TEST REPORT

Ref. Report No.
01-341-008

Name and address of the applicant

ShinKwang Enterprise Co., Ltd.
330-6, Dukji-ri, Umbong-myun, Asan-si,
Chungnam-do, 336-860 Korea

Standard / Test regulation

FCC Part 18

Test result

Pass

Test item(s) ;

RF Lighting Devices – Consumer Equipment (Electronic Ballast)

Model/type ref. ;

SKS20EA, SKS23EA,
SKT320EA, SKT323EA

Manufacturer ;

ShinKwang Enterprise Co., Ltd.

Additional information ;

-Required Authorization : Certification
-FCC ID. : JEE20E

Incoming date : February 24, 2001

Test date : February 26, 2001 **Issue date : March 5, 2001**

Tested and reported by

Jeong-Min Kim , Senior Engineer

Reviewed by

Won-Seo Cho , EMC Team Leader

KOREA TESTING LABORATORY

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¥ ·°GENERAL INFORMATION

1. Grantee's Name and Mailing Address : ShinKwang Enterprise Co., Ltd.
330-6, Dukji-ri, Umbong-myun, Asan-si,
Chungnam-do, 36-860 Korea

2. Manufacturer's Name and Mailing Address : ShinKwang Enterprise Co., Ltd.
330-6, Dukji-ri, Umbong-myun, Asan-si,
Chungnam-do, 36-860 Korea

3. Equipment Descriptions

3.1 Model Name : SKS20EA, SKS23EA, SKT320EA, SKT323EA(*)
3.2 Input Voltage : AC 110 V, 60 Hz
3.3 Lamp Wattage : 20 W (Model : SKS20EA, SKT320EA),
23 W (Model : SKS23EA, SKT323EA)
3.4 Tested Model : SKT323EA

(*) Note : The test data of SKT323EA are also apply to other models because the results of all models are in compliance with the limit. The differences of these models are power consumption and appearance. All models will use same FCC ID. Refer to attached schematics of device.

4. Rules and Regulations : FCC Part 18

5. Measuring Procedure : FCC / OET MP-5 (1986)

6. Date of Measurement

6.1 Conducted Emission : February 26, 2001
6.2 Radiated Emission : February 27, 2001

¥ ±CONDUCTED EMISSION MEASUREMENT (Section 18.307)

1. Test Procedure

The EUT was installed with fluorescent lamp in accordance with the manufacturer's instruction and operated in a manner that is the representative of the typical usage for equipment.

Conducted emission measurements on the EUT were performed by "Conducted Powerline Measurement" procedure as per MP-5. The EUT was set up on a wooden table 0.4 meters height, 1.0 by 1.5 meters in size, placed in the shielded enclosed with a side of wall of which constituted a vertical conducting surface of 2.2 m x 3.1 m in size to maintain 0.8 meters from the rear of EUT

LISN's(Line Impedance Stabilization Network, EMCO, 3825/2, 50 ohm / 50 μH) were installed and electrically boned to the conducting ground plane. The EUT was connected to the LISN.

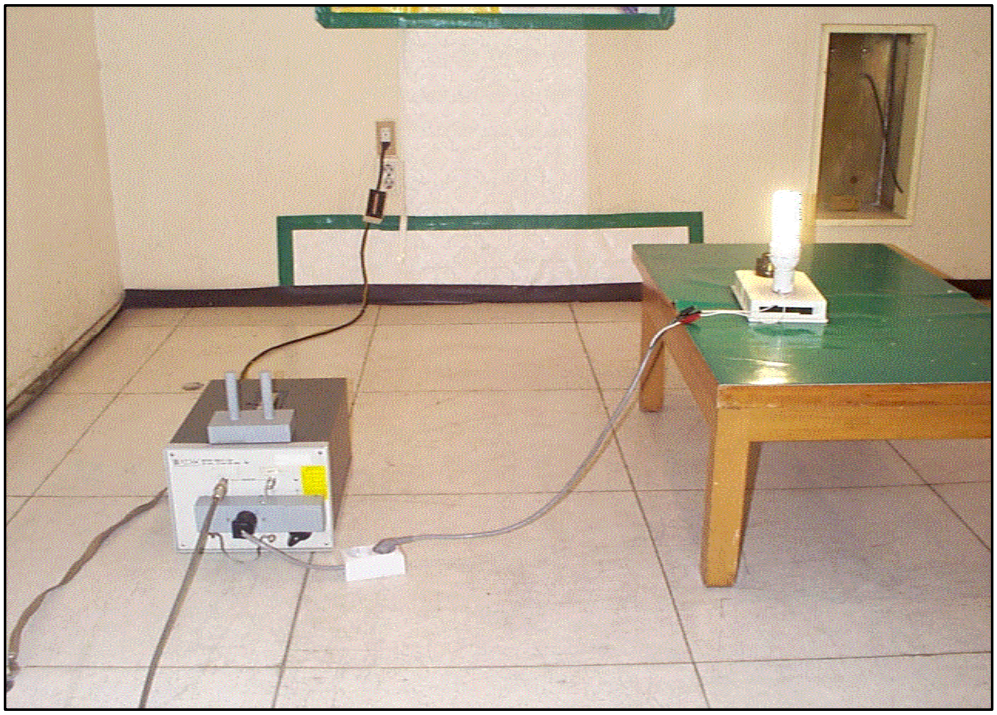
One of two 50 ohm output terminals of the LISN was connected to the Spectrum Analyzer(HP, 8566B, 10 kHz to 22 GHz) with the Quasi-Peak Adapter (HP, 85650A, 10 kHz to 1.0 GHz) and the other was terminated in 50 ohms. Measurements were again performed after interchanging such a connection oppositely.

The frequency range from 450 kHz to 30 MHz was examined and the peak values that are within 6 dB of the limit would be compared to quasi-peak values using the Quasi-Peak instrument (ROHDE & SCHWARZ, ESH3, 9 kHz to 30 MHz : Detector Function CISPR Quasi-Peak) or HP Quasi-Peak adapter(85650A, 10 kHz to 1.0 GHz)

The voltage developed across the 50 ohms port in LISN was measured by the Spectrum Analyzer and graphed by the Plotter(HP, 7470A). The 6 dB bandwidth of the Spectrum Analyzer and Quasi-Peak Adapter was set to 9 kHz with no post detector video filter.

The position of connecting cables of the EUT was changed to find the worst case configuration during measurements. The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

2. Photograph for the test configuration



3. Sample Calculation

The emission level measured in decibels above one microvolt (dB§ Å) was converted into microvolt (§ Å) as shown in following sample calculation.

For example :

	Measured Value at	0.45 MHz	44.9 dB§ Å
+	Cable Losses *		0.0 dB
=	Conducted Emission		44.9 dB§ Å
			(= 175.8 § Å)

* In case of RG214/ RF cable 15 Ft, the loss is about 0.17 dB at the frequency of 30 MHz which is negligible.

