



TEST REPORT NO. RSI-2790E
ELECTROMAGNETIC EMISSION EVALUATION
OF THE
LUTRON ELECTRONICS
MODEL #: HRT-xKP-yy
FCC PART 15, SUBPART B AND C
5 OCTOBER 2005

PREPARED FOR:

Lutron Electronics
7200 Suter Road
Coopersburg, PA 18036

SUBMITTED BY:

Radiation Sciences Inc.
3131 Detwiler Road
Harleysville, PA 19438

PREPARED BY:

Ron Smith
EMC Test Engineer
Radiation Sciences Inc.

REVIEWED BY:

Daniel J. Signore
President
Radiation Sciences Inc.



TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
	Table of Contents	i
	List of Figures	ii
	Administrative Data	iii
	Summary of Test Results	iv
1.0	INTRODUCTION	1
2.0	DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT)	2
3.0	TEST INSTRUMENTATION	3
4.0	TEST RESULTS	4
4.1	Conducted Emissions Test Results	4
4.2	Radiated Emissions Test Results	15
4.3	Bandwidth Measurements	29
5.0	Conclusions	32



LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
FIGURE 1	Conducted Emissions Test Setup Diagram	5
FIGURE 2	Conducted Emissions Test Setup Photographs	6
FIGURE 3	Conducted Emissions Test Results Phase Line, Tx431MHz	7
FIGURE 4	Conducted Emissions Test Results Neutral Line, Tx431MHz	8
FIGURE 5	Conducted Emissions Test Results Phase Line, Rx431MHz	9
FIGURE 6	Conducted Emissions Test Results Neutral Line, Rx431MHz	10
FIGURE 7	Conducted Emissions Test Results Phase Line, Tx437MHz	11
FIGURE 8	Conducted Emissions Test Results Neutral Line, Tx437MHz	12
FIGURE 9	Conducted Emissions Test Results Phase Line, Rx437MHz	13
FIGURE 10	Conducted Emissions Test Results Neutral Line, Rx437MHz	14
FIGURE 11	Duty Cycle Correction Factor	16
FIGURE 12	Radiated Emissions Test Setup Diagram	17
FIGURE 13	Radiated Emissions Test Setup Photographs	18
FIGURE 14	Radiated Emissions Test Results Data, Rx, Mode, 431MHz	19
FIGURE 15	Radiated Emissions Test Results Graph, Rx, Mode, 431MHz	20
FIGURE 16	Radiated Emissions Test Results Data, Rx, Mode, 437MHz	21
FIGURE 17	Radiated Emissions Test Results Graph, Rx, Mode, 437MHz	22
FIGURE 18	Radiated Emissions Test Results Data, CW, Tx Mode, 431MHz, Horiz.	23
FIGURE 19	Radiated Emissions Test Results Data, CW, Tx Mode, 431MHz, Vert.	24
FIGURE 20	Radiated Emissions Test Results Data, CW, Tx Mode, 437MHz, Horiz.	25
FIGURE 21	Radiated Emissions Test Results Data, CW, Tx Mode, 437MHz, Vert.	26
FIGURE 22	Intentional Radiator Test Results Data, CW, Tx Mode, 431MHz	27
FIGURE 23	Intentional Radiator Test Results Data, CW, Tx Mode, 437MHz	28
FIGURE 24	Bandwidth Test Results Data, CW, Tx Mode, 431MHz	30
FIGURE 25	Bandwidth Test Results Data, CW, Tx Mode, 437MHz	31



ADMINISTRATIVE DATA

TEST PERFORMED:

Measurements of Radiated RF and Conducted Emissions.

PURPOSE OF TEST:

To evaluate the ElectroMagnetic Emission (EME) characteristics of the Equipment Under Test (EUT) with respect to Subpart B and C of Part 15 of the Federal Communications Commission (FCC) Rules for intentional and unintentional radiators.

EQUIPMENT UNDER TEST (EUT):

Model Number: **HRT-xKP-yy**
Serial Number: nsn

CONTRACT:

Purchase Order Number: 0047111

TEST PERIOD:

TEST FACILITY:

Radiation Sciences Incorporated (RSI), EMC Test Laboratory, located at: 3131 Detwiler Road, Harleysville, Pennsylvania 19438.

TEST PERSONNEL AND COORDINATORS:

Radiation Sciences Inc.

Ron Smith

Lutron Electronics

Mark Clouser



SUMMARY OF TEST RESULTS

The **Model #:** HRT-xKP-yy, configured as described herein, **FULLY COMPLIES WITH THE REQUIREMENTS SET FORTH IN SUBPART B AND C OF PART 15 OF THE FEDERAL COMMUNICATIONS COMMISSION (FCC) RULES FOR INTENTIONAL AND UNINTENTIONAL RADIATORS.**

The test results contained in this report represent emission and/or immunity characteristics of only the product(s) (model and serial no.) tested. Radiation Sciences Inc. makes no claim that identical test results will be obtained for future tests of the same model/equipment.



1.0 INTRODUCTION

This document is a report of tests to determine the EME characteristics of the **Model #: HRT-xKP-yy**, presented by **Lutron Electronics** of Coopersburg, Pennsylvania.

The purpose of the testing was to evaluate the EMC characteristics of the test sample with respect to Subpart B and C of Part 15 of the **FCC Rules** for intentional and unintentional radiators.

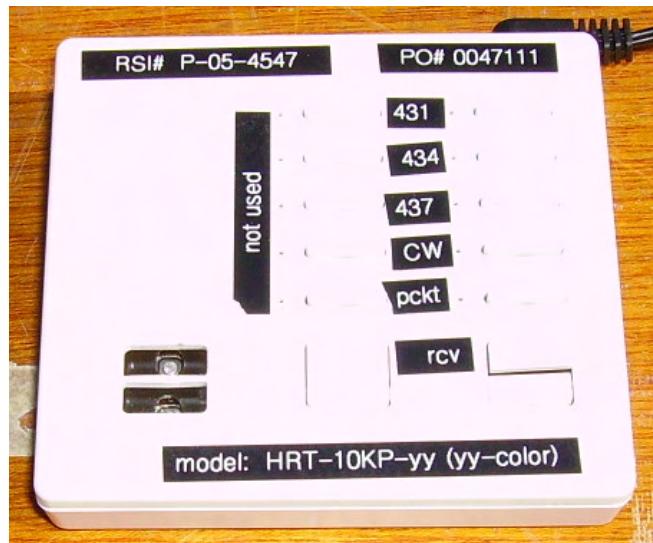
All test procedures used meet the requirements of the American National Standards Institute Procedure C63:4: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz", 2003.



2.0 DESCRIPTION OF THE TEST SAMPLE:

The **Model # HRT-xKP-yy**, manufactured by **Lutron Electronics** of Coopersburg PA, is a Home Works tabletop radio frequency key pad control.

Hereinafter, the **Model # HRT-xKP-yy**, will be referred to as the **EUT** (Equipment Under Test).





3.0 TEST INSTRUMENTATION

RSI INV NO.	DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	CAL DUE DATE
31	SPEC ANALYZER	ADVANTEST	R3271	J003583	10/27/2005
32.1	SPEC. ANALY.	H.P.	8566B	3638A08767	8/13/2006
33.1	SPEC. ANALY. DISPLY	H.P.		3701A22258	8/13/2006
52	ANTENNA	EMCO	3115	2425	6/10/2007
75	ANTENNA	TENSOR	4108	204	6/11/2007
80	ANTENNA	AMP.RES.Assoc.	AT1000	4094-025	6/14/2007
391	RECEIVER	R & S	ESVP	861744/015	12/15/2005
501	MINI MAST	EMCO	2075-2	0002-2278	
502	TURNTABLE	EMCO	2065-1.21	0001-2156	
503	CONTROLLER	EMCO	2090	0001-1489	
708	40ft Cable RG-223	PASTERNAK	BNC TO BNC	N/A	9/23/2006
712	20ft Cable RG-223	PASTERNAK	BNC TO BNC	N/A	9/16/2006

IF CAL DUE DATE = BLANK FIELD
Calibration is not required for this item. Equipment
not used to obtain a final reading (i.e. transmitting antenna).



4.0 TEST RESULTS

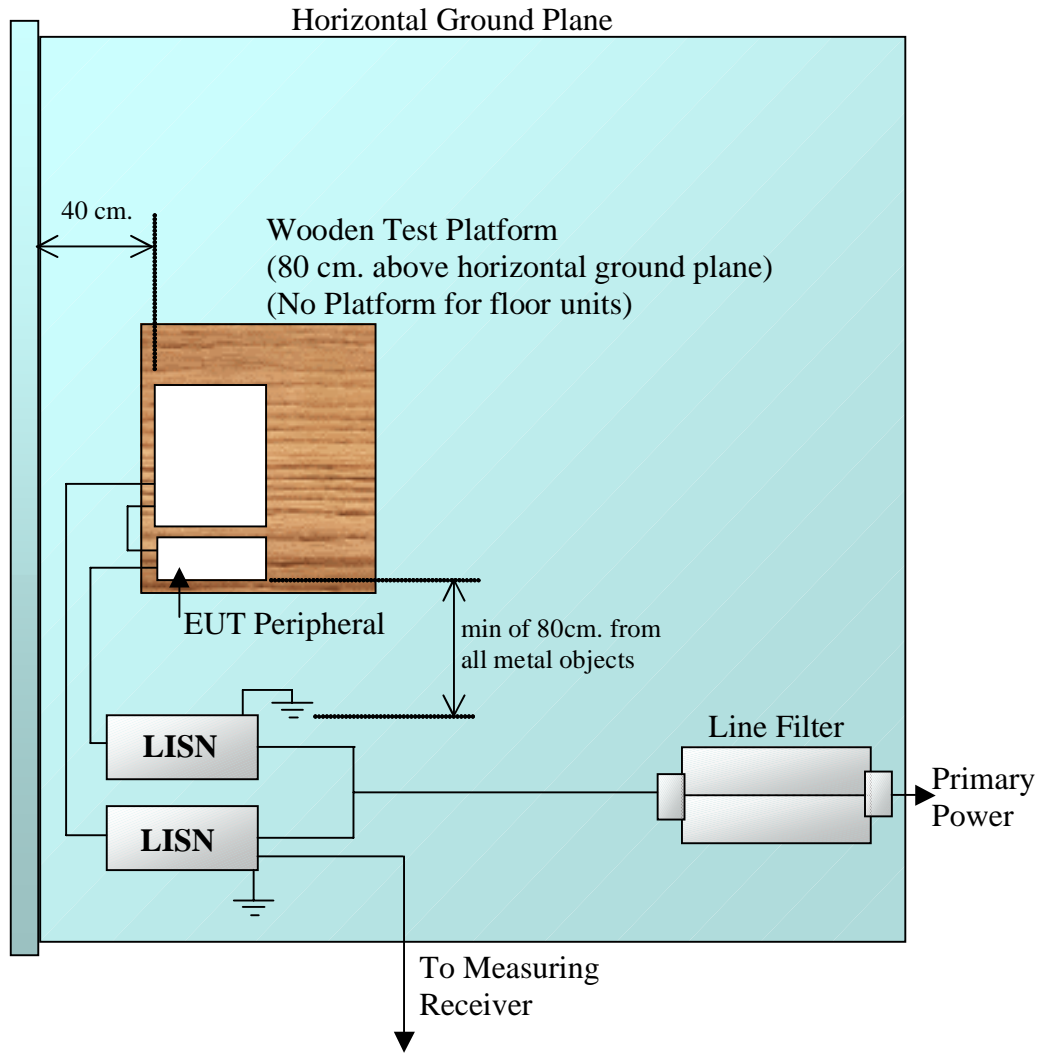
4.1 Conducted Power Line Measurements, Paragraph 15.107

Conducted power line measurements were recorded for the **Model HRT-xKP-yy**.

