

EMC TEST REPORT
For

Tea-Energy China Limited

LED Panel Lamp

Model No.: SP-6060-ND-060-WW-00

Additional Model No.: Please Refer to Page 61

Prepared for : Tea-Energy China Limited
Address : 4th Floor, 0100029 Building, Xiawei Industrial Zone, Xiahu
Community, Guanlan Town, Longhua District, Shenzhen, China

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Date of receipt of test sample : May 26, 2014
Number of tested samples : 1
Serial number : Prototype
Date of Test : May 26, 2014 - June 05, 2014
Date of Report : June 05, 2014



EMC TEST REPORT**EN 55015: 2006+A1: 2007+A2: 2009**

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

EN 61547: 2009

Equipment for general lighting purposes - EMC immunity requirements

Report Reference No. : LCS1405261165E

Date Of Issue: June 05, 2014

Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.Address: 1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue,
Bao'an District, Shenzhen, Guangdong, ChinaTesting Location/ Procedure.....: Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name : Tea-Energy China Limited**Address: 4th Floor, 0100029 Building, Xiawei Industrial Zone, Xiahu
Community, Guanlan Town, Longhua District, Shenzhen, China**Test Specification:**Standard: EN 55015: 2006+A1: 2007+A2: 2009
EN 61000-3-2: 2006+A1: 2009+A2: 2009
EN 61000-3-3: 2008
EN 61547: 2009

Test Report Form No.....: LCSEMC-1.0

TRF Originator: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF.....: Dated 2011-03

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Test Item Description. : LED Panel Lamp

Trade Mark: QALEDO

Model/ Type Reference: SP-6060-ND-060-WW-00

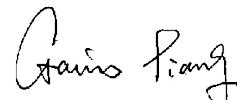
Ratings: AC 85-277V, 50/60Hz, 60W

Result : Positive**Compiled by:**

Yoyo Wang/ File administrators

Supervised by:

Danny Huang/ Technique principal

Approved by:

Gavin Liang/ Manager

EMC -- TEST REPORT**Test Report No. : LCS1405261165E**June 05, 2014

Date of issue

Type/Model..... : SP-6060-ND-060-WW-00

EUT..... : LED Panel Lamp

Applicant..... : Tea-Energy China Limited

Address..... : 4th Floor, 0100029 Building, Xiawei Industrial Zone, Xiahu Community, Guanlan Town, Longhua District, Shenzhen, China

Telephone..... : /

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Manufacturer..... : Tea-Energy China Limited

Address..... : 4th Floor, 0100029 Building, Xiawei Industrial Zone, Xiahu Community, Guanlan Town, Longhua District, Shenzhen, China

Telephone..... :

Fax..... :

Factory..... : Tea-Energy China Limited

Address..... : 4th Floor, 0100029 Building, Xiawei Industrial Zone, Xiahu Community, Guanlan Town, Longhua District, Shenzhen, China

Telephone..... : /

Fax..... : /

Test Result according to the standards on page 7:**Positive**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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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.

EMISSION (EN 55015: 2006+A1: 2007+A2: 2009)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55015: 2006+A1: 2007+A2: 2009	-----	PASS
Magnetic field emission	EN 55015: 2006+A1: 2007+A2: 2009	-----	PASS
Radiated disturbance	EN 55015: 2006+A1: 2007+A2: 2009	-----	PASS
Harmonic current emissions	EN 61000-3-2: 2006+A1: 2009+A2: 2009	Class C	PASS
Voltage fluctuations & flicker	EN 61000-3-3: 2008	-----	PASS
IMMUNITY (EN 61547: 2009)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2006+A1: 2008	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4: 2004+A1: 2010	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5: 2006	B	PASS
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2009	A	PASS
Power frequency magnetic field	EN 61000-4-8: 2010	A	PASS
Voltage dips, 30% reduction	EN 61000-4-11: 2004	C	PASS
Voltage interruptions		B	PASS
N/A is an abbreviation for Not Applicable.			

1.2. Description of Performance Criteria

General Performance Criteria

Examples of functions defined by the manufacturer to be evaluated during testing include, but are not limited to, the following:

- essential operational modes and states;
- tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);
- quality of software execution;
- quality of data display and transmission;
- quality of speech transmission.

1.2.1. Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacture when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.2. Performance criterion B

After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacture, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

During the test, degradation of performance is allowed. However, no change of operation state or stored data is allowed to persist after the test.

If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

1.2.3. Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacture's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : LED Panel Lamp

Model Number : SP-6060-ND-060-WW-00

Power Supply : AC 85-277V, 50/60Hz, 60W

2.2. Description of Test Facility

EMC Lab. : Accredited by CNAS, April 28, 2013
The Certificate Registration Number. is L4595.

Accredited by FCC, July 14, 2011
The Certificate Registration Number. is 899208.

Accredited by Industry Canada, May. 02, 2011
The Certificate Registration Number. is 9642A-1

Accredited by VCCI, Japan January 30, 2012
The Certificate Registration Number. is C-4260 and R-3804

Accredited by ESMD, April 24, 2012
The Certificate Registration Number. is ARCB0108.

Accredited by UL, July 25, 2013
The Certificate Registration Number. is 100571-492.

Accredited by TUV, December 23, 2013
The Certificate Registration Number. is SCN1134

Accredited by Intertek, October 30, 2013
The Certificate Registration Number. is 2011-RTL-L1-50.

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. To CISPR 16 – 4 “Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements” and is documented in the LCS quality system acc. To DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

2.4.Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	30MHz~200MHz	$\pm 2.96\text{dB}$	(1)
		200MHz~1000MHz	$\pm 3.10\text{dB}$	(1)
Conduction Uncertainty	:	150kHz~30MHz	$\pm 1.63\text{dB}$	(1)
Power disturbance	:	30MHz~300MHz	$\pm 1.60\text{dB}$	(1)

- (1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1. Conducted Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2013/06/18
2	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2013/06/18
3	Artificial Mains	SCHWARZBECK	NSLK 8127	8127-716	2013/12/13
4	EMI Test Software	AUDIX	E3	N/A	2013/06/18

3.2. Disturbance Power

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2013/06/18
2	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2013/06/18
3	Absorbing clamp	ROHDE & SCHWARZ	MDS 21	4033	2013/06/19
4	EMI Test Software	AUDIX	E3	N/A	2013/06/18

3.3. Radiated Electromagnetic Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2013/06/18
2	Triple-loop Antenna	EVERFINE	LLA-2	11050003	2013/06/18
3	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2013/06/18
4	EMI Test Software	AUDIX	E3	N/A	2013/06/18

3.4. Radiated Disturbance (Electric Field)

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	101142	2013/06/18
2	EMI Test Receiver	ROHDE & SCHWARZ	ESPI	101840	2013/06/18
3	Log per Antenna	SCHWARZBECK	VULB9163	9163-470	2013/06/21
4	Amplifier	Compliance Direction	PAP-0102	21001	2013/06/18
5	Spectrum Analyzer	Agilent	E4407B	MY41440754	2013/07/16
6	Horn Antenna	ETS.LINDGREN	3115	00034771	2013/12/11
7	EMI Test Software	AUDIX	E3	N/A	2013/06/18

3.5. Harmonic Current

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2013/06/18

3.6. Voltage fluctuation and Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2013/06/18

3.7. Electrostatic Discharge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	KIKUSUI	KC001311	KES4021	2013/06/19

3.8. RF Field Strength Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	HP	8648A	625U00573	2013/06/17
2	Amplifier	AR	500A100	17034	2013/06/18
3	Amplifier	AR	100W/1000M 1	17028	2013/06/18
4	Isotropic Field Monitor	AR	FM2000	16829	2013/06/18
5	Isotropic Field Probe	AR	FP2000	16755	2013/06/18
6	Bi-conic Antenna	EMCO	3108	9507-2534	2013/06/19
7	By-log-periodic Antenna	AR	AT1080	16812	2013/06/19
8	EMS Test Software	ROHDE & SCHWARZ	ESK1	N/A	2013/06/19

3.9. Electrical Fast Transient/Burst

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Electrical fast transient(EFT)generator	3CTEST	EFT-4021	EC0461044	2013/06/18
2	Coupling Clamp	3CTEST	EFTC	EC0441098	2013/06/18

3.10. Surge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Surge test system	3CTEST	SG-5006G	EC5581070	2013/06/18
2	Coupling/decoupling network	3CTEST	SGN-5010G	ECS5591033	2013/06/18

3.11. Conducted Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Conducted Immunity Test System	FRANKONIA	CIT-10	126A1195	2013/06/18
2	Coupling/decoupling network	FRANKONIA	CDN-M2+M3	A2210177	2013/06/18

3.12. Power Frequency Magnetic Field Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power frequency mag-field generator System	EVERFINE	EMS61000-8 K	906003	2013/06/18

3.13.Voltage Dips

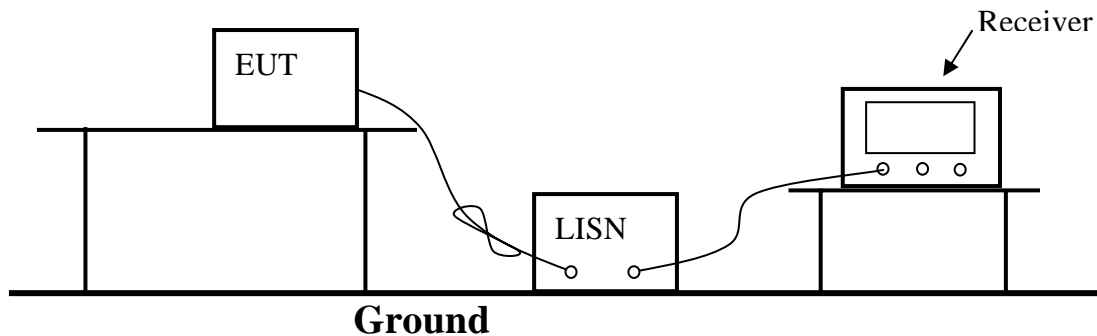
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2013/06/18

3.14.Voltage Short Interruptions

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2013/06/18

4. POWER LINE CONDUCTED MEASUREMENT

4.1. Block Diagram of Test Setup



4.2. Conducted Power Line Emission Measurement Standard and Limits

4.2.1. Standard:

EN 55015: 2006+A1: 2007+A2: 2009

4.2.2. Limits

Frequency	At mains terminals (dB μ V)	
	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 Test

The configuration of the EUT is same as Section 3.1.

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 EN 55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN 55015 standard.

The bandwidth of the test receiver is set at 200Hz in 9k~150kHz range and 9kHz in 150k~30MHz range.

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

All the test results are listed in Section 4.6.

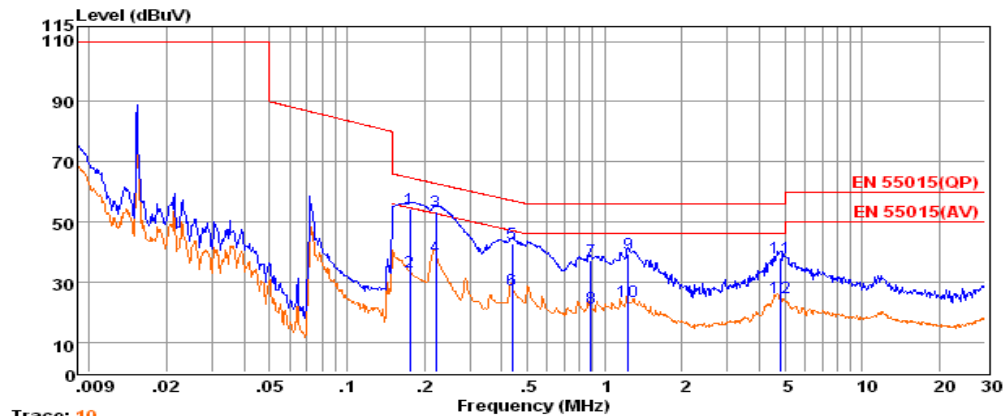
The frequency range from 9kHz to 30MHz is investigated.

4.6. Test Results

PASS.

