FCC PART 18
MEASUREMENT AND TEST REPORT

For

Buffalo Lite

P.O. Box 696
Buena Park, CA 90621

FCC ID: QNBSPI

September 23, 2002

This Report Concerns:	**Equipment Type:**
☒ Original Report	Indoor Light

Test Engineer:	Jerry Wang
Report Number:	R0208301
Test Date:	September 10, 2002
Reviewed By:	Jeff Lee
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

1.1 Product Description for Equipment Under Test (EUT)

Buffalo Lite.'s model *1014, 1015, 1020, 1025* or the "EUT" as referred to in this report is an indoor light which measures 5.0"L x 1.75"W x 1.75" H (1014), 5.0"L x 2.0"W x 2.0" H (1015), 5.5"L x 2.0"W x 2.0" H (1020) and 5.5"L x 2.0"W x 2.0" H (1025).

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 *Buffalo Lite* 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 MP-5, FCC Methods of Measurement of Radio-Noise Emissions from Industrial, Scientific and Medical Equipment. 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 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
Buffalo Lite	Indoor Light	1014, 1015, 1020, 1025	None	QNBSPI

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

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

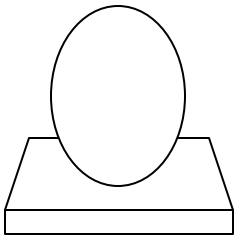
2.2 Schematics / Block Diagram

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

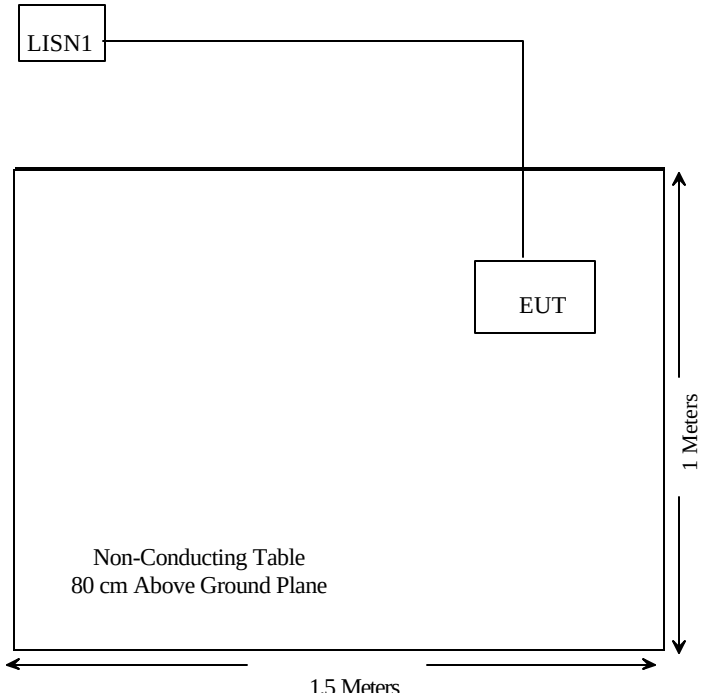
2.3 Equipment Modifications

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 **O**pen **A**rea **T**est **S**ite, using the same setup per MP-5 measurement procedure. The specification used was the FCC 18.307 (c) Class B 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 dBµV 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 18.307 (c) Class B Conducted margin for industry, scientific and medical device, and with the worst margin reading of:

-2.6 dBµV at **0.48** MHz at the **Neutral** mode, 0.45-30MHz, M/N: 1014.

-13.9 dBµV at **2.96** MHz at the **Neutral** mode, 0.45-30MHz, M/N: 1015.

-11.8 dBµV at **3.20** MHz at the **Neutral** mode, 0.45-30MHz, M/N: 1020.

-9.8 dBµV at **2.86** MHz at the **Neutral** mode, 0.45-30MHz, M/N: 1025.

3.6 Conducted Emissions Test Data

3.6.1 Test Data for 1014, 0.45-30MHz

LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency MHz	Amplitude dBµV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBµV	Margin dB
0.48	45.4	QP	Neutral	48	-2.6
0.48	45.3	QP	Line	48	-2.7
1.96	27.7	QP	Neutral	48	-20.3
26.29	23.6	QP	Line	48	-24.4
15.37	10.2	QP	Line	48	-37.8
15.37	8.7	QP	Neutral	48	-39.3

3.6.2 Test Data for 1015, 0.45-30MHz

LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency MHz	Amplitude dBµV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBµV	Margin dB
2.96	34.1	QP	Neutral	70	-13.9
2.96	32.8	QP	Line	70	-15.2
1.34	31.6	QP	Line	48	-16.4
1.19	31.2	QP	Neutral	48	-16.8
5.52	24.1	QP	Neutral	48	-23.9
9.17	18.6	QP	Line	48	-29.4

