



# Data Sheet

## M-FIAM7

### Military COTS 28 Vin Filter Input Attenuator Module

Model Number: M-FIAM7M21\*



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-1275A/B/D, MIL-STD-704A-F and DO-160E
- Environments-MIL-STD-810, MIL-STD-202
- Environmental stress screening
- Low profile mounting options
- Output current up to 10 Amps
- Mini sized package
- Inrush current limiting
- Reverse polarity protection

#### Product Highlights

The M-FIAM7 is a DC front-end module that provides EMI filtering and transient protection. The M-FIAM7 enables designers using Vicor's 28 V DC-DC V•I Chip modules to meet conducted emission/ conducted susceptibility per MIL-STD-461E; and input transients per MIL-STD-1275A/B/D, MIL-STD-704A-F and DO-160E. The M-FIAM7 accepts an input voltage of 14 – 50 Vdc and delivers output current up to 10 A.

M-FIAM7 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

- 28 V Input DC-DC V•I Chip modules.

Note: This product is not compatible with Maxi, Mini, Micro DC-DC converters.

#### Absolute Maximum Rating

Parameter	Rating	Unit	Notes
+In to -In	50	Vdc	Continuous
+In to -In	100	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
	750 (390)	°F(°C)	<7 sec; hand solder

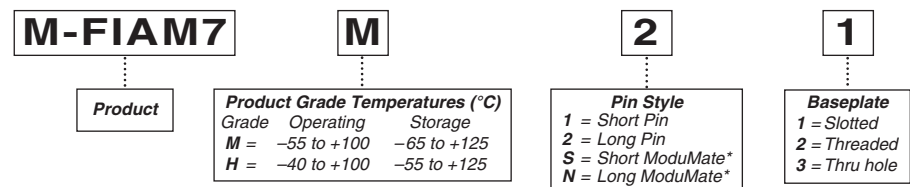
#### Thermal Resistance and Capacity

Parameter	Min	Typ	Max	Unit
Baseplate to sink flat, greased surface		0.16		°C/Watt
		0.1		°C/Watt
Baseplate to ambient Free convection		7.9		°C/Watt
	1000 LFM	2.2		°C/Watt

#### MTBF per MIL-HDBK-217F (M-FIAM7M21)

Temperature	Environment	MTBF	Unit
25°C	Ground Benign: G.B.	3,540	1,000 Hrs
50°C	Naval Sheltered: N.S.	637	1,000 Hrs
65°C	Airborne Inhabited Cargo: A.I.C.	499	1,000 Hrs

#### Part Numbering\*



\*Compatible with SurfMate and InMate socketing system.

## SPECIFICATIONS

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

### INPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Input voltage	14	28	50	Vdc	Continuous
Inrush limiting			0.007	A/ $\mu\text{F}$	
Transient immunity			100	Vdc	50 ms per MIL-STD-1275A/B/D, continuous operation
			250	Vdc	70 $\mu\text{s}$ per MIL-STD-1275B, continuous operation
			70	Vdc	20 ms per MIL-STD-704A, continuous operation
			80	Vdc	100 ms per DO-160E, Section 16, Power Input, Category Z

### OUTPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Output current			10	A	
Efficiency	96	98		%	
Internal voltage drop		0.5	0.7		@10 A, 100°C baseplate
External capacitance	330		1000	$\mu\text{F}$	See illustration C1 on page 4 63 V

### CONTROL PIN SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
ON/OFF control					
Enable (ON)	0.0		1.0	Vdc	Referenced to – Vout
Disable (OFF)	4.0		5.50	Vdc	100 k $\Omega$ internal pull-up resistor

### SAFETY SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Dielectric withstand		1,500	Vrms		Input/Output to Base
		2,121	Vdc		Input/Output to Base

### EMI

Standard	Test Procedure	Notes
MIL-STD-461E		
Conducted emissions:	CE101, CE102	
Conducted susceptibility:	CS101, CS114, CS115, CS116	

