

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	DC-To-DC Converters
Model:	<p>i9Czz***A%%V-xxx(-R)</p> <p>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</p> <p>i9Cyy&&&A###V-xxx(-R)</p> <p>Where "yy" may be 4W or 2W OR can be any two alphanumeric characters that represents input voltage between 9 to 60 VDC, 60 A max current Where "&&&" may be rated output current up to max 50 A. Where "###" represent rated output voltage between 5 to 36 VDC and 'xxx' indicates a number of alphanumeric characters for non safety features. Optional "-R" may be to denote RoHS compliance</p>
Rating:	Not required. Optional.
Applicant Name and Address:	TDK-LAMBDA AMERICAS INC 3000 TECHNOLOGY DR, SUITE 100 PLANO TX 75074 UNITED STATES

Issue Date: 2024-10-18

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Report No.

E220248-A6036-UL

Revision Date: 2025-12-10

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: Edward Martin / Project Handler Reviewed By: Michael Lockhart / 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 rated output power will be 1500W or less.

Model Differences

Model series i9Cyy&&&A###V-xxx(-R) is identical to model series i9Czz***A%%V-xxx(-R) except for inductor, thermistor, and ratings.

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)	117 C at baseplate
IP protection class	IPX0
Power Systems	N/A
Altitude during operation (m)	5000 m
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 (T_{ma}) permitted by the manufacturer's specification of : 117°C at baseplate
- 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 lfm (550CFM). Heating Test shall be evaluated in end product. The following components require special consideration during end-product Thermal (Heating) tests: 117°C at baseplate.
- 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 to 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.
- For models in the i9Cyy&&&A###V-xxx(-R) family, see the derating curves in enclosure 04-02.

Additional Information

Amendment 1 (Technical) – Update report E220248-A6036-CB-1 - Limited testing was deemed necessary to add model i9Cyy&&&A###V-xxx(-R) based on similarity to model i9Czz***A%%V-xxx(-R). The new model is identical to previous except uses different inductor and thermistor to increase maximum output current rating from 30A to 50A. Product is derated such that the maximum output power is still the same 1500W. Additionally, no testing was deemed necessary to increase the maximum rated altitude from 2000m to 5000m.

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

Special Instructions to UL Representative

Units can be fully manufactured in either the Malaysia or Plano, TX location; however, it is also possible that completed units can go back to either factory for rework where a new product label can be applied based on the location that completed the rework.

The Field Inspector should verify that the reworked units came from the original manufacturer (the Factory ID (if any) should be verified). The Field Inspector should verify that the new product label includes all required markings as shown in the Markings and Instructions section.