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**Report of Measurements
Of Electromagnetic Compatibility Testing**

Test Report File No.: **NC2219** Date of issue: 26 August 2003
Applicant: Lutron Electronics Co. Inc.
Model / Serial No.: RA / SBT
Product Type: System Bridging Time lock
Power Supply: 120Vac, 60Hz
Manufacturer: Same As Applicant
License holder: Same As Applicant
Address: 7200 Suter Road
Coopersburg, PA 18036
Test Type: **Compliance Investigation
Manufacturer's Specification**
Test Project Number: 03ME10791
References(s) FCC ID: JPZ0026

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1.0 GENERAL - Product Description

Device Function: The RA-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 RA-SBT to monitor system devices and turn zones of light ON or OFF in response. The RA-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 RA-SBT and monitor activity.

RF Function: The receiver down converts a 418.00 MHz carrier frequency using a 407.30 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 RA-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 RA-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 normal orientation that represents the worst-case orientation.

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, because that was deemed worst-case emissions.

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

The device was powered with 120VAC, 60Hz.

Device	Manufacturer	Model Number	Serial Number	FCC ID
System Bridging Time-lock	Lutron Electronics Co. Inc	RA-SBT	-----	FCC ID: JPZ0026
AC Adapter	Stancor	STA-4118	AEC-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

Yes, See below:

This 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:

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 15.205, 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 418MHz. In addition, two modes were evaluated one in the Transmit and the other in Standby, which is receive mode

2.1.1 Conducted Emissions Tests

Test Applicable

Temperature: 20.5 °C
Humidity: 49 %RH
Pressure: 999 mbar
Date test performed: 28 July 2003

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

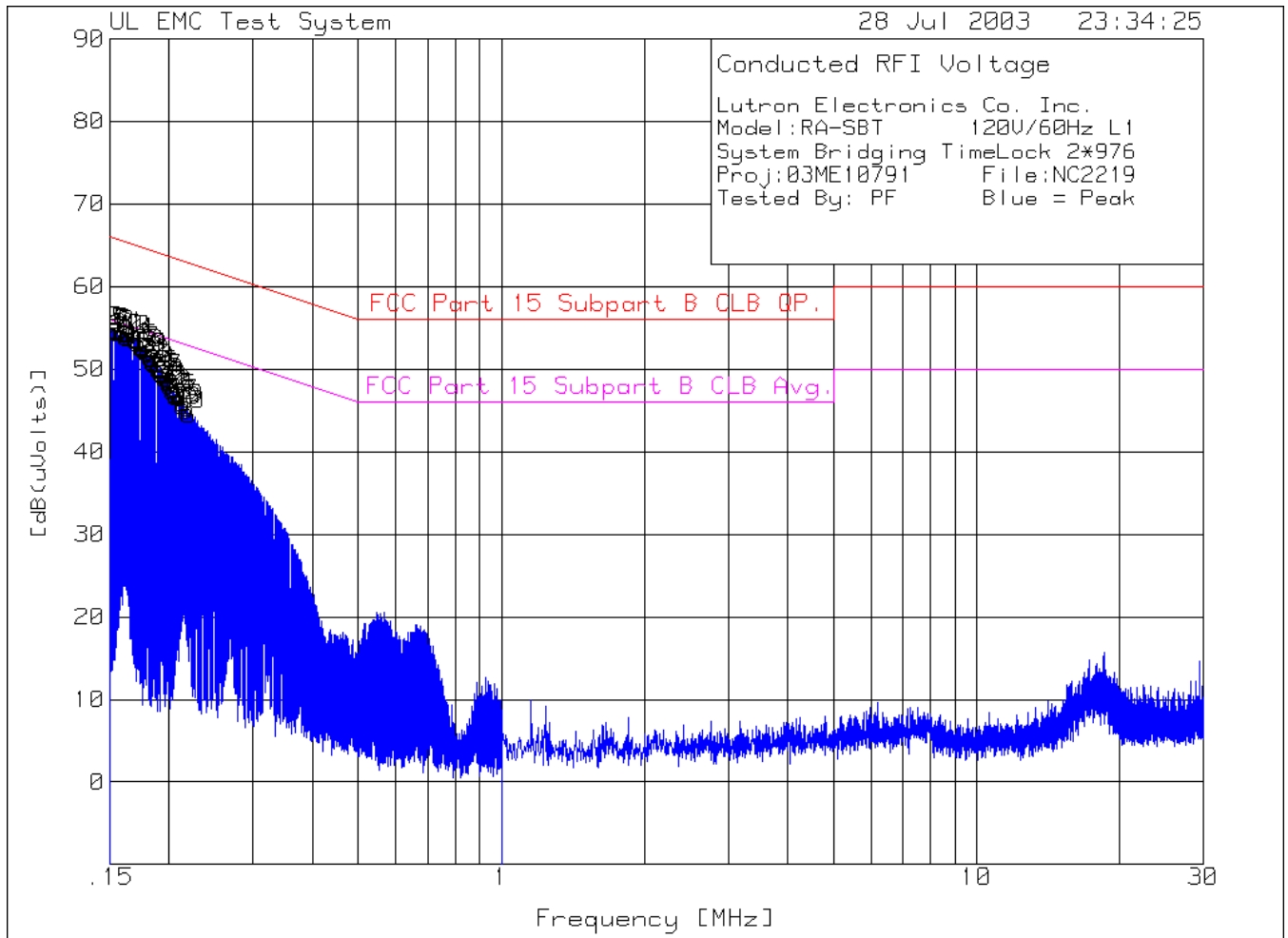
Test equipment used for conducted emissions:

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: 150K-30M	Last Calibration Date: 20 August 2002	Calibration Due Date: 20 August 2003	

11947A	Hewlett Packard	Transient Limiter	Equipment No.: ME5A-443
Last Calibration Date: 28 January 2003		Calibration Due Date: 28 January 2004	

9252-50-R-24-BNC	Solar Electronics	LISN	Equipment No.: ME5A-637
Last Calibration Date: 25 March 2003		Calibration Due Date: 25 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 2003		Calibration Due Date: 27 May 2004	



File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co. Inc.
 Model:RA-SBT 120V/60Hz L1
 System Bridging TimeLock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

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	.15113	44.58 pk	10.1	0	54.68	65.9	55.9
				Margin [dB]		-11.22	-1.22
2	.15227	44.48 pk	10.1	0	54.58	65.9	55.9
				Margin [dB]		-11.32	-1.32
3	.15482	44.59 pk	10.1	0	54.69	65.7	55.7
				Margin [dB]		-11.01	-1.01
4	.15595	44.31 pk	10.1	0	54.41	65.7	55.7
				Margin [dB]		-11.29	-1.29
5	.15822	44.42 pk	10.1	0	54.52	65.6	55.6
				Margin [dB]		-11.08	-1.08
6	.15949	44.24 pk	10.1	0	54.34	65.5	55.5
				Margin [dB]		-11.16	-1.16
7	.16077	44.15 pk	10.1	0	54.25	65.4	55.4
				Margin [dB]		-11.15	-1.15
8	.1619	43.85 pk	10.1	0	53.95	65.4	55.4
				Margin [dB]		-11.45	-1.45
9	.16304	44.09 pk	10.1	0	54.19	65.3	55.3
				Margin [dB]		-11.11	-1.11
10	.16361	43.6 pk	10.1	0	53.7	65.3	55.3
				Margin [dB]		-11.6	-1.6
11	.16531	43.84 pk	10.1	0	53.94	65.2	55.2
				Margin [dB]		-11.26	-1.26
12	.16899	43.49 pk	10.1	0	53.59	65	55
				Margin [dB]		-11.41	-1.41
13	.17012	43.39 pk	10.1	0	53.49	65	55
				Margin [dB]		-11.51	-1.51
14	.17239	43.09 pk	10.1	0	53.19	64.8	54.8
				Margin [dB]		-11.61	-1.61
15	.17494	42.39 pk	10.1	0	52.49	64.7	54.7
				Margin [dB]		-12.21	-2.21
16	.17608	42.33 pk	10.1	0	52.43	64.7	54.7
				Margin [dB]		-12.27	-2.27

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 System Bridging TimeLock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
17	.17721	42.15 pk	10.1	0	52.25	64.6	54.6
				Margin [dB]		-12.35	-2.35
18	.18004	41.83 pk	10.1	0	51.93	64.5	54.5
				Margin [dB]		-12.57	-2.57
19	.18259	41.28 pk	10.1	0	51.38	64.4	54.4
				Margin [dB]		-13.02	-3.02
20	.18373	41.27 pk	10.1	0	51.37	64.3	54.3
				Margin [dB]		-12.93	-2.93
21	.1843	40.79 pk	10.1	0	50.89	64.3	54.3
				Margin [dB]		-13.41	-3.41
22	.186	40.5 pk	10.1	0	50.6	64.2	54.2
				Margin [dB]		-13.6	-3.6
23	.18968	39.91 pk	10.1	0	50.01	64.1	54.1
				Margin [dB]		-14.09	-4.09
24	.19195	39.41 pk	10.1	0	49.51	64	54
				Margin [dB]		-14.49	-4.49

