



MI-MegaMod™ Family

**Military Chassis Mount DC-DC Converters 10 to 300W
Single, Dual, Triple Outputs**

Product Highlights

Vicor's MI-MegaMod family of single, dual, and triple output DC-DC converters provide power system designers with cost-effective, high-performance, off-the-shelf solutions to applications that might otherwise require a custom supply.

Incorporating standard MI-200 or MI-J00 family converters in rugged, chassis mount packages, MegaMods can be ordered with single, dual, or triple outputs, having a combined output power of up to 300W. Totally isolated outputs eliminate efficiency penalties and output interaction problems.

Features

- ✦ Inputs: 28, 155, 165 and 270Vdc
- ✦ Any output: 2 to 48Vdc
- ✦ Up to 13.5W/in³
- ✦ High efficiency
- ✦ Remote sense
- ✦ ZVS/ZCS power architecture
- ✦ Low noise FM control
- ✦ Size — 1-up half-size: 2.58" x 2.5" x 0.62" (65,5 x 63,5 x 15,7mm)
- ✦ Size — 1-up full-size: 4.9" x 2.5" x 0.62" (124,5 x 63,5 x 15,7mm)
- ✦ Size — 2-up half-size: 2.58" x 4.9" x 0.62" (65,5 x 124,5 x 15,7mm)
- ✦ Size — 2-up full-size: 4.9" x 4.9" x 0.62" (124,5 x 124,5 x 15,7mm)
- ✦ Size — 3-up half-size: 2.58" x 7.3" x 0.62" (65,5 x 185,4 x 15,7mm)
- ✦ Size — 3-up full-size: 4.9" x 7.3" x 0.62" (124,5 x 185,4 x 15,7mm)

Configuration Chart

| Full-Size MegaMods | | | | Number of Modules |
|---------------------------|------------|----------------------|--|-------------------|
| Single Output | | | | |
| MI-L | 50 – 100W | 4.9" x 2.5" x 0.62" | | 1 |
| MI-M | 150 – 200W | 4.9" x 4.9" x 0.62" | | 2 |
| MI-N | 300W | 4.9" x 7.3" x 0.62" | | 3 |
| Dual Output | | | | |
| MI-P | 100 – 200W | 4.9" x 4.9" x 0.62" | | 2 |
| MI-Q | 200 – 300W | 4.9" x 7.3" x 0.62" | | 3 |
| Triple Output | | | | |
| MI-R | 150 – 300W | 4.9" x 7.3" x 0.62" | | 3 |
| Half-Size MegaMods | | | | |
| Single Output | | | | |
| MI-LJ | 10 – 50W | 2.58" x 2.5" x 0.62" | | 1 |
| Dual Output | | | | |
| MI-PJ | 20 – 100W | 2.58" x 4.9" x 0.62" | | 2 |
| Triple Output | | | | |
| MI-RJ | 30 – 150W | 2.58" x 7.3" x 0.62" | | 3 |

| Input Voltage | | |
|---------------|---------------------------|-----------|
| Nominal | Range | Transient |
| 2=28Vdc | 18 – 50V ⁽¹⁾ | 60V |
| 5=155Vdc | 100 – 210V | 230V |
| 6=270Vdc | 125 – 400V ⁽²⁾ | 475V |
| 7=165Vdc | 100 – 310V ⁽³⁾ | |

| Output Voltage | | |
|----------------|-----------|-----------|
| Z = 2V | T = 6.5V | N = 18.5V |
| Y = 3.3V | R = 7.5V | 3 = 24V |
| O = 5V | M = 10V | L = 28V |
| X = 5.2V | 1 = 12V | J = 36V |
| W = 5.5V | P = 13.8V | K = 40V |
| V = 5.8V | 2 = 15V | 4 = 48V |

| Product Grade |
|---------------------|
| Full-Size |
| I = -40°C to +85°C |
| M = -55°C to +85°C |
| Half-Size |
| I = -40°C to +100°C |
| M = -55°C to +100°C |

| Output Power/Current | |
|----------------------|-------------|
| Full-Size | Half-Size |
| ≥5V <5V | ≥5V <5V |
| Y = 50W 10A | A = 10W — |
| X = 75W 15A | Z = 25W 5A |
| W = 100W 20A | Y = 50W 10A |
| V = — 30A | |

| Output Power/Current | |
|----------------------|-----|
| ≥5V | <5V |
| V = 150W | 30A |
| U = 200W | — |
| S = — | 60A |

| Output Power/Current | |
|----------------------|-----|
| ≥5V | <5V |
| S = 300W | — |
| P = — | 90A |

⁽¹⁾ 16V operation at 75% load.

