Alternating Input Module
MI-AIM™

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

AC Input Front End Module

Features & Benefits

- Inputs: 115V_{AC} 60/400Hz
- Output power: 250W
- MIL-STD-704A 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 12,7mm)

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 115V_{AC} and provide 250W 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.

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	V_{AC}	
	47	60/400	440	Hz	Operates over entire range
Inrush current			40	A, peak	125V_{AC}
Conducted EMI*	CE102 per MIL-STD-461 D/E				100 – 125V_{AC}; 60Hz
Input transient MIL-STD-704A/ MIL-HDBK-704-1-8	TABLE SAC109-II normal voltage transients				Performance Criteria: Nominal output voltage may deviate but self recovers
	TABLE SAC302-II abnormal voltage transients				Performance Criteria: Nominal output voltage may deviate but self recovers

*EMI performance is subject to a wide variety of external influences such as PCB construction, circuit layout etc. As such, external components in addition to those listed herein may be required in specific instances to gain full compliance to the standards specified.

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		%	115V_{AC}; 60/400Hz

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°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

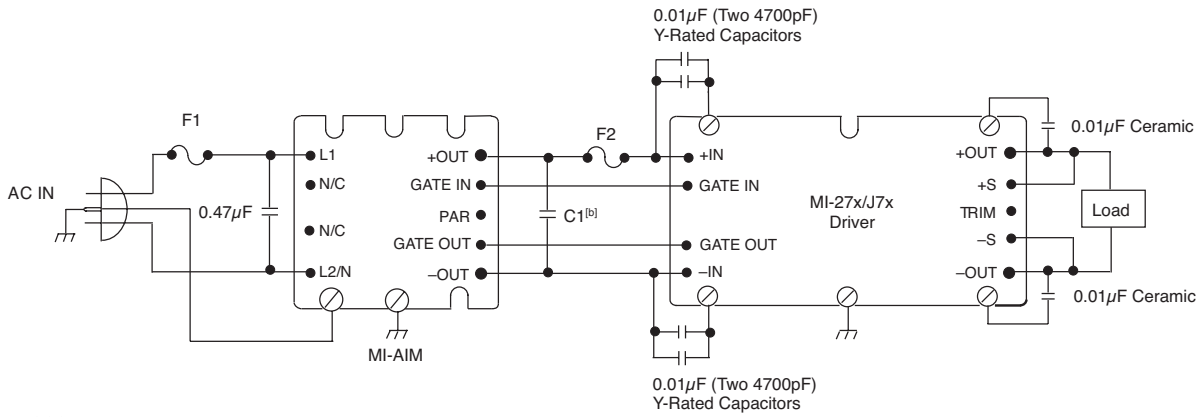
ENVIRONMENTAL QUALIFICATIONS

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

Storage

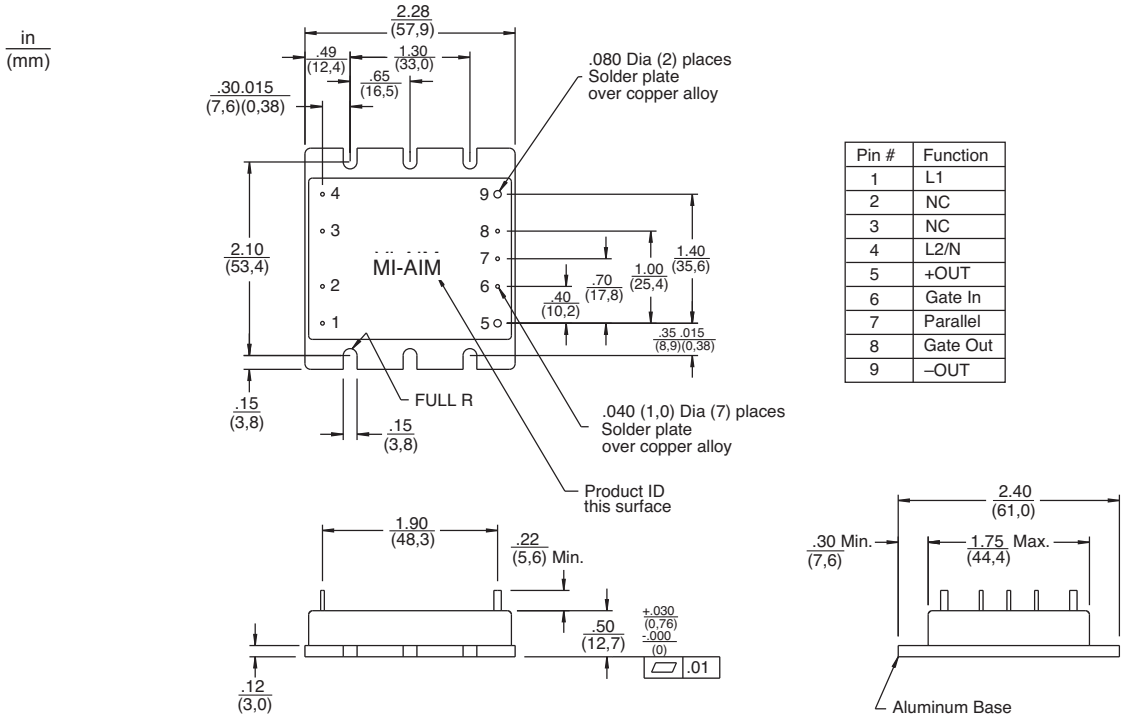
Vicor products, when not installed in customer units, should be stored in ESD safe packaging in accordance with ANSI/ESD S20.20, "Protection of Electrical and Electronic Parts, Assemblies and Equipment" and should be maintained in a temperature controlled factory/warehouse environment not exposed to outside elements controlled between the temperature ranges of 15°C and 38°C. Humidity shall not be condensing, no minimum humidity when stored in an ESD compliant package.

Mechanical Drawings, Connection Diagram



[b] 1,200µF max.
Fuse 1: 7A F03A type recommended
Fuse 2: MI-x7x-xx – Buss PC – TRON 2 – 5A (450V)

Figure 1 — *MI-AIM Connection diagram, typical application*



Pin #	Function
1	L1
2	NC
3	NC
4	L2/N
5	+OUT
6	Gate In
7	Parallel
8	Gate Out
9	–OUT

Figure 2 — *Mechanical diagram*

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

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