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**Report of Measurements
Of Electromagnetic Compatibility Testing**

Test Report File No.: **NC2219** Date of issue: 9/9/03
Applicant: Lutron Electronics Inc.
Model: RB-SBT
Product Type: System Bridging Timeclock
Power Supply: 120Vac, 60Hz
Manufacturer: Same As Applicant
License holder: Same As Applicant
Address: 7200 Suter Road
Coopersburg, PA 18036
Test Type: **Compliance Investigation**
Test Project Number: 03ME10791
References(s) FCC ID: JPZ0027

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1.0 GENERAL - Product Description

Device Function: The RB-SBT acts as a central hub and programming interface of an integrated lighting control system. It contains an AM transceiver and an antenna. The purpose of the RF communication is to transmit and receive command signals. Transmitted commands allow the triggering of system events and the updating of control indicator status. Received command signals allow the RB-SBT to monitor system devices and turn zones of light ON or OFF in response. The RB-SBT contains an astronomic time clock for scheduling commands based on time of day or sunrise sunset. It also contains contact closure inputs for activating lighting scenes, and an RS-232 port to allow third party systems to send commands to the RB-SBT and monitor activity.

RF Function: The receiver down converts a 433.92 MHz carrier frequency using a 423.22 MHz local oscillator producing a 10.7 MHz IF signal. The signal is further processed to decode data. The transmitter uses a SAW oscillator and power amplifier, which is keyed ON/OFF to produce the modulated carrier. The RB-SBT contains a micro controller running at 52 MHz to ensure that all transmissions stop within 5 seconds of the button release or within 5 seconds on the beginning of the transmission. A transmission actuated shall automatically cease within 5 seconds after activation. The ceasing of the transmission is accomplished via the micro-controller. Modulation is AM, specifically ON/OFF Keyed (OOK) or sometimes called Amplitude Shift Keyed (ASK) data at 15.625kbps. The antenna is permanently attached and cannot be modified or easily replaced by the user since the fastening mechanism is located inside the sheet metal enclosure. This sheet metal enclosure is closed securely by several screws and by keying features in the sheet metal itself.

Analog Function: The RB-SBT obtains power through a 120Vac to 18Vac Class 2 transformer. The voltage is then down converted with a switching buck converter to produce a 5Vdc output, which is used to power all analog and micro controller activities.

1.1 Device Configuration During Test

The device under test was tested in the orientation that represents the worst-case emissions.

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.

Note: The Conducted Emissions test was performed while in transmit mode

The manufacturer configured the device. The antenna is an Integral part of the EUT (equipment under test) and cannot be changed or removed. Therefore, meets Part 15, paragraph 15.203

The device was powered with 120VAC, 60Hz.

Device	Manufacturer	Model Number	Serial Number	FCC ID
System Bridging Time lock	Lutron	RB-SBT	-----	JPZ0027
AC Adaptor	Stancor	STA-4118	-----	-----

"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"

1.2 Deviations from ANSI C63.4

Not applicable, the ANSI C63.4 test measurements procedures were employed.

1.3 Device Modifications Necessary for Compliance

See below:

The following modification was implemented to meet the Radiated Emissions criteria while in Receive Mode.

A resister value was changed on the receive circuitry only on Board number 4701076

Reference Designator R27

Value was 1.5k changed to 2.2k

1.4 Test Summary

Test	Basic Standard	Considered	Tested	In Compliance
Conducted Voltage Emissions	FCC Part 15, Subpart C, Paragraph 15.205	Yes	Yes	Yes
Radiated Emissions	FCC Part 15 Subpart C, Intentional Radiators, Paragraph 15.209	Yes	Yes	Yes
Radiated Emissions	FCC Part 15 Subpart B, Class B, Un-Intentional Radiators, Paragraph 15.109	Yes	Yes	Yes
Cease Operation < 5 seconds	FCC Part 15 Subpart C, Paragraph 15.231	Yes	Yes	Yes
Occupied Bandwidth	FCC Part 15 Subpart C, Paragraph 15.231	Yes	Yes	Yes

1.5 FCC Labeling Information

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.”

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.”

Labeling.

1.6.3.1 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.

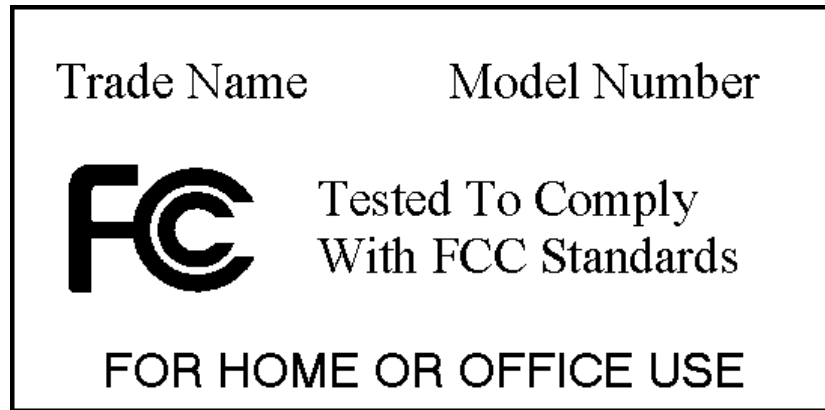
(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, 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.

1.6.3.2 Declaration of Conformity Labeling

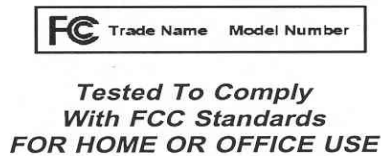
In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

(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 points.
- (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.

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.”

2.0 EMISSIONS TEST REGULATIONS

FCC Part 15, Subpart B, Paragraph 15.107 & 15.109
FCC Part 15 Subpart C, Paragraph 15.203, 15.205, 15.207, 15.209 & 15.231

2.1 EUT OPERATION MODE - EMISSIONS TESTS

As per manufacturer's instructions: The EUT was configured to continuously transmit at its operating frequency 433.9MHz. In addition, two modes were evaluated one in the Transmit and the other in Standby, which is receiving mode.

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 FCC ID: JPZ0027

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2.1.1 Conducted Emissions Tests

Test Applicable

Temperature: 20.5 °C
 Humidity: 54%RH
 Pressure: 1007 mbar
 Date test performed: 18 August 2003

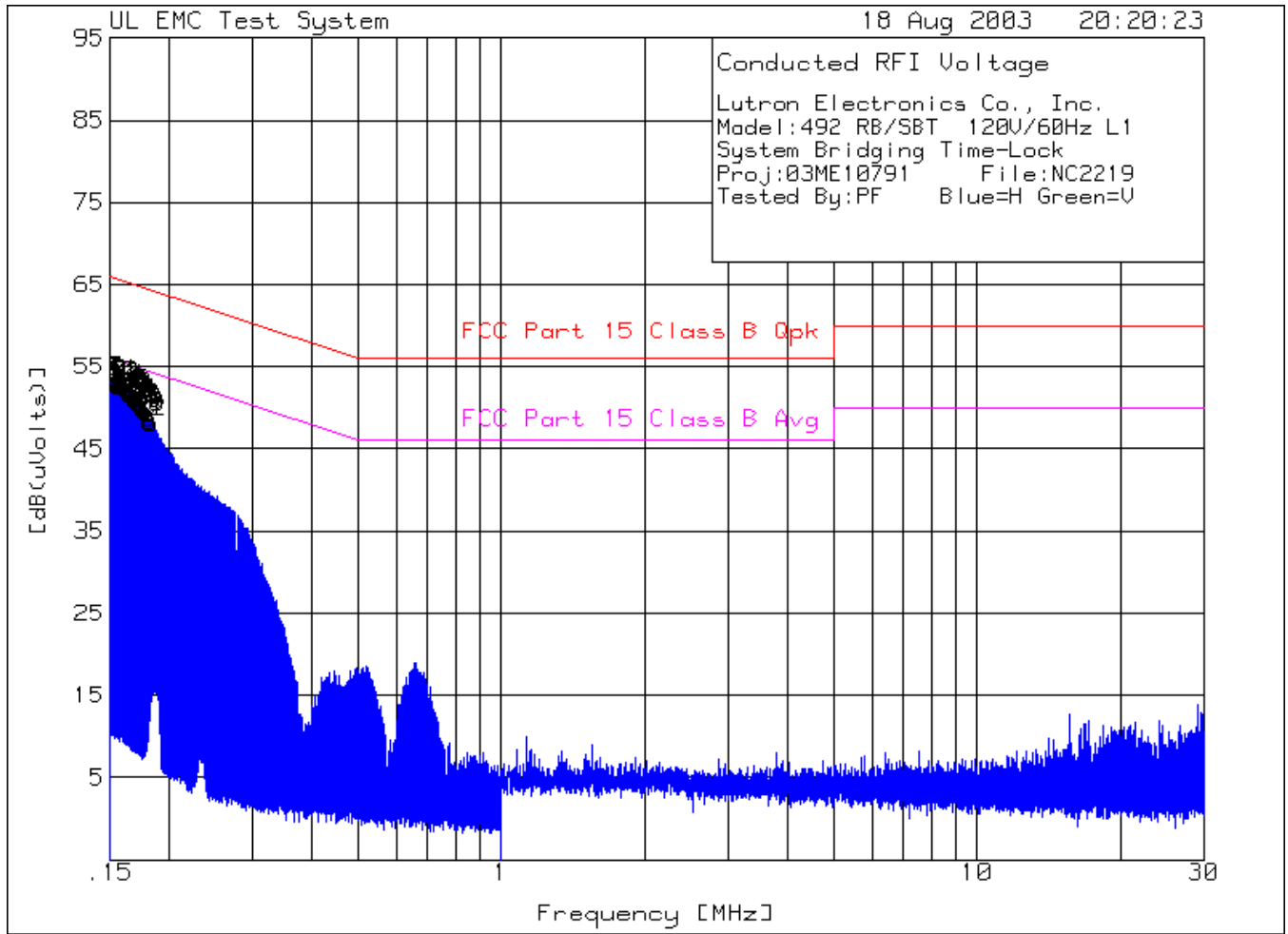
Frequency range on each side of line.

