

CERTIFICATE OF COMPLIANCE

Certificate Number 20171128-E135493
Report Reference E135493-A36-UL
Issue Date 2017-NOVEMBER-28

Issued to: VICOR CORP
25 FRONTAGE RD
ANDOVER, MA 01810-5424
UNITED STATES


This is to certify that representative samples of Power Supplies for Information Technology Equipment Including Electrical Business Equipment
See Addendum.

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 60950-1, (Information Technology Equipment - Safety - Part 1: General Requirements)
CAN/CSA C22.2 No. 60950-1-07, (Information Technology Equipment - Safety - Part 1: General Requirements)

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's Certification and Follow-Up Service.

The UL Recognized Component Mark generally consists of the manufacturer's identification and catalog number, model number or other product designation as specified under "Marking" for the particular Recognition as published in the appropriate UL Directory. As a supplementary means of identifying products that have been produced under UL's Component Recognition Program, UL's Recognized Component Mark: , may be used in conjunction with the required Recognized Marks. The Recognized Component Mark is required when specified in the UL Directory preceding the recognitions or under "Markings" for the individual recognitions.

Recognized components are incomplete in certain constructional features or restricted in performance capabilities and are intended for use as components of complete equipment submitted for investigation rather than for direct separate installation in the field. The final acceptance of the component is dependent upon its installation and use in complete equipment submitted to UL LLC.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

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This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements.

DC-DC Converter
Model: Low Voltage 3814 VIA BCM and VIA NBM Series

(see Additional Information or Miscellaneous Enclosure 7-01 for Model nomenclature)



Bruce Mahrenholz, Director North American Certification Program

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UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements) CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	DC-DC Converter
Model:	Low Voltage 3814 VIA BCM and VIA NBM Series (see Additional Information or Miscellaneous Enclosure 7-01 for Model nomenclature)
Rating:	Rated Input Voltage: 54 Vdc (36 - 60) Maximum Rated Output Voltage: 15 Vdc Maximum Rated Output Current: 170 A
Applicant Name and Address:	VICOR CORP 25 FRONTAGE RD ANDOVER MA 01810-5424 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: James C. Powley

Reviewed by: Lesley Green

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 low voltage VIA BCM and VIA NBM series of DC-DC converters are designed for building in. The output voltage is an un-regulated fixed turns ratio of the input voltage (k factor).

The output return (-OUT or -LO) is directly connected to the Case for both the BCM and NBM models.

The BCMs provide Basic insulation from the Input to the Output/Case.

The NBM are non-isolating and provide Functional insulation from the Input to the Output/Case.

Model Differences

N/A

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : for building-in
- Over voltage category (OVC) : Other - DC Powered
- Mains supply tolerance (%) or absolute mains supply values : 36 - 60 Vdc
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Not classified
- Considered current rating of protective device as part of the building installation (A) : 40A for k=1/4, 1/5 and 1/6 models. 60A for k= 1/3 models.
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : <5000
- Altitude of test laboratory (m) : less than 2000 meters
- Mass of equipment (kg) : approximately 0.1
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual

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 investigated Pollution Degree is: 2
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The input to the LV VIA BCMs and NBMs is intended to be supplied from a SELV, TNV-2, or other non-hazardous secondary source.
- The Output return (-OUT/-LO) is directly connected to the case for all models.
- If the case of the VIA is connected to Protective Earth, then the consequences of the circuit possibly being earthed at a second point should be considered in the end application per clause 2.9.4.
- The input of the VIA BCMs are separated from the Output/Case by Basic insulation and the output is considered SELV.
- The output and case of the non-isolating VIA NBM can be considered SELV if the input is SELV.
- See de-rating curves for maximum output current versus case temperature.
- The k=1/4, 1/5 and 1/6 was evaluated with a Littelfuse 456 or TLS Series fuse rated 40A max. The k=1/3 model was evaluated using a Littelfuse TLS or 881 series fuse rated 60A max. Alternate overcurrent protection for the non-isolating parts may be evaluated in the end product. Use of any fusing used that's not specified as above will require additional testing.
- The output has not been investigated for energy hazards.

Additional Information

Low Voltage VIA BCM and VIA NBM Model Matrix: AAA3814cddewwxyzz

Example: BCM3814V60E15A3T01

AAA = BCM

Product Function	
BCM	Isolated Bus Converter Module
NBM	Non-isolated Bus Converter Module

