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:	Switching Power Supply
Model:	ECS65USXX (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF" and/or "-B"
Rating:	Model ECS65USXX Series: Input: 100-240Vac, 1.2A, 50/60Hz Model ECS65US12: Input 100-240Vac, 1.2A, 50/60Hz or 100-240Vac, 1.2A, 50/60/400Hz Output: See Enclosure - Miscellaneous Ratings Table for details.
Applicant Name and Address:	XP POWER LLC SUITE 100 15641 RED HILL AVE 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 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 ECS65USXX 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 below:

Model ECS65US12: Output Rated: 10.1 to 13.5 Vdc, 5.4 A max. (65 W max.)
Model ECS65US15: Output Rated: 13.6 to 17 Vdc, 4.3 A max. (65 W max.)
Model ECS65US18: Output Rated: 17.1 to 21 Vdc, 3.6 A max. (65 W max.)
Model ECS65US24: Output Rated: 21.1 to 26 Vdc, 2.7 A max. (65 W max.)
Model ECS65US28: Output Rated: 26.1 to 31 Vdc, 2.3 A max. (65 W max.)
Model ECS65US33: Output Rated: 31.1 to 33 Vdc, 2.0 A max. (65 W max.)
Model ECS65US36: Output Rated: 33.1 to 42 Vdc, 1.8 A max. (65 W max.)
Model ECS65US48: Output Rated: 42.1 to 54 Vdc, 1.35 A max. (65 W max.)

See Enclosure - Miscellaneous for de-rating tables.

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

Additional Suffix "-B" denotes units provided with additional EMI filter inductor, L2.

Test Item Particulars

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	+6%, -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)	1.2 A
Pollution degree (PD)	PD 3
IP protection class	IP X0
Altitude of operation (m)	3048
Altitude of test laboratory (m)	33
Mass of equipment (kg)	0.25 kg

Technical Considerations

- 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.
- 1.7 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).
- 1.2 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)
- 1.4 The product is intended for use on the following power systems: IT, TN
- 1.8 The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C29
- 1.3 The means of connection to the mains supply is: for building-in

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.
- Clearance spacing evaluated for 3048 m altitude. Additional consideration maybe necessary in the end-use product.
- 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.
- 1.2 The following Production-Line tests are conducted for this product: Electric Strength
- 1.3 The end-product Electric Strength Test is to be based upon a maximum working voltage of:
  Primary-Earthed Dead Metal: 244 Vrms, 359 Vpk
  Primary-SELV: 249 Vrms, 588 Vpk
- 1.5 The following secondary output circuits are SELV: All outputs.
- 1.7 The following secondary output circuits are at non-hazardous energy levels: All outputs.
- 1.10 The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" or "Y2" capacitors.
- 1.11 The power supply terminals and/or connectors are: Suitable for factory wiring only
- 1.12 The maximum investigated branch circuit rating is: 20 A
- 1.13 The investigated Pollution Degree is: 3
- 1.15 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 SEC components (mounted above chassis/accessible metal parts on Insulating posts etc). Class II units have no reliance upon protective earthing.
- 1.16 An investigation of the protective bonding terminals has: Not been conducted
- 1.17 The following input terminals/connectors must be connected to the end-product supply neutral: ACN J1
- 1.18 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, L3 and T1 (Class F, 155°C)
- 1.19 The following end-product enclosures are required: Mechanical
  Fire
  Electrical
- 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 PS2 energy levels : All DC Outputs
- 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

“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 national level."

CBTR E139109-A61-CB-3-Reissue:

This report is a reissue of CBTR Ref. No. E139109-A61-CB-2, CB Test Certificate Ref. No. US-19493-UL. No sample and no testing were conducted under this investigation due to:
1) Upgrade the Standard to IEC 60950-1 (2nd Ed +Amd 1 + Amd 2). All required testing carried out under original investigation. Based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product complies with the standard;
2) Update license Optical Isolators - Renesas (NEC), Type PS2561 Series, see Enclosure - License 8-14 for details;
3) Revise the output rating;
4) Update Table Critical Components to add alternate Primary Connector (J1); alternate Secondary Connector (J2); and PWB Conformal Coating;
5) Changed Applicant and Manufacturer's address;
6) Update National Differences to all countries.

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).

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. Marking plate for 50/60Hz represented marking plate for 50/60/400 Hz.

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 + A1:2011 +A2:2014, 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

1.7.1 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
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

Inspect the transformer(s) listed in production-line testing requirements per AA1.1- (C). When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in BD1.1 is conducted at the component manufacturer. The test record noted above shall be submitted to the manufacturer from transformer manufacturer. The test record can be in the form of a actual test record. A stamp or sticker on the transformer or other method verifying the routine test is being completed on 100% production is also acceptable.