

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20180711-E139109  
**Report Reference** E139109-A6022-UL  
**Issue Date** 2018-JULY-11

**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 FOR USE WITH  
AUDIO/VIDEO, INFORMATION AND COMMUNICATION  
TECHNOLOGY EQUIPMENT COMPONENT - POWER  
SUPPLIES, INFORMATION TECHNOLOGY EQUIPMENT  
INCLUDING ELECTRICAL BUSINESS EQUIPMENT  
REFER ADDENDUM PAGE FOR MODELS

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** REFER ADDENDUM PAGE

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://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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contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20180711-E139109  
**Report Reference** E139109-A6022-UL  
**Issue Date** 2018-JULY-11

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

## Switching Power Supply

GCS150PSxxyy and GCS150PSxxKyy (where xx can be any number between 12 and 48 and yy is "-C", "-TF", "-EF" or blank and may be preceded by "-R"; all "-" considered optional; may also be provided with additional suffix "SF", "S", or "L").

GCS180PSxxyy (where xx can be any number between 12 and 48 and yy is "-C", "-TF", "-EF", or blank and may be preceded by "-R"; all "-" considered optional; may also be provided with additional suffix "SF", "S", or "L").

AVPQ073M245165 may be provided with suffix A-Z for non-safety related options

UL 62368-1 & CAN/CSA C22.2 No. 62368-1-14 - Audio/video, information and communication technology equipment Part 1: Safety requirements



Bruce Mahrenholz, Director North American Certification Program

UL LLC

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## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed (Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	QQGQ2, QQGQ8(Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	Switching Power Supply  GCS150PSxxyy and GCS150PSxxKyy (where xx can be any number between 12 and 48 and yy is "-C", "-TF", "-EF" or blank and may be preceded by "-R"; all "-" considered optional; may also be provided with additional suffix "SF", "S", or "L").
<b>Model:</b>	GCS180PSxxyy (where xx can be any number between 12 and 48 and yy is "-C", "-TF", "-EF", or blank and may be preceded by "-R"; all "-" considered optional; may also be provided with additional suffix "SF", "S", or "L").  AVPQ073M245165 may be provided with suffix A-Z for non-safety related options.  GCS150PSxxyy and GCS150PSxxKyy series Input: 100-240 Vac, 50/60 Hz, 1.8A Output: See Model Differences for details
<b>Rating:</b>	GCS180PSxxyy series Input: 100-240 Vac, 50/60 Hz, 2.2A Output: See Model Differences for details  AVPQ073M245165 Input: 100-240 Vac, 50/60 Hz, 1.6A Output: See Model Differences for details
<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 model covered in this report is a component AC - DC power supply intended for use in Audio/video, information and communication technology equipment. It is an open frame power supply intended for building-in and may be optionally provided with a cover and a fan.

**Model Differences**

Model GCS150PSxxy series, GCS150PSxxKyy and Model GCS180PSxxy are identical the with exception to input ratings, power output, the shape of the Primary Heatsink, and minor differences in the PWB layout.

All models in the Model GCS150PSxx series and Model GCS180PSxx 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 Table Below:

Model AVPQ073M245165 is constructed with model GCS180PS24 mounted inside a chassis with an appliance inlet, power switch and output PWB.

Model GCS150PS12: Output Rated: 12 Vdc (10.1 Vdc to 13.5 Vdc), 12.5 A Max (150 W Max)

Model GCS150PS15: Output Rated: 15 Vdc (13.6 Vdc to 17 Vdc), 10.0 A Max (150 W Max)

Model GCS150PS18: Output Rated: 18 Vdc (17.1 Vdc to 21 Vdc), 8.3 A Max (150 W Max)

Model GCS150PS24: Output Rated: 24 Vdc (21.1 Vdc to 26 Vdc), 6.3 A Max (150 W Max)

Model GCS150PS28: Output Rated: 28 Vdc (26.1 Vdc to 31 Vdc), 5.4 A Max (150 W Max)

Model GCS150PS33: Output Rated: 33 Vdc (31.1 Vdc to 33 Vdc), 4.5 A Max (150 W Max)

