

**FCC PART 18 CONSUMER EQUIPMENT
EMI MEASUREMENT AND TEST REPORT
FOR
SHANGHAI EAST PEARL LIGHTING CO., LTD.**

No. 1399 Yongtai Road, Pudong New District, Shanghai 200124, P. R. China

MODEL: QAOWSZEP003

March 23, 2002

This Report Concerns: ☒ Original Report	Equipment Type: Energy saving lamp-lighting device
Test Engineer: Peter Liao	
Test Date: March 21, 2002	
Certified By: John Y. Chan – Engineering Manager	
Prepared By: Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732 9162 Fax: (408) 732 9164	

Note: This report may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

TABLE OF CONTENTS

1 - GENERAL INFORMATION.....	3
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
1.2 OBJECTIVE	3
1.3 RELATED SUBMITTAL(S)/GRANT(S).....	3
1.4 TEST METHODOLOGY	3
1.5 TEST FACILITY	3
1.6 TEST EQUIPMENT LIST	4
1.7 EQUIPMENT UNDER TEST (EUT)	4
1.8 LOCAL SUPPORT EQUIPMENT LISTS AND DETAILS.....	5
2 - SYSTEM TEST CONFIGURATION.....	6
2.1 JUSTIFICATION	6
2.2 EUT EXERCISE PROGRAM	6
2.3 SCHEMATICS/BLOCK DIAGRAM	6
2.4 EQUIPMENT MODIFICATIONS	6
2.5 CONFIGURATION OF TEST SYSTEM.....	7
2.6 TEST SETUP BLOCK DIAGRAM	8
3 - CONDUCTED EMISSIONS TEST.....	9
3.1 MEASUREMENT UNCERTAINTY	9
3.2 EUT SETUP.....	9
3.3 SPECTRUM ANALYZER	9
3.4 TEST PROCEDURE	10
3.5 SUMMARY OF TEST RESULTS	10
3.6 CONDUCTED EMISSIONS TEST DATA (0.45-30MHz).	10
3.7 CONDUCTED EMISSIONS TEST PHOTOS	14
4 - RADIATED EMISSIONS TEST	15
4.1 MEASUREMENT UNCERTAINTY	15
4.2 EUT SETUP.....	15
4.3 SPECTRUM ANALYZER SETUP	15
4.4 TEST PROCEDURE	16
4.5 CORRECTED AMPLITUDE & MARGIN CALCULATION	16
4.6 SUMMARY OF TEST RESULTS	16
4.7 RADIATED EMISSIONS TEST RESULT DATA, FULLY CONFIGURED, 3 METER.....	16
4.8 RADIATED EMISSIONS TEST PHOTOS	24

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *SHANGHAI EAST PEARL LIGHTING CO., LTD.*, model *10405,10407,10409,20107,20109,20111,20113,30209,30211,30213,30215,50309,50311,50313,50315, or the EUT*" as referred to in this report is an Energy saving lamp.

Its details are presented in Appendix D of this report as reference.

1.2 Objective

This report is prepared on behalf of *SHANGHAI EAST PEARL LIGHTING CO., LTD.* in accordance with Part 2, Subpart J, and Part 18, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC Part 18 ISM Consumer equipment limits for RF lighting devices.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report are conducted with FCC Measurement Procedure MP-5, technical requirements for Methods of Measurement of Radio-Noise Emissions from ISM Equipment.

All radiated and conducted emissions measurements are performed at Bay Area Compliance Laboratory Corp. The radiated tests are performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by Sichuan Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is at Xinmiao District, Wuhou Main Street, Chengdu City, Sichuan Province, P. R. C.

Test site at Sichuan Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992 and FCC MP-5.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices,

IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Last Cal. Data	Cal. Due Data
HP	Spectrum Analyzer	8568B	2610A02165	12/6/02	12/6/03
HP	Spectrum Analyzer	8593B	2919A00242	12/20/02	12/20/03
HP	Amplifier	8349B	2644A02662	12/20/02	12/20/03
HP	Quasi-Peak Adapter	85650A	917059	12/6/02	12/6/03
HP	Amplifier	8447E	1937A01046	12/6/02	12/6/03
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/02	11/2/03
Com-Power	Biconical Antenna	AB-100	14012	11/2/02	11/2/03
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/02	12/28/03
Com-Power	LISN	LI-200	12208	12/20/02	12/20/03
Com-Power	LISN	LI-200	12005	12/20/02	12/20/03
BACL	Data Entry Software	DES1	0001	12/20/02	12/20/03
OATS	Open Area Test Site	OATS1	0006	8 /25/01	8 /25/02
No.3 Institution of Electric Industry Department	Main Block Filter	KG-MSF	No	6/5/01	6/5/02
No.3 Institution of Electric Industry Department	High Filter	KG-FG1	No	6/5/01	6/5/02

