

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20150331-E146893  
**Report Reference** E146893-D1002-1-ULCB  
**Issue Date** 2015-03-31

**Issued to:** XP POWER LLC  
15641 Red Hill Ave., Ste. 100  
Tustin, CA 97280 USA

**This is to certify that  
representative samples of**

Component power supply  
CHD250PSXXYY, (where the "XX" can be any number between  
12 to 48 indicating main output voltage, "YY" can be SF or blank  
indicating Single Fuse), may also be provided with additional  
suffixes "-S", "-C", "-L", and/or "A"

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** ANSI/AAMI ES60601-1:2005/(R)2012, CSA CAN/CSA-C22.2  
NO. 60601-1:14, IEC 60601-1 Edition 3.1 (2012)

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information.

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in  
performance capabilities and are intended for use as components of complete equipment  
submitted for investigation rather than for direct separate installation in the field. The final  
acceptance of the component is dependent upon its installation and use in complete equipment  
submitted to UL LLC.

Look for the UL Certification Mark on the product.

This is to certify that representative samples of the product as specified on this certificate were tested  
according to the current UL requirements.

*B. Mahlen* *Joe Hosey*

Bruce Mahlenholz, Assistant Chief Engineer, Global Inspection and Field Services, UL LLC  
Joseph Hosey, General Manager, Director of Sales – Canada, UNDERWRITERS LABORATORIES OF CANADA INC.

*Helena Y. Wolf*

Helena Y. Wolf, Director, Global Market Access Operations, UL LLC

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Customer Service Representative [www.ul.com/contactus](http://www.ul.com/contactus)



Description

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	ANSI/AAMI ES60601-1:2005/(R)2012, CSA CAN/CSA-C22.2 NO. 60601-1:14, IEC 60601-1 Edition 3.1 (2012)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQHM2 / QQHM8
<b>Product:</b>	Component power supply
<b>Model:</b>	E146893-D1002-1-ULCB
<b>Rating:</b>	Input: 100-240Vac, 50/60Hz, 3.1A Max; Output: See Model Differences & Miscellaneous Enclosure for details
<b>Applicant Name and Address:</b>	XP POWER LLC 15641 Red Hill Ave., Ste. 100 Tustin, CA 92800, USA

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.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared by: Bernadette Matsuoka      Reviewed by: Melissa DeGuia

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

Refer to the Report Modifications page for any modifications made to this report.

### Model Differences

All models in the Model CHD250PSXX-YY 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 at 50°C.

Output Ratings:

CHD250PS12: 10.1Vdc to 13.5Vdc, 20.8A Max., 250 W Max.

CHD250PS15: 13.6Vdc to 17Vdc, 16.7A Max. 250 W Max.

CHD250PS18: 17.1Vdc to 21Vdc, 13.9A Max. 250 W Max.

CHD250PS24: 21.1Vdc to 26Vdc, 10.4A Max. 250 W Max.

CHD250PS28: 26.1Vdc to 31Vdc, 8.93A Max. 250 W Max.

CHD250PS33: 31.1Vdc to 33Vdc, 7.58A Max. 250 W Max.

CHD250PS36: 33.1Vdc to 42Vdc, 6.94A Max. 250 W Max.

CHD250PS48: 42.1Vdc to 54Vdc, 5.2A Max. 250 W Max.

See Miscellaneous enclosure Power Output Table for additional information regarding power output and the various configurations.

Suffix "SF" indicates single fuse provided in the line side of the primary.

Units provided with suffix "-C" provided with cover.

Units provided with suffix "-S" provided with screw terminal.

Units provided with suffix "-L" provided with input leads.

Units provided with suffix "-A" provided with 5V Stand-by output rated 5Vdc, 1A.

### Additional Information

Marking label is representative of all models.

Licenses older than 3 years to be provided by the manufacturer upon request.

The required clearance values have been assessed for suitability up to 5000 m elevation

The testing was conducted at XP POWER LLC, 1241 E DYER RD, SUITE 150, SANTA ANA, CA 92705, USA. The client moved to 15641 Red Hill Ave., Ste. 100, Tustin, CA 97280 in December 2015 and has been re-audited as an SMT at this location.

