



Actual size:  
 2.28 x 2.2 x 0.5in  
 [57,9 x 55,9 x 12,7mm]



## Filter Input Attenuator Module

### Features & Benefits

- RoHS Compliant (with F or G pin style)
- EMI filtering – Class B <sup>[a]</sup>
- Transient protection
- Low-profile mounting options
- 10 and 20 Ampere versions
- UL, CSA, EN compliance
- Mini-size package
- Inrush current limiting

### Product Highlights

The FIAM is a DC front-end module providing transient protection, inrush current limiting and Class B EMI filtering in a Mini-size package. The FIAM enables designers using Vicor 48V<sub>IN</sub> Mini, Micro or Maxi DC-DC converters to meet the transient immunity and EMI requirements of Bellcore, FCC, ETSI and European Norms and protect system hardware from inrush current. The FIAM accepts an input voltage of 36 – 76V<sub>DC</sub>, is available in 10 or 20A versions and provides reverse polarity protection and remote on/off control.

The FIAM is housed in an industry-standard “half brick” module measuring 2.28 x 2.2 x 0.5in and, depending upon model selected, may be mounted onboard or inboard for height-critical applications.

<sup>[a]</sup> EMI performance is subject to a wide variety of external influences such as PCB construction, circuit layout etc. As such, external components in addition to those listed herein may be required in specific instances to gain full compliance to the standards specified.

### Compatible Products

- Mini, Micro, Maxi 48V Input DC-DC converters

### Absolute Maximum Rating

Parameter	Rating	Unit	Notes
+IN to –IN	80	V <sub>DC</sub>	Continuous
	100	V	100ms
+OUT to –OUT	75	V <sub>DC</sub>	Continuous
Mounting torque	5 [0.57]	in-lbs [N·m]	6 each, #4-40 or M3
Operating temperature	–40 to +100	°C	T- and H-Grade
Storage temperature	–55 to +125	°C	H-Grade
Pin soldering temperature	500 [260]	°F [°C]	<5sec; wave solder
	750 [390]	°F [°C]	<7sec; hand solder

### Thermal Resistance

Parameter	Min	Typ	Max	Unit
Baseplate to sink				
			0.16	°C/Watt
flat, greased surface				
thermal pad (P/N 20264)			0.14	°C/Watt
Baseplate to ambient				
			8.0	°C/Watt
Free Convection				
1000LFM			1.9	°C/Watt

### Part Numbering



<sup>[b]</sup> Not intended for socket or Surfmate mounting

Note: Product images may not highlight current product markings.

## 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	36	48	76	$V_{DC}$	Continuous
Inrush limiting			0.014	A/ $\mu\text{F}$	Capacitor C1. Figure 6

### Output Specifications

Parameter	Min	Typ	Max	Unit	Notes
Output current					
FIAM1xxx			10	A	
FIAM2xxx			20	A	
Efficiency	96.0	97.5		%	Internal voltage drop is 1.4 max. @ 20A, 100°C baseplate
External capacitance					See illustration on page 3, Figure 6.
FIAM1xxx	10		150	$\mu\text{F}$	100V
FIAM2xxx	100		330	$\mu\text{F}$	100V

### Control Pin Specifications

Parameter	Min	Typ	Max	Unit	Notes
ON / OFF control					
Enable (ON)	0.0		1.0	$V_{DC}$	Referenced to $-V_{OUT}$
Disable (OFF)	3.5		5.0	$V_{DC}$	100k $\Omega$ internal pull-up resistor

### Electromagnetic Compatibility

Parameter	Min	Typ	Max	Unit	Notes
Transient immunity					
Bellcore TR-NWT-000499			200	V	1 $\mu\text{sec}$ duration
ETS 300 386-1 Class 2			200	V	5.0 $\mu\text{sec}$ rise time, 50 $\mu\text{sec}$ duration surge
			250	V	1 – 100nsec burst

### Safety Specifications

Parameter	Min	Typ	Max	Unit	Notes
Dielectric withstand (I/O to baseplate)		1,500		$V_{RMS}$	
		2,121		$V_{DC}$	

## Specifications (Cont.)

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

### Agency Approvals

Safety Standards	Markings	Notes
UL1950, CSA 22.2-950, EN60950		
Conducted Emission (Figures 2&3) <sup>[c]</sup>		
Bellcore GR-001089-Core		Issue 2
EN55022		Level B; When used with Vicor Mini, Maxi, Micro 48V <sub>IN</sub> DC-DC converter
FCC Part 15		Level B

### General Specifications

Parameter	Min	Typ	Max	Unit	Remarks
Reverse polarity protection					No damage to module, external fuse required
Weight		3.1 [88]	4 [113]	ounces [grams]	
Warranty			2	years	



Figure 1 — FIAM block diagram

<sup>[c]</sup> EMI performance is subject to a wide variety of external influences such as PCB construction, circuit layout etc. As such, external components in addition to those listed herein may be required in specific instances to gain full compliance to the standards specified.

Conducted Noise



Figure 2 — FIAM and model V48A12C500 DC-DC converter



Figure 3 — FIAM and model V48B24C250 DC-DC converter

Inrush Limiting



Figure 4 — Inrush limiting: inrush current with 330μF external capacitance

Transient Immunity



Figure 5 — Transient immunity: FIAM output response to an input transient

Transient and Surge Protection



Figure 6 — Typical connection diagram

## Storage

Vicor products, when not installed in customer units, should be stored in ESD safe packaging in accordance with ANSI/ESD S20.20, "Protection of Electrical and Electronic Parts, Assemblies and Equipment" and should be maintained in a temperature controlled factory/warehouse environment not exposed to outside elements controlled between the temperature ranges of 15°C and 38°C. Humidity shall not be condensing, no minimum humidity when stored in an ESD compliant package.

## Mechanical Diagram



## PCB Mounting Specifications



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