

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed-(Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	N/A
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	MINT1500WXX14YZZ  Where W is A, C, T, or E, XX is a number from 12 through 56, Y is a letter A through Z, ZZ is a number from 00 through 99.  LU500SXXY-XXX  Where XX is 12 or 24, Y is a letter from A through Z, XXX is a number from 000 through 999 or blank.
<b>Rating:</b>	MINT1500WXX14YZZ INPUT: 100-240V~, 50-60Hz, 6A OUTPUT: See Model Differences section.  LU500SXXY-XXX INPUT: 100-277V ~ 6A, 50-60Hz, OUTPUT: See Model Differences section.
<b>Applicant Name and Address:</b>	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: Adam Tangocci / Project Handler    Reviewed By: Gregory Ray / 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 MINT1500WXX14YZZ series is an open frame AC/DC power supply designed for building-in to an ITE end-product.

The LU500SXXY-XXX series is an open frame AC/DC power supply designed for building-in to an ITE and LED lighting end-products. The Applicant has requested that reference to LED lighting applications be added in this report, but evaluation for use in LED applications has not been evaluated as part of this investigation.

**Model Differences**

Models in the MINT1500WXX14YZZ are identical to each other except for the transformer windings and minor secondary components to achieve the various output voltages.

MINT1500WXX14YZZ Model Nomenclature:

Where

W is A, C, T, or E, representing cover configurations influencing airflow requirements and output ratings.

XX is a number 12 through 56, representing output voltage.

Y is a letter from A through Z, representing options not related to safety.

ZZ is a number from 00 through 99, representing options not related to safety.

MINT1500WXX14YZZ Series Airflow and Output Ratings:

Where W is A (Convection):

Main Output: (12 to 56) Vdc, (16.6 to 5.36) A

Fan Output: 12 Vdc, 1.0 A

Signal: 5VSB, 0.2 A

Where W is C (Convection):

Main Output: (12 to 56) Vdc, (16.6 to 4.94) A

Fan Output: 12 Vdc, 1.0 A

Signal: 5VSB, 0.2 A

Where W is C (With External 200 LFM):

Main Output: (12 to 56) Vdc, (40 to 8.93) A

Fan Output: 12 Vdc, 1.0 A

Signal: 5 VSB, 0.2 A

Where W is T (With Internal Fan, 17 CFM):

Main Output: (12 to 56) Vdc, (40 to 8.93) A

Fan Output: 12 Vdc, 1.0 A

Signal: 5 VSB, 0.2 A

Where W is E (With Internal Fan, 7.7 CFM):

Main Output: (12 to 56) Vdc, (40 to 8.93) A

Fan Output: 12 Vdc, 1.0 A

Signal: 5 VSB, 0.2 A

The LU500SXXY-XXX series is identical to the MINT1500WXX14YZZ series except for the elimination of the fan and signal outputs, active current share added for redundant applications, the AC input rating increased to 100-277 Vac, and the circuitry on the Bias PWB is incorporated into a single PWB and uses a larger U-channel chassis.

LU500SXXY-XXX Model Nomenclature:

Where

XX is 12 or 24, representing output voltage.

Y is a letter from A through Z, representing options not related to safety.

XXX is a number from 000 through 999 or blank, representing options not related to safety.

LU500SXXY-XXX Series Airflow and Output Ratings:

Where XX is 12: 12 Vdc, 34 A, External 200 LFM

Where XX is 24: 24 Vdc, 20.8 A, External 200 LFM

#### Test Item Particulars

Classification of use by	Ordinary person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	See Technical Considerations section.
Considered current rating of protective device as part of building or equipment installation	20 A; building;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	50
IP protection class	IPX0
Power Systems	TN IT - 230 V L-L

Altitude during operation (m)	up to 5000 m m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	Max. 0.812

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of : 50°C
- The product is intended for use on the following power systems : TN, IT (230 V L-L)
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The equipment disconnect device is considered to be : For the MINT1500EXX14YZZ series the disconnect device is an Appliance inlet. For all other models, to be determined in the end product.
- The product was investigated to the following additional standard : UL 62368-1 2nd Edition, CSA C22.2 No. 62368-1 2nd Edition, IEC 62368-1:2014, EN 62368-1:2014 + A11:2017
- Required clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.48 for operating at an altitude of 5000 meters. If the calculated clearance exceeded the creepage, the creepage was adjusted to the value of clearance.
- Series LU500SXXY-XXX are open frame AC/DC power supplies designed for building-in to an ITE and LED lighting end-products. The Applicant has requested that reference to LED lighting applications be added in this report, but evaluation for use in LED applications has not been evaluated as part of this investigation.