1.7 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	Chip Set
Shanghai East Pearl Lighting Co., Ltd.	Energy saving lamp	EP104-5W,7W,9W; EP201-7W,9W,11W,13W; EP302-9W,11W,13W,15W; EP503-9W,11W,13W,15W	No	No

1.8 Local Support Equipment Lists and Details

Manufacturer	Description	Model	Serial Number	FCC ID
No	Lamp holder	No	No	No

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT is configured for testing in a typical fashion (as normally used by a typical user).

The Energy saving lamp is used in normal lighting at 120V/60Hz AC.

2.2 EUT Exercise Program

The sequence used is as follows:

The EUT will light after being screwed into the lamp holder and being connected with power supply.

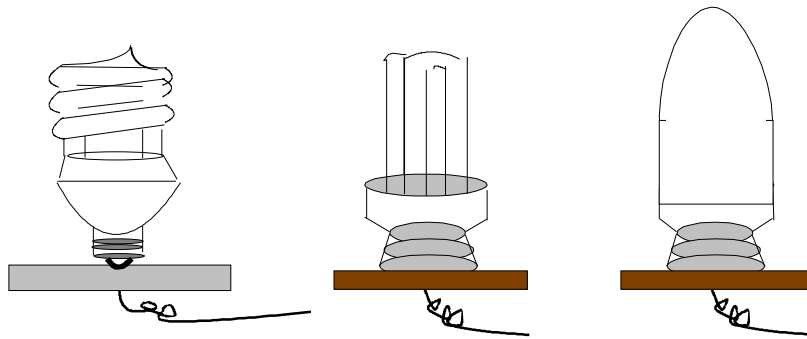
2.3 Schematics/Block Diagram

The EUT's block diagram is presented in Appendix C of this report as reference.

