

# Mega Module & Mega Module Jr. Family

25 to 600 Watts  
DC-DC Converters  
Single, Dual,  
Triple Output  
Chassis Mount

## Features

- Inputs: 10 to 400Vdc
- Any Output, 1 to 95Vdc
- UL, CSA, TÜV, VDE, BABT
- CE Marked
- 80-90% Efficiency (Typical)
- Up to 27W/Cubic Inch
- 1 Up  
2.58" x 2.5" x 0.62" (Junior)  
4.9" x 2.5" x 0.62" (Full Size)
- 2 Up  
2.58" x 4.9" x 0.62" (Junior)  
4.9" x 4.9" x 0.62" (Full Size)
- 3 Up  
2.58" x 7.3" x 0.62" (Junior)  
4.9" x 7.3" x 0.62" (Full Size)
- ZCS Power Architecture
- Low Noise FM Control
- Booster Versions Available for Expanded Output Power-Full size only

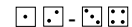
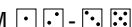
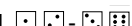


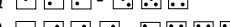
## Product Highlights

Vicor's Mega Module and Mega Module Jr. Families 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 VI-200 or VI-J00 Family converters in rugged, chassis mount packages, Mega Module and Mega Module Jr.'s can be ordered with single, dual or triple outputs, having a combined output power of up to 600W. Totally isolated outputs eliminate efficiency penalties and output interaction problems.

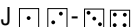
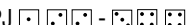
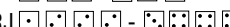
## Configuration Chart

### Full-Size Modules

Mega Modules:				# of Modules
Single Output	VI-L 	50-200W	4.9" x 2.5" x 0.62"	1
	VI-M 	100-400W	4.9" x 4.9" x 0.62"	2
	VI-N 	300-600W	4.9" x 7.3" x 0.62"	3
Dual Output	VI-P 	100-400W	4.9" x 4.9" x 0.62"	2
	VI-Q 	150-600W	4.9" x 7.3" x 0.62"	3
Triple Output	VI-R 	150-600W	4.9" x 7.3" x 0.62"	3

### Junior-Size Modules

#### Mega Module Juniors:

Single Output	VI-LJ 	25-100W	2.58" x 2.5" x 0.62"	1
Dual Output	VI-PJ 	50-200W	2.58" x 4.9" x 0.62"	2
Triple Output	VI-RJ 	75-300W	2.58" x 7.3" x 0.62"	3

□ Input Voltage						□ Output Voltage			
Nominal	Range	Brownout*	Transient**	Mega Module	Mega Module Jr.	Z	Y	M	L
0 = 12V	10 - 20V	n/a	22	(4)	(1)	Z = 2V			
1 = 24V	21 - 32V	18	36	(8)	(5)	Y = 3.3V			
W = 24V	18 - 36V	n/a	n/a	(8)	(5)	0 = 5V			
2 = 36V	21 - 56V	18	60	(6)	(1)	M = 10V			
3 = 48V	42 - 60V	36	72	(10)	(5)	1 = 12V			
N = 48V	36 - 76V	n/a	n/a	(10)	(5)	2 = 15V			
4 = 72V	55 - 100V	45	110	(9)	(4)	3 = 24V			
T = 110V	66 - 160V	n/a	n/a	(8)	(5)	L = 28V			
5 = 150V	100 - 200V	85	215	(9)	(5)	4 = 48V			
6 = 300V	200 - 400V	170	425	(10)	(6)				
7 = 150/300V	100 - 375V	90	n/a	(5)	(1)				

(1 to 95V, consult factory)

□ Product Grade		□ Output Power/Current			
	Mega Module	Mega Module Jr.	Mega Module	Mega Module Jr.	
E =	-10°C to +85°C	-10°C to +100°C	V <sub>OUT</sub> ≥ 5V	V <sub>OUT</sub> < 5V	V <sub>OUT</sub> ≥ 5V
C =	-25°C to +85°C	-25°C to +100°C	Y = 50W	Y = 10A	Z = 25W
I =	-40°C to +85°C	-40°C to +100°C	X = 75W	X = 15A	Z = 5A
M =	-55°C to +85°C	-55°C to +100°C	W = 100W	W = 20A	Y = 50W
			V = 150W	V = 30A	Y = 10A
			U = 200W	U = 40A	X = 75W
					X = 15A
					W = 100W
					W = 20A