3.6.3 Test Data for 1020, 0.45-30MHz

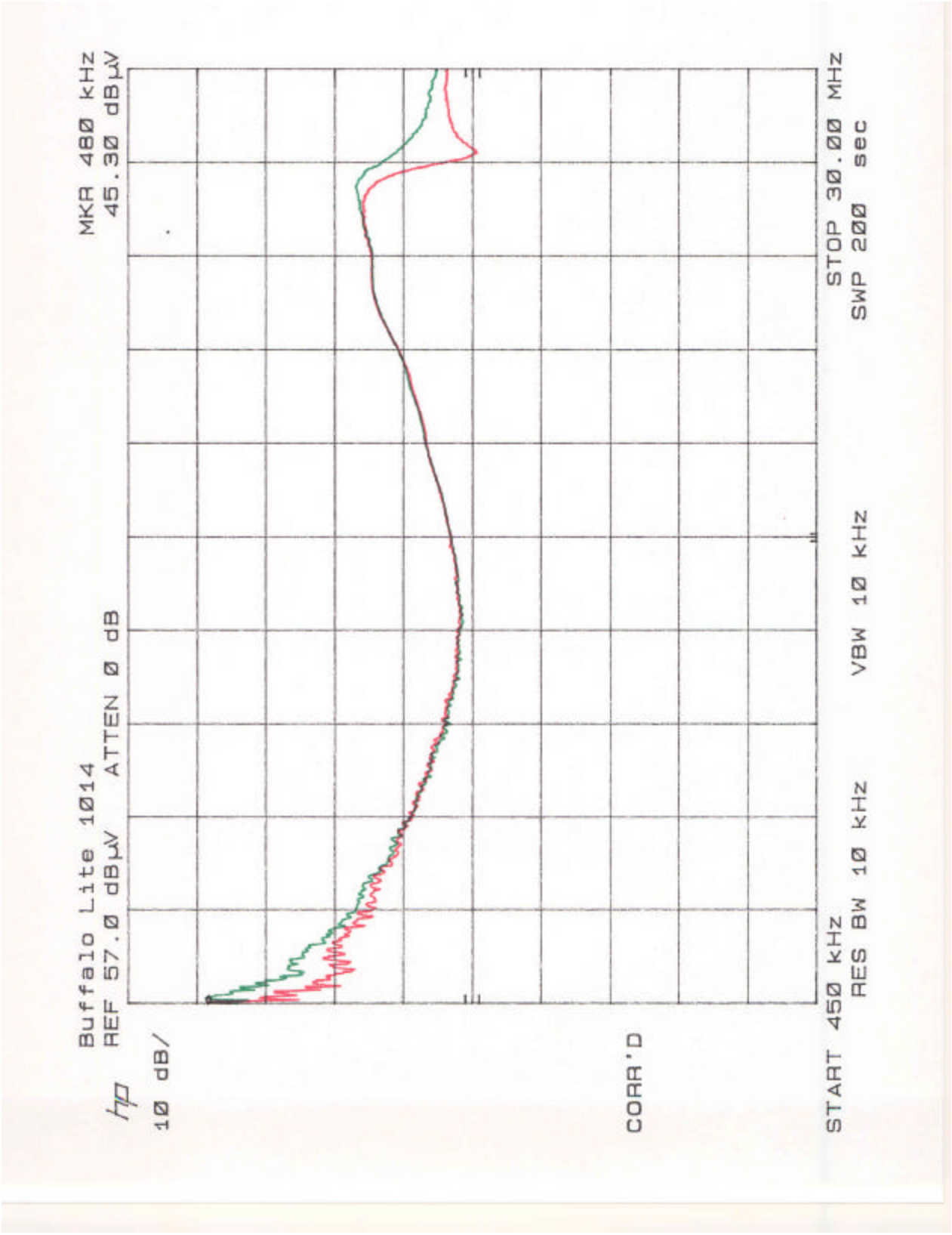
LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency MHz	Amplitude dBµV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBµV	Margin dB
3.20	36.2	QP	Neutral	48	-11.8
3.20	35.8	QP	Line	48	-12.2
9.43	25.7	QP	Line	48	-22.3
8.13	25.7	QP	Neutral	48	-22.3
10.67	22.4	QP	Neutral	48	-25.6
15.34	11.3	QP	Line	48	-36.7

