



Data Sheet

MI-MegaMod Family

10 to 300 Watts DC-DC Converters

Single, Dual, Triple Output

Chassis Mount



Features

- Inputs: 28, 155, 165 and 270 Vdc
- One, two or three outputs
- Outputs from 2 to 48 Vdc
- MIL-STD-704D/E/F transient compliance for 28 and 270 Vdc
- MIL-STD-1399A compliance for 155 Vdc
- Up to 13.5 W/in³
- High efficiency
- Remote sense
- ZCS power architecture
- Low noise FM control
- 1 Up:
 - 2.58" x 2.5" x 0.62" (Half Size)
 - 4.9" x 2.5" x 0.62" (Full Size)
- 2 Up:
 - 2.58" x 4.9" x 0.62" (Half Size)
 - 4.9" x 4.9" x 0.62" (Full Size)
- 3 Up:
 - 2.58" x 7.3" x 0.62" (Half Size)
 - 4.9" x 7.3" x 0.62" (Full Size)

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 300 W. Totally isolated outputs eliminate efficiency penalties and output interaction problems.

Configuration Chart

Full-Size Modules – MegaMod			Junior-Size Modules – MegaMod Jr		
Configuration	Output Power	# of Modules	Configuration	Output Power	# of Modules
Single Output			Single Output		
MI-L -	50 – 100 W	1	MI-LJ -	10 – 50 W	1
MI-M -	150 – 200 W	2			
MI-N -	300 W	3			
Dual Output			Dual Output		
MI-P -	100 – 200 W	2	MI-PJ -	20 – 100 W	2
MI-Q -	200 – 300 W	3			
Triple Output			Triple Output		
MI-R -	150 – 300 W	3	MI-RJ -	30 – 150 W	3

• Input Voltage

Nominal	Range	Transient ^[a]
2 = 28 V	18 – 50 V ^[b]	60
5 = 155 V	100 – 210 V	230
6 = 270 V	125 – 400 V	475
7 = 165 V	100 – 310 V	n/a

^[a] Transient voltage for 1 second.

^[b] 16 V operation at 75% load.

•• Output Voltage

Z = 2 V	T = 6.5 V ^[c]	N = 18.5 V
Y = 3.3 V	R = 7.5 V ^[c]	3 = 24 V
O = 5 V	M = 10 V	L = 28 V
X = 5.2 V	I = 12 V	J = 36 V
W = 5.5 V	P = 13.8 V	K = 40 V
V = 5.8 V	2 = 15 V	4 = 48 V

••• Product Grade Temperature (°C)

MegaMod	MegaMod Jr.
I = –40 to +85 M = –55 to +85	–40 to +100 –55 to +100
Refers to Baseplate Temperature	

^[c] 75 W max. module power for 28 V input voltage

••• Output Power/Current

MegaMod		MegaMod Jr.	
VOUT ≥ 5 V	VOUT < 5 V	VOUT ≥ 5 V	VOUT < 5 V
Y = 50 W X = 75 W W = 100 W V = —	Y = 10 A X = 15 A W = 20 A V = 30 A	A = 10 W Z = 25 W Y = 50 W	A = — Z = 5 A Y = 10 A

•••• Output Power/Current

VOUT ≥ 5 V	VOUT < 5 V
V = 150 W U = 200 W S = —	V = 30 A U = — S = 60 A

••••• Output Power/Current

VOUT ≥ 5 V	VOUT < 5 V
S = 300 W P = —	S = — P = 90 A

MEGAMOD SPECIFICATIONS

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

■ INPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Inrush charge		120×10^{-6}	200×10^{-6}	Coulombs	Nom. line, per module
Input reflected ripple current – pp		10		% I_{IN}	Nom. line, full load
Input ripple rejection		$30 + 20 \log \left(\frac{V_{IN}}{V_{OUT}} \right)$		dB	120 Hz, nom. line
		$20 + 20 \log \left(\frac{V_{IN}}{V_{OUT}} \right)$		dB	2400 Hz, nom. line
No load power dissipation		1.35	2	Watts	Per module

■ OUTPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Setpoint accuracy		0.5	1	% V_{NOM}	
Load / line regulation		0.05	0.2	% V_{NOM}	LL to HL, 10% to FL
		0.2	0.5	% V_{NOM}	LL to HL, NL to 10%
Output temperature drift		0.01	0.02	% / $^{\circ}\text{C}$	Over rated temp.
Long term drift		0.02		%/1K hours	
Output ripple - pp					
$\leq 10 \text{ V}$		80	150	mV	20 MHz bandwidth
12 – 48 V		0.75	1.5	% V_{NOM}	20 MHz bandwidth
Output voltage trimming ^[a]	50		110	% V_{NOM}	
Total remote sense compensation	0.5			Volts	0.25 V 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}	

^[a] 10 V, 12 V and 15 V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.

