



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

CERTIFICATION TEST REPORT

FOR

MOTORIZED SHADES DRIVE

MODEL NUMBER: QSFC-J-EDU-R2

**FCC ID: JPZ0095
IC: 2851A-JPZ0095**

REPORT NUMBER: 10052927-AC

ISSUE DATE: 2013-09-13

Prepared for
**LUTRON ELECTRONICS CO INC
7200 SUTER RD
COOPERSBURG , PA 18036 USA**

Prepared by
**UL LLC
1285 WALT WHITMAN RD.
MELVILLE, NY 11747, U.S.A.
TEL: (631) 271-6200
FAX: (877) 854-3577**



NVLAP LAB CODE 100255-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2013-09-13	Initial Issue	B. DeLisi

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. MEASURING INSTRUMENT CALIBRATION	5
4.2. SAMPLE CALCULATION	5
4.3. MEASUREMENT UNCERTAINTY	5
5. EQUIPMENT UNDER TEST	6
5.1. DESCRIPTION OF EUT	6
5.2. DESCRIPTION OF AVAILABLE ANTENNAS	6
5.3. SOFTWARE AND FIRMWARE	6
5.4. WORST-CASE CONFIGURATION AND MODE	6
5.5. MODIFICATIONS	6
5.6. DESCRIPTION OF TEST SETUP	7
6. TEST AND MEASUREMENT EQUIPMENT	9
7. ANTENNA PORT TEST RESULTS	11
7.1. 20 dB AND 99% BW	11
7.2. DUTY CYCLE	15
7.3. TRANSMISSION TIME	19
8. RADIATED EMISSION TEST RESULTS	21
8.1. TX RADIATED SPURIOUS EMISSION	21
8.2. RX RADIATED SPURIOUS EMISSION	29
9. AC MAINS LINE CONDUCTED EMISSIONS	34
10. SETUP PHOTOS	47

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LUTRON ELECTRONICS CO INC
7200 SUTER RD
COOPERSBURG , PA 18036 USA

EUT DESCRIPTION: Motorized Shade Drive

MODEL: QSFC-J-EDU-R2

SERIAL NUMBER: Non-serialized production unit

DATE TESTED: 2013-08-29 through 2013-09-06

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

UL LLC 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 UL LLC 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 UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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:

Tested By:



Bob DeLisi
WiSE Principal Engineer
UL LLC

Joseph Danisi
WiSE Project Lead
UL LLC

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:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

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 motor shade drive with wireless control capability powered by an external AC/DC power supply.

The model tested, QSFC-J-EDU-R2 represents SYC-J-EDU-R2. Electrically there is no difference between the two units. The model difference distinguishes types of other devices that work with the unit.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral monopole antenna constructed of a wire..

5.3. SOFTWARE AND FIRMWARE

RF_Godwit_1.68_FCC1_TXPow0x85 - Transmit
RF_Godwit_1.68_FCC2_TXPow0x85 - Receive
RF_Godwit_2.91_FCC4_TXPow0x85 – Transmit on Button Press

5.4. WORST-CASE CONFIGURATION AND MODE

Testing was conducted on the lowest and highest channels for all radiated and mains conducted tests. All other tests were conducted on a single channel. The antenna was oriented 90° from the motor housing for worst case emissions.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Not Applicable

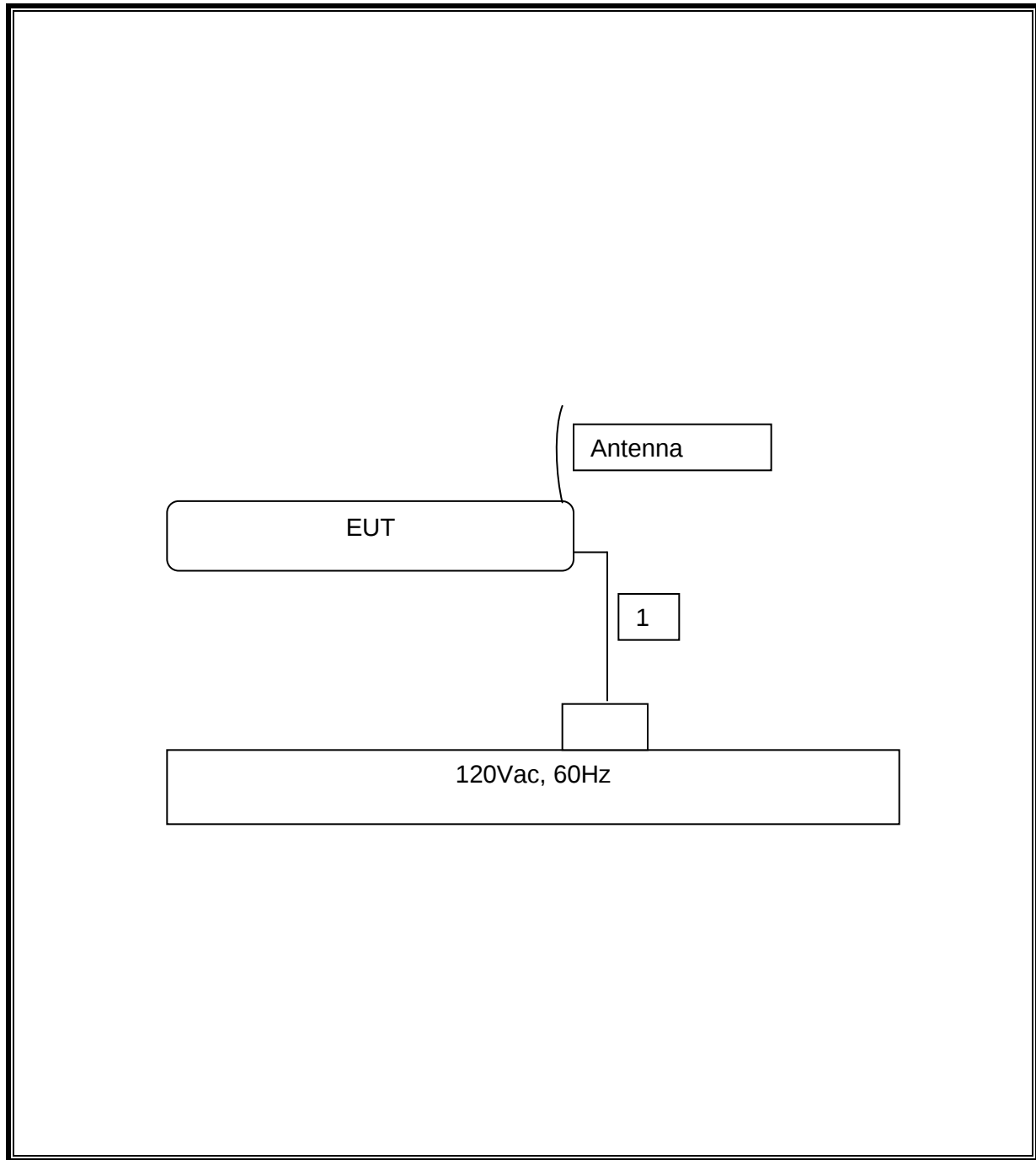
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	plug-in	Shielded	>3m	Cable between AC wall wart and EUT connector

TEST SETUP

The EUT was tested as a stand-alone device connected to an AC/DC power source.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESCI7	75141	2013-01-30	2014-01-31
Bicon Antenna	Schaffner	VBA6106A	54	2013-04-03	2014-04-03
Log-P Antenna	Schaffner	UPA6109	44067	2013-07-09	2014-07-09
Bias Tee	Miteq	AM-1523-7687	44392	N/A	N/A
Bias Tee	Miteq	AM-1523-7687	44393	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44391	N/A	N/A
Preamp	Miteq	AM-3A-000110-7687	44394	N/A	N/A
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 9.5	44740	N/A	N/A
Multimeter	Fluke	87V	64386	2013-01-28	2014-01-31
Temp/Humidity/Pressure Meter	Cole Palmer	99760-00	4268	2012-12-22	2014-12-22
Above 1GHz (Band Optimized System)					
Spectrum Analyzer	Agilent	E4446A	72823	2013-01-30	2014-01-31
Horn Antenna (1-2 GHz)	ETS	3161-01 (26°)**	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02 (22°)**	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03 (22°)**	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 9.5	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2012-12-22	2014-12-22
Multimeter	Fluke	87V	79648	2013-01-30	2014-01-31
* - 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. ** - Number in parentheses denotes antenna beam width.					

Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-28	2014-01-31
LISN	Solar	9252-50-R-24-BNC	ME5A-636	2013-04-01	2014-04-01
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.5	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13
Multimeter	Fluke	83V	43443	2013-01-28	2014-01-31

Bench Tests					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2013-01-28	2014-01-31
Dipole Antenna	EMCO	3121C	3359	2012-12-27	2013-12-27
Multimeter	Fluke	83V	43443	2013-01-28	2014-01-31

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:

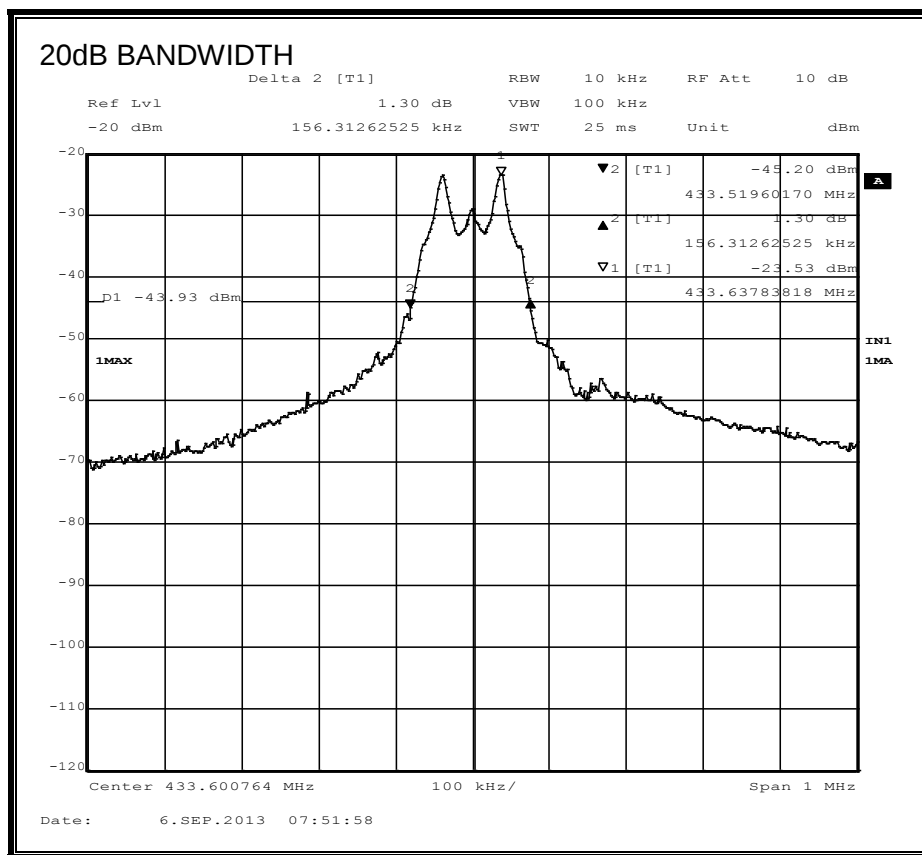
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.6	156.3	1084	-927.7

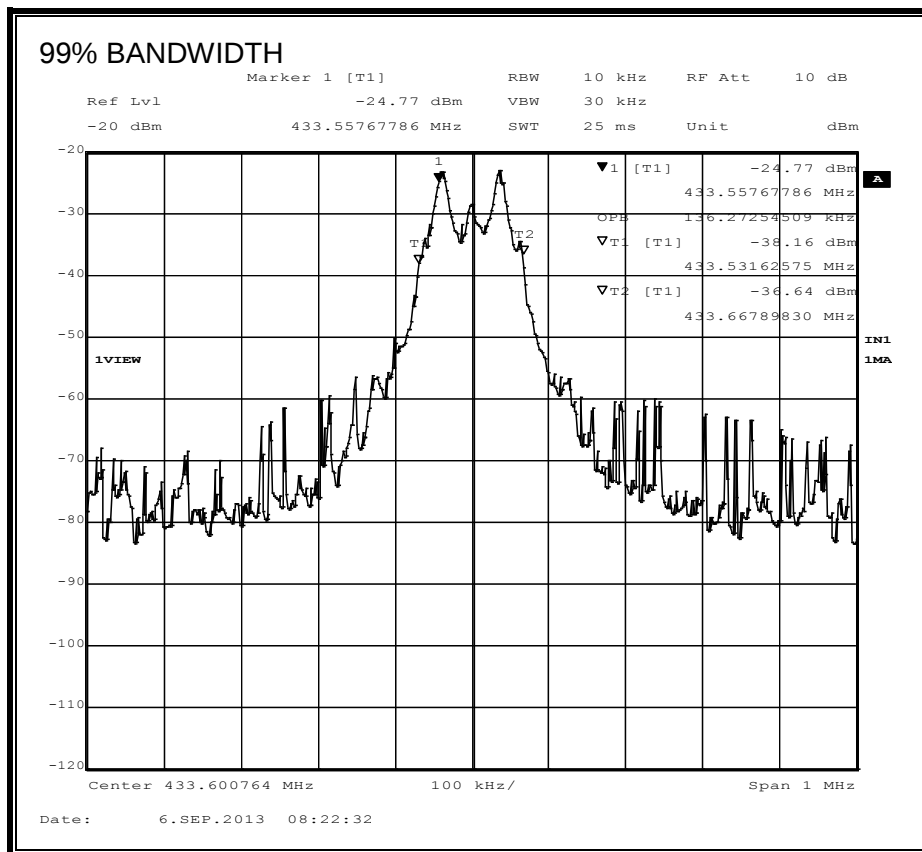
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.6	136.3	1084	-947.7