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No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
25	.19308	39.28 pk	10.1	0	49.38	63.9	53.9
				Margin [dB]		-14.52	-4.52
26	.19563	38.87 pk	10.1	0	48.97	63.8	53.8
				Margin [dB]		-14.83	-4.83
27	.1979	38.8 pk	10.1	0	48.9	63.7	53.7
				Margin [dB]		-14.8	-4.8
28	.19903	38.27 pk	10.1	0	48.37	63.7	53.7
				Margin [dB]		-15.33	-5.33
29	.20017	37.91 pk	10.1	0	48.01	63.6	53.6
				Margin [dB]		-15.59	-5.59
30	.20272	37.33 pk	10.1	0	47.43	63.5	53.5
				Margin [dB]		-16.07	-6.07
31	.20499	37.45 pk	10.1	0	47.55	63.4	53.4
				Margin [dB]		-15.85	-5.85
32	.20612	36.88 pk	10.1	0	46.98	63.4	53.4
				Margin [dB]		-16.42	-6.42
33	.20725	36.5 pk	10.1	0	46.6	63.3	53.3
				Margin [dB]		-16.7	-6.7
34	.2098	36.46 pk	10.1	0	46.56	63.2	53.2
				Margin [dB]		-16.64	-6.64
35	.21094	36.33 pk	10.1	0	46.43	63.2	53.2
				Margin [dB]		-16.77	-6.77
36	.2132	35.54 pk	10.1	0	45.64	63.1	53.1
				Margin [dB]		-17.46	-7.46
37	.21434	35.76 pk	10.1	0	45.86	63	53
				Margin [dB]		-17.14	-7.14
38	.21689	34.86 pk	10.1	0	44.96	62.9	52.9
				Margin [dB]		-17.94	-7.94
39	.21916	35.1 pk	10.1	0	45.2	62.9	52.9
				Margin [dB]		-17.7	-7.7
40	.22029	34.39 pk	10.1	0	44.49	62.8	52.8
				Margin [dB]		-18.31	-8.31

LIMIT 1: FCC Part 15 Subpart B CLB QP.
 LIMIT 2: FCC Part 15 Subpart B CLB 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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 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	[dB(uVolts)]		
Range: 1 .15 - 1MHz						
.15232	10.81	avem	10.1	0	20.91	65.9 55.9
				Margin [dB]:		-44.99 -34.99
.15218	10.75	avem	10.1	0	20.85	65.9 55.9
				Margin [dB]:		-45.05 -35.05
.15437	11.24	avem	10.1	0	21.34	65.8 55.8
				Margin [dB]:		-44.46 -34.46
.15443	11.29	avem	10.1	0	21.39	65.8 55.8
				Margin [dB]:		-44.41 -34.41
.15764	13.31	avem	10.1	0	23.41	65.6 55.6
				Margin [dB]:		-42.19 -32.19
.15901	14.35	avem	10.1	0	24.45	65.5 55.5
				Margin [dB]:		-41.05 -31.05
.1596	14.95	avem	10.1	0	25.05	65.5 55.5
				Margin [dB]:		-40.45 -30.45
.16017	15.31	avem	10.1	0	25.41	65.5 55.5
				Margin [dB]:		-40.09 -30.09
.16108	15.19	avem	10.1	0	25.29	65.4 55.4
				Margin [dB]:		-40.11 -30.11
.16194	14.92	avem	10.1	0	25.02	65.4 55.4
				Margin [dB]:		-40.38 -30.38
.16347	13.91	avem	10.1	0	24.01	65.3 55.3
				Margin [dB]:		-41.29 -31.29
.16701	11.02	avem	10.1	0	21.12	65.1 55.1
				Margin [dB]:		-43.98 -33.98
.16818	10.44	avem	10.1	0	20.54	65 55
				Margin [dB]:		-44.46 -34.46
.17018	9.83	avem	10.1	0	19.93	65 55
				Margin [dB]:		-45.07 -35.07
.17279	9.65	avem	10.1	0	19.75	64.8 54.8
				Margin [dB]:		-45.05 -35.05
.17394	9.37	avem	10.1	0	19.47	64.8 54.8
				Margin [dB]:		-45.33 -35.33
.17497	9.33	avem	10.1	0	19.43	64.7 54.7
				Margin [dB]:		-45.27 -35.27
.17787	8.92	avem	10.1	0	19.02	64.6 54.6
				Margin [dB]:		-45.58 -35.58
.18092	8.53	avem	10.1	0	18.63	64.4 54.4
				Margin [dB]:		-45.77 -35.77
.18168	8.57	avem	10.1	0	18.67	64.4 54.4
				Margin [dB]:		-45.73 -35.73
.18229	8.46	avem	10.1	0	18.56	64.4 54.4
				Margin [dB]:		-45.84 -35.84
.18493	8.35	avem	10.1	0	18.45	64.3 54.3
				Margin [dB]:		-45.85 -35.85
.18778	7.74	avem	10.1	0	17.84	64.1 54.1
				Margin [dB]:		-46.26 -36.26
.18984	7.56	avem	10.1	0	17.66	64 54

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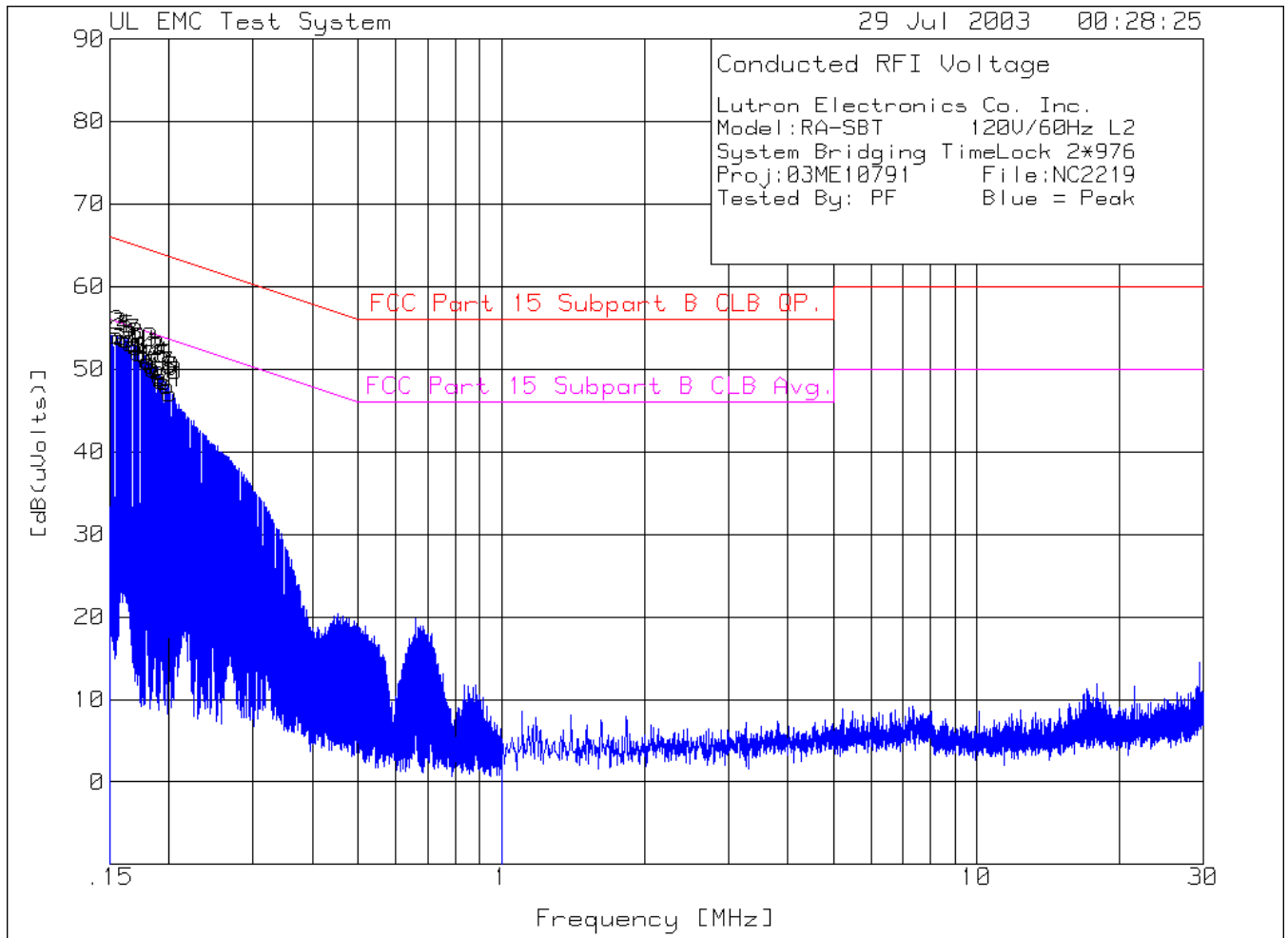
Issued: 26 August 2003

