



Test Report issued under
the responsibility of:



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

Report Reference No: E122103-A187-CB-2
Date of issue: 2016-01-07
Total number of pages: 8

CB Testing Laboratory: UL Japan, Inc.
Address: 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan

Applicant's name: TDK-LAMBDA CORP
NAGAOKA TECHNICAL CENTER
Address: R&D DIV
2704-1 SETTAYA-MACHI
NAGAOKA-SHI
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

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If this test Report 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 | Switching Power Supply |
| Trade Mark |  |
| Manufacturer | TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN |
| Model/Type reference | ZWD225PAF-0524x, ZWD225PAF-0541x and JP225PAF-0524x (where x = blank, /J, /L, /T, /A, /FG, /CO, /FGCO, /LCO, /LFG, /LFGCO, /ACO, /AFG, /AFGCO, /JCO, /JFG, /JFGCO, /JL, /JLCO, /JLFG, /JLFGCO, /JA, /JACO, /JAFG, /JAFGCO, /TCO, /TFG, /TFGCO, /TL, /TLCO, /TLFG, /TLFGCO, /TA, /TACO, /TAFG, /TAFGCO) |
| | Note: The variable in above has a definition as describe in below: a) Connector type, - "Blank" with Molex connector - "J" with JST connector - "T" with Terminal Block b) Different metal chassis, - "L" with L-shape metal plate type - "A" with L-shape metal plate and cover c) "FG" with low leakage current (not affecting safety) d) "CO" with coating (not affecting safety) |
| Ratings | ZWD225PAF-0524x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 5 A; 24 V dc, 9.0 A ZWD225PAF-0541x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 5 A; 41 V dc, 5.3 A (36 - 41 V dc, Max. 5.3 A, Max. 225W) JP225PAF-0524x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 1.8 A; 24 V dc, 9.0 A |

| | |
|---|---|
| Testing procedure and testing location: | |
| <input checked="" type="checkbox"/> CB Testing Laboratory | |
| Testing location / address | UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan |
| <input type="checkbox"/> Associated CB Test Laboratory | |
| Testing location / address | |
| Tested by (name + signature) | Ayano Matsumoto  |
| Approved by (name + signature)..... | Tetsuo Iwasaki  |
| <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) | |
| Approved by (name + signature)..... | |
| Supervised by (name + signature) .. | |
| <input type="checkbox"/> 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 (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: AT, BE, BG, BY, CA, CH, CN, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IT, JP, KR, NL, NO, PL, PT, RO, 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 - Refer to Enclosure titled Marking Plate for copy.

Test item particulars :

| | |
|---|-----------------------|
| Equipment mobility | for building-in |
| Connection to the mains | pluggable A |
| Operating condition | continuous |
| Access location | N/A |
| 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 | Class I (earthed) |
| Considered current rating of protective device as part of the building installation (A) | 20A |
| Pollution degree (PD) | PD 2 |
| IP protection class | IP X0 |
| Altitude of operation (m) | up to 2000 |
| Altitude of test laboratory (m) | less than 2000 meters |
| Mass of equipment (kg) | 1.08 |

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.
 "(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Manufacturer's Declaration per Sub Clause 4.2.5 of IEC 60950-1:

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

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 MALAYSIA

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

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

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2016-01-07 to include the following changes/additions:
The test report should be read in conjunction with the original report number:
E122103-A187-CB-2 Reissue, issued on 2016-01-07

-- This Report were deemed to correct, due to:
Add below missing information in Additional Information:
"This is reissue for transfer NCB from Denmark to Japan."

Product Description

PWB with electronics components.

Model Differences

Model ZWD225PAF-0541x is similar to Model ZWD225PAF-0524x except for DC output rating and transformer T2 construction.

Model JP225PAF-0524x is similar to Model ZWD225PAF-0524x except for PWB construction on control circuit for low voltage start up and shut down and OCP with hiccup mode, alternate double layer PWB and output rating.

Additional Information

This report is a reissue of CBTR Ref. No. E122103-A187-CB-1, CB Test Certificate Ref. No. DK-46785-UL due to following modification.

- Addition of Alternate Fuse (F2), Daito Communication Apparatus Co., Ltd., Type DCP20.
- This is reissue for transfer NCB from Denmark to Japan.

Based on previously conducted testing and the review of product construction, product technical documentation including photos, schematics, wiring diagrams and similar, only limited tests were deemed necessary.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: The ambient temperature is specified for air forced cooling at 60°C. , The ambient temperature is specified for convection cooling at 50°C.

