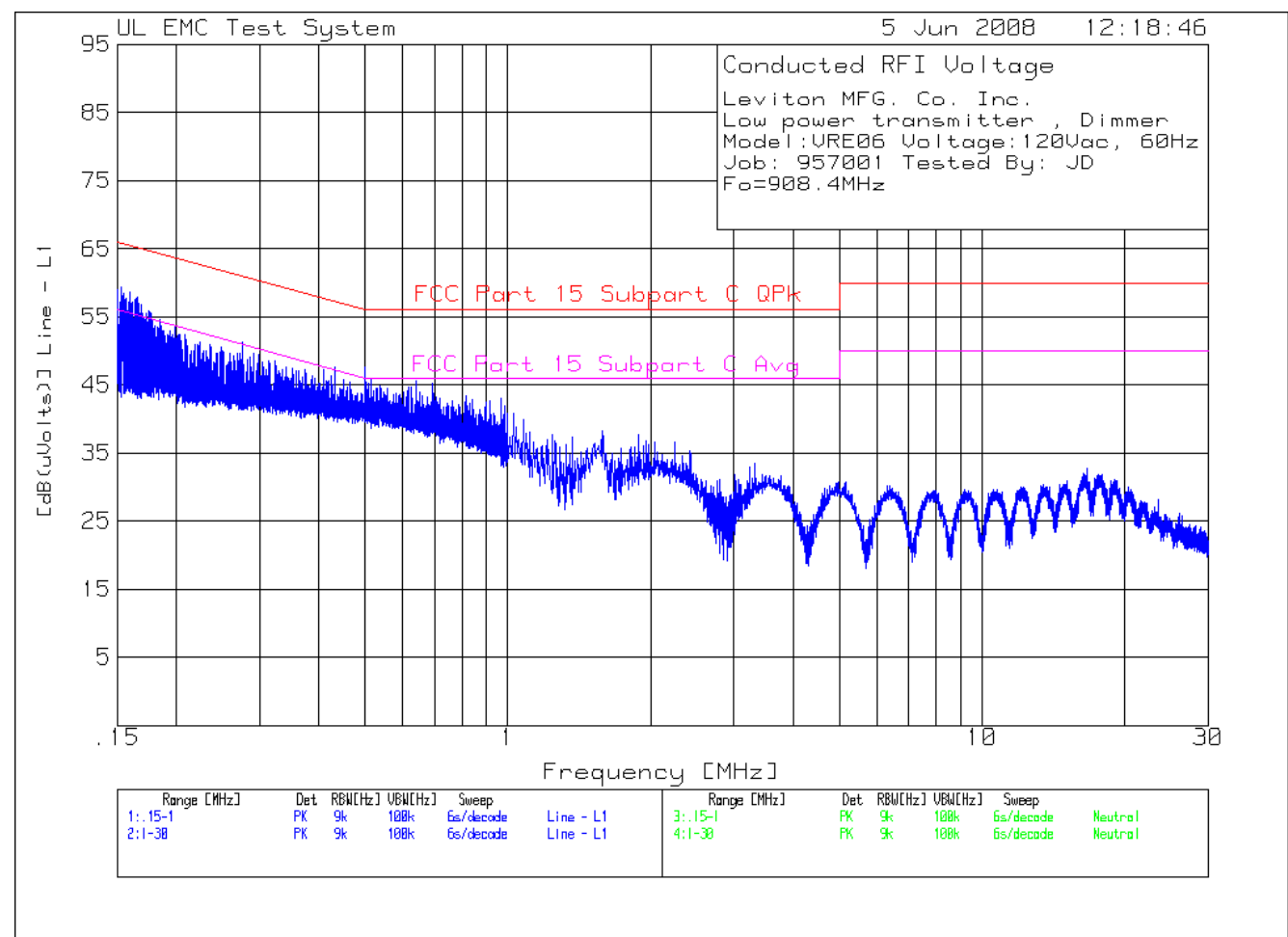
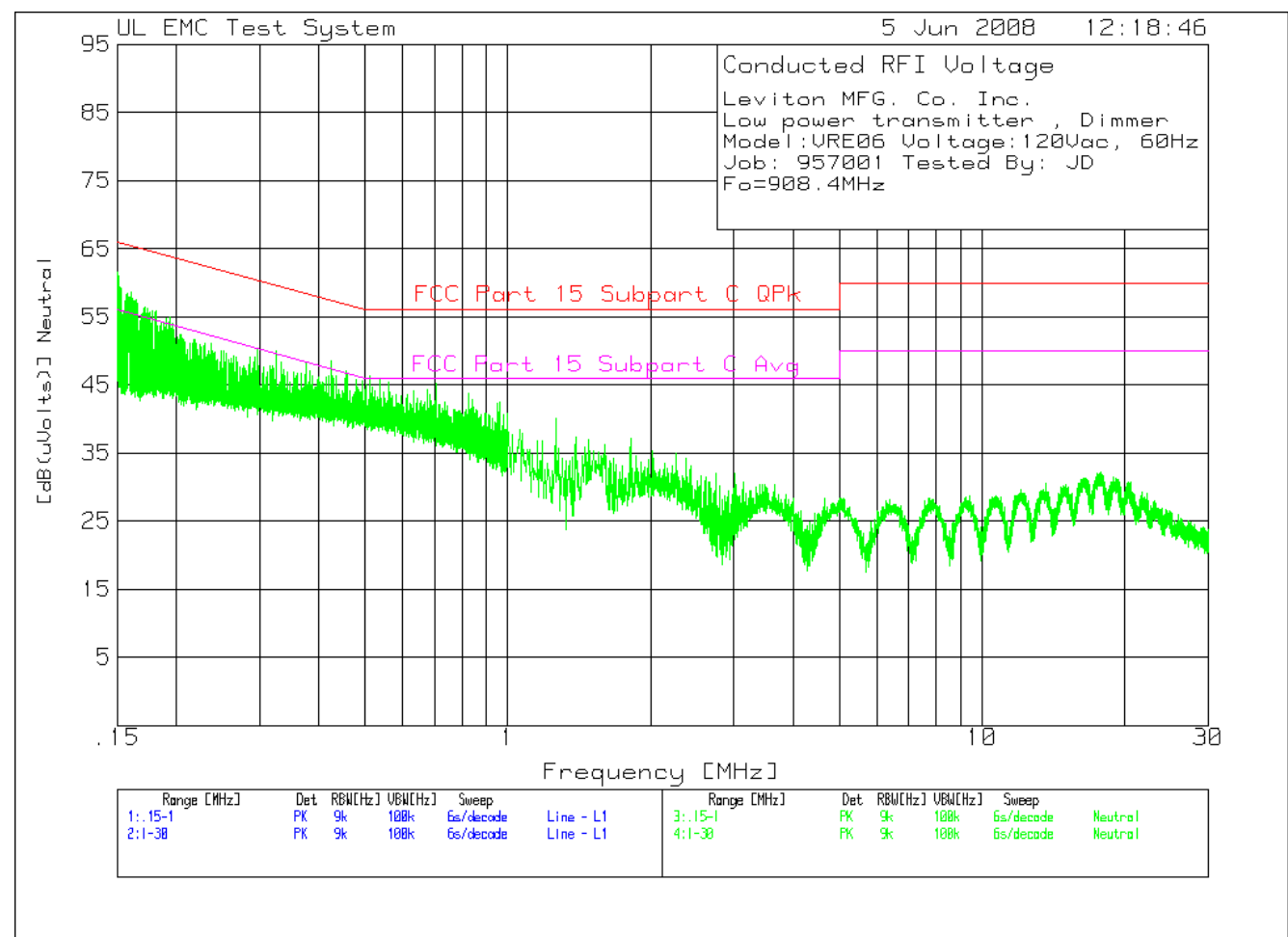


Figure 3 Conducted Emissions Graph



Job Number: 957001 File Number: MC15211 Page 16 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 3 Conducted Emissions Data Points

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRE06 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
=====											
Line - L1 .15 - 1MHz											
18	.15289	47.18 pk	12.1	0	59.28	65.8	55.8	-	-	-	-
				Margin [dB]		-6.52	3.48	-	-	-	-
19	.1653	45.98 pk	11.9	0	57.88	65.2	55.2	-	-	-	-
				Margin [dB]		-7.32	2.68	-	-	-	-
20	.17466	44.24 pk	11.7	0	55.94	64.7	54.7	-	-	-	-
				Margin [dB]		-8.76	1.24	-	-	-	-
21	.19455	41.35 pk	11.5	0	52.85	63.8	53.8	-	-	-	-
				Margin [dB]		-10.95	-.95	-	-	-	-
22	.27532	40.35 pk	10.9	0	51.25	61	51	-	-	-	-
				Margin [dB]		-9.75	.25	-	-	-	-
23	.32378	37.67 pk	10.8	0	48.47	59.6	49.6	-	-	-	-
				Margin [dB]		-11.13	-1.13	-	-	-	-
24	.50129	37.06 pk	10.5	0	47.56	56	46	-	-	-	-
				Margin [dB]		-8.44	1.56	-	-	-	-
25	.63919	35.12 pk	10.4	0	45.52	56	46	-	-	-	-
				Margin [dB]		-10.48	-.48	-	-	-	-
26	.6936	34.77 pk	10.4	0	45.17	56	46	-	-	-	-
				Margin [dB]		-10.83	-.83	-	-	-	-
27	.81687	33.07 pk	10.4	0	43.47	56	46	-	-	-	-
				Margin [dB]		-12.53	-2.53	-	-	-	-
28	.98402	31.53 pk	10.4	0	41.93	56	46	-	-	-	-
				Margin [dB]		-14.07	-4.07	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Job Number: 957001 File Number: MC15211 Page 17 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRE06 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
=====											
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
=====											
Neutral .15 - 1MHz -----											
1	.15034	49.53 pk	12.1	0	61.63	66	56	-	-	-	-
				Margin [dB]		-4.37	5.63	-	-	-	-
2	.15765	46.4 pk	12	0	58.4	65.6	55.6	-	-	-	-
				Margin [dB]		-7.2	2.8	-	-	-	-
3	.16071	46.7 pk	11.9	0	58.6	65.4	55.4	-	-	-	-
				Margin [dB]		-6.8	3.2	-	-	-	-
4	.17227	44.56 pk	11.8	0	56.36	64.9	54.9	-	-	-	-
				Margin [dB]		-8.54	1.46	-	-	-	-
5	.17636	43.93 pk	11.7	0	55.63	64.7	54.7	-	-	-	-
				Margin [dB]		-9.07	.93	-	-	-	-
6	.18163	44.23 pk	11.6	0	55.83	64.4	54.4	-	-	-	-
				Margin [dB]		-8.57	1.43	-	-	-	-
7	.19302	42.68 pk	11.5	0	54.18	63.9	53.9	-	-	-	-
				Margin [dB]		-9.72	.28	-	-	-	-
8	.20764	40.25 pk	11.4	0	51.65	63.3	53.3	-	-	-	-
				Margin [dB]		-11.65	-1.65	-	-	-	-
9	.21903	40.29 pk	11.3	0	51.59	62.9	52.9	-	-	-	-
				Margin [dB]		-11.31	-1.31	-	-	-	-
10	.23774	39.93 pk	11.1	0	51.03	62.2	52.2	-	-	-	-
				Margin [dB]		-11.17	-1.17	-	-	-	-
11	.26987	37.31 pk	11	0	48.31	61.1	51.1	-	-	-	-
				Margin [dB]		-12.79	-2.79	-	-	-	-
12	.3248	39.22 pk	10.8	0	50.02	59.6	49.6	-	-	-	-
				Margin [dB]		-9.58	.42	-	-	-	-
13	.42325	38.02 pk	10.6	0	48.62	57.4	47.4	-	-	-	-
				Margin [dB]		-8.78	1.22	-	-	-	-
14	.70635	34.8 pk	10.4	0	45.2	56	46	-	-	-	-
				Margin [dB]		-10.8	-.8	-	-	-	-
15	.82453	33.28 pk	10.4	0	43.68	56	46	-	-	-	-
				Margin [dB]		-12.32	-2.32	-	-	-	-
16	.96191	32.11 pk	10.4	0	42.51	56	46	-	-	-	-
				Margin [dB]		-13.49	-3.49	-	-	-	-
Neutral 1 - 30MHz -----											
17	1.26105	29.81 pk	10.3	0	40.11	56	46	-	-	-	-
				Margin [dB]		-15.89	-5.89	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Job Number: 957001 File Number: MC15211 Page 18 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRE06 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
Neutral .15 - 1MHz										
.15113	29.97 ave	12.1	0	42.07	65.9	55.9	-	-	-	-
			Margin [dB]:		-23.83	-13.83	-	-	-	-
.15793	29.46 ave	12	0	41.46	65.6	55.6	-	-	-	-
			Margin [dB]:		-24.14	-14.14	-	-	-	-
.16039	29.51 ave	11.9	0	41.41	65.4	55.4	-	-	-	-
			Margin [dB]:		-23.99	-13.99	-	-	-	-
.1732	29.07 ave	11.7	0	40.77	64.8	54.8	-	-	-	-
			Margin [dB]:		-24.03	-14.03	-	-	-	-
.17642	29.09 ave	11.7	0	40.79	64.7	54.7	-	-	-	-
			Margin [dB]:		-23.91	-13.91	-	-	-	-
.18068	28.94 ave	11.6	0	40.54	64.5	54.5	-	-	-	-
			Margin [dB]:		-23.96	-13.96	-	-	-	-
.19284	28.66 ave	11.5	0	40.16	63.9	53.9	-	-	-	-
			Margin [dB]:		-23.74	-13.74	-	-	-	-
.20699	27.98 ave	11.4	0	39.38	63.3	53.3	-	-	-	-
			Margin [dB]:		-23.92	-13.92	-	-	-	-
.21836	28.01 ave	11.3	0	39.31	62.9	52.9	-	-	-	-
			Margin [dB]:		-23.59	-13.59	-	-	-	-
.2376	27.86 ave	11.1	0	38.96	62.2	52.2	-	-	-	-
			Margin [dB]:		-23.24	-13.24	-	-	-	-
.26924	27 ave	11	0	38	61.1	51.1	-	-	-	-
			Margin [dB]:		-23.1	-13.1	-	-	-	-
.32433	27.11 ave	10.8	0	37.91	59.6	49.6	-	-	-	-
			Margin [dB]:		-21.69	-11.69	-	-	-	-
.42308	26.31 ave	10.6	0	36.91	57.4	47.4	-	-	-	-
			Margin [dB]:		-20.49	-10.49	-	-	-	-
.70642	23.24 ave	10.4	0	33.64	56	46	-	-	-	-
			Margin [dB]:		-22.36	-12.36	-	-	-	-
.82458	21.76 ave	10.4	0	32.16	56	46	-	-	-	-
			Margin [dB]:		-23.84	-13.84	-	-	-	-
.96143	18.91 ave	10.4	0	29.31	56	46	-	-	-	-
			Margin [dB]:		-26.69	-16.69	-	-	-	-
Neutral 1 - 30MHz										
1.24351	12.37 ave	10.4	0	22.77	56	46	-	-	-	-
			Margin [dB]:		-33.23	-23.23	-	-	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection

Figure 4 Conducted Emissions Graph

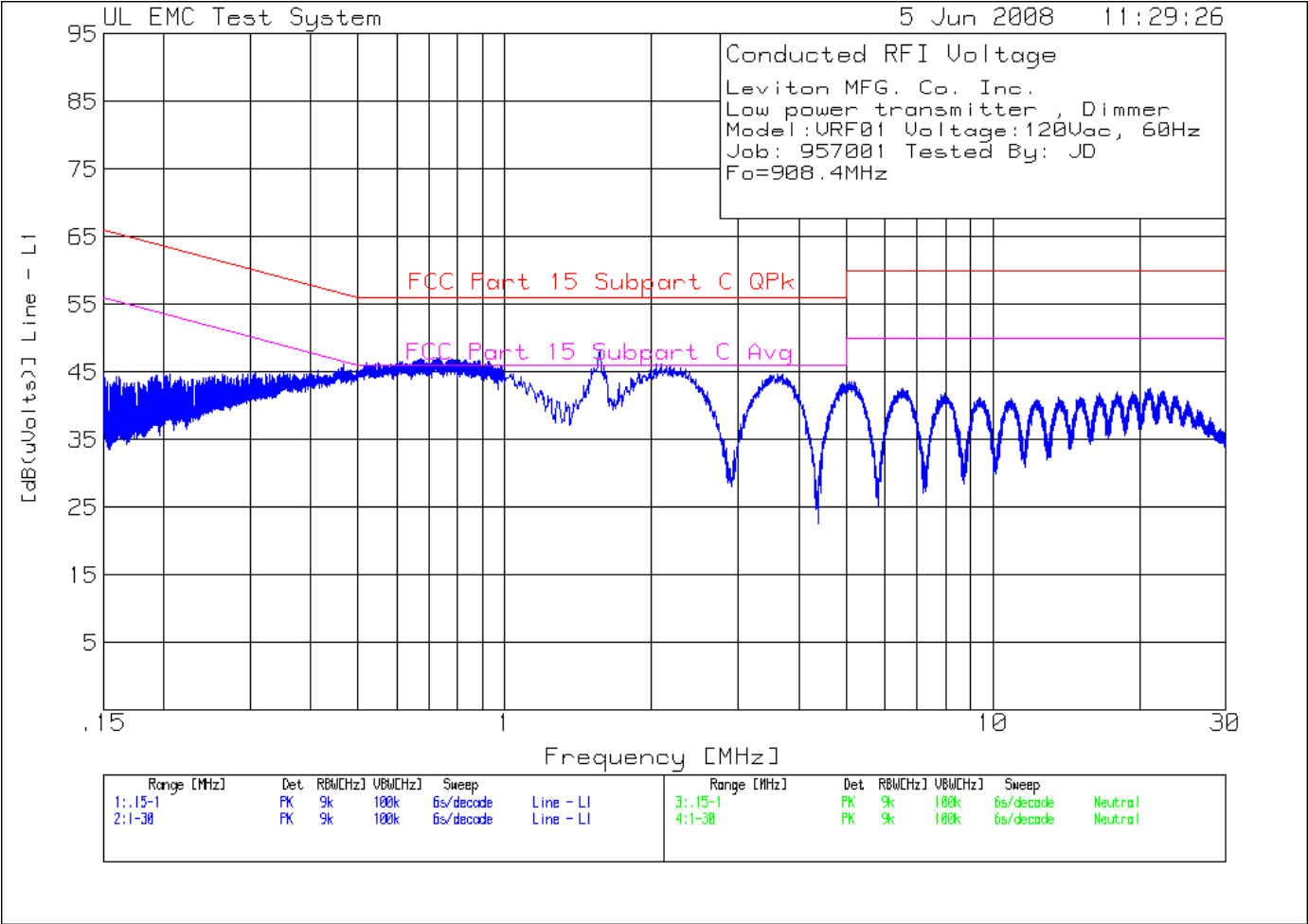
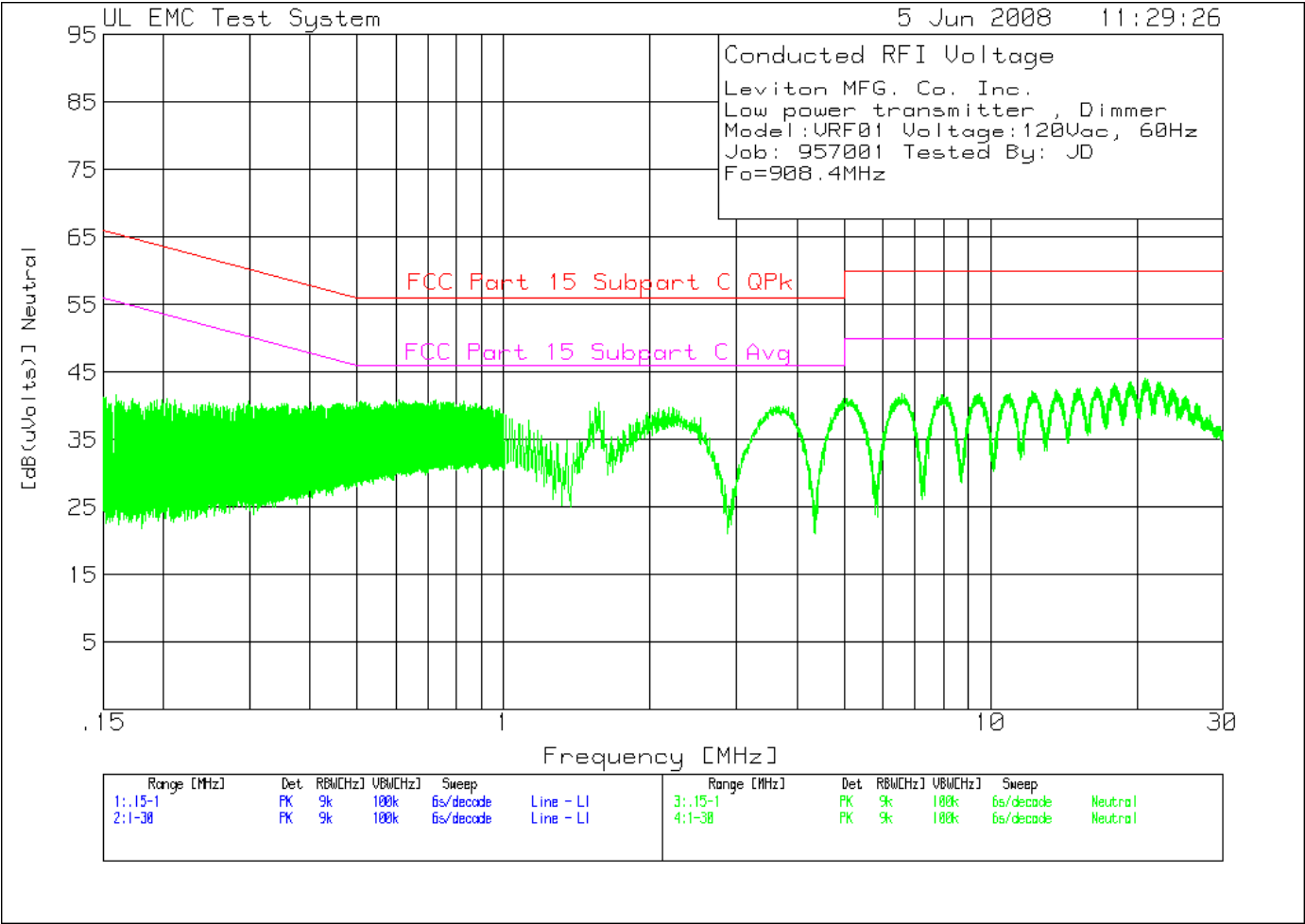


Figure 5 Conducted Emissions Graph



Job Number: 957001 File Number: MC15211 Page 21 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 4 Conducted Emissions Data Points

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRF01 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
Line - L1 .15 - 1MHz -----											
1	.46575	35.7 pk	10.5	0	46.2	56.6	46.6	-	-	-	-
				Margin [dB]		-10.4	-.4	-	-	-	-
2	.61606	36.06 pk	10.5	0	46.56	56	46	-	-	-	-
				Margin [dB]		-9.44	.56	-	-	-	-
3	.72642	36.74 pk	10.4	0	47.14	56	46	-	-	-	-
				Margin [dB]		-8.86	1.14	-	-	-	-
4	.87077	36.15 pk	10.4	0	46.55	56	46	-	-	-	-
				Margin [dB]		-9.45	.55	-	-	-	-
5	.99388	34.8 pk	10.4	0	45.2	56	46	-	-	-	-
				Margin [dB]		-10.8	-.8	-	-	-	-
Line - L1 1 - 30MHz -----											
6	1.04061	34.39 pk	10.4	0	44.79	56	46	-	-	-	-
				Margin [dB]		-11.21	-1.21	-	-	-	-
7	1.56271	37.8 pk	10.3	0	48.1	56	46	-	-	-	-
				Margin [dB]		-7.9	2.1	-	-	-	-
8	2.18344	35.81 pk	10.3	0	46.11	56	46	-	-	-	-
				Margin [dB]		-9.89	.11	-	-	-	-
9	3.62793	34.24 pk	10.4	0	44.64	56	46	-	-	-	-
				Margin [dB]		-11.36	-1.36	-	-	-	-
10	5.13043	33.22 pk	10.4	0	43.62	60	50	-	-	-	-
				Margin [dB]		-16.38	-6.38	-	-	-	-
11	6.58652	31.74 pk	10.5	0	42.24	60	50	-	-	-	-
				Margin [dB]		-17.76	-7.76	-	-	-	-
Neutral .15 - 1MHz -----											
12	.15204	29.18 pk	12.1	0	41.28	65.9	55.9	-	-	-	-
				Margin [dB]		-24.62	-14.62	-	-	-	-
13	.20305	29.75 pk	11.4	0	41.15	63.5	53.5	-	-	-	-
				Margin [dB]		-22.35	-12.35	-	-	-	-
14	.66996	30 pk	10.4	0	40.4	56	46	-	-	-	-
				Margin [dB]		-15.6	-5.6	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Job Number: 957001 File Number: MC15211 Page 22 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRF01 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
Neutral 1 - 30MHz -----											
15	1.56271	30.21 pk	10.4	0	40.61	56	46	-	-	-	-
				Margin [dB]		-15.39	-5.39	-	-	-	-
16	2.18344	29.44 pk	10.4	0	39.84	56	46	-	-	-	-
				Margin [dB]		-16.16	-6.16	-	-	-	-
17	3.66273	29.55 pk	10.4	0	39.95	56	46	-	-	-	-
				Margin [dB]		-16.05	-6.05	-	-	-	-
18	5.17684	30.54 pk	10.4	0	40.94	60	50	-	-	-	-
				Margin [dB]		-19.06	-9.06	-	-	-	-
19	6.58652	31.35 pk	10.5	0	41.85	60	50	-	-	-	-
				Margin [dB]		-18.15	-8.15	-	-	-	-
20	7.9788	31.12 pk	10.5	0	41.62	60	50	-	-	-	-
				Margin [dB]		-18.38	-8.38	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - average detector
 avlg - average log detection
 ave - average detection
 cav - CISPR average detection

Job Number: 957001 File Number: MC15211 Page 23 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton MFG. Co. Inc.
 Low power transmitter , Dimmer
 Model:VRF01 Voltage:120Vac, 60Hz
 Job: 957001 Tested By: JD
 Fo=908.4MHz

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 [dB(uVolts)]	2	3	4	5	6
=====									
Line - L1 .15 - 1MHz									
.46479	29.94 ave	10.5	0	40.44	56.6	46.6	-	-	-
			Margin [dB]:		-16.16	-6.16	-	-	-
.6173	30.94 ave	10.5	0	41.44	56	46	-	-	-
			Margin [dB]:		-14.56	-4.56	-	-	-
.72644	31.27 ave	10.4	0	41.67	56	46	-	-	-
			Margin [dB]:		-14.33	-4.33	-	-	-
.87085	30.95 ave	10.4	0	41.35	56	46	-	-	-
			Margin [dB]:		-14.65	-4.65	-	-	-
.99317	29.62 ave	10.4	0	40.02	56	46	-	-	-
			Margin [dB]:		-15.98	-5.98	-	-	-
Line - L1 1 - 30MHz									
1.03534	29.4 ave	10.4	0	39.8	56	46	-	-	-
			Margin [dB]:		-16.2	-6.2	-	-	-
1.56413	28.9 ave	10.3	0	39.2	56	46	-	-	-
			Margin [dB]:		-16.8	-6.8	-	-	-
2.19594	30.39 ave	10.3	0	40.69	56	46	-	-	-
			Margin [dB]:		-15.31	-5.31	-	-	-
3.62384	28.98 ave	10.4	0	39.38	56	46	-	-	-
			Margin [dB]:		-16.62	-6.62	-	-	-
5.14052	28.15 ave	10.4	0	38.55	60	50	-	-	-
			Margin [dB]:		-21.45	-11.45	-	-	-
6.59325	26.85 ave	10.5	0	37.35	60	50	-	-	-
			Margin [dB]:		-22.65	-12.65	-	-	-
Neutral .15 - 1MHz									
.15192	10.96 ave	12.1	0	23.06	65.9	55.9	-	-	-
			Margin [dB]:		-42.84	-32.84	-	-	-
.20297	13.4 ave	11.4	0	24.8	63.5	53.5	-	-	-
			Margin [dB]:		-38.7	-28.7	-	-	-
.67049	16.04 ave	10.4	0	26.44	56	46	-	-	-
			Margin [dB]:		-29.56	-19.56	-	-	-
Neutral 1 - 30MHz									
1.56109	18.59 ave	10.4	0	28.99	56	46	-	-	-
			Margin [dB]:		-27.01	-17.01	-	-	-
2.19956	22.23 ave	10.4	0	32.63	56	46	-	-	-
			Margin [dB]:		-23.37	-13.37	-	-	-
3.67385	24.47 ave	10.4	0	34.87	56	46	-	-	-
			Margin [dB]:		-21.13	-11.13	-	-	-
5.19156	25.31 ave	10.4	0	35.71	60	50	-	-	-
			Margin [dB]:		-24.29	-14.29	-	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

LIMIT 1: FCC Part 15 Subpart C QPk
 LIMIT 2: FCC Part 15 Subpart C Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection

Job Number: 957001 File Number: MC15211 Page 24 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

4.2 Test Conditions and Results – Occupied Bandwidth

Test Description	Measurements were made in the laboratory environment. A Dipole (or equivalent) antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.		
Basic Standard		FCC Part 15, Subpart C, 15.215, RSS-210	
Occupied Bandwidth Limits			
0.25% of the Fundamental Frequency			

Table 5 Occupied Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 6 Occupied Bandwidth Spectrum Analyzer Settings

Resolution Bandwidth (MHz)	Occupied Bandwidth Requirements	
	dBc	%
1% of the Span	-20	99
Supplementary information: None		

Table 7: Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Dipole Antenna	EMCO	3121C	3359
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Measurement Software	UL	Version 9.3	44740
Multimeter	Fluke	87V	44547

Job Number: 957001 File Number: MC15211 Page 25 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 6 Test Setup for Occupied Bandwidth

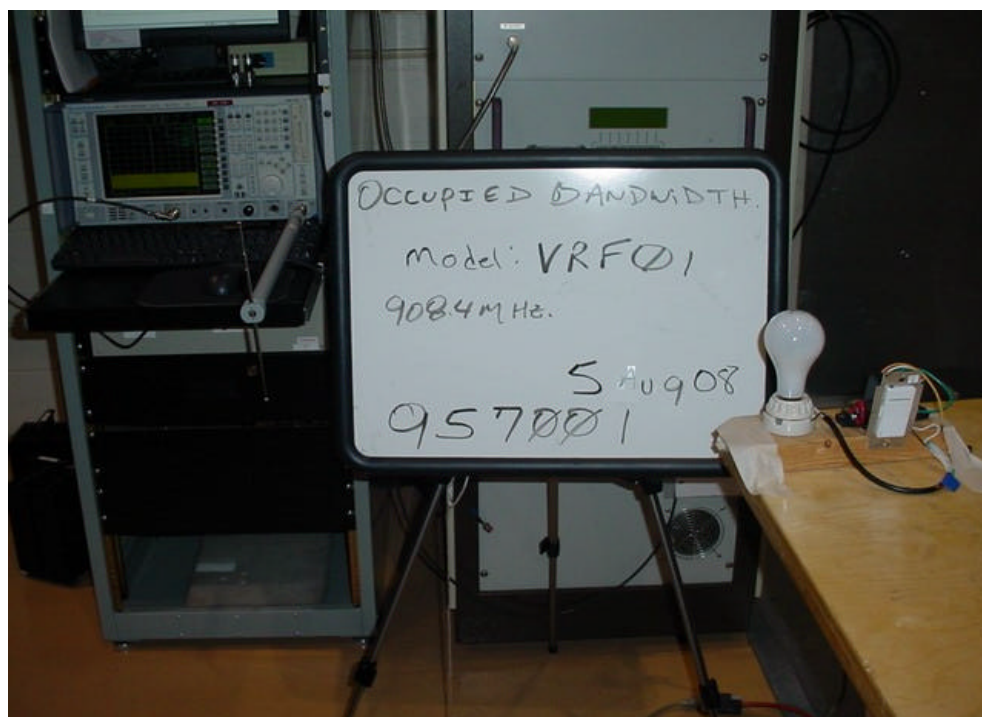
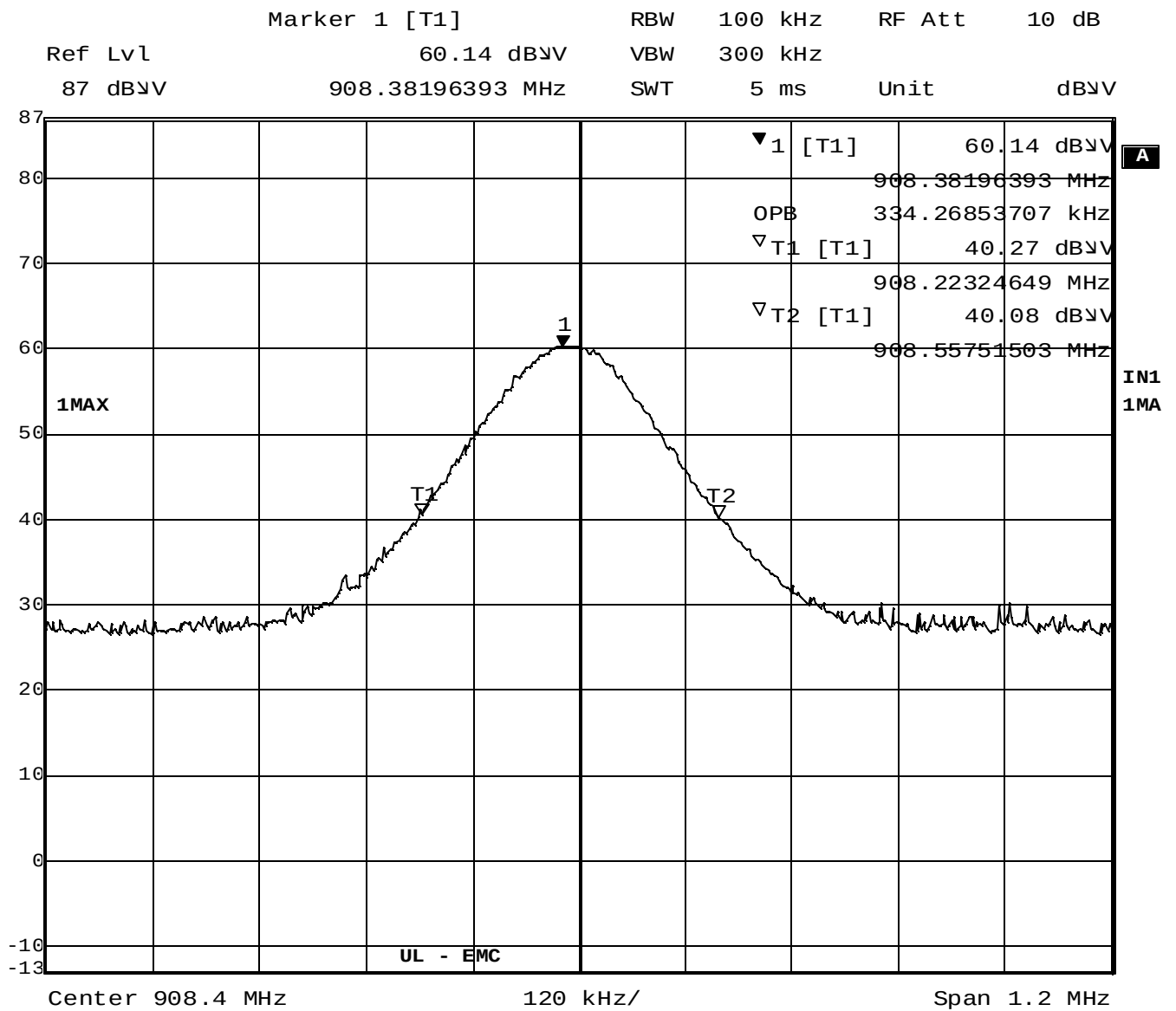


