



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 power up to 130 W
- Output current up to 10 A
- Mini sized package
- Inrush current limiting

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
	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

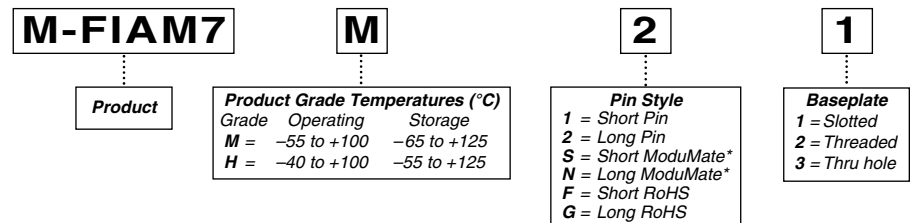
Thermal Resistance and Capacity

Parameter	Min	Typ	Max	Unit
Baseplate to sink				
flat, greased surface		0.16		°C/Watt
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-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/ μF	
Transient immunity			100	Vdc	50 ms per MIL-STD-1275A/B/D, continuous operation
			250	Vdc	70 μs 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	Over continuous input and temp. range (see Fig.4)
Output power			130	W	Transient compliance over temp. range (see Fig.6)
Efficiency	96	98		%	
Internal voltage drop		0.5	0.7		@10 A, 100 $^{\circ}\text{C}$ baseplate
External capacitance	330		1000	μF	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 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

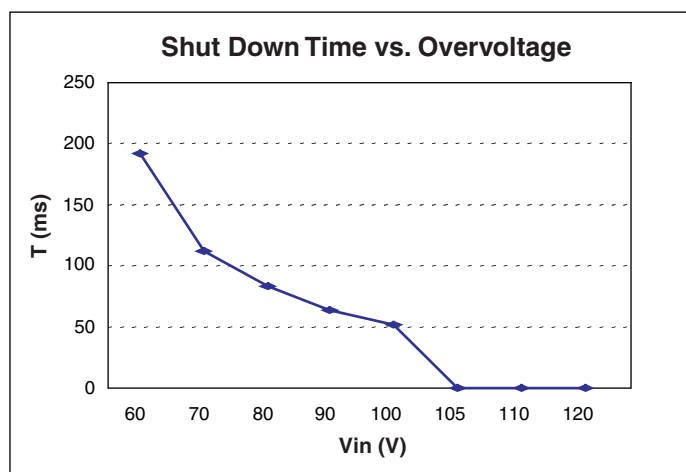


Figure 1 – T = Time period before over-voltage protection.
Vin = Input voltage (switching up from 28 Vdc)

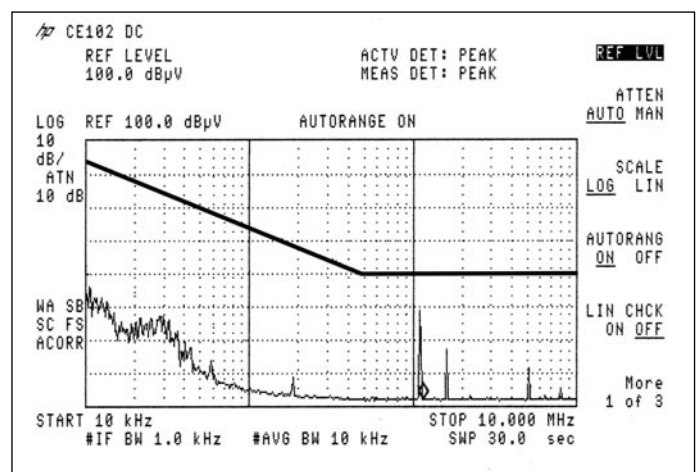


Figure 2 – Conducted Noise; M-FIAM7 and MP028F036M12AL + MV036F120M010 DC-DC V•I Chip modules operating at 28 Vdc, 120 W.

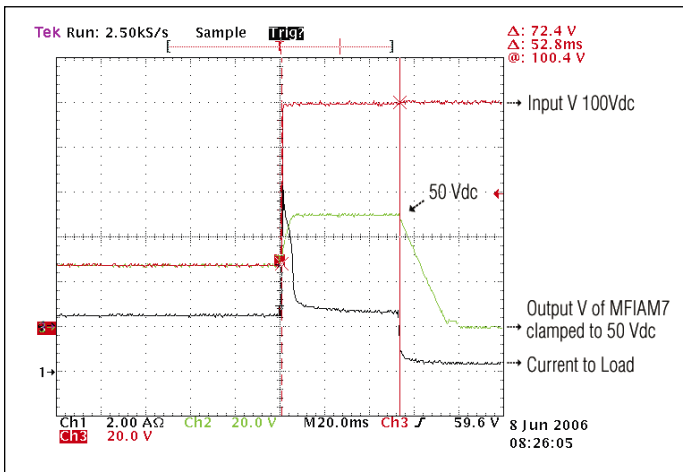


Figure 3 – Transient Immunity; M-FIAM7 output response to an input transient.

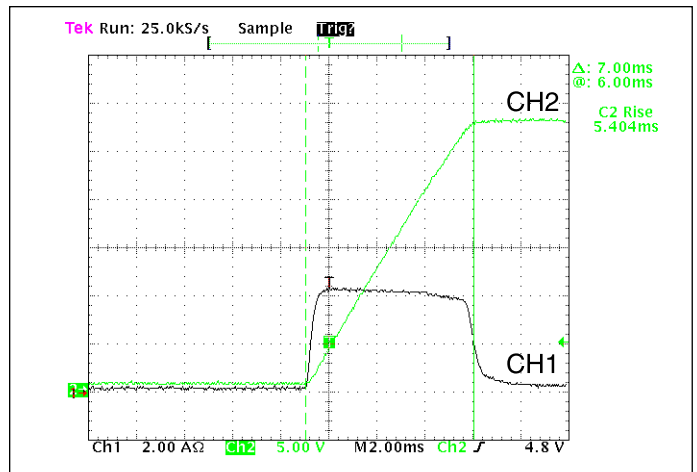


Figure 4 – Inrush Limiting; Inrush current with 1000 μ F external capacitance.

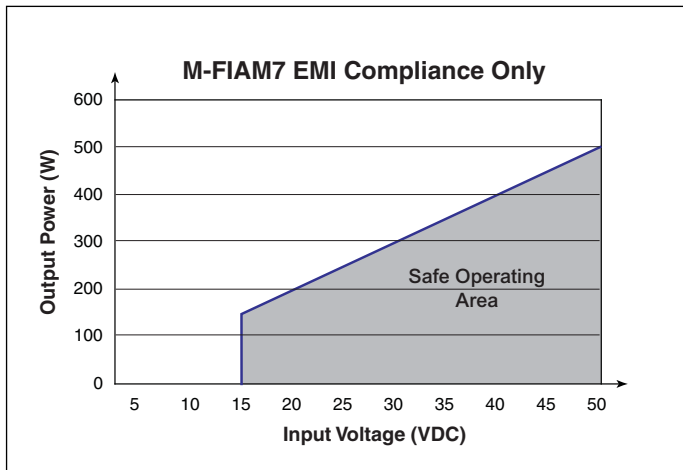


Figure 5 – M-FIAM7 EMI Compliance only

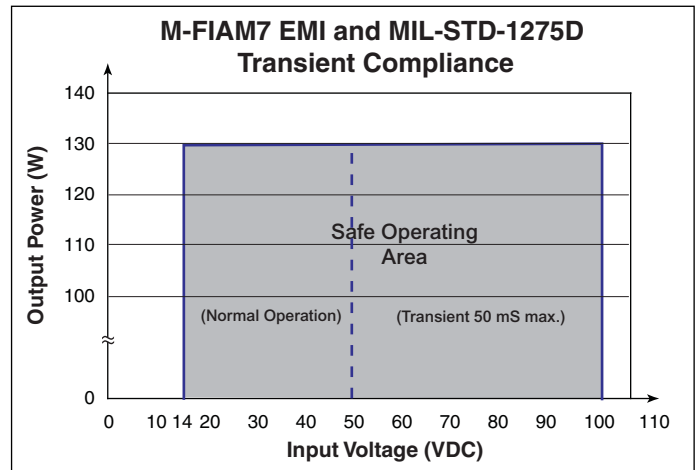


Figure 6 – M-FIAM7 EMI and MIL-STD-1275D Transient Compliance

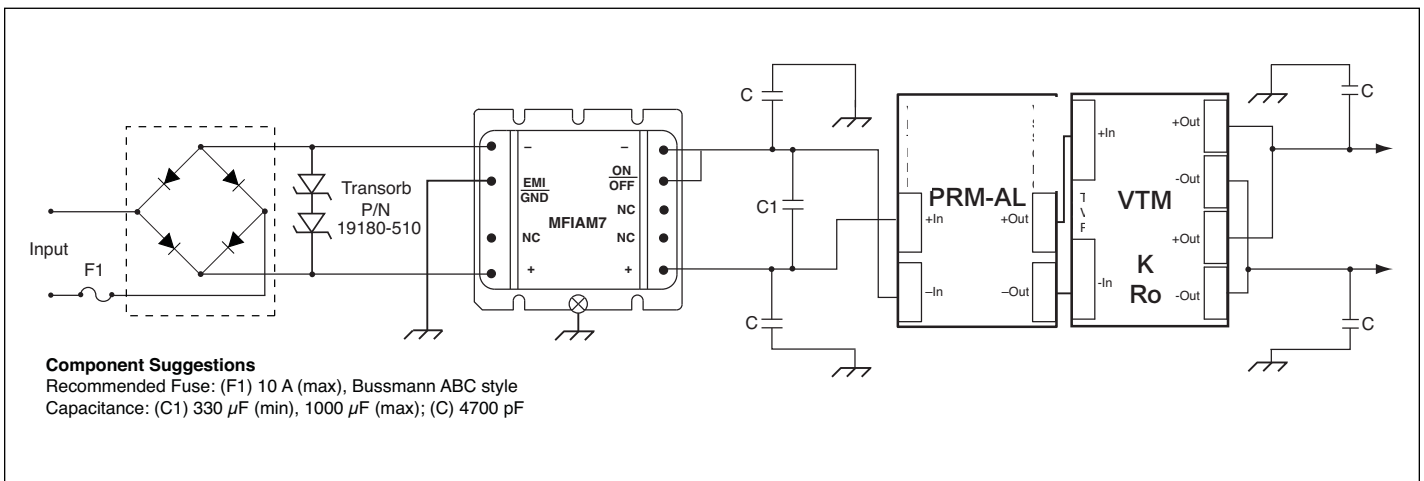


Figure 7 – Basic connection diagram with Transient, Surge Protection and Recommended Reverse Polarity Protection.