**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 product-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 : MINT1500WXX14YZZ Primary-Earth: 322 Vrms, 416 Vpk; MINT1500WXX14YZZ Primary-Secondary: 390 Vrms, 438 Vpk; LU500SXXY-XXX Primary-Earth: 360 Vrms, 600 Vpk; LU500SXXY-XXX Primary-Secondary: 279 Vrms, 477 Vpk
- The following output circuits are at ES1 energy levels : All Outputs
- The following output circuits are at PS3 energy levels : All Outputs
- 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 on any models except the MINT1500EXX14YZZ series.
- The following input terminals/connectors must be connected to the end-product supply neutral : N
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- 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) : T201 and T300 (Class F, 155)
- The maximum continuous power supply output (Watts) relied on forced air cooling from : See Model Differences section.
- A suitable main disconnect device shall be provided in the end product (except for the MINT1500EXX14YZZ series).
- The power supplies covered by this report have a fuse in the neutral of the primary circuit. A warning for service persons shall be considered in the end product.
- The power supplies in this report have been subjected to the capacitor discharge test of Clause 5.5.2.2. Additionally, all associated component safeguards have been subjected to the test of Clause G.10.2. Additional capacitor discharge testing should not be needed if directly connected to mains (e.g. using an appliance inlet, wiring terminals, etc.).
- Consideration to performing the touch current test of Clause 5.7.4 should be given in the end product evaluation.
- Consideration to monitoring the temperature of parts of this equipment during normal, abnormal, and fault operating conditions should be given in the end product evaluation.
- When installed in the end product, the power supply shall be mounted in a manner that provides the minimum required creepage and clearance between applicable parts of the power supply, accessible conductive parts, and secondary circuits of the end product.
- The power supply terminals and/or connectors are not investigated for field wiring.
- The MINT1500EXX14YZZ has not been evaluated for any end use enclosure requirements.
- 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 should be considered during the end product investigation (except for the MINT1500EXX14YZZ series).

### Additional Information

The Marking Plates provided are representative of all models.

This report is based on previously conducted testing and the review of product construction of original CBTR reference number E135803-A73-CB-3, CBTC reference number US-32551-UL, issued 2018-10-10, issued by UL. Refer to the "Summary of testing" section which covers the tests accepted and the additional testing performed as part of this evaluation.

The following test was selected as representative of the test program applicable to models covered by this CBTR: Annex B.2.5 - Input Test. This test has been witnessed for models selected as representative of the standard covered by this report and of the applicable test program.

It is noted that on a previously accepted datasheet, some sample received dates conflict with some of the test

dates (see below). It has been confirmed with the customer that this was due to an error in the date entry process which has since been corrected. The correct sample received dates are not available, so they are provided in this report as recorded in the datasheets.

Sample S001, received date 2012-02-29, conflicting with test dates 2012-02-16, 2012-02-17, and 2012-02-28.  
Sample S002, received date 2012-03-15, conflicting with test dates 2012-03-09, and 2012-03-11 TO 2012-03-13

#### **Additional Standards**

The product fulfills the requirements of: UL 62368-1 2nd Edition, CSA C22.2 No. 62368-1 2nd Edition, IEC 62368-1:2014, EN 62368-1:2014 + A11:2017

#### **Markings and Instructions**

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"

#### **Special Instructions to UL Representative**

N/A

<b>BD1.0</b>	<b>TABLE: Production-Line Testing Requirements</b>					
<b>BD1.1</b>	<b>Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.</b>					
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
<b>BD1.2</b>	<b>Earthing Continuity Test Exemptions – This test is not required for the following models:</b>					
<b>BD1.3</b>	<b>Electric Strength Test Exemptions – This test is not required for the following models:</b>					
<b>BD1.4</b>	<b>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.</b>					

<b>BE1.0</b>	<b>Sample and Test Specifics for Follow-Up Tests at UL</b>				
Model	Component	Material	Test	Sample (s)	Test Specifics
N/A	--	--	--	--	--