

**TEST REPORT****IEC 60950-1: 2005 (2nd Edition) and/or EN 60950-1:2006****Information technology equipment – Safety –****Part 1: General requirements****Report Reference No.**: 12020901 002

Date of issue: 2010-08-11

Total number of pages: 26

CB/CCA Testing Laboratory: TÜV Rheinland Japan Ltd., Yokohama Laboratory

Address: 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

Applicant's name: TDK-Lambda Corp., Nagaoka Technical Center

Address: 2701 Togawa Settaya Nagaoka-shi Niigata 940-1195, Japan

Manufacturer's name: (same as Applicant)

Address: (same as Applicant)

Factory's name: 1. TDK-Lambda Corp., Nagaoka Technical Center

Address: 2701 Togawa, Settaya, Nagaoka-shi, Niigata 940-1195, Japan

2. TDK-Lambda Malaysia Sdn. Bhd.

PL033, Kawasan Perindustrian, 81400 Senai Johor, Malaysia

3. TDK-Lambda Malaysia Sdn. Bhd.

Lot 2 & 3, Batu 9 3/4 Kawasan Perindustrian Banbar Baru Jaya
Gading 26070 Kuantan Pahang, Malaysia

4. Wuxi TDK-Lambda Electronics Co., Ltd.

Lot 107 Wuxi Singapore Ind. Park, Xing Chuang Erlu, Wuxi,
Jiangsu 214028, P. R. China

5. TDK-Lambda Facilities Corp.

36-1 Kasuminosato, Ami-machi, Inashiki-gun, Ibaraki 300-0396,
Japan

6. Zhangjiagang Hua Yang Electronics Co., Ltd.

Zhao Feng Industrial Zone, Leyu Town Zhangjiagang, Jiangsu
215622, P.R. China**Test specification:**Standard: IEC 60950-1:2005 (2nd Edition) and
 EN 60950-1:2006

Test procedure: CB-scheme / TMP Procedure

Non-standard test method: N/A



Test Report Form No.....: IECEN60950_1C

Test Report Form(s) Originator: SGS Fimko Ltd

Master TRF.....: Dated 2007-06

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Test item description.....: Switching Power Supply

Trade Mark: TDK-Lambda

Manufacturer.....: Same as applicant

Model/Type reference.....: ZWS100BAF-xx
xx; 3, 5, 12, 15, 24, 48
maybe followed by suffix, /CO2, /FG, /FV, /R, /A, /L

Ratings.....:	Input:	AC100-240V, 50/60Hz, 1.0A (for model ZWS100BAF-3, -3/A, -3/L)
		1.3A (except for model ZWS100BAF-3, -3/A, -3/L)
	Output :	DC3.3V, 20A ZWS100BAF-3 (DC 2.64V – 3.63V, max. 20A, max. 66.0W)
		DC5V, 20A ZWS100BAF-5 (DC 4.0 – 5.5V, max. 20A, max. 100W)
		DC12V, 8.5A ZWS100BAF-12 (DC 9.6 – 13.2V, max. 8.5A, max. 102W)
		DC15V, 6.7A ZWS100BAF-15 (DC 12.0 – 16.5V, max. 6.7A, max. 100.5W)
		DC24V, 4.3A ZWS100BAF-24 (DC 19.2 – 26.4V, max. 4.3A, max. 103.2W)
		DC48V, 2.1A ZWS100BAF-48 (DC 38.4 – 52.8V, max. 2.1A, max. 100.8W)

Testing procedure and testing location:

CB/CCA Testing Laboratory: TÜV Rheinland Japan Ltd., Yokohama Laboratory

Address.....: 4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

Associated CB Laboratory: N/A

Testing location/ address.....: N/A

Tested by (name + signature).....: N/A

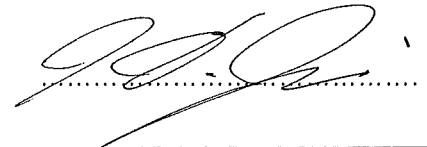
Approved by (+ signature).....: N/A

Testing procedure: TMP

Tested by (name + signature).....: K. Sato



Approved by (+ signature).....: H. Irie



Testing location/ address.....: (same as Applicant)

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.....:

Summary of testing:

Test sample(s):

The manufacturer declared that the samples submitted for evaluation were representative of the products from each factory.

