Application for FCC Certificate
On Behalf of
Shanghai Fusu Electronic Co., Ltd.

Fluorescent luminaires

Model No. : TOP-20W, TOP-10W

Serial No. : E2009031102, E2009031103

FCC ID : XDOGTL-FL

Prepared For : Shanghai Fusu Electronic Co., Ltd.
No. 16 Gangwan Road, Xiaowan Village,
Wanggang Town, Pudong New District,
Shanghai, P.R.C.

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F09026
Date of Test : Mar 25 - 31, 2009
Date of Report : Apr 02, 2009

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TEST REPORT FOR FCC CERTIFICATE

Applicant : Shanghai Fusu Electronic Co., Ltd.

Manufacturer : Shanghai Fusu Electronic Co., Ltd.

EUT Description : Fluorescent luminaires

(A) Model No.	TOP-20W	TOP-10W
(B) Serial No.	E2009031102	E2009031103
(C) Power Supply	120V/60Hz	

Test Procedure Used:

FCC RULES AND REGULATIONS PART 18 SUBPART C RF LIGHTING DEVICES OCTOBER 2008 AND MP-5/1986

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 18 Subpart C (RF Lighting Devices) limits both radiated and conducted emissions.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: TOP-20W, TOP-10W; S/N: E2009031102; E2009031103) which was tested in 3m anechoic chamber on Mar 25 - 31, 2009 is technically compliance with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Mar 25 - 31, 2009 Date of Report : Apr 02, 2009

Producer : Zeno Gu
ZENO GU/ Assistant

Review :
BYRON WU / Supervisor

AUDIX® For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory :
Authorized Signature EMC SAMMY CHEN / Assistant Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Meets Limit	Results
EMISSION			
Conducted Disturbance at the Mains Terminals	FCC RULES AND REGULATIONS PART 18 SUBPART C OCTOBER 2008 AND MP-5/1986	18.307(c) Consumer Equipment	Pass
Magnetic Field Strength	FCC RULES AND REGULATIONS PART 18 SUBPART C OCTOBER 2008 AND MP-5/1986	18.305(b) Any type, Non-ISM Frequency	Pass
Radiated Emission	FCC RULES AND REGULATIONS PART 18 SUBPART C OCTOBER 2008 AND MP-5/1986	18.305(c) Consumer Equipment	Pass

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : Fluorescent luminaires

Type of EUT : ☑ Production ☐ Pre-product ☐ Pro-type

Model No. :

TOP-20W	TOP-10W

Serial No.

E2009031102	E2009031103

Applicant : Shanghai Fusu Electronic Co., Ltd.
No. 16 Gangwan Road, Xiaowan Village,
Wanggang Town, Pudong New District,
Shanghai, P.R.C.

Manufacturer : Shanghai Fusu Electronic Co., Ltd.
No. 16 Gangwan Road, Xiaowan Village,
Wanggang Town, Pudong New District,
Shanghai, P.R.C.

Model No	**Apparent Power (VA)**	**Real Power (W)**	**Power Factor**
TOP-20W	26.10	25.20	0.965
TOP-10W	14.53	14.10	0.972

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	:	Sept. 17, 1998 file on July 26, 2006 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	:	Audix Technology (Shanghai) Co., Ltd.
Site Location	:	3F 34Bldg 680 Guiping Rd, Caohejing Hi-Tech Park, Shanghai 200233, China
NVLAP Lab Code	:	200371-0

2.3 Measurement Uncertainty

Conducted Emission Expanded Uncertainty: U = 1.26 dB
Radiated Emission Expanded Uncertainty : U = 3.02 dB

3 CONDUCTED EMISSION TEST

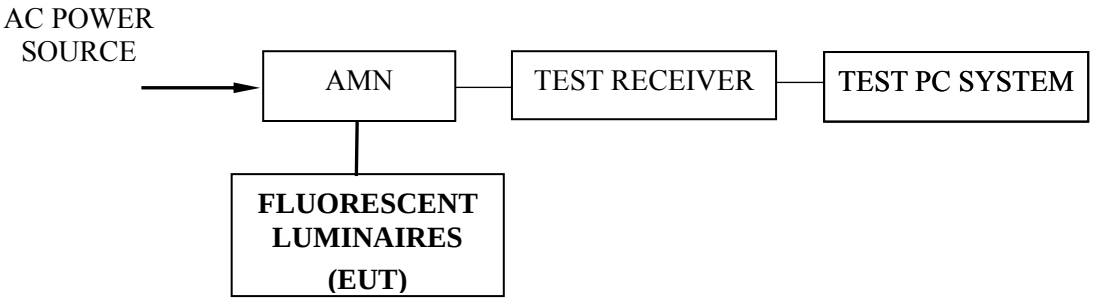
3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Nov 21, 2008	Nov 21, 2009
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2008	Apr 02, 2009
3.	50 Ω Coaxial Switch	Anritsu	MP59B	6200426389	Mar 19, 2009	Sep 19, 2009
4.	50Ω Terminator	Anritsu	BNC	001	Apr 02, 2008	Apr 02, 2009
5.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup

3.2.1 Conducted Disturbance Test Setup



—— : Signal Line
▬▬ : Power Line

3.3 Conducted Emission Limits (FCC Part 18 Consumer Equipment)

Frequency (MHz)	Maximum RF Line Voltage	
	(μV)	dB(μV)
0.45 ~ 2.51	250	48
2.51 ~ 3.0	3000	70
3.0 ~ 30	250	48

NOTE 1 – RF Line Voltage dB (μV) = 20 log RF Line Voltage (μV)
NOTE 2 – The tighter limits shall apply at the boundary between two frequency ranges.

3.4 Test Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet FCC requirement and operating in a manner that tends to maximize its emission level in a normal application.

3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of EUT.

3.5.3 The EUT will be operated normally.

3.5.4 Set the EUT on the lighting test mode, and then test.

3.6 Test Procedures

The EUT was connected to the power mains through a Artificial Mains Network (AMN). This provided a 50 ohm coupling impedance for the measuring equipment.

Both sides of AC line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to MP-5/1986 during conducted emission test.

The I.F bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 450 kHz to 30 MHz for Lighting mode was checked.

The test modes were done on conducted test and the test results of the highest emissions are listed in Sec. 3.7.

3.7 Test Results

< PASS >

The frequency and amplitude of the highest conducted emission relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

Model No	Test Mode	Data Page
TOP-20W	Lighting	P9
TOP-10W		P10

NOTE 1 – Factor = Cable Loss + AMN Factor.
NOTE 2 – Emission Level = Meter Reading + Factor.
NOTE 3 – All readings are Quasi-Peak values. (QP)
NOTE 4 – The worst case is for TOP-10W model. The worst emission is detected at 0.454 MHz with corrected signal level of 46.42 dB (μV) (limit is 48.00 dB (μV)), when the Neutral of the EUT is connected to AMN.

EUT	:	Fluorescent luminaires	Temperature :	18℃
Model No.	:	TOP-20W	Humidity :	48%RH
Serial No.	:	E2009031102	Date of Test :	Mar 31, 2009
Test Mode	:	Lighting		

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.454	43.28	0.64	43.92	48.00	4.08	QP
	0.513	**44.30**	**0.62**	**44.92**	**48.00**	**3.08**	
	0.848	40.59	0.55	41.14	48.00	6.86	
	1.016	34.48	0.54	35.02	48.00	12.98	
	3.029	26.26	0.56	26.82	48.00	21.18	
	26.118	20.16	0.88	21.04	48.00	26.96	
Neutral	0.453	44.11	0.62	44.73	48.00	3.27	QP
	0.509	41.07	0.62	41.69	48.00	6.31	
	0.676	39.78	0.56	40.34	48.00	7.66	
	0.848	40.01	0.54	40.55	48.00	7.45	
	1.016	33.02	0.53	33.55	48.00	14.45	
	1.302	30.66	0.52	31.18	48.00	16.82	

TEST ENGINEER: WENCY YANG

EUT	:	Fluorescent luminaires	Temperature :	18℃
Model No.	:	TOP-10W	Humidity :	48%RH
Serial No.	:	E2009031103	Date of Test :	Mar 31, 2009
Test Mode	:	Lighting		

Test Line	Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
Line	0.450	45.58	0.64	46.22	48.00	1.78	QP
	0.506	40.34	0.63	40.97	48.00	7.03	
	0.676	38.05	0.57	38.62	48.00	9.38	
	0.848	41.35	0.55	41.90	48.00	6.10	
	1.792	33.14	0.47	33.61	48.00	14.39	
	18.981	16.84	0.88	17.72	48.00	30.28	
Neutral	**0.454**	**45.80**	**0.62**	**46.42**	**48.00**	**1.58**	QP
	0.513	40.26	0.61	40.87	48.00	7.13	
	0.682	41.80	0.55	42.35	48.00	5.65	
	0.848	38.63	0.54	39.17	48.00	8.83	
	1.134	35.53	0.53	36.06	48.00	11.94	
	18.981	18.01	0.95	18.96	48.00	29.04	

