

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:	Listing
CCN:	QQGQ, QQGQ7 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Supply
Model:	PSAC60X-YYYZZZZZ, where X is M or W, YYY is 120, 180, 240, 480, or 560, and Z is any alphanumeric character, dash, or blank.
Rating:	Input: 100 - 240Vac, 50-60Hz, 1.6A Output: PSAC60X-120ZZZZZ: 12Vdc, 5A PSAC60X-180ZZZZZ: 18Vdc, 3.33A PSAC60X-240ZZZZZ: 24Vdc, 2.5A PSAC60X-480ZZZZZ: 48Vdc, 1.25A PSAC60X-560ZZZZZ: 56Vdc, 1.08A
Applicant Name and Address:	PHIHONG TECHNOLOGY CO LTD 568 FU XING 3RD RD GUISHAN DISTRICT TAOYUAN 33383 TAIWAN

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: Paul Pham

Reviewed by: Walid Beytoughan

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 power supply consisting of electronic components mounted on PWB and housed within a plastic enclosure.

Connection to IT Power Systems were considered as part of this investigation.

Model Differences

PSAC60X-YYYZZZZZZ vary in that the models are either Class I or Class II type inputs and DC outputs are either 12V, 18V, 24V, 48V, or 56V. Transformers vary for each output voltage and Class I units have earth pin on appliance inlet and line-to-ground RFI capacitors.

Input Class: When X = M the appliance inlet has an earth pin and when X = W the appliance inlet is for Class II, no earth pin.

Output Voltage: YYY, where YYY = either 120, 180, 240, 480, or 560, refers to rated DC Output Voltage, 120 = 12Vdc, 180 = 18Vdc, 240 = 24Vdc; 480 = 48Vdc, and 560 = 56Vdc output.

Marking label is representative of all models.

Suffix ZZZZZZ is for marketing use and has no effect on product safety.

Maximum V, A, VA:

Model	Max. V(DC)	Max. A	Max. VA
PSAC60W-120ZZZZZZ	12.19	7.64	81.5
PSAC60M-120ZZZZZZ	12.20	7.55	80.7
PSAC60X-240ZZZZZZ	24.32	3.53	82.9
PSAC60X-480ZZZZZZ	47.90	1.77	83.9
PSAC60M-560ZZZZZZ	55.77	1.67	92.5
PSAC60W-560ZZZZZZ	55.93	1.59	88.0

Models not specifically noted above were considered included, based on output voltage rating.

Technical Considerations

- Equipment mobility : movable and transportable
- Connection to the mains : pluggable A

- Operating condition : continuous
- Access location : operator accessible
- 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) : 230V
- Class of equipment : Class I (earthed) or Class II (see Model Differences)
- 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) : 3048m
- Altitude of test laboratory (m) : 43m
- Mass of equipment (kg) : 0.27kg
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 40°C
- The means of connection to the mains supply is: Detachable power cord
- The product is intended for use on the following power systems: TN, IT, TT.
- The equipment disconnect device is considered to be: Appliance inlet
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): All external DC Outputs.
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- 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).

Additional Information

This report is an upgrade to IEC 60950-1:2005 (2nd Edition); Am 1:2009; Am2: 2013 of CBTR Ref. No. E127643-A229-CB-2, CB Test Certificate Ref. No. US-21304-UL.

The reissued report also covered the following:

- Update manufacturer's address;
- Delete Appliance Inlet manufactured by Supercom Wire & Cable Ltd., Type SC-14 used in Model PSAC60M prefix models and Type SC-12S used in Model PSAC60W prefix models;
- Delete an alternate Varistor (ZNR1) manufactured by Centra Science Corp., Type CNR-14D471.
- Update manufacturer of X-Capacitor (CX1) from:
 - + Strong Capacitor Co. Ltd. to Strong Components Co. Ltd.;
 - + Arcotronics Italia SPA to Kemet Electronics Italia SRL;
 - + Pilkor Electronics Ltd. to Cowell Fashion Co. Ltd.;
- Delete an alternate Insulation Tape/Sheet (used in 2 locations: one wrapped at Heatsink (for BD1, Q1), the other wrapped at Heatsink (for D4)) manufactured by Alliance Material Co. Ltd., Type S391;
- Revise the rating of Discharge Resistors (R1, R2) from 1.5 MΩ to 2.2 MΩ as a typo in previous evaluation.

Based on the results of previous testing, and a current review of the product construction, it was determined that the products continue to comply with the standard, without testing. The "Test Performance Date" noted is the date of completion of the original testing of the product.

Samples were not considered necessary under this investigation since there were no declared modifications to the product since the last testing; and construction analysis to verify compliance with the new standard was completed based on the review of the product technical documentation including existing CBTR, previous and new photos, schematics, wiring diagrams and similar, and in all cases, the verification of critical components was completed based on documentation. All required tests were carried out under the original investigation.

The product was investigated to the following additional standards: The unit was evaluated to be operated up to 10,000 feet (3,048 m) above sea level and the multiplication factor (1.15, linear interpolation used) of table A.2 of IEC 60664-1:1992+A1: 2000+A2: 2002 was applied to determinate the minimum required clearance. The creepage was adjusted to the same value as the clearance if the resulting clearance was larger than the creepage.

Testing primarily done using Model PSAC60W-120 and PSAC60M-120 to represent all models in the series. Other models used where specified and are interchangeable for some testing, such as for component fault testing. All models are of similar layout and construction except for transformer varies with output voltage.

Models PSAC60X-YYY where X is M (Ground Pin on Appliance Inlet) and where X is W (Class II, no Ground Pin), are interchangeable for testing purposes, except where specified.

Additional Standards

The product fulfills the requirements of: Refer to Technical Considerations

Markings and instructions

Clause Title	Marking or Instruction Details
Limited Power Source	Optional: Units may be marked "LPS".
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 fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel

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	Transformer (T1)	--	Primary to Secondary	300 0	4242	1

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

All models discribed in this section.

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					