Serial No.: Production sample without serial number.

Relevant tests were performed on those models within the series that were ZWS100BAF-5/A, ZWS100BAF-48/A unless otherwise stated in test report.

All tests was considered to represent the worst case condition for the respective tests.

Tests performed (name of test and test clause): (see below)	Testing location: (see Testing Location above)
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Testing		Applicable (Yes/No)	Comments
Clause	Test description		
1.6.2	Input current	No	
2.1.1.5	Energy hazards	No	
2.1.1.7	Discharge of capacitors in primary	No	
2.2.2	Hazardous voltage measurement	No	
2.2.3	SEL voltage measurement	No	
2.3.5	Operating voltages generated externally	No	
2.4.2	Limited current circuits	No	
2.5	Limited power sources	No	
2.6.3.4	Resistance of earthing conductors and their terminations	No	
2.9.2	Humidity conditioning	Yes	
2.10	Creepage and Clearances, Distance through Insulation	No	
2.10.2.2/ 2.10.2.3	Determination of working voltage	No	
2.10.5	Solid insulation	No	
2.10.7	Enclosed and sealed parts	No	
3.2.6	Cord anchorages and strain relief	No	
4.1	Stability	No	
4.2	Mechanical strength	No	
4.3.6	Direct plug-in equipment	No	
4.3.13	Radiation	No	
4.5.2	Maximum Temperatures	Yes	
4.5.5	Resistance to abnormal heat	No	
5.1	Touch current and protective conductor current	No	

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5.2	Electric strength	Yes	
5.3	Abnormal operating and fault conditions	Yes	
6.1.2	Separation of the telecommunication network from earth	No	
6.2	Protection of equipment users from overvoltages on telecom. networks	No	
6.3	Protection of the telecommunication wiring system from overheating	No	
7.2	Protection of equipment users from overvoltages on cable distribution system	No	
7.3	Insulation between primary and cable distribution system	No	
Annex A	Resistance to heat and fire	No	
Annex B	Locked-rotor overload test	No	
Annex C	Overload test	Yes	See table 5.3
Annex G	Determining minimum clearances	No	
Annex H	Ionizing radiation	No	
Annex K	Thermal controls	No	
Annex M	Criteria for telephone ringing signals	No	
Annex Q	Voltage dependent resistors (VDRs)	No	
Annex U	Insulated wire for use without interleaved insulation	No	
Annex Y	Ultraviolet light conditioning test	No	

Additionally evaluated Test specifications (see appended test report).

EN 60950-1:2006 + A11:2009

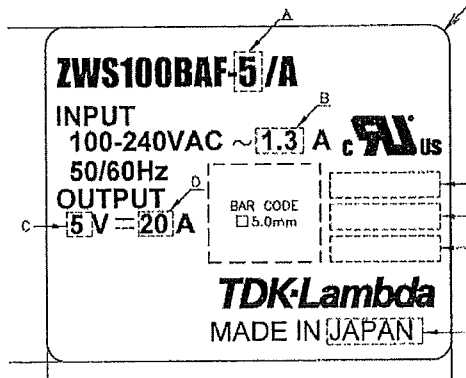
Summary of compliance with National Differences:

EU Group Differences, EU Special National Conditions, EU A-Deviations, and National Differences AT, AU, CA, CN, CH, DE, DK, FI, FR, GB, IT, JP, KR, NL, NO, PL, SE, SI, US.

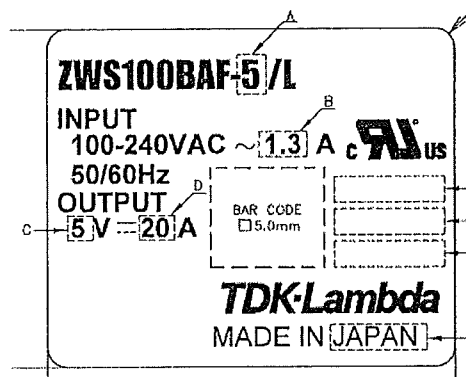
Explanation of used codes: AT=Austria, AU=Australia, CA=Canada, CN=China, CH=Switzerland, DE=Germany, DK=Denmark, FI=Finland, FR=France, GB=United Kingdom, IT=Italy, JP=Japan, KR=Korea, NL=The Netherlands, NO=Norway, PL=Poland, SE=Sweden, SI=Slovenia, US=United States of America.

