ELECTROMAGNETIC COMPLIANCE TEST REPORT

For

LED Wash Light

Model: PHN005, PHN007, PHN009, PHN012, PHN013, PHN014, PHN016, PHN018, PHN020, PHN021, PHN023, PHN026, PHN027, PHN029, PHN031, PHN032, PHN035, PHN036, PHN037, PHN040, PHN042, PHN043, PHN046, PHN053, PHN054, PHN055, PHN056, PHN057, PHN060, PHN061, PHN062, PHN063, PHN064, PHN065, PHN066, PHN067, PHN069, PHN072, PHN073, PHN074, PHN075, PHN076, PHN077, PHN078, PHN080, PHN081, PHN082, PHN083, PHN084, PHN085, PHN086, PHN087, PHN088, PHN089, PHN090, PHN091, PHN092, PHH028, PHH009, PHH013.

Brand Name: PHOENIXLIGHTING

Report No.: ENC1901280GZ78E1

Date of Issue: Jul. 23, 2018

Prepared For

Guangdong Phoenix Lighting Co., Ltd.

No.38 Yagang South Road, Shijing Town, Guangzhou, Guangdong, China.

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Prepared By

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1. VERIFICATION OF CONFORMITY

Equipment Under Test:	LED Wash Light
Model	PHN005, PHN007, PHN009, PHN012, PHN013, PHN014, PHN016, PHN018, PHN020, PHN021, PHN023, PHN026, PHN027, PHN029, PHN031, PHN032, PHN035, PHN036, PHN037, PHN040, PHN042, PHN043, PHN046, PHN053, PHN054, PHN055, PHN056, PHN057, PHN060, PHN061, PHN062, PHN063, PHN064, PHN065, PHN066, PHN067, PHN069, PHN072, PHN073, PHN074, PHN075, PHN076, PHN077, PHN078, PHN080, PHN081, PHN082, PHN083, PHN084, PHN085, PHN086, PHN087, PHN088, PHN089, PHN090, PHN091, PHN092, PHH028, PHH009, PHH013.
Model Difference:	The series models have same electrical structure as PHN076, except for the different appearance and power.
Brand:	PHOENIXLIGHTING
Applicant:	Guangdong Phoenix Lighting Co., Ltd.
	No.38 Yagang South Road, Shijing Town, Guangzhou, Guangdong, China.
Manufacturer:	Guangdong Phoenix Lighting Co., Ltd.
	No.38 Yagang South Road, Shijing Town, Guangzhou, Guangdong, China.
Type of Test:	EMC Directive 2014/30/EU for CE Marking
Technical Standards:	EN 55015:2013+A1:2015 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61547:2009
File Number:	ENC1901280GZ78E1
Date of test:	Jul. 13, 2018 - Jul. 23, 2018
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by East Notice Certification Service Co., Ltd. for compliance with the requirements set forth in EMC Directive 2014/30/EU and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements. Should any objections to the test reports occurred, should submit it to the company within ten days since the issuing of the report, Fail to accept.
The test results of this report relate only to the tested Sample identified in this report.

Checked By _____
Yemig Jul. 23, 2018

Authorized By _____
Ray Zhou Jul. 23, 2018

2. SYSTEM DESCRIPTION

EUT Test Procedure:

1. Connect EUT and peripheral devices if need.
2. Power on the EUT, the EUT begins to work.
3. Make sure the EUT operates normally during the test.

3. PRODUCT INFORMATION

Housing Type	:	Metal
Rated voltage	:	90-240V~, 50/60Hz
Rated power	:	300W
Protection Class	:	I

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
AC Input port	1	1	1

4. SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

***Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.*

***Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.*

5. TEST FACILITY

Location: 1/F, Haohui Commercial Building, Zhuji Street, Dongpu Town, Tianhe District, Guangzhou City, China

Description: There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4 and CISPR 15/EN 55015 requirements.

Site Filing: The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Instrument Tolerance: All measuring equipment is in accord with ANSI C63.4 and CISPR 22 requirements that meet industry regulatory agency and accreditation agency requirement.

6. EN 55015 LINE CONDUCTED EMISSION TEST

6.1. TEST EQUIPMENT OF LINE CONDUCTED EMISSION TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Aeroflex	2399A	N/A	03/19/2018	03/18/2019
Biconilog Antenna	ETS	3142C	N/A	03/19/2018	03/18/2019
Multi-device Controller	ETS	2090	N/A	03/19/2018	03/18/2019

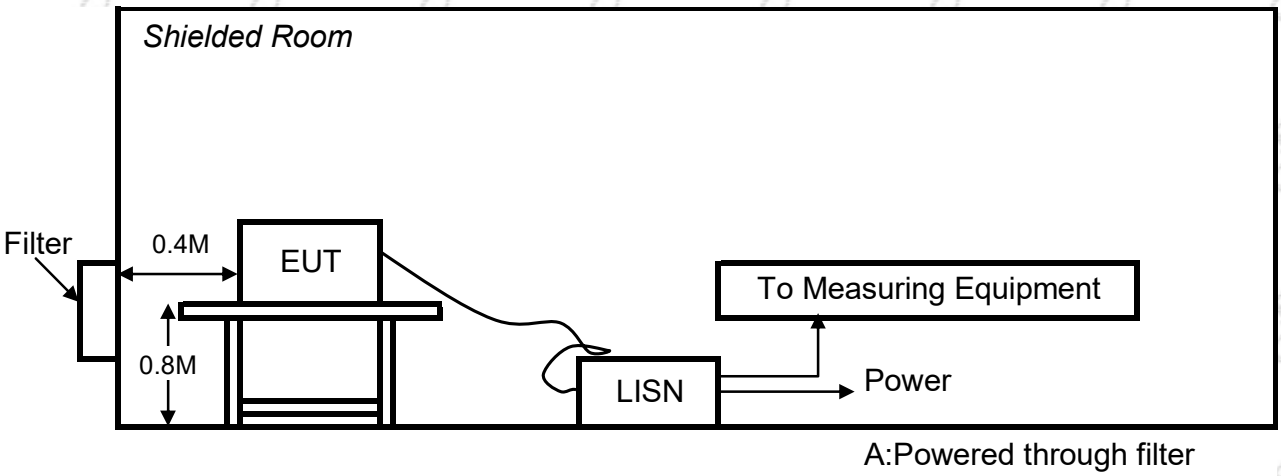
6.2. LIMITS OF LINE CONDUCTED EMISSION TEST AT MAINS TERMINALS

Frequency Range	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
9 KHz-50 KHz	110	--
50 KHz-150 KHz	90-80	--
150 kHz-500 kHz	66-56	56-46
500 kHz-2.51 MHz	56	46
2.51 MHz-3.0 MHz	73	63
3.0 MHz-5.0 MHz	56	46
5.0 MHz-30.0 MHz	60	50

***Note:** 1. At the transition frequency, the lower limit applies.*

2. The limit decreases linearly with the logarithm of the frequency in the range 50 KHz to 150 KHz and 150 KHz to 0.5 MHz.

6.3. BLOCK DIAGRAM OF TEST SETUP



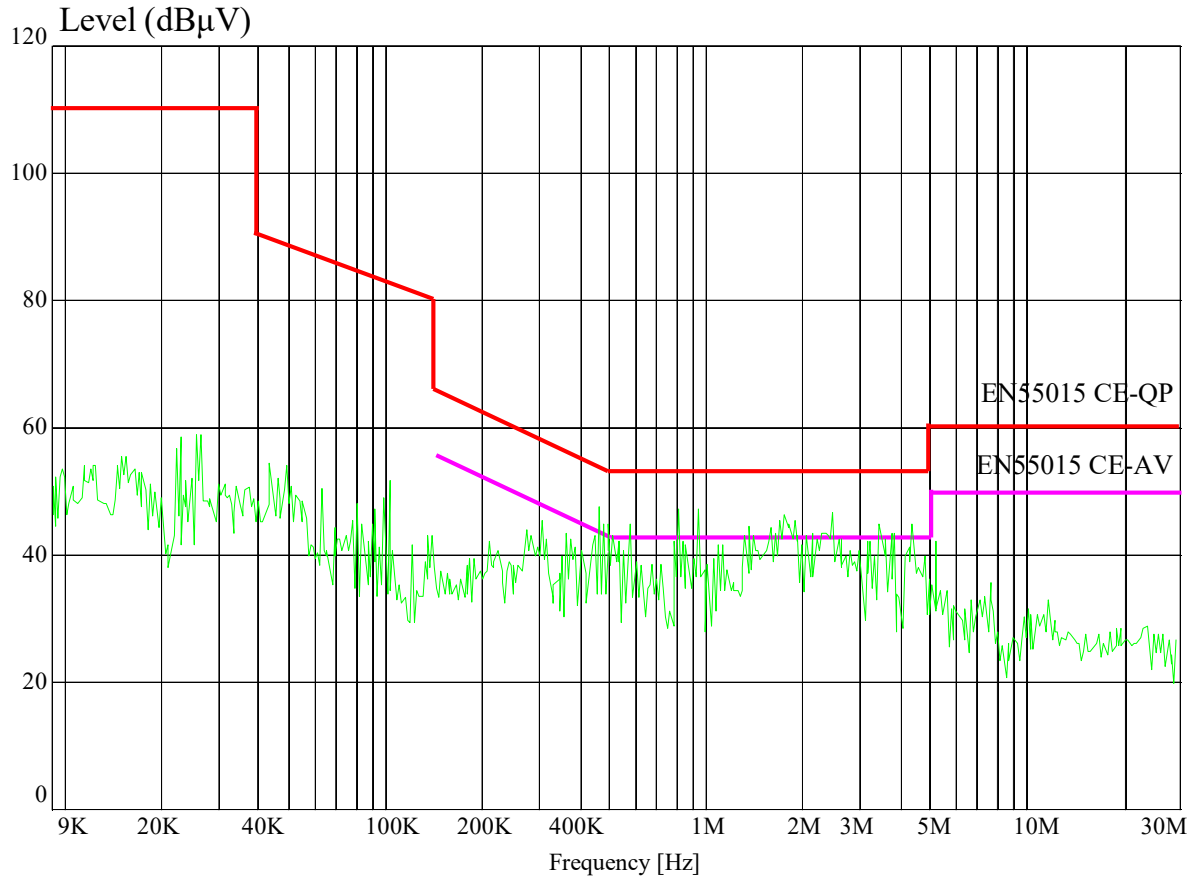
6.4. PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55015 (see Test Facility for the dimensions of the ground plane used).When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per EN 55015.
3) All I/O cables were positioned to simulate typical actual usage as per EN 55015.
4) The EUT received AC230V/50Hz power through the outlet socket under the turntable.
5) All support equipments received AC230V/50Hz power from socket under the turntable, if any.
6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1. connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver
7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) The test mode(s) were scanned during the test
10) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
11) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

The test data of the worst case condition(s) was reported on the Summary Data page.

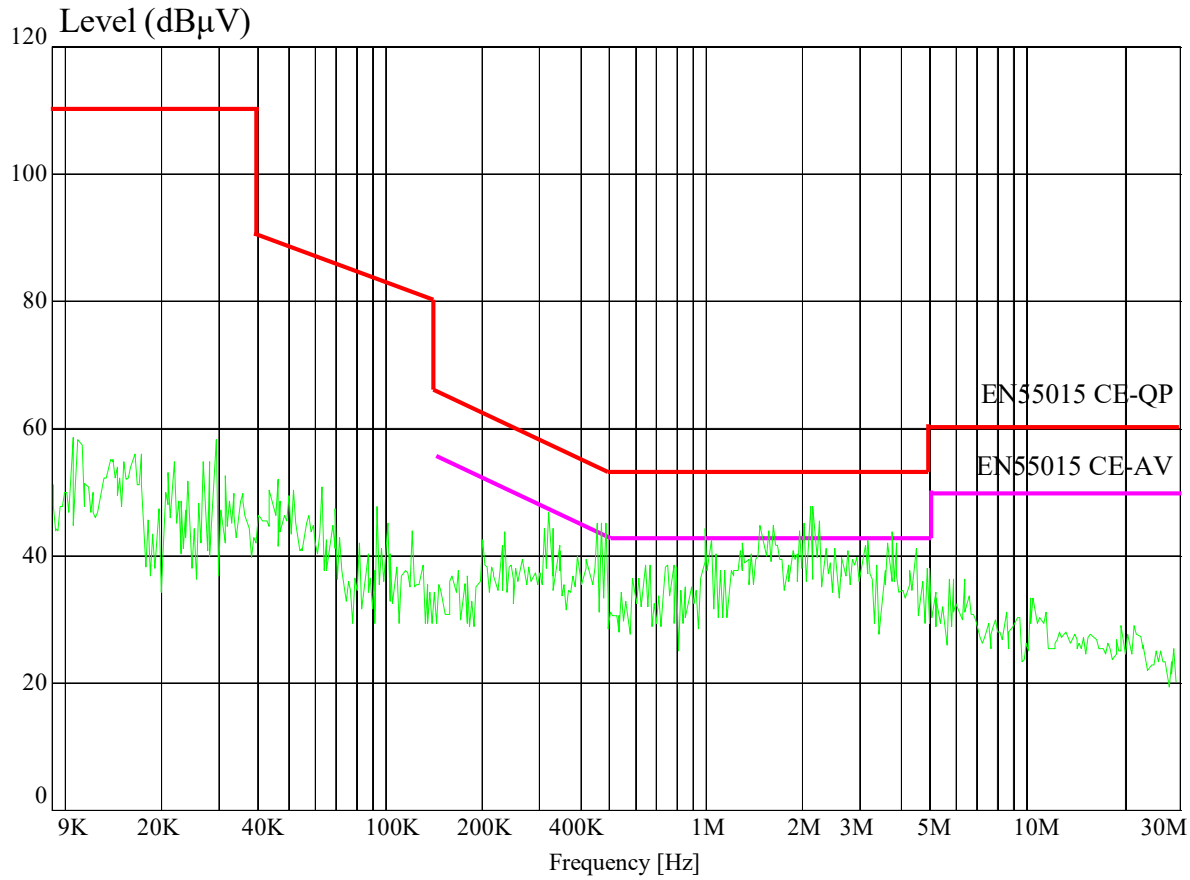
6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

TEST RESULT OF LINE CONDUCTED EMISSION-N



No. MK	Freq.	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuA	dBuA	dB		
1	0.561	46.70	56.00	-9.30	Peak	NEUTRAL
2	0.819	47.05	56.00	-8.95	Peak	NEUTRAL
3 *	0.930	47.36	56.00	-8.64	Peak	NEUTRAL
4	0.561	36.29	46.00	-9.71	Average	NEUTRAL
5	0.819	37.10	46.00	-8.90	Average	NEUTRAL
6 *	0.930	37.29	46.00	-8.71	Average	NEUTRAL

TEST RESULT OF LINE CONDUCTED EMISSION-L



No. MK	Freq.	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuA	dBuA	dB		
1	0.986	46.20	56.00	-9.80	Peak	LINE
2	1.533	46.46	56.00	-9.54	Peak	LINE
3 *	2.061	47.98	56.00	-8.02	Peak	LINE
4	0.986	36.18	46.00	-9.82	Average	LINE
5	1.533	36.48	46.00	-9.52	Average	LINE
6 *	2.061	38.06	46.00	-7.94	Average	LINE

7. EN 55015 RADIATED ELECTROMAGNETIC DISTURBANCE TEST

7.1. TEST EQUIPMENT OF RADIATED ELECTROMAGNETIC DISTURBANCE TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	Aeroflex	2399A	N/A	03/19/2018	03/18/2019
Biconilog Antenna	ETS	3142C	N/A	03/19/2018	03/18/2019
Multi-device Controller	ETS	2090	N/A	03/19/2018	03/18/2019