Refers to Baseplate Temperature

□ Output Power/Current		□ Output Power/Current	
V <sub>OUT</sub> ≥ 5V	V <sub>OUT</sub> < 5V	V <sub>OUT</sub> ≥ 5V	V <sub>OUT</sub> < 5V
W = 100W	W = 20A	S = 300W	S = 60A
V = 150W	V = 30A	P = 450W	P = 90A
U = 200W	U = 40A	M = 600W	M = 120A
S = 300W	S = 60A		
Q = 400W	Q = 80A		

Max. Output Per Module	5V Outputs	>5V Outputs	<5V Outputs	Max. Output Per Module	5V Outputs	>5V Outputs	<5V Outputs
(1)	50W	50W	10A	(7)	100W	150W	30A
(4)	75W	75W	15A	(8)	150W	150W	30A
(5)	75W	100W	20A	(9)	150W	200W	40A
(6)	100W	100W	20A	(10)	200W	200W	40A

\*Brownout 75% of rated load.  
\*\*Transient voltage for 1 second.  
\*\*\*Consult factory for availability of "T" input Mega Module Jrs.

## Mega Module Specifications

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

PARAMETER	Mega Module (E-Grade)			Mega Module (C-, I-, M-Grade)			UNITS	TEST CONDITIONS
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
<b>■ Input Characteristics</b>								
Inrush charge		120x10 <sup>-6</sup>		120x10 <sup>-6</sup>	200x10 <sup>-6</sup>		Coulombs	Nom. line, per module
Input reflected ripple current – pp		10%		10%			I <sub>IN</sub>	Nom. line, full load
Input ripple rejection		25+20Log( $\frac{V_{in}}{V_{out}}$ )		30+20Log( $\frac{V_{in}}{V_{out}}$ )			dB	120 Hz, nom. line
				20+20Log( $\frac{V_{in}}{V_{out}}$ )				2400 Hz, nom. line
No load power dissipation		1.35	2	1.35	2		Watts	Per module
<b>■ Output Characteristics</b>								
Setpoint accuracy		1%	2%	0.5%	1%		V <sub>NOM</sub>	
Load/line regulation			0.5%	0.05%	0.2%		V <sub>NOM</sub>	LL to HL, 10% to FL
Load/line regulation			1%	0.2%	0.5%		V <sub>NOM</sub>	LL to HL, NL to 10%
Output temperature drift		0.02		0.01	0.02		% / °C	Over rated temp.
Long term drift		0.02		0.02			%/1K hours	
Output ripple - pp:								
2V, 3.3V			150	60	100		mV	20 MHz bandwidth
5V			5%	2%	3%			20 MHz bandwidth
10-48V			3%	0.75%	1.5%			20 MHz bandwidth
High/low program <sup>1</sup>	50%		110%	50%	110%			
Total remote sense compensation	0.5			0.5			Volts	0.25V max. neg. leg
OVP setpoint <sup>2</sup>		125%		115%	125%	135%	V <sub>NOM</sub>	Recycle power
Current limit	105%		135%	105%		125%	I <sub>NOM</sub>	Automatic restart
Short circuit current <sup>3</sup>	20%		140%	20%		130%	I <sub>NOM</sub>	
<b>■ Control Pin Characteristics</b>								
Gate out impedance		50		50			Ohms	
Gate in impedance		10 <sup>3</sup>		10 <sup>3</sup>			Ohms	
Gate in open circuit voltage		6		6			Volts	Use open collector
Gate in low threshold	0.65			0.65			Volts	
Gate in low current			6		6		mA	
Power sharing accuracy	.95		1.05	0.95		1.05		
<b>■ Dielectric Withstand Characteristics</b>								
Input to output	3,000			3,000			V <sub>RMS</sub>	Baseplate earthed
Output to baseplate	500			500			V <sub>RMS</sub>	
Input to baseplate	1,500			1,500			V <sub>RMS</sub>	
<b>■ Thermal Characteristics</b>								
Efficiency		78-88%		80-90%				
Baseplate to chassis		0.1		0.1			°C/Watt	
Thermal Shutdown (Drivers only)Baseplate	90	95	105	90	95	105	°C	Cool and recycle power to restart
<b>■ Mechanical Specifications</b>								
Weight								
1 Up		9.0 (255)		9.0 (255)			Ounces (Grams)	
2 Up		1.2 (545)		1.2 (545)			Lbs. (Grams)	
3 Up		1.7 (772)		1.7 (772)			Lbs. (Grams)	

