Compliance Labs Inc.

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An EMC/EMI Testing Company

Measured Radio Frequency Emissions
From

TCP Fluorescent Lamps
ET and E4P- Series

Report 1112
September 15, 1999

For:
Technical Consumer Products
29401 Ambina Drive
Solon OH 44139

Contact:
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Tests performed by: Tests approved by _____
David Liebal and Ed Koskie R. Edward Koskie, President

Summary: The testing for compliance to FCC Regulations Part 18, Subpart C were performed on three Technical Consumer Products, Inc. ET Series lamps. The devices are subject to FCC rules and regulations as a RF lighting device.

In the testing performed May 5, 1999, June 29, 1999 and August 24, 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:

Three ET-Series and six E4P 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 expands the range of lamps in the product family.
For reference, the model numbers on the original application were:
TCP Fluorescent Lamps: ES11, ES 15 and ES 18. The listed FCC authorization number was:
FCC ID: NIR-10108

II. Equipment Listing

Instrument	Manufacturer	Calibration date
EMI Test System	Dynamic Sciences DSI 2020	12/21/98
LISN	Fisher Custom Communications Mod. 50/250-25-4	8/4/99
Cables	Various	

III. Configuration and Identification of Device under test

The DUT is a fluorescent lamp assembly designed to be screwed into a standard light socket. It has a plastic case containing electronic ballast that is constructed on a PC board which is identical to those in the original U of M testing. The ET lamps are configured into three looped tubes. The E4P lamps are one spiral starting from the base and turning back on itself to return to the base. The ballast is a switching power supply operating at 45kHz. Because of this, radiated emission tests are not required.

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

They are identified as:
TCP Fluorescent Lamps

E4P-11	ET-15
E4P-15	ET-20
E4P-18	ET-23
E4P-23	
E4P-26	
E4P-32	

FCC ID: NIR-10108

The E4P-11 through E4P-26 lamps are all high power factor lamps and will be identified on the unit as such. The E4P-32 and the ER lamps are all low power factor and will be identified on the unit as such.

A standard table lamp socket with a one meter two wire cord was prepared for powering the lamps.

3.1 Modifications

There were no modifications made on the lamps under test. However, TCP replaced two lamps that initially failed the test.

4. Emission limits

The lamps were tested in accordance with Part 18, Subpart C. The frequency of test and the limits are given in the table below.

4.1 Conducted Emission Limits

Table 4.1 Conducted emission limits
(Ref: 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. 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 peakemission 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- 9and Table 1-9. The red line is the hot line and the blue is the neutral line. The limit line is also shown. Some of the lamps had suspect frequencies. The data thus shows that the units meet the Consumer Equipment limits.

