

Underwriters Laboratories Inc.
1285 Walt Whitman Road
Melville, New York 11747-3081
(631) 271-6200

**Report of Measurements
Of Electromagnetic Compatibility Testing**

Test Report File No.:	NC2219	Date of issue: 6/18/2003
Applicant:	Lutron Electronics Co. Inc.	
Model:	STRD-7B	
Product Type:	Transceiver (431 to 437MHz)	
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:	03ME09392	
References(s)	FCC ID: JPZ0025	

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Report Directory

1.0	<i>GENERAL - Product Description</i>	3
1.1	Device Configuration During Test	4
1.2	Deviations from ANSI C63.4	5
1.3	Device Modifications Necessary for Compliance	5
1.4	Test Summary	5
1.5	FCC Labeling Information	6
2.0	<i>EMISSIONS TEST REGULATIONS</i>	6
2.1	EUT OPERATION MODE - EMISSIONS TESTS	6
2.1.2	Conducted Emissions	17
2.1.3	Cease Operation Within 5 Seconds	10
2.1.4	Radiated Emissions Test (10 Meter Semi-Anechoic Chamber)	20
2.1.5	Occupied Bandwidth	52
2.1.6	Fundamental Frequency and Spurious Emissions Measurement Limit Calculations	57
3	<i>SUMMARY:</i>	58

1.0 G E N E R A L - Product Description

Device Function: The STR Keypad is a wall mounted master control station. It contains an FM transceiver and an antenna, which is not accessible to the user. It is used as part of an integrated lighting control system. The purpose of the 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.

RF Function: The receiver down converts a 431-437MHz-carrier frequency using a 420.3-426.3MHz voltage-controlled oscillator producing a 10.7MHz IF signal. The signal is further processed to decode data. The transmitter uses the voltage-controlled oscillator, which is frequency modulated, and power amplifier to produce the modulated carrier. The STR Keypad contains a micro controller running at 32MHz to ensure that all transmissions stop within 5 seconds of a button release or within 5 seconds on the beginning of a transmission. A transmission shall automatically cease within 5 seconds after activation. The ceasing of the transmission is accomplished via the micro-controller. Modulation is FM, sometimes referred to as Frequency Shift Keyed (FSK), data at 62.5kbps. The antenna cannot be easily modified or replaced by the user.

Analog Function: The STR Keypad 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:

Device Function: The STR Keypad is a wall mounted master control station. It contains an FM transceiver and an antenna, which is not accessible to the user. It is used as part of an integrated lighting control system. The purpose of the 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.

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Analog Function: The STR Keypad 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.

Device	Manufacturer	Model Number	Serial Number	FCC ID
Transceiver (keypad)	Lutron	STRD-7B	-----	JPZ0025

Cable	Manufacturer	Shielding	Shield Bonding	Type	Length (Feet)
Power	Linetek	no	-----	SJT LL90989 FT2	3

Note: The EUT was investigated and the orientation and position depicted in the report was deemed worst-case emissions.

"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

1.3 Device Modifications Necessary for Compliance

N/A

1.4 Test Summary

Test	Basic Standard	Considered	Tested	In Compliance
Conducted Voltage Emissions (Continuous Data Transmit Mode)	FCC Part 15 Subpart B, Class B. Paragraph 15.205	✓	✓	✓
Radiated Emissions	FCC Part 15 Subpart C, Class B, Intentional Radiators, Paragraph 15.209	✓	✓	✓
Radiated Emissions	FCC Part 15 Subpart B, Class B, Un-Intentional Radiators, Paragraph 15.109	✓	✓	✓
Cease Operation < 5 seconds	FCC Part 15 Subpart C, Paragraph 15.231	✓	✓	✓
Occupied Bandwidth	FCC Part 15 Subpart C, Paragraph 15.231	✓	✓	✓

1.5 FCC Labeling Information

Not Requested

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 RF communication was set to transmit and receive command signals. Transmitted commands allow the triggering of system events. Received commands allow for updating of control indicator status.

Test modes:

Button 3: listen @ 431 MHz (receive)

Button 4: listen @ 437 MHz (receive)

Button 5: constant packet transmit @ 431 MHz (TX time ~4mS with 45mS period)

Button 6: constant packet transmit @ 437 MHz (TX time ~4mS with 45mS period)

Button 7: one packet transmits @ 431 MHz (TX time ~4mS): This mode was utilized for cease operation.

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

2.1.2 Conducted Emissions Tests

Test Applicable

Temperature: 20.8 °C
Humidity: 65 %RH
Pressure: 1040 mbar
Date test performed: 27 June 03

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
		RBW	10 KHz
		Quasi Peak BW:	9kHz
		RBW	100 KHz
		Quasi Peak BW:	120 kHz
		RBW	1.0 MHz

Range: 150kHz –30MHz Last Calibration Date: 20 August 02 Calibration Due Date: 20 August 03

9252-50-R-24-BNC **Solar Electronics** **LISN** **Equipment No.: ME5A-636**

Last Calibration Date: 16 September 02 Calibration Due Date: 16 September 03

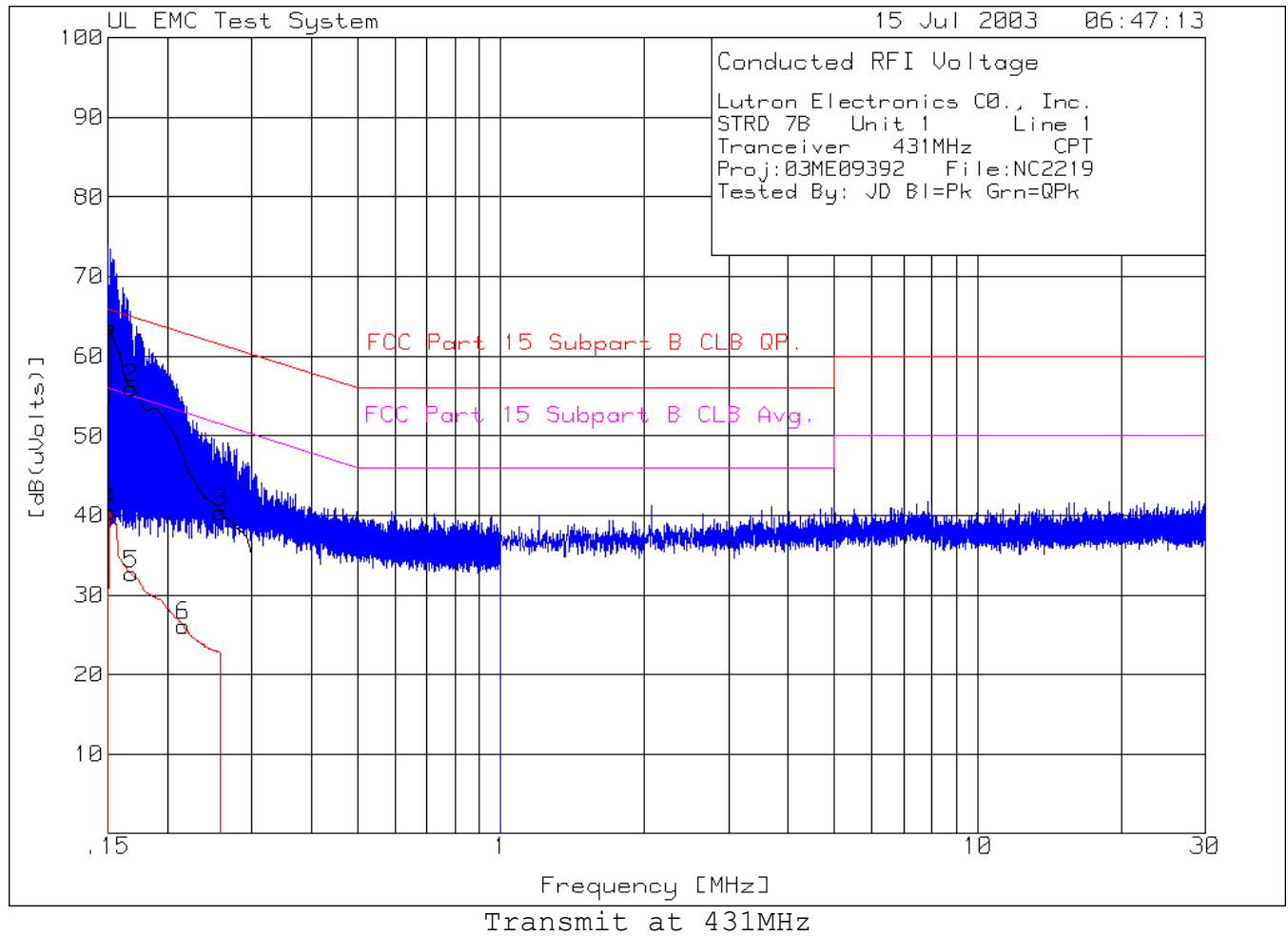
99760-00 **Cole –Parmer** **Hydrometer/Temp/Barometer** **Equipment No.: ME4-268**

Ranges: Temp:0°C-55°C

Humidity 25% to 95 %RH

Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 02 Calibration Due Date: 27 May 04



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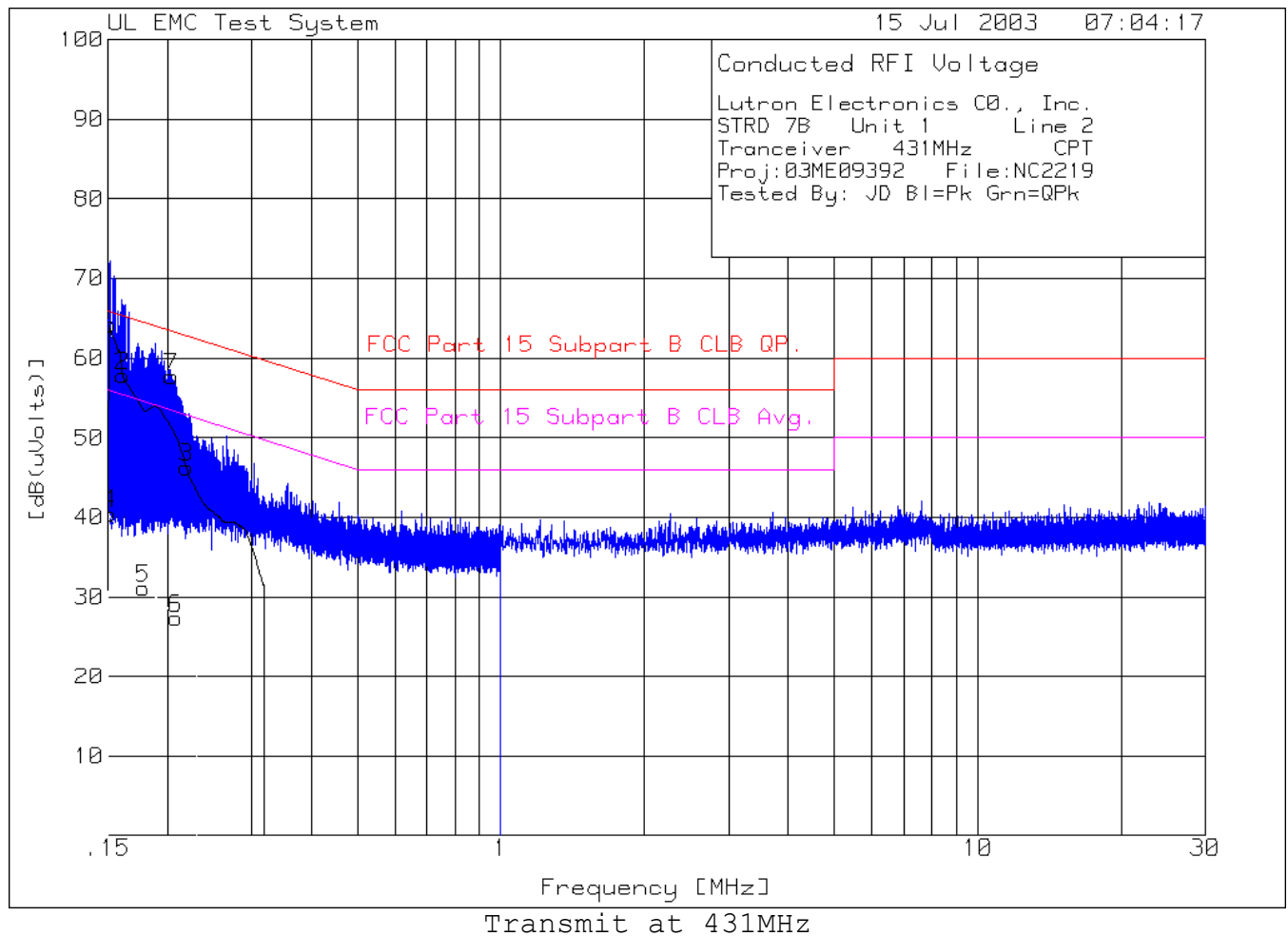
Issued: 6/18/2003

Lutron Electronics CO., Inc.
 STRD 7B Unit 1 Line 1
 Transceiver 431MHz CPT
 Proj:03ME09392 File:NC2219
 Tested By: JD Bl=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	.151	33.63 qp	10.1	20 Margin [dB]	63.73	65.9 -2.17	55.9 7.83
2	.168	25.91 qp	10.1	20 Margin [dB]	56.01	65.1 -9.09	55.1 .91
3	.258	10.31 qp	10.1	20 Margin [dB]	40.41	61.5 -21.09	51.5 -11.09
4	.151	10.34 avem	10.1	20 Margin [dB]	40.44	65.9 -25.46	55.9 -15.46
5	.168	2.58 avem	10.1	20 Margin [dB]	32.68	65.1 -32.42	55.1 -22.42
6	.216	-3.96 avem	10.1	20 Margin [dB]	26.14	63 -36.86	53 -26.86

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



File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics CO., Inc.
 STRD 7B Unit 1 Line 2
 Transceiver 431MHz CPT
 Proj:03ME09392 File:NC2219
 Tested By: JD Bl=Pk Grn=QPk

