



Test Report issued under the responsibility of:



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

Report Number: 212475-CI3-1 CBDE1-52299/A1/M1
Date of issue: 2015-08-06
Total number of pages.....: 191

Applicant's name.....: TDK-Lambda Americas Inc.
Address: 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA

Test specification:

Standard: 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 procedure: VDE ÜG, CB Scheme
Non-standard test method.....: N/A

Test Report Form No.....: IEC60950_1F
Test Report Form(s) Originator.....: SGS Fimko Ltd
Master TRF: Dated 2014-02

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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:

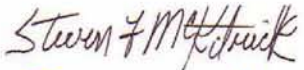


The test results presented in this report relate only to the object tested.
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Test item description :	Component DC DC Converter for use with IT Equipment
Trade Mark :	 and/or  and/or TDK-Lambda
Manufacturer	TDK-Lambda Americas Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA
Model/Type reference	iEH series (See model matrix below)

Ratings :	
	Input: DC 36 - 75 V, 10.5 A max, See model Matrix below Output: DC 9.6 – 12.0 V, max. 42 A, max. 480 W (SELV) See model Matrix below

MODEL No.	Input Voltage	Max Input Current (1)	Output Voltage (2)	Output Current	Max. Output Power
iEH48025A120V-xxx(-R)	36-75 V	9.0 A	12 V	25 A	300 W
iEH48020A120V-xxx(-R)	36-75 V	7.5 A	12 V	20 A	240 W
iEH4N028A108V-xxx(-R)	51-55 V	6.5 A	10.8 V	28 A	302 W
iEH4N033A096V-xxx(-R)	38-55 V	8.5 A	9.6 V	33.3 A	320 W
iEH4N031A096V-xxx(-R)	38-55 V	8.0 A	9.6 V	31.3 A	300 W
iEH4N040A120V-xxx(-R)	49.5-55.5 V	10.5 A	12 V	40 A	480 W
iEH4N042A108V-xxx(-R)	49.5-55.5 V	9.8 A	10.8 V	42 A	454 W

Supplementary information:

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	VDE Prüf- und Zertifizierungsinstitut GmbH VDE <i>Testing and Certification Institute</i>
Testing location/ address.....:		Merianstrasse 28, D-63069 Offenbach, Germany
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address.....:		
Tested by (name + signature).....:		(authorization of test report)
Approved by (name + signature).....:		
<hr/>		
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:	
Testing location/ address.....:		
Tested by (name + signature).....:		(authorization of test report)
Approved by (name + signature).....:		
<hr/>		
<input checked="" type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:	
Testing location/ address.....:		TDK-Lambda Americas Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA WMT/CTF Stage 2 (TDAP, VDE File No. 2520400-9501-0001)
Tested by (name + signature).....:		Steve McKitrick 
Witnessed by (name + signature).....:		Thomas Dankesreiter (authorization of test report) 
Approved by (name + signature).....:		Holger Kreuzer 
<hr/>		
<input type="checkbox"/>	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).....:		
<hr/>		

List of Attachments (including a total number of pages in each attachment):		
Appendix No.	Description	Page(s)
1	Photos	126 - 127
2	Model Matrix	128 - 129
3	Label	130
4	Critical component list; Test data, drawings, schematics	131 - 191
Summary of testing:		
Tests performed (name of test and test clause):		Testing location:
1.5 Components 1.6 Power interface 4.5 Thermal requirements 5.3 Abnormal operating and fault conditions See Appendix		TDK-Lambda Americas Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA WMT/CTF Stage 2 (TDAP, VDE 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 (2 nd Edition); am1:2009 / EN 60950-1:2006/A11:2009/A1:2010/A12:2011/A2:2013 and those deviations taken into account of				
<input checked="" type="checkbox"/> CENELEC common modifications	<input checked="" type="checkbox"/> United Kingdom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Finland	<input checked="" type="checkbox"/> Denmark	<input checked="" type="checkbox"/> Ireland	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Sweden	<input checked="" type="checkbox"/> Germany	<input checked="" type="checkbox"/> Spain	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Norway	<input checked="" type="checkbox"/> Switzerland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> CB Bull. NATIONAL DIFFERENCES IEC 60950-1:2005 (2nd Edition)				
<input checked="" type="checkbox"/> Switzerland	<input checked="" type="checkbox"/> Finland	<input checked="" type="checkbox"/> Norway	<input checked="" type="checkbox"/> USA	<input type="checkbox"/>
<input checked="" type="checkbox"/> Germany	<input checked="" type="checkbox"/> United Kingdom	<input checked="" type="checkbox"/> Sweden	<input checked="" type="checkbox"/> Israel	<input type="checkbox"/>
<input checked="" type="checkbox"/> Denmark	<input checked="" type="checkbox"/> Ireland	<input checked="" type="checkbox"/> Group Differences	<input checked="" type="checkbox"/> Australia	<input type="checkbox"/>
<input checked="" type="checkbox"/> Spain	<input checked="" type="checkbox"/> Korea	<input checked="" type="checkbox"/> Canada	<input checked="" type="checkbox"/> New Zealand	<input type="checkbox"/>
For national and cenelec differences refer to main test report				
<input checked="" type="checkbox"/> 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:	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains:	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input checked="" type="checkbox"/> not directly connected to the mains
Operating condition:	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input checked="" type="checkbox"/> other: DC supplied
Mains supply tolerance (%) or absolute mains supply values	N/A, not connected to the mains
Tested for IT power systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	N/A
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IPX0
Altitude during operation (m)	≤ 2000 m
Altitude of test laboratory (m)	app. 180 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	2015-02-17
Date (s) of performance of tests	2015-02-17 to 2015-05-22
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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	

