



EMC

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Project:	06ME09603
File:	MC15211
Date:	20 March 2007
Revision Date:	2 April 2007
Revision Date:	26 Jan. 2009
Model:	RZCS4-Z4
FCCID:	QGH-RZC04
Industry Canada:	2473A-RZC04

Electromagnetic Compatibility Test Report

For

LEVITON MFG CO INC

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to public safety and committed to
quality service for over 100 years**

Project Number: 06ME09603 File Number MC15211 Page 2 of 56
Model Number: RZCS4-Z4 & RZCZ4-1L
FCC ID: QGH-RZC04
Industry Canada ID: 2473A-RZC04

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 PKY
LITTLE NECK, NY 11362

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Test Report Date: **20 March 2007**
Test Report Revision Date: **2 April 2007**
Test Report Revision Date: **26 January 2009**

Product Type: **In Wall Controller**

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

Model Number: **RZCS4-Z4 & RZCZ4-1L**

Sample Serial Number: **Prototype**

Sample Tag Number: **0884112001**

Sample Receive Date: **7/24/06**

EUT Category: **Transceiver**

Testing Start Date: **24 July 2006**

Date Testing Complete: **26 Jan. 2009**

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, 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 webs ites referenced at the end of this report.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
2 April 2007	Product Description on Page 2 should be In-Wall Controller and on page 4 add Z4 on suffix. Also, page 5 remove EUT Handheld Controller.	Joseph Danisi	-
26 January 2009	Revise the report date nothing else has changed all circuits and tests were not modified and add new 99% Occupied Bandwidth photo.	Joseph Danisi	Bob DeLisi

1.0 GENERAL - Product Description

RF four-button remote zone/group/scene controller rated at 120Vac, 60Hz. Z-wave enabled technology.

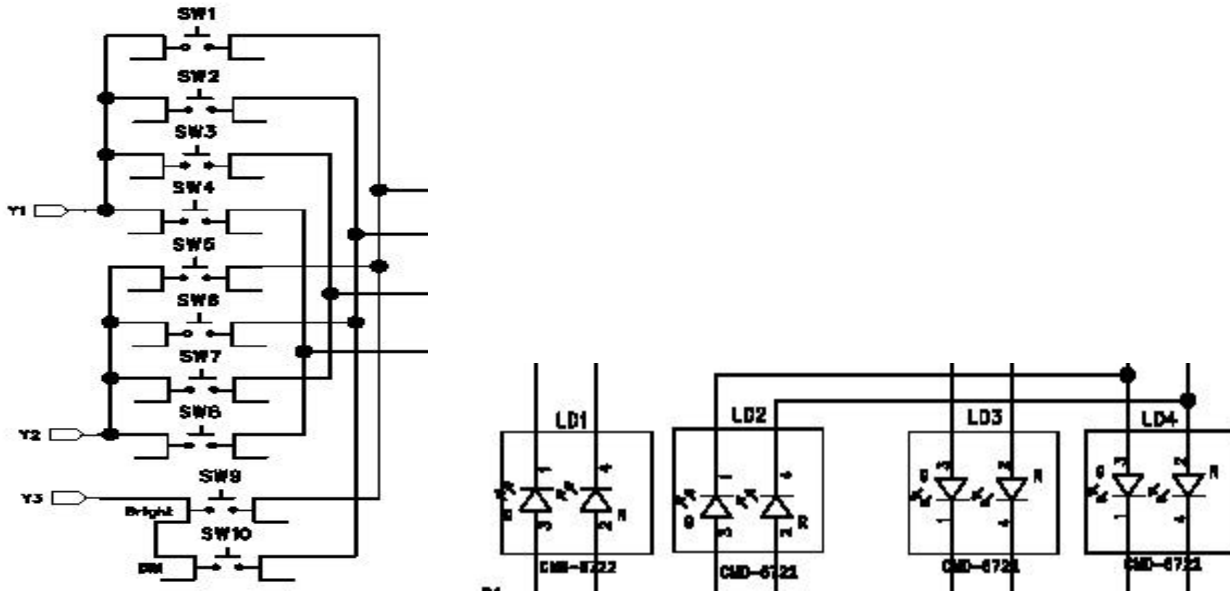
Per FCC Part 2.1093 (C) this device is not required to undergo testing for radio-frequency radiation exposure.

Antenna description: It is a permanently attached to the internal RF circuit board and the transmit antenna type is a wire within the product enclosure.

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

The software version during the evaluation was as follows: V1.10.

The difference between the RZCS4-Z4 and the RZCZ4-1L is the RZCS4-Z4 SW5 to SW8 is not populated (connected) and for RZCS4-Z4 LD1 to LD4 shift right by 0.029inches. Per the client Leviton the circuit board to the RF circuitry between both model numbers are identical. However, the only difference is the horizontal trace to LD2 is reduced slightly with the LD2 indicator only.



Note: The RZCS4 was the actual model number that was evaluated under this investigation therefore; it is the manufacturers Leviton responsibility that the RZCZ4-Z4 performs as the RZCS4.

1.1 Device Configuration During Test

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	In Wall-Controller	Leviton	RZCS4-Z4	-
ACC	Load	Leviton	-	Incandescent Light bulb

* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	NO	NO	None

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
 I/O = Signal Input or Output Port (Not Involved in Process Control)
 PMC = Process Measurement and Control Port

1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
908.42	Fundamental	7.376974	Crystal

1.1.4 Power Interface:

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

1.2 EUT Operation Modes:

Mode #	Description
1	The EUT was set to transmit at it's maximum allowable power rating at the fundamental frequency of 908.42MHz

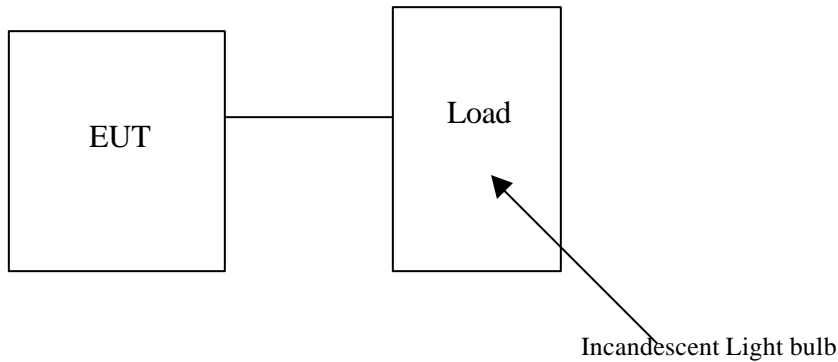
1.3 EUT Configuration Modes:

Mode #	Description
1	Transmitter Continuous CW
2	Transmitter Normal operation
3	Standby (receive)

"The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report"

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 Deviations from standard test methods.

Not Applicable

1.6 Device Modifications Necessary for Compliance

Not Applicable.

1.7 Test Summary

Product Standards	FCC Part 15, Subpart C, 15.207, 15.209, and 15.249
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Summary of EMC Emission Tests	Standard	Test Name	Result
	FCC Part 15.207	Conducted Emissions	1
	FCC Part 15.209	Radiated Emissions	1
	FCC Part 15.249 (d)	Radiated Spurious Emissions	1
	FCC Part 15.249	Occupied Bandwidth	1
	FCC Part 15.31(e)	Tx Versus Output Voltage	1
	FCC Part 15.249(a)	Fundamental Field Strength	1

Remarks:

- 1) Compliant – Indicates no modifications required for compliance.
- 2) Modifications required to comply as described in Section 1.6

2.0 Conclusion:

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.

The equipment under test has met the technical requirements as defined under sections 5.0 and 6.0.

Test Start Date: 24 July 2006
Test Completion Date: 16 March 2007



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3.0 FCC Labeling Information

1.6 Identification.

Devices Subject to Verification

In 47 CFR, Part 2, **§ 2.954**:

“Devices subject only to verification shall be uniquely identified by the person responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified or type accepted equipment. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification for each verified device.”

Devices Subject to Declaration of Conformity

In 47 CFR, Part 2, **§ 2.1074**:

“Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified, type accepted or type approved equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device.”

1.7 Compliance information

§ 2.1077 Compliance information.

(a) If a product must be tested and authorized under a Declaration of Conformity, a compliance information statement shall be supplied with the product at the time of marketing or importation, containing the following information:

- (1) Identification of the product, e.g., name and model number;
- (2) A statement, similar to that contained in § 15.19(a)(3) of this chapter, that the product complies with part 15 of this chapters; and
- (3) The identification, by name, address and telephone number, of the responsible party, as defined

in § 2.909.

The responsible party for a Declaration of Conformity must be located within the United States.

(c) The compliance information statement shall be included in the user’s manual or as a separate sheet.

§ 15.19(a)(3):

“ All other devices shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

1.8 Labeling.

Labeling Certification or Verification

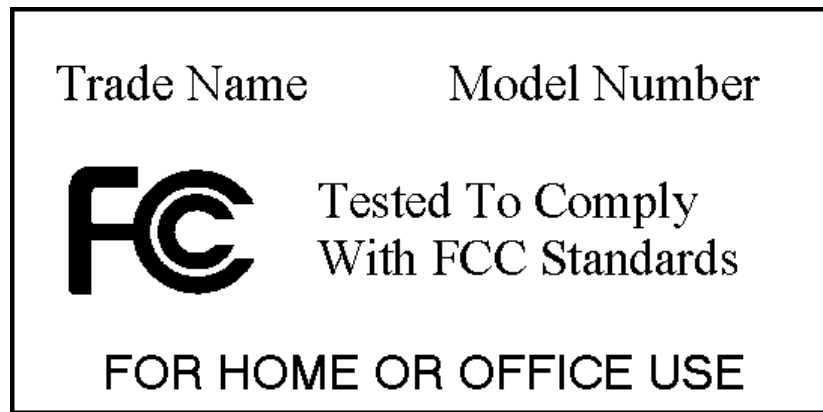
In addition to the requirements in Part 2 of this CFR 47 (See **1.6.1 Identification** above), a device subject to certification or verification shall be labeled as follows:

- (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:
This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.
- (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:
This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.
- (3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.
- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

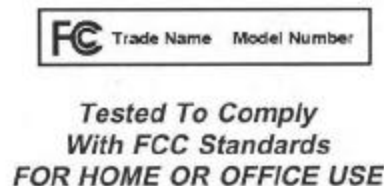
Declaration of Conformity Labeling

In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

- (1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:
 - (i) If the product is authorized based on testing of the product or system:



Alternate label format for small devices:



The text shown in ***bold-face italics*** may be placed in a prominent location in the instruction manual or pamphlet supplied to the user.

- (2) Label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight point.
- (3) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.
- (4) The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d) of this chapter. “Permanently affixed” means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

1.9 User information.

In 47 CFR, Part 15, § 15.21 **Information to user:**

“The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.”

In 47 CFR, Part 15, § 15.105 **Information to the user:**

Class A Devices

“(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.”

Class B Devices

“(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help*

“(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.”

4.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is the manufacturer recommends one year or what 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.

5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

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

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

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

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

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

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150
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TEST TITLE: Conducted Emissions Test – Mains & I/O Lines

METHOD

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. For all equipment, except floor-standing equipment, the EUT was located 40cm from a vertical conducting surface. All power was connected to the system through Line Impedance Stabilization Networks (LISN) and distance between the EUT and the LISN was 80cm or more. Conducted voltage measurements on mains lines were made at the output of the LISN. Conducted Current measurements on I/O lines are made with the current probe.

One fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point	
150kHz to 30MHz	Voltage	Mains

Mode*		
Power	Operation	Configuration
1	1	1

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	10kHz	200Hz	1Hz
150kHz to 30MHz	100kHz	100kHz	9kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

Section 15.207 Limits

Frequency (MHz)	Limit (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66-56	56-46
0.5-5	56	46
5-30	60	50

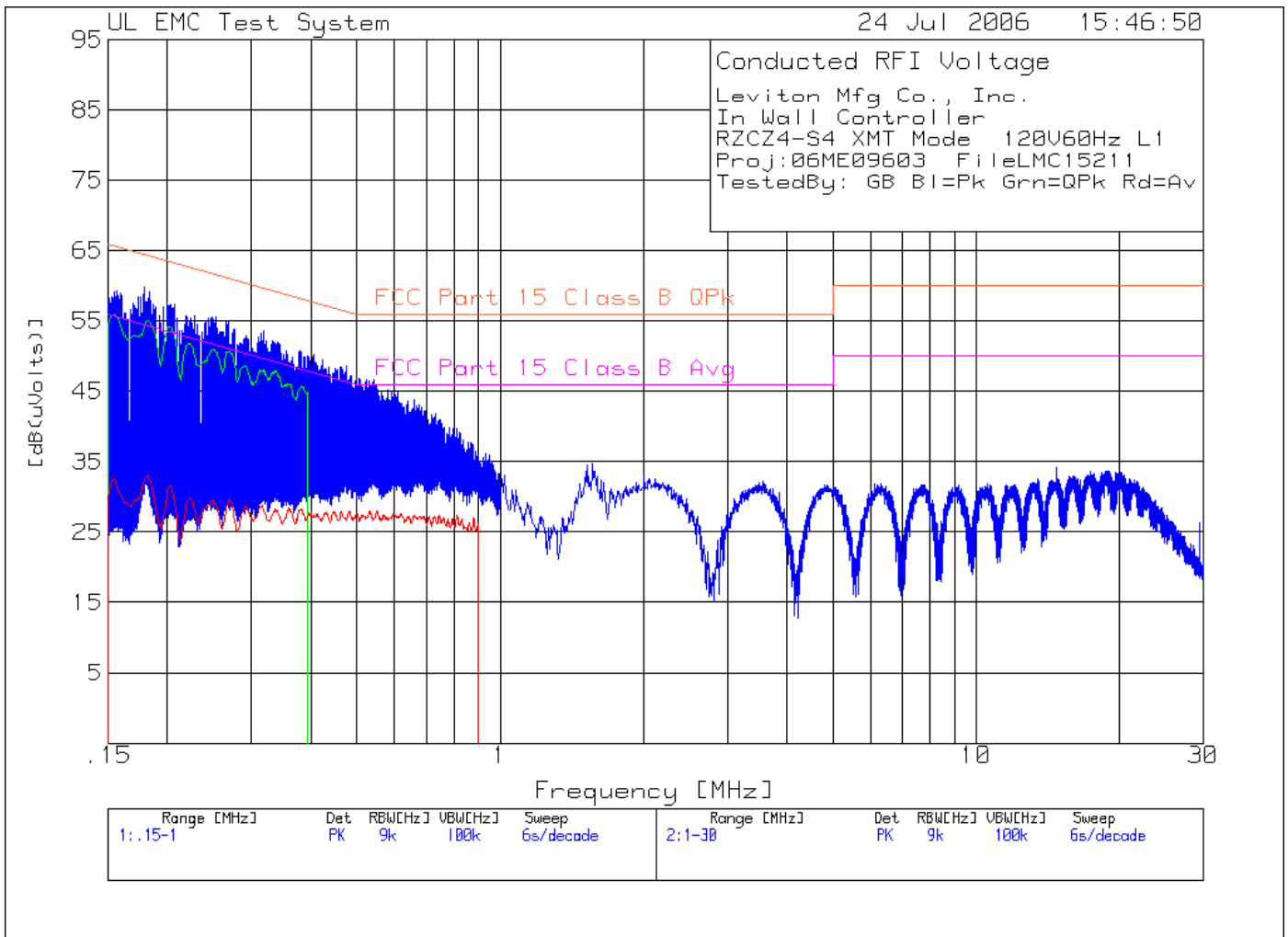
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	22	°C
Humidity:	34	%RH
Pressure:	1002	Mbar
Test Date	24 July 2006	

The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwartz	ESIB 26	ME5B-081	11 Oct 05	31 Oct 06
50 Ω LISN	Solar Electronics	9252-50-R-24-BNC	ME5A-636	20 Oct 05	31 Oct 06
Transient Limiter	Hewlett Packard	11947A	ME5A-443	25 Jan 06	31 Jan 07
Hygrometer/Temp/Barometer	Cole -Parmer	99760-00	ME4-268	16 May 06	31 May 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	06 June 06	NA



FCC Part 15 Class B limit depicted on the graph is equivalent to the 15.207 Conducted Emissions limit

Project Number: 06ME09603 File Number MC15211 Page 18 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode 120V60Hz L1
 Proj:06ME09603 FileLMC15211
 TestedBy: GB Bl=Pk Grn=QPk Rd=Av

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
=====									
Range: 1 .15 - 1MHz -----									
1	.15646	49.28 pk	10	0	59.28	65.6	55.6	-	-
					Margin [dB]	-6.32	3.68	-	-
2	.18349	49.08 pk	10	0	59.08	64.3	54.3	-	-
					Margin [dB]	-5.22	4.78	-	-
3	.20729	47.55 pk	9.9	0	57.45	63.3	53.3	-	-
					Margin [dB]	-5.85	4.15	-	-
4	.24826	45.61 pk	10	0	55.61	61.8	51.8	-	-
					Margin [dB]	-6.19	3.81	-	-
5	.31779	43.54 pk	10	0	53.54	59.8	49.8	-	-
					Margin [dB]	-6.26	3.74	-	-
6	.38069	40.83 pk	10	0	50.83	58.3	48.3	-	-
					Margin [dB]	-7.47	2.53	-	-
7	.54338	36.62 pk	10	0	46.62	56	46	-	-
					Margin [dB]	-9.38	.62	-	-
8	.7297	31.81 pk	10	0	41.81	56	46	-	-
					Margin [dB]	-14.19	-4.19	-	-
9	.155	45.87 qp	10	0	55.87	65.7	55.7	-	-
					Margin [dB]	-9.83	.17	-	-
10	.182	45.13 qp	10	0	55.13	64.4	54.4	-	-
					Margin [dB]	-9.27	.73	-	-
11	.201	44.23 qp	10	0	54.23	63.6	53.6	-	-
					Margin [dB]	-9.37	.63	-	-
12	.25	40.98 qp	10	0	50.98	61.8	51.8	-	-
					Margin [dB]	-10.82	-.82	-	-
13	.318	38.12 qp	10	0	48.12	59.8	49.8	-	-
					Margin [dB]	-11.68	-1.68	-	-
14	.358	36.17 qp	10	0	46.17	58.8	48.8	-	-
					Margin [dB]	-12.63	-2.63	-	-

LIMIT 1: FCC Part 15, Section 15.207 QPk
 LIMIT 2: FCC Part 15, Section 15.207 Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

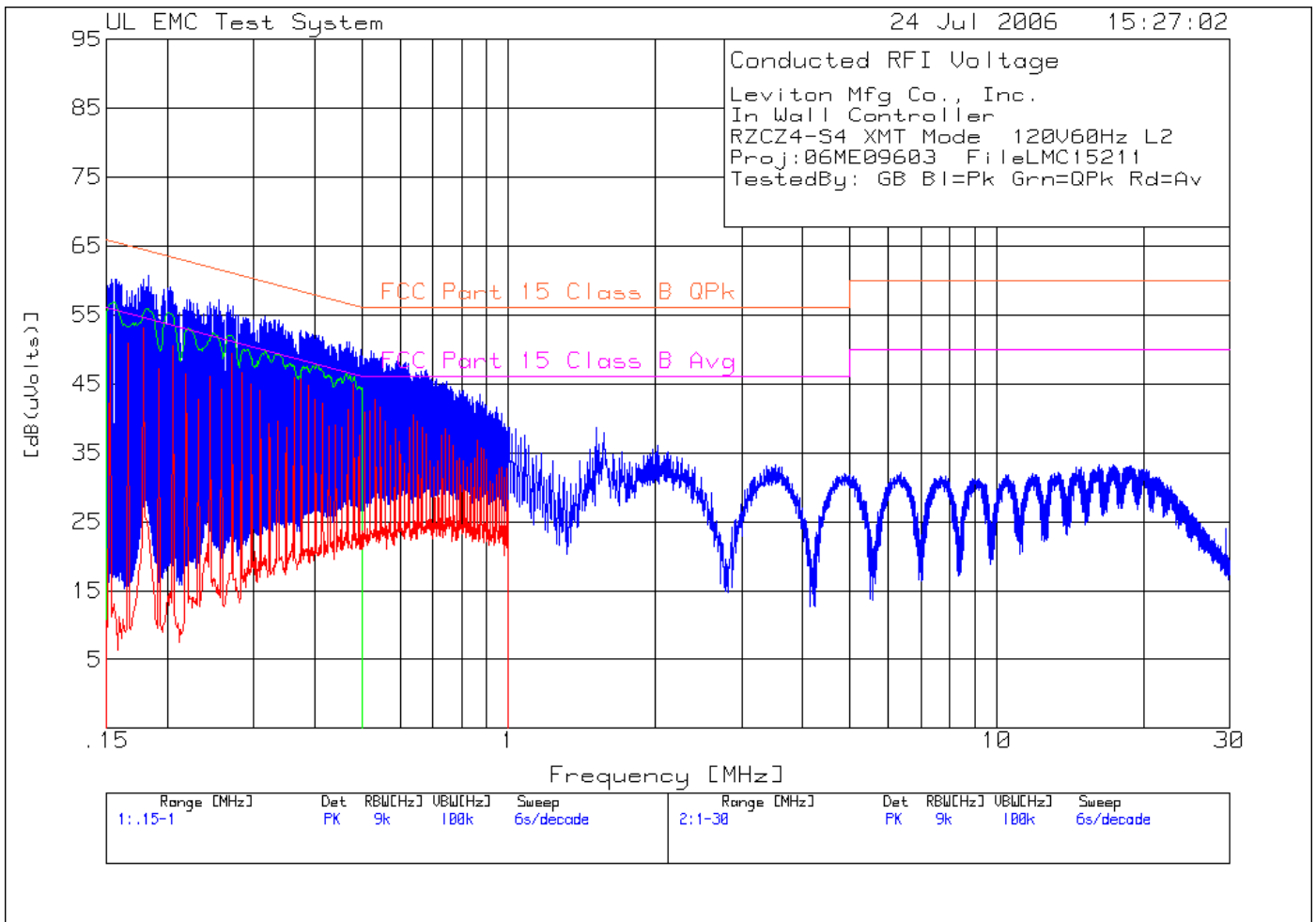
Project Number: 06ME09603 File Number MC15211 Page 19 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode 120V60Hz L1
 Proj:06ME09603 FileLMC15211
 TestedBy: GB Bl=Pk Grn=QPk Rd=Av

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
15	.155	22.54 ave	10	0	32.54	65.7	55.7	-	-
					Margin [dB]	-33.16	-23.16	-	-
16	.182	23.03 ave	10	0	33.03	64.4	54.4	-	-
					Margin [dB]	-31.37	-21.37	-	-
17	.203	21.69 ave	10	0	31.69	63.5	53.5	-	-
					Margin [dB]	-31.81	-21.81	-	-
18	.36	18.39 ave	10	0	28.39	58.7	48.7	-	-
					Margin [dB]	-30.31	-20.31	-	-
19	.532	18.01 ave	10	0	28.01	56	46	-	-
					Margin [dB]	-27.99	-17.99	-	-
20	.744	17.38 ave	10	0	27.38	56	46	-	-
					Margin [dB]	-28.62	-18.62	-	-

LIMIT 1: FCC Part 15, Section 15.207 QPk
 LIMIT 2: FCC Part 15, Section 15.207 Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result



FCC Part 15 Class B limit depicted on the graph is equivalent to the 15.207 Conducted Emissions limit

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 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode 120V60Hz L2
 Proj:06ME09603 FileLMC15211
 TestedBy: GB Bl=Pk Grn=QPk Rd=Av

