

## UL TEST REPORT AND PROCEDURE

**Standard:** UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements)  
CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)

**Certification Type:** Power Supplies for Information Technology Equipment Including Electrical Business Equipment

**CCN:** QQGQ2, QQGQ8

**Product:** Power Supply, Built-In DC/DC

**Model:** IE(A/C)48008A050V-0##[R]  
IE(A/C)48015A050V-0##[R]  
IE(A/C)48010A033V-0##[R]  
IE(A/C)48025A033V-0##[R]  
IE(A/C)48020A033V-0##[R]  
IE(A/C)48010A025V-0##[R]  
IE(A/C)48025A025V-0##[R]  
IE(A/C)48020A025V-0##[R]  
IE(A/C)48010A020V-0##[R]  
IE(A/C)48025A020V-0##[R]  
IE(A/C)48020A020V-0##[R]  
IE(A/C)48010A018V-0##[R]  
IE(A/C)48025A018V-0##[R]  
IE(A/C)48020A018V-0##[R]  
IE(A/C)48010A015V-0##[R]  
IE(A/C)48025A015V-0##[R]  
IE(A/C)48020A015V-0##[R]  
IE(A/C)48010A012V-0##[R]  
IE(A/C)48025A012V-0##[R]  
IE(A/C)48020A012V-0##[R]  
IE(A/C)48015A012V-0##[R]  
IE(A/C)48015A015V-0##[R]  
IE(A/C)48015A018V-0##[R]  
IE(A/C)48015A020V-0##[R]  
IE(A/C)48015A025V-0##[R]  
IE(A/C)48015A033V-0##[R]  
IE(A/C)48007A120V-0##[R]  
IE(A/C)48005A150V-0##[R]  
IE(A/C)48004A180V-0##[R]  
IE(A/C)48004A200V-0##[R]  
IE(A/C)48003A240V-0##[R]  
IE(A/C)48003A280V-0##[R]  
IE(A/C)48013A050V-0##[R]  
IE(A/C)4W004A120V-0##[R]  
where # can be any number or letter which affects non-safety issues

where A denotes through hole pins and C denotes surface mount pins.

**Rating:**

Input: Voltage = 36-75Vdc, Current = 4A  
Except the following which is 2A:

IE(A/C)48008A050V-0##[R]  
IE(A/C)48010A033V-0##[R]  
IE(A/C)48010A025V-0##[R]  
IE(A/C)48010A020V-0##[R]  
IE(A/C)48010A018V-0##[R]  
IE(A/C)48010A015V-0##[R]  
IE(A/C)48010A012V-0##[R]

Except the following which is 18-60Vdc, 5A:

IE(A/C)4W004A120V-0##[R]

Output:

IE(A/C)48008A050V-0##[R] / 5V, 8A, 40W  
IE(A/C)48015A050V-0##[R] / 5V, 15A, 75W  
IE(A/C)48010A033V-0##[R] / 3.3V, 10A, 33W  
IE(A/C)48025A033V-0##[R] / 3.3V, 25A, 82.5W  
IE(A/C)48020A033V-0##[R] / 3.3V, 20A, 66W  
IE(A/C)48010A025V-0##[R] / 2.5V, 10A, 25W  
IE(A/C)48025A025V-0##[R] / 2.5V, 25A, 62.5W  
IE(A/C)48020A025V-0##[R] / 2.5V, 20A, 50W  
IE(A/C)48010A020V-0##[R] / 2.0V, 10A, 20W  
IE(A/C)48025A020V-0##[R] / 2.0V, 25A, 50W  
IE(A/C)48020A020V-0##[R] / 2.0V, 20A, 40W  
IE(A/C)48010A018V-0##[R] / 1.8V, 10A, 18W  
IE(A/C)48025A018V-0##[R] / 1.8V, 25A, 45W  
IE(A/C)48020A018V-0##[R] / 1.8V, 20A, 36W  
IE(A/C)48010A015V-0##[R] / 1.5V, 10A, 15W  
IE(A/C)48025A015V-0##[R] / 1.5V, 25A, 37.5W  
IE(A/C)48020A015V-0##[R] / 1.5V, 20A, 30W  
IE(A/C)48010A012V-0##[R] / 1.2V, 10A, 12W  
IE(A/C)48025A012V-0##[R] / 1.2V, 25A, 30W  
IE(A/C)48020A012V-0##[R] / 1.2V, 20A, 24W  
IE(A/C)48015A012V-0##[R] / 1.2V, 15A, 18W  
IE(A/C)48015A015V-0##[R] / 1.5V, 15A, 22.5W  
IE(A/C)48015A018V-0##[R] / 1.8V, 15A, 27W  
IE(A/C)48015A020V-0##[R] / 2V, 15A, 30W  
IE(A/C)48015A025V-0##[R] / 2.5V, 15A, 37.5W  
IE(A/C)48015A033V-0##[R] / 3.3V, 15A, 49.5W