### GENERAL SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Weight			3.3 (94)	Ounces (grams)	
Warranty			2	Years	

## SPECIFICATIONS (CONT.)

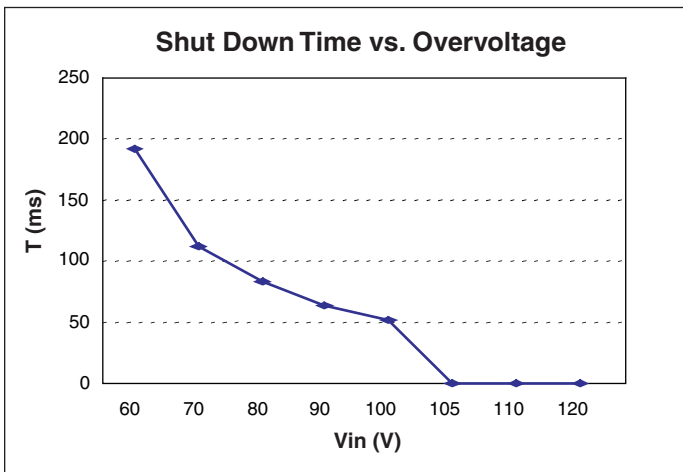
### ■ ENVIRONMENTAL QUALIFICATION

<b>Altitude</b> MIL-STD-810F, Method 500.4, Procedure I & II, 40,000 ft. and 70,000 ft. Operational.
<b>Explosive Atmosphere</b> MIL-STD-810F, Method 511.4, Procedure I, Operational.
<b>Vibration</b> 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 G rms 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 G rms for 1 hour per axis.
<b>Shock</b> MIL-STD-810F, Method 516.5, Procedure I, Functional Shock, 40 g. MIL-S-901D, Lightweight Hammer Shock, 3 impacts/axis, 1,3,5 ft. MIL-STD-202F, Method 213B, 60 g, 9ms half sine. MIL-STD-202F, Method 213B, 75 g, 11ms Saw Tooth Shock.
<b>Acceleration</b> MIL-STD-810F, Method 513.5, Procedure II, table 513.5-II, Operational, 2-7 g, 6 directions.
<b>Humidity</b> MIL-STD-810F, Method 507.4.
<b>Solder Test</b> MIL-STD-202G, Method 208H, 8 hour aging.

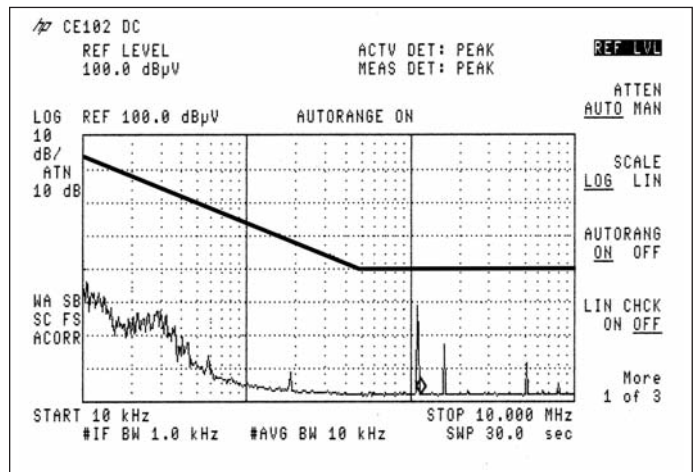
### ■ ENVIRONMENTAL STRESS SCREENING

Parameter	H-Grade	M-Grade
Operating temperature	-40°C to +100°C	-55°C to +100°C
Storage temperature	-55°C to +125°C	-65°C to +125°C
Temperature cycling*	12 cycles -65°C to +100°C	12 cycles -65°C to +100°C
Ambient test @ 25°C	Yes	Yes
Power cycling burn-in	12 hours, 29 cycles	24 hours, 58 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

