

EMC – TEST REPORT

Issue Date: July 22, 1998

EMISSIONS

IMMUNITY

Test Report File No. : E187189
Project No. : 98NK26136

Model / Type : CTL, CTU, CDU, CTT,CGOB,CPO, CGO-1
& CGO-2

Kind of Product : Energy Saving Lamp

Applicant : Corso Ltd.

License Holder : Corso Ltd.

Address : 1425 Louis Ave.
Elk Grove, IL 60007

Manufacturer : Same as Applicant

Test Result : **COMPLIANT**

This report without appendices consists of 9 pages. Appendix A contains test photos, and Appendix B contains original test data. The data contained in this report reflects only the items tested in the configurations and mode of operations described. An attempt has been made to arrange the EUT, with the equipment provided, into a test configuration which maximizes the observed emissions of the EUT while simulating, as close as practical, a typical end-use installation.

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REPORT DIRECTORY

SECTION TITLE

GENERAL

- 1.0 General Product Description
- 1.1 Model Differences
- 1.2 Environmental Conditions in Test Lab
- 1.3 Calibration Details of Equipment Used for Measurement
- 1.4 EUT (Equipment Under Test) Configuration
- 1.5 EUT Operating Mode
- 1.6 Device Modifications

EMISSIONS

- 2.0 Emissions Test Regulations
 - Conducted Voltage
 - Radiated Electric Field Emissions
 - Radiated Magnetic Field Emissions
 - Conducted Power
 - Discontinuous Interference (Clicks)
 - Harmonic Current Emissions and Voltage Fluctuations / Flicker

IMMUNITY

- 3.0 Immunity Test Regulations
- 3.1 Performance Criteria

CONCLUSION

- 4.0 General Remarks
- 4.1 Summary

APPENDICIES

- A Test Setups (Photos, Diagrams and Drawings)
- B Test Data

1.0 GENERAL PRODUCT DESCRIPTION

Energy saving lamp, Florescent type with standard lamp holder screw shell base assembly.

1.0.1 Equipment Mobility:

Fixed

1.0.2 Test Voltage and Frequency:

<u>Voltage (V)</u>	<u>Frequency (Hz)</u>
120	60

1.1 MODEL DIFFERENCES

Any other model(s) represented by the models tested in this investigation will be documented by the manufacturer.

1.2 ENVIRONMENTAL CONDITIONS IN TEST LAB

Temperature: 20-25 °C
Relative Humidity: 30-60% RH
Atmospheric Pressure: 680-1060 mbar

1.3 CALIBRATION OF EQUIPMENT USED FOR MEASUREMENT

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

1.4 EUT CONFIGURATION(s)

See Appendix A for individual set-up configuration(s). In addition to the EUT, the following peripheral devices and/or cables were connected during the measurement:

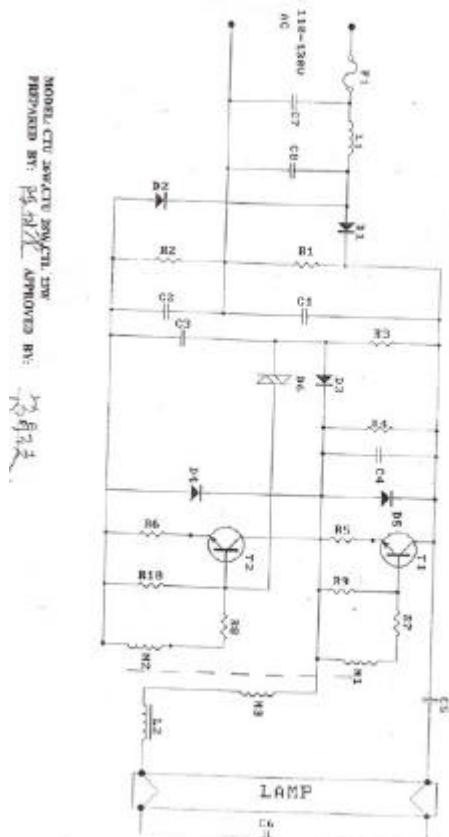
Device	Manufacturer	Model	Serial #	FCC ID
N/A				