⁽²⁾ These units rated at 75% load from 125 – 150Vin: Full-size – 5Vout @ 100W; 2Vout and 3.3Vout @ 30A
Half-Size – 5Vout @ 50W; 2V and 3.3V @ 10A.

⁽³⁾ For use with Vicor's MI-AIM

Full-Size

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

| PARAMETER | MIN | TYP | MAX | UNITS | NOTES |
|--|-------|---|----------------------|--------------------------------|--------------------------|
| Input Characteristics | | | | | |
| Inrush charge | | 120×10^{-6} | 200×10^{-6} | Coulombs | Nominal line, per module |
| Input reflected ripple current – pp: | | 10 | | % I_{in} | Nominal line, full load |
| Input ripple rejection | | $30 + 20\text{Log} \left(\frac{V_{in}}{V_{out}} \right)$ | | dB | 120Hz, nominal line |
| | | $20 + 20\text{Log} \left(\frac{V_{in}}{V_{out}} \right)$ | | dB | 2400Hz, nominal line |
| No load power dissipation | | 1.35 | 2.0 | Watts | Per module |
| Output Characteristics | | | | | |
| Setpoint accuracy | | 0.5 | 1.0 | % V_{nom} | |
| Load/line regulation | | 0.05 | 0.2 | % V_{nom} | LL to HL, 10% to FL |
| Load/line regulation | | 0.2 | 0.5 | % V_{nom} | LL to HL, NL to 10% |
| Output temperature drift | | 0.01 | 0.02 | % / $^{\circ}\text{C}$ | Over rated temperature |
| Long term drift | | 0.02 | | %/1K hours | |
| Output ripple – p-p: $\leq 10\text{V}$ | | 80 | 150 | mV | 20MHz bandwidth |
| 12-48V | | 0.75 | 1.5 | % | 20MHz bandwidth |
| Output voltage trimming ⁽¹⁾ | 50 | | 110 | % V_{nom} | |
| Total remote sense compensation | 0.5 | | | Vdc | 0.25V max. neg. leg |
| OVP setpoint | 115 | 125 | 135 | % V_{nom} | Recycle power |
| Current limit | 105 | | 125 | % I_{nom} | Automatic restart |
| Short circuit current | | | 130 | % I_{nom} | |
| Control Pin Characteristics | | | | | |
| Gate out impedance | | 50 | | Ohms | |
| Gate in impedance | | 10^3 | | Ohms | |
| Gate in open circuit voltage | | 6.0 | | Vdc | Use open collector |
| Gate in low threshold | 0.65 | | | Vdc | |
| Gate in low current | | | 6.0 | mA | |
| Isolation Characteristics | | | | | |
| Isolation (input to output) | 3,000 | | | Vrms | |
| Isolation (output to baseplate) | 500 | | | Vrms | |
| Isolation (input to baseplate) | 1,500 | | | Vrms | |
| Thermal Characteristics | | | | | |
| Efficiency | | 80-90 | | % | |
| Baseplate to chassis | | 0.1 | | $^{\circ}\text{C}/\text{Watt}$ | |
| Thermal shutdown | 90 | 95 | 105 | $^{\circ}\text{C}$ | |
| Mechanical Specifications | | | | | |
| Weight | | | | | |
| 1-up | | 9.0 (255) | | ounces (grams) | |
| 2-up | | 1.2 (525) | | pounds (grams) | |
| 3-up | | 1.7 (780) | | pounds (grams) | |

⁽¹⁾ 10V, 12V, and 15V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.