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

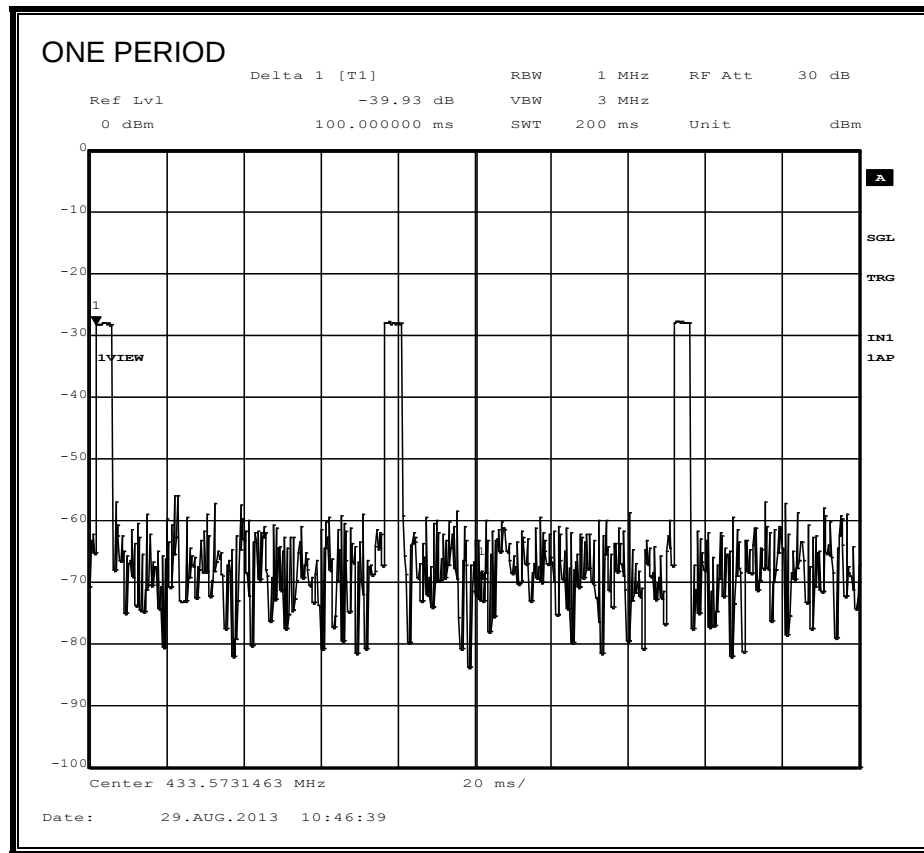
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

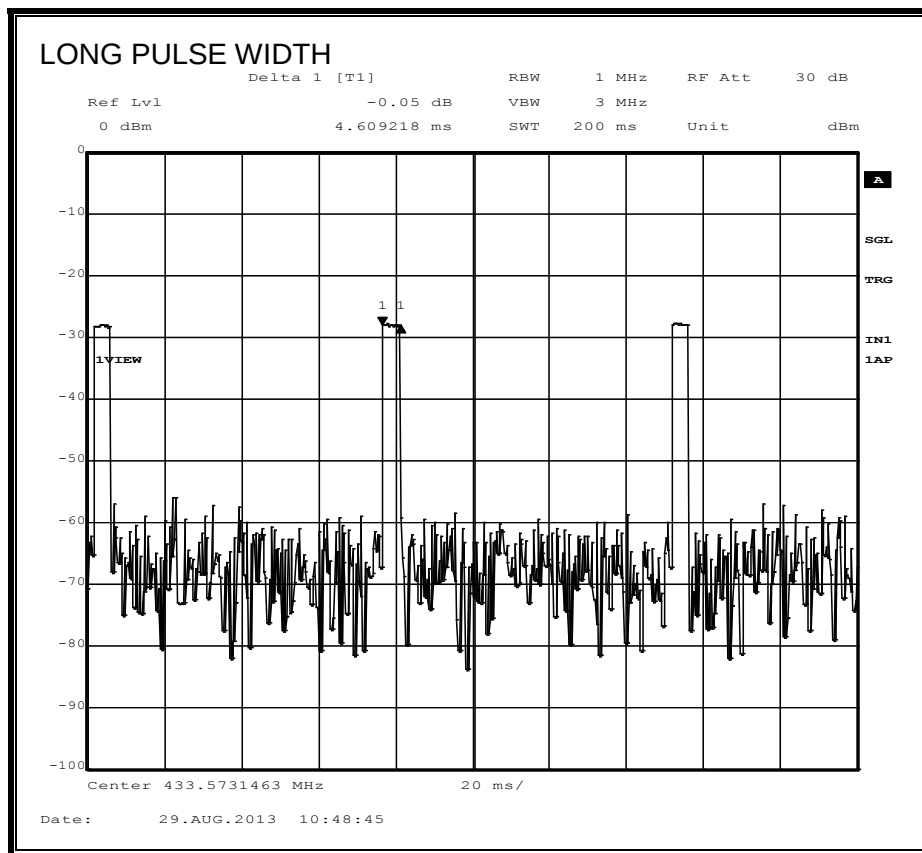
No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	4.61	1	4.21	1	0.088	-21.09

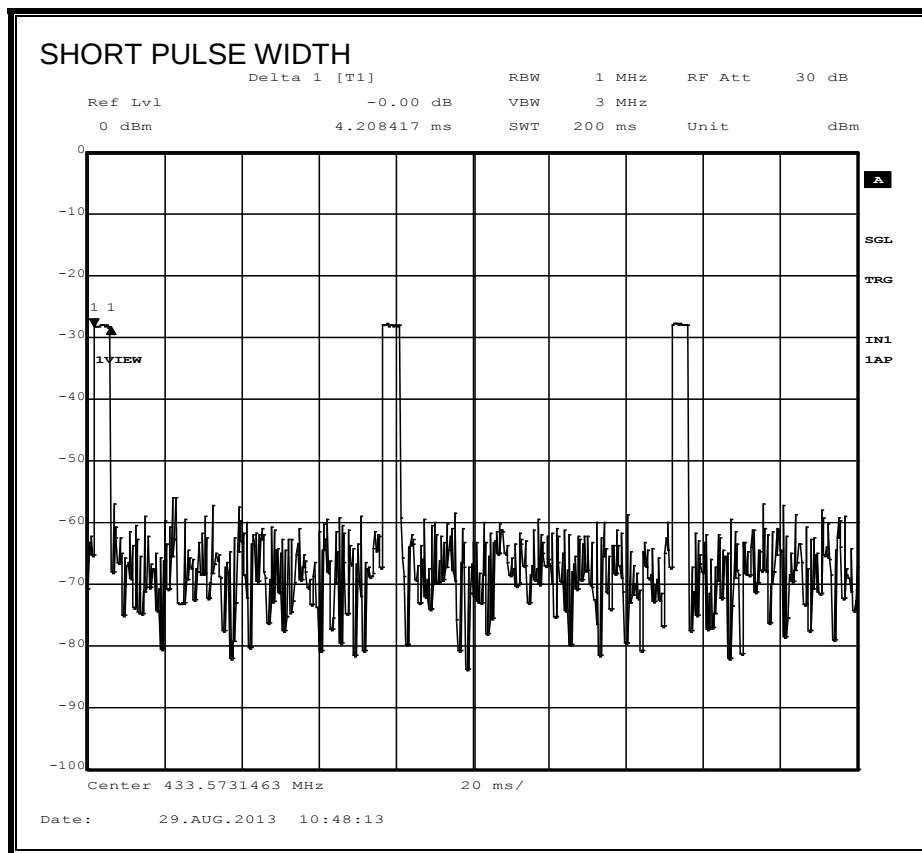
ONE PERIOD



LONG PULSE WIDTH



SHORT PULSE WIDTH



7.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

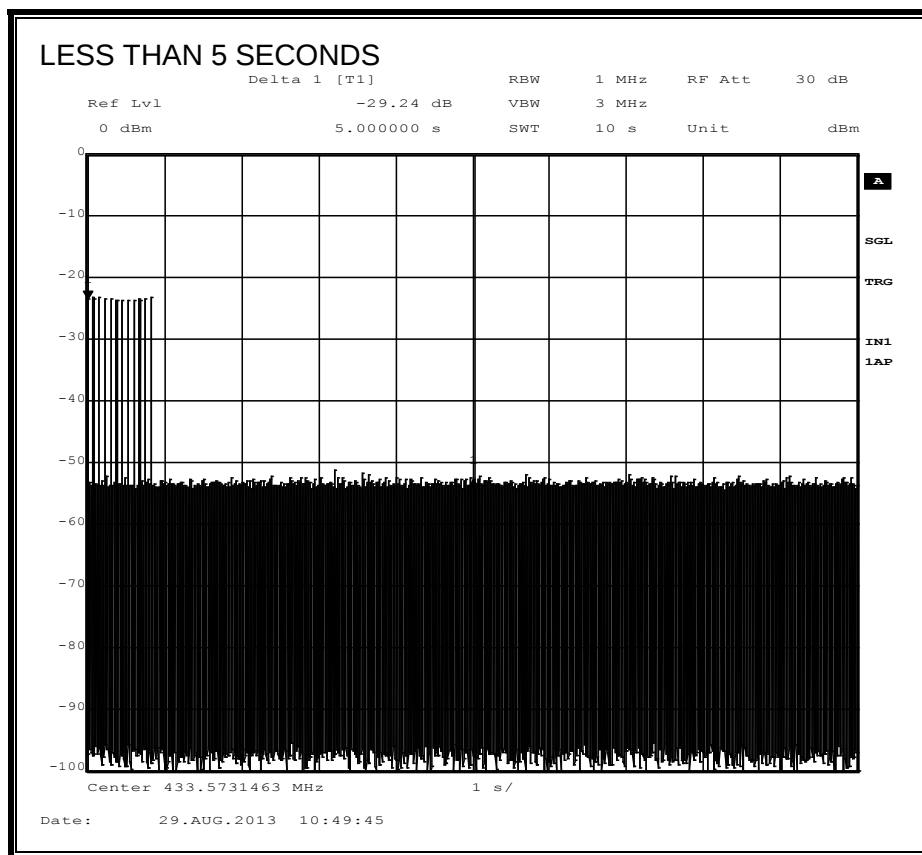
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

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:



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 3,750 ¹	125 to 375 ¹
174 - 260	3,750	375
260 - 470	3,750 to 12,500 ¹	375 to 1,250 ¹
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)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
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. 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.

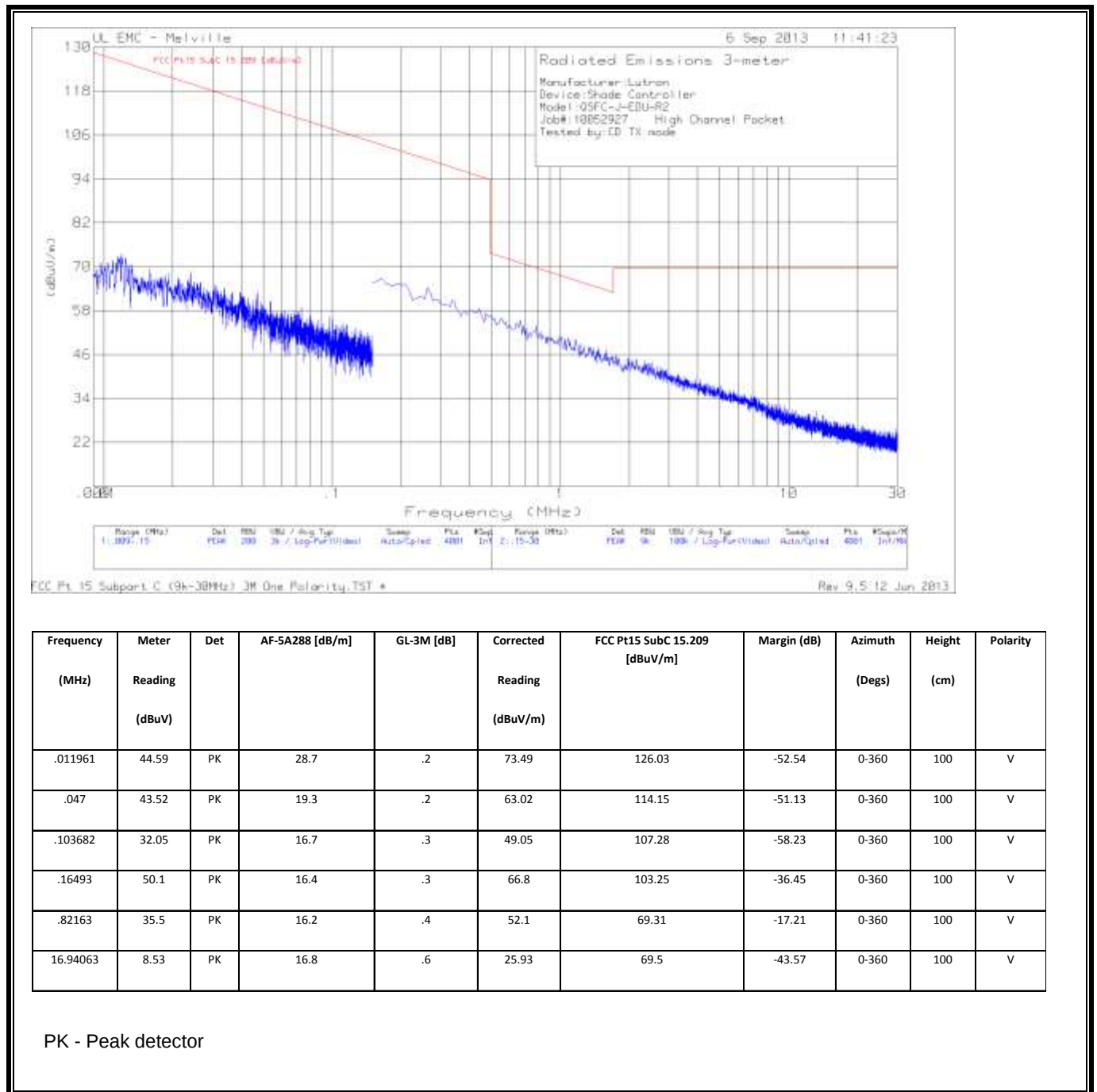
For measurements above 1 GHz the resolution and video bandwidth is set to 1 MHz, Average values are determined by application of the duty cycle correction factor.

