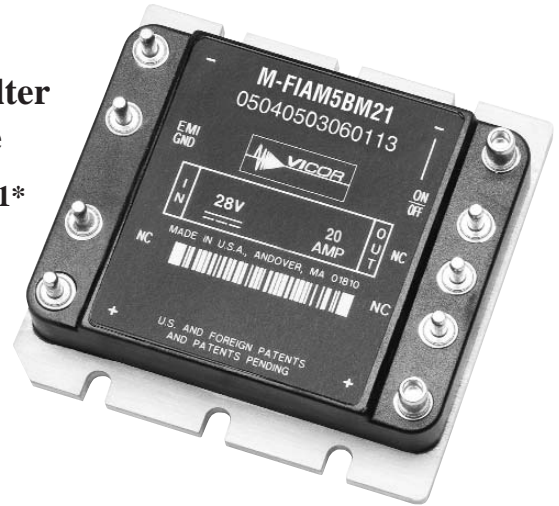




# M-FIAM5

## Military COTS 28 Vin Filter Input Attenuator Module

Model Number: M-FIAM5BM21\*



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 20 Amps
- Mini sized package
- Inrush current limiting
- Reverse polarity protection

### Product Highlights

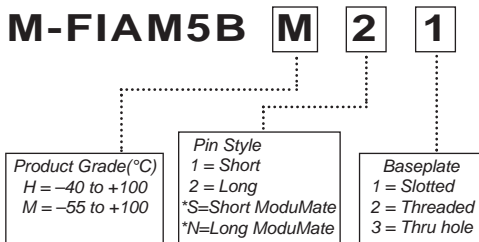
The M-FIAM5 is a DC front-end module that provides EMI filtering and transient protection. The M-FIAM5 enables designers using Vicor 2nd Generation 24 V DC-DC converters to meet conducted emission/ conducted susceptibility per MIL-STD-461E; and input transients per MIL-STD-704E/F. The M-FIAM5 accepts an input voltage of 18-36 Vdc and delivers output current up to 20 Amps.

M-FIAM5 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 onboard or inboard for height critical applications.

### Compatible Products

- 2nd Generation 24 V Input DC-DC converters

### \*Part Number Format



\*Compatible with SurfMate and InMate socketing system.

### Absolute Maximum Rating

Parameter	Rating	Unit	Notes
+In to -In	36	Vdc	Continuous
+In to -In	50	Vdc	See Fig.1
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	18 Vdc	28 Vdc	36 Vdc	Continuous
Output current			20 A	
Inrush limiting			0.007 A/μF	
Transient immunity			50 Vdc	12.5 mS per MIL-STD-704E/F, continuous operation
EMI:MIL-STD-461E				
Conducted emissions: CE101, CE102				
Conducted susceptibility: CS101, CS114, CS115, CS116				
Dielectric withstand		1,500 Vrms 2,121 Vdc		Input/Output to Base Input/Output to Base
Efficiency	96%	98%		
Internal voltage drop		0.5	0.7	@20 A, 100°C baseplate
ON/OFF control				
Enable (ON)	0.0 Vdc		1.0 Vdc	Referenced to -Vout
Disable (OFF)	3.5 Vdc		5.0 Vdc	100 kΩ internal pull-up resistor
External capacitance		330μF	1000 μF	See illustration C1 on page 3 50 V
Weight		3.3 (94)		Ounces (grams)
Warranty			2	Years

### 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 ambient; 1000 LFM	2.2°C/Watt

### MTBF per MIL-HDBK-217F (M-FIAM5BM21)

Temp	Environment	MTBF	Unit
25°C	Ground Benign: G.B.	2,581	1,000 Hrs
50°C	Naval Sheltered: N.S.	464	1,000 Hrs
65°C	Airborne Inhabited Cargo: A.I.C.	364	1,000 Hrs

# Environmental Qualification

## Altitude

MIL-STD-810C, Method 500.2, Procedure I & II, 40,000 ft. and 70,000 ft. Operational.

## Explosive Atmosphere

MIL-STD-810F, Method 511.4, Procedure I, Operational.

## Vibration

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.

## Shock

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.

## Acceleration

MIL-STD-810F, Method 513.5, Procedure II, table 513.5-II, Operational, 2-7 G's, 6 directions.

## Humidity

MIL-STD-810F, Method 507.4, Procedure I, Cycle I, 240 hrs, 95% RH.

## Solder Test

MIL-STD-202F, Method 208, 8 hour aging.

