DC-DC Converters

VI-200
VE-200



50 to 200 Watts

Features

- Isolated output
- Up to 50 W/in^3
- cURus, cTÜVus
- Up to 90% efficiency
- Size: 4.6" x 2.4" x 0.5" (116,8 x 61,0 x 12,7mm)
- Remote sense and current limit
- OVP, thermal shutdown
- Logic disable
- Wide range output adjust
- Compatible power booster modules
- ZCS power architecture
- Low noise FM control
- CE Marked
- RoHS compliant (VE-200)

Product Highlights

The VI-200 family, with over 14 million units shipped, is Vicor's broad series of "zero-current-switching" component-level DC-DC converters.

Operating at frequencies up to 2 MHz, VI-200 family converters offer exceptional power density, efficiency, noise performance, reliability and ease of use. Booster modules (VI-Bxx) provide a simple, cost-effective, off-the-shelf solution for higher power output requirements. One or more boosters may be used to create synchronous arrays capable of supplying several kilowatts of output power.

The flexibility of Vicor's power components is also available in half-size, half-power VI-J00 MiniMods.

Part Numbering

VI	–	2	6	1	–	C	W

Family
VI = Non-RoHS
VE = RoHS

Series
2 = 200
B = Booster

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

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 85°C
C = –25 to 85°C
I = –40 to 85°C
M = –55 to 85°C

Power

≥ 5 V	**< 5 V**
U = 200 W	**U** = 40 A
V = 150 W	**V** = 30 A
W = 100 W	**W** = 20 A
X = 75 W	**X** = 15 A
Y = 50 W	**Y** = 10 A

Maximum Power Available for VI-2xx-xx [a]

Input				Output																						
Voltage Nom. (Range)	Low Line 75% Max Power	Transient[b]	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	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24 (10-36)	n/a	n/a	**V**	--	X	Y	Y	Y	Y	Y	X	X	X	X	X	X	X	X	X	X	X	--	--	--	--	--
24 (21-32)	18	36	**1**	U	U	U	U	U	U	V	V	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
24 (18-36)	n/a	n/a	**W**	V	V	V	V	V	V	W	W	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
36 (21-56)	18	60	**2**	W	V	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	--	--	--	--
48 (42-60)	36	72	**3**	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
48 (36-76)	n/a	n/a	**N**	V	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
72 (55-100)	45	110	**4**	U	U	U	U	U	U	V	V	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
110 (66-160)	n/a	n/a	**T**	V	V	V	V	V	V	W	W	V	V	V	V	V	V	V	V	V	V	V	V	--	--	--
150 (100-200)	85[c]	215	**5**	U	U	V	V	V	V	V	V	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
150 (100-375)	n/a	n/a	**7**	W	W	X	Y	Y	Y	W	W	W	W	W	W	W	W	W	W	W	W	W	--	--	--	--
300 (200-400)	170[d]	425	**6**	U	U	U	U	U	U	V	V	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

[a] For additional output power, "booster" modules are available. (VI-Bxx-xx)

[b] Transient voltage for 1 second.

[c] 15 Vout, 200 W models are limited to 90 Vdc

[d] 15 Vout, 200 W models are limited to 185 Vdc

CONVERTER SPECIFICATIONS

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

■ INPUT SPECIFICATIONS

Parameter	VI-200 E-Grade Min	VI-200 E-Grade Typ	VI-200 E-Grade Max	VI-200 C-, I-, M-Grade Min	VI-200 C-, I-, M-Grade Typ	VI-200 C-, I-, M-Grade Max	Units	Test Conditions
Inrush charge		120×10^{-6}			120×10^{-6}	200×10^{-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-200 E-Grade Min	VI-200 E-Grade Typ	VI-200 E-Grade Max	VI-200 C-, I-, M-Grade Min	VI-200 C-, I-, M-Grade Typ	VI-200 C-, I-, M-Grade 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
Load/line regulation			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 temp.
Long term drift		0.02			0.02		%/1K hours	
Output ripple – pp:								
2 V, 3.3 V			150		60	100	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
OVP set point		125%[b]		115%	125%[b]	135%	V_{NOM}	Recycle power
Current limit	105%		135%	105%		125%	$I_{full\ load}$	Automatic restart
Short circuit current[c]	20%		140%	20%		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.
3.3 V output trim range 2.20 to 3.63 V, 95 V output –50 + 0% trim range.

[b] 131% nominal for booster modules.

[c] Output voltages of 3.3 V or 5 V incorporate foldback current limiting; For output voltages from 5.2 V to 7.5 V consult factory; All other outputs provide constant current limiting.

