EMC TEST REPORT
for
DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD

LED STRIP
Model No.: AA063, AA043, AA051, AA059

Prepared for	:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD
Address	:	TANGSI INDUSTRIAL AREA, TANGJIAO MANAGEMENT DISTRICT, CHASHAN TOWN, DONGGUAN CITY, GUANGDONG, PROVINCE, CHINA
Prepared by	:	Accurate Technology Co., Ltd.
Address	:	F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China Tel: +86-755-26503290 Fax: +86-755-26503396

Report No.	:	ATE20131641
Date of Test	:	August 1, 2013
Date of Report	:	August 2, 2013

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Test Report

Test Report

Applicant	:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD
Manufacturer	:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD
Product	:	LED STRIP
Model No.	:	AA063, AA043, AA051, AA059

Measurement Procedure Used:

EN 61000-6-3: 2007 + A1: 2011
EN 61000-6-1: 2007 (IEC 61000-4-2: 2008
IEC 61000-4-3: 2010)

The device described above is tested by Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Accurate Technology Co., Ltd. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 61000-6-3 and EN 61000-6-1 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Accurate Technology Co., Ltd.

Date of Test : August 1, 2013

Prepared by : Ting Lv

(Ting Lü, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)

1. TEST RESULTS SUMMARY

Test Items	Test Standard	Test Results
Radiated Emission	EN 61000-6-3: 2007 + A1: 2011	Pass
Electrostatic Discharge Immunity	EN 61000-6-1: 2007 (IEC 61000-4-2: 2008)	Pass
Radiated Electromagnetic Fields Immunity	EN 61000-6-1: 2007 (IEC 61000-4-3: 2010)	Pass

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

Product	:	LED STRIP
Model No.	:	AA063, AA043, AA051, AA059 (Note: These samples are same except their appearance is different. So we prepare AA063 for test only.)
Rating	:	DC 3-6V
Applicant	:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD
Address	:	TANGSI INDUSTRIAL AREA, TANGJIAO MANAGEMENT DISTRICT, CHASHAN TOWN, DONGGUAN CITY, GUANGDONG, PROVINCE, CHINA
Manufacturer	:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD
Address	:	TANGSI INDUSTRIAL AREA, TANGJIAO MANAGEMENT DISTRICT, CHASHAN TOWN, DONGGUAN CITY, GUANGDONG, PROVINCE, CHINA
Date of sample receiver	:	July 29, 2013
Date of Test	:	August 1, 2013

2.2.Accessory and Auxiliary Equipment

n.a.

2.3.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 253065 Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-1 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	Accurate Technology Co., Ltd.
Site Location	:	F1, Bldg. A&D, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan District, Shenzhen 518057, P.R. China
Subcontracted Items	:	RF Field Strength Susceptibility Test
Subcontractor	:	Shenzhen Academy of Metrology and Quality Inspection
Site Location	:	Bldg. of Metrology & Quality Inspection, Longzhu Road Nanshan District, Shenzhen, Guangdong, China

2.4.Measurement Uncertainty

Radiated emission expanded uncertainty (9kHz-30MHz)	:	U=3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	:	U=4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	:	U=4.06dB, k=2
Conduction Emission Expanded Uncertainty	:	U=2.23dB, k=2
Power disturbance Expanded Uncertainty	:	U=2.92dB, k=2

