

5. CONDUCTED POWER LINE TEST

5.1 TEST EQUIPMENT

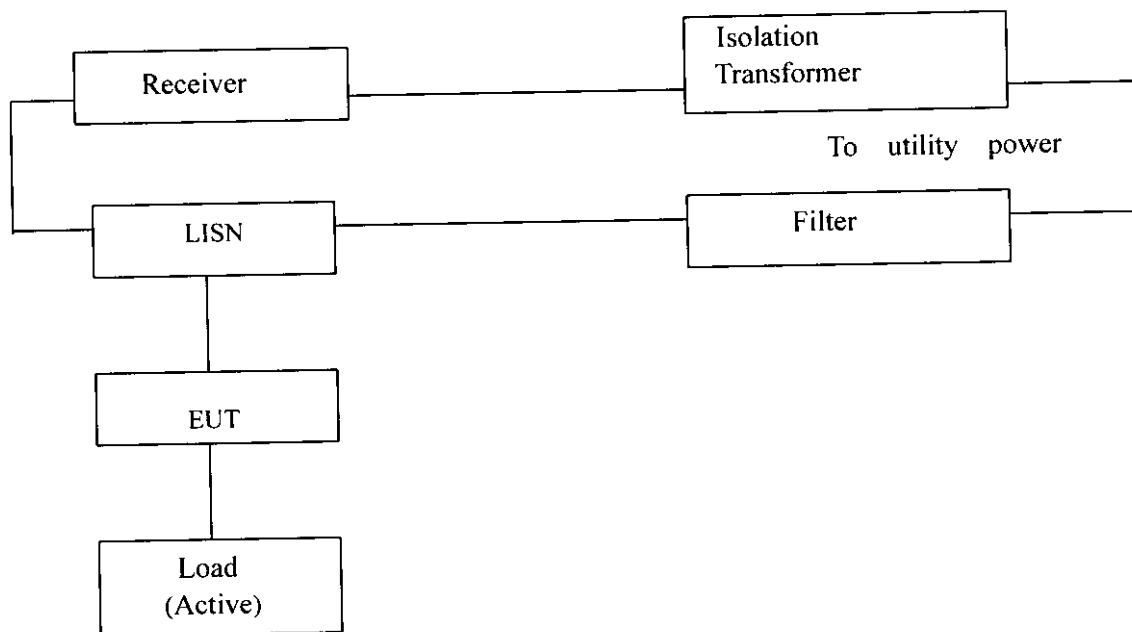
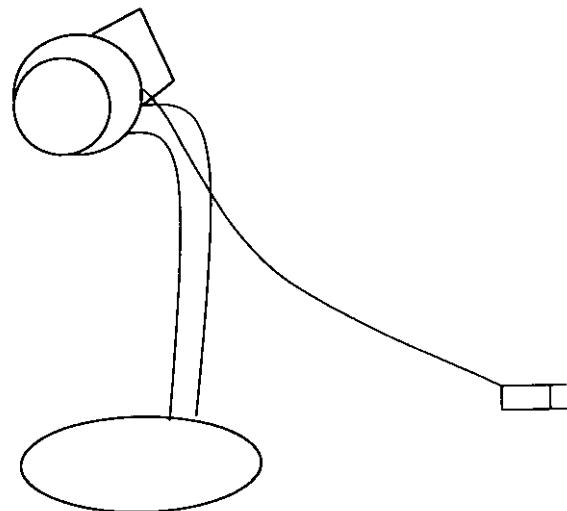
The following test equipment were used during the conducted power line test :

EQUIPMENT/ FACILITIES	SPECIFICATIONS	MANUFACTURER	MODEL#/ SERIAL#	DATE OF CAL. & CAL. CENTER	DU ^E DATE	FINAL TEST
SPECTRUM ANALYZER	9 KHz TO 1 GHz	HP	8590L/ 3624A01317	AUGUST 1998 ETC	1Y	
EMI TEST RECEIVER	9 KHz TO 30 MHz	ROHDE & SCHWARZ	ESHS30/ 826003/008	AUGUST 1998 ETC	1Y	✓
LISN	50 uH, 50 ohm	SOLAR ELECTRONICS	9252-50- R24-BNC/ 951315	AUGUST 1998 ETC	1Y	✓
LISN	50uH, 50 ohm	SOLAR ELECTRONICS	9252-50- R24-BNC/ 951318	AUGUST 1998 ETC	1Y	✓
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL 1999 ETC	1Y	✓
POWER CONVERTER	0 TO 300 VAC VAC 47-500 Hz	AFC	AFC-1KW/ 850510	MARCH 1999 SRT	1Y	✓

