



Shenzhen Academy of Metrology & Quality Inspection



National Digital Electronic Product Testing Center

EMC Declaration of Conformity(DoC)

No: WT148005407

Applicant: E&S Company Ltd.

Address: Unit 12, 18/FI,Blk.C, Wah Lok Ind. Centre, 31-35 Shan Mei St., Fo Tan
N.T. HK

has successfully demonstrated that its product

Product: Micro servo

Model: SD150,D60,FS40,TS1816,S2009

Brand: Ripmax,Dymond,Robbe,Topmodel

are compliant with

EMC: EN 55014-1:2006/A2:2011

CISPR 14-1:2005/A2:2011

EN 55014-2: 1997+A1:2001+A2:2008

CISPR 14-2: 1997+A1:2001+A2:2008

This certificate of compliance shows that the tested sample technically complies with essential requirements as given in the EMC Directive 2004/108/EC. The certificate applies to the tested sample above mentioned only and shall not imply an assessment of the whole production.



Authorized Signer:



Issued Date:

Jan. 12, 2015



Shenzhen Academy of Metrology & Quality Inspection

NETC National Digital Electronic Product Testing Center

EMC TEST REPORT

For

Micro servo

Model Number: SD150,D60,FS40,TS1816,S2009

CE

Report Number: WT148005407

Test Laboratory : Shenzhen Academy of Metrology and Quality Inspection
National Digital Electronic Product Testing Center
Site Location : NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China
Tel : 0086-755-86928965
Fax : 0086-755-86009898-31396
Web : www.smq.com.cn





Test report declaration

Applicant : E&S Company Ltd.
 Address : Unit 12, 18/FI,Blk.C, Wah Lok Ind. Centre, 31-35 Shan Mei St.,
 Fo Tan N.T. HK
 Manufacturer : ---
 Address : ---
 Factory : ---
 Address : ---
 EUT Description : Micro servo
 Model No. : SD150,D60,FS40,TS1816,S2009
 Trade mark : Ripmax,Dymond,Robbe,Topmodel

Test Standards:

EN 55014-1:2006/A2:2011 CISPR 14-1:2005/A2:2011
 EN 55014-2: 1997+A1:2001+A2:2008 CISPR 14-2: 1997+A1:2001+A2:2008

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT and ensure the EUT to be compliance with the immunity requirements of the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory, is assumed full responsibility for the accuracy of the test results. Also, this report shows that the EUT technically complies with essential requirements as given in **Annex I Article 1 (a), (b) of EC Directive 2004/108/EC.**

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Project Engineer: 施昌达 Date: Jan 12,2015
 (Shi Changda)
 Checked by: 杨东平 Date: Jan 12,2015
 (Yang dongping)
 Approved by: 林斌 Date: Jan 12,2015
 (Lin Bin)



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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	Test Results
ESD Immunity	Pass
Radiated emission	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 SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ 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, SMQ 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 SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at No.4 TongFa Road, Xili Town, Nanshan District, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 446246 806614 994606(semi anechoic chamber).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is 11177A.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

2.3. Measurement Uncertainty

ESD Immunity

It is compliant with the requirements of the standard at the confidence of 95%.

Radiated Emission

30MHz-1000MHz 4.5dB



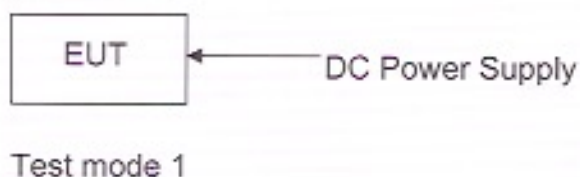
3. PRODUCT DESCRIPTION

3.1.EUT Description

Description : Micro servo
Manufacturer : E&S Company Ltd.
Model Number : SD150,D60,FS40,TS1816,S2009
Rated Input : DC4.8~6V
EUT
Classification : Category II (EN 55014-2)
Rated voltage : DC4.8~6V
Max current : 0.6A

Remark: SD150 and the series models D60/FS40/TS1816/S2009 are identical except for the model name.