Cable	Manufacturer	Length	Type	Shield Type	Shield Termination
N/A					

BLOCK DIAGRAM & ELECTRICAL SCHEMATIC



NO	DESCRIPTION	SPECIFICATION	QTY	CODE NO	REMARKS
1	TRANSISTOR	K5C1005	3	Q1 Q2	
2	DIODE	IN4007	1	D1 - D3	
3		FR105	2	D4 D5	
4	TRIGGERING DIODE	DB3	1	D6	
5	RESISTOR	RT-0.25W-56K ± 10%	3	R1 R2 R4	
6	RESISTOR	RT-0.3W-56K ± 10%	1	R3	
7	RESISTOR	RT-0.25W-1.2Ω ± 10%	2	R5 R6	
8	RESISTOR	RT-0.25W-15Ω ± 10%	2	R7 R8	
9	RESISTOR	RT0.25W-100Ω ± 10%	1	R9 R10	AD1
10	CAPACITOR	220nF/3V CL11	1	C1	
11	CAPACITOR	220nF/50V 105°C	2	C1 C2	
12	CAPACITOR	332nF/30V CHB	1	C6	
13	CAPACITOR	473nF/60V CL11	1	C5	
14	CAPACITOR	222nF/30V CL11	1	C4	
15	CAPACITOR	472nF/1KV CT3	2	C7 C8	
16	TOPODAL CORE	8.2KGR OR 8.5KGR ± 10% ± 5%	1		
17	INDUCTOR	7.0mH ± 10% ± 5%	1	L1	
18	WIRE FOR CORE	31	2	N1 N2	
19	WIRE FOR CORE	81	1	N3	
20	INDUCTOR	2.8mH EEE19 RJKBD	1	L2	
21	LAMP TUBE	SCREWY TUBE 23W	1		
22	BASE	E26 NICKLE ON COPPER	1		
23	UPPER AND LOWER CASE	Φ 58	2	B5	
24	LINE WIRE	105°C 24AWG	3		
25	PCB	COSU-411 ± 54	1		
26	FUSE	1A 250V 115°C	1		
27	FIBREGLASS TUBE	Φ 1.9mm L=2.5m	4		
28	FIBREGLASS TUBE	Φ 1.9mm L=1.5m	4		
29	FIBREGLASS TUBE	Φ 4.0mm L=9cm	1		
30	SHINKABLE TUBE	Φ 6mm L=5.5cm	1		



CORSO LTD

1.5 EUT OPERATING MODE(s)

The equipment under test was operated during the measurements under the following conditions:

'ON' Continuous operation

1.6 DEVICE MODIFICATIONS

The following modifications were necessary for compliance:

None.

2.0 EMISSIONS TEST REGULATIONS

Emissions testing was performed according to the following regulations:

47 CFR Part 18: 1996

CONDUCTED VOLTAGE EMISSIONS

Test Location

Ground Plane (Test Station 3)

UL Procedure

4414-LPG-001

Test Instruments

Spectrum Analyzer / Quasi-peak Adapter / Preselector

Advantest Model 3261A Spectrum Analyzer No. FCA 4001
Model R3551 Preselector No. FCA4005, Last Cal. 11/97

Line Impedance Stabilization Networks (LISNs)

SOLAR Model 8602-50-TS-50-N	S/N 963903	No. EMC4068, Last Cal. 7/97
SOLAR Model 8602-50-TS-50-N	S/N 963904	No. EMC4069, Last Cal. 7/97

Transient Limiter

Hewlett Packard Model 11947A No. EMC 4005

Frequency Range on each line

450kHz to 30 MHz

Test Results

The requirements are:
MET

Remarks

See App. B for complete test results.

RADIATED ELECTRIC FIELD EMISSIONS

Test Location

10 Meter Semi-Anechoic Chamber

UL Procedure

4414-LPG-002

Test Instruments

Spectrum Analyzer / Quasi-peak Adapter / Preselector

Hewlett Packard Model 8566B Spectrum Analyzer

Model 85650A Quasi-peak Adapter

Model 85685A RF Preselector No. FCA4002, FCA4003, EMC4001, EMC4002

Last Cal. .6/98

Antennas

Chase EMC Ltd., Biconical Antenna Model VBA6106A, S/N 1237, Last Cal. 2/98

Chase EMC Ltd., Log Periodic Antenna Model UPA6108, S/N 1120, Last Cal. 2/98

Frequency Range of Measurement

30 MHz – 1000 MHz

Measurement Distance

10 meters

Test Results

The requirements are:

MET

Remarks

See App. B for complete test results.