### Technical Considerations

- The product was investigated to the following additional standards: ANSI/AAMI ES60601-1:2005 (R2012), CSA C22.2 No. 60601-1:2014, EN 60601-1:2006/A1:2013/A12:2014
- The following additional investigations were conducted: None
- The product was not investigated to the following standards or clauses: Electromagnetic

Compatibility (IEC 60601-1-2), Clause 14, Programmable Electronic Systems, Biocompatibility (ISO 10993-1)

- The following accessories were investigated for use with the product: None
- Scope of Power Supply evaluation defers the following clauses to the be determined as part of the end product: Clause 7.5 (Safety Signs), Clause 7.9 (Accompanying Documents), Clause 9 (ME Hazard), Clause 10 Radiation), Clause 14 (PEMS), Clause 16 (ME Systems)
- Scope of Power Supply evaluation excludes the following: □ Patient applied parts clauses: 4.6, 7.2.10, 8.3, 8.5.2, 8.5.5, 8.7.4.7-8.7.4.9, 8.9.1.15; Battery related clauses: 7.3.3, 15.4.3; Hand Control related clauses: 8.10.4; Oxygen related clauses: 11.2.2, Fluids related clauses: 11.6.2 – 11.6.4, Sterilization clause: 11.6.7, Biocompatibility Clause: 11.7 (ISO 10993), Motor related clauses: 13.2.13.3, 13.4, Heating Elements related clause: 13.2
- The product is evaluated only to the following hazards: Casualty, Fire, Shock
- The degree of protection against harmful ingress of water is: Ordinary
- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No
- The power supply was evaluated for use in 50°C ambient at Full Rated Output and see Enclosure Miscellaneous for additional ratings and various configurations

### **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 end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Secondary: 292 Vrms, 478 Vpk, Primary-Earthed Dead Metal: 240 Vrms, 420 Vpk and for Models CHD250PSXXYY, where XX is 5 to 36, Secondary to Ground at 250Vrms, 354Vpk
- The power supply terminals and/or connectors are: Not investigated for field wiring
- The maximum investigated branch circuit rating is: 20A
- 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 (CON1) 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): T1, T2, T3, T1-Standby (Class F, 155°C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- Suitable disconnect device is to be provided in the end system
- Temperature, Leakage and Dielectric Strength testing shall be considered in the end system
- Printed Wiring Board rated 130°C.
- Heatsinks are floating and considered live. They should not be accessible in the end-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

- These components have been judged on the basis of the required spacings in the ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10 + A1:2012) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance), CAN/CSA-C22.2 No. 60601-1 (2008) + CSA C22.2 No. 60601-1:2014 (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance), which covers the end-use product for which the component was designed, IEC 60601-1, Edition 3.1, EN 60601-1:2006/A1:2013/A12:2014
- Clearance spacing evaluated for 5000 m altitude. Additional consideration maybe necessary in the end-use product
- Units provided with additional suffix “SF”, provided with only one fuse. The need for additional fusing shall be determined as part of the end product
- The power supplies were evaluated as having 2 MOPP between primary-to-secondary for 292Vrms, 478Vpk, and 1 MOPP between primary-to-ground for 240Vac and 420Vpk. Models CHD250PSXX-YY where XX is 12 to 36 only and were also evaluated for 2 MOPP between secondary to ground for working voltage of 42Vdc and 1 MOPP for a working voltage of 250Vrms between secondary and earth for BF output considerations.
- Overcurrent releases of adequate breaking capacity must be employed in the end product
- The legibility and durability of Marking Test shall be conducted as part of the end product investigation.

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20150219-E139109  
**Report Reference** E139109-A144-UL  
**Issue Date** 2015-FEBRUARY-19

**Issued to:** XP POWER L L C  
15641 RED HILL AVE, SUITE 100  
TUSTIN CA 92780

**This is to certify that  
representative samples of** COMPONENT - POWER SUPPLIES, INFORMATION  
TECHNOLOGY EQUIPMENT INCLUDING ELECTRICAL  
BUSINESS EQUIPMENT

See next page

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.