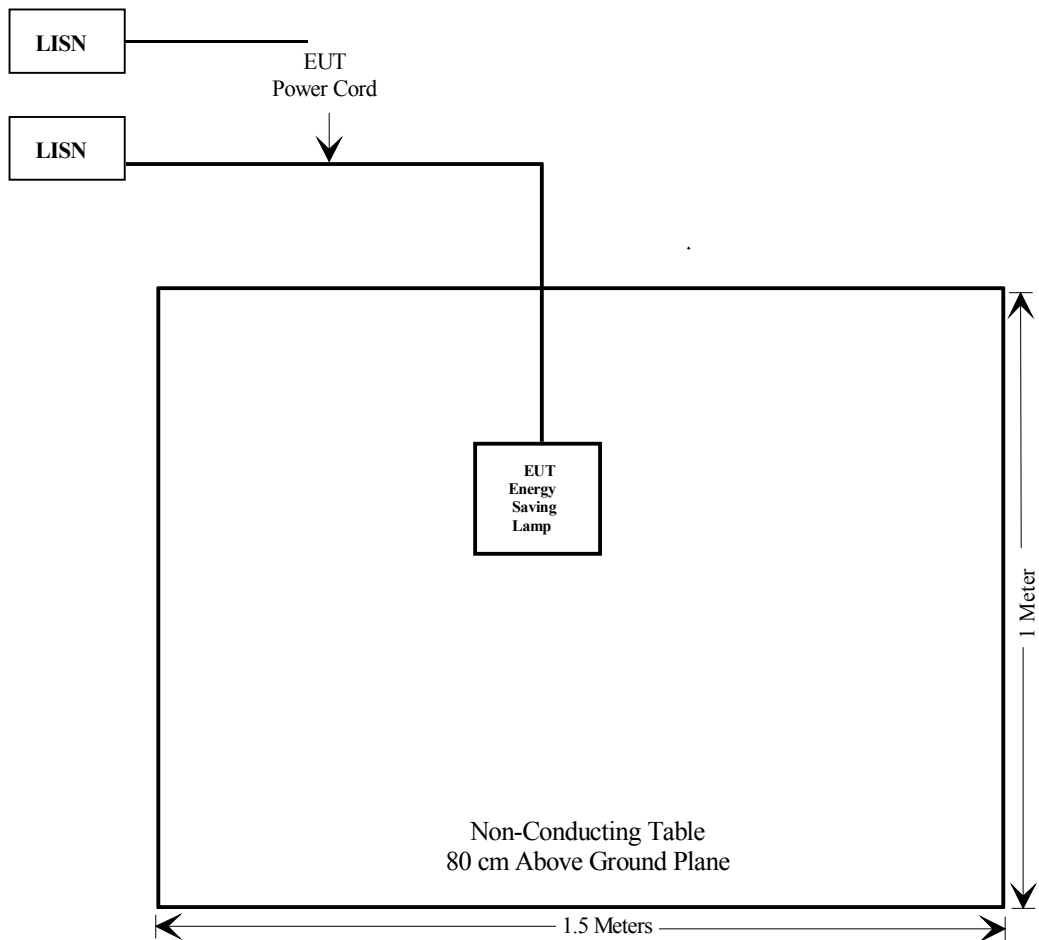
2.4 Equipment Modifications

No modifications are made by BACL Corp. to ensure the EUT complies with the applicable limits and standards.

2.5 Configuration of Test System



2.6 Test Setup Block Diagram



3 - CONDUCTED EMISSIONS TEST

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMI Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ± 2.4 dB.

3.2 EUT Setup

The measurement is performed at the Open Area Test Site, using the same setup per FCC MP-5 measurement procedure.

The EUT is tested independently.

The EUT is placed on the side of test table.

The power supply used by the EUT is connected to a 120VAC/ 60Hz power source.

3.3 Spectrum Analyzer

The spectrum analyzer is configured during the conduction test is as follows:

Start Frequency.....	450 kHz
Stop Frequency.....	30 MHz
Sweep Speed.....	Auto
IF Bandwidth.....	9 kHz
Video Bandwidth.....	100 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode.....	Normal

3.4 Test Procedure

During the conducted emission test, the power cord of the EUT is connected to the auxiliary outlet of the LISN.

Maximizing procedure is performed on the six (6) highest emissions to ensure EUT compliance using all installation combination. All data is recorded in the peak detection mode. Quasi-peak readings are only performed when an emission is found to be marginal (within -4 dBμV of specified limitations). Quasi-peak readings are distinguished with a "Qp".

Final test data for this test configuration is recorded in the table listed under section 3.6 of this report.

3.5 Summary of Test Results

According to the data in section 3.6, the EUT, complied with the FCC 18 Conducted margin for a RF lighting device-Consumer Equipment limits and these test results is deemed satisfactory evidence.

3.6 Conducted Emissions Test Data (0.45-30MHz).

Model: 10405

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Peak	Line/Neutral	dBμV	dB
0.45	43.7	QP	Neutral	48	-4.3
0.45	43.2	QP	Line	48	-4.8
12.12	21.9	QP	Line	48	-26.1
1.66	21.3	QP	Neutral	48	-26.7
11.83	21.1	QP	Neutral	48	-26.9
13.92	19.1	QP	Line	48	-28.9

Model: 10407

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Ave/Peak	Line/Neutral	dBμV	dB
0.45	45.1	QP	Line	48	-2.9
0.45	43.9	QP	Neutral	48	-4.1
13.90	18.7	QP	Neutral	48	-29.3
13.90	18.0	QP	Line	48	-30.0
2.13	17.9	QP	Neutral	48	-30.1
11.83	17.6	QP	Line	48	-30.4

Model: 10409

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER	
--------------------------	--	--	--	----------------	--

				EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	43.2	QP	Line	48	-4.8
0.45	42.6	QP	Neutral	48	-5.4
13.90	22.0	QP	Line	48	-26.0
13.90	21.7	QP	Neutral	48	-26.3
11.83	20.6	QP	Line	48	-27.4
2.13	19.3	QP	Neutral	48	-28.7

Model: 20107

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	40.8	QP	Neutral	48	-7.2
0.45	38.7	QP	Line	48	-9.3
11.80	28.9	QP	Neutral	48	-19.1
12.06	27.4	QP	Line	48	-20.6
1.99	23.6	QP	Neutral	48	-24.4
2.05	20.5	QP	Line	48	-27.5

