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-(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:	AC-DC Power Supply
Model:	DRF120-24-1-xyz, DRF120-24-1/HL-xyz, Where x, y and z can be any alphanumeric character or blank and is non safety related information. HL - designates model provided with coating.
Rating:	I/P: 100-240 Vac; 1.5 A; 50/60 Hz O/P: 24-28 Vdc; 5-4.3 A Max. power 120W
Applicant Name and Address:	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM

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:	Piotr A. Bizunowicz / Project handler	Reviewed By:	Hubert Koszewski / 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 product is a switching power supply intended for building-in, mounting on DIN rail, provided with terminal blocks suitable for field wiring. Output voltage can be adjusted from 24V to 28V with total output power max. 120W.

Model Differences

DRF120-24-1-xyz, DRF120-24-1/HL-xyz represent family of same construction with no differences affecting safety, model with suffix HL designates version with coating.

Test Item Particulars

Classification of use by	Skilled person, Instructed person
Supply Connection	AC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	Unit for building in: to be determined in End Product
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 (for building-in)
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	70
IP protection class	IPX0
Power Systems	TN TT IT - 230 V L-L
Altitude during operation (m)	3000 m
Altitude of test laboratory (m)	less than 2000 meters m
Mass of equipment (kg)	approx. 0.6 kg

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 70 °C with derating of 2.5%/°C between 60 and 70 °C.
- The product is intended for use on the following power systems : TT, TN, IT
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The equipment disconnect device is considered to be : part of end product evaluation whether device or installation instructions are provided
- The following were investigated as part of the protective earthing/bonding : Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product was investigated to the following additional standard : EN 62368-1:2014 + A11:2017
- The following scope limitations apply to this test report and are confirmed by Applicant to be covered separately. Additional evaluation and/or tests may be required when submitting this CB Report to a National Certification Body (NCB) to obtain a national mark:
  1) no EMC tests nor evaluation to EMC Directive 2004/108/EC and 2014/30/EU,
  2) no evaluation to RoHS Directives 2002/95/EC, 2011/65/EU and (EU) 2016/585,
  3) no evaluation to Council Recommendation 1999/519/EC nor 2006/25/EC,
  4) only English version of markings and instructions provided and reviewed,
  5) no evaluation to Directive 96/29/Euratom.

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, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary-SELV: 427 Vrms, 880 Vpk, Primary-Earthed Dead Metal: 413 Vrms, 850 Vpk
- The following output circuits are at ES1 energy levels : Main output
- The following output circuits are at PS2 energy levels : Signal connector
- The following output circuits are at PS3 energy levels : main ouptut
- 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 : Been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral : pin2 of CN1 terminal block
- The following end-product enclosures are required : Mechanical, Fire, Electrical
- 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) : T101 (155 °C), T401 (155 °C)
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing : metal chassis (100.1 °C)
- Power supply has been additionally tested for intermittent operation. See Additional Information in the beginning of this test report. Additional duty cycle marking to be evaluated in end product.
- The Clearances and Creepage Distances have additionally been assessed for suitability up to 3 000 m elevation.

Additional Information

Power supply has been additionally tested with duty cycle defined as peak output power 180 W for 4 seconds and resting time 7.3 seconds at 68.64 W load, which equals total rms power 120 W.

Maximum Normal Load:

A- 60°C: 24 Vdc / 5A; Max. output power: 120 W
B- 60°C: 28 Vdc / 4.3 A; Max. output power: 120 W
C- 70°C: 24 Vdc / 3.75 A; Max. output power: 90 W
D- 65°C: 24 Vdc / 4.37A; Max. output power: 105 W
E- 60°C: 24 Vdc; 7.5 A/4 sec./180 W, 2.86 A/7.43 sec./68.64 W;

This report is based on previously conducted testing (as listed below) and the review of product construction of original report E135494-A95-UL last revised 2016-01-21.
Refer to Section “Test performed (name of test and test clause)” and enclosure 7-05 covering all applicable performance tests and rationale for waived tests.

Additional Standards

The product fulfills the requirements of: EN 62368-1:2014 + A11:2017

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	(component ID:_____), Ratings (____A), "Ratings (____A, ____V)", and (symbol of required characteristics) located on or adjacent to fuse or fuseholder or in service manual.
Class I equipment -Terminal for main protective earthing	Provided adjacent to the main protective earthing terminal  (IEC 60417-5019)
See Installation Instructions	The symbol 

Special Instructions to UL Representative

N/A