Measurement Point

150kHz to 30MHz Voltage Mains

Test equipment used for conducted emissions:

HP 8574A	Hewlett-Packard	EMI Receiver,	Equipment No.: ME5A-461
Range: 150KHz-30MHz	Last Calibration Date: 16 January 2003	Calibration Due Date: 16 January 2004	
Consisting of:			
HP - 8566B	Hewlett-Packard	Spectrum Analyzer,	
	Resolution BW:	100kHz	9kHz to 30 MHz
		1MHz	30MHz to 1000 MHz
	Video BW:	100kHz	9kHz to 30 MHz
		1MHz	30MHz TO 1000MHz
HP - 85662A	Hewlett-Packard	Analyzer Display	
HP - 85650A	Hewlett-Packard	Quasi-Peak Adapter,	
	Quasi Peak BW:	200Hz	9kHz to 150kHz
		9kHz	150kHz to 30MHz
		120kHz	30 to 1000 MHz
HP - 85685A	Hewlett-Packard	Preselector	
11947A	Hewlett Packard	Transient Limiter	Equipment No.: ME5A-443
Last Calibration Date: 16 January 2003		Calibration Due Date: 16 January 2004	
9252-50-R-24-BNC	Solar Electronics	LISN	Equipment No.: ME5A-636
Last Calibration Date: 16 September 2002		Calibration Due Date: 16 September 2003	
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			
Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004	



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 Model: RB/SBT 120V/60Hz L1
 System Bridging Timeclock
 Proj:03ME10791 File:NC2219
 Tested By:PF Blue=H Green=V

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	.15021	42.7 pk	10.3	0	53	66	56
				Margin [dB]		-13	-3
2	.15132	42.9 pk	10.3	0	53.2	65.9	55.9
				Margin [dB]		-12.7	-2.7
3	.15238	42.8 pk	10.3	0	53.1	65.9	55.9
				Margin [dB]		-12.8	-2.8
4	.15348	42.7 pk	10.3	0	53	65.8	55.8
				Margin [dB]		-12.8	-2.8
5	.15459	42.9 pk	10.3	0	53.2	65.7	55.7
				Margin [dB]		-12.5	-2.5
6	.15565	42.5 pk	10.3	0	52.8	65.7	55.7
				Margin [dB]		-12.9	-2.9
7	.15675	42.3 pk	10.3	0	52.6	65.6	55.6
				Margin [dB]		-13	-3
8	.15781	42.7 pk	10.3	0	53	65.6	55.6
				Margin [dB]		-12.6	-2.6
9	.15892	42.3 pk	10.3	0	52.6	65.5	55.5
				Margin [dB]		-12.9	-2.9
10	.15998	42.4 pk	10.3	0	52.7	65.5	55.5
				Margin [dB]		-12.8	-2.8
11	.16108	42.5 pk	10.3	0	52.8	65.4	55.4
				Margin [dB]		-12.6	-2.6
12	.16214	42.1 pk	10.3	0	52.4	65.4	55.4
				Margin [dB]		-13	-3
13	.16325	41.9 pk	10.3	0	52.2	65.3	55.3
				Margin [dB]		-13.1	-3.1
14	.16431	42 pk	10.3	0	52.3	65.2	55.2
				Margin [dB]		-12.9	-2.9
15	.16541	41.3 pk	10.3	0	51.6	65.2	55.2
				Margin [dB]		-13.6	-3.6
16	.16652	41.4 pk	10.3	0	51.7	65.1	55.1
				Margin [dB]		-13.4	-3.4
17	.16758	41.5 pk	10.3	0	51.8	65.1	55.1
				Margin [dB]		-13.3	-3.3
18	.16834	41.3 pk	10.3	0	51.6	65	55
				Margin [dB]		-13.4	-3.4
19	.1694	40.8 pk	10.3	0	51.1	65	55
				Margin [dB]		-13.9	-3.9
20	.17051	41 pk	10.3	0	51.3	64.9	54.9
				Margin [dB]		-13.6	-3.6
21	.17157	40.8 pk	10.3	0	51.1	64.9	54.9
				Margin [dB]		-13.8	-3.8
22	.17267	40.4 pk	10.3	0	50.7	64.8	54.8
				Margin [dB]		-14.1	-4.1
23	.17374	40.1 pk	10.3	0	50.4	64.8	54.8
				Margin [dB]		-14.4	-4.4
24	.17484	40.3 pk	10.3	0	50.6	64.7	54.7
				Margin [dB]		-14.1	-4.1

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Lutron Electronics Co., Inc.
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 System Bridging Timeclock
 Proj:03ME10791 File:NC2219
 Tested By:PF Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
25	.1759	39.7 pk	10.3	0	50	64.7	54.7
				Margin [dB]		-14.7	-4.7
26	.177	39.6 pk	10.3	0	49.9	64.6	54.6
				Margin [dB]		-14.7	-4.7
27	.17811	39.5 pk	10.3	0	49.8	64.6	54.6
				Margin [dB]		-14.8	-4.8
28	.17917	39.3 pk	10.3	0	49.6	64.5	54.5
				Margin [dB]		-14.9	-4.9
29	.18027	39 pk	10.3	0	49.3	64.5	54.5
				Margin [dB]		-15.2	-5.2
30	.18134	38.5 pk	10.3	0	48.8	64.4	54.4
				Margin [dB]		-15.6	-5.6
31	.18244	38.1 pk	10.3	0	48.4	64.4	54.4
				Margin [dB]		-16	-6
32	.1835	37.9 pk	10.3	0	48.2	64.3	54.3
				Margin [dB]		-16.1	-6.1

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

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Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency	Reading	Factor	Factor	[dB(uVolts)]		
[MHz]	[dB(uV)]	[dB]	[dB]			
Range: 1 .15 - 1MHz						
.15112	2.92 av	10.3	0	13.22	65.9	55.9
			Margin [dB]:		-52.68	-42.68
.15132	2.92 av	10.3	0	13.22	65.9	55.9
			Margin [dB]:		-52.68	-42.68
.15238	2.84 av	10.3	0	13.14	65.9	55.9
			Margin [dB]:		-52.76	-42.76
.15348	3.28 av	10.3	0	13.58	65.8	55.8
			Margin [dB]:		-52.22	-42.22
.15459	3.49 av	10.3	0	13.79	65.7	55.7
			Margin [dB]:		-51.91	-41.91
.15565	3.69 av	10.3	0	13.99	65.7	55.7
			Margin [dB]:		-51.71	-41.71
.15675	3.65 av	10.3	0	13.95	65.6	55.6
			Margin [dB]:		-51.65	-41.65
.15781	3.59 av	10.3	0	13.89	65.6	55.6
			Margin [dB]:		-51.71	-41.71
.15892	3.56 av	10.3	0	13.86	65.5	55.5
			Margin [dB]:		-51.64	-41.64
.15998	3.54 av	10.3	0	13.84	65.5	55.5
			Margin [dB]:		-51.66	-41.66
.16108	3.5 av	10.3	0	13.8	65.4	55.4
			Margin [dB]:		-51.6	-41.6
.16214	3.5 av	10.3	0	13.8	65.4	55.4
			Margin [dB]:		-51.6	-41.6
.16325	2.73 av	10.3	0	13.03	65.3	55.3
			Margin [dB]:		-52.27	-42.27
.16431	1.81 av	10.3	0	12.11	65.2	55.2
			Margin [dB]:		-53.09	-43.09
.16541	1.46 av	10.3	0	11.76	65.2	55.2
			Margin [dB]:		-53.44	-43.44
.16652	1.26 av	10.3	0	11.56	65.1	55.1
			Margin [dB]:		-53.54	-43.54
.16758	1.16 av	10.3	0	11.46	65.1	55.1
			Margin [dB]:		-53.64	-43.64
.16834	1.06 av	10.3	0	11.36	65	55
			Margin [dB]:		-53.64	-43.64
.1694	.86 av	10.3	0	11.16	65	55
			Margin [dB]:		-53.84	-43.84
.17051	.7 av	10.3	0	11	64.9	54.9
			Margin [dB]:		-53.9	-43.9
.17157	.6 av	10.3	0	10.9	64.9	54.9
			Margin [dB]:		-54	-44
.17267	.36 av	10.3	0	10.66	64.8	54.8
			Margin [dB]:		-54.14	-44.14
.17374	.31 av	10.3	0	10.61	64.8	54.8

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.17484	.15 av	10.3	Margin [dB]:		-54.19	-44.19
			0	10.45	64.7	54.7
			Margin [dB]:		-54.25	-44.25