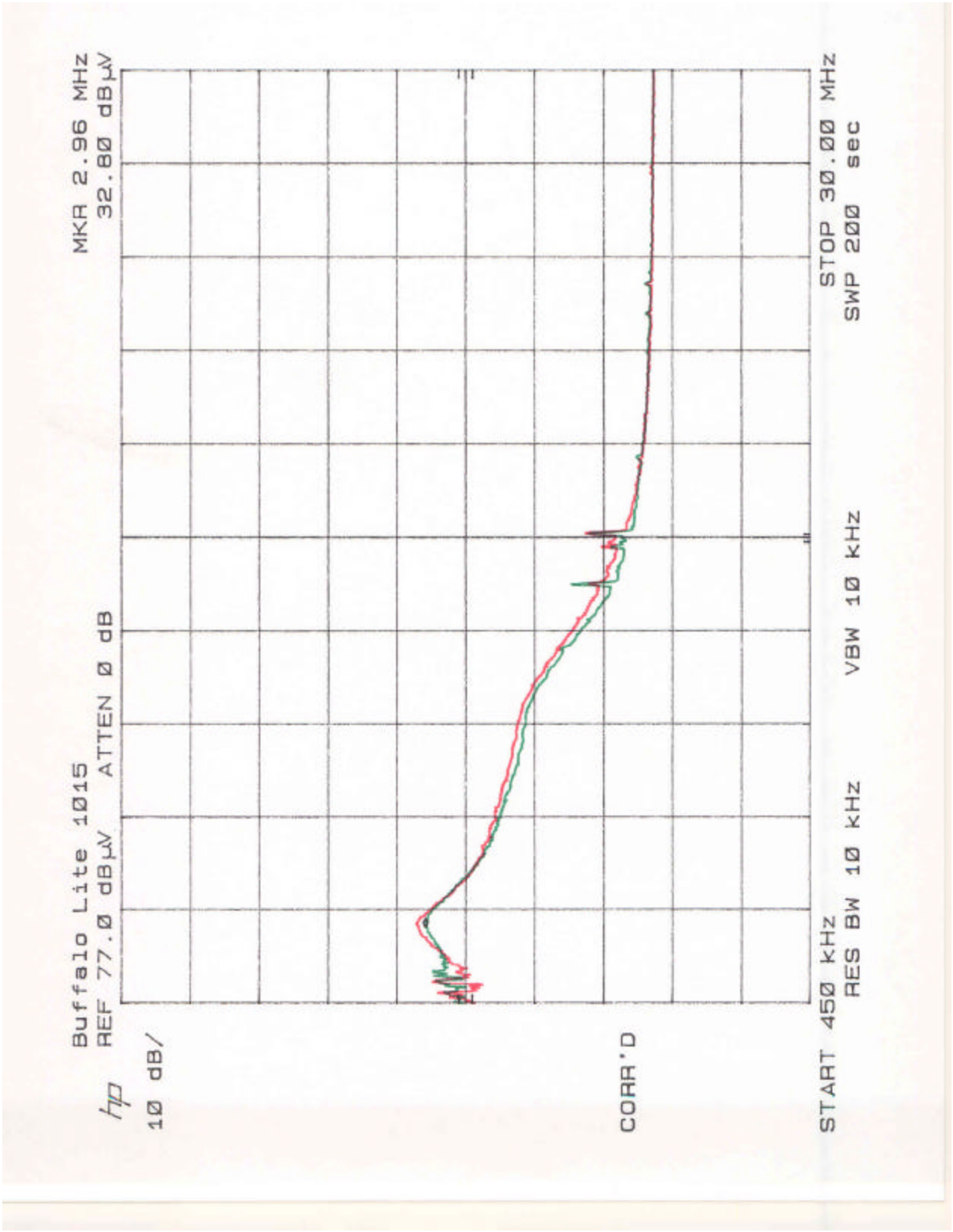
3.6.4 Test Data for 1025, 0.45-30MHz

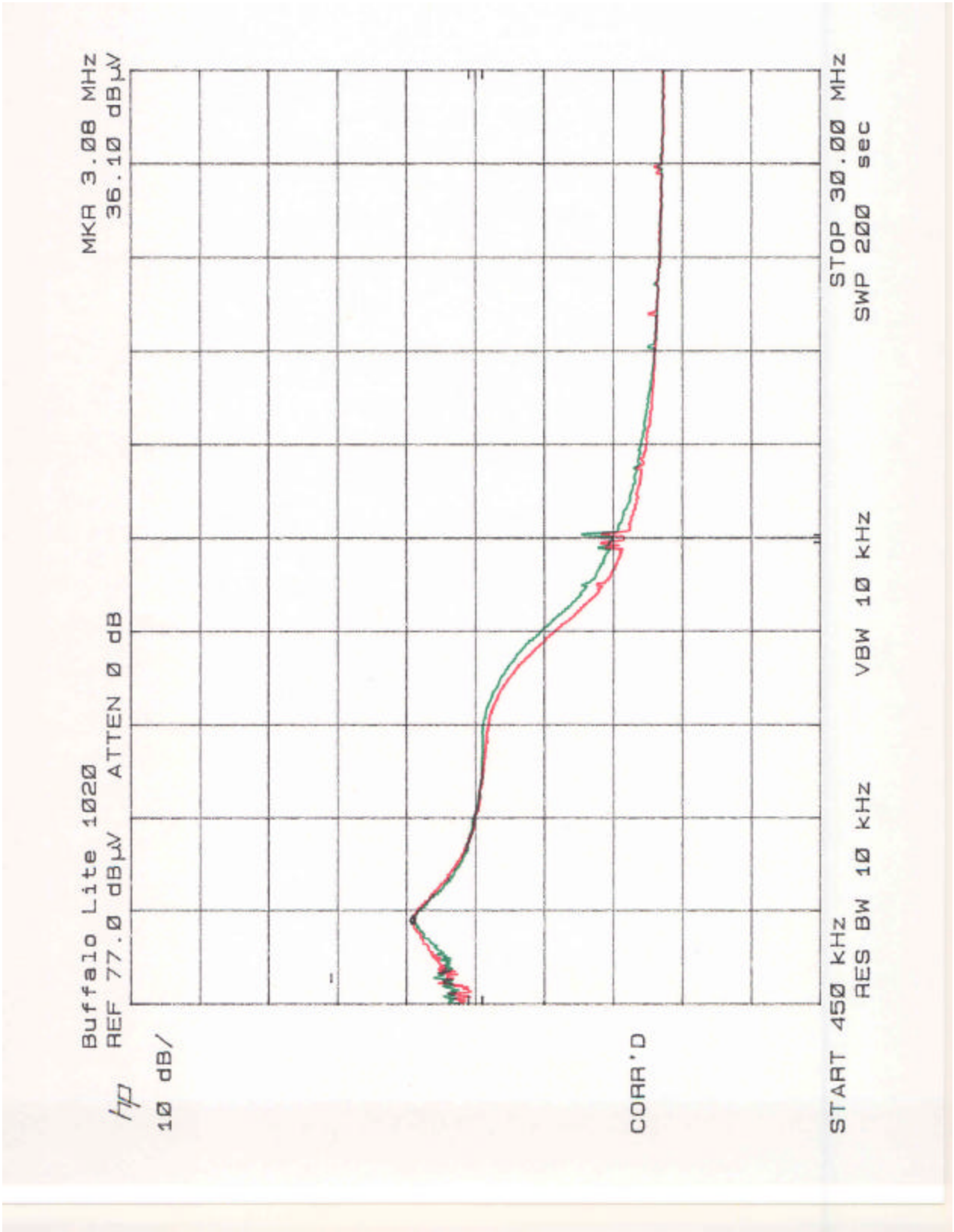
LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBµV	Qp/Ave/Peak	Line/Neutral	dBµV	dB
2.86	38.2	QP	Neutral	70	-9.8
2.87	36.8	QP	Line	70	-11.2
0.78	34.2	QP	Line	48	-13.8
1.87	33.2	QP	Neutral	48	-14.8
9.01	17.3	QP	Neutral	48	-30.7
8.97	16.7	QP	Line	48	-31.3

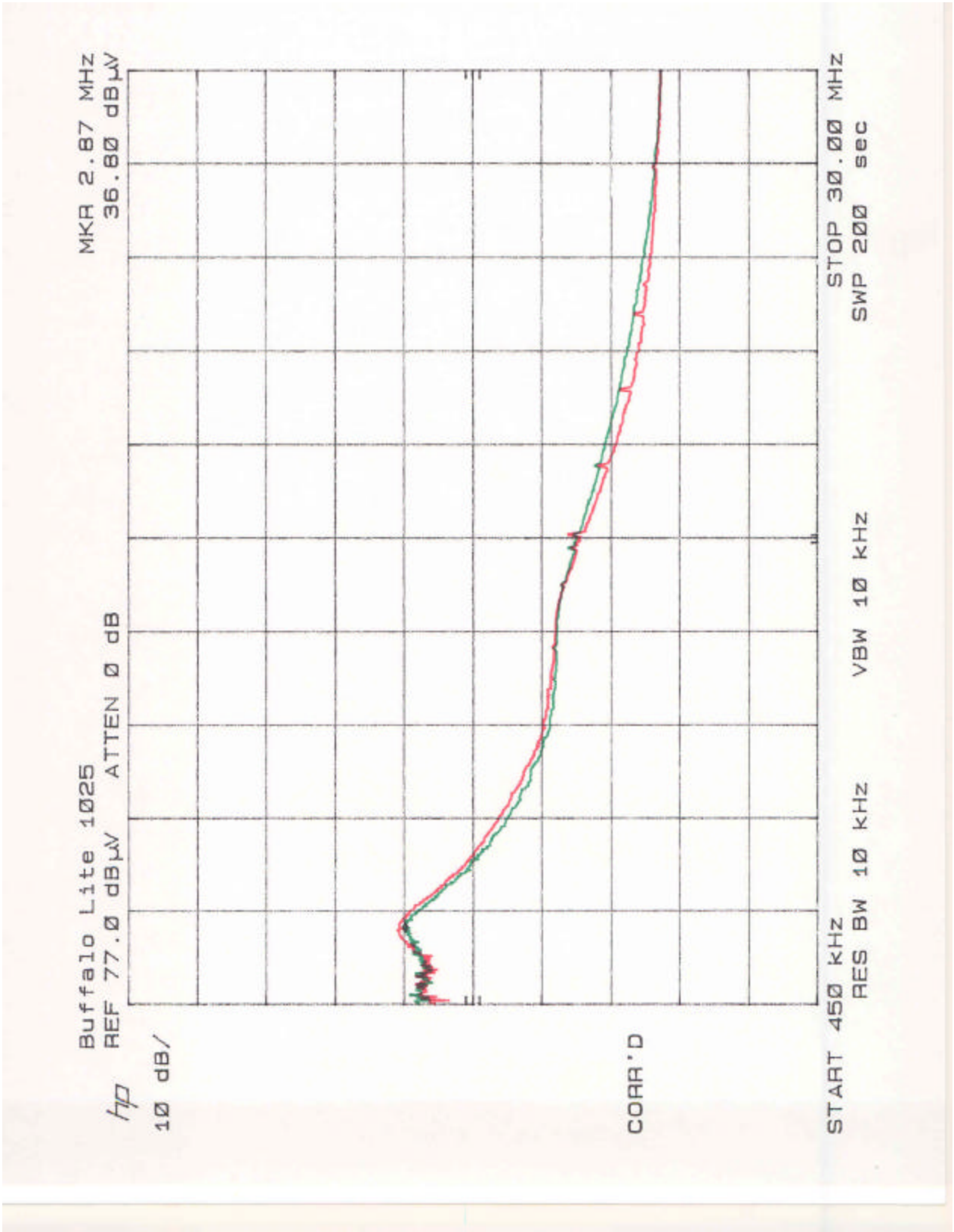
3.7 Plot(s) of Conducted Emissions Test Data