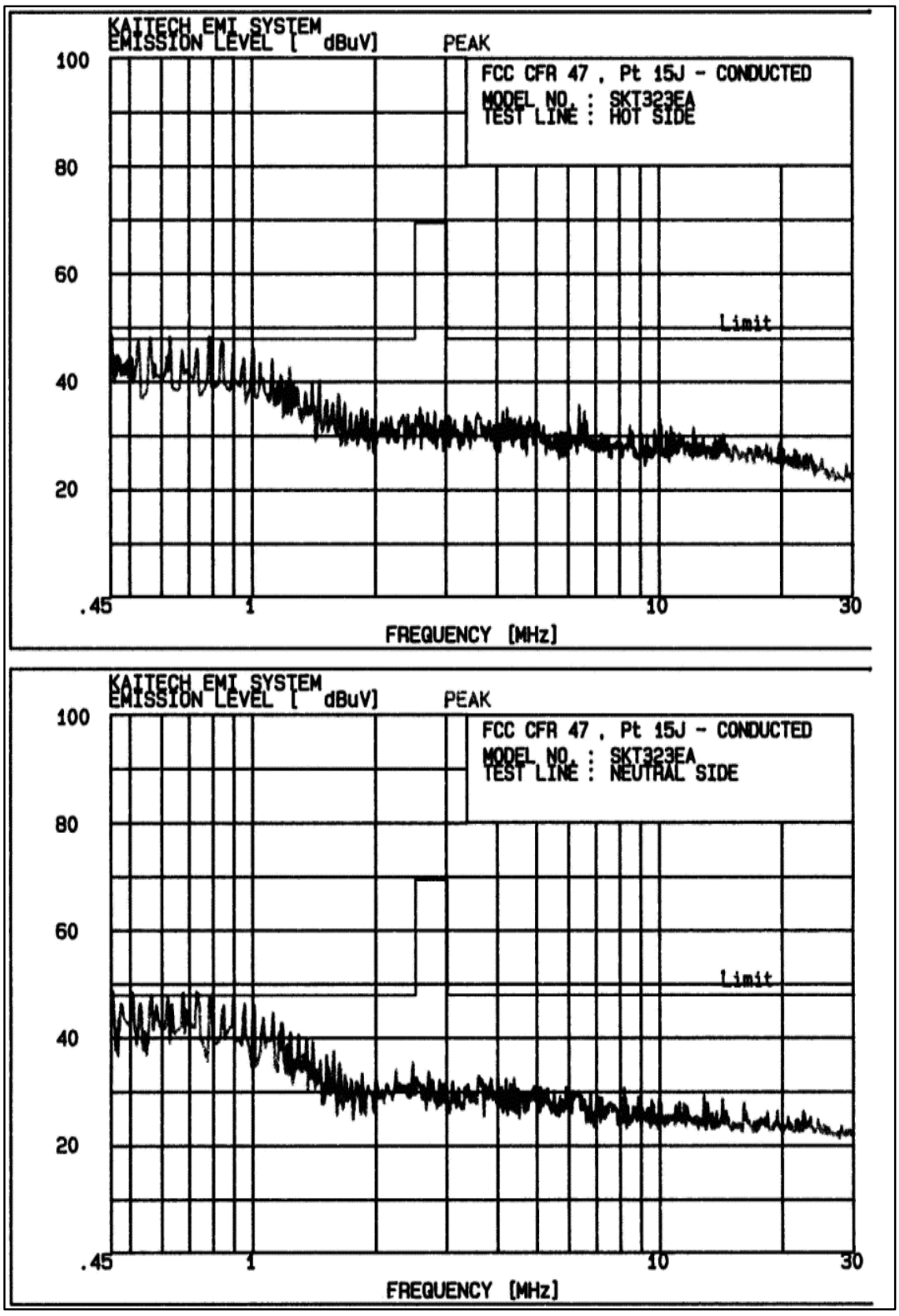
4. Measurement Data

- Resolution Bandwidth : x Peak (6dB Bandwidth : 9kHz)
  x CISPR Quasi-Peak (6dB Bandwidth : 9kHz)

Power Lead Tested	Frequency (MHz)	Measured Value		Emission Level		Limit	(*) Margin (dB)
		Peak (dB§ Å	Q-Peak (dB§ Å	(dB§ Å	(§ Å	(§ Å	
Live to Ground	0.45	47.4	43.3	43.3	146.2	250	- 4.7
	0.56	47.7	44.6	44.6	154.9	250	- 4.2
	0.63	47.7	43.8	43.8	169.8	250	- 3.4
	0.79	45.9	41.2	41.2	101.2	250	- 7.9
	0.84	45.2	40.1	40.1	117.5	250	- 6.6
	1.01	44.7	41.4	41.4	114.8	250	- 6.8
	-	-	-	-	-	-	-
Neutral to Ground	0.45	47.8	44.9	44.9	175.8	250	- 3.1
	0.51	45.7	42.7	42.7	136.5	250	- 5.3
	0.59	45.9	41.9	41.9	124.5	250	- 6.1
	0.62	46.2	43.3	43.3	146.2	250	- 4.7
	0.73	46.6	42.8	42.8	138.0	250	- 5.2
	1.13	41.3	38.3	38.3	82.2	250	- 9.7
	-	-	-	-	-	-	-

Note : The noise floor level of the spectrum analyzer was observed in 22dB§ Å
Refer to measured graphs on next page.

