

FCC PART 18

MEASUREMENT AND TEST REPORT

For

SUNPARK ELECTRONICS CORP.

1815 WEST 205TH ST., SUITE 104
TORRANCE, CA90501

FCC ID: N96-12066

June 10, 2002

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Ballast
Test Engineer: <u>Jerry Wang</u>	
Report Number: <u>R0211131</u>	
Test Date: <u>May 14, 2002</u>	
Reviewed By: <u>Wayne Chia</u>	
Prepared By: Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732-9164	

Note: The test report is specially limited to the use of the above client company and the product model. It 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 AND DETAILS.....	4
1.7 LOCAL SUPPORT EQUIPMENT LIST	5
1.8 EQUIPMENT UNDER TEST (EUT).....	5
2 - SYSTEM TEST CONFIGURATION	6
2.1 JUSTIFICATION	6
2.2 SCHEMATICS / BLOCK DIAGRAM	6
2.3 EQUIPMENT MODIFICATIONS.....	6
2.4 CONFIGURATION OF TEST SYSTEM.....	7
2.5 TEST SETUP BLOCK DIAGRAM	7
3 - CONDUCTED EMISSIONS TEST DATA	8
3.1 MEASUREMENT UNCERTAINTY	8
3.2 EUT SETUP	8
3.3 SPECTRUM ANALYZER SETUP	8
3.4 TEST PROCEDURE	8
3.5 SUMMARY OF TEST RESULTS.....	9
3.6 CONDUCTED EMISSIONS TEST DATA.....	9
3.7 PLOT(S) OF CONDUCTED EMISSIONS TEST DATA.....	11
5 - FCC PRODUCT LABELING AND WARNING STATEMENT	16
5.1 PROPOSED FCC LABEL FORMAT	16
5.2 PROPOSED LABEL LOCATION ON EUT.....	16
5.3 FCC WARNING STATEMENT	16
6 - CONDUCTED AND RADIATED SETUP PHOTOGRAPHS	17
6.1 F32T8 CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	17
6.2 F32T8 CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW.....	17
6.3 F40T12 CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	18
6.4 F40T12 CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	18
6.5 F34T12 CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	19
6.6 F34T12 CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	19
6.7 F25T12 CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	20
6.8 F25T12 CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	20
6.9 F25T8 CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	21
6.10 F25T8 CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	21
6.11 CFQ26W CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	22
6.12 CFQ26W CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	22
6.13 CFM32W CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	23
6.14 CFM32W CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	23
6.15 FC8T9 22W + FC12T9 32W CONDUCTED EMISSION PHOTOGRAPH – FRONT VIEW,.....	24
6.16 FC8T9 22W + FC12T9 32W CONDUCTED EMISSION PHOTOGRAPH – REAR VIEW	24
7 - PHOTOGRAPHS	25
7.1 EUT – BALLAST TOP VIEW	25
7.2 EUT – COMPONENT VIEW	25
7.3 EUT – SOLDER VIEW	26
APPENDIX A - BLOCK DIAGRAM/SCHEMATICS/PARTS LIST	27
APPENDIX B - USER MANUAL	28

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *SUNPARK ELECTRONICS CORP.*'s *SL15* or the "EUT" as referred to in this report is a ballast. The EUT measures 5.0" L x 1.75" W x 0.85" H.

The EUT can be fit in the following lamps and therefore, it was tested in these 8 different configurations.

Linear lamps: 25W T12, 40W T12, 34W T12, 25W T8 and 32W T8

Circline lamp: 22W+32W

Biax types: 26W twin tube and 32W triple tube

Note: The test data was only good for the test sample. It may have deviation for other test sample.

1.2 Objective

The following test report is prepared on behalf of *SUNPARK ELECTRONICS CORP.* in accordance with Part 2, Subpart J, and Part 18, Subparts A, B, and C of the Federal Communication Commissions rules and regulations.

The objective of the manufacturer is to demonstrate compliance with FCC Part 18 limit requirements for Industrial, Scientific, and Medical Equipment.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –2000, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 Meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2000.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is 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 is 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 and Details

Manufacturer	Description	Model	Serial Number	Last Cal. Date	Cal. Due Date
HP	Spectrum Analyzer	8568B	Panel 2408A00105 Display 2403A06544	5/1/2002	5/1/2003
HP	Spectrum Analyzer	8593A	29190A00242	5/1/2002	5/1/2003
HP	Amplifier	8447E	1937A01054	5/1/2002	5/1/2003
HP	Quasi-Peak Adapter	85650A	2521A00718	5/1/2002	5/1/2003
HP	Signal generator	8640B	1727A06741	5/1/2002	5/1/2003
HP	Signal generator	8685A	2214A03081	5/1/2002	5/1/2003
Com-Power	Biconical Antenna	AB-100	14012	5/1/2002	5/1/2003
SOLAR	LISN	9252-50-R-24-BNC	984412	5/1/2002	5/1/2003
SOLAR	LISN	9252-50-R-20-BNC	984413	5/1/2002	5/1/2003
Com-Power	Log Periodic Antenna	AL-100	16091	5/1/2002	5/1/2003
Com-Power	Log Periodic Antenna	AB-900	15049	5/1/2002	5/1/2003

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp certifies that all calibration has been performed using suitable standards traceable to the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (NIST).