MECHANICAL DRAWINGS

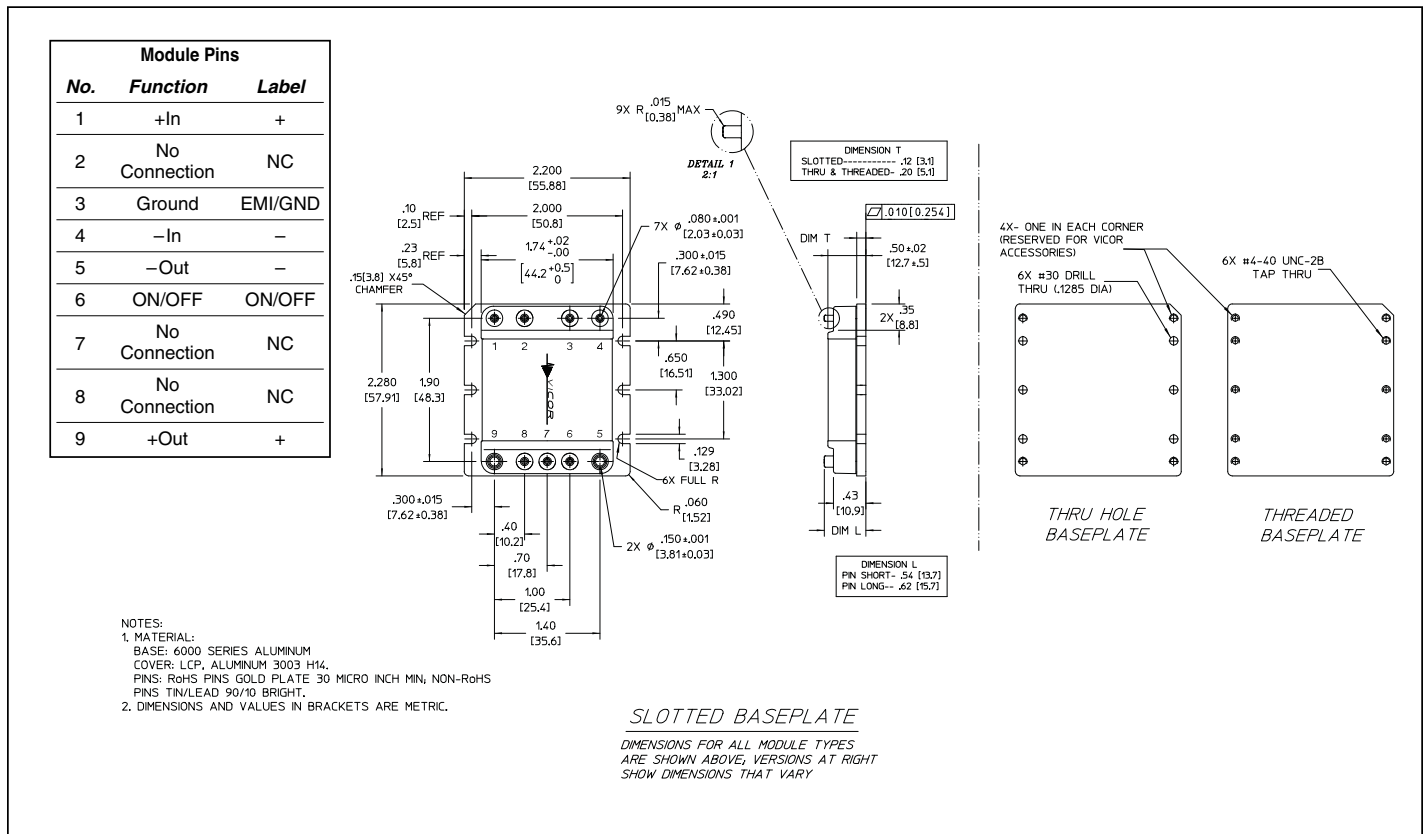


Figure 8 – Mechanical diagram

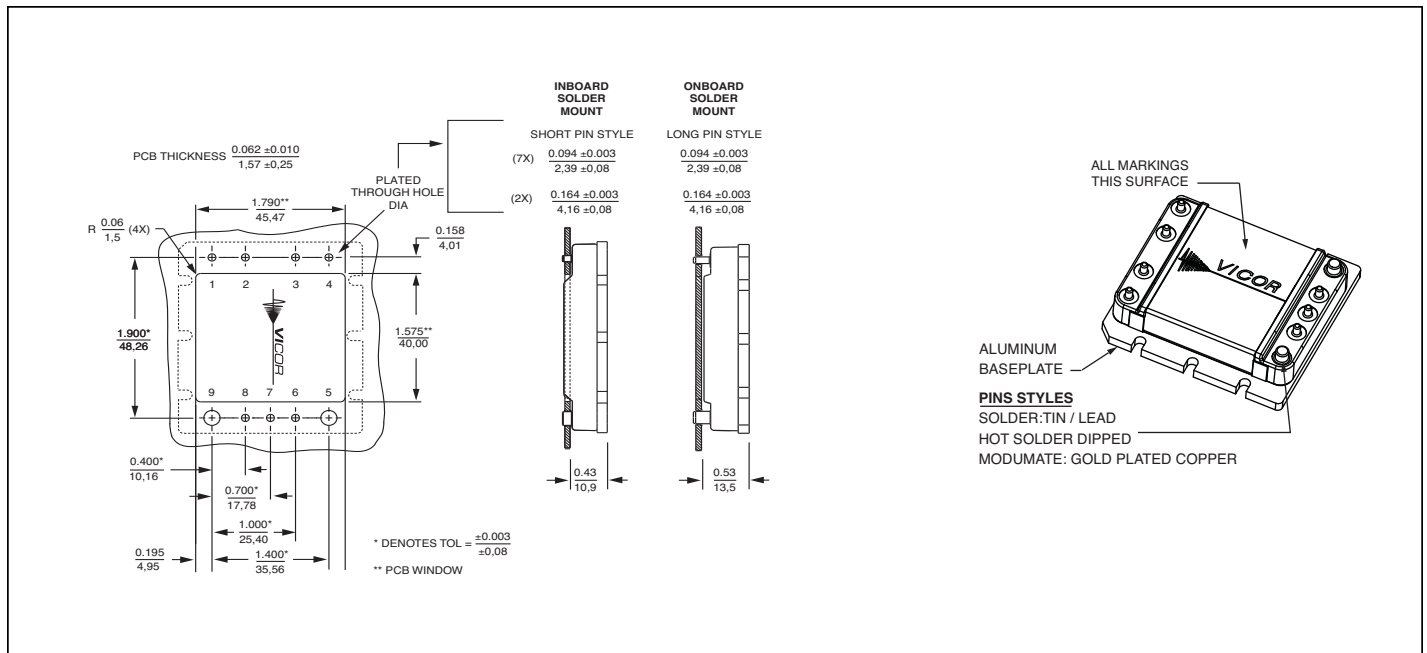


Figure 9 – PCB Mounting Specifications

Warranty

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