**Test Report issued under the responsibility of:**

# TEST REPORT
# IEC 60950-1
# Information technology equipment - Safety - Part 1: General requirements

| | |
|---|---|
| **Report Reference No** ..... : | E122103-A159-CB-2 |
| Date of issue ..... : | 2015-08-10 |
| Total number of pages ..... : | 16 |
| **CB Testing Laboratory** ..... : | UL Japan, Inc. |
| Address ..... : | 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan |
| **Applicant's name** ..... : | TDK-LAMBDA CORP |
| Address ..... : | NAGAOKA TECHNICAL CENTER<br>R&D DIV<br>2704-1 SETTAYA-MACHI<br>NAGAOKA-SHI<br>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 |

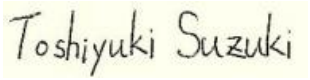


**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**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** | : | Switching Power Supply |
| Trade Mark | : | TDK-Lambda |
| Manufacturer | : | TDK-LAMBDA CORP<br>NAGAOKA TECHNICAL CENTER<br>R&D DIV<br>2704-1 SETTAYA-MACHI<br>NAGAOKA-SHI<br>NIIGATA 940-1195 JAPAN |
| Model/Type reference | : | RWS50B-5, RWS50B-12, RWS50B-24, and RWS50B-48<br><br>Maybe followed by suffix "abc" (a is /, b is CO2, c is FG, DIN; and "abc" may be blank). |
| Ratings | : | Input:<br>100-240 Vac, 50-60 Hz, 1.1 A |

| **Testing procedure and testing location:** | | |
|---|---|---|
| [x] | **CB Testing Laboratory** | |
| | Testing location / address .....: | UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan |
| [ ] | **Associated CB Test Laboratory** | |
| | Testing location / address .....: | |
| | Tested by (name + signature) .....: | Tetsuo Iwasaki  |
| | Approved by (name + signature)....: | Toshiyuki Suzuki  |
| [ ] | **Testing Procedure: TMP/CTF Stage 1** | |
| | Testing location / address .....: | |
| | Tested by (name + signature) .....: | |
| | Approved by (name + signature)....: | |
| [ ] | **Testing Procedure: WMT/CTF Stage 2** | |
| | Testing location / address .....: | |
| | Tested by (name + signature) .....: | |
| | Witnessed by (name + signature) ..: | |
| | Approved by (name + signature)....: | |
| [ ] | **Testing Procedure: SMT/CTF Stage 3 or 4** | |
| | Testing location / address .....: | |
| | Tested by (name + signature) .....: | |
| | Approved by (name + signature)....: | |
| | Supervised by (name + signature) .: | |
| [ ] | **Testing Procedure: RMT** | |
| | Testing location / address .....: | |
| | Tested by (name + signature) .....: | |
| | Approved by (name + signature)....: | |
| | Supervised by (name + signature) .: | |

**List of Attachments**

National Differences (29 pages)

Enclosures (0 pages)

**Summary of Testing:**

No tests were conducted

**Summary of Compliance with National Differences:**

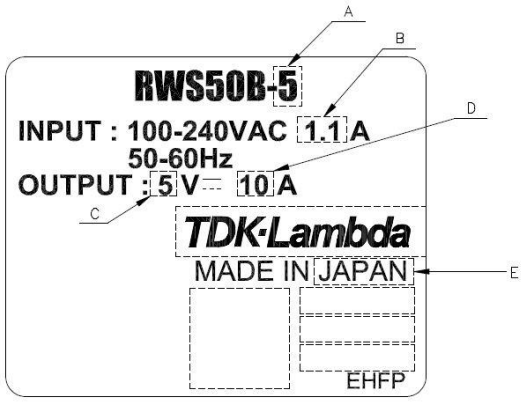
Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AR, AT, AU, BE, BY, CA, CH, CN, CZ, DE, DK, ES, EU, FI, FR, GB, HU, IL, IN, IT, JP, KR, MY, NL, NO, NZ, PL, SA, SE, SG, SI, SK, UA, US

