



# 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/in<sup>3</sup>
- ✦ 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
<b>Single Output</b>			
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
<b>Dual Output</b>			
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
<b>Triple Output</b>			
MI-R	150 – 300W	4.9" x 7.3" x 0.62"	3
<b>Half-Size MegaMods</b>			
<b>Single Output</b>			
MI-LJ	10 – 50W	2.58" x 2.5" x 0.62"	1
<b>Dual Output</b>			
MI-PJ	20 – 100W	2.58" x 4.9" x 0.62"	2
<b>Triple Output</b>			
MI-RJ	30 – 150W	2.58" x 7.3" x 0.62"	3

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

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
<b>Full-Size</b>
I = -40°C to +85°C
M = -55°C to +85°C
<b>Half-Size</b>
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

<sup>(1)</sup> 16V operation at 75% load.

<sup>(2)</sup> 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.

<sup>(3)</sup> 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
<b>Input Characteristics</b>					
Inrush charge		$120 \times 10^{-6}$	$200 \times 10^{-6}$	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
<b>Output Characteristics</b>					
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 <sup>(1)</sup>	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	% $I_{nom}$	
<b>Control Pin Characteristics</b>					
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	
<b>Isolation Characteristics</b>					
Isolation (input to output)	3,000			Vrms	
Isolation (output to baseplate)	500			Vrms	
Isolation (input to baseplate)	1,500			Vrms	
<b>Thermal Characteristics</b>					
Efficiency		80-90		%	
Baseplate to chassis		0.1		$^{\circ}\text{C}/\text{Watt}$	
Thermal shutdown	90	95	105	$^{\circ}\text{C}$	
<b>Mechanical Specifications</b>					
Weight					
1-up		9.0 (255)		ounces (grams)	
2-up		1.2 (525)		pounds (grams)	
3-up		1.7 (780)		pounds (grams)	

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

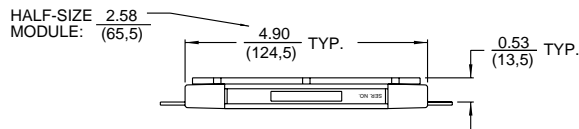
## Half-Size

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

PARAMETER	MIN	TYP	MAX	UNITS	NOTES
<b>Input Characteristics</b>					
Inrush charge		$60 \times 10^{-6}$	$100 \times 10^{-6}$	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
<b>Output Characteristics</b>					
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 <sup>(1)</sup>	50		110	% $V_{nom}$	
Total remote sense compensation	0.5			Vdc	0.25V max. neg. leg
Current limit	105		125	% $I_{nom}$	Automatic restart
<b>Control Pin Characteristics</b>					
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	
<b>Isolation Characteristics</b>					
Isolation (input to output)	3,000			Vrms	
Isolation (output to baseplate)	500			Vrms	
Isolation (input to baseplate)	1,500			Vrms	
<b>Thermal Characteristics</b>					
Efficiency		80-90		%	
Baseplate to chassis		0.1		$^{\circ}\text{C}/\text{Watt}$	
<b>Mechanical Specifications</b>					
Weight					
1-up		4.5 (127)		ounces (grams)	
2-up		8.8 (250)		ounces (grams)	
3-up		13.3 (377)		ounces (grams)	

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

**Inputs**



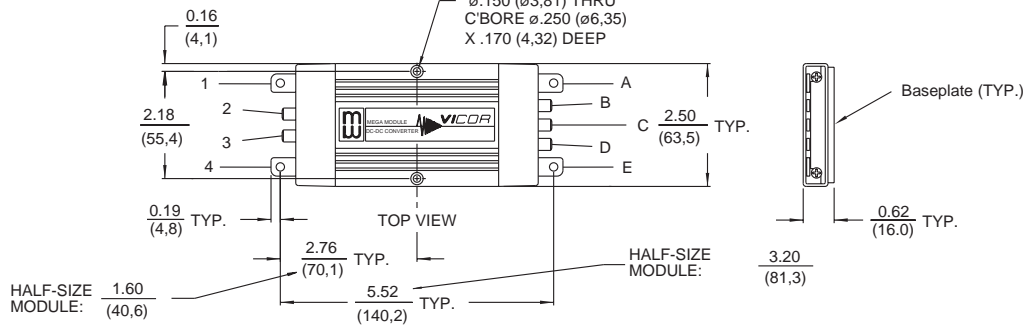
**Outputs**

Side view (all models)