3.2.Block Diagram of EUT Configuration



3.3.Operating Condition of EUT

Test mode 1: Working

3.4. Test Conditions

Date of test: Dec 31,2014- Jan 8,2015
Date of EUT Receive: Dec 31,2014
Temperature: (23-25℃)
Relative Humidity: (53-57 %)



No modification was made.

3.6.Performance Criterion

Criterion A: The equipment shall continue to operate as intended without operator intervention. No degradation of performance or 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. Test Equipment Used to Measure Radiated Disturbance

Table 2 Radiated Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.20,2014	1 Year
SB5472/02	Bilog Antenna	SCHWARZBECK	VULB9163	Jan.20,2014	1 Year

4.2. Test Equipment Used to Measure Electrostatic Discharge Immunity

Table 3 ESD Immunity Test Equipment

No.	Equipment	Manufacturer	Model No.	LAST CALIB	Period
SB8001	ESD tester	EM TEST	ESD30N	Jan.20,2014	1 Year



5. RADIATED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1. Test Standard

EN 55014-1:2006/A2:2011
CISPR 14-1:2005/A2:2011

5.1.2. Test Limit

Table 4 Radiated Disturbance Test Limit

Frequency	Limit (dB μ V/m)
	Quasi-peak Level
30MHz~230MHz	40
230MHz~1000MHz	47

- * The lower limit shall apply at the transition frequency.
- * The test distance is 3m.

5.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.



Emissions don't show below are too low against the limits, the test curves are shown in the next page.

Table 5 Radiated Disturbance Test Data

Model No.: SD150			
Test Mode: 1			
Frequency MHz	Readings dB(μ V/m)	Polarization	Limits dB (μ V/m)
204.988	30.4	Horizontal	40
223.904	31.9	Horizontal	40
441.572	30.9	Horizontal	47
800.374	36.1	Horizontal	47
449.137	32.1	Vertical	47



Radiated Emission

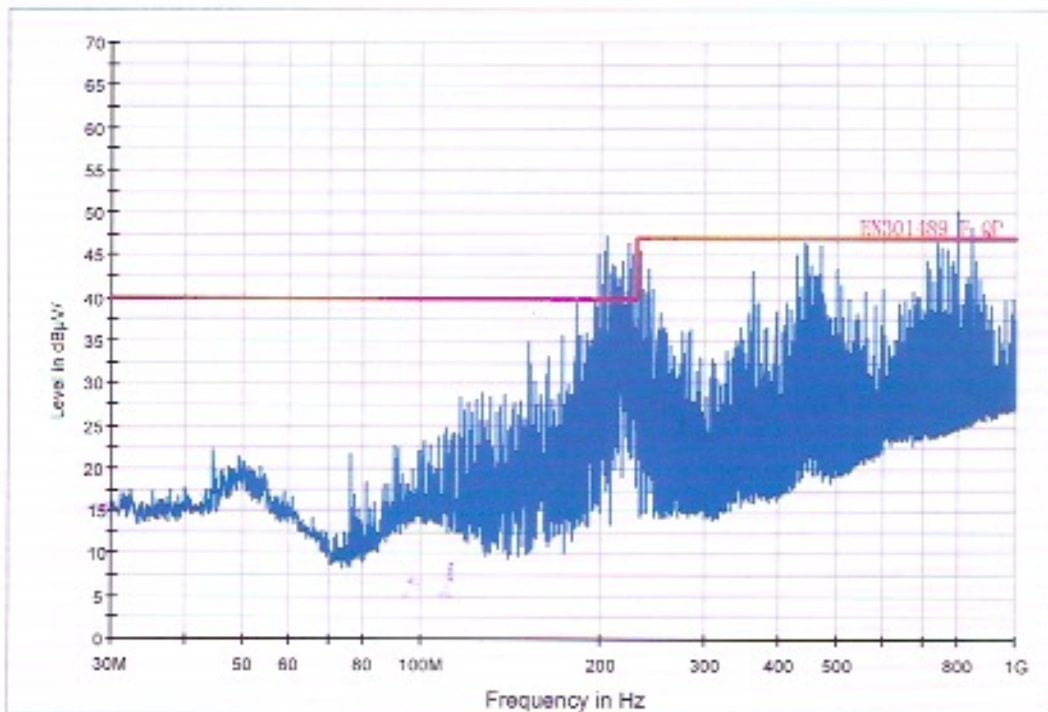
EUT Information

EUT Model name: SD150
Operator Mode: WORKING
Comment:

Common Information

Test Description: SMQ NETC EMC Lab.3m Chamber
Customer:
Antenna Position: Horizontal
Operator Name:
Comment1: DC8V
Comment2:

Field strength 30M-1GHz 1F 3m chamber





Radiated Emission

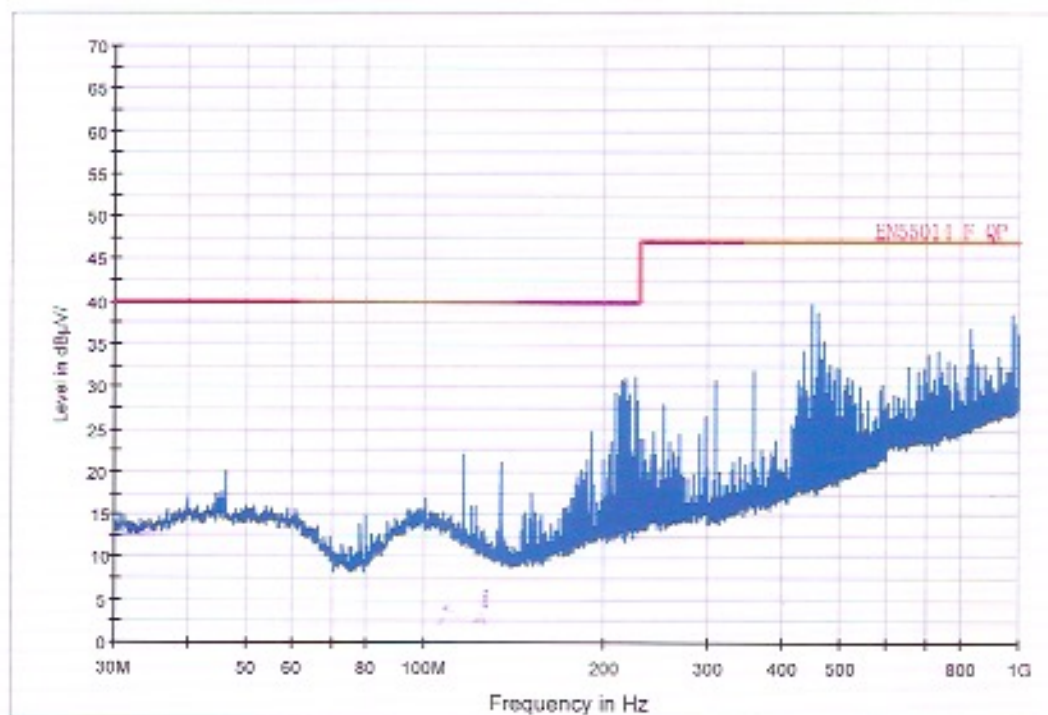
EUT Information

EUT Model name: SD150
Operator Mode: WORKING
Comment:

Common Information

Test Description: SMQ NETC EMC Lab.3m Chamber
Customer:
Antenna Position: Vertical
Operator Name:
Comment1: DC6V
Comment2:

Field strength 30M-1GHz 1F 3m chamber





6. ELECTROSTATIC DISCHARGE IMMUNITY TEST

6.1. Test Requirements

6.1.1. Test Standard

EN 55014-2:1997+A1:2001+A2:2008

CISPR 14-2:1997+A1:2001+A2:2008

6.1.2. Test Level

Table 6 Test Level for ESD

Port	Test Specification
Enclosure Port	8kV air discharge 4kV contact discharge

6.1.3. Performance criterion: B

6.2. Test Procedure

6.2.1. Contact Discharge:

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. 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

6.2.2. Air Discharge:

Air discharge is used where contact discharge can't be applied. 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

6.2.3. Indirect discharge for horizontal coupling plane

At least 10 single discharges shall be applied to the horizontal coupling plane, at



points on each side of the EUT.