<sup>1</sup>10V, 12V and 15V outputs, standard trim range ±10%. Consult factory for wider trim range.

<sup>2</sup>131% typical for booster modules.

<sup>3</sup>Output voltages of 5V or less incorporate foldback current limiting; outputs of 10V and above contain straight-line limiting.

## Mega Module Jr. Specifications

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

PARAMETER	Mega Module Jr. (E-Grade)			Mega Module Jr. (C-, I-, M-Grade)			UNITS	TEST CONDITIONS
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
<b>■ Input Characteristics</b>								
Inrush charge		$60 \times 10^{-6}$	$100 \times 10^{-6}$		$60 \times 10^{-6}$	$100 \times 10^{-6}$	Coulombs	Nom. line, per module
Input reflected ripple current — pp		10%			10%		$I_{IN}$	Nom. line, full load
Input ripple rejection		$25 + 20 \text{Log} \left( \frac{V_{in}}{V_{out}} \right)$			$30 + 20 \text{Log} \left( \frac{V_{in}}{V_{out}} \right)$		dB	120 Hz, nom. line
					$20 + 20 \text{Log} \left( \frac{V_{in}}{V_{out}} \right)$			2400 Hz, nom. line
No load power dissipation		1.35	2		1.35	2	Watts	Per module
<b>■ Output Characteristics</b>								
Setpoint accuracy		1.0%	2.0%		0.5%	1%	$V_{NOM}$	
Load/line regulation			0.5%		0.05%	0.2%	$V_{NOM}$	LL to HL, 10% to FL
Load/line regulation			1.0%		0.2%	0.5%	$V_{NOM}$	LL to HL, NL to 10%
Output temperature drift		0.02			0.01		$\% / ^{\circ}\text{C}$	Over rated temp.
Long term drift		0.02			0.02		$\% / 1\text{K hours}$	
Output ripple, pp:								
2V, 3.3V		200			100	150	mV	20 MHz bandwidth
5V		5%			2%	3%		20 MHz bandwidth
10V-48V		3%			0.75%	1.5%		20 MHz bandwidth
High/low program <sup>1</sup>	50%		110%	50%		110%	$V_{NOM}$	
Total remote sense compensation	0.5			0.5			Volts	0.25V max. neg. leg
OVP setpoint		N/A			N/A			
Current limit	105%		135%	105%		125%	$I_{NOM}$	Automatic restart
Short circuit current	105%		140%	105%		130%	$I_{NOM}$	
<b>■ Control Pin Characteristics</b>								
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	
<b>■ Dielectric Withstand Characteristics</b>								
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			$V_{RMS}$	
<b>■ Thermal Characteristics</b>								
Efficiency		78-88%			80-90%			
Baseplate to chassis		0.2			0.2		$^{\circ}\text{C/Watt}$	
<b>■ Mechanical Specifications</b>								
Weight								
1 Up		4.5 (127)			4.5 (127)		Ounces (Grams)	
2 Up		8.8 (250)			8.8 (250)		Ounces (Grams)	
3 Up		13.3 (377)			13.3 (377)		Ounces (Grams)	