The test result please refer to the next page.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Line	Test Engineer	Gao

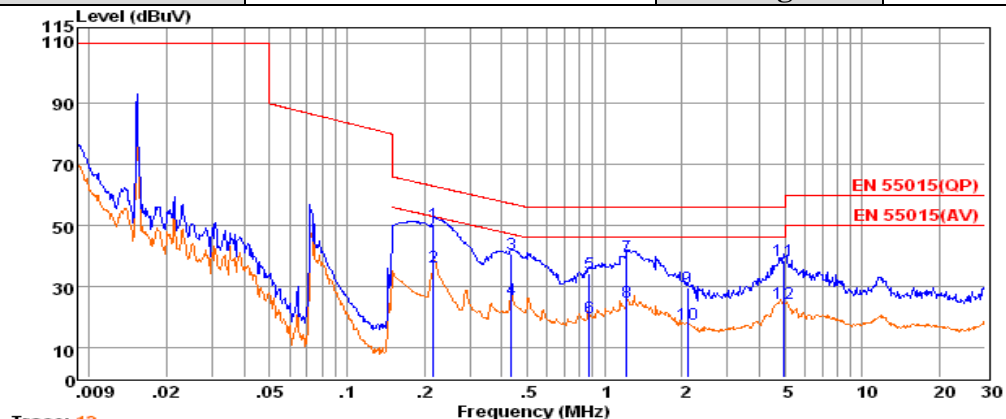


Trace: 10

	Freq	Reading	LisnFac	CabLos	AttFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.17523	34.76	9.60	0.02	10.00	54.38	64.71	-10.33	QP
2	0.17543	13.90	9.60	0.02	10.00	33.52	54.70	-21.18	Average
3	0.22171	33.77	9.63	0.03	10.00	53.43	62.75	-9.32	QP
4	0.22181	18.88	9.63	0.03	10.00	38.54	52.75	-14.21	Average
5	0.43823	23.03	9.62	0.04	10.00	42.69	57.10	-14.41	QP
6	0.43833	7.90	9.62	0.04	10.00	27.56	47.09	-19.53	Average
7	0.88755	17.31	9.63	0.04	10.00	36.98	56.00	-19.02	QP
8	0.88765	1.66	9.63	0.04	10.00	21.33	46.00	-24.67	Average
9	1.23774	19.67	9.63	0.05	10.00	39.35	56.00	-16.65	QP
10	1.23874	4.02	9.63	0.05	10.00	23.70	46.00	-22.30	Average
11	4.83586	18.51	9.65	0.06	10.00	38.22	56.00	-17.78	QP
12	4.83686	4.94	9.65	0.06	10.00	24.65	46.00	-21.35	Average

Remarks: 1. Measured = Reading + Lisn Factor + Cable Loss + AttFac.
2. The emission levels that are 20dB below the official limit are not reported.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Neutral	Test Engineer	Gao



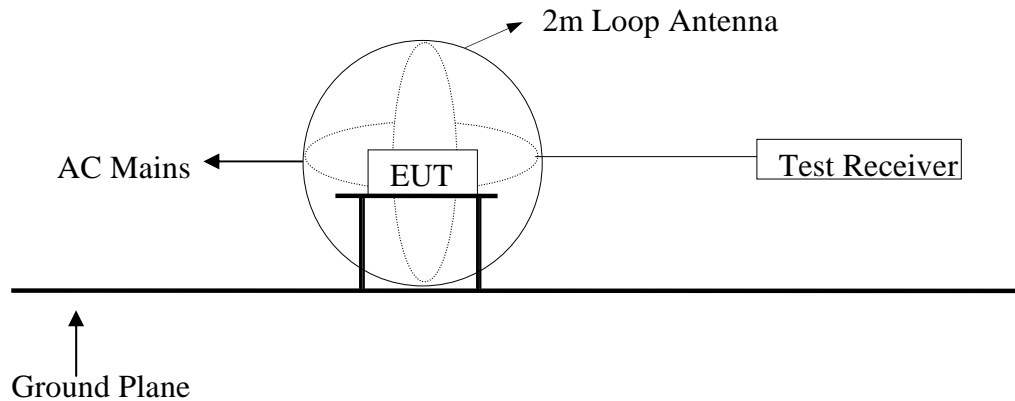
Trace: 12

	Freq	Reading	LisnFac	CabLos	AttFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.21638	30.89	9.59	0.03	10.00	50.51	62.96	-12.45	QP
2	0.21648	16.91	9.59	0.03	10.00	36.53	52.95	-16.42	Average
3	0.43469	20.83	9.62	0.04	10.00	40.49	57.16	-16.67	QP
4	0.43479	5.88	9.62	0.04	10.00	25.54	47.16	-21.62	Average
5	0.87327	14.70	9.63	0.04	10.00	34.37	56.00	-21.63	QP
6	0.87337	0.14	9.63	0.04	10.00	19.81	46.00	-26.19	Average
7	1.21782	20.27	9.63	0.05	10.00	39.95	56.00	-16.05	QP
8	1.21882	4.99	9.63	0.05	10.00	24.67	46.00	-21.33	Average
9	2.09709	9.68	9.63	0.05	10.00	29.36	56.00	-26.64	QP
10	2.09809	-1.98	9.63	0.05	10.00	17.70	46.00	-28.30	Average
11	4.95498	18.77	9.66	0.06	10.00	38.49	56.00	-17.51	QP
12	4.95598	4.70	9.66	0.06	10.00	24.42	46.00	-21.58	Average

Remarks: 1. Measured = Reading + Lisn Factor + Cable Loss + AttFac.
2. The emission levels that are 20dB below the official limit are not reported.

5. MAGNETIC FIELD EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



5.2. Magnetic Field Emission Measurement Standard and Limits

5.2.1. Test Standard

EN 55015: 2006+A1: 2007+A2: 2009

5.2.2. Test Limits

Frequency	Limits for loop diameter (dB μ A)
	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.

5.3. EUT Configuration on Test

The configuration of the EUT is same as Section 3.3.

5.4. Operating Condition of EUT

Same as conducted measurement which is listed in Section 4.4, except the test set up replaced by Section 5.1.

5.5. 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.

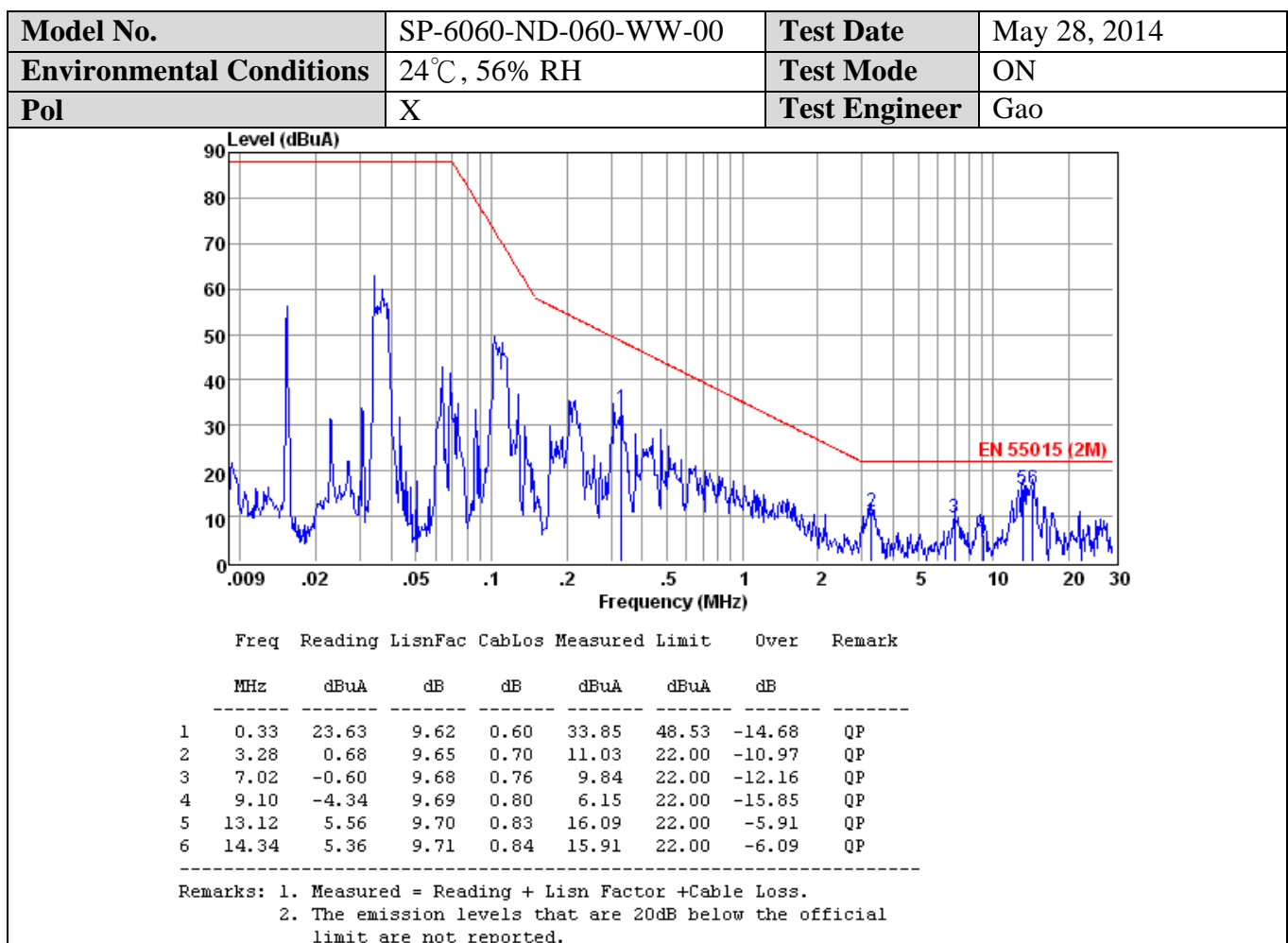
The frequency range from 9kHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9kHz to 150kHz, the bandwidth of the field strength meter is set at 200Hz. For frequency band 150kHz to 30MHz, the bandwidth is set at 9kHz.

All the test results are listed in Section 5.6.

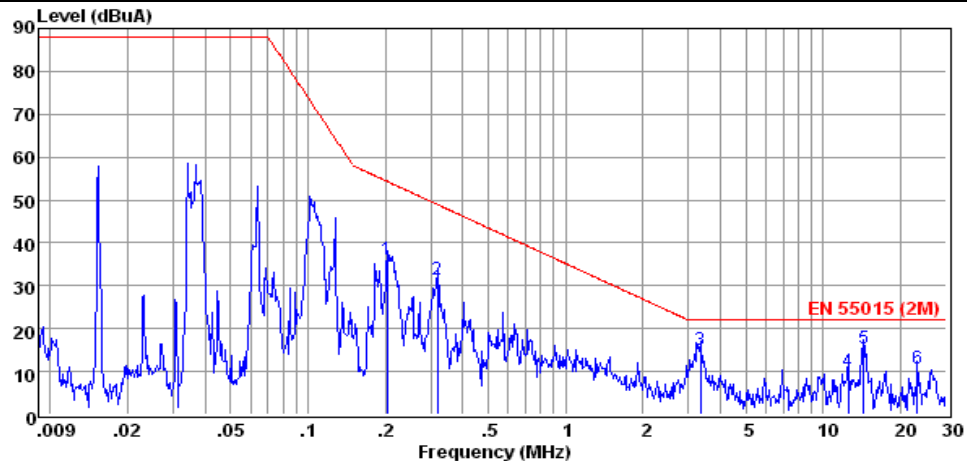
5.6. Test Results

PASS.

