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# EMC Test Report

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Report No.: AGC09902200301EE01

**PRODUCT DESIGNATION** : Heating Pad

**BRAND NAME** : Ainuanxin

**MODEL NAME** : Hp1-9, Hp1-1, Hp1-2, Hp1-3, Hp1-4, Hp1-5, Hp1-6, Hp1-7, Hp1-8

**APPLICANT** : Quanzhou Chuanmu Intelligent Technology Co., Ltd.

**DATE OF ISSUE** : Mar. 24, 2020

**STANDARD(S)** : EN 55032:2015/AC:2016  
EN 61000-3-2:2014  
EN 61000-3-3:2013  
EN 55024:2010/A1:2015

**REPORT VERSION** : V1.0

## Attestation of Global Compliance(Shenzhen) Co., Ltd

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Attestation of Global Compliance

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**REPORT REVISE RECORD**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 24, 2020	Valid	Initial release



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### 1 VERIFICATION OF CONFORMITY

<b>Applicant</b>	Quanzhou Chuanmu Intelligent Technology Co., Ltd.
<b>Address</b>	93-3 Dongmaonan District, Keshan Village, Yonghe Town, Jinjiang City, Fujian Province
<b>Manufacturer</b>	Quanzhou Chuanmu Intelligent Technology Co., Ltd.
<b>Address</b>	93-3 Dongmaonan District, Keshan Village, Yonghe Town, Jinjiang City, Fujian Province
<b>Factory</b>	Quanzhou Chuanmu Intelligent Technology Co., Ltd.
<b>Address</b>	93-3 Dongmaonan District, Keshan Village, Yonghe Town, Jinjiang City, Fujian Province
<b>Product Designation</b>	Heating Pad
<b>Brand Name</b>	Ainuanxin
<b>Test Model</b>	Hp1-9
<b>Series Model</b>	Hp1-1, Hp1-2, Hp1-3, Hp1-4, Hp1-5, Hp1-6, Hp1-7, Hp1-8
<b>Difference description</b>	All the same except for model name.
<b>Date of test</b>	Mar. 10, 2020 to Mar. 24, 2020
<b>Deviation</b>	The sample has no any deviation to the method of standard mentioned on page 1
<b>Condition of Test Sample</b>	Normal
<b>Test Result</b>	Pass

The above equipment was tested by Attestation of Global Compliance(Shenzhen) Co., Ltd. for compliance with the requirements set forth in 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.

Prepared By Faler Yang  
 Faler Yang(Yang Feiyue)  
 Project Engineer Mar. 24, 2020

Reviewed By Erik Yang  
 Erik Yang(Yang Jianmin)  
 Reviewer Mar. 24, 2020

Approved By Forrest Lei  
 Forrest Lei(Lei Yonggang)  
 Authorized Officer Mar. 24, 2020

## 2 SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Heating	V
Note: 1. V means EMI worst mode.		

## 3 MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Conducted Emission,  $U_c = \pm 3.1 \text{ dB}$
- Uncertainty of Radiated Emission Below 1GHz,  $U_c = \pm 4.0 \text{ dB}$
- Uncertainty of Radiated Emission above 1GHz,  $U_c = \pm 5.4 \text{ dB}$



#### 4 PRODUCT INFORMATION

Housing Type	Plastic and metal
EUT Input Rating	DC 5V 2A

I/O Port Information ( Applicable  Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
USB	1	1.4m Unshielded	1



### 5 SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
Adapter	Samsung	EP-TA200	--	--	--





## 6 TEST FACILITY

<b>Site</b>	Attestation of Global Compliance (Shenzhen) Co., Ltd
<b>Location</b>	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

## 7 TEST EQUIPMENT LIST

### TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Jun. 12, 2019	Jun. 11, 2020
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020
Test software	R&S	ES-K1(Ver.V1.7.1)	N/A	N/A	N/A

### TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Jun.12, 2019	Jun. 11, 2020
Antenna	SCHWARZBECK	VULB9168	494	Sep. 20, 2019	Sep. 19, 2021
Double-Ridge Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 12, 2019	Dec.11, 2020
Test software	Tonscend	JS32-re(Ver.2.5)	N/A	N/A	N/A

### TEST EQUIPMENT OF POWER HARMONICS / VOLTAGE FLUCTUATION / FLICKER TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Conditioning Unit	Schaffner	CCN1000-1	72431	Aug. 26, 2019	Aug. 25, 2020
AC Source	Schaffner	NSG1007	56825	Aug. 26, 2019	Aug. 25, 2020

### TEST EQUIPMENT OF SURGE/EFT/DIPSTEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
EFT Surge Generator	Schaffner	Modula 6150	34437	Aug. 26, 2019	Aug. 25, 2020



**TEST EQUIPMENT OF ESD TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	EM Test	dito	P1527160053	Oct. 24, 2019	Oct. 23, 2020

**TEST EQUIPMENT OF RS IMMUNITY TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Jun. 12, 2019	Jun. 11, 2020
Power Sensor	R&S	URV5-Z4	100124	May 17, 2019	May 16, 2020
Power Meter	R&S	NRVD	8323781027	May 17, 2019	May 16, 2020
Power Amplifier	KALMUS	7100LC	04-02/17-06-00 1	Jun.12, 2019	Jun.11, 2020
Power Amplifier	Milmega	AS0104-55_55	1004793	Jun.12, 2019	Jun.11, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May 17, 2019	May 16, 2021
Antenna	SCHWARZBEC K	VULB9168	D69250	Jan. 09, 2019	Jan. 08, 2021

**TEST EQUIPMENT OF CS IMMUNITY TEST**

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Amplifier	AR	75A250	18464	Jun. 12, 2019	Jun. 11, 2020
CDN	ZHINAN	ZN3751	15004	Sep. 09, 2019	Sep. 08, 2020
6dB attenuator	ZHINAN	E-002	N/A	Sep. 09, 2019	Sep. 08, 2020
Power Sensor	R&S	URV5-Z4	100124	May 17, 2019	May 16, 2020
Power Meter	R&S	NRVD	8323781027	May 17, 2019	May 16, 2020
Signal Generator	R&S	E4421B	MY43351603	Jun. 12, 2019	Jun. 11, 2020



### 8 TEST SUMMARY LIST

Test item	Test Requirement	Test Method	Class/Severity	Result
CONDUCTED EMISSION	EN 55032	EN 55032	Class B	Pass
RADIATED EMISSION	EN 55032	EN 55032	Class B	Pass
Harmonic current emission	EN 61000-3-2	EN 61000-3-2	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3	EN 61000-3-3	§5 of EN 61000-3-3	Pass
Electrostatic Discharge Immunity	EN 55024	EN 61000-4-2	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)	Pass
Radiated RF Electromagnetic	EN 55024	EN 61000-4-3	3V/m with 80% AM. 1kHz Modulation.	Pass
Electrical fast transient/burst Immunity	EN 55024	EN 61000-4-4	+/- 1kV for Power Supply Lines	Pass
SURGE IMMUNITY	EN 55024	EN 61000-4-5	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)	Pass
Immunity to Conducted Disturbances Induced by RF fields	EN 55024	EN 61000-4-6	3V with 80% AM. 1 kHz Modulation	Pass
Power frequency magnetic field	EN 55035	EN61000-4-8	1A/m 50Hz or 60Hz	N/A
Voltage dips and short interruptions immunity	EN 55024	EN 61000-4-11	0degrees	Pass

**Note :** N/A means not applicable.



## 9 EN 55032 LINE CONDUCTED EMISSION TEST

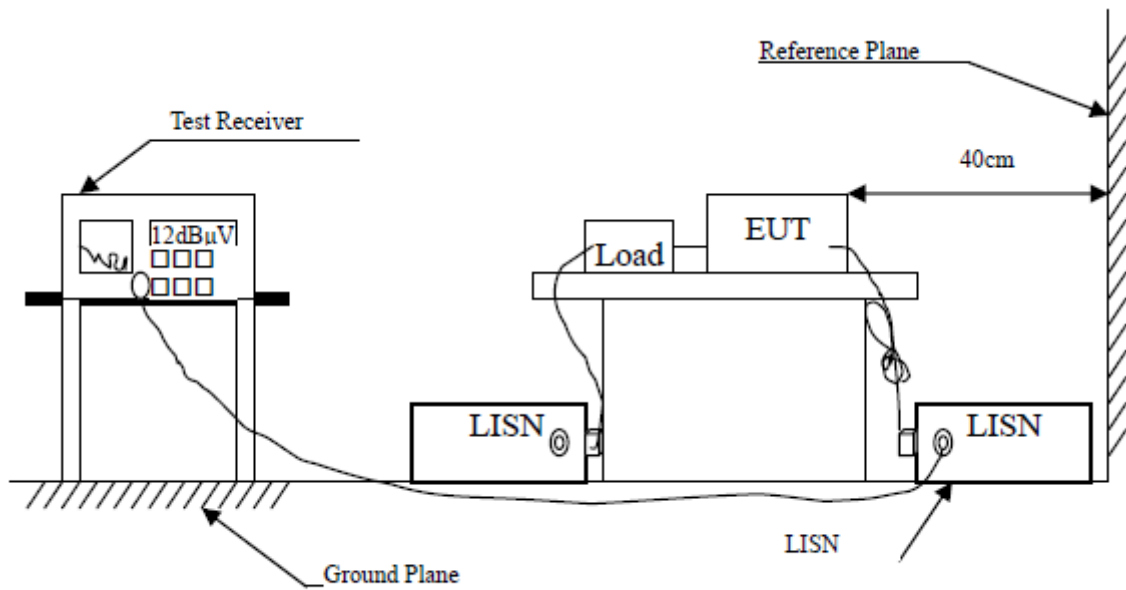
### 9.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

**Note:**

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

### 9.2 BLOCK DIAGRAM OF TEST SETUP





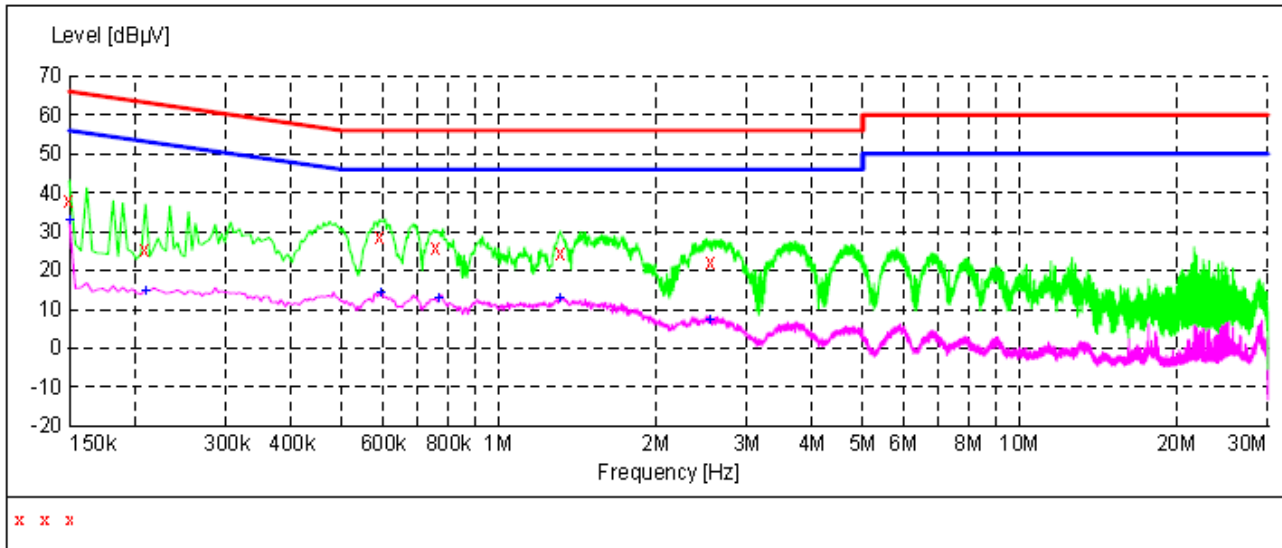
### 9.3 PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (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 table with a height of 0.8 meters is used and is placed on the ground plane as per EN55032 (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 10cm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN55032.
- (4) The EUT received DC5V power from adapter which received AC 230V/50Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane..
- (5) All support equipments received power from a second LISN supplying power of AC230V/50Hz, 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 150kHz to 30MHz for emissions in each of the test modes.
- (8) During the above scans, the emissions were maximized by cable manipulation.
- (9) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- (10) 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  $-2\text{dB}$  to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.



**9.4 TEST RESULT OF LINE CONDUCTED EMISSION TEST**

**LINE CONDUCTED EMISSION TEST-L**



**MEASUREMENT RESULT:**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	38.00	11.3	66	28.0	QP	L1	FLO
0.210000	25.20	11.3	63	38.0	QP	L1	FLO
0.594000	28.50	11.3	56	27.5	QP	L1	FLO
0.758000	25.70	11.3	56	30.3	QP	L1	FLO
1.314000	24.40	11.3	56	31.6	QP	L1	FLO
2.546000	22.20	11.4	56	33.8	QP	L1	FLO

**MEASUREMENT RESULT:**

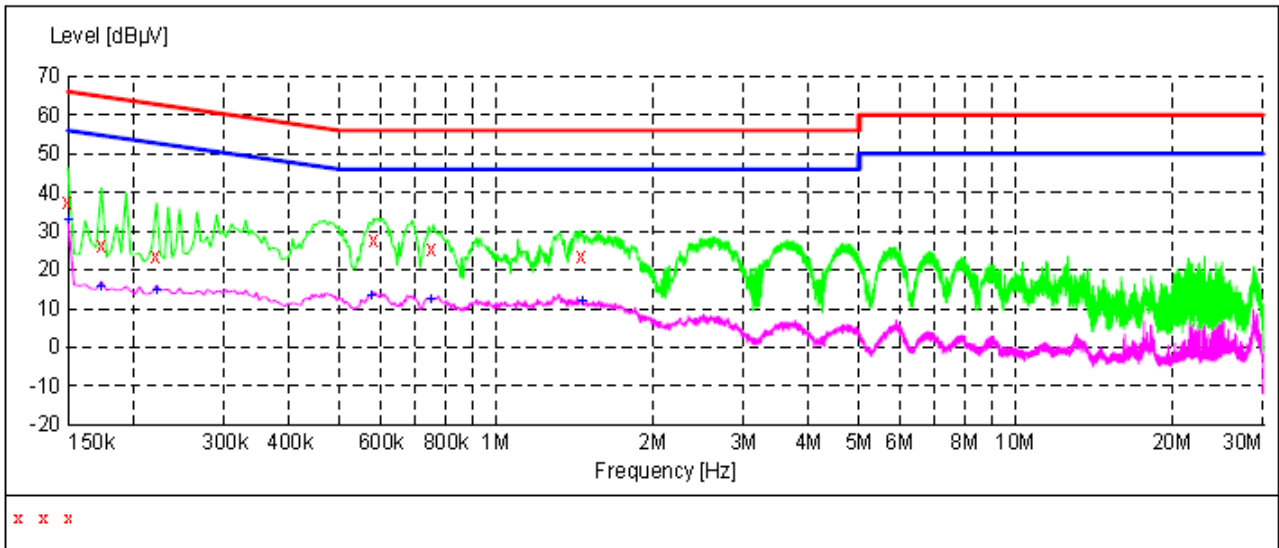
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	32.90	11.3	56	23.1	AV	L1	FLO
0.210000	14.40	11.3	53	38.8	AV	L1	FLO
0.594000	14.00	11.3	46	32.0	AV	L1	FLO
0.770000	12.80	11.3	46	33.2	AV	L1	FLO
1.314000	12.90	11.3	46	33.1	AV	L1	FLO
2.546000	7.30	11.4	46	38.7	AV	L1	FLO

**RESULT: PASS**



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LINE CONDUCTED EMISSION TEST-N



**MEASUREMENT RESULT:**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	37.70	11.3	66	28.3	QP	N	FLO
0.174000	26.50	11.3	65	38.3	QP	N	FLO
0.222000	23.60	11.3	63	39.1	QP	N	FLO
0.582000	27.60	11.3	56	28.4	QP	N	FLO
0.754000	25.50	11.3	56	30.5	QP	N	FLO
1.462000	23.60	11.3	56	32.4	QP	N	FLO

**MEASUREMENT RESULT:**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	32.90	11.3	56	23.1	AV	N	FLO
0.174000	15.40	11.3	55	39.4	AV	N	FLO
0.222000	14.80	11.3	53	37.9	AV	N	FLO
0.578000	13.30	11.3	46	32.7	AV	N	FLO
0.750000	12.40	11.3	46	33.6	AV	N	FLO
1.462000	11.70	11.3	46	34.3	AV	N	FLO

**RESULT: PASS**



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## 10 EN 55032 RADIATED EMISSION TEST

### 10.1 LIMITS OF RADIATED DISTURBANCES

#### AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

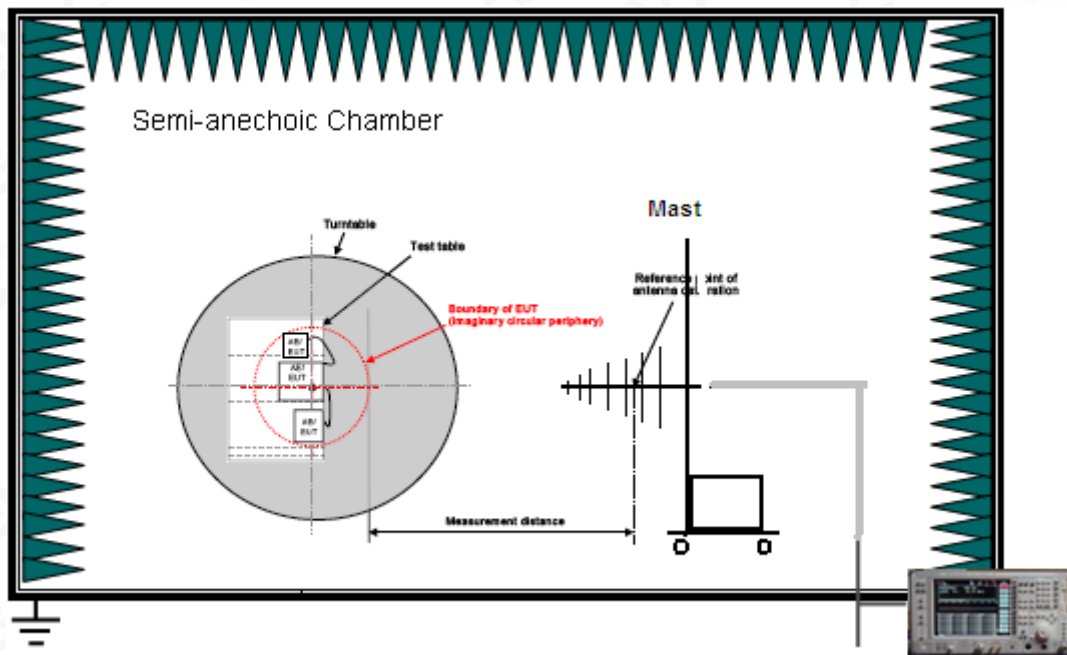
#### AT 3M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40.00
230-1000	3	47.00

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

### 10.2 BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators





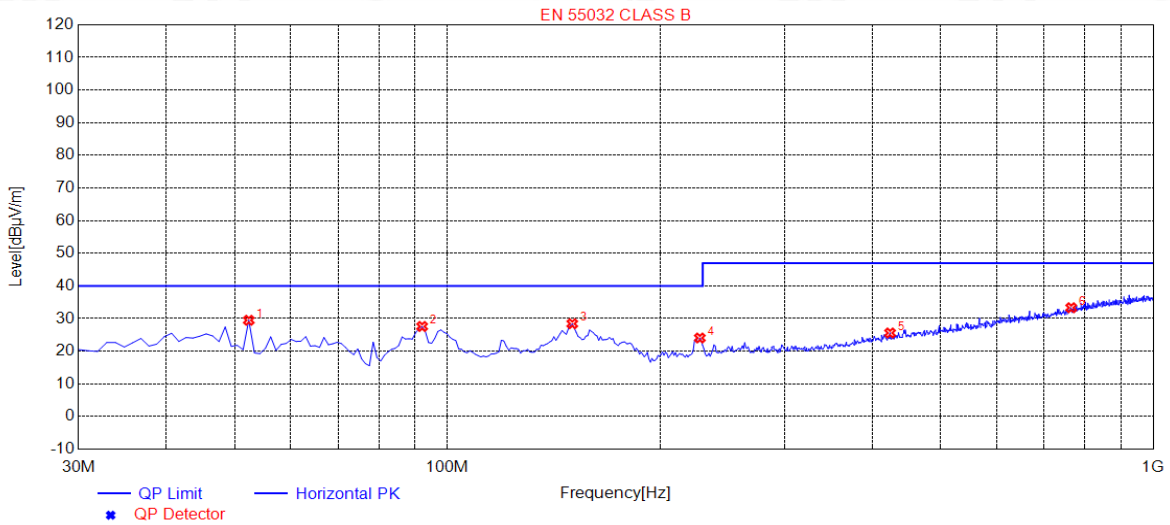
### 10.3 PROCEDURE OF RADIATED EMISSION TEST

- (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 55032 (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 10cm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN 55032.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN 55032.
- (4) The EUT received DC 5V power from adapter. All support equipments received AC230V power from socket under the turntable, if any.
- (5) The antenna was placed at 3 meter away from the EUT as stated in EN 55032. 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 test mode(s) were scanned during the test:
- (8) 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.



### 10.4 TEST RESULT OF RADIATED EMISSION TEST

#### Radiated Emission below 1GHz Test at 3m Distance-Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	52.3100	29.49	14.49	40.00	10.51	200	300	Horizontal
2	92.0800	27.60	10.50	40.00	12.40	200	183	Horizontal
3	150.280	28.43	14.88	40.00	11.57	200	0	Horizontal
4	227.880	24.06	13.87	40.00	15.94	100	74	Horizontal
5	423.820	25.60	20.37	47.00	21.40	200	8	Horizontal
6	765.260	33.33	27.58	47.00	13.67	100	303	Horizontal

**RESULT: PASS**



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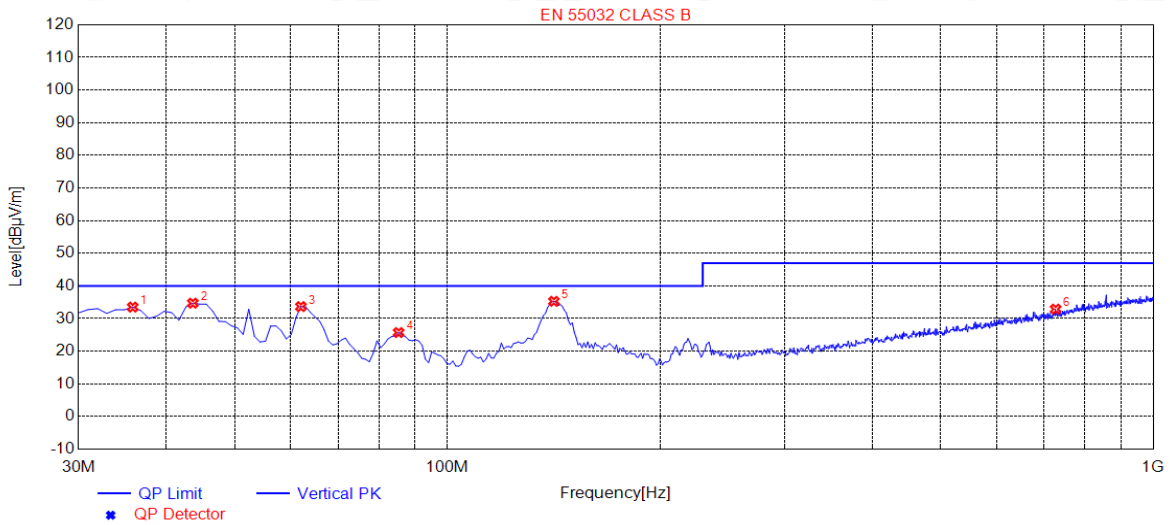
Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,  
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

Radiated Emission below 1GHz Test at 3m Distance-Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8200	33.53	13.93	40.00	6.47	100	210	Vertical
2	43.5800	34.73	14.84	40.00	5.27	100	253	Vertical
3	62.0100	33.68	13.58	40.00	6.32	100	69	Vertical
4	85.2900	25.73	10.20	40.00	14.27	100	83	Vertical
5	141.550	35.30	14.88	40.00	4.70	100	103	Vertical
6	727.430	32.90	26.64	47.00	14.10	100	217	Vertical

**RESULT: PASS**

Note:

Level(dBuV/m)=Reading(dBuV)+Factor(dB/m)

Factor(dB/m)=Antenna Factor(dB/m)+Cable loss(dB)+Attenuation(dB)for Attenuator

Margin=Limit -Level



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E-mail: agc@agc-cert.com

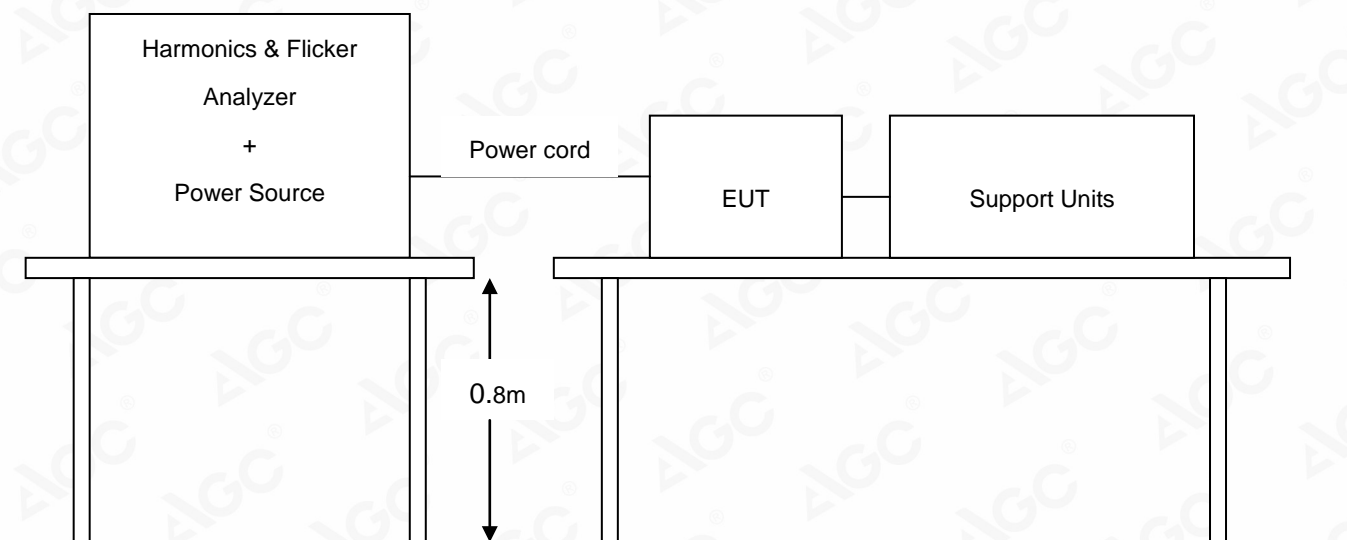
Service Hotline: 400 089 2118

## 11 EN 61000-3-2 POWER HARMONICS TEST

### POWER HARMONICS MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-2
Limits	<input checked="" type="checkbox"/> CLASS A ; <input type="checkbox"/> CLASS B ; <input type="checkbox"/> CLASS C ; <input type="checkbox"/> CLASS D
Tester	Faler
Temperature	25°C
Humidity	55%

