Half Brick, DC-DC Converters

VI-J00
VE-J00

25 to 100 Watts

Features

- Isolated output
- Up to 50 Watts per cubic inch
- cURus, cTÜVus
- CE Marked
- Up to 90% efficiency
- Size: 2.28" x 2.4" x 0.5" (57,9 x 61,0 x 12,7)
- Remote sense and current limit
- Logic disable
- Wide range output adjust
- ZCS power architecture
- Low noise FM control
- RoHS compliant (VE versions)

Product Highlights

The VI-J00 MiniMod family established a new standard in component-level DC-DC converters. This "junior" size complement to the higher power VI-200 family offers up to 100 W of isolated and regulated power in a board mounted package. With thousands of input/output/power combinations, and with a maximum operating temperature rating of 100˚C, the MiniMod provides nearly unlimited flexibiliy for power system designers to meet demanding time to market requirements.

Utilizing Vicor's "zero-current-switching" forward converter technology, proven by an installed base of over 8 million units, the MiniMod family combines state of the art power density with the efficiency, low noise and reliability required by next generation power systems.

Part Numbering

VI – J 6 1 – C W

Family
VI = Non-RoHS
VE = RoHS

Series
J = J00

Input

0 = 12 V	**N** = 48 V
V = 24 V	**4** = 72 V
1 = 24 V	**T** = 110 V
W = 24 V	**5** = 150 V
2 = 36 V	**6** = 300 V
3 = 48 V	**7** = 150/300 V

Output

Z = 2 V	**M** = 10 V	**K** = 40 V
Y = 3.3 V	**1** = 12 V	**4** = 48 V
0 = 5 V	**P** = 13.8 V	**H** = 52 V
X = 5.2 V	**2** = 15 V	**F** = 72 V
W = 5.5 V	**N** = 18.5 V	**D** = 85 V
V = 5.8 V	**3** = 24 V	**B** = 95 V
T = 6.5 V	**L** = 28 V	
R = 7.5 V	**J** = 36 V	

Grade
E = –10 to 100°C
C = –25 to 100°C
I = –40 to 100°C
M = –55 to 100°C

Power

≥ 5 V	<5
W = 100 W	**W** = 20 A
X = 75 W	**X** = 15 A
Y = 50 W	**Y** = 10 A
Z = 25 W	**Z** = 5 A

Note: For additional packaging options, please see page 5.

Maximum Power Available for VI-Jxx-xx

Input				Output																						
Voltage Nom. (Range)	Low Line 75% Max Power	Transient[a]	Vin Designators	Vout Designators																						
				2	3.3	5	5.2	5.5	5.8	6.5	7.5	10	12	13.8	15	18.5	24	28	36	40	48	52	72	85	95
				Z	Y	0	X	W	V	T	R	M	1	P	2	N	3	L	J	K	4	H	F	D	B
12 (10-20)	n/a	22	**0**	X	X	Y	Y	Y	Y	Y	Y	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24 (10-36)	n/a	n/a	**V**	--	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	--	--	--	--
24 (21-32)	18	36	**1**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
24 (18-36)	n/a	n/a	**W**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
36 (21-56)	18	60	**2**	Y	Y	Y	Y	Y	Y	Y	Y	X	X	X	X	X	X	X	X	X	X	X	--	--	--
48 (42-60)	36	72	**3**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
48 (36-76)	n/a	n/a	**N**	W	W	X	X	X	X	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
72 (55-100)	45	110	**4**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
110 (66-160)	n/a	n/a	**T**	W	W	X	X	X	X	X	X	W	W	W	W	W	W	W	W	W	W	W	W	--	--
150 (100-200)	85	215	**5**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W
150 (100-375)	n/a	n/a	**7**	Y	Y	Y	Y	Y	Y	Y	Y	X	X	X	X	X	X	X	X	X	X	X	--	--	--
300 (200-400)	170	425	**6**	W	W	W	W	W	W	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W

[a] Transient voltage for 1 second.