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

**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.




| MODEL | A | B | C | D |
|---|---|---|---|---|
| RWS50B-5 | 5 | 1.1 | 5 | 10 |
| RWS50B-12 | 12 | 1.1 | 12 | 4.3 |
| RWS50B-24 | 24 | 1.1 | 24 | 2.2 |
| RWS50B-48 | 48 | 1.1 | 48 | 1.1 |

E: COUNTRY OF MANUFACTURE WILL BE SHOWN. JAPAN, MALAYSIA OR CHINA.

| | |
|---|---|
| **Test item particulars :** | |
| Equipment mobility ..... : | for building-in |
| Connection to the mains ..... : | N/A |
| Operating condition ..... : | continuous |
| Access location ..... : | N/A (for building-in) |
| Over voltage category (OVC) ..... : | OVC II |
| Mains supply tolerance (%) or absolute mains supply values ..... : | +10%, -10% |
| Tested for IT power systems ..... : | Yes |
| IT testing, phase-phase voltage (V) ..... : | 230 |
| Class of equipment ..... : | Class I (earthed) |
| Considered current rating of protective device as part of the building installation (A) ..... : | 20 A |
| Pollution degree (PD) ..... : | PD 2 |
| IP protection class ..... : | IP X0 |
| Altitude of operation (m) ..... : | Up to 3000 m |
| Altitude of test laboratory (m) ..... : | approximately 10 to 20 m |
| Mass of equipment (kg) ..... : | approximately 0.23 kg |
| **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:**<br><br>"(see Enclosure #)" refers to additional information appended to the report.<br>"(see appended table)" refers to a table appended to the report.<br><br>Throughout this report a point is used as the decimal separator. | |
| **Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02:** | Yes |
| 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 .....<br><br>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<br>NO 6 XING CHUANG ER LU WUXI JIANGSU 214028 CHINA<br><br>TDK-LAMBDA MALAYSIA SDN BHD<br>PLO33 KAWASAN PERINDUSTRIAN SENAI 81400 SENAI<br>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

SENDAN ELECTRONICS MFG CO LTD
1010 HABUSHIN NANTO-SHI TOYAMA-KEN 939-1756 JAPAN

ZHANGJIAGANG HUA YANG ELECTRONICS CO LTD
TONGXIN RD ZHAOFENG ECONOMIC DEVELOPMENT ZONE LEYU TOWN ZHANGJIAGANG 215622 JIANGSU CHINA

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

**GENERAL PRODUCT INFORMATION:**

**Report Summary**

The original report was modified on 2016-06-03 to include the following changes/additions:
This report is only valid in conjunction with CB Test Report Ref. No. E122103-A159-CB-2.

Amendment 1 is to cover the following:

- Correction of component type name of Terminal Block (TB1), to Model TBW-05 (T7513-A) from TBW-07 (T7513-A).
- Addition of evaluation for the following National Differences:
AR, AT, AU, BE, BY, CH, CN, CZ, ES, FR, HU, IL, IN, IT, JP, MY, NL, NO, NZ, PL, RS, RU, SA, SG, SK, TR, UA.

No tests were deemed necessary.

**Product Description**

The product covered in this Test Report is building-in type switching power supply with a single output circuit.

Output:
5 Vdc (4.5 Vdc - 5.75 Vdc), maximum 10 A (maximum 50 W) (for RWS50B-5)
12 Vdc (10.8 Vdc - 13.8 Vdc), maximum 4.3 A (maximum 51.6 W) (for RWS50B-12)
24 Vdc (21.6 Vdc - 27.6 Vdc), maximum 2.2 A (maximum 52.8 W) (for RWS50B-24)
48 Vdc (43.2 Vdc - 52.8 Vdc), maximum 1.1 A (maximum 52.8 W) (for RWS50B-48)

**Model Differences**

Each model is identical, except for model designation, output rating, secondary winding and internal construction of Transformer (T1), and secondary components.

