Compliance Labs Inc.

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An EMC/EMI Testing Company

Measured Radio Frequency Emissions
From

TCP Fluorescent Lamps
EC & FEA Series

Report 1127
August 2, 1999

For:
Technical Consumer Products
29401 Ambina Drive
Solon OH 44139

Summary: The testing for compliance to FCC Regulations Part 18, Subpart C, dated 10/1/97, was performed on four Technical Consumer Products, Inc. EC Series lamps also identified as FEA series. The devices are subject to FCC rules and regulations as a RF lighting device.

In the testing performed between June 29 and July 22, 1999, the samples of the lamps were found to meet the required FCC specifications for conducted emissions

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R. Edward Koskie, President

I. **Introduction:**

Five EC-Series lamps were tested for compliance with FCC Regulations, Part 18, Subpart C, Dated 10/1/97. The testing was done at Compliance Labs Inc., 16740 Peters Road, Middlefield OH 44062. Test procedures were as defined in FCC/OST MP-5 (1986) Methods of Measurement of Radio Noise Emission from Industrial, Scientific and Medical Equipment. Description of the Compliance Lab facility is on file with the FCC Laboratory, Colombia, Maryland (FCC file 31040/SIT, 1300F2).

This testing is a continuation of previous work reported by the University of Michigan and completes the range of lamps in the product family.
For reference, the model numbers on the original application were:
TCP Fluorescent Lamp, EC-20W-02, EC-20W-20, EC-22W-22, EC-30W-22, EC-30W-30 and EC 36W-30. The listed FCC authorization number was:
FCC ID: NIR-12508

The Lamps in this test are identified by Model as:

TCP Fluorescent Lamp,
ECN-22W-6
ECN-22W-8 or FEA 22 CIR
ECN-30W-8 or FEA 30 CIR
ECN-30W-9 or FEA 30 CIR
ECN-36W-9

The above are all low power factor lamps and the label will identify them as such.

II. **Test Equipment Listing**

Instrument	Manufacturer	Calibration date
EMI Test System	Dynamic Sciences DSI 2020	12/21/98
LISN	Fisher Custom Communications M 50/250-25-4	7/31/98
Cables	Various	N/A

III. Configuration and Identification of Device under test

The DUT's are fluorescent lamp assemblies designed to be screwed into a standard light socket. They have a plastic case containing an electronic ballast that is constructed on a PC board. The lamp is configured into a circle whose diameter is a function of the wattage. The ballast is a switching power supply operating at 45kHz. At this frequency, conducted but not radiated emission tests are required.

The unit is designed by Technical Consumer Products, Inc. 29401 Ambina Drive, Solon OH 44139, and is manufactured by Shanghai Jensing Electron Electrical Equipment Co. 23 Kai Jiange Rd. E, Si Jing, Song Jiang, 201601 Shanghai, China.

A standard table lamp socket with a 1.2M two wire
cord was prepared for powering the lamps. This length was selected to accommodate the requirement that no part of the EUT be closer that 0.8 M from the LISN. The test setup is shown as Figure 6.

3.1 Modifications

There were no modifications made on the lamps under test. However, TCP supplied replacement lamps for some that failed initially.

4. Emission limits

The lamps were tested in accordance with Part 18, Subpart C, dated 10/1/97. The frequency of test and the limits are given in the following table.

4.1 Conducted Emission Limits

Table 4.1 Conducted emission limits
(Paragraph: 18.307; consumer equipment)

Frequency, KHz	Consumer equipment	
	‘µV	DBµV
45-170.5	250	48.0
170.5-3000	250	48.0

5. Emission Tests and Results

Power line conducted emission tests were measured with a FCC approved setup with the DUT on a table as shown in figure1. The lamp cord was routed across the table and to the LISN. The conductive noise level was measured with a DSI measurement system that automatically plotted emission values in dBμV from 450 kHz to30 MHz for both the hot and neutral lines. The system was set to record those points that exceeded the limit line of 48dB.

The tests were run as follows. An automatic scam using peak detection was completed over the specified frequency range. Peak detection was used because of the ability of the equipment to scan significantly faster than at quasi-peak. Since any quasi-peak measurement would be less than peak, where the scan showed reading at or less than limit the unit would obviously pass. For points above 48 dB a test at the suspect frequency was performed with a quasi-peak detector and a pass/fail decision made.

