Compliance Labs Inc.

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An EMC/EMI Testing Company

Measured Radio Frequency Emissions
From

TCP Fluorescent Lamp
Model EC3ST

Report 1128
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 one Technical Consumer Products, Inc. EC3ST Series lamp. The device is subject to FCC rules and regulations as a RF lighting device.

In the testing performed on July 28, 1999, the sample of the lamp was found to meet the required FCC specifications for conducted emissions

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R. Edward Koskie, President

I. **Introduction:**

One EC3ST lamp was 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

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 was a fluorescent lamp assembly designed to be screwed into a 3-way light socket. It has a plastic case containing two electronic balasts that are constructed on PC boards identical to those in the U of M testing. The selection of the lamp or lamps to be energized is done by an external switch in the three-way socket. The lamps are 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.

The Lamps in this application expansion are identified by Model as:

TCP Fluorescent Lamp,
EC3ST-36W-22W
FCC ID: NIR-12508

A standard 3-way table lamp socket with a 1.2M two wire cord was prepared for powering the lamp. 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 4.

3.1 Modifications

There were no modifications made on the lamps under test.

4. Emission limits

The lamp was 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

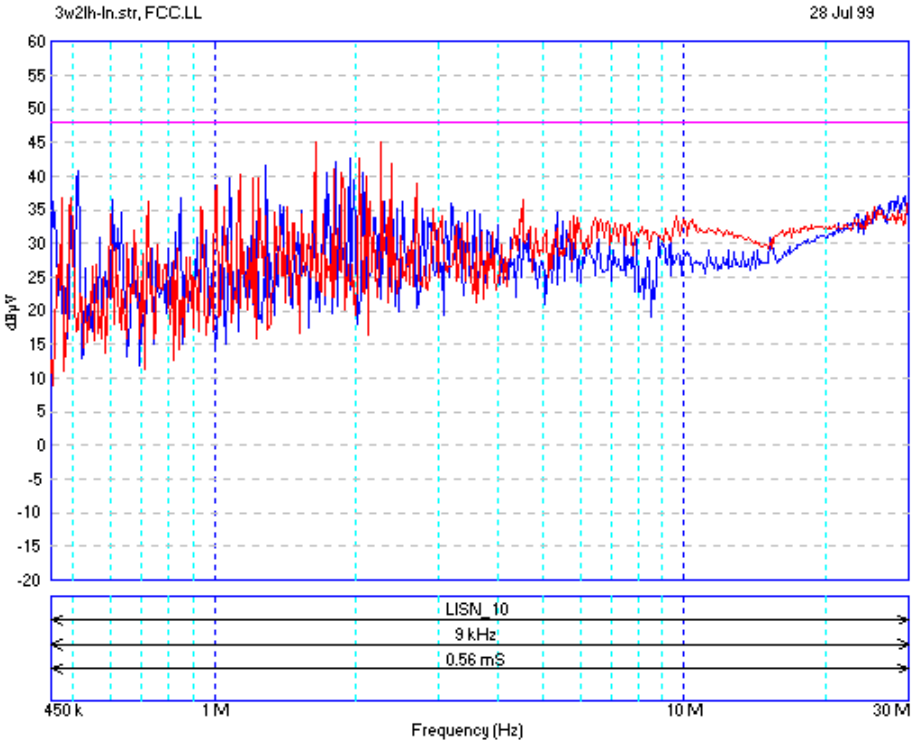
Power line conducted emission tests were measured with a FCC approved setup with the DUT on a table as shown in figure1. The lamp cord was routed across the table and to the LISN. The conductive noise level was measured with a DSI measurement system that automatically plotted emission values in dBµV 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 verification, where the scan indicated a value at or above the limit value, that frequency was examined with quasi-peak detection and a pass/fail judgement made.

5.1 Conducted Emission Results

The results of the scans on each of the units are shown as figure 1,2 and 3. The blue line is the hot line and the red is the neutral line. The frequencies where values exceeded the limit and the measured quasi-peak values are shown in Tables 2&3. The data thus shows that the units meet the Consumer Equipment limits.