■ CONTROL PIN SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Gate out impedance		50		Ω	
Gate in impedance		10^3		Ω	
Gate in open circuit voltage		6.0		Volts	Use open collector
Gate in low threshold	0.65			Volts	
Gate in low current			6.0	mA	

MEGAMOD SPECIFICATIONS (cont.)

■ DIELECTRIC WITHSTAND CHARACTERISTICS

Parameter	Min	Typ	Max	Unit	Notes
Isolation (input to output)	3,000			VRMS	
Isolation (output to baseplate)	500			VRMS	
Isolation (input to baseplate)	1,500			VRMS	

■ THERMAL CHARACTERISTICS

Parameter	Min	Typ	Max	Units	Notes
Efficiency		80 – 90%			
Baseplate to chassis		0.1		°C/Watt	
Thermal Shutdown (drivers only)	90	95	105	°C	

■ MECHANICAL SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Weight					
1 Up		9.0 (255)		Ounces (Grams)	
2 Up		1.2 (545)		Lbs. (Grams)	
3 Up		1.7 (772)		Lbs. (Grams)	

MEGAMOD JR. SPECIFICATIONS

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

■ INPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Inrush charge		60×10^{-6}	100×10^{-6}	Coulombs	Nom. line, per module
Input reflected ripple current — pp		10		% I_{IN}	Nom. line, full load
Input ripple rejection		$30 + 20 \text{Log} \left(\frac{V_{IN}}{V_{OUT}} \right)$		dB	120 Hz, nom. line
		$20 + 20 \text{Log} \left(\frac{V_{IN}}{V_{OUT}} \right)$		dB	2400 Hz, nom. line
No load power dissipation		1.35	2	Watts	Per module

■ OUTPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Setpoint accuracy		0.5	1	% V_{NOM}	
Load/line regulation		0.05	0.2	% V_{NOM}	LL to HL, 10% to FL
		0.2	0.5	% V_{NOM}	LL to HL, NL to 10%
Output temperature drift		0.01	0.02	%/ $^{\circ}\text{C}$	Over rated temp.
Long term drift		0.02		%/1K hours	
Output ripple, pp					
$\leq 10 \text{ V}$		80	150	mV	20 MHz bandwidth
12 V – 48 V		0.75	1.5	% V_{NOM}	20 MHz bandwidth
Output voltage trimming ^[a]	50		110	% V_{NOM}	
Total remote sense compensation	0.5			Volts	0.25V max. neg. leg
OVP setpoint		N/A			
Current limit	105		125	% I_{NOM}	Automatic restart

^[a] 10 V, 12 V and 15 V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.

■ CONTROL PIN SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Gate out impedance		50		Ω	
Gate in impedance		10^3		Ω	
Gate in high threshold		6.0		Volts	Use open collector
Gate in low threshold	0.65			Volts	
Gate in low current			6.0	mA	

MEGAMOD JR. SPECIFICATIONS (cont.)

■ DIELECTRIC WITHSTAND CHARACTERISTICS

Parameter	Min	Typ	Max	Unit	Notes
Isolation (input to output)	3,000			V _{RMS}	Baseplate earthed
Isolation (output to baseplate)	500			V _{RMS}	
Isolation (input to baseplate)	1,500			V _{RMS}	

■ THERMAL CHARACTERISTICS

Parameter	Min	Typ	Max	Units	Notes
Efficiency		80 – 90%			
Baseplate to chassis		0.1		°C/Watt	

■ MECHANICAL SPECIFICATIONS

Parameter	Min	Typ	Max	Units	Notes
Weight					
1 Up		4.5 (127)		Ounces (Grams)	
2 Up		8.8 (250)		Ounces (Grams)	
3 Up		13.3 (377)		Ounces (Grams)	

MEGAMOD MECHANICAL SPECIFICATIONS

Inputs

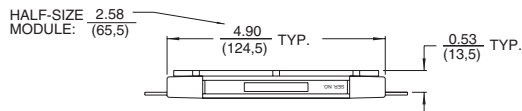
1 -Input	5 Gate Out #2
2 Gate Out #1	6 Gate In #2
3 Gate In #1	7 Gate Out #3
4 +Input	8 Gate In #3

Outputs

Output #1	Output #2	Output #3
A -Output	F -Output	L -Output
B -Sense	G -Sense	M -Sense
C Trim	H Trim	N Trim
D +Sense	J +Sense	P +Sense
E +Output	K +Output	Q +Output