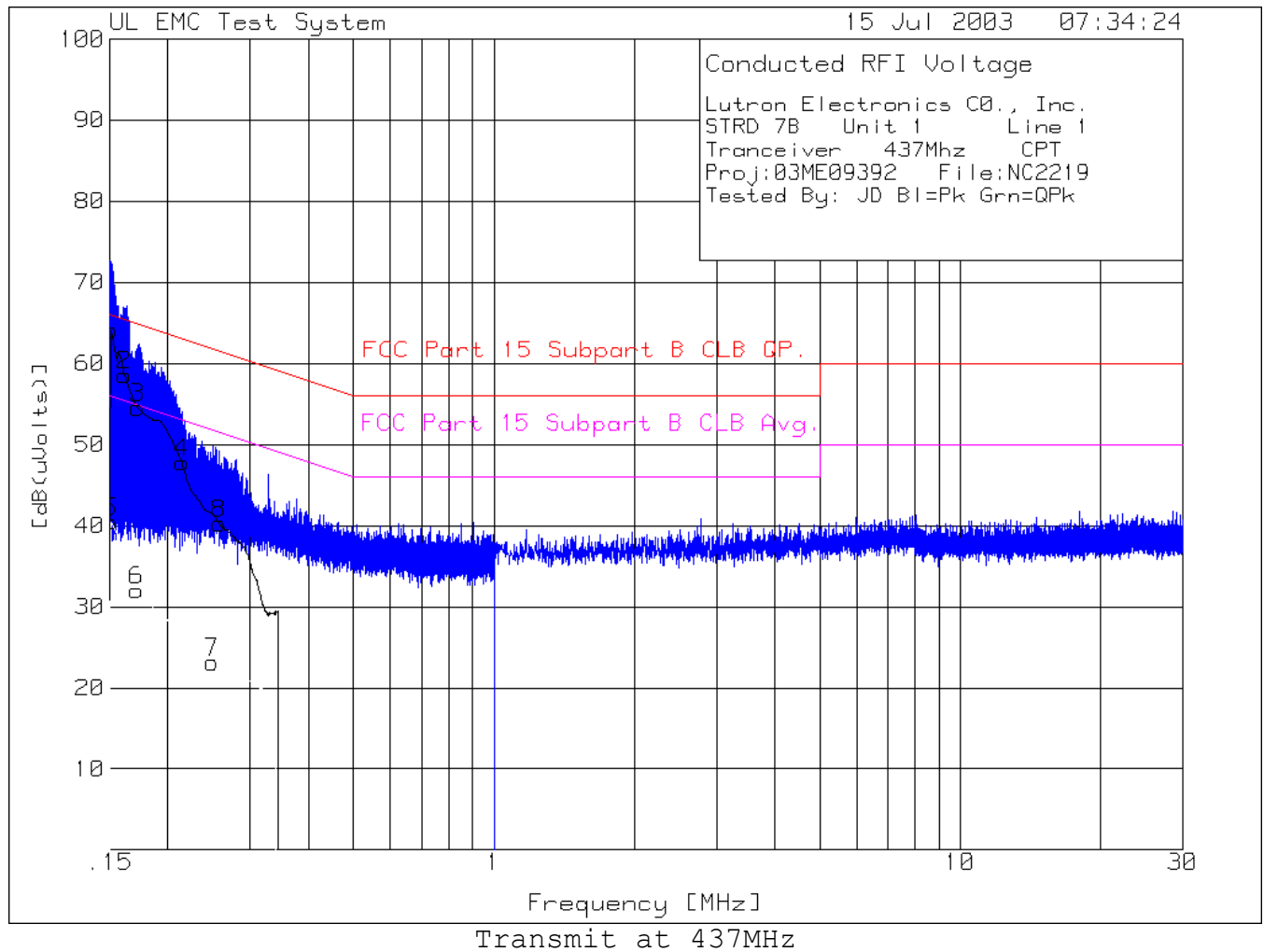
No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.151	34.11 qp	10.1	20 Margin [dB]	64.21	65.9 -1.69	55.9 8.31
2	.161	27.71 qp	10.1	20 Margin [dB]	57.81	65.4 -7.59	55.4 2.41
3	.219	16.16 qp	10.1	20 Margin [dB]	46.26	62.9 -16.64	52.9 -6.64
4	.151	10.34 avem	10.1	20 Margin [dB]	40.44	65.9 -25.46	55.9 -15.46
5	.178	.98 avem	10.1	20 Margin [dB]	31.08	64.6 -33.52	54.6 -23.52
6	.208	-2.75 avem	10.1	20 Margin [dB]	27.35	63.3 -35.95	53.3 -25.95

LIMIT 1: FCC Part 15 Subpart B CLB QP.
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File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
 Project Number: 03ME09392
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 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics CO., Inc.
 STRD 7B Unit 1 Line 1
 Transceiver 437Mhz CPT
 Proj:03ME09392 File:NC2219
 Tested By: JD Bl=Pk Grn=QPk

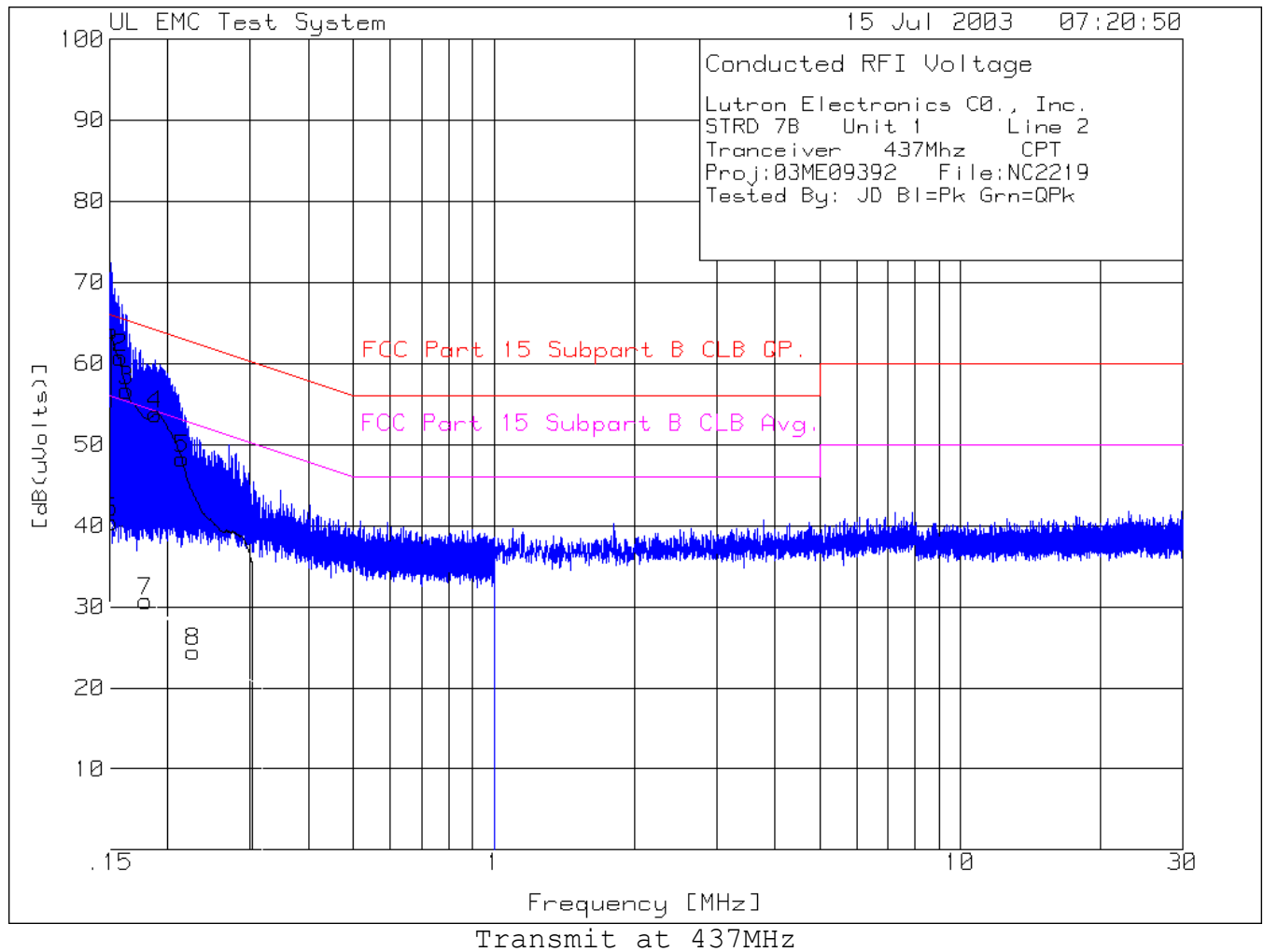
No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.151	33.98 qp	10.1	20	64.08	65.9	55.9
				Margin [dB]		-1.82	8.18
2	.161	28.49 qp	10.1	20	58.59	65.4	55.4
				Margin [dB]		-6.81	3.19
3	.172	24.44 qp	10.1	20	54.54	64.9	54.9
				Margin [dB]		-10.36	-.36
4	.214	17.71 qp	10.1	20	47.81	63	53
				Margin [dB]		-15.19	-5.19
5	.151	10.38 avem	10.1	20	40.48	65.9	55.9
				Margin [dB]		-25.42	-15.42
6	.171	1.94 avem	10.1	20	32.04	64.9	54.9
				Margin [dB]		-32.86	-22.86
7	.249	-6.95 avem	10.1	20	23.15	61.8	51.8
				Margin [dB]		-38.65	-28.65
8	.258	10.17 qp	10.1	20	40.27	61.5	51.5
				Margin [dB]		-21.23	-11.23

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics CO., Inc.
 STRD 7B Unit 1 Line 2
 Transceiver 437Mhz CPT
 Proj:03ME09392 File:NC2219
 Tested By: JD Bl=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	.151	33.89 qp	10.1	20 Margin [dB]	63.99	65.9 -1.91	55.9 8.09
2	.158	30.64 qp	10.1	20 Margin [dB]	60.74	65.6 -4.86	55.6 5.14
3	.163	26.56 qp	10.1	20 Margin [dB]	56.66	65.3 -8.64	55.3 1.36
4	.188	23.66 qp	10.1	20 Margin [dB]	53.76	64.1 -10.34	54.1 -.34
5	.214	18.16 qp	10.1	20 Margin [dB]	48.26	63 -14.74	53 -4.74
6	.151	10.34 avem	10.1	20 Margin [dB]	40.44	65.9 -25.46	55.9 -15.46
7	.179	.6 avem	10.1	20 Margin [dB]	30.7	64.5 -33.8	54.5 -23.8
8	.227	-5.63 avem	10.1	20 Margin [dB]	24.47	62.6 -38.13	52.6 -28.13

LIMIT 1: FCC Part 15 Subpart B CLB QP.
 LIMIT 2: FCC Part 15 Subpart B CLB Avg.

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File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



Conducted Emissions Test Set-Up 150k-30MHz

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

2.1.3 Cease Operation Within 5 Seconds

Test Applicable

Temperature: 21.8 °C
Humidity: 53%RH
Pressure: 998 mbar
Date test performed: 26 June 03

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	Equipment No.: 5B-123
Last Calibration Date: 25 January 2003 Calibration Due Date: 25 January 2004			

3121C-DB4	EMCO	Dipole Antenna	Equipment No.: ME-751
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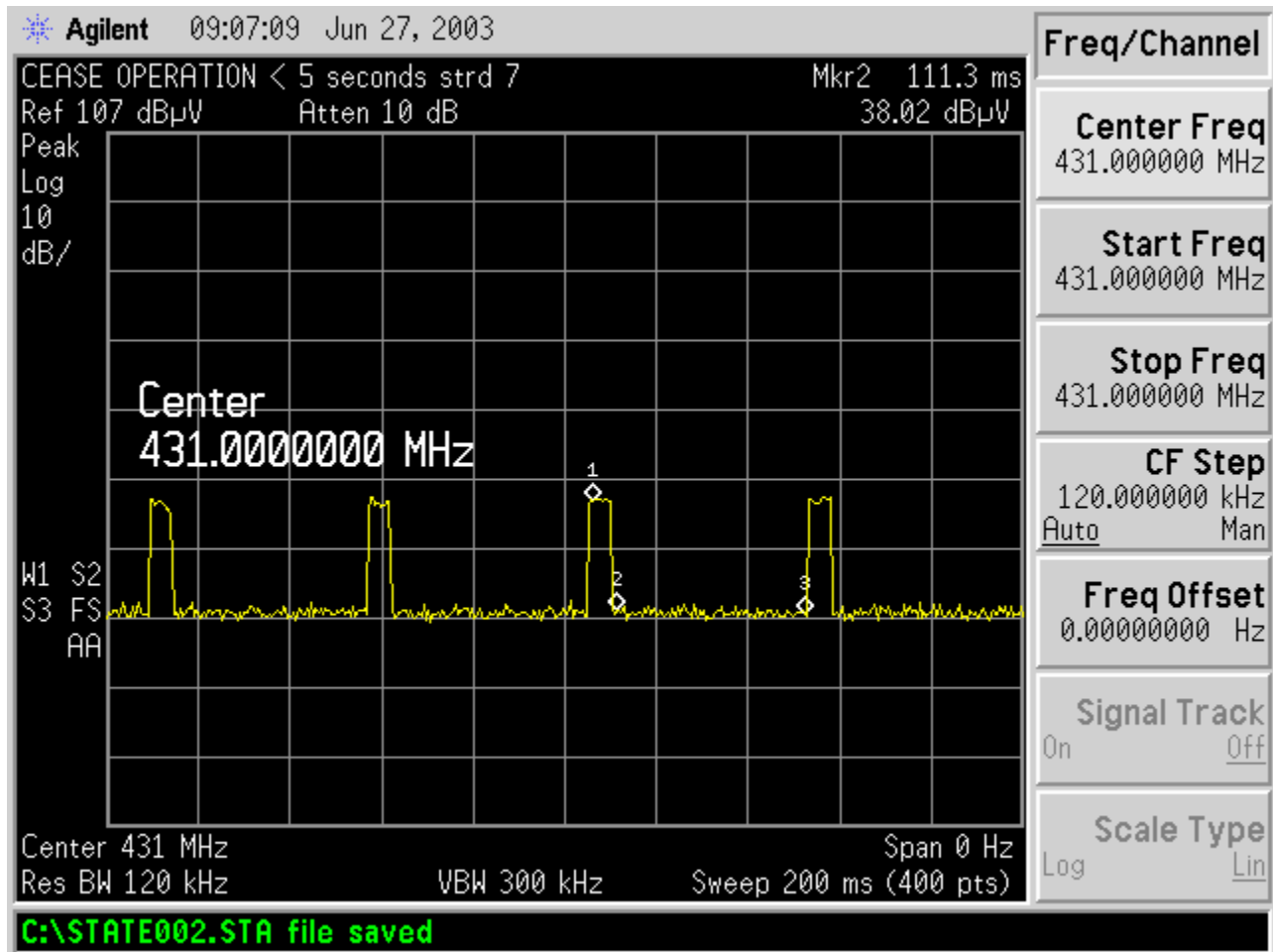
99760-00	Cole –Parmer	Hydrometer/Temp/Barometer	Equipment No.: ME4-268
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Ranges: Temp:0°C-55°C

Humidity 25% to 95 %RH

Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 02 Calibration Due Date: 27 May 04

