



EMC TEST REPORT

Product Name : Electronic Throttle Controller
Product Model : POTENT BOOSTER
Trade Name : Not Applicable
Report Number : HYT201407152709E
Date : July 15, 2014
Regulations : See below

Standards	Results
☒ EN 55022: 2010	PASS
☒ EN 61000-3-2: 2006/A2:2009	N/A
☒ EN 61000-3-3: 2008	N/A
☒ EN 55024: 2010	PASS
☒ IEC 61000-4-2: 2009	PASS
☒ IEC 61000-4-3: 2006+A2:2010	N/A
☒ IEC 61000-4-4: 2012	N/A
☒ IEC 61000-4-5: 2006	N/A
☒ IEC 61000-4-6: 2009	N/A
☒ IEC 61000-4-8: 2010	N/A
☒ IEC 61000-4-11: 2004	N/A

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(Note: N/A means not applicable)



1. GENERAL INFORMATION

Applicant: ShenZhen TROS technology Co., LTD.
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Manufacturer: ShenZhen TROS technology Co., LTD.
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EMC Directive: 2004/108/EC

Product Name: Electronic Throttle Controller

Trade Name: N/A

Model Name: POTENT BOOSTER

Serial Number: N/A

Report Number: HYT201407152709E

Date of Test: July 15, 2014-July 21, 2014

The results of this test report are only valid for the mentioned equipment under test. The test report with all its sub-reports, e.g. tables, photographs and drawings, is copyrighted. Unauthorized utilization, especially without permission of the test laboratory, is not allowed and punishable. For copying parts of the test report, a written permission by the test laboratory is needed.

The test results of this report relate only to the tested sample identified in this report.

Reviewed by : Jack. Guo
Engineer

Approved by :
Manager



Approved date : 2014.07.21

2. TEST SUMMARY

The EUT has been tested according to the following specifications:

EMISSION		
Standard	Test Item	Test
EN 55022	Conducted disturbance at mains terminals	N/A
EN 55022	Conducted disturbance at telecommunication ports	N/A
EN 55022	Radiated disturbance	PASS
EN 61000-3-2	Harmonic current emission	N/A
EN 61000-3-3	Voltage fluctuations & flicker	N/A

IMMUNITY (EN 55024)		
Standard	Test Item	Test
IEC 61000-4-2	Electrostatic discharge immunity	PASS
IEC 61000-4-3	Radiated, radio frequency, electromagnetic field immunity	N/A
IEC 61000-4-4	Electrical fast transient / burst immunity	N/A
IEC 61000-4-5	Surge immunity	N/A
IEC 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields	N/A
IEC 61000-4-8	Power frequency magnetic field immunity	N/A
IEC 61000-4-11	Voltage dips, short interruptions and voltage variations immunity	N/A

3. PRODUCT INFORMATION AND TEST SETUP

3.1 PRODUCT INFORMATION

Technical Data: Input: DC3.3V -12V /15mA-25mA

3.2 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

3.3 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	---	---	---	---	---	---

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4. FACILITIES AND ACCREDITATIONS

4.1 TEST FACILITY

The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

4.2 TEST EQUIPMENT LIST

3M Semi-anechoic Chamber - RE Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
10M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	10/29/2014
Spectrum Analyzer	Agilent	E4443A	MY46185649	10/29/2014
Biconilog Antenna	ETS-LINGREN	3142C	920250	10/29/2014

Shielding Room No. 3 - ESD Test (IEC 61000-4-2)				
Equipment	Manufacturer	Model	Serial No.	Due Date
ESD Simulator	SCHAFFNER	NSG438	230	12/17/2014

