# CERTIFICATE OF EMC

CERTIFICATE NO.: SET2015-01566

| | |
|---|---|
| Product: | Group control board |
| Model: | BL2000-QKB-V* (*=2-2.99, 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 |

This is to certify that, on the basis of the tests undertaken as per Report No. SET2015-01566, the submitted sample of the above item complies with:

EN61000-6-4:2007+A1:2011
EN61000-6-2:2005

and fulfils testing requirement of the EMC directive 2004/108/EC

Signed for and on behalf of
CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.

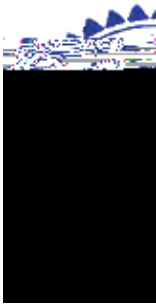
Wu Li An, Vice Director

Date of Issue: Feb. 06, 2015

CCIC Southern Electronic Product Testing (Shenzhen) Co.,Ltd.
Building 28/29, Shiguang Industrial Area, Xili Street, Nanshan District,
Shenzhen, Guangdong, China
Tel:86-755-26627338 Fax:86-755-26627238 http://www.ccic-set.com


Product Testing






Product Testing

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# 1 General Information

## 1.1 Description of EUT

**Product:** Group control board
**Model No.:** BL2000-QKB-V2
**Brand Name:** /
**Serial No.:** /
**Rating:** Input: 5V DC
**Accessories:** /

**NOTE:**

1. For more detailed features description about the EUT, please refer to User's Manual.
2. Application model is BL2000-QKB-V* (*=2-2.99, 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-QKB-V2 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.

## 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 Broadba5

# 3 Emission Test

## 3.1 EUT Setup and Operating Conditions

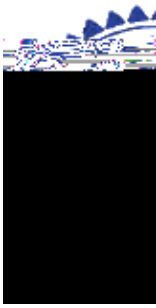
The EUT was powered by 5V DC mains. The EUT was continuously operated during the test.

## 3.2 Radiated Disturbance Measurement

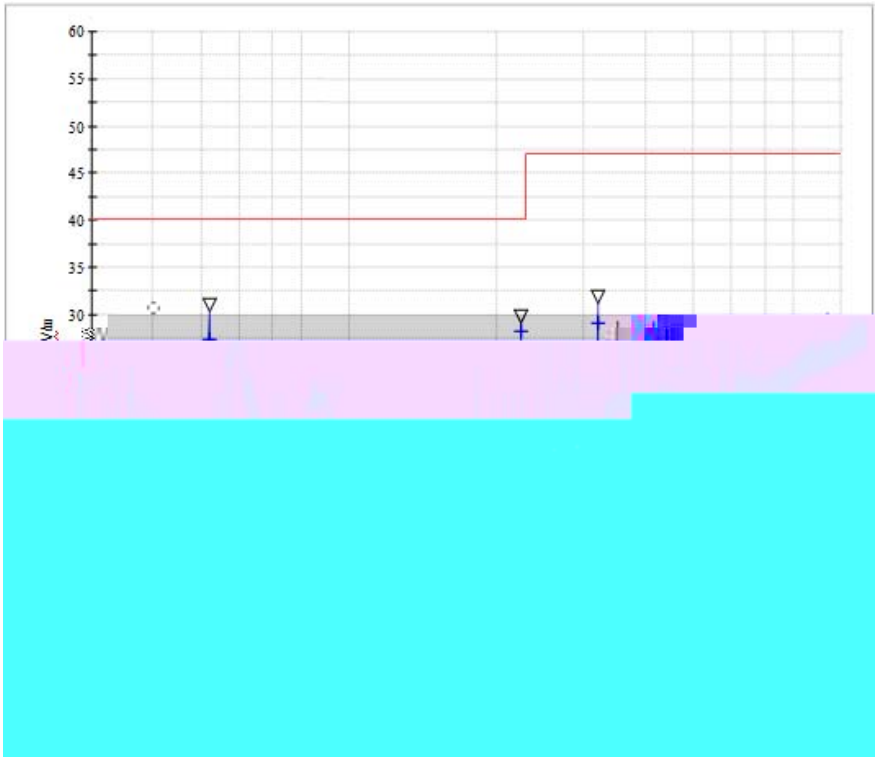
### 3.2.1 Limits of Radiated Disturbance