Copy of marking plate:

Copy of marking label:



MODEL	A	B	C	D
ZWS100BAF-3/A HFP	3	1.0	3.3	20
ZWS100BAF-5/A HFP	5	1.3	5	20
ZWS100BAF-12/A HFP	12	1.3	12	8.5
ZWS100BAF-15/A HFP	15	1.3	15	6.7
ZWS100BAF-24/A HFP	24	1.3	24	4.3
ZWS100BAF-48/A HFP	48	1.3	48	2.1



MODEL	A	B	C	D
ZWS100BAF-3/L HFP	3	1.0	3.3	20
ZWS100BAF-5/L HFP	5	1.3	5	20
ZWS100BAF-12/L HFP	12	1.3	12	8.5
ZWS100BAF-15/L HFP	15	1.3	15	6.7
ZWS100BAF-24/L HFP	24	1.3	24	4.3
ZWS100BAF-48/L HFP	48	1.3	48	2.1

Other models are identical except for the part of the above A to D.

Copy of trademark:

TDK-Lambda



IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Test item particulars

Equipment mobility: movable hand-held transportable
 stationary for building-in direct plug-in

Connection to the mains.....: pluggable equipment permanent connection
 detachable power supply cord
 non-detachable power supply cord
 not directly connected to the mains

Operating condition.....: continuous
 rated operating / resting time:

Access location: operator accessible
 restricted access location

Over voltage category (OVC): OVC I OVC II OVC III OVC IV
 other:

Mains supply tolerance (%) or absolute mains supply values: ±10%

Tested for IT power systems: Yes No

IT testing, phase-phase voltage (V): --

Class of equipment: Class I Class II Class III
 Not classified. Class I construction.

Considered current rating (A): 16A (for Europe), 20A (for Canada and USA)

Pollution degree (PD): PD 1 PD 2 PD 3

IP protection class: Not rated, indoor use only

Altitude during operation (m): Up to 2000

Altitude of test laboratory (m): < 1000

Mass of equipment (kg): 0.3 (approx.) (except for suffix /A, /L)
0.47 (approx.) (suffix /A)
0.43 (approx.) (suffix /L)

Possible test case verdicts:

- test case does not apply to the test object: N/A

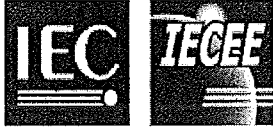
- test object does meet the requirement: P (Pass)

- test object does not meet the requirement: F (Fail)

Testing.....:

Date of receipt of test item.....: N/A (TMP)

Date(s) of performance of tests.....: 2010-04-09 – 2010-07-16



IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

General remarks:

The test results presented in this report relate only to the object tested.

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"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

Throughout this report a point is used as the decimal separator.

Changes of Manufacturer:

(not changed)

Changes of Factory(ies):

(not changed)

History of amendments and modifications:

Ref. No. 12020901 001, dated 2010-05-14 (original test report)

General product information:**Description of change(s):**

1. Addition of suffix models

Suffix /A: with L shape metal chassis and cover.

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

Models were identical except for model name with suffixes.

Input rating, see bold letter of input, page 2.

Addition of mass of equipment: 0.47 (approx.) (suffix /A), 0.43 (approx.) (suffix /L)

2. Addition of Chassis, Cover and Chassis for suffix /A and /L models respectively (see components list table 1.5.1)

3. Addition of output information

DC 2.64V – 3.63V, max. 20A, max. 66.0W (for ZWS100BAF-3)

DC 4.0 – 5.5V, max. 20A, max. 100W (for ZWS100BAF-5)

DC 9.6 – 13.2V, max. 8.5A, max. 102W (for ZWS100BAF-12)

DC 12.0 – 16.5V, max. 6.7A, max. 100.5W (for ZWS100BAF-15)

DC 19.2 – 26.4V, max. 4.3A, max. 103.2W (for ZWS100BAF-24)

