UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2019-05-09 (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:	Power supply for building-in, switch mode type
Model:	SMP350PSxx (where xx can be any number between 12 and 48 may also be provided with additional suffix "SF")
Rating:	Input: 100-240 Vac, 50/60Hz, 4.9A Max. Output: See Model Differences 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: Robert Leon / Project Handler Reviewed By: Walid Beytoughan / 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 models covered in this Test Report are component AC-DC power supplies intended for use in Information Technology Equipment. Open frame switching power supplies intended for building-in.

Model Differences

All models in the Model SMP350PSXX series are identical with exception to model designation, Transformer (T1) and secondary components/circuitry that allow for different output voltage ratings.

Model output ratings as follows.

Model SMP350PS12: Output Rated: 10.1 Vdc - 13.5 Vdc, 25 A Max., 300 W Max.

Model SMP350PS15: Output Rated: 13.6 Vdc - 17 Vdc, 22 A Max., 330 W Max.

Model SMP350PS18: Output Rated: 17.1 Vdc - 21 Vdc, 19.4 A Max, 350 W Max.

Model SMP350PS24: Output Rated: 21.1 Vdc - 26 Vdc, 14.6 A Max., 350 W Max.

Model SMP350PS28: Output Rated: 26.1 Vdc - 31 Vdc, 12.5 A Max., 350 W Max.

Model SMP350PS33: Output Rated: 31.1 Vdc - 33 Vdc, 10.6 A Max., 350 W Max.

Model SMP350PS36: Output Rated: 33.1 Vdc - 42 Vdc, 9.70 A Max, 350 W Max.

Model SMP350PS48: Output Rated: 42.1 Vdc - 54 Vdc, 7.30 A Max., 350 W Max.

Provided with additional suffix "SF" to indicate single pole fusing.

Test Item Particulars

Mass of equipment (kg)	0.4 kg
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	To be 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)	5000 m
Altitude of test laboratory (m)	less than 2000 m

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 50°C at full rated load. 70°C at 50% rated load.
- The means of connection to the mains supply is : For building-in. To be evaluated in end-product.
- The product is intended for use on the following power systems : TN / IT
- The equipment disconnect device is considered to be : For building-in. To be evaluated in end-product.
- 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 : Load Side of Bridging Capacitor (C21).
- The following were investigated as part of the protective earthing/bonding : Printed wiring board trace (refer to Enclosure - Schematics + PWB, 5-01 for layouts and 5-03 for measurements and calculations.)

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: 240 Vrms / 340 Vpk, Primary-Earthed Dead Metal: 240 Vrms / 340 Vpk
- The following secondary output circuits are at hazardous energy levels : All outputs
- 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.
- An investigation of the protective bonding terminals has : Not been conducted
- 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, L4, and T1 (Class F / 155°C)
- The following end-product enclosures are required : Electrical / Fire / Mechanical
- Fans : The fan provided in this sub-assembly is provided with a fan guard that is integral to the chassis to reduce the risk of operator contact with the stator.
- Suitable disconnect device is to be provided in the end-product.
- In accordance with IEC60664-1, Table A2, required clearances were adjusted by multiplying the clearance at sea level by a factor of 1.48 for operating at an altitude of 5000 m. The correction factor is based on barometric pressure of 70 kPa 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 and are not explicitly addressed in UL 60950-1.
- Printed Wiring Board rated 130°C.
- The power supply is provided with a fuse in both the line and neutral of the primary circuit. The need for a marking warning service person of the hazards associated with neutral fusing shall be considered in the end-product.
- Heating (Thermal Requirements) Test was not conducted on power supply with input/output leads. If power supply is provided with input and/or output leads, then temperature on leads must be measured and cannot exceed 105°C.

Additional Information

The switching power supply series covered by this Test Report used Double/Reinforced Insulation between Primary and Secondary circuits.

This report includes licenses for components that are more than 3 years old. Recognizing NCBs may challenge certification documents more than three years old. Additional documentation, testing, and evaluation may be required when submitting this product to a National Certification Body (NCB) for obtaining certification at the national level.

Marking Plate Label is representative of all models.

Amendment 1 (Technical):
1. Added alternate fan (Sunonwealth, type MF40201VX)
2. Updated Test Report Form.
3. Added alternate Label, 3M, type 7818.
4. Added alternate Capacitors (C28,C45) Vishay and TDK Corp
5. Added alternate Bridging Capacitors (C20,C21) Vishay, TDK Corp and Success Electronics Co Ltd
6. Added alternate Y-Capacitors (C38) Vishay, TDK Corp and Success Electronics Co Ltd
7. Added alternate Y-Capacitors (C2, C3) Vishay, TDK Corp and Success Electronics Co Ltd
8. Added alternate X-Capacitors (C1, C55) Panasonic Corp

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
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
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

Enclosed electrical schematics, trace layouts, component layouts, transformer diagrams, inductor diagrams, and enclosure diagrams are for engineering use only and may only be used by the field representative for reference. Verify that Transformer (T1) is subjected to 100% Production Line Electric Strength Test between Primary/Secondary, minimum 3000 Vac or 4200 Vdc.

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
SMP350PSxxyy	T1	--	Pri/SELV	3000	4200	1
BD1.2	**Earthing Continuity Test Exemptions – This test is not required for the following models:**					
	All					
BD1.3	**Electric Strength Test Exemptions – This test is not required for the following models:**					
	All					
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:**					
	N/A					

BE1.0	Sample and Test Specifics for Follow-Up Tests at UL				
Model	Component	Material	Test	Sample (s)	Test Specifics
-	-	-	-	-	-