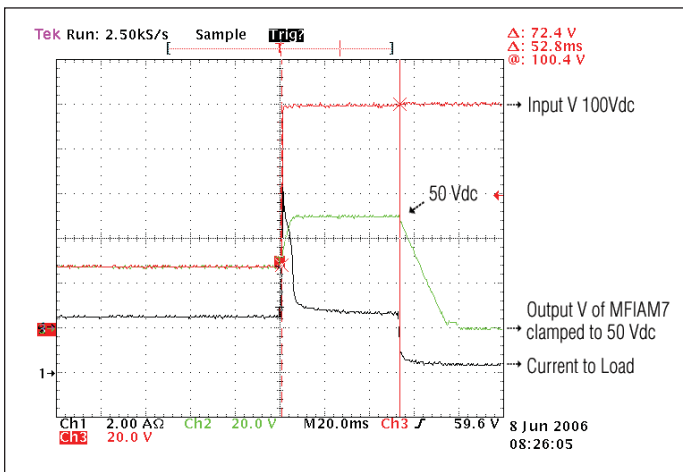
\*Temperature cycled with power off, 17°C per minute rate of change.



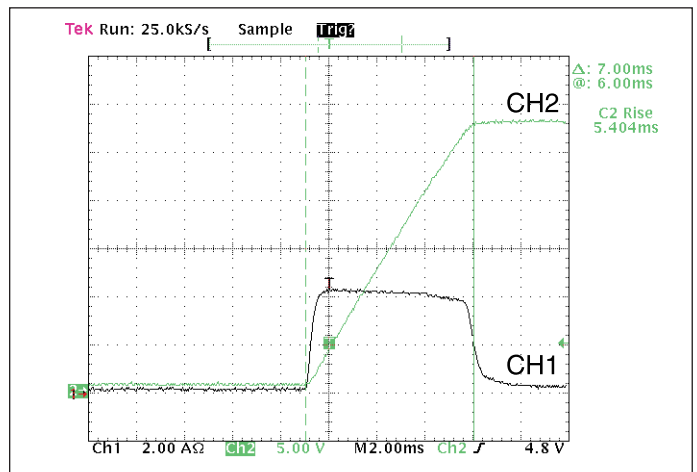
**Figure 1** – T = Time period before over-voltage protection.  
Vin = Input voltage (switching up from 28 Vdc)



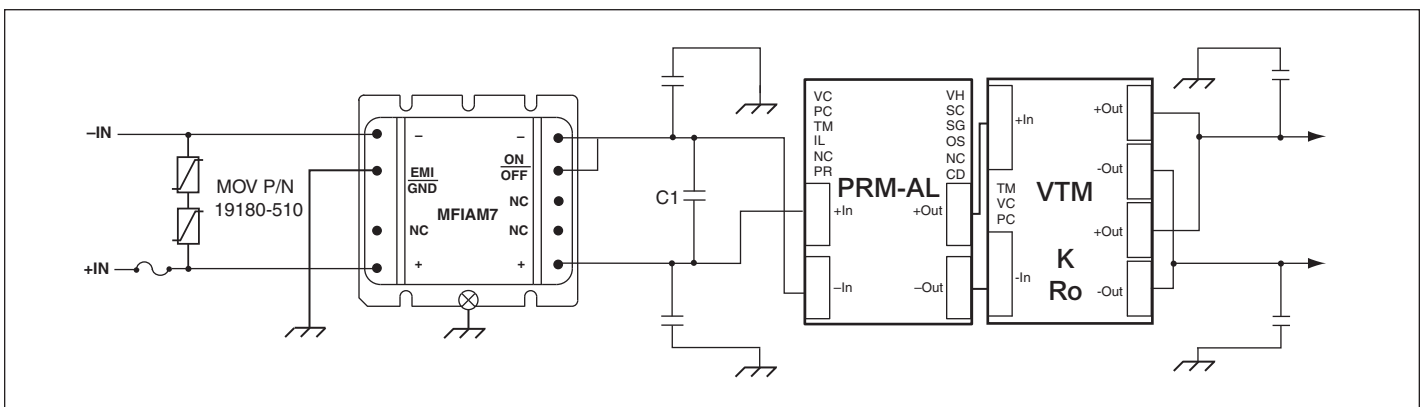
**Figure 2** – Conducted Noise; M-FIAM7 and MP028F036M12AL + MV036F120M010 DC-DC V•I Chip modules operating at 28 Vdc, 120 W.



