



Data Sheet

MI-AIM

AC Input Front End Module

Features

- Inputs: 115 Vac 60/400 Hz
- Output power: 250 W
- MIL-STD-704A-F input transient protection
- MIL-STD-461D/E EMI compliant
- MIL-STD-810, MIL-STD-202 environments
- Compatible with MI-x7x family modules
- Efficiency: 95%
- Operating temperature to 100°C
- Size: 2.28" x 2.4" x 0.5" (57,9 x 61,0 x 12,7 mm)



Actual size:
2.28 x 2.4 x 0.5 in
57,9 x 61,0 x 12,7 mm

Product Highlights

The AC input module interfaces directly with AC mains to provide line rectification, EMI filtering, transient protection, and inrush limiting. These front-end modules accept 115 Vac and provide 250 W of output power for any of Vicor's MI-x7x family of standard and junior size modules.

The MI-AIM meets CE102 conducted emissions requirements of MIL-STD-461D/E and the transient and spike requirements of MIL-STD-704A-F.

Fully encapsulated in Vicor's industry standard package, the MI-AIM meets MIL-STD-810 Environmental testing requirements for humidity, fungus, salt-fog, explosive atmosphere, acceleration, vibration and shock.

Packaging Options

Standard: Slotted baseplate

SlimMod: Flangeless baseplate, option suffix: - S
Example: MI - AIM - M1 - S

FinMod: Finned heat sink, option suffix:
- F1, - F2, -F3 or -F4

Examples:

- MI - AIM - M1 -F1, 0.25" fins, longitudinal
- MI - AIM - M1 -F2, 0.50" fins, longitudinal
- MI - AIM - M1 -F3, 0.25" fins, transverse
- MI - AIM - M1 -F4, 0.50" fins, transverse

Input Characteristics

Parameter	Min	Typ	Max	Unit	Notes
AC line input	85	115	140	Vac	
	47	60/400	440	Hz	Operates over entire range
Inrush current			40	A, peak	125 Vac
Transient input					
	(V)	80		Vrms	20 ms, per MIL-STD-704A
	(f)		180	Vrms	100 ms, per MIL-STD-704A
Conducted EMI		CE102 per MIL-STD-461 D/E			100 – 125 Vac; 60 Hz
Spikes			±50	%	Nominal line voltage, 50 µs

Output Characteristics

Parameter	Min	Typ	Max	Unit	Notes
Output power		250		W	100°C
Hold-up time		Application specific			A function of external capacitance and power
Efficiency		95%			115 Vac; 60/400 Hz

Model Selection Chart

Model Number	Compatible MI-Series	Converter	Operating Temp (°C)	Storage Temp (°C)
MI-AIM-M1	MI-27x/MI-J7x	M-grade	-55 to +85/+100	-65 to +100/+125
MI-AIM-I1	MI-27x/MI-J7x	I-grade	-40 to +85/+100	-55 to +100/+125

SPECIFICATIONS

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

■ SAFETY SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Dielectric withstand					
Input to output		None			Provided by DC-DC converter
Input/output to baseplate		1,500			V _{rms}

■ ENVIRONMENTAL — MIL-STD-810D

Parameter	Min	Typ	Max	Unit	Notes
Altitude - Method 500.2	70,000			feet	Procedure II
Humidity - Method 507.2	88/ 240			%/ hours	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-AIM-M1)

Parameter	Min	Typ	Max	Unit	Notes
25°C Ground Benign: G.B.		5,545		1,000 hrs	
50°C Naval Sheltered: N.S.		998		1,000 hrs	
65°C Airborne Inhabited Cargo: A.I.C.		782		1,000 hrs	

■ GENERAL SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Size		2.28 x 2.4 x 0.5 (57,9 x 61,0 x 12,7)		in (mm)	
Weight		3.0 (85)		Ounces (Grams)	

SPECIFICATIONS (cont.)

