

## UL TEST REPORT AND PROCEDURE

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|------------------------------------|---|
| <b>Standard:</b>                   | UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements)<br>CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)                                       |
| <b>Certification Type:</b>         | Component Recognition   |
| <b>CCN:</b>                        | QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)  |
| <b>Product:</b>                    | Power Supply  |
| <b>Model:</b>                      | TB110SXXYWW<br>Where XX is any number of 12 through 48, designates additional information indicating normal output voltage. Where Y is either letter of K (for Class I), WW can be any number between 00-99 or blank  |
| <b>Rating:</b>                     | Input: 100-240 Vac, 50-60 Hz, 1.5A<br>Output:<br>Convection cooled, total max. 85W<br>Main output: 12 Vdc/6.7 A to 48Vdc/1.67A,<br>Standby output: 5Vdc/1.0A<br><br>with 200LFM forced air, total max. 110W<br>Main output: 12 Vdc/8.7 A to 48Vdc/2.19A,<br>Standby output: 5Vdc/1.0A |
| <b>Applicant Name and Address:</b> | SL POWER ELECTRONICS CORP<br>BLDG A<br>6050 KING DR<br>VENTURA CA 93003<br>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.

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Reviewed by: Jie Qian

**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**

Electric components mounted on min.V-1 PWB, Open frame power supply designed for building-in to an ITE end-product.

**Model Differences**

The power supplies are similar to each other except for output ratings, secondary winding of power transformer and secondary components.

**Technical Considerations**

- Equipment mobility : for building-in
- Connection to the mains : evaluated in end product
- Operating condition : continuous
- Access location : operator accessible
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -15%
- 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) : 5000 m
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : Max.0.181
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C
- The means of connection to the mains supply is: To be determined in the end product.
- 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).
- 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: Primary-SELV: 334 Vrms, 586 Vpk,
- The following secondary output circuits are SELV: Output
- The following secondary output circuits are at non-hazardous energy levels: Output
- The following output terminals were referenced to earth during performance testing: output return
- 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: Not been conducted
- 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): Transformers T1 and T2 (Class B)
- The following end-product enclosures are required: Electrical, Mechanical and Fire
- The maximum continuous power supply output (Watts) relied on forced air cooling from: external airflow of 200 LFM. details refer to enclosure
- The equipment is suitable for direct connection to: AC mains supply
- The following "External and/or Internal force Air Cooling" configurations were employed as an element of this investigation: Tunnel Method (for 200 LFM simulation): See Miscellaneous Enclosure Id 7-02 for details.
- The chassis must be bonded to protective earth in the end product. Using the earth terminal for the end product protective earthing is not recommended and a separate dedicated bonding conductor and suitable termination should be used to connect the chassis to the end product protective earth.

**Additional Information**

**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. |
| Warning to service personnel | "CAUTION: Double pole/neutral fusing"  |

**Special Instructions to UL Representative**

Inspect the transformer(s) listed in table "Electric Strength Test Special Constructions" 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.

**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 | Transformers<br>T1, T2 | --              | Primary to Secondary | 300<br>0 | 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:**

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**Sample and Test Specifics for Follow-Up Tests at UL**

| Model | Component | Material | Test | Sample(s) | Test Specifics |
|-------|-----------|----------|------|-----------|----------------|
| N/A   |           |          |      |           |                |