



# M-FIAM3

## Military COTS 270Vin Filter Input Attenuator Module



Shown actual size:  
2.28 x 2.2 x 0.5 in  
57,9 x 55,9 x 12,7 mm

### Features

- EMI filtering-MIL-STD-461E
- Transient protection-MIL-STD-704E/F
- Environments-MIL-STD-810, MIL-STD-202
- Environmental stress screening
- Low profile mounting options
- Output current up to 3 Amps
- Mini sized package
- Inrush current limiting

### Product Highlights

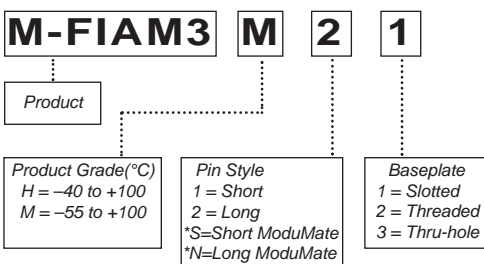
The M-FIAM3 is a DC front-end module that provides EMI filtering and transient protection. The M-FIAM3 enables designers using Vicor 2nd Generation 300V DC-DC converters to meet conducted emission/ conducted susceptibility per MIL-STD-461E; and input transients per MIL-STD-704E/F. The M-FIAM3 accepts an input voltage of 180-375Vdc and delivers output current up to 3 Amps.

M-FIAM3 is housed in an industry standard "half brick" module measuring 2.28" x 2.2" x 0.5" and depending upon model selected, may be mounted on-board or in-board for height critical applications.

### Compatible Products

- 2nd Generation 300V Input DC-DC converters

### Part Number Format



\*Compatible with SurfMate and InMate socketing systems.

### Thermal Resistance

| Parameter                                  | Typ         |
|--|-------------|
| Baseplate to sink; flat, greased surface   | 0.16°C/Watt |
| Baseplate to sink; thermal pad (P/N 20264) | 0.1°C/Watt  |
| Baseplate to ambient                       | 7.9°C/Watt  |
| Baseplate to sink; 1000 LFM                | 2.2°C/Watt  |

### Absolute Maximum Rating

| Parameter                     | Rating      | Unit    | Notes               |
|-------------------------------|-------------|---------|---------------------|
| +In to -In                    | 375         | Vdc     | Continuous          |
| +In to -In                    | 400         | Vdc     | 100ms               |
| Mounting torque               | 5 (0.57)    | in-lbs  | 6 each, #4-40 or M3 |
| Pin Soldering temperature     | 500 (260)   | °F (°C) | <5 sec; wave solder |
| Pin Soldering temperature     | 750 (390)   | °F (°C) | <7 sec; hand solder |
| Operating temperature H-Grade | -40 to +100 | °C      | Baseplate           |
| Storage temperature H-Grade   | -55 to +125 | °C      |                     |
| Operating temperature M-Grade | -55 to +100 | °C      | Baseplate           |
| Storage temperature M-Grade   | -65 to +125 | °C      |                     |

### Specifications

(typical at TBP = 25°C, nominal line, 75% load, unless otherwise specified)

| Parameter                 | Min    | Typ                        | Max       | Remarks                          |
|---------------------------|--------|----------------------------|-----------|----------------------------------|
| Input voltage             | 180Vdc | 270Vdc                     | 375Vdc    | Continuous                       |
| Output current            |        |                            | 3A        |                                  |
| Inrush limiting           |        |                            | 0.018A/μF |                                  |
| Transient immunity        |        |                            |           | Exceeds limits of MIL-STD-704E/F |
| EMI:MIL-STD-461E          |        |                            |           |                                  |
| Conducted emissions:      |        | CE101, CE102               |           |                                  |
| Conducted susceptibility: |        | CS101, CS114, CS115, CS116 |           |                                  |
| Dielectric withstand      |        | 1,500Vrms                  |           | Input/Output to base             |
|                           |        | 2,121Vdc                   |           | Input/Output to base             |
| Efficiency                | 96%    | 98%                        |           |                                  |
| Internal voltage drop     |        | 3.0Vdc                     | 5.0Vdc    | @ 3A, 100°C baseplate            |
| ON/OFF control            |        |                            |           |                                  |
| Enable (ON)               | 0.0Vdc |                            | 1.0Vdc    | Referenced to -Vout.             |
| Disable (OFF)             | 3.5Vdc |                            | 5.0Vdc    | 100kΩ internal pull-up resistor  |
| External capacitance      |        |                            |           | See illustration C1 on page 3.   |
|                           | 10μF   |                            | 22μF      | 400V                             |
| Weight                    |        | 3.3 (94)                   |           | Ounces (grams)                   |
| Warranty                  |        |                            | 2         | Years                            |