1.7 Local Support Equipment List

Manufacturer	Description	Model	Serial Number	FCC ID
Philips	Tubular Lamp	F32T8	N/A	DOC
Sylvania	Tubular Lamp	F40T12	N/A	DOC
Sylvania	Tubular Lamp	F34T12	N/A	DOC
GE	Tubular Lamp	T25T12	N/A	DOC
Philips	Tubular Lamp	F25T8	N/A	DOC
Quad	Single Ended Lamp	CFQ26W	N/A	DOC
Philips	Single Ended Lamp	CFM32W	N/A	DOC
GE	Circline Lamp	FC8T9 22W + FC12T9 32W	N/A	DOC

1.8 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
SUNPARK ELECTRONICS CORP.	Ballast	SL15	None	N96-12066

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was tested under normal mode as used by a common (typical) user.

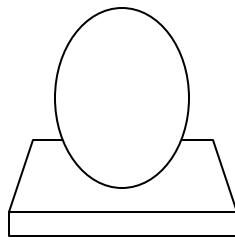
2.2 Schematics / Block Diagram

Appendix A contains a copy of the EUT's schematics diagram as reference.

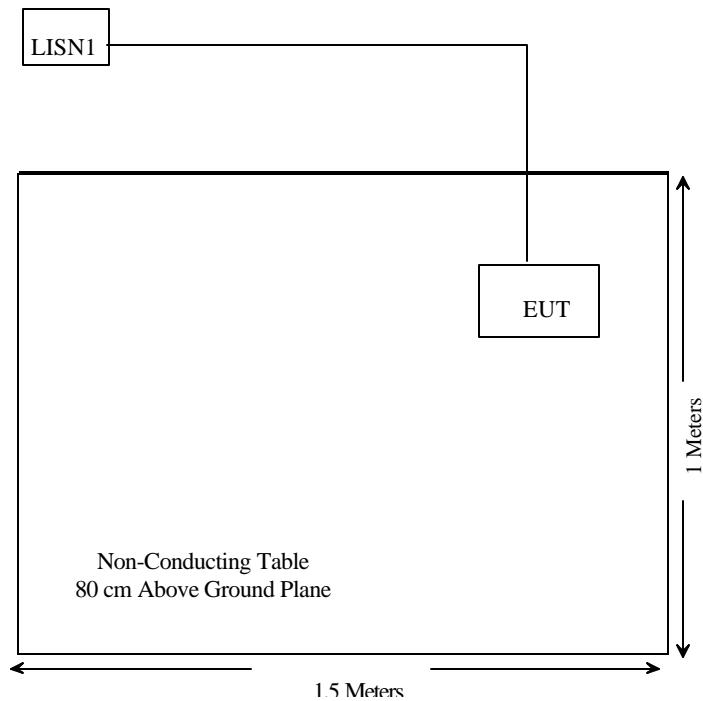
2.3 Equipment Modifications

No modifications were made by BACL Corporation to ensure the EUT to comply with the application limits and requirements.

2.4 Configuration of Test System



2.5 Test Setup Block Diagram



3 - CONDUCTED EMISSIONS TEST DATA

3.1 Measurement Uncertainty

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

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

3.2 EUT Setup

The measurement was performed at the **Open Area Test Site**, using the same setup per ANSI C63.4 - 2000 measurement procedure. The specification used was the FCC Part 18 limits.

The EUT was placed on the center of the back edge on the test table.

The power cord extension of the EUT was connected with 110 Vac/60 Hz power source.

3.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configuration during the conduction test:

Start Frequency	450 kHz
Stop Frequency	30 MHz
Sweep Speed.....	Auto
IF Bandwidth.....	10 kHz
Video Bandwidth	10 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 power cord extension was connected to the auxiliary outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure that the EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dB μ V of specification limits). Quasi-peak readings are distinguished with a "Qp".

The EUT was tested under the normal modes during the final qualification test to represent the worst case results.

3.5 Summary of Test Results

According to the data in section 3.6, the EUT complied with the FCC 18 Conducted margin for industry, scientific and medical device, and with the worst margin reading of:

- 17.4 dB μ V at **0.75** MHz at the **Line** mode, **F32T8**, 0.45-30MHz.
- 12.8 dB μ V at **0.48** MHz at the **Line** mode, **F40T12**, 0.45-30MHz.
- 12.3 dB μ V at **0.54** MHz at the **Line** mode, **F34T12**, 0.45-30MHz.
- 17.6 dB μ V at **0.66** MHz at the **Line** mode, **F25T12**, 0.45-30MHz.
- 15.8 dB μ V at **0.51** MHz at the **Line** mode, **F25T8**, 0.45-30MHz.
- 19.3 dB μ V at **0.48** MHz at the **Line** mode, **CFQ26W**, 0.45-30MHz.
- 19.3 dB μ V at **0.63**MHz at the **Neutral** mode, **CFM32W**, 0.45-30MHz.
- 9.2 dB μ V at **15.4**MHz at the **Line** mode, **CF8T9 22W + FC12T9 32W**, 0.45-30MHz.

3.6 Conducted Emissions Test Data

3.6.1 Test Data, F32T8

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.75	30.6	QP	Line	48	-17.4
0.69	28.5	QP	Neutral	48	-19.5
1.48	26.0	QP	Line	48	-22.0
3.46	18.0	QP	Line	48	-30.0
3.08	18.0	QP	Neutral	48	-30.0
17.74	6.7	QP	Neutral	48	-41.3

3.6.2 Test Data, F40T12

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.48	35.2	QP	Line	48	-12.8
0.48	34.1	QP	Neutral	48	-13.9
8.23	27.5	QP	Line	48	-20.5
8.22	27.4	QP	Neutral	48	-20.6
12.02	27.3	QP	Line	48	-20.7
12.60	27.0	QP	Neutral	48	-21.0

3.6.3 Test Data, F34T12

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.54	35.7	QP	Line	48	-12.3
0.54	32.8	QP	Neutral	48	-15.2
12.80	27.3	QP	Neutral	48	-20.7
12.80	27.2	QP	Line	48	-20.8
8.22	27.2	QP	Neutral	48	-20.8
8.55	27.1	QP	Line	48	-20.9

3.6.4 Test Data, F25T12

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.66	30.4	QP	Neutral	48	-17.6
0.63	28.9	QP	Line	48	-19.1
16.64	27.0	QP	Neutral	48	-21.0
12.98	26.9	QP	Neutral	48	-21.1
16.38	25.5	QP	Line	48	-22.5
13.07	25.2	QP	Line	48	-22.8

3.6.5 Test Data, F25T8

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.51	32.2	QP	Line	48	-15.8
0.45	29.9	QP	Neutral	48	-18.1
8.81	28.8	QP	Neutral	48	-19.2
16.14	27.7	QP	Line	48	-20.3
8.43	27.6	QP	Line	48	-20.4
14.34	27.5	QP	Neutral	48	-20.5

3.6.6 Test Data, CFQ26W

LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency MHz	Amplitude dB μ V	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dB μ V	Margin dB
0.48	28.7	QP	Line	48	-19.3
0.48	28.6	QP	Neutral	48	-19.4
17.80	26.1	QP	Neutral	48	-21.9
17.79	25.1	QP	Line	48	-22.9
12.02	23.4	QP	Neutral	48	-24.6
12.02	23.2	QP	Line	48	-24.8

3.6.7 Test Data, CFM32W

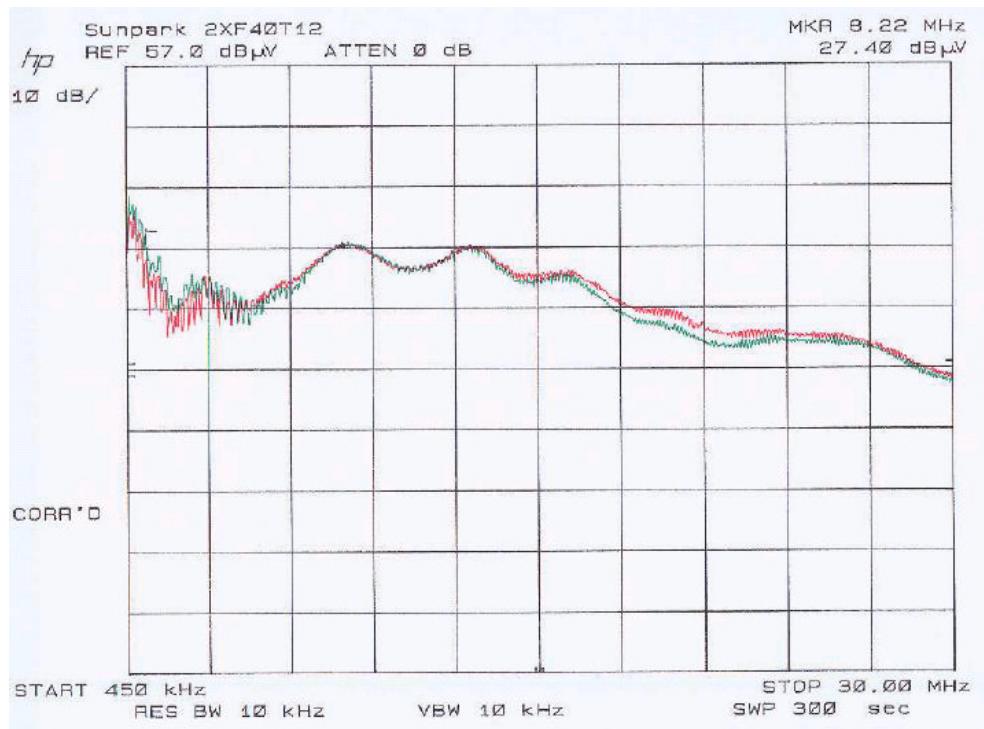
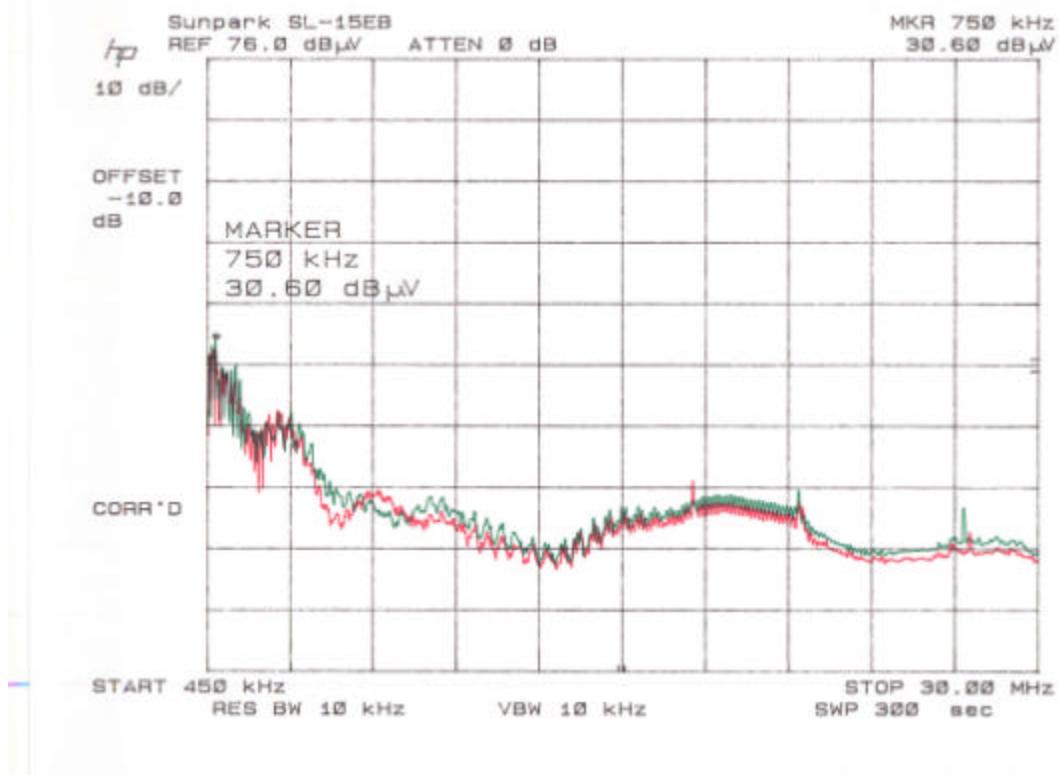
LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	Qp/Ave/Peak	Line/Neutral	dB μ V	dB
0.63	28.7	QP	Neutral	48	-19.3
0.63	28.6	QP	Line	48	-19.4
17.65	21.7	QP	Neutral	48	-26.3
17.65	20.3	QP	Line	48	-27.7
8.58	13.2	QP	Line	48	-34.8
8.10	12.9	QP	Neutral	48	-35.1

