



Test Report issued under the responsibility of:



**TEST REPORT**  
**IEC 62368-1**  
**Audio/video, information and communication technology equipment**  
**Part 1: Safety requirements**

**Report Number** .....: E220248-A6002-CB-1  
**Date of issue**.....: 2019-05-28  
**Total number of pages** .....: 55

**Applicant's name**.....: **TDK-LAMBDA AMERICAS INC**  
**Address** .....: **SUITE 100**  
**3320 MATRIX DR**  
**RICHARDSON TX 75082**  
**UNITED STATES**

**Name of Test Laboratory** .....: UL RTP  
**preparing the Report** .....: 12 Laboratory Drive, Research Triangle Park , NC, 27709, USA

**Test specification:**  
**Standard** .....: IEC 62368-1:2014 (Second Edition)  
**Test procedure** .....: CB Scheme  
**Non-standard test method**.....: N/A

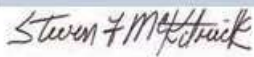

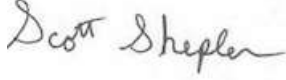
**Test Report Form No**.....: IEC62368\_1B  
**Test Report Form(s) Originator** .....: UL(US)  
**Master TRF**.....: 2014-03

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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 Power Supply
Trade Mark .....	:	None
Manufacturer .....	:	TDK-LAMBDA AMERICAS INC SUITE 100 3320 MATRIX DR RICHARDSON TX 75082 UNITED STATES
Model/Type reference .....	:	i7Azz**A%%V-#xx(-R)  Where where zz may be 4W or 2W or can be any two alpha numeric characters that represents input voltage between 4.5-60Vdc input,40A max input current *** represents rated output current between 0A - 50A, %%% represents rated output voltage between 0.8Vdc – 24Vdc # could be any alphanumeric character and xx indicates a number or alphanumeric character which do not affect safety related features May be followed by Optional –R indicating RoHS compliance
Ratings .....	:	Optional
Testing procedure and testing location:		
<input type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address .....		
Tested by (name + signature).....		
Approved by (name + signature) .....		
Testing procedure: CTF Stage 1		
Testing location/ address.....		
Tested by (name + signature).....		
Approved by (name + signature) .....		
Testing procedure: CTF Stage 2		
Testing location/ address.....		TDK-LAMBDA AMERICAS INC SUITE 100 3320 MATRIX DR RICHARDSON TX 75082 UNITED STATES

Tested by (name + signature).....:		Steve McKitrick / Tester	
Witnessed by (name + signature).....:		Mengis Tesfay / Project Handler	
Approved by (name + signature) .....		Scott Shepler / Reviewer	
<input type="checkbox"/>	Testing procedure: CTF Stage 3		
<input type="checkbox"/>	Testing procedure: CTF Stage 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):**

National Differences (28 pages)

Enclosures (34 pages)

**Summary of testing:****Tests performed (name of test and test clause):**

INPUT TEST: SINGLE PHASE (B.2.5)  
NORMAL OPERATING CONDITIONS  
TEMPERATURE MEASUREMENT (B.2.6)  
SIMULATED ABNORMAL OPERATING  
CONDITIONS (B.3)  
SIMULATED SINGLE FAULT CONDITIONS (B.4)  
TEST FOR THE PERMANENCE OF MARKINGS  
(ANNEX F.3.10)

**Testing Location:**

**CTF Stage 2: TDK-LAMBDA AMERICAS INC  
SUITE 100  
3320 MATRIX DR  
RICHARDSON TX 75082  
UNITED STATES**

**Summary of compliance with National Differences:****List of countries addressed:** AU,NZ, JP, EU Group Differences, US,CA **The product fulfils the requirements of:** EN 62368-1:2014 + A11:2017