Model: 20109

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	40.7	QP	Line	48	-7.3
0.45	40.5	QP	Neutral	48	-7.5
11.80	28.2	QP	Neutral	48	-19.8
1.66	25.6	QP	Neutral	48	-22.4
1.87	21.8	QP	Line	48	-26.2
15.73	20.3	QP	Line	48	-27.7

Model: 20111

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	40.7	QP	Line	48	-7.3
0.45	40.5	QP	Neutral	48	-7.5
11.80	28.2	QP	Neutral	48	-19.8
1.66	25.6	QP	Neutral	48	-22.4
1.87	21.8	QP	Line	48	-26.2

15.73	20.3	QP	Line	48	-27.7
-------	------	----	------	----	-------

Model: 20113

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	39.7	QP	Neutral	48	-8.3
0.45	38.9	QP	Line	48	-9.1
1.54	31.0	QP	Line	48	-17.0
1.57	30.9	QP	Neutral	48	-17.1
15.61	22.9	QP	Neutral	48	-25.1
18.12	22.5	QP	Line	48	-25.5

Model: 30209

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	37.2	QP	Neutral	48	-10.8
0.45	35.5	QP	Line	48	-12.5
12.09	29.4	QP	Neutral	48	-18.6
11.77	29.4	QP	Line	48	-18.6
13.78	23.1	QP	Line	48	-24.9
13.81	22.7	QP	Neutral	48	-25.3

Model: 30211

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	38.7	QP	Neutral	48	-9.3
0.45	36.6	QP	Line	48	-11.4
12.09	29.9	QP	Line	48	-18.1
12.12	29.0	QP	Neutral	48	-19.0
13.90	24.4	QP	Line	48	-23.6
13.90	21.6	QP	Neutral	48	-26.4

Model: 30213

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	40.9	QP	Neutral	48	-7.1

0.45	40.6	QP	Line	48	-7.4
12.12	30.4	QP	Line	48	-17.6
12.12	29.8	QP	Neutral	48	-18.2
15.70	21.8	QP	Line	48	-26.2
15.61	21.0	QP	Neutral	48	-27.0

odel: 30215

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
1.51	40.3	QP	Line	48	-7.7
2.40	38.2	QP	Line	48	-9.8
1.51	38.0	QP	Neutral	48	-10.0
2.43	37.9	QP	Neutral	48	-10.1
9.67	28.0	QP	Neutral	48	-20.0
9.70	26.7	QP	Line	48	-21.3

Model: 50309

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	42.3	QP	Line	48	-5.7
0.45	41.0	QP	Neutral	48	-7.0
1.51	30.1	QP	Line	48	-17.9
9.79	25.8	QP	Line	48	-22.2
9.85	25.4	QP	Neutral	48	-22.6
2.13	23.0	QP	Neutral	48	-25.0

Model: 50311

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	39.7	QP	Neutral	48	-8.3
0.45	37.4	QP	Line	48	-10.6
11.77	30.4	QP	Line	48	-17.6
12.15	29.3	QP	Neutral	48	-18.7
1.28	27.4	QP	Line	48	-20.6
1.66	27.2	QP	Neutral	48	-20.8

Model: 50313

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
--------------------------	--	--	--	--------------------------	--

				EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	44.3	QP	Line	48	-3.7
0.45	42.8	QP	Neutral	48	-5.2
11.77	29.7	QP	Neutral	48	-18.3
11.77	28.7	QP	Line	48	-19.3
13.84	22.3	QP	Neutral	48	-25.7
13.90	21.1	QP	Line	48	-26.9

Model: 50315

LINE CONDUCTED EMISSIONS				FCC18 CONSUMER EQUIPMENT	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	QP/Ave/Peak	Line/Neutral	dB μ V	dB
0.45	38.7	QP	Line	48	-9.3
0.45	38.6	QP	Neutral	48	-9.4
2.39	33.4	QP	Neutral	48	-14.6
1.58	32.9	QP	Line	48	-15.1
11.18	31.9	QP	Neutral	48	-16.1
12.12	31.6	QP	Line	48	-16.4

3.7 Conducted Emissions Test Photos

Conducted emissions test photos were contained in Appendix A of this report as reference.

4 - RADIATED EMISSIONS TEST

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMI Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

4.2 EUT Setup

The radiated emission tests are performed in the open area 3 meters test site for the final test configuration, using the setup accordance with the ANSI C63.4 – 1992 or FCC MP-5. The specification used is according to FCC Part 18 Consumer Equipment limits for the final test configuration.

The EUT is placed on the center of the test table.