5.1 Conducted Emission Results

The results of the scans on each of the units are shown as figures 1- 5 and Figures 1-5. The red line is the hot line and the blue is the neutral line. The scans and frequency examinations clearly show that the units meet the FCC requirement.

Figure 1

Frequency scan of ECN-22W-6

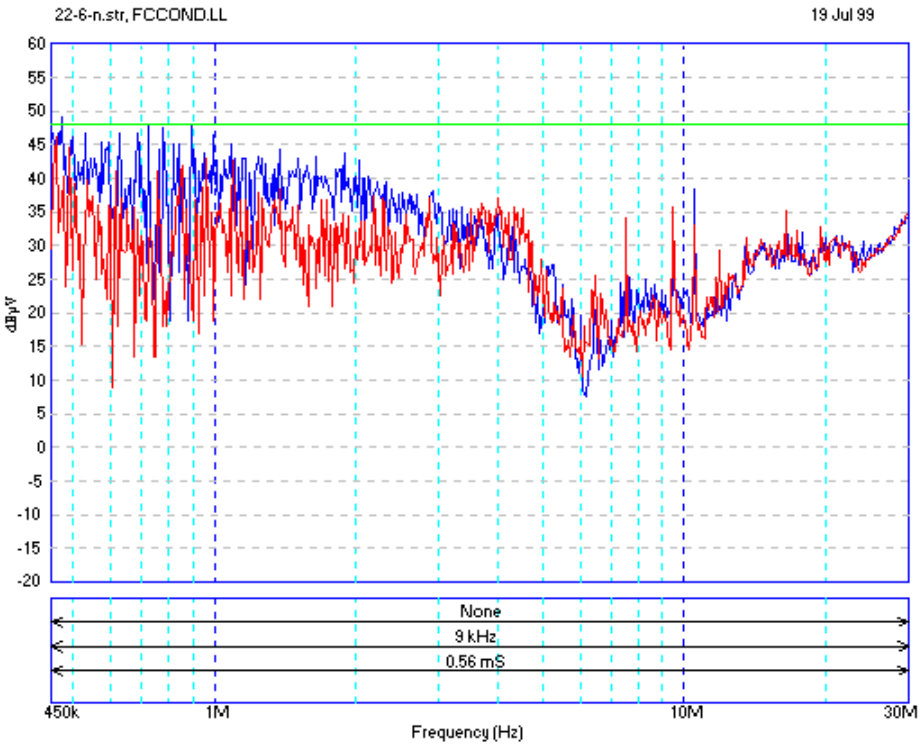

Table 1

Results of examining suspect frequencies

Datalog file: EC26L2.DL

Measurement Units: dBµV/m

Num	Frequency	Peak	QPeak	Date	Time
1	473.000 kHz	47.6	44.2	07/19/99	10:35:21
2	576.500 kHz	49.2	47.1	07/19/99	10:55:20
3	891.500 kHz	49.2	45.7	07/19/99	10:35

