



Project: 03ME13330
File: NC2219
Date: 11/20/03
Model: RBLB-5W

Test Report

On

Electromagnetic Compatibility Testing

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quality service for over 100 years**

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

Test Report Details

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

Tests Performed For: **Lutron Electronics Co. Inc.
7200 Suter Road.
Coopersburg, Pa 18036**

Applicant Contact: **Mark Clouser**
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Test Report Date: **11/20/03**

Product Type: **Keypad**

Model Number: **RBLB-5W**

Sample Serial Number: **Not Provided**

Sample Tag Number: **0534332001**

Sample Receive Date: **11/04/03**

EUT Category: **Radio Transmitter**

Testing Start Date: **11/04/03**

Date Testing Complete: **11/17/03**

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
Not Applicable	Not Applicable	Not Applicable	Not Applicable

1.0 G E N E R A L - Product Description

Device Function: The RBLB-5W is a wall mounted master control station. It contains an AM transceiver and an antenna, which are not accessible to the user. It is used as part of acts as a central hub and programming interface of an integrated lighting control system. It contains an AM transceiver and an antenna. It is used as part of an integrated lighting control system. The purpose of RF communication is to transmit and receive command signals. Transmitted commands allow the triggering of system events. Received commands allow for updating of control indicator status.

Analog Function: The RBLB-5W obtains power through standard household wiring. The power supply and voltage regulator produces a 5VDC output, which is used to power all analog and micro controller activities.

1.1 Device Configuration During Test

The device was tested in two modes of operation:

1. Continuously transmitting an intentional radio frequency in Continuous Wave (CW).
2. Standby mode (Receive). The device is waiting to receive a signal source.

The manufacturer configured the device. The antenna is an Integral part of the EUT (equipment under test) and cannot be changed or removed.

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Keypad	Lutron	RBLB-5W	There was no support equipment necessary except for the keypad.

* 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	< 3m	None	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
434	Operating Frequency	-----	-----

1.1.4 Power Interface:

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

1.2 EUT Operation Modes:

Mode #	Description
1	The EUT was configured to continuously transmit at its operating frequency 434MHz.
2	The EUT was configured to be in Standby, which is receive mode

1.3 EUT Configuration Modes: See section 1.1

"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

Test Name Test Requirement/Specification	Comply	Does Not Comply	See Remark
Conducted Voltage Emissions (Continuous Data Transmit Mode): FCC Part 15 Subpart B, Class B. Paragraph 15.205	Yes	-	1
Radiated Emissions: FCC Part 15 Subpart C, Class B, Intentional Radiators, Paragraph 15.209, 15.231	Yes	-	1
FCC Part 15 Subpart B, Class B, Un-Intentional Radiators, Paragraph 15.109	Yes	-	1
Cease Operation < 5 seconds: FCC Part 15 Subpart C, Paragraph 15.231	Yes	-	1
Occupied Bandwidth: FCC Part 15 Subpart C, Paragraph 15.231	Yes	-	1

Remarks:

- 1) No Modifications required for compliance.
- 2) Modifications required to comply as described in Section 1.5

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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 as being applicable to the Equipment Under Test determined the test list. 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 section(s) 5.0

Test Start Date: 11/4/03
Test Completion Date: 11/17/03



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3.0 FCC Labeling Information

3.1 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.”

3.2 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.”

3.3 Labeling.

Labeling Certification or Verification

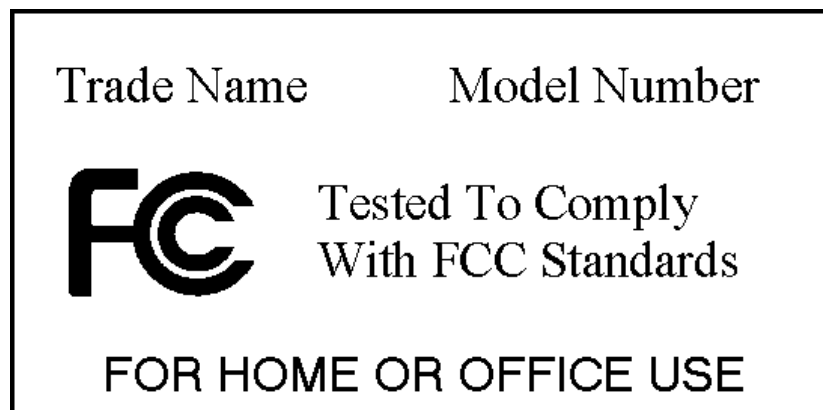
In addition to the requirements in Part 2 of this CFR 47 (See **1.6.1 Identification** above), a device subject to certification or verification shall be labeled as follows:

- (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.

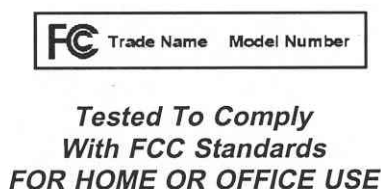
Declaration of Conformity Labeling

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.

3.4 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 one year or what is recommended by the manufacturer, 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.

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Model Number: RBLB-5W
FCC ID: JPZ0029

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5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

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

FCC Part 15, Subpart B, Paragraph 15.107 & 15.109	Code of Federal Regulations, Part 15,
FCC Part 15 Subpart C, Paragraph 15.205, 15.207,	Subpart C, Radio Frequency Devices
15.209 & 15.231	

5.1.1 Conducted Emissions Tests

Test Applicable

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). Conducted voltage measurements on mains lines were made at the output of the LISN.

Results

The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	21.5 °C
Humidity:	55%RH
Pressure:	1013 mbar
Date test performed:	6 November 2003

1 fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point		Mode*	
			Power	Operation
150kHz to 30MHz	Voltage	Mains	1	1
150kHz to 30 MHz	Voltage	Mains	1	2

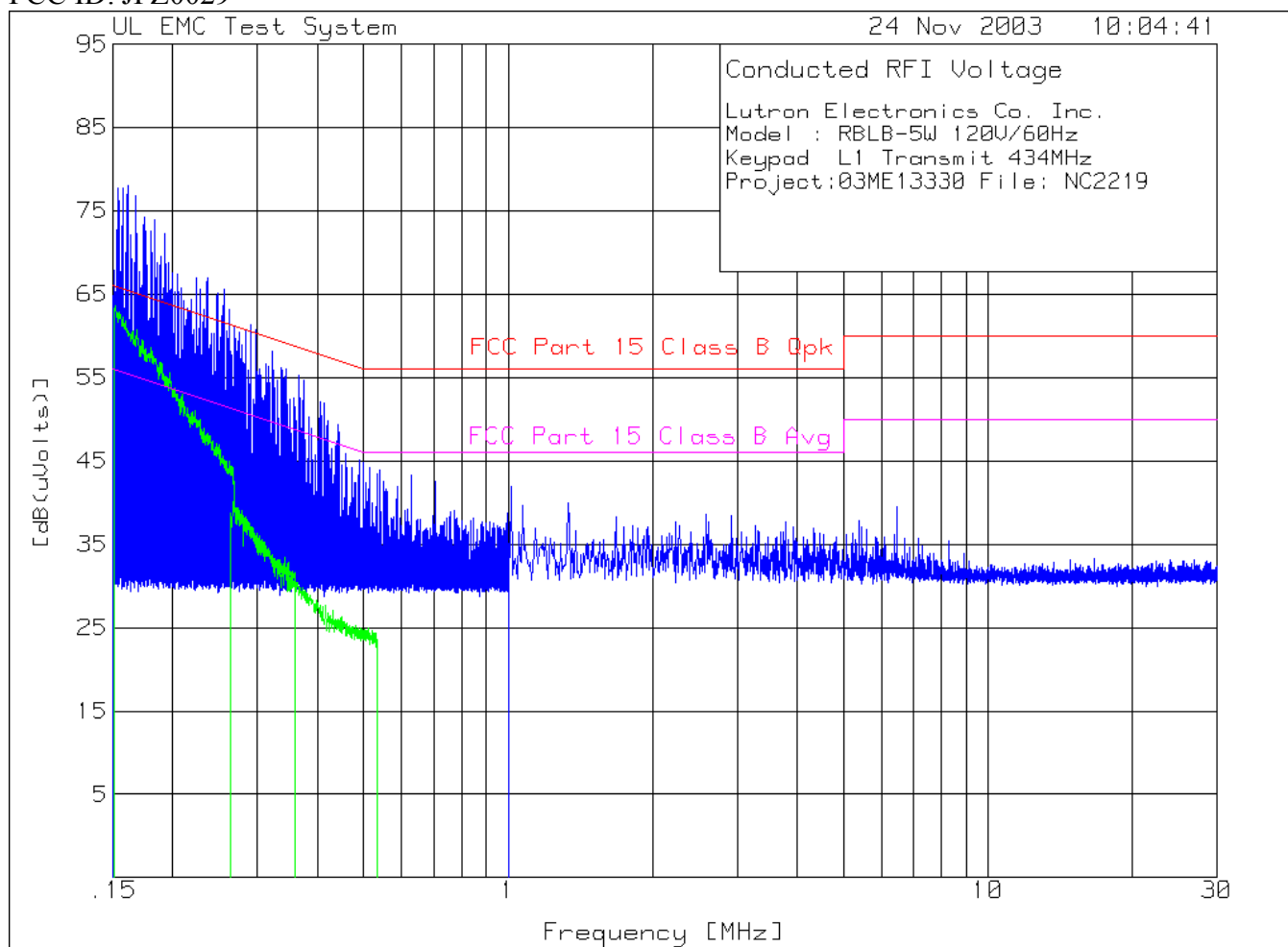
*See Power Interface and EUT Operating Modes for details

Test equipment used for conducted emissions

E7402A	Agilent Technologies	EMI Spectrum Analyzer	Equipment No.: ME5B-123
Range: 150KHz to 30MHz	Last Calibration Date: 25 January 2003	Calibration Due Date: 25 January 2004	

Test Accessories for Conducted Emissions

11947A	Hewlett Packard	Transient Limiter	Equipment No.: ME5A-444
Range: 150KHz to 30MHz	Last Calibration Date: 17 October 2003	Calibration Due Date: 17 October 2004	
9252-50-R-24-BNC	Solar Electronics	50Ω LISN	Equipment No.: ME5A-636
Range: 150KHz to 30 MHz	Last Calibration Date: 16 September 2003	Calibration Due Date: 16 September 2004	
99760-00	Cole –Parmer	Hygrometer/Temp/Baro meter	Equipment No.: ME4-268
Range: 0°C-55°C		Ranges	Temp: 0°C-55°C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar Calibration Due Date: 27 May 2004
Last Calibration Date: 27 May 2003			



File Number: NC2219
 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Electronics Co. Inc.
 Model : RBLB-5W 120V/60Hz
 Keypad L1 Transmit 434MHz
 Project:03ME13330 File: NC2219

Test No.	Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.15162	53.55 qp	10.1	0	63.65	65.9	55.9
				Margin [dB]		-2.25	7.75
2	.16831	50.61 qp	10.1	0	60.71	65	55
				Margin [dB]		-4.29	5.71
3	.18422	47.14 qp	10.1	0	57.24	64.3	54.3
				Margin [dB]		-7.06	2.94
4	.20899	42.92 qp	10.1	0	53.02	63.2	53.2
				Margin [dB]		-10.18	-.18
5	.23637	38.21 qp	10.1	0	48.31	62.2	52.2
				Margin [dB]		-13.89	-3.89
6	.2627	34.8 qp	10.1	0	44.9	61.3	51.3
				Margin [dB]		-16.4	-6.4
7	.27723	28.53 qp	10.1	0	38.63	60.9	50.9
				Margin [dB]		-22.27	-12.27
8	.3163	24.3 qp	10.1	0	34.4	59.8	49.8
				Margin [dB]		-25.4	-15.4
9	.36479	20.36 qp	10.1	0	30.46	58.6	48.6
				Margin [dB]		-28.14	-18.14
10	.43045	16.93 qp	10.1	0	27.03	57.2	47.2
				Margin [dB]		-30.17	-20.17
11	.52171	14.47 qp	10.1	0	24.57	56	46
				Margin [dB]		-31.43	-21.43