<b>TEST ITEM PARTICULARS:</b>	
Classification of use by	Instructed person
Supply Connection	External Circuit - not Mains connected
Supply % Tolerance	None. Declared range.
Supply Connection – Type	Not connected to Mains
Considered current rating of protective device as part of building or equipment installation	40 A. External fuse to be provided in the end product. A; equipment
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Not classified
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer’s specified maximum operating ambient	85°C, per client's provided de-rating curve °C
IP protection class	IPX0
Power Systems	N/A
Altitude during operation (m)	2000 m or less
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	0.10 kg
<b>POSSIBLE TEST CASE VERDICTS:</b>	
- 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)
<b>TESTING:</b>	
Date of receipt of test item..... :	2019-05-06
Date (s) of performance of tests..... :	2019-05-14
<b>GENERAL REMARKS:</b>	
<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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
<b>Manufacturer’s Declaration per sub-clause 4.2.5 of IEC60068-2-1:</b>	
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 .....	<input checked="" type="checkbox"/> <b>Yes</b> <input type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	

<b>Name and address of factory (ies) .....</b>	TDK-LAMBDA AMERICAS INC SUITE 100 3320 MATRIX DR RICHARDSON TX 75082 UNITED STATES  TDK-LAMBDA MALAYSIA SDN BHD PLO33 KAWASAN PERINDUSTRIAN SENAI 81400 SENAI JOHOR MALAYSIA
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**GENERAL PRODUCT INFORMATION:**

**Report Summary**  
 All applicable tests according to the referenced standard(S) have been carried out.

**Product Description**  
 The i7A product family consists of non-isolated DC-DC power modules intended to be used as a component in an end-user's power system. The modules will be offered in multiple input voltage and output voltage ranges. The input ranges from 4.5 - 60Vdc input at 40 A max. The output voltage will be adjustable between 0.8V to 24Vdc.

**Model Differences**  
 All models within the series are similar except for input rating, output rating, and size of inductor.

**Additional application considerations – (Considerations used to test a component or sub-assembly) -**  
 Marking label provided represents all models in series.

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 25°C. See derating curve for more details
- The product is intended for use on the following power systems : No direct connection
- Considered current rating of protective device as part of the building installation (A) : External fast blow 40 A fuse to be provided in the end product.
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- The equipment disconnect device is considered to be : For building in
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product was investigated to the following additional standards : EN 62368-1:2014 + A11:2017

**Engineering Conditions of Acceptability**  
 When installed in an end-product, consideration must be given to the following:

- The following output circuits are at ES1 energy levels : All
- The following output circuits are at PS3 energy levels : All
- The investigated Pollution Degree is : 2
- An investigation of the protective bonding terminals has : Not been conducted
- The following end-product enclosures are required : Electrical, Fire

- The maximum continuous power supply output (Watts) relied on forced air cooling from : Ranging from 5.2 to 70 CFM depending on ambient, and load. See Derating Curve
- The power supply was evaluated to be used at altitudes up to : "2,000 m"
- Test was conducted using fast blow external fuse rated 40 A. External fuse employed shall comply with IEC 60127.
- Heating Test need to re-conducted as part of an end product evaluation to ensure the max temperature of 130 C is not exceeded.

<b>ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:</b>	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
<b>Electrically-caused injury (Clause 5):</b> (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input <span style="float: right;">ES1</span>	
Source of electrical energy	Corresponding classification (ES)
Input (All Models)	ES1
Output (All Models)	ES1
<b>Electrically-caused fire (Clause 6):</b> (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): <span style="float: right;">PS2</span>	
Source of power or PIS	Corresponding classification (PS)
Input (All Models)	PS3
Output (All Models)	PS3
<b>Injury caused by hazardous substances (Clause 7)</b> (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component <span style="float: right;">Glycol</span>	
Source of hazardous substances	Corresponding chemical
N/A	--
<b>Mechanically-caused injury (Clause 8)</b> (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit <span style="float: right;">MS2</span>	
Source of kinetic/mechanical energy	Corresponding classification (MS)
N/A	--
<b>Thermal burn injury (Clause 9)</b> (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure <span style="float: right;">TS1</span>	
Source of thermal energy	Corresponding classification (TS)
PWB and Components	TS3 (for building in, to be addressed in the end product)
<b>Radiation (Clause 10)</b> (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product <span style="float: right;">RS1</span>	
Type of radiation	Corresponding classification (RS)
N/A	--



### ENERGY SOURCE DIAGRAM

Indicate which energy sources are included in the energy source diagram. Insert diagram below

ES     PS     MS     TS     RS