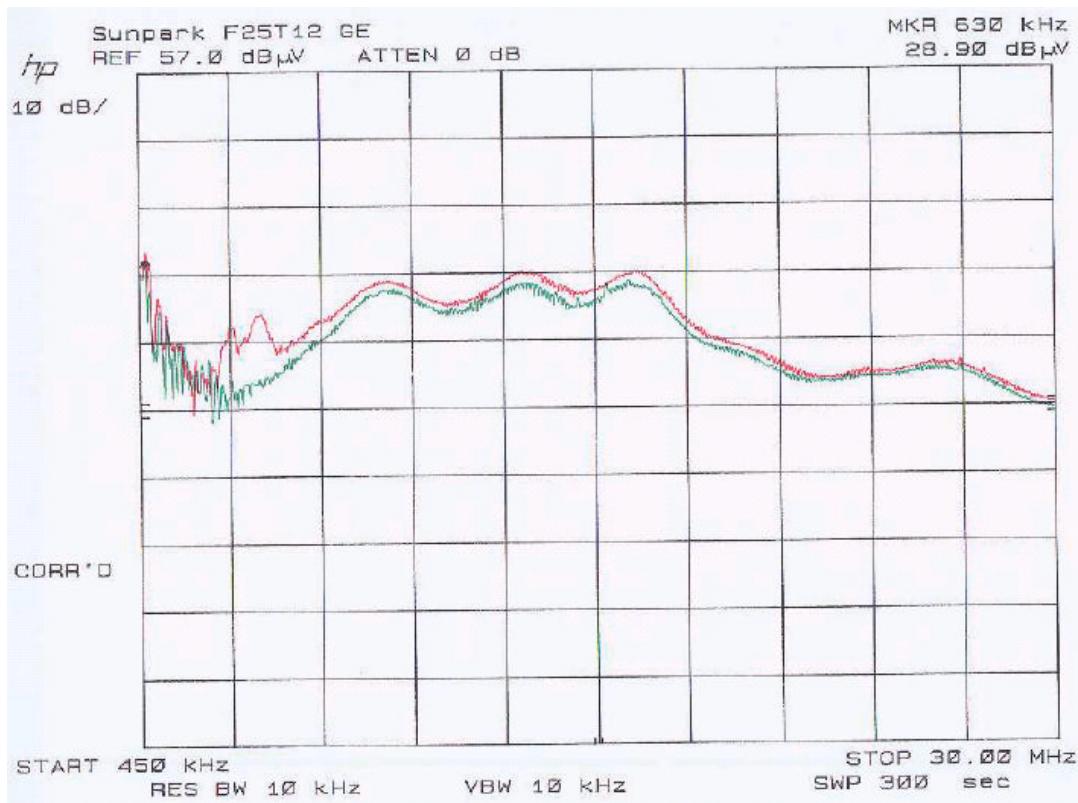
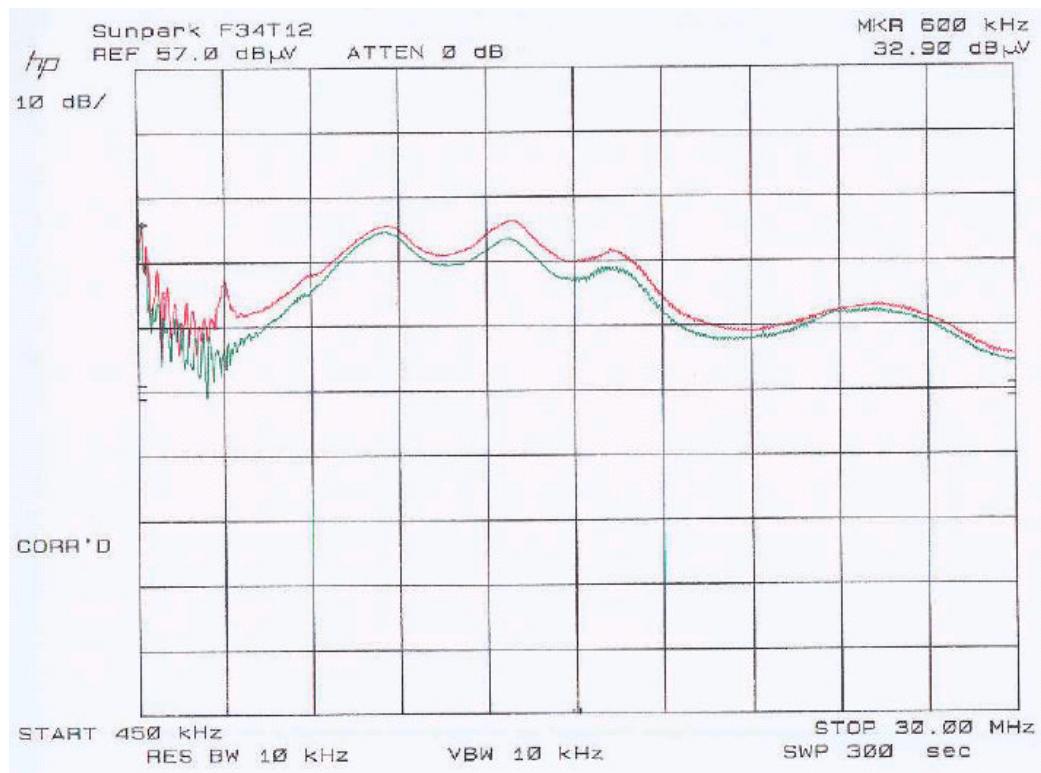
3.6.8 Test Data, CF8T9 22W + FC12T9 32W