Figure 1

Frequency scan of EC3ST in low intensity 22W position



Results of examining suspect frequencies

There were no suspect frequencies

Figure 2

Frequency scan of EC3ST in medium intensity 36W position

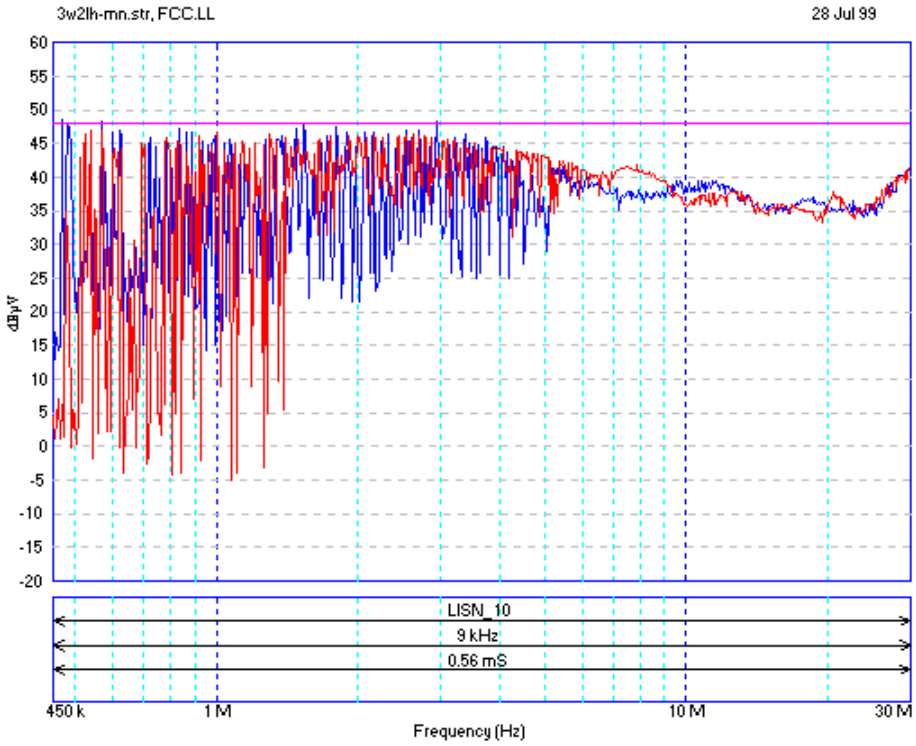


Table 2

Results of examining suspect frequencies

```
@ Datalog File

@ Log 1  07/28/99 08:00:07 (933174007)
  Frequency: 450.000 kHz
  Peak Measurement - Raw: 43.1 dBµV  Corrected: 53.1 dBµV
  Quasi Peak - Raw: 35.7 dBµV  Corrected: 45.7 dBµV
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -2.3 dB
  Notes: hot side
```

@ Log 2 07/28/99 07:46:43 (933173203)
  Frequency: 468.500 kHz
  Peak Measurement - Raw: 41.4 dBµV Corrected: 51.4 dBµV
  Quasi Peak - Raw: 37.7 dBµV Corrected: **47.7 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -30.3 dB
  Notes: hot side

@ Log 3 07/28/99 07:47:12 (933173232)
  Frequency: 482.000 kHz
  Peak Measurement - Raw: 35.1 dBµV Corrected: 45.1 dBµV
  Quasi Peak - Raw: 31.4 dBµV Corrected: **41.4 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -6.6 dB
  Notes: hot side

@ Log 4 07/28/99 07:47:44 (933173264)
  Frequency: 567.500 kHz
  Peak Measurement - Raw: 37.0 dBµV Corrected: 47.0 dBµV
  Quasi Peak - Raw: 32.1 dBµV Corrected: **42.1 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -5.9 dB
  Notes: hot side

@ Log 5 07/28/99 07:48:05 (933173285)
  Frequency: 2.939000 MHz
  Peak Measurement - Raw: 37.1 dBµV Corrected: 47.1 dBµV
  Quasi Peak - Raw: 33.5 dBµV Corrected: **43.5 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -4.5 dB
  Notes: hot side

@ End of Datalog

Figure 3

Frequency scan of EC3ST in high intensity 55W position

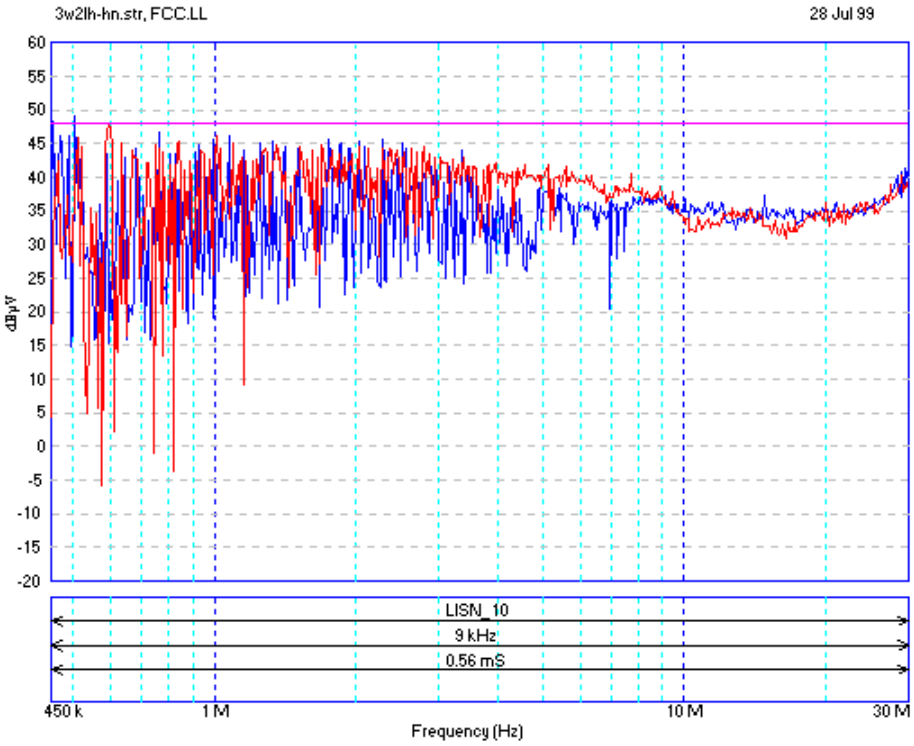


Table 3

Results of examining suspect frequencies

@ Log 1 07/28/99 08:11:35 (933174695)
  Frequency: 455.000 kHz
  Peak Measurement - Raw: 32.3 dBµV Corrected: 42.3 dBµV
  Quasi Peak - Raw: 37.7 dBµV Corrected: **37.7 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -30.3 dB
  Notes: hot line

@ Log 2 07/28/99 08:11:56 (933174716)
  Frequency: 504.500 kHz
  Peak Measurement - Raw: 38.2 dBµV Corrected: 48.2 dBµV
  Quasi Peak - Raw: 33.5 dBµV Corrected: **43.5 dBµV**
  Limit Level: 48.0 dBµV
  Limit Type: QPeak
  Delta Limit: -4.5 dB
  Notes: hot line

@ End of Datalog