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



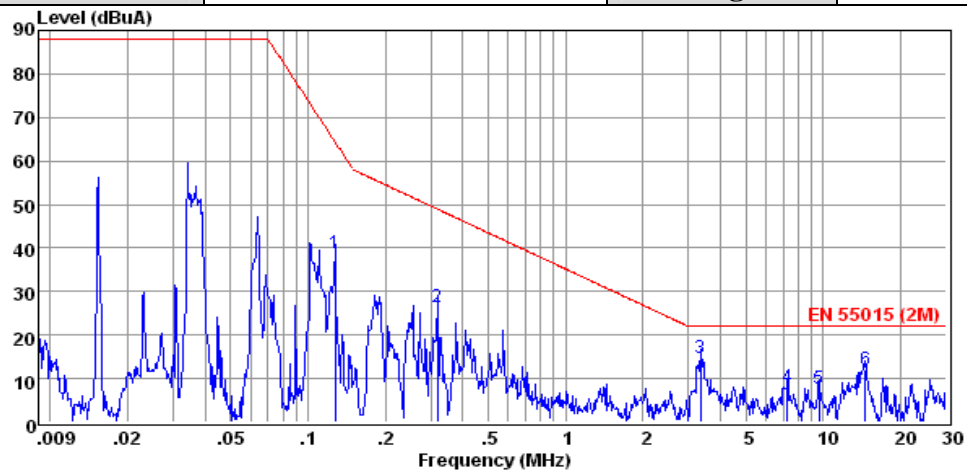
Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Y	Test Engineer	Gao



	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuA	dB	dB	dBuA	dBuA	dB	
1	0.20	26.11	9.63	0.56	36.30	54.38	-18.08	QP
2	0.32	21.18	9.62	0.60	31.40	48.92	-17.52	QP
3	3.33	4.61	9.65	0.70	14.96	22.00	-7.04	QP
4	12.49	-0.53	9.70	0.83	10.00	22.00	-12.00	QP
5	14.34	4.95	9.71	0.84	15.50	22.00	-6.50	QP
6	23.14	-0.05	9.71	0.88	10.54	22.00	-11.46	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Z	Test Engineer	Gao

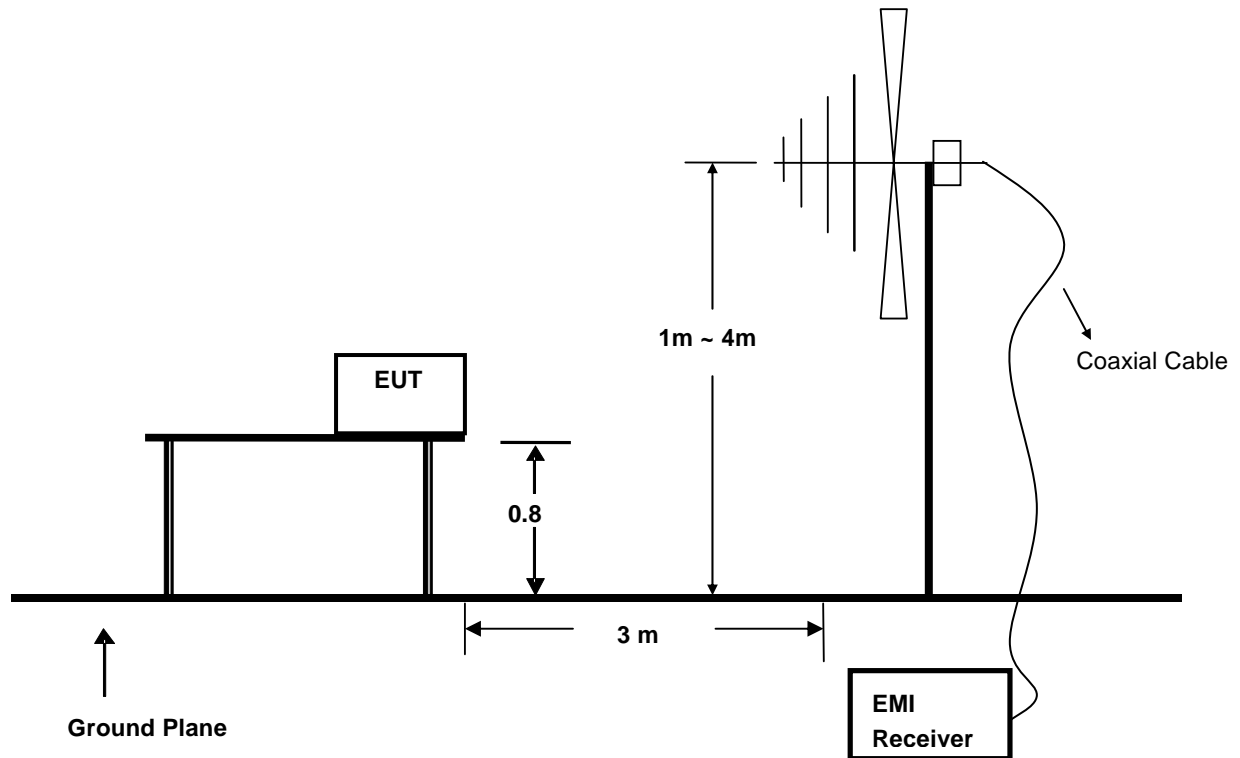


	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuA	dB	dB	dBuA	dBuA	dB	
1	0.13	28.70	9.59	0.53	38.82	64.33	-25.51	QP
2	0.32	16.11	9.62	0.60	26.33	48.92	-22.59	QP
3	3.33	4.41	9.65	0.70	14.76	22.00	-7.24	QP
4	7.25	-2.38	9.68	0.77	8.07	22.00	-13.93	QP
5	9.64	-2.77	9.69	0.81	7.73	22.00	-14.27	QP
6	14.57	1.59	9.71	0.84	12.14	22.00	-9.86	QP

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
2. The emission levels that are 20dB below the official limit are not reported.

6. RADIATED EMISSION MEASUREMENT

6.1. Block Diagram of Test Setup



6.2. Test Standard

EN 55015: 2006+A1: 2007+A2: 2009

6.3. Radiated Emission Limits

All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB μ V/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.

6.4.EUT Configuration on Test

The EN 55015 regulations test method must be used to find the maximum emission during radiated emission measurement.

6.5.Operating Condition of EUT

6.5.1 Turn on the power.

6.5.2 After that, let the EUT work in test mode (ON) and measure it.

6.6.Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable 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 an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. By-log antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

The bandwidth of the Receiver is set at 120kHz.

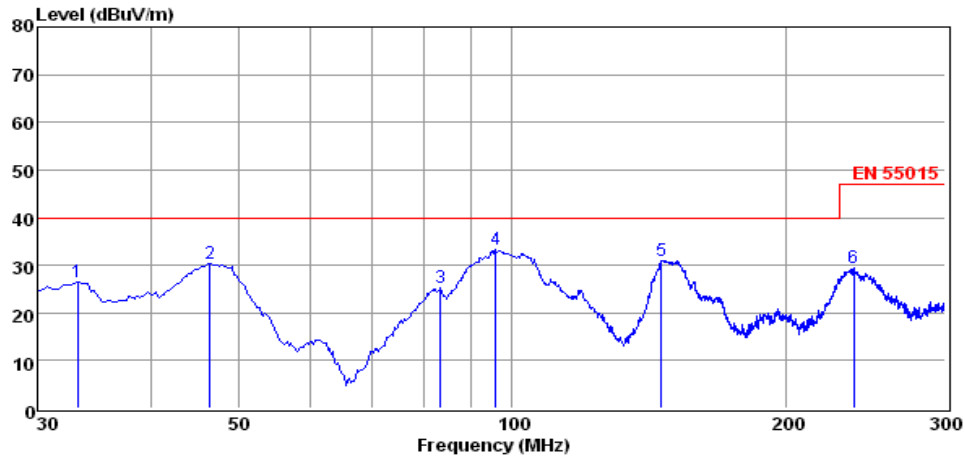
The frequency range from 30MHz to 300MHz is investigated.

6.7.Test Results

PASS.

The test result please refer to the next page.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Vertical	Detector Function	Quasi-peak
Test Engineer	Gao	Distance	3m



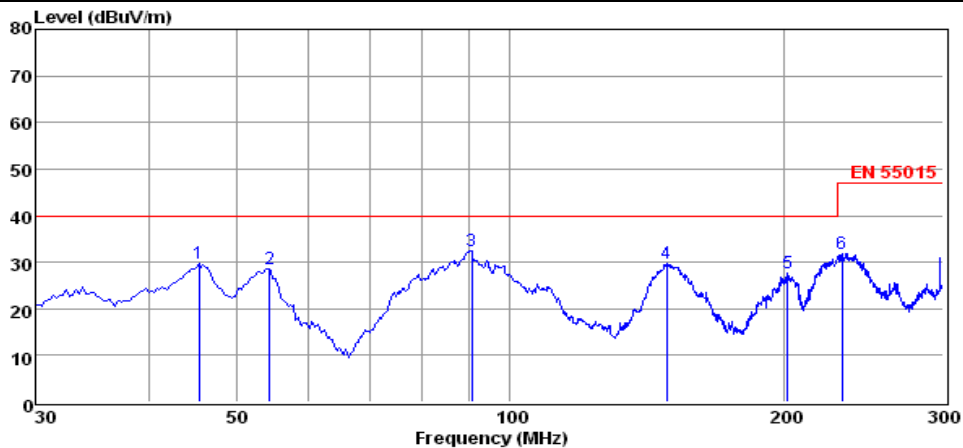
	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	33.24	13.65	0.37	12.31	26.33	40.00	-13.67	QP
2	46.47	16.45	0.35	13.46	30.26	40.00	-9.74	QP
3	83.46	14.91	0.54	9.76	25.21	40.00	-14.79	QP
4	95.88	19.70	0.58	12.90	33.18	40.00	-6.82	QP
5	146.10	22.04	0.77	8.23	31.04	40.00	-8.96	QP
6	238.17	16.50	0.96	12.01	29.47	47.00	-17.53	QP

Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that at 20db blow the official limit are not reported

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Environmental Conditions	24°C, 56% RH	Test Mode	ON
Pol	Horizontal	Detector Function	Quasi-peak
Test Engineer	Gao	Distance	3m



	Freq	Reading	CabLos	Antfac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	45.39	15.65	0.41	13.53	29.59	40.00	-10.41	QP
2	54.30	15.09	0.46	13.05	28.60	40.00	-11.40	QP
3	90.75	19.76	0.68	12.04	32.48	40.00	-7.52	QP
4	148.80	20.59	0.86	8.25	29.70	40.00	-10.30	QP
5	202.26	16.14	0.82	10.64	27.60	40.00	-12.40	QP
6	231.96	19.18	0.98	11.73	31.89	47.00	-15.11	QP

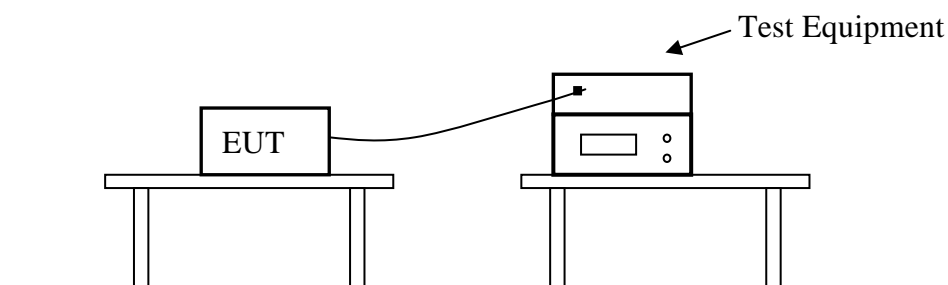
Note: 1. All readings are Quasi-peak values.

2. Measured= Reading + Antenna Factor + Cable Loss

3. The emission that at 20db blow the official limit are not reported

7. HARMONIC CURRENT MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Test Standard

EN 61000-3-2: 2006+A1: 2009+A2: 2009

7.3. Operating Condition of EUT

Same as Section 4.4, except the test setup replaced by Section 7.1.

7.4. Test Results

PASS.