4.0 GENERAL REMARKS

Sample Receipt Date : July 17, 1998

Test Dates

Start : July 17, 1998
End : July 17, 1998

4.1 SUMMARY

The requirements according to the technical regulations are:

MET

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333 Pfingsten Road
Northbrook, IL 60062 USA

Test Engineer:

Reviewed by:

Mike Ehas (Ext 42351)
EMC Engineering Associate
International EMC Services

Mike Windler
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APPENDIX A

PHOTOS

CONDUCTED VOLTAGE
RADIATED EMISSIONS

FIG. 1
FIG. 2

CONDUCTED EMISSIONS

FIG. 1



RADIATED EMISSIONS

FIG. 2

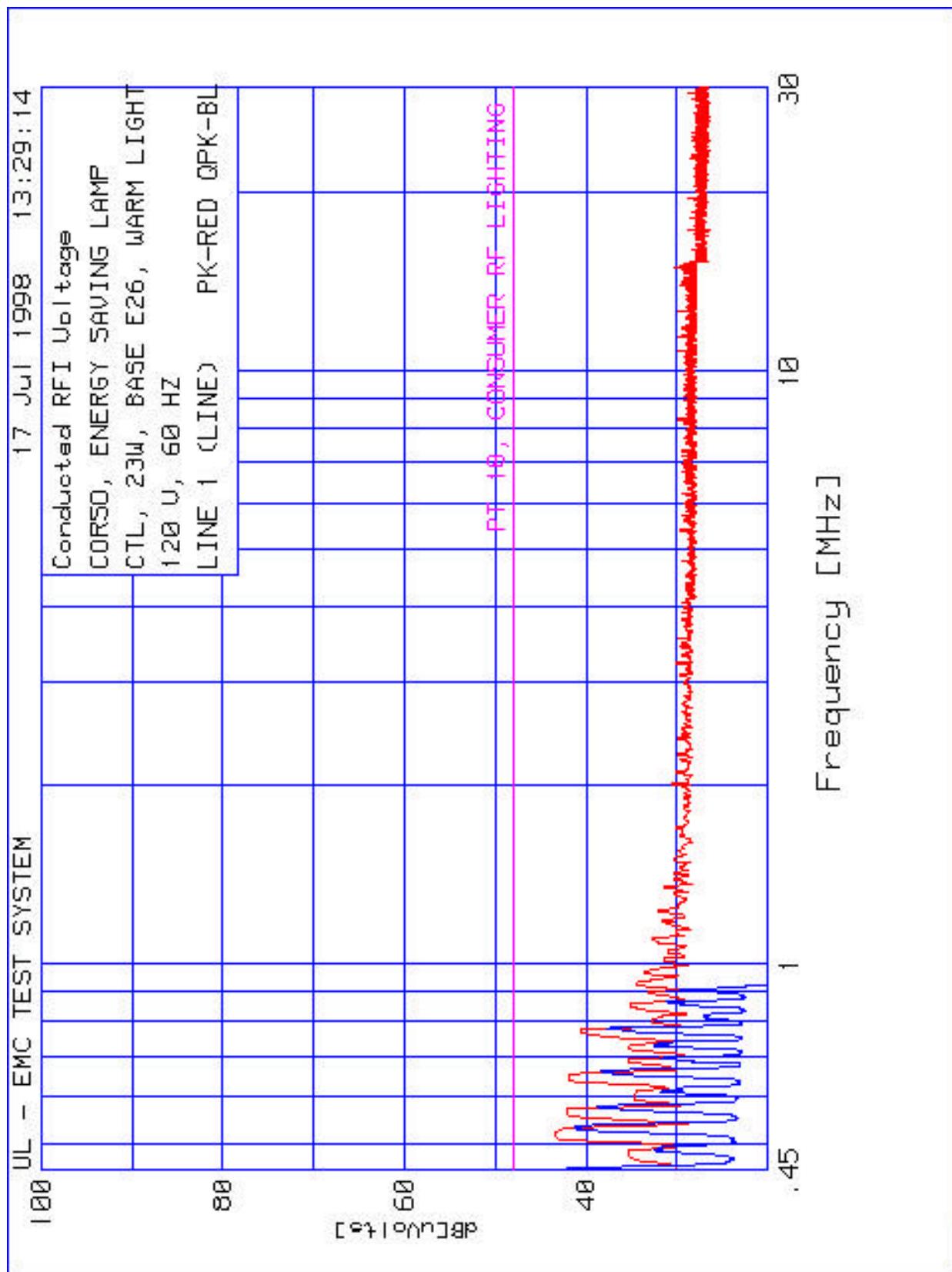


APPENDIX B

TEST DATA

EMISSIONS

Conducted Voltage