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.

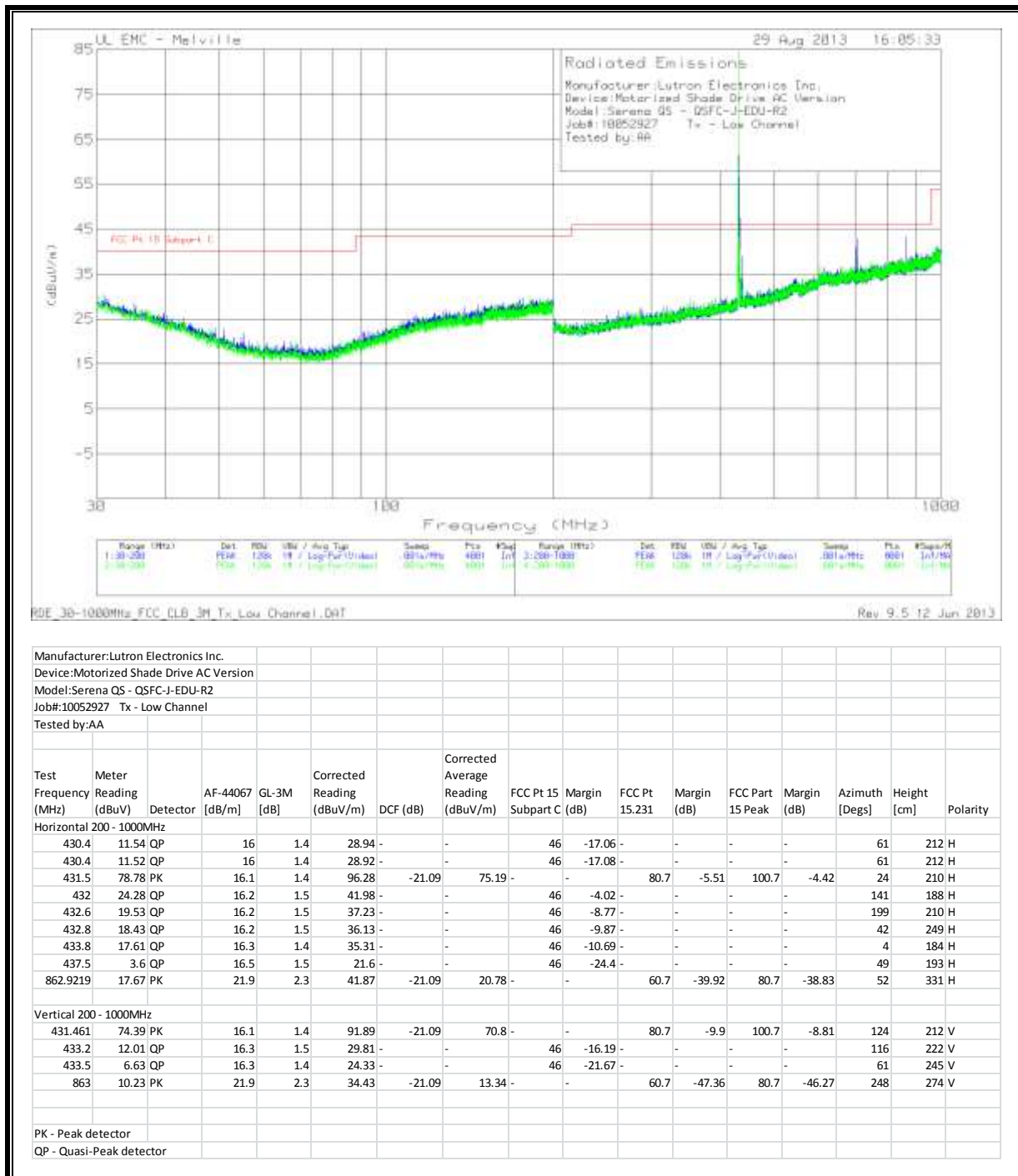
RESULTS

No non-compliance noted:

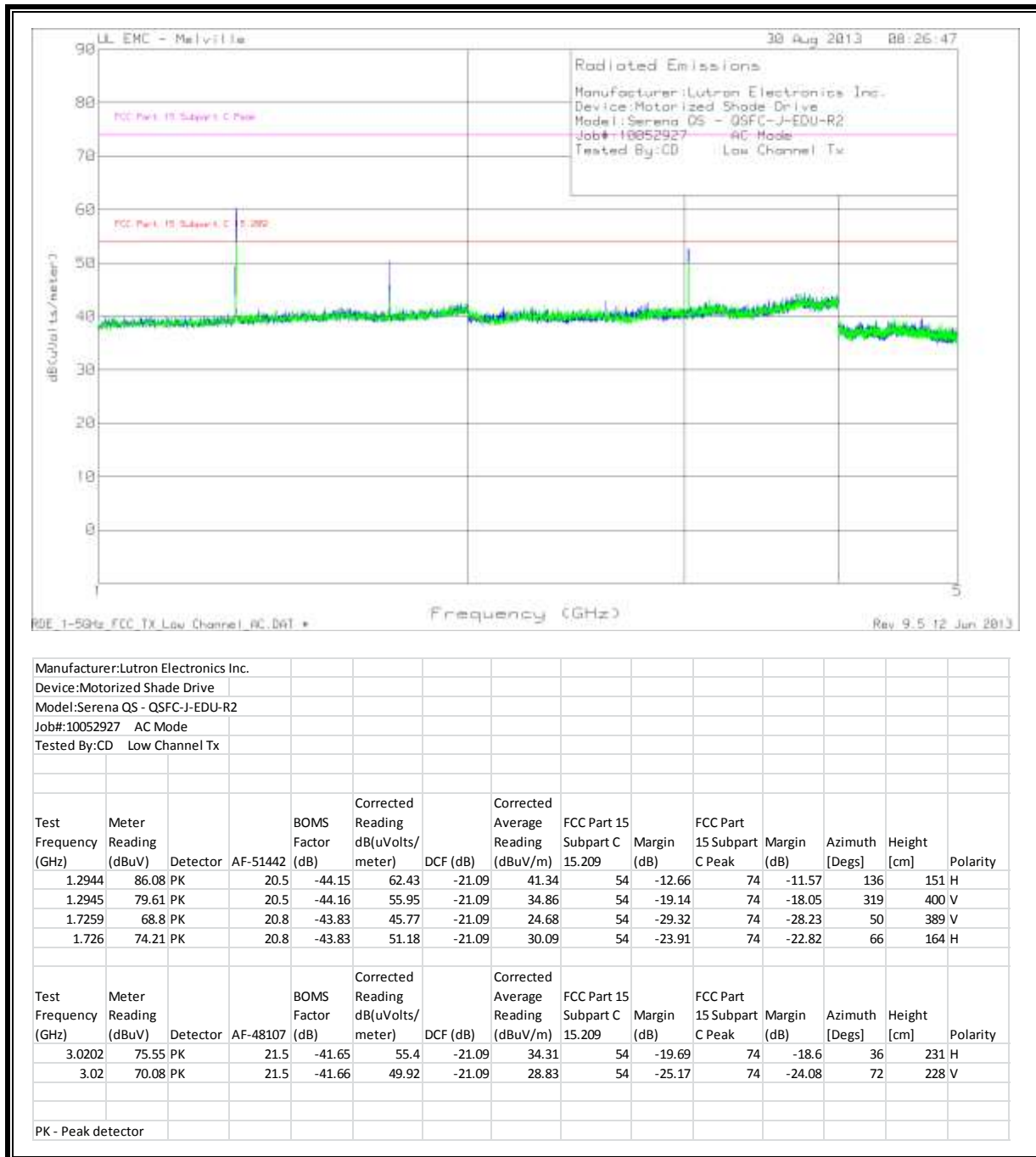
SPURIOUS EMISSION (9kHz – 30 MHz) – Worst case



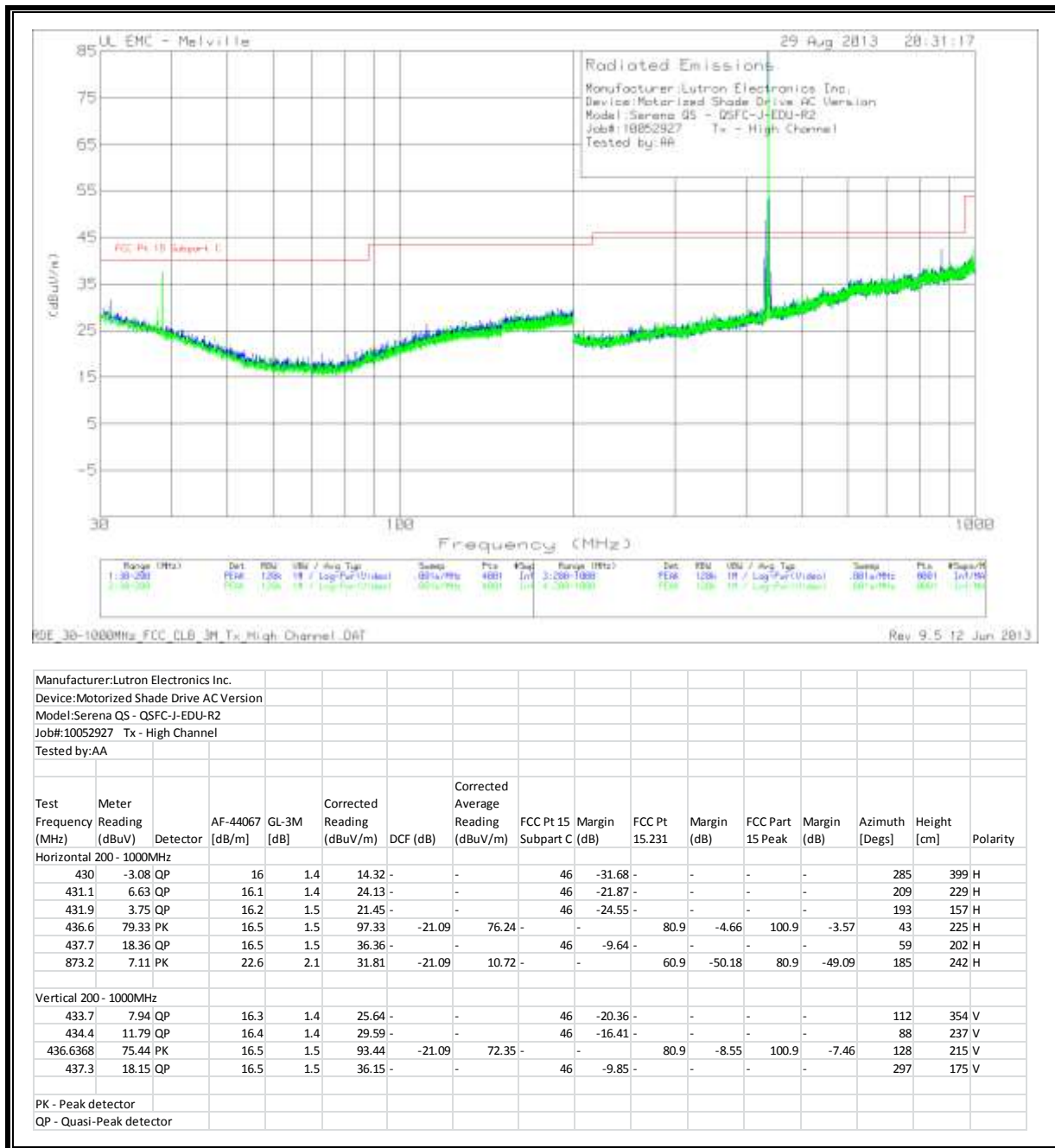
FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz) – Low Channel



