

## 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>Complementary CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	CMP250PSXX-YY, where XX is 24-48, YY is "SF" or blank, may also be provided with additional suffixes "-C", and "-S", all "-" considered optional.
<b>Rating:</b>	Input: 100-240Vac, 50/60Hz, 3.8A  Output: See Model Differences
<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 / 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 products in this report are open frame component power supplies that are intended for use in Information Technology Equipment.

### Model Differences

All models within the each series are identical with exception to the output rating, mains transformer windings, and minor secondary components.

Models CMP250PSXX-YY have the following nomenclature:

XX = 24-48, denotes the rated output voltage.

YY = SF or blank, denotes either single pole fusing (SF) or double fusing (blank)

Units provided with additional suffix "-C" provided with Cover.

Units provided with additional suffix "-S" indicates models provided with input screw terminals.

See below for the Output Rating for 50°C Ambient provided with Forced Air Cooling. See De-rating Curve, Misc. Enclosure 7-02, for 70°C Ambient loading.

Model CMP250PS24XX-YY: 21.1 Vdc to 26 Vdc, 10.4 A Max, (250 W Max, Convection Cooling or Forced-Air Cooling or Covered with Forced Air Cooling)(206 W Max, Covered Convection Cooling)

Model CMP250PS28XX-YY: 26.1 Vdc to 31 Vdc, 9.0 A Max, (250 W Max, Convection Cooling or Forced-Air Cooling or Covered with Forced Air Cooling)(206 W Max, Covered Convection Cooling)

Model CMP250PS33XX-YY: 31.1 Vdc to 33 Vdc, 7.6 A Max, (250 W Max, Convection Cooling or Forced-Air Cooling or Covered with Forced Air Cooling)(206 W Max, Covered Convection Cooling)

Model CMP250PS36XX-YY: 33.1 Vdc to 42 Vdc, 6.9 A Max, (250 W Max, Convection Cooling or Forced-Air Cooling or Covered with Forced Air Cooling)(206 W Max, Covered Convection Cooling)

Model CMP250PS48XX-YY: 42.1 Vdc to 54 Vdc, 5.2 A Max, (250 W Max, Convection Cooling or Forced-Air Cooling or Covered with Forced Air Cooling)(203 W Max, Covered Convection Cooling)

Stand-by Output for all models: 5Vdc, 1.5 A Max, de-rated by percentage same as conditions noted above for main 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 : To be considered in the end system
- 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) : 20 A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 5000
- Altitude of test laboratory (m) : 17
- Mass of equipment (kg) : 1.2
- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: 50°C (Output loaded to 100% of rated load, Convection Cooling) de-rated linearly to 70°C (Output loaded to 50% of rated, convection cooling), See Model Differences for all loading conditions.
- The means of connection to the mains supply is: for building-in, to be determined in the end-product.
- The product is intended for use on the following power systems: TN
- 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: IEC 62368-1 2nd Ed and 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 Capacitors (C33)
- 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.
- The internal wiring is certified Appliance Wiring Material rated VW-1 and/or FT-1 which were considered equivalent to the tests of IEC60332-1-2 and IEC60332-1-3. The final acceptability of the internal wiring may be determined under the discretion of the receiving NCB.

#### **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: 240Vrms, 484Vpk, Primary-Earthed Dead Metal: 240Vrms, 340Vpk
- The following secondary output circuits are SELV: All Outputs
- The following secondary output circuits are at hazardous energy levels: All Main Outputs

- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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 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 (mounted above chassis/accessible metal parts on Insulating posts etc). Class II units have no reliance upon protective earthing.
- 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): T1, T2, T3, T4, PFC (min. Class F),
- The following end-product enclosures are required: Mechanical, Electrical and Fire
- 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.
- The end-product Electric Strength Test is to be based upon a Mains Transient Voltage of 2500Vdc for Basic and 4000Vdc for Reinforced.
- Safeguards against capacitor discharge after disconnection of a connector (clause 5.5.2.2) shall be evaluated in the end-product.
- Clearances were evaluated for 5000m altitude. Additional consideration maybe necessary in the end-use product.
- Consideration to repeating the Touch Current test should be given in the end-product evaluation.

#### Additional Information

Report update on 2018-02-28:

1. General Product Information - Clarified Model Differences description of each model operating conditions.
2. Technical Considerations - Removed references to IT power system use.
3. Clarified Table 4.5 - clarified test loads used for each test condition.
4. Added Thermal Curve as Miscellaneous Enclosure 7-02.

Report updated on 2018-03-08:

- Changed Model scheme CMP250PSXX-YY, where XX is 24-48, YY is "SF" or blank, may also be provided with additional suffixes "-C", and "-S", all "-" considered optional.
- Added Australian/New Zealand National Deviations as Enclosure 7-04.
- Added Japan National Deviations as Enclosure 7-03.

Testing of the marking label for durability was conducted previously for this manufacturer as part of CBTR E139109-A141, CBTC US-24246-UL.

Nameplate Markings are representatives for all models described in this report.

#### Additional Standards

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013, IEC 60950-1:2005 + A1:2009 + A2:2013. Japan National Differences to IEC 60950-1:2005, Second Edition, A1:2009 + A2:2013 J60950-1 (H29) refer to Miscellaneous Enclosure 7-03. Australian/New Zealand National Differences to IEC 60950-1:2005, Second Edition, A1:2009 + A2:2013 60950-1, AS/NZS 60950.1:2015 refer to Miscellaneous Enclosure 7-04.

#### 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 - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
Fuse Warning	For Models without suffix "SF" -"CAUTION: Double pole/neutral fusing"
<b>Special Instructions to UL Representative</b> Inspect the transformer(s) listed in Production-Line Testing Requirements (Electric Strength Test Special Constructions) 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%.	

<b>Production-Line Testing Requirements</b>						
<b><u>Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.</u></b>						
Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
CMP250PSX X Series	T1, T2, T3, T4	N/A	Pri/Selv	300 0	4200	1
CMP250PSX X Series	T1, T2, T3, T4	N/A	Pri/Earth	175 0	2500	1
<b><u>Earthing Continuity Test Exemptions - This test is not required for the following models:</u></b>						
All						
<b><u>Electric Strength Test Exemptions - This test is not required for the following models:</u></b>						
N/A						
<b><u>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:</u></b>						
N/A						
<b><u>Sample and Test Specifics for Follow-Up Tests at UL</u></b>						
Model	Component	Material	Test	Sample(s)	Test Specifics	
N/A						