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

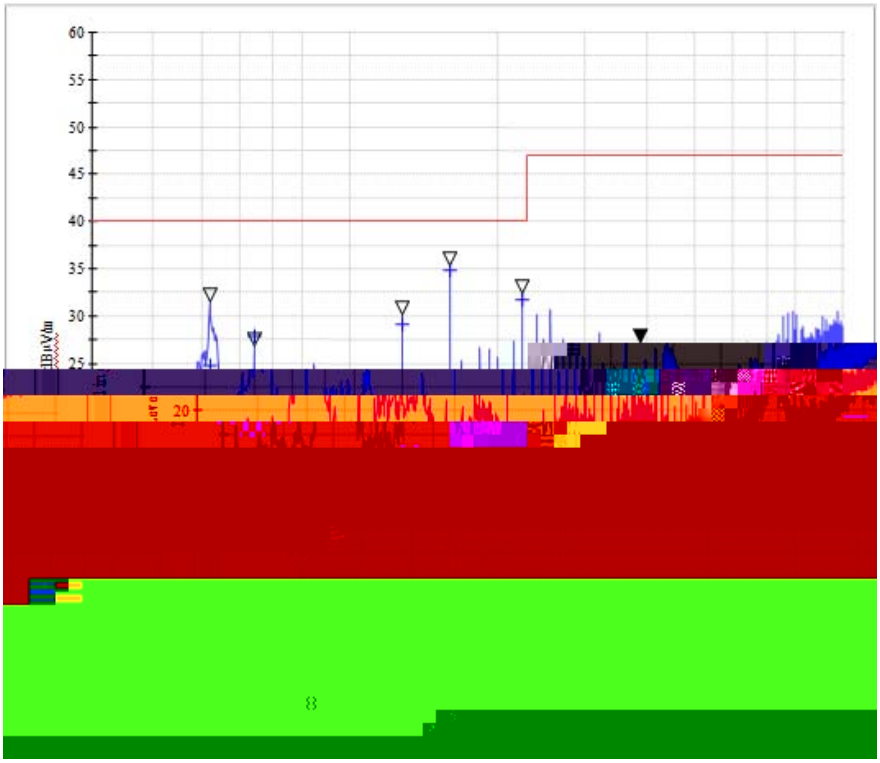




1. Electromagnetic radiation disturbances, max peak detector, antenna polarization: Vertical




2. Electromagnetic radiation disturbances, max peak detector, antenna polarization: Horizontal



# 4 Immunity Test

## 4.1 EUT Setup and Operating Conditions

Same as 3.1.

## 4.2 Performance Criteria

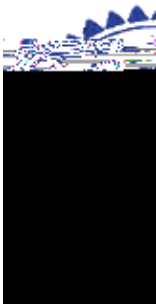
| | |
|---|---|
| **Criterion A** | The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. |
| **Criterion B** | The apparatus shall continue to 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. |
| **Criterion C** | Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls. |

## 4.3 Electrostatic Discharge Immunity Test

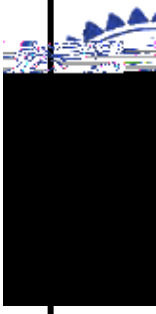
### 4.3.1 Test Specification

| | |
|---|---|
| **Basic Standard:** | IEC 61000-4-2 |
| **Discharge Impedance** | 330Ω / 150 pF |
| **Discharge Voltage:** | Air Discharge: 8 kV<br>Contact Discharge: 4kV |
| **Polarity:** | Positive / Negative |
| **Number of Discharge:** | Minimum 20 times at each test point |
| **Discharge Mode:** | Single discharge |
| **Discharge Period:** | 1-second minimum |
| **Criterion:** | B |









### 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:

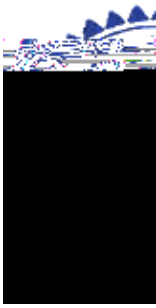
(1). The EUT continued to operate as intended. No degradation of performance was observed.

