# UL TEST REPORT AND PROCEDURE

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|---|---|
| **Standard:** | UL 60950-1, 2nd Edition, 2019-05-09 (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) |
| **Certification Type:** | Component Recognition |
| **CCN:** | QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment) |
| **Complementary CCN:** | N/A |
| **Product:** | Switching Power Supply |
| **Model:** | 1) CINT1175VXXYYKZZ, CINT1175A4806K02,<br>2) CINT1175A4806K03<br>Where V is A or B, where XX is any number 12 through 56, where YY or ZZ is any number 00 through 99. |
| **Rating:** | 1) Input: 100-240 V~, 50-60 Hz, 2.0 A<br>Output:<br>Without Fan:<br>Mainboard output: 12 Vdc, 10 A to 56 Vdc, 2.15 A, Max. 120 W<br>With Fan (200 LFM):<br>Mainboard output: 12 Vdc, 14.6 A to 56 Vdc, 3.13 A<br>Fan board output: 12 Vdc, 0.4 A, Max. 175 W<br><br>For CINT1175A4806K02:<br>48 Vdc, 1.25 A, max. 60 W with convection<br><br>2) Input: 100-277Vac, 50-60Hz, 2.0A<br>Output: 48Vdc/3.6A and 12Vdc/0.4A for fan with 200 LFM airflow; 48Vdc/2.5 with convection |
| **Applicant Name and Address:** | 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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| Prepared By: | Yuan Yuan / Jie Qian / Project handler | Reviewed By: | Xing Liu / 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**

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

The units were evaluated to operate up to the altitude of 3000m.

**Model Differences**

The power supplies in the CINT1175VXXYYKZZ are similar to each other except for output ratings and secondary winding of power transformer.

The Model number "CINT1175VXXYYKZZ" nomenclature explains construction as below:

where V is A or B, A is for Class I construction, B is for Class II construction, where XX is any number 12 through 56, represents the output voltage, where YY or ZZ is any number 00 through 99, designates additional configurations indicating non-safety related options.

CINT1175AXXYYKZZ is similar in construction to CINT1175BXXYYKZZ except for CINT1175AXXYYKZZ contains protective bonding conductor and bridge capacitors C115, C116 (Primary to Earthing)), C311 (Secondary to Earthing).

CINT1175A4806K02 is similar to CINT1175A4806K01 except for the following:

1.Output rating: 48Vdc, 1.25A, max. 60W with convection

2.Maximum ambient temperature is 65 deg C

3.L101, L102, L1 and Primary heatsink

CINT1175A4806K03 is similar to CINT1175A4806K01 except for the following:

1. Input and Output rating, refer to the rating part

2. Primary components: Primary Winding with core, Fuse (F100), Varistor (R100), X-cap (C100), Y-cap (C115, C116, C216), E-cap (C105), Transformer T200 and T400, FET Q200 and Q201, mylar sheet between primary winding and bridge diode D100, and other minor changes for SMT

3. Add additional Chassis and insulator between the PWB and Chassis, thermal pad between heat sink and capacitor C102

4. Minor changes in the secondary circuitry

| Test Item Particulars | |
|---|---|
| Equipment mobility | for building-in |
| Connection to the mains | To be determined in end use |
| 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 | Yes |
| IT testing, phase-phase voltage (V) | 230 V |
| 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 3000 m |
| Altitude of test laboratory (m) | no more than 2000 m |
| Mass of equipment (kg) | 0.214 |

**Technical Considerations**

- The product is intended for use on the following power systems : TN, IT
- 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).
- Heat sink is considered as primary live part.
- 1.2 The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50 degree C for all models.
- 1.3 The means of connection to the mains supply is: Determined in end-product
- 1.5 The equipment disconnect device is considered to be: Determined in end product
- 1.13 The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- 1.8 The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Secondary pin of C216

