



Data Sheet

M-FIAM3

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 A
- 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's Maxi, Mini, Micro Series 300 V 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 – 375 Vdc and delivers output current up to 3 A.

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

- Maxi, Mini, Micro Series 300 V Input DC-DC converters

Military COTS 270 Vin Filter Input Attenuator Module

Model Number: M-FIAM3M21*

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



Absolute Maximum Rating

Parameter	Rating	Unit	Notes
+In to -In	375	Vdc	Continuous
	400	Vdc	100 ms
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

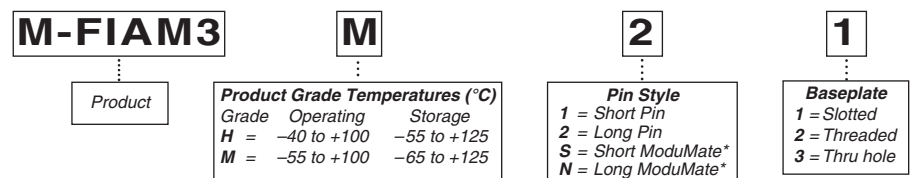
Thermal Resistance and Capacity

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-FIAM3M21)

Temperature	Environment	MTBF	Unit
25°C	Ground Benign: G.B.	3,644	1,000 Hrs
50°C	Naval Sheltered: N.S.	656	1,000 Hrs
65°C	Airborne Inhabited Cargo: A.I.C.	514	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	180	270	375	Vdc	Continuous
Inrush limiting			0.018	A/ μF	
Transient immunity					Exceeds limits of MIL-STD-704E/F

OUTPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Output current			3	A	
Efficiency	96	98		%	
Internal voltage drop		3.0	5.0		@3 A, 100°C baseplate
External capacitance	10		22	μF	See Figure 4 on page 4. 400 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)	3.5		5.0	Vdc	100 k Ω 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

Altitude	MIL-STD-810F, Method 500.4, 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 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.
Shock	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, 9 ms half sine. MIL-STD-202F, Method 213B, 75 g, 11 ms Saw Tooth Shock.
Acceleration	MIL-STD-810F, Method 513.5, Procedure II, table 513.5-II, Operational, 2-7 g, 6 directions.
Humidity	MIL-STD-810F, Method 507.4.
Solder Test	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.

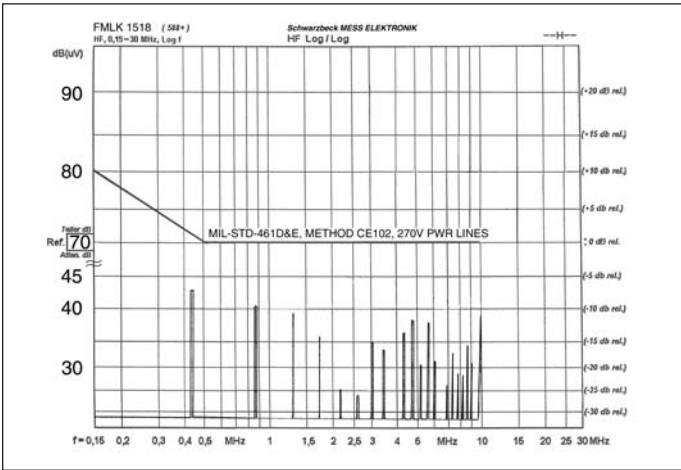


Figure 1 – Conducted noise; M-FIAM3 and V300A48M500BL DC-DC converter operating at 180 Vdc, input with 130 W.

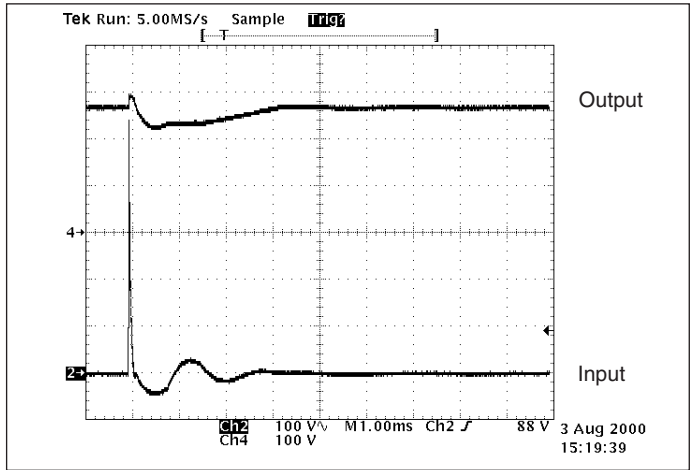


Figure 2 – Transient Immunity; M-FIAM3 output response to an input transient.

