

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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>	Class I Power Supplies: GNT2XX-YYY G Series, where XX is any number from 12 through 48, which represents the output voltage. The third X is an optional letter L, U, F or T which represents L-Bracket, U-Channel, Fan/Cover with U-Channel or Slotted Cover with U-Channel. -YYY is any number 000-999 which represents value added options not related to Safety, and G indicates compliance by the manufacturer to RoHS. Model GNT212-104G, where G indicates compliance by the manufacturer to RoHS. (RoHS compliance has not been evaluated by UL).  Class II Power Supplies: G2T2XX-YYY G Series, where XX is any number from 12 through 48, which represents the output voltage, -YYY is any number 000-999 which represents value added options not related to Safety and G indicates compliance by the manufacturer to RoHS. (RoHS compliance has not been evaluated by UL).
<b>Rating:</b>	Input: 100-240 V ac, 3.0-1.5 A, 50/60 Hz  Output: See Enclosures - Miscellaneous for output ratings.
<b>Applicant Name and Address:</b>	SL POWER ELECTRONICS CORP 6050 KING DRIVE, BLDG. A VENTURA CA 93003

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: David Heath

### 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

Switching Power Supplies.

### Model Differences

The GNT2XX Series models, and Model GNT212-104G are Class I power supplies and are similar to each other and differ only on secondary circuitry.

The G2T2XX Series models are Class II power supplies and are similar to each other and differ only in secondary circuitry.

Differences between Class I and Class II models:

Components C4, C8, W1, W3 and Ground Tab are provided in Class I models and are not provided in Class II models. Components W2, C20 and C23 are provided in Class II models and are not provided in Class I models.

There are several Chassis and or cover options identified by the letters:

- L - L-Bracket,
- U - U-Channel,
- F - Fan/Cover with U-Channel,
- T - Slotted Cover with U-Channel.

The above options are not provided in the Model G2T2XX Series.

Model GNT212-104G is identical to the GNT2 Series units, except input connector "J1" is rotated 180 deg., and cladding is not used in the mounting holes.

### Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : for building-in
- Operating condition : continuous
- Access location : operator accessible
- 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
- Class of equipment : Class I, and Class II. See GPI, Model Differences.
- Considered current rating of protective device as part of the building installation (A) : 20
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 2000
- Altitude of test laboratory (m) : 62
- Mass of equipment (kg) : 0.85
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: 40 °C and 50 °C.
- The product is intended for use on the following power systems: IT TN

#### **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:

- This component has been judged on the basis of the required spacings in the Standard for Safety of Information Technology Equipment, UL60950-1, First Edition, dated April 1, 2003.
- The power supply shall be installed in compliance with the enclosure, mounting, spacing, casualty and segregation requirements of the end-use application.
- The unit was evaluated under several conditions; a) 40 °C convection cooled reduced load, b) 50 °C convection cooled at reduced load, c) 50 °C full load with external 200 LFM airflow, d) 40 °C full load with external 200 LFM airflow, e) Optional chassis/ cover configurations U and F were tested in a 50 °C ambient at full load, f) Optional chassis/ cover configurations U, L and T were tested in a 40 °C ambient with a reduced load.
- The ground tab on the PWB has not been evaluated for use as the main earthing connection for the end product.
- The product input and output are isolated from each other by Reinforced insulation.
- All tests were conducted with an internal UL R/C fuse, rated T4.0 A, 250 V.
- Both Line and Neutral of the power supplies are fused, warning shall be provided in the end product.
- The Output Common for the class II models should not be connected to Earth Ground in the end product application, as this will violate spacings between Primary and Secondary. The unit should be mounted to a non-conductive chassis or with non-conductive mounting hardware in order to maintain proper Primary to Secondary spacings. ,
- When installing the power supplies to the end-product, A non-conductive barrier should be placed between the unit and any conductive metal chassis or mounting platform.
- 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
- 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): T4 and T5 (Class F) (140 °C)

- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing: C6, C8 (105°C), L1, L2, T3, T4 (130°C)
- The following secondary output circuits are SELV: All.
- An investigation of the protective bonding terminals has: Not been conducted
- The following secondary output circuits are at non-hazardous energy levels: All.
- Proper bonding to the end-product main protective earthing termination is: Required for the Class I models (GNT2XX Series)
- The maximum continuous power supply output (Watts) relied on forced air cooling from: 200 W with 200 LFM turbulent airflow from the output side of the power supply to the input side of the power supply or model options F and U which include an integral 6.4 cfm fan.
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 474 Vrms, 739 Vpk

**Additional Information**

Samples of Models GNT30-12, GNT30-24, and GNT30-48, and G2T30-48 were tested to represent Models G2T30-5, G2T30-12, G2T30-15, G2T30-24, G2T30-28 and G2T30-48 respectively. Where testing was applicable to Class II models only, samples of Model G2T30-48 was tested to represent the entire Class II series.

The Applicant has requested that the Electrical Schematics not be included in this report for proprietary purposes. Electrical Schematics can be obtained from the Applicant upon request.

Each unit is provided with two Nameplate Labels, as noted in Enclosures - Marking Plate. One label is for the Manufacturer's Name or Trademark, Electrical Ratings. The other Label is for the Model Number. Labels provided in the Enclosure are representative of the entire Series.

The photographs in Enclosures - Photographs are representative of Model G2T2 Series. See also Model Differences.

The testing for this CB report and CB Test Certificate was obtained from testing that was previously conducted under SMT.

This is a CBTR Reissue/Standard Upgrade from Report Reference No. E135803-A36-CB-2, US/15783/UL. All data extracted from the original report (including related CB Amendments). No sample was deemed necessary to be reviewed and no additional testing was required based on engineering judgment to reissue/upgrade this Report. Previous tests were still applicable and test data was transferred to this report for reference.

Some of the capacitors, varistors and optical isolators CBTC's may be more than three years old. According to Publication IEC60067-2, Clause 6.3.4, Recognizing NCB's may challenge this certificate.

**Markings and instructions**

Clause Title	Marking or Instruction Details
1.7.1 Power rating - Model	Model Number
1.7.1 Power rating - Company	Listee's or Recognized company's name, Trade Name, Trademark or File Number

identification	
1.7.1 Power rating - Class II symbol	Symbol for Class II construction
1.7.6 Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

**Special Instructions to UL Representative**

The power supplies described in this report have the same model number/construction as the power supplies described in Report Ref. # E116994-A35-UL. Please verify that X-Capacitors (C1, C2), and Y-Capacitors, C4, C5, C11 and C32 are UL R/C (FOWX2), and have been evaluated to IEC 60384-14:1993 by a known agency. Models GNT2XX Series are class I power supplies and Models G2T2XX are class II power supplies.

**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
-	Transformer T4 and T5	N/A	Between Primary and Secondary; and Between Primary and Core	300 0	-	1

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

All Models listed in this report.

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

All Models listed in this report.

**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
N/A	N/A	N/A	N/A	N/A	N/A