

CERTIFICATE OF COMPLIANCE

Certificate Number 20181105-E135493
Report Reference E135493-A35-UL
Issue Date 2018-NOVEMBER-05

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

**This certificate confirms that
representative samples of**

COMPONENT - POWER SUPPLIES, INFORMATION
TECHNOLOGY EQUIPMENT INCLUDING ELECTRICAL
BUSINESS EQUIPMENT

DC/DC Converter
SM-ChiP VTM model: VTMaaaaSbbZwwxyzz
SM-ChiP NBM model: NBMaaaaSbbDwwxyzz

Have been investigated by UL in accordance with the
component requirements in the Standard(s) indicated on
this Certificate. UL Recognized components are incomplete
in certain constructional features or restricted in
performance capabilities and are intended for installation in
complete equipment submitted for investigation to UL LLC.

Standard(s) for Safety: UL 60950-1 and 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
<https://iq.ulprospector.com> for additional information.

This *Certificate of Compliance* does not provide authorization to apply the UL Recognized Component Mark.

Only those products bearing the UL Recognized Component Mark should be considered as being UL Certified
and covered under UL's Follow-Up Services.

Look for the UL Recognized Component Mark on the product.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

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contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



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, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	DC/DC Converter
Model:	SM-ChiP VTM model: VTMaaaaSbbZwwxyzz SM-ChiP NBM model: NBMaaaaSbbDwwxyzz See Miscellaneous Enclosure for model matrix
Rating:	VTM series: Input; 48Vdc, (26-60) Output: 2.0Vdc Output Power: 135A Max NBM series: Input; 54Vdc, (38-54) Output: 13.5Vdc Output Power: 64A Max See Miscellaneous Enclosure for model matrix and electrical ratings.
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.

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Prepared by: Jeff Smith

Reviewed by: William E. Platts

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 SM-ChiP VTMs and NBMs are a series of low voltage surface mount DC-DC converters that are designed for building-in. The SM VTMs are non-isolating low voltage devices that provide functional insulation. The SM NBMs are non-isolating bus modules that provide functional insulation.

Model Differences

See Model Matrix

Technical Considerations

- Equipment mobility : for building-in
- Connection to the mains : not directly connected to the mains
- Operating condition : continuous
- Access location : building-in
- Over voltage category (OVC) : Other
- Mains supply tolerance (%) or absolute mains supply values : No direct connection to mains. See model matrix for electrical ratings.
- 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) : See Conditions of Acceptability
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : up to 5000.
- Altitude of test laboratory (m) : below 2000.
- Mass of equipment (kg) : 0.00356 (2308); 0.00598(2313)
- The means of connection to the mains supply is: not directly connected to the mains.

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 investigated Pollution Degree is: 2
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- SM-ChiP VTMs are rated at full current to a maximum case temperature of 100°C.
- 2. The SM-ChiP VTMs are non-isolating low voltage devices that provide functional insulation.
- 3. The SM-ChiP VTMs were evaluated without external overcurrent protection. The need for external overcurrent protection to be considered in the end use product. ,

Additional Information

N/A

Additional Standards

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011

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
Power rating - Ratings	Ratings (voltage, frequency/dc, current)

Special Instructions to UL Representative

N/A

VICOR SM-ChiP VTM Model Matrix: VTMaaaaSbbZwwxyzz

Example: VTM2313S60Z01A4T00

VTM = Constant

Product Function	
VTM	Voltage Transformation Module

aaaa = 2313

Package Size Designator (mm)	
1408	14 x 08
2308	23 x 08
2313	23 x 13

S = Constant

Lead Designator	
S	Surface Mount

bb = 60

Input Voltage designator Max (range)	
52	52 Vdc (26-52)
55	55 Vdc (26-55)
60	60 Vdc (26-60)

Z = Constant

Voltage Range Ratio	
Z	Z

ww = 01

Output Voltage Designator (range)	
01	1 Vdc (0.54 – 1.25)
02	2 Vdc (0.65 – 2.30)

xx = A4

Output Current Designator					
50	50A	95	95A	A3	130A
76	76A	A1	105A	A4	135A

y = T

Product Grade (defines the max internal temp, the max external surface temp is limited to 100°C)			
C	0 to 100°C	T	-40 to 125°C
M	-55 to 125°C		

zz = 00

Revision / Options, Z is not used in first option position, reserved for use in isolated VTM series	
zz	Any alphanumeric character

VICOR SM-ChiP NBM Model Matrix: NBMaaaaSbbDwwxyzz

Example: NBM2313S54D164T0R

NBM = Constant

Product Function	
NBM	Non-isolating Bus Module

aaaa = 2317

Package Size Designator (mm)	
2317	23 x 17

S = Constant

Lead Designator	
S	Surface Mount

bb = 54

Input Voltage designator Max (range)	
54	54 Vdc (38-54)

D = Constant

Voltage Range Ratio	
D	D

ww = 14

Output Voltage Designator Nominal (range)	
14	13.5 Vdc (9.5 – 13.5)

xx = 64

Output Current / Power Designator	
64	64A / 750W

y = T

Product Grade (max internal temperature)					
C	0 to 125°C	T	-40 to 125°C	M	-55 to 125°C

zz = 0R

Revision / Options	
zz	Any alphanumeric character