Shenzhen SoStron Technology Co., Ltd.

EMC REPORT

Applicant	Shenzhen SoStron Technology Co., Ltd.
Address	4th Floor, Building D, Sanmin Industrial Park, Shiyan Town, Baoan District, Shenzhen
Product Name	LED Display
Trademark	/
Model Number	P3mm
Additional Models	Storm P2.5, P3, P4, P6.67, P8, P10mm
Test Laboratory	Shenzhen Circle Testing Certification Co., Ltd.
Address	101,1/F.,Building 1,Donglongxing Technology Park,Huaning Road, Longhua District,Shenzhen,Guangdong,China
Test Date	Mar. 23, 2022 - Mar. 28, 2022
Date of Report	Mar. 28, 2022
Report Number	CTC48F03241ER

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TEST REPORT DECLARATION

Applicant	Shenzhen SoStron Technology Co., Ltd.
Address	4th Floor, Building D, Sanmin Industrial Park, Shiyan Town, Baoan District, Shenzhen
EUT Description	LED Display
Model Number	See page 1 (Note: The additional models have the same circuit diagram, PCB layout and functionality. The differences are the model name and appearance with P3mm.)

Test Standards:

EN 55032:2015+A11:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019
EN 61000-3-3:2013+A1:2019

The EUT described above is tested by Shenzhen Circle Testing Certification Co., Ltd.(CTC) EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT.CTC EMC Laboratory is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with the 2014/30/EU directive and its amendment requirements.
The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested By: Irving

Test Engineer

Approved & Authorized Signer:

Technical Manager

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
Power Line Conducted Emission Test	PASS
Magnetic Test	PASS
Radiated Emission	PASS
Harmonic Current Emission Test	PASS
Voltage Fluctuations & Flicker Test	PASS
Electrostatic Discharge Test	PASS
RF Field Strength Susceptibility Test	PASS
Electrical Fast Transient/Burst Test	PASS
Surge Test	PASS
Injected Currents Susceptibility Test	PASS
Magnetic Field Immunity Test	PASS
Voltage Dips And Interruptions Test	PASS

2. GENERAL INFORMATION

2.1. Report information

2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that CTC approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that CTC in any way guarantees the later performance of the product/equipment.

2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, CTC therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through CTC, unless the applicant has authorized CTC in writing to do so.

2.2. Measurement Uncertainty

(95% confidence levels, k=2)

Test Item	**Uncertainty**
Uncertainty for Conduction emission test	2.2dB
Uncertainty for Magnetic emission test	3.3dB

Uncertainty for Radiation emission test (30MHz to 1GHz)	4.0dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

EUT Description	LED Display
Applicant	Shenzhen SoStron Technology Co., Ltd.
Address	4th Floor, Building D, Sanmin Industrial Park, Shiyan Town, Baoan District, Shenzhen
Manufacturer	Shenzhen SoStron Technology Co., Ltd.
Address	4th Floor, Building D, Sanmin Industrial Park, Shiyan Town, Baoan District, Shenzhen
Model Number	P3mm
Additional Models	Storm P2.5, P3, P4, P6.67, P8, P10mm

3.2. Block Diagram of EUT Configuration



3.3. Operating Condition of EUT

Test mode 1: White Light, maximum brightness (It's the worst case)
Test mode 2: Colour bars with moving picture element
Test mode 3: Scroll H characters

3.4. Test Conditions

Temperature: 22-26℃
Relative Humidity: 55-60%
Atmospheric pressure: 101kPa

3.5. Modifications

No modification was made.

3.6. Abbreviations

AC	Alternating Current
AMN	Artificial Mains Network
DC	Direct Current
EM	ElectroMagnetic
EMC	ElectroMagnetic Compatibility
EUT	Equipment Under Test
IF	Intermediate Frequency
RF	Radio Frequency
rms	root mean square
EMI	Electromagnetic Interference
EMS	Electromagnetic Susceptibility

3.7. Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance of loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

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 manufacturer, when the equipment is used as intended.

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 manufacturer's instructions.

4. TEST EQUIPMENT USED

4.1. For Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS30	828985/018	Jun. 01, 23	1 Year
2.	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Jun. 01, 23	1 Year
3.	L.I.S.N.	Rohde & Schwarz	ESH2-Z5	834549/005	Jun. 01, 23	1 Year
4.	Conical	Emtek	N/A	N/A	N/A	N/A
5.	Voltage Probe	Schwarzbeck	TK9416	N/A	Jun. 01, 23	1 Year
6.	Coaxial Switch	Anritsu	MP59B	6100214550	Jun. 01, 23	1 Year

4.2. For Magnetic Test (In Shielding Room)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESHS20	836600/006	Jun. 04, 23	1 Year
2.	Triple-loop Antenna	Rohde & Schwarz	HM020	843885/002	Jun. 05, 23	1 Year
3.	RF Cable	MIYAZAKI	5D-2W	Tri-loop Cable	Jun. 28, 23	1/2 Year
4.	Coaxial Switch	Anritsu	MP59B	M73989	Jun. 04, 23	1/2 Year

4.3. For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Jun. 01, 23	1 Year
2.	Test Receiver	Rohde&Schwarz	ESC830	828982/018	Jun. 01, 23	1 Year
3.	Bilog Antenna	Schwarzbeck	VULB9163	142	Jun. 01, 23	1 Year
4.	50 Coaxial Switch	Anritsu Corp	MP59B	6100237248	Jun. 01, 23	1 Year
5.	Cable	Schwarzbeck	AK9513	ACRX1	Jun. 01, 23	1 Year
6.	Cable	Rosenberger	N/A	FR2RX2	Jun. 01, 23	1 Year
7.	Cable	Schwarzbeck	AK9513	CRRX2	Jun. 01, 23	1 Year
8.	Cable	Schwarzbeck	AK9513	CRRX2	Jun. 01, 23	1 Year
9.	Signal Generator	HP	864A	3625U00573	Jun. 01, 23	1 Year

4.4. For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Harmonic and Flicker analyzer	Laplace	AC2000A	309709	Oct. 15, 2023	1 Year

4.5. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PSD 1600	H911'292	Jun. 02, 23	1 Year

4.6. For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	HP	8648A	3633A02081	Jun. 03,23	1 Year
2.	Amplifier	A&R	500A100	17034	NCR	NCR
3.	Amplifier	A&R	100W/1000M1	17028	NCR	NCR
4.	Isotropic Field Monitor	A&R	FM2000	16829	NCR	NCR
5.	Isotropic Field Probe	A&R	FLW220100	16755	Jun. 03, 23	1 Year
6.	Biconic Antenna	EMCO	3108	9507-2534	NCR	NCR
7.	Log-periodic Antenna	A&R	AT1080	16812	NCR	NCR
8.	PC	N/A	486DX2	N/A	N/A	N/A

4.7. For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Burst Tester	HAEFELY	PEFT 4010	080981-16	Jun. 01, 23	1 Year

4.8. For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Tester	HAEFELY	PSURGE4.1	080107-04	Jun. 01, 23	1 Year

4.9. For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Simulator	EMTEST	CWS 500C	0900-12	Jun. 01, 23	1 Year
2.	CDN	EMTEST	CDN-M2	510010010010	Jun. 01, 23	1 Year
3.	VDN	EMTEST	CDN-M3	0900-11	Jun. 01, 23	1 Year
4.	Injection Clamp	EMTEST	F-2031-23MM	368	Jun. 01, 23	1 Year
5.	Attenuator	EMTEST	ATT6	0010222a	Jun. 01, 23	1 Year

4.10. For Magnetic Field Immunity Test

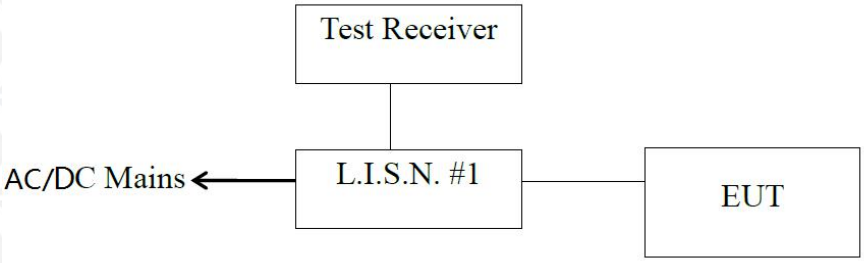
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Magnetic Field Tester	HEAFELY	MAG100.1	083858-10	Jun. 01, 23	1 Year

4.11. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Dips Tester	HEAFELY	PLINE 1610	083732-18	Jun. 01, 23	1 Year

5. POWER LINE CONDUCTED EMISSION TEST

5.1. Block Diagram of Test Setup



5.2. Test Standard

EN 55032:2015+A11:2020 Class A

5.3. Power Line Conducted Emission Limit

Frequency		Limits dB(uV)
MHz	Quasi-peak Level	Average Level
0.15-0.50	79	66
0.50-30	73	60

Notes: 1.*Decreasing linearly with logarithm of frequency.
2.The lower limit shall apply at the transition frequencies.

5.4. EUT Configuration on Test

The following equipment are installed on conducted emission test to meet EN 55032 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

5.5. Operating Condition of EUT

5.5.1.Setup the EUT and simulators as shown in Section 5.1.
5.5.2.Turn on the power of all equipment.
5.5.3.Let the EUT work in test modes (ON) and test it.

5.6. Test Procedure

The EUT is put on the ground and connected to the AC/DC mains through a Artificial Mains Network (AMN). This provided 50ohm-coupling impedance for the tested equipment. Both sides of AC/DC line are checked to find out the maximum conducted emission levels according to the EN 55032 regulations during conducted emission test.

The bandwidth of the test receiver is set at 9kHz.

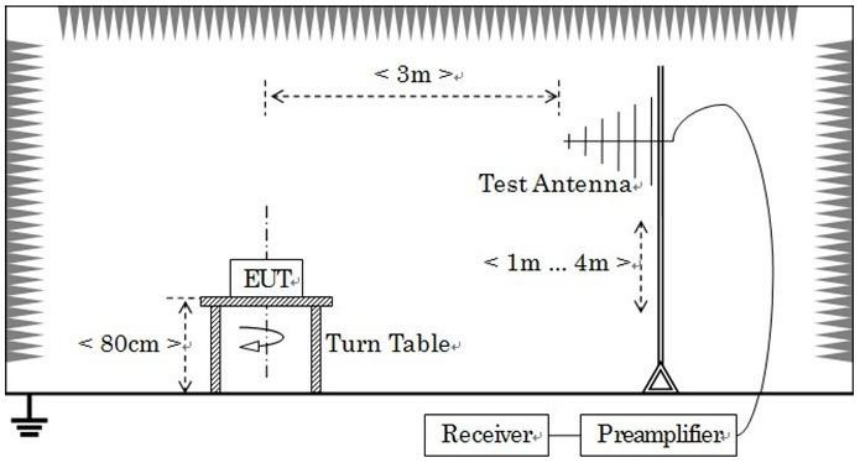
The frequency range from 150 kHz to 30 MHz is investigated. and all the scanning waveform is put in **Appendix I.**

5.7. Test Result

PASS.

6. RADIATED EMISSION TEST

6.1 Semi-Anechoic Chamber Setup Diagram



6.2 Test Standard

EN 55032:2015+A11:2020 Class A

6.3 Radiated Emission Limit

All emanations from a Class B computing devices 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 LIMITS (dBuV/m)
30-230	3	50
230-1000	3	57

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

6.4 EUT Configuration on Test

The EN 55032 Class A regulations test method must be used to find the maximum emission during radiated emission test.

6.5 Operating Condition of EUT

6.5.1.Setup the EUT as shown on Section 6.1.

6.5.2.Turn on the power of all equipment.

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

6.6 Test Procedure

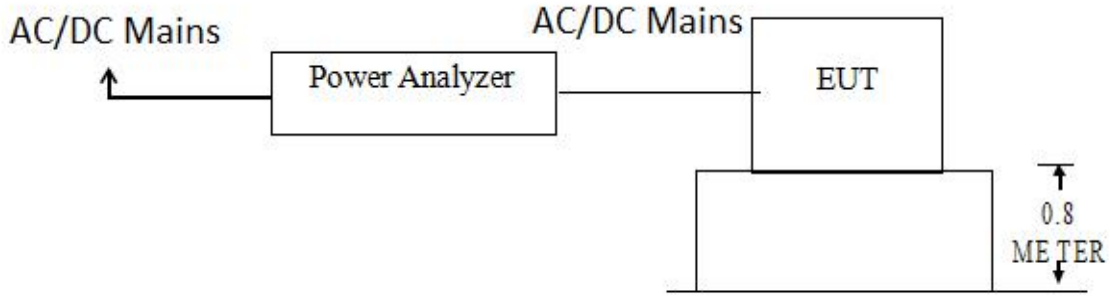
The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.
The bandwidth setting on the test receiver is 120 kHz.
The EUT is tested in Semi-Anechoic Chamber. and all the scanning waveform is put in **Appendix II.**

6.7 Test Results

PASS.

7. HARMONIC CURRENT EMISSION TEST

7.1 Block Diagram of Test Setup



7.2 Test Standard

EN IEC 61000-3-2:2019 Class A

7.3 Operating Condition of EUT

7.3.1.Setup the EUT as shown in Section 7.1.
7.3.2.Turn on the power of all equipments.
7.3.3.Let the EUT work in test mode (ON) and test it.

7.4 Test Procedure

The power cord of the EUT is connected to the output of the test system. Turn on the Power of the EUT and use the test system to test the harmonic current level.

7.5 Test Results

PASS

8. VOLTAGE FLUCTUATIONS & FLICKER TEST

8.1 Block Diagram of Test Setup

Same as Section 7.1.

8.2 Test Standard

EN 61000-3-3:2013+A1:2019

8.3 Operating Condition of EUT

Same as Section 8.3.. The power cord of the EUT is connected to the output of the test system. Turn on the power of the EUT and use the test system to test.

Flicker Test Limit

Test items	Limits
Pst	1.0
dc	3.3%
dmax	4.0%
dt	Not exceed 3.3% for 500ms

8.4 Test Data

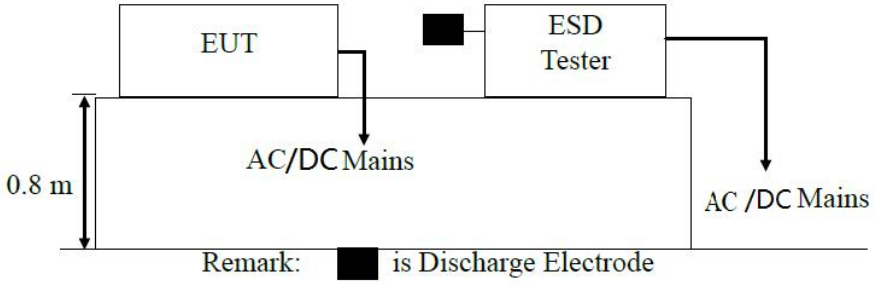
Test Mode: 1		
Items	Reading	Limit
dmax	0.01	4.0%
dc	0.03	3.3%
dt	0.05	Not exceed 3.3% for 500ms
Pst	0.001	1.0

8.5 Test Results

PASS.

9. ELECTROSTATIC DISCHARGE TEST

9.1. Block Diagram of ESD Test Setup



9.2. Test Standard

EN 55035:2017+A11:2020
Severity Level 3 for Air Discharge at 8kV
Severity Level 2 for Contact Discharge at 4kV

9.3. Severity Levels and Performance Criterion

9.3.1.Severity level

Level	Test Voltage	Test Voltage
	Contact Discharge (kV)	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 are listed in Section 3.2.

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 equipment.

9.5.3.Let the EUT work in test mode (On) and test 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.

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

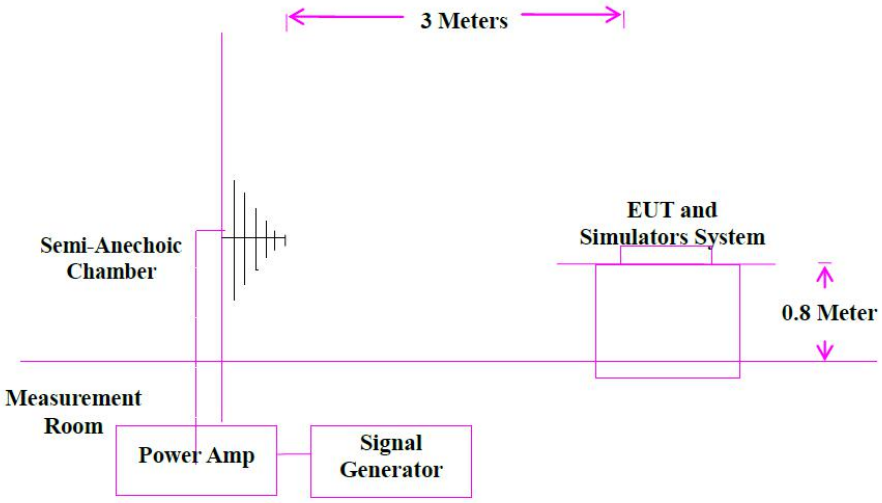
Temperature:	22℃	Humidity:	50%
Air Discharge: ±8kV Contact Discharge: ±4kV	For each point positive 10 times and negative 10 times discharge.		

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Product surface	A	PASS
Crevice	A	PASS
Shell	C	PASS
HCP	C	PASS
VCP	C	PASS
Input port	A	PASS
Power cord	A	PASS
Metal	C	PASS
Gap	A	PASS
Led Display	A	PASS

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

10.RF FIELD STRENGTH SUSCEPTIBILITY TEST

10.1.R/S Test Setup



10.2.Test Standard

EN 55035:2017+A11:2020

10.3.Severity Levels and Performance Criterion

10.3.1.Severity level 2

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

10.3.2.Performance criterion : A

10.4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.2

10.5.Operating Condition of EUT

Setup the EUT as shown in Section 10.1. The operating condition of EUT are listed in section 3.3.

10.6.Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters 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 the EUT. All the scanning conditions are as follows :

Condition of Test	Remarks
1. Fielded Strength	3 V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80 - 1000 MHz, 1.4GHz-2.7GHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1 Sec.

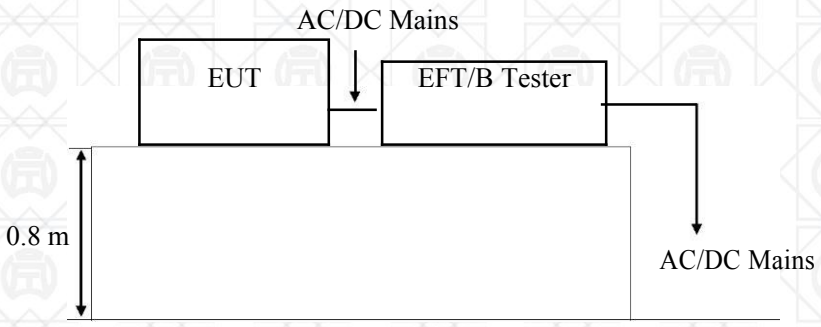
10.7.Test Results

Temperature:	22℃	Humidity:	50%
Modulation: ■AM	☐ Pulse	☐ none	■1kHz 80%
Criterion : A			
Frequency Range : 80 MHz to 1000 MHz，1.4GHz-2.7GHz			
Steps:1%			

	Horizontal	Vertical
Front	Pass	Pass
Right	Pass	Pass
Rear	Pass	Pass
Left	Pass	Pass

11.ELECTRICAL FAST TRANSIENT/BURST TEST

11.1.EFT Test Setup



11.2.Test Standard

EN 55035:2017+A11:2020
Severity Level 2 at 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 3.2.

11.5.Operating Condition of EUT

Setup the EUT as shown in Section 11.1. The operating condition of EUT are listed in section 3.3.

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 the 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: It's unnecessary to test.

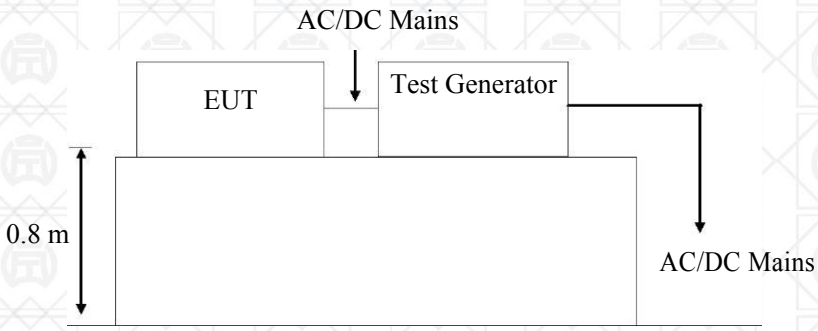
11.6.3.For DC output line ports: It's unnecessary to test.

