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Find the *Aitech Defense Systems E108* at our website: ***Click HERE***

# E108

## Fin Cooled ½-ATR Short VME Enclosure




- **Rugged Chassis for Locomotive Applications**
- **Designed for Harsh Mechanical, Climatic, Chemical and Electrical Stresses**
- **Environmentally Sealed**
- **Compact and Lightweight with 5 Standard VME64x Slots**
- **Internally Conduction-Cooled; External Convection and Radiation by Fins**
- **Fully Sealed Faraday Cage and Complete EMI/RFI Filtering**
- **Customized Front Panel Connectors with I/O Transition Board**
- **P232 72 Vdc input, Multi-Output Removable VME 6U Power Supply**

**Aitech Defense Systems, Inc.**
**A member of the Aitech Rugged Group**
19756 Prairie Street, Chatsworth, Ca. 91311
Tel: (888) Aitech-8 (248-3248) Fax: (818) 718-9787 e-mail: sales@rugged.com web: www.rugged.com

## *Overview*

Aitech's E108 Convection/Radiation cooled VME computer enclosure is built to be rugged and reliable as well as lightweight and compact. EMI/RFI protected and environmentally sealed, the E108 is capable of withstanding extreme environmental conditions of temperature, humidity, shock, vibration, EMI and chemical exposure. This makes it ideal for use in harsh locomotive environments.

### *Sturdy Mechanical Design*

The E108 is constructed of durable CNC machined 6061-T6 aluminum. Fasteners are stainless steel and often-used threads have self-locking stainless steel helicoils to withstand severe vibration and shock. All connectors are located on the front panel of the enclosure for easy access. Side and back walls are externally finned for natural convection and radiation cooling without sacrificing ruggedness. Designed with a built-in lifting handle, the E108 is also equipped with hooks and mounting holes to facilitate installation in standard 1/2-ATR short mounting trays. Optional mounting side flanges are available for hard mounting to a shelf.

### *Board Capacity*

The E108 accommodates 5 standard VME boards with 0.8 inch pitch, including:

- IEEE 1101.2 conduction-cooled VME cards
- Commercial VME boards without front panels

### *VME Backplane*

The backplane is VME64x compliant with 160-pin, 5-row J1/J2 connectors and 95-pin PO connectors in all slots.

Any of the pins in rows A and C, and user defined pins in rows Z and D of the J2 connectors, as well as the 95 I/O pins from each of the P0 connectors (up to a maximum of 280), can be routed to front panel I/O connectors.

The backplane is designed to mate with the Front Panel I/O Transition Board (see below) using high density connectors.

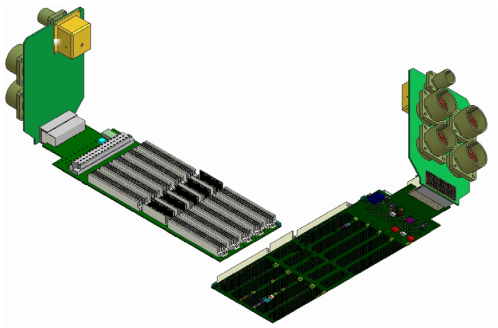
### *Front Panel*

The front panel features a flexible configuration of connectors that conform to military standards, one for input power and all others for I/O. It may also be equipped with any of the following options: LED indicator to track system operation, On/Off switch, and external grounding screw.

### *Front Panel I/O Transition Board*

Input power and I/O signals are routed from front panel connectors to the backplane via a solid state I/O transition board that is hard mounted to the enclosure front panel and that plugs into the backplane using high density connectors. The solid state design provides high reliability and maximum signal integrity using optimum signal routing, controlled impedance, and signal fencing as appropriate. Filtering elements can also be incorporated in accordance with specific signal and EMI/RFI requirements. The modular nature of the transition module also simplifies maintenance of the enclosure.

The I/O transition board/backplane mechanical concept is shown below:



The customized backplane and the I/O transition board are designed using the same I/O signal characteristics, ensuring full matching of controlled impedances and signal integrity.

### *Thermally Efficient*

Heat generated by cards in the enclosure is conducted through the aluminum back and sidewalls and dissipated by the exterior fins to the surrounding air by means of natural convection and, to a lesser degree, radiation; external forced air or base plate cooling are not required.

### *Electro-Magnetic Compatibility*

Aitech's E108 minimizes emission and susceptibility interference with these features:

- Metal-to-metal clamping with conductive surfaces and fasteners
- Conductive seals
- Shielded power supply board
- Input line filter on the inner surface of the front panel for reduced EMI/RFI noise to/from power cable, additional line filter module on the power supply board.
- Isolated chassis; input; and digital grounds, with optional connections between them.
- External chassis grounding screw.

### *Environmental Sealing*

The E108 is sealed against humidity, raindrops, and splash. Enclosure mating surfaces are sealed with hollow silicone rubber seals. Connectors and other accessories are protected in the same manner.

### *Corrosion Resistant Finish*

External surfaces of the E108 are hard anodize coated for excellent corrosion resistance. As an option, epoxy paint is available upon request.

Internal surfaces are chemical conversion coated for corrosion resistance and electrical conductivity. All finishes and components are fungus resistant.

All internal boards are conformally coated.

### *High Performance Power Supply*

The P232 removable power supply provides continuous high current, high efficiency operation, under the most adverse conditions. It can be easily replaced by the user, in similar fashion to other VME cards, thereby reducing maintenance downtime.