## 4.5 Electrical Fast Transient/Burst Immunity Test

### 4.5.1 Test Specification

**Basic Standard:** IEC 61000-4-4





# 4.7 Immunity to Conducted Disturbances Induced by RF Fields

## 4.7.1 Test Specification

| | |
|---|---|
| **Basic Standard:** | IEC 61000-4-6 |

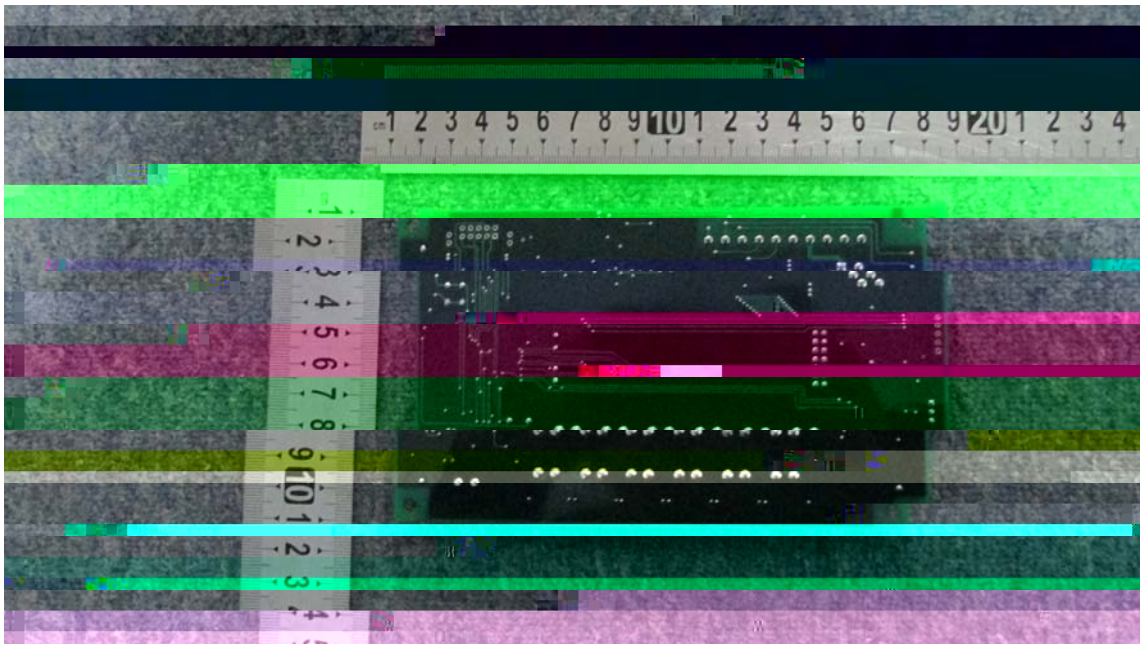
# 4.8 Power Frequency Magnetic Field Immunity Test