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
=====									
Range: 1 .15 - 1MHz -----									
1	.15697	50.25 pk	10	0	60.25	65.6	55.6	-	-
					Margin [dB]	-5.35	4.65	-	-
2	.18298	50.7 pk	10	0	60.7	64.3	54.3	-	-
					Margin [dB]	-3.6	6.4	-	-
3	.2027	49.13 pk	10	0	59.13	63.5	53.5	-	-
					Margin [dB]	-4.37	5.63	-	-
4	.27206	46.43 pk	9.9	0	56.33	61.1	51.1	-	-
					Margin [dB]	-4.77	5.23	-	-
5	.47266	41.15 pk	9.9	0	51.05	56.5	46.5	-	-
					Margin [dB]	-5.45	4.55	-	-
6	.156	46.74 qp	10	0	56.74	65.7	55.7	-	-
					Margin [dB]	-8.96	1.04	-	-
7	.182	45.98 qp	10	0	55.98	64.4	54.4	-	-
					Margin [dB]	-8.42	1.58	-	-
8	.202	45.33 qp	10	0	55.33	63.5	53.5	-	-
					Margin [dB]	-8.17	1.83	-	-
9	.27	42.05 qp	10	0	52.05	61.1	51.1	-	-
					Margin [dB]	-9.05	.95	-	-
10	.463	36.62 qp	9.9	0	46.52	56.6	46.6	-	-
					Margin [dB]	-10.08	-.08	-	-
11	.179	43.03 ave	10	0	53.03	64.5	54.5	-	-
					Margin [dB]	-11.47	-1.47	-	-
12	.205	40.46 ave	10	0	50.46	63.4	53.4	-	-
					Margin [dB]	-12.94	-2.94	-	-
13	.271	39.36 ave	10	0	49.36	61.1	51.1	-	-
					Margin [dB]	-11.74	-1.74	-	-
14	.481	35.01 ave	10	0	45.01	56.3	46.3	-	-
					Margin [dB]	-11.29	-1.29	-	-

LIMIT 1: FCC Part 15, Section 15.207 QPk
 LIMIT 2: FCC Part 15, Section 15.207 Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

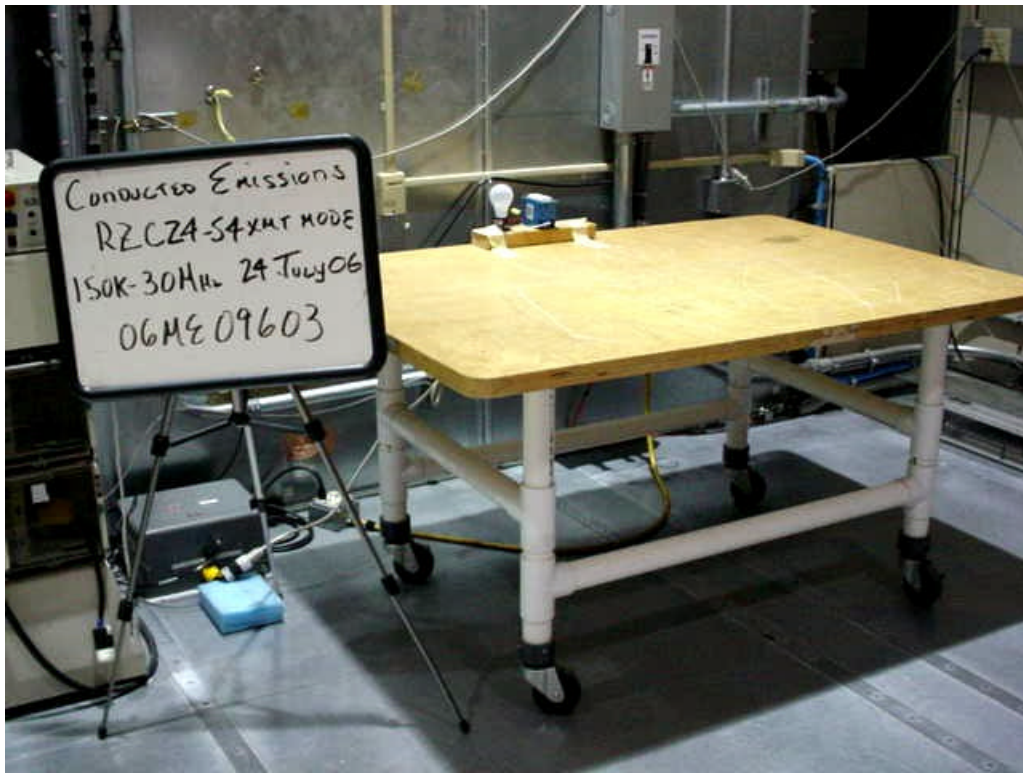
Project Number: 06ME09603 File Number MC15211 Page 22 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode 120V60Hz L2
 Proj:06ME09603 FileLMC15211
 TestedBy: GB Bl=Pk Grn=QPk Rd=Av

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
15	.153	42.13 ave	10	0	52.13	65.8	55.8	-	-
					Margin [dB]	-13.67	-3.67	-	-
16	.53029	39.41 pk	10	0	49.41	56	46	-	-
					Margin [dB]	-6.59	3.41	-	-
17	.74024	35.05 pk	10	0	45.05	56	46	-	-
					Margin [dB]	-10.95	-.95	-	-
18	.533	32.78 ave	10	0	42.78	56	46	-	-
					Margin [dB]	-13.22	-3.22	-	-
19	.743	28.46 ave	10	0	38.46	56	46	-	-
					Margin [dB]	-17.54	-7.54	-	-

LIMIT 1: FCC Part 15, Section 15.207 QPk
 LIMIT 2: FCC Part 15, Section 15.207 Avg

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result



Model RZCZ4-Z4

Conducted Emissions Test Set-Up

TEST TITLE: Occupied Bandwidth

METHOD

The bandwidth of the emissions shall be no wider than 0.99% of the center frequency for the devices operating at 908.42 MHz. The bandwidth is determined at the points 20 dB down from the modulated carrier. The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter as either the fundamental frequency or the first order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst-case bandwidth. If no bandwidth requirement is specified by the procuring or regulatory agency, measure the bandwidth at -26 Db with respect to the reference level.

In order to measure the modulated signal properly, a resolution bandwidth that is small compared with the bandwidth required by the procuring or regulatory agency shall be used on the measuring instrument. However, the resolution bandwidth of the measuring instrument shall be set to a value greater than 5% of the bandwidth requirement. When no bandwidth requirements are specified, the minimum resolution bandwidth of the measuring is given in the following table:

Fundamental Frequency	Minimum Resolution Bandwidth
9KHz to 30MHz	1KHz
30 to 1000MHz	10KHz
1000 MHz to 40GHz	100KHz

Bandwidth measured= (99%) 427KHz
 Bandwidth measured at (20dB) 376KHz

Mode*		
Power	Operation	Configuration
1	1	1

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	10kHz	200Hz	1Hz
150kHz to 30MHz	100kHz	100kHz	9kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

Project Number: 06ME09603 File Number MC15211 Page 25 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Frequency (MHz)	20dB	99%
908.42	376KHz	427KHz

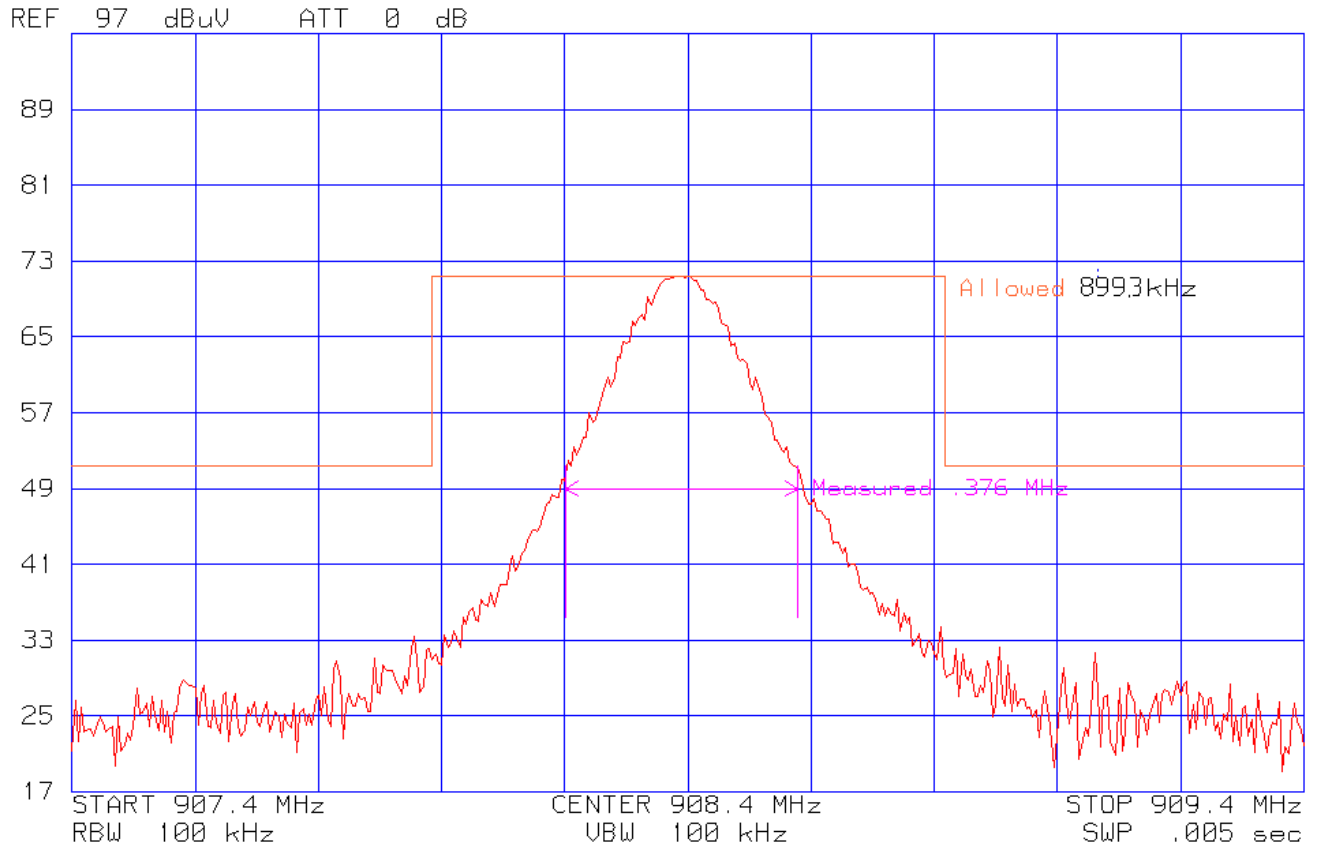
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	20	°C
Humidity:	45	%RH
Pressure:	1013	Mbar
Test Date	5 September 2006	

