Test Report issued under the responsibility of:

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

Report Reference No ..... :	E122103-A144-CB-1
Date of issue ..... :	2013-08-26
Total number of pages ..... :	83
CB Testing Laboratory ..... :	UL Japan, Inc.
Address ..... :	4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan
Applicant's name ..... :	TDK-LAMBDA CORP
Address ..... :	NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN
Test specification:	
Standard ..... :	IEC 60950-1:2005 (2nd Edition); Am 1:2009
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1C
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	2012-08

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.

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 ..... :	RWS300B-5, RWS300B-12, RWS300B-24, and RWS300B-48 RWS300B Series maybe followed by suffix "abc" (a is /, b is CO2, c is FG, and "abc" may be blank)
Ratings ..... :	Input: 100-240 Vac, 50-60 Hz, 3.3 A (for Model RWS300B-5) and 3.8 A (for Models RWS300B-12, RWS300B-24, and RWS300B-48)

Testing procedure and testing location:			
[x]	**CB Testing Laboratory**		
	Testing location / address..... :	UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan	
[ ]	**Associated CB Test Laboratory**		
	Testing location / address..... :		
	Tested by (name + signature) ..... :	Hiroaki Mitani	H Mitani
	Approved by (name + signature) ... :	Elicia M. Sosa	Esosa
[ ]	**Testing Procedure: TMP**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: WMT**		
	Tested by (name + signature) ..... :		
	Witnessed by (+ signature)..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: SMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: RMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		

List of Attachments

National Differences (33 pages)

Enclosures (34 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**
	Guide Information Page - Maximum Output Voltage, Current, and Volt Ampere Measurement (1.2.2.1)	

Input: Single-Phase (1.6.2)	
Capacitance Discharge (2.1.1.7)	X-Capacitor (C1) rated 0.68 µF used.
SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)	
Protective Bonding II (2.6.3.4, 2.6.1)	
Humidity (2.9.1, 2.9.2, 5.2.2)	Conducted at 40±2°C, 93±2% for 120 hours.
Determination of Working Voltage; Working Voltage Measurement (2.10.2)	
Thin Sheet Material (2.10.5.9, 2.10.5.10, 2.10.5.6)	
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)	Y-Capacitors (C2, C3, C8) rated 2200 pF used.
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)	Represented by Power Supply Output Short-Circuit/Overload Test.
Power Supply Output Short-Circuit/Overload (5.3.7)	
Locked-Rotor Overload for DC Motors in Secondary Circuits (Annex B.7)	

Summary of Compliance with National Differences:

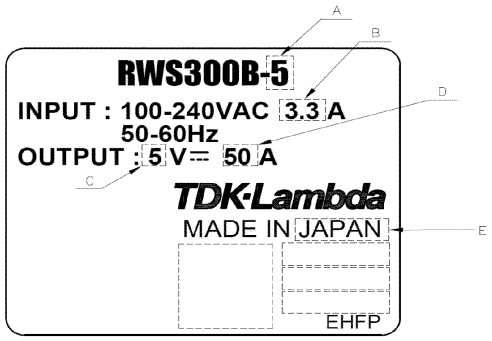
Countries outside the CB Scheme membership may also accept this report.

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

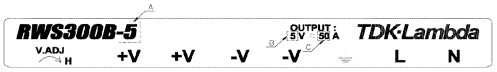
Copy of Marking Plate

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.



MODEL	A	B	C	D
RWS300B-5 EHFP	5	3.3	5	50
RWS300B-12 EHFP	12	3.8	12	25
RWS300B-24 EHFP	24	3.8	24	12.5
RWS300B-48 EHFP	48	3.8	48	6.3

F: COUNTRY OF MANUFACTURE WILL BE SHOWN, JAPAN, MALAYSIA OR CHINA.



MODEL	A	B	C
RWS300B-5 EHFP	5	5	50
RWS300B-12 EHFP	12	12	25
RWS300B-24 EHFP	24	24	12.5
RWS300B-48 EHFP	48	48	6.3

Test item particulars :	
Equipment mobility ..... :	for building-in
Connection to the mains ..... :	N/A
Operating condition ..... :	continuous
Access location ..... :	N/A (for building-in)
Over voltage category (OVC) ..... :	OVC II
Mains supply tolerance (%) or absolute mains supply values ..... :	+10%, -10%
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) ..... :	20 A (branch circuit)
Pollution degree (PD) ..... :	PD 2
IP protection class ..... :	IP X0
Altitude of operation (m) ..... :	less than 3000 m
Altitude of test laboratory (m) ..... :	approximately 10 to 20 m
Mass of equipment (kg) ..... :	approximately 0.9 kg
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 ..... :	2013-07-03
Date(s) of Performance of tests ..... :	2013-07-10 to 2013-08-07
General remarks:	
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 testing laboratory. "(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 6.2.5 of IECEE 02:	Yes
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.	
Name and address of Factory(ies):	WUXI TDK-LAMBDA ELECTRONICS CO LTD NO6 XING CHUANG ER LU WUXI JIANGSU 214028 CHINA