- The means of connection to the mains supply is: Pluggable A
- The product is intended for use on the following power systems: 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:

- The equipment had been tested with an external DC cooling fan providing an airflow of 0.7 m/s. --
- The following Production-Line tests are conducted for this product: Electric Strength, Earthing Continuity --
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: JP225PAF-0524x & ZWD225PAF-0524x: T1: Primary-SELV: 231 Vrms, 620 Vpk; T2: Primary-SELV: 285 Vrms, 456 Vpk; ZWD225PAF-0541x T1: Primary-SELV: 351 Vrms, 583 Vpk; T2: Primary-SELV: 386 Vrms, 688 Vpk., --
- The following secondary output circuits are SELV: ZWD225PAF-0524x: +5 V dc and +24 V dc ZWD225PAF-0541x: +5 V dc and +41 V dc JP225PAF-0524x: +5 V dc and +24 V dc , --
- The following secondary output circuits are at hazardous energy levels: ZWD225PAF-0524x: +24 V dc output ZWD225PAF-0541x: +41 V dc output , JP225PAF-0524x: +24 V dc output , --
- The following secondary output circuits are at non-hazardous energy levels: ZWD225PAF-0524x, ZWD225PAF-0541x and JP225PAF-0524x: +5 V dc output. --
- The following output terminals were referenced to earth during performance testing: CN2, pin4 --
- 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: Been conducted --
- The following input terminals/connectors must be connected to the end-product supply neutral: CN1, pin 4 (For MOLEX, model 41791 series); CN1, pin 3 (For JST, model VH series);, CN1, pin 2 (For EMUDEN, model T69XX-A-X), --
- 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), T2 (Class F) --
- The following end-product enclosures are required: Mechanical, Fire, Electrical --
- The maximum continuous power supply output (Watts) relied on forced air cooling from: Fan at 0.7 m/S in flow applied to primary side, see Enclosure Miscellaneous 7-01 for details. --

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 |

Issue Date: 2016-01-07

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Report Reference #

E122103-A187-CB-2

Correction 1 2016-01-07

Indicate used abbreviations (if any)



Test Report issued under
the responsibility of:



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

Report Reference No: E122103-A187-CB-2

Date of issue: 2016-01-07

Total number of pages: 76

CB Testing Laboratory: UL Japan, Inc.

Address: 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan

Applicant's name: TDK-LAMBDA CORP
NAGAOKA TECHNICAL CENTER

Address: R&D DIV
2704-1 SETTAYA-MACHI
NAGAOKA-SHI
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

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|------------------------------------|---|
| Test item description | Switching Power Supply |
| Trade Mark |  |
| Manufacturer | TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2704-1 SETTAYA-MACHI NAGAOKA-SHI NIIGATA 940-1195 JAPAN |
| Model/Type reference | ZWD225PAF-0524x, ZWD225PAF-0541x and JP225PAF-0524x (where x = blank, /J, /L, /T, /A, /FG, /CO, /FGCO, /LCO, /LFG, /LFGCO, /ACO, /AFG, /AFGCO, /JCO, /JFG, /JFGCO, /JL, /JLCO, /JLFG, /JLFGCO, /JA, /JACO, /JAFG, /JAFGCO, /TCO, /TFG, /TFGCO, /TL, /TLCO, /TLFG, /TLFGCO, /TA, /TACO, /TAFG, /TAFGCO) |
| | Note: The variable in above has a definition as describe in below: a) Connector type, - "Blank" with Molex connector - "J" with JST connector - "T" with Terminal Block b) Different metal chassis, - "L" with L-shape metal plate type - "A" with L-shape metal plate and cover c) "FG" with low leakage current (not affecting safety) d) "CO" with coating (not affecting safety) |
| Ratings | ZWD225PAF-0524x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 5 A; 24 V dc, 9.0 A ZWD225PAF-0541x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 5 A; 41 V dc, 5.3 A (36 - 41 V dc, Max. 5.3 A, Max. 225W) JP225PAF-0524x: I/P: 100-240 V ac, 3.0 A, 50/60 Hz O/P: 5 V dc, 1.8 A; 24 V dc, 9.0 A |

| | |
|---|--|
| Testing procedure and testing location: | |
| <input checked="" type="checkbox"/> CB Testing Laboratory | Testing location / address: UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan |
| <input type="checkbox"/> Associated CB Test Laboratory | Testing location / address: |
| | Tested by (name + signature): Ayano Matsumoto <i>A. Matsumoto</i> |
| | Approved by (name + signature).....: Tetsuo Iwasaki <i>T. Iwasaki</i> |
| <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): _____ |
| | Approved by (name + signature).....: _____ |
| | Supervised by (name + signature) ..: _____ |
| <input type="checkbox"/> Testing Procedure: RMT | Testing location / address: |
| | Tested by (name + signature): _____ |
| | Approved by (name + signature).....: _____ |
| | Supervised by (name + signature) ..: _____ |

