



# Half Brick, DC-DC Converters

VI-J00  
VE-J00



25 to 100 Watts

## Features & Benefits

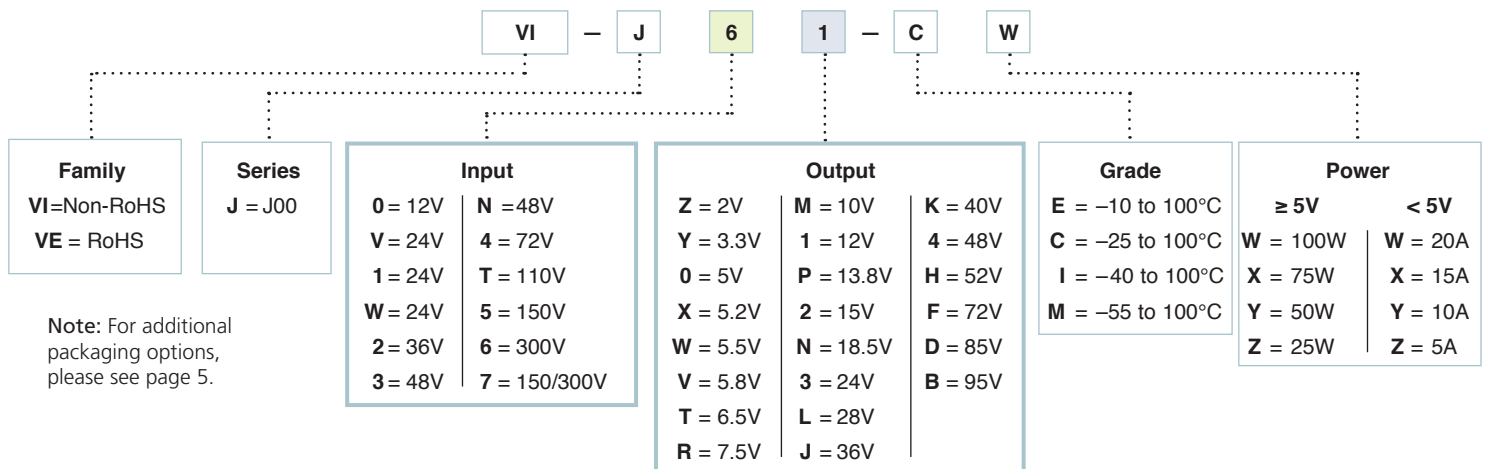
- Isolated output
- Up to 50W/in<sup>3</sup>
- cURus, cTÜVus
- CE Marked
- Up to 90% efficiency
- Size: 2.28" x 2.4" x 0.5"  
(57,9 x 61,0 x 12,7mm)
- Remote sense and current limit
- Logic disable
- Wide range output adjust
- ZCS power architecture
- Low noise FM control
- RoHS compliant (VE versions)

## Product Highlights

The VI-J00 MiniMod family established a new standard in component-level DC-DC converters. This "junior" size complement to the higher power VI-200 family offers up to 100W of isolated and regulated power in a board mounted package. With thousands of input/output/power combinations, and with a maximum operating temperature rating of 100°C, the MiniMod provides nearly unlimited flexibility for power system designers to meet demanding time to market requirements.

Utilizing Vicor's "zero-current-switching" forward converter technology, proven by an installed base of over 8 million units, the MiniMod family combines state of the art power density with the efficiency, low noise and reliability required by next generation power systems.

