



Test Report issued under  
the responsibility of:



**TEST REPORT**  
**IEC 60950-1**  
**Information technology equipment - Safety -**  
**Part 1: General requirements**

**Report Reference No** .....: E252373-A6-CB-4

Date of issue .....: 2014-12-15

Total number of pages .....: 103

**CB Testing Laboratory** .....: UL International Singapore Pte Ltd

Address .....: 20 Kian Teck Lane, #01-00PT, 627854 Singapore

**Applicant's name** .....: TDK-LAMBDA SINGAPORE PTE LTD  
#06-01/08

Address .....: 1008 TOA PAYOH NORTH  
SINGAPORE 318996 SINGAPORE

**Test specification:**

Standard .....: IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013

Test procedure .....: CB Scheme

Non-standard test method .....: N/A

**Test Report Form No.** .....: IEC60950\_1F

Test Report Form originator .....: SGS Fimko Ltd

Master TRF .....: Dated 2014-02

**Copyright © 2014 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.


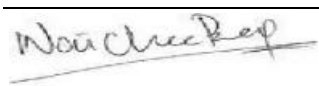
If this test Report is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

**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.**

**General disclaimer**

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 CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .....	Switching Power Supply
Trade Mark .....	<b>TDK-Lambda</b>
Manufacturer .....	TDK-LAMBDA SINGAPORE PTE LTD #06-01/08 1008 TOA PAYOH NORTH SINGAPORE 318996 SINGAPORE
Model/Type reference .....	LS50-X /YYYYYY, where X can be 3.3, 5, 7, 12, 15, 18, 24, 28, 36, 40, 48 and 56. And /YYYYYY can be /B, /BCO, /BCO2, /BCOL, /BCO2L, /BM, /BMCO, /BMCO2, /BMCOL, /BMCO2L, /BL, /BML, /CO, /CO2, /COL, /CO2L, /L or blank.
Ratings .....	Input: AC 100-240V, 1.3A, 50/60Hz  Output: LS50-3.3: +3.3 Vdc (+3 - +3.6 V dc), 10 A max; LS50-5: +5 Vdc (+4.75 - +5.5 V dc), 10 A max; LS50-7: +7 V dc, 7.2 A; LS50-12: +12 Vdc (+10.8 - +13.2 V dc), 4.2 A max; LS50-15: +15 Vdc (+13.5 - +16.5 V dc), 3.4 A max; LS50-18: +18 V dc, 2.8 A; LS50-24: +24 Vdc (+22 - +27.2 V dc), 2.2 A max; LS50-28: +28 V dc, 1.8 A; LS50-36: +36 Vdc (+32 - +40 V dc), 1.4 A max; LS50-40: +40 V dc, 1.3 A; LS50-48: +48 Vdc (+42 - +54 V dc), 1.1 A max; LS50-56: +56 V dc, 0.9 A  (Voltage range indicated in '( )' represents voltage tolerance evaluated)

<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>CB Testing Laboratory</b>	Testing location / address .....: UL International Singapore Pte Ltd 20 Kian Teck Lane, #01-00PT, 627854 Singapore
<input type="checkbox"/> <b>Associated CB Test Laboratory</b>	Testing location / address .....:
	Tested by (name + signature) .....: Maelyn Shi 
	Approved by (name + signature).....: CheeBeng Wai 
<input type="checkbox"/> <b>Testing Procedure: TMP/CTF Stage 1</b>	Testing location / address .....:
	Tested by (name + signature) .....: _____
	Approved by (name + signature).....: _____
<input type="checkbox"/> <b>Testing Procedure: WMT/CTF Stage 2</b>	Testing location / address .....:
	Tested by (name + signature) .....: _____
	Witnessed by (name + signature) ...: _____
	Approved by (name + signature).....: _____
<input type="checkbox"/> <b>Testing Procedure: SMT/CTF Stage 3 or 4</b>	Testing location / address .....:
	Tested by (name + signature) .....: _____
	Approved by (name + signature).....: _____
	Supervised by (name + signature) ..: _____
<input type="checkbox"/> <b>Testing Procedure: RMT</b>	Testing location / address .....:
	Tested by (name + signature) .....: _____
	Approved by (name + signature).....: _____
	Supervised by (name + signature) ..: _____

<b>List of Attachments</b>
National Differences (59 pages)
Enclosures (46 pages)
<b>Summary of Testing:</b>
All Applicable tests according to the referenced standard(s) have been carried out
<b>Summary of Compliance with National Differences:</b>
Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AR, AT, AU, BE, BG, BY, CA, CH, CN, CS, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IN, IT, JP, KR, MY, NL, NO, NZ, PL, PT, RO, SA, SE, SG, SI, SK, UA, US, ZA