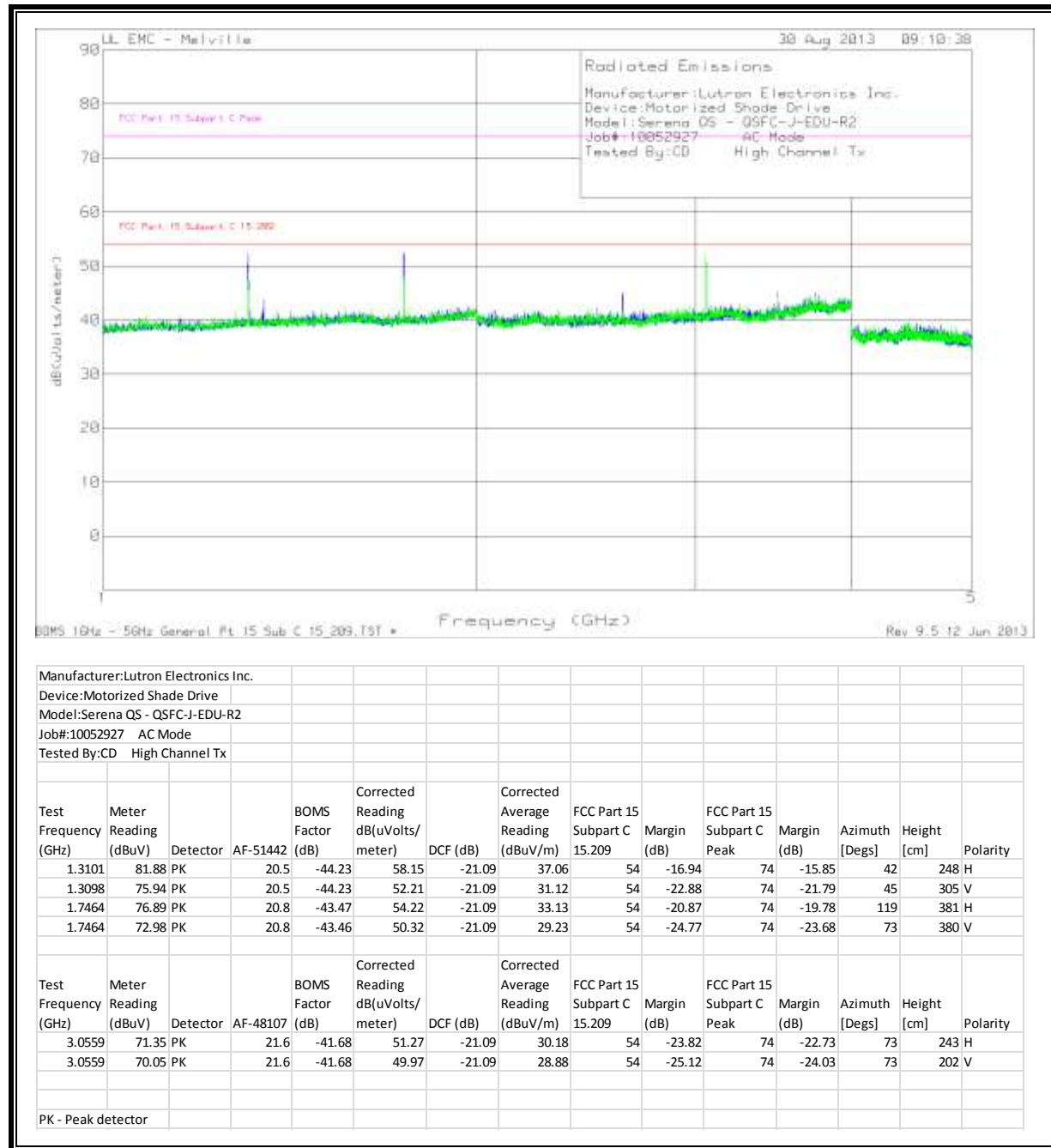
HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – Low Channel



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



HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz – High Channel



8.2. RX RADIATED SPURIOUS EMISSION

LIMITS

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 (dB μ V/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. 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.

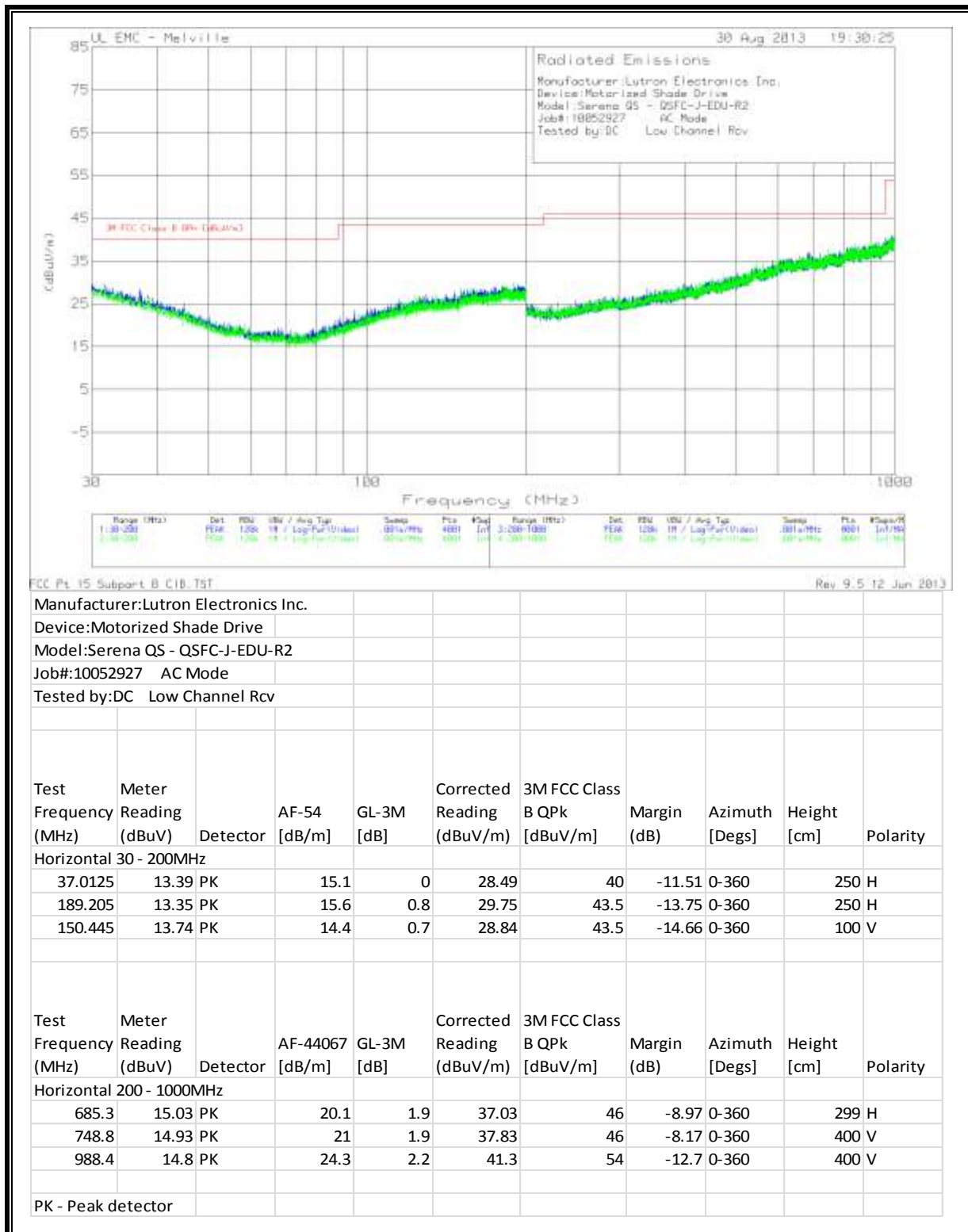
The spectrum from 30 MHz to 5th harmonic is investigated with the transmitter set to the middle channel.

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.

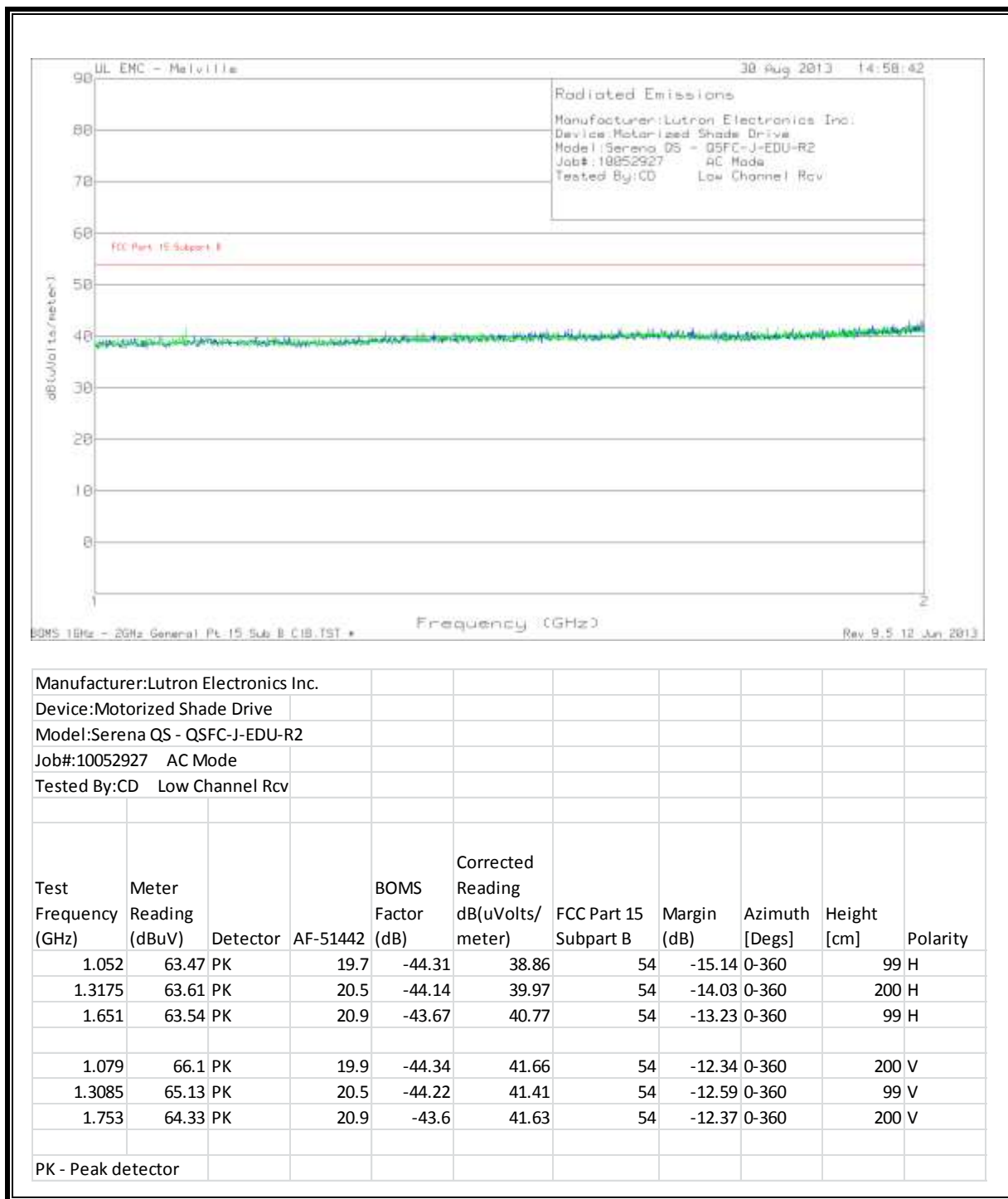
RESULTS

No non-compliance noted:

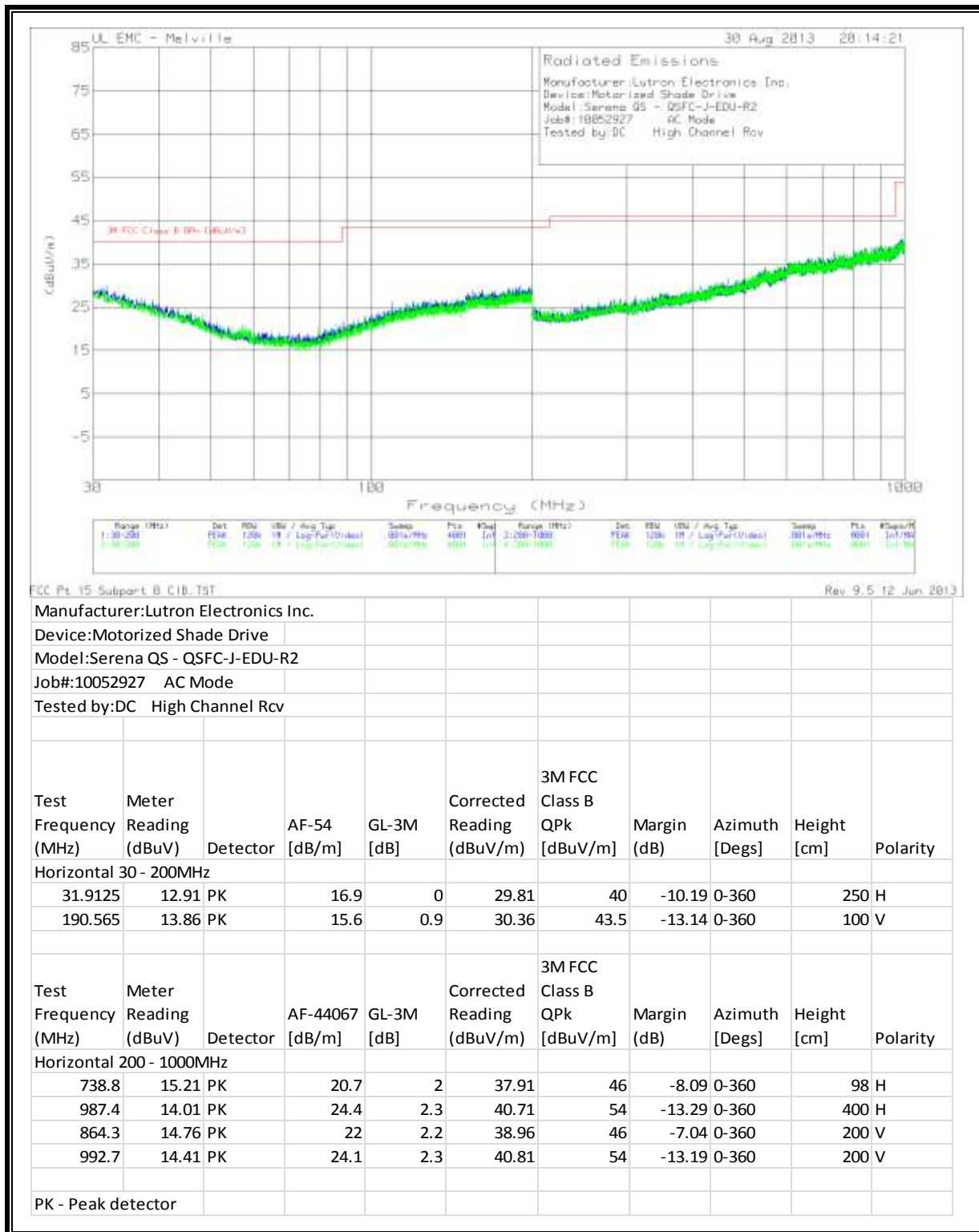
RECEIVER SPURIOUS EMISSION (30MHz - 1GHz) – Low channel



