

#### **Features**

- RoHS compliant (VE-200)
- Up to  $50 \text{ W/in}^3$
- · cULus, 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

#### **Product Highlights**

The VI-200 family, with over 12 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.

#### **Packaging Options**

SlimMods<sup>TM</sup>, high power density, flangeless devices and FinMods<sup>TM</sup>, featuring integral finned heatsinks.

**SlimMod:** Option suffix: **- S** Example: VI - 2XX - XX **- S** 

FinMod: Option suffix: - F1, - F2, -F3 or -F4

Examples:

VI - 2XX - XX -F1, 0.25" fins, longitudinal VI - 2XX - XX -F2, 0.50" fins, longitudinal VI - 2XX - XX -F3, 0.25" fins, transverse

VI - 2XX - XX - **F3**, 0.25 fins, transverse VI - 2XX - XX - **F4**, 0.50" fins, transverse

**BusMod:** Option suffix: -B1 **MegaMod:** VI - LXX - XX

# Data Sheet VI-200, VE-200 DC-DC Converters 50 to 200 Watts



#### **Converter Selection Chart**



[a] E for RoHS compliant

## **└** Input Voltage

Nominal	Input Range Full Power	Max Power [b]	Low Line 75% Max Power	Transient [c]
<b>0</b> = 12 V	10 – 20 V	(1)	n/a	22 V
<b>V</b> = 24 V	10 – 36 V	(7)	n/a	n/a
1 = 24 V	21 – 32 V	(4)	18	36 V
<b>W</b> = 24 V	18 – 36 V	(2)	n/a	n/a
<b>2</b> = 36 V	21 – 56 V	(3)	18	60 V
<b>3</b> = 48 V	42 – 60 V	(4)	36	72 V
<b>N</b> = 48 V	36 – 76 V	(4)	n/a	n/a
4 = 72 V	55 – 100 V	(4)	45	110 V
<b>T</b> = 110 V	66 – 160 V	(2)	n/a	n/a
<b>5</b> = 150 V	100 – 200 V	(5)	85	215 V
<b>6</b> = 300 V	200 – 400 V	(4)	170	425 V
<b>7</b> = 150/300 V	100 – 375 V	(6)	90	n/a

<sup>[b]</sup> Maximum Power	5 V Outputs	>5 V Outputs	<5 V Outputs
(1)	75 W	75 W	15 A
(2)	150 W	150 W	30 A
(3)	100 W	100 W	20 A
(4)	200 W	200 W	40 A
(5)	150 W	200 W	40 A
(6)	75 W	100 W	20 A
(7)	50 W	75 W <sup>[d]</sup>	15 A

<sup>[</sup>c] Transient voltage for 1 second.

# **Output Voltage**

<b>Z</b> =	2.0 V	2 =	15 V
Y =	3.3 V	N =	18.5 V
0 =	5.0 V	3 =	24 V
<b>X</b> =	5.2 V	L =	28 V
W =	5.5 V	J =	36 V
<b>V</b> =	5.8 V	K =	40 V
T =	6.5 V	4 =	48 V
<b>R</b> =	7.5 V	H =	52 V
M =	10 V	F =	72 V
1 =	12 V	D =	85 V
<b>P</b> =	13.8 V	B =	95 V

# Product Grade Temperatures (°C)

Operating	Storage					
$\mathbf{E} = -10 \text{ to } +85$	$\mathbf{E} = -20 \text{ to } +100$					
$\mathbf{C} = -25 \text{ to } +85$	$\mathbf{C} = -40 \text{ to } +100$					
I = -40  to  +85	I = -55  to  +100					
M = -55  to  +85	M = -65  to  +100					
Overtemperature sh	nutdown 95°C typical					
(recycle pow	ver to restart)					

# Output Power/Current Vout

≥ 5 V	<5 V
<b>Y</b> = 50 W	<b>Y</b> = 10 A
X = 75 W	<b>X</b> = 15 A
<b>W</b> = 100 W	<b>W</b> = 20 A
V = 150 W	<b>V</b> = 30 A
<b>U</b> = 200 W	<b>U</b> = 40 A
	"D ! "

For additional output power use "Boosters".

Change (VI-2xx-xx) to (VI-Bxx-xx)

Vicor Corp. Tel: 800-735-6200, 978-470-2900 Fax: 978-475-6715

VI-200 DC-DC Converters 50 to 200 Watts

Rev. 2.4

Page 1 of 5

<sup>[</sup>d] X,V, and T outputs are 50 W max.