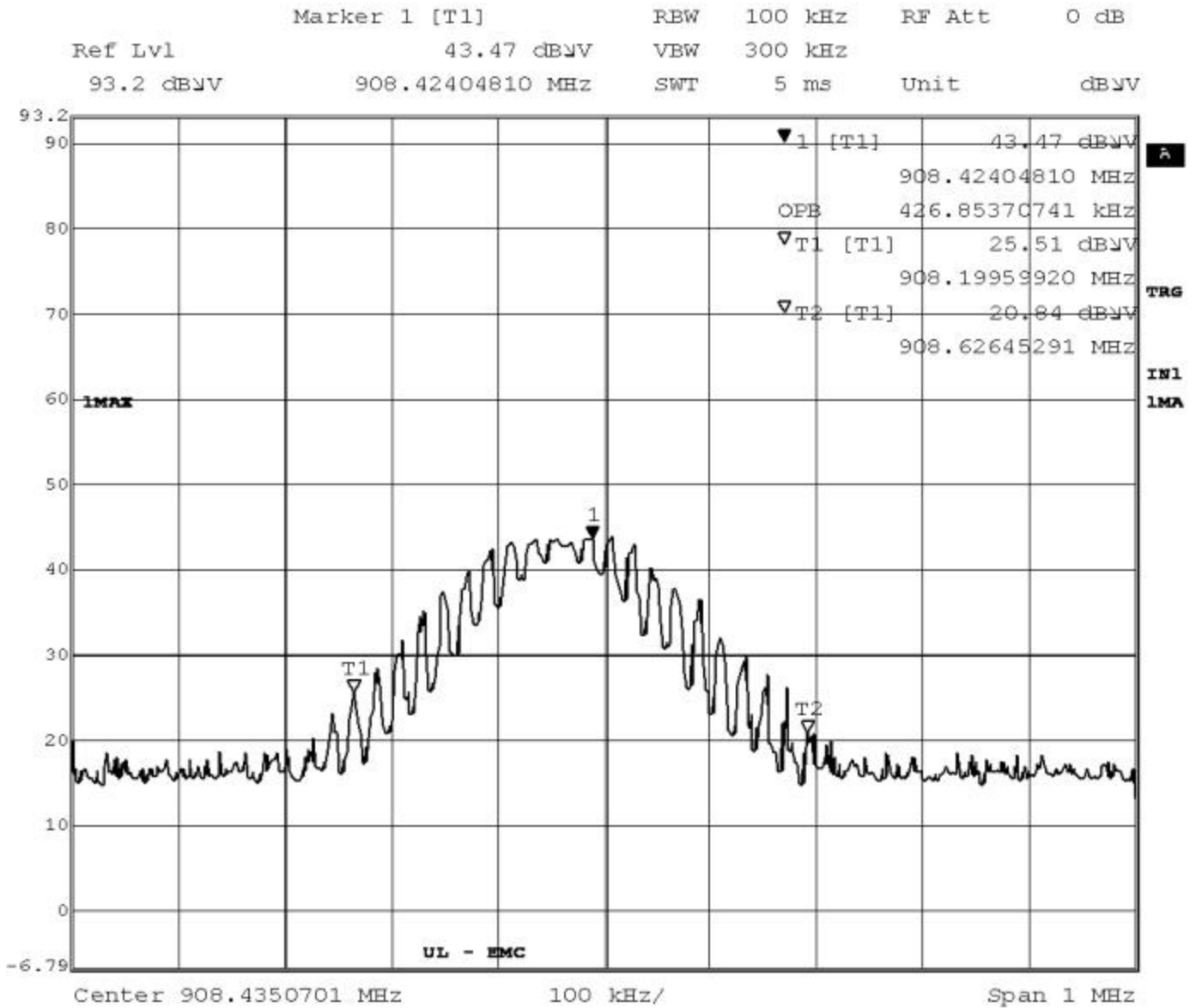
The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	11 Oct 05	31 Oct 06
EMI Test Receiver	Rohde & Schwarz	ESI26	5B -081	5 Jan. 2008	5 Jan 09
Dipole Antenna	ElectroMetrics	3121C-D134	5751	16 Aug 05	31 Aug 06
Hygrometer/Temp/Barometer	Cole -Parmer	99760-00	ME4-268	16 May 06	31 May 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	06 June 06	NA



Occupied Bandwidth RZCS4-Z4 (20dB)



Date: 26.JAN.2009 11:00:28

Occupied Bandwidth RZCS4-Z4 (99%)



Model RZCS4-Z4

Occupied Bandwidth Test Set-Up 20dB down



Model RZCS4-Z4

Occupied Bandwidth Test Set-Up 99%

TEST TITLE: Radiated Emissions Test

METHOD

Measurements were made in a 10-meter semi-anechoic chamber that complies to 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 1, 2, 3 and 4 meter 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.

One fully configured sample was scanned over the following frequency range:

Electric fields:	30MHz - 1GHz	(3 meter measurement distance)
	1GHz - 10GHz	(3 meter measurement distance)

Mode*		
Power	Operation	Configuration
1	1	1 & 2

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	1MHz	200Hz	1Hz
150kHz to 30MHz	100kHz	1MHz	9kHz	1Hz
30 to 1000MHz	1MHz	1MHz	-	1Hz
1000MHz to 10000 MHz	1MHz	1MHz	-	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

Section 15.209 Limits: Spurious Emissions

Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak	Average
30-88	40	-
88-216	43.5	-
216-960	46	-
960-10000	-	54

Limits 15.249 (a): Fundamental & Harmonics

Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak	Average
908.42	94	-
908-1000	54	-
1000-10000	-	54

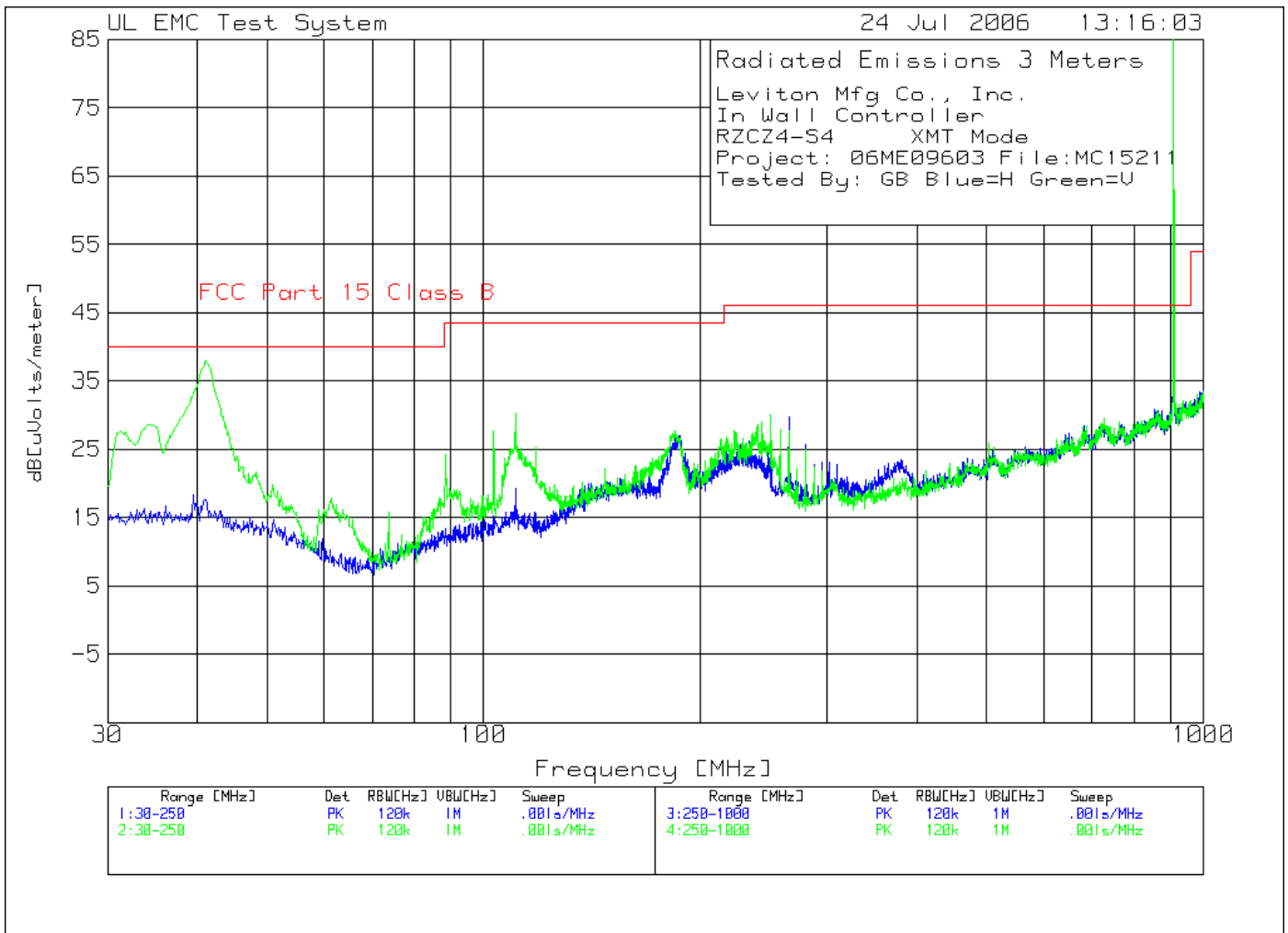
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	23	°C
Humidity:	33	%RH
Pressure:	1002	Mbar
Test Date	24 & 25 July 2006	

The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwartz	ESIB 40	34968	28 Nov 05	28 Nov 06
Biconical Antenna	Ailtech	94455-1	ME5-439	14 Dec 05	31 Dec 06
Log Periodic Antenna	EMCO	3146	ME5-451	19 Dec 05	31 Dec 06
Horn Antenna	Electro-metrics	RGA-180	ME5-766	24 Aug. 05	31 Aug. 06
Hygrometer/Temp/Baro meter	Cole-Parmer	99760-00	ME4-268	28 Jun 05	30 Jun 06

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
1-26GHz Pre-Amp	Hewlett Packard	8449B	ME5-914	12 Sep 05	30 Sep 06
Measurement Software	UL	UL EMI Software	Version 9.3	01 Feb 06	NA



FCC Part 15 Class B limit depicted on the graph is equivalent to the 15.209 Radiated Emissions limit

Project Number: 06ME09603 File Number MC15211 Page 32 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====									
Vertical 30 - 250MHz -----									
1	41.1541	24.15 pk	.3	13.5	37.95	40	-	-	-
	Azimuth:109	Height:101	Vert	Margin [dB]		-2.05	-	-	-
2	88.559	13.38 pk	.7	10.2	24.28	43.5	-	-	-
	Azimuth:73	Height:101	Vert	Margin [dB]		-19.22	-	-	-
3	103.2355	16.38 pk	.8	10.6	27.78	43.5	-	-	-
	Azimuth:180	Height:101	Vert	Margin [dB]		-15.72	-	-	-
4	110.5737	19.15 pk	.9	10.3	30.35	43.5	-	-	-
	Azimuth:75	Height:101	Vert	Margin [dB]		-13.15	-	-	-

Horizontal 250 - 1000MHz -----									
5	908.439	66.23 pk	3.5	22.5	92.23	46	94	-	-
	Azimuth:11	Height:100	Horz	Margin [dB]		46.23	-1.77	-	-

Vertical 250 - 1000MHz -----									
6	908.439	66.64 pk	3.5	22.5	92.64	46	94	-	-
	Azimuth:352	Height:249	Vert	Margin [dB]		46.64	-1.36	-	-

