Test Report issued under the responsibility of:

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

Report Reference No ..... :	E135494-A115-CB-1
Date of issue ..... :	2017-10-20
Total number of pages ..... :	16
CB Testing Laboratory ..... :	UL VS Limited
Address ..... :	Unit 3 Horizon, Kingsland Business Park, Wade Road, RG24 8AH Basingstoke UNITED KINGDOM
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

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	:	TDK-Lambda
Manufacturer	:	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Model/Type reference	:	CM4 for nomenclature - output ratings correlation, see Additional Information below.
Ratings	:	Input: 100-240Vac (or 120-370Vdc), 7A max, 50-60Hz Maximum output power 600W. Individual outputs are rated according to combinations between modules fitted. The output modules are: S1 = 1.5 - 7.5 V dc, 25 A, 125 W S2 = 4.5 - 15 V dc, 15 A, 150 W S3 = 9 - 30 V dc, 7.5 A, 150 W S4 = 18 - 58 V dc, 3.75 A, 150 W (see Model Differences for output configurations and ratings)

Testing procedure and testing location:		
[x]	**CB Testing Laboratory**	
	Testing location / address .....:	UL VS Limited Unit 3 Horizon, Kingsland Business Park, Wade Road, RG24 8AH Basingstoke UNITED KINGDOM
[ ]	**Associated CB Test Laboratory**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	Dennis Butcher / Handler
	Approved by (name + signature)....:	David Snook / Reviewer
[ ]	**Testing Procedure: TMP/CTF Stage 1**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: WMT/CTF Stage 2**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Witnessed by (name + signature) ..:	
	Approved by (name + signature)....:	
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**	
	Testing location / address .....:	
	Tested by (name + signature) .....:	
	Approved by (name + signature)....:	
	Supervised by (name + signature) .:	
[ ]	**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 (0 pages)

Summary of Testing:

No tests were conducted

Summary of Compliance with National Differences:

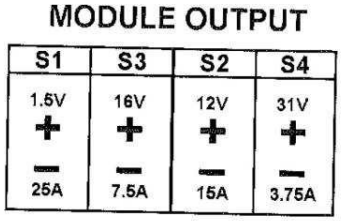
Countries outside the CB Scheme membership may also accept this report.

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; UL 60950-1 2nd Edition, 2014-10-14; CAN/CSA C22.2 No. 60950-1-07 2nd Edition, 2014-10

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 .....:	unit for building-in, to be determined in the end product
Operating condition .....:	continuous
Access location .....:	unit for building-in, to be determined in the end product
Over voltage category (OVC) .....:	OVC II
Mains supply tolerance (%) or absolute mains supply values .....:	+10%, -15% for AC mains
Tested for IT power systems .....:	Yes
IT testing, phase-phase voltage (V) .....:	240 V
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 3000 meters
Altitude of test laboratory (m) .....:	less than 2000 meters
Mass of equipment (kg) .....:	0.65 kg + 0.10 kg per output module
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 .....:	N/A
Date(s) of Performance of tests .....:	N/A
General remarks: "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a point is used as the decimal separator.	
Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02:	Yes
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 ..... When differences exist, they shall be identified in the General Product Information section.	
Name and address of Factory(ies):	TDK LAMBDA UK LTD KINGSLEY AVENUE ILFRACOMBE NORTH DEVON EX34 8ES, UNITED KINGDOM

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

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2019-03-26 to include the following changes/additions:
Correction report:
The output types were corrected (some output modules were incorrectly designated as SELV outputs); Working Voltage measurements; Creepage & Clearances table & Electric Strength test tables updated due to a correction in the original source report.
A revew of the original test data and the original reports and technical documentation for the product shows that the product continues to comply with the Standard.
This report should be read in conjunction with CBTR E135494-A115-CB-1-Original, E135494-115-CB-1-Amendment-1 and CBTC DK-67545-A1-UL.

Product Description

CM4 series is an AC/DC switch mode power supply. The device uses fan-less, modular architecture based on selection of output modules. Unit can be configured with up to four output modules (in parallel / series combinations) that determine output ratings. The total output power is 600 W (for deratings see additional information). Equipment is open-frame, uses metal baseplate and is intended for building-in to the host equipment.

The CM4 switch mode power supply consists of:
1. Input filter board and power conversion board (PRIMARY)
2. Planar transformer (PRI/SEC)
3. Output modules (SECONDARY)

See Model Differences for details of output modules.

Model Differences

Nomenclature:
CM4 xZ xY xY xY [opt] [fact]
Where x = Output voltage from the table below.
Where Z = module from the table below.
Where Y = optional (depending on total number of slots) module from the table below or O for not fitted.
Where [opt] can be blank or -IN for power supply inhibit or -EN for power supply enable.
Where [fact] (for factory option) can be blank for standard unit or -xxx where xxx is any combination of letters or numbers for non-safety related modifications.