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

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 215622 JIANGSU CHINA

ALPS LOGISTICS FACILITIES CO LTD
36-1 KASUMINOSATO
AMI-MACHI
INASHIKI-GUN
IBARAKI-KEN 300-0396
JAPAN

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 Test Report is building-in type switching power supply with a single output circuit.

Output:
Model RWS300B-5
5 Vdc (4.5 Vdc - 5.75 Vdc), maximum 50 A (maximum 250 W)
Model RWS300B-12
12 Vdc (10.8 Vdc - 13.8 Vdc), maximum 25 A (maximum 300 W)
Model RWS300B-24
24 Vdc (21.6 Vdc - 27.6 Vdc), maximum 12.5 A (maximum 300 W)
Model RWS300B-48
48 Vdc (43.2 Vdc - 52.8 Vdc), maximum 6.3 A (maximum 302.4 W)
See Enclosure Id. 7-01 (RWS300B series Specifications) for details.

Model Differences

Each model is identical, except for model designation, output rating, secondary winding and internal

construction of Transformer (T1), and secondary components.

Standard model is Terminal Block model with Chassis and Cover.
RWS300B Series maybe followed by suffix "abc". (a is /, b is CO2, c is FG; and "abc" may be blank)
1. CO2: Model with optional Thin Coating (QMJU2) on both component and solder side of PWB
2. FG: Model with Low Leakage (the capacitances for Primary - FG reduced).

Additional Information

Evaluation of clearance was considered at 3000 m sea level by manufacturer's request. (see appended table 2.10.3 and 2.10.4)

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. 7-01 (RWS300B series Specifications) 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 (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: [Model RWS300B-5] Primary - Secondary: 472 Vrms and 848 Vpk / Primary - Ground: 431 Vrms and 840 Vpk , [Model RWS300B-12] Primary - Secondary: 413 Vrms and 784 Vpk / Primary - Ground: 411 Vrms and 776 Vpk , [Model RWS300B-24] Primary - Secondary: 454 Vrms and 672 Vpk / Primary - Ground: 390 Vrms and 616 Vpk , [Model RWS300B-48] Primary - Secondary: 456 Vrms and 664 Vpk / Primary - Ground: 388 Vrms and 612 Vpk
- The following secondary output circuits are SELV: Output of Models RWS300B-5, RWS300B-12, RWS300B-24, and RWS300B-48
- The following secondary output circuits are at hazardous energy levels: Output of Models RWS300B-5, RWS300B-12, RWS300B-24, and RWS300B-48
- 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: 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): Transformer (T1) (Class F)
- The following end-product enclosures are required: Electrical / Fire
- X-Capacitor (C1) rated maximum 0.68 µF; therefore, consideration shall be given to conducting Capacitance Discharge Test in the end-product with respect to the variation in X-Capacitor (C1). --
- Y-Capacitors (C2, C3, C8) rated maximum 2200 pF; therefore, consideration shall be given to

conducting Touch Current Test in the end-product with respect to the variation in Y-Capacitors (C2, C3, C8). --

- Earth Terminal provided on Terminal Block (TB1) was not evaluated as protective earthing terminal. If the earth terminal connected to protective earthing in the end-product, Limited Short-Circuit Test in accordance with CSA C22.2 No.04 shall be conducted. This component is intended to be connected to a protective earth of the end-product via Chassis. Protective Bonding Mark (60417-1-IEC-5017) is provided on PWB near Earth Terminal on Terminal Block (TB1). --
- Model RWS300B-5 was tested with Output Voltage Range of 4.5 - 5.75 Vdc (maximum 250 W). , Model RWS300B-12 was tested with Output Voltage Range of 10.8 - 13.8 Vdc (maximum 300 W). , Model HWS50A-24 was tested with Output Voltage Range of 21.6 - 27.6 Vdc (maximum 300 W). , Model HWS50A-48 was tested with Output Voltage Range of 43.2 - 52.8 Vdc (maximum 302.4 W). , See Enclosure Id. 7-01 (RWS300B series Specifications) 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)