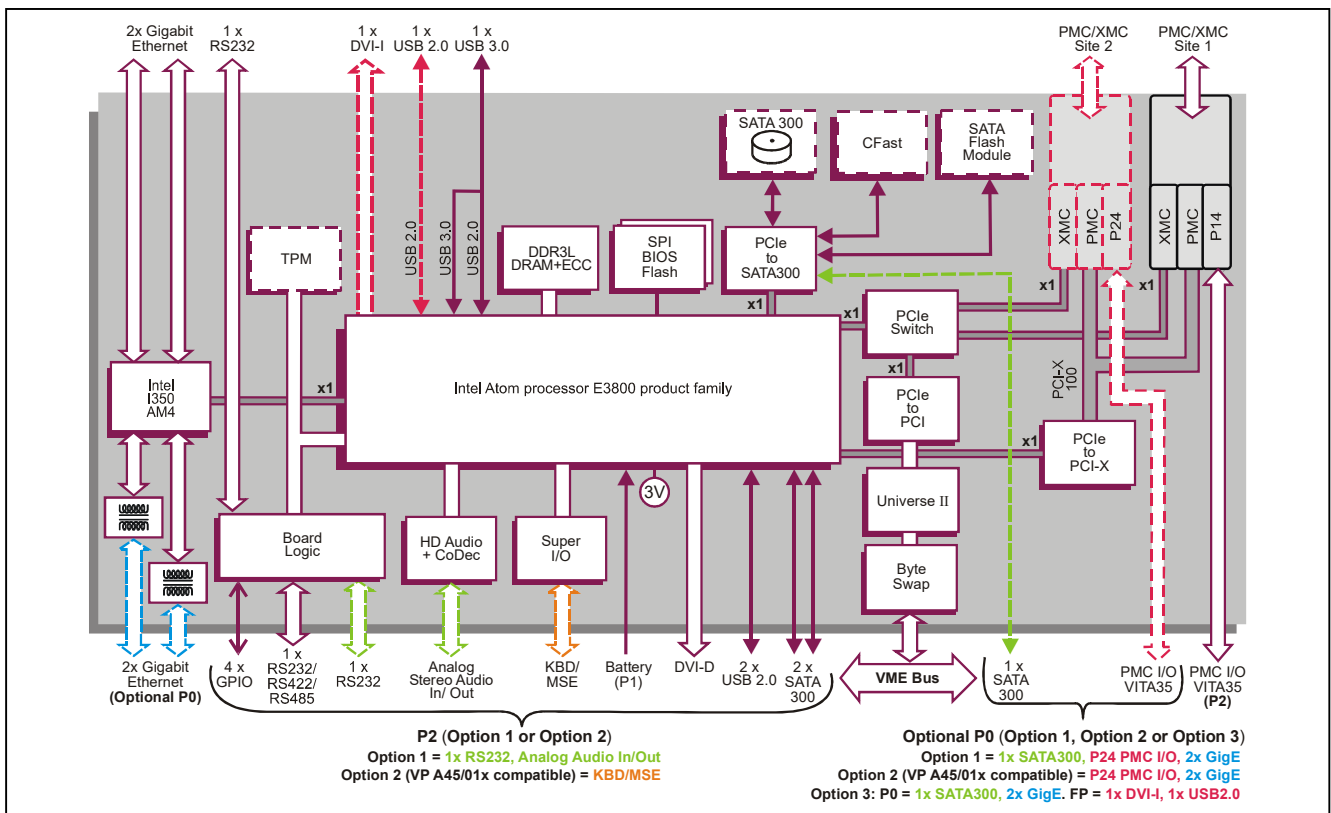


## VME board based on Intel® Atom™ Processor E3800 Product Family

### Key Features

VP E2x/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 1-core processor options allowing for performance and power optimizations
- Up to 8 Gbytes DRAM with built in 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 options for reliable boot image and data storage
- Off the shelf board support packages available for Linux®, Windows® and VxWorks®



## Central Processor

- Intel Atom™ processor E3800 product family:
  - 4-core 1.91 GHz Intel Atom™ processor E3845, 2M Last Level cache
  - 1-core 1.46 GHz Intel Atom™ processor E3815, 512K Last Level cache

## DRAM

- either 4 Gbytes soldered DDR3L DRAM, ECC:
  - 1-core or 4-core processor (build option)
  - peak bandwidth of 10.6 Gbytes