Project:	04ME09006
File:	NC2219
Date:	9/28/04
Model:	HRP5-120
FCC ID:	JPZ0033

Test Report

On

Electromagnetic Compatibility Testing

Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747

Tel: (631) 271-6200 Fax: (631) 439-6095

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **1285 Walt Whitman Rd.** **Melville, NY 11747**
Tests Performed For:	**Lutron Electronics Inc.** **7200 Suter Road** **Coopersburg, PA 18036**
Applicant Contact:	**Mark Clouser**
Title:	**Field Applications Specialist**
Phone:	**(610) 282-3800**
Fax:	**(610) 282-0298**
E-mail:	**mclouser@lutron.com**
Test Report Date:	**9/17/2004**
Product Type:	**Processor**
Model Number:	**HRP5-120**
Sample Serial Number:	**Not Provided**
Sample Tag Number:	**0592754001**
Sample Receive Date:	**7/1/2004**
EUT Category:	**Radio Transmitter**
Testing Start Date:	**7/1/2004**
Date Testing Complete:	**7/6/2004**

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
9/17/2004	Original	--	--

1.0 G E N E R A L - Product Description

Device Function: The HRP5 acts as a data storage hub of an integrated lighting control system. It contains an FM 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.

Analog Function: The HRP5 obtains power from a Class 2 wall plug in transformer. The Class 2 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.

Device is exempt from routine RF exposure testing per FCC Part 2.1091.

Device contains an integrated antenna. It is not detachable or replaceable by the user

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.

The manufacturer configured the device. The device was powered with 120VAC, 60Hz.

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Processor	Lutron	HRP5-2P	None
ACC	Laptop	IBM	-	None

* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	< 3M	No	None
2	Ethernet	DC	> 3m	Yes	None
3	RS232	DC	> 3m	Yes	None

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
PMC = Process Measurement and Control Port

1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
431	Operating Frequency	-	-
437	Operating Frequency	-	-

1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	-	-	-	-	-	-
1	120	-	-	AC/60	1	-

1.2 EUT Operation Modes:

Mode #	Description
1	Transmit 431MHz
2	Receive 431MHz
3	Transmit 437MHz
4	Receive 437MHz

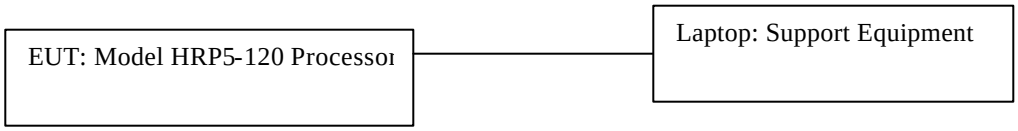
1.3 EUT Configuration Modes:

Mode #	Description
1	The device was tested in two modes of operation: The manufacturer configured the device. 1. Continuously transmitting an intentional radio frequency in Continuous Wave (CW). 2. Standby mode (Receive). The device is waiting to receive a signal source.

"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"

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 Deviations from standard test methods.

Not Applicable

1.6 Device Modifications Necessary for Compliance

Not Applicable.

1.7 Test Summary

Test Name Test Requirement/Specification	Comply	Does Not Comply	See Remark
Radiated Disturbance Emissions - 30 to 5000MHz Electric Field FCC Part 15 Subpart C, Intentional Radiators, Paragraph 15.209	Y	-	1
FCC Part 15 Subpart B, Class B, Un-Intentional Radiators, Paragraph 15.109	Y	-	1
FCC Part 15, Subpart C, Cease Operation < 5seconds	Y	-	1
FCC Part 15 Subpart C, Paragraph 15.231, Occupied Bandwidth	Y	-	1
FCC Part 15 Subpart C, Paragraph 15.231, Pulse Train Measurements	Y	-	1

Remarks:

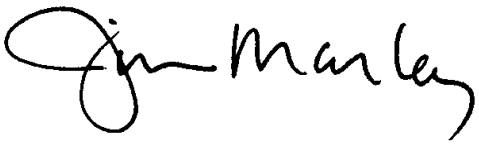
1) No Modifications required for compliance.
2) Modifications required to comply as described in Section 1.6

2.0 Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The Applicant as being applicable to the Equipment Under Test determined the test list. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has met the technical requirements as defined under section 5.0.

Test Start Date: 01 July 2004
Test Completion Date: 06 July 2004



Joseph Danisi (Ext.23055)
Senior Engineering Associate
International EMC Services
Conformity Assessment Services-3027EMEL

Jim Marley
Engineer Staff
International EMC Services
Conformity Assessment Services-3027EMEL

3.0 FCC Labeling Information

3.1 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."

3.2 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."

3.3 Labeling.

Labeling 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.

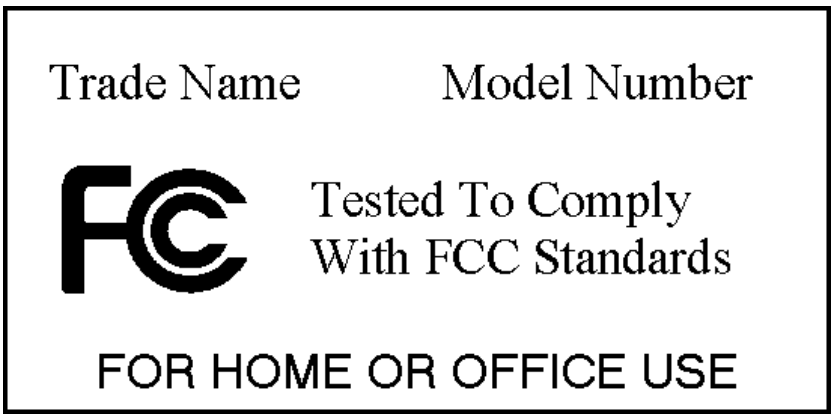
(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively,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

Declaration of Conformity Labeling

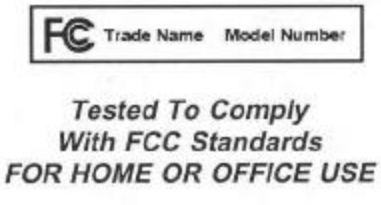
In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

(1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:

(i) If the product is authorized based on testing of the product or system:



Alternate label format for small devices:



The text shown in ***bold-face italics*** may be placed in a prominent location in the instruction manual or pamphlet supplied to the user.

(2) Label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight point.

(3) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

(4) The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d) of this chapter. “Permanently affixed” means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

3.4 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."

4.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is the manufacturer recommends one year or what whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

---------- United States ----------

FCC Part 15, Subpart C	Code of Federal Regulations, Part 15, Radio Frequency Devices.

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

5.1.1 Conducted Emissions Tests

Test Applicable

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). Conducted voltage measurements on mains lines were made at the output of the LISN.

Results

The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	21 °C
Humidity:	60 %RH
Pressure:	1008 mbar
Date test performed:	02 July 2004

1 fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point	Mode*	
		Power	Operation
150kHz to 30MHz	Voltage, Mains	1	1
150kHz to 30MHz	Voltage, Mains	1	2
150kHz to 30MHz	Voltage, Mains	1	3
150kHz to 30MHz	Voltage, Mains	1	4

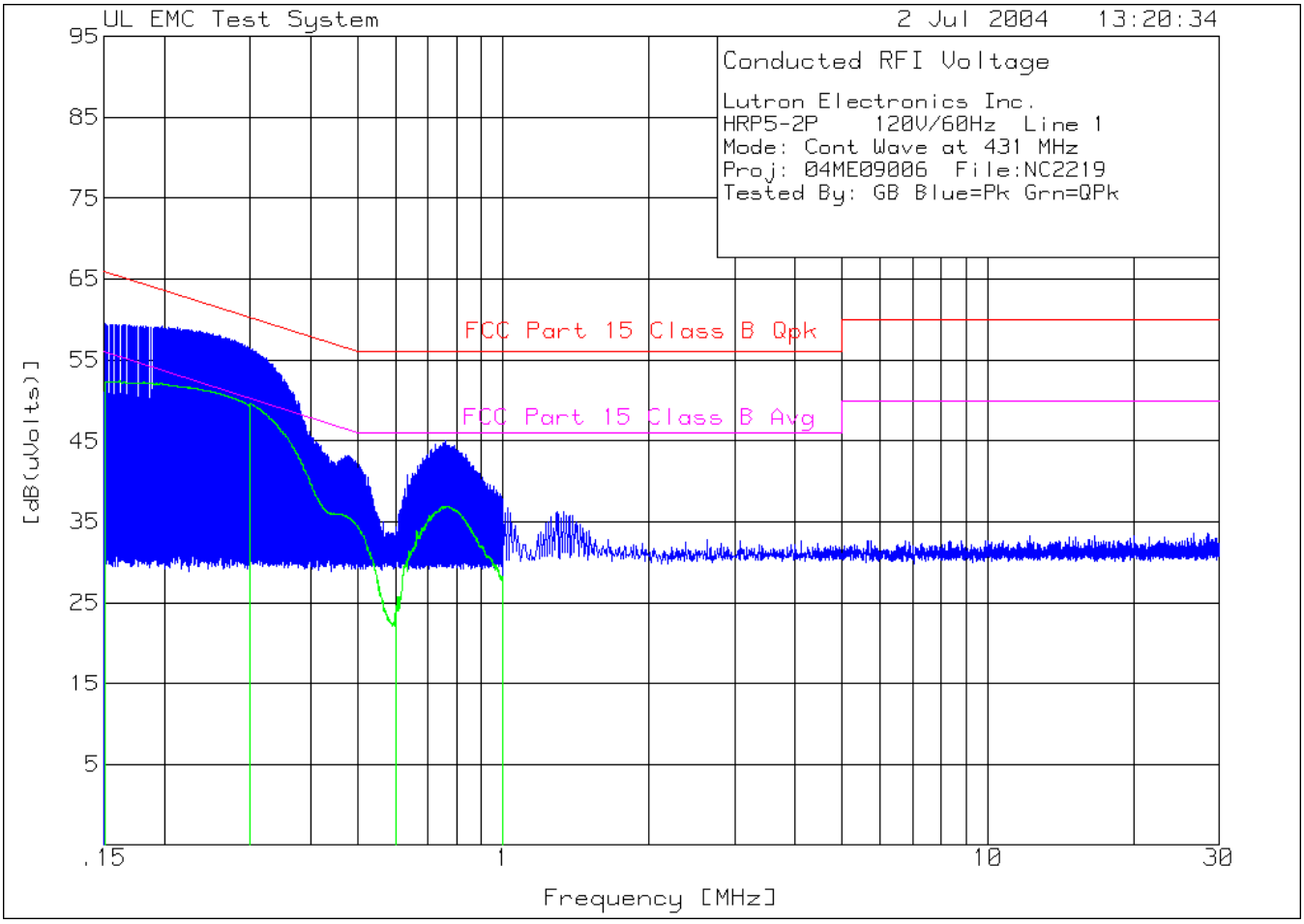
*See Power Interface and EUT Operating Modes for details

Test equipment used for conducted emissions

E7402A	**Agilent Technologies**	**EMI Spectrum Analyzer**	**Equipment No.: ME5B-123**
Range: 150k-30MHz	Last Calibration Date: 22 January 2004		Calibration Due Date: 22 January 2005

Test Accessories for Conducted Emissions

EC - 3825/2	**EMCO**	**50W LISN**	**Equipment No.: ME5-629**
Range: 150k-30MHz	Last Calibration Date: 26 March 2004		Calibration Due Date: 26 March 2005
11947A	**Hewlett Packard**	**Transient Limiter**	**Equipment No.: ME5A-444**
Range:	Last Calibration Date:		Calibration Due Date: 27 March 2005
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0^{o}C-55^{o}C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 18 June 2004		Calibration Due Date: 18 June 2005

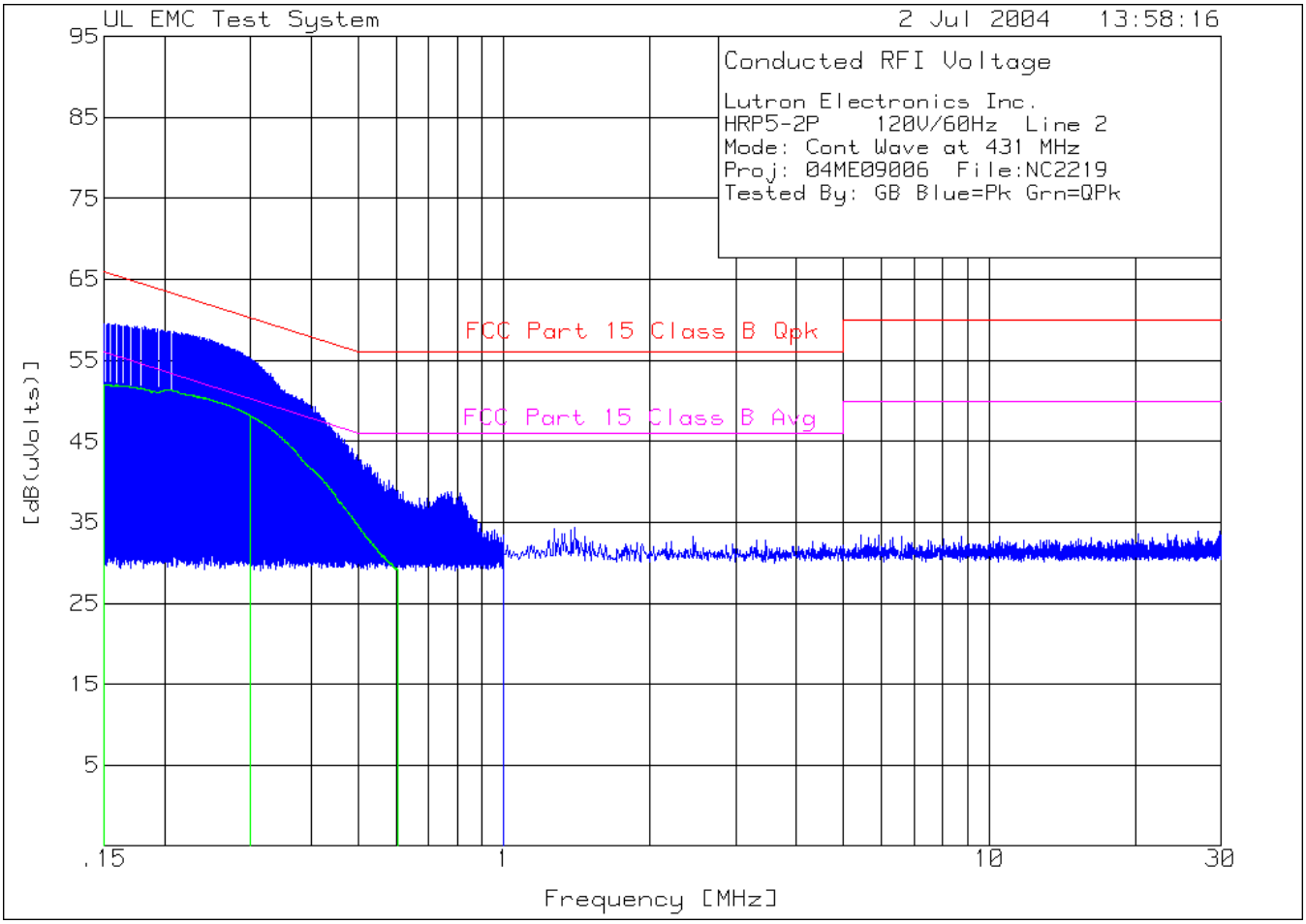

UL EMC Test System
2 Jul 2004 13:20:34
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 1
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.16145	42.29 qp	10.1	0	52.39	65.4	55.4
				Margin [dB]		-13.01	-3.01
2	.26741	40.51 qp	10.1	0	50.61	61.2	51.2
				Margin [dB]		-10.59	-.59
3	.29264	39.59 qp	10.1	0	49.69	60.4	50.4
				Margin [dB]		-10.71	-.71
4	.31722	38.57 qp	10.1	0	48.67	59.8	49.8
				Margin [dB]		-11.13	-1.13
5	.37249	33.55 qp	10.1	0	43.65	58.4	48.4
				Margin [dB]		-14.75	-4.75
6	.76672	26.83 qp	10.1	0	36.93	56	46
				Margin [dB]		-19.07	-9.07