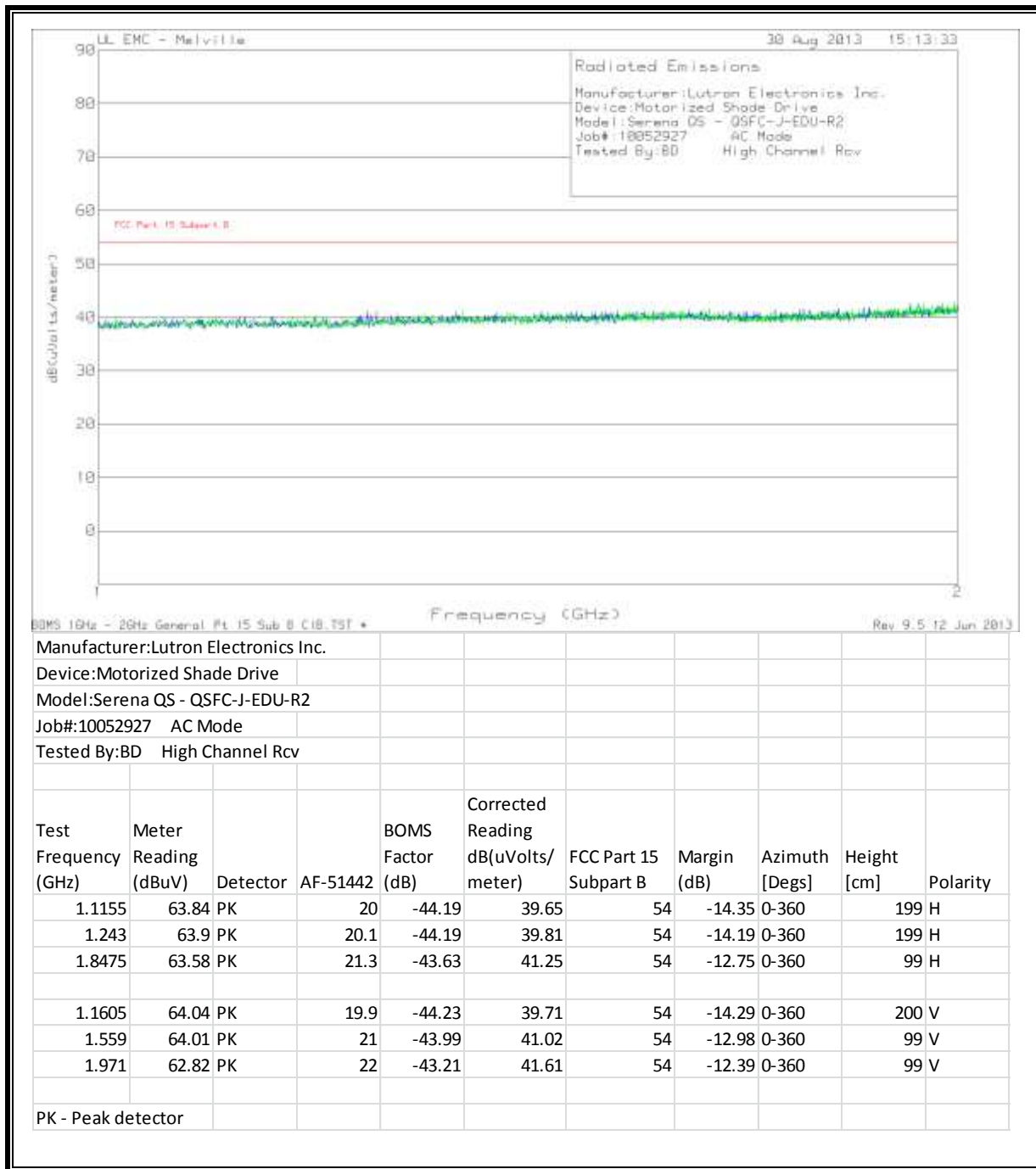
RECEIVER SPURIOUS EMISSION ABOVE 1GHz – Low Channel



RECEIVER SPURIOUS EMISSION (30MHz - 1GHz) – High channel



RECEIVER SPURIOUS EMISSION ABOVE 1GHz – High Channel



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

RESULTS

No non-compliance noted:

6 WORST EMISSIONS – Low Channel TX

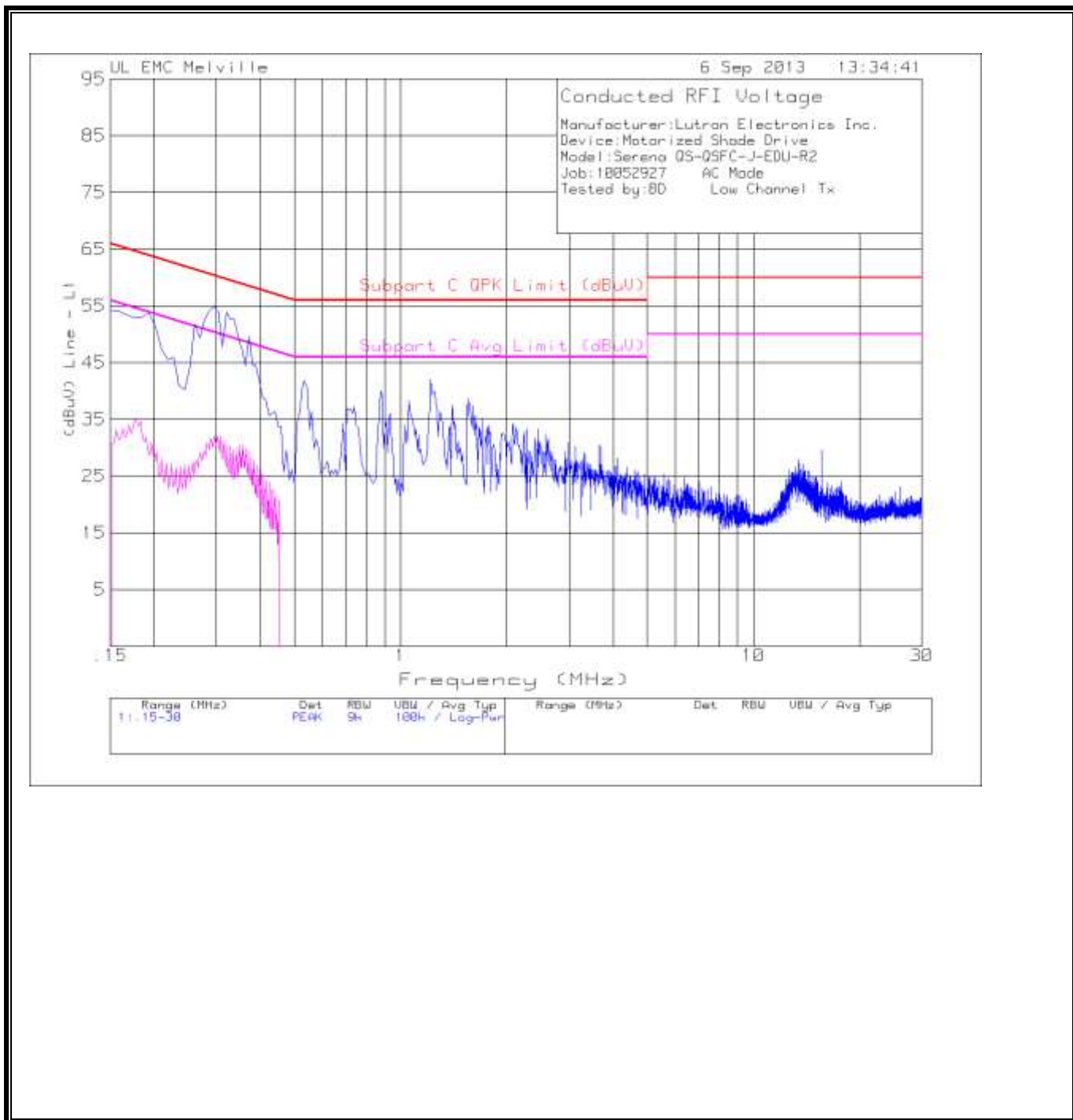
Frequency (MHz)	Meter Reading (dBuV)	Det	5A636 L1 (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.15	44.19	PK	10	54.19	66	-11.81	-	-
.29503	44.91	PK	10	54.91	60.38	-5.47	-	-
.32915	42.66	PK	10	52.66	59.47	-6.81	-	-
.37181	39.63	PK	10	49.63	58.46	-8.83	-	-
.5339	31.81	PK	10	41.81	56	-14.19	-	-
1.21638	32.06	PK	10.1	42.16	56	-13.84	-	-
.16279	23.42	Av	10	33.42	65.32	-31.9	55.32	-21.9
.18304	24.78	Av	10	34.78	64.35	-29.57	54.35	-19.57
.20329	19.49	Av	10	29.49	63.48	-33.99	53.48	-23.99
.29554	22	Av	10	32	60.37	-28.37	50.37	-18.37
.34954	20.58	Av	10	30.58	58.97	-28.39	48.97	-18.39
.45079	10.84	Av	10	20.84	56.86	-36.02	46.86	-26.02

PK - Peak detector
Av - average detection

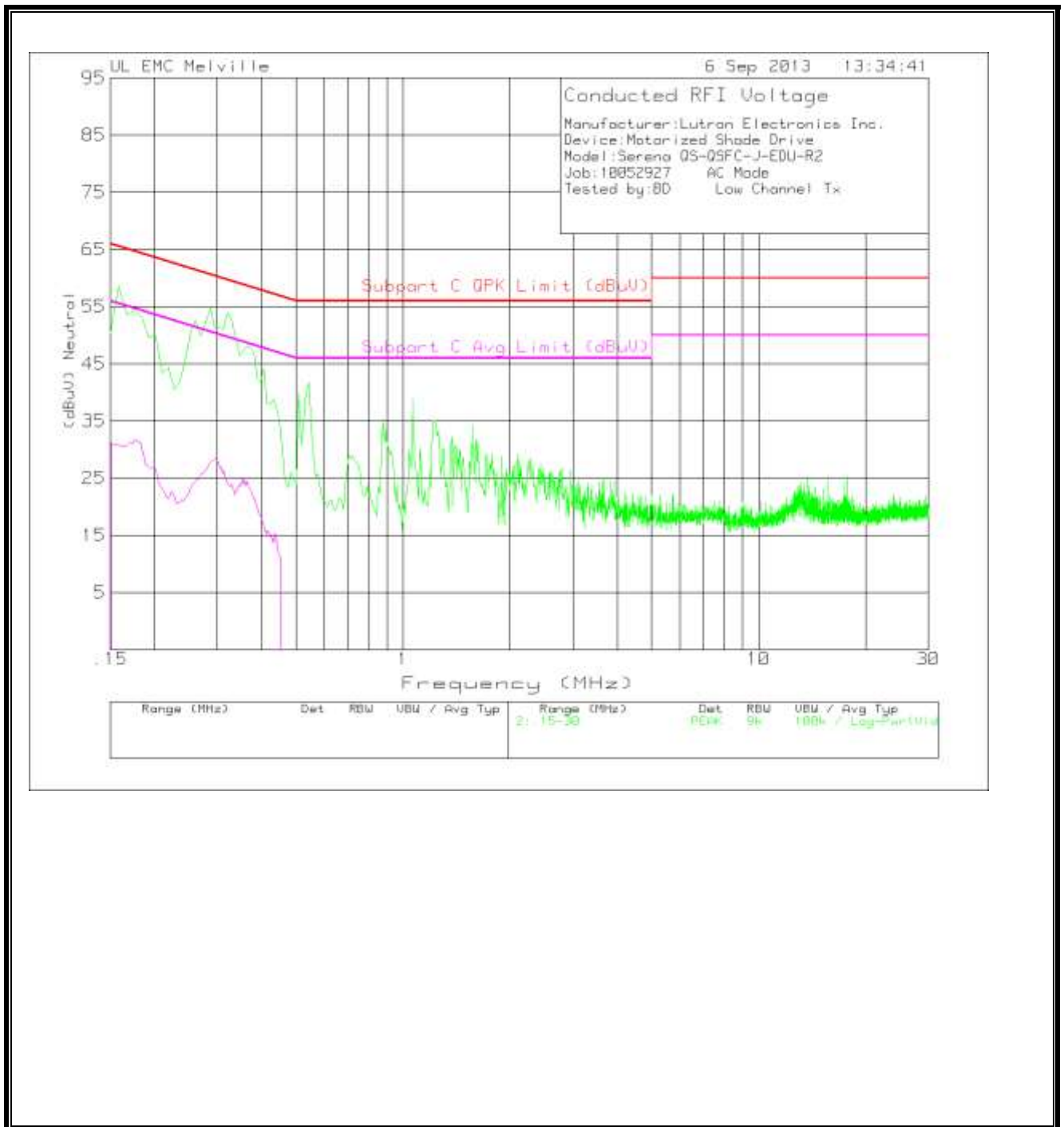
Frequency (MHz)	Meter Reading (dBuV)	Det	5A636 Neut (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.15853	48.53	PK	10.1	58.63	65.54	-6.91	-	-
.2865	44.73	PK	10	54.73	60.63	-5.9	-	-
.32062	43.94	PK	10	53.94	59.69	-5.75	-	-
.54243	31.71	PK	10	41.71	56	-14.29	-	-
1.06282	28.78	PK	10.1	38.88	56	-17.12	-	-
1.23344	25.01	PK	10.1	35.11	56	-20.89	-	-
.1508	21.04	Av	10.1	31.14	65.96	-34.82	55.96	-24.82
.1778	21.71	Av	10	31.71	64.59	-32.88	54.59	-22.88
.2003	16.95	Av	10	26.95	63.6	-36.65	53.6	-26.65
.2273	11.85	Av	10	21.85	62.55	-40.7	52.55	-30.7
.2993	18.28	Av	10	28.28	60.26	-31.98	50.26	-21.98
.3578	14.82	Av	10	24.82	58.78	-33.96	48.78	-23.96

