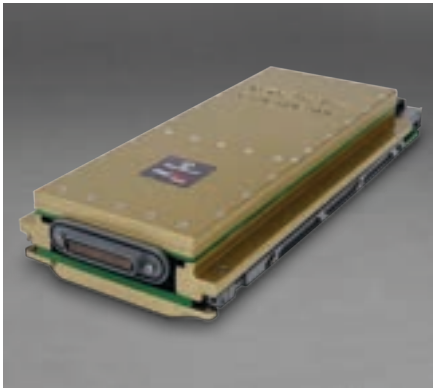


CASCADE SINGLE BOARD COMPUTER



The Cascade Single Board Computer (SBC) is designed to bring high configurability to meet the demands of space. The Moog Cascade SBC is a 3U extended SpaceVPX board aligned to Space SOSA. The Cascade SBC board integrates the Microchip PIC64-HPSC® High-Performance Spaceflight Computing (HPSC) microprocessor which is a radiation-hardened 10-Core RISC-V® processor with Layer 2 switch. The Cascade SBC cores provide secure boot, dedicated system controller, and eight application cores. The application cores include WorldGuard® isolation for independent applications, dual-core lockstep for increased upset tolerance, and various shared or cache-isolated configurations. The Cascade SBC enables a single board to support multiple payloads and spacecraft bus processing needs within a single unit.

PROCESSOR FUNCTIONS

- 8 RISC-V Application Cores
 - Per Core:
 - RISC-V Vector Extension
 - 32KB I-Cache, 64KB D-Cache
 - 256KB L2 Cache
 - 8MB L3 Cache
 - Real Time Dual-Core Lockstep with Fault Detection and Mitigation
- PCIe CXL Links
- WorldGuard/Fault Isolation
- RISC-V System Controller Processor
 - System and Power Management
- RISC-V Secure Controller Processor
 - Secure Boot
- Multiple Levels of Encryption
- Layer 2 Switch with TSN support
- VxWorks/Linux® Software Support
- Debug Capabilities:
 - JTAG and HSSTP test ports

BACKPLANE I/O FUNCTIONS

- Data Plane: 1G or 10G Ethernet
- Expansion Plane: PCIe® Gen 1,2,3 supported
- Control Plane: SpW or 1G Ethernet
- Utility Plane: I2C Utility Plane