#### **CONVERTER SPECIFICATIONS**

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

#### **■ INPUT SPECIFICATIONS**

	V	I-200 E-Grad	<u>e</u>	VI	-200 C-, I-, M-	Grade		
Parameter	Min	Тур	Max	Min	Тур	Max	Units	Test Conditions
Inrush charge		120 x 10 <sup>-6</sup>			120 x 10 <sup>-6</sup>	200 x 10 <sup>-6</sup>	Coulombs	Nominal line
Input reflected ripple current – pp		10%			10%			Nominal line, full load
Input ripple rejection	25+20 Log(Vin Vout)				$30+20 \operatorname{Log}\left(\frac{\operatorname{Vin}}{\operatorname{Vout}}\right)$			120 Hz, nominal line
					$20 + 20 \operatorname{Log}\left(\frac{\operatorname{Vii}}{\operatorname{Vo}}\right)$	$\frac{n}{ut}$	dB	2400 Hz, nominal line
No load power dissipation		1.35	2		1.35	2	Watts	

#### ■ OUTPUT CHARACTERISTICS

	VI	-200 E-Grac	l <u>e</u>	VI-	200 C-, I-, M-C	<u>Grade</u>		
Parameter	Min	Тур	Max	Min	Тур	Max	Units	Test Conditions
Setpoint accuracy		1%	2%		0.5%	1%	Vnom	
Load/line regulation			0.5%		0.05%	0.2%	Vnom	LL to HL, 10% to Full Load
Load/line regulation			1%		0.2%	0.5%	V <sub>NOM</sub>	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%	Vnom	20 MHz bandwidth
10 – 48 V			3%		0.75%	1.5%	Vnom	20 MHz bandwidth
Trim range <sup>[a]</sup>	50%		110%	50%		110%	Vnom	
Total remote sense compensation	0.5			0.5			Volts	0.25 V max. neg. leg
OVP set point		125% <sup>[b]</sup>		115%	125% <sup>[b]</sup>	135%	Vnom	Recycle power
Current limit	105%		135%	105%		125%	Іпом	Automatic restart
Short circuit current [c]	20%		140%	20%		130%	Іпом	

<sup>[</sup>a] 10 V, 12 V, 15 V outputs, and V input range (10 – 36 V) 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.

#### ■ CONTROL PIN SPECIFICATIONS

	VI-200 E-Grade			<u>VI-2</u>	VI-200 C-, I-, M-Grade			
Parameter	Min	Тур	Max	Min	Тур	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		

*Vicor Corp.* Tel: 800-735-6200, 978-470-2900 Fax: 978-475-6715

VI-200 DC-DC Converters 50 to 200 Watts

Rev. 2.4

Page 2 of 5

<sup>[</sup>b] 131% nominal for booster modules.

<sup>[</sup>c] Output voltages of 3.3 V or 5 V incorporate foldback current limiting; all other outputs provide constant current limiting.

### **CONVERTER SPECIFICATIONS (cont.)**

#### **■ DIELECTRIC WITHSTAND CHARACTERISTICS**

	VI-200 E-Grade			VI-2	VI-200 C-, I-, M-Grade			
Parameter	Min	Тур	Max	Min	Тур	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**

VI-200 E-Grade					VI-200 C-, I-, M-Grade			
Parameter	Min	Тур	Max	Min	Тур	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 <sup>[d]</sup> (Drivers only)	90	95	105	90	95	105	°C	Cool and recycle power to restart

<sup>[</sup>d] No overtemp protection in booster modules.

#### **■ MECHANICAL SPECIFICATIONS**

	VI-200 E-, C-Grade			<u>VI</u> -	VI-200 I-, M-Grade			
Parameter	Min	Тур	Max	Min	Тур	Max	Units	Test Conditions
Weight	6.2 (176)	6.3 (178)	6.4 (181)	7.2 (205)	7.3 (208)	7.4 (210)	Ounces (Grams)	

Set your site on VICOR at www.vicorpower.com



#### Warranty

Vicor products are guaranteed for two years from date of shipment against defects in material or workmanship when in normal use and service. This warranty does not extend to products subjected to misuse, accident, or improper application or maintenance. Vicor shall not be liable for collateral or consequential damage. This warranty is extended to the original purchaser only.

EXCEPT FOR THE FOREGOING EXPRESS WARRANTY, VICOR MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Vicor will repair or replace defective products in accordance with its own best judgement. 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.

Information published by Vicor has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Vicor reserves the right to make changes to any products without further notice to improve reliability, function, or design. Vicor does not assume any liability arising out of the application or use of any product or circuit; neither does it convey any license under its patent rights nor the rights of others. Vicor general policy does not recommend the use of its components in life support applications wherein a failure or malfunction may directly threaten life or injury. Per Vicor Terms and Conditions of Sale, the user of Vicor components in life support applications assumes all risks of such use and indemnifies Vicor against all damages.

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 components are not designed to be used in applications, such as life support systems, wherein a failure or malfunction could result in injury or death. All sales are subject to Vicor's Terms and Conditions of Sale, which are available upon request.

Specifications are subject to change without notice.

#### **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. 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