* Margin(dB) : Emission Level (dB) - Limit (dB)


KAITECH EMI SYSTEM
EMISSION LEVEL [dBuV]
PEAK
FCC CFR 47 , Pt 15J - CONDUCTED
MODEL NO. : SKT323EA
TEST LINE : HOT SIDE
Limit
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]
KAITECH EMI SYSTEM
EMISSION LEVEL [dBuV]
PEAK
FCC CFR 47 , Pt 15J - CONDUCTED
MODEL NO. : SKT323EA
TEST LINE : NEUTRAL SIDE
Limit
100
80
60
40
20
.45
1
10
30
FREQUENCY [MHz]

¥ ²RADIATED EMISSION MEASUREMENT (Section 18.305)

1. Test Procedure

1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. The EUT was installed with fluorescent lamp in accordance with the manufacturer's instruction and operated in a manner that is the representative of the typical usage for equipment.

Receiving antenna (Biconical antenna : 30 to 300 MHz or Log-periodic antenna : 200 to 1000 MHz) was placed at the distance of 1 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT while rotating the table and varying antenna height.

Emissions level from the EUT with various configurations were examined on a Spectrum Analyzer connected with a RF amplifier and graphed by a plotter.

1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC.

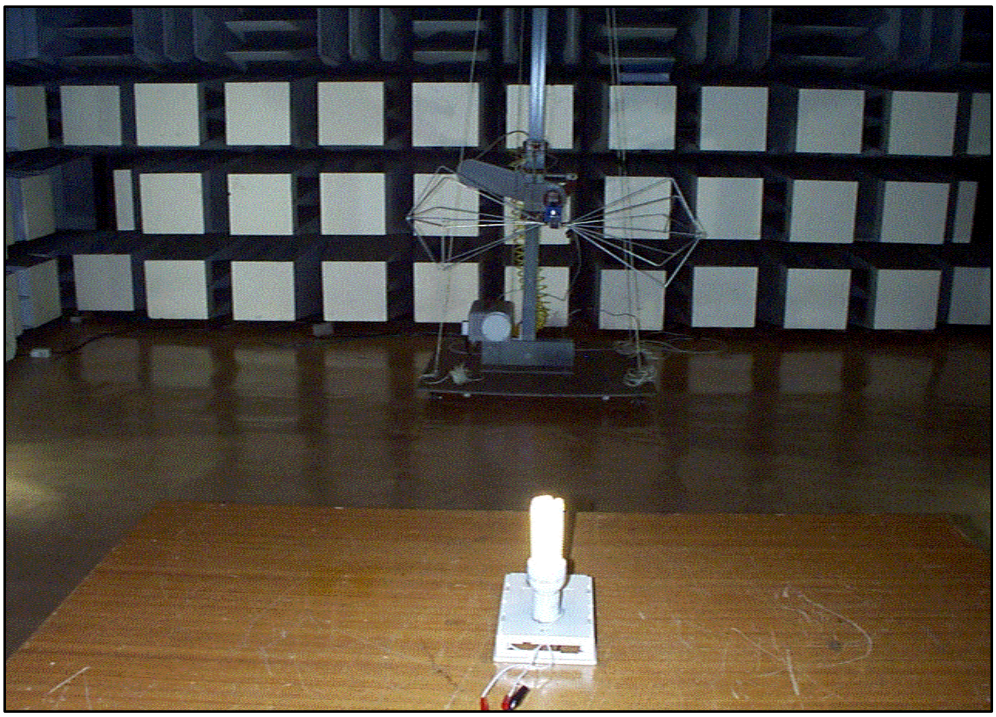
Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver or spectrum analyzer with a RF amplifier.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

2. Photograph for the test configuration



3. Sample Calculation

The emission level measured in decibels above one microvolt (dB § Å) was converted into microvolt per meter (§ Å/m) as shown in following sample calculation.