TEST ENGINEER: WENCY YANG

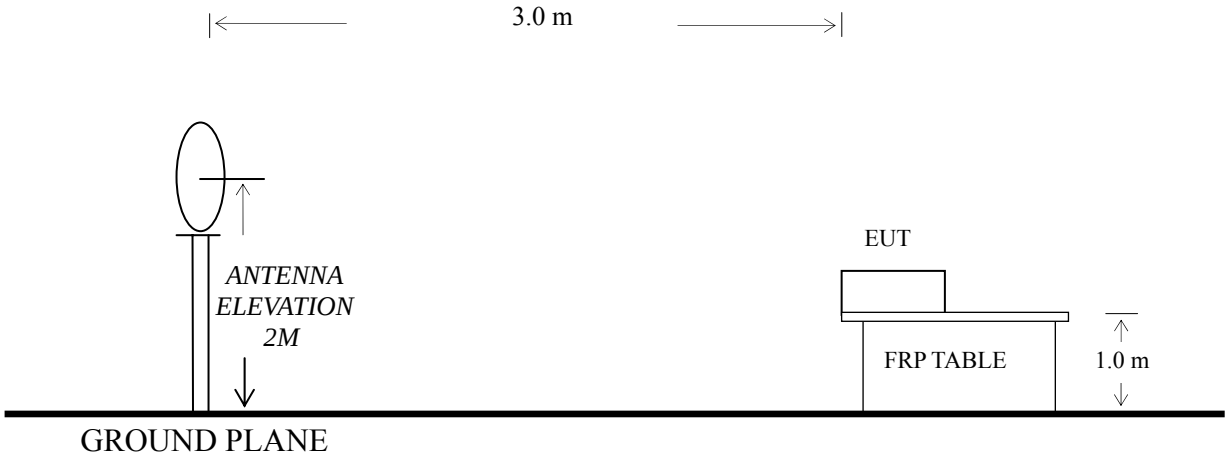
4 MAGNETIC FIELD EMISSION TEST

4.1 Test Equipment

The following test equipment are used during the field strength test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Loop Antenna	Schaffner	HLA6120	1193	Apr 06, 2008	Apr 06, 2009
2.	Test Receiver	R&S	ESHS10	844077/020	Feb 20, 2009	Feb 20, 2010
3.	50Ω Coaxial Switch	ANRITSU	MP59B	6200426390	Mar 18, 2009	Sep 18, 2009
4.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup



4.3 Magnetic Field Emission Limit (FCC Part 18 305(b))

All emanations from Non-ISM frequency devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

Frequency (MHz)	Distance (m)	Field Strength Limits (μV/m)	Converted Field Strength Limits By 3 Meters Measuring Distance dB (μV/m)
0.009~30	300	15	63.5
NOTE 1 - Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT. NOTE 2 - Audix Technology (Shanghai) Co., Ltd. only has a 3 meters Semi-anechoic Chamber to do the radiated disturbance test, therefore, Audix Shanghai used 3 meters measuring distance and converted limits to judge the EUT compliance with or not.			

4.4 Test Configuration

The FCC part 18 regulations test method must be used to find the maximum emission during Radiated Emission test.

The configuration of the EUT is same as used in conducted emission test. Please Refer to Section 3.4.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown on Section 4.2.

4.5.2 Turn on the power of all equipments.

4.5.3 Let the EUT work in test mode and test it.

4.6 Test Procedures

The EUT was placed on a table, which is 1.0 meter above ground. Measurements are performed at distance 3.0m with a 0.6m loop antenna as described in 2.2.4 of MP-5. The antenna shall be with the lower edge of the loop at height 2m above the floor.

The bandwidth setting on the test receiver (R&S Test Receiver ESHS10) is 200Hz from 9kHz to 150kHz and 10kHz from 150kHz to 30MHz. The EUT is tested in a semi-anechoic chamber.

All the test results are attached within Sec. 4.7.

4.7 Test Results

<**PASS**>

Refer to the following pages.

Model No	Test Mode	Data Page
TOP-20W	Lighting	P14
TOP-10W		P15

NOTE 1 - Factor = Antenna Factor + Cable Loss
NOTE 2 - All reading are Quasi-Peak Values.
NOTE 3 – The worst case is for TOP-20W model. The worst emission is detected at 0.014 MHz with corrected signal level of 47.86 dB (μV) (limit is 63.50 dB (μV)).

