



Test Report issued under the responsibility of:



TEST REPORT

IEC 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety requirements

| | |
|-----------------------------|--------------------|
| Report Number | E135494-A6012-CB-1 |
| Date of issue..... | 2019-09-26 |
| Total number of pages | 73 |

| | |
|-------------------------------|--|
| Applicant's name | TDK-LAMBDA UK LTD |
| Address | KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM |

| | |
|--|---|
| Name of Test Laboratory preparing the Report | UL International Polska Sp. z o.o. Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland |
|--|---|

| | |
|-------------------------------|-----------------------------------|
| Test specification: | |
| Standard | IEC 62368-1:2014 (Second Edition) |
| Test procedure | CB Scheme |
| Non-standard test method..... | N/A |

| | |
|--------------------------------------|-------------|
| Test Report Form No | IEC62368_1B |
| Test Report Form(s) Originator | UL(US) |
| Master TRF..... | 2014-03 |

Copyright © 2014 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.


This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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.

General disclaimer:

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.

| | | |
|---|---|---|
| Test Item description | : AC-DC Power Supply for DIN rail | |
| Trade Mark | : TDK LAMBDA | |
| Manufacturer | : TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM | |
| Model/Type reference | : DRB100-24-1-xzy where x, y and z may be any alphanumeric character or blank, considered non safety relevant information. | |
| Ratings | : Input: 100-240 Vac, 50/60 Hz, 1.8 A Maximum Output: 24-28 Vdc, 4.2-3.6 A Maximum power: 100.8 W Operating ambient temperature: 55 °C for 100% load. >55 °C up to 70 °C for 50% load. | |
| Testing procedure and testing location: | | |
| <input checked="" type="checkbox"/> | CB Testing Laboratory: | |
| Testing location/ address | : UL International Polska Sp. z o.o., Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland | |
| Tested by (name + signature)..... | Piotr A. Bizunowicz / Project Handler | |
| Approved by (name + signature) | Robert Dmitruk / Reviewer |  |
| Testing procedure: CTF Stage 1 | | |
| Testing location/ address..... | : | |
| Tested by (name + signature)..... | | |
| Approved by (name + signature) | | |
| Testing procedure: CTF Stage 2 | | |
| Testing location/ address..... | : | |
| Tested by (name + signature)..... | | |
| Witnessed by (name + signature)..... | | |
| Approved by (name + signature) | | |

| <input type="checkbox"/> | Testing procedure: CTF Stage 3 | |
|--|--------------------------------|--|
| <input type="checkbox"/> | Testing procedure: CTF Stage 4 | |
| Testing location/ address..... : | | |
| Tested by (name + signature).....: | | |
| Witnessed by (name + signature).....: | | |
| Approved by (name + signature) | | |
| Supervised by (name + signature) | | |

List of Attachments (including a total number of pages in each attachment):

National Differences (30 pages)

Enclosures (62 pages)

Summary of testing:

Tests performed (name of test and test clause):

STEADY FORCE TEST, 30 N (4.4.4.2, ANNEX T.3)

STEADY FORCE TEST FOR INTERNAL ENCLOSURE AND BARRIER (4.4.4.5, ANNEX T.3)

STRESS RELIEF TEST (4.4.4.7, ANNEX T.8)

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES (5.2, 5.7)

MAXIMUM OPERATING TEMPERATURE FOR MATERIALS, COMPONENTS AND SYSTEMS (5.4.1.4, Annex B.2)

DETERMINATION OF WORKING VOLTAGE (5.4.1.8)

BALL PRESSURE TEST (5.4.1.10.3)

HUMIDITY CONDITIONING (5.4.8)

ELECTRIC STRENGTH TEST (5.4.9)

SAFEGUARDS AGAINST CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR (5.5.2.2)

PROTECTIVE BONDING CONDUCTORS: LIMITED SHORT CIRCUIT TEST (5.6.4, Annex R)

RESISTANCE OF THE PROTECTIVE BONDING SYSTEM (5.6.6.2)

PROSPECTIVE TOUCH VOLTAGE AND TOUCH CURRENT MEASUREMENT (5.7)

POWER MEASUREMENTS (6.2.2.2, 6.2.2.3)

Testing Location:

CBTL: UL International Polska Sp. z o.o., Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland

Test per IEC60950-1 2nd ed+Am1 clause 4.2.3 derived from test record no.1 of E135494-A91 are considered representative.

