漢翔航空工業股份有限公司
電磁效應實驗室
Aerospace Industrial Development Corporation
Electromagnetic Effect Laboratory

EMC Test Report For :

CHIEN TI ENTERPRISE CO., LTD.

Product Name : ELECTRICAL SCOOTER

Model / Type : HS-118

Testing Laboratory
0367

地址：台中縣沙鹿鎮公明里中清路 38 之 3 號 電話：886-4-26244053 傳真：886-4-26244023
LAB. LOCATION: (J128) NO.38-3 JONG-CHING ROAD SHA-LU TOWN TAICHUNG HSIN TAIWAN R.O.C
MAIL ADDRESS: 111-16-6, LANE 68, FU-HSING N. ROAD TAICHUNG, TAIWAN, 407 R.O.C.
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Aerospace Industrial Development Corporation
Electromagnetic Effect Laboratory
EMC Testing Department

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TEL : 886-4-26244053 FAX : 886-4-26244023

Certificate of Compliance

Certificate Report No.	: EME-99-0120(CE)
Applicant	: CHIEN TI ENTERPRISE CO., LTD. No. 13, Lane 227, Fu Ying Rd., Hsin Chuang, Taipei, Taiwan, R.O.C.
Product	: ELECTRICAL SCOOTER
Model	: HS-118
Manufacturer	: CHIEN TI ENTERPRISE CO., LTD. No. 33-12, Chiu-Tou Lin 1, Chiu-Tou Village, Hsin-WU, Hsiang, Tao-Yuan Hsien, Taiwan, R.O.C.
Measurement Standard	: EN 12184: 2009 (SECTION 9 for ISO 7176-21:2003) ◎CISPR 11: 2004+A2:2006 ◎IEC 61000-4-2: 2008 ◎IEC 61000-4-3: 2006
Date of issue	: Apr. 26, 2010

Approved by Authorized Signatory: _____ Alex Song

報告發行章 AIDC EME LAB

CE

EMC TEST REPORT

for

ELECTRICAL SCOOTER

Trade Name : C.T.M.

Model Number : HS-118

Issued for :

CHIEN TI ENTERPRISE CO., LTD.

No. 13, Lane 227, Fu Ying Rd., Hsin Chuang, Taipei, Taiwan, R.O.C.

Issued by :

AIDC EME Lab.
111-16-6, Lane 68, Fu-Hsing N. Road Taichung, Taiwan, 407 R.O.C.
TEL: 886-4-26244053 FAX: 886-4-26244023

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of AIDC EME Lab., the test report shall not be reproduced except in full.
- This test report is only applicable to European Community.

CE

EC-Declaration of Conformity

For the following equipment:

ELECTRICAL SCOOTER
(Product Name)

HS-118 / C.T.M.
(Model Designation / Trade name)

CHIEN TI ENTERPRISE CO., LTD.
(Manufacturer Name)

No. 33-12, Chiu-Tou Lin 1, Chiu-Tou Village, Hsin-WU, Hsiang, Tao-Yuan Hsien, Taiwan, R.O.C.
(Manufacturer Address)

is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility Directive (Medical Device Directive 2007/47/EC), For the evaluation regarding the Electromagnetic Compatibility (Medical Device Directive 2007/47/EC), the following standards are applied:

- EN 12184:2009 (SECTION 9 for ISO 7176-21:2003)
  - CISPR 11: 2004+A2:2006
  - IEC 61000-4-2: 2008
  - IEC 61000-4-3:2006

The following manufacturer / importer or authorized representative established within the EUT is responsible for this declaration:

Company Name	
Company Address	

Person responsible for making this declaration:

Name, Surname	
Position / Title	

(Place) (Date) (Legal Signature)

Table of Contents

1 VERIFICATION OF COMPLIANCE

Equipment Under Test:	ELECTRICAL SCOOTER
Trade Name:	C.T.M.
Model Number:	HS-118
Serial Number:	Pre-production
EUT Powered during test:	DC24V
Applicant:	CHIEN TI ENTERPRISE CO., LTD. No. 13, Lane 227, Fu Ying Rd., Hsin Chuang, Taipei, Taiwan, R.O.C.
Manufacturer:	CHIEN TI ENTERPRISE CO., LTD. No. 33-12, Chiu-Tou Lin 1, Chiu-Tou Village, Hsin-WU, Hsiang, Tao-Yuan Hsien, Taiwan, R.O.C.
Type of Test:	Medical Device Directive 2007/47/EC for Marking
Technical Standards:	EN 12184: 2009 (SECTION 9 for ISO 7176-21:2003) ➢CISPR 11: 2004+A2:2006 ➢IEC 61000-4-2: 2008 ➢IEC 61000-4-3: 2006
ile Number:	EME-99-0120(CE)
Date of test:	Apr.08, 2010 - Apr.20, 2010
Date of issue:	Apr. 26, 2010
Test Result:	Comply
Condition of Test Sample:	Normal

The above equipment was tested by AIDC EME Laboratory for compliance with the requirements set forth in Medical Device Directive 2007/47/EC and 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.

Tested by: **Tested review by:**

Eric Chang Becker Lin

Eric Chang *Becker Lin*

2 GENERAL INFORMATION OF TEST

2.1 TEST FACILITY

Location: AIDC Electromagnetic Effect Laboratory
(J128) No.38-3 Jong-Ching Road Sha-Lu Town Taichung Hsin Taiwan R.O.C.

Description: There is one 3/10m open area test site and one line conducted lab for final test, The Open Area Test Sites and The line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.

Site Filing: A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.

Certified to CSA Standards.

Accredited by TAF for Industrial, Scientific and Medical Instrument、Information Technology Equipment、Household Appliances/tools、broadcast receivers and related equipments and fluorescent lights/luminaries.
Also accredited by TAF for military standard 461 and 462 (USA)

Accredited by BSMI for Information Technology Equipment、Household Appliances/tools、broadcast receivers and related equipments and fluorescent lights/luminaries.

Accredited by TÜV RHEINLAND for European Product-Family and Generic Standards & Basic and International Standards.

Accredited by DNV (DET NORSKE VERITAS) for European Medical Equipment, Product-Family and Generic Standards & Basic and International Standards.

Measurement Uncertainty: Radiated Emission Test ±2.72dB

(This includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.)

EMI Chamber: 9m x 6m x 6m

RF Shieldings Sidt / Frankonia CEM966 Anechoic Chambers.

