Test Report issued under the responsibility of:

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

Report Reference No ..... :	E252373-A7-CB-4
Date of issue ..... :	2015-01-12
Total number of pages ..... :	107
CB Testing Laboratory ..... :	UL International Singapore Pte Ltd
Address ..... :	20 Kian Teck Lane, Speedy-Tech Industrial Building 627854 Singapore
Applicant's name ..... :	TDK-LAMBDA SINGAPORE PTE LTD
Address ..... :	#06-01/08 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

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 for building-in
Trade Mark ..... :	TDK·Lambda
Manufacturer ..... :	TDK-LAMBDA SINGAPORE PTE LTD #06-01/08 1008 TOA PAYOH NORTH SINGAPORE 318996 SINGAPORE
Model/Type reference ..... :	LS75-X /YYYYYY, where X can be 3.3, 5, 12, 15, 24, 36 and 48. 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: 100-240 V ac, 1.6 A, 50/60 Hz. Output: LS75-3.3: +3.3 V dc (+3 - +3.6 V dc), 15 A max; LS75-5: +5 V dc (+4.75 - +5.5 Vdc), 12 A max; LS75-12: +12 V dc (+10.8 - +13.2 V dc), 6 A max; LS75-15: +15 V dc (+13.5 - +16.5 V dc), 5 A max; LS75-24: +24 V dc (+22 - +27.2 V dc), 3.2 A max; LS75-36: +36 V dc (+32 - +40 V dc), 2.1 A max; LS75-48: +48 V dc (+42 - +54 V dc), 1.6 A max. (Voltage range indicated in '( )' represents voltage tolerance evaluated)

Testing procedure and testing location:		
[x]	**CB Testing Laboratory**	
	Testing location / address .....:	UL International Singapore Pte Ltd 20 Kian Teck Lane, Speedy-Tech Industrial Building 627854 Singapore
[ ]	**Associated CB Test Laboratory**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	Maelyn Shi
	Approved by (name + signature)....:	CheeBeng Wai
[ ]	**Testing Procedure: TMP/CTF Stage 1**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: WMT/CTF Stage 2**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Witnessed by (name + signature) ..:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	
[ ]	**Testing Procedure: RMT**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	

List of Attachments
National Differences (59 pages)
Enclosures (54 pages)
Summary Of Testing Unless otherwise indicated, all tests were conducted at UL International Singapore Pte Ltd 20 Kian Teck Lane, Speedy-Tech Industrial Building 627854 Singapore.

Tests performed (name of test and test clause)	**Testing location / Comments**
End Product Reference Page	

General Guidelines

Power Supply Reference Page

Guide Information Page - Maximum Output Voltage, Current, and Volt Ampere Measurement (1.2.2.1)

Input: Single-Phase (1.6.2)

Energy Hazard Measurements (2.1.1.5, 2.1.2, 1.2.8.10)

Heating (4.5.1, 1.4.12, 1.4.13)

Ball Pressure (4.5.5, 4.5)

Component Failure (5.3.1, 5.3.4, 5.3.7)

Abnormal Operation (5.3.1 - 5.3.9)

Summary of Compliance with National Differences:

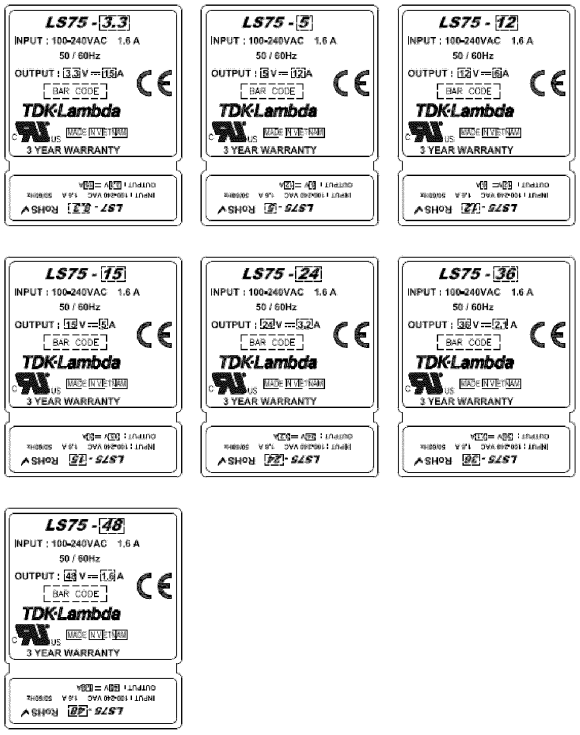
Countries outside the CB Scheme membership may also accept this report.

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.