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1.For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analyzer	ANRITSU	MS2651B	6200238856	Jan. 12, 2013	1 Year
2.	Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Dec. 10, 2012	1 Year
3.	Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 12, 2013	1 Year
4.	Test Receiver	Rohde& Schwarz	ESPI3	100396/003	Jan. 12, 2013	1 Year
5.	Test Receiver	Rohde& Schwarz	ESPI3	101526/003	Feb. 06, 2013	1 Year
6.	Bilog Antenna	Schwarzbeck	VULB9163	9163-194	Feb. 06, 2013	1 Year
7.	Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 12, 2013	1 Year
8.	Loop Antenna	Schwarzbeck	FMZB1516	1516131	Dec.13, 2012	1 Year
9.	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 12, 2013	1 Year
10.	Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 12, 2013	1 Year
11.	50 Coaxial Switch	Anritsu Corp	MP59B	6200237248	Jan. 12, 2013	1 Year
12.	50 Coaxial Switch	Anritsu Corp	MP59B	6200506474	Jan. 12, 2013	1 Year
13.	RF Coaxial Cable	Schwarzbeck	N-5m	No.1	Jan. 12, 2013	1 Year
14.	RF Coaxial Cable	Schwarzbeck	N-1m	No.6	Jan. 12, 2013	1 Year
15.	RF Coaxial Cable	Schwarzbeck	N-1m	No.7	Jan. 12, 2013	1 Year
16.	RF Coaxial Cable	SUHNER	N-3m	No.8	Jan. 12, 2013	1 Year
17.	RF Coaxial Cable	RESENBERGER	N-3.5m	No.9	Jan. 12, 2013	1 Year
18.	RF Coaxial Cable	SUHNER	N-6m	No.10	Jan. 12, 2013	1 Year
19.	RF Coaxial Cable	RESENBERGER	N-12m	No.11	Jan. 12, 2013	1 Year
20.	RF Coaxial Cable	RESENBERGER	N-0.5m	No.12	Jan. 12, 2013	1 Year
21.	Pre-Amplifier	Agilent	8447D	294A10619	Jan. 12, 2013	1 Year
22.	Pre-Amplifier	Rohde&Schwarz	CBLU11835 40-01	3791	Jan. 12, 2013	1 Year

3.2.For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1610	H4001552	Jan.15, 2013	1 Year

3.3.For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Rohde&Schwarz	SMT03	100059	Jan. 16, 2013	1 Year
2.	Voltage Probe	Rohde&Schwarz	URV5-Z2	100012	Jan. 24, 2013	1 Year
3.	Voltage Probe	Rohde&Schwarz	URV5-Z2	100013	Jan. 24, 2013	1 Year
4.	Power Amplifier	AR	150W1000	300999	Jan. 21, 2013	1 Year
5.	Power Amplifier	AR	150A220M6	305965	Jan. 22, 2013	1 Year
6.	Power Amplifier	AR	25S 1G4AM1	305993	Jan. 22, 2013	1 Year
7.	Audio Analyzer	Rohde & Schwarz	UPL	100026	Dec. 20, 2012	1 Year
8.	Antenna	CHASE	CBL6111C	2576	Jan. 21, 2013	1 Year
9.	Horn Antenna	AR	AT4002A	305754	Jan. 21, 2013	1 Year

4. RADIATED EMISSION MEASUREMENT

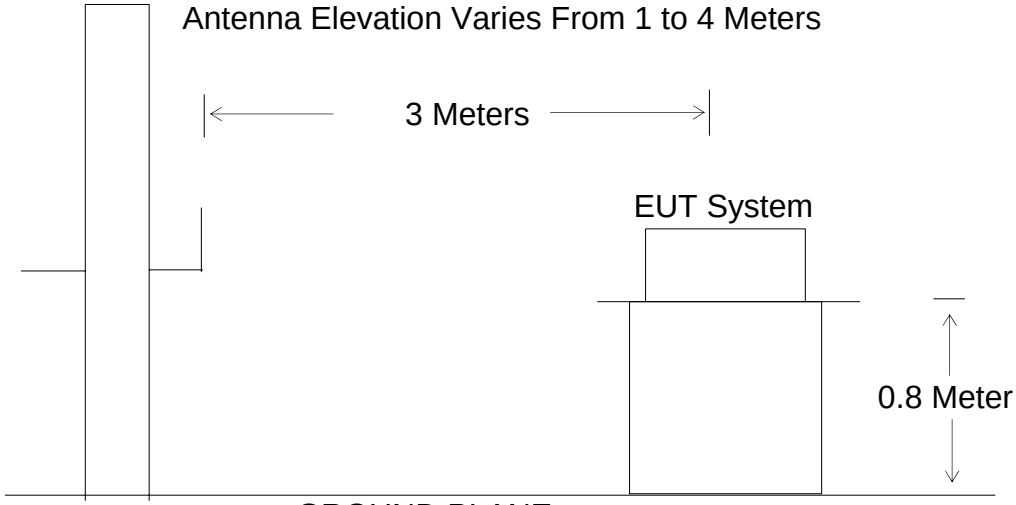
4.1. Block Diagram of Test

4.1.1. Block diagram of connection between the EUT and simulators

EUT

(EUT: LED STRIP)

4.1.2. Block diagram of test setup (In chamber)



(EUT: LED STRIP)

4.2. Measuring Standard

EN 61000-6-3: 2007 + A1: 2011

4.3. Radiated Emission Limits

Frequency (MHz)	Distance (Meters)	Field Strengths Limit dB(μV/m)
30 - 230	3	40
230 - 1000	3	47

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

4.4.EUT Configuration on Test

Test equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

4.4.1. LED STRIP (EUT)

Model No.: AA063
Manufacturer: DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD

4.5.Operating Condition of EUT

4.5.1. Turn on the power.

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

4.6.Test Procedure

The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable 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 an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna (calibrated by Dipole Antenna) is used as a receiving antenna. Both horizontal and vertical polarizations of the antenna are set on test.

