



Test Report issued under the responsibility of:



**TEST REPORT**

**IEC 62368-1**

**Audio/video, information and communication technology equipment**

**Part 1: Safety requirements**

|                             |                    |
|-----------------------------|--------------------|
| <b>Report Number</b> .....  | E135494-A6013-CB-1 |
| Date of issue.....          | 2019-09-27         |
| Total number of pages ..... | 66                 |

|                               |  |
|-------------------------------|--|
| <b>Applicant's name</b> ..... | <b>TDK-LAMBDA UK LTD</b>                                       |
| Address .....                 | <b>KINGSLEY AVE<br/>ILFRACOMBE<br/>EX34 8ES UNITED KINGDOM</b> |

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

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

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

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**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.**

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 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<br>  |   |
| Manufacturer                            | : TDK-LAMBDA UK LTD<br>KINGSLEY AVE<br>ILFRACOMBE<br>EX34 8ES UNITED KINGDOM  |   |
| Model/Type reference                    | : DRB50-5-1-xyz,<br>DRB50-12-1-xyz,<br>DRB50-15-1-xyz,<br>DRB50-24-1-xyz,<br>DRB50-48-1-xyz<br><br>where x, y and z can be any alphanumeric character or blank,<br>not safety relevant.   |   |
| Ratings                                 | : Input:<br>All models: 100-240 Vac, 2.4 A max, 50/60 Hz<br>Output:<br>DRB50-5-1-xyz: 5-5.5 Vdc / 6-5.4 A, max 30 W.<br>DRB50-12-1-xyz: 12-15 Vdc / 3.4 A, max. 51 W.<br>DRB50-15-1-xyz: 15 Vdc / 3.4 A, max. 51 W.<br>DRB50-24-1-xyz: 24-28 Vdc / 2.1-1.8 A, max. 50.4 W.<br>DRB50-48-1-xyz: 48-52.8 Vdc / 1.05-0.95 A, max. 50.4 W. |   |
| 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<br>Sekocin Nowy, Poland  |   |
| Tested by (name + signature)            | Piotr A. bizunowicz / Project<br>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 (47 pages)

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

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)

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)

ARCING PIS DETERMINATION (6.2.3.1)

NORMAL OPERATING CONDITIONS TEMPERATURE TEST (6.3)

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

conducted within this evaluation (after stress relief)

conducted within this evaluation

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-A93 are considered representative.

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A93 are considered representative.

Tests per IEC60950-1 2nd ed+Am1 clause 2.10.2 derived from test record no.1 of E135494-A93 are considered representative.

Tests per IEC60950-1 2nd ed+Am1 clause 2.10.2 derived from test record no.1 of E135494-A93 are considered representative.

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 5.2 derived from test record no.1 of E135494-A93 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-A93 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 record no.1 of E135494-A93 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-A93

Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A93 are considered representative.

|  |  |
|--|--|
| INPUT TEST: SINGLE PHASE (B.2.5)   | Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 1.6.2 derived from test record no.1 of E135494-A93 are considered representative.   |
| NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT (B.2.6)  | Unless otherwise noted, tests per IEC60950-1 2nd ed+Am1 clause 4.5 derived from test record no.1 of E135494-A93 are considered representative.   |
| SIMULATED ABNORMAL OPERATING CONDITIONS (B.3)  | 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-A93 are considered representative.                      |
| SIMULATED SINGLE FAULT CONDITIONS (B.4)  | 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-A93 are considered representative.          |
| TEST FOR THE PERMANENCE OF MARKINGS (ANNEX F.3.10)   | conducted within this evaluation   |
| TRANSFORMER OVERLOAD (ANNEX G.5.3.3)   | tests per IEC60950-1 2nd ed+Am1 annex C derived from test record no.1 of E135494-A93 are considered representative.  |
| LIMITED POWER SOURCE (ANNEX Q.1)   | tests per IEC60950-1 2nd ed+Am1 clause 2.5 derived from test record no.1 of E135494-A93 and test per UL1310 derived from Test record no. 2 of E135494-A93 are considered representative. |
| LIMITED SHORT CIRCUIT TEST (ANNEX R.1, 5.6.4.1, 5.6.4.4, 5.6.5.1)  | conducted within this evaluation   |
| STEADY FORCE TEST, 10 N (ANNEX T.2, 5.4.2.6, 5.4.3.2, G.15.3.6)  | tests per IEC60950-1 2nd ed+Am1 clause 4.2.2 derived from test record no.1 of E135494-A93 are considered representative.   |
| <p><b>Summary of compliance with National Differences:</b></p> <p><b>List of countries addressed:</b> AU,NZ, JP, EU Group Differences, US,CA</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of:</b> EN 62368-1:2014 + A11:2017</p> |  |

