TEST REPORT

EN 61347-1

Lamp controlgear-

Part 1: General and safety requirements

Report reference No.----------	LVD-2K06040
Date of issue----------	Feb.06, 2006
Applicant----------	Semicon-Optronics Channel Corp.
Address----------	9F, No.563, Sec.1, Beising Rd., Jhudong, Hsinchu, 31042, Taiwan
Manufacturer---------- :	Semicon-Optronics Channel Corp.
Address---------- :	9F, No.563, Sec.1, Beising Rd., Jhudong, Hsinchu, 31042, Taiwan
Product----------	High Power LED Driver
Model and/or type reference---- :	HPD
Trademark---------- :	SOC logo
Rating(s)---------- :	Input: 100-230V 50Hz 0.27A, Output:350mA
Tested according to---------- :	EN 61347-1: 2001 Lamp controlgear- Part 1: General and safety requirements
Testing laboratory---------- :	Euro-Am Test Laboratory Co., Ltd.
Address---------- :	1F, No.66, Alley27, Lane372, Zhong Xiao E. Rd., Sec.5, Taipei 110, Taiwan
Testing location---------- :	1F, No.34, Alley27, Lane372, Zhong Xiao E. Rd., Sec.5, Taipei 110, Taiwan
Date of receipt of test item------ :	Nov.29, 2004
Date(s) of performance of test-- :	Nov.29, 2004 to Dec 30, 2004
Abbreviations---------- :	P(ass) = Test item does meet the requirement F(ail) = Test item does not meet the requirement N/A = Test case does not apply to the test object
Conclusion---------- :	The Device Under Test (DUT) is considered as ☐ Meeting specification ☑ Meeting specification with alterations And hence fulfills the requirements specified in Low Voltage Directive 73/23/EEC and 93/68/EEC

Reported by……: Daniel Lin (+ signature)

Approved by……: Roven Ma (+ signature)

General remarks:
"(see remark #)" refers to a remark appended to the report.
"(see appended table #)" refers to a table appended to the report.
This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.
National deviations were not evaluated.

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
6.	**Classification**		-
	According to the method of installation:		-
	- built-in;		P
	- independent;		N/A
	- integral.		N/A
7.	**Marking**		-
7.1	Items to be marked		-
	The following items shall be marked as mandatory markings or provided as information to be given		P
	a) mark of origin	SOC	P
	b) model number or type reference	HPD	P
	c) symbol for independent lamp controlgear		N/A
	d) the correlation between replaceable and interchangeable parts	Not intended to replaceable or interchangeable	N/A
	e) rated supply voltage, voltage range, supply frequency and supply current(s)	1000-230VAC, 50Hz, 0.27A	PA
	f) the earthing terminals shall be identified by the symbol	Not intended to connect earthed	N/A
	g) the claimed value of the rated maximum operating temperature of the winding following the symbol t_w		N/A
	h) indication that the lamp controlgear does not rely upon the luminaire enclosure		N/A
	i) indication of the cross-section of conductors		PA
	j) the lamp type and rated wattage	350mA (This product is designed to be used for LED load with a maximum rated current not exceeding 350mA.)	PA
	k) wiring diagram indicating the position and purpose of terminals		PA
	l) value of t_c	t_c=105℃	PA
	m) symbol for temperature declared, thermally protected controlgear	No thermally protector used	N/A
	n) heat sink(s) required additional to the lamp controlgear	Heat sink integral with controller	N/A

