EMC COMPLIANCE TEST REPORT

For

LED Canopy Light

Trade Name : V-TAC

Model Number : VT-9-155

Serial Number : N/A

Report Number : TK180116016-S-E

Date : January 16，2018

Regulations : See below

Standards	Results (Pass/Fail)
EN 55015: 2013;/A1：2015	PASS
EN 61000-3-2: 2014	PASS
EN 61000-3-3: 2013;	PASS
EN 61547: 2009;	PASS

Prepared for :

V-TAC Exports Limited
Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong

Prepared by :

TOKE-TEST LABORATORY CO., LTD.

d.b.a.

TOKE-TEST LABORATORY CO., LTD.
NO.7 ,XINSHIDAI INDUSTRIAL,GUANTIAN VILLAGE,
SHIYAN TOWN, BAOAN DISTRICT, SHENZHEN, CHINA
TEL: 86-755-33263607 FAX: 86-755-33263587

EC-Declaration of Conformity

For the following equipment:

(Product Name)
LED Canopy Light

(Model Designation / Trade name)
VT-9-155

(Manufacturer Name)
V-TAC Exports Limited

(Manufacturer Address)
Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive 2014/30/EU, For the evaluation regarding the Electromagnetic Compatibility the following standards are applied:

V	EN 55015: 2013;
V	EN 61000-3-2: 2014
V	EN 61000-3-3: 2013;
V	EN 61547: 2009;

The following manufacturer / importer or authorized representative established within the EUT is responsible for this declaration:

V-TAC Exports Limited

(Company Name)
Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong

(Company Address)

Person responsible for making this declaration:

(Name, Surname)

(Position / Title)

(Place) (Date) (Legal Signature)

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

TABLE OF CONTENTS

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

VERIFICATION OF COMPLIANCE

Equipment Under Test:	LED Canopy Light
Trade Name:	V-TAC
Model Number:	VT-9-155
Serial Number:	N/A
Applicant:	V-TAC Exports Limited Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong
Manufacturer:	V-TAC Exports Limited Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong
Type of Test:	EMC Directive 2014/30/EU for CE Marking
Technical Standards:	EN 61000-3-3：2013 EN 55015: 2013/A1：2015 EN 61547: 2009; EN61000-3-2:2014
File Number:	TK180116016-S-E
Date of test:	January 16，2018
Deviation:	None
Condition of Test Sample:	Normal

The above equipment was tested by TOKE Laboratory 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.

The test results of this report relate only to the tested sample identified in this report.

Approved by Authorized Signatory: _____

SALON OUYANG / Q.A. Manager

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

GENERAL INFORMATION

Applicant:	V-TAC Exports Limited Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong
Manufacturer:	V-TAC Exports Limited Room No 301, Kam On Building, 176A Queens Road Central, Central, Hong Kong
File Number:	TK180116016-S-E
Date of Test:	January 16，2018
Equipment Under Test:	LED Canopy Light
Model Number:	VT-9-155
Serial Number:	N/A
Type of Test:	EMC Directive 2014/30/EU arking
Technical Standards:	EN 55015: 2013/1：2015 EN 61000-3-2: 2014; EN 61000-3-3: 2013; EN 61547: 2009;

Frequency Range (EN 55015):	9kHz to 30MHz for Line Conducted Test 30MHz to 1000MHz for Radiated Emission Test
Test Site	TOKE LABORATORY CO., LTD. No. 7, Xinshidai industrial, Guantian Village, Shiyan Town, Baoan District, Shenzhen, China

SHENZHEN TOKE TECHNOLOGY CO., LTD. TEST REPORT

SYSTEM DESCRIPTION

EUT Test Program:

1. Set up EUT with the auxiliary equipment.

2. Let EUT work in the test mode and measure it.

PRODUCT INFORMATION

EUT Sheathing Material:	LED Canopy Light
EUT Power Rating:	AC100-240V ,50/60Hz,
Power during Test:	AC 220V / 50Hz
DC Power Cable:	N/A

I/O Port of EUT:

I/O Port Type	Q'TY	Tested with
Power in port	1	1

Difference between model numbers as below:

These products listed in the report are identical, except that their model numbers are different just for marketing purpose.

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

SUPPORT EQUIPMENT

No.	Equipment	Model #	Serial #	Trade Name	Data Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A

****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.

TEST FACILITY

Location: No. 7,Xinshidai industrial, Guantian Village,
Shiyan Town, Baoan District Shenzhen, China.

Description: There is one 3/10m open area test sites and one 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: A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Site Accreditation: Accredited by FCC.
The certificate registration number is 963441
Accredited by TUV.

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.

Ground Plane: Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna. It has no holes or gaps having longitudinal dimensions larger than one-tenth of a wavelength at the highest frequency of measurement up to 1GHz.

TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at SinTek Laboratory Co., Ltd. for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 9kHz to 1.0GHz or above.

Equipment used during the tests:

Open Area Test Site: A

Open Area Test Site A					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL. DUE**
EMI TEST RECEIVER	SCHAFFNER	SCR3501	464	10/12/2017	10/12/2018
AMPLIFIER	Com-Power	PA-103	161062	10/12/2017	10/12/2018
ANTENNA	SCHAFFNER	CBL6111C	2775	10/12/2017	10/12/2018
CABLE	TIME MICROWAVE	LMR-400	N-TYPE04	10/12/2017	10/12/2018

Conducted Emission Test Site: 843

Conducted Emission Test Site 843					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL. DUE**
Spectrum Analyzer	ADVANTEST	R3132	140301570	10/12/2017	10/12/2018
LISN(EUT)	Com-Power	LI115	2027	10/12/2017	10/12/2018

The calibrations of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument.

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

TEST EQUIPMENT LIST

ESD test (61000-4-2)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
ESD Generator	SCHAFFNER	NSG 435	5488	10/12/2017	10/12/2018

Radiated Electromagnetic Field immunity Measurement (61000-4-3)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Signal Generator	Maconi	2022D	119246/003	10/12/2017	10/12/2018
Power Amplifier	M2S	A00181/ 1000	9801-112	10/12/2017	10/12/2018
Power Amplifier	M2S	AC8113/ 800-250A	9801-179	10/12/2017	10/12/2018
Power Antenna	SCHAFFNER	CBL6140A	1204	10/12/2017	10/12/2018

Fast Transients/Burst test (61000-4-4)/Surge(61000-4-5)/Voltage Dips &Interruptions(61000-4-11)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Fast Transients/Burst Generator	SCHAFFNER	MODULA 6000	34354	10/12/2017	10/12/2018

CS test (61000-4-6)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Signal Generator	SCHAFFNER	NSG 2070	1086	10/12/2017	10/12/2018
CDN	SCHAFFNER	M016	20812	10/12/2017	10/12/2018

Magnetic Field test (61000-4-8)					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Magnetic Field Tester	SCHAFFNER	MAG100	2500	10/12/2017	10/12/2018

SECTION 1 EN 55015(LINE CONDUCTED AND RADIATED EMISSION)

MEASUREMENT PROCEDURE
(PRELIMINARY 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 table with a height of 0.8 meters is used and is placed on the ground plane as per EN55015 (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 EN55015.

1) All I/O cables were positioned to simulate typical actual usage as per EN55015.

2) The EUT received AC 230V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane

3) All support equipment received AC 230V/50Hz power from a second LISN which supplied power source, if any.

4) 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.

5) Analyzer / Receiver scanned from 9kHz to 30MHz for emissions in each of the test modes.

6) During the above scans, the emissions were maximized by cable manipulation.

7) The following test mode(s) were scanned during the preliminary test:

Preliminary Conducted Emission Test			
Frequency Range Investigated		9KHz TO 30 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
ON	2018-01-08	VT-9-155 (L,N)	☒

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

MEASUREMENT PROCEDURE
(FINAL LINE CONDUCTED EMISSION TEST)

1) EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.

2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. 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 an Average detector.

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

Data Sample:

Freq. MHz	Peak Raw dBuV	Q.P. Raw dBuV	Average Raw dBuV	Q.P. Limit dBuV	Average Limit dBuV	Q.P. Margin dB	Average Margin dB	Note
x.xxx	41.90	---	---	56.00	46.00	---	-4.10	L 1

Freq.	= Emission frequency in MHz
Raw dBuV	= Uncorrected Analyzer/Receiver reading
Limit dBuV	= Limit stated in standard
Margin dB	= Reading in reference to limit
Note	= Current carrying line of reading
"---"	= The emission level complied with the Average limits, with at least 2 dB margin, so no further recheck.

LINE CONDUCTED EMISSION LIMIT

Frequency	Maximum RF Line Voltage	
	Q.P.	AVERAGE
9kHz-50kHz	110dBuV	--
50kHz-150kHz	90-80dBuV	--
150kHz-0.5MHz	66-56dBuV	56-46dBuV
0.5MHz-5MHz	56dBuV	46dBuV
5.0MHz-30MHz	60dBuV	50dBuV

**Note: The lower limit shall apply at the transition frequency.

MEASUREMENT PROCEDURE
(PRELIMINARY RADIATED 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 AC 230V/50Hz power from the outlet socket under the turntable. All support equipment received AC 230V/50Hz power from socket under the turntable, if any.

5) The antenna was placed at 10 meters away from the EUT as stated in EN 55015. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.

6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

7) The following test mode(s) were scanned during the preliminary test:

Preliminary Radiated Emission Test			
Frequency Range Investigated		30 MHz TO 1000 MHz	
Mode of operation	Date	Data Report No.	Worst Mode
ON	2018-01-08	VT-9-155 (V, H)	☒

Then, the EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for final testing.

MEASUREMENT PROCEDURE
(FINAL RADIATED EMISSION TEST)

1) EUT and support equipment were set up on the turntable as per step 7 of the preliminary test.

2) The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

3) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

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

Data Sample:

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
34.85	V	9.21	16.47	25.68	30.00	-4.32	P

Freq. = Emission frequency in MHz
Reading (dBuV/m) = Uncorrected Analyzer / Receiver reading
Corr. Factor (dB) = Correction factors of antenna factor and cable loss
Measured dBuV/m = Raw reading converted to dBuV/m and CF added
Limit dBuV/m = Limit stated in standard
Margin dB = Reading in reference to limit
P =Peak Reading
Q =Quasi-peak

RADIATED EMISSION LIMIT

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBu V/m/ Q.P.)
30-230	3	40
230-1000	3	47

****Note:** The lower limit shall apply at the transition frequency.

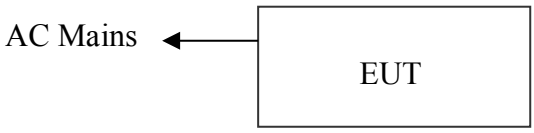
BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators

EUT : LED Canopy Light

Trade Name : V-TAC

Model Number : VT-9-155



（**EUT:** LED Canopy Light）

SUMMARY DATA
(LINE CONDUCTED TEST)

Model Number: VT-9-155 **Location:** 843-site

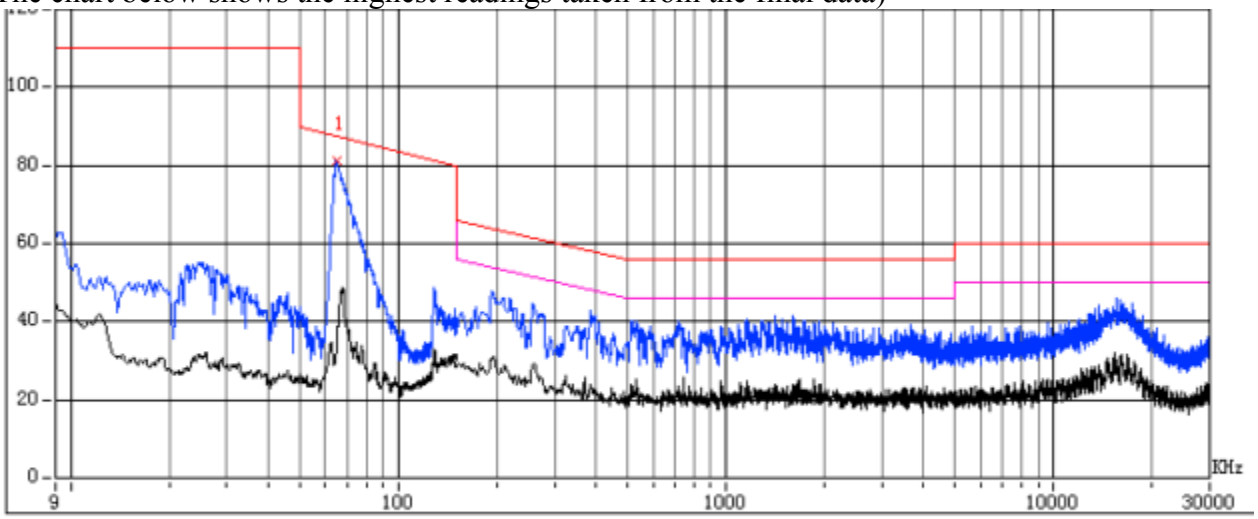
Tested by: steven

Test Mode: ON

Test Results: Passed

Temperature: 21°C **Humidity:** 60%RH

(The chart below shows the highest readings taken from the final data)



	Freq(KHz)	Peak Amptd(dBuV)	QP Amptd(dBuV)	Avg Amptd(dBuV)	QP Limit(dBuV)	Avg Limit(dBuV)	QP Margin(dB)	Avg Margin(dB)	Factor(dB)
1	64.6950	81.40	---	---	88.53	88.53	-7.13	N/A	0.31

L1 = Line One (Hot side) / L2 = Line Two (Neutral side)

****NOTE:** "---" denotes the emission level was or more than 2dB below the Average limit, so no re-check anymore.

SHENZHEN TOKE TECHNOLOGY CO., LTD. TEST REPORT

SUMMARY DATA

(RADIATED EMISSION TEST)

Model Number: VT-9-155 **Location:** A-site

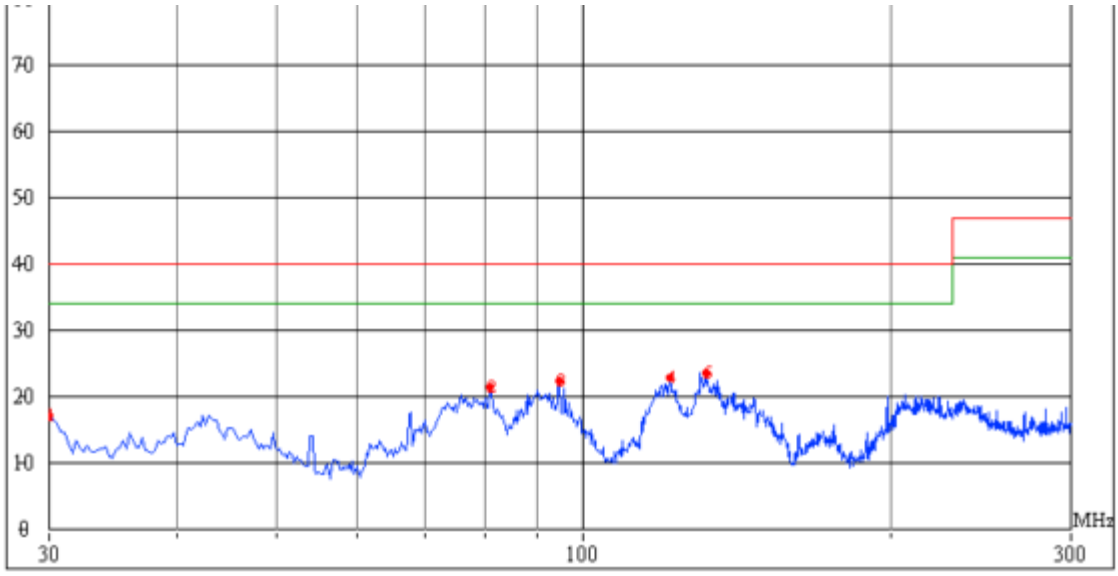
Tested by: salon **Test Distance:** 3m

Test Mode: ON **Test Results:** Passed

Detector Function: Peak/QP

Temperature: 21ºC **Humidity:** 60%RH

(The chart below shows the highest readings taken from the final data)



	Freq(MHz)	Level(dBuV/m)	Margin(dB)	Limit(dBuV/m)	Reading(dBuV)	Factor(dB)	Remark
1	30.0000	17.06	-22.94	40.00	8.66	8.40	
2	81.0300	21.42	-18.58	40.00	5.88	15.54	
3	94.8000	22.49	-17.51	40.00	5.19	17.30	
4	121.5300	22.95	-17.05	40.00	11.80	11.15	
5	131.7900	23.61	-16.39	40.00	9.45	14.16	

SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

SECTION 2 EN 61000-3-2 & EN 61000-3-3(POWER HARMONICS & VOLTAGE FLUCTUATION / FLICKER)

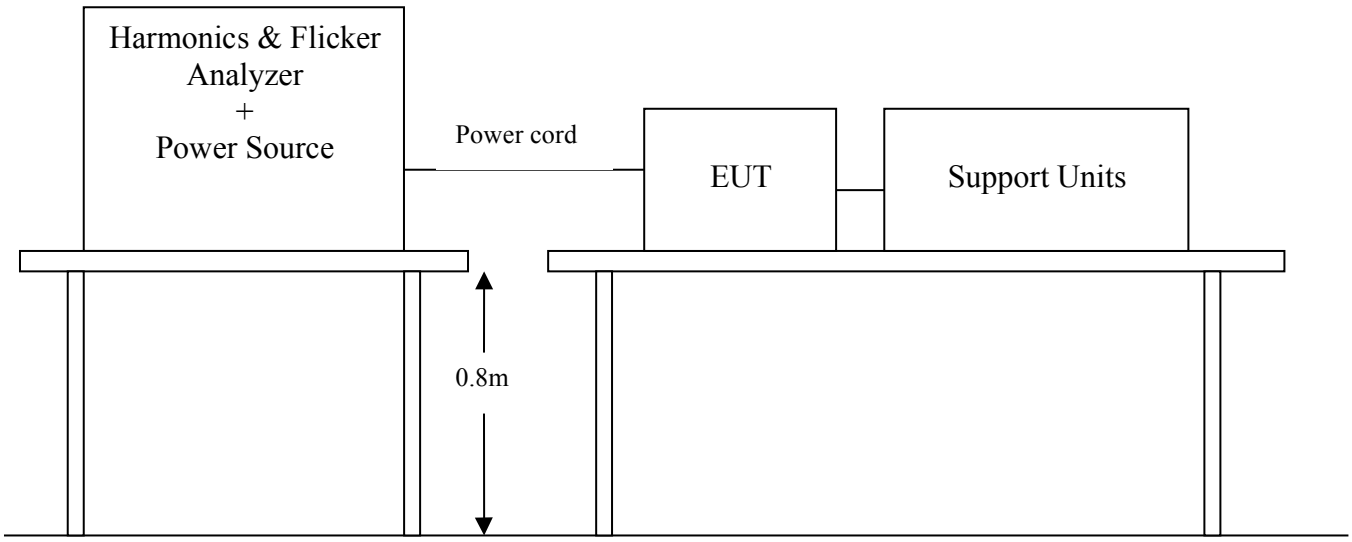
POWER HARMONICS MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-2 (2006+A1:2009+A2:2009)
Limits : [V] CLASS C ; [ ] CLASS D
Tester : Ray
Temperature : 24°C
Humidity : 60%

VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port : AC mains
Basic Standard : EN 61000-3-3 (2008)
Limits : section 5 of EN 61000-3-3
Tester : Ray
Temperature : 24°C
Humidity : 60%

Block Diagram of Test Setup:



Result:PASS

Please see the attached test data

N/A(The EUT max power be not more than 25W,this test items not be required.)

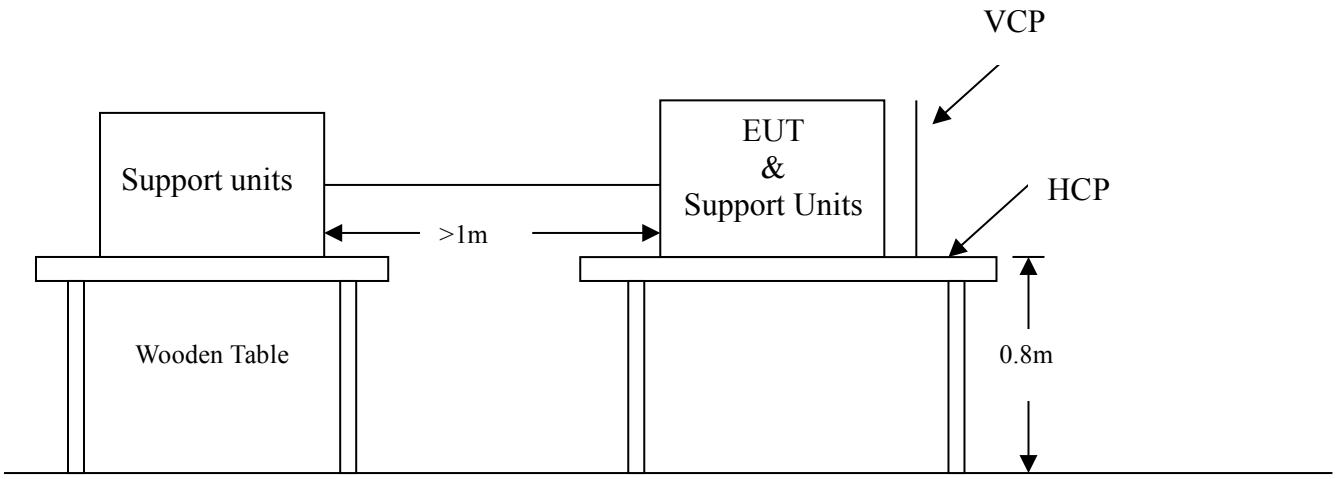
SECTION 3 EN 61000-4-2 (ELECTROSTATIC DISCHARGE)

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	:	Enclosure
Basic Standard	:	EN 61000-4-2
Test Level :		± 8 kV (Air Discharge) ±4kV (Contact Discharge)
Performance Criteria	:	B (Standard require)
Tester :		Steven
Temperature/Humidity:		25ºC/60%

Block Diagram of Test Setup:

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



Ground Reference Plane

Test Procedure:

2. 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.
3. Set up EUT with the auxiliary equipment.
4. Let EUT work in the test mode and measure it.
5. Active the communication function if the EUT with such port(s).
6. As per the requirement of EN 55024; applying direct contact discharge at the sides other than front of EUT at minimum 50 discharges (25 positive and 25 negative) if applicable, can't be applied direct contact discharge side of EUT then the indirect discharge shall be applied. One of the test points shall be subjected to at least 50 indirect discharge (contact) to the front edge of horizontal coupling plane.
7. Other parts of EUT where it is not possible to perform contact discharge then selecting appropriate points of EUT for air discharge, a minimum of 10 single air discharges shall be applied.
8. The application of ESD to the contact of open connectors is not required.
9. Putting a mark on EUT to show tested points. The following test condition was followed during the tests.

Note: As per the A2 to EN 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 10 /Point	±8kV	Air Discharge	Pass
Mini 10 /Point	±4kV	Contact Discharge	Pass
Mini 10 /Point	±4kV	Indirect Discharge HCP	Pass
Mini 10 /Point	±4kV	Indirect Discharge VCP(Front)	Pass
Mini 10 /Point	±4kV	Indirect Discharge VCP(Left)	Pass
Mini 10 /Point	±4kV	Indirect Discharge VCP(Back)	Pass
Mini 10 /Point	±4kV	Indirect Discharge VCP(Right)	Pass

Performance & Result:

[V] **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.

[V] *PASS*	[ ] *FAILED*

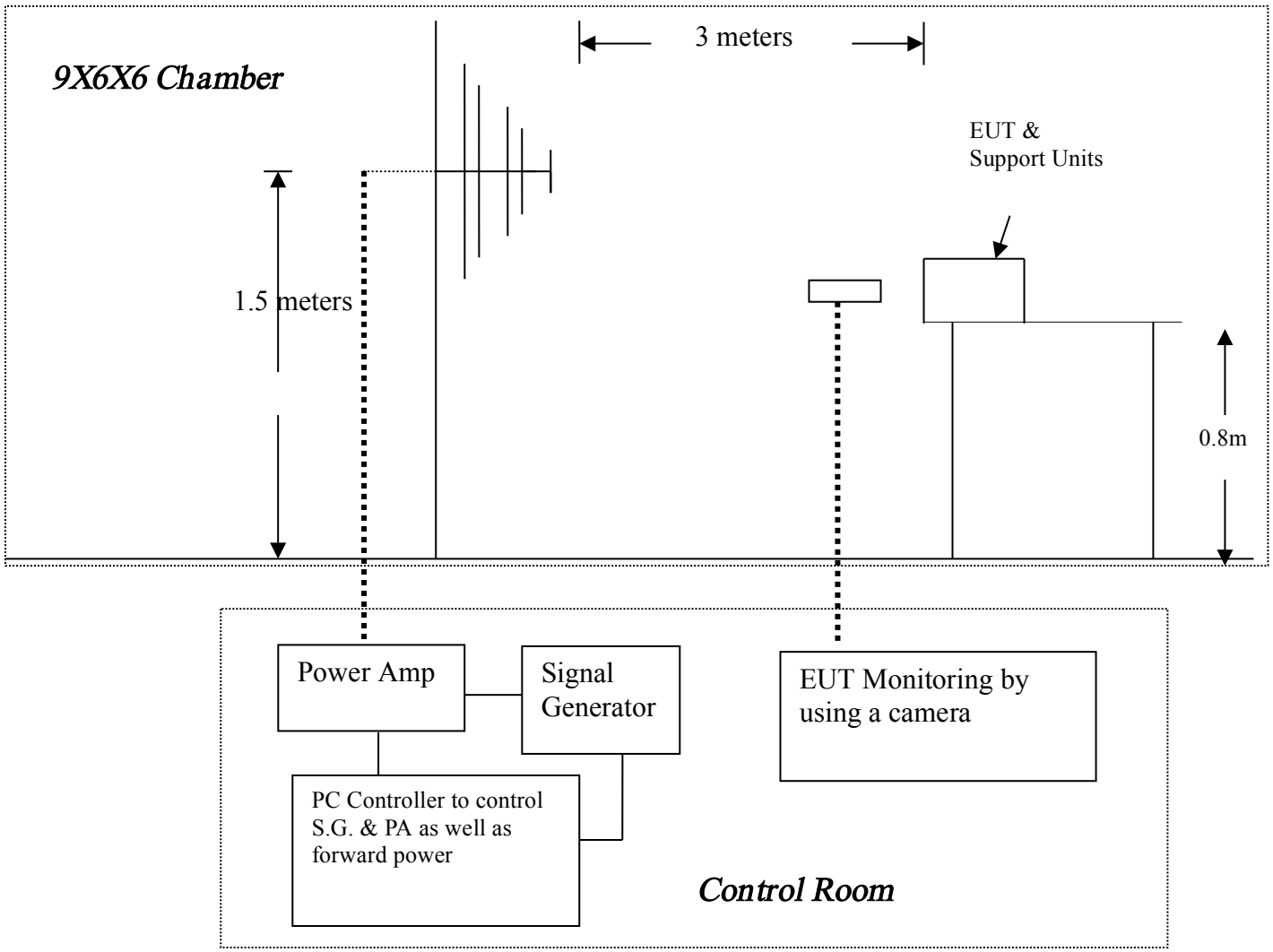
SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

SECTION 4 EN 61000-4-3 (RADIATED ELECTROMAGNETIC FIELD)

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	**:** Enclosure
Basic Standard	**:** EN61000-4-3
Requirements	**:** 3 V/m(non-modulation) with 80% AM. 1kHz
Performance Criteria	**:** A (Standard require)
Tester	**:** Steven
Temperature	**:** 25ºC
Humidity	**:** 60%

Block Diagram of Test Setup:



Test Procedure:

5) 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 EN 61000-4-3.
6) Set up EUT with the auxiliary equipment.
7) Let EIT work in the test mode and measure it.
8) Setting the testing parameters of RS test software per EN 61000-4-3.
9) Performing the pre-test at each side of with double specified level (6V/m) at 4% steps.
10) From the result of pre-test in step 5, choice the worst side of EUT for final test from 80 MHz to 1000 MHz at 1% steps.
11) Recording the test result in following table.
12) It is not necessary to perform test as per annex A of EN 55024 if the EUT doesn't belong to TTE product.

EN 61000-4-3 Preliminary test conditions:

Test level : 6V/m
Steps : 4 % of fundamental
Dwell Time : 1 sec

Range (MHz)	Field	Non-modulation	Polarity	Position (°)	Result (Pass/Fail)
80-1000	6V/m	Yes	H	Front	Pass
80-1000	6V/m	Yes	V	Front	Pass
80-1000	6V/m	Yes	H	Right	Pass
80-1000	6V/m	Yes	V	Right	Pass
80-1000	6V/m	Yes	H	Back	Pass
80-1000	6V/m	Yes	V	Back	Pass
80-1000	6V/m	Yes	H	Left	Pass
80-1000	6V/m	Yes	V	Left	Pass

EN 61000-4-3 Final test conditions:

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

Range (MHz)	Field	Non-modulation	Polarity	Position (°)	Result (Pass/Fail)
80-1000	3V/m	Yes	H	Back	Pass
80-1000	3V/m	Yes	V	Back	Pass

Performance & Result:

[V] **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.

[V] *PASS*	[ ] *FAILED*

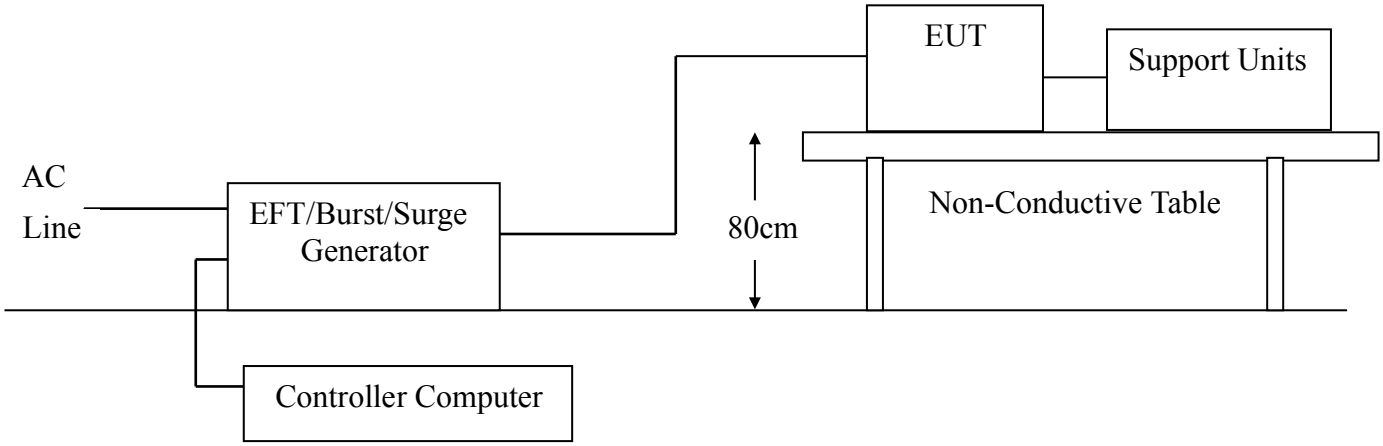
SHENZHEN TOKE TECHNOLOGY CO., LTD TEST REPORT

SECTION 5 EN 61000-4-4 (FAST TRANSIENTS/BURST)

FAST TRANSIENTS/BURST IMMUNITY TEST

Port	**:** On Power Supply Lines
Basic Standard	**:** EN 61000-4-4
Requirements	**:** +/- 1kV Direct for Power Supply Lines; +/- 2kV Clamp for Power Supply Lines
Performance Criteria	**:** B (Standard require)
Tester	**:** Steven
Temperature	**:** 25ºC
Humidity	**:** 60%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground reference plane.
2. A 1.0 meter long power cord was attached to EUT during the test.
3. The length of communication cable between communication port and clamp was keeping within 1 meter.
4. Set up EUT with the auxiliary equipment.
5. Let EUT work in the test mode and measure it.
6. Related peripherals work during the test.
7. Recording the test result as shown in following table.

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

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

Performance & Result:

[V] **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.

[V] *PASS* [ ] *FAILED*

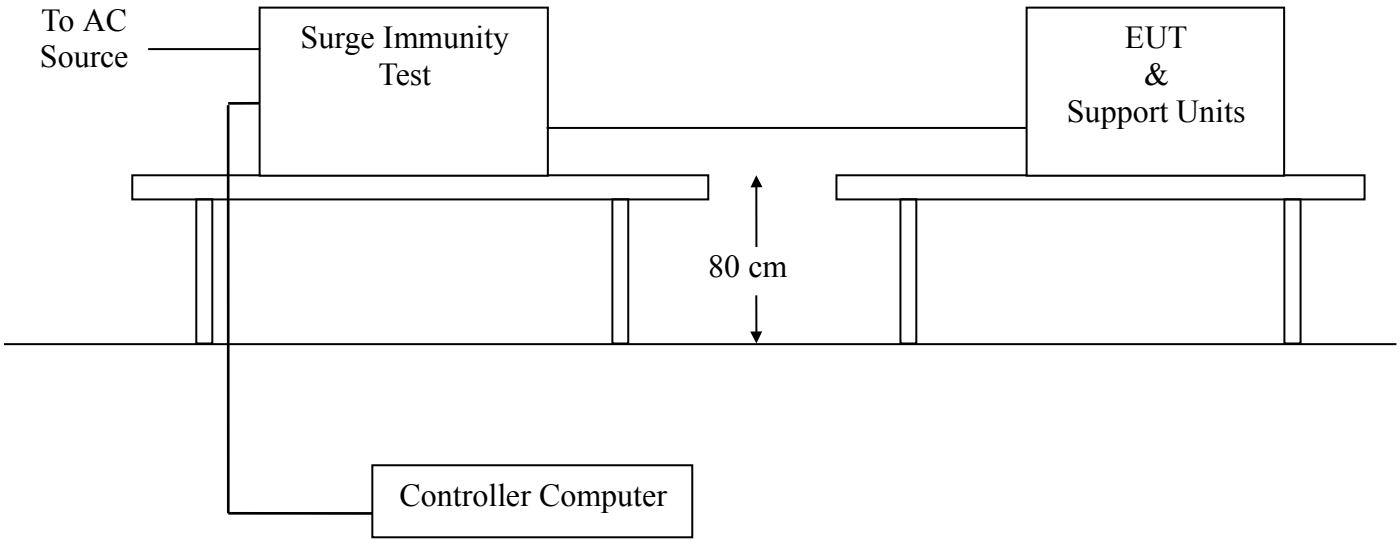
SHENZHEN TOKE TECHNOLOGY CO.,LTD. TEST REPORT

SECTION 6 EN 61000-4-5 (SURGE IMMUNITY)

SURGE IMMUNITY TEST

Port : On Power Supply Lines
Basic Standard : EN 61000-4-5
Requirements : +/- 0.5kV (Line to Line)
: +/- 1kV (Line to Ground)
Performance Criteria : C (Standard require)
Tester : Steven
Temperature : 25°C
Humidity : 60%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on a wooden table 0.8 m away from ground floor.
2. Set up EUT with the auxiliary equipment.
3. Let EUT work in the test mode and measure it.
4. Related peripherals work during the test.
5. Recording the test result as shown in following table.

Test conditions:

Voltage Waveform : 1.2/50 *u*s
Current Waveform : 8/20 *u*s
Polarity : Positive/Negative
Phase angle : 90º ,270 º
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

Performance & Result:

[V] **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.

