UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Power Supplies for Information Technology Equipment Including Electrical Business Equipment
CCN:	QQGQ2, QQGQ8
Product:	Power Supplies
Model:	SWS600L-3xy, SWS600L-5xy, SWS600L-12xy, SWS600L-15xy, SWS600L-24xy, SWS600L-36xy, SWS600L-48xy, SWS600L-60xy, HWS600L-3xy, HWS600L-5xy, HWS600L-12xy, HWS600L-15xy, HWS600L-24xy, HWS600L-36xy, HWS600L-48xy, HWS600L-60xy, with optional suffix x which could be blank or /RF, and optional suffix y which could be CO2, /CO2. SWS600L-12/DAK, SWS600L-12/DAK2, HWS600L-12/DAK, HWS600L-12/DAK2, followed by optional suffix /RF, /CO2, or /RFC02. SWS600L-12/LNF, HWS600L-12/LNF, followed by optional suffix /CO2
Rating:	Rated Input : 100-240Vac, 10A, 50/60Hz Rated Output Voltage and Current : see Enclosures 7-07 for details.
Applicant Name and Address:	TDK-LAMBDA CORP NAGAOKA TECHNICAL CENTER R&D DIV 2701 TOGAWA, SETTAYA NAGAOKA-SHI NIIGATA 940-1195 JAPAN

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 Underwriters Laboratories Inc. ('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 Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

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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

The tested equipment is a series of switching power supplies (building-in type) for use in information technology equipment.

Model Differences

All models in each series are identical except for output rating, the turns of secondary winding in transformer (T32) and output Coil (L51), the rating of some components in secondary circuits and the type of input terminal block, the fan reversed, and an additional coating material on the pwb.

Models with suffix /RF are identical to basic model except they have the fan installed in reverse.
Models with suffix /CO2 are identical to basic models except for an additional coating material on the pwb.
Models with suffix /RFCO2 are identical to basic model except for the fan reversed and an additional coating material on the pwb.

For models SWS600L-60 and SWS600L-60/RF, the output terminal in secondary circuits DO NOT comply with SELV requirements. To avoid the risk of electrical shock hazards, this needs to be considered in the final installation or system

SWS600L-12/LNF is identical to SWS600L-12 except for fan type.

The differences between SWS600L-12, SWS600L-12/DAK and SWS600L-12/DAK2 are only terminal block and coating material on PCB, and /DAK and /DAK2 have two types of optional metal cover near input. See below for details.

Model	Type of terminal block	Coating material on PCB
SWS600L-12	Maf.: EMUDEN Type: T7273/ T6968	No
SWS600L-12/DAK	Maf.: TYCO Type: 1(6)450130-3	Yes
SWS600L-12/DAK2	No	Yes

Model HWS600L-3xy is identical to Model SWS600L-3xy except for model designation.
Model HWS600L-5xy is identical to Model SWS600L-5xy except for model designation.
Model HWS600L-12xy is identical to Model SWS600L-12xy except for model designation.
Model HWS600L-15xy is identical to Model SWS600L-15xy except for model designation.
Model HWS600L-24xy is identical to Model SWS600L-24xy except for model designation.
Model HWS600L-36xy is identical to Model SWS600L-36xy except for model designation.
Model HWS600L-48xy is identical to Model SWS600L-48xy except for model designation.
Model HWS600L-60xy is identical to Model SWS600L-60xy except for model designation.
Model HWS600L-12/DAK is identical to Model SWS600L-12/DAK except for model designation.
Model HWS600L-12/DAK2 is identical to Model SWS600L-12/DAK2 except for model designation.
Model HWS600L-12/LNF is identical to Model SWS600L-12/LNF except for model designation.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/A
- Operating condition : continuous
- Over voltage category : OVC II
- Mains supply tolerance (%) : +10%, -10%
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : -
- Class of equipment : Class I (earthed)
- Mass of equipment (kg) : 1.8 kg.
- Pollution degree : PD 2
- IP protection class : IP X0
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: +50 °C (100% load) and + 74 °C (50%load),for detailed information refer to output derating curve in the Manual enclosure. For model SWS600L-12/LNF and HWS600L-12/LNF, +40 °C (100% load) and + 50 °C (80% load), for detailed information refer to output derating curve in the Manual enclosure.
- The product is intended for use on the following power systems: TN
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace of the models SWS600L-5,12,24 and DAK, DAK2 (refer to Enclosure - Schematics + PWB for layouts)

Engineering Conditions of Acceptability

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

- The following secondary output circuits are SELV: All models EXCEPT in models SWS600L-60 and SWS600L-60/RF, the output terminal, in secondary circuits DO NOT comply with SELV requirements. To avoid the risk of electrical shock hazards, this shall be considered in the final installation or system.
- The following secondary output circuits are at hazardous energy levels: All Outputs
- The power supply terminals and/or connectors are: Not investigated for field wiring
- 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: Neutral
- The following end-product enclosures are required: Fire, Electrical
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 522 Vrms, 880 Vpk, Primary-Earthed Dead Metal: 522 Vrms, 880 Vpk
- 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): T21 (Class B) and T32 (Class B)

Additional Information

Unless otherwise specified, all tests were conducted on base models SWS600L-5, SWS600L-12/DAK and SWS600L-24 to represent the worst case condition for the respective tests according to max. output voltage, max. output current or max. output power reasons.
Max. operating temperature specified in instruction manual or output derating curve depends on mounting direction and load condition.
Heating measurement were performed according to the maximum operating temperature, mounting direction and load conditions specified in instruction manual and output derating curve. See Enclosure for Manuals.

For models SWS600L-60 and SWS600L-60/RF, the output terminal in secondary circuits DO NOT comply with SELV requirements. To avoid the risk of electrical shock hazards, this needs to be considered in the final installation or system.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Model	Model Number
Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

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 be conducted at the component manufacturer.

Production-Line Testing Requirements

Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
All models	Transformer T21	N/A	Primary to secondary	3000	4242	1

Earthing Continuity Test Exemptions - This test is not required for the following models:

Electric Strength Test Exemptions - This test is not required for the following models:

Electric Strength Test Component Exemptions - The following solid-state components may disconnected from the remainder of the circuitry during the performance of this test:

N/A

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
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