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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) |
|--|---|

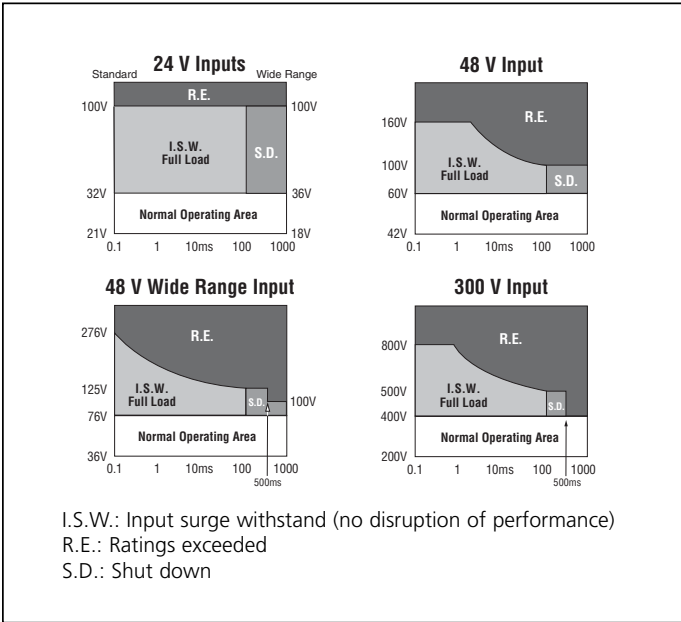


Figure 1 — Safe operating area based on input voltage of IAM (1% duty cycle max., $Z_s=0.5\Omega$, for short duration transient capability refer to specifications.)

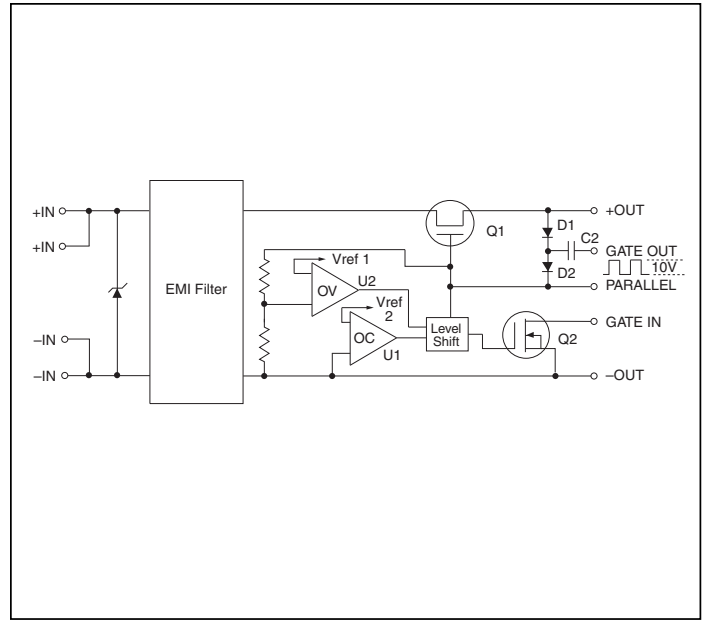


Figure 2 — Block diagram of Input Attenuator Module (IAM)

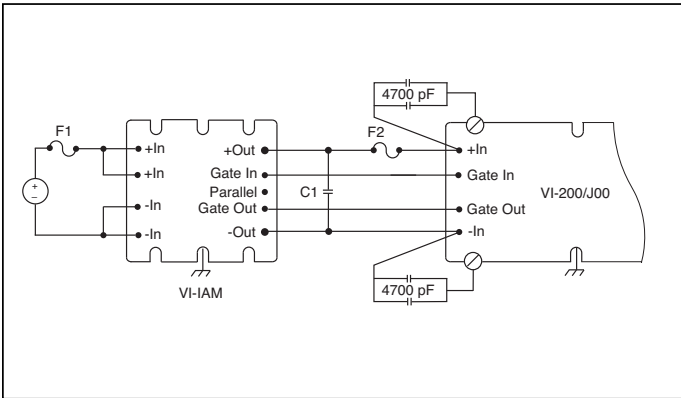


Figure 3 — Typical connection diagram. For recommended fuse (F2) see [VI-200 / VI-J00 application manual](#).

