

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CSA C22.2 No. 62368-1-14, 2nd Ed., Issue Date: 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
<b>Complementary CCN:</b>	N/A
<b>Product:</b>	DC-To-DC Converters
<b>Model:</b>	i9Czz***A%%%V-xxx(-R)  Where "zz" may be 4W or 2W OR can be any two alphanumeric characters that represents input voltage between 9 to 80 VDC, 60 A max current Where "****" may be rated output current up to max 30 A. Where "%%%%" represent rated output voltage between 9.5 to 60 VDC and 'xxx" indicates a number of alphanumeric characters for non safety features. Optional "-R" may be to denote RoHS compliance
<b>Rating:</b>	Not required. Optional.
<b>Applicant Name and Address:</b>	TDK-LAMBDA AMERICAS INC 3000 TECHNOLOGY DR, SUITE 100 PLANO TX 75074 UNITED STATES

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By: Mengis Tesfay / Project Handler      Reviewed By: Gregory Ray / Reviewer

### Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

A. Authorization - The Authorization page may include additional Factory Identification Code markings.

B. Generic Inspection Instructions -

- i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
- ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
- iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

### Product Description

The i9C 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 9 - 80Vdc input at 60 A max. The output voltage will be adjustable between 9.5V to 60V. The rated output power will be 1500W or less.

### Model Differences

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

### Test Item Particulars

Classification of use by	Instructed person
Supply Connection	External Circuit - not Mains connected ES2
Supply % Tolerance	None
Supply Connection – Type	No direct connection to Mains. Considered in the end-product
Considered current rating of protective device as part of building or equipment installation	60 A; equipment
Equipment mobility	for building-in
Over voltage category (OVC)	OVC I
Class of equipment	Not classified
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	125 C at base plate
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)	0.08

### Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 125°C at faceplate

- 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) : N/A. For building in.
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- The equipment disconnect device is considered to be : N/A
- 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

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following output circuits are at ES2 energy levels : All
- The following output circuits are at PS3 energy levels : Output Terminal
- 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 units provide Functional Insulation only between input and output circuits.
- Tests conducted in wind tunnel with 900 Ifm (550CFM). Heating Test shall be evaluated in end product. The following components require special consideration during end-product Thermal (Heating) tests.
- This component has been evaluated in 'control of fire spread' method assuming appropriate fire enclosure is provided in end product. Unless the fire enclosure is made of non-combustible or V-0 material, the separation from the PIS shall be considered
- Classification of PIS has not been conducted. Therefore, all electrical components and conductors including printed wirings were assumed to be arcing/resistive PIS.
- Power to the DC-DC Converter is intended to be supplied by isolated secondary circuitry in an end use application.
- Output voltage may be adjusted for up the maximum fixed output power (i.e. maximum output current is decreased). When the output voltage is adjusted down, the maximum output current is fixed (i.e. available output power is decreased).
- ES Classification of EUT is to be verified during end product. Declared ES2, but the converter is non-isolating and it is to be used by Instructed or Skilled person.

### Additional Information

All original sample and test dates are noted in the testing portion of this report.

The nameplate included in the report is representative of all models covered under this report.

### Additional Standards

The product fulfills the requirements of: AS/NZS 62368.1:2018,  
EN 62368-1:2014+A11:2017,  
J62368-1 (2020),  
CSA/UL 62368-1:2014

### Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee's or Recognized companys name, Trade Name, Trademark or File Number

Equipment identification marking – model identification	Model Number
<b>Special Instructions to UL Representative</b> N/A	