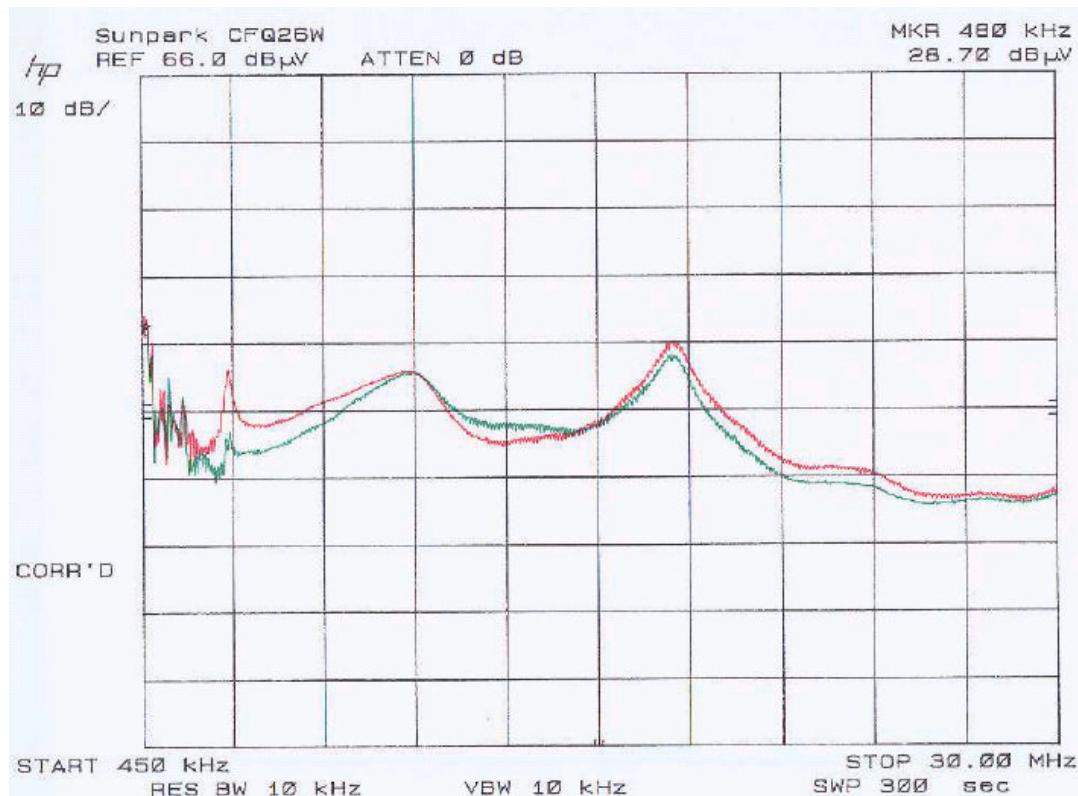
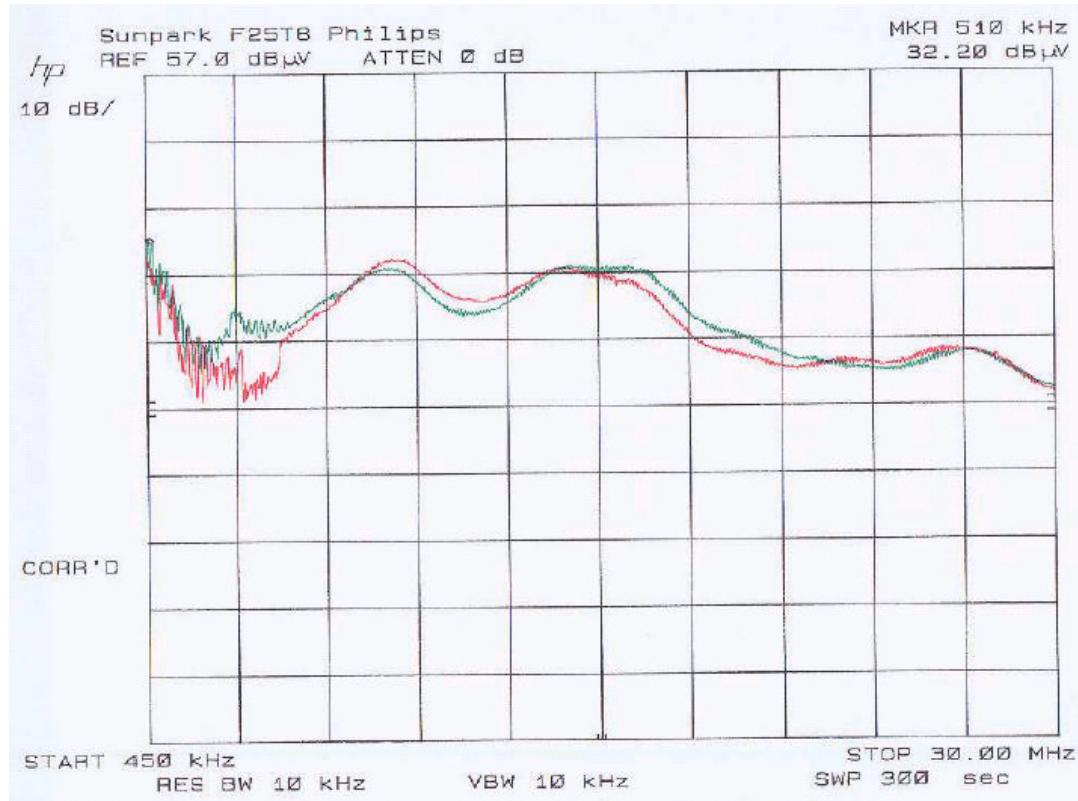
LINE CONDUCTED EMISSIONS				FCC PART 18	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	Qp/Ave/Peak	Line/Neutral	dB μ V	dB
15.40	38.8	QP	Line	48	-9.2
15.25	36.7	QP	Neutral	48	-11.3
9.52	31.0	QP	Line	48	-17.0
9.23	30.2	QP	Neutral	48	-17.8
0.48	29.0	QP	Neutral	48	-19.0
0.48	28.7	QP	Line	48	-19.3