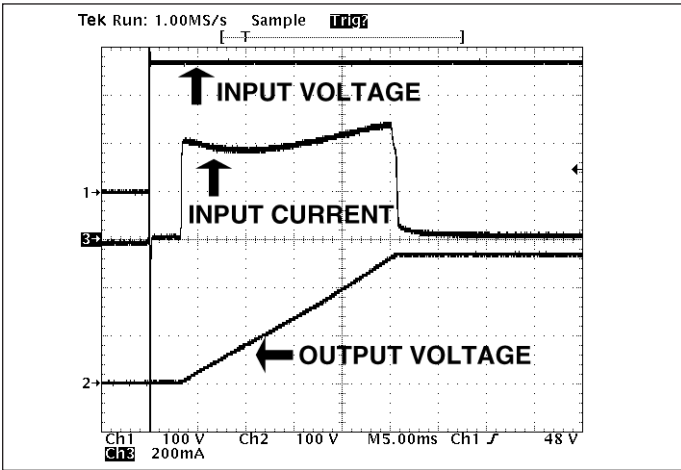


Figure 3– Inrush Limiting; Inrush current with 22 μ F external capacitance, (C1 in Figure4)

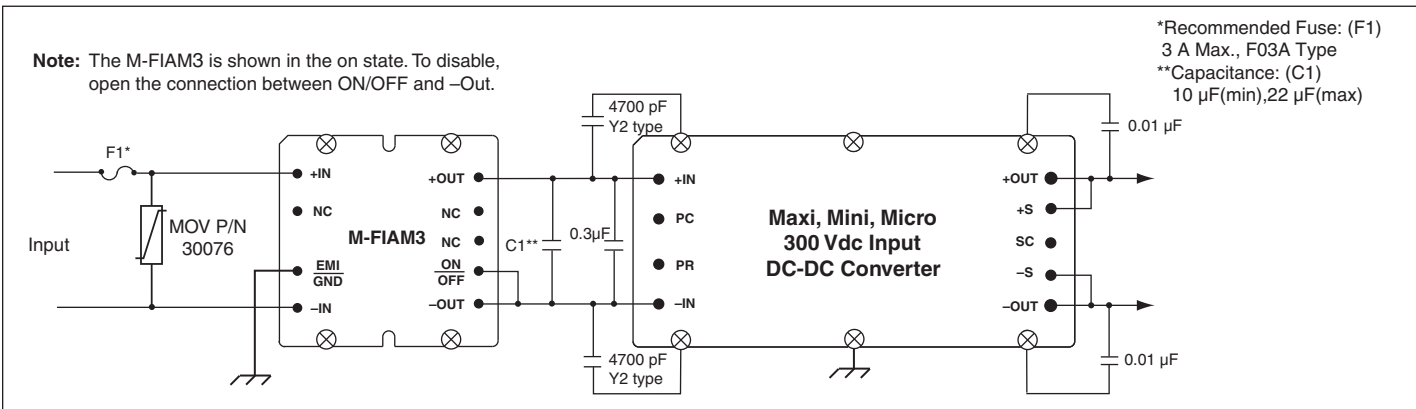


Figure 4 – Basic connection diagram with Transient and Surge Protection