The test result please refer to the next page.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014
Test Engineer	Gao		
Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002		
Limits:	Class C > 25W		
Power Analyzer:	Voltech PM6000 SN: 200006700523 Firmware version: v1.21.07RC2		
	Channel(s):		
	1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None		
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None		
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None		
	Shunt(s):		
	1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None		
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None		
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None		
AC Source:	Mains / Manual Source		
Harmonic Results Against Chosen Limits:	Notes:		
PASS			
Test Parameter Details	User Entered	Measured	
Operating Frequency:	50	49.9840	
Operating Voltage:	230	229.3989	
Specified Power:	0.0000	58.6231	
Fundamental Current:	0.1470	0.2555	
Power Factor:	0.9800	0.9529	
Average Input Current:		0.1518	
Maximum POHC:		0.0043	
POHC Limit:		0.0139	
Maximum THC:		0.0391	
Minimum Power:	75		
Class Multiplier:	1.0000		
Test Duration:	00:02:30		

Voltech IEC61000-3 Windows Software 1.14.06RC1					
Type of Test: Fluctuating Harmonics Test - Source Qualification (2006)					
Power Analyzer: Voltech PM6000 SN: 200006700523 Firmware version: v1.21.07RC2					
Channel(s):					
1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None					
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None					
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None					
Shunt(s):					
1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None					
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None					
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None					
AC Source: Mains / Manual Source					
Overall Result:					
PASS					

	Nominal	Measured	Deviation	Allowed Deviation	Result
Supply Voltage	230.00V	229.16V	0.84V	4.60V	Pass
Supply Frequency	50.00Hz	49.98Hz	0.02Hz	0.25Hz	Pass
Crest Factor	1.4100	1.4194	0.0094	+/- 0.01	Pass

Harmonic	Reading	Limit	Result	Harmonic	Reading	Limit	Result
2	0.11%	0.20%	Pass	3	0.06%	0.90%	Pass
4	0.04%	0.20%	Pass	5	0.04%	0.40%	Pass
6	0.03%	0.20%	Pass	7	0.05%	0.30%	Pass
8	0.03%	0.20%	Pass	9	0.04%	0.20%	Pass
10	0.02%	0.20%	Pass	11	0.03%	0.10%	Pass
12	0.02%	0.10%	Pass	13	0.02%	0.10%	Pass
14	0.01%	0.10%	Pass	15	0.03%	0.10%	Pass
16	0.01%	0.10%	Pass	17	0.02%	0.10%	Pass
18	0.01%	0.10%	Pass	19	0.02%	0.10%	Pass
20	0.01%	0.10%	Pass	21	0.03%	0.10%	Pass
22	0.01%	0.10%	Pass	23	0.01%	0.10%	Pass
24	0.01%	0.10%	Pass	25	0.02%	0.10%	Pass
26	0.01%	0.10%	Pass	27	0.03%	0.10%	Pass
28	0.01%	0.10%	Pass	29	0.01%	0.10%	Pass
30	0.01%	0.10%	Pass	31	0.01%	0.10%	Pass
32	0.01%	0.10%	Pass	33	0.01%	0.10%	Pass
34	0.01%	0.10%	Pass	35	0.01%	0.10%	Pass
36	0.01%	0.10%	Pass	37	0.03%	0.10%	Pass
38	0.01%	0.10%	Pass	39	0.03%	0.10%	Pass
40	0.01%	0.10%	Pass				

Voltech IEC61000-3 Windows Software 1.14.06RC1

Type of Test: Fluctuating Harmonics Test - Normalised Worst Case Bar Chart (2006)

Power Analyzer: Voltech PM6000 SN: 200006700523 Firmware version: v1.21.07RC2

Channel(s):

1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None

3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None

5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None

Shunt(s):

1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None

3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None

5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None

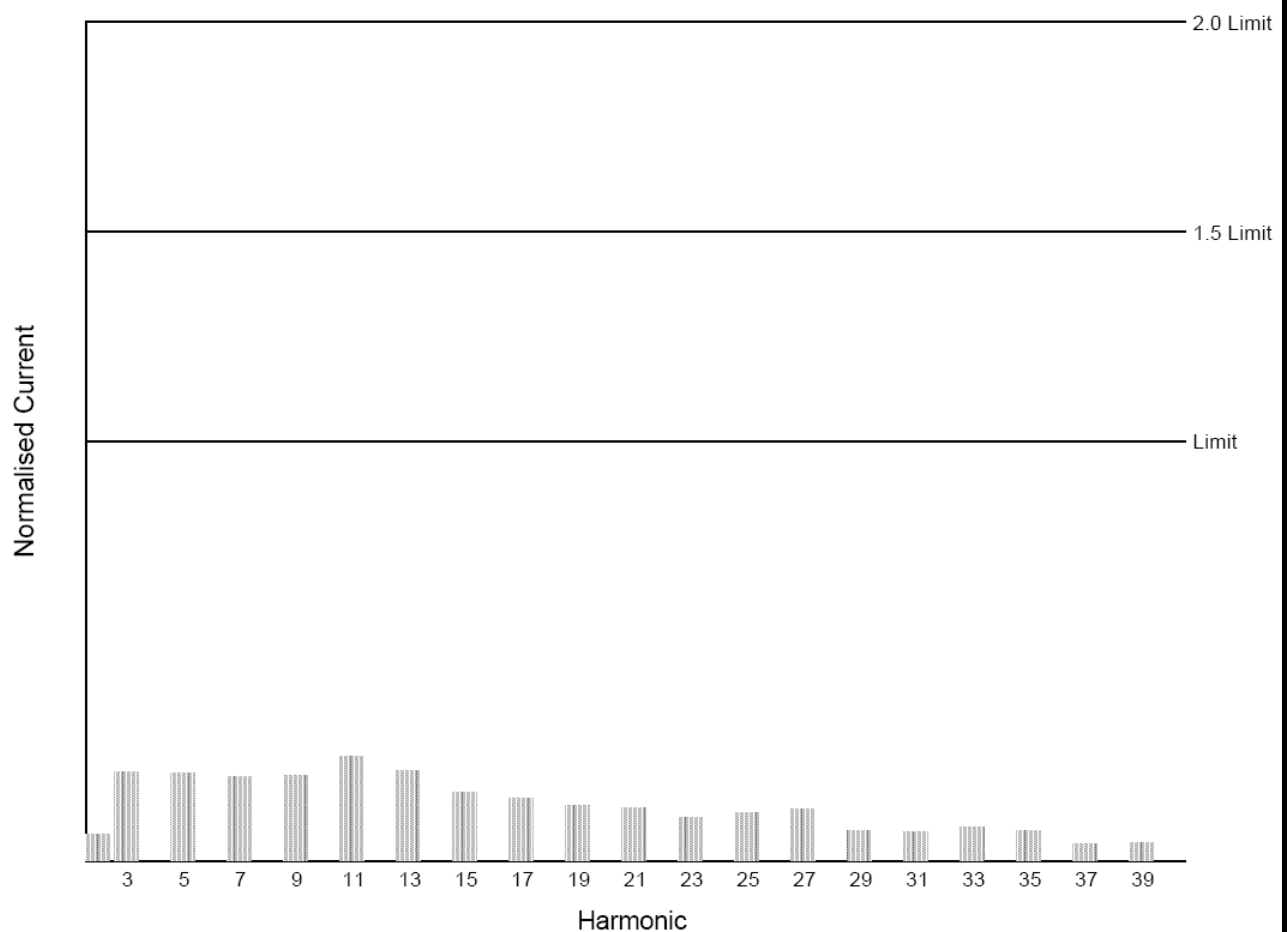
AC Source: Mains / Manual Source

Overall Result:

PASS

Class Class C > 25W

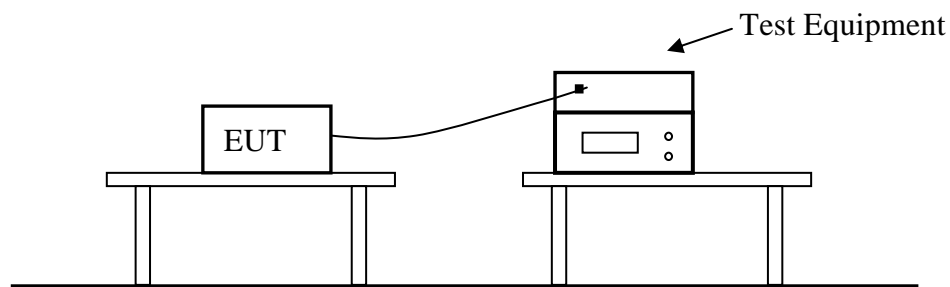
Class Multiplier 1



Voltech IEC61000-3 Windows Software 1.14.06RC1															
Type of Test:		Fluctuating Harmonics Test - Worst Case Table (2006)													
Power Analyzer:		Voltech PM6000 SN: 200006700523 Firmware version: v1.21.07RC2													
Channel(s):		1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None													
Shunt(s):		1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None													
AC Source:		Mains / Manual Source													
Overall Result:		PASS													
Class		Class C > 25W													
Class Multiplier		1													
Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	16.85mA	25.28mA	0.979mA	✓ ✓	1.052mA	✓	N/A	3	249.9mA	374.9mA	52.59mA	✓ ✓	52.82mA	✓	Pass
4	None	None	0.307mA		0.346mA		N/A	5	84.27mA	126.4mA	17.41mA	✓ ✓	17.57mA	✓	Pass
6	None	None	0.256mA		0.305mA		N/A	7	58.99mA	88.48mA	11.83mA	✓ ✓	11.93mA	✓	Pass
8	None	None	0.255mA		0.383mA		N/A	9	42.13mA	63.20mA	8.501mA	✓ ✓	8.572mA	✓	Pass
10	None	None	0.253mA		0.289mA		N/A	11	25.28mA	37.92mA	6.260mA	✓ ✓	6.299mA	✓	Pass
12	None	None	0.292mA		0.329mA		N/A	13	25.28mA	37.92mA	5.416mA	✓ ✓	5.457mA	✓	Pass
14	None	None	0.220mA		0.238mA		N/A	15	25.28mA	37.92mA	4.123mA	✓ ✓	4.156mA	✓	N/A
16	None	None	0.154mA		0.166mA		N/A	17	25.28mA	37.92mA	3.743mA	✓ ✓	3.770mA	✓	N/A
18	None	None	0.169mA		0.190mA		N/A	19	25.28mA	37.92mA	3.334mA	✓ ✓	3.368mA	✓	N/A
20	None	None	0.260mA		0.277mA		N/A	21	25.28mA	37.92mA	3.184mA	✓ ✓	3.213mA	✓	N/A
22	None	None	0.276mA		0.288mA		N/A	23	25.28mA	37.92mA	2.557mA	✓ ✓	2.587mA	✓	N/A
24	None	None	0.377mA		0.392mA		N/A	25	25.28mA	37.92mA	2.825mA	✓ ✓	2.863mA	✓	N/A
26	None	None	0.258mA		0.272mA		N/A	27	25.28mA	37.92mA	3.076mA	✓ ✓	3.109mA	✓	N/A
28	None	None	0.251mA		0.268mA		N/A	29	25.28mA	37.92mA	1.811mA	✓ ✓	1.845mA	✓	N/A
30	None	None	0.215mA		0.240mA		N/A	31	25.28mA	37.92mA	1.697mA	✓ ✓	1.733mA	✓	N/A
32	None	None	0.240mA		0.255mA		N/A	33	25.28mA	37.92mA	1.987mA	✓ ✓	2.022mA	✓	N/A
34	None	None	0.299mA		0.318mA		N/A	35	25.28mA	37.92mA	1.783mA	✓ ✓	1.813mA	✓	N/A
36	None	None	0.430mA		0.445mA		N/A	37	25.28mA	37.92mA	0.962mA	✓ ✓	1.010mA	✓	N/A
38	None	None	0.335mA		0.350mA		N/A	39	25.28mA	37.92mA	1.061mA	✓ ✓	1.112mA	✓	N/A
40	None	None	0.302mA		0.326mA		N/A								
<L1 : Reading is below limit 1. <L2 : Reading is below limit 2. N/A : Harmonic current below 0.6% of rated current or 5mA, whichever is greater, are disregarded.															

8. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Test Standard

EN 61000-3-3: 2008

8.3. Operating Condition of EUT

Same as Section 4.4, except the test setup replaced by Section 8.1.

8.4. Test Results

PASS.

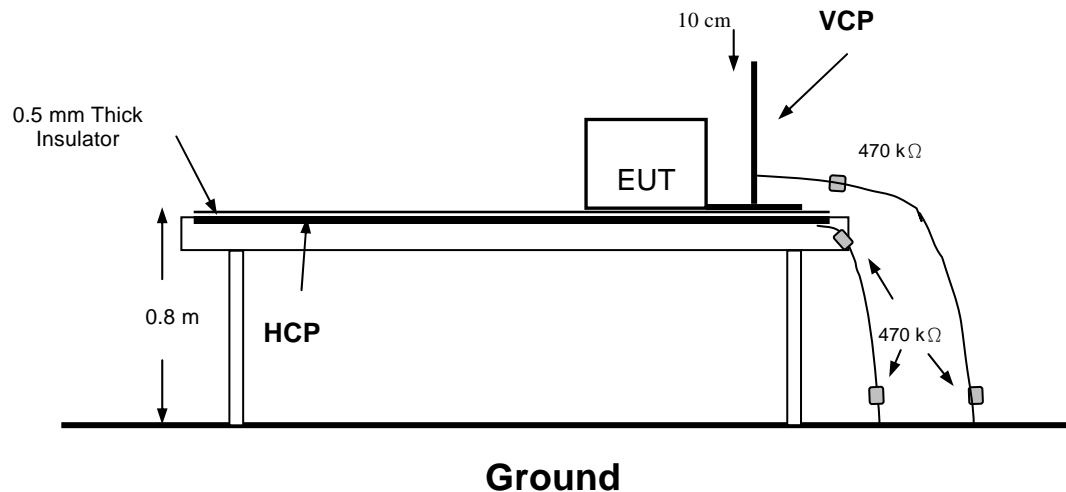
The test result please refer to the next page.