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
	o) the limiting temperature of the winding under abnormal conditions shall be respected when the controlgear in built into a luminaire.	Not intended to built into a luminaire	N/A
	p) the test period for the endurance test for lamp controlgear	30 days need not be indicated	N/A
	q) for lamp controlgear for which a constant S other than 4500	Not shown	N/A
7.2	Durability and legibility of marking		-
	Marking shall be durable and legible.		PA
8.	**Terminals**		-
	Screws terminal shall comply with section 14 of IEC 60598-1		
8(14)	SCREW TERMINALS		
8(14.1)	General		
8(14.2)	Definitions		
8(14.2.1)	Pillar terminal	Input and output terminal block	P
8(14.2.2)	Screw terminal		N/A
8(14.2.3)	Stud terminal		N/A
8(14.2.4)	Saddle terminal		N/A
8(14.2.5)	Lug terminal		N/A
8(14.2.6)	Mantle terminal		N/A
8(14.3)	General requirements and basic principles		
8(14.3.1)	These requirements apply to terminals with screw clamping.		P
8(14.3.2)	Terminals are of varied design and have different shapes.		P
8(14.3.2.1)	Terminals are primarily for the connection of only one conductor, they may in some cases be suitable for clamping two conductors	One conductor	P
8(14.3.2.2)	In general, terminals will be suitable for the connection of cables and flexible cords without special preparation of the conductor		P
8(14.3.2.3)	A numerical classification for terminals is adopted.		P
8(14.3.3)	Terminal shall allow the proper connection of copper conductors		P
8(14.3.4)	Terminals shall provide adequate connection of the conductors.		P

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
8(14.4)	Mechanical tests		
8(14.4.1)	For pillar terminals,		P
	- For mantle terminals,		N/A
8(14.4.2)	Terminals shall be so designed or placed that neither a solid conductor nor a strand of a stranded conductor can slip out while the clamping screws or nuts are being tightened.		P
8(14.4.3)	Terminal sizes up to and including size 5 shall allow the conductor to be connected without special preparation		P
8(14.4.4)	Terminals shall have adequate mechanical strength		P
	- Screws shall not be of metal which is soft or liable to creep		P
8(14.4.5)	Terminals shall be resistance to corrosion		P
8(14.4.6)	Terminals shall be fixed to the luminaire or to a terminal block		P
	- Screws and nuts are tightened and loosened five times by means of a suitable test screwdriver or wrench		P
	-During the test, terminals shall not work loose and there shall be no damage		P
8(14.4.7)	Terminals shall clamp the conductor reliably between metal surfaces	No conductors are used	N/A
	- Each conductor is then subjected to a pull of the value, given in table, for 1 min		N/A
	Terminal size: 0 | 1 | 2 | 3		N/A
	Pull (N): 30 | 40 | 50 | 50		
	- During the test, the conductor shall not move noticeable in the terminal		N/A
8(14.4.8)	Terminals shall clamp the conductor without undue damage to the conductor		N/A
	Screwless terminals shall comply with section 15 of IEC 60598-1.		N/A
8(15.1)	General		-
	- This section specifies requirements for all types of terminals which do not employ screws, for solid or stranded copper conductors up to 2.5mm^2		N/A
8(15.2)	Definitions		-
8(15.2.1)	Screwless terminals		N/A

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
	- Parts required to make connections in electrical circuits by mechanical means without screws		N/A
8(15.2.2)	Permanent connections		-
	- Connections designed to be made only once with the same conductor		N/A
8(15.2.3)	Non-permanent connections		N/A
8(15.2.4)	Lead assemblies		N/A
8(15.2.5)	Non-prepared conductors		-
	- Conductors without special preparation		N/A
8(15.2.6)	Test current		-
	- Current assigned to a terminal by the manufacturer		N/A
8(15.3)	General requirements		-
8(15.3.1)	Parts of terminals for carrying current shall be made of		-
	- copper		N/A
	- any alloy containing at least 50% copper		N/A
8(15.3.2)	Terminals and connections shall clamp the conductor with sufficient pressure and without undue damage to the conductor.		N/A
	- Terminals for circuits having a rated current not exceeding 2 A may have one non-metallic surface if the requirements of 15.3.5 are met		N/A
8(15.3.3)	Terminals shall be so designed that further insertion of its end is prevented by a stop.		N/A
8(15.3.4)	Terminals other than those for lead assemblies, shall accept “non-prepared conductors”		N/A
8(15.3.5)	Electrical connections shall be so designed that the pressure essential for good electrical conductivity is not transmitted through insulating material		N/A
8(15.3.6)	It shall be clear in which way spring-type non-permanent screwless terminals is effected		N/A
8(15.3.7)	Terminals for connection to several conductors under spring clamps shall clamp each conductor independently		N/A
8(15.3.8)	Terminals shall be suitably fixed to the equipment or to a terminal block.		N/A
8(15.3.9)	Terminals and connections shall withstand the mechanical, electrical and thermal stresses occurring in normal use.		N/A

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
8(15.3.10)	Manufacturers shall state the conductor size or sizes for which the component is designed and the type of conductor.		N/A
8(15.4)	General instructions on tests		N/A
	TERMINALS AND CONNECTIONS FOR INTERNAL WIRING		-
8(15.5)	Mechanical tests		-
	- Terminals and connections shall have adequate mechanical strength		N/A
8(15.5.1)	Non-permanent connections		N/A
8(15.5.2)	Permanent connections		-
	- The connection shall remain fully effective when a pull-off force of 20 N is applied, for 1 min		N/A
8(15.6)	Electric tests		-
	Terminals and connectors shall have adequate electrical performance.		N/A
8(15.6.1)	Contact resistance test		-
	The electrical performance of terminals is checked on a set of four terminals.		N/A
8(15.6.1.1)	For spring-type terminals, the test according to 15.6.1.3 is made with the four solid copper non-insulated conductors.		N/A
8(15.6.1.2)	In the case of pin or tab and receptacle type terminals, the test of 15.6.1.3 is made with lead assemblies.		N/A
8(15.6.1.3)	Each terminals with its conductor is loaded with test current and after 1h, the measured voltage drop shall not exceed 15mV.		N/A
8(15.6.2)	Heating tests		-
8(15.6.2.1)	Terminals with rated current up to and including 6A are then subjected to an ageing test.		N/A
	It is without current, of 25 cycles duration, each cycle comprising 30min at 100℃±5℃ or T±5℃, followed by a cooling down period to a temperature between 15℃ and 30℃		N/A
	Terminals with rated current exceeding 6A are subjected to an ageing test of 100 such cycles.		N/A
8(15.6.2.2)	The voltage drop is again measured on each terminal:		-

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
	a) after the 10th and 25th cycles for terminals with rated current up to and including 6A;		N/A
	b) after the 50th and 100th cycles for terminals with rated current greater than 6A.		N/A
	It shall not exceed by more than 50% the voltage drop measurements under 15.6.1, or if the increase in voltage drop is less than 2mV, the terminals comply with the requirement.		N/A
	If the voltage drop of any of the terminals exceeds 22.5mV, the terminals are rejected.		N/A
	If the voltage drop of one of the terminals exceeds by more than 50%, but does not exceed 22.5mV, the four terminals are subjected to a new ageing test.		N/A
8(15.6.2.3)	If a terminal is so designed that the conductor is tightened against a surface of insulating material, this surface shall not be deformed during these heating tests.		N/A
	TERMINALS AND CONNECTIONS FOR EXTERNAL WIRING		-
8(15.7)	Conductors		-
	- Spring-type terminals shall be suitable for the connection of rigid conductors, given in table		N/A
	MAX. rated current of terminals A / Nominal cross-sectional areas of conductors mm^2		-
	6 / 0.5 to 1		N/A
	10 / 1 to 1.5		
8(15.8)	Mechanical tests		-
	- Terminals and connections shall have adequate mechanical strength		N/A
8(15.8.1)	In the case of spring-type terminals, the test is made alternately with solid copper conductors		N/A
	- After the final connection, each conductor is subjected to a pull test according to table		N/A
8(15.8.2)	Pin or tab and receptacle type connections are also subjected to a pull test according to table		-
	MAX. rated current of terminals A / Pull N: Spring type / Pin or tab and receptacle type		N/A
	6 / 20 / 8		
	6 / 30 / 15		

