



Data Sheet

VI-2xx, VI-Jxx

DC-DC Converters

Industrial Grade

Railway Series

Features

- Wide input range: 66-160 V
- cULus, cTUVus, CE Marked
- Up to 90% efficiency
- Remote sense and current limit
- OVP, thermal shutdown (VI-2xx only)
- Logic disable
- Wide range output adjust
- Compatible power booster modules
- ZCS Power architecture
- Low noise FM control
- -40°C operation, -55°C storage



Product Highlights

The VI-2xx/VI-Jxx family, with over 20 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.

Packaging Options

SlimMods™, high power density, flangeless packages and FinMods™, 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 -F4, 0.50" fins, transverse
- VI - JXX - XX -F1, 0.75" height
- VI - JXX - XX -F2, 1.00" height

Converter Selection Chart

Model	Input Voltage	Output Voltage	Output Power	Operating Temp. Range	Storage Temp. Range	Notes
VI-2T0-07	66-160 V	5 V	150 W	-40 to +85°C	-55 to +100°C	
VI-2T1-05	66-160 V	12 V	150 W	-40 to +85°C	-55 to +100°C	
VI-2T2-01	66-160 V	15 V	150 W	-40 to +85°C	-55 to +100°C	
VI-2T3-06	66-160 V	24 V	150 W	-40 to +85°C	-55 to +100°C	
VI-2TL-01	66-160 V	28 V	150 W	-40 to +85°C	-55 to +100°C	
VI-BT0-01	66-160 V	5 V	150 W	-40 to +85°C	-55 to +100°C	Booster module for VI-2T0-07
VI-BT1-03	66-160 V	12 V	150 W	-40 to +85°C	-55 to +100°C	Booster module for VI-2T1-05
VI-BT2-01	66-160 V	15 V	150 W	-40 to +85°C	-55 to +100°C	Booster module for VI-2T2-01
VI-BT3-02	66-160 V	24 V	150 W	-40 to +85°C	-55 to +100°C	Booster module for VI-2T3-06
VI-BTL-01	66-160 V	28 V	150 W	-40 to +85°C	-55 to +100°C	Booster module for VI-2TL-01
VI-JT0-03	66-160 V	5 V	75 W	-40 to +100°C	-55 to +105°C	
VI-JT1-04	66-160 V	12 V	100 W	-40 to +100°C	-55 to +105°C	
VI-JT2-03	66-160 V	15 V	100 W	-40 to +100°C	-55 to +105°C	
VI-JT3-03	66-160 V	24 V	100 W	-40 to +100°C	-55 to +105°C	
VI-JTL-02	66-160 V	28 V	100 W	-40 to +100°C	-55 to +105°C	

CONVERTER SPECIFICATIONS

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

INPUT SPECIFICATIONS

Parameter	VI-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
Inrush charge		60×10^{-6}	100×10^{-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		$30 + 20 \text{Log} \left(\frac{V_{in}}{V_{out}} \right)$			$30 + 20 \text{Log} \left(\frac{V_{in}}{V_{out}} \right)$		dB	120 Hz, nominal line
		$20 + 20 \text{Log} \left(\frac{V_{in}}{V_{out}} \right)$			$20 + 20 \text{Log} \left(\frac{V_{in}}{V_{out}} \right)$		dB	2400 Hz, nominal line
No load power dissipation		1.35	2		1.35	2	Watts	

OUTPUT CHARACTERISTICS

Parameter	VI-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
Setpoint accuracy		0.5%	1%		0.5%	1%	V_{NOM}	
Load/line regulation		0.05%	0.2%		0.05%	0.2%	V_{NOM}	LL to HL, 10% to Full Load
Load/line regulation		0.2%	0.5%		0.2%	0.5%	V_{NOM}	LL to HL, No Load to 10%
Output temperature drift		0.01	0.02		0.01	0.02	% / $^{\circ}\text{C}$	Over rated temp.
Long term drift		0.02			0.02		%/1K hours	
Output ripple – pp:								
5 V		2%	3%		2%	3%	V_{NOM}	20 MHz bandwidth
10 – 48 V		0.75%	1.5%		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		N/A		115%	125% ^[b]	135%	V_{NOM}	Recycle power
Current limit	105%		125%	105%		125%	I_{NOM}	Automatic restart
Short circuit current ^[c]	105%		130%	20%		130%	I_{NOM}	

^[a] 10 V, 12 V and 15 V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.
3.3 V output trim range 2.20 to 3.63 V

^[b] 131% nominal for booster modules.