■ PRODUCT GRADE SPECIFICATIONS

Parameter	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, 29 cycles	96 hours, 213 cycles
Temperature cycled with power off 17°C per minute rate of change	12 cycles -65°C to +100°C	12 cycles -65°C to +100°C
Test data supplied at these temperatures [a]	-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

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

■ ENVIRONMENTAL QUALIFICATIONS

Parameter	Qualification
Altitude	MIL-STD-810D, Method 500.2, Procedure III, explosive decompression (40 K ft.).
	MIL-STD-810D, Method 500.2, Procedure II, 40,000 ft., 1000 – 1500 ft./min. to 70,000 ft., unit functioning
Explosive Atmosphere	MIL-STD-810C, Method 511.1, Procedure I
Vibration	MIL-STD-810D, Method 514.3, Procedure I, category 6, helicopter, 20 g
	MIL-STD-810D, Method 514.3 random: 10 – 300 Hz @ 0.02 g ² /Hz, 2000 Hz @ 0.002 g ² /Hz, 3.9 total G rms 3 hrs/axis. Sine: 30 Hz @ 20 g, 60 Hz @ 10 g, 90 Hz @ 6.6 g, 120 Hz @ 5.0 g, 16.0 total G rms, 3 axes
	MIL-STD-810E, Method 514.4, Table 514.4-VII, ±6 db/octave, 7.7 G rms, 1hr/axis
Shock	MIL-STD-810D, Method 516.3, Procedure I, functional shock, 40 g
	MIL-STD-202F, Method 213B, 18 pulses, 60 g, 9 msec
	MIL-STD-202F, Method 213B, 75 g, 11 ms saw tooth shock
	MIL-STD-202F, Method 207A, 3 impacts / axis, 1, 3, 5 feet
Acceleration	MIL-STD-810D, Method 513.3, Procedure II Operational test, 9 g for 1 minute along 3 mutually perpendicular axes
Humidity	MIL-STD-810D, Method 507.2, Procedure I, cycle I, 240 hrs, 88% relative humidity
Solder Test	MIL-STD-202, Method 208, 8 hr. aging
Fungus	MIL-STD-810C, Method 508.1
Salt-Fog	MIL-STD-810C, Method 509.1

