



Data Sheet

VI-IAM™, VE-IAM™ Input Attenuator Modules



Features

- Inputs: 24, 48 and 300 Vdc
- High surge withstand:
 - Bellcore
 - British Telecom BTR 2511
 - IEC-60801-5
- EMI/RFI specifications:
 - Bellcore TR-TSY-000513
 - British Telecom BTR 2511
 - FCC Level “A”
 - EN55022 Level “B”
- cULus, CTÜVus
- 97% efficiency
- Logic disable
- Expansion output for arrays
- Size: 2.28" x 2.4" x 0.5"
(57,9 x 61,0 x 12,7)
- CE Marked
- RoHS Compliant (VE-IAM)

Product Highlights

The Input Attenuator Module (VI-IAM) is a component-level, DC input front end filter designed to occupy minimum board space while providing maximum protection for today’s sophisticated electrical systems. The VI-IAM, in combination with Vicor 24, 48 and 300 Vdc input modules, provides a highly efficient, high density power system with outputs from 1 to 95 Vdc and power expandable from 25 to 800 W. Your system will benefit from the small size, efficiency and inherent reliability of Vicor’s component-level converters, while meeting the toughest demands of Telecommunications and Industrial power applications.

This combination provides compliance with the transient requirements of Bellcore, British Telecom and IEC standards, and meets the EMI/RFI specifications of Bellcore, British Telecom and FCC Part 15, Subpart B and EN55022.

Compatible Products

- VI-200, VE-200, VI-J00, VE-J00
(Inputs: 1, W, 3, N and 6)
- Mega Modules
(Inputs: 1, W, 3, N and 6)

[For additional information see Section 14 of the VI-200 & VI-J00 Design Guide.](#)

VI-IAM Specifications

(Typical at T_{BP} = 25°C, nominal line, 75% load, unless otherwise specified)

Input Characteristics

| Parameter | Min | Typ | Max | Units | Notes |
|--------------------------------------|-----|-----|------|-------------------|-------------------------------------|
| 24 Vdc modules | | | | | |
| Steady state input | 21 | 24 | 32 | Vdc | –A11– models |
| Input spike limit | | | 300 | Vdc | Per BTNR2571 issue 4 |
| | | | 2500 | Vdcpk | Ringwave 0.5 µs rise 100 kHz |
| Input surge limit | | | 100 | Vdc | Figure 1 |
| Overtoltage shut down ^[a] | 34 | | 38 | Vdc | 100 ms, automatic recovery |
| Recommended fuse | | | 20 | Amps | 32 V ACG-20 |
| 24 Vdc modules | | | | | |
| Steady state input | 18 | 24 | 36 | Vdc | –AWW– models |
| Input spike limit | | | 300 | Vdc | Per BTNR2571 issue 4 |
| | | | 2500 | Vdcpk | Ringwave 0.5 µs rise 100 kHz |
| Input surge limit | | | 100 | Vdc | Figure 1 |
| Overtoltage shut down ^[a] | 37 | | 42 | Vdc | 100 ms, automatic recovery |
| Recommended fuse | | | 20 | Amps | 36 V ACG-20 |
| 48 Vdc modules | | | | | |
| Steady state input | 42 | | 60 | Vdc | –A33– models |
| Input spike limit | | | 300 | Vdc | Per BTNR2571 issue 4 |
| | | | 2500 | Vdcpk | Ringwave 0.5 µs rise 100 kHz |
| Input surge limit | | | 160 | Vdc | Figure 1 |
| Overtoltage shut down ^[a] | 62 | | 67 | Vdc | 100 ms, automatic recovery |
| Recommended fuse | | | 20 | Amps | 60 V 3AB-20 |
| 48 Vdc modules | | | | | |
| Steady state input | 36 | | 76 | Vdc | –ANN– models |
| Input spike limit | | | 300 | Vdc | Per BTNR2571 issue 4 |
| | | | 2500 | Vdcpk | Ringwave 0.5 µs rise 100 kHz |
| Input surge limit | | | 276 | Vdc | Figure 1 |
| Overtoltage shut down ^[a] | 77 | | 83 | Vdc | 100 ms, automatic recovery |
| Recommended fuse | | | 20 | Amps | 80 V 3AB-20 |
| 300 Vdc modules | | | | | |
| Steady state input | 200 | | 400 | Vdc | –A66– models |
| Input spike limit | | | 1000 | Vdc | DM, 2 Joule, IAW IEC-801-5 |
| | | | 2000 | Vdc | CM, 2 Joule, IAW IEC-801-5 |
| Input surge limit | | | 800 | Vdc | Figure 1 |
| Overtoltage shut down ^[a] | 402 | | 424 | Vdc | 100 ms, automatic recovery |
| Recommended fuse | | | 5 | Amps | 250 V Bussman PC-Tron |
| All models | | | | | |
| No load power dissipation | | 0.5 | 1.5 | Watts | |
| Inrush current | | 110 | 125 | % I _{IN} | Steady state, I _{IN} 10 ms |

^[a] The VI-IAM disables downstream converters and clamps the converter input voltage at a safe level.

Model Selection Chart

| Model Number | Nominal Input Voltage | Input Range | Compatible DC-DC Converter | Converter |
|---------------------|-----------------------|---------------|----------------------------|-----------|
| VI-A11-CU/VE-A11-CU | 24 Vdc | 21 – 32 Vdc | VI-21x-Cx and VI-J1x-Cx | C-grade |
| VI-AWW-CU/VE-AWW-CU | 24 Vdc | 18 – 36 Vdc | VI-2Wx-Cx and VI-JWx-Cx | C-grade |
| VI-A33-CQ/VE-A33-CQ | 48 Vdc | 42 – 60 Vdc | VI-23x-Cx and VI-J3x-Cx | C-grade |
| VI-ANN-CQ/VE-ANN-CQ | 48 Vdc | 36 – 76 Vdc | VI-2Nx-Cx and VI-JNx-Cx | C-grade |
| VI-A66-CQ/VE-A66-CQ | 300 Vdc | 200 – 400 Vdc | VI-26x-Cx and VI-J6x-Cx | C-grade |

Note: For alternative product grades change the “C” in the part number to “E”, “I”, or “M”.

SPECIFICATIONS

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

■ OUTPUT CHARACTERISTICS

| Parameter | Min | Typ | Max | Units | Test Conditions/Notes |
|-----------------------|-------|-----|------|-------|---|
| Clamp voltage | | | | | |
| 24 Vdc input | 36.0 | | 44.0 | Vdc | –A11– models |
| | 40.5 | | 50.0 | Vdc | –AWW– models |
| 48 Vdc input | 62.0 | | 71 | Vdc | –A33– models |
| | 80.0 | | 90.0 | Vdc | –ANN– models |
| 300 Vdc input | 400 | | 435 | Vdc | –A66– models |
| Output power | | | | | |
| 24 V models | | | 250 | Watts | Output of IAM |
| 48 V models | | | 510 | Watts | Output of IAM |
| 300 V models | | | 510 | Watts | Output of IAM |
| Internal voltage drop | | | | | |
| 24 Vdc | 0.6 | | 0.85 | Vdc | |
| 48 Vdc | 0.6 | | 0.95 | Vdc | |
| 300 Vdc | 1.7 | | 3.5 | Vdc | |
| Overload protection | | | | | |
| 24 Vdc input | –AWW– | 20 | | Amps | Foldback threshold; auto recovery with latched shut down after 2 ms |
| | –A11– | 15 | | Amps | |
| 48 Vdc input | –ANN– | 20 | | Amps | |
| | –A33– | 15 | | Amps | |
| 300 Vdc input | –A66– | 4 | | Amps | |
| | | | | | |

■ ISOLATION CHARACTERISTICS

| Parameter | Min | Typ | Max | Units | Test Conditions |
|----------------|-----|-------|-----|-------|-----------------|
| Input to base | | 1,500 | | Vrms | 1 minute |
| Output to base | | 1,500 | | Vrms | 1 minute |

■ THERMAL CHARACTERISTICS

| Parameter | Min | Typ | Max | Units | Test Conditions |
|----------------------------------|-----|------|-----|--------------------------------|----------------------------------|
| Efficiency | | 97 | | % | |
| Baseplate to sink | | 0.14 | | $^{\circ}\text{C}/\text{Watt}$ | |
| Operating temperature, baseplate | | | 100 | $^{\circ}\text{C}$ | See product grade specifications |
| Storage temperature | | | 125 | $^{\circ}\text{C}$ | See product grade specifications |

