

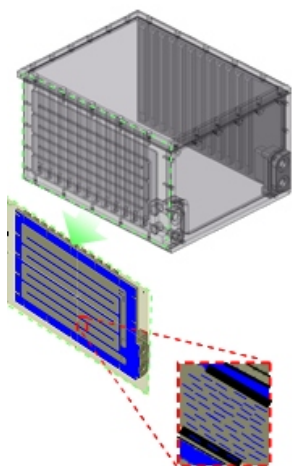
Advanced Thermal Enclosure Assembly

Description

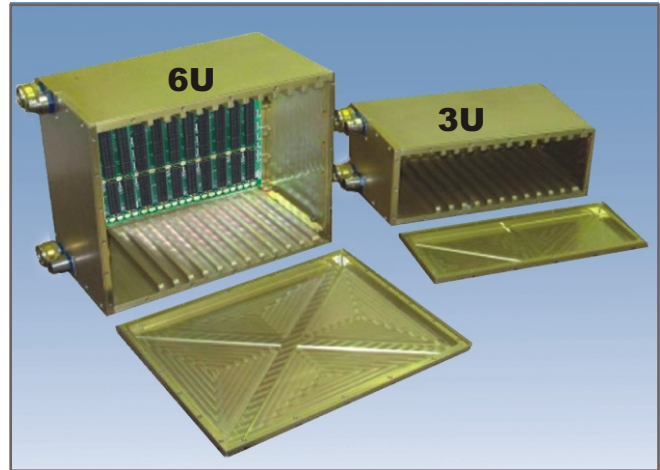
The Meggitt Defense Systems Inc. Advanced Thermal Enclosure Assembly (ATEA) is a 11 slot liquid flow through enclosure, designed to remove up to 1.5kW of continuous heat load while operating in extreme environments. The box is designed to accommodate most COTS back planes and power supplies in either a 3U or 6U configuration (VITA 46/48 compliant). The ATEA is a 3U or 6U rugged modular liquid cooled enclosure utilizing self-contained liquid flow through sidewalls designed for extreme environments and combat applications.

The standard ATEA is designed to exceed Mil-STD 810F requirements and is constructed of 6061-T6 aluminum high speed CNC machined plates designed for self-sealing, self-aligning, tool-less assembly, with hard anodized coated surfaces assembled with stainless steel fasteners to prevent corrosion.

The modular liquid flow through side panels are seamless self-contained brazed aluminum panels designed for optimal laminar flow and Reynolds numbers with a minimum proof pressure of 250 psi.



- **Modular construction using Advanced Fin Technology**
- **Integrated parallel cooling side walls**
 - **Maximum conduction cooling**
 - **Low pressure drop**
 - **Plate fin brazed channels**
 - **Laminar and turbulent flow CFD optimized**
- **No liquid pass through in assembled joints (No potential leak paths)**



Illustrated with clear finish, can be finished to customer requirements.

The modular unit, cover, and base can be configured to accommodate the extended height or base required for fiber optic cables, rack mounting or with a wider base to meet any customer mounting requirements.

The front and rear panels may be customized to meet customer I/O connector requirements, switches, shielded power connections, thermal readouts, and handles. The upper section of the front panel is available for fiber optic connectors.

The ATEA accommodates 11 standard VME/VME64 boards with 0.8 inch pitch, including IEEE 1101.2 conduction-cooled VME cards, Commercial VME boards without front panels and most PMC Mezzanine Cards and Conduction Card Cover kits. It also come in a 10 slot VITA46/48 configuration with (8) 0.85 inch + (2) 1.0 inch pitch slots.

The box is designed to accommodate a VME64, VME64x, VPX or VITA 46/48 compliant backplane with an 11 row J1 and J2 connector in all slots.

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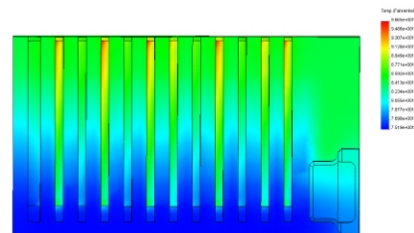
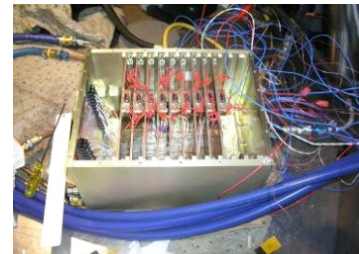
The ATEA is conduction cooled through the specially designed self-contained sidewalls. Heat is channeled from the power supplies and VME boards to the ATEA cold plate. The box uses parallel independent cooling paths to assure optimal conduction cooling and redundancy. The ATEA is optimized to ensure a stable thermal profile using Computational Fluid Dynamics for channel and fin design and finite element analysis of the of the complete chassis. The ATEA can use a variety of fluids for conduction cooling including dissipation of 1,500 W total heat.

The ATEA minimizes EMI/RFI emissions and susceptibility through metal-to-metal clamping with conductive surfaces and fasteners. It is designed to accommodate a metallic partition between the power supply and VME/VXS sections with provisions for a Faraday cage input power line filter mounted on the inside of the front panel. It also has isolated chassis ground connections with front panel grounding screw. ATEA is designed to meet the emanation and susceptibility limits of MIL-STD-461, as per MIL-STD-462 requirements.

All aluminum surfaces of the ATEA are hard anodized or chemical conversion coated for excellent corrosion resistance and can be painted with epoxy paint in standard military colors. Internal surfaces are conversion coated for corrosion resistance and electrical conductivity. All finishes and components are fungus resistant. The ATEA is made from 6061 Hard Anodized Aluminum designed to meet MIL-STD 810F Environmental, Shock and Vibration requirements operating from -55°C to +71°C at 0%-95% relative humidity and in storage from -55°C to +125°C. The ATEA can be provided fully assembled or as a kit, with or without Quick Disconnects (QD's), and can accommodate most cooling fluids including Ethylene Glycol Water (EGW), Poly Glycol Water (PGW), Coolanol, Polyalphaolefin (PAO), Mil-H-5606 and water at 1-9 liters/min.

Specifications

- Operating Cold Plate Temp: -55 °C to +75 °C
- Non-operating Temp: -55 °C to +125 °C
- Humidity: 0%-95% non- condensing
- Vibration: Vibration 16 Grms at 20-2000Hz
Shock
- Shock 40 g terminal sawtooth/11 ms or half sine 40 g peak 3 axes 11 ms duration
- Bench Handling: 4-in unpackaged drop at a 45° angle to simulate conditions during servicing
- EMI/RFI: Designed to meet the emanation and susceptibility limits of MIL-STD-461, as per MIL-STD-462 requirements, CE102, Cs101, CS114, & RE102.
- MTBF: SF >320,000 hrs@49°C
ML >5,300 hrs @ 49° C
- Size: 6U 10 or 11 slot 1 ATR Short Maximum external dimensions including I/O connectors and handles: 10.6 x 14.1 x 7.8 in (W x D x H)
3U 10 slot ½ ATR Short External dimensions without I/O connectors and handles: 4.9 X 12.6 X 7.6 in



Verification of thermal model

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MEGGITT
smart engineering for
extreme environments