EMC TEST REPORT

For

GLOBAL(LED) LIGHTING SOLUTIONS

x-Glo strip light

Model No.: x-Glo-72-110v

Prepared for	:	GLOBAL(LED) LIGHTING SOLUTIONS
Address	:	Suite 402, 4th floor, Northbank Buiding Lane, Northbank Lane Century City Town, 7441
Prepared By	:	EMTEK (DONGGUAN) CO., LTD.
Address	:	No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China Tel : +86-769-22807078 Fax: +86-769-22807079

Report Number	:	ED170727001E
Date of Test	:	July 27, 2017 to July 31, 2017
Date of Report	:	July 31, 2017

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Test Report Description Page

TEST REPORT VERIFICATION

Applicant	:	GLOBAL(LED) LIGHTING SOLUTIONS
Manufacturer	:	GLOBAL(LED) LIGHTING SOLUTIONS
EUT	:	x-Glo strip light
Model No.	:	x-Glo-72-110v
Input Rating	:	110V~, 50/60Hz, 13W/m, Max 4.8A

Measurement Procedure Used:

EN 55015: 2013+A1: 2015
EN 61547: 2009
(IEC 61000-4-2: 2008, IEC 61000-4-3: 2006+A1: 2007+A2: 2010, IEC 61000-4-4: 2012, IEC 61000-4-5: 2014, IEC 61000-4-6: 2013, IEC 61000-4-11: 2004)

The device described above is tested by EMTEK (DONGGUAN) CO., LTD. and EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (DONGGUAN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN55015, EN61000-3-2, EN61000-3-3 and EN61547 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (DONGGUAN) CO., LTD.

Date of Test : July 27, 2017 to July 31, 2017

Prepared by : Lizzy Li

Lizzy Li/ Editor

Reviewer : Alan He

Alan He/ Supervisor

Approved & Authorized Signer :

Sam Lv / Manager

Modified Information

Version	Summary	Revision Date	Report No.
Ver.1.0	Original Report	/	ED170727001E

1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

EMISSION			
Description of Test Item	Standard	Limits	Results
Disturbance Voltage at the Mains Terminal	EN 55015: 2013+A1: 2015	Table 2a	Pass
Radiated Disturbance	EN 55015: 2013+A1: 2015	Table 3b	Pass
Magnetic Field Emission Measurement	EN 55015: 2013+A1: 2015	Table 3a	N/A
Harmonic Current Emissions	EN 61000-3-2: 2014	Class C	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3: 2013	Section 5	N/A
IMMUNITY			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic Discharge (ESD)	IEC 61000-4-2: 2008	B	Pass
RF Field Strength Susceptibility (R/S)	IEC 61000-4-3: 2006+A1: 2007+A2: 2010	A	Pass
Electro Fast Transient (EFT)	IEC 61000-4-4: 2012	B	Pass
Surge (Input AC Power Port)	IEC 61000-4-5: 2014	C	Pass
Radio-Frequency, Continuous Conducted Disturbance	IEC 61000-4-6: 2013	A	Pass
Power Frequency Magnetic Field	IEC 61000-4-8: 2009	A	N/A
Voltage Interruptions, 100%	IEC 61000-4-11: 2004	B	Pass
Voltage Dips, 30% Reduction		C	
Note: N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1 Description of Device (EUT)

EUT	:	x-Glo strip light
Model Number	:	x-Glo-72-110v
Trade Mark	:	x·Glo
Power Supply for Test	:	AC 110V/50Hz
Operate mode	:	ON
Applicant	:	GLOBAL(LED) LIGHTING SOLUTIONS
Address	:	Suite 402, 4th floor, Northbank Buiding Lane, Northbank Lane Century City Town, 7441
Manufacturer	:	GLOBAL(LED) LIGHTING SOLUTIONS
Address	:	Suite 402, 4th floor, Northbank Buiding Lane, Northbank Lane Century City Town, 7441
Date of sample receiver	:	July 27, 2017
Date of Test	:	July 27, 2017 to July 31, 2017

2.2 Description of Test Facility

Site Description

EMC Lab.	:	Accredited by CNAS, 2015.09.24 The certificate is valid until 2018.07.03 The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006 The Certificate Registration Number is L3150 Registered on Industry Canada, January 13, 2017 The Certificate Number is 9444A.
Name of Firm	:	EMTEK (DONGGUAN) CO., LTD.
Site Location	:	No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China

2.3 Measurement Uncertainty

Test Item		Uncertainty
Conducted Emission Uncertainty	:	2.42dB
Radiated Emission Uncertainty (3m Chamber)	:	3.34dB (30M~1GHz Polarize: H) 3.32dB (30M~1GHz Polarize: V)
Magnetic Emission Uncertainty		2.8dB
Uncertainty for Flicker test	:	0.25%
Uncertainty for Harmonic test	:	0.014%
Uncertainty for C/S Test	:	1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	:	2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	:	0.6℃ 4%

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Power Line Conducted Emission

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESCI	100137	May 16, 2017	1 Year
2.	L.I.S.N.	Schwarzbeck	NNLK8121	8121-641	May 16, 2017	1Year
3.	Pulse Limiter with 10dB Attenuation	Schwarzbeck	VTSD 9561-F	9561-F028	May 16, 2017	1Year

3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	1166.5950. 03	May 16, 2017	1 Year
2.	Bilog Antenna	Schwarzbeck	VULB9163	000141	May 16, 2017	1 Year
3.	Power Amplifier	CDS	RSU-M352	818	May 16, 2017	1 Year
4.	Power Amplifier	HP	8447F	OPT H64	May 16, 2017	1 Year
5.	Color Monitor	SUNSPO	SP-140A	N/A	May 16, 2017	1 Year
6.	Single Line Filter	JIANLI	XL-3	N/A	May 16, 2017	1 Year
8.	Single Phase Power Line Filter	JIANLI	DL-2X100B	N/A	May 16, 2017	1 Year
8.	3 Phase Power Line Filter	JIANLI	DL-4X100B	N/A	May 16, 2017	1 Year
6.	DC Power Filter	JIANLI	DL-2X50B	N/A	May 16, 2017	1 Year
8.	Cable	Schwarzbeck	PLF-100	519489	May 16, 2017	1 Year
8.	Cable	Rosenberger	CIL02	A0783566	May 16, 2017	1 Year
9.	Cable	Rosenberger	RG 233/U	525178	May 16, 2017	1 Year

3.3 For Magnetic Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 16, 2017	1 Year
2.	Loop Antenna	Laplace Instrument Ltd	RF300	8006	May 16, 2017	1 Year
3.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 16, 2017	1 Year
4.	RF Cable	FUJIKURA	RG-55/U	LISN Cable	May 16, 2017	1 Year
5.	Coaxial Switch	Anritsu	MP59B	M73989	May 16, 2017	1 Year

3.4 For Electrostatic Discharge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	ESD Tester	TESEQ AG	NSG437	EE166	May 16, 2017	1 Year

3.5 For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	RF Power Meter. Dual	BOONTON	4232A	10539	May 16, 2017	1 Year

	Channel					
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236/34238	May 16, 2017	1 Year
3.	Broad-Band Horn Antenna	SCHWARZBECK	BBHA9120 L3F	332	May 16, 2017	1 Year
4.	Power Amplifier	PRANA	AP32MT215	N/A	May 16, 2017	1 Year
5.	Power Amplifier	MILMEGA	AS0102-55	N/A	May 16, 2017	1 Year
6.	Signal Generator	AEROFLEX	2023B	N/A	May 16, 2017	1 Year
7.	Field Strength Meter	HOLADAY	HI-6005	N/A	May 16, 2017	1 Year
8.	RS232 Fiber Optic Modem	HOLADAY	HI-4413P	N/A	May 16, 2017	1 Year
9.	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	N/A	May 16, 2017	1 Year

3.6 For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	EM TEST	UCS500M6B	V0526100502	May 16, 2017	1 Year
2.	Coupling Clamp	EM TEST	HFK	0605-10	May 16, 2017	1Year

3.7 For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	EM TEST	VCS 500M6T	V0526100503	May 16, 2017	1 Year

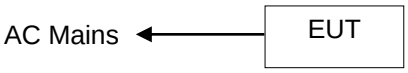
3.8 For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	FRANKONIA	CIT-10	126B121012012	May 17, 2017	1Year
2.	CDN	EM TEST	CDN-M2	100100100	May 17, 2017	1Year
3.	CDN	EM TEST	CDN-M3	0900-11	May 17, 2017	1 Year
4.	Injection Clamp	EM TEST	F-2031-23MM	368	May 17, 2017	1Year
5.	Attenuator	EM TEST	ATT6	0010222A	May 17, 2017	1Year

4. POWER LINE CONDUCTED MEASUREMENT

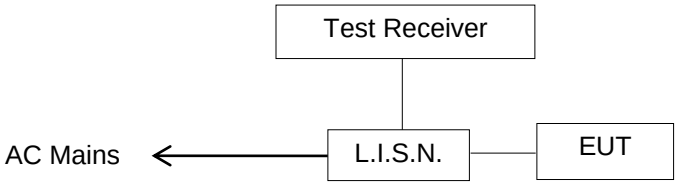
4.1 Block Diagram of Test Setup

4.1.1 Block diagram of connection between the EUT and simulators



(EUT: x-Glo strip light)

4.1.2 Block Diagram of Test Setup



(EUT: x-Glo strip light)

4.2 Conducted Power Line Emission Measurement Standard and Limits

4.2.1 Standard:

EN 55015: 2013+A1: 2015

4.2.2 Limits

Frequency	At mains terminals (dBμV)	
	Quasi-peak Level	Average Level
9KHz ~ 50KHz	110	--
50KHz ~ 150KHz	90 ~ 80*	--
150KHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
0.5MHz ~ 5.0MHz	56	46
5.0MHz ~ 30MHz	60	50

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

4.3 EUT Configuration on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

EUT	:	x-Glo strip light
Model Number	:	x-Glo-72-110v

4.4 Operating Condition of EUT

4.4.1 Setup the EUT as shown in Section 4.1.

4.4.2 Turn on the power of all equipments.

4.4.3 Let the EUT work in test mode (ON) and measure it.

4.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN55015 standard.