4.3 LABORATORY ACCREDITATIONS AND LISTINGS

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

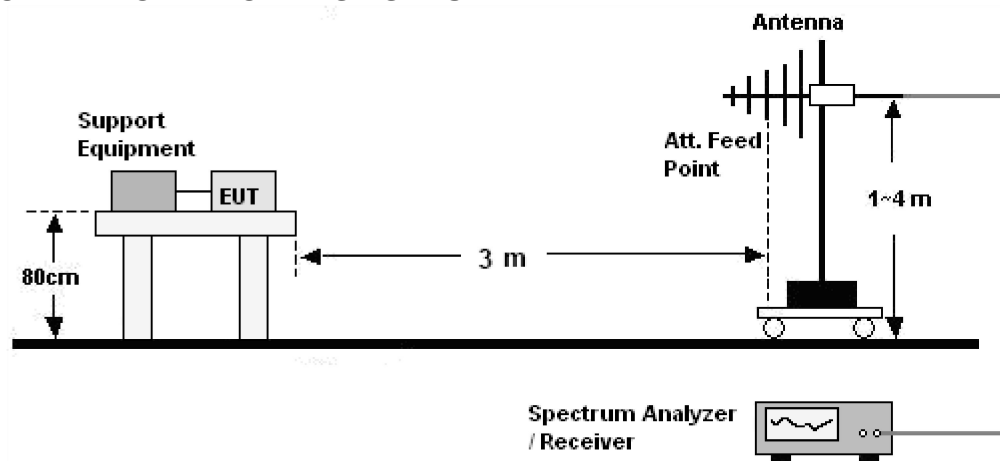
5. RADIATED DISTURBANCE TEST (RE)

5.1 LIMITS

Frequency (MHz)	Quasi-peak limit at 3m (dB μ V/m) – Class B ITE
30-230	40
230-1000	47

NOTE: The lower limit shall apply at the transition frequencies.

5.2 BLOCK DIAGRAM OF TEST SETUP



5.3 TEST PROCEDURE

- The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3-meter chamber, and 3 meters away from the antenna mounted on a variable-height tower.
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW in 30 MHz ~ 1 GHz. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied from 1 m to 4 m above the ground in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- For each frequency whose maximum record was higher or close to limit, measure its QP value: scan the antenna from 1 meter to 4 meters and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum QP value.

5.4 TEST RESULTS

EUT : Electronic Throttle Controller **M/N** : POTENT BOOSTER
Power : DC5V **Temperature** : 22.0℃
Mode : Normal **Humidity** : 60.7%