11.7.Test Results

Temperature:	22℃			Humidity:	50%				
Power Supply :	AC 230V/50Hz			Test Mode:	on				
Inject Place : AC Mains									
Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage kV	Inject Time(s)	Inject Method	Results
L	±1	120	Direct	PASS					
N	±1	120	Direct	PASS					
L+N	±1	120	Direct	PASS					
PE	±1	120	Direct	PASS					
L+N+PE	±1	120	Direct	PASS					
L+PE	±1	120	Direct	PASS					
N+PE	±1	120	Direct	PASS					

12.SURGE TEST

12.1.Surge Test Setup



12.2.Test Standard

EN 55035:2017+A11:2020
Severity Level 2 for Line to Line at 1.0kV
Severity Level 3 for Line to earth(ground) at 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

Performance criterion **: B**

12.4.EUT Configuration on Test

The configuration of EUT are listed in Section 3.2.

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 equipment.

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

12.6.Test Procedure

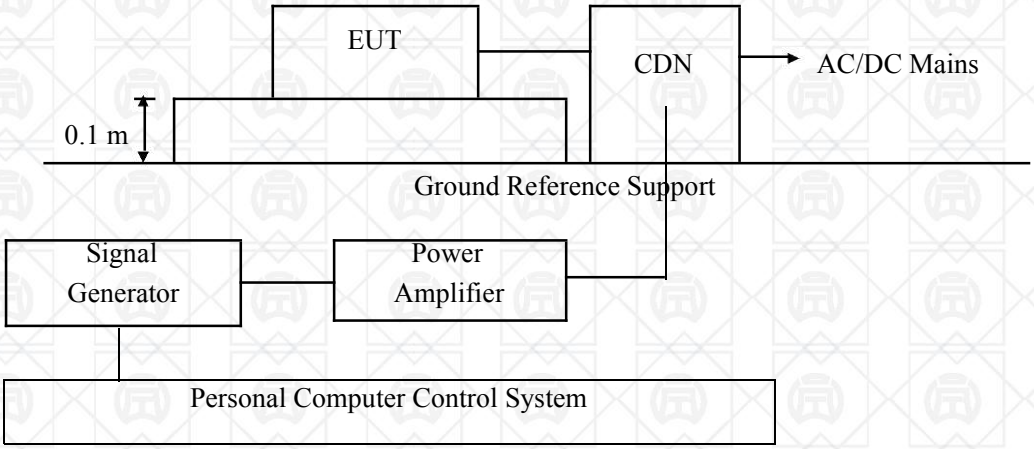
1. Setup the EUT and test generator as shown on Section 12.1.
2. For line to line coupling mode, provide a 1.0kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
3. At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate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

12.7.Test Results

Temperature:	22℃		Humidity:	50%	
Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (kV)	Result
L-N	+/-	90/270	5	1.0	PASS
L-PE	+/-	90/270	5	2.0	PASS
N-PE	+/-	90/270	5	2.0	PASS
L+N-PE	+/-	90/270	5	2.0	PASS

13.INJECTED CURRENTS SUSCEPTIBILITY TEST

13.1.Block Diagram of Test AC Mains Setup



13.2.Test Standard

EN 55035:2017+A11:2020
Severity Level 2 at 3 V (rms), 0.15MHz ~ 30MHz
Severity Level 1 at 1V (rms), 30MHz ~ 80MHz

13.3.Severity Levels and Performance Criterion

13.3.1.Severity level 2

Level	Field Strength V/m
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 3.2

13.5.Operating Condition of EUT

Setup the EUT as shown in Section 13.1.. The operating condition of EUT are listed in section 3.3

13.6.Test Procedure

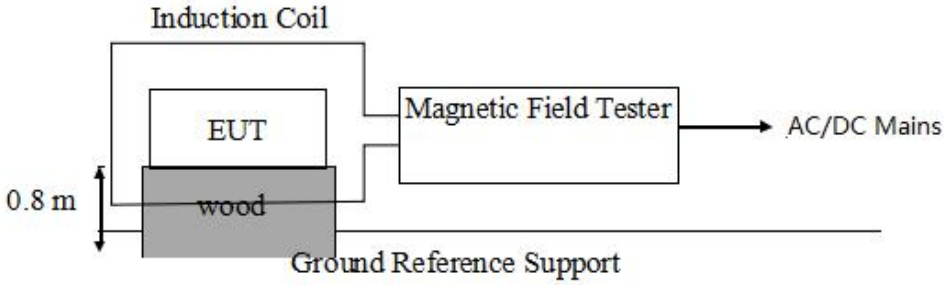
1. Set up the EUT, CDN and test generators as shown on Section 13.1.
2. Let the EUT work in test mode and test it.
3. The EUT are placed on an insulating support 0.8m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
4. The disturbance signal described below is injected to EUT through CDN.
5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
6. The frequency range is swept from 150kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
7. The rate of sweep shall not exceed 1.5*10-3decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

13.7.Test Results

Temperature	22℃	Humidity	50%	
Frequency Range (MHz)	Injected Position	Strength	Criterion	Result
0.15 ~ 30	AC Line	3V(rms), Unmodulated	A	PASS
30 ~ 80	AC Line	1V(rms), Unmodulated	A	PASS
30 ~ 80	AC Line	3V(rms), Unmodulated	A	PASS

14.MAGNETIC FIELD IMMUNITY TEST

14.1 Block Diagram of Test Setup



14.2 Test Standard

EN 55035:2017+A11:2020
Severity Level 1 at 1A/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 3.2.