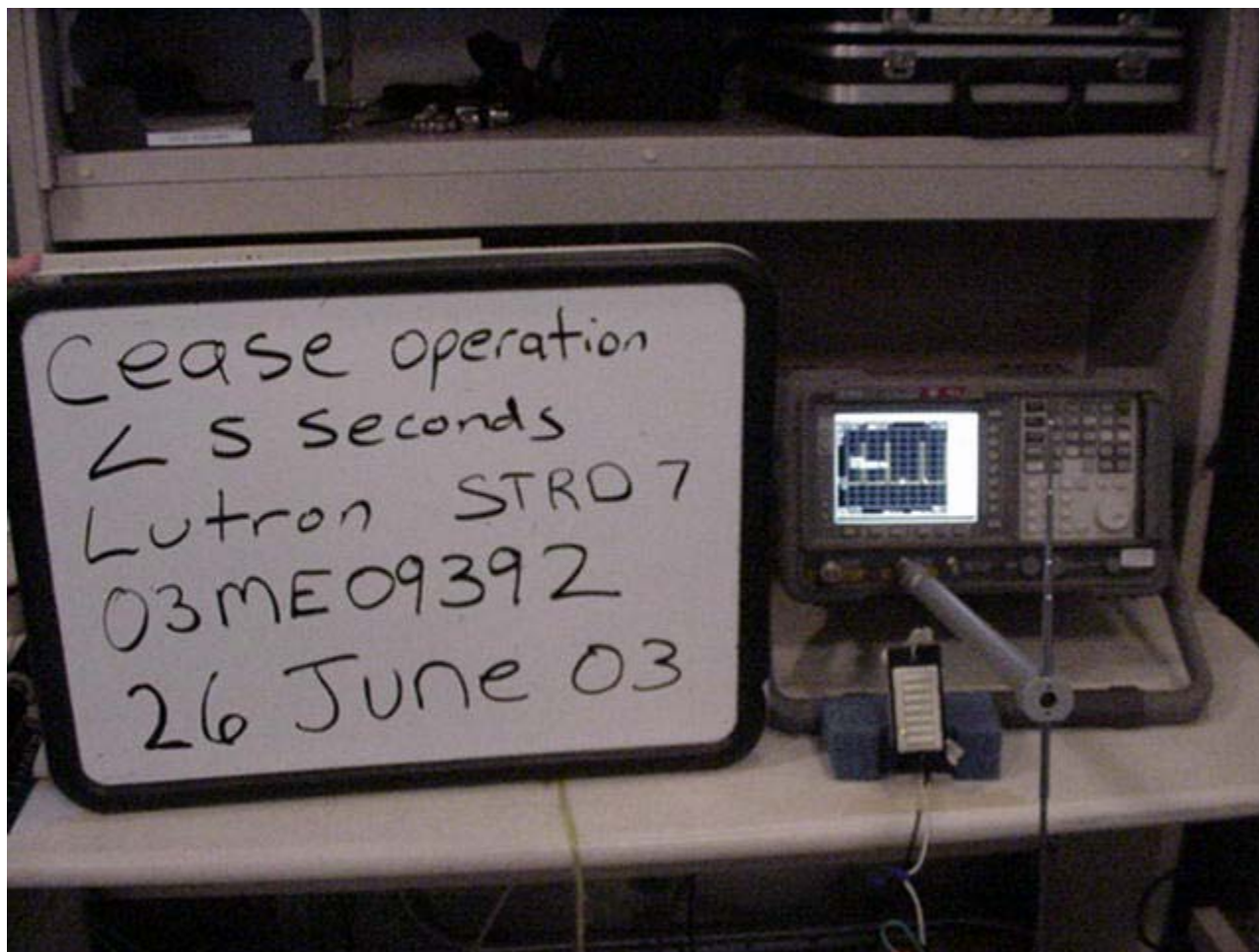


STRD-7B < 5 Seconds (total activation time 5.26ms)

This pictorial is showing 4 transmitting pulses. However, the deactivation (cease operation) of one pulse is less than 6ms

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



Test Set-Up Cease Operation < 5 seconds

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

Test Applicable

Temperature: 21.0 °C
 Humidity: 63.0 %RH
 Pressure: 999 mbar
 Date test performed: 24 June 03

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.

Mode: constant packet transmit

Measurement distance: 3 meters

Frequency Range: 30MHz - 5000MHz Electric Intentional @ low band 431MHz & High band 437MHz
 30MHz - 2000MHz Electric Unintentional @ low band 431MHz & High band 437MHz

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

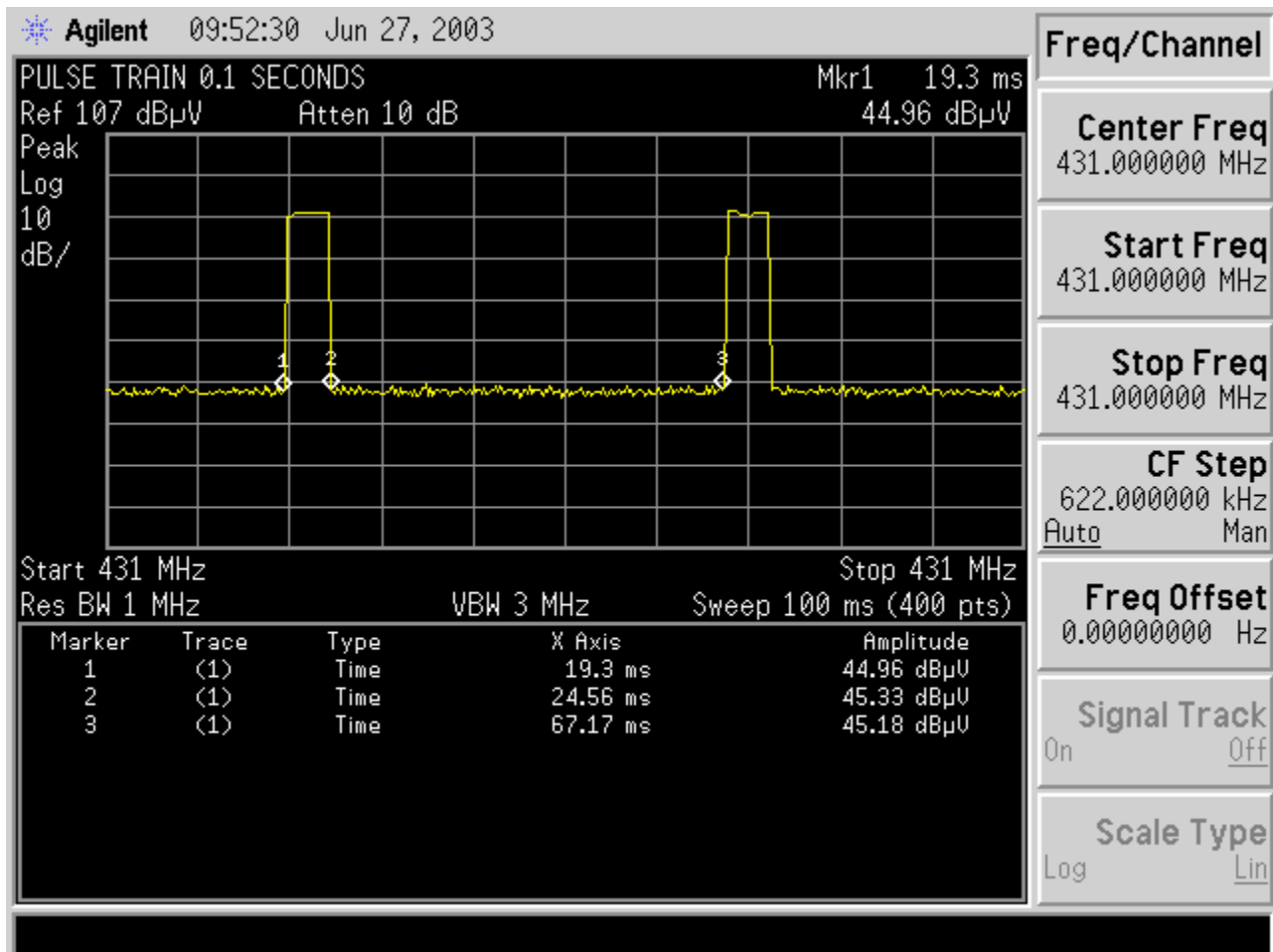
Range: 30MHz – 5GHz Last Calibration Date: 20 August 02 Calibration Due Date: 20 August 03

Test Accessories for Radiated Emissions:

94455-1	Ailtech	Biconnical Antenna	Equipment No.: ME5-439
Last Calibration Date: 15 November 02		Calibration Due Date: 15 November 03	
3146 EMCO	Log Periodic Antenna	Equipment No.: ME5-451	
Last Calibration Date: 21 November 02		Calibration Due Date: 21 November 03	
3115 EMCO	Horn Antenna	Equipment No.: ME5A-766	
Last Calibration Date: 9 July 02		Calibration Due Date: 9 July 03	
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	

Paragraph 15.35:

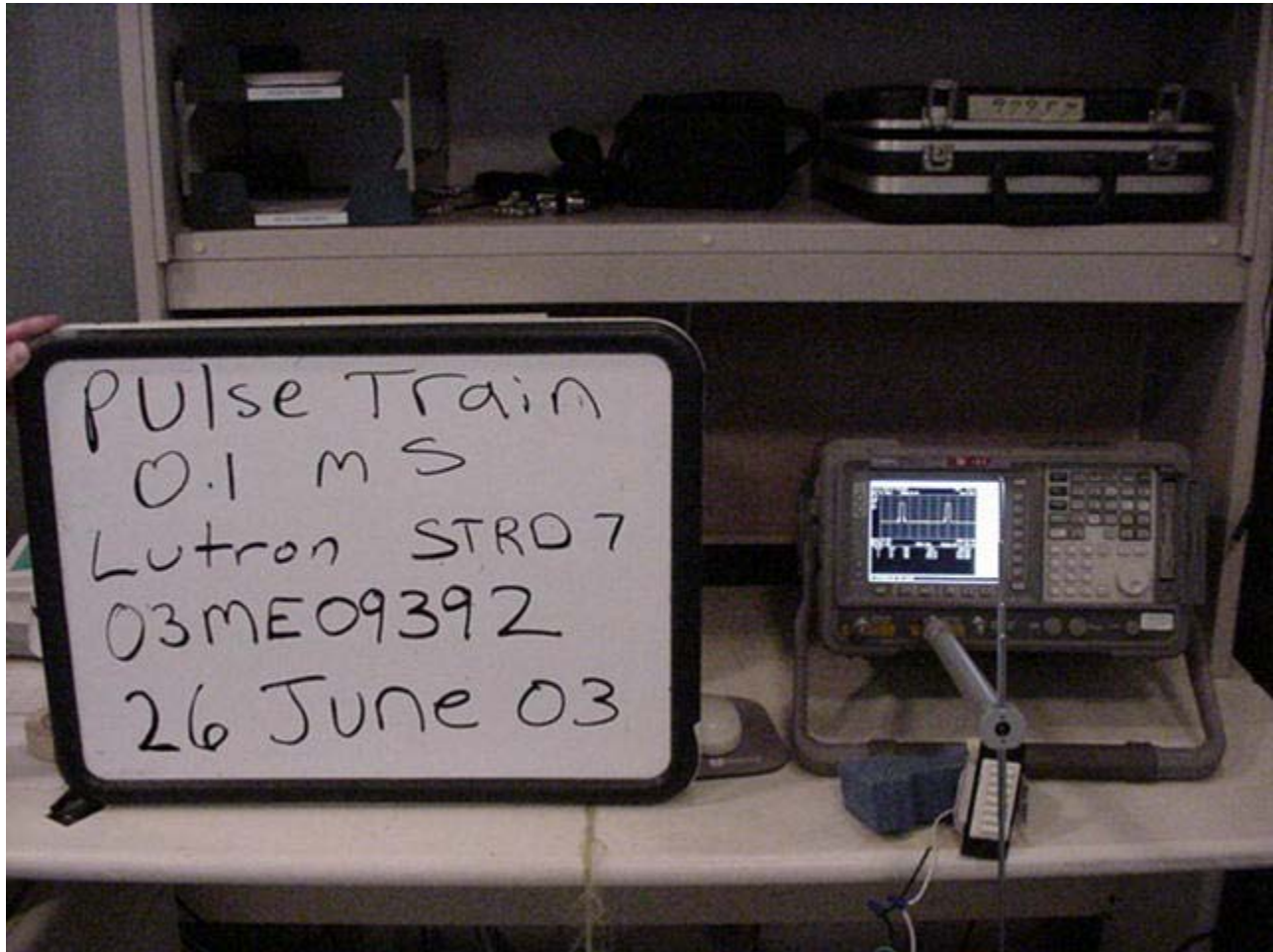
When the Radiated Limits are expressed in terms of the average value of the emissions, and pulse operation is employed, the pulse measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds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



STRD-7B One Complete Pulse Train < 100ms wide profile
 Pulse width = 24.56ms – 19.3ms = 5.26ms
 One complete pulse train = 47.87ms

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

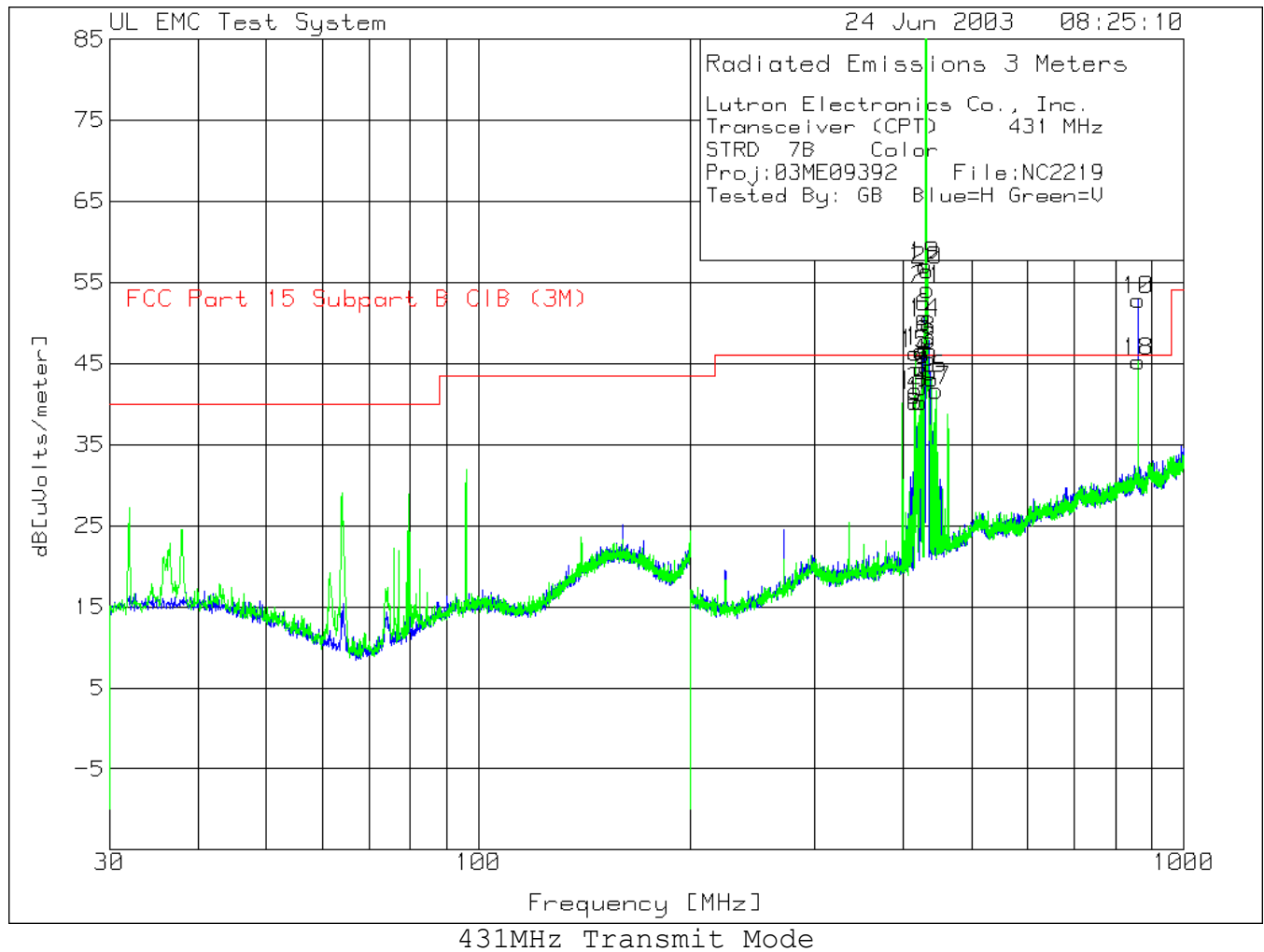
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Pulse Train Test Set-Up

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
 Transceiver (CPT) 431 MHz
 STRD 7B Color
 Proj:03ME09392 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	Limit: 2
-----	----------------------------	-------------------------------	-----------------------------	------------------------------	---------------------------	---------	----------