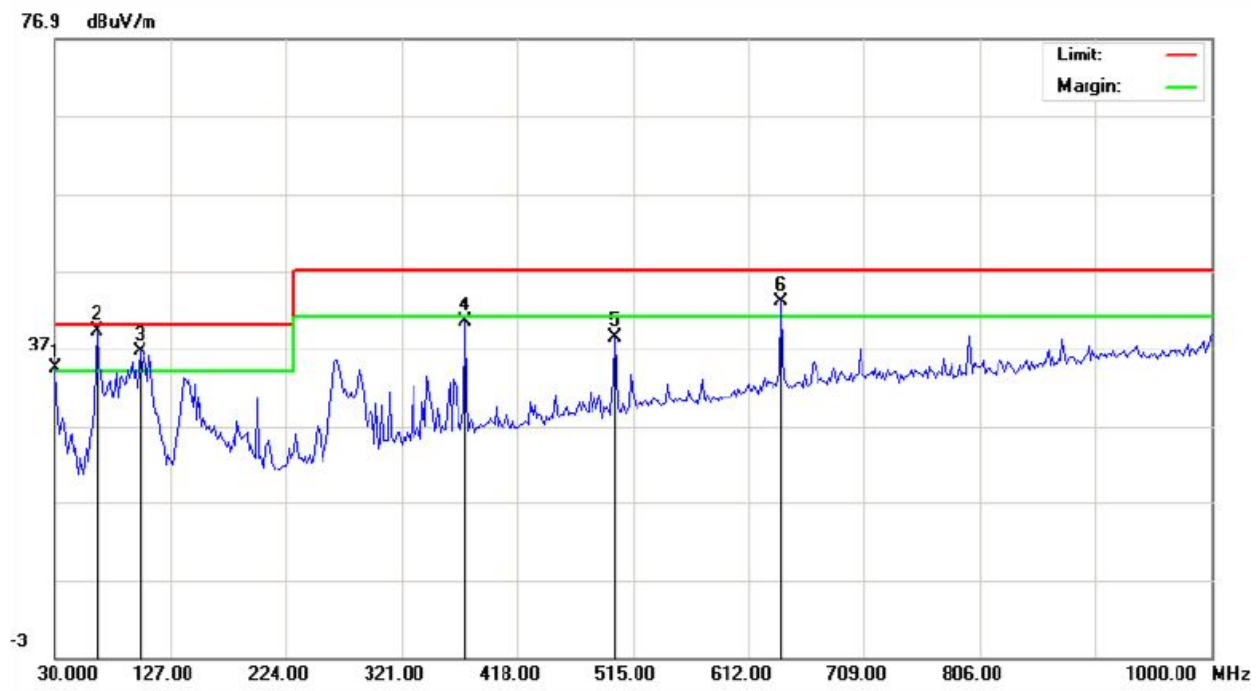
RE Test Result									
Frequency (MHz)	Reading Level (dBuV/m)		Correct Factor (dB)	Measurement (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Result (P/F)	Remarks (H/V)
	Peak	Q.P.		Peak	Q.P.	Q.P.	Q.P.		
30.0000	16.76	—	17.63	34.39	—	40.00	<-5	P	H
65.5666	31.15	27.51	8.15	39.30	35.66	40.00	-4.34	P	H
101.1333	26.27	24.06	10.35	36.62	34.41	40.00	-5.59	P	H
374.3500	22.35	—	18.05	40.40	—	47.00	<-6	P	H
500.4499	18.37	—	19.96	38.33	—	47.00	<-8	P	H
639.4832	19.74	17.00	23.29	43.03	40.29	47.00	-6.71	P	H
30.0000	17.59	16.90	17.63	35.22	33.72	40.00	-6.28	P	V
65.5666	27.34	25.17	8.15	35.49	33.32	40.00	-6.68	P	V
94.6667	27.86	25.06	10.19	38.05	35.25	40.00	-4.75	P	V
143.1666	24.93	—	9.96	34.89	—	40.00	<-5	P	V
266.0332	20.57	—	14.56	35.13	—	47.00	<-10	P	V
500.4499	17.70	—	19.96	37.66	—	47.00	<-9	P	V

Correct Factor
 Measurement
 Margin
 “—”

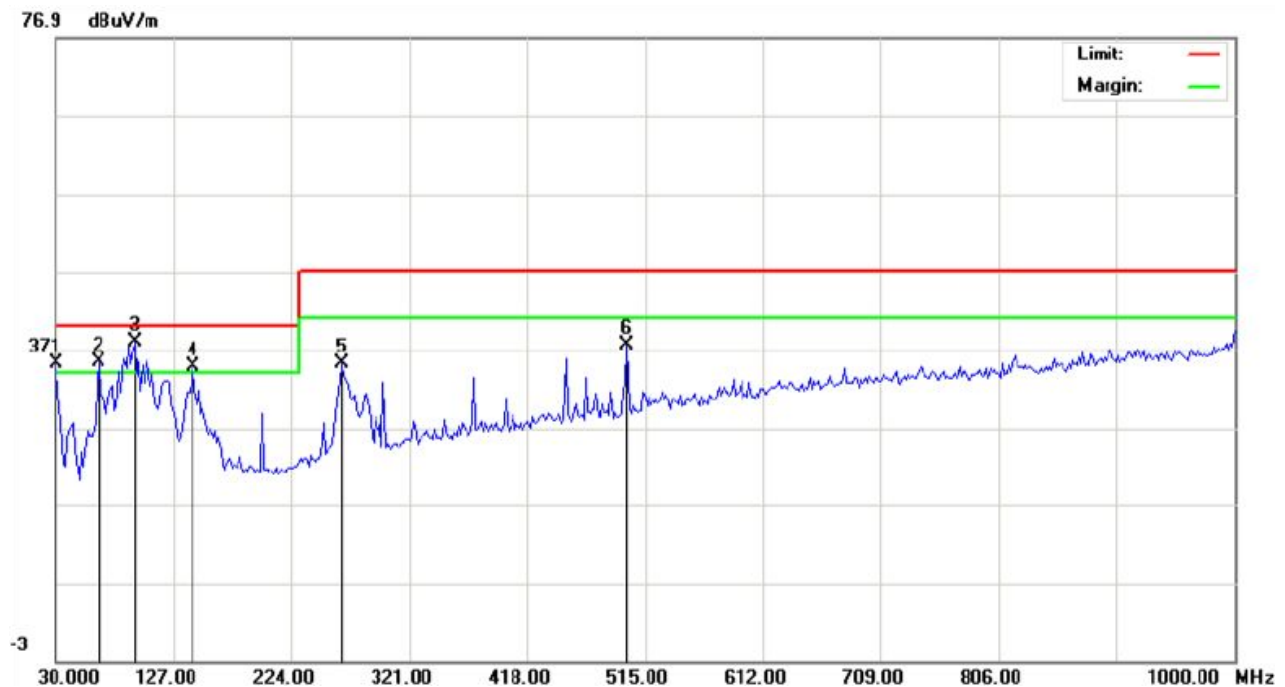
= Cable loss + Antenna Factor
 = Reading level + Factor
 = Reading in reference to limit
 = The emission level complied with the limits, with
 sufficient margin, so no further recheck.