Figure 1

Frequency scan of E4P-11

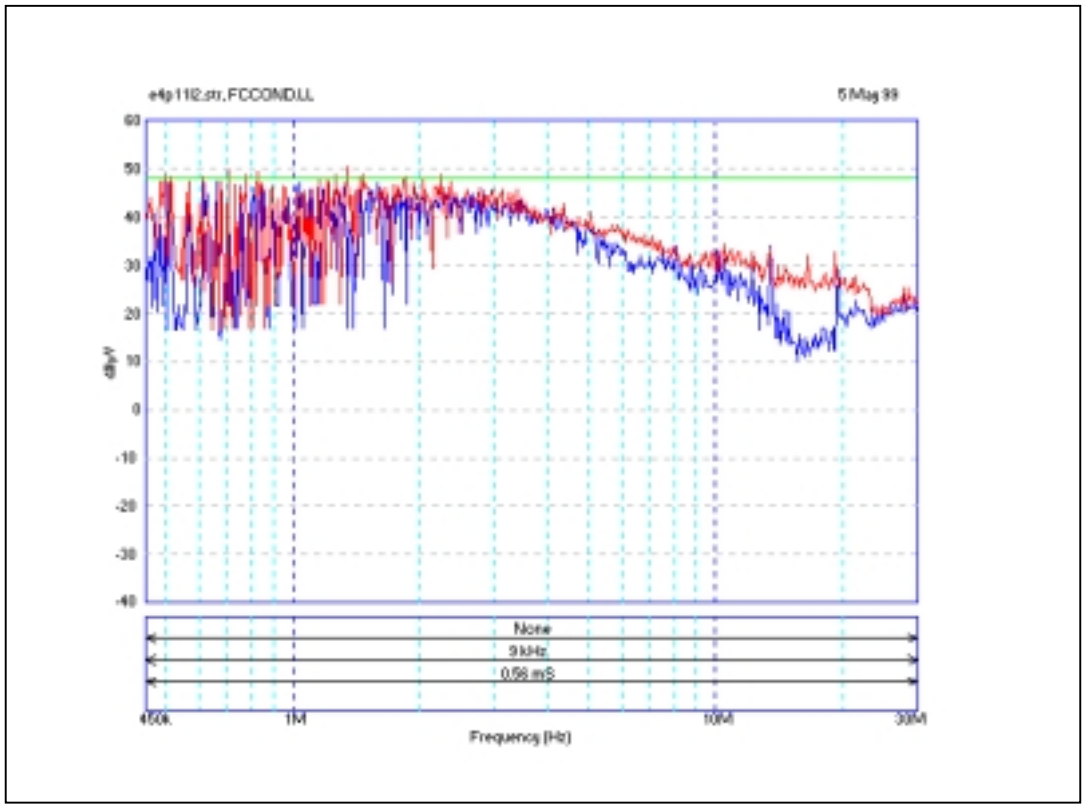

Table 1

Results of scan of suspect frequencies

Freq.	BW	Peak	QP	Limit	Delta		
710.216k	9k	49.9	47.7	48	-0.3		
780.031k	9k	50.7	44.8	48	-1.7		
830.805k	9k	48.2	47.2	48	-0.8		
1.338 M	9k	49.4	45.7	48	-2.3		