LIMIT 1: FCC Part 15, Section 15.209
 LIMIT 2: FCC Part 15 Section 15.249

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

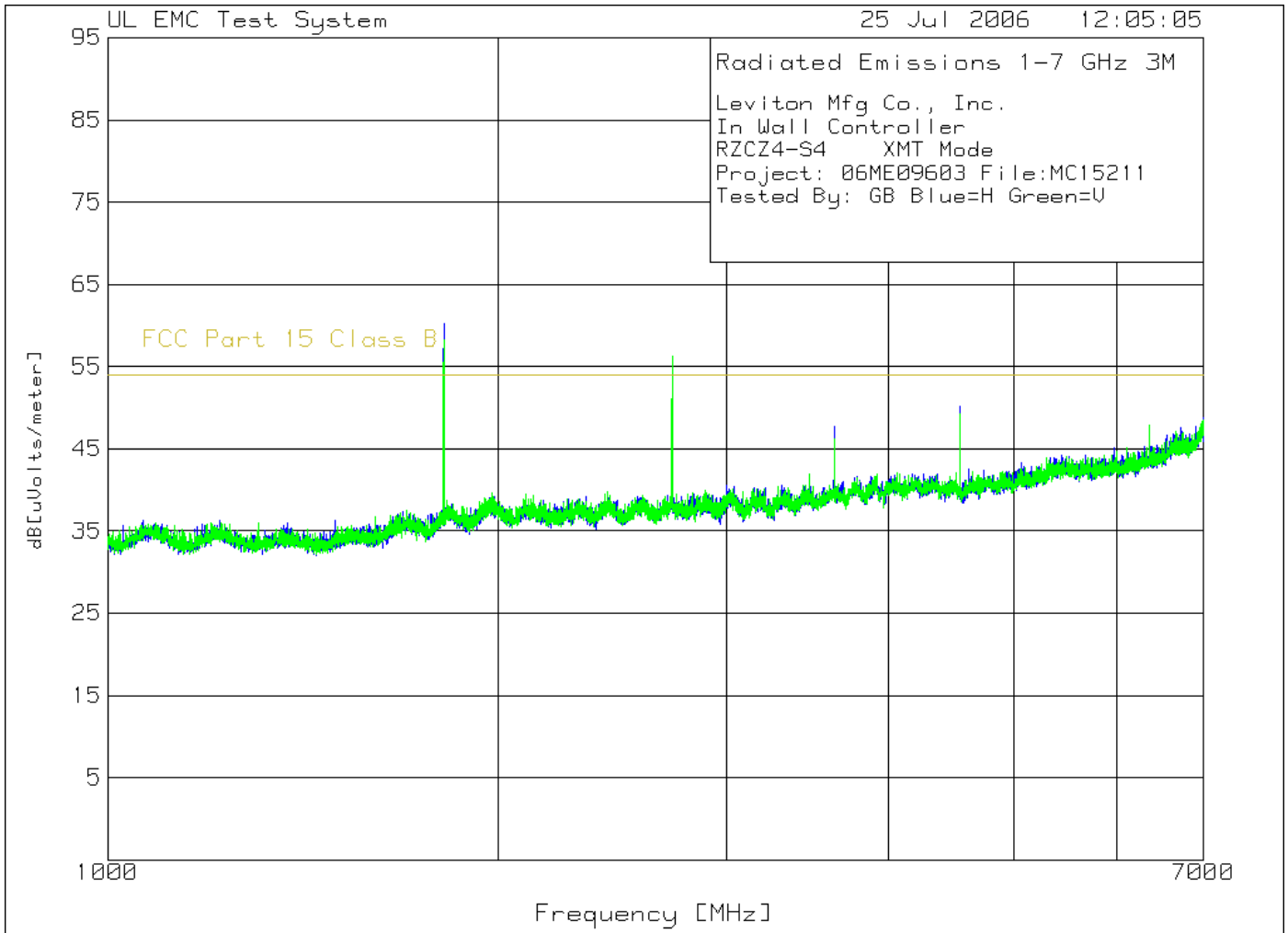
Project Number: 06ME09603 File Number MC15211 Page 33 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4
Frequency	Reading	Factor	Factor	dB[uVolts/meter]				
[MHz]	[dB(uV)]	[dB]	[dB]					
=====								
Horizontal	250 - 1000MHz							
908.4029	62.88 qp	3.5	22.5	88.88	46	94	-	-
Azimuth: 136	Height:153	Horz		Margin [dB]:	42.88	-5.12	-	-

LIMIT 1: FCC Part 15, Section 15.209
 LIMIT 2: FCC Part 15 Section 15.249

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



FCC Part 15 Class B limit depicted on the graph is equivalent to the 15.209 Radiated Emissions limit

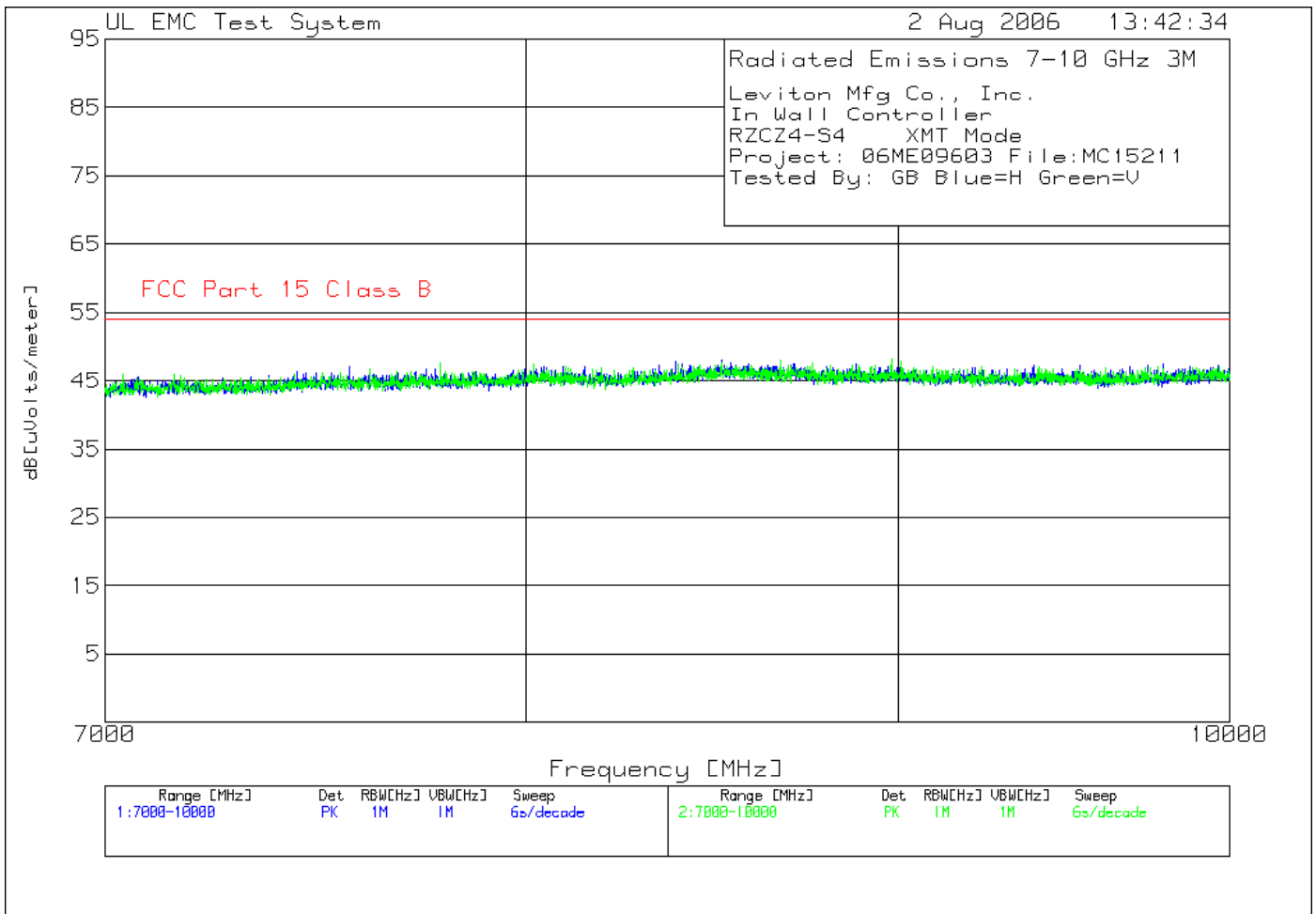
Project Number: 06ME09603 File Number MC15211 Page 35 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====								
Horizontal 1000 - 2000MHz								
1816.8423	43.46 ave	-28.8	27.1	41.76	54	-	-	-
Azimuth: 146 Height:103 Horz					Margin [dB]:	-12.24	-	-
Horizontal 2000 - 3500MHz								
2725.2939	46.02 ave	-27.7	29.4	47.72	54	-	-	-
Azimuth: 236 Height:127 Horz					Margin [dB]:	-6.28	-	-
Horizontal 3500 - 7000MHz								
3633.6137	43.81 ave	-26.6	31.6	48.81	54	-	-	-
Azimuth: 94 Height:118 Horz					Margin [dB]:	-5.19	-	-
4537.5501	25.64 ave	-25.4	32.4	32.64	54	-	-	-
Azimuth: 109 Height:121 Horz					Margin [dB]:	-21.36	-	-
6363.9	30.99 ave	-22.2	34.5	43.29	54	-	-	-
Azimuth: 288 Height:119 Horz					Margin [dB]:	-10.71	-	-
Vertical 1000 - 2000MHz								
1816.8423	55.38 ave	-28.8	27.1	53.68	54	-	-	-
Azimuth: 223 Height:143 Vert					Margin [dB]:	-.32	-	-
Vertical 2000 - 3500MHz								
2725.238	51.96 ave	-27.7	29.4	53.66	54	-	-	-
Azimuth: 80 Height:129 Vert					Margin [dB]:	-.34	-	-
Vertical 3500 - 7000MHz								
3633.6388	46.34 ave	-26.6	31.6	51.34	54	-	-	-
Azimuth: 305 Height:129 Vert					Margin [dB]:	-2.66	-	-
4537.5	25.67 ave	-25.4	32.4	32.67	54	-	-	-
Azimuth: 311 Height:114 Vert					Margin [dB]:	-21.33	-	-
6363.9	31 ave	-22.2	34.5	43.3	54	-	-	-
Azimuth: 293 Height:170 Vert					Margin [dB]:	-10.7	-	-

LIMIT 1: FCC Part 15, Section 15.209

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



FCC Part 15 Class B limit depicted on the graph is equivalent to the 15.209 Radiated Emissions limit

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====									
Horizontal 7000 - 10000MHz -----									
1	7562.187	37.25 pk	-26.7	36.6	47.15	54	-	-	-
	Azimuth:16	Height:102	Horz	Margin [dB]		-6.85	-	-	-
4	8510.503	36.47 pk	-25.9	37.5	48.07	54	-	-	-
	Azimuth:57	Height:102	Horz	Margin [dB]		-5.93	-	-	-
Vertical 7000 - 10000MHz -----									
2	7785.262	37.48 pk	-26.6	36.7	47.58	54	-	-	-
	Azimuth:22	Height:102	Vert	Margin [dB]		-6.42	-	-	-
3	8019.34	37.06 pk	-26.5	36.8	47.36	54	-	-	-
	Azimuth:344	Height:102	Vert	Margin [dB]		-6.64	-	-	-
5	8670.557	36.55 pk	-26	37.5	48.05	54	-	-	-
	Azimuth:137	Height:102	Vert	Margin [dB]		-5.95	-	-	-
6	8981.66	37 pk	-26.4	37.6	48.2	54	-	-	-
	Azimuth:182	Height:102	Vert	Margin [dB]		-5.8	-	-	-

LIMIT 1: FCC Part 15, Section 15.209

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

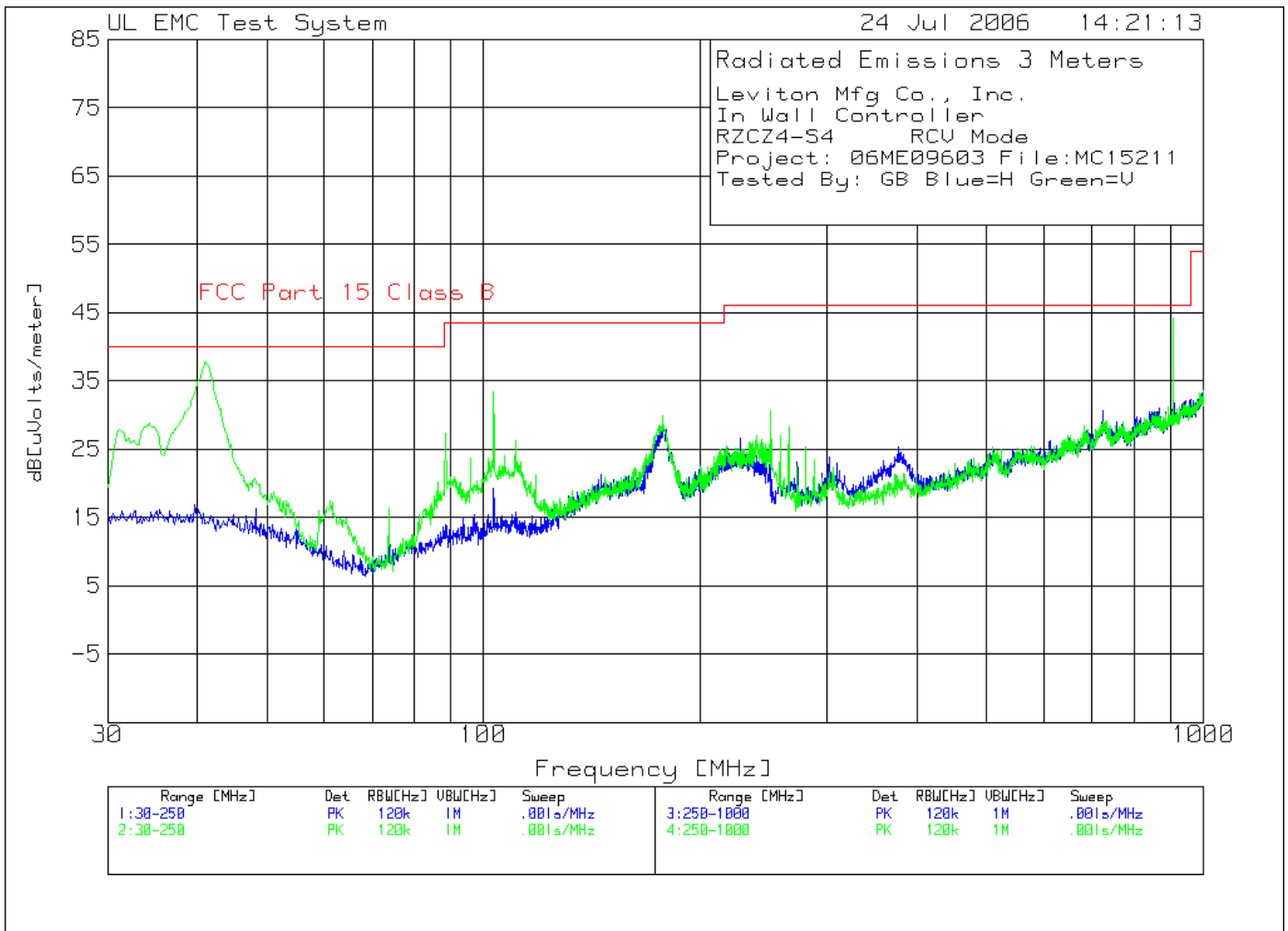
Project Number: 06ME09603 File Number MC15211 Page 38 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 XMT Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====									
Horizontal 7000 - 10000MHz									
8670.5		27.28 ave	-26	37.5	38.78	54	-	-	-
Azimuth: 18		Height:114	Horz		Margin [dB]:	-15.22	-	-	-
8981.6		27.19 ave	-26.4	37.6	38.39	54	-	-	-
Azimuth: 92		Height:186	Horz		Margin [dB]:	-15.61	-	-	-