LIMIT 1: FCC Part 15 Class B Qpk
 LIMIT 2: FCC Part 15 Class B Avg

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

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 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

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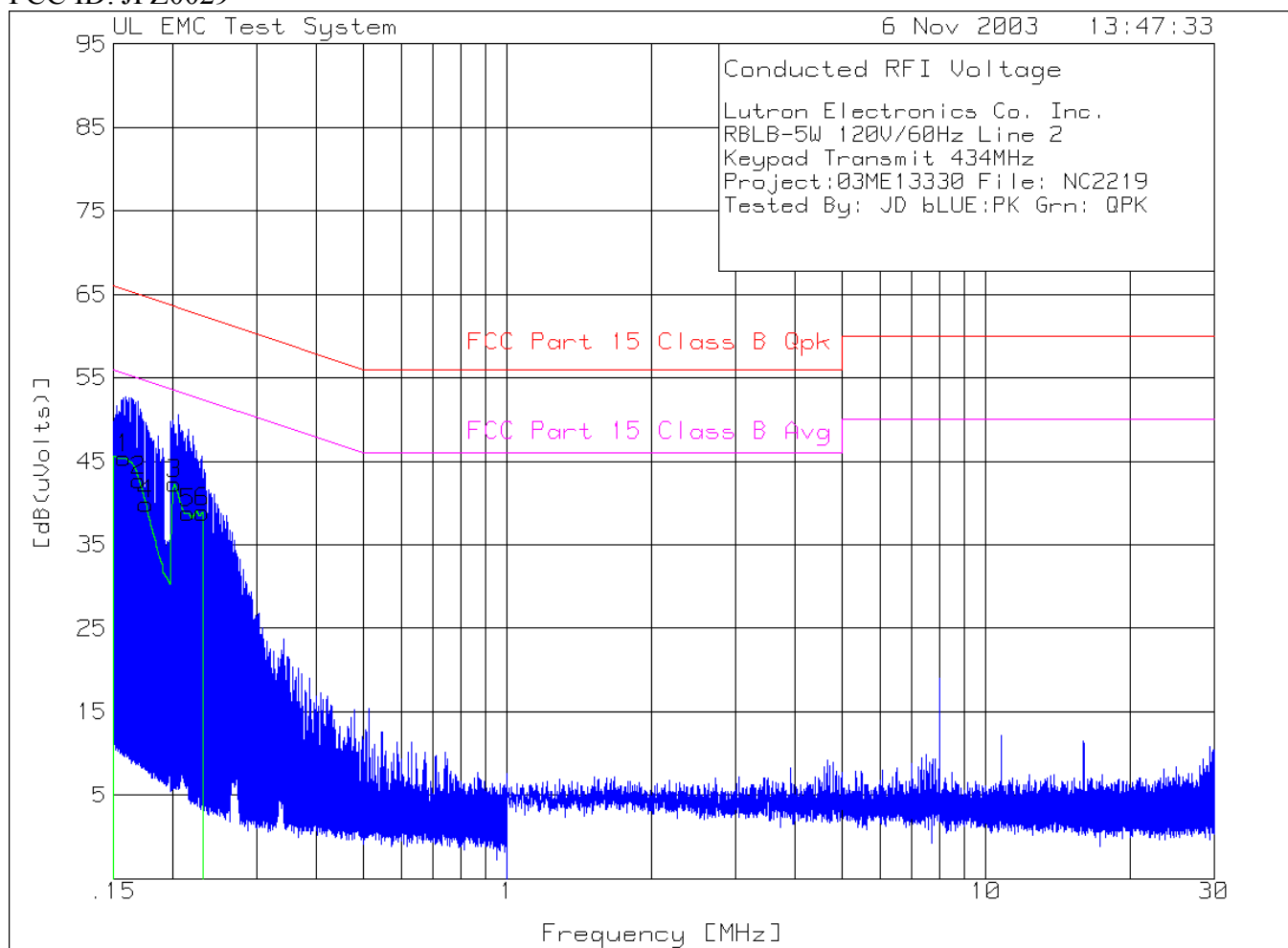
Lutron Electronics Co. Inc.
 Model : RBLB-5W 120V/60Hz
 Keypad L1 Transmit 434MHz
 Project:03ME13330 File: NC2219

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====						
Range: 1 .15 - 1MHz						
.15175	6.99 avem	10.1	0	17.09	65.9	55.9
			Margin [dB]:		-48.81	-38.81
.17344	3.7 avem	10.1	0	13.8	64.8	54.8
			Margin [dB]:		-51.0	-41.0
.17983	6.99 avem	10.1	0	17.09	64.5	54.5
			Margin [dB]:		-47.41	-37.41
.20885	10.45 avem	10.1	0	20.55	63.3	53.3
			Margin [dB]:		-42.75	-32.75
.22844	8.84 avem	10.1	0	18.94	62.5	52.5
			Margin [dB]:		-43.56	-33.56
.2316	4.99 avem	10.1	0	15.09	62.4	52.4
			Margin [dB]:		-47.4	-37.4

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

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

LIMIT 1: FCC Part 15 Class B Qpk
 LIMIT 2: FCC Part 15 Class B Avg



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 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Electronics Co. Inc.
 RBLB-5W 120V/60Hz Line 2
 Keypad Transmit 434MHz
 Project:03ME13330 File: NC2219
 Tested By: JD bLUE:PK Grn: QPK

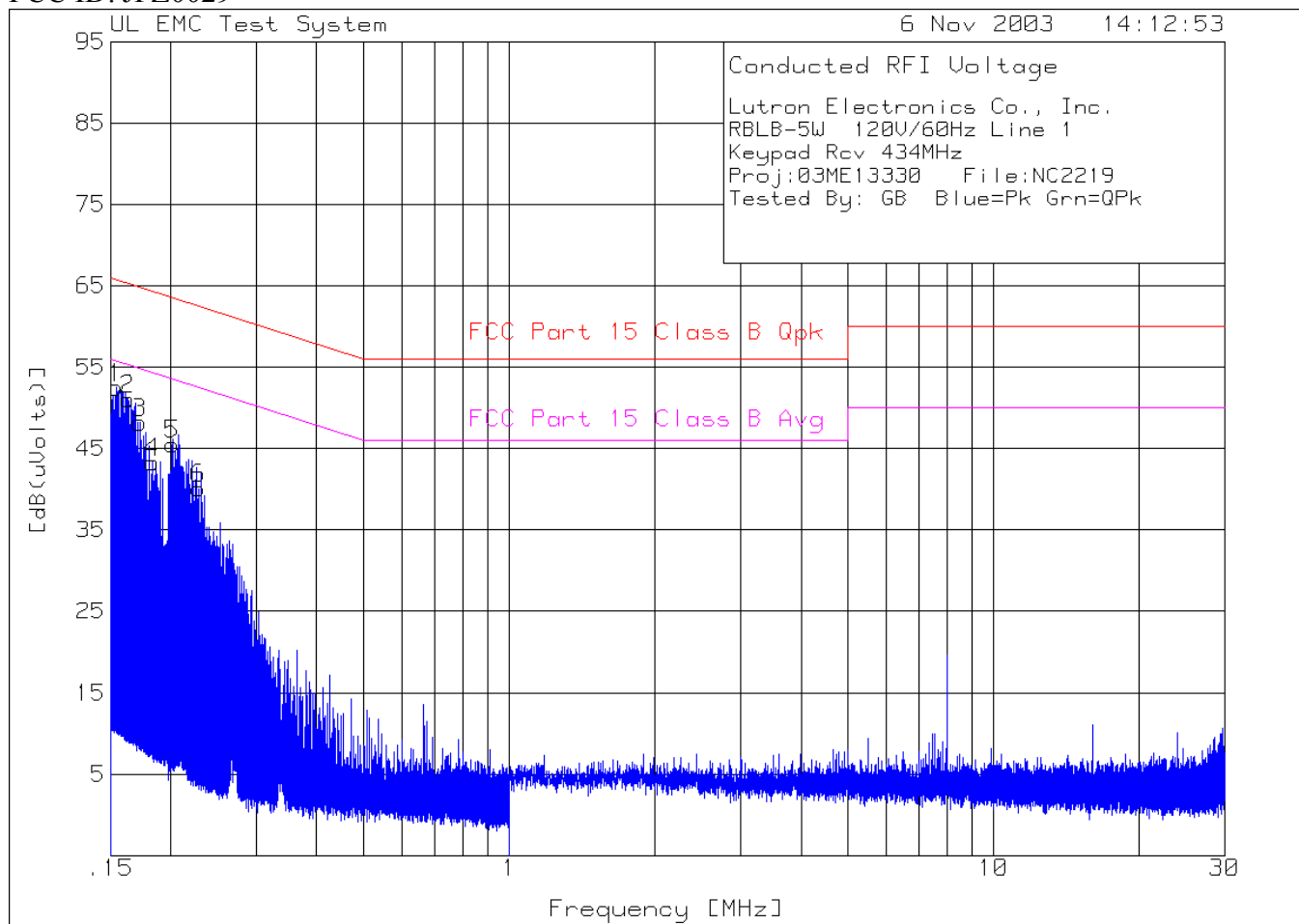
No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.15818	35.1 qp	10.3	0	45.4	65.6	55.6
				Margin [dB]		-20.2	-10.2
2	.17035	32.4 qp	10.3	0	42.7	64.9	54.9
				Margin [dB]		-22.2	-12.2
3	.20161	32 qp	10.3	0	42.3	63.5	53.5
				Margin [dB]		-21.2	-11.2
4	.17603	29.6 qp	10.3	0	39.9	64.7	54.7
				Margin [dB]		-24.8	-14.8
5	.21508	28.5 qp	10.3	0	38.8	63	53
				Margin [dB]		-24.2	-14.2
6	.23061	28.6 qp	10.3	0	38.9	62.4	52.4
				Margin [dB]		-23.5	-13.5