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

### Copy of Marking Plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



<b>Test item particulars :</b>	
Equipment mobility .....	for building-in
Connection to the mains .....	N/A
Operating condition .....	continuous
Access location .....	operator accessible
Over voltage category (OVC) .....	OVC II
Mains supply tolerance (%) or absolute mains supply values .....	+10%, -10% (manufacturer declared)
Tested for IT power systems .....	No
IT testing, phase-phase voltage (V) .....	N/A
Class of equipment .....	Class I (earthed)
Considered current rating of protective device as part of the building installation (A) .....	20A
Pollution degree (PD) .....	PD 2
IP protection class .....	IP X0
Altitude of operation (m) .....	below 2000m
Altitude of test laboratory (m) .....	less than 2000 meters
Mass of equipment (kg) .....	0.34
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object .....	N / A
- test object does meet the requirement .....	P(Pass)
- test object does not meet the requirement .....	F(Fail)
<b>Testing:</b>	
Date(s) of receipt of test item .....	2014-07-03
Date(s) of Performance of tests .....	2014-07-03 to 2014-08-13
<b>General remarks:</b>	
"(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 point is used as the decimal separator.	
<b>Manufacturer's Declaration per Sub Clause 4.2.5 of IEC 60950-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....	
When differences exist, they shall be identified in the General Product Information section.	
<b>Name and address of Factory(ies):</b>	TDK-LAMBDA MALAYSIA SDN BHD PLO33 KAWASAN PERINDUSTRIAN SENAI 81400 SENAI MALAYSIA
	TDK-LAMBDA MALAYSIA SDN BHD LOT 2 & 3, BATU 9 3/4

KAWASAN PERINDUSTRIAN  
BANDAR BARU JAYA GADING  
26070 KUANTAN MALAYSIA

WUXI TDK-LAMBDA ELECTRONICS CO LTD  
NO 6  
XING CHUANG ER LU  
WUXI  
JIANGSU 214028 CHINA

KAYNES TECHNOLOGY INDIA PVT LTD  
PLOT NO -339  
HEBBAL INDUSTRIAL AREA  
HEBBAL  
MYSORE KA 570016 INDIA

TRIO ENGINEERING CO LTD  
SHIJI INDUSTRIAL ESTATE  
DONGYONG  
PANYU  
GUANGZHOU GUANGDONG CHINA

## GENERAL PRODUCT INFORMATION:

### Report Summary

All applicable tests according to the referenced standard(s) have been carried out.

### Product Description

Electronic components mounted on PWB.

### Model Differences

All Models are similar to each other, except the following:-

- a) Output rating;
- b) Layout;
- c) Transformer (T1) secondary winding;
- d) Model designation (refer to Additional information more designation information)

#### Options:

- 1) B => Input Connector (CN1) and Output connector (CN2) are from JST;
- 2) BM => Input Connector (CN1) and Output connector (CN2) are from Molex;
- 3) CO => PCB with one (1) side coating;
- 4) CO2 => PCB with two (2) sides coating;
- 5) L => Open frame (Cover removed);
- 6) blank => Input connector and output connector using terminal block TB1.

### Additional Information

No tests conducted under this investigation due to the following:

- 1) Upgrade standard to IEC 60950-1 (2ND EDITION + AMD1 + AMD2 INFORMATION TECHNOLOGY EQUIPMENT - SAFETY - PART 1: GENERAL REQUIREMENTS - Edition 2 - Revision Date 2013/05/01.

2) Revise model rating to indicate the voltage range as voltage tolerance evaluated.

All required tests were carried out under the original investigation.

This report is a reissue of the following CBTRs:

- 1) CBTR Ref. No. E252373-A6-CB-3-Reissue, issued date 2013-02-06 with CB Test Certificate Ref. No. DK-30954-UL, issued date 2013-02-07;
- 2) CBTR Ref. No. E252373-A6-CB-3-Amendment-1, issued date 2014-08-28 with CB Test Certificate Ref. No. DK-30954-A1-UL, issued date 2014-08-28.

Based on the previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard.

### Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: 50°C, 100% load; 70°C, 70% load (output de-rating for mounting A, B, D); 60°C, 50% load (output de-rating for mounting C)
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (which includes all European national differences, including those specified in this test report).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Bridging capacitor C24
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace (refer to Enclosure 5-01, point A to point B),
- LEDs provided in the product are considered low power devices: Yes

### Engineering Conditions of Acceptability

When installed in an end-product, consideration must be given to the following:

- The following Production-Line tests are conducted for this product: Electric Strength, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 265.8 V<sub>rms</sub>, 529.3 V<sub>pk</sub>, Primary-Earthed Dead Metal: 234.5 V<sub>rms</sub>, 336.5 V<sub>pk</sub>,
- The following secondary output circuits are SELV: All secondary outputs,
- The following secondary output circuits are at non-hazardous energy levels: All secondary outputs,
- The following secondary output circuits are Limited Current Circuits: Secondary side of C24,
- The following output terminals were referenced to earth during performance testing: T1 pin 7, 8, 9,
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- The maximum investigated branch circuit rating is: 20 A
- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: Required
- An investigation of the protective bonding terminals has: Been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral: For model LS50-X, where input is terminal block TB1 (pin 2); For model LS50-X/B or LS50-X/BM, where input is connector CN1 (pin 2).



- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C): T1 (Class B),
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The following LEDs operate within the exempt group per IEC 62471: All LEDs.,
- The power supply is evaluated to 4 mounting positions. Refer to enclosure 4-09 for details. --

Abbreviations used in the report:

- normal condition .....	N.C.	- single fault condition .....	S.F.C
- operational insulation .....	OP	- basic insulation .....	BI
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation .....	SI
- double insulation .....	DI	- reinforced insulation .....	RI

Indicate used abbreviations (if any)