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Find the *Aitech Defense Systems E190* at our website: ***Click HERE***

E190

2-Slot 3U CompactPCI/VPX Enclosure



- **Rugged Chassis for Military and other Harsh Environment Applications**
- **Two Standard 3U CompactPCI or VPX Slots**
- **Compact and Lightweight**
- **Designed for Harsh Mechanical, Climatic, Chemical and Electrical Stresses**
- **Environmentally Sealed**
- **Convection-Cooled (fins) and Cold Plate-Cooled Variants**
- **Fully Sealed Faraday Cage and Complete EMI/RFI Filtering**
- **Multi-Output Removable 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) 407-1502 e-mail: sales@rugged.com web: www.rugged.com

Overview

Aitech's E190 CompactPCI/VPX computer enclosure is built to be rugged and reliable as well as lightweight and compact. EMI/RFI protected and environmentally sealed, the E190 is capable of withstanding extreme environmental conditions of temperature, humidity, shock, vibration, EMI and chemical exposure. This makes it ideal for use in military and other harsh environment applications.

Sturdy Mechanical Design

The E190 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. Designed with a built-in lifting handle for convenient handling, the E190 is equipped with brackets and captive screws for convenient hard mounting.

Board Capacity

The E190 accommodates two standard 3U CompactPCI or VPX boards with 1.0 inch pitch, including:

- ANSI/VITA 30.1-2002 CompactPCI cards
- ANSI/VITA 46.0-2007 VPX cards
- ANSI/VITA 48.2-2010 VPX REDI cards

Backplane

The E190 is available with a 2-slot 3U CompactPCI or 3U VPX compliant backplane.

The CompactPCI backplane has a standard CompactPCI bus, and the VPX backplane has a PCIe data plane comprising a single x8 port of up to 5 GHz.

I/O signals from the card slots are routed to front panel I/O connectors via the I/O Transition Board.

Standard E190 backplanes are designed for compatibility with Aitech's CompactPCI (C800, C802, C900) or VPX (C870, C873) SBCs, providing the appropriate controlled impedance, differential, and fenced traces for the I/O of those boards. Custom backplanes and I/O Transition Boards can be designed for compatibility with other SBCs or to meet specific customer requirements.

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

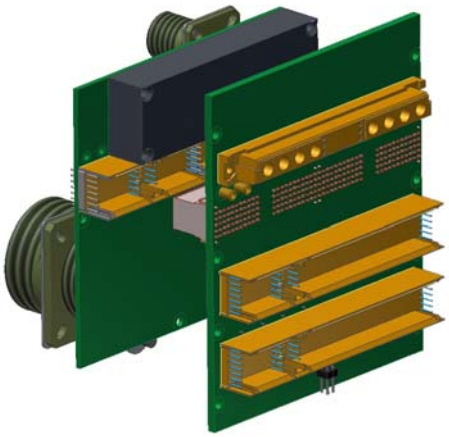
Front Panel

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 is also equipped with an 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 (with CompactPCI backplane) 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.

Cooling Configurations

The E190 is available in both natural convection air-cooled and cold plate conduction-cooled configurations. Both configurations are internally conduction-cooled, with the heat generated by the boards being conducted through the enclosure sidewalls for dissipation to the surrounding air or to the cold plate.

Sidewalls of the air-cooled configuration are externally finned for natural convection and radiation cooling without sacrificing ruggedness.

The cold plate-cooled E190 includes sidewalls that are specifically designed to efficiently conduct heat to the enclosure base. The high quality surface finish of the thermal surfaces at the bottom of the enclosure provides excellent thermal contact with the cooling base plate to ensure maximum heat transfer and cooling. The cold plate cooling is supplemented with convective cooling by means of the sidewall fins.