## 4.8.1 Test Specification

| | |
|---|---|
| Basic Standard: | IEC 61000-4-8 |
| Frequency Range: | 50Hz |

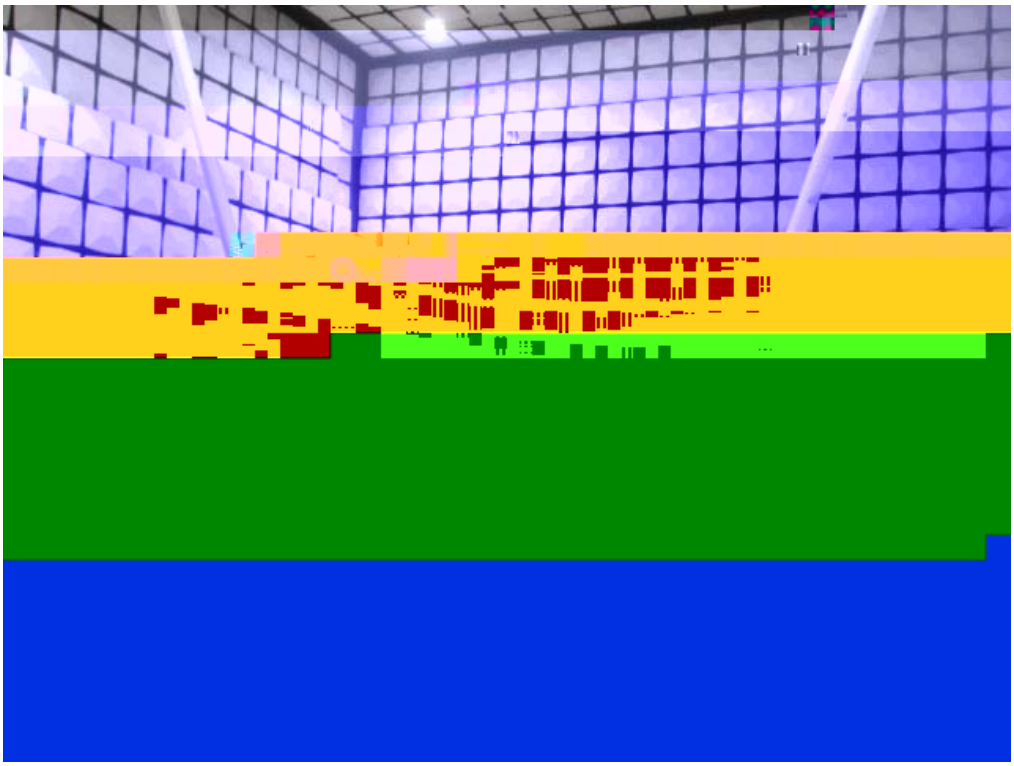
# Appendix I Photographs of the