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
	- The pull is applied without jerks, for 1 min		N/A
	- During the test, the conductor or lead assembly shall not move out from the terminal		N/A
8(15.9)	Electrical tests		-
	- Terminals and connections shall have adequate electrical performance.		N/A
8(15.9.1)	Contact resistance test		N/A
8(15.9.2)	Heating tests		N/A
	The thermal performance of terminals is checked		N/A
9.	**Provisions for protective earthing**	Not intended to connected earthed	N/A
10.	**Protection against accidental contact with live parts**		-
10.1	Lamp controlgear shall be sufficiently protected against protected against accidental contact with live parts when installed as in normal use.	Integral enclosure and built-in lamp controlgear	P
	Integral lamp controlgear shall be tested according to its intended use.		N/A
	Lacquer or enamel is not considered to be adequate protection or insulation	Not used	N/A
	Parts providing protection against accidental contact shall have adequate mechanical strength and shall not work loose in normal use.		P
	It shall not be possible to remove then without the use of a tool.		P
10.2	Lamp controlgear incorporating capacitors of total capacitance exceeding 0.5μF shall not hazard live after disconnection from supply 1 min.		P
11.	**Moisture resistance and insulation**		-
	Lamp controlgear shall be moisture-resistant.		P
	The lamp controlgear is placed in the most unfavourable position of normal use.		P
	The humidity test is carried out with a relative humidity of 91% to 95% and temperature is maintained between 20℃ and 30℃, the sample is kept in the cabinet for 48h.	93%, 25℃ 48h	P

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Clause	**Requirement - Testing**		**Result-Remark**	**Verdict**
	Immediately after the moisture treatment, the insulation resistance shall be measured, that insulation resistance shall be not less than 2MΩ for basic insulation.		>100MΩ	P
12.	**Electric strength**			-
	Lamp controlgear shall have adequate electric strength.			P
	Immediately after the measurement of the insulation resistance, the lamp controlgear shall withstand an electric strength test for 1min.			P
	Working voltage U	Test voltage V		-
	Up to and including 42V	500		N/A
	Above 42V up to and including 1000V	2U+1000	1500V between live parts and enclosure	P
	No flashover or breakdown shall occur during the test.			P
13.	**Thermal endurance test for windings of ballasts**			-
	Windings of ballasts shall have adequate thermal endurance.		No ballast used	N/A
14.	**Fault conditions**			-
	Lamp controlgear shall be so designed that, when operated under fault conditions, there shall be no emission of flames or molten material or production of flammable gases.		No emission of flames occurred	P
	Totally enclosed lamp controlgear or components shall not be opened for examination nor for the application of internal fault conditions.			P
	A lamp controlgear or component is considered to be totally enclosed if it is encapsulated in a self-hardening compound bonded to the relevant surfaces so that clearances in air do not exist.			P
	Capacitor, resistors or inductors not complying with a relevant standard shall be short-circuited or disconnected, whichever is the more unfavourable.		Capacitor, diode and transistor short-circuited	P

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Clause	**Requirement - Testing**			**Result-Remark**	**Verdict**
	For lamp controlgear marked with symbol for temperature declared, the lamp controlgear case temperature at any place shall not exceed the marked value.				N/A
14.1	Short circuit across creepage distances and clearances, if less than the values specified in clause 16.			Creepage distance of L and N layout trace shall comply with clause 16 or provided with overcurrent protective device in AC main circuit.	PA
14.2	Short circuit across or, if applicable, interruption of semi-conductor devices.			No hazard could be occurred	P
14.3	Short circuit across insulation consisting of covering of lacquer, enamel or textile			No lacquer, enamel or textile used	N/A
14.4	Short circuit across electrolytic capacitors				P
15.	**Construction**				-
15.1	Wood, cotton, silk, paper and similar fibrous material shall not be used as insulation.			No wood, cotton, silk or paper used	P
15.2	Printed circuits are permitted for internal connections.				P
16.	**Creepage distances and clearances**				-
	Creepage distances and clearances shall be not less than the values given in tables 3 and 4.			Per table 3	P
	Table 3 – Minimum distances for a.c. (50/60 Hz) sinusoidal voltages				-
	Parts	RMS working voltage not exceeding V			-
		150	250		
	a) between live parts of different polarity, and				-
	b) between live parts and accessible metal parts which are permanently fixed to the lamp controlgear				-