The power supply used by the EUT is connected to a 120VAC/ 60Hz power source.

4.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 18.309, the tested performed from 30MHz to 1000MHz.

During the radiated emission test, the spectrum analyzer is set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed	Auto
IF Bandwidth	100 kHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth.....	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth.....	1 MHz

4.4 Test Procedure

For the radiated emissions test, Maximizing procedure is performed on the twelve (12) highest emissions to ensure EUT is compliant with all installation combinations.

All data is recorded in the peak detection mode. Quasi-peak readings performed only when an emission is found to be marginal (within -4 dB μ V of specified limitations), and are distinguished with a "Qp" in the data table.

Therefore, the final test data for this configuration is recorded and represented in the table(s) listed under section 4.7 of this report.

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for lighting devices- ISM Consumer Equipment. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Consumer Equipment Limit}$$

4.6 Summary of Test Results

According to the data in section 4.7, the EUT, complied with the FCC Part 18 standards for the final test and these test results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations.

4.7 Radiated Emissions Test Result Data, Fully Configured, 3 Meter.

Model: 10405

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
30.44	30.6	0.0	1	H	15.7	2.1	22.0	26.4	40	-13.6
39.98	31.6	0.0	1	V	14.6	2.1	22.0	26.3	40	-13.7
32.37	29.9	0.0	1	H	15.7	2.1	22.0	25.7	40	-14.3
32.38	30.1	0.0	1	V	15.3	2.1	22.0	25.5	40	-14.5
36.75	30.8	0.0	1	V	14.6	2.1	22.0	25.5	40	-14.5
36.75	30.9	0.0	1	H	14.4	2.1	22.0	25.4	40	-14.6
39.98	30.7	0.0	1	H	14.4	2.1	22.0	25.2	40	-14.8
30.45	29.7	0.0	1	V	15.3	2.1	22.0	25.1	40	-14.9
44.15	31.5	0.0	1	H	13.1	2.2	22.0	24.8	40	-15.2
41.45	31.0	0.0	1	H	13.1	2.2	22.0	24.3	40	-15.7
44.16	32.4	0.0	1	V	11.1	2.2	22.0	23.7	40	-16.3
41.43	31.9	0.0	1	V	11.1	2.2	22.0	23.2	40	-16.8

Model: 10407

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
34.14	30.7	0.0	1	H	15.7	2.1	22.0	26.5	40	-13.5
31.75	30.0	0.0	1	H	15.7	2.1	22.0	25.8	40	-14.2
36.84	31.1	0.0	1	H	14.4	2.1	22.0	25.6	40	-14.4
39.45	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
34.14	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
36.83	30.6	0.0	1	V	14.6	2.1	22.0	25.3	40	-14.7
39.44	30.6	0.0	1	V	14.6	2.1	22.0	25.3	40	-14.7
31.76	29.7	0.0	1	V	15.3	2.1	22.0	25.1	40	-14.9
44.69	31.8	0.0	1	H	13.1	2.2	22.0	25.1	40	-14.9
41.52	31.7	0.0	1	H	13.1	2.2	22.0	25.0	40	-15.0
44.69	32.8	0.0	1	V	11.1	2.2	22.0	24.1	40	-15.9
41.51	32.5	0.0	1	V	11.1	2.2	22.0	23.8	40	-16.2

Model: 10409

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
30.62	30.4	0.0	1	H	15.7	2.1	22.0	26.2	40	-13.8
33.09	30.4	0.0	1	H	15.7	2.1	22.0	26.2	40	-13.8
37.45	30.9	0.0	1	H	14.4	2.1	22.0	25.4	40	-14.6
30.63	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
33.08	29.7	0.0	1	V	15.3	2.1	22.0	25.1	40	-14.9
43.68	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
45.98	31.7	0.0	1	H	12.7	2.5	22.0	24.9	40	-15.1
40.46	31.5	0.0	1	H	13.1	2.2	22.0	24.8	40	-15.2
37.45	29.7	0.0	1	V	14.6	2.1	22.0	24.4	40	-15.6
40.45	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1
43.68	32.4	0.0	1	V	11.1	2.2	22.0	23.7	40	-16.3
45.98	32.1	0.0	1	V	10.5	2.5	22.0	23.1	40	-16.9

