



# 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.

#### 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     |
|                 |                           |        | 180 | Vrms    | 100 ms, per MIL-STD-704A    |
| (f)             |                           |        | 480 | Hz      | Peak, 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                           |

#### 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

#### 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 <sub>rms</sub>            |

### ■ 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<br>(57,9 x 61,0 x 12,7) |     | in<br>(mm)        |       |
| Weight    |     | 3.0<br>(85)                              |     | Ounces<br>(Grams) |       |

## SPECIFICATIONS (cont.)

### ■ PRODUCT GRADE SPECIFICATIONS

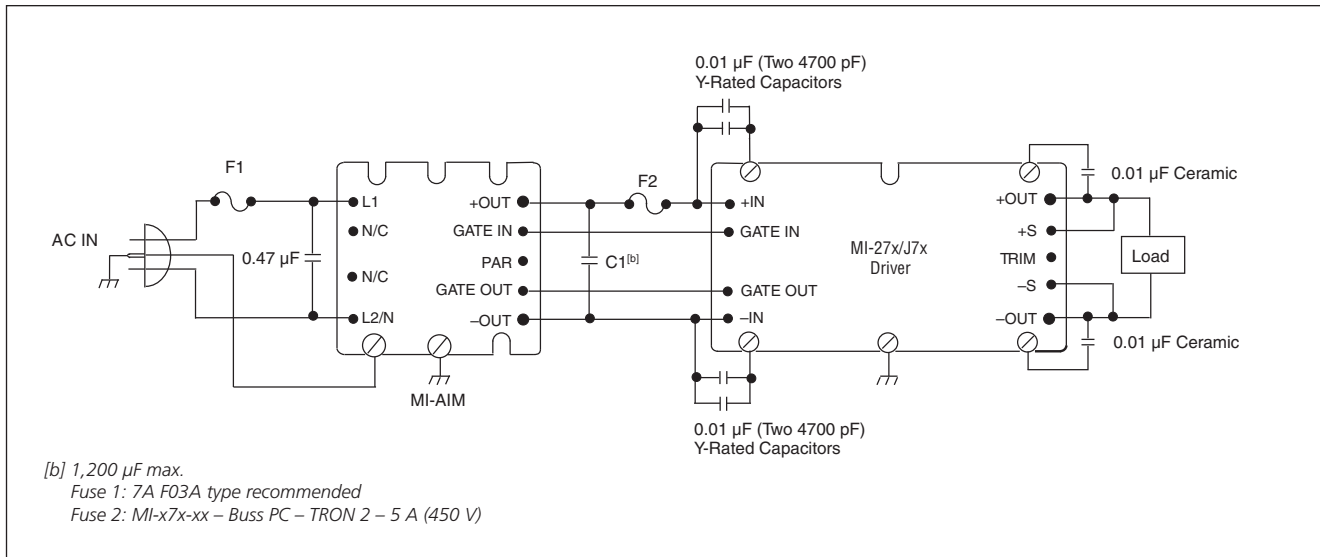
| Parameter   | I-Grade                      | M-Grade                      |
|---|------------------------------|------------------------------|
| Storage temperature   | -55°C to +125°C              | -65°C to +125°C              |
| Operating temperature (baseplate)                                   | -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<br>17°C per minute rate of change | 12 cycles<br>-65°C to +100°C | 12 cycles<br>-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

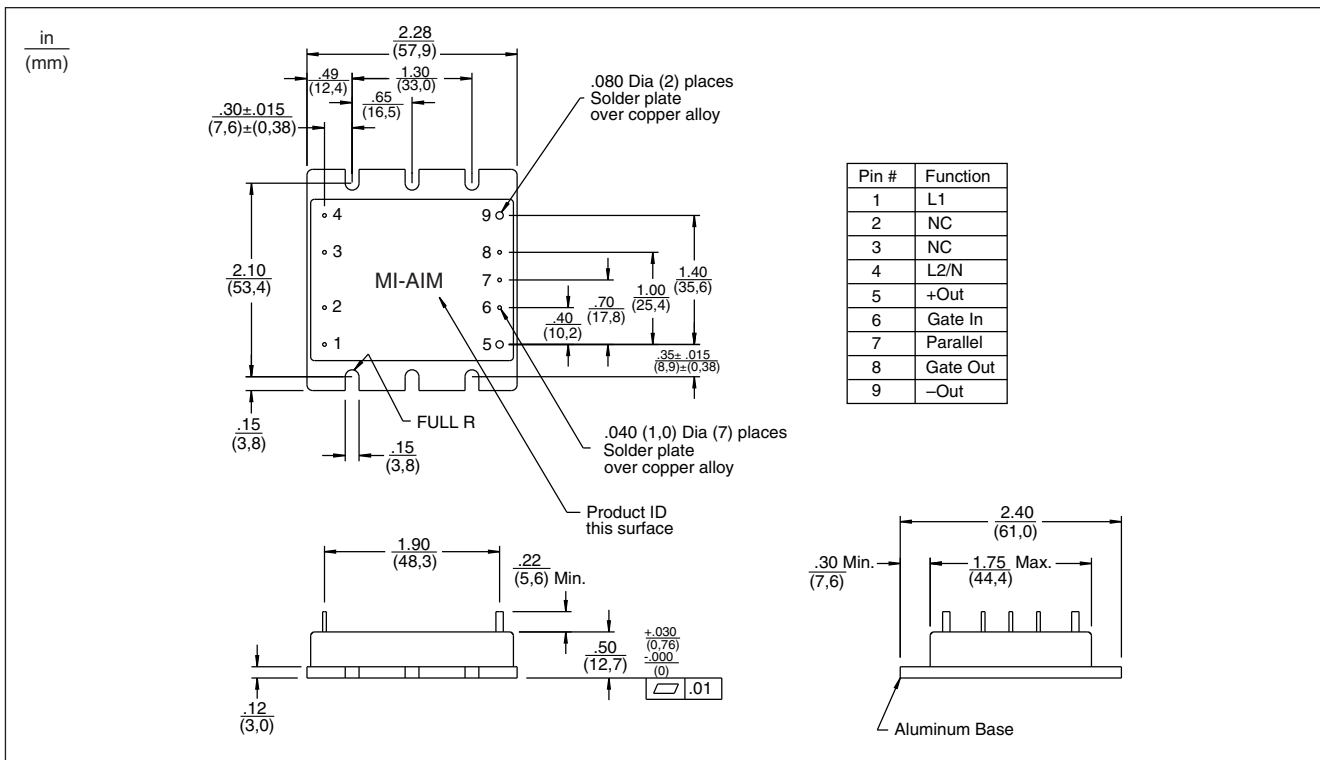
### ■ ENVIRONMENTAL QUALIFICATIONS

| 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 <sup>2</sup> /Hz, 2000 Hz @ 0.002 g <sup>2</sup> /Hz, 3.9 total G rms<br>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](http://vicorpower.com)

## Warranty

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