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

| <b>TEST ITEM PARTICULARS:</b>  |   |
|--|---|
| Classification of use by   | Skilled person  |
| Supply Connection  | AC Mains  |
| Supply % Tolerance   | range 85-264Vac                                       |
| Supply Connection – Type   | To be determined in End Use Application               |
| Considered current rating of protective device as part of building or equipment installation   | 20 A;<br>building;                                    |
| Equipment mobility   | for building-in                                       |
| Over voltage category (OVC)  | OVC II  |
| Class of equipment   | Class I   |
| Access location  | Not accessible for ordinary person                    |
| Pollution degree (PD)  | PD 2  |
| Manufacturer’s specified maximum operating ambient (°C)  | 55 °C (full load) and 70 °C (with derating 50% load). |
| IP protection class  | IPX0  |
| Power Systems  | TN<br>TT  |
| Altitude during operation (m)  | 3000 m  |
| Altitude of test laboratory (m)  | 2000 m or less  |
| Mass of equipment (kg)   | 0.2   |
| <b>POSSIBLE TEST CASE VERDICTS:</b>  |   |
| - 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)  |
| <b>TESTING:</b>  |   |
| Date of receipt of test item.....:   | 2019-07-19, 2019-08-20                                |
| Date (s) of performance of tests.....:   | 2019-09-06 to 2019-09-13                              |
| <b>GENERAL REMARKS:</b>  |   |
| <p>"(See Enclosure #)" refers to additional information appended to the report.<br/>                     "(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> |   |
| <b>Manufacturer’s Declaration per sub-clause 4.2.5 of IEC60335-1:</b>  |   |

|  |   |
|--|---|
| <p>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 .....</p> | <p><input type="checkbox"/> Yes<br/> <input checked="" type="checkbox"/> Not applicable</p> |
|--|---|

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

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

**GENERAL PRODUCT INFORMATION:**

**Report Summary**

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

**Product Description**

The equipment is a switch-mode AC-DC power supply (DIN rail type) intended for building-in.

**Model Differences**

All models share the same mechanical and electrical design, except for output ratings, transformer (number of turns in secondary winding) and differences in output circuitry.

DRB50-5-1-xyz: output can be adjusted between 5-5.5 Vdc / 6-5.4 A, max 30 W.  
 DRB50-12-1-xyz: output can be adjusted between 12-15 Vdc / 3.4 A, max. 51 W.  
 DRB50-24-1-xyz: output can be adjusted between 24-28 Vdc / 2.1-1.8 A, max. 50.4 W.  
 DRB50-48-1-xyz: output can be adjusted between 48-52.8 Vdc / 1.05-0.95 A, max. 50.4 W.

**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 report UL Ref. No. E135494-A93, dated 2013-11-13.

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

The following derating was considered:  
 100% load at 55°C ambient.  
 50% load at 70°C ambient.  
 Linear derating of output load from 55°C to 70°C.

Additional investigation for the output of the PSU to be classified as NEC Class 2 Output acc. to UL 1310 / CSA C22.2 No.223 was conducted under the project # 4787390364. This classification does not apply to DRB50-5-1, which has output rating exceeding UL1310 limits.

**Technical Considerations**



- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of : 55 °C (full load) and 70 °C (with derating 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 : Absolute 85-264V
- The equipment disconnect device is considered to be : To be determined in End product
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS) : Output of the power supply DRB50-12-1, DRB50-24-1, DRB50-48-1. This is not applicable to DRB50-5-1.
- 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
- Output of the power supply DRB50-12-1, DRB50-24-1, DRB50-48-1 is classified to be NEC Class 2 Output. This is not applicable to DRB50-5-1.
- 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,
  - 5) no evaluation to Directive 96/29/Euratom.

### **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 : Primary-SELV: 219 Vrms, 488 Vpk, Primary-Earthed Dead Metal: 219 Vrms, 418 Vpk
- The following output circuits are at ES1 energy levels : All outputs
- The following output circuits are at PS2 energy levels : All outputs
- 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 : Electrical, Fire
- 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 class 155 (F)
- The power supply was evaluated to be used at altitudes up to : 3000m