Test item particulars :	
Equipment mobility ..... :	for building-in
Connection to the mains ..... :	N/A
Operating condition ..... :	continuous
Access location ..... :	N/A
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) ..... :	NA
Class of equipment ..... :	Class I (earthed)
Considered current rating of protective device as part of the building installation (A) ..... :	20
Pollution degree (PD) ..... :	PD 2
IP protection class ..... :	IP X0
Altitude of operation (m) ..... :	less than 2000 meters
Altitude of test laboratory (m) ..... :	less than 2000 meters
Mass of equipment (kg) ..... :	0.4kg
Possible test case verdicts:	
- 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)
Testing:	
Date(s) of receipt of test item ..... :	2014-11-05
Date(s) of Performance of tests ..... :	2014-11-24 to 2014-12-02
General remarks: "(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.	
Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02: 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.	Yes
Name and address of Factory(ies):	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 and housed with metal enclosure.

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)

Model LS75-X /YYYYYY, where X can be 3.3, 5, 12, 15, 24, 36 and 48. And /YYYYYY can be /B, /BCO, /BCO2, /BCOL, /BCO2L, /BM, /BMCO, /BMCO2, /BMCOL, /BMCO2L, /BL, /BML, /CO, /CO2, /COL, /CO2L, /L or blank.

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;

**Terminal block TB1 can only be used with PWB type A; Input Connector CN1 can only be used with PWB type B.

Additional Information

This report is reissued from E252373-A7-CB-3 due to the following:
1) Upgrade standard to IEC 60950-1 2ND EDITION + AMD 1 + AMD 2 INFORMATION TECHNOLOGY EQUIPMENT - SAFETY - PART 1: GENERAL REQUIREMENTS - Edition 2 - Revision Date 2013/05/01;

2) Add mounting methods (B), (C), (D), see enclosure diagram 4-28;

3) Add output derating for LS75-3.3 and LS75-5:
60 °C for 60 % load (output derating), Mounting Position C.
70 °C for 70 % load (output derating), Mounting Position A, B and D.

4) Add output derating for LS75-12, LS75-15, LS75-24, LS75-36 and LS75-48:
60 °C for 70 % load (output derating), Mounting Position C.
70 °C for 60 % load (output derating), Mounting Position A, B and D.

5) Evaluate voltage range as identified by manufacturer for LS75-3.3 (+/- 9.1%), LS75-5 (+10%, -5%), LS75-12 (+/-10%), LS75-15 (+/-10%), LS75-24 (+13.3%, -8.3%), LS75-36 (+/-11.1%) and LS75-48 (+/-12.5%);

6) Add alternate components (PC1, PC2, C1, C2, C3, C4, C5, and TB1);

7) Remove following components from table 1.5.1:
- Terminal Block TB1, Mfg: PHOENIX MECANO, Type: PMS30950-01
- X-capacitor C1, C2, Mfg: KEMET ELECTRONICS, Type: R.46 Series
- X-capacitor C1, C2, Mfg: Hua Jung, Type: MKP Series
- X-capacitor C1, C2, Mfg: Panasonic, Type: ECQUL

8) Update of transformer T1 specification for LS75-3.3 and LS75-5;

9) Correction of temperature limit for capacitor C6 from 130 °C to 105 °C in table 1.5.1;

10) Remove of models LS75-7, LS75-18, LS75-28, LS75-40 and LS75-56.

This report is a reissue of CB Test Report Ref. No. E252373-A7-CB-3, issued date 2013-03-29 with CB Test Certificate No. DK-31891-UL, issued date 2013-03-29.

Based on previously conducted testing and the review of product construction, only limited tests were deemed necessary.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: Models LS75-3.3 and LS75-5:, 45 °C for 100 % load, Mounting Position C., 50 °C for 100 % load, Mounting Position A, B and D., 60 °C for 60 % load (output derating), Mounting Position C., 70 °C for 70 % load (output derating), Mounting Position A, B and D., , Models LS75-12, LS75-15, LS75-24, LS75-36 and LS75-48:, 50 °C for 100 % load, Mounting Position A, B, C and D., 60 °C for 70 % load (output derating), Mounting Position C., 70 °C for 60 % load (output derating), Mounting Position A, B and D.
- 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: Secondary side of C40.
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace (refer to Enclosure 3-08, point 1 - point 2),
- 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-Earthed Dead Metal: 240 Vrms, 359 Vpk, Primary-SELV: 267 Vrms, 567 Vpk
- 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 C40.
- 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: Terminal Block TB1 (pin 2), 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): LS75-3.3 & LS75-5: Transformer T1 (Class F), LS75-12, LS75-15, LS75-24, LS75-36 & LS75-48: Transformer T1 (Class B)
- The following end-product enclosures are required: Electrical, Mechanical, Fire
- 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 4-28 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)