Test Report issued under the responsibility of:

Underwriters Laboratories

TEST REPORT
IEC 61347-2-13
Part 2: Particular requirements
Section Thirteen – d.c. or a.c. supplied electronic controlgear for LED modules

Report Reference No.....:	10CA54481-1
Date of issue.....:	March 02, 2011, Amendment 1 November 24, 2011
Total number of pages .....:	50 including Attachments
CB Testing Laboratory.....:	UL International Italia S.r.l.
Address .....:	Via Delle Industrie, 6 – 20061 – Carugate (MI) – Italy
Applicant's name.....:	TDK-Lambda Singapore Ltd
Address .....:	1008 Toa Payoh North #06-01/08 – Singapore 318996
Test specification:	
Standard.....:	IEC 61347-2-13:2006 used in conjunction with IEC 61347-1:2007
Test procedure .....:	CB
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC61347_2_13B
TRF Originator.....:	Intertek Semko AB
Master TRF .....:	Dated 2007-11

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....:	electronic control gear for Light Emitting Diodes
Trade Mark .....:	TDK-Lambda
Manufacturer .....:	VIETTRONICS BINH HOA JOINT STOCK COMPANY. 204 No Trang Long St., Ward 12, Binh Thanh Dist., Ho Chi Minh city, VIETNAM
Model/Type reference .....:	Series: ALC and Series ALV
Ratings .....:	Model: ALV80-12-6R5 Input: 100-240 V ac, 50/60 Hz, 1.1 A, λ 0,95, 95 W Output: 6,5 A ⎓; V out 12 V tc 85 °C; ta -30..+50 °C, Class II, IP66 See pages 11 and 12 for the ratings of all the models.

Testing procedure and testing location:	
☒ **CB Testing Laboratory**:	UL International Italia srl
Testing location/ address.....:	Via delle Inustrie 6, 20061Carugate (MI) Italy
☐ **Associated CB Laboratory:**	
Testing location/ address.....:	
Tested by (name + signature).....:	Davide Porta
Approved by (+ signature) .....:	Walter Parmiani
☐ **Testing procedure: TMP**	
Tested by (name + signature).....:	
Approved by (+ signature) ..... :	
Testing location/ address.....:	
☐ **Testing procedure: WMT**	
Tested by (name + signature).....:	
Witnessed by (+ signature) ..... :	
Approved by (+ signature) .....:	
Testing location/ address.....:	
☐ **Testing procedure: SMT**	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address..... :	
☐ **Testing procedure: RMT**	
Tested by (name + signature).....:	
Approved by (+ signature) .....:	
Supervised by (+ signature).....:	
Testing location/ address.....:	

Summary of testing:				
Tests performed (name of test and test clause):				**Testing location:**
11	Moisture resistance and insulation	Applicable	Pass	**UL**
12	Electric strength	Applicable	Pass	**UL**
14	Fault conditions	Applicable	Pass	**UL**
18	Creepage distances and clearances	Applicable	Pass	**UL**
Annex I	Particular additional requirements for independent SELV d.c. or a.c. supplied electronic step-down convertors for filament lamps.	Applicable	Pass	**UL**
	Annex B – D – E – G- H	Not applicable	N/A	**—**
	Testing location: UL International Italia S.r.l. Via delle Industrie 6, 20061 Carugate (MI) Italy			
	TEST RESULTS WERE FAVOURABLE			

Summary of compliance with National Differences:

This test report covers testing according to both IEC 61347-1:2007 and EN 61347-1:2008 and IEC 61347-2-13:2006 and EN 61347-2-13:2006.

No National Differences, Common Differences, Group differences are declared on current CB bulletin.

As there are clauses of the above mentioned standards that call for clauses in IEC 60598-1, on request of the manufacturer in **ANNEX 3 National Differences for Japan to IEC 61347-1 and IEC 61347-2-13** are considered.