7.2. LIMITS OF RADIATED ELECTROMAGNETIC DISTURBANCE IN THE RANGE 9 KHz to 30 MHz

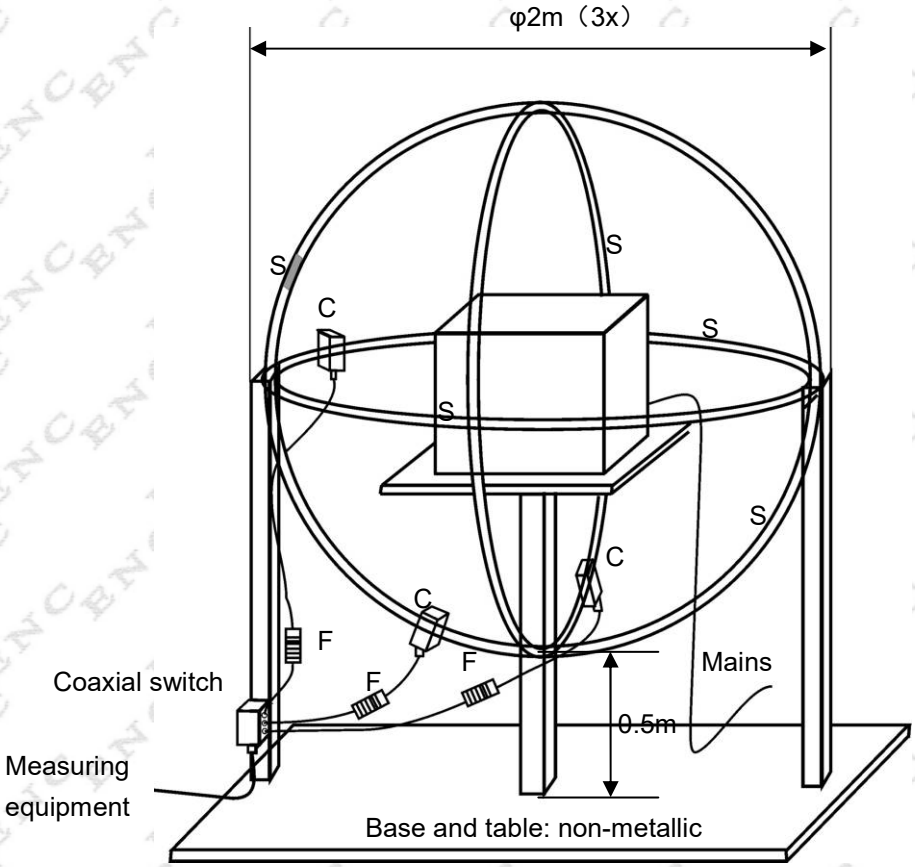
Frequency Range	Limits for Loop Diameter dB(uA) *		
	2m	3m	4m
9 KHz-70 KHz	88	81	75
70 KHz-150 KHz	88 to 58 * *	81 to 51 * *	75 to 45 * *
150 kHz-3.0 MHz	58 to 22 * *	51 to 15 * *	45 to 9 * *
3.0 MHz-30 MHz	22	15 to 16 * * *	9 to 12 * * *

Note: * *At the transition frequency, the lower limit applies.*

* * Decreasing *linearly with the logarithm of the frequency. For electrodeless lamps and luminaries, the limit in the frequency range of 2.2 MHz to 3.0 MHz is 58 dB(uA) for 2m, 51 dB(uA) for 3m and 45 dB(uA) for 4m loop diameter.*

* * * *Increasing linearly with the logarithm of the frequency.*

7.3. BLOCK DIAGRAM OF TEST SETUP



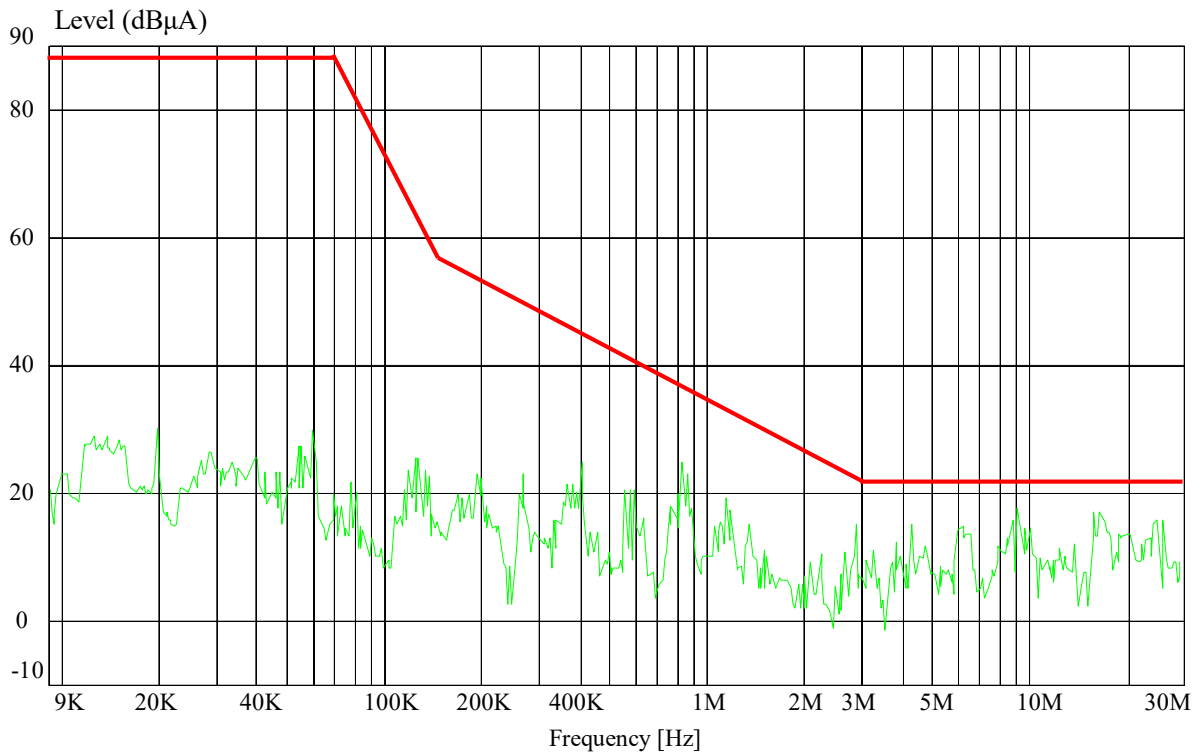
7.4. TEST PROCEDURE

The magnetic component shall be measured by means of a loop antenna as described in EN 55015. The lighting equipment shall be placed in the centre of the antenna, and the position is not critical.

The test object was operated at its upper limit of its rated voltage and its rated frequency. The induced current in the loop antenna is measured by means of a current probe (1V/A) and the CISPR measuring receiver. By means of a coaxial switch the three field directions can be measured in sequence. Each value shall fulfill the requirements given.