Standard model is Terminal Block model with Chassis and Cover.
And RWS50B Series maybe followed by suffix "abc" (a is /, b is CO2, c is FG, DIN; and "abc" may be blank).
1. CO2: Model with optional thin coating (QMJU2) on both sides of PWB.
2. FG: Model with Low Leakage (the capacitances for Primary - FG reduced).
3. DIN: Model with Cover and DinRail Mounting Bracket.

**Additional Information**

The Clearances and Creepage Distances have additionally been assessed for suitability up to 3000 m elevation.

UL94 Standard has requirements that meet or exceed the relevant IEC requirements.

In addition, following National Differences were considered:
- Russian Federation (RU)**,
- Turkey (TR)**.
- Serbia (RS)**
Note) **: Only Group Differences.

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: See Enclosure Id. 7-01.
- The product is intended for use on the following power systems: IT, TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (which includes all European national differences, including those specified in this test report).

**Engineering Conditions of Acceptability**

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

- Earth terminal provided on Terminal Block (TB1) has not been evaluated as protective earthing terminal. This component is intended to be connected to a protective earth via earthed parts of end-product. If protective earthing conductor is connected to the earth terminal on Terminal Block (TB1) in the end product, Limited Short-Circuit Test per CSA C22.2 No.04 shall be conducted. --
- Model RWS50B-5 was tested with Output Voltage Range of 4.5 - 5.75 Vdc (maximum 50 W). , Model RWS50B-12 was tested with Output Voltage Range of 10.8 - 13.8 Vdc (maximum 51.6 W). , Model HWS50B-24 was tested with Output Voltage Range of 21.6 - 27.6 Vdc (maximum 52.8 W). , Model RWS50B-48 was tested with Output Voltage Range of 43.2 - 52.8 Vdc (maximum 52.8 W). Adjustment was made via Variable Resistor (VR51). --
- Line to Line Capacitor C1 have maximum 0.33 uF for capacitance, C4 have maximum 0.1 uF for capacitance. C1: 0.33 uF and C4: 0.1 uF were used in test. Therefore, consideration shall be given in conducting Discharge Test in the end product application with respect to the variation in C1 and C4. --
- Line to ground Capacitors C2, C3 and C5 has maximum 2200 pF for capacitance. C2, C3 and C5: 2200pF were used in test. Therefore, consideration shall be given in conducting Touch Current Test in the end product application with respect to the variation in C2, C3 and C5. --
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: [Model RWS50B-5] Primary-Secondary: 255 Vrms, 444 Vpk / Primary-Ground: 251 Vrms, 462 Vpk, [Model RWS50B-12] Primary-Secondary: 259 Vrms, 472 Vpk / Primary-Ground: 256 Vrms, 460 Vpk, [Model RWS50B-24] Primary-Secondary: 261 Vrms, 488 Vpk / Primary-Ground: 260 Vrms, 476 Vpk, [Model RWS50B-48] Primary-Secondary: 267 Vrms, 474 Vpk / Primary-Ground: 268 Vrms, 464 Vpk, --

- The following secondary output circuits are SELV: Output of Models RWS50B-5, RWS50B-12, RWS50B-24, and RWS50B-48 --
- The following secondary output circuits are at non-hazardous energy levels: Output of Models RWS50B-5, RWS50B-12, RWS50B-24, and RWS50B-48. --
- The following secondary output circuits are supplied by a Limited Power Source: Output of Models RWS50B-12, RWS50B-24, and RWS50B-48 --
- The power supply terminals and/or connectors are: Suitable for factory wiring only --
- 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: Not been conducted --
- 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): Transformer (T1) (Class F or Class B) --
- The following end-product enclosures are required: Electrical, Fire --

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)