## Shut Down Time vs. Overvoltage

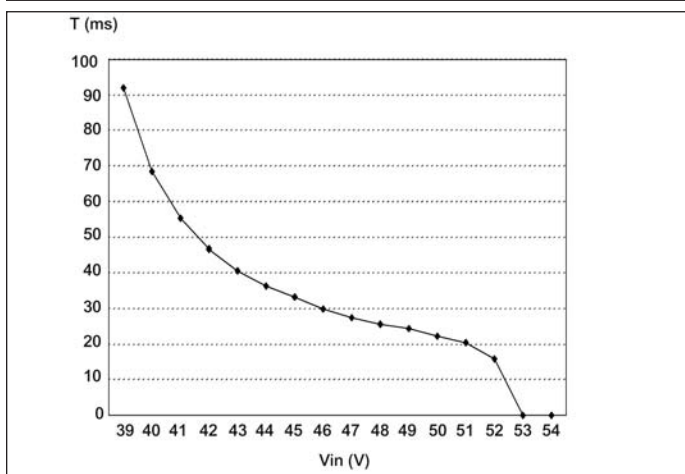


Figure 1-  $T$  = Time period before over-voltage protection  
 $V_{in}$  = Input voltage (switching up from 28 V)

## Conducted Noise

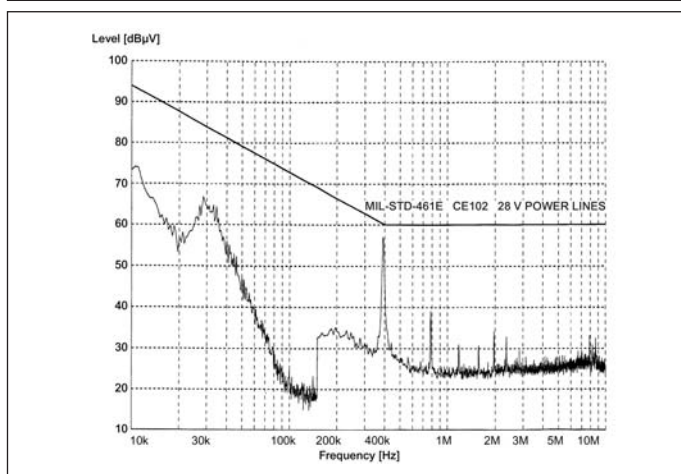


Figure 2- M-FIAM5 and Model V24A12M400A DC-DC converter operating at 28 Vdc, 400 W.

## Transient Immunity

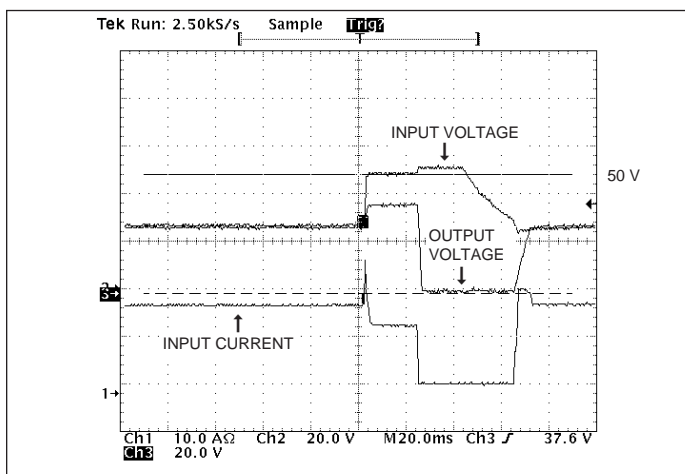


Figure 3 - Transient Immunity: M-FIAM5 output response to an input transient.

## Inrush Limiting

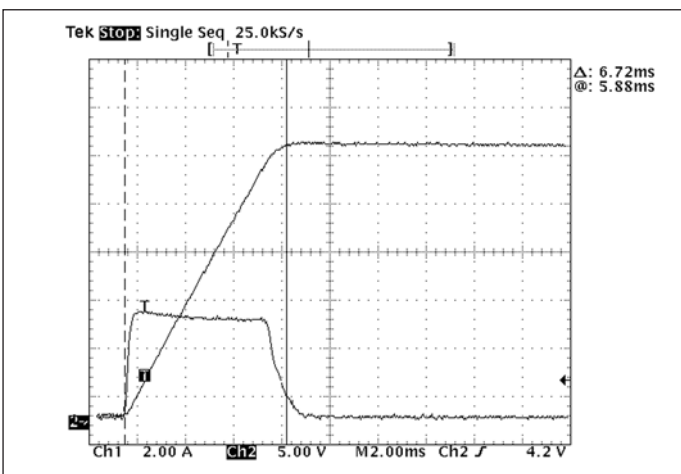


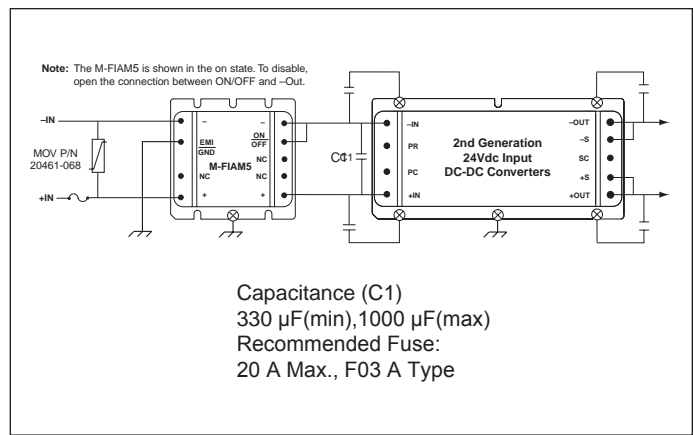
Figure 4- Inrush Limiting: Inrush current with 1000  $\mu$ F external capacitance.

