

UL TEST REPORT AND PROCEDURE

| | |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard: | UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed-(Audio/video, information and communication technology equipment Part 1: Safety requirements) |
| Certification Type: | Component Recognition |
| CCN: | QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment) |
| Complementary CCN: | N/A |
| Product: | Switching Power Supply for building-in |
| Model: | <p>LS200-X / YYYYY, where X can be 3.3 or 5 and / YYYYY can be / L, / F, / CO, / CO2, / COL, / CO2L, / COF, / CO2F, / LPY or blank.</p> <p>LS200-X / YYYYYY, where X can be 7.5, 12, 15, 18, 24, 28, 36, 40, 48 or 56 and / YYYYYY can be / B, / BCO, / BCO2, / BCOL, / BCO2L, / BM, / BMCO, / BMCO2, / BMCOL, / BMCO2L, / BL, / BML, / L, / F, / CO, / CO2, / COL, / CO2L, / COF, / CO2F, / BF, / BMF, / BCOF, / BCO2F, / BMCOF, / BMCO2F, / LPY or blank.</p> |
| Rating: | <p>Input: 100-240 V ac, 3.5 A, 50/60 Hz</p> <p>Output:</p> <p>LS200-3.3: 3.3 Vdc (+3 - +3.6 Vdc), 40 A or 26 A; LS200-5: 5 Vdc (+4.75 - +5.5 Vdc), 40 A or 26 A; LS200-7.5: 7.5 Vdc (+6.8 - +8.2 Vdc), 26.7 A or 17.3 A; LS200-12: 12 Vdc (+10.8 - +14.4 Vdc), 16.7 A or 11.6 A; LS200-15: 15 Vdc (+13.5 - +16.5 Vdc), 13.4 A or 9.3 A; LS200-18: 18 Vdc, 11.2 A or 7.8 A; LS200-24: 24 Vdc (+22.0 - +28.8 Vdc), 8.4 A or 5.8A; LS200-28: 28 Vdc, 7.2 A or 5 A; LS200-36: 36 Vdc (+32.0 - +40.0 Vdc), 5.6 A or 3.9 A; LS200-40: 40 Vdc, 5 A or 3.5A; LS200-48: 48 Vdc (+42.0 - +57.6 Vdc), 4.2 A or 2.9A; LS200-56: 56 Vdc, 3.6 A or 2.5 A</p> |
| Applicant Name and Address: | <p>TDK-LAMBDA SINGAPORE PTE LTD #06-01/08 1008 TOA PAYOH NORTH SINGAPORE 318996 SINGAPORE</p> |

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Ming Yuo Chai / Project Handler Reviewed By: Orville Chang / Reviewer

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

Electronic components mounted on PWB and housed within metal enclosure.

Model Differences

All Models are similar to each other, except the following:-

- a) Output rating;
- b) Transformer (T1) Secondary winding;
- c) Model designation.

LS200-X / YYYY, where X can be 3.3 or 5 and / YYYY can be / L, / F, / CO, / CO2, / COL, / CO2L, / COF, / CO2F, / LPY or blank.

LS200-X / YYYYYY, where X can be 7.5, 12, 15, 18, 24, 28, 36, 40, 48 or 56 and / YYYYYY can be / B, / BCO, / BCO2, / BCOL, / BCO2L, / BM, / BMCO, / BMCO2, / BMCOL, / BMCO2L, / BL, / BML, / L, / F, / CO, / CO2, / COL, / CO2L, / COF, / CO2F, / BF, / BMF, / BCOF, / BCO2F, / BMCOF, / BMCO2F, / LPY or blank.

- 1) B => Input Connector (CN3) and Output connector (CN4) are from JST;
- 2) BM => Input Connector (CN3) and Output connector (CN4) are from Molex;
- 3) CO => PCB with one (1) side coating;
- 4) CO2 => PCB with two (2) sides coating;
- 5) L => Open frame (Cover removed);
- 6) blank => Input connector and output connector using terminal block TB1 and with fan
- 7) F => perforated cover, without fan
- 8) LPY => for internal customer reference

Test Item Particulars

| | |
|--------------------------|-----------------|
| Classification of use by | Ordinary person |
| Supply Connection | AC Mains |
| Supply % Tolerance | +10%/-10% |
| Supply Connection – Type | for building-in |

| | |
|----------------------------------------------------------------------------------------------|-------------------------------|
| 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 |
| Access location | N/A |
| Pollution degree (PD) | PD 2 |
| Manufacturer's specified maximum operating ambient (°C) | See "Technical Consideration" |
| IP protection class | IPX0 |
| Power Systems | TN |
| Altitude during operation (m) | 2000 m or less |
| Altitude of test laboratory (m) | 2000 m or less |
| Mass of equipment (kg) | 0.17 |

Technical Considerations

- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- 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
- The product was investigated to the following additional standard : EN 62368-1:2014 + A11:2017
- Power Supply Unit is evaluated to output derating. Refer to enclosure 07-03 for details.
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50 °C for 100 % load, (Condition A and B), Mounting Position A, B and C; 70 °C for 60 % load, (Condition E and F), Mounting Position A, B and C. (Model LS200-3.3, LS200-5, LS200-7.5, LS200-12, LS200-15, LS200-24, LS200-36 and LS200-48)
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 30 °C for 65 % load, (Condition C and D), Mounting Position B, C, E and F; 40 °C for 65 % load, (Condition C and D), Mounting Position A; 65 °C for 40 % load, (Condition G and H), Mounting Position A; 65 °C for 30 % load, (Condition I and J), Mounting Position B, C, E and F. (Model LS200/L-3.3, LS200/L-5, LS200/L-7.5)
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40 °C for 70 % load, (Condition C and D), Mounting Position B, C, E and F; 50 °C for 70 % load, (Condition C and D), Mounting Position A; 70 °C for 35 % load, (Condition G and H), Mounting Position A, B, C, E and F. (Model LS200/L-12, LS200/L-15, LS200/L-24, LS200/L-36, LS200/L-48)
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of Forced Air 50 °C, Conventional cooling 30 °C. (Other Models)

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following product-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 : Primary-Earthed Dead Metal: 236.751 Vrms, 340.365 Vpk; Primary-SELV: 438.656 Vrms, 783.203 Vpk
- The following output circuits are at ES1 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 : Terminal Block TB1 (pin 2), connector CN3 (pin 2).
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- 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 equipment is suitable for direct connection to : AC mains supply
- The power supply was evaluated to be used at altitudes up to : "2,000 m"
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- The following output terminals were referenced to earth during performance testing: T1 pin 9, 10
- Models LS200-3.3, LS200-5, LS200-7.5, LS200-12, LS200-15, LS200-24, LS200-36 and LS200-48 were evaluated to mounting position A, B and C. Models LS200/L-3.3, LS200/L-5, LS200/L-7.5, LS200/L-12, LS200/L-15, LS200/L-24, LS200/L-36 and LS200/L-48 were evaluated to mounting position A, B, C, E and F. Other Models only evaluated at mounting position A. Refer to enclosure 4-17 for details.

Additional Information


(*1): This report is based on previously conducted testing and the review of product construction of Original CBTR Ref. No. E252373-A12-CB-4, CB Test Certificate Ref. No. DK-47506-UL and CBTR Ref. No. E252373-A12-CB-4-Amendment 1, CB Test Certificate Ref. No. DK-47506-A1-UL. Refer to Section "Tests performed (name of test and test clause):" covering all applicable performed tests and rational for waived tests.

Additional Standards

The product fulfills the requirements of: EN 62368-1:2014/A11:2017
 UL 62368-1 2ND Ed, Issued December 1, 2014;
 CSA CAN/CSA-C22.2 NO. 62368-1 2nd Ed, Issued December 1, 2014.

Markings and Instructions

| Clause Title | Marking or Instruction Details |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Equipment identification marking – Manufacturer identification | Listees or Recognized companys name, Trade Name, Trademark or File Number |
| Equipment identification marking – model identification | Model Number |
| Equipment rating marking – ratings | "Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)" |

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Fuses – replaceable by skilled person</p> | <p>(component ID: F1), Ratings (5 A), "Ratings (5 A, 250 V)", and (symbol of required characteristics) located on or adjacent to fuse or fuseholder or in service manual.</p> |
| <p>Class I equipment -Terminal for main protective earthing</p> | <p>Provided adjacent to the main protective earthing terminal  (IEC 60417-5019)</p> |
| <p>Special Instructions to UL Representative</p> <p>Inspect the transformer(s) listed in BD1.1 per AA1.1– (C). When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in BD1.1 is conducted at the component manufacturer. The test record noted above shall be submitted to the manufacturer from transformer manufacturer. The test record can be in the form of a actual test record. A stamp or sticker on the transformer or other method verifying the routine test is being completed on 100% production is also acceptable.</p> | |