EMC TEST REPORT
For

KLM Lighting Co., Limited

LED Down Light

Model No.: KLM-HP30WSS

Additional Model No.: Please Refer to Page 59

Prepared for	:	KLM Lighting Co., Limited
Address	:	15# Xi Zhouwei Street Zhongshan Guangdong China 528421

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Tel	:	(+86)755-82591330
Fax	:	(+86)755-82591332
Web		www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com

Date of receipt of test sample	:	November 11, 2013
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	November 11, 2013 - November 18, 2013
Date of Report	:	November 18, 2013

CE

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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. ..... :	**LCS131109299TE**
Date Of Issue .....:	November 18, 2013
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, China
Testing Location/ Procedure.....:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name ..... :	**KLM Lighting Co., Limited**
Address .....:	15# Xi Zhouwei Street Zhongshan Guangdong China 528421
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 Down Light**
Trade Mark .....:	KLM Lighting
Model/ Type Reference .....:	KLM-HP30WSS
Ratings.....:	AC 200-240V, 50/60Hz, Max.30W
Result ..... :	Positive

Compiled by:	**Supervised by:**	**Approved by:**
Elan Liu	Fox Zhang	Gavin Liang
Elan Liu/ File administrators	Fox Zhang/ Technique principal	Gavin Liang/ Manager

EMC -- TEST REPORT

Test Report No. : LCS131109299TE	November 18, 2013 Date of issue

Type/Model.....	:	KLM-HP30WSS
EUT.....	:	LED Down Light
Applicant.....	**:**	**KLM Lighting Co., Limited**
Address.....	:	15# Xi Zhouwei Street Zhongshan Guangdong China 528421
Telephone.....	:	/
Fax.....	:	/
Manufacturer.....	**:**	**KLM Lighting Co., Limited**
Address.....	:	15# Xi Zhouwei Street Zhongshan Guangdong China 528421
Telephone.....	:	
Fax.....	:	
Factory.....	**:**	**KLM Lighting Co., Limited**
Address.....	:	15# Xi Zhouwei Street Zhongshan Guangdong China 528421
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.			

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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 deriver 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 deriver 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 loss.

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2. GENERAL INFORMATION

2.1.Description of Device (EUT)

EUT	**:** LED Down Light
Model Number	**:** KLM-HP30WSS
Power Supply	**:** AC 200-240V, 50/60Hz, Max.30W

2.2.Description of Test Facility

Site Description

EMC Lab.

Accredited by CNAS, June 04, 2010
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, June 11, 2012
The Certificate Registration Number. is 100571-492.

Accredited by TUV, November 21, 2012
The Certificate Registration Number. is SCN1081

Accredited by Intertek, December 21, 2012
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.

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2.4.Measurement Uncertainty

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty	:	30MHz~200MHz	±2.96dB	(1)
		200MHz~1000MHz	±3.10dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±1.63dB	(1)
Power disturbance	:	30MHz~300MHz	±1.60dB	(1)

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

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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	ROHDE & SCHWARZ	ENV216	101288	2013/06/18
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	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

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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/1000M1	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	EMS61000-8K	906003	2013/06/18

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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

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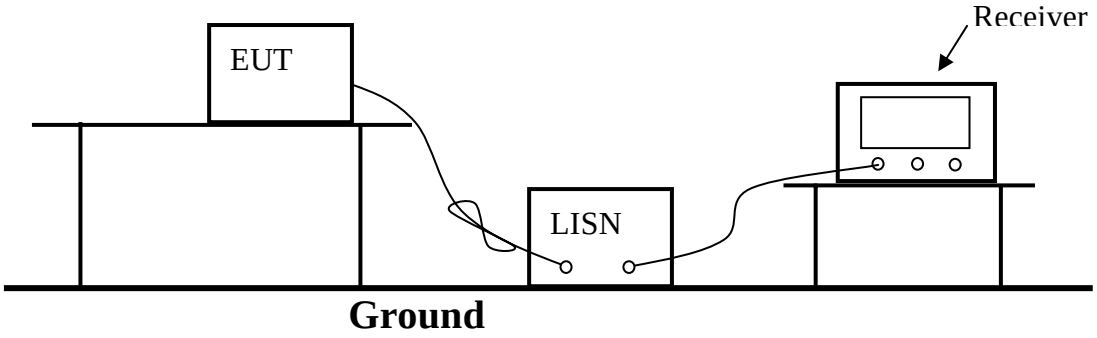
4. POWER LINE CONDUCTED MEASUREMENT

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 (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 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.

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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.

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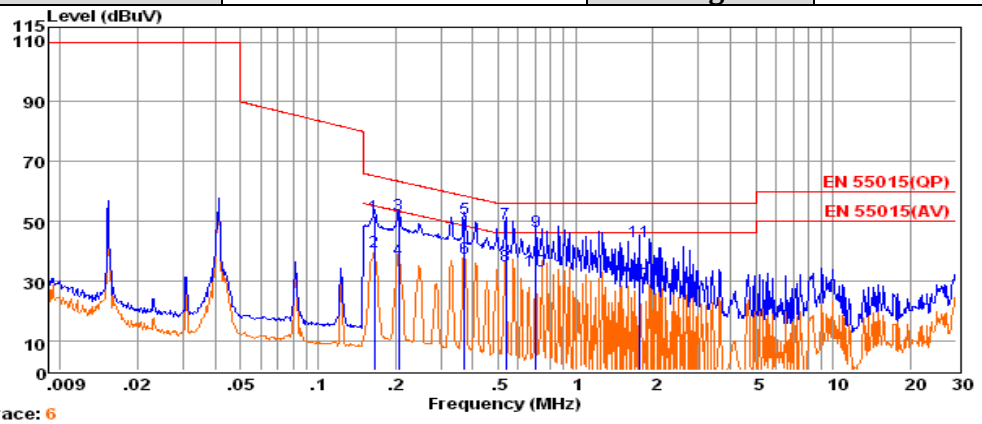
Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Line	**Test Engineer**	Kano

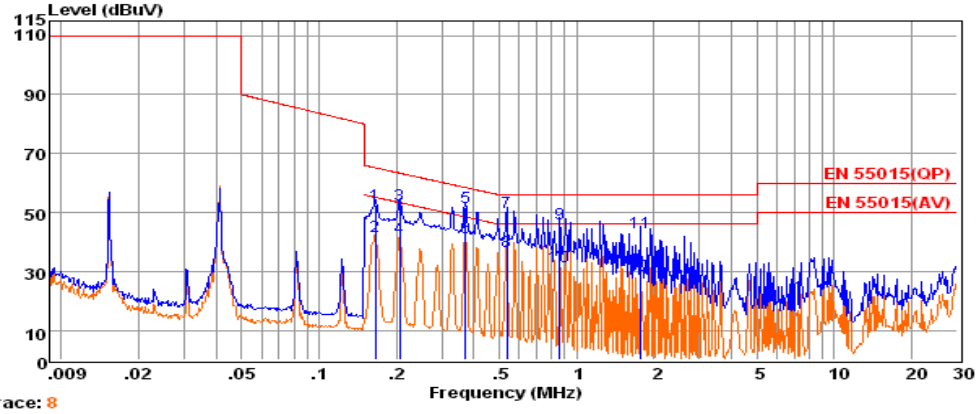


Trace: 6

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.16556	42.22	9.59	0.02	51.83	65.18	-13.35	QP
2	0.16566	30.00	9.59	0.02	39.61	55.18	-15.57	Average
3	0.20610	42.35	9.63	0.03	52.01	63.36	-11.35	QP
4	0.20620	27.44	9.63	0.03	37.10	53.36	-16.26	Average
5	0.36959	41.41	9.62	0.03	51.06	58.51	-7.45	QP
6	0.36969	28.00	9.62	0.03	37.65	48.51	-10.86	Average
7	0.53675	39.67	9.62	0.04	49.33	56.00	-6.67	QP
8	0.53685	25.35	9.62	0.04	35.01	46.00	-10.99	Average
9	0.70150	37.09	9.64	0.04	46.77	56.00	-9.23	QP
10	0.70160	23.69	9.64	0.04	33.37	46.00	-12.63	Average
11	1.76863	33.48	9.64	0.05	43.17	56.00	-12.83	QP
12	1.76963	19.52	9.64	0.05	29.21	46.00	-16.79	Average

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

Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Neutral	**Test Engineer**	Kano



Trace: 8

	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.16556	42.79	9.66	0.02	52.47	65.18	-12.71	QP
2	0.16566	32.39	9.66	0.02	42.07	55.18	-13.11	Average
3	0.20610	42.94	9.59	0.03	52.56	63.36	-10.80	QP
4	0.20620	31.78	9.59	0.03	41.40	53.36	-11.96	Average
5	0.36959	41.93	9.61	0.03	51.57	58.51	-6.94	QP
6	0.36969	31.65	9.61	0.03	41.29	48.51	-7.22	Average
7	0.53675	40.16	9.62	0.04	49.82	56.00	-6.18	QP
8	0.53685	27.27	9.62	0.04	36.93	46.00	-9.07	Average
9	0.85921	36.69	9.63	0.04	46.36	56.00	-9.64	QP
10	0.85931	22.04	9.63	0.04	31.71	46.00	-14.29	Average
11	1.76863	33.66	9.63	0.05	43.34	56.00	-12.66	QP
12	1.76963	19.10	9.63	0.05	28.78	46.00	-17.22	Average

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

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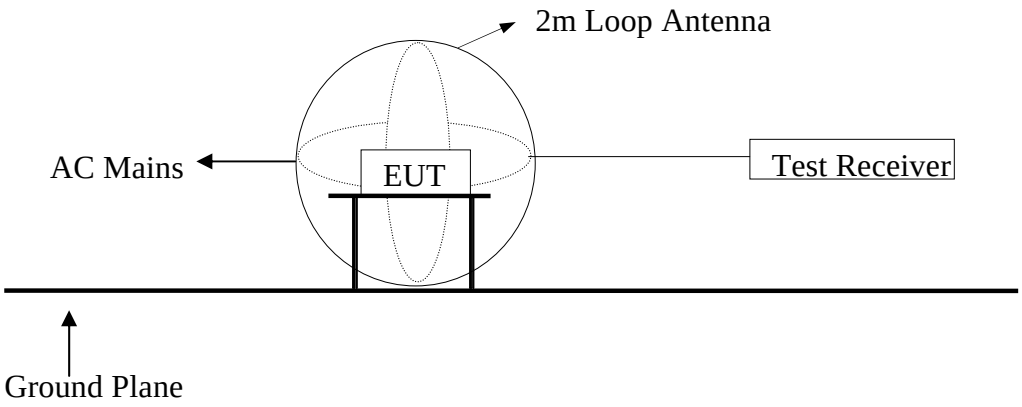
5. MAGNETIC FIELD EMISSION MEASUREMENT

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 (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.

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.

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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.

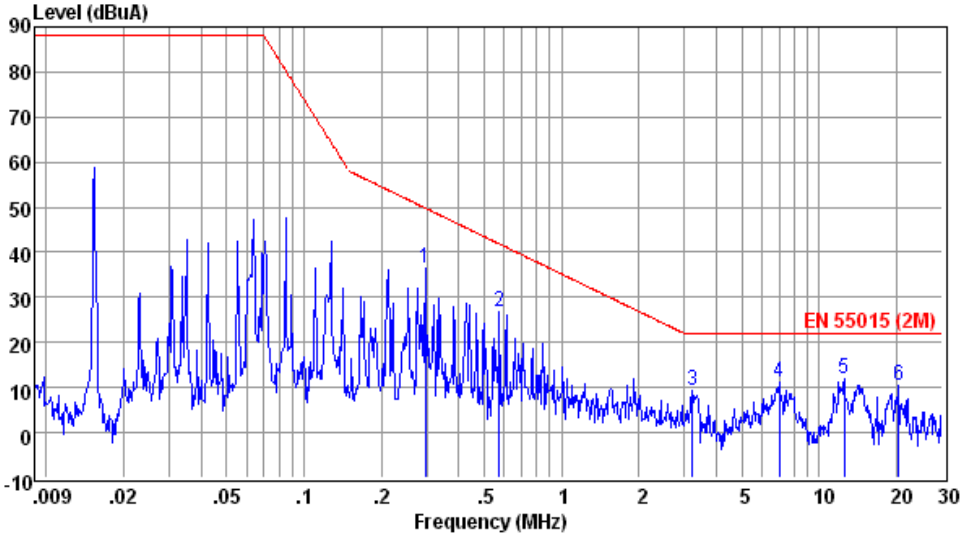
All the test results are listed in Section 5.6.

5.6.Test Results

PASS.

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

Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	X	**Test Engineer**	Kano



	Freq	Reading	LISNFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuA	dB	dB	dBuA	dBuA	dB	
1	0.30	26.21	9.60	0.59	36.40	49.80	-13.40	QP
2	0.57	16.43	9.62	0.64	26.69	41.90	-15.21	QP
3	3.22	-1.18	9.65	0.70	9.17	22.00	-12.83	QP
4	7.02	0.65	9.69	0.76	11.10	22.00	-10.90	QP
5	12.49	1.32	9.73	0.83	11.88	22.00	-10.12	QP
6	20.32	-0.17	9.88	0.87	10.58	22.00	-11.42	QP

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

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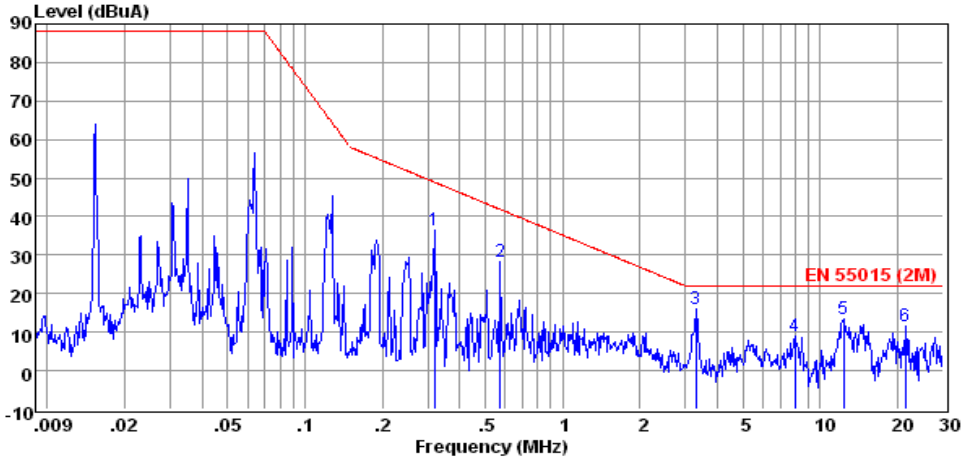
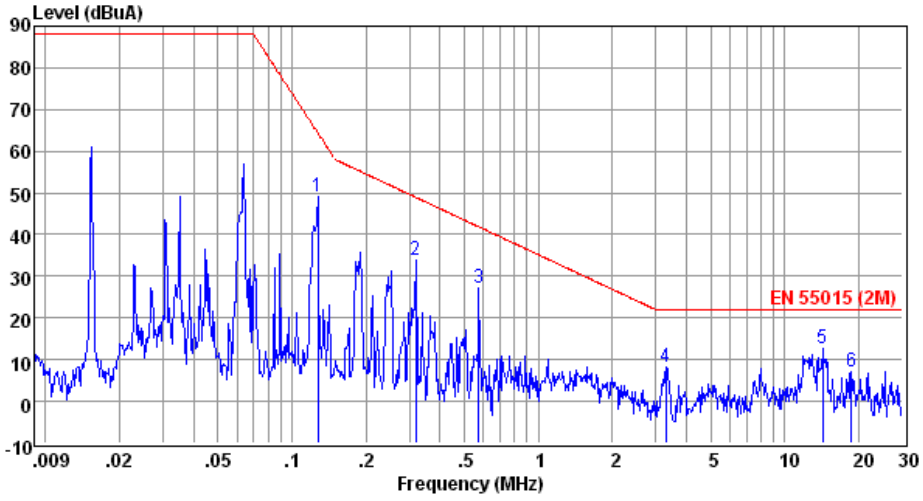
Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Y	**Test Engineer**	Kano



	Freq	Reading	LISNFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuA	dB	dB	dBuA	dBuA	dB	
1	0.32	26.39	9.62	0.60	36.61	48.92	-12.31	QP
2	0.57	17.90	9.63	0.64	28.17	41.90	-13.73	QP
3	3.30	5.62	9.65	0.70	15.97	22.00	-6.03	QP
4	8.00	-1.67	9.68	0.78	8.79	22.00	-13.21	QP
5	12.29	2.80	9.70	0.83	13.33	22.00	-8.67	QP
6	21.34	0.96	9.73	0.87	11.56	22.00	-10.44	QP

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

Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Z	**Test Engineer**	Kano



	Freq	Reading	LISNFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBuA	dB	dB	dBuA	dBuA	dB	
1	0.13	38.88	9.67	0.53	49.08	64.33	-15.25	QP
2	0.32	23.81	9.61	0.60	34.02	48.92	-14.90	QP
3	0.57	16.83	9.62	0.64	27.09	41.90	-14.81	QP
4	3.30	-2.16	9.65	0.70	8.19	22.00	-13.81	QP
5	14.22	2.13	9.74	0.84	12.71	22.00	-9.29	QP
6	18.59	-3.46	9.83	0.86	7.23	22.00	-14.77	QP

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

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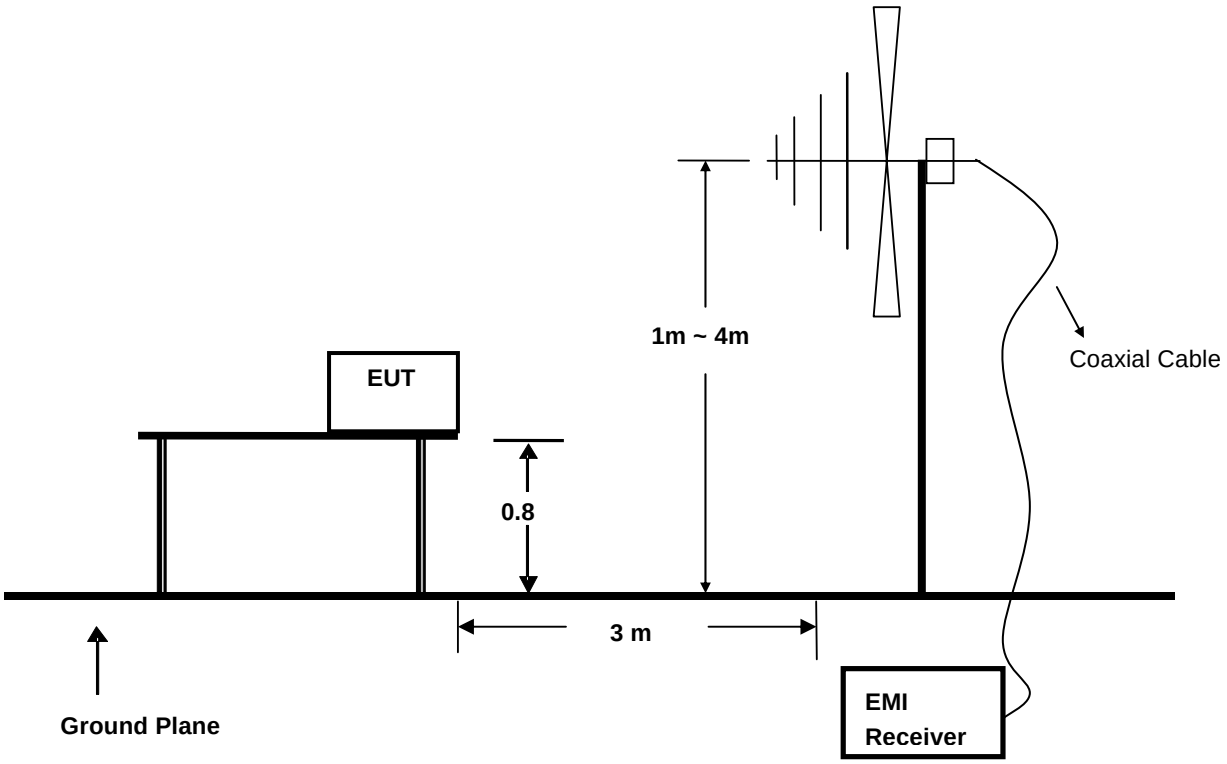
6. RADIATED EMISSION MEASUREMENT

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 (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.

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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.

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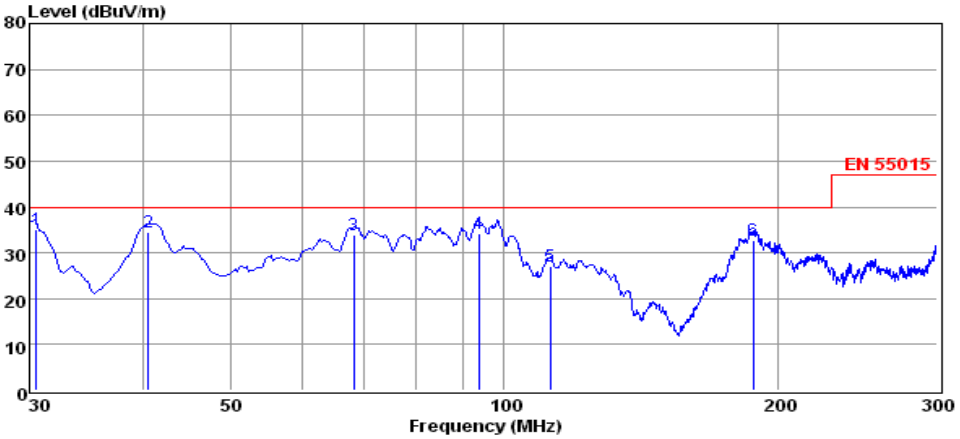
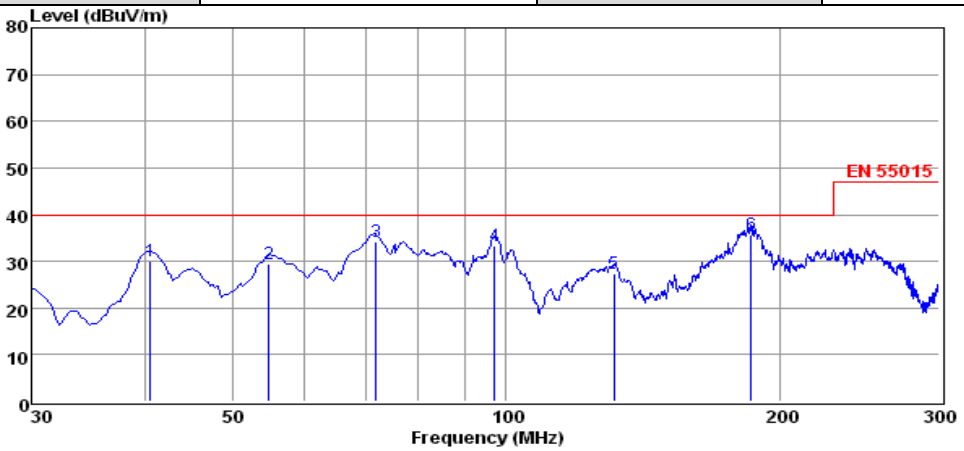
Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Vertical	**Detector Function**	Quasi-peak
Test Engineer	Kano	**Distance**	3m



