FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

SHADE CONTROLLER

MODEL NUMBER: CSV-SYJ-B AND CSV-SYJ-PS

FCC ID: JPZ0085
IC: 2851A-JPZ0085

REPORT NUMBER: 1001441478

ISSUE DATE:2011-11-29

Prepared for
LUTRON ELECTRONICS INC
7200 SUTTER ROAD
COOPERBURG
PA 18036, USA

Prepared by
UNDERWRITERS LABORATORIES INC.
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NVLAP LAB CODE 100255-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2011-11-29	Initial Issue	B. DeLisi

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LUTRON ELECTRONICS INC
7200 SUTTER ROAD
COOPERBURG, PA 18036, USA

EUT DESCRIPTION: Shade Controller

MODEL: CSV-SYJ-B AND CSV-SYJ-PS

SERIAL NUMBER: Non-serialized production unit

DATE TESTED: 2011-11-17 through 2011-11-22

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	Pass
INDUSTRY CANADA RSS-210 Issue 8, Annex 1	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

Underwriters Laboratories Inc. tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Joseph Danisi
Lead Engineering Assoicate
UL

Tested By:

Bob DeLisi
Sr. Staff Engineer
UL

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/1002550.htm.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a shade controller intended for wireless control of Lutron Electronics Inc. shade systems.

The following models are also covered by the testing under this investigation:

CSV-YJ-B	CSV-YJ-B-N	CSV-YJ-PS	CSV-YJ-PS-N
CSV-SYJ-B	CSV-SYJ-B-N	CSV-SYJ-PS	CSV-SYJ-PS-N
CSA-YJ-B	CSA-YJ-B-N	CSA-YJ-PS	CSA-YJ-PS-N
CSA-SYJ-B	CSA-SYJ-B-N	CSA-SYJ-PS	CSA-SYJ-PS-N

Note: the model shown in plots and in data CXx-TT-PP-E is a generic model name and represents the differences shown in the table above.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an external, permanently attached dipole antenna.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was developed and supplied by Lutron Electronics Inc.

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted at the low and high channels for both battery and AC powered configurations for both field strength and conducted emissions. The worst case configuration was with the antenna extended away from the transmitting device.

5.5. MODIFICATIONS

The fundamental power was lowered via software at Lutron to a new target level of 0dBm.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

None

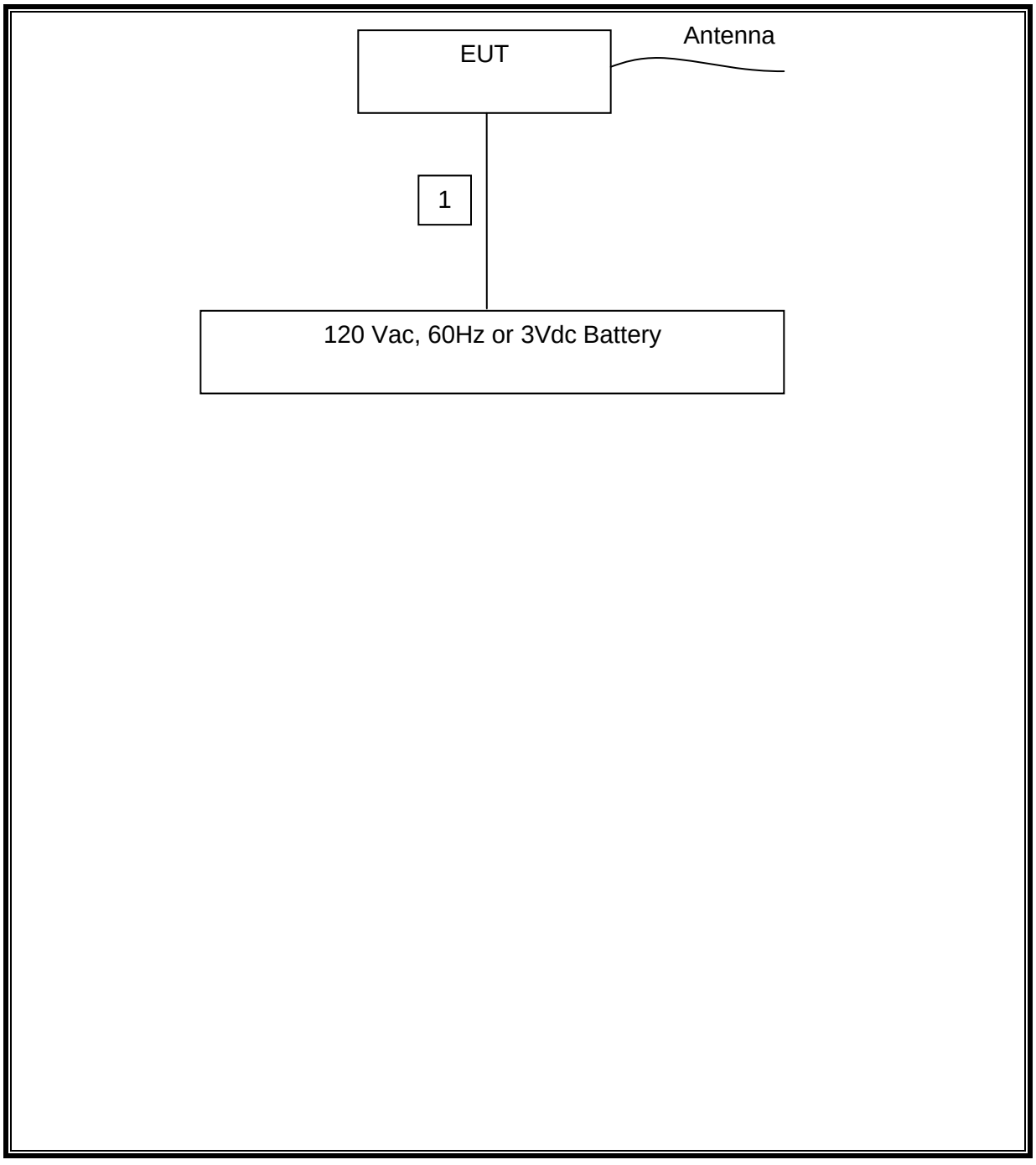
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identica Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	12	AC	Unshielded	1.8m	None

TEST SETUP

The EUT is a stand-alone device which is inserted into a plastic shade housing. Test software exercised the radio that allowed either constant transmit or constant receive modes of operation.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used – Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2011-03-01	2012-03-01
Bicon Antenna	Schaffner	VBA6106A	43441	2011-10-12	2012-10-12
Log-P Antenna	Schaffner	UPA6109	44067	2011-04-29	2012-04-29
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2011-02-01	2012-02-29
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2011-07-26	2012-07-26
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2011-02-01	2012-02-29

* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration.
* Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.

Test Equipment Used – Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2011-02-04	2012-02-28
Switch Driver	HP	11713A	44397	NA	NA
RF Switch Box	UL	4	44404	NA	NA
Measurement Software	UL	Version 9.3	44736	NA	NA
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2010-03-08	2012-03-08
Multimeter	Fluke	87V	64386	2011-02-02	2012-02-29

Test Equipment Used – Occupied Bandwidth/Cease Operation/Duty Cycle					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Spectrum Analzyer	Agilent	E4446A	72822	2011-07-02	2012-07-02
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2011-01-27	2012-01-27
Dipole Antenna	EMCO	3121C	3359	2010-12-08	2011-12-08
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-03-08	2012-03-08
Oscilloscope	Tektronix	TDS3052	OS004	2011-02-01	2012-02-29

7. ANTENNA PORT TEST RESULTS

7.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

IC A1.1.3
For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 10 KHz. The VBW is set to 100 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

No non-compliance noted:

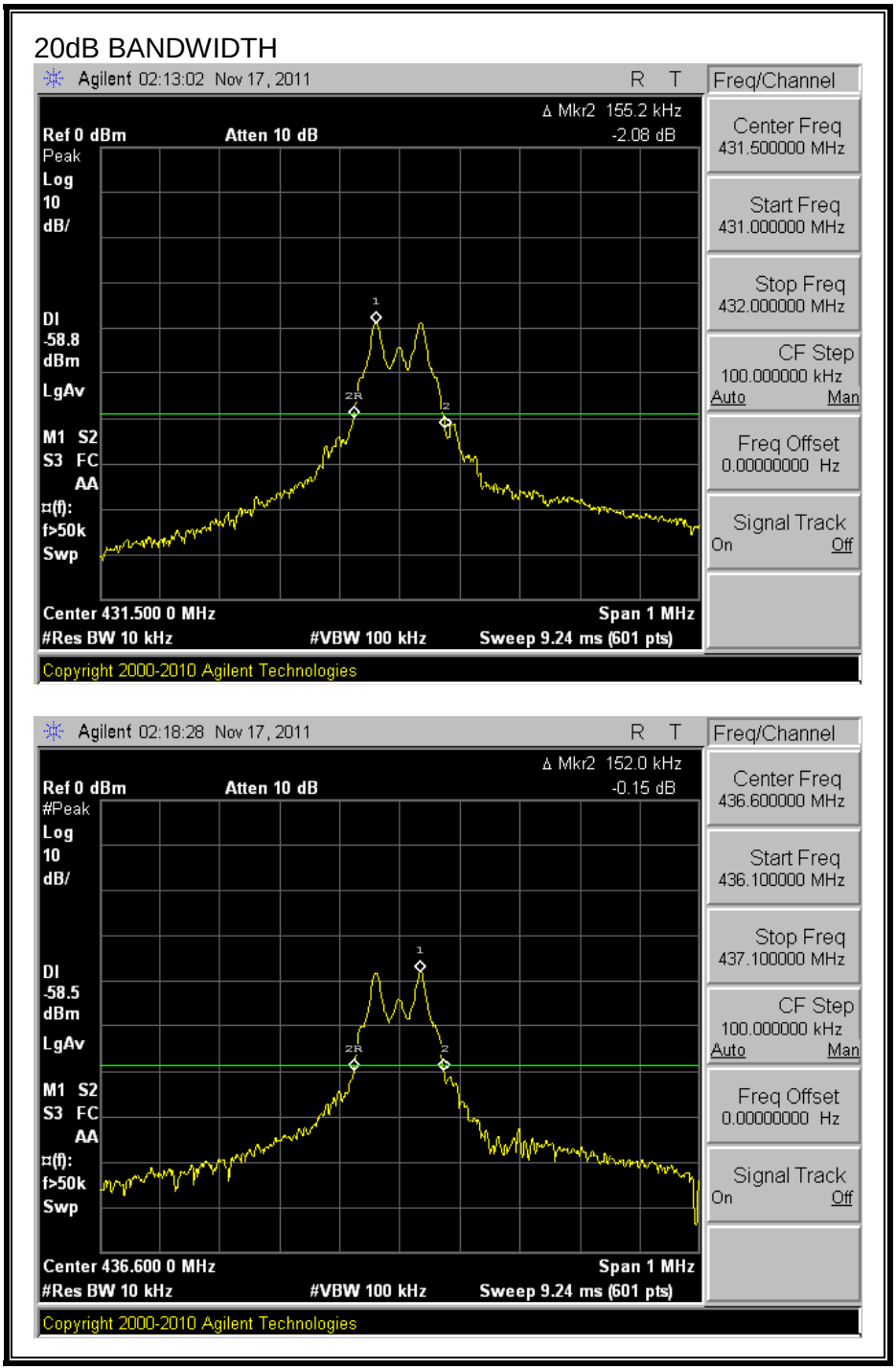
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	155.2	1077.5	-922.3
437	152	1092.5	-940.5

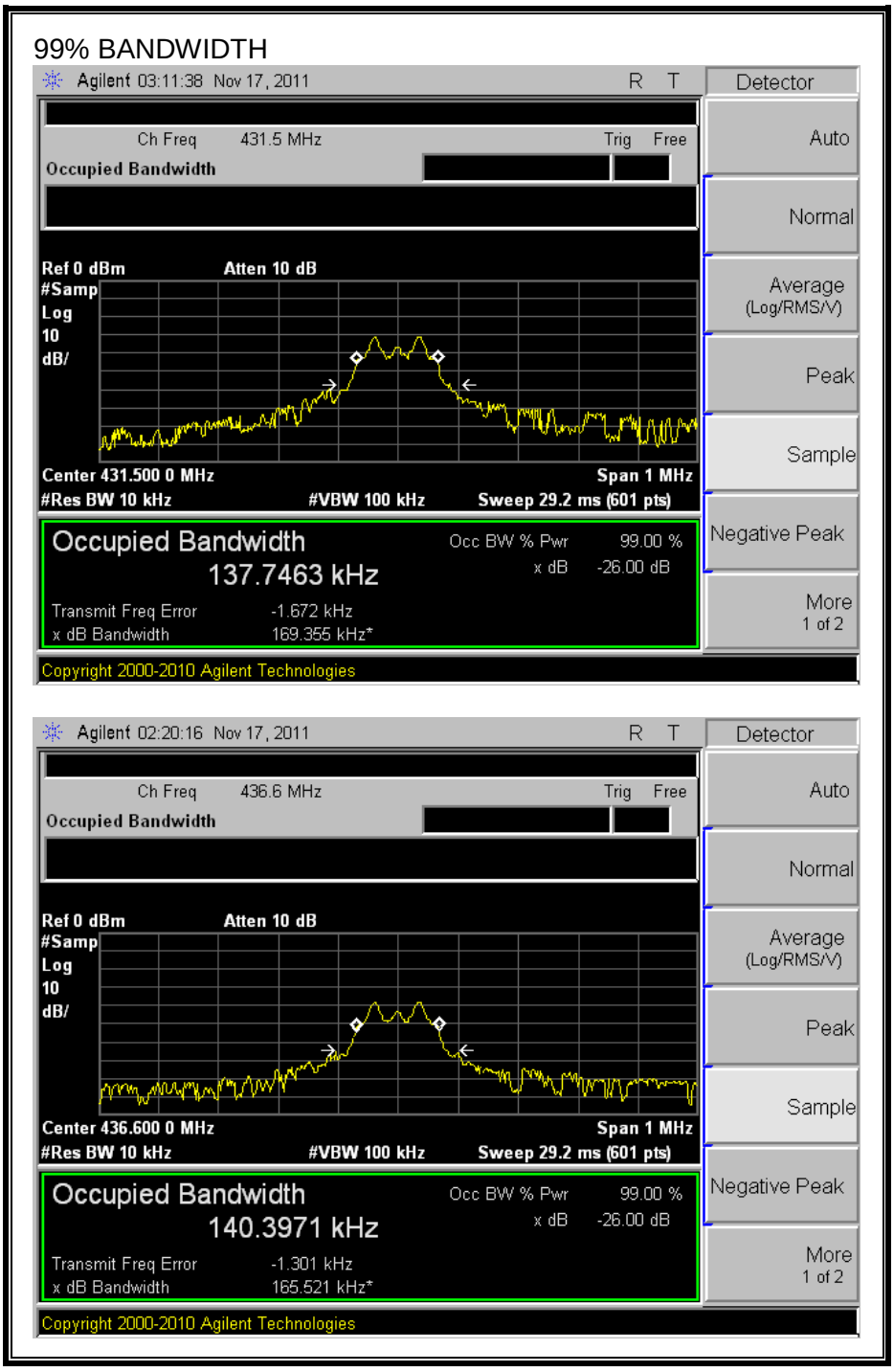
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
431	137.7	1077.5	-939.8
437	140.4	1092.5	-952.1

20dB BANDWIDTH



99% BANDWIDTH



7.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)
The 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. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, 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 exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

CALCULATION

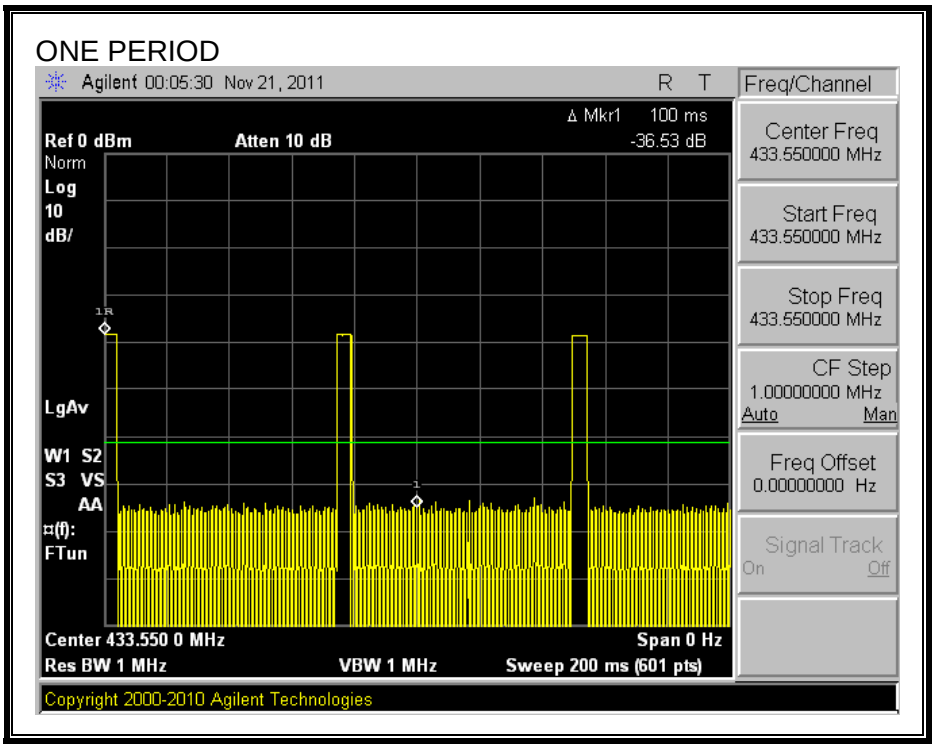
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is
(# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

No non-compliance noted:

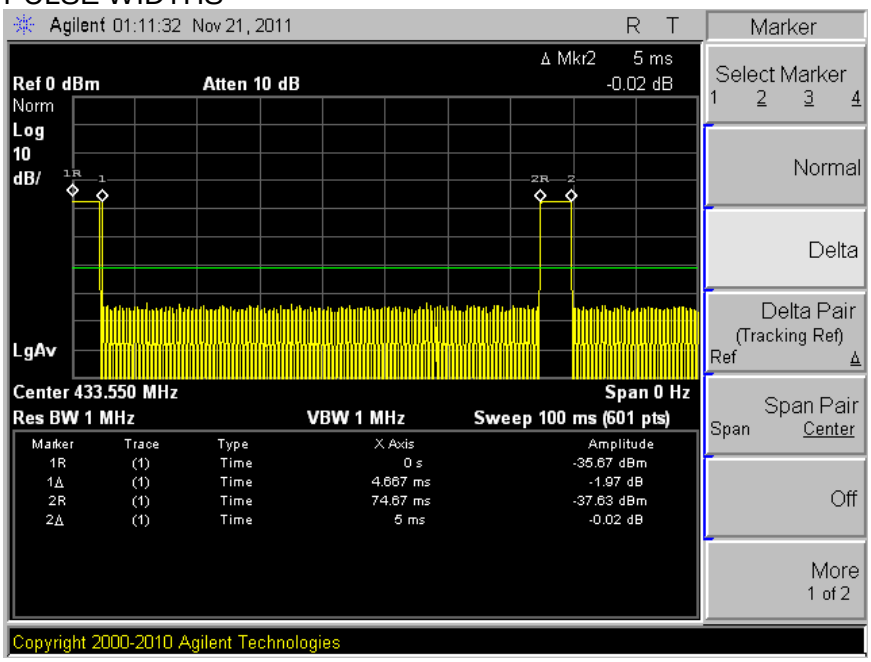
One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	5	1	4.67	1	0.097	-20.29

ONE PERIOD



PULSE WIDTH

PULSE WIDTHS



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

A transmitter activated automatically shall cease transmission within 5 seconds after activation.

