

MI-J00

10-50W DC-DC CONVERTER MODULE

MILITARY

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
- Efficiency: Up to 90%
- Remote sense
- Current limit
- 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)



PRODUCT INFORMATION

The **MI-J00** family of miniaturized DC-DC converters is designed for applications utilizing distributed power architectures. Based on Vicor's VI-200 / VI-J00 family of zero-current switching, component-level, DC-DC converters, the MI-J00 family offers exceptional performance in terms of power density, efficiency, noise, ease of use, and reliability.

The MI-J00 family meets all steady-state, transient and under / overvoltage requirements of MIL-STD-704D/E/F for both 28 Vdc input (MI-J2X) and 270 Vdc input (MI-J6X), and the worst case envelope of MIL-STD-1399A for 155 Vdc input (MI-J5X).

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.

Fully encapsulated in Vicor's industry standard package, the MI-J00 family units meet MIL-STD-810 environmental testing requirements for humidity, fungus, salt-fog, explosive atmosphere, acceleration, vibration, and shock.

GENERAL SPECIFICATIONS

(At TBP = 25°C, nominal line and 75% unless otherwise specified)

PARAMETER	MIN	TYP	MAX	UNIT	NOTE
INPUT					
Input voltage range	See input voltage chart on the next page				
No load power dissipation	1.35	2.0		Watts	
OUTPUT					
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%

PARAMETER	MIN	TYPE	MAX	UNIT	NOTE
Output temperature drift		0.01	0.02	%/°C	
Output noise - pp		1.0	1.5	% Vnom	Whichever is greater
		100	150	mV	20 MHz BW
Output voltage trimming ^[a]	50		110	% Vnom	
Remote sense compensation	0.5			Vdc	
Current limit	105		125	% Inom	Auto restart
Short circuit current	105		130	% Inom	
CONTROL PIN					
Gate in high threshold		6.0		Vdc	
Gate in low threshold	0.65			Vdc	
Gate in low current			6.0	mA	
ISOLATION					
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	88 / 240			% / hrs	Procedure I, cycle 1
Acceleration - Method 513.3	9.0			g	Procedure II
Vibration - Method 514.3	20			g	Procedure I, category 6
Shock - Method 516.3	40			g	Procedure I
RELIABILITY – MIL-HDBK-217F (MI-J2L-MY)					
25°C Ground Benign: G.B.		3,732		1,000 hrs	
50°C Naval Sheltered: N.S.		672		1,000 hrs	
65°C Airborne Inhabited Cargo: A.I.C.		526		1,000 hrs	
THERMAL					
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		3.7 (107)		ounces (grams)	

^[a] 10 V, 12 V, and 15 V outputs, standard trim range ±10%. Consult factory for wider trim range.

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CONFIGURATION CHART

MI - J ■ ■ - ■ ■ ■ ■

Semi-custom modules available:
Consult factory.

[b] 16 V operation at 75% load.

[c] 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 ^[b]	60 V
5 = 155 V	100 – 210 V	230 V
6 = 270 V	125 – 400 V ^[c]	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 hrs, 29 cycles	96 hrs, 213 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 ^[d]	-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

[d] Test data available for review or download from vicorpower.com

MECHANICAL DRAWING