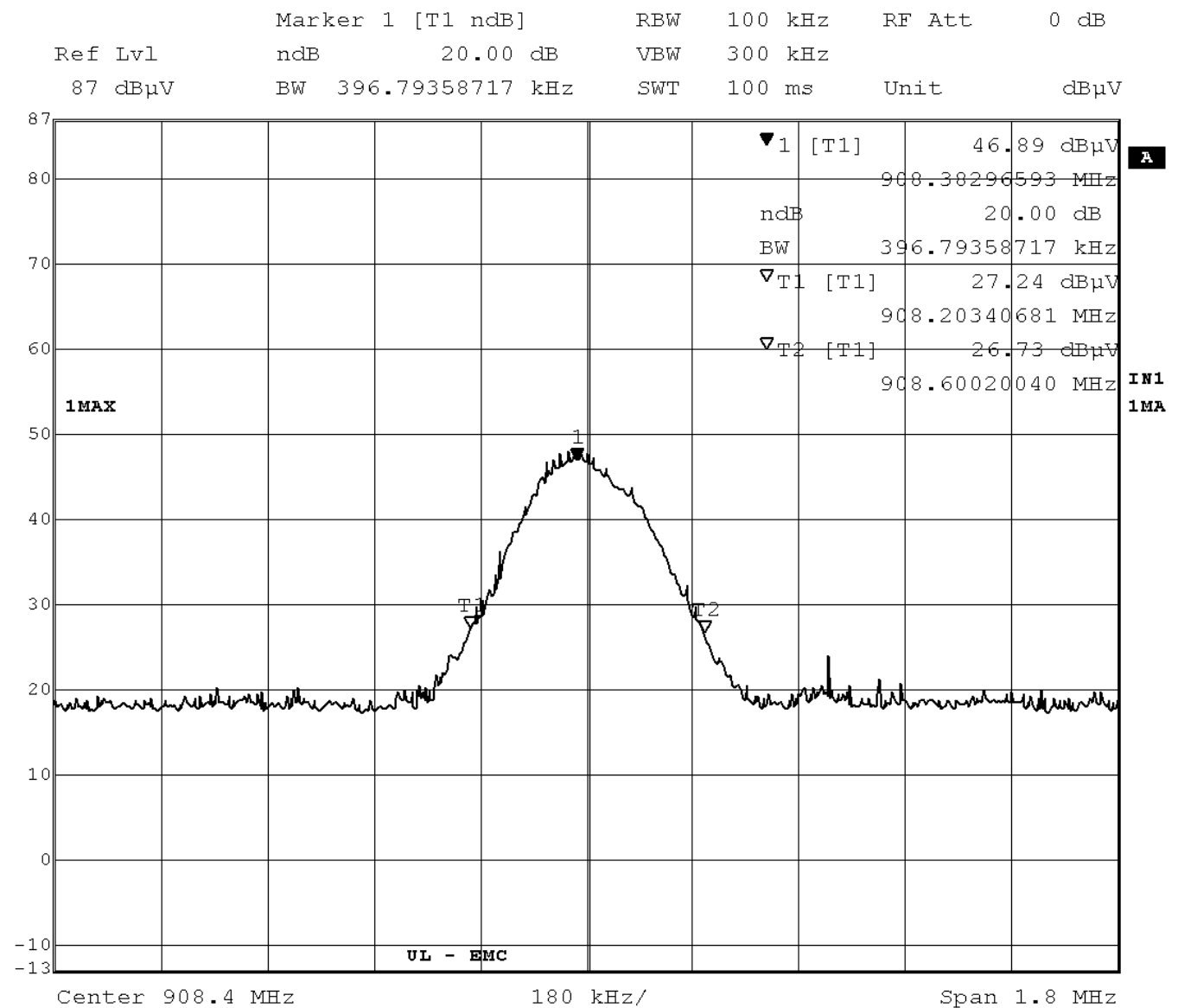
Figure 7 Occupied Bandwidth Graph Model VRE06



Date: 5.AUG.2008 08:11:01

Job Number: 957001 File Number: MC15211 Page 27 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

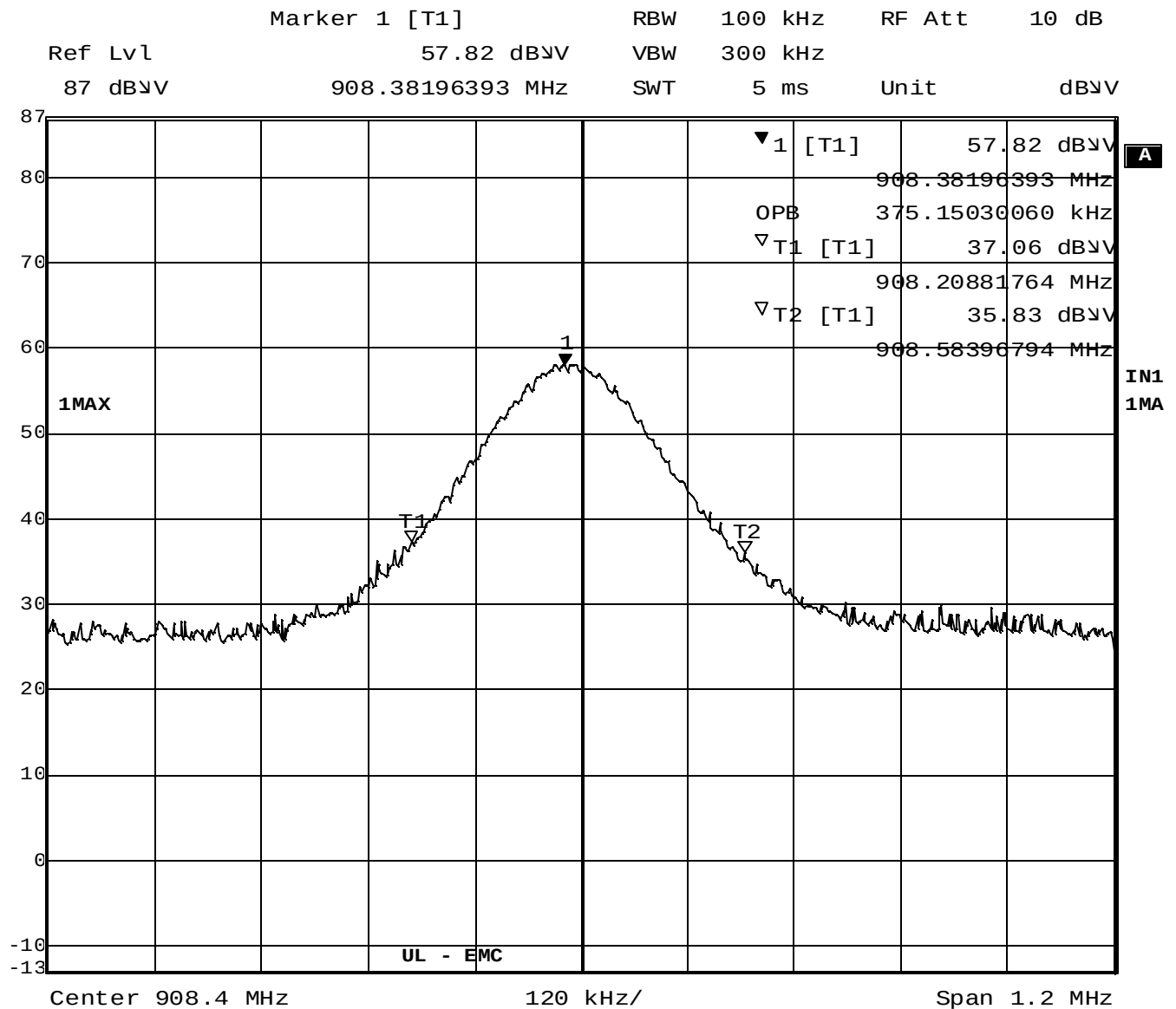
Figure 8 Occupied Bandwidth Graph Model VRE06



Date: 5.JUN.2008 15:43:39

Job Number: 957001 File Number: MC15211 Page 28 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

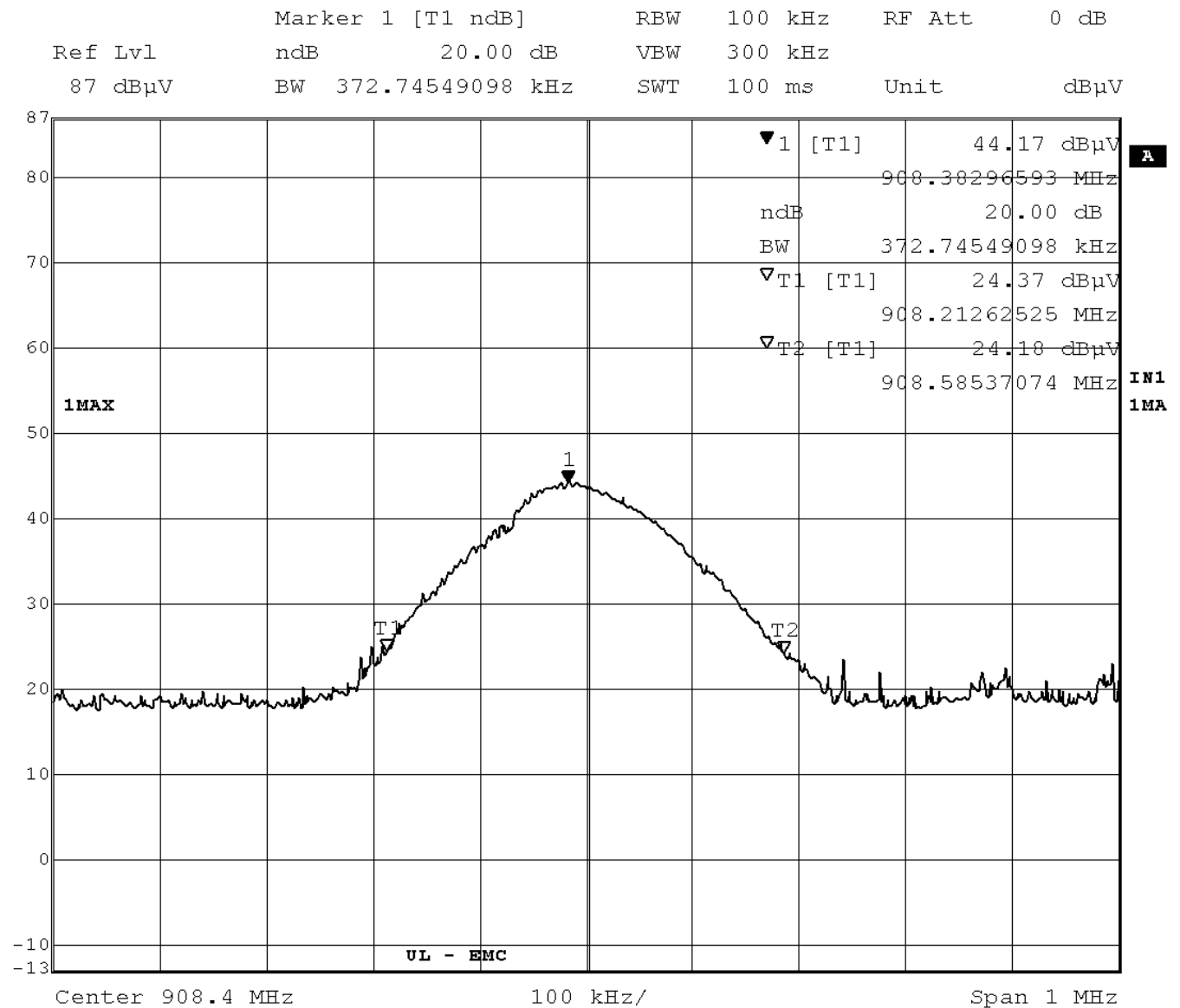
Figure 9 Occupied Bandwidth Graph Model VRF01



Date: 5.AUG.2008 07:59:49

Job Number: 957001 File Number: MC15211 Page 29 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 10 Occupied Bandwidth Graph Model VRF01



Date: 5.JUN.2008 15:10:13

Job Number: 957001 File Number: MC15211 Page 30 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

4.3 Test Conditions and Results – RADIATED EMISSIONS

Test Description	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		
Basic Standard		FCC Part 15, Subpart C, 15.249, RSS-210	
UL LPG		80-EM-S0029	
	Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range	0.009 MHz – 30MHz	(3 meter measurement distance)	
Fully configured sample scanned over the following frequency range	30 MHz – 1GHz	(3 meter measurement distance)	
Fully configured sample scanned over the following frequency range	1GHz – 10 GHz	(3 meter measurement distance)	
Limits			
Frequency (MHz)	Limit (dBµV/m)		
	Quasi-Peak	Average	
	General Emissions	Fundamental	Spurious
0.009 – 0.490	128.5 – 93.8	-	-
0.490 – 1.705	73.8 – 63	-	-
1.705 – 30	69.5	-	-
30 – 88	40	-	-
88 – 216	43.5	-	-
216-960	46	-	
960-1000	54		
1000-10000	-	-	54
Fundamental	-	94	
Spurious	-		54
Supplementary information: Spurious limits are only applied against products of the transmitter. All other emissions must meet the general limits. Portable transmitters are to be checked in 3 orthogonal Axis.			