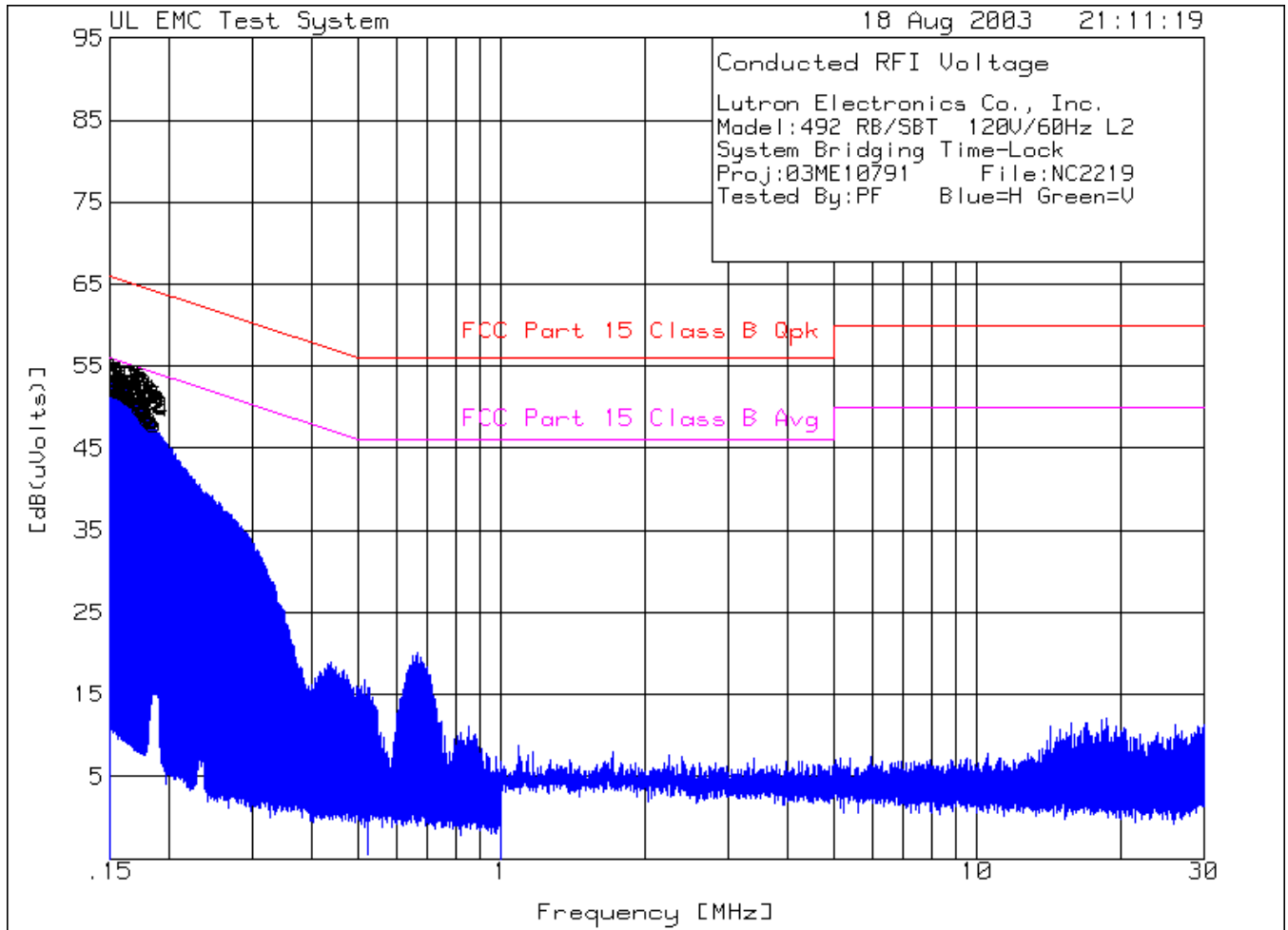
Lutron Electronics Co., Inc.
 Model: RB/SBT 120V/60Hz L1
 System Bridging Timeclock
 Proj:03ME10791 File:NC2219
 Tested By:PF Blue=H Green=V

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency	Reading	Factor	Factor	[dB(uVolts)]		
[MHz]	[dB(uV)]	[dB]	[dB]			
=====						
.1759	.04 av	10.3	0	10.34	64.7	54.7
			Margin [dB]:		-54.36	-44.36
.177	-.17 av	10.3	0	10.13	64.6	54.6
			Margin [dB]:		-54.47	-44.47
.17811	-.26 av	10.3	0	10.04	64.6	54.6
			Margin [dB]:		-54.56	-44.56
.17917	-.35 av	10.3	0	9.95	64.5	54.5
			Margin [dB]:		-54.55	-44.55
.18027	.35 av	10.3	0	10.65	64.5	54.5
			Margin [dB]:		-53.85	-43.85
.18134	2.8 av	10.3	0	13.1	64.4	54.4
			Margin [dB]:		-51.3	-41.3
.18244	4.83 av	10.3	0	15.13	64.4	54.4
			Margin [dB]:		-49.27	-39.27
.1835	5.43 av	10.3	0	15.73	64.3	54.3
			Margin [dB]:		-48.57	-38.57

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



File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co., Inc.
 Model: RB/SBT 120V/60Hz L2
 System Bridging Timeclock
 Proj:03ME10791 File:NC2219
 Tested By:PF Blue=H Green=V

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	.15017	42 pk	10.3	0	52.3	66	56
				Margin [dB]		-13.7	-3.7
2	.15123	42.5 pk	10.3	0	52.8	65.9	55.9
				Margin [dB]		-13.1	-3.1
3	.15234	42.2 pk	10.3	0	52.5	65.9	55.9
				Margin [dB]		-13.4	-3.4
4	.1534	42 pk	10.3	0	52.3	65.8	55.8
				Margin [dB]		-13.5	-3.5
5	.1545	42 pk	10.3	0	52.3	65.8	55.8
				Margin [dB]		-13.5	-3.5
6	.15556	42.1 pk	10.3	0	52.4	65.7	55.7
				Margin [dB]		-13.3	-3.3
7	.15667	41.7 pk	10.3	0	52	65.6	55.6
				Margin [dB]		-13.6	-3.6
8	.15773	41.9 pk	10.3	0	52.2	65.6	55.6
				Margin [dB]		-13.4	-3.4
9	.15883	41.8 pk	10.3	0	52.1	65.5	55.5
				Margin [dB]		-13.4	-3.4
10	.15994	41.6 pk	10.3	0	51.9	65.5	55.5
				Margin [dB]		-13.6	-3.6
11	.16121	41.8 pk	10.3	0	52.1	65.4	55.4
				Margin [dB]		-13.3	-3.3
12	.16227	41.9 pk	10.3	0	52.2	65.3	55.3
				Margin [dB]		-13.1	-3.1
13	.16338	41.3 pk	10.3	0	51.6	65.3	55.3
				Margin [dB]		-13.7	-3.7
14	.16448	41.2 pk	10.3	0	51.5	65.2	55.2
				Margin [dB]		-13.7	-3.7
15	.16554	41.4 pk	10.3	0	51.7	65.2	55.2
				Margin [dB]		-13.5	-3.5
16	.16664	40.9 pk	10.3	0	51.2	65.1	55.1
				Margin [dB]		-13.9	-3.9
17	.16771	40.8 pk	10.3	0	51.1	65.1	55.1
				Margin [dB]		-14	-4
18	.16881	41 pk	10.3	0	51.3	65	55
				Margin [dB]		-13.7	-3.7
19	.16987	40.5 pk	10.3	0	50.8	65	55
				Margin [dB]		-14.2	-4.2
20	.17098	40.6 pk	10.3	0	50.9	64.9	54.9
				Margin [dB]		-14	-4
21	.17204	40.4 pk	10.3	0	50.7	64.9	54.9
				Margin [dB]		-14.2	-4.2
22	.17314	39.8 pk	10.3	0	50.1	64.8	54.8
				Margin [dB]		-14.7	-4.7
23	.17424	39.9 pk	10.3	0	50.2	64.8	54.8
				Margin [dB]		-14.6	-4.6
24	.17531	40 pk	10.3	0	50.3	64.7	54.7

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

No.	Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
						-14.4	-4.4
Lutron Electronics Co., Inc.							
Model: RB/SBT 120V/60Hz L2							
System Bridging Timeclock							
Proj:03ME10791 File:NC2219							
Tested By:PF Blue=H Green=V							
25	.17641	39.4 pk	10.3	0	49.7	64.7	54.7
				Margin [dB]		-15	-5
26	.17747	39.5 pk	10.3	0	49.8	64.6	54.6
				Margin [dB]		-14.8	-4.8
27	.17858	39.3 pk	10.3	0	49.6	64.6	54.6
				Margin [dB]		-15	-5
28	.17964	38.8 pk	10.3	0	49.1	64.5	54.5
				Margin [dB]		-15.4	-5.4
29	.18074	38.5 pk	10.3	0	48.8	64.5	54.5
				Margin [dB]		-15.7	-5.7
30	.1818	38.7 pk	10.3	0	49	64.4	54.4
				Margin [dB]		-15.4	-5.4
31	.18291	38.1 pk	10.3	0	48.4	64.4	54.4
				Margin [dB]		-16	-6
32	.18397	38.2 pk	10.3	0	48.5	64.3	54.3
				Margin [dB]		-15.8	-5.8
33	.18507	38 pk	10.3	0	48.3	64.3	54.3
				Margin [dB]		-16	-6
34	.18618	37.7 pk	10.3	0	48	64.2	54.2
				Margin [dB]		-16.2	-6.2

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

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co., Inc.
 Model: RB/SBT 120V/60Hz L2
 System Bridging Timeclock
 Proj:03ME10791 File:NC2219
 Tested By:PF Blue=H Green=V