6.2.4. Indirect discharge for vertical coupling plane

At least 10 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.

6.3. Test Data

Table 7 ESD Test Data

Model No.: SD150				
Test Mode: 1				
Location	Voltage	Amount of test points	Discharge Method	Results
Conductive Enclosure	+ 4	6	CD	Pass
HCP	± 4	4	CD	Pass
VCP	± 4	4	CD	Pass
Non-conductive Enclosure	± 8	4	AD	Pass

AD: Air discharge

CD: contact discharge



APPENDIX I TEST PHOTO



Photo 1 Radiated Disturbance Test



Photo 2 ESD Immunity Test





APPENDIX II EUT Photo



Photo 1 Appearance of EUT

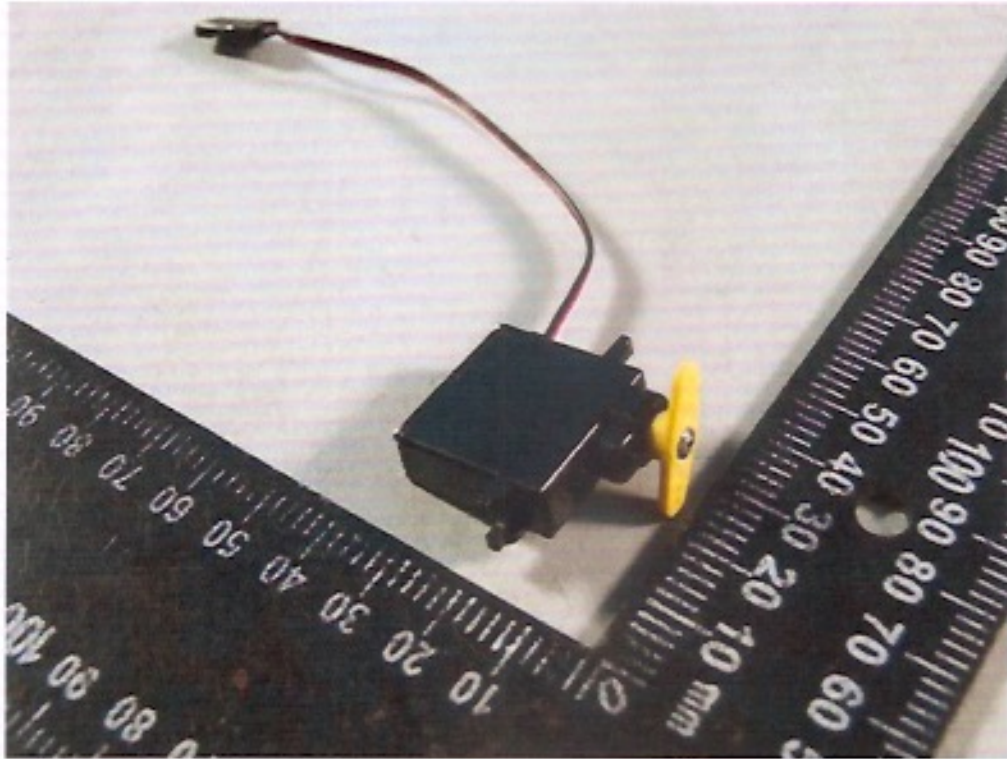
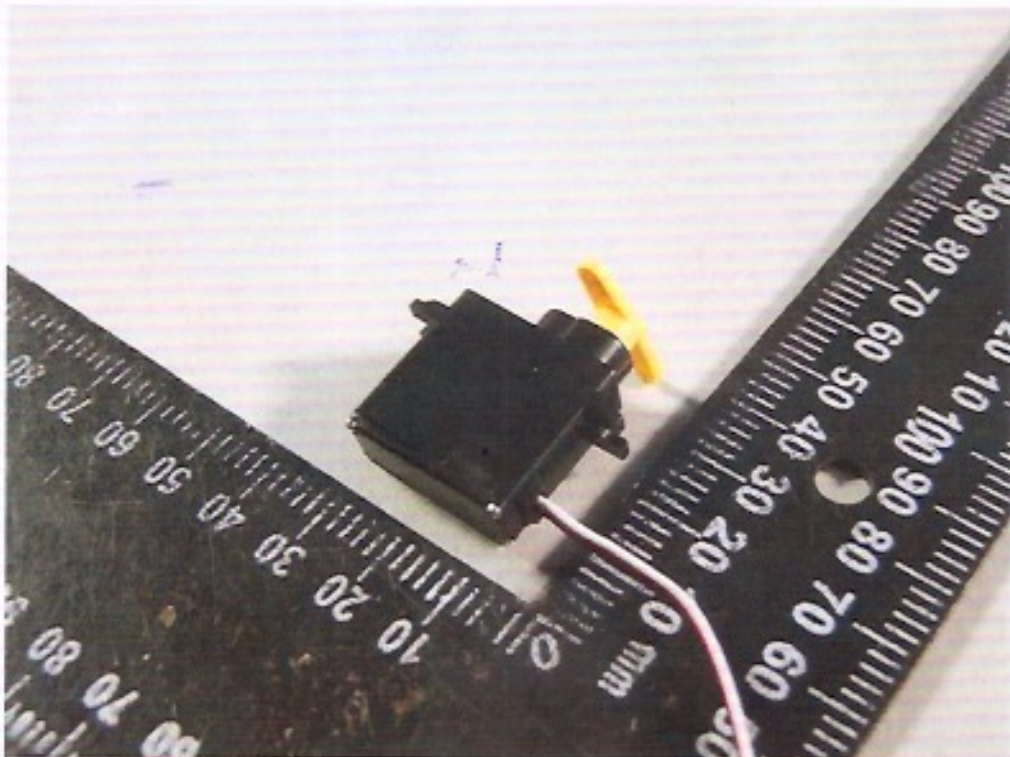