Inputs

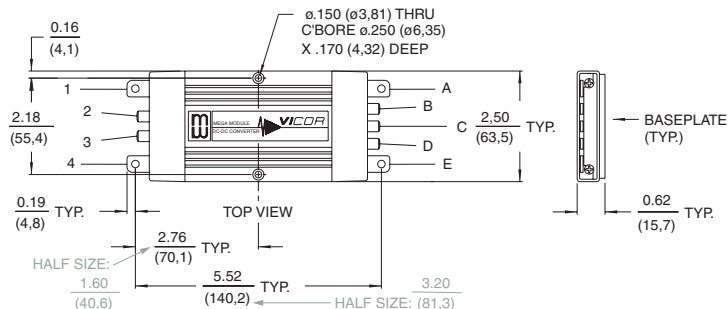
Outputs



Side view (all models)

L- and LJ-Series

L- and LJ-Series

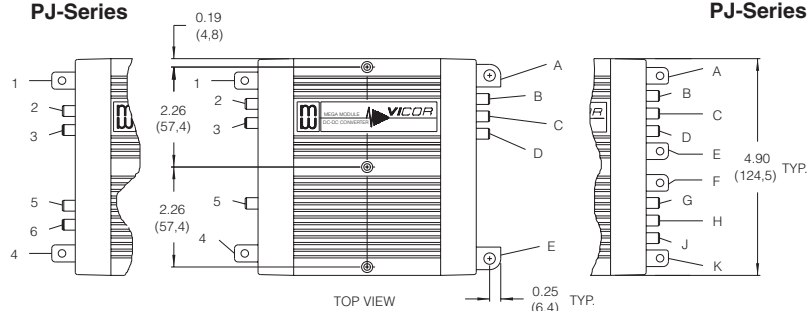


P- and PJ-Series

M-Series

M-Series

P- and PJ-Series



Mounting Information

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

R- and RJ-Series

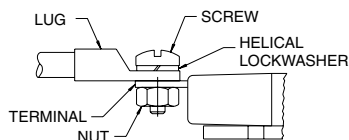
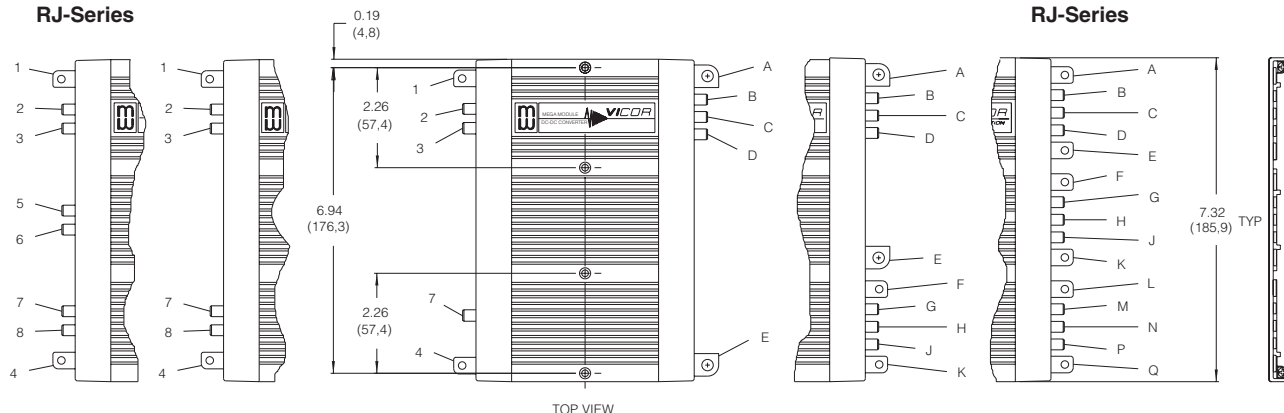
Q-Series

N-Series

N-Series

Q-Series

R- and RJ-Series



Terminal and Product Model	Terminal Style	Screw Size	Recommended Torque
-Input, +Input All models	PCB	8-32 UNC	10 in-lb (1.1 N-m)
-Output, +Output L-, P-, R-, LJ-, PJ- & RJ-Series	PCB	8-32 UNC	10 in-lb (1.1 N-m)
M- & N-Series	Metal	1/4-20 UNC	65 in-lb (7.2 N-m)
Q-Series	PCB	8-32 UNC	10 in-lb (1.1 N-m)
Supervisory All models	Metal	1/4-20 UNC	65 in-lb (7.2 N-m)

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Vicor Corporation
25 Frontage Road
Andover, MA, USA 01810
Tel: 800-735-6200
Fax: 978-475-6715

email

Customer Service: custserv@vicorpower.com
Technical Support: apps@vicorpower.com