PK - Peak detector
Av - average detection

LINE 1 RESULTS – Low Channel TX



LINE 2 RESULTS – Low Channel TX



6 WORST EMISSIONS – High Channel TX

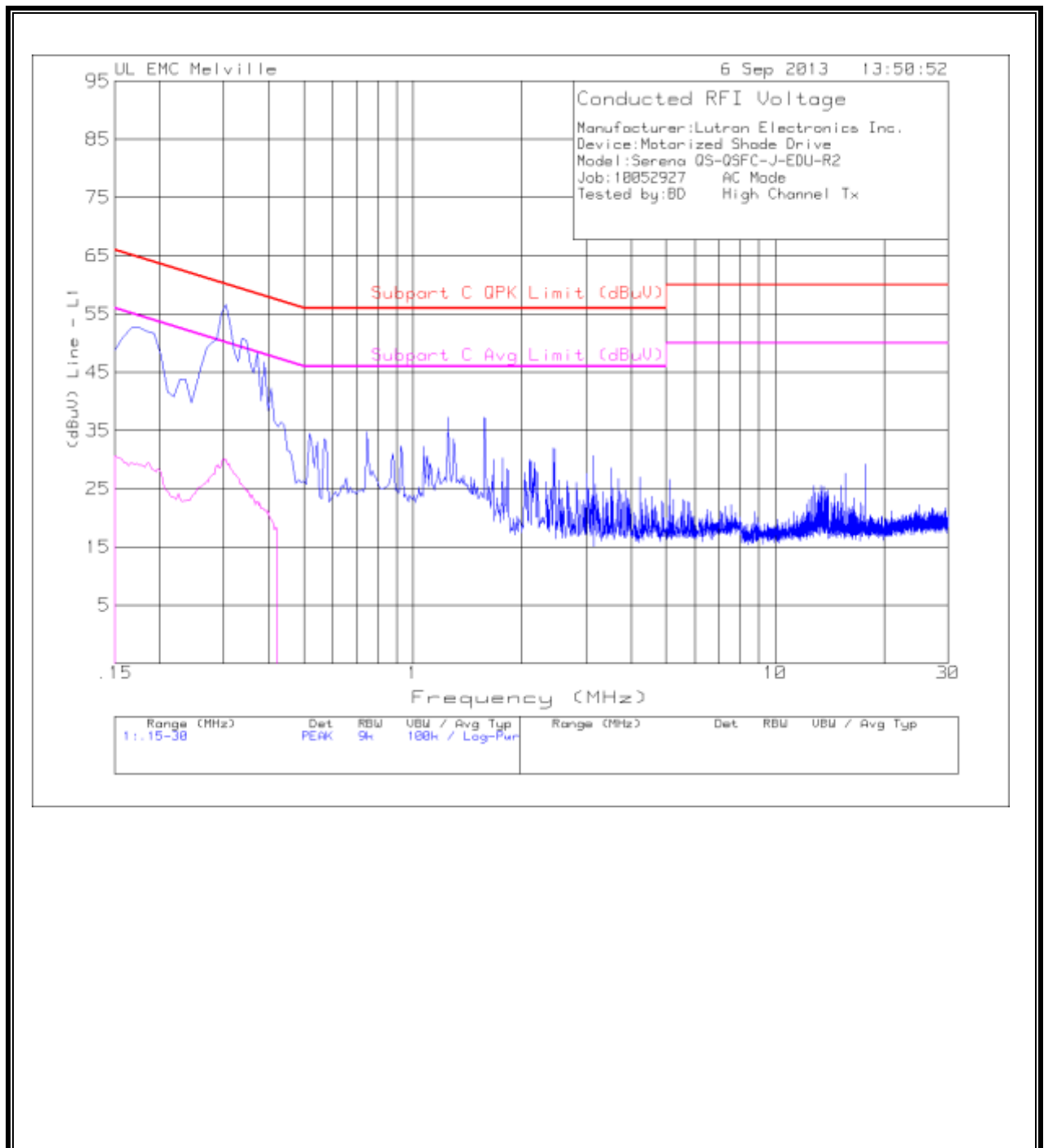
Frequency (MHz)	Meter Reading (dBuV)	Det	5A636 L1 (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.17133	42.6	PK	10	52.6	64.9	-12.3	-	-
.30356	46.56	PK	10	56.56	60.14	-3.58	-	-
.33768	40.84	PK	10	50.84	59.26	-8.42	-	-
.37181	38.31	PK	10	48.31	58.46	-10.15	-	-
.38887	36.78	PK	10	46.78	58.09	-11.31	-	-
1.57468	27.09	PK	10.1	37.19	56	-18.81	-	-
.15457	20.21	Av	10	30.21	65.75	-35.54	55.75	-25.54
.18382	19.3	Av	10	29.3	64.31	-35.01	54.31	-25.01
.20632	14.95	Av	10	24.95	63.35	-38.4	53.35	-28.4
.26932	16.37	Av	10	26.37	61.14	-34.77	51.14	-24.77
.29857	20.19	Av	10	30.19	60.28	-30.09	50.28	-20.09
.37732	12.61	Av	10	22.61	58.34	-35.73	48.34	-25.73

PK - Peak detector
Av - average detection

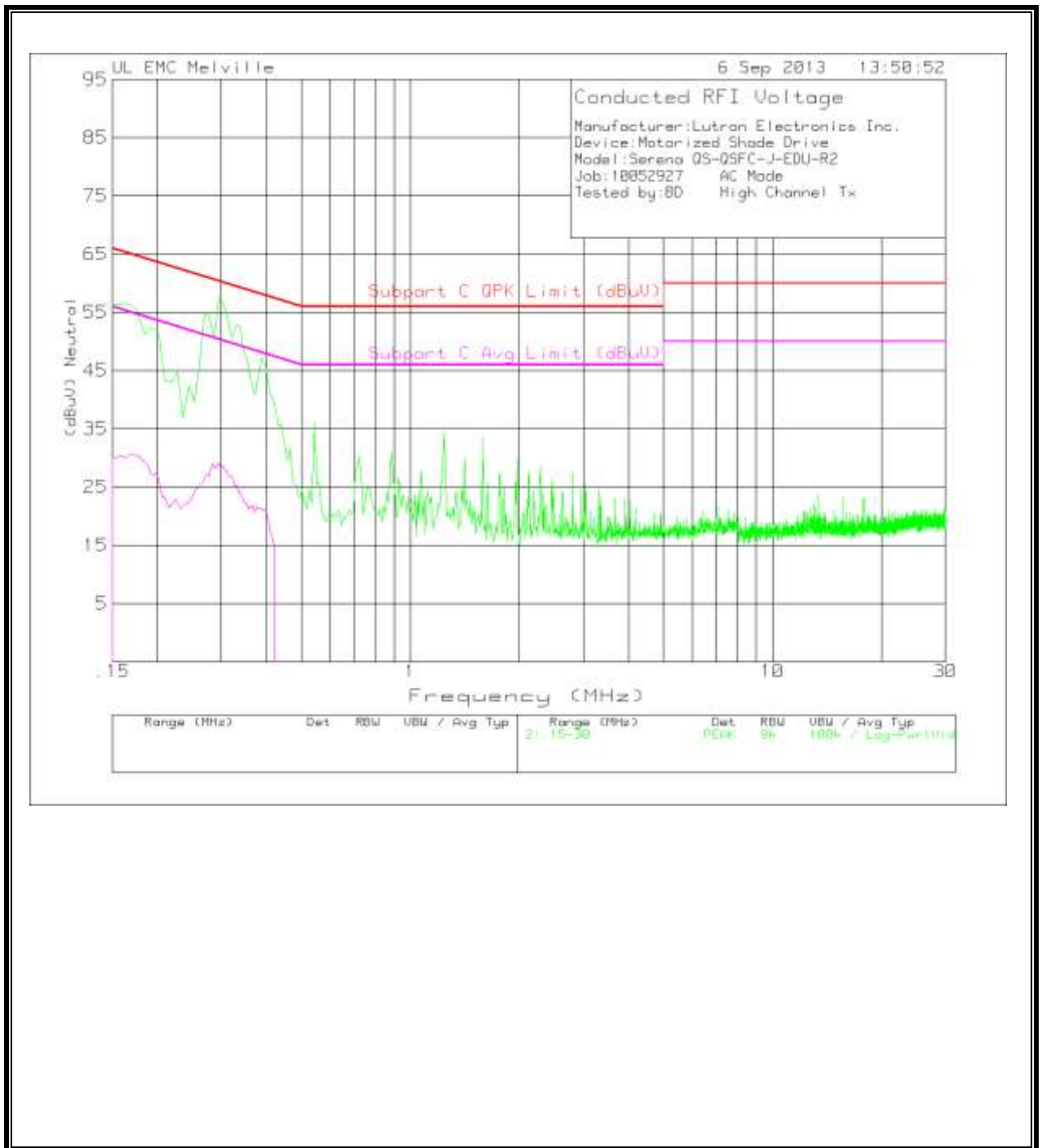
Frequency (MHz)	Meter Reading (dBuV)	Det	5A636 Neut (dB)	Corrected Reading (dBuV)	Subpart C QPK Limit (dBuV)	Margin (dB)	Subpart C Avg Limit (dBuV)	Margin (dB)
.16706	46.45	PK	10	56.45	65.11	-8.66	-	-
.26943	44.57	PK	10	54.57	61.14	-6.57	-	-
.29503	47.52	PK	10	57.52	60.38	-2.86	-	-
.32915	42.65	PK	10	52.65	59.47	-6.82	-	-
.38887	37.18	PK	10	47.18	58.09	-10.91	-	-
1.23344	24.27	PK	10.1	34.37	56	-21.63	-	-
.15007	20.1	Av	10.1	30.2	66	-35.8	56	-25.8
.17707	20.23	Av	10	30.23	64.62	-34.39	54.62	-24.39
.20407	14.48	Av	10	24.48	63.44	-38.96	53.44	-28.96
.26257	15.38	Av	10	25.38	61.35	-35.97	51.35	-25.97
.29407	19.03	Av	10	29.03	60.41	-31.38	50.41	-21.38
.38407	11.51	Av	10	21.51	58.19	-36.68	48.19	-26.68