Electro-Magnetic Compatibility

Aitech's E190 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
- Optional filtering of I/O signals per customer specifications
- Isolated chassis, input, and digital grounds, with optional connections between them
- External chassis grounding screw

Environmental Sealing

The E190 is sealed against humidity, rain, and splash. Enclosure mating surfaces are sealed with silicone rubber seals. Connectors and other accessories are protected in the same manner.

Corrosion Resistant Finish

External surfaces of the E190 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 E190 is furnished with Aitech's P230 power supply, with nominal 28 V input, for military/airborne applications. The P230 is a 150 W power supply providing continuous, high current, high efficiency, operation under the most adverse conditions. The power supply is modular and plugs into the backplane in similar fashion to the CompactPCI or VPX cards in the system. This enables convenient replacement by the user thereby reducing maintenance downtime.

Main power supply features:

- 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: 18 - 36 Vdc
- EMI/RFI input filter and input transient protection
- Outputs: 5 V, 3.3 V, ±12 V
- Output over/undervoltage and short-circuit protections
- ~SYSRST control signal
- 4 ms holdup time (50 ms with optional capacitor bank)
- Input/output and chassis Isolation
- Thermal shutdown and reverse polarity protection
- Internal BIT status and alarms for voltages and currents

Refer to the P230 datasheet for a complete description.

E190

2-Slot 3U CompactPCI/VPX Enclosure

Environmental

- **Operating Temperature**
  Ser 200 Enclosure: -40 to +71 °C
  Ser 400 Enclosure: -55 to +71 °C
- **Non-operating Temperature**
  Ser 200 Enclosure: -50 to +100 °C
  Ser 400 Enclosure: -62 to +125 °C
- **Humidity**
  5%-95% relative humidity with condensation
- **Vibration**

Sine*	Cycling of 5 g (max) at 5 to 500 Hz
Random*	12 g_{rms} at 20 to 2000 Hz
Transportation	Loose cargo vibration

- **Shock***
  Single half-sine shocks: 40 g_{peak}/11 ms
- **Transit Drop****
  1 ft. drop on concrete
- **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

* Hard mounted
** Packed in cargo box

General Specifications

- **Dimensions**
  Maximum external dimensions with fins and handle:

  Convection-Cooled Enclosure
  181 x 261 x 132 mm (W x D x H)
  7.13 x 10.26 x 5.20 in (W x D x H)

  Cold Plate-Cooled Enclosure
  156 x 261 x 133 mm (W x D x H)
  6.12 x 10.26 x 5.21 in (W x D x H)
- **Weight**
  Less than 5.3 kg (11.7 lbs) without boards.
- **Power Dissipation Capability**

  Convection-Cooled Enclosure
  More than 70 W at 55 °C ambient air temperature at sea level
  (with maximum ΔT of 30 °C at card edge).

  Cold Plate-Cooled Enclosure
  More than 150 W with 55 °C cold plate and 55 °C ambient air temperature at sea level
  (with maximum ΔT of 30 °C at card edge).

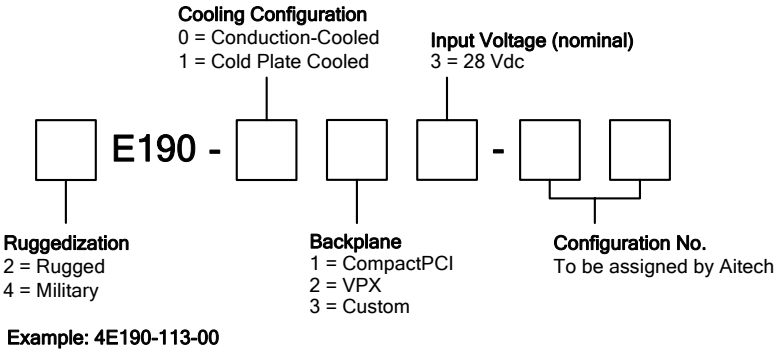
Development System Compatibility

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

Accessories

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

Ordering Information



Example: 4E190-113-00

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

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