

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	AC-DC Power Supply
Model:	Series MINT1500WXX14YZZ
Rating:	<p>Where: MINT= Medical Internal New Technology 1 = 1 Output 500 = 500W W = A, C, T or E where A is U-Channel, C is U-Channel with Cover, T is U-Channel /Cover with top located fan and E is enclosed unit with end located fan (used in conjunction with IEC inlet) XX =Output Voltage 12 to 56 Vdc 14 = is Output Connector (Screw Type) Y =input Connector and can be E, L, I or other, where E is 3 Pin, L is Terminal Block, I is IEC320 Type and others are available. ZZ = 01 is standard 02-99 are value added options not related to Safety.</p> <p>INPUT RATINGS: 100-240 Vac, 50-60 Hz, 6 A.</p> <p>OUTPUT RATINGS (With Max. 200 LFM (linear feet per minute) forced air flow or integral fan options): Main Output: 12 Vdc, 40 A to 56 Vdc, 8.93 A, Max. 500 W Fan Output: 12 Vdc, 1.0 A Signal: 5 VSB, 0.2 A</p> <p>OUTPUT RATINGS (Without forced air flow): Main Output: 12 Vdc, 16.6A to 56 Vdc, 5.36A, Max. 350 W Fan Output: 12 Vdc, 1.0A Signal: 5VSB, 0.2A</p>
Applicant Name and Address:	SL POWER ELECTRONICS CORP. 6050 KING DR. BLDG. A VENTURA CA 93003 USA

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Report Reference #

E135803-A73-UL

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: Timothy Geiger

Reviewed by: Luis Martinez

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 MINT1500WXX14YZZ is an open frame AC/DC power supply designed for building-in to an ITE end-product.

Model Differences

The transformers are different among the models and minor secondary components are changed to achieve the various output voltages.

MINT1500WXX14YZZ

Where:

MINT= Medical Internal New Technology

1 = 1 Output

500 = 500W

W = A, C, T or E where A is U-Channel, C is U-Channel with Cover, T is Top Fan/Cover and E is End Fan/Cover.

XX = Output Voltage 12 to 56 Vdc

14 = is Output Connector (Screw Type)

Y =input Connector and can be E or L or other, where E is 3 Pin, L is Terminal Block and others are available.

ZZ = 01 is standard; 2-99 are value added options not related to Safety.

Airflow Requirements are Convection, 200 LFM or Internal fans on T and E covers.

Where W = A, Model Convection - 350W

Where W = C, Model Convection (Cover) - 290W

Where W = C, Model 200LFM (Cover) - 500W

Where W = T, Model (Cover/Top Fan) - 500W

Where W = E, Model (Cover w/End Fan) - 500W

Ambient= 50C

Airflow: Where W = C - 17 cfm,

Airflow: Where W = E - 7.7 cfm integral fans

External - 200LFM

All members of the family are RoHS compliant

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- 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 : 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) : 3000 m
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : Models: MINT1500AXXYY, 0.667; MINT1500CXXYY, 0.704; MINT1500TXXYY, 0.754; MINT1500EXXYY, 0.812
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 50°C
- The means of connection to the mains supply is: Pluggable A, detachable power cord for Series Models MINT1500E. , , Not applicable for all other series Models described in this report and means of connection to mains shall be determine as an element of the end-product investigation.
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: For Series Models MINT1500E the disconnect device is an Appliance inlet. For all other series models, compliance shall be determine as an element of the end-product investigation.
- 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 following are available from the Applicant upon request: Installation (Safety) Instructions / Manual, Schematic Diagrams

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: 390 Vrms, 438 Vpk, Primary-Earthed Dead Metal: 322 Vrms, 416 Vpk
- The following secondary output circuits are SELV: Main, Fan and Aux.,
- The following secondary output circuits are at hazardous energy levels: Main secondary output.,
- The following secondary output circuits are at non-hazardous energy levels: 12 Vdc Fan and the 5Vsb Aux.,

- The power supply terminals and/or connectors are: Suitable for factory wiring only., 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 all models except Series MINT1500E (Note: E is enclosed unit with end located fan used in conjunction with IEC inlet)
- An investigation of the protective bonding terminals has: Has only been conducted for Series MINT1500E (Note: E is enclosed unit with end located fan used in conjunction with IEC inlet). It has not been conducted for all other models in the Series.
- 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): Transformers (T300) and (T201) employ Class F (155).
- The following end-product enclosures are required: Electrical, Mechanical and Fire
- The maximum continuous power supply output (Watts) relied on forced air cooling from: Integral fans or external airflow of 200 LFM.
- The fans included as part of this component are suitable for use in a user access area: No
- Fans: The fan provided in this sub-assembly is not intended for operator access. 4.4.5 Considerations for access to the fans by User and/or Service Person shall be determined in the end product installation.
- 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 7-03 for details. , Top Cover "T" (with Integral Fan): provides 17 CFM, inhale orientation) , Chassis "E" (with End Fan): provides 7.7 CFM, inhale orientation)
- Enclosure - Model series with chassis "E" suffix have not been evaluated for any end use enclosure requirements.
- Compliance with Sub Clause 2.7.6, "Warning To Service Persons" shall be determined as an element of the end-product investigation.
- 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. If a separate dedicated bonding conductor is not used to connect the chassis to the end product protective earth, the Limited Short Circuit Current Test (except for Model Series MINT1500EXX14YZZ) should be considered during the end product investigation.
- The total output power is based on the combined outputs of outputs 1 (Main) and 2 (Fan). End product loading of the power supply outputs shall not exceed the limits specified in this report.

Additional Information

The marking plate artwork is considered representative for all models described in this report.

Units were evaluated for an altitude of 3000 meter. In accordance with IEC 60664-1, Table A2, required clearance values have been adjusted with a correction factor of 1.14.

Multiple Factory Declarations - Please refer to Enclosure Id 7-01, Miscellaneous, Letter of Assurance.

Additional Standards

The product fulfills the requirements of: IEC 60950-1:2005 + A1:2009, EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011

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 - Model	Model Number
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
Warning to service personnel	"CAUTION: Double pole/neutral fusing"
<p>Special Instructions to UL Representative</p> <p>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 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.</p>	

Production-Line Testing Requirements						
<u>Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.</u>						
Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
All Models	Transformers T300, T201	--	Primary to Secondary	300 0	4242	1s
<u>Earthing Continuity Test Exemptions - This test is not required for the following models:</u>						
All models except Series MINT1500E (Note: E is enclosed unit with end located fan (used in conjunction with IEC inlet)						
<u>Electric Strength Test Exemptions - This test is not required for the following models:</u>						
-						
<u>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:</u>						
-						
<u>Sample and Test Specifics for Follow-Up Tests at UL</u>						
Model	Component	Material	Test	Sample(s)	Test Specifics	
N/A						