Model GCS150PS36: Output Rated: 36 Vdc (33.1 Vdc to 42 Vdc), 4.2 A Max (150 W Max)

Model GCS150PS48: Output Rated: 48 Vdc (42.1 Vdc to 54 Vdc), 3.2 A Max (150 W Max)

Model GCS180PS12: Output Rated: 12 Vdc (10.1 Vdc to 13.5 Vdc), 15 A Max (180 W Max)

Model GCS180PS15: Output Rated: 15 Vdc (13.6 Vdc to 17 Vdc), 12 A Max (180 W Max)

Model GCS180PS18: Output Rated: 18 Vdc (17.1 Vdc to 21 Vdc), 10 A Max (180 W Max)

Model GCS180PS24: Output Rated: 24 Vdc (21.1 Vdc to 26 Vdc), 7.5 A Max (180 W Max)

Model GCS180PS28: Output Rated: 28 Vdc (26.1 Vdc to 31 Vdc), 6.4 A Max (180 W Max)

Model GCS180PS33: Output Rated: 33 Vdc (31.1 Vdc to 33 Vdc), 5.5 A Max (180 W Max)

Model GCS180PS36: Output Rated: 36 Vdc (33.1 Vdc to 42 Vdc), Max 5.0 A (180 W Max)

Model GCS180PS48: Output Rated: 48 Vdc (42.1 Vdc to 54 Vdc), 3.75 A Max (180 W Max)

Model AVPQ073M245165: Output Rated: V1: 15Vdc, 3.24A

V2: +24Vdc, 2.16A

V3: -24Vdc, 0.97A

(124W Max)

See Enclosure - Miscellaneous for de-rated output values for higher ambient.

See Enclosure - Miscellaneous for max Power Outputs based on model, ambient, and forced air cooling.

Units provided with suffix "R" is remote inhibit.

Units provided with suffix "C" is provided with cover.

Units provided with suffix "TF" is provided with top fan.

Units provided with suffix "EF" is provided with end fan.

Units provided with suffix "K" can operate at full power at an ambient of 40°C.

Units provided without suffix "C", "TF" or "EF" is open frame (without cover).

Units provided with additional suffix "SF" to indicate single pole fusing.

Units provided with additional suffix "S" to indicate screw terminal block.

Units provided with additional suffix "L" to indicate fly leads.

<b>Test Item Particulars</b>	
Classification of use by:	Skilled Person
Supply Connection:	AC Mains
Supply % Tolerance:	+10%/-10%
Supply Connection – Type:	Other : For building-in
Considered current rating of protective device as part of building or equipment installation:	20 A; Installation location: building
Equipment mobility:	for building-in
Over voltage category (OVC):	OVC II
Class of equipment:	Not classified
Access Location:	N/A
Pollution degree (PD):	PD 2
Manufacturer's specified maximum operating ambient:	50°C at 100% of Output Rating, 70°C at 50% of Output Rating. Model AVPQ073M245165 was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of 55°C at 100°C of Output Rating, 70°C at 5
IP protection class:	IPX0
Power Systems:	TN
Altitude during operation (m):	5000 m
Altitude of test laboratory (m):	17 m
Mass of equipment (kg):	0.6 kg
<b>Technical Considerations</b>	
<ul style="list-style-type: none"> <li>• The product is intended for use on the following power systems : TN</li> <li>• Considered current rating of protective device as part of the building installation (A) : 20</li> <li>• Mains supply tolerance (%) or absolute mains supply values : +10%/-10%</li> <li>• The equipment disconnect device is considered to be: <ul style="list-style-type: none"> <li>: For model AVPQ073M245165 an appliance inlet is used. All other models are for building in and will be determined in the end use installation.</li> </ul> </li> <li>• 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, 70°C at 50% of Output Rating. Model AVPQ073M245165 was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of 55°C at 100°C of Output Rating, 70°C at 50% of Output Rating.</li> <li>• The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits. Additionally evaluated for Basic Insulation between Line and Neutral up to and across the fuse (F1) per internal requirements of XP Power engineering specifications.</li> <li>• 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).</li> <li>• Printed Wiring Board rated 130°C.</li> <li>• The internal wiring used in model AVPQ073M245165 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.</li> </ul>	
<b>Engineer Conditions of Acceptability</b>	