■ MECHANICAL SPECIFICATIONS

| Parameter | Min | Typ | Max | Units | Test Conditions |
|-----------|-----|----------|-----|----------------|-----------------|
| Weight | | 3.0 (85) | | ounces (grams) | |

■ PRODUCT GRADE SPECIFICATIONS

| Parameter | E | C | I | M |
|-----------------------------|---|---|---|---|
| Storage Temp. (Baseplate) | -20°C to $+105^{\circ}\text{C}$ | -40°C to $+105^{\circ}\text{C}$ | -55°C to $+105^{\circ}\text{C}$ | -65°C to $+105^{\circ}\text{C}$ |
| Operating Temp. (Baseplate) | -10°C to $+100^{\circ}\text{C}$ | -25°C to $+100^{\circ}\text{C}$ | -40°C to $+100^{\circ}\text{C}$ | -55°C to $+100^{\circ}\text{C}$ |

■ EMI CHARACTERISTICS

| | |
|-------------------------------|---|
| EMI/RFI (conducted emissions) | Meets Bellcore TR-TSY-000513, Issue 2, Rev. 1 (24 and 48V Input); British Telecom BTR 2511, Issue 2 (24 and 48V Input); FCC Part 15, Class A, EN55022 Class B |
|-------------------------------|---|

■ TRANSIENT PROTECTION

| | |
|--|---|
| | Meets Bellcore TA-TSY-001003, Issue 1, 9/89 British Telecom BTR 2511, IEC61000-4-5 Level 2 (VI-A66 only) |
|--|---|

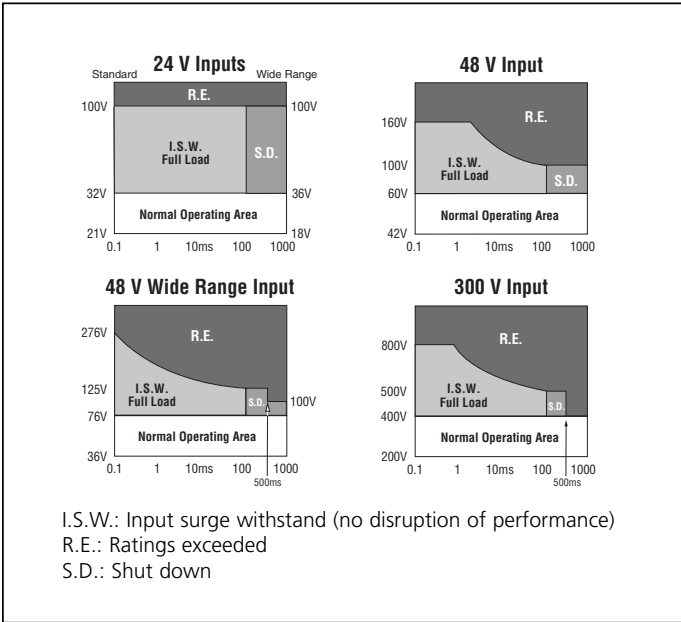


Figure 1 — Safe operating area based on input voltage of IAM (1% duty cycle max., $Z_s=0.5\Omega$, for short duration transient capability refer to specifications.)

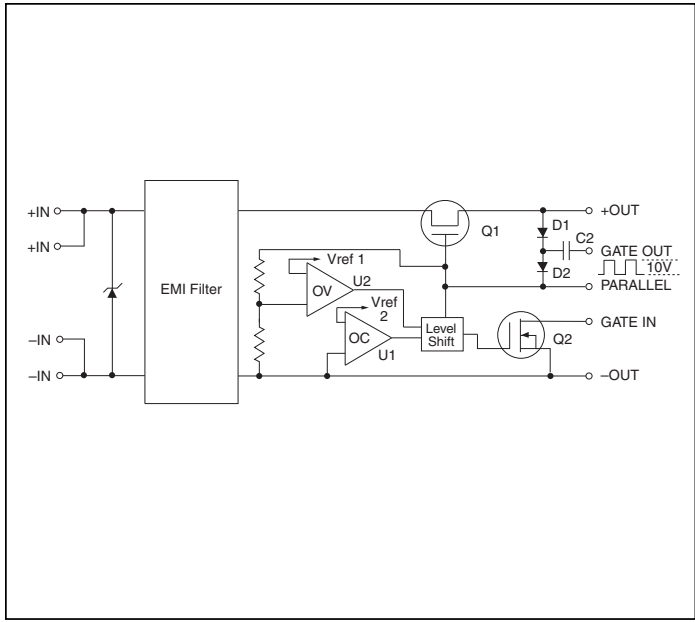


Figure 2 — Block diagram of Input Attenuator Module (IAM)