Test per IEC60950-1 2nd ed+Am1 clause 4.2.3 derived from test record no.1 of E135494-A91 are considered representative.

Test per IEC60950-1 2nd ed+Am1 clause 4.2.7 derived from test record no.1 of E135494-A91 are considered representative.

Unless otherwise noted, Tests per IEC60950-1 2nd ed+Am1 clauses 2.2.2, 2.4.1, 2.10.2, 5.1 derived from test record no.1 of E135494-A91 are considered representative.

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A91 are considered representative.

Tests per IEC60950-1 2nd ed+Am1 clause 2.10.2 derived from test record no.1 of E135494-A91 are considered representative.

test per IEC60950-1 2nd ed+Am1 clause 4.5.5 derived from test record no.1 of E135494-A91 is considered representative.

conducted within this evaluation

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 5.2 derived from test record no.1 of E135494-A91 are considered representative.

conducted within this evaluation

conducted within this evaluation

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clauses 2.6.1 and 2.6.3.4 derived from test record no.1 of E135494-A91 are considered representative.

conducted within this evaluation

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clauses 1.2.2.1, 2.1.1.5, 2.1.2 derived from test

| | |
|--|--|
| <p>ARCING PIS DETERMINATION (6.2.3.1)</p> | <p>record no.1 of E135494-A91 are considered representative. assessed by review of results of tests per IEC60950-1 2nd ed+Am1 clauses 2.2.2 and 2.10.2 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>NORMAL OPERATING CONDITIONS TEMPERATURE TEST (6.3)</p> | <p>Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>INPUT TEST: SINGLE PHASE (B.2.5)</p> | <p>Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.2 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT (B.2.6)</p> | <p>Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>SIMULATED ABNORMAL OPERATING CONDITIONS (B.3)</p> | <p>Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clauses 5.3.1 to 5.3.9, annex C derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>SIMULATED SINGLE FAULT CONDITIONS (B.4)</p> | <p>Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clauses 2.2.2, 2.2.3, 5.3.1 5.3.4 and 5.3.7 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>TEST FOR THE PERMANENCE OF MARKINGS (ANNEX F.3.10)</p> | <p>tests per IEC60950-1 2nd ed+Am1 clause 1.7.11 derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>TRANSFORMER OVERLOAD (ANNEX G.5.3.3)</p> | <p>tests per IEC60950-1 2nd ed+Am1 annex C derived from test record no.1 of E135494-A91 are considered representative.</p> |
| <p>LIMITED SHORT CIRCUIT TEST (ANNEX R.1, 5.6.4.1, 5.6.4.4, 5.6.5.1)</p> | <p>performed under this evaluation</p> |
| <p>STEADY FORCE TEST, 10 N (ANNEX T.2, 5.4.2.6, 5.4.3.2, G.15.3.6)</p> | <p>tests per IEC60950-1 2nd ed+Am1 clause 4.2.2 derived from test record no.1 of E135494-A91 are considered representative.</p> |

Summary of compliance with National Differences:

List of countries addressed: AU,NZ, JP, EU Group Differences, US,CA

The product fulfils the requirements of: EN 62368-1:2014 + A11:2017

Copy of Marking Plate - Refer to Enclosure titled Marking Plate for copy.

