Test Report issued under the responsibility of:

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

Report Reference No ..... :	E139109-A47-CB-3
Date of issue ..... :	2015-04-20
Total number of pages ..... :	22
CB Testing Laboratory ..... :	UL San Jose
Address ..... :	455 E. Trimble Rd., San Jose, CA, 95131-1230, USA
Applicant's name ..... :	XP POWER L L C
Address ..... :	SUITE 100 15641 RED HILL AVE 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 ..... :	Switching Power Supply
Trade Mark ..... :	
Manufacturer ..... :	XP POWER L L C SUITE 100 15641 RED HILL AVE TUSTIN CA 92780 UNITED STATES
Model/Type reference ..... :	ECS45US05, ECS45USXX and ECS25USXX (where XX can be any number between 12 and 48 designating the output voltage, may also be followed by suffix SF, -C, -S or all). 102174-P1 (UL, CUL only)
Ratings ..... :	Input Rating: Model ECS45US05 and Model ECS45USXX Series: 100-240 Vac, 0.9 A, 50/60 Hz Model ECS25USXX Series: 100-240 Vac, 0.6 A, 50/60 Hz Model 102174-P1 (UL, CUL only): 100-240 Vac, 0.9 A, 50/60 Hz Output Rating: All Series: See Model Differences for details.

Testing procedure and testing location:		
[x]	**CB Testing Laboratory**	
	Testing location / address .....:	UL San Jose 455 E. Trimble Rd., San Jose, CA, 95131-1230, USA
[ ]	**Associated CB Test Laboratory**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	Robert Leon
	Approved by (name + signature)....:	Walid Beytoughan
[ ]	**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)....:	
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	
[ ]	**Testing Procedure: RMT**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	

List of Attachments

National Differences (2 pages)

Enclosures (11 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 2014-10-14, IEC 60950-1:2005 + A1:2009 + A2:2013

Copy of Marking Plate - Refer to Enclosure titled Marking Plate for copy.

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	:	+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)	:	20A
Pollution degree (PD)	:	PD 3
IP protection class	:	IPX0
Altitude of operation (m)	:	3048
Altitude of test laboratory (m)	:	less than 2000 meters
Mass of equipment (kg)	:	0.17 kg
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 L L C
990 BENECIA AVE
SUNNYVALE CA 94085
UNITED STATES

XP POWER (KUNSHAN) LIMITED

230, BIN JIANG NAN ROAD,
ZHANG PU TOWN
KUNSHAN,
JIANGSU 215300 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2015-07-15 to include the following changes/additions:
Correction 1 - Added alternate PWB Layout, Photos ID 5-03 and 5-04 to Enclosure based on previous investigation.

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 ECS45USXX 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 Table Below:

Model ECS45US05: Output Rated: 4.1 Vdc to 6 Vdc, 6 A Max (30W Max)
Model ECS45US12: Output Rated: 10.1 Vdc to 13.5 Vdc, 3.75 A (45W Max)
Model ECS45US15: Output Rated: 13.6 Vdc to 17 Vdc, 3.00 A (45W Max)
Model ECS45US18: Output Rated: 17.1 Vdc to 21 Vdc, 2.5 A Max (45 W Max)
Model ECS45US24: Output Rated: 21.1 Vdc to 26 Vdc Vdc, 1.90 A (45W Max)
Model ECS45US28: Output Rated: 26.1 Vdc to 31 Vdc, 1.61 A Max (45 W Max)
Model ECS45US33: Output Rated: 31.1 Vdc to 33 Vdc, 1.36 A Max (45 W Max)
Model ECS45US36: Output Rated: 33.1 Vdc to 42 Vdc, 1.25 A Max (45 W Max)
Model ECS45US48: Output Rated: 42.1 Vdc to 54 Vdc, 0.95 A (45 W Max)

Model 102174-P1 (UL, CUL only) is identical to ECS45US12, except for output rating 12 Vdc, 2.08 A at 70 deg. C, potting compound, an addition of surge PWB.