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

CONTROL PIN SPECIFICATIONS

Parameter	VI-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
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-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
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}	

■ THERMAL CHARACTERISTICS

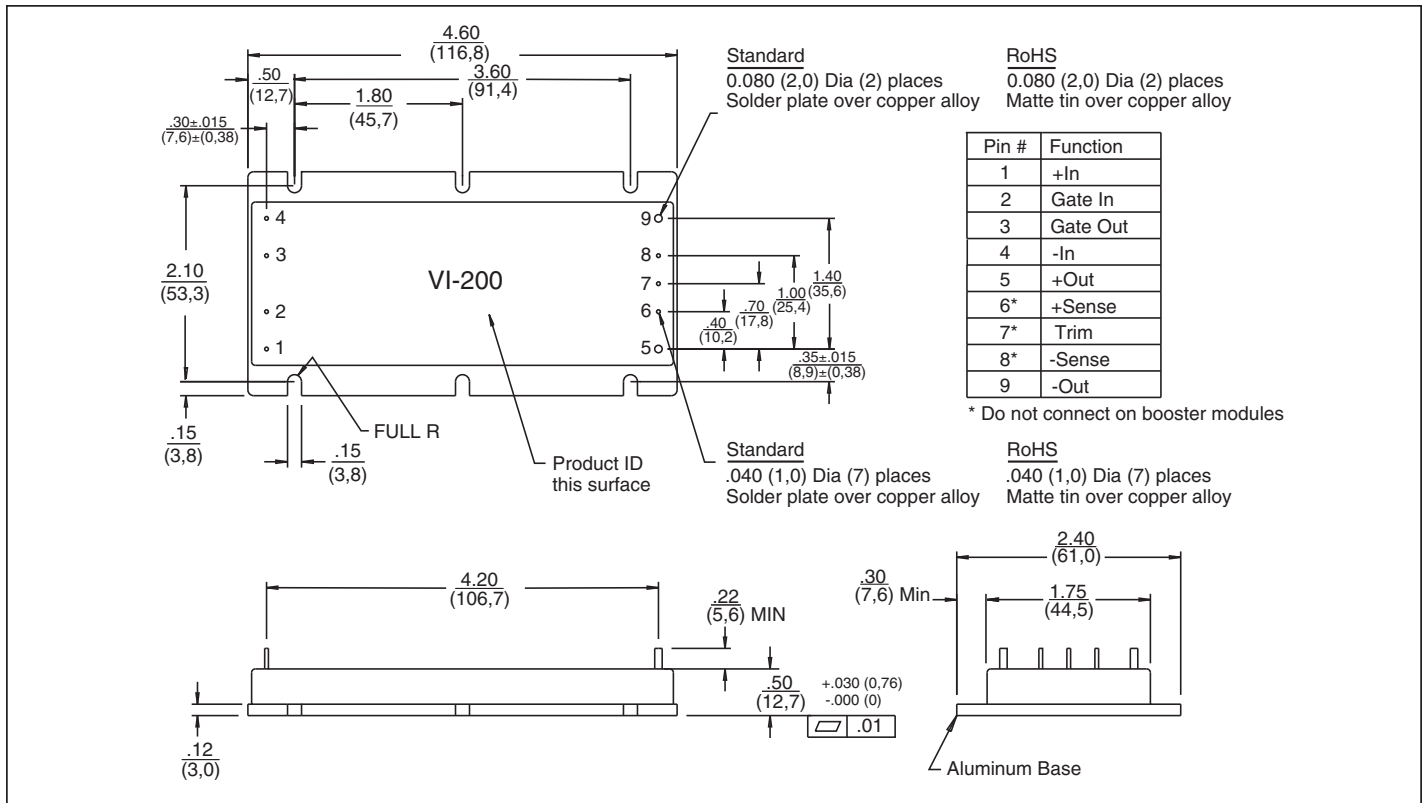
Parameter	VI-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
Efficiency		80 – 90%			80 – 90%			
Baseplate to sink thermal impedance		0.14			0.07		°C/Watt	With Vicor P/N 20266
Thermal shutdown ^[d] (Drivers only)		N/A		90	95	105	°C	Cool and recycle power to restart

^[d] No overtemp protection in booster modules.