**Figure 3** – Transient Immunity; M-FIAM7 output response to an input transient.



**Figure 4** – Inrush Limiting; Inrush current with 1000  $\mu$ F external capacitance.



**Figure 5** – Transient and Surge Protection; capacitance (C1) 330  $\mu$ F (min), 1,000  $\mu$ F (max)  
Recommended fuse: 10 A MAX F03 TYPE

# MECHANICAL DRAWINGS

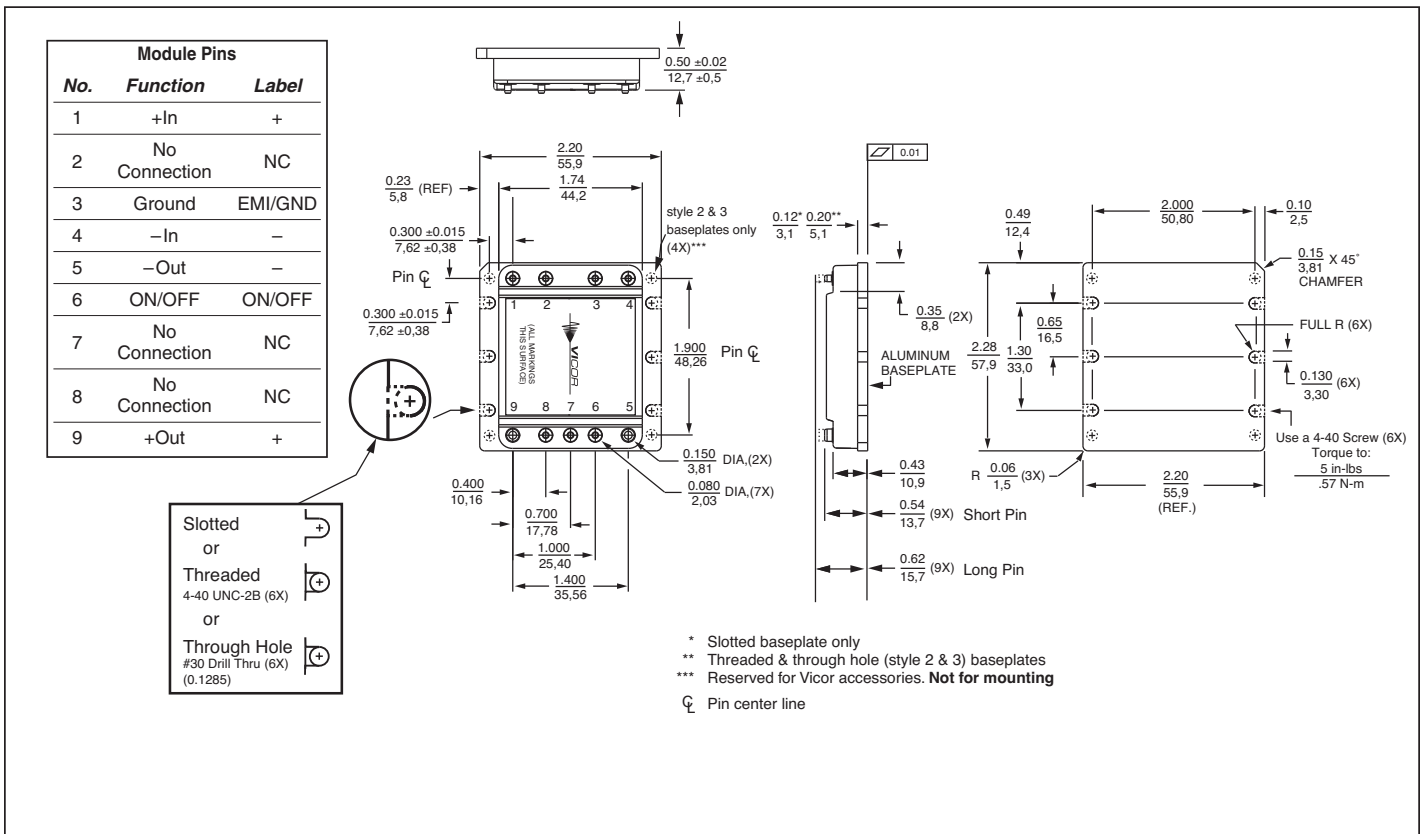


Figure 6 – Mechanical diagram

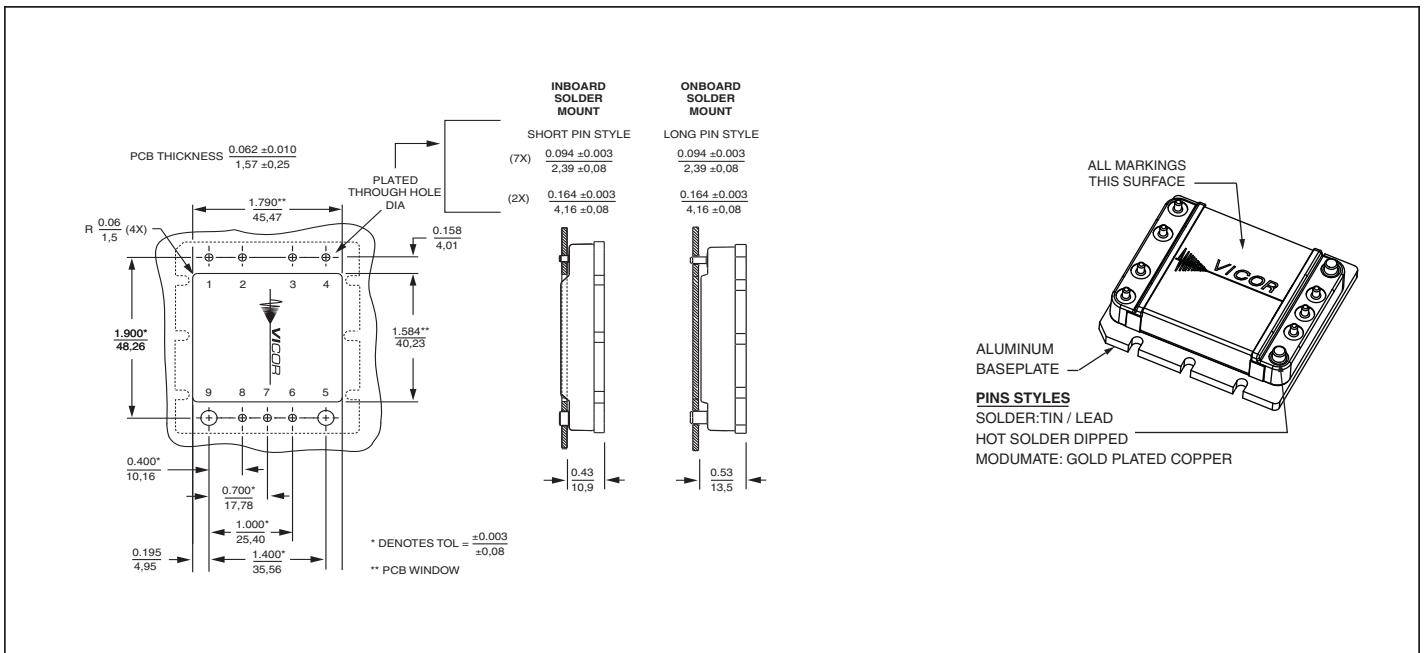


Figure 7 – PCB Mounting Specifications

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