Radiated Electric Field Emissions

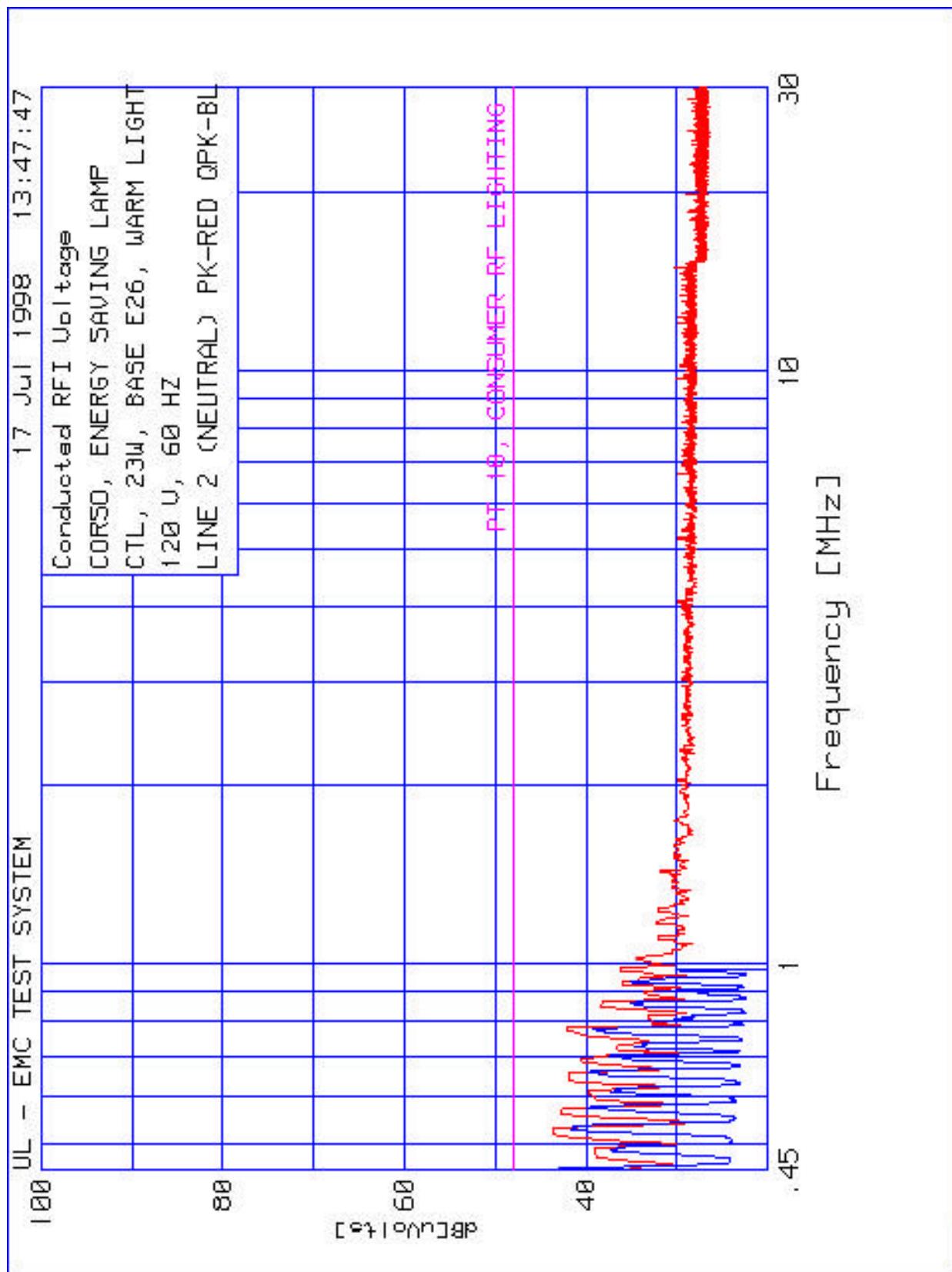


UNDERWRITERS LABORATORIES INC.
Conducted Emissions

Date Tested: 17 July 1998

Manufacturer : Corso Ltd.
Equipment Under Test : CTL, 23W, Base E26 Energy Saving Lamp
Requirement : FCC CFR 47, PART 18
Detection Mode : Quasi-peak (q-pk)
Bandwidth : 200 Hz for measurements 9 kHz to 150 kHz
9 kHz for measurements 150 kHz to 30 MHZ
Line : L1

Frequency	Meter Reading	Cable Loss	Transducer Factor	Measured Intensity	Limit
MHz	dBuV	dB	dB	dBuV	dBuV
0.451	33.9	-0.1	10	43.8	48
0.532	31.3	-0.1	10	41.2	48
0.576	28.9	-0.1	10	38.8	48
0.662	28.5	-0.1	10	38.4	48
0.782	27.5	-0.1	10	37.4	48
0.865	21.3	-0.1	10	31.2	48