The bandwidth of the test receiver (R&S ESCS30) is set at 200Hz in 9KHz~150KHz range and 9KHz in 150KHz~30MHz range.

The frequency range from 9KHz to 30MHz is checked.

All the test results are listed in Section 4.6.

4.6 Measurement Results

PASS.

The frequency range from 9KHz to 30MHz is investigated.

The test data are attached in the following pages.

Site site #1 Phase: *L1* Temperature: 24

Limit: (CE)EN55015_QP Power: AC 110V/50Hz Humidity: 55 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	20.44	10.11	30.55	66.00	-35.45	QP	
2		0.1500	1.64	10.11	11.75	56.00	-44.25	AVG	
3		0.2180	8.45	10.13	18.58	62.89	-44.31	QP	
4		0.2180	-3.45	10.13	6.68	52.89	-46.21	AVG	
5		0.2660	7.77	10.14	17.91	61.24	-43.33	QP	
6		0.2660	-1.64	10.14	8.50	51.24	-42.74	AVG	
7		2.2380	8.23	10.16	18.39	56.00	-37.61	QP	
8		2.2380	-5.15	10.16	5.01	46.00	-40.99	AVG	
9		22.1900	12.99	10.44	23.43	60.00	-36.57	QP	
10		22.1900	2.96	10.44	13.40	50.00	-36.60	AVG	
11		24.0020	14.37	10.48	24.85	60.00	-35.15	QP	
12	*	24.0020	4.70	10.48	15.18	50.00	-34.82	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator:

Site site #1 Phase: N Temperature: 24

Limit: (CE)EN55015_QP Power: AC 110V/50Hz Humidity: 55 %

Mode: ON

Note:

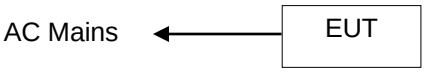
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	13.10	10.11	23.21	66.00	-42.79	QP	
2		0.1500	-1.49	10.11	8.62	56.00	-47.38	AVG	
3		0.2340	8.19	10.13	18.32	62.31	-43.99	QP	
4		0.2340	0.43	10.13	10.56	52.31	-41.75	AVG	
5		0.6380	6.92	10.19	17.11	56.00	-38.89	QP	
6		0.6380	-4.95	10.19	5.24	46.00	-40.76	AVG	
7		1.3420	7.75	10.17	17.92	56.00	-38.08	QP	
8		1.3420	-4.49	10.17	5.68	46.00	-40.32	AVG	
9		22.2180	13.72	10.44	24.16	60.00	-35.84	QP	
10	*	22.2180	3.94	10.44	14.38	50.00	-35.62	AVG	
11		29.9700	13.24	10.60	23.84	60.00	-36.16	QP	
12		29.9700	-5.27	10.60	5.33	50.00	-44.67	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator:

5. RADIATED EMISSION MEASUREMENT

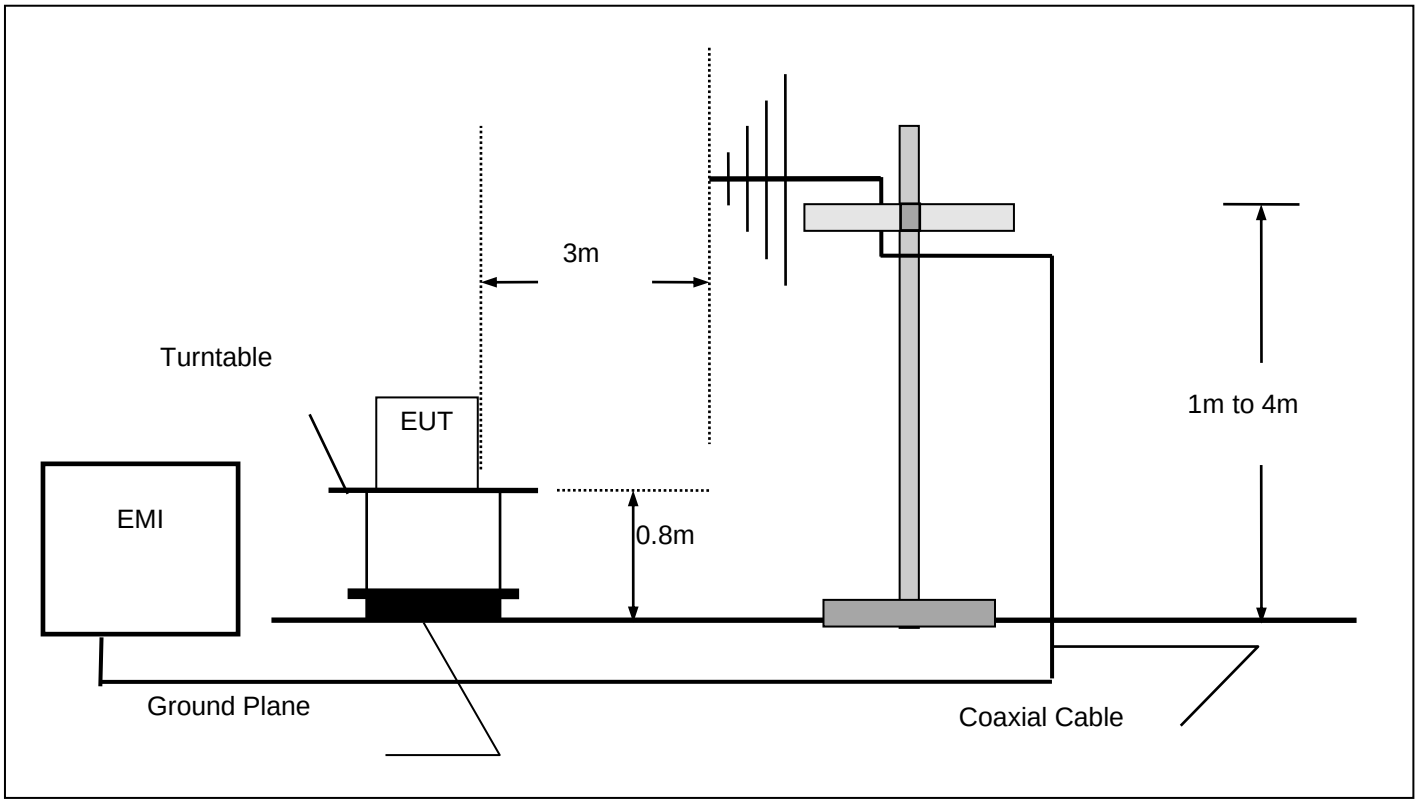
5.1 Block Diagram of Test

5.1.1 Block diagram of connection between the EUT and simulators



(EUT: x-Glo strip light)

5.1.2 Block diagram of test setup (In chamber)



(EUT: x-Glo strip light)

5.2 Measuring Standard

EN 55015: 2013+A1: 2015

5.3 Radiated Emission Limits

All emanations from a device or system shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	40
230 ~ 300	3	47

Note**:** (1) The smaller limit shall apply at the combination point between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4 EUT Configuration on Test