3814 = Constant

Package Size (L x W)	
3814	3.8 x 1.4 in

c = V

Package Type	
V	Chassis mount
B	Board mount

dd = 60

Maximum Input Voltage (range)	
46	46 Vdc (36-46)
60	60 Vdc (36-60)

e = E

Range Ratio			
C	1.3	E	1.6

ww = 15

Maximum Output Voltage	
10	10 Vdc
12	12 Vdc
15	15 Vdc

xx = A3

Maximum Output Current			
A3	130A	A6	160A
A5	150A	A7	170A

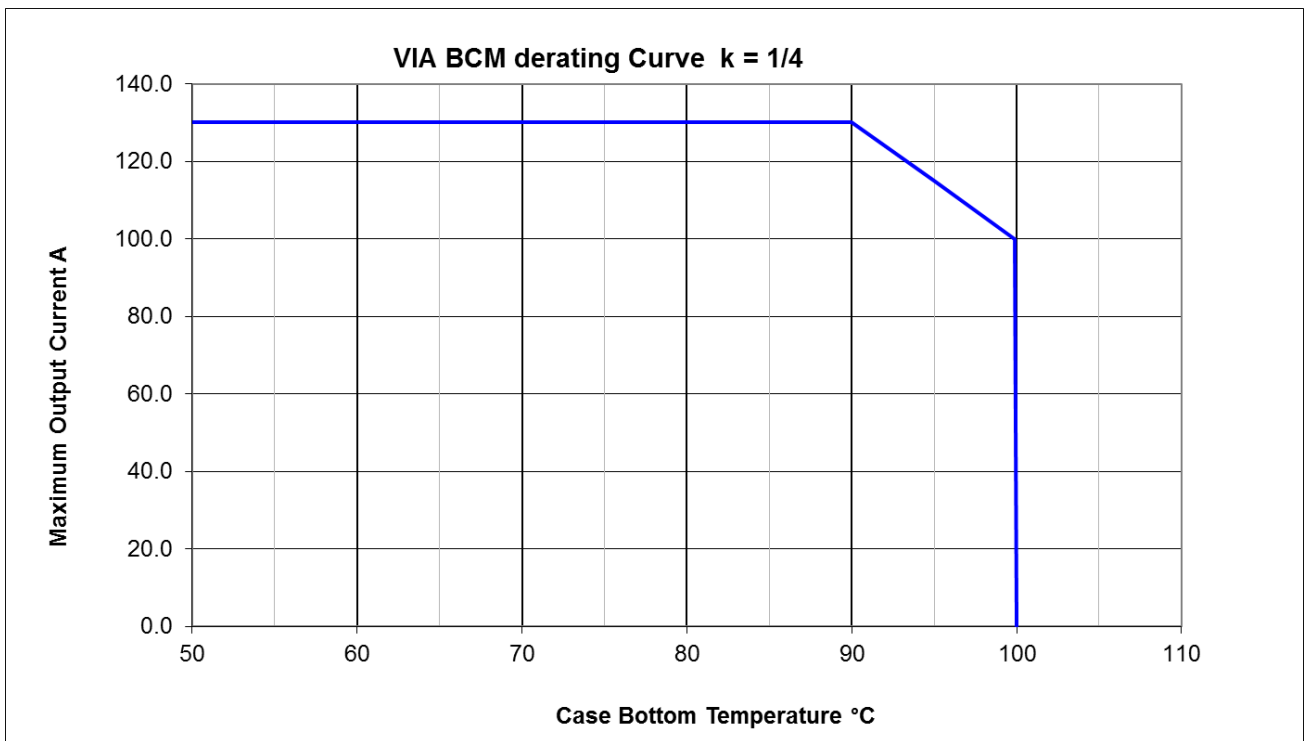
y = T

Product Grade	
C	-20 to 100°C
T	-40 to 100°C
M	-55 to 100°C

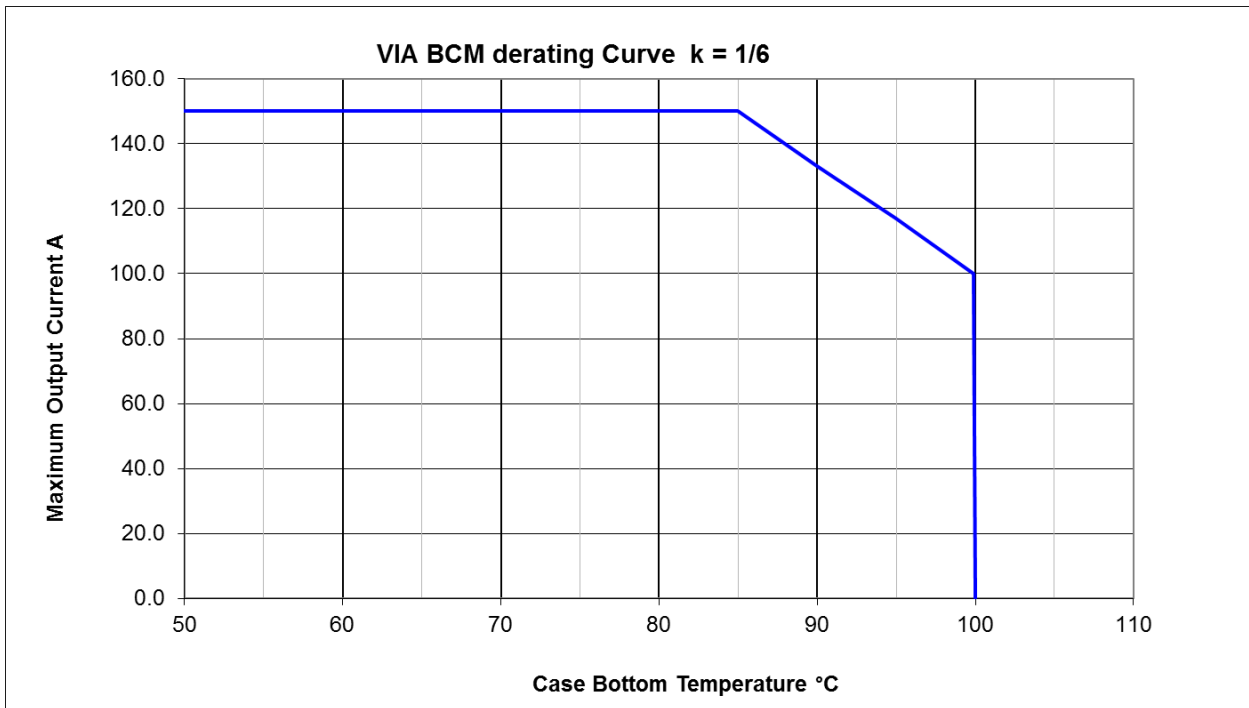
zz = 01

Options (non-safety related)	