Job Number: 957001 File Number: MC15211 Page 31 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 8 Radiated Emissions Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	3
Supplementary information: None		

Table 9 Radiated Emissions Test Equipment

Test Equipment Used			
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Bicon Antenna	Schaffner	VBA6106A	43441
Log-P Antenna	Schaffner	UPA6109	44068
Bias Tee	Miteq	AM-1523-7687	44392
Bias Tee	Miteq	AM-1523-7687	44393
Preamp	Miteq	AM-3A-000110-7687	44391
Preamp	Miteq	AM-3A-000110-7687	44394
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547
Above 1GHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Horn Antenna	Electro-Metrics	RGA-180	ME5-565
Preamp (1 - 26GHz)	HP	8449B	ME5-914
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547

Figure 11 Test Setup for Radiated Emissions 9KHz to 30MHz– VRE06

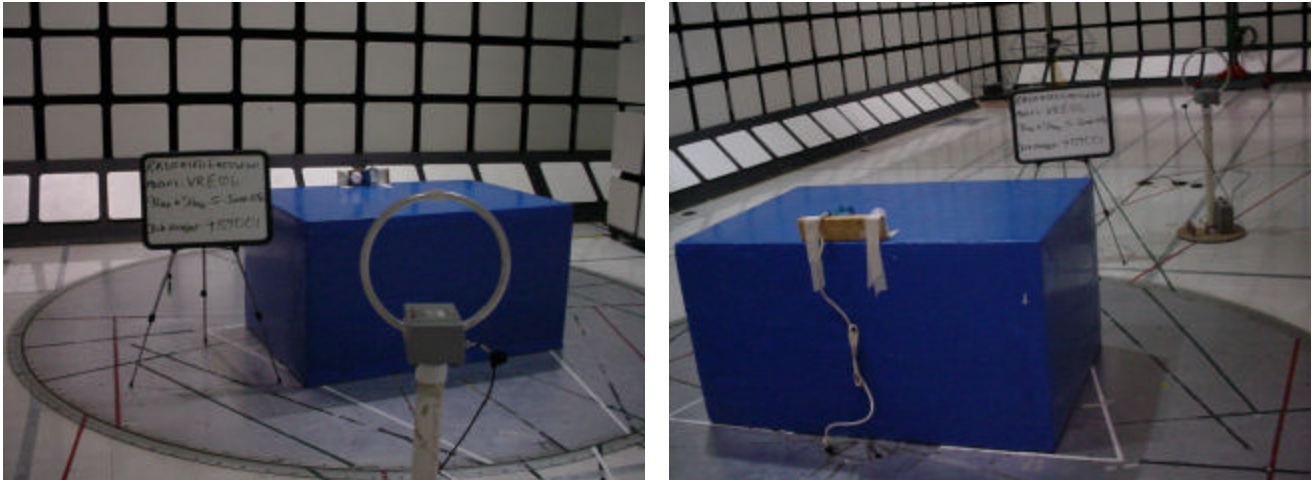


Figure 12 Test Setup for Radiated Emissions 30MHz to 1000MHz– VRE06

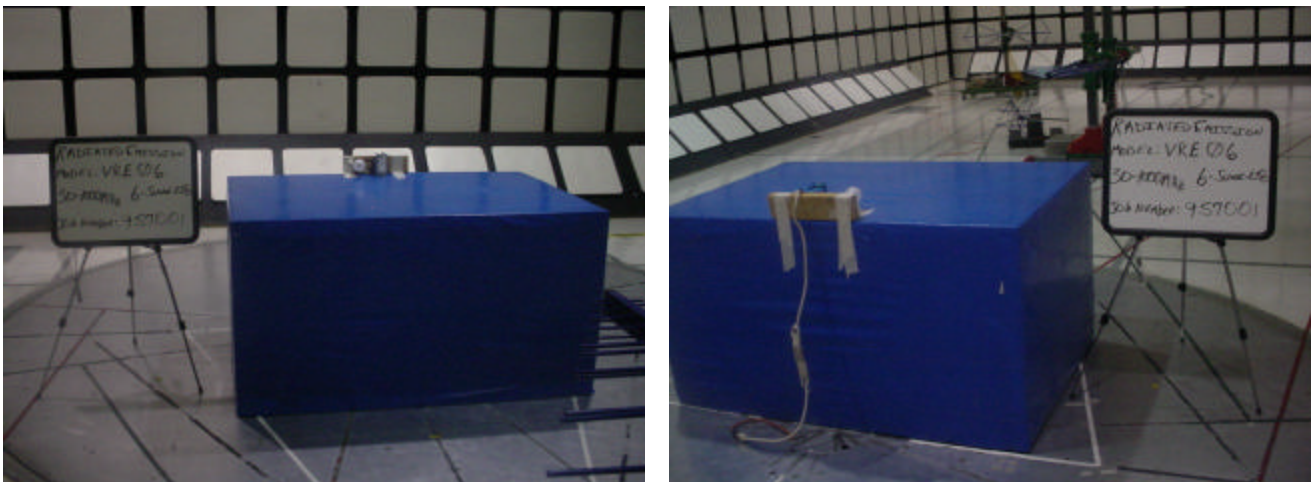


Figure 13 Test Setup for Radiated Emissions 1 to 10GHz – VRE06

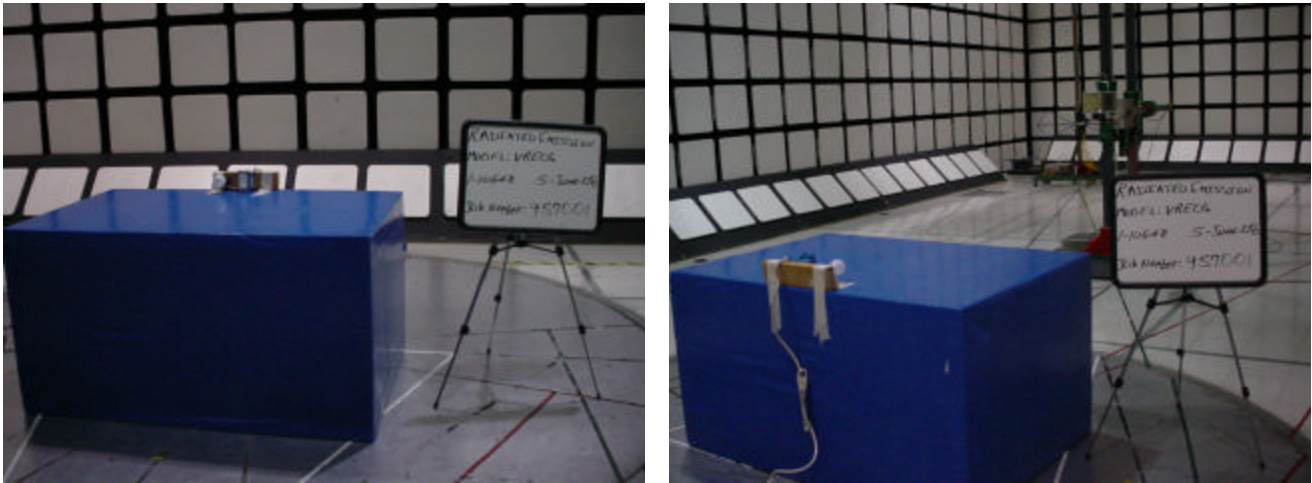


Figure 14 Test Setup for Radiated Emissions 9KHz to 30MHz – VRF01

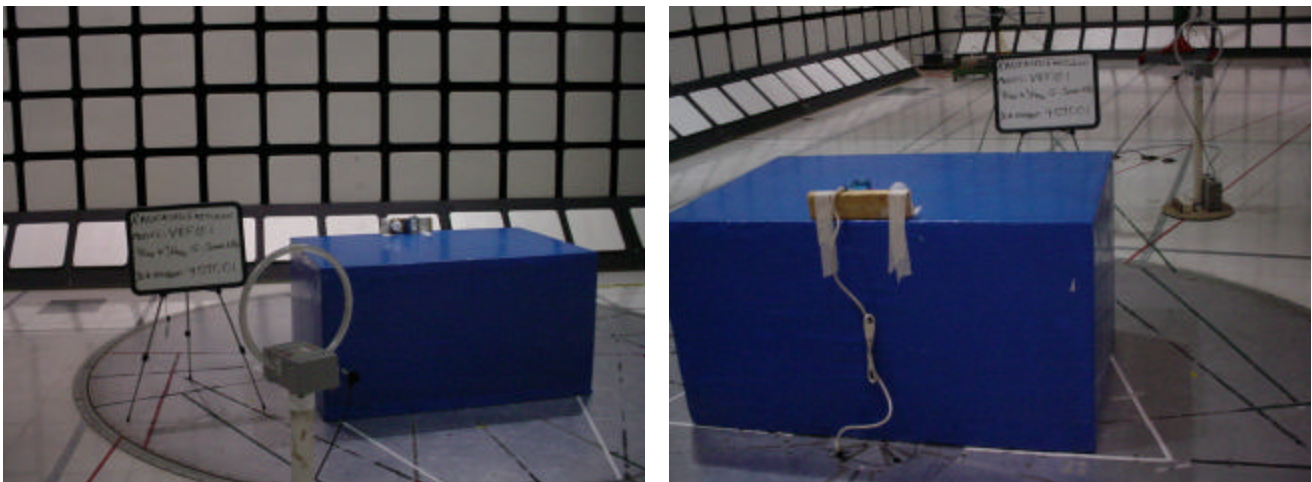


Figure 15 Test Setup for Radiated Emissions 30MHz to 1000MHz– VRF01

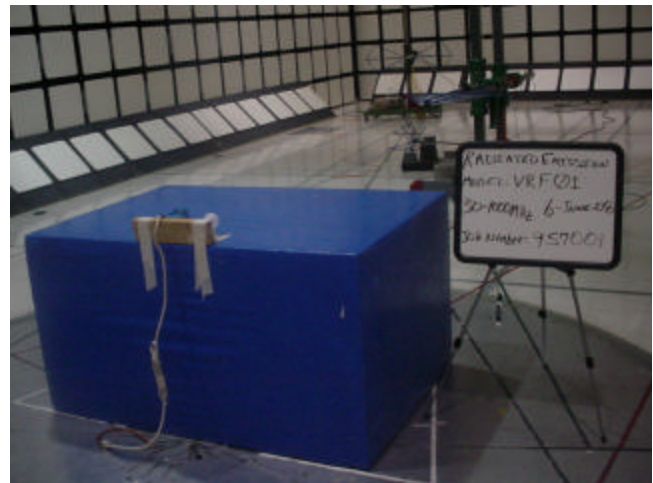


Figure 16 Test Setup for Radiated Emissions 1 GHz to 10GHz– VRF01

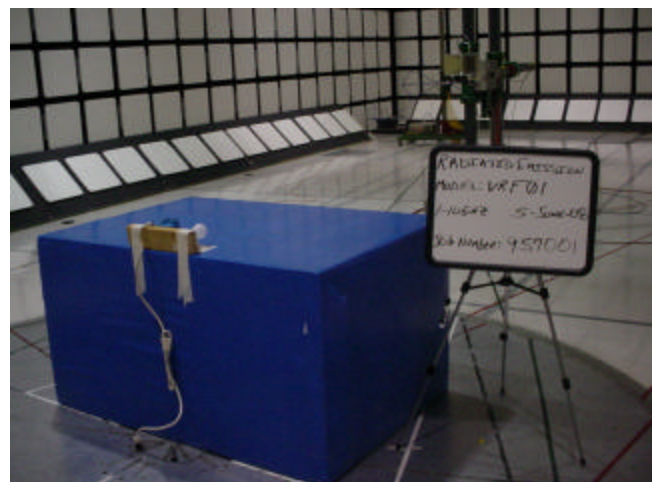
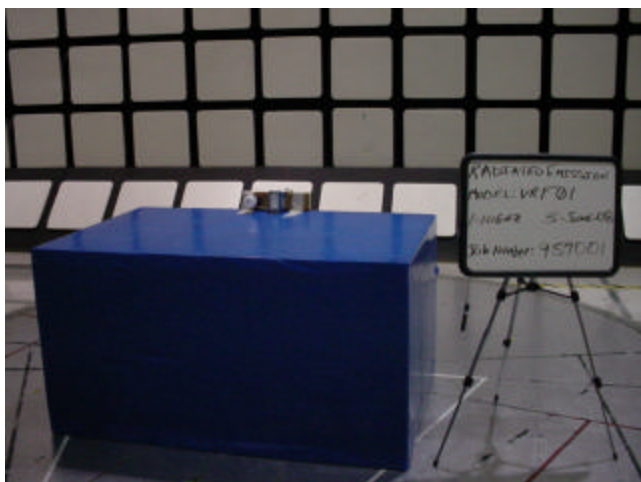
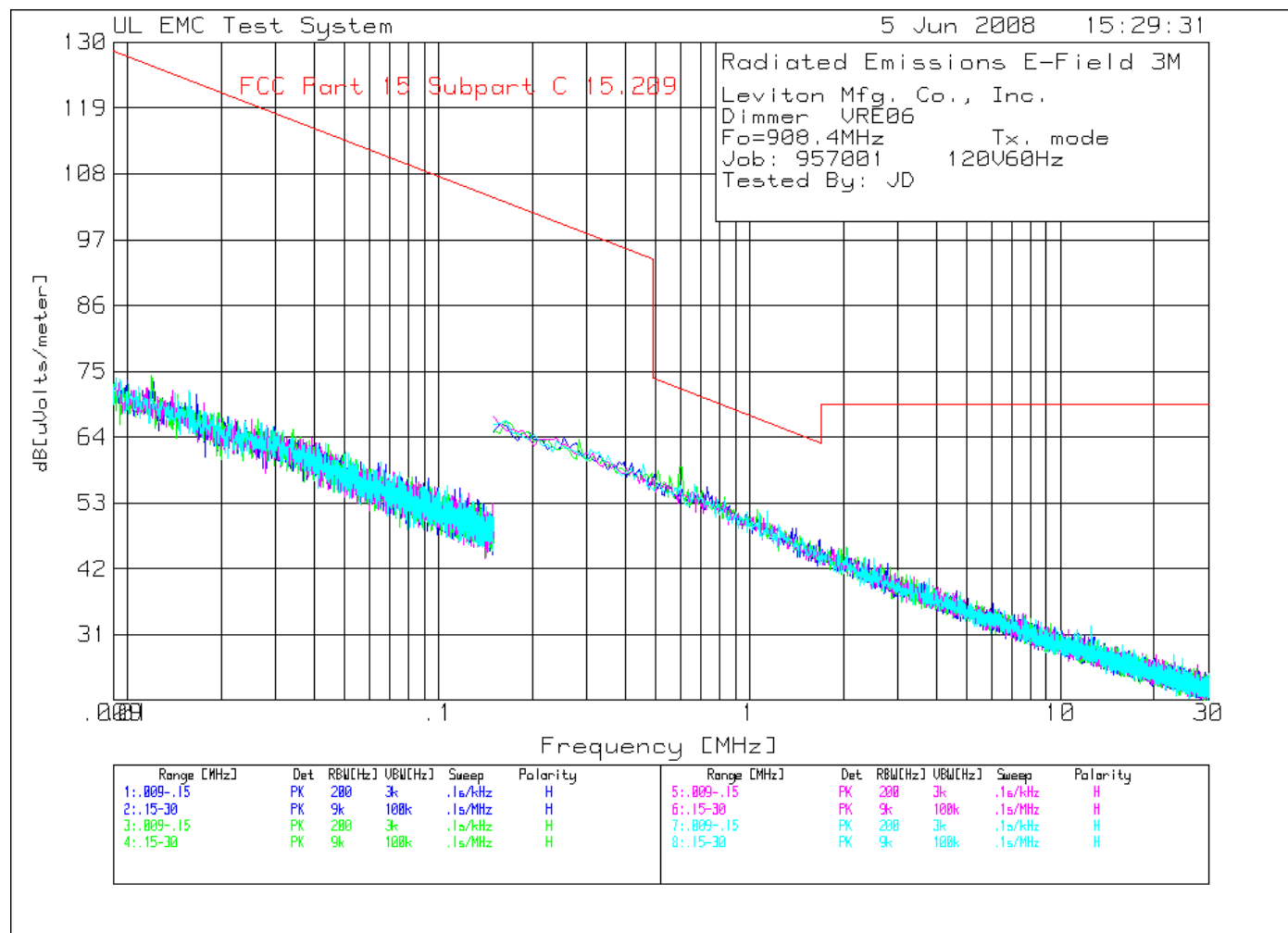


Figure 17 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 36 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 10 Radiated Emissions Data Points

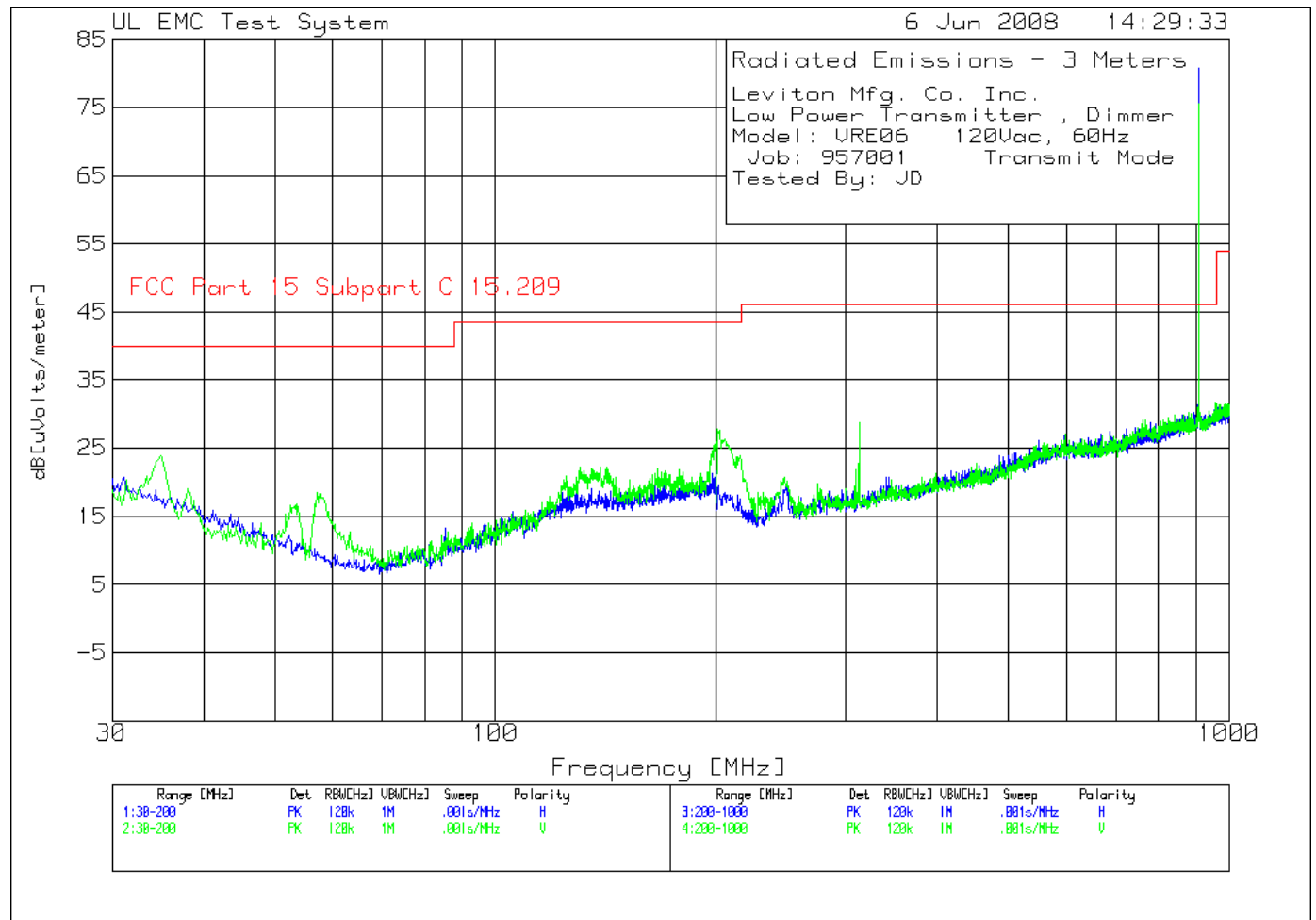
Leviton Mfg. Co., Inc.
 Dimmer VRE06
 Fo=908.4MHz Tx. mode
 Job: 957001 120V60Hz
 Tested By: JD

