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:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Power Supply
Model:	FR1Ux-350Py (where suffix "x" maybe any number 0 to 9 or any letter A to Z; suffix "y" maybe maximum 50 characters consisting of any alphanumeric character, parenthesis, hyphen or blank which denote control number)
Rating:	Input: 100-240 Vac, 50/60 Hz, 3.5-1.5 A Output: 12 Vdc, 24 A (peak 29 A within 5 seconds); 5 Vdc, 2.0 A (total 298 W maximum; 348 W peak for within 5 seconds)
Applicant Name and Address:	NIPRON CO LTD 2-57 OHAMA-CHO AMAGASAKI-SHI HYOGO-KEN 660-0095 JAPAN

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: Yoshifusa Koyanagi Reviewed by: Satoru Ohnishi

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 equipment is a component type redundant switching power supply for use with general office use end-product.

This Power Supply contains one or two identical Power Supply Modules. Power Supply with one Power Supply Module supplied outputs to the end-product. Power Supply with two Power Supply Modules supplied outputs to the end-product equally.

Power Supply Modules evaluated as hot-swappable.

Fan in each Power Supply Module operates in the lowest speed with 5 Vdc Output loaded and 12 Vdc Output not loaded.

Model Differences

Suffixes "x" and "y" of the model name FR1Ux-350Py replace as follows:
"x" maybe any number 0 to 9 or any letter A to Z.
"y" maybe maximum 50 characters consisting of any alphanumeric character, parenthesis, hyphen or blank which denote control number.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : pluggable A
- Operating condition : continuous
- Access location : N/A
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10% / -15%
- Tested for IT power systems : Yes (Considered for Norway)
- IT testing, phase-phase voltage (V) : 230 Vac
- 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 5000 m (Considered for China)
- Altitude of test laboratory (m) : approximately 10 to 20 m
- Mass of equipment (kg) : less than 18 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40°C for 100% Load / 60°C for 50% Load
- The means of connection to the mains supply is: Detachable Power Supply Cord / Pluggable A
- The product is intended for use on the following power systems: IT (Considered for Norway) / TN
- The equipment disconnect device is considered to be: Appliance Inlet,
- 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).

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: Earthing Continuity / Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Earthed Dead Metal: 372 Vrms / 640 Vpk, Primary-SELV: 372 Vrms / 644 Vpk
- The following secondary output circuits are SELV: 12 Vdc Output and 5 Vdc Output
- The following secondary output circuits are at hazardous energy levels: 12 Vdc Output
- The following secondary output circuits are at non-hazardous energy levels: 5 Vdc Output
- The following output terminals were referenced to earth during performance testing: Output Connector (CN501) of Power Supply Unit, 6, 7, 8, 13, 18, 19, 20, 21, 24 Pins; or Output Connector (CN301) of Power Supply Module, 8, P2B-1, P2B-2, P2B-3, P2B-4, P2T-1, P2T-2, P2T-3, P2T-4 Pins.
- The power supply terminals and/or connectors are: Not investigated for field wiring
- 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 magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C): Transformer (T101) (Class B) / Transformer (T201) (Class B)
- The following end-product enclosures are required: Electrical / Fire
- The equipment is suitable for direct connection to: AC mains supply
- Fans: The Fans provided in this sub-assembly are not intended for operator access.
- Thermistors (TH102, TH302) were by-passed.
- The tests were conducted with the following Capacitors: X-Capacitor (C601) rated 0.47 µF / X-Capacitor (C104) rated 1 µF / Y-Capacitors (C101, C102, C117) rated 2200 pF.

Additional Information

Test Condition A: 100% Load (12 Vdc, 24 A; 5 Vdc, 2.0 A; total 298 W maximum)*
Test Condition B: 50% Load (12 Vdc, 12 A; 5 Vdc, 1.0 A; total 149 W maximum)

*Peak value continued for maximum 5 seconds is 12 Vdc, 29 A; 5 Vdc, 2.0 A; total 348 W maximum.

Unless otherwise specified, the tests were conducted on Power Supply Unit with two Power Supply Modules used.

<For CB>
This report is a re-issued report of CB Test Report Ref. No. E161936-A90-CB-1 due to the modifications below.
- Standard update from IEC 60950-1:2005 (2nd Edition); Am 1:2009 to IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013.
- Correction of company name of Insulation Sheet, Core Cover of Inductor and Bobbin of Inductor, from "Sabic Innovative Plastics Japan L L C" to "Sabic Japan L L C".
- Correction of company name of X-Capacitor, from "Pilkor Electronics Ltd." to "Cowell Fashion Co., Ltd. Pilkor Electronics".

No tests conducted under this investigation due to reissue of CB Test Report Ref. No. E161936-A90-CB-1. All required tests were carried out under the original investigation.

National Differences of Japan according to IEC60950-1 2nd. Edition was evaluated. See Enclosure Id. 7-08 (National Differences of Japan based on J60950-1 (H26) and J3000 (H25)) for details.

In this Test Report, CENELEC mark license indicating compliance to EN standard was used to verify component compliance to IEC standard because the standards are technically equivalent.

For Plastic materials, UL Standard (UL94) has requirements that meet or exceed the relevant IEC requirements.

Optical Isolators (PC101, PC102, PC103, PC104, PC201, PC202) Type TLP785 and PS2561A-1 are certified (approved) under IEC60950-1(ed.2) + Am.1 only.
The certification does not include IEC60950-1 A2:2013. However, it can be accepted because the standard requirements, both IEC60950-1 A1:2009 and IEC60950-1 A2:2013 for Optical Isolator are technically equivalent. Recognizing NCBs may require additional information, testing and evaluation.

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.

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
FR1Ux-350Py (where suffix "x" maybe any number 0 to 9 or any letter A to Z; suffix "y" maybe maximum 50 characters consisting of any alphanumeric character, parenthesis, hyphen or blank which denote control number)	Transformer (T101)	--	Primary to Secondary	3000 Vac or	4243 Vdc	Minimum 1
FR1Ux-350Py (where suffix "x" maybe any number 0 to 9 or any letter A to Z; suffix "y" maybe maximum 50 characters consisting of any alphanumeric character, parenthesis, hyphen or blank which denote control number)	Transformer (T201)	--	Primary to Secondary	3000 Vac or	4243 Vdc	Minimum 1

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

N/A

Electric Strength Test Exemptions - This test is not required for the following models:

N/A

Electric Strength Test Component Exemptions - The following solid-state components may disconnected from the remainder of the circuitry during the performance of this test:

N/A

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
N/A	--	--	--	--	--