UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) 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:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Product:	Switching Power Supply
Model:	ECP150PSXX (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF" ECP150PS12-XE0358B
Rating:	Input: 100-240 Vac, 2.5 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table 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: Scott Corley Reviewed by: Gregory Ray

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 model covered in this report is a component power supply intended for use in Information Technology Equipment. It is an open frame power supply intended for building-in Class I or Class II end-products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the Model ECP150PSXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. See below for Model Ratings Table for 50°C ambient with 10cfm fan cooling:

Model ECP150PS12: Output Rated: 12 Vdc, 12.5 A
Model ECP150PS15: Output Rated: 15 Vdc, 10 A
Model ECP150PS24: Output Rated: 24 Vdc, 6.25 A
Model ECP150PS28: Output Rated: 28 Vdc, 5.4 A
Model ECP150PS48: Output Rated: 48 Vdc, 3.1 A
Model ECP150PS12-XE0358B: Output Rated: 12 Vdc, 12.5 A

Model ECP150PS12-XE0358B is identical to Model ECP150PS12, except for TR1 rated Class F insulating system.

See Enclosure 7-01 for additional ratings information.

Additional Suffix "SF" denotes units provided with only a single line side fuse.

Technical Considerations

- Equipment mobility : movable
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : for building-in
- 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 or Class II (Determined by end product)
- § Considered current rating of protective device as part of the building installation (A) : 2.5 A
- § Pollution degree (PD) : PD 2
- § IP protection class : IPX0
- § Altitude of operation (m) : up to 5000 m
- § Altitude of test laboratory (m) : 33
- § Mass of equipment (kg) : 0.25 kg
- § The product was investigated to the following additional standards: CSA/UL/IEC 62368-1 2nd Ed, 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).
- § Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Double insulated symbol is optionally provided. See Conditions of Acceptability for insulation required for Class II. Earthing symbol may only be provided for Class I power supplies.
- § The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C (See De-rating Curve, Enclosure 7-01 for details)
- § The product is intended for use on the following power systems: TN
- § The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of CY5
- § The means of connection to the mains supply is: for building-in, to be determined in the end-product.
- § According to IEC60664-1, Table A2, 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. The correction factor is based on barometric pressure of 70kPa and Overvoltage Category II. 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:

- § Printed Wiring Board rated 130°C.
- § The equipment is provided with a fuse in both the Line and Neutral of the primary circuit, unless provided with suffix "SF" to indicate only one fuse provided in the Line.
- § Primary side heat sinks are floating and considered live. They should not be accessible in the end-product.
- § Touch Current test to be conducted in the end-product evaluation.
- § The clearance and creepage distances have additionally been assessed for suitability up to 5000 m elevation. Further evaluation may be necessary if installed above 5000 meters.
- § Units provided with fuses in the line and neutral shall be considered for the need for "Double Pole Fusing" warning markings as part of the end-product.
- § Unit was evaluated as a component for building-in, the need for markings and marking durability testing shall be determined as part of the end product.
- § 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-Earthed Dead Metal: 261 Vrms, 370 Vpk, Primary-SELV: 355 Vrms, 531 Vpk,
- § The following secondary output circuits are SELV: All outputs
- § The following secondary output circuits are at non-hazardous energy levels: All outputs

- § The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" or "Y2" capacitors.,
- § The power supply terminals and/or connectors are: Suitable for factory wiring only
- § 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 when the power supply is used in a Class I end product. The power supply will be considered Class II only when protection against electric shock does not rely on Basic Insulation and provides a minimum of 5 mm creepage and 4 mm clearance distance between Primary and SELV components (mounted above chassis/accessible metal parts on Insulating posts etc). Class II units have no reliance upon protective earthing.
- § 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 J1
- § The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class 105 (A): L1, L2, L3, and TR1 - Class 130(B); L4 - Class 155(F); TR1 for Model ECP150PS12-XE0358B - Class 155 (F).
- § The following end-product enclosures are required: Mechanical, Fire
- § UL 62368-1 Capacitance Discharge - Safeguards against capacitor discharge after disconnection of a connector (clause 5.5.2.2) shall be evaluated in the end-product.
- § UL 62368-1 The following output circuits are at PS3 energy levels : All DC Outputs except 12V Fan Output which is PS2
- § UL 62368-1 The following output circuits are at ES1 energy levels : All DC Outputs
- § UL 62368-1 Prospective Touch Current and Voltage testing to be conducted in the end-product evaluation.
- § UL 62368-1 When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts.
- § UL 62368-1 When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 4.5 mm Clearance between the power supply and any accessible conductive parts.

Additional Information

The clearance and creepage distances have additionally been assessed for suitability up to 5000 m elevation.

The need for the additional testing and evaluation shall be determined in the end product investigation.

The nameplate markings provided as an Enclosure - Marking Plate are considered representative of the entire series.

The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.

When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 4 mm Clearance between the power supply and any accessible conductive parts.

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 2nd Ed. Revised 2014-10-14, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013, UL 60950-1 2nd Ed. Revised 2014-10-14, IEC 60950-1:2005 + A1:2009 + A2:2013, CSA/UL/IEC 62368-1 2nd Ed

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
1.7.6 Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
1.7.1 Power rating - Model	Model Number
1.7.7.2 Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative

N/A