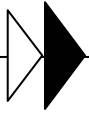
The test setup diagram is shown in Figure 1 and a photograph is shown in Figure 2.

The results of the line-to-ground radio noise voltage measurements are shown on graphs in Figures 3 through 10 for transmit and receive modes on each operating frequency.

ALL LEVELS ARE BELOW THE APPLICABLE LIMITS AS SPECIFIED BY THE FCC IN PARAGRAPH 15.107.



**Conducted Emissions Test Setup Diagram (Top View)
Figure 1**



**Conducted Emissions Test Setup Photographs
Figure 2**

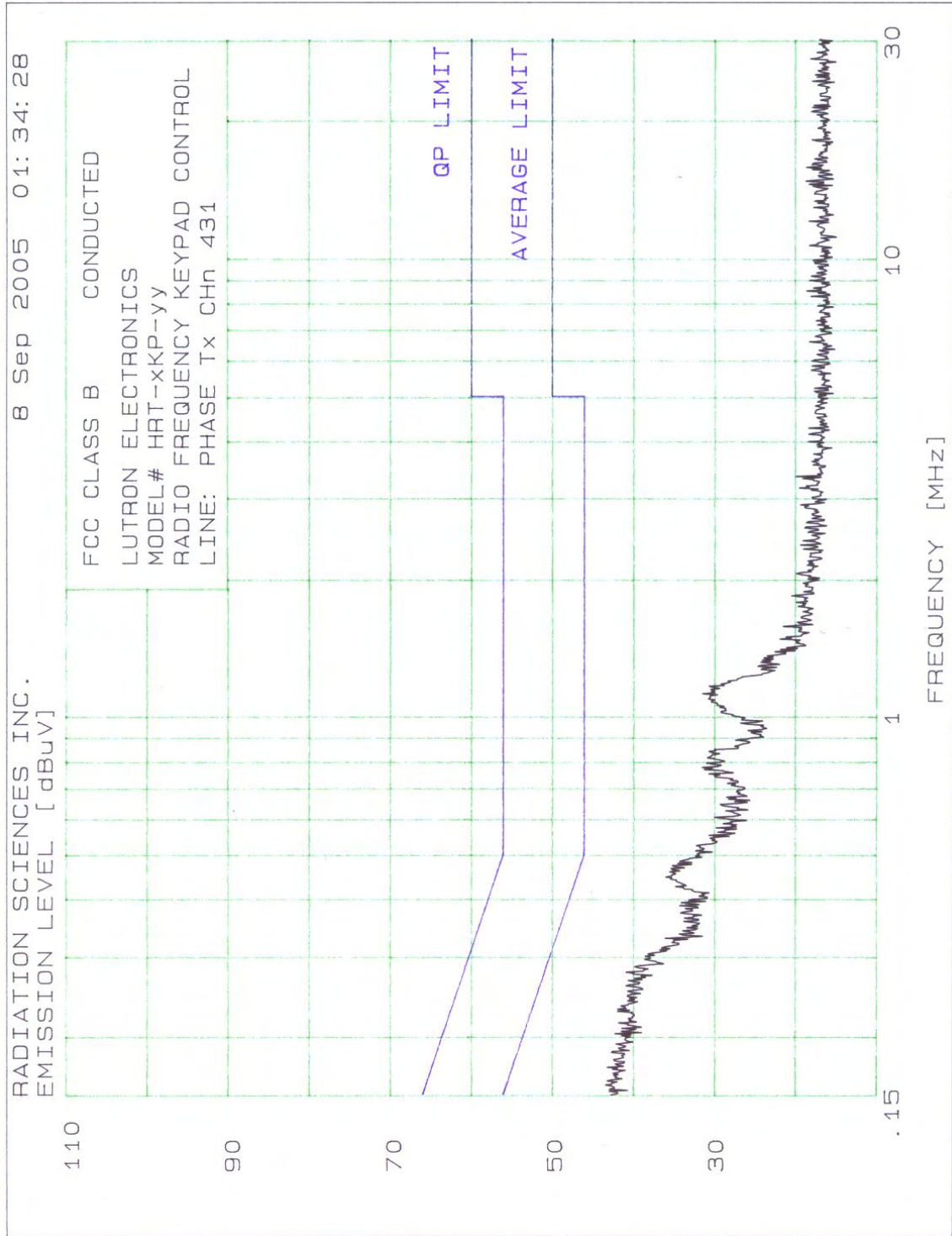


Figure 3

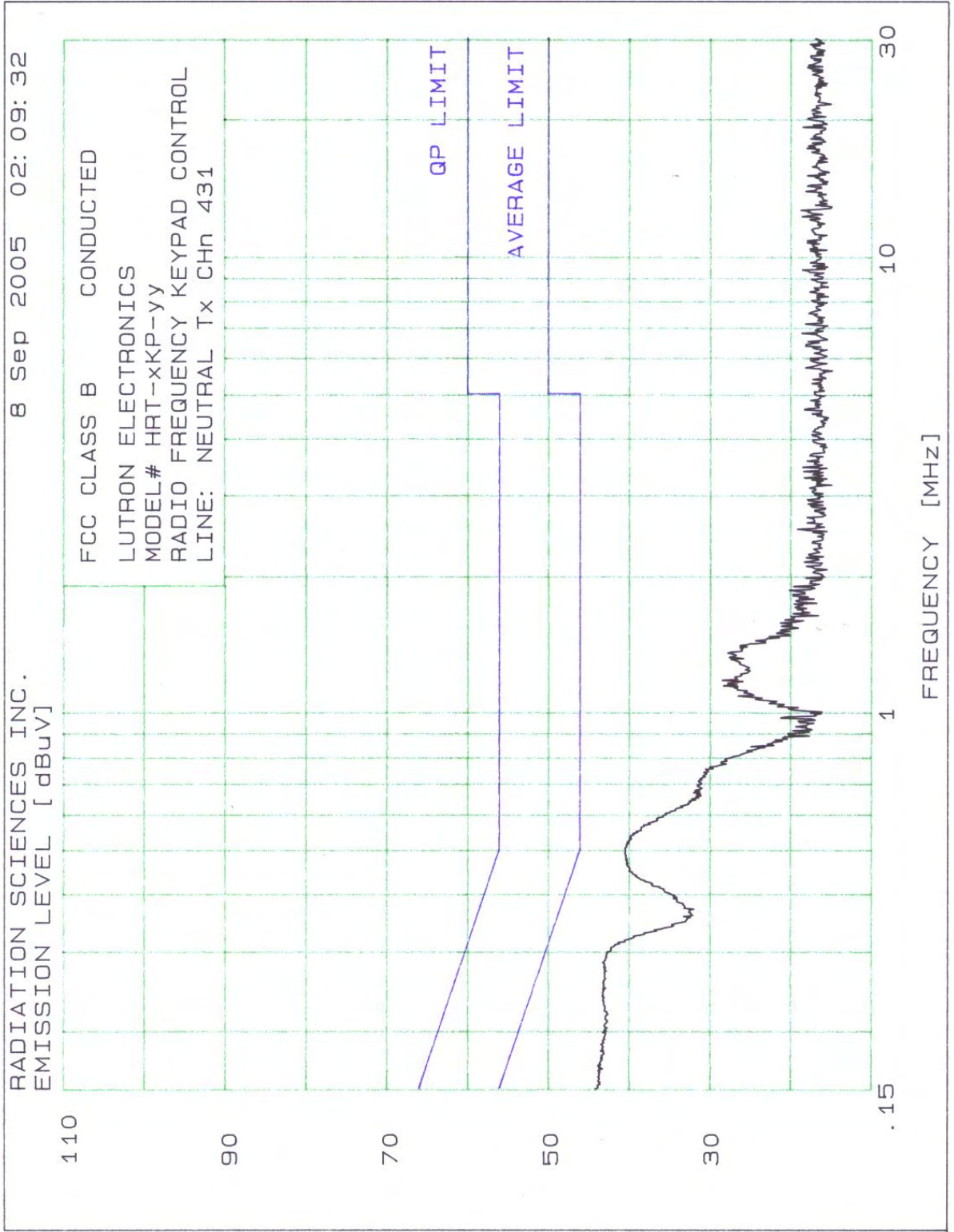


Figure 4

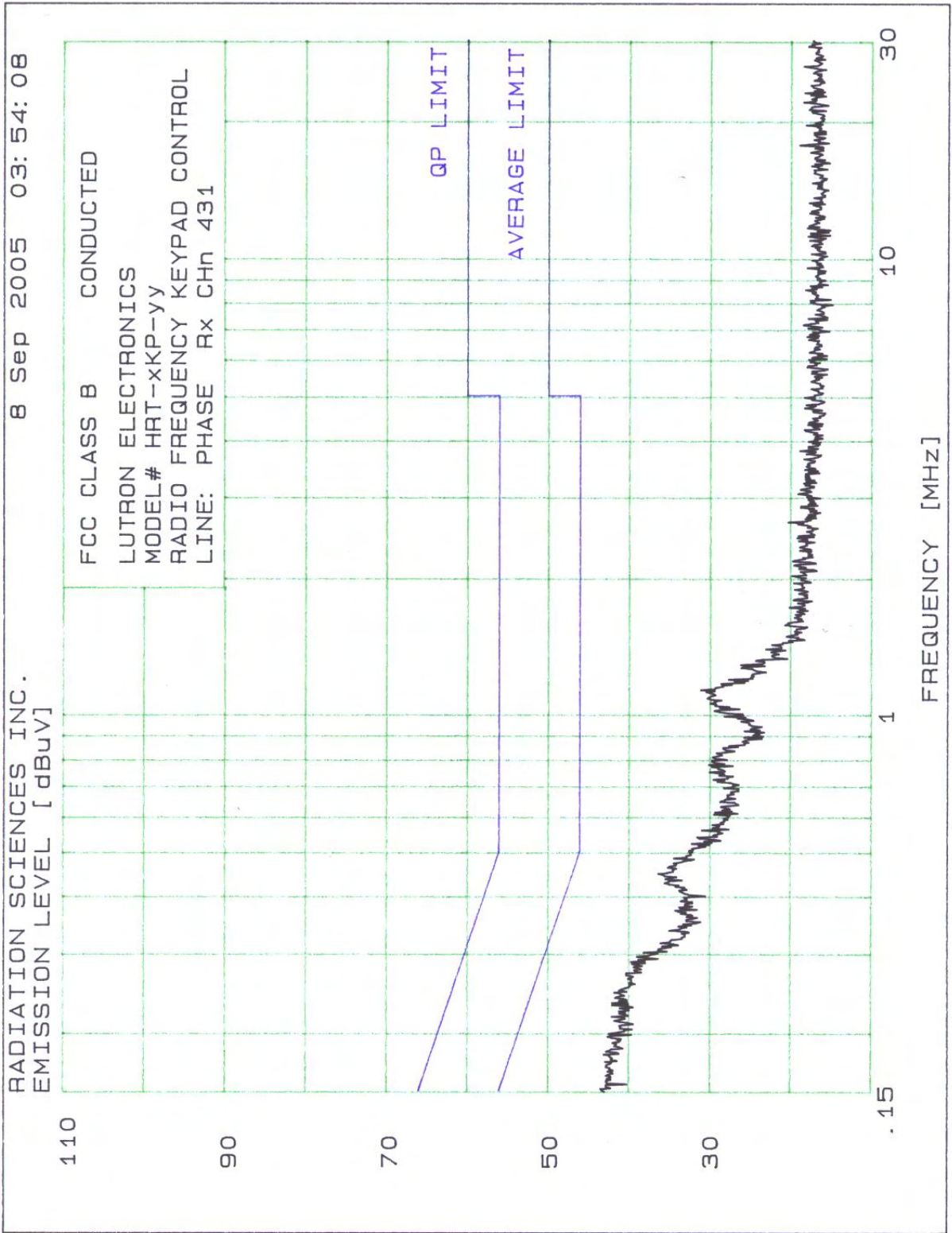
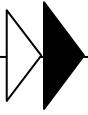