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	[dB(uVolts)]		
.19088	7.35 avem	10.1	0	17.45	64	54
			Margin [dB]:		-46.55	-36.55
.19383	6.88 avem	10.1	0	16.98	63.9	53.9
			Margin [dB]:		-46.92	-36.92
.19607	6.65 avem	10.1	0	16.75	63.8	53.8
			Margin [dB]:		-47.05	-37.05
.19694	6.69 avem	10.1	0	16.79	63.7	53.7
			Margin [dB]:		-46.91	-36.91
.19811	6.64 avem	10.1	0	16.74	63.7	53.7
			Margin [dB]:		-46.96	-36.96
.20078	6.22 avem	10.1	0	16.32	63.6	53.6
			Margin [dB]:		-47.28	-37.28
.20297	6.05 avem	10.1	0	16.15	63.5	53.5
			Margin [dB]:		-47.35	-37.35
.20399	6.12 avem	10.1	0	16.22	63.4	53.4
			Margin [dB]:		-47.18	-37.18
.20514	6.08 avem	10.1	0	16.18	63.4	53.4
			Margin [dB]:		-47.22	-37.22
.20818	6.25 avem	10.1	0	16.35	63.3	53.3
			Margin [dB]:		-46.95	-36.95
.20887	6.4 avem	10.1	0	16.5	63.3	53.3
			Margin [dB]:		-46.8	-36.8
.2115	8.05 avem	10.1	0	18.15	63.1	53.1
			Margin [dB]:		-44.95	-34.95
.21301	9.21 avem	10.1	0	19.31	63.1	53.1
			Margin [dB]:		-43.79	-33.79
.21505	9.64 avem	10.1	0	19.74	63	53
			Margin [dB]:		-43.26	-33.26
.21705	8.43 avem	10.1	0	18.53	62.9	52.9
			Margin [dB]:		-44.37	-34.37
.21831	7.23 avem	10.1	0	17.33	62.9	52.9
			Margin [dB]:		-45.57	-35.57

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 Subpart B CLB QP.
 LIMIT 2: FCC Part 15 Subpart B CLB Avg.



File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co. Inc.
 Model:RA-SBT 120V/60Hz L2
 System Bridging TimeLock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

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	.1517	44.01 pk	10.1	0	54.11	65.9	55.9
				Margin [dB]		-11.79	-1.79
2	.15539	44.02 pk	10.1	0	54.12	65.7	55.7
				Margin [dB]		-11.58	-1.58
3	.15765	43.76 pk	10.1	0	53.86	65.6	55.6
				Margin [dB]		-11.74	-1.74
4	.16134	43.55 pk	10.1	0	53.65	65.4	55.4
				Margin [dB]		-11.75	-1.75
5	.16361	43.45 pk	10.1	0	53.55	65.3	55.3
				Margin [dB]		-11.75	-1.75
6	.16587	43.04 pk	10.1	0	53.14	65.2	55.2
				Margin [dB]		-12.06	-2.06
7	.16842	42.93 pk	10.1	0	53.03	65	55
				Margin [dB]		-11.97	-1.97
8	.17069	42.57 pk	10.1	0	52.67	64.9	54.9
				Margin [dB]		-12.23	-2.23
9	.17296	41.9 pk	10.1	0	52	64.8	54.8
				Margin [dB]		-12.8	-2.8
10	.17551	41.87 pk	10.1	0	51.97	64.7	54.7
				Margin [dB]		-12.73	-2.73
11	.17778	41.58 pk	10.1	0	51.68	64.6	54.6
				Margin [dB]		-12.92	-2.92
12	.18004	40.79 pk	10.1	0	50.89	64.5	54.5
				Margin [dB]		-13.61	-3.61
13	.18146	40.91 pk	10.1	0	51.01	64.4	54.4
				Margin [dB]		-13.39	-3.39
14	.18486	40.31 pk	10.1	0	50.41	64.3	54.3
				Margin [dB]		-13.89	-3.89
15	.186	39.84 pk	10.1	0	49.94	64.2	54.2
				Margin [dB]		-14.26	-4.26
16	.18855	39.95 pk	10.1	0	50.05	64.1	54.1
				Margin [dB]		-14.05	-4.05
17	.19081	39.09 pk	10.1	0	49.19	64	54
				Margin [dB]		-14.81	-4.81
18	.19308	38.53 pk	10.1	0	48.63	63.9	53.9
				Margin [dB]		-15.27	-5.27
19	.19563	38.42 pk	10.1	0	48.52	63.8	53.8
				Margin [dB]		-15.28	-5.28
20	.1979	37.89 pk	10.1	0	47.99	63.7	53.7
				Margin [dB]		-15.71	-5.71
21	.20017	36.95 pk	10.1	0	47.05	63.6	53.6
				Margin [dB]		-16.55	-6.55

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co. Inc.
 Model:RA-SBT 120V/60Hz L2
 System Bridging TimeLock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	[dB(uVolts)]		
=====						
Range: 1 .15 - 1MHz						
.15171	10.4 avem	10.1	0	20.5	65.9	55.9
			Margin [dB]:		-45.4	-35.4
.15468	10.63 avem	10.1	0	20.73	65.7	55.7
			Margin [dB]:		-44.97	-34.97
.15702	11.87 avem	10.1	0	21.97	65.6	55.6
			Margin [dB]:		-43.63	-33.63
.15944	13.52 avem	10.1	0	23.62	65.5	55.5
			Margin [dB]:		-41.88	-31.88
.16189	13.7 avem	10.1	0	23.8	65.4	55.4
			Margin [dB]:		-41.6	-31.6
.16395	12.29 avem	10.1	0	22.39	65.3	55.3
			Margin [dB]:		-42.91	-32.91
.1663	10.46 avem	10.1	0	20.56	65.1	55.1
			Margin [dB]:		-44.54	-34.54
.16866	9.9 avem	10.1	0	20	65	55
			Margin [dB]:		-45	-35
.17088	9.3 avem	10.1	0	19.4	64.9	54.9
			Margin [dB]:		-45.5	-35.5
.17364	8.81 avem	10.1	0	18.91	64.8	54.8
			Margin [dB]:		-45.89	-35.89
.17576	8.59 avem	10.1	0	18.69	64.7	54.7
			Margin [dB]:		-46.01	-36.01
.17824	8.34 avem	10.1	0	18.44	64.6	54.6
			Margin [dB]:		-46.16	-36.16
.17948	8.24 avem	10.1	0	18.34	64.5	54.5
			Margin [dB]:		-46.16	-36.16
.18293	7.93 avem	10.1	0	18.03	64.4	54.4
			Margin [dB]:		-46.37	-36.37
.18391	7.7 avem	10.1	0	17.8	64.3	54.3
			Margin [dB]:		-46.5	-36.5
.18659	7.35 avem	10.1	0	17.45	64.2	54.2
			Margin [dB]:		-46.75	-36.75
.1887	7.2 avem	10.1	0	17.3	64.1	54.1
			Margin [dB]:		-46.8	-36.8
.19087	7.02 avem	10.1	0	17.12	64	54
			Margin [dB]:		-46.88	-36.88

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co. Inc.
 Model:RA-SBT 120V/60Hz L2
 System Bridging TimeLock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: PF Blue = Peak

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2
Frequency [MHz]	Reading [dB(uV)]	Factor [dB]	Factor [dB]	[dB(uVolts)]		
.19377	6.71 avem	10.1	0	16.81	63.9	53.9
			Margin [dB]:		-47.09	-37.09
.19588	6.55 avem	10.1	0	16.65	63.8	53.8
			Margin [dB]:		-47.15	-37.15
.19799	6.34 avem	10.1	0	16.44	63.7	53.7
			Margin [dB]:		-47.26	-37.26

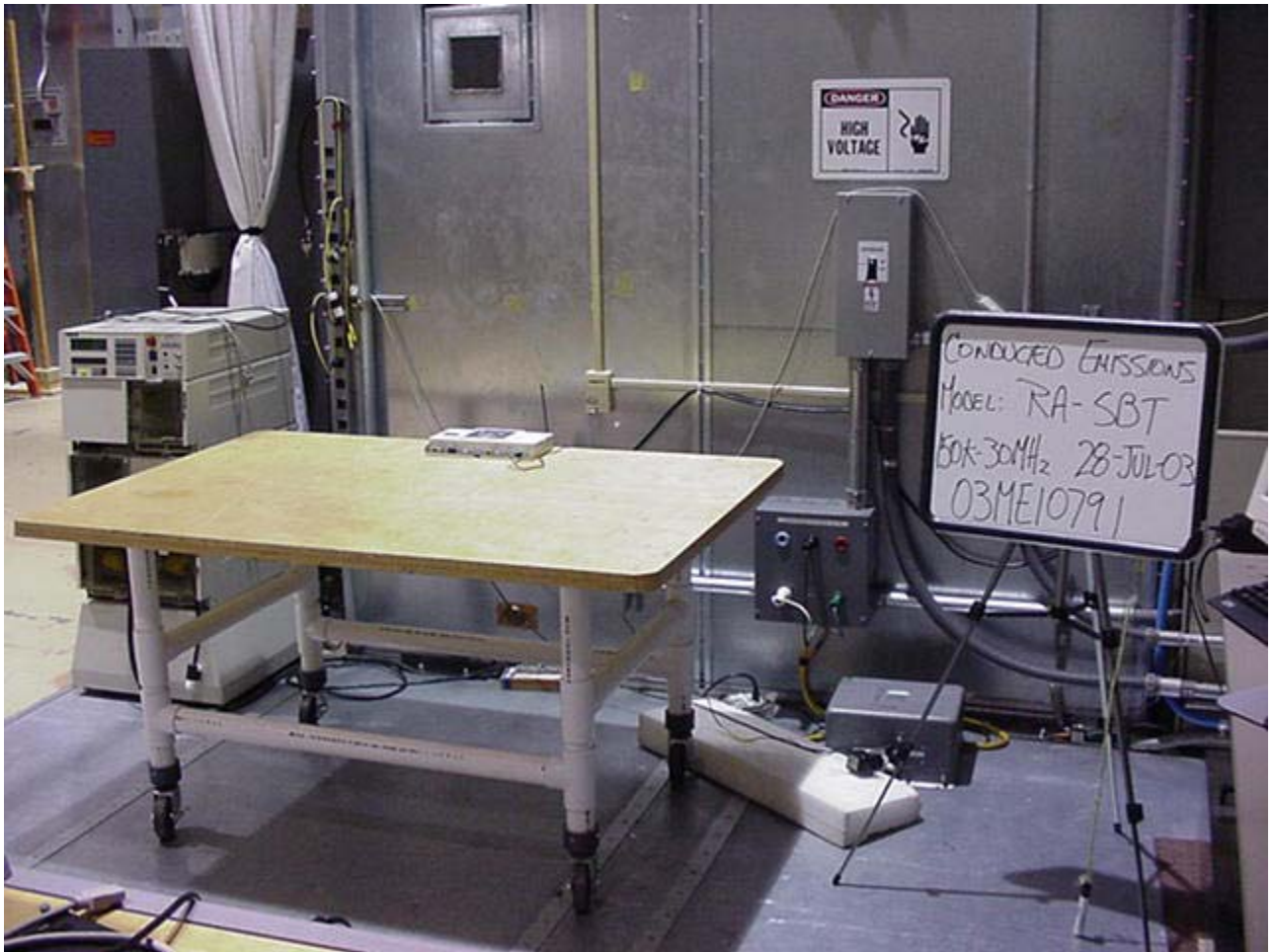
NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