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
0° .009 - .15MHz -----										
1	.01002	44.1 pk	.2	29.2	73.5	127.6	-	-	-	-
	Azimuth:6	Height:100	Horz	Margin [dB]		-54.1	-	-	-	-
2	.01222	45.33 pk	.1	27.9	73.33	125.8	-	-	-	-
	Azimuth:354	Height:100	Horz	Margin [dB]		-52.47	-	-	-	-
3	.01673	45.94 pk	0	25.3	71.24	123.1	-	-	-	-
	Azimuth:6	Height:100	Horz	Margin [dB]		-51.86	-	-	-	-
4	.02655	43.15 pk	0	22.2	65.35	119.1	-	-	-	-
	Azimuth:77	Height:100	Horz	Margin [dB]		-53.75	-	-	-	-
5	.11711	39.49 pk	0	15.9	55.39	106.2	-	-	-	-
	Azimuth:6	Height:100	Horz	Margin [dB]		-50.81	-	-	-	-
0° .15 - 30MHz -----										
6	.15746	50.71 pk	0	15.7	66.41	103.7	-	-	-	-
	Azimuth:93	Height:100	Horz	Margin [dB]		-37.29	-	-	-	-
7	.49336	42.24 pk	0	15.5	57.74	73.7	-	-	-	-
	Azimuth:215	Height:100	Horz	Margin [dB]		-15.96	-	-	-	-
45° .009 - .15MHz -----										
11	.034	44.61 pk	0	20.8	65.41	117	-	-	-	-
	Azimuth:284	Height:121	Horz	Margin [dB]		-51.59	-	-	-	-
12	.05233	42.59 pk	0	17.8	60.39	113.2	-	-	-	-
	Azimuth:227	Height:121	Horz	Margin [dB]		-52.81	-	-	-	-
45° .15 - 30MHz -----										
8	.59786	43.49 pk	0	15.5	58.99	72.1	-	-	-	-
	Azimuth:358	Height:121	Horz	Margin [dB]		-13.11	-	-	-	-
9	1.29951	32.79 pk	.1	15.5	48.39	65.3	-	-	-	-
	Azimuth:267	Height:121	Horz	Margin [dB]		-16.91	-	-	-	-
10	1.06065	36.34 pk	0	15.5	51.84	67.1	-	-	-	-
	Azimuth:358	Height:121	Horz	Margin [dB]		-15.26	-	-	-	-
13	.16493	51.17 pk	0	15.7	66.87	103.3	-	-	-	-
	Azimuth:328	Height:121	Horz	Margin [dB]		-36.43	-	-	-	-
90° .15 - 30MHz -----										
14	2.38931	27.19 pk	.1	15.5	42.79	69.5	-	-	-	-
	Azimuth:185	Height:141	Horz	Margin [dB]		-26.71	-	-	-	-
15	.51575	40.84 pk	0	15.5	56.34	73.4	-	-	-	-
	Azimuth:185	Height:141	Horz	Margin [dB]		-17.06	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 18 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 38 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 11 Radiated Emissions Data Points

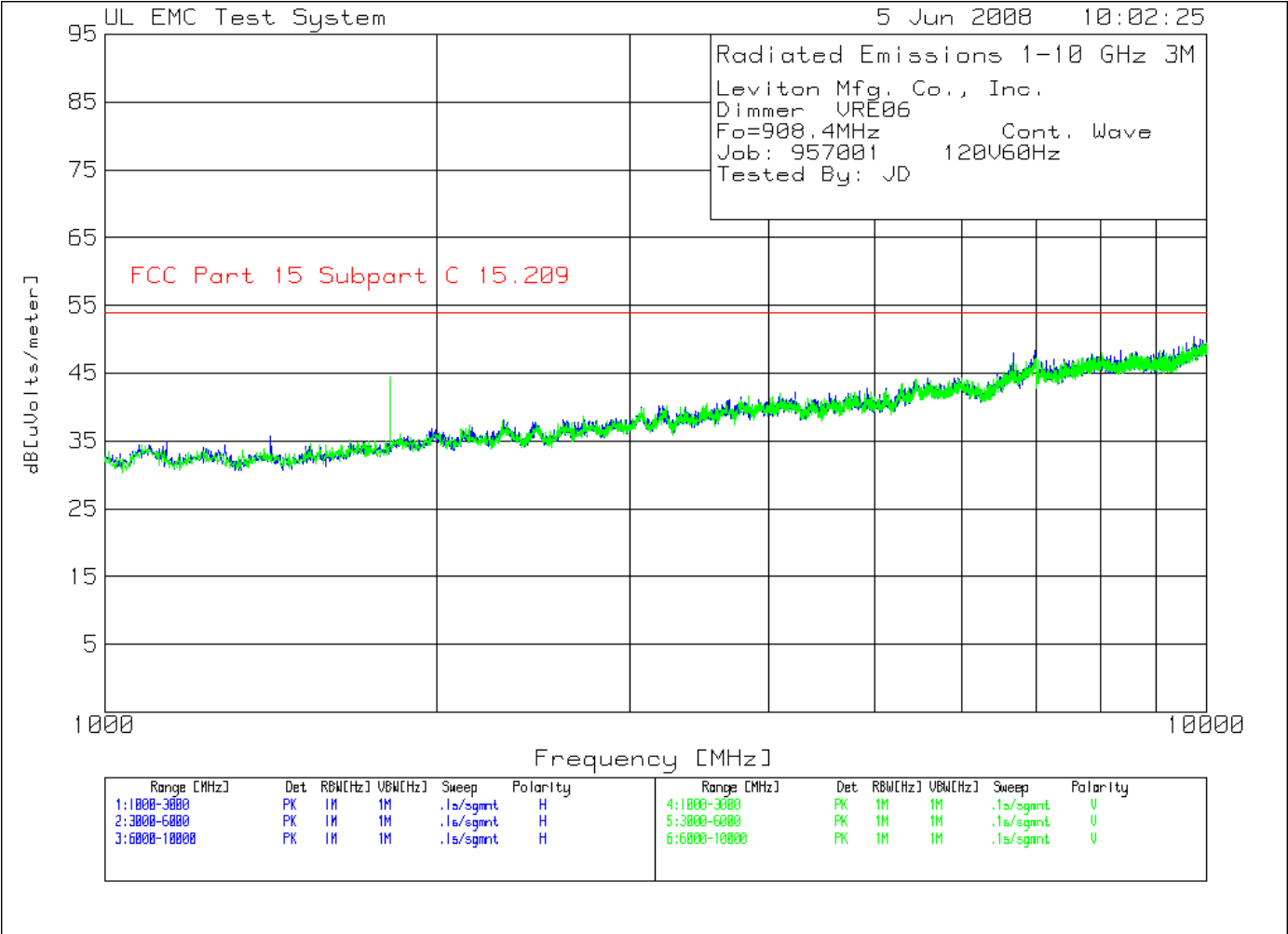
Leviton Mfg. Co. Inc.
 Low Power Transmitter , Dimmer
 Model: VRE06 120Vac, 60Hz
 Job: 957001 Transmit Mode
 Tested By: JD

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Vertical 30 - 200MHz -----											
1	34.9349	8.52 pk	.4	14.9	23.82	40	-	-	-	-	-
	Azimuth:322	Height:100	Vert	Margin [dB]		-16.18	-	-	-	-	-
2	37.998	5.03 pk	.4	13.7	19.13	40	-	-	-	-	-
	Azimuth:352	Height:100	Vert	Margin [dB]		-20.87	-	-	-	-	-
3	53.6537	8.14 pk	.5	8.1	16.74	40	-	-	-	-	-
	Azimuth:27	Height:100	Vert	Margin [dB]		-23.26	-	-	-	-	-
4	57.0571	10.86 pk	.5	7.2	18.56	40	-	-	-	-	-
	Azimuth:248	Height:100	Vert	Margin [dB]		-21.44	-	-	-	-	-
5	138.7387	6.93 pk	.7	14.5	22.13	43.5	-	-	-	-	-
	Azimuth:27	Height:100	Vert	Margin [dB]		-21.37	-	-	-	-	-
6	200	8.93 pk	.9	16.2	26.03	43.5	-	-	-	-	-
	Azimuth:175	Height:100	Vert	Margin [dB]		-17.47	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
9	908.3542	55.69 pk	2	23.1	80.79	-	94	-	-	-	-
	Azimuth:233	Height:100	Horz	Margin [dB]		34.79	-15.21	-	-	-	-
Vertical 200 - 1000MHz -----											
7	312.8564	13.68 pk	1.2	13.9	28.78	46	-	-	-	-	-
	Azimuth:149	Height:200	Vert	Margin [dB]		-17.22	-	-	-	-	-
8	908.3542	50.39 pk	2	23.1	75.49	-	94	-	-	-	-
	Azimuth:190	Height:200	Vert	Margin [dB]		29.49	-18.51	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 2: FCC Part 15 Subpart C 15.249

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 19 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 40 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 12 Radiated Emissions Data Points

Leviton Mfg. Co., Inc.
 Dimmer VRE06
 Fo=908.4MHz Cont. Wave
 Job: 957001 120V60Hz
 Tested By: JD

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Horizontal 1000 - 3000MHz -----										
1	1074.074	41.49 pk	-32.3	25.2	34.39	54	-	-	-	-
	Azimuth:6	Height:100	Horz	Margin [dB]	-19.61	-	-	-	-	-
2	1138.138	42 pk	-32.2	25.1	34.9	54	-	-	-	-
	Azimuth:193	Height:100	Horz	Margin [dB]	-19.1	-	-	-	-	-
3	1414.414	41.93 pk	-31.2	25	35.73	54	-	-	-	-
	Azimuth:248	Height:200	Horz	Margin [dB]	-18.27	-	-	-	-	-
4	1816.817	45.95 pk	-30.5	26.8	42.25	54	-	-	-	-
	Azimuth:248	Height:100	Horz	Margin [dB]	-11.75	-	-	-	-	-
Horizontal 3000 - 6000MHz -----										
5	3068.045	36.96 pk	-27.4	30.4	39.96	54	-	-	-	-
	Azimuth:109	Height:200	Horz	Margin [dB]	-14.04	-	-	-	-	-
6	3182.121	37.46 pk	-27.8	30.6	40.26	54	-	-	-	-
	Azimuth:26	Height:200	Horz	Margin [dB]	-13.74	-	-	-	-	-
7	4230.821	35.12 pk	-25.3	32.4	42.22	54	-	-	-	-
	Azimuth:2	Height:100	Horz	Margin [dB]	-11.78	-	-	-	-	-
Horizontal 6000 - 10000MHz -----										
8	6678.339	34.62 pk	-21.7	35	47.92	54	-	-	-	-
	Azimuth:0	Height:200	Horz	Margin [dB]	-6.08	-	-	-	-	-
9	6982.491	33.64 pk	-20.9	35.6	48.34	54	-	-	-	-
	Azimuth:138	Height:100	Horz	Margin [dB]	-5.66	-	-	-	-	-
10	9747.874	31.28 pk	-18.7	37.9	50.48	54	-	-	-	-
	Azimuth:111	Height:100	Horz	Margin [dB]	-3.52	-	-	-	-	-
Vertical 1000 - 3000MHz -----										
11	1816.817	48.21 pk	-30.5	26.8	44.51	54	-	-	-	-
	Azimuth:111	Height:100	Vert	Margin [dB]	-9.49	-	-	-	-	-
Vertical 3000 - 6000MHz -----										
12	3838.559	35.71 pk	-26.1	32.1	41.71	54	-	-	-	-
	Azimuth:221	Height:100	Vert	Margin [dB]	-12.29	-	-	-	-	-
13	5437.625	33.52 pk	-23.4	34	44.12	54	-	-	-	-
	Azimuth:83	Height:200	Vert	Margin [dB]	-9.88	-	-	-	-	-
Vertical 6000 - 10000MHz -----										
14	6996.498	32.55 pk	-20.8	35.4	47.15	54	-	-	-	-
	Azimuth:358	Height:200	Vert	Margin [dB]	-6.85	-	-	-	-	-
15	9897.949	29.61 pk	-18.5	38.1	49.21	54	-	-	-	-
	Azimuth:332	Height:100	Vert	Margin [dB]	-4.79	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 41 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

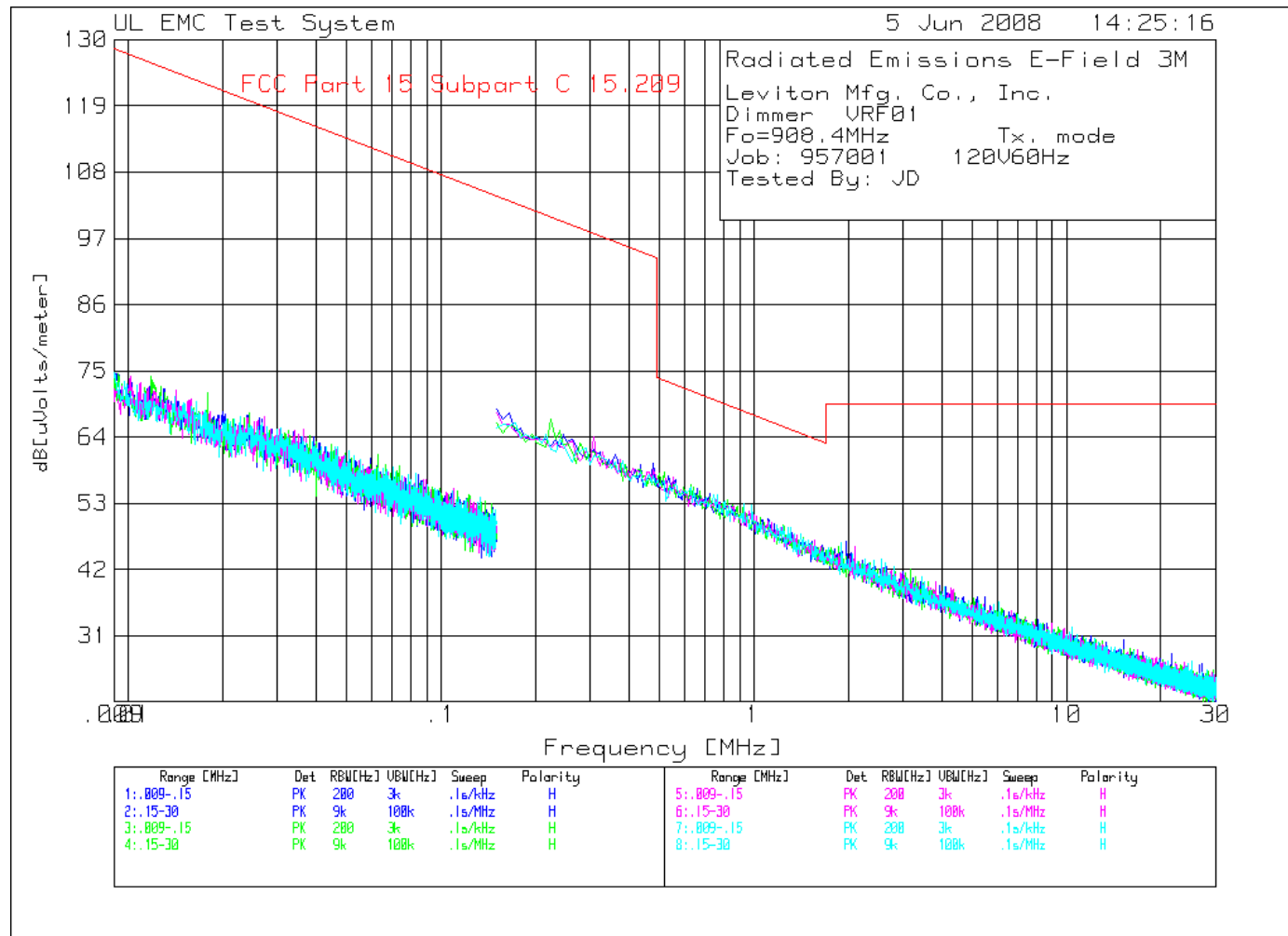
Leviton Mfg. Co., Inc.
 Dimmer VRE06
 Fo=908.4MHz Cont. Wave
 Job: 957001 120V60Hz
 Tested By: JD

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
=====										
Horizontal 6000 - 10000MHz										
6982	34.57 ave	-20.9	35.6	49.27	54	-	-	-	-	-
Azimuth: 113 Height:100 Horz			Margin [dB]:	-4.73		-	-	-	-	-
9747.87	25.51 ave	-18.7	37.9	44.71	54	-	-	-	-	-
Azimuth: 113 Height:100 Horz			Margin [dB]:	-9.29		-	-	-	-	-
9747.87	25.54 ave	-18.7	37.9	44.74	54	-	-	-	-	-
Azimuth: 180 Height:168 Horz			Margin [dB]:	-9.26		-	-	-	-	-
Vertical 6000 - 10000MHz										
9897.94	25.17 ave	-18.5	38.1	44.77	54	-	-	-	-	-
Azimuth: 2 Height:152 Vert			Margin [dB]:	-9.23		-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Figure 20 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 43 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

