



FCC CFR47 PART 18 SUBPART C ISM EQUIPMENT

for

Electromagnetic Emissions

of

BALLAST

Trade Name : TDC power

Model Number : EBA120-042L1AL/PLT-42W

Serial Number : N/A

Report Number : SZ051011B05-EF

Date : October 13,2005

Prepared for :

TDC POWER PRODUCTS CO., LTD.

**DONGHANG 3 RD, INDUSTRIAL, DISTRICT DONG HANG,
DONG GUAN CITY, GUANG DONG PROVINCE, CHINA**

Prepared by :

COMPLIANCE CERTIFICATION SERVICES (SHENZHEN) INC.

(d.b.a. COMPLIANCE ENGINEERING SERVICE)

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TEST RESULT CERTIFICATION

Equipment Under Test: BALLAST

Trade Name: TDC POWER

Model Number: EBA120-042L1AL/PLT-42W

Serial Number: N/A

Applicant: TDC POWER PRODUCTS CO., LTD.
DONGHANG 3 RD, INDUSTRIAL, DISTRICT DONG HANG,
DONG GUAN CITY, GUANG DONG PROVINCE, CHINA

Manufacturer: TDC POWER PRODUCTS CO., LTD.
DONGHANG 3 RD, INDUSTRIAL, DISTRICT DONG HANG,
DONG GUAN CITY, GUANG DONG PROVINCE, CHINA

Type of Test: FCC CFR47 PART 18
ISM EQUIPMENT

FCC Rules: Part 18 (10-1-04 Edition)

Technical Limit: Subpart C

Measurement Procedure: ANSI C63.4:2003

File Number: SZ051011B05-EF

Date of test: October 11-13,2005

Deviation: None

Condition of Test Sample: Normal

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, Subpart B and the measurement procedure according to ANSI C63.4. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Clinton.Kao / EMC Manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.

Tested By:

Vincent.Yao / Engineer

Reviewed By:

Villian.Xu / Assistant manager
COMPLIANCE CERTIFICATION
SERVICES (SHENZHEN) INC.



SYSTEM DESCRIPTION

EUT Test Program:

EUT worked with one lamp, and make sure EUT worked normally during the test.



PRODUCT INFORMATION

Housing Type:	Metal
EUT Power Rating:	AC120V $\pm$ 10%,50Hz/60Hz
Power during Test:	AC120V/60Hz
AC Power Cord Type:	N/A
OSC/Clock Frequencies:	N/A

I/O Port of EUT:

I/O Port Type	Q'TY	Tested with
1) AC in	4	4
2) AC out	2	2

Difference between model numbers as below:

	Model Number	Trade Name
1	EBA120-042L1AL/PLT-32W	TDC power
2	EBA120-042L1AL/PLT-24W	TDC power
3	EBA120-042L1A/PLC-26W	TDC power
4	EBA120-042L1A/FCL-22W	TDC power
5	EBA120-042L1A/FCL-32W	TDC power
6	EBA120-042L1A/FCL-40W	TDC power
7	EBA120-042L1A/PLL-24W	TDC power
8	EBA120-042L1AL/PLL-36W	TDC power
9	EBA120-042L1AL/T5-24W	TDC power
10	EBA120-042L1AL/T8-30W	TDC power
11	EBA120-042L1AL/T8-32W	TDC power
12	EBA120-042L1AL/T8-36W	TDC power
13	EBA120-042L1AL/T12-20W	TDC power
14	EBA120-042L1AL/T12-40W	TDC power
15	EBA120-042L1AL/UV-20W	TDC power
16	EBA120-042L1AL/UV-21W	TDC power
17	EBA120-042L1AL/UV-25W	TDC power
18	EBA120-042L1AL/UV-40W	TDC power

Note: There are different output power between the model names.



SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	Trade Name	Data Cable	Power Cord	FCC ID
1)	LAMP	FCL-40W	N/A	N/A	N/A	N/A	N/A

****Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.



SECTION 1 FCC (LINE CONDUCTED & RADIATED EMISSION)

MEASUREMENT PROCEDURE

(PRELIMINARY LINE CONDUCTED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5) All support equipments received AC120V/60Hz power from a second LISN supplying power, if any.
- 6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 450kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

Preliminary Conducted Emission Test			
Frequency Range Investigated		450KHz TO 30 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
Normal	2005-10-13	EBA120-042L1AL/PLT-42W_0(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/PLT-32W_1(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/PLT-24W_2(L,N)	☐
Normal	2005-10-13	EBA120-042L1A/PLC-26W_3(L,N)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-22W_4(L,N)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-32W_5(L,N)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-40W_6(L,N)	☒
Normal	2005-10-13	EBA120-042L1A/PLL-24W_7(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/PLL-36W_8(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T5-24W_9(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-30W_10(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-32W_11(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-36W_12(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T12-20W_13(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/T12-40W_14(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-20W_15(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-21W_16(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-25W_17(L,N)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-40W_18(L,N)	☐

Then, the EUT configuration and cable configuration of the above highest emission level was recorded for reference of final testing.



MEASUREMENT PROCEDURE (FINAL LINE CONDUCTED EMISSION TEST)

- 1) EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the Q.P limit in Peak mode, then the emission signal was re-checked using an Q.P. detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. MHz	Peak Raw dBuV	Q.P. Raw dBuV	Q.P. Limit dBuV	Q.P. Margin dB	Note
xx.xxx	39.82	---	48.00	-8.18	L 1

Freq.	= Emission frequency in MHz
Raw dBuV	= Uncorrected Analyzer/Receiver reading
Limit dBuV	= Limit stated in standard
Margin dB	= Reading in reference to limit
Note	= Current carrying line of reading
“---“	= The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	Maximum RF Line Voltage
(MHz)	Q.P.(uV)	Q.P.(dBuV)
0.45~2.51	250.0	48.0
2.51~3.0	3000.0	69.5
3.0~30	250.0	48.0

****Note:** 1. According to section §18.307(c) Consumer equipment conduction limits is as above;

2. Conduction Level in dBuV = $20\log(uV)$

3. The lower limit shall apply at the transition frequency.



MEASUREMENT PROCEDURE (PRELIMINARY RADIATED EMISSION TEST)

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) The EUT received AC120V/60Hz power through the outlet socket under the turntable. All support equipments received AC120V/60Hz power from socket under the turntable, if any.
- 5) The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- 6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 7) The following test mode(s) were scanned during the preliminary test:

Preliminary Radiated Emission Test			
Frequency Range Investigated		30 MHz TO 1000 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
Normal	2005-10-13	EBA120-042L1AL/PLT-42W_0(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/PLT-32W_1(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/PLT-24W_2(H,V)	☐
Normal	2005-10-13	EBA120-042L1A/PLC-26W_3(H,V)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-22W_4(H,V)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-32W_5(H,V)	☐
Normal	2005-10-13	EBA120-042L1A/FCL-40W_6(H,V)	☒
Normal	2005-10-13	EBA120-042L1A/PLL-24W_7(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/PLL-36W_8(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T5-24W_9(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-30W_10(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-32W_11(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T8-36W_12(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T12-20W_13(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/T12-40W_14(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-20W_15(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-21W_16(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-25W_17(H,V)	☐
Normal	2005-10-13	EBA120-042L1AL/UV-40W_18(H,V)	☐

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for final testing.



MEASUREMENT PROCEDURE (FINAL RADIATED EMISSION TEST)

- 1) EUT and support equipment were set up on the turntable as per step 7 of the preliminary test.
- 2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- 3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P/Peak. reading is presented.
- 4) The test data of the worst case condition(s) was reported on the Summary Data page.

Data Sample:

Freq. (MHz)	Raw Data (dBuV/m)	Corr. Factor (dB)	Emiss. Level (dBuV/m)	Limits	Margin (dB)	Reading Type P/Q
xx.xxx	14.02	12.25	26.27	33.0	-6.73	P

Freq.	= Emission frequency in MHz
Raw Data (dBuV/m)	= Uncorrected Analyzer / Receiver reading
Corr. Factor (dB)	= Correction factors of antenna factor and cable loss
Emiss. Level	= Raw reading converted to dBuV/m and CF added
Limit dBuV/m	= Limit stated in standard
Margin dB	= Reading in reference to limit
P	=Peak Reading
Q	=Quasi-peak



RADIATED EMISSION LIMIT

Frequency (MHz)	Maximum Field Strength Limit at 30M (uV/m/ Q.P.)	Maximum Field Strength Limit at 10M (dBuV/m/ Q.P.)
30-88	10.0	29.5
88-216	15.0	33.0
216-1000	20.0	35.6

- **Note:** 1. According to section §18.305(c) Consumer equipment emission limits is as above;
2. Emission Level in dBuV/m = $20\log(uV/m)$
3. Emission Limit at 10M (Distance) = Limit at 30M (dBuV/m) + $20\log(30/10)$
4. The lower limit shall apply at the transition frequency.



SUMMARY DATA (LINE CONDUCTED TEST)

Model Number: EBA120-042L1A/FCL-40W**Location:** Site G**Tested by:** Vincent**Test Mode:** Normal**Test Results:** Passed**Temperature:** 25°C**Humidity:** 55%RH

(The chart below shows the highest readings taken from the final data)

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	Q.P. Limit dBuV	PEAK Margin Db	Q.P. Margin dB	NOTE
0.650	43.95	---	48.00	-4.05	---	L1
0.728	43.50	---	48.00	-4.50	---	L1
1.436	39.27	---	48.00	-8.73	---	L1
2.080	37.95	---	48.00	-10.05	---	L1
12.028	41.57	---	48.00	-6.43	---	L1
21.695	35.02	29.89	48.00	-12.98	-18.11	L1
0.643	43.21	---	48.00	-4.79	---	L2
0.698	45.30	---	48.00	-2.70	---	L2
1.288	41.39	---	48.00	-6.61	---	L2
12.028	38.39	---	48.00	-9.61	---	L2
13.755	37.68	---	48.00	-10.32	---	L2
21.679	45.58	---	48.00	-2.42	---	L2

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

****NOTE:** "---" denotes the emission level was or more than 2dB below the Q.P. limit, so no re-check anymore.



SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: EBA120-042L1A/FCL-40W**Location:** Site G**Tested by:** Vincent**Polar:** Vertical / Horizontal**Test Mode:** Normal**Test Distance:** 10m**Test Results:** Passed**Temperature:** 25**Humidity:** 55%RH

(The chart below shows the highest readings taken from the final data)

Frequency Range Investigated (30 MHz TO 1000 MHz)							
Freq (MHz)	Meter Reading (dBuV/m)	C.F. (dBuV/m)	Corrected Reading (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading Type P/Q	Pol. H/V
30.820	5.37	19.41	24.78	29.5	-4.72	Q	V
44.320	12.46	8.93	21.39	29.5	-8.11	Q	V
59.400	15.71	6.10	21.81	29.5	-7.69	Q	V
86.850	16.33	8.16	24.49	29.5	-5.01	Q	V
246.820	16.61	14.23	30.84	35.6	-4.76	P	V
625.650	7.71	21.59	29.30	35.6	-6.30	Q	V
40.270	14.23	11.02	25.25	29.5	-4.25	P	H
135.450	17.09	9.55	26.64	33.0	-6.36	P	H
221.850	16.93	14.71	31.64	35.6	-3.96	P	H
452.650	12.09	19.71	31.80	35.6	-3.80	P	H
594.150	8.71	20.90	29.61	35.6	-5.99	P	H
665.900	8.53	21.30	29.83	35.6	-5.77	P	H

C.F. (Correction Factor) = Antenna Factor + Cable Loss - Amplifier Gain (+ Attenuator 6dB)

Corrected Reading = Metering Reading + C.F.

Margin = Corrected Reading - Limits

P = Peak Reading

H = Horizontal Polarization/Antenna

Q = Quasi-peak

V = Vertical Polarization/Antenna

Comments: N/A



TEST FACILITY

- Location:** No. 6, Jinao industrial park, No. 35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China
- Description:** There is one 3/10m open area test sites and one line conducted labs for final test.
The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents FCC CFR47 Part 18 Subpart C requirements.
- Site Filing:** A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.
- Site Accreditation:** Accredited by NEMKO (Authorization #: ELA106), VCCI (Registration No#: R-1996,C-2150), FCC (Registration: 101879) & NVLAP (Lab code:200577-0) for EMC.
- Instrument Tolerance:** All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.
- Ground Plane:** Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.



TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at Compliance Certification Services (Shenzhen) Inc. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10kHz to 1.0GHz or above.

Equipment used during the tests:

Open Area Test Site: G

Open Area Test Site G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMC Analyzer	Agilent	E7402	MY42000139	06/10/2005	06/09/2006
Amplifier	H.P.	8447D	2944A07999	06/10/2005	06/09/2006
Bi-log Antenna	EMCO	3142	9910-1436	06/10/2005	06/09/2006
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	06/10/2005	06/09/2006
System-Controller	CT	SC100	N/A	N/A	N/A
Turn Table	EMCO	2081-1.21	N/A	N/A	N/A
Antenna Tower	CT	N/A	N/A	N/A	N/A

Note: The measurement uncertainty is less than +/- 2.5078dB, which is evaluated as per the UKAS LAB34 and CISPR/A/291/CDV.

