# CERTIFICATE OF EMC

**CERTIFICATE NO.: SET2015-01565**

**Product:**

**Model:**

**Applicant:**

**Address:**

**SET2015-01565,**

**CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.**

CCIC Southern Electronic Product Testing (Shenzhen) Co.,Ltd.
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[redacted]

# EMC TEST REPORT

| | |
|---|---|
| **Report No.:** | SET2015-01565 |
| **Product:** | Car-Top Board |
| **Model No:** | BL2000-JDB-V* (*=1-1.99, indicate the different customer or/and Software function number) |
| **Applicant:** | ShenYang Bluelight Automatic Technology Co., Ltd. |
| **Address:** | No. 37 Shiji Road, Hunnan New District, Shenyang, China |
| **Issued by:** | CCIC Southern Electronic Product Testing (Shenzhen)CO., Ltd. |
| **Lab location:** | Building 28/29, Shigudong, Xili Industrial Area, Xili Street, Nanshan District, Shenzhen, Guangdong, China |
| **Tel:** | 86 755 26627338 FaxÖ 86 755 26627238 |




This test report consists of 23 pages in total. It

查询码：6PA7ZR5b

# Report

| | |
|---|---|
| **Product.....:** | Car-Top Board |
| **Model No. .....:** | BL2000-JDB-V* (*=1-1.99, indicate the different customer or/and Software function number) |
| **Brand Name.....:** | / |
| **Applicant.....:** | ShenYang Bluelight Automatic Technology Co., Ltd. |
| **Applicant Address.....:** | No. 37 Shiji Road, Hunnan New District, Shenyang, China |
| **Manufacturer.....:** | ShenYang Bluelight Automatic Technology Co., Ltd. |
| **Manufacturer Address.....:** | No. 37 Shiji Road, Hunnan New District, Shenyang, China |
| **Test Standards.....:** | **EN61000-6-4:2007+A1:2011** Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments<br>**EN61000-6-2:2005** Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments |
| **Test Result.....:** | Pass |
| **Tested by .....:** | Chen Weichang Feb. 06. 2015<br>Signature, Date |
| **Reviewed by.....:** | Zhu Qi Feb. 06. 2015<br>Signature, Date |
| **Approved by.....:** | Wu Lian Feb. 06. 2015<br>Signature, Date |

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# 1 General Information

## 1.1 Description of EUT

**Product:** Car-Top Board
**Model No.:** BL2000-JDB-V1.2
**Brand Name:** /
**Serial No.:** /
**Rating:** Input: 24V DC
**Accessories:** /

**NOTE:**

1. For more detailed features description about the EUT, please refer to User's Manual.
2. Application model is BL2000-JDB-V* (*=1-1.99, indicate the different customer or/and Software function number). Models differences do not affect the performance of EMC. All tests were performed on Model BL2000-JDB-V1.2 and results represented other models.
3. The highest frequency of the internal source of the EUT is below 108 MHz, so the radiated emission measurement shall be made up to 1GHz.

## 1.2 Objective

Perform ElectroMagnetic Interference (EMI) and ElectroMagnetic Susceptibility (EMS) tests for CE Marking.

# 2 Test Facilities and Configuration

## 2.1 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

## 2.2 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 Radiated Emission, Uc = ±4.7dB

## 2.3 Test Standards and Results

The EUT has been tested according to the following specifications:

| EMISSION | | |
|---|---|---|
| **Standard** | **Test Type** | **Result** |
| EN61000-6-4:2007+A1:2011 | Radiated disturbance | PASS |
| **IMMUNITY (EN61000-6-2:2005)** | | |
| **Basic Standard** | **Test Type** | **Result** |
| IEC 61000-4-2 | Electrostatic discharge immunity | PASS |
| IEC 61000-4-3 | Radiated, radio frequency electromagnetic field immunity | PASS |
| IEC 61000-4-4 | Electrical fast transient/burst immunity | PASS |
| IEC 61000-4-5 | Surge immunity | PASS |
| IEC 61000-4-6 | Immunity to conducted disturbances induced by RF fields | PASS |
| IEC 61000-4-8 | Power frequency magnetic field immunity | PASS |