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 test it.

14.6 Test Procedure

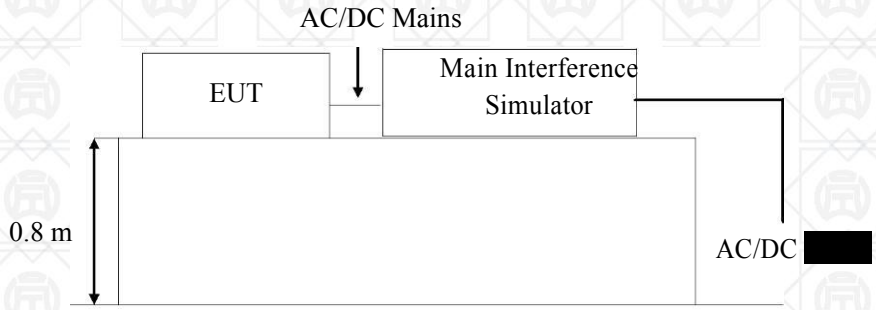
The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 14.1. The induction coil shall then be rotated by 90°in order to expose the EUT to the test field with different orientations.

14.7 Test Results

PASS.

15. VOLTAGE DIPS AND INTERRUPTIONS TEST

15.1. Voltage Dips and Interruptions Test Setup



Remark: Combination wave generator and decoupling network are included in test generator.

15.2. Test Standard

EN 55035:2017+A11:2020

15.3. Severity Levels and Performance Criterion

15.3.1. Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)	Duration Times
0	100	0.5p	10ms
70	30	25p	500ms
0	100	250p	5000ms

15.3.2. Performance criterion : C & B

15.4. EUT Configuration on Test

The configuration of EUT are listed in Section 3.2.

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 equipment.

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

15.6. Test Procedure

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

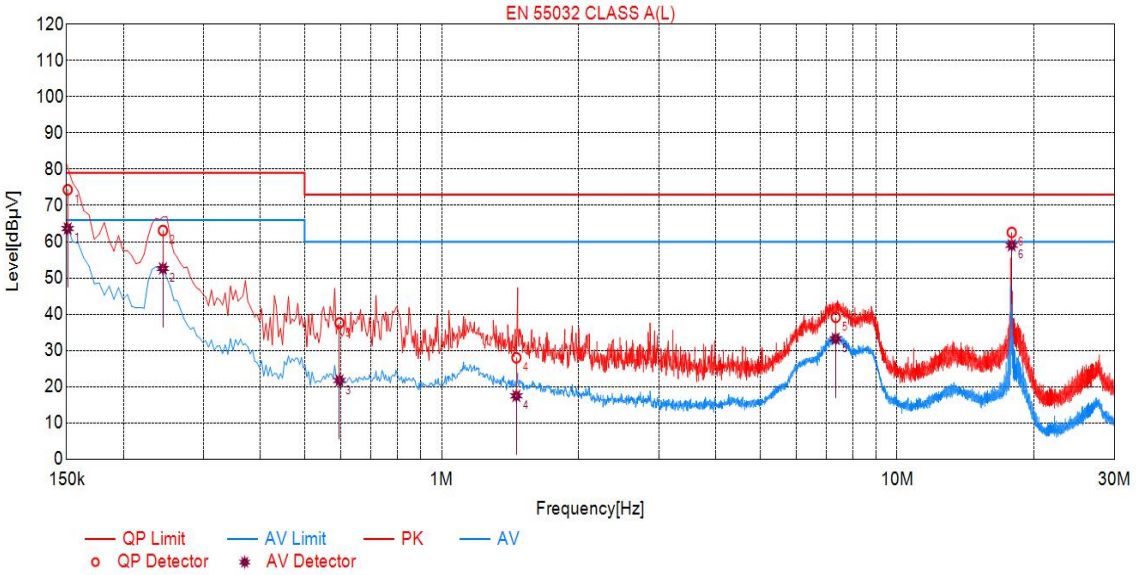
15.7.Test Result

Temperature	22℃		Humidity	50%	
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Phase Angle	Criterion	Result
0	100	0.5P	0º ,90º , 270º	A	PASS
30	70	25P	0º ,90º , 270º	A	PASS
0	100	250P	0º ,90º , 270º	C	PASS

APPENDIX I :Conducted Emission Test data

Operation Mode : White Light, maximum brightness
Phase : L (150kHz – 30MHz)