=====							
Horizontal 200 - 1000MHz -----							
1	415.8053	21.98 pk	3.1	15.2	40.28	60.7	N/A
	Azimuth:182	Height:198	Horz	Margin [dB]		-20.42	
2	416.6055	23.34 pk	3.1	15.2	41.64	60.7	N/A
	Azimuth:345	Height:398	Horz	Margin [dB]		-19.06	
3	423.2744	21.56 pk	3.1	15.6	40.26	60.7	N/A
	Azimuth:19	Height:99	Horz	Margin [dB]		-20.44	
4	424.875	25.62 pk	3.1	15.6	44.32	60.7	N/A
	Azimuth:65	Height:198	Horz	Margin [dB]		-16.38	
5	427.009	27.29 pk	3.1	15.7	46.09	60.7	N/A
	Azimuth:241	Height:198	Horz	Margin [dB]		-14.61	
6	427.8093	31.89 pk	3.1	15.7	50.69	60.7	N/A
	Azimuth:182	Height:198	Horz	Margin [dB]		-10.01	
7	431.0103	74.84 pk	3.2	15.7	93.74	80.7	N/A
	Azimuth:300	Height:99	Horz	Margin [dB]		13.04	
8	434.7449	29.02 pk	3.2	15.7	47.92	60.7	N/A
	Azimuth:300	Height:99	Horz	Margin [dB]		-12.78	
9	436.3454	25 pk	3.2	15.7	43.9	60.7	N/A
	Azimuth:241	Height:198	Horz	Margin [dB]		-16.8	
10	861.8206	26.12 pk	4.4	22.3	52.82	60.7	N/A
	Azimuth:273	Height:99	Horz	Margin [dB]		-7.88	
Vertical 200 - 1000MHz -----							
11	415.5385	22.75 pk	3.1	15.2	41.05	60.7	N/A
	Azimuth:303	Height:100	Vert	Margin [dB]		-19.65	
12	416.8723	27.96 pk	3.1	15.2	46.26	60.7	N/A
	Azimuth:359	Height:100	Vert	Margin [dB]		-8.44	
13	424.0747	27.82 pk	3.1	15.6	46.52	60.7	N/A
	Azimuth:186	Height:100	Vert	Margin [dB]		-14.18	
14	428.8763	31.11 pk	3.2	15.7	50.01	60.7	N/A
	Azimuth:10	Height:198	Vert	Margin [dB]		-10.69	
15	431.0103	71.53 pk	3.2	15.7	90.43	80.7	N/A
	Azimuth:303	Height:299	Vert	Margin [dB]		9.73	
16	438.7462	24.23 pk	3.2	15.7	43.13	60.7	N/A

File Number: NC2219
 Project Number: 03ME09392
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Issued: 6/18/2003

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    Azimuth:186 Height:100 Vert      Margin [dB]      -17.57
    Lutron Electronics Co., Inc.
    Transceiver (CPT)      431 MHz
    STRD 7B      Color
    Proj:03ME09392      File:NC2219
    Tested By: GB      Blue=H Green=V
    Test      Meter      Gain/Loss      Transducer Level Limit:1 Limit:2
    No. Frequency Reading Factor Factor dB[uVolts/meter]
    [MHz]      [dB(uV)]      [dB]      [dB]
=====
17  445.1484      22.69 pk      3.2      15.8      41.69      60.7      N/A
    Azimuth:10      Height:198 Vert      Margin [dB]      -19.01

18  862.0874      18.53 pk      4.4      22.3      45.23      60.7      N/A
    Azimuth:214      Height:100 Vert      Margin [dB]      -15.47

19  429.4098      38.2 pk      3.2      15.7      57.1      60.7      N/A
    Azimuth:186      Height:100 Vert      Margin [dB]      -3.6

20  432.6109      37.56 pk      3.2      15.7      56.46      60.7      N/A
    Azimuth:68      Height:100 Vert      Margin [dB]      -4.24

21  433.4111      35.24 pk      3.2      15.7      54.14      60.7      N/A
    Azimuth:68      Height:100 Vert      Margin [dB]      -6.56
  
```

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

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

File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

```

Lutron Electronics Co., Inc.
Transceiver (CPT)      431 MHz
STRD 7B      Color
Proj:03ME09392      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 200 - 1000MHz
415.805      8.13 qp      3.1      15.2      26.43      60.7
Azimuth: 150 Height:171 Horz      Margin [dB]: -34.3

416.6      8.24 qp      3.1      15.2      26.54      60.7
Azimuth: 141 Height:180 Horz      Margin [dB]: -34.16

420.3028      18.89 qp      3.1      15.4      37.39      60.7
Azimuth: 148 Height:193 Horz      Margin [dB]: -23.31

423.6      8.52 qp      3.1      15.6      27.22      60.7
Azimuth: 149 Height:197 Horz      Margin [dB]: -33.48

424.8      9.73 qp      3.1      15.6      28.43      60.7
Azimuth: 150 Height:190 Horz      Margin [dB]: -32.27

427      10.67 qp      3.1      15.7      29.47      60.7
Azimuth: 151 Height:204 Horz      Margin [dB]: -31.23

427.8      11.82 qp      3.1      15.7      30.62      60.7
Azimuth: 153 Height:212 Horz      Margin [dB]: -30.08

431      *55.28 pk      3.2      15.7      *74.18      80.7
Azimuth: 86 Height:102 Horz      Margin [dB]: -6.52

431.1186      *55.28pk      3.2      15.7      *74.18      80.7
Azimuth: 121 Height:189 Horz      Margin [dB]: -6.52

434.7      10.8 qp      3.2      15.7      29.7      60.7
Azimuth: 149 Height:172 Horz      Margin [dB]: -31.0

436.3      8.41 qp      3.2      15.7      27.31      60.7
Azimuth: 146 Height:213 Horz      Margin [dB]: -33.39

862      26.51 qp      4.4      22.3      53.21      60.7
Azimuth: 194 Height:170 Horz      Margin [dB]: -7.49
Vertical 200 - 1000MHz
415.53      8.57 qp      3.1      15.2      26.87      60.7
Azimuth: 217 Height:122 Vert      Margin [dB]: -33.83

416.8      12.57 qp      3.1      15.2      30.87      60.7
Azimuth: 187 Height:135 Vert      Margin [dB]: -29.83

420.3106      23.15 qp      3.1      15.4      41.65      60.7
Azimuth: 194 Height:122 Vert      Margin [dB]: -19.05

424      12.07 qp      3.1      15.6      30.77      60.7

```

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Azimuth: 183 Height:128 Vert

Margin [dB]: -29.93

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver (CPT) 431 MHz
STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By: GB Blue=H Green=V

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
428.8	22.02 qp	3.2	15.7	40.92	60.7
Azimuth: 183 Height:123 Vert			Margin [dB]: -19.78		
429.4	26.3 qp	3.2	15.7	45.2	60.7
Azimuth: 200 Height:135 Vert			Margin [dB]: -15.5		
431	*51.97 pk	3.2	15.7	*70.87	80.7
Azimuth: 185 Height:123 Vert			Margin [dB]: -9.83		
432.6	26.51 qp	3.2	15.7	45.41	60.7
Azimuth: 178 Height:112 Vert			Margin [dB]: -15.29		
433.4	23.32 qp	3.2	15.7	42.22	60.7
Azimuth: 193 Height:129 Vert			Margin [dB]: -15.48		
438.7	17.1 qp	3.2	15.7	36	60.7
Azimuth: 36 Height:145 Vert			Margin [dB]: -24.7		
445.2	17.69 qp	3.2	15.8	36.69	60.7
Azimuth: 187 Height:111 Vert			Margin [dB]: -24.01		
862	20 qp	4.4	22.3	46.7	60.7
Azimuth: 129 Height:104 Vert			Margin [dB]: -14.0		

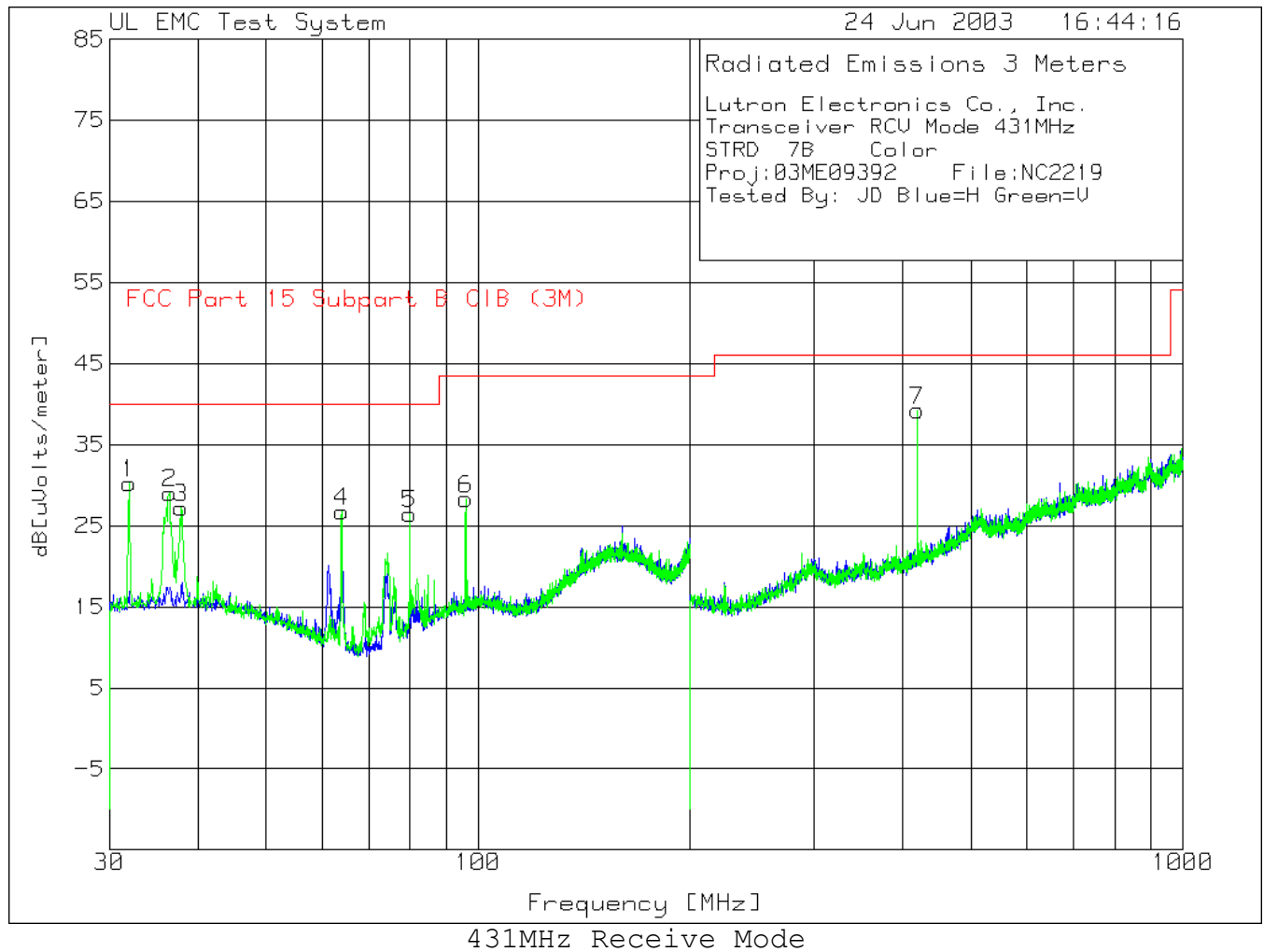
LIMIT 1: FCC Part 15 Subpart C-Section 15.231

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

*** Duty Cycle correction factor of -19.56 added to Average level.**

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

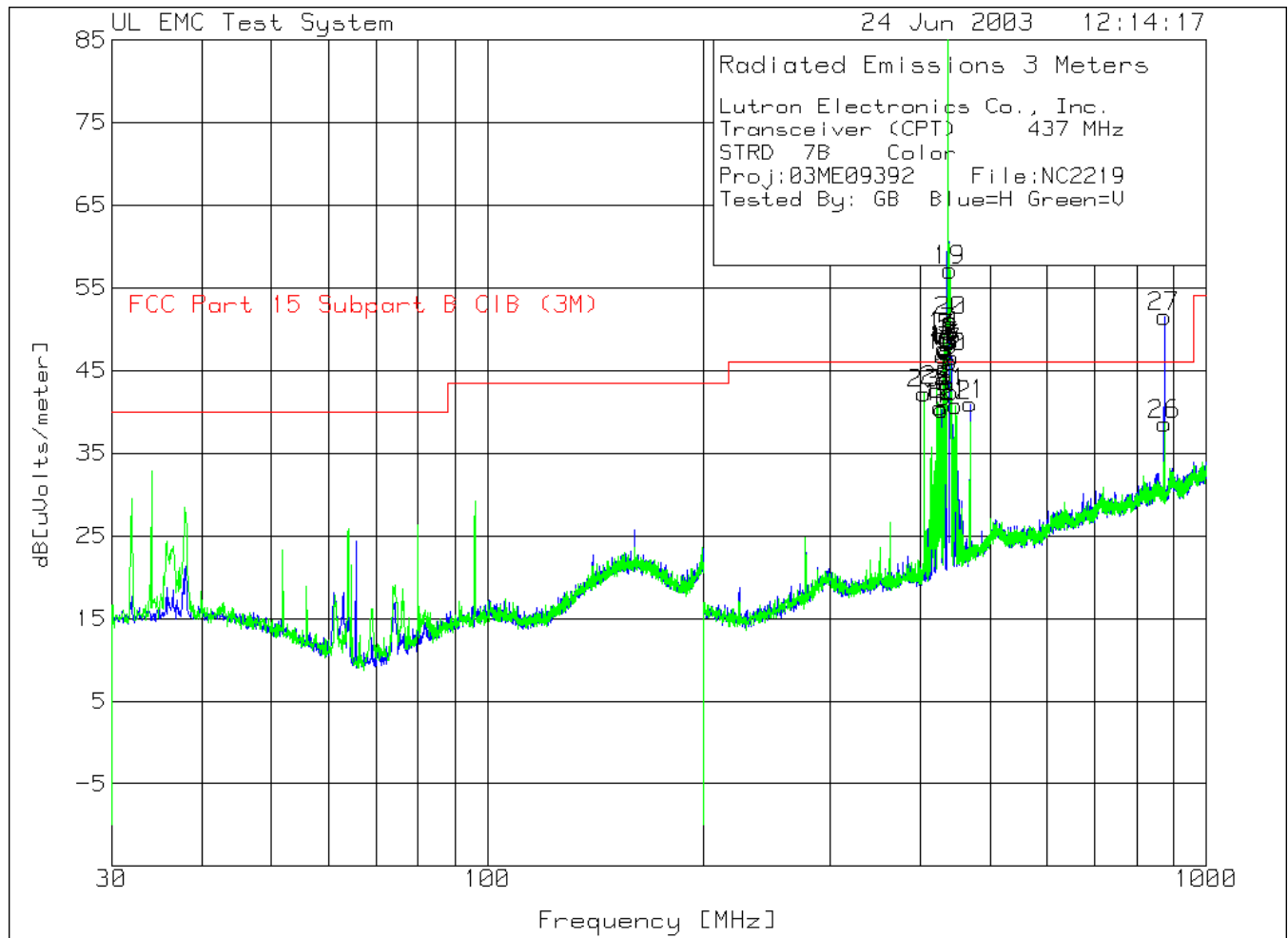
Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver RCV Mode 431MHz
STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By: JD 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 30 - 200MHz -----						
1	31.956	16.05 pk	.9	13.3	30.25	40
	Azimuth:88	Height:100	Vert	Margin [dB]		-9.75
2	36.4632	14.59 pk	.9	13.5	28.99	40
	Azimuth:290	Height:100	Vert	Margin [dB]		-11.01
3	37.909	12.76 pk	.9	13.5	27.16	40
	Azimuth:88	Height:100	Vert	Margin [dB]		-12.84
4	64.017	18.91 pk	1.1	6.7	26.71	40
	Azimuth:20	Height:100	Vert	Margin [dB]		-13.29
5	80.005	16.76 pk	1.3	8.4	26.46	40
	Azimuth:223	Height:199	Vert	Margin [dB]		-13.54
6	95.993	15.9 pk	1.4	11	28.3	43.5
	Azimuth:291	Height:100	Vert	Margin [dB]		-15.2
Vertical 200 - 1000MHz -----						
7	420.3401	20.72 pk	3.1	15.4	39.22	46
	Azimuth:124	Height:100	Vert	Margin [dB]		-6.78

LIMIT 1: FCC Part 15 Subpart B ClB (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



437 MHz Transmit Mode

File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
 Transceiver (CPT) 437 MHz
 STRD 7B Color
 Proj:03ME09392 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	Limit:2
-----	----------------------------	-------------------------------	-----------------------------	------------------------------	---------------------------	---------	---------

Horizontal 200 - 1000MHz -----							
1	428.3428	21.4 pk	3.2	15.7	40.3	60.9	N/A
	Azimuth:119	Height:100	Horz	Margin [dB]		-34.21	
2	431.5438	24.66 pk	3.2	15.7	43.56	60.9	N/A
	Azimuth:296	Height:199	Horz	Margin [dB]		-17.34	
3	433.1444	28.51 pk	3.2	15.7	47.41	60.9	N/A
	Azimuth:2	Height:100	Horz	Margin [dB]		-13.49	
4	431.0103	22.94 pk	3.2	15.7	41.84	60.9	N/A
	Azimuth:178	Height:199	Horz	Margin [dB]		-19.06	
5	435.0117	30.01 pk	3.2	15.7	48.91	60.9	N/A
	Azimuth:61	Height:199	Horz	Margin [dB]		11.99	
6	436.879	77.08 pk	3.2	15.7	95.98	80.9	N/A
	Azimuth:119	Height:100	Horz	Margin [dB]		15.08	
7	439.2798	30.76 pk	3.2	15.7	49.66	60.9	N/A
	Azimuth:296	Height:199	Horz	Margin [dB]		-11.24	
8	440.08	29.61 pk	3.2	15.7	48.51	60.9	N/A
	Azimuth:341	Height:199	Horz	Margin [dB]		-12.39	
9	440.8803	27.19 pk	3.2	15.7	46.09	60.9	N/A
	Azimuth:2	Height:100	Horz	Margin [dB]		-14.81	
10	441.6806	27.68 pk	3.2	15.7	46.58	60.9	N/A
	Azimuth:2	Height:100	Horz	Margin [dB]		-14.32	
11	468.8896	20.85 pk	3.4	16.7	40.95	60.9	N/A
	Azimuth:127	Height:100	Horz	Margin [dB]		-19.95	
27	874.0914	25.25 pk	4.5	21.8	51.55	60.9	N/A
	Azimuth:358	Height:100	Horz	Margin [dB]		-9.35	

Vertical 200 - 1000MHz -----							
12	426.2087	21.85 pk	3.1	15.6	40.55	60.9	N/A
	Azimuth:60	Height:100	Vert	Margin [dB]		-20.35	
13	430.4768	27.88 pk	3.2	15.7	46.78	60.9	N/A
	Azimuth:2	Height:100	Vert	Margin [dB]		-14.12	
14	431.2771	30.33 pk	3.2	15.7	49.23	60.9	N/A
	Azimuth:2	Height:100	Vert	Margin [dB]		-11.7	
15	432.3441	28.76 pk	3.2	15.7	47.66	60.9	N/A

File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