CONVERTER SPECIFICATIONS

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

■ INPUT SPECIFICATIONS

Parameter	VI-J00 E-Grade Min	VI-J00 E-Grade Typ	VI-J00 E-Grade Max	VI-J00 C-, I-, M-Grade Min	VI-J00 C-, I-, M-Grade Typ	VI-J00 C-, I-, M-Grade Max	Units	Test Conditions
Inrush charge		60×10^{-6}			60×10^{-6}	100×10^{-6}	Coulombs	Nominal line
Input reflected ripple current – pp		10%			10%		I_{IN}	Nominal line, full load
Input ripple rejection		$25+20\,\mathrm{Log}\left(\frac{Vin}{Vout}\right)$			$30+20\,\mathrm{Log}\left(\frac{Vin}{Vout}\right)$		dB	120 Hz, nominal line
					$20+20\,\mathrm{Log}\left(\frac{Vin}{Vout}\right)$		dB	2400 Hz, nominal line
No load power dissipation		1.35	2		1.35	2	Watts	

CONVERTER SPECIFICATIONS (cont.)

■ OUTPUT CHARACTERISTICS

Parameter	VI-J00 E-Grade Min	Typ	Max	VI-J00 C-, I-, M-Grade Min	Typ	Max	Units	Test Conditions
Setpoint accuracy		1%	2%		0.5%	1%	V_{NOM}	
Load/line regulation			0.5%		0.05%	0.2%	V_{NOM}	LL to HL, 10% to Full Load
			1%		0.2%	0.5%	V_{NOM}	LL to HL, No Load to 10%
Output temperature drift		0.02			0.01	0.02	% / °C	Over rated temperature
Long term drift		0.02			0.02		%/1K hours	
Output ripple – pp:								
2 V, 3.3 V			200		100	150	mV	20 MHz bandwidth
5 V			5%		2%	3%	V_{NOM}	20 MHz bandwidth
10 – 95 V			3%		0.75%	1.5%	V_{NOM}	20 MHz bandwidth
Trim range[a]	50%		110%	50%		110%	V_{NOM}	
Total remote sense compensation	0.5			0.5			Volts	0.25 V max. neg. leg
Current limit	105%		135%	105%		125%	$I_{full\ load}$	Automatic restart
Short circuit current	105%		140%	105%		130%	$I_{full\ load}$	Automatic restart

[a] 10 V, 12 V, 13.8 V, 15 V outputs, or "V" input range have standard trim range ±10%. Consult factory for wider trim range.
95 V output –50 + 0% trim range.

■ CONTROL PIN SPECIFICATIONS

Parameter	VI-J00 E-Grade Min	Typ	Max	VI-J00 C-, I-, M-Grade Min	Typ	Max	Units	Test Conditions
Gate out impedance		50			50		Ohms	
Gate in impedance		1000			1000		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	

CONVERTER SPECIFICATIONS (cont.)

■ DIELECTRIC WITHSTAND CHARACTERISTICS

Parameter	VI-J00 E-Grade Min	Typ	Max	VI-J00 C-, I-, M-Grade Min	Typ	Max	Units	Test Conditions
Input to output	3,000			3,000			VRMS	Baseplate earthed
Output to baseplate	500			500			VRMS	
Input to baseplate	1,500			1,500			VRMS	

■ THERMAL CHARACTERISTICS

Parameter	VI-J00 E-Grade Min	Typ	Max	VI-J00 C-, I-, M-Grade Min	Typ	Max	Units	Test Conditions
Efficiency		78 – 88%			80 – 90%			
Baseplate to sink		0.14			0.14		°C/Watt	With Vicor P/N 20267