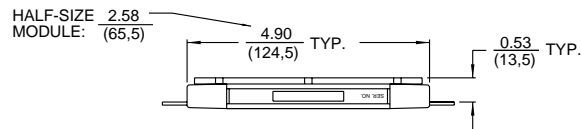
Half-Size

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

| PARAMETER | MIN | TYP | MAX | UNITS | NOTES |
|--|-------|---|----------------------|--------------------------------|--------------------------|
| Input Characteristics | | | | | |
| Inrush charge | | 60×10^{-6} | 100×10^{-6} | Coulombs | Nominal line, per module |
| Input reflected ripple current – pp: | | 10 | | % I_{in} | Nominal line, full load |
| Input ripple rejection | | $30 + 20\text{Log} \left(\frac{V_{in}}{V_{out}} \right)$ | | dB | 120Hz, nominal line |
| | | $20 + 20\text{Log} \left(\frac{V_{in}}{V_{out}} \right)$ | | dB | 2400Hz, nominal line |
| No load power dissipation | | 1.35 | 2.0 | Watts | Per module |
| Output Characteristics | | | | | |
| Setpoint accuracy | | 0.5 | 1.0 | % V_{nom} | |
| Load/line regulation | | 0.05 | 0.2 | % V_{nom} | LL to HL, 10% to FL |
| Load/line regulation | | 0.2 | 0.5 | % V_{nom} | LL to HL, NL to 10% |
| Output temperature drift | | 0.01 | 0.02 | % / $^{\circ}\text{C}$ | Over rated temperature |
| Long term drift | | 0.02 | | %/1K hours | |
| Output ripple – p-p: $\leq 10\text{V}$ | | 80 | 150 | mV | 20MHz bandwidth |
| 12-48V | | 0.75 | 1.5 | % | 20MHz bandwidth |
| Output voltage trimming ⁽¹⁾ | 50 | | 110 | % V_{nom} | |
| Total remote sense compensation | 0.5 | | | Vdc | 0.25V max. neg. leg |
| Current limit | 105 | | 125 | % I_{nom} | Automatic restart |
| Control Pin Characteristics | | | | | |
| Gate out impedance | | 50 | | Ohms | |
| Gate in impedance | | 10^3 | | Ohms | |
| Gate in open circuit voltage | | 6.0 | | Vdc | Use open collector |
| Gate in low threshold | 0.65 | | | Vdc | |
| Gate in low current | | | 6.0 | mA | |
| Isolation Characteristics | | | | | |
| Isolation (input to output) | 3,000 | | | Vrms | |
| Isolation (output to baseplate) | 500 | | | Vrms | |
| Isolation (input to baseplate) | 1,500 | | | Vrms | |
| Thermal Characteristics | | | | | |
| Efficiency | | 80-90 | | % | |
| Baseplate to chassis | | 0.1 | | $^{\circ}\text{C}/\text{Watt}$ | |
| Mechanical Specifications | | | | | |
| Weight | | | | | |
| 1-up | | 4.5 (127) | | ounces (grams) | |
| 2-up | | 8.8 (250) | | ounces (grams) | |
| 3-up | | 13.3 (377) | | ounces (grams) | |

⁽¹⁾ 10V, 12V, and 15V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.

Inputs



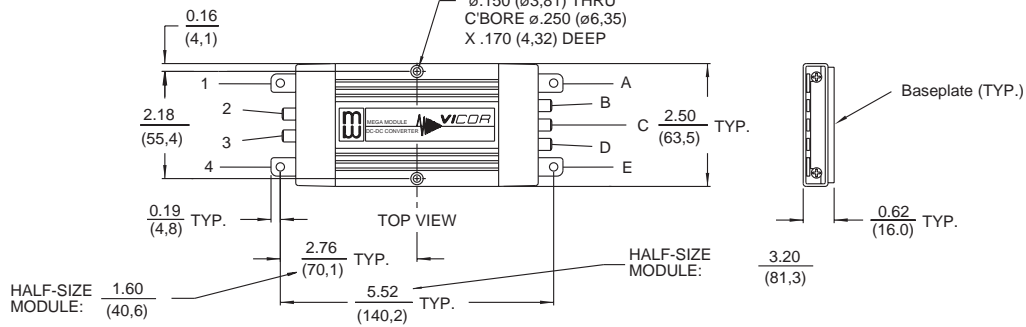
Outputs

Side view (all models)

1-Up

L- and LJ-Series

L- and LJ-Series



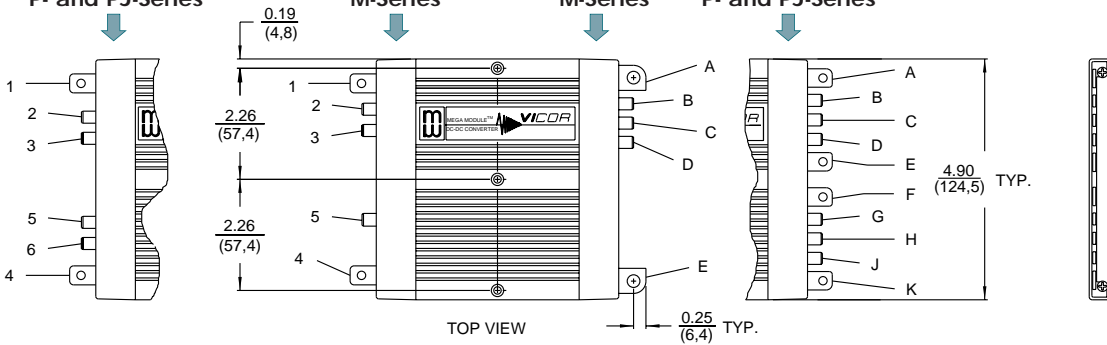
2-Up

P- and PJ-Series

M-Series

M-Series

P- and PJ-Series



3-Up

R- and RJ-Series

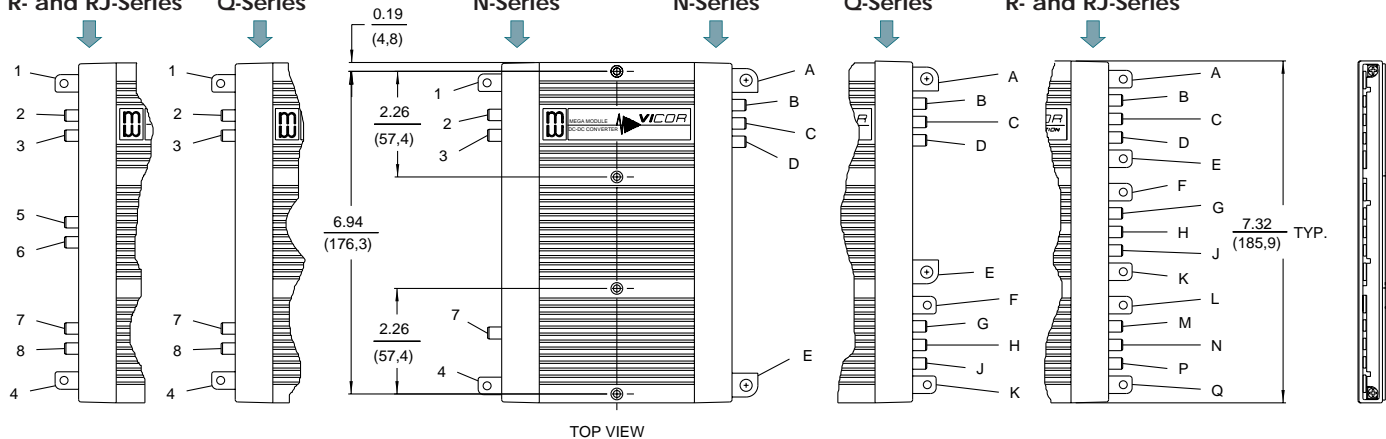
Q-Series

N-Series

N-Series

Q-Series

R- and RJ-Series



| Inputs | | Outputs | | |
|---------------|---------------|-----------|-----------|-----------|
| 1 -Input | 5 Gate Out #2 | Output #1 | Output #2 | Output #3 |
| 2 Gate Out #1 | 6 Gate In #2 | A -Output | F -Output | L -Output |
| 3 Gate In #1 | 7 Gate Out #3 | B -Sense | G -Sense | M -Sense |
| 4 +Input | 8 Gate In #3 | C Trim | H Trim | N Trim |
| | | D +Sense | J +Sense | P +Sense |
| | | E +Output | K +Output | Q +Output |

Mounting Information
Use #6 machine hardware torqued to 5-7 in-lbs.