### MTBF per MIL-HDBK-217F (M-FIAM3M21)

| Temp. | Environment                     | MTBF  | Unit      |
|-------|---------------------------------|-------|-----------|
| 25°C  | Ground benign:G.B.              | 4,031 | 1,000 Hrs |
| 50°C  | Naval sheltered:N.S.            | 725   | 1,000 Hrs |
| 65°C  | Airborne inhabited cargo:A.I.C. | 568   | 1,000 Hrs |

## Environmental Qualification

|   |
|---|
| <b>Altitude</b><br>MIL-STD-810C, Method 500.2, Procedure I & II, 40,000 ft. and 70,000 ft. Operational.   |
| <b>Explosive Atmosphere</b><br>MIL-STD-810F, Method 511.4, Procedure I, Operational.  |
| <b>Vibration</b><br>MIL-STD-810F, Method 514.5, Procedure I, Category 14, Sine and Random vibration per Table 514.5C for Helicopter AH-6J Main Rotor with overall level of 5.6 grams for 4 hours per axis. MIL-STD-810F, Method 514.5C, General Minimum Integrity Curve per Figure 514.5C-17 with overall level of 7.7 grams for 1 hour per axis. |
| <b>Shock</b><br>MIL-STD-810-F, Method 516.5, Procedure I, Functional Shock, 40 G's. MIL-S-901D, Lightweight Hammer Shock, 3 impacts/axis, 1,3,5 ft. MIL-STD-202F, Method 213B, 60 G's, 9ms half sine. MIL-STD-202F, Method 213B, 75 G's, 11ms Saw Tooth Shock.  |
| <b>Acceleration</b><br>MIL-STD-810F, Method 513.5, Procedure II, table 513.5-II, Operational, 2-7 G's, 6 directions.  |
| <b>Humidity</b><br>MIL-STD-810F, Method 507.4, Procedure I, Cycle I, 240 hrs, 95% RH.   |
| <b>Solder Test</b><br>MIL-STD-202F, Method 208, 8 hour aging.   |

## Environmental Stress Screening

|                                      | H Grade                      | M Grade                      |
|--------------------------------------|------------------------------|------------------------------|
| Operating Temp.                      | -40°C to +100°C              | -55°C to +100°C              |
| Storage Temp.                        | -55°C to +125°C              | -65°C to +125°C              |
| Temp. Cycling:*                      | 12 cycles<br>-65°C to +100°C | 12 cycles<br>-65°C to +100°C |
| Ambient Test @ 25°C                  | Yes                          | Yes                          |
| Power Cycling Burn-In:               | 12 hours,<br>28 cycles       | 24 hours,<br>56 cycles       |
| Functional and Parametric ATE Tests: | -40°C and<br>+100°C          | -55°C and<br>+100°C          |
| Hi-Pot Test                          | Yes                          | Yes                          |
| Visual Inspection:                   | Yes                          | Yes                          |
| Test Data                            | vicorpower.com               | vicorpower.com               |

\*Temperature cycled with power off, 17°C per minute rate of change.

## Conducted Noise

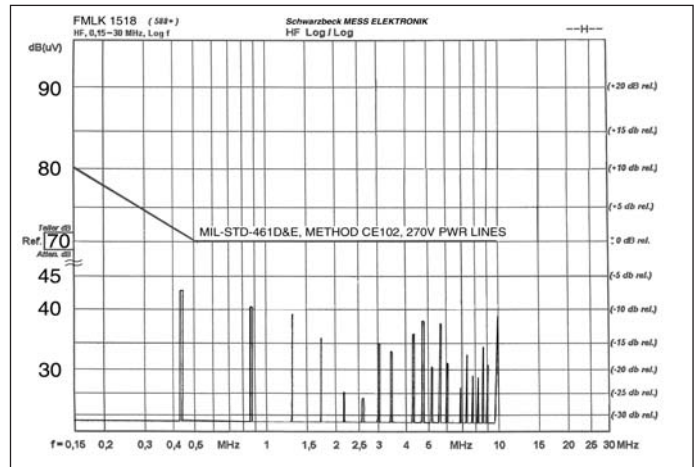


Figure 1– M-FIAM3 and Model V300A48M500AL DC-DC converter operating at 180Vdc, 130W.

## Transient Immunity

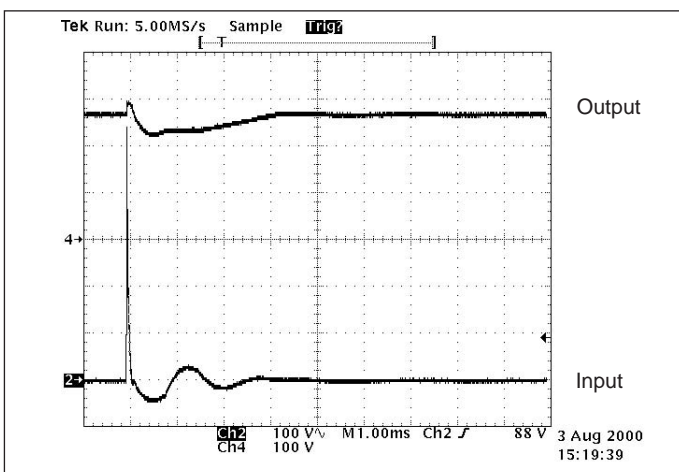


Figure 2 – Transient Immunity: M-FIAM3 output response to an input transient.

## Inrush Limiting

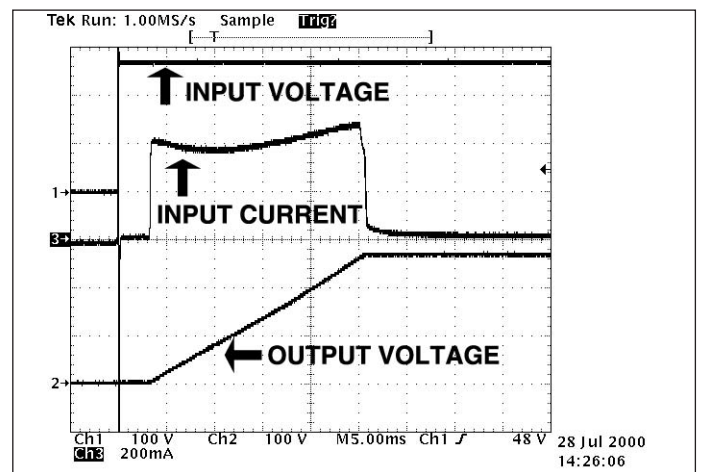
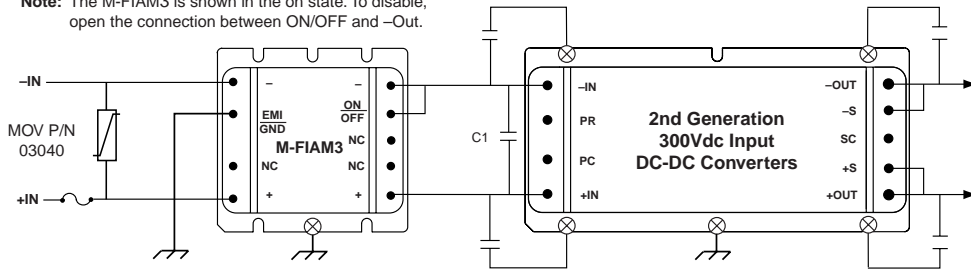


Figure 3– Inrush Limiting: Inrush current with 22μF external capacitance.

