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*

M-FIAM5B | **M** | **2** | **1**

Product

Product Grade Temperatures (°C)

Grade	Operating	Storage
H =	–40 to +100	–55 to +125
M =	–55 to +100	–65 to +125

Pin Style
1 = Short Pin
2 = Long Pin
S = Short ModuMate*
N = Long ModuMate*

Baseplate
1 = Slotted
2 = Threaded
3 = Thru hole

*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°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					See Figure 5 on page 4
	330		1000	μF	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 kΩ 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	

■ 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.

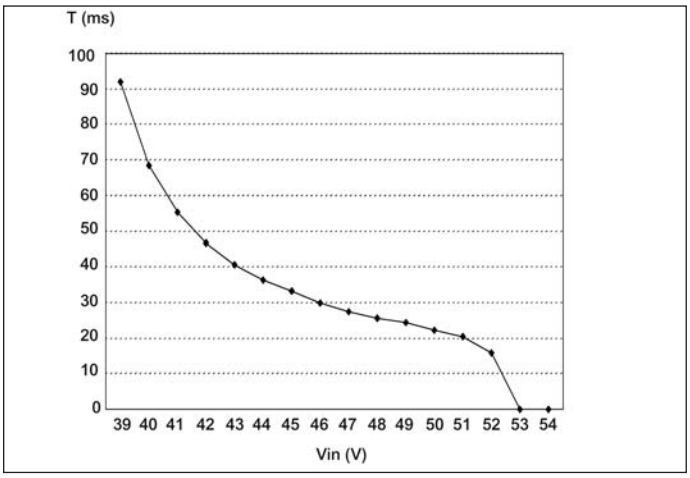


Figure 1 *— Shut Down Time of M-FIAM5 vs. Overvoltage*

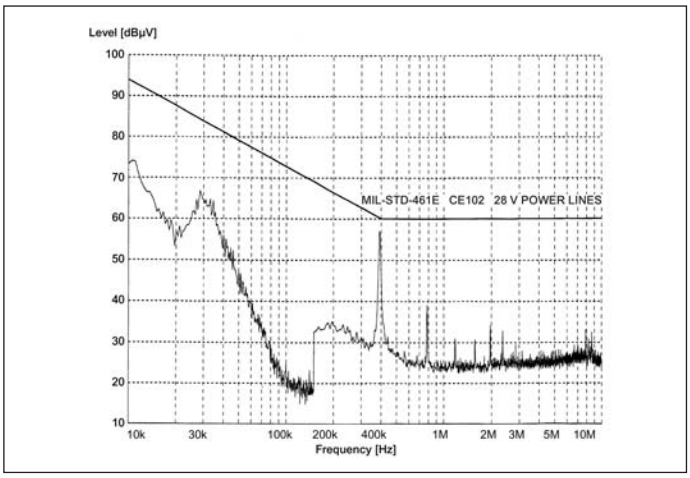


Figure 2 *— Conducted Noise; M-FIAM5 and Model V24A12M400B DC-DC converter operating at 28 Vdc, 400 W.*

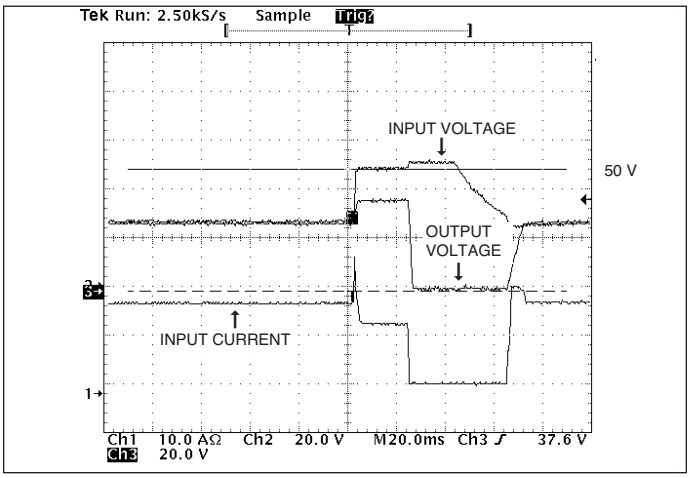


Figure 3 *— Transient Immunity: M-FIAM5 output response to an input transient.*

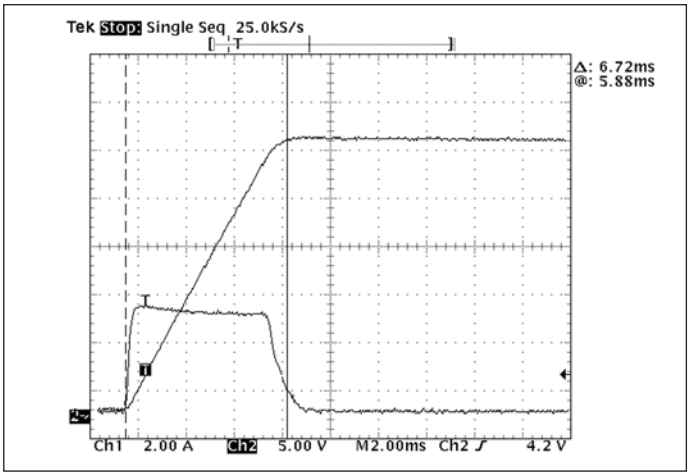


Figure 4*— Inrush Limiting: Inrush current with 1000 µF external capacitance, (C1 in Figure 5)*

