



MI-200TM

Military DC-DC Converters 50 to 100W

Product Highlights

The MI-Series is designed for military applications and is based on Vicor's 1st Generation family of zero-current/zero-voltage switching, component level DC-DC converters. Operating at frequencies in excess of 1MHz, the MI-Series offers state-of-the-art performance in terms of power density, efficiency, noise, ease of use, and reliability.

All units are manufactured in ISO 9001-registered facilities. Full epoxy encapsulation in Vicor's industry standard package enables the MI-Series to meet MIL-STD-810 environmental requirements for humidity, fungus, salt, fog, explosive atmosphere, acceleration, vibration, and shock. (See page 32.)

Standard features such as wide output trimming/programming, current limiting, remote sense, output inhibit, and latching OVP and OTP combine to offer a high degree of protection, versatility, and reliability for military power systems.

Features

- ✦ Inputs:
 - 28Vdc per MIL-STD-704D/E
 - 155Vdc per MIL-STD-1399A
 - 270Vdc per MIL-STD-704D/E
- ✦ Single output: 2 – 48Vdc
- ✦ Up to 23W/in³
- ✦ MIL-STD-810 environments
- ✦ Up to 90% efficiency
- ✦ Remote sense
- ✦ Current limit
- ✦ OVP and thermal shutdown
- ✦ Power boosters for higher power outputs
- ✦ ZVS/ZCS power architecture
- ✦ Low noise FM control
- ✦ Size: 4.6" x 2.4" x 0.5" (116,8 x 61,0 x 12,7mm)

Converter/Booster Specifications

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

PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Characteristics					
Input voltage range	See input voltage chart				
No load power dissipation	1.35	2.0		Watts	
Output Characteristics					
Set point accuracy		0.5	1.0	% Vnom	
Load/line regulation		0.05	0.2	% Vnom	LL to HL, 10% to FL
		0.2	0.5	% Vnom	LL to HL, NL to 10%
Output temperature drift		0.01	0.02	%/°C	
Output noise - pp		1.0	1.5	% Vnom	} Whichever is greater 20MHz BW
		100	150	mV	
Output voltage trimming ⁽¹⁾	50		110	% Vnom	
Remote sense compensation		0.5		Vdc	
OVP set point ⁽²⁾	115	125	135	% Vnom	Latching
Current limit	105		125	% Inom	Auto restart
Short circuit current ⁽³⁾	20		130	% Inom	
Control Pin Characteristics					
Gate-in high threshold		6		Vdc	
Gate-in low threshold	0.65			Vdc	
Gate-in low current			6	mA	
Power sharing accuracy	0.95		1.05		
Isolation Characteristics					
Isolation (input to output)	3,000			Vrms	
Isolation (output to baseplate)	500			Vrms	
Isolation (input to baseplate)	1,500			Vrms	
Input/output capacitance		50	75	pF	
Environmental (MIL-STD-810)					
Altitude - method 500.2	70,000			feet	Procedure II
Humidity - method 507.2	86/240			%/hours	Procedure 1, cycle 1
Acceleration - method 513.3	9			g's	Procedure 2
Vibration - method 514.3	20			g's	Procedure 1, category 6
Shock - method 516.3	40			g's	Procedure 1
Reliability (MIL-HDBK-217F)					
25°C Ground Benign: G.B.		2,478,477		hours	
50°C Naval Sheltered: N.S.		584,920		hours	
65°C Airborne Inhabited Cargo: A.I.C.		483,303		hours	
Thermal Characteristics					
Efficiency		80-90		%	
Baseplate to sink		0.07		°C/W	With thermal pads
Thermal shutdown	90	95	105	°C	Latching
Baseplate operating temperature			+85	°C	See product grade
Storage temperature			+100	°C	See product grade
Mechanical Specifications					
Weight		6.0 (170)		ounces (grams)	

⁽¹⁾ 10V, 12V, and 15V outputs, standard trim range $\pm 10\%$. Consult factory for wider trim range.

⁽²⁾ No over temperature or voltage protection in booster modules.