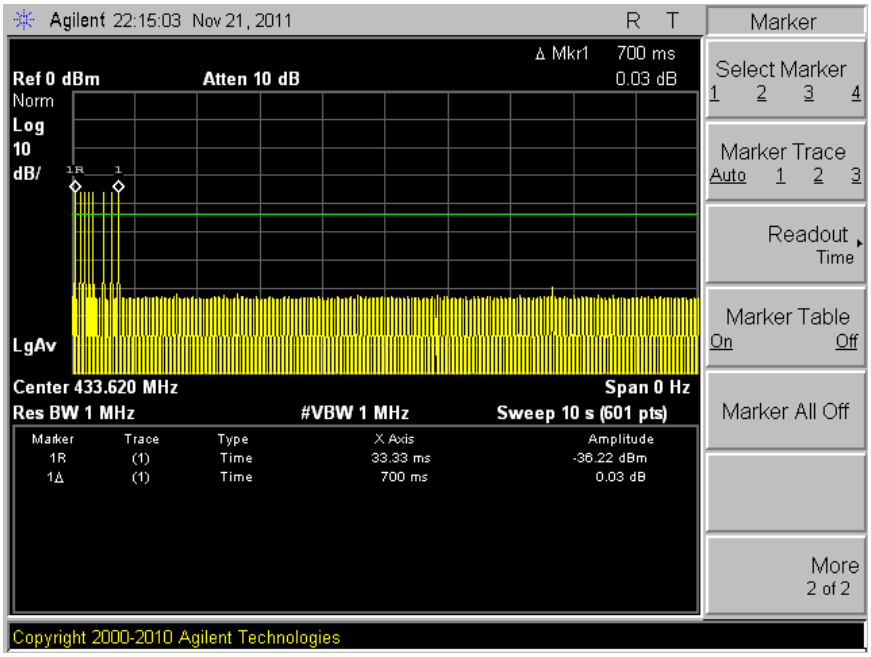
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

RESULTS

No non-compliance noted:

LESS THAN 5 SECONDS



8. RADIATED EMISSION TEST RESULTS

8.1. TX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.231 (b)
IC A1.1.2
In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,7501	125 to 3751
174 - 260	3,750	375
260 - 470	3,750 to 12,5001	375 to 1,2501
Above 470	12,500	1,250

1 Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 – 13.41	322 - 335.4		

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 88	100 **	3
88 216	150 **	3
216 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4:2003. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

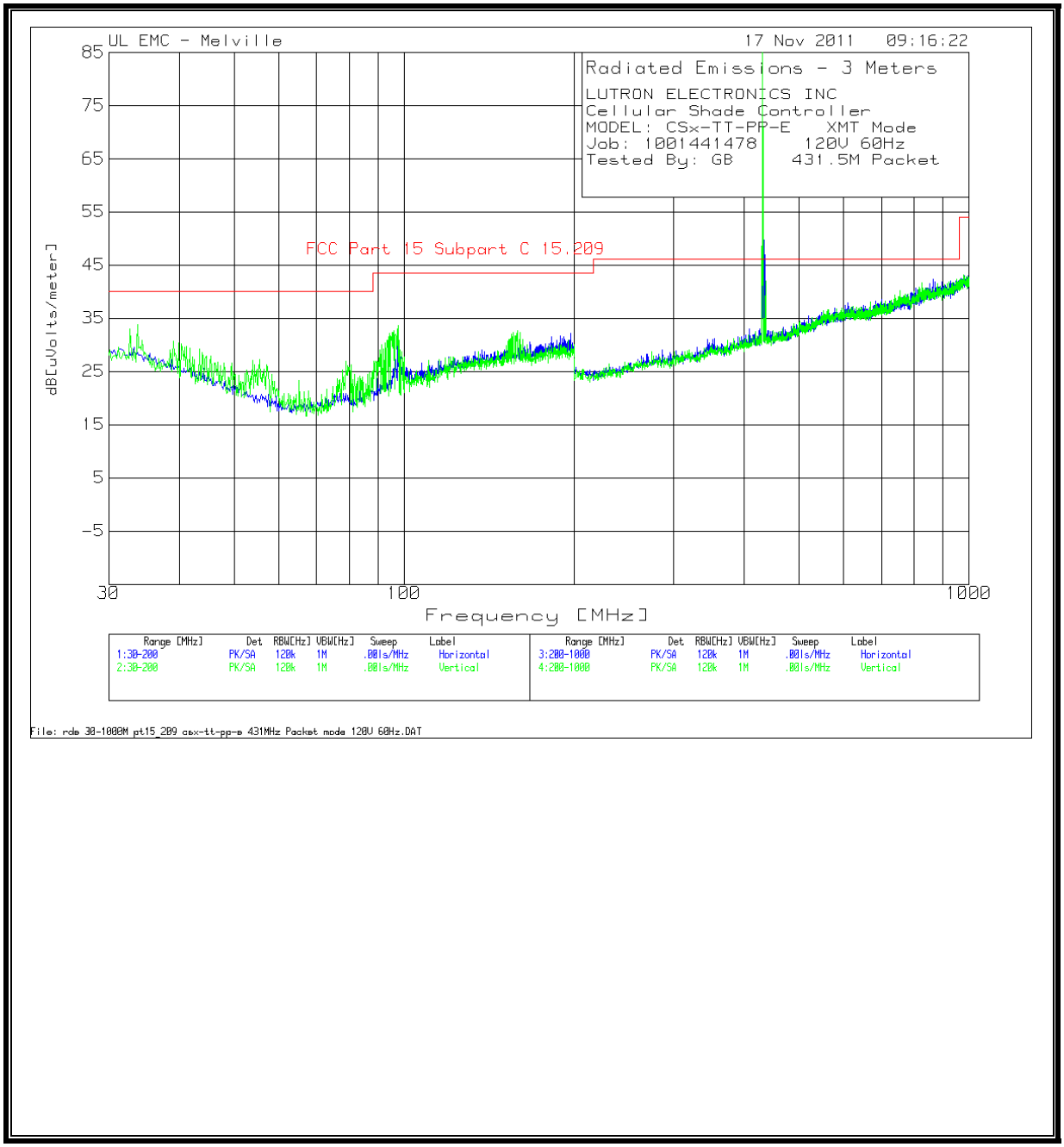
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

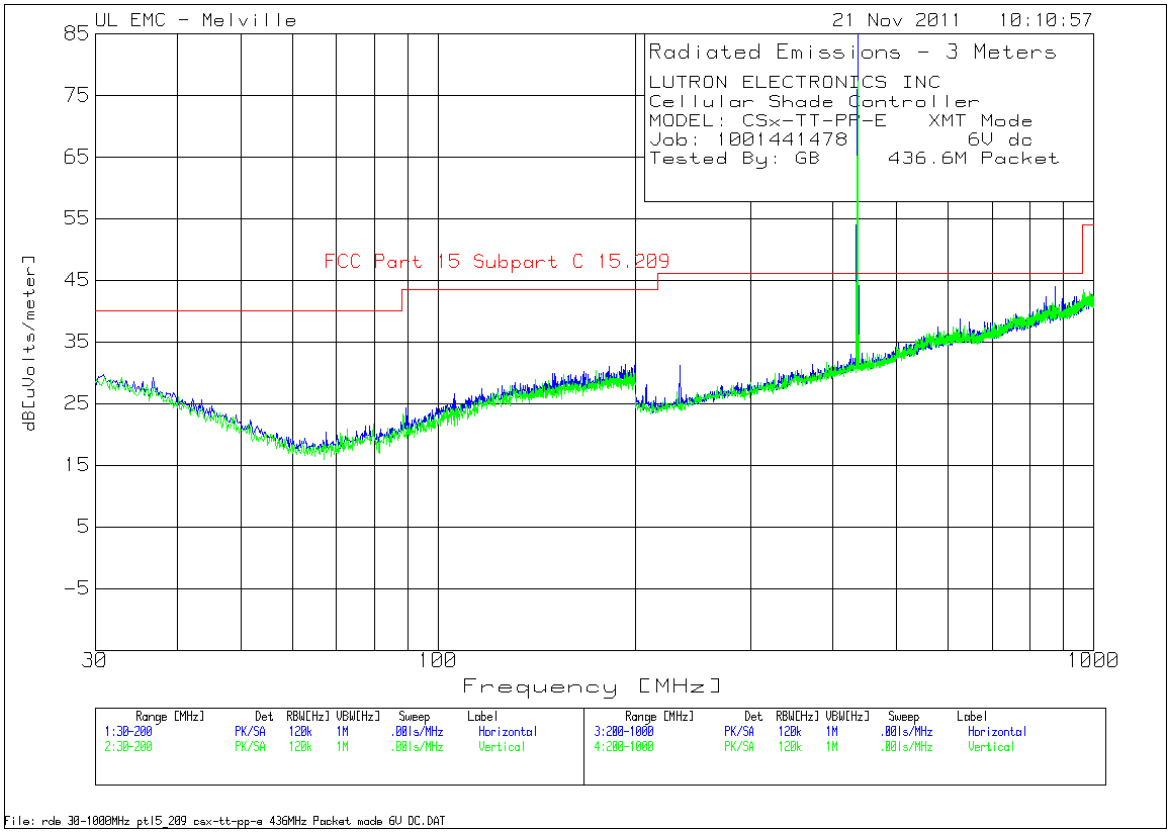
FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 120V 60Hz
Tested By: GB 431.5M Packet

Test Frequency	Meter Reading	Detector	AF-44067 [dB]	GL-3M [dB]	dB[uVolts /meter]	DCF [dB]	Corrected Level dB[uVolts/ meter	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C 15.231	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 200 - 1000MHz																
431.5351	80.44	PK	17	2.3	99.74	-20.29	79.45	-	-	80.7	-1.25	100.7	-0.96	170	102	Horz
433.3	16.17	QP	17.1	2.3	35.57	-	-	46	-10.43	-	-	-	-	349	312	Horz
433.2124	17.34	QP	17.1	2.3	36.74	-	-	46	-9.26	-	-	-	-	23	198	Horz
435.2525	10.54	QP	17.1	2.3	29.94	-	-	46	-16.06	-	-	-	-	304	180	Horz
Vertical 200 - 1000MHz																
431.5368	69.57	PK	16.5	2.3	88.37	-20.29	68.08	-	-	80.7	-12.62	100.7	-12.33	283	248	Vert
429.7	8.24	QP	16.5	2.3	27.04	-	-	46	-18.96					236	236	Vert
435.8537	7.6	QP	16.6	2.3	26.5	-	-	46	-19.5					86	375	Vert

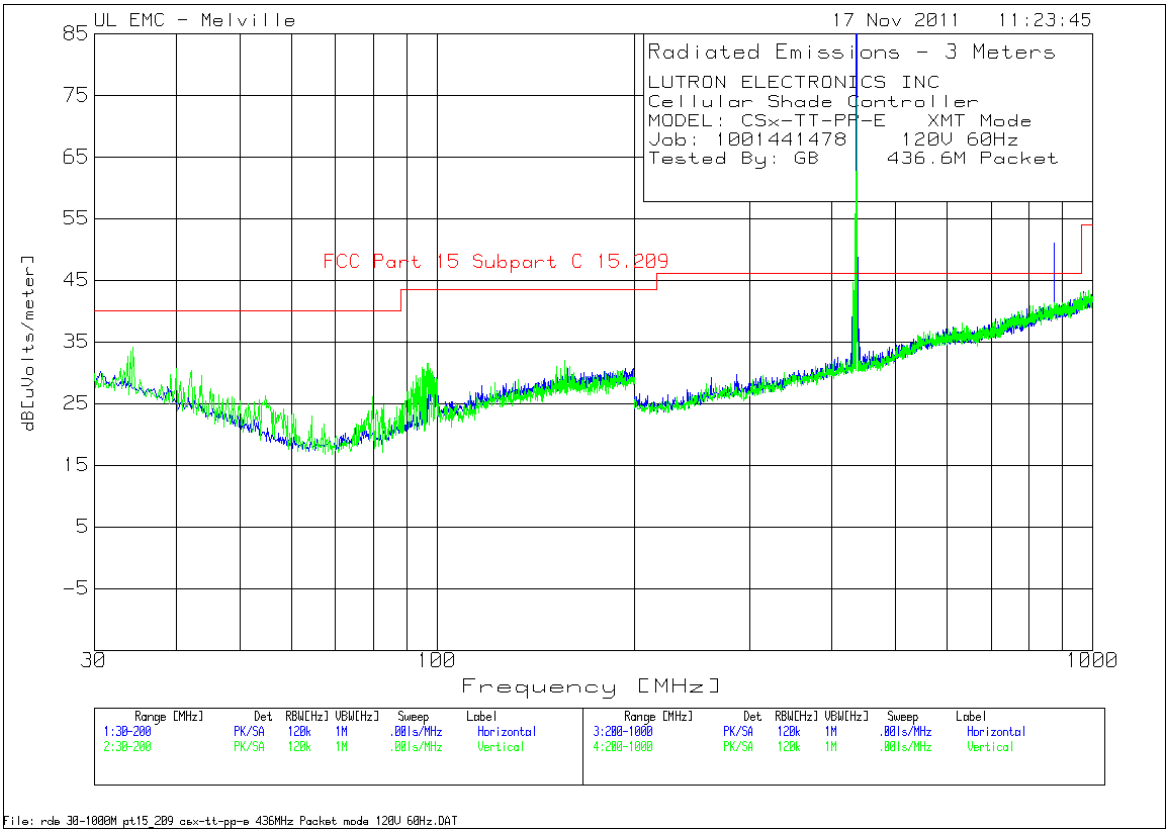
PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 120V 60Hz
Tested By: GB 436.6M Packet

Test Frequency	Meter Reading	Detector	AF-44067 [dB]	GL-3M [dB]	dB[uVolts/meter]	DCF [dB]	Corrected Level dB[uVolts/meter	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C 15.231	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 200 - 1000MHz																
436.6355	79.14	PK	17.1	2.3	98.54	-20.29	78.25	-	-	80.9	-2.65	100.7	-2.16	158	230	Horz
433.3	7.48	QP	17.1	2.3	26.88	-	-	46	-19.12	-	-	-	-	91	155	Horz
437.7	23.62	QP	17.2	2.3	43.12	-	-	46	-2.88	-	-	-	-	325	259	Horz
438.5	11.04	QP	17.2	2.3	30.54	-	-	46	-15.46	-	-	-	-	141	298	Horz
439.3	7.72	QP	17.2	2.3	27.22	-	-	46	-18.78	-	-	-	-	233	103	Horz
875.0681	8.73	QP	23.3	3.4	35.43	-	-	46	-10.57	-	-	-	-	95	302	Horz
Vertical 200 - 1000MHz																
436.6328	67.51	PK	16.6	2.3	86.41	-20.29	66.12	-	-	80.9	-14.78	100.7	-14.29	75	270	Vert
433.2595	8.3	QP	16.6	2.3	27.2	-	-	46	-18.8	-	-	-	-	45	286	Vert
432.4008	7.6	QP	16.5	2.3	26.4	-	-	46	-19.6	-	-	-	-	230	196	Vert
434.1351	9.34	QP	16.6	2.3	28.24	-	-	46	-17.76	-	-	-	-	211	273	Vert
437.3	20.16	QP	16.6	2.3	39.06	-	-	46	-6.94	-	-	-	-	88	341	Vert

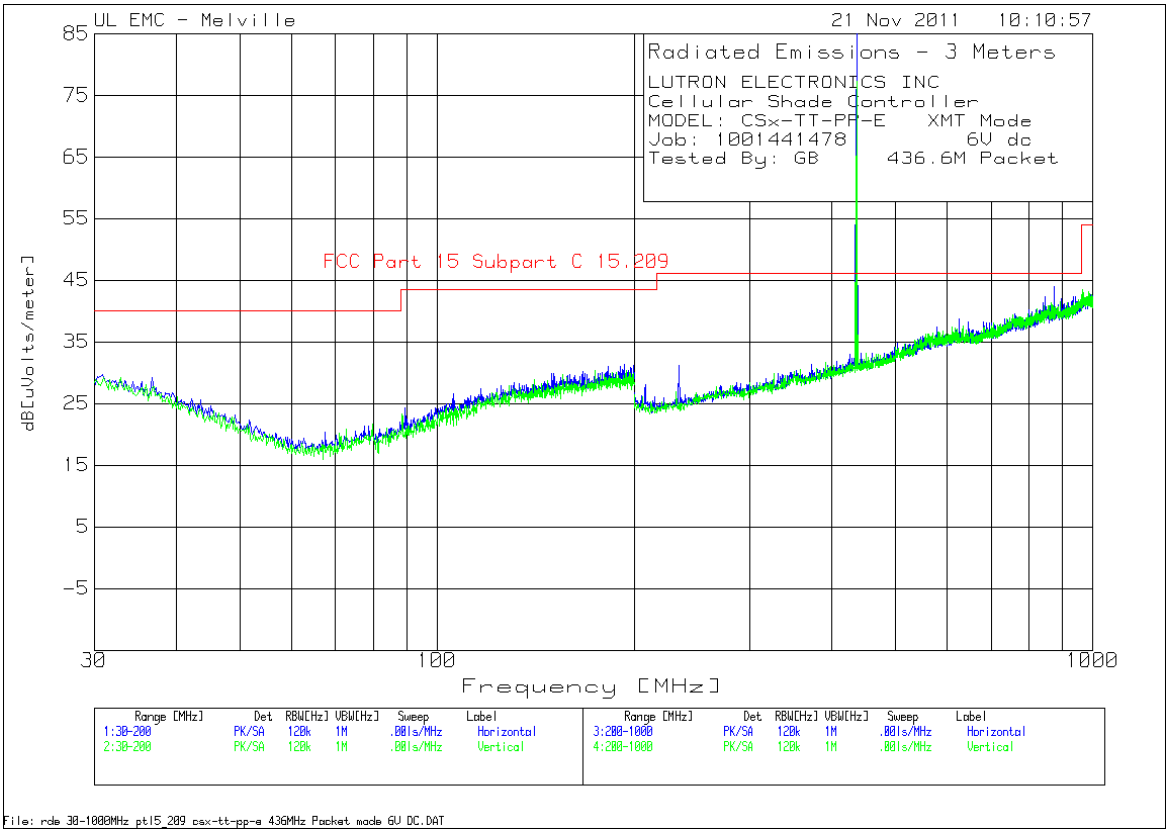
PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 120V 60Hz
Tested By: GB 436.6M Packet