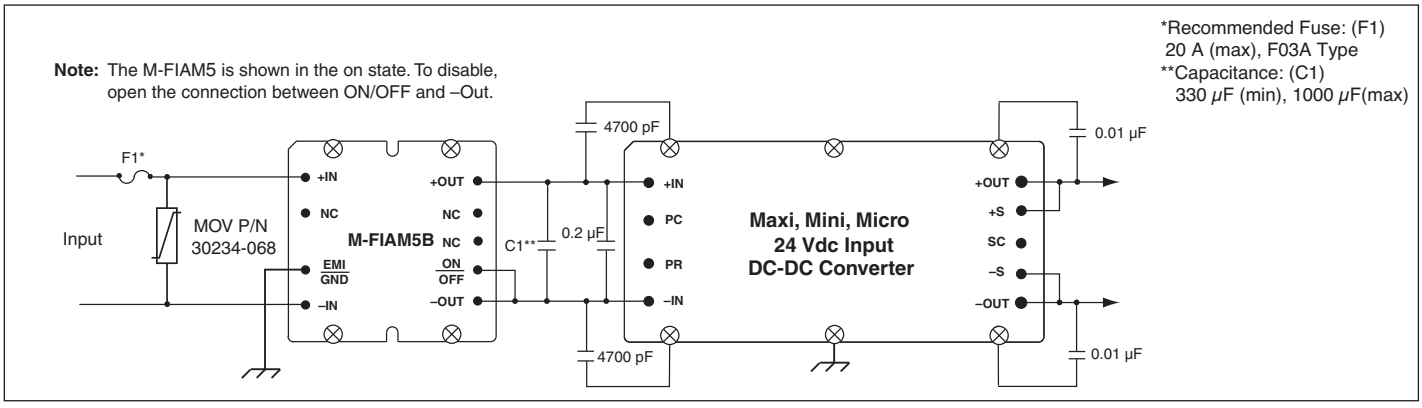


Figure 5*— Basic connection diagram with Transient and Surge Protection*

MECHANICAL DRAWINGS

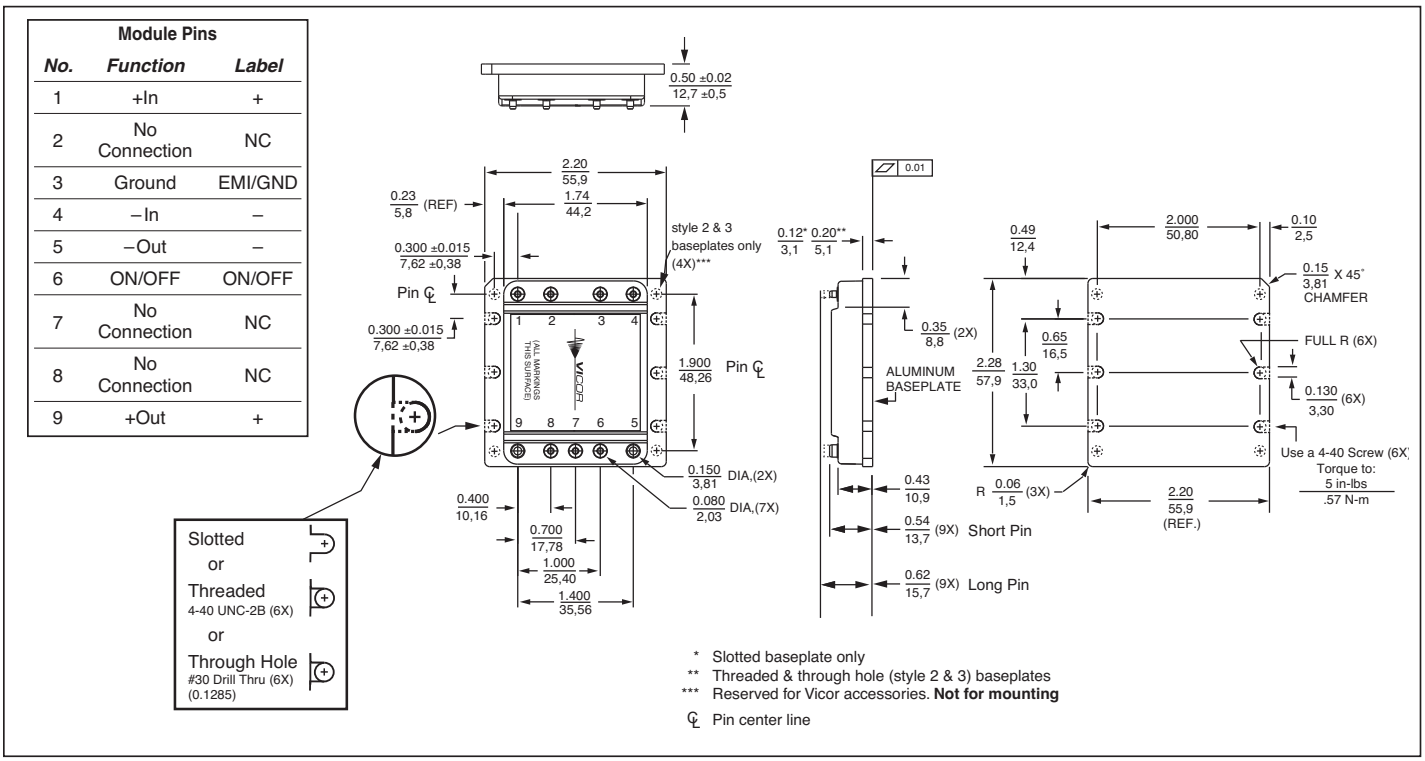


Figure 6 — *Mechanical diagram*

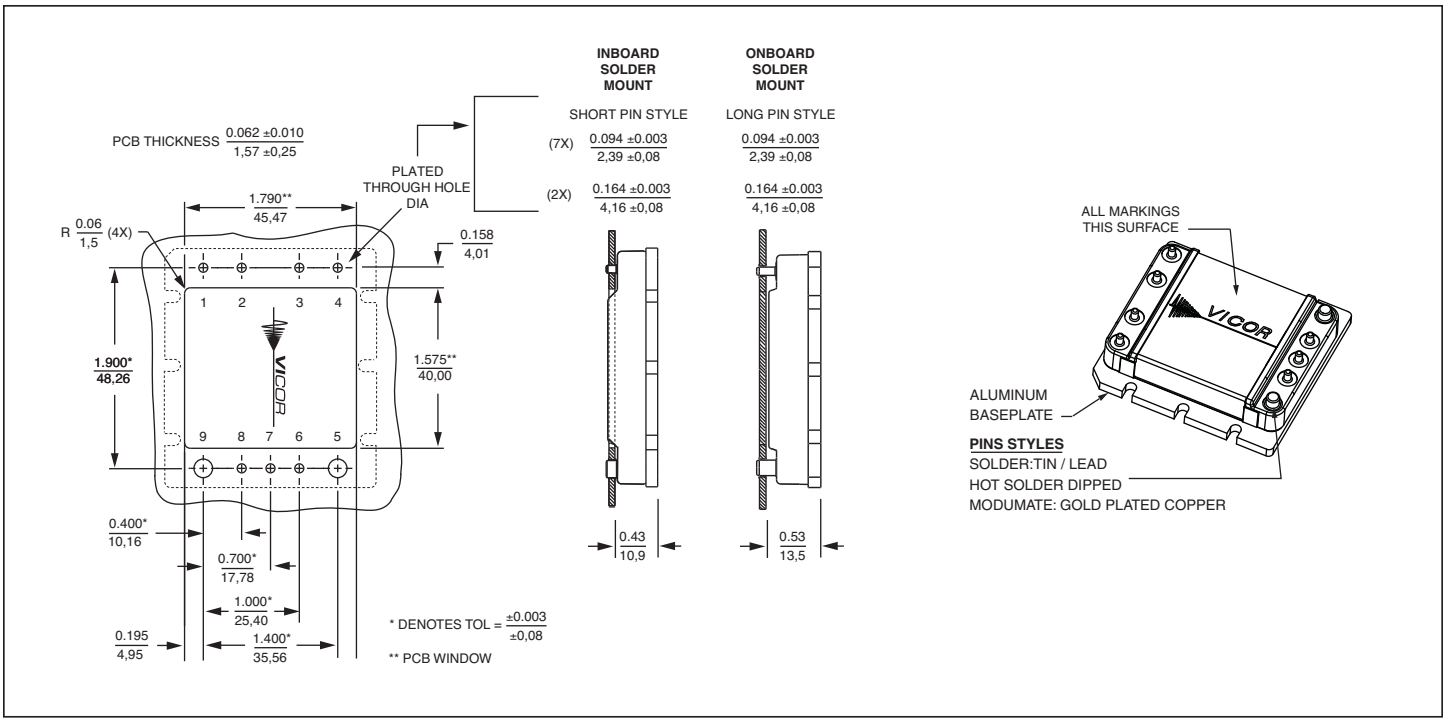