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	[dB(uVolts)]		
=====						
Range: 1 .15 - 1MHz						
.15112	2.89 av	10.3	0	13.19	65.9	55.9
			Margin [dB]:		-52.71	-42.71
.15123	2.9 av	10.3	0	13.2	65.9	55.9
			Margin [dB]:		-52.7	-42.7
.15234	2.8 av	10.3	0	13.1	65.9	55.9
			Margin [dB]:		-52.8	-42.8
.1534	3.16 av	10.3	0	13.46	65.8	55.8
			Margin [dB]:		-52.34	-42.34
.1545	3.45 av	10.3	0	13.75	65.8	55.8
			Margin [dB]:		-52.05	-42.05
.15556	3.58 av	10.3	0	13.88	65.7	55.7
			Margin [dB]:		-51.82	-41.82
.15667	3.63 av	10.3	0	13.93	65.6	55.6
			Margin [dB]:		-51.67	-41.67
.15773	3.63 av	10.3	0	13.93	65.6	55.6
			Margin [dB]:		-51.67	-41.67
.15883	3.58 av	10.3	0	13.88	65.5	55.5
			Margin [dB]:		-51.62	-41.62
.15994	3.59 av	10.3	0	13.89	65.5	55.5
			Margin [dB]:		-51.61	-41.61
.16121	3.54 av	10.3	0	13.84	65.4	55.4
			Margin [dB]:		-51.56	-41.56
.16227	3.43 av	10.3	0	13.73	65.3	55.3
			Margin [dB]:		-51.57	-41.57
.16338	2.84 av	10.3	0	13.14	65.3	55.3
			Margin [dB]:		-52.16	-42.16
.16448	1.78 av	10.3	0	12.08	65.2	55.2
			Margin [dB]:		-53.12	-43.12
.16554	1.44 av	10.3	0	11.74	65.2	55.2
			Margin [dB]:		-53.46	-43.46
.16664	1.33 av	10.3	0	11.63	65.1	55.1
			Margin [dB]:		-53.47	-43.47
.16771	1.13 av	10.3	0	11.43	65.1	55.1
			Margin [dB]:		-53.67	-43.67
.16881	.98 av	10.3	0	11.28	65	55
			Margin [dB]:		-53.72	-43.72
.16987	.89 av	10.3	0	11.19	65	55
			Margin [dB]:		-53.81	-43.81
.17098	.73 av	10.3	0	11.03	64.9	54.9
			Margin [dB]:		-53.87	-43.87
.17204	.64 av	10.3	0	10.94	64.9	54.9
			Margin [dB]:		-53.96	-43.96
.17314	.43 av	10.3	0	10.73	64.8	54.8
			Margin [dB]:		-54.07	-44.07
.17424	.27 av	10.3	0	10.57	64.8	54.8
			Margin [dB]:		-54.23	-44.23
.17531	.17 av	10.3	0	10.47	64.7	54.7



Conducted Emission Test Set-up 150KHz to 30MHz

2.1.2 Cease Operation Within 5 Seconds

Test Applicable

Test Requirement:

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.

The client configured a test button to transmit upon request. In normal operation, the device only transmits when requested from a remote control or from the on-board keypad. Once the device transmits the required information it returns to a receive mode awaiting information to re-transmit.

Test equipment used for Cease Operation measurements:

HP 8574A	Hewlett-Packard	EMI Receiver,	Equipment No.: ME5A-461
Range: 20Hz- 22GHz	Last Calibration Date: 16 Jan 2003		Calibration Due Date: 16 Jan 2004

Consisting of:

HP - 8566B	Hewlett-Packard	Spectrum Analyzer,
	Resolution BW:	9kHz to 30 MHz
		30MHz to 1000 MHz
	Video BW:	9kHz to 30 MHz
		30MHz TO 1000MHz
HP - 85662A	Hewlett-Packard	Analyzer Display
HP - 85650A	Hewlett-Packard	Quasi-Peak Adapter,
	Quasi Peak BW:	9kHz to 150kHz
		150kHz to 30MHz
		30 to 1000 MHz
HP - 85685A	Hewlett-Packard	Preselector

3121C-DB4	EMCO	Dipole Antenna	Equipment No.: ME-751
	Last Calibration Date: 06 March 2003		Calibration Due Date: 06 March 2004

99760-00	Cole -Parmer	Hygrometer/Temp/Barometer	Equipment No.: ME4-268
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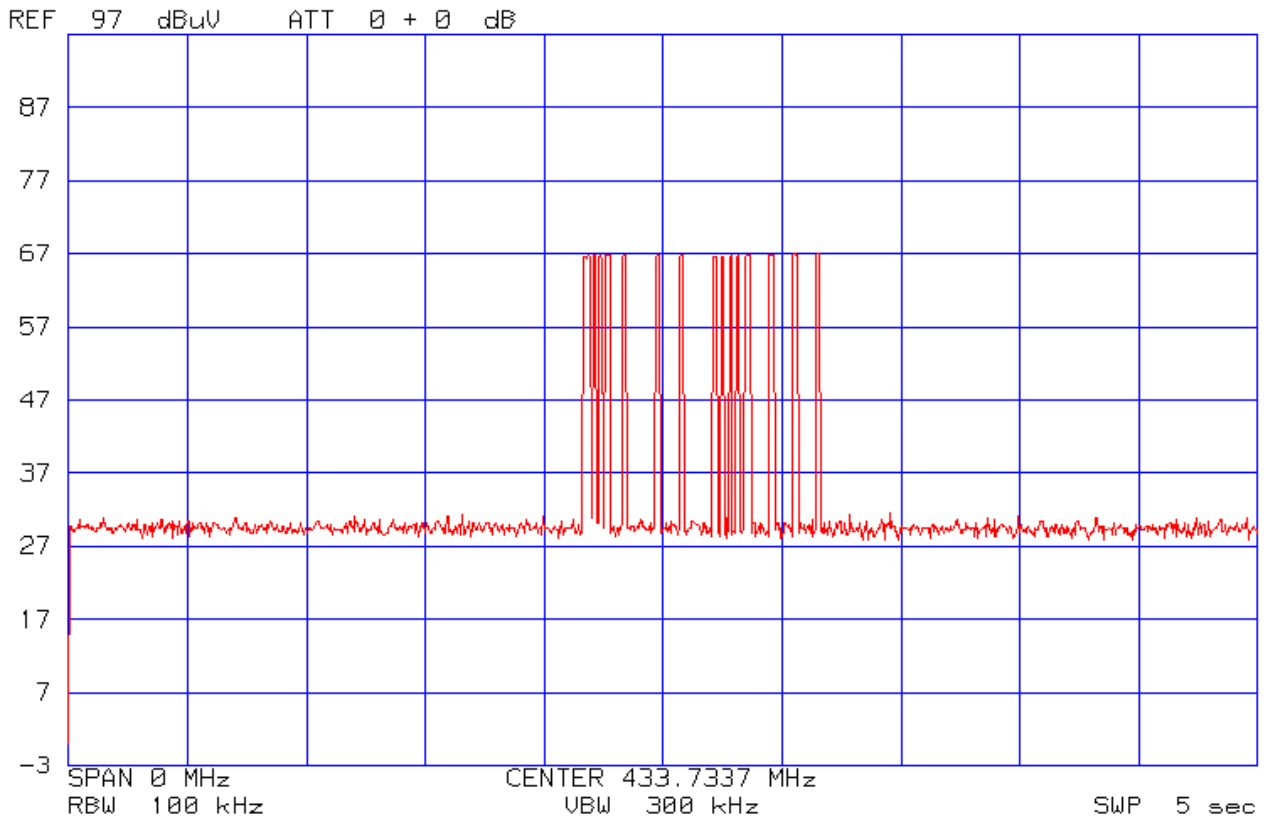
Ranges: Temp:0°C-55°C

Humidity 25% to 95 %RH

Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 2002

Calibration Due Date: 27 May 2004.



Cease Operation in less then 5 seconds

File Number: NC2219
Project Number: 03ME10791
Model Number: RB-SBT
FCC ID: JPZ0027

Issued: 9/9/03



Cease Operation in Less Than 5 seconds Test Set-Up
Note: The test photo depicted states RA-SBT 418 MHz.
This is actually the RB-SBT, which operates at 433.9 MHz

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

Test Applicable

Temperature: 20.0 °C
Humidity: 58 %RH
Pressure: 1000 mbar
Date test performed: 23 July 2003