# Transient and Surge Protection

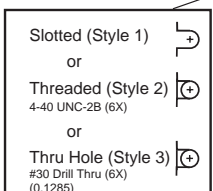
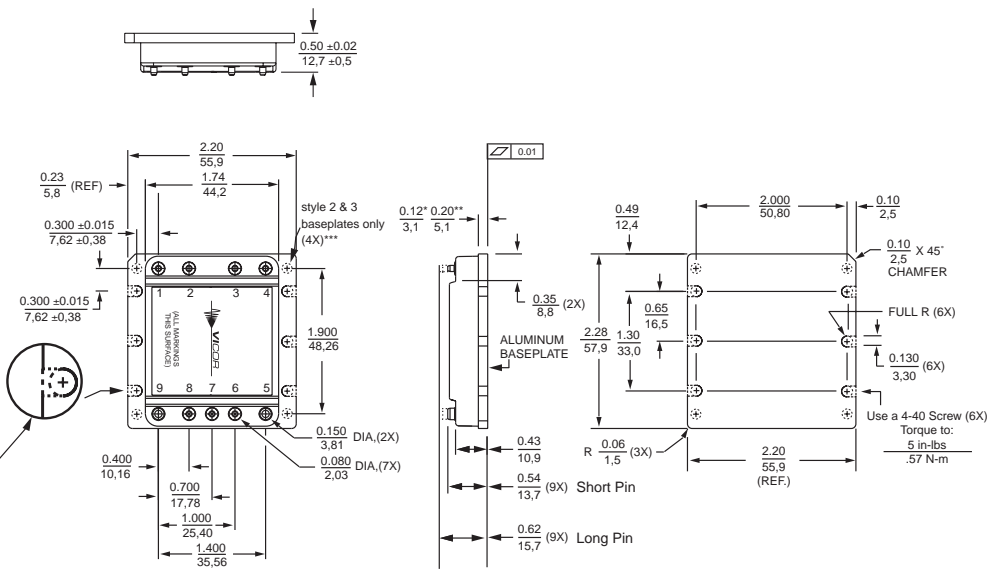
Note: The M-FIAM3 is shown in the on state. To disable, open the connection between ON/OFF and -Out.



Capacitance (C1)  
10µF(min),22µF(max)  
Recommended Fuse:  
3A Max., F03A Type

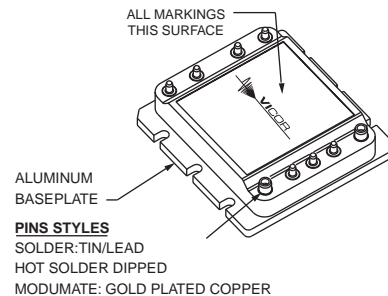
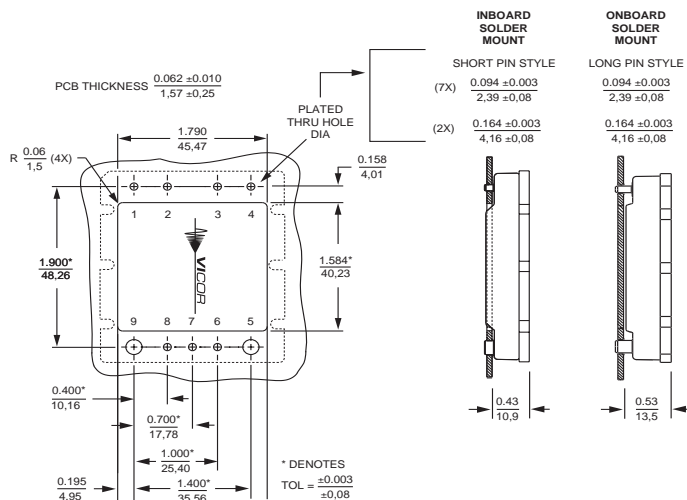
## Mechanical Diagram

| Module Pins |               |         |
|-------------|---------------|---------|
| No.         | Function      | Label   |
| 1           | +In           | +       |
| 2           | No Connection | NC      |
| 3           | Ground        | EMI/GND |
| 4           | -In           | -       |
| 5           | -Out          | -       |
| 6           | ON/OFF        | ON/OFF  |
| 7           | No Connection | NC      |
| 8           | No Connection | NC      |
| 9           | +Out          | +       |



\* Style 1 baseplate only  
\*\* Style 2 & 3 baseplates  
\*\*\* Reserved for Vicor accessories  
**Not for mounting**

## PCB Mounting Specifications



**Vicor's comprehensive line of power solutions includes high density AC-DC and DC-DC modules and accessory components, fully configurable AC-DC and DC-DC power supplies, and complete custom power systems.**

Information furnished by Vicor is believed to be accurate and reliable. However, no responsibility is assumed by Vicor for its use. Vicor components are not designed to be used in applications, such as life support systems, wherein a failure or malfunction could result in injury or death. All sales are subject to Vicor's Terms and Conditions of Sale, which are available upon request.

**Specifications are subject to change without notice.**



*Component Solutions  
for Your Power System*

**Vicor Corporation**  
25 Frontage Road  
Andover, MA, USA 01810  
Tel: 800-735-6200  
978-470-2900  
Fax: 978-475-6715

**Email**

Vicor Express: [vicorexp@vicr.com](mailto:vicorexp@vicr.com)  
Technical Support: [apps@vicr.com](mailto:apps@vicr.com)