The difference between the standard IEC 61347-1:2007 and EN 61347-1:2008 are indicated in the table below

30 (16)	TABLE: creepage distances and clearances EN 61347-1:2008					
RMS working voltage (V) not exceeding	50	150	250	500	750	1000
a) between live parts of different polarity Measured (mm)……..:			**Cr 8,98 mm** **Cl 8,98 mm**			
b) between live parts and accessible parts which are permanently fixed to the lamp control gear, including screws or devices for fixing covers or fixing the ballast to its support. Measured (mm)……..:			**Cr > 10 mm** **Cl > 10 mm**			
c) for ballast declared not rely on the luminaire enclosure for protection against electric shock between live parts and outer accessible surface of insulating part. Measured (mm)……..:			**Cr > 10 mm** **Cl > 10 mm**			
Required creepage distances (mm), **Basic insulation** PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
PTI <600	1,2	1,6	**2,5**	5	8	10
Required creepage distances (mm), **Supplementary insulation** PTI ≥ 600	—	0,8	1,5	3	4	5,5
PTI <600	—	1,6	2,5	5	8	10
Required creepage distances (mm), **Reinforced insulation**	—	3,2	**5**	6	8	11
Required clearances distances (mm), **Basic insulation**	0,2	0,8	1,5	3	4	5,5
Required clearances distances (mm), **Supplementary insulation**	—	0,8	1,5	3	4	5,5
Required clearances distances (mm), **Reinforced insulation**	—	1,6	3	6	8	11

This report consists of:	
Test results:	**25 pages**
Transformer T1 constructional evaluation	**(Annex 1): 26 page**
Critical components list	**(Annex 2): 5 pages**
Fault conditions	**(Annex 3): 2 pages**
Creepage and Clearances distances	**(Annex 4): 1 page**
Schematic diagrams	**(Annex 5): 2 pages**
Transformer T1 constructional details	**(Annex 6): 8 pages**
Photograph	**(Annex 7): 6 pages**

Copy of marking plate

The marking plates are
Yupo 80 MIC synthetic paper, white (purchased printing)
PET 50 MIC synthetic paper, white (inhouse printing)
PA-T1 or equivalent no peeling -30 °C÷ 100 °C
Lettering black with white background