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Clause	**Requirement - Testing**						**Result-Remark**	**Verdict**
	- Creepage distances		1.6		2.5		1.6mm<2.5mm between live parts of different polarity 4mm>2.5mm between current-carry parts and accessible parts	PA
	- Clearance		1.4		1.7		1.7mm>1.7mm between live parts of different polarity 4mm>1.7mm between current-carry parts and accessible parts	P
	c) between live parts and a flat supporting surface or a loose metal cover							-
	- Clearances		3.2		3.6			N/A
	Table 4 – Minimum distances for non-sinusoidal pulse voltage							-
		Rated pulse voltage peak kV						-
		2.0	2.5	3.0	4.0			-
	Minimum clearance in mm	1.0	1.5	2	3			N/A
	Creepage distances shall be not less than the required minimum clearance.							P
17.	**Screws, current-carrying parts and connections**							-
	Screws, current-carrying parts and mechanical connections shall withstand the mechanical stresses occurring in normal use.							P
18.	**Resistance to heat, fire and tracking**							-
18.1	Parts of insulating material either retaining live parts in position or providing protection against electric shock shall be sufficiently resistant to heat.							P
	For materials other than ceramic, compliance is checked by subjecting the parts to the ball-pressure test.						75℃ for enclosure, <2mm	P

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**
18.2	External parts of insulating material providing protection against electric shock and parts of insulating material retaining live parts in position shall be sufficiently resistant to flame and ignition/fire.		P
18.3	External parts of insulating material providing protection against electric shock shall be subjected for 30s to the flow-wire test		P
18.4	Parts of insulating material retaining live parts in position shall be subjected to the needle-flame test	PCB is retaining live parts and approved by UL recognized,	P
18.5	Lamp controlgear intended for building into luminaries other than ordinary and lamp controlgear having insulation subject to starting voltages with a peak value higher than 1500V shall be resistant to tracking.		N/A
19.	**Resistance to corrosion**		-
	Ferrous parts, the rusting of which might cause the lamp controlgear to become unsafe, shall be adequately protected against rusting.	Not used	N/A

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Clause	**Requirement - Testing**	**Result-Remark**	**Verdict**

Heating test result:

Part	MAX. Temp. ℃		-
Lamp caps:	IEC lamp standard		N/A
Case:			-
- If t_c is marked	t_c (105)	46	P
- If t_c is not marked	50		N/A
winding	t_w (100)	94	P
Insulation of wiring: -PVC	90		N/A
Contacts of ceramic lampholders and insulating material of lampholders and starterholders: -T marked (B15 and B22)	165 for T1 210 for T2		N/A
-Fluoresecnt lampholder/starter-holders without T marking	80		N/A
Switches: -With T marking	T marking		N/A
-Without T marking	55		N/A
Mounting surface: -Normally flammable surface	90	46	P
Parts intended to be handled or touched frequently: -Metal parts	70		N/A
-Non-metal parts	85	46	P
Parts intended to be gripped by hand:			-
-Metal part	60		N/A
-Non-metal parts	75		N/A
Silicone rubber (Not used for electrical insulation)	230		N/A

