



Test Report issued under the responsibility of:



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

**Report Reference No** ..... : 4786910628-4  
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**CB Testing Laboratory** ..... : UL Japan, Inc.  
**Address** ..... : 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan

**Applicant's name** ..... : TDK-LAMBDA CORP  
 NAGAOKA TECHNICAL CENTER  
**Address** ..... : R&D DIV  
 2704-1 SETTAYA-MACHI  
 NAGAOKA-SHI  
 NIIGATA 940-1195 JAPAN

**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

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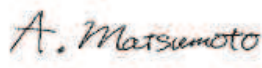
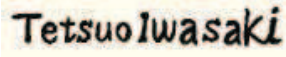
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<b>Test item description</b> .....	Switching Power Supply
Trade Mark .....	<b>TDK·Lambda</b> or <b>TDK·Lambda</b>
Manufacturer .....	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN
Model/Type reference .....	HWS100-a/xyz, HWS80-a/xyz, HWS100-24/CQC a = 3, 5, 12, 15, 24 or 48. x = R, B or blank. y = A or blank. z = CO, HD, HDA or blank (for HWS100-a/xyz) z = CO or blank (for HWS80-a/xyz)
Ratings .....	Input: HWS100-a/xyz, HWS100-24/CQC AC 100-240 V, 50/60 Hz, 1.0A for models HWS100-3/xyz, 1.4 A for other models  HWS80-a/xyz AC 100-240 V, 50/60 Hz, 0.8A for models HWS80-3/xyz, 1.1 A for other models  Output: HWS100-3/xyz DC 3.3V (DC 2.97-3.96V), 20 A (max. 66 W) HWS100-5/xyz DC 5V (DC 4.0-6.0V), 20 A (max. 100 W) HWS100-12/xyz DC 12V (DC 9.6-14.4V), 8.5A (max. 102 W) HWS100-15/xyz DC 15V (DC 12.0-18.0V), 7A (max. 105 W) HWS100-24/xyz DC 24V (DC 19.2-28.8V), 4.5A (max. 108 W) HWS100-48/xyz DC 48V (DC 38.4-52.8V), 2.1A (max. 108 W) HWS80-3/xyz DC 3.3V (DC 2.97-3.96V), 16 A (max. 52.8 W) HWS80-5/xyz DC 5V (DC 4.0-6.0V), 16 A (max. 80 W) HWS80-12/xyz DC 12V (DC 9.6-14.4V), 6.7A (max. 80.4 W) HWS80-15/xyz DC 15V (DC 12.0-18.0V), 5.4A (max. 81 W) HWS80-24/xyz DC 24V (DC 19.2-28.8V), 3.4A (max. 81.6 W) HWS80-48/xyz DC 48V (DC 38.4-52.8V), 1.7A (max. 81.6 W) HWS100-24/CQC DC 24V (DC 19.2-28.8V), 4.5A (max. 108 W)

<b>Testing procedure and testing location:</b>	
<input checked="" type="checkbox"/> <b>CB Testing Laboratory</b>	Testing location / address ..... : UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan
<input type="checkbox"/> <b>Associated CB Test Laboratory</b>	Testing location / address ..... :
	Tested by (name + signature) ..... : Ayano Matsumoto 
	Approved by (name + signature)... : Tetsuo Iwasaki 
<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 ( 24 pages)
Enclosures ( 44 pages)
<b>Summary Of Testing</b>
Unless otherwise indicated, all tests were conducted at UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan.

Tests performed (name of test and test clause)	Testing location / Comments
Input: Single-Phase (1.6.2)	
Capacitance Discharge (2.1.1.7)	
SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4)	
Protective Bonding I (2.6.3.4, 2.6.1)	
Humidity (2.9.1, 2.9.2, 5.2.2)	
Determination of Working Voltage; Working Voltage Measurement (2.10.2)	
Transformer and Wire /Insulation Electric Strength (2.10.5.13)	
Heating (4.5.1, 1.4.12, 1.4.13)	
Ball Pressure (4.5.5, 4.5)	
Touch Current (Single-Phase; TN/TT System) (5.1, Annex D)	
Electric Strength (5.2.2)	
Component Failure (5.3.1, 5.3.4, 5.3.7)	
Abnormal Operation (5.3.1 - 5.3.9)	
Transformer Abnormal Operation (5.3.3, 5.3.7b, Annex C.1)	
Power Supply Output Short-Circuit/Overload (5.3.7)	
<p><b>Summary of Compliance with National Differences:</b>  Countries outside the CB Scheme membership may also accept this report.  List of countries addressed: CA, DE, DK, EU, FI, GB, KR, SE, SI, US  The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013</p>	