2.2 TEST VOLTAGE

DC 24V

2.3 STANDARD FOR METHODS OF MEASUREMENT

EN 12184:2009 (SECTION 9 for ISO 7176-21:2003)		
Immunity Standard	**Comment**	**Test Results**
CISPR 11: 2004+A2:2006	Radiation Emission	Pass
IEC 61000-4-2: 2008	Electrostatic Discharge	Pass
IEC 61000-4-3: 2006	Radiated Electromagnetic Field	Pass

2.4 FREQUENCY RANGE INVESTIGATED

- Radiated emission test : from 30MHz to 1000MHz
- Radio frequency electromagnetic field immunity test: 26-1000MHz

2.5 TEST DISTANCE

- The test distance of radiated emission test from antenna to EUT is 10m.
- The test distance of radio frequency electromagnetic field immunity test from antenna to EUT 3m.

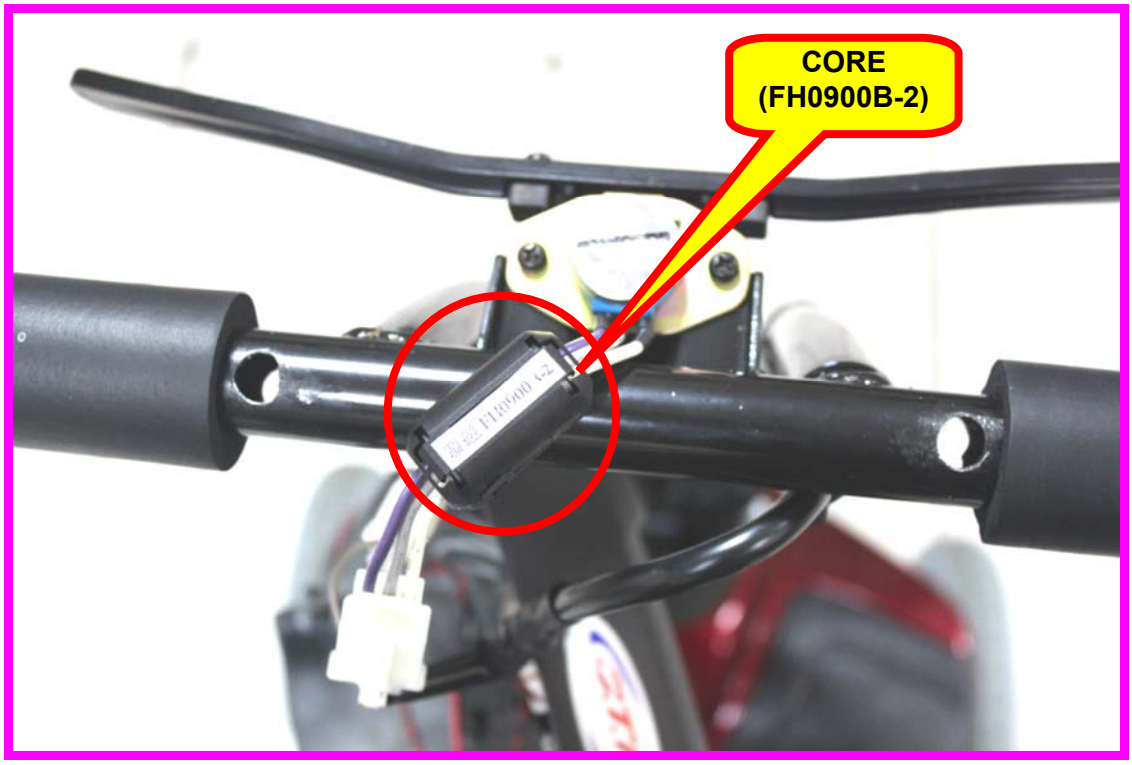
3 EUT DESCRIPTION

3.1 DESCRIPTION OF EUT & POWER

Specification \ Model No.		HS-118
Overall Length		1000mm / 39.4"
Overall Width		520mm / 20.5"
Overall Height		890mm / 35"
Wheels: Front		195mm / 8"
Wheels: Rear		195mm / 8"
Weight w/ Batteries		39.8kgs / 87.7 lbs
Max. Speed		6.4 kmph / 4 mph
Weight Capacity		115 kgs / 253.5 lbs
Ground Clearance		130 mm/ 5.1"
Grade Climbable		8 degree
Curb Climbing		35 mm / 1.4"
Turning Radius		1270 mm / 50"
Brake		Electro – Mechanical
Seat Type		Padded Foldable Swivel
Seat Width		425 mm / 16.7"
Motor Size		250 watt / 4700 r.p.m.
Battery Size		12V / 12 Ah ×2
Battery Weight		9.2kg / 20.3 lbs
Travel Range		10 km / 6.2 Miles
Battery Charger		1.8A Off Board
Electronics		On / Off Key Switch, Battery Level Indicator, Speed Control Knob
Controller	Trade Name	China Terminals & Electric Co., Ltd.
	Model No.	STAR-Z 70（70 Amp.）
Motor	Trade Name	Motion Technology Electric & Machinery CD.,LTD.
	Model No.	511100-11800

3.2 MODIFIED COMPONENT

Manufacture	Component	Specification (Item)	Quantity	Remarks
Erocore Enterprise Co.,Ltd	CORE	FH0900B-2	1EA	The shape and location are shown in【Figure 1】



【Figure 1】

3.3 DESCRIPTION OF SUPPORT UNITS

N/A

4 EMISSION TEST

4.1 RADIATED EMISSION TEST

4.1.1 Measuring Instrument Setting

Test regulation : CISPR 11, group 1, Class B

Frequency range of testing: 30MHz – 1000MHz

DETECTOR	FREQUENCY RANGE	RESOLUTION BANDWIDTH	VIDEO BANDWIDTH
Peak/QP	30 MHz-1000MHz	120kHz	300kHz

Note: All readings on data pages are taken with the detector in peak mode unless otherwise stated.

4.1.2 Limit

Frequency range MHz	GROUP I,CLASS B (10m) dB (μV/m)
30～230	30
230～1000	37
The lower limit is applicable at the transition frequency	

4.1.3 Test Equipments

EQUIPMENT TYPE	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
EMI Receiver	HP8572			
Spectrum	HP8566B	3138A07945	12/30/2009	12/29/2010
Preselector	HP85685A	3221A01390	01/05/2010	01/04/2011
Qp Adapter	HP85650A	3033A01685	12/02/2009	12/01/2010
Pre-Amplifier	8447D	2727A05314	12/01/2009	12/01/2010
Bi-Log Antenna	CBL6112B	2565	07/08/2009	07/07/2010

Note:HP8572 EMI Receiver including HP8566B Spectrum Analyzer、HP85650A Quasi-Peak Adapter and HP 85685A RF Preselector.