The bandwidth of the Receiver (ESCS30) is set at 120 kHz.

4.7.Measuring Results

PASS.

The frequency range from 30MHz to 1000MHz is investigated.

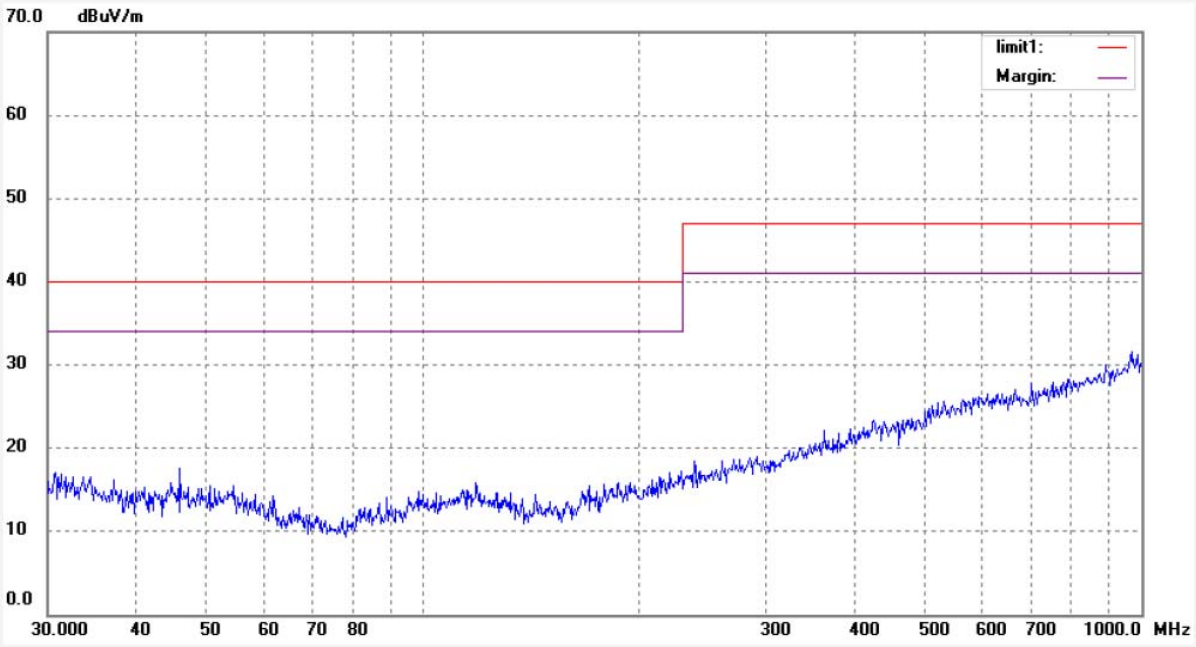
Note: Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Igwade #28	Polarization: Horizontal
Standard: EN61000-6-3	Power Source: DC 3V
Test item: Radiation Test	Date: 13/08/01/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 17/29/46
EUT: LED STRIP	Engineer Signature: LGWADE
Mode: ON	Distance: 3m
Model: AA063	
Manufacturer: NIANNIANWANG	