Major features of the P232 include:

- DC-DC converters, designed to operate even with irregular or noisy power sources
- 150 Watt Output with 85% Efficiency (typical)
- Very wide input voltage range: 50 - 90 Vdc
- EN 50155 Input Compliance
- EMI/RFI Input Filter and Input Transient Protection
- Outputs: 5 V, 3.3 V, ±12 V
- Output Over/Undervoltage and Short-Circuit Protections
- Equipped with all VME64x control signals: ~ACFAIL, ~SYSRST and ~SYSFAIL
- 4 ms Holdup Time
- Input/Output and Chassis Isolation
- Thermal Shutdown and Reverse Polarity Protection
- Internal BIT Status and Alarms for Voltages and Currents

Refer to the P232 datasheet for a complete description. Following are its specifications.

## *Power Supply Specifications*

### *Input*

| | |
|---|---|
| Voltage Range (DC Continuous) | 50 to 90 Vdc |
| Non Damage DC input voltage | Max 100 Vdc |
| Nominal Input Voltage | 72 Vdc |
| Reverse Polarity | Protected 0 to 90 Vdc |
| General Characteristics and transient suppression | Per EN 50155 |

### *Outputs*

| Voltage | Combined Operation |
|---|---|
| +5.0 V | 20 A |
| +3.3 V | 10 A |
| +12 V | 1 A |
| -12 V | 1 A |

Total Output Power, Maximum - 150 W

- Low output ripple
- Outputs isolated from inputs
- Isolation to chassis
- Short-circuit protection and overvoltage protection

| Output Specifications | MAIN | OUT2 | OUT3 | OUT4 |
|---|---|---|---|---|
| Voltage (Vdc) Min | +4.875 | +3.2 | +11.64 | -11.64 |
| Voltage (Vdc) Max | +5.25 | +3.45 | +12.6 | -12.6 |
| Overvoltage Protection (V) | 6-6.45 | 3.8-4.2 | +13.8-14.9 | -13.8-14.9 |
| Current (A), Max | 30 | 12 | 1 | 1 |
| Current Limit, Max Load (%) | 110-160 | 120-165 | 110-230 | 110-230 |
| Ripple/Noise (P-P, mV) | <50 | <50 | <50 | <50 |

### *Efficiency*

- 85% (typical)

### *Thermal Shutdown*

- Above 125 ± 5 °C

### *Isolation Resistance*

- >10 MΩ at 120 V input to chassis and 100 V output to chassis.

### *5 V Output Voltage Sensing*

- Sense lines routed to the power connector for remote sensing.

### *EMI/RFI Input filter*

- The power supply is equipped with an EMI/RFI input Filter.

### *ACFAIL and SYSRST*

- Input/Output Under Voltage Sensing

| | Output | | Input |
|---|---|---|---|
| **ACFAIL State** | **3.3 V** | **5 V** | **72 V** |
| **Decreasing Voltage** | 2.9 | 4.5 | 44 ± 2 |
| **Increasing** Voltage | 3.18 | 4.85 | 48 ± 2 |

- ACFAIL high to SYSRST high: >200 ms

### *SYSFAIL*

- Output Undervoltage Sensing

| SYSFAIL State | +12 V | -12 V |
|---|---|---|
| **Decreasing Voltage** | 11 | -11 |
| **Increasing Voltage** | 11.64 | -11.64 |

- Output Overvoltage Sensing and Indication

| SYSFAIL State | 5 V | 3.3 V | 12 V | -12 V |
|---|---|---|---|---|
| **Decreasing Voltage** | 5.35 | 3.46 | 12.65 | -12.65 |
| **Increasing Voltage** | 5.9 | 3.75 | 13.7 | -13.7 |

### *Holdup Circuit*

Enables all outputs for at least 4 ms after input drops under 50 Vdc, at maximum load.

## *Enclosure Environmental Spec*

- **Operating Temp.**
  Ser 200 level Enclosure: -40 to +71 °C*
  Ser 400 level Enclosure: -55 to +71 °C*
- **Non-operating Temp.**
  Ser 200 level Enclosure: -50 to +85 °C
  Ser 400 level Enclosure: -62 to +100 °C
- **Humidity**
  5%-95% relative humidity with condensation
- **Vibration**

| | |
|---|---|
| Sine** | Cycling of 5 g (max) at 5 to 500 Hz |
| Random** | 10 g RMS at 20 to 2000 Hz |
| Transportation | Loose cargo vibration |

- **Shock**** - Single half-sine shocks:
  40 g peak
  3 axes
  11 ms duration

** Hard mounted

- **Transit Drop***** 1 ft. drop on concrete

*** Packed in cargo box

- **Bench Handling**
  4-in unpackaged drop at a 45° angle to simulate conditions during servicing
- **Salt Fog** 5% salt spray
- **Fine Dust:** Wind and fine dust particles

## General Specifications

- **Dimensions**

  Standard 1/2-ATR short mounting footprint:
  4.88 x 12.62 in (W x D)

  Maximum external dimensions with fins and handle:
  6.5 x 15.7 x 7.62 in (W x D x H)

- **Weight**

  Less than 15 lbs without boards.

- **Power Dissipation Capability**

  More than 85 W at 60 °C ambient air temperature (maximum ΔT of 25 °C at card edge).

## Development System Compatibility

To provide for a smooth transition between development and deployment, Aitech offers an equivalent, low-cost commercial integrated system with standard VME boards and an AC-operated, fan-cooled enclosure.

## Accessories

Aitech offers a wide range of custom mounting options and cable sets.

For more information about Aitech's rugged and military VME enclosures or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

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E108T0309R10

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