



MI-J00™

Military COTS DC-DC Converters 10 to 50 W

Product Highlights

The MI-J00 family of miniaturized DC-DC converters is designed for applications utilizing distributed power architectures. Based on Vicor's 1st Generation family of zero-current/zero-voltage switching, component-level, DC-DC converters, the MI-J00 family offers state-of-the-art performance in terms of power density, efficiency, noise, ease of use, and reliability.

The output voltage can be externally trimmed or programmed from 50% to 110% of nominal output. Current limiting, remote sense, and an inhibit pin all combine to offer a high degree of protection, versatility, and reliability for power systems.

All units are manufactured in ISO 9001-registered facilities. Fully encapsulated in Vicor's industry standard package enables the MI-J00 family units to meet MIL-STD-810 environmental testing requirements for humidity, fungus, salt fog, explosive atmosphere, acceleration, vibration, and shock. (See page 32.)

Features

- ✦ Inputs:
 - 28 Vdc per MIL-STD-704D/E/F
 - 155 Vdc per MIL-STD-1399A
 - 270 Vdc per MIL-STD-704D/E/F
- ✦ Single output: 2 – 48 Vdc
- ✦ Up to 23 W/in³
- ✦ MIL-STD-810 environments
- ✦ Up to 90% efficiency
- ✦ Remote sense
- ✦ Current limit
- ✦ ZVS/ZCS power architecture
- ✦ Low noise FM control
- ✦ Size: 2.28" x 2.4" x 0.5" (57,9 x 61,0 x 12,7 mm)

Converter 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 20 MHz BW
		100	150	mV	
Output voltage trimming ⁽¹⁾	50		110	% Vnom	
Remote sense compensation	0.5			Vdc	
OVP set point		N/A			
Current limit	105		125	% Inom	Auto restart
Short circuit current	105		130	% Inom	
Control Pin Characteristics					
Gate in high threshold		6		Vdc	
Gate in low threshold	0.65			Vdc	
Gate in low current			6	mA	
Isolation Characteristics					
Isolation (input to output)	3,000			V _{rms}	
Isolation (output to baseplate)	500			V _{rms}	
Isolation (input to baseplate)	1,500			V _{rms}	
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 (MI-J21-MY)					
25°C Ground Benign: G.B.		3,619		1,000 hours	
50°C Naval Sheltered: N.S.		2,208		1,000 hours	
65°C Airborne Inhabited Cargo: A.I.C.		1,701		1,000 hours	
Thermal Characteristics					
Efficiency		80-90		%	
Baseplate to sink		0.14		°C/W	With thermal pads
Thermal shut down		N/A			
Baseplate operating temperature			+100	°C	See product grade
Storage temperature			+125	°C	See product grade
Mechanical Specifications					
Weight		3.0 (85)		ounces (grams)	

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

Configuration Chart

MI-J



Semi-custom modules available:
Consult factory.

(1) 16 V operation at 75% load.

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

- MI-J6Z-xY
- MI-J6Y-xY
- MI-J60-xY

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

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

Output Voltage		
Z = 2 V	T = 6.5 V	N = 18.5 V
Y = 3.3 V	R = 7.5 V	3 = 24 V
0 = 5 V	M = 10 V	L = 28 V
X = 5.2 V	1 = 12 V	J = 36 V
W = 5.5 V	P = 13.8 V	K = 40 V
V = 5.8 V	2 = 15 V	4 = 48 V

Product Grade	Operating Temp.
I	= -40°C to +100°C
M	= -55°C to +100°C

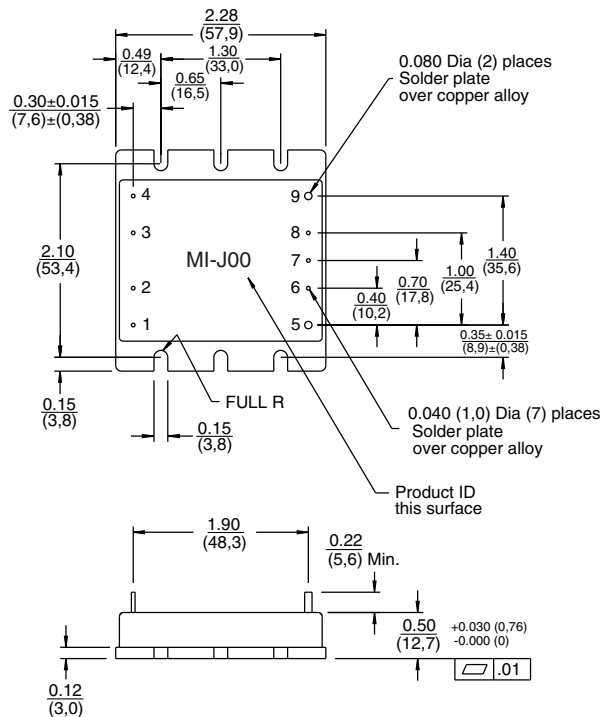
Output Power/Current	
	≥ 5 V < 5 V
A =	10 W —
Z =	25 W 5 A
Y =	50 W 10 A

Product Grade Specifications

PARAMETER	PRODUCT GRADE	
	I-Grade	M-Grade
Storage temperature	-55°C to +125°C	-65°C to +125°C
Operating temperature (baseplate)	-40°C to +100°C	-55°C to +100°C
Power cycling burn-in	12 hours, 25 cycles	96 hours, 200 cycles
Temperature cycled with power off	12 cycles	12 cycles
17°C per minute rate of change	-65°C to +100°C	-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



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