Graphs:

H:



V:



6. IMMUNITY TEST

6.1 PERFORMANCE CRITERIA DESCRIPTION

General Performance Criteria	
Product Standard	EN 55024:1998+A1:2001+A2:2003 clause 7.1
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. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if 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. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
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. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

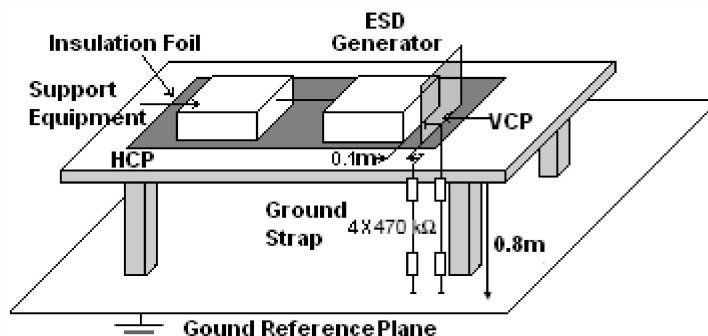
Particular Performance Criteria	
Product Standard	EN 55024:1998+A1:2001+A2:2003 Annex 0.0
CRITERION A	
CRITERION B	
CRITERION C	

6.2 ELECTROSTATIC DISCHARGE IMMUNITY (ESD)

6.2.1 TEST SPECIFICATION

Basic Standard	: EN 55024 & IEC 61000-4-2
Discharge Impedance	: 330 ohm / 150 pF
Discharge Mode	: Single Discharge
Discharge Period	: 1 discharge per second

6.2.2 BLOCK DIAGRAM OF TEST SETUP



6.2.3 TEST PROCEDURE

ESD shall be applied only to those points and surfaces of the EUT which are expected to be touched during usual operation, including user access, as specified in the user manual.

The discharges shall be applied in two ways:

a. Contact discharges to the conductive surfaces and to coupling planes (HCP & VCP):

The EUT shall be exposed to at least 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 discharges. If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Tests shall be performed at a maximum repetition rate of one discharge per second.