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

Measurement distance: 3 meters
433.92 MHz Transmit
423.22 Receive Mode

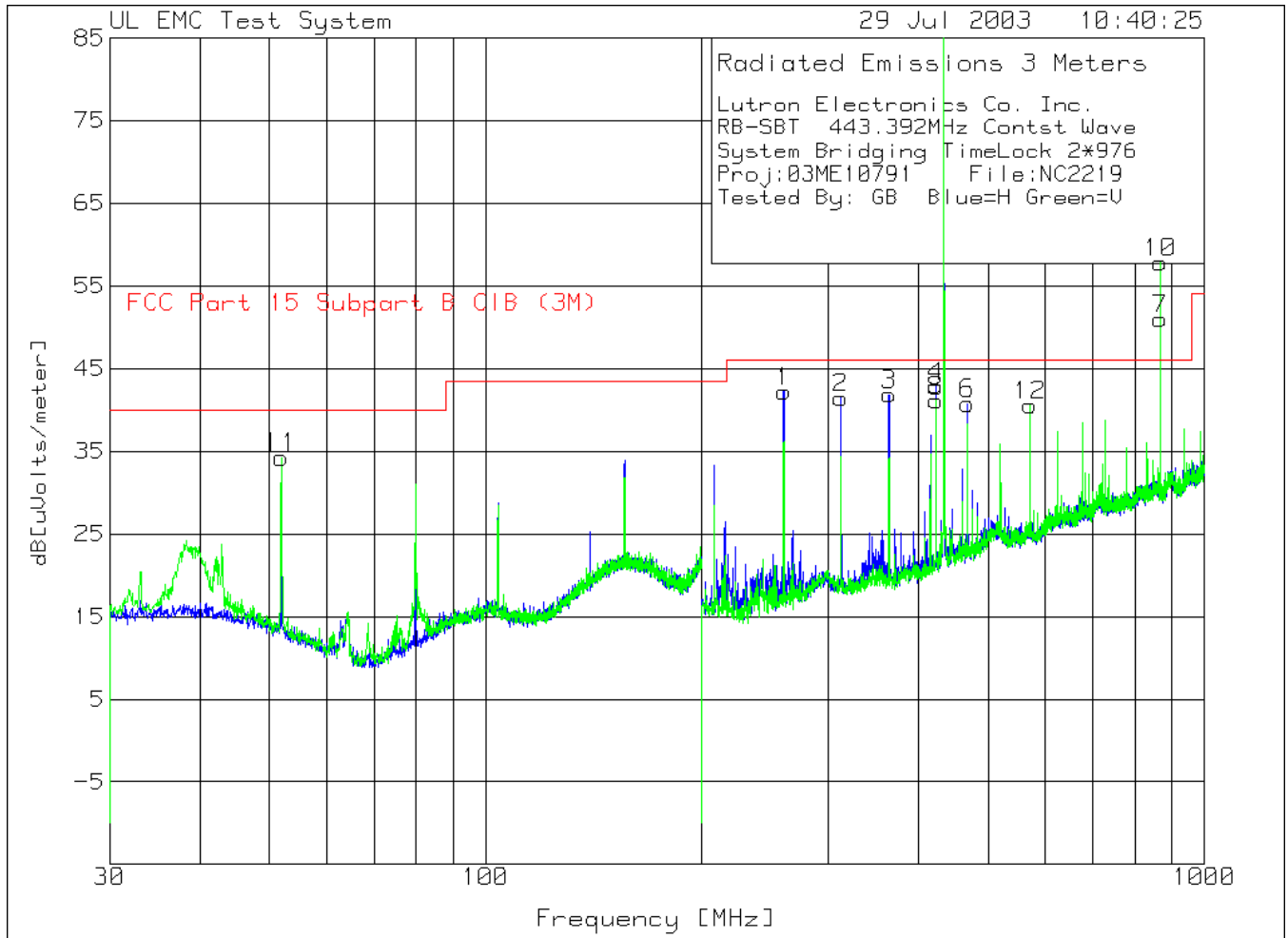
Frequency Range: 30MHz - 1000MHz Electric Receive and transmit mode
1GHz - 2GHz Electric Receive
1GHz - 5GHz Electric Transmit mode

Test equipment used for final radiated emissions tests:

ESI26	Rhode & Schwartz	EMI Receiver	Equipment No.: ME5B-081
		Quasi Peak BW:	200Hz
		RBW	10 KHz
		Quasi Peak BW:	9kHz
		RBW	100 KHz
		Quasi Peak BW:	120 kHz
		RBW	1.0 MHz
Range: 30MHz- 5GHz	Last Calibration Date: 20 August 2002	Calibration Due Date: 20 August 2003	

Test Accessories for Radiated Emissions:

94455-1	Ailtech	Biconnical Antenna	Equipment No.: ME5-439
Last Calibration Date: 15 November 2002		Calibration Due Date: 15 November 2003	
3146 EMCO	Log Periodic Antenna		Equipment No.: ME5-451
Last Calibration Date: 21 November 2002		Calibration Due Date: 15 November 2003	
RGA-180	EMCO	Horn Antenna	Equipment No.: ME5-565
Last Calibration Date: 21 November 2002		Calibration Due Date: 15 November 2003	
8449BHewlett Packard	1-26GHz Pre –Amp	Equipment No.: ME5-914	
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			
Last Calibration Date: 27 May 2003		Calibration Due Date: 27 May 2004	



30-1000MHz Transmit Frequency 433.9MHz
The frequency depicted in the title should say 433.9 MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co. Inc.
 RB-SBT 433.392MHz Contst Wave
 System Bridging Timeclock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: GB Blue=H Green=V

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

Vertical 30 - 200MHz -----

11	51.941	22.53 pk	1	10.7	34.23	40	61
	Azimuth:0	Height:100	Vert	Margin [dB]		-5.77	

Horizontal 200 - 1000MHz -----

1	260.02	27.74 pk	2.2	12.3	42.24	46	61
	Azimuth:183	Height:100	Horz	Margin [dB]		-3.76	-18.76
2	312.0373	25.17 pk	2.4	13.9	41.47	46	61
	Azimuth:11	Height:100	Horz	Margin [dB]		-4.53	-19.53
3	364.0547	24.96 pk	2.7	14.2	41.86	46	61
	Azimuth:176	Height:100	Horz	Margin [dB]		-4.14	-19.14
4	423.2744	24.11 pk	3.1	15.6	42.81	46	61
	Azimuth:176	Height:198	Horz	Margin [dB]		-3.19	-18.19
5	433.9446	*56.9 avg	3.2	15.7	*75.9	46	81
	Azimuth:235	Height:198	Horz	Margin [dB]		50.15	-5.1
6	468.0894	20.87 pk	3.3	16.6	40.77	46	61
	Azimuth:71	Height:198	Horz	Margin [dB]		-5.23	-20.23
7	867.956	24.59 pk	4.4	22	50.99	46	61
	Azimuth:239	Height:100	Horz	Margin [dB]		4.99	-36.41

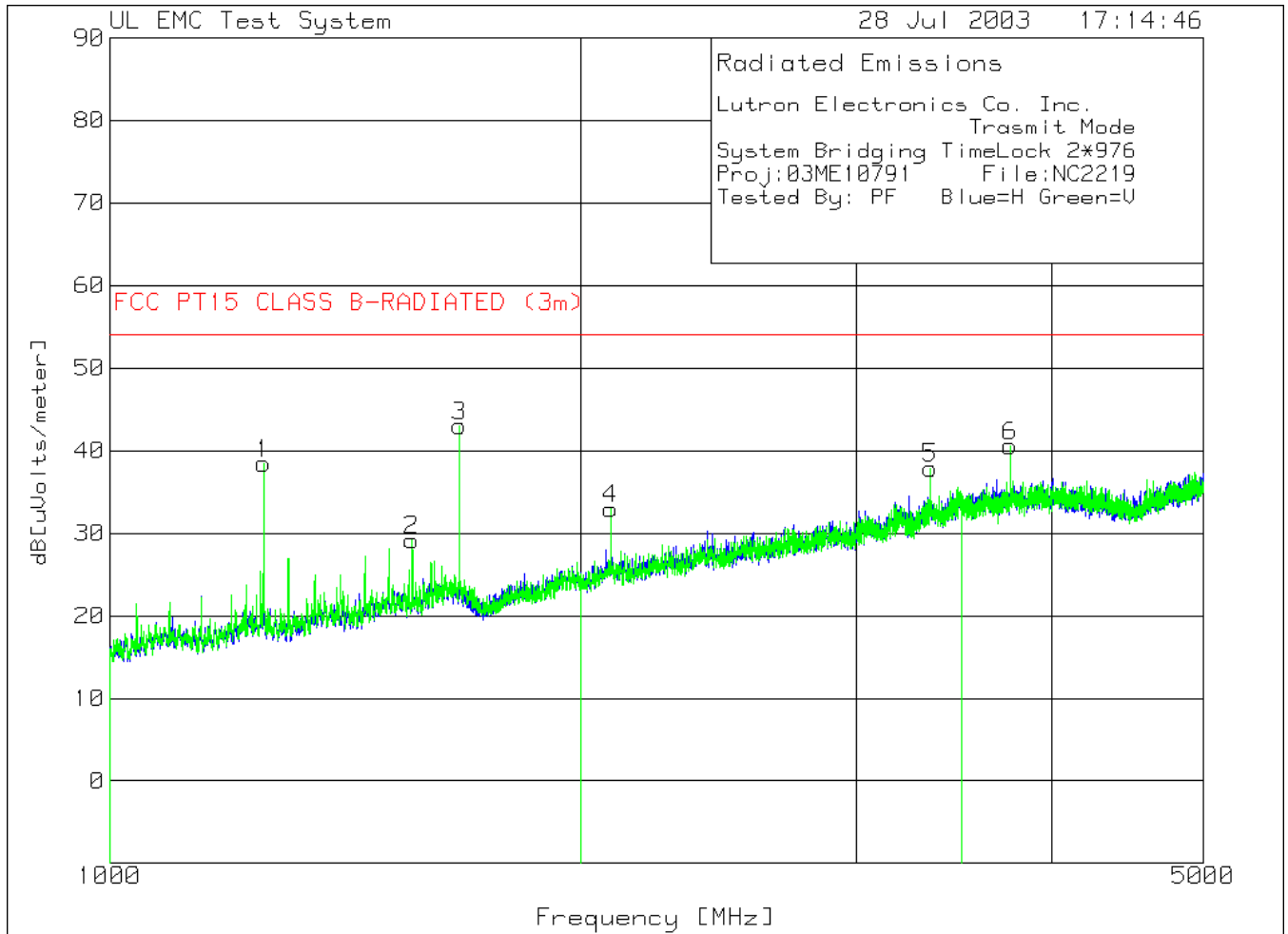
Vertical 200 - 1000MHz -----

8	423.2744	22.43 pk	3.1	15.6	41.13	46	61
	Azimuth:118	Height:100	Vert	Margin [dB]		-4.87	-19.87
9	433.9446	*60.35avg	3.2	15.7	*79.2	46	81
	Azimuth:344	Height:100	Vert	Margin [dB]		50.39	-1.8
10	867.956	31.43 pk	4.4	22	57.83	46	61
	Azimuth:322	Height:100	Vert	Margin [dB]		11.83	-3.17
12	572.124	18.67 pk	3.7	18.2	40.57	46	61
	Azimuth:358	Height:100	Vert	Margin [dB]		-5.43	-20.43