4.1.4 Test Procedure

1. The test for radiated emission as specified in CISPR 11 and ISO 7176-21:2003(E).
2. For driving mode test; set up the scooter as floor-standing equipment, place support equipment specified in 6.1 of ISO 7176-21:2003(E) so that the scooter is secure, with the driven wheels free to rotate.
3. Set the control device for a forward wheel speed of 50%±10% of the maximum speed.
4. The measurement of radiated emission in the frequency range of 30MHz to 1000MHz was performed with quasi-peak detector taken in horizontal and vertical antenna polarization at 10m open area test side(OATS).
5. In order to distinguish the disturbance of EUT from ambient noises, The EUTs were initial scaned in semi-anechoic chamber (9mx6mx6m) to find disturbances at a number of significant frequencies before executed final measurement at 10m OATS.

4.1.5 Mode of operation

The customer requesting the test provided the modes, configurations and setting available to evaluate, all of the EUT operation modes list below were investigated.

■ Operating mode investigated

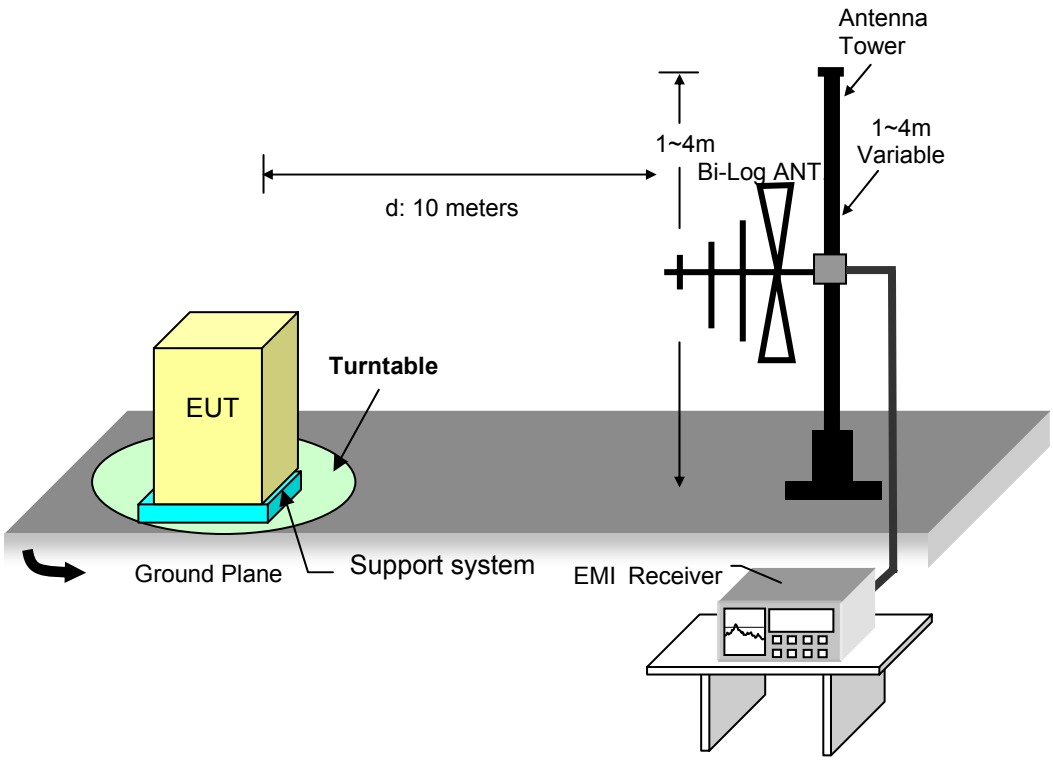
Mode 1: Set driven wheels turn at 50%±10% of maximum forward speed with charge the scooter batteries to not less than 2% above their nominal voltage.

■ Worst case operating mode

Mode 1: Set driven wheels turn at 50%±10% of maximum forward speed with charge the scooter batteries to not less than 2% above their nominal voltage.

The final conducted emissions test was performed using the mode described above as worst case.

4.1.6 Test Set-up



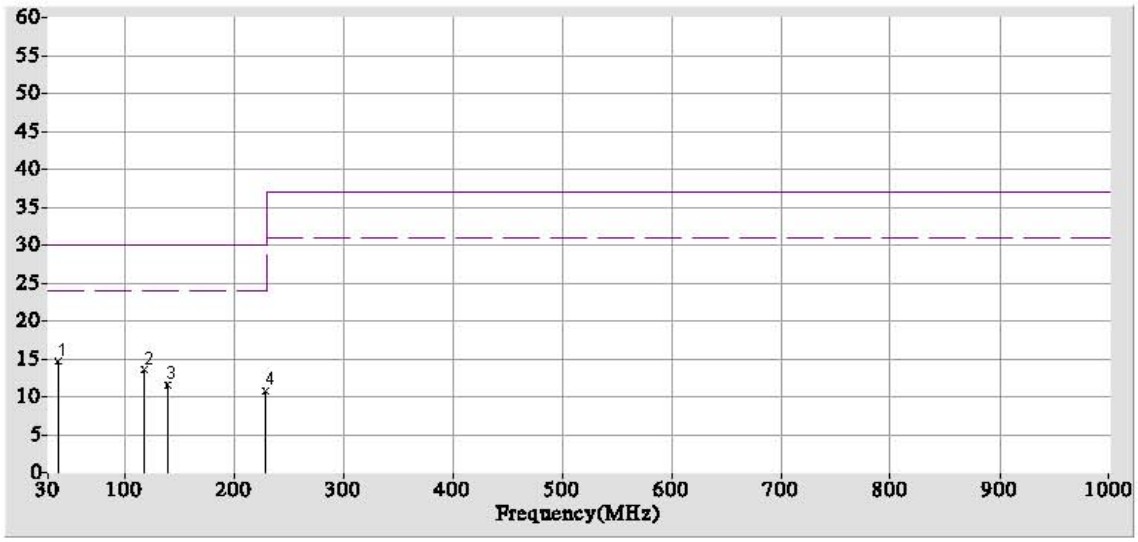
4.1.7 Test Result

AIDC EMC LAB.