	Freq	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	30.54	22.31	0.39	12.33	0.00	35.03	40.00	-4.97	QP
2	40.53	20.34	0.50	13.58	0.00	34.42	40.00	-5.58	QP
3	68.34	23.96	0.51	9.33	0.00	33.80	40.00	-6.20	QP
4	93.72	20.97	0.56	12.60	0.00	34.13	40.00	-5.87	QP
5	112.35	14.56	0.65	11.83	0.00	27.04	40.00	-12.96	QP
6	188.22	21.36	0.98	10.40	0.00	32.74	40.00	-7.26	QP

Note: 1. All readings are Quasi-peak values.
2.Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
3.The emission levels that ate 20dB below the official limit are not reported.

Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Environmental Conditions	24℃/ 56% RH	**Test Mode**	ON
Pol	Horizontal	**Detector Function**	Quasi-peak
Test Engineer	Kano	**Distance**	3m



	Freq	Reading	CabLos	AntFac	PreFac	Measured	Limit	Over	Remark
	MHz	dBuV	dB	dB/m	dB	dBuV/m	dBuV/m	dB	
1	40.53	16.07	0.50	13.58	0.00	30.15	40.00	-9.85	QP
2	54.84	15.89	0.46	13.03	0.00	29.38	40.00	-10.62	QP
3	71.85	25.17	0.55	8.34	0.00	34.06	40.00	-5.94	QP
4	97.23	19.80	0.61	12.98	0.00	33.39	40.00	-6.61	QP
5	131.52	17.78	0.76	8.82	0.00	27.36	40.00	-12.64	QP
6	186.33	24.44	0.98	10.24	0.00	35.66	40.00	-4.34	QP

Note: 1. All readings are Quasi-peak values.
2.Measured = Reading + Antenna Factor + Cable Loss - Amp Factor.
3.The emission levels that ate 20dB below the official limit are not reported.

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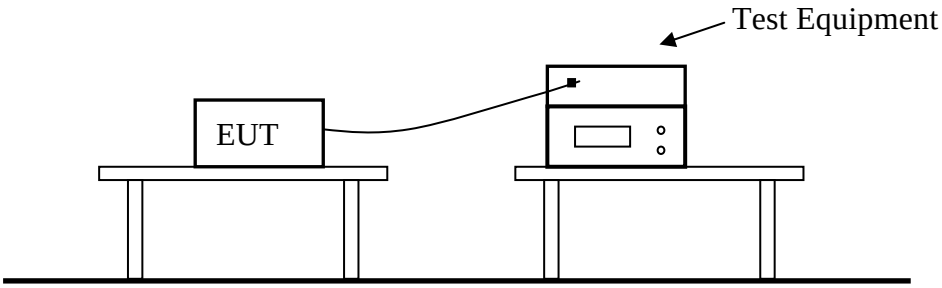
7. HARMONIC CURRENT MEASUREMENT

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.

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Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Test Engineer	Kano		

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:

PASS

Notes:

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	49.9840
Operating Voltage:	230	229.3082
Specified Power:	0.0000	49.32652
Fundamental Current:	0.4700	0.2151
Power Factor:	0.9800	0.9534
Average Input Current:		0.4800
Maximum POHC:		0.0063
POHC Limit:		0.0446
Maximum THC:		0.1130
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

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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	229.31V	0.69V	4.60V	Pass
Supply Frequency	50.00Hz	49.98Hz	0.02Hz	0.25Hz	Pass
Crest Factor	1.4100	1.4200	0.0100	+/- 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	0.05%	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				

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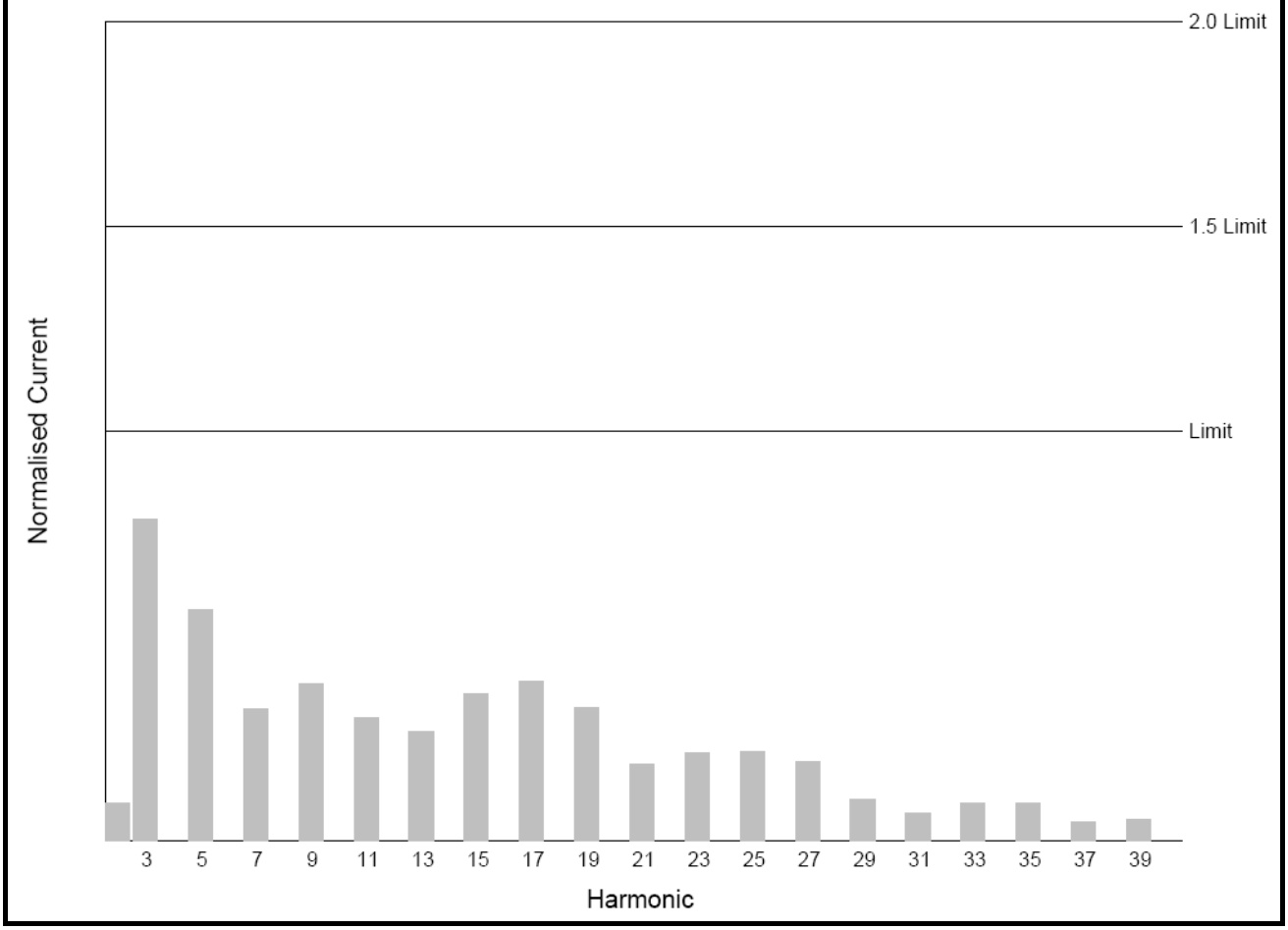
Voltech IEC61000-3 Windows Software 1.14.06RC1	
Type of Test:	Fluctuating Harmonics Test - Normalised Worst Case Bar Chart (2006)
Power Analyzer:	Voltech PM6000 SN: 200006700523 Firmware version: v1.21.07RC2 Channel(s): 1. SN: 090015502053, 28 Adjusted Date: 22 JUN 2011. 2. SN:None Adjusted Date:None 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



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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	9.400mA	14.10mA	0.793mA	✓	✓	0.868mA	✓	N/A	3	138.1mA	207.2mA	108.2mA	✓	✓	108.3mA	✓	Pass
4	None	None	0.314mA			0.355mA		N/A	5	47.00mA	70.50mA	26.21mA	✓	✓	26.48mA	✓	Pass
6	None	None	0.327mA			0.360mA		N/A	7	32.89mA	49.34mA	10.54mA	✓	✓	10.66mA	✓	Pass
8	None	None	0.291mA			0.338mA		N/A	9	23.50mA	35.25mA	8.956mA	✓	✓	9.058mA	✓	Pass
10	None	None	0.300mA			0.336mA		N/A	11	14.09mA	21.14mA	4.179mA	✓	✓	4.246mA	✓	N/A
12	None	None	0.344mA			0.387mA		N/A	13	14.09mA	21.14mA	3.706mA	✓	✓	3.772mA	✓	N/A
14	None	None	0.306mA			0.339mA		N/A	15	14.09mA	21.14mA	5.005mA	✓	✓	5.080mA	✓	Pass
16	None	None	0.296mA			0.341mA		N/A	17	14.09mA	21.14mA	5.458mA	✓	✓	5.508mA	✓	Pass
18	None	None	0.297mA			0.342mA		N/A	19	14.09mA	21.14mA	4.541mA	✓	✓	4.604mA	✓	N/A
20	None	None	0.349mA			0.400mA		N/A	21	14.09mA	21.14mA	2.576mA	✓	✓	2.662mA	✓	N/A
22	None	None	0.318mA			0.362mA		N/A	23	14.09mA	21.14mA	3.003mA	✓	✓	3.057mA	✓	N/A
24	None	None	0.357mA			0.397mA		N/A	25	14.09mA	21.14mA	3.007mA	✓	✓	3.099mA	✓	N/A
26	None	None	0.310mA			0.352mA		N/A	27	14.09mA	21.14mA	2.625mA	✓	✓	2.723mA	✓	N/A
28	None	None	0.304mA			0.342mA		N/A	29	14.09mA	21.14mA	1.389mA	✓	✓	1.455mA	✓	N/A
30	None	None	0.300mA			0.336mA		N/A	31	14.09mA	21.14mA	0.859mA	✓	✓	0.954mA	✓	N/A
32	None	None	0.308mA			0.346mA		N/A	33	14.09mA	21.14mA	1.217mA	✓	✓	1.307mA	✓	N/A
34	None	None	0.309mA			0.356mA		N/A	35	14.09mA	21.14mA	1.266mA	✓	✓	1.320mA	✓	N/A
36	None	None	0.380mA			0.422mA		N/A	37	14.09mA	21.14mA	0.564mA	✓	✓	0.653mA	✓	N/A
38	None	None	0.330mA			0.379mA		N/A	39	14.09mA	21.14mA	0.661mA	✓	✓	0.755mA	✓	N/A
40	None	None	0.328mA			0.365mA		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.

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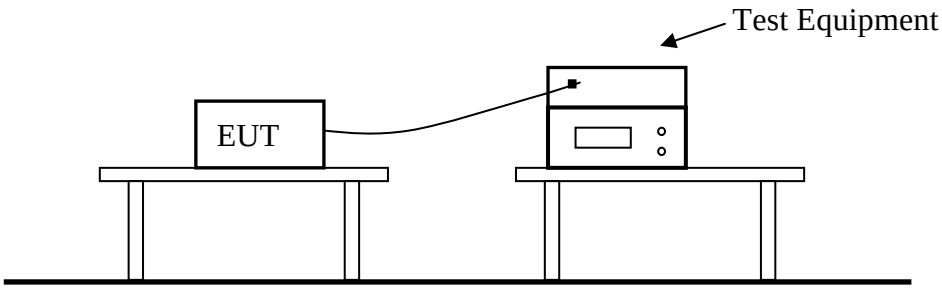
8. VOLTAGE FLUCTUATIONS & FLICKER MEASUREMENT

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.

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Model No.	KLM-HP30WSS	**Test Date**	November 13, 2013
Test Engineer	Kano		

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: **PASS**

Notes:
Measurement method - Voltage

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.089	0.008	0.156	0

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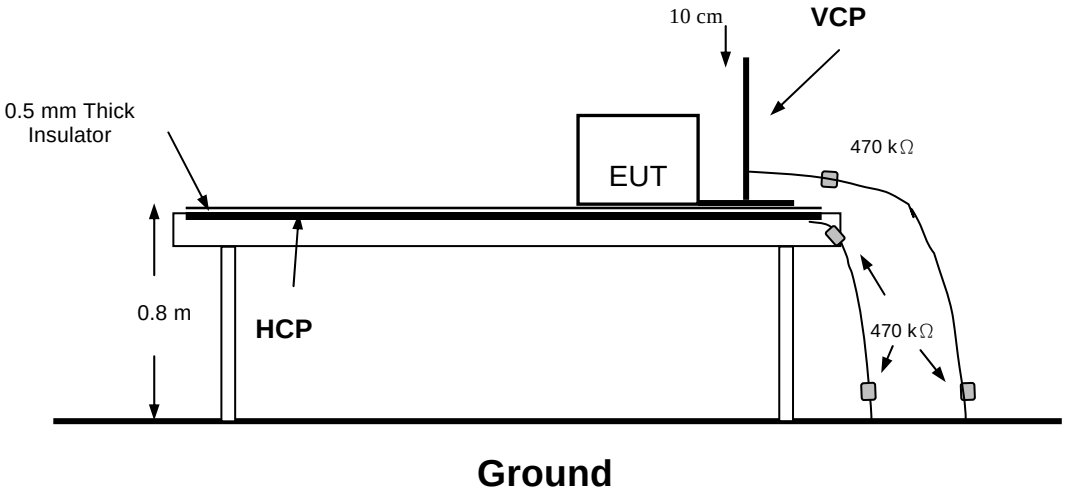
9. ELECTROSTATIC DISCHARGE TEST

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, ±8KV Contact Discharge: Level 2, ±4KV)

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

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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.

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Electrostatic Discharger Test Results

Standard	☐ IEC 61000-4-2 ☑ EN 61000-4-2		
Applicant	Auroras Lighting Solution (Zhuhai) Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Criterion	B	**Pressure**	1021mbar
Test Mode	ON	**Test Date**	November 13, 2013
Test Engineer	Kano		

Air Discharge

Test Points	Test Levels			Results		
	± 2KV	± 4KV	± 8KV	Pass	Fail	Performance Criterion
Front	☒	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☒	☐	☐A ☒B
Top	☒	☒	☒	☒	☐	☐A ☒B
Bottom	☒	☒	☒	☒	☐	☐A ☒B

Contact Discharge

Test Points	Test Levels		Results		
	± 2 KV	±4 KV	Pass	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B
Top	☒	☒	☒	☐	☐A ☒B
Bottom	☒	☒	☒	☐	☐A ☒B

Discharge To Horizontal Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 KV	± 4 KV	Pass	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B

Discharge To Vertical Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 KV	± 4 KV	Pass	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B

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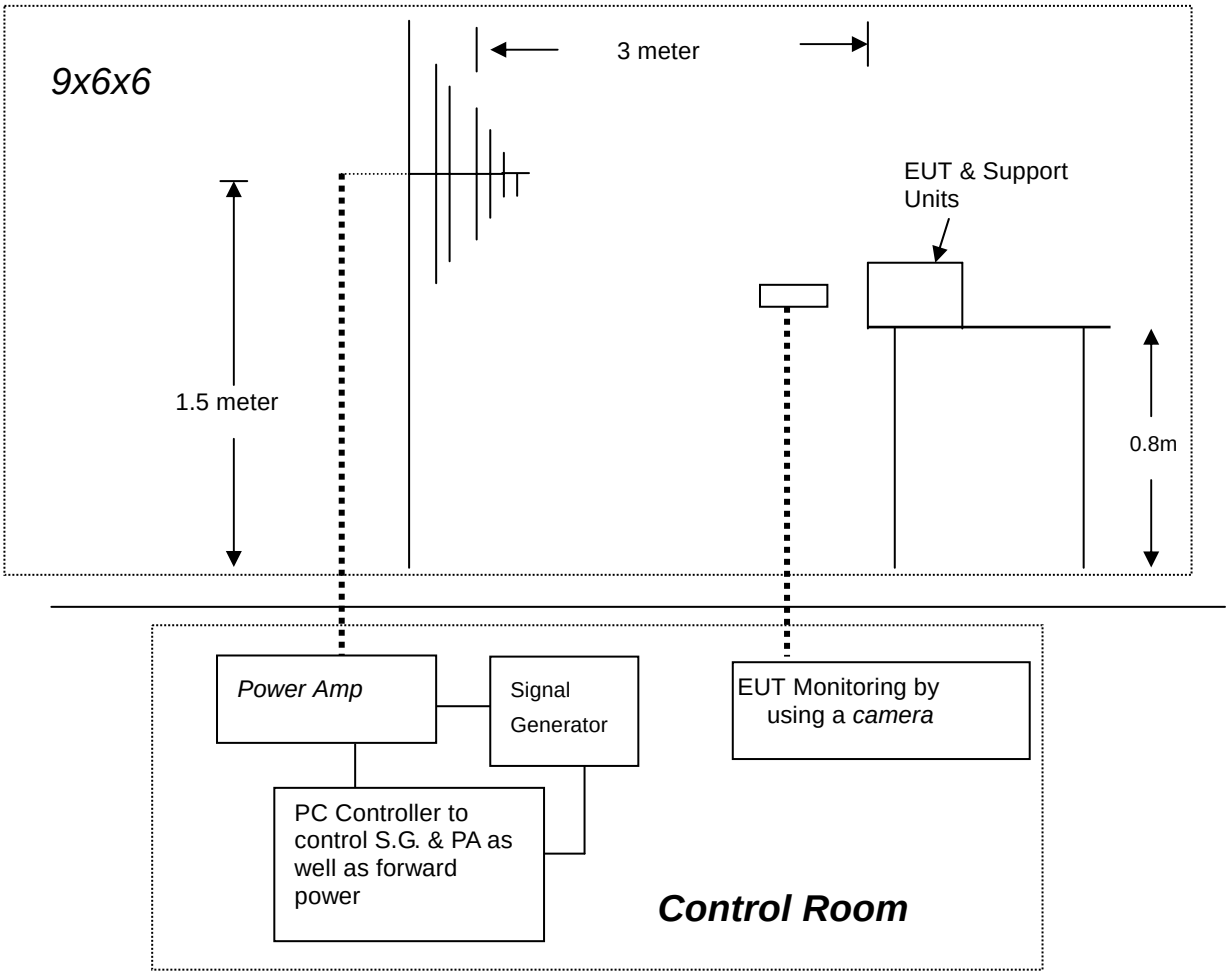
10. RF FIELD STRENGTH SUSCEPTIBILITY TEST

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**

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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.

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RF Field Strength Susceptibility Test Results

Standard	☐ IEC 61000-4-3 ☑ EN 61000-4-3		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Field Strength	3 V/m	**Criterion**	A
Test Mode	ON	**Test Engineer**	Kano
Frequency Range	80 MHz to 1000 MHz	**Test Date**	November 13, 2013
Modulation	☐None ☐ Pulse ☑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:

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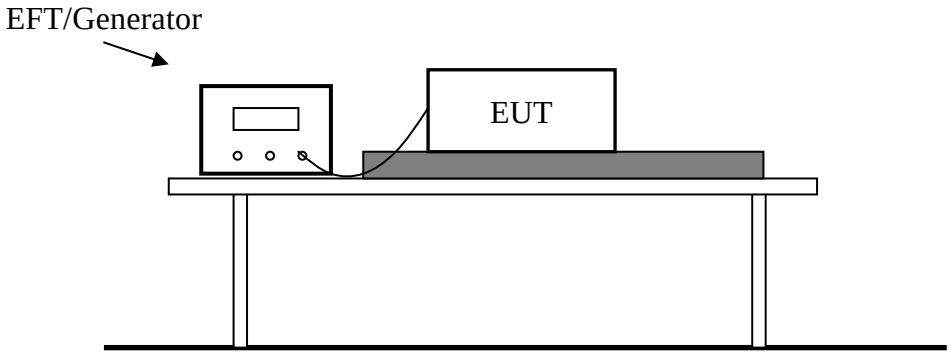
11. ELECTRICAL FAST TRANSIENT/BURST TEST

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 ±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.

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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.

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Electrical Fast Transient/Burst Test Results

Standard	☐ IEC 61000-4-4 ☑ EN 61000-4-4		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Test Mode	ON	**Criterion**	B
Test Engineer	Kano	**Test Date**	November 13, 2013

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:

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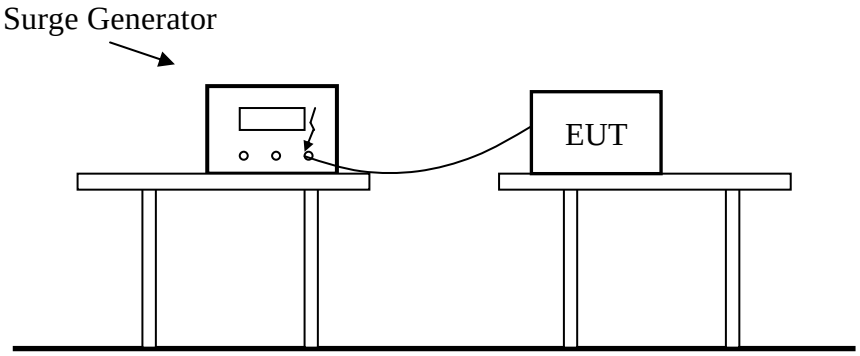
12. SURGE IMMUNITY TEST

12.1.Block Diagram of Test Setup



12.2.Test Standard

EN 61547: 2009 (EN61000-4-5: 2006, Severity Level: Line to Line: Level 1, 0.5KV; 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

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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 0.5KV 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.

