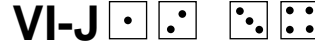


# VI-J00 MiniMod DC-DC Converters 25 to 100 Watts

## Converter Selection Chart



### Features

- Up to 50W/Cubic Inch
- UL, CSA, TÜV, VDE, BABT
- CE Marked
- Up to 90% Efficiency
- Size: 2.28" x 2.4" x 0.5" (57,9 x 61,0 x 12,7)
- Remote Sense and Current Limit
- Logic Disable
- Wide Range Output Adjust
- ZCS Power Architecture
- Low Noise FM Control

### Product Highlights

The VI-J00 MiniMod family establishes 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. At one-half the size and twice the power density of previous 100W modules, and with a maximum operating temperature rating of 100°C, the MiniMod opens new horizons for board-mounted (distributed) power architectures.

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.

### Packaging Options

SlimMods™, high power density, flangeless packages and FinMods™, featuring integral finned heatsinks.

**SlimMod:** Option suffix: - S

Example: VI - JXX - XX - S

**FinMod:** Option suffix: - F1 and - F2

Examples:

VI - JXX - XX - F1, 0.75" height

VI - JXX - XX - F2, 1.00" height

| Input Voltage |               | Output Voltage      |      |
|---------------|---------------|---------------------|------|
| Nominal       | Range         | Brownout/Transient* |      |
| 0 = 12V       | 10 - 20V(5)   | n/a                 | 22V  |
| 1 = 24V       | 21 - 32V(2)   | 18V                 | 36V  |
| W = 24V       | 18 - 36V(2)   | n/a                 | n/a  |
| 2 = 36V       | 21 - 56V(6)   | 18V                 | 60V  |
| 3 = 48V       | 42 - 60V(3)   | 36V                 | 72V  |
| N = 48V       | 36 - 76V(2)   | n/a                 | n/a  |
| 4 = 72V       | 55 - 100V(2)  | 45V                 | 110V |
| T = 110V      | 66 - 160V(2)  | n/a                 | n/a  |
| 5 = 150V      | 100 - 200V(2) | 85V                 | 215V |
| 6 = 300V      | 200 - 400V(3) | 170V                | 425V |
| 7 = 150/300V  | 100 - 375V(6) | 90V                 | n/a  |

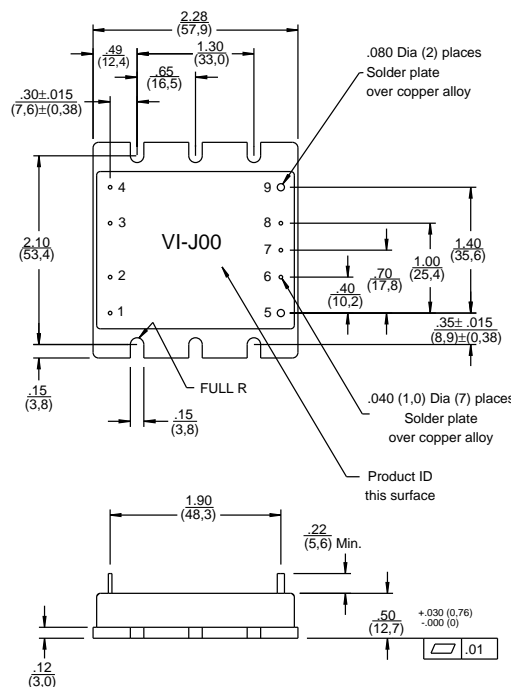
| Product Grade/Operating Temp. |  | Product Grade/Storage Temp. |  | Output Power/Current  |         |
|-------------------------------|--|-----------------------------|--|-----------------------|---------|
| E = -10°C to +100°C           |  | E = -20°C to +105°C         |  | V <sub>OUT</sub> ≥ 5V |         |
| C = -25°C to +100°C           |  | C = -40°C to +105°C         |  | Z = 25W               | Z = 5A  |
| I = -40°C to +100°C           |  | I = -55°C to +105°C         |  | Y = 50W               | Y = 10A |
| M = -55°C to +100°C           |  | M = -65°C to +105°C         |  | X = 75W               | X = 15A |
|                               |  |                             |  | W = 100W              | W = 20A |

| Max. Output For | 5V Outputs | > 5V Outputs | < 5V Outputs |
|-----------------|------------|--------------|--------------|
| (1)             | 50W        | 50W          | 10A          |
| (2)             | 75W        | 100W         | 20A          |
| (3)             | 100W       | 100W         | 20A          |

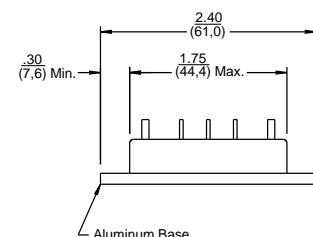
| Max. Output For | 5V Outputs | > 5V Outputs | < 5V Outputs |
|-----------------|------------|--------------|--------------|
| (4)             | 75W        | 75W          | 15A          |
| (5)             | 50W        | 75W          | 15A          |
| (6)             | 50W        | 75W          | 10A          |

\*Brownout 75% of rated load; transient voltage for 1 second.