### 11.1 BLOCK DIAGRAM OF TEST SETUP



### 11.2 RESULT

**Note:** Owing to the power of EUT is less than 75W, so test is not applicable.



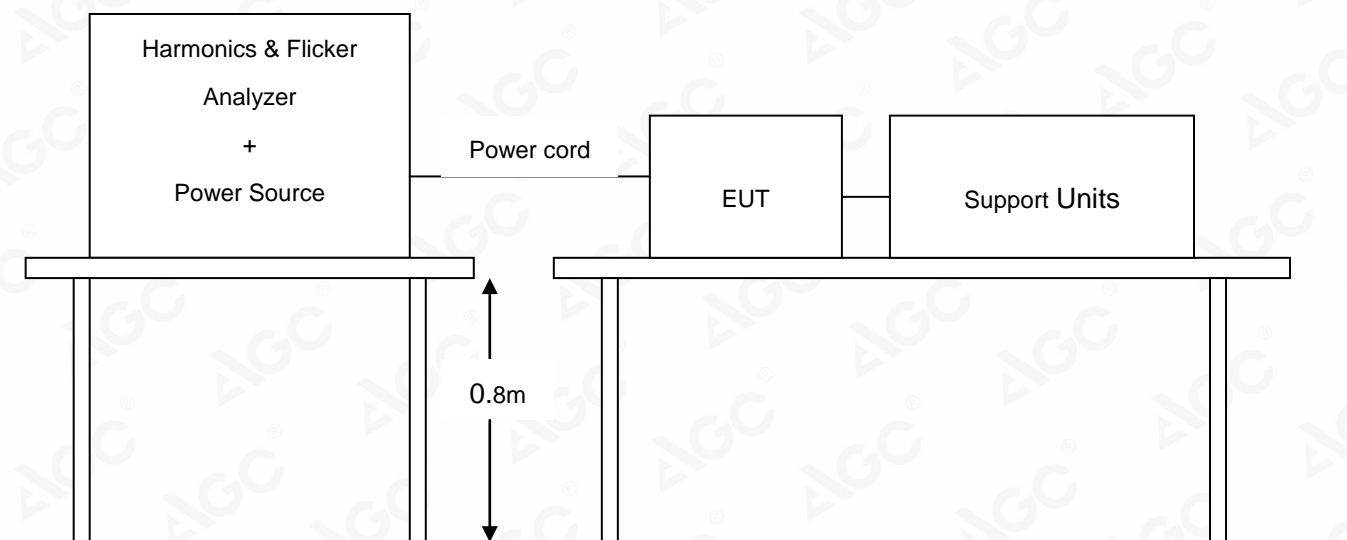


## 12 EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST

### VOLTAGE FLUCTUATION/FLICKER MEASUREMENT

Port	AC mains
Basic Standard	EN 61000-3-3
Limits	§5 of EN 61000-3-3
Tester:	Faler
Temperature	25°C
Humidity	55%

### 12.1 BLOCK DIAGRAM OF TEST SETUP



## 12.2 RESULT

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

EUT: Hp1-9

Tested by: Faler

Test category: All parameters (European limits)

Test Margin: 100

Test date: 19/03/2020

Start time: 15:33:06

End time: 15:43:28

Test duration (min): 10

Data file name: F-001079.cts\_data

Comment: Heating

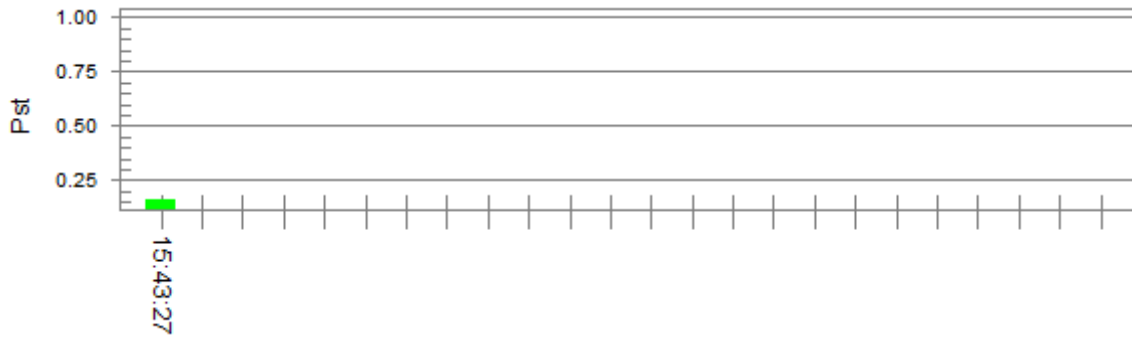
Customer: Quanzhou Chuanmu Intelligent Technology Co., Ltd.

Test Result: Pass

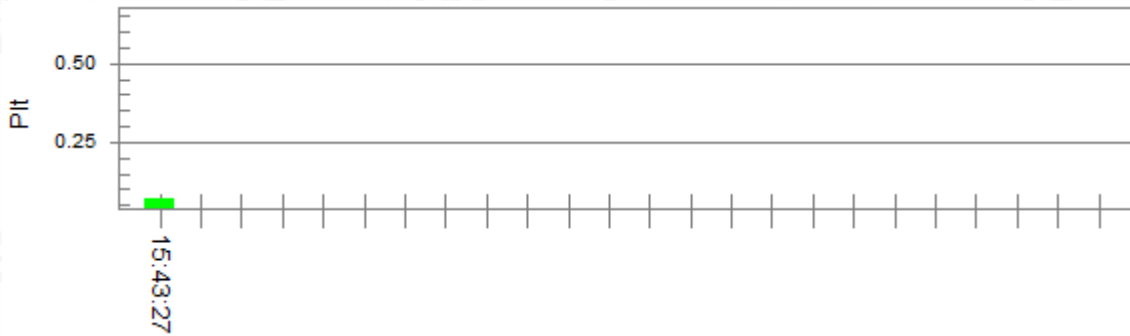
Status: Test Completed

#### Pst<sub>i</sub> and limit line

#### European Limits



#### Plt and limit line



#### Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.80

Highest dt (%):	0.00	Test limit (%):	3.30	Pass
Highest dt (mS):	0.0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.160	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.070	Test limit:	0.650	Pass



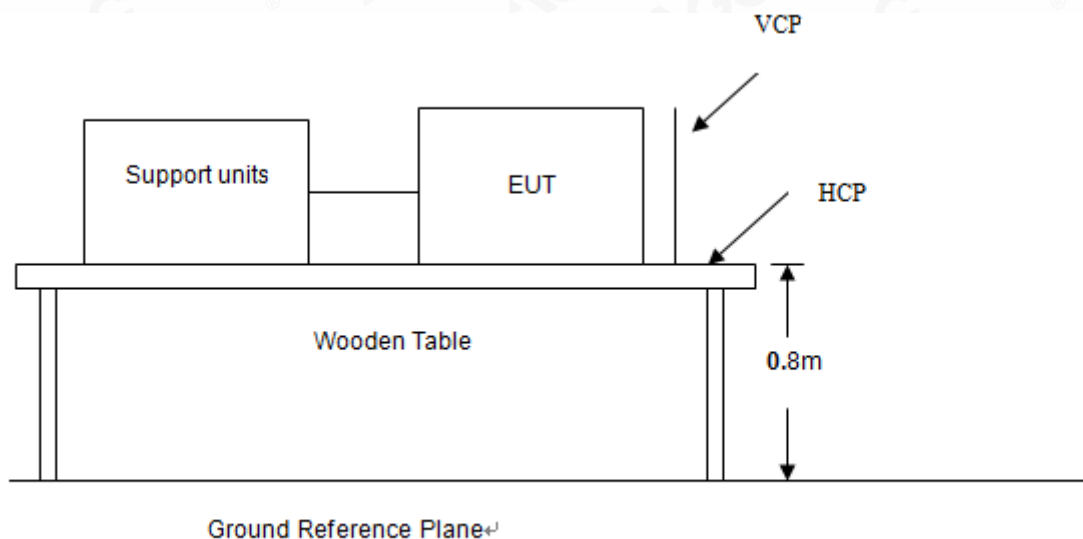
**13 EN 61000-4-2 ESD IMMUNITY TEST**

**ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST**

Port	Enclosure
Basic Standard	EN 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Tester	Faler
Temperature	23.8°C
Humidity	58.6%

**13.1 BLOCK DIAGRAM OF TEST SETUP**

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



### 13.2 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.

Active the communication function if the EUT with such port(s).

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.

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.

The application of ESD to the contact of open connectors is not required.

**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:

Voltage	Coupling	Test Performance	Result
±4kV	Contact Discharge	No function loss	A
±4kV	Indirect Discharge HCP (Front)	No function loss	A
±4kV	Indirect Discharge HCP (Left)	No function loss	A
±4kV	Indirect Discharge HCP (Back)	No function loss	A
±4kV	Indirect Discharge HCP (Right)	No function loss	A
±4kV	Indirect Discharge VCP (Front)	No function loss	A
±4kV	Indirect Discharge VCP (Left)	No function loss	A
±4kV	Indirect Discharge VCP (Back)	No function loss	A
±4kV	Indirect Discharge VCP (Right)	No function loss	A
±8kV	Air Discharge	No function loss	A





### 13.3 PERFORMANCE & RESULT

<b>Criteria A:</b>	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.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

**PASS**

**FAIL**

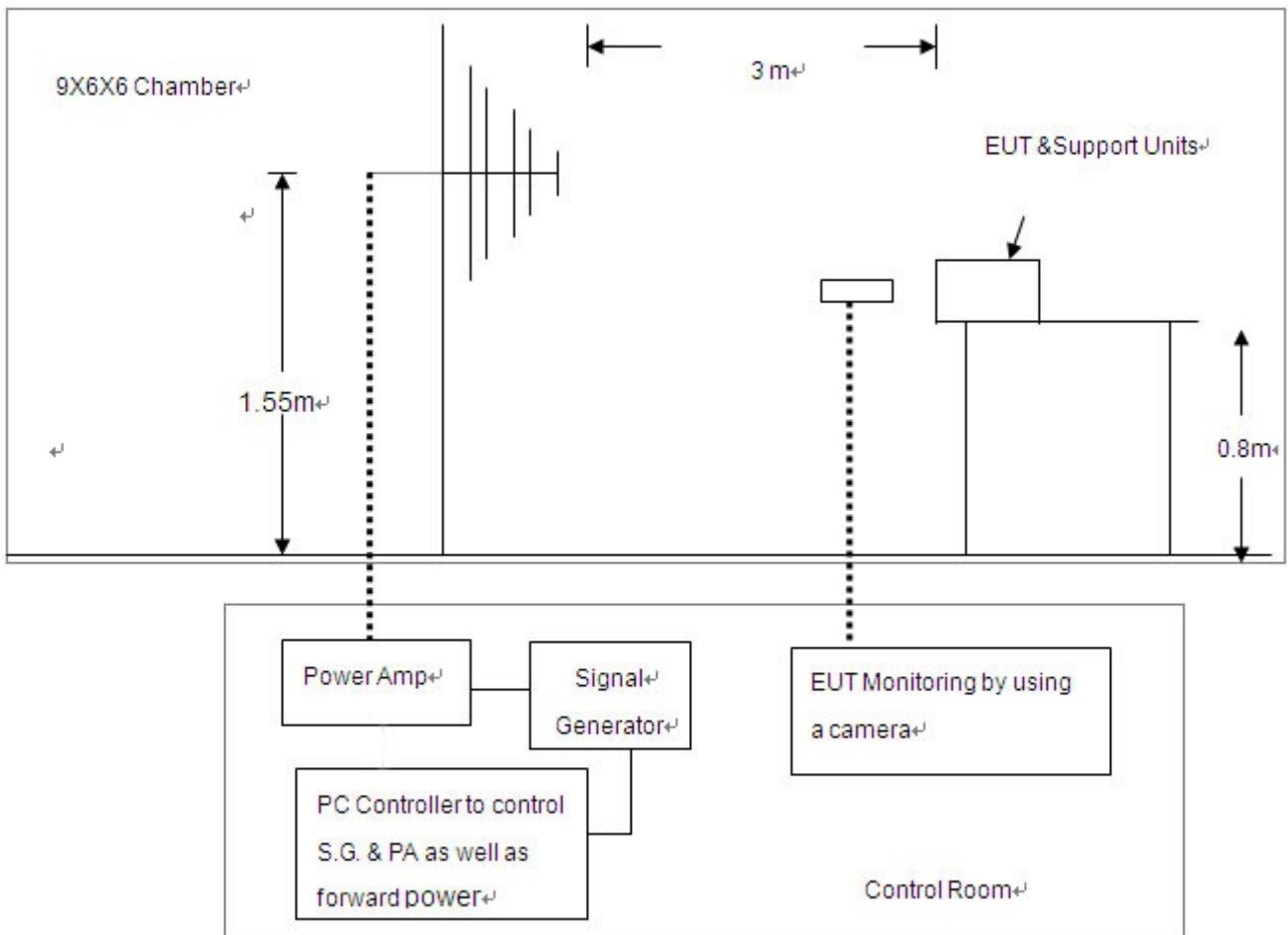


**14 EN 61000-4-3 RS IMMUNITY TEST**

**RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST**

Port	Enclosure
Basic Standard	EN 61000-4-3
Test Level:	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Tester	Faler
Temperature	21.2°C
Humidity	55.6%

**14.1 BLOCK DIAGRAM OF TEST SETUP**



### 14.2 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 EN 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per EN 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

Recording the test result in following table.

#### EN 61000-4-3 Final test conditions:

Test level: 3V/m

Steps: 1 % of fundamental

Dwell Time: 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result
80-1000	3V/m	AM	H	Front	No function loss	A
80-1000	3V/m	AM	H	Left	No function loss	A
80-1000	3V/m	AM	H	Back	No function loss	A
80-1000	3V/m	AM	H	Right	No function loss	A
80-1000	3V/m	AM	V	Front	No function loss	A
80-1000	3V/m	AM	V	Left	No function loss	A
80-1000	3V/m	AM	V	Back	No function loss	A
80-1000	3V/m	AM	V	Right	No function loss	A

### 14.3 PERFORMANCE & RESULT

<b>Criteria A:</b>	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.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

**PASS**
                 
  **FAIL**

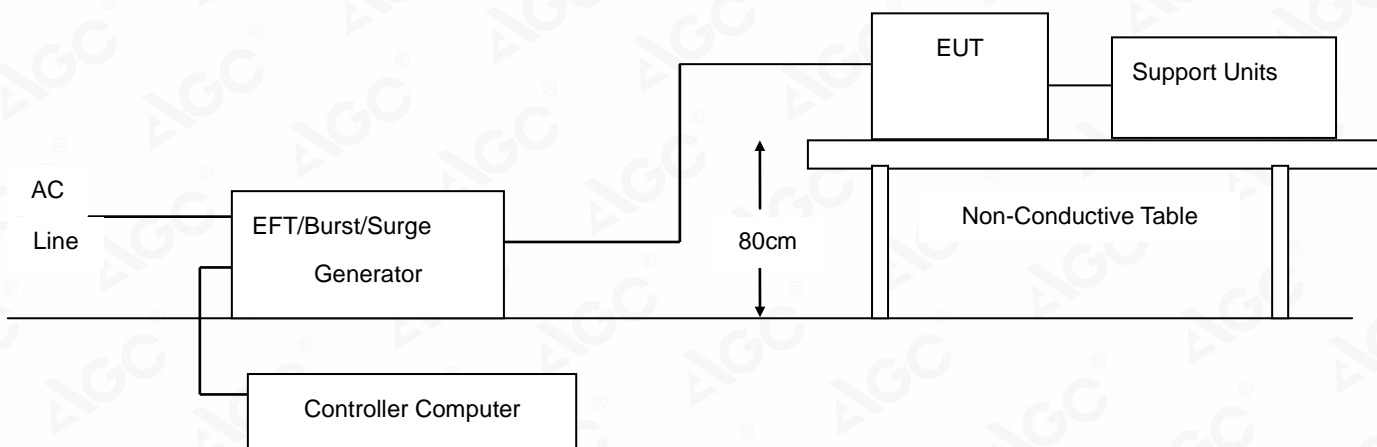


**15 EN 61000-4-4 EFT IMMUNITY TEST**

**ELECTRICAL FAST TRANSIENTS/BURST IMMUNITY TEST**

<b>Port</b>	On Power Supply Lines
<b>Basic Standard</b>	EN 61000-4-4
<b>Test Level</b>	+/- 1kV for Power Supply Lines
<b>Standard require</b>	B
<b>Tester</b>	Faler
<b>Temperature</b>	23.6°C
<b>Humidity</b>	59.0%

**15.1 BLOCK DIAGRAM OF TEST SETUP**





### 15.2 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: 5kHz  
Tr/Th: 5/50ns  
Burst Duration: 15ms  
Burst Period: 300ms

Inject Line	Voltage kV	Inject Method	Test Performance	Result
L+N	+/- 1	Direct	No function loss	A

### 15.3 PERFORMANCE & RESULT

<b>Criteria A:</b>	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.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