LIMIT 1: FCC Part 15 Subpart B ClB (3M)
 LIMIT 1: 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 -16.0 dB added to Average level.**



1000-5000 MHz Transmit Frequency 433.9MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

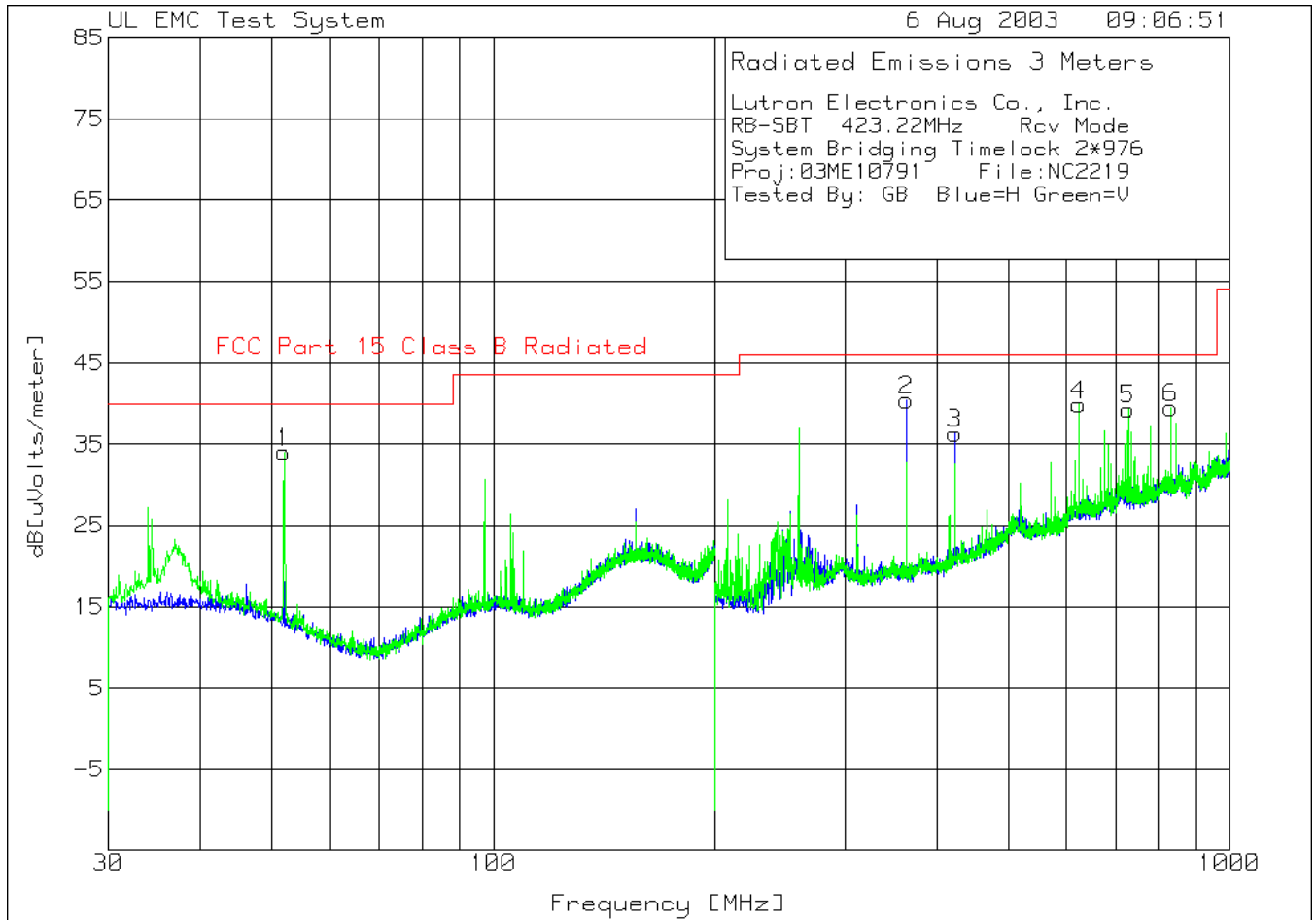
Issued: 9/9/03

Lutron Electronics Co. Inc.
 RB-SBT 433.9MHz Trasmit Mode
 System Bridging Timeclock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF 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
Vertical 1000 - 2000MHz -----						
1	1254.085	45.66 pk	-33	25.8	38.46	54
	Azimuth:330	Height:199	Vert	Margin [dB]		-15.54
2	1559.853	34.34 pk	-32.2	27	29.14	54
	Azimuth:221	Height:100	Vert	Margin [dB]		-24.86
3	1672.558	47.3 pk	-31.8	27.5	43	54
	Azimuth:358	Height:100	Vert	Margin [dB]		-11
Vertical 2000 - 3500MHz -----						
4	2090.03	34.46 pk	-30.7	29.2	32.96	54
	Azimuth:266	Height:199	Vert	Margin [dB]		-21.04
5	3344.948	33.28 pk	-27.8	32.4	37.88	54
	Azimuth:266	Height:199	Vert	Margin [dB]		-16.12
Vertical 3500 - 5000MHz -----						
6	3762.588	34.28 pk	-27.3	33.6	40.58	54
	Azimuth:1	Height:199	Vert	Margin [dB]		-13.42

LIMIT 1: FCC PT15 CLASS B-RADIATED (3m)

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



30-1000MHz Receive Mode Frequency 423.22MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co., Inc.
 RB-SBT 423.22MHz Rcv Mode
 System Bridging Timeclock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: GB Blue=H Green=V

No.	Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====						
Vertical 30 - 200MHz -----						
1	51.941	22.3 pk	1	10.7	34	40
	Azimuth:156	Height:100	Vert	Margin [dB]		-6
Horizontal 200 - 1000MHz -----						
2	363.7879	23.51 pk	2.7	14.2	40.41	46
	Azimuth:240	Height:100	Horz	Margin [dB]		-5.59
3	423.2744	17.78 pk	2.9	15.6	36.28	46
	Azimuth:299	Height:100	Horz	Margin [dB]		-9.72
Vertical 200 - 1000MHz -----						
4	623.8746	16.58 pk	3.7	19.6	39.88	46
	Azimuth:76	Height:101	Vert	Margin [dB]		-6.12
5	727.9093	14.38 pk	3.9	21	39.28	46
	Azimuth:19	Height:101	Vert	Margin [dB]		-6.72
6	831.944	13.29 pk	4.2	22	39.49	46
	Azimuth:355	Height:101	Vert	Margin [dB]		-6.51

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: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co., Inc.
 RB-SBT 423.22MHz Rcv Mode
 System Bridging Timeclock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: GB Blue=H Green=V
 Test Meter Gain/Loss Transducer Level Limit:1
 Frequency Reading Factor Factor dB[uVolts/meter]
 [MHz] [dB(uV)] [dB] [dB]

```

=====
Horizontal 30 - 200MHz
52.0022 10.5 qp 1 10.6 22.1 40
Azimuth: 211 Height:254 Horz Margin [dB]: -17.9

Horizontal 200 - 1000MHz
364.0123 23.3 qp 2.7 14.2 40.2 46
Azimuth: 293 Height:102 Horz Margin [dB]: -5.8

423.2433 18.64 qp 2.9 15.6 37.14 46
Azimuth: 261 Height:103 Horz Margin [dB]: -8.86

Vertical 200 - 1000MHz
624.0048 16.71 qp 3.7 19.6 40.01 46
Azimuth: 8 Height:103 Vert Margin [dB]: -5.99

728.0013 15.01 qp 3.9 21 39.91 46
Azimuth: 355 Height:103 Vert Margin [dB]: -6.09

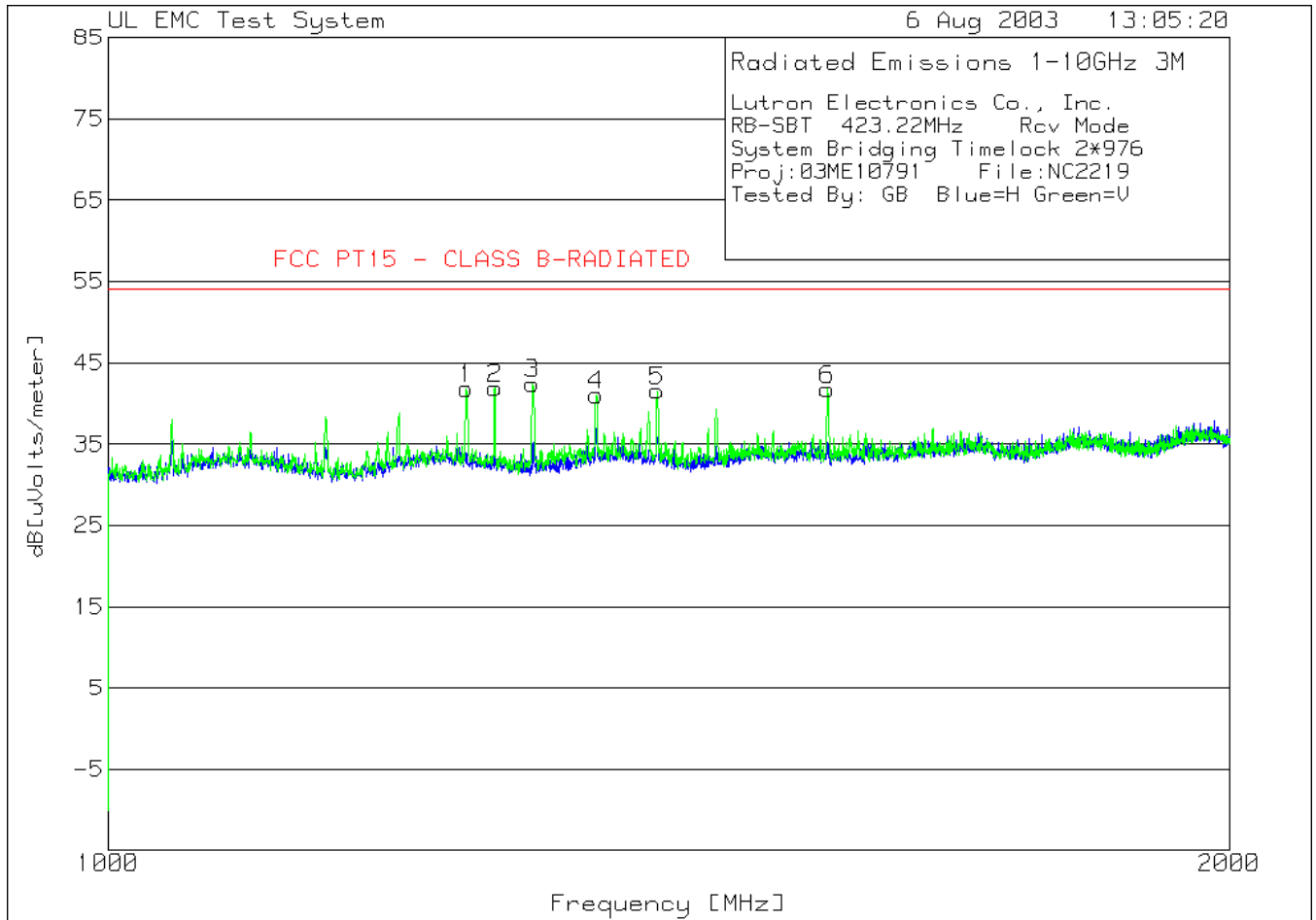
832.0045 14.73 qp 4.2 22 40.93 46
Azimuth: 339 Height:146 Vert Margin [dB]: -5.07
  
