UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 1st Edition, 2007-10-31 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-03, 1st Edition, 2006-07 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Power Supply, Non Isolating DC-DC Converter
Model:	Models: iCF05003A006V-0xx iCF12003A007V-0xx iCF12004A025V-0xx iCF12005A007V-0xx iCG05006A006V-0xx iCG12006A007V-0xx iCG12005A007V-0xx iCG12003A007V-0xx iBF05012A006V-0xx iBF12012A007V-0xx iBF12010A025V-0xx iAF05020A006V-0xx iAF12020A007V-0xx iCH12012A007V-0xx iCH12010A025V-0xx iBH12020A007V-0xx iBH12012A025V-0xx where xx is a two digit number or letters indicating a mechanical or control function modification.
Rating:	Class III, (optional) iCF05003A006V-0xx Input: Voltage Range - 2.4 - 5.5Vdc, 3.5A Output: 0.6- 3.63Vdc, 3A, Max Power 10.9W iCF12003A007V-0xx Input: Voltage Range - 4.5 - 14Vdc, 3.5A Output: 0.6- 5.5Vdc, 3A Max Power 16.5W iCF12004A025V-0xx Input: Voltage Range - 7 - 14Vdc, 5A Output: 2.5- 8.5Vdc, 4A Max Power 34W iCF12005A007V-0xx Input: Voltage Range - 4.5 - 14Vdc, 5A Output: 0.7- 5.5Vdc, 4.5A Max Power 24.75W

iCG05006A006V-0xx
Input: Voltage Range - 2.4 - 5.5Vdc, 7A
Output: 0.6- 3.63Vdc, 6A Max Power 21.8W

iCG12006A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 7A
Output: 0.7- 5.5Vdc, 6A Max Power 33W

iCG12005A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 5A
Output: 0.7- 5.5Vdc, 4.5A Max Power 24.75W

iCG12003A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 3.5A
Output: 0.7- 5.5Vdc, 3A Max Power 16.5W

iBF05012A006V-0xx
Input: Voltage Range - 2.4 - 5.5Vdc, 12A
Output: 0.6- 3.63Vdc, 12A Max Power 43.6W

iBF12012A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 12A
Output: 0.7- 5.5Vdc, 12A Max Power 66W

iBF12010A025V-0xx
Input: Voltage Range - 7 - 14Vdc, 10A
Output: 2.5- 8.5Vdc, 10A Max Power 85W

iAF05020A006V-0xx
Input: Voltage Range - 2.4 - 5.5Vdc, 20A
Output: 0.6- 3.63Vdc, 20A Max Power 72.6W

iAF12020A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 20A
Output: 0.7- 5.5Vdc, 20A Max Power 110W

iCH12012A007V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 12A
Output : 0.7- 8.5Vdc, 10A Max Power 85W

iCH12010A025V-0xx
Input: Voltage Range - 4.5 - 14Vdc, 12A
Output: 2.5- 8.5Vdc, 10A Max Power 85W

iBH12020A007V-0xx
Input: Voltage Range - 3 - 14Vdc, 21A
Output: 0.7- 5.5Vdc, 20A Max Power 110W

iBH12020A025V-0xx
Input: Voltage Range - 3 - 14Vdc, 13A
Output: 2.5- 8.5Vdc, 12.5A Max Power 106.5W

Output voltage maybe adjusted by employing external trim resistor

	(connected between Vout trim terminal and ground terminal) See Miscellaneous Enclosure for product spec sheet
Applicant Name and Address:	TDK-LAMBDA AMERICAS INC SUITE 100 3320 MATRIX DR RICHARDSON TX 75082 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: Rupi Dhadda Reviewed by: Gregory Gatt

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 product is a class III component for building-in type DC/DC power module. The converter is provided with input terminal pins for factory installation. The unit is non-isolating (FI) type.

Output voltage maybe adjusted by employing external trim resistor (connected between Vout trim terminal and ground terminal)

Model Differences

Models covered within this series are similar as they share same power train, consisting of two Mosfets, power inductor and input/output filtering capacitors.

Modules with iCF prefix utilize a single FR-4 PWB whereas iCG module utilize two FR-4 PWBs joined together by interconnecting pins.

Technical Considerations

- Equipment mobility : for building-in
- Operating condition : continuous
- Mains supply tolerance (%) : No direct connection
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class III (supplied by SELV)
- Mass of equipment (kg) : less than 1 kg
- Protection against ingress of water : IP X0
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 25°C
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual
- The power supply wiring means are meant for building in.

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 secondary output circuits are SELV: All
- The following secondary output circuits are at non-hazardous energy levels: All
- The maximum investigated branch circuit rating is: 20 A. In addition Power board/ test fixture is provided with 10A fuse for testing purpose.,
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The maximum continuous power supply output (Watts) relied on forced air cooling from: iAF12020A007V-xxx-(R) testing was conducted in a wind tunnel with forced air cooling set to 60LFM [and 0 to 80LFM for Overload] with a unit output loaded to max rated Load of 110W. , , , Fan Distance from Unit: ~81 cm, Fan Location: Above unit, Air-flow Direction: unit is in input left orientation, airflow is flowing upwards in this orientation,
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Consideration should be given to conducting the Heating Test in the End Product. The PWB is rated 130°C.

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The investigated Pollution Degree is: 2

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The power DC Converter is intended to be supplied by isolated secondary circuitry in an end-use application.

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The input-output connectors are not acceptable for field wiring and are only intended for connection to mating connectors of internal wiring inside an end product The acceptability of these and the mating connectors relative to secureness, insulating materials, and temperature shall be considered in the end product.

Additional Information

- The products may optionally provide a suffix [R] which indicates a non-safety related function.

- The report was modified to correct the model description to where xx is a two digit number or letters indicating a mechanical or control function modification.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
1.7.1 Power rating - Ratings	Optional, Ratings (voltage dc, current)

Special Instructions to UL Representative

Listee's or Recognized company's name, Trade Name (TDK-Lambda and/or TDK-Lambda Americas Inc.), Trademark or File Number may be located on the unit or the smallest packaging. The unit rating are optional and are embedded as part of the part number.

Production-Line Testing Requirements

Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A						

Earthing Continuity Test Exemptions - This test is not required for the following models:

Electric Strength Test Exemptions - This test is not required for the following models:

Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:

Sample and Test Specifics for Follow-Up Tests at UL

Model	Component	Material	Test	Sample(s)	Test Specifics
N/A					