

UL TEST REPORT AND PROCEDURE

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| Standard: | UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements) |
| Certification Type: | Component Recognition |
| CCN: | QQGQ2, QGGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment) |
| Product: | Power Supply |
| Model: | TB65SXXYWW Where XX is any number from 12 to 48 designating output voltage, Y is K or C designating class I or Class II models, WW is any number from 00 to 99 or blank designating additional configurations with non-safety related options. |
| Rating: | Input: 100-240 Vac, 50-60 Hz, 1.5A Output: Refer to enclosure 7-01 for output rating |
| Applicant Name and Address: | SL POWER ELECTRONICS CORP BLDG A 6050 KING DR VENTURA CA 93003 UNITED STATES |

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: Scholl Zhang

Reviewed by: Vonty Zhang

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 units are open-frame AC/DC power supplies, designed for building-in to an end-product.

The units were evaluated to operate upto the altitude of 5000m.

Model Differences

All models were similar in construction except for secondary winding of transformer, secondary components and output rating. See Enclosure 7-07 for details.

For Class I construction, the earthing pin G1 is to be connected to the ground in end product.

For Class II construction, the pillar of earthing pin G1 is removed

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined
- Operating condition : continuous
- Access location : To be determined
- 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) or Class II (double insulated)
- Considered current rating of protective device as part of the building installation (A) : 16A (20A for north America)
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : no more than 5000m
- Altitude of test laboratory (m) : no more than 2000m
- Mass of equipment (kg) : 0.139
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: When maximum operating temperature is 50 degree C, output power is 65W. When maximum operating temperature is 70 degree C, output power is

45.5W. Please see base model outputs above for detail.

- The means of connection to the mains supply is: Determined in end-product,
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: Determined in end-product,
- 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).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: C17 secondary side for Class I construction, C17 and C18 secondary side for Class II construction
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual

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 Production-Line tests are conducted for this product: Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: 331 Vrms, 582 Vpk ,
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at non-hazardous energy levels: All outputs
- The following secondary output circuits are Limited Current Circuits: C17 secondary side for Class I construction, C17 and C18 secondary side for Class II construction,
- 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 for Class I construction,
- An investigation of the protective bonding terminals has: Not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral: N pin of input connector
- 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): examples: T1 (Class F),
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The equipment is suitable for direct connection to: AC mains supply
- For class II construction: Y caps C1, C2 and C18 is max 470pF, and the cl/cr between C1 pin1 to pin2, C2 pin1 to pin2, C18 pin1 to pin2, (item28 of enclosure 7-04) complied with basic insulation. The spacing shall be reconsidered in end use. Refer to enclosure for reference.
- An investigation of the protective bonding is not evaluated, should be determined in end product.

Additional Information

N/A

Additional Standards

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

| Markings and instructions | |
|---|--|
| Clause Title | Marking or Instruction Details |
| Power rating - Ratings | Ratings (voltage, frequency/dc, current) |
| Power rating - Company identification | Listee's or Recognized company's name, Trade Name, Trademark or File Number |
| 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 table "Electric Strength Test Special Constructions" per BD1.1: 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 the table 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 T1 | -- | Primary to Secondary | min. 300 0 | min. 4242 | 1s |
| All models | Transformer T1 | -- | Secondary to core | min. 300 0 | min. 4242 | 1s |

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

All 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 be 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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