IE(A/C)48007A120V-0##[R] / 12V, 6.5A, 78W  
IE(A/C)48005A150V-0##[R] / 15V, 5.2A, 78W

IE(A/C)48004A180V-0##[R] / 18V, 4.3A, 78W

IE(A/C)48004A200V-0##[R] / 20V, 3.9A, 78W

IE(A/C)48003A240V-0##[R] / 24V, 3.3A, 78W

IE(A/C)48003A280V-0##[R] / 28V, 2.8A, 78W

IE(A/C)48013A050V-0##[R] / 5V, 13A, 65W

IE(A/C)4W004A120V-0##[R] / 12V, 4A, 48W

**Applicant Name and Address:** TDK INNOVETA 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 Underwriters Laboratories Inc. ('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 Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

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Underwriters Laboratories Inc.

*Rupinderpal Dhadda*

Reviewed by: Scott Varner  
Underwriters Laboratories Inc.

*Scott Varner*

### 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 iEA/IEC family is a series of DC-DC converters

### Model Differences

The number of turns in the transformer is the only difference from model to model.

### Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : building-in
- Operating condition : continuous
- Access location : building-in
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : 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)
- Considered current rating (A) : 20A max

- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 2000
- Altitude of test laboratory (m) : 2000
- Mass of equipment (kg) : less than 1 kg
- The power supply means are: meant for building in.
- The product was submitted and tested for use at the manufacturer's recommended ambient temperature (Tmra) of: 25 °C

#### **Engineering Conditions of Acceptability**

For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. 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: iEA4W004A120V-0xx: 12Vdc
- This equipment has been evaluated to provide functional insulation between input and output when input voltage is less than 60V. When input is between 60V and 75V, this equipment has been evaluated to provide basic insulation, based on the shorting of the isolation and SELV output remains SELV after shorting.
- This product was tested with external cooling at a minimum of 250 LFM @ 36V input and 400 LFM @ 75V input. Additional testing should be considered in the end product investigation if external cooling is different than these values. Except no airflow for model IE(A/C)4W004A120V-0##[R]
- An external 10A fuse was used during fault tests located on power board. Consideration should be given to re conducting fault tests in the end product for fuse rating of greater than 10A.
- The following components require special consideration during end-product Heating tests due to the indicated maximum temperature measurements during component-level testing: Transformer winding on PWB (125°C)
- The investigated Pollution Degree is: 2

- The following secondary output circuits are at non-hazardous energy levels: All
- The following secondary output circuits are SELV: All
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: 136Vrms, 95Vpk. Primary-SELV: (IEA4W004A120V-0xx Main Transformer T1 pin 2 to pin 3) 166.9Vpk, 50.14Vrms

**Additional Information**

These models have been evaluated as having Basic insulation from input to output.  
-The suffix [R] is an option, when employed it indicates a non safety related function.

**Markings and instructions**

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

**Special Instructions to UL Representative**

Listee's or Recognized company's name, Trade Name, 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