⁽³⁾ Output voltages of 5V or less incorporate foldback current limiting; outputs of 10V and above provide constant current limiting.

Configuration Chart

MI - 2

Semi-custom driver and booster modules available: *Consult factory.*

(1) 16V operation at 75% load.

(2) These units rated at 75% load from 125-150Vin:

MI-26Z-xV
MI-26Y-xV
MI-260-xW

28Vdc input per MIL-STD 704D/E
155Vdc input per DOD-STD-1399A
270Vdc input per MIL-STD-704D/E

Input Voltage		
Nominal	Range	Transient
2 = 28V	18 - 50V ⁽¹⁾	60V
5 = 155V	100 - 210V	230V
6 = 270V	125 - 400V ⁽²⁾	475V
7 = 165V	100 - 310V	

Output Voltage		
Z = 2V	T = 6.5V	N = 18.5V
Y = 3.3V	R = 7.5V	3 = 24V
O = 5V	M = 10V	L = 28V
X = 5.2V	1 = 12V	J = 36V
W = 5.5V	P = 13.8V	K = 40V
V = 5.8V	2 = 15V	4 = 48V

Product Grade	Operating Temp.
I	= -40°C to +85°C
M	= -55°C to +85°C

Output Power/Current	
≥5V	<5V
Y = 50W	10A
X = 75W	15A
W = 100W	20A
V = —	30A

For additional power, 100W and 75W booster modules available. Change MI-2xx-xx to MI-Bxx-xx.

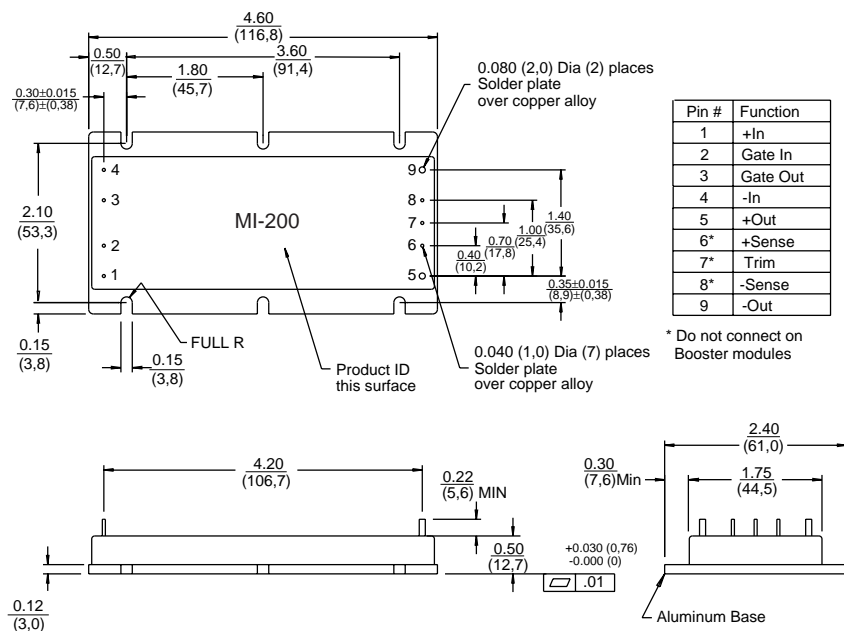
Product Grade Specifications

PARAMETER	PRODUCT GRADE	
	I-Grade	M-Grade
Storage temperature	-55°C to +100°C	-65°C to +100°C
Operating temperature (baseplate)	-40°C to +85°C	-55°C to +85°C
Power cycling burn-in	12 hours, 25 cycles	96 hours, 200 cycles
Temperature cycled with power off	48 hours, 12-16 cycles -55°C to +100°C	48 hours, 12-16 cycles -65°C to +100°C
Test data supplied at these temperatures*	-40°C, +80°C	-55°C, +80°C
Warranty	2 years	2 years
Environmental compliance	MIL-STD-810	MIL-STD-810
Derating	NAVMAT P-4855-1A	NAVMAT P-4855-1A

*Test data available for review or download from vicorpower.com

Mechanical Drawing

MI-200 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

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