7.5. TEST RESULTS OF RADIATED ELECTROMAGNETIC DISTURBANCE

Radiated Electromagnetic Disturbance Measurement



Site: #1 Phase: *L1* Temperature: 20℃

Limit: EN55015 Magnetic Test Power: AC 230V Humidity: 52%

EUT: LED Wash Light

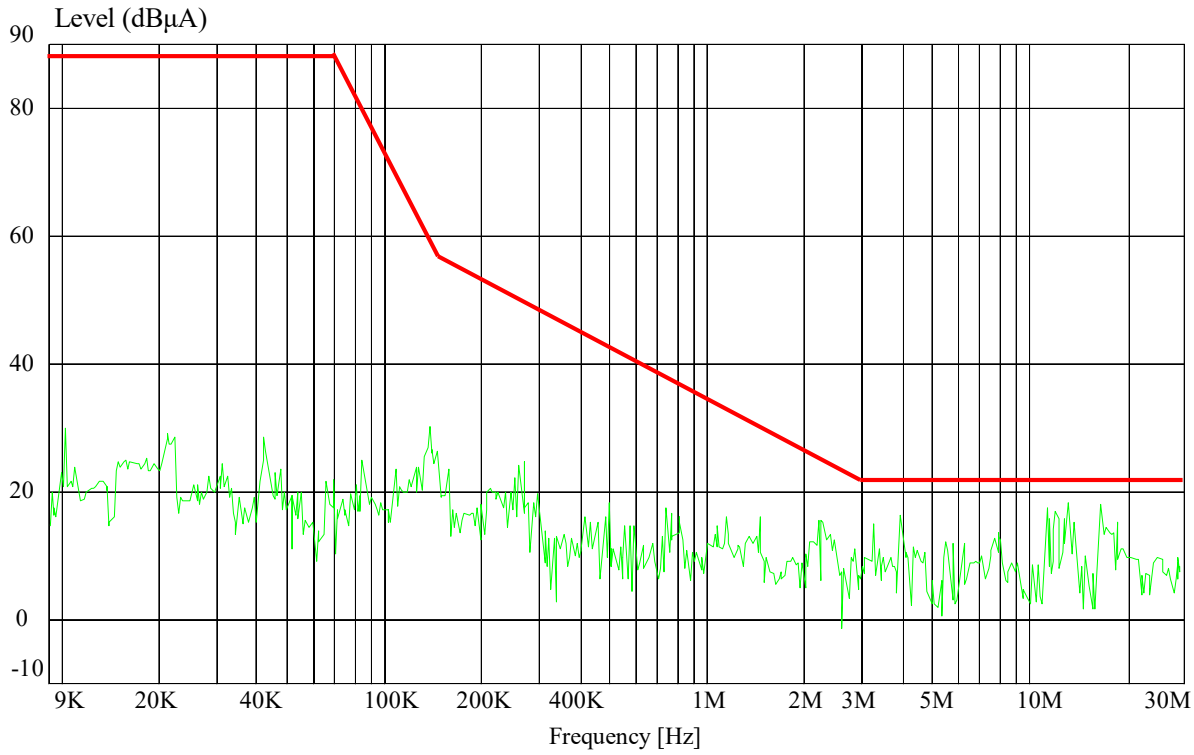
M/N: PHN076

Mode: Lighting

Note:

No. MK	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	4.109	15.42	0.32	15.74	22.00	-6.26	QP	
2	6.133	15.63	0.41	16.04	22.00	-5.96	QP	
3	8.961	15.95	0.50	16.45	22.00	-5.55	QP	
4	9.026	17.50	0.50	18.00	22.00	-4.00	QP	
5 *	15.406	17.55	0.62	18.17	22.00	-3.83	QP	
6	24.564	16.92	0.72	17.64	22.00	-4.36	QP	

Radiated Electromagnetic Disturbance Measurement



Site: #1 Phase: *L2* Temperature: 20℃

Limit: EN55015 Magnetic Test Power: AC 230V Humidity: 52%

EUT: LED Wash Light

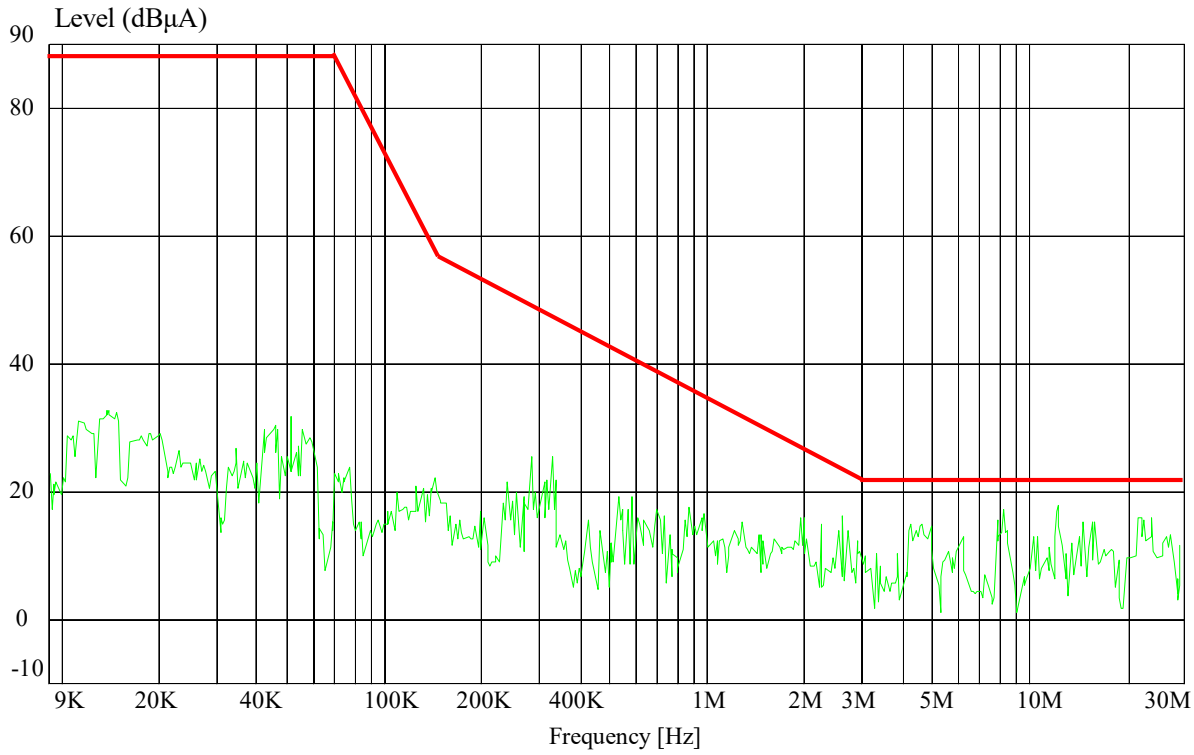
M/N: PHN076

Mode: Lighting

Note:

No. MK	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	3.214	15.50	0.26	15.76	22.00	-6.24	QP	
2	3.926	16.36	0.31	16.67	22.00	-5.33	QP	
3	7.950	12.21	0.47	12.68	22.00	-9.32	QP	
4	11.919	17.43	0.56	17.99	22.00	-4.01	QP	
5	13.893	18.65	0.59	19.24	22.00	-2.76	QP	
6 *	17.028	18.66	0.64	19.30	22.00	-2.70	QP	

Radiated Electromagnetic Disturbance Measurement



Site: #1 Phase: *L3* Temperature: 20℃

Limit: EN55015 Magnetic Test Power: AC 230V Humidity: 52%

EUT: LED Wash Light

M/N: PHN076

Mode: Lighting

Note:

No. MK	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
	MHz	dBuA	dB	dBuA	dBuA	dB	Detector	Comment
1	4.093	15.68	0.32	16.00	22.00	-6.00	QP	
2	4.548	15.62	0.34	15.96	22.00	-6.04	QP	
3	6.166	12.62	0.41	13.03	22.00	-8.97	QP	
4	8.081	17.72	0.47	18.19	22.00	-3.81	QP	
5 *	12.725	17.94	0.57	18.51	22.00	-3.49	QP	
6	22.105	17.01	0.70	17.71	22.00	-4.29	QP	

8. EN 61000-3-2 POWER HARMONICS TEST

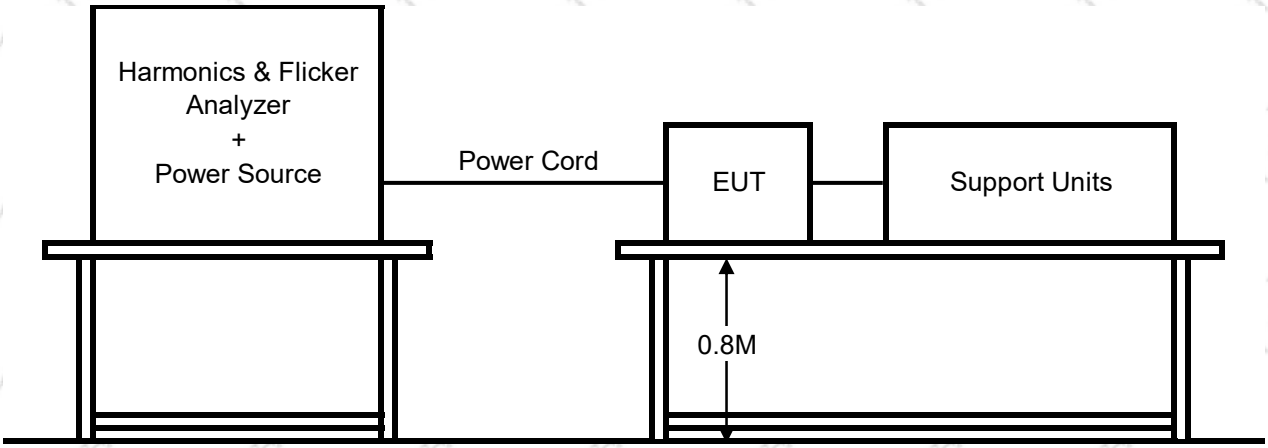
POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2:2014
Limits : ☒CLASS A
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

8.1. TEST EQUIPMENT OF POWER HARMONICS TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Harmonic Emission Flicker	California instruments	500LIX-400	N/A	03/19/2018	03/18/2019

8.2. BLOCK DIAGRAM OF TEST SETUP



8.3. RESULT

PASS.