5.2 TEST PROCEDURE

The EUT was tested according to ANSI C63.4 - 1992. The frequency spectrum from 0.45 MHz to 30 MHz was investigated. The LISN used was 50 ohm / 50 uHenry as specified by SECTION 5.1 of ANSI C63.4 - 1992. Cables and peripherals were moved to find the maximum emission levels for each frequency.

5.3 TEST SETUP



5.4 CONFIGURATION OF THE EUT

The EUT was configured according to ANSI C63.4 - 1992. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

DEVICE	MANUFACTURER	MODEL #	FCCID / DoC
ENERGY SAVING LAMPS	CHUAN SHIH INDUSTRIAL CO., LTD.	CGEFL15,CTEFL15	KQP03

B. INTERNAL DEVICES

C. PERIPHERALS

- **REMARK** :

(1). Cable - uns : Unshielded
 s : Shielded
 S1 : Single point shielding
 S2 : 360° shielding
 S3 : Double point shielding

(2). Cables - All 1m or greater in length - bundled according to ANSI C63.4 - 1992.

5.5 EUT OPERATING CONDITION

Operating condition is according to ANSI C63.4 - 1992.

1. EUT power on.

5.6 CONDUCTED POWER LINE EMISSION LIMIT

FREQUENCY RANGE (MHz)	CLASS A	CLASS B
0.45 - 1.705	1000 uV	250 uV
1.705 - 30	3000 uV	250 uV

NOTE : In the above table, the tighter limit applies at the band edges.

5.7 CONDUCTED POWER LINE TEST RESULT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values with a resolution bandwidth of 9 KHz.

Temperature : 14 C

Humidity : 59 %RH

QUASI-PEAK

FREQUENCY (MHz)	LINEL (uV)	LINEL2 (uV)	LIMIT (uV)
0.45	*	4.518	250
0.47	1.737	*	250
0.79	*	1.905	250
0.87	1.047	*	250
1.11	*	1.202	250

REMARKS :

- (1). * = Measurement does not apply for this frequency
- (2). Uncertainty in conducted emission measured is <+/-2dB
- (3). Any departure from specification : N/A
- (4). CGEFL15

SIGNED BY TESTING ENGINEER :

KIKI WU

5.7 CONDUCTED POWER LINE TEST RESULT

The frequency spectrum from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values with a resolution bandwidth of 9 KHz.

Temperature : 14 C

Humidity : 59 %RH

QUASI-PEAK

FREQUENCY (MHz)	LINE1 (uV)	LINE2 (uV)	LLIMIT (uV)
0.49	69.98	1.531	250
0.85	68.39	1.717	250
1.43	51.88	*	250
3.70	30.90	*	250
6.43	13.18	*	250

REMARKS :

- (1). * = Measurement does not apply for this frequency
- (2). Uncertainty in conducted emmission measured is <+/-2dB
- (3). Any departure from specification : N/A
- (4). CTEFL15