## 2.4 List of Equipments Used

| Description | Manufacturer | Model No. | Calibration Date | Serial No. |
|---|---|---|---|---|
| Test Receiver | ROHDE&SCHWARZ | ESCI | Jun.10, 2015 | A0902601 |
| Broadband Ant. | ROHDE&SCHWARZ | VULB 09160 | Jun.10, 2015 | A0805560 |
| Anechoic Chamber | Albatross | SAC-10MAC 19.6*11.8*8.55m | Jun.23, 2015 | A0802520 |
| Signal Generator | ROHDE&SCHWARZ | SMR27 | Jun.10, 2015 | A0304219 |
| Signal Generator | ROHDE&SCHWARZ | SML02 | Jun.10, 2015 | A0304261 |
| EMS Antenna | Amplifier Research | AR AT1080 | Jun.10, 2015 | A0304249 |
| EMS Antenna | Amplifier Research | AR AT4002A | Jun.10, 2015 | A0304250 |
| Power Amplifier | Amplifier Research | 150W1000 | / | A0304247 |
| Power Amplifier | Amplifier Research | AR 75A250M | / | A0304255 |
| Power Amplifier | Amplifier Research | 25S1g4AM1 | / | A0304248 |
| Capacitive clamp | ROHDE&SCHWARZ | F2301 | / | A0304258 |
| EFT Test System | HAEFELY | PEFT JUNIOR | May.22, 2015 | A0103110 |
| Surge Test System | EM TEST | VCS500M10 | Jun.10, 2015 | A0712509 |
| | EM TEST | CNV503S9 | Jun.10, 2015 | A0712510 |
| ESD Test System | EM TEST | ESD30C | Sep.24.2015 | A0712513 |
| Magnetic Field Tester | HAEFELY | MAG 100.1 | Jun.10. 2015 | A0103109 |

**NOTE:** Equipments above have been calibrated and are in the period of validation.

# 3 Emission Test

## 3.1 EUT Setup and Operating Conditions

The EUT was powered by 24V DC mains. The EUT was continuously operated during the test.

## 3.2 Radiated Disturbance Measurement

### 3.2.1 Limits of Radiated Disturbance

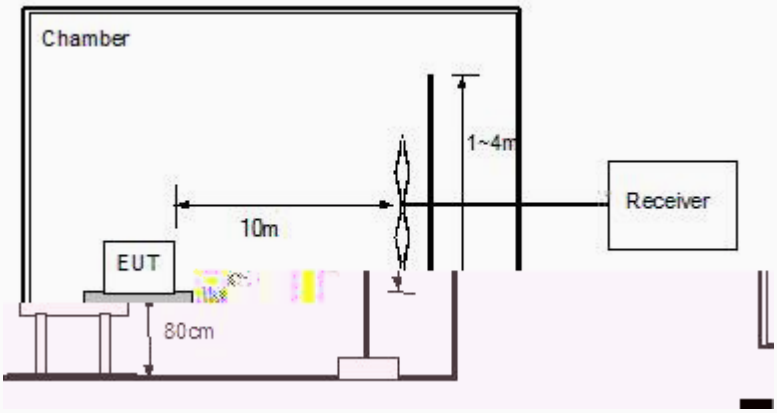
| Frequency range (MHz) | Quasi peak limits(dB V/m), at 10m measurement distance |
|---|---|
| 30 – 230 | 40 |
| 230 - 1000 | 47 |

**Notes:**

(1) The lower limit shall apply at the transition frequency.

(2) Additional provisions may be required for cases where interference occurs.

### 3.2.2Test Setup



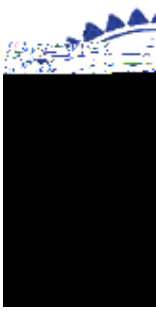
### 3.2.3 Test Result

| No. | Frequency (MHz) | Antenna Polarization | Antenna Height (cm) | Table Angle (Degree) | QP Limits (dB V/m) | Emission Level (dB V/m) |
|---|---|---|---|---|---|---|
| 1 | 52.080000 | H | 400 | 0 | 40 | 24.8 |
| 2 | 64.000000 | H | 400 | 0 | 40 | 27.8 |
| 3 | 127.960000 | H | 400 | 0 | 40 | 29.1 |
| 4 | 160.000000 | H | 400 | 0 | 40 | 34.8 |
| 5 | 224.000000 | H | 400 | 0 | 40 | 31.6 |
| 6 | 390.120000 | H | 400 | 0 | 40 | 24.2 |
| 7 | 31.960000 | V | 100 | 0 | 40 | 21.2 |
| 8 | 52.080000 | V | 100 | 0 | 40 | 27.4 |
| 9 | 75.840000 | V | 100 | 0 | 40 | 21.1 |
| 10 | 160.000000 | V | 100 | 0 | 40 | 21.3 |
| 11 | 224.000000 | V | 100 | 0 | 40 | 28.3 |
| 12 | 320.000000 | V | 100 | 0 | 40 | 29.1 |