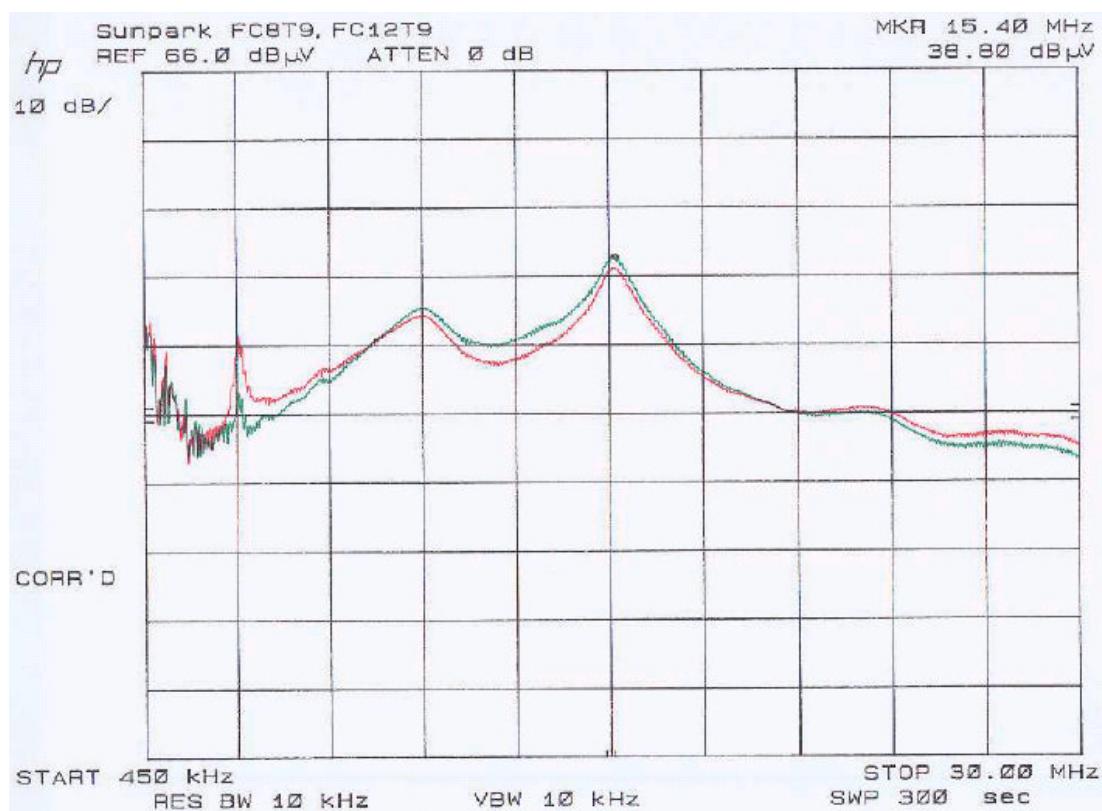
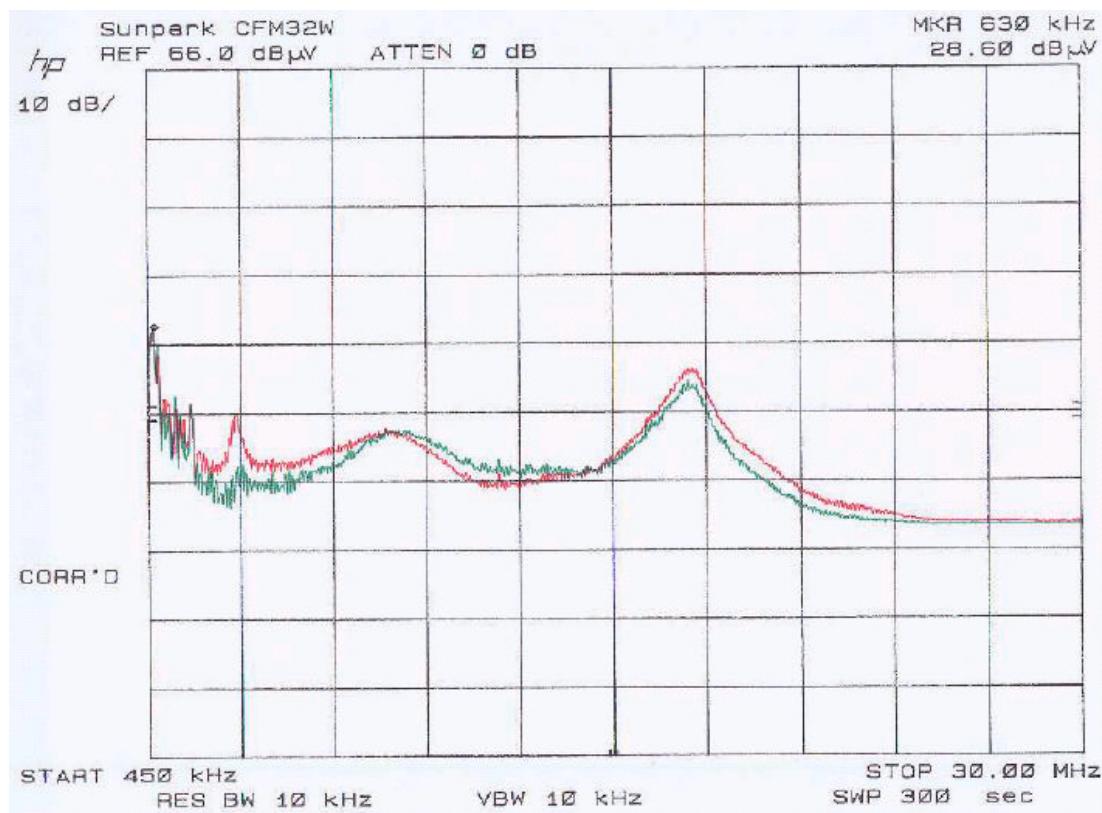
3.7 Plot(s) of Conducted Emissions Test Data