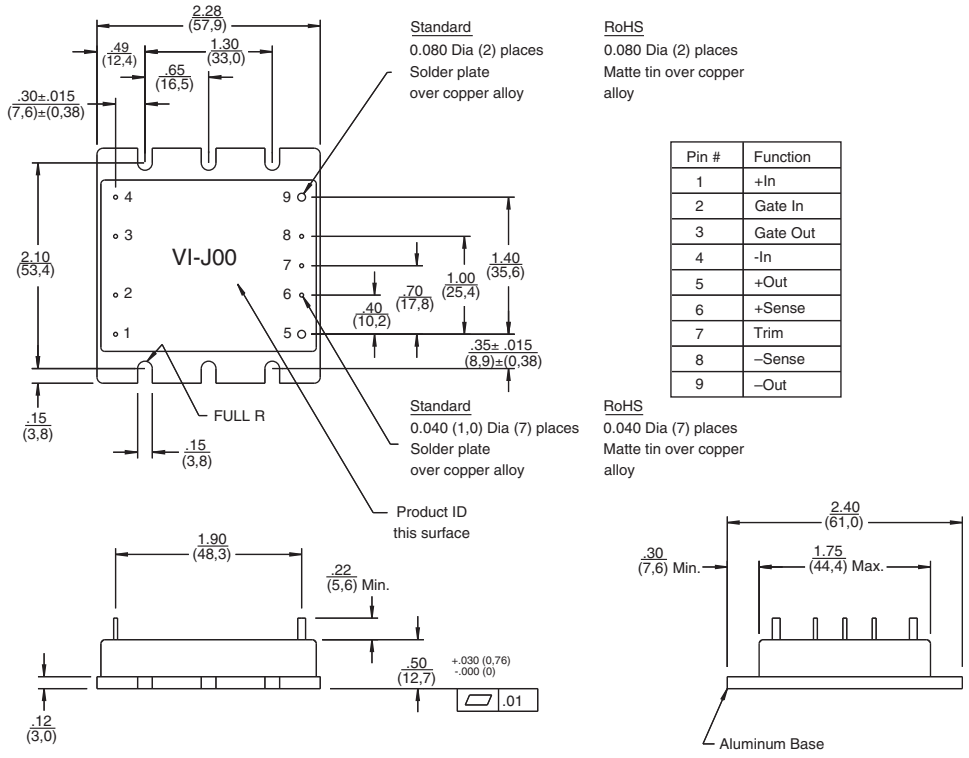
■ MECHANICAL SPECIFICATIONS

Parameter	VI-J00 E-, C-Grade Min	Typ	Max	VI-J00 I-, M-Grade Min	Typ	Max	Units	Test Conditions
Weight	2.9	3.2	3.6	3.4	3.8	4.1	Ounces	
	82.8	92	101.2	96.3	107	117.7	Grams	

■ PRODUCT GRADE TEMPERATURES

Parameter	Storage	Operating	Units	Notes
E	-20 to +105	-10 to + 100	°C	
C	-40 to +105	-25 to + 100	°C	
I	-55 to +105	-40 to + 100	°C	
M	-65 to +105	-55 to + 100	°C	

MECHANICAL DRAWING



Pin #	Function
1	+In
2	Gate In
3	Gate Out
4	-In
5	+Out
6	+Sense
7	Trim
8	–Sense
9	–Out

■ PACKAGING OPTIONS

Flangeless package

2.28"L x 1.80"W x 0.50"H
(57,9 x 45,7 x 12,7 mm)

To order the SlimMod configuration add the suffix "–S" to the standard module part number.

Qty (2) grounding clips are included with each SlimMod P/N 32187

Flangeless package with integral heat sink

Longitudinal, 0.25"(6.35 mm) fins — add suffix "–F1"
Longitudinal, 0.50"(12.7 mm) fins — add suffix "–F2"

Transverse, 0.25"(6.35 mm) fins — add suffix "–F3"
Transverse, 0.50"(12.7 mm) fins — add suffix "–F4"

Available with longitudinal or transverse fins of 0.25"(6.35 mm) or 0.50"(12.7 mm) height. Add the appropriate suffix to the module part number.

Qty (4) grounding clips are included with each FinMod
F1, F2 P/N 32185
F3, F4 P/N 32186

MegaMod Jr.

Chassis mount alternatives, one, two, or three outputs: up to 300 W

1 up – 2.58" x 2.5" x 0.62" (65,5 x 63,5 x 15,7 mm)
2 up – 2.58" x 4.9" x 0.62" (65,5 x 124,5 x 15,7 mm)
3 up – 2.58" x 7.3" x 0.62" (65,5 x 185,4 x 15,7 mm)

BusMod

2.28"L x 2.40"W x 1.08"H
(57,9 x 61,0 x 27,4 mm)

To order the BusMod fully assembled, add suffix "–B1" to the standard module part number.

To order the BusMod separately:
Half-sized BusMod — P/N 18952

See BusMod Mechanical Drawings for more details.

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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