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


Buffalo Lite 1014
REF 57.0 dBµV ATTEN 0 dB
MKR 480 kHz
45.30 dBµV
10 dB/
CORR'D
START 450 kHz
RES BW 10 kHz
VBW 10 kHz
STOP 30.00 MHz
SWP 200 sec


Buffalo Lite 1015
REF 77.0 dBµV ATTEN 0 dB
10 dB/
MKR 2.96 MHz
32.80 dBµV
CORR'D
START 450 kHz
RES BW 10 kHz
VBW 10 kHz
STOP 30.00 MHz
SWP 200 sec


Buffalo Lite 1020
REF 77.0 dBµV ATTEN 0 dB
10 dB/
MKR 3.08 MHz
36.10 dBµV
CORR'D
START 450 kHz
RES BW 10 kHz
VBW 10 kHz
STOP 30.00 MHz
SWP 200 sec


Buffalo Lite 1025
REF 77.0 dBµV
ATTEN 0 dB
MKR 2.87 MHz
36.80 dBµV
10 dB/
CORR'D
START 450 kHz
RES BW 10 kHz
VBW 10 kHz
STOP 30.000 MHz
SWP 200 sec

4 - RADIATED EMISSION DATA

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is $\pm$4.0 dB.

4.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the MP-5. The specification used in this report was the FCC 18.307 (c) Class B 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.

4.3 Spectrum Analyzer Setup

According to FCC Rules, the system was tested to 1000 MHz.

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed	Auto
IF Bandwidth	1 MHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

4.4 Test Procedure

For the radiated emissions test, the power cord of the power cord extension was connected to the AC floor outlet.

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

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBµV of specification limits), and are distinguished with a "**Qp**" in the data table.

The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBµV means the emission is 7dBµV below the maximum limit for FCC Part 18. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 18 Limit

4.6 Summary of Test Results

According to the data in section 4.7, the EUT complied with the FCC 18.307 (c) Class B standards for a industry, scientific and medical device, and had the worst margin of:

-10.3 dBmV at **38.00 MHz** in the **Vertical** polarization, **30 to 1000MHz, 3 meters, 1014**

-10.0 dBmV at **38.02 MHz** in the **Vertical** polarization, **30 to 1000MHz, 3 meters, 1015**

-9.8 dBmV at **40.00 MHz** in the **Vertical** polarization, **30 to 1000MHz, 3 meters, 1020**

-9.3 dBmV at **38.00 MHz** in the **Vertical** polarization, **30 to 1000MHz, 3 meters, 1025**

4.7 Radiated Emissions Test Data

4.7.1 Final Test Data, 30-1000MHz, 3 Meters, 1014

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 18	
Frequency MHz	Ampl. dBmV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBmV/m	Cable dB	Amp. dB	Corr. Ampl. dBmV/m	Limit dBmV/m	Margin dB
38.00	39.8	30	1.2	V	15.1	1.5	26.7	29.7	40	-10.3
38.00	39.5	90	2	H	15.1	1.5	26.7	29.4	40	-10.6
86.00	42.1	270	1.2	V	9.9	2.2	27.5	26.7	40	-13.3
50.00	40.8	120	2.5	H	10.2	1.7	27.3	25.4	40	-14.6
72.00	42.7	30	1.2	V	8.1	1.9	27.5	25.2	40	-14.8
85.99	40.5	0	1.2	V	9.9	2.2	27.5	25.1	40	-14.9
86.00	39.2	180	2	H	9.9	2.2	27.5	23.8	40	-16.2
72.02	40.5	180	2	H	8.1	1.9	27.5	23.0	40	-17.0
132.00	37.9	300	1.2	V	10.7	2.8	27.5	23.9	43.5	-19.6
132.00	36.9	270	2	H	10.7	2.8	27.5	22.9	43.5	-20.6

4.7.2 Final Test Data, 30-1000MHz, 3 Meters, 1015

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 18	
Frequency MHz	Ampl. dBmV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBmV/m	Cable dB	Amp. dB	Corr. Ampl. dBmV/m	Limit dBmV/m	Margin dB
38.02	40.1	200	1.2	V	15.1	1.5	26.7	30.0	40	-10.0
38.01	39.8	180	2	H	15.1	1.5	26.7	29.7	40	-10.3
72.00	46.1	90	1.2	V	8.1	1.9	27.5	28.6	40	-11.4
124.00	45.6	180	2	H	11.1	3.0	27.7	32.0	43.5	-11.5
124.00	44.7	30	1.2	V	11.1	3.0	27.7	31.1	43.5	-12.4
48.00	40.2	200	3	H	11.6	1.5	26.9	26.4	40	-13.6
48.00	39.8	200	1.2	V	11.6	1.5	26.9	26.0	40	-14.0
60.00	41.9	180	1.2	V	8.9	1.8	27.5	25.1	40	-14.9
68.00	39.0	45	1.2	V	8.4	1.9	27.5	21.8	40	-18.2
68.00	38.9	270	2.5	H	8.4	1.9	27.5	21.7	40	-18.3

4.7.3 Final Test Data, 30-1000MHz, 3 Meters, 1020

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 18	
Frequency MHz	Ampl. dBmV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBmV/m	Cable dB	Amp. dB	Corr. Ampl. dBmV/m	Limit dBmV/m	Margin dB
40.00	43.4	120	1.2	V	12.3	1.4	26.9	30.2	40	-9.8
124.00	46.1	300	2	H	11.1	3.0	27.7	32.5	43.5	-11.0
124.00	45.1	120	1.2	V	11.1	3.0	27.7	31.5	43.5	-12.0
72.00	44.2	300	2	H	8.1	1.9	27.5	26.7	40	-13.3
40.00	37.9	270	2	H	12.3	1.4	26.9	24.7	40	-15.3
72.00	42.1	120	1.2	V	8.1	1.9	27.5	24.6	40	-15.4
56.00	38.2	90	1.2	V	9.2	1.7	27.3	21.8	40	-18.2
68.00	38.9	30	1.2	V	8.4	1.9	27.5	21.7	40	-18.3
70.00	37.8	90	1.2	V	8.1	1.9	27.5	20.3	40	-19.7