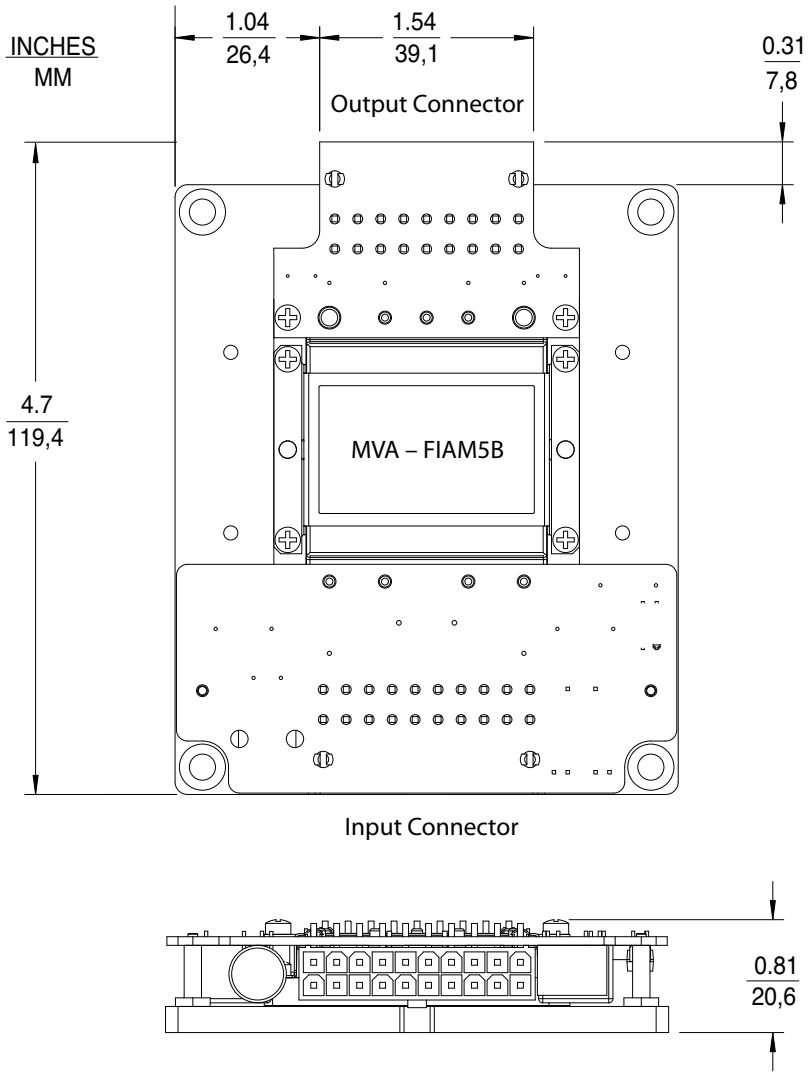
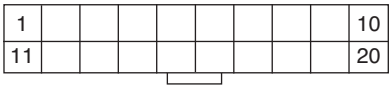
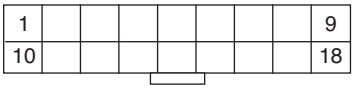


Figure 7 — *PCB Mounting Specifications.*







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

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