PK - Peak detector
Av - average detection

LINE 1 RESULTS – High Channel TX



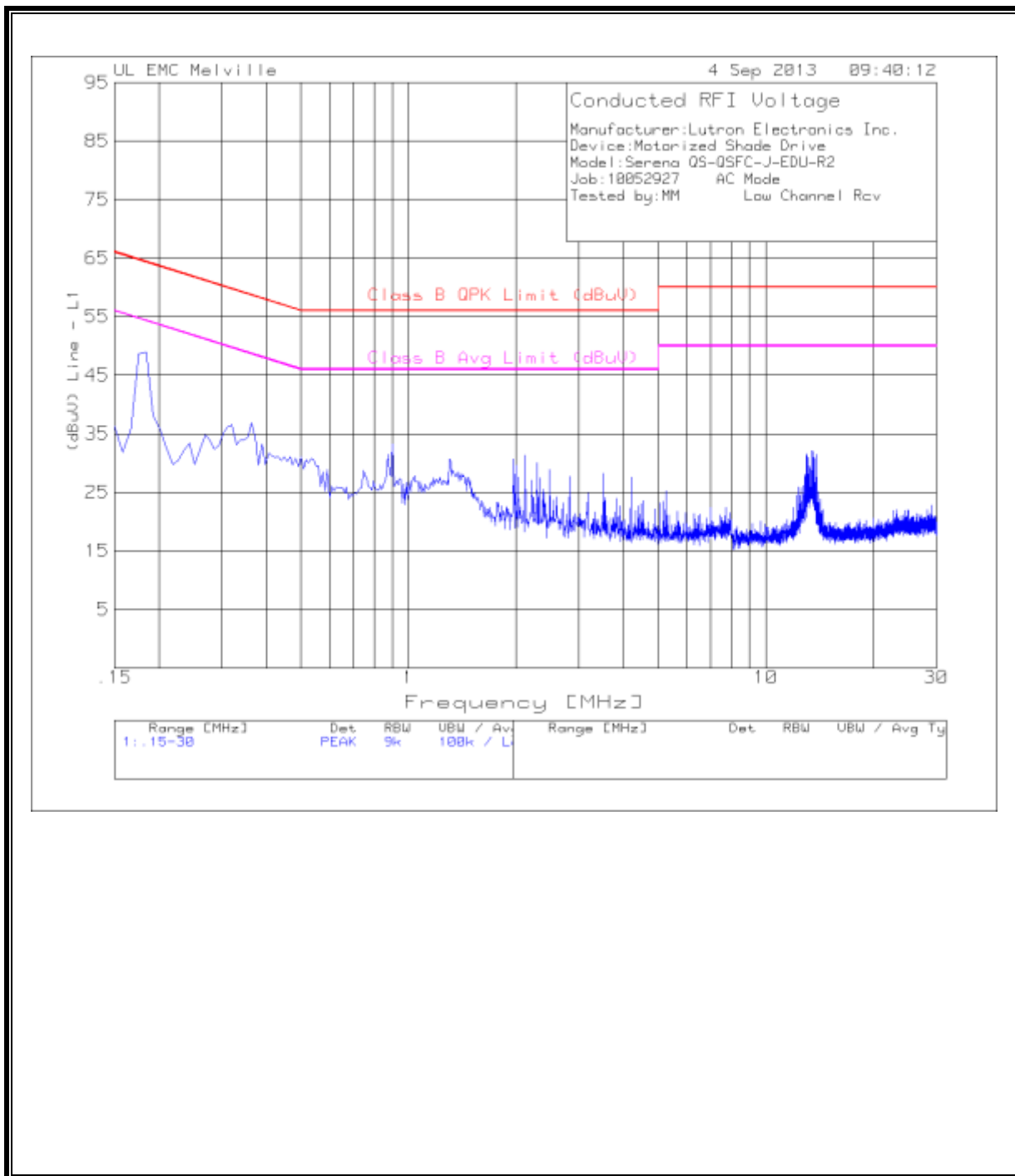
LINE 2 RESULTS – high Channel TX



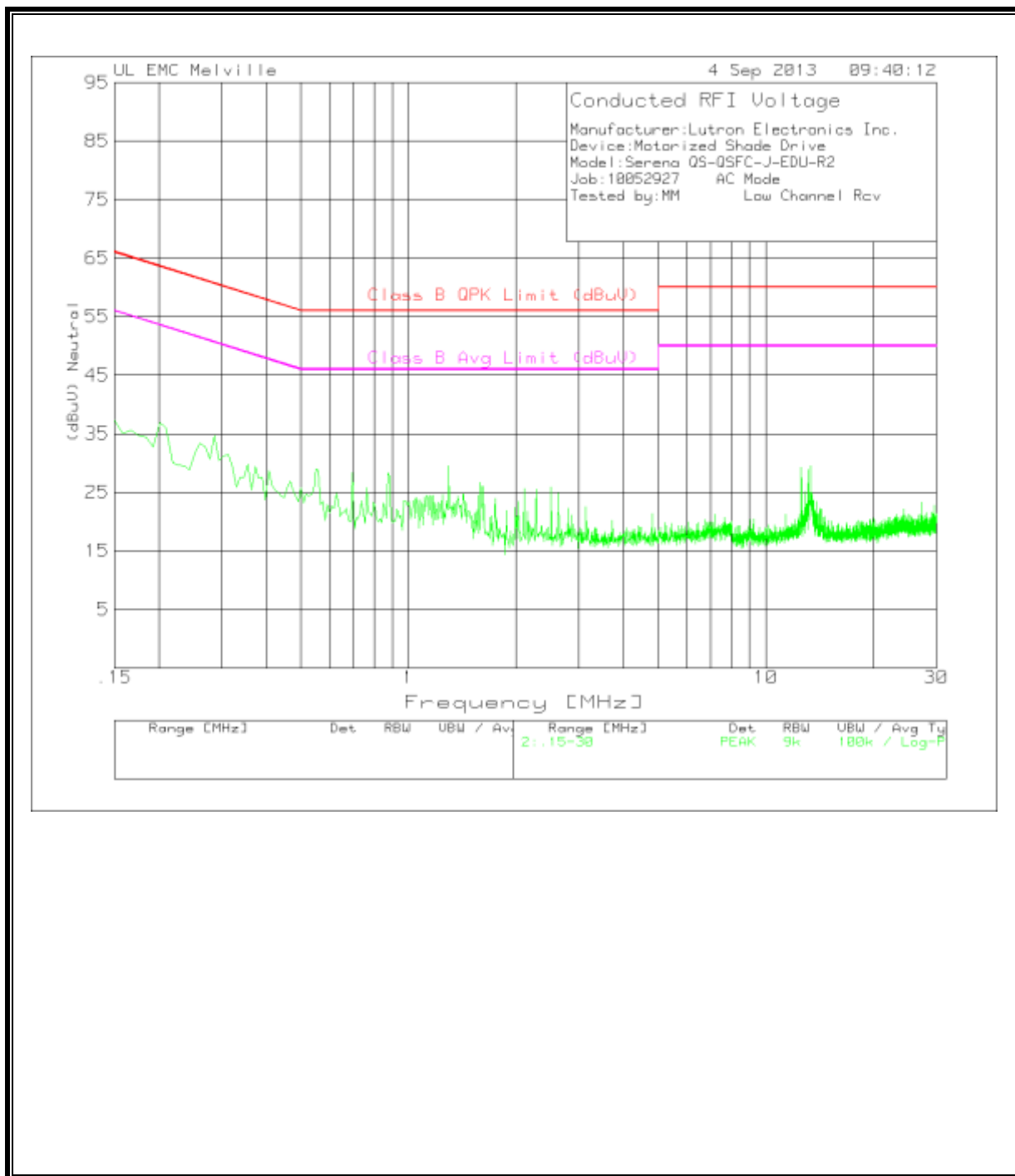
6 WORST EMISSIONS – Low Channel RX

Manufacturer:Lutron Electronics Inc.								
Device:Motorized Shade Drive								
Model:Serena QS-QSFC-J-EDU-R2								
Job:10052927 AC Mode								
Tested by:MM Low Channel Rcv								
Test Frequency (MHz)	Meter Reading (dBuV)	Detector	5A636(dB)	Corrected Reading (dBuV)	Class B QPK Limit (dBuV)	Margin (dB)	Class B Avg Limit (dBuV)	Margin (dB)
Line - L1 .15 - 30MHz								
0.18412	38.9	PK	10	48.9	64.3	-15.4	54.3	-5.4
0.36328	26.83	PK	10	36.83	58.65	-21.82	48.65	-11.82
0.90073	23.3	PK	10	33.3	56	-22.7	46	-12.7
1.96711	20.59	PK	10.1	30.69	56	-25.31	46	-15.31
3.50269	18.07	PK	10.1	28.17	56	-27.83	46	-17.83
13.53515	21.14	PK	10.8	31.94	60	-28.06	50	-18.06
Neutral .15 - 30MHz								
0.20119	26.92	PK	10	36.92	63.56	-26.64	53.56	-16.64
0.55096	18.84	PK	10.1	28.94	56	-27.06	46	-17.06
0.87514	18.23	PK	10.1	28.33	56	-27.67	46	-17.67
1.29316	19.35	PK	10.1	29.45	56	-26.55	46	-16.55
1.59174	16.53	PK	10.1	26.63	56	-29.37	46	-19.37
13.07448	15.74	PK	10.8	26.54	60	-33.46	50	-23.46
PK - Peak detector								