Figure 2

Frequency scan of ECN-22W-8 or FEA 22 CIR

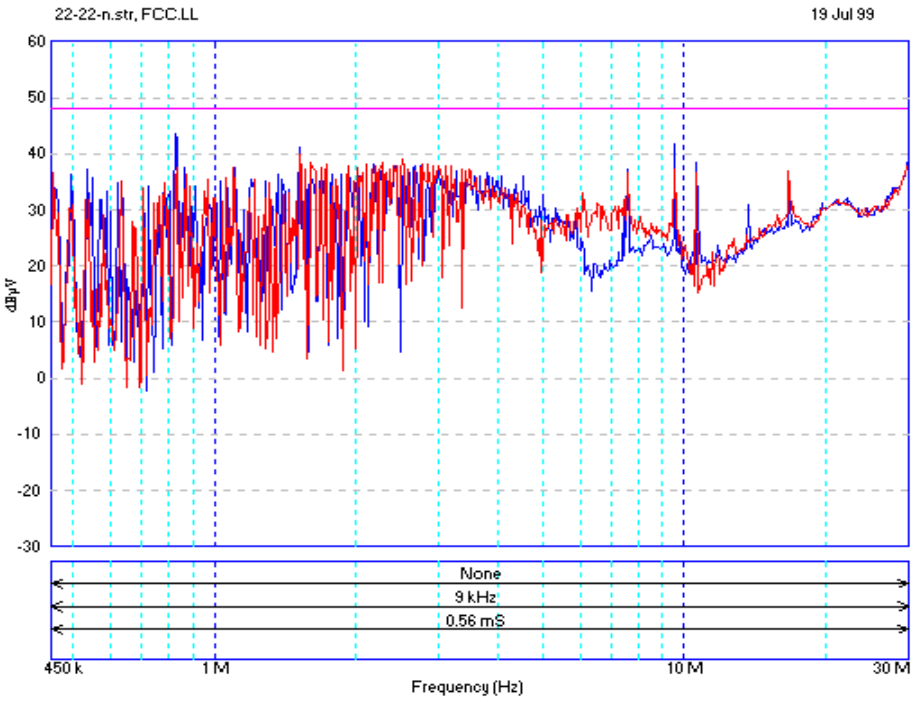

Table 2

Results of examining suspect frequencies

There were no suspect frequencies

Figure 3

Frequency scan of ECN-30W-8 or FEA 30 CIR

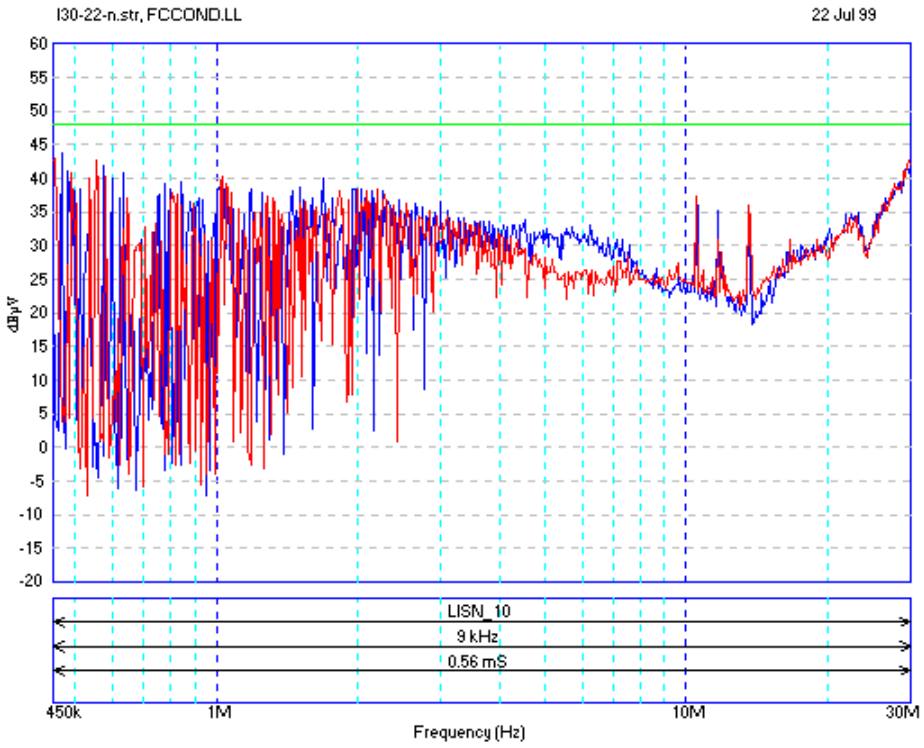

Table 3

Results of examining suspect frequencies

There were no suspect frequencies

Figure 4

Frequency scan of ECN-30W-9 or FEA 30 CIR

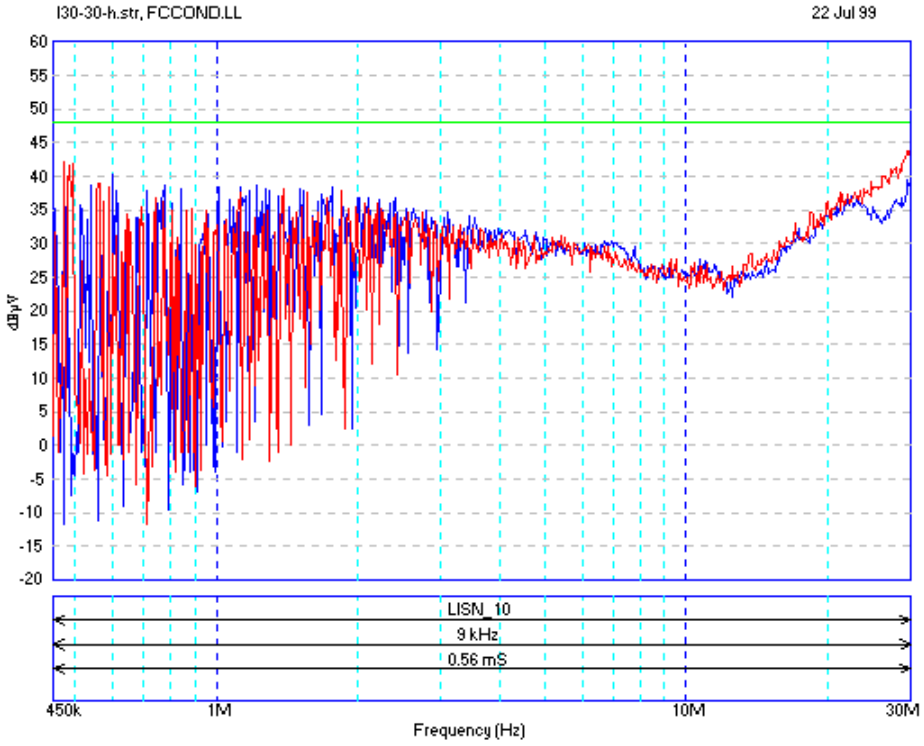

Table 4

Results of examining suspect frequencies

There were no suspect frequencies

Figure 5

Frequency scan of ECN-36W-9