Speaking codes

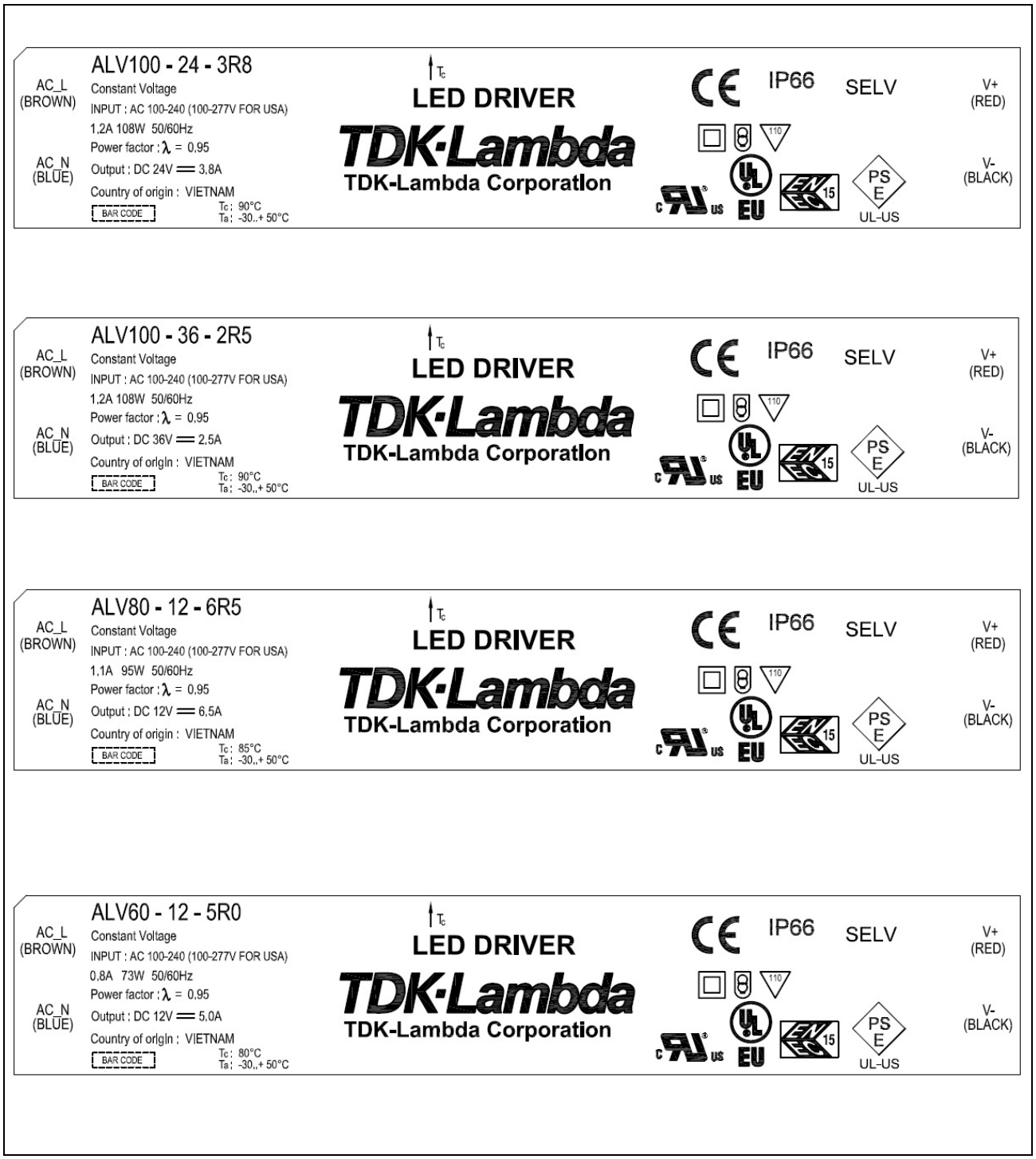
Model ALXYYY-ZZ-DDDD/EE
(X= V or C; YYY= 60, 80 or 100, ZZ= 12, 22, 24, 36, 42 or 48,
DDDD=1R05, 1R4,1R7, 2R5, 3R0, 3R3, 3R8, 4R0, 5R0 or 6R5,
E options can be any combination of /W, /N, /K, /FC or blank)

Definition of variables in the model:

Variable:	Range of variable:	Content:
X	V or C	V = Constant Voltage C = Constant Current
YYY	60, 80 or 100	Rated Output Power
ZZ	12, 22, 24, 36, 42 or 48	Rated Output Voltage
DDDD	1R05, 1R4,1R7, 2R5, 3R0, 3R3, 3R8, 4R0, 5R0 or 6R5	Rated Output Current

Options:

/W	Outdoor
/N	Nexus specified output wires
/K	For Korea market
/FC	White-colored input and output cables


AC_L (BROWN)
AC_N (BLUE)
ALV100 - 24 - 3R8
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
1.2A 108W 50/60Hz
Power factor : λ = 0.95
Output : DC 24V ⎓ 3.8A
Country of origin : VIETNAM
BAR CODE
Tc : 90°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US
AC_L (BROWN)
AC_N (BLUE)
ALV100 - 36 - 2R5
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
1.2A 108W 50/60Hz
Power factor : λ = 0.95
Output : DC 36V ⎓ 2.5A
Country of orlgln : VIETNAM
BAR CODE
Tc : 90°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US
AC_L (BROWN)
AC_N (BLUE)
ALV80 - 12 - 6R5
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
1.1A 95W 50/60Hz
Power factor : λ = 0.95
Output : DC 12V ⎓ 6.5A
Country of origin : VIETNAM
BAR CODE
Tc : 85°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US
AC_L (BROWN)
AC_N (BLUE)
ALV60 - 12 - 5R0
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
0.8A 73W 50/60Hz
Power factor : λ = 0.95
Output : DC 12V ⎓ 5.0A
Country of orlgln : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US


ALV60 - 24 - 2R5
AC_L (BROWN)
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
0.8A 73W 50/60Hz
Power factor : λ = 0.95
AC_N (BLUE)
Output : DC 24V ⎓ 2.5A
Country of orIgIn : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30,,+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US


ALV60 - 36 - 1R7
AC_L (BROWN)
Constant Voltage
INPUT : AC 100-240 (100-277V FOR USA)
0.8A 73W 50/60Hz
Power factor : λ = 0.95
AC_N (BLUE)
Output : DC 36V ⎓ 1.7A
Country of orIgIn : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30,,+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
PS E
UL-US


ALC100 - 22 - 4R0
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
1.2A 108W 50/60Hz
Power factor : λ = 0.95
Output : DC 4.0A ⎓ 6-22V
Max DC Voltage : 28V
Country of orlgln : VIETNAM
BAR CODE
Tc : 90°C
Ta : -30,,+ 50°C
LED DRIVER
TDK·Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
UL-US


ALC80 - 48 - 1R7
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
1.1A 99W 50/60Hz
Power factor : λ = 0.95
Output : DC 1.7A ⎓ 6-48V
Max DC Voltage : 60V
Country of origin : VIETNAM
BAR CODE
Tc : 85°C
Ta : -30,,+ 50°C
LED DRIVER
TDK·Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
UL-US


ALC80 - 24 - 3R3
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
1.1A 99W 50/60Hz
Power factor : λ = 0.95
Output : DC 3.3A ⎓ 6-24V
Max DC Voltage : 32V
Country of orlgln : VIETNAM
BAR CODE
Tc : 85°C
Ta : -30,,+ 50°C
LED DRIVER
TDK·Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
UL-US


ALC60 - 48 - 1R05
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
0.7A 62W 50/60Hz
Power factor : λ = 0.95
Output : DC 1.05A⎓ 6-48V
Max DC Voltage : 60V
Country of orlgln : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30,,+ 50°C
LED DRIVER
TDK·Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
UL-US


ALC60 - 42 - 1R4
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
0.8A 72W 50/60Hz
Power factor : λ = 0.95
Output : DC 1.4A ⎓ 6-42V
Max DC Voltage : 52V
Country of orlgln : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
EU
PS E
UL-US


ALC60 - 42 - 1R4
AC_L (BROWN)
AC_N (BLUE)
Constant Current
INPUT : AC 100-240 (100-277V FOR USA)
0.8A 72W 50/60Hz
Power factor : λ = 0.95
Output : DC 1.4A ⎓ 6-42V
Max DC Voltage : 52V
Country of orlgln : VIETNAM
BAR CODE
Tc : 80°C
Ta : -30..+ 50°C
LED DRIVER
TDK-Lambda
TDK-Lambda Corporation
IP66
SELV
V+ (RED)
V- (BLACK)
EU
PS E
UL-US

Test item particulars	:	Electronic control gears for LED modules
.....	:	For building-in,
		tails
.....	:	isolation in class II
.....	:	SELV, IP66

Possible test case verdicts:

- test case does not apply to the test object	:	N/A (not applicable)
- test object does meet the requirement	:	P (Pass)
- test object does not meet the requirement	:	F (Fail)

Testing

Date of receipt of test item	:	September 2011
Date (s) of performance of tests	:	September - November 2011

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a comma is used as the decimal separator.
Clause numbers between brackets refer to clauses in IEC 61347-1.

