UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	Switching Power Supply
Model:	SHP650PSXX-YY Where XX is between 12-48, -YY is -EF, -TF or blank.
Rating:	INPUT ~ 100 - 240VAC 50/60Hz 9A INPUT ~ 100 - 120VAC 400Hz 9A Output: See Model Differences section for details.
Applicant Name and Address:	XP POWER L L C 15641 RED HILL AVE, SUITE 100 TUSTIN CA 92780 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: Randy Johnson / 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 product is a component AC-DC power supply for building-in, open frame type provided with a metal chassis intended for Class I end-product application.

The main PWB is secured to the chassis studs by multiple machine screws.

Model Differences

The power supplies in the series are differentiated by the output voltage and current ratings, number of turns of primary/secondary windings in the Transformers (T302 (Power)), type of Fan Chassis Top Cover and minor differences in the secondary circuit components and PWB layout.

See below for Model Ratings Table Below:

Model SHP650PS12-YY: Output Rated: 12.0 Vdc, 50 A (607 W) @ 50 C ambient; 12.0 Vdc, 25 A (300 W) @ 70 C ambient

Model SHP650PS15-YY: Output Rated: 15.0 Vdc, 40 A (607 W) @ 50 C ambient; 15.0 Vdc, 20 A (300 W) @ 70 C ambient

Model SHP650PS24-YY: Output Rated: 24.0 Vdc, 27 A (657 W) @ 50 C ambient; 24.0 Vdc, 13.5 A (324 W) @ 70 C ambient

Model SHP650PS28-YY: Output Rated: 28.0 Vdc, 23 A (651 W) @ 50 C ambient; 28.0 Vdc, 11.5 A (322 W) @ 70 C ambient

Model SHP650PS36-YY: Output Rated: 36.0 Vdc, 18 A (657 W) @ 50 C ambient; 36.0 Vdc, 9.0 A (324 W) @ 70 C ambient

Model SHP650PS48-YY: Output Rated: 48.0 Vdc, 13.5 A (657 W) @ 50 C ambient; 48.0 Vdc, 6.75 A (324 W) @ 70 C ambient

50°C at full rated load and 70°C at half rated load.

Models provided with the following YY values differ as follows:

Model SHP650PSXX-EF provided with top cover with fan located at the end of the power supply chassis.

Model SHP650PSXX-TF provided with top cover with fan located at the top of the power supply chassis.

Model SHP650PSXX not provided with top cover and no fan, only provide with U-shaped chassis.

Test Item Particulars	
Classification of use by	Ordinary person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	For building-in
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	Not classified
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient	See Model Differences section.
IP protection class	IPX0
Power Systems	TN
Altitude during operation (m)	5000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	1.25

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : See Model Differences section.
- The product is intended for use on the following power systems : TN
- The equipment disconnect device is considered to be : To be determined in the end-product.
- The following are available from the Applicant upon request : Specific data sheets for LED indicators that are class I and operate at wavelength in the 400-710 nm range.
- 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.

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 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 (Class I)
- An investigation of the protective bonding terminals has : Not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : AC N
- The following end-product enclosures are required : Mechanical, Fire, Electrical
- 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) : L1-L3, T201, T301-T303, and L301 (min. Class B) and L50 (min. Class F)
- The power supply was evaluated to be used at altitudes up to : "5000 m"
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides the minimum required Clearance between the primary side of power supply and protectively earthed accessible conductive parts.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.
- A suitable main disconnect device shall be provided in the end product.
- Consideration to repeating the Touch Current test should be given in the end-product evaluation.
- The power supplies in this report have been subject to Capacitance Discharge testing. Additionally, all associated component safeguards have been assessed to the applicable requirement in Annex G.10. Additional testing should not be needed if directly connected to mains e.g. using an appliance inlet, wiring terminals, etc.

Additional Information

Marking Plate is representative of all models
This report is based on a previous evaluation to IEC 60950-1:2005 (2nd Ed.), Am1:2009 + Am2:2013 under CBTR Ref. No. E139109-A41-CB-2 including Amendments, CBTR Ref. No. E139109-D1-CB-1 including Amendments, CBTC Ref. No. US-19577-UL, US-19577-A1-UL, US-25396-UL. Based on the previously conducted performance testing, only the tests conducted as part of this investigation were considered necessary.

Amendment 1 (Technical):
Based on a review of product technical documentation such as photos, schematics, and wiring diagrams, changes associated with this report are considered not to affect compliance with the requirements of the standard. Because of this and previously performed testing, no sample or additional testing was considered necessary. Changes and notes:
-CBTL updated from "Camas WA" to "Vancouver WA".
-Technical Considerations: Altitude statement corrected.
-Product Description: Updated to include statement regarding Class I application.
-Energy Source Table and Safeguards Table: MS evaluation removed. To be evaluated in end product.
-Clause 5.4.3.3: Comment corrected.
-Clause 5.4.4: Evaluation corrected as TIW is used.
-Clause F.3.5.3: Comment updated for clarity.
-Clause F.3.6: Verdicts and comments corrected.
-Table 4.1.2: "Fan (SELV) - Alternate" and "Chassis Fan Cover": Applicable models clarified.
-Table 4.1.2: Additional information about testing added to labels.
-Table 5.2: Additional applicable data added from original 60950-1 evaluation.
-Table 5.4.9: Locations expanded to be more specific.
-Table B.2.5: "Hz" column added to Input Test Table.

Amendment 2 (Technical):

Based on the review of the technical information provided, no testing was required.
1) Added alternate ADDA Fan
2) Added alternate Temperature limiters
3) Added alternate C2, C3, C5, C6, C10, C11 capacitors
4) Added alternate C1, C4 capacitors

Correction 1 - Service Request 5338810:
Corrections associated with this project are considered not to affect compliance with the requirements of the standard. Because of this and previously performed testing, no sample or additional testing was considered necessary. Changes and notes:
-UL Only: "Main Printed Wiring Board" and "Daughter Board Printed Wiring Board" CCNs corrected from "ZMPV2" to "ZPMV2".

Additional Standards

The product fulfills the requirements of: 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

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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	Enclosure	--	Primary to Ground	1768	2500	1
BD1.2	**Earthing Continuity Test Exemptions – This test is not required for the following models:**					
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BD1.3	**Electric Strength Test Exemptions – This test is not required for the following models:**					
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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.**					
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BE1.0	**Sample and Test Specifics for Follow-Up Tests at UL**				
Model	Component	Material	Test	Sample (s)	Test Specifics