Figure 5

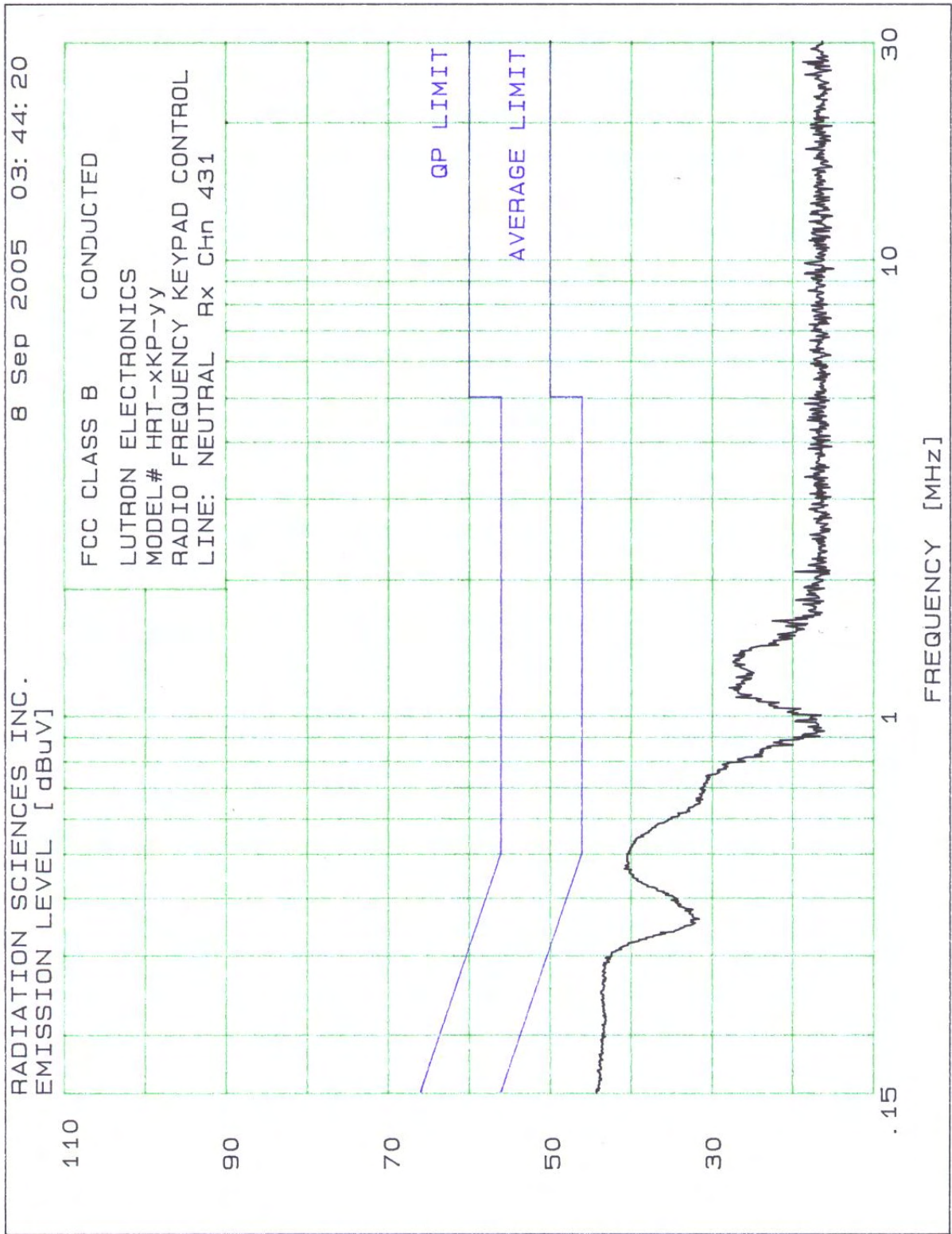


Figure 6

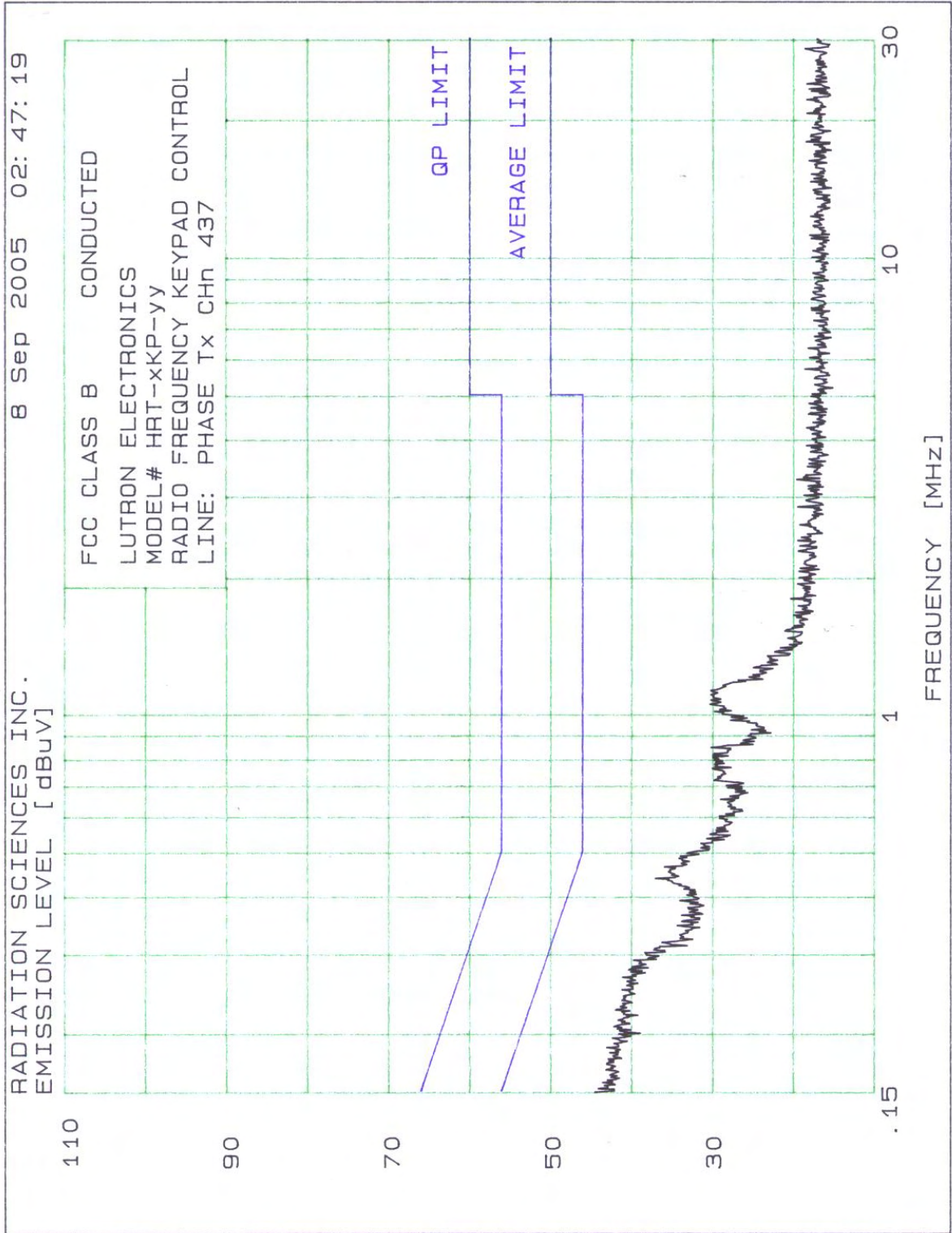


Figure 7

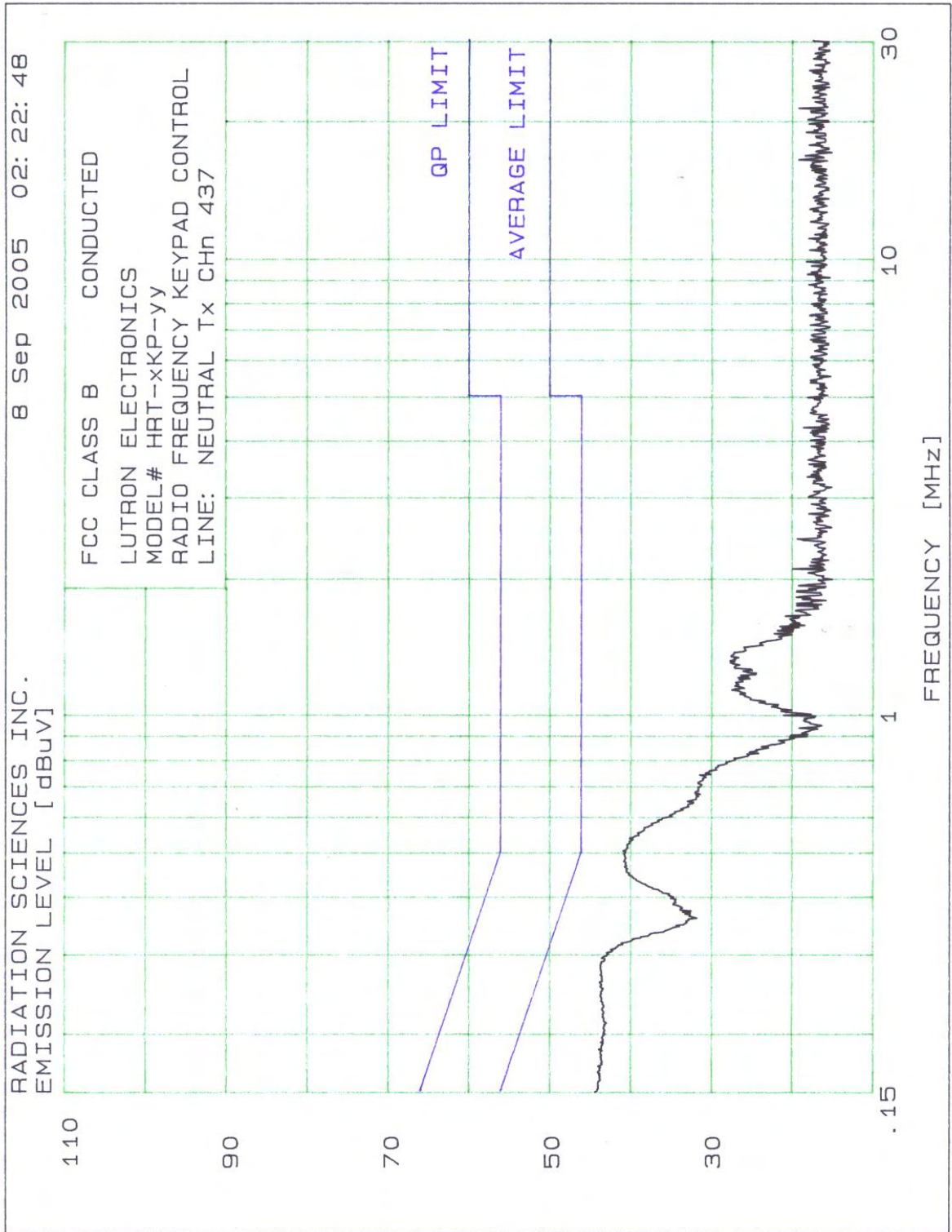


Figure 8

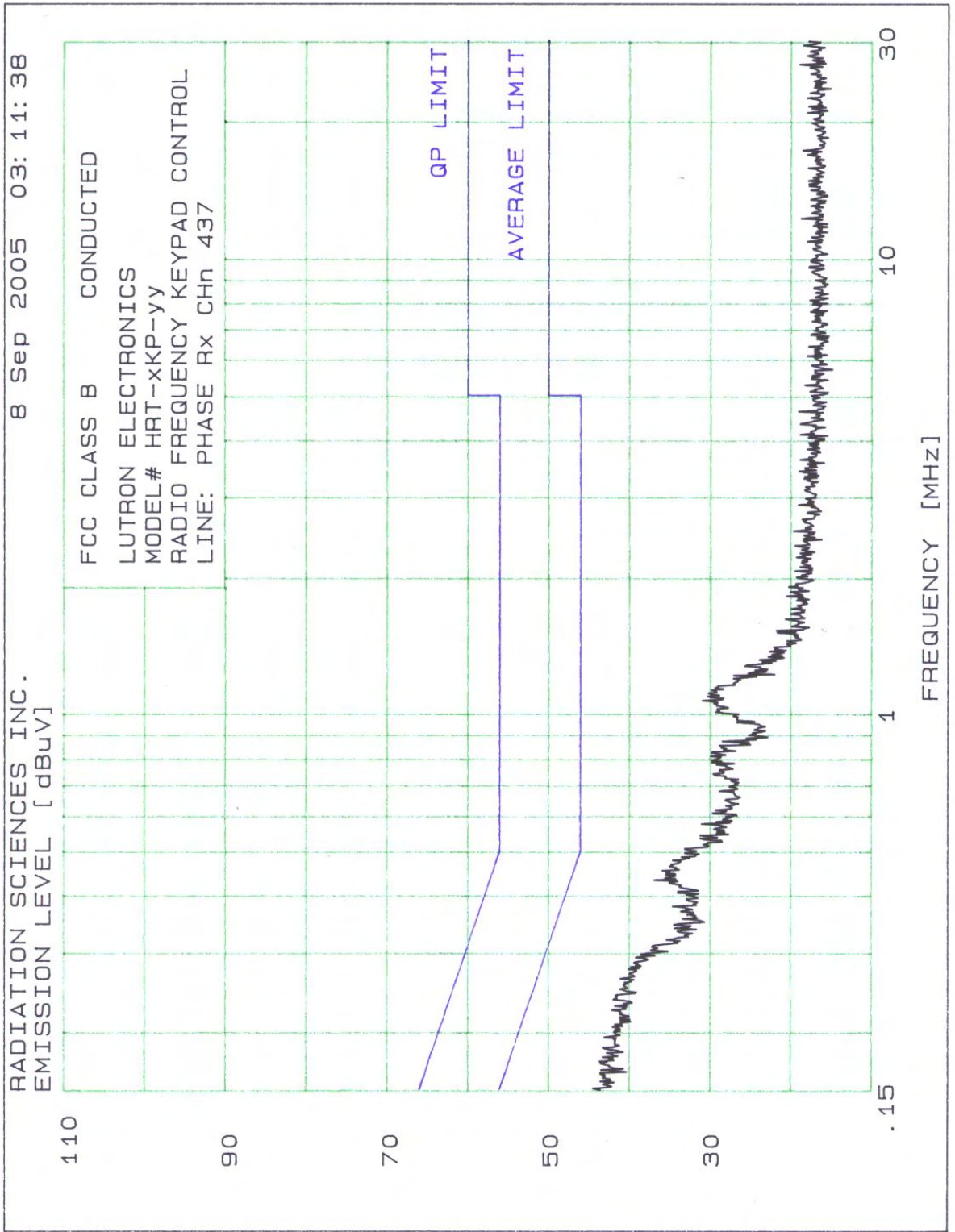
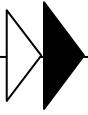


Figure 9

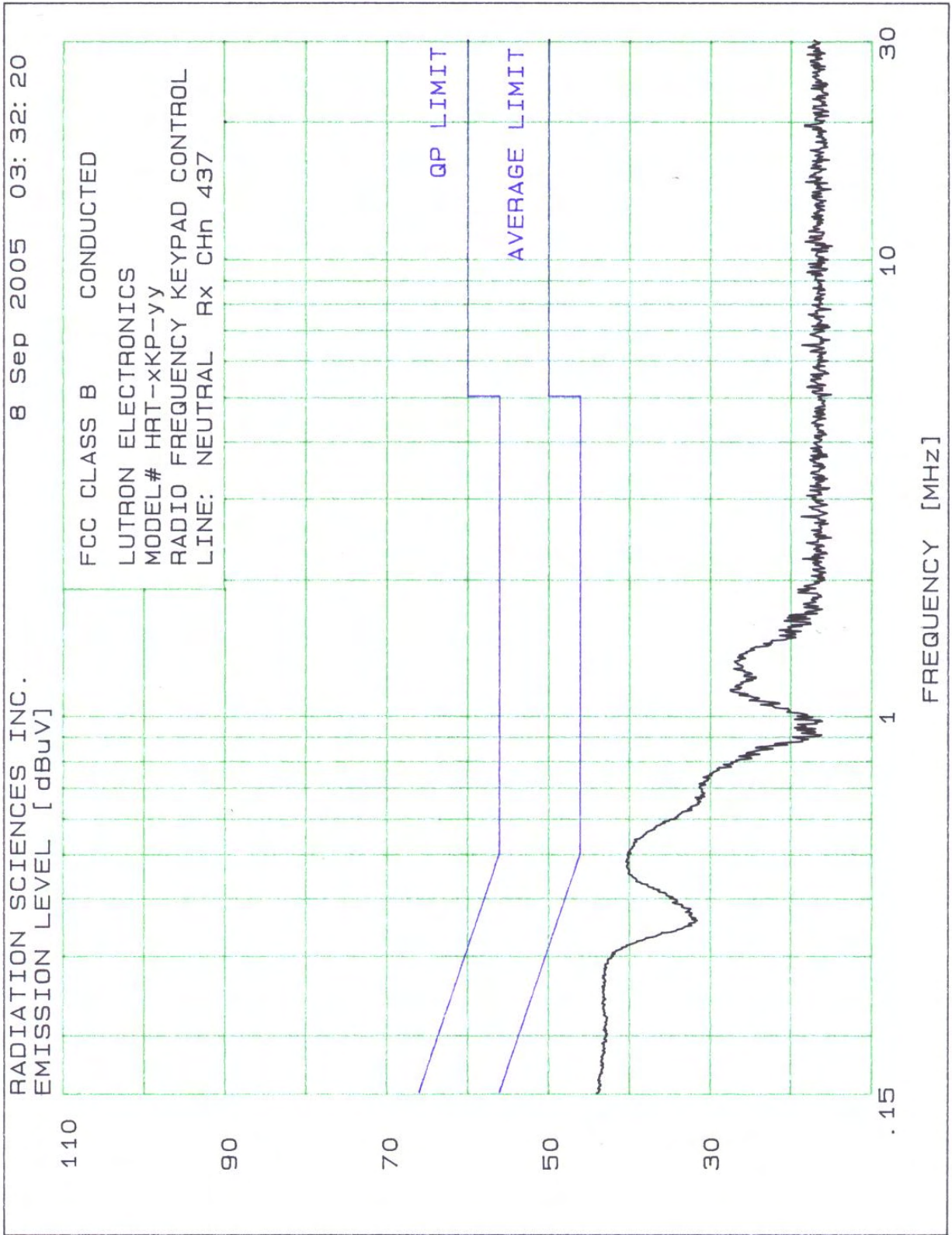
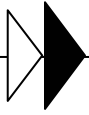


Figure 10



4.2 Radiated Emissions Measurements, §15.33, §15.35, §15.109, §15.205, §15.209, §15.231

Radiated Emissions measurements were recorded for the test sample at a distance of 3 meters. Radiated Emissions were measured with the antenna in both the horizontal and vertical polarizations. The antenna was raised 1 to 4 meters in height and the Equipment Under Test (**EUT**) was rotated 360° to maximize the emission. No significant emission level changes occurred while positioning the **EUT** power cable.

For intentional radiators the field strength of emissions of the **EUT** were measured out to the tenth harmonic of the carrier frequency. The carrier frequency was set to 431 and 437MHz.

An average factor of 20dB was applied to the level of the fundamental emission when compared to the **FCC** limit. The **EUT** duty cycle information supporting the -20dB factor is shown in Figure 11.

Figure 12 is a test setup diagram for Radiated Emissions and Figure 13 is a test setup photograph.