```

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: 03ME10791
Model Number: RB-SBT
FCC ID: JPZ0027

Issued: 9/9/03



Radiated Emissions 1000 to 2000MHz Receive Mode 423.22 MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RB-SBT
 FCC ID: JPZ0027

Issued: 9/9/03

Lutron Electronics Co., Inc.
 RB-SBT 423.22MHz Rcv Mode
 System Bridging Timeclock 2*976
 Proj:03ME10791 File:NC2219
 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
Vertical 1000 - 2000MHz -----						
1	1247.749 Azimuth:194	47.42 pk Height:100	-31.4 Vert	25.8 Margin [dB]	41.82	54 -12.18
2	1269.757 Azimuth:194	47.29 pk Height:100	-31.3 Vert	25.9 Margin [dB]	41.89	54 -12.11
3	1299.767 Azimuth:343	47.64 pk Height:100	-31.2 Vert	26 Margin [dB]	42.44	54 -11.56
4	1352.117 Azimuth:17	45.85 pk Height:100	-31 Vert	26.2 Margin [dB]	41.05	54 -12.95
5	1403.801 Azimuth:17	46.06 pk Height:100	-30.9 Vert	26.4 Margin [dB]	41.56	54 -12.44
6	1559.853 Azimuth:29	45.15 pk Height:100	-30.4 Vert	27 Margin [dB]	41.75	54 -12.25

LIMIT 1: FCC PT15 - 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: 03ME10791
Model Number: RB-SBT
FCC ID: JPZ0027

Issued: 9/9/03



Radiated Emissions Test Set-Up



Radiated Emissions Test Set-Up 30-1000MHz Front View



Radiated Emissions Test Set-Up 30-1000MHz Rear View



Radiated Emissions Test Set-Up above 1GHz Front View



Radiated Emissions Test Set-Up above 1GHz Rear View

2.1.4 Duty Cycle Correction Factor

Paragraph 15.35: Pulse Train Measurements

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.

Duty Cycle factor calculation.

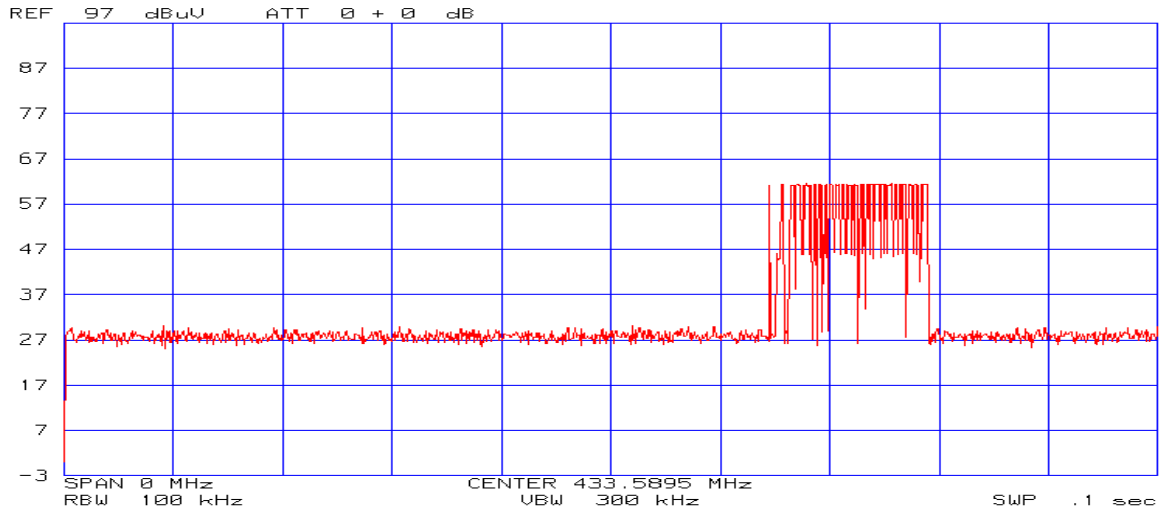
Total number of pulses counted (1).
 Total time on = 15.6ms
 Duty cycle correction factor = $20 \log ((1) 15.6\text{ms} / 100\text{ms})$
 = $20 \log (0.156)$
 = - 16.0dB

The correction factor is added to the measured field strength in dBuV/m

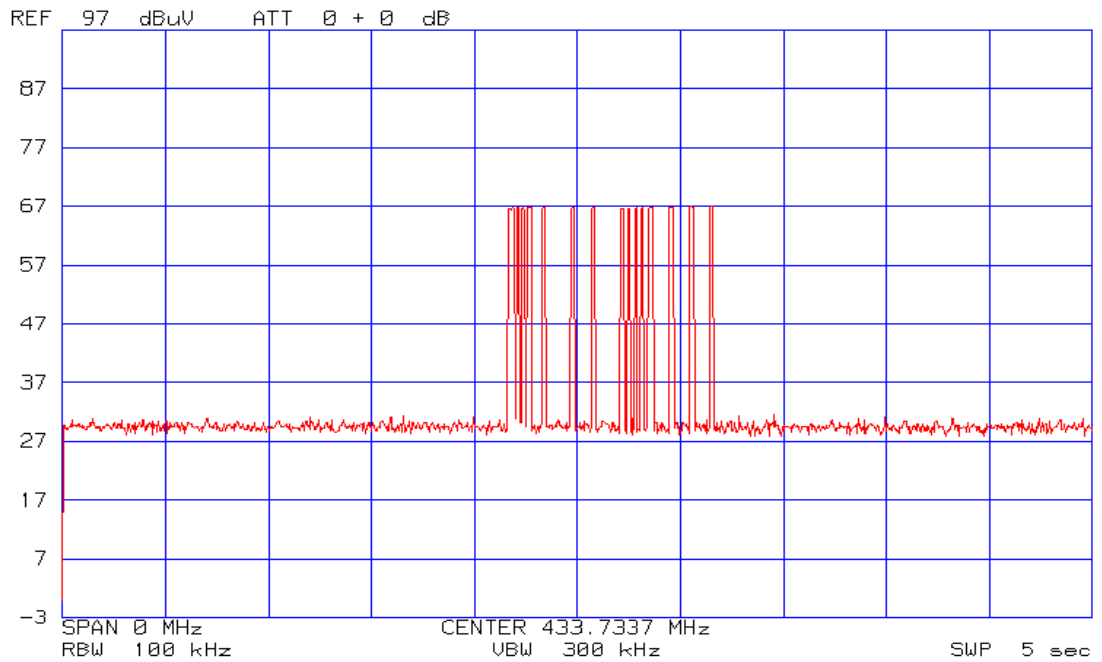
Equipment to determine product Duty Cycle Correction Factor:

HP 8574A	Hewlett-Packard	EMI Receiver,	Equipment No.: ME5A-461
Range: 20Hz- 22GHz	Last Calibration Date: 16 Jan 2003		Calibration Due Date: 16 Jan 2004
Consisting of:			
	HP - 8566B	Hewlett-Packard	Spectrum Analyzer,
		Resolution BW:	100kHz
			1MHz
		Video BW:	9kHz to 30 MHz
			30MHz to 1000 MHz
			9kHz to 30 MHz
			30MHz TO 1000MHz
	HP - 85662A	Hewlett-Packard	Analyzer Display
	HP - 85650A	Hewlett-Packard	Quasi-Peak Adapter,
		Quasi Peak BW:	9kHz to 150kHz
			150kHz to 30MHz
			30 to 1000 MHz
	HP - 85685A	Hewlett-Packard	Preselector
3121C-DB4	EMCO	Dipole Antenna	Equipment No.: ME-751
	Last Calibration Date: 06 March 2003		Calibration Due Date: 06 March 2004
99760-00	Cole –Parmer	Hygrometer/Temp/Barometer	Equipment No.: ME4-268