## Part Numbering



## Maximum Power Available for VI-Jxx-xx

| Input                   |                                    |                          |                                | Output                       |     |   |     |     |     |     |     |    |    |      |    |      |    |    |    |    |    |    |    |    |    |   |  |  |
|-------------------------|------------------------------------|--------------------------|--------------------------------|------------------------------|-----|---|-----|-----|-----|-----|-----|----|----|------|----|------|----|----|----|----|----|----|----|----|----|---|--|--|
| Voltage<br>Nom. (Range) | Low<br>Line<br>75%<br>Max<br>Power | Transient <sup>[a]</sup> | V <sub>IN</sub><br>Designators | V <sub>OUT</sub> 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   | O | 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   | Y | Y   | Y   | Y   | Y   | Y   | X  | X  | X    | X  | X    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X |  |  |
| 24 (10 – 36)            | n/a                                | n/a                      | V                              | -                            | Y   | Y | Y   | Y   | Y   | Y   | Y   | Y  | Y  | Y    | Y  | Y    | Y  | Y  | Y  | Y  | -  | -  | -  | -  | -  | - |  |  |
| 24 (21 – 32)            | 18                                 | 36                       | 1                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 24 (18 – 36)            | n/a                                | n/a                      | W                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 36 (21 – 56)            | 18                                 | 60                       | 2                              | Y                            | Y   | Y | Y   | Y   | Y   | Y   | Y   | X  | X  | X    | X  | X    | X  | X  | X  | X  | X  | X  | -  | -  | -  | - |  |  |
| 48 (42 – 60)            | 36                                 | 72                       | 3                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 48 (36 – 76)            | n/a                                | n/a                      | N                              | W                            | W   | X | X   | X   | X   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 72 (55 – 100)           | 45                                 | 110                      | 4                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 110 (66 – 160)          | n/a                                | n/a                      | T                              | W                            | W   | X | X   | X   | X   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | -  | -  | - |  |  |
| 150 (100 – 200)         | 85                                 | 215                      | 5                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |
| 150 (100 – 375)         | n/a                                | n/a                      | 7                              | Y                            | Y   | Y | Y   | Y   | Y   | Y   | Y   | X  | X  | X    | X  | X    | X  | X  | X  | X  | X  | X  | -  | -  | -  | - |  |  |
| 300 (200 – 400)         | 170                                | 425                      | 6                              | W                            | W   | W | W   | W   | W   | X   | X   | W  | W  | W    | W  | W    | W  | W  | W  | W  | W  | W  | W  | W  | W  | W |  |  |

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

## Converter Specifications

(Typical at T<sub>BP</sub> = 25°C, nominal line and 75% load, unless otherwise specified.)

## Input Specifications

| Parameter                           | VI-J00 E-Grade |                                        |     | VI-J00 C-, I-, M-Grade |                                        |                        | Units           | Test Conditions         |
|-------------------------------------|----------------|----------------------------------------|-----|------------------------|----------------------------------------|------------------------|-----------------|-------------------------|
|                                     | Min            | Typ                                    | Max | Min                    | Typ                                    | Max                    |                 |                         |
| Inrush charge                       |                | 60 x 10 <sup>-6</sup>                  |     |                        | 60 x 10 <sup>-6</sup>                  | 100 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 ( $\frac{V_{IN}}{V_{OUT}}$ ) |     |                        | 30+20 Log ( $\frac{V_{IN}}{V_{OUT}}$ ) |                        | dB              | 120Hz, nominal line     |
|                                     |                |                                        |     |                        | 20+20 Log ( $\frac{V_{IN}}{V_{OUT}}$ ) |                        | dB              | 2400Hz, nominal line    |
| No load power dissipation           |                | 1.35                                   | 2   |                        | 1.35                                   | 2                      | Watts           |                         |

## Converter Specifications (Cont.)

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

### Output Characteristics

| Parameter                                         | VI-J00 E-Grade |      |      | VI-J00 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>2V, 3.3V<br>5V<br>10 – 95V |                |      | 200  |                        | 100   | 150  | mV                     | 20MHz bandwidth            |
|                                                   |                |      | 5%   |                        | 2%    | 3%   | $V_{NOM}$              | 20MHz bandwidth            |
|                                                   |                |      | 3%   |                        | 0.75% | 1.5% | $V_{NOM}$              | 20MHz bandwidth            |
| Trim range <sup>[a]</sup>                         | 50%            |      | 110% | 50%                    |       | 110% | $V_{NOM}$              |                            |
| Total remote sense compensation                   | 0.5            |      |      | 0.5                    |       |      | Volts                  | 0.25V max. neg. leg        |
| Current limit                                     | 105%           |      | 135% | 105%                   |       | 125% | $I_{FULL\ LOAD}$       | Automatic restart          |
| Short circuit current                             | 105%           |      | 140% | 105%                   |       | 130% | $I_{FULL\ LOAD}$       | Automatic restart          |

<sup>[a]</sup> 10V to 15V outputs, or “V” input range have standard trim range  $\pm 10\%$ . Consult factory for wider trim range.  
95V output  $-50 + 0\%$  trim range.

**Note:** The permissible load current must never be exceeded during normal, abnormal or test conditions. For additional output related application information, please refer to output connections on page 5.

### Control Pin Specifications

| Parameter              | VI-J00 E-Grade |      |     | VI-J00 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 high threshold |                | 6    |     |                        |      | 6   | Volts | Use open collector |
| Gate in low threshold  | 0.65           |      |     | 0.65                   |      |     | Volts |                    |
| Gate in low current    |                |      | 6   |                        |      | 6   | mA    |                    |

## Converter Specifications (Cont.)

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

### Dielectric Withstand Characteristics

| Parameter           | VI-J00 E-Grade |     |     | VI-J00 C-, I-, M-Grade |     |     | Units     | Test Conditions   |
|---------------------|----------------|-----|-----|------------------------|-----|-----|-----------|-------------------|
|                     | Min            | Typ | Max | Min                    | Typ | Max |           |                   |
| Input to output     | 3,000          |     |     | 3,000                  |     |     | $V_{RMS}$ | Baseplate earthed |
| Output to baseplate | 500            |     |     | 500                    |     |     | $V_{RMS}$ |                   |
| Input to baseplate  | 1,500          |     |     | 1,500                  |     |     | $V_{RMS}$ |                   |

