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Find the *Aitech Defense Systems E195* at our website: ***Click HERE***

E195

1/2 ATR Short 3U VPX Enclosure





- ***Four Standard 3U VPX Slots.***
- ***Rugged Chassis for Military and Other Harsh Environment Applications***
- ***Internally Conduction-Cooled***
- ***Two External Cooling Configurations***
  - **Forced Convection (Fan) Cooling**
  - **Cold Plate Cooling**
- ***Compact and Lightweight***
- ***Protected from Mechanical, Climatic, Chemical, and Electrical Stresses***
- ***Environmentally Sealed***
- ***Fully Sealed Faraday Cage and Complete EMI/RFI Filtering***
- ***Multi-Output Removable DC Power Supply***
- ***Solid State I/O Transition Board (no wiring harness)***

Aitech Defense Systems, Inc.
A member of the Aitech Rugged Group
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Overview

Aitech's E195 VPX computer enclosure is built to be rugged and reliable as well as lightweight and compact. EMI/RFI protected and environmentally sealed, the E195 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 E195 is constructed of durable CNC machined 6061-T6 aluminum. Fasteners are stainless steel and often-used threads have self-locking stainless steel inserts to withstand severe vibration and shock. All connectors are located on the front panel of the enclosure for easy access, and a built-in lifting handle is provided for convenient handling.

Cooling Configurations

The E195 is available in forced convection (fan) cooled and cold plate conduction cooled configurations. Both configurations are internally conduction cooled.

In the forced convection (fan) cooled E195, heat is conducted through the aluminum sidewalls and dissipated by the exterior heat exchanger to the surrounding air by means of forced convection using an integral cooling fan (base plate cooling is not required).

The cold plate cooled E195 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.

Mounting Configurations

The cold plate cooled E195 includes mounting holes and captive screws for convenient hard mounting.

The fan cooled E195 is available with hard mounting brackets or ARINC 404A type mounting features for convenient installation in a standard ½ ATR short ARINC 404A mounting tray. Note that length of the fan-cooled E195 is shorter than standard. Also, the heat exchanger is wider than ½ ATR, though this does not affect the mounting footprint.

Board Capacity

The E195 accommodates four standard 3U VPX boards with 1.0 inch pitch, including:

- ANSI/VITA 46.0-2007
- ANSI/VITA 48.2-2010

Backplane

The standard E195 has a 4-slot 3U VPX compliant backplane. A CompactPCI version can quickly be developed upon request.

The VPX backplane has a PCIe data plane comprising a single x8 port of up to 5 GHz.

The backplane provides the BKP3-CEN03-15.2.9-n Open VPX profile (1 Payload + 2 Peripheral slots) plus an extra slot for an Ethernet switch.

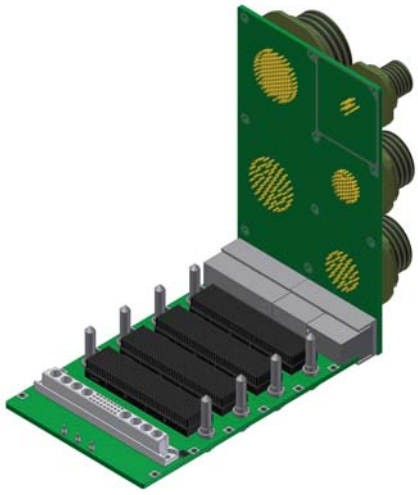
I/O signals from the card slots are routed to the front panel I/O connectors via the I/O transition board (see below).

The backplane is designed to mate with the I/O transition board using high density connectors.

Front Panel and 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 I/O transition board/backplane mechanical concept is shown below.



The standard front panel and I/O transition board feature four I/O connectors and a 28 V input power connector. The standard configuration provides a large number of I/O signals (82 differential pairs and 59 SE) with fixed routing to the four I/O connectors.

To minimize EMI/RFI, the power connector and the input line filter are encased in a metal faraday cage.

As the I/O transition board is a plug-in unit, system maintenance is also greatly simplified, and there are no wires that can break during maintenance operations.

The solid-state, no harnessing design approach ensures optimal signal routing and maximum signal integrity, with controlled impedance traces, fenced signals, etc.

Customer/application specific I/O requirements are easily met by designing custom front panel and I/O transition boards with the required routing and signal characteristics.