LIMIT 1: FCC Part 15, Section 15.209

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



Project Number: 06ME09603 File Number MC15211 Page 40 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====									
Vertical 30 - 250MHz -----									
1	41.1541	23.99 pk	.3	13.5	37.79	40	-	-	-
	Azimuth:144	Height:101	Vert	Margin [dB]		-2.21	-	-	-
2	88.4123	16.46 pk	.7	10.2	27.36	43.5	-	-	-
	Azimuth:288	Height:101	Vert	Margin [dB]		-16.14	-	-	-
3	103.2355	22.02 pk	.8	10.6	33.42	43.5	-	-	-
	Azimuth:108	Height:101	Vert	Margin [dB]		-10.08	-	-	-
4	177.058	14.54 pk	1.2	14.1	29.84	43.5	-	-	-
	Azimuth:216	Height:250	Vert	Margin [dB]		-13.66	-	-	-

Horizontal 250 - 1000MHz -----									
5	908.439	16.21 pk	3.5	22.5	42.21	46	-	-	-
	Azimuth:255	Height:400	Horz	Margin [dB]		-3.79	-	-	-

Vertical 250 - 1000MHz -----									
6	908.439	18.23 pk	3.5	22.5	44.23	46	-	-	-
	Azimuth:358	Height:250	Vert	Margin [dB]		-1.77	-	-	-

LIMIT 1: FCC Part 15 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

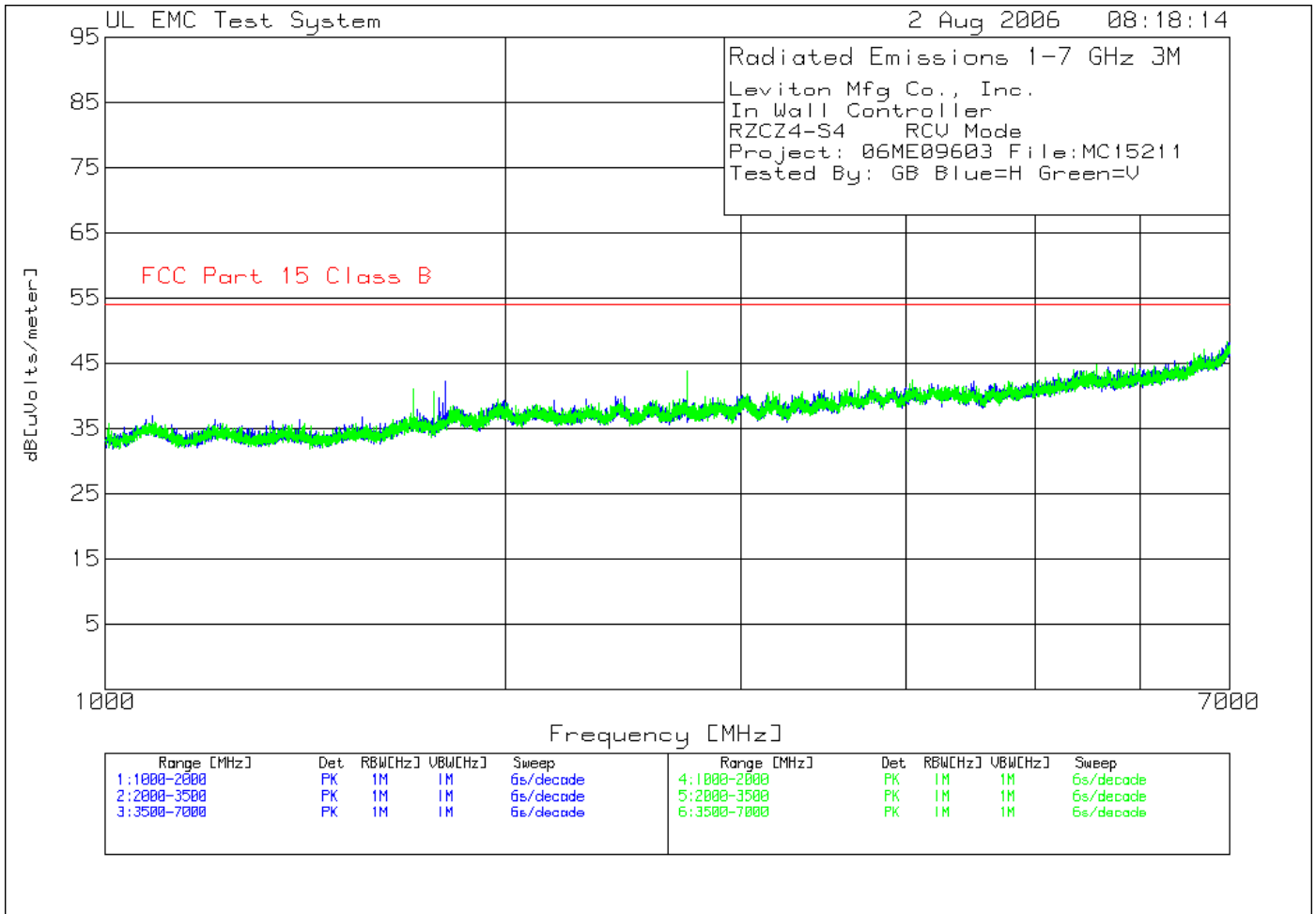
Project Number: 06ME09603 File Number MC15211 Page 41 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====								
Vertical 30 - 250MHz								
41.15	22.53 qp	.3	13.5	36.33	40	-	-	-
Azimuth: 176	Height:104	Vert		Margin [dB]:	-3.67	-	-	-
Horizontal 250 - 1000MHz								
908.2667	17.82 qp	3.5	22.5	43.82	46	-	-	-
Azimuth: 38	Height:349	Horz		Margin [dB]:	-2.18	-	-	-
Vertical 250 - 1000MHz								
908.2667	19.44 qp	3.5	22.5	45.44	46	-	-	-
Azimuth: 86	Height:113	Vert		Margin [dB]:	-.56	-	-	-

LIMIT 1: FCC Part 15 Class B

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



Project Number: 06ME09603 File Number MC15211 Page 43 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4

Horizontal 1000 - 2000MHz									
1	1816.606	38.67 pk	-28.8	27.1	36.97	54	-	-	-
	Azimuth:49	Height:100	Horz	Margin [dB]		-17.03	-	-	-

Horizontal 2000 - 3500MHz									
3	2724.241	36.97 pk	-27.7	29.4	38.67	54	-	-	-
	Azimuth:347	Height:100	Horz	Margin [dB]		-15.33	-	-	-

Horizontal 3500 - 7000MHz									
5	3633.044	36.03 pk	-26.6	31.6	41.03	54	-	-	-
	Azimuth:74	Height:100	Horz	Margin [dB]		-12.97	-	-	-
8	4744.081	33.32 pk	-25	32.8	41.12	54	-	-	-
	Azimuth:14	Height:100	Horz	Margin [dB]		-12.88	-	-	-
9	5450.15	31.71 pk	-23.8	34.1	42.01	54	-	-	-
	Azimuth:212	Height:100	Horz	Margin [dB]		-11.99	-	-	-

Vertical 1000 - 2000MHz									
2	1816.272	39.94 pk	-28.8	27.1	38.24	54	-	-	-
	Azimuth:143	Height:100	Vert	Margin [dB]		-15.76	-	-	-

Vertical 2000 - 3500MHz									
4	2723.241	36.89 pk	-27.7	29.4	38.59	54	-	-	-
	Azimuth:346	Height:100	Vert	Margin [dB]		-15.41	-	-	-

Vertical 3500 - 7000MHz									
6	3633.044	34.28 pk	-26.6	31.6	39.28	54	-	-	-
	Azimuth:25	Height:100	Vert	Margin [dB]		-14.72	-	-	-
7	4742.914	33.87 pk	-25	32.8	41.67	54	-	-	-
	Azimuth:1	Height:100	Vert	Margin [dB]		-12.33	-	-	-
10	5450.15	32.68 pk	-23.8	34.1	42.98	54	-	-	-
	Azimuth:30	Height:100	Vert	Margin [dB]		-11.02	-	-	-

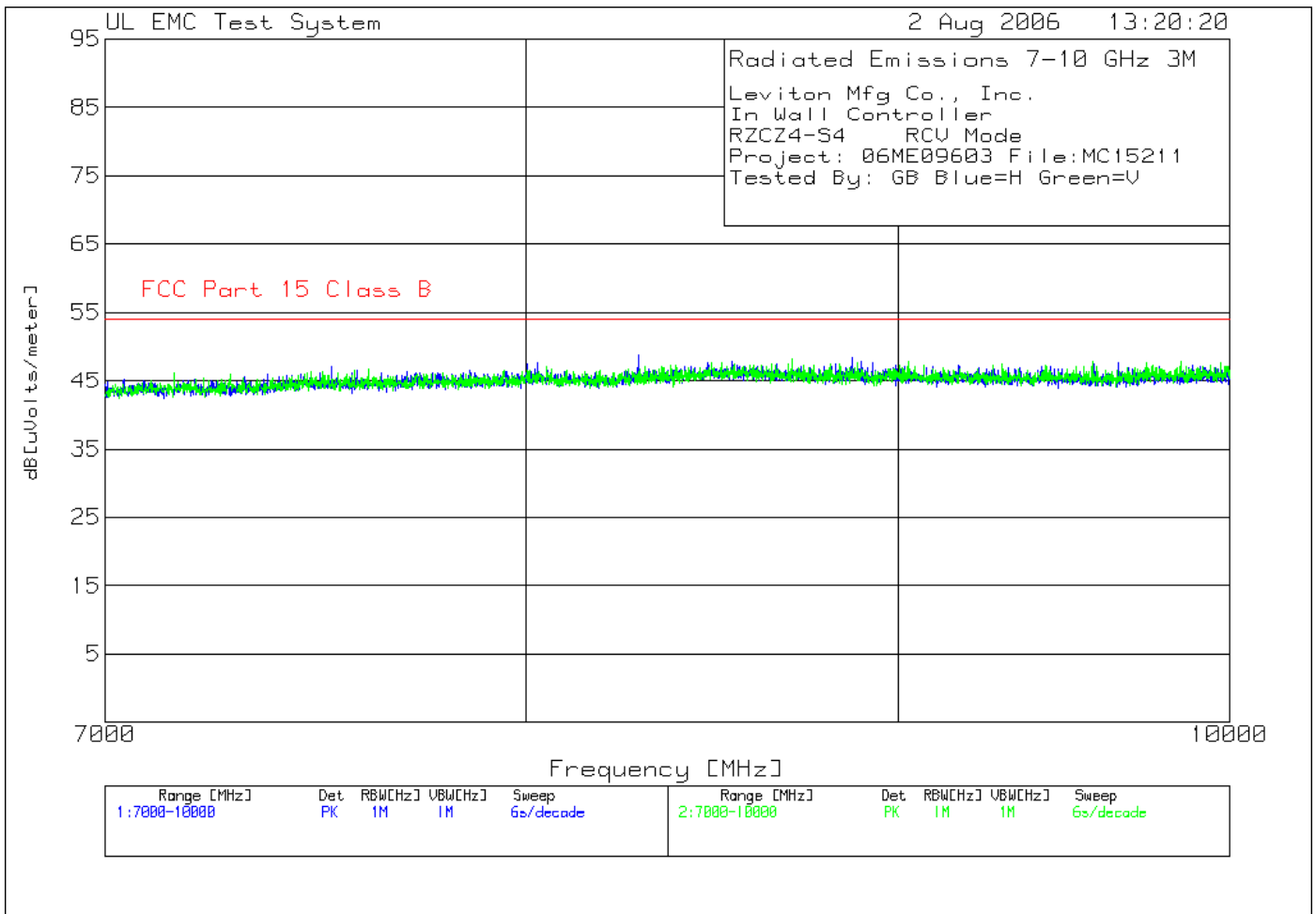
LIMIT 1: FCC Part 15 Class B
 pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

Project Number: 06ME09603 File Number MC15211 Page 44 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====								
Horizontal 1000 - 2000MHz								
1816.9	32.2 ave	-28.8	27.1	30.5	54	-	-	-
Azimuth: 37	Height:155	Horz		Margin [dB]:	-23.5	-	-	-
1816.9	29.33 ave	-28.8	27.1	27.63	54	-	-	-
Azimuth: 302	Height:101	Horz		Margin [dB]:	-26.37	-	-	-
Horizontal 2000 - 3500MHz								
2725	27.48 ave	-27.7	29.4	29.18	54	-	-	-
Azimuth: 302	Height:101	Horz		Margin [dB]:	-24.82	-	-	-
Horizontal 3500 - 7000MHz								
3633.5	27.16 ave	-26.6	31.6	32.16	54	-	-	-
Azimuth: 59	Height:117	Horz		Margin [dB]:	-21.84	-	-	-
4542.5	25.6 ave	-25.4	32.4	32.6	54	-	-	-
Azimuth: 34	Height:106	Horz		Margin [dB]:	-21.4	-	-	-
5450.5	28.65 ave	-23.8	34.1	38.95	54	-	-	-
Azimuth: 111	Height:144	Horz		Margin [dB]:	-15.05	-	-	-
Vertical 1000 - 2000MHz								
1816.9	30.72 ave	-28.8	27.1	29.02	54	-	-	-
Azimuth: 208	Height:131	Vert		Margin [dB]:	-24.98	-	-	-
Vertical 2000 - 3500MHz								
2725.2	27.49 ave	-27.7	29.4	29.19	54	-	-	-
Azimuth: 204	Height:166	Vert		Margin [dB]:	-24.81	-	-	-
Vertical 3500 - 7000MHz								
3633.5	27.14 ave	-26.6	31.6	32.14	54	-	-	-
Azimuth: 213	Height:144	Vert		Margin [dB]:	-21.86	-	-	-
4542	25.64 ave	-25.4	32.4	32.64	54	-	-	-
Azimuth: 103	Height:134	Vert		Margin [dB]:	-21.36	-	-	-
5450.5	28.61 ave	-23.8	34.1	38.91	54	-	-	-
Azimuth: 0	Height:186	Vert		Margin [dB]:	-15.09	-	-	-

LIMIT 1: FCC Part 15 Class B
 pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector



Project Number: 06ME09603 File Number MC15211 Page 46 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====									
Horizontal 7000 - 10000MHz -----									
1	7520.173	37.24 pk	-26.7	36.6	47.14	54	-	-	-
	Azimuth:12	Height:101	Horz	Margin [dB]		-6.86	-	-	-
2	8000.333	37.11 pk	-26.5	36.8	47.41	54	-	-	-
	Azimuth:84	Height:101	Horz	Margin [dB]		-6.59	-	-	-
3	8026.342	37.33 pk	-26.5	36.8	47.63	54	-	-	-
	Azimuth:84	Height:101	Horz	Margin [dB]		-6.37	-	-	-
4	8288.429	37.68 pk	-26.1	37.2	48.78	54	-	-	-
	Azimuth:337	Height:101	Horz	Margin [dB]		-5.22	-	-	-
5	8869.623	36.99 pk	-26.2	37.6	48.39	54	-	-	-
	Azimuth:62	Height:101	Horz	Margin [dB]		-5.61	-	-	-
6	9652.884	36.09 pk	-26.3	37.9	47.69	54	-	-	-
	Azimuth:15	Height:101	Horz	Margin [dB]		-6.31	-	-	-

LIMIT 1: FCC Part 15 Class B

pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - denotes average log detection
 ave - denotes average detection
 tm - Trace Math Result

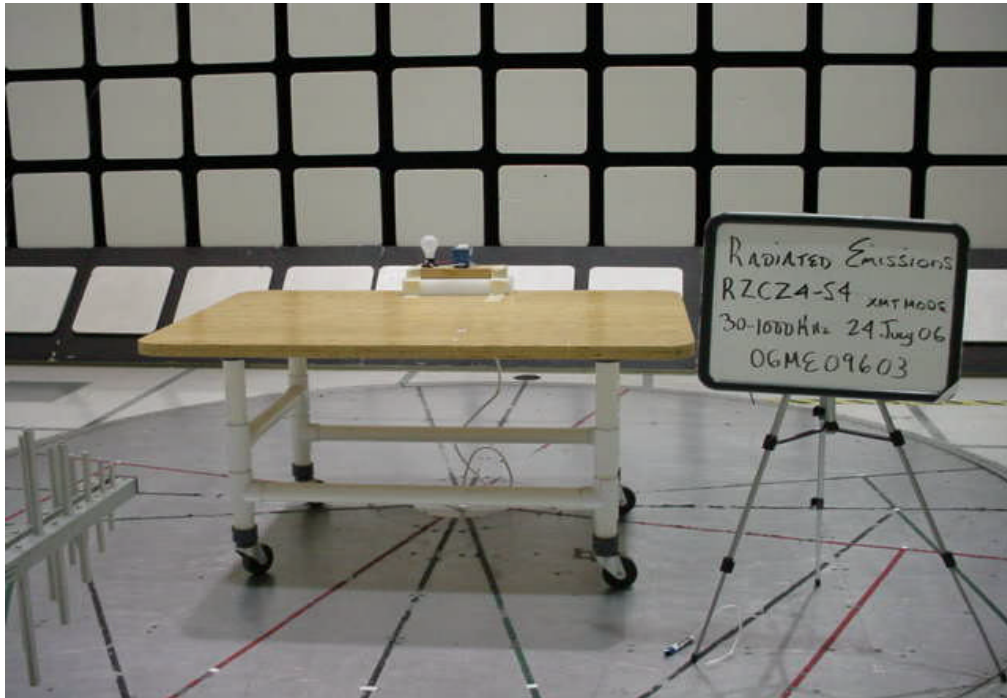
Project Number: 06ME09603 File Number MC15211 Page 47 of 56
 Model Number: RZCS4-Z4 & RZCZ4-1L
 FCC ID: QGH-RZC04
 Industry Canada ID: 2473A-RZC04

Leviton Mfg Co., Inc.
 In Wall Controller
 RZCS4-Z4 RCV Mode
 Project: 06ME09603 File:MC15211
 Tested By: GB Blue=H Green=V

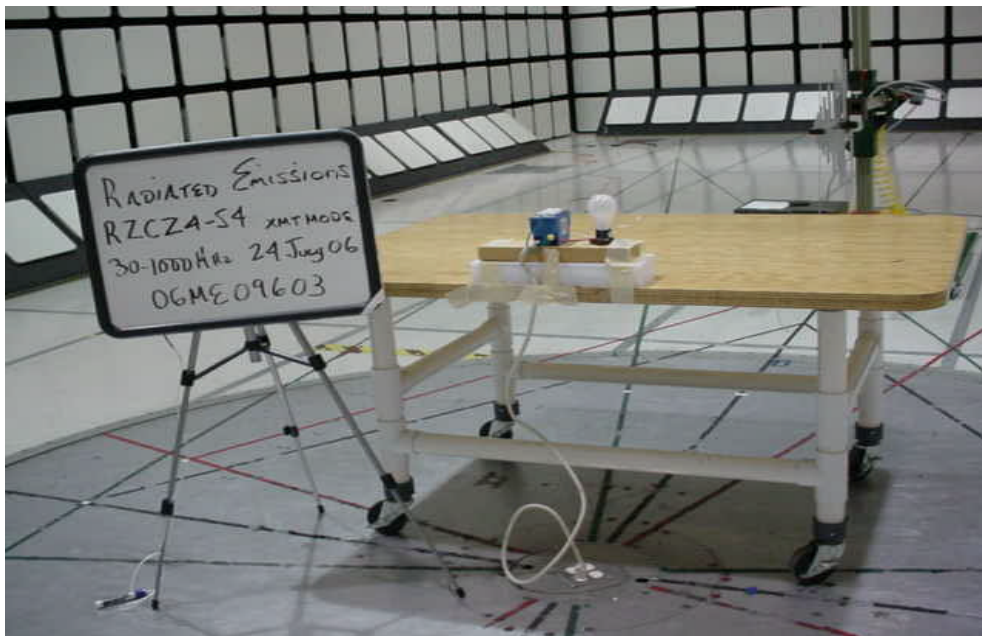
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====								
Horizontal 7000 - 10000MHz								
8288	27.3 ave	-26.1	37.2	38.4	54	-	-	-
Azimuth: 151 Height:153 Horz					Margin [dB]:	-15.6	-	-
8869.6	27.31 ave	-26.2	37.6	38.71	54	-	-	-
Azimuth: 174 Height:102 Horz					Margin [dB]:	-15.29	-	-

LIMIT 1: FCC Part 15 Class B

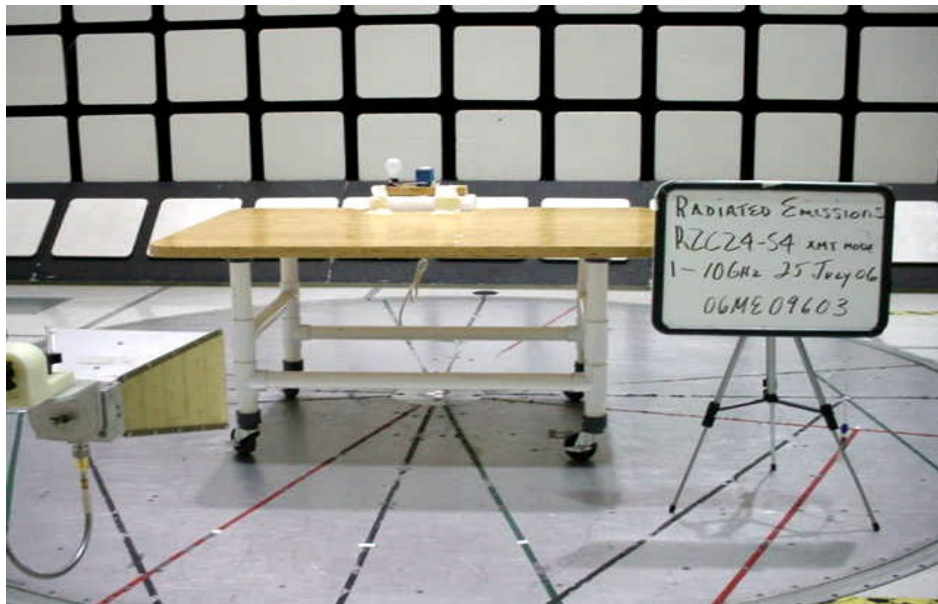
pk - Peak detector
 qp - Quasi-Peak detector
 av - Average detector
 avlg - Average log detector
 ave - Average detector