**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:

- If fuse F101 is also used in product, Clause 2.7.6 for dual fuses used shall be reconsidered in end use.
- For Class II construction, the Y2 capacitors (C115, C116) and protective bonding conductor are removed for unit, however, the spacing between primary circuits and earthing terminal only meets the requirements of basic insulation. The suitability of use and the spacing, electric strength and touch current shall be reconsidered in end product, if necessary.
- For Class I construction, Clause 2.6.3 shall be reconsidered in end use, if necessary.
- 1.2 The following Production-Line tests are conducted for this product: Electric Strength
- 1.3 The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 348 Vrms, 540 Vpk
  Primary-Earth: 301 Vrms, 416 Vpk; For CINT1175A4806K03 Primary-SELV: 412 Vrms, 604 Vpk, Primary-Earth: 338 Vrms, 448 Vpk.
- 1.5 The following secondary output circuits are SELV: All outputs
- 1.12 The maximum investigated branch circuit rating is: 20 A
- 1.13 The investigated Pollution Degree is: 2
- 1.15 Proper bonding to the end-product main protective earthing termination is: Required for Class A construction
- 1.18 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): T200 (Class F), T400 (Class B)
- 1.19 The following end-product enclosures are required: Mechanical
  Fire
  Electrical
- 1.23 The equipment is suitable for direct connection to: AC mains supply
- 1.6 The following secondary output circuits are at hazardous energy levels: Main Outputs of Models CINT1175A5606K01, CINT1175A4806K01 and 48Vdc output for CINT1175A4806K03.
- 1.21 The maximum continuous power supply output (Watts) relied on forced air cooling from: For "With Fan' condition: One cooling fan with 200LFM (32 CFM) applied to front the unit. Refer to enclosure 7-03 for test condition.
- 1.11 The power supply terminals and/or connectors are: Not investigated for field wiring
- 1.17 The following input terminals/connectors must be connected to the end-product supply neutral: N pin of input connector
- 1.16 An investigation of the protective bonding terminals has: Not been conducted
- 1.7 The following secondary output circuits are at non-hazardous energy levels: Main outputs of Models CINT1175A1206K01 and CINT1175A2406K01, Fan board outputs of all Models.
- 1.8 The following secondary output circuits are Limited Current Circuits: Secondary pin of C216
- "When installing the power supply into the end-product, a non-conductive insulator may be placed between the unit and any conductive metal chassis or mounting platform. Final suitability of the insulator to be assessed in the end product application."

**Additional Information**

The Critical Components List includes components in the product as submitted and also includes, in certain cases, alternate generic descriptions (designated as "interchangeable") for equivalent component substitutions. Recognizing NCBs may require newer or updated licenses, additional information and/or evaluation to qualify alternate components.

User's Manuals, instructions and markings will be provided in the national language of the country of sale. The manufacturer is aware of the requirements for language requirements for markings/instructions, cords/cables, plugs and EMC. Detailed information may be obtained directly from the client. See Enclosure-Miscellaneous for a Letter of Assurance.

Some of the attached Critical Component Licenses/Certs may be more than 3 years old. Manufacturer to

provide updated licenses upon request from an accepting NCB.

The label is a draft of an artwork for marking plate pending approval by National Certification Bodies and it shall not be affixed to products prior to such an approval.

**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 |
|---|---|
| 1.7.1 Power rating - Ratings | Ratings (voltage, frequency/dc, current) |
| 1.7.1 Power rating - Company identification | Listee's or Recognized company's name, Trade Name, Trademark or File Number |
| 1.7.1 Power rating - Model | Model Number |
| 1.7.6 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.

| BD1.0 | TABLE: Production-Line Testing Requirements | | | | | |
|---|---|---|---|---|---|---|
| **BD1.1** | **Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.** | | | | | |
| Model | Component | Removable parts | Test probe location | Test V rms | Test V dc | Test Time, s |
| All models | Transformer T200, T400 | -- | T200, T400 Primary to Core | min. 3000 | min. 4242 | 1s |
| All models | Transformer T200, T400 | -- | T200, T400 Primary to Secondary | min. 3000 | min. 4242 | 1s |
| **BD1.2** | **Earthing Continuity Test Exemptions – This test is not required for the following models:** | | | | | |
| | All models | | | | | |
| **BD1.3** | **Electric Strength Test Exemptions – This test is not required for the following models:** | | | | | |
| | N/A | | | | | |
| **BD1.4** | **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 | | | | | |

| BE1.0 | Sample and Test Specifics for Follow-Up Tests at UL | | | | |
|---|---|---|---|---|---|
| Model | Component | Material | Test | Sample (s) | Test Specifics |
| -- | -- | -- | -- | -- | -- |