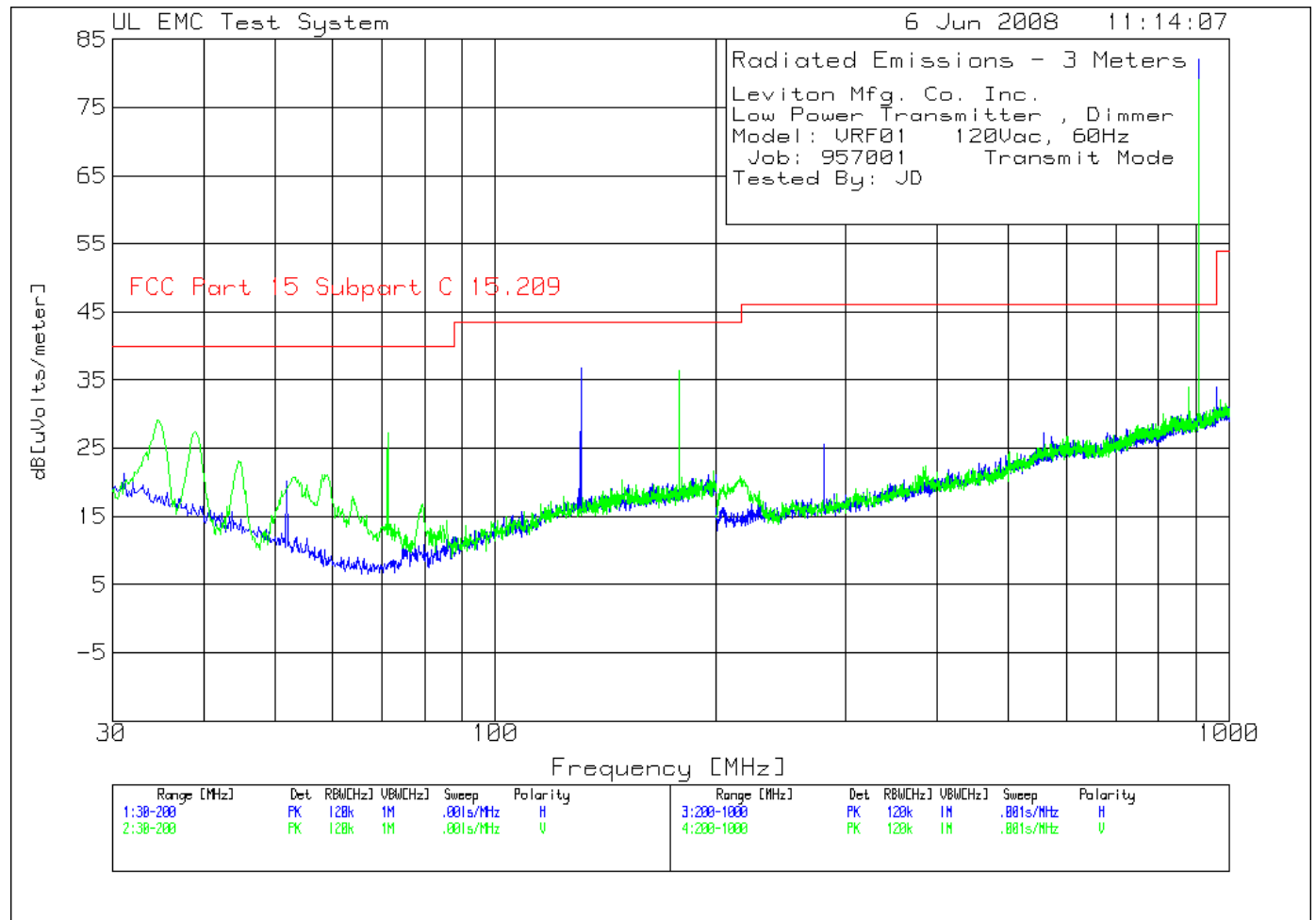
Table 13 Radiated Emissions Data Points

Leviton Mfg. Co., Inc.
 Dimmer VRF01
 Fo=908.4MHz Tx. mode
 Job: 957001 120V60Hz
 Tested By: JD

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
0° .009 - .15MHz -----										
1	.00911	43.65 pk	.8	30.1	74.55	128.4	-	-	-	-
	Azimuth:227	Height:101	Horz	Margin [dB]		-53.85	-	-	-	-
2	.01182	44.93 pk	.2	28.1	73.23	126.1	-	-	-	-
	Azimuth:77	Height:101	Horz	Margin [dB]		-52.87	-	-	-	-
3	.01374	42.96 pk	0	27	69.96	124.8	-	-	-	-
	Azimuth:2	Height:101	Horz	Margin [dB]		-54.84	-	-	-	-
45° .009 - .15MHz -----										
4	.01792	46.8 pk	0	24.6	71.4	122.5	-	-	-	-
	Azimuth:6	Height:121	Horz	Margin [dB]		-51.1	-	-	-	-
5	.02615	43.76 pk	0	22.2	65.96	119.2	-	-	-	-
	Azimuth:284	Height:121	Horz	Margin [dB]		-53.24	-	-	-	-
6	.06407	40.55 pk	0	17.2	57.75	111.5	-	-	-	-
	Azimuth:6	Height:121	Horz	Margin [dB]		-53.75	-	-	-	-
45° .15 - 30MHz -----										
9	.22464	51.48 pk	0	15.6	67.08	100.6	-	-	-	-
	Azimuth:237	Height:121	Horz	Margin [dB]		-33.52	-	-	-	-
90° .009 - .15MHz -----										
7	.08269	39.88 pk	0	16.4	56.28	109.2	-	-	-	-
	Azimuth:302	Height:141	Horz	Margin [dB]		-52.92	-	-	-	-
135° .15 - 30MHz -----										
8	.17239	50.62 pk	0	15.7	66.32	102.9	-	-	-	-
	Azimuth:267	Height:161	Horz	Margin [dB]		-36.58	-	-	-	-
10	2.06834	29.08 pk	.1	15.5	44.68	69.5	-	-	-	-
	Azimuth:22	Height:161	Horz	Margin [dB]		-24.82	-	-	-	-
11	5.24816	20.94 pk	.1	15.7	36.74	69.5	-	-	-	-
	Azimuth:85	Height:161	Horz	Margin [dB]		-32.76	-	-	-	-
12	.62772	40.12 pk	0	15.5	55.62	71.6	-	-	-	-
	Azimuth:145	Height:161	Horz	Margin [dB]		-15.98	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

Figure 21 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 45 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 14 Radiated Emissions Data Points

Leviton Mfg. Co. Inc.
 Low Power Transmitter , Dimmer
 Model: VRF01 120Vac, 60Hz
 Job: 957001 Transmit Mode
 Tested By: JD

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Horizontal 30 - 200MHz -----											
14	51.952	10.21 pk	.5	9.5	20.21	40	-	-	-	-	-
	Azimuth:247	Height:99	Horz	Margin [dB]		-19.79	-	-	-	-	-
15	130.7407	22.01 pk	.7	14	36.71	43.5	-	-	-	-	-
	Azimuth:17	Height:99	Horz	Margin [dB]		-6.79	-	-	-	-	-
Vertical 30 - 200MHz -----											
1	34.5946	13.66 pk	.4	15.1	29.16	40	-	-	-	-	-
	Azimuth:134	Height:100	Vert	Margin [dB]		-10.84	-	-	-	-	-
2	39.019	13.7 pk	.4	13.3	27.4	40	-	-	-	-	-
	Azimuth:60	Height:100	Vert	Margin [dB]		-12.6	-	-	-	-	-
3	44.6346	11.57 pk	.4	11.2	23.17	40	-	-	-	-	-
	Azimuth:97	Height:100	Vert	Margin [dB]		-16.83	-	-	-	-	-
4	53.1431	12.06 pk	.5	8.2	20.76	40	-	-	-	-	-
	Azimuth:209	Height:100	Vert	Margin [dB]		-19.24	-	-	-	-	-
5	58.0781	13.76 pk	.5	6.9	21.16	40	-	-	-	-	-
	Azimuth:97	Height:100	Vert	Margin [dB]		-18.84	-	-	-	-	-
6	63.8639	11.7 pk	.5	5.8	18	40	-	-	-	-	-
	Azimuth:60	Height:100	Vert	Margin [dB]		-22	-	-	-	-	-
7	71.3514	20.88 pk	.6	5.8	27.28	40	-	-	-	-	-
	Azimuth:284	Height:100	Vert	Margin [dB]		-12.72	-	-	-	-	-
8	79.5195	8.32 pk	.6	7.8	16.72	40	-	-	-	-	-
	Azimuth:17	Height:100	Vert	Margin [dB]		-23.28	-	-	-	-	-
9	85.8158	4.48 pk	.6	9.3	14.38	40	-	-	-	-	-
	Azimuth:358	Height:100	Vert	Margin [dB]		-25.62	-	-	-	-	-
10	177.8779	19.76 pk	.8	15.8	36.36	43.5	-	-	-	-	-
	Azimuth:60	Height:100	Vert	Margin [dB]		-7.14	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
16	280.4402	11.21 pk	1	13.4	25.61	46	-	-	-	-	-
	Azimuth:317	Height:200	Horz	Margin [dB]		-20.39	-	-	-	-	-
17	908.3542	56.96 pk	2	23.1	82.06	-	94	-	-	-	-
	Azimuth:232	Height:300	Horz	Margin [dB]		36.06	-11.94	-	-	-	-
18	962.3812	8.1 pk	1.9	24	34	54	-	-	-	-	-
	Azimuth:358	Height:300	Horz	Margin [dB]		-20	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 1: FCC Part 15 Subpart C 15.249

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 46 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton Mfg. Co. Inc.
 Low Power Transmitter , Dimmer
 Model: VRF01 120Vac, 60Hz
 Job: 957001 Transmit Mode
 Tested By: JD

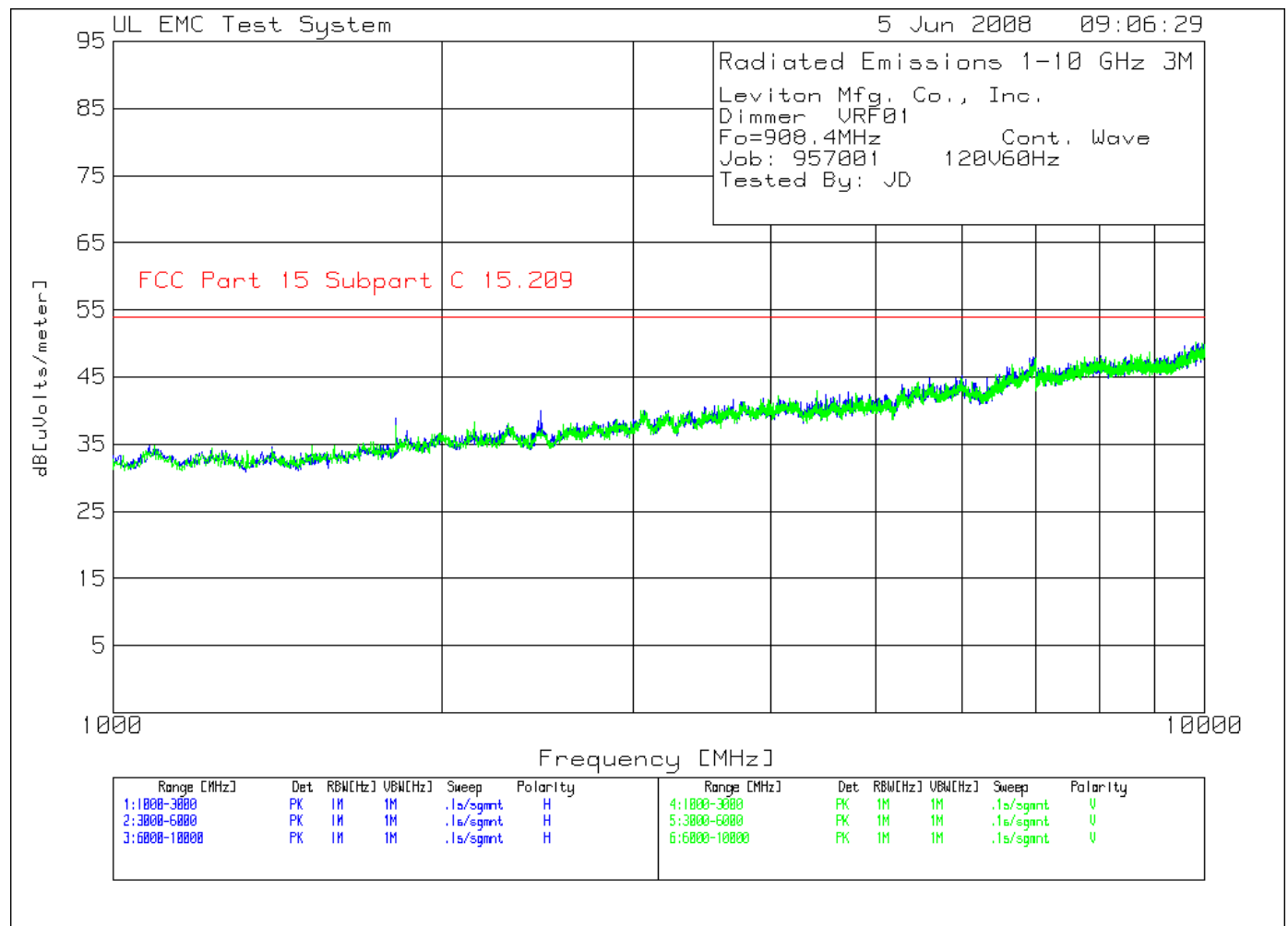
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Vertical 200 - 1000MHz -----										
11	215.6078	8.79 pk	.9	11.2	20.89	43.5	-	-	-	-
	Azimuth:342	Height:100	Vert	Margin [dB]	-22.61	-	-	-	-	-
12	881.5408	9.03 pk	1.8	23.2	34.03	46	-	-	-	-
	Azimuth:358	Height:100	Vert	Margin [dB]	-11.97	-	-	-	-	-
13	908.3542	54.08 pk	2	23.1	79.18	-	94	-	-	-
	Azimuth:65	Height:100	Vert	Margin [dB]	33.18	-14.82	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
 LIMIT 1: FCC Part 15 Subpart C 15.249

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 47 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 22 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 48 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 15 Radiated Emissions Data Points

Leviton Mfg. Co., Inc.
 Dimmer VRF01
 Fo=908.4MHz Cont. Wave
 Job: 957001 120V60Hz
 Tested By: JD

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Horizontal 1000 - 3000MHz -----										
1	1080.08	41.92 pk	-32.3	25.2	34.82	54	-	-	-	-
	Azimuth:358	Height:100	Horz	Margin [dB]	-19.18	-	-	-	-	-
2	1816.817	42.53 pk	-30.5	26.8	38.83	54	-	-	-	-
	Azimuth:54	Height:100	Horz	Margin [dB]	-15.17	-	-	-	-	-
3	2143.143	38.6 pk	-29.4	28.1	37.3	54	-	-	-	-
	Azimuth:220	Height:100	Horz	Margin [dB]	-16.7	-	-	-	-	-
4	2467.467	40.24 pk	-29	28.7	39.94	54	-	-	-	-
	Azimuth:331	Height:100	Horz	Margin [dB]	-14.06	-	-	-	-	-
Horizontal 3000 - 6000MHz -----										
5	3072.048	37.02 pk	-27.4	30.4	40.02	54	-	-	-	-
	Azimuth:82	Height:199	Horz	Margin [dB]	-13.98	-	-	-	-	-
6	3700.467	36.13 pk	-26.2	31.7	41.63	54	-	-	-	-
	Azimuth:359	Height:199	Horz	Margin [dB]	-12.37	-	-	-	-	-
7	4400.934	34.82 pk	-25.4	32.5	41.92	54	-	-	-	-
	Azimuth:28	Height:199	Horz	Margin [dB]	-12.08	-	-	-	-	-
8	5997.999	33.04 pk	-22.8	34.5	44.74	54	-	-	-	-
	Azimuth:82	Height:199	Horz	Margin [dB]	-9.26	-	-	-	-	-
Horizontal 6000 - 10000MHz -----										
9	6680.34	32.82 pk	-21.7	35	46.12	54	-	-	-	-
	Azimuth:303	Height:100	Horz	Margin [dB]	-7.88	-	-	-	-	-
10	6972.486	33.39 pk	-21	35.5	47.89	54	-	-	-	-
	Azimuth:358	Height:200	Horz	Margin [dB]	-6.11	-	-	-	-	-
11	9959.98	29.96 pk	-18.3	38.2	49.86	54	-	-	-	-
	Azimuth:82	Height:200	Horz	Margin [dB]	-4.14	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 49 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Leviton Mfg. Co., Inc.
 Dimmer VRF01
 Fo=908.4MHz Cont. Wave
 Job: 957001 120V60Hz
 Tested By: JD