```

    Azimuth:60   Height:100 Vert   Margin [dB]           -13.24
    Lutron Electronics Co., Inc.
    Transceiver (CPT)           437 MHz
    STRD 7B   Color
    Proj:03ME09392   File:NC2219
    Tested By: GB   Blue=H Green=V
    Test      Meter      Gain/Loss  Transducer  Level  Limit:1  Limit:2
    No. Frequency Reading  Factor      Factor    dB[uVolts/meter]
    [MHz]     [dB(uV)]    [dB]       [dB]
=====
16  433.1444   28.57 pk    3.2        15.7       47.47   60.9     N/A
    Azimuth:341 Height:199 Vert   Margin [dB]           -13.43

17  434.7449   28.34 pk    3.2        15.7       47.24   60.9     N/A
    Azimuth:119 Height:100 Vert   Margin [dB]           -13.66

18  436.879    71.3 pk    3.2        15.7       90.2    80.9     N/A
    Azimuth:354 Height:298 Vert   Margin [dB]           29.3

19  439.8133   38.27 pk    3.2        15.7       57.17   60.9     N/A
    Azimuth:341 Height:100 Vert   Margin [dB]           -3.73

20  441.147    32.14 pk    3.2        15.7       51.04   60.9     N/A
    Azimuth:341 Height:100 Vert   Margin [dB]           -9.5

21  441.6806   23.5 pk    3.2        15.7       42.4    60.9     N/A
    Azimuth:341 Height:199 Vert   Margin [dB]           -18.5

22  448.3495   21.58 pk    3.3        15.9       40.78   60.9     N/A
    Azimuth:295 Height:100 Vert   Margin [dB]           -20.12

23  404.8683   24.52 pk    3          14.7       42.22   60.9     N/A
    Azimuth:236 Height:100 Vert   Margin [dB]           -18.68

24  421.9406   24.02 pk    3.1        15.5       42.62   60.9     N/A
    Azimuth:354 Height:100 Vert   Margin [dB]           -18.28

25  421.9406   24.02 pk    3.1        15.5       42.62   60.9     N/A
    Azimuth:354 Height:100 Vert   Margin [dB]           -18.28

26  874.8916   12.23 pk    4.5        21.8       38.53   60.9     N/A
    Azimuth:209 Height:298 Vert   Margin [dB]           -22.37
  
```

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

File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

```

Lutron Electronics Co., Inc.
Transceiver (CPT)      437 MHz
STRD 7B      Color
Proj:03ME09392      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 200 - 1000MHz
428.3      17.84 qp      3.2      15.7      36.74      60.9
Azimuth: 35      Height:177 Horz      Margin [dB]: -24.16

431      17.84 qp      3.2      15.7      36.74      60.9
Azimuth: 344      Height:173 Horz      Margin [dB]: -24.16

431.5      17.78 qp      3.2      15.7      36.68      60.9
Azimuth: 8      Height:181 Horz      Margin [dB]: -24.22

433.1      17.9 qp      3.2      15.7      36.8      60.9
Azimuth: 132      Height:133 Horz      Margin [dB]: -24.1

435      18.57 qp      3.2      15.7      37.47      60.9
Azimuth: 9      Height:195 Horz      Margin [dB]: -23.43

437      *57.52pk      3.2      15.7      *76.42      80.9
Azimuth: 200      Height:100 Horz      Margin [dB]: -4.48

439.3      18.73 qp      3.2      15.7      37.63      60.9
Azimuth: 255      Height:200 Horz      Margin [dB]: -23.27

440.8      18.19 qp      3.2      15.7      37.09      60.9
Azimuth: 244      Height:237 Horz      Margin [dB]: -23.81

440.8      18.07 qp      3.2      15.7      36.97      60.9
Azimuth: 33      Height:184 Horz      Margin [dB]: -23.93

441.7      18.07 qp      3.2      15.7      36.97      60.9
Azimuth: 267      Height:221 Horz      Margin [dB]: -23.93

468.8      17.96 qp      3.4      16.7      38.06      60.9
Azimuth: 50      Height:149 Horz      Margin [dB]: -22.84

874      26.73 qp      4.5      21.8      53.03      60.9
Azimuth: 185      Height:159 Horz      Margin [dB]: -7.87

Vertical 200 - 1000MHz
404.86      18.95 qp      3      14.7      36.65      60.9
Azimuth: 348      Height:116 Vert      Margin [dB]: -24.25

422      8.78 qp      3.1      15.5      27.38      60.9
Azimuth: 175      Height:117 Vert      Margin [dB]: -33.52