## 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 -65°C to +100°C	12 cycles -65°C to +100°C
Ambient test @ 25°C	Yes	Yes
Power cycling	12 hours	24 hours
Burn-In:	28 cycles	56 cycles
Functional and parametric ATE tests:	-40°C and +100°C	-55°C and +100°C
Hi-Pot test	Yes	Yes
Visual inspection:	Yes	Yes
Test data	vicorpower.com	vicorpower.com

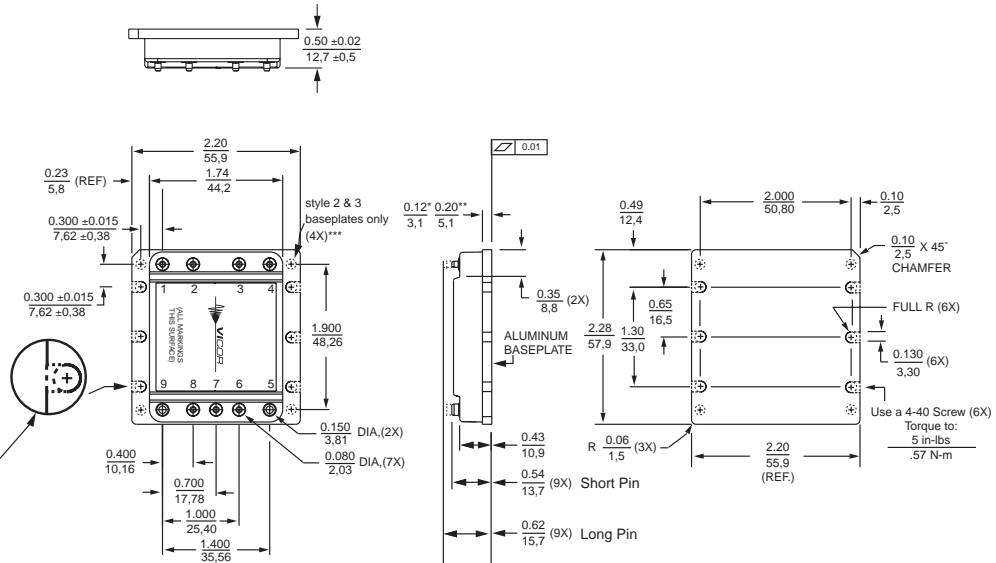
\*Temperature cycled with power off, 17°C per minute rate of change.

## Transient and Surge Protection



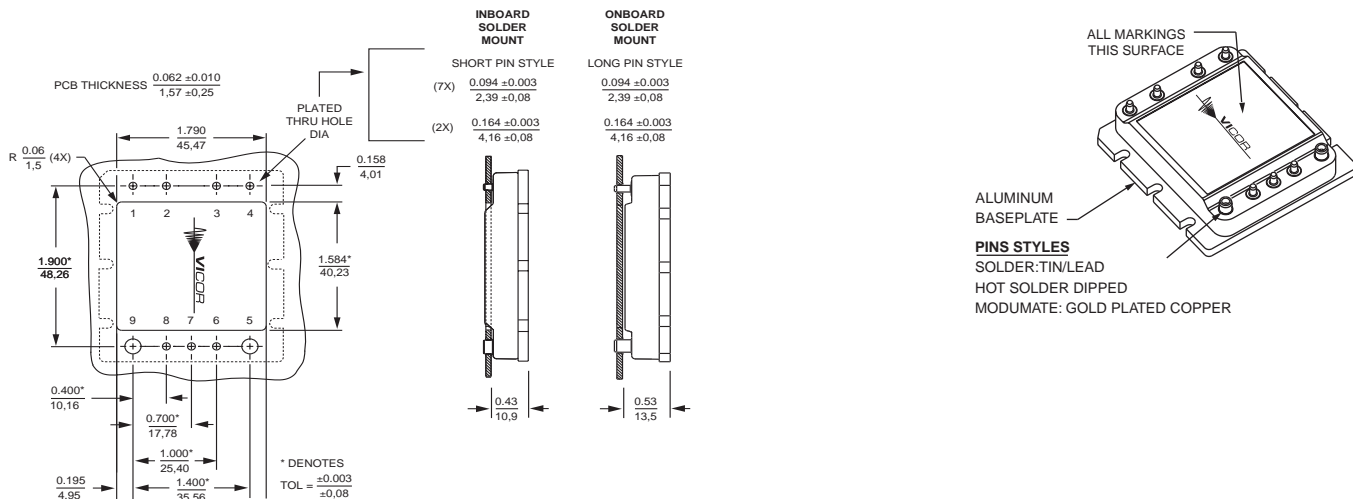
## Mechanical Diagram

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.**

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**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)