The plots of conducted emission tested was presented hereinafter as reference.









5 – FCC PRODUCT LABELING AND WARNING STATEMENT

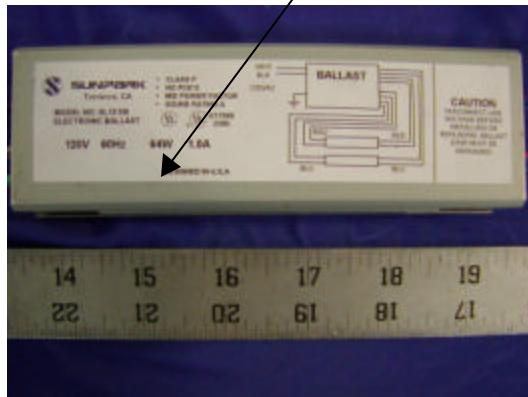
5.1 Proposed FCC Label Format

FCC ID: N96-12066

Specifications: Text is black or white in color and is left justified. Labels are silk-screened and shall be “permanently affixed” at a conspicuous location on the EUT.

5.2 Proposed Label Location on EUT

Front View of EUT Proposed FCC Label Location



5.3 FCC Warning Statement

This device complies with Part 18 of FCC rules.

Information on the following matters shall be provided to the user in the instruction manual or on the packaging if an instruction manual is not provided for any type of any ISM equipment:

- a. The interference potential of the device or system
- b. Maintenance of the system
- c. Simple measures that can be taken by the user to correct interference.