426.3096      30.71 qp      3.1      15.6      49.41      60.9
Azimuth: 188      Height:120 Vert      Margin [dB]: -11.49
  
```

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver (CPT) 437 MHz
STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By: GB Blue=H Green=V

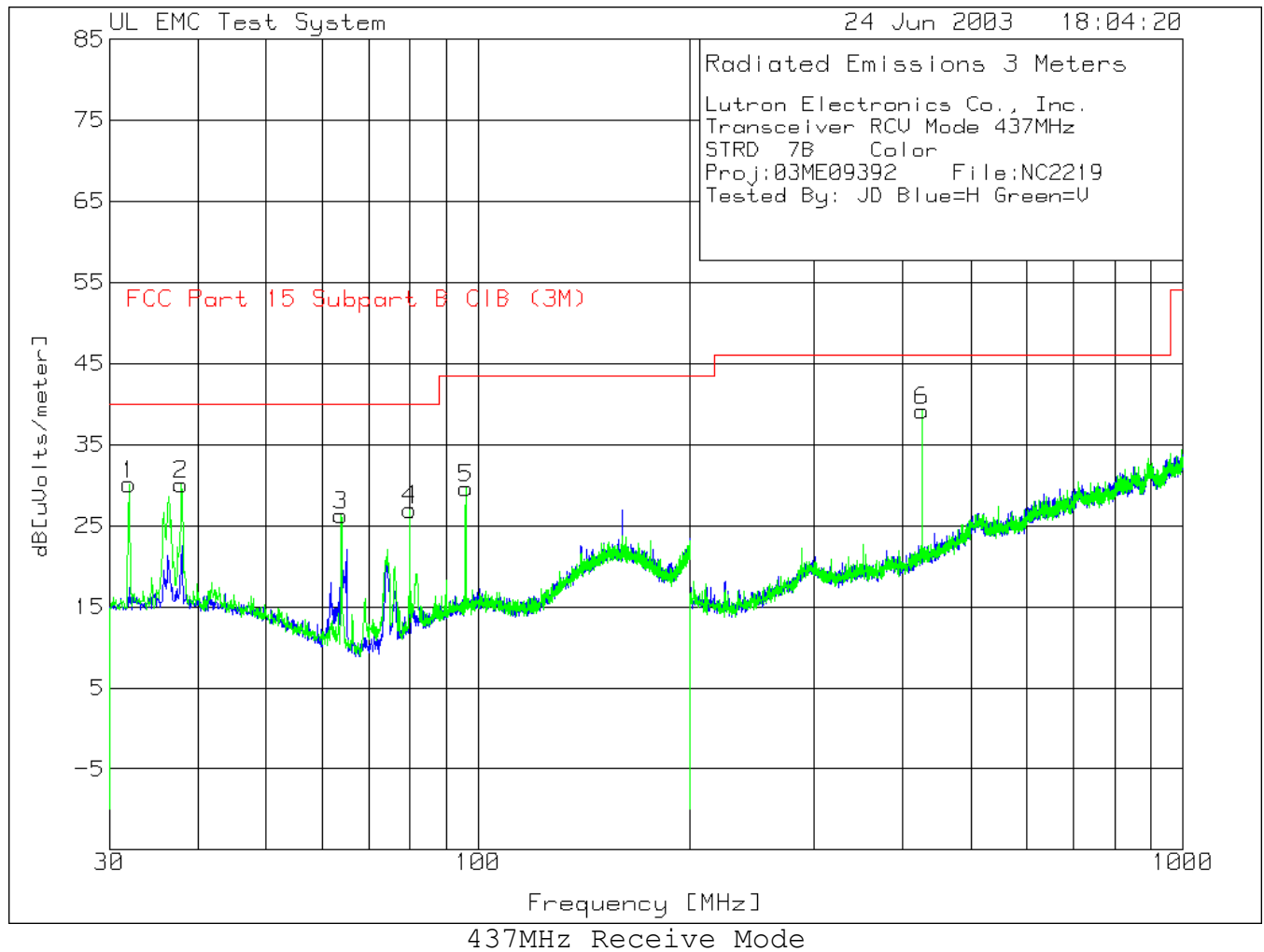
Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
430.47	13.38 qp	3.2	15.7	32.28	60.9
Azimuth: 188	Height:114	Vert	Margin [dB]:		-28.62
431.27	14.46 qp	3.2	15.7	33.36	60.9
Azimuth: 175	Height:100	Vert	Margin [dB]:		-27.54
432.34	16.94 qp	3.2	15.7	35.84	60.9
Azimuth: 193	Height:118	Vert	Margin [dB]:		-25.06
433.14	18.67 qp	3.2	15.7	37.57	60.9
Azimuth: 175	Height:100	Vert	Margin [dB]:		-23.33
434.74	23.45 qp	3.2	15.7	42.35	60.9
Azimuth: 170	Height:113	Vert	Margin [dB]:		-18.55
437	*51.47 pk	3.2	15.7	*70.37	80.9
Azimuth: 43	Height:103	Vert	Margin [dB]:		-10.53
439.8	21.83 qp	3.2	15.7	40.73	60.9
Azimuth: 189	Height:118	Vert	Margin [dB]:		-20.17
441.14	18.13 qp	3.2	15.7	37.03	60.9
Azimuth: 166	Height:120	Vert	Margin [dB]:		-23.87
441.6	16.69 qp	3.2	15.7	35.59	60.9
Azimuth: 188	Height:120	Vert	Margin [dB]:		-25.31
448.34	8.35 qp	3.3	15.9	27.55	60.9
Azimuth: 162	Height:107	Vert	Margin [dB]:		-33.35
874	22.14 qp	4.5	21.8	48.44	60.9
Azimuth: 245	Height:133	Vert	Margin [dB]:		-12.46

LIMIT 1: 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 -19.56 added to Average level.**

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

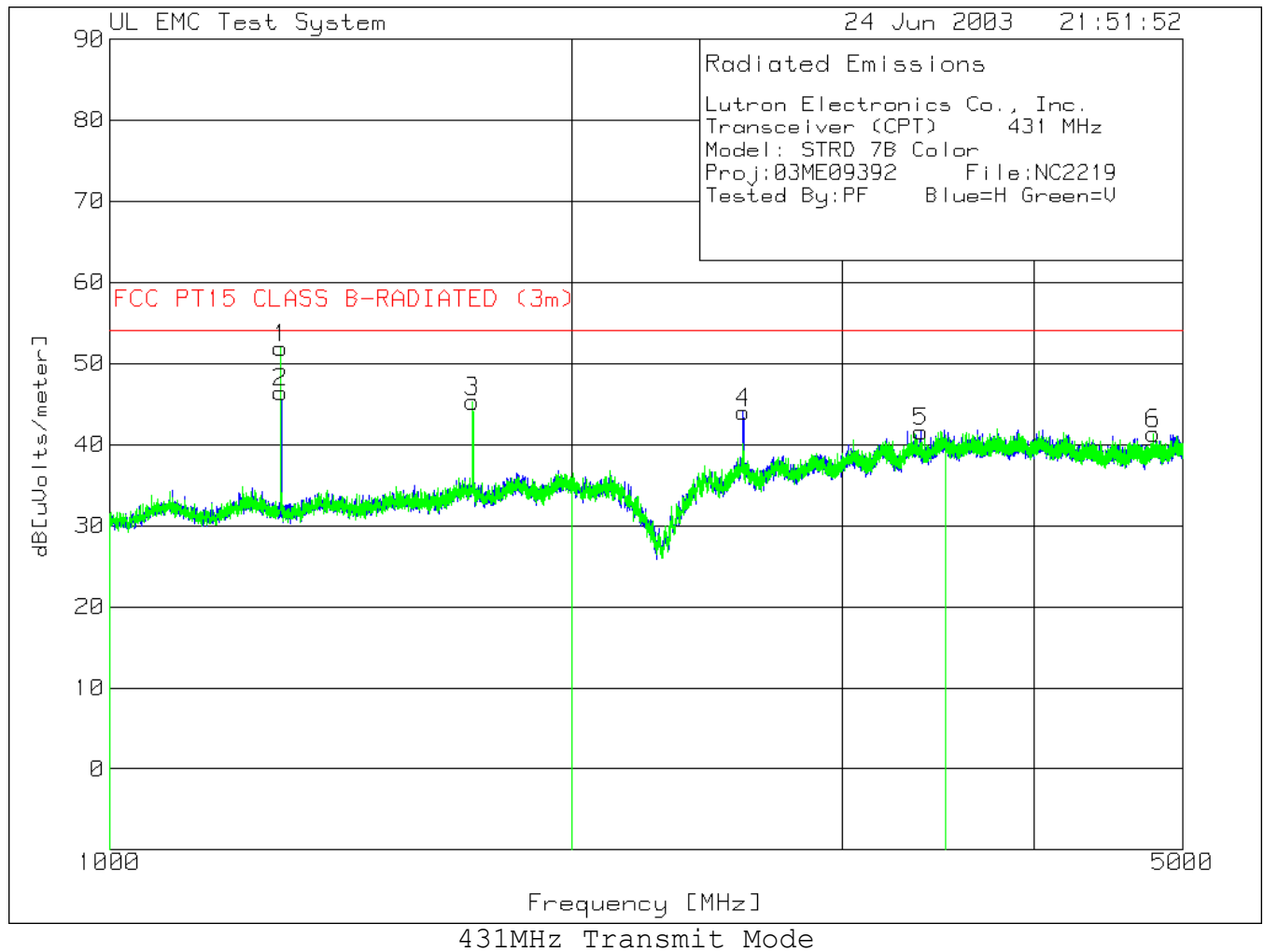
Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver RCV Mode 437MHz
STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By: JD 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 30 - 200MHz -----						
1	31.956	15.92 pk	.9	13.3	30.12	40
	Azimuth:156	Height:100	Vert	Margin [dB]		-9.88
2	37.909	15.68 pk	.9	13.5	30.08	40
	Azimuth:358	Height:100	Vert	Margin [dB]		-9.92
3	63.932	18.48 pk	1.1	6.7	26.28	40
	Azimuth:358	Height:100	Vert	Margin [dB]		-13.72
4	80.005	17.26 pk	1.3	8.4	26.96	40
	Azimuth:86	Height:198	Vert	Margin [dB]		-13.04
5	95.993	17.19 pk	1.4	11	29.59	43.5
	Azimuth:222	Height:100	Vert	Margin [dB]		-13.91
Vertical 200 - 1000MHz -----						
6	426.2087	20.5 pk	3.1	15.6	39.2	46
	Azimuth:124	Height:100	Vert	Margin [dB]		-6.8

LIMIT 1: FCC Part 15 Subpart B ClB (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



File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
 Transceiver (CPT) 431 MHz
 Model: STRD 7B Color
 Proj:03ME09392 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
=====						
Horizontal 1000 - 2000MHz -----						
2	1293.098	53.34 pk	-32.9	26	46.44	54
	Azimuth:304	Height:198	Horz	Margin [dB]		-7.56
Horizontal 2000 - 3500MHz -----						
4	2586.195	43.38 pk	-30.2	30.8	43.98	54
	Azimuth:319	Height:198	Horz	Margin [dB]		-10.02
5	3376.459	36.67 pk	-27.6	32.5	41.57	54
	Azimuth:341	Height:100	Horz	Margin [dB]		-12.43
Vertical 1000 - 2000MHz -----						
1	1292.097	58.78 pk	-32.9	26	51.88	54
	Azimuth:20	Height:101	Vert	Margin [dB]		-2.12
3	1723.908	49.2 pk	-31.6	27.7	45.3	54
	Azimuth:331	Height:199	Vert	Margin [dB]		-8.7
Vertical 3500 - 5000MHz -----						
6	4783.428	33.98 pk	-27.1	34.5	41.38	54
	Azimuth:358	Height:100	Vert	Margin [dB]		-12.62

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver (CPT) 431 MHz
Model: STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By:PF Blue=H Green=V

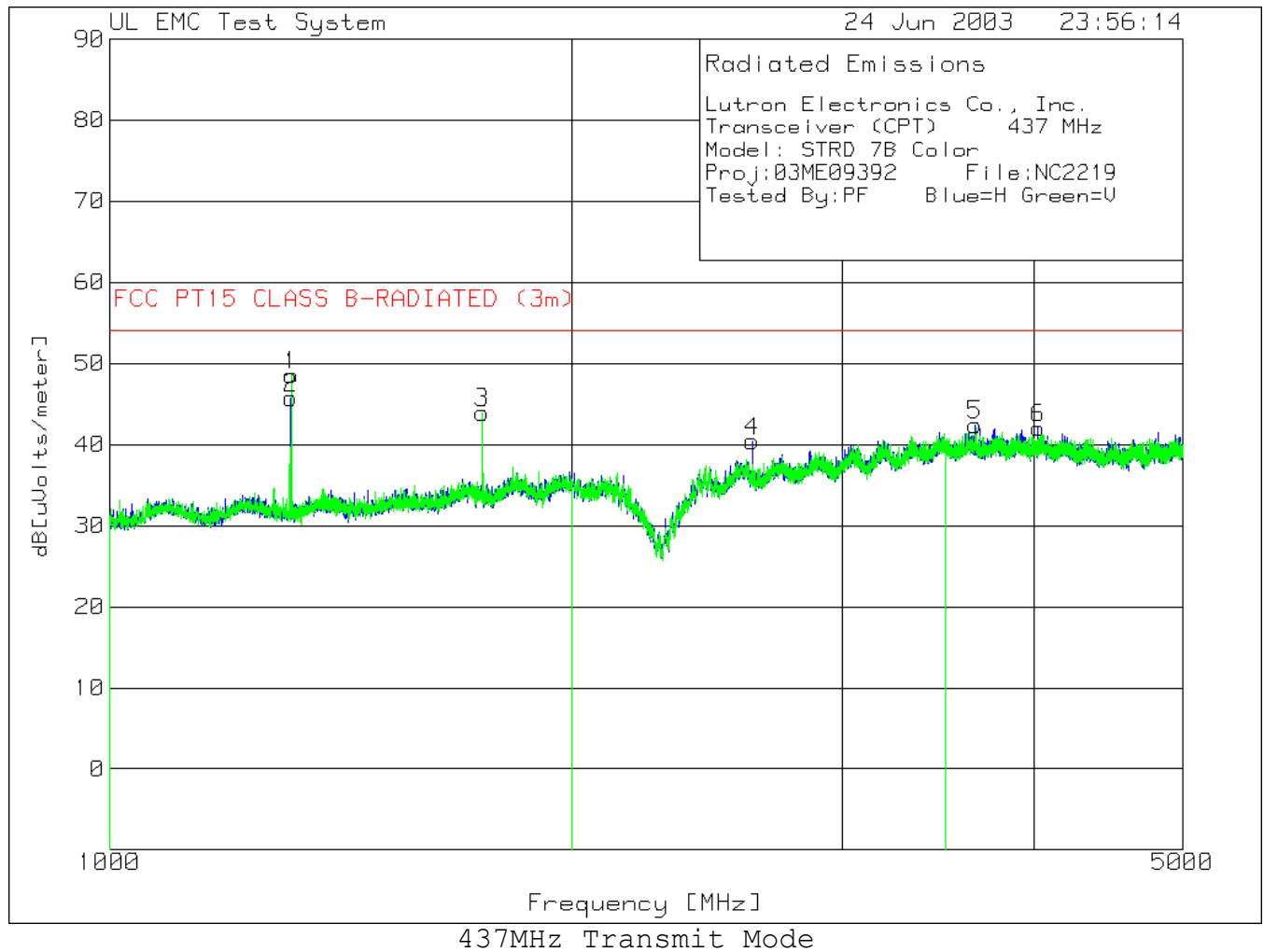
Test	Meter	Gain/Loss	Transducer	Level	Limit:1
Frequency	Reading	Factor	Factor	dB[uVolts/meter]	
[MHz]	[dB(uV)]	[dB]	[dB]		
=====					
Horizontal 1000 - 2000MHz					
1293.0752	37.02	avem -32.9	26	30.12	60.7
Azimuth: 231 Height:104 Horz			Margin [dB]: -30.58		
Horizontal 2000 - 3500MHz					
2750	25.59	avem -29.8	31.1	26.89	60.7
Azimuth: 336 Height:172 Horz			Margin [dB]: -33.81		
Horizontal 3500 - 5000MHz					
3366.4935	24.11	avem -27.7	32.5	28.91	60.7
