

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	Switching Power Supply for building-in
Model:	UCP180PSXX (where XX can be any number 12, 15, 18, 24, 28, 36 or 48 designating the output voltage), may also be provided with additional suffix "-SF" or "-C" or "-T" or "-YYYYYY"; the hyphen is optional. "-SF" denotes that unit is provided with only a single line fuse at live side. "-C" denotes that unit is provided with option top cover. "-T" denotes that unit is provided with screw type terminal. "-YYYYYY" can be blank or any alphanumeric for marketing purposes only.
Rating:	Input: 100-240 Vac, 50/60 Hz, 3 A Output: See Model Differences for Output Ratings 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.

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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 product is a AC/DC switching mode power supply intended for building-in and use in Information Technology Equipment.

Model Differences

All models in the UCP180PSXX series are identical with exception to the Mains Transformer, TR1, and minor secondary components that allow for different output voltage ratings.

Convention cooling

UCP180PS12: 12Vdc (10.1 - 13.5 Vdc), 10 A max, 120W max
UCP180PS15: 15Vdc (13.6 - 17 Vdc) , 8 A max, 120W max
UCP180PS18: 18Vdc (17.1 - 21 Vdc) , 6.67 A max, 120W max
UCP180PS24: 24Vdc (21.1 - 26 Vdc) , 5 A max, 120W max
UCP180PS28: 28Vdc (26.1 - 31 Vdc) , 4.3 A max, 120W max.
UCP180PS36: 36Vdc (31.1 - 42 Vdc) , 3.33 A max, 120W max
UCP180PS48: 48Vdc (42.1 - 52 Vdc) , 2.5 A max, 120W max

Forced air cooling

UCP180PS12: 12Vdc (10.1 - 13.5 Vdc), 15 A max, 180W max
UCP180PS15: 15Vdc (13.6 - 17 Vdc) , 12 A max, 180W max
UCP180PS18: 18Vdc (17.1 - 21 Vdc) , 10 A max, 180W max
UCP180PS24: 24Vdc (21.1 - 26 Vdc) , 7.5 A max, 180W max
UCP180PS28: 28Vdc (26.1 - 31 Vdc) , 6.43 A max, 180W max.
UCP180PS36: 36Vdc (31.1 - 42 Vdc) , 5 A max, 180W max
UCP180PS48: 48Vdc (42.1 - 52 Vdc) , 3.75 A max, 180W max

See Enclosure ID 7-02 for de-rating details.

All models are provided with a Fan Output @ CN3 (12 Vdc, 0.5A).

Test Item Particulars

Classification of use by	Instructed person
Supply Connection	AC Mains ES1
Supply % Tolerance	+10%/-10%
Supply Connection – Type	for building-in
Considered current rating of protective device as part of building or equipment installation	20 A; building;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient	Without top cover option: 50°C at 100% rated output load; 70°C at 50% rated output load; With top cover option: 50°C at 90% rated output load; 70°C at 45% rated output load. See Enclosure ID 7-02 for derating details. °C
IP protection class	IPX0
Power Systems	TN
Altitude during operation (m)	5000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	0.236kg without top cover; 0.258kg with top cover

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : Without top cover option: 50°C at 100% rated output load; 70°C at 50% rated output load; With top cover option: 50°C at 90% rated output load and 70°C at 45% rated output load. See Enclosure ID 7-02 for derating details.
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual

Engineer 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 product-line tests are conducted for this product : Electric Strength
- The following output circuits are at ES1 energy levels : All circuits
- The following output circuits are at PS3 energy levels : All circuits
- 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 installed in a Class I end product.
- The following end-product enclosures are required : Fire, Electrical
- 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) : TR1 - Class F (155)
- The power supply was evaluated to be used at altitudes up to : "5,000 m"

Additional Information

N/A

Additional Standards

The product fulfills the requirements of: EN 62368-1:2014 + A11:2017

Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listees or Recognized companys name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	"Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)"
Fuses – replaceable by skilled person	F1, F2: Ratings (3.15A, 250V) located on or adjacent to fuse or fuseholder or in service manual.