Photo 2 Appearance of EUT



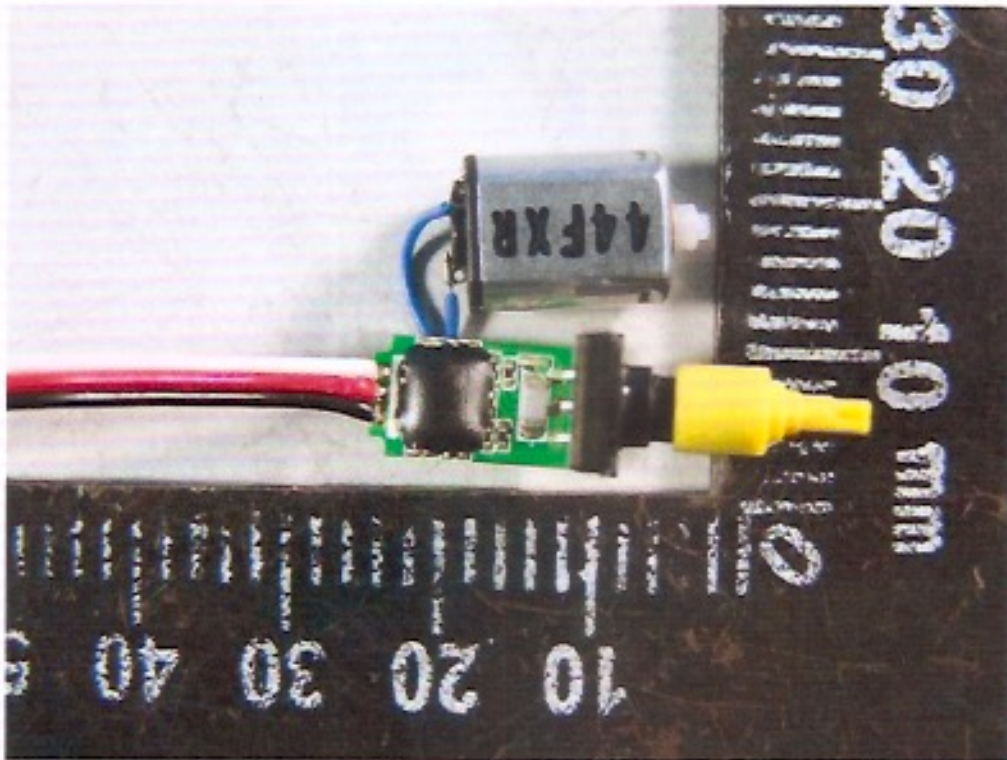
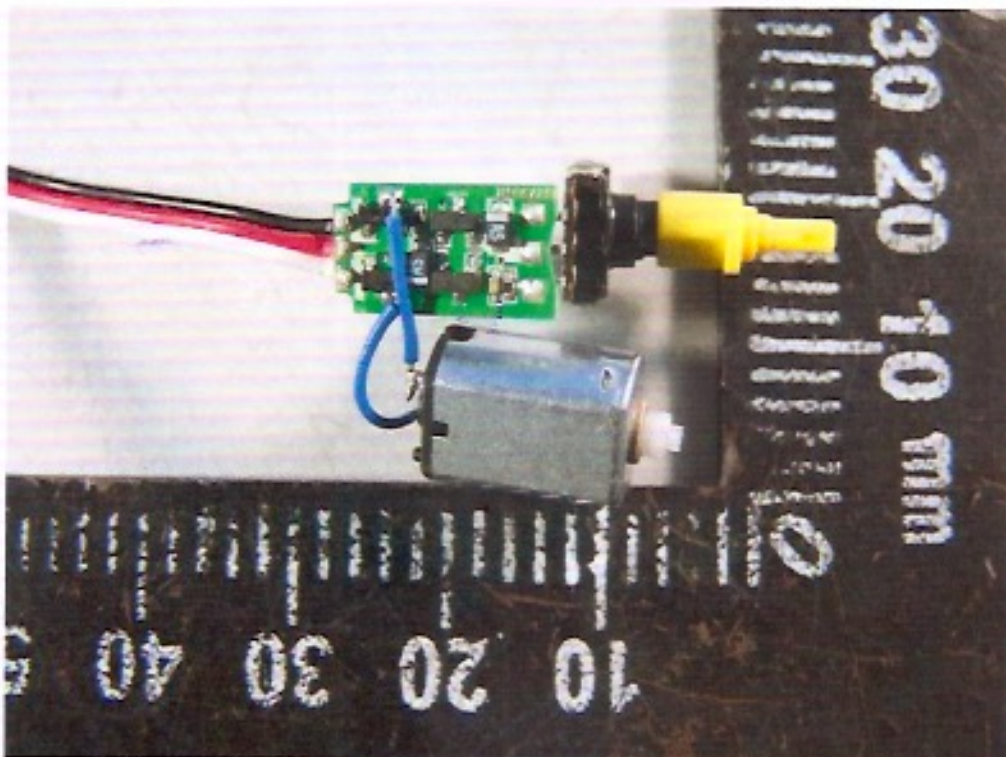


Photo 4 Inside of EUT



Establishment of following institutions

- National Digital Electronic Product Testing Center
- National Sports Goods Quality Supervision and Inspection Center
- National Hi-tech Metrology Station
- National Digital Electronic Product Testing Center
- National Data Center for City Energy Measurement(Shenzhen)
- CNLIC Quality Supervision and Inspection Institution for Furniture Products(Shenzhen)
- Guangdong Quality Supervision and Inspection Institution for Furniture Products (Shenzhen)
- Guangdong Quality Supervision and Inspection Institution for Food (Shenzhen)
- Guangdong Quality Supervision and Inspection Institution for Generic Cabling System
- Guangdong Quality Supervision and Inspection Institution for Bicycle Quality
- Guangdong Quality Supervision and Inspection Institution for Electromagnetic Compatibility
- Guangdong Quality Supervision and Inspection Institution for Leather Products
- Guangdong Quality Supervision and Inspection Institution for Ecological Textile and Garment Products (Shenzhen)
- Guangdong Quality Supervision and Inspection Institution for Horological Products (Shenzhen)
- Shenzhen Quality Inspection Institution for Fiber and Textile
- Shenzhen Quality Supervision and Inspection Institution for Building Materials
- Shenzhen Testing Center for Burning Behavior of Fire Protection Products