



Test Report issued under the responsibility of:



TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number.: T223-0491/15

Date of issue: 2016-02-05

Total number of pages..... 281 pages

Applicant's name.....: TDK-Lambda UK Ltd

Address: Kingsley Avenue, Ilfracombe, Devon, EX34 8ES, UK

Test specification:

Standard: IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013

Test procedure.....: CB Scheme

Non-standard test method.....: N/A

Test Report Form No.....: IEC60950_1F

Test Report Form(s) Originator.....: SGS Fimko Ltd

Master TRF: Dated 2014-02

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General disclaimer:

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

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Test item description	AC DC Power Supply series for building in
Trade Mark	TDK-Lambda
Manufacturer	TDK-Lambda UK Ltd Kingsley Avenue, Ilfracombe, Devon, EX34 8ES, UK
Model/Type reference.....	KPSA x-y "x" stands for output power (5, 10 or 15) "y" stands for output voltage (3,3 – 24) See explanation for "y" 3R3 – 3,3Vdc 5 – 15V 12 – 12V dc 15 – 15Vdc 24 – 24Vdc
Ratings	Input: KPSA5:100-240 Vac; 0,25 A; 50-60 Hz KPSA10:100-240 Vac; 0,5 A; 50-60 Hz KPSA15:100-240 Vac; 0,5 A; 50-60 Hz Output: Voltage range 3,3 Vdc – 24 Vdc; Output power: KPSA5: 5 W KPSA10: 10 W KPSA15: 15 W

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	SIQ Ljubljana Testing Laboratory is accredited by Slovenian Accreditation, Reg. No.: LP-009
Testing location/ address.....:		Tržaška c. 2, SI-1000 Ljubljana Slovenia
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address.....:		
Tested by (name + signature)		Luka Košir
Approved by (name + signature)		Mihal Kiseljca
<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)		
Witnessed by (name + signature).....:		
Approved by (name + signature)		
Supervised by (name + signature)		

List of Attachments:

1. Test Report (118 pages)
2. National Differences – Enclosure No. 1 (41 pages)
3. European Group Differences and National Differences according to EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 – Enclosure No. 1a (21 pages)
4. Pictures – Enclosure No. 2 (7 pages)
5. Schematics, Layouts, Transformer data - Enclosure No. 3 (121 pages)

Summary of testing:
Tests performed (name of test and test clause):

1.6.2 Input Test
1.7.11 Durability
2.1.1.5 Energy Hazard Measurements
2.1.1.8 Energy hazards – d.c. mains supplies
2.2.2 SELV: Hazard Voltage (Circuit) Measurement Test
2.2.3 SELV Reliability testing
2.4 Limited Current Circuit (Bridging components)
2.5 Limited Power Source
2.9.2 Humidity Test
2.10.2 Working Voltage measurement on PCB and Transformer
2.10.3/2.10.4 Clearance and Creepage distance measurement
2.10.5 Distance Through Insulation measurement
2.10.5.6 Thin Sheet Material (barriers)
4.2.2-4.2.4 Steady force test, 10N
4.5.2 Heating (Temperature) Test
4.5.5 Resistance to abnormal heat (Ball pressure test)
5.1 Touch Current and protective conductor current
5.2 Electric Strength Test
5.3 Abnormal Operating Tests foreseeable misuse:
SELV reliability and failure in the voltage regulation, Functional insulation, Component faults, Overload and short and no load at the outputs

Testing location:

SIQ Ljubljana, Tržaška c. 2, SI-1000 Ljubljana, Slovenia

Summary of compliance with National Differences**List of countries addressed:**

Argentina**, Australia, Austria***, Bahrain**, Belarus**, Belgium***, Brazil**, Bulgaria***, Canada, China, Cyprus***, Colombia**, Croatia**, Czech Republic***, Denmark***, Finland***, France***, Germany***, Greece***, Hungary***, India**, Indonesia**, Iran**, Ireland***, Israel, Italy***, Japan*, Kazakhstan**, Kenya**, Korea, Libya**, Malaysia**, Mexico**, Netherlands***, New Zealand*, Norway***, Pakistan**, Poland***, Portugal***, Romania***, Russian Federation**, Saudi Arabia**, Serbia**, Singapore**, Slovakia***, Slovenia***, South Africa**, Spain***, Sweden, Switzerland, Thailand**, Turkey***, Ukraine**, United Arab Emirates**, United Kingdom, Uruguay**, USA, Vietnam**

* No national differences to IEC 60950-1:2005 (2nd edition) (+ A1 + A2) declared

** No national differences to IEC 60950-1:2005 (2nd edition) + A1 + A2 or IEC 60950-1:2001 (1st edition) declared

*** EU group differences

☒ **The product fulfils the requirements of EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011 (see Enclosure No. 1a).**

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.

a) KPSA5 series:



b) KPSA10 series:



c) KPSA15 series:



Test item particulars:	
Equipment mobility:	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains:	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input checked="" type="checkbox"/> not directly connected to the mains
Operating condition:	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> service access area (for building-in)
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	90 – 264Vac Rated input DC voltage range: 100-300 Vdc Operational input DC voltage range: 100-370 Vdc
Tested for IT power systems	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
IT testing, phase-phase voltage (V)	230 Vac line to line (Norway only)
Class of equipment	<input type="checkbox"/> Class I <input checked="" type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	16A (IEC); 20A (North America)
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IPX0
Altitude during operation (m)	2000m
Altitude of test laboratory (m)	300m
Mass of equipment (kg)	KPSA5 series: 25,7 g KPSA10 series: 37,7 g KPSA15 series: 45,4 g

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.....: 2010-09-16

Date(s) of performance of tests: From 2010-09-20 to 2010-10-25

From 2012-07-05 to 2012-12-03 (Revision No. 1.0)

From 2015-11-30 to 2015-12-02 (Revision No. 2.0)

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 ☒ comma / ☐ 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 location 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**
☐ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies) : 1) Dongguan Cincon Electronics Limited

No. 1 Jing Xiang Rd. DongCheng Foreign, Trade Industrial Park,ZhuShan DongCheng District, DongGuan, 523128 Guangdong, P.R., China

2) Cincon Electronics Co., Ltd.

No. 8-1, Fu Kung Rd., Fu Hsing Park, Fu Hsing Hsiang, Chang Hua Hsien, Taiwan

General product information:

Information about the Product:

Open frame Switch mode Power Supply for building in for information technology equipment use.

Model description:

KPSA5-y, 5W Series, y=3,3-24 in steps of 0,1

Models	Output voltage	Max. load
KPSA5-3R3 (*)	3,3 Vdc	1,25 A
KPSA5-5	5 Vdc	1,0 A
KPSA5-12	12 Vdc	0,42 A
KPSA5-15	15 Vdc	0,33 A
KPSA5-24 (*)	24 Vdc	0,23 A

KPSA10-y, 10W Series, y=3,3-24 in steps of 0,1

Models	Output voltage	Max. load
KPSA10-3R3 (*)	3,3 Vdc	2,5 A
KPSA10-5	5 Vdc	2,0 A
KPSA10-12	12 Vdc	0,84 A
KPSA10-15	15 Vdc	0,67 A
KPSA10-24 (*)	24 Vdc	0,42 A

KPSA15-y, 15W Series, y=3,3-24 in steps of 0,1

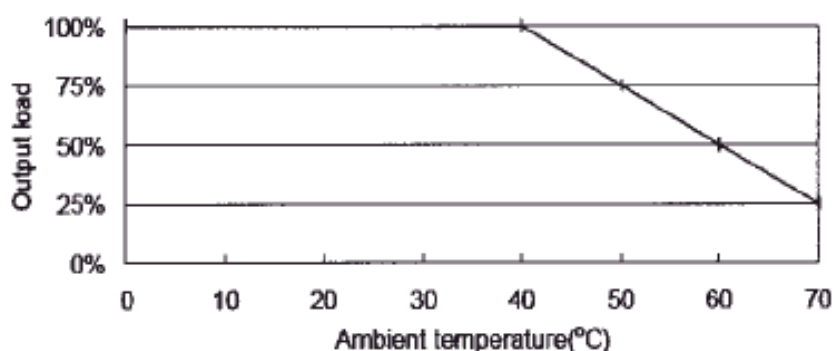
Models	Output voltage	Max. load
KPSA15-3R3 (*)	3,3 Vdc	3,0 A
KPSA15-5	5 Vdc	3,0 A
KPSA15-12	12 Vdc	1,25 A
KPSA15-15	15 Vdc	1,0 A
KPSA15-24 (*)	24 Vdc	0,63 A

Summary of testing:

The component was tested according to the standard IEC 60950-1:2005 (2nd Edition) + A1:2009 + A2:2013 and/or EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011.

Additionally the component was also evaluated according to the standards CSA C22.2 No. 60950-1:2007 + A1:2011 + A2:2014 and UL60950-1:2007 (2nd Edition) + A1:2011 + A2:2014 and fulfils the requirements of these standards.

- 1) The products were tested to be suitable for connection to 16A (IEC) and 20 A (North America) branch circuit. The unit is approved for TN mains star connections and IT mains with 230 Vac phase to phase voltage. The unit provides internally one fuse in line.
- 2) All secondary output circuits are separated from mains by reinforced insulation and rated SELV non hazardous energy levels.
- 3) The unit does not provide disconnect device. Disconnecting device is end product consideration. Power supply unit is intended for building-in.
- 4) Safety Instructions: Built in product, safety instructions are end product considerations
- 5) The power supply is rated class II. Power supply unit is provided with input and output pins or insulated wires for soldering to a PCB (proper mounting is end product consideration).
- 6) The transformer T1 provides reinforced insulation. These transformers are built up to fulfil the requirement of insulation class B and provide in addition an UR (OBJY2) insulation system (see also list of safety critical components).
- 7) The equipment has been evaluated for use in a Pollution Degree 2 and overvoltage category II environment and a maximum altitude of 2000 m.
- 8) A suitable Electrical and Fire enclosure shall be provided in the end equipment.
- 9) The product was evaluated for a maximum ambient of 70 °C. The unit works with rated load condition up to 40°C. For ambient temperatures above 40°C the unit is specified with derating of 2,5% load per °C.



- 10) Approval within the end product: Leakage current measurement should be verified with the unit built into the end product.
- 11) Power supply unit could also be powered by DC Input voltage.
Rated input voltage range: 100-270 Vdc
Operational input voltage range: 100-370 Vdc
Rated and operational input voltage range specified within the technical specification.
- 12) DC mains is considered as secondary circuit.

History Sheet:

Date	Report No.	Change/Modification	Rev. No.
2010-10-25	T223-0315/10	Initial Test Report issued	--
2012-12-03	T223-0208/12	<p>This report is a reissue of CB Test Report Ref. No.: T223-0315/10, CB Test Certificate Ref. No. SI-2708. 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.</p> <p>This test report has been amended, due upgrade to IEC 60950-1:2005 (2nd Ed.) + A1:2009 / EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011</p> <p>No additional tests were considered necessary.</p>	1.0
2016-02-05	T223-0491/15	<p>Test report updated to IEC 60950-1:2005 (Second Edition) + A1:2009 + A2:2013 and EN 60950-1:2006 + A1:2010 + A2:2013 + A11:2009 + A12:2011</p> <p>Minor update of the PCB trace on secondary side (see enclosure No. 3, Revision No. 2.0).</p> <p>List of critical components was updated and transformer drawings.</p> <p>No additional tests were considered necessary.</p>	2.0

Abbreviations used in the report:

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

Indicate used abbreviations (if any)