Model: 20107

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
33.58	31.0	0.0	1	H	15.7	2.1	22.0	26.8	40	-13.2
33.59	30.4	0.0	1	V	15.3	2.1	22.0	25.8	40	-14.2
36.98	31.2	0.0	1	H	14.4	2.1	22.0	25.7	40	-14.3
36.98	30.7	0.0	1	V	14.6	2.1	22.0	25.4	40	-14.6
39.75	30.6	0.0	1	V	14.6	2.1	22.0	25.3	40	-14.7
41.45	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
44.71	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
31.67	29.3	0.0	1	V	15.3	2.1	22.0	24.7	40	-15.3
31.67	28.9	0.0	1	H	15.7	2.1	22.0	24.7	40	-15.3
39.76	30.1	0.0	1	H	14.4	2.1	22.0	24.6	40	-15.4
44.73	32.7	0.0	1	V	11.1	2.2	22.0	24.0	40	-16.0
41.45	32.5	0.0	1	V	11.1	2.2	22.0	23.8	40	-16.2

Model: 20109

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
33.05	30.9	0.0	1	H	15.7	2.1	22.0	26.7	40	-13.3
30.79	30.6	0.0	1	V	15.3	2.1	22.0	26.0	40	-14.0
39.62	31.1	0.0	1	V	14.6	2.1	22.0	25.8	40	-14.2
30.78	29.8	0.0	1	H	15.7	2.1	22.0	25.6	40	-14.4
36.45	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
36.44	30.7	0.0	1	V	14.6	2.1	22.0	25.4	40	-14.6
33.04	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
39.63	30.7	0.0	1	H	14.4	2.1	22.0	25.2	40	-14.8
45.38	31.8	0.0	1	H	12.7	2.5	22.0	25.0	40	-15.0
42.98	31.5	0.0	1	H	13.1	2.2	22.0	24.8	40	-15.2
42.98	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1
45.38	32.4	0.0	1	V	10.5	2.5	22.0	23.4	40	-16.6

Model: 20111

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
32.35	30.6	0.0	1	H	15.7	2.1	22.0	26.4	40	-13.6
38.66	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
32.34	29.7	0.0	1	V	15.3	2.1	22.0	25.1	40	-14.9
35.47	30.6	0.0	1	H	14.4	2.1	22.0	25.1	40	-14.9
30.09	29.5	0.0	1	V	15.3	2.1	22.0	24.9	40	-15.1
30.08	29.1	0.0	1	H	15.7	2.1	22.0	24.9	40	-15.1
41.32	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
44.59	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
38.66	30.2	0.0	1	V	14.6	2.1	22.0	24.9	40	-15.1
35.47	30.1	0.0	1	V	14.6	2.1	22.0	24.8	40	-15.2
41.31	32.7	0.0	1	V	11.1	2.2	22.0	24.0	40	-16.0
44.59	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1

Model: 20113

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
34.44	30.7	0.0	1	H	15.7	2.1	22.0	26.5	40	-13.5
31.03	30.1	0.0	1	H	15.7	2.1	22.0	25.9	40	-14.1
34.45	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
31.00	29.8	0.0	1	V	15.3	2.1	22.0	25.2	40	-14.8
37.35	30.6	0.0	1	H	14.4	2.1	22.0	25.1	40	-14.9
45.75	31.5	0.0	1	H	12.7	2.5	22.0	24.7	40	-15.3
43.61	31.3	0.0	1	H	13.1	2.2	22.0	24.6	40	-15.4
40.98	31.1	0.0	1	H	13.1	2.2	22.0	24.4	40	-15.6
37.35	29.7	0.0	1	V	14.6	2.1	22.0	24.4	40	-15.6
40.98	32.4	0.0	1	V	11.1	2.2	22.0	23.7	40	-16.3
43.62	32.3	0.0	1	V	11.1	2.2	22.0	23.6	40	-16.4
45.76	32.6	0.0	1	V	10.5	2.5	22.0	23.6	40	-16.4

Model: 30209

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
33.05	30.7	0.0	1	H	15.7	2.1	22.0	26.5	40	-13.5
30.48	30.4	0.0	1	H	15.7	2.1	22.0	26.2	40	-13.8
36.58	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
33.03	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
38.98	30.7	0.0	1	H	14.4	2.1	22.0	25.2	40	-14.8
36.58	30.3	0.0	1	V	14.6	2.1	22.0	25.0	40	-15.0
42.06	31.7	0.0	1	H	13.1	2.2	22.0	25.0	40	-15.0
44.58	31.7	0.0	1	H	13.1	2.2	22.0	25.0	40	-15.0
30.47	29.5	0.0	1	V	15.3	2.1	22.0	24.9	40	-15.1
38.98	29.9	0.0	1	V	14.6	2.1	22.0	24.6	40	-15.4
44.57	32.9	0.0	1	V	11.1	2.2	22.0	24.2	40	-15.8
42.06	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1