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

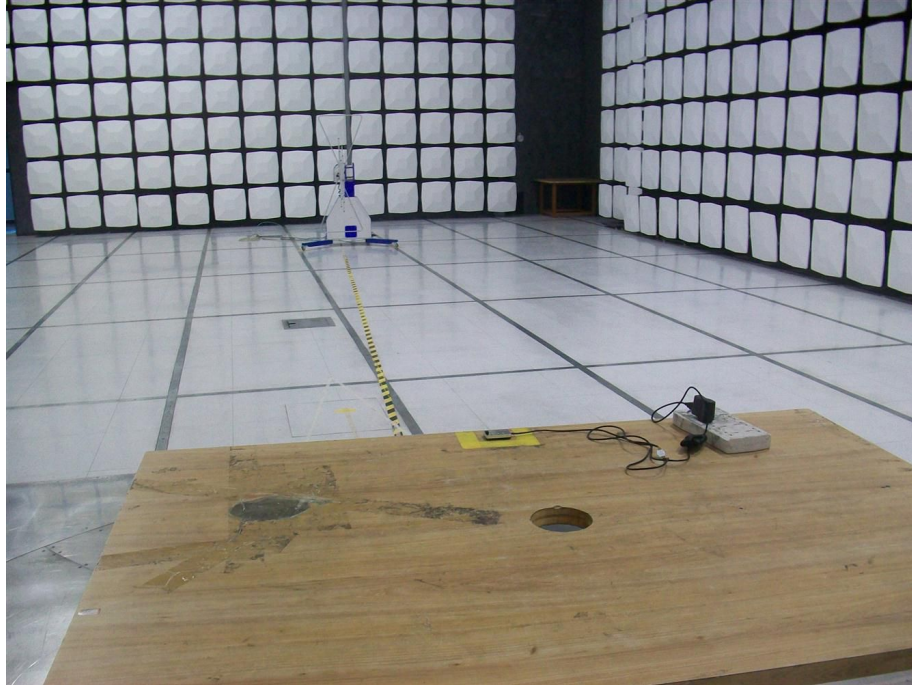
On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. A minimum of 10 single air discharges shall be applied to the selected test point for each such area.

6.2.4 RESULTS & PERFORMANCE

Discharge Method	Discharge Position	Voltage (kV)	Amount of Discharges	Required Level	Performance Criterion
Contact Discharge	Conductive Surfaces	± 4	At least 200 discharges	B	A
	Indirect Discharge HCP	± 4		B	A
	Indirect Discharge VCP	± 4		B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	± 8	Min 10 / point	B	A*

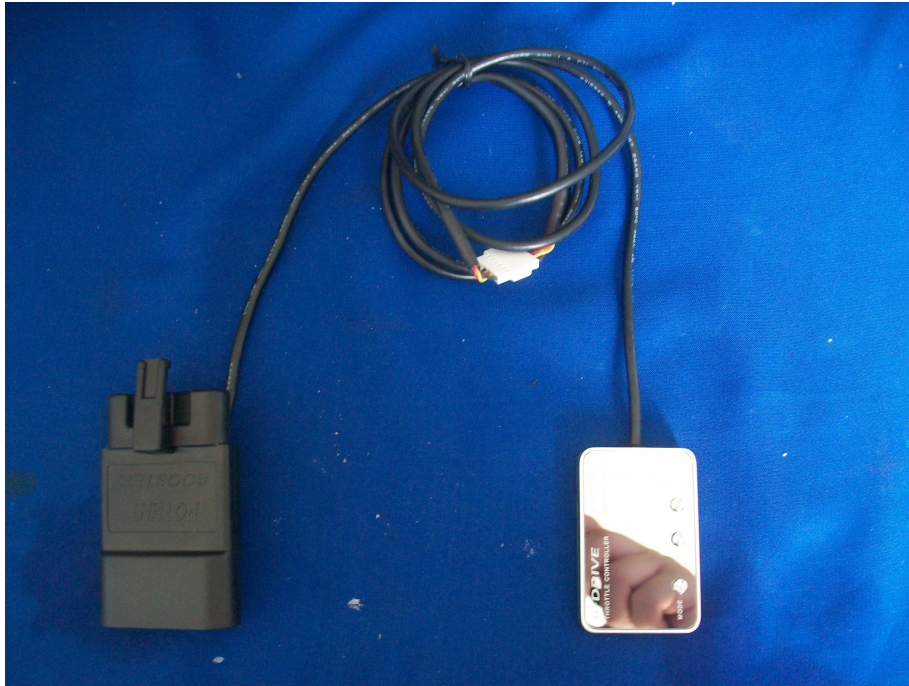
*, No air discharge point.

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP



RE TEST SETUP

APPENDIX 2 PHOTOGRAPHS OF EUT



View of EUT-1



View of EUT-2

----End of the report---