### Mechanical Drawing



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



## Converter Specifications

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

| PARAMETER                                     | VI-J00 E-Grade |                                      |      | VI-J00 C-, I-, M-Grade               |                      |      | UNITS            | TEST CONDITIONS            |
|---|----------------|--------------------------------------|------|--------------------------------------|----------------------|------|------------------|----------------------------|
|   | MIN.           | TYP.                                 | MAX. | MIN.                                 | TYP.                 | MAX. |                  |                            |
| <b>■ Input Characteristics</b>                |                |                                      |      |                                      |                      |      |                  |                            |
| Inrush charge                                 |                | 60x10 <sup>-6</sup>                  |      | 60x10 <sup>-6</sup>                  | 100x10 <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+20Log( $\frac{V_{in}}{V_{out}}$ ) |      | 30+20Log( $\frac{V_{in}}{V_{out}}$ ) |                      |      | dB               | 120 Hz, nominal line       |
|   |                |                                      |      | 20+20Log( $\frac{V_{in}}{V_{out}}$ ) |                      |      |                  | 2400 Hz, nominal line      |
| No load power dissipation                     | 1.35           | 2                                    |      | 1.35                                 | 2                    |      | Watts            |                            |
| <b>■ Output Characteristics</b>               |                |                                      |      |                                      |                      |      |                  |                            |
| Setpoint accuracy                             |                | 1.0%                                 | 2.0% | 0.5%                                 | 1.0%                 |      | V <sub>NOM</sub> |                            |
| Load/line regulation                          |                |                                      | 0.5% | 0.05%                                | 0.2%                 |      | V <sub>NOM</sub> | LL to HL, 10% to Full Load |
| Load/line regulation                          |                |                                      | 1.0% | 0.2%                                 | 0.5%                 |      | V <sub>NOM</sub> | LL to HL, No Load to 10%   |
| Output temperature drift                      |                | 0.02                                 |      | 0.01                                 | 0.02                 |      | %/°C             | Over rated temperature     |
| Long term drift                               |                | 0.02                                 |      | 0.02                                 |                      |      | %/1K hours       |                            |
| Output ripple - pp:                           |                |                                      |      |                                      |                      |      |                  |                            |
| 2V, 3.3V                                      |                | 200                                  |      | 100                                  | 150                  |      | mV               | 20 MHz bandwidth           |
| 5V  |                | 5%                                   |      | 2%                                   | 3%                   |      |                  | 20 MHz bandwidth           |
| 10-48V  |                | 3%                                   |      | 0.75%                                | 1.5%                 |      |                  | 20 MHz bandwidth           |
| Trim range <sup>1</sup>                       | 50%            |                                      | 110% | 50%                                  |                      | 110% | V <sub>NOM</sub> |                            |
| Total remote sense compensation               | 0.5            |                                      |      | 0.5                                  |                      |      | Volts            | 0.25V max. neg. leg        |
| Current limit                                 | 105%           |                                      | 135% | 105%                                 |                      | 125% | I <sub>NOM</sub> | Automatic restart          |
| Short circuit current                         | 105%           |                                      | 140% | 105%                                 |                      | 130% | I <sub>NOM</sub> |                            |
| <b>■ Control Pin Characteristics</b>          |                |                                      |      |                                      |                      |      |                  |                            |
| Gate out impedance                            |                | 50                                   |      | 50                                   |                      |      | Ohms             |                            |
| Gate in impedance                             |                | 10 <sup>3</sup>                      |      | 10 <sup>3</sup>                      |                      |      | 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               |                            |
| <b>■ Dielectric Withstand Characteristics</b> |                |                                      |      |                                      |                      |      |                  |                            |
| 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> |                            |
| <b>■ Thermal Characteristics</b>              |                |                                      |      |                                      |                      |      |                  |                            |
| Efficiency                                    |                | 78-88%                               |      | 80-90%                               |                      |      |                  |                            |
| Baseplate to sink                             |                | 0.4                                  |      | 0.4                                  |                      |      | °C/Watt          | With Vicor P/N 04308       |
| <b>■ Mechanical Specifications</b>            |                |                                      |      |                                      |                      |      |                  |                            |
| Weight  |                | 3.0 (85)                             |      | 3.0 (85)                             |                      |      | Ounces (Grams)   |                            |

<sup>1</sup>10V, 12V and 15V outputs, standard trim range ±10%. Consult factory for wider trim range.

For product compliance with agency standards please refer to pages 67 - 69.