



# Data Sheet

## VI-200, VE-200

### DC-DC Converters

#### 50 to 200 Watts



#### Features

- RoHS compliant (VE-200)
- Up to 50 W/in<sup>3</sup>
- cULus, cTUVus
- Up to 90% efficiency
- Size: 4.6" x 2.4" x 0.5" (116,8 x 61,0 x 12,7mm)
- Remote sense and current limit
- OVP, thermal shutdown
- Logic disable
- Wide range output adjust
- Compatible power booster modules
- ZCS power architecture
- Low noise FM control
- CE Marked
- Isolated output

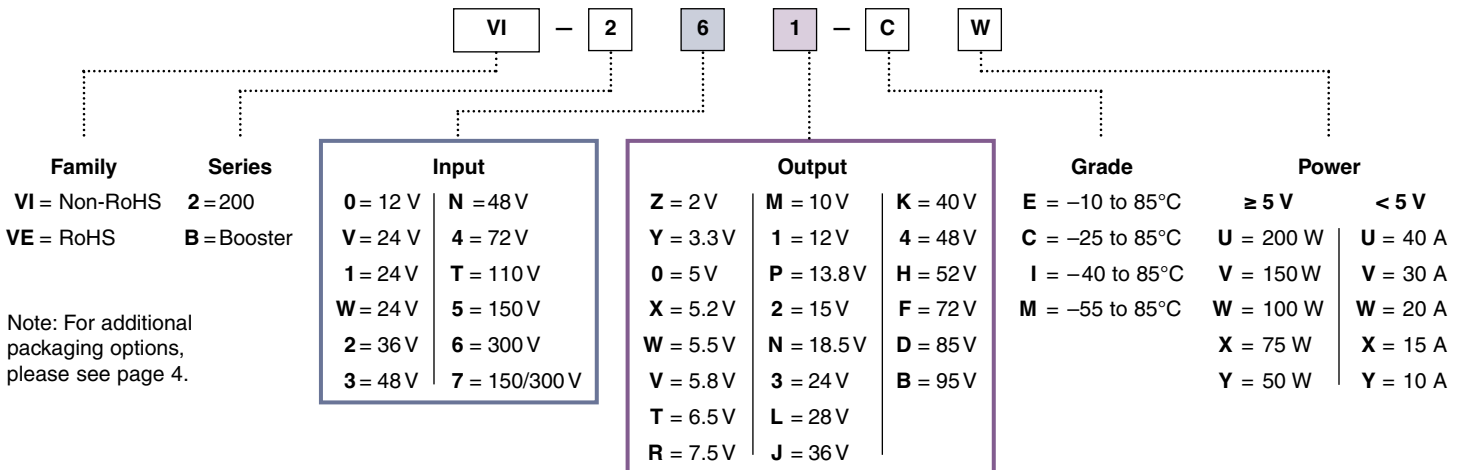
#### Product Highlights

The VI-200 family, with over 14 million units shipped, is Vicor's broad series of "zero-current-switching" component-level DC-DC converters.

Operating at frequencies up to 2 MHz, VI-200 family converters offer exceptional power density, efficiency, noise performance, reliability and ease of use. Booster modules (VI-Bxx) provide a simple, cost-effective, off-the-shelf solution for higher power output requirements. One or more boosters may be used to create synchronous arrays capable of supplying several kilowatts of output power.

The flexibility of Vicor's power components is also available in half-size, half-power VI-J00 MiniMods.

