

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 for building-in
Model:	GPSA-1500-24Px and GPSA-1500-48Px (where x maybe maximum 50 characters, any alphanumeric character, hyphen or blank, which denotes control number)
Rating:	For Model GPSA-1500-24Px (Output (24Vdc): 1056W or less) Input: 100-240Vac, 13-5.4A, 50/60Hz Output: 24Vdc, 44A (Peak 55A), 12VSB, 0.5A (Output (24Vdc): more than 1056W) Input: 200-240Vac, 9.2-7.7A, 50/60Hz Output: 24Vdc, 63A (Peak 85A), 12VSB, 0.5A For Model GPSA-1500-48Px (Output (48Vdc): 1104W or less) Input: 100-240Vac, 14-5.6A, 50/60Hz Output: 48Vdc, 23A (Peak 27.5A), 12VSB, 0.5A (Output (48Vdc): more than 1104W) Input: 200-240Vac, 9.7-8.3A, 50/60Hz Output: 48Vdc, 34A (Peak 44A), 12VSB, 0.5A
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.

Issue Date: 2013-11-27
2015-10-05

Page 2 of 19

Report Reference #

E161936-A87-UL

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

This product is a component switching mode power supply for building into an end-product.

Model Differences

Model GPSA-1500-24Px is the base model in this Test Report.

Model GPSA-1500-48Px is identical to Model GPSA-1500-24Px, except for secondary output rating, input rating, Transformer (T101) and components of secondary circuit.

Models GPSA-1500-24Px and GPSA-1500-48Px: where x maybe maximum 50 characters, any alphanumeric character, hyphen or blank.

This suffix denotes the modifications as follows.

- FAN direction
- Output terminal (Bus bar or terminal block)
- Presence or absence, of Coating for Printed Wiring Board (PWB)
- Customer
- Control number, that does not related for safety.

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/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 : Yes (for Norway)
- IT testing, phase-phase voltage (V) : 230V
- 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 2.8 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 60°C or 50°C
- The product is intended for use on the following power systems: IT (for Norway) / TN
- 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).
- The following were investigated as part of the protective earthing/bonding: Metal Enclosure

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 / Primary-SELV: 358 Vrms, 640 Vpk
- The following secondary output circuits are SELV: all secondary output connectors
- The following secondary output circuits are at hazardous energy levels: 24Vdc output for Model GPSA-1500-24Px / 48Vdc output for Model GPSA-1500-48Px
- The following secondary output circuits are at non-hazardous energy levels: 12VSB output
- The following output terminals were referenced to earth during performance testing: Metal Chassis
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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 magnetic devices (e.g. transformers or inductor) are provided with an OBJ2 insulation system with the indicated rating greater than Class A (105°C): T101 (Class F), T102 (Class B), T105 (Class B), DT101 (Class B), DT102 (Class B), DT103 (Class B), and DT104 (Class B)
- The following end-product enclosures are required: Fire, Electrical, and Mechanical
- Fans: The fan provided in this sub-assembly is not intended for operator access.
- The product must be installed to the end-product with the distance of more than 50 mm from the fan motor to the barrier and of more than 50 mm from the terminal to the barrier.
- Metal Chassis of the power supply unit shall be connected to protective earthing in the end-product.
- The test voltage of 85-264 Vac was specified by the manufacturer. Test voltage of 85-90 Vac shall be considered the derating curve. See Enclosure Id. 7-09 for details.
- Output ratings shall be considered the derating curve. See Enclosure Id. 7-09 for details.

Additional Information

The test voltage of 85-264 Vac (-15%/+10% of 100-240 Vac) was specified by the manufacturer request.

Unless otherwise noted, all tests were conducted under the following condition.

Installation Condition:

Distance of more than 50 mm from the fan motor to the barrier and of more than 50 mm from the terminal to the barrier.

Output Load condition:

Due to the difference of the input voltage, allowed output current is changed. In 200-240 Vac range of input voltage, Condition (2) of output load can be accepted.

Model GPSA-1500-24Px

Condition A: Rated Load Condition

(1) 24V / 44A (1056W), 12VSB / 0.5A

(2) 24V / 63A (1512W), 12VSB / 0.5A

Condition B: Peak load condition: Peak rating is operated at 5 seconds or less, and average of wattage is limited 1000W (100V) or 1400W (200V) or less.

