CERTIFICATE OF COMPLIANCE

Certificate Number	20180205-E139109
Report Reference	E139109-A175-UL
Issue Date	2018-FEBRUARY-05
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; COMPONENT - POWER SUPPLIES FOR USE WITH AUDIO/VIDEO, INFORMATION AND COMMUNICATION TECHNOLOGY EQUIPMENT See Addendum Page Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	See Addendum Page
Additional Information:	See the UL Online Certifications Directory at 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.

The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions.

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, Director North American Certification Program

UL LLC

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Certificate Number	20180205-E139109
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This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

Power supply for building-in, switch mode type, Model GCU500PSxxyy (where xx can be any number between 12 and 48 and yy is “-EF” or blank; all "-" considered optional; may also be provided with additional suffix "SF".

Standards for Safety:
UL 60950-1 and CAN/CSA C22.2 No. 60950-1-07, Information Technology Equipment - Safety - Part 1: General Requirements.

Bruce Mahrenholz, Director North American Certification Program

UL LLC

UL TEST REPORT AND PROCEDURE

Standard:	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)
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:	Power supply for building-in, switch mode type
Model:	GCU500PSxxyy (where xx can be any number between 12 and 48 and yy is “-EF” or blank; all "-" considered optional; may also be provided with additional suffix "SF"
Rating:	Input: 100-240 Vac, 50/60 Hz, 6.0 A 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: Gregory Ray / Project handler Reviewed by: Scott Corley / 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 GCU500PSXX series are identical with exception to the Mains Transformer T1 and secondary components/circuitry that allow for different output voltage ratings.

See below for Model Ratings:

Model GCU500PS12: Output Rated: 10.1 Vdc - 13.5 Vdc, 41.7 A Max., 500 W Max.
Model GCU500PS15: Output Rated: 13.6 Vdc - 17 Vdc, 33.3 A Max., 500 W Max.
Model GCU500PS18: Output Rated: 17.1 Vdc - 21 Vdc, 27.8 A Max., 500 W Max.
Model GCU500PS24: Output Rated: 21.1 Vdc - 26 Vdc, 20.8 A Max., 500 W Max.
Model GCU500PS28: Output Rated: 26.1 Vdc - 31 Vdc, 17.9 A Max., 500 W Max.
Model GCU500PS33: Output Rated: 31.1 Vdc - 33 Vdc, 15.2 A Max., 500 W Max.
Model GCU500PS36: Output Rated: 33.1 Vdc - 42 Vdc, 13.9 A Max, 500 W Max.
Model GCU500PS48: Output Rated: 42.1 Vdc - 54 Vdc, 10.4 A Max., 500 W Max.

Units provided with suffix "EF" are provided with end fan.
Units provided with additional suffix "SF" to indicate single pole fusing.

All Models are provided with 5Vdc, 0.2A Output Standby.

See Enclosure Id. 7-08 (Power Output Table) for additional details.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : To be determined in end-use product
- Operating condition : continuous
- Access location : To be determined in end-use product
- 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 or Class II (Determined by end-product)
- 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 m
- Altitude of test laboratory (m) : less than 2000 m
- Mass of equipment (kg) : 1.2kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C at 100% of Output Rating (with -EF and 13 cfm forced-air), 40°C at 50% of Output Rating (convection cooled), 50°C at 45% of Output Rating (with convection cooled), 70°C at 50% of Output Rating (with -EF and 13 cfm forced-air), 70°C at 23% of Output Rating (with convection cooling). 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 evaluated 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 evaluated 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)
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C21 (Pri to Sec bridging capacitor)
- 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.

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: 322 Vrms / 492 Vpk, Primary-Earthed Dead Metal: 240 Vrms / 340 Vpk
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at hazardous energy levels: All outputs
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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 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.
- 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:

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-L5, L7, L8, T1 and T2 (Class F / 155°C)
- The following end-product enclosures are required: Electrical / Fire / Mechanical
- The maximum continuous power supply output (Watts) relied on forced air cooling from: 13 cfm fan applied 1 inch from input side, blowing inward.
- The equipment is suitable for direct connection to: AC mains supply. For building-in. To be evaluated in end-product.
- Suitable disconnect device is to be provided in the end-product.
- In accordance with IEC60664-1, Table A2, required clearances were adjusted by multiplying the clearance at sea level by a factor of 1.48 for operating at an altitude of 5000 m. The correction factor is based on barometric pressure of 70 kPa 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 and are not explicitly addressed in UL 60950-1.
- Printed Wiring Board rated 130°C.
- The power supply 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. Heatsinks should not be accessible in the end-product.
- Heating test should be repeated in the end-use product
- Touch Current test to be conducted in the end-product evaluation
- 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.
- UL 62368-1 The following output circuits are at PS3 energy levels : All DC Outputs
- UL 62368-1 The following output circuits are at ES1 energy levels : All DC Outputs

Additional Information

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).

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

The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.

This report references component licenses documentation or certificates that are older than 3 years or issued to previous IEC/EN Standard editions. It has being 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 nameplate markings provided are considered representative of the entire series and only the output ratings may vary.

Testing of the marking label for durability was conducted previously as part of TRF E139109-A178, CBTC US-31019-UL.

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 2014-10-17, IEC 60950-1:2005 + A1:2009 + A2:2013, CSA/UL 62368-1 2nd Ed

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
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

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	Transformer T1	--	Primary to Secondary	3000	4242	1

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

ALL

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					