Special Instructions to UL Representative

N/A

BD1.0						
TABLE: Product-Line Testing Requirements						
BD1.1						
Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.						
Model	Component	Removable parts	Test probe location	Test V rms	Test V dc	Test Time, s
UCP180PSXX	TR1	N/A	Primary/Secondary	2800	4000	1
UCP180PSXX	N/A	N/A	Primary/Earth	1800	2500	1
BD1.2						
Earthing Continuity Test Exemptions – This test is not required for the following models:						
N/A						
BD1.3						
Electric Strength Test Exemptions – This test is not required for the following models:						
N/A						
BD1.4						
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.						
N/A						

BE1.0					
Sample and Test Specifics for Follow-Up Tests at UL					
Model	Component	Material	Test	Sample (s)	Test Specifics

4.1.2	TABLE: List of critical components					Pass
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Product Category CCN(s)	Mark(s) of conformity	Supplement ID
1. U-Chassis	Interchangeable	Interchangeable	U-Shaped, aluminum. See Enclosure diagram Id 04-12 for dimension details.	--	--	
1-1. Insulation sheet (between U-chassis and PWB)	FORMEX, DIV OF ILLINOIS TOOL WORKS INC	GK-17	Rated V-0 (measured 0.43mm thick), minimum 115°C. See Enclosure diagram Id 04-14 for dimension details.	QMFZ2	UL	
2. Top cover (Optional)	Interchangeable	Interchangeable	Aluminum. See Enclosure diagram Id 04-13 for dimension details.	--	--	
3.Primary Connector (CN1)	Long Chu Electronics Co., Ltd.	P101	Rated 7A, 250V, min. 85°C (Internal Connection only).	ECBT2	UL	
3a.Primary Connector (CN1) (Alternate)	Degson Electronics Co., Ltd.	DG350	Rated 7A, 300V, min. 85°C (Internal Connection only).	XCFR2	UL	
3b.Primary Connector (CN1)	Long Chu Electronics co., ltd.	P3060	Rated 7A, 250V, min. 85°C (Internal Connection only).	ECBT2	UL	
4. Secondary Connector (CN2, CN3) (SELV)	Long Chu Electronics co., ltd.	P101	Rated 7A, 250V, min. 85°C (Internal Connection only).	ECBT2	UL	
5. Fuses (F1, F2)	Cooper Bussmann	SS-5 Series	T3.15 A, 250 V, soldered to PWB	JDYX2	UL	
5a. Fuses (F1, F2) - (Alternate)	Conquer Electronics Co., Ltd	Type MST	T3.15 A, 250 V, soldered to PWB	JDYX2	UL	

6. Thermistor (TH1)	Interchangeable	Interchangeable	NTC. Rated 240 V, 150°C., 2.5 ohm max, I _{ss} min. 5 A.	--	--	
7. Bridge Diodes (BD1)	Interchangeable	Interchangeable	Rated voltage (rms) 600 V, min. 10 A, 150°C.	--	--	
8. X-Capacitors (CX1)	Carli Electronics Co., Ltd.	MPX Series	Rated max. 0.47uF, min. 250 V, min. 100°C, Class X2.	FOWX2	UL	
8a. X-Capacitors (CX1)	Hua Jung Components Co., Ltd.	MKP Series	Rated max. 0.47uF, min. 250 V, 110°C, Class X2.	FOWX2	UL	
9. Y-Capacitors (CY1, CY2,CY3) - Optional	TDK Corporation	CD	Rated max. 1000 pF, min. 250 Vac, 125°C, Class Y1.	FOWX2	UL	
10. Y-Capacitors (CY7, CY8,CY9)	TDK Corporation	CD	Rated max. 1000 pF, min. 250 Vac, 125°C, Class Y1.	FOWX2	UL	
11. Electrolytic Capacitor (C2) (PRI)	Interchangeable	Interchangeable	Rated 82 uF, min. 420 V, 105°C.	--	--	
12. MOSFET (Q1,Q2, Q3) (PRI)	Interchangeable	Interchangeable	Rated min. 500 V, 5A min, 150°C max. Q2 & Q3 soldered on PWB. See Enclosure Id 03-08, Q1 pins must be fully inserted and soldered at the other side of PWB.	--	--	
13. Optical Isolators (IC3, IC4)	Lite-On Technology Corp	LTV-817 series	Double protection, isolation voltage min. 5000 V (DTI min. 0.4mm). Maximum operating temp. 115°C.	FPQU2	UL	