Figure 2

Frequency scan of E4P-15

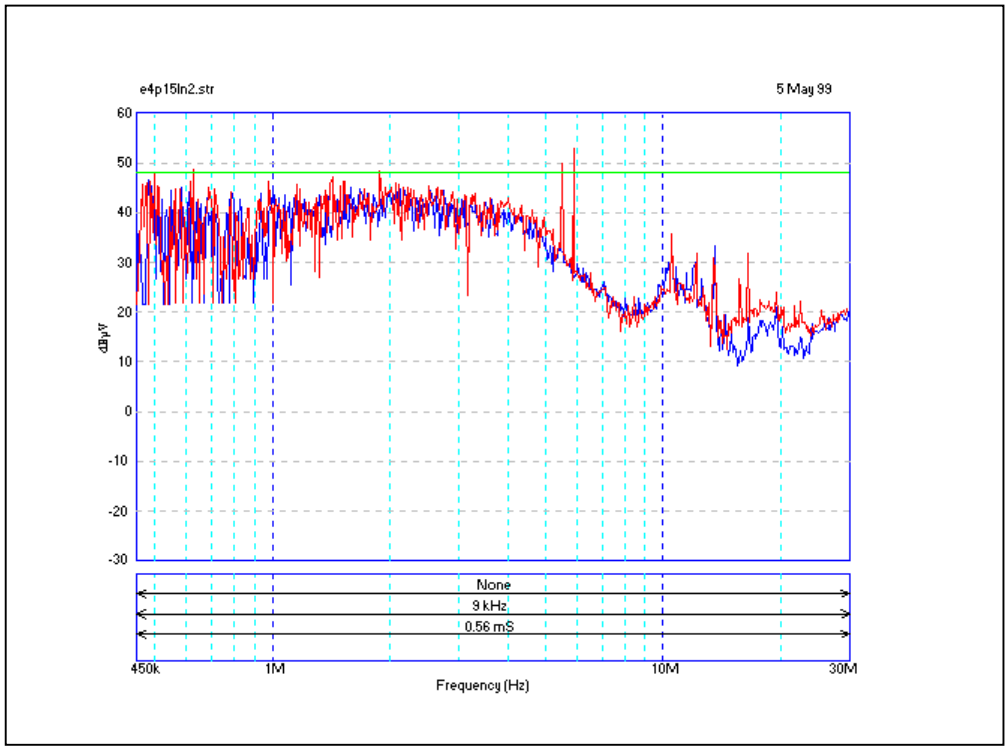

Table 2

Results of scan of suspect frequencies

Freq.	BW	Peak	QP	Limit	Delta		
626.067k	9k	45.2	42.5	48	-5.5		
5.5343M	9k	33.5	31.8	48	-16.2		
5.9509M	9k	27.2	19.4	48	-28.6		