**1-Up**

L- and LJ-Series

L- and LJ-Series



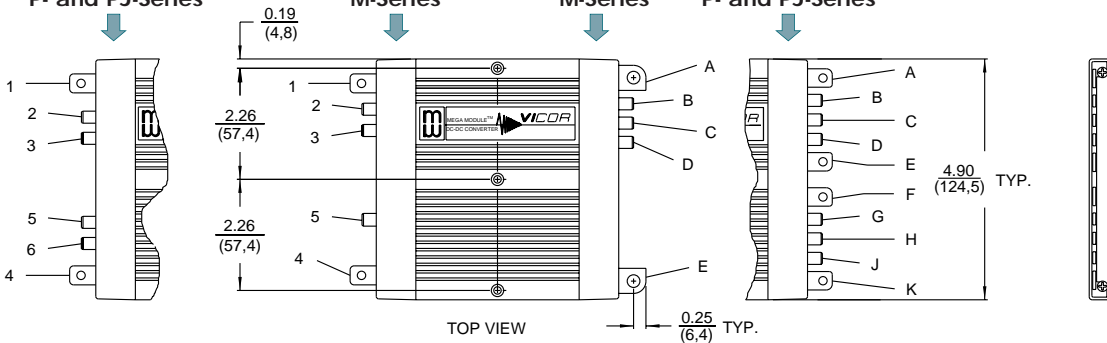
**2-Up**

P- and PJ-Series

M-Series

M-Series

P- and PJ-Series



**3-Up**

R- and RJ-Series

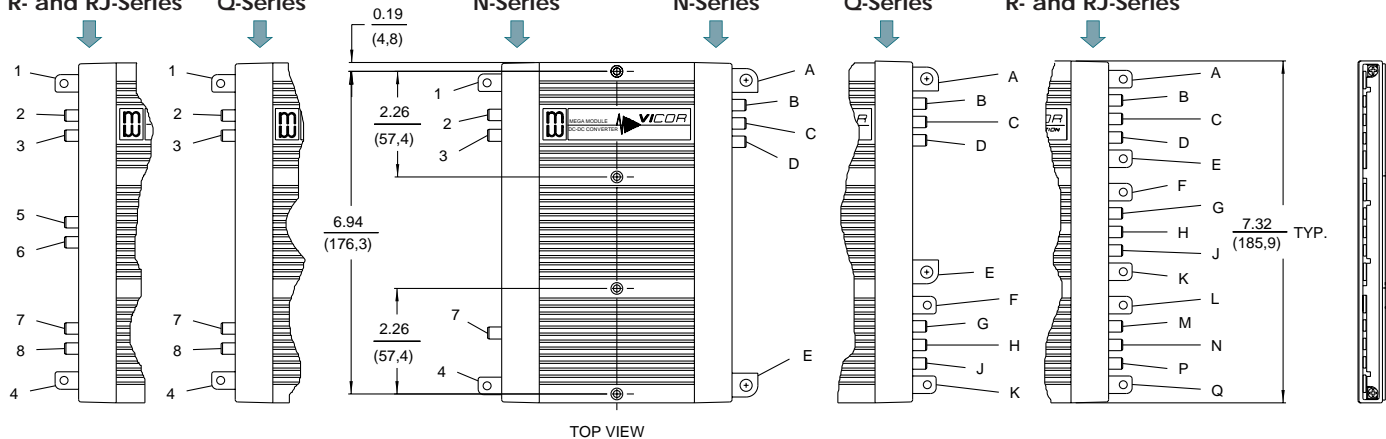
Q-Series

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.