RADIATION SCIENCES INC.

ACCREDITED
1986.01

TEST REPORT NO. RSI-2881E, REV. A
ELECTROMAGNETIC EMISSION EVALUATION
OF THE
LUTRON ELECTRONICS
MODEL #: HRT-3LD
FCC PART 15, SUBPART B AND C
9 AUGUST 2006

PREPARED FOR:

Lutron Electronics
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SUBMITTED BY:

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Harleysville, PA 19438
A wholly owned subsidiary of
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REVISION STATUS LOG

DOC/DWG NO. RSI-2881E

REVISION	DESCRIPTION	DATE
A	Front Cover, Sign off Sheet	8/9/06
A	Table of Contents page -i-, List of Figures page -iii-, Administrative Data page -iv-	8/9/06
A	Added 4.4 Radiated Emissions Measurements (FM Tx Mode) pages 50-56	8/9/06
A	Added 4.5 Bandwidth Measurements (FM Tx Mode) pages 57-63	8/9/06

Rev. 5/00
RSI-QF9814

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES continued

ADMINISTRATIVE DATA

TEST PERFORMED:

Measurements of Radiated RF and Conducted Emissions.

PURPOSE OF TEST:

To evaluate the ElectroMagnetic Emissions (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:

Model Number: **HRT-3LD**
Serial Number: **030071303095**

CONTRACT:

Purchase Order Number: NP-56455

TEST PERIOD:

25, 26 April 2006 and 24 July, 1 August 2006

TEST FACILITY:

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

TEST PERSONNEL AND COORDINATORS:

Radiation Sciences Inc.	**Lutron Electronics**
John Kavalusky	Mark Clouser

SUMMARY OF TEST RESULTS

The **Model #: HRT-3LD**, 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 or that the test results contained herein could be duplicated after the tested product leaves the possession of the Radiation Sciences Inc. test laboratory.

1.0 INTRODUCTION

This document is a report to determine the EME characteristics of the **Model #: HRT-3LD**, presented by **Lutron Electronics** of Coopersburg, Pennsylvania.

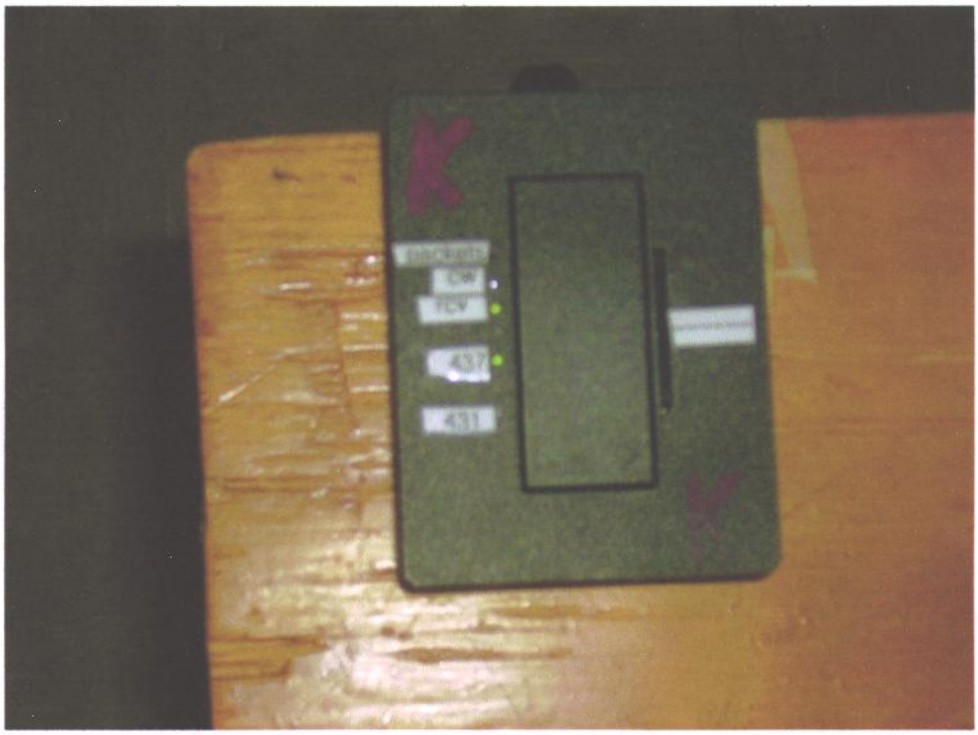
The purpose of the testing was to evaluate the EMC characteristics of the test sample with respect to Subpart B and C of Part 15 of the **FCC** Rules for intentional and unintentional radiators.

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 EQUIPMENT UNDER TEST (EUT)

The **Model # HRT-3LD,** manufactured by **Lutron Electronics** of Coopersburg Pennsylvania is a Home Works table-top radio frequency controlled Lamp Dimmer.

Hereinafter, the **Model # HRT-3LD,** will be referred to as the **EUT** (Equipment Under Test).



3.0 TEST INSTRUMENTATION

RSI INV #	DESCRIPTION	MANUFACTURER	MODEL #	SERIAL #	CAL DUE DATE
31	SPEC ANALYZER	ADVANTEST	R3271	J003583	11/12/2006
32.1	SPEC. ANALY.	H.P.	8566B	3638A08767	8/13/2006
33.1	SPEC. A.DISPLY	H.P	85662B	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	2/1/2007
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	PASTERNACK	BNC TO BNC	N/A	10/26/2006
712	20ft Cable RG-223	PASTERNACK	BNC TO BNC	N/A	10/26/2006

IF CAL DUE DATE = BLANK FIELD
Calibration is not required. This equipment is not used to obtain a final reading.
EXAMPLE: Transmitting antenna

4.0 TEST RESULTS

4.1 Conducted Power Line Measurements, Paragraph 15.107

Conducted power line measurements were recorded for the **EUT**.

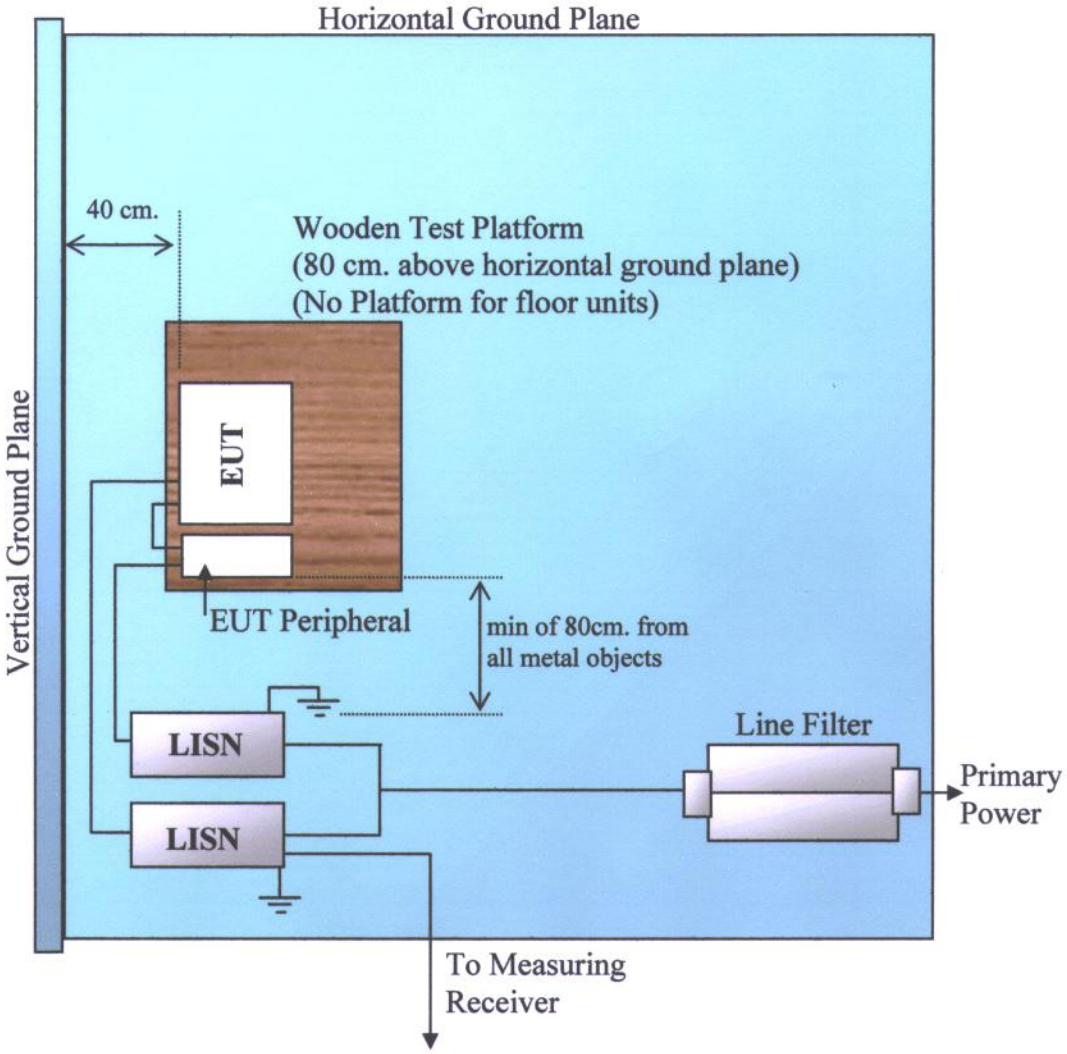
Initial scans were performed with an HP "Peak Reading" Spectrum Analyzer. A retest was performed with a Rohde & Schwarz receiver with a quasi peak and average detector in areas that showed emissions above the limit with the "peak" scan.

The test setup diagram is shown in Figure 1 and test setup photographs are shown in Figure 2.

The **EUT** was tested while operated at two transmit frequencies of 431 and 437MHz.

The results of the line-to-ground radio noise voltage measurements are shown on data sheets and graphs in Figures 3 through 22 for transmit and receive modes on each operating frequency.

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



Conducted Emissions Test Setup Diagram (Top View)
Figure 1

EUT 80cm
From LISN

EUT 40cm from
vertical ground
plane

Conducted Emissions Test Setup Photographs
Figure 2

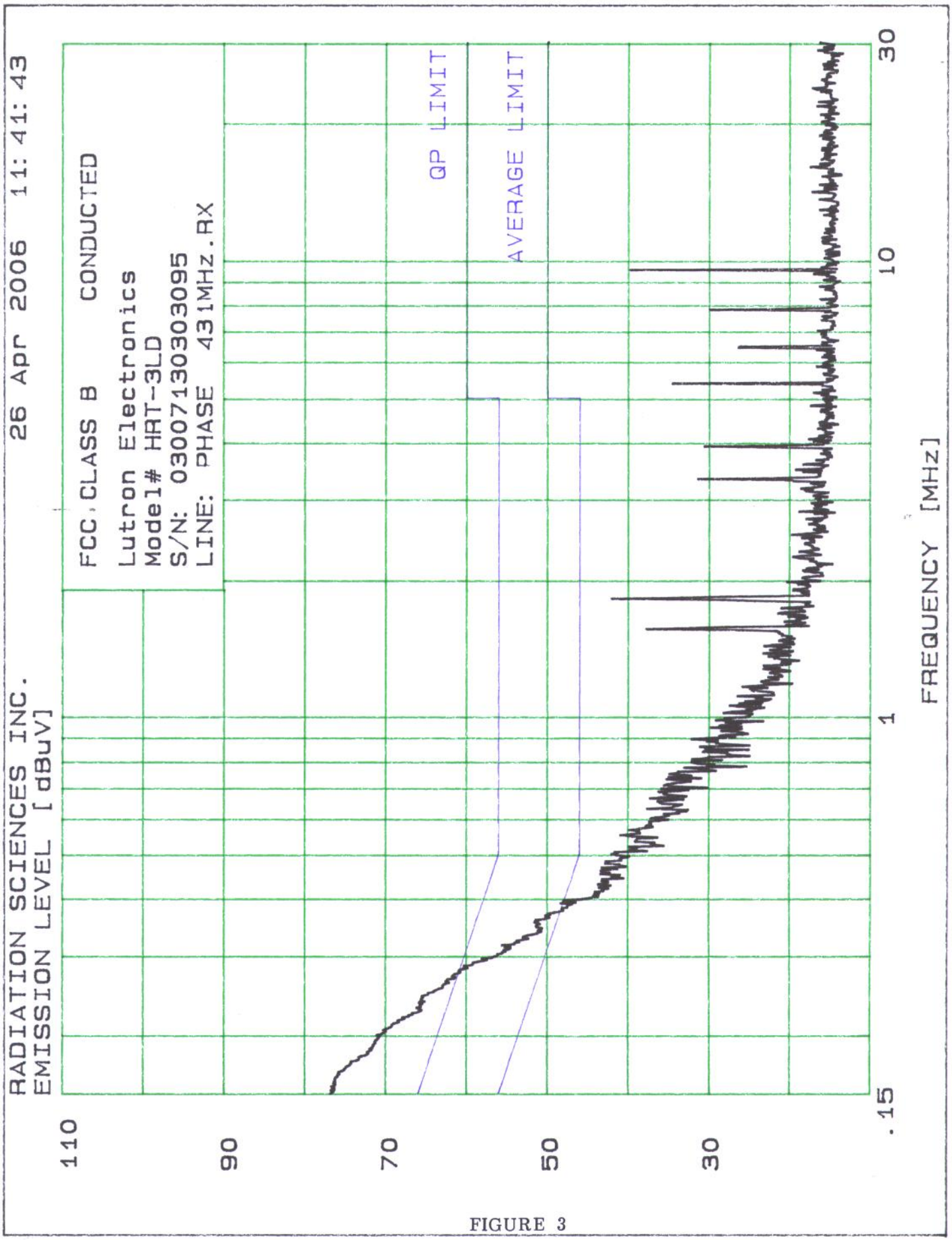

RADIATION SCIENCES INC.
EMISSION LEVEL [dBuV]
26 Apr 2006 11:41:43
FCC,CLASS B CONDUCTED
Lutron Electronics
Model# HRT-3LD
S/N: 0300713030309S
LINE: PHASE 431MHz.RX
QP LIMIT
AVERAGE LIMIT
110
90
70
50
30
.15
1
10
30
FREQUENCY [MHz]

FIGURE 3

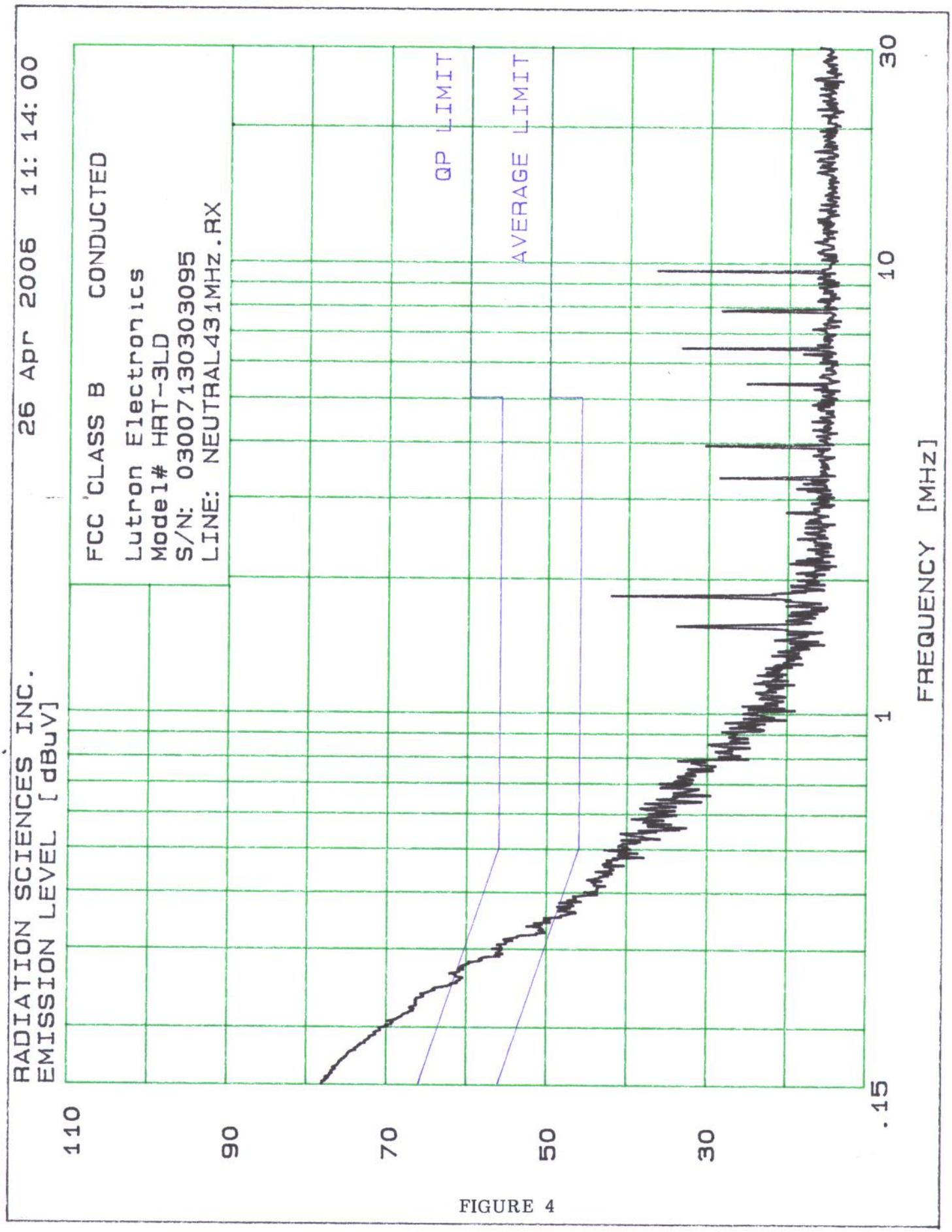

RADIATION SCIENCES INC.
EMISSION LEVEL [dBuV]
26 Apr 2006 11:14:00
FCC 'CLASS B CONDUCTED
Lutron Electronics
Model# HRT-3LD
S/N: 03007130303095
LINE: NEUTRAL431MHz.RX
QP LIMIT
AVERAGE LIMIT
110
90
70
50
30
.15
1
10
30
FREQUENCY [MHz]

FIGURE 4

RADIATION SCIENCES INC.

Electromagnetic Emission Test

EUT	**Manufacturer:** Lutron Electronics **Model #:** HRT-3LD **Serial #:** 030071303095 **Mode:** RECEIVE 431MHz	**Date:** 4/26/06 **Test Instruments:** RSI # 32.1, 33.1, 177, 245, 246, 391, 712 **Frequency Range:** .150 – 30MHz	Test Code **CE** Technician JK Engineer
Temperature: 70°F **Humidity:** 32 %	**Additional Info:**		**Test Spec:** FCC Part15, Class B Unintentional Radiators
Radiated Distance: Antenna:	☐ HORIZ. ☐ BB ☐ NB ☐ VERT. ☐ H ☐ E	**Conducted** Line: *Phase/Neutral* Function:	☐ BB ☐ NB

FREQ.	QP IND. Level	AVG IND. Level	Correction Factors			QP Final Level	AVG Final Level		Remarks
			ANT.	Cable loss					
MHz	dBµV	dBµV	dB	dB		dBµV	dBµV		
.150	64.6	-2.2		0		64.6	-2.2		Phase
.180	59.7	-3.6		0		59.7	-3.6		↓
.200	54.3	-4.6		0		54.3	-4.6		↓
.250	40.7	-6.5		0		4.07	-6.7		↓
.150	65.7	-2.6		0		65.7	-2.6		Neutral
.180	60.0	-4.1		0		60.0	-4.1		↓
.200	54.5	-4.7		0		54.5	-4.7		↓
.250	40.7	-6.8		0		40.7	-6.8		↓