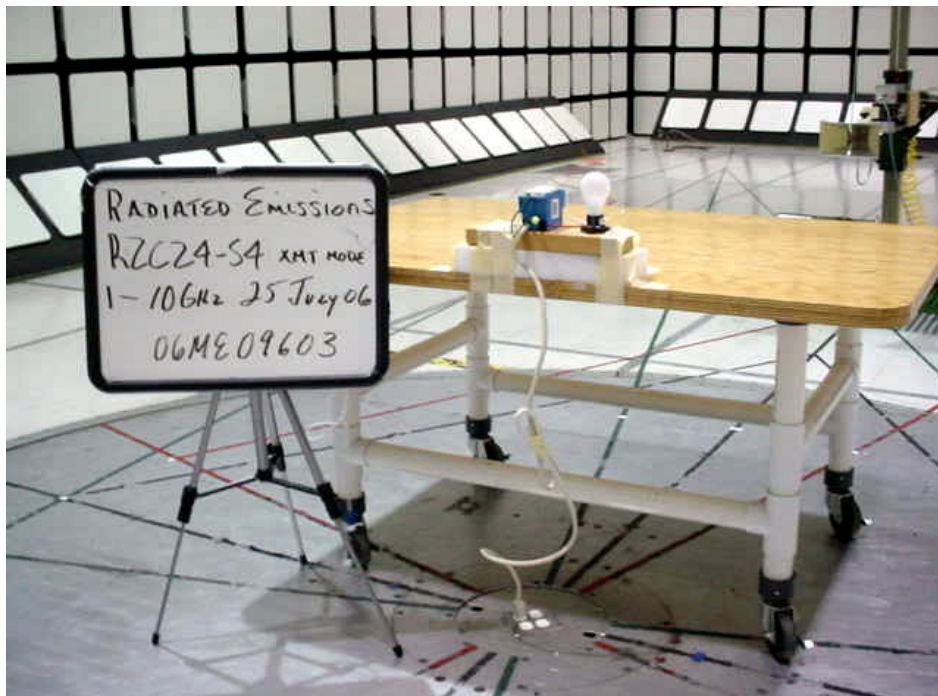
Model RZCS4-Z4 – Front View 30-1000MHz



Model RZCS4-Z4 – Rear View 30-1000MHz



Model RZCS4-Z4 – Front View 1-10GHz



Model RZCS4-Z4 – Rear View 1-10GHz

TEST TITLE: Transmission On Time (Duty Cycle) Paragraph 15.35

METHOD

When the Radiated Limits are expressed in terms of the average value of the emissions, and pulse operation is employed, the pulse measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds (100ms) or in cases where the pulse train exceeds 0.1seconds the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Mode*		
Power	Operation	Configuration
1	1	1

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	10kHz	200Hz	1Hz
150kHz to 30MHz	100kHz	100kHz	9kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

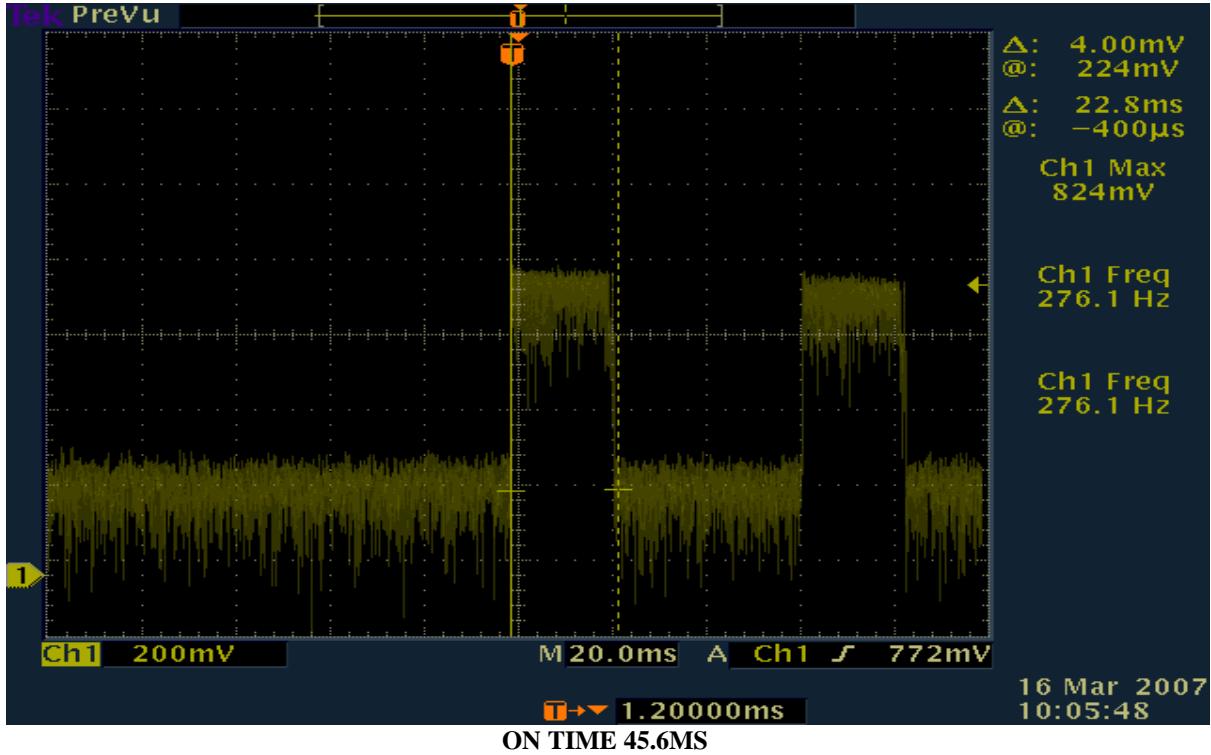
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	22.5	°C
Humidity:	34	%RH
Pressure:	1001	Mbar
Test Date	5 September 06 & 16 March 07	

The results of this test **[complied]** **[did not comply]** with the requirements.

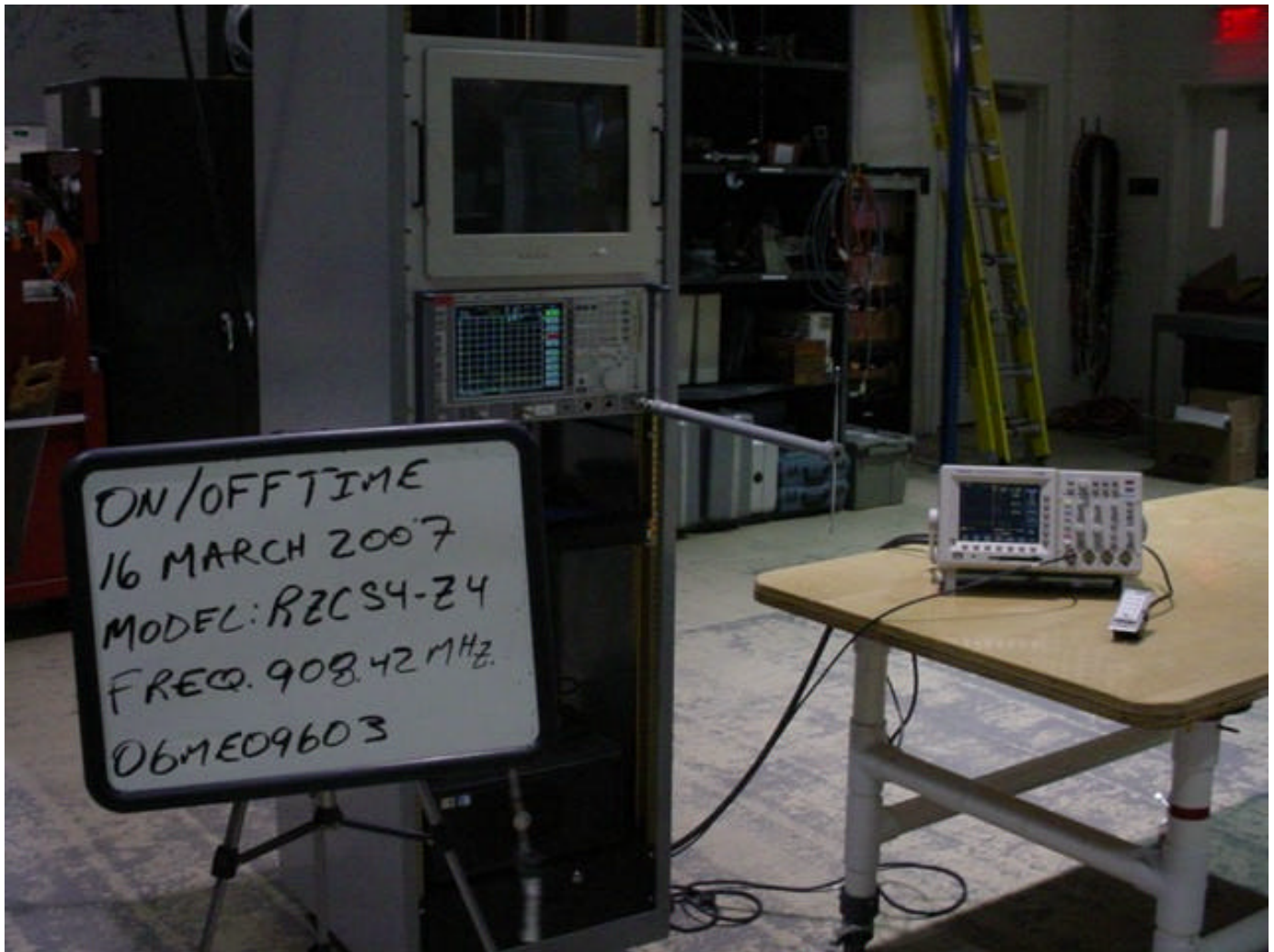
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Dipole Antenna	ElectroMetrics	3121C-D134	5751	16 Aug 06	31 Aug 07
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	3 Oct. 05	31 Oct. 06
EMI Spectrum Analyzer	Agilent Technologies				
Ocilloscope	Tektronix				
Hygrometer/Temp/Barometer	Cole-Parmer	99760-00	ME4-268	15 Aug 06	30 Jun 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	-	NA



Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Dipole Antenna	ElectroMetrics	3121C-D134	5751	16 Aug 06	31 Aug 07
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	3 Oct. 05	31 Oct. 06
Hygrometer/Temp/Barometer	Cole-Parmer	99760-00	ME4-268	15 Aug 06	31 Aug 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	-	NA



ON/OFF Test Set-Up

TEST TITLE: Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation

Fundamental Frequency is MHz

$$\text{Limit} = 20 * \log (\text{mV/m})$$

$$\text{Limit} = 20 * \log (50000)$$

$$\text{Limit} = 94\text{dBuV}$$

From table in section 15.209

$$\text{Limit for Spurious Emissions} = 20\text{dB lower then fundamental} = \text{dBuV/m}$$

Fundamental Frequency is 902-928MHz

$$\text{Limit} = 20 * \log (\text{uV/m})$$

$$\text{Limit} = 20 * \log (500)$$

$$\text{Limit} = 54\text{dBuV}$$

$$\text{Limit for Harmonic Emissions} = 50\text{dB lower then fundamental} = 54\text{dBuV/m}$$

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

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

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

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

Radiated Emissions test data obtained during measurements.

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

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

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

Duty Cycle factor calculation.

Total number of pulses counted in 100ms.

Total time on = 55

$$\text{Duty cycle correction factor} = 20 \log (45.6\text{ms} / 100\text{ms})$$

$$= 20 \log (0.456)$$

$$= - 6.8\text{dB}$$

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. 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 and accepted in a letter dated September 24, 1997 (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-160.

Project Number: 06ME09603 File Number MC15211 Page 56 of 56
Model Number: RZCS4-Z4 & RZCZ4-1L
FCC ID: QGH-RZC04
Industry Canada ID: 2473A-RZC04



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.

U.S. Identifier Number: US0113