Azimuth: 288 Height:148 Horz			Margin [dB]: -31.79		
Vertical 1000 - 2000MHz					
1293.3758	37.39	avem -32.9	26	30.49	60.7
Azimuth: 225 Height:105 Vert			Margin [dB]: -30.21		
Vertical 2000 - 3500MHz					
1723.9248	35.19	avem -31.6	27.7	31.29	60.7
Azimuth: 142 Height:116 Vert			Margin [dB]: -29.41		
Vertical 3500 - 5000MHz					
4787.0456	21.82	avem -27.1	34.5	29.22	60.7
Azimuth: 336 Height:172 Vert			Margin [dB]: -31.48		

LIMIT 1: 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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver (CPT) 437 MHz
Model: STRD 7B Color
Proj:03ME09392 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
-----	----------------------------	-------------------------------	-----------------------------	------------------------------	---------------------------	---------

=====						
Horizontal 1000 - 2000MHz -----						
2	1312.437	52.68 pk	-32.9	26	45.78	54
	Azimuth:304	Height:98	Horz	Margin [dB]		-8.22
Horizontal 2000 - 3500MHz -----						
4	2621.207	39.73 pk	-30.1	30.8	40.43	54
	Azimuth:319	Height:198	Horz	Margin [dB]		-13.57
Horizontal 3500 - 5000MHz -----						
5	3662.054	36.31 pk	-27.2	33.3	42.41	54
	Azimuth:347	Height:198	Horz	Margin [dB]		-11.59
6	4025.175	35.06 pk	-27.4	34.4	42.06	54
	Azimuth:250	Height:198	Horz	Margin [dB]		-11.94
Vertical 1000 - 2000MHz -----						
1	1312.771	55.49 pk	-32.9	26	48.59	54
	Azimuth:20	Height:198	Vert	Margin [dB]		-5.41
3	1748.249	47.73 pk	-31.6	27.8	43.93	54
	Azimuth:111	Height:198	Vert	Margin [dB]		-10.07

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver (CPT) 437 MHz
Model: STRD 7B Color
Proj:03ME09392 File:NC2219
Tested By:PF Blue=H Green=V

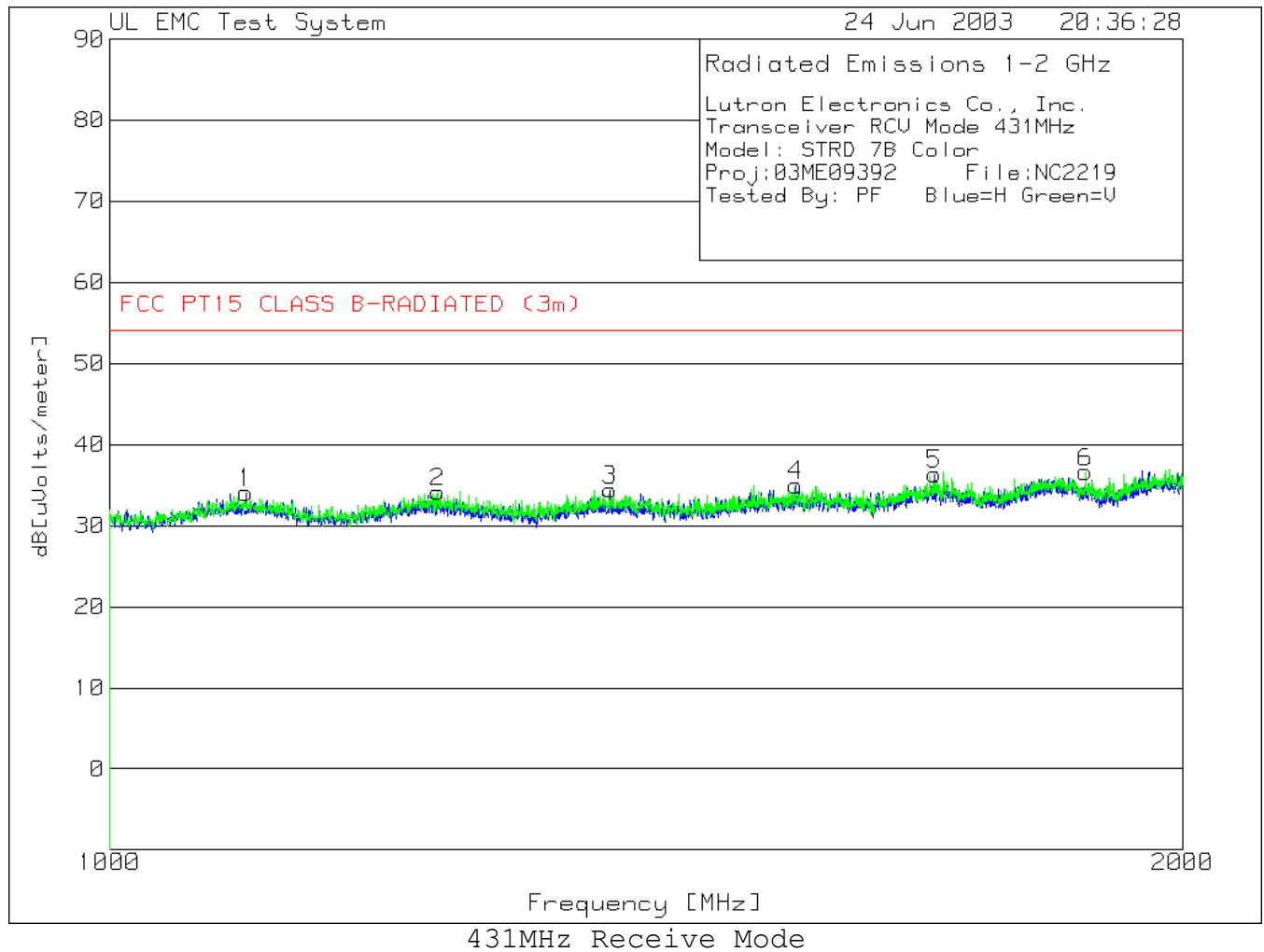
Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====					
Horizontal 1000 - 2000MHz					
1310.7577	35.93	avem -32.9	26	29.03	60.9
Azimuth: 219 Height:105 Horz			Margin [dB]: -31.87		
Horizontal 2000 - 3500MHz					
2623.8933	24.35	avem -30.1	30.8	25.05	60.9
Azimuth: 55 Height:126 Horz			Margin [dB]: -35.85		
Horizontal 3500 - 5000MHz					
3661.7205	23.22	avem -27.2	33.3	29.32	60.9
Azimuth: 267 Height:103 Horz			Margin [dB]: -31.58		
4025.7719	21.99	avem -27.4	34.4	28.99	60.9
Azimuth: 203 Height:100 Horz			Margin [dB]: -31.91		
Vertical 1000 - 2000MHz					
1311.023	41.09	avem -32.9	26	34.19	60.9
Azimuth: 283 Height:100 Vert			Margin [dB]: -26.71		
1747.9671	29.79	avem -31.6	27.8	25.99	60.9
Azimuth: 48 Height:193 Vert			Margin [dB]: -34.91		

LIMIT 1: 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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
Transceiver RCV Mode 431MHz
Model: STRD 7B Color
Proj:03ME09392 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
-----	----------------------------	-------------------------------	-----------------------------	------------------------------	---------------------------	---------

=====						
Horizontal 1000 - 2000MHz -----						
1	1092.031	42.41 pk	-33.5	25.2	34.11	54
	Azimuth:20	Height:199	Horz	Margin [dB]		-19.89
3	1381.794	40.82 pk	-32.7	26.3	34.42	54
	Azimuth:275	Height:100	Horz	Margin [dB]		-19.58
4	1557.519	40.18 pk	-32.2	27	34.98	54
	Azimuth:358	Height:100	Horz	Margin [dB]		-19.02
5	1703.568	40.48 pk	-31.7	27.6	36.38	54
	Azimuth:16	Height:199	Horz	Margin [dB]		-17.62

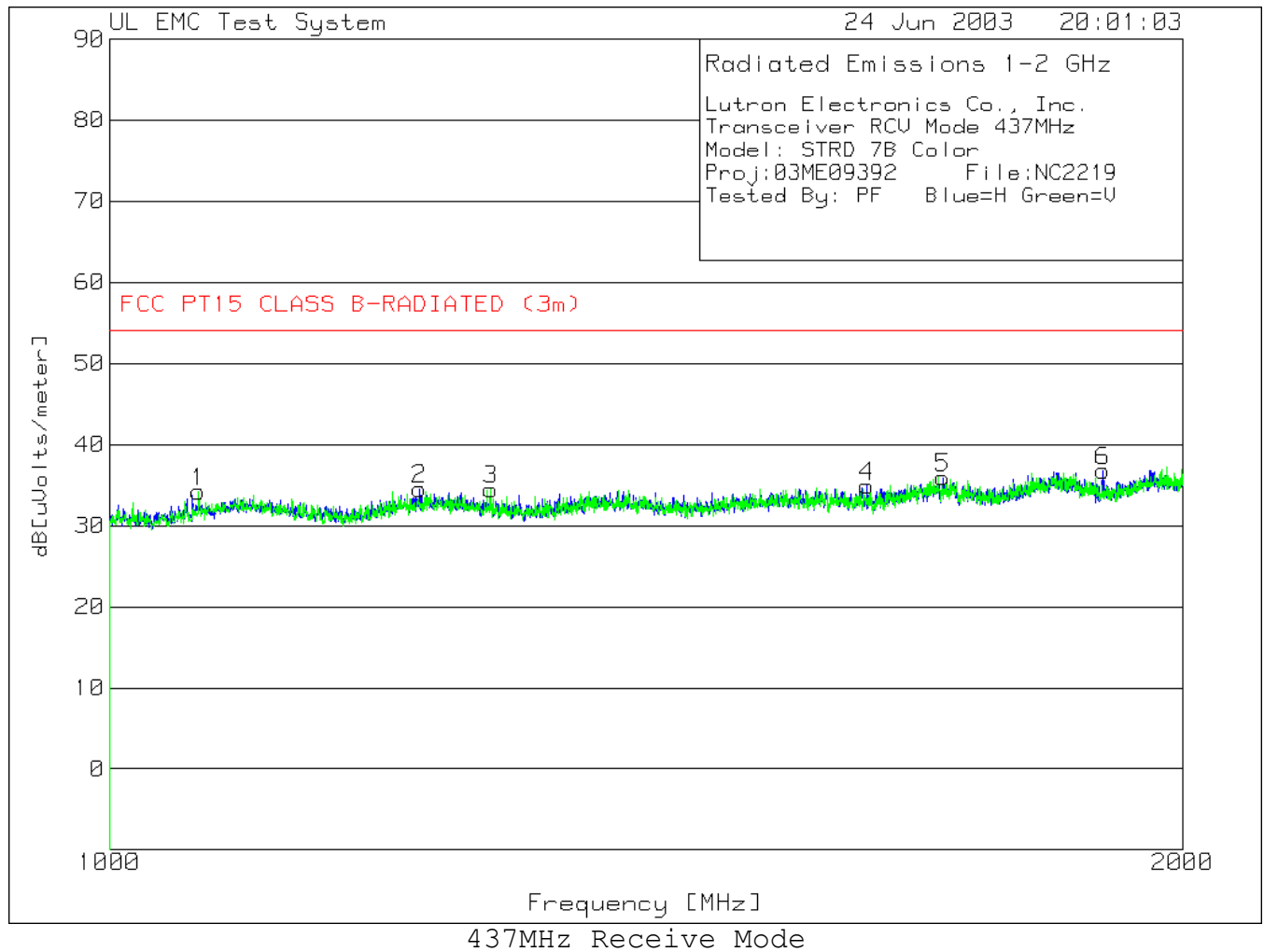
Vertical 1000 - 2000MHz -----						
2	1236.079	41.53 pk	-33.1	25.7	34.13	54
	Azimuth:193	Height:199	Vert	Margin [dB]		-19.87
6	1877.959	39.33 pk	-31.1	28.4	36.63	54
	Azimuth:344	Height:199	Vert	Margin [dB]		-17.37

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



File Number: NC2219
 Project Number: 03ME09392
 Model Number: STRD-7B
 FCC ID: JPZ0025

Issued: 6/18/2003

Lutron Electronics Co., Inc.
 Transceiver RCV Mode 437MHz
 Model: STRD 7B Color
 Proj:03ME09392 File:NC2219
 Tested By: PF Blue=H Green=V

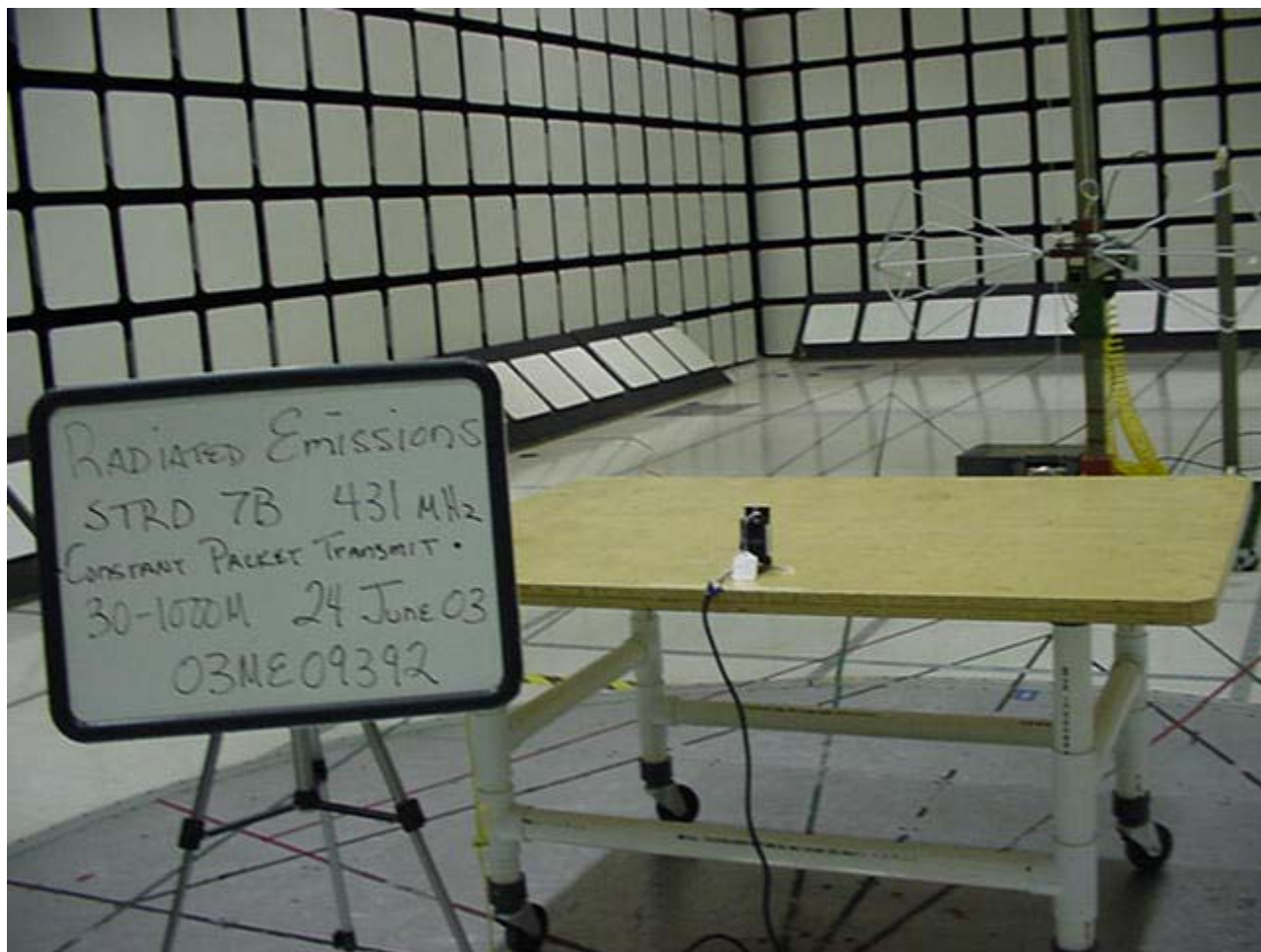
No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