EUT



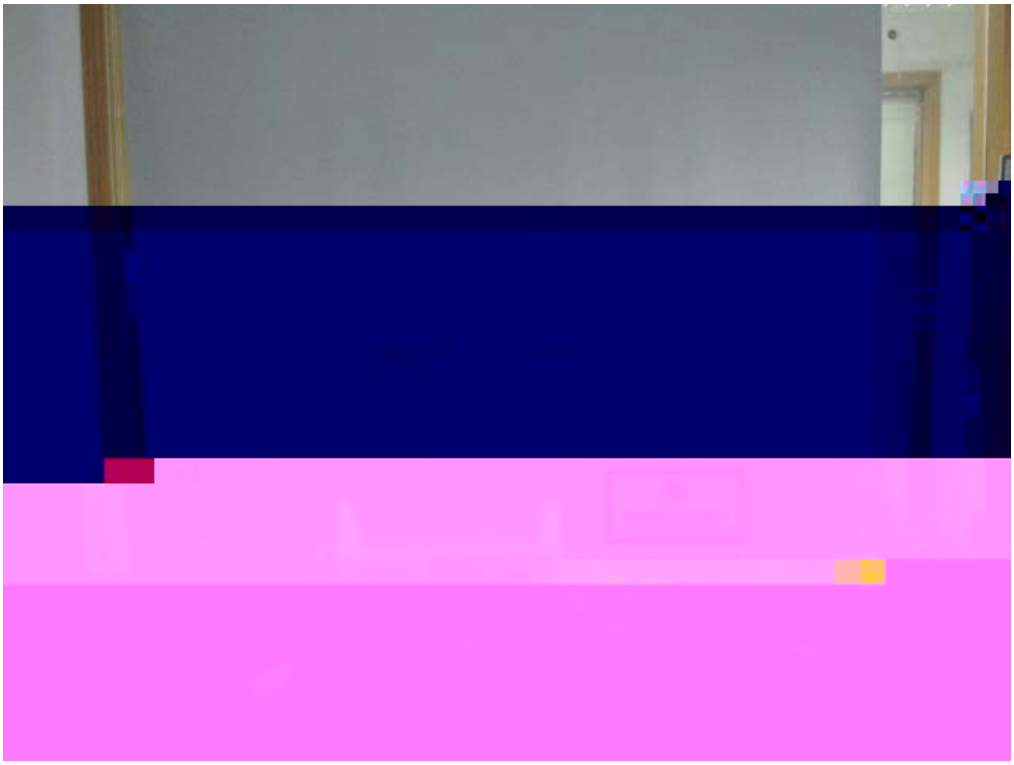


# Appendix II Photographs of EMC Test Configuration

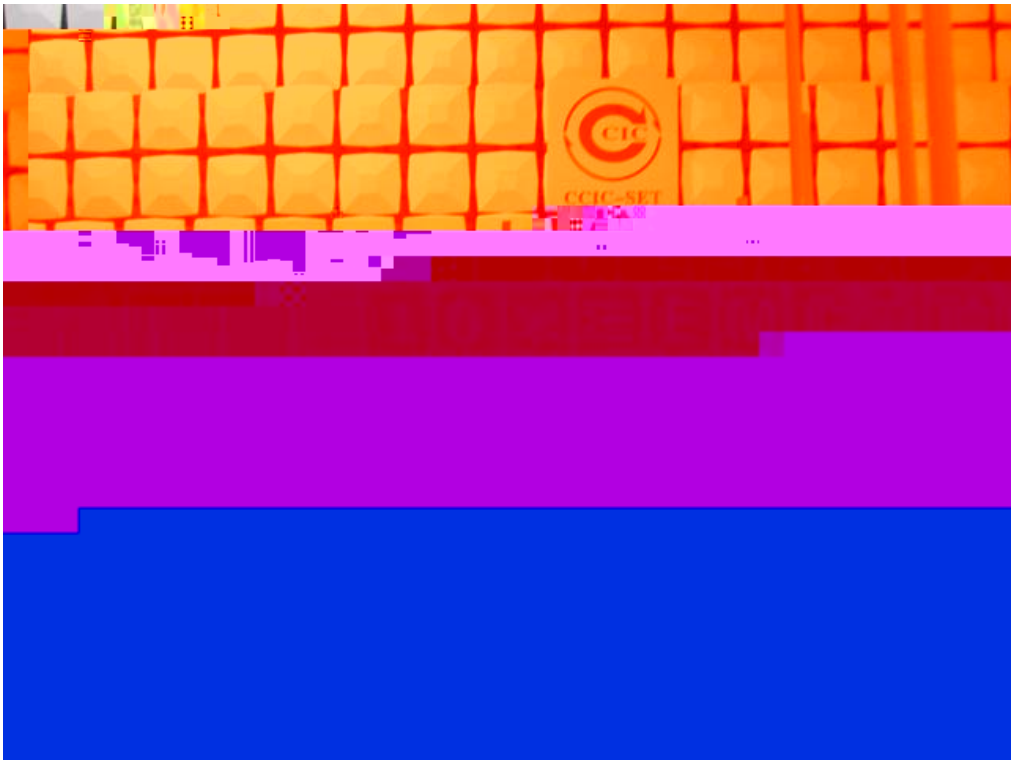
## 1. Radiated Field Strength Measurement



