


	<p>Test Report issued under the responsibility of:</p>	
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<p><b>TEST REPORT</b> <b>IEC 60950-1</b> <b>Information technology equipment - Safety -</b> <b>Part 1: General requirements</b></p>	
<b>Report Reference No</b> .....	4786910627-9
Date of issue .....	2015-10-19
Total number of pages .....	143
<b>CB Testing Laboratory</b> .....	UL Japan, Inc.
Address .....	4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan
<b>Applicant's name</b> .....	TDK-LAMBDA CORP
Address .....	NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN
<b>Test specification:</b>	
Standard .....	IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
Test procedure .....	CB Scheme
Non-standard test method .....	N/A
<b>Test Report Form No.</b> .....	IEC60950_1F
Test Report Form originator .....	SGS Fimko Ltd
Master TRF .....	Dated 2014-02
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<b>General disclaimer</b>	
<p>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.</p>	

<b>Test item description</b> .....	Switching Power Supply																																																																		
Trade Mark .....																																																																			
Manufacturer .....	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN																																																																		
Model/Type reference .....	1) JWS600-x/y, JWS600-5/MV, JWS600-12/508, JWS600-15/508, JWS600-24/508 2) JWS600-24/HKM, JWS600-48/HKM, JWS600-48/HKH 3) JWS480P-v, JWS480P-24/508  (series name; 1) and 2) JWS600 series, 3) JWS480P series)  x = 2, 3, 5, 6, 8, 9, 12, 15, 24, 28, 48 /y = /PV or blank ("/" is not used when y = blank) v = 24, 36, 48																																																																		
Ratings .....	Input: AC 100-240V, 50/60Hz, 8.2A for JWS600 series, 6.4A for JWS480P series  Output: <table border="0"> <tr><td>1) model JWS600-2/y</td><td>DC 2V,</td><td>120A</td></tr> <tr><td>1) model JWS600-3/y</td><td>DC 3.3V,</td><td>120A</td></tr> <tr><td>1) model JWS600-5/y</td><td>DC 5V,</td><td>120A</td></tr> <tr><td>1) model JWS600-5/MV</td><td>DC 5.5V,</td><td>109A</td></tr> <tr><td>1) model JWS600-6/y</td><td>DC 6V,</td><td>100A</td></tr> <tr><td>1) model JWS600-8/y</td><td>DC 8V,</td><td>68A</td></tr> <tr><td>1) model JWS600-9/y</td><td>DC 9V,</td><td>68A</td></tr> <tr><td>1) model JWS600-12/y</td><td>DC 12V,</td><td>53A</td></tr> <tr><td>1) model JWS600-12/508</td><td>DC 12V,</td><td>53A</td></tr> <tr><td>1) model JWS600-15/y</td><td>DC 15V,</td><td>43A</td></tr> <tr><td>1) model JWS600-15/508</td><td>DC 15V,</td><td>43A</td></tr> <tr><td>1) model JWS600-24/y</td><td>DC 24V,</td><td>27A</td></tr> <tr><td>1) model JWS600-24/508</td><td>DC 24V,</td><td>27A</td></tr> <tr><td>1) model JWS600-28/y</td><td>DC 28V,</td><td>23A</td></tr> <tr><td>1) model JWS600-48/y</td><td>DC 48V,</td><td>13A</td></tr> <tr><td>2) model JWS600-24/HKM</td><td>DC 24V,</td><td>27A</td></tr> <tr><td>2) model JWS600-48/HKM</td><td>DC 48V,</td><td>13A</td></tr> <tr><td>2) model JWS600-48/HKH</td><td>DC 48V,</td><td>13A</td></tr> <tr><td>3) model JWS480P-24</td><td>DC 24V,</td><td>20A</td></tr> <tr><td>3) model JWS480P-24/508</td><td>DC 24V,</td><td>20A</td></tr> <tr><td>3) model JWS480P-36</td><td>DC 36V,</td><td>13.3A</td></tr> <tr><td>3) model JWS480P-48</td><td>DC 48V,</td><td>10A</td></tr> </table>	1) model JWS600-2/y	DC 2V,	120A	1) model JWS600-3/y	DC 3.3V,	120A	1) model JWS600-5/y	DC 5V,	120A	1) model JWS600-5/MV	DC 5.5V,	109A	1) model JWS600-6/y	DC 6V,	100A	1) model JWS600-8/y	DC 8V,	68A	1) model JWS600-9/y	DC 9V,	68A	1) model JWS600-12/y	DC 12V,	53A	1) model JWS600-12/508	DC 12V,	53A	1) model JWS600-15/y	DC 15V,	43A	1) model JWS600-15/508	DC 15V,	43A	1) model JWS600-24/y	DC 24V,	27A	1) model JWS600-24/508	DC 24V,	27A	1) model JWS600-28/y	DC 28V,	23A	1) model JWS600-48/y	DC 48V,	13A	2) model JWS600-24/HKM	DC 24V,	27A	2) model JWS600-48/HKM	DC 48V,	13A	2) model JWS600-48/HKH	DC 48V,	13A	3) model JWS480P-24	DC 24V,	20A	3) model JWS480P-24/508	DC 24V,	20A	3) model JWS480P-36	DC 36V,	13.3A	3) model JWS480P-48	DC 48V,	10A
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<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
	<i>A. Matsumoto</i>
	Approved by (name + signature)... : Tetsuo Iwasaki
	<b>Tetsuo Iwasaki</b>
<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 ( 60 pages)
<b>Summary Of Testing</b> Unless otherwise indicated, all tests were conducted at TDK-LAMBDA CORPORATION, NAGAOKA TECHNICAL CENTER, 2704-1 SETTAYA-MACHI, NAGAOKA-SHI, NIIGATA-KEN, 940-1195 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)	
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></p> <p>Countries outside the CB Scheme membership may also accept this report.</p> <p>List of countries addressed: CA, DE, DK, EU, FI, GB, KR, SE, SI, US</p> <p>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%, +6%
Tested for IT power systems .....	Yes
IT testing, phase-phase voltage (V) .....	230V
Class of equipment .....	Not classified (class I construction)
Considered current rating of protective device as part of the building installation (A) .....	B/I
Pollution degree (PD) .....	PD 2
IP protection class .....	IPX0
Altitude of operation (m) .....	≤ 2000m
Altitude of test laboratory (m) .....	< 1000m
Mass of equipment (kg) .....	3kg

