FIAM™
48V Input

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 [a]
- 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_{IN} 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_{DC}, 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.

[a] 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_{DC}	Continuous
	100	V	100ms
+OUT to –OUT	75	V_{DC}	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				
flat, greased surface		0.16		°C/Watt
thermal pad (P/N 20264)		0.14		°C/Watt
Baseplate to ambient				
Free Convection		8.0		°C/Watt
1000LFM		1.9		°C/Watt

Part Numbering

FIAM	1	C	1	1
Product	Type	Product Grade Temperatures (°C)	Pin Style	Baseplate

Type
1 = 10A
2 = 20A

Product Grade Temperatures (°C)

Grade	Operating	Storage
E	–10 to +100	–20 to 125
C	–20 to +100	–40 to 125
T	–40 to +100	–40 to 125
H	–40 to +100	–55 to 125

Pin Style
1 = Short
2 = Long
S = Short ModuMate
N = Long ModuMate
F = Short RoHS
G = Long RoHS
K = Extra Long RoHS [b]

Baseplate
1 = Slotted
2 = Threaded
3 = Thru hole

[b] Not intended for socket or Surfmate mounting

Note: Product images may not highlight current product markings.

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	36	48	76	V_{DC}	Continuous
Inrush limiting			0.014	A/µF	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	µF	100V
FIAM2xxx	100		330	µF	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}	100kΩ internal pull-up resistor

Electromagnetic Compatibility

Parameter	Min	Typ	Max	Unit	Notes
Transient immunity					
Bellcore TR-NWT-000499			200	V	1µsec duration
ETS 300 386-1 Class 2			200	V	5.0µsec rise time, 50µsec 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°C, nominal line and 75% load, unless otherwise specified.)

Agency Approvals

Safety Standards	Markings	Notes
UL1950, CSA 22.2-950, EN60950		
UKCA		Electrical equipment (safety) regulations
Conducted Emission (Figures 2&3) [c]		
Bellcore GR-001089-Core		Issue 2
EN55022		Level B; When used with Vicor Mini, Maxi, Micro 48V_{IN} 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	