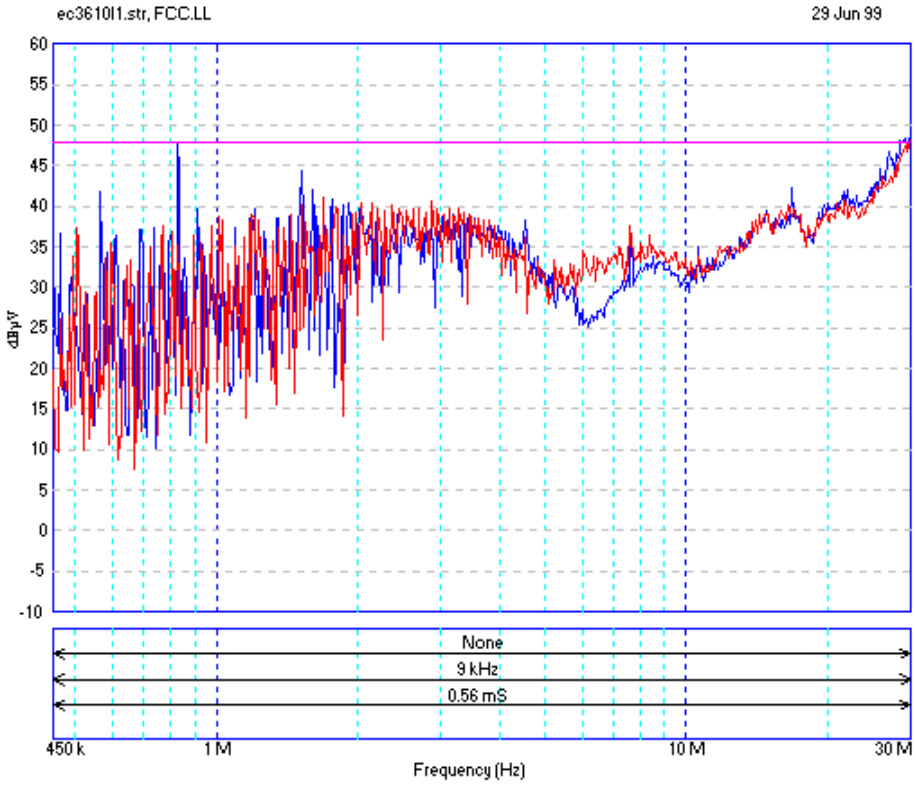

Table 5

Results of examination of suspect frequencies

```
@ Log 1  06/29/99 10:15 (930676523)
  Frequency: 29.9115 MHz
  Peak Measurement - Raw: 45.3 dBuV  Corrected: 45.3 dBµV
  Quasi Peak - Raw: 43.9 dBuV  Corrected: 43.9 dBµV
  Limit Level: 48.0 dBuV
  Limit Type: Peak

@ Log 2  06/29/99 10:15 (930676504)
  Frequency: 30 MHz
  Peak Measurement - Raw: 45.0 dBuV  Corrected: 45.0 dBµV
  Quasi Peak - Raw: 43.6 dBuV  Corrected: 43.6 dBµV
  Limit Level: 48.0 dBuV
  Limit Type: Peak
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