

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)
Complementary CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Product:	AC-DC Power Supply
Model:	DRB120-24-1/xyz, DRB120-24-1/Ry-xyz, DRJ120-24-1/xyz, and DRJ120-24-1/E-xyz (where x, y and z can be any alphanumeric or blank and is considered as non safety related information)
Rating:	Input: 100-240 VAC, 1.5A, 50/60 Hz. Output: 24-28 Vdc, 5-4.3A. Maximum power: 120W
Applicant Name and Address:	TDK-LAMBDA SINGAPORE PTE LTD #06-01/08 1008 TOA PAYOH NORTH SINGAPORE 318996 SINGAPORE

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: Chai Ming Yuo, Project Handler

Reviewed by: Jim Kao, 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 equipment is a switch-mode power supply (DIN rail type) intended for building-in.

Model Differences

Model DRB120-24-1/R Y:

Identical to model DRB120-24-1 except for photo coupler (PC200) which interfacing external control circuit is replaced by photo MOS.

Model DRJ120-24-1:

Identical to model DRB120-24-1 except for Input and Output terminal blocks type, and Input Board and Output Board PCB trace design respectively.

Model DRJ120-24-1/E:

Identical to model DRB240-24-1 except for Input and Output terminal blocks type, and Input Board and Output Board PCB trace design respectively.

Model / Input and Output PCB Drawing No. / Terminal Block Cat. No.

DRB120-24-1/ SCB479A / Euro Type by DECA Switchlab.

DRJ120-24-1/ SCB489A / Screw type by Emuden Corp.

DRJ120-24-1/E / SCB488A / Screwless type by Tianli Electrical Machinery (NingBo) Co., Ltd.

Rating label designs are identical except for model name.

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%, -15%
- 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
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : up to 3000 m
- Altitude of test laboratory (m) : 10 to 20 m
- Mass of equipment (kg) : 0.45
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: Up to 70 °C, which depend on mounting direction and load factor. (See Enclosed Id. 7-01 for details.),
- The means of connection to the mains supply is: N/A
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: Provided in end product.

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
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV/Earthed Dead Metal: 259 Vrms, 438 Vpk
- The following secondary output circuits are SELV: Output.
- The following secondary output circuits are at non-hazardous energy levels: Output.
- 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 (via Chassis)
- 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): T1, L3 (Class 155(F))
- The following end-product enclosures are required: Fire, Electrical
- X-Capacitor (C3 and C6) may have the capacitance 1.0 uF and 0.47 uF respectively at the maximum. Therefore, consideration shall be given in conducting Capacitance Discharge test in end product application with respect to the variation in C3 and C6.
- Line to ground capacitors (C4, C5) may have the capacitance 2200 pF at the maximum. Therefore, consideration shall be given in conducting Touch current test in end product application with respect to the variation in those capacitors.
- Line to ground capacitors (C7, C8) may have the capacitance 1500 pF at the maximum. Therefore, consideration shall be given in conducting Touch current test in end product application with respect to the variation in those capacitors.
- Line to ground capacitors (C1, C2) may have the capacitance 100 pF at the maximum. Therefore, consideration shall be given in conducting Touch current test in end product application with respect to the variation in those capacitors.
- The following secondary output circuits are ES1: Output
- The following secondary output circuits are at PS3 energy level: Output

- Humidity conditioning has been conducted by tropical condition.
- Classification of PIS has not been conducted. Therefore, all electrical components and conductors including printed wirings were assumed to be arcing/resistive PIS.
- This component has been evaluated in "control of fire spread" method assuming appropriate fire enclosure is provided in end product. Unless the fire enclosure is made of non-combustible or V-0 material, the separation from the PIS shall be considered.

Additional Information

The Clearances and Creepage Distances have additionally been assessed for suitability up to 3000 m elevation.

Rated output condition for testing:
Test load condition A: 24 Vdc, 5A.
Test load condition B: 28 Vdc, 4.3A.

Unless otherwise noted, all tests were conducted on model DRB120-24-1 as representative of all models in this report.

Manufacturer has simulated end-product loading condition to power supply 144 W for 10 seconds and resting time 18.6 seconds at 105.6 W, which equals total r.m.s. power 119.8 W. Refer Enclosure ID 7-03 for details.

Additional Standards

The product fulfills the requirements of: The product fulfills the requirements of: UL 62368-1, 2nd Edition, 2014-12-01, CAN/CSA C22.2 No. 62368-1-14, 2nd Edition, 2014-12.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number

Special Instructions to UL Representative

Inspect the transformer listed in "Production-Line Testing Requirements" 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 "Production-Line Testing Requirements" be conducted at the component manufacturer.