Model: 30211

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
30.45	30.4	0.0	1	H	15.7	2.1	22.0	26.2	40	-13.8
32.58	30.2	0.0	1	H	15.7	2.1	22.0	26.0	40	-14.0
32.59	30.3	0.0	1	V	15.3	2.1	22.0	25.7	40	-14.3
37.12	30.8	0.0	1	V	14.6	2.1	22.0	25.5	40	-14.5
37.12	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
30.44	29.7	0.0	1	V	15.3	2.1	22.0	25.1	40	-14.9
35.98	30.6	0.0	1	H	14.4	2.1	22.0	25.1	40	-14.9
40.79	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
43.98	31.5	0.0	1	H	13.1	2.2	22.0	24.8	40	-15.2
35.98	29.9	0.0	1	V	14.6	2.1	22.0	24.6	40	-15.4
43.98	32.5	0.0	1	V	11.1	2.2	22.0	23.8	40	-16.2
40.79	32.4	0.0	1	V	11.1	2.2	22.0	23.7	40	-16.3

Model: 30213

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
39.45	31.6	0.0	1	V	14.6	2.1	22.0	26.3	40	-13.7
33.68	30.1	0.0	1	V	15.3	2.1	22.0	25.5	40	-14.5
39.46	31.0	0.0	1	H	14.4	2.1	22.0	25.5	40	-14.5
33.68	29.4	0.0	1	H	15.7	2.1	22.0	25.2	40	-14.8
44.55	31.9	0.0	1	H	13.1	2.2	22.0	25.2	40	-14.8
36.07	30.6	0.0	1	H	14.4	2.1	22.0	25.1	40	-14.9
42.31	31.8	0.0	1	H	13.1	2.2	22.0	25.1	40	-14.9
31.47	29.6	0.0	1	V	15.3	2.1	22.0	25.0	40	-15.0
36.07	30.3	0.0	1	V	14.6	2.1	22.0	25.0	40	-15.0
31.46	29.1	0.0	1	H	15.7	2.1	22.0	24.9	40	-15.1
44.56	32.7	0.0	1	V	11.1	2.2	22.0	24.0	40	-16.0
42.33	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1

Model: 30215

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
31.03	30.6	0.0	1	H	15.7	2.1	22.0	26.4	40	-13.6
33.46	30.4	0.0	1	V	15.3	2.1	22.0	25.8	40	-14.2
33.45	29.7	0.0	1	H	15.7	2.1	22.0	25.5	40	-14.5
39.53	30.8	0.0	1	V	14.6	2.1	22.0	25.5	40	-14.5
44.98	32.1	0.0	1	H	13.1	2.2	22.0	25.4	40	-14.6
36.27	30.6	0.0	1	V	14.6	2.1	22.0	25.3	40	-14.7
31.02	29.8	0.0	1	V	15.3	2.1	22.0	25.2	40	-14.8
36.29	30.5	0.0	1	H	14.4	2.1	22.0	25.0	40	-15.0
39.55	30.1	0.0	1	H	14.4	2.1	22.0	24.6	40	-15.4
42.02	31.0	0.0	1	H	13.1	2.2	22.0	24.3	40	-15.7
44.98	33.0	0.0	1	V	11.1	2.2	22.0	24.3	40	-15.7
42.01	32.6	0.0	1	V	11.1	2.2	22.0	23.9	40	-16.1

Model: 50309

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBµV/m	Degree	Meter	H/ V	dBµV/m	dB	dB	dBµV/m	dBµV/m	dB
34.45	30.7	0.0	1	H	15.7	2.1	22.0	26.5	40	-13.5
39.98	31.4	0.0	1	V	14.6	2.1	22.0	26.1	40	-13.9
31.40	30.0	0.0	1	H	15.7	2.1	22.0	25.8	40	-14.2
34.44	30.2	0.0	1	V	15.3	2.1	22.0	25.6	40	-14.4
37.05	31.1	0.0	1	H	14.4	2.1	22.0	25.6	40	-14.4
37.06	30.8	0.0	1	V	14.6	2.1	22.0	25.5	40	-14.5
39.98	30.8	0.0	1	H	14.4	2.1	22.0	25.3	40	-14.7
31.42	29.6	0.0	1	V	15.3	2.1	22.0	25.0	40	-15.0
41.66	31.7	0.0	1	H	13.1	2.2	22.0	25.0	40	-15.0
45.02	31.4	0.0	1	H	12.7	2.5	22.0	24.6	40	-15.4
45.00	32.8	0.0	1	V	10.5	2.5	22.0	23.8	40	-16.2
41.65	32.0	0.0	1	V	11.1	2.2	22.0	23.3	40	-16.7