LIMIT 1: FCC Part 15 Class B Qpk
 LIMIT 2: FCC Part 15 Class B Avg

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

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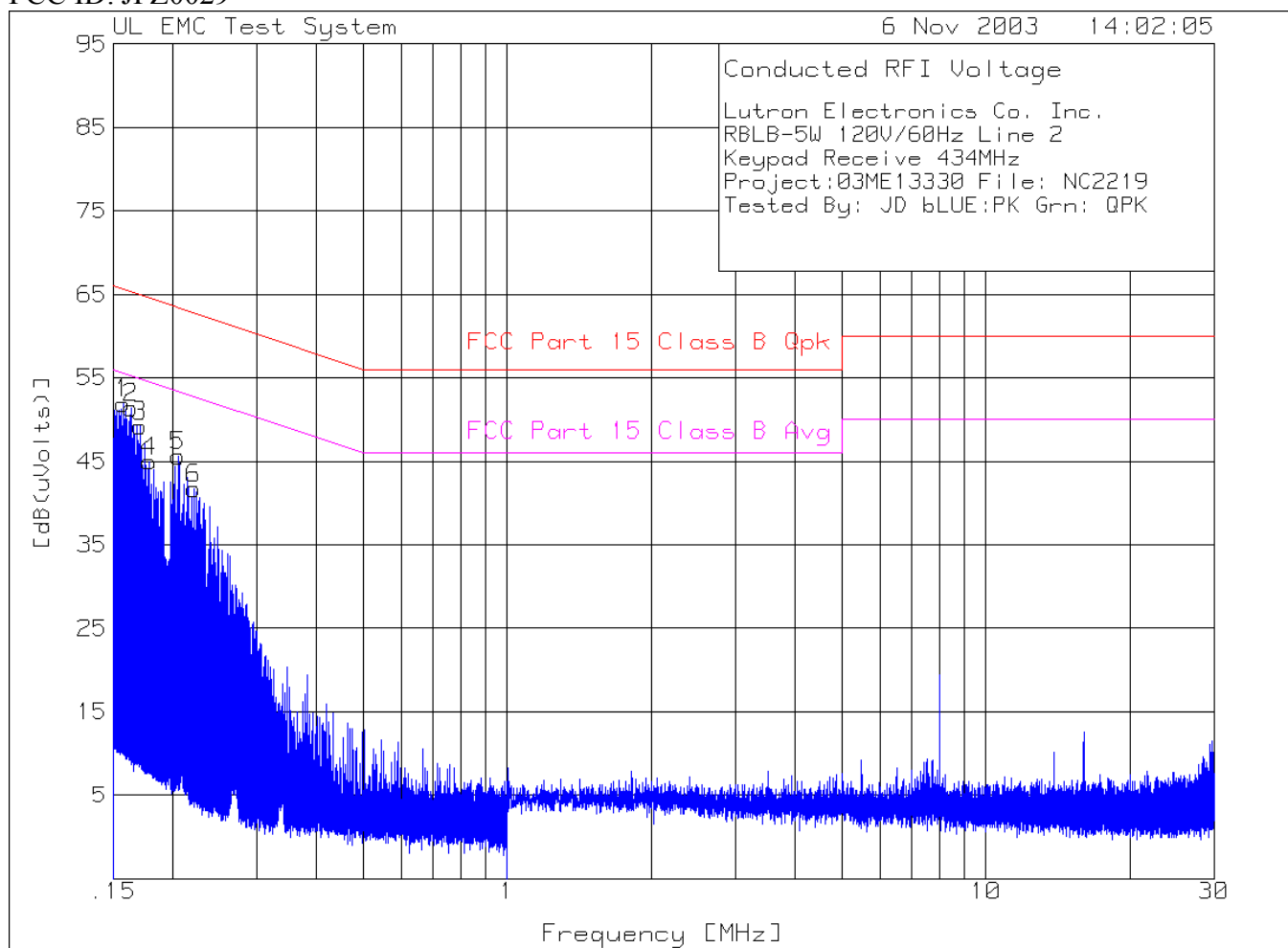
Issued: 11/20/03

Lutron Electronics Co., Inc.
 RBLB-5W 120V/60Hz Line 1
 Keypad Rcv 434MHz
 Proj:03ME13330 File:NC2219
 Tested By: GB Blue=Pk Grn=QPk

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.1542	42.2 pk	10.3	0	52.5	65.8	55.8
				Margin [dB]		-13.3	-3.3
2	.16291	40.8 pk	10.3	0	51.1	65.3	55.3
				Margin [dB]		-14.2	-4.2
3	.17233	37.9 pk	10.3	0	48.2	64.8	54.8
				Margin [dB]		-16.6	-6.6
4	.18316	33 pk	10.3	0	43.3	64.3	54.3
				Margin [dB]		-21	-11
5	.20129	35.2 pk	10.3	0	45.5	63.6	53.6
				Margin [dB]		-18.1	-8.1
6	.22817	29.8 pk	10.3	0	40.1	62.5	52.5
				Margin [dB]		-22.4	-12.4

LIMIT 1: FCC Part 15 Class B Qpk
 LIMIT 2: FCC Part 15 Class B Avg

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



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FCC ID: JPZ0029

Issued: 11/20/03

Lutron Electronics Co. Inc.
RBLB-5W 120V/60Hz Line 2
Keypad Receive 434MHz
Project:03ME13330 File: NC2219
Tested By: JD bLUE:PK Grn: QPK

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.15747	41.6 pk	10.3	0	51.9	65.6	55.6
				Margin [dB]		-13.7	-3.7
2	.16401	41.1 pk	10.3	0	51.4	65.3	55.3
				Margin [dB]		-13.9	-3.9
3	.17123	38.9 pk	10.3	0	49.2	64.9	54.9
				Margin [dB]		-15.7	-5.7
4	.17883	34.7 pk	10.3	0	45	64.5	54.5
				Margin [dB]		-19.5	-9.5
5	.20554	35.3 pk	10.3	0	45.6	63.4	53.4
				Margin [dB]		-17.8	-7.8
6	.2215	31.4 pk	10.3	0	41.7	62.8	52.8
				Margin [dB]		-21.1	-11.1

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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



Conducted Emission Test Set-Up

5.1.2 Cease Operation Within 5 Seconds

Test Applicable

Results

The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	21.5°C
Humidity:	51%RH
Pressure:	1013mbar
Date test performed:	5 November 2003

Test Procedure:

This test is performed one time at any frequency band. A manual operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released

Test equipment used for Cease Operation measurements:

E7402A Agilent EMC Analyzer
Last Calibration Date: 25 January 2003

Equipment No.: 5B-123
Calibration Due Date: 25 January 2004

3121C-DB4 EMCO Dipole Antenna
Last Calibration Date: 6 March 2003

Equipment No.: ME-751
Calibration Due Date: 6 March 2004

99760-00 Cole –Parmer Hydrometer/Temp/Barometer Equipment No.: ME4-268

Ranges: Temp:0°C-55°C
Humidity 25% to 95 %RH
Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 2003

Calibration Due Date: 27 May 2004

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



CEASE OPERATION < 5 SECONDS RBLB-5W 434MHZ

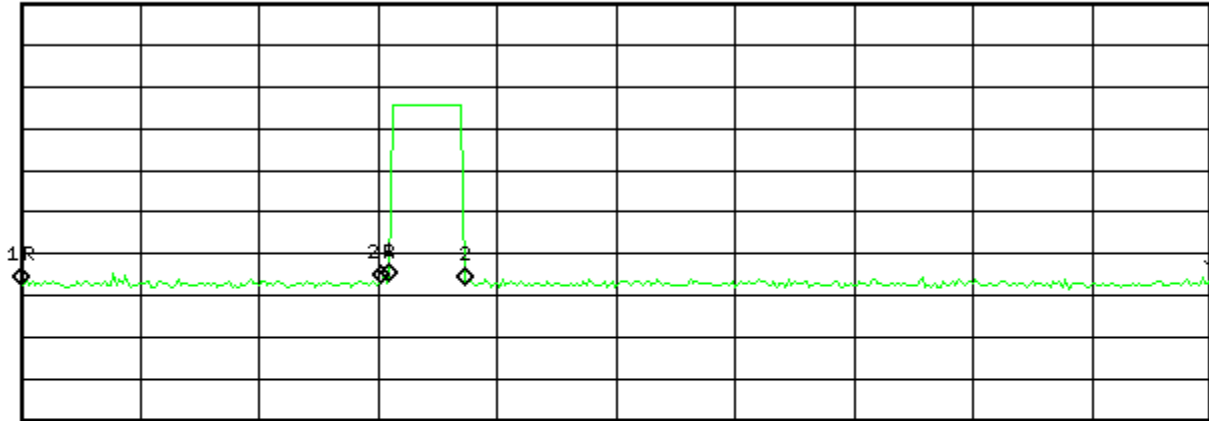
Mkr2 Δ 350 ms

Ref 107 dB μ V

#Atten 20 dB

-0.197 dB

Peak
Log
10
dB/



Center 434 MHz

Span 0 Hz

Res BW 120 kHz

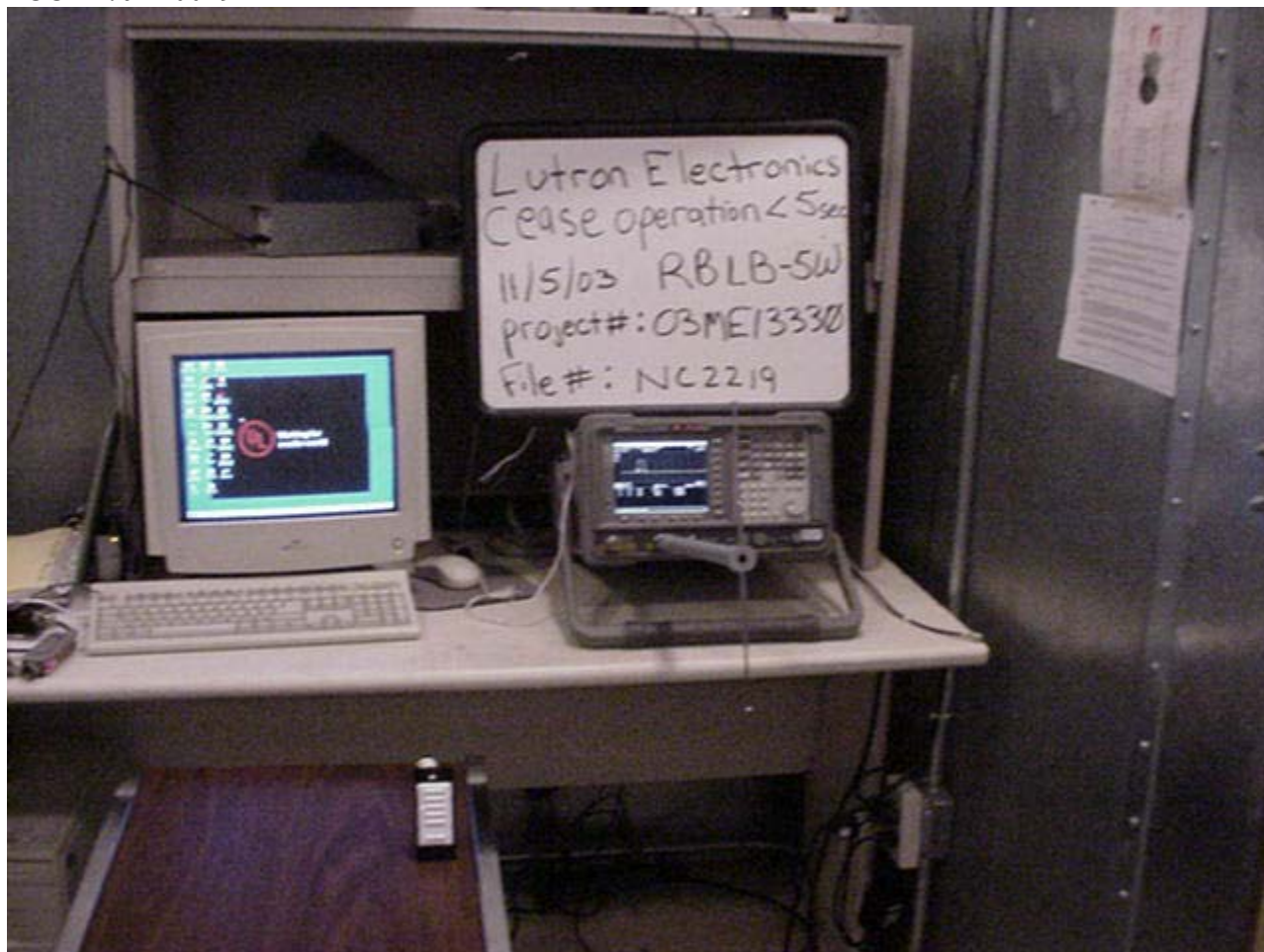
VBW 300 kHz

Sweep 5 s (401 pts)

Marker	Trace	Type	X Axis	Amplitude
1R	(1)	Time	0 s	39.34 dB μ V
1 Δ	(1)	Time	1.55 s	1.193 dB
2R	(1)	Time	1.512 s	39.86 dB μ V
2 Δ	(1)	Time	350 ms	-0.197 dB

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



Cease Operation in Less Than 5 seconds Test Set-Up

5.1.3 Radiated Emissions Test (10 Meter Semi-Anechoic Chamber)

Test Applicable

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

The EUT (equipment under test) was tested in 3 orthogonal axes and the orientation depicted in the Radiated Emission test set-up was deemed worst case.

Results

The system met the requirements for radiated emissions. Data Pages follow.