**Copy of Marking Plate** - Refer to Enclosure titled Marking Plate for copy.

**Test item particulars :**

Equipment mobility .....	for building-in
Connection to the mains .....	not directly connected to the mains
Operating condition .....	continuous
Access location .....	N/A
Over voltage category (OVC) .....	OVC II
Mains supply tolerance (%) or absolute mains supply values .....	±10%
Tested for IT power systems .....	Yes
IT testing, phase-phase voltage (V) .....	230V
Class of equipment .....	Class I
Considered current rating of protective device as part of the building installation (A) .....	B/I, Not considered.
Pollution degree (PD) .....	PD 2
IP protection class .....	Not rated
Altitude of operation (m) .....	< 2000 m
Altitude of test laboratory (m) .....	< 1000 m
Mass of equipment (kg) .....	0.39kg

**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 .....	2005-05, 2012-09-20
Date(s) of Performance of tests .....	2005-05 to 2005-07, 2006-02, 2007-07, 2012-09-24

**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 IEC60950-1:**

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 ..... Yes

When differences exist, they shall be identified in the General Product Information section.

**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

ALPS LOGISTICS FACILITIES CO LTD  
593-1 NISHIOHASHI  
TSUKUBA-SHI  
IBARAKI-KEN 305-0831 JAPAN

Wuxi TDK-Lambda Electronics Co Ltd  
NO 6  
XING CHUANG ER LU  
WUXI  
JIANGSU 214028 CHINA

SENDAN ELECTRONICS MFG CO LTD  
1010 HABUSHIN  
NANTO-SHI  
TOYAMA-KEN 939-1756 JAPAN

TDK-LAMBDA CORP  
2704-1 SETTAYA-MACHI  
NAGAOKA-SHI  
NIIGATA-KEN 940-1195 JAPAN

ZHANGJIAGANG HUA YANG ELECTRONICS CO LTD  
TONGXIN RD  
ZHAOFENG ECONOMIC DEVELOPMENT ZONE  
LEYU TOWN  
ZHANGJIAGANG  
JIANGSU 215622 CHINA

#### GENERAL PRODUCT INFORMATION:

##### Report Summary

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

##### Product Description

The product tested is built-in type switching power supply for use in general office equipment (host equipment is not specified).

##### Model Differences

HWS100 series and HWS80 series are identical each other except for output rating, winding of Transformer T2, and minor components.

HWS80-a/xyz are identical to HWS100-a/xyz except for output current rating when suffix "a" is same.

Definition of variable(s):

Variable:	Range of variable:	Content:
a	3, 5, 12, 15, 24, 48	Output voltage
x	R, B, blank	Blank: without cover
y	A or blank	R: with ON/OFF control function
z	CO, HD, HAD or blank	B: terminal block TB1 is replaced with input connector CN1 A: with cover CO: thin coating on solder side of PWB HD: thin coating on the both sides of PWB and max. operating temperature is 71°C HDA thin coating on the both sides of PWB with

Unless otherwise stated, tests were conducted on models HWS100-5, -24, -48 considered to represent the worst case condition the respective tests.

**Additional Information**

This report is a reissue of CBTR Ref. No.: 12027307 001 and 12027307 002, CB Test Certificate Ref. No.JPTUV-045059 and JPTUV-045059-A1. 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.

Abbreviations used in the report.

- built-in application: B/I

In this Test Report, CENELEC mark license indicating compliance to EN standard was used to verify component compliance to IEC standard because the standards are technically equivalent.

It was considered that UL Standard has requirements that meet or exceed the relevant IEC requirements.

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of: See enclosure Id 7-03.
- 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).

**Engineering Conditions of Acceptability**

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

- The end-product Electric Strength Test is to be based upon a maximum working voltage of: max working voltage: 274 Vrms, 556 Vpk

- The following secondary output circuits are SELV: All output
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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: Not been conducted
- 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): T2 (Class F)
- The following end-product enclosures are required: Fire, Electrical

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)