■ CONTROL PIN SPECIFICATIONS

Parameter	VI-200 E-Grade Min	VI-200 E-Grade Typ	VI-200 E-Grade Max	VI-200 C-, I-, M-Grade Min	VI-200 C-, I-, M-Grade Typ	VI-200 C-, I-, M-Grade Max	Units	Test Conditions
Gate out impedance		50			50		Ohms	
Gate in impedance		1000			1000		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	0.95		1.05	0.95		1.05		

CONVERTER SPECIFICATIONS (cont.)

■ DIELECTRIC WITHSTAND CHARACTERISTICS

Parameter	VI-200 E-Grade Min	VI-200 E-Grade Typ	VI-200 E-Grade Max	VI-200 C-, I-, M-Grade Min	VI-200 C-, I-, M-Grade Typ	VI-200 C-, I-, M-Grade 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-200 E-Grade Min	VI-200 E-Grade Typ	VI-200 E-Grade Max	VI-200 C-, I-, M-Grade Min	VI-200 C-, I-, M-Grade Typ	VI-200 C-, I-, M-Grade Max	Units	Test Conditions
Efficiency		78 – 88%			80 – 90%			
Baseplate to sink thermal impedance		0.07			0.07		°C/Watt	With Vicor P/N 20266
Thermal shutdown[d] (Drivers only)	90	95	105	90	95	105	°C	Cool and recycle power to restart

[d] No overtemp protection in booster modules.