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 Subpart B CLB QP.
 LIMIT 2: FCC Part 15 Subpart B CLB Avg.



Conducted Emission Test Set-up



Conducted Emission Test Set-up

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 the EUT to transmit a single one time upon activating a test button on the EUT.

Test equipment used for Cease Operation measurements:

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

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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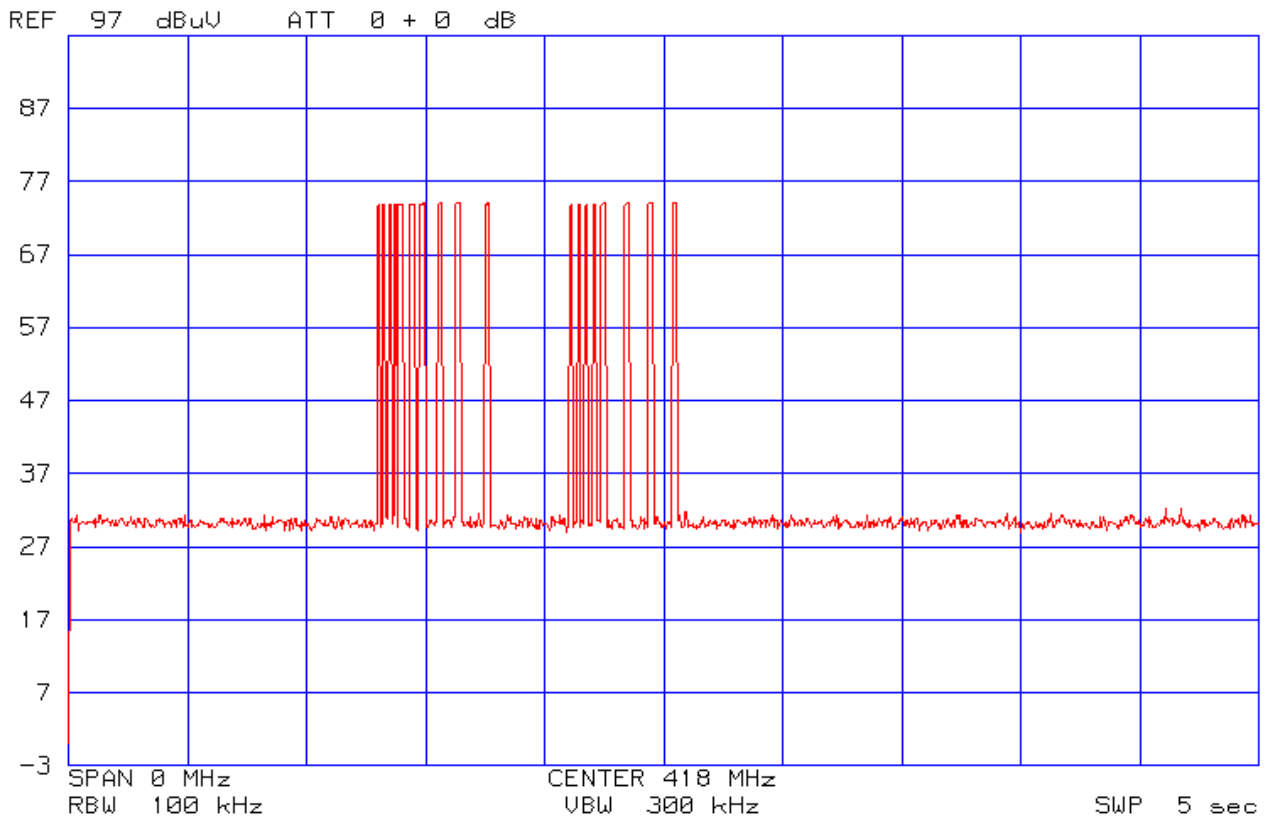
Ranges: Temp:0°C-55°C

Humidity 25% to 95 %RH

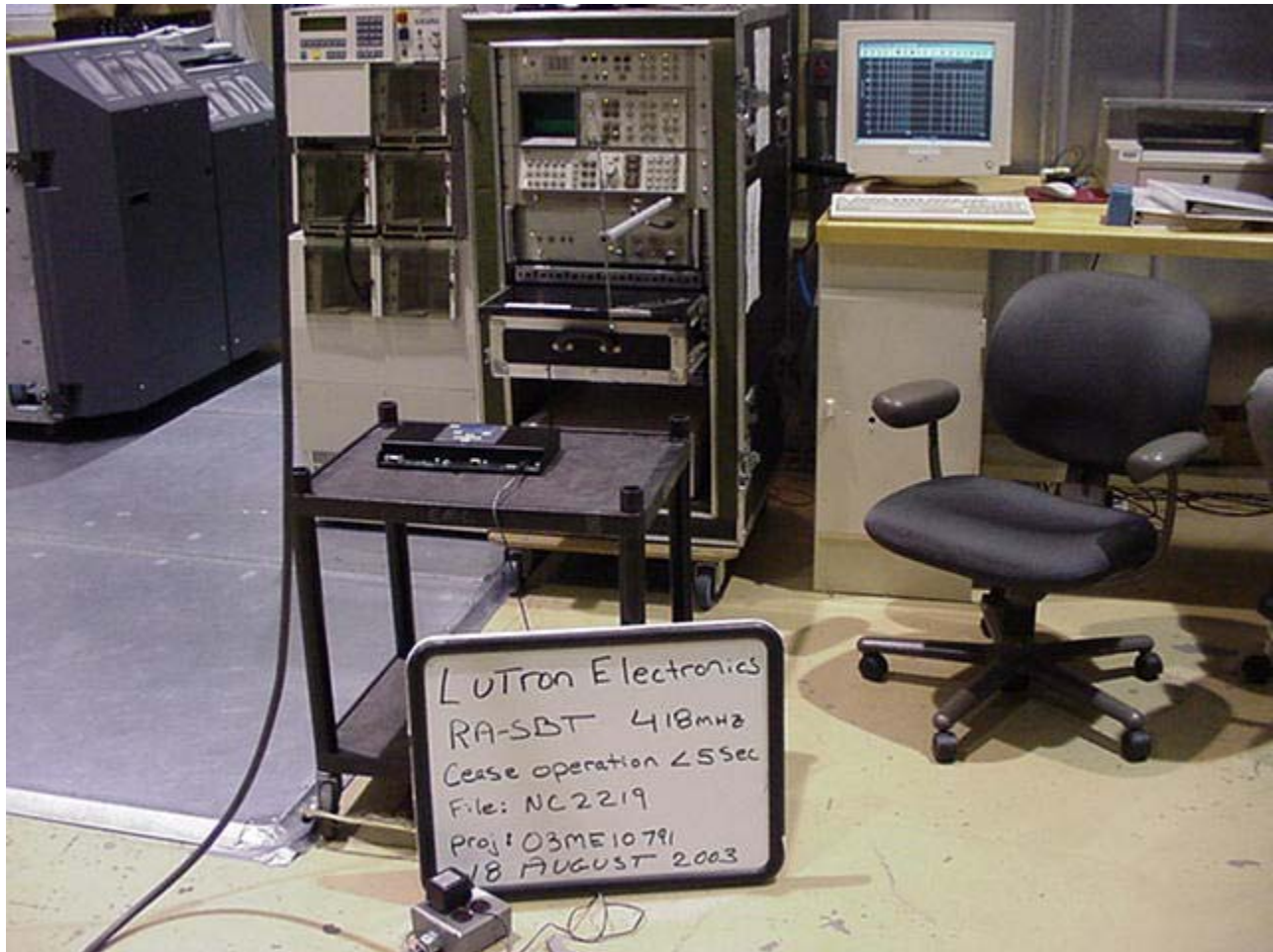
Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 2002

Calibration Due Date: 27 May 2004.



