

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 | C = -25°C to +100°C | E = -20°C to +105°C | C = -40°C to +105°C | V _{OUT} ≥ 5V | |
| I = -40°C to +100°C | M = -55°C to +100°C | I = -55°C to +105°C | M = -65°C to +105°C | Z = 25W | Z = 5A |
| | | | | Y = 50W | Y = 10A |
| | | | | 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. | | |
| ■ Input Characteristics | | | | | | | | |
| Inrush charge | | 60x10 ⁻⁶ | | 60x10 ⁻⁶ | 100x10 ⁻⁶ | | Coulombs | Nominal line |
| Input reflected ripple current – pp | | 10% | | 10% | | | I _{IN} | Nominal line, full load |
| Input ripple rejection | | 25+20Log($\frac{V_{in}}{V_{out}}$) | | 30+20Log($\frac{V_{in}}{V_{out}}$) | | | | 120 Hz, nominal line |
| | | | | | 20+20Log($\frac{V_{in}}{V_{out}}$) | | | |
| No load power dissipation | | 1.35 | 2 | | 1.35 | 2 | Watts | |
| ■ Output Characteristics | | | | | | | | |
| Setpoint accuracy | | 1.0% | 2.0% | | 0.5% | 1.0% | 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% | | 0.2% | 0.5% | V _{NOM} | 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 ¹ | | 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 _{NOM} | Automatic restart |
| Short circuit current | | 105% | 140% | | 105% | 130% | I _{NOM} | |
| ■ Control Pin Characteristics | | | | | | | | |
| Gate out impedance | | 50 | | | 50 | | Ohms | |
| Gate in impedance | | 10 ³ | | | 10 ³ | | 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 | |
| ■ Dielectric Withstand Characteristics | | | | | | | | |
| 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 | | | | | | | | |
| Efficiency | | 78-88% | | | 80-90% | | | |
| Baseplate to sink | | 0.4 | | | 0.4 | | °C/Watt | With Vicor P/N 04308 |
| ■ Mechanical Specifications | | | | | | | | |
| Weight | | 3.0 (85) | | | 3.0 (85) | | Ounces (Grams) | |

¹10V, 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.