10 to 300 Watts DC-DC Converters Single, Dual, Triple Output Chassis Mount

Features & Benefits

- Inputs: 28, 155, 165 and 270V_{DC}
- One, two or three outputs
- Outputs from 2 to 48V_{DC}
- MIL-STD-704D/E/F transient compliance for 28 and 270V_{DC}
- MIL-STD-1399A compliance for 155V_{DC}
- Up to 13.5 W/in^3
- 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)
- 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 300W. 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 = 28V	18 – 50V[b]	60
5 = 155V	100 – 210V	230
6 = 270V	125 – 400V	475
7 = 165V	100 – 310V	n/a

[a] Transient voltage for 1 second. [b] 16 V operation at 75% load.

Output Voltage

Z = 2V	**T** = 6.5V[c]	**N** = 18.5V
Y = 3.3V	**R** = 7.5V[c]	**3** = 24V
0 = 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 Temperature (°C)

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

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

Output Power/Current

MegaMod		MegaMod Jr.	
$V_{OUT} \geq 5V$	$V_{OUT} < 5V$	$V_{OUT} \geq 5V$	$V_{OUT} < 5V$
Y = 50W **X** = 75W **W** = 100W **V** = —	**Y** = 10A **X** = 15A **W** = 20A **V** = 30A	**A** = 10W **Z** = 25W **Y** = 50W	**A** = — **Z** = 5A **Y** = 10A

Output Power/Current

$V_{OUT} \geq 5V$	$V_{OUT} < 5V$
V = 150W **U** = 200W **S** = —	**V** = 30A **U** = — **S** = 60A

Output Power/Current

$V_{OUT} \geq 5V$	$V_{OUT} < 5V$
S = 300W **P** = —	**S** = — **P** = 90A

MI-MegaMod Specifications

(typical at T_{BP} = 25ºC, nominal line, 75% load, unless otherwise specified)

INPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Inrush charge		$120x10^{-6}$	$200x10^{-6}$	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	120Hz, nom. line
		$20+20\,Log\left(\frac{V_{IN}}{V_{OUT}}\right)$		dB	2400Hz, 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	% / °C	Over rated temp.
Long term drift		0.02		%/1K hours	
Output ripple - pp					
≤ 10V		80	150	mV	20MHz bandwidth
12 – 48V		0.75	1.5	$\%V_{NOM}$	2 MHz bandwidth
Output voltage trimming [a]	50		110	$\%V_{NOM}$	
Total remote sense compensation	0.5			Volts	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	$\%I_{NOM}$	

[a] 10V to 15V outputs, standard trim range ±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	

MI-MegaMod Specifications (Cont.)

DIELECTRIC WITHSTAND CHARACTERISTICS

Parameter	Min	Typ	Max	Unit	Notes
Isolation (input to output)	3,000			V_{RMS}	
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	
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)	

MI-MegaMod Specifications

(typical at T_{BP} = 25°C, nominal line, 75% load, unless otherwise specified)

INPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Inrush charge		$60x10^{-6}$	$100x10^{-6}$	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	120Hz, nom. line
		$20+20\text{Log}\left(\frac{V_{IN}}{V_{OUT}}\right)$		dB	2400Hz, 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	%/°C	Over rated temp.
Long term drift		0.02		%/1K hours	
Output ripple, pp					
≤ 10V		80	150	mV	20 MHz bandwidth
12V – 48V		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] 10V to 15V outputs, standard trim range ±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	

MI-MegaMod 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

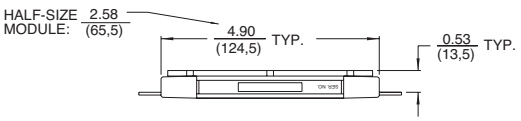
Parameter	Min	Typ	Max	Units	Notes
Weight					
1 Up		4.5 (127)		Ounces (Grams)	
2 Up		8.8 (250)		Ounces (Grams)	
3 Up		13.3 (377)		Ounces (Grams)	