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Product General

Item	Component	Identification/Type	Rating	Approval
1.	**Enclosure**	Molded plastic enclosure. Openings provided for connected input and output conductors. MFR: NAN YA PLASTICS CORP LTD Type: 1403G3	94V-0 130℃	UL E235269
2.	**Terminal block**	MFR: GREAT DRAGON ELECTRICAL CORP LTD Type: GGC-20	10A 300V	UL E199806
3.	**PCB**	MFR: TAIWAN SEIKO Type: 2L One provided, double sided.	94V-0 105℃	UL E208126
4.	**Capacitor**	Film type: C6	104K 250JS	-
		Film type: C9	224K 400JS	-
		Electrolytic type: C7	400V, 22μF 105℃	-
5.	**MOSFET**	Type:IRF820, Q2	2.5A 500V	-
6.	**Bridge diode**	MFR: Type: 5S54	-	-
7.	**Alteration**	1. Marking and instruction shall conform to Report Clause 7. 2. Creepage and clearance not enough, between different polarity of PCB layout trace shall kept 2.5mm at least or provided with an overcurrent protective in AC input circuit. 3. Choke L2 shall be comply Class E material insulation. 4. Printed Wiring Board shall be rated 94V-0 130℃ at least.		

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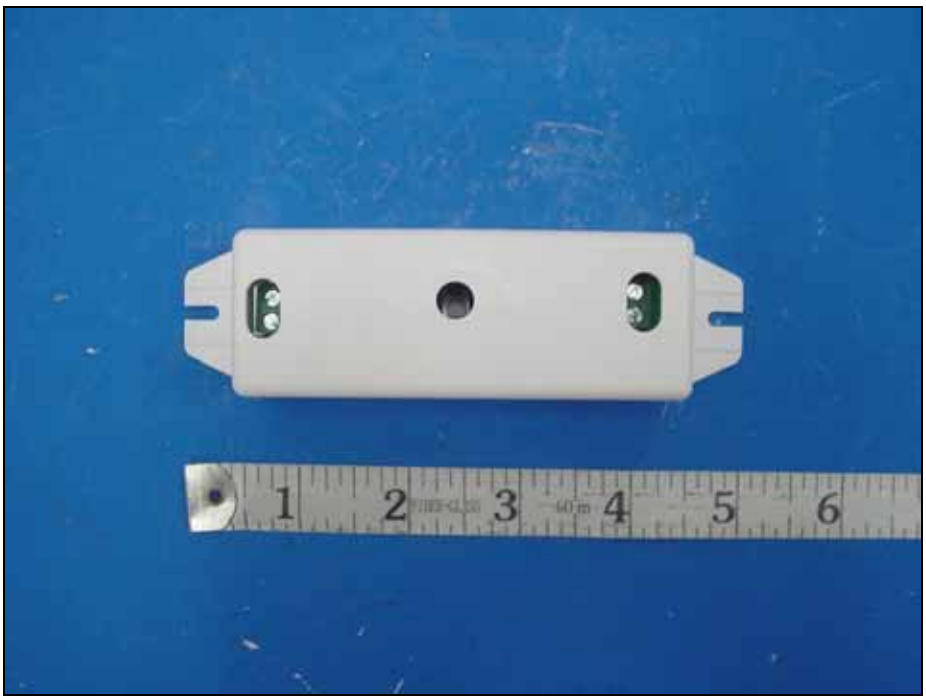
Photos