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Surge Immunity Test Result

Standard	☐ IEC 61000-4-5 ☑ EN 61000-4-5		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Test Mode	ON	**Criterion**	B
Test Engineer	Kano	**Test Date**	November 13, 2013

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					

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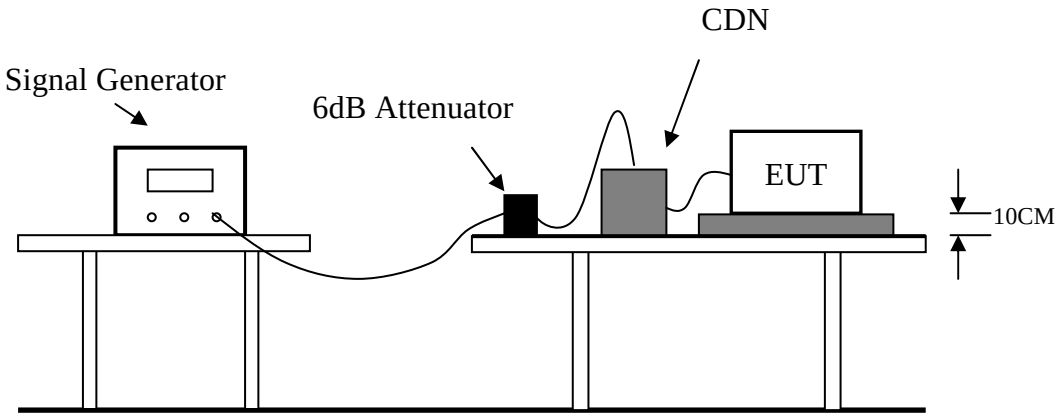
13. INJECTED CURRENTS SUSCEPTIBILITY TEST

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.

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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*10-3decades/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.

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.

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Injected Currents Susceptibility Test Results

Standard	☐ IEC 61000-4-6 ☑ EN 61000-4-6		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Test Mode	ON	**Criterion**	A
Test Engineer	Kano	**Test Date**	November 13, 2013

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:

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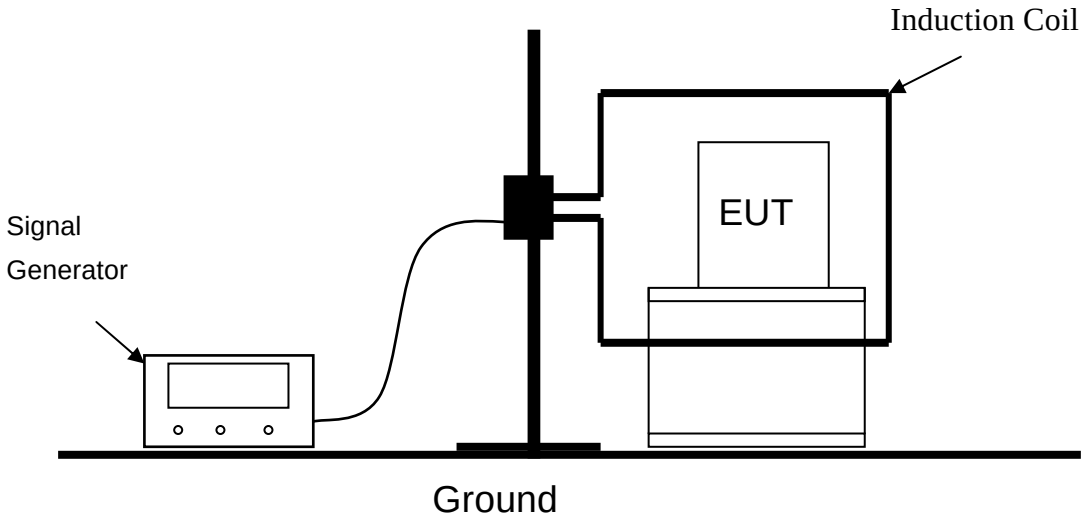
14. MAGNETIC FIELD IMMUNITY TEST

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.

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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.

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Magnetic Field Immunity Test Result

Standard	☐ IEC 61000-4-8 ☑ EN 61000-4-8		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Test Mode	ON	**Criterion**	A
Test Engineer	Kano	**Test Date**	November 13, 2013

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:

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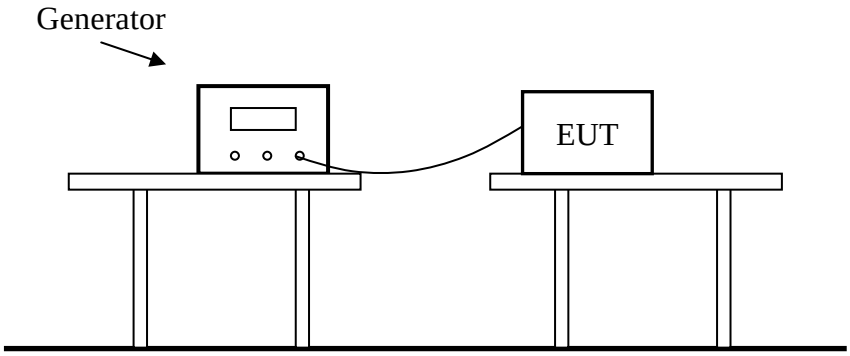
15. VOLTAGE DIPS AND INTERRUPTIONS TEST

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.

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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	☐ IEC 61000-4-11 ☑ EN 61000-4-11		
Applicant	KLM Lighting Co., Limited		
EUT	LED Down Light	**Temperature**	26℃
M/N	KLM-HP30WSS	**Humidity**	51％
Test Mode	ON	**Criterion**	B&C
Test Engineer	Kano	**Test Date**	November 13, 2013

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:

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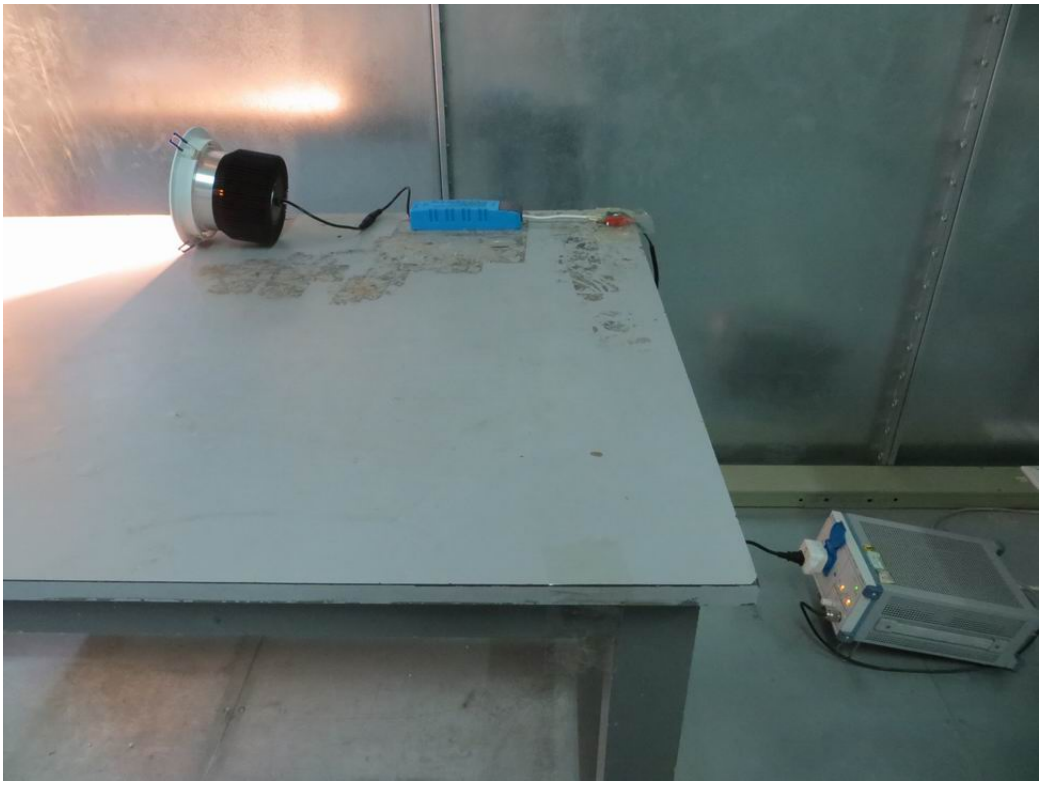
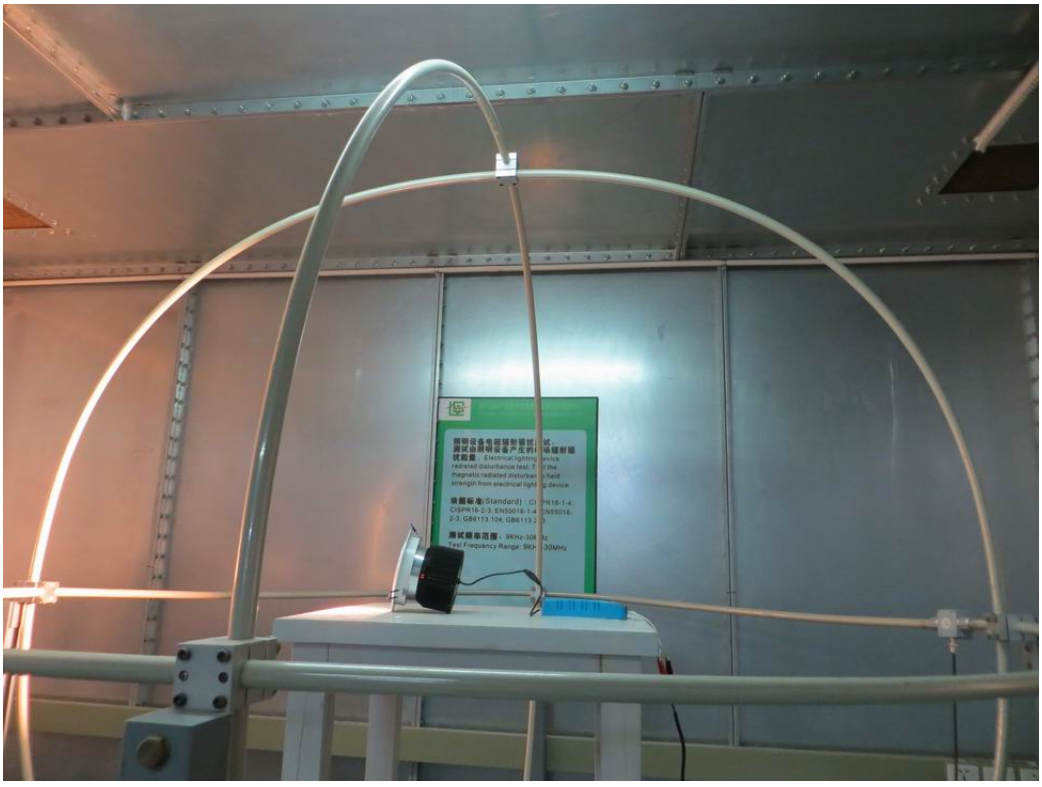
16. PHOTOGRAPH

16.1. Photo of Power Line Conducted Measurement



16.2. Photo of Radiated Electromagnetic Disturbance Measurement



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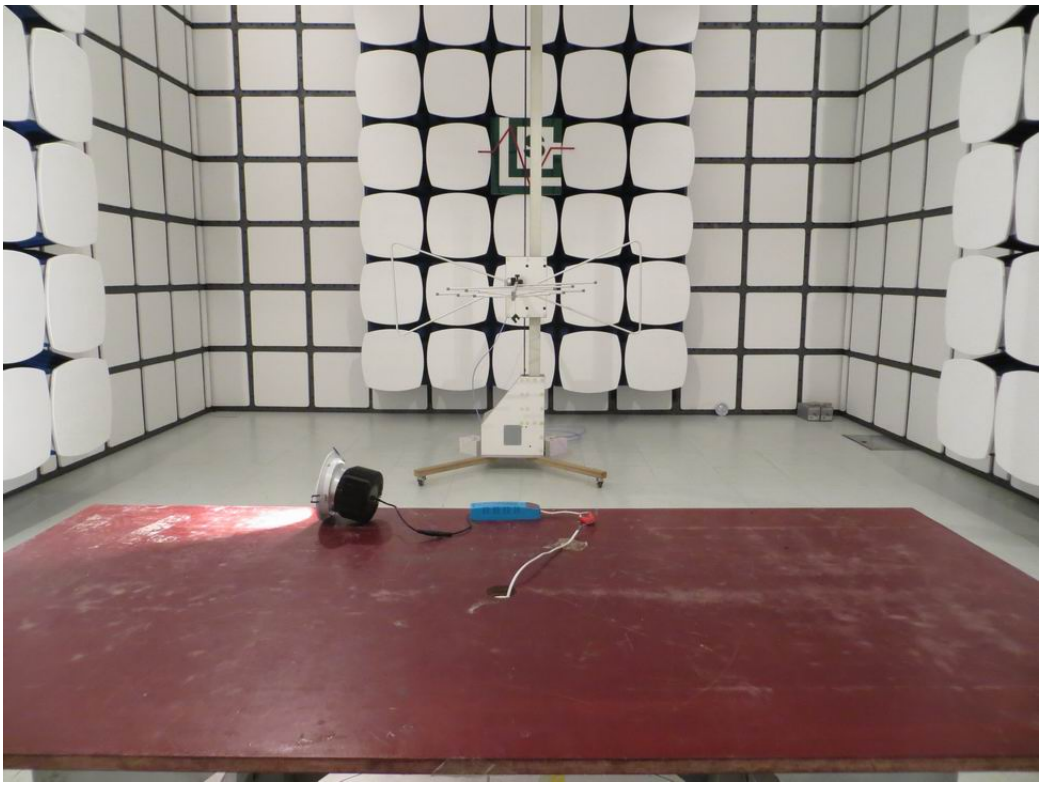
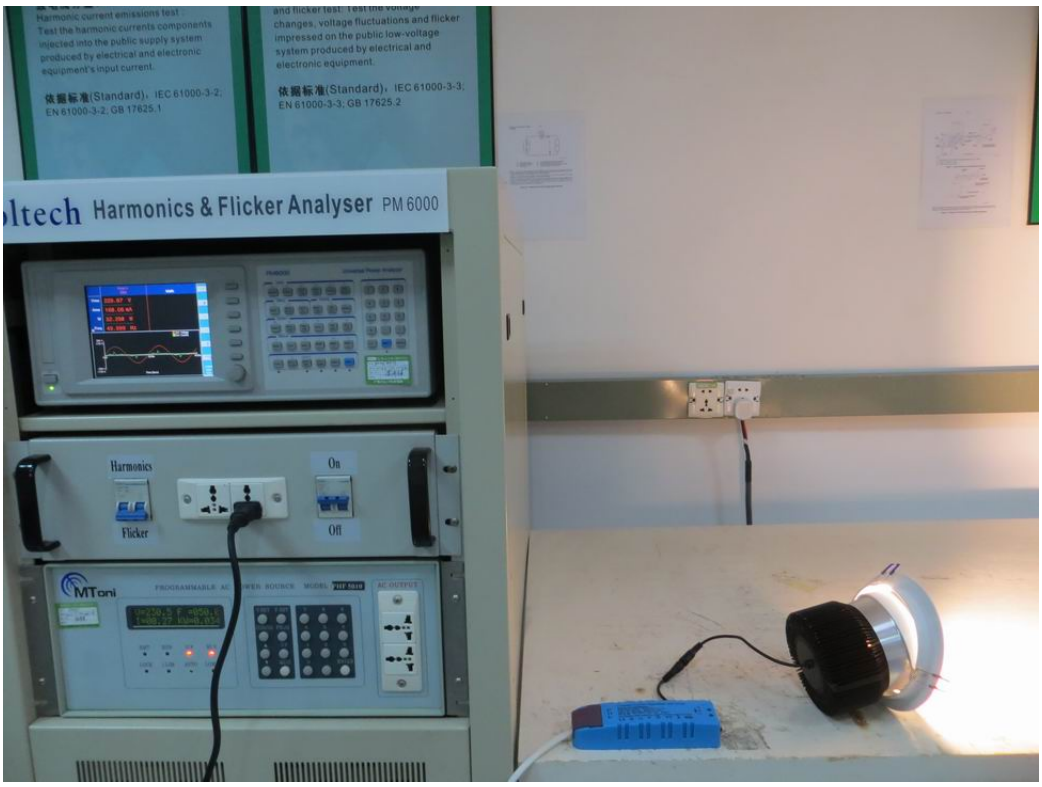
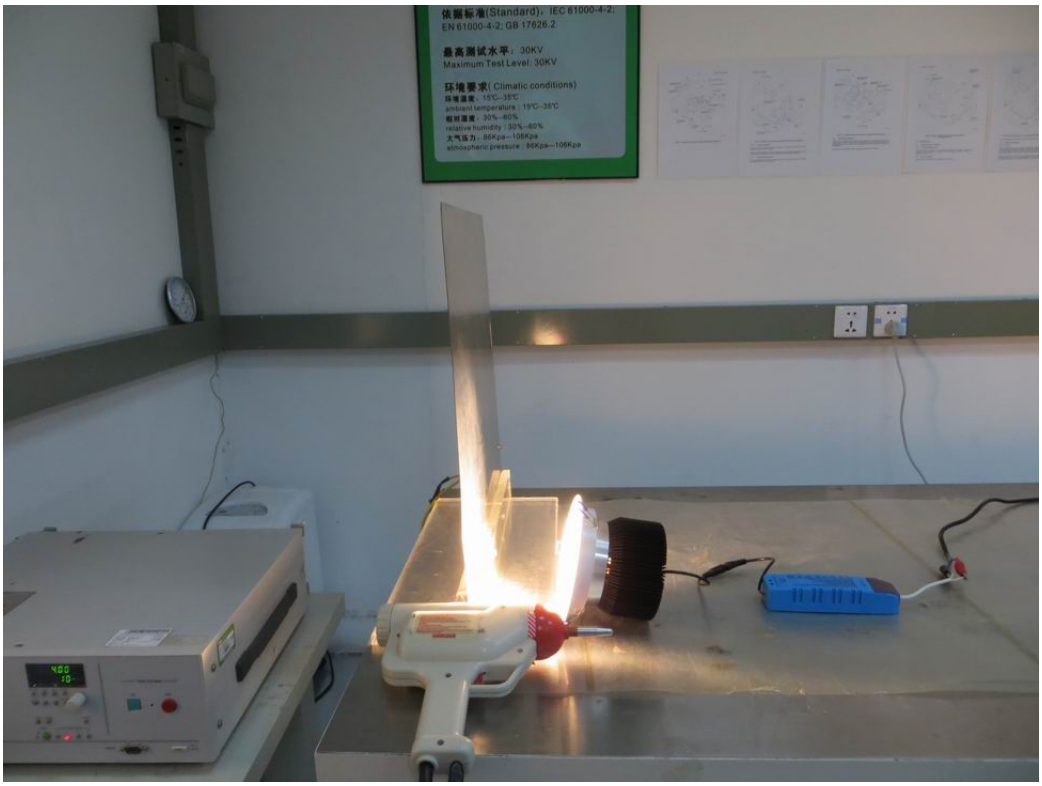
16.3. Photo of Radiated Measurement



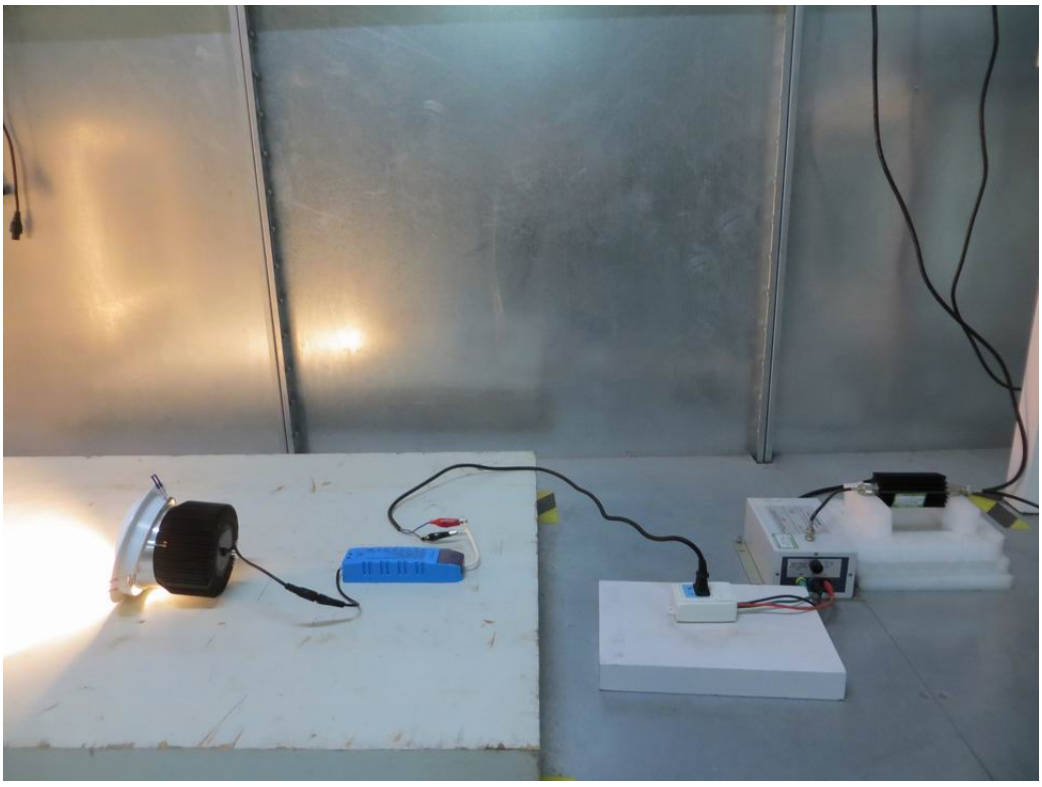
16.4. Photo of Harmonic & Flicker Measurement