Figure 3

Frequency scan of E4P-18

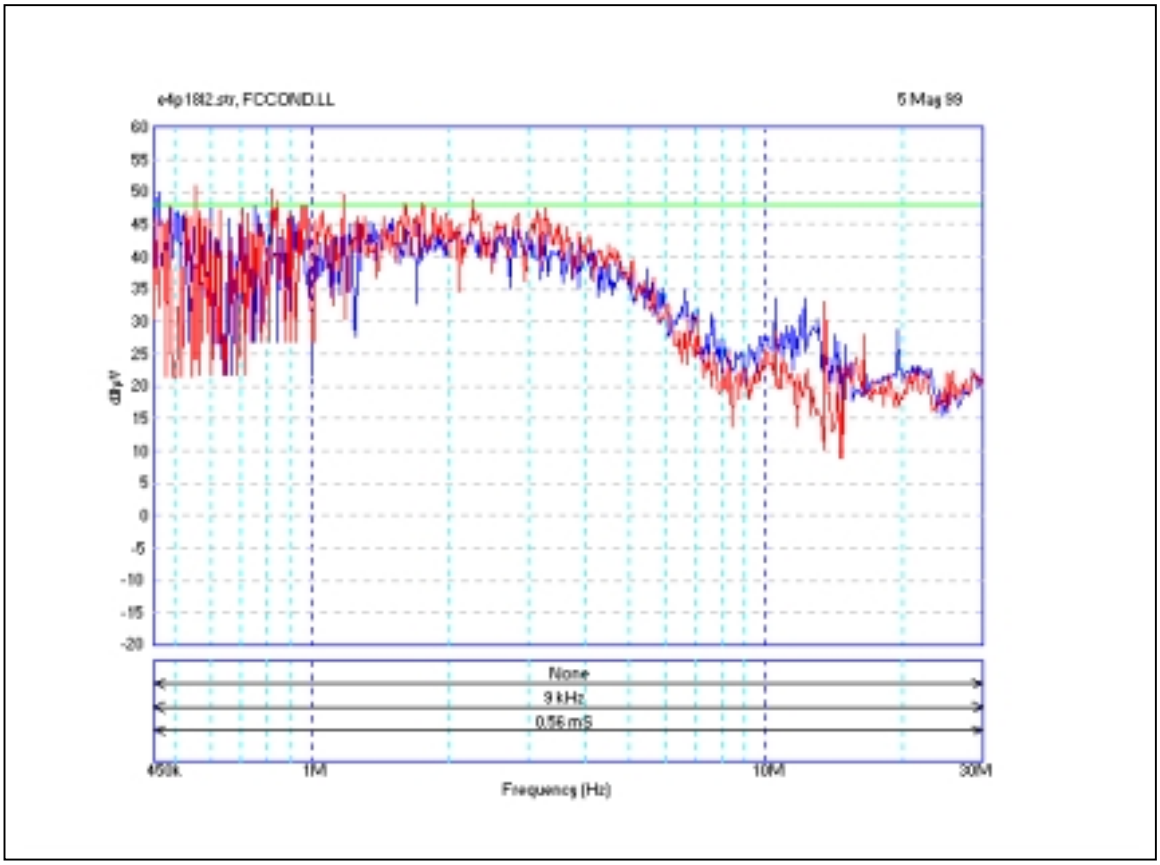

Table 3

Results of examination of suspect frequencies

Freq.	BW	Peak	QP	Limit	Delta		
458.384k	9k	49.1	45.9	48	-2.1		
553.2110k	9k	49.2	45.7	48	-2.3		
823.2416k	9k	48.1	46.0	48	-2.0		
1.1810M`	9k	50.1	447.2	48	-.08		
2.2645M	9k	46.0	44.2	48	-3.8		