LINE 1 RESULTS – Low Channel RX



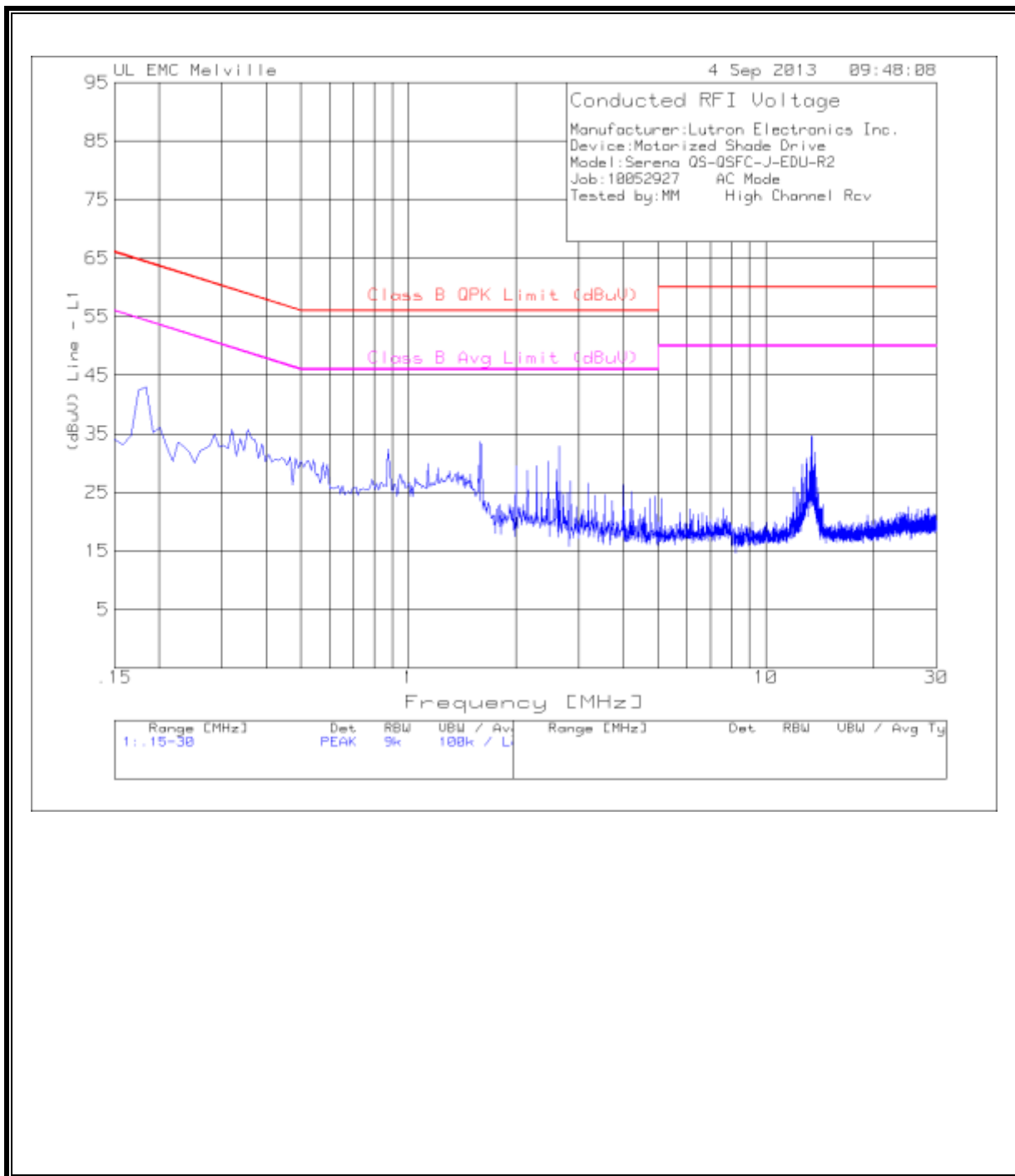
LINE 2 RESULTS – Low Channel RX



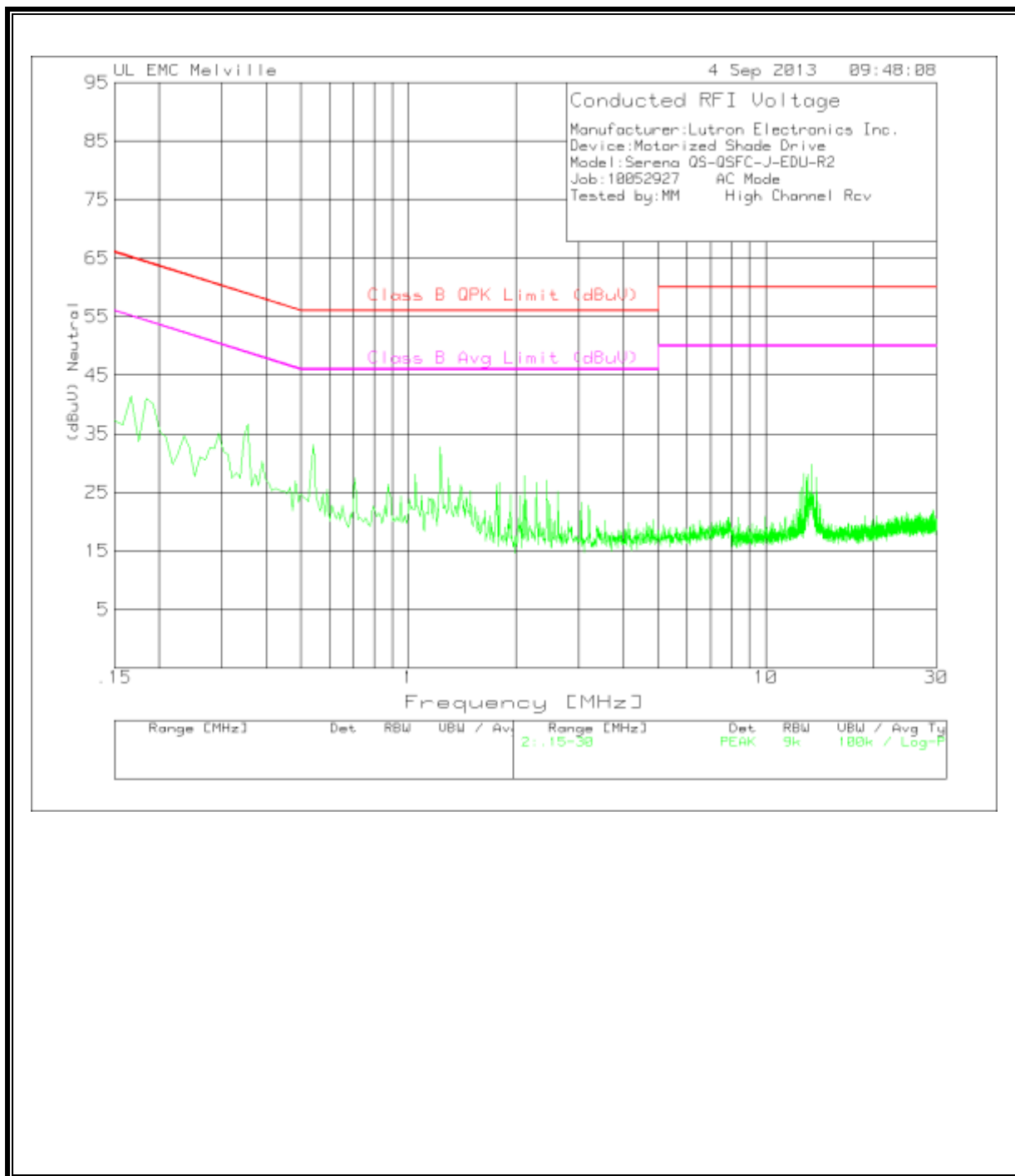
6 WORST EMISSIONS – High Channel RX

Manufacturer:Lutron Electronics Inc.								
Device:Motorized Shade Drive								
Model:Serena QS-QSFC-J-EDU-R2								
Job:10052927 AC Mode								
Tested by:MM High Channel Rcv								
Test	Meter			Corrected				
Frequency	Reading			Reading	Class B QPK	Margin	Class B Avg	Margin
(MHz)	(dBuV)	Detector	5A636(dB)	(dBuV)	Limit (dBuV)	(dB)	Limit (dBuV)	(dB)
Line - L1 .15 - 30MHz								
0.18412	32.96	PK	10	42.96	64.3	-21.34	54.3	-11.34
0.87514	22.34	PK	10	32.34	56	-23.66	46	-13.66
1.59174	23.48	PK	10.1	33.58	56	-22.42	46	-12.42
2.63252	22.79	PK	10.1	32.89	56	-23.11	46	-13.11
3.98042	16.07	PK	10.2	26.27	56	-29.73	46	-19.73
13.44131	23.77	PK	10.8	34.57	60	-25.43	50	-15.43
Neutral .15 - 30MHz								
0.16706	31.42	PK	10	41.42	65.11	-23.69	55.11	-13.69
0.18412	31.05	PK	10	41.05	64.3	-23.25	54.3	-13.25
0.35474	26.68	PK	10	36.68	58.85	-22.17	48.85	-12.17
0.54243	23.19	PK	10	33.19	56	-22.81	46	-12.81
1.22491	22.67	PK	10.1	32.77	56	-23.23	46	-13.23
13.05742	17.24	PK	10.8	28.04	60	-31.96	50	-21.96
PK - Peak detector								

LINE 1 RESULTS – High Channel RX



LINE 2 RESULTS – High Channel RX

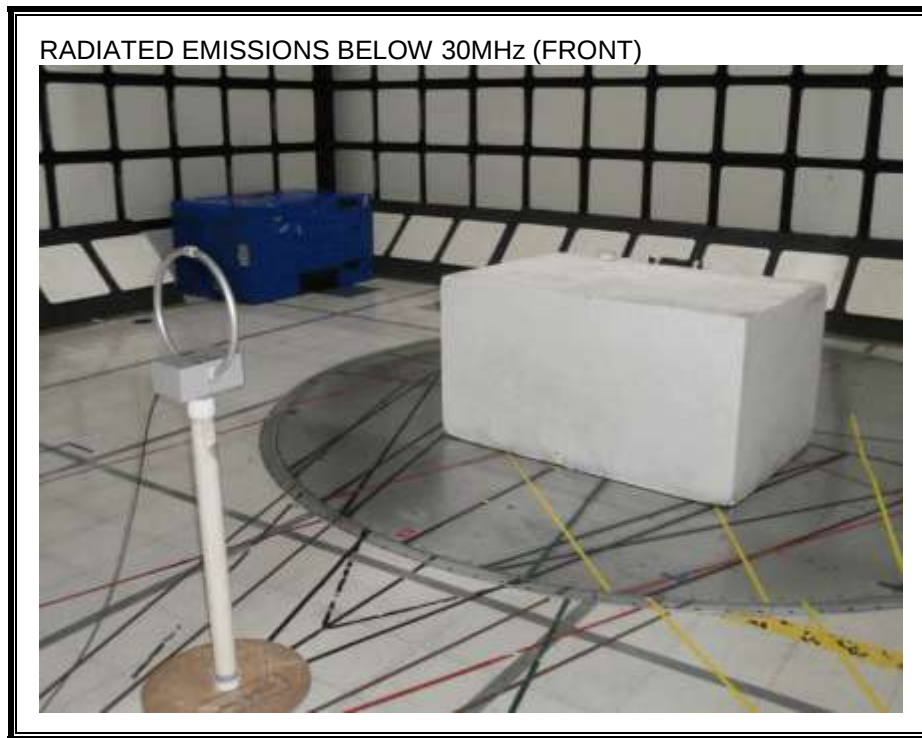


10. SETUP PHOTOS

ANTENNA PORT



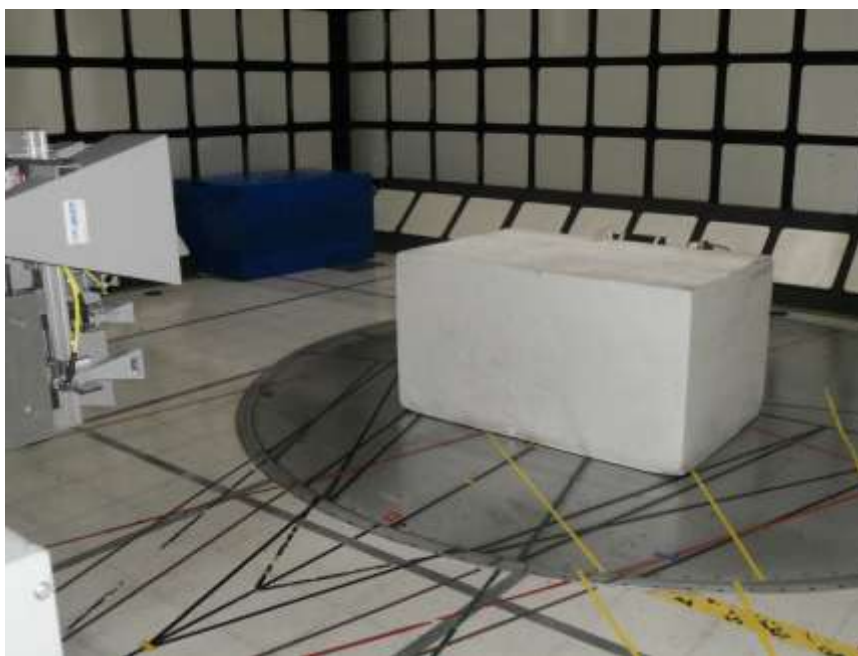
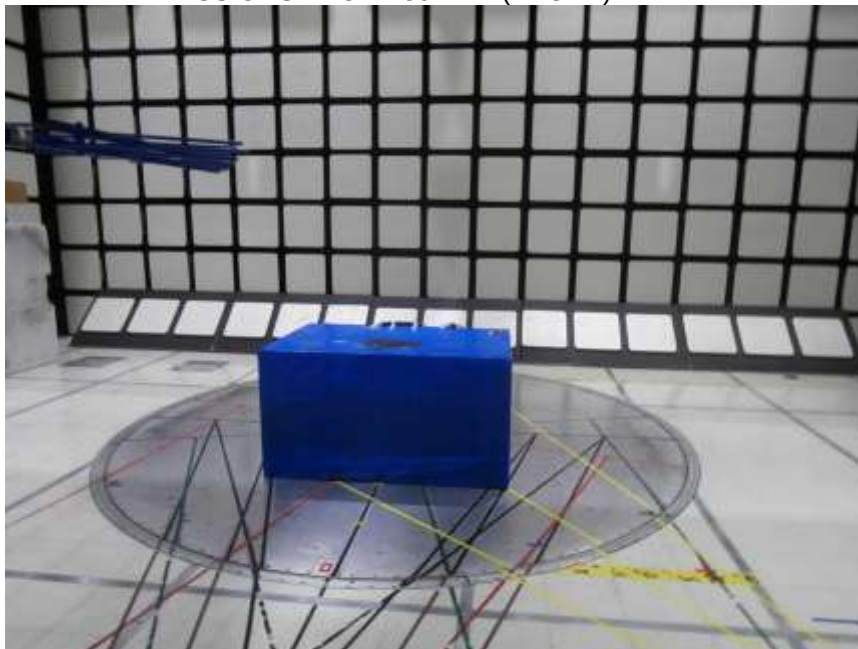
RADIATED EMISSION BELOW 30 MHz





RADIATED EMISSION ABOVE 30 MHz

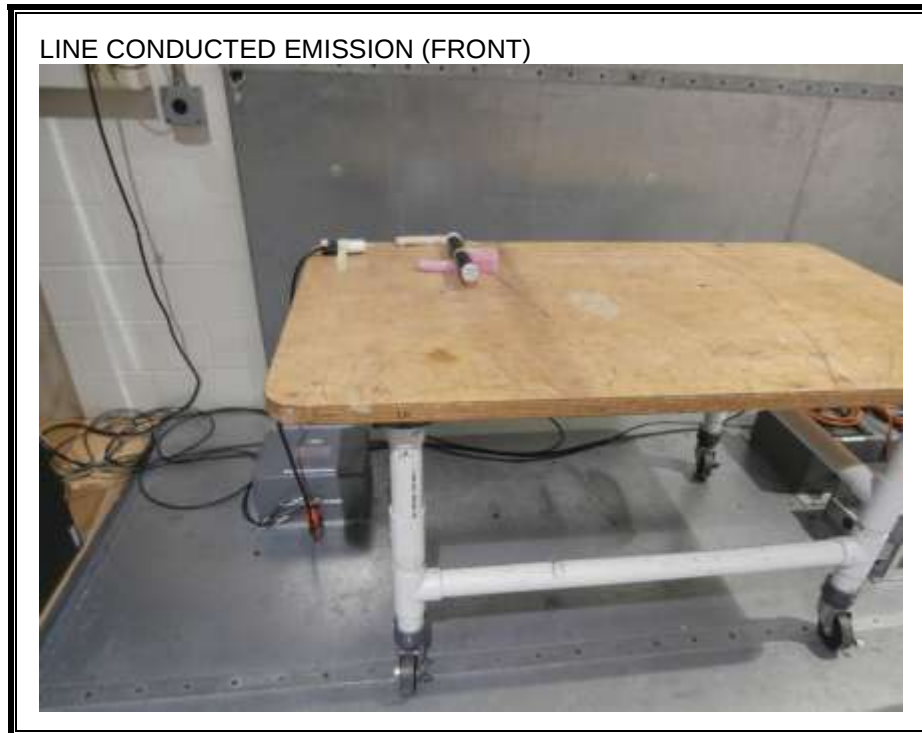
RADIATED EMISSIONS ABOVE 30 MHz (FRONT)



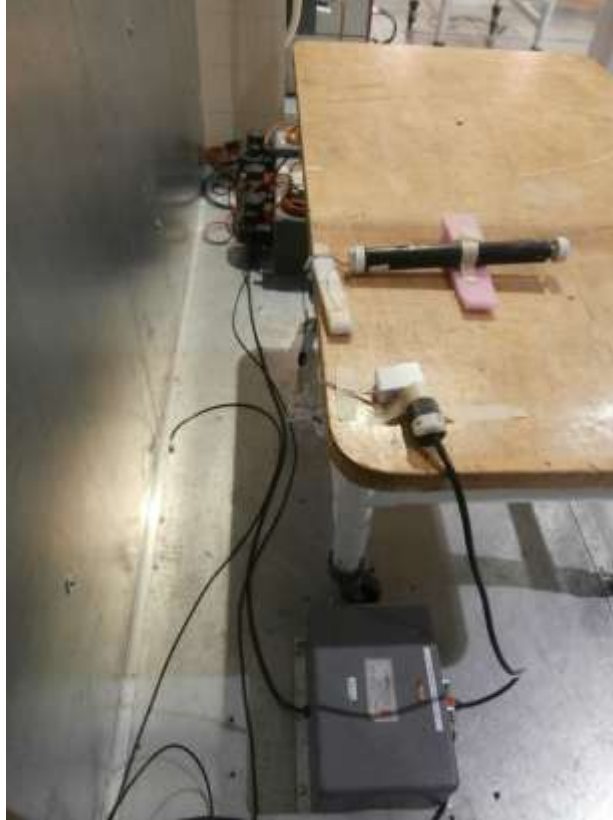
RADIATED EMISSIONS ABOVE 30 MHz (BACK)



AC MAINS LINE CONDUCTED EMISSION



LINE CONDUCTED EMISSION (BACK)



END OF REPORT