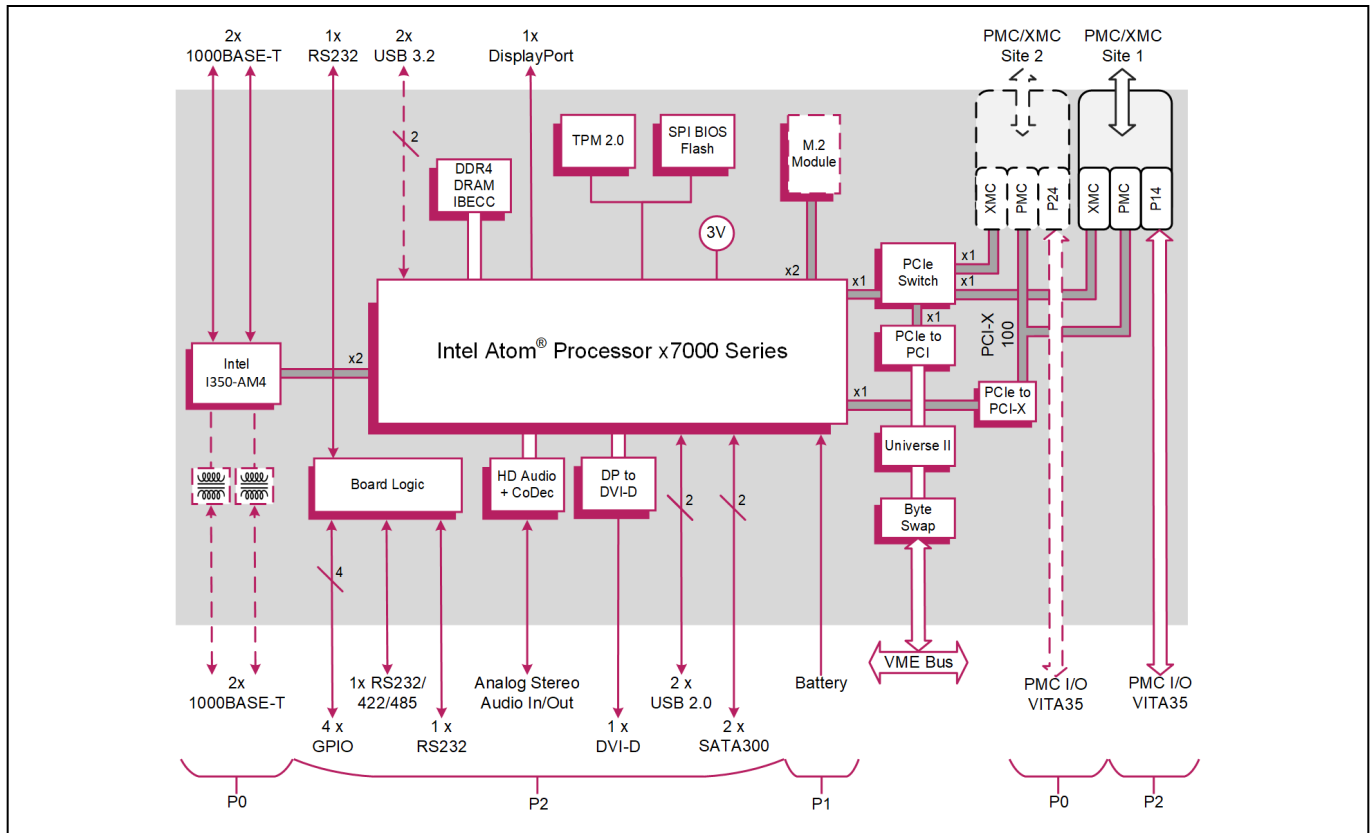
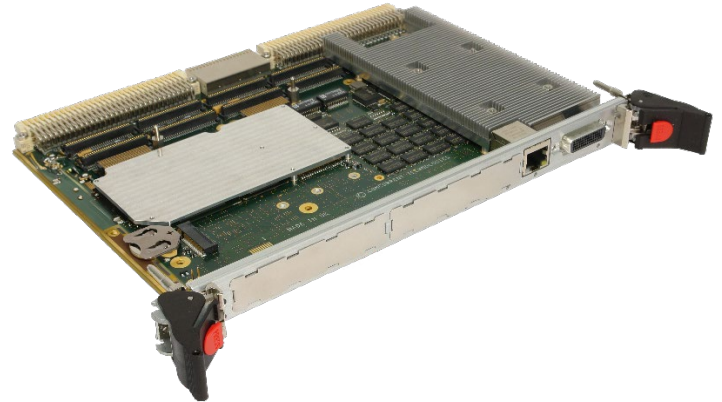


VME board based on Intel® Atom™ Processor x7000 Series

Key Features

Rhea (VP ECx/msd) is a low power consumption VME board with a wide spread of I/O interfaces that has been designed for long life-cycle applications.

