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:	Switch Mode Power Supply
Model:	EMH350PDXX, where XX can be 10-97 to represent model number code, may also be provided with additional suffixes "-U", "-EF", "-SF", "-S", and "-L"; all "-" considered optional.
Rating:	Input: 100-240Vac, 50/60Hz, 4.8A Output: See Model Differences and Enclosures 7-02 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: Jason Ferguson 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 products covered in this report are dual output switching power supplies for building-in to Information Technology Equipment.

Model Differences

All models in the Model EMH350PDXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings.

See Enclosures 7-02 for a list of V1 and V2 output voltage ranges which are covered under this Report.

The Output voltage code will determine the output voltage range/output current for V1 and output voltage range/current for V2; total output power is not to exceed 350W in any configuration.

Stand-by Output for all models: 5Vdc, 2A
Fan Output for all models: 12 Vdc, 0.6 A

Units provided with suffix "-U" provided with U-Channel.
Units provided with suffix "-EF" provided with End Fan and Cover.
Units provided with suffix "-SF" indicates models provided with single fusing.
Units provided with suffix "S" to indicate screw terminal block.
Units provided with suffix "L" to indicate fly leads.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : for building-in
- 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 : Yes
- IT testing, phase-phase voltage (V) : 230
- 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) : 20 A

- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : less than 1 Kg
- The product was investigated to the following additional standards: 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).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: C33
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C at 100% load, 70 °C at 50% load
- The means of connection to the mains supply is: for building-in, to be determined in the end-product.
- The product is intended for use on the following power systems: TT IT TN
- According to IEC60664-1, Table A2, required Clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.15 for operating at an altitude of 3048 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. No other additional requirements were considered at this time as they are not explicitly addressed in 60950-1.

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.
- End product to determine the need for "Double Pole Fuse" Marking for units provided with double pole fusing.
- The equipment may be provided with a fuse in both the Line and Neutral of the primary circuit.
- Temperature, Leakage, Earthing, and Dielectric to be considered as part of the end product , investigation.
- Heating test was not conducted on unit with input/output leads. If unit is provided with input and/or output leads, then temperature on leads must be measured and cannot exceed 105°C.
- The fan connector (CON6) is in the Primary circuit. Fans provide basic insulation (greater than 0.4 mm).
- Heatsinks are floating and considered live. They should not be accessible in 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-SELV: 259 Vrms, 620 Vpk Primary-Earthed Dead Metal: 263 Vrms, 400 Vpk
- The following secondary output circuits are SELV: All outputs with the exception of model EMH350PD25.
- The following secondary output circuits are at hazardous energy levels: All
- 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
- 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 Earth connection pin of CON1 is not suitable as the main protective earth terminal. Earthing must be done either at the earthing terminal on the PWB or the chassis must be directly bonded to Protective Earth in the end product.

- 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: CON1
- 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): T1 and T2 (Class F, 155°C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing: C1 (105°C)
- The maximum continuous power supply output (Watts) relied on forced air cooling from: 16 cfm fan applied 1 inch from input side, blowing inward
- The equipment is suitable for direct connection to: AC mains supply. Means of connection will need to be evaluated in the end product.
- Fans: The fan provided in this sub-assembly is not intended for operator access, to be evaluated in end product.

Additional Information

This Test Report is a reissue of CB Test Report Ref. No. E139109-A129-CB-2 (issued 2014-06-13), CB Test Certificate Ref. No. US-23473-UL. Based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, it has been determined that the product complies with the standard. All required testing was carried out under the original investigation. No testing was considered necessary to upgrade the report to IEC 60950-1, Second Edition, Amendment 2.

Output V1 and V2 can be connected in series to achieve a maximum total output voltage of 120 Vdc, 350 W max.

Models covered under this Report have been evaluated for 50°C ambient with 10 cfm external air-flow for end fan option and 16 cfm external air-flow for open frame and U-channel options.

The clearance distances have additionally been assessed for suitability up to 5000 m elevation (1.48 correction factor as per IEC 60664-1, Table A2).

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

The nameplate markings provided are considered representative of the entire series.

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

Additional Standards

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

Markings and instructions

Clause Title	Marking or Instruction Details
1.5.5 Inter-connecting cables - External detachable	Listee's Name and Part number (Marking or Instruction)