Figure 5

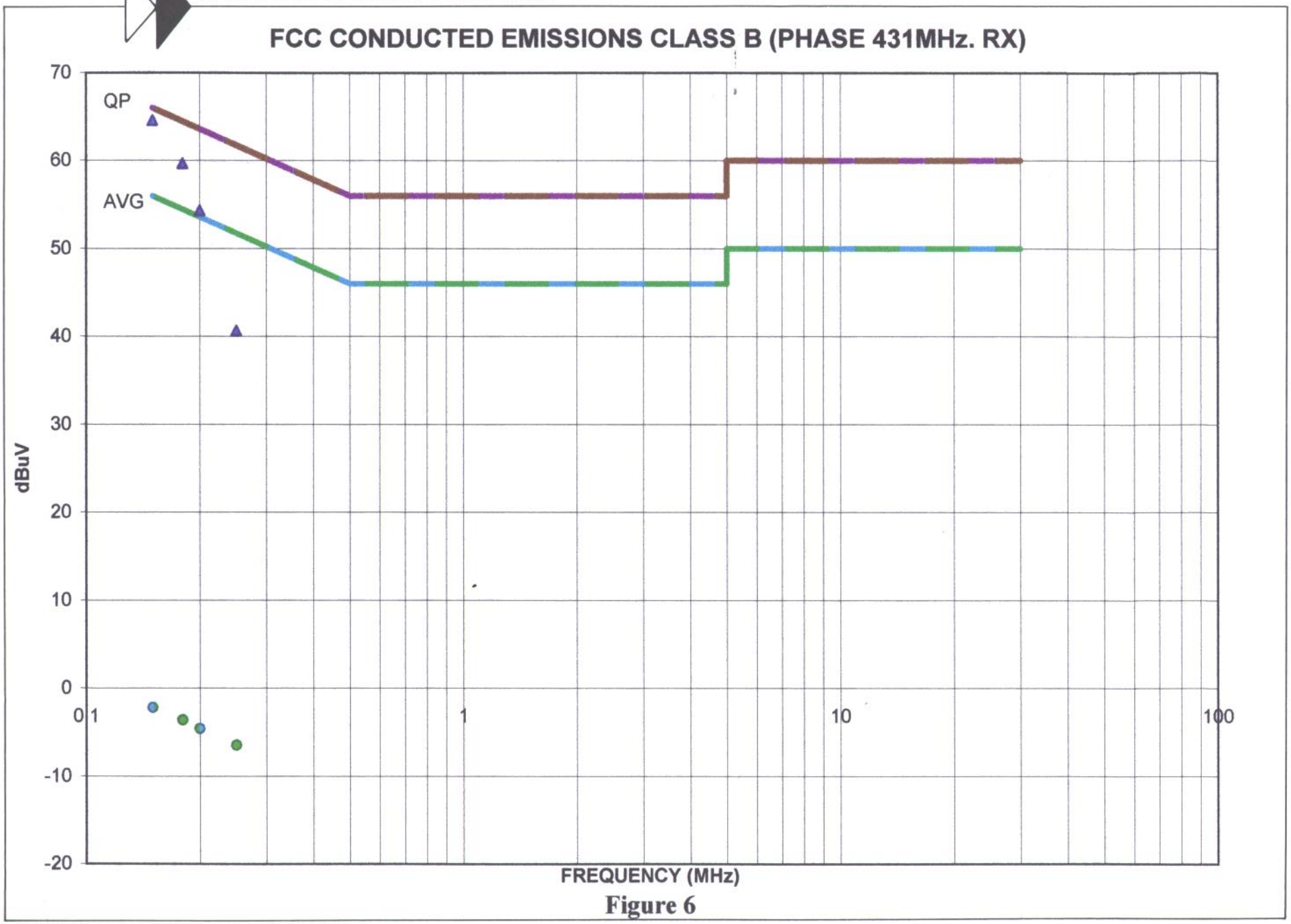

FCC CONDUCTED EMISSIONS CLASS B (PHASE 431MHz. RX)
QP
AVG
70
60
50
40
30
20
10
0
-10
-20
dBuV
0.1
1
10
100
FREQUENCY (MHz)

Figure 6