Cease Operation in less than 5 seconds



Cease Operation in Less Than 5 seconds Test Set-Up

Radiated Emissions Test (10 Meter Semi-Anechoic Chamber)

Test Applicable

Temperature: 21.0 °C
Humidity: 67 %RH
Pressure: 997 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
418 MHz Transmit
407.223 MHz Receive Mode

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

Test equipment used for final radiated emissions tests:

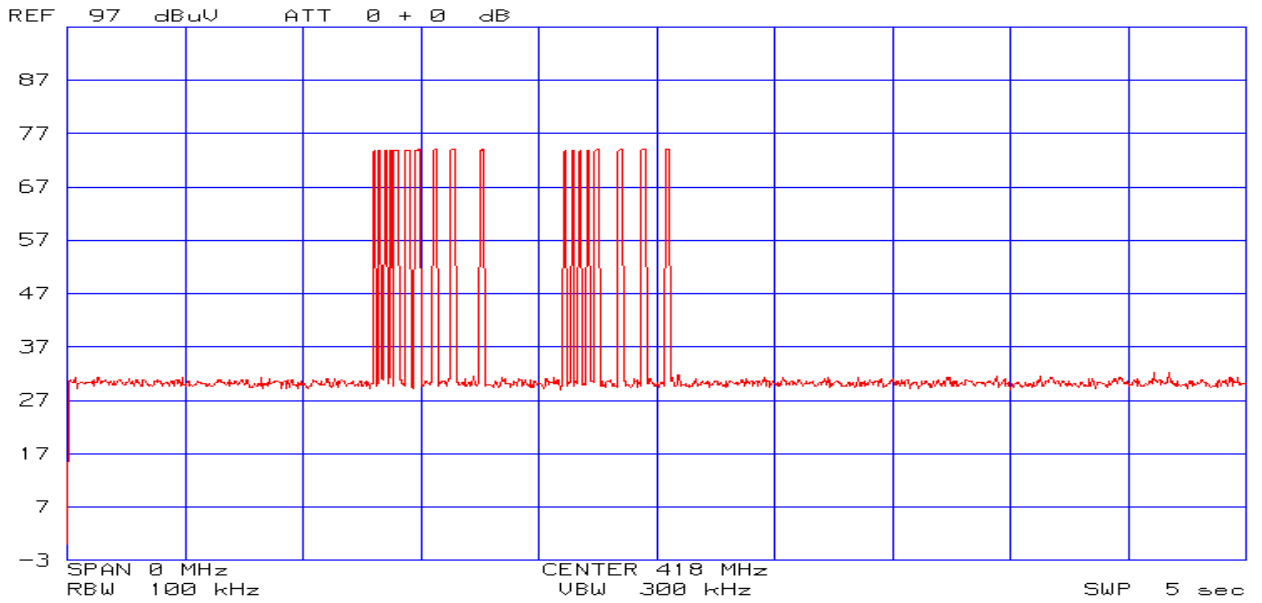
ESI26	Rhode & Schwartz	EMI Receiver	Equipment No.: ME5B-081
		Quasi Peak BW:	200Hz
		RBW	10 KHz
		Quasi Peak BW:	9kHz
		RBW	100 KHz
		Quasi Peak BW:	120 kHz
		RBW	1.0 MHz
Range: 30M- 5GHz	Last Calibration Date: 20 August 2002	Calibration Due Date: 20 August 2003	

Test Accessories for Radiated Emissions:

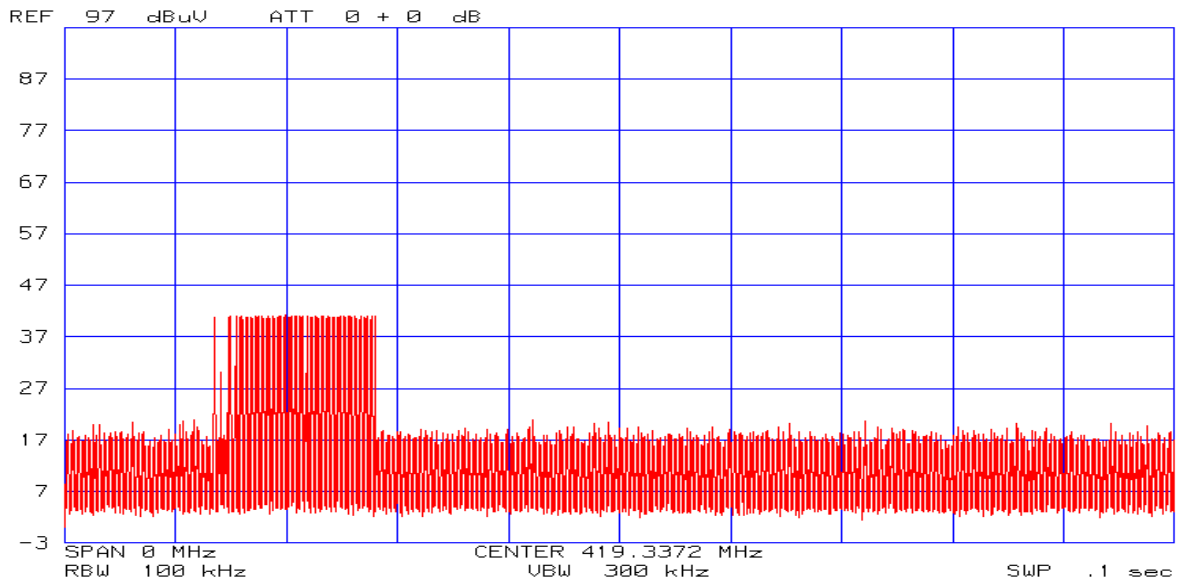
94455-1	Ailtech	Biconnical Antenna	Equipment No.: ME5-439
Last Calibration Date: 15 November 2002		Calibration Due Date: 15 November 2003	
3146	EMCO	Log Periodic Antenna	Equipment No.: ME5-451
Last Calibration Date: 21 November 2002		Calibration Due Date: 15 November 2003	
RGA-180	EMCO	Horn Antenna	Equipment 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	

Paragraph 15.35: Pulse Train Measurements

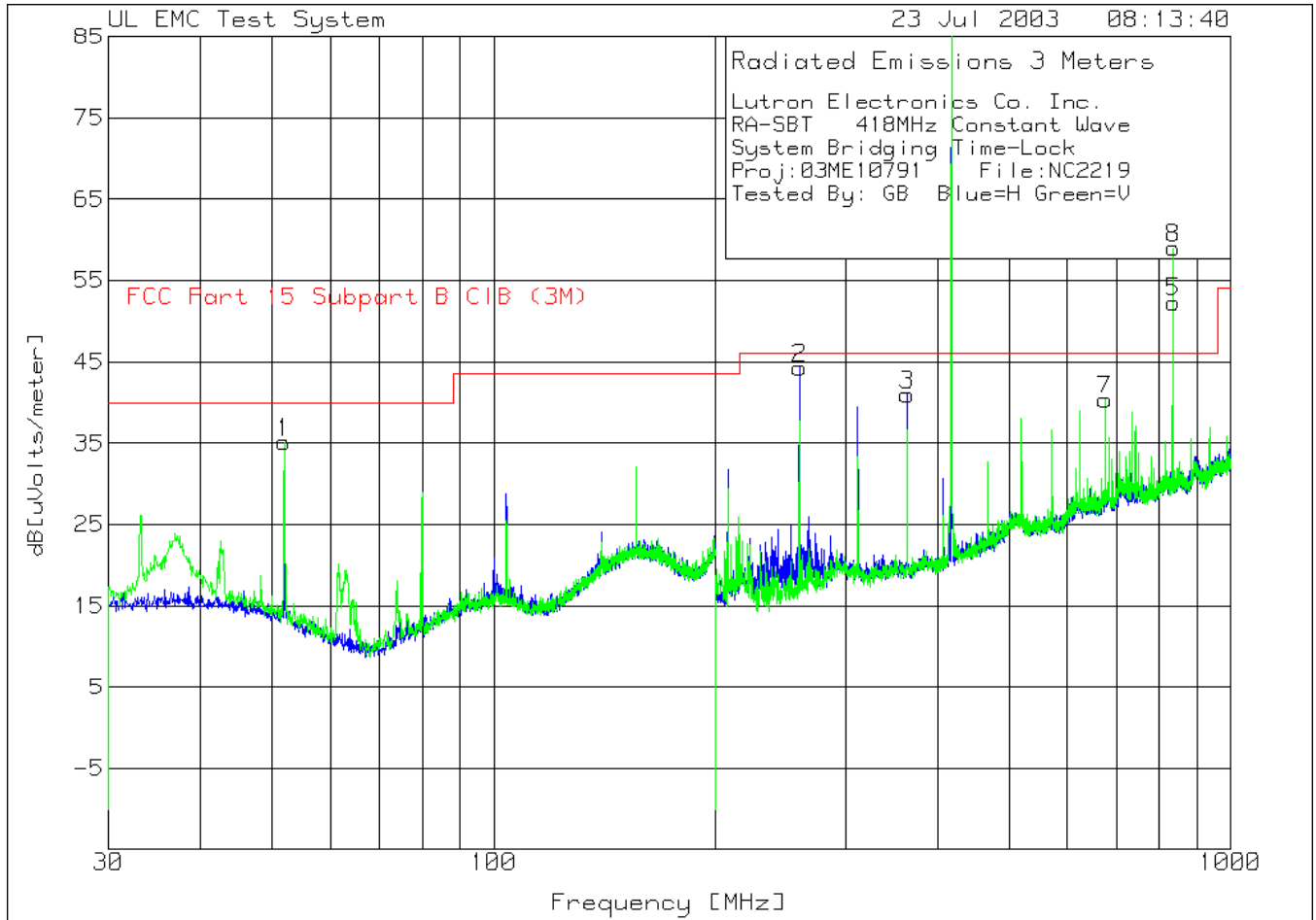
When the Radiated Limits are expressed in terms of the average value of the emissions, and pulse operation is employed, the pulse measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds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



Pulse train = 500 ms



One Pulse Less than 100ms including blanking intervals.