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4	5	6
Frequency	Reading	Factor	Factor	dB[uVolts/meter]						
[MHz]	[dB(uV)]	[dB]	[dB]							
=====										
Horizontal 6000 - 10000MHz										
6972.5245	34.26 ave	-21	35.5	48.76	54	-	-	-	-	-
Azimuth: 47	Height:142	Horz		Margin [dB]:	-5.24	-	-	-	-	-
9959	25.14 ave	-18.3	38.2	45.04	54	-	-	-	-	-
Azimuth: 156	Height:123	Horz		Margin [dB]:	-8.96	-	-	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number:	957001	File Number:	MC15211	Page	50 of 64
Model Number:	VRF01 and VRE06				
Client Name:	Leviton Mfg. Co. Inc.				
FCC ID:	QGH-VRSDC				
Industry Canada ID:	2473A-VRSDC				

4.4 Test Conditions and Results – RADIATED EMISSIONS

Test Description	Measurements were made in a 3 & 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 & 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	CISPR 22, ICES-003, Issue 4	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	(10 meter measurement distance)
	1GHz – 5GHz	(3 meter measurement distance)
Limits - Class B		
Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30 to 230	30	NA
230 to 1000	37	NA
Above 1000 (FCC)	NA	54 (at 3-meter)
Supplementary information: None		

Table 16 Radiated Emissions Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	3
Supplementary information: None		

Job Number: 957001 File Number: MC15211 Page 51 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 15 Radiated Emissions Test Equipment

Test Equipment Used			
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Bicon Antenna	Schaffner	VBA6106A	43441
Log-P Antenna	Schaffner	UPA6109	44068
Bias Tee	Miteq	AM-1523-7687	44392
Bias Tee	Miteq	AM-1523-7687	44393
Preamp	Miteq	AM-3A-000110-7687	44391
Preamp	Miteq	AM-3A-000110-7687	44394
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547
Above 1GHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Horn Antenna	Electro-Metrics	RGA-180	ME5-565
Preamp (1 - 26GHz)	HP	8449B	ME5-914
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Measurement Software	UL	Version 9.3	44740
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
Multimeter	Fluke	87V	44547

Figure 23 Test setup for Radiated Emissions 30MHz to 1000MHz – VRE06

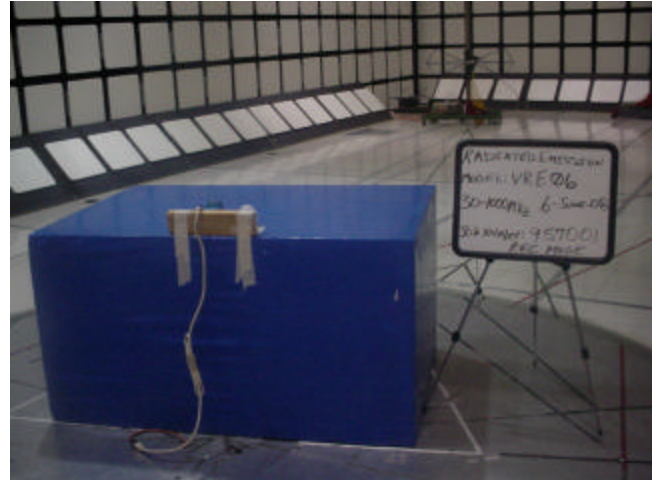
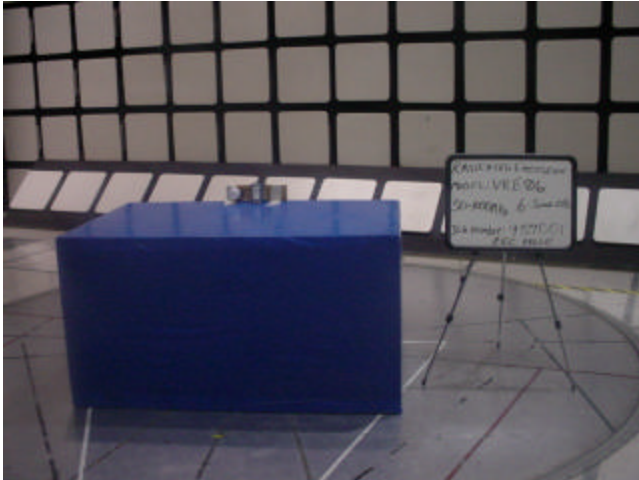
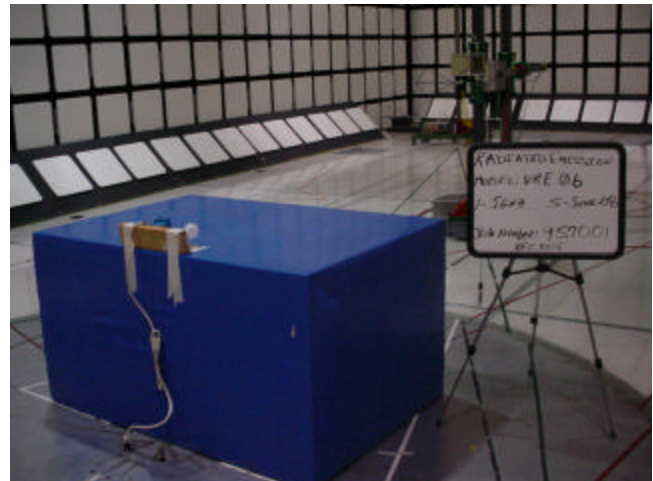
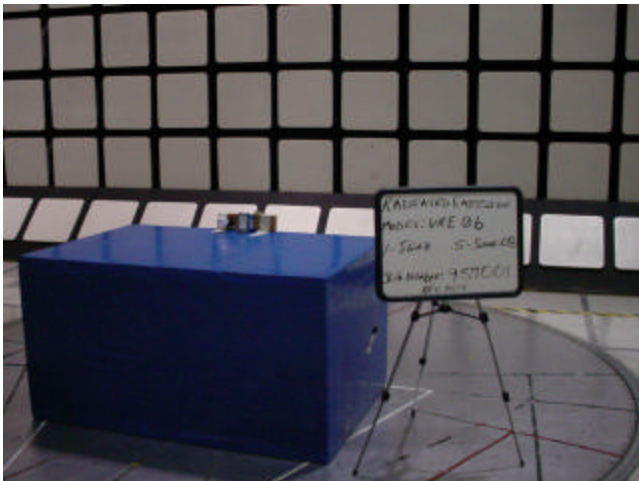


Figure 24 Test setup for Radiated Emissions 1GHz to 5GHz – VRE06



Page 53 of 64

Figure 25 Test setup for Radiated Emissions 30 to 1000MHz– VRF01

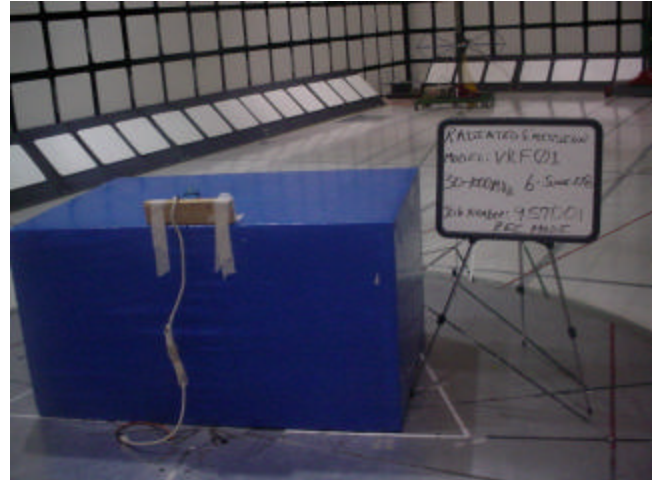
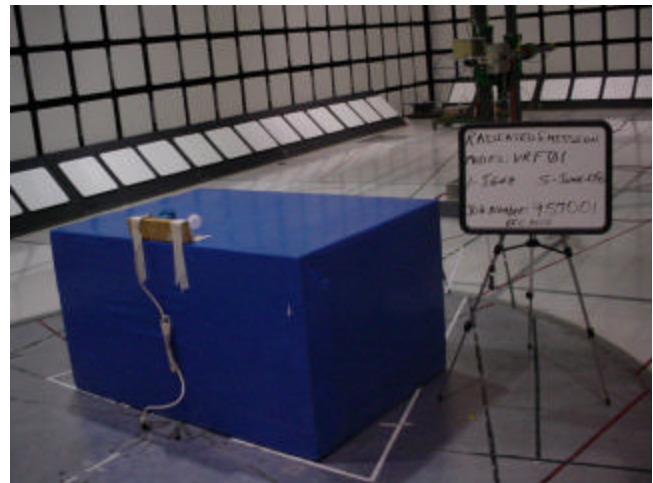
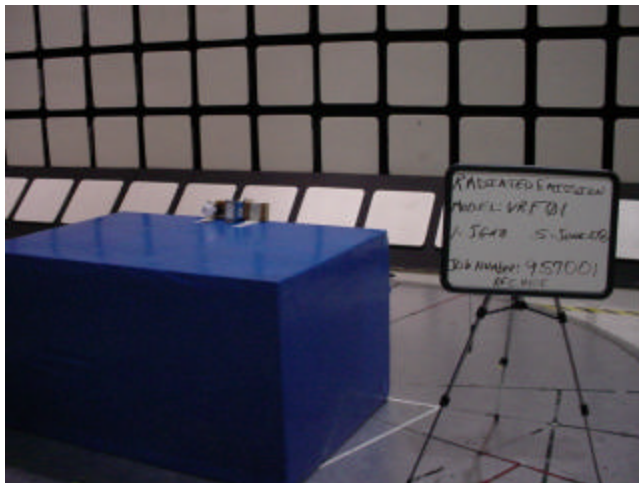
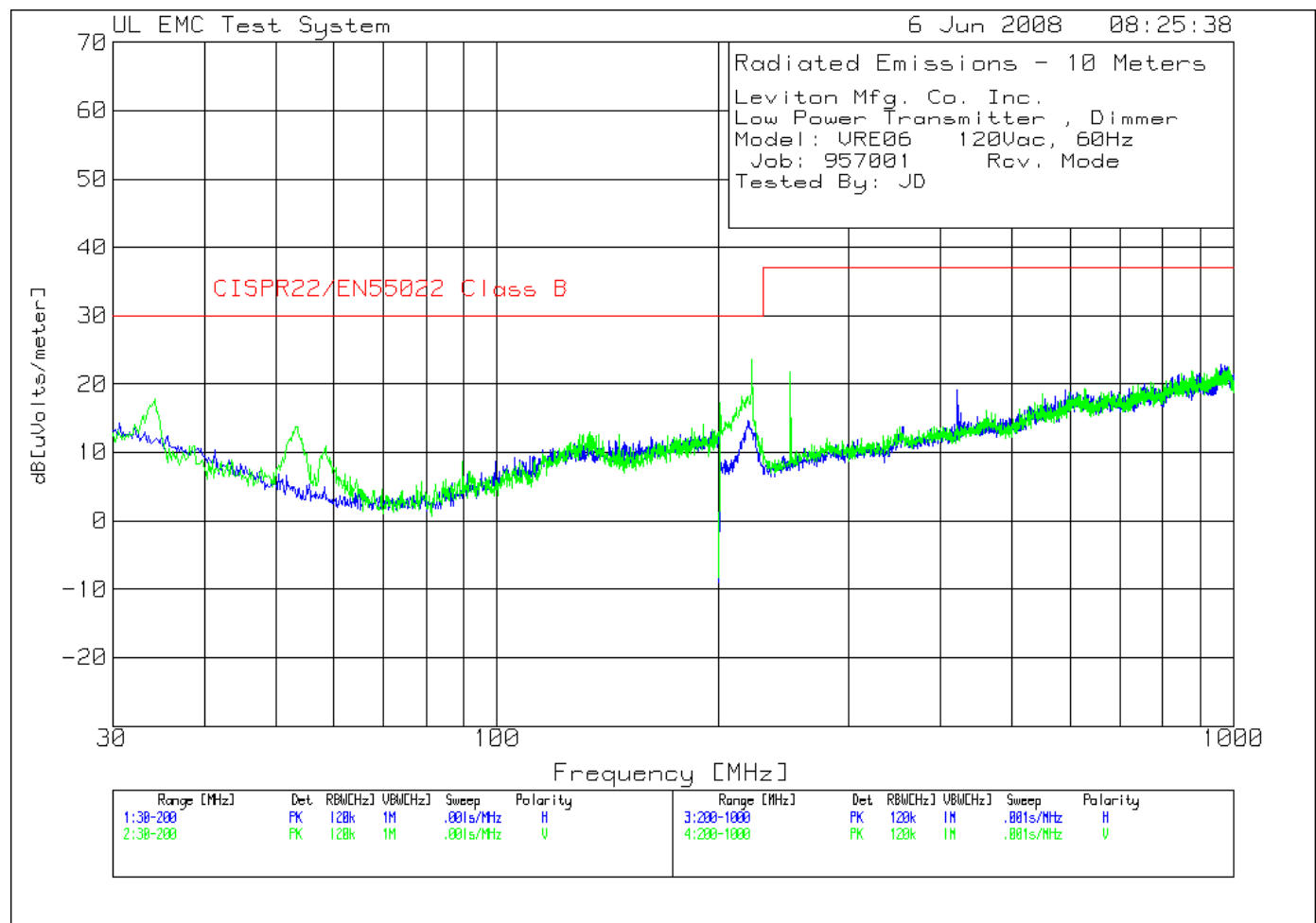


Figure 26 Test setup for Radiated Emissions 1GHz to 5GHz – VRF01



Job Number: 957001 File Number: MC15211 Page 54 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 27 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 55 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 16 Radiated Emissions Data Points

Leviton Mfg. Co. Inc.
 Low Power Transmitter , Dimmer
 Model: VRE06 120Vac, 60Hz
 Job: 957001 Rcv. Mode
 Tested By: JD

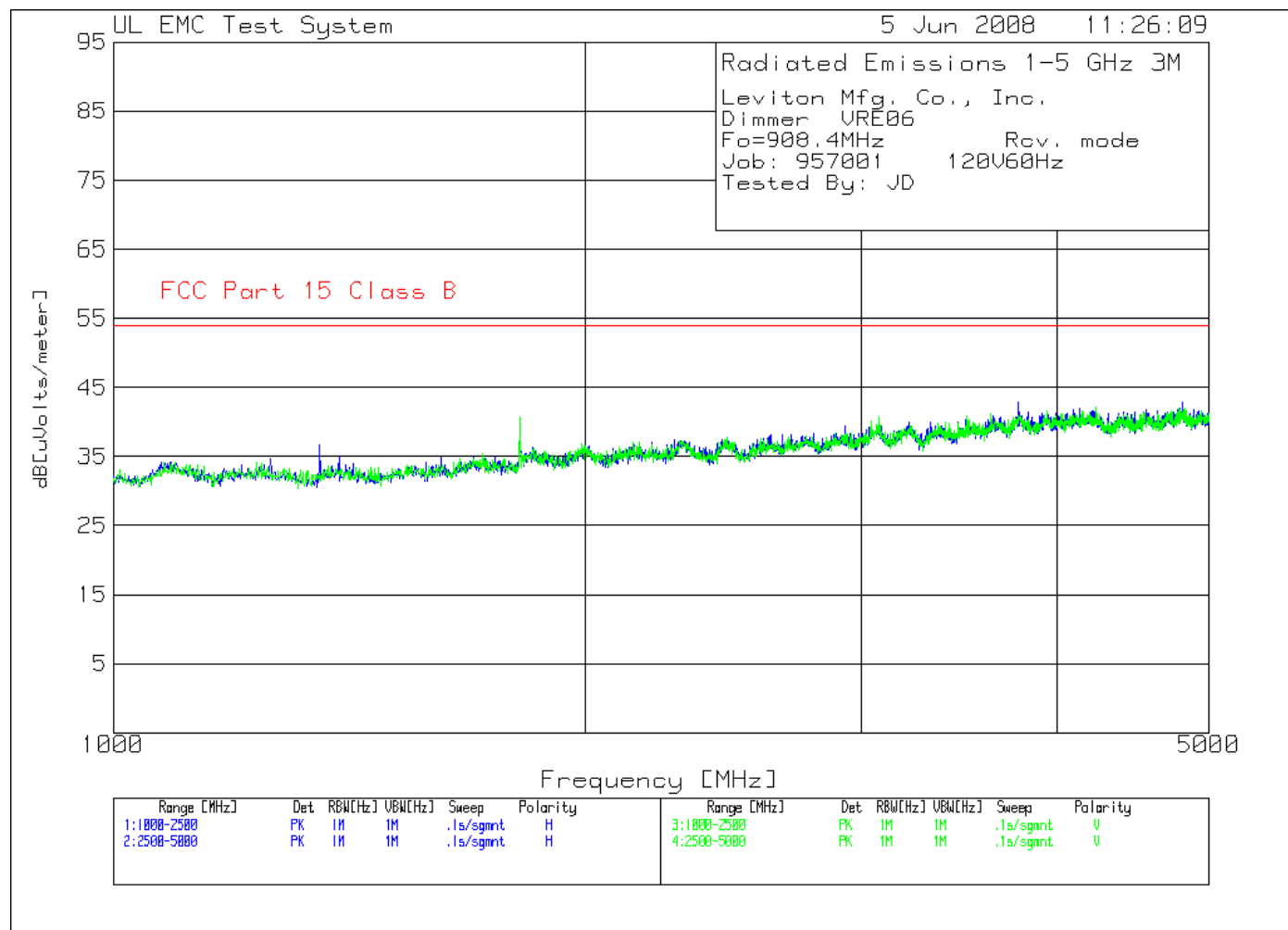
Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
Vertical 30 - 200MHz -----											
1	34.2543	37.57 pk	-35.1	15.4	17.87	30	-	-	-	-	-
	Azimuth:344	Height:101 Vert		Margin [dB]		-12.13	-	-	-	-	-
2	53.3133	40.18 pk	-35.4	9	13.78	30	-	-	-	-	-
	Azimuth:239	Height:101 Vert		Margin [dB]		-16.22	-	-	-	-	-
3	58.4184	38.91 pk	-35.5	7.5	10.91	30	-	-	-	-	-
	Azimuth:158	Height:101 Vert		Margin [dB]		-19.09	-	-	-	-	-
Horizontal 200 - 1000MHz -----											
7	219.2096	38.44 pk	-34.6	10.8	14.64	30	-	-	-	-	-
	Azimuth:358	Height:401 Horz		Margin [dB]		-15.36	-	-	-	-	-
8	421.7109	36.23 pk	-33.2	16.1	19.13	37	-	-	-	-	-
	Azimuth:16	Height:201 Horz		Margin [dB]		-17.87	-	-	-	-	-
Vertical 200 - 1000MHz -----											
4	200.8004	40.37 pk	-34.9	11.9	17.37	30	-	-	-	-	-
	Azimuth:179	Height:101 Vert		Margin [dB]		-12.63	-	-	-	-	-
5	221.6108	47.42 pk	-34.7	11	23.72	30	-	-	-	-	-
	Azimuth:357	Height:201 Vert		Margin [dB]		-6.28	-	-	-	-	-
6	250.025	44.44 pk	-34.6	12	21.84	37	-	-	-	-	-
	Azimuth:17	Height:300 Vert		Margin [dB]		-15.16	-	-	-	-	-

