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Find the *Aitech Defense Systems E116* at our website: ***Click HERE***

E116

Fan Cooled ATR Compact Short VME Enclosure



- ***Rugged Chassis for Mobile Military Applications***
- ***Designed for Harsh Mechanical, Climatic, Chemical and Electrical Stresses***
- ***Environmentally Sealed***
- ***Compact and Lightweight with 6 Standard VME64x Slots***
- ***Internally Conduction-Cooled; Externally Forced Air-Cooled with integral Fan***
- ***Fully Sealed Faraday Cage and Complete EMI/RFI Filtering***
- ***Customized Front Panel Connectors with optional I/O transition board***
- ***P221 Multi-Output Removable VME 6U Power Supply***

Aitech Defense Systems, Inc.
A member of the Ai-Rugged Group
9301 Oakdale Ave, Chatsworth, Ca 91311
Tel: (888) Aitech-8 (248-3248) Fax: (818) 718-9787 e-mail: sales@rugged.com web: www.rugged.com

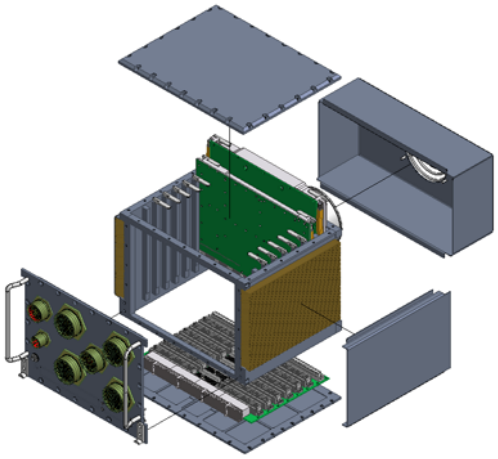
Overview

Aitech's E116 Forced air Fan-cooled VME computer enclosure is built to be rugged and reliable as well as lightweight and compact. EMI/RFI protected and environmentally sealed, the E116 is capable of withstanding extreme environmental conditions of altitude, temperature, humidity, shock, vibration, EMI and chemical exposure. This makes it ideal for use in all military environments.

Sturdy Mechanical Design

The E116 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 internally finned for forced air-cooling without sacrificing ruggedness. Designed with 2 built-in handles, the E116 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.

The mechanical structure concept of the E116 is shown below:



Board Capacity

The E116 accommodates 6 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 695), can be routed to front panel I/O 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.

I/O harness

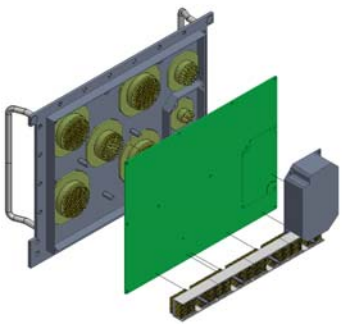
The front panel connectors are routed to the backplane via customized I/O harness.

This approach is recommended for small quantities and prototyping, for large quantities and for complete I/O lines filtering and protection the use of an optional I/O transition board is recommended.

Optional Front Panel I/O transition board

An optional I/O transition board can be supplied per customer requierments suitable for the signal integrity of the specific I/O signals and per any EMI/RFI requierments, including high-energy spikes and lightning protections. Consults Aitech for customization of the A/M option.

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



In order to allow the use optional I/O transition board the backplane should be also customized

to include all the I/O signals with full signal integrity and controlled impedance and rout them to connect with the I/O transition board.

The design of the customized backplane and the I/O transition board is done using the same I/O signals characteristics, ensuring full matching of controlled impedances and signal integrity.

Thermally Efficient

The E116 does not require external forced air or base plate cooling. The E116 is cooled by forced air blown from the rear end of the enclosure into two side heat exchangers. Heat from the cards is conducted to the aluminum sidewalls and dissipates the heat to the surroundings by the airflow of a powerful military fan. The fan is temperature controlled and operates when the enclosure heats up beyond the point of self-sustained heat dissipation.

Note:

There is no airflow on the cards; the internal part of the enclosure remains environmentally sealed.

Electro-Magnetic Compatibility

Aitech's E116 minimizes emission and susceptibility interference with these features:

- Metal-to-metal clamping with conductive surfaces and fasteners
- Conductive O-ring 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 E116 is sealed against humidity, rain drops and splash. Enclosure mating surfaces are sealed with hollow silicone rubber O-ring seals. Connectors and other accessories are protected in the same manner.