Manufacturer's Declaration per sub-clause 4.2.5 of IEC60950-1:	
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 see VDE construction form 131	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not applicable (one factory)
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)	30014661 TDK-Lambda Americas Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA 30017287 TDK-Lambda Malaysia Sdn. Bhd. PLO 33 Kawasan Perindustrian Senai; Locked Bag No. 110; SENAI, JOHOR 81400; Johor; Malaysia
General product information:	
<p>The product is a component type DC/DC power module, intended to be used as a component in an end-user's power system. This device is a DC-DC power supply with open frame for building-in.</p> <p>The Cooleta (iEH) product family consists of high density DC-DC power converter modules intended to be purchased and used as a component in an end-user's power system. The input operating voltage ranges is from 36 V – 75 Vdc. The output voltage range will be between 9.6 V and 12 V depending upon the model number.</p> <p>The iEH product is available in one mechanical configuration using the same transformer core set and output filter inductor geometry except for the air gap and number of turns used in the inductor. Only one (1) house-keeping transformer (bias transformer) is used in iEH platform, which is similar to AT00131 used in TDK iQLs and iQGs platforms with the exception of one (1) additional secondary auxiliary winding and higher temperature rated wires used for class F (130C) insulation. The control circuit is based on the secondary side, and the PWB traces are used for the output load current sensing and over-load protection. A digital isolator is used to deliver the drive pulses to cross the isolation boundary to the primary side.</p>	
Conditions of Installation:	
<p>The equipment shall be installed in compliance with the enclosure, mounting, spacing, casualty and segregation requirements of the end-use application.</p> <p>Operating Conditions: Units are components within customers end-use system.</p> <p>The DC-DC power supply input is protected by fuse, provided by the end product.</p>	

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. :					
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 Converter for use with IT Equipment			
Made by :		TDK-Lambda Americas Inc. 3320 Matrix Drive, Suite 100, Richardson, Texas 75082, USA			
Trade mark :		 and/or  and/or			
Model/type ref. :		iEH series			
Rated :		Input: DC 36 - 75 V, 10.5 A max, See model Matrix below Output: DC 9.6 – 12.0 V, max. 42 A, max. 480 W (SELV) See model Matrix below			
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Commission received from		Steve, Mc Kitrick		Date: 2015-03-16	
Modification on the appliance:					
1.	Add model iEH4N040A120V-xxx(-R) and iEH4N042A108V-xxx(-R) to iEH series				

Test Report History:			
This report may consist of more than one report and is valid only with additional or previous issued reports:			
Date: (jjjj-mm-dd)	VDE-Certificate: CB-Ref. No.:	VDE File No.: Test Report Number	Modifications:
2015-08-06	40037572 CB DE1-52299/A1/M1	2520400-3336-0048/ 212475-CI3-1	additional Test Report (this Test Report) add models iEH4N040A120V-xxx(-R) and iEH4N042A108V-xxx(-R)
2015-03-17	40037572 CB DE1-52299/A1	2520400-3336-0048/207809	additional Test Report 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
2013-05-22	40037572 CB DE1-52299	2520400-3336-0048/104493	Origin Test Report DC / DC converters iEH - series