Test Frequency	Meter Reading	Detector	AF-44067 [dB]	GL-3M [dB]	dB[uVolts/meter]	DCF [dB]	Corrected Level dB[uVolts/meter	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C 15.231	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 200 - 1000MHz																
436.6355	79.14	PK	17.1	2.3	98.54	-20.29	78.25	-	-	80.9	-2.65	100.7	-2.16	158	230	Horz
433.3	7.48	QP	17.1	2.3	26.88	-	-	46	-19.12	-	-	-	-	91	155	Horz
437.7	23.62	QP	17.2	2.3	43.12	-	-	46	-2.88	-	-	-	-	325	259	Horz
438.5	11.04	QP	17.2	2.3	30.54	-	-	46	-15.46	-	-	-	-	141	298	Horz
439.3	7.72	QP	17.2	2.3	27.22	-	-	46	-18.78	-	-	-	-	233	103	Horz
875.0681	8.73	QP	23.3	3.4	35.43	-	-	46	-10.57	-	-	-	-	95	302	Horz
Vertical 200 - 1000MHz																
436.6328	67.51	PK	16.6	2.3	86.41	-20.29	66.12	-	-	80.9	-14.78	100.7	-14.29	75	270	Vert
433.2595	8.3	QP	16.6	2.3	27.2	-	-	46	-18.8	-	-	-	-	45	286	Vert
432.4008	7.6	QP	16.5	2.3	26.4	-	-	46	-19.6	-	-	-	-	230	196	Vert
434.1351	9.34	QP	16.6	2.3	28.24	-	-	46	-17.76	-	-	-	-	211	273	Vert
437.3	20.16	QP	16.6	2.3	39.06	-	-	46	-6.94	-	-	-	-	88	341	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 6V dc
Tested By: GB 436.6M Packet

Test Frequency	Meter Reading	Detector	AF-44067 [dB]	GL-3M [dB]	dB[uVolts/meter]	DCF [dB]	Corrected Level dB[uVolts/meter	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C 15.231	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 200 - 1000MHz																
436.6265	76.3	PK	17.1	2.3	95.7	-20.29	75.41	-	-	80.9	-5.49	100.9	-5.2	203	217	Horz
437.7	23.25	QP	17.2	2.3	42.75	-	-	46	-3.25	-	-	-	-	183	225	Horz
435.1046	8.35	QP	17.1	2.3	27.75	-	-	46	-18.25	-	-	-	-	238	360	Horz
433.5731	7.48	QP	17.1	2.3	26.88	-	-	46	-19.12	-	-	-	-	279	275	Horz
Vertical 200 - 1000MHz																
436.6265	69.22	PK	16.6	2.3	88.12	-20.29	67.83	-	-	80.9	-13.07	100.9	-12.78	256	269	Vert
434.5	7.9	QP	16.6	2.3	26.8	-	-	46	-19.2	-	-	-	-	209	354	Vert
436.9	15.34	QP	16.6	2.3	34.24	-	-	46	-11.76	-	-	-	-	62	231	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
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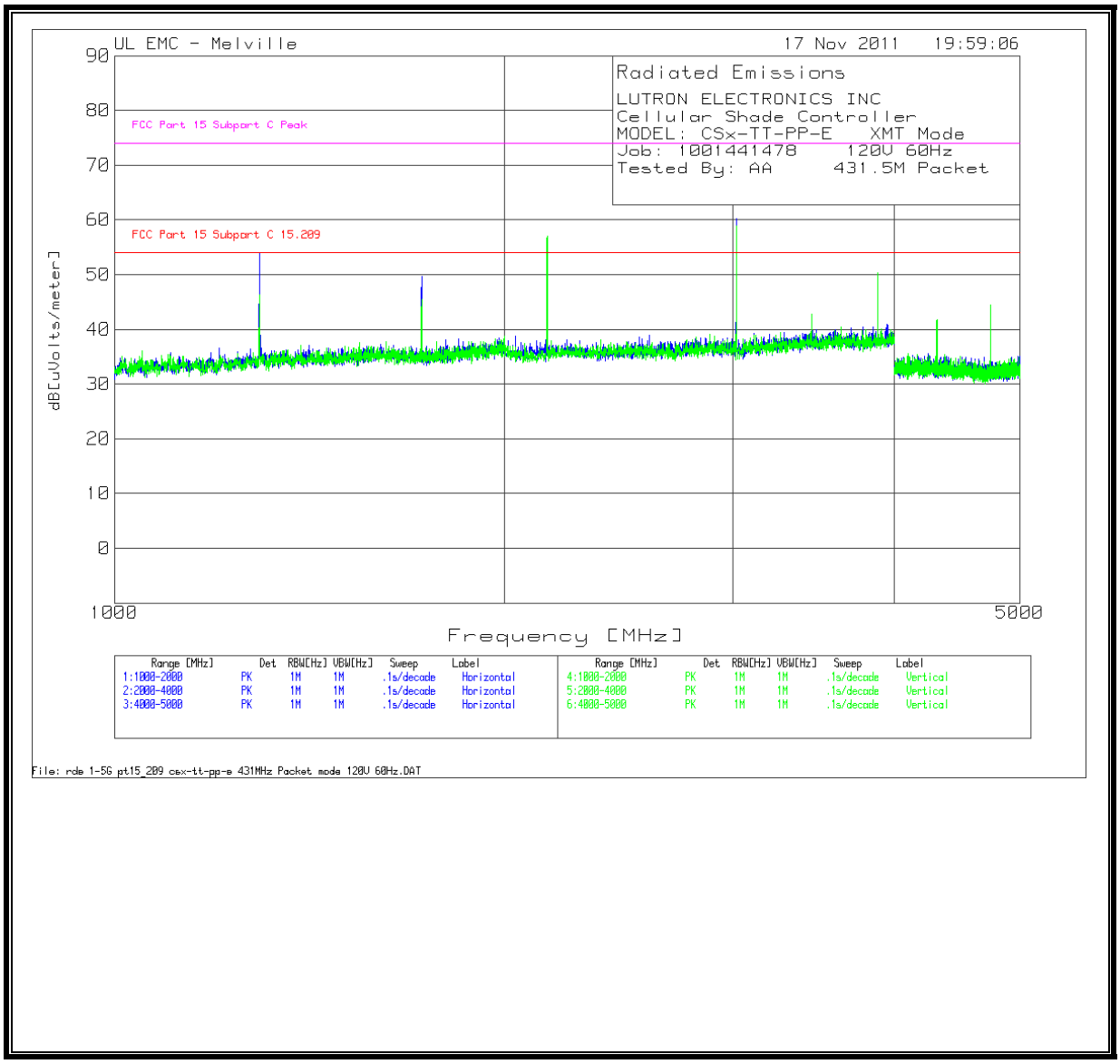
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 120V 60Hz
Tested By: AA 431.5M Packet

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts /meter]	DCF [dB]	Corrected Level dB[uVolts /meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz														
1294.615	81.7	PK	20.5	-44.38	57.82	-20.29	37.53	54	-16.47	74	-16.18	129	244	Horz
1726.137	78.6	PK	20.8	-44.11	55.29	-20.29	35	54	-19	74	-18.71	50	388	Horz
Horizontal 2000 - 4000MHz														
2157.296	80.02	PK	21.4	-43.31	58.11	-20.29	37.82	54	-16.18	74	-15.89	193	300	Horz
3020.755	86.11	PK	21.5	-41.85	65.76	-20.29	45.47	54	-8.53	74	-8.24	144	374	Horz
3451.675	82.64	PK	22.2	-41.74	63.1	-20.29	42.81	54	-11.19	74	-10.9	167	364	Horz
3883.83	77.39	PK	22.6	-41.88	58.11	-20.29	37.82	54	-16.18	74	-15.89	160	188	Horz
Horizontal 4000 - 5000MHz														
4315.36	65.87	PK	27.7	-51.64	41.93	-20.29	21.64	54	-32.36	74	-32.07	300	144	Horz
4746.054	75.73	PK	27.2	-52.52	50.41	-20.29	30.12	54	-23.88	74	-23.59	180	360	Horz
Vertical 1000 - 2000MHz														
1294.378	75.19	PK	20.5	-44.38	51.31	-20.29	31.02	54	-22.98	74	-22.69	58	331	Vert
1726.032	78.92	PK	20.8	-44.11	55.61	-20.29	35.32	54	-18.68	74	-18.39	71	294	Vert
Vertical 2000 - 4000MHz														
2157.266	78.49	PK	21	-43.32	56.17	-20.29	35.88	54	-18.12	74	-17.83	305	168	Vert
3020.769	83.25	PK	21.7	-41.85	63.1	-20.29	42.81	54	-11.19	74	-10.9	346	363	Vert
3451.689	78.07	PK	22.2	-41.74	58.53	-20.29	38.24	54	-15.76	74	-15.47	309	172	Vert
3883.103	70.9	PK	22.6	-41.88	51.62	-20.29	31.33	54	-22.67	74	-22.38	134	304	Vert
Vertical 4000 - 5000MHz														
4314.78	68.22	PK	27.8	-51.64	44.38	-20.29	24.09	54	-29.91	74	-29.62	348	358	Vert
4746.069	74.32	PK	27.1	-52.52	48.9	-20.29	28.61	54	-25.39	74	-25.1	289	324	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
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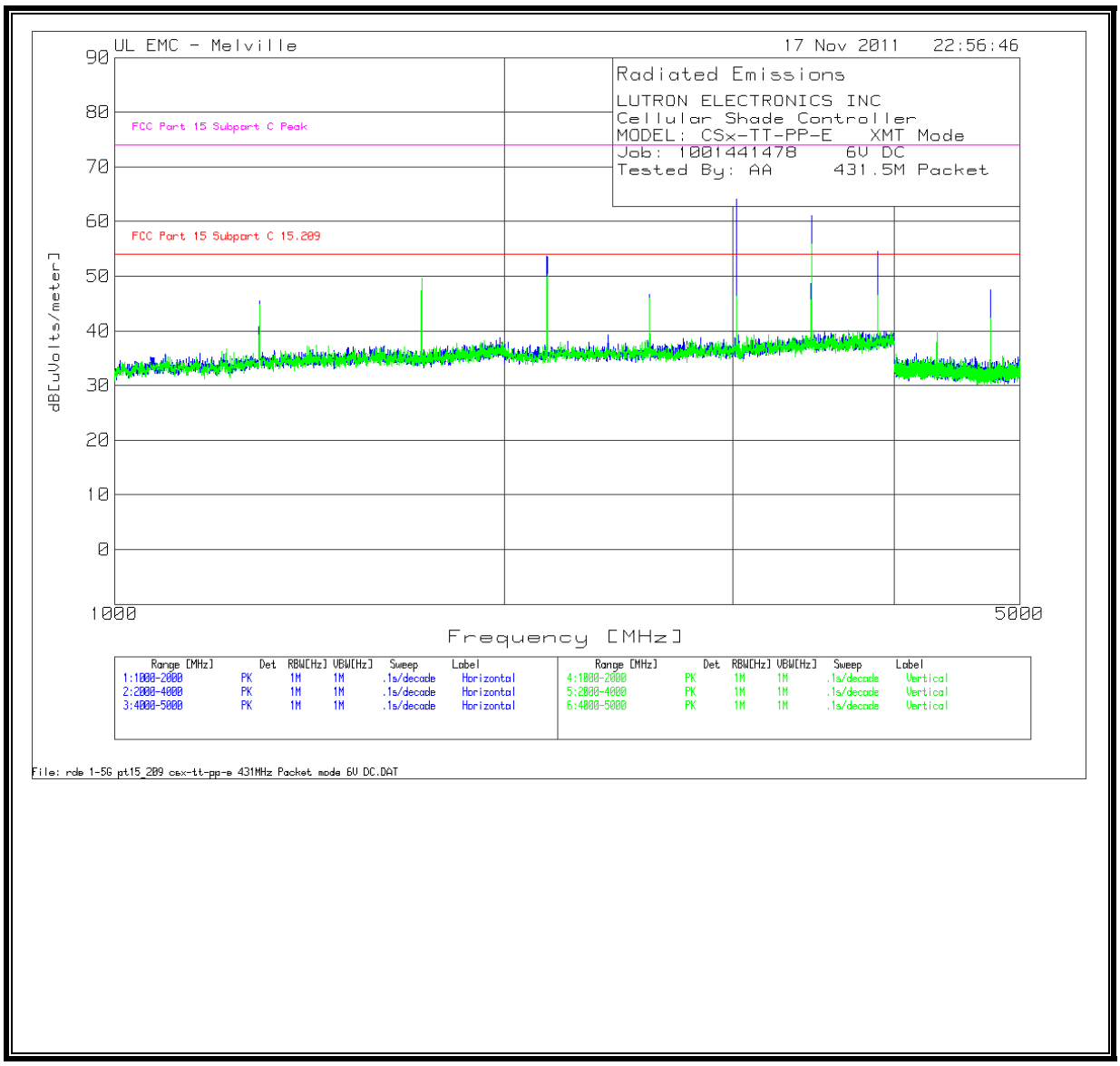
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

UNDERWRITERS LABORATORIES INC. FORM NO: CCSUP4701D
1285 WALT WHITMAN RD, MELVILLE, NY 11747, USA TEL: (631) 271-6200 FAX: (877) 854-3577



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 6V DC
Tested By: AA 431.5M Packet

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts /meter]	DCF [dB]	Corrected Level dB[uVolts/ meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz														
1294.365	80.33	PK	20.5	-44.38	56.45	-20.29	36.16	54	-17.84	74	-17.55	151	116	Horz
1726.027	85.79	PK	20.8	-44.11	62.48	-20.29	42.19	54	-11.81	74	-11.52	248	152	Horz
Horizontal 2000 - 4000MHz														
2157.441	90.54	PK	21.4	-43.31	68.63	-20.29	48.34	54	-5.66	74	-5.37	214	206	Horz
2588.721	75.6	PK	21.3	-42.51	54.39	-20.29	34.1	54	-19.9	74	-19.61	155	384	Horz
3020.23	87.07	PK	21.5	-41.84	66.73	-20.29	46.44	54	-7.56	74	-7.27	133	362	Horz
3451.649	82.1	PK	22.2	-41.74	62.56	-20.29	42.27	54	-11.73	74	-11.44	132	299	Horz
3883.093	79.62	PK	22.6	-41.88	60.34	-20.29	40.05	54	-13.95	74	-13.66	75	256	Horz
Horizontal 4000 - 5000MHz														
4315.519	67.34	PK	27.7	-51.64	43.4	-20.29	23.11	54	-30.89	74	-30.6	350	251	Horz
4746.975	75.54	PK	27.2	-52.51	50.23	-20.29	29.94	54	-24.06	74	-23.77	290	189	Horz
Vertical 1000 - 2000MHz														
1294.303	77.71	PK	20.5	-44.38	53.83	-20.29	33.54	54	-20.46	74	-20.17	314	178	Vert
1726.087	82.76	PK	20.8	-44.11	59.45	-20.29	39.16	54	-14.84	74	-14.55	273	400	Vert
Vertical 2000 - 4000MHz														
2157.331	85.93	PK	21	-43.31	63.62	-20.29	43.33	54	-10.67	74	-10.38	80	290	Vert
2588.806	73.39	PK	21.5	-42.52	52.37	-20.29	32.08	54	-21.92	74	-21.63	94	353	Vert
3020.15	82.54	PK	21.7	-41.84	62.4	-20.29	42.11	54	-11.89	74	-11.6	82	266	Vert
3451.679	79.55	PK	22.2	-41.74	60.01	-20.29	39.72	54	-14.28	74	-13.99	82	337	Vert
3883.178	75.8	PK	22.6	-41.88	56.52	-20.29	36.23	54	-17.77	74	-17.48	127	291	Vert
Vertical 4000 - 5000MHz														
4315.373	69.92	PK	27.8	-51.64	46.08	-20.29	25.79	54	-28.21	74	-27.92	103	133	Vert
4746.85	77.01	PK	27.1	-52.51	51.6	-20.29	31.31	54	-22.69	74	-22.4	160	161	Vert

PK - Peak detector (Maximized)
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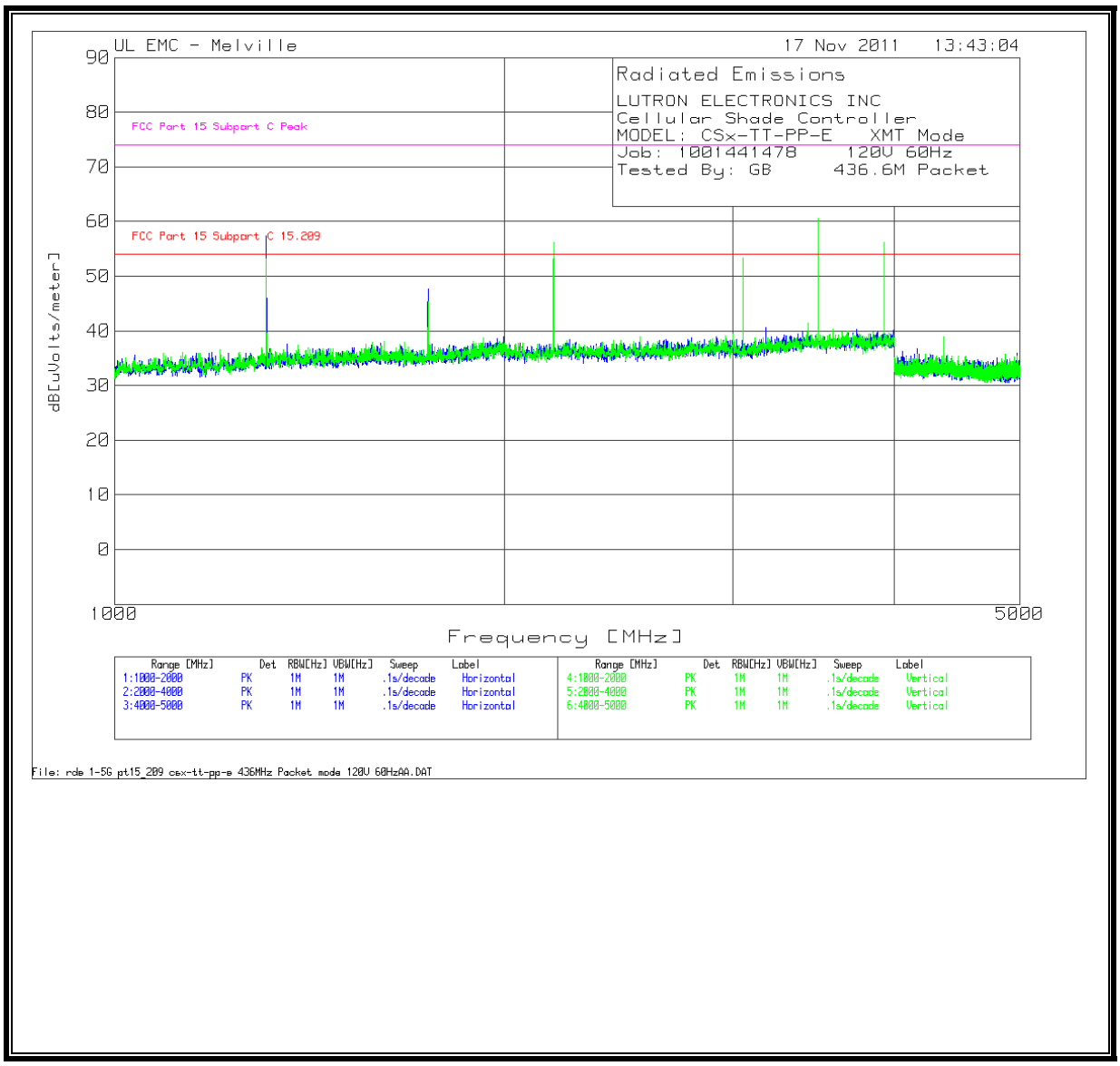

LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 120V 60Hz
Tested By: GB 436.6M Packet

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts /meter]	DCF [dB]	Corrected Level dB[uVolts/ meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz														
1309.88	85.38	PK	20.5	-44.37	61.51	-20.29	41.22	54	-12.78	74	-12.49	143	190	Horz
1746.427	83.21	PK	20.8	-44.15	59.86	-20.29	39.57	54	-14.43	74	-14.14	56	372	Horz
Horizontal 2000 - 4000MHz														
2183.19	78.6	PK	21.4	-43.19	56.81	-20.29	36.52	54	-17.48	74	-17.19	57	132	Horz
3055.832	85.18	PK	21.6	-41.86	64.92	-20.29	44.63	54	-9.37	74	-9.08	103	173	Horz
3492.808	82.14	PK	22.2	-41.73	62.61	-20.29	42.32	54	-11.68	74	-11.39	166	302	Horz
3929.805	80.12	PK	22.7	-41.72	61.1	-20.29	40.81	54	-13.19	74	-12.9	161	338	Horz
Horizontal 4000 - 5000MHz														
4365.675	67.46	PK	27.6	-51.63	43.43	-20.29	23.14	54	-30.86	74	-30.57	247	231	Horz
Vertical 1000 - 2000MHz														
1309.905	85.58	PK	20.5	-44.37	61.71	-20.29	41.42	54	-12.58	74	-12.29	142	320	Vert
1746.422	82.78	PK	20.8	-44.15	59.43	-20.29	39.14	54	-14.86	74	-14.57	250	294	Vert
Vertical 2000 - 4000MHz														
2182.804	77.9	PK	21.2	-43.2	55.9	-20.29	35.61	54	-18.39	74	-18.1	253	286	Vert
3055.917	81.35	PK	21.8	-41.86	61.29	-20.29	41	54	-13	74	-12.71	169	368	Vert
3493.083	77.57	PK	22.4	-41.73	58.24	-20.29	37.95	54	-16.05	74	-15.76	168	369	Vert
3929.025	72.49	PK	22.7	-41.73	53.46	-20.29	33.17	54	-20.83	74	-20.54	120	255	Vert
Vertical 4000 - 5000MHz														
4366.354	67.31	PK	27.7	-51.63	43.38	-20.29	23.09	54	-30.91	74	-30.62	324	338	Vert

PK - Peak detector (Maximized)
QP - Quasi-Peak detector
LnAv - Linear Average detector
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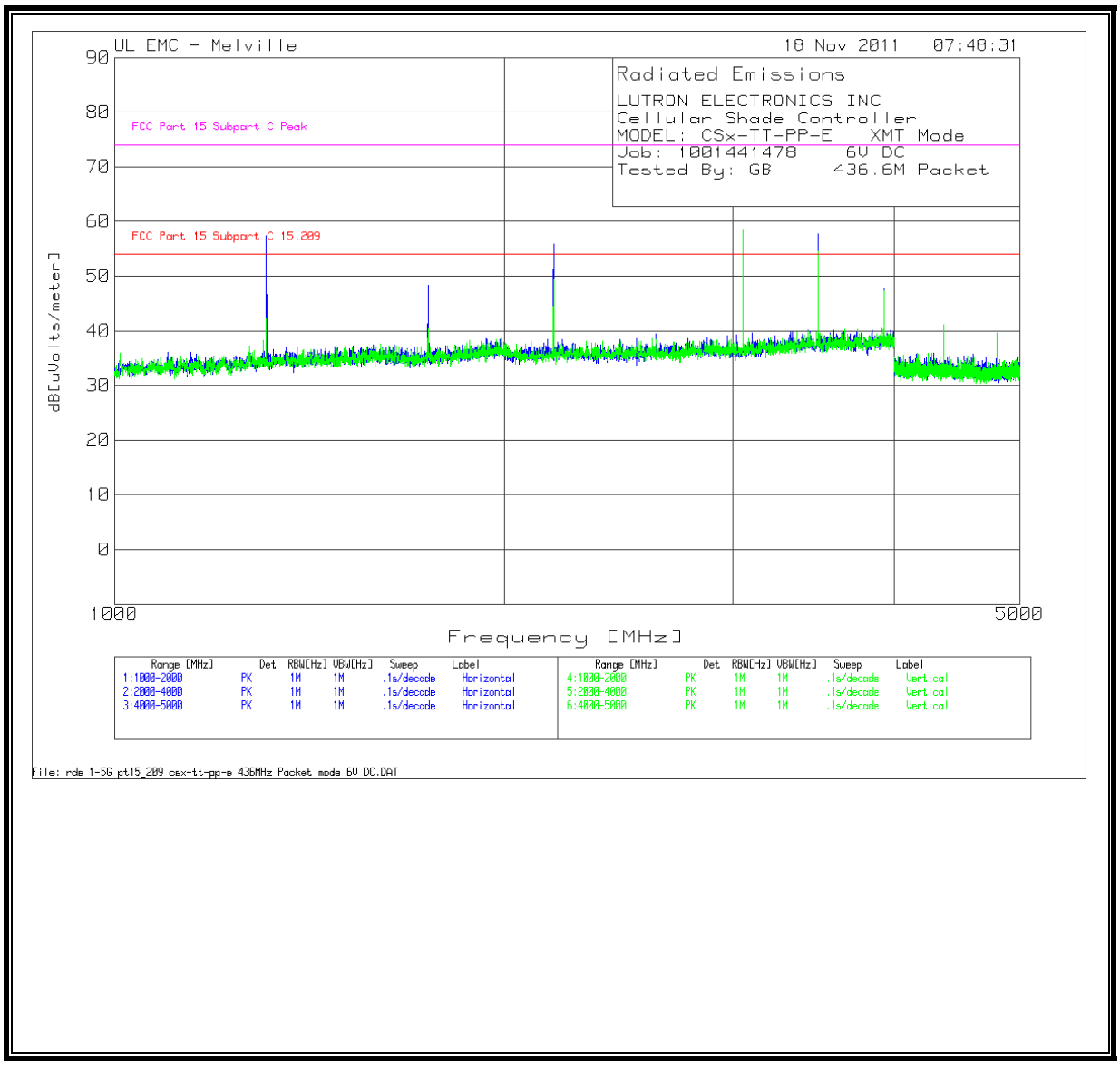
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E XMT Mode
Job: 1001441478 6V DC
Tested By: GB 436.6M Packet

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/ meter]	DCF [dB]	Corrected Level dB[uVolts/ meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz														
1309.905	80.54	PK	20.5	-44.37	56.67	-20.29	36.38	54	-17.62	74	-17.33	179	107	Horz
1746.6	76.66	PK	20.8	-44.15	53.31	-20.29	33.02	54	-20.98	74	-20.69	162	255	Horz
Horizontal 2000 - 4000MHz														
2183.175	81.78	PK	21.4	-43.19	59.99	-20.29	39.7	54	-14.3	74	-14.01	216	294	Horz
3056.3	84.34	PK	21.6	-41.86	64.08	-20.29	43.79	54	-10.21	74	-9.92	130	247	Horz
3493.085	83.45	PK	22.2	-41.73	63.92	-20.29	43.63	54	-10.37	74	-10.08	120	292	Horz
3929.745	76.24	PK	22.7	-41.72	57.22	-20.29	36.93	54	-17.07	74	-16.78	152	279	Horz
Horizontal 4000 - 5000MHz														
4365.595	66.95	PK	27.6	-51.63	42.92	-20.29	22.63	54	-31.37	74	-31.08	86	356	Horz
4802.19	69.59	PK	27.1	-52.51	44.18	-20.29	23.89	54	-30.11	74	-29.82	6	363	Horz
Vertical 1000 - 2000MHz														
1309.8	72.69	PK	20.5	-44.37	48.82	-20.29	28.53	54	-25.47	74	-25.18	220	370	Vert
1746.62	65.51	PK	20.8	-44.15	42.16	-20.29	21.87	54	-32.13	74	-31.84	43	183	Vert
1302.4	62	PK	20.5	-44.37	38.13	-20.29	17.84	54	-36.16	74	-35.87	66	394	Vert
Vertical 2000 - 4000MHz														
2183.18	75.91	PK	21.2	-43.19	53.92	-20.29	33.63	54	-20.37	74	-20.08	126	390	Vert
3055.885	82.9	PK	21.8	-41.86	62.84	-20.29	42.55	54	-11.45	74	-11.16	164	378	Vert
3492.455	78.54	PK	22.4	-41.73	59.21	-20.29	38.92	54	-15.08	74	-14.79	117	196	Vert
3929.735	71.05	PK	22.7	-41.72	52.03	-20.29	31.74	54	-22.26	74	-21.97	198	292	Vert
Vertical 4000 - 5000MHz														
4366.13	67.26	PK	27.7	-51.63	43.33	-20.29	23.04	54	-30.96	74	-30.67	357	174	Vert
4802.935	69.27	PK	27.3	-52.52	44.05	-20.29	23.76	54	-30.24	74	-29.95	88	131	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

8.2. RX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.209
IC RSS-Gen Issue 2, section 7.2.3.2

All spurious emissions shall comply with the limits shown below:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dBµV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4:2003. The EUT is set to receive in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

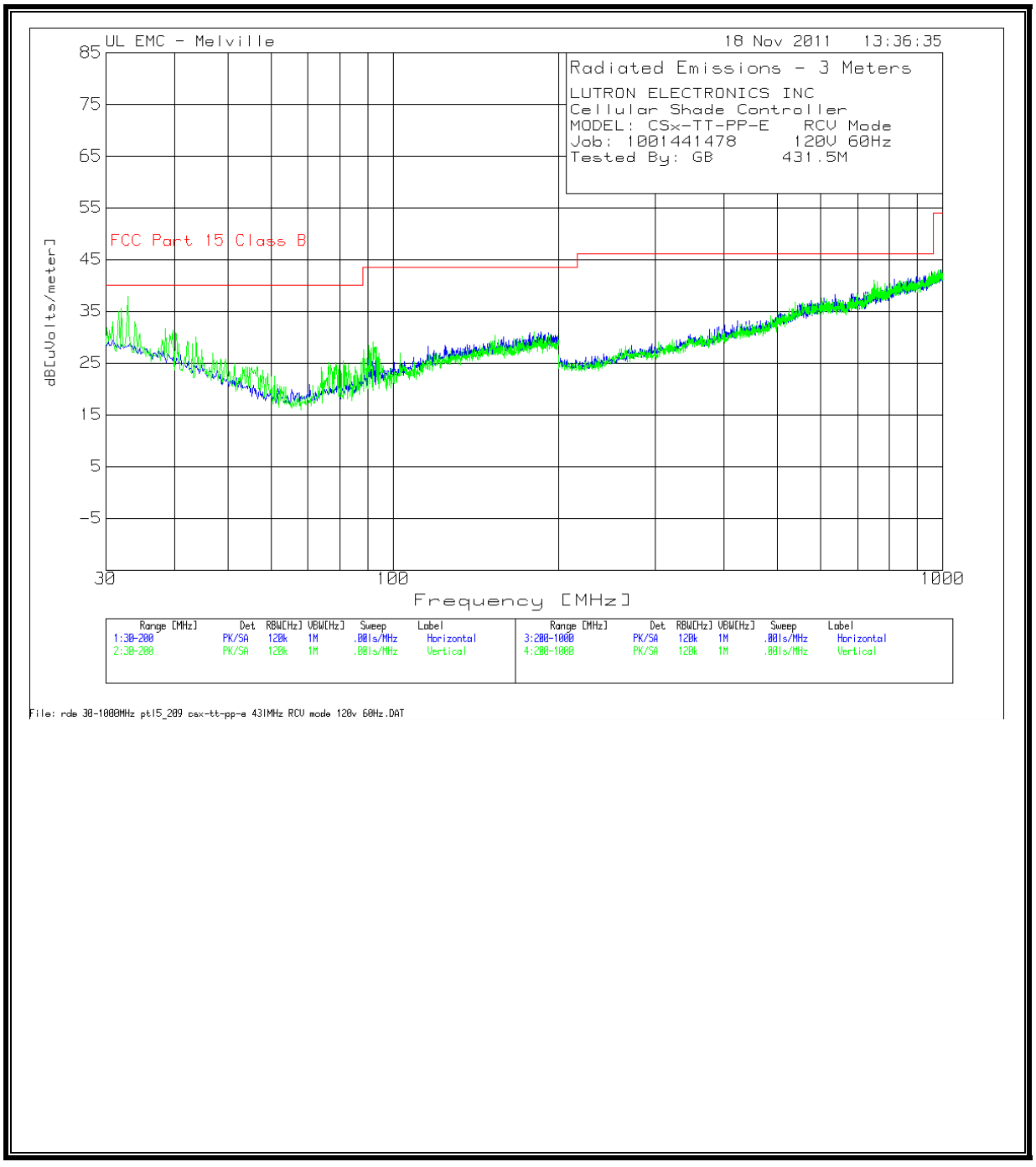
The spectrum from 30 MHz to 5th harmonic is investigated with the transmitter set to the middle channel.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

No non-compliance noted:

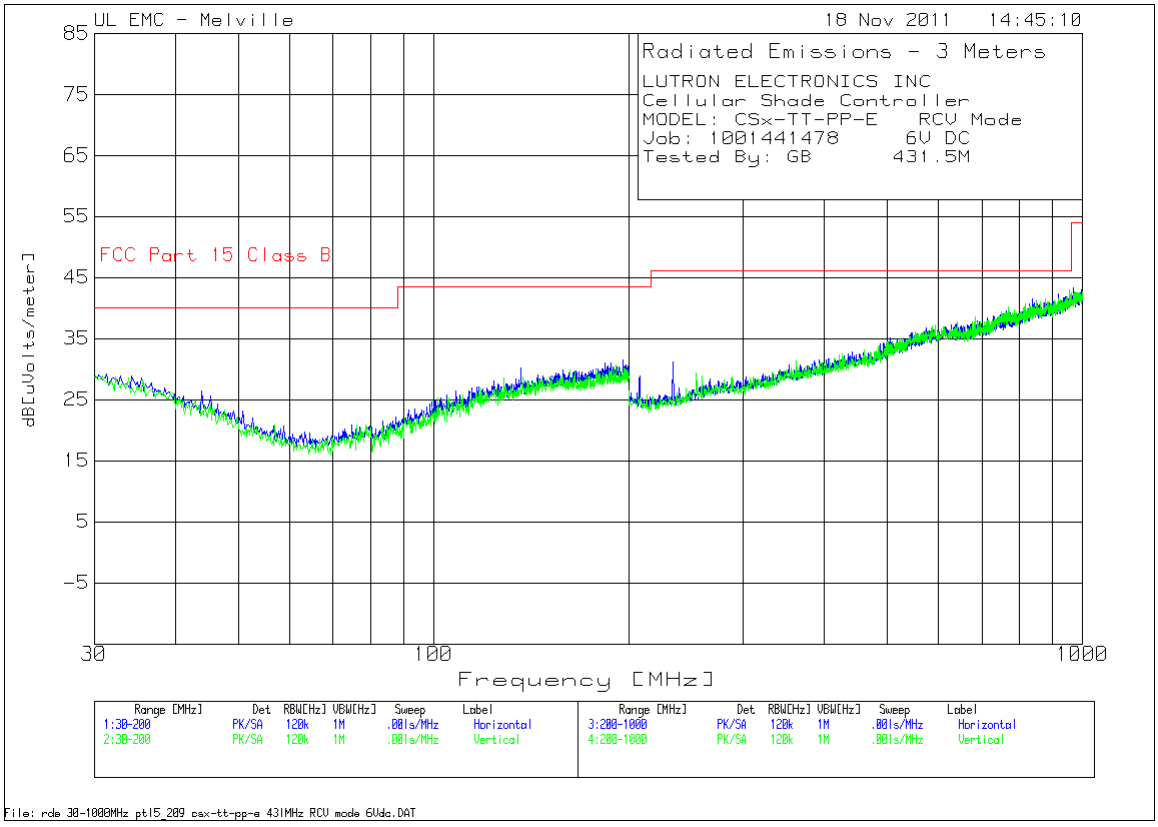
RECEIVER SPURIOUS EMISSION (30MHz - 1GHz)



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 120V 60Hz
Tested By: GB 431.5M

Test Frequency	Meter Reading	Detector	AF-43441 [dB]	GL-3M [dB]	dB[uVolts /meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
Vertical 30 - 200MHz										
32.042	17.92	PK	17.2	0.5	35.62	40	-4.38	12	100	Vert
32.8929	20.32	PK	17	0.6	37.92	40	-2.08	17	100	Vert
91.9419	18.37	PK	9.7	1	29.07	43.5	-14.43	12	100	Vert
Horizontal 200 - 1000MHz										
816.7084	15.31	PK	22.6	3.3	41.21	46	-4.79	307	200	Horz
956.3782	15.07	PK	24	3.6	42.67	46	-3.33	18	100	Horz
Vertical 200 - 1000MHz										
944.7724	14.75	PK	24	3.6	42.35	46	-3.65	2	400	Vert
Vertical 30 - 200MHz										
32	7.78	QP	17.2	0.5	25.48	40	-14.52	0	132	Vert
32.8	16.03	QP	17	0.5	33.53	40	-6.47	2	114	Vert
Horizontal 200 - 1000MHz										
816.7	8.41	QP	22.6	3.3	34.31	46	-11.69	188	323	Horz
956.3	8.84	QP	24	3.6	36.44	46	-9.56	74	231	Horz
Vertical 200 - 1000MHz										
944.7351	8.94	QP	24	3.6	36.54	46	-9.46	83	174	Vert