Figure 4

Frequency scan of E4P-23

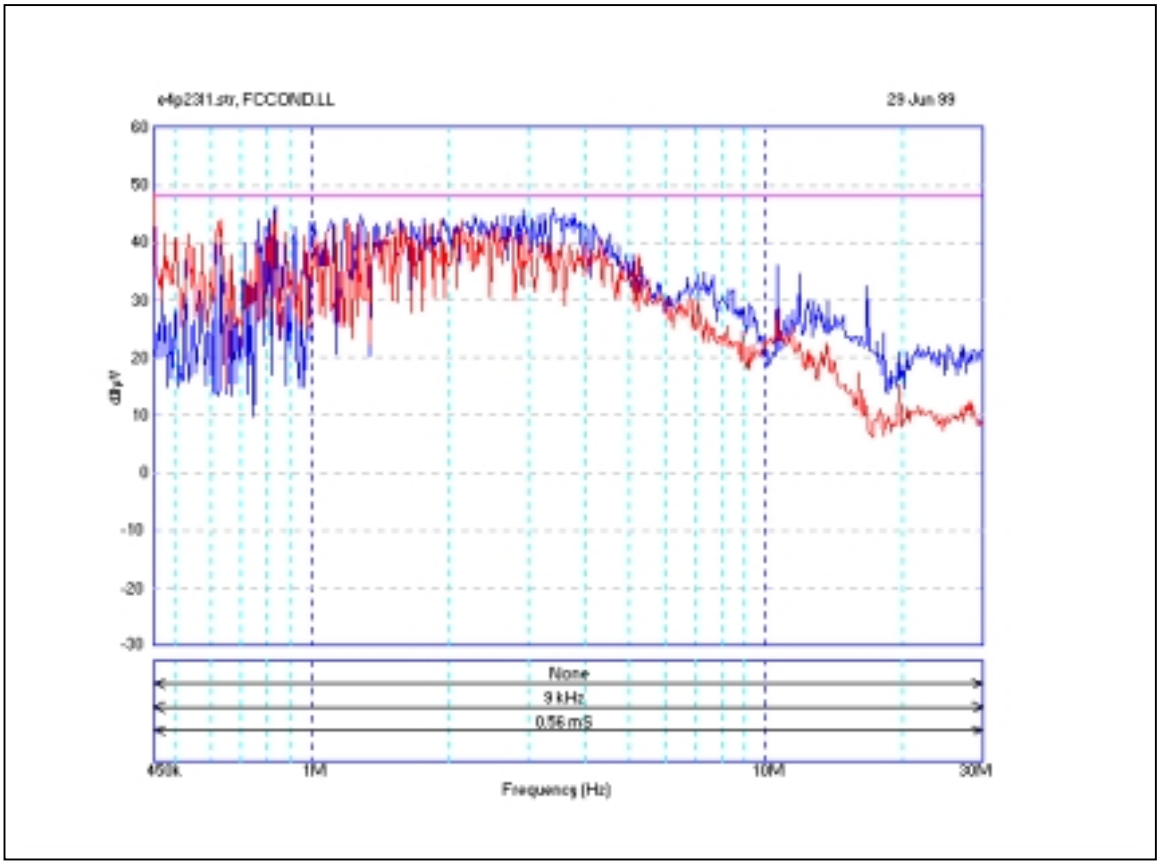

Table 4

Results of examination of suspect frequencies

There were no suspect frequencies

Figure 5

Frequency scan of E4P-26

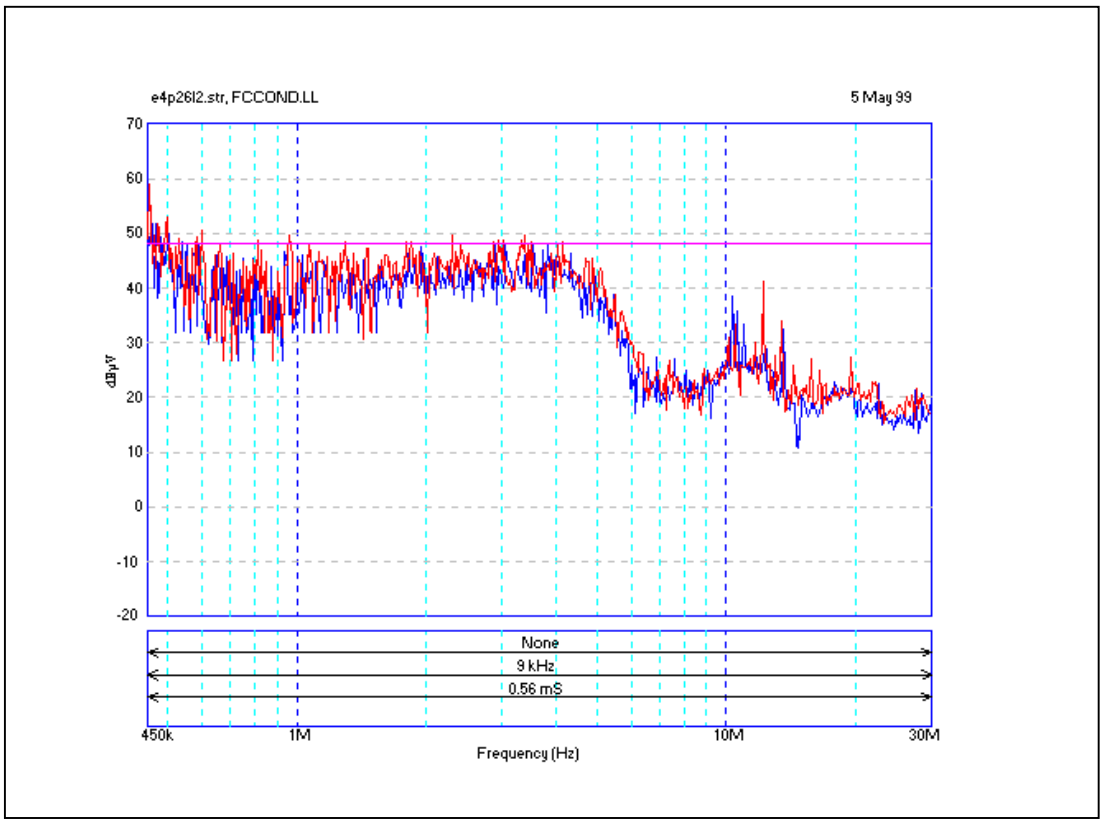

Table 5

Results of scan of suspect frequencies

Freq.	BW	Peak	QP	Limit	Delta		
455.0769k	9k	48.9	44.8	48	-3.2		
457.7982k	9k	49.9	47.4	48	-0.6		
468.3486k	9k	46.2	45.6	48	-2.4		
482.1101k	9k	47.9	46.2	48	-1.8		
502.7523k	9k	48.4	45.7	48	-2.3		
583.6923k	9k	48.3	44.2	48	-3.8		
598.9230k	9k	49.3	45.5	48	-2.5		
956.0000k	9k	50.8	47	48	-1.0		