Note: Report No:ATE20131641

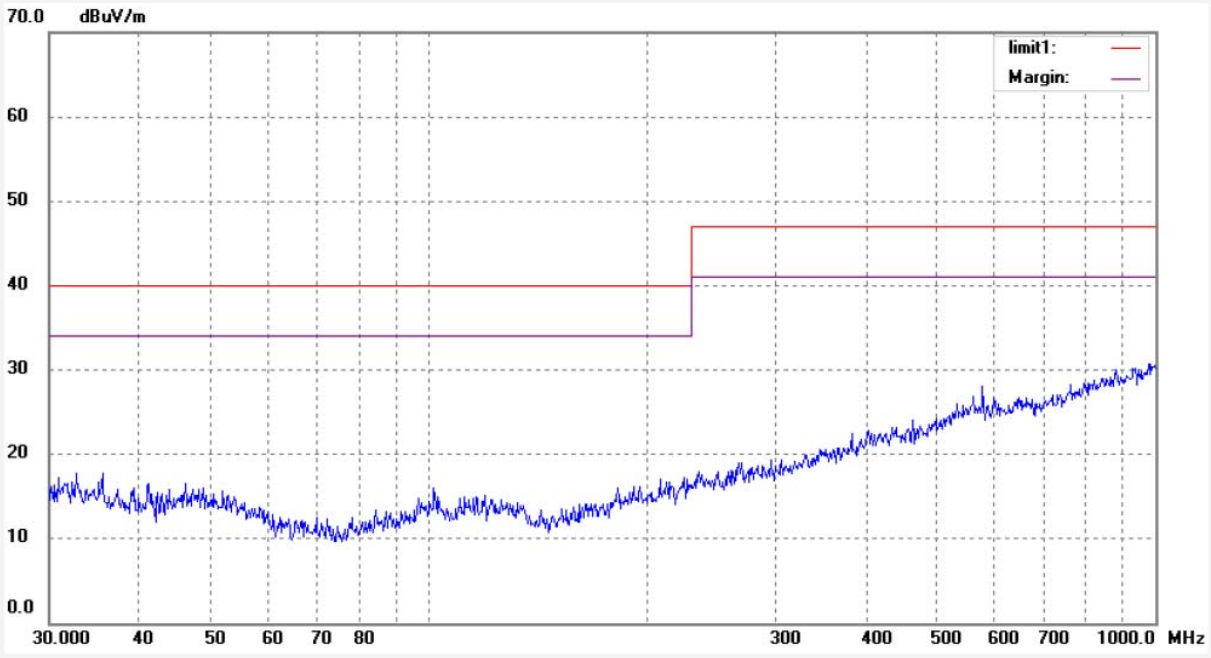


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Igwade #27	Polarization: Vertical
Standard: EN61000-6-3	Power Source: DC 3V
Test item: Radiation Test	Date: 13/08/01/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 17/28/51
EUT: LED STRIP	Engineer Signature: LGWADE
Mode: ON	Distance: 3m
Model: AA063	
Manufacturer: NIANNIANWANG	

Note: Report No:ATE20131641



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark

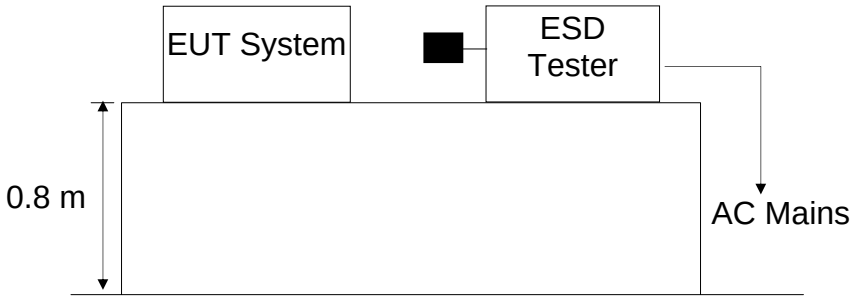
5. ELECTROSTATIC DISCHARGE IMMUNITY TEST

5.1. Block Diagram of Test Setup

5.1.1. Block diagram of connection between the EUT and simulators

(EUT: LED STRIP)

5.1.2. Block diagram of test setup



(EUT: LED STRIP)

5.2. Test Standard

EN 61000-6-1: 2007 (IEC61000-4-2: 2008, Severity Level: 2
Contact Discharge: ±4kV, Severity Level: 3/ Air Discharge: ±8kV)
Testing shall also be satisfied at the lower levels

5.3. Severity Levels and Performance Criterion

5.3.1. Severity level

Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

5.3.2. Performance Criterion: **B**

5.4. EUT Configuration

The configuration of EUT is listed in Section 4.4.

5.5. Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.5 except for the test set up replaced by Section 5.1.

5.6. Test Procedure

5.6.1. Contact discharges to the conductive surfaces and to coupling planes:

The EUT shall be exposed to at lease 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points (a minimum of 50 discharges at each point). One of the test points shall be subjected to at least 50 indirect discharges (contact) to the centre of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode [see IEC 61000-4-2 for use of the Vertical Conducting Plane (VCP)]. Tests shall be performed at a maximum repetition rate of one discharge per second.