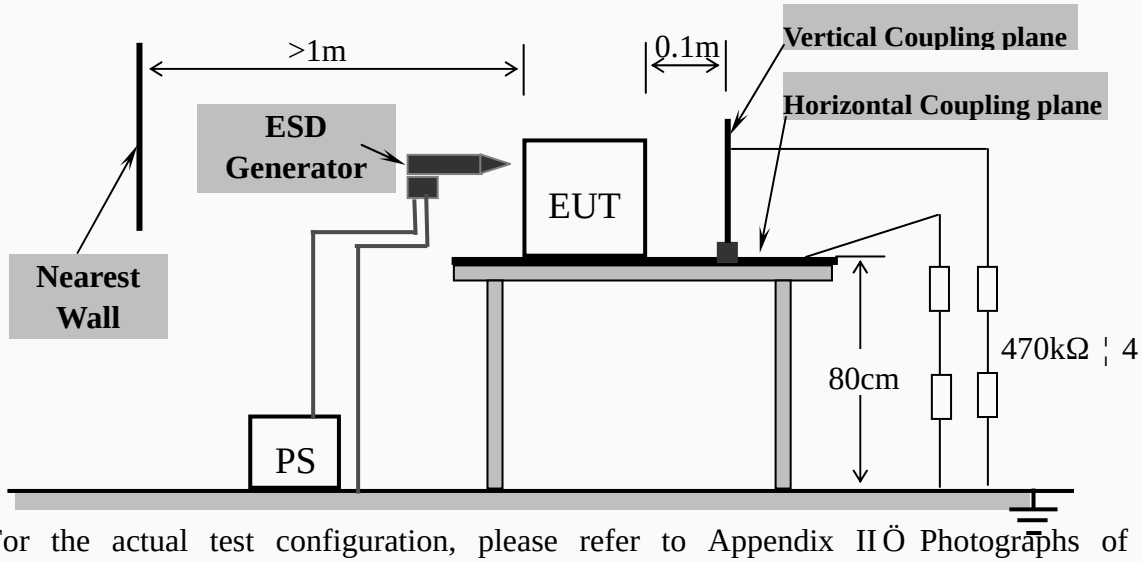








### 4.3.2 Test Setup




For the actual test configuration, please refer to Appendix II Ö Photographs of the Test Configuration.

### 4.3.3 Test Result

| Test Points | Discharge Level (kV) | Discharge Mode | Observation | Comply with Criterion |
|---|---|---|---|---|
| Screen | ±2, 4, 6, 8 | Air | Note(1) | A |
| HCP | f 2, 4 | Contact | Note(1) | A |
| VCP | f 2, 4 | Contact | Note(1) | A |

**NOTE:**
(1). The EUT continued to operate as intended. No degradation of performance was observed.

# 4.4 Radiated, Radio Frequency Electromagnetic Field Immunity Test

## 4.4.1 Test Specification

| | | | |
|---|---|---|---|
| **Basic Standard:** | EN 61000-4-3 | | |
| **Frequency Range:** | 80 MHz – 1000MHz | 1.4GHz – 2.0GHz | 2.0GHz – 2.7GHz |
| **Field Strength:** | 10V/m | 3V/m | 1V/m |
| **Modulation:** | 1kHz sine wave, 80%, AM modulation | | |
| **Frequency Step:** | 1% of fundamental | | |
| **Polarity of Antenna** | Horizontal and Vertical | | |
| **Test Distance:** | 3m | | |

### 4.4.3 Test Result

| Frequency | Polarity | Azimuth | Field Strength (V/m) | Observation | Comply with Criterion |
|---|---|---|---|---|---|
| 80-1000 MHz | V&H | 0,90, 80, 270 | 10 | Note(1) | A |
| 1.4-2.0GHz | V&H | 0,90, 80, 270 | 3 | Note(1) | A |
| 2.0-2.7GHz | V&H | 0,90, 80, 270 | 1 | Note(1) | A |

NOTE:

(1). The EUT continued to operate as intended. No degradation of performance was observed.

## 4.5 Electrical Fast Transient/Burst Immunity Test

### 4.5.1 Test Specification

| | |
|---|---|
| [redacted]**ard:** | IEC 61000-4-4 |
| **Test Voltage:** | DC. Power port: 2 kV, Signal port: 1 kV |
| [redacted] | Positive/Negative |

For the actual test configuration, please refer to Appendix IIÖ Photographs of the Test Configuration.

### 4.5.3 Test Result

| Test Point | Polarity | Test Level (kV) | Observation | Comply with Criterion |
|---|---|---|---|---|
| DC. power | +/- | 2 | Note (1) | A |
| Signal port | +/- | 1 | Note (1) | A |

**NOTE:**

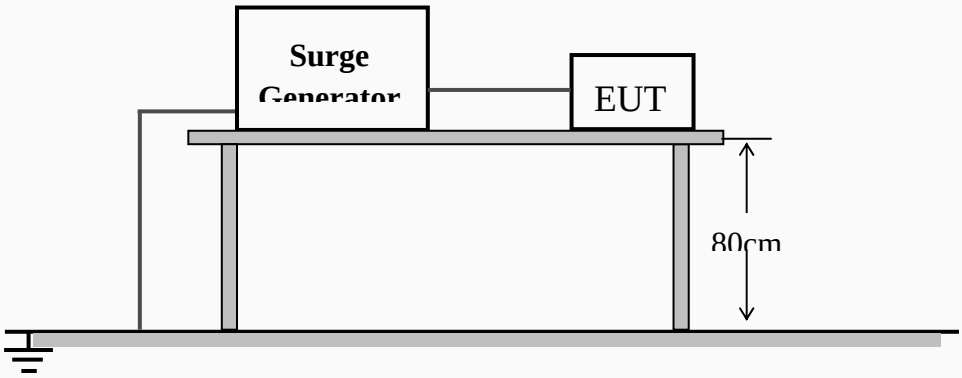
(1). The EUT continued to operate as intended. No degradation of performance was observed.

## 4.6 Surge Immunity Test

### 4.6.1 Test Specification

| | |
|---|---|
| **Basic Standard:** | IEC 61000-4-5 |
| **Waveform:** | Voltage 1.2/50 s; Current 8/20 s |
| **Test Voltage:** | DC power port: line to line 0.5 kV, line to earth 0.5 kV |
| **Polarity:** | Positive/Negative |
| **Repetition Rate:** | 60sec |
| **Times:** | 5 time/each condition. |
| **Criterion:** | B |

### 4.6.2 Test Setup




### 4.6.3 Test Result

| Coupling Line | Polarity | Voltage (kV) | Observation | Comply with Criterion |
|---|---|---|---|---|
| DC power, Line-Line | +/- | 0.5 | Note (1) | B |

**NOTE:**

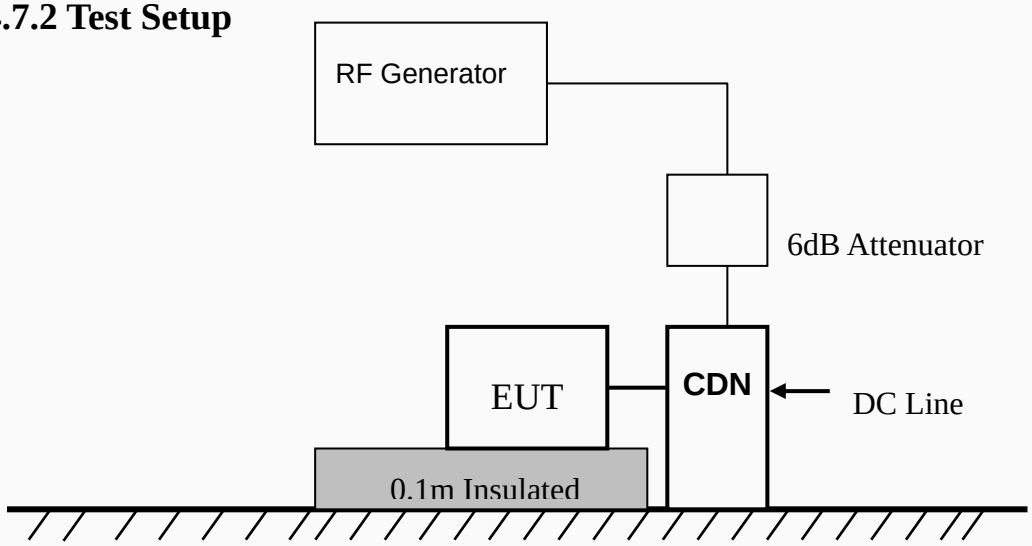
(1). The EUT continued to operate as inten3hd. No degradation of performance was observhd.

# 4.7 Immunity to Conducted Disturbances Induced by RF Fields

## 4.7.1 Test Specification

| | |
|---|---|
| **Basic Standard:** | IEC 61000-4-6 |
| **Frequency Range:** | 0.15 MHz – 80 MHz |
| **Field Strength:** | 10V |
| **Modulation:** | 1 kHz Sine Wave, 80%, AM Modulation |
| **Frequency Step:** | 1% of fundamental |
| **Coupled Cable:** | DC. power line |
| **Coupling Device:** | Capacitive clamp |
| **Criterion:** | A |

## 4.7.2 Test Setup




Ground Reference Plane

## 4.7.3 Test Result

| Test Point | Frequency | Field Strength (Vrms) | Observation | Comply with criterion |
|---|---|---|---|---|
| DC Power Line | 0.15 – 80 MHz | 10 | Note(1) | A |
| Signal port | 0.15 – 80 MHz | 10 | Note (1) | A |

**NOTE:**

(1). The EUT continued to operate as intended. No degradation of performance was observed.

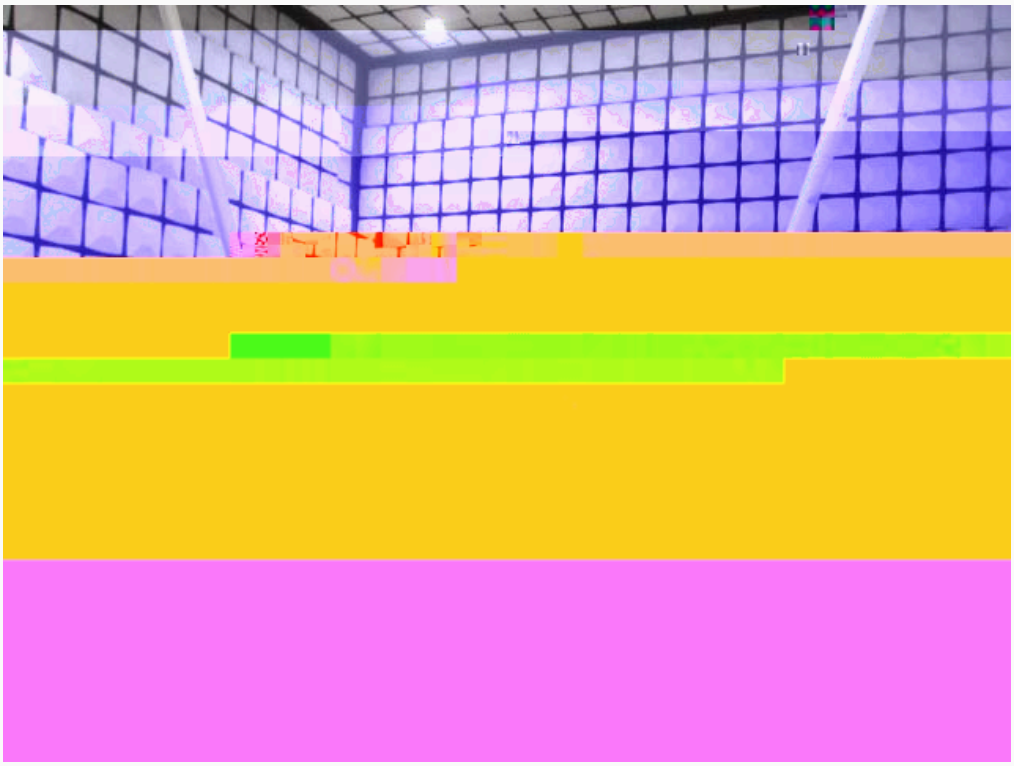




# Appendix IÖ Photographs of the EUT

# Appendix IIÖ Photographs of EMC Test Configuration

## 1. Radiated Field Strength Measurement



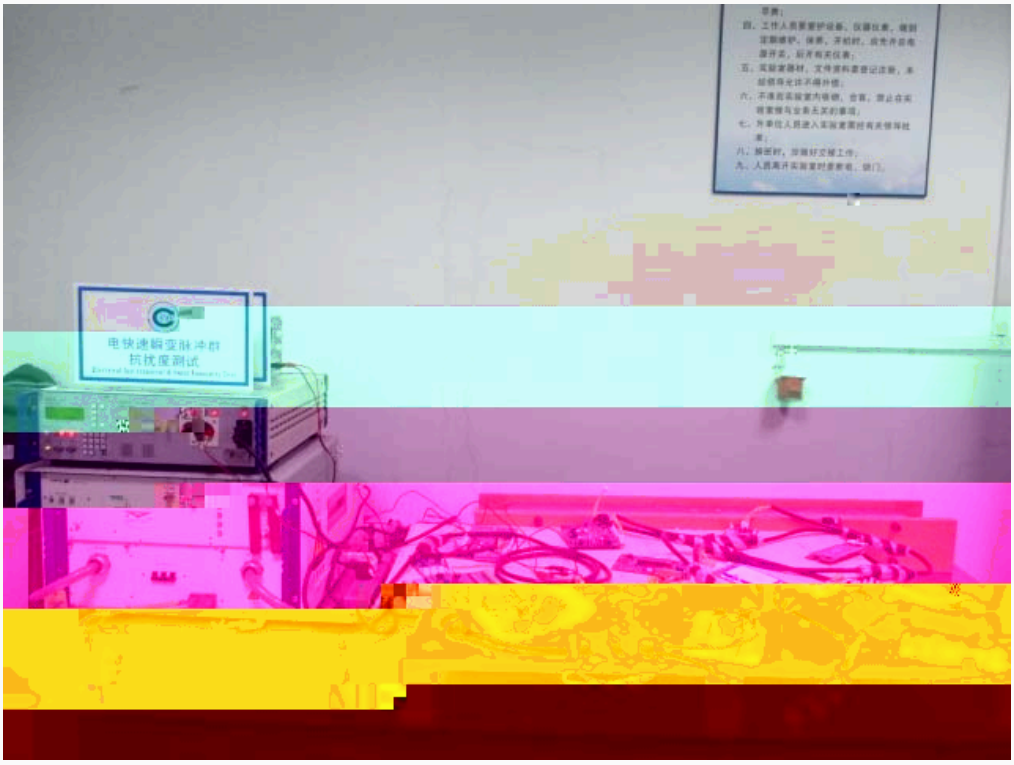
## 2. Electrostatic Discharge Immunity Test



