

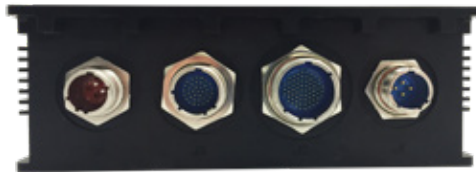
FEATURES AND BENEFITS

- Enables Use of Commercial Mini-ITX Processor in Rugged, Deployed Applications
- Rated for altitudes in excess of 50,000 feet
- Highly optimized for size, weight, and power (SWAP) constrained applications
- ESS screening validates ruggedness of production units



SFF SOLUTION 760-92

DATA SHEET



The Small Form Factor (SFF) 760 Series rugged electronic packaging design enables off-the-shelf Mini-ITX and PCIe commercial electronics CCAs to be deployed in SWAP and cost-constrained, harsh environments. These types of applications present many challenges to electronic components

including extreme temperature ranges, vibration, shock, dust, salt, fog and more. Commercially available components, particularly Mini-ITX processor boards and PCIe expansion cards, are simply not designed to be utilized in these types of rugged, deployed applications. Often, this has prevented system integrators from choosing state-of-the-art commercial electronics in favor of much more expensive rugged solutions designed specifically for the military market. The 760 Series currently has two variants.

The small form factor 760-92 both house a processor board and three PCIe cards in a small chassis 11.22" L x 9.06" W x 3.43" H. The chassis and internal electronics weigh 13 lbs and consume < 100W. Despite using components that are commercially rated, the chassis meets an operating temperature of -32C to +55C, using an internal heater prior to power-on. The enclosure utilizes baseplate cooling allowing it to provide MIL-STD-810 shock and vibration. Every unit passes environmental stress screening ensuring that it meets the specific ruggedization requirements of the application.

The 760-92 is an enhancement of the 760 family that allows the enclosure to be deployed at stratospheric heights, well above 50,000 feet. The SFF Solution 760-92 is a hermetically sealed rugged enclosure which maintains an internal atmospheric pressure of one atmosphere at all times, essentially simulating a lab operating environment. In order to maintain a seal, Atrenne employs a gasket able to buffer mechanical occlusions between the two precisely machined aluminum surfaces of the enclosure. Atrenne has also developed a creative solution to maintain a seal around I/O cables (including an optional fiber optic) and connectors.

Environmental Stress Screening (ESS) is a process which exposes each manufactured article to a series of environmental stress tests. ESS testing can catch component manufacturing variances that may have undermined the operation of the system in the field. While a design may be believed to be rugged on paper, passing ESS tests on each and every production unit provides an additional measure of confidence.

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The 760 Series SFF enclosures are able to utilize state-of-the-art processing with multi-processor and multi-core technology. With a strict power budget, there is excess heat generated. Atrenne can provide an innovative application-optimized heat sink, which utilizes a copper piping enclosure with a porous sintered material in the middle. Atrenne also adds a chromatic liquid into the closed system that evaporates (at the chip contact point) and then condenses as it moves through the pipe via the porous material. The result is a capillary action that effectively transfers heat to the baseplate of the chassis. With this novel design, Atrenne is able to deliver best-in-class thermal performance in this conduction-cooled enclosure.

To minimize boot time and power consumption, Atrenne designed a circuit to prioritize a heating element at power-on until the operating environment reaches 0°C, at which point the heater switches off and the system boots.

Atrenne's expertise allowed us to devise a solution to incorporate thermal systems to heat and cool the components to maintain proper operating temperature. Every aspect of the system has been carefully designed to meet SWaP-C, military and manufacturing standards.

TABLE 1: SPECIFICATIONS

CHASSIS SPECIFICATIONS	
DIMENSIONS	
Operating Temperature	-32°C - 55°C
Storage Temperature	-40°C - 71°C
Weight	13lbs
Shock and Vibration	MIL-STD-810
Cooling	Baseplate conduction
Internal	Mini-ITX with 3 PCIe slots or similar
EMI	MIL-STD-461E
Power	<100W, MIL-STD-704E
Altitude	Well above 50,000 feet

CERTIFICATIONS AND ACCREDITATIONS

- ITAR Registered
- AS 9100
- ISO 9001:2008
- J - STD - 001
- IPC / WHMA 620
- DFARS
- MIL-DTL - 5541.

WARRANTY

This product has a one year warranty.

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