EUT	:	Fluorescent luminaires	Temperature :	22℃
Model No.	:	TOP-20W	Humidity :	60%RH
Serial No.	:	E2009031102	Date of Test :	Mar 31, 2009
Test Mode	:	Lighting		

Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
0.014	**27.36**	**20.50**	**47.86**	**63.50**	**15.64**	QP
0.025	27.07	20.55	47.62	63.50	15.88	
0.031	23.94	20.60	44.54	63.50	18.96	
0.679	16.11	20.24	36.35	63.50	27.15	
2.589	17.77	20.50	38.27	63.50	25.23	
4.797	20.56	20.72	41.28	63.50	22.22	

TEST ENGINEER: TOM SI

EUT	:	Fluorescent luminaires	Temperature :	22℃
Model No.	:	TOP-10W	Humidity :	60%RH
Serial No.	:	E2009031103	Date of Test :	Mar 31, 2009
Test Mode	:	Lighting		

Frequency (MHz)	Meter Reading dB(μV)	Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Remark
0.013	**27.30**	**20.51**	**47.81**	**63.50**	**15.69**	QP
0.031	23.94	20.60	44.54	63.50	18.96	
0.154	17.36	20.18	37.54	63.50	25.96	
1.644	13.58	20.22	33.80	63.50	29.70	
3.095	16.61	20.47	37.08	63.50	26.42	
10.451	12.37	20.70	33.07	63.50	30.43	

TEST ENGINEER: TOM SI

5 RADIATED EMISSION TEST

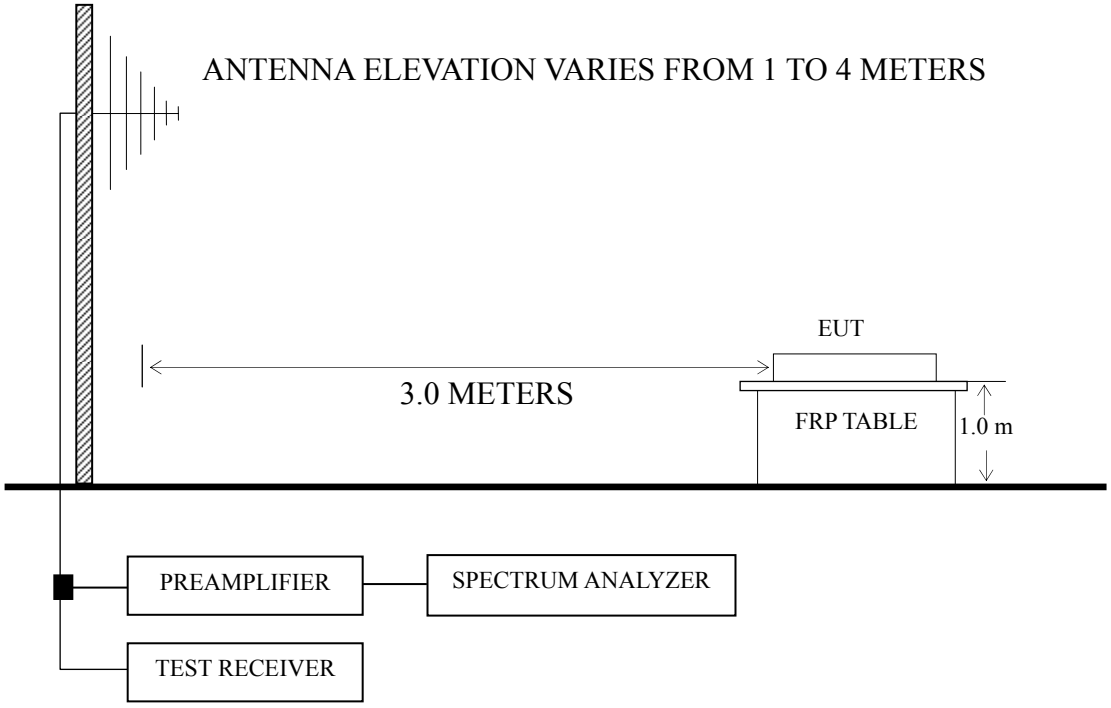
5.1 Test Equipment

The following test equipments are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESVS10	844594/001	Mar 07, 2009	Mar 07, 2010
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 19, 2009	Sep 19, 2009
3.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 14, 2008	May 14, 2009
4.	Spectrum	Agilent	E7405A	MY45106600	May 19, 2008	May 19, 2009
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