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6. RADIATED EMISSION TEST

6.1 TEST EQUIPMENT

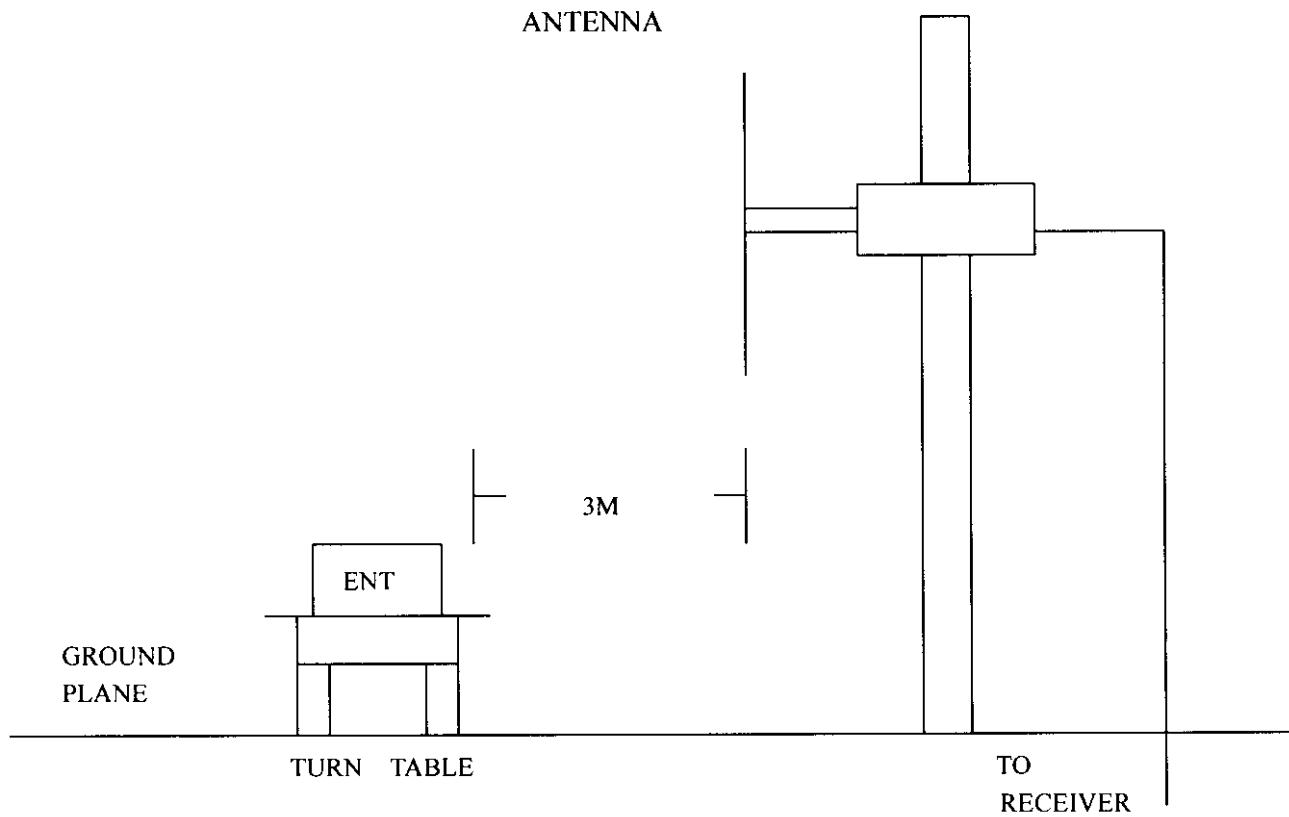
The following test equipment were used during the radiated emission test :

EQIPMENT / FACILITIES	SPECIFICAT- IONS	MANUFACTUR - ER	MODEL # / SERIAL #	DATE OF CAL. & CAL. CENTER	DUE DATE	FINAL TEST
RECEIVER	20 MHz TO 1000 MHz	R & S	ESVSS30/ 841977/003	APRIL 1999 ETC	1Y	✓
SPECTRUM ANALYZER	100 Hz TO 1500 MHz	HP	8568B/ 3019A05294	OCT. 1998 ETC	1Y	
SPECTRUM ANALYZER	9 KHz TO 22 GHz	HP	8593E/ 3322A00670	APRIL 1999 ETC	1Y	
SPECTRUM ANALYZER	100 Hz TO 1000 MHz	IFR	A-7550/ 2684/1248	JULY 1998 ETC	1Y	
SIGNAL GENERATOR	9 KHz TO 1080 MHz	ROHDE & SCHWARZ	SMY01/ 841104/019	APRIL 1999 ETC	1Y	✓
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9003-534	MARCH 1999 SRT	1Y	
DIPOLE ANTENNA	28 MHz TO 1000 MHz	EMCO	3121C/ 9611-1239	SEP. 1998 SRT	1Y	
BI-LOG ANTENNA	26 MHz TO 2000 MHz	EMCO	3142/ 9608-1073	SEP. 1998 SRT	1Y	✓
BI-LOG ANTENNA	26 MHz TO 1100 MHz	EMCO	3143/ 9509-1152	SEP. 1998 SRT	1Y	
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A08402	APRIL 1999 ETC	1Y	
PRE-AMPLIFIER	0.1 MHz TO 1300 MHz	HP	8447D/ 2944A06412	AUGUST 1998 ETC	1Y	
HORN ANTENNA	1 GHz TO 18 GHz	EMCO	3115/ 9012-3619	JAN. 1999 EMCO	1Y	