Amendment 1 Report:

The original Test Report Ref. 10CA54481-1, dated 2011-03-02 has been modified on November 24, 2011 to include the following modification/ variation:

1) Added protection Degree IP66 (the control gears have been tested in accordance with clauses 9.2.2 and 9.2.6 of the standard IEC 60598-1: 2008 and EN 60598-2-1: 2008 +A1: 2009
2) HF Transformer: Change from tape around copper strip ---> No tape around copper strip.
3) Added alternative potting material
4) Added option model /K for korea market (basically nothing is changed, only model name will have added suffix)
5) Added option /FC for White-colored input and output cables
6) TH1 change position (from after PFC choke to before PFC choke)
7) Add alternative fuse 5 A 350 V
8) Add optional VDR

Factory:

VIETTRONICS BINH HOA JOINT STOCK COMPANY.
204 No Trang Long St., Ward 12,
Binh Thanh Dist., Ho Chi Minh city, VIETNAM

General product information:

The devices are built-in electronic step-down control gears, intended to supply Light Emitting Diodes working at constant voltage and constant current, SELV output, insulation Class II, IP66
The enclosure is made of polymeric material.
The control gears are sealed in potting compound for thermal conductivity.
Supply and output tails are provided with double insulation.

Series / Models	Classification	V in V ~	Iin A (at 100 V ac)	P in W	Hz	PF λ	IPXX
ALV60-12-5R0	built-in	100-240	0,8	73	50/60	0,95	66
ALV60-24-2R5	built-in	100-240	0,8	73	50/60	0,95	66
ALV60-36-1R7	built-in	100-240	0,8	73	50/60	0,95	66
ALV80-12-6R5	built-in	100-240	1,1	95	50/60	0,95	66
ALV100-24-3R8	built-in	100-240	1,2	108	50/60	0,95	66
ALV100-36-2R5	built-in	100-240	1,2	108	50/60	0,95	66

Series / Models	Rated output Current A	Vout max Vdc	P out W	Insulation class	ta (°C)	Tc (°C)
ALV60-12-5R0	5,0	12	60	II	-30..+50	80
ALV60-24-2R5	2,5	24	60	II	-30..+50	80
ALV60-36-1R7	1,7	36	60	II	-30..+50	80
ALV80-12-6R5	6,5	12	80	II	-30..+50	85
ALV100-24-3R8	3,8	24	90	II	-30..+50	90
ALV100-36-2R5	2,5	36	90	II	-30..+50	90

Additional information common to all the models:

Transformer insulation class: 155

Pollution degree: normal pollution

Overheating protection: 

Note: information about operating ambient temperatures are provided on the technical documentation.

Series / Models	Classification	V in V ~	Iin A (at 100 V ac)	P in W	Hz	PF λ	IPXX
ALC60-42-1R4	built-in	100-240	0,8	72	50/60	0,95	66
ALC60-48-1R05	built-in	100-240	0,7	62	50/60	0,95	66
ALC80-48-1R7	built-in	100-240	1,1	99	50/60	0,95	66
ALC80-24-3R3	built-in	100-240	1,0	95	50/60	0,95	66
ALC80-24-3R0	built-in	100-240	1,1	99	50/60	0,95	66
ALC100-22-4R0	built-in	100-240	1,2	108	50/60	0,95	66

Series / Models	Rated output Current A	Vout dc (range)	Max Vout dc	P out	Insulation class	Ta (°C)	Tc (°C)
ALC60-42-1R4	1,4	6-42	52	W	II	-30..+50	85
ALC60-48-1R05	1,05	6-48	60	60	II	-30..+50	85
ALC80-48-1R70	1,7	6-48	60	55	II	-30..+50	85
ALC80-24-3R3	3,3	6-24	32	84	II	-30..+50	85
ALC80-24-3R0	3,0	6-24	32	91	II	-30..+50	85
ALC100-22-4R0	4,0	6-22	28	85	II	-30..+50	85

Additional information common to all the models:

Transformer insulation class: 155

Pollution degree: normal pollution

Overheating protection: 

Note: information about operating ambient temperatures are provided on the technical documentation.