Model: 50311

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
32.42	31.0	0.0	1	H	15.7	2.1	22.0	26.8	40	-13.2
32.43	30.6	0.0	1	V	15.3	2.1	22.0	26.0	40	-14.0
30.65	30.1	0.0	1	V	15.3	2.1	22.0	25.5	40	-14.5
30.65	29.7	0.0	1	H	15.7	2.1	22.0	25.5	40	-14.5
38.96	30.7	0.0	1	V	14.6	2.1	22.0	25.4	40	-14.6
38.97	30.6	0.0	1	H	14.4	2.1	22.0	25.1	40	-14.9
36.57	30.3	0.0	1	V	14.6	2.1	22.0	25.0	40	-15.0
44.32	31.7	0.0	1	H	13.1	2.2	22.0	25.0	40	-15.0
41.36	31.3	0.0	1	H	13.1	2.2	22.0	24.6	40	-15.4
36.56	30.0	0.0	1	H	14.4	2.1	22.0	24.5	40	-15.5
44.34	32.9	0.0	1	V	11.1	2.2	22.0	24.2	40	-15.8
41.36	32.5	0.0	1	V	11.1	2.2	22.0	23.8	40	-16.2

Model: 50313

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
33.44	30.5	0.0	1	H	15.7	2.1	22.0	26.3	40	-13.7
39.01	31.5	0.0	1	H	14.4	2.1	22.0	26.0	40	-14.0
36.98	31.1	0.0	1	H	14.4	2.1	22.0	25.6	40	-14.4
39.02	30.9	0.0	1	V	14.6	2.1	22.0	25.6	40	-14.4
31.12	29.6	0.0	1	H	15.7	2.1	22.0	25.4	40	-14.6
33.45	29.9	0.0	1	V	15.3	2.1	22.0	25.3	40	-14.7
31.13	29.8	0.0	1	V	15.3	2.1	22.0	25.2	40	-14.8
36.98	30.4	0.0	1	V	14.6	2.1	22.0	25.1	40	-14.9
45.04	31.9	0.0	1	H	12.7	2.5	22.0	25.1	40	-14.9
41.65	31.3	0.0	1	H	13.1	2.2	22.0	24.6	40	-15.4
41.64	32.5	0.0	1	V	11.1	2.2	22.0	23.8	40	-16.2
45.03	32.8	0.0	1	V	10.5	2.5	22.0	23.8	40	-16.2

Model: 50315

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART18 CONSUMER EQUIPMENT	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/ V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
33.98	31.0	0.0	1	H	15.7	2.1	22.0	26.8	40	-13.2
30.45	30.3	0.0	1	H	15.7	2.1	22.0	26.1	40	-13.9
33.99	30.7	0.0	1	V	15.3	2.1	22.0	26.1	40	-13.9
36.08	30.6	0.0	1	V	14.6	2.1	22.0	25.3	40	-14.7
30.44	29.8	0.0	1	V	15.3	2.1	22.0	25.2	40	-14.8
42.60	31.6	0.0	1	H	13.1	2.2	22.0	24.9	40	-15.1
45.08	31.7	0.0	1	H	12.7	2.5	22.0	24.9	40	-15.1
40.02	31.5	0.0	1	H	13.1	2.2	22.0	24.8	40	-15.2
36.05	30.1	0.0	1	H	14.4	2.1	22.0	24.6	40	-15.4
42.59	32.7	0.0	1	V	11.1	2.2	22.0	24.0	40	-16.0
45.09	32.7	0.0	1	V	10.5	2.5	22.0	23.7	40	-16.3
40.01	32.0	0.0	1	V	11.1	2.2	22.0	23.3	40	-16.7

4.8 Radiated Emissions Test Photos

Radiated emissions test photos were contained in Appendix A of this report as reference.