D.U.T. High Power LED Driver, Model HPD

Photos

D.U.T. High Power LED Driver, Model HPD



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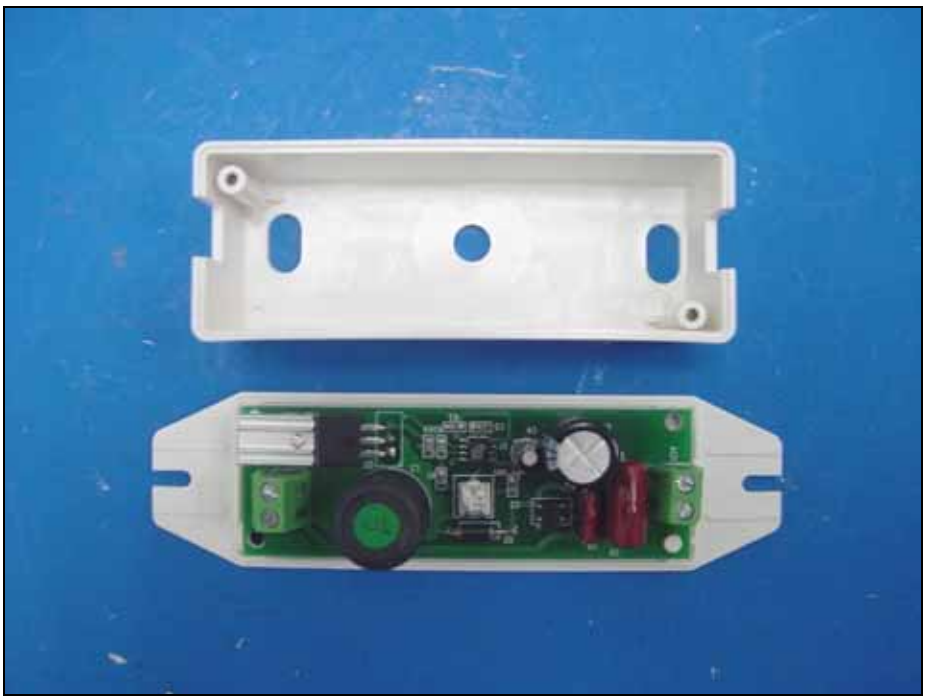