#### Part Numbering



#### Maximum Power Available for VI-2xx-xx<sup>[a]</sup>

| Input                   |                              |                          |                    | Output           |     |   |     |     |     |     |     |    |    |      |    |      |    |    |    |    |    |    |    |    |    |  |
|-------------------------|------------------------------|--------------------------|--------------------|------------------|-----|---|-----|-----|-----|-----|-----|----|----|------|----|------|----|----|----|----|----|----|----|----|----|--|
| Voltage<br>Nom. (Range) | Low Line<br>75%<br>Max Power | Transient <sup>[b]</sup> | Vin<br>Designators | Vout Designators |     |   |     |     |     |     |     |    |    |      |    |      |    |    |    |    |    |    |    |    |    |  |
|                         |                              |                          |                    | 2                | 3.3 | 5 | 5.2 | 5.5 | 5.8 | 6.5 | 7.5 | 10 | 12 | 13.8 | 15 | 18.5 | 24 | 28 | 36 | 40 | 48 | 52 | 72 | 85 | 95 |  |
|                         |                              |                          |                    | Z                | Y   | 0 | X   | W   | V   | T   | R   | M  | 1  | P    | 2  | N    | 3  | L  | J  | K  | 4  | H  | F  | D  | B  |  |
| 12 (10-20)              | n/a                          | 22                       | 0                  | X                | X   | X | X   | X   | X   | X   | X   | X  | X  | X    | X  | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  |  |
| 24 (10-36)              | n/a                          | n/a                      | V                  | --               | X   | Y | Y   | Y   | Y   | Y   | X   | X  | X  | X    | X  | X    | X  | X  | X  | X  | -- | -- | -- | -- |    |  |
| 24 (21-32)              | 18                           | 36                       | 1                  | U                | U   | U | U   | U   | U   | V   | V   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |
| 24 (18-36)              | n/a                          | n/a                      | W                  | V                | V   | V | V   | V   | V   | W   | W   | V  | V  | V    | V  | V    | V  | V  | V  | V  | V  | V  | V  | V  | V  |  |
| 36 (21-56)              | 18                           | 60                       | 2                  | W                | V   | W | W   | W   | W   | W   | W   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | -- | -- | -- |    |  |
| 48 (42-60)              | 36                           | 72                       | 3                  | U                | U   | U | U   | U   | U   | U   | U   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |
| 48 (36-76)              | n/a                          | n/a                      | N                  | V                | U   | U | U   | U   | U   | U   | U   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |
| 72 (55-100)             | 45                           | 110                      | 4                  | U                | U   | U | U   | U   | U   | V   | V   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |
| 110 (66-160)            | n/a                          | n/a                      | T                  | V                | V   | V | V   | V   | V   | W   | W   | V  | V  | V    | V  | V    | V  | V  | V  | V  | V  | V  | -- | -- |    |  |
| 150 (100-200)           | 85 <sup>[c]</sup>            | 215                      | 5                  | U                | U   | V | V   | V   | V   | V   | V   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |
| 150 (100-375)           | n/a                          | n/a                      | 7                  | W                | W   | Y | Y   | Y   | Y   | W   | W   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | -- | -- | -- |    |  |
| 300 (200-400)           | 170 <sup>[d]</sup>           | 425                      | 6                  | U                | U   | U | U   | U   | U   | V   | V   | U  | U  | U    | U  | U    | U  | U  | U  | U  | U  | U  | U  | U  |    |  |

<sup>[a]</sup> For additional output power, "booster" modules are available. (VI-Bxx-xx)

<sup>[c]</sup> 15 Vout, 200 W models are limited to 90 Vdc

<sup>[b]</sup> Transient voltage for 1 second.

<sup>[d]</sup> 15 Vout, 200 W models are limited to 185 Vdc

## CONVERTER SPECIFICATIONS

(typical at  $T_{BP} = 25^{\circ}\text{C}$ , nominal line and 75% load, unless otherwise specified)

### INPUT SPECIFICATIONS

| VI-200 E-Grade                      |     |                                                 |     | VI-200 C-, I-, M-Grade |                                                 |                        | Units           | Test Conditions         |
|-------------------------------------|-----|-------------------------------------------------|-----|------------------------|-------------------------------------------------|------------------------|-----------------|-------------------------|
| Parameter                           | Min | Typ                                             | Max | Min                    | Typ                                             | Max                    |                 |                         |
| Inrush charge                       |     | 120 x 10 <sup>-6</sup>                          |     |                        | 120 x 10 <sup>-6</sup>                          | 200 x 10 <sup>-6</sup> | Coulombs        | Nominal line            |
| Input reflected ripple current – pp |     | 10%                                             |     |                        | 10%                                             |                        | I <sub>IN</sub> | Nominal line, full load |
| Input ripple rejection              |     | 25+20 Log $\left(\frac{V_{in}}{V_{out}}\right)$ |     |                        | 30+20 Log $\left(\frac{V_{in}}{V_{out}}\right)$ |                        | dB              | 120 Hz, nominal line    |
|                                     |     |                                                 |     |                        | 20+20 Log $\left(\frac{V_{in}}{V_{out}}\right)$ |                        | dB              | 2400 Hz, nominal line   |
| No load power dissipation           |     | 1.35                                            | 2   |                        | 1.35                                            | 2                      | Watts           |                         |

### OUTPUT CHARACTERISTICS

| Parameter                            | VI-200 E-Grade |                     |      | VI-200 C-, I-, M-Grade |                     |      | Units                  | Test Conditions            |
|--------------------------------------|----------------|---------------------|------|------------------------|---------------------|------|------------------------|----------------------------|
|                                      | Min            | Typ                 | Max  | Min                    | Typ                 | Max  |                        |                            |
| Setpoint accuracy                    |                | 1%                  | 2%   |                        | 0.5%                | 1%   | $V_{NOM}$              |                            |
| Load/line regulation                 |                |                     | 0.5% |                        | 0.05%               | 0.2% | $V_{NOM}$              | LL to HL, 10% to Full Load |
| Load/line regulation                 |                |                     | 1%   |                        | 0.2%                | 0.5% | $V_{NOM}$              | LL to HL, No Load to 10%   |
| Output temperature drift             |                | 0.02                |      |                        | 0.01                | 0.02 | % / $^{\circ}\text{C}$ | Over rated temp.           |
| Long term drift                      |                | 0.02                |      |                        | 0.02                |      | %/1K hours             |                            |
| Output ripple – pp:<br>2 V, 3.3 V    |                |                     | 150  |                        | 60                  | 100  | mV                     | 20 MHz bandwidth           |
|                                      |                |                     |      |                        |                     |      | $V_{NOM}$              | 20 MHz bandwidth           |
|                                      |                |                     |      |                        |                     |      | $V_{NOM}$              | 20 MHz bandwidth           |
| 5 V                                  |                |                     | 5%   |                        | 2%                  | 3%   | $V_{NOM}$              | 20 MHz bandwidth           |
|                                      |                |                     |      |                        |                     |      | $V_{NOM}$              | 20 MHz bandwidth           |
|                                      |                |                     |      |                        |                     |      | $V_{NOM}$              | 20 MHz bandwidth           |
| Trim range <sup>[a]</sup>            | 50%            |                     | 110% | 50%                    |                     | 110% | $V_{NOM}$              |                            |
| Total remote sense compensation      | 0.5            |                     |      | 0.5                    |                     |      | Volts                  | 0.25 V max. neg. leg       |
| OVP set point                        |                | 125% <sup>[b]</sup> |      | 115%                   | 125% <sup>[b]</sup> | 135% | $V_{NOM}$              | Recycle power              |
| Current limit                        | 105%           |                     | 135% | 105%                   |                     | 125% | $I_{full\ load}$       | Automatic restart          |
| Short circuit current <sup>[c]</sup> | 20%            |                     | 140% | 20%                    |                     | 130% | $I_{full\ load}$       | Automatic restart          |

<sup>[a]</sup> 10 V, 12 V, 13.8 V, 15 V outputs, or “V” input range have standard trim range  $\pm 10\%$ . Consult factory for wider trim range.

3.3 V output trim range 2.20 to 3.63 V, 95 V output  $-50 + 0\%$  trim range.

<sup>[b]</sup> 131% nominal for booster modules.

<sup>[c]</sup> Output voltages of 3.3 V or 5 V incorporate foldback current limiting; For output voltages from 5.2 V to 7.5 V consult factory; All other outputs provide constant current limiting.

### CONTROL PIN SPECIFICATIONS

| Parameter                    | VI-200 E-Grade |      |      | VI-200 C-, I-, M-Grade |      |      | Units | Test Conditions    |
|------------------------------|----------------|------|------|------------------------|------|------|-------|--------------------|
|                              | Min            | Typ  | Max  | Min                    | Typ  | Max  |       |                    |
| Gate out impedance           |                | 50   |      |                        | 50   |      | Ohms  |                    |
| Gate in impedance            |                | 1000 |      |                        | 1000 |      | Ohms  |                    |
| Gate in open circuit voltage |                | 6    |      |                        | 6    |      | Volts | Use open collector |
| Gate in low threshold        | 0.65           |      |      | 0.65                   |      |      | Volts |                    |
| Gate in low current          |                |      | 6    |                        |      | 6    | mA    |                    |
| Power sharing accuracy       | 0.95           |      | 1.05 | 0.95                   |      | 1.05 |       |                    |

## CONVERTER SPECIFICATIONS (cont.)

### ■ DIELECTRIC WITHSTAND CHARACTERISTICS

| Parameter           | VI-200 E-Grade |     |     | VI-200 C-, I-, M-Grade |     |     | Units            | Test Conditions   |
|---------------------|----------------|-----|-----|------------------------|-----|-----|------------------|-------------------|
|                     | Min            | Typ | Max | Min                    | Typ | Max |                  |                   |
| Input to output     | 3,000          |     |     | 3,000                  |     |     | V <sub>RMS</sub> | Baseplate earthed |
| Output to baseplate | 500            |     |     | 500                    |     |     | V <sub>RMS</sub> |                   |
| Input to baseplate  | 1,500          |     |     | 1,500                  |     |     | V <sub>RMS</sub> |                   |

### ■ THERMAL CHARACTERISTICS

| Parameter                                         | VI-200 E-Grade |          |     | VI-200 C-, I-, M-Grade |          |     | Units   | Test Conditions                   |
|---------------------------------------------------|----------------|----------|-----|------------------------|----------|-----|---------|-----------------------------------|
|                                                   | Min            | Typ      | Max | Min                    | Typ      | Max |         |                                   |
| Efficiency                                        |                | 78 – 88% |     |                        | 80 – 90% |     |         |                                   |
| Baseplate to sink thermal impedance               |                | 0.07     |     |                        | 0.07     |     | °C/Watt | With Vicor P/N 20266              |
| Thermal shutdown <sup>[d]</sup><br>(Drivers only) | 90             | 95       | 105 | 90                     | 95       | 105 | °C      | Cool and recycle power to restart |

<sup>[d]</sup> No overtemp protection in booster modules.

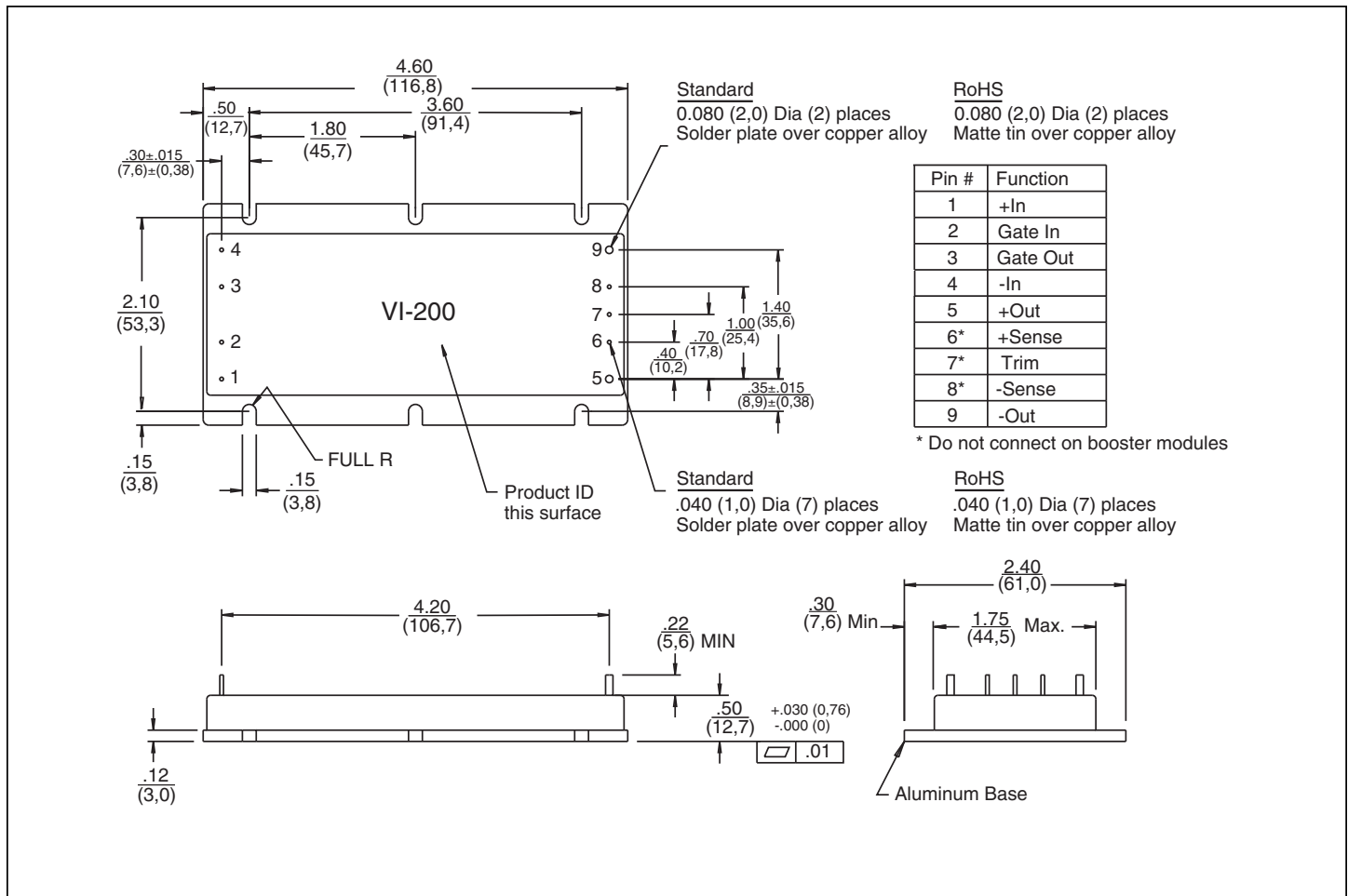
### ■ MECHANICAL SPECIFICATIONS

| Parameter | VI-200 E-, C-Grade |              |                | VI-200 I-, M-Grade |              |                | Units             | Test Conditions |
|-----------|--------------------|--------------|----------------|--------------------|--------------|----------------|-------------------|-----------------|
|           | Min                | Typ          | Max            | Min                | Typ          | Max            |                   |                 |
| Weight    | 5.7<br>(160.2)     | 6.3<br>(178) | 6.9<br>(195.8) | 6.6<br>(187.2)     | 7.3<br>(208) | 8.1<br>(228.8) | Ounces<br>(Grams) |                 |

### ■ PRODUCT GRADE TEMPERATURES

| Parameter | Storage     | Operating   | Units | Notes                                                               |
|-----------|-------------|-------------|-------|---------------------------------------------------------------------|
| E         | -20 to +100 | -10 to + 85 | °C    | Overtemperature shutdown<br>95°C typical (recycle power to restart) |
| C         | -40 to +100 | -25 to + 85 | °C    |                                                                     |
| I         | -55 to +100 | -40 to + 85 | °C    |                                                                     |
| M         | -65 to +100 | -55 to + 85 | °C    |                                                                     |

## MECHANICAL DRAWING



## PACKAGING OPTIONS

### SlimMod Flangeless package



4.60"L x 1.80"W x 0.50"H  
(116,8 x 45,7 x 12,7 mm)

To order the SlimMod configuration add the suffix "-S" to the standard module part number.

Qty (2) grounding clips are included with each SlimMod  
P/N 32187

### FinMod Flangeless package with integral heat sink



Longitudinal, 0.25"(6.35 mm) fins — add suffix "-F1"  
Longitudinal, 0.50"(12.7 mm) fins — add suffix "-F2"



Transverse, 0.25"(6.35 mm) fins — add suffix "-F3"  
Transverse, 0.50"(12.7 mm) fins — add suffix "-F4"

Available with longitudinal or transverse fins of 0.25"(6.35 mm) or 0.50"(12.7 mm) height. Add the appropriate suffix to the module part number.

Qty (4) grounding clips are included with each FinMod  
F1, F2 P/N 32185  
F3, F4 P/N 32186

### MegaMod Chassis mount alternatives, one, two, or three outputs: up to 600 W



1 up – 4.9" x 2.5" x 0.62" (124,4 x 63,5 x 15,7 mm)  
2 up – 4.9" x 4.9" x 0.62" (124,4 x 124,4 x 15,7 mm)  
3 up – 4.9" x 7.3" x 0.62" (124,4 x 185,4 x 15,7 mm)

### BusMod



4.60"L x 2.40"W x 1.08"H  
(116,8 x 61,0 x 27,4 mm)

To order the BusMod fully assembled, add suffix "-B1" to the standard module part number.

To order the BusMod separately:  
Full-sized BusMod — P/N 06322

[See BusMod Mechanical Drawings for more details.](#)

## **Vicor's comprehensive line of power solutions includes high density AC-DC and DC-DC modules and accessory components, fully configurable AC-DC and DC-DC power supplies, and complete custom power systems.**

Information furnished by Vicor is believed to be accurate and reliable. However, no responsibility is assumed by Vicor for its use. Vicor makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication. Vicor reserves the right to make changes to any products, specifications, and product descriptions at any time without notice. Information published by Vicor has been checked and is believed to be accurate at the time it was printed; however, Vicor assumes no responsibility for inaccuracies. Testing and other quality controls are used to the extent Vicor deems necessary to support Vicor's product warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

**Specifications are subject to change without notice.**

### **Vicor's Standard Terms and Conditions**

All sales are subject to Vicor's Standard Terms and Conditions of Sale, which are available on Vicor's webpage or upon request.

### **Product Warranty**

In Vicor's standard terms and conditions of sale, Vicor warrants that its products are free from non-conformity to its Standard Specifications (the "Express Limited Warranty"). This warranty is extended only to the original Buyer for the period expiring two (2) years after the date of shipment and is not transferable.

UNLESS OTHERWISE EXPRESSLY STATED IN A WRITTEN SALES AGREEMENT SIGNED BY A DULY AUTHORIZED VICOR SIGNATORY, VICOR DISCLAIMS ALL REPRESENTATIONS, LIABILITIES, AND WARRANTIES OF ANY KIND (WHETHER ARISING BY IMPLICATION OR BY OPERATION OF LAW) WITH RESPECT TO THE PRODUCTS, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR REPRESENTATIONS AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, INFRINGEMENT OF ANY PATENT, COPYRIGHT, OR OTHER INTELLECTUAL PROPERTY RIGHT, OR ANY OTHER MATTER.

This warranty does not extend to products subjected to misuse, accident, or improper application, maintenance, or storage. Vicor shall not be liable for collateral or consequential damage. Vicor disclaims any and all liability arising out of the application or use of any product or circuit and assumes no liability for applications assistance or buyer product design. Buyers are responsible for their products and applications using Vicor products and components. Prior to using or distributing any products that include Vicor components, buyers should provide adequate design, testing and operating safeguards.

Vicor will repair or replace defective products in accordance with its own best judgment. For service under this warranty, the buyer must contact Vicor to obtain a Return Material Authorization (RMA) number and shipping instructions. Products returned without prior authorization will be returned to the buyer. The buyer will pay all charges incurred in returning the product to the factory. Vicor will pay all reshipment charges if the product was defective within the terms of this warranty.

### **Life Support Policy**

VICOR'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE CHIEF EXECUTIVE OFFICER AND GENERAL COUNSEL OF VICOR CORPORATION. As used herein, life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness. Per Vicor Terms and Conditions of Sale, the user of Vicor products and components in life support applications assumes all risks of such use and indemnifies Vicor against all liability and damages.

### **Intellectual Property Notice**

Vicor and its subsidiaries own Intellectual Property (including issued U.S. and Foreign Patents and pending patent applications) relating to the products described in this data sheet. No license, whether express, implied, or arising by estoppel or otherwise, to any intellectual property rights is granted by this document. Interested parties should contact Vicor's Intellectual Property Department.

#### **Vicor Corporation**

25 Frontage Road  
Andover, MA, USA 01810  
Tel: 800-735-6200  
Fax: 978-475-6715

#### **email**

Customer Service: [custserv@vicorpower.com](mailto:custserv@vicorpower.com)  
Technical Support: [apps@vicorpower.com](mailto:apps@vicorpower.com)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.