CM4 series switch mode power supply can be configured in the following variations "CM4" followed by "Sx", "Zx", "Yx" or "Hx". For output values corresponding to each configuration see table below:

Module	#Slots	Output	Nominal	Output	Rated

		Voltage Range (Vdc)	Voltage (Vdc)	Current (A)	Power (W)
S1	1	1.5 - 7.5	5	25	125
Z1	2	1.5 - 7.5	5	50	250
ZA	3	1.5 - 7.5	5	75	375
ZN	4	1.5 - 7.5	5	100	500
Y1	2	3 - 15	10	25	250
HA	4	3 - 15	10	50	500
S2	1	4.5 - 15	12	15	150
Z2	2	4.5 - 15	12	30	300
YA	3	4.5 - 22.5	15	25	375
ZB	3	4.5 - 15	12	45	450
ZP	4	4.5 - 15	12	60	600
YN	4	6 - 30	20	25	500
S3	1	9 - 30	24	7.5	150
Y2	2	9 - 30	24	15	300
ZC	3	9 - 30	24	22.5	450
HB	4	9 - 30	24	30	600
ZQ	4	9 - 30	24	30	600
YB	3	13.5 - 45	36	15	450
S4	1	18 - 58	48	3.75	150
Y3	2	18 - 60	48	7.5	300
ZD	3	18 - 58	48	11.25	450
ZR	4	18 - 58	48	15	600
YP	4	18 - 60	48	15	600
YC	3	27 - 90	72	7.5	450
Y4	2	36 - 116	96	3.75	300
YQ	4	36 - 120	96	7.5	600
YD	3	54 - 174	144	3.75	450
YR	4	72 - 232	192	3.75	600

Additional Information

Input Parameters:

Nominal input voltage 100 - 240 Vac (or 120 - 370 V dc)
Input voltage range 85 - 264 Vac (or 120 - 370 V dc)
Input frequency range 50 / 60 Hz (47 - 63 Hz tolerated)
Maximum input current 7 A rms (fuse 8 A)

The total output power is 600 W from output modules plus 5 W bias power from J5-Global connector (5 V dc, 1 A).

The following power deratings are applicable:

a. Line voltages <120 V ac:

600 W @ 120 V ac to 425 W @ 85 V ac (linear, applies to input and output power)

b. baseplate temperatures > 85°C:

600 W @ 85°C TO 300 W @ 105°C (linear, applies to output power and bias power)
Baseplate temperature shall be measured on the TS1 reference point defined in the Diagram-01 (see

Enclosures).

c. ambient temperatures > 50°C:

600 W @ 50°C to 300 W @ 70°C (linear, applies to input power)

Line deratings and temperature deratings are cumulative.

Amendment1:
The original E316486-A9-CB1 report was modified to include the following change:
- adding non safety related options [opt] and [fact] to model nomenclature in the Model Differences section of this report.
Equipment construction remains unchanged. No testing was considered necessary to make this change.

This report is a reissue of CBTR Ref. No. E316486-A9-CB1, CBTC Ref. No. DK-62159-UL (including Am.1: DK-62159-A1-UL).
The following changes were applied:
1. Change of applicant's name to TDK-Lambda UK Ltd;
2. Change of manufacturer's name to
TDK-LAMBDA UK LTD
KINGSLEY AVE
ILFRACOMBE
EX34 8ES UNITED KINGDOM
3. Change of factory address to:
TDK LAMBDA UK LTD
KINGSLEY AVENUE
ILFRACOMBE
NORTH DEVON
EX34 8ES,
UNITED KINGDOM

PANYU TRIO MICROTRONICS CO LTD
SHIJI INDUSTRIAL ESTATE
DONGYONG
NANSHA
GUANGZHOU
GUANGDONG
CHINA
4. Change of model name to "CM4" series (see Model Differences for nomenclature).
5. The model names and output variants in the report were modified to match the new nomenclature.
6. Installation/ Safety Manual, Letter of Assurance and signed copy of the CB Certificate were updated to match the new details.
There are no changes to the product's construction/configuration.
Based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams and similar, has been determined that the product continues to comply with the standard. All required tests were carried out under the original investigation.

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 power deratings above 50°C - see

additional information)

- The product is intended for use on the following power systems: TT, TN, IT
- The equipment disconnect device is considered to be: provided in the end product (equipment for building-in)
- 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), UL 60950-1 2nd Edition, 2014-10-14; CAN/CSA C22.2 No. 60950-1-07 2nd Edition, 2014-10-14 ,
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): J5-Global and J5-Output bias power.
- 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

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: Electric Strength, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 370 Vrms, 487 Vpk, Primary-Earthed Dead Metal: 370 Vrms, 540 Vpk
- The following secondary output circuits are SELV: S1, S2, S3 Output Modules, J4, J5-Global, J5-Output)
- The following secondary output circuits are at hazardous energy levels: S2, S3, Z1, ZA, ZN, Y1, HA, Z2, YA, ZB, ZP, YN, Y2, ZC, HB, ZQ, YB, Y3, ZD, ZR, YP, YC, Y4, YQ, YD, YR
- The following secondary output circuits are at non-hazardous energy levels: S1, S4, J5-Global, J5-Output
- The following output terminals were referenced to earth during performance testing: Output modules S1 - S4 negatives (-), bias power negatives, J2 (standby control) negative (-)
- 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: Required
- An investigation of the protective bonding terminals has: Been conducted
- 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: Baseplate temperature (TS1 reference point, see diagram): max. 85°C without deratings, max. 105°C with deratings (see also additional information).
- For DC operation, an appropriately rated DC fuse must be included in the end application. --

Abbreviations used in the report: