



Data Sheet

M-FIAM5

Military COTS 28 Vin Filter Input Attenuator Module

Model Number: M-FIAM5BM21*



M-FIAM5:
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 A
- Mini sized package
- Inrush current limiting
- Reverse polarity protection

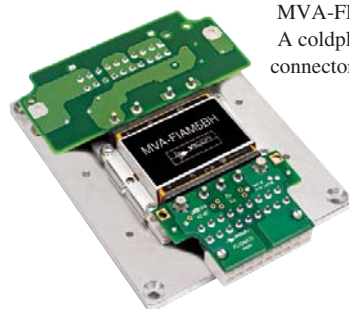
Product Highlights

The M-FIAM5 is a DC front-end module that provides EMI filtering and transient protection. The M-FIAM5 enables designers using Vicor's Maxi, Mini, Micro Series 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 14 – 36 Vdc and delivers output current up to 20 A.

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

- Maxi, Mini, Micro Series 24 V Input DC-DC converters
- 24 V Input VIPAC Arrays



MVA-FIAM5B:
A coldplate and connector option.

The MVA-FIAM5B provides a coldplate and connector option for use with either 24 V input Maxi, Mini, Micro series DC-DC converters or VIPAC Arrays.

Absolute Maximum Rating

Parameter	Rating	Unit	Notes
+In to -In	36	Vdc	Continuous
	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
	750 (390)	°F(°C)	<7 sec; hand solder

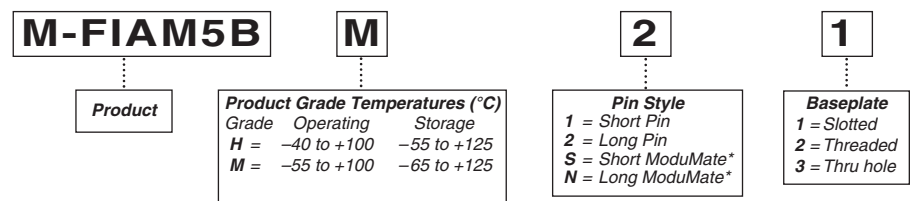
Thermal Resistance and Capacity

Parameter	Min	Typ	Max	Unit
Baseplate to sink				
	flat, greased surface		0.16	°C/Watt
	with thermal pad (P/N 20264)		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-FIAM5BM21)

Temperature	Environment	MTBF	Unit
25°C	Ground Benign: G.B.	2,533	1,000 Hrs
50°C	Naval Sheltered: N.S.	456	1,000 Hrs
65°C	Airborne Inhabited Cargo: A.I.C.	375	1,000 Hrs

Part Numbering*



*Compatible with SurfMate and InMate socketing system.

MVA-FIAM5BH: H-Grade version (-40°C to +100°C operation)

MVA-FIAM5BM: M-Grade version (-55°C to +100°C operation)

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	36	Vdc	Continuous
Inrush limiting			0.007	A/ μF	
Transient immunity			50	Vdc	12.5 ms per MIL-STD-704E/F, continuous operation

OUTPUT SPECIFICATIONS

Parameter	Min	Typ	Max	Unit	Notes
Output current			20	A	
Efficiency	96	98		%	
Internal voltage drop		0.5	0.7		@20 A, 100°C baseplate
External capacitance	330		1000	μF	See Figure 5 on page 4 50 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, 9ms half sine. MIL-STD-202F, Method 213B, 75 g, 11ms 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.

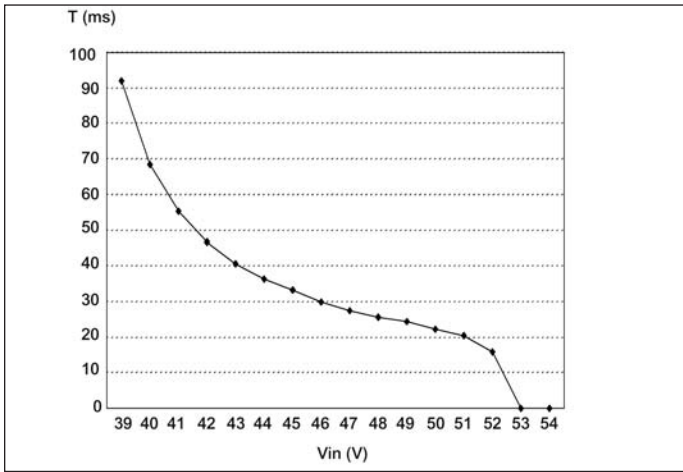


Figure 1 — Shut Down Time of M-FIAM5 vs. Overvoltage

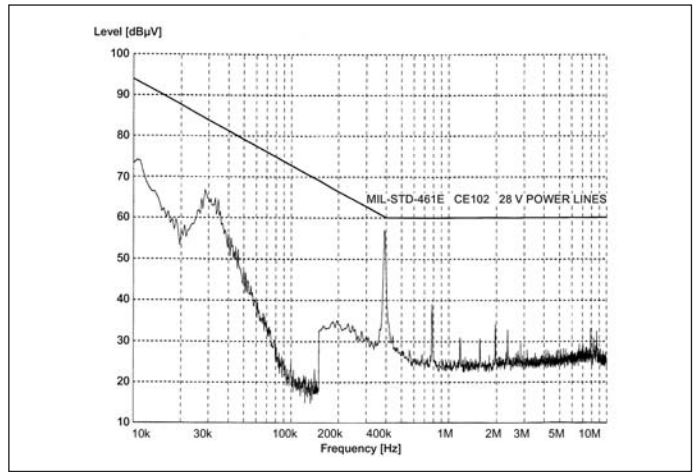


Figure 2 — Conducted Noise; M-FIAM5 and Model V24A12M400B DC-DC converter operating at 28 Vdc, 400 W.

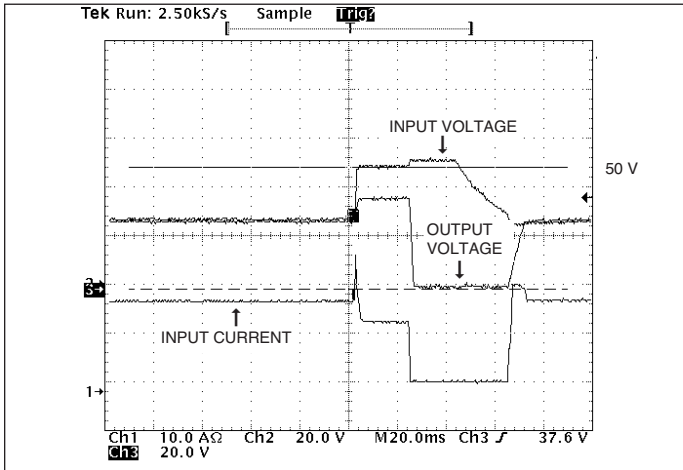


Figure 3 — Transient Immunity: M-FIAM5 output response to an input transient.

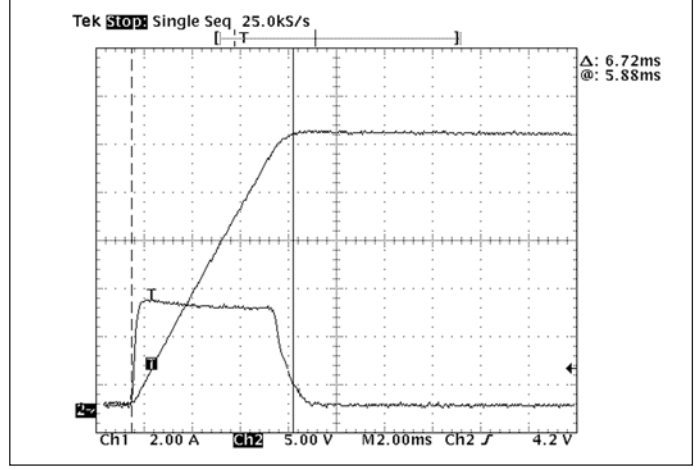


Figure 4— Inrush Limiting: Inrush current with 1000 μF external capacitance, (C1 in Figure 5)

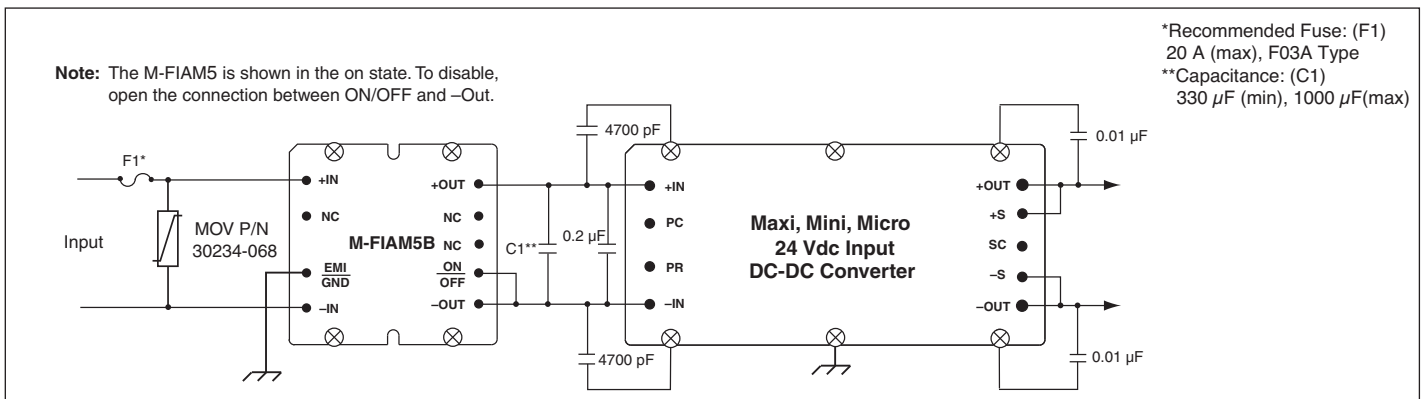


Figure 5— Basic connection diagram with Transient and Surge Protection

MECHANICAL DRAWINGS

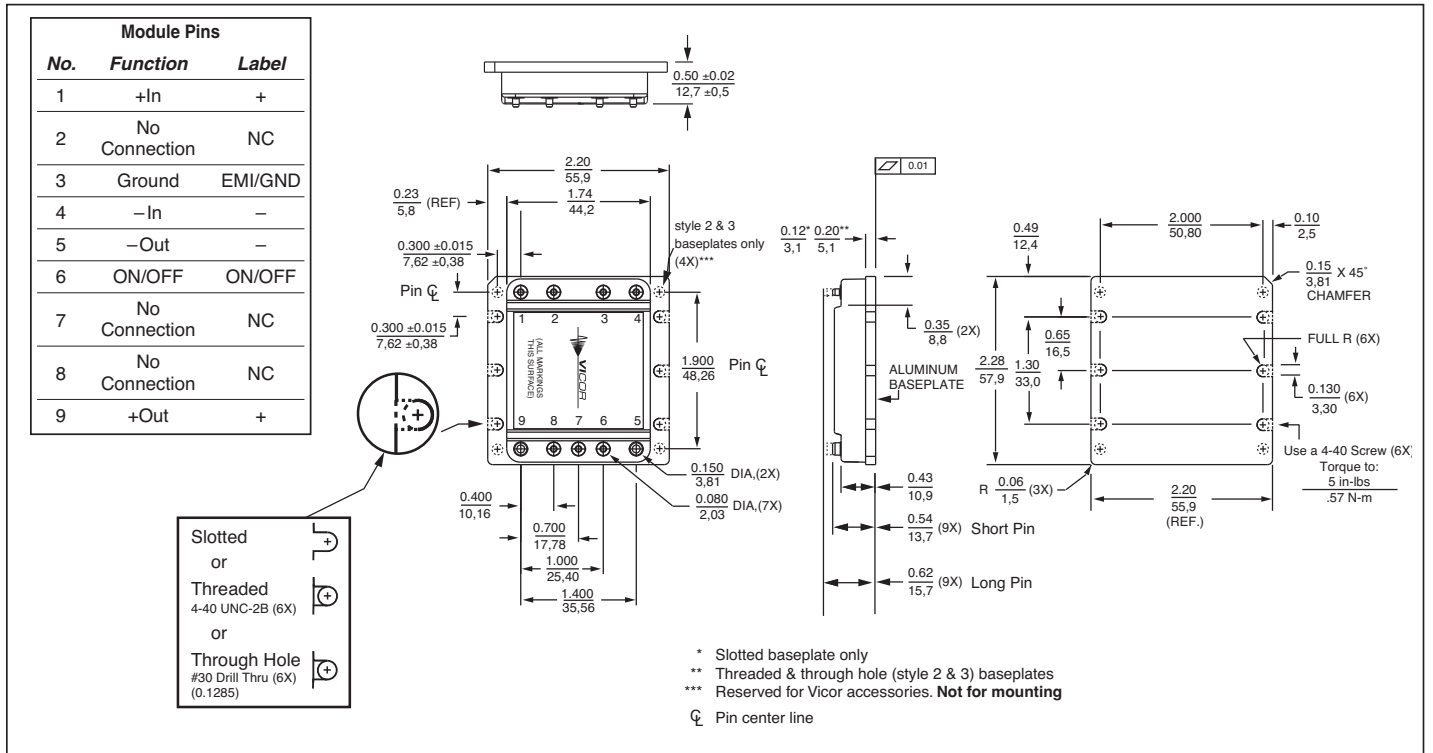


Figure 6 — Mechanical diagram

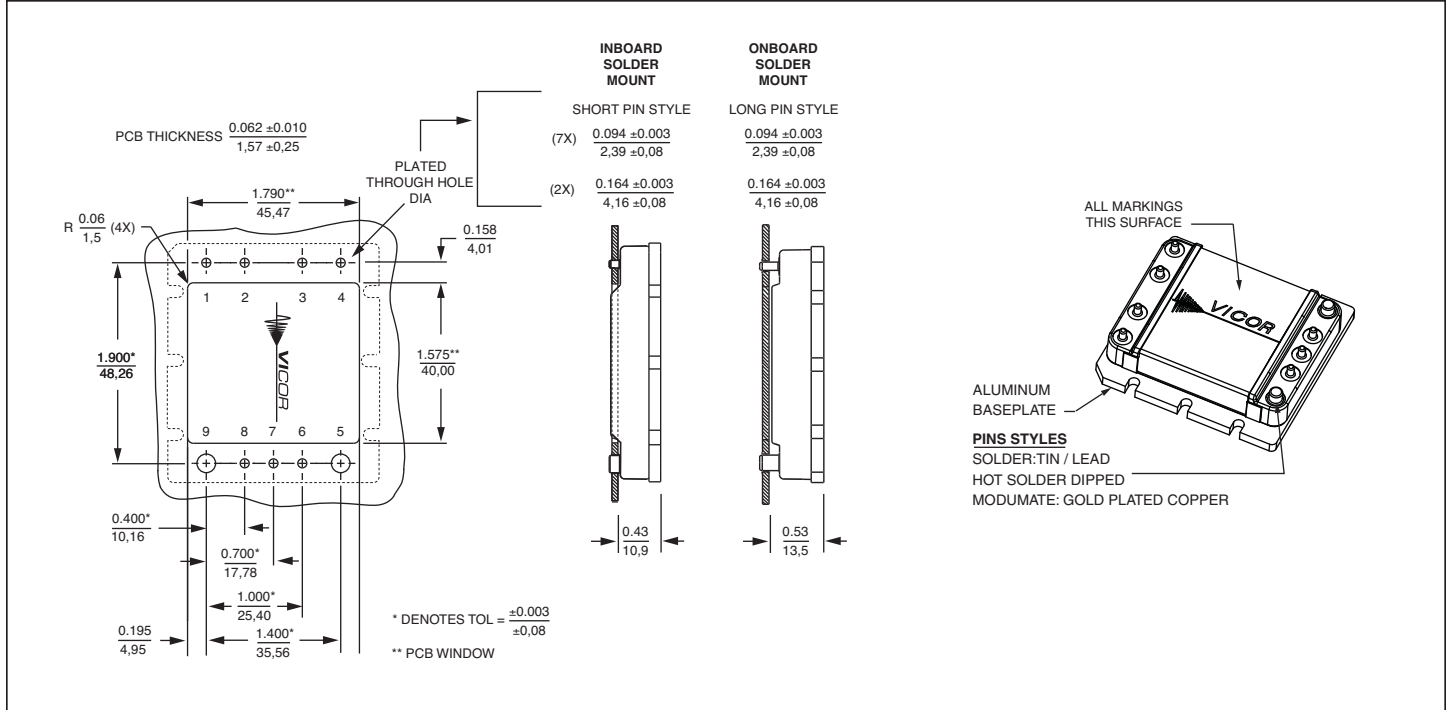
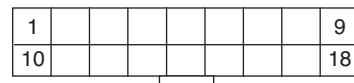
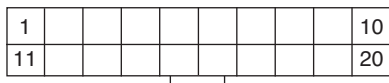
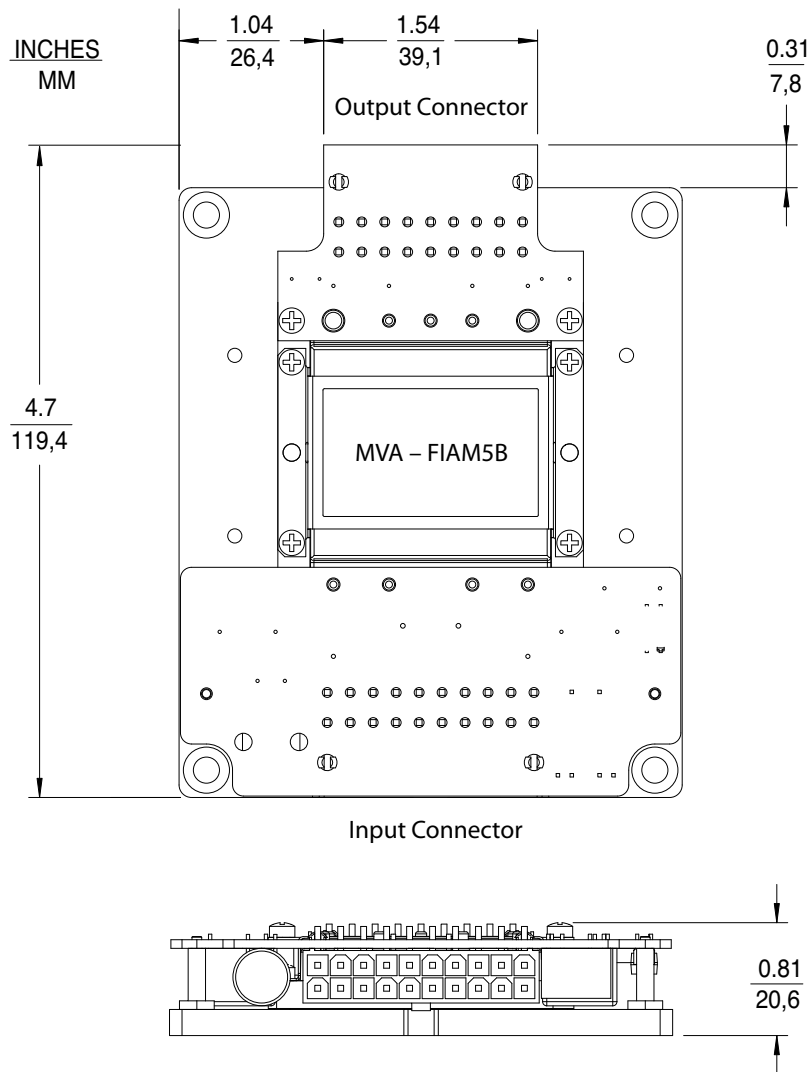


Figure 7 — PCB Mounting Specifications.



Input Connector

Pin #	Function
1 – 4	–Vin
5 – 7	+Vin
8	NC / PR bus
9	PE protective earth
10	Neg. enable
11 – 13	–Vin
14 – 17	+Vin
18	NC / PR bus
19	PE protective earth
20	Pos. enable

Output Connector

Pin #	Function	Pin #	Function
1	+Vout	10	+Vout
2	+Vout	11	+Vout
3	+Vout	12	+Vout
4	N/C	13	N/C
5	N/C	14	N/C
6	N/C	15	N/C
7	–Vout	16	–Vout
8	–Vout	17	–Vout
9	–Vout	18	–Vout

Figure 8 — MVA-FIAM5B Packaging Option

Warranty

Vicor products are guaranteed for two years from date of shipment against defects in material or workmanship when in normal use and service. This warranty does not extend to products subjected to misuse, accident, or improper application or maintenance. Vicor shall not be liable for collateral or consequential damage. This warranty is extended to the original purchaser only.

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