30-1000MHz Transmit Frequency 418MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co. Inc.
 RA-SBT 418MHz Constant Wave
 System Bridging Time-Lock
 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 -----
 1 51.941 23.41 pk 1 10.7 35.11 40 60.3
 Azimuth:56 Height:101 Vert Margin [dB] -4.89 -25.19

Horizontal 200 - 1000MHz -----
 2 260.02 29.75 pk 2.2 12.3 44.25 46 60.3
 Azimuth:73 Height:100 Horz Margin [dB] -1.75 -16.05

3 364.0547 24.06 pk 2.7 14.2 40.96 46 60.3
 Azimuth:176 Height:100 Horz Margin [dB] -5.04 -19.34

4 417.9393 *59.82 Avg 3.1 15.3 *78.22 46 80.3
 Azimuth:235 Height:100 Horz Margin [dB] 48.22 -2.08

5 836.2121 25.93 pk 4.3 22.1 52.33 46 60.3
 Azimuth:246 Height:100 Horz Margin [dB] 6.33 -7.97

Vertical 200 - 1000MHz -----
 6 417.9393 *56.71 Avg 3.1 15.3 *75.11 46 80.3
 Azimuth:341 Height:199 Vert Margin [dB] 45.11 -5.19

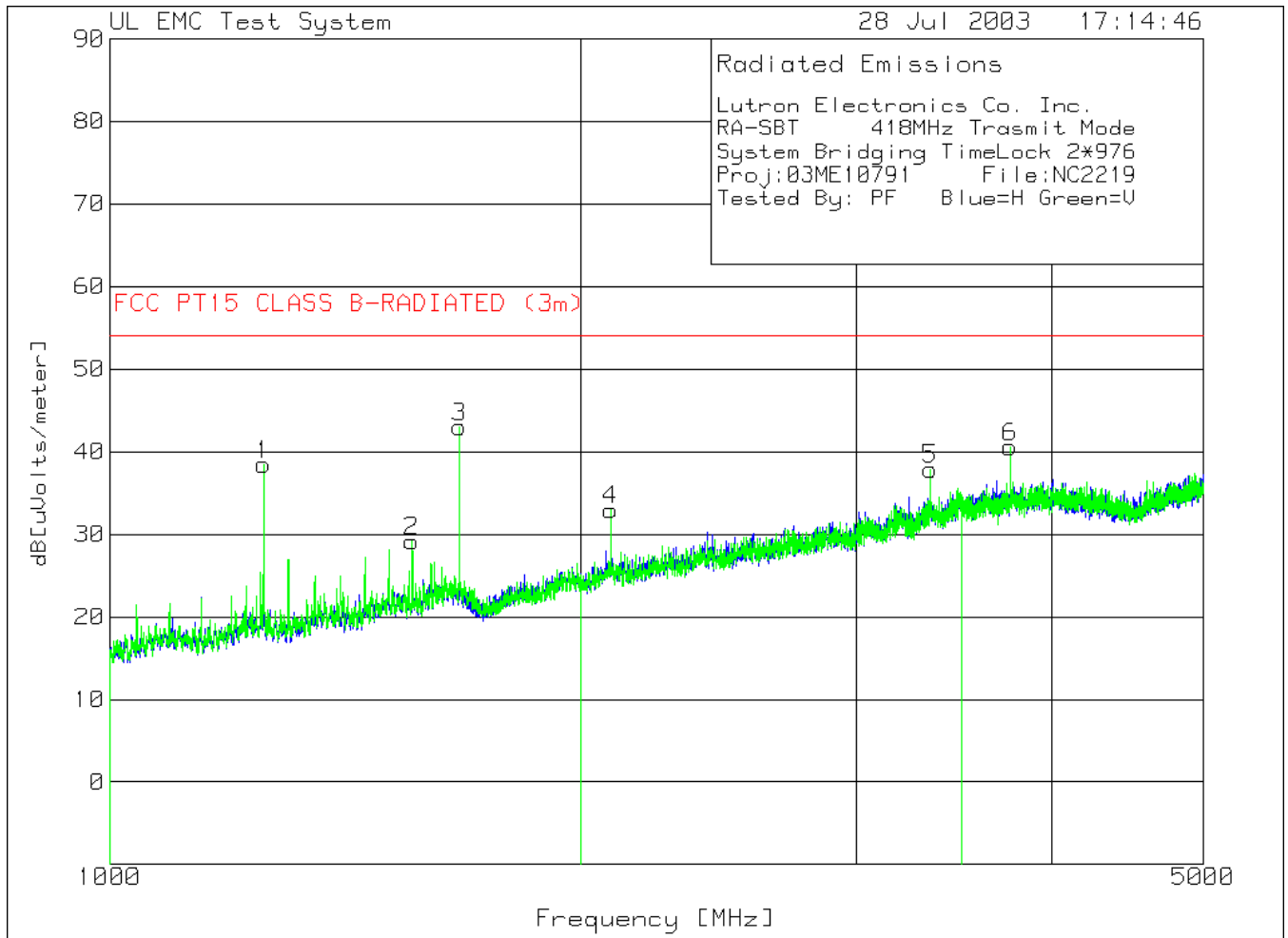
7 675.892 16.06 pk 3.9 20.4 40.36 46 60.3
 Azimuth:352 Height:100 Vert Margin [dB] -5.64 -19.94

8 836.2121 32.58 pk 4.3 22.1 58.98 46 60.3
 Azimuth:302 Height:100 Vert Margin [dB] 12.98 -1.32

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 418MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

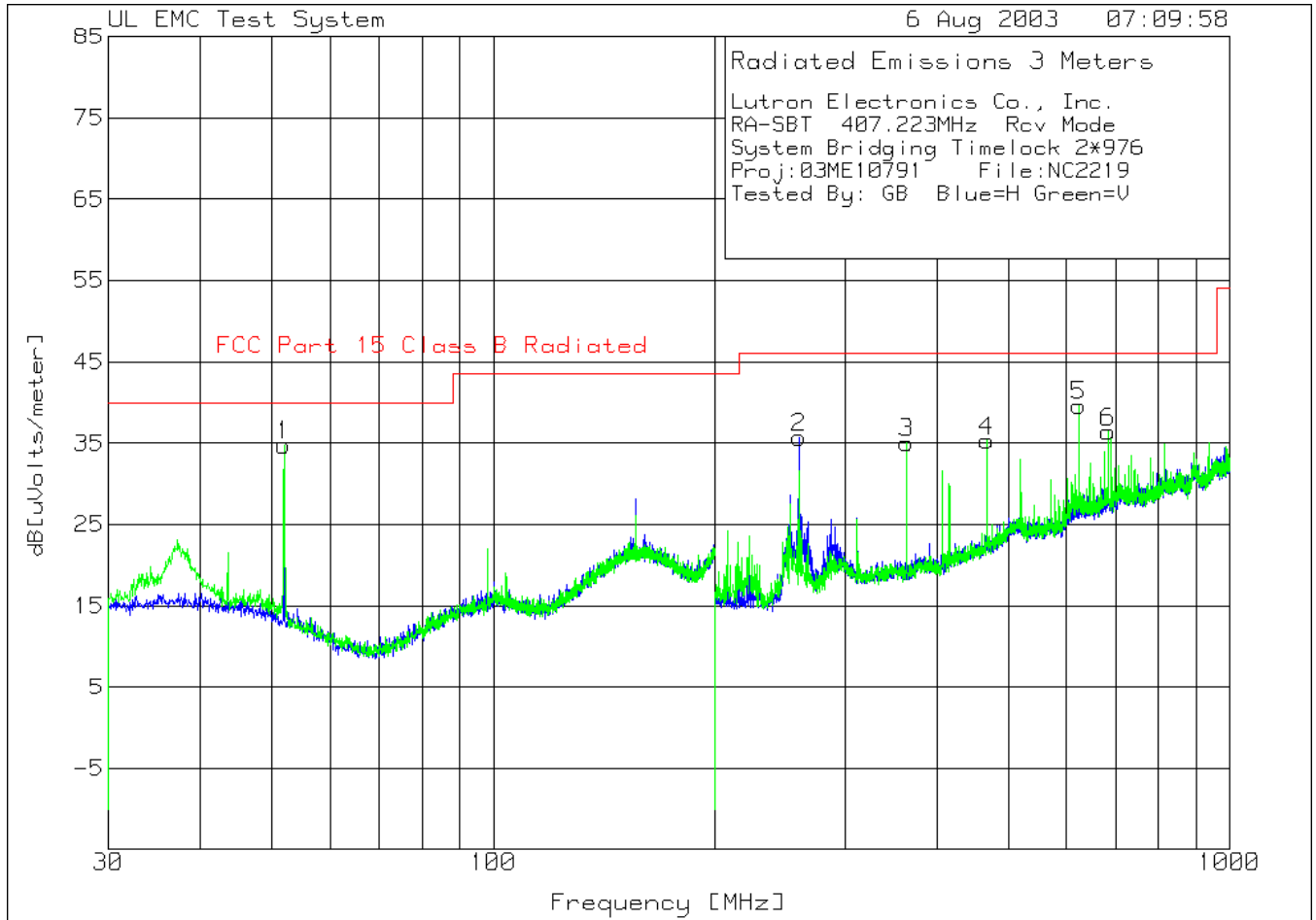
Issued: 26 August 2003

Lutron Electronics Co. Inc.
 RA-SBT 418MHz Transmit Mode
 System Bridging TimeLock 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