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

## Mega Module Mechanical Specifications

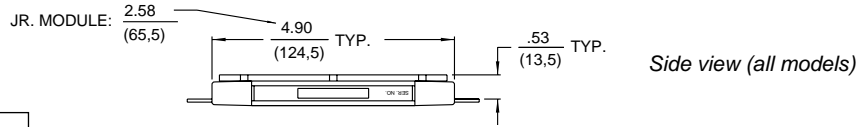
Inputs	
1 -Input	5 Gate Out #2
2 Gate Out #1	6 Gate In #2
3 Gate In #1	7 Gate Out #3
4 +Input	8 Gate In #3

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

\*For Units with BatMod  
 B-IMON  
 C-ITRIM  
 D-VTRIM

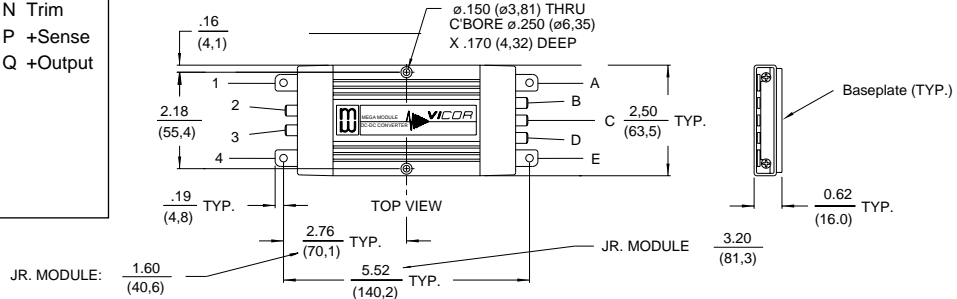
### Inputs

### Outputs



### L- and LJ-Series

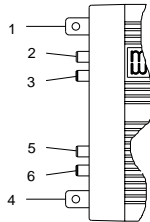
### L- and LJ-Series



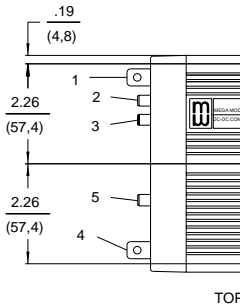
### Mounting Information

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

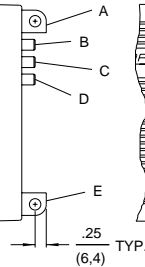
### P- and PJ-Series



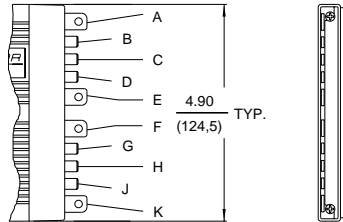
### M-Series



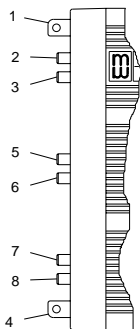
### M-Series



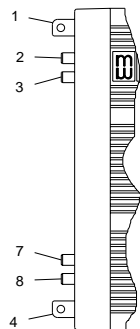
### P- and PJ-Series



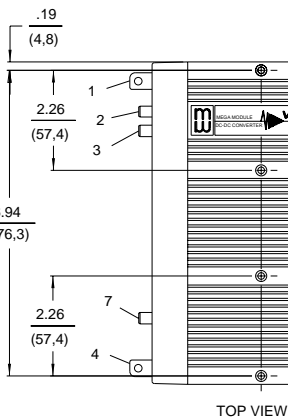
### R- and RJ-Series



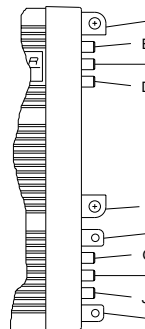
### Q-Series



### N-Series

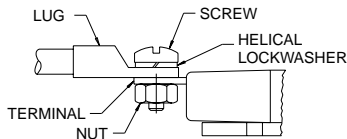
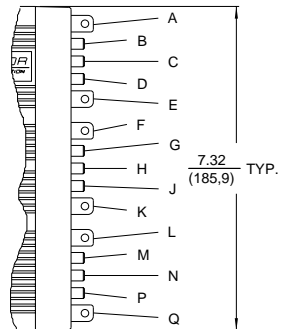


### N-Series



### 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	Sized to accept AMP Faston® insulated receptacle #2-520184-2		
All models			