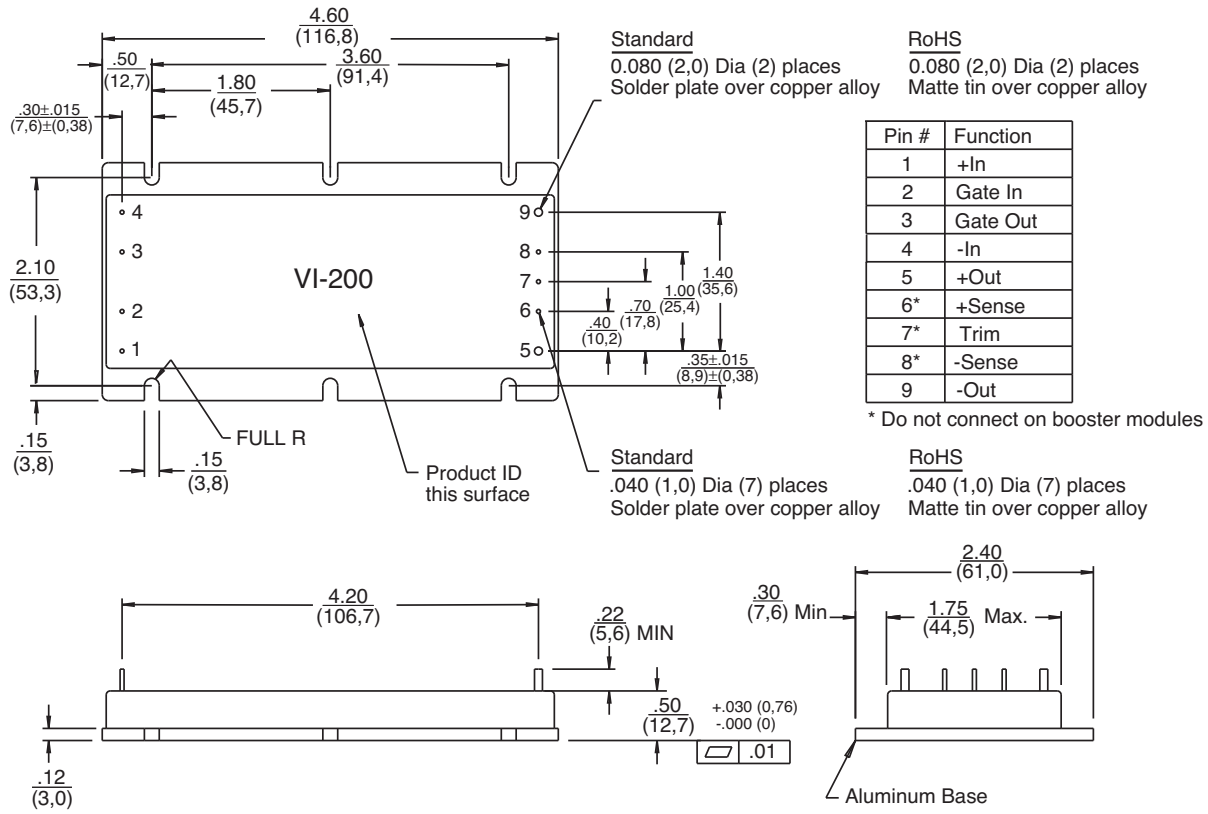
■ MECHANICAL SPECIFICATIONS

Parameter	VI-200 E-, C-Grade Min	VI-200 E-, C-Grade Typ	VI-200 E-, C-Grade Max	VI-200 I-, M-Grade Min	VI-200 I-, M-Grade Typ	VI-200 I-, M-Grade Max	Units	Test Conditions
Weight	5.7 (160.2)	6.3 (178)	6.9 (195.8)	6.6 (187.2)	7.3 (208)	8.1 (228.8)	Ounces (Grams)	

■ PRODUCT GRADE TEMPERATURES

Parameter	Storage	Operating	Units	Notes
E	-20 to +100	-10 to + 85	°C	Overtemperature shutdown 95°C typical (recycle power to restart)
C	-40 to +100	-25 to + 85	°C	
I	-55 to +100	-40 to + 85	°C	
M	-65 to +100	-55 to + 85	°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

* Do not connect on booster modules

■ PACKAGING OPTIONS

SlimMod
Flangeless package



4.60"L x 1.80"W x 0.50"H
(116,8 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

FinMod
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
Chassis mount alternatives, one, two, or three outputs: up to 600 W



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

BusMod



4.60"L x 2.40"W x 1.08"H
(116,8 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:
Full-sized BusMod — P/N 06322

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.

Information furnished by Vicor is believed to be accurate and reliable. However, no responsibility is assumed by Vicor for its use. Vicor makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication. Vicor reserves the right to make changes to any products, specifications, and product descriptions at any time without notice. Information published by Vicor has been checked and is believed to be accurate at the time it was printed; however, Vicor assumes no responsibility for inaccuracies. Testing and other quality controls are used to the extent Vicor deems necessary to support Vicor's product warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

Specifications are subject to change without notice.

Vicor's Standard Terms and Conditions

All sales are subject to Vicor's Standard Terms and Conditions of Sale, which are available on Vicor's webpage or upon request.

Product Warranty

In Vicor's standard terms and conditions of sale, Vicor warrants that its products are free from non-conformity to its Standard Specifications (the "Express Limited Warranty"). This warranty is extended only to the original Buyer for the period expiring two (2) years after the date of shipment and is not transferable.

UNLESS OTHERWISE EXPRESSLY STATED IN A WRITTEN SALES AGREEMENT SIGNED BY A DULY AUTHORIZED VICOR SIGNATORY, VICOR DISCLAIMS ALL REPRESENTATIONS, LIABILITIES, AND WARRANTIES OF ANY KIND (WHETHER ARISING BY IMPLICATION OR BY OPERATION OF LAW) WITH RESPECT TO THE PRODUCTS, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OR REPRESENTATIONS AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, INFRINGEMENT OF ANY PATENT, COPYRIGHT, OR OTHER INTELLECTUAL PROPERTY RIGHT, OR ANY OTHER MATTER.

This warranty does not extend to products subjected to misuse, accident, or improper application, maintenance, or storage. Vicor shall not be liable for collateral or consequential damage. Vicor disclaims any and all liability arising out of the application or use of any product or circuit and assumes no liability for applications assistance or buyer product design. Buyers are responsible for their products and applications using Vicor products and components. Prior to using or distributing any products that include Vicor components, buyers should provide adequate design, testing and operating safeguards.

Vicor will repair or replace defective products in accordance with its own best judgment. For service under this warranty, the buyer must contact Vicor to obtain a Return Material Authorization (RMA) number and shipping instructions. Products returned without prior authorization will be returned to the buyer. The buyer will pay all charges incurred in returning the product to the factory. Vicor will pay all reshipment charges if the product was defective within the terms of this warranty.

Life Support Policy

VICOR'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE CHIEF EXECUTIVE OFFICER AND GENERAL COUNSEL OF VICOR CORPORATION. As used herein, life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness. Per Vicor Terms and Conditions of Sale, the user of Vicor products and components in life support applications assumes all risks of such use and indemnifies Vicor against all liability and damages.

Intellectual Property Notice

Vicor and its subsidiaries own Intellectual Property (including issued U.S. and Foreign Patents and pending patent applications) relating to the products described in this data sheet. No license, whether express, implied, or arising by estoppel or otherwise, to any intellectual property rights is granted by this document. Interested parties should contact Vicor's Intellectual Property Department.

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