EMI TESTING DATA

DATE: 04-14-2010
TIME: 10:43:02

EUT : Electrical Scooter	POLARIZATION: Horizontal
CLIENT: 建迪	TEST DISTANCE: 10 m
MODEL: HS-118	PROJECT ID:
RATING:	FILE/DATA#: HS-118.emi/2
Ser#:	OPERATOR: Eric Chang
TRACE:	TEST SITE: OATS
Level(dBuV)	LIMIT : CISPR 11.LMT



COMMENT: 50% of max. speed

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Factor	Other Factor	Remark
	MHz	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	
1	39.942	14.70	-15.30	30.00	29.40	12.65	0.60	27.95	QP
2	118.387	13.58	-16.42	30.00	26.50	12.60	2.08	27.60	QP
3	139.639	11.55	-18.45	30.00	25.20	11.51	2.31	27.47	QP
4	229.337	10.80	-19.20	30.00	24.70	10.13	3.01	27.04	QP

HS-118.emi/2 1/1

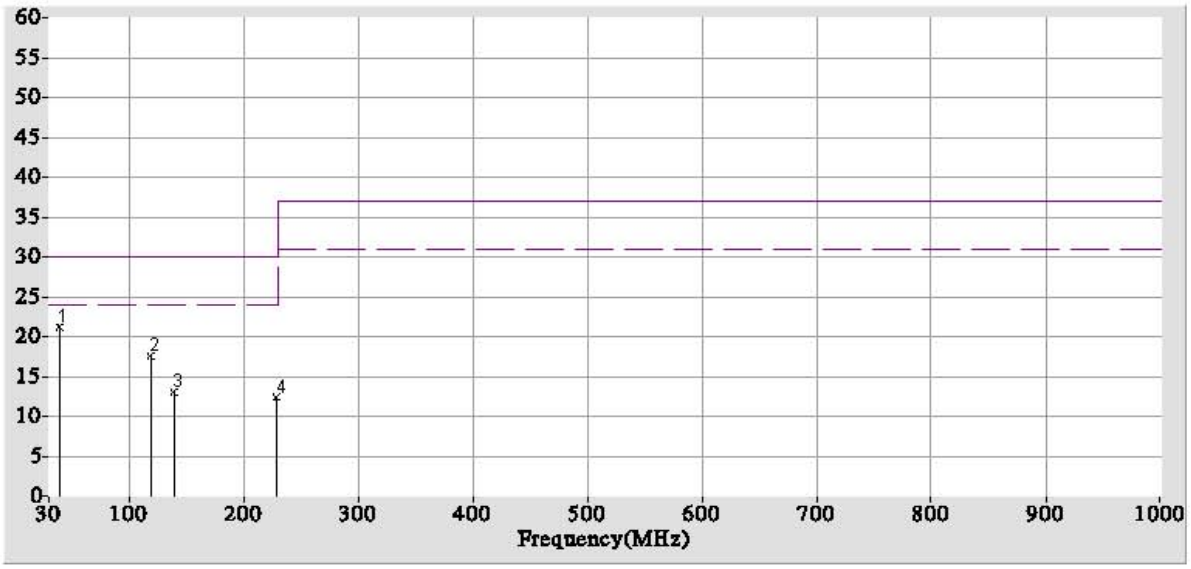
AIDC EMC LAB.

EMI TESTING DATA

DATE: 04-14-2010
TIME: 10:24:21

EUT : Electrical Scooter
CLIENT: 建迪
MODEL: HS-118
RATING:
Ser#:
TRACE:

POLARIZATION: Vertical
TEST DISTANCE: 10 m
PROJECT ID:
FILE/DATA#: HS-118.emi/1
OPERATOR: Eric Chang
TEST SITE: OATS
LIMIT : CISPR 11.LMT



COMMENT: 50% of max. speed

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Factor	Other Factor	Remark
	MHz	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	
1	39.495	21.20	-8.80	30.00	35.50	13.05	0.60	27.95	QP
2	119.076	17.59	-12.41	30.00	30.50	12.60	2.09	27.60	QP
3	139.453	13.06	-16.94	30.00	26.70	11.52	2.31	27.47	QP
4	229.337	12.40	-17.60	30.00	26.30	10.13	3.01	27.04	QP

HS-118.emi/1 1/1

5 IMMUNITY TEST

5.1 ELECTROSTATIC DISCHARGE(ESD) IMMUNITY TEST

5.1.1 Electrostatic Discharge (ESD) Immunity test

Basic Standard	: IEC 61000-4-2 EN 12184:2009
Port	: Enclosure
Tested Level	: Contact Discharge ■±2kV ■±4kV ■±6kV □±8kV
	Air Discharge ■±2kV ■±4kV ■±8kV □±15kV
	Charged Frame Test ■±8kV
Discharge Impedance	: 330 ohm/150pF
Charge Impedance	: 50Mohm
Number of Discharge	: 10
Polarity	: positive and negative
Temperature	: 25℃
Humidity	: 50%
Performance Criteria	: Driving mode: - shall meet the requirements of 5.2.2 ISO 7176-21:2003(E) (average wheel speed change shall not exceed ±20% during each discharge and for 2s following each set of discharges)

5.1.2 Test Equipments

EQUIPMENT TYPE	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL. DUE
Noiseken	Ess-2000	2099C01880	11/05/2009	11/04/2010

5.1.3 Test Procedure

◎ Driving test:

1. Set up scooter as floor standing equipment in accordance with clause 7 of ISO 7176-21:2003 and place support system so that any driven wheels are free to rotate.
2. Set the control device for a forward wheel speed of 50%±10% of maximum speed.
3. Perform the test in accordance with IEC 61000-4-2, using the level of ±2kV, ±4kV, ±6kV for contact discharges and test levels of ±2kV, ±4kV and ±8kV for air discharges.

◎ Charged-frame test:

1. Set the scooter mode the same as driving test.
2. The charged frame test was conducted in accordance with 10.2 of ISO 7176-21:2003(E) charged ±8kV to frame of the scooter with discharge to ground via 25 mm^2 ground strap.