The test results for Radiated Emissions testing are shown in the following figures:

- Figure 14 Unintentional Radiated Emissions, data sheet, 431MHz Receive Mode
- Figure 15 Unintentional Radiated Emissions, graph, 431MHz Receive Mode
- Figure 16 Unintentional Radiated Emissions, data sheet, 437MHz Receive Mode
- Figure 17 Unintentional Radiated Emissions, graph, 437MHz Receive Mode
- Figure 18 Unintentional Radiated Emissions, data sheet, 431MHz CW Transmit Mode, Horiz
- Figure 19 Unintentional Radiated Emissions, data sheet, 431MHz CW Transmit Mode, Vert
- Figure 20 Unintentional Radiated Emissions, data sheet, 437MHz CW Transmit Mode, Horiz
- Figure 21 Unintentional Radiated Emissions, data sheet, 437MHz CW Transmit Mode, Vert

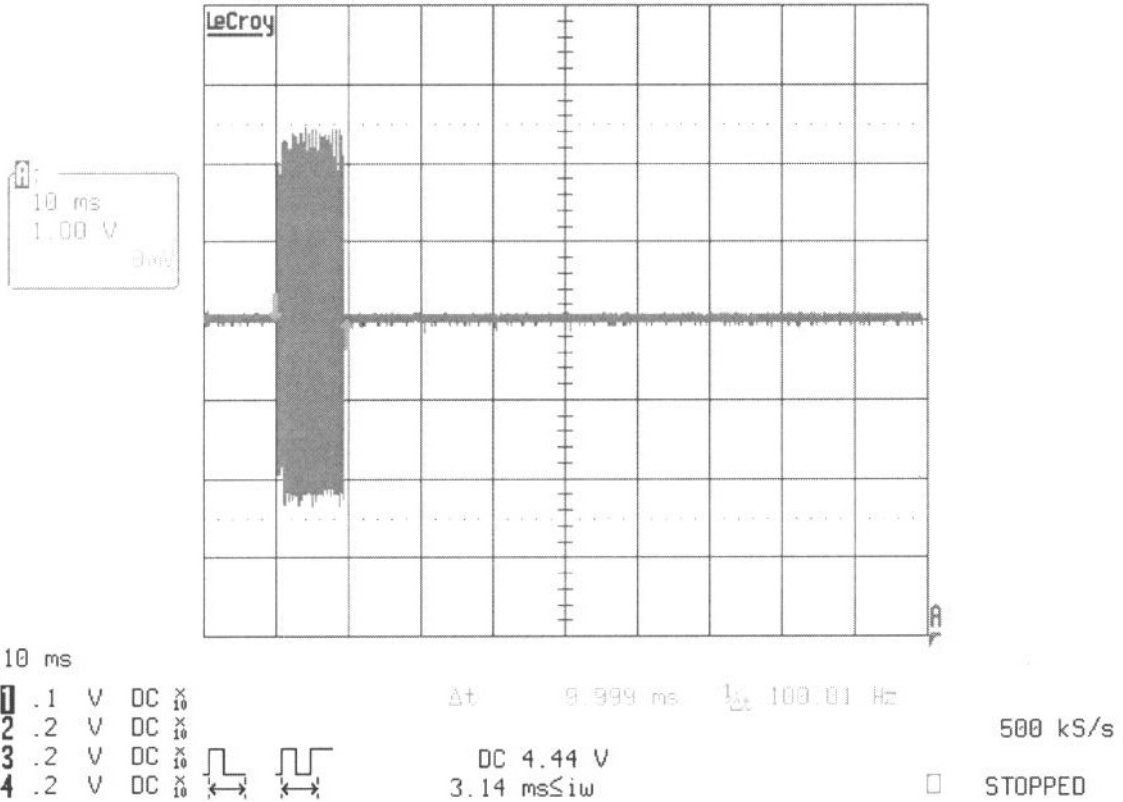
- Figure 22 Intentional Radiated Emissions, data sheet, 431MHz CW Transmit Mode
- Figure 23 Intentional Radiated Emissions, data sheet, 437MHz CW Transmit Mode

ALL LEVELS COMPLY WITH THE APPLICABLE FCC LIMITS FOR RADIATED EMISSIONS PER THE APPLICABLE PARAGRAPHS.



4-May-05
7:43:59

Reading Floppy Disk Drive



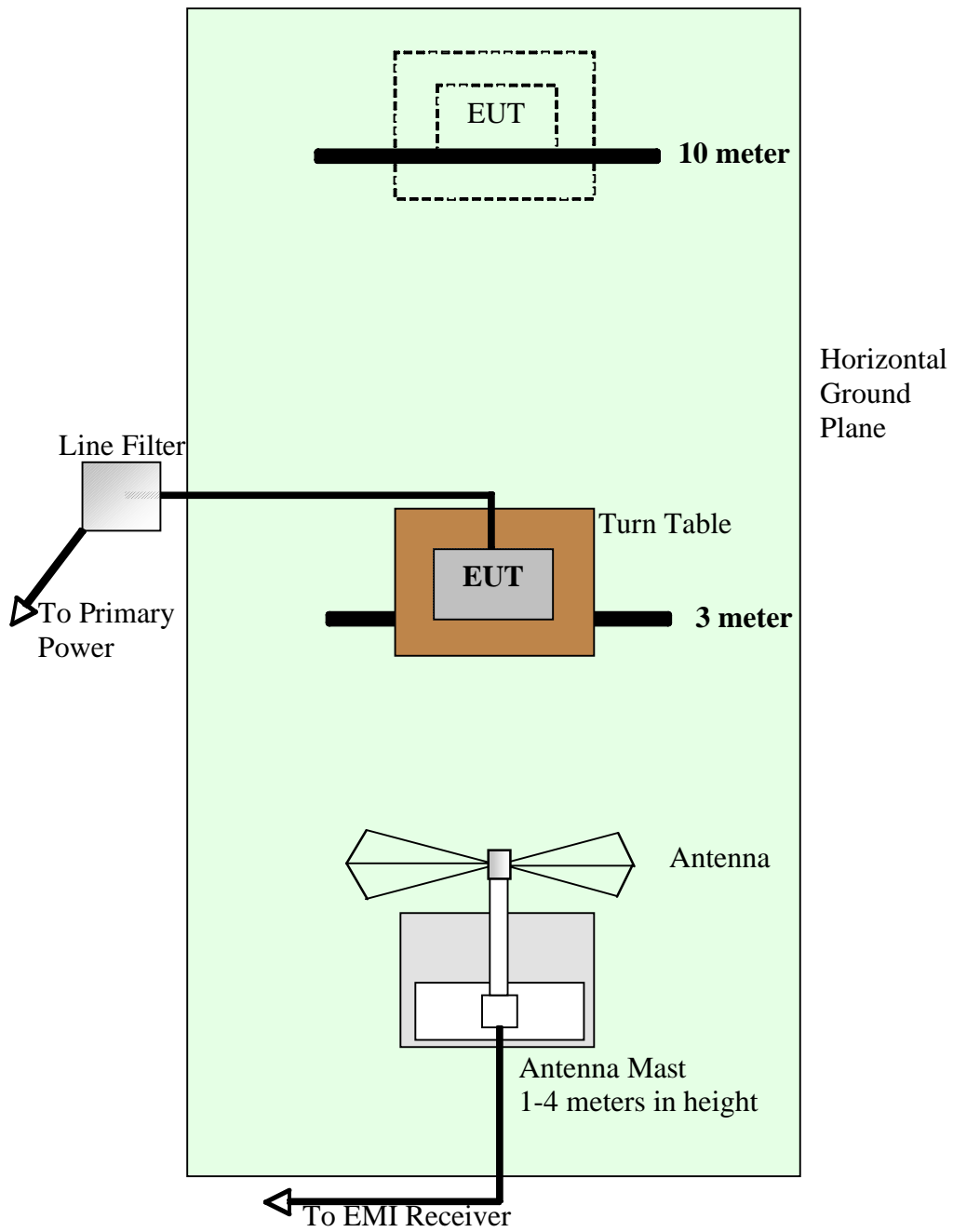
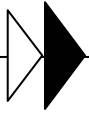
Duty Cycle Correction Factor Calculation:

Total Number of Pulses counted in 100ms

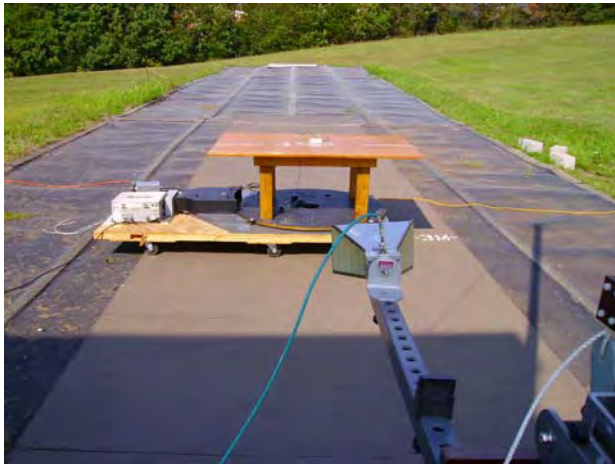
Total Time On = 9.999ms

$$\begin{aligned}
 \text{Duty Cycle Correction Factor} &= 20 \log [\text{Time On} / (\text{Time On} + \text{Time Off})] \\
 &= 20 \log [9.999 \text{ ms} / 100 \text{ ms}] \\
 &= 20 \log [0.1] \\
 &= -20 \text{ dB}
 \end{aligned}$$

**Duty Cycle Correction Factor
Figure 11**



**Radiated Emissions Test Setup Diagram
Figure 12**



**Radiated Emission Test Setup Photographs
Figure 13**



Electromagnetic Emission Test

E U T	Manufacturer: Lutron Electronics Model#: HRD-xKP-yy Serial #: N/A Mode: Receive 431MHz	Date: 9/6&7/05 Test Instruments: RSI # 75, 80, 391, 708, 501, 502, 503	Test Code RE Technician
	Frequency Range: 30MHz S 1000MHz		Engineer

Temperature: 80°F Humidity: 46%	Additional Info:	Test Spec: FCC Part15, Class B Unintentional Radiators
--	-------------------------	--

Radiated Distance: 3 meter Antenna: Bicon / Log	<input checked="" type="checkbox"/> HORIZ. <input type="checkbox"/> BB <input type="checkbox"/> NB <input checked="" type="checkbox"/> VERT. <input type="checkbox"/> H <input type="checkbox"/> E	Conducted Line: Function:	<input type="checkbox"/> BB <input type="checkbox"/> NB
--	---	--	--