13a. Optical Isolators (IC3, IC4) (Alternate)	Renesas Electronics Corporation	PS2561 Series	Double protection, isolation voltage min. 5000 V (DTI min. 0.4mm). Maximum operating temp. 100°C.	FPQU2	UL	
13b. Optical Isolators (IC3, IC4) (Alternate)	Toshiba	TLP781, TLP781F	Double protection, isolation voltage min. 5000 V (DTI min. 0.4mm). Maximum operating temp. 115°C.	FPQU2	UL	
14. Transformer (TR1) (for output 12Vdc)	Yu Jing Technology Co Ltd	X25BCTR01F	See Enclosure 04-01 for details.	--	--	
14-1. Insulation System	Yu Jing Technology Co Ltd	Insulation system: SBI5.1	Class 155 (F)	OBJY2	UL	
14-2. Core	Interchangeable	Interchangeable	Ferrite. Overall 40 x 32 x 14 mm	--	--	
14-3. Bobbin	Sumitomo Bakelite Co Ltd	PM-9820 or PM-9630	Phenolic, min. thickness 0.71 mm, V-0, 150°C.	QMFZ2	UL	
14-4. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	OANZ2	UL	
14-5. Winding wire (pin 1 -2, pin 7 – 8, pin 9 – 10, pin 11 – 12)	Interchangeable	Interchangeable	Rated min. 155°C.	OBMW2	UL	
14-6. Triple insulated wire (pin 5 – pin 6)	Furukawa Electric Co Ltd	TEX-F	Rated min. 155°C.	OBJT2	UL	
14-6a. Triple insulated wire (pin 5 – pin 6) (Alternate)	Totoku Electric Co Ltd	TIW-3X	Rated min. 155°C.	OBJT2	UL	
14-7. Tubing	Great Holding Industrial Co Ltd	TFL	Rated min. 200°C.	YDPU2	UL	

14-8. Varnish	Hitachi Chemical Co Ltd	WP-2952F-2G	Min. 130°C	OBOR2	UL	
14a. Transformer (TR1) (Alternate) (for output 15Vdc, 18Vdc, 24Vdc, 28Vdc, 36Vdc, 48Vdc)	Yu Jing Technology Co Ltd	225-15 (for output 15 & 18Vdc), 225-24 (for output 24Vdc), 225-28 (for output 28Vdc), 225-36 (for output 36Vdc), 225-48 (for output 48Vdc)	See Enclosure 04-02, 04-03, 04-04, 04-05, 04-06 respectively for details.	--	--	
14a-1. Insulation System	Yu Jing Technology Co Ltd	Insulation system: SBI4.2	Class 130 (B)	OBJY2	UL	
14a-2. Core	Interchangeable	Interchangeable	Ferrite. Overall 40 x 32 x 14 mm	--	--	
14a-3. Bobbin	Sumitomo Bakelite Co Ltd	PM-9820 or PM-9630	Phenolic, min. thickness 0.71 mm, V-0, 150°C.	QMFZ2	UL	
14a-4. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	OANZ2	UL	
14a-5. Winding wire (pin 1 -2, pin 7 – 8, pin 9 – 10, pin 11 – 12)	Interchangeable	Interchangeable	Rated min. 130°C.	OBMW2	UL	
14a-6. Triple insulated wire (pin 5 – pin 6)	Furukawa Electric Co Ltd	TEX-E	Rated min. 130°C.	OBJT2	UL	
14a-6a. Triple insulated wire (pin 5 – pin 6) (Alternate)	Totoku Electric Co Ltd	TIW-2X	Rated min. 130°C.	OBJT2	UL	
14a-7. Tubing	Great Holding Industrial Co Ltd	TFL	Rated min. 200°C.	YDPU2	UL	
14a-8. Varnish	Hitachi Chemical Co Ltd	WP-2952F-2G	Min. 130°C	OBOR2	UL	

