Test Report issued under the responsibility of:

TEST REPORT
IEC 60950-1
Information technology equipment - Safety - Part 1: General requirements

Report Reference No ..... :	E139109-A175-CB-1
Date of issue ..... :	2018-02-02
Total number of pages ..... :	24
CB Testing Laboratory ..... :	UL Vancouver
Address ..... :	14301 SE 1st Street, Suite 140, Vancouver, WA, 98684, USA
Applicant's name ..... :	XP POWER L L C
Address ..... :	15641 RED HILL AVE, SUITE 100 TUSTIN CA 92780 UNITED STATES
Test specification:	
Standard ..... :	IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1F
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-02

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description ..... :	Power supply for building-in, switch mode type
Trade Mark ..... :	
Manufacturer ..... :	XP POWER L L C 15641 RED HILL AVE, SUITE 100 TUSTIN CA 92780 UNITED STATES
Model/Type reference ..... :	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"
Ratings ..... :	Input: 100-240 Vac, 50/60 Hz, 6.0 A Output: See Model Differences for details

Testing procedure and testing location:		
[ ]	**CB Testing Laboratory**	
	Testing location / address .....:	
[ ]	**Associated CB Test Laboratory**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: TMP/CTF Stage 1**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: WMT/CTF Stage 2**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Witnessed by (name + signature) ..:	
	Approved by (name + signature)....:	
[x]	**Testing Procedure: SMT/CTF Stage 3 or 4**	
	Testing location / address .....:	XP Power LLC 15641 RED HILL AVE, SUITE 100, TUSTIN, CA 92780 USA
	Tested by (name + signature) .....:	Rodney Reyes / Tester — See the original CBTR for signatures
	Witnessed by (name + signature) ..:	N/A
	Approved by (name + signature)....:	Gregory Ray / Approver 
	Supervised by (name + signature) .:	Gregory Ray / Project Handler — See the original CBTR for signatures

List of Attachments

National Differences (0 pages)

Enclosures (20 pages)

Summary of Testing:

No tests were conducted

Summary of Compliance with National Differences:

Countries outside the CB Scheme membership may also accept this report.

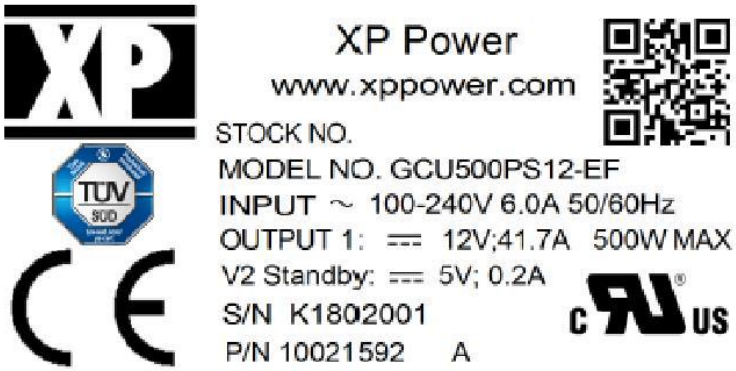
List of countries addressed: AR, AT, AU, BE, BG, BY, CA, CH, CN, CS, CZ, DE, DK, ES, EU, FI, FR, GB,

GR, HU, IE, IL, IN, IT, JP, KR, MY, NL, NO, NZ, PL, PT, RO, SA, SE, SG, SI, SK, UA, US, ZA

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

Copy of Marking Plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars :	
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
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N / A
- test object does meet the requirement ..... :	P(Pass)
- test object does not meet the requirement ..... :	F(Fail)
Testing:	
Date(s) of receipt of test item ..... :	N/A
Date(s) of Performance of tests ..... :	N/A

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02: Yes

The application for obtaining a CB Test Certificate includes more than one factory and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....

When differences exist, they shall be identified in the General Product Information section.

Name and address of Factory(ies):

XP POWER INC
990 BENECIA AVE
SUNNYVALE CA 94085
UNITED STATES

XP POWER (KUNSHAN) LTD

230 BIN JIANG NAN RD
ZHANGPU TOWN
KUNSHAN
JIANGSU 215321 CHINA

XP POWER (VIETNAM) CO LTD
LOT D - 4Q - CN
MY PHUOC 3 INDUSTRIAL PARK
BEN CAT DISTRICT
BINH DUONG VIETNAM

XP POWER PLC
HORESHOE PARK
PANGBOURNE
RG87 JW UNITED KINGDOM

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2019-08-27 to include the following changes/additions:
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:
-CB Only: The CTF-3 "Supervised by" name was corrected from "Scott Corley / Reviewer" to "Gregory Ray / Project Handler". No project handler signature was provided in the original CBTR due to this error.
-CB Only: The CBTL location was updated from Camas WA to UL Vancouver WA.
-Table 1.5.1: The rated fuse current was corrected from 5 A to 8 A. All previous testing was conducted with units employing fuses rated 8 A.
-CB Only: Enclosures: Australia and New Zealand national differences added.
-CB Only: Enclosures: Japan national differences added.

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.

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.

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:
-CB Only: The CTF-3 "Supervised by" name was corrected from "Scott Corley / Reviewer" to "Gregory Ray / Project Handler". No project handler signature was provided in the original CBTR due to this error.
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Technical Considerations

- 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

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 --

Abbreviations used in the report:

- normal condition	N.C.	- single fault condition	S.F.C
- operational insulation	OP	- basic insulation	BI
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation	SI
- double insulation	DI	- reinforced insulation	RI

Indicate used abbreviations (if any)