FREQ.	IND. Level	Pre-Amp Factor	Correction Factors		Final Level	Antenna Height	EUT Azimuth	Remarks
			ANT.	Cable loss				
MHz	dBμV	dB	dB	dB	dBμV/m	Meters	Degree	
31.99	10.9		12.7	.8	24.4	1.00	297	Vertical/Bicon
63.99	15.6		9.2	1.2	26	1.00	326	
127.96	9.0		12.1	1.9	23	1.00	98	
192.0	4.4		14.2	2.2	20.8	1.00	250	
200.0	1.7		14.6	2.3	18.6	1.00	326	↓
300.0	-1.4		14.8	3.0	16.4	1.00	0	Vertical/LogP.
430.692	-1.6		17.4	3.6	19.4	1.00	0	
500.0	-1.6		17.9	4.0	20.3	1.00	0	
861.384	2.4		22.8	5.4	30.6	1.00	0	
1000.0	-0.2		24.2	5.8	29.8	1.00	0	↓
1292.0	46.9	-31.0	25.0	1.0	42	1.00	0	Vert/3115 Horn
1723.0	49.0	-33.0	26.3	1.0	43.3	1.00	0	↓
2153.0	44.6	-29.0	28.0	1.0	47.3	1.00	0	↓
31.99	7.4		13.6	.8	21.8	3.50	25	Horizontal/Bicon
63.99	12.0		8.9	1.2	22.1	2.67	360	
127.96	8.7		11.6	1.9	22.2	1.57	264	
192.0	8.8		13.4	2.2	24.4	1.63	217	
200.0	7.4		14.0	2.3	23.7	1.70	178	↓
300.0	-1.1		14.8	3.0	16.7	2.18	0	Horizontal/LogP.
430.692	-1.6		17.3	3.6	19.3	2.18	0	
500.0	-1.6		18.2	4.0	20.6	2.18	0	
861.384	2.4		23.3	5.4	31.1	2.18	0	
1000.0	-.2		24.6	5.8	30.2	2.18	0	↓
1292.0	46.6	-31.0	25.0	1.0	41.6	1.00	0	Horiz/3115 Horn
1723.0	48.7	-33.0	26.6	1.0	43.3	1.00	0	↓
2153.0	45.50	-29.0	28.0	1.0	45.5	1.00	0	↓

Figure 14

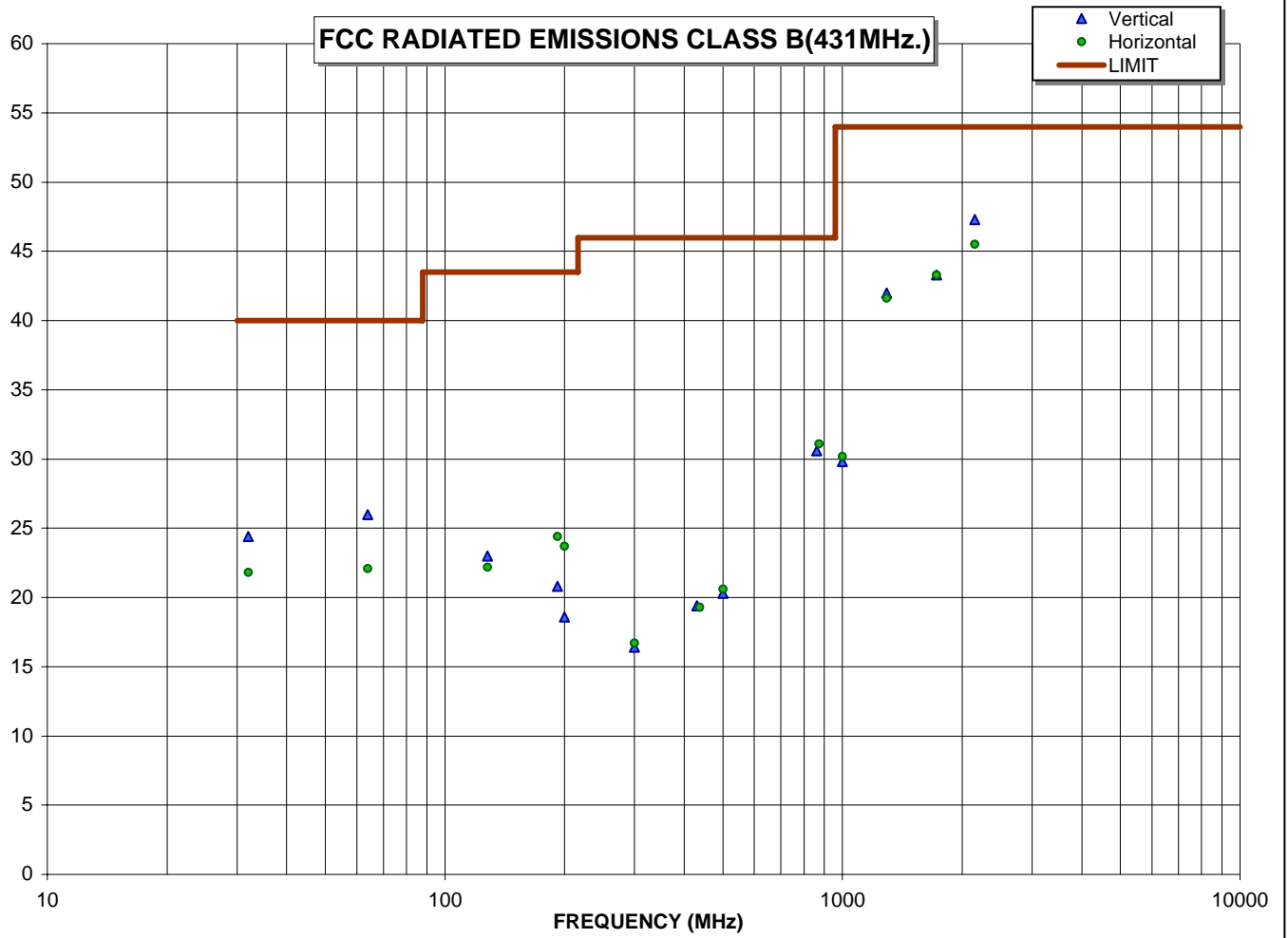
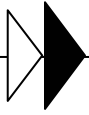


Figure 15



Electromagnetic Emission Test

E U T	Manufacturer: Lutron Electronics	Date: 9/06&7/05	Test Code RE
	Model#: HRT-xKP-yy	Test Instruments: RSI # 75, 80, 391, 708, 501, 502, 503	Technician
	Serial #: N/A		
	Mode: Receive 437MHz	Frequency Range: 30MHz S 2153MHz	Engineer

Temperature: 80°F	Additional Info:	Test Spec: FCC Part15, Class B Unintentional Radiators
Humidity: 46%		

Radiated Distance: 3 meter Antenna: Bicon / Log	<input checked="" type="checkbox"/> HORIZ. <input type="checkbox"/> BB <input type="checkbox"/> NB <input checked="" type="checkbox"/> VERT. <input type="checkbox"/> H <input type="checkbox"/> E	Conducted Line: Function:	<input type="checkbox"/> BB <input type="checkbox"/> NB
--	---	--	--

FREQ.	IND. Level	Pre-Amp Factor	Correction Factors		Final Level	Antenna Height	EUT Azimuth	Remarks
			ANT.	Cable loss				
MHz	dBμV	dB	dB	dB	dBμV/m	Meters	Degree	
31.99	11.4		12.7	.8	24.9	1.00	325	Vertical/Bicon
63.99	14.5		9.2	1.2	24.9	1.00	18	
127.96	9.0		12.1	1.9	23	1.00	58	
192.0	4.4		14.2	2.2	20.8	1.00	257	
200.0	2.1		14.6	2.3	19.0	1.00	228	↓
300.0	-.6		14.8	3.0	17.2	1.00	88	Vertical/LogP.
436.692	-1.6		17.4	3.7	19.5	1.00	88	
500.0	-1.6		17.9	4.0	20.3	1.00	88	
873.384	2.4		22.8	5.4	30.6	1.00	88	
1000	-.2		24.2	5.8	29.8	1.00	88	↓
1310	47.0	-31.0	25.1	1.0	42.1	1.00	0	Vert/3115 Horn
1747	49.0	-33.0	26.3	1.0	43.3	1.00	0	↓
2183	47.3	-29.0	28.0	1.0	47.3	1.00	0	↓
31.99	7.9		13.6	.8	22.3	2.91	65	Horizontal/Bicon
63.99	12.9		8.9	1.2	23	2.67	69	
127.96	8.7		11.6	1.9	22.2	1.40	264	
192.0	8.6		13.4	2.2	24.2	1.71	226	
200.0	7.3		14.0	2.3	23.6	1.70	178	↓
300.0	-1.6		15.2	3.0	16.6	2.18	0	Horizontal/LogP.
436.692	-2.2		17.3	3.7	18.8	2.18	0	
500.0	-1.6		18.2	4.0	20.6	2.18	0	
873.384	2.4		23.3	5.4	31.1	2.18	0	
1000	-.2		24.6	5.8	30.2	2.18	0	↓
1310	47.0	-31.0	25.0	1.0	42	1.00	0	Horiz/3115 Horn
1747	49.5	-33.0	26.6	1.0	44.1	1.00	0	↓
2183	48.5	-29.0	28.0	1.0	48.5	1.00	0	↓

Figure 16

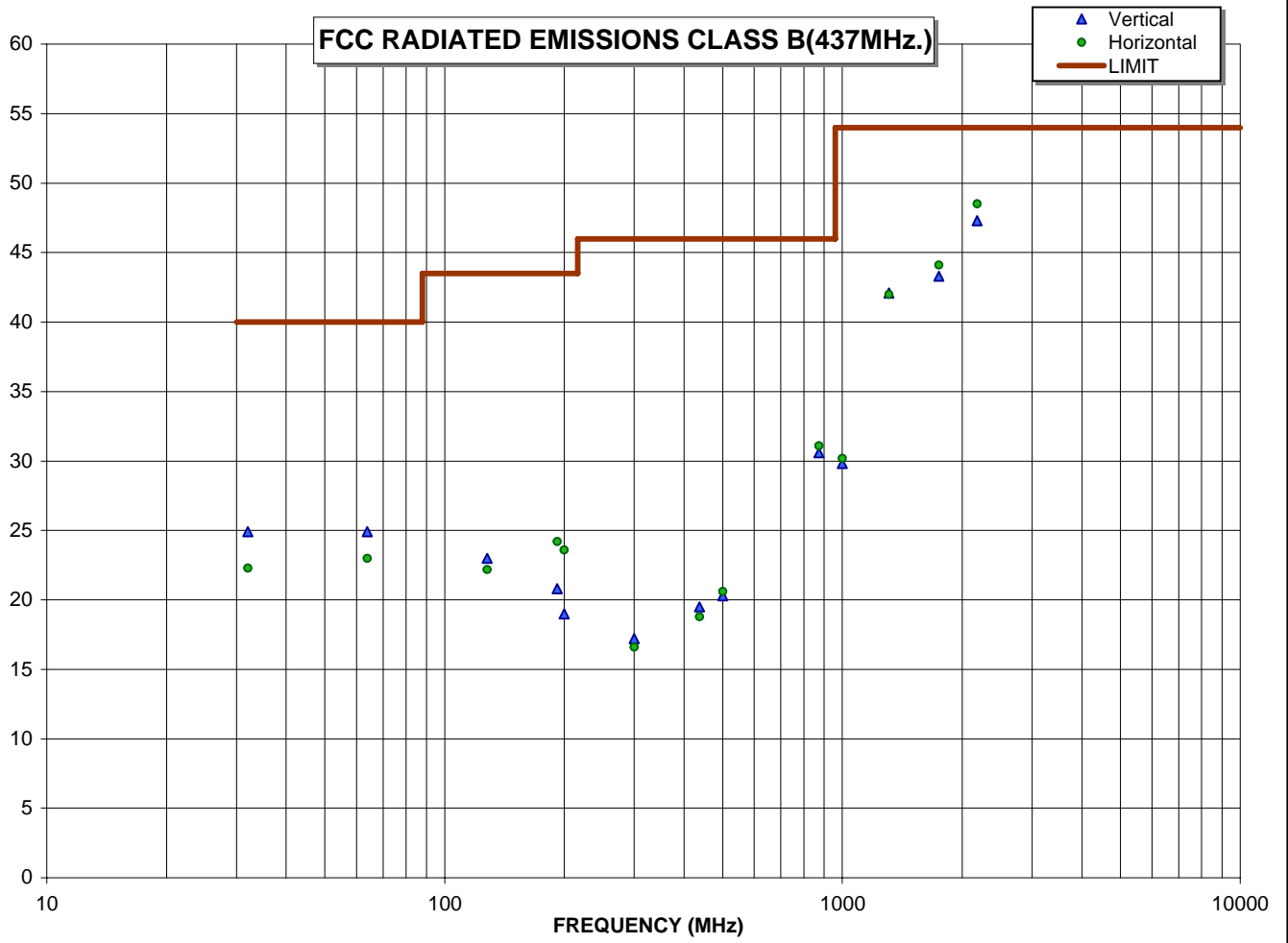
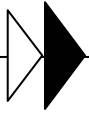


Figure 17



Company: Lutron Electronics
Model # HRT-xKP-yy
Fund. Freq.: 431MHz

Test Personnel: Ron Smith
Date: 9/6/05-9/7/05

Radiated Emissions for Unintentional Radiators

Frequency (MHz)	Polarity	Antenna Height (Meters)	Azimuth (Degrees)	Indicated Level (dBuV)	Antenna Factor (dB)	Pre-Amp Gain Factor (dB)	Cable Loss (dB)	Averaging Factor (dB)	Field Strength @ 3m (dBuV/m)	Limits @ 3m (dBuV/m)	Margin (dB)
63.99	Horiz	2.54	140	13.9	8.9	0.0	1.2		24.0	41.93	-17.9
127.96	Horiz	1.46	223	9.6	11.6	0.0	1.9		23.1	41.93	-18.8
192.0	Horiz	1.59	223	9.0	13.4	0.0	2.2		24.6	51.48	-26.9
200.0	Horiz	1.85	116	7.0	14.0	0.0	2.3		23.3	51.48	-28.2
300.0	Horiz	1.00	231	-0.7	15.2	0.0	3.0		17.5	54.67	-37.2
427.63	Horiz	1.00	230	29.2	17.3	0.0	3.6		50.1	60.61	-10.5
434.32	Horiz	1.00	229	34.4	17.3	0.0	3.7		55.4	60.84	-5.4
434.97	Horiz	1.00	230	32.4	17.30	0.0	3.7		53.4	60.86	-7.5
430.693	Horiz	1.00	231	24.9	17.3	0.0	3.6		45.8	60.92	-15.1
500.0	Horiz	1.00	231	-1.1	18.2	0.0	4.0		21.1	61.9	-40.8
861.386	Horiz	1.00	231	2.4	22.7	0.0	5.4		30.5	61.9	-31.4
1000.0	Horiz	1.00	231	-0.2	24.6	0.0	5.8		30.2	61.9	-31.7
1292.0	Horiz	1.00	0	46.6	25.0	-31.0	1.0		41.6	61.9	-20.3
1723.0	Horiz	1.00	0	48.7	26.6	-33.0	1.0		43.3	61.9	-18.6
2153.0	Horiz	1.00	0	45.5	28.0	-29.0	1.0		45.5	61.9	-16.4

Figure 18



Company: Lutron Electronics
Model # HRT-xKP-yy
Fund. Freq.: 431MHz

Test Personnel: Ron Smith
Date: 9/6/05-9/7/05

Radiated Emissions for Unintentional Radiators

Frequency (MHz)	Polarity	Antenna Height (Meters)	Azimuth (Degrees)	Indicated Level (dBuV)	Antenna Factor (dB)	Pre-Amp Gain Factor (dB)	Cable Loss (dB)	Averaging Factor (dB)	Field Strength @ 3m (dBuV/m)	Limits @ 3m (dBuV/m)	Margin (dB)
63.99	Vert	1.00	333	15.1	9.2	0.0	1.2		25.5	41.93	-16.4
127.96	Vert	1.00	68	9.8	12.1	0.0	1.9		23.8	41.93	-18.1
192.0	Vert	1.00	272	4.4	14.2	0.0	2.2		20.80	51.48	-30.7
200.0	Vert	1.00	0	1.7	14.6	0.0	2.3		18.6	51.48	-32.9
300.0	Vert	1.00	0	-1.1	14.8	0.0	3.0		16.7	54.67	-38.0
427.63	Vert	1.21	220	28.9	17.4	0.0	3.6		49.9	60.61	-10.7
434.32	Vert	1.21	222	32.5	17.4	0.0	3.7		53.6	60.84	-7.2
434.97	Vert	1.20	228	29.8	17.4	0.0	3.7		50.90	60.86	-10.0
430.693	Vert	1.22	221	21.2	17.4	0.0	3.6		42.2	60.92	-18.7
500.0	Vert	1.20	228	-1.6	17.9	0.0	4.0		20.3	61.9	-41.6
861.386	Vert	1.22	221	2.4	22.4	0.0	5.4		30.2	61.9	-31.7
1000.0	Vert	1.22	221	-0.2	24.2	0.0	5.8		29.8	61.9	-32.1
1292.0	Vert	1.00	0	46.9	25.0	-31.0	1.0		41.9	61.9	-20.0
1723.0	Vert	1.00	0	49.0	26.3	-33.0	1.0		43.3	61.9	-18.6
2153.0	Vert	1.00	0	44.6	28.0	-29.0	1.0		44.6	61.9	-17.3

Figure 19



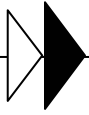
Company: Lutron Electronics
 Model # HRT-xKP-yy
 Fund. Fre q.: 431MHz

Test Personnel: Ron Smith
 Date: 9/02/05

Radiated Emission for Intentional Radiators

Frequency (MHz)	Polarity	Antenna Height (Meters)	Azimuth (Degrees)	Indicated Level (dBuV)	Antenna Factor (dB)	Pre-Amp Gain Factor (dB)	Cable Loss (dB)	Averaging Factor (dB)	Field Strength @ 3m (dBuV/m)	Limits @ 3m (dBuV/m)	Margin (dB)
431	Vert	1.31	67	74.5	17.4	0.0	3.6	-20.0	75.5	80.73	-5.2
862	Vert	3.50	0	21.8	22.5	0.0	5.4	-20.0	29.7	61.93	-32.2
1293	Vert	1.00	0	44.91	25.0	-31.0	1.0	-20.0	19.91	61.93	-42.0
1724	Vert	1.00	0	46.66	26.3	-33.0	1.0	-20.0	20.96	61.93	-41.0
2155	Vert	1.00	0	45.0	28.0	-29.0	1.0	-20.0	25.0	61.93	-36.9
2586	Vert	1.00	0	44.09	30.0	-32.0	1.0	-20.0	23.09	61.93	-38.8
3017	Vert	1.00	0	43.69	30.3	-27.0	1.0	-20.0	27.99	61.93	-33.9
3448	Vert	1.00	0	40.0	31.3	-25.0	1.0	-20.0	27.3	61.93	-34.6
3879	Vert	1.00	0	37.6	32.4	-23.3	1.0	-20.0	27.73	54.0	-26.3
4310	Vert	1.00	0	37.0	32.5	-22.0	1.0	-20.0	28.5	54.0	-25.5
431	Horiz	1.00	257	75.4	17.3	0.0	3.6	-20.0	76.3	80.73	-4.4
862	Horiz	1.00	216	45.4	22.8	0.0	5.4	-20.0	53.6	61.93	-8.3
1293	Horiz	1.00	198	51.0	25.0	-31.0	1.0	-20.0	26.0	61.93	-35.9
1724	Horiz	1.00	0	46.0	26.6	-33.0	1.0	-20.0	20.6	61.93	-41.3
2155	Horiz	1.00	0	44.28	28.0	-29.0	1.0	-20.0	24.28	61.93	-37.7
2586	Horiz	1.00	0	43.44	29.9	-32.0	1.0	-20.0	22.3	61.93	-39.6
3017	Horiz	1.00	0	42.31	30.4	-27.0	1.0	-20.0	26.71	61.93	-35.2
3448	Horiz	1.00	0	40.56	31.4	-25.0	1.0	-20.0	27.96	61.93	-34.0
3879	Horiz	1.00	0	39.31	32.5	-23.3	1.0	-20.0	29.51	54.0	-24.5
4310	Horiz	1.00	0	39.59	32.5	-22.0	1.0	-20.0	31.09	54.0	-22.9

Figure 22



Company: Lutron Electronics
Model # HRT-xKP-yy
Fund. Fre q.: 437MHz

Test Personnel: Ron Smith
Date: 9/02/05

Radiated Emission for Intentional Radiators

Frequency (MHz)	Polarity	Antenna Height (Meters)	Azimuth (Degrees)	Indicated Level (dBuV)	Antenna Factor (dB)	Pre-Amp Gain Factor (dB)	Cable Loss (dB)	Averaging Factor (dB)	Field Strength @ 3m (dBuV/m)	Limits @ 3m (dBuV/m)	Margin (dB)
437	Vert	1.28	50	73.2	17.4	0.0	3.6	-20.0	74.2	80.3	-6.1
874	Vert	3.50	64	40.0	22.8	0.0	5.4	-20.0	48.2	61.9	-13.7
1311	Vert	1.00	198	53.53	25.1	-32.0	1.0	-20.0	27.6	61.9	-34.3
1748	Vert	1.00	0	46.66	26.3	-33.0	1.0	-20.0	20.96	54.0	-33.0
2185	Vert	1.00	0	47.0	28.2	-29.0	1.0	-20.0	27.2	61.9	-34.7
2622	Vert	1.00	0	43.18	30.0	-32.0	1.0	-20.0	22.18	61.9	-39.7
3059	Vert	1.00	0	41.97	30.3	-27.0	1.0	-20.0	26.27	61.9	-35.6
3496	Vert	1.00	0	41.0	31.4	-25.0	1.0	-20.0	28.4	54.0	-25.6
3933	Vert	1.00	0	39.1	32.44	-23.3	1.0	-20.0	29.24	54.0	-24.8
4370	Vert	1.00	0	37.0	32.5	-22.0	1.0	-20.0	28.5	54.0	-25.5
437	Horiz	1.00	239	75.4	17.3	0.0	3.6	-20.0	76.3	80.3	-4.0
874	Horiz	1.00	216	47.0	23.3	0.0	5.4	-20.0	55.7	61.9	-6.2
1311	Horiz	1.00	98	51.69	25.1	-32.0	1.0	-20.0	25.79	61.9	-36.1
1748	Horiz	1.00	0	48.25	26.6	-33.0	1.0	-20.0	22.85	54.0	-31.2
2185	Horiz	1.00	0	47.13	28.2	-29.0	1.0	-20.0	27.3	61.9	-34.6
2622	Horiz	1.00	0	43.91	29.9	-32.0	1.0	-20.0	22.81	61.9	-39.1
3059	Horiz	1.00	0	41.94	30.4	-27.0	1.0	-20.0	26.34	61.9	-35.6
3496	Horiz	1.00	0	41.84	31.5	-25.0	1.0	-20.0	29.34	54.0	-24.7
3933	Horiz	1.00	0	38.10	32.54	-23.3	1.0	-20.0	28.34	54.0	-25.7
4370	Horiz	1.00	0	39.54	32.5	-22.0	1.0	-20.0	31.04	54.0	-23.0

Figure 23



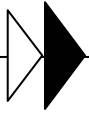
4.3 Bandwidth Measurements, Paragraph 15.231

Bandwidth measurements were made at the three transmit frequencies of 431 and 437MHz.