MECHANICAL DRAWINGS

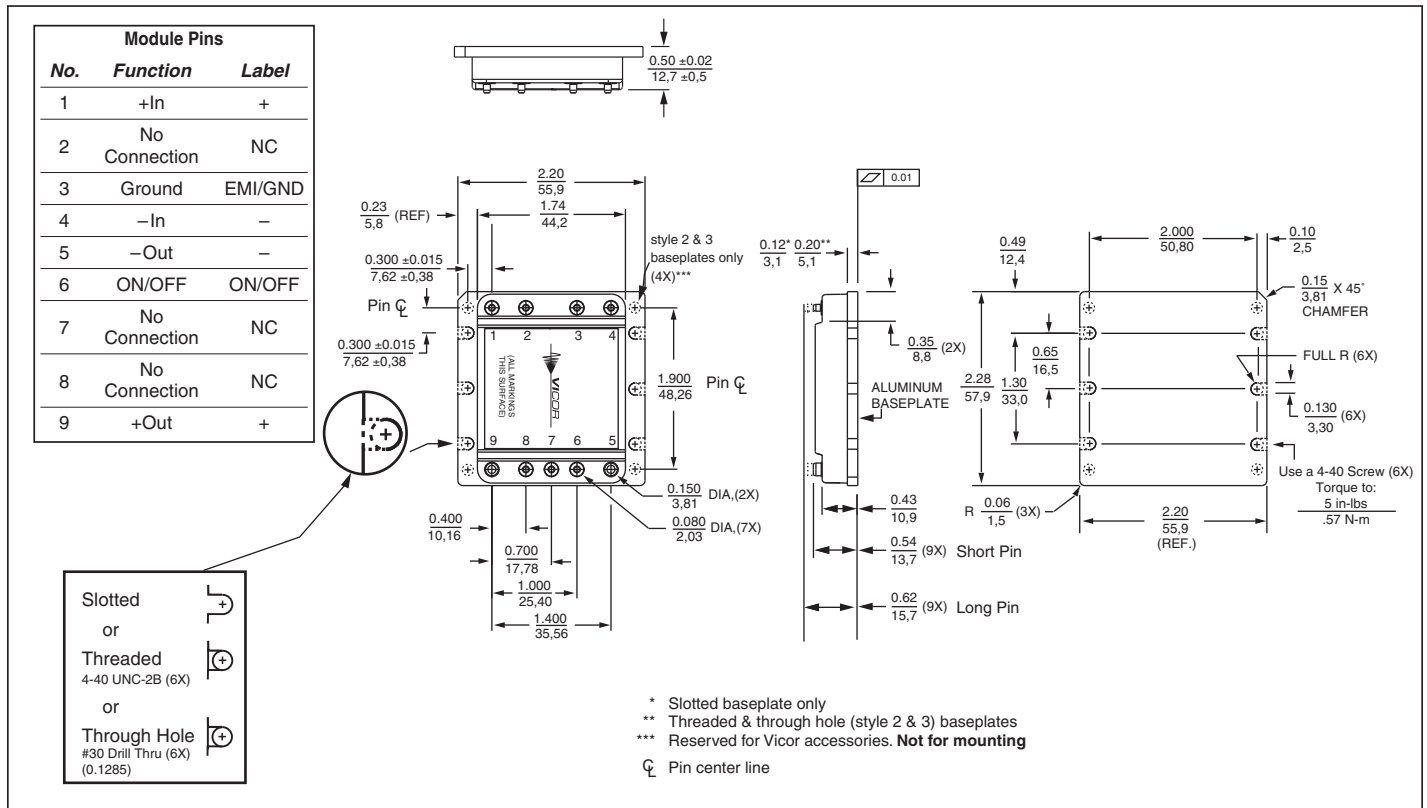


Figure 5 – Mechanical diagram

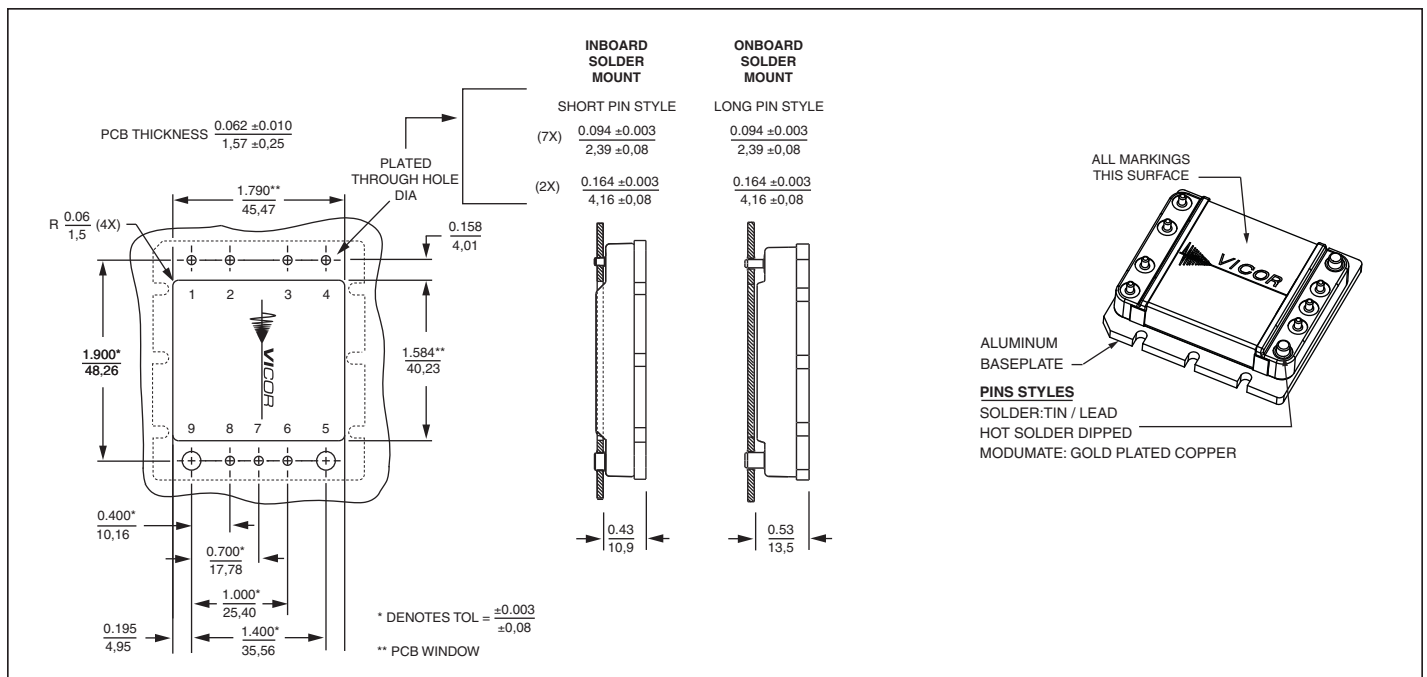


Figure 6 – PCB Mounting Specifications

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