6 - Conducted and Radiated Setup Photographs

6.1 F32T8 Conducted Emission Photograph – Front View,



6.2 F32T8 Conducted Emission Photograph – Rear View



6.3 F40T12 Conducted Emission Photograph – Front View,



6.4 F40T12 Conducted Emission Photograph – Rear View



6.5 F34T12 Conducted Emission Photograph – Front View,



6.6 F34T12 Conducted Emission Photograph – Rear View



6.7 F25T12 Conducted Emission Photograph – Front View,



6.8 F25T12 Conducted Emission Photograph – Rear View



6.9 F25T8 Conducted Emission Photograph – Front View,



6.10 F25T8 Conducted Emission Photograph – Rear View



6.11 CFQ26W Conducted Emission Photograph – Front View,



6.12 CFQ26W Conducted Emission Photograph – Rear View



6.13 CFM32W Conducted Emission Photograph – Front View,



6.14 CFM32W Conducted Emission Photograph – Rear View



6.15 FC8T9 22W + FC12T9 32W Conducted Emission Photograph – Front View,

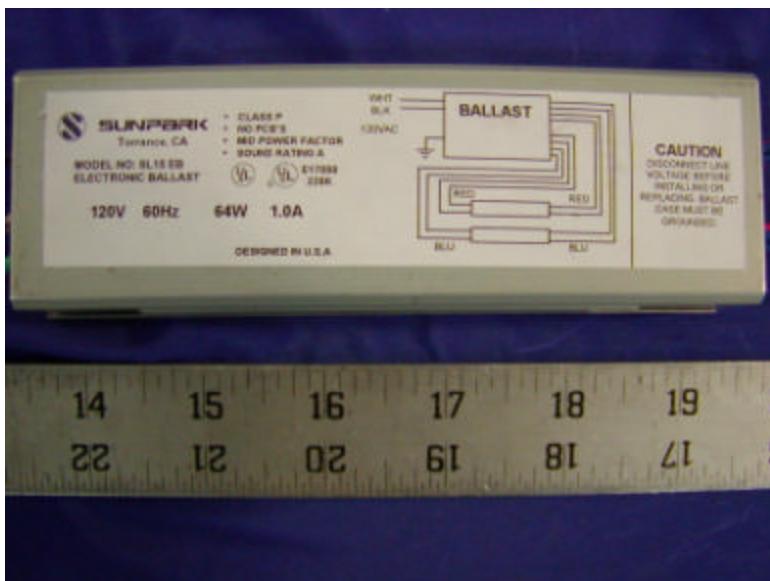


6.16 FC8T9 22W + FC12T9 32W Conducted Emission Photograph – Rear View

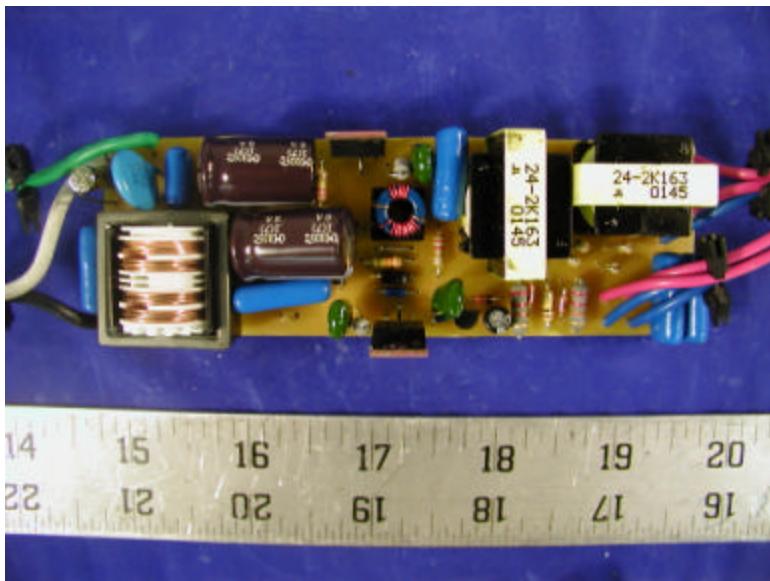


7 - PHOTOGRAPHS

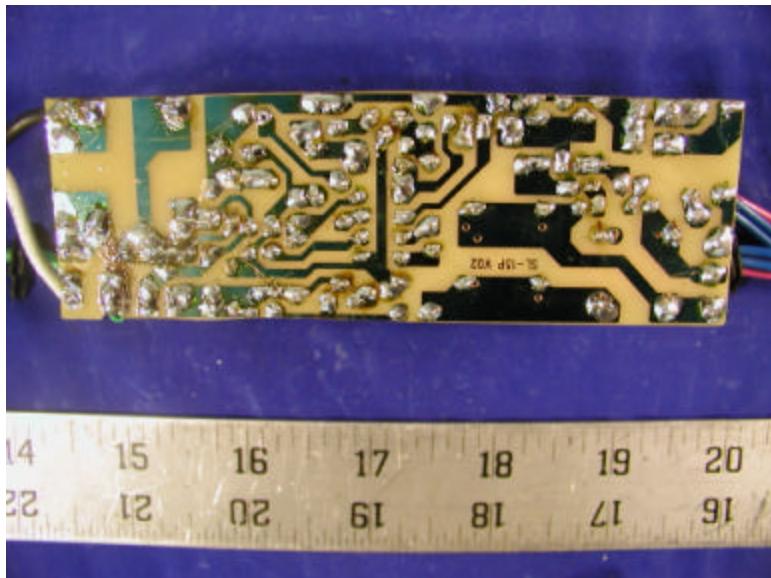
7.1 EUT – Ballast Top View



7.2 EUT – Component View



7.3 EUT – Solder View



APPENDIX A - BLOCK DIAGRAM/SCHEMATICS/PARTS LIST

APPENDIX B - USER MANUAL