**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 .....	1998-12, 2012-09-20
Date(s) of Performance of tests .....	1998-12, 1999-02, 1999-04, 1999-10 to 1999-11, 2001-03, 2008-12, 2012-09-24, 2012-11

**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 CORP

2704-1 SETTAYA-MACHI  
NAGAOKA-SHI NIIGATA-KEN 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 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

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

Models of JWS600-x/y are identical each other except for model name, output rating, winding of transformer T52, and minor secondary components.

Models of JWS480P-v are identical to models of JWS600-x/y except for rated input current, maximum power consumption, inductor L3 and transformer T52. (see appended table 1.5.1 for critical components.)

Models JWS600-12/508, JWS600-15/508, JWS600-24/508 and JWS480P-24/508 are identical to models JWS600-12/y, JWS600-15/y, JWS600-24/y and JWS480P-24 respectively except for type of terminal block TB1.

Models with "HKM" in its model name has a protection circuit of "input surge voltage". It is identical to the basic models except for minor primary circuit and PWB layout (No differences in the insulation distances).

Models with "HKH" in its model name are identical to the models with "HKM" except resistor R5 is not mounted.

Variable	Range of variable	Content
x	2, 3, 5, 6, 8, 9, 12, 15, 24, 28, 36, 48	Output voltage (see page 2)
/y	/PV or blank ("/" is not used when y = blank)	Blank: basic model PV: Output voltage can be adjusted by external control circuit.
v	24, 36, 48	Output voltage (see page 2)

### Additional Information

This report is a reissue of CBTR Ref. No.: 12027290 001 and 12027290 002, CB Test Certificate Ref. No. JPTUV-047973 and JPTUV-047973-A1/M1. 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.

All tests were conducted at TDK-LAMBDA CORPORATION, NAGAOKA TECHNICAL CENTER, 2704-1 SETTAYA-MACHI, NAGAOKA-SHI, NIIGATA-KEN, 940-1195 JAPAN under CTF program by TUV Rheinland Japan.

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 (T<sub>ma</sub>) permitted by the manufacturer's specification of: 50°C (100% Load), 60°C (70% Load), 65°C (55% Load)
- 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: 448 V<sub>rms</sub>, 728 V<sub>pk</sub>

- 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): T1 (Class B), T51 (Class B), T52 (Class B)
- 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)