The EN55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

EUT **:** x-Glo strip light

Model No. **:** x-Glo-72-110v

5.5 Operating Condition of EUT

5.5.1 Turn on the power.

5.5.2 Let the EUT work in test mode (ON) and measure it.

5.6 Test Procedure

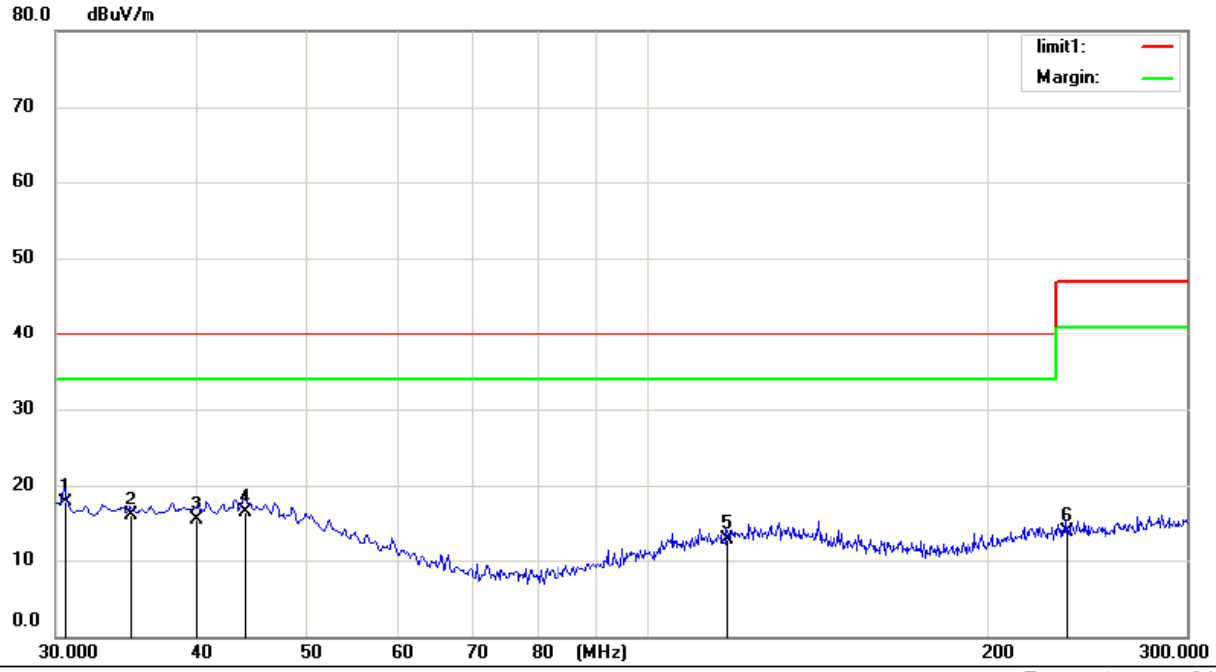
The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meter to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

5.7 Test Results

PASS.
The frequency range from 30MHz to 300MHz is investigated.

The test data are attached in the following pages.



Site Chamber #1 Polarization: **Horizontal** Temperature: 24

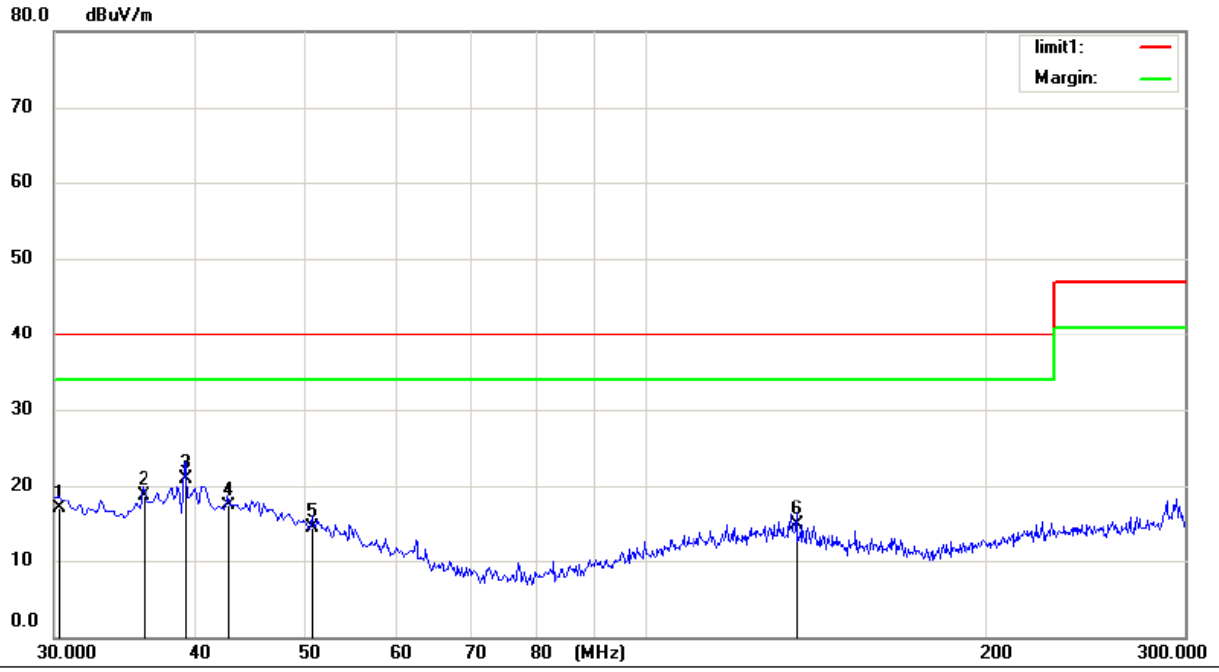
Limit: (RE)EN55015_3m Power: AC 110V/50Hz Humidity: 55 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	30.5400	32.69	-15.01	17.68	40.00	-22.32	QP			
2		34.8600	30.10	-14.18	15.92	40.00	-24.08	QP			
3		39.9900	28.95	-13.69	15.26	40.00	-24.74	QP			
4		44.0400	29.68	-13.33	16.35	40.00	-23.65	QP			
5		117.7500	29.78	-17.12	12.66	40.00	-27.34	QP			
6		234.6600	29.69	-15.91	13.78	47.00	-33.22	QP			

*:Maximum data x:Over limit !:over margin Operator:



Site Chamber #1 Polarization: **Vertical** Temperature: 24

Limit: (RE)EN55015-3m Power: AC 110V/50Hz Humidity: 55 %

Mode: ON

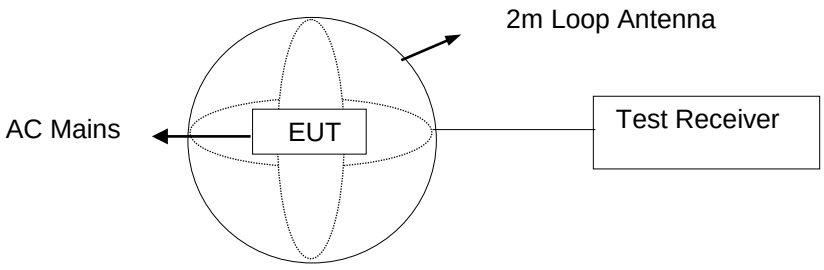
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.2700	31.96	-15.08	16.88	40.00	-23.12	QP			
2		35.9400	32.85	-14.07	18.78	40.00	-21.22	QP			
3	*	39.1800	34.68	-13.74	20.94	40.00	-19.06	QP			
4		42.6900	30.74	-13.48	17.26	40.00	-22.74	QP			
5		50.7900	30.13	-15.74	14.39	40.00	-25.61	QP			
6		136.1100	31.39	-16.62	14.77	40.00	-25.23	QP			

*:Maximum data x:Over limit !:over margin Operator:

6. Magnetic field emissiOn MEASUREMENT

6.1 Block Diagram of Test Setup



(EUT: x-Glo-72-110v, HALO 1-36)

6.2 Magnetic Field Emission Measurement Standard and Limits

6.2.1 Test Standard

EN 55015: 2013+A1: 2015

6.2.2 Test Limits

Frequency	Limits for loop diameter (dBμA)
	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 3.0MHz	58 ~ 22*
3.0MHz ~ 30MHz	22

1. At the transition frequency the lower limit applies.
2. * decreasing linearly with logarithm of the frequency.

6.3 EUT Configuration on Measurement

The configuration of the EUT is same as Section 4.3.

6.4 Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.4, except that the test setup replaced by Section 6.1.