DC 38.4 – 52.8V, max. 2.1A, max. 100.8W (for ZWS100BAF-48)

4. Correction of Result – Remark and/or Verdict

Cl. 1.5.7: from N/A to P

Cl. 1.7.1: from P to N/A

Cl. 2.10.1.4: from N/A to P

Cl. 2.10.3.2: from N/A to P

Cl. 2.10.3.4: from P to N/A

Cl. 2.10.5.3: from P to N/A

Annex W: from P to N/A

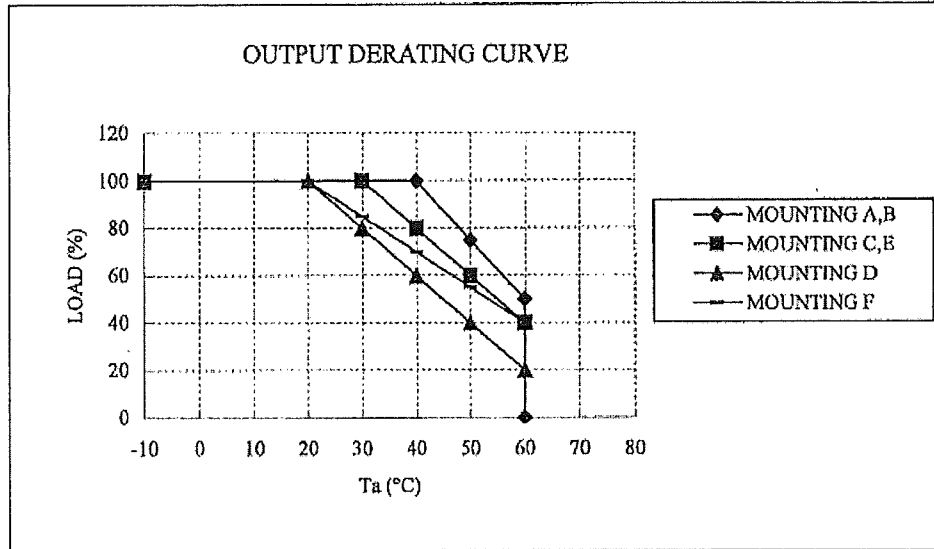
ZC, cl. 1.7.2.1: from P to N/A

Allowed Tmax (°C) for PC101 and PC102 from 120°C to 100°C of Temperature rise measurements (8) table 4.5

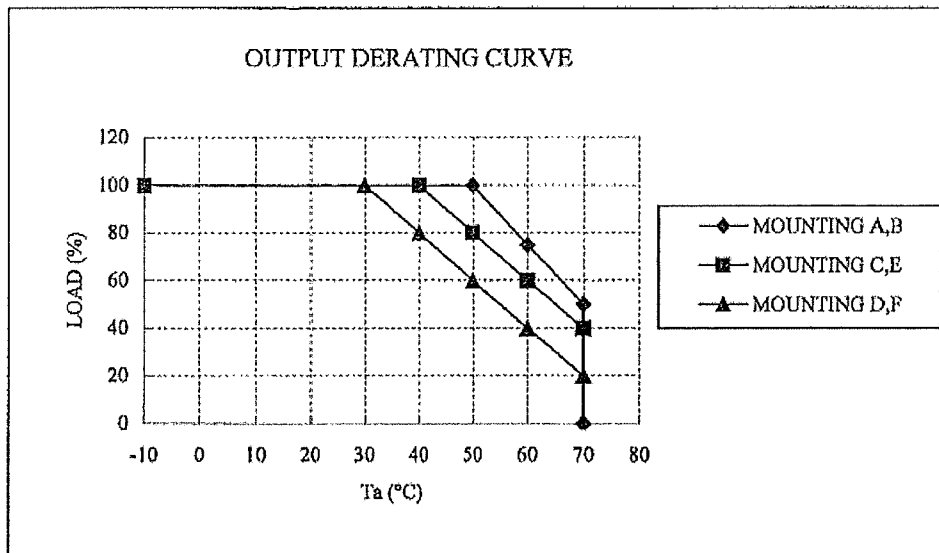
IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Related to above item 1, Output Derating and Mounting Positions:

Convection cooling for model with suffix /A;

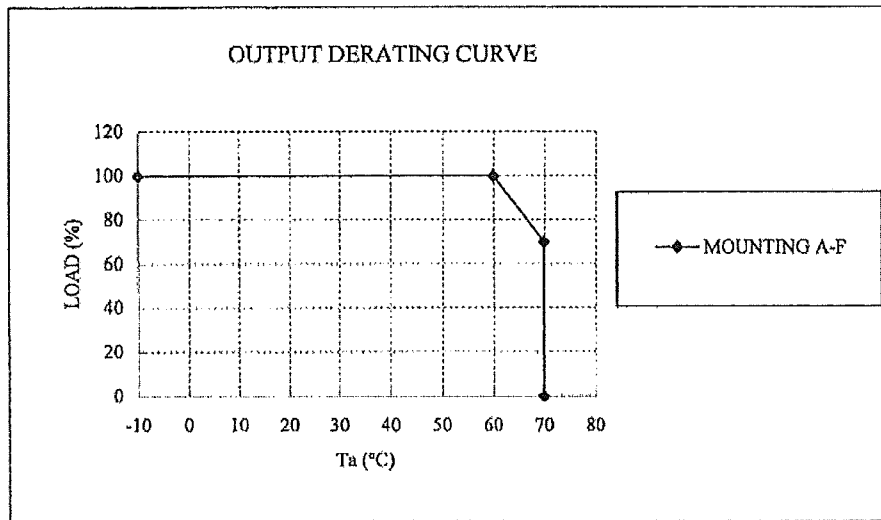


Convection cooling for model with suffix /L;

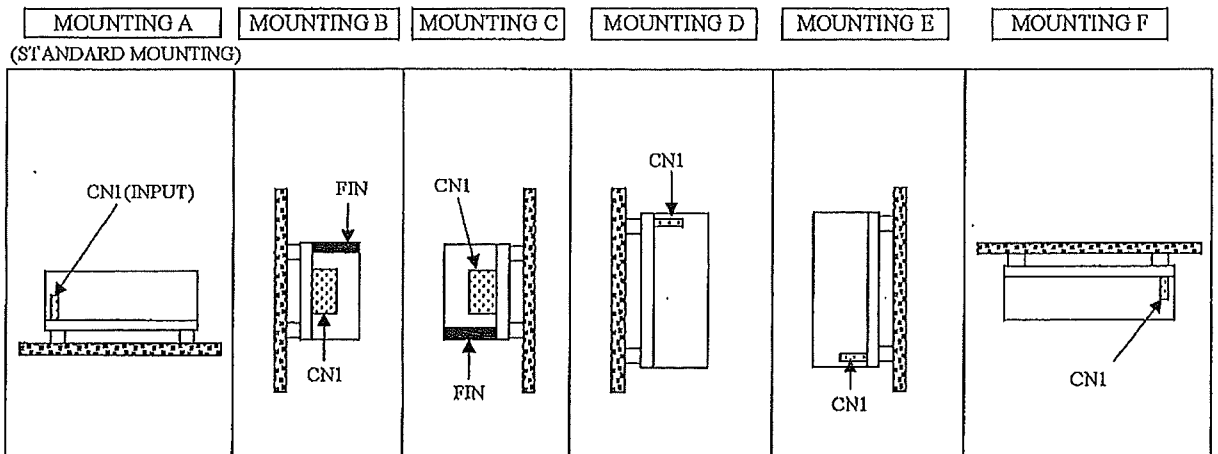


IEC/EN 60950-1			
Clause	Requirement + Test	Result - Remark	Verdict

Forced air cooling for model with suffix /A and suffix /L ;
 Air velocity, $\geq 0.7\text{m/s}$ must be blown from component side.



Mounting position;



For the above described change(s) the following was considered to be necessary:

Change	Testing (Please use test data sheet)		Comments
	Clause	Test description	
1, 2	2.9.2	Humidity conditioning	
	4.5.2	Maximum Temperatures	
	5.2	Electric strength	
	5.3	Abnormal operating and fault conditions	
	Annex C	Overload test	See table 5.3
3, 4	-	-	No additional test is necessary