Model No.	SP-6060-ND-060-WW-00	Test Date	May 28, 2014	
Test Engineer	Gao			
Voltech IEC61000-3 Windows Software 1.14.06RC1				
Type of Test:	Flickermeter Test - Table			
Power Analyzer:	Voltech PM6000 SN: 200006700523 Firmware Version: v1.21.07RC2			
Channel(s):				
1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None				
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None				
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None				
Shunt(s):				
1. SN: 091024301916, 4 Adjusted Date: 23 JUN 2011. 2. SN:None Adjusted Date:None				
3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None				
5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None				
AC Source:	Mains / Manual Source			
Overall Result:	Notes:			
PASS	Measurement method - Voltage			

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.096	0.009	0.198	0

9. ELECTROSTATIC DISCHARGE TEST

9.1. Block Diagram of Test Setup



9.2. Test Standard

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

9.3. Severity Levels and Performance Criterion

9.3.1. 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

9.3.2. Performance criterion: **B**

9.4. EUT Configuration on Test

The configuration of EUT is listed in Section 3.7

9.5. 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.

9.6. Test Procedure

9.6.1. Air Discharge

This test is done on a non-conductive surfaces. 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.

Because the case of the EUT is metal surface, so it does not need to be tested.

9.6.2. Contact Discharge

All the procedure shall be same as Section 9.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

9.6.3. 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.

9.6.4. 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.

9.7. Test Results

PASS.

Please refer to the following page.

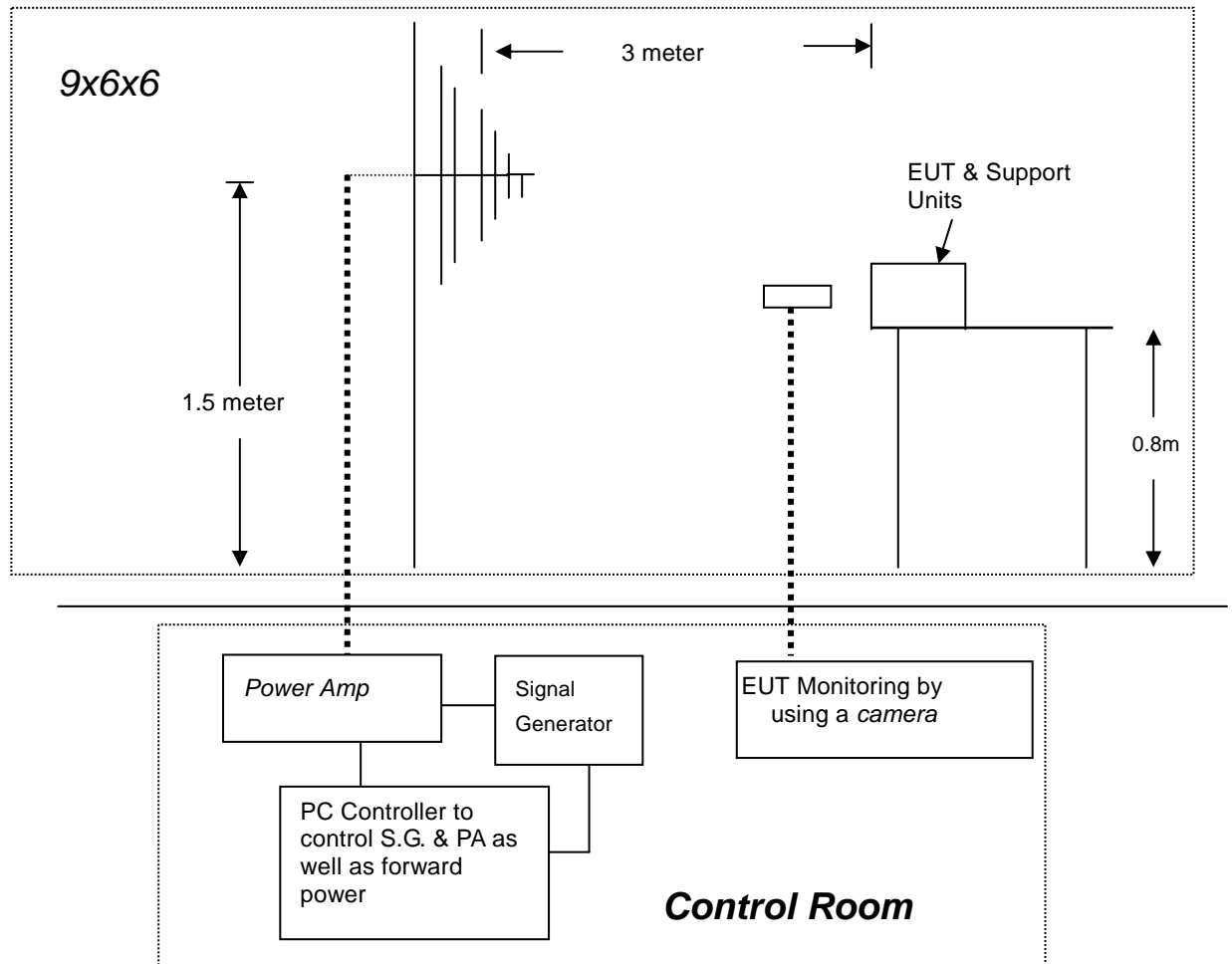
Electrostatic Discharger Test Results

Standard	<input type="checkbox"/> IEC 61000-4-2 <input checked="" type="checkbox"/> EN 61000-4-2		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26°C
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Criterion	B	Pressure	1021mbar
Test Mode	ON	Test Date	May 28, 2014
Test Engineer	Gao		

Air Discharge						
Test Points	Test Levels			Results		
	± 2KV	± 4KV	± 8KV	Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Contact Discharge						
Test Points	Test Levels			Results		
	± 2 KV	±4 KV		Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Top	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Bottom	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Discharge To Horizontal Coupling Plane						
Side of EUT	Test Levels			Results		
	± 2 KV	± 4 KV		Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Discharge To Vertical Coupling Plane						
Side of EUT	Test Levels			Results		
	± 2 KV	± 4 KV		Pass	Fail	Performance Criterion
Front	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Back	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Left	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B
Right	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> A <input checked="" type="checkbox"/> B

10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1. Block Diagram of Test Setup



10.2. Test Standard

EN 61547: 2009 (EN 61000-4-3: 2006+A1: 2008, Severity Level: 2, 3V / m)

10.3. Severity Levels and Performance Criterion

10.3.1. Severity level

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

10.3.2. Performance criterion: A

10.4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.8.

10.5.Operating Condition of EUT

10.5.1.Setup the EUT as shown in Section 10.1.

10.5.2.Turn on the power of all equipments.

10.5.3.Let the EUT work in test mode (On) and measure it.

10.6.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 polarization 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	Unmodulated
3. Scanning Frequency	80 - 1000 MHz
4. Dwell time of radiated	0.0015 decade/s
5. Waiting Time	3 Sec.

10.7.Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Standard	<input type="checkbox"/> IEC 61000-4-3 <input checked="" type="checkbox"/> EN 61000-4-3		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26°C
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Field Strength	3 V/m	Criterion	A
Test Mode	ON	Test Engineer	Gao
Frequency Range	80 MHz to 1000 MHz	Test Date	May 28, 2014
Modulation	<input type="checkbox"/> None <input type="checkbox"/> Pulse <input checked="" type="checkbox"/> AM 1KHz 80%		
Steps	1%		

	Horizontal	Vertical
Front	PASS	PASS
Right	PASS	PASS
Rear	PASS	PASS
Left	PASS	PASS

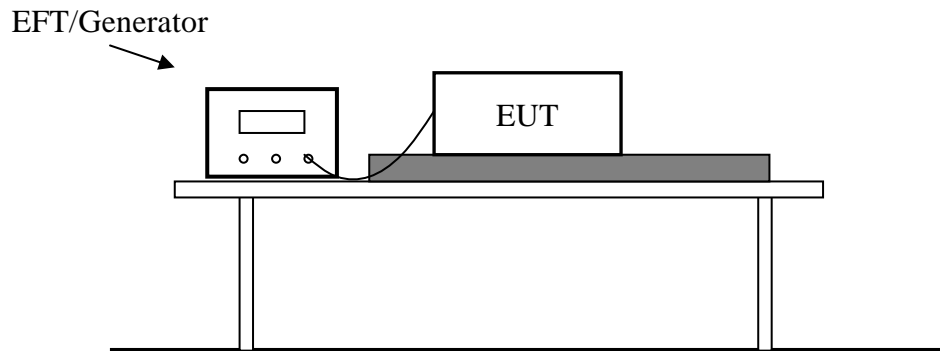
Test Equipment:

1. Signal Generator: 2031 (MARCONI)
2. Power Amplifier: 500A100 & 100W/1000M1 (A&R)
3. Power Antenna: 3108 (EMCO) & AT1080 (A&R)
4. Field Monitor: FM2000 (A&R)

Note:

11. ELECTRICAL FAST TRANSIENT/BURST TEST

11.1. Block Diagram of Test Setup



11.2. Test Standard

EN 61547: 2009 (EN 61000-4-4: 2004+A1: 2010, Severity Level: Level 2: 1KV)

11.3. Severity Levels and Performance Criterion

11.3.1. Severity level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

11.3.2. Performance criterion: **B**

11.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.9.

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

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.

11.6.1. 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.

11.6.2. For signal lines and control lines ports:

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

11.6.3. For DC output line ports:

It's unnecessary to test.

11.7. Test Results

PASS.

Please refer to the following page.

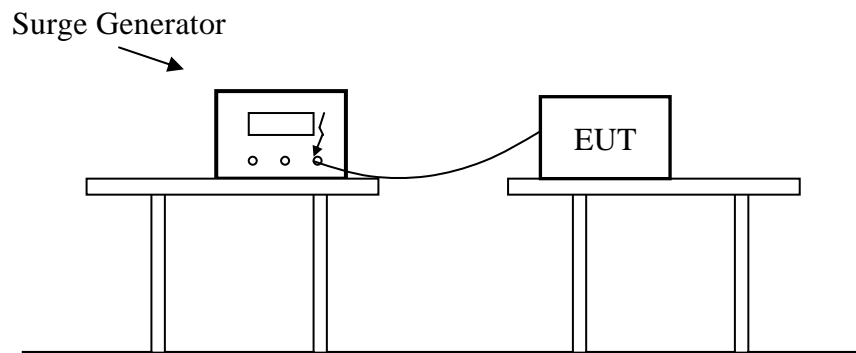
Electrical Fast Transient/Burst Test Results

Standard	<input type="checkbox"/> IEC 61000-4-4 <input checked="" type="checkbox"/> EN 61000-4-4		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26℃
M/N	SP-6060-ND-060-WW-00	Humidity	51 %
Test Mode	ON	Criterion	B
Test Engineer	Gao	Test Date	May 28, 2014

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			
I/O Cable			
Note:			

12. SURGE IMMUNITY TEST

12.1. Block Diagram of Test Setup



12.2. Test Standard

EN 61547: 2009 (EN61000-4-5: 2006, Severity Level: Line to Line: Level 2, 1.0KV;
Line to Earth: Level 3, 2.0KV)

12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

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

12.3.2. Performance criterion: **B**

12.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.10

12.5.Operating Condition of EUT

- 12.5.1.Setup the EUT as shown in Section 12.1.
- 12.5.2.Turn on the power of all equipments.
- 12.5.3.Let the EUT work in test mode (ON) and measure it.