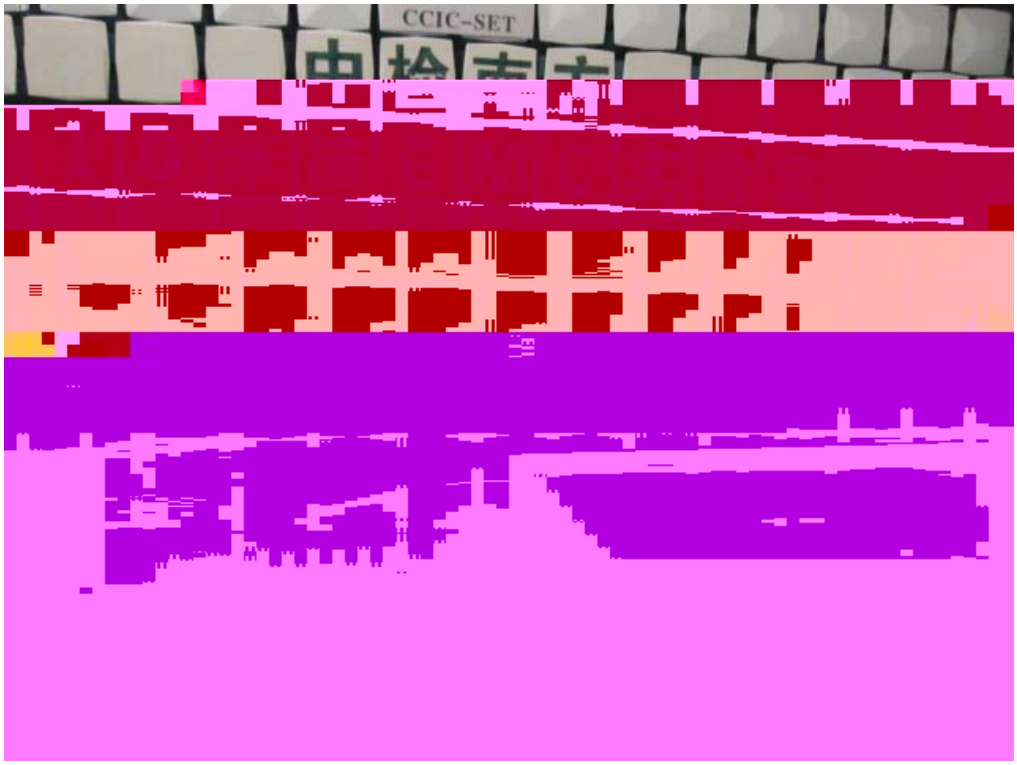
## 2. Electrostatic Discharge Immunity Test



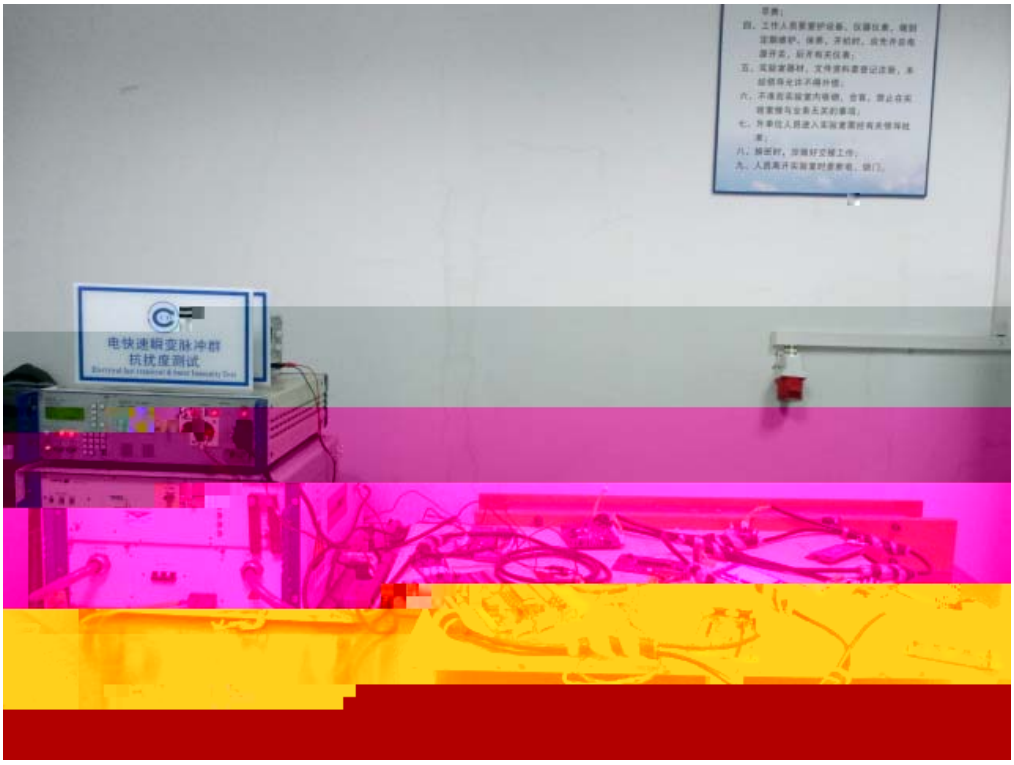
### 3. Radiated, Radio Frequency Electromagnetic Field Immunity Test (below 1GHz)