Corrosion Resistant Finish

External surfaces of the E116 are hard anodizing coated for excellent corrosion resistance. As an option, epoxy paint in standard military colors is available with nonstandard colors 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 P221 removable power supply provides continuous high current, high efficiency operation, under the most adverse conditions. The user, to avoid enclosure maintenance downtime, can easily replace it, similar to other VME cards.

Major features of the P221 include:

- DC-DC converters, designed to operate even with irregular or noisy power sources
- 175 Watt Output with Greater Than 75% Efficiency
- Very wide input voltage range 16 - 36 Volt DC Input Range with Drop to 14 V for 45 Sec.
- MIL-STD-704A and D Input Compliance
- EMI/RFI Input Filter and Input Transient Protection
- Outputs: 5 V @ 30 A, ±12 V @ 1.0 A each, 3.3V @ 12 A
- Output Over/Undervoltage and Short-Circuit Protections
- Equipped with all VME64x control signals: ~ACFAIL, ~SYSRST and ~SYSFAIL
- High Holdup Time: 50 ms
- Input/Output and Chassis Isolation
- Thermal Shutdown and Reverse Polarity Protection
- External ON/OFF Control.
- DC Fan Output Drive and Control
- Internal BIT Status and Alarms for Voltages, Currents, and Temperatures

The full description of the P221 is given in its brochure. Following are its specifications.

Power Supply Specifications

Input

Voltage Range (DC Continuous)	16 V to 36 V
Voltage input drop	14 V to 45 Sec
Non Damage DC input voltage	Max 50 V
Nominal Input Voltage	24 V
Reverse Polarity	Protected 0 to 50 Vdc
General Characteristics and transient suppression	Per MIL-STD 704 D and A, (with the exception of meeting the input voltage surges for MIL-STD-704A for non damage only)

Outputs

Voltage	Combined Operation	Independent Operation
+5.0V	30A	Max combined output power 5 and 3.3 Volts outputs = 150W
+3.3V	12A	
+12V	1A	
-12V	1A	

Total Output Power, Maximum - 175 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

- >75%

Thermal Shutdown

- Above 100 °C ± 5 °C

Isolation Resistance

- >10 MΩ at 500 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	**3.3V**	**5V**	**24V**
Decreasing Voltage	2.9	4.5	13.7 ± 0.3
Increasing Voltage	3.18	4.85	17.7 ± 0.3

- ACFAIL low to SYSRST low: >2 ms
- ACFAIL high to SYSRST high: >200 ms

SYSFAIL

Output Undervoltage Sensing

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

Output Overvoltage Sensing and Indication

SYSFAIL State	5V	3.3V	12V	-12V
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 50 ms after input drops under 14 Vdc, at load conditions of 125 Watts.

Enclosure Environmental Spec

- **Operating Temp.**
  Ser 200 level Enclosure: -40 °C to +71 °C*
  Ser 400 level Enclosure: -55 °C to +71 °C*
- **Non-operating Temp.**
  Ser 200 level Enclosure: -50 °C to +85 °C
  Ser 400 level Enclosure: -62 °C to +100 °C
- **Low Pressure**

Operating*:	Up to 22,000 ft
Storage:	Up to 60,000 ft

  * Maximum operating temperature is a function of total power dissipation and altitude. Specified temperature is for power dissipation of 160 W with card edge of 85 °C @ sea level.

- **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
- **EMI/RFI**
  Designed to meet the emanation and susceptibility limits of MIL-STD-461, as per MIL-STD-462 requirements, CE101/102, CS101/102,114, & RE101/102 RS101/103.

General Specifications

- **Dimensions**
  Standard Full -ATR short mounting footprint, except for shorter length:
  10.12 x 8.1 in (W x D)
  Maximum external dimensions with fan unit and handle:
  11 x 12.52 x 7.62 in (W x D x H)
- **Weight**
  Less than 17.5 lbs, without boards and I/O transition board.
  Less than 19 lbs, without boards.
- **Power Dissipation Capability**
  More than 160 W at 71°C ambient air temperature at sea level, with maximum ΔT of 14°C to 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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A member of the Ai-Rugged Group
9301 Oakdale Ave, Chatsworth, Ca 91311
Tel: (888) Aitech-8 (248-3248) Fax: (818) 718-9787 e-mail: sales@rugged.com web: www.rugged.com

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