4.7.4 Final Test Data, 30-1000MHz, 3 Meters, 1025

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 18	
Frequency MHz	Ampl. dBmV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBmV/m	Cable dB	Amp. dB	Corr. Ampl. dBmV/m	Limit dBmV/m	Margin dB
38.00	40.8	180	1.2	V	15.1	1.5	26.7	30.7	40	-9.3
38.00	39.6	30	2	H	15.1	1.5	26.7	29.5	40	-10.5
34.03	39.4	45	2	H	14.6	1.5	26.7	28.8	40	-11.2
34.01	38.5	200	1.2	V	14.6	1.5	26.7	27.9	40	-12.1
72.00	45.2	30	1.2	V	8.1	1.9	27.5	27.7	40	-12.3
72.00	43.9	120	2	H	8.1	1.9	27.5	26.4	40	-13.6
67.98	42.8	0	1.2	V	8.4	1.9	27.5	25.6	40	-14.4
58.02	39.2	0	1.2	V	9.2	1.7	27.3	22.8	40	-17.2
68.00	38.7	120	2	H	8.4	1.9	27.5	21.5	40	-18.5

5 – FCC PRODUCT LABELING AND WARNING STATEMENT

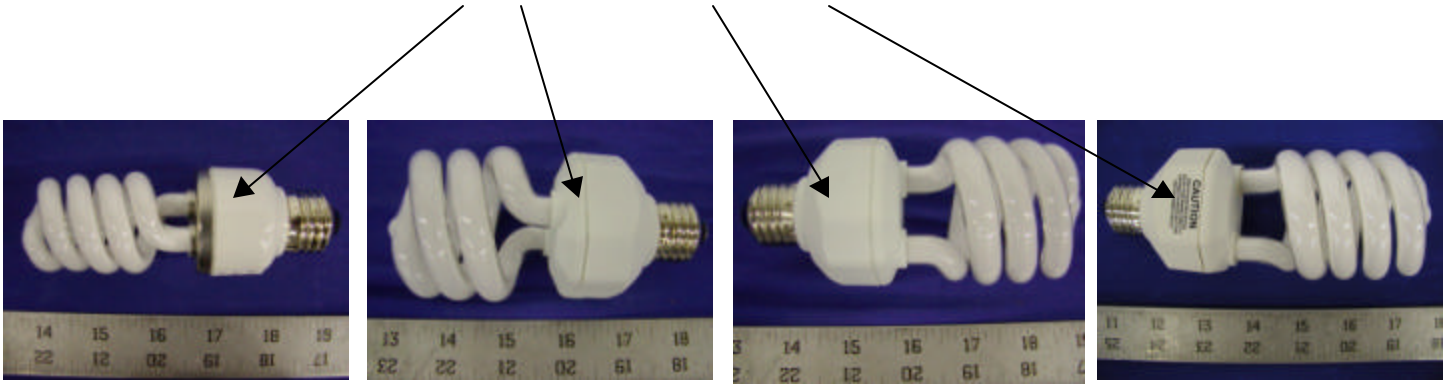
5.1 Proposed FCC Label Format

FCC ID: QNBSPI

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

Rear 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 Conducted Emission Photograph – Front View (1014)

6.2 Conducted Emission Photograph – Rear View (1014)

6.3 Conducted Emission Photograph – Front View (1015)

6.4 Conducted Emission Photograph – Rear View (1015)

6.5 Conducted Emission Photograph – Front View (1020)

6.6 Conducted Emission Photograph – Rear View (1020)

6.7 Conducted Emission Photograph – Front View (1025)

6.8 Conducted Emission Photograph – Rear View (1025)

6.9 Radiated Emission Photograph – Front View (1014)

6.10 Radiated Emission Photograph – Rear View (1014)

6.11 Radiated Emission Photograph – Front View (1015)

6.12 Radiated Emission Photograph – Rear View (1015)

6.13 Radiated Emission Photograph – Front View (1020)

6.14 Radiated Emission Photograph – Rear View (1020)

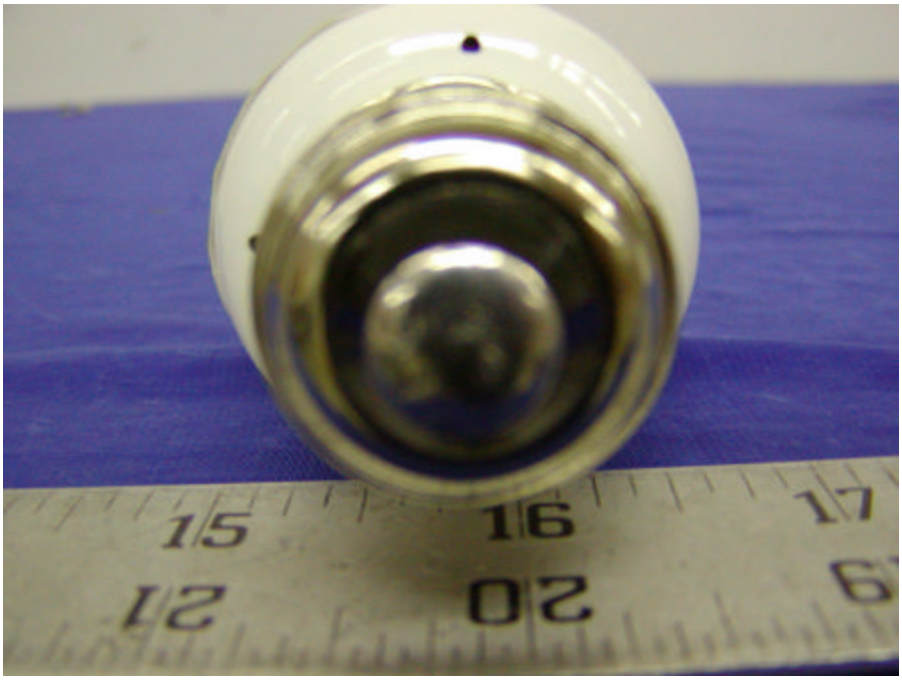
6.15 Radiated Emission Photograph – Front View (1025)

6.16 Radiated Emission Photograph – Rear View (1025)

7 - PHOTOGRAPHS

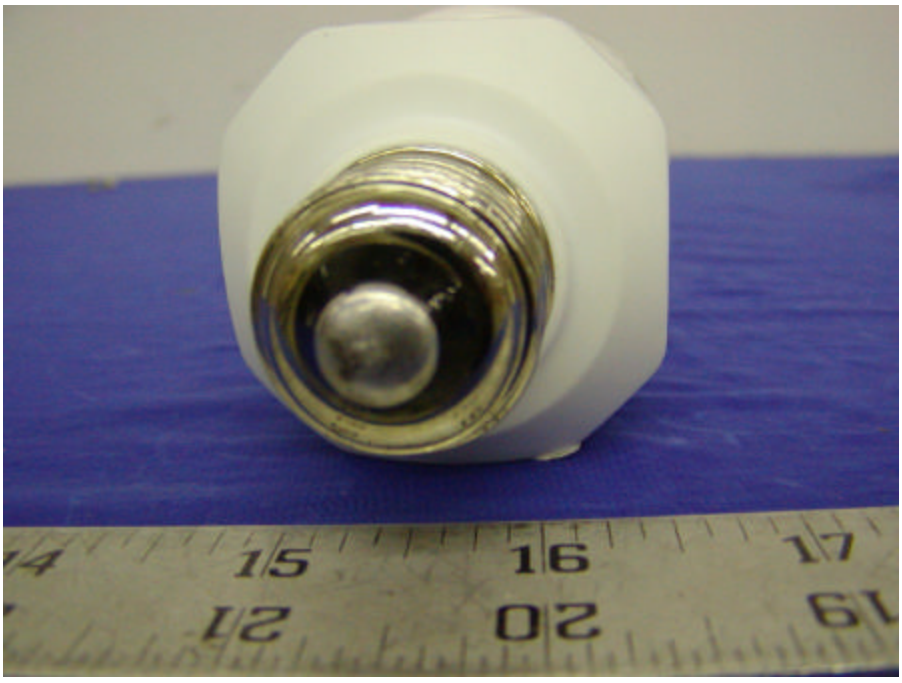
7.1 EUT – Front View (1014)

7.2 EUT – Bottom View (1014)



7.3 EUT – Front View (1015)

7.4 EUT – Bottom View (1015)

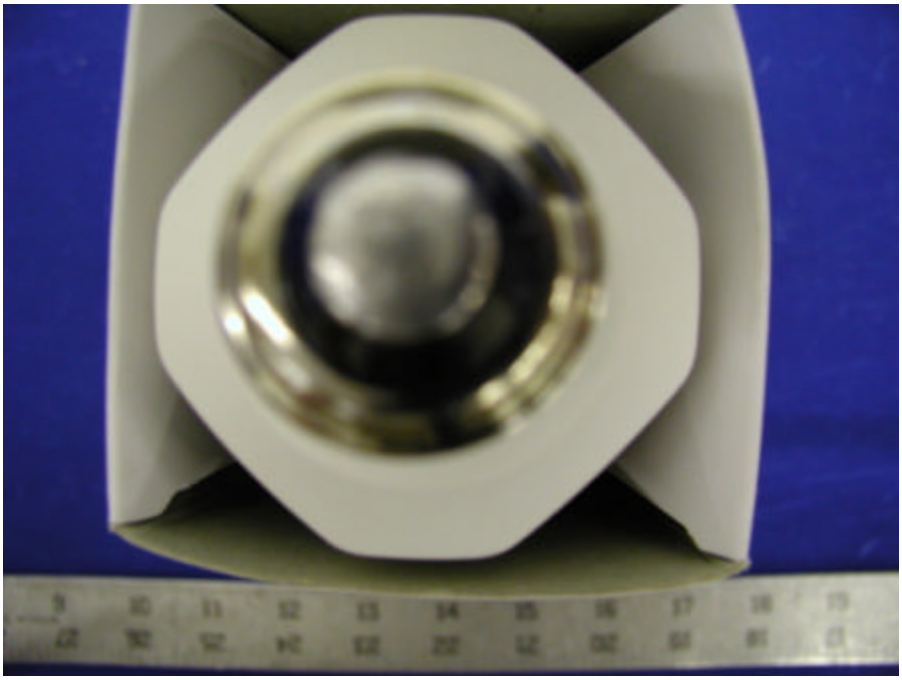


7.5 EUT – Top View (1020)

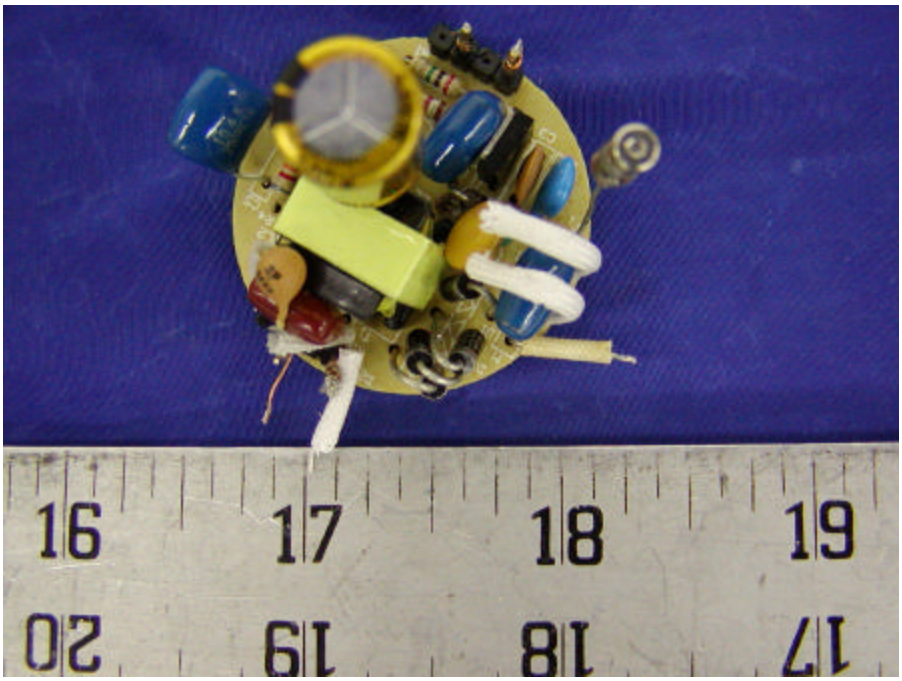
7.6 EUT – Bottom View (1020)

7.7 EUT – Top View (1025)

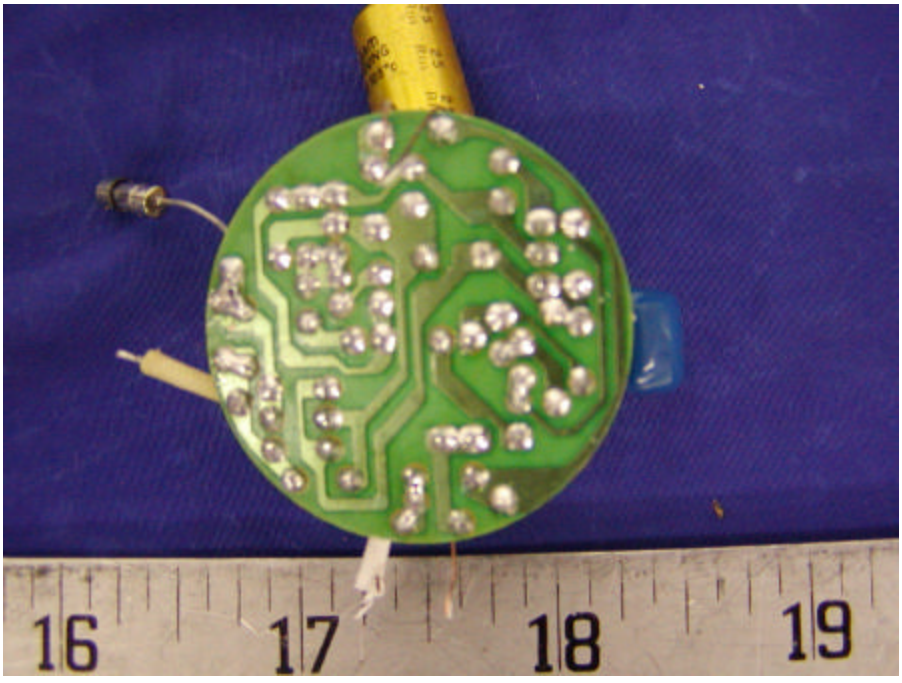
7.8 EUT – Bottom View (1025)