### Thermal Characteristics

| Parameter         | VI-J00 E-Grade |          |     | VI-J00 C-, I-, M-Grade |          |     | Units                          | Test Conditions      |
|-------------------|----------------|----------|-----|------------------------|----------|-----|--------------------------------|----------------------|
|                   | Min            | Typ      | Max | Min                    | Typ      | Max |                                |                      |
| Efficiency        |                | 78 – 88% |     |                        | 80 – 90% |     |                                |                      |
| Baseplate to sink |                | 0.14     |     |                        | 0.14     |     | $^{\circ}\text{C}/\text{Watt}$ | With Vicor P/N 20267 |

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

### Mechanical Specifications

| Parameter | VI-J00 E-Grade |             |                | VI-J00 C-, I-, M-Grade |              |                | Units             | Test Conditions |
|-----------|----------------|-------------|----------------|------------------------|--------------|----------------|-------------------|-----------------|
|           | Min            | Typ         | Max            | Min                    | Typ          | Max            |                   |                 |
| Weight    | 2.9<br>(82.8)  | 3.2<br>(92) | 3.6<br>(101.2) | 3.4<br>(96.3)          | 3.8<br>(107) | 4.1<br>(117.7) | Ounces<br>(Grams) |                 |

### Product Grade Temperatures

| Parameter | Storage     | Operating   | Units              | Notes |
|-----------|-------------|-------------|--------------------|-------|
| E         | -20 to +105 | -10 to +100 | $^{\circ}\text{C}$ |       |
| C         | -40 to +105 | -25 to +100 | $^{\circ}\text{C}$ |       |
| I         | -55 to +105 | -40 to +100 | $^{\circ}\text{C}$ |       |
| M         | -65 to +105 | -55 to +100 | $^{\circ}\text{C}$ |       |

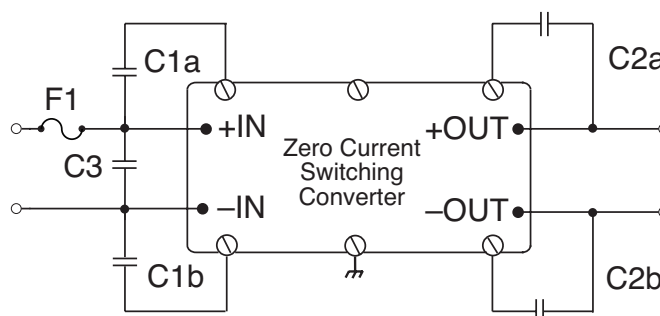
### Maximum Capacitance, Rated Output Voltage <5V

| Rated $V_{OUT}$ (V) | $I_{OUT}$ Rating (A) | $C_{MAX}$ ( $\mu\text{F}$ ) | $I_{OUT}$ Rating (A) | $C_{MAX}$ ( $\mu\text{F}$ ) |
|---------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 2 to <3             | $\leq 10$            | 1500                        | >10 to 20            | 5000                        |
| 3 to <5             | $\leq 10$            | 1000                        | >10 to 20            | 5000                        |

### Maximum Capacitance, Rated Output Voltage $\geq 5\text{V}$

| Rated $V_{OUT}$ (V) | $P_{OUT}$ Rating (W) | $C_{MAX}$ ( $\mu\text{F}$ ) | $P_{OUT}$ Rating (W) | $C_{MAX}$ ( $\mu\text{F}$ ) |
|---------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 5 to <7.5           | $\leq 50$            | 1000                        | >50 to 100           | 1500                        |
| 7.5 to <10          | $\leq 50$            | 400                         | >50 to 100           | 700                         |
| 10 to <28           | $\leq 50$            | 400                         | >50 to 100           | 500                         |
| >28                 | $\leq 50$            | 150                         | >50 to 100           | 250                         |

## Basic Module Operation



$$C3 (\mu F) = \frac{400}{V_{IN} \text{ Minimum}}$$

**Figure 1** — Basic module operation requires fusing, grounding, bypassing capacitors.\* See [Design Guide & Applications Manual](#).

### Output Connections and Considerations

The permissible load current<sup>[e]</sup> must never be exceeded during normal, abnormal or test conditions. Converters subject to dynamic loading exceeding 25% of rated current must be reviewed by Vicor Applications Engineering to ensure that the converter will operate properly.

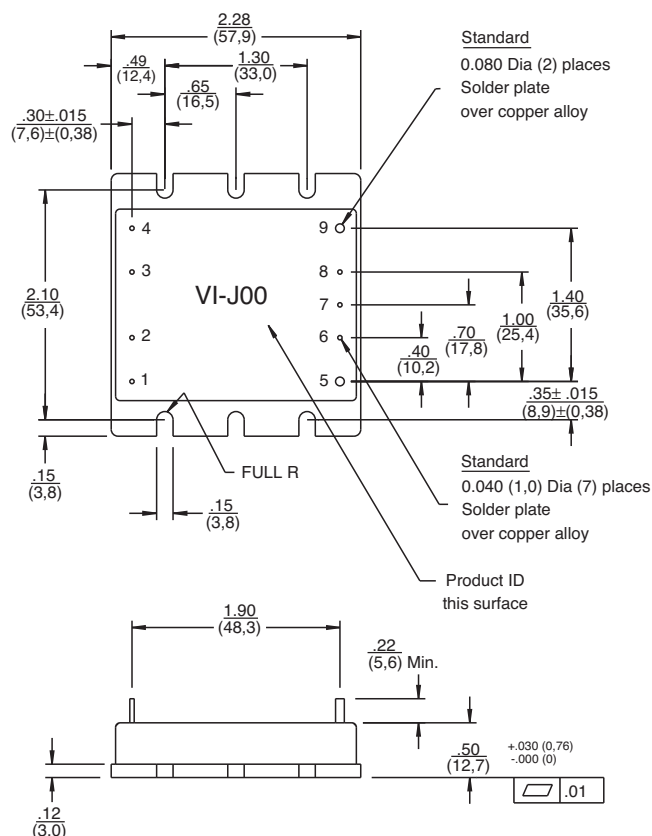
Under dynamic load, light load, or no load conditions, the converter may emit audible noise. Converters that utilize remote sense may require compensation circuitry to offset the phase lag caused by the external output leads and load impedance. Remote Sense leads must be protected for conditions such as lead reversal, noise pickup, open circuit, or excessive output lead resistance between the sense point and the converter's output terminals. For applications that may draw more than the rated current, a fast acting electronic circuit breaker must be utilized to protect the converter. Under no circumstance should the rated current be exceeded. Utilizing or testing of current limit or short circuit current will damage the converter. Ensure that the total output capacitance connected to the converter does not exceed the limits on Page 4.

### Storage

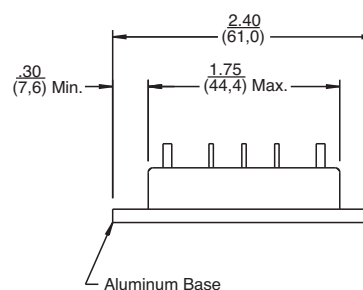
Vicor products, when not installed in customer units, should be stored in ESD safe packaging in accordance with ANSI/ESD S20.20, "Protection of Electrical and Electronic Parts, Assemblies and Equipment" and should be maintained in a temperature controlled factory/warehouse environment not exposed to outside elements controlled between the temperature ranges of 15°C and 38°C. Humidity shall not be condensing, no minimum humidity when stored in an ESD compliant package.

<sup>[e]</sup> Permissible load current: 
$$\frac{\text{Nominal Power Rating}}{\text{Nominal } V_{OUT}}$$

## Mechanical Drawing

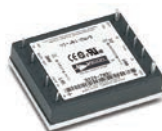


| Pin # | Function |
|-------|----------|
| 1     | +In      |
| 2     | Gate In  |
| 3     | Gate Out |
| 4     | -In      |
| 5     | +Out     |
| 6     | +Sense   |
| 7     | Trim     |
| 8     | -Sense   |
| 9     | -Out     |



## PACKAGING OPTIONS

## Flangeless package

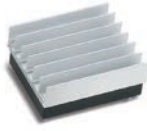


2.28"L x 1.80"W x 0.50"H  
(57.9 x 45.7 x 12.7mm)

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

## Flangeless package with integral heat sink



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



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

Available with longitudinal or transverse fins of 0.25"(6.35mm) or 0.50"(12.7mm) 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 Jr.

Chassis mount alternatives, one, two or three outputs: up to 300W



1 up – 2.58" x 2.5" x 0.62" (65.5 x 63.5 x 15.7mm)  
2 up – 2.58" x 4.9" x 0.62" (65.5 x 124.5 x 15.7mm)  
3 up – 2.58" x 7.3" x 0.62" (65.5 x 185.4 x 15.7mm)

## BusMod



2.28"L x 2.40"W x 1.08"H  
(57.9 x 61.0 x 27.4mm)

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

To order the BusMod separately:  
Half-sized BusMod — P/N 18952

[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.**

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