6 . 2 TEST PROCEDURE

- (1).The EUT was tested according to ANSI C63.4 - 1992. The radiated test was performed at SRT lab's open site. this site is on file with the FCC laboratory division, reference 31040 / SIT.
- (2).The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-1992.
- (3).The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.
- (4). The antenna height were varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5). The antenna polarization : Vertical polarization and horizontal polarization.

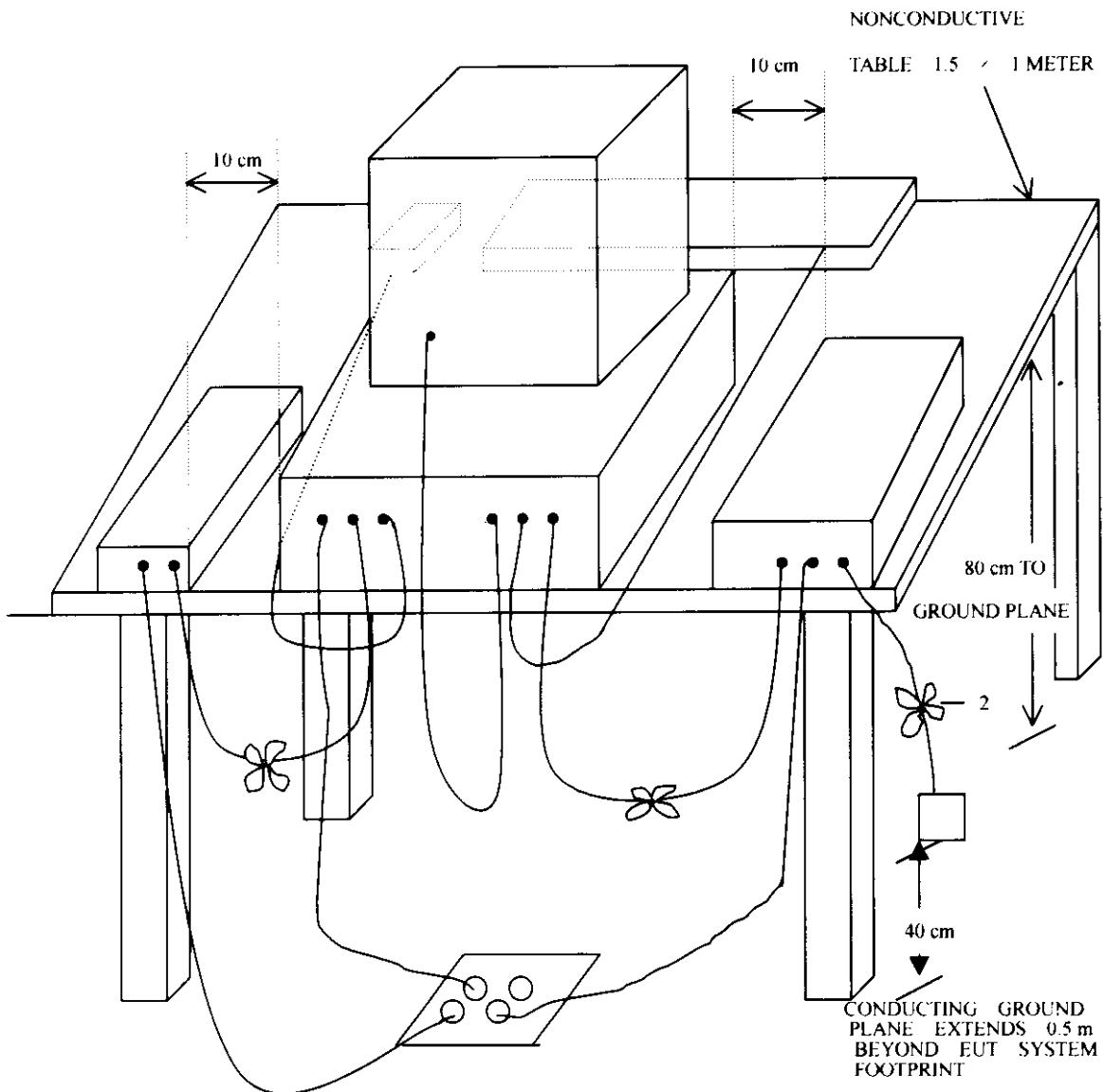
6 . 3 RADIATED TEST SET-UP



6 . 3 RADIATED TEST SET-UP

ANSI

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE IN THE RANGE OF 9 KHz TO 40 GHz C63.4-1992



6.4 CONFIGURATION OF THE THE EUT

Same as section 4.4 of this report

6.5 EUT OPERATING CONDITION

Same as section 4.5 of this report.

6.6 RADIATED EMISSION LIMIT

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below :

CLASS B

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	100
88 - 216	3	150
216 - 960	3	200
ABOVE 960	3	500

CLASS B (OPEN CASE)

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	199.5
88 - 216	3	298.5
216 - 960	3	398.1

CLASS A

FREQUENCY (MHz)	DISTANCE (m)	FIELD STRENGTH (uV/m)
30 - 88	3	316.3
88 - 216	3	473.2
216 - 960	3	613.0
ABOVE 960	3	1000.0

NOTE : 1. In the emission tables above, the tighter limit applies at the band edges.
 2. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

6.7 RADIATED EMISSION TEST RESULT

The frequency spectrum from 30 MHz to 1 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz. Measurements were made at 3 meters.