15. Inductor L2	Ain Hsin Electronics Co., Ltd	T16*9*5-C	Rated min. 130°C. See Enclosure 04-07 for details.	--	--	
16. Inductor L3	Ain Hsin Electronics Co., Ltd	T50-26	Rated min. 130°C. See Enclosure 04-08 for details.	--	--	
17. Inductor L4	Ain Hsin Electronics Co., Ltd	180L-230	Rated min. 130°C. See Enclosure 04-09 for details.	--	--	
17-1. Core	Interchangeable	Interchangeable	Ferrite. See Enclosure 04-09 for details.	--	--	
17-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	OBMW2	UL	
17-3. Bobbin	Sumitomo Bakelite Co Ltd	PM-9820	Phenolic, minimum V-0, minimum 150°C.	QMFZ2	UL	
17-4. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape.	OANZ2	UL	
17-4a. Insulation tape (Alternate)	Jingjiang Yahua Pressure Sensitive Glue Co Ltd	CT	Min. 130°C, polyester film tape.	OANZ2	UL	
17-4b. Insulation tape (Alternate)	Chyun Yih Tape Co Ltd	P2XXF^ (b)	Min. 130°C, polyester film tape.	OANZ2	UL	
17-5. Varnish	Interchangeable	Interchangeable	Rated min. 130°C	OBOR2	UL	
17-6. Tubing	Interchangeable	Interchangeable	Rated min. 130°C	YDPU2	UL	
17a. Inductor L4 (Alternate)	Anjou Co., Ltd	180L-230	Rated min. 130°C. See Enclosure 04-10 for details.	--	--	
17a-1. Core	Interchangeable	Interchangeable	Ferrite. See Enclosure 04-10 for details.	--	--	
17a-2. Coil	Interchangeable	Interchangeable	Rated min. 130°C	OBMW2	UL	
17a-3. Bobbin	Sumitomo Bakelite Co Ltd	PM-9820 or PM-9823 or PM-9630	Phenolic, minimum V-0, minimum 150°C.	QMFZ2	UL	
17a-4. Insulation tape	3M	1350F-1 or 1318-1	Min. 130°C, polyester film tape.	OANZ2	UL	

17a-4a. Insulation tape (Alternate)	Symbio Inc	35660	Min. 130°C, polyester film tape.	OANZ2	UL	
17a-5. Varnish	Interchangeable	Interchangeable	Rated min. 130°C	OBOR2	UL	
17a-6. Tubing	Interchangeable	Interchangeable	Rated min. 130°C	YDPU2	UL	
18. Inductor L5	Ain Hsin Electronics Co., Ltd.	R5*18+UL	Rated min. 130°C. See Enclosure 04-11 for details.	--	--	
18-1. Insulating Tubing/Sleeving for Inductor L5	Shenzhen Xingqi Plastic Product Co Ltd	X-2	Heat-Shrinkable Polyolefin Tubing, Rated 600V, 125 degree C, marked VW-1.	YDPU2	UL	
18-2. Insulation tape	3M	1350F-1	Min. 130°C, polyester film tape. Fully cover top of core.	OANZ2	UL	
19. Bleed resistors (R1, R1A, R2, R2A)	Interchangeable	Interchangeable	Max. 2 MOhm.	--	--	
20. PWB	Interchangeable	Interchangeable	Rated min. V-1, 130°C.	ZMPV2	UL	
21. Label	RONG TAY EMBOSSING PRINTING ART FACTORY	RT-05	Rated at min. 96°C.	PGDQ2	UL	
22. Thermal Pad	T-Global Technology Co Ltd	L37-3	Rated V-0, 150°C. Located at top of Q2 & D1. See Enclosure 04-15 for details.	QMFZ2	UL	

Enclosures

Type	Supplement Id	Description
Photographs	03-01	Overall View 1 With Optional Top Cover
Photographs	03-02	Overall View 2 With Optional Top Cover
Photographs	03-03	Overall View 1 Without Optional Top Cover
Photographs	03-04	Overall View 2 Without Optional Top Cover
Photographs	03-05	Bottom Chassis View
Photographs	03-06	Top PWB Side
Photographs	03-07	Bottom PWB Side
Photographs	03-08	Q1 on PWB
Diagrams	04-01	Transformer (TR1) - 12Vdc
Diagrams	04-02	Transformer (TR1) - 15Vdc & 18Vdc
Diagrams	04-03	Transformer (TR1) - 24Vdc
Diagrams	04-04	Transformer (TR1) - 28Vdc
Diagrams	04-05	Transformer (TR1) - 36Vdc
Diagrams	04-06	Transformer (TR1) - 48Vdc
Diagrams	04-07	Inductor (L2)
Diagrams	04-08	Inductor (L3)
Diagrams	04-09	Inductor (L4)
Diagrams	04-10	Inductor (L4) - Alternate
Diagrams	04-11	Inductor (L5)
Diagrams	04-12	Dimension Drawing of U-chassis
Diagrams	04-13	Dimension Drawing of Top Cover
Diagrams	04-14	Dimension Drawing of Insulation Sheet
Diagrams	04-15	Dimension Drawing of Thermal Pad
Schematics + PWB	05-01	PWB Layout
Miscellaneous	07-01	CB Letter of Assurance
Miscellaneous	07-02	De-rating Table