| | |
|---|------------------------------------|
| List of Attachments | |
| National Differences (49 pages) | |
| Enclosures (31 pages) | |
| Summary Of Testing | |
| Unless otherwise indicated, all tests were conducted at UL Japan, Inc. 4383-326 Asama-cho, Ise-shi, Mie, 516-0021, Japan. | |
| Tests performed (name of test and test clause) | Testing location / Comments |
| Component Failure (5.3.1, 5.3.4, 5.3.7) | |

Summary of Compliance with National Differences:

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

List of countries addressed: AT, BE, BG, BY, CA, CH, CN, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IT, JP, KR, NL, NO, PL, PT, RO, 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 - Refer to Enclosure titled Marking Plate for copy.

Test item particulars :

| | |
|---|-----------------------|
| Equipment mobility | for building-in |
| Connection to the mains | pluggable A |
| Operating condition | continuous |
| Access location | N/A |
| 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 | Class I (earthed) |
| Considered current rating of protective device as part of the building installation (A) | 20A |
| Pollution degree (PD) | PD 2 |
| IP protection class | IP X0 |
| Altitude of operation (m) | up to 2000 |
| Altitude of test laboratory (m) | less than 2000 meters |
| Mass of equipment (kg) | 1.08 |

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 | 2015-12-09 |
| Date(s) of Performance of tests | 2015-12-22, 2015-12-25 |

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 point is used as the decimal separator.

Manufacturer's Declaration per Sub Clause 4.2.5 of IEC 60950-1:

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

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 MALAYSIA

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

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

GENERAL PRODUCT INFORMATION:

Report Summary

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

Product Description

PWB with electronics components.

Model Differences

Model ZWD225PAF-0541x is similar to Model ZWD225PAF-0524x except for DC output rating and transformer T2 construction.

Model JP225PAF-0524x is similar to Model ZWD225PAF-0524x except for PWB construction on control circuit for low voltage start up and shut down and OCP with hiccup mode, alternate double layer PWB and output rating.

Additional Information

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- Addition of Alternate Fuse (F2), Daito Communication Apparatus Co., Ltd., Type DCP20.

Based on previously conducted testing and the review of product construction, product technical documentation including photos, schematics, wiring diagrams and similar, only limited tests were deemed necessary.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: The ambient temperature is specified for air forced cooling at 60°C. , The ambient temperature is specified for convection cooling at 50°C.
- The means of connection to the mains supply is: Pluggable A
- The product is intended for use on the following power systems: 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:

- The equipment had been tested with an external DC cooling fan providing an airflow of 0.7 m/s. --
- The following Production-Line tests are conducted for this product: Electric Strength, Earthing Continuity --
- The end-product Electric Strength Test is to be based upon a maximum working voltage of:
JP225PAF-0524x & ZWD225PAF-0524x: T1: Primary-SELV: 231 Vrms, 620 Vpk; T2: Primary-SELV: 285 Vrms, 456 Vpk; ZWD225PAF-0541x T1: Primary-SELV: 351 Vrms, 583 Vpk; T2: Primary-SELV: 386 Vrms, 688 Vpk., --
- The following secondary output circuits are SELV: ZWD225PAF-0524x: +5 V dc and +24 V dc ZWD225PAF-0541x: +5 V dc and +41 V dc JP225PAF-0524x: +5 V dc and +24 V dc , --
- The following secondary output circuits are at hazardous energy levels: ZWD225PAF-0524x: +24 V dc output ZWD225PAF-0541x: +41 V dc output , JP225PAF-0524x: +24 V dc output , --
- The following secondary output circuits are at non-hazardous energy levels: ZWD225PAF-0524x, ZWD225PAF-0541x and JP225PAF-0524x: +5 V dc output. --
- The following output terminals were referenced to earth during performance testing: CN2, pin4 --
- 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: Been conducted --
- The following input terminals/connectors must be connected to the end-product supply neutral: CN1, pin 4 (For MOLEX, model 41791 series); CN1, pin 3 (For JST, model VH series);, CN1, pin 2 (For EMUDEN, model T69XX-A-X), --
- 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), T2 (Class F) --
- The following end-product enclosures are required: Mechanical, Fire, Electrical --
- The maximum continuous power supply output (Watts) relied on forced air cooling from: Fan at 0.7 m/S in flow applied to primary side, see Enclosure Miscellaneous 7-01 for details. --

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)