30-1000MHz Receive Mode Frequency 407.223MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co., Inc.
 RA-SBT 407.223MHz Rcv Mode
 System Bridging Timelock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: GB Blue=H Green=V
 Test Meter Gain/Loss Transducer Level Limit:1
 No. Frequency Reading Factor Factor dB[uVolts/meter]
 [MHz] [dB(uV)] [dB] [dB]

Vertical 30 - 200MHz -----
 1 51.941 23.05 pk 1 10.7 34.75 40
 Azimuth:291 Height:100 Vert Margin [dB] -5.25

Horizontal 200 - 1000MHz -----
 2 260.02 21.1 pk 2.3 12.3 35.7 46
 Azimuth:19 Height:101 Horz Margin [dB] -10.3

Vertical 200 - 1000MHz -----
 3 364.0547 18.16 pk 2.7 14.2 35.06 46
 Azimuth:358 Height:198 Vert Margin [dB] -10.94
 4 468.0894 15.61 pk 3.1 16.6 35.31 46
 Azimuth:176 Height:101 Vert Margin [dB] -10.69
 5 623.8746 16.28 pk 3.7 19.6 39.58 46
 Azimuth:358 Height:101 Vert Margin [dB] -6.42
 6 683.0944 11.6 pk 3.9 20.9 36.4 46
 Azimuth:190 Height:101 Vert Margin [dB] -9.6

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: RA-SBT
FCC ID: JPZ0026

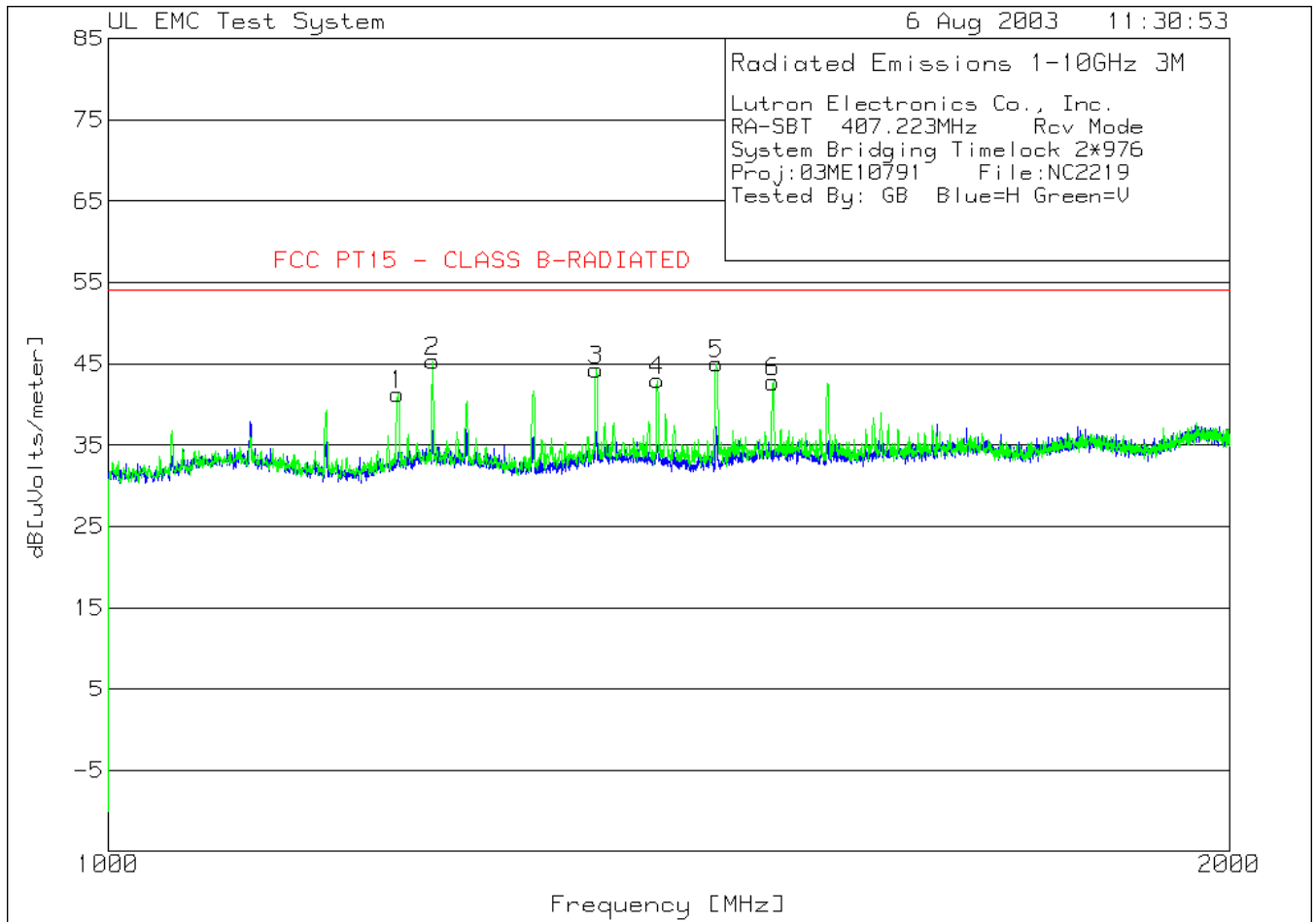
Issued: 26 August 2003

Lutron Electronics Co., Inc.
RA-SBT 407.223MHz Rcv Mode
System Bridging Timelock 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]		
=====					
Vertical 30 - 200MHz					
52	23 qp	1	10.6	34.6	40
Azimuth: 96	Height:104	Vert		Margin [dB]:	-5.4
Horizontal 200 - 1000MHz					
260.0122	16.86 qp	2.3	12.3	31.46	46
Azimuth: 184	Height:100	Horz		Margin [dB]:	-14.54
Vertical 200 - 1000MHz					
364.0066	19.67 qp	2.7	14.2	36.57	46
Azimuth: 301	Height:141	Vert		Margin [dB]:	-9.43
467.9944	12.83 qp	3.1	16.6	32.53	46
Azimuth: 321	Height:126	Vert		Margin [dB]:	-13.47
624.012	17.78 qp	3.7	19.6	41.08	46
Azimuth: 326	Height:105	Vert		Margin [dB]:	-4.92
683.3031	13.38 qp	3.9	20.9	38.18	46
Azimuth: 316	Height:102	Vert		Margin [dB]:	-7.82

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



Radiated Emissions 1000 to 2000MHz Receive Mode 407.22 MHz

File Number: NC2219
 Project Number: 03ME10791
 Model Number: RA-SBT
 FCC ID: JPZ0026

Issued: 26 August 2003

Lutron Electronics Co., Inc.
 RA-SBT 407.223MHz Rcv Mode
 System Bridging Timelock 2*976
 Proj:03ME10791 File:NC2219
 Tested By: GB Blue=H Green=V