LIMIT 1: CISPR22/EN55022 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 56 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 28 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 57 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 17 Radiated Emissions Data Points

Leviton Mfg. Co., Inc.
 Dimmer VRE06
 Fo=908.4MHz Rcv. mode
 Job: 957001 120V60Hz
 Tested By: JD

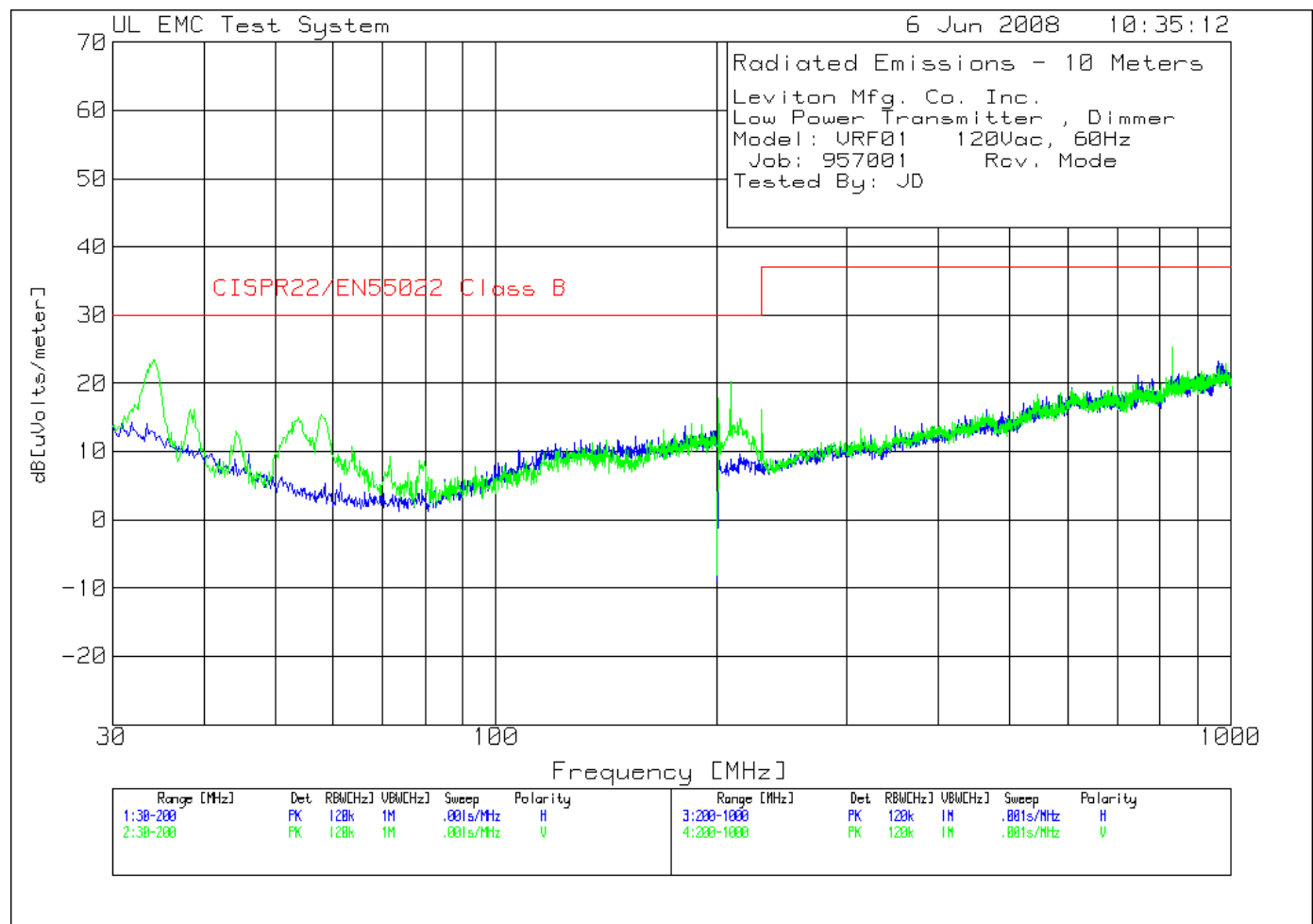
Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Horizontal 1000 - 2500MHz -----										
1	1090.09	41.11 pk	-32.2	25.2	34.11	54	-	-	-	-
	Azimuth:354	Height:200	Horz	Margin [dB]	-19.89	-	-	-	-	-
2	1354.354	43.05 pk	-31.5	25.1	36.65	54	-	-	-	-
	Azimuth:82	Height:100	Horz	Margin [dB]	-17.35	-	-	-	-	-
3	1816.817	43.37 pk	-30.5	26.8	39.67	54	-	-	-	-
	Azimuth:109	Height:100	Horz	Margin [dB]	-14.33	-	-	-	-	-
Horizontal 2500 - 5000MHz -----										
4	3780.854	36.3 pk	-25.4	31.9	42.8	54	-	-	-	-
	Azimuth:168	Height:100	Horz	Margin [dB]	-11.2	-	-	-	-	-
5	4222.815	34.45 pk	-25.3	32.4	41.55	54	-	-	-	-
	Azimuth:83	Height:100	Horz	Margin [dB]	-12.45	-	-	-	-	-
6	4808.205	34.45 pk	-24.4	32.9	42.95	54	-	-	-	-
	Azimuth:110	Height:100	Horz	Margin [dB]	-11.05	-	-	-	-	-
Vertical 1000 - 2500MHz -----										
7	1235.736	41.08 pk	-31.9	25	34.18	54	-	-	-	-
	Azimuth:82	Height:199	Vert	Margin [dB]	-19.82	-	-	-	-	-
8	1372.372	39.93 pk	-31.4	25.1	33.63	54	-	-	-	-
	Azimuth:110	Height:199	Vert	Margin [dB]	-20.37	-	-	-	-	-
9	1816.817	44.34 pk	-30.5	26.8	40.64	54	-	-	-	-
	Azimuth:165	Height:100	Vert	Margin [dB]	-13.36	-	-	-	-	-
Vertical 2500 - 5000MHz -----										
10	2558.372	37 pk	-29	28.8	36.8	54	-	-	-	-
	Azimuth:359	Height:200	Vert	Margin [dB]	-17.2	-	-	-	-	-
11	3080.387	37.71 pk	-27.5	30.4	40.61	54	-	-	-	-
	Azimuth:331	Height:100	Vert	Margin [dB]	-13.39	-	-	-	-	-
12	3775.851	34.19 pk	-25.3	31.9	40.79	54	-	-	-	-
	Azimuth:84	Height:100	Vert	Margin [dB]	-13.21	-	-	-	-	-

LIMIT 1: FCC Part 15 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 58 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

Figure 29 Radiated Emissions Graph



Job Number: 957001 File Number: MC15211 Page 59 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 18 Radiated Emissions Data Points

Leviton Mfg. Co. Inc.
 Low Power Transmitter , Dimmer
 Model: VRF01 120Vac, 60Hz
 Job: 957001 Rcv. Mode
 Tested By: JD

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Vertical 30 - 200MHz -----										
1	34.0841	43.06 pk	-35.1	15.5	23.46	30	-	-	-	-
	Azimuth:278	Height:103 Vert		Margin [dB]		-6.54	-	-	-	-
2	38.3383	37.19 pk	-35	13.9	16.09	30	-	-	-	-
	Azimuth:76	Height:103 Vert		Margin [dB]		-13.91	-	-	-	-
3	44.2943	36.01 pk	-35.2	12.1	12.91	30	-	-	-	-
	Azimuth:278	Height:103 Vert		Margin [dB]		-17.09	-	-	-	-
4	53.8238	41.43 pk	-35.4	9	15.03	30	-	-	-	-
	Azimuth:318	Height:103 Vert		Margin [dB]		-14.97	-	-	-	-
5	57.9079	43.19 pk	-35.4	7.6	15.39	30	-	-	-	-
	Azimuth:157	Height:103 Vert		Margin [dB]		-14.61	-	-	-	-
6	63.6937	39.91 pk	-35.4	6.2	10.71	30	-	-	-	-
	Azimuth:197	Height:103 Vert		Margin [dB]		-19.29	-	-	-	-
7	71.6917	38.93 pk	-35.5	5.8	9.23	30	-	-	-	-
	Azimuth:343	Height:103 Vert		Margin [dB]		-20.77	-	-	-	-
8	78.6687	36.81 pk	-35.6	7.5	8.71	30	-	-	-	-
	Azimuth:197	Height:103 Vert		Margin [dB]		-21.29	-	-	-	-
Vertical 200 - 1000MHz -----										
9	200.8004	40.94 pk	-34.9	11.9	17.94	30	-	-	-	-
	Azimuth:314	Height:101 Vert		Margin [dB]		-12.06	-	-	-	-
10	208.4042	43.46 pk	-34.8	11.6	20.26	30	-	-	-	-
	Azimuth:17	Height:401 Vert		Margin [dB]		-9.74	-	-	-	-
11	230.015	39.86 pk	-34.6	11	16.26	37	-	-	-	-
	Azimuth:358	Height:301 Vert		Margin [dB]		-20.74	-	-	-	-
12	832.7164	35.22 pk	-32.3	22.4	25.32	37	-	-	-	-
	Azimuth:269	Height:401 Vert		Margin [dB]		-11.68	-	-	-	-

LIMIT 1: CISPR22/EN55022 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 61 of 64
 Model Number: VRF01 and VRE06
 Client Name: Leviton Mfg. Co. Inc.
 FCC ID: QGH-VRSDC
 Industry Canada ID: 2473A-VRSDC

Table 19 Radiated Emissions Data Points

Leviton Mfg. Co., Inc.
 Dimmer VRF01
 Fo=908.4MHz Rcv. mode
 Job: 957001 120V60Hz
 Tested By: JD

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level Limit:1 dB[uVolts/meter]	2	3	4	5	6
Horizontal 1000 - 2500MHz -----										
1	1085.586	42.35 pk	-32.2	25.2	35.35	54	-	-	-	-
	Azimuth:248	Height:200	Horz	Margin [dB]	-18.65	-	-	-	-	-
2	1816.817	40.58 pk	-30.5	26.8	36.88	54	-	-	-	-
	Azimuth:331	Height:200	Horz	Margin [dB]	-17.12	-	-	-	-	-
3	2193.694	39.3 pk	-29.3	28.2	38.2	54	-	-	-	-
	Azimuth:27	Height:100	Horz	Margin [dB]	-15.8	-	-	-	-	-
Horizontal 2500 - 5000MHz -----										
4	3073.716	37.16 pk	-27.4	30.4	40.16	54	-	-	-	-
	Azimuth:303	Height:200	Horz	Margin [dB]	-13.84	-	-	-	-	-
5	3680.787	36.36 pk	-26.2	31.6	41.76	54	-	-	-	-
	Azimuth:278	Height:100	Horz	Margin [dB]	-12.24	-	-	-	-	-
6	4117.745	34.96 pk	-25.5	32.4	41.86	54	-	-	-	-
	Azimuth:250	Height:100	Horz	Margin [dB]	-12.14	-	-	-	-	-
Vertical 1000 - 2500MHz -----										
7	1100.601	41.51 pk	-32.2	25	34.31	54	-	-	-	-
	Azimuth:138	Height:200	Vert	Margin [dB]	-19.69	-	-	-	-	-
8	1238.739	40.85 pk	-31.8	25	34.05	54	-	-	-	-
	Azimuth:82	Height:200	Vert	Margin [dB]	-19.95	-	-	-	-	-
9	1816.817	40.71 pk	-30.5	26.8	37.01	54	-	-	-	-
	Azimuth:331	Height:100	Vert	Margin [dB]	-16.99	-	-	-	-	-
10	2240.24	38.2 pk	-29.2	28.2	37.2	54	-	-	-	-
	Azimuth:6	Height:200	Vert	Margin [dB]	-16.8	-	-	-	-	-
11	1238.739	40.85 pk	-31.8	25	34.05	54	-	-	-	-
	Azimuth:82	Height:200	Vert	Margin [dB]	-19.95	-	-	-	-	-
Vertical 2500 - 5000MHz -----										
12	3012.008	37.13 pk	-27.8	30.2	39.53	54	-	-	-	-
	Azimuth:331	Height:100	Vert	Margin [dB]	-14.47	-	-	-	-	-
13	3780.854	35.81 pk	-25.4	31.9	42.31	54	-	-	-	-
	Azimuth:1	Height:100	Vert	Margin [dB]	-11.69	-	-	-	-	-
14	4431.288	34.96 pk	-25.2	32.3	42.06	54	-	-	-	-
	Azimuth:54	Height:100	Vert	Margin [dB]	-11.94	-	-	-	-	-

LIMIT 1: FCC Part 15 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector

Job Number: 957001 File Number: MC15211 Page 62 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC

5.0 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations:

Limit Calculation

Fundamental Frequency is 908.4MHz

Limit = $20 \cdot \log(\mu\text{V/m})$

Limit = $20 \cdot \log(50000)$

Limit = 94dBuV

From table in section 15.209

Limit for Spurious Emissions = 20dB lower then fundamental = dBuV/m

Fundamental Frequency is 908.4MHz

Limit = $20 \cdot \log(\mu\text{V/m})$

Limit = $20 \cdot \log(500)$

Limit = 94dBuV

Limit for Harmonic Emissions = 50dB lower then fundamental = 54dBuV/m

Radiated Emissions Limit conversion from mV/m to dBmV/m (accordance with paragraph 15.109)

Radiated Emissions Limit ($\text{dB}\mu\text{V/m}$) = $20 \cdot \log(\mu\text{V/m})$

Radiated Emissions Limit ($\text{dB}\mu\text{V/m}$) = $20 \cdot \log(90)$

Radiated Emissions Limit ($\text{dB}\mu\text{V/m}$) = 39.1

Radiated Emissions test data obtained during measurements.

Field Strength ($\text{dB}\mu\text{V/m}$) = Measured field strength ($\text{dB}\mu\text{V/m}$) + Antenna Factor (dB) + Cable Factor (dB)

Field Strength ($\text{dB}\mu\text{V/m}$) = $19.7\text{dB}\mu\text{V/m} + 12.5\text{dB} + 0.3\text{dB}$

Field Strength ($\text{dB}\mu\text{V/m}$) = 32.5

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see <http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-267.

Job Number: 957001 File Number: MC15211 Page 64 of 64
Model Number: VRF01 and VRE06
Client Name: Leviton Mfg. Co. Inc.
FCC ID: QGH-VRSDC
Industry Canada ID: 2473A-VRSDC



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6

Compliance Certificate

Company Name and Location: Leviton Mfg. Co. Inc.
59-25 Little Neck Parkway, Little Neck, NY 11362-2591

File Number: MC15211

Date of Report: 5 Aug 2008

Product Description: Dimmers

Investigated in accordance with FCC Part 15, Subpart C, 15.249(2007)

Model Designation: VRF01 and VRE06

Serial Number: Prototype

Job Number: 957001

Project Number: 08ME06443

A sample of the product described above has been investigated by Underwriters Laboratories Inc. in accordance with the requirements indicated above and has been found in compliance with those requirements as shown in the Test Report Ref. No. 957001 which forms part of this Certificate. It is the responsibility of the company shown above that the products it produces are in compliance with the applicable requirements.

The name of Underwriters Laboratories (UL), any abbreviation thereof, or any symbol shall not be used on or in connection with the product unless and until specifically authorized by UL.

Tested by:



Reviewed by:



Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories (UL) or any authorized licensee of UL.