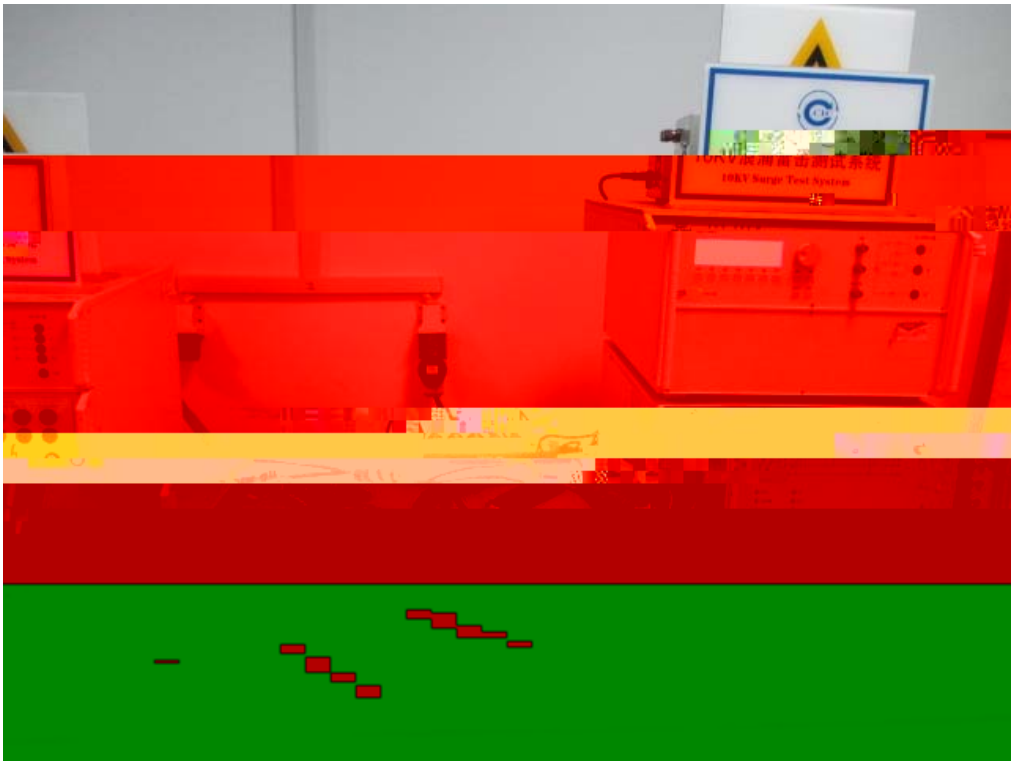
### 4. Radiated, Radio Frequency Electromagnetic Field Immunity Test (above 1GHz)



## 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

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4. **The test report is invalid if erased and corrected.**
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8. **If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.**

Address: Building 28/29, Shigudong, Xili Industrial Area, Xili Street, Nanshan District, Shenzhen, Guangdong, China

P.C. 518055

TEL 0755-26628093 26627338 FAX 0755-26627238

Internet http://www.ccic-set.com E-Mail manager@ccic-set.com