6.5 Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver.
Three field components are checked by means of a coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the field strength meter (R&S test receiver ESCS30) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

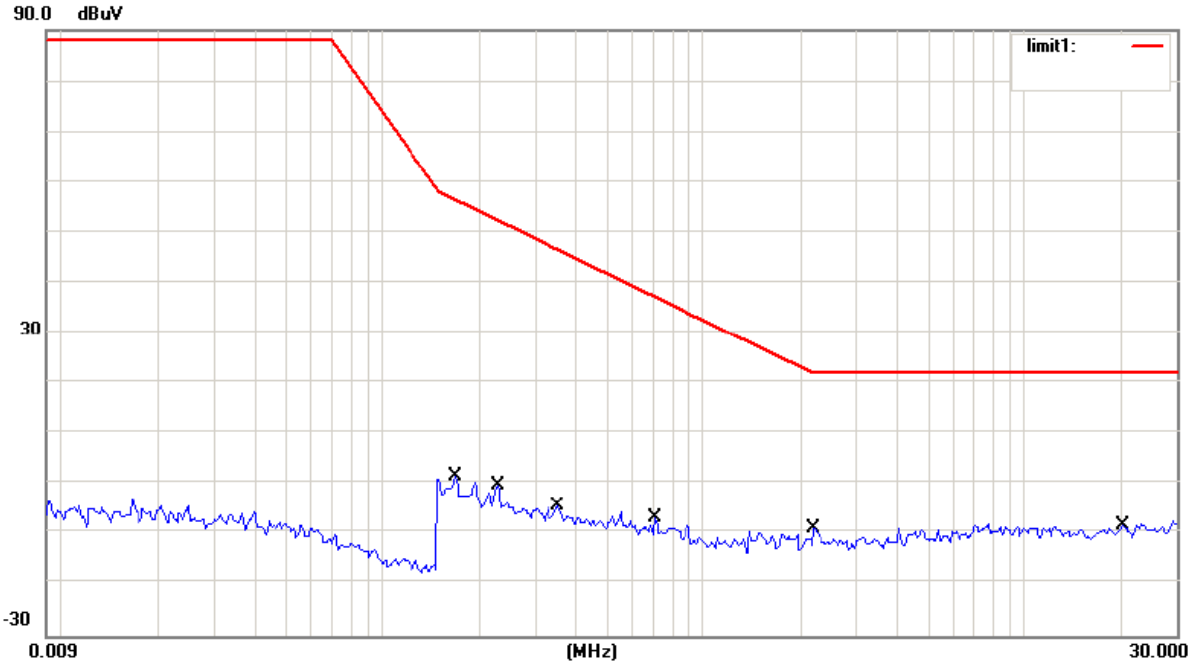
6.6 Test Results

PASS.

These test result outsourced to EMTEK (SHENZHEN) CO., LTD.

The frequency range from 9KHz to 30MHz is investigated.

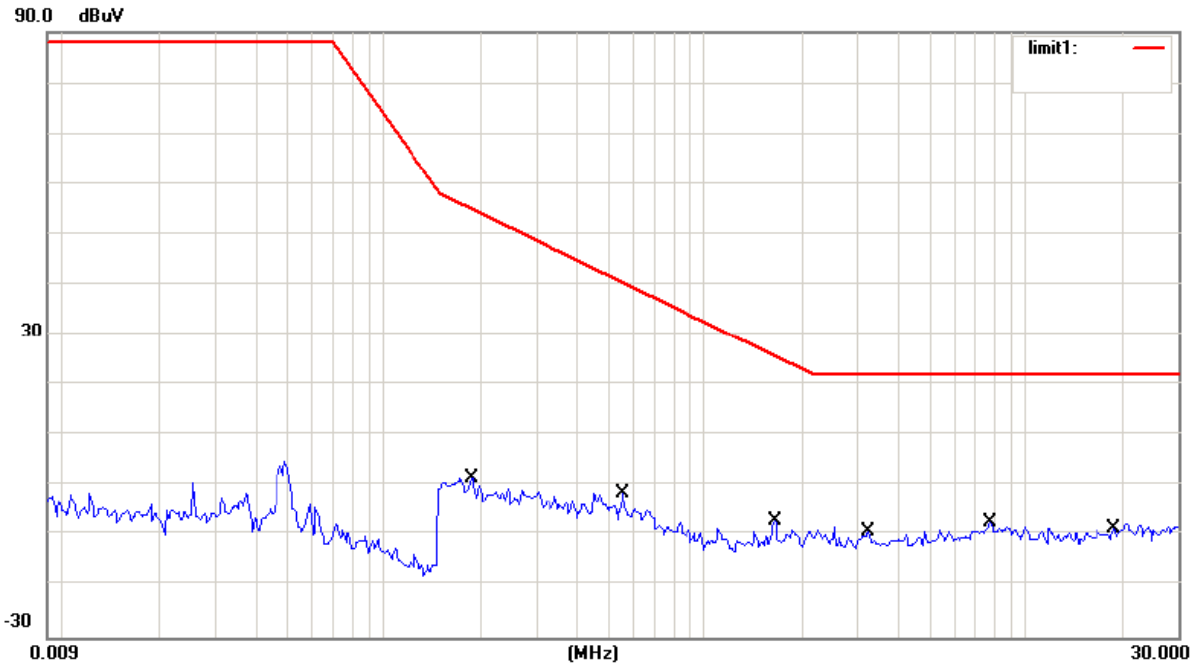
The test data are attached in the following pages.



Site site #1 Phase: LOOP A Temperature: 26
Limit: (ME)EN55015_2m Power: AC 110V/50Hz Humidity: 60 %
Mode: ON
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1700	1.54	0.00	1.54	56.32	-54.78	QP	
2		0.2300	-0.25	0.00	-0.25	52.27	-52.52	QP	
3		0.3550	-4.42	0.00	-4.42	46.45	-50.87	QP	
4		0.7100	-6.87	0.00	-6.87	37.16	-44.03	QP	
5		2.2163	-8.78	0.00	-8.78	22.00	-30.78	QP	
6	*	20.4750	-8.26	0.00	-8.26	22.00	-30.26	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver.



Site site #1 Phase: LOOP B Temperature: 26

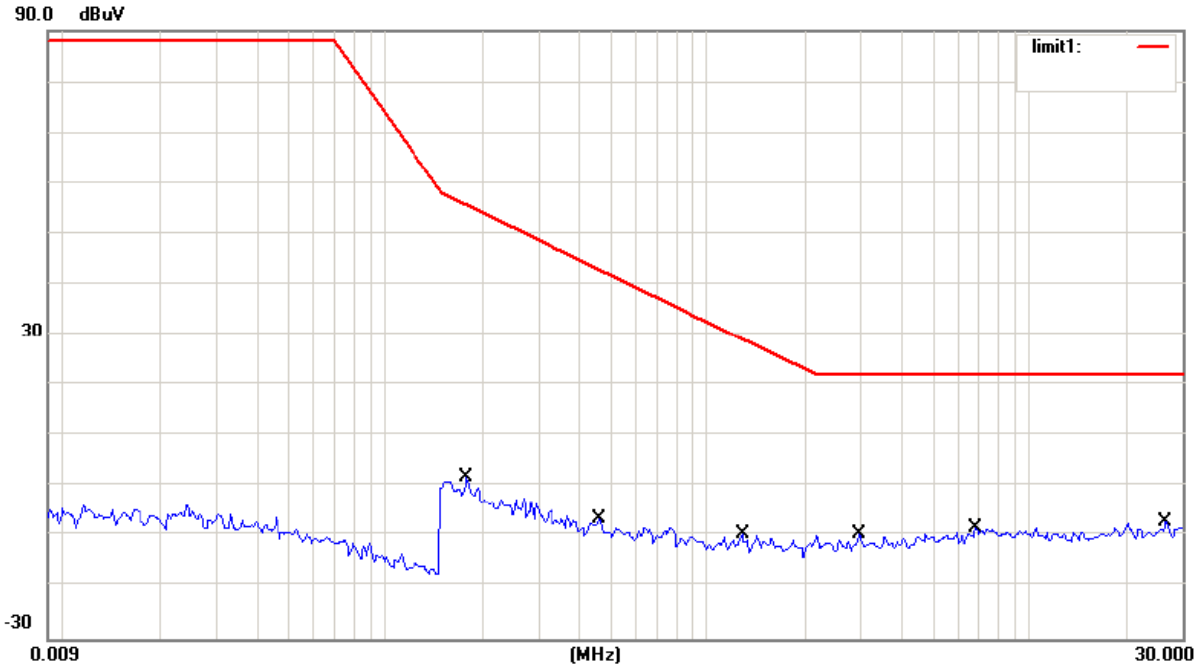
Limit: (ME)EN55015_2m Power: AC 110V/50Hz Humidity: 60 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1900	1.72	0.00	1.72	54.83	-53.11	QP	
2		0.5600	-1.35	0.00	-1.35	40.34	-41.69	QP	
3		1.6700	-7.16	0.00	-7.16	25.69	-32.85	QP	
4		3.2664	-9.26	0.00	-9.26	22.00	-31.26	QP	
5	*	7.8364	-7.44	0.00	-7.44	22.00	-29.44	QP	
6		18.9500	-8.53	0.00	-8.53	22.00	-30.53	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver.



Site site #1 Phase: LOOP C Temperature: 26

Limit: (ME)EN55015_2m Power: AC 110V/50Hz Humidity: 60 %

Mode: ON

Note:

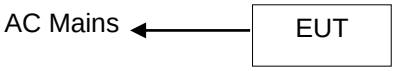
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1800	1.87	0.00	1.87	55.56	-53.69	QP	
2		0.4650	-6.39	0.00	-6.39	42.83	-49.22	QP	
3		1.2900	-9.47	0.00	-9.47	29.16	-38.63	QP	
4		2.9763	-9.31	0.00	-9.31	22.00	-31.31	QP	
5		6.8564	-8.30	0.00	-8.30	22.00	-30.30	QP	
6	*	26.7500	-7.05	0.00	-7.05	22.00	-29.05	QP	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver.

7. ELECTROSTATIC DISCHARGE TEST

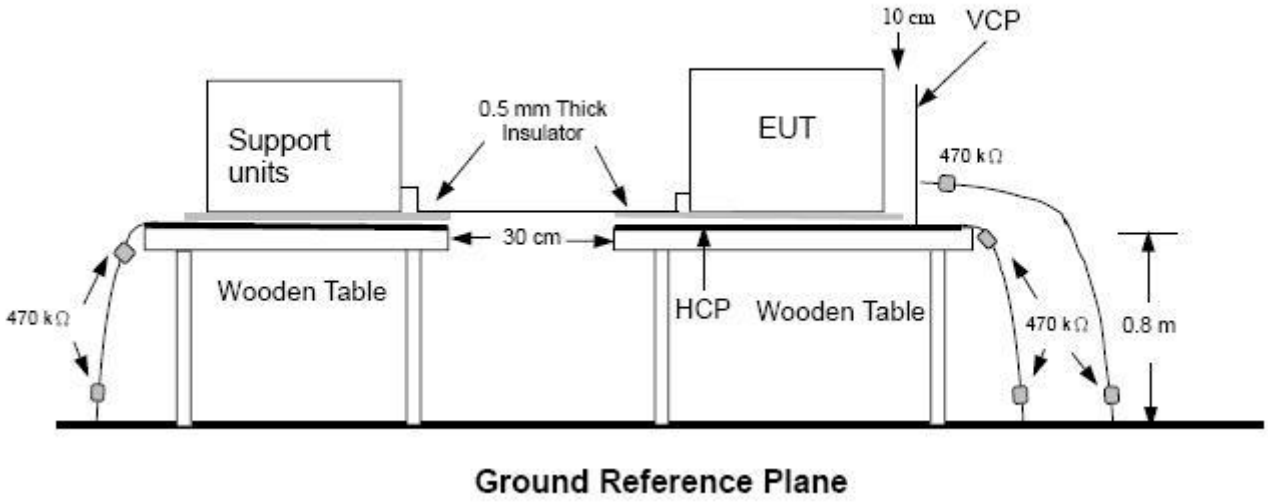
7.1 Block Diagram of Test Setup

7.1.1 Block Diagram of the EUT



(EUT: x-Glo strip light)

7.1.2 Block Diagram of ESD Test Setup



(EUT: x-Glo strip light)

7.2 Test Standard

EN 61547: 2009
(IEC 61000-4-2: 2008,
Severity Level**:** Air Discharge: Level 3, ±8KV Contact Discharge: Level 2, ±4KV)

7.3 Severity Levels and Performance Criterion

7.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

7.3.2 Performance criterion**: B**

7.4 EUT Configuration

The configuration of EUT is listed in Section 4.3.

7.5 Operating Condition of EUT

7.5.1 Setup the EUT as shown in Section 6.1.

7.5.2 Turn on the power of all equipments.

7.5.3 Let the EUT work in test mode (ON) and measure it.

7.6 Test Procedure

7.6.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

7.6.2 Contact Discharge:

All the procedure shall be same as Section 6.6.1 except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.6.3 Indirect discharge for horizontal coupling plane:

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

7.6.4 Indirect discharge for vertical coupling plane:

At least 20 single discharge shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

7.7 Test Results

PASS.

Please refer to the following page.

Electrostatic Discharge Test Results

EMTEK (DONGGUAN) CO., LTD.

Applicant	: GLOBAL(LED) LIGHTING SOLUTIONS	Test Date	: July 27, 2017
EUT	: x-Glo strip light	Temperature	: 24℃
M/N	: x-Glo-72-110v	Humidity	: 54%
Power Supply	: AC 110V/50Hz	Test Engineer:	Bruce
Test Mode	: ON	Criterion	: B

Air Discharge: ±2, 4, 8KV

Contact Discharge: ±2, 4KV # For each point positive 10 times and negative 10 times

Location			**Kind** A-Air Discharge C-Contact Discharge	**Result**
Slot of EUT	10	points	A	PASS
Screw	5	points	A	PASS
HCP			C	PASS
VCP			C	PASS

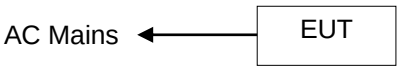
Remark :	Test Equipment : ESD Tester (TESEQ AG, NSG437)

Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).

8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

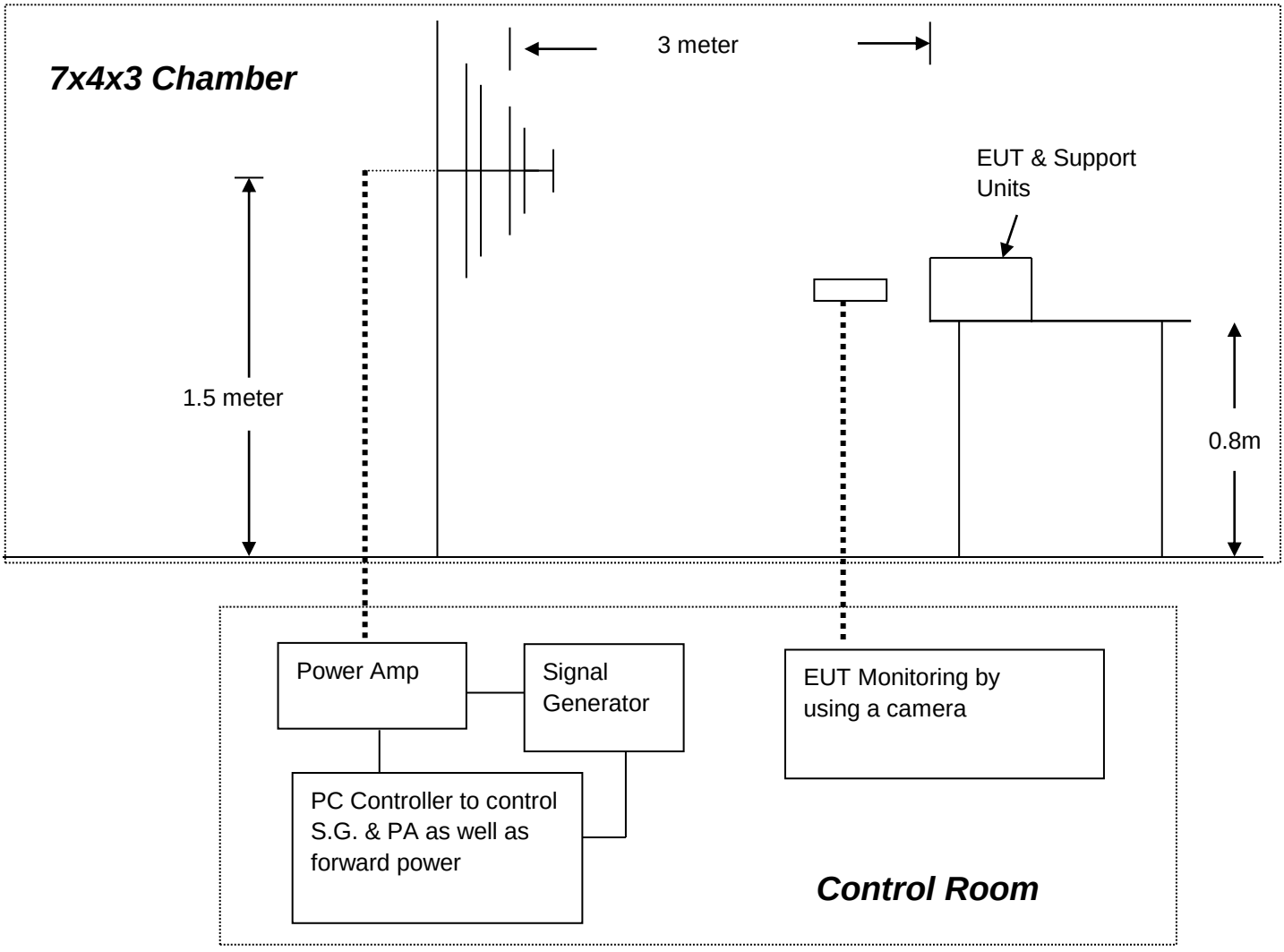
8.1 Block Diagram of Test Setup

8.1.1 Block Diagram of the EUT and the simulators



(EUT: x-Glo strip light)

8.1.2 R/S Test Setup



(EUT: x-Glo strip light)

8.2 Test Standard

EN 61547: 2009
(IEC 61000-4-3: 2006+A1: 2007+A2: 2010, Severity Level: 2, 3V / m)

8.3 Severity Levels and Performance Criterion

8.3.1 Severity level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

8.3.2 Performance criterion**: A**

8.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

8.5 Operating Condition of EUT

8.5.1 Setup the EUT as shown in Section 8.1.

8.5.2 Turn on the power of all equipments.

8.5.3 Let the EUT work in test mode (ON) and measure it.

8.6 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows**:**

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	1 Sec.