(1)' 24V / 55A, 12VSB / 0.5A

(2)' 24V / 85A, 12VSB / 0.5

Condition C: No Load Condition

(1)" 24V / 0A, 12VSB / 0A

(2)" 24V / 0A, 12VSB / 0A

Model GPSA-1500-48Px

Condition A: Rated Load Condition

(1) 48V / 23A (1104W), 12VSB / 0.5A

(2) 48V / 34A (1632W), 12VSB / 0.5A

Condition B: Peak load condition: Peak rating is operated at 5 seconds or less, and average of wattage is limited 1000W (100V) or 1400W (200V) or less.

(1)' 48V / 27.5A, 12VSB / 0.5A

(2)' 48V / 44A, 12VSB / 0.5

Condition C: No Load Condition

(1)" 48V / 0A, 12VSB / 0A

(2)" 48V / 0A, 12VSB / 0A

Derating curve for input voltage.

Test voltage of 85-90 Vac shall be considered to the derating curve. See Enclosure Id. 7-09 for details.

Derating curve for ambient temperature.

the derating curve shall be considered, if ambient temperature exceed 50°C. See Enclosure Id. 7-09 for details.

Fan direction

The direction of Fan Motor is available in two kinds of exhaust and Intake. In this report, both direction of Fan Motor were evaluated.

<For CB Application>

This Test Report is a reissue based on Test Report (Test Report Ref. No. E161936-A87-CB-1) due to the following modifications.

- Standard update from IEC 60950-1:2005 (2nd Edition); Am 1:2009 to IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013.

- Addition of alternate Line to Line Capacitors (C101, C102, C110), Type LE-FX.
- Addition of alternate Coating for Printed Wiring Board (PWB), Type 1B51LU.
- Change of Manufacturer and Type of Bridging Diode (D101) to "Interchangeable".
- Correction of company name of Line to Line Capacitor (C101, C102, C110), Type PCX2 337, from "Pilkor Electronics Co., Ltd." to "Cowell Fashion Ltd. Pilkor Electronics".
- Correction of Rating of FETs (Q107, Q107A, Q108, Q108A), from "Minimum 600V, minimum 52A" to "Minimum 500V, minimum 47A".
- Correction of company name of Insulation Sheet, Type FR65 or FR60, from "Sabic Innovative Plastics Japan L L C" to "Sabic Japan L L C".

No tests conducted under this investigation due to reissue of CB Test Report Ref. No. E161936-A87-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. 7-13 (National Differences of Japan based on J60950-1 (H26) and J3000 (H25)) for details.

Optical Isolators (PC101, PC401, PC402, PC403), Type PS2561A-1 and PS2561DL 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.

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. (refer to appended table 1.5.1)

UL Standard has requirements that meet or exceed relevant IEC requirements.

Markings and instructions

Clause Title	Marking or Instruction Details
1.7.1 Power rating - Model	Model name with suffix (see Enclosure ID. 7-12 for marking location.)
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.6 Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)

Special Instructions to UL Representative

Inspect the transformer(s) listed in Electric Strength Test Special Constructions per Production-Line Testing Requirements.

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 Electric Strength Test be conducted at the Component manufacturer.

Production-Line Testing Requirements							
<u>Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.</u>							
Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s	
MT1645	T101	None	Primary to Secondary	minimum 3000	minimum 4243	1	
MT1646	T101	None	Primary to Secondary	minimum 3000	minimum 4243	1	
DT1067 X	DT101, DT102, DT103, DT104	None	Primary to Secondary	minimum 3000	minimum 4243	1	
MT1644 X	T102	None	Primary to Secondary	minimum 3000	minimum 4243	1	
CT1052 X	T105	None	Primary to Secondary	minimum 3000	minimum 4243	1	
<u>Earthing Continuity Test Exemptions - This test is not required for the following models:</u>							
N/A							
<u>Electric Strength Test Exemptions - This test is not required for the following models:</u>							
N/A							
<u>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:</u>							
N/A							
<u>Sample and Test Specifics for Follow-Up Tests at UL</u>							
Model	Component	Material	Test	Sample(s)		Test Specifics	
N/A	--	--	--	--		--	