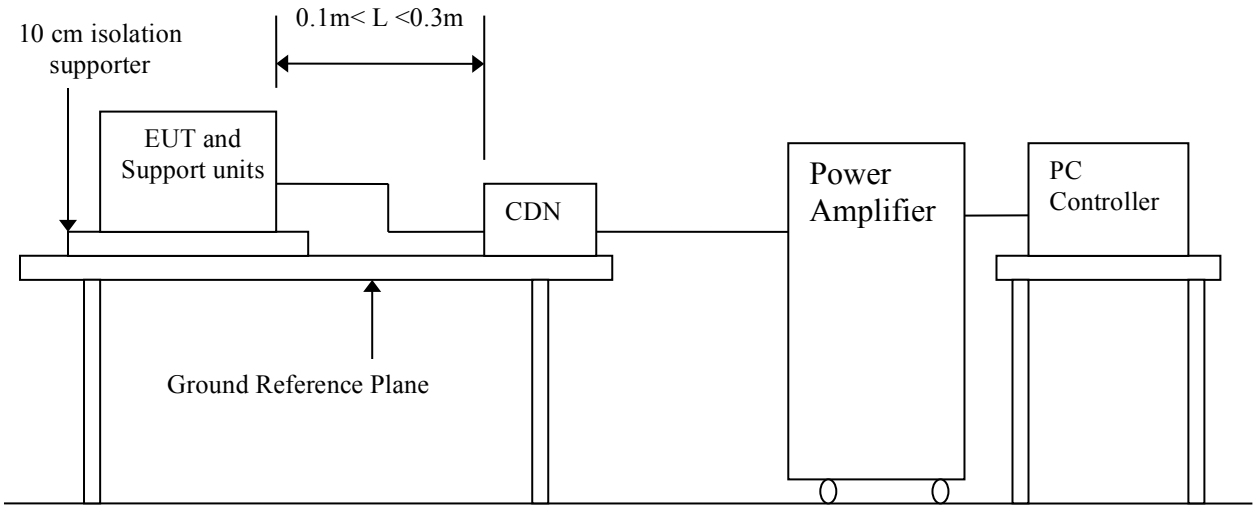
[ ] **Criteria C:** Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

[V] *PASS* [ ] *FAILED*

SECTION 7 EN 61000-4-6(CONDUCTED DISTURBANCE/INDUCED BY RADIO-FREQUENCY FIELD)

Port	**:** On Power Supply Lines
Basic Standard	**:** EN 61000-4-6
Requirements	**:** 3V(non-modulation) with 80% AM. 1kHz
Injection Method	**:** CDN
Performance Criteria	**:** A (Standard require)
Tester	**:** Steven
Temperature	**:** 25°C
Humidity	**:** 60%

Block Diagram of Test Setup:



Test Procedure:

1. 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.
2. Set up EUT with the auxiliary equipment.
3. Let EUT work in the test mode and measure it.
4. Related peripherals work during the test.
5. Setting the testing parameters of CS test software per EN 61000-4-6.
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)	Field	Non-modulation	Result (Pass/Fail)
0.15-80	3V	Yes	Pass

Performance & Result:

[V] **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.

[V] *PASS* [ ] *FAILED*

SHENZHEN TOKE TECHNOLOGY CO., LTD. TEST REPORT

SECTION 8 EN 61000-4-11 (VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS)

VOLTAGE DIPS / SHORT INTERRUPTIONS

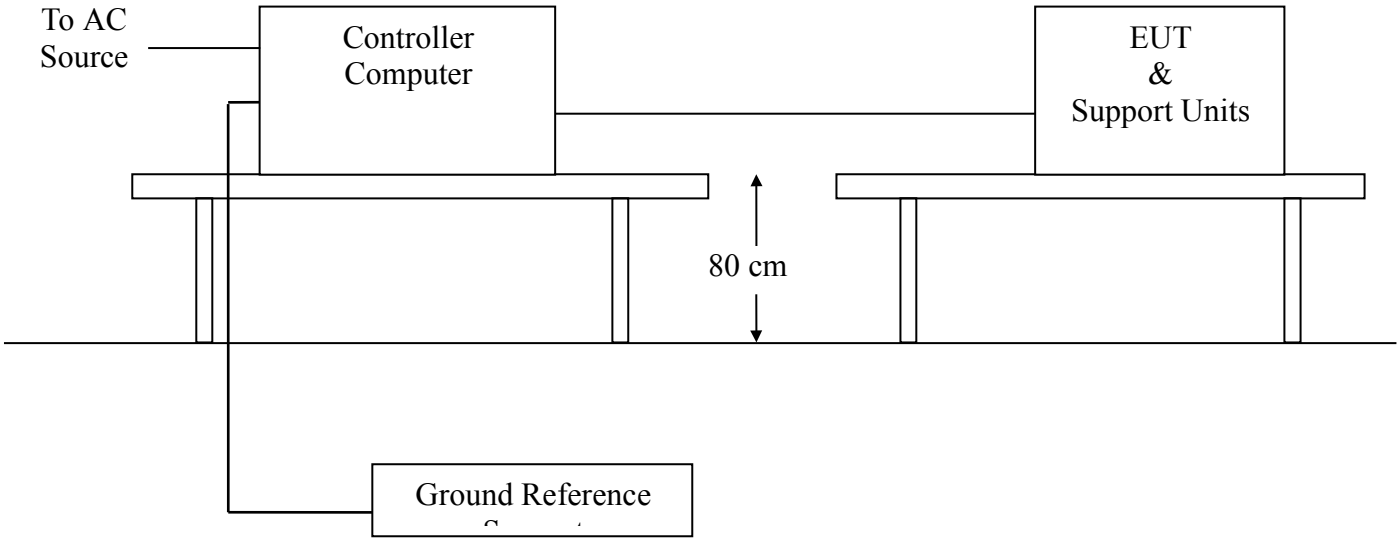
Port : On Power Supply Lines
Basic Standard : EN 61000-4-11
Requirement : PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees

	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
Voltage Dips	70	30	10	C

	Test Level % U_T	Reduction (%)	Duration (periods)	Performance Criteria
Voltage Interceptions	0	100	0.5	B

Test Interval : Min. 10 sec.
Tester : Steven
Temperature : 25°C
Humidity : 60%

Block Diagram of Test Setup:



Test Procedure:

1. The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
2. Set up EUT with the auxiliary equipment.
3. Let EUT work in the test mode and measure it.
4. Setting the parameter of tests and then Perform the test software of test simulator.
5. Conditions changes to occur at 0 degree crossover point of the voltage waveform.
6. 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:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
70	30	10	Normal	B

Voltage Interruptions:

Test Level % U_T	Reduction (%)	Duration (periods)	Observation	Meet Performance Criteria
0	100	0.5	EUT shut down,and self-recovered	B