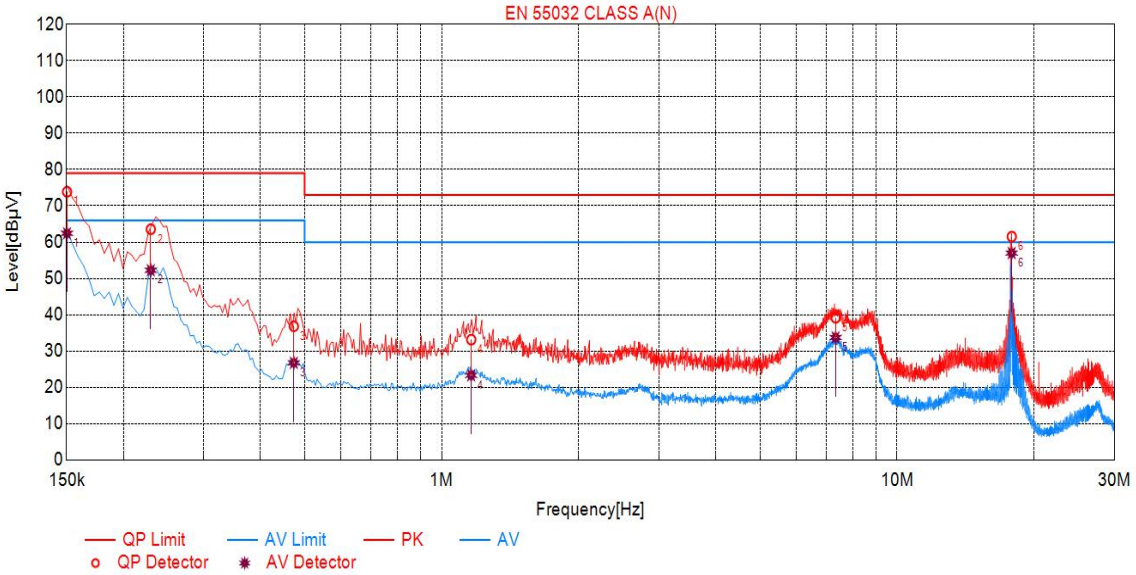
Test Graph



Final Data List								
NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1508	74.35	79.00	4.65	63.64	66.00	2.36	PASS
2	0.2441	63.10	79.00	15.90	52.62	66.00	13.38	PASS
3	0.5962	37.57	73.00	35.43	21.71	60.00	38.29	PASS
4	1.4588	27.97	73.00	45.03	17.45	60.00	42.55	PASS
5	7.3344	39.16	73.00	33.84	33.22	60.00	26.78	PASS
6	17.8638	62.58	73.00	10.42	59.02	60.00	0.98	PASS

Operation Mode	:	White Light, maximum brightness
Phase	:	N (150kHz – 30MHz)

Test Graph



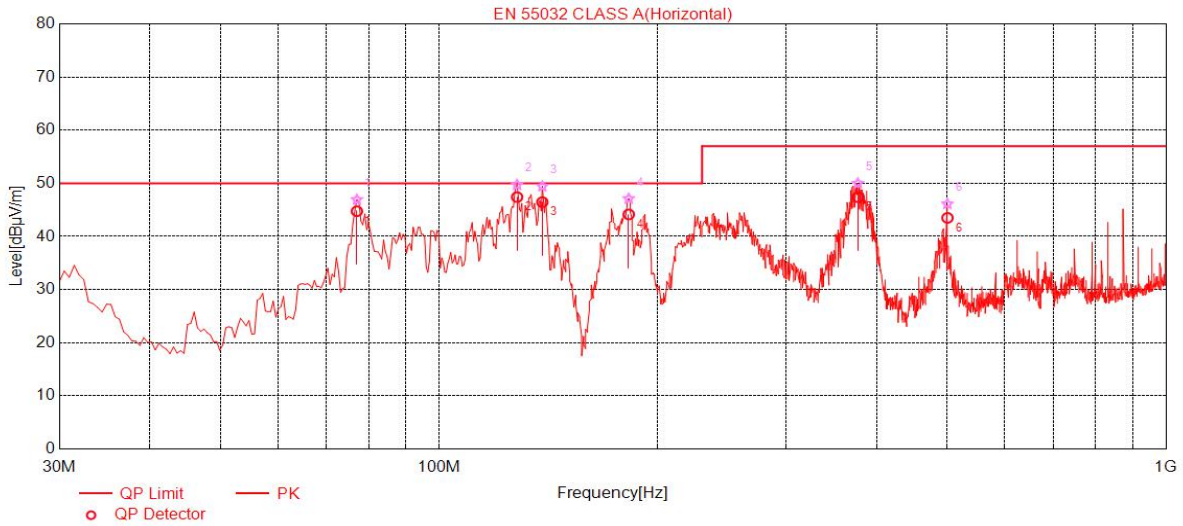
Final Data List

NO.	Freq. [MHz]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1503	73.88	79.00	5.12	62.43	66.00	3.57	PASS
2	0.2296	63.57	79.00	15.43	52.25	66.00	13.75	PASS
3	0.4733	36.81	79.00	42.19	26.74	66.00	39.26	PASS
4	1.1606	33.14	73.00	39.86	23.30	60.00	36.70	PASS
5	7.3313	39.17	73.00	33.83	33.73	60.00	26.27	PASS
6	17.8646	61.53	73.00	11.47	57.00	60.00	3.00	PASS

APPENDIX II: Radiated Emission Test data

Polarization : Horizontal
Operation Mode : White Light, maximum brightness

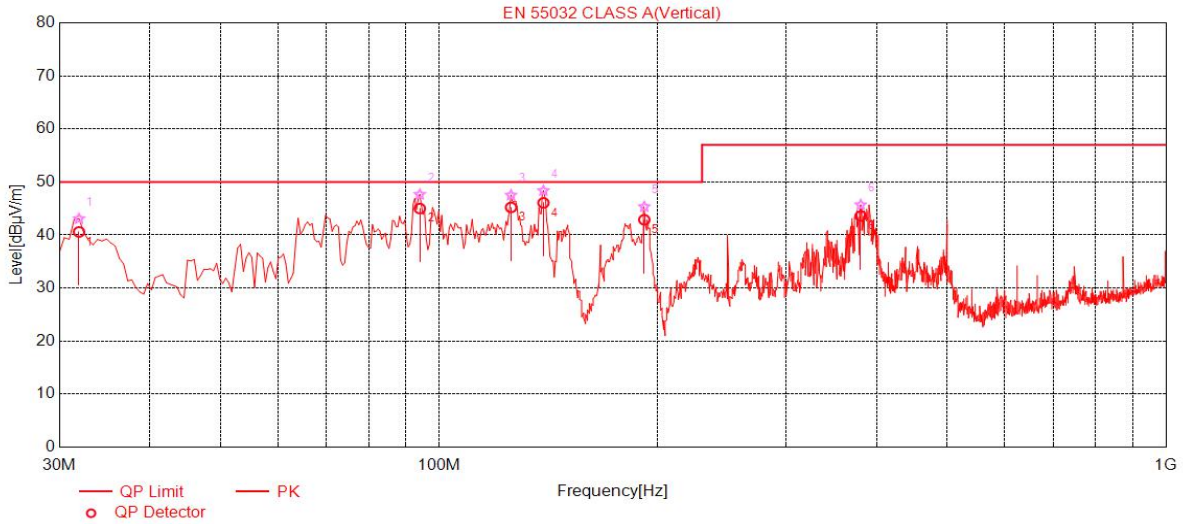
Test Graph



Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	77.0450	-13.69	44.75	50.00	5.25	100	211	Horizontal
2	127.9700	-10.78	47.40	50.00	2.60	100	347	Horizontal
3	138.6400	-12.23	46.46	50.00	3.54	100	358	Horizontal
4	182.2900	-9.90	44.14	50.00	5.86	100	184	Horizontal
5	376.7750	-4.98	47.38	57.00	9.62	100	323	Horizontal
6	500.4500	-3.06	43.49	57.00	13.51	100	67	Horizontal

Polarization	Vertical
Operation Mode	White Light, maximum brightness

Test Graph



Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.9400	-10.65	40.58	50.00	9.42	100	335	Vertical
2	94.0200	-10.95	44.99	50.00	5.01	100	269	Vertical
3	125.5450	-10.42	45.21	50.00	4.79	100	203	Vertical
4	139.1250	-12.30	46.05	50.00	3.95	100	355	Vertical
5	191.5050	-9.44	42.87	50.00	7.13	100	203	Vertical
6	380.1700	-4.93	43.58	57.00	13.42	100	223	Vertical

APPENDIX III: EUT and Test Setup Photo



Figure 1: EUT Front-side



Figure 2: EUT Back-side



Figure3: Conducted Emission Test Setup



Figure 4: Radiated Emission Test Setup

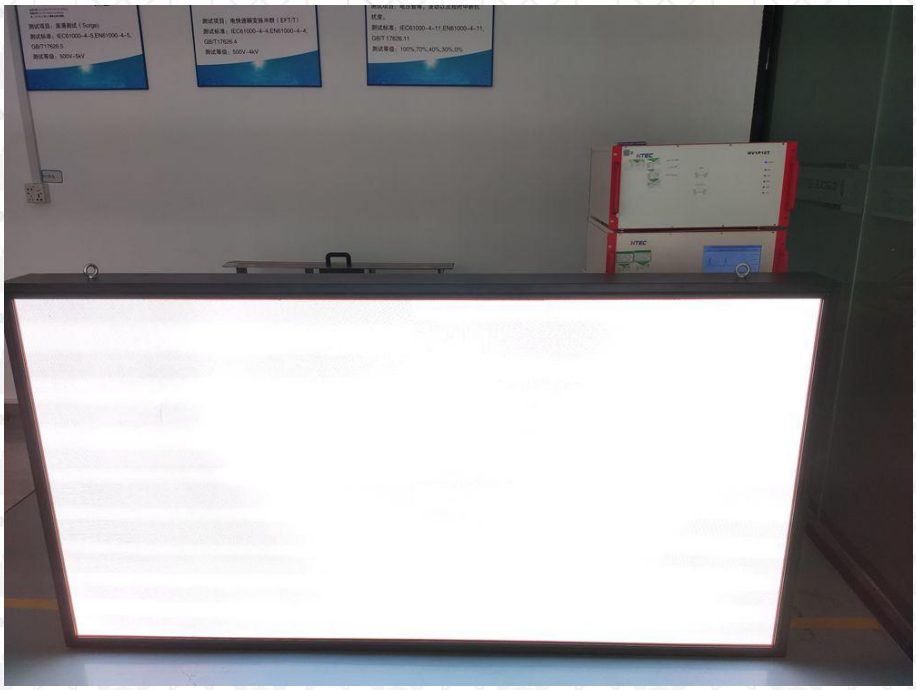


Figure 5: EFT\AC-DIP & Surge Test Setup



Figure 6: ESD Test Setup

***** End of Report *****