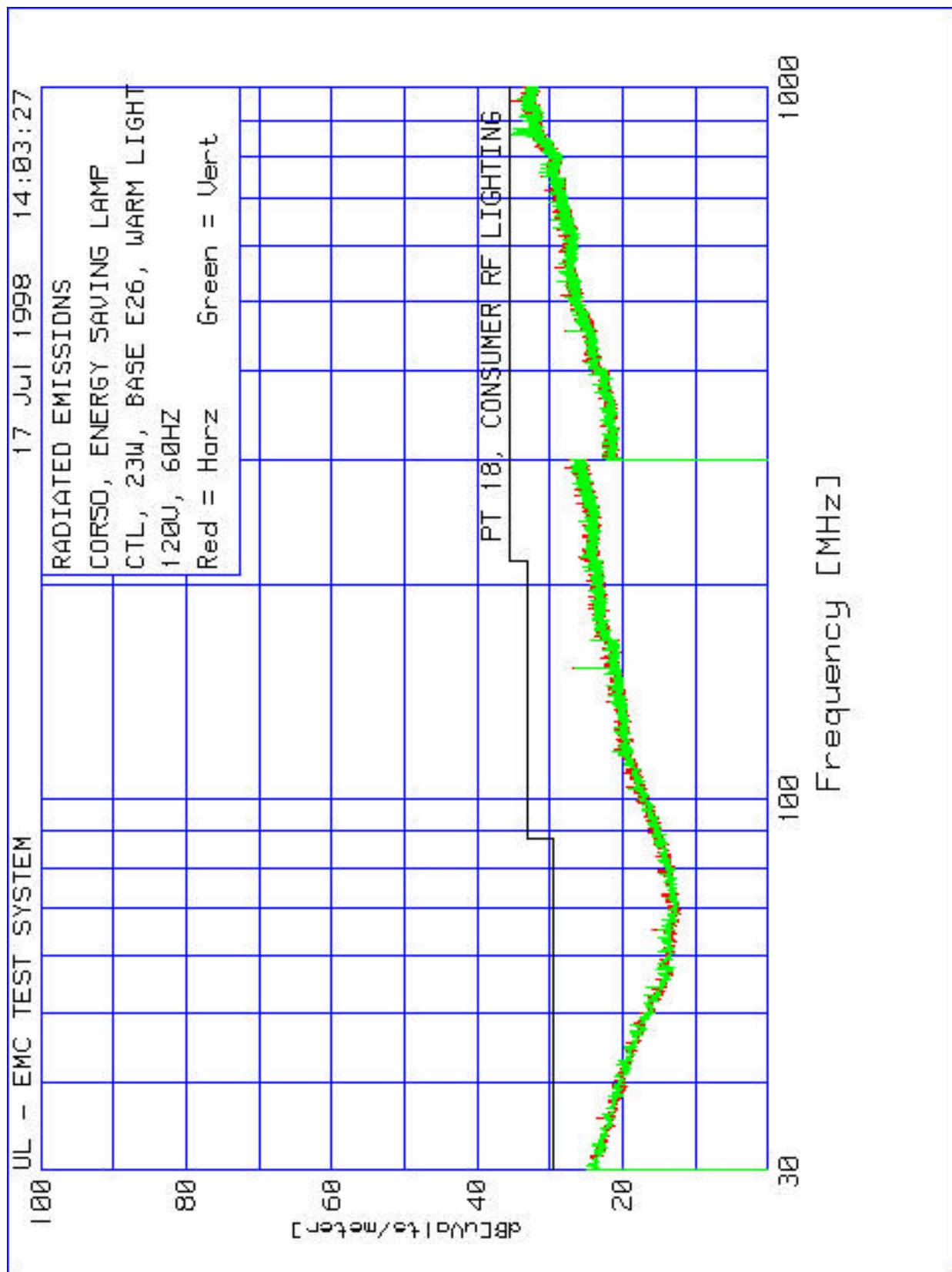


UNDERWRITERS LABORATORIES INC.
Conducted Emissions

Date Tested: 17 July 1998

Manufacturer : Corso Ltd.
Equipment Under Test : CTL, 23W, Base E26 Energy Saving Lamp
Requirement : FCC CFR 47, PART 18
Detection Mode : Quasi-peak (q-pk)
Bandwidth : 200 Hz for measurements 9 kHz to 150 kHz
 9 kHz for measurements 150 kHz to 30 MHZ
Line : L2

Frequency	Meter Reading	Cable Loss	Transducer Factor	Measured Intensity	Limit
MHz	dBuV	dB	dB	dBuV	<u>dBuV</u>
0.451	34.8	-0.1	10	44.7	48
0.528	31.8	-0.1	10	41.7	48
0.574	30.0	-0.1	10	39.9	48
0.660	29.8	-0.1	10	39.7	48
0.702	27.4	-0.1	10	37.3	48
0.778	29.4	-0.1	10	39.3	48
0.862	25.2	-0.1	10	35.1	48
0.934	25.2	-0.1	10	35.1	48



UNDERWRITERS LABORATORIES INC.
Radiated Emissions

Date Tested: 17 July 1998

Manufacturer : Corso Ltd.
Equipment Under Test : CTL, 23W, Base E26 Energy Saving Lamp
Requirement : FCC CFR 47, PART 18
Detection Mode : Peak (pk)
Bandwidth : 120 kHz
Measurement Distance : 10 meter
Antenna Type : 30 - 300 Mhz, Biconical
 300 - 1000 Mhz, Log-Periodic

Frequency <u>MHz</u>	Meter Reading <u>dBuV/m</u>	Cable Loss <u>dB</u>	Antenna Factor <u>dB</u>	Measured Intensity <u>dBuV/m</u>	10 meter Limit <u>dBuV/m</u>	Antenna Height <u>meter</u>	Turntable Azimuth <u>degrees</u>
30.067	5.5	0.8	18.6	24.9	29.5	200 V	74
35.968	5.5	1.0	16.2	22.7	29.5	100 V	248
152.626**	9.3	2.4	14.7	26.4	33.1	400 V	0
247.226	5.5	3.0	16.5	25.0	35.6	400 V	0
872.657**	8.4	3.9	22.6	34.9	35.6	400 V	0
957.435**	7.9	4.1	23.4	35.4	35.6	301 H	27

Notes:

H - Horizontal antenna polarity
 V - Vertical antenna polarity

(*) Measurement data using Peak detection is less than the quasi-peak limit.

(**) Emission not from EUT