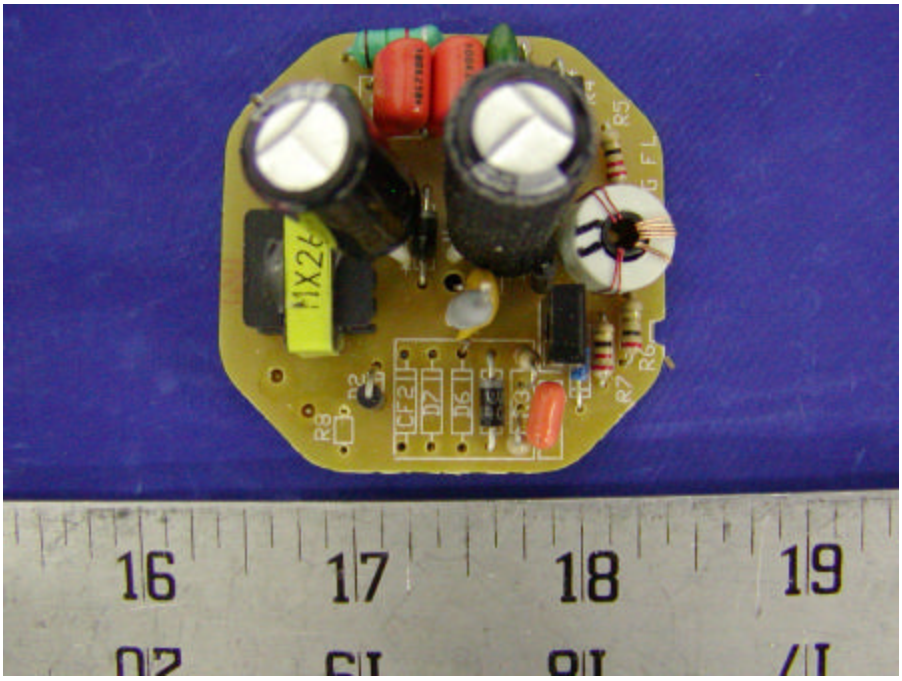
7.9 EUT – Component View (1014)



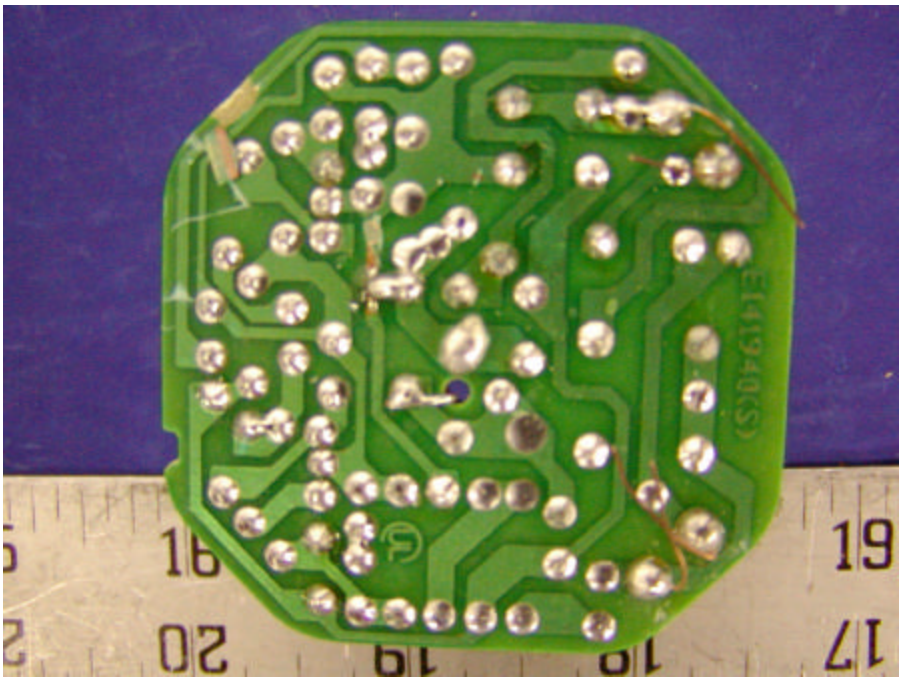
7.10 EUT – Solder View (1014)



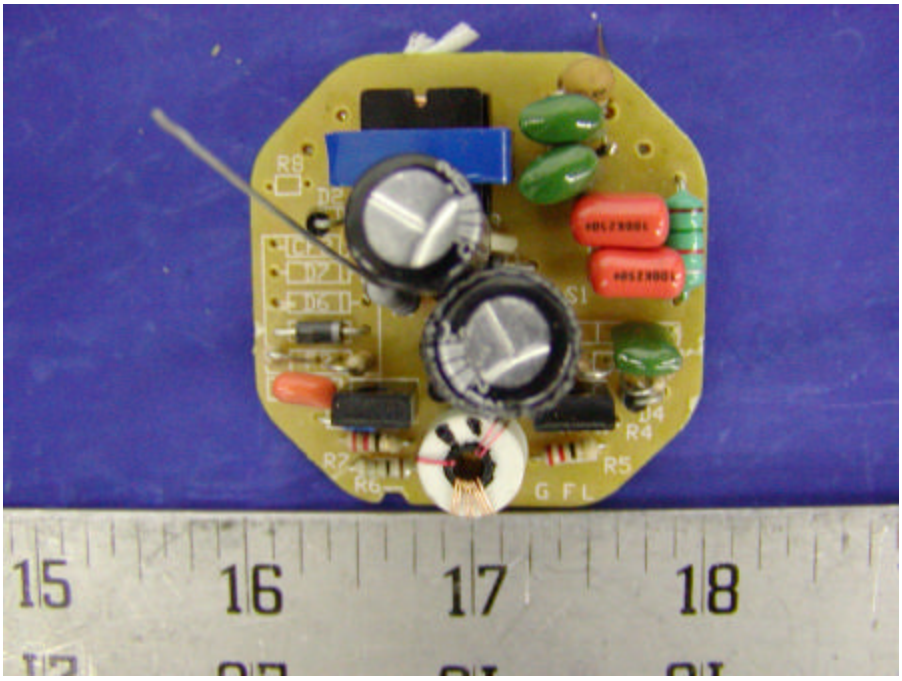
7.11 EUT – Component View (1015)



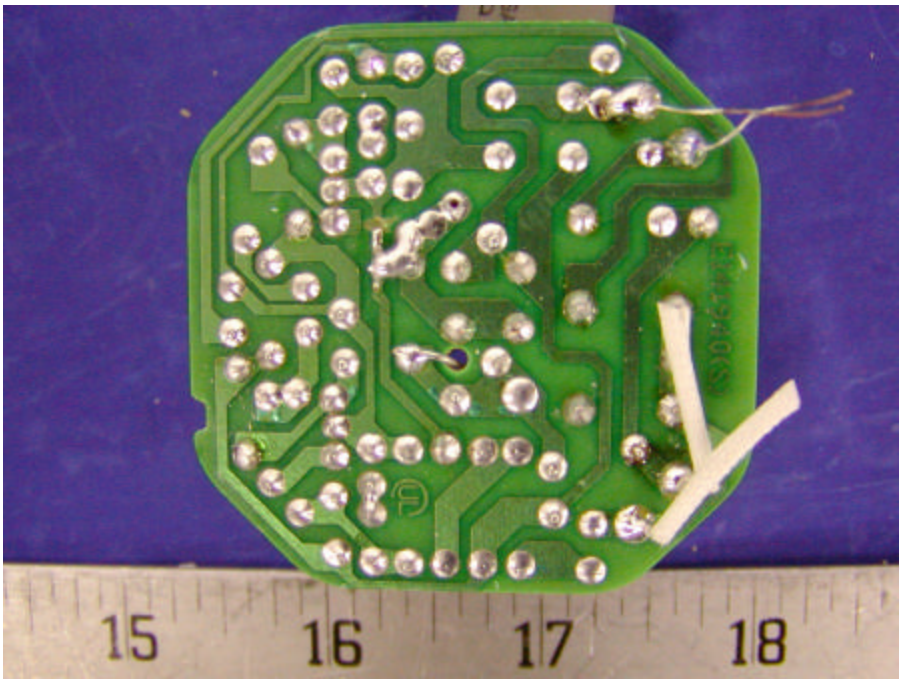
7.12 EUT – Solder View (1015)



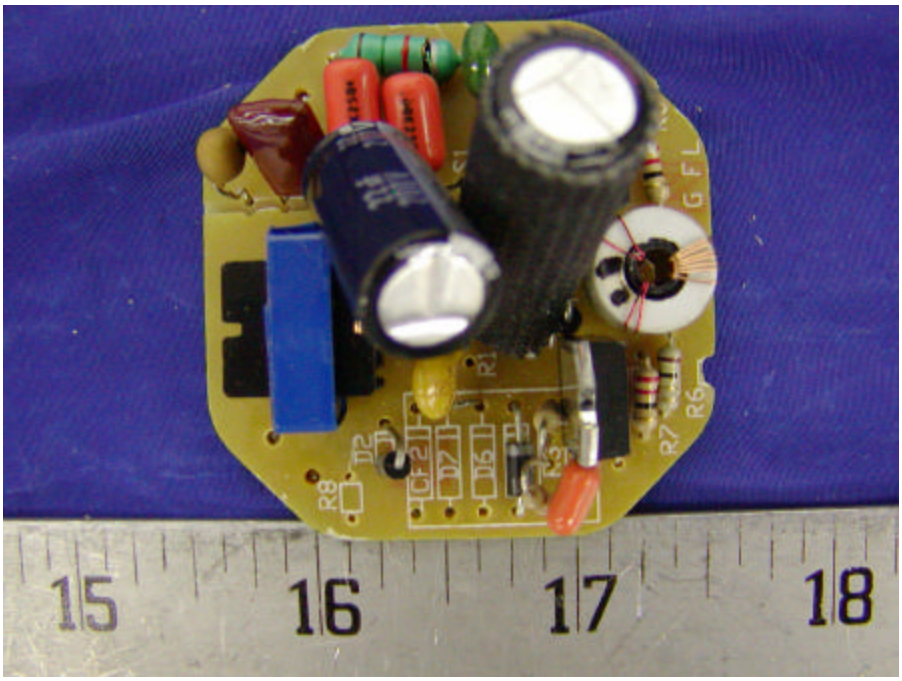
7.13 EUT – Component View (1020)



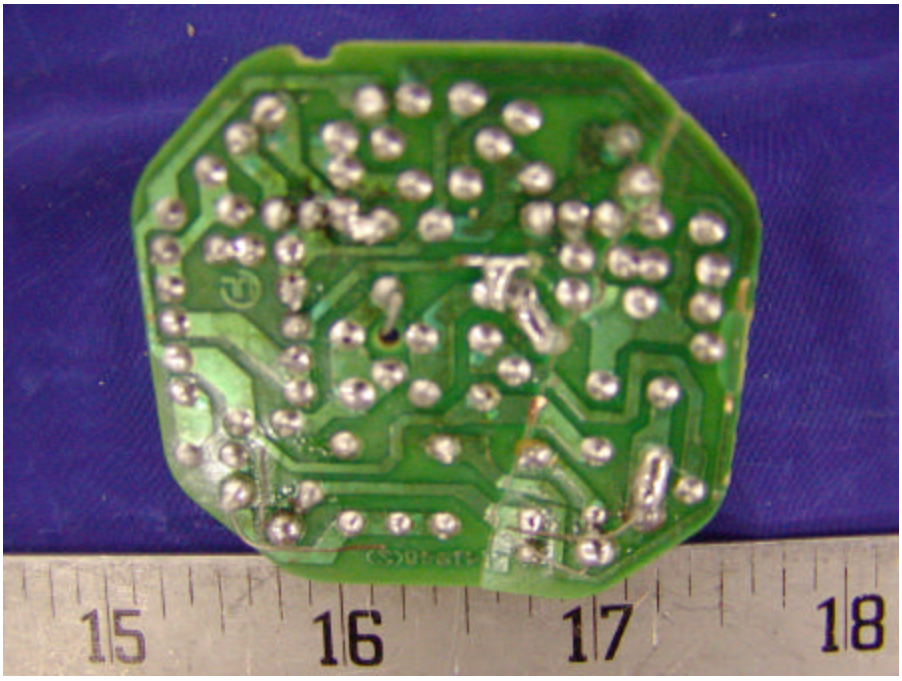
7.14 EUT – Solder View (1020)



7.15 EUT – Component View (1025)



7.16 EUT – Solder View (1025)



APPENDIX A - BLOCK DIAGRAM/SCHEMATICS/PARTS LIST

APPENDIX B - USER MANUAL