For example :

	Measured Value at 30.0 MHz	< 35.0 dB § Å
+	Antenna Factor	18.0 dB
+	Cable Loss	1.0 dB
-	Preamplifier	30.0 dB
-	Distance Correction Factor *	20.0 dB
=	Radiated Emission	< 4.0 dB § Å/m
		(= < 1.6 § Å/m)

* Extrapolated from the measured distance to the specified distance by an inverse linear distance extrapolation.

4. Measurement Data

- Resolution Bandwidth : x CISPR Quasi-Peak (6dB Bandwidth : 120kHz)
  _____ Peak (3dB Bandwidth : 100kHz)
- Measurement Distance : 3 Meter

Frequency (MHz)	* D.M.	* A.P.	Measured Value (dB§ Å)	* A.F. + C.L (dB)	* A.G. (dB)	* D.C.F. (dB)	Emission Level (dB§ Åm)	Emission Level (§ Åm)	Limit (§ Åm)	** Margin (dB)
All measured emission levels with RF preamplifier (30dB) are within the test receiver's noise floor of 35.0 dB§ Å										
-	-	-	-	-	-	-	-	-	-	-

Note

* D.M. : Detect Mode (P : Peak, Q : Quasi-Peak, A : Average)
A.P. : Antenna Polarization (H : Horizontal, V : Vertical)
A.F. : Antenna Factor
C.L. : Cable Loss
A.G. : Amplifier Gain
D.C.F. : Distance Correction Factor
< : Less than

** Margin (dB) = Emission Level (dB) - Limit (dB)

¥ ³TEST EQUIPMENT USED FOR MEASUREMENTS

Equipment	Model No.	Manufacturer	Serial No.	Effective Cal. Duration
[x] EMI Receiver (20MHz-1GHz)	ESVS30	R & S	830516/002	06/13/00-06/12/01
[x] Spectrum Analyzer (9kHz-26.5GHz)	8563A	H. P.	3222A02069	02/18/01-02/17/02
[x] Spectrum Analyzer (100Hz-22GHz)	8566B	H. P.	3014A07057	05/24/00-05/23/01
[x] Quasi-Peak Adapter (10kHz-1GHz)	85650A	H. P.	3107A01511	05/24/00-05/23/01
[x] RF-Preselector (20Hz-2GHz)	85685A	H. P.	3010A01181	05/24/00-05/23/01
[x] Test Receiver (9kHz-30MHz)	ESH3	R & S	860905/001	06/13/00-06/12/01
[x] Pre-Amplifier (0.1-3000MHz, 30dB)	8347A	H. P.	2834A00543	05/24/00-05/23/01
[x] LISN(50ohm , 50µH) (10kHz-100MHz)	3825/2	EMCO	9010-1710	-
[ ] LISN(50ohm , 50µH) (10kHz-100MHz)	3825/2	EMCO	9011-1720	-
[x] Plotter	7470A	H. P.	3104A21292	-
[x] Tuned Dipole Ant. (30MHz-300MHz)	VHA 9103	Schwarzbeck	-	*
[x] Tuned Dipole Ant. (300MHz-1GHz)	UHA 9105	Schwarzbeck	-	*
[x] Biconical Ant. (30MHz-300MHz)	BBA 9106	Schwarzbeck	-	*
[x] Log Periodic Ant. (200MHz-1GHz)	3146	EMCO	-	*
[ ] Horn Ant. (1GHz-18GHz)	3115	EMCO	-	*
[ ] DC Power Supply	6260B	H.P.	1145A04822	-
[x] Shielded Room (5.0m x 4.5m)	-	SIN-MYUNG	-	-

* Each set of antennas has been calibrated to ensure correlation with ANSI C63.5 standard. The calibration of antennas is traceable to Korea Standard Research Institute(KSRI).