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result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Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 2
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 2
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.15883	41.8 qp	10.1	0	51.9	65.5	55.5
				Margin [dB]		-13.6	-3.6
2	.20167	41.28 qp	10.1	0	51.38	63.5	53.5
				Margin [dB]		-12.12	-2.12
3	.2926	38.46 qp	10.1	0	48.56	60.5	50.5
				Margin [dB]		-11.94	-1.94
4	.34368	35.65 qp	10.1	0	45.75	59.1	49.1
				Margin [dB]		-13.35	-3.35
5	.42092	30.27 qp	10.1	0	40.37	57.4	47.4
				Margin [dB]		-17.03	-7.03
6	.52556	22.79 qp	10.1	0	32.89	56	46
				Margin [dB]		-23.11	-13.11

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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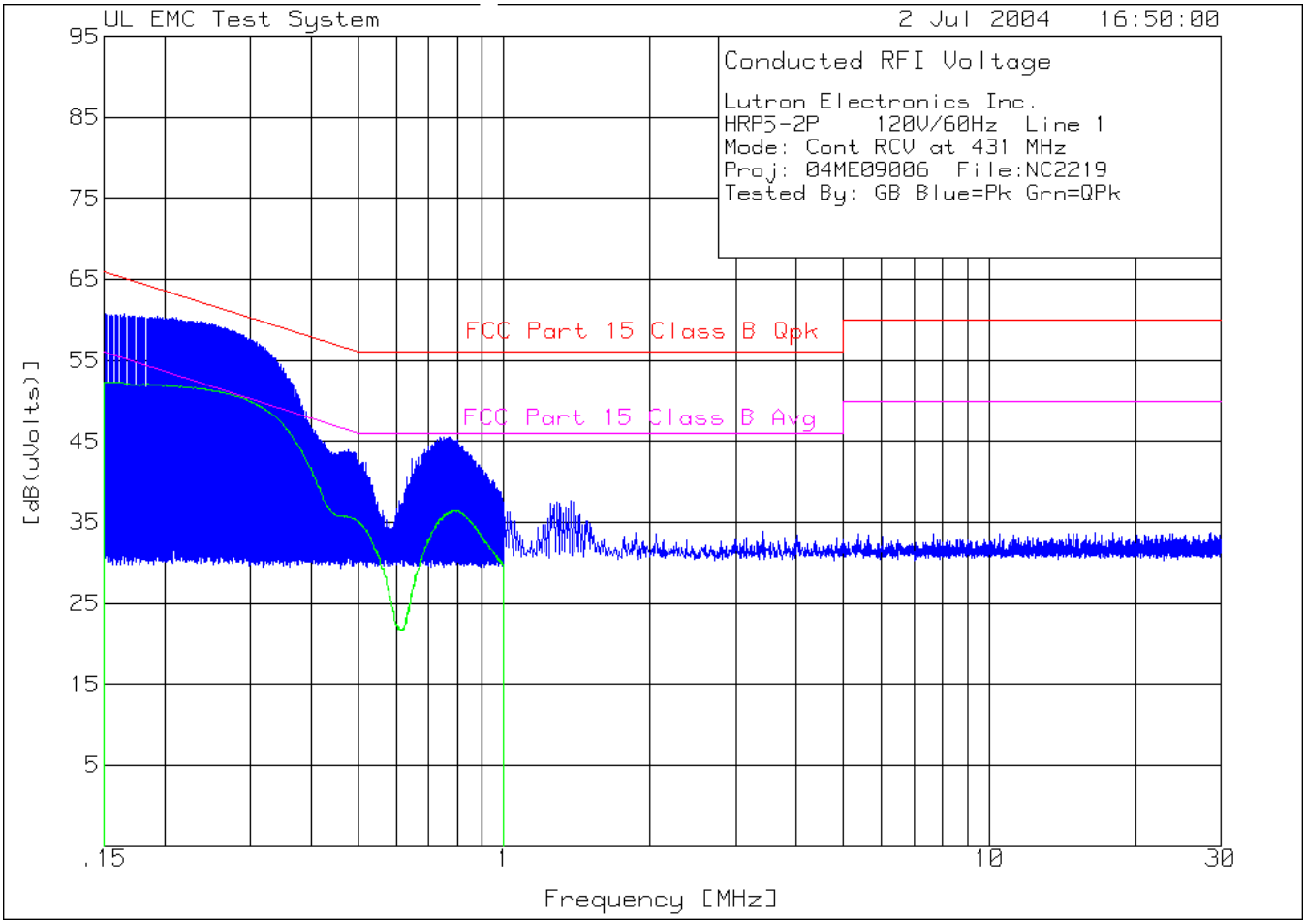

UL EMC Test System
2 Jul 2004 16:50:00
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 1
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.15742	42.22 qp	10.1	0	52.32	65.6	55.6
				Margin [dB]		-13.28	-3.28
2	.18073	41.97 qp	10.1	0	52.07	64.5	54.5
				Margin [dB]		-12.43	-2.43
3	.20511	41.76 qp	10.1	0	51.86	63.4	53.4
				Margin [dB]		-11.54	-1.54
4	.23584	41.42 qp	10.1	0	51.52	62.2	52.2
				Margin [dB]		-10.68	-.68
5	.25915	41.03 qp	10.1	0	51.13	61.5	51.5
				Margin [dB]		-10.37	-.37
6	.28247	40.45 qp	10.1	0	50.55	60.7	50.7
				Margin [dB]		-10.15	-.15
7	.31108	39.35 qp	10.1	0	49.45	59.9	49.9
				Margin [dB]		-10.45	-.45
8	.33228	38.29 qp	10.1	0	48.39	59.4	49.4
				Margin [dB]		-11.01	-1.01
9	.35559	36.4 qp	10.1	0	46.5	58.8	48.8
				Margin [dB]		-12.3	-2.3
10	.36725	35.37 qp	10.1	0	45.47	58.6	48.6
				Margin [dB]		-13.13	-3.13

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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

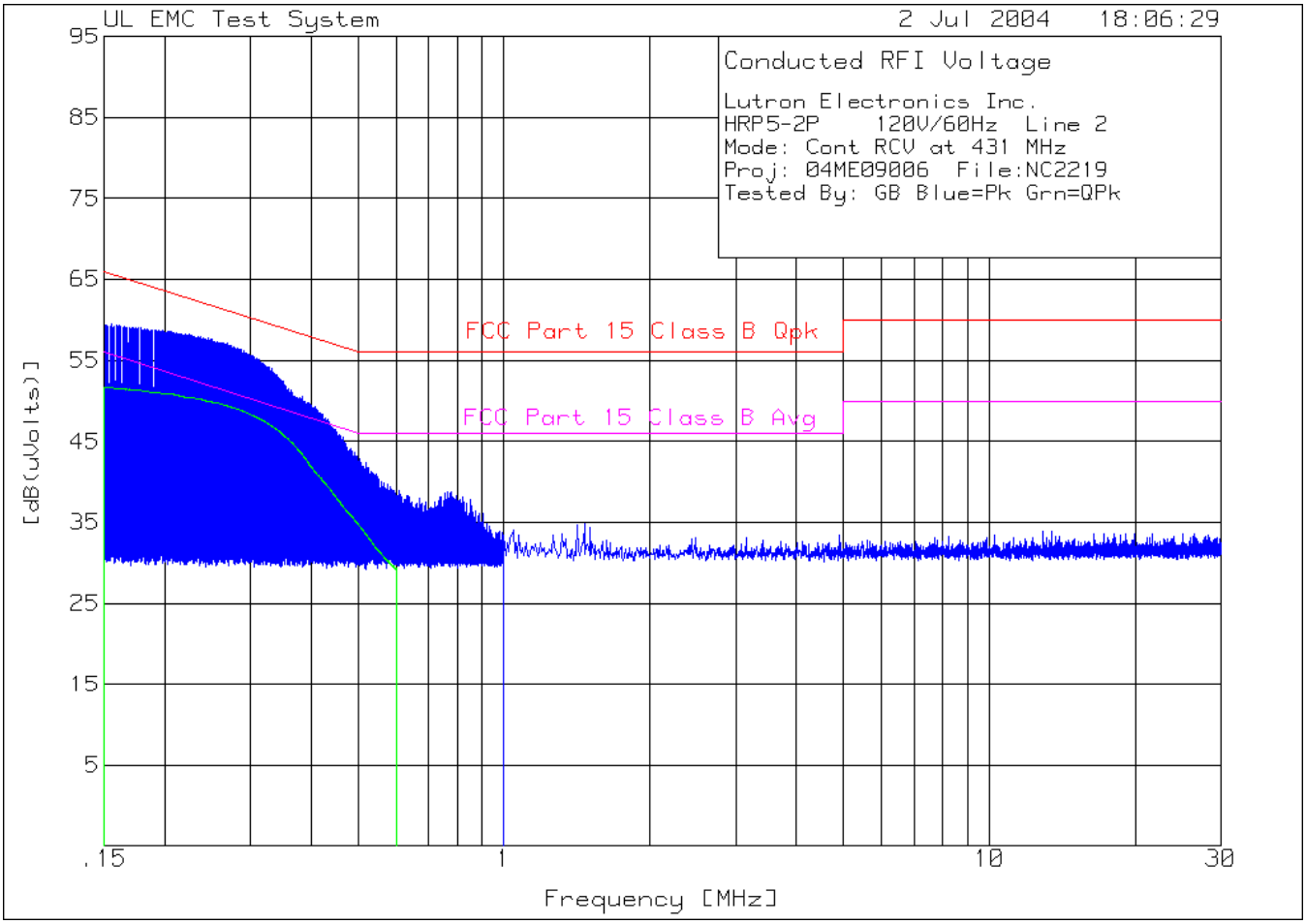
Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz						
.15742	-4.52 avem	10.1	0	5.58	65.6	55.6
			Margin [dB]:		-60.02	-50.02
.18073	-2.6 avem	10.1	0	7.5	64.5	54.5
			Margin [dB]:		-57	-47
.20511	-2.9 avem	10.1	0	7.2	63.4	53.4
			Margin [dB]:		-56.2	-46.2
.23584	-4.99 avem	10.1	0	5.11	62.2	52.2
			Margin [dB]:		-57.09	-47.09
.25915	-3.14 avem	10.1	0	6.96	61.5	51.5
			Margin [dB]:		-54.54	-44.54
.28247	-5.01 avem	10.1	0	5.09	60.7	50.7
			Margin [dB]:		-55.61	-45.61
.31108	-3.84 avem	10.1	0	6.26	59.9	49.9
			Margin [dB]:		-53.64	-43.64
.33228	-2.87 avem	10.1	0	7.23	59.4	49.4
			Margin [dB]:		-52.17	-42.17
.35559	.73 avem	10.1	0	10.83	58.8	48.8
			Margin [dB]:		-47.97	-37.97
.36725	.44 avem	10.1	0	10.54	58.6	48.6
			Margin [dB]:		-48.06	-38.06

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

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

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg


UL EMC Test System
2 Jul 2004 18:06:29
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 2
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 2
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.15	41.58 qp	10.1	0	51.68	66	56
				Margin [dB]		-14.32	-4.32
2	.17876	41.17 qp	10.1	0	51.27	64.5	54.5
				Margin [dB]		-13.23	-3.23
3	.21203	40.63 qp	10.1	0	50.73	63.1	53.1
				Margin [dB]		-12.37	-2.37
4	.24811	39.83 qp	10.1	0	49.93	61.8	51.8
				Margin [dB]		-11.87	-1.87
5	.29604	38.38 qp	10.1	0	48.48	60.4	50.4
				Margin [dB]		-11.92	-1.92
6	.33382	36.7 qp	10.1	0	46.8	59.4	49.4
				Margin [dB]		-12.6	-2.6
7	.37329	34.12 qp	10.1	0	44.22	58.4	48.4
				Margin [dB]		-14.18	-4.18
8	.40431	31.44 qp	10.1	0	41.54	57.8	47.8
				Margin [dB]		-16.26	-6.26

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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

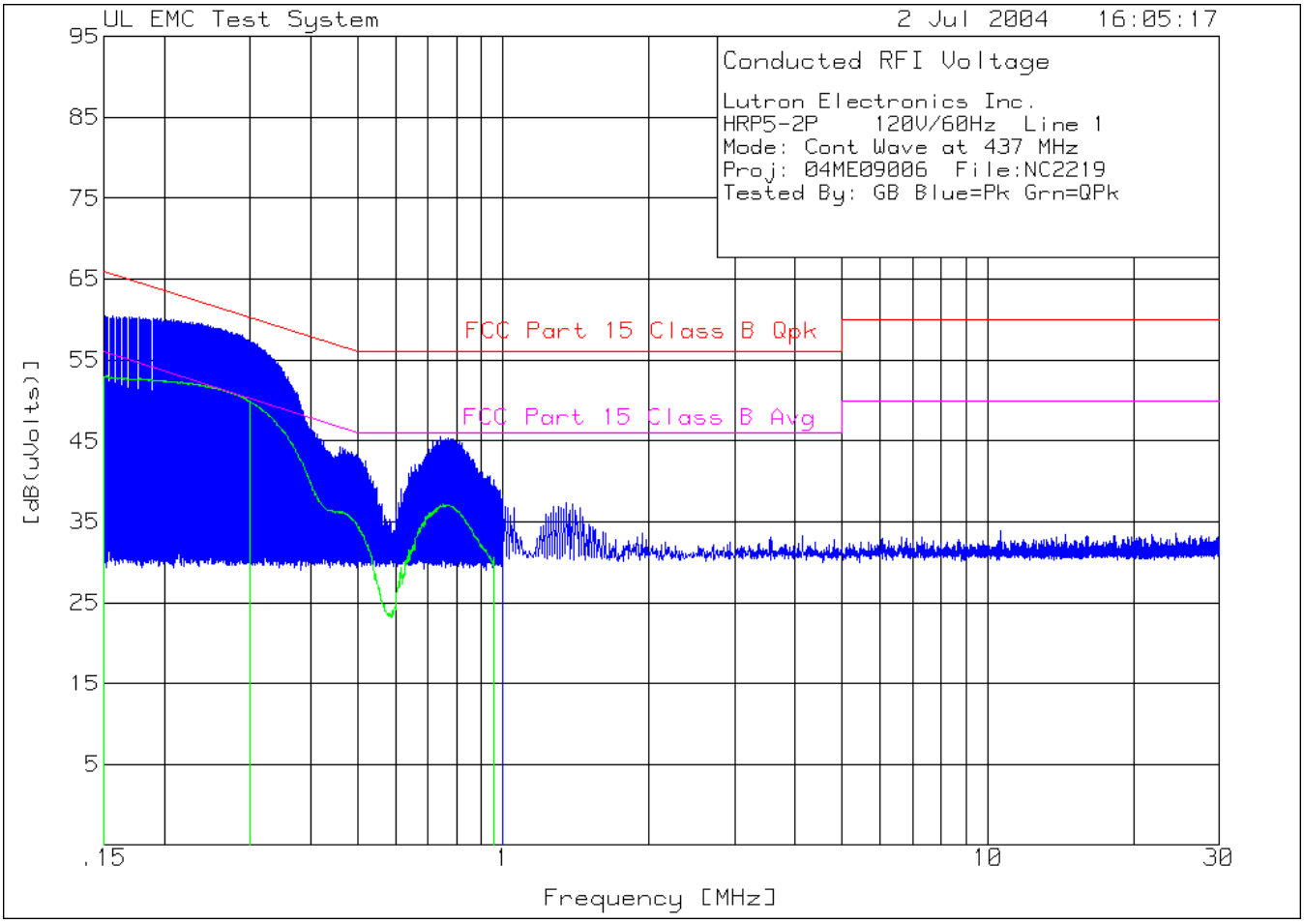
Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 2
Mode: Cont RCV at 431 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz						
.15175	-1.89 avem	10.1	0	8.21	65.9	55.9
			Margin [dB]:		-57.69	-47.69
.17876	.91 avem	10.1	0	11.01	64.5	54.5
			Margin [dB]:		-53.49	-43.49
.21203	-1.05 avem	10.1	0	9.05	63.1	53.1
			Margin [dB]:		-54.05	-44.05
.24811	-.8 avem	10.1	0	9.3	61.8	51.8
			Margin [dB]:		-52.5	-42.5
.29604	1.99 avem	10.1	0	12.09	60.4	50.4
			Margin [dB]:		-48.31	-38.31
.33382	1.87 avem	10.1	0	11.97	59.4	49.4
			Margin [dB]:		-47.43	-37.43
.37329	2.08 avem	10.1	0	12.18	58.4	48.4
			Margin [dB]:		-46.22	-36.22
.40431	.2 avem	10.1	0	10.3	57.8	47.8
			Margin [dB]:		-47.5	-37.5

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

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

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg


UL EMC Test System
2 Jul 2004 16:05:17
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 1
Mode: Cont Wave at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

```
 Lutron Electronics Inc.
 HRP5-120    120V/60Hz  Line 1
 Mode: Cont Wave at 437 MHz
 Proj: 04ME09006  File:NC2219
 Tested By: GB Blue=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	.15357	42.77 qp	10.1	0	52.87	65.8	55.8
				Margin [dB]		-12.93	-2.93
2	.20599	42.23 qp	10.1	0	52.33	63.4	53.4
				Margin [dB]		-11.07	-1.07
3	.27381	40.85 qp	10.1	0	50.95	61	51
				Margin [dB]		-10.05	-.05
4	.3003	39.72 qp	10.1	0	49.82	60.2	50.2
				Margin [dB]		-10.38	-.38
5	.39708	30.36 qp	10.1	0	40.46	57.9	47.9
				Margin [dB]		-17.44	-7.44
6	.75055	27.03 qp	10.1	0	37.13	56	46
				Margin [dB]		-18.87	-8.87

```
LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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

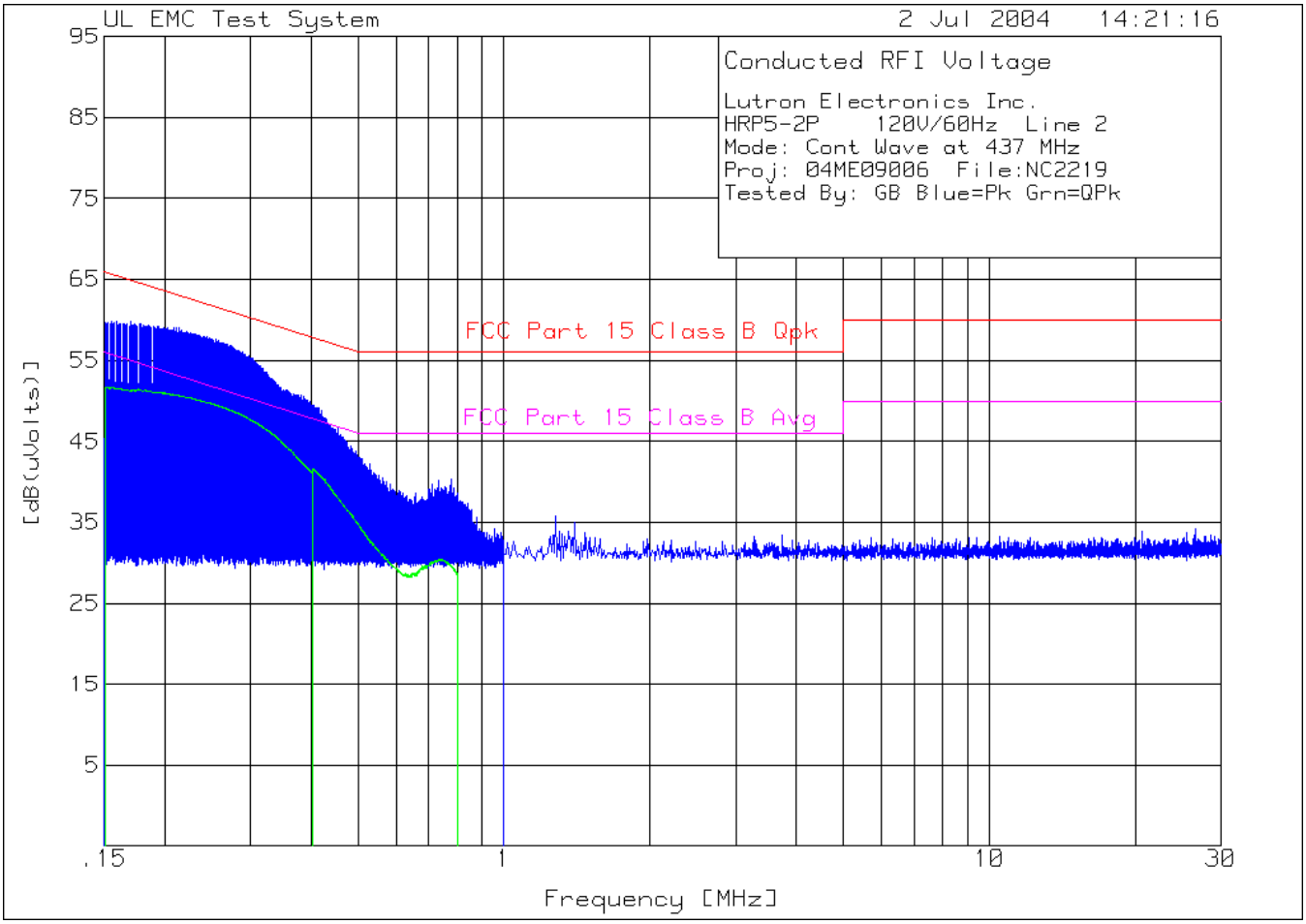
Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont Wave at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz						
.15357	-2.27 avem	10.1	0	7.83	65.8	55.8
			Margin [dB]:		-57.97	-47.97
.20599	-6.48 avem	10.1	0	3.62	63.4	53.4
			Margin [dB]:		-59.78	-49.78
.27381	-3.01 avem	10.1	0	7.09	61	51
			Margin [dB]:		-53.91	-43.91
.3003	-2.63 avem	10.1	0	7.47	60.2	50.2
			Margin [dB]:		-52.73	-42.73
.39708	1.36 avem	10.1	0	11.46	57.9	47.9
			Margin [dB]:		-46.44	-36.44
.75055	-2.64 avem	10.1	0	7.46	56	46
			Margin [dB]:		-48.54	-38.54

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

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

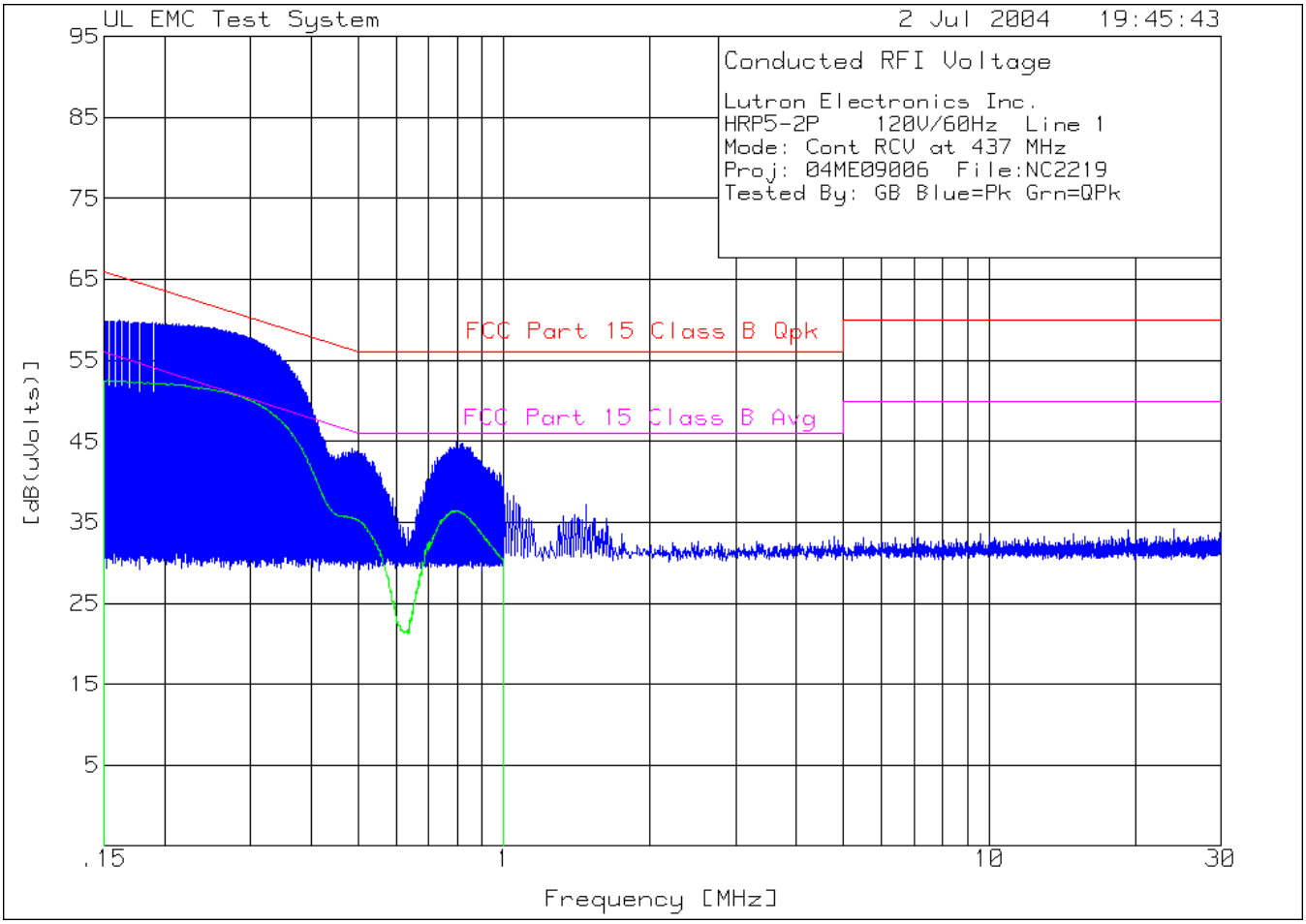
LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg


UL EMC Test System
2 Jul 2004 14:21:16
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 2
Mode: Cont Wave at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

```
 Lutron Electronics Inc.
 HRP5-120    120V/60Hz  Line 2
 Mode: Cont Wave at 437 MHz
 Proj: 04ME09006  File:NC2219
 Tested By: GB Blue=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	.15206	41.59 qp	10.1	0	51.69	65.9	55.9
				Margin [dB]		-14.21	-4.21
2	.19757	40.87 qp	10.1	0	50.97	63.7	53.7
				Margin [dB]		-12.73	-2.73
3	.25634	39.35 qp	10.1	0	49.45	61.5	51.5
				Margin [dB]		-12.05	-2.05
4	.3107	37.06 qp	10.1	0	47.16	60	50
				Margin [dB]		-12.84	-2.84
5	.38559	32.08 qp	10.1	0	42.18	58.2	48.2
				Margin [dB]		-16.02	-6.02
6	.74309	20.39 qp	10.1	0	30.49	56	46
				Margin [dB]		-25.51	-15.51

```
LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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


UL EMC Test System
2 Jul 2004 19:45:43
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 1
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.15318	42.42 qp	10.1	0	52.52	65.8	55.8
				Margin [dB]		-13.28	-3.28
2	.17014	42.22 qp	10.1	0	52.32	65	55
				Margin [dB]		-12.68	-2.68
3	.20087	41.99 qp	10.1	0	52.09	63.6	53.6
				Margin [dB]		-11.51	-1.51
4	.24008	41.46 qp	10.1	0	51.56	62.1	52.1
				Margin [dB]		-10.54	-.54
5	.27293	40.83 qp	10.1	0	50.93	61	51
				Margin [dB]		-10.07	-.07
6	.30472	39.75 qp	10.1	0	49.85	60.1	50.1
				Margin [dB]		-10.25	-.25
7	.35029	37.2 qp	10.1	0	47.3	59	49
				Margin [dB]		-11.7	-1.7
8	.37255	35.12 qp	10.1	0	45.22	58.4	48.4
				Margin [dB]		-13.18	-3.18
9	.39162	32.92 qp	10.1	0	43.02	58	48
				Margin [dB]		-14.98	-4.98
10	.42342	28.08 qp	10.1	0	38.18	57.4	47.4
				Margin [dB]		-19.22	-9.22

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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

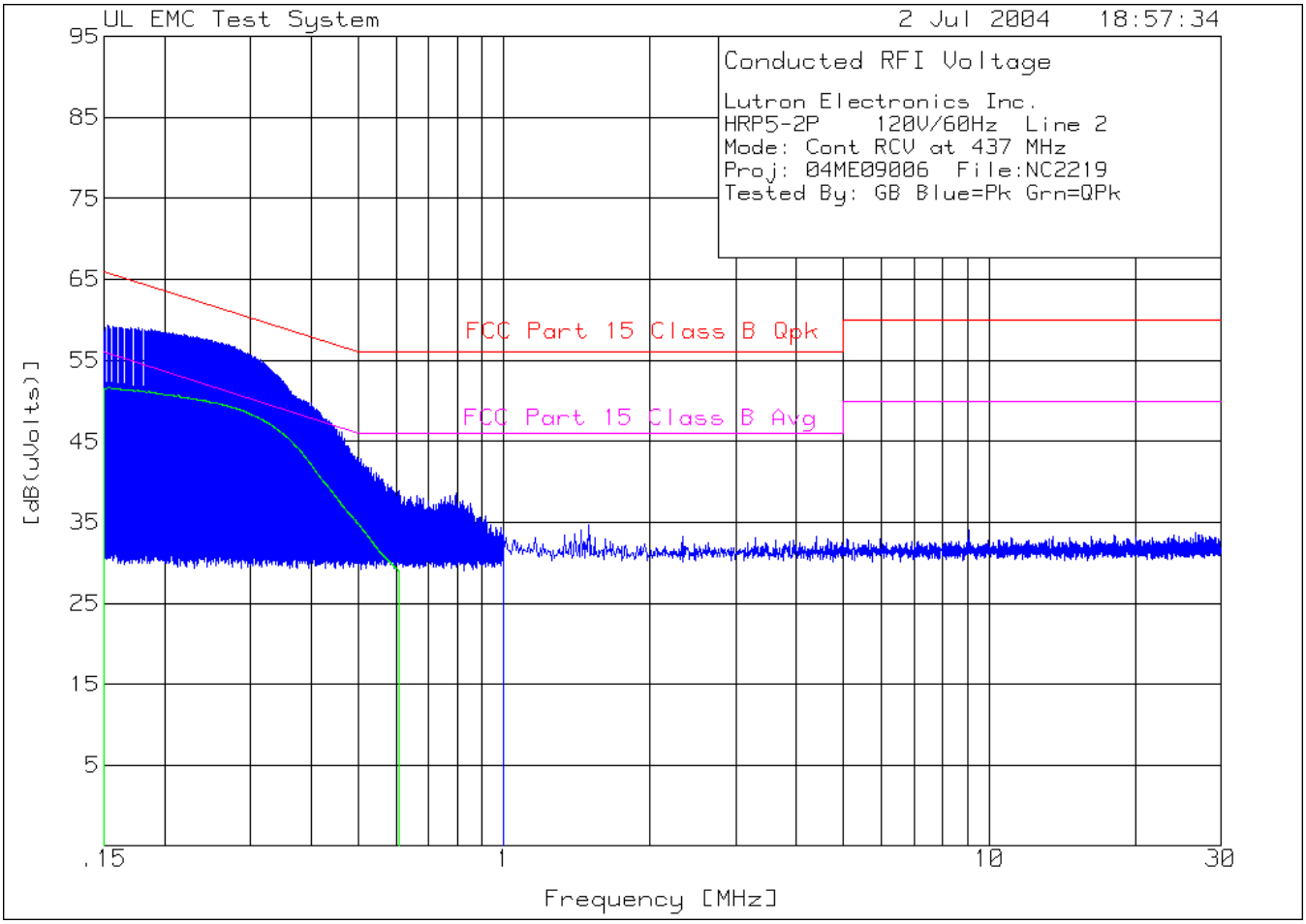
Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 1
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz						
.15318	-3.8 avem	10.1	0	6.3	65.8	55.8
			Margin [dB]:		-59.5	-49.5
.17014	-6.46 avem	10.1	0	3.64	65	55
			Margin [dB]:		-61.36	-51.36
.20087	-3.89 avem	10.1	0	6.21	63.6	53.6
			Margin [dB]:		-57.39	-47.39
.24008	-1.79 avem	10.1	0	8.31	62.1	52.1
			Margin [dB]:		-53.79	-43.79
.27293	-4.05 avem	10.1	0	6.05	61	51
			Margin [dB]:		-54.95	-44.95
.30472	-3.06 avem	10.1	0	7.04	60.1	50.1
			Margin [dB]:		-53.06	-43.06
.35029	-1.94 avem	10.1	0	8.16	59	49
			Margin [dB]:		-50.84	-40.84
.37255	-.53 avem	10.1	0	9.57	58.4	48.4
			Margin [dB]:		-48.83	-38.83
.39162	-.01 avem	10.1	0	10.09	58	48
			Margin [dB]:		-47.91	-37.91
.42342	.02 avem	10.1	0	10.12	57.4	47.4
			Margin [dB]:		-47.28	-37.28

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

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

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg


UL EMC Test System
2 Jul 2004 18:57:34
Conducted RFI Voltage
Lutron Electronics Inc.
HRP5-2P 120V/60Hz Line 2
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk
FCC Part 15 Class B Qpk
FCC Part 15 Class B Avg
[dB(uVolts)]
95
85
75
65
55
45
35
25
15
5
.15
1
10
30
Frequency [MHz]

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 2
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=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	.15458	41.5 qp	10.1	0	51.6	65.8	55.8
				Margin [dB]		-14.2	-4.2
2	.17635	41.16 qp	10.1	0	51.26	64.7	54.7
				Margin [dB]		-13.44	-3.44
3	.21302	40.56 qp	10.1	0	50.66	63.1	53.1
				Margin [dB]		-12.44	-2.44
4	.24166	39.92 qp	10.1	0	50.02	62	52
				Margin [dB]		-11.98	-1.98
5	.26286	39.43 qp	10.1	0	49.53	61.3	51.3
				Margin [dB]		-11.77	-1.77
6	.29608	38.42 qp	10.1	0	48.52	60.4	50.4
				Margin [dB]		-11.88	-1.88
7	.31728	37.56 qp	10.1	0	47.66	59.8	49.8
				Margin [dB]		-12.14	-2.14
8	.33733	36.58 qp	10.1	0	46.68	59.3	49.3
				Margin [dB]		-12.62	-2.62
9	.3591	35.3 qp	10.1	0	45.4	58.7	48.7
				Margin [dB]		-13.3	-3.3
10	.38488	33.38 qp	10.1	0	43.48	58.2	48.2
				Margin [dB]		-14.72	-4.72
11	.3992	32.11 qp	10.1	0	42.21	57.9	47.9
				Margin [dB]		-15.69	-5.69

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

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

Lutron Electronics Inc.
HRP5-120 120V/60Hz Line 2
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: GB Blue=Pk Grn=QPk

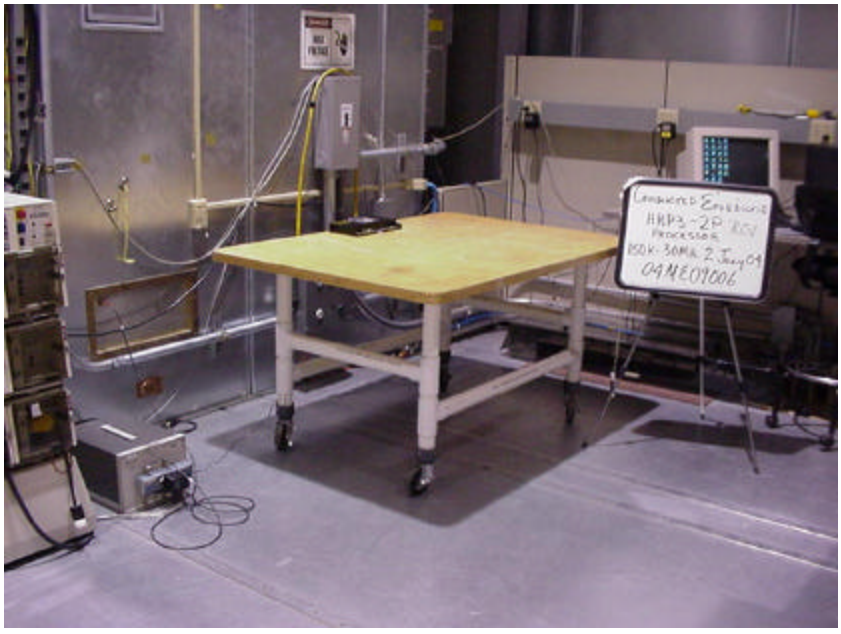
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2
Range: 1 .15 - 1MHz						
.15458	-1.45 avem	10.1	0	8.65	65.8	55.8
			Margin [dB]:		-57.15	-47.15
.17635	-.01 avem	10.1	0	10.09	64.7	54.7
			Margin [dB]:		-54.61	-44.61
.21302	-1.42 avem	10.1	0	8.68	63.1	53.1
			Margin [dB]:		-54.42	-44.42
.24166	.33 avem	10.1	0	10.43	62	52
			Margin [dB]:		-51.57	-41.57
.26286	-1.07 avem	10.1	0	9.03	61.3	51.3
			Margin [dB]:		-52.27	-42.27
.29608	1.59 avem	10.1	0	11.69	60.4	50.4
			Margin [dB]:		-48.71	-38.71
.31728	1.84 avem	10.1	0	11.94	59.8	49.8
			Margin [dB]:		-47.86	-37.86
.33733	2.06 avem	10.1	0	12.16	59.3	49.3
			Margin [dB]:		-47.14	-37.14
.3591	2.41 avem	10.1	0	12.51	58.7	48.7
			Margin [dB]:		-46.19	-36.19
.38488	1.41 avem	10.1	0	11.51	58.2	48.2
			Margin [dB]:		-46.69	-36.69
.3992	1.07 avem	10.1	0	11.17	57.9	47.9
			Margin [dB]:		-46.73	-36.73

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

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

LIMIT 1: FCC Part 15 Class B Qpk
LIMIT 2: FCC Part 15 Class B Avg

HRP5-120 XMT
The model number depicted in the title block should be HRP5-120



HRP5-120 RCV
The model number depicted in the title block should be HRP5-120

Conducted Emissions Test Set-Up

5.1.2 Conducted Click Emissions Tests

Test Not Applicable

The EUT does not contain devices that produce transient emissions as defined by the standard.

5.1.3 Cease Operation Within 5 Seconds

Test Applicable

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

Results

The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	21.5 °C
Humidity:	42 %RH
Pressure:	1011 mbar
Date test performed:	6 July 2004

1 fully configured sample was scanned over the following frequency range

Test equipment used for Cease Operation measurements:

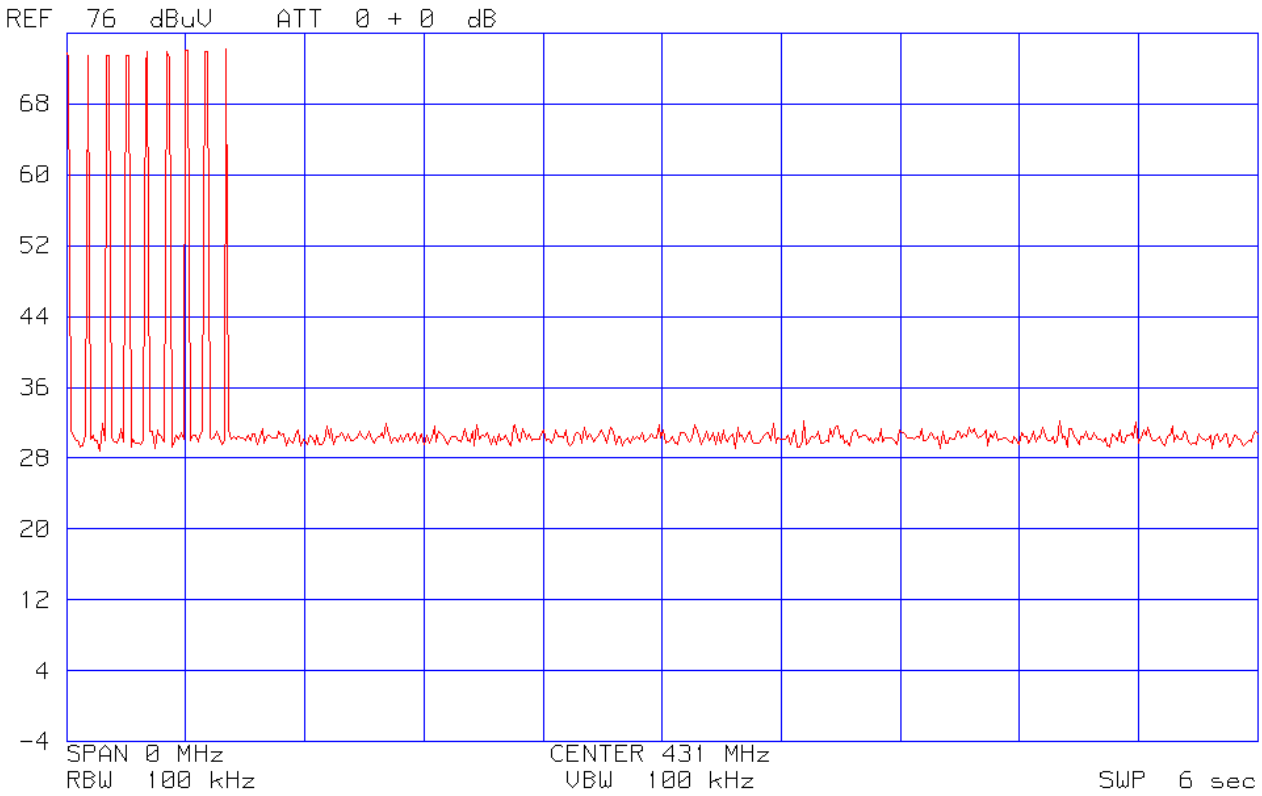
ESI26 Rhode & Schwartz EMI Receiver Equipment No.: ME5B-081
Quasi Peak BW: 200Hz 9kHz to 150kHz RBW 10 KHz
Quasi Peak BW: 9kHz 150kHz to 30MHz RBW 100 KHz
Quasi Peak BW: 120 kHz 30 to 1000MHz RBW 1.0 MHz
Range: 30MHz-1000MHz Last Calibration Date: 28 August 2003 Calibration Due Date: 31 August 2004

3121C-DB4 EMCO Log-Periodic Antenna Equipment No.: ME5-811
Last Calibration Date: 1 April 2004 Calibration Due Date: 1 April 2005

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: 18 June 2004 Calibration Due Date: 18 June 2005



Cease Operation < 5 seconds

Cease Operation Test Set-Up

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

Test Applicable

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Results

The system met the requirements for radiated emissions. Data Pages follow.

Temperature:	21 °C
Humidity:	58 %RH
Pressure:	1011mbar
Date test performed:	01 July 2004

Mode*	
Power	**Operation**
1	1
1	2
1	3
1	4

1 fully configured sample was scanned over the following frequency range:

Electric fields:	30MHz - 5GHz	(3 meter measurement distance) Intentional Transmit at 431 MHz and 437 MHz
Electric fields:	30MHz - 2GHz	(3 meter measurement distance) Unintentional Receive at 431 MHz and 437 MHz

Test equipment used for radiated emissions

ESI26	**Rhode & Schwartz**	**EMI Receiver**	**Equipment No.: ME5B-081**	
			Quasi Peak BW: 200Hz RBW 10 KHz	**9kHz to 150kHz**
			Quasi Peak BW: 9kHz RBW 100 KHz	**150kHz to 30MHz**
			Quasi Peak BW: 120 kHz RBW 1.0 MHz	**30 to 1000MHz**
Range: 30-1000MHz	Last Calibration Date: 28 August 2003		Calibration Due Date: 31 August 2004	

Test equipment used for radiated emissions above 1GHz

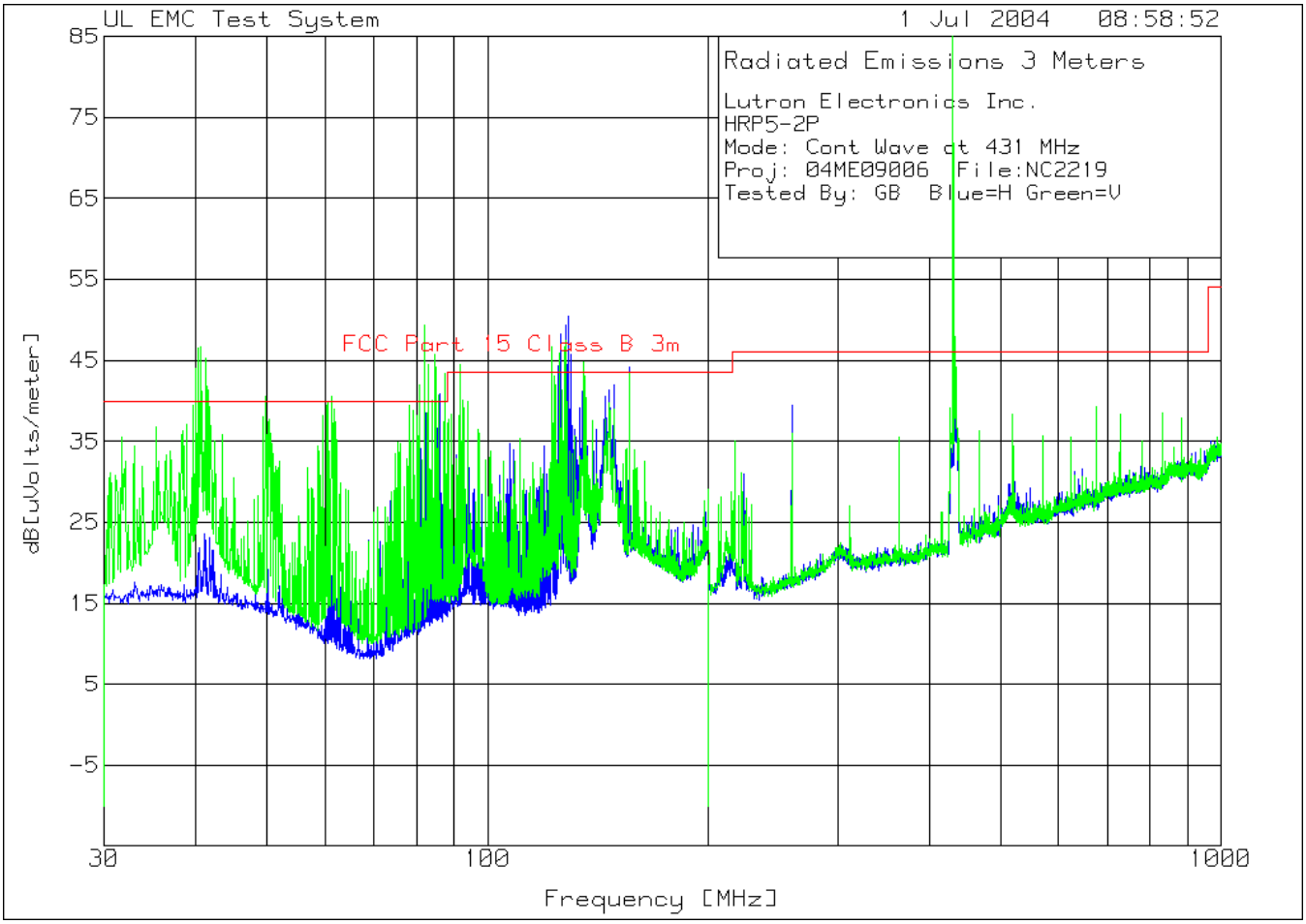
ES126	**Rhode & Schwartz**	**EMI Receiver**	**Equipment No.: ME5B-081**	
			Resolution BW: 1MHz Video BW: 1MHz	
Range: 1-5GHz	Last Calibration Date: 28 August 2003		Calibration Due Date: 31 August 2004	

Test Accessories for Radiated Emissions

94455-1	**Ailtech**	**Biconnical Antenna**	**Equipment No.: ME5-439**	
Range: 30-200MHz	Last Calibration Date: 02 December 2003		Calibration Due Date: 02 December 2004	
3146	**EMCO**	**Log Periodic Antenna**	**Equipment No.: ME5-451**	
Range: 200-1000MHz	Last Calibration Date: 04 December 2003		Calibration Due Date: 04 December 2004	
3115	**EMCO**	**Horn Antenna**	**Equipment No.: ME5A-766**	
Range: 1-5GHz	Last Calibration Date: 18 July 2003		Calibration Due Date: 18 July 2004	
8449B	**Hewlett Packard**	**1-26GHz Pre-Amp**	**Equipment No.: ME5-914**	
Range: 1-5GHz	Last Calibration Date: 21 January 2004		Calibration Due Date: 21 January 2005	
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**	
		Ranges	Temp: 0^{o}C-55^{o}C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar	
	Last Calibration Date: 02 June 2004		Calibration Due Date: 02 June 2005	

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.



The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 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	Limit:1 dB[uVolts/meter]	Limit:2 dB[uVolts/meter]
Horizontal 30 - 200MHz							
5	125.6734	35.1 pk	1.6	11.5	48.2	43.5	60.7
	Azimuth:202	Height:168 Horz		Margin [dB]		4.7	-12.5
6	129.0751	36.59 pk	1.6	12.3	50.49	43.5	60.7
	Azimuth:202	Height:168 Horz		Margin [dB]		6.99	-10.21
Vertical 30 - 200MHz							
3	40.5453	32.38 pk	.9	13.4	46.68	40	60.7
	Azimuth:314	Height:100 Vert		Margin [dB]		6.68	-14.02
4	81.9613	39.47 pk	1.3	8.6	49.37	40	60.7
	Azimuth:2	Height:100 Vert		Margin [dB]		9.37	-11.33
Horizontal 200 - 1000MHz							
1	431.0107	*46.33pk	3	16.3	*65.63	46	80.7
	Azimuth:201	Height:168 Horz		Margin [dB]		42.63	-15.07
Vertical 200 - 1000MHz							
2	431.0107	*48.13pk	3	16.3	*67.43	46	80.7
	Azimuth:267	Height:100 Vert		Margin [dB]		44.43	-13.27

LIMIT 1: FCC Part 15 Class B 3m
LIMIT 2: FCC Part 15 Subpart C-Section 15.231

***Duty Cycle correction factor of –23dB added to Average level.**

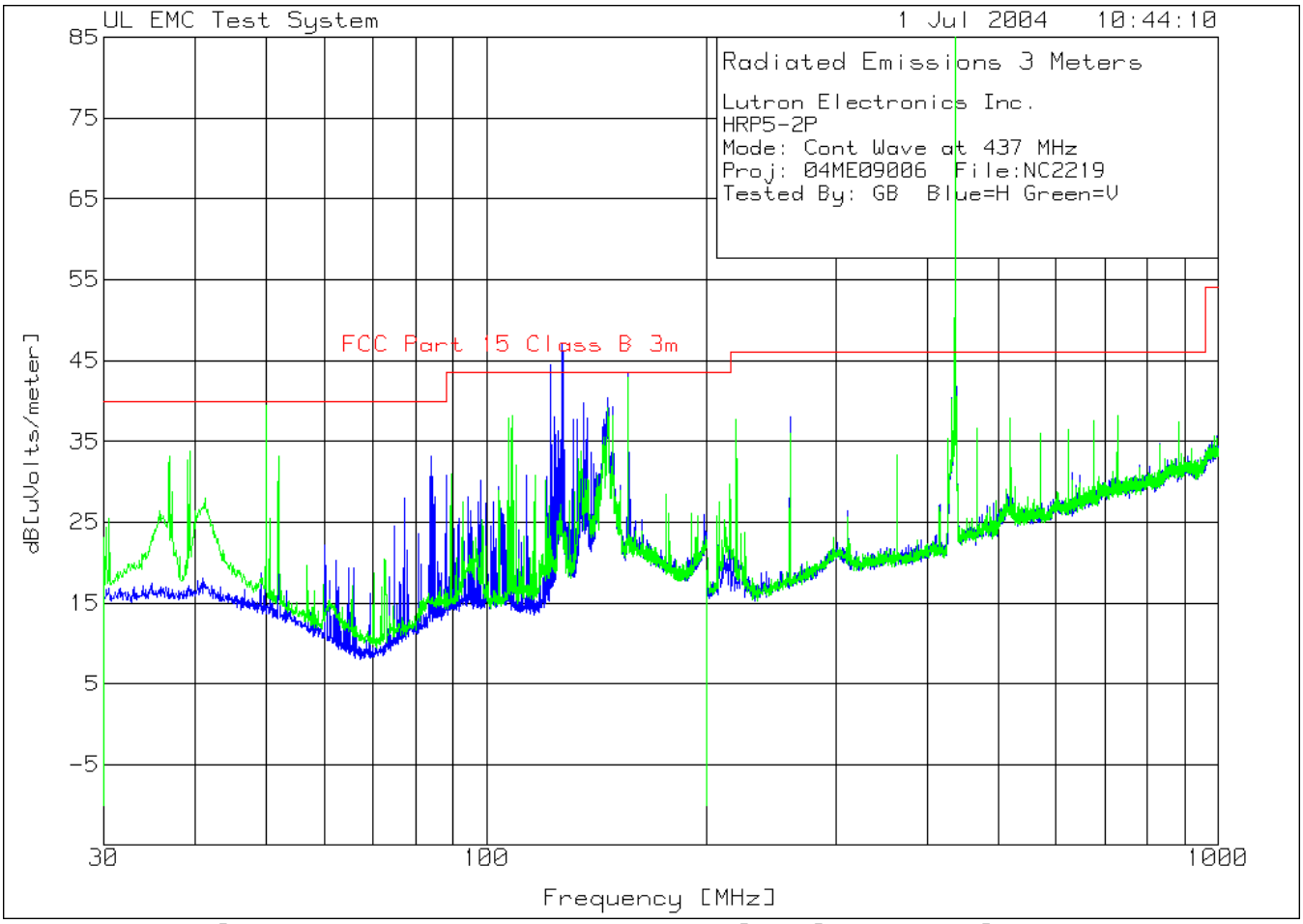
pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

Lutron Electronics Inc.
HRP5-120
Mode: Cont Wave at 431 MHz
Proj: 04ME09006 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
Horizontal 30 - 200MHz						
125.67	18.06	qp	1.6	11.5	31.16	43.5
Azimuth: 24	Height:106	Horz		Margin [dB]:		-12.34
129	18.24	qp	1.6	12.3	32.14	43.5
Azimuth: 138	Height:205	Horz		Margin [dB]:		-11.36
Vertical 30 - 200MHz						
40.5	16.48	qp	.9	13.4	30.78	40
Azimuth: 0	Height:100	Vert		Margin [dB]:		-9.22
82	17.3	qp	1.3	8.6	27.2	40
Azimuth: 33	Height:102	Vert		Margin [dB]:		-12.8

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector



The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont Wave at 437 MHz
Proj: 04ME09006 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 dB[uVolts/meter]	Limit:2 dB[uVolts/meter]
Horizontal 30 - 200MHz							
2	122.4417	32.16 pk	1.6	10.7	44.46	43.5	60.9
	Azimuth:159	Height:101 Horz		Margin [dB]		.96	-16.44
3	126.7789	33.56 pk	1.6	11.8	46.96	43.5	60.9
	Azimuth:159	Height:298 Horz		Margin [dB]		3.46	-13.94
4	127.5443	32.77 pk	1.6	11.9	46.27	43.5	60.9
	Azimuth:343	Height:199 Horz		Margin [dB]		2.77	-14.63
Vertical 30 - 200MHz							
1	49.9851	26.91 pk	1	11.5	39.41	40	60.9
	Azimuth:18	Height:100 Vert		Margin [dB]		-.59	-21.49
Horizontal 200 - 1000MHz							
5	436.8793	*47.64pk	3	16.5	*67.14	46	80.9
	Azimuth:292	Height:198 Horz		Margin [dB]		44.14	-13.76
Vertical 200 - 1000MHz							
6	436.8793	*46.52pk	3	16.5	*66.02	46	80.9
	Azimuth:358	Height:100 Vert		Margin [dB]		43.07	-14.88

LIMIT 1: FCC Part 15 Class B 3m
LIMIT 2: FCC Part 15 Subpart C-Section 15.231

***Duty Cycle correction factor of –23dB added to Average level.**

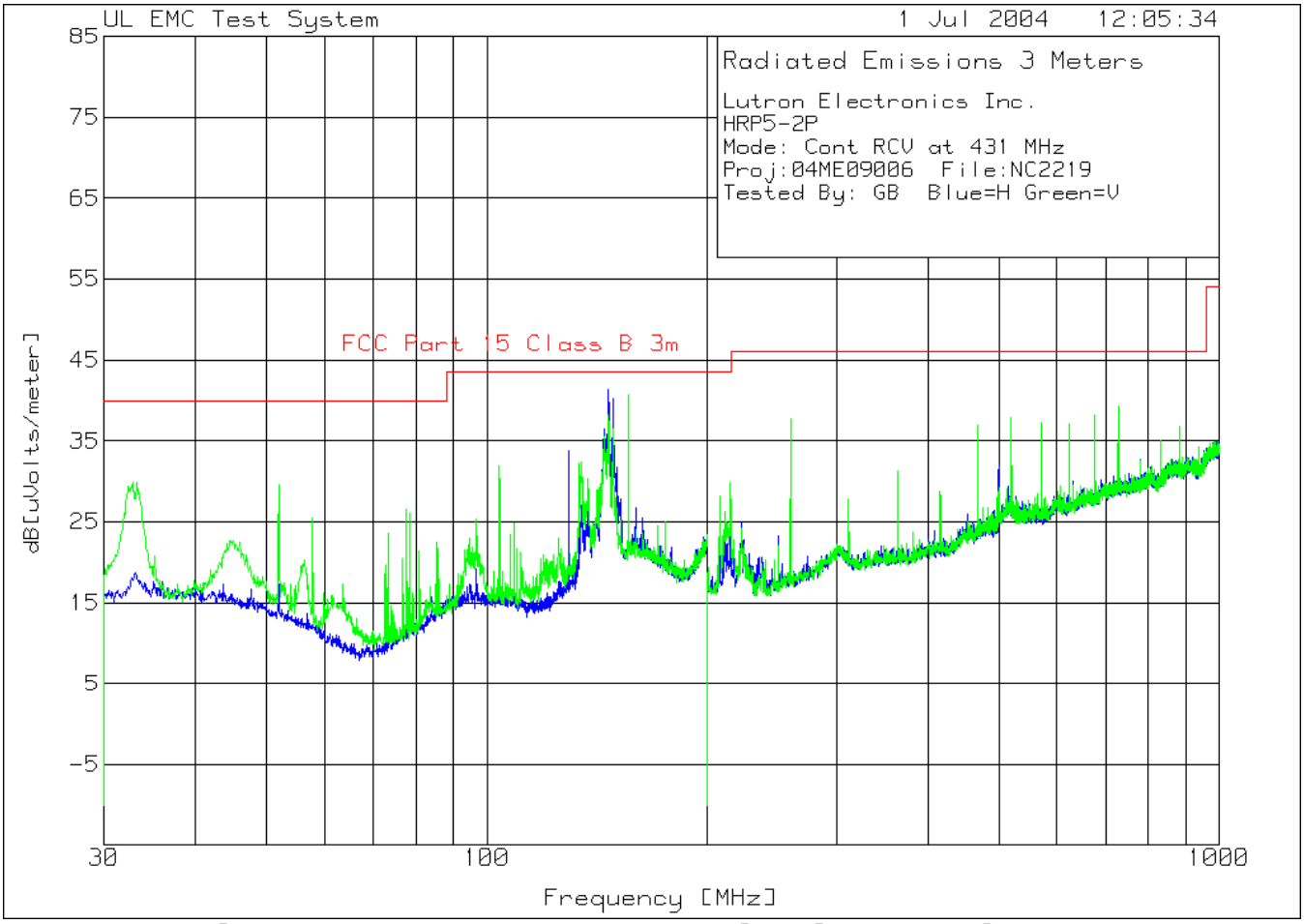
pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result

Lutron Electronics Inc.
HRP5-120
Mode: Cont Wave at 437 MHz
Proj: 04ME09006 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
Horizontal 30 - 200MHz					
122.44	18.06 qp	1.6	10.7	30.36	43.5
Azimuth: 230	Height:157 Horz		Margin [dB]:		-13.14
126.8	18.24 qp	1.6	11.8	31.64	43.5
Azimuth: 15	Height:224 Horz		Margin [dB]:		-11.86
127.55	18.24 qp	1.6	11.9	31.74	43.5
Azimuth: 35	Height:184 Horz		Margin [dB]:		-11.76
Vertical 30 - 200MHz					
50	16.9 qp	1	11.5	29.4	40
Azimuth: 143	Height:100 Vert		Margin [dB]:		-10.6

LIMIT 1: FCC Part 15 Class B 3m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector



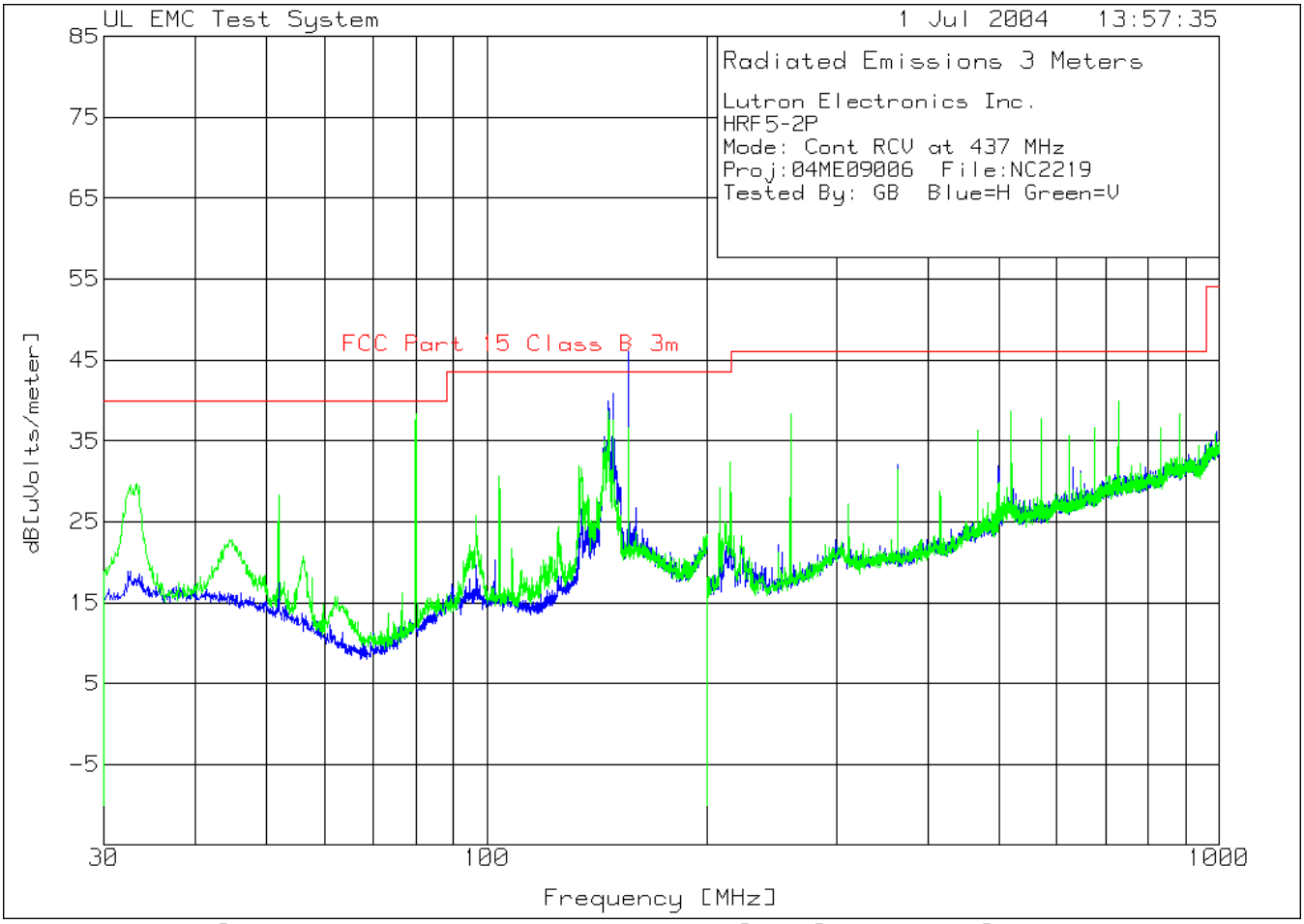
The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont RCV at 431 MHz
Proj:04ME09006 File:NC2219
Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
Vertical 200 - 1000MHz						
	259.7533	22.31 qp	2.3	13.1	37.71	46
	Azimuth:345	Height:198 Vert		Margin [dB]		-8.29
	519.8404	15.34 qp	3.3	19.3	37.94	46
	Azimuth:197	Height:101 Vert		Margin [dB]		-8.06
Horizontal 30 - 200MHz						
	146.5338	14.21 qp	1.7	15.6	31.51	43.5
	Azimuth: 49	Height:194 Horz		Margin [dB]:		-11.99
	148.6944	20.92 qp	1.7	15.8	38.42	43.5
	Azimuth: 45	Height:196 Horz		Margin [dB]:		-5.08
	155.9969	23.31 qp	1.8	16.3	41.41	43.5
	Azimuth: 247	Height:185 Horz		Margin [dB]:		-2.09
Vertical 30 - 200MHz						
	155.9956	20.46 qp	1.8	16.3	38.56	43.5
	Azimuth: 98	Height:101 Vert		Margin [dB]:		-4.94

LIMIT 1: FCC Part 15 Class B 3m

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



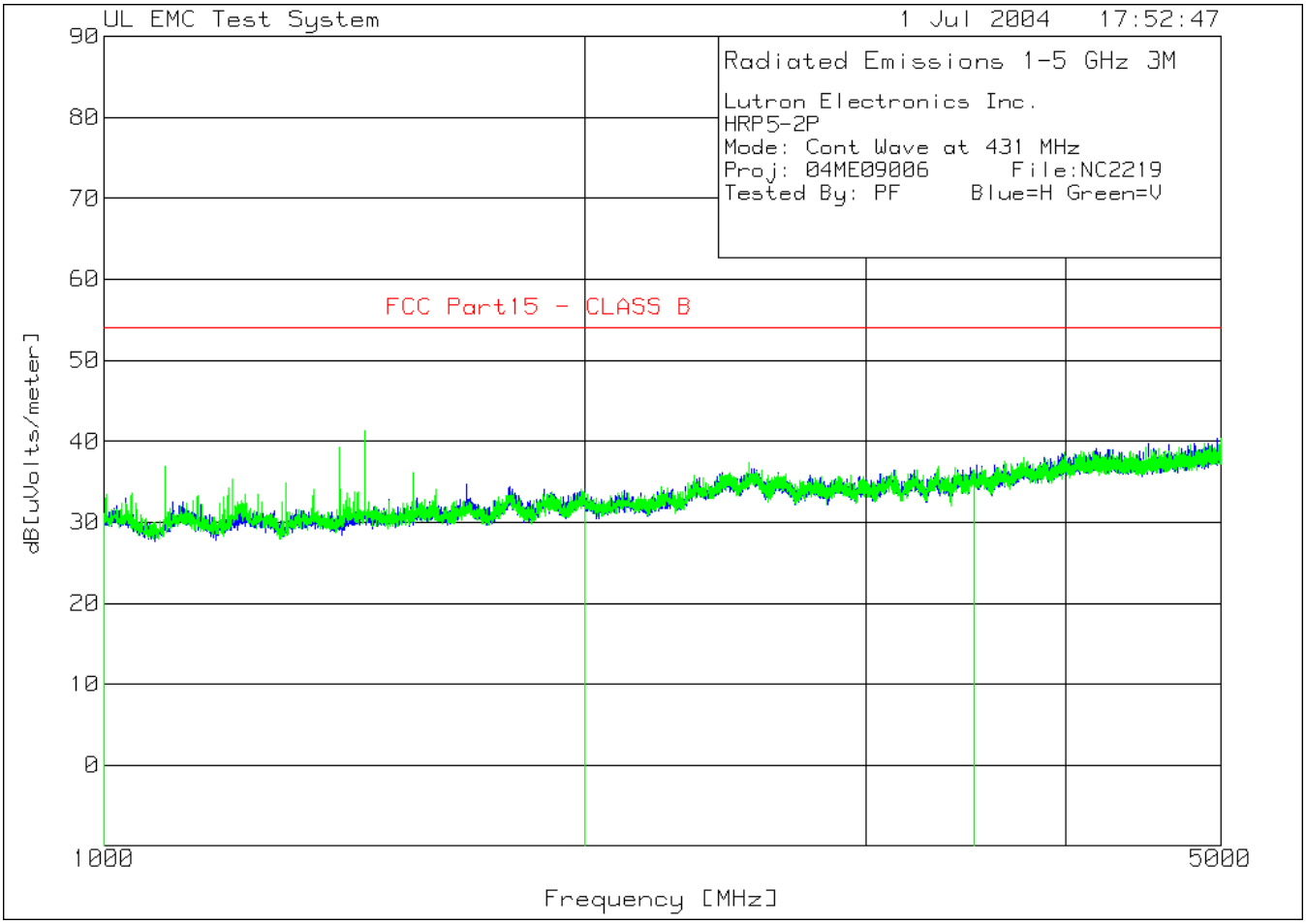
The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont RCV at 437 MHz
Proj:04ME09006 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
Horizontal 30 - 200MHz					
146.7	14.51 qp	1.7	15.6	31.81	43.5
Azimuth: 29	Height:209	Horz	Margin [dB]:	-11.69	
148.7432	18.27 qp	1.7	15.8	35.77	43.5
Azimuth: 43	Height:204	Horz	Margin [dB]:	-7.73	
156.0102	22.4 qp	1.8	16.3	40.5	43.5
Azimuth: 0	Height:187	Horz	Margin [dB]:	-3	
Vertical 30 - 200MHz					
80	7.84 qp	1.2	8	17.04	40
Azimuth: 73	Height:119	Vert	Margin [dB]:	-22.96	
146.6263	11.59 qp	1.7	15.6	28.89	43.5
Azimuth: 320	Height:182	Vert	Margin [dB]:	-14.61	
148.683	16.39 qp	1.7	15.8	33.89	43.5
Azimuth: 314	Height:199	Vert	Margin [dB]:	-9.61	

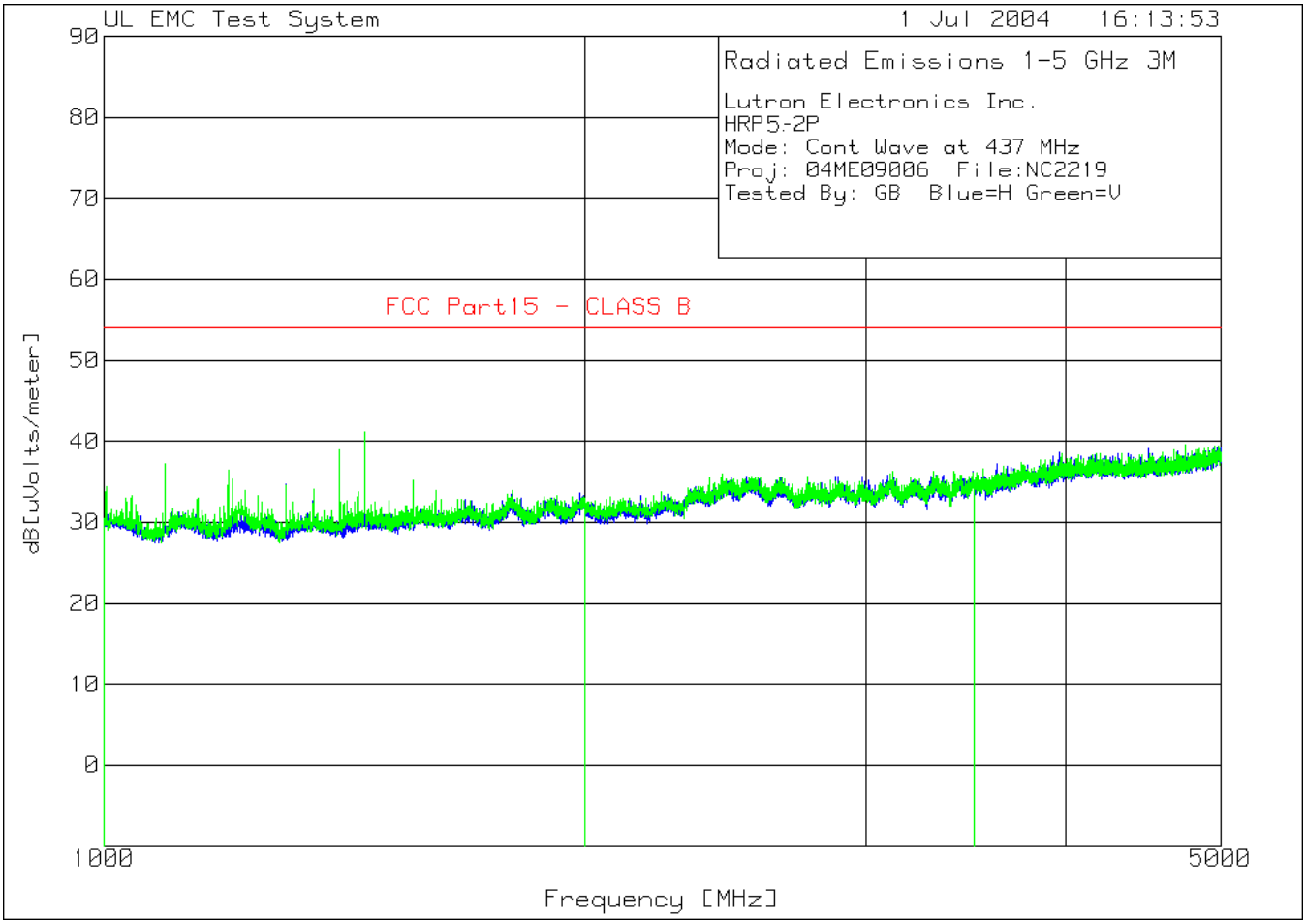
LIMIT 1: FCC Part 15 Class B 3m

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



The model number depicted in the title block should be HRP5-120

```
 Lutron Electronics Inc.
 HRP5-120
 Mode: Cont Wave at 431 MHz
 Proj: 04ME09006      File:NC2219
 Tested By: PF     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 1000 - 2000MHz ----------------------------------------------------
1  1091.697     43.56 pk     -31.8     25.2      36.96   54
   Azimuth:167   Height:100 Vert     Margin [dB]         -17.04

2  1203.067     41.17 pk     -31.5     25.6      35.27   54
   Azimuth:21    Height:100 Vert     Margin [dB]         -18.73

3  1299.766     40.02 pk     -31.2     26        34.82   54
   Azimuth:358   Height:100 Vert     Margin [dB]         -19.18

4  1403.801     43.7 pk      -30.9     26.4      39.2    54
   Azimuth:328   Height:100 Vert     Margin [dB]         -14.8

5  1455.818     45.43 pk     -30.7     26.5      41.23   54
   Azimuth:328   Height:100 Vert     Margin [dB]         -12.77

6  1559.852     39.5 pk      -30.4     27        36.1    54
   Azimuth:18    Height:100 Vert     Margin [dB]         -17.9

LIMIT 1: FCC Part15 - CLASS B

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



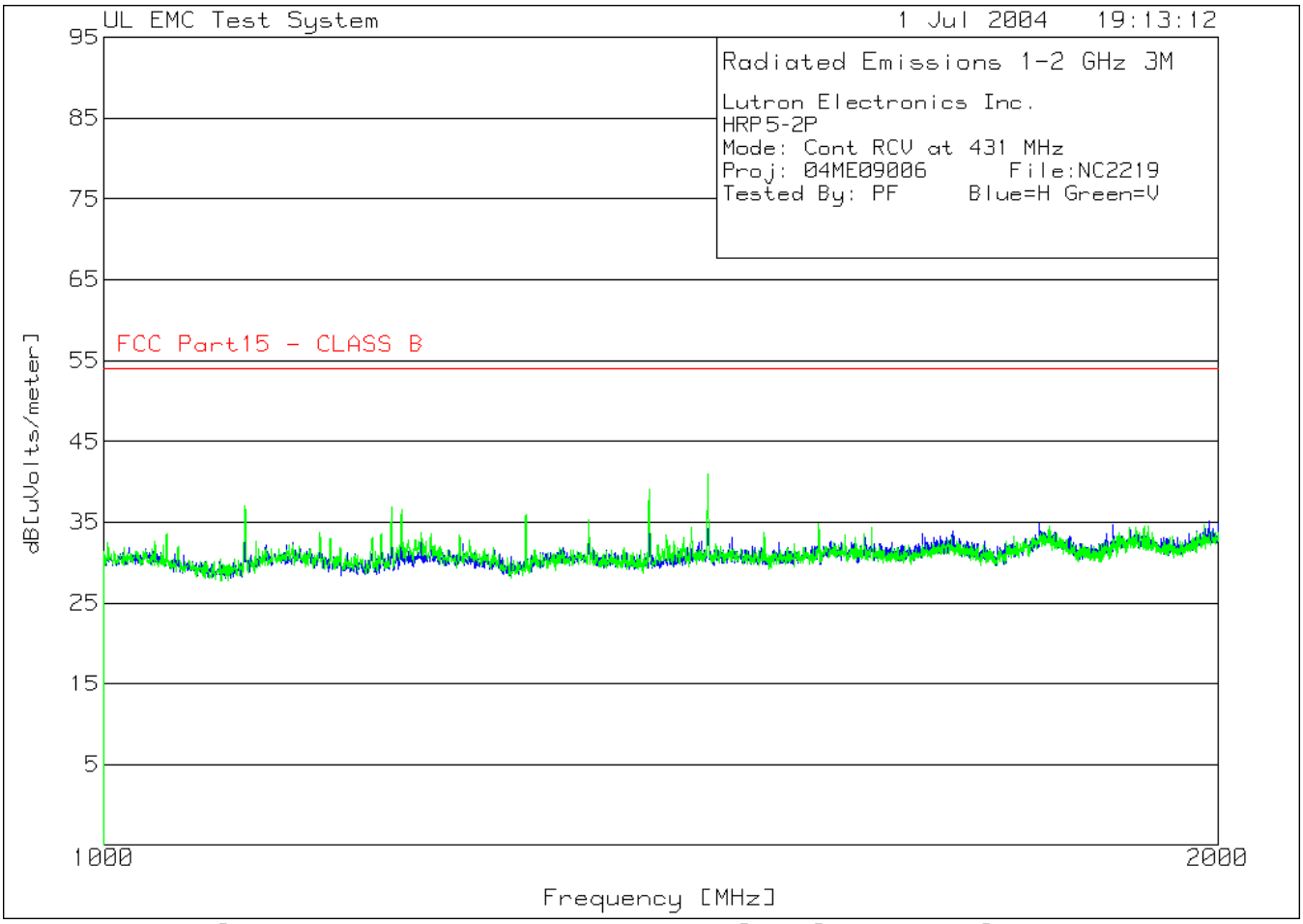
The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 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	43.87 pk	-31.8	25.2	37.27	54
	Azimuth:358	Height:198 Vert	Margin [dB]			-16.73
2	1195.732	42.35 pk	-31.5	25.6	36.45	54
	Azimuth:21	Height:198 Vert	Margin [dB]			-17.55
3	1203.401	41.6 pk	-31.5	25.6	35.7	54
	Azimuth:359	Height:198 Vert	Margin [dB]			-18.3
4	1351.783	40.8 pk	-31	26.2	36	54
	Azimuth:196	Height:101 Vert	Margin [dB]			-18
5	1403.801	43.54 pk	-30.9	26.4	39.04	54
	Azimuth:338	Height:101 Vert	Margin [dB]			-14.96
6	1456.151	44.71 pk	-30.7	26.5	40.51	54
	Azimuth:338	Height:198 Vert	Margin [dB]			-13.49

LIMIT 1: FCC Part15 - CLASS B

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



The model number depicted in the title block should be HRP5-120

```
 Lutron Electronics Inc.
 HRP5-120
 Mode: Cont RCV at 431 MHz
 Proj: 04ME09006      File:NC2219
 Tested By: PF     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]
================================================================
Horizontal 1000 - 2000MHz ---------------------------------------------------
1  1091.697     43.68 pk     -31.8     25.2      37.08   54
   Azimuth:359   Height:101 Vert     Margin [dB]         -16.92

2  1196.065     42.75 pk     -31.5     25.6      36.85   54
   Azimuth:359   Height:199 Vert     Margin [dB]         -17.15

3  1203.401     42.48 pk     -31.5     25.6      36.58   54
   Azimuth:21    Height:199 Vert     Margin [dB]         -17.42

4  1300.1       41.14 pk     -31.2     26        35.94   54
   Azimuth:213   Height:101 Vert     Margin [dB]         -18.06

5  1403.801     43.6 pk      -30.9     26.4      39.1    54
   Azimuth:338   Height:199 Vert     Margin [dB]         -14.9

6  1456.151     45.16 pk     -30.7     26.5      40.96   54
   Azimuth:338   Height:101 Vert     Margin [dB]         -13.04

LIMIT 1: FCC Part15 - CLASS B

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

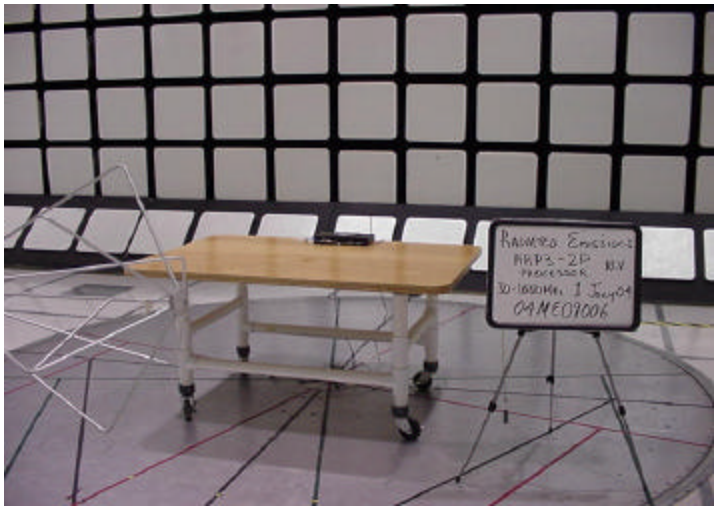
The model number depicted in the title block should be HRP5-120

Lutron Electronics Inc.
HRP5-120
Mode: Cont RCV at 437 MHz
Proj: 04ME09006 File:NC2219
Tested By: PF Blue=H Green=V

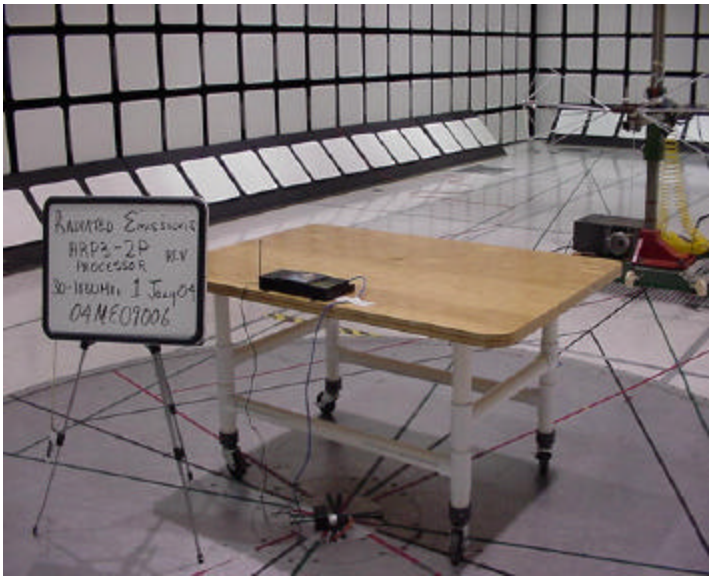
No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1
Horizontal 1000 - 2000MHz						
1	1092.031	43.87 pk	-31.8	25.2	37.27	54
	Azimuth:358	Height:198 Vert	Margin [dB]			-16.73
2	1195.732	42.35 pk	-31.5	25.6	36.45	54
	Azimuth:21	Height:198 Vert	Margin [dB]			-17.55
3	1203.401	41.6 pk	-31.5	25.6	35.7	54
	Azimuth:359	Height:198 Vert	Margin [dB]			-18.3
4	1351.783	40.8 pk	-31	26.2	36	54
	Azimuth:196	Height:101 Vert	Margin [dB]			-18
5	1403.801	43.54 pk	-30.9	26.4	39.04	54
	Azimuth:338	Height:101 Vert	Margin [dB]			-14.96
6	1456.151	44.71 pk	-30.7	26.5	40.51	54
	Azimuth:338	Height:198 Vert	Margin [dB]			-13.49

LIMIT 1: FCC Part15 - CLASS B

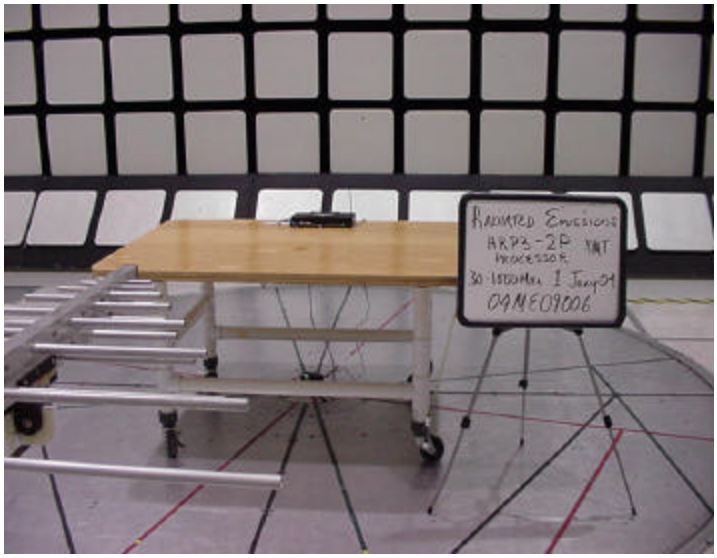
pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
avem - denotes EMI average detection
tm - Trace Math Result



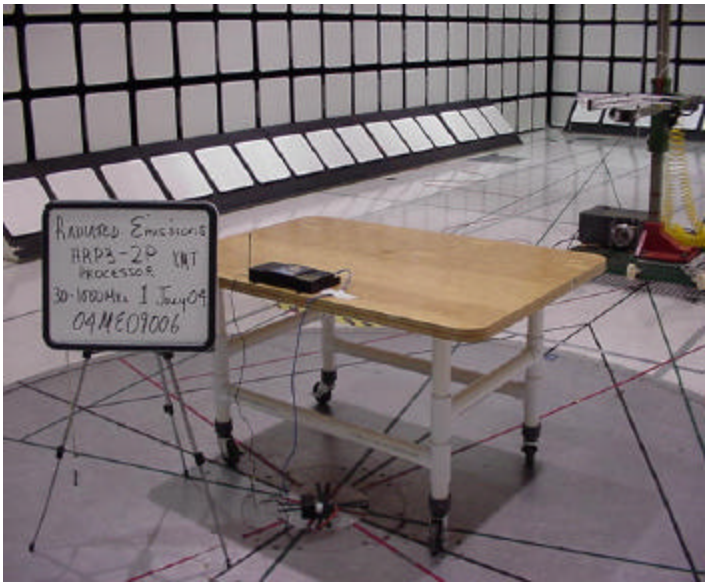
Front – 30-1000MHz – Receiver
The model number depicted in the title block should be HRP5-120



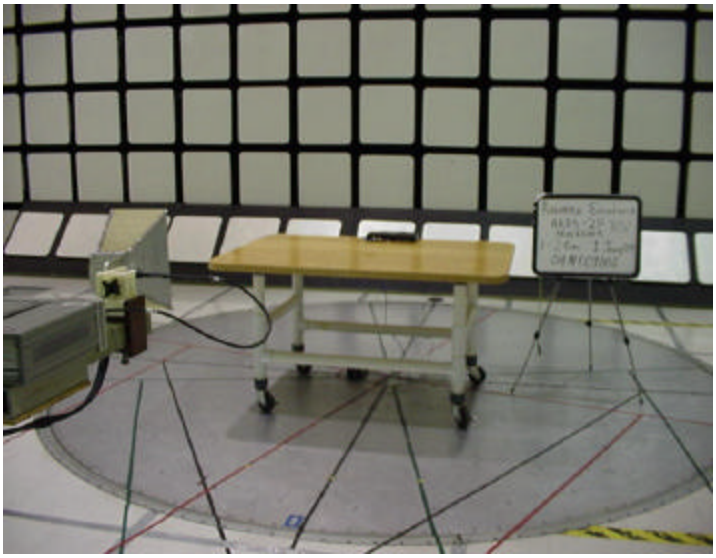
Rear – 30-1000MHz - Receiver
The model number depicted in the title block should be HRP5-120



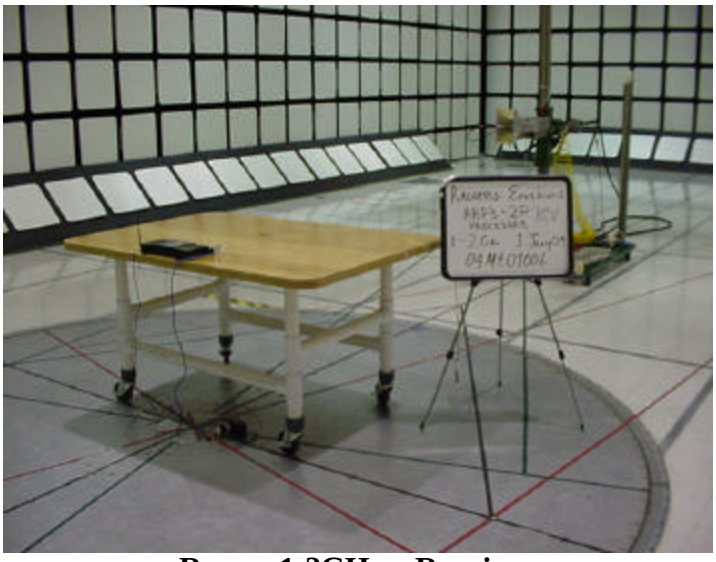
Front – 30-1000MHz - Transmitter
The model number depicted in the title block should be HRP5-120



Rear – 30-1000MHz - Transmitter
The model number depicted in the title block should be HRP5-120



Front - 1-2GHz – Receiver
The model number depicted in the title block should be HRP5-120



Rear – 1-2GHz – Receiver
The model number depicted in the title block should be HRP5-120

Radiated Emissions Test Set-Up

5.1.5 Pulse Train

Test Applicable

Test Procedure: 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.

Results
The system met the requirements for conducted emissions. Data Pages follow.

Temperature:	21.5°C
Humidity:	46%RH
Pressure:	1011mbar
Date test performed:	24 May 2004

ESI26 **Rhode & Schwartz** **EMI Receiver** **Equipment No.: ME5B-081**

Quasi Peak BW: 200Hz 9kHz to 150kHz
RBW 10 KHz
Quasi Peak BW: 9kHz 150kHz to 30MHz
RBW 100 KHz
Quasi Peak BW: 120 kHz 30 to 1000MHz
RBW 1.0 MHz

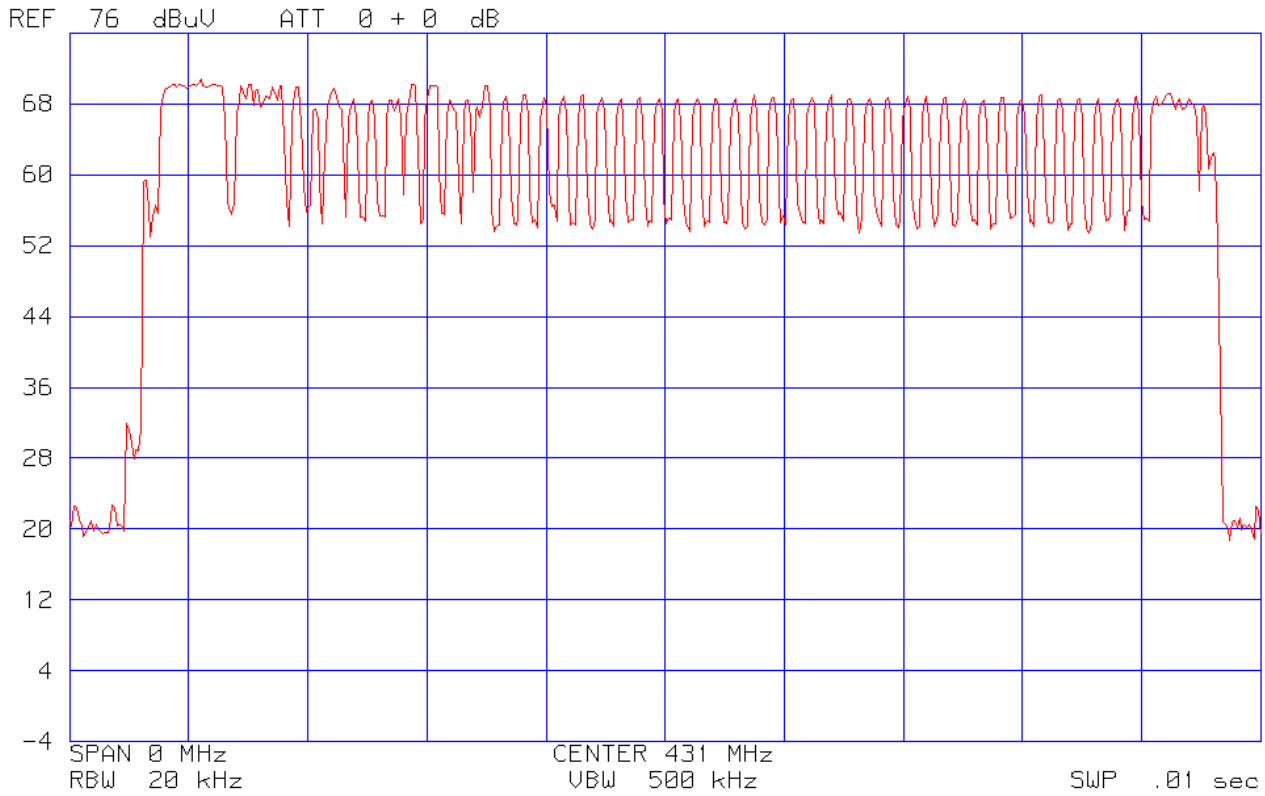
Range: 30MHz-1000MHz Last Calibration Date: 28 August 2003 Calibration Due Date: 31 August 2004