| TEST ITEM PARTICULARS: | |
|--|--|
| Classification of use by | Skilled person |
| Supply Connection | AC Mains |
| Supply % Tolerance | range 90-264Vac |
| Supply Connection – Type | Not directly connected to MAINS |
| Considered current rating of protective device as part of building or equipment installation | 20 A; building; |
| Equipment mobility | for building-in |
| Over voltage category (OVC) | OVC II |
| Class of equipment | Class I Class II with functional earthing |
| Access location | N/A |
| Pollution degree (PD) | PD 2 |
| Manufacturer’s specified maximum operating ambient (°C) | 55 °C (100% load) and 70 °C (50% load) |
| IP protection class | IPX0 |
| Power Systems | TN TT |
| Altitude during operation (m) | 3000m m |
| Altitude of test laboratory (m) | 2000 m or less |
| Mass of equipment (kg) | 0.31 |
| 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..... : | 2019-07-19, 2019-08-20 |
| Date (s) of performance of tests..... : | 2019-09-13 to 2019-09-20 |
| 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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> | |
| Manufacturer’s Declaration per sub-clause 4.2.5 of IEC60068-2-1: | |

| | |
|---|--|
| 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 : | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable |
|---|--|

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

| | |
|--|--|
| Name and address of factory (ies) : | TDK-LAMBDA MALAYSIA SDN BHD LOT 2 & 3, BATU 9 3/4 KAWASAN PERINDUSTRIAN BANDAR BARU JAYA GADING 26070 KUANTAN PAHANG MALAYSIA |
|--|--|

GENERAL PRODUCT INFORMATION:

Report Summary

All applicable tests according to the referenced standard(s) have been carried out.

Product Description

The product is a Switch Mode AC-DC Power Supply for DIN-Rail mounting.

Model Differences

N/A

Additional application considerations – (Considerations used to test a component or sub-assembly) -

This report is based on previously conducted testing (as listed below) and the review of product construction of original UL report Ref. No. E135494-A91 dated 2013-09-03.

Refer to Section “Test performed (name of test and test clause)” covering all applicable performance tests and rationale for waived tests.

Output: 24-28 Vdc, 4.2-3.6 A
 Maximum power: 100.8 W

Operating ambient temperature: 55 °C at 100% load and derating above 55 °C up to 70 °C at 50% load.

Sample Operation Position: DIN-Rail vertical (input connectors aligned on bottom, output connectors on top side).

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of : 55 °C (100% load) and 70 °C (50% load)
- The product is intended for use on the following power systems : TN, TT
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : Range 90-264Vac
- The equipment disconnect device is considered to be : determined in End PProduct

- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS) : Output
- The following were investigated as part of the protective earthing/bonding : Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)
- The Risk Group of a lamp or lamp system (including LEDs) is : Exempt
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual, including French language for Canada
- The product was investigated to the following additional standards : EN 62368-1:2014 + A11:2017
- The following scope limitations apply to this test report and are confirmed by Applicant to be covered separately. Additional evaluation and/or tests may be required when submitting this CB Report to a National Certification Body (NCB) to obtain a national mark:
 - 1) no EMC tests nor evaluation to EMC Directive 2004/108/EC and 2014/30/EU,
 - 2) no evaluation to RoHS Directives 2002/95/EC, 2011/65/EU and (EU) 2016/585,
 - 3) no evaluation to Council Recommendation 1999/519/EC nor 2006/25/EC,
 - 4) only English version of markings and instructions provided and reviewed,

Engineering Conditions of Acceptability

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

- The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : T1-Primary-Protective Earth: 372Vrms, 536Vpk, T1-Primary-SELV: 368Vrms, 584Vpk
- The following output circuits are at ES1 energy levels : Output
- The following output circuits are at PS3 energy levels : Output
- 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 conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : "N"
- The following end-product enclosures are required : Fire, Electrical
- 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 Class155(F)
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing : T1, PC101, PC102, C55
- The power supply was evaluated to be used at altitudes up to : 3000m