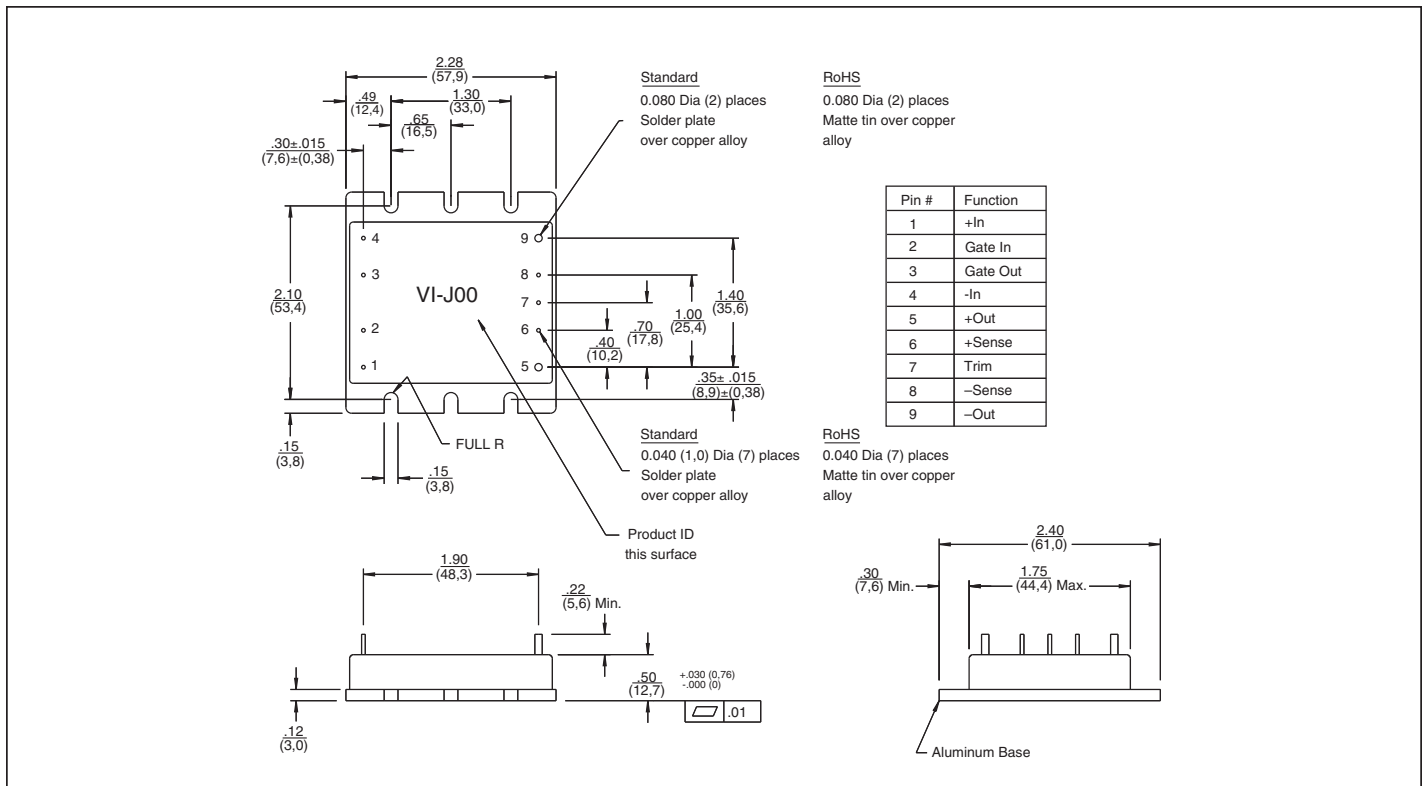
■ MECHANICAL SPECIFICATIONS

Parameter	VI-JTx-xx			VI-2Tx-xx			Units	Test Conditions
	Min	Typ	Max	Min	Typ	Max		
Weight		3.0 (85)			6.0 (170)		Ounces (Grams)	

MECHANICAL DRAWING



VI-2xx mechanical drawing



VI-Jxx mechanical drawing

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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