A custom I/O transition board also requires a custom backplane to mate with it. The backplane is designed with the same I/O signal characteristics, ensuring full matching of controlled impedances, fencing, etc. Both the backplane and I/O transition board are fitted with high density connecters to conduct power and I/O signals from the front panel connectors to the backplane slots.

The custom I/O transition board can also include any required EMI/RFI filtering circuitry adjacent to the various I/O connectors, increasing the effectiveness of the filtering. Lightning protection or other required protection devices can also be incorporated.

Electro-Magnetic Compatibility

Aitech's E195 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 E195 is sealed against humidity, rain, and splash. Enclosure mating surfaces are sealed with conductive silicone rubber seals. Connectors and other accessories are protected in the same manner.

Corrosion Resistant Finish

External surfaces of the E195 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 boards (backplane, I/O transition board, P230 power supply) are conformally coated.

High Performance Power Supply

The E195 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 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
- ~ACFAIL, ~SYSRST and ~SYSFAIL control signals
- 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.

Enclosure Environmental Specification

- **Operating Temperature** [1]
  -40 [2] to +71 °C
- **Non-operating Temperature**
  -55 to +100 °C
- **Humidity**
  5% - 100% relative humidity with condensation
- **Vibration**

Sine [3]	Cycling of 5 g (max) at 5 to 500 Hz
Random [3]	12 g_{rms} at 20 to 2000 Hz
Transportation [3]	Loose cargo vibration

- **Shock** [3]
  Single half-sine shocks: 40 g_{peak}/11 ms
- **Transit Drop** [4]
  1 ft. drop on concrete
- **Bench Handling**
  4-inch unpackaged drop at a 45° angle to simulate conditions during servicing
- **Salt Fog** 5% salt spray
- **Fine Dust** Wind and fine dust particles
- **Rain** IP67: Blowing rain & water jets

General Specifications

- **Dimensions**
  Maximum external dimensions with heat exchanger/fins and handle:

  Fan Cooled Enclosure
  145.0 x 329 x 194 mm (W x D x H)
  5.71 x 12.95 x 7.62 " (W x D x H)

  Cold Plate Cooled Enclosure
  164 x 242 x 194 mm (W x D x H)
  6.46 x 9.50 x 7.64 " (W x D x H)

- **Weight**
  Weight without VPX boards, but with backplane, I/O transition board and P230 power supply (with capacitor bank)

Fan Cooled Enclosure	< 6 kg
Cold Plate Cooled Enclosure	< 8 kg

- **Power Dissipation Capability**
  Forced Convection (fan) Cooled Enclosure
  125 W at 71 °C ambient air temperature at sea level (with maximum ΔT of 14 °C at card edge).
  175 W at 65 °C ambient air temperature at sea level (with maximum ΔT of 20 °C at card edge).

  Cold Plate Cooled Enclosure
  125 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.

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1 See Power Dissipation Capability section for more information

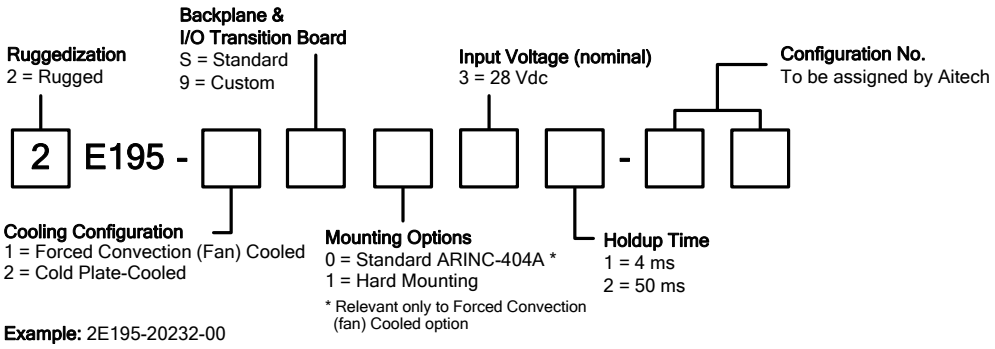
2 -55 °C available by special order

3 Hard mounted

4 Packed in cargo box

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Ordering Information



Example: 2E195-20232-00

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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