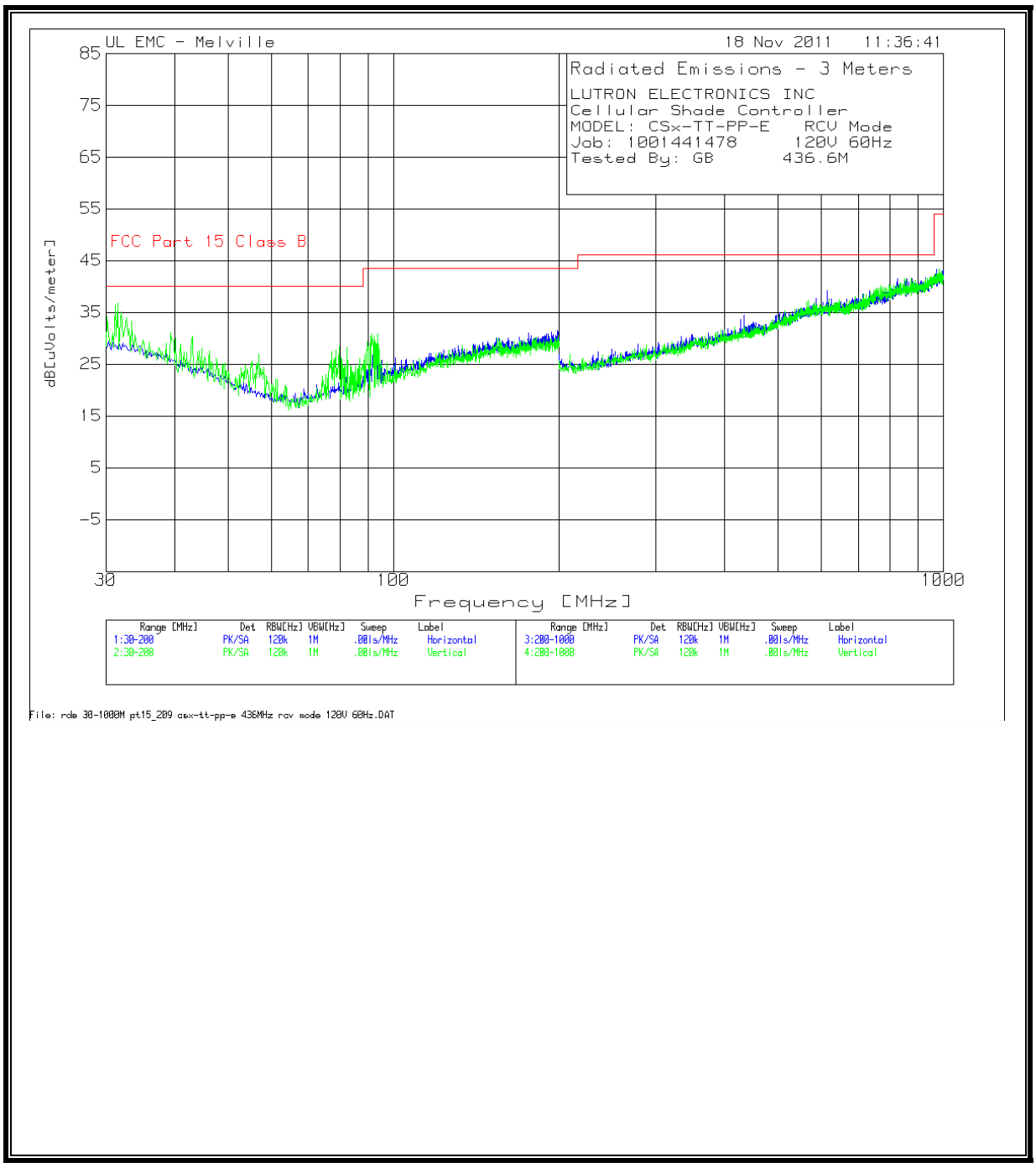
PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 6V DC
Tested By: GB 431.5M

Test Frequency	Meter Reading	Detector	AF-43441 [dB]	GL-3M [dB]	dB[uVolts/ meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 30 - 200MHz										
43.954	13.17	PK	12.5	0.7	26.37	40	-13.63	181	200	Horz
45.3153	12.82	PK	12.1	0.6	25.52	40	-14.48	357	400	Horz
136.3564	14.93	PK	14.1	1.2	30.23	43.5	-13.27	357	300	Horz
Horizontal 200 - 1000MHz										
233.6168	17.41	PK	12.1	1.6	31.11	46	-14.89	324	100	Horz
953.1766	15.42	PK	23.9	3.6	42.92	46	-3.08	187	100	Horz
Vertical 200 - 1000MHz										
955.978	15.18	PK	24.2	3.6	42.98	46	-3.02	324	100	Vert
Horizontal 200 - 1000MHz										
953.2	8.84	QP	23.9	3.6	36.34	46	-9.66	302	366	Horz
Vertical 200 - 1000MHz										
955.9	8.62	QP	24.2	3.6	36.42	46	-9.58	6	167	Vert

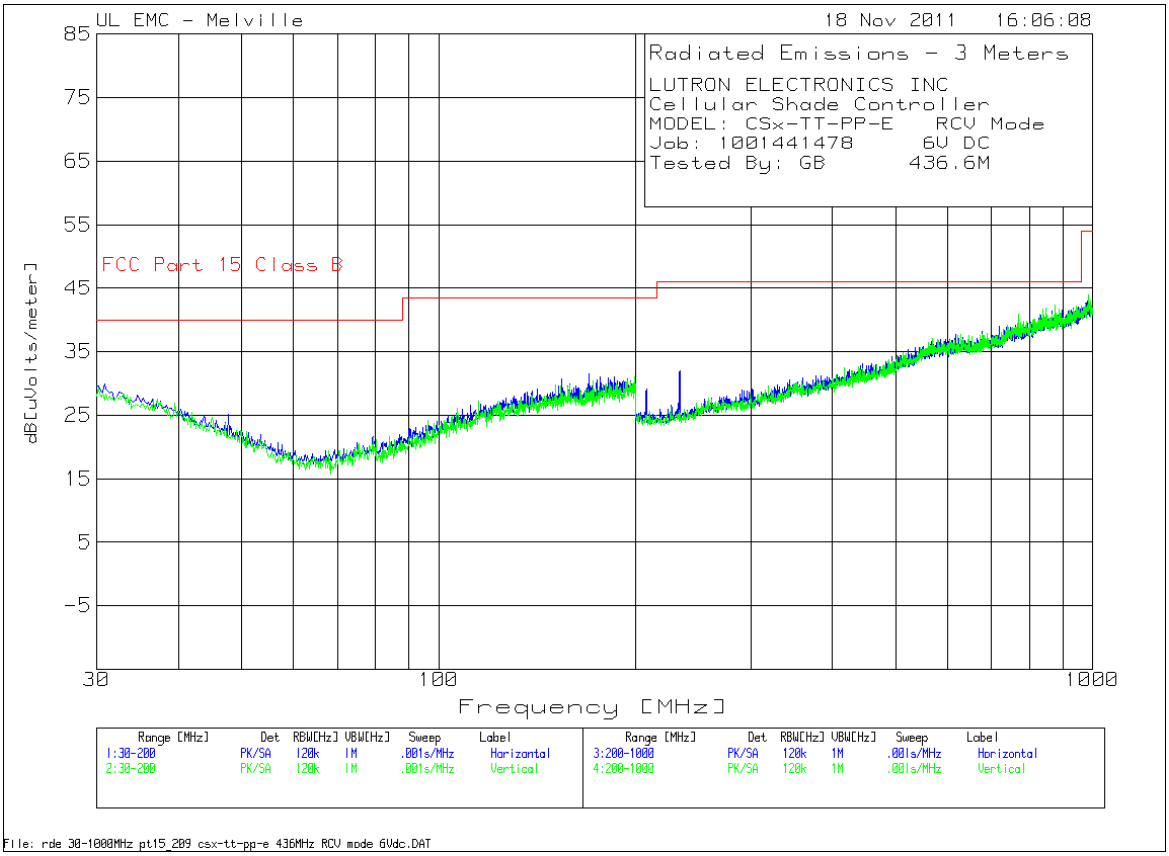
PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 120V 60Hz
Tested By: GB 436.6M

Test Frequency	Meter Reading	Detector	AF-43441 [dB]	GL-3M [dB]	dB[uVolts /meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
Vertical 30 - 200MHz										
31.1912	18.28	PK	17.6	0.5	36.38	40	-3.62	121	100	Vert
31.5315	18.79	PK	17.4	0.5	36.69	40	-3.31	0	100	Vert
79.6897	19.81	PK	7.6	0.9	28.31	40	-11.69	330	100	Vert
91.4314	20.15	PK	9.6	1	30.75	43.5	-12.75	91	100	Vert
Horizontal 200 - 1000MHz										
951.1756	14.02	PK	23.9	3.6	41.52	46	-4.48	155	200	Horz
Vertical 200 - 1000MHz										
948.3742	14.18	PK	24.1	3.6	41.88	46	-4.12	291	300	Vert
Vertical 30 - 200MHz										
31.2	6.3	QP	17.6	0.5	24.4	40	-15.6	202	153	Vert
31.7591	6.65	QP	17.3	0.5	24.45	40	-15.55	301	142	Vert
Horizontal 200 - 1000MHz										
951.2	8.84	QP	23.9	3.6	36.34	46	-9.66	336	109	Horz
Vertical 200 - 1000MHz										
948.4	8.89	QP	24.1	3.6	36.59	46	-9.41	217	230	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

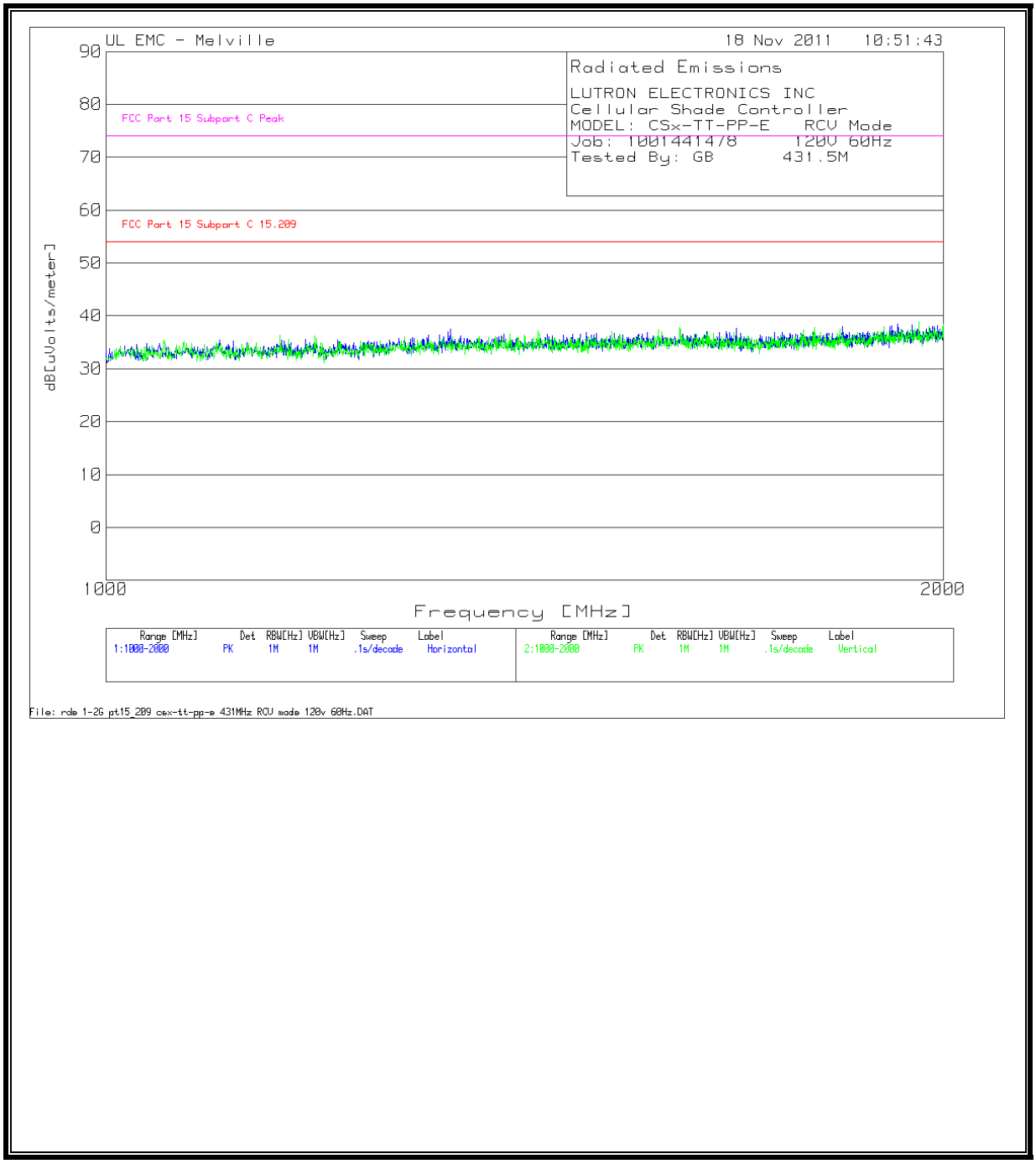


LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 6V DC
Tested By: GB 436.6M

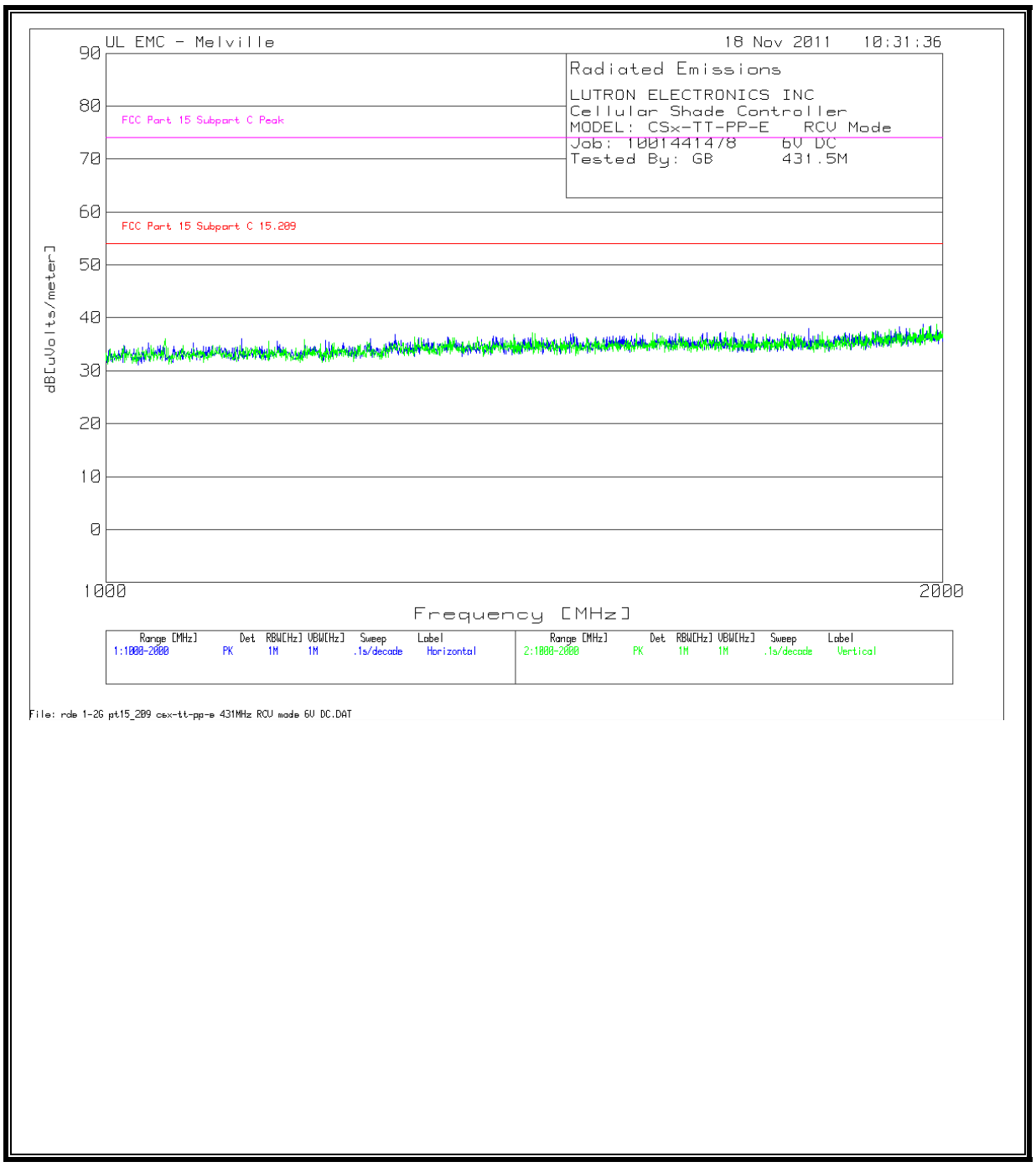
Test Frequency	Meter Reading	Detector	AF-43441 [dB]	GL-3M [dB]	dB[uVolts /meter]	FCC Part 15 Class B	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 30 - 200MHz										
30.8509	11.72	PK	17.7	0.5	29.92	40	-10.08	18	300	Horz
47.6977	13.38	PK	11	0.7	25.08	40	-14.92	184	300	Horz
170.0501	14.94	PK	15.2	1.4	31.54	43.5	-11.96	63	300	Horz
Horizontal 200 - 1000MHz										
234.017	18.17	PK	12.1	1.7	31.97	46	-14.03	220	100	Horz
951.976	14.49	PK	23.9	3.6	41.99	46	-4.01	290	400	Horz
Vertical 200 - 1000MHz										
945.5728	14.63	PK	24	3.6	42.23	46	-3.77	290	101	Vert
Horizontal 200 - 1000MHz										
952	8.84	QP	23.9	3.6	36.34	46	-9.66	332	247	Horz
Vertical 200 - 1000MHz										
945.5	8.94	QP	24	3.6	36.54	46	-9.46	214	195	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