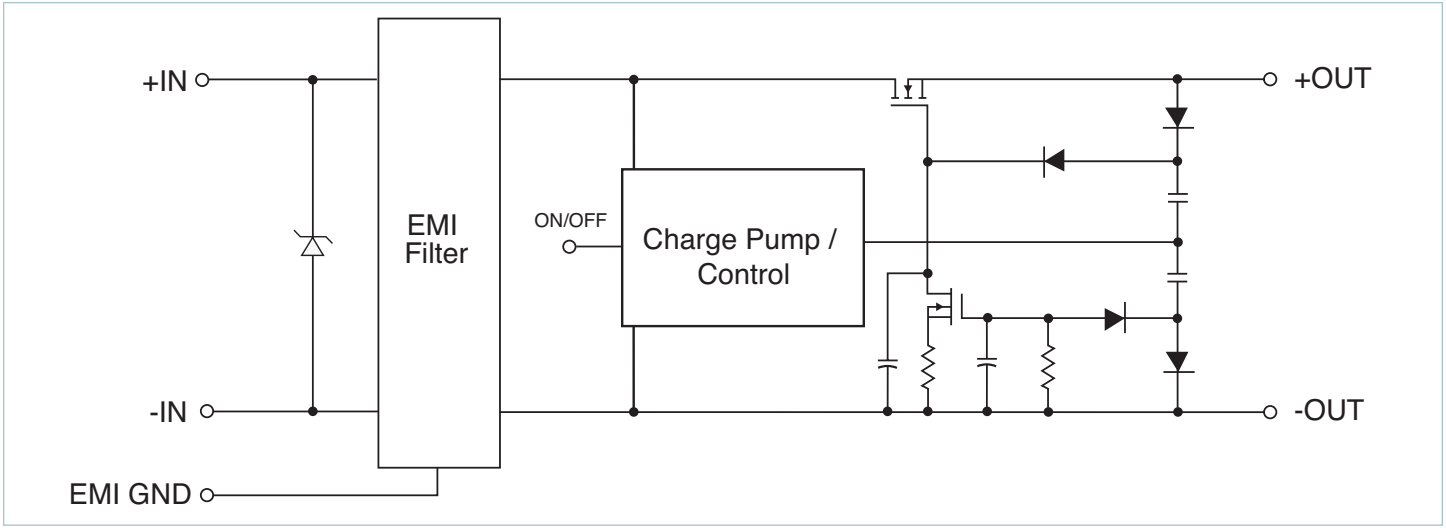


Figure 1 — *FIAM block diagram*

[c] 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

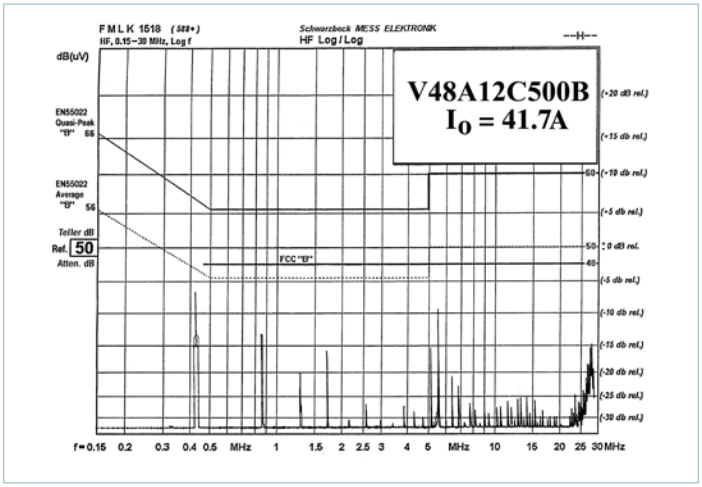


Figure 2 — *FIAM and model V48A12C500 DC-DC converter*

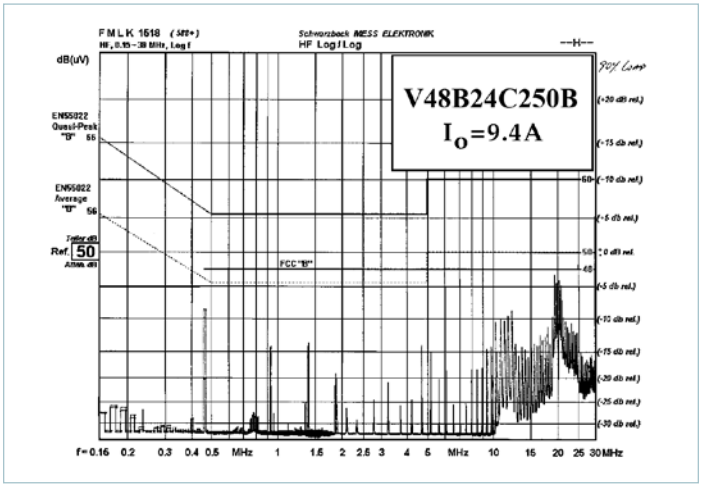


Figure 3 — *FIAM and model V48B24C250 DC-DC converter*

Inrush Limiting

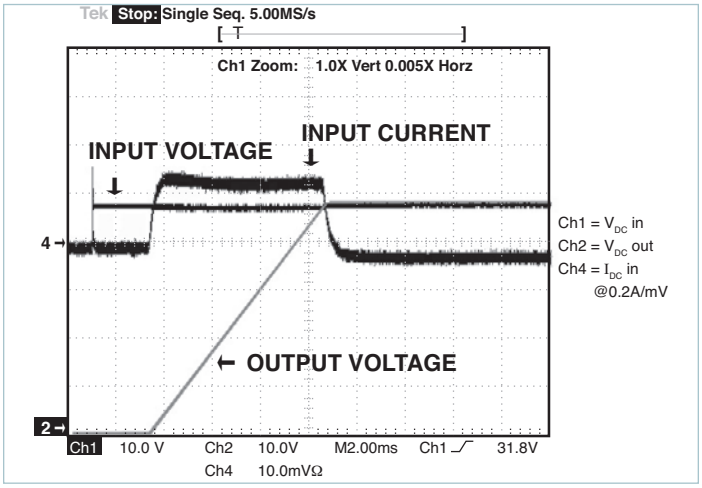


Figure 4 — *Inrush limiting: inrush current with 330µF external capacitance*

Transient Immunity

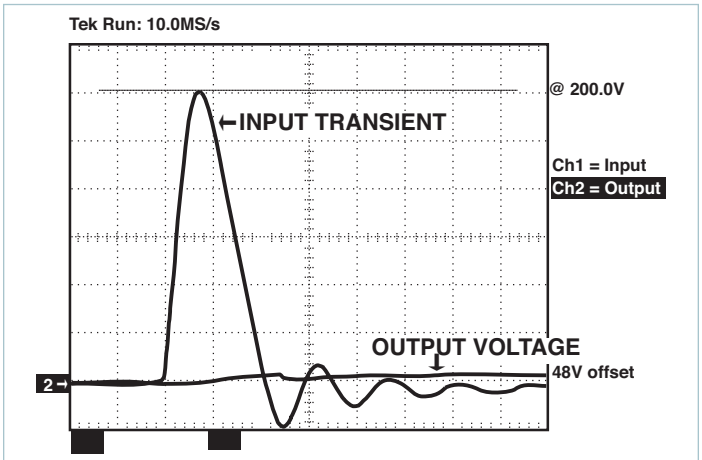


Figure 5 — *Transient immunity: FIAM output response to an input transient*

Transient and Surge Protection

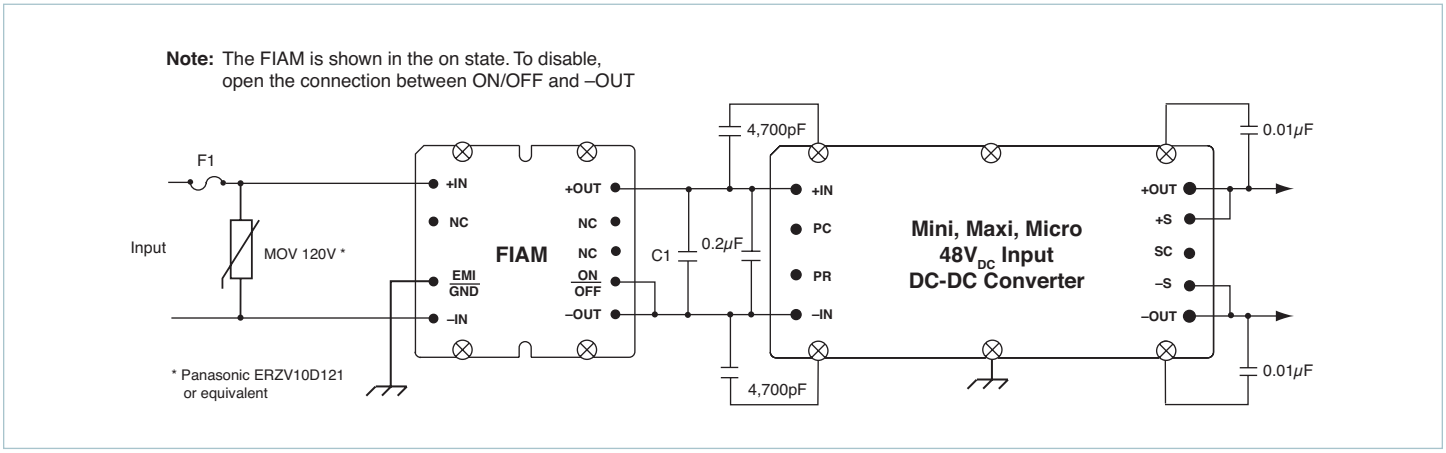


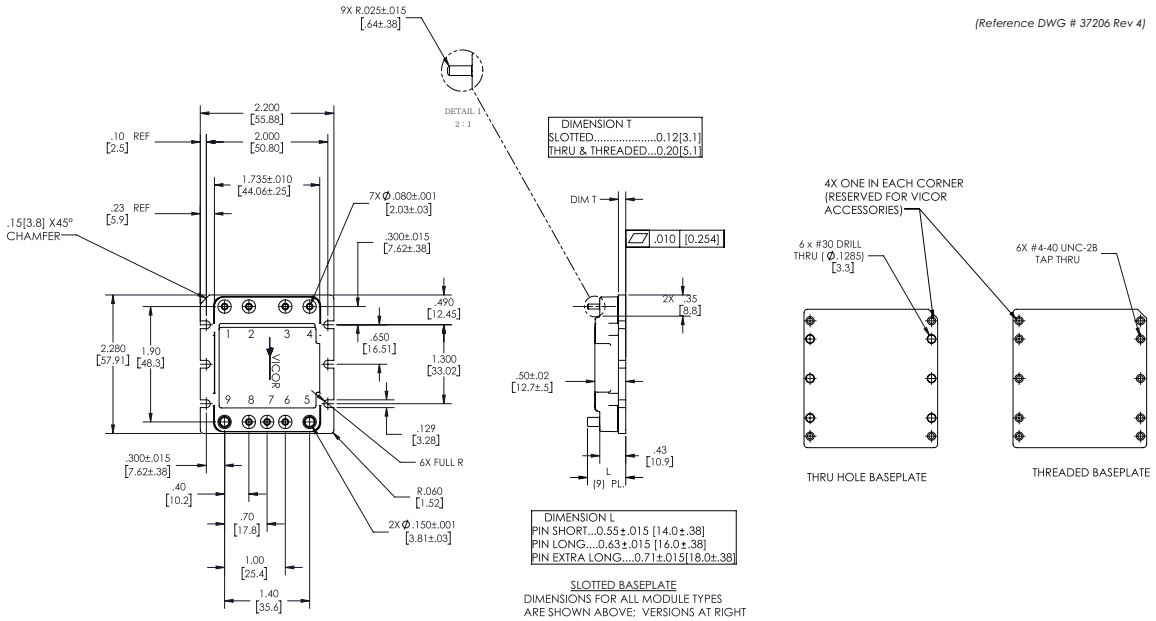
Figure 6 — *Typical connection diagram*

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.

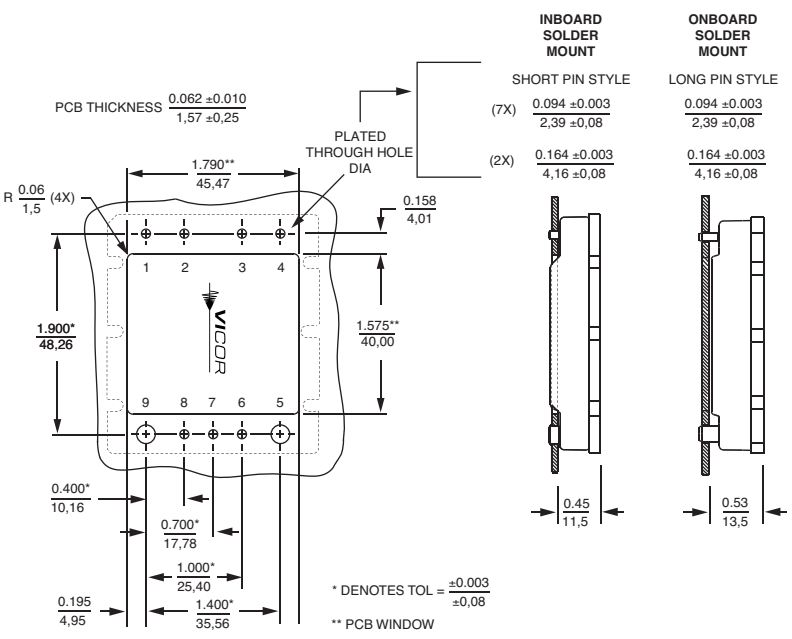
Mechanical Diagram

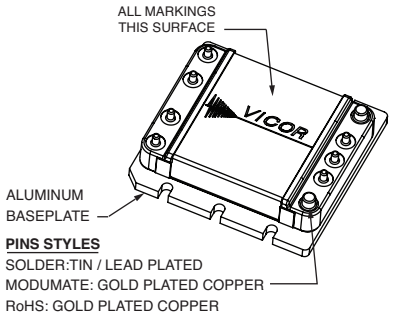
Converter Pins		
No.	*Function*	*Label*
1	+IN	+
2	No Connection	NC
3	Ground	EMI/GND
4	–IN	–
5	–OUT	–
6	ON/OFF	ON/OFF
7	No Connection	NC
8	No Connection	NC
9	+OUT	+



NOTES:
1. MATERIAL:
   BASE: 6000 SERIES ALUMINUM
   PIN PLATING: NICKEL BARRIER FOLLOWED BY
   (RoHS PINS) GOLD PLATE (30 MICRO INCH MIN); OR PALLADIUM (35 UIN MIN), FOLLOWED BY 3 TO 5 UIN GOLD.
   (NON-RoHS PINS) TIN/LEAD 90/10 BRIGHT
2. DIMENSIONS AND VALUES IN BRACKETS ARE METRIC
3. MANUFACTURING CONTROL IS IN PLACE TO ENSURE THAT THE SPACING BETWEEN THE MODULES LABEL SURFACE TO THE PRINTED CIRCUIT BOARD OF THE APPLICATION RANGES FROM DIRECT CONTACT (ZERO), TO THE MAXIMUM GAP AS CALCULATED FROM THE TOLERANCE STACK-UP AND IS NOT SUBJECT NEGATIVE TOLERANCE ACCUMULATION

PCB Mounting Specifications





Consult Vicor Application Note: Soldering methods and procedures for 1st and 2nd Generation modules.

Vicor's comprehensive line of power solutions includes high density AC-DC and DC-DC modules and accessory components, fully configurable AC-DC and DC-DC power supplies, and complete custom power systems.

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Visit http://www.vicorpower.com/dc-dc_filters/fiam-filter_input_attenuator_module for the latest product information.

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