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* ☐ *FAILED*

APPENDIX 1

PHOTOGRAPHS OF TEST SETUP

PHOTO 1

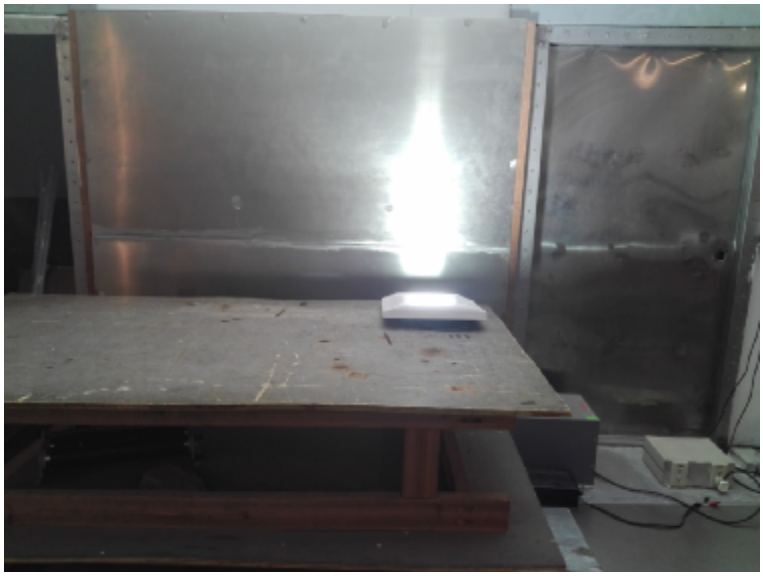


PHOTO 2

PHOTO 3

PHOTO 4

APPENDIX 2

PHOTOGRAPHS OF EUT

PHOTO 1

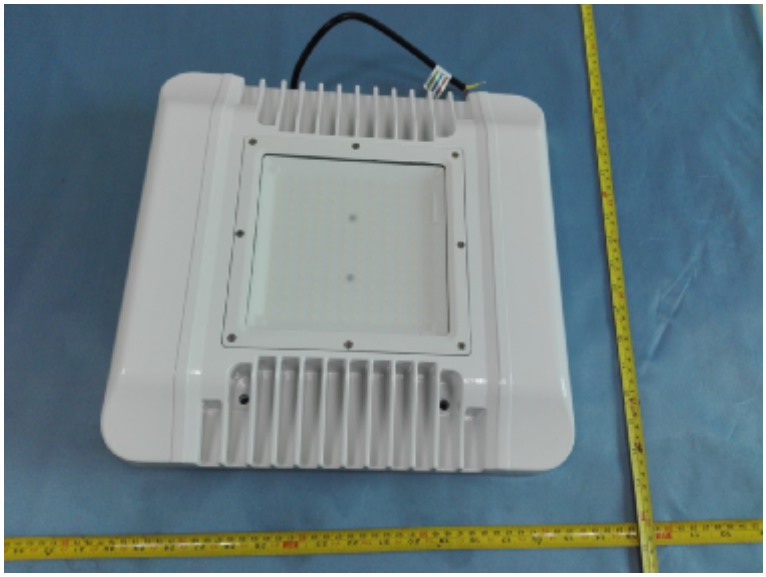


PHOTO 2

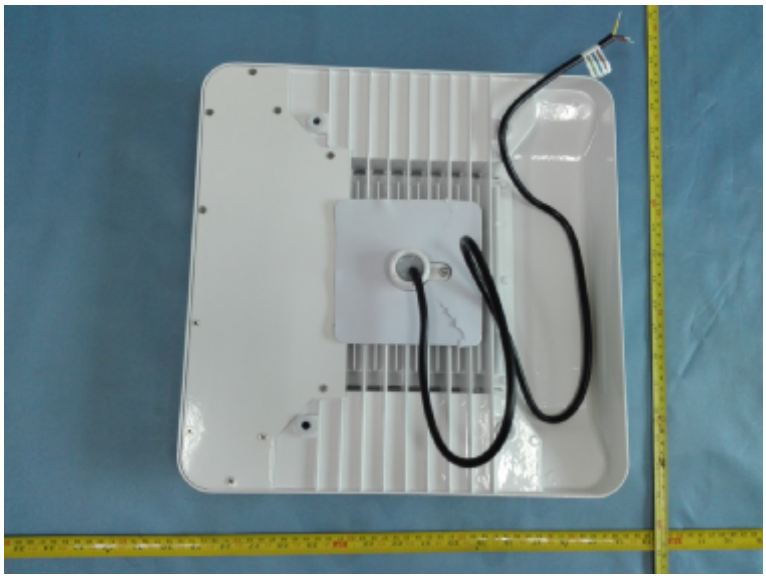
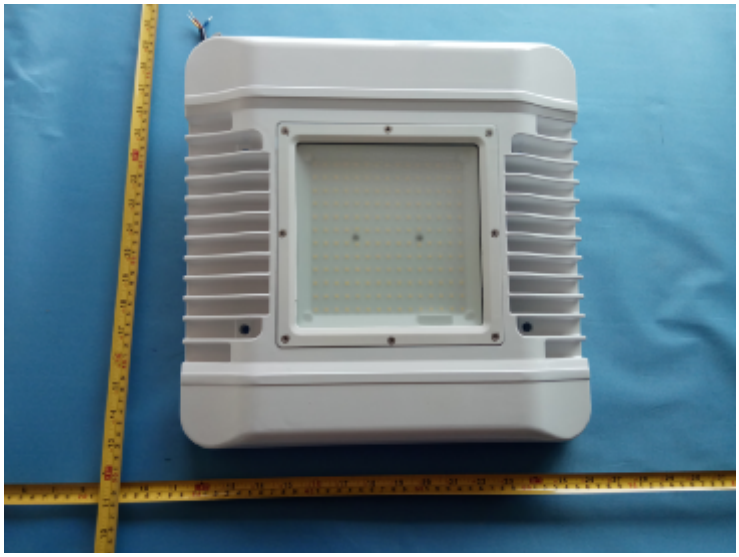


PHOTO 3

PHOTO 4



----------End of test report----------