



Test Report issued under
the responsibility of:



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

Report Reference No : 4786910622-3

Date of issue : 2015-08-03

Total number of pages : 180

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

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	TDK·Lambda
Manufacturer	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN
Model/Type reference	HWS1000-xy x = 3, 5, 6, 7, 12, 15, 24, 36, 48, 60 y = /CO, /HD, /RY (for x=24), /RYCO (for x=24), /RYHD (for x=24) or blank
Ratings	Input: AC 100-240 V, 50/60 Hz, 9.6 A for model HWS1000-3y 13.5 A for other models Output: HWS1000-3y 3.3Vdc (2.64 – 3.96 Vdc), 200 A (max. 660 W) HWS1000-5y 5Vdc (4.0 – 6.0 Vdc), 200 A (max.1000 W) HWS1000-6y 6Vdc (4.8 – 7.2 Vdc), 167 A (max.1002 W) HWS1000-7y 7.5Vdc (6.0 – 9.0 Vdc), 134 A (max.1005 W) HWS1000-12y 12Vdc (9.6 – 14.4 Vdc), 88 A (max. 1056 W) HWS1000-15y 15Vdc (12.0 – 18.0 Vdc), 70 A (max. 1050 W) HWS1000-24y 24Vdc (19.2 – 28.8 Vdc), 46 A (max. 1104 W) HWS1000-36y 36Vdc (28.8 – 43.2 Vdc), 30.7 A (max. 1104 W) HWS1000-48y 48Vdc (38.4 – 52.8 Vdc), 23 A (max. 1104 W) HWS1000-60y 60Vdc (48.0 – 66.0 Vdc), 18.4 A (max. 1104 W)

Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory	Testing location / address: UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan
<input type="checkbox"/> Associated CB Test Laboratory	Testing location / address:
	Tested by (name + signature): Ayano Matsumoto
	<i>A. Matsumoto</i>
	Approved by (name + signature) ...: Tetsuo Iwasaki
	Tetsuo Iwasaki
<input type="checkbox"/> Testing Procedure: TMP/CTF Stage 1	Testing location / address:
	Tested by (name + signature):
	Approved by (name + signature) ...:
<input type="checkbox"/> Testing Procedure: WMT/CTF Stage 2	Testing location / address:
	Tested by (name + signature):
	Witnessed by (name + signature) ..:
	Approved by (name + signature) ...:
<input type="checkbox"/> Testing Procedure: SMT/CTF Stage 3 or 4	Testing location / address:
	Tested by (name + signature):
	Approved by (name + signature) ...:
	Supervised by (name + signature) .:
<input type="checkbox"/> Testing Procedure: RMT	Testing location / address:
	Tested by (name + signature):
	Approved by (name + signature) ...:
	Supervised by (name + signature) .:

List of Attachments
National Differences (22 pages)
Enclosures (75 pages)

Summary Of Testing

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)	
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)	
Summary of Compliance with National Differences:	
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	

Test item particulars :	
Equipment mobility	for building-in
Connection to the mains	not directly connected to the mains
Operating condition	continuous
Access location	restricted access location
Over voltage category (OVC)	OVC II
Mains supply tolerance (%) or absolute mains supply values	-15%, +10%
Tested for IT power systems	Yes
IT testing, phase-phase voltage (V)	230V (for Norway)
Class of equipment	Not classified
Considered current rating of protective device as part of the building installation (A)	N/A (built-in equipment)
Pollution degree (PD)	PD 2
IP protection class	IPX0
Altitude of operation (m)	≤ 2000 m
Altitude of test laboratory (m)	< 1000 m
Mass of equipment (kg)	3.0 kg (approx.)
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	N/A
Date(s) of Performance of tests	2006.06 to 2006.09, 2007.12, 2008.01, 2008.02
General remarks:	
<p>"(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p>	
Manufacturer's Declaration per Sub Clause 4.2.5 of IEC 60068-2-1:	
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 CORP 2704-1 SETTAYA-MACHI

NAGAOKA-SHI
NIIGATA 940-1195 JAPAN

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
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

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 covered in this report is building-in type switching power supply with a single output circuit.

Model Differences

HWS1000 series are identical except for output rating, winding of Transformer T201, thermostat TH201, secondary coil L401, and minor components.

Definition of variable(s):

Variable:	Range of variable:	Content:
x	3, 5, 6, 7, 12, 15, 24, 36, 48, or 60	Output voltage
y	/CO, /HD or blank,	/CO: thin coating on solder side of PWB /HD: thin coating on the both sides of PWB blank: No thin coating on PWB
	For x = 24, /RY, /RYCO, /RYHD	/RY, /RYCO and /RYHD are identical to, blank, /CO and /HD except for addition of the secondary relay which is not safety relevant.

Additional Information

This report is a reissue of CBTR Ref. No.: 12027315 001, CB Test Certificate Ref. No.JPTUV-045602. 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.

Sample Received date is 2012-05-09.

Construction review was conducted on 2012-05-16.

Abbreviations used in the report.

- built-in application: B/I

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: Maximum 71°C. See Enclosed Id. 7-08 for details.
- 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: 600Vpk
- The following secondary output circuits are SELV: All output except for HWS1000-60y.
- The power supply terminals and/or connectors are: Suitable for factory wiring only

- The maximum investigated branch circuit rating is: 16 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: 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): T201 (Class F), T203 (Class B), T700 (Class E)
- 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)