Temperature : 27 °C Humidity : 45 %RH

FREQ. (MHz)	FACTOR (dB)	ANT. FACTOR (dB/m)	READING (dBµV)		EMISSION (mV/m)		EMISSION (V/m)
			HORIZ	VERT	HORIZ	VERT	
81.25	0.7	8.00	12.60	*	11.61	*	100
113.8	0.9	15.2	*	10.30	*	20.89	150
144.8	1.0	10.6	11.9	10.9	14.96	11.74	150
223.1	1.2	11.5	*	16.90	*	30.19	200
744.8	2.5	22.9	9.800	*	48.97	*	200

REMARKS : (1). * = Measurement does not apply for this frequency.
(2). Uncertainty in radiated emission measured is <+/-4dB
(3). Any departure from specification : N/A
(4). Factor will include cable loss and correction factor.
(5). Sample calculation
20 log (emission) uV/m = Factor(dB)+Ant. factor(dB/m)+reading(dBuV)
(6). CGEFL15

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6.7 RADIATED EMISSION TEST RESULT

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Temperature : 27 C Humidity : 45 %RH

FREQ. (MHz)	FACTPR (dB)	ANT. FACTOR (dB/m)	READING (dBuV)		EMISSION (uV/m)		EMIS. (uV/m)
			HORIZ	VERT	HORIZ	VERT	
109.3	0.8	9.3	12.30	*	13.18	*	150
181.3	1.1	10.8	13.90	*	19.49	*	150
277.5	1.5	11.7	*	17.20	*	33.11	200
576.2	2.0	22.0	9.500	*	47.31	*	200
612.3	2.1	15.7	*	18.30	*	63.82	200
893.8	2.9	23.0	*	12.40	*	82.22	200

REMARKS : (1). * =Measurement does not apply for this frequency.
(2). Uncertainty in radiated emission measured is <+/-4dB
(3). Any departure from specification : N/A
(4). Factor will include cable loss and correction factor.
(5). Sample calculation
20 log (emission) uV/m = Factor(dB)+Ant. factor(dB/m)+reading(dBuV)
(6). CTEFL15

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