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

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

| | |
|---|---|
| **Report Reference No** ..... : | E122103-A200-CB-1 |
| Date of issue ..... : | 2015-10-15 |
| Total number of pages ..... : | 10 |
| **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 |

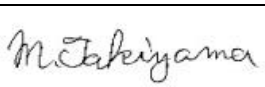


**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**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** ..... : | AC-DC 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 ..... : | KWS5A-5, KWS5A-12, KWS5A-15, KWS5A-24.<br>KWS10A-5, KWS10A-12, KWS10A-15, KWS10A-24. |
| Ratings ..... : | Input:<br>100-240 V, AC 50-60 Hz, 0.13 A (KWS5A series)<br>100-240 V, AC 50-60 Hz, 0.25 A (KWS10A series)<br><br>Output: See Additional Information. |

| **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)....: | Masatomo Takiyama  |
| [ ] | **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 (0 pages)

Enclosures (7 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: CA, DE, DK, EU, FI, GB, KR, SE, SI, US
The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

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

| | |
|---|---|
| **Test item particulars :** | |
| Equipment mobility ..... : | for building-in |
| Connection to the mains ..... : | N/A |
| Operating condition ..... : | continuous |
| Access location ..... : | for building-in |
| Over voltage category (OVC) ..... : | OVC II |
| Mains supply tolerance (%) or absolute mains supply values ..... : | +10%, -10% |
| Tested for IT power systems ..... : | No |
| IT testing, phase-phase voltage (V) ..... : | N/A |
| Class of equipment ..... : | Not classified |
| Considered current rating of protective device as part of the building installation (A) ..... : | 20 A |
| Pollution degree (PD) ..... : | 2 |
| IP protection class ..... : | IPX0 |
| Altitude of operation (m) ..... : | Up to 3000 m |
| Altitude of test laboratory (m) ..... : | less than 2000 m |
| Mass of equipment (kg) ..... : | 35 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(s) of receipt of test item ..... : | N/A |
| Date(s) of Performance of tests ..... : | N/A |
| **General remarks:** | |
| "(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):** | ALPS LOGISTICS FACILITIES CO LTD<br>593-1 NISHIOOHASHI<br>TSUKUBA-SHI<br>IBARAKI-KEN 305-0831 JAPAN<br><br>ZHANGJIAGANG HUA YANG ELECTRONICS CO LTD |

TONGXIN RD
ZHAOFENG ECONOMIC DEVELOPMENT ZONE
LEYU TOWN
ZHANGJIAGANG
JIANGSU 215622 CHINA

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

TDK-LAMBDA MALAYSIA SDN BHD
LOT 2 & 3, BATU 9 3/4
KAWASAN PERINDUSTRIAN
BANDAR BARU JAYA GADING
26070 KUANTAN MALAYSIA

TDK-LAMBDA MALAYSIA SDN BHD
PLO33 KAWASAN PERINDUSTRIAN SENAI
81400 SENAI MALAYSIA

WUXI TDK-LAMBDA ELECTRONICS CO LTD
NO 6
XING CHUANG ER LU
WUXI
JIANGSU 214028 CHINA

**GENERAL PRODUCT INFORMATION:**

**Report Summary**

The original report was modified on 2016-03-14 to include the following changes/additions:
This report is only valid in conjunction with CB Test Report Ref. No. E122103-A200-CB-1.
Amendment 1 report covers following modifications:
(1) - Addition of components R108, R109 and D104.
(2) - Typo correction of material information for potting compound.
[From] Canada Silicone Inc., Type ES8082AH/BH.
[To] MOMENTIVE PERFORMANCE MATERIALS JAPAN L L C., Type TSE3331.

No tests were performed on modification (1) because it was considered minor and does not have negative impact to previous test results. Due to this modification, revisions were made on Enclosure id. 5-01, 5-02, 5-03, 5-04, 5-06, and 5-07.

**Product Description**

The unit is building-in component, module type switching power supply filled with insulating compound.

Output ratings, see Additional Information.

**Model Differences**

<Model Differences between each models in KWS5A series and in KWS10A series >
All models are identical except output ratings, Transformer (T1), and rating of some minor components.

<Differences between KWS5A series and KWS10A series>
KWS5A series and KWS10A series are identical in construction except capacitance of C2, Diode of secondary side (and associated pattern trace), and resistance of R101, R105, R106 (minor component).

**Additional Information**

Rated Output:
KWS5A-5: DC 5V, 1A
KWS5A-12: DC 12V, 0.45A
KWS5A-15: DC 15V, 0.35A
KWS5A-24: DC 24V, 0.22A

KWS10A-5: DC 5V, 2A
KWS10A-12: DC 12V, 0.9A
KWS10A-15: DC 15V, 0.7A
KWS10A-24: DC 24V, 0.5A

See Enclosure id. 7-01 for Output Derating Specification.

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

In this Test Report, CENELEC mark license indicating compliance to EN standard was used to verify component compliance to IEC standard because the standards are technically equivalent.

It was considered that UL Standard has requirements that meet or exceed the relevant IEC requirements.

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 85°C (Depends on load factor. Refer to Enclosed Id 7-01.)
- The product is intended for use on the following power systems: TN

**Engineering Conditions of Acceptability**

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

- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 250 Vrms, 516 Vpk [For KWS5A series], Primary-SELV: 259 Vrms, 516 Vpk [For KWS10A series]
- The following secondary output circuits are SELV: Output of all models
- The following secondary output circuits are at non-hazardous energy levels: Output of all models
- 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

- 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 B)
- The following end-product enclosures are required: Fire, Electrical
- The Case and Base have been evaluated to Reinforced insulation as solid insulation. --

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)