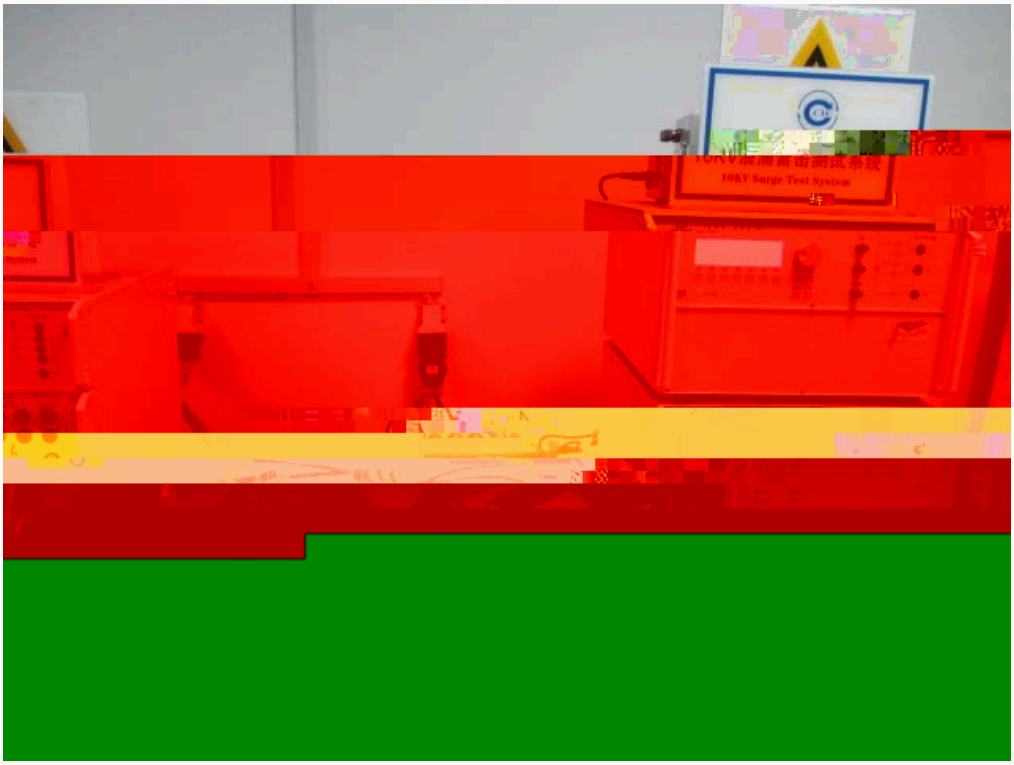




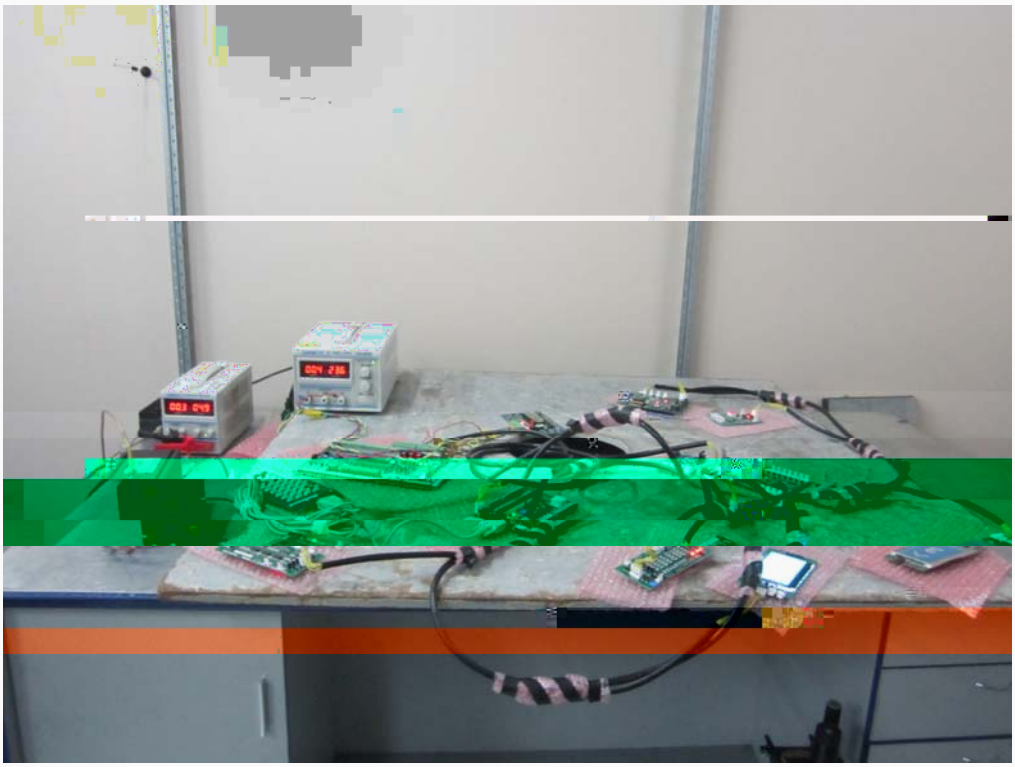
## 5. Electrical Fast Transient/Burst Immunity Test



## 6. Surge Immunity Test



## 7. Immunity to Conducted Disturbances Induced by RF Fields



## 8. Power Frequency magnetic Field Immunity



# STATEMENT

**This test laboratory is accredited by CNAS, Accreditation Certificate No.L1659.**

2. **The test report is invalid without stamp of laboratory.**

3. The test r5 TjT85 TDto edited b036 1 Tf .75 8 TD .00016 .75 0tdesD[2sampe 2ling by clientory2.5