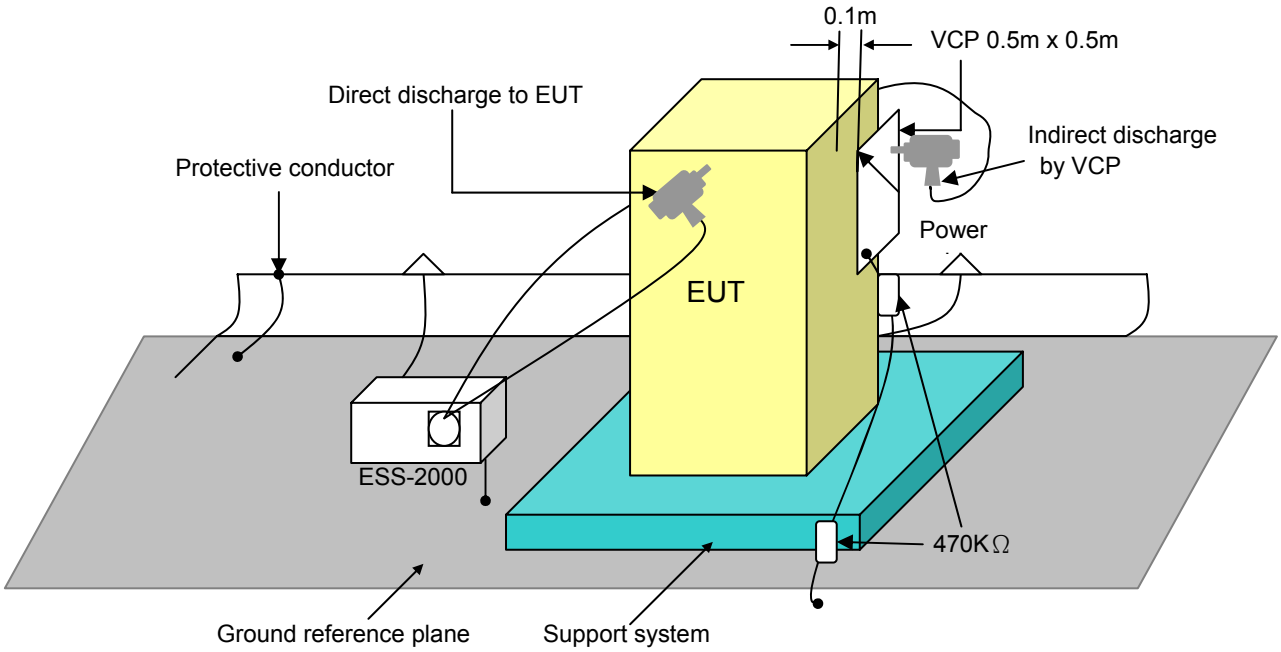
◎ Also see photo documentation of test set-up in section 6.

5.1.4 Mode of operation

The equipment under test was operated during the measurement under following conditions:

- Driving mode.

5.1.5 Test Set-up



5.1.6 Test Result

The electrostatic discharges were applied as follows:

Parameters	Test Results	Comments
±2kV, ±4kV, ±6kV Contact Discharge	Pass	No degradation or loss of performance
±2kV, ±4kV, ±8kV Air Discharge	Pass	No degradation or loss of performance
±8kV Charged Frame Test	Pass	No degradation or loss of performance

5.1.7 Electronics Discharge (ESD) of Test Point

: CONTACT DISCHARGE
ALL PASS

: AIR DISCHARGE
ALL PASS

: CHARGED- FRAME TEST
ALL PASS

5.2 RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

5.2.1 Radiated Electromagnetic Field Immunity test

Basic Standard	: IEC61000-4-3 EN 12184:2009
Field Strength	: 12V/m
Modulation	: 80%, AM (1kHz sin wave)
Frequency Step	: 1.0% increment
Test site	: Absorbing chamber
Polarity of Antenna	: Horizontal and Vertical
Test Distance	: 3m
Dwell Time	: 2 sec
Frequency Range	: 26-1000MHz
Temperature	: 25℃
Humidity	: 55%
Pressure	: 988hPa
Test Mode	: Forward speed of 50±10% of the maximum speed
Performance Criteria	: when the scooter is tested as specified in driving mode - the average wheel speed change, ΔS_{avg} shall not exceed 20%.

