

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:	GSP750PSXX (where XX = represents the output voltage between 12-48, maybe followed with additional suffix “-“ followed by “EF” or/and “SF”)
Rating:	Input: 100-240VAC 50/60Hz 9.5A 100-120VAC 50/60/400Hz 9.5A 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: 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 isolating 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 (T1 (Power)), and minor differences in the secondary circuit components and PWB layout.

See below for Model Ratings Table Below:

Convection Cooling Method: 50W output max

Model GSP750PS12:

Output Rated:

12 Vdc (10.1 - 13.5 Vdc), 4.16 A Max (50 W) @ 70°C ambient

12.6 Vdc (10.1 - 13.5 Vdc), 4.16 A Max (50 W) @ 70°C ambient

Model GSP750PS15:

Output Rated:

15 Vdc (13.6 - 17 Vdc), 3.33 A Max (50 W) @ 70°C ambient

Model GSP750PS18:

Output Rated:

18 Vdc (17.1 - 21 Vdc), 2.77 A Max (50 W) @ 70°C ambient

Model GSP750PS24:

Output Rated:

24 Vdc (21.1 - 26 Vdc), 2.08 A Max (50 W) @ 70°C ambient

Model GSP750PS28:

Output Rated:

28 Vdc (26.1 - 31 Vdc), 1.78 A Max (50 W) @ 70°C ambient

Model GSP750PS33:

Output Rated:

33 Vdc (31.1 - 33 Vdc), 1.51 A Max (50 W) @ 70°C ambient

Model GSP750PS36:

Output Rated:

36 Vdc (33.1 - 42 Vdc), 1.38 A Max (50 W) @ 70°C ambient

Model GSP750PS48:

Output Rated:

48 Vdc (42.1 - 52 Vdc), 1.04 A Max (50 W) @ 70°C ambient

Forced air cooling method: 750W output max

Model GSP750PS12:

Output Rated:

12 Vdc (10.1 - 13.5 Vdc), 62.5 A Max (750 W) @ 50°C ambient

12 Vdc (10.1 - 13.5 Vdc), 31.25 A Max (375 W) @ 70°C ambient

Model GSP750PS12:

Output Rated:

12.6 Vdc (10.1 - 13.5 Vdc), 62.5 A Max (750 W) @ 50°C ambient

12.6 Vdc (10.1 - 13.5 Vdc), 31.25 A Max (375 W) @ 70°C ambient

Model GSP750PS15:

Output Rated:

15 Vdc (13.6 - 17 Vdc), 50 A Max (750 W) @ 50°C ambient

15 Vdc (13.5 - 17 Vdc), 25 A Max (375 W) @ 70°C ambient

Model GSP750PS18:

Output Rated:

18 Vdc (17.1 - 21 Vdc), 41.6 A Max (750 W) @ 50°C ambient

18 Vdc (17.1 - 21 Vdc), 20.8 A Max (375 W) @ 70°C ambient

Model GSP750PS24:

Output Rated:

24 Vdc (21.1 - 26 Vdc), 31.3 A Max (750 W) @ 50°C ambient

24 Vdc (21.1 - 26 Vdc), 15.6 A Max (375 W) @ 70°C ambient

Model GSP750PS28:**Output Rated:**

28 Vdc (26.1 - 31 Vdc), 26.8 A Max (750 W) @ 50°C ambient

28 Vdc (26.1 - 31 Vdc), 13.4 A Max (375 W) @ 70°C ambient

Model GSP750PS33:**Output Rated:**

33 Vdc (31.1 - 33 Vdc), 22.7 A Max (750 W) @ 50°C ambient

33 Vdc (31.1 - 33 Vdc), 11.4 A Max (375 W) @ 70°C ambient

Model GSP750PS36:**Output Rated:**

36 Vdc (33.1 - 42 Vdc), 20.8 A Max (750 W) @ 50°C ambient

36 Vdc (33.1 - 42 Vdc), 10.4 A Max (375 W) @ 70°C ambient

Model GSP750PS48:**Output Rated:**

48 Vdc (42.1 - 52 Vdc), 15.6 A (750 W) @ 50°C ambient

48 Vdc (42.1 - 52 Vdc), 7.81 A (375 W) @ 70°C ambient

Models provided with the following -EF values differ as follows:

Model GSP750PSXX-EF provided with top cover with fan located at the end of the power supply chassis.

No fan provided for model GSP750PSXX, only provided with U-shaped chassis and top cover.

Additional suffix "SF" provided for units provided with only one fuse in the line and no fuse in the neutral.

All models are provided with a Standby Output (5 Vdc, 3A).

Test Item Particulars

Classification of use by	Skilled 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	Class I
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	See Model Differences section.
IP protection class	IPX0

Power Systems	TN IT - 230 V L-L
Altitude during operation (m)	5000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	1.4 kg

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : See Model Differences section.
- The product is intended for use on the following power systems : TN, IT (230 V L-L)
- The equipment disconnect device is considered to be : N/A - To be provided as an element of the end product.
- The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.
- The unit has two cooling condition: 1) External Forced Air Cooling: 10CFM air flow, 1 inch distance from Fan to input side of the unit with inward air-flow direction; 2) Convection cooling. The maximum continuous power supply output (Watts) relies on forced air cooling.
- 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).

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 DC Outputs
- The following output circuits are at PS3 energy levels : All DC Outputs with air cooling.
- 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 end-product enclosures are required : Mechanical, Electrical, Fire
- 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 (Class F, 155), T2 and T100 (Class, B, 130 or Class F, 155)
- The maximum continuous power supply output (Watts) relied on forced air cooling from : 15 cfm fan applied at chassis edge (near C20 and D60)
- The power supply was evaluated to be used at altitudes up to : "5,000 m"
- 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.
- Prospective Touch Current and Voltage testing to be conducted in the end-product evaluation.
- The fans provided in this sub-assembly are provided with fan guards that are integral to the chassis to reduce the risk of operator contact with the stator.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.
- The need for "Double Pole Fuse" Marking for units provided with double pole fusing to be determined during the end use evaluation.
- The equipment may be provided with a fuse in both the Line and Neutral of the primary circuit.
- Heating test should be repeated in the end-use product.
- 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 equipment suitability for connection to AC Mains shall be determined in the end use product .

Additional Information

Marking Plate is representative of all models.

The E139109-A168-UL report serves as CRD for 60950-1.

This report is based on a previous evaluation to IEC 60950-1:2005 (2nd Ed.), Am1:2009 + Am2:2013 under CBTR Ref. No. E139109-A168-CB including Amendments, CBTC Ref. No. US-28586-UL. Based on the previously conducted performance testing, only the tests conducted as part of this investigation were considered necessary.

The following tests were conducted under CTDSP SMT/CTF Stage 3 to IEC 60950-1 E2+A1+A2 at XP POWER LLC, 15641 RED HILL AVE, SUITE 100, TUSTIN , CA 92780, USA:

Input: Single-Phase (1.6.2)

Capacitance Discharge (2.1.1.7)

SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)

Humidity (2.9.1, 2.9.2, 5.2.2)

Determination of Working Voltage; Working Voltage Measurement (2.10.2)

Distance Through Insulation Measurements (2.10.5)

Heating (4.5.1, 1.4.12, 1.4.13)

Ball Pressure (4.5.5, 4.5)

Electric Strength (5.2.2)

Component Failure (5.3.1, 5.3.4, 5.3.7)

Abnormal Operation (5.3.1 - 5.3.9)

Transformer Abnormal Operation (5.3.3, 5.3.7b, Annex C.1)

Power Supply Output Short-Circuit/Overload (5.3.7)

The following additional tests were conducted on a sample of model GSP750PS12-EF in accordance with IEC 62368-1:2014 (Second Edition) at XP POWER LLC, 15641 RED HILL AVE, SUITE 100, TUSTIN, CA 92780 USA:

Electric Strength Test (5.4.9)

Prospective Touch Voltage and Touch Current Measurement (5.7)

This report references component licenses documentation or certificates that are older than 3 years or issued to previous IEC/EN Standard editions. It has been determined that all critical components comply with current safety requirements. Receiving NCB may request additional information. Acceptance of these licenses, certificates or relevant documentation is at the discretion of the Receiving NCB.