01	Any alphanumeric

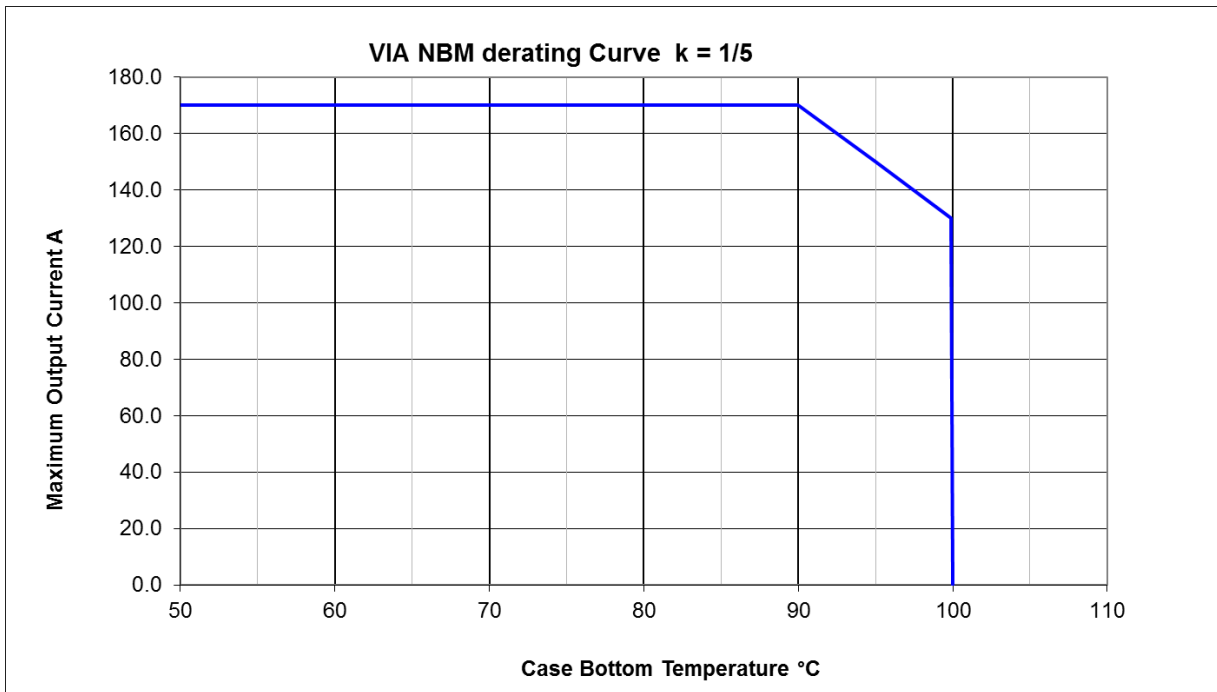
LV VIA BCM $k = 1/4$	
Model Number: BCM3814x60E15A3yzz	
Vin = 54V (36-60)	Vout = 13.5V (9.0-15.0)
	Iout = 130A max



LV VIA BCM k = 1/6	
Model Number: BCM3814x60E10A5yzz	
Vin = 54V (36-60)	Vout = 9.0V (6.0-10.0)
	Iout = 150A max



LV VIA NBM k = 1/5	
Model Number: NBM3814x60E12A7yzz	
Vin = 54V (36-60)	Vout = 10.8V (7.2-12.0)
	Iout = 170A max



LV VIA NBM k = 1/3	
Model Number: NBM3814x46C15A6yzz	
Vin = 42V (36-46)	Vout = 14.0V (12.0-15.3)
	Iout = 160A max