Temperature:	21.5 °C	Mode*	
Humidity:	51%RH	Power	Operation
Pressure:	1007mbar	1	1
Date test performed:	4 November 2003	1	2

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

Electric fields:	30MHz – 1GHz	(3 meter measurement distance) Unintentional
	1GHz – 2.2GHz	(3 meter measurement distance) Unintentional
	30MHz - 1GHz	(3 meter measurement distance) Intentional
	1GHz - 5GHz	(3 meter measurement distance) Intentional

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

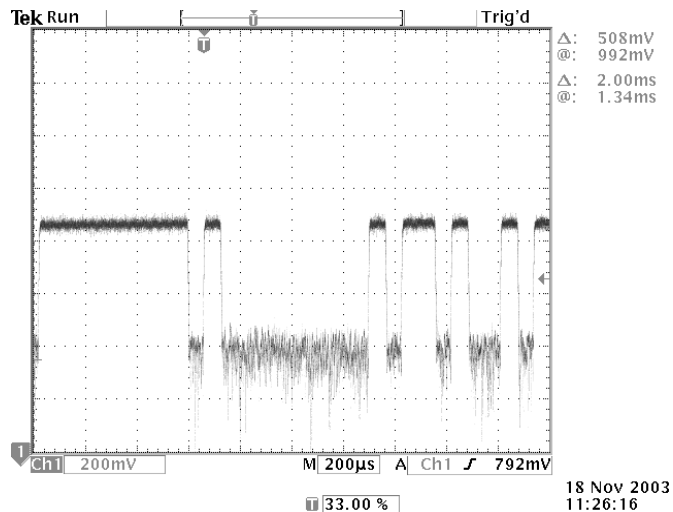
Issued: 11/20/03

Test equipment used for final radiated emissions tests:

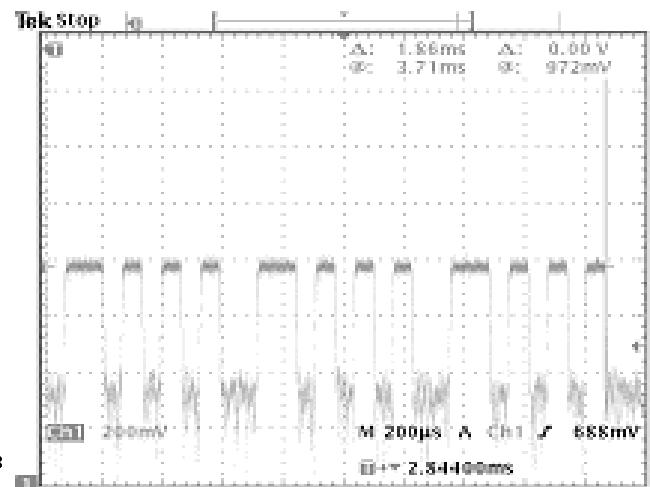
ESI26	Rhode & Schwartz	EMI Receiver	Equipment No.: ME5B-081
			Quasi Peak BW: 200Hz
			9kHz to 150kHz
			RBW 10 KHz
			Quasi Peak BW: 9kHz
			150kHz to 30MHz
			RBW 100 KHz
			Quasi Peak BW: 120
			30 to 1000MHz
			kHz
			RBW 1.0 MHz
			Calibration Due Date: 28 August 2004
Range: 30 TO 5GHz	Last Calibration Date: 28 August 2003		
Test Accessories for Radiated Emissions			
94455-1	Ailtech	Biconnical Antenna	Equipment No.: ME5-439
Range: 30 to 200MHz	Last Calibration Date: 15 November 2002		Calibration Due Date: 15 November 2003
3146	EMCO	Log Periodic Antenna	Equipment No.: ME5-451
Range: 200 to 1000MHz	Last Calibration Date: 21 November 2002		Calibration Due Date: 21 November 2003
RGA-180	EMCO	Horn Antenna	Equipment No.: ME5-565
Range: 1 to 5GHz	Last Calibration Date: 24 June 2003		Calibration Due Date: 24 June 2004
99760-00	Cole -Parmer	Hygrometer/Temp/Barometer	Equipment No.: ME4-268
		Ranges	Temp: 0°C-55°C
			Humidity: 25% to 95 %RH
			Pressure: 795 to 1050 mbar
			Calibration Due Date: 27 May 2004
Range: 0 -55	Last Calibration Date: 27 May 2003		

Paragraph 15.35:

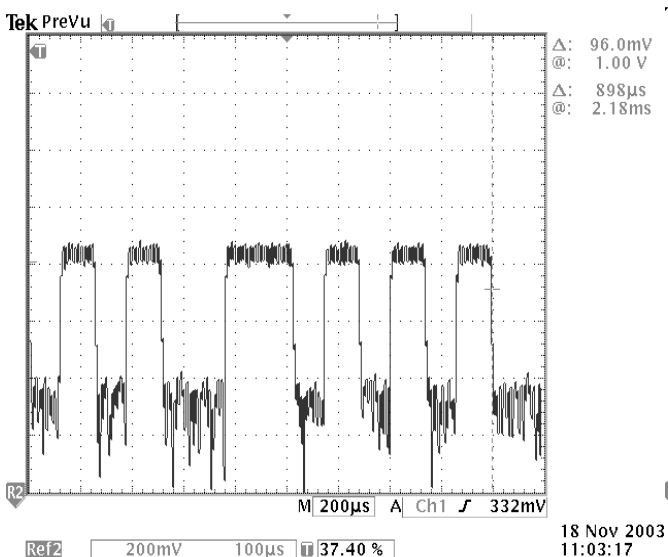
When the Radiated Limits are expressed in terms of the average value of the emissions, and pulse operation is employed, the pulse measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds (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.



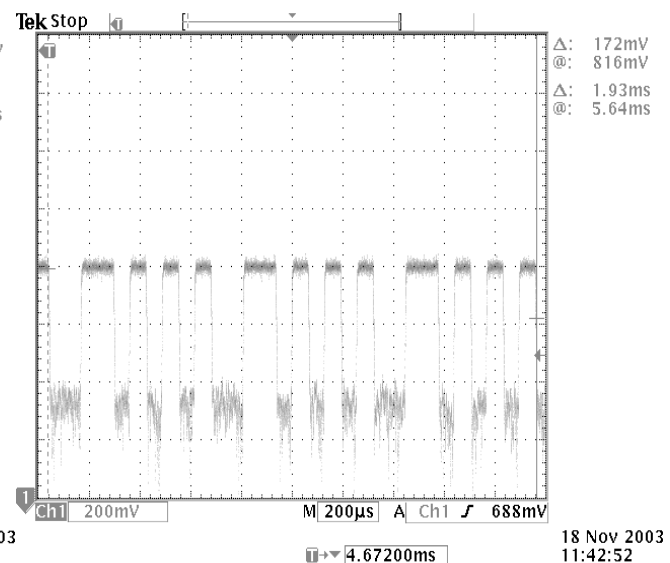
T= TØ to T1 = Individual Pulses



T= T1 to T2 = Individual Pulses



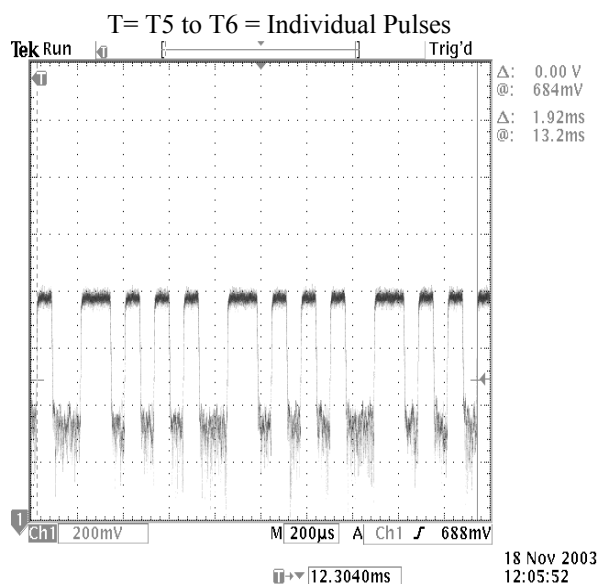
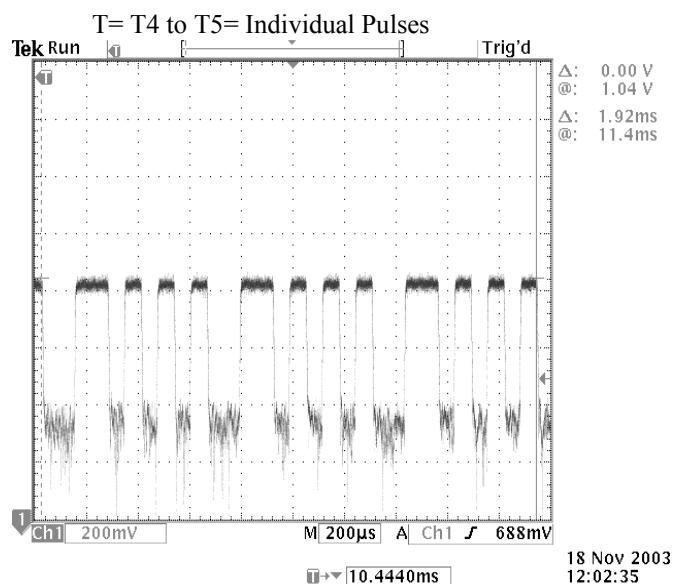
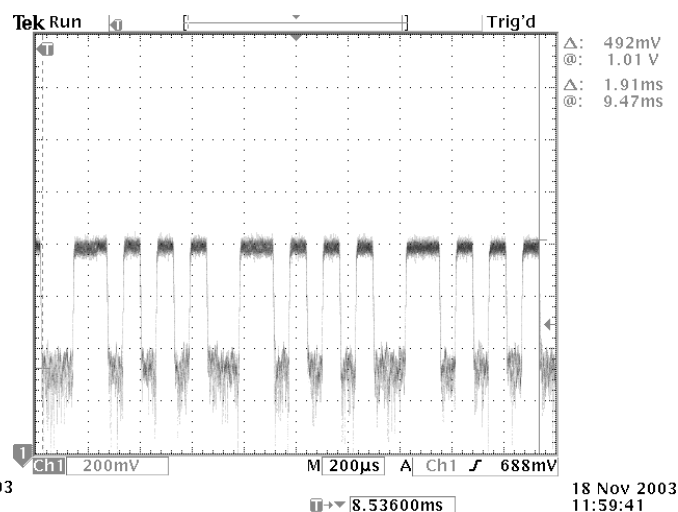
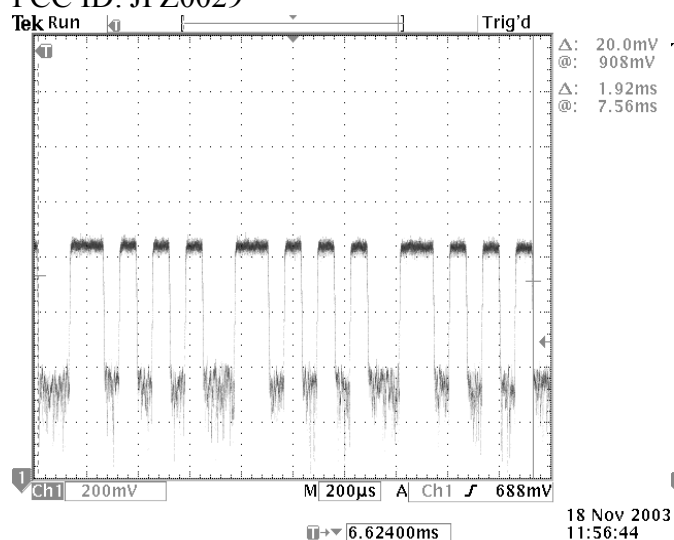
T= T2 to T3 = Individual Pulses