12.6.Test Procedure

- 12.6.1.Set up the EUT and test generator as shown on Section 12.1.
- 12.6.2.For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 12.6.3.At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 12.6.4. Different phase angles are done individually.
- 12.6.5.Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

12.7.Test Results

PASS.

Please refer to the following page.

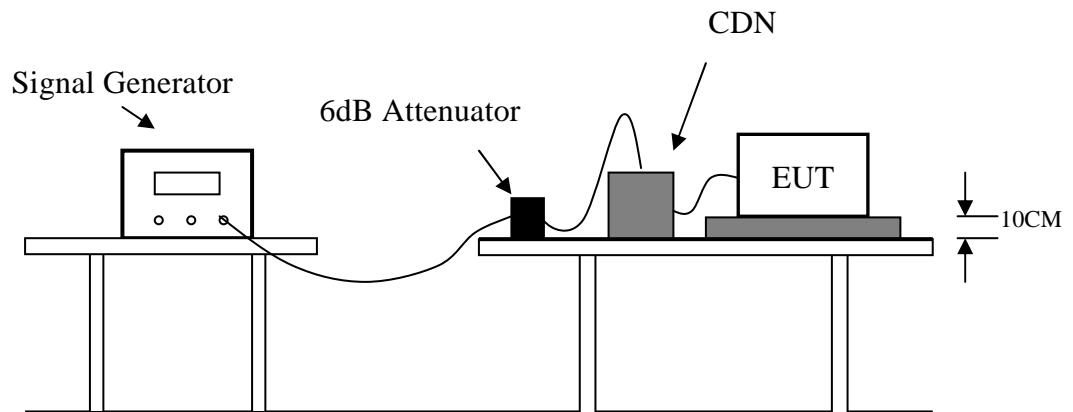
Surge Immunity Test Result

Standard	<input type="checkbox"/> IEC 61000-4-5 <input checked="" type="checkbox"/> EN 61000-4-5		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26°C
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Test Mode	ON	Criterion	B
Test Engineer	Gao	Test Date	May 28, 2014

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	0°	5	1.0	PASS
	+	90°	5	1.0	PASS
	+	180°	5	1.0	PASS
	+	270°	5	1.0	PASS
	-	0°	5	1.0	PASS
	-	90°	5	1.0	PASS
	-	180°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

13. INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1. Block Diagram of Test Setup



13.2. Test Standard

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

13.3. Severity Levels and Performance Criterion

13.3.1. Severity level

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

13.3.2. Performance criterion: A

13.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.11.

13.5. Operating Condition of EUT

- 13.5.1. Setup the EUT as shown in Section 13.1.
- 13.5.2. Turn on the power of all equipments.
- 13.5.3. Let the EUT work in test mode (ON) and measure it.

13.6. Test Procedure

- 13.6.1. Set up the EUT, CDN and test generators as shown on Section 13.1.
- 13.6.2. Let the EUT work in test mode and measure it.
- 13.6.3. 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).
- 13.6.4. The disturbance signal described below is injected to EUT through CDN.
- 13.6.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 13.6.6. 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.
- 13.6.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/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.
- 13.6.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.7. Test Results

PASS.

Please refer to the following page.

Injected Currents Susceptibility Test Results

Standard	<input type="checkbox"/> IEC 61000-4-6 <input checked="" type="checkbox"/> EN 61000-4-6		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26°C
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Test Mode	ON	Criterion	A
Test Engineer	Gao	Test Date	May 28, 2014

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

Remark:

1. Modulation Signal: 1kHz 80% AM

2. Measurement Equipment:

Simulator: CIT-10 (FRANKONIA)

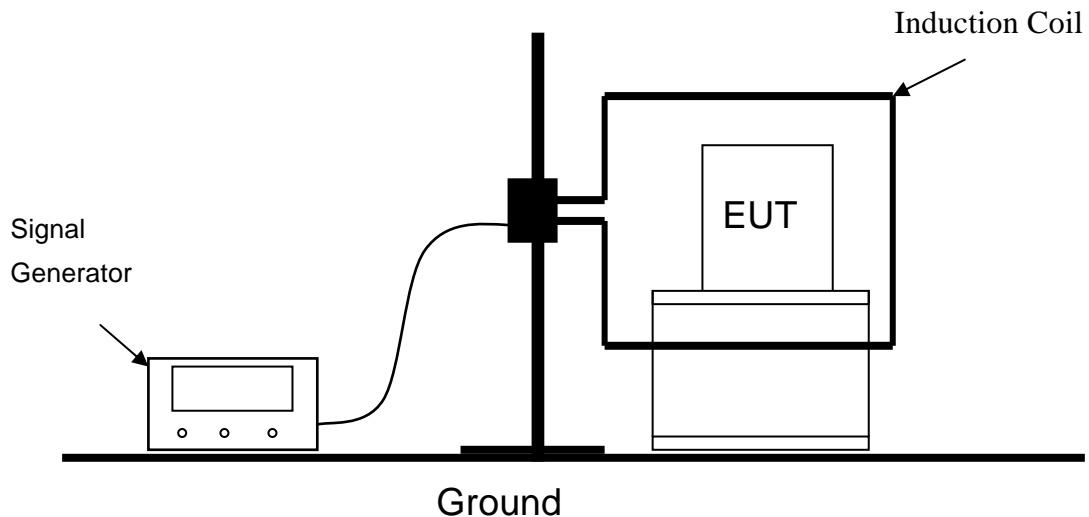
CDN : ☒ CDN-M2 (FRANKONIA)

☐ CDN-M3 (FRANKONIA)

Note:

14. MAGNETIC FIELD IMMUNITY TEST

14.1. Block Diagram of Test Setup



14.2. Test Standard

EN 61547: 2009 (EN 61000-4-8: 2010, Severity Level 2: 3A/m)

14.3. Severity Levels and Performance Criterion

14.3.1. Severity level

Level	Magnetic Field Strength (A/m)
1.	1
2.	3
3.	10
4.	30
5.	100
X	Special

14.3.2. Performance criterion: A

14.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.12.

14.5.Operating Condition of EUT

- 14.5.1.Setup the EUT as shown in Section 14.1.
- 14.5.2.Turn on the power of all equipments.
- 14.5.3.Let the EUT work in test mode (On) and measure it.

14.6.Test Procedure

- 14.6.1.Set up the EUT system as shown on Section 14.1.
- 14.6.2.The Induction coil is set up in horizontal or vertical.
- 14.6.3.Let the EUT work in test mode and measure it.

14.7.Test Results

PASS.

Please refer to the following page.

Magnetic Field Immunity Test Result

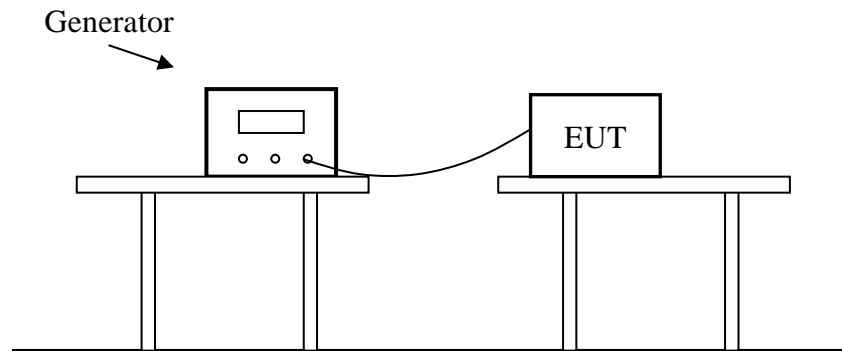
Standard	<input type="checkbox"/> IEC 61000-4-8 <input checked="" type="checkbox"/> EN 61000-4-8		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26℃
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Test Mode	ON	Criterion	A
Test Engineer	Gao	Test Date	May 28, 2014

Test Level (A/M)	Testing Duration	Coil Orientation	Criterion	Result
3	5 mins	X	A	PASS
3	5 mins	Y	A	PASS
3	5 mins	Z	A	PASS

Note:

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

15.1. Block Diagram of Test Setup



15.2. Test Standard

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

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level (% U _T)	Voltage dip and short interruptions (% U _T)	Duration (in period)
0	100	0.5
70	30	10

15.3.2. Performance criterion: **B&C**

15.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.13&3.14.

15.5.Operating Condition of EUT

- 15.5.1.Setup the EUT as shown in Section 15.1.
- 15.5.2.Turn on the power of all equipments.
- 15.5.3.Let the EUT work in test mode (ON) and measure it.

15.6.Test Procedure

- 15.6.1.Set up the EUT and test generator as shown on Section 15.1.
- 15.6.2.The interruptions is introduced at selected phase angles with specified duration.
- 15.6.3.Record any degradation of performance.

15.7.Test Results

PASS.

Please refer to the following page.

Voltage Dips And Interruptions Test Results

Standard	<input type="checkbox"/> IEC 61000-4-11 <input checked="" type="checkbox"/> EN 61000-4-11		
Applicant	Tea-Energy China Limited		
EUT	LED Panel Lamp	Temperature	26°C
M/N	SP-6060-ND-060-WW-00	Humidity	51%
Test Mode	ON	Criterion	B&C
Test Engineer	Gao	Test Date	May 28, 2014

Test Level % U _T	Voltage Dips & Short Interruptions % U _T	Duration (in periods)	Criterion	Result
0	100	0.5P	B	PASS
70	30	10P	C	PASS

Note:

16. PHOTOGRAPH

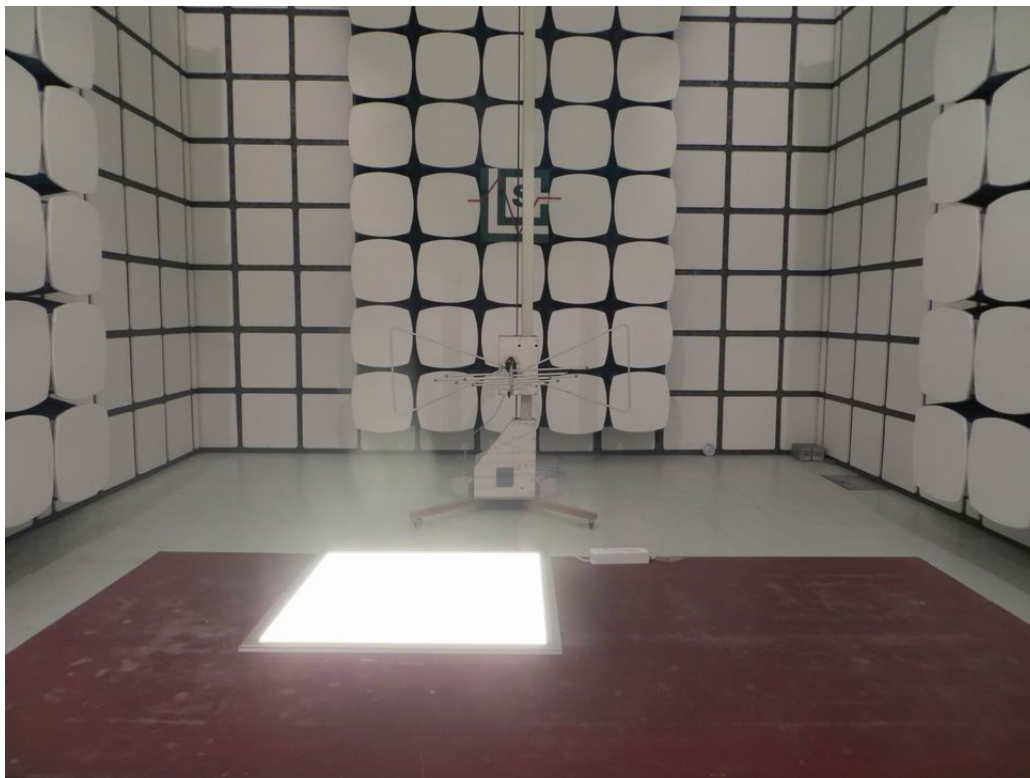
16.1. Photo of Power Line Conducted Measurement