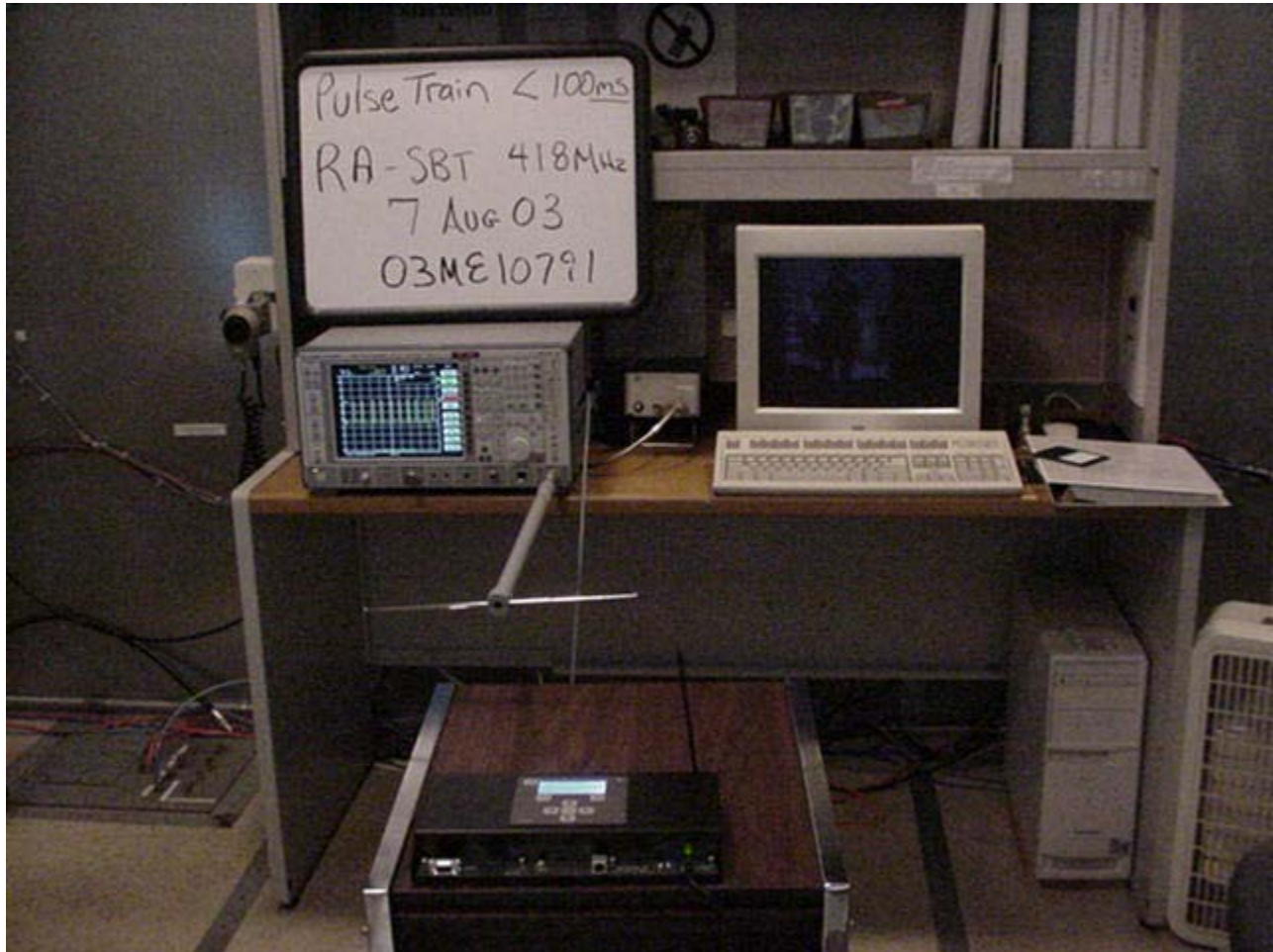
Ranges: Temp:0°C-55°C
 Humidity 25% to 95 %RH
 Pressure 795 to 1050 mbar
 Last Calibration Date: 27 May 2002 Calibration Due Date: 27 May 2004.



One Pulse in 100ms including blanking intervals.
Based on total pulse of 500ms shown below



Pulse train = 500 ms



Pulse train Test Set-Up

Note: The test photo depicted states RA-SBT 418 MHz.
This is actually the RB-SBT, which operates at 433.9 MHz

2.1.5 Occupied Bandwidth

Test Applicable

Temperature: 23 °C
Humidity: 59 %RH
Pressure: 1000 mbar
Date test performed: 6 August 2003

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.

433.92MHz

Bandwidth = 0.25% of 433.92MHz = 1.085MHz

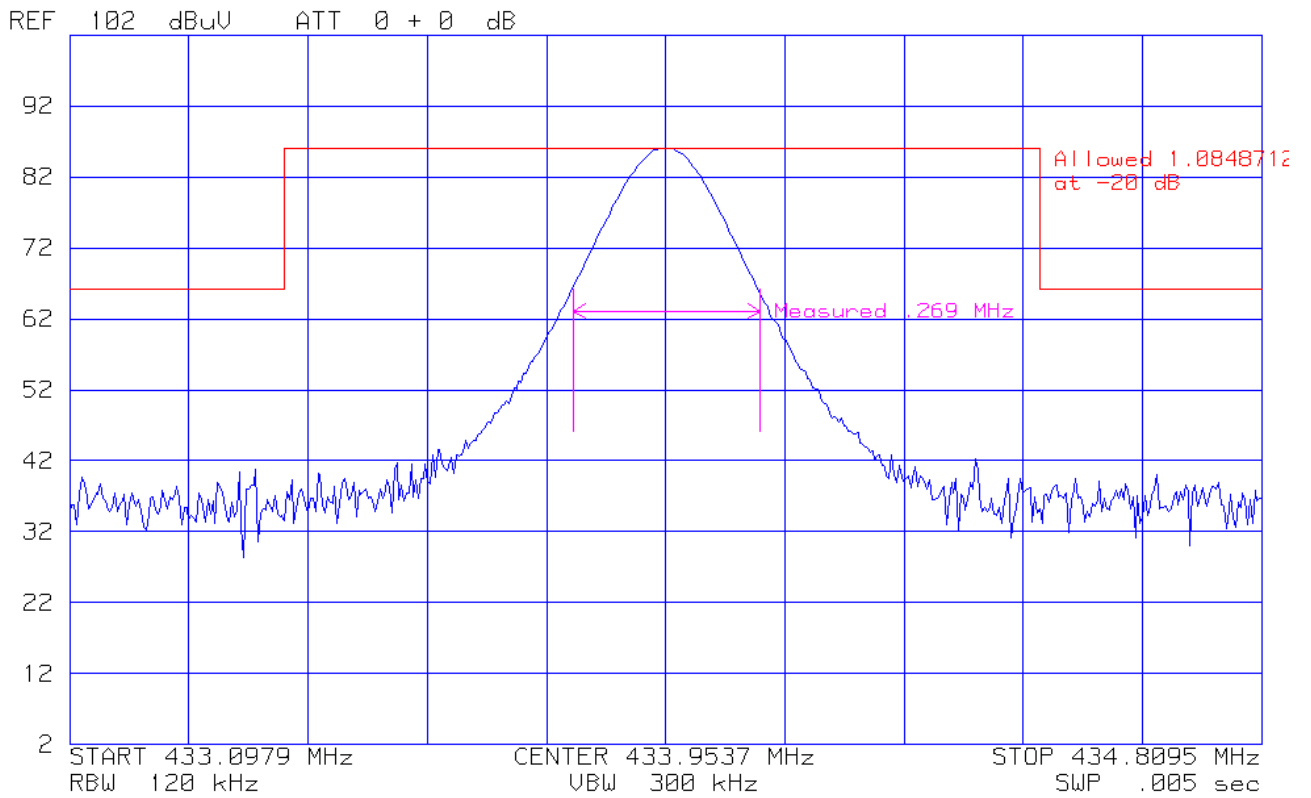
Test equipment used for Occupied Bandwidth Measurements:

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 kHz		30 to 1000MHz
		RBW	1.0 MHz		
Range: 30MHz – 5GHz		Last Calibration Date: 20 August 02		Calibration Due Date: 20 August 03	

Test Accessories for Radiated Emissions:

3121C-DB4	EMCO	Dipole Antenna	Equipment No.: ME-751
Last Calibration Date: 06 March 03		Calibration Due Date: 06 March 04	
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
Last Calibration Date: 27 May 03
Calibration Due Date: 27 May 04



Occupied Bandwidth 0.269 MHz



Occupied Bandwidth Test Set-up

2.1.6 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation

Fundamental Frequency is 433.9MHz

From table in section 15.231

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

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

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

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

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

Fundamental Frequency is 433.9MHz

From table in section 15.231

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

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

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

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

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

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 (1).

Total time on = 15.6ms

$$\text{Duty cycle correction factor} = 20 \log ((1) 15.6\text{ms} / 100\text{ms})$$

$$= 20 \log (0.156)$$

$$= - 16.0\text{dB}$$

The correction factor is added to the measured field strength in dB μ V/m

File Number: NC2219
Project Number: 03ME10791
Model Number: RB-SBT
FCC ID: JPZ0027

Issued: 9/9/03

3.0 SUMMARY:

The equipment under test has

Met the technical requirements as defined under section(s) 2.0

Test Start Date: 23 July 2003

Test Completion Date: 18 August 2003

- UNDERWRITERS LABORATORIES, INC. -

Project Engineer



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Senior Engineering Associate
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Reviewer



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