Figure 6

Frequency scan of E4P-32

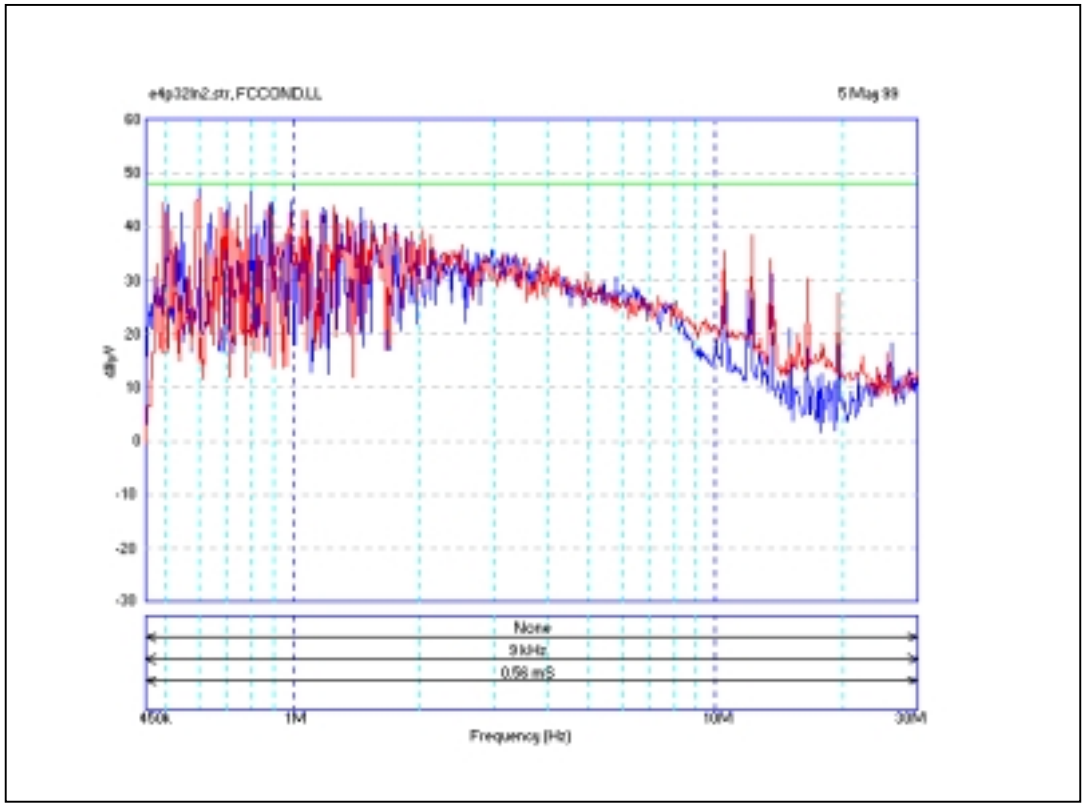

Table 6

Results of scan of suspect frequencies

There were no suspect frequencies

Figure 7
Frequency scan of ET-15

