



Test Report issued under
the responsibility of:



TEST REPORT
IEC 60950-1
Information technology equipment - Safety -
Part 1: General requirements

Report Reference No : E135494-A109-CB-1

Date of issue : 2016-08-25

Total number of pages : 45

CB Testing Laboratory : UL International Polska Sp. z o.o.

Address : Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland

Applicant's name : TDK-LAMBDA UK LTD

Address : KINGSLEY AVE
ILFRACOMBE
EX34 8ES UNITED KINGDOM

Test specification:

Standard : IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013

Test procedure : CB Scheme

Non-standard test method : N/A

Test Report Form No. : IEC60950_1F

Test Report Form originator : SGS Fimko Ltd

Master TRF : Dated 2014-02

Copyright © 2014 Worldwide System for Conformity Testing and Certification of Electrotechnical Equipment and Components (IECEE), Geneva, Switzerland. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.



If this test Report is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description	AC-DC Power Supply
Trade Mark	None
Manufacturer	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Model/Type reference	DRB480-24-1-xyz DRB480-48-1-xyz where x, y, z may be any letter or digit or blank, considered non safety relevant information, see model differences
Ratings	INPUT: 100-240 Vac, 5.4A, 50/60 Hz OUTPUT DRB480-24: 24-26.4Vdc, 20-18.2A (max 480W) DRB480-48: 48-52.8 Vdc, 10-9.09A (max 480W)

Testing procedure and testing location:	
<input checked="" type="checkbox"/> CB Testing Laboratory	Testing location / address: UL International Polska Sp. z o.o. Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland
<input type="checkbox"/> Associated CB Test Laboratory	Testing location / address
	Tested by (name + signature): Piotr A. Bizunowicz (Project engineer) 
	Approved by (name + signature).....: Sebastian Cichocki (Project reviewer) 
<input type="checkbox"/> Testing Procedure: TMP/CTF Stage 1	Testing location / address: Tested by (name + signature): Approved by (name + signature).....:
<input type="checkbox"/> Testing Procedure: WMT/CTF Stage 2	Testing location / address: Tested by (name + signature): Witnessed by (name + signature) ..: Approved by (name + signature).....:
<input type="checkbox"/> Testing Procedure: SMT/CTF Stage 3 or 4	Testing location / address: Tested by (name + signature): Approved by (name + signature).....: Supervised by (name + signature) .:
<input type="checkbox"/> Testing Procedure: RMT	Testing location / address: Tested by (name + signature): Approved by (name + signature).....: Supervised by (name + signature) .:

List of Attachments	
National Differences (0 pages)	
Enclosures (15 pages)	
Summary Of Testing	
Unless otherwise indicated, all tests were conducted at UL International Polska Sp. z o.o. Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland.	
Tests performed (name of test and test clause)	Testing location / Comments
Power Supply Reference Page	

Input: Single-Phase (1.6.2)
SELV Reliability Test Including Hazardous Voltage
Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)
Transformer and Wire /Insulation Electric Strength
(2.10.5.13)
Steady Force (4.2.1 - 4.2.4)
Heating (4.5.1, 1.4.12, 1.4.13)
Electric Strength (5.2.2)
Component Failure (5.3.1, 5.3.4, 5.3.7)
Abnormal Operation (5.3.1 - 5.3.9)
Transformer Abnormal Operation (5.3.3, 5.3.7b, Annex
C.1)
Overload of Operator Accessible Connector (5.3.7)

Summary of Compliance with National Differences:

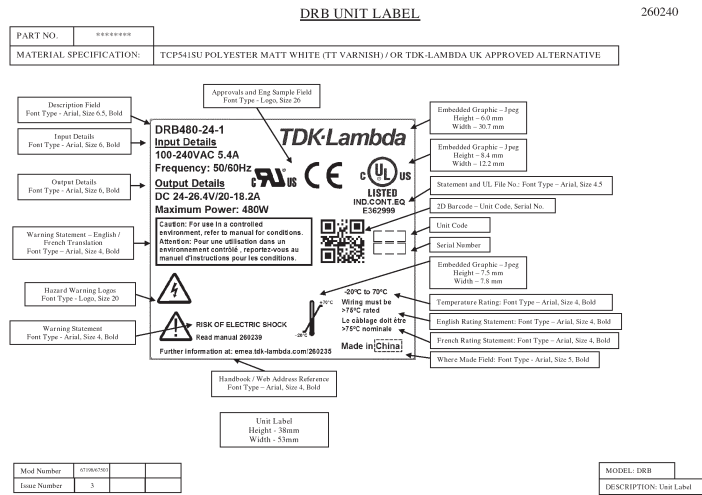
Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AR, AT, AU, BE, BG, BY, CA, CH, CN, CS, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IN, IT, JP, KR, MY, NL, NO, NZ, PL, PT, RO, SA, SE, SG, SI, SK, UA, US, ZA

The product fulfills the requirements of: EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011 + A2:2013

