

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, Issued: 2014-12-01 (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:	DC Power Supply
Model:	HPCFX-350Px, HPCFX-350P-12VO-S05x, HPCFX-350P-12VO-S12x (where x maybe maximum 50 characters, any alphanumeric character, hyphen or blank, which denotes control number)
Rating:	<p>HPCFX-350Px: Input: 100-240 Vac, 2.9-1.2 A, 50/60 Hz Outputs: +3.3 Vdc, 8 A, +5 Vdc, 8 A, +12 Vdc, 14 A, -12 Vdc, 0.5 A, +5 VSBdc, 1 A</p> <p>HPCFX-350P-12VO-S05x: Input: 100-240 V~, 2.9-1.2 A, 50/60 Hz Outputs: +12 Vdc, 20 A, +5 VSBdc, 1 A</p> <p>HPCFX-350P-12VO-S12x: Input: 100-240 V~, 2.9-1.2 A, 50/60 Hz Outputs: +12 Vdc, 20 A, +12 VSBdc, 0.4 A</p>
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Issue Date: 2017-08-30

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Report Reference #

E161936-A6001-UL

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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.

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Handler

Reviewed By: Tadao Nakayama / Reviewer

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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 building-in type switching power supply.

Model Differences

Model HPCFX-350Px is basic model in this report.

The suffix, "x", denotes manufacturer's production control number and does not affect to safety requirements.

Models HPCFX-350P-12VO-S05x and HPCFX-350P-12VO-S12x are identical to Model HPCFX-350Px except for Model designation, deletion of output, and output voltage/current.

Test Item Particulars

Classification of use by	Skilled person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	pluggable equipment type A - appliance coupler
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 (°C)	50°C (100% load, Input rating voltage), 60°C (80% load, 90% Input voltage)
IP protection class	IPX0
Power Systems	TN IT - 230 V L-L
Altitude during operation (m)	3000 m
Altitude of test laboratory (m)	approximately 10 - 20 m
Mass of equipment (kg)	approximately 0.7 kg

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 (100% load, Input rating voltage), 60°C (80% load, 90% Input voltage)
- The product is intended for use on the following power systems : TN, IT (for Norway)
- Considered current rating of protective device as part of the building installation (A) : 20
- The equipment disconnect device is considered to be : Appliance inlet

Engineering 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 end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-Secondary: 380 Vrms / 632 Vpk
- The following output circuits are at ES1 energy levels : All secondary outputs
- The following output circuits are at ES3 energy levels : Phase to Neutral (capacitance limits)
- The following output circuits are at PS2 energy levels : Outputs: -12 Vdc, 5Vdc, 3.3 Vdc, 5 VSB dc, 12 VSB dc
- The following output circuits are at PS3 energy levels : Output: 12 Vdc
- 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
- An investigation of the protective bonding terminals has : not been conducted
- The following end-product enclosures are required : Electrical, Fire
- 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) : T21 (Class B)
- The power supply was evaluated to be used at altitudes up to : 3,000 m
- The power supply terminals and/or connectors are: Suitable for factory wiring only

Additional Information

- Unless otherwise stated, all tests were conducted with Model HPCFX-350Px.

- Unless otherwise stated, all tests with Model HPCFX-350Px were conducted under rated output load condition.

[Rating] CH1: +3.3 Vdc, 8 A, CH2: + 5Vdc, 8 A, CH3: +12 Vdc, 14 A, CH4: -12 Vdc, 0.5 A, CH5 (5VSB): + 5 Vdc, 1.0 A

- Derating of temperature of Tma is 60 °C and input voltage of 90 % were conducted under 80% of rated output load condition. (See Enclosure Id: 07-01 for details.)

[80% Load] CH1: +3.3 Vdc, 6.4 A, CH2: + 5Vdc, 6.4 A, CH3: +12 Vdc, 11.2 A, CH4: -12 Vdc, 0.4 A, CH5 (5VSB): + 5 Vdc, 0.8 A

Unless otherwise noted, all tests except input test and Heating Test were conducted at [Rated Output, Tma 50 °C].

- Regarding tests with Model HPCFX-350P-12VO-S12x were conducted under rated output load condition. [Rating] CH1: +12 Vdc, 20 A, CH2 (12VSB): + 12 Vdc, 0.4 A

- Derating of temperature of Tma is 60 °C were conducted under 80% of rated output load condition. (See Enclosure Id: 07-01 for details.)

[Rating] CH1: +12 Vdc, 16 A, CH2 (12VSB): + 12 Vdc, 0.32 A

- Derating of input voltage 85Vac were conducted under 70% of rated output load condition. (See Enclosure Id: 07-01 for details.)

[Rating] CH1: +12 Vdc, 14 A, CH2 (12VSB): + 12 Vdc, 0.28 A

- Sample operation position placed on the bench under horizontal position by applicant's request. (See Enclosure Id: 07-01 for details.)

- EN standards were used to verify the compliance of the some critical components, because EN standards were well harmonized to IEC standard, and technically equivalent (see appended table 4.1.2).

- UL Standard (UL94) has requirements that meet or exceed relevant IEC requirements.

Copy of marking plate of represent models attached in the Copy of marking plate can be representative of other series of models because this copy of marking plate includes all required items and same items are described in the marking plate of other series models.

Additional Standards

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

Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee's 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	Fuse (F11), Ratings (250V T6.3AL) located on adjacent to fuse.

Special Instructions to UL Representative

For transformer test - When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in Production-Line Testing Requirements be conducted at the component manufacturer.

BD1.0						
TABLE: Production-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
HPCFX-350Px, HPCFX-350P-12VO-S05x, HPCFX-350P-12VO-S12x	Transformer (T11), Type MT6136X, MT6156X	--	Primary to Secondary	3000	4000	1
HPCFX-350Px, HPCFX-350P-12VO-S05x, HPCFX-350P-12VO-S12x	Transformer (T21), Type MT6135X	--	Primary to Secondary	3000	4000	1
BD1.2						
Earthing Continuity Test Exemptions – This test is not required for the following models:						
HPCFX-350Px, HPCFX-350P-12VO-S05x, HPCFX-350P-12VO-S12x						
BD1.3						
Electric Strength Test Exemptions – This test is not required for the following models:						
HPCFX-350Px, HPCFX-350P-12VO-S05x, HPCFX-350P-12VO-S12x						
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