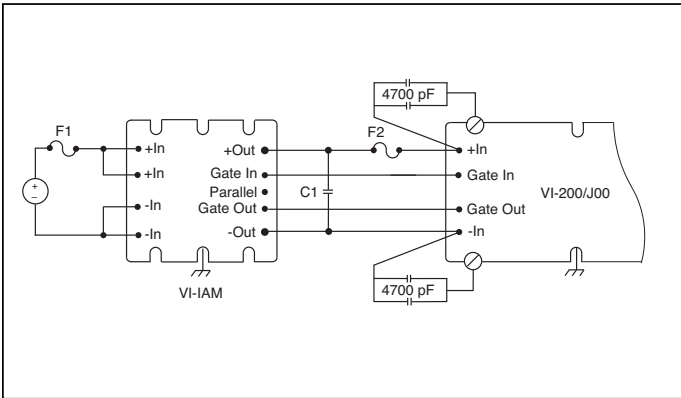


Figure 3 — Typical connection diagram. For recommended fuse (F2) see [VI-200 / VI-J00 application manual](#).

| Input Voltage | Recommended Fuse |
|---------------|-----------------------------|
| 24 V | 20 A / 32 V (AGC-20) |
| 24 V "W" | 20 A / 36 V (AGC-20) |
| 48 V | 20 A / 60 V (3AB-20) |
| 48 V "N" | 20 A / 80 V (3AB-20) |
| 300 V | 5 A / 250 V Bussman PC-Tron |

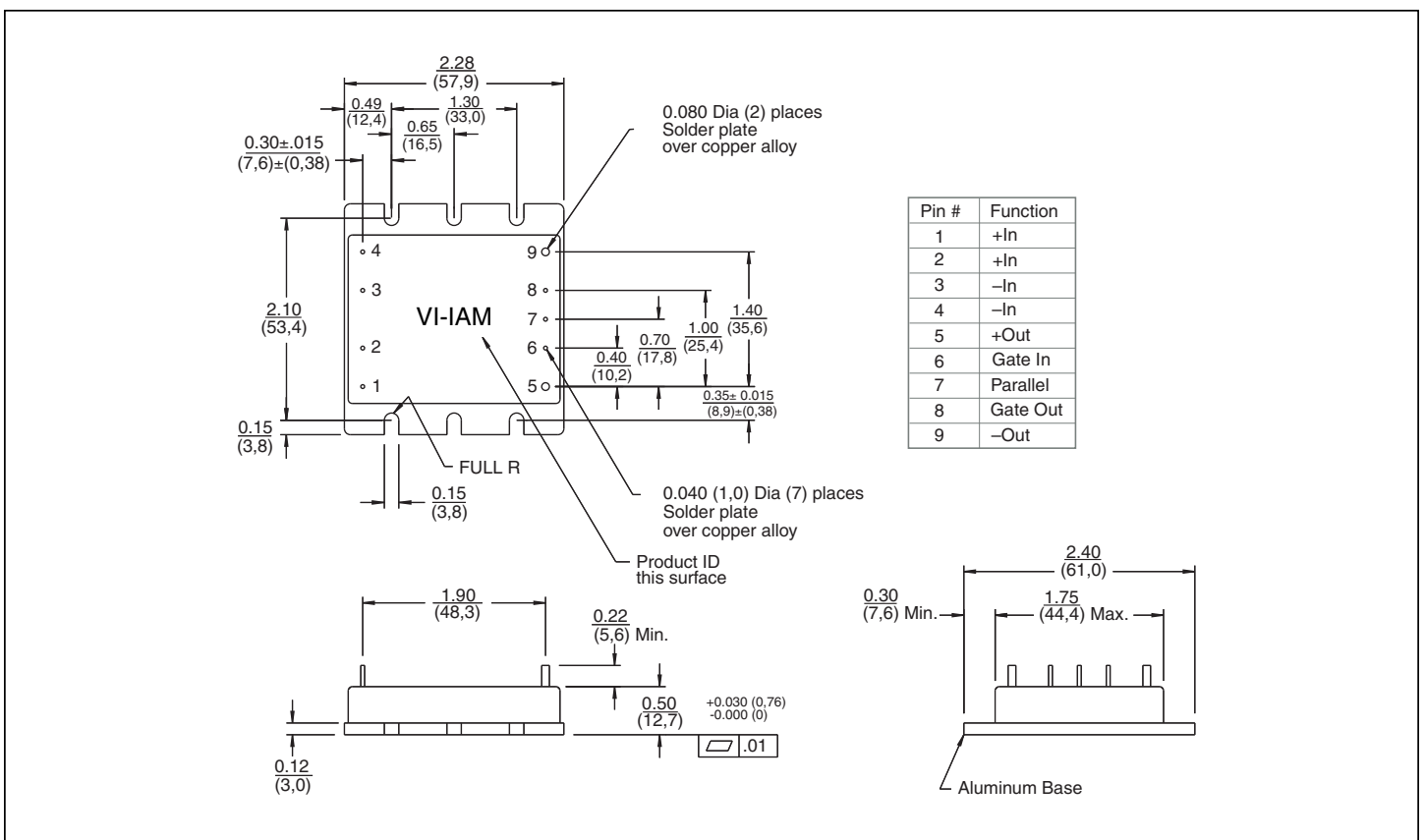
Table 1 — Recommended F1 fusing based on input voltage (see Fig3)

| Input Voltage | Maximum Capacitance ^[a] |
|-----------------------|------------------------------------|
| 24 Vdc (21 – 32 V) | 470 μ F |
| 24 Vdc (18 – 36 V) | 470 μ F |
| 48 Vdc (42 – 60 V) | 220 μ F |
| 48 Vdc (36 – 76 V) | 120 μ F |
| 300 Vdc (200 – 400 V) | 27 μ F |

^[a] Capacitance should be distributed across the input of each DC-DC converter. (C1, Figure 3)

Table 2 — Recommended distributed capacitance on input of DC-DC converter(s)

MECHANICAL DRAWING



Note: For alternate packaging options refer to the mechanical drawing page of vicorpower.com

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.

EXCEPT FOR THE FOREGOING EXPRESS WARRANTY, VICOR MAKES NO WARRANTY, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Vicor will repair or replace defective products in accordance with its own best judgement. For service under this warranty, the buyer must contact Vicor to obtain a Return Material Authorization (RMA) number and shipping instructions. Products returned without prior authorization will be returned to the buyer. The buyer will pay all charges incurred in returning the product to the factory. Vicor will pay all reshipment charges if the product was defective within the terms of this warranty.

Information published by Vicor has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies. Vicor reserves the right to make changes to any products without further notice to improve reliability, function, or design. Vicor does not assume any liability arising out of the application or use of any product or circuit; neither does it convey any license under its patent rights nor the rights of others. Vicor general policy does not recommend the use of its components in life support applications wherein a failure or malfunction may directly threaten life or injury. Per Vicor Terms and Conditions of Sale, the user of Vicor components in life support applications assumes all risks of such use and indemnifies Vicor against all damages.

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.

Information furnished by Vicor is believed to be accurate and reliable. However, no responsibility is assumed by Vicor for its use. Vicor components are not designed to be used in applications, such as life support systems, wherein a failure or malfunction could result in injury or death. All sales are subject to Vicor's Terms and Conditions of Sale, which are available upon request.

Specifications are subject to change without notice.

Intellectual Property Notice

Vicor and its subsidiaries own Intellectual Property (including issued U.S. and Foreign Patents and pending patent applications) relating to the products described in this data sheet. Interested parties should contact Vicor's Intellectual Property Department.

Vicor Corporation
25 Frontage Road
Andover, MA, USA 01810
Tel: 800-735-6200
Fax: 978-475-6715

email

Customer Service: custserv@vicorpower.com
Technical Support: apps@vicorpower.com