

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2019-05-09 (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:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Complementary CCN:	N/A
Product:	Switching Power Supply
Model:	PCFX-220Px (where x maybe maximum 50 characters, any alphanumeric character, hyphen or blank, which denotes control number)
Rating:	<p>Input: 100-240 Vac, 50/60 Hz, 2.5-1.1 A</p> <p>Output: CH1: +5 Vdc, 8 A (maximum 10 A, peak 12 A) CH2: +3.3 Vdc, 8 A (maximum 10 A, peak 12 A) CH3: +12 Vdc, 8 A (maximum 10 A, peak 12 A) CH4: -12 Vdc, 0.3 A CH5: +5VSB, 1 A (maximum 2 A, peak 2 A)</p> <p>Peak: Maximum 5 seconds. Interval: 45 seconds</p> <p>Total Wattage: Maximum 170 W. Total Peak Wattage: Maximum 220 W.</p>
Applicant Name and Address:	NIPRON CO LTD 2-57 OHAMA-CHO AMAGASAKI-SHI HYOGO-KEN 660-0095 JAPAN

Issue Date: 2010-01-06
Revision Date: 2023-06-01

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Report Reference #

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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.

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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

This equipment is component type switching power supply.

Model Differences

Suffix x maybe maximum 50 characters, any alphanumeric character, hyphen or blank, and denotes control number.

Test Item Particulars

Equipment mobility	for building-in
Connection to the mains	pluggable equipment pluggable A
Operating condition	continuous
Access location	N/A
Over voltage category (OVC)	OVC II
Mains supply tolerance (%) or absolute mains supply values	+10% / -10%
Tested for IT power systems	No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	Class I (earthed)
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)	up to 2000 m
Altitude of test laboratory (m)	approximately 10 to 20 m
Mass of equipment (kg)	approximately 810 g

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 40°C (100% Load) and 50°C (70% Load)
- The means of connection to the mains supply is : Pluggable A / Detachable Power Supply Cord
- The product is intended for use on the following power systems : TN

- 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 Production-Line tests are conducted for this product : Electric Strength, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-SELV: 1.0 kV / 466 Vrms
- The following secondary output circuits are SELV : CH1: +5 Vdc Output, CH2: +3.3 Vdc Output, CH3: +12 Vdc Output, CH4: -12 Vdc Output, CH5: +5VSB Output
- The following secondary output circuits are at hazardous energy levels : CH3: +12 Vdc Output
- The following secondary output circuits are at non-hazardous energy levels : CH1: +5 Vdc Output, CH2: +3.3 Vdc Output, CH4: -12 Vdc Output, CH5: +5VSB Output
- 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 : Not required
- An investigation of the protective bonding terminals has : Been conducted
- The following end-product enclosures are required : Electrical / Fire / Mechanical
- The Heating Test shall be evaluated in the end-product.

Additional Information

Unless otherwise stated, all tests were conducted under following Output Conditions and Sample Positions.

<Output Conditions>

100% Rated Load Condition:

CH1: 5 Vdc, 8 A, CH2: 3.3 Vdc, 8 A, CH3: 12 Vdc, 8 A, CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 1 A (Total 171 W)

70% Load Condition 1:

CH1: 5 Vdc, 8 A, CH2: 3.3 Vdc, 8 A, CH3: 12 Vdc, 3.7 A, CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 1 A (Total 119 W)

70% Load Condition 2:

CH1: 5 Vdc, 2 A, CH2: 3.3 Vdc, 1.4 A, CH3: 12 Vdc, 8 A, CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 1 A (Total 119 W)

Maximum Load Condition 1;

CH1: 5 Vdc, 10 A, CH2: 3.3 Vdc, 0 A, CH3: 12 Vdc, 10 A, CH4: -12 Vdc, 0 A, CH5: 5 Vdc, 0 A (Total 170 W)

Maximum Load Condition 2:

CH1: 5 Vdc, 8.4 A, CH2: 3.3 Vdc 10 A, CH3: 12 Vdc, 6.8 A, CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 2 A (Total 170 W)

Pulse Load Condition 1:

CH1: 5 Vdc, 9.1 Apk (5 seconds), 8 A (45 seconds), CH2: 3.3 Vdc, 12 Apk (5 seconds), 8 A (45 seconds), CH3: 12 Vdc, 10.1 Apk (5 seconds), 8 A (45 seconds), CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 2 Apk (5 second), 1 A (45 seconds) (Total 220 W peak)

Pulse Load Condition 2:

CH1: 5 Vdc, 12 Apk (5 seconds), 8 A (45 seconds), CH2: 3.3 Vdc, 0.8 A (5 seconds), 8 A (45 second), CH3: 12 Vdc, 12 Apk (5 seconds), 8 A (45 seconds), CH4: -12 Vdc, 0.3 A, CH5: 5 Vdc, 2 Apk (5 second), 1 A (45 seconds) (Total 220 W peak)

No Load Condition:

CH1: 5 Vdc, 0 A, CH2: 3.3 Vdc, 0 A, CH3: 12 Vdc, 0.5 A, CH4: -12 Vdc, 0 A, CH5: 5 Vdc, 0 A

<Sample Positions>

See Enclosure Id. 07-06 for the details.

This power supply has two types of Integrated Circuit (IC102), differences is manufacturer only.

This switching power supply has three types of Cooling Sheet. All tests were conducted on the switching power supply with Cooling Sheet (Shin-Etsu Chemical Co., Ltd., Type TC-xxxxHS-1.4). Tests for alternate Cooling Sheet (Taica Co., Ltd., Type \$ GEL COH-1002, Shin-Etsu Chemical Co., Ltd., Type TC-xxxxHSV-1.4) were waived, because thermal conductivity of alternate is same or better than original one.

Additional Standards

The product fulfills the requirements of:

Markings and Instructions

Clause Title	Marking or Instruction Details
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 - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

Special Instructions to UL Representative

Inspect the transformer(s) listed in BD1.1 per AA1.1 - C.
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 BD1.1 be conducted at the component manufacturer.

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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
PCFX-220Px	Transformer (T102)	N/A	PRI to SEC	3000	--	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
N/A	--	--	--	--	--