T= T3 to T4= Individual Pulses

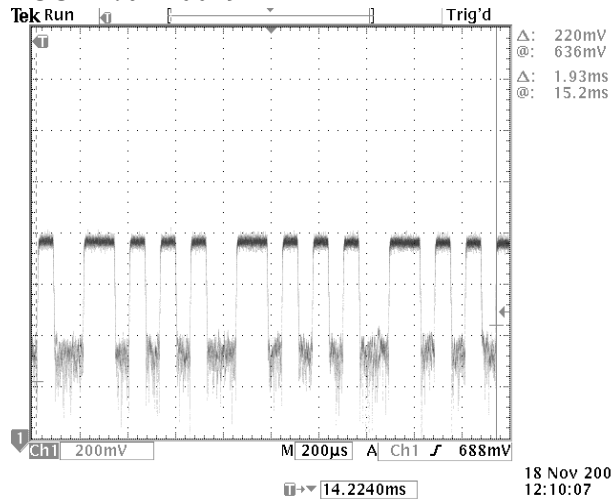
File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

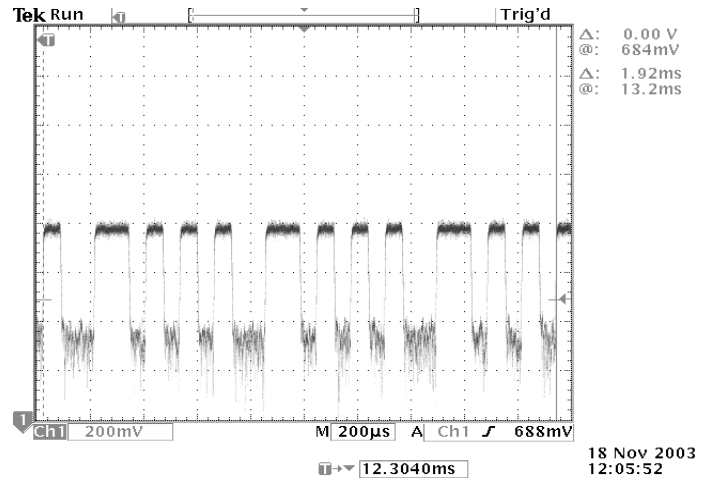


T= T6 to T7= Individual Pulses

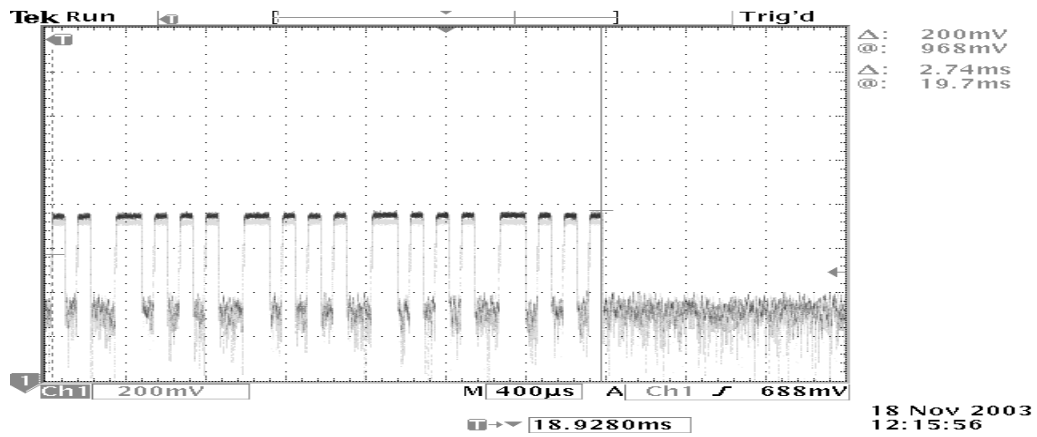
T= T7 to T8 = Individual Pulses



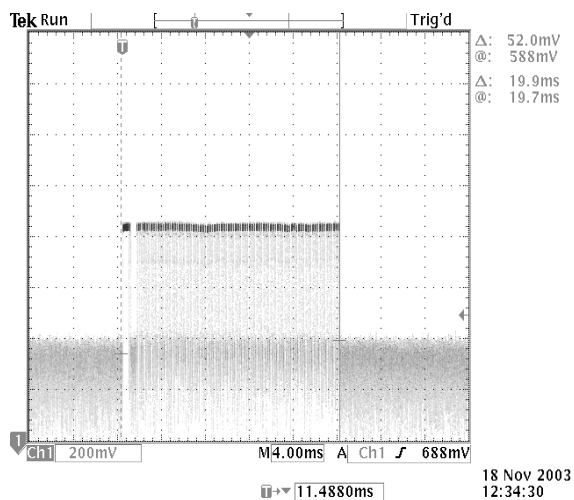
T= T8 to T9= Individual Pulses



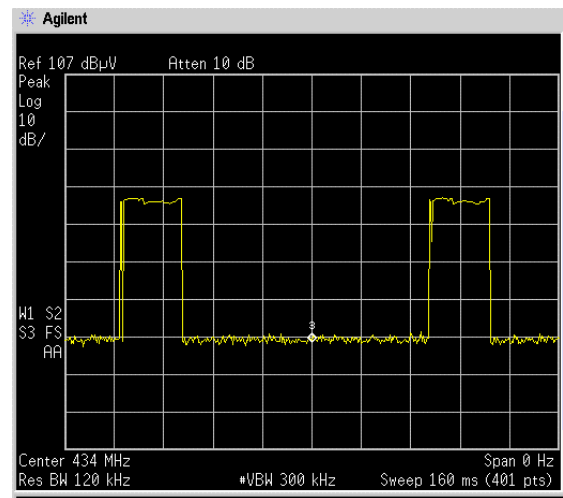
T= T9 to T10 = Individual Pulses



T= T10 to T11 = Individual Pulses



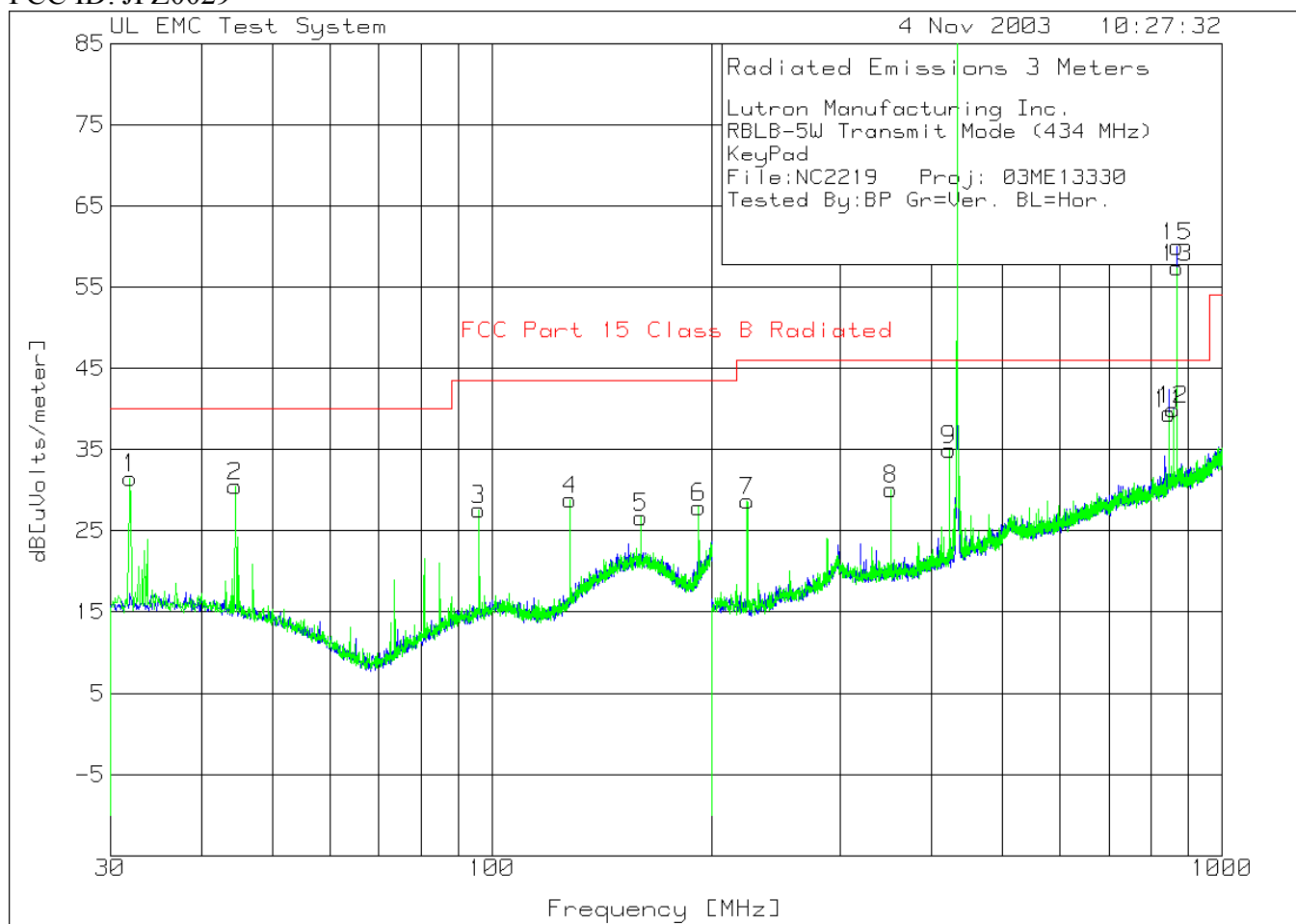
One complete pulse train



one complete pulse train

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



File Number: NC2219
 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
 RBLB-5W Transmit Mode (434 MHz)
 KeyPad
 File:NC2219 Proj: 03ME13330
 Tested By:BP Gr=Ver. BL=Hor.

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	Limit 2
=====							
Vertical 30 - 200MHz -----							
1	31.956	16.68 pk	.8	14	31.48	40	61
	Azimuth:333	Height:101	Vert	Margin [dB]		-8.52	
2	44.5423	16.37 pk	1	13.1	30.47	40	61
	Azimuth:265	Height:397	Vert	Margin [dB]		-9.53	
3	95.993	15.18 pk	1.4	11	27.58	43.5	61
	Azimuth:64	Height:101	Vert	Margin [dB]		-15.92	
4	127.969	14.9 pk	1.6	12.3	28.8	43.5	61
	Azimuth:17	Height:101	Vert	Margin [dB]		-14.7	
5	160.03	7.94 pk	1.8	16.9	26.64	43.5	61
	Azimuth:333	Height:101	Vert	Margin [dB]		-16.86	
6	192.006	11.22 pk	2	14.7	27.92	43.5	61
	Azimuth:61	Height:101	Vert	Margin [dB]		-15.58	
Horizontal 200 - 1000MHz -----							
14	433.9446	*59.65 pk	3	16.6	*79.25	46	81
	Azimuth:237	Height:100	Horz	Margin [dB]		53.25	-1.75
15	867.956	*11.88 pk	4.2	23.9	*39.98	46	61
	Azimuth:270	Height:100	Horz	Margin [dB]		13.98	-21.02
Vertical 200 - 1000MHz -----							
7	223.7412	14.98 pk	2.2	11.5	28.68	46	61
	Azimuth:225	Height:101	Vert	Margin [dB]		-17.32	

LIMIT 1: FCC Part 15 Subpart B ClB (3M)
 LIMIT 2: FCC Part 15 Subpart C-Section 15.231

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
RBLB-5W Transmit Mode (434 MHz)
KeyPad
File:NC2219 Proj: 03ME13330
Tested By:BP Gr=Ver. BL=Hor.

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	Limit 2
8	352.0507 Azimuth:57	12.29 pk Height:101	2.7 Vert	15.1 Margin [dB]	30.09 -15.91	46	61
9	423.2744 Azimuth:348	15.74 pk Height:101	2.9 Vert	16.3 Margin [dB]	34.94 -11.06	46	61
10	433.9446 Azimuth:116	*59.69 pk Height:101	3 Vert	16.6 Margin [dB]	*79.29 53.29	46	81 -1.71
11	846.6155 Azimuth:343	11.95 pk Height:101	4.2 Vert	23.3 Margin [dB]	39.45 -6.55	46	61
Vertical 200 - 1000MHz -----							
12	857.2858 Azimuth:193	11.98 pk Height:101	4.2 Vert	23.7 Margin [dB]	39.88 -6.12	46	61
13	867.956 Azimuth:337	*9.25 pk Height:101	4.2 Vert	23.9 Margin [dB]	*37.35 11.35	46	61 -23.65

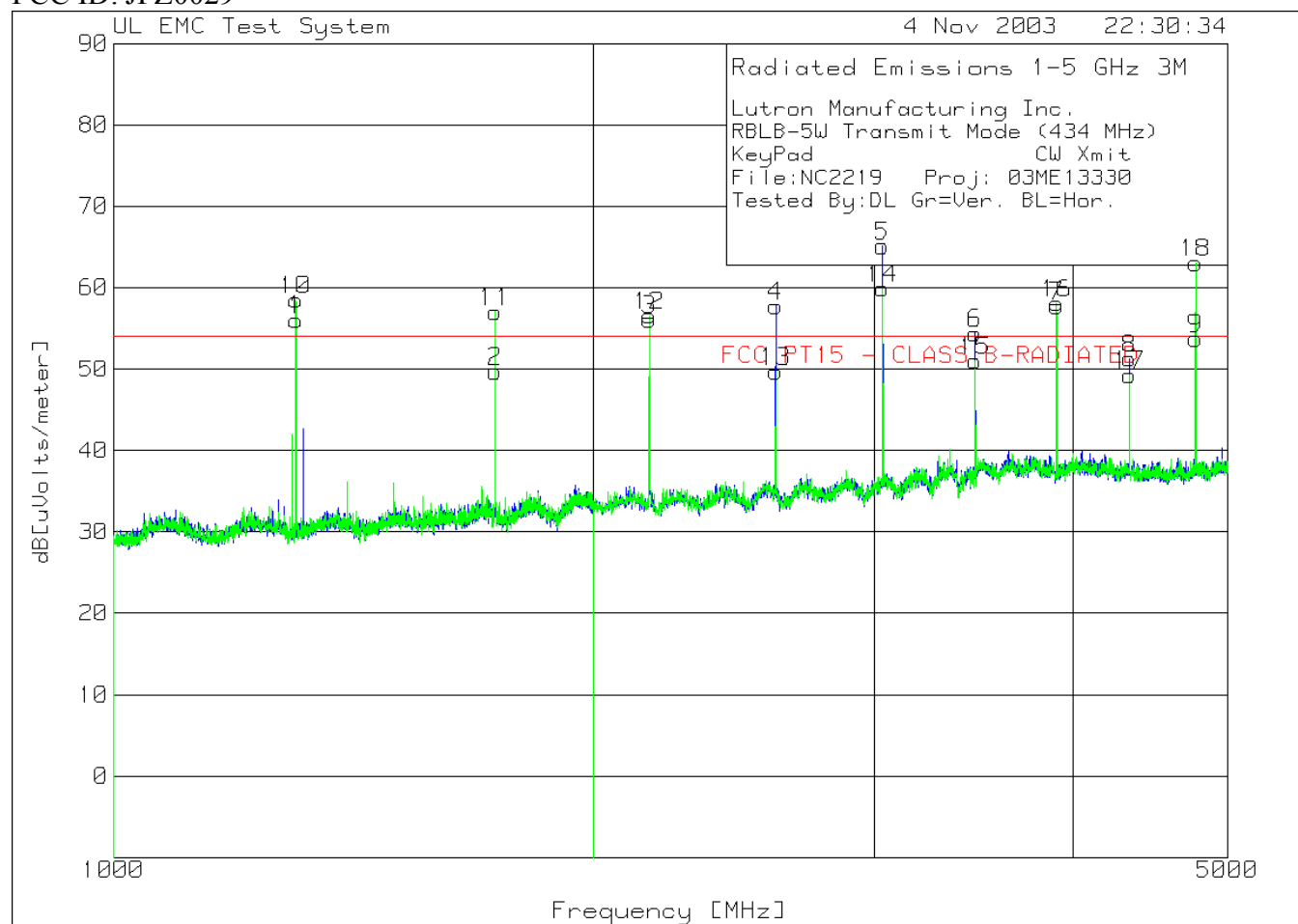
LIMIT 1: FCC Part 15 Subpart B ClB (3M)
LIMIT 2: FCC Part 15 Subpart C-Section 15.231

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

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



File Number: NC2219
 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
 RBLB-5W Transmit Mode (434 MHz)
 KeyPad CW Xmit
 File:NC2219 Proj: 03ME13330
 Tested By:DL Gr=Ver. BL=Hor.

Test No.	Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level	Limit:1 dB[uVolts/meter]	Limit 2
Horizontal 1000 - 2000MHz -----							
1	1301.767	*42.92 pk	-32.9	26	*36.02	54	61
	Azimuth:276	Height:101	Horz	Margin [dB]		2.02	-24.98
2	1735.912	53.62 pk	-31.6	27.7	49.72	54	61
	Azimuth:303	Height:200	Horz	Margin [dB]		-4.28	
Horizontal 2000 - 5000MHz -----							
3	2169.056	*37.18 pk	-30.6	29.5	*36.08	54	61
	Azimuth:118	Height:199	Horz	Margin [dB]		2.08	-24.92
4	2603.201	*37.15 pk	-30.2	30.8	*37.75	54	61
	Azimuth:347	Height:199	Horz	Margin [dB]		3.75	-23.25
5	3037.346	*42.5 pk	-29	31.6	*45.1	54	61
	Azimuth:124	Height:101	Horz	Margin [dB]		11.1	-15.9
6	3471.49	*28.89 pk	-27.2	32.7	*34.39	54	61
	Azimuth:124	Height:101	Horz	Margin [dB]		.39	-26.61
7	3905.635	*30.92 pk	-27.3	34.1	*37.72	54	61
	Azimuth:59	Height:199	Horz	Margin [dB]		3.72	-23.28
8	4339.78	44.66 pk	-27.3	33.9	51.26	54	61
	Azimuth:19	Height:101	Horz	Margin [dB]		-2.74	
9	4773.925	*26.34 pk	-27.1	34.5	*33.74	54	61
	Azimuth:177	Height:101	Horz	Margin [dB]		-.26	-27.26
Vertical 1000 - 2000MHz -----							
10	1301.767	*45.37 pk	-32.9	26	*38.47	54	61
	Azimuth:166	Height:100	Vert	Margin [dB]		4.47	-22.53

LIMIT 1: FCC Part 15 Subpart B ClB (3M)
 LIMIT 2: FCC Part 15 Subpart C-Section 15.231

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
 RBLB-5W Transmit Mode (434 MHz)
 KeyPad CW Xmit
 File:NC2219 Proj: 03ME13330
 Tested By:DL Gr=Ver. BL=Hor.

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	Limit 2
11	1735.912	*40.95 pk	-31.6	27.7	*37.05	54	61
	Azimuth:248	Height:100 Vert		Margin [dB]		3.05	-23.95
Vertical 2000 - 5000MHz -----							
12	2169.056	*37.64 pk	-30.6	29.5	*36.54	54	61
	Azimuth:58	Height:101 Vert		Margin [dB]		2.54	-24.46
13	2603.201	49.08 pk	-30.2	30.8	49.68	54	61
	Azimuth:2	Height:101 Vert		Margin [dB]		-4.32	
14	3037.346	*37.27 pk	-29	31.6	*39.87	54	61
	Azimuth:241	Height:199 Vert		Margin [dB]		5.87	-21.13
15	3471.49	45.49 pk	-27.2	32.7	50.99	54	61
	Azimuth:241	Height:199 Vert		Margin [dB]		-3.01	
16	3905.635	*31.27 pk	-27.3	34.1	*38.07	54	61
	Azimuth:345	Height:199 Vert		Margin [dB]		4.07	-22.93
17	4339.78	42.66 pk	-27.3	33.9	49.26	54	61
	Azimuth:242	Height:101 Vert		Margin [dB]		-4.74	
18	4773.925	*35.64 pk	-27.1	34.5	*43.04	54	61
	Azimuth:176	Height:101 Vert		Margin [dB]		9.04	-17.96

LIMIT 1: FCC Part 15 Subpart B ClB (3M)
 LIMIT 2: FCC Part 15 Subpart C-Section 15.231

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

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
 Project Number: 03ME13330
 Model Number: RBLB-5W
 FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
 RBLB-5W Transmit Mode (434 MHz)
 KeyPad CW Xmit
 File:NC2219 Proj: 03ME13330
 Tested By:DL Gr=Ver. BL=Hor.

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	Limit 2
=====						
Horizontal 1000 - 2000MHz						
1301.9228	*43.22	avem -32.9	26	*46.32	54	61
Azimuth: 241 Height:108 Horz			Margin	[dB]:	2.32	-14.68
1735.8868	54.31	avem -31.6	27.7	50.41	54	61
Azimuth: 238 Height:112 Horz			Margin	[dB]:	-3.59	
Horizontal 2000 - 5000MHz						
2169.8768	*39.96	avem -30.6	29.5	*38.86	54	61
Azimuth: 265 Height:112 Horz			Margin	[dB]:	4.86	-22.14
2603.8166	*38.83	avem -30.2	30.8	*39.43	54	61
Azimuth: 345 Height:144 Horz			Margin	[dB]:	5.43	-21.57
3037.7916	*44.04	avem -29	31.6	*46.64	54	61
Azimuth: 52 Height:147 Horz			Margin	[dB]:	12.64	-14.36
3471.8317	*27.63	avem -27.2	32.7	*33.13	54	61
Azimuth: 121 Height:155 Horz			Margin	[dB]:	-.87	-27.87
3905.7315	*32.44	avem -27.3	34.1	*39.24	54	61
Azimuth: 73 Height:155 Horz			Margin	[dB]:	5.24	-21.76
4339.7114	*27.38	avem -27.3	33.9	*33.98	54	61
Azimuth: 289 Height:149 Horz			Margin	[dB]:	-.02	-27.02
4773.6914	*32.01	avem -27.1	34.5	*39.41	54	61
Azimuth: 61 Height:138 Horz			Margin	[dB]:	5.41	-21.59
Vertical 1000 - 2000MHz						
1301.977	*47.31	avem -32.9	26	*40.41	54	61
Azimuth: 179 Height:140 Vert			Margin	[dB]:	6.41	-20.59

LIMIT 1: FCC Part 15 Subpart B ClB (3M)
 LIMIT 2: FCC Part 15 Subpart C-Section 15.231

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
RBLB-5W Transmit Mode (434 MHz)
KeyPad CW Xmit
File:NC2219 Proj: 03ME13330
Tested By:DL Gr=Ver. BL=Hor.

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	Limit 2
1735.9118	*41.22 avem	-31.6	27.7	*37.32	54	61
Azimuth: 210 Height:143 Vert				Margin [dB]:	3.32	-23.68
Vertical 2000 - 5000MHz						
2169.8968	*41.17 avem	-30.6	29.5	*40.07	54	61
Azimuth: 175 Height:142 Vert				Margin [dB]:	6.07	-20.93
2603.8317	48.71 avem	-30.2	30.8	49.31	54	61
Azimuth: 38 Height:144 Vert				Margin [dB]:	-4.69	
3037.8542	*42.3 avem	-29	31.6	*44.9	54	61
Azimuth: 237 Height:100 Vert				Margin [dB]:	10.9	-16.1
3471.8191	45.54 avem	-27.2	32.7	51.04	54	61
Azimuth: 237 Height:101 Vert				Margin [dB]:	-2.96	
3905.8116	*28.43 avem	-27.3	34.1	*35.23	54	61
Azimuth: 280 Height:169 Vert				Margin [dB]:	1.23	-25.77
4339.6601	41.88 avem	-27.3	33.9	48.48	54	61
Azimuth: 193 Height:138 Vert				Margin [dB]:	-5.52	
4773.7315	*34.33 avem	-27.1	34.5	*41.73	54	61
Azimuth: 199 Height:105 Vert				Margin [dB]:	7.73	-19.27

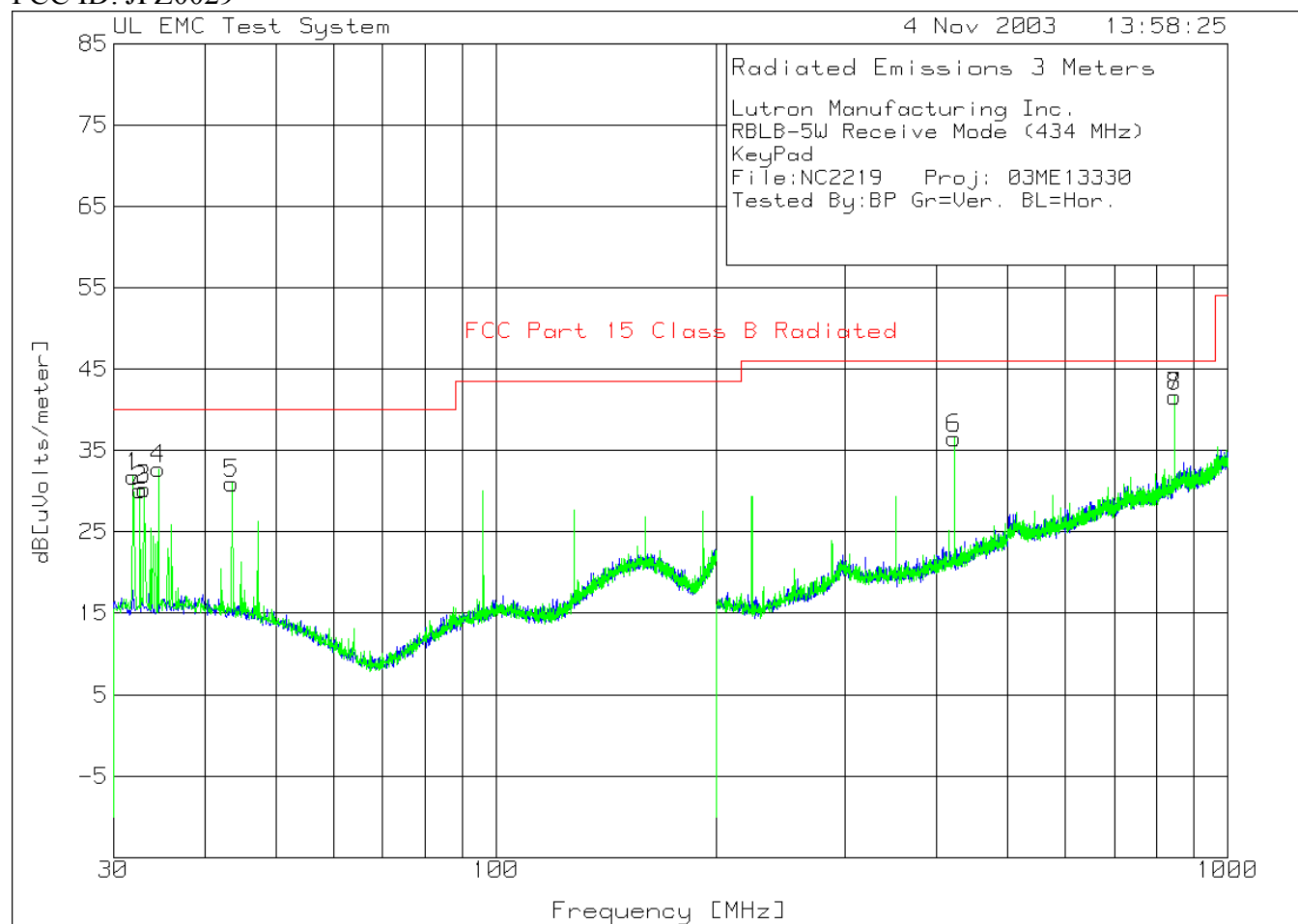
LIMIT 1: FCC Part 15 Subpart B ClB (3M)
LIMIT 2: FCC Part 15 Subpart C-Section 15.231

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
avem - EMI Average detector

***Duty Cycle correction factor of -20.0 dB added to Average level.**

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
RBLB-5W Receive Mode (434 MHz)
KeyPad
File:NC2219 Proj: 03ME13330
Tested By:BP Gr=Ver. BL=Hor.

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====						
Vertical 30 - 200MHz -----						
1	31.956	17 pk	.8	14	31.8	40
	Azimuth:0	Height:101	Vert	Margin [dB]		-8.2
2	32.6363	15.14 pk	.8	14.2	30.14	40
	Azimuth:197	Height:199	Vert	Margin [dB]		-9.86
3	33.0615	15.14 pk	.8	14.3	30.24	40
	Azimuth:355	Height:101	Vert	Margin [dB]		-9.76
4	34.5923	17.73 pk	.8	14.2	32.73	40
	Azimuth:0	Height:101	Vert	Margin [dB]		-7.27
5	43.6068	16.87 pk	.9	13.2	30.97	40
	Azimuth:0	Height:101	Vert	Margin [dB]		-9.03
Horizontal 200 - 1000MHz -----						
8	846.6155	14.11 pk	4.2	23.3	41.61	46
	Azimuth:358	Height:100	Horz	Margin [dB]		-4.39
Vertical 200 - 1000MHz -----						
6	423.2744	17.29 pk	2.9	16.3	36.49	46
	Azimuth:119	Height:101	Vert	Margin [dB]		-9.51
7	846.6155	14.11 pk	4.2	23.3	41.61	46
	Azimuth:358	Height:101	Vert	Margin [dB]		-4.39

LIMIT 1: FCC Part 15 Class B Radiated

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

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03

Lutron Manufacturing Inc.
RBLB-5W Receive Mode (434 MHz)
KeyPad
File:NC2219 Proj: 03ME13330
Tested By:BP Gr=Ver. BL=Hor.

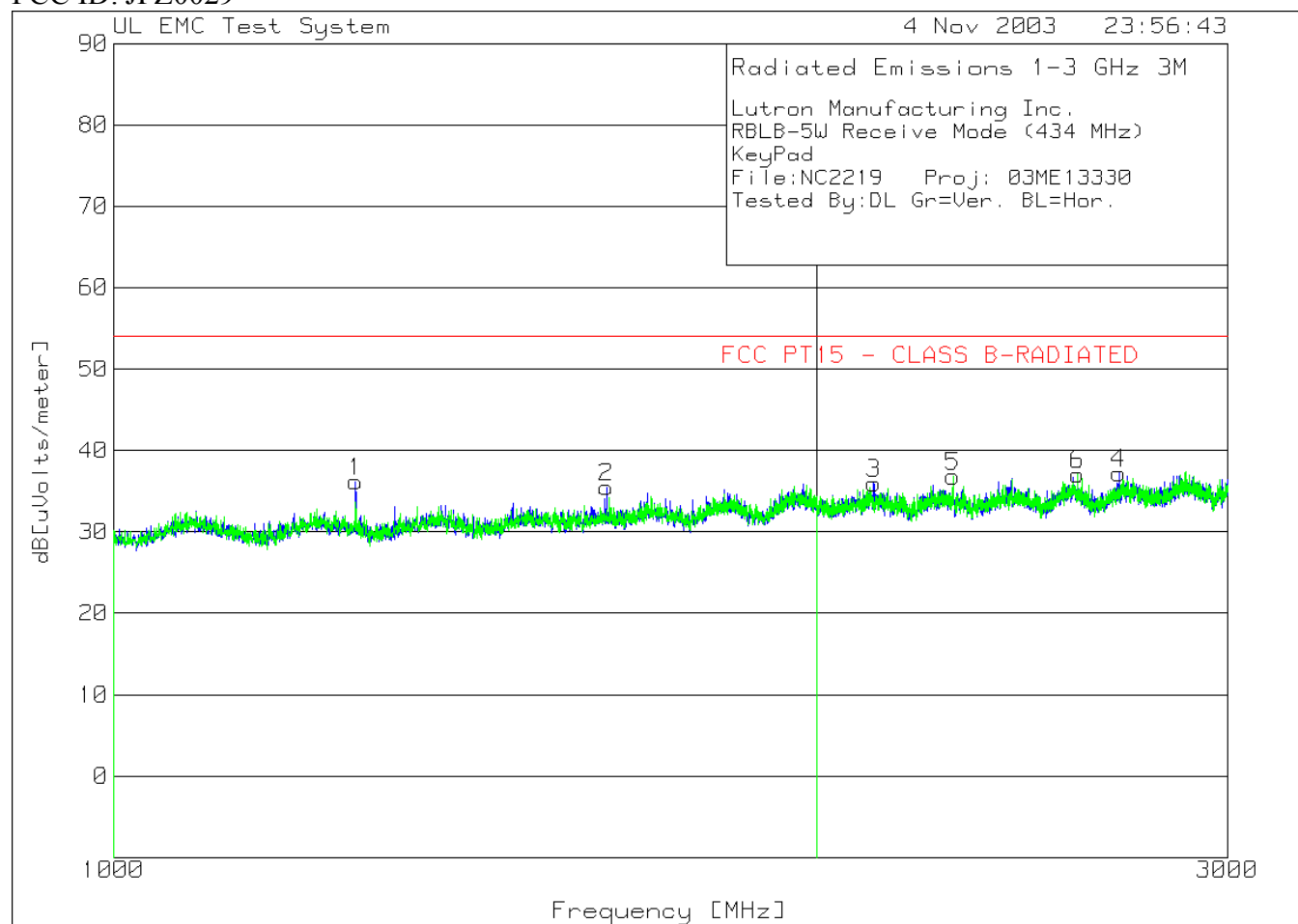
Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====					
Vertical 30 - 200MHz					
31.9938	16.75 qp	.8	14	31.55	40
Azimuth: 263	Height:113	Vert		Margin [dB]:	-8.45
32.6363	6.02 qp	.8	14.2	21.02	40
Azimuth: 113	Height:400	Vert		Margin [dB]:	-18.98
33.06	6.02 qp	.8	14.3	21.12	40
Azimuth: 5	Height:231	Vert		Margin [dB]:	-18.88
34.59	6.09 qp	.8	14.2	21.09	40
Azimuth: 48	Height:110	Vert		Margin [dB]:	-18.91
43.6	6.37 qp	.9	13.2	20.47	40
Azimuth: 55	Height:103	Vert		Margin [dB]:	-19.53
Horizontal 200 - 1000MHz					
846.4762	17.67 qp	4.2	23.3	45.17	46
Azimuth: 284	Height:101	Horz		Margin [dB]:	-.83
846.4758	18.13 qp	4.2	23.3	45.63	46
Azimuth: 288	Height:102	Horz		Margin [dB]:	-.37
Vertical 200 - 1000MHz					
846.4704	15.87 qp	4.2	23.3	43.37	46
Azimuth: 345	Height:101	Vert		Margin [dB]:	-2.63
423.2341	18.64 qp	2.9	16.3	37.84	46
Azimuth: 263	Height:113	Vert		Margin [dB]:	-8.16

LIMIT 1: FCC Part 15 Class B Radiated

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
avem - EMI Average detector