5.6.2. Air discharge at slots and apertures, and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur; examples are openings at edges of keys, or in the cover of keyboards and telephone handsets. Such points are tested using the air discharge method. See also IEC 61000-4-2 regarding painted surfaces. This investigation should be restricted to those areas normally handled by the user. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

The application of electrostatic discharges to the contacts of open connectors is not required by this publication.

5.7. Test Results

PASS

Please refer to the following page.

Electrostatic Discharge Test Results

Accurate Technology Co., Ltd.

Applicant:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD	Test Date:	August 1, 2013
EUT:	LED STRIP	Temperature:	25 ºC
M/N:	AA063	Humidity:	50%
Air discharge:	± 2kV; ± 4kV; ± 8kV	Criterion:	B
Contact discharge:	± 2kV; ± 4kV	Test Engineer:	LGWADE
Test Mode:	ON		

Location	**Kind** A-Air Discharge C-Contact Discharge	**Result**
Nonconductive Enclosure	A	PASS
Conductive Enclosure	C	PASS
HCP	C	PASS
VCP of front	C	PASS
VCP of rear	C	PASS
VCP of left	C	PASS
VCP of right	C	PASS

Note:

Test Equipment: ESD Simulator (HAEFELY, PESD1610)

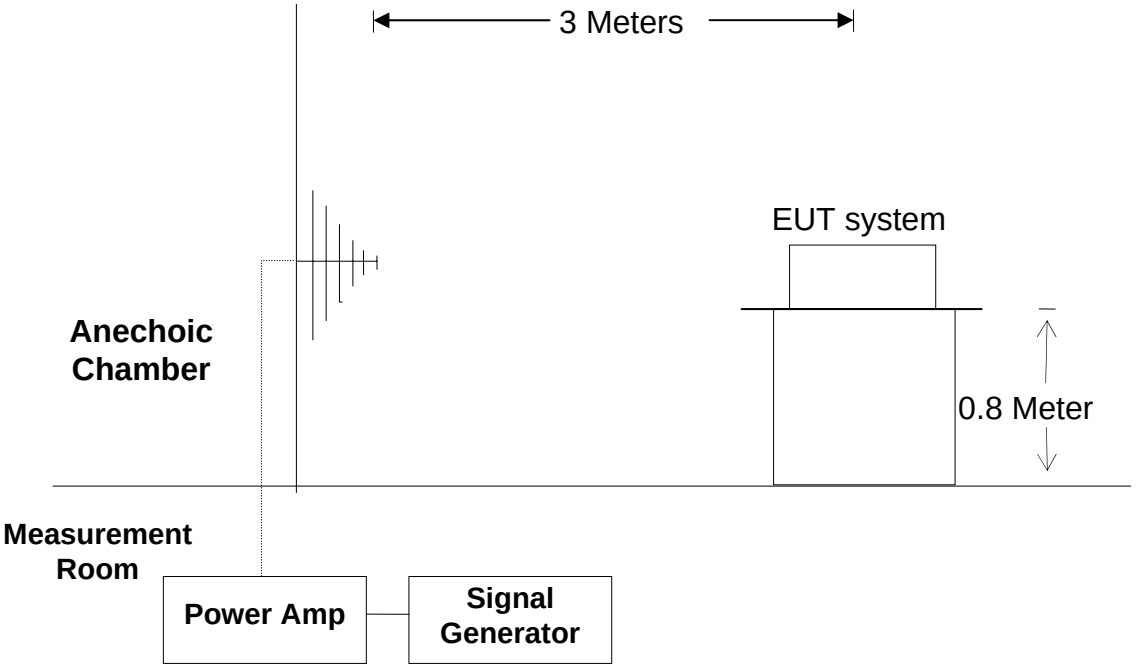
6. RF FIELD STRENGTH SUSCEPTIBILITY TEST

6.1. Block Diagram of Test

6.1.1. Block diagram of connection between the EUT and simulators

(EUT: LED STRIP)

6.1.2. Block diagram of R/S test setup



(EUT: LED STRIP)

6.2. Test Standard

EN 61000-6-1: 2007
(IEC61000-4-3: 2010, Severity Level: 2, 3V / m)

6.3. Severity Levels and Performance Criterion

6.3.1. Severity Level

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

6.3.2. Performance Criterion: **A**

6.4. EUT Configuration on Test

The configuration of the EUT is same as Section 4.4.