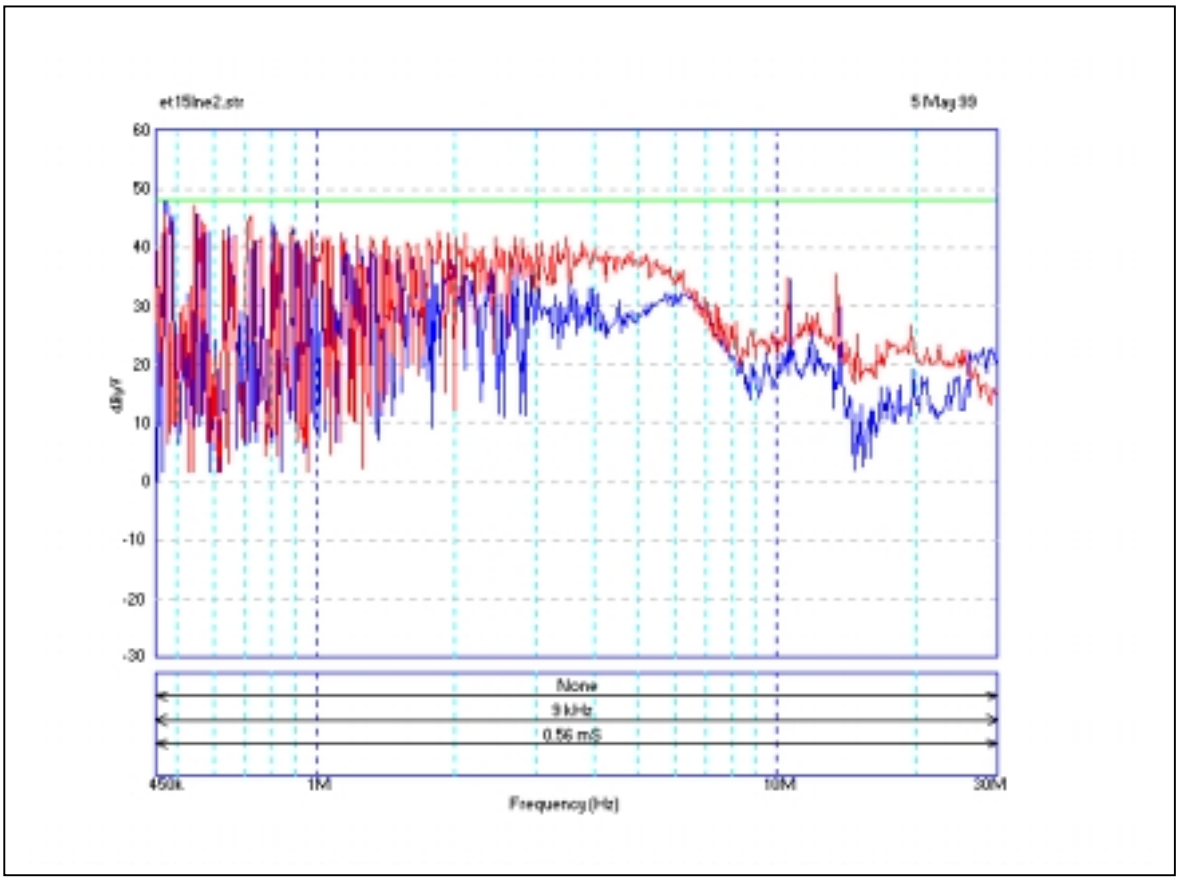

Table 7
Results of scan of suspect frequencies

There were no suspect frequencies

Figure 8
Frequency scan of ET-20

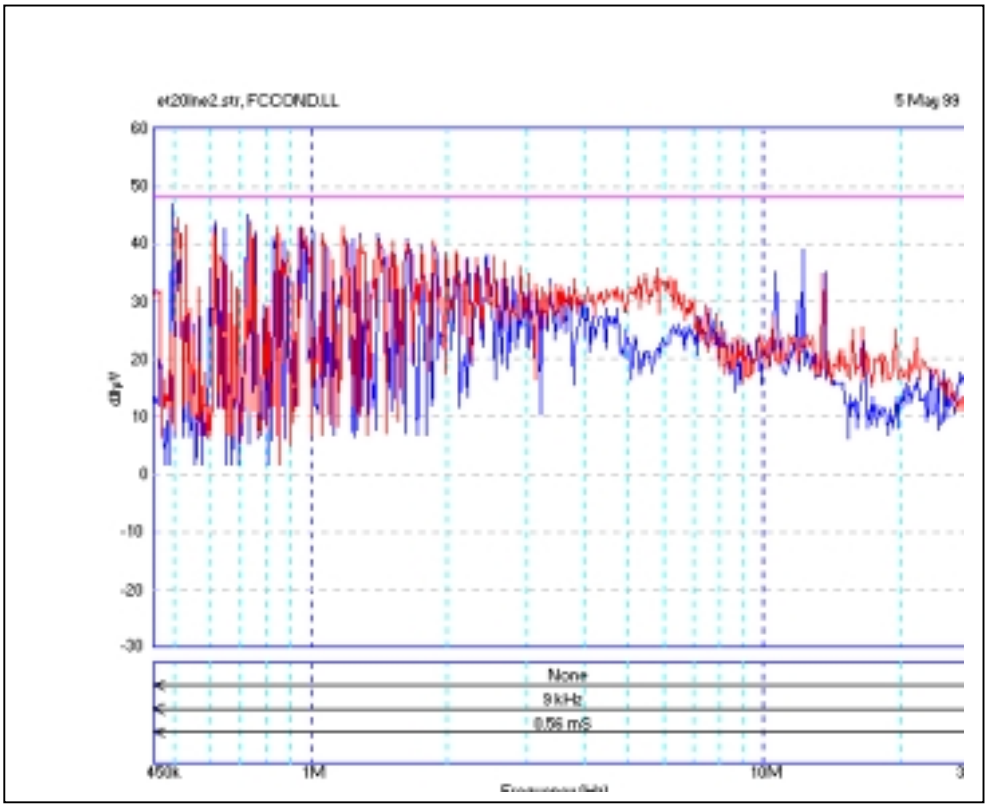

Table 8
Results of scan of suspect frequencies