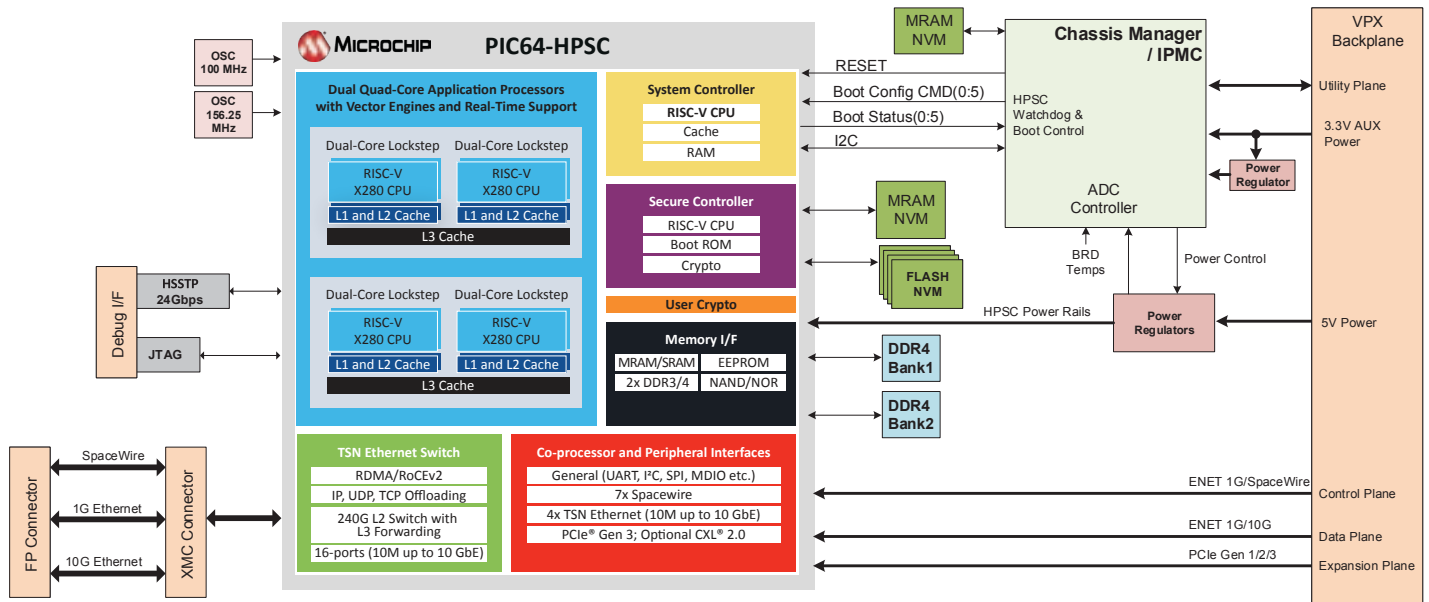
BOARD FUNCTIONS

- 16GBytes DDR4
- 4Gbits MRAM Boot Code
- 64GBytes SLC NAND FLASH
- Chassis Manager
 - Power Control
 - Watchdog, Voltage and Temp Monitors
 - Multi-Boot Modes/Configurations
- Radiation
 - 50KRAD TID without shielding
 - SEL: 78 MeV/cm² after bootup
- Flexible Power Management
 - Power: 2W Standby, 25W Typical (usage dependent)

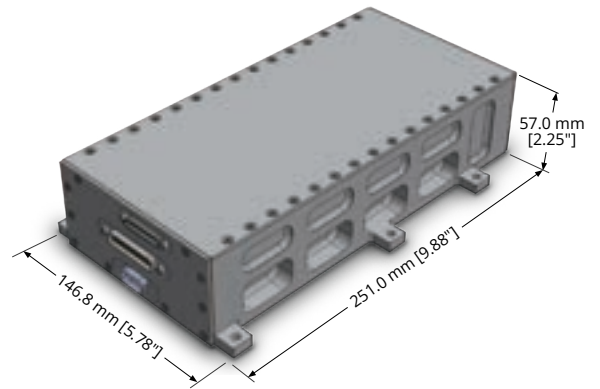
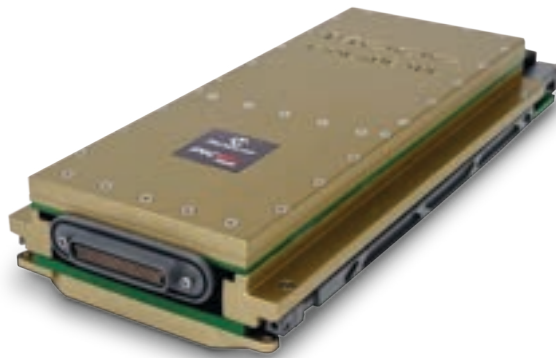
FRONT PANEL FUNCTIONS

- Configurable XMC
 - Optical 10G Ethernet
 - 1G Ethernet
 - 300Mbps SpaceWire with RMAP & Time
 - 1PPS Time Sync In/Out

CASCADE SINGLE BOARD COMPUTER



CASCADE SBC Block Diagram



CASCADE SBC BOARD

Features	Specifications
Form Factor	Extended 3U
Dimension	Form Factor: 220 x 100 x 40.64 mm (Width x Depth x Height)
Power Input	3.3V Auxiliary Power: Chassis Manager Only
	5V Main Power

CASCADE SBC WITH ENCLOSURE (Optional)

Features	Specifications
Form Factor	Extended 3U Box
Dimension	146.8 mm X 251.0 mm X 76.2 mm (Width x Depth x Height)
Power Input	28 ± 6 V Input EMI Filtered Isolated Power

MOOG

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Moog Space and Defense



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