

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:	LS35-X /YYYYYY, where X can be 3.3, 5, 7, 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, /CO, /CO2, /COL, /CO2L, /L or blank.
Rating:	<p>Input: 100-240 V ac, 0.8 A, 50/60 Hz</p> <p>Output:</p> <p>LS35-3.3: 3.3 V dc (+2.85 - +3.6 Vdc), 7 A; LS35-5: 5 V dc (+4.5 - +5.5 Vdc), 7 A; LS35-7: 7 V dc, 5 A; LS35-12: 12 V dc (+10.8 - +13.2 Vdc), 3 A; LS35-15: 15 V dc (+13.5 - +16.5 Vdc), 2.4 A; LS35-18: 18 V dc, 2 A; LS35-24: 24 V dc (+22 - +27.6 Vdc), 1.5 A; LS35-28: 28 V dc, 1.3 A; LS35-36: 36 V dc (+32 - +40 Vdc), 1 A; LS35-40: 40 V dc, 0.9 A; LS35-48: 48 V dc (+42 - +54 Vdc), 0.8 A; LS35-56: 56 V dc, 0.7 A.</p>
Applicant Name and Address:	<p>TDK-LAMBDA SINGAPORE PTE LTD</p> <p>#06-01/08</p> <p>1008 TOA PAYOH NORTH</p> <p>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: Jim Kao / 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 with metal enclosure.

Model Differences

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

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

LS35-X /YYYYYY, where X can be 3.3, 5, 7, 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, /CO, /CO2, /COL, /CO2L, /L or blank.

- 1) B => Input Connector (CN1) and Output connector (CN2) are from JST;
- 2) BM => Input Connector (CN1) and Output connector (CN2) 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;

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)	0.4

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : Models LS35-7, LS35-18, LS35-28, LS35-40, LS35-56: 50 °C for 100 % load Mounting Position A; Models LS35-3.3, LS35-5, LS35-12, LS35-15, LS35-24, LS35-36, LS35-48: 45 °C for 100 % load (Condition A and B), Mounting Position C; 50 °C for 100 % load (Condition A and B), Mounting Position A, B and D; 65 °C for 50 % load (Condition C and D), Mounting Position C; 70 °C for 50 % load (Condition C and D), Mounting Position A, B and D.
- 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 standards : EN 62368-1:2014 + A11:2017
- Power Supply Unit is evaluated to output derating. Refer to enclosure 4-09 for details.

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-SELV: 251.024 Vrms, 633.333 Vpk; Primary-Earthed Dead Metal: 237.182 Vrms, 349.365 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 : TB1 pin 2 or CN1 pin 2.
- The following end-product enclosures are required : Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJ2 insulation system with the indicated rating greater than Class A (105°C) : LS35-3.3, LS35-12, LS35-15, LS35-18, LS35-24, LS35-28, LS35-36, LS35-40: T1 (Class B); LS35-5, LS35-7, LS35-48; LS35-56: T1 (Class F)
- 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 6, 7
- The power supply is evaluated to 4 mounting positions. Refer to enclosure ID 4-08 for details.


Additional Information

This report is based on previously conducted testing and the review of product construction of Original CBTR Ref. No. E252373-A19-CB-4, CB Test Certificate Ref. No. DK-54721-UL. Refer to Section "Tests performed (name of test and test clause):" covering all applicable performed tests and rationale 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)"
Fuses – replaceable by skilled person	(component ID: F1), Ratings (6.3 A), "Ratings (2.0 A, 250 V)", and (symbol of required characteristics) located on or adjacent to fuse or fuseholder or in service manual.
Class I equipment -Terminal for main protective earthing	Provided adjacent to the main protective earthing terminal  (IEC 60417-5019)

Special Instructions to UL Representative

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.