MECHANICAL DRAWINGS, CONNECTION DIAGRAM

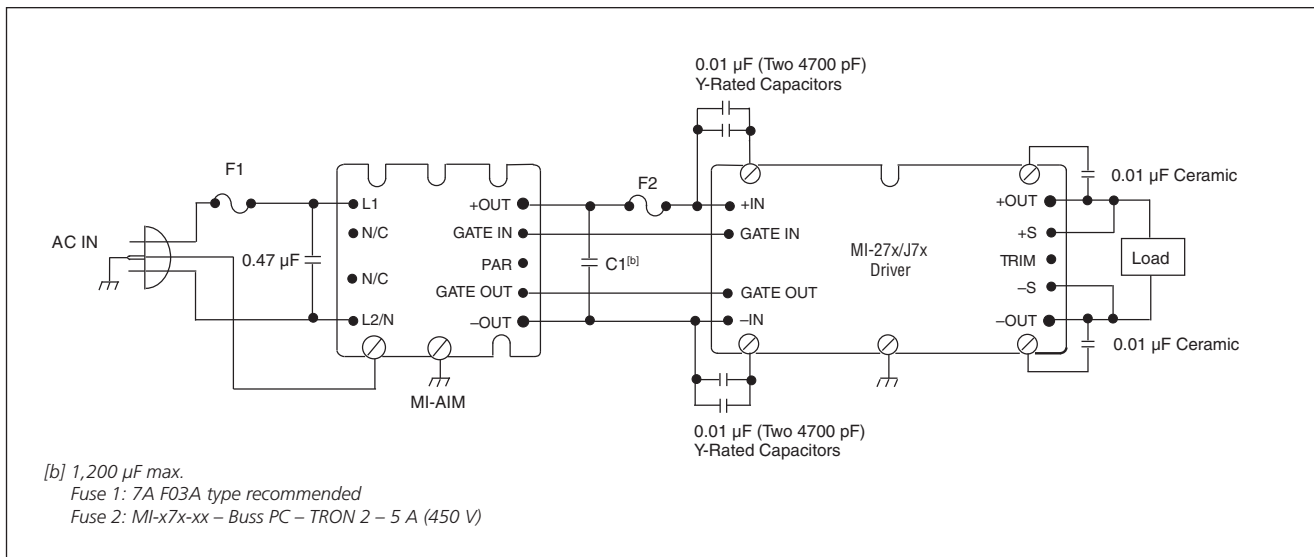


Figure 1 — MI-AIM Connection diagram, typical application

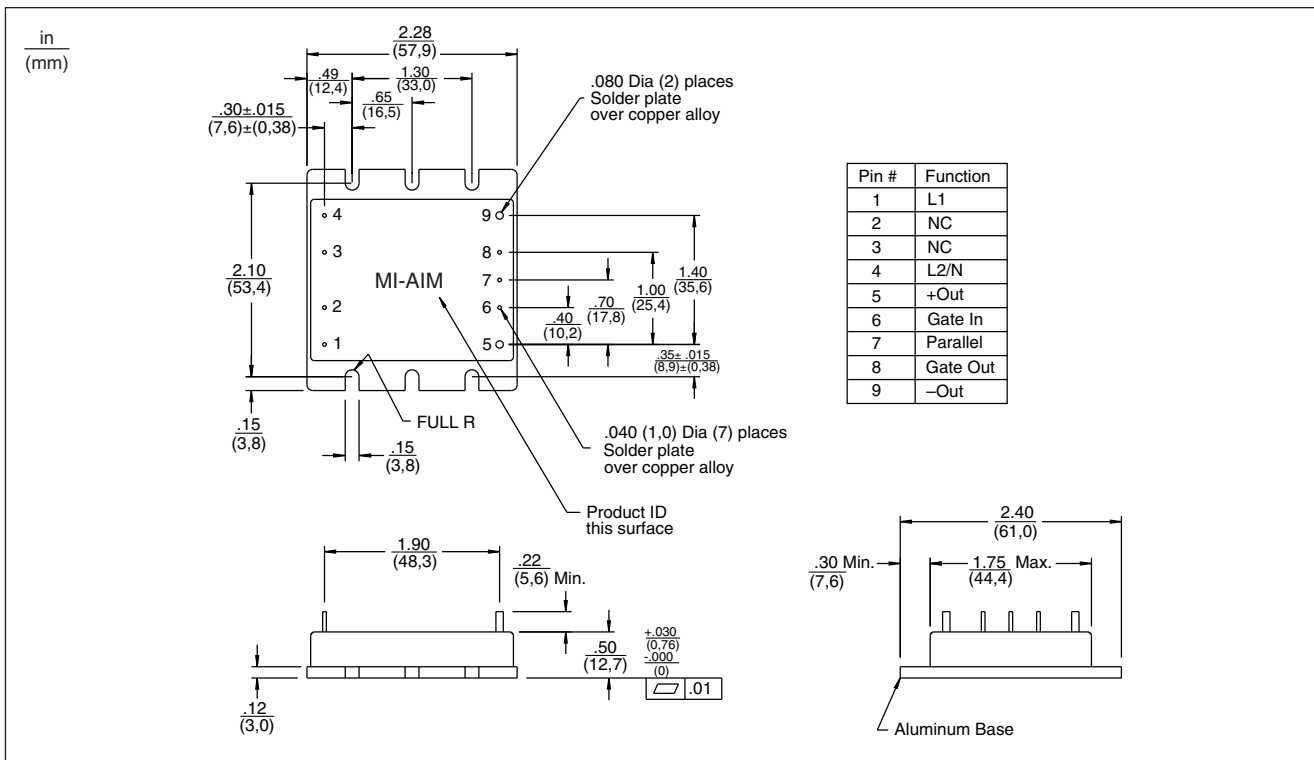


Figure 2 — Mechanical diagram

Note: For alternate packaging options refer to the mechanical drawing page at vicorpower.com

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