

	Test Report issued under the responsibility of:	
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TEST REPORT IEC 60950-1 Information technology equipment - Safety - Part 1: General requirements	
Report Reference No	4787190432-2
Date of issue	2015-12-15
Total number of pages	13
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	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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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	ZWS150BAF-3, -5, -12, -15, -24 or -48 may be followed by /xyz (x is R or blank, y is A or L or blank, z is CO2 or FG or FV or FGM or SN or blank)
Ratings	Input: Model ZWS150BAF-3: 100-240 Vac, 50/60 Hz, 1.4A Models ZWS150BAF-5, -12, -15, -24, -48 100-240 Vac, 50/60 Hz, 2.0A Output: 3.3 Vdc, 30A: ZWS150BAF-3 (DC 2.64 - 3.63 V, max 30A, max 99.0W) 5 Vdc, 30A: ZWS150BAF-5 (DC 4.0 - 5.5 V, max 30A, max 150W) 12 Vdc, 12.5A: ZWS150BAF-12 (DC 9.6 - 13.2 V, max 12.5A, max 150W) 15 Vdc, 10A: ZWS150BAF-15 (DC 12.0 - 16.5 V, max 10A, max 150W) 24 Vdc, 6.3A: ZWS150BAF-24 (DC 19.2 - 26.4 V, max 6.3A, max 151.2W) 48 Vdc, 3.2A: ZWS150BAF-48 (DC 38.4 - 52.8 V, max 3.2A, max 153.6W)

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 (0 pages)
Enclosures (0 pages)
Summary Of Testing
No tests were conducted

Summary of Compliance with National Differences:

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

List of countries addressed: CA, DE, DK, ES, EU, FI, GB, KR, SI, US

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

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%, -10%
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	-
Class of equipment	Not classified, Class 1 construction
Considered current rating of protective device as part of the building installation (A)	16A (for Europe), 20A (for Canada and USA)
Pollution degree (PD)	PD 2
IP protection class	IP X0
Altitude of operation (m)	< 2000 meters
Altitude of test laboratory (m)	< 1000 meters
Mass of equipment (kg)	0.4kg (approx.) (except for suffix /A, /L), 0.6kg (approx.) (suffix /A), 0.56kg (approx.) (suffix /L)
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	N/A
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 IEC60335-1:	
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): WUXI TDK-LAMBDA ELECTRONICS CO LTD
NO 6
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 JIANGSU 215622 CHINA

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

GENERAL PRODUCT INFORMATION:

Report Summary

This report is only valid in conjunction with CB Test Report Ref. No. 4786896001, dated 2015-05-18 for the following amendment.

Amendment 1:

- Minor modifications of description in Table 1.5.1.

No tests were considered necessary because construction was not changed.

Product Description

The product is a switching power supply intended for building in to an ITE end product.

Model Differences

All models ZWS150BAF-3, -5, -12, -15, -24 or -48 may be followed by /xyz were identical for input rating of model ZWS150BAF-3, output rating and following suffixes.

ZWS150BAF-3, -5, -12, -15, -24 or -48 may be followed by /xyz
(x is R or blank, y is A or L or blank, z is CO2 or FG or FV or FGM or SN or blank)

/R: with remote ON/OFF control function.

/A: with L shaped metal chassis and cover.

/L: with L shaped metal chassis mounted solder side of unit.

/CO2: Coating on both sides of PWB.

/FG: Low Leakage.

/FV: Fixed output voltage without adjustable volume.

/FGM: Additional C2, C3 and C8 capacitance (for low touch current).

/SN: Up to 3000m for altitude of operation (Model ZWS150BAF-12 only)

Additional Information

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: For Model Series ZWS150BAF with all suffixes except /A: 100% load @ 50°C ambient for Mounting position A, B with convection cooling; 100% load @ 40°C ambient for Mounting positions C, E with convection cooling; 100% load @ 30°C ambient for Mounting positions D, F with convection cooling; For Model Series ZWS150BAF with suffix /A, 100% load @ 40°C ambient for Mounting position A, B with convection cooling; 100% load @ 30°C ambient for Mounting positions C, E with convection cooling; 100% load @ 20°C ambient for Mounting positions D, F with convection cooling; , See Enclosure Miscellaneous ID 7-01 for complete Output Derating Curves.
- The product is intended for use on the following power systems: TN

Engineering Conditions of Acceptability

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

- The following secondary output circuits are SELV: All

- The following secondary output circuits are at non-hazardous energy levels: All
- The power supply terminals and/or connectors are: Not investigated for field wiring
- 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 fully conducted. Resistance of Earthing Test of 2.6.3.4 (40A / 2 min) and Limited Short Circuit Test (US/CAN difference of 2.6.3.4) performed with acceptable results.
- 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) or L1, L2, L3, T1 (130°C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- Heating Tests shall be repeated in the end product evaluation.
- The Clearances and Creepage Distances have additionally been assessed for suitability up to 3000 m elevation. (for Model suffix by "/SN")

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)