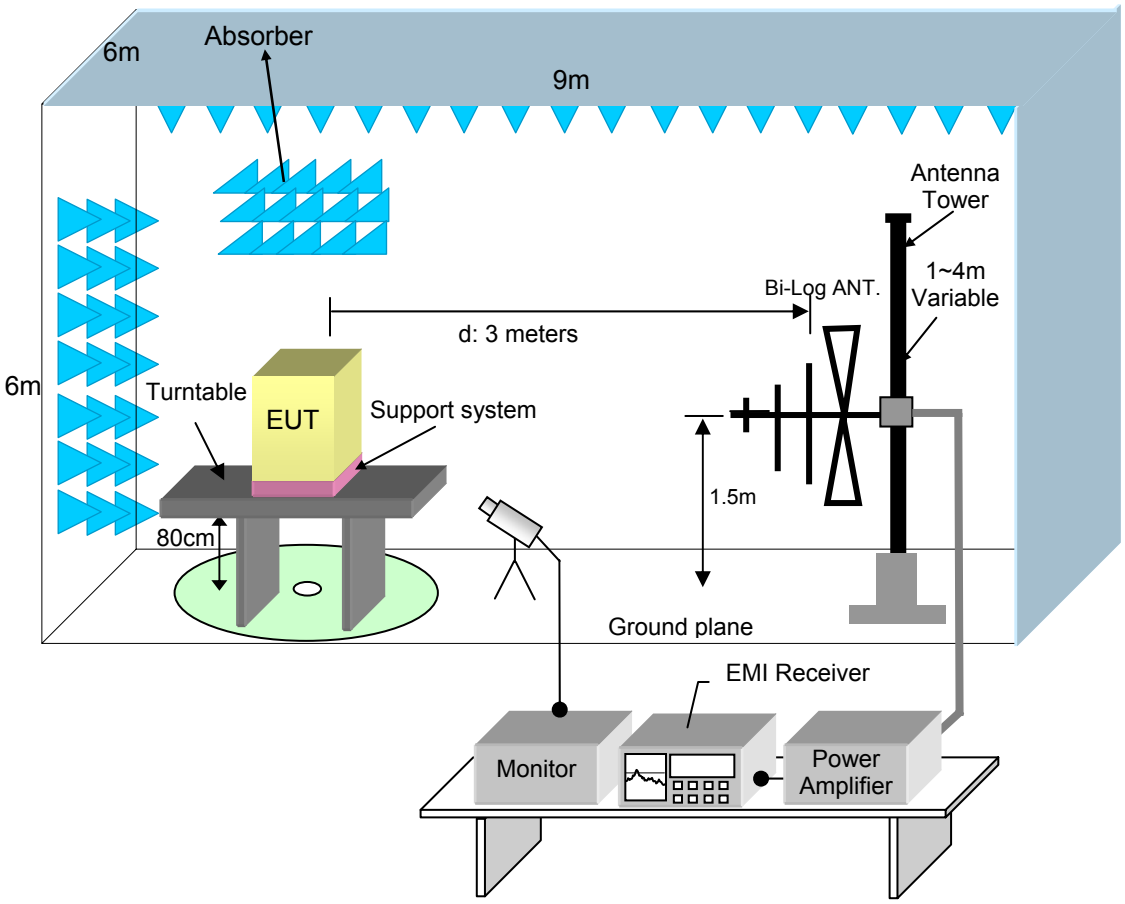
5.2.2 Test Equipments

MANUFACTURER /TYPE	MODEL NO.	SERIAL NO.	LAST CAL.	CAL. DUE
Sidt/Fran konia RF Shieldings Anechoic Chambers	CEM966	N/A	N/A	N/A
Bi-log antenna	CBL 6111B	2226	10/08/2009	10/07/2010
Amplifier Research /Power Amp. (1MHz ~ 1GHz)	100W1000B	309171	N/A	N/A
Wandel & Goltermann /Field Strength Meter	EMR-30	X-0011	03/15/2010	03/14/2011
HP/Sweep Generator	HP8648A	3642U01839	03/26/2010	03/25/2011

5.2.3 Test Procedure

1. An anechoic chamber as specified by IEC61000-4-3 is used.
2. The scooter set up as table-top equipment specified in clause 7 of ISO 7176-21:2003(E). Place the support system specified in 6.1 of ISO7176-21:2003(E) so that the scooter is secure, with the driven wheels free to rotate.
3. Set driven wheels turn at 50%±10% of maximum forward speed with the scooter batteries shall not less than 2% above their nominal voltage.
4. Three orientations of the scooter and two polarization of radiating antenna were tested:
5. the forward direction of travel is toward the antenna.
6. the forward direction of travel is perpendicular to the line between the scooter and antenna, with the antenna facing the side of the scooter on which the control device is located.
7. the forward direction of travel is away from the antenna.
8. For each orientation of the scooter, the radiating antenna was positioned so that the E-field polarization is (1) horizontal and (2) vertical.
9. During the test, the wheels speed shall be monitored by a camera and tachometers in order to recognize whether the average wheel speed change, ΔS_{avg} exceed 20% or not.
10. Please see photo documentation of test set-up in section 6.

5.2.4 Test Set-up



5.2.5 Test Result

Range	Field	Polarization	Test Results
26-1000MHz	12V / m	Horizontal	Pass
26-1000MHz	12V / m	Vertical	Pass

5.2.6 Test Data

Radiated Immunity *Test Log* in Chamber

Client :
Brand : Electrical Scooter
Model No. : HS-118
Test Standard : IEC 61000-4-3
Test level : 12 *V/m*
Frequency range : 26.00 MHz -1000.00 MHz
Frequency Step : 1.0 % increment
Test site : Chamber
Polarization : Vertical & Horizontal
Modulation : 80 % AM (1KHz sin wave)
Dwell time : 2.0 sec
Temperature : 25°C
Humidity : 55 %
Pressure : 988 hPa

Test Mode : Forward speed of 50 ± 10% of the maximum speed.
Test Configuration:

Polarization	Location of EUT	Remark
Vertical	The forward direction of travel is toward the antenna	The speed of any driven wheel not change 20% of its recorded speed .
	The forward direction of travel is perpendicular to the line between the wheelchair and the antenna	The speed of any driven wheel not change 20% of its recorded speed .
Horizontal	The forward direction of travel is toward the antenna	The speed of any driven wheel not change 20% of its recorded speed .
	The forward direction of travel is perpendicular to the line between the wheelchair and the antenna	The speed of any driven wheel not change 20% of its recorded speed .