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

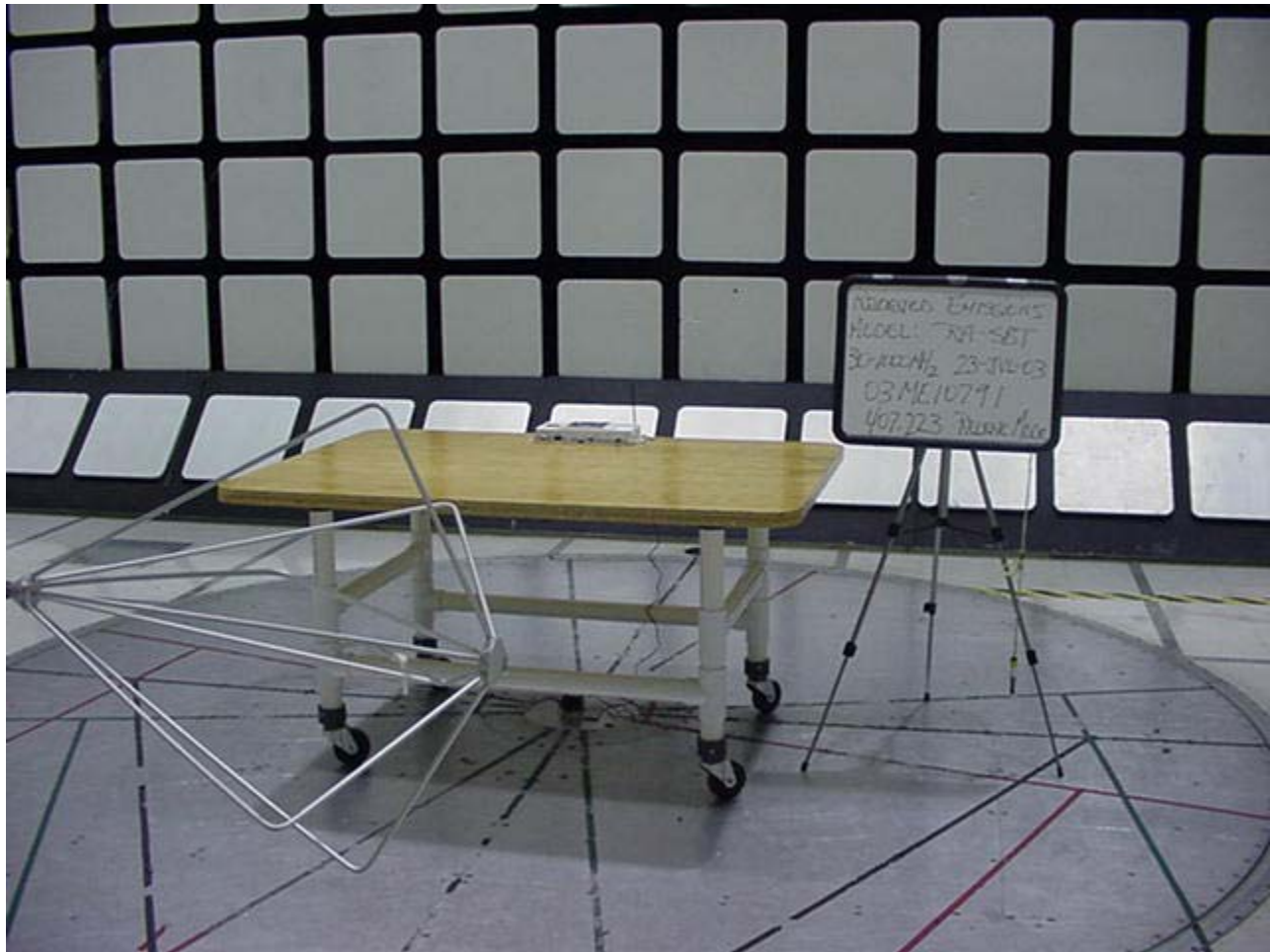
Vertical 1000 - 2000MHz -----						
1	1195.732	47.19 pk	-31.5	25.6	41.29	54
	Azimuth:193	Height:101 Vert		Margin [dB]		-12.71
2	1222.074	51.04 pk	-31.4	25.7	45.34	54
	Azimuth:303	Height:101 Vert		Margin [dB]		-8.66
3	1351.784	49.08 pk	-31	26.2	44.28	54
	Azimuth:331	Height:101 Vert		Margin [dB]		-9.72
4	1404.135	47.46 pk	-30.9	26.4	42.96	54
	Azimuth:331	Height:101 Vert		Margin [dB]		-11.04
5	1456.485	49.2 pk	-30.7	26.5	45	54
	Azimuth:20	Height:101 Vert		Margin [dB]		-9
6	1508.169	46.67 pk	-30.6	26.7	42.77	54
	Azimuth:20	Height:101 Vert		Margin [dB]		-11.23

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

File Number: NC2219
Project Number: 03ME10791
Model Number: RA-SBT
FCC ID: JPZ0026

Issued: 26 August 2003



Radiated Emissions Test Set-Up



Radiated Emissions Test Set-Up



Radiated Emissions Test Set-Up



Radiated Emissions Test Set-Up

2.1.3 Occupied Bandwidth

Test Applicable

Temperature: 20.5 °C
Humidity: 51 RH
Pressure: 1003 mbar
Date test performed: 29 July 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.

418MHz

Bandwidth = 0.25% of 418MHz = 1.045MHz

Test equipment used for Occupied Bandwidth Measurements:

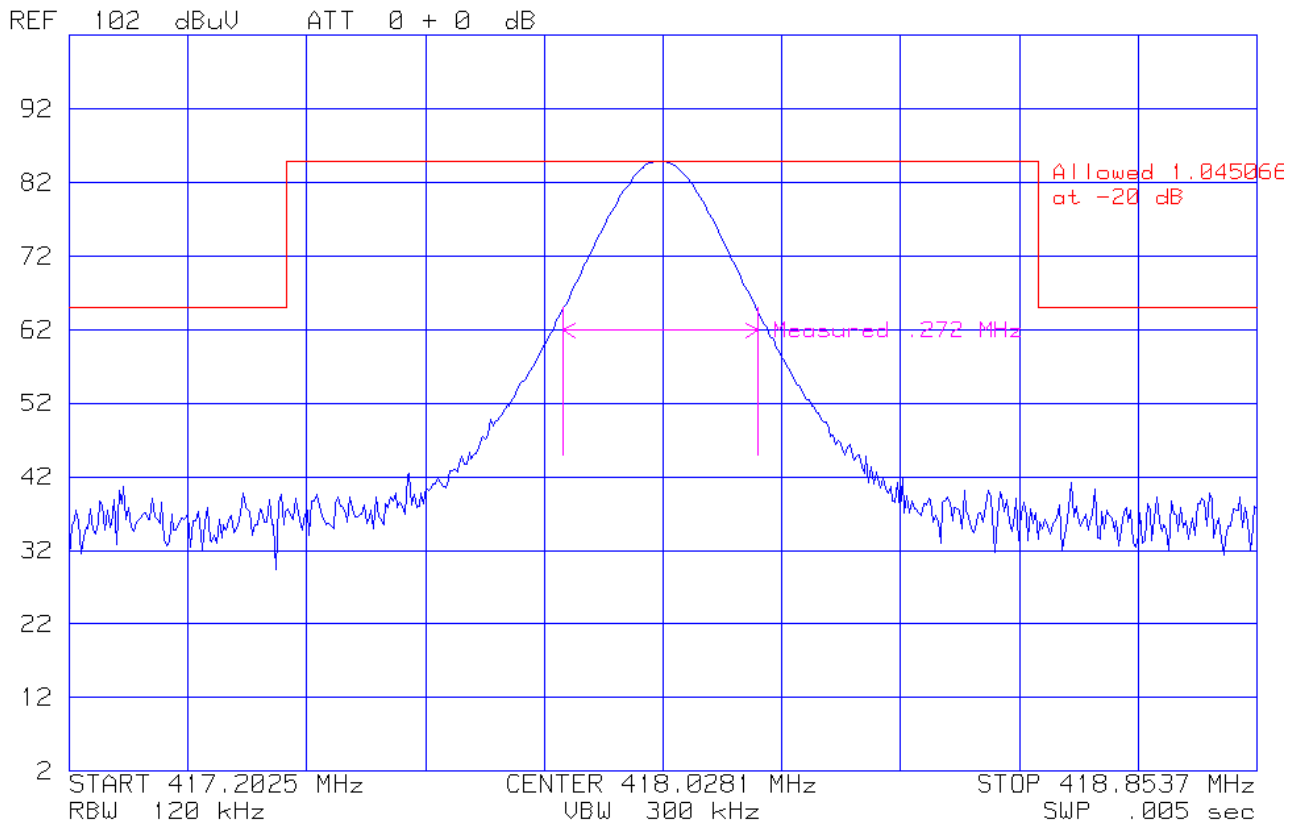
ESI26	Rhode & Schwartz	EMI Receiver	Equipment No.: ME5B-081
		Quasi Peak BW:	9kHz to 150kHz
		RBW	10 KHz
		Quasi Peak BW:	150kHz to 30MHz
		RBW	100 KHz
		Quasi Peak BW:	30 to 1000MHz
		RBW	1.0 MHz

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
3146	EMCO	Log Periodic Antenna	Equipment No.: ME5-451
			Last Calibration Date: 21 November 02 Calibration Due Date: 21 November 03
8449B	Hewlett 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 0.272 MHz



Occupied Bandwidth Test Set-up

2.1.6 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation

Fundamental Frequency is 418MHz

From table in section 15.231

Limit = $41.6667(418) - 7083.3333$

Limit = 10333.348uV

Limit = $\text{Log } 10333.348 (20)$

Limit = 80.3dBuV

Limit for Spurious Emissions = 20dB lower then fundamental = 60.3dBuV/m

Radiated Emissions Limit conversion from $\mu\text{V}/\text{m}$ to $\text{dB}\mu\text{V}/\text{m}$ (accordance with paragraph 15.109)

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

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

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

Radiated Emissions test data obtained during measurements.

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

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

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

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

3.0 SUMMARY:

The equipment under test has

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

Test Start Date: 7/28/03

Test Completion Date: 8/19/03

- UNDERWRITERS LABORATORIES, INC. -

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