| 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 |

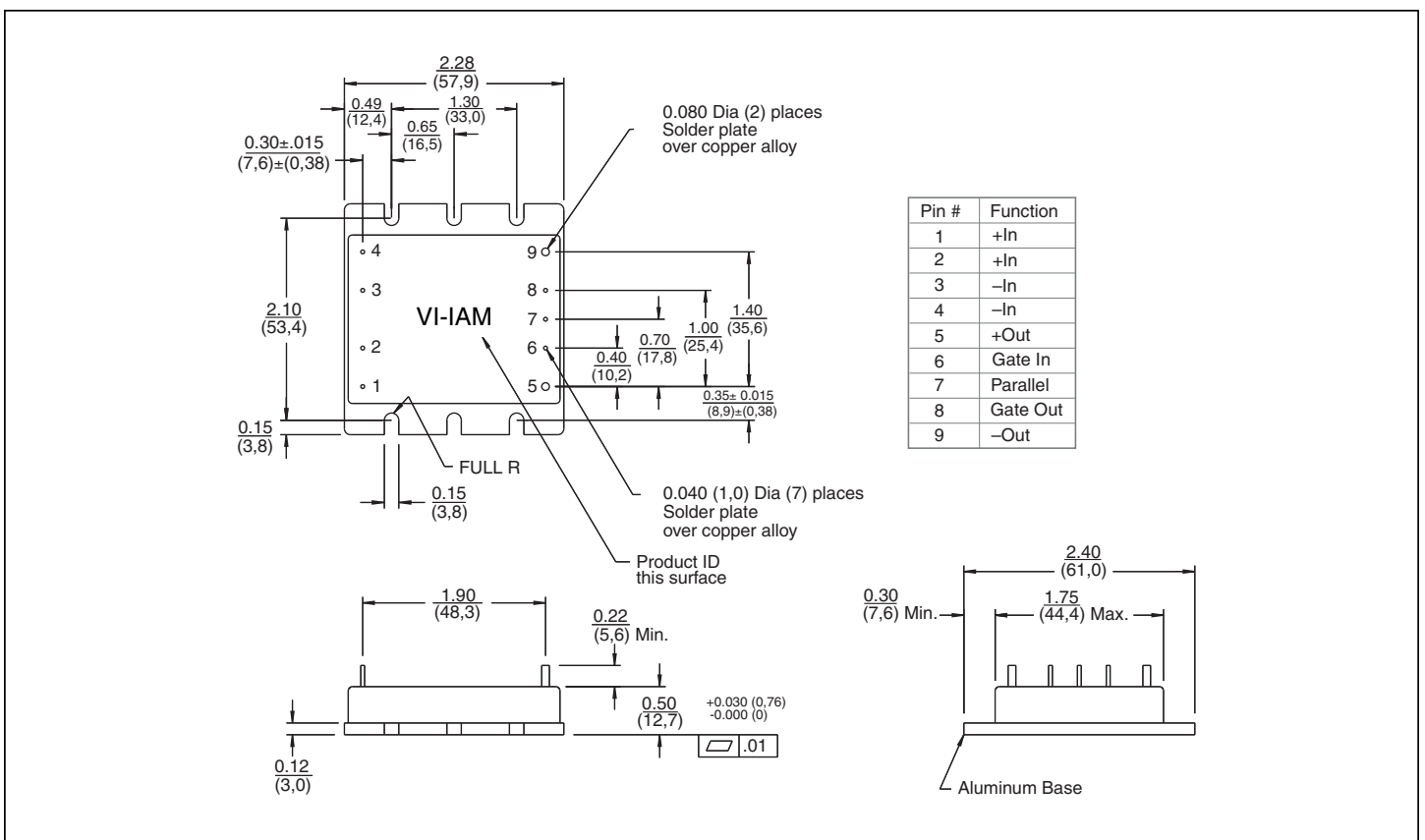
Table 1 — Recommended F1 fusing based on input voltage (see Fig3)

| 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

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