=====						
Horizontal 1000 - 2000MHz -----						
2	1221.741	41.93 pk	-33.1	25.7	34.53	54
	Azimuth:85	Height:199	Horz	Margin [dB]		-19.47
4	1630.877	39.48 pk	-31.9	27.3	34.88	54
	Azimuth:344	Height:199	Horz	Margin [dB]		-19.12
5	1712.904	40.04 pk	-31.7	27.6	35.94	54
	Azimuth:56	Height:199	Horz	Margin [dB]		-18.06
6	1899.633	39.38 pk	-31.1	28.5	36.78	54
	Azimuth:19	Height:99	Horz	Margin [dB]		-17.22
Vertical 1000 - 2000MHz -----						
1	1059.02	42.6 pk	-33.5	25.1	34.2	54
	Azimuth:84	Height:101	Vert	Margin [dB]		-19.8
3	1279.093	41.47 pk	-32.9	25.9	34.47	54
	Azimuth:194	Height:101	Vert	Margin [dB]		-19.53

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

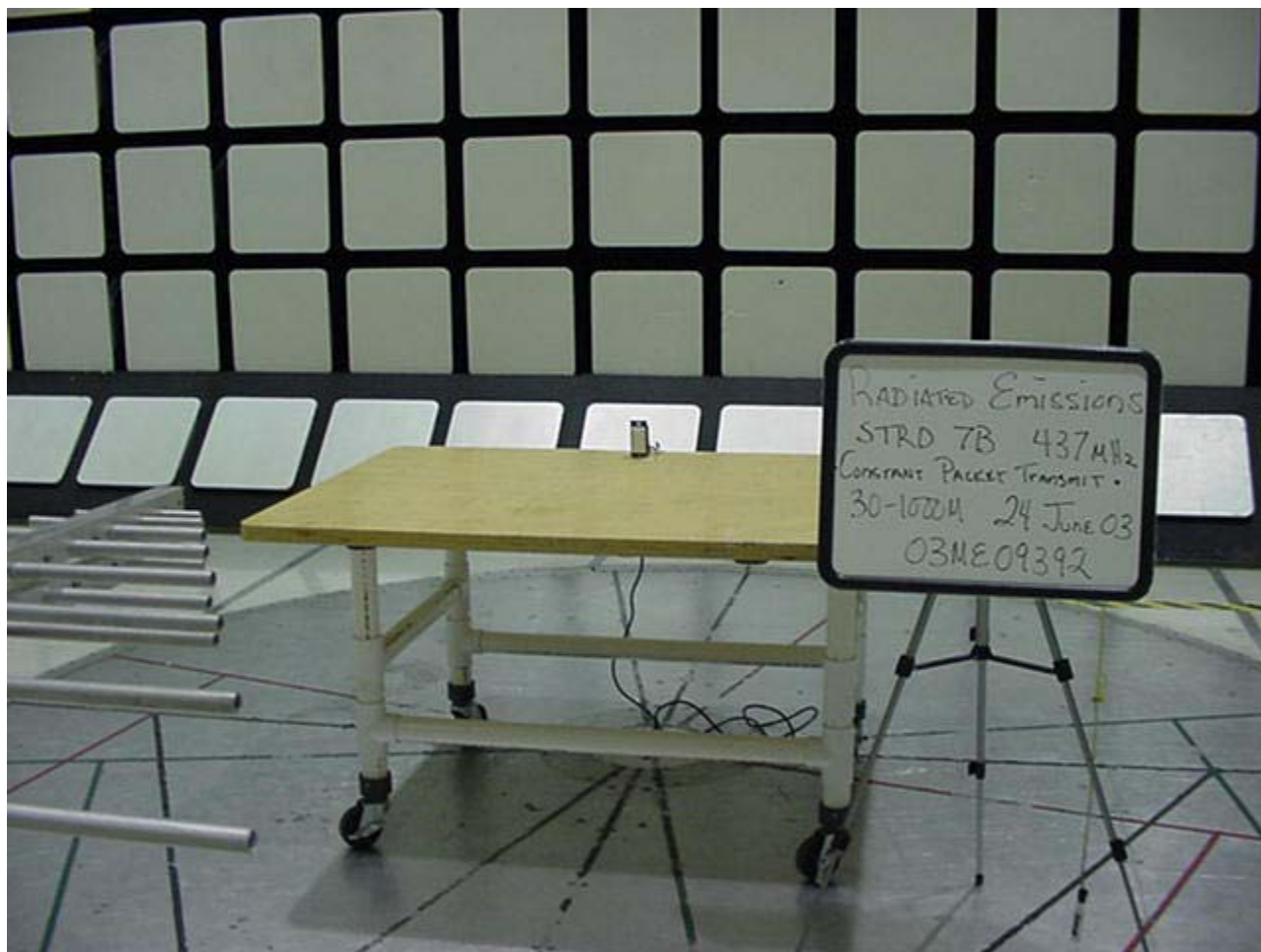
Issued: 6/18/2003



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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003



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



Radiated Emission Test Set-Up 1-2GHz Rear View



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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

2.1.5 Occupied Bandwidth

Test Applicable

Temperature: 20.8 °C
Humidity: 69%RH
Pressure: 1040mbar
Date test performed: 24 June 03

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.

431MHz and 437MHz

Bandwidth = 0.25% of 431MHz = 1.0775MHz

Bandwidth = 0.25% of 437MHz = 1.0925MHz

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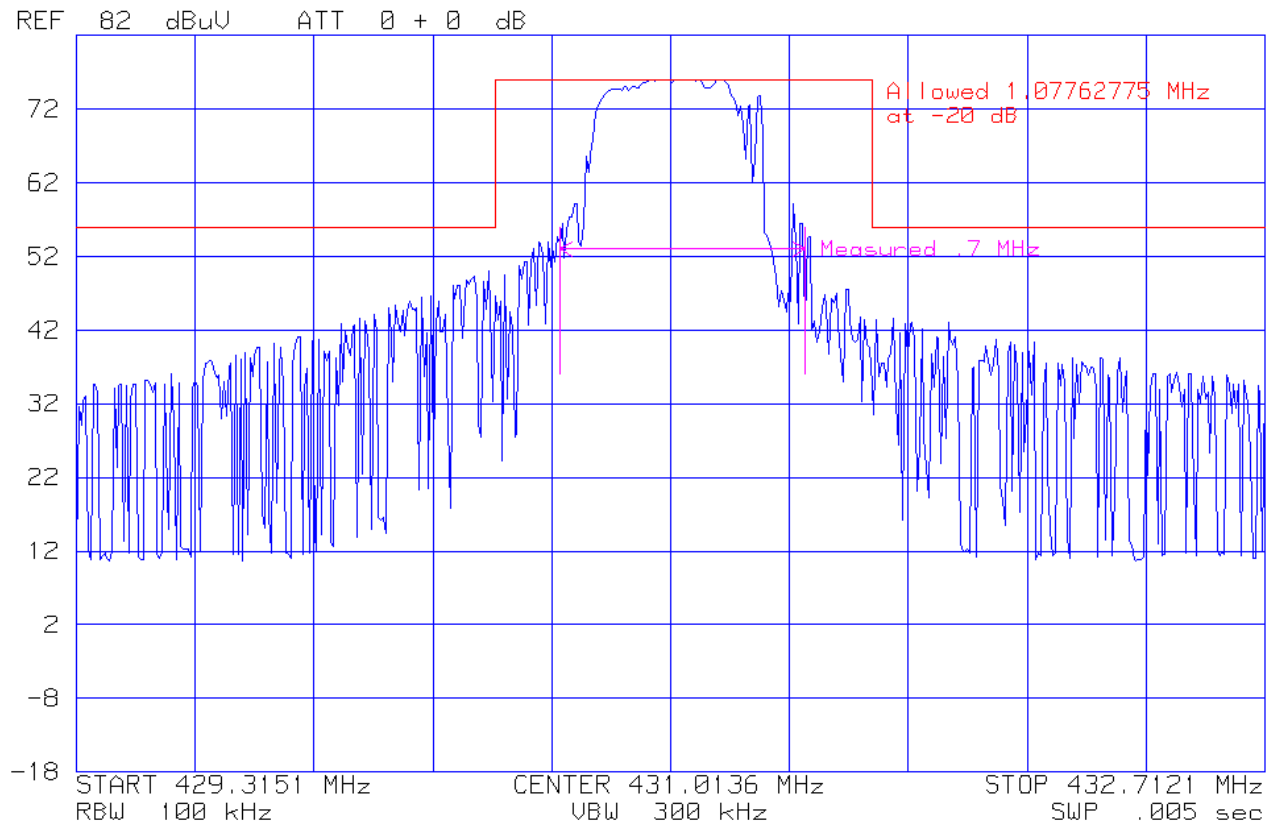
3146	EMCO	Log Periodic Antenna	Equipment No.: ME5-451
Last Calibration Date: 21 November 02		Calibration Due Date: 21 November 03	

8449B	Hewlett Packard	1-26GHz Pre-Amp	Equipment No.: ME5-914
99760-00	Cole –Parmer	Hydrometer/Temp/Barometer	Equipment No.: ME4-268

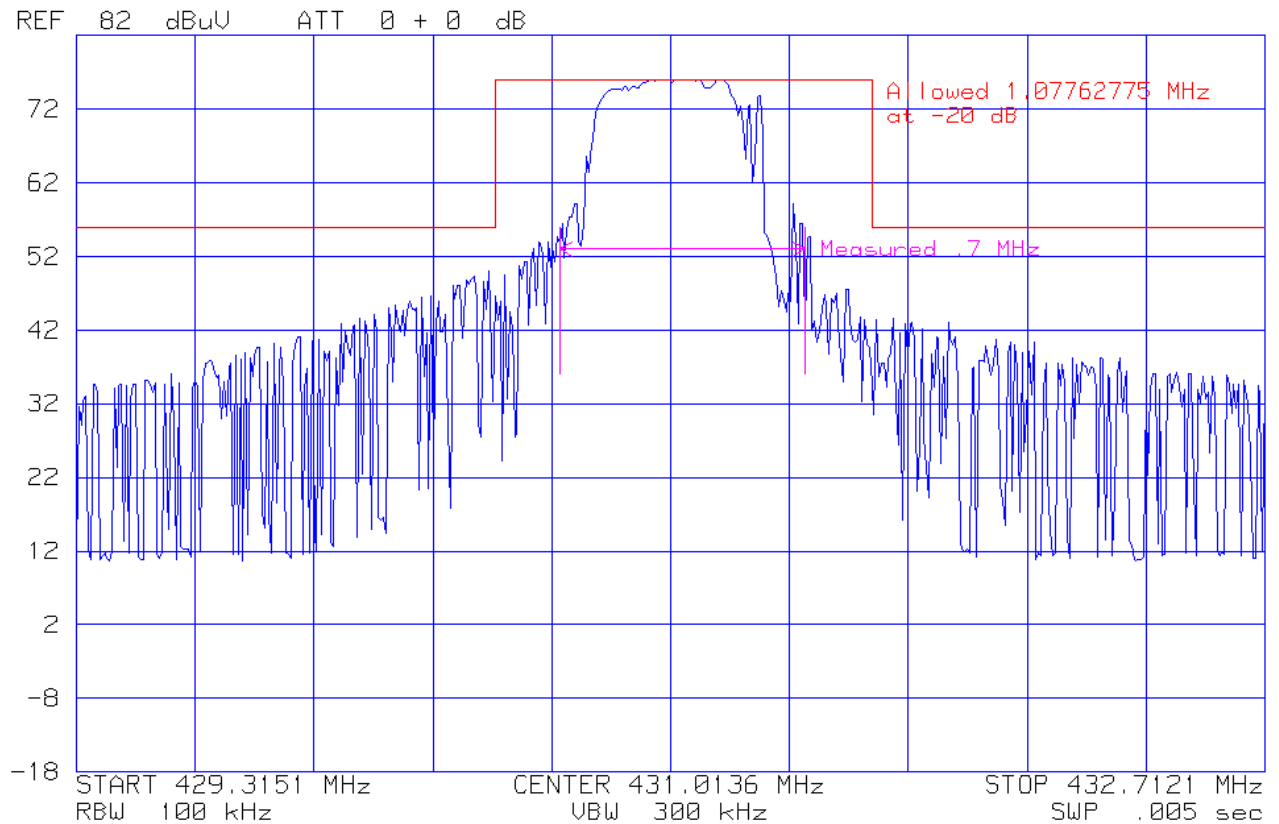
Ranges:: Temp:0°C-55°C
Humidity 25% to 95 %RH
Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 03

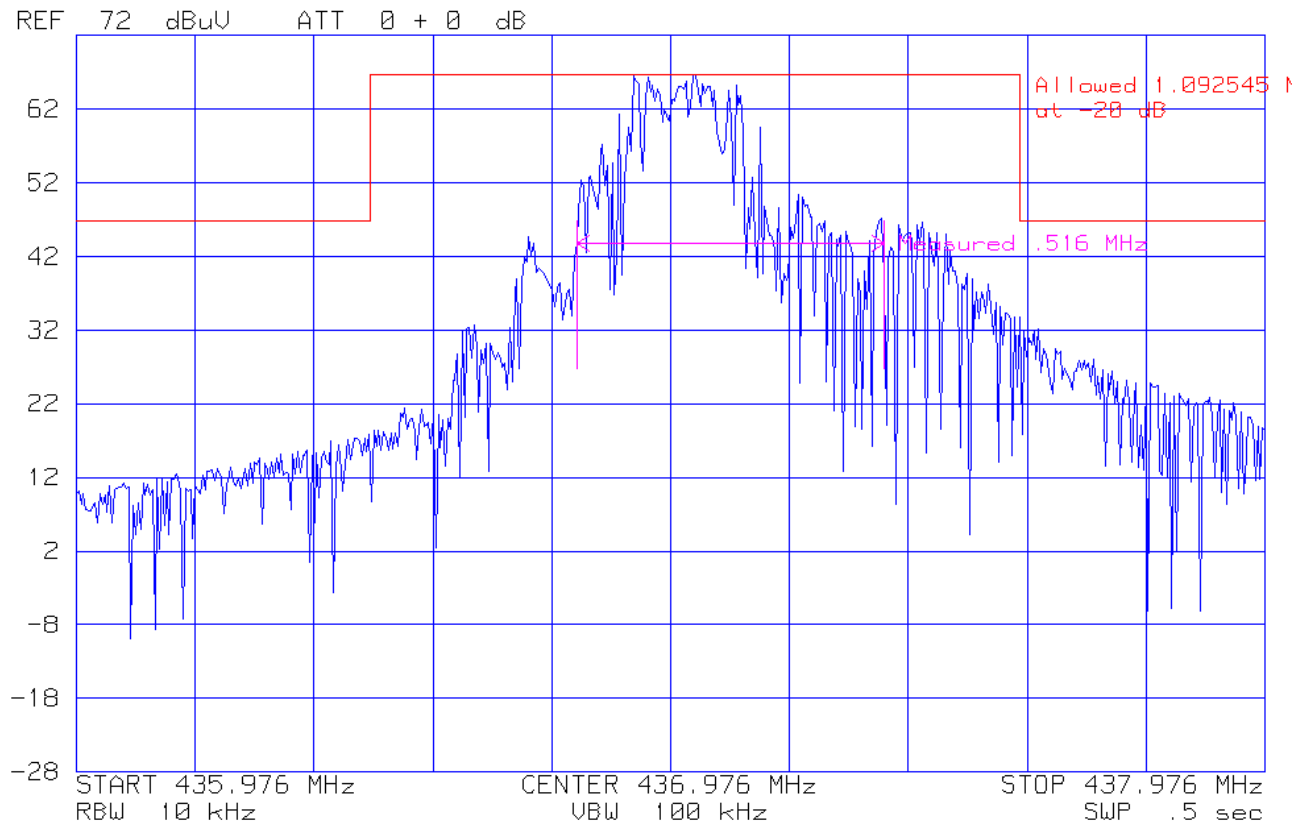
Calibration Due Date: 27 May 04



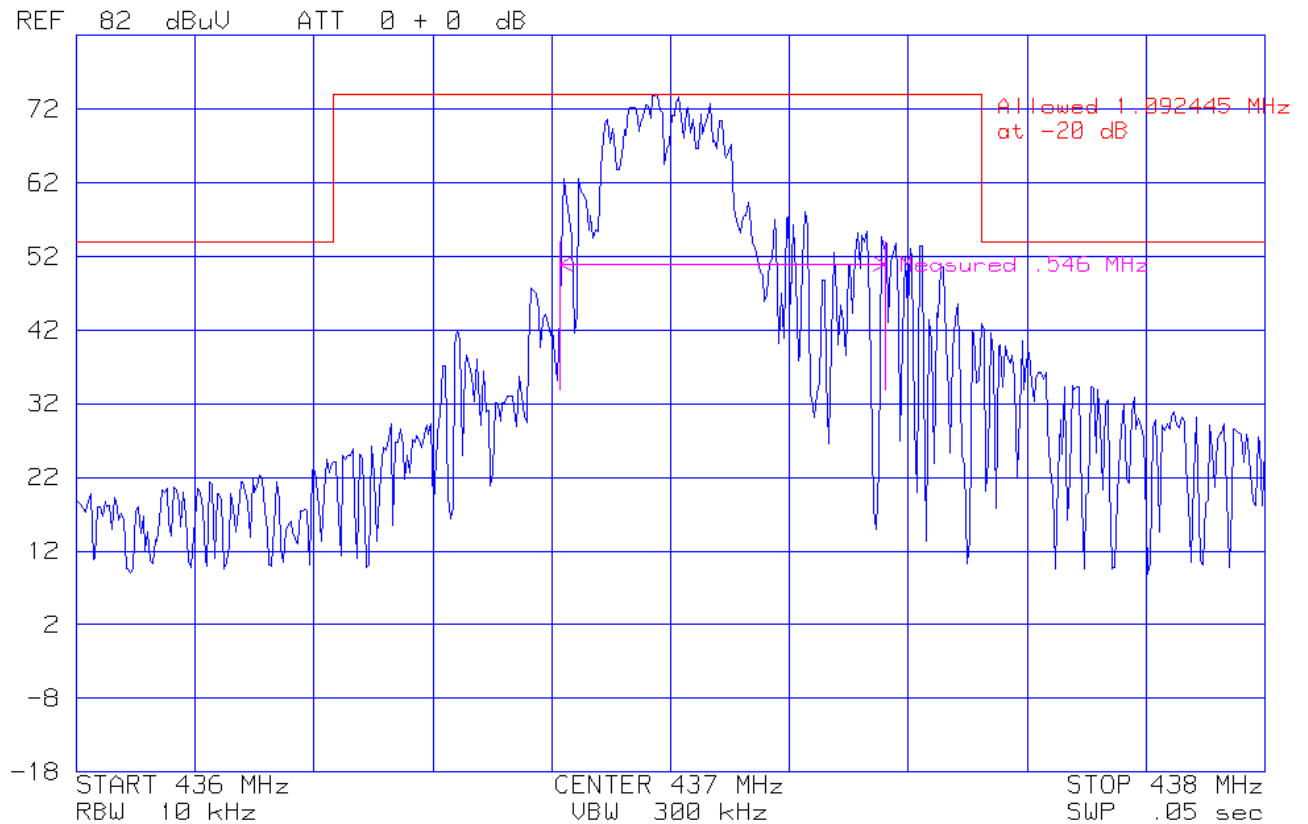
431MHz Occupied Bandwidth @ 20 db = 0.7 MHz Horizontal Polarity



431MHz Occupied Bandwidth @ 20 db = 0.7 MHz Vertical Polarity



437MHz Occupied Bandwidth @ 20 db = 0.516MHz Horizontal Polarity



437MHz Occupied Bandwidth @ 20 db = 0.546MHz Vertical Polarity

2.1.6 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation

Fundamental Frequency is 431MHz

From table in section 15.231

Limit = $41.6667(431) - 7083.3333$

Limit = 10846.3uV

Limit = $\text{Log } 10846.3(20)$

Limit = 80.7dBuV

Limit for Spurious Emissions = 20dB lower then fundamental = 60.7dBuV/m

Fundamental Frequency is 437MHz

From table in section 15.231

Limit = $41.6667(437) - 7083.3333$

Limit = 11125.018uV

Limit = $\text{Log } 11125.018 (20)$

Limit = 80.9dBuV

Limit for Spurious Emissions = 20dB lower then fundamental = 60.9dBuV/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 ($\text{dB}\mu\text{V}/\text{m}$) = $20 \cdot \log (\mu\text{V}/\text{m})$

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

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 in 100ms (2).

2 pulses = $5.26 \cdot 2 = 10.52\text{ms}$

Total time on = 10.52ms

Duty cycle correction factor = $20 \log (10.52\text{ms} / 100\text{ms})$

= $20 \log (0.526)$

= - 19.56dB

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

File Number: NC2219
Project Number: 03ME09392
Model Number: STRD-7B
FCC ID: JPZ0025

Issued: 6/18/2003

3.0 SUMMARY:

The equipment under test has

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

Test Start Date: 24 June 03

Test Completion Date: 27 June 03

- UNDERWRITERS LABORATORIES, INC. -

Project Engineer



Joseph Danisi (Ext.23055)
Senior Engineering Associate
International EMC Services
Conformity Assessment Services-3014AMEL

Reviewer



Robert DeLisi (Ext.22452)
Senior Staff Engineer
International EMC Services
Conformity Assessment Services -3014AMEL