Copy of Marking Plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



Test item particulars :	
Equipment mobility	for building-in
Connection to the mains	N/A (component for building-in)
Operating condition	continuous
Access location	N/A (component for building-in)
Over voltage category (OVC)	OVC II
Mains supply tolerance (%) or absolute mains supply values	+10%, -10%
Tested for IT power systems	Yes
IT testing, phase-phase voltage (V)	400
Class of equipment	Class I (earthed)
Considered current rating of protective device as part of the building installation (A)	20A
Pollution degree (PD)	PD 2
IP protection class	IP X0
Altitude of operation (m)	3000 (See Technical Considerations)
Altitude of test laboratory (m)	less than 2000 meters
Mass of equipment (kg)	1.18
Possible test case verdicts:	
- test case does not apply to the test object	N / A
- test object does meet the requirement	P(Pass)
- test object does not meet the requirement	F(Fail)
Testing:	
Date(s) of receipt of test item	2018-08-01, 2018-08-16, 2018-09-04, 2018-10-29
Date(s) of Performance of tests	2018-09-06 to 2018-10-30
General remarks:	
<p>"(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report.</p> <p>Throughout this report a point is used as the decimal separator.</p>	
Manufacturer's Declaration per Sub Clause 4.2.5 of IEC60950-1:	
<p>The application for obtaining a CB Test Certificate includes more than one factory and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided</p> <p>When differences exist, they shall be identified in the General Product Information section.</p>	<p>Not Applicable</p>
Name and address of Factory(ies):	PANYU TRIO MICROTRONICS CO LTD SHIJI INDUSTRIAL ESTATE DONGYONG NANSHA GUANGZHOU GUANGDONG 511453 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2018-11-28 to include the following changes/additions:

Technical amendment:

adding new model (DRB480-48-1) with revised construction and different rating. cbtl changed to UL Poland

Product Description

Device is AC/DC switch mode power supply for building-in on DIN rail.

Model Differences

suffix '-xyz' is optional and denotes customer-specific variant (like fixed voltage or no LED), and is deemed not safety relevant.

Model DRB480-48-1 is mechanically and electrically identical to model DRB480-24-1, except for:

-different output ratings

-different transformer TX1, output choke L5

-different FET on ASSY1

-passive elements in SELV circuit to accommodate different output ratings

-changed PWB layouts -- the safety relevant part (spacings, PE path) remain unchanged,

Primary side of all models is strictly identical.

Additional Information

DERATING INFORMATION:

Max. Output power: 480W up to 50°C, derate linearly down to 300W at 70°C. See manual.

Project 4787710370 - Revision (UL: E135494-A109)/Amendment 1 (CB: E135494-A109-CB-1):

- production site corrected from TDK-LAMBDA MALAYSIA SDN BHD to PANYU TRIO MICROTRONICS CO LTD as described below:

TDK-LAMBDA MALAYSIA SDN BHD
LOT 2 & 3, BATU 9 3/4
KAWASAN PERINDUSTRIAN
BANDAR BARU JAYA GADING
26070 KUANTAN
PAHANG MALAYSIA

PANYU TRIO MICROTRONICS CO LTD
SHIJI INDUSTRIAL ESTATE
DONGYONG
NANSHA
GUANGZHOU
GUANGDONG 511453 CHINA

- for main PWB changes (PFC stage, parallelly connected R1, R2, R3 and R4 replaced by R1 only) and new type of LED (D9) the following items have been addressed:

a) updated PWB layouts and components placement - Schematics + PWB ID 5-01,

b) revised Photographs ID 3-06 and 3-07.

Testing of DRB480-24-1-xyz was not considered necessary based on the results of previous investigation and no spacings influence by PWB changes.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 50°C, 70°C with derating
- The means of connection to the mains supply is: to be determined in End Product
- The product is intended for use on the following power systems: TT, TN, IT
- The equipment disconnect device is considered to be: determined in End Product
- 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 accessible locations (with circuit/schematic designation) are within a limited current circuit: Output
- 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
- LEDs provided in the product are considered low power devices: Yes
- The following scope limitations apply to this test report and additional evaluation and/or tests may be required when submitting this CB Report to a National Certification Body (NCB) to obtain a national mark: - no EMC tests nor evaluation to EMC Directive 2004/108/EC and 2014/30/EU - no evaluation to RoHS Directive 2002/95/EC - no evaluation to Council Recommendation 1999/519/EC nor 2006/25/EC - only English version of markings and instructions provided and reviewed --
- The Clearances and Creepage Distances have additionally been assessed for suitability up to 3 000 m elevation. --

Engineering Conditions of Acceptability

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: 316 Vrms, 584 Vpk, Primary-SELV: 233 Vrms, 423 Vpk
- The following secondary output circuits are SELV: output
- The following output terminals were referenced to earth during performance testing: Output negative.
- The power supply terminals and/or connectors are: Suitable for field wiring
- The maximum investigated branch circuit rating is: 20A
- 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: J7-2
- 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 T1 (class 155°C), Coil L4 (class 155°C), Coil L1 (class 155°C)

- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing: metal housing (85.8°C) - additional requirements for accessibility to be evaluated in end product.

Abbreviations used in the report:

- normal condition	N.C.	- single fault condition	S.F.C
- operational insulation	OP	- basic insulation	BI
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation	SI
- double insulation	DI	- reinforced insulation	RI

Indicate used abbreviations (if any)