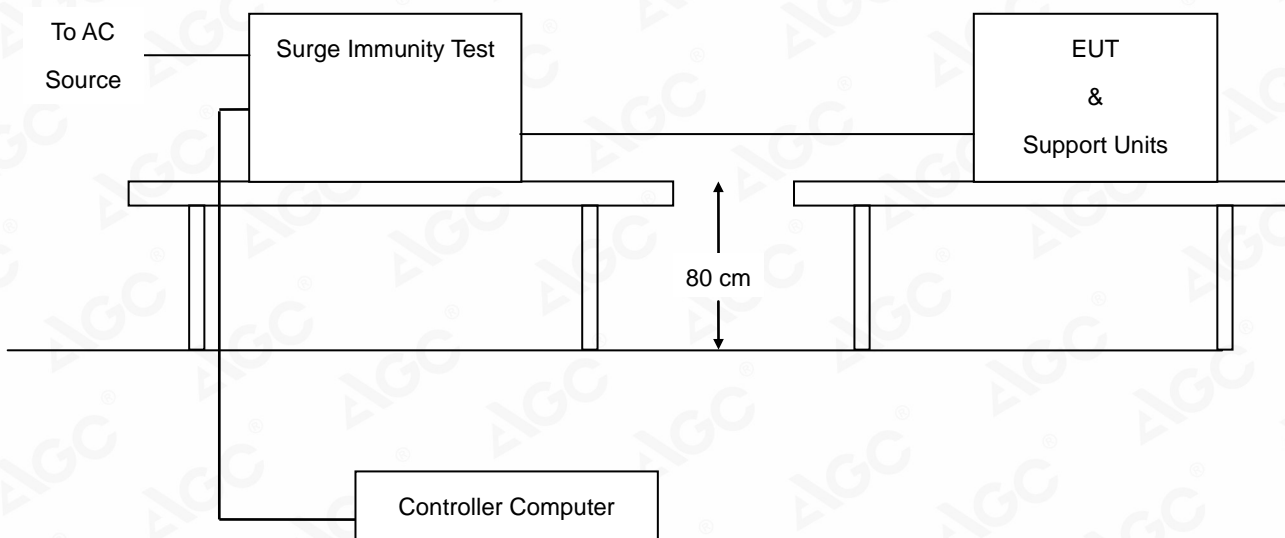
**PASS**
                 
  **FAIL**

**16 EN 61000-4-5 SURGE IMMUNITY TEST**

**SURGE IMMUNITY TEST**

<b>Port</b>	On Power Supply Lines
<b>Basic Standard</b>	EN 61000-4-5
<b>Requirements</b>	+/- 1kV (Line to Line)
<b>Standard require</b>	B
<b>Tester</b>	Faler
<b>Temperature</b>	23.6°C
<b>Humidity</b>	59.0%

**16.1 BLOCK DIAGRAM OF TEST SETUP**



### 16.2 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:**

<b>Voltage Waveform</b>	1.2/50 <i>us</i>
<b>Current Waveform</b>	8/20 <i>us</i>
<b>Polarity</b>	Positive/Negative
<b>Phase angle</b>	0°, 180°, 90°, 270°
<b>Number of Test</b>	5

Coupling Line	Voltage (kV)	Polarity	Coupling Method	Test Performance	Result
L1-N	1	Positive	Capacitive	No function loss	A
L1-N	1	Negative	Capacitive	No function loss	A

### 16.3 PERFORMANCE & RESULT

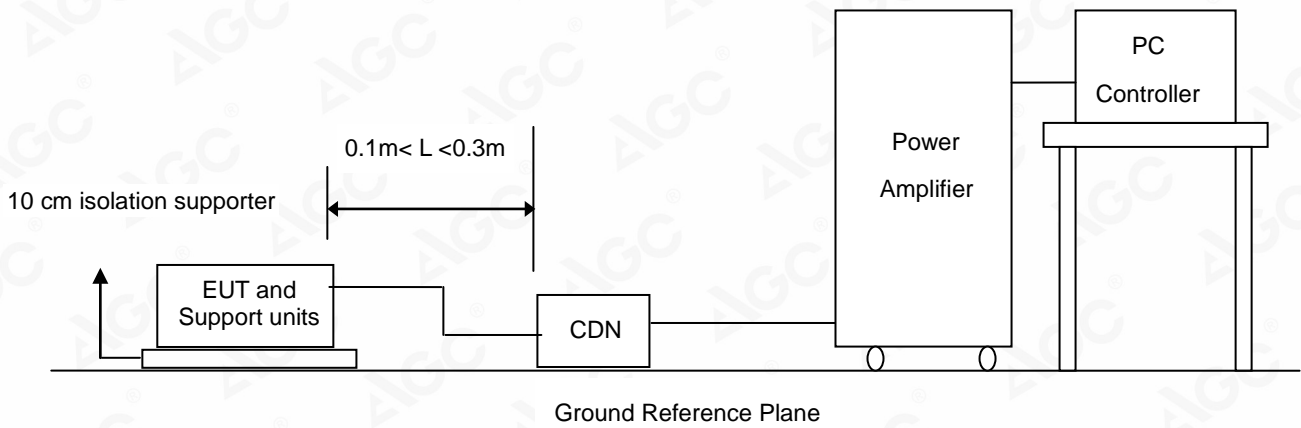
<b>Criteria A:</b>	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

**PASS**
                 
  **FAIL**

**17 EN 61000-4-6 CS IMMUNITY TEST**

<b>Port</b>	On Power Supply Lines
<b>Basic Standard</b>	EN 61000-4-6
<b>Requirements</b>	3V with 80% AM. 1kHz Modulation
<b>Standard require</b>	A
<b>Tester</b>	Faler
<b>Temperature</b>	23.5°C
<b>Humidity</b>	58.5%

**17.1 BLOCK DIAGRAM OF TEST SETUP**





### 17.2 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 EN 61000-4-6.  
Recording the test result in following table.

**Test conditions:**

<b>Frequency Range</b>	0.15MHz-80MHz
<b>Frequency Step</b>	1% of fundamental
<b>Dwell Time</b>	1 sec

Range (MHz)	Strength	Modulation	Result
0.15-80	3V	AM	A

### 17.3 PERFORMANCE & RESULT

<b>Criteria A:</b>	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.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

**PASS**
                         
  **FAIL**

**18 EN 61000-4-11 DIPS IMMUNITY TEST**

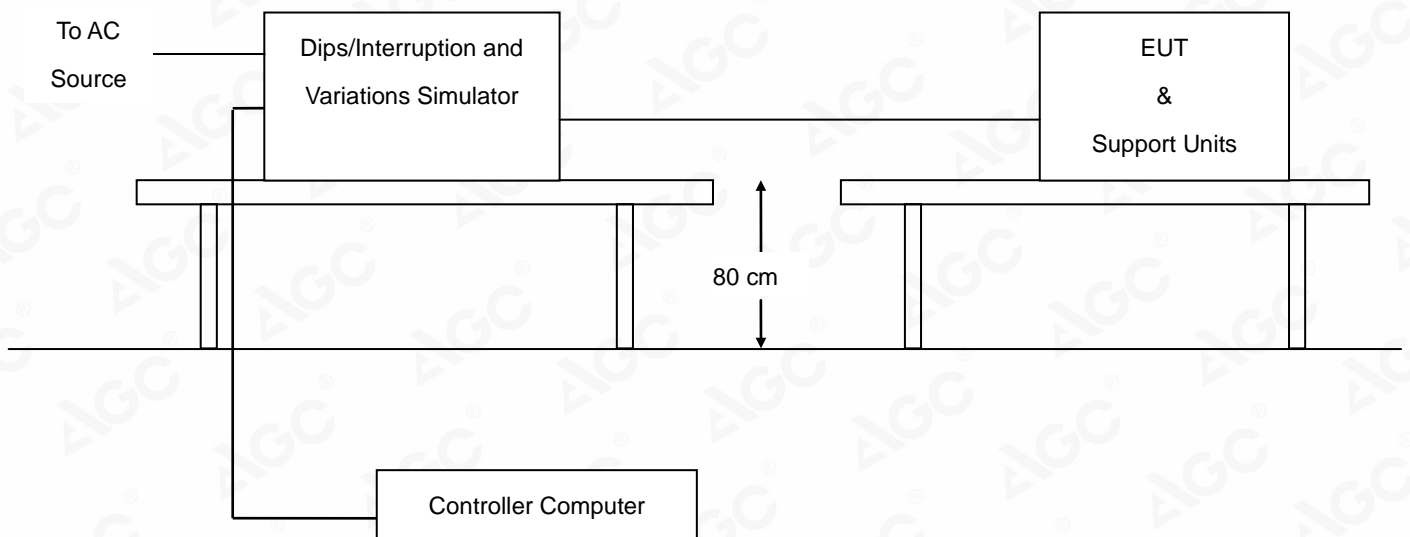
**VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST**

<b>Port</b>	On Power Supply Lines
<b>Basic Standard</b>	EN 61000-4-11
<b>Requirements</b>	0degrees
<b>Test Interval</b>	Min. 10 sec.
<b>Tester</b>	Faler
<b>Temperature</b>	23.6°C
<b>Humidity</b>	59.0%

	<b>Test Level % U<sub>T</sub></b>	<b>Reduction (%)</b>	<b>Duration ( periods )</b>	<b>Performance Criteria</b>
<b>Voltage Dips</b>	<5	>95	0.5	B
	70	30	25	C

	<b>Test Level % U<sub>T</sub></b>	<b>Reduction (%)</b>	<b>Duration ( periods )</b>	<b>Performance Criteria</b>
<b>Voltage Interruptions</b>	<5	>95	250	C

**18.1 BLOCK DIAGRAM OF TEST SETUP**



### 18.2 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:**

Test Level % U <sub>T</sub>	Reduction (%)	Duration ( periods)	Observation	Performance Result
<5	>95	0.5	Normal	A
70	30	25	Normal	A

**Voltage Interruptions:**

Test Level % U <sub>T</sub>	Reduction (%)	Duration ( periods)	Observation	Performance Result
<5	>95	250	The EUT stopped working during the test, but it can be recovered by operator after test.	C

### 18.3 INTERPRETATION

<b>Criteria A:</b>	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.
<b>Criteria B:</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.
<b>Criteria C:</b>	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

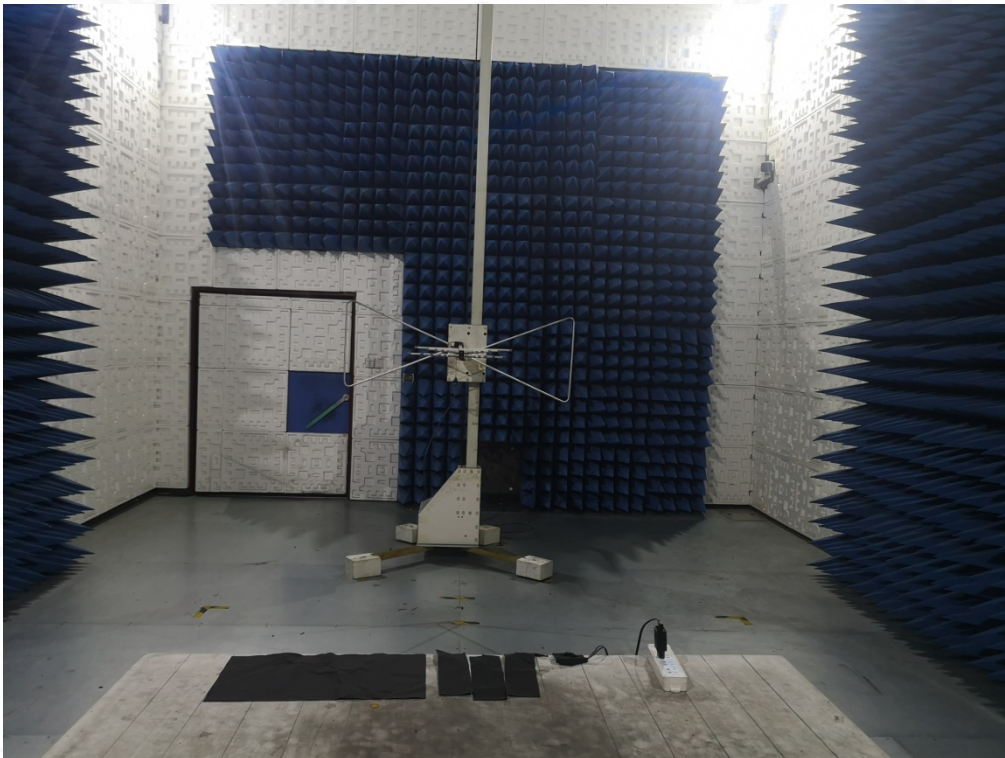
**PASS**
                 
  **FAIL**



**APPENDIX A: PHOTOGRAPHS OF TEST SETUP**  
**EN 55032 CONDUCTED EMISSION TEST SETUP**



**EN 55032 RADIATED EMISSION TESTSETUP**

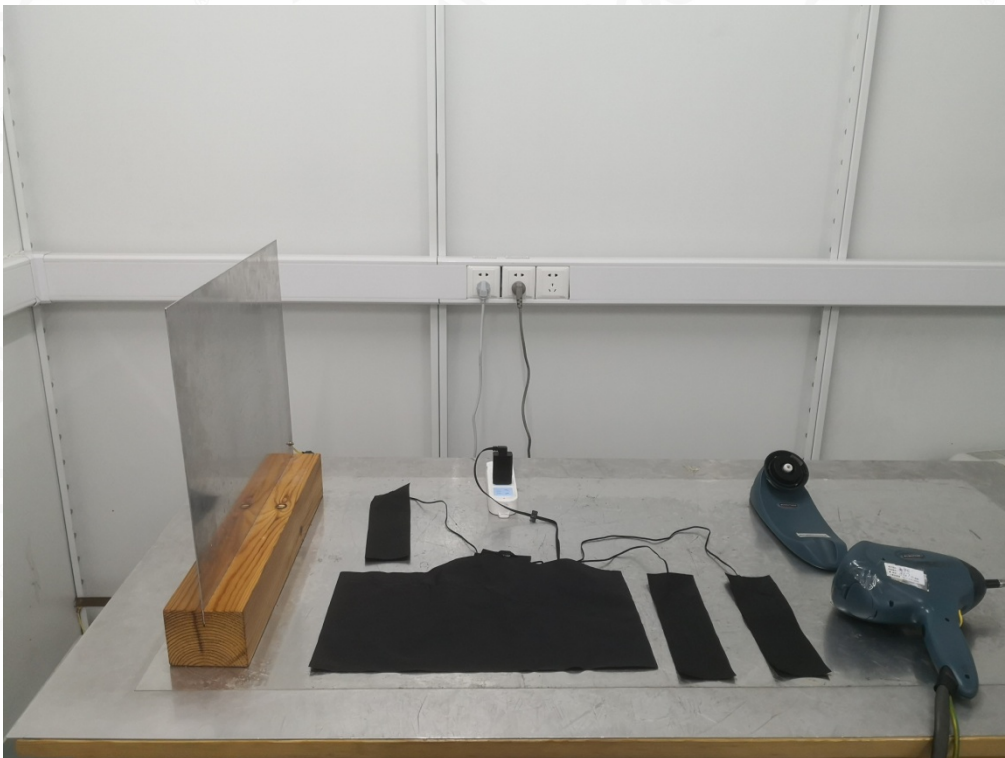




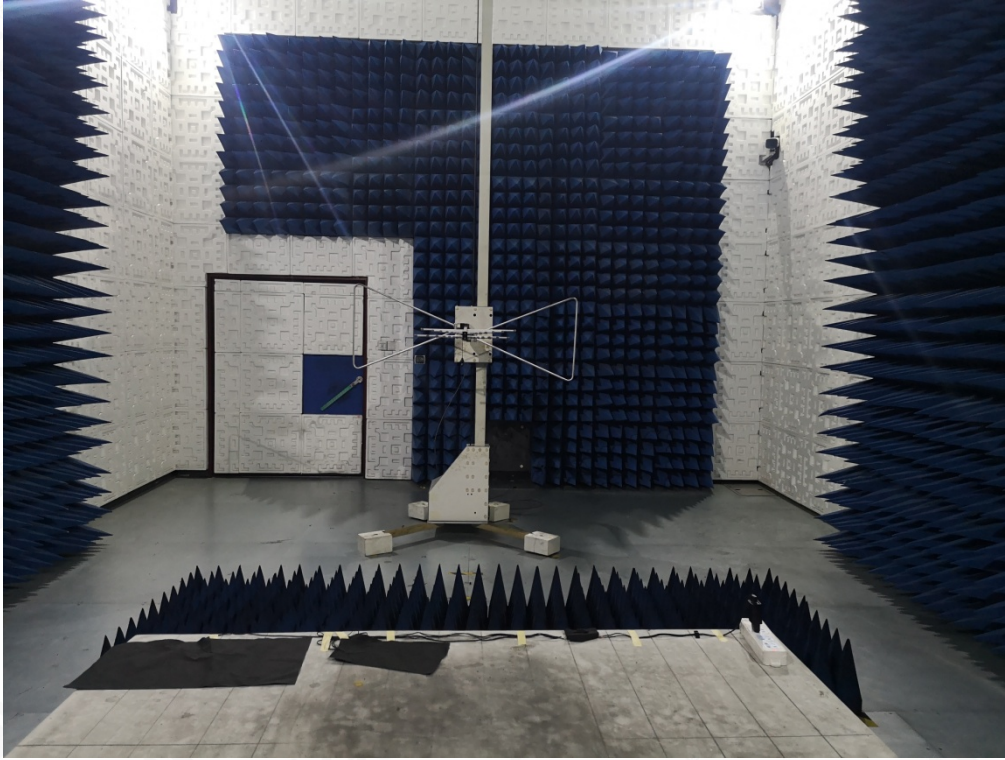
EN 61000-3-3 VOLTAGE FLUCTUATION / FLICKER TEST



