Test Report issued under the responsibility of:

VDE

TEST REPORT

IEC 60950-1

Information technology equipment – Safety – Part 1: General requirements

Report Number. .....:	**221868-CI3-1**	**CB DE1-56823**
Date of issue .....:	**2016-02-10**	
Total number of pages.....	**172**	
Applicant's name.....:	**TDK-Lambda Americas Inc.**	
Address .....:	**3320 Matrix Drive; Suite 100; RICHARDSON TX 75082; USA**	
Test specification:		
Standard .....:	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013	
Test procedure .....:	VDE, CB Scheme	
Non-standard test method.....:	DIN EN 60950-1 (VDE 0805-1):2014-08 EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013	
Test Report Form No.....:	IEC60950_1F	
Test Report Form(s) Originator.....:	SGS Fimko Ltd	
Master TRF .....:	Dated 2014-02	

If this Test Report Form 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 ..... :		Component DC-DC Converters for building in IT equipment.
Trade Mark ..... :		TDK and/or TDK·Lambda
Manufacturer ..... :		TDK-Lambda Americas Inc.; 3320 Matrix Drive; Suite 100; RICHARDSON TX 75082; USA
Model/Type reference ..... :		iAC series (see model matrix – Appendix 3)
Ratings ..... :		The DC-DC Converters are not internally fused. An external input line normal blow fuse with a max. value of 30 A is required.
10003893	Rated voltage……..…..:	DC 6.0 – 14.4 V (SELV), (0% Tolerance)
10004017	Rated current……..…..:	max. 18.0 A
10003951	Output voltages and currents……..:	DC 0.75 – 5.5 V, 16 A (refer to Appendix 3)
	Ambient……..:	Max. 125°C temperature at reference point (Q1)
Supplementary information: The above listing was introduced only for internal VDE administration process.		

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**	VDE Prüf- und Zertifizierungsinstitut GmbH VDE *Testing and Certification Institute*	
Testing location/ address.....:		Merianstrasse 28, D-63069 Offenbach, Germany	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name + signature).....:		(authorization of test report)	
Approved by (name + signature).....:			
☐	**Testing procedure: TMP/CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name + signature).....:		(authorization of test report)	
Approved by (name + signature).....:			
☒	**Testing procedure: WMT/CTF Stage 2:**		
Testing location/ address.....:		TDK Innoveta Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA CTF Stage 2 (TDAP under File No. 2520400-9501-0001)	
Tested by (name + signature).....:		Steve McKitrick	Steven F McKitrick
Witnessed by (name + signature).....:		Ulrich Schafranka (authorization of test report)	U. Schafranka
Approved by (name + signature).....:		Holger Kreuzer	H. Kreuzer
☐	**Testing procedure: SMT/CTF Stage 3 or 4:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name + signature).....:			
Approved by (name + signature).....:			
Supervised by (name + signature).....:			

List of Attachments (including a total number of pages in each attachment):		
Appendix No.	Description	Page(s)
1	Photos	147
2	Rating Labels	148
3	Model Matrix	149-150
4	Circuit diagram (Schematics)	151- 151
5	Layout	152-156
6	Data sheet	157-172

Summary of testing:

Tests performed (name of test and test clause):	**Testing location:**
For the upgrade are no tests required. All Test were done under previous Test Reports (VDE file: 2520400-3336-0013)	TDK Innoveta Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA WMT / CTF Stage 2 (TDAP under File No. 2520400-9501-0001)

Summary of compliance with National Differences: **List of countries addressed**				
The product has been tested according to standard IEC 60950-1:2005 (2nd Edition); am1:2009; am2:2013 / EN 60950-1:2006; A11:2009; A1:2010; A12:2011; A2:2013 and those deviations taken into account of				
☒ CENELEC common modifications		☒ United Kingdom	☐	☐
☒ Finland	☒ Denmark	☒ Ireland	☐	☐
☒ Sweden	☒ Germany	☒ Spain	☐	☐
☒ Norway	☒ Switzerland	☐	☐	☐
☒ **CB Bull. NATIONAL DIFFERENCES IEC 60950-1:2005 (2nd Edition)**				
☒ Switzerland	☒ Finland	☒ Norway	☒ USA	☒ Japan
☒ Germany	☒ United Kingdom	☒ Sweden	☒ Israel	☐
☒ Denmark	☒ Ireland	☒ Group Differences	☒ Australia	☐
☒ Spain	☒ Korea	☒ Canada	☒ New Zealand	☐
☒ **The product fulfils the requirements of** DIN EN 60950-1 (VDE 0805-1):2014-08 EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013 IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013				