Conducted Emission Test Site: G

Conducted Emission Test Site G					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Spectrum Analyzer	ADVANTEST	R3132	120901472	06/10/2005	06/09/2006
EMI Test Receiver	SCHAFFNER	SCR3501	401	02/27/2005	02/26/2006
LISN	EMCO	3825/2	1371	02/27/2005	02/26/2006
LISN	EMCO	3825/2	8901-1459	02/27/2005	02/26/2006

Note: The measurement uncertainty is less than +/- 2.2318dB, which is evaluated as per the UKAS LAB34 and CISPR/A/291/CDV.

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.



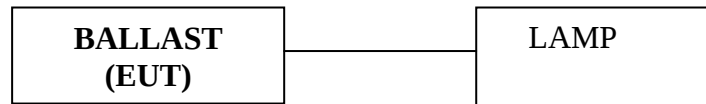
BLOCK DIAGRAM OF TEST SETUP

SYSTEM Diagram of Connections between EUT and Simulators

EUT: BALLAST

Trade Name: TDC power

Model Number: EBA120-042L1A/FCL-40W





APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

(TEST SETUP OF LINE CONDUCTED EMISSION)

LINE CONDUCTED EMISSION TEST





APPENDIX 2

PHOTOGRAPHS OF TEST SETUP (TEST SETUP OF RADIATED EMISSION)

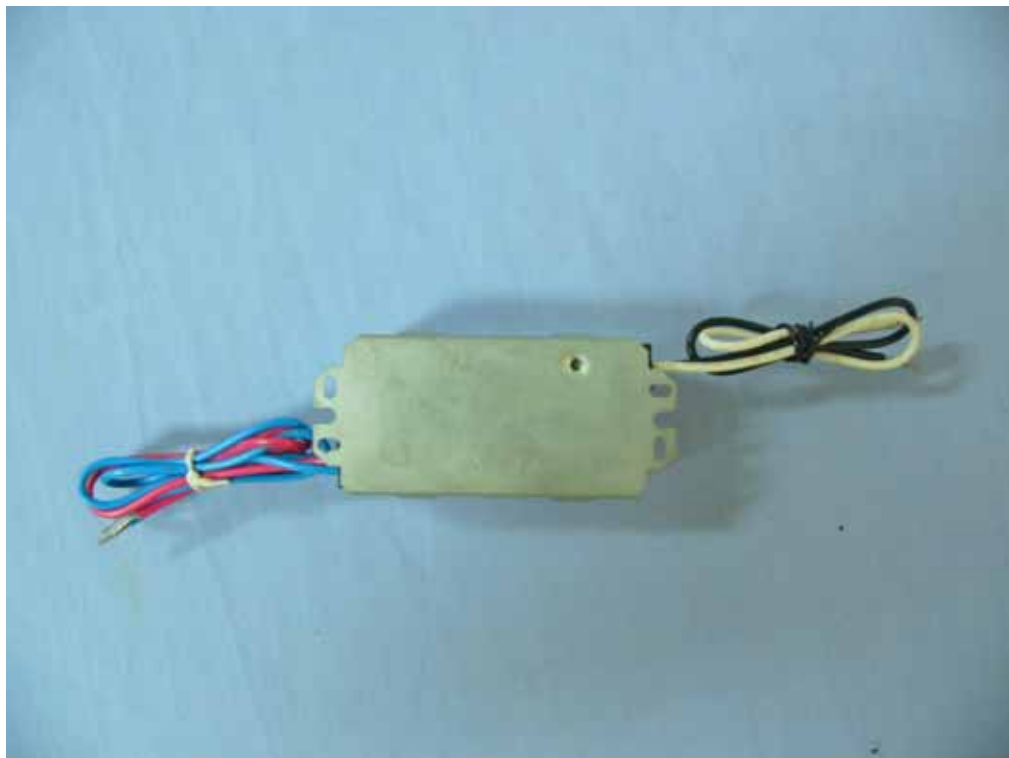
RADIATED EMISSION TEST





APPENDIX 3

EXTERNAL PHOTOGRAPHS OF EUT









APPENDIX 4

INTERNAL PHOTOGRAPHS OF EUT