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 investigated Pollution Degree is:  
: 2
- The following input terminals/connectors must be connected to the end-product supply neutral:  
: J1
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJ2 insulation system with the indicated rating greater than Class A (105°C):  
: Inductors L1, L4 and Transformer T1 (all Class F, 155)
- The power supply was evaluated to be used at altitudes up to:  
: 5000 m
- The following end-product enclosures are required:  
: Electrical, Fire
- 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: 294 Vrms, 528 Vpk,
- The maximum investigated branch circuit rating is:  
: 20 A
- 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. When installed in a Class II product an Electric Strength Test for Reinforced Insulation at 4000Vdc will be required between any dead metal and the primary circuits in the end use installation
- The maximum continuous power supply output (Watts) relied on forced air cooling from:  
: 7 cfm fan applied 2 inches from input side, blowing inward.
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing:  
: Model GCS180PS12: T1 (125.3°C), J2 (98.7°C)
- The following output circuits are at PS3 energy levels : All Output Circuits are rated 150 - 180 Watts.
- An investigation of the protective bonding terminals has:  
: not been conducted
- The following output circuits are at ES1 energy levels : All outputs.
- The following product-line tests are conducted for this product : Electric Strength and Earthing Continuity
- 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.
- Heating (Thermal Requirements) Test was not conducted on power supply with input/output leads. If power supply is provided with input and/or output leads, then temperature on leads must be measured and cannot exceed 105°C.
- Fans: For models with the suffix "EF", the fan provided in this sub-assembly is not intended for operator access., For models with the suffix "TF", the fan provided in this sub-assembly is provided with a fan guard to reduce the risk of operator contact with the stator.
- The equipment is suitable for direct connection to: AC mains supply. Means of connection will need to be evaluated in the end product.
- Safeguards against capacitor discharge after disconnection of a connector (clause 5.5.2.2) shall be evaluated in the end-product. Bleeding resistors provided are certified to G.10.1 and G.10.2.
- Heatsinks are floating and considered live. They should not be accessible in the end-product.



**Additional Information**

Limited tests were conducted under this investigation based on testing previously conducted under CBTR Ref. No. E139109-A116-CB-2, CB Test Certificate Ref. Nos. US-24737-UL, US-24737-A1-UL to IEC 60950-1:2005 (Second Edition), Am1:2009 + Am2:2013. All required tests were carried out under the previous investigation except where specifically noted.

Some component licenses are more than 3 years old and updated licenses may be requested by accepting NCB if found necessary.

Marking label is representative of all models.

The Hazardous Voltage Measurement for the secondary side of inductor L4 was conducted by UL at the UL CBTL.

**Additional Standards**

The product fulfills the requirements of: EN 62368-1:2014 + A11:2017, UL 62368-1 2nd Ed, Issued December 1, 2014, CSA CAN/CSA-C22.2 NO. 62368-1 2nd Ed, Issued December 1, 2014

**Markings and Instructions**

Clause Title	Marking or Instruction Details
F.3.2.1 Equipment identification marking – Manufacturer identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
F.3.2.2 Equipment identification marking – model identification	Model Number
F.3.3 Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"

**Special Instructions to UL Representative**

N/A

<b>BD1.0</b>	<b>TABLE: Product-Line Testing Requirements</b>					—
<b>BD1.1</b>	<b>Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.</b>					
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
All Models	Transformer T1	--	Primary Pins - Secondary Pins	2828 Vac	4000	1 sec
<b>BD1.2</b>	<b>Earthing Continuity Test Exemptions – This test is not required for the following models:</b>					
	All Models					
<b>BD1.3</b>	<b>Electric Strength Test Exemptions – This test is not required for the following models:</b>					
	N/A					
<b>BD1.4</b>	<b>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.</b>					
	N/A					
<b>Sample and Test Specifics for Follow-Up Tests at UL</b>						
Model	Component	Material	Test	Sample (s)	Test Specifics	