RECEIVER SPURIOUS EMISSION ABOVE 1GHz



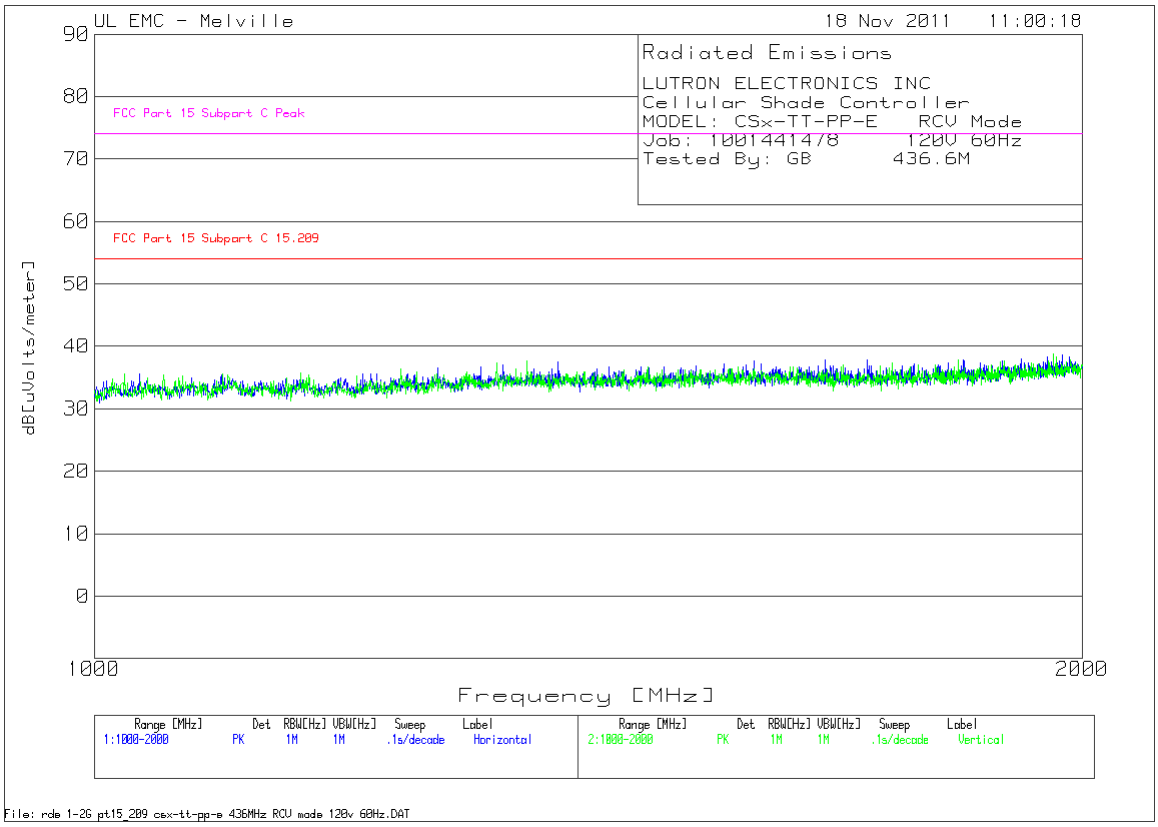
LUTRON ELECTRONICS INC												
Cellular Shade Controller												
MODEL: CSx-TT-PP-E RCV Mode												
Job: 1001441478 120V 60Hz												
Tested By: GB 431.5M												
Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts /meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz												
1098.951	59.91	PK	20	-44.49	35.42	54	-18.58	74	-38.58	259	250	Horz
1330.335	61.35	PK	20.6	-44.43	37.52	54	-16.48	74	-36.48	28	250	Horz
1684.658	61.06	PK	20.8	-44.16	37.7	54	-16.3	74	-36.3	181	250	Horz
Vertical 1000 - 2000MHz												
1049.475	60.41	PK	19.6	-44.63	35.38	54	-18.62	74	-38.62	182	250	Vert
1155.422	60.96	PK	19.9	-44.54	36.32	54	-17.68	74	-37.68	5	99	Vert
1608.196	60.82	PK	21.2	-44.22	37.8	54	-16.2	74	-36.2	182	99	Vert
PK - Peak detector												
QP - Quasi-Peak detector												
LnAv - Linear Average detector												
LgAv - Log Average detector												
Av - Average detector												
CAV - CISPR Average detector												
RMS - RMS detection												
CRMS - CISPR RMS detection												



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 6V DC
Tested By: GB 431.5M

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts /meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz												
1119.44	60.57	PK	20	-44.53	36.04	54	-17.96	74	-37.96	308	100	Horz
1270.365	60.92	PK	20.3	-44.33	36.89	54	-17.11	74	-37.11	106	250	Horz
1790.105	61.05	PK	21	-44.08	37.97	54	-16.03	74	-36.03	182	100	Horz
Vertical 1000 - 2000MHz												
1050.475	60.96	PK	19.7	-44.61	36.05	54	-17.95	74	-37.95	181	250	Vert
1573.213	60.27	PK	21.1	-44.23	37.14	54	-16.86	74	-36.86	181	99	Vert
1810.095	60.35	PK	21.1	-44.05	37.4	54	-16.6	74	-36.6	55	250	Vert

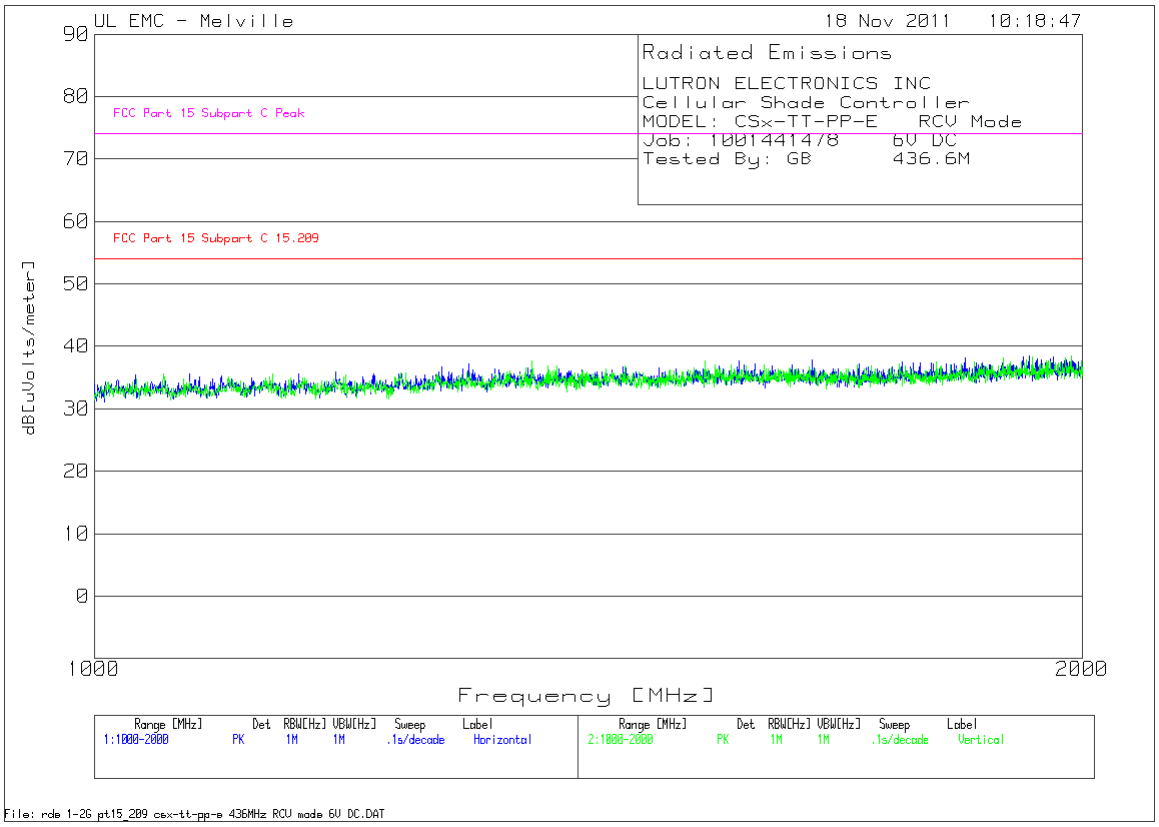
PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 120V 60Hz
Tested By: GB 436.6M

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/ meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz												
1031.984	60.73	PK	19.5	-44.59	35.64	54	-18.36	74	-38.36	359	250	Horz
1272.364	60.5	PK	20.3	-44.29	36.51	54	-17.49	74	-37.49	358	99	Horz
1384.808	61.19	PK	20.7	-44.38	37.51	54	-16.49	74	-36.49	158	250	Horz
Vertical 1000 - 2000MHz												
1239.88	60.73	PK	20.1	-44.37	36.46	54	-17.54	74	-37.54	183	99	Vert
1354.823	61.34	PK	20.6	-44.35	37.59	54	-16.41	74	-36.41	309	250	Vert
1833.583	60.54	PK	21.2	-43.97	37.77	54	-16.23	74	-36.23	107	99	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection



LUTRON ELECTRONICS INC
Cellular Shade Controller
MODEL: CSx-TT-PP-E RCV Mode
Job: 1001441478 6V DC
Tested By: GB 436.6M

Test Frequency	Meter Reading	Detector	AF-51442 [dB]	BOMS Factor [dB]	dB[uVolts/ meter]	FCC Part 15 Subpart C 15.209	Margin	FCC Part 15 Subpart C Peak	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 1000 - 2000MHz												
1029.485	60.44	PK	19.5	-44.59	35.35	54	-18.65	74	-38.65	308	99	Horz
1300.35	61.11	PK	20.5	-44.36	37.25	54	-16.75	74	-36.75	30	250	Horz
1655.172	61.18	PK	20.9	-44.21	37.87	54	-16.13	74	-36.13	55	250	Horz
Vertical 1000 - 2000MHz												
1049.975	60.63	PK	19.6	-44.61	35.62	54	-18.38	74	-38.38	181	249	Vert
1359.82	61.44	PK	20.6	-44.37	37.67	54	-16.33	74	-36.33	6	99	Vert
1534.733	61.13	PK	20.9	-44.33	37.7	54	-16.3	74	-36.3	106	99	Vert

PK - Peak detector
QP - Quasi-Peak detector
LnAv - Linear Average detector
LgAv - Log Average detector
Av - Average detector
CAV - CISPR Average detector
RMS - RMS detection
CRMS - CISPR RMS detection

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 7.2.2

Frequency of emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50
* Decreases with the logarithm of the frequency.		

TEST PROCEDURE

ANSI C63.4:2003

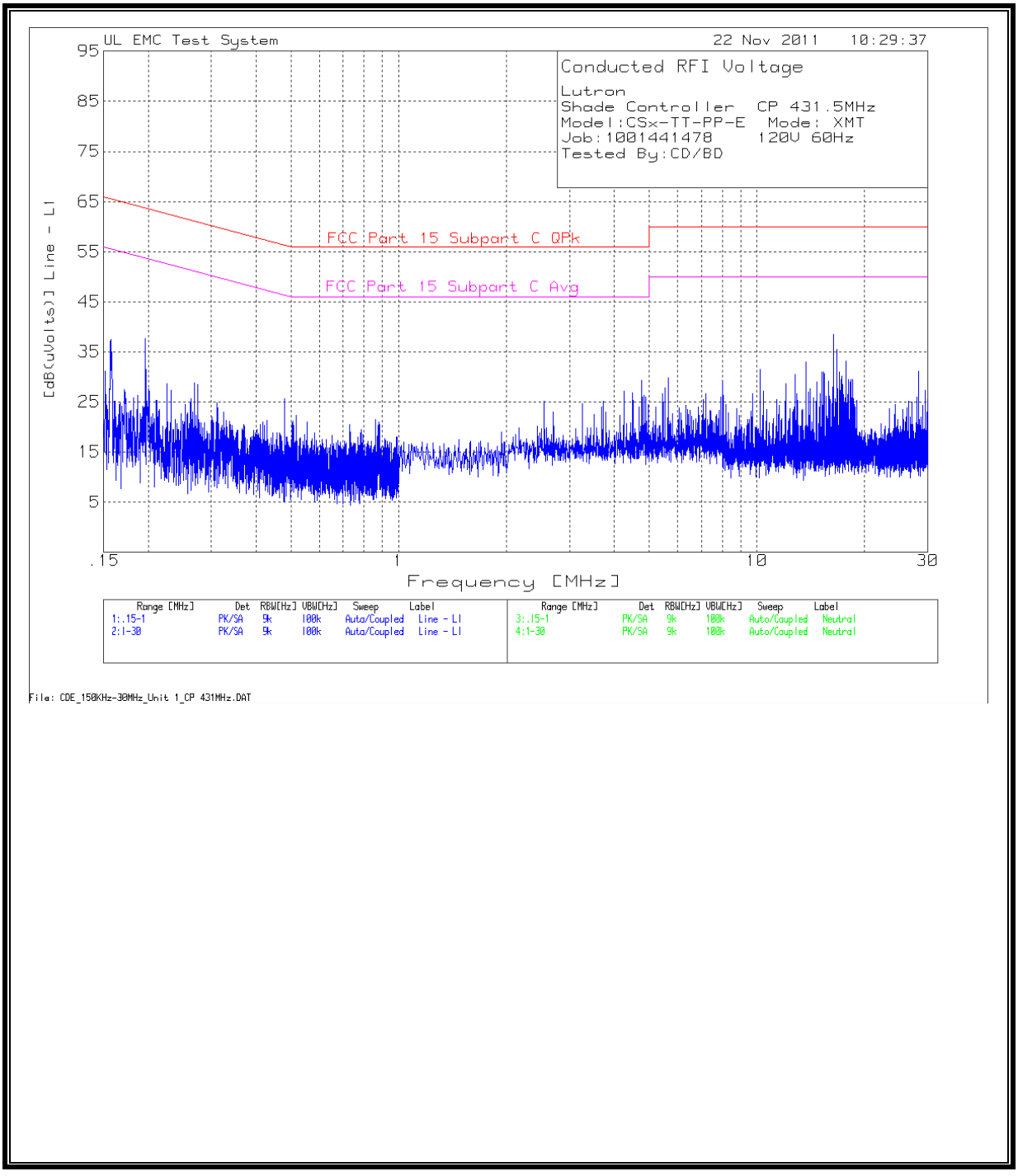
RESULTS

No non-compliance noted:

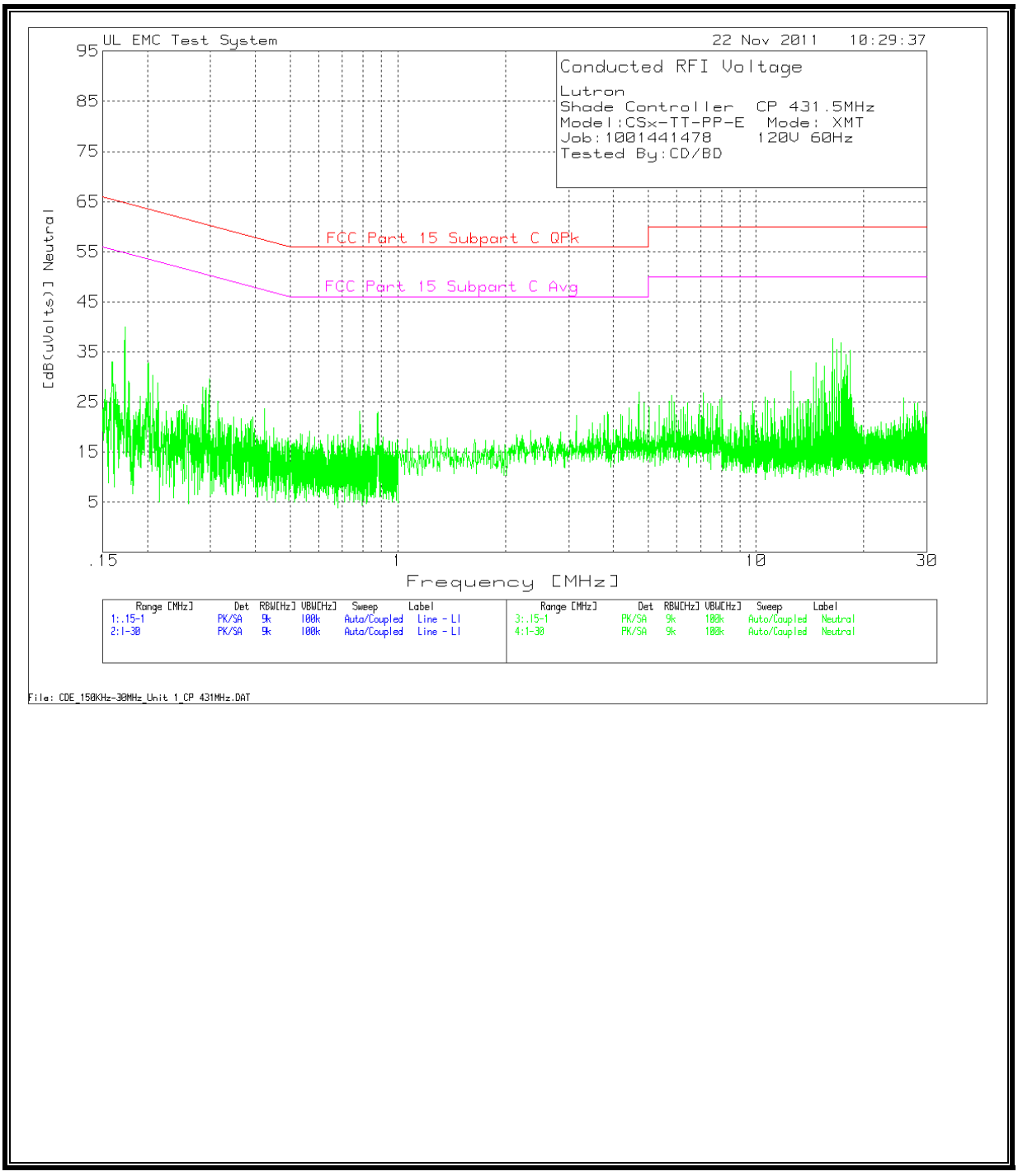
6 WORST EMISSIONS (TX 431MHz)

Lutron								
Shade Controller CP 431.5MHz								
Model:CSx-TT-PP-E Mode: XMT								
Job:1001441478 120V 60Hz								
Tested By:CD/BD								
Test Frequency	Meter Reading	Detector	5A636 with Tl and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
Line - L1 .15 - 1MHz								
0.1568	25.91	PK	11.5	37.41	65.6	-28.19	55.6	-18.19
0.19591	26.42	PK	11.2	37.62	63.8	-26.18	53.8	-16.18
Line - L1 1 - 30MHz								
16.32667	27.78	PK	10.7	38.48	60	-21.52	50	-11.52
10.18904	20.94	PK	10.5	31.44	60	-28.56	50	-18.56
13.72775	22.42	PK	10.6	33.02	60	-26.98	50	-16.98
17.69574	22.46	PK	10.7	33.16	60	-26.84	50	-16.84
Neutral .15 - 1MHz								
0.17279	28.71	PK	11.3	40.01	64.8	-24.79	54.8	-14.79
0.20084	21.78	PK	11.1	32.88	63.6	-30.72	53.6	-20.72
Neutral 1 - 30MHz								
14.73135	22.04	PK	10.7	32.74	60	-27.26	50	-17.26
16.79076	24.67	PK	10.8	35.47	60	-24.53	50	-14.53
17.23745	26.03	PK	10.8	36.83	60	-23.17	50	-13.17
18.30486	24.58	PK	10.8	35.38	60	-24.62	50	-14.62
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

LINE 1 RESULTS



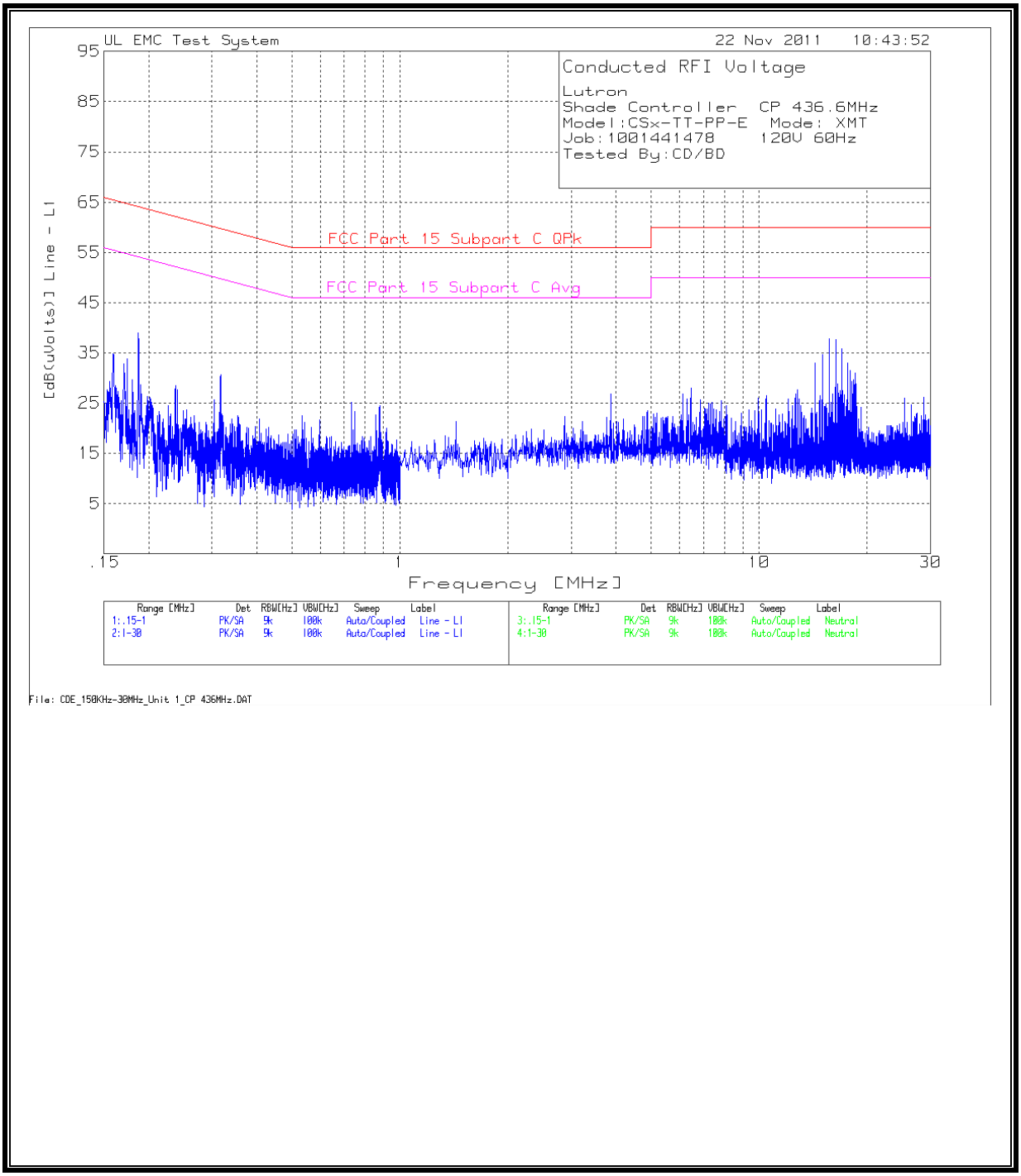
LINE 2 RESULTS



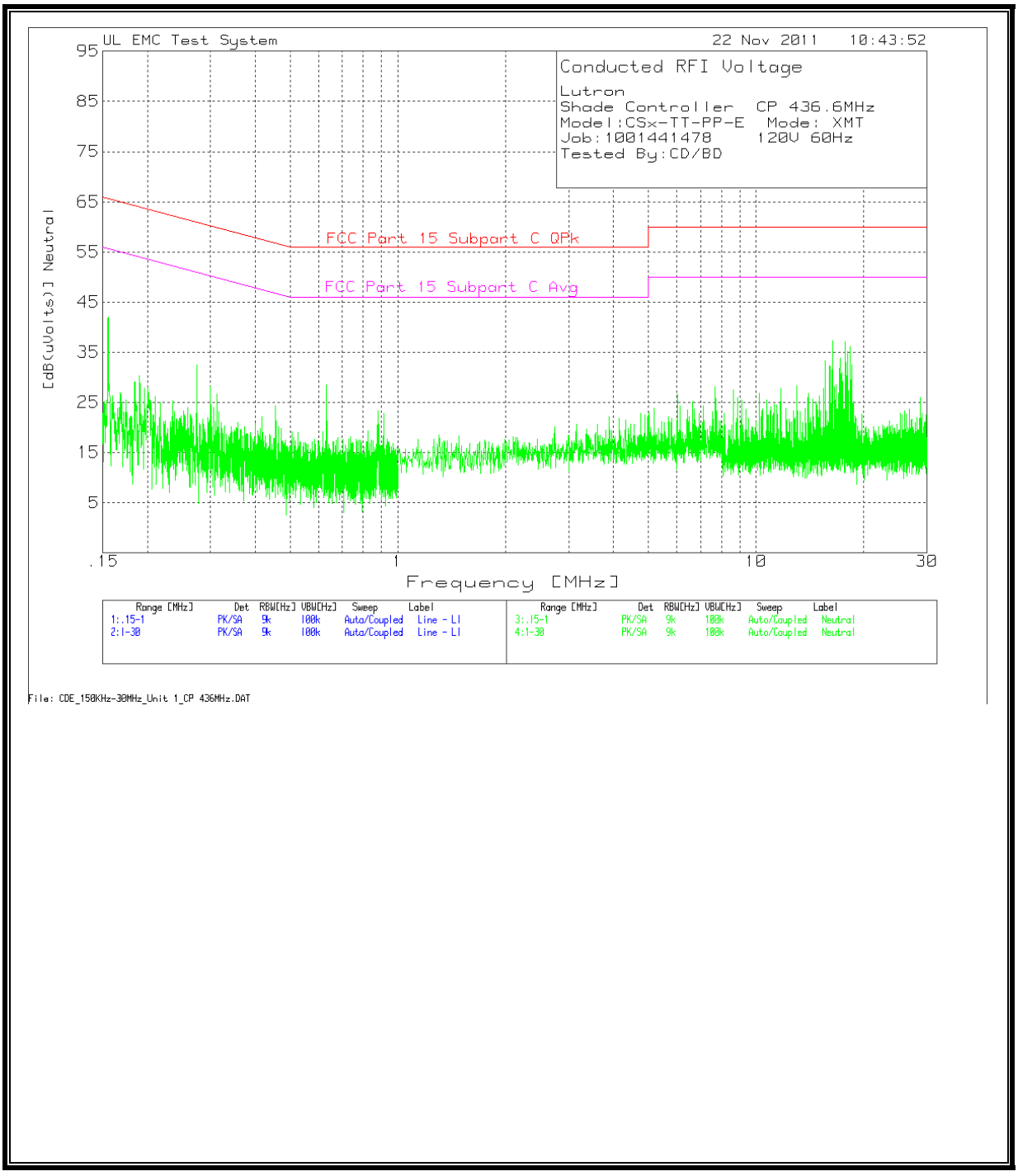
6 WORST EMISSIONS (TX 437MHz)

Lutron								
Shade Controller CP 436.6MHz								
Model:CSx-TT-PP-E Mode: XMT								
Job:1001441478 120V 60Hz								
Tested By:CD/BD								
Test Frequency	Meter Reading	Detector	5A636 with Tl and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
Line - L1 .15 - 1MHz								
0.1591	23.32	PK	11.5	34.82	65.5	-30.68	55.5	-20.68
0.1869	27.81	PK	11.2	39.01	64.2	-25.19	54.2	-15.19
Line - L1 1 - 30MHz								
14.30206	22.39	PK	10.6	32.99	60	-27.01	50	-17.01
15.0156	23.85	PK	10.7	34.55	60	-25.45	50	-15.45
15.65953	27.06	PK	10.7	37.76	60	-22.24	50	-12.24
16.39048	26.92	PK	10.7	37.62	60	-22.38	50	-12.38
Neutral .15 - 1MHz								
0.15527	30.33	PK	11.6	41.93	65.7	-23.77	55.7	-13.77
0.2743	21.63	PK	10.8	32.43	61	-28.57	51	-18.57
0.63205	17.96	PK	10.5	28.46	56	-27.54	46	-17.54
Neutral 1 - 30MHz								
16.34987	26.51	PK	10.8	37.31	60	-22.69	50	-12.69
17.72475	26.38	PK	10.8	37.18	60	-22.82	50	-12.82
18.33387	25.28	PK	10.8	36.08	60	-23.92	50	-13.92
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

LINE 1 RESULTS



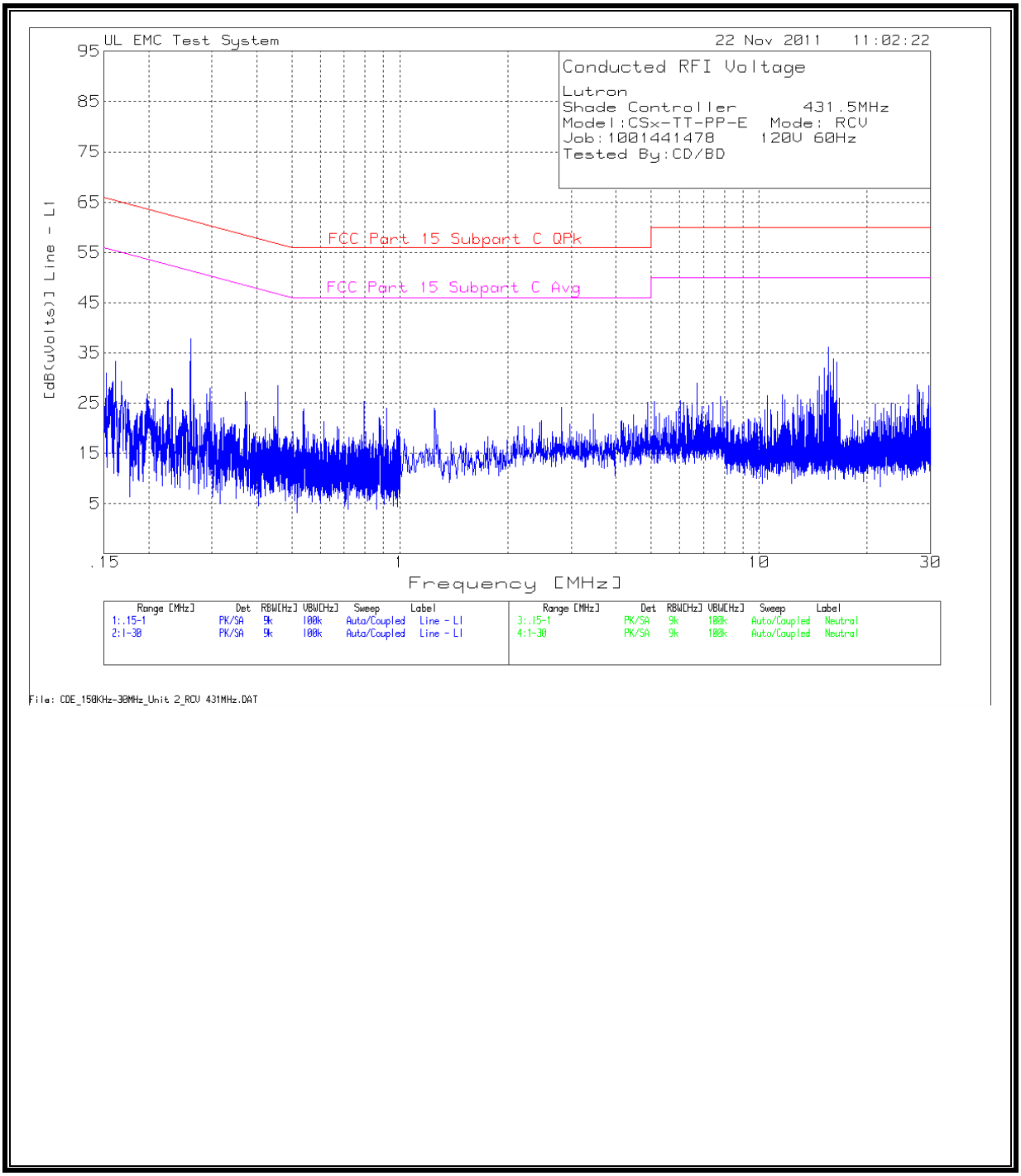
LINE 2 RESULTS



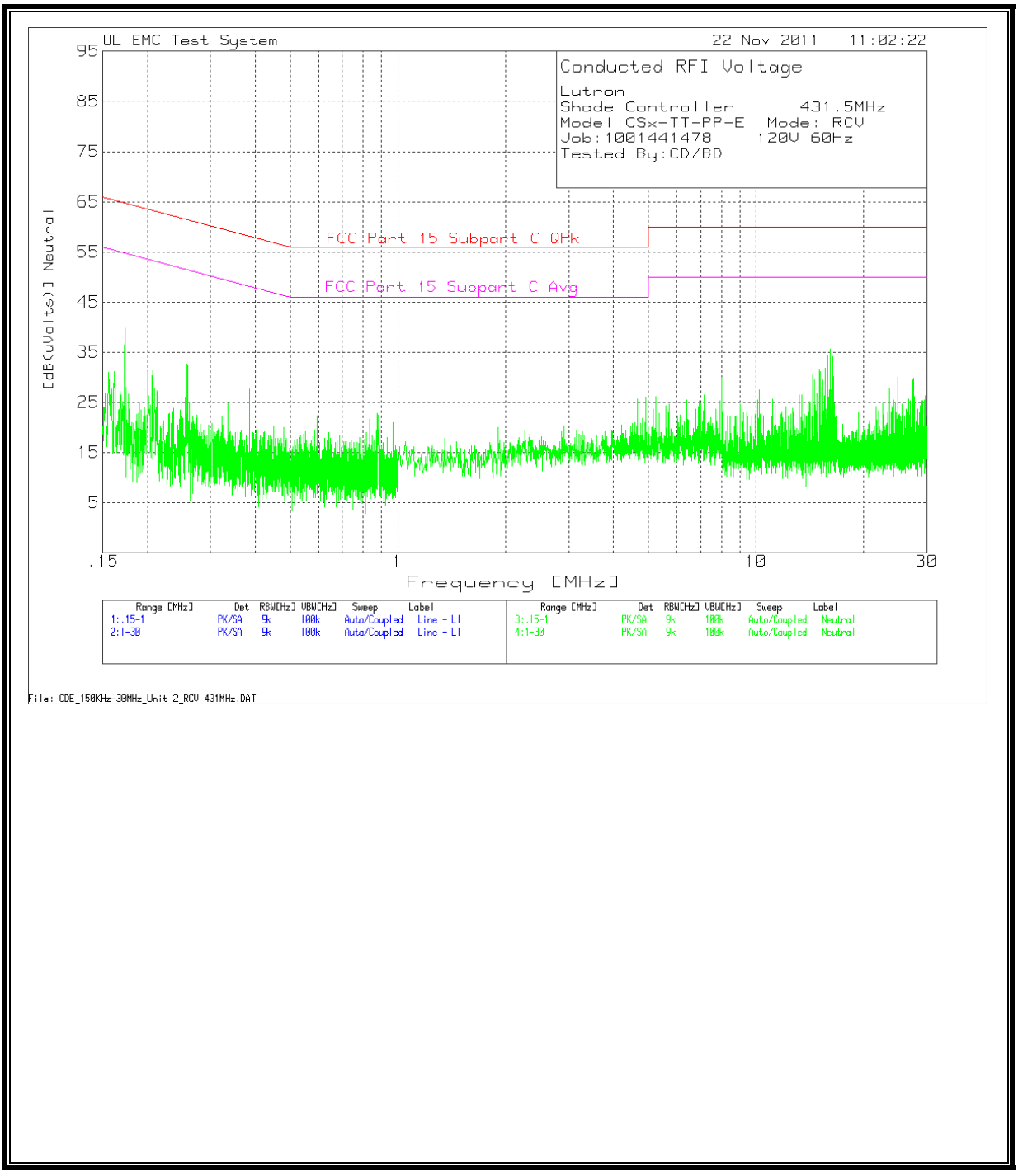
6 WORST EMISSIONS (RX 431MHz)

Lutron								
Shade Controller 431.5MHz								
Model:CSx-TT-PP-E Mode: RCV								
Job:1001441478 120V 60Hz								
Tested By:CD/BD								
Test Frequency	Meter Reading	Detector	5A636 with Tl and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
Line - L1 .15 - 1MHz								
0.2612	26.95	PK	10.8	37.75	61.4	-23.65	51.4	-13.65
0.4564	17.97	PK	10.5	28.47	56.8	-28.33	46.8	-18.33
Line - L1 1 - 30MHz								
15.17223	21.34	PK	10.7	32.04	60	-27.96	50	-17.96
15.59572	25.48	PK	10.7	36.18	60	-23.82	50	-13.82
16.06561	23.16	PK	10.7	33.86	60	-26.14	50	-16.14
16.44849	22.43	PK	10.7	33.13	60	-26.87	50	-16.87
Neutral .15 - 1MHz								
0.17296	28.52	PK	11.3	39.82	64.8	-24.98	54.8	-14.98
Neutral 1 - 30MHz								
14.37167	19.85	PK	10.7	30.55	60	-29.45	50	-19.45
15.09682	20.51	PK	10.7	31.21	60	-28.79	50	-18.79
15.86257	23.55	PK	10.7	34.25	60	-25.75	50	-15.75
16.05981	24.95	PK	10.7	35.65	60	-24.35	50	-14.35
16.32667	23.28	PK	10.8	34.08	60	-25.92	50	-15.92
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