EN 61000-4-2 ESD IMMUNITY TEST SETUP



EN 61000-4-3 RS IMMUNITY TEST SETUP

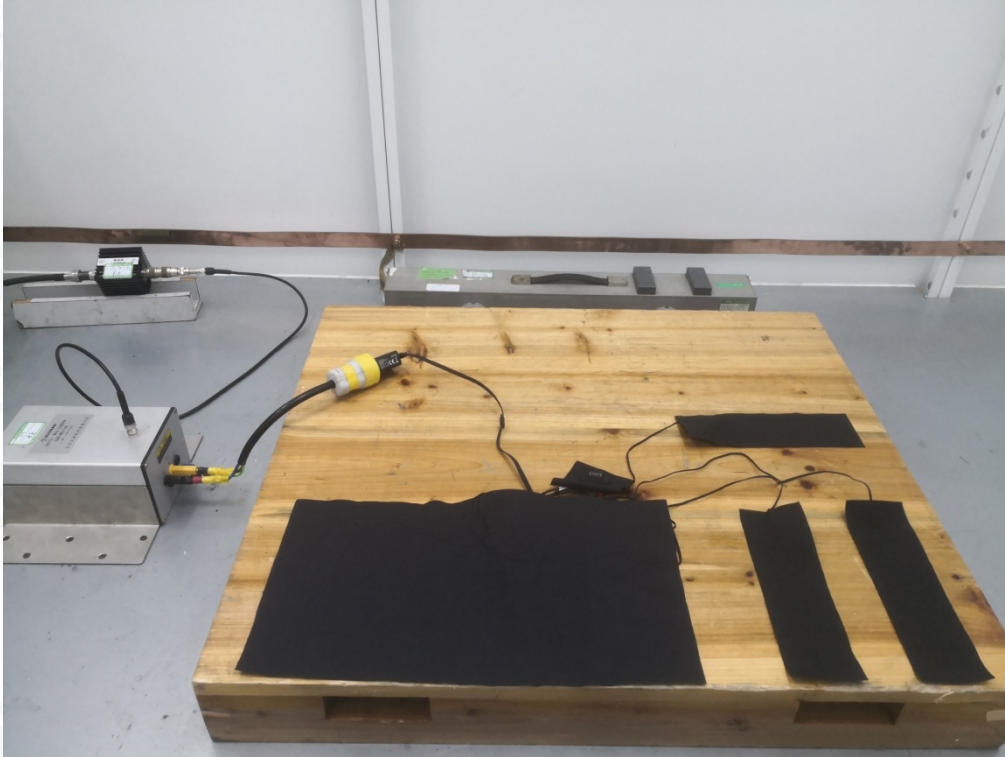


EN 61000-4-4/-5/-11 EFT/SURGE/DIPSIMMUNITY TEST SETUP



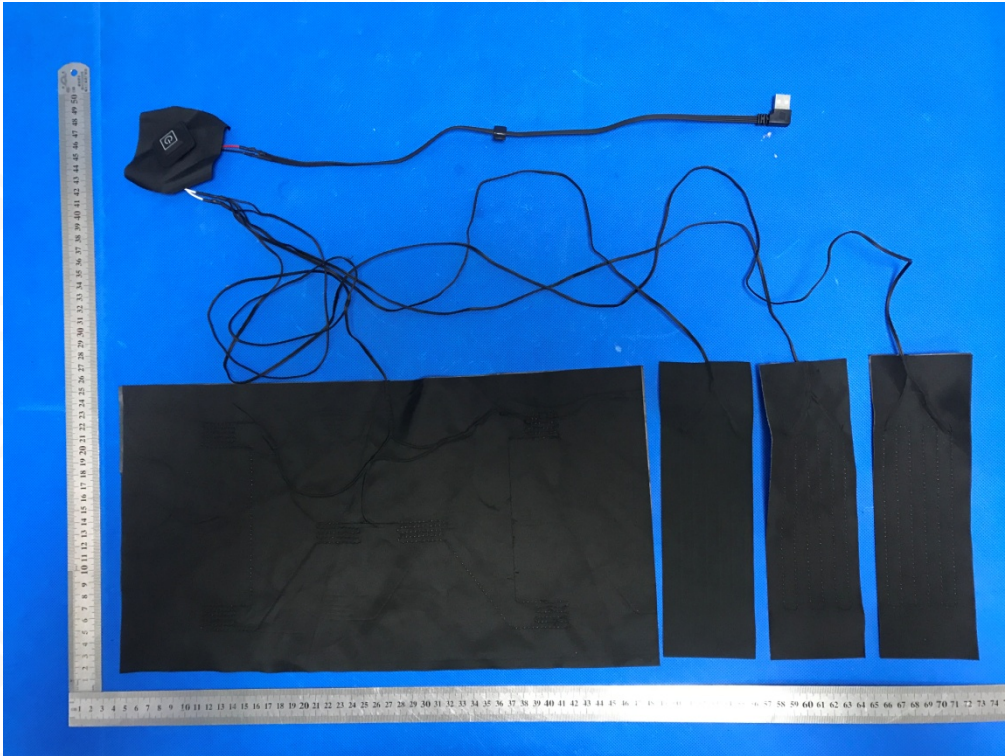


EN 61000-4-6 CS IMMUNITY TEST SETUP

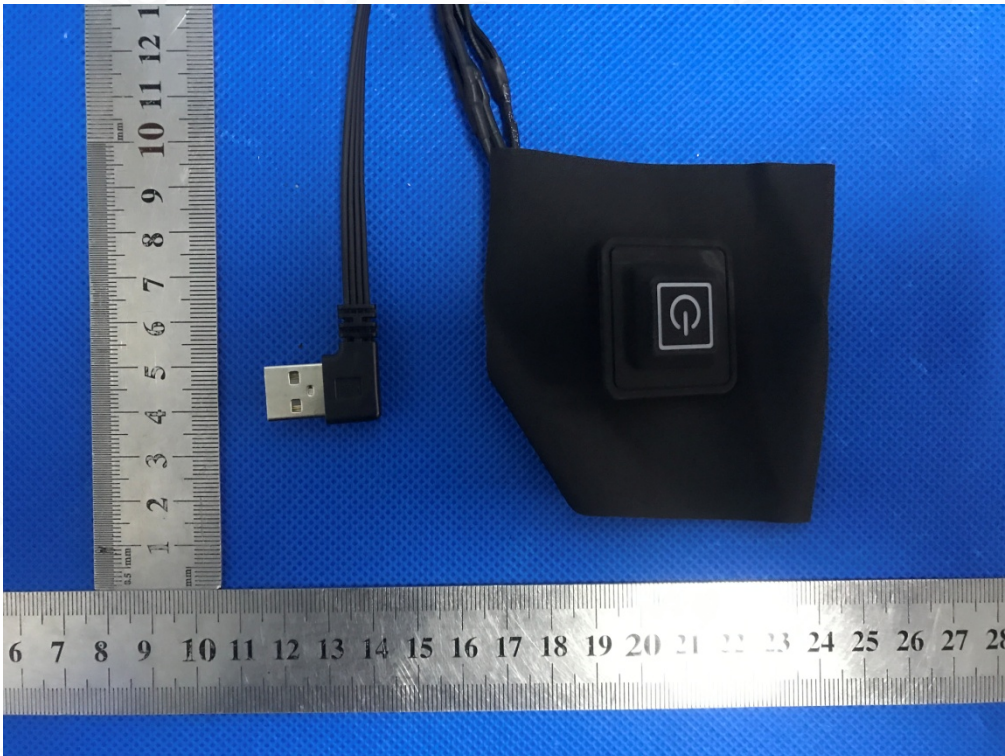


**APPENDIX B: PHOTOGRAPHS OF EUT**

**ALL VIEW OF EUT**

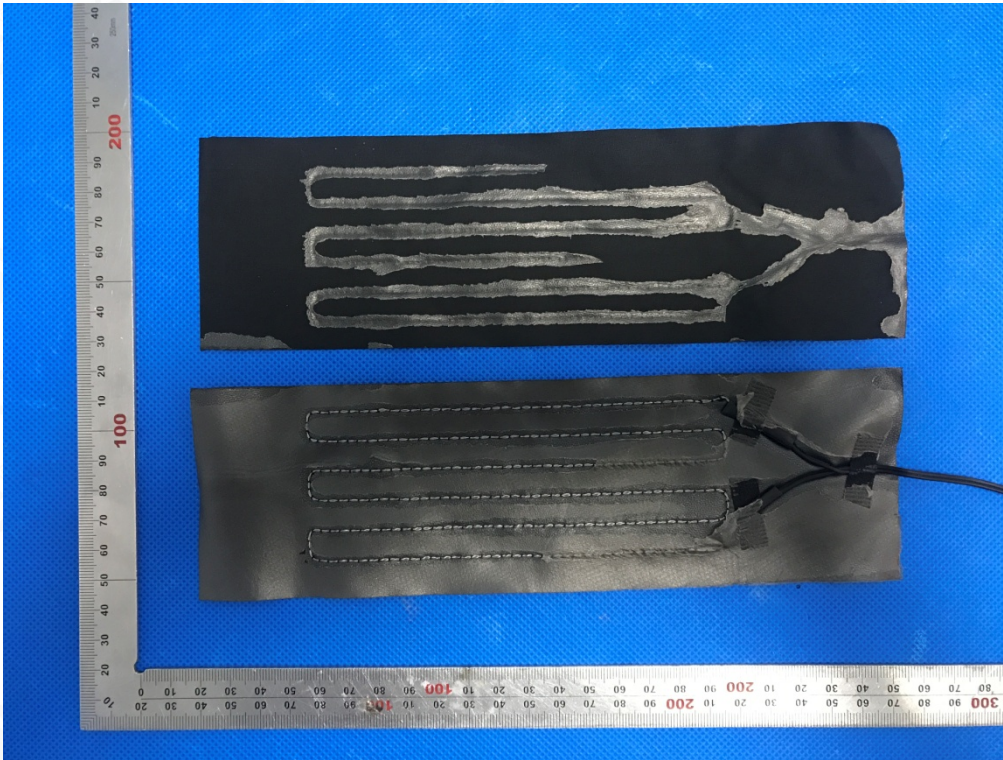


**PART VIEW OF EUT**





OPEN VIEW OF EUT



SERIAL MODEL



----END OF REPORT----