Test result : *Pass* *(Pass/Fail)*
Tester : Eric **Test date** : *Apr. 08. 2010*

6 PHOTOGRAPHS OF TEST SETUP

Photo 1 RE test photo

Photo 2 RS test photo

Photo 3 ESD Test Photo 1

Photo 4 ESD Test Photo 2

7 Photographs of EUT

Photo 1 Front view

Photo 2 Back view

Photo 3 Top Control Panel view

Photo 4 Free Wheeling Lever View

Photo 5 Internal View 1

Photo 6 Internal View 2

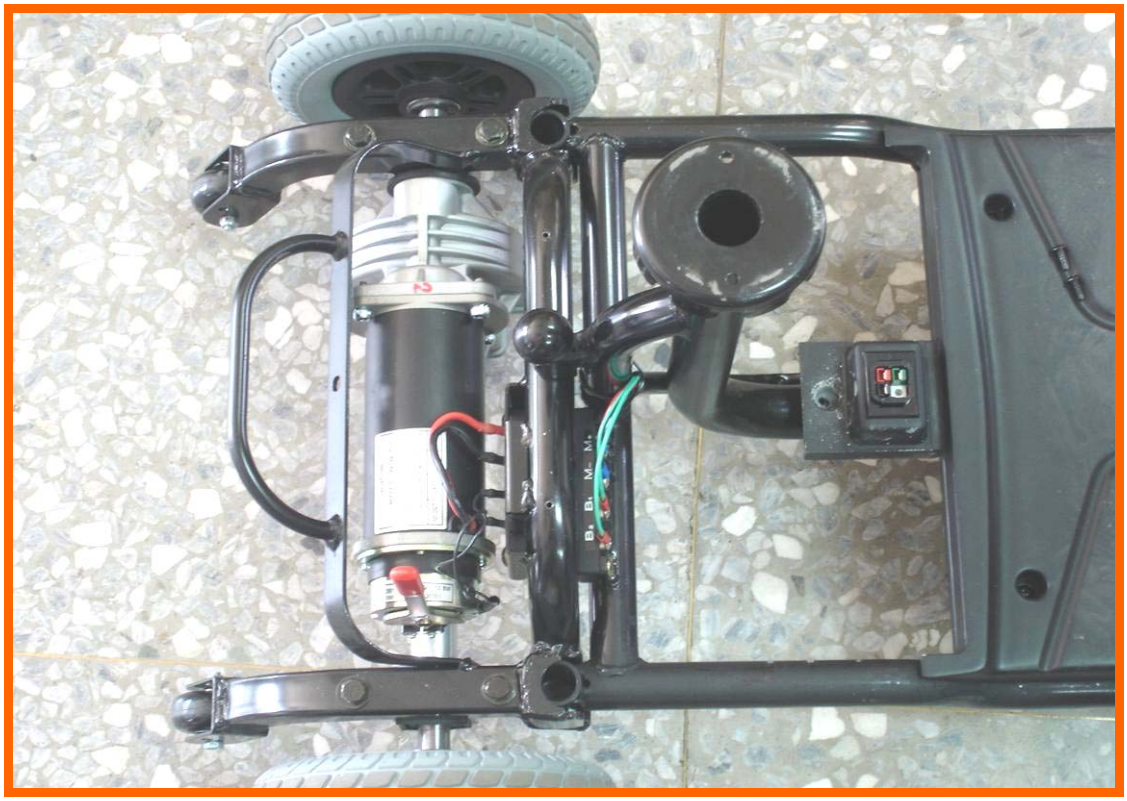


Photo 7 Internal View 3

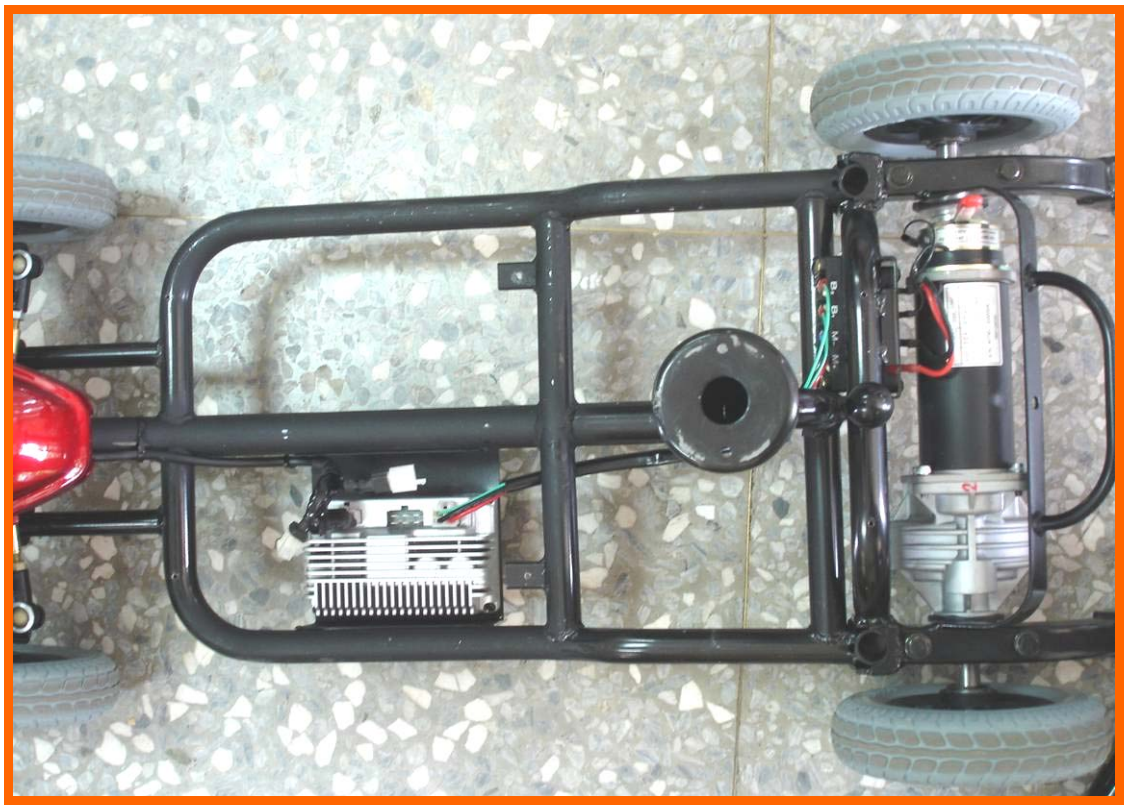


Photo 8 Internal View 4

Photo 9 Motor View

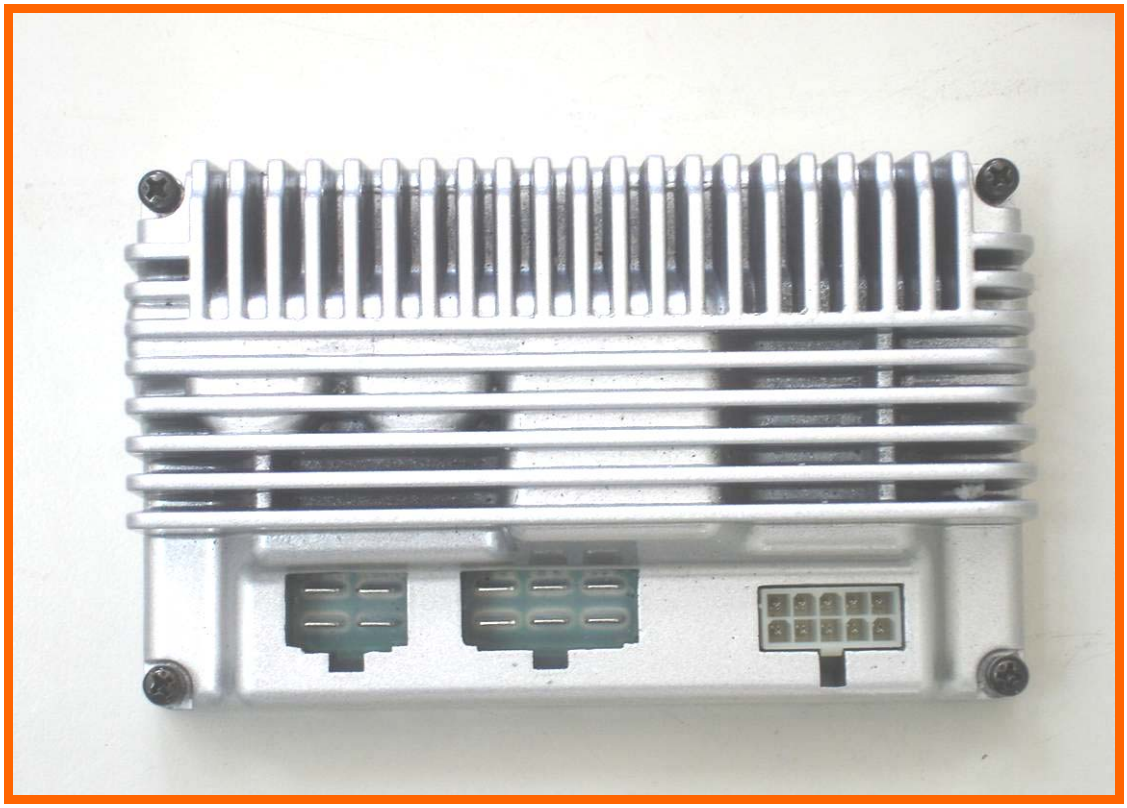


Photo 10 Controller View

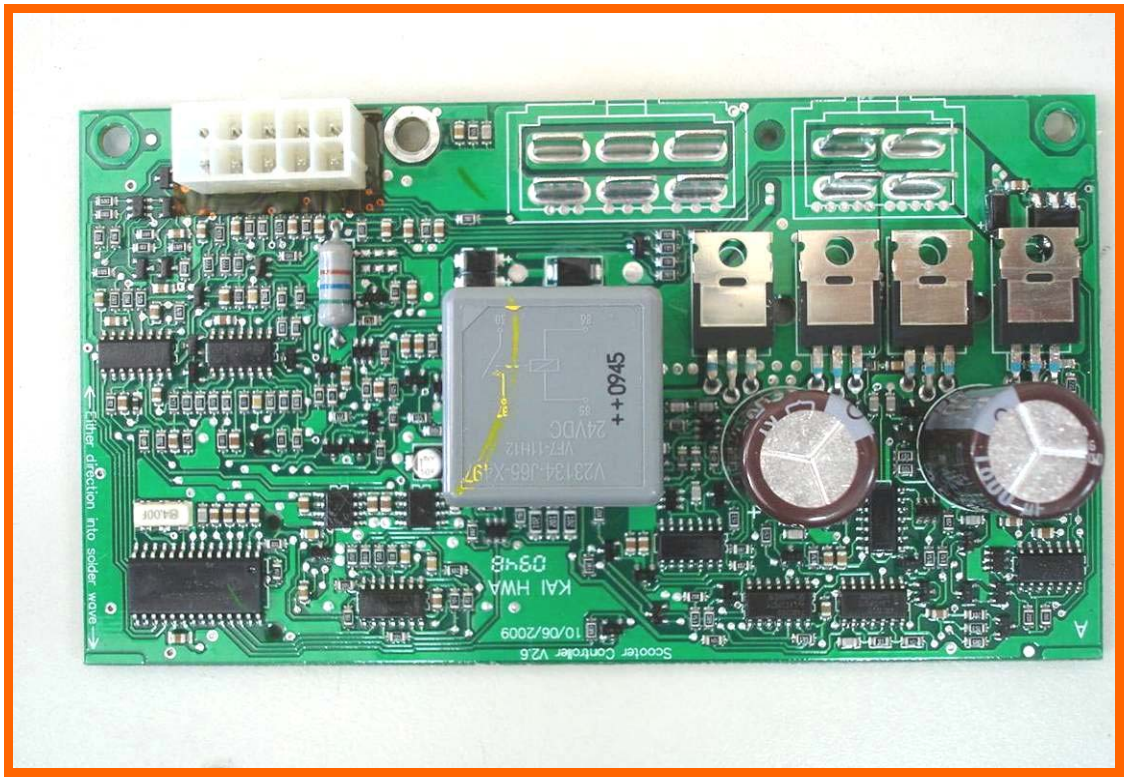


Photo 11 Controller PCB Front View

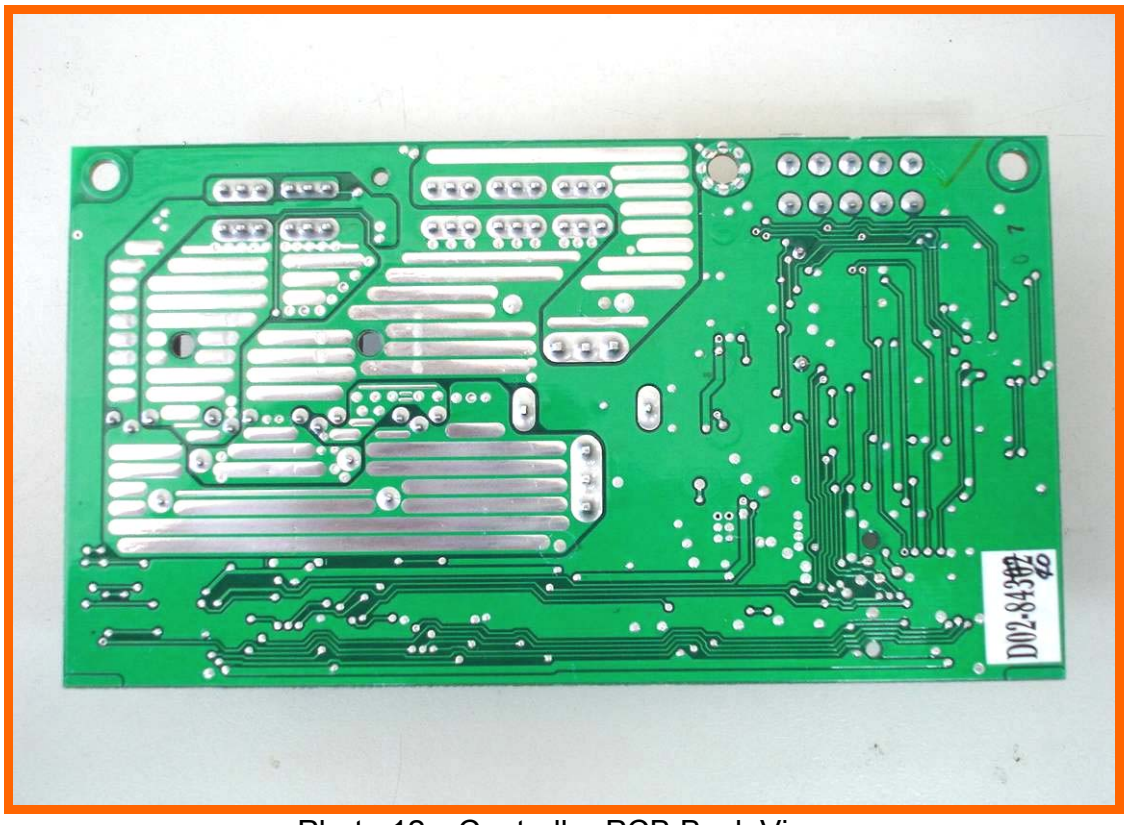


Photo 12 Controller PCB Back View