6.5. Operating Condition of EUT

6.5.1. Turn on the power.

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

6.6. Test Procedure

The EUT are placed on a table, which is 0.8 meter high 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 polarizations of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera is used to monitor its screen.
All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	1V/m&3V/m (Severity Level 1&2)
2. Radiated Signal	Unmodulated
3. Scanning Frequency	80-1000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

6.7. Test Results

PASS.

Please refer to the following page.

RF Field Strength Susceptibility Test Results

Accurate Technology Co., Ltd.

Applicant:	DONGGUAN NIANNIANWANG ELECTRONIC PRODUCTS CO., LTD	Test Date:	August 1, 2013
EUT:	LED STRIP	Temperature:	25ºC
M/N:	AA063	Humidity:	50%
Test Mode:	ON	Criterion:	A
Rating:	DC 3V	Test Engineer:	LGWADE

Modulation: ☐ None ☐ Pulse ☑ AM 1kHz 80%

Frequency Range	Field Strength	Antenna polarity	Side	Result
80 MHz to 1000MHz	3 V/m	Horizontal Vertical	Front Right Rear Left	PASS
1.4 GHz -2.0 GHz	3 V/m			
2.0 GHz -2.7 GHz	1 V/m			

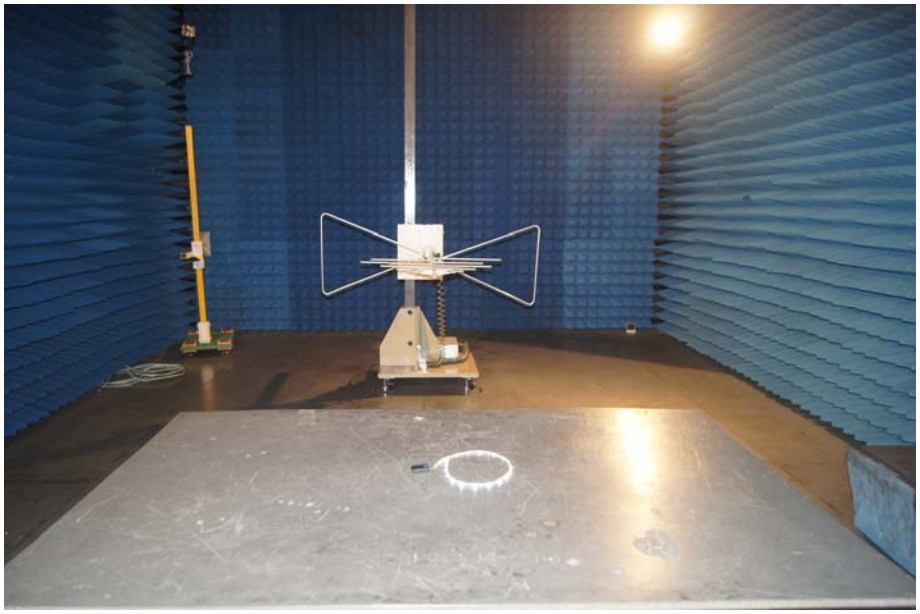
Test Equipment **:**

1. Signal Generator : SMT03 (Rohde & Schwarz)
2. Power Amplifier : 150W1000 (AR)
3. Bilog Antenna : CBL6111C (Chase)

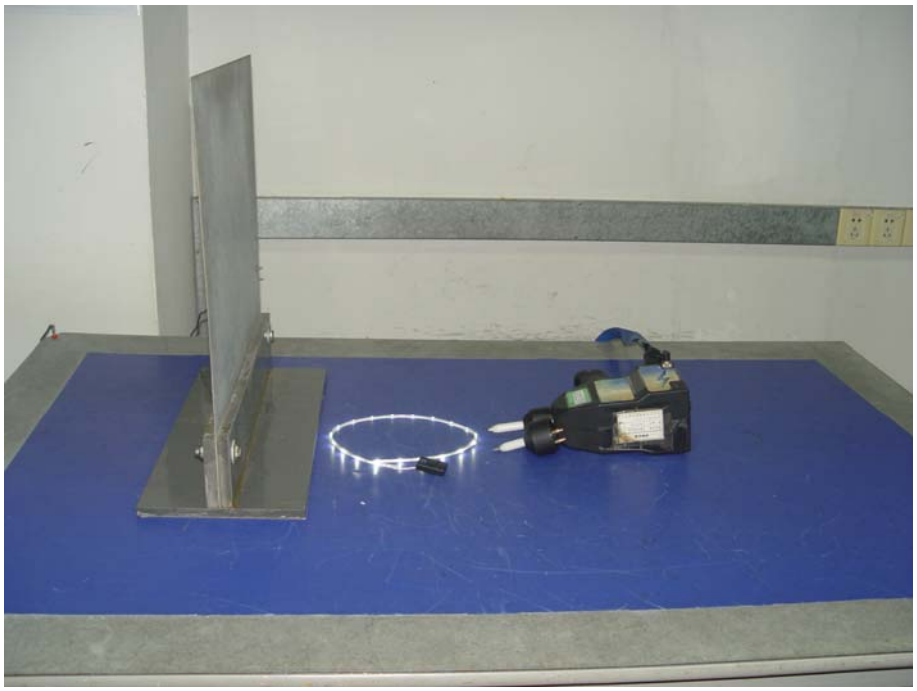
Note:

7. PHOTOGRAPHS

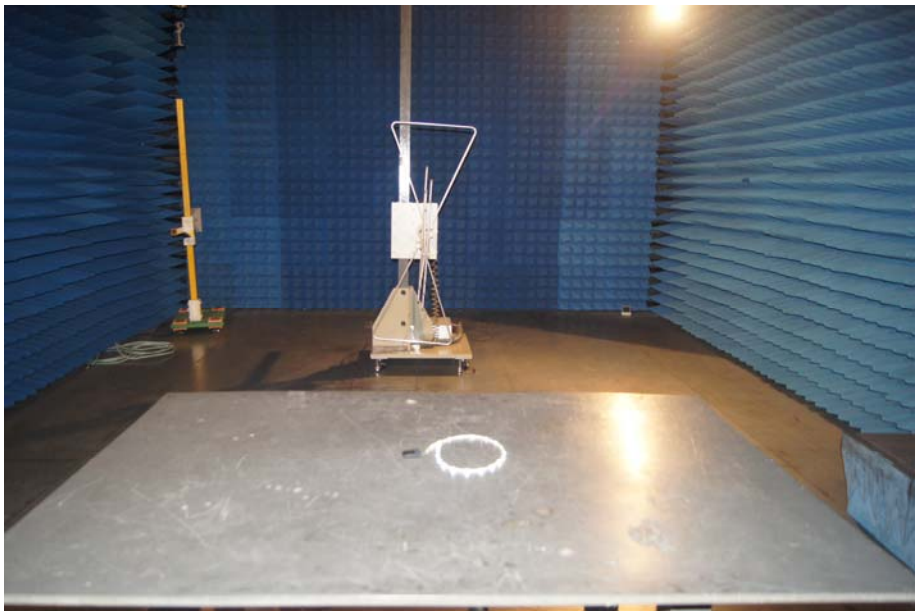
7.1.Photos of Radiated Emission Measurement



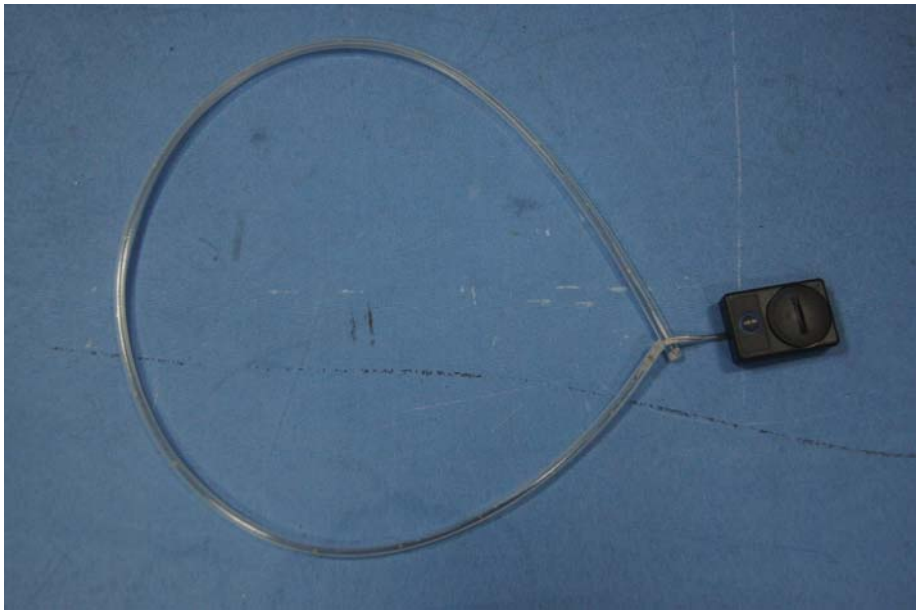
7.2.Photo of Electrostatic Discharge Test

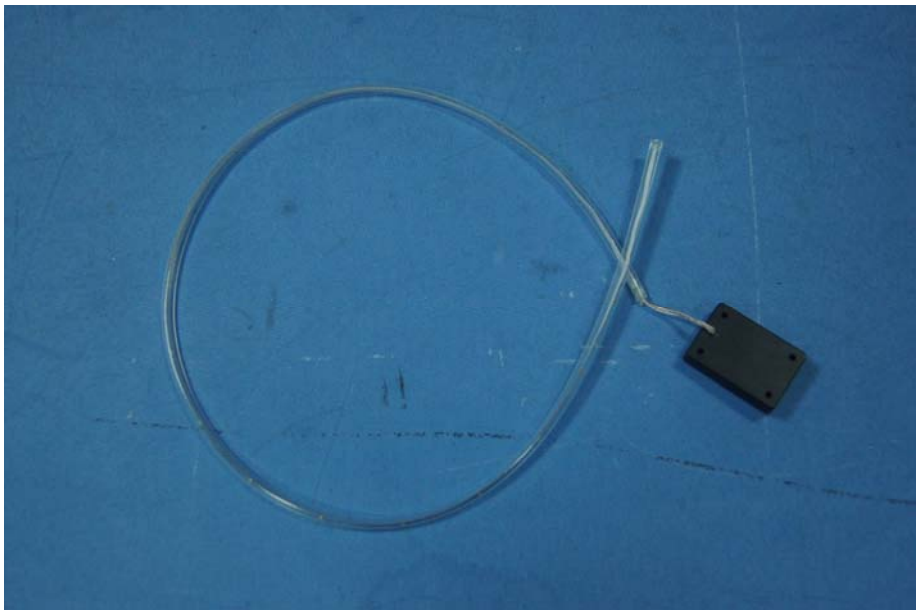


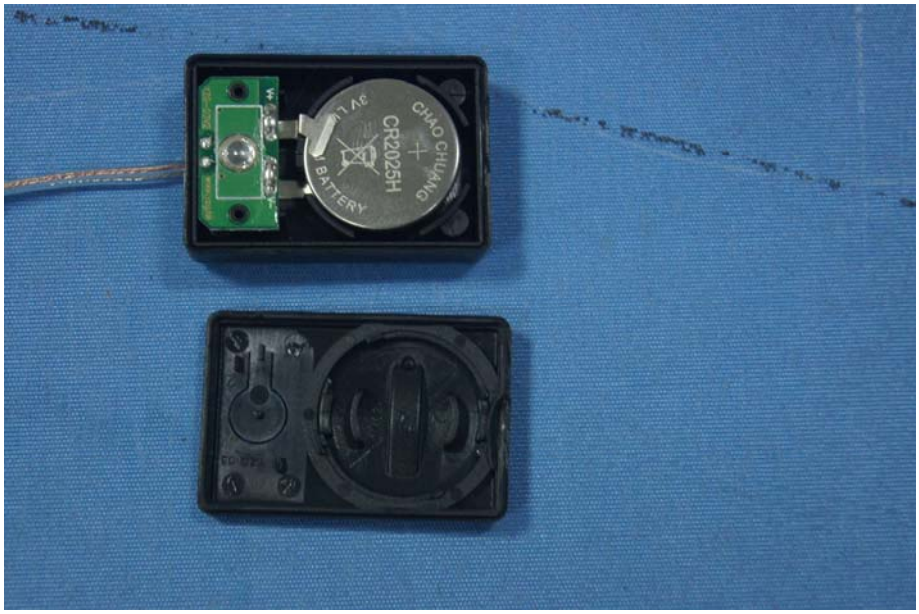
7.3.Photo of RF Field Strength Susceptibility Test



7.4.Photo of EUT






CHAO CHUANG
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