16.5. Photo of Electrostatic Discharge Test



16.6. Photo of Electrical Fast Transient/Burst Test



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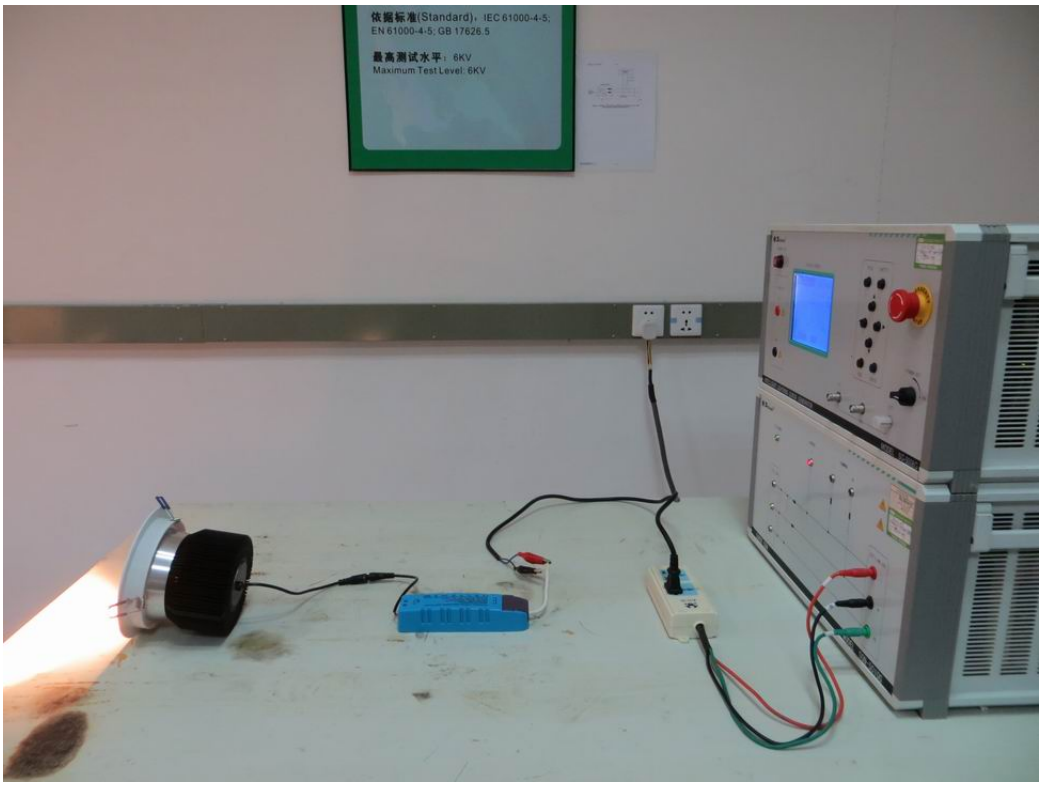
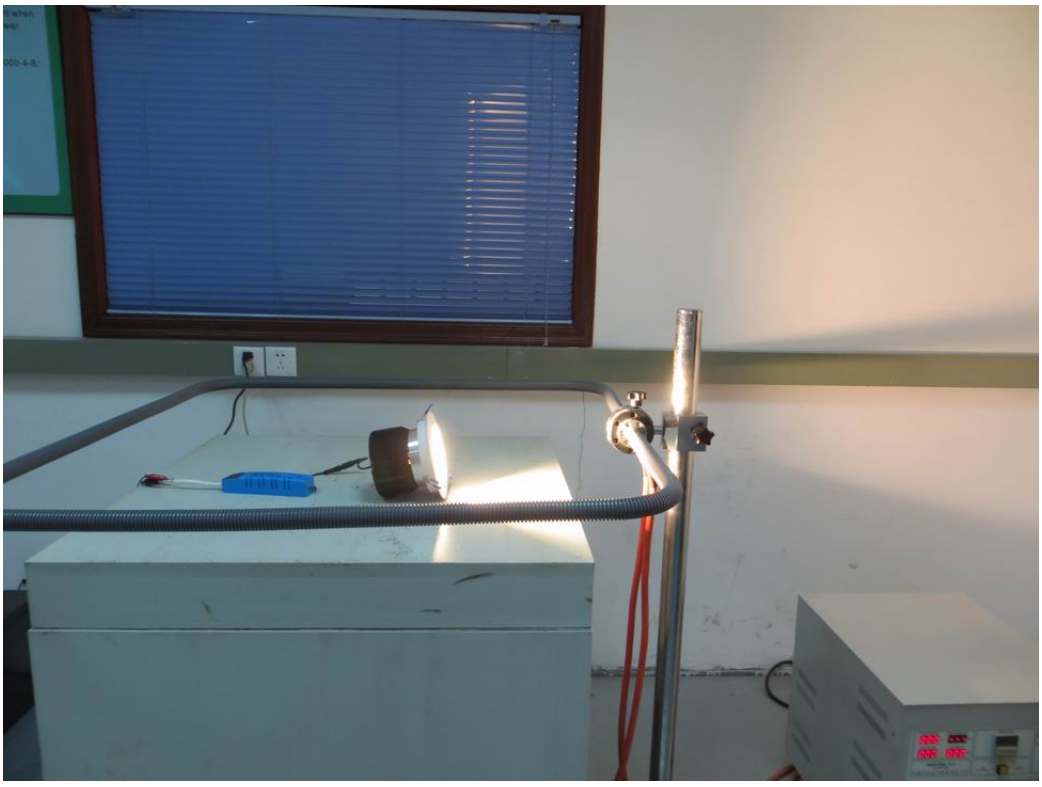
16.7. Photo of Surge Immunity Test



16.8. Photo of Magnetic Field Immunity Test



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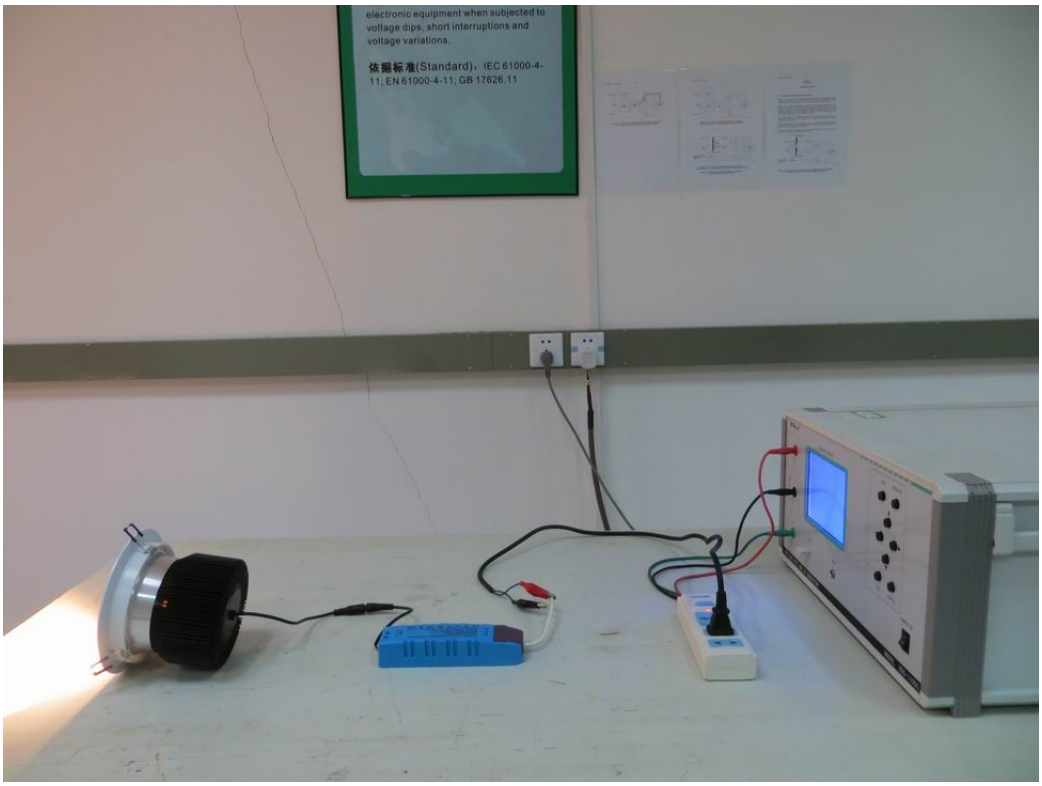
16.9. Photo of Voltage Dips and Short Interruptions Immunity Test



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17. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