8.7 Test Results

PASS.

These test result outsourced to EMTEK (SHENZHEN) CO., LTD.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant: GLOBAL(LED) LIGHTING SOLUTIONS

Test Date : July 28, 2017

EUT : x-Glo strip light

Temperature : 22℃

M/N : x-Glo-72-110v

Humidity : 52%

Field Strength: 3 V/m

Criterion: A

Power Supply: AC 110V/50Hz

Frequency Range: 80 MHz to 1000 MHz

Test Engineer: Bruce

Modulation: ☑ AM ☐ Pulse ☐none 1 KHz 80%

Test Mode : ON

	Frequency Rang : 80-1000MHz	
Steps	1 %	
	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

Test Equipment :

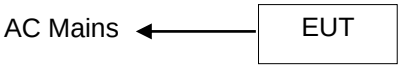
1. Signal Generator : 2023B (AEROFLEX)
2. Power Amplifier : AS0102-55 (MILMEGA)& AP32MT215 (PRANA)
3. Log.-Per. Antenna: VULP 9118E(SCHWARZBECK)
4. Broad-Band Horn Antenna: BBHA9120L3F (SCHWARZBECK)
5. RF Power Meter. Dual Channel : 4232A (BOONTON)
6. Field Strength Meter: HI-6005(HOLADAY)

Note:

9. ELECTRICAL FAST TRANSIENT/BURST TEST

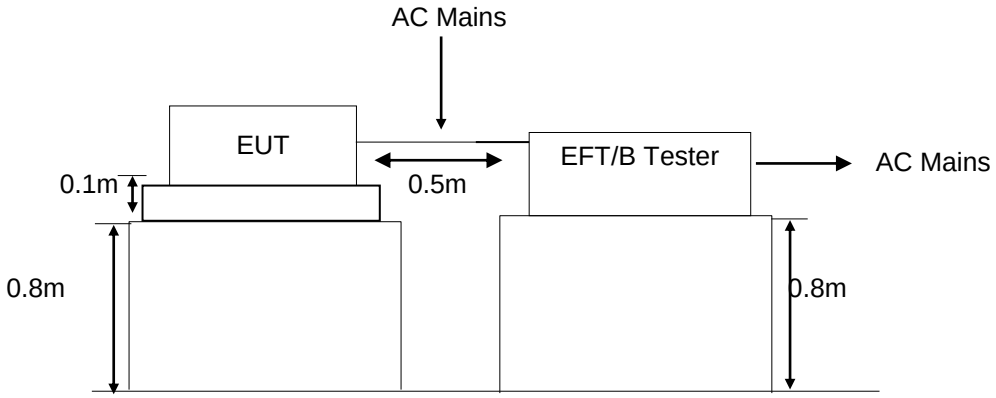
9.1 Block Diagram of Test Setup

9.1.1 Block Diagram of the EUT and the simulators



(EUT: x-Glo strip light)

9.1.2 Block Diagram of Test Setup



(EUT: x-Glo strip light)

9.2 Test Standard

EN 61547: 2009
(IEC 61000-4-4: 2012, Severity Level, Level 2**:** 1KV)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5 KV	5 or 100	0.25 KV	5 or 100
2.	1 KV	5 or 100	0.5 KV	5 or 100
3.	2 KV	5 or 100	1 KV	5 or 100
4.	4 KV	5 or 100	2 KV	5 or 100
X	Special	Special	Special	Special
NOTE 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. NOTE 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.				
"X" is an open level. The level has to be specified in the dedicated equipment specification.				

9.3.2 Performance criterion**: B**

9.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

9.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 8.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (ON) and measure it.

9.6 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.6.1 For input and output AC power ports**:**

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6.2 For signal lines and control lines ports**:**

No I/O ports. It's unnecessary to test.

9.6.3 For DC output line ports**:**

No I/O ports. It's unnecessary to test.

9.7 Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

EMTEK (DONGGUAN) CO., LTD.

Standard :	☒ IEC 61000-4-4 ☐ EN 61000-4-4	Result : ☒PASS / ☐ FAIL

Applicant : GLOBAL(LED) LIGHTING SOLUTIONS

EUT : x-Glo strip light

M/N : x-Glo-72-110v

Input Voltage: AC 110V/50Hz

Criterion : B

Ambient Condition : 24 ℃ 54% RH

Operation Mode : ON

Line : ☒AC Mains	Line *:* ☐ Signal ☐ I/O Cable
Coupling *:* ☒Direct	Coupling *:* ☐Capacitive
Test Time *: 120s*	

Line	Test Voltage	Result (+)	Result (-)
L	1KV	PASS	PASS
N	1KV	PASS	PASS
PE			
L、N	1KV	PASS	PASS
L、PE			
N、PE			
L、N、PE			
Signal Line			
DC Line			

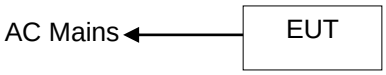
Note:

Test Equipment	Burst Tester Model : UCS500M6B

11. SURGE IMMUNITY TEST

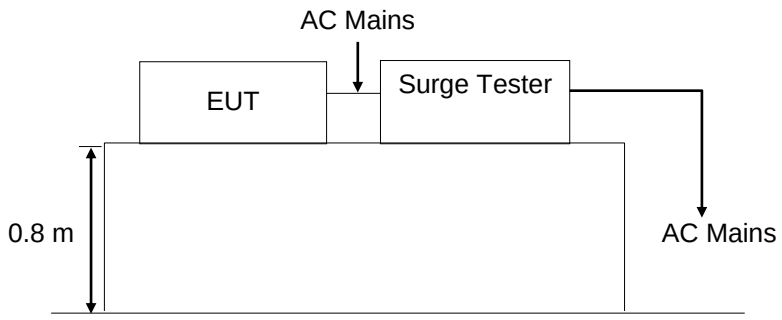
11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



(EUT: x-Glo strip light)

11.1.2 Surge Test Setup



(EUT: x-Glo strip light)

11.2 Test Standard

EN 61547: 2009
(IEC 61000-4-5: 2014, Severity Level: Line to Line: Level 2, 1.0KV)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

11.3.2 Performance criterion**: C**

11.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

11.5 Operating Condition of EUT

9.5.1 Setup the EUT as shown in Section 9.1.

9.5.2 Turn on the power of all equipments.

9.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

1) Set up the EUT and test generator as shown on Section 9.1.2.
2) For line to line coupling mode, provide a 1.0 KV, 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
4) Different phase angles are done individually.
5) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

11.7 Test Results

PASS.

Please refer to the following page.

Surge Immunity Test Results

EMTEK (DONGGUAN) CO., LTD.

Applicant : GLOBAL(LED) LIGHTING SOLUTIONS	Test Date : July 27, 2017
EUT : x-Glo strip light	Temperature : 22℃
M/N : x-Glo-72-110v	Humidity : 50%
Power Supply : AC 110V/50Hz	Test Engineer : Terry
Test Mode : ON	Criterion : C

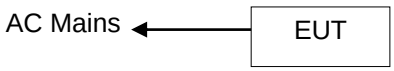
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Result
L-N	+	90^0	5	1.0	PASS
	-	270^0	5	1.0	PASS
L-PE					
N-PE					

Remark:	Test Equipment : Surge Generator VCS 500M6T

11. INJECTED CURRENTS SUSCEPTIBILITY TEST

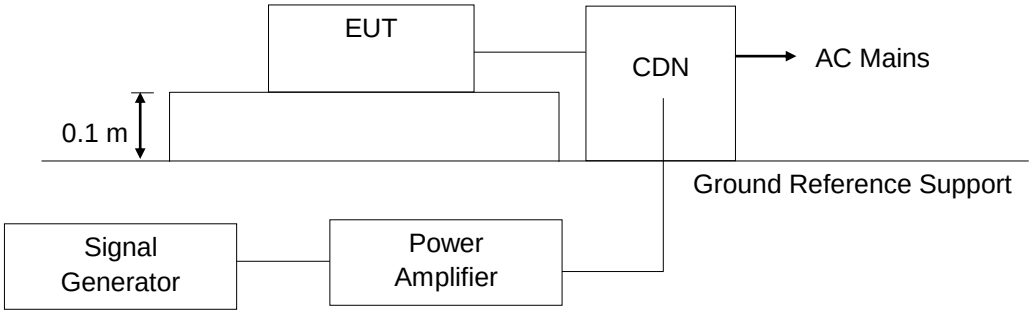
11.1 Block Diagram of Test Setup

11.1.1 Block Diagram of the EUT



(EUT: x-Glo strip light)

11.1.2 Block Diagram of Test Setup



(EUT: x-Glo strip light)

11.2 Test Standard

EN 61547: 2009
(IEC 61000-4-6: 2013, Severity Level 2**:** 3V (rms), 0.15MHz ~ 80MHz)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V
1.	1
2.	3
3.	10
X	Special

11.3.2 Performance criterion**: A**

11.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

11.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.

11.5.2 Turn on the power of all equipments.

11.5.3 Let the EUT work in test mode (ON) and measure it.

11.6 Test Procedure

1) Set up the EUT, CDN and test generators as shown on Section11.1.2.
2) Let the EUT work in test mode and measure it.
3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
4) The disturbance signal described below is injected to EUT through CDN.
5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
7) The rate of sweep shall not exceed 1.5*10-3decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

11.7 Test Results

PASS.

These test result outsourced to EMTEK (SHENZHEN) CO., LTD.

Please refer to the following page.

Injected Currents Susceptibility Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant : GLOBAL(LED) LIGHTING SOLUTIONS	Test Date : July 28, 2017
EUT : x-Glo strip light	Temperature : 22℃
M/N : x-Glo-72-110v	Humidity : 50%
Power Supply : AC 110V/50Hz	Test Engineer : Bruce

Test Mode : ON

Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~ 80	AC Mains	3V(rms)	A	PASS

Test Mode :

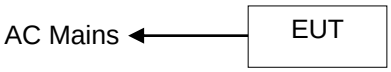
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result

Remark : 1. Modulation Signal:1KHz 80% AM Measurement Equipment : Simulator: CIT-10 (FRANKONIA) CDN : ☑CDN-M2 (SWITZERLAND EM TEST) ☐CDN-M3 (SWITZERLAND EM TEST)	Note:

12. VOLTAGE DIPS AND INTERRUPTIONS TEST

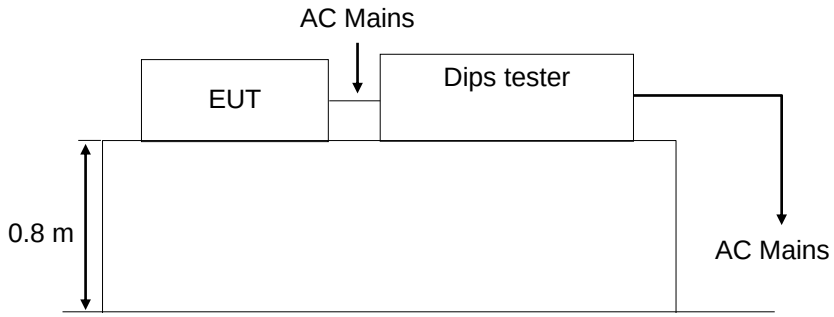
12.1 Block Diagram of Test Setup

12.1.1 Block Diagram of the EUT



(EUT: x-Glo strip light)

12.1.2 Dips Test Setup



(EUT: x-Glo strip light)

12.2 Test Standard

EN 61547: 2009
(IEC 61000-4-11: 2004)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5 1 5 10 25 50 *
40	60	
70	30	

12.3.2 Performance criterion**: B, C**

12.4 EUT Configuration

The configurations of EUT are listed in Section 4.3.

12.5 Operating Condition of EUT

11.5.1 Setup the EUT as shown in Section 11.1.
11.5.2 Turn on the power of all equipments.
11.5.3 Let the EUT work in test mode (ON) and measure it.

12.6 Test Procedure

Set up the EUT and test generator as shown on Section 13.1.2.
The interruption is introduced at selected phase angles with specified duration.
Record any degradation of performance.

12.7 Test Results

PASS.

These test result outsourced to EMTEK (SHENZHEN) CO., LTD.

Please refer to the following page.

Voltage Dips And Interruptions Test Results

EMTEK (SHENZHEN) CO., LTD.

Applicant : GLOBAL(LED) LIGHTING SOLUTIONS	Test Date : July 28, 2017
EUT : x-Glo strip light	Temperature : 22℃
M/N : x-Glo-72-110v	Humidity : 50%
Power Supply : AC 110V/50Hz	Test Engineer : Bruce

Test Model : ON

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Criterion ☐A ☒B ☒C ☐D	Result
70	30	10P	C	PASS
0	100	0.5P	B	PASS

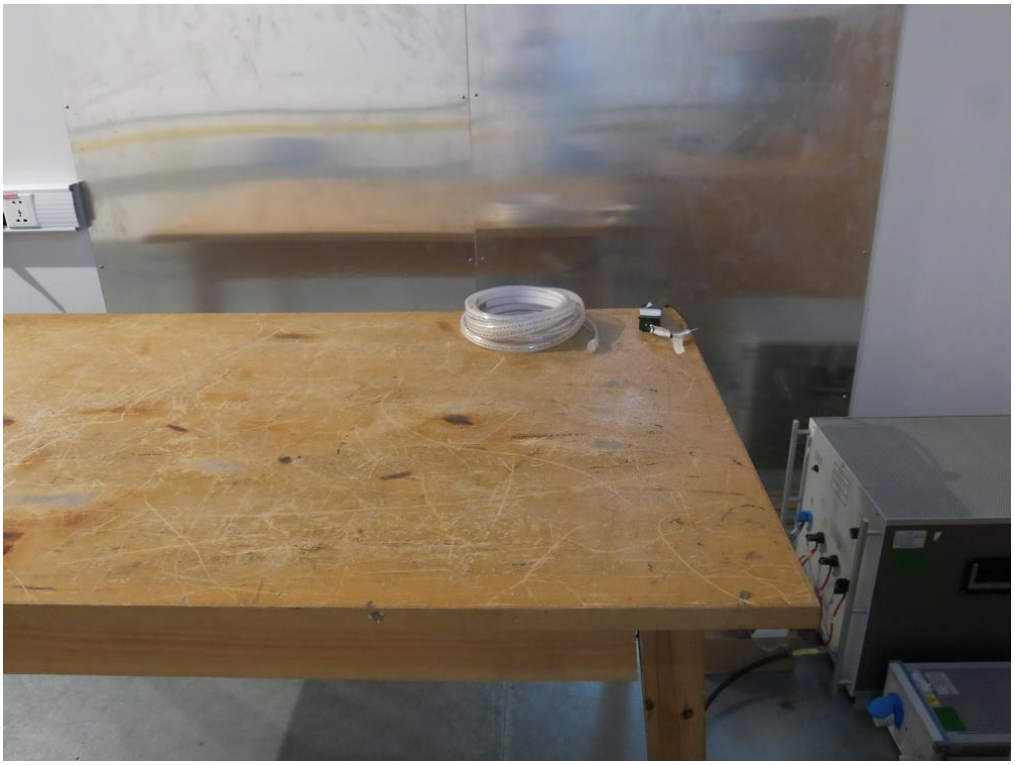
Test Model :

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Criterion ☐A ☒B ☒C ☐D	Result

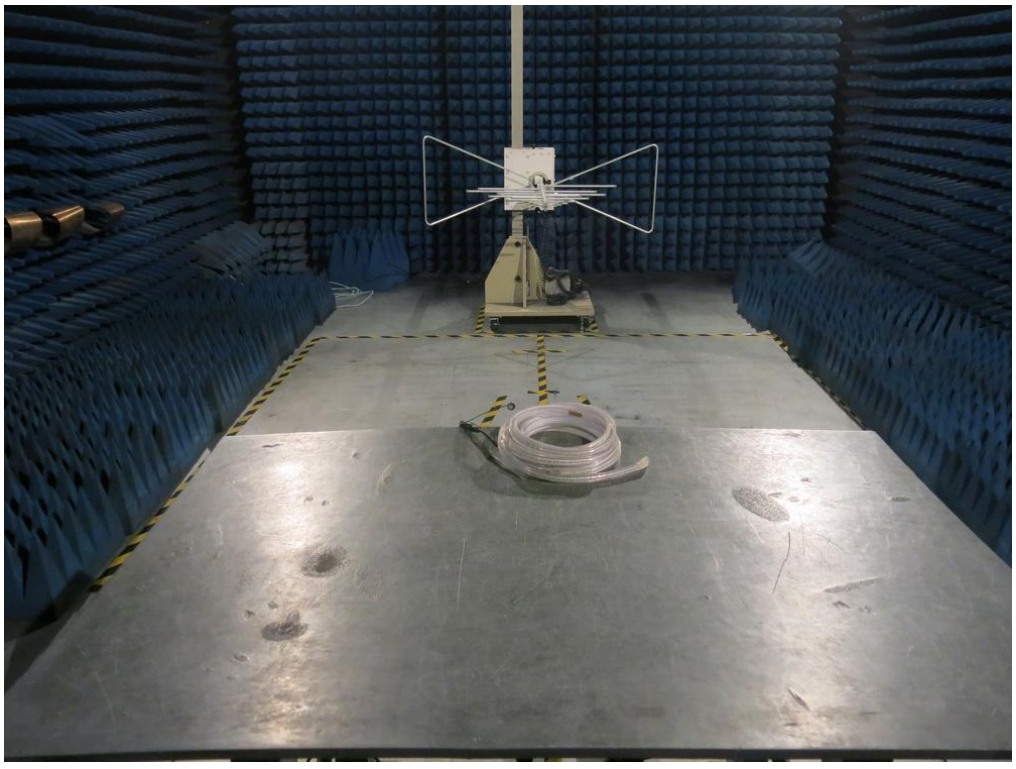
Remark: U_T is the rated voltage for the equipment.	Test Equipment : 45KVA AC Power source (NSG 1007-45/45KVA)

13. PHOTOGRAPH

13.1 Photo of Conducted Emission Measurement



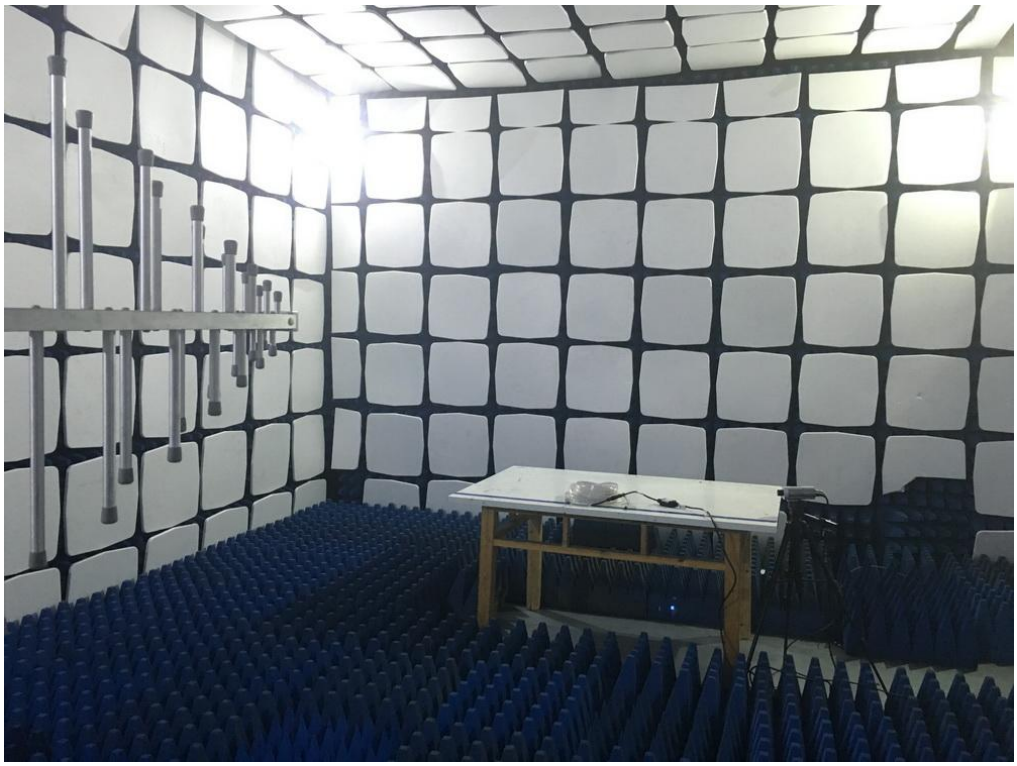
13.2 Photo of Radiation Emission Measurement



13.3 Photo of Magnetic field emission Measurement

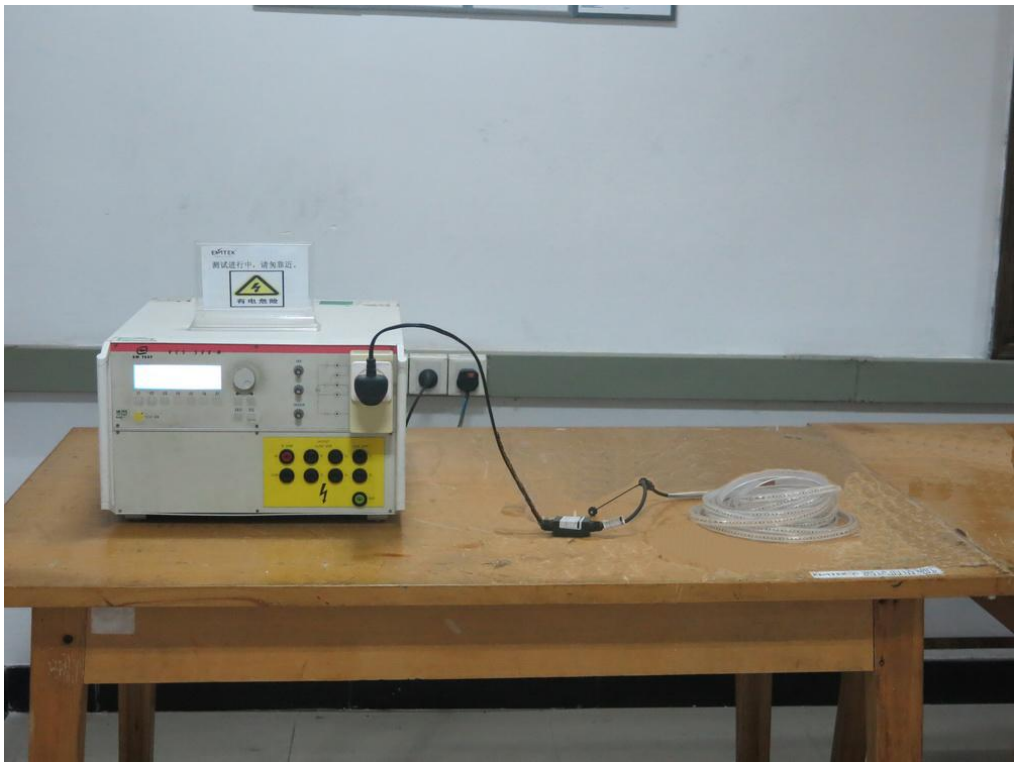
13.4 Photo of Electrostatic Discharge Test

13.6 Photo of RF Field Strength susceptibility Test

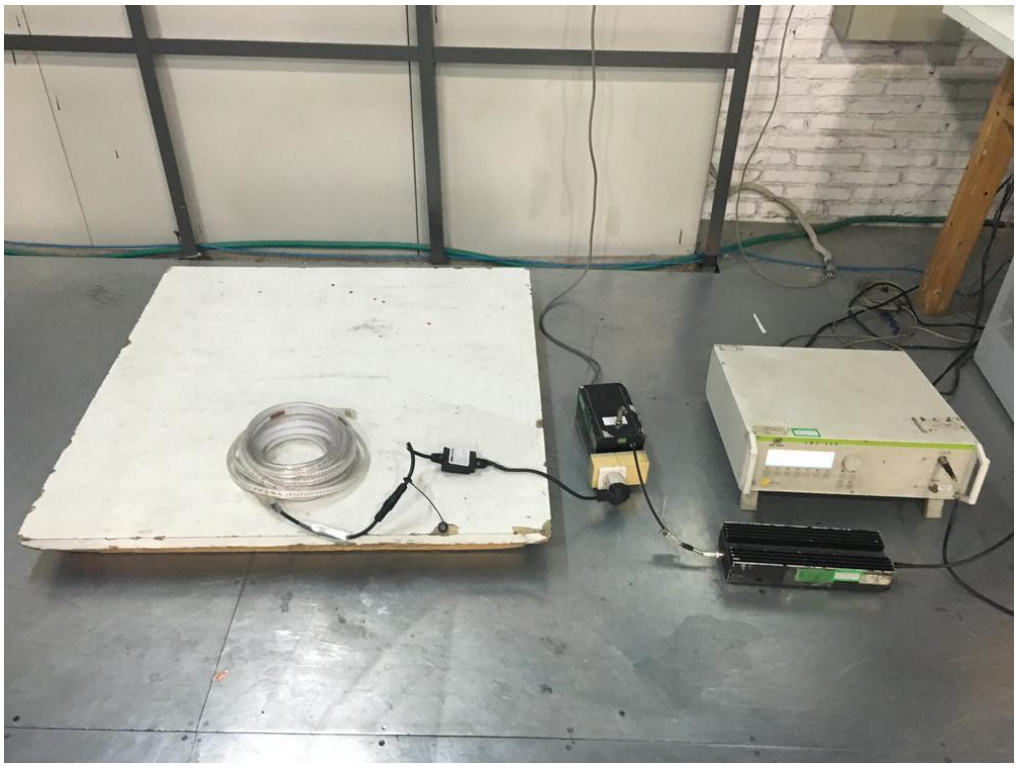


13.7 Photo of Electrical Fast Transient /Burst Test

13.8 Photo of Surge Immunity Test



13.9 Photo of Injected Currents Susceptibility Test



13.10 Photo of Voltage Dips and Interruption Immunity Test

APPENDIX
(Photos of EUT)