- 4-core and 2-core processor (previously Amston Lake) options allowing for performance and power optimizations
- 16 Gbytes DRAM with in-band error correction for reliable operation
- Up to 2 x PMC/XMC module interfaces for local I/O expansion
- Built in I/O interfaces including SATA, USB, Ethernet, graphics, GPIO, audio and serial
- On board solid state disk option for reliable boot image and data storage
- Off the shelf board support packages available for Linux® and Windows®



Central Processor

- Intel® Atom™ processor x7000 Series:
 - 4-core 1.5Ghz Intel® Atom™ processor x7433RE
 - 2-core 2Ghz Intel® Atom™ processor x7213RE

DRAM

- 16 Gbytes soldered DDR4 DRAM, in-band ECC:
 - 3200MT/s

Mass Storage Interfaces

- Up to 2 x external SATA300 interfaces:
 - 2 x SATA via P2
- On-board PCIe support for optional:
 - M.2 Module

Ethernet Interfaces

- Up to 4 x Gigabit Ethernet interfaces:
 - Implemented by an Intel® I350-AM4 Ethernet Controller via a x1 PCI Express® Gen 2 port
- 2 x Gigabit Ethernet interfaces via front panel RJ45 connectors
- 2 x Gigabit Ethernet interfaces via rear:
 - Via optional P0
 - One interface supports VITA 31.1 (Gigabit Ethernet for VME64x backplanes)
 - On-board magnetics (50V isolation via P0)

PMC/XMC Interfaces

- Single or dual PMC/XMC interfaces
- PMC/XMC site 1:
 - Front panel I/O
 - P14 rear I/O via P2 (VITA 35)
- PMC/XMC site 2 (build option):
 - Front panel I/O: option for PMC/XMC site or extra front panel I/O connectors (USB 3.2 and DisplayPort interfaces)
 - P24 rear I/O via optional P0 (VITA 35)
- PMC interface(s) support:
 - Shared 32/64-bit, 33/66MHz PCI bus
 - Shared 64-bit PCI-X bus up to 100MHz
 - 5V and 3.3V signaling
- XMC (Switched Mezzanine Card) site(s):
 - Support x1 PCI Express® (Gen 1, Gen 2, Gen 3)
 - Both powered from 5V supply
- Expansion to optional dual PMC/XMC carrier board via x1 PCI Express XMC site

Serial Interfaces

- 1 x RS232 via RJ45 on front panel:
 - Tx, Rx, CTS, RTS, DSR, DTR and DCD
- 1 x RS232/422/485 via P2:
 - RS232 supports Tx, Rx, CTS, RTS, DSR, DTR, DCD and RI
- 1 x RS232 via P2 (build option):
 - Tx and Rx
- 16550 compatible UARTS

Stereo Audio

- Intel® High Definition Audio interface (on-board codec) via P2 (build option):
 - Analog stereo audio input and output

Graphics Interfaces

- DisplayPort interface via front panel (single site build option, disables PMC/XMC site 2): Up to 1920 x 1080 @ 16M colors

Other Peripheral Interfaces

- PC-compatible Real Time Clock
- Watchdog timer; 1 x 32-bit Long Duration Timer with processor interrupt capability
- Up to 4 x USB interfaces:
 - 2 x USB 3.2 on the front panel (single site option, disables PMC/XMC site 2)
 - 2 x USB 2.0 via P2 connector
- 4 x GPIO signals via P2 with processor interrupt capability

Flash EPROM

- Dual BIOS SPI Flash EPROM

Software Support

- Supports Linux® and Windows®

Firmware Support

- AMI UEFI BIOS
- Optional Fast Boot solution based on the Intel® Firmware Support Package (Intel® FSP)
- LAN boot firmware included

Optional Built-In Test (BIT) Support

- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

Optional Board Security Features

- Trusted Platform Module (TPM):
 - TPM 2.0
- Option for Sanitization Utility Software Package
- Proprietary board-level security features

VME Interface

- P1 and P2 connectors compatible with VME64x
- Implemented using IDT® Universe II™ device
- VME Master/Slave
- A32/A24/A16/D64/D32/D16/D8(E0)/MBLT
- Fast hardware byte swapping
- Auto system controller detect
- Full interrupter / interrupt handler support
- Bus error interrupt hardware

Safety

- PCB (PWB) manufactured with flammability rating of UL94V-0

Electrical Specification

- Typical power consumption is typically TBD for the 2-core Intel Atom processor x7213RE board
- +5V (+5%/-2.5%) is required, +3.3V is not required
- +12V @ 0.0A; -12V @ 0.0A
- +12V and -12V routed to both PMC/XMC sites

Environmental Specification

- Commercial operating temperature (N-Series):
 - 0°C to +70°C
- Extended operating temperatures (E-Series):
 - -25°C to +70°C
- Extended operating temperatures (K-Series):
 - -40°C to +85°C
- Non-operating temperature: -40°C to +85°C
- Operating altitude: 0 to 15,000 feet (0 to 4,572 meters)

- 5% to 95% Relative Humidity, non-condensing:
 - K-Series includes humidity sealant

Mechanical Specification

- 6U form-factor
- Single slot, front panel width 0.8 inch (20.3mm)
- Utilizes 160-way connectors for P1 and P2
- Optional P0 connector
- IEEE 1101.10 handles
- Operating mechanical:
 - Shock - 20g, 11ms, ½ sine
 - Vibration - 5Hz-2000Hz at 2g, 0.38mm peak displacement