Harmonic current results

Hn	Harms(max) [A]	Limit [%]	Limit[A]	Result
1	1.380			
2	0.064	5.886	1.080	PASS
3	0.351	15.242	2.300	PASS
4	0.051	11.803	0.430	PASS
5	0.207	18.138	1.140	PASS
6	0.042	14.098	0.300	PASS
7	0.181	23.558	0.770	PASS
8	0.033	14.302	0.230	PASS
9	0.055	13.628	0.400	PASS
10	0.026	14.302	0.184	PASS
11	0.023	7.120	0.330	PASS
12	0.018	11.672	0.153	PASS
13	0.017	8.056	0.210	PASS
14	0.015	11.479	0.131	PASS
15	0.017	11.278	0.150	PASS
16	0.011	9.807	0.115	PASS
17	0.012	9.256	0.132	PASS
18	0.011	11.057	0.102	PASS
19	0.010	8.762	0.118	PASS
20	0.007	7.151	0.092	PASS
21	0.009	8.784	0.107	PASS
22	0.007	7.832	0.084	PASS
23	0.008	7.672	0.098	PASS
24	0.004	4.882	0.077	PASS
25	0.008	8.354	0.090	PASS
26	0.004	5.295	0.071	PASS
27	0.007	7.927	0.083	PASS
28	0.004	5.696	0.066	PASS
29	0.007	8.435	0.078	PASS
30	0.002	3.082	0.061	PASS
31	0.007	9.012	0.073	PASS
32	0.002	3.241	0.058	PASS
33	0.004	5.529	0.068	PASS
34	0.002	3.481	0.054	PASS
35	0.004	5.874	0.064	PASS
36	0.002	3.686	0.051	PASS
37	0.003	4.622	0.061	PASS
38	0.002	3.916	0.048	PASS
39	0.002	3.241	0.058	PASS
40	0.001	1.659	0.046	PASS

9. EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

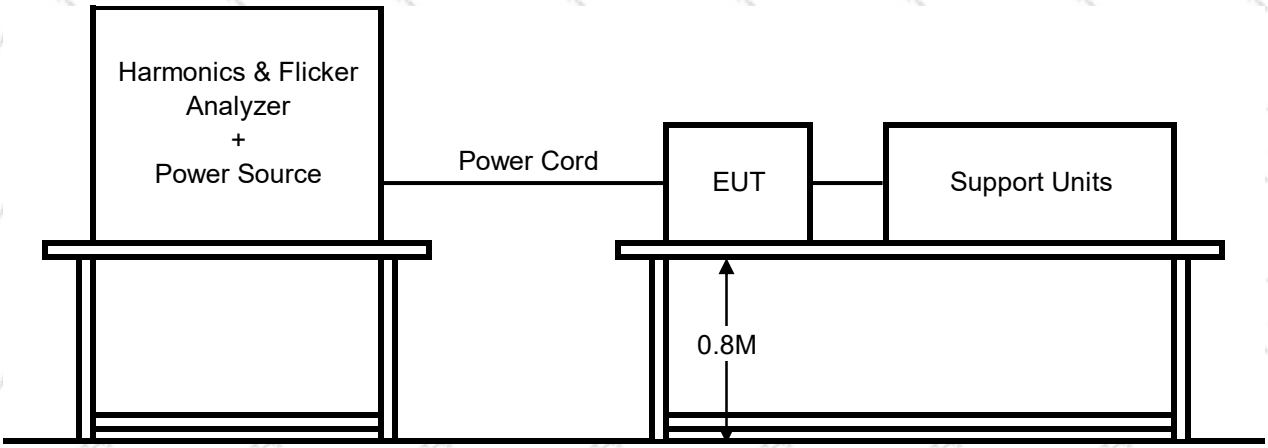
VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3: 2013
Limits : §5 of EN 61000-3-3
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

9.1. TEST EQUIPMENT OF VOLTAGE FLUCTUATION / FLICKER TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Harmonic Emission Flicker	California instruments	500LIX-400	N/A	03/19/2018	03/18/2019

9.2. BLOCK DIAGRAM OF TEST SETUP



Note:

1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The test voltage was maintained within ±2 % of the nominal value. The frequency was 50 Hz ±0.5 %.
2. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.
3. The observation period, Tp, for the assessment of flicker values by flicker measurement, flicker simulation, or analytical method was:

   — for Pst, Tp = 10 min;

   — for Plt, Tp = 2 h.

   The observation period included that part of the whole operation cycle in which the EUT produces the most unfavourable sequence of voltage changes.

9.3. RESULT

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: LED Wash Light | Tested by: Sam Liu

Test category: All parameters (European limits) | Test Margin: 100

Test date: 2018-07-22 | Start time: 09:56:24 | End time: 10:06:24

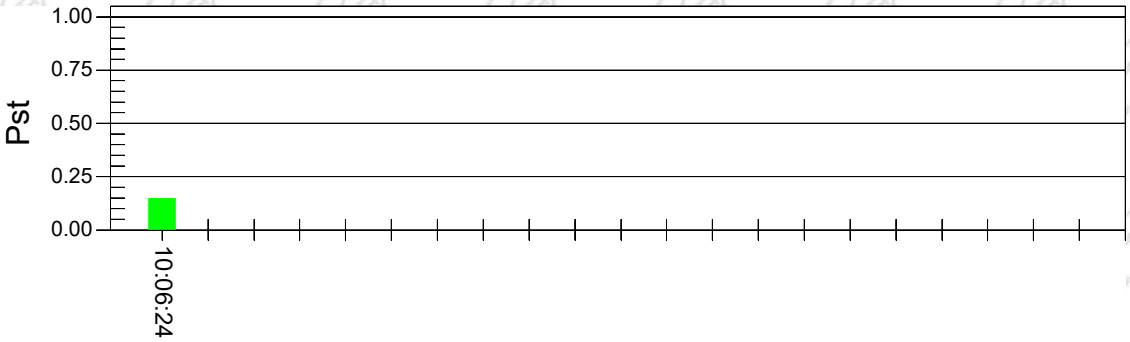
Test duration (min): 10

Comment: On

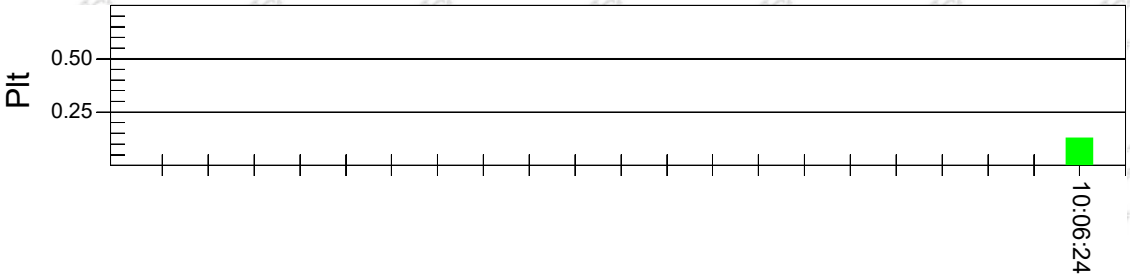
Customer: Guangdong Phoenix Lighting Co., Ltd.

Test Result: Pass **Source qualification: OK**

Pst and limit line **European Limits**



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.1			
Highest dt(%):	-0.26	Test limit (%):	3.30	Pass
Time(mS) > dt:	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.16	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.162	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.146	Test limit:	0.650	Pass

10. IEC 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

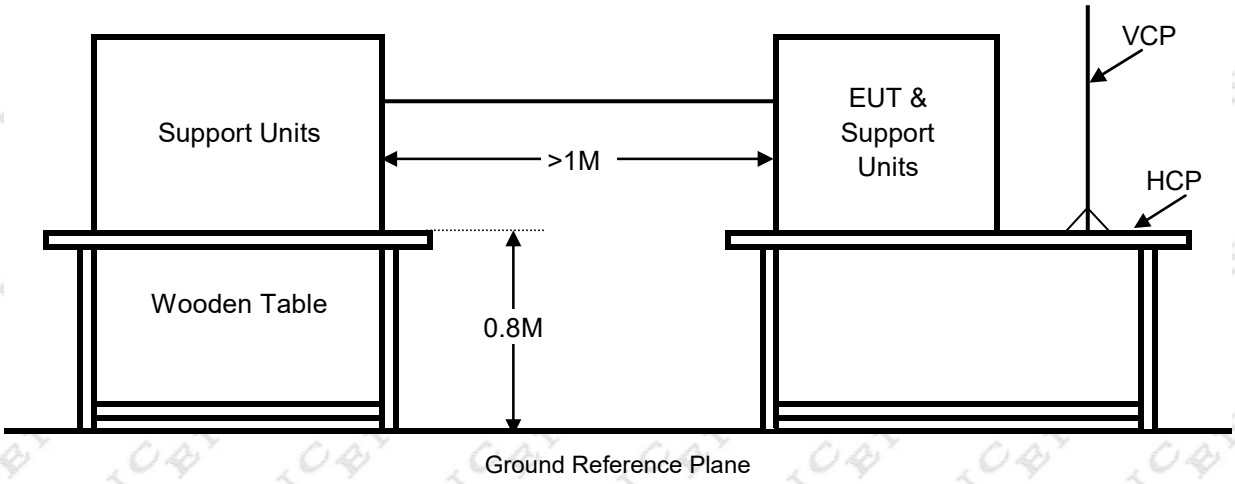
Port : Enclosure
Basic Standard : IEC 61000-4-2:2008
Test Level : ±8 kV (Air Discharge)
±4 kV (Contact Discharge)
±4 kV (Indirect Discharge)
Standard require : B
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

10.1. TEST EQUIPMENT OF ESD TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
ESD Simulator	EM-Test	EST883	N/A	03/19/2018	03/18/2019

10.2. BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



10.3. TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.
The support units were located 1 m minimum away from the EUT.
EUT worked with resistance load, and make sure EUT worked normally.
Actives the communication function if the EUT with such port(s).
As per the requirement of EN 55015: Contact discharge is the preferred test method. 20 discharges (10 with positive and 10 negative polarity) shall be applied on each accessible metal part of the enclosure. In case of a non-conductive enclosure, discharges shall be applied on the horizontal or vertical coupling planes as specified in IEC 61000-4-2.
Air discharges shall be used where contact discharges cannot be applied.

The following test condition was followed during the tests.

Note: *As per the A2 to IEC 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.*

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result (Pass/Fail)
Mini 20 /Point	±2kV; ±4kV	Contact Discharge	Pass
Mini 10 /Point	±2kV; ±4kV	Indirect Discharge HCP (Front)	Pass
Mini 10 /Point	±2kV; ±4kV	Indirect Discharge VCP (Left)	Pass
Mini 10 /Point	±2kV; ±4kV	Indirect Discharge VCP (Back)	Pass
Mini 10 /Point	±2kV; ±4kV	Indirect Discharge VCP (Right)	Pass
Mini 10 /Point	±2kV; ±4kV;±8kV;	Air Discharge	Pass

10.4. PERFORMANCE & RESULT

☐ Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS*** ☐ ***FAIL***

11. IEC 61000-4-3 TEST

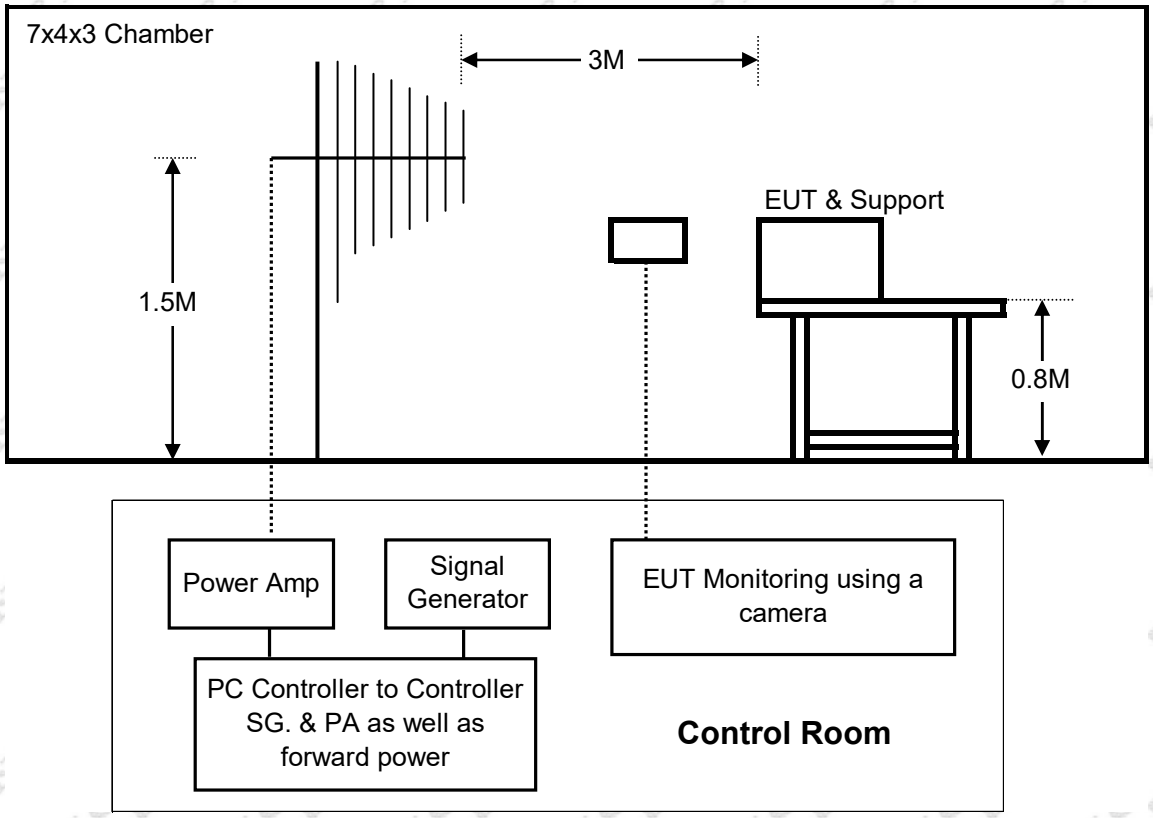
RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port : Enclosure
Basic Standard : IEC 61000-4-3:2010
Test Level : 3V/m with 80% AM. 1kHz Modulation.
Standard require : A
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

11.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Signal Generator	IFA	2023B	N/A	03/19/2018	03/18/2019
Power Amplifier	AR	150W1000	N/A	03/19/2018	03/18/2019
Power Antenna	AR	25S1G4A	N/A	03/19/2018	03/18/2019

11.2. BLOCK DIAGRAM OF TEST SETUP



11.3. TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per IEC 61000-4-3.
EUT worked with resistance load, and make sure EUT worked normally.
Setting the testing parameters of RS test software per IEC 61000-4-3.
Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz and 1400MHz to 2700MHz.
Recording the test result in following table.
It is not necessary to perform test as per annex A of EN 55015 if the EUT doesn't belong to TTE product.

IEC 61000-4-3 Final test conditions:

Test level : 3V/m
Steps : 1 % of fundamental
Dwell Time : 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Result (Pass/Fail)
80-1000 1400-2000	3V/m	AM	H	Front	Pass
80-1000 1400-2000	3V/m	AM	H	Left	Pass
80-1000 1400-2000	3V/m	AM	H	Back	Pass
80-1000 1400-2000	3V/m	AM	H	Right	Pass
80-1000 1400-2000	3V/m	AM	V	Front	Pass
80-1000 1400-2000	3V/m	AM	V	Left	Pass
80-1000 1400-2000	3V/m	AM	V	Back	Pass
80-1000 1400-2000	3V/m	AM	V	Right	Pass

11.4. PERFORMANCE & RESULT

☒Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

12. IEC 61000-4-4 TEST

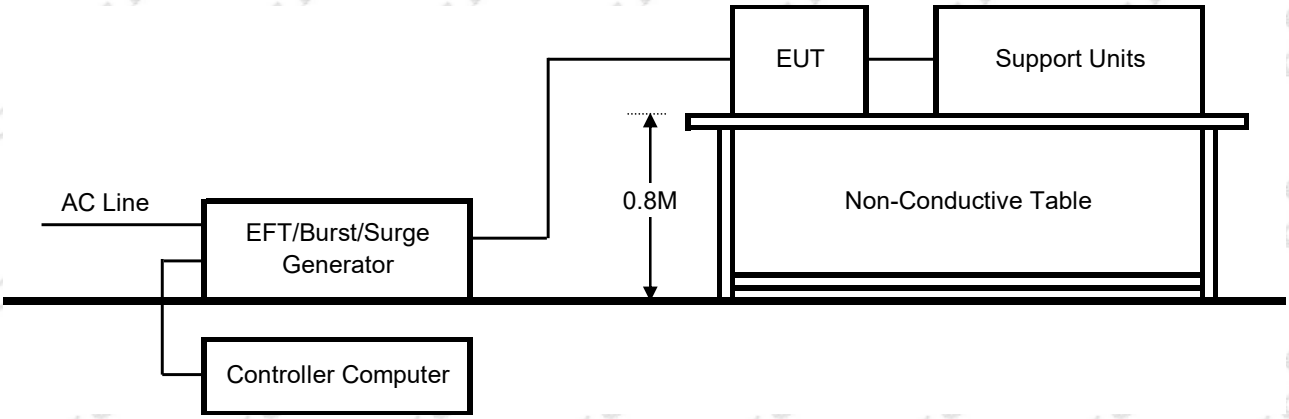
ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST

Port : On Power Supply Lines
Basic Standard : IEC 61000-4-4:2012
Test Level : +/- 1kV for Power Supply Lines
Standard require : B
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

12.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/19/2018	03/18/2019
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/19/2018	03/18/2019
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/19/2018	03/18/2019

12.2. BLOCK DIAGRAM OF TEST SETUP



12.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8m away from ground reference plane.
A 1.0 meter long power cord was attached to EUT during the test.
The length of communication cable between communication port and clamp was keeping within 1 meter.
EUT worked with resistance load, and make sure EUT worked normally.
Related peripherals work during the test.
Recording the test result as shown in following table.

Test conditions:

Impulse Frequency: 5 kHz
Tr/Th: 5/50ns
Burst Duration: 15ms
Burst Period: 300ms

Inject Line	Voltage kV	Inject Method	Result (Pass/Fail)
L+N	+ /- 1	Direct	Pass

12.4. PERFORMANCE & RESULT

☐Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

13. IEC 61000-4-5 SURGE IMMUNITY TEST

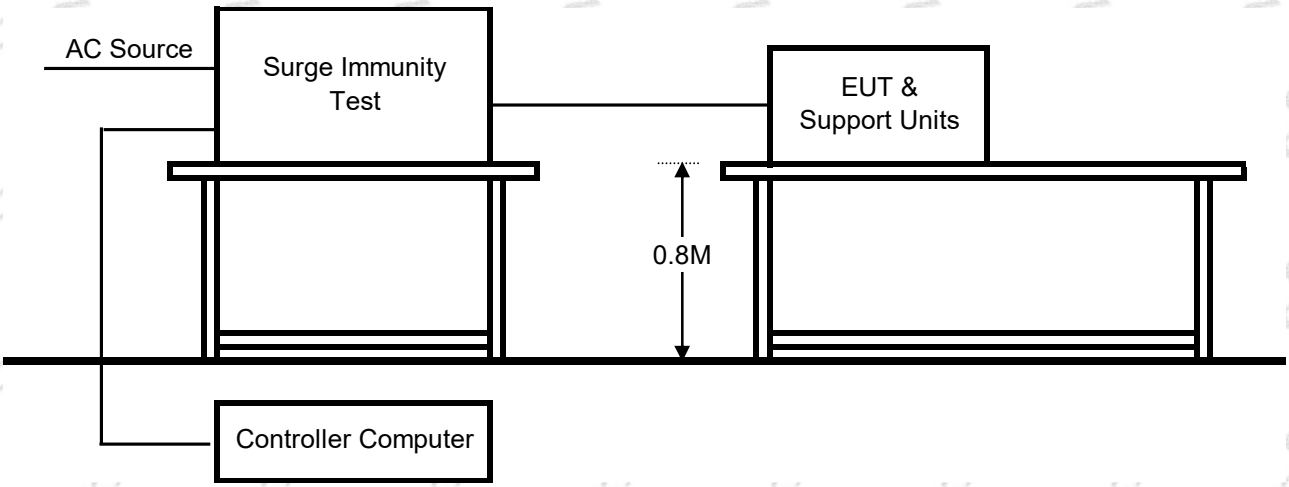
SURGE IMMUNITY TEST

Port	:	On Power Supply Lines
Basic Standard	:	IEC 61000-4-5:2014
Requirements	:	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)
Standard require	:	B
Tester	:	Sam Liu
Temperature	:	20℃
Humidity	:	52%

13.1. TEST EQUIPMENT OF SURGE TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/19/2018	03/18/2019
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/19/2018	03/18/2019
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/19/2018	03/18/2019

13.2. BLOCK DIAGRAM OF TEST SETUP



13.3. TEST PROCEDURE

The EUT and support units were located on a wooden table 0.8 m away from ground floor.
EUT worked with resistance load, and make sure EUT worked normally.
Recording the test result as shown in following table.

Test conditions:

Voltage Waveform	:	1.2/50 us
Current Waveform	:	8/20 us
Polarity	:	Positive/Negative
Phase angle	:	0°, 90°, 270°
Number of Test	:	5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Result (Pass/Fail)
L1-L2	0.5	Positive	Capacitive	Pass
L1-L2	0.5	Negative	Capacitive	Pass

13.4. PERFORMANCE & RESULT

☐Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☒Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

14. IEC 61000-4-6 TEST

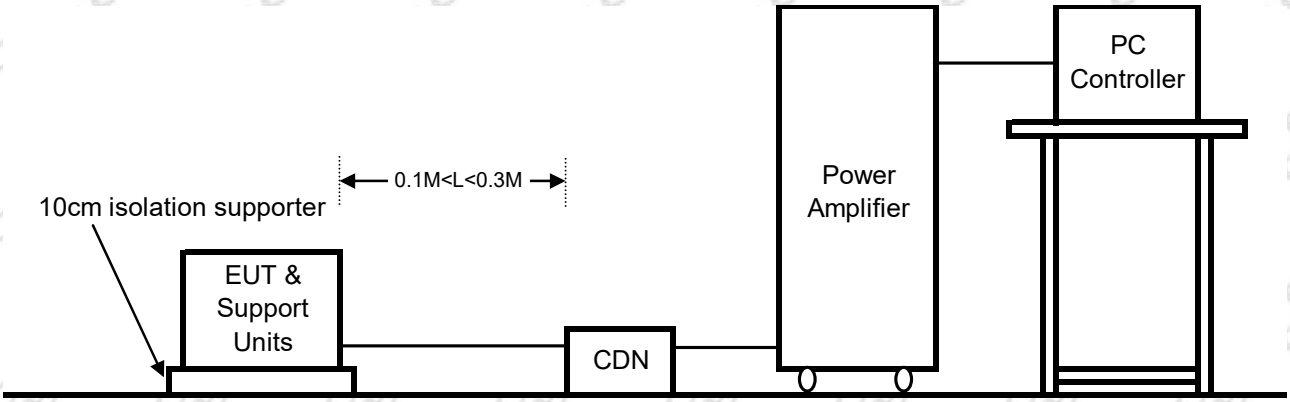
IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELD

Port : Power Supply Lines
Basic Standard : IEC 61000-4-6:2013
Requirements : 3V with 80% AM. 1 kHz Modulation
Standard require : A
Tester : Sam Liu
Temperature : 20℃
Humidity : 52%

14.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Power Amplifier	AR	150W1000	N/A	03/19/2018	03/18/2019
CDN	EM-Test	CNV504S1	N/A	03/19/2018	03/18/2019
Direction Coupler	EM-Test	DC2600N	N/A	03/19/2018	03/18/2019
EM-Clamp	EM-Test	EM101	N/A	03/19/2018	03/18/2019
Caliberation	EM-Test	CAM2/M3	N/A	03/19/2018	03/18/2019
Attenuator	EM-Test	ATT6/75	N/A	03/19/2018	03/18/2019
Power Sensor	AR	PH2000	N/A	03/19/2018	03/18/2019
Power Meter	AR	PM2002	N/A	03/19/2018	03/18/2019
Signal Generator	IFA	2023A	N/A	03/19/2018	03/18/2019

14.2. BLOCK DIAGRAM OF TEST SETUP



14.3. TEST PROCEDURE

The EUT and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
EUT worked with resistance load, and make sure EUT worked normally.
Related peripherals work during the test.
Setting the testing parameters of CS test software per IEC 61000-4-6.
Recording the test result in following table.

Test conditions:

Frequency Range: 0.15MHz-80MHz
Frequency Step: 1% of fundamental
Dwell Time: 1 sec

Range (MHz)	Strength	Modulation	Result (Pass/Fail)
0.15-80	3V	AM	Pass

14.4. PERFORMANCE & RESULT

☒Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ *PASS*	☐ *FAIL*

15. IEC 61000-4-8 TEST

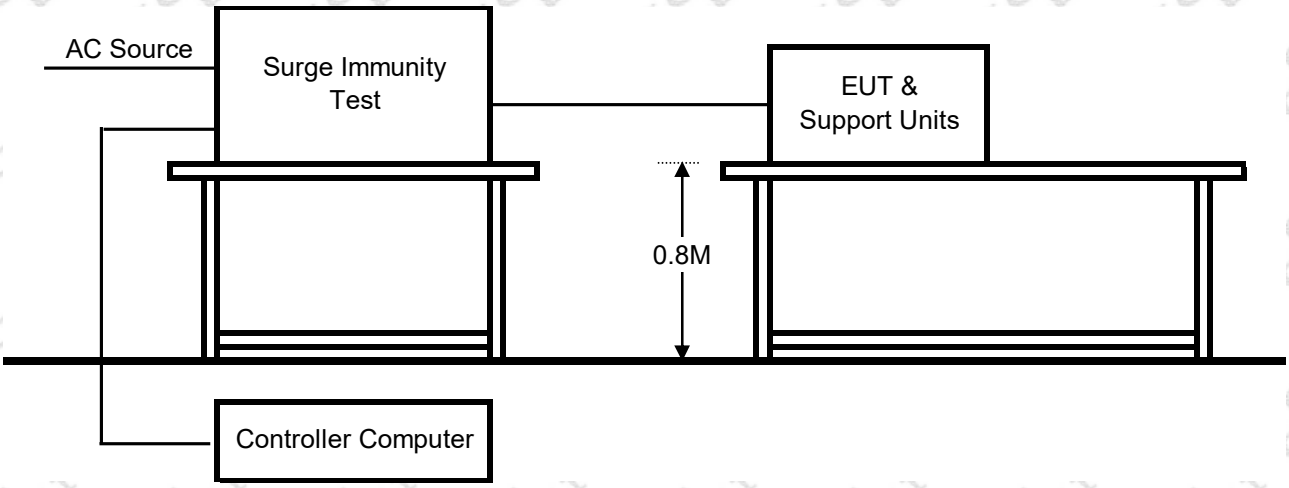
POWER FREQUENCY ELECTROMAGNETIC FIELDS IMMUNITY TEST

Port	:	Enclosure
Basic Standard	:	IEC 61000-4-8:2009
Requirements	:	50/60 Hz, 3A/m
Standard require	:	A
Tester	:	Sam Liu
Temperature	:	20℃
Humidity	:	52%

15.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMCPRO	KEYTEK	--	N/A	03/19/2018	03/18/2019
COIL	FCC	F-1000-4-8	N/A	03/19/2018	03/18/2019

15.2. BLOCK DIAGRAM OF TEST SETUP



15.3. TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m × 1m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

Test Conditions:

Frequency	Polarity	Level	Observation	Meet Performance Criteria
50 Hz	X	3 A/m	Normal	A
50 Hz	Y	3 A/m	Normal	A
50 Hz	Z	3 A/m	Normal	A

15.4. PERFORMANCE

☒Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☐Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ ***PASS***	☐ ***FAIL***

16. IEC 61000-4-11 TEST

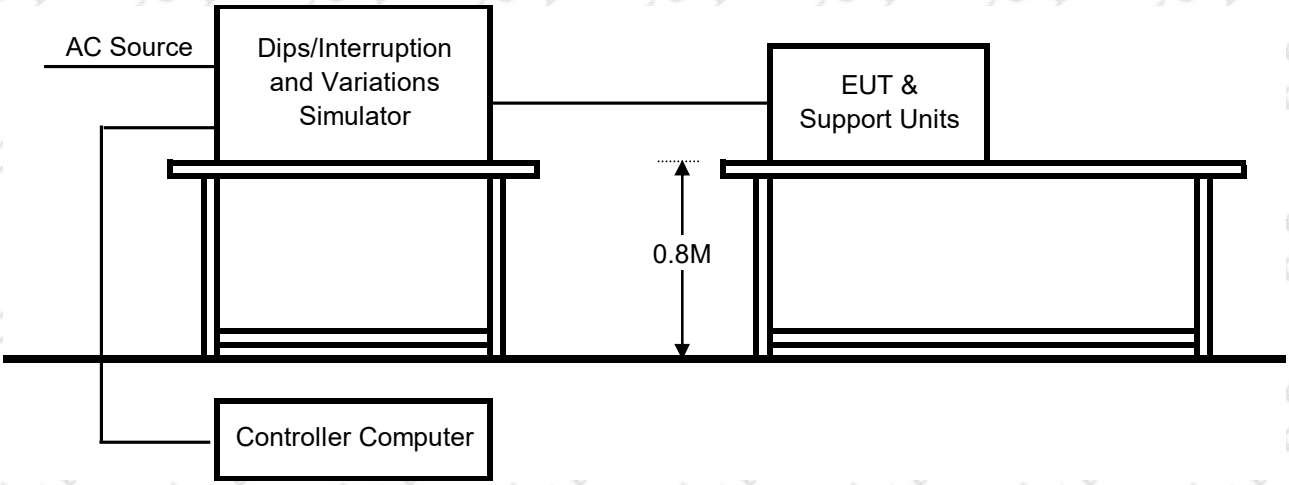
VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

Port	:	Power Supply Lines
Basic Standard	:	IEC 61000-4-11:2004
Requirements	:	0, 45, 90, 135, 180, 225, 270, 315 degrees
Standard require	:	Min. 10 sec.
Test Interval:	:	Sam Liu
Temperature	:	20℃
Humidity	:	52%

16.1. TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Compact Generator	EM-Test	UCS500M	N/A	03/19/2018	03/18/2019
Capacitive Clamp	EM-Test	HY21-EFTC	N/A	03/19/2018	03/18/2019
CDN for Telecom Port	EM-Test	CNV504S1	N/A	03/19/2018	03/18/2019

16.2. BLOCK DIAGRAM OF TEST SETUP



16.3. TEST PROCEDURE

The EUT and support units were located on a wooden table, 0.8 m away from ground floor. EUT worked with resistance load, and make sure EUT worked normally.

Setting the parameter of tests and then perform the test software of test simulator.

Conditions changes to occur at 0 degree crossover point of the voltage waveform.

Recording the test result in test record form.

Test conditions:

The duration with a sequence of three dips/interruptions with interval of 10 s minimum (Between each test event)

Voltage Dips and Interruptions:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	0.5	Normal	B
70	30	25	Normal	C

16.4. PERFORMANCE

☐Criteria A: The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.

☐Criteria B: The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.

☒Criteria C: Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒ *PASS*	☐ *FAIL*

----END OF REPORT----