16.2. Photo of Radiated Electromagnetic Disturbance Measurement



16.3. Photo of Radiated Measurement



16.4. Photo of Harmonic & Flicker Measurement



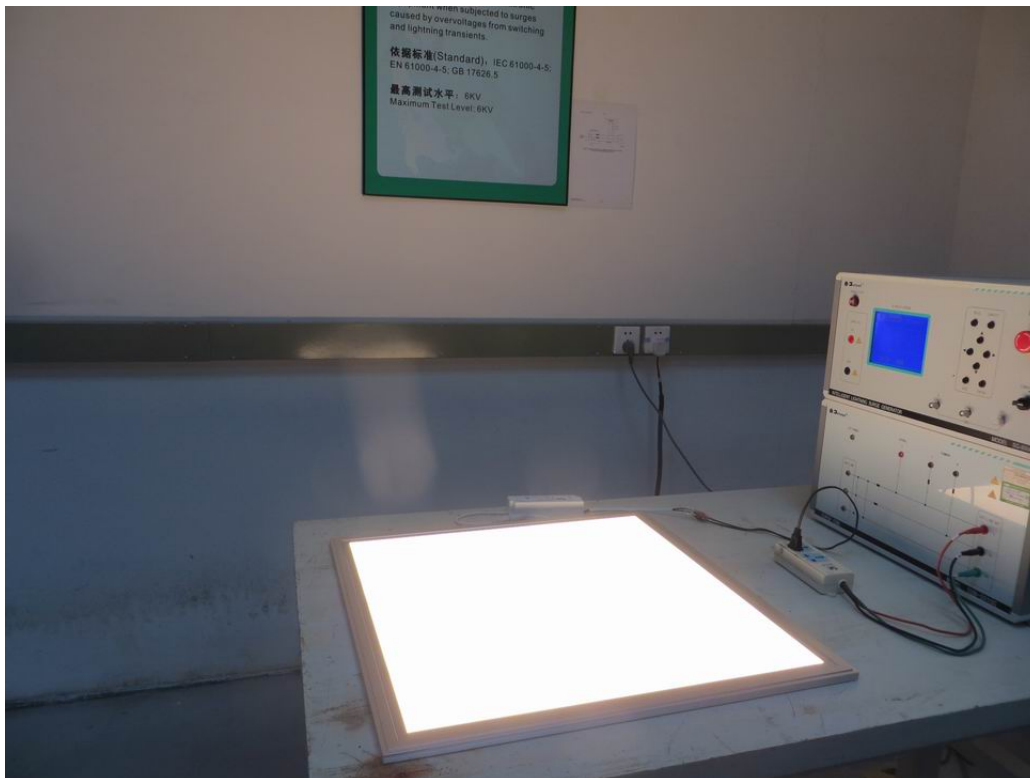
16.5. Photo of Electrostatic Discharge Test



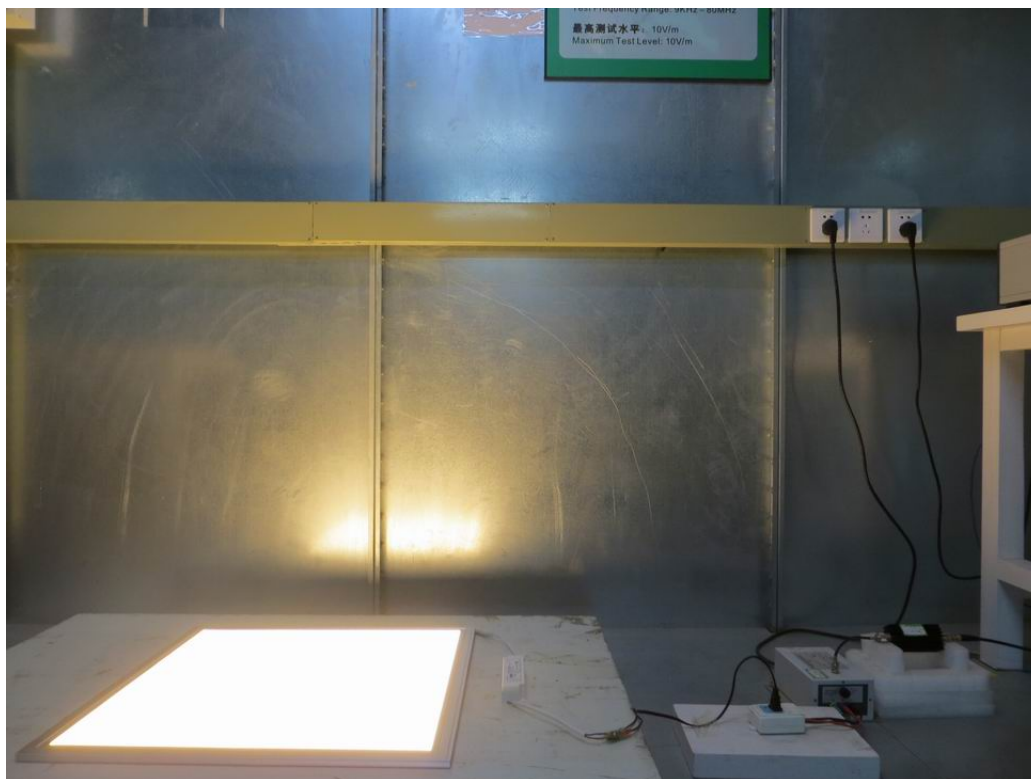
16.6. Photo of Electrical Fast Transient/Burst Test



16.7. Photo of Surge Immunity Test



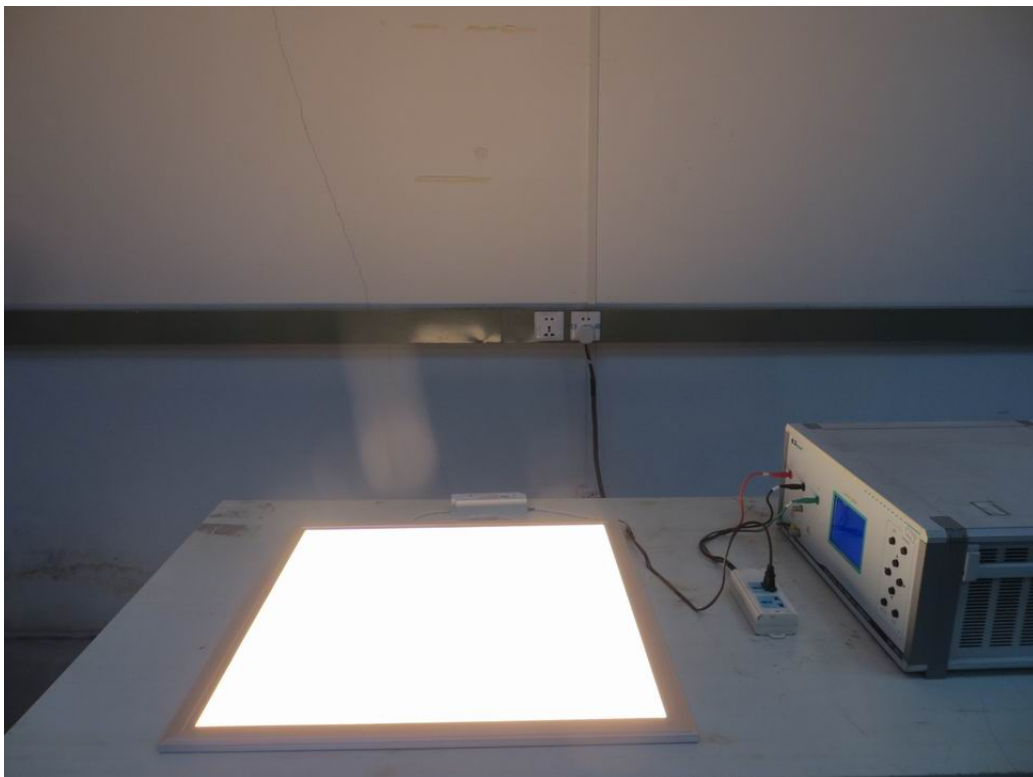
16.8. Photo of Injected Currents Susceptibility Test



16.9. Photo of Magnetic Field Immunity Test



16.10. Photo of Voltage Dips and Short Interruptions Immunity Test



17. EXTERNAL AND INTERNAL PHOTOS OF THE EUT



Fig. 1 Model: SP-6060-ND-060-WW-00

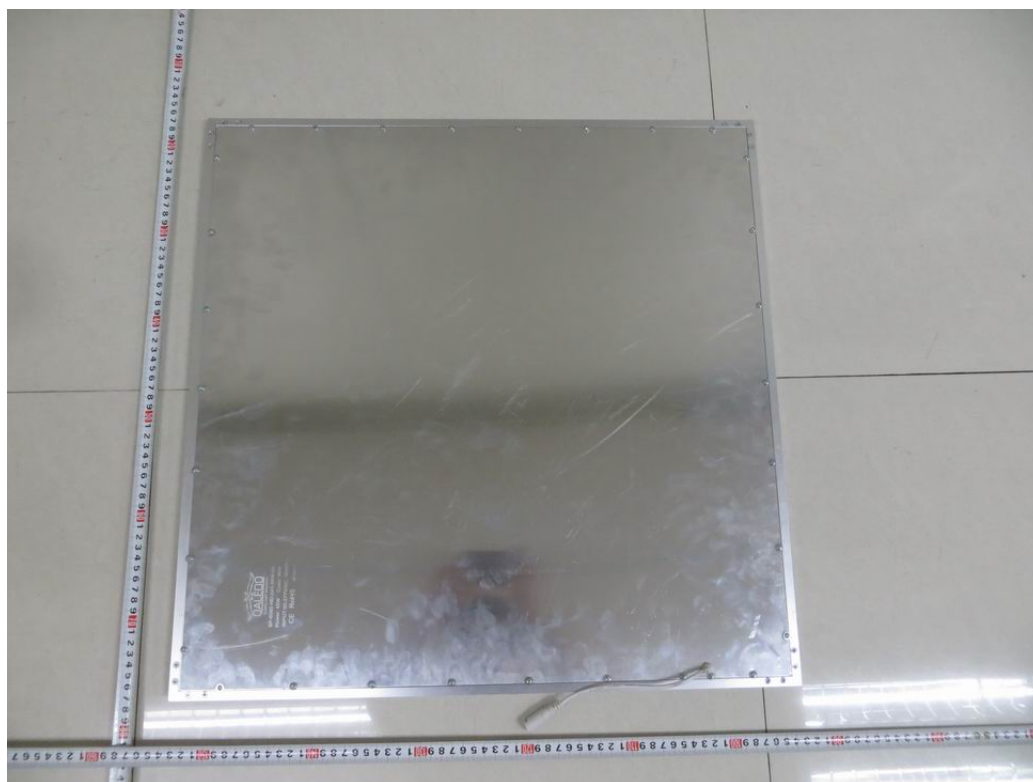


Fig. 2 Model: SP-6060-ND-060-WW-00



Fig. 3 Model: SP-018-ND-CW-00

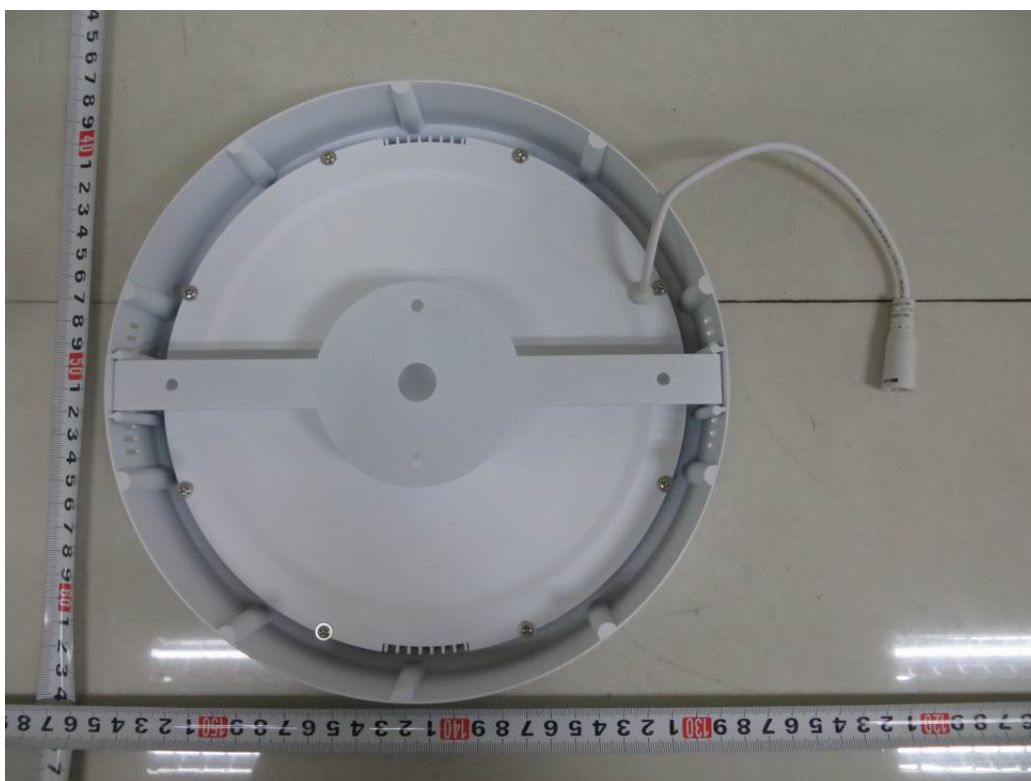


Fig. 4 Model: SP-018-ND-CW-00

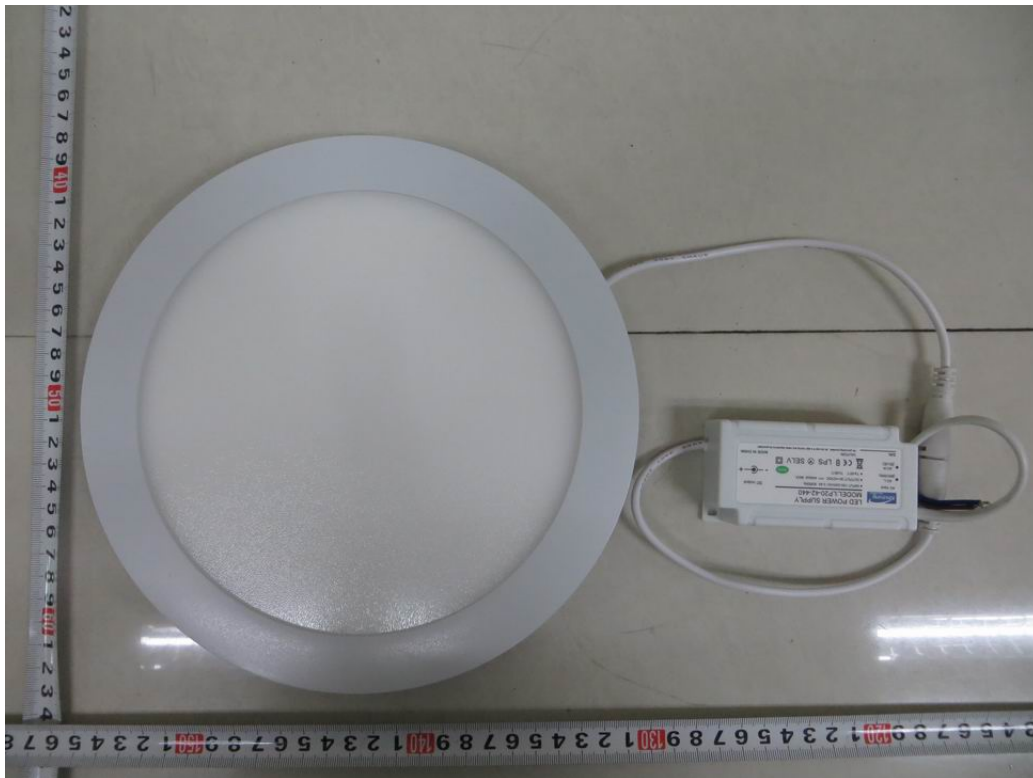


Fig. 5 Model: RP-018-ND-WW-01

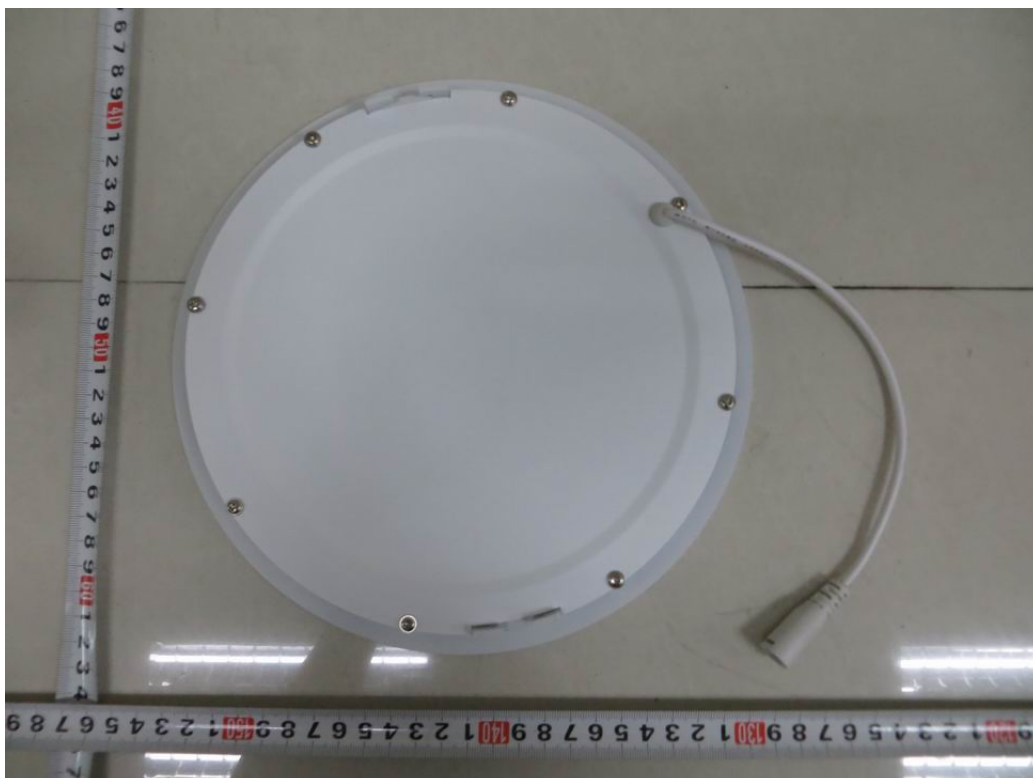


Fig. 6 RP-018-ND-WW-01



Fig. 7

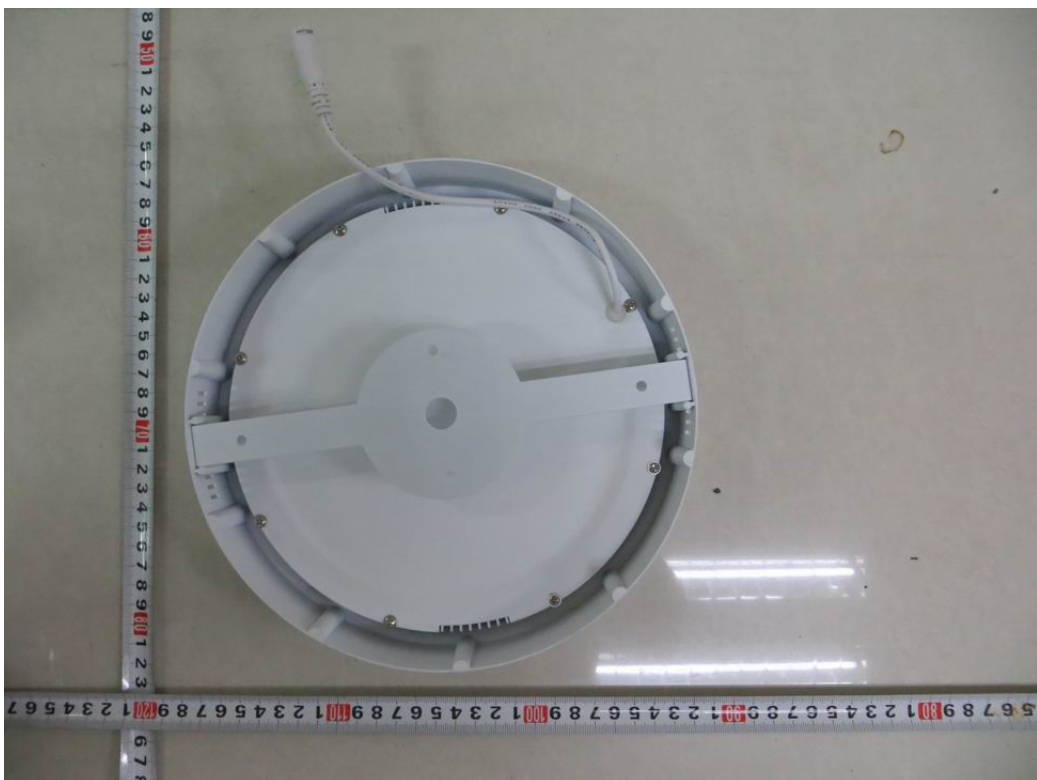


Fig. 8



Fig. 9

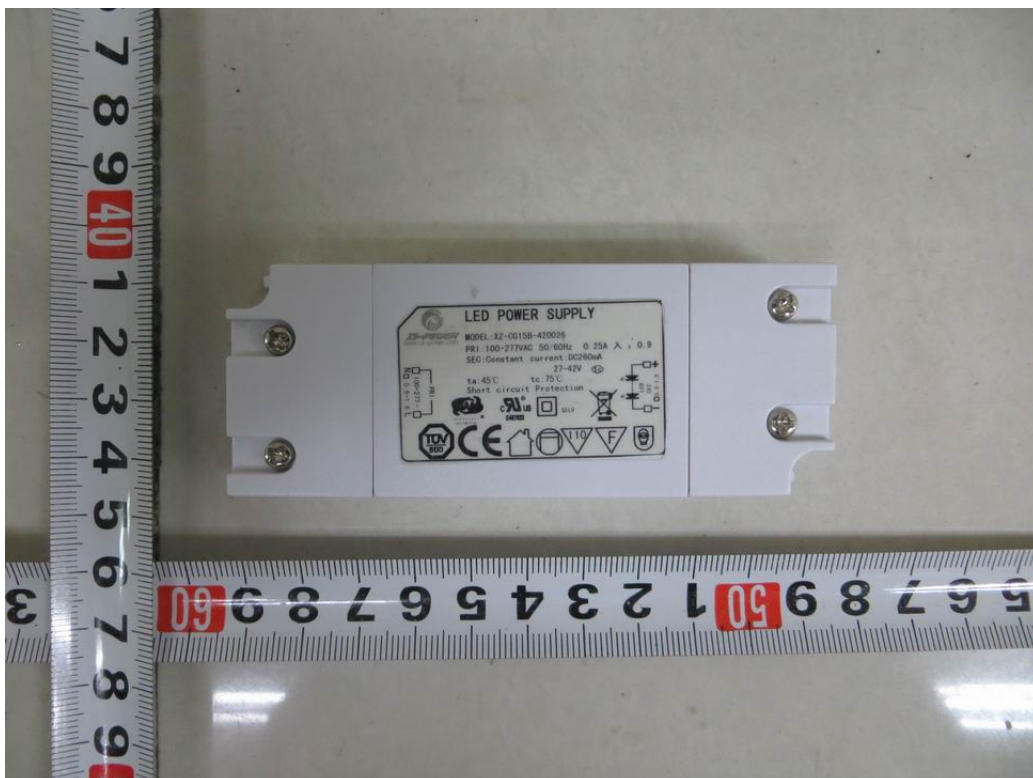


Fig. 10

18. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

SP-3030-XX-YYY-AA-BB	SP-3060-XX-YYY-AA-BB	SP-3012-XX-YYY-AA-BB
SP-6012-XX-YYY-AA-BB	RP-YYY-XX-AA-BB	SP-6060-XX-YYY-AA-BB
(XX-Stands for Dimmability(ND-not dimmable, D-dimmable), YYY-Stands for Power(060-60W), AA-Stands for color temperature(CW-Cool White, NW-Neutral White, WW-Warm White) ,BB-Stands for flow Code.)		

Belong to the tested device:

Product description : LED Panel Lamp
Model name : SP-6060-ND-060-WW-00

Remark: PCB board, structure and internal of these model(s) are the same,
So no additional models were tested.

-----THE END OF REPORT-----