LINE 1 RESULTS



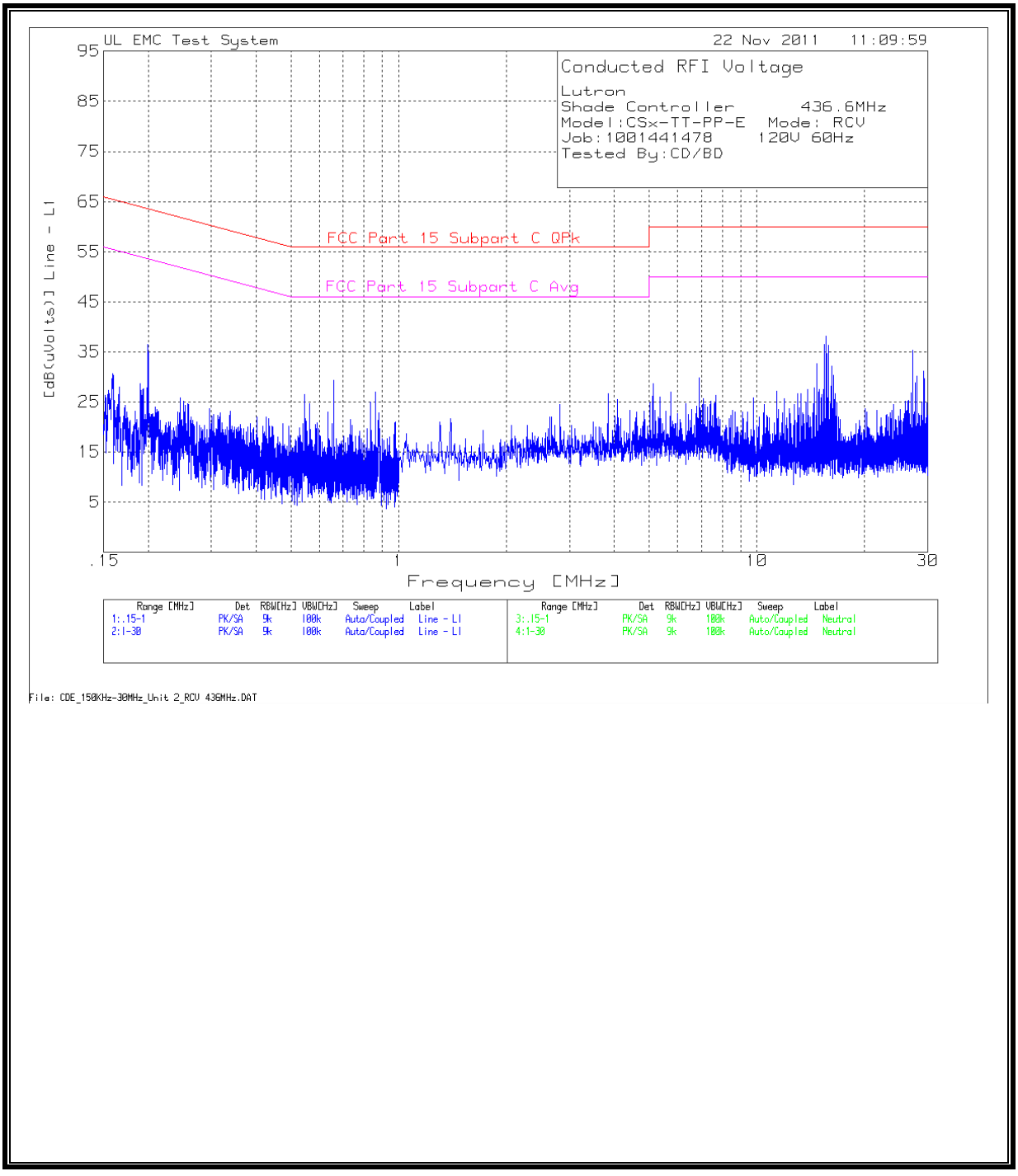
LINE 2 RESULTS



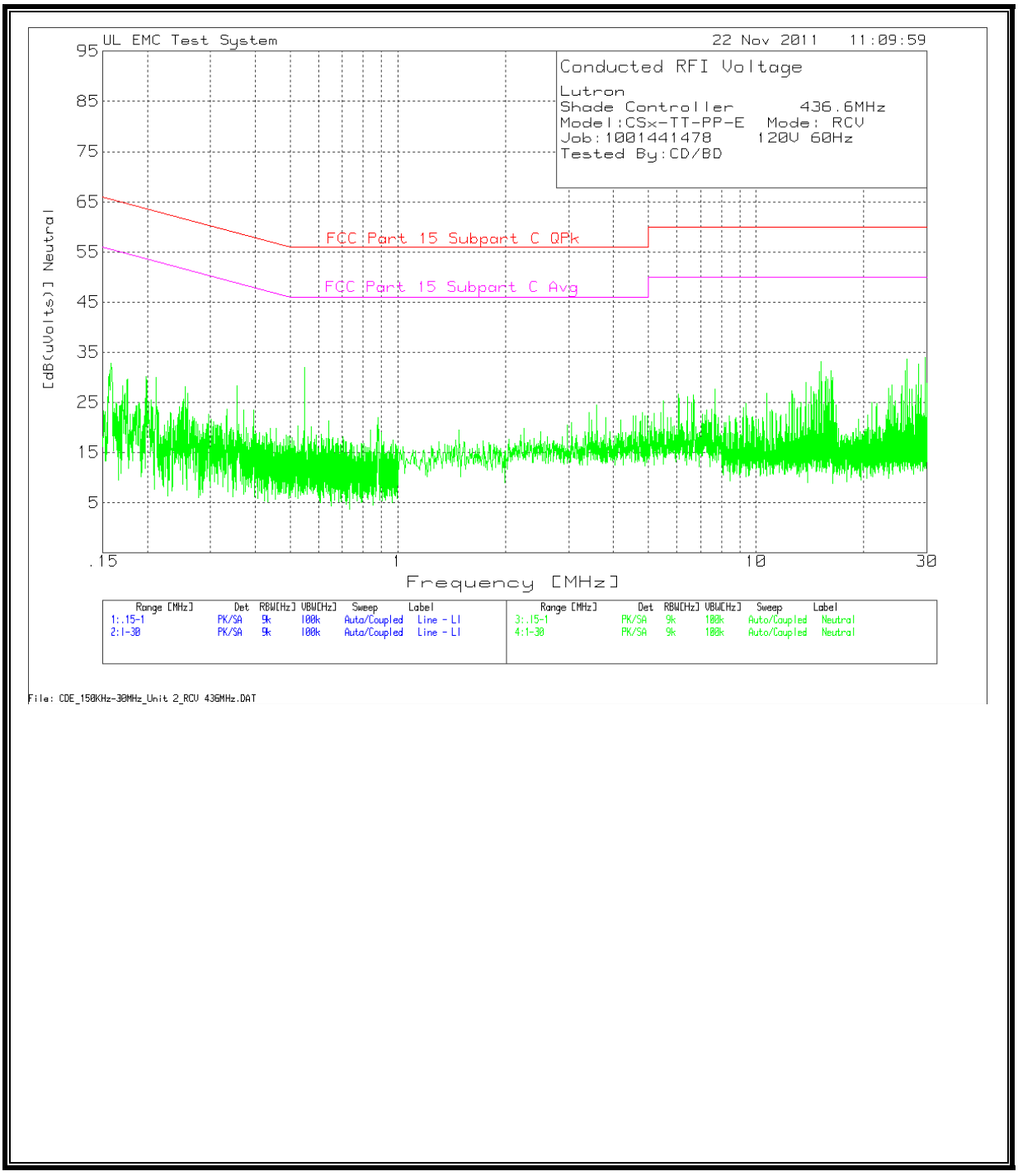
6 WORST EMISSIONS (RX 437MHz)

Lutron								
Shade Controller 436.6MHz								
Model:CSx-TT-PP-E Mode: RCV								
Job:1001441478 120V 60Hz								
Tested By:CD/BD								
Test Frequency	Meter Reading	Detector	5A636 with Tl and Sw Line 1 [dB]	[dB(uVolts)]	FCC Part 15 Subpart C QPk	Margin	FCC Part 15 Subpart C Avg	Margin
Line - L1 .15 - 1MHz								
0.19931	25.43	PK	11.1	36.53	63.6	-27.07	53.6	-17.07
Line - L1 1 - 30MHz								
14.70234	22.11	PK	10.6	32.71	60	-27.29	50	-17.29
15.41588	25.43	PK	10.7	36.13	60	-23.87	50	-13.87
15.63053	27.44	PK	10.7	38.14	60	-21.86	50	-11.86
15.82196	25.58	PK	10.7	36.28	60	-23.72	50	-13.72
27.29086	24.27	PK	11	35.27	60	-24.73	50	-14.73
Neutral .15 - 1MHz								
0.5489	21.46	PK	10.5	31.96	56	-24.04	46	-14.04
Neutral 1 - 30MHz								
13.76255	18.35	PK	10.7	29.05	60	-30.95	50	-20.95
15.0156	20.48	PK	10.7	31.18	60	-28.82	50	-18.82
15.16063	22.51	PK	10.7	33.21	60	-26.79	50	-16.79
26.33367	22.56	PK	11.1	33.66	60	-26.34	50	-16.34
28.4859	21.51	PK	11.1	32.61	60	-27.39	50	-17.39
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

LINE 1 RESULTS



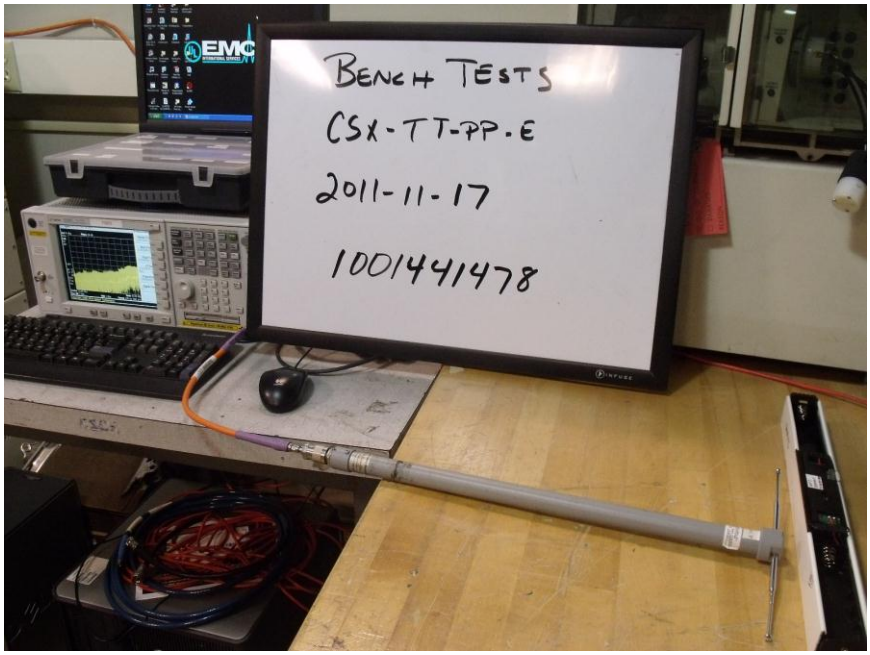
LINE 2 RESULTS



10. SETUP PHOTOS

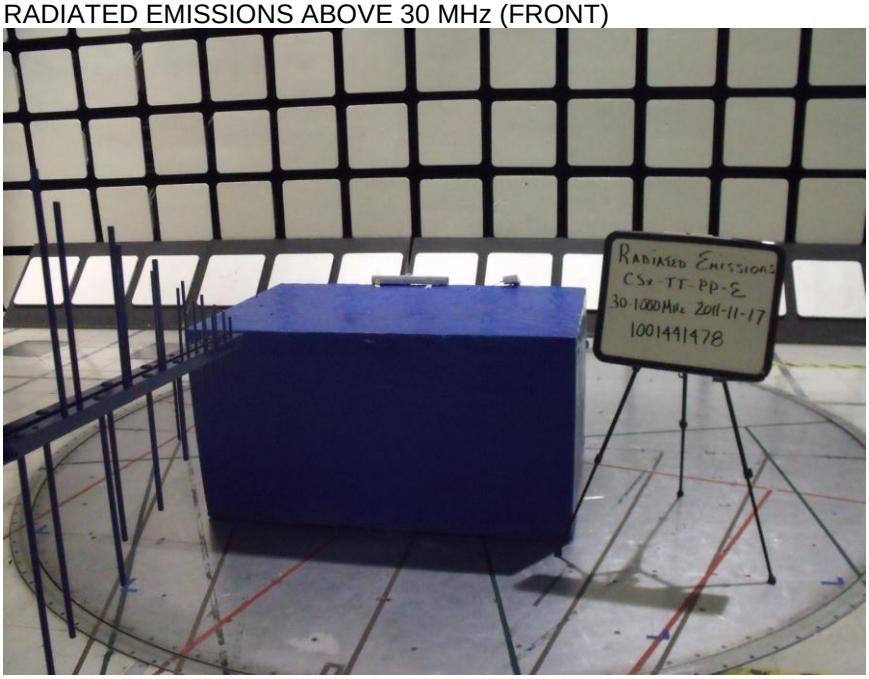
ANTENNA PORT

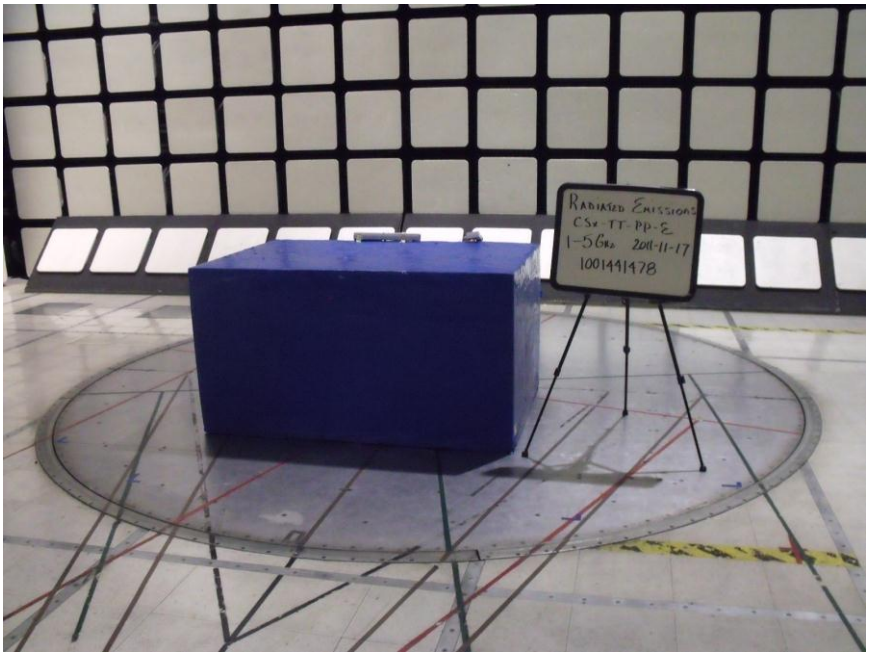
ANTENNA PORT



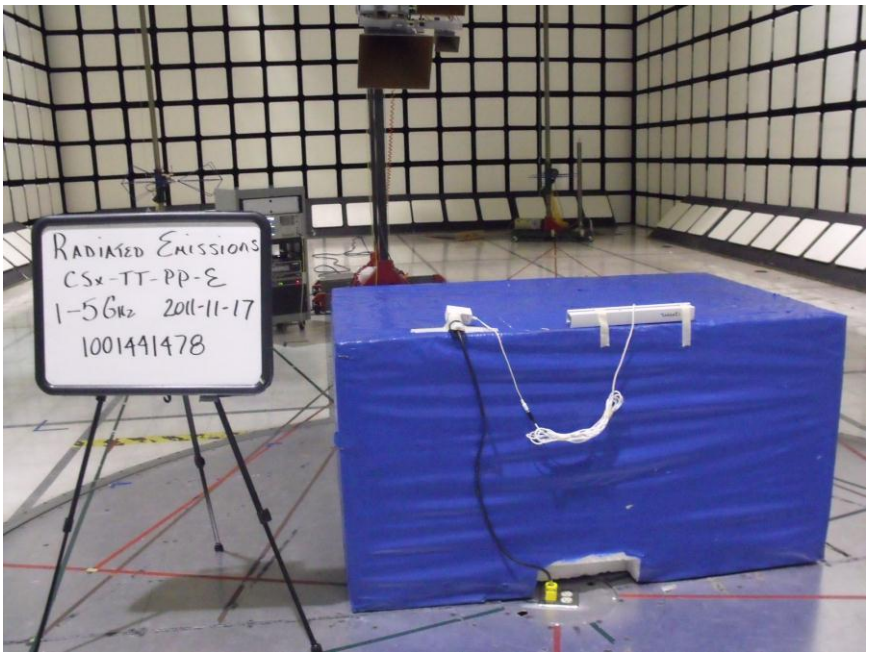
RADIATED EMISSION ABOVE 30 MHz

RADIATED EMISSIONS ABOVE 30 MHz (FRONT)





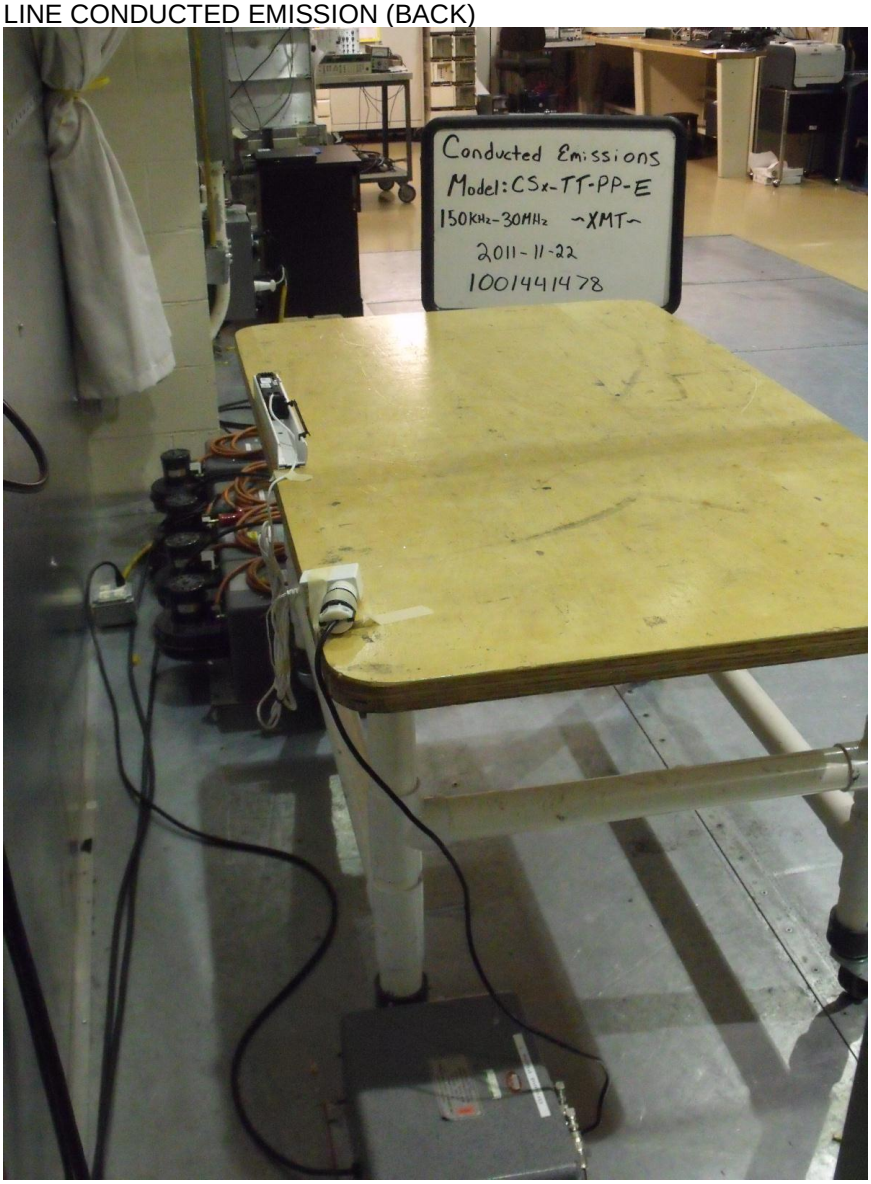
RADIATED EMISSIONS ABOVE 30 MHz (BACK)



AC MAINS LINE CONDUCTED EMISSION

LINE CONDUCTED EMISSION (FRONT)

LINE CONDUCTED EMISSION (BACK)



END OF REPORT