MI-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

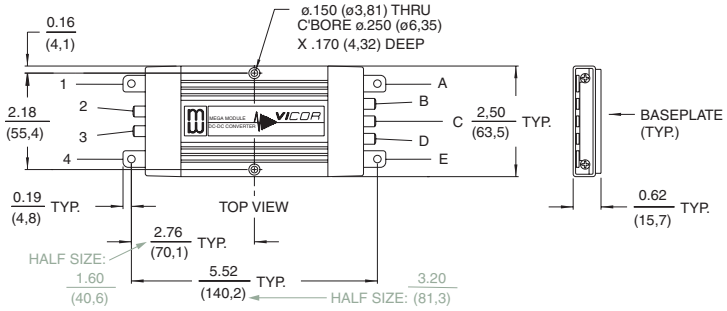
Outputs		
Output #1	Output #2	Output #3
A –Output	F –Output	L –Output
B –Sense	G –Sense	M –Sense
C Trim	H Trim	N Trim
D +Sense	J +Sense	P +Sense
E +Output	K +Output	Q +Output

Inputs **Outputs**



Side view (all models)

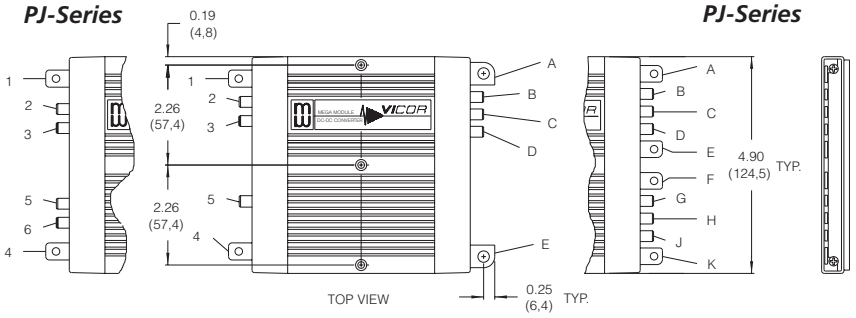
L- and LJ-Series **L- and LJ-Series**



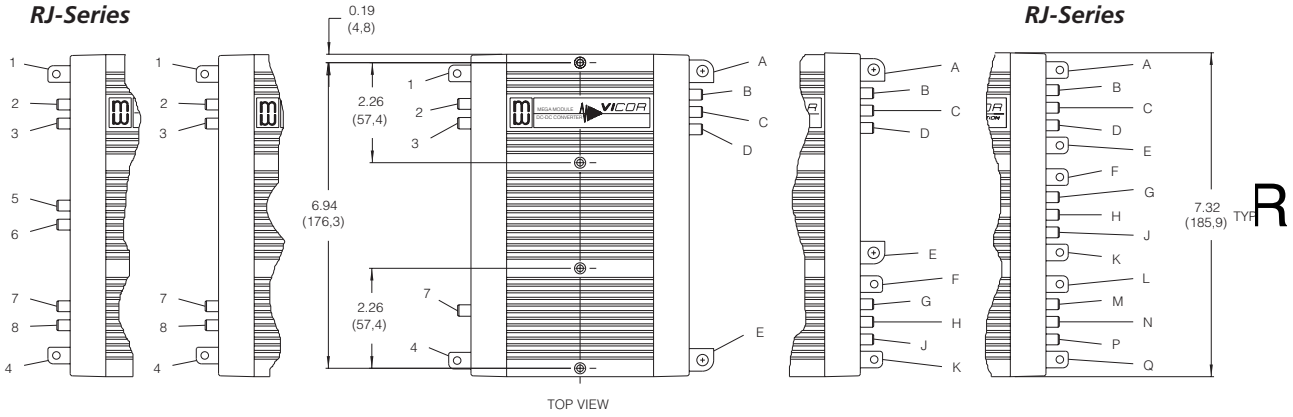
Mounting Information

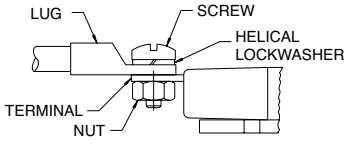
Use #6 machine hardware torqued to 5-7 in-lbs.

P- and PJ-Series ***M-Series*** ***M-Series*** ***P- and PJ-Series***



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)
	Metal	1/4-20 UNC	65 in-lb (7.2 N-m)
Supervisory All models	Sized to accept AMP Faston® insulated receptacle #2-520184-2		

Vicor's comprehensive line of power solutions includes high density AC-DC and DC-DC modules and accessory components, fully configurable AC-DC and DC-DC power supplies, and complete custom power systems.

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