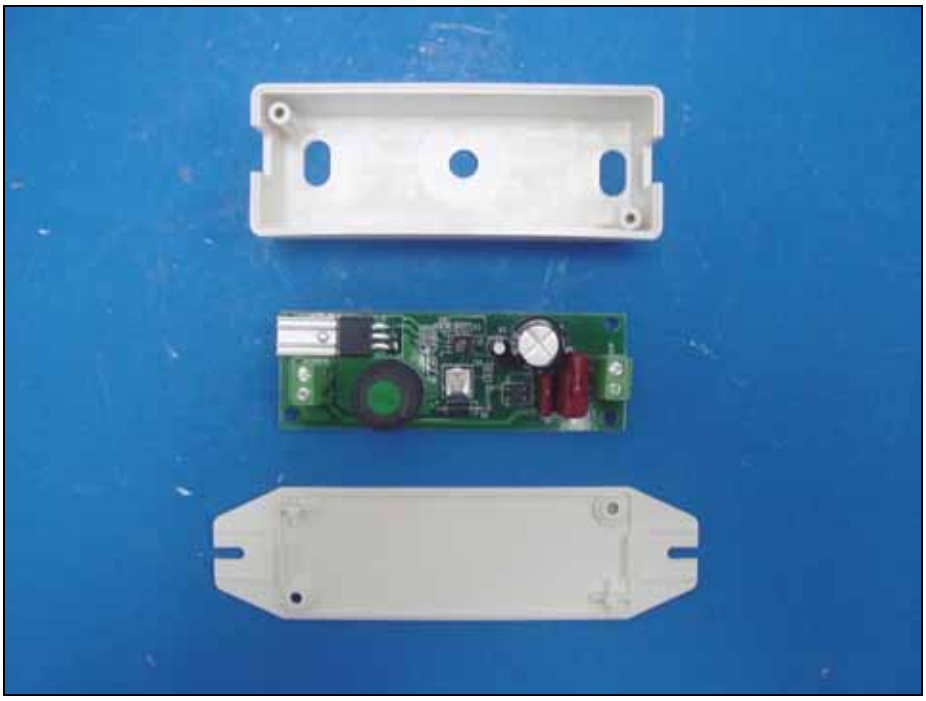

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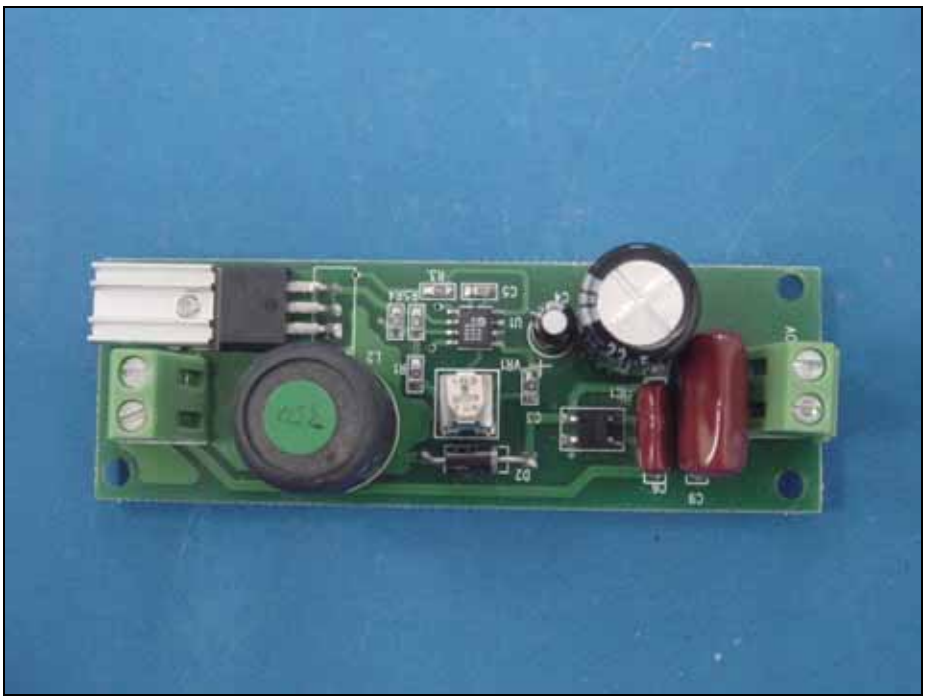

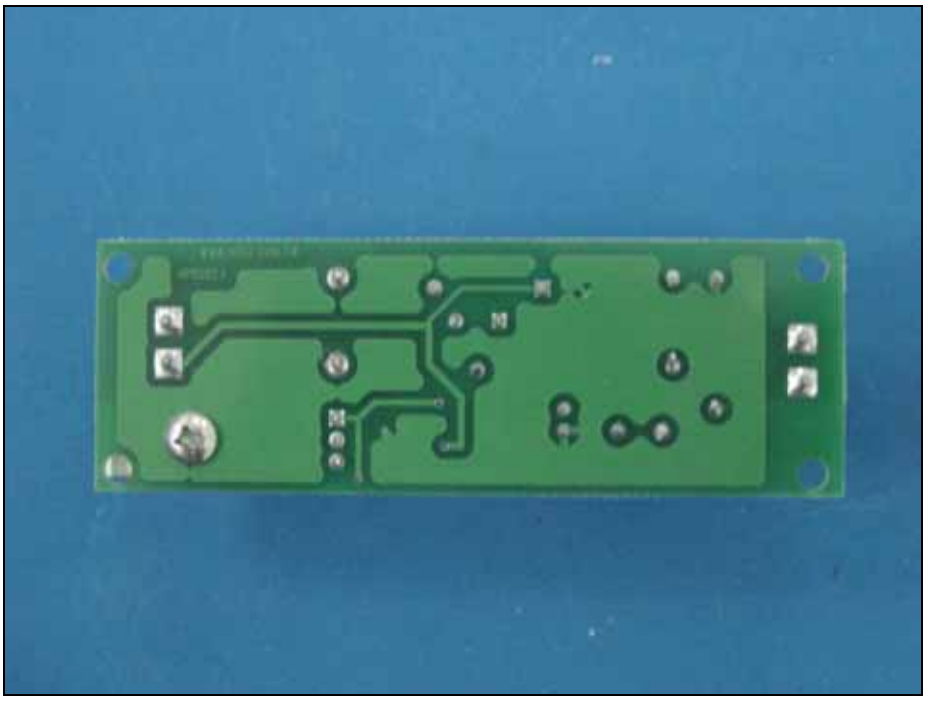

Photos

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******* End of Report *******