There were no suspect frequencies

Figure 9

Frequency scan of ET-23

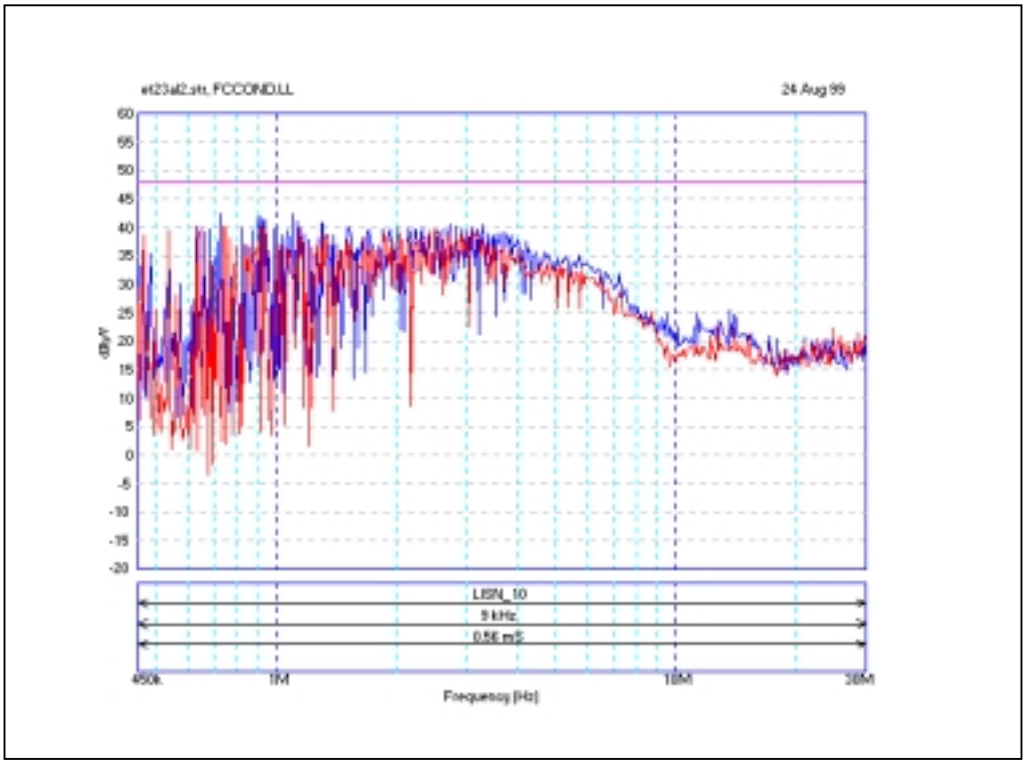

Table 9
Results of scan of suspect frequencies

There were no suspect frequencies