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

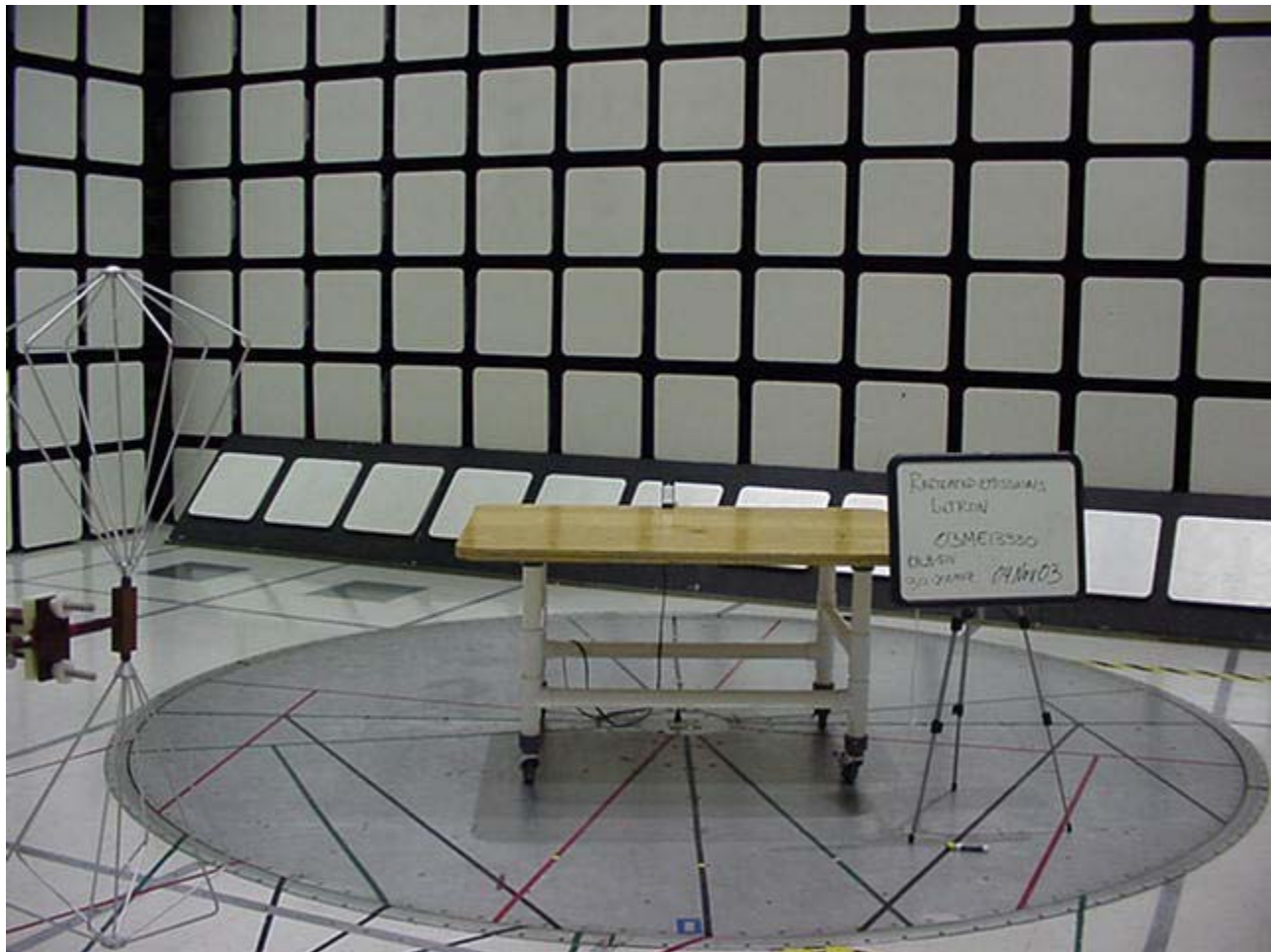
Issued: 11/20/03

Lutron Manufacturing Inc.
RBLB-5W Receive Mode (434 MHz)
KeyPad
File:NC2219 Proj: 03ME13330
Tested By:DL Gr=Ver. BL=Hor.

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====						
Horizontal 1000 - 2000MHz -----						
1	1269.757	43.26 pk	-33	25.9	36.16	54
	Azimuth:276	Height:100	Horz	Margin [dB]		-17.84
2	1626.542	40.08 pk	-31.9	27.3	35.48	54
	Azimuth:111	Height:100	Horz	Margin [dB]		-18.52
Horizontal 2000 - 3000MHz -----						
3	2116.372	37.37 pk	-30.7	29.3	35.97	54
	Azimuth:153	Height:200	Horz	Margin [dB]		-18.03
4	2694.565	36.19 pk	-30	31	37.19	54
	Azimuth:106	Height:200	Horz	Margin [dB]		-16.81
Vertical 2000 - 3000MHz -----						
5	2288.096	37.52 pk	-30.6	29.9	36.82	54
	Azimuth:102	Height:199	Vert	Margin [dB]		-17.18
6	2587.529	36.47 pk	-30.2	30.8	37.07	54
	Azimuth:343	Height:199	Vert	Margin [dB]		-16.93

LIMIT 1: FCC PT15 - CLASS B-RADIATED

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



Radiated Emission Test Set-Up 30-200 MHz Front View

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



Radiated Emission Test Set-Up 200 to 1000 MHz Rear View



Radiated Emission Test Set-Up 1-5GHz Rear View

5.1.4 Occupied Bandwidth

Test Applicable

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

434MHz

Bandwidth = 0.25% of 434MHz = 1.085MHz

Results

The system met the requirements for fluctuating harmonic emissions and flicker. Data Pages follow.

Temperature:	21.5°C
Humidity:	49%RH
Pressure:	1012mbar
Date test performed:	November 5, 2003

Test equipment used for Occupied Bandwidth Measurements:

ESI 126	Rhode & Schwartz	EMI Receiver	Equipment No.: ME5B-081
		Quasi Peak BW:	9kHz to 150kHz
		RBW	
		Quasi Peak BW:	150kHz to 30MHz
		RBW	
		Quasi Peak BW:	30 to 1000MHz
		RBW	

Range: 30MHz – 5GHz Last Calibration Date: 28 August 2003 Calibration Due Date: 28 August 04

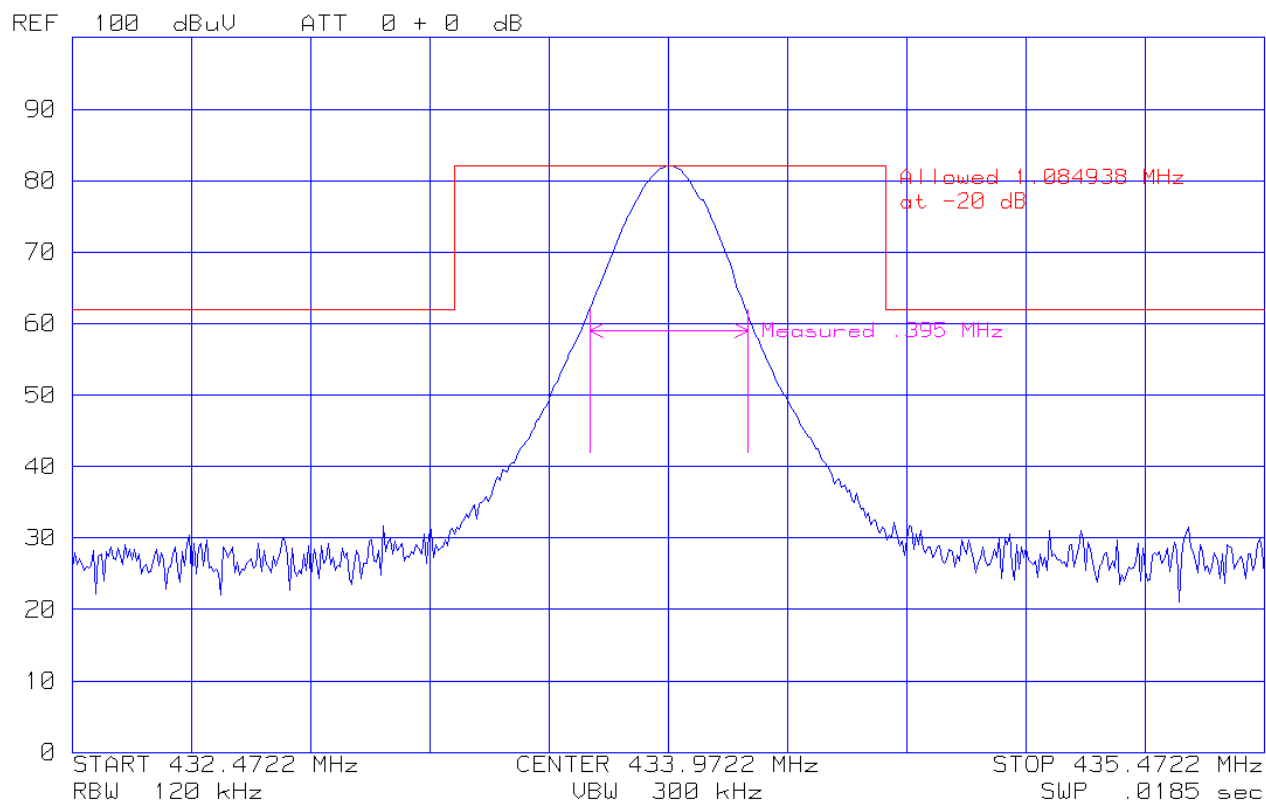
Test Accessories for Radiated Emissions:

3121C-DB4	EMCO	Dipole Antenna	Equipment No.: ME-751
Last Calibration Date: 6 March 2003			Calibration Due Date: 6 March 2004
8449BHewlett Packard		1-26GHz Pre-Amp	Equipment No.: ME5-914
99760-00	Cole –Parmer	Hydrometer/Temp/Barometer	Equipment No.: ME4-268

Ranges:: Temp:0°C-55°C
 Humidity 25% to 95 %RH
 Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 03

Calibration Due Date: 27 May 04



Occupied Bandwidth 0.395 MHz

File Number: NC2219
Project Number: 03ME13330
Model Number: RBLB-5W
FCC ID: JPZ0029

Issued: 11/20/03



Occupied Bandwidth Test Set-up

5.1.5 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation

Fundamental Frequency is 433.9MHz

From table in section 15.231

$$\text{Limit} = 41.6667(433.9) - 7083.3333$$

$$\text{Limit} = 10996.011\mu\text{V}$$

$$\text{Limit} = \text{Log } 10996.011(20)$$

$$\text{Limit} = 81.0\text{dB}\mu\text{V}$$

$$\text{Limit for Spurious Emissions} = 20\text{dB lower than fundamental} = 61.0\text{dB}\mu\text{V/m}$$

Fundamental Frequency is 433.9MHz

From table in section 15.231

$$\text{Limit} = 41.6667(433.9) - 7083.3333$$

$$\text{Limit} = 10996.011\mu\text{V}$$

$$\text{Limit} = \text{Log } 10996.011(20)$$

$$\text{Limit} = 81.0\text{dB}\mu\text{V}$$

$$\text{Limit for Spurious Emissions} = 20\text{dB lower than fundamental} = 61.0\text{dB}\mu\text{V/m}$$

Radiated Emissions Limit conversion from $\mu\text{V/m}$ to $\text{dB}\mu\text{V/m}$ (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 = 10.08ms

$$\text{Duty cycle correction factor} = 20 \log (10.08 / 100\text{ms})$$

$$= 20 \log (0.1008)$$

$$= -20\text{dB}$$

The correction factor is added to the measured field strength in $\text{dB}\mu\text{V/m}$

Appendix A

Accreditations and Authorizations



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. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, FCC Method - 47 CFR Part 68, AS/NZS 3548, IEC 61000-3-2, EN 61000-3-2, CISPR 14-1, EN 55014-1, AS/NZS 1044, CNS 13783-1, CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing. NVLAP Lab code: 100255-0.



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.



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