**Standard(s) for Safety:** UL 60950-Information Technology Equipment - Safety -  
Part 1: General Requirements  
CAN/CSA C22.2 No. 60950-1-07- Information Technology  
Equipment - Safety - Part 1: General Requirements

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Recognized components are incomplete in certain constructional features or restricted in performance  
capabilities and are intended for use as components of complete equipment submitted for investigation rather  
than for direct separate installation in the field. The final acceptance of the component is dependent upon its  
installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

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contact a local UL Customer Service Representative at [www.ul.com/contactus](http://www.ul.com/contactus)





# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20150219-E139109  
**Report Reference** E139109-A144-UL  
**Issue Date** 2015-FEBRUARY-19

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

## Switching Power Supply

CHD250PSXXYY, (where the "XX" can be any number between 12 to 48 indicating main output voltage, "YY" can be SF or blank indicating Single Fuse), may also be provided with additional suffixes "-S", "-C", "-L", and/or "A".



Bruce Mahrenholz, Assistant Chief Engineer, Global Inspection and Field Services

UL LLC

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## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	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)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	CHD250PSXXYY, (where the "XX" can be any number between 12 to 48 indicating main output voltage, "YY" can be SF or blank indicating Single Fuse), may also be provided with additional suffixes "-S", "-C", "-L", and/or "A".
<b>Rating:</b>	Input: 100-240 Vac, 50/60Hz, 3.1 Max.  Output: See Model Differences for details.
<b>Applicant Name and Address:</b>	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

Reviewed by: Gregory Gatt



**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 report are component power supplies intended for use in Information Technology Equipment. They are open frame power supplies intended for building-in.

**Model Differences**

All models in the Model CHD250PSXX-YY 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 at 50°C:

**Output Ratings:**

CHD250PS12: 10.1Vdc to 13.5Vdc, 20.8A Max., 250 W Max.  
CHD250PS15: 13.6Vdc to 17Vdc, 16.7A Max. 250 W Max.  
CHD250PS18: 17.1Vdc to 21Vdc, 13.9A Max. 250 W Max.  
CHD250PS24: 21.1Vdc to 26Vdc, 10.4A Max. 250 W Max.  
CHD250PS28: 26.1Vdc to 31Vdc, 8.93A Max. 250 W Max.  
CHD250PS33: 31.1Vdc to 33Vdc, 7.58A Max. 250 W Max.  
CHD250PS36: 33.1Vdc to 42Vdc, 6.94A Max. 250 W Max.  
CHD250PS48: 42.1Vdc to 54Vdc, 5.2A Max. 250 W Max.

See Miscellaneous enclosure Power Output Table for additional information regarding power output and the various configurations.

Suffix "SF" indicates single fuse provided in the line side of the primary.

Units provided with suffix "-C" provided with cover.

Units provided with suffix "-S" provided with screw terminal.

Units provided with suffix "-L" provided with input leads.

Units provided with suffix "-A" provided with 5V Stand-by output rated 5Vdc, 0.5A.

**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
- 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
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : 0.394 without cover; 0.582 with cover
- 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. See Miscellaneous enclosure - "Power Output Table" for additional information regarding power output and the various configurations.
- The means of connection to the mains supply is: for building-in, to be determined 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 determined 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).

#### **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-SELV: 289 Vrms, 475 Vpk, Primary-Earthed Dead Metal: 240 Vrms, 420 Vpk
- 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: 20A
- 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 (CON1) 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): T1, T2, T3, T1-Standby (Class F, 155°C)
- The following end-product enclosures are required: Mechanical, Electrical

- Suitable disconnect device is to be provided in the end system.
- Temperature, Leakage and Dielectric Strength testing shall be considered in the end system.
- According to IEC60664-1, Table A2, required Clearances have been adjusted by multiplying the clearance at sea level by a factor of 1.48 for operating at an altitude of 5000 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 UL 60950-1.
- Printed Wiring Board rated 130°C.
- The equipment 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.
- Heatsinks are floating and considered live. They should not be accessible in the end-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.

#### Additional Information

The required clearance values have 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 as an Enclosure - Marking Plate 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: 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
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	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel