UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Switching Power Supplies
Model:	SHP350PSXX (where XX = represents the output voltage between 12-48)
Rating:	Input: 100-240 Vac, 50/60 Hz, 4.6 A Output: See Model Differences.
Applicant Name and Address:	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 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: Linus Park Reviewed by: Scott Varner

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 an open-frame component AC-DC power supply for building-in Information Technology Equipment.

Model Differences

All models with the series are identical, with exception to the output voltage and current ratings, number of turns of primary/secondary windings in the Transformers (T302 (Power)), and minor differences in the secondary circuit components and PWB layout.

See below for Model Ratings Table (up to 50°C) for Model SHP350PSXX, where XX indicated the output voltage:

Model SHP350PS12: Output Rated: 12.0 Vdc, 26.5A (350W)
Model SHP350PS15: Output Rated: 15.0 Vdc, 22 A (350W)
Model SHP350PS24: Output Rated: 24.0 Vdc, 14.5 A (350W)
Model SHP350PS24 (Input: 180-240Vac): Output Rated: 24.0 Vdc, 17.5 A (420W)
Model SHP350PS28: Output Rated: 28.0 Vdc, 12.5 A (350W)
Model SHP350PS28 (Input: 180-240Vac): Output Rated: 28.0 Vdc, 15 A (420W)
Model SHP350PS36: Output Rated: 36.0 Vdc, 9.7 A (350W)
Model SHP350PS36 (Input: 180-240Vac): Output Rated: 36.0 Vdc, 11.7 A (420W)
Model SHP350PS48: Output Rated: 48.0 Vdc, 7.3 A (350W)
Model SHP350PS48 (Input: 180-240Vac): Output Rated: 48.0 Vdc, 8.75 A (420W)

All models also provided with 5V, 0.2A stand-by output.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined in the end-use product
- Operating condition : continuous
- Access location : N/A

- 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 (earthed)
- Considered current rating of protective device as part of the building installation (A) : 20A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048
- Altitude of test laboratory (m) : 166
- Mass of equipment (kg) : 1.8
- 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 and 70°C at half rated load.
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 +A1:2010+A12:2011 (which includes all European national differences, including those specified in this test report).
- LEDs provided in the product are considered low power devices: Yes

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: Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-

SELV: 347 Vrms, 692 Vpk, Primary-Earthed Dead Metal: 311 Vrms, 548 Vpk

- The following secondary output circuits are SELV: All Outputs
- The following secondary output circuits are at hazardous energy levels: Main Power Output
- 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
- 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: Input Connector N Terminal.
- 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, L2, L50, T201, T301-T303 (Class B)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- Fans: The fan provided in this sub-assembly is not intended for operator access.
- Consideration to repeating Heating and Touch Current Tests should be given in the end-product evaluation.

Additional Information

The clearance distances have additionally been assessed for suitability up to 3048 m elevation (1.15 correction factor as per IEC 60664-1, Table A2).

Marking label is representative of all models.

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, , EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, UL 60950-1 2nd Ed. Revised 2011-12-19, IEC 60950-1:2005 + A1:2009

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 company's 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

Special Instructions to UL Representative

N/A

Production-Line Testing Requirements

Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
All Models	T302	-	Primary to Secondary	3000	4242	1
All Models	T301	-	Primary to Secondary	3000	4242	1
All Models	T201	-	Primary to Secondary	3000	4242	1

Earthing Continuity Test Exemptions - This test is not required for the following models:

Electric Strength Test Exemptions - This test is not required for the following models:

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:

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
N/A					

UL TEST REPORT AND PROCEDURE

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Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Supplies
Model:	SHP650PSXXYY (where XX = represents the output voltage between 12-48, YY = EF, TF or blank)
Rating:	Input: 100-240 Vac, 50/60 Hz, 9.0 A Output: See Enclosure - Output Ratings for details
Applicant Name and Address:	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

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Prepared by: Karl Bier Reviewed by: Linus Park

Supporting Documentation

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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, incorporating primary and SELV components.

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 SHP650PS12YY: Output Rated: 12.0 Vdc, 50 A (607 W) @ 50 C ambient; 12.0 Vdc, 25 A (300 W) @ 70 C ambient
Model SHP650PS15YY: Output Rated: 15.0 Vdc, 40 A (607 W) @ 50 C ambient; 15.0 Vdc, 20 A (300 W) @ 70 C ambient
Model SHP650PS24YY: Output Rated: 24.0 Vdc, 27 A (657 W) @ 50 C ambient; 24.0 Vdc, 13.5 A (324 W) @ 70 C ambient
Model SHP650PS28YY: Output Rated: 28.0 Vdc, 23 A (651 W) @ 50 C ambient; 28.0 Vdc, 11.5 A (322 W) @ 70 C ambient
Model SHP650PS36YY: Output Rated: 36.0 Vdc, 18 A (657 W) @ 50 C ambient; 36.0 Vdc, 9.0 A (324 W) @ 70 C ambient
Model SHP650PS48YY: Output Rated: 48.0 Vdc, 13.5 A (657 W) @ 50 C ambient; 48.0 Vdc, 6.75 A (324 W) @ 70 C ambient

See Enclosure-Miscellaneous for details.

Models provided with the following YY values differ as follows:

Model SHP650PSXXEF provided with top cover with fan located at the end of the power supply chassis.

Model SHP650PSXXTF 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.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined in the end-use product.
- 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 (earthed)
- Considered current rating of protective device as part of the building installation (A) : 9
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 3048
- Altitude of test laboratory (m) : 34
- Mass of equipment (kg) : 1.25
- 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 and 70°C at half rated load.
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- 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.,

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, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Earthed Dead Metal: 245 Vrms, 350 Vpk, Primary-SELV: 240 Vrms, 442 Vpk,
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at hazardous energy levels: Power output
- 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
- 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: J1
- 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 following end-product enclosures are required: Electrical, Fire, Mechanical
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing: Model SHP650PS12TF: PWB under D310 (129°C),
- Consideration to repeating Heating and Touch Current Tests should be given in the end-product evaluation.

Additional Information

The clearance distances have additionally been assessed for suitability up to 3048 m elevation (1.15 correction factor extrapolated as per IEC 60664-1, Table A2).

Marking label is representative of all models.

No tests were considered necessary to make Y-Capacitors (C2, C3, C5, C6, C10, C11) optional, due to testing with the Y-Capacitors provided being considered worst case.

This Test Report is a reissue of CBTR Ref. No. E139109-A41-CB-1, CB Test Certificate Ref. No. US/14350A/UL. Based on previously conducted testing and the review of product technical documentation it was determined that the product complies with the upgrade of the Second Edition of the standard to Amendment 1.

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, IEC 60950-1:2005 + A1:2009, , UL 60950-1 2nd Ed. Revised 2011-12-19

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 company's 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
Warning to service personnel	"CAUTION: Double pole/neutral fusing"

Special Instructions to UL Representative

Units provided with optional fuse, F2, should also be provided with the "CAUTION: Double pole/neutral fusing". The marking is not required for single pole fused units.

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (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)
Product:	Switching Power Supplies
Model:	SHP1000PSXX (where XX = represents the output voltage between 12-48)
Rating:	Input: 100-240 Vac, 50/60 Hz, 13 A Output: See Enclosure - Misc Output Ratings for details
Applicant Name and Address:	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

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Prepared by: Curtis Butler Reviewed by: Kevin Tang

Supporting Documentation

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Product Description

The product is a component AC-DC power supply for building-in, open frame type provided with a metal chassis, incorporating primary and SELV components.

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)), and minor differences in the secondary circuit components and PWB layout.

See below for Model Ratings Table Below:

Model SHP1000PS12: Output Rated: 12.0 Vdc, 83 A (1001 W)
Model SHP1000PS15: Output Rated: 15.0 Vdc, 67 A (1010 W)
Model SHP1000PS24: Output Rated: 24.0 Vdc, 42 A (1013 W)
Model SHP1000PS24: Output Rated: 24.0 Vdc, 50 A (1200 W)
Model SHP1000PS28: Output Rated: 28.0 Vdc, 36 A (1013 W)
Model SHP1000PS28: Output Rated: 28.0 Vdc, 43 A (1204 W)
Model SHP1000PS36: Output Rated: 36.0 Vdc, 28 A (1013 W)
Model SHP1000PS36: Output Rated: 36.0 Vdc, 33 A (1188 W)
Model SHP1000PS48: Output Rated: 48.0 Vdc, 21 A (1013 W)
Model SHP1000PS48: Output Rated: 48.0 Vdc, 25 A (1200 W)

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined in the end-use product
- Operating condition : continuous
- Access location : N/A
- 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 (earthed)
- Considered current rating of protective device as part of the building installation (A) : 12.7
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : up to 3048
- Altitude of test laboratory (m) : 166
- Mass of equipment (kg) : 1.25
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- 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 and 70°C at half rated load.
- The product is intended for use on the following power systems: TN
- 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.
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)

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:

- Fans: The fan provided in this sub-assembly is provided with a fan guard to reduce the risk of operator contact with the stator. Compliance shall be determined in the end-product.
- Consideration to repeating Heating and Touch Current Tests should be given in the end-product evaluation.
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Earthed Dead Metal: 264 Vrms, 373 Vpk, Primary-SELV: 353 Vrms, 608 Vpk
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at hazardous energy levels: Power output
- 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
- 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: J1
- 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 following end-product enclosures are required: Mechanical, Fire, Electrical

- The following Production-Line tests are conducted for this product: Earthing Continuity, Electric Strength

Additional Information

This report is a reissue of CBTR Ref. No. E139109-A52-CB-1, CB Test Certificate Ref. No. US/15582/UL. Based on the previously conducted testing and the review of product technicial documentation including photos, schematics, wiring diagrams and similar, it has been determined that the product complies with IEC60950-1, 2nd Edition + Am. 1.

No tests were conducted under this investigation due to reissue of CB Test Report Ref. No. E139109-A52-CB-1. All required tests were carried out under the original investigation.

Required values for clearance are adjusted for 3048 m (1.15 correction factor as per IEC 60664-1, Table A2).

Marking label is representative of all models.

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011, IEC 60950-1:2005 + A1:2009, UL 60950-1 2nd Ed. Revised 2011-12-19

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
1.7.1 Power rating - Model	Model 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
2.7.6 Warning to service personnel	"CAUTION: Double pole/neutral fusing"

Special Instructions to UL Representative

Units provided with optional fuse, F2, should also be provided with the "CAUTION: Double pole/neutral fusing". The marking is not required for single pole fused units.