5.2 Block Diagram of Test Setup

5.2.1 Radiated emission test setup



■ : 50 ohm Coaxial Switch

5.3 Radiated Emission Limit (FCC Part 18.305(c) Consumer Equipment)

Frequency (MHz)	Distance (m)	Field strength limits		Converted Field Strength Limits By 3 Meters Measuring Distance
		(μV/m)	dB (μV/m)	dB (μV/m)
30 ~ 88	30	10	20.0	40.0
88 ~ 216	30	15	23.5	43.5
216 ~ 1000	30	20	26.0	46.0

NOTE 1 - The lower limit shall apply at the transition frequency.
NOTE 2 - Measuring distance of 30 m is a primary requirement. However, 3 m (instead of 30 m) distance maybe allowed. In this case, the limits with measuring distance of 3 m shall be the above limit value increased 20lg(30/3)=20dB.
NOTE 3 - 1 μV/m is regarded as 0 dBμV/m.

5.4 Test Configuration

The configuration of the EUT and peripherals are same as those used in conducted emission test.

Please refer to Sec.3.4.

5.5 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.5, except for the test setup replaced by Sec.5.2.

5.6 Test Procedures

The EUT was placed on a turntable that is 1.0 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to FCC MP-5: 1986 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESVS10 was set at 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked.

The test mode was done on radiated disturbance test and all the test results are listed in Sec.5.7.

5.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Model No	Test Mode	Data Page
TOP-20W	Lighting	P19
TOP-10W		P20

NOTE 1 – Emission Level = Antenna Factor + Cable Loss + Meter Reading.

NOTE 2 – The emission levels that are 20dB below the official limit are not reported.

NOTE 3 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 4 – The worst case is for TOP-20W model. The worst emission at horizontal polarization was detected at 31.940 MHz with corrected signal level of 34.88 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.00 m height and the turntable was at 120°. The worst emission at vertical polarization was detected at 31.940 MHz with corrected signal level of 35.65 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.00 m height and the turntable was at 320°.

EUT	:	Fluorescent luminaires	Temperature :	22℃
Model No.	:	TOP-20W	Humidity :	60%RH
Serial No.	:	E2009031102	Date of Test :	Mar 25, 2009
Test Mode	:	Lighting		

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	**31.940**	**15.80**	**18.49**	**0.59**	**34.88**	**40.00**	**5.12**
	60.070	19.69	6.60	0.82	27.11	40.00	12.89
	153.190	16.09	11.04	0.93	28.06	43.50	15.44
	280.260	14.38	13.55	1.44	29.37	46.00	16.63
	578.050	5.79	18.94	2.55	27.28	46.00	18.72
	859.350	2.38	21.31	3.44	27.13	46.00	18.87
Vertical	**31.940**	**16.57**	**18.49**	**0.59**	**35.65**	**40.00**	**4.35**
	57.160	22.17	7.18	0.81	30.16	40.00	9.84
	110.510	14.53	12.32	0.87	27.72	43.50	15.78
	207.510	12.14	11.05	1.11	24.30	43.50	19.20
	280.260	24.21	13.55	1.44	39.20	46.00	6.80
	371.440	9.35	15.88	1.91	27.14	46.00	18.86

TEST ENGINEER: TOM SI

EUT	:	Fluorescent luminaires	Temperature :	22℃
Model No.	:	TOP-10W	Humidity :	60%RH
Serial No.	:	E2009031103	Date of Test :	Mar 25, 2009
Test Mode	:	Lighting		

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	**31.940**	**1.84**	**18.49**	**0.59**	**20.92**	**40.00**	**19.08**
	34.850	0.33	16.97	0.62	17.92	40.00	22.08
	256.980	1.48	13.03	1.31	15.82	46.00	30.18
	399.570	1.36	16.50	2.04	19.90	46.00	26.10
	547.980	2.11	18.55	2.49	23.15	46.00	22.85
	784.660	1.58	20.55	3.30	25.43	46.00	20.57
Vertical	**30.970**	**12.19**	**19.03**	**0.57**	**31.79**	**40.00**	**8.21**
	34.850	9.14	16.97	0.62	26.73	40.00	13.27
	39.700	3.09	14.08	0.68	17.85	40.00	22.15
	153.190	2.58	11.04	0.93	14.55	43.50	28.95
	437.400	0.95	17.03	2.18	20.16	46.00	25.84
	661.470	1.99	19.52	2.87	24.38	46.00	21.62

TEST ENGINEER: TOM SI

6 DEVIATION TO TEST SPECIFICATIONS

None.