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

This is a technical amendment. 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:

- IT Power Systems evaluation added.
- Additional Information: Further information added about tests waived and performed.
- Engineering Conditions of Acceptability: Capacitance Discharge statement updated for clarity.
- Added A11:2017 to EN 62368 in additional standards.
- Clause 5.4.4: Evaluation corrected as TIW is used.
- Clause 5.7.5: Comment removed as measurement not taken.
- Clause 6.4.5: Verdict corrected to N/A.
- Clause F.3.5.3: Comment updated for clarity.
- Clause G.8: Verdicts and comments corrected.
- Table 4.1.2: Bleeder resistors added that are separately evaluated to clause G.10.
- Table 4.1.2: Additional information about testing added to labels.
- Table 5.2: Additional applicable data added from original 60950-1 evaluation.
- Table B.2.6: Temperature limits for components L1, L2, L3, and L4 corrected from 155C to 130C.
- Table 5.4.9: Inapplicable test data removed.
- Table 5.4.9: Locations expanded to be more specific.
- Table 5.5.2.2: Applicable test data from 60950-1 evaluation added.
- Table 6.2.2: Model GSP750PS48, V Standby classification corrected to "PS3 (Declared)".
- Table B.2.5: "Hz" column added to Input Test Table.
- Table B.4: Note in supplementary information regarding component T2 updated for clarity.
- Enclosures: Schematics removed from enclosures.

This is a correction. Corrections to 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:

- Additional Information statement for amendment revised as ES1 was not present in original report.
- Marking Plate added.

This is a Technical Amendment. Limited testing was considered necessary to make the following revisions:

- 1) Ratings: Add a 400hz at 100-120VAC rating, no component changes were made for this update.
- 2) Model differences: Addition output voltage rating was added to GSP750PS12 to add 12.6Vdc nominal output, which is within the previously set output voltage range.
- 3) Marking Plate: Revised the Marking Plate added with additional 100-120Vac/400Hz rating.

- 4) CBTL location updated from UL Camas to UL Vancouver (WA)
- 5) Additional Information: Corrected model callout from XXX to GSP750PS12-EF, in previous additional test note, IEC 62368-1:2014 (Second Edition) at XP POWER LLC, 15641 RED HILL AVE, SUITE 100, TUSTIN, CA 92780 USA
- 6) Table B.2.6: Added * to differential testing collected from UL/IEC 60950-1 and new testing to UL/IEC 62368-1.
- 7) Table B.2.5: Added * to differential testing collected from UL/IEC 60950-1 and new testing to UL/IEC 62368-1.
- 8) Table 5.5.2.2: Added * to differential testing collected from UL/IEC 60950-1 and new testing to UL/IEC 62368-1.
- 9) Clause 1.1: Added the result statement noting Dual-Language marking requirements not evaluated in this report as no DANGER, WARNING, and CAUTION, markings or instructions were required for this standard investigation.

The following additional tests were conducted on a sample of model GSP750PS12-EF in accordance with IEC 62368-1:2014 (Second Edition) at XP POWER LTD, 401 COMMONWEALTH DR. HAW PAR TECHNOCENTRE LOBBY B, #02-02. SINGAPORE 149598, SG:

Safeguards Against Capacitor Discharge After Disconnection of a Connector (5.5.2.2)

Prospective Touch Voltage and Touch Current Measurement (5.7)

Input Test (B.2.5)

Normal Operating Conditions Temperature Measurement (B.2.6)

Amendment 3 (Technical) - SR 5280870: Changes 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: Complementary CCNs QQQQ2 and QQQQ8 removed.

-CB Only: National differences evaluated for Australia/New Zealand and Japan.

-Table B.2.6: Temperature data corrected for GSP750PS24 Convection cooling (50W).

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	
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

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	Transformer T1	--	Primary Pins - Secondary Pins	3000 Vac	4200	1 sec
BD1.2	Earthing Continuity Test Exemptions – This test is not required for the following models:					
	All Models					
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