RSI used an HP 8566 Spectrum Analyzer to perform bandwidth measurements. Bandwidth plots are shown on data sheets.

The requirement states that the bandwidth shall be no wider than .25% of the center frequency at the 20dB down points. Results of testing are shown in Figures 24 and 25.

THE BANDWIDTH MEASUREMENTS COMPLIED WITH THE FCC REQUIREMENTS SET FORTH IN PARAGRAPH 15.231.



Company: Lutron Electronics
Model # HRT-XKP
Fund. Freq.: 431MHz

Test Personnel: Ron Smith
Date: 9/8/05

Bandwidth of Fundamental Frequency

	Frequency (MHz)	Measurement (dBuV/m)
Center Frequency	431.0	91.90
20 dB down	431.009	71.85
20 dB down	430.974	71.70

The bandwidth is 35KHz

Allowable Bandwidth: 0.25% of Fundamental Frequency
For 431MHz: ± 0.5388 MHz

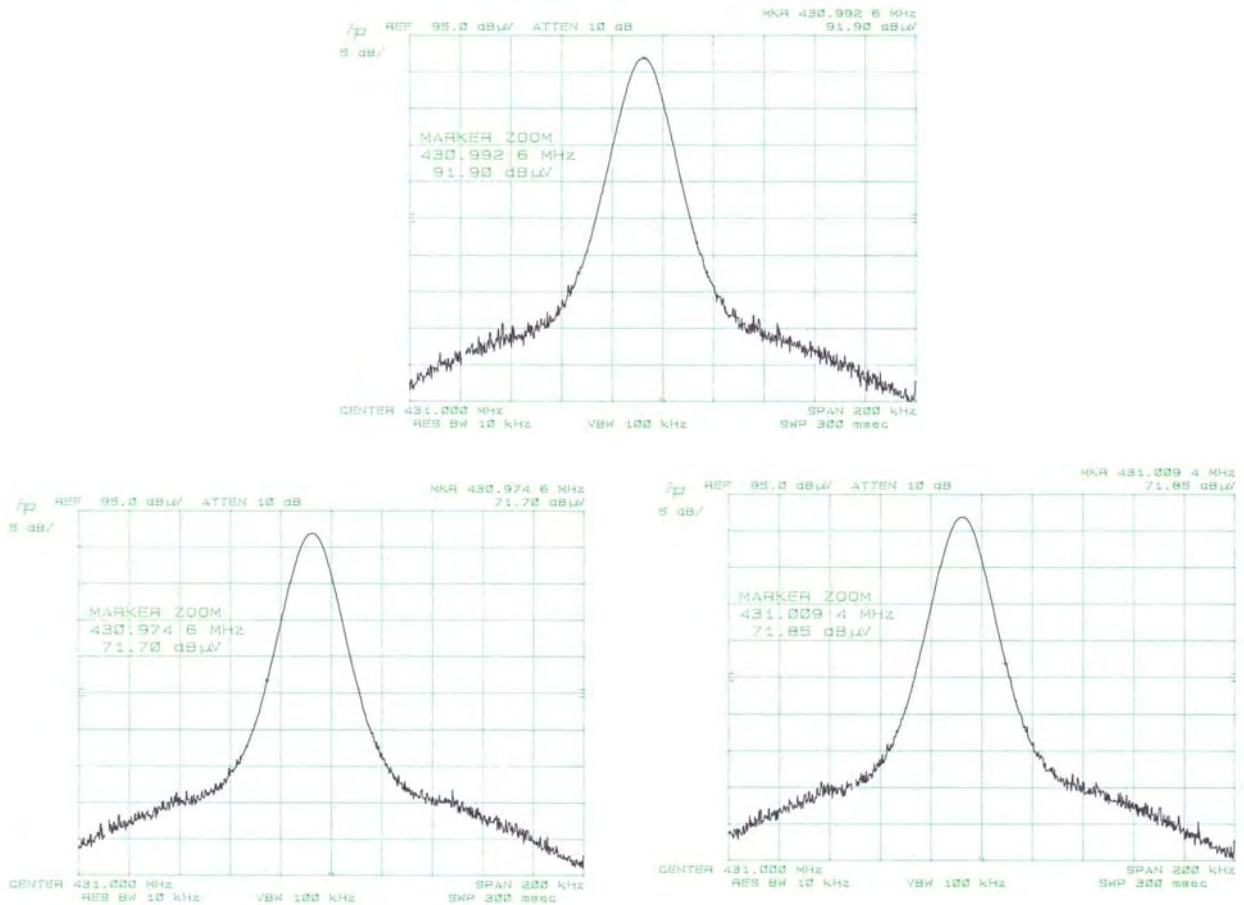


Figure 24



Company: Lutron Electronics
Model # HRT-XKP
Fund. Freq.: 437MHz

Test Personnel: Ron Smith
Date: 9/8/05

Bandwidth of Fundamental Frequency

	Frequency (MHz)	Measurement (dBuV/m)
Center Frequency	437.0	89.75
20 dB down	437.008	69.75
20 dB down	436.974	69.75

The bandwidth is 34KHz

Allowable Bandwidth: 0.25% of Fundamental Frequency
For 437MHz: ± 0.5463 MHz

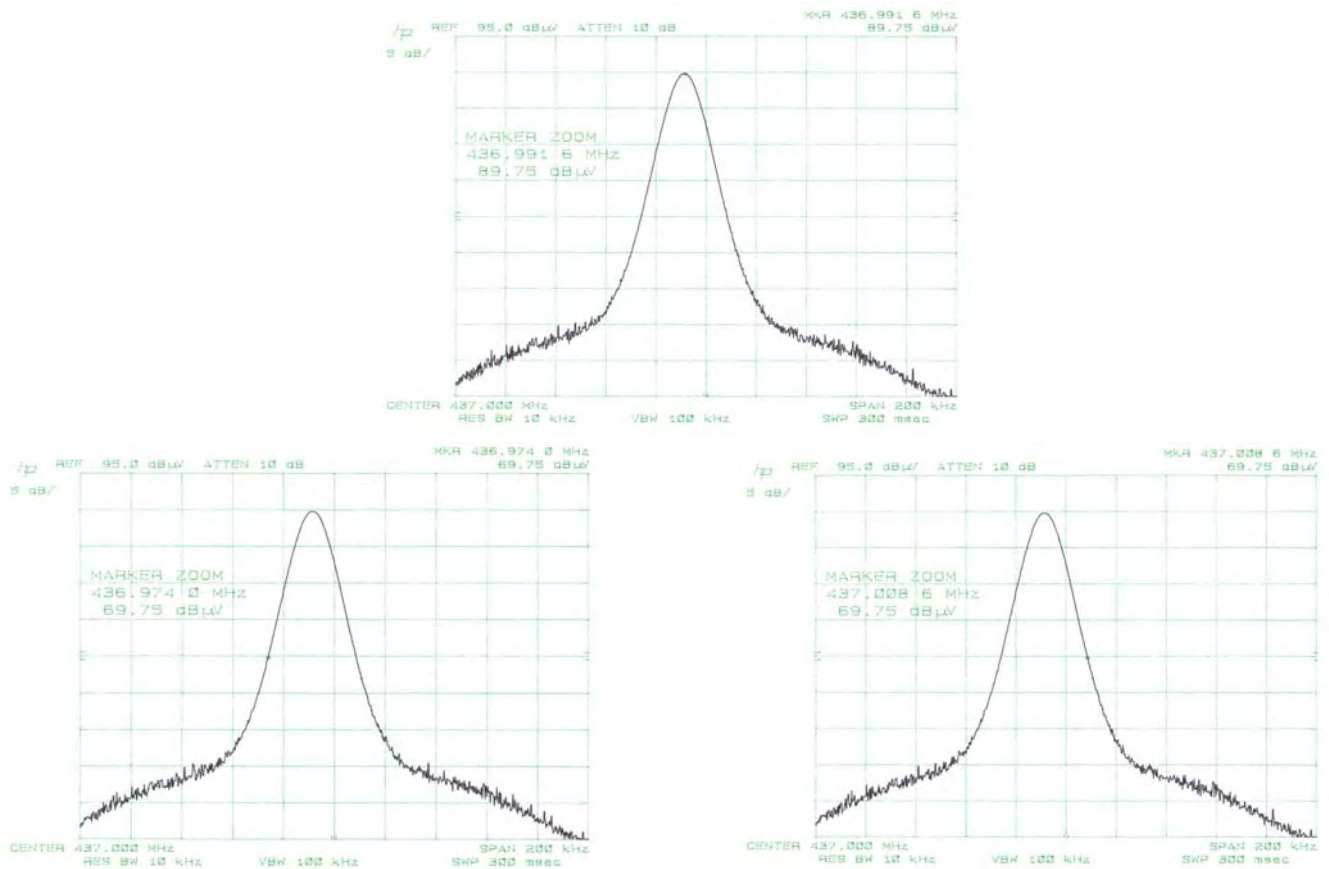


Figure 25



5.0 CONCLUSIONS

The evaluation of the **Lutron Electronics Model #: HRT-xKP-yy**, configured as described herein, indicated that the unit complies with the requirements set forth in Subpart B and C of Part 15 of the **FCC Rules** for unintentional and intentional radiators.

1. The **EUT** meets the Conducted Emissions limits set forth in §15.107
2. The **EUT** meets the Radiated Emissions limits for unintentional radiators set forth in §15.109.
3. The **EUT** meets the Radiated Emissions limits for intentional radiators set forth in §15.205, §15.209, and §15.231 (c).