

UL TEST REPORT AND PROCEDURE

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| 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: | DC/DC Converter |
| Model: | VIZ0014, VIZ0014x BcbbbRcccxyyyVM-ww |
| Rating: | Input:352 Vdc Output: 11 Vdc Power: 650W Max. See Enclosure Miscellaneous for model details |
| Applicant Name and Address: | VICOR CORP 25 FRONTAGE RD ANDOVER MA 01810 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.



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

General product information: VIZ0014, VIZ0014x

The VIZ0014 is a VI Brick BCM Array with a customer specific model number and is electrically and mechanically equivalent to the BC352R110T060VM-00. The VIZ0014 is a DC-DC Converter designed for building-in. The VIZ0014 incorporates 2 approved Vicor VI Chip DC-DC Bus Converter (BCM) modules into a thermally adept package. The VIZ0014 has a front end filter circuit with an input fuse that satisfies the conditions of acceptability required by the individual High Voltage BCM approval. Reinforced Insulation is provided from input to output, Supplemental Insulation from Input to the heatsink, and basic insulation from output to heatsink. The output of the VIZ0014 DC-DC converter is considered SELV.

General product information: VI Brick BCM Array

The VI Brick BCM Array is a family of DC-DC Converters designed for building-in. The VI Brick BCM Array incorporates up to 2 approved Vicor VI Chip DC-DC Bus Converter (BCM) modules into a thermally adept package. The VI Brick BCM Array has a front end filter circuit with an input fuse that satisfies the conditions of acceptability required by the individual BCM approval. The Heatsink was considered an intervening unconnected conductive part. Reinforced Insulation is provided from input to output, Supplemental Insulation from Input to the heatsink, and basic insulation from output to heatsink. The output of the VI Brick Array DC-DC converter is considered SELV.

Model Differences

See Miscellaneous Enclosure for model nomenclature.

Model BC352R110T060VM-00 is identical to model VIZ0014 except for the marking label.

VIZ0014x, x = revision, any letter A through Z, non-safety related

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : N/A
- Operating condition : continuous
- Access location : Building-in
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : 330-365Vdc
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : -
- Class of equipment : Class II
- Considered current rating (A) : -
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : 2000
- Altitude of test laboratory (m) : 150
- Mass of equipment (kg) : 0.0125
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: max. case temperature of 125°C
- The product is intended for use on the following power systems: DC mains supply

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 VIZ0014 or BC352R110T060VM-00 module provides Reinforced Insulation from input to output, Supplementary Insulation from input to case, and Basic Insulation from output to case.
- The heatsink was considered an intervening unconnected conductive part.
- Max Temperature: Keep the maximum semiconductor junction temperature of the VIZ0014 or BC352R110T060VM-00 at 125°C or less. There are two methods to demonstrate compliance. Method 1: Keep T casemax < 95°C under all conditions where T casemax is the maximum case temp of the VI chip. Method 2: Keep T casemax < 125°C – (P dissmax X 0.65) under all conditions where P dissmax = P inputmax – P outputmax. P dissmax is the amount of power in Watts dissipated within the device. The thermal resistance of the full size VIZ0014 or BC352R110T060VM-00 from the internal semiconductor junction to the case is 0.65°C/Watts.
- VIZ0014x, x = revision, any letter A through Z, non-safety related
- The following Production-Line tests are conducted for this product: Electric Strength
- The following secondary output circuits are SELV: All
- The power supply terminals and/or connectors are: Not investigated for field wiring
- The investigated Pollution Degree is: 2
- The following end-product enclosures are required: Fire , Mechanical , Electrical
- The following secondary output circuits are at hazardous energy levels: All

VI Brick BCM Array Model Number: BCbbbRcccxyyyVM-ww

Example: BC352R440T065VM-00

BC = Constant

| VI BRICK BCM ARRAY | |
|--------------------|----------------|
| BC | Buss Converter |

bbb = 352

| Nominal Input Voltage (range) | |
|-------------------------------|-------------------|
| 270 | 270 Vdc (240-330) |
| 352 | 352 Vdc (330-365) |
| 384 | 384 Vdc (360-400) |

R = R

| | |
|--------------|------------------------|
| r = Constant | BCM Array Package Size |
|--------------|------------------------|

ccc = 440

| OUTPUT VOLTAGE DESIGNATOR | | | |
|---------------------------|----------|-----|----------|
| 110 | 11.0 Vdc | 440 | 44.0 Vdc |
| 120 | 12.0 Vdc | 480 | 48.0 Vdc |

x = T

| Product Grade | | Temp Range |
|---------------|------------|-------------|
| C | Commercial | 0 - 100°C |
| T | Telecom | -40 - 100°C |

yyy = 065

| OUTPUT POWER DESIGNATOR | | | |
|-------------------------|-------|-----|-------|
| 024 | 240 W | 048 | 480 W |
| 030 | 300 W | 060 | 600 W |
| 033 | 330 W | 065 | 650 W |

VM = VM

| | |
|---------------|----------------|
| VM = Constant | Vertical Mount |
|---------------|----------------|

ww = 00

| Customer designator (non-safety related) | |
|--|----------------------------|
| ww | Any alphanumeric character |