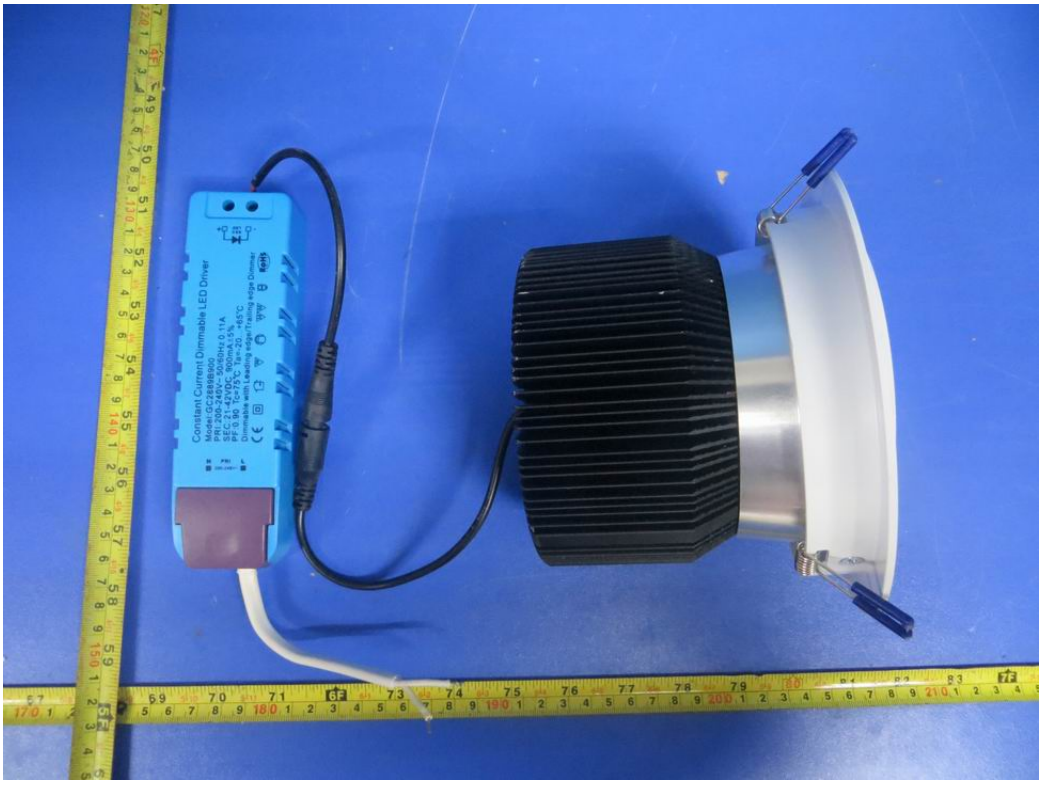

Fig. 1

Fig. 2

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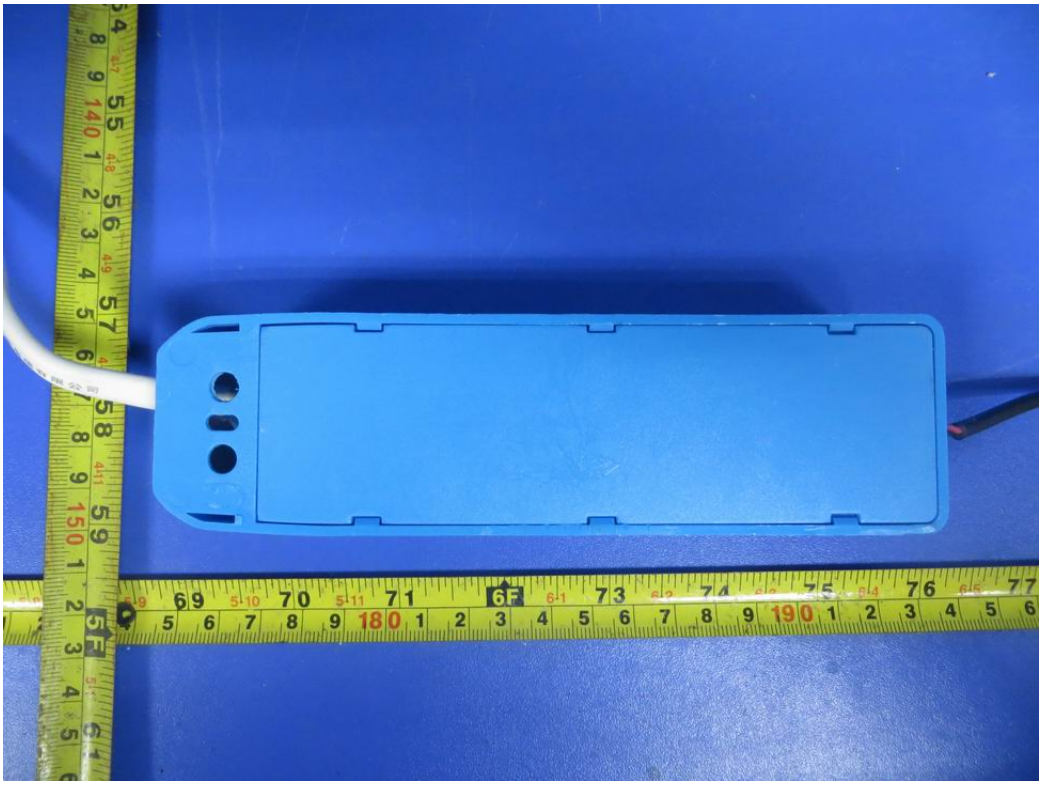

Fig. 3

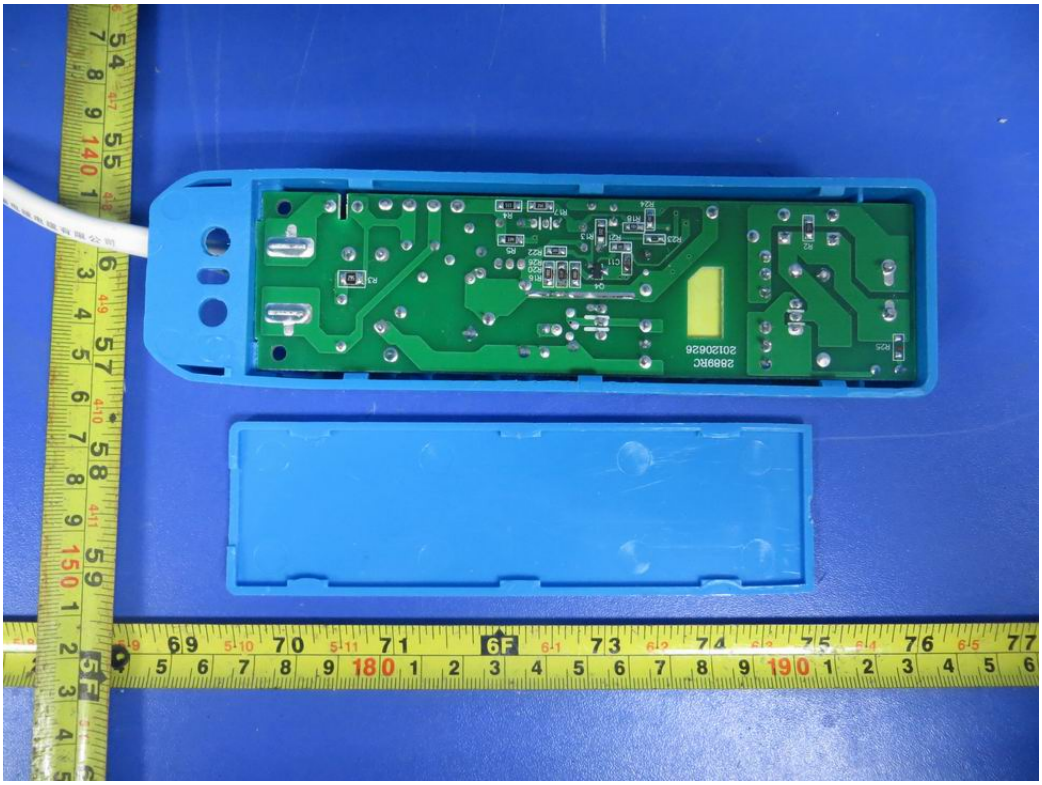

Fig. 4

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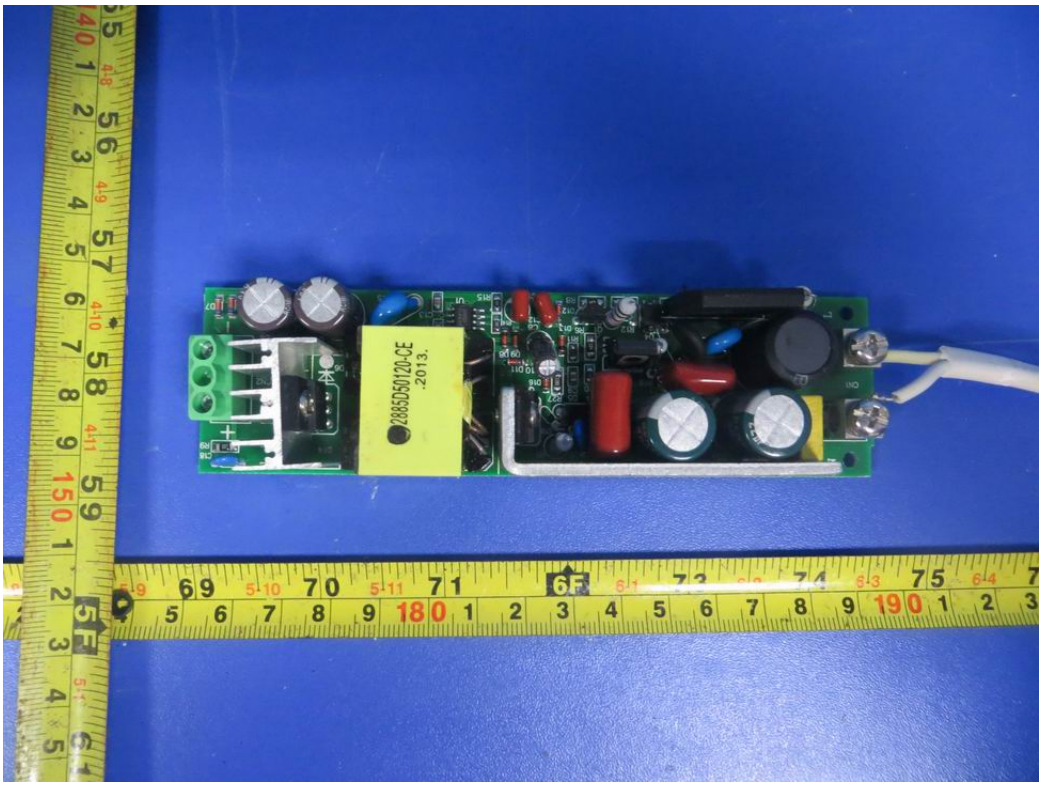

Fig. 5

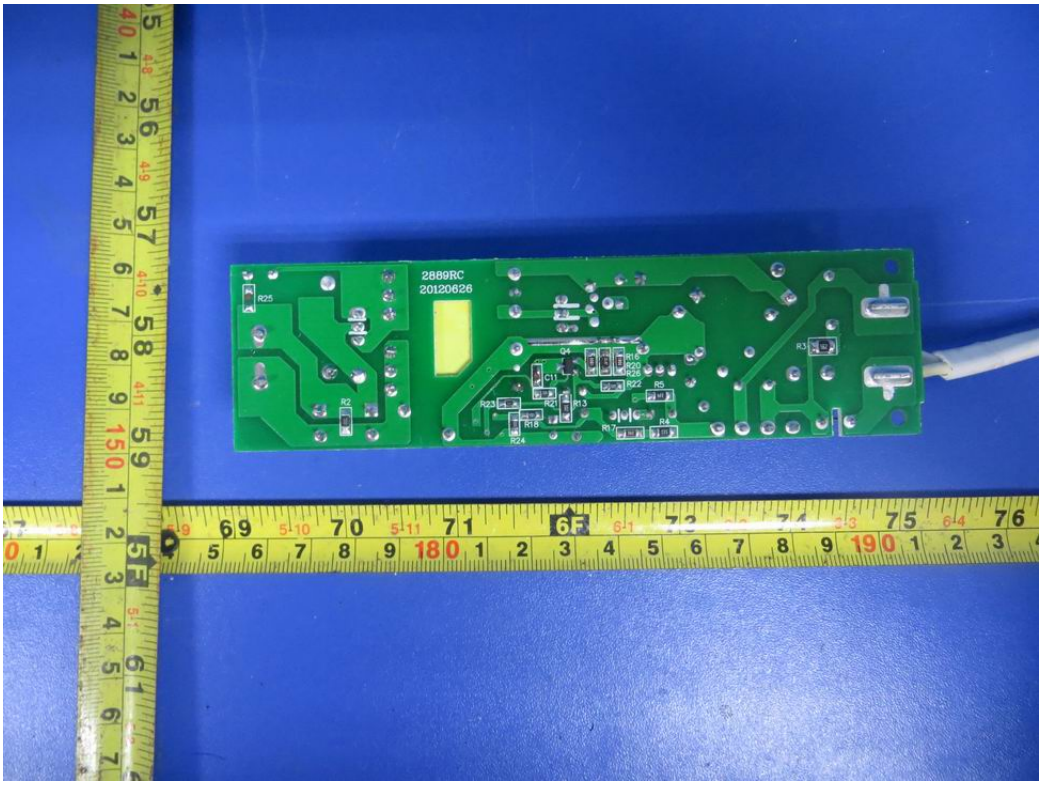

Fig. 6

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KLM-HP30WSS

KLM-HP25WSS

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KLM-HP20WSS

KLM-HP20WSS

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KLM-HP15WSS

KLM-HP12WSS

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KLM-HP10WSS

KLM-HP7WSS

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KLM-HP5WSS

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18. MANUFACTURER/ APPROVAL HOLDER DECLARATION

The following identical model(s):

KLM-HP20WSS	KLM-HP25WSS	KLM-HP30WSS
KLM-HP15WSS	KLM-HP10WSS	KLM-HP12WSS
KLM-HP7WSS	KLM-HP5WSS	--

Belong to the tested device:

Product description : LED Down Light
Model name : KLM-HP30WSS

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

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

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