3121C-DB4 EMCO Log-Periodic Antenna Equipment No.: ME5-811
Last Calibration Date: 1 April 2004 Calibration Due Date: 1 April 2005

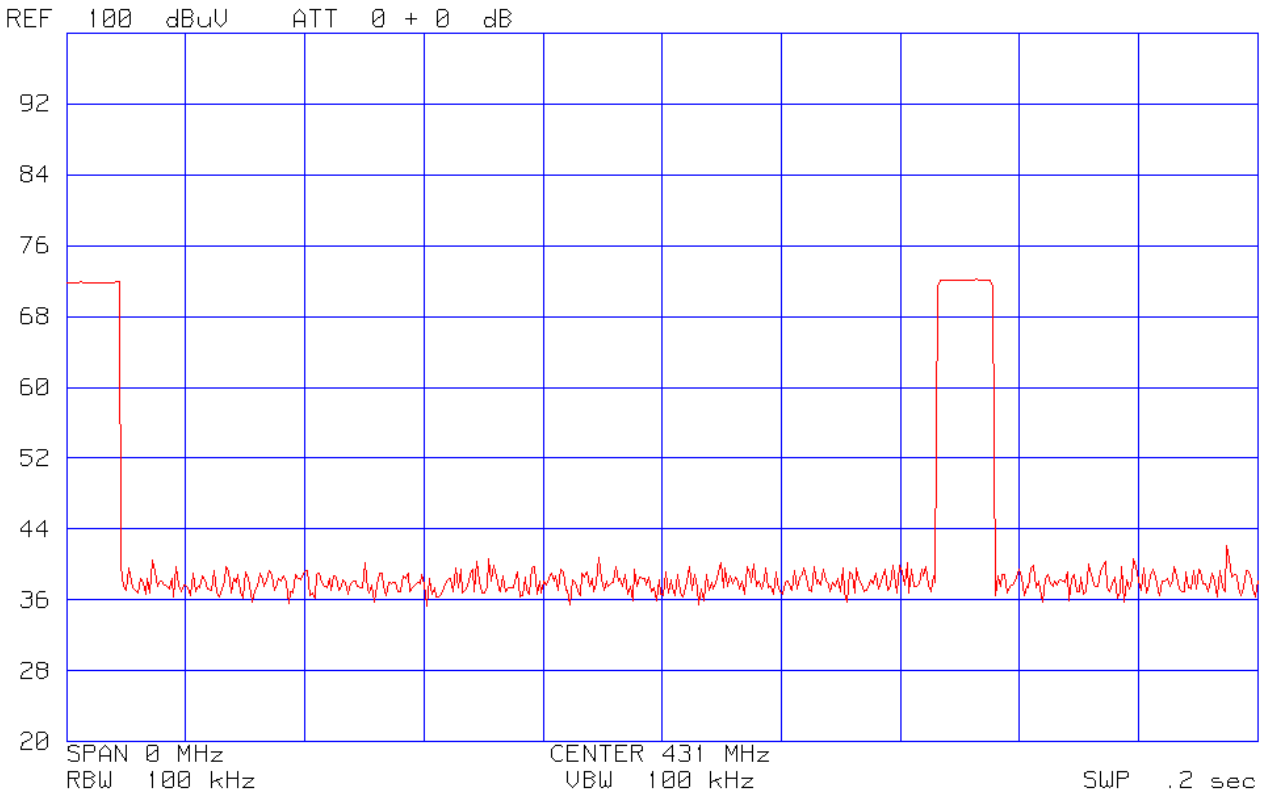
99760-00 Cole –Parmer Hydrometer/Temp/Barometer Equipment No.: ME4-268

Ranges: 0^{o}C-55^{o}C Temp:0^{o}C-55^{o}C
Humidity 25% to 95 %RH
Pressure 795 to 1050 mbar

Last Calibration Date: 27 May 2003 Calibration Due Date: 27 May 2004



One Complete Pulse Train 8.96ms



Depicting two pulse trains
Blanking Interval =146.29ms

Pulse Train Test Set-Up

5.1.6 Occupied Bandwidth:

Test Applicable

Temperature: 21.0 °C
Humidity: 59.0 RH
Pressure: 1007 mbar
Date test performed: 06 July 2004

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 at a distance of 100cm.

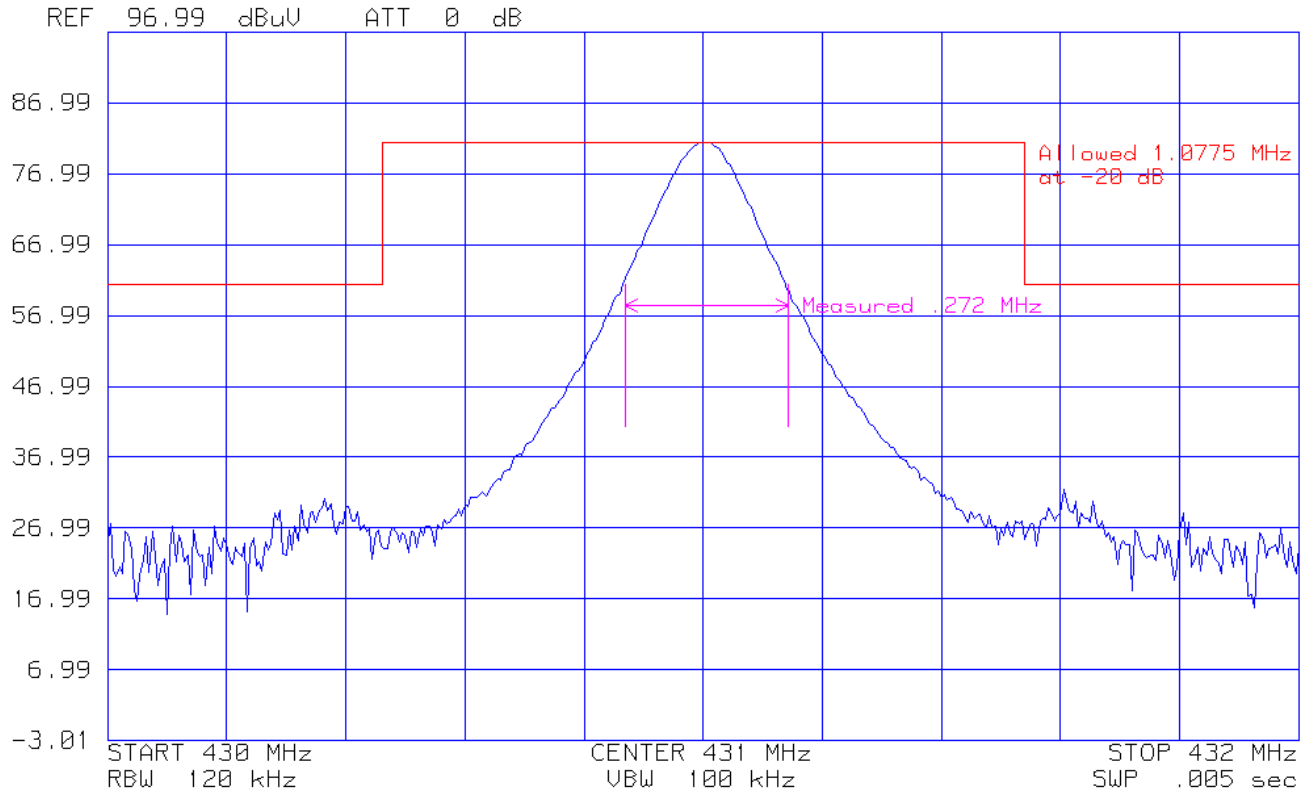
Mode: " Constant (Continuous) Transmit"
Frequency range:

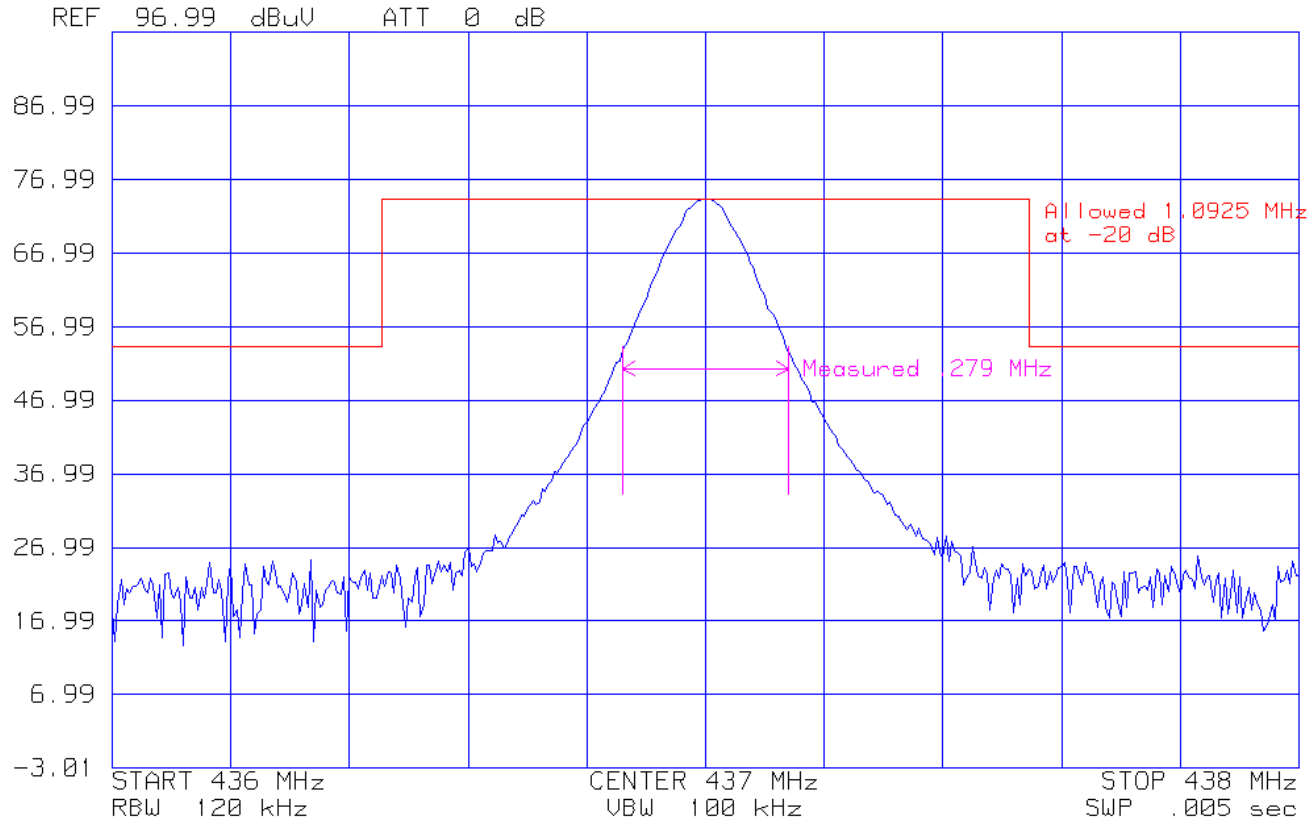
431MHz and 437MHz

Bandwidth = 0.25% of 431MHz = 1.0775MHz
Bandwidth = 0.25% of 437MHz = 1.0925MHz

Test equipment used for Occupied Bandwidth Measurements:

E7402A	**Agilent Technologies**	**EMI Spectrum Analyzer**	**Equipment No.: ME5B-123**
Range: 150k-30MHz	Last Calibration Date: 22 January 2004		Calibration Due Date: 22 January 2005
3146	**EMCO**	**Log Periodic Antenna**	**Equipment No.: ME5-811**
	Last Calibration Date: 01 April 2004		Calibration Due Date: 01 April 2005
99760-00	**Cole –Parmer**	**Hygrometer/Temp/Barometer**	**Equipment No.: ME4-268**
		Ranges	Temp: 0^{o}C-55^{o}C Humidity: 25% to 95 %RH Pressure: 795 to 1050 mbar
	Last Calibration Date: 02 June 2004		Calibration Due Date: 02 June 2005


REF 96.99 dBuV
ATT 0 dB
86.99
76.99
66.99
56.99
46.99
36.99
26.99
16.99
6.99
-3.01
Allowed 1.0775 MHz
at -20 dB
Measured .272 MHz
START 430 MHz
RBW 120 kHz
CENTER 431 MHz
VBW 100 kHz
STOP 432 MHz
SWP .005 sec


REF 96.99 dBuV
ATT 0 dB
86.99
76.99
66.99
56.99
46.99
36.99
26.99
16.99
6.99
-3.01
Allowed 1.0925 MHz
at -20 dB
Measured 279 MHz
START 436 MHz
RBW 120 kHz
CENTER 437 MHz
VBW 100 kHz
STOP 438 MHz
SWP .005 sec

Occupied Bandwidth Test Set-Up

The model number depicted in the title block should be HRP5-120

5.1.7 Fundamental Frequency and Spurious Emissions Measurement Limit Calculations

Limit Calculation:
Fundamental Frequency is 437MHz
From table in section 15.231
Limit = 41.6667(437) – 7083.3333
Limit = 11125.018uV
Limit = Log 11125.018 (20)
Limit = 80.9dBuV
Limit for Spurious Emissions = 20dB lower then fundamental = 60.9dBuV/m

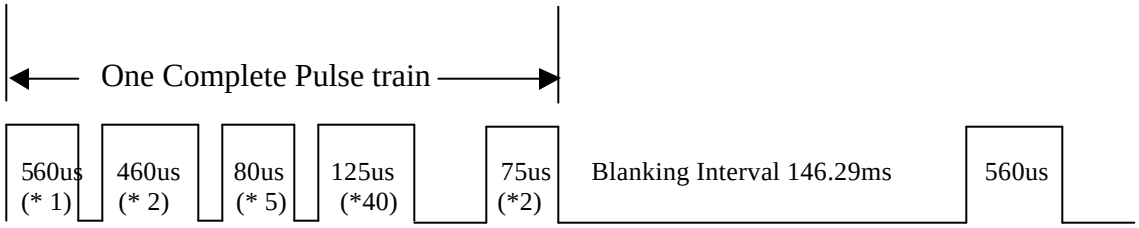
Radiated Emissions Limit conversion from mV/m to dBmV/m (accordance with paragraph 15.109)
Radiated Emissions Limit (dBµV/m) = 20*log (µV/m)
Radiated Emissions Limit (dBµV/m) = 20 * log (90)
Radiated Emissions Limit (dBµV/m) = 39.1

Radiated Emissions test data obtained during measurements.

Field Strength (dBµV/m)=Measured field strength (dBµV/m)+Antenna Factor (dB) + Cable Factor (dB)
Field Strength (dBµV/m) = 19.7dBµV/m + 12.5dB + 0.3dB
Field Strength (dBµV/m) = 32.5

Duty Cycle factor calculation.

Total number of pulses = 50
P1=560us * 1, P2=460us *2, P3= 125us *40, P4=80 *5, P5=75us *2
Blanking interval = 146.29ms
Pulse width= 560us+ 920us + 125us + 75us + 200us = Total time on
Total time on = 7ms



Duty cycle correction factor = 20 log (7 / 100ms)
= 20 log (0.07)
= - 23dB

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

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, EN 55022:1998, AS/NZS 1044, CNS 13438:1997, ANSI C63.4, FCC Method - 47 CFR Part 15, FCC Method –47 CFR Part 68, AS/NZS 3548, IEC 61000-3-2, EN 61000-3-2, CISPR 14-1, EN 55014-1, AS/NZS 1044, CNS 13783-1, CISPR 22, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing.

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 91040).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.
U.S. Identifier Number: US0113