Test item particulars.....:	
Equipment mobility.....:	[] movable [] hand-held [] transportable [] stationary [x] for building-in [] direct plug-in
Connection to the mains.....:	[] pluggable equipment [] type A [] type B [] permanent connection [] detachable power supply cord [] non-detachable power supply cord [x] not directly connected to the mains
Operating condition.....:	[x] continuous [] rated operating / resting time:
Access location .....:	[] operator accessible [] restricted access location [x] to be determined in the end use equipment
Over voltage category (OVC) .....:	[x] OVC I [] OVC II [] OVC III [] OVC IV [] other: DC supplied
Mains supply tolerance (%) or absolute mains supply values .....:	N/A; not directly connected to the mains. see page 2 for input voltage range.
Tested for IT power systems .....:	[] Yes [x] No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	[] Class I [] Class II [] Class III [x] Not classified
Considered current rating of protective device as part of the building installation (A) .....:	N/A
Pollution degree (PD) .....:	[] PD 1 [x] PD 2 [] PD 3
IP protection class .....:	IP---
Altitude during operation (m) .....:	≤ 2000 m
Altitude of test laboratory (m) .....:	app. 179 m
Mass of equipment (kg) .....:	< 18 kg

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 of receipt of test item .....:	2016-02-09
Date (s) of performance of tests.....:	2016-02-09 (visible check)

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 ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location 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 ..... :	☒ **Yes** ☐ **Not applicable**
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) ..... :	TDK-Lambda Americas Inc.; 3320 Matrix Drive Suite 100; RICHARDSON TX 75082; USA / Reference 30014661 TDK-Lambda Malaysia Sdn. Bhd.; PLO 33 Kawasan Perindustrian Senai Locked Bag No. 110; 81400 SENAI, JOHOR; Johor; Malaysia / Reference 30017287

General product information:

The label includes:

Optional "-R" appended to product code to indicate ROHS compliance. eg. iACXXXXXXXXXX-### -R Series

Product Overview:

The Metamere product family consists of high density DC-DC power modules intended to be purchased and used as a component in an end-user's power system. The modules currently come in one input voltage range; a wide range 6.0 - 14.4 Vdc input. The output voltage will be between 0.7525V and 5.0V depending upon the model number. (See Appendix 3 for details)

The product is available in one mechanical configuration - the iAC

The design intention is that the modules within a platform consist of a family of units with similar form, fit and function with the exception of the output voltage and current. The only differences between the modules will be:

The semiconductors such as main switches Q1 & Q2 will be in the same physical package but may be different devices depending upon the specific voltage and current stresses in the various power module designs.

The core on board output filter inductors and the input and output capacitors will be in the same physical packages but may be different values depending upon the specific voltage and current stresses in the various power module designs.

Control circuits will have value changes to scale the typical circuit parameters such as output voltage and output current limit set point as required for the different designs.

Other control circuits such as the feedback compensation may have value changes as required for each specific design.

The Electrical and Fire Enclosures are to be provided by the end product.

Units are components within customer's end-use system. Input to converters is DC 6.0 - 14.4 V

The DC-DC Converter series provides functional insulation, between input and output.

Operating Conditions:

If the input meets all requirements for SELV, then the output may be considered SELV

The DC-DC Converters are not internally fused. An external input line normal blow fuse with a max. value of 30 A is required.

Tests were performed on model iAC12016A050V-001, output DC 5 V / 16 A / 80 W, for reference, since all models uses the same electrical circuits. The unit was tested with a maximum continuous output

For more detail and test results see previous Test Reports under VDE File 2520400-3336-0013

Abbreviations used in the report:

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

Indicate used abbreviations (if any)

Information to test report reference No. :	**221868-CI3-1**
VDE Test- and Certification Institute GmbH Merianstrasse 28 D - 63069 Offenbach	DIN EN 60950-1 (VDE 0805-1):2014-08 EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013 IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013

Test item description:	Component DC-DC Converters for building in IT equipment.
Made by :	TDK-Lambda Americas Inc.; 3320 Matrix Drive; Suite 100; RICHARDSON TX 75082; USA
Trade mark :	TDK and/or TDK·Lambda
Model/type ref. :	iAC Series
Rated :	Refer to page 2 (see model matrix Appendix 3)

Commission received from	Steve McKitrick	Date:	2016-02-09

Modification on the appliance:

1.	Standard upgrade to: DIN EN 60950-1 (VDE 0805-1):2014-08 EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011+A2:2013 IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013

Test Report History:

Date: (jjjj-mm-dd)	VDE-Certificate: CB-Ref. No.:	VDE File No.: Test Report Number	Modifications:
2016-02-10	40015516 DE1-56823	2520400-3336-0013 221868-CI3-1	Origin Test Report (DC / DC converter iAC-series)