All respective models in the Model ECS25USXX Series are identical Model ECS45USXX Series, except for the lower output power rating and the heatsinks (HS1, HS2) are not provided. See below for Model Ratings at 50°C Table Below:

Model ECS25US12: Output Rated: 10.1 Vdc to 13.5 Vdc, 2.08 A Max (25W Max)
Model ECS25US15: Output Rated: 13.6 Vdc to 17 Vdc, 1.67 A Max (25W Max)
Model ECS25US18: Output Rated: 17.1 Vdc to 21 Vdc, 1.39 A Max (25W Max)
Model ECS25US24: Output Rated: 21.1 Vdc to 26 Vdc, 1.04 A Max (25W Max)
Model ECS25US28: Output Rated: 26.1 Vdc to 31 Vdc, 0.89 A Max (25 W Max)
Model ECS25US33: Output Rated: 31.1 Vdc to 33 Vdc, 0.76 A Max (25 W Max)
Model ECS25US36: Output Rated: 33.1 Vdc to 42 Vdc, 0.69 A Max (25 W Max)
Model ECS25US48: Output Rated: 42.1 Vdc to 54 Vdc, 0.52 A

See Enclosure - Miscellaneous for details on de-rated outputs based upon higher ambients.

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.

Additional Information

This CB Report is a reissue of CBTR Ref. No. E139109-A47-CB-2, CB Test Certificate Ref. No. US-20364-UL. No sample and no testing was 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) Changed Applicant and Manufacturer's address;
3) Update National Differences to all countries;
4) Add alternate Secondary Connector (J2) and Label Marking.

“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.”

The required clearance values have 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.

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

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. --
- 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 and Enclosure 7-02 for details) --
- 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: IT, TN --
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): Models ECS25USXX and ECS45USXX (where XX =12-48): Power Output --
- The equipment disconnect device is considered to be: for building-in, to be determined in the 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

When installed in an end-product, consideration must be given to the following:

- Printed Wiring Board rated 130°C. --
- Units may be provided with one fuse in the Line side or one fuse in both the Line and Neutral sides. The need for additional fusing shall be determined as part of the end-product evaluation. --
- Heatsink (HS2) is floating and considered live. They should not be accessible in the end-product. --
- Touch Current test to be repeated in the end-product evaluation. --
- Clearance spacing evaluated for 3048 m altitude. Additional consideration maybe necessary in the end-use product. --
- Units provided with either a Cover or Chassis should be used only in a Class I application. The cover and chassis shall be reliably earthed in the end-use application. --
- Mounting hole near connector, J2, is considered part of the SELV circuit. The need for providing supplementary insulation (4 mm creepage/2 mm clearance up to 2000m) to floating metal parts separated from the primary by basic insulation only should be considered in the end-use evaluation. --
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a min. 2 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts up to 2000m elevation. 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 up to 2000m elevation. --
- The following warning or its equivalent shall be provided by the end-use product when double pole fused units are installed: "CAUTION. Double pole/neutral fusing" --
- For Models provided with suffix "-S". Terminal block type EK381V series suitable for solid/stranded copper wiring only, 16-30 AWG, 1.73 in-lbs. torque. --
- 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-Earthed Dead Metal: 244 Vrms, 356 Vpk, Primary-SELV: 240 Vrms, 531 Vpk, --
- The following secondary output circuits are SELV: All outputs --
- The following secondary output circuits are at non-hazardous energy levels: All outputs --
- The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" or "Y2" capacitors., --
- 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: 3 --
- 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 is installed such that it provides a min. 8 mm creepage/4 mm clearance between primary to secondary circuits or to

accessible metal circuits in a Pollution Degree 3 environment or provides min. 5 mm creepage/4 mm clearance in a Pollution Degree 2 environment up to 2000m elevation. Class II units have no reliance upon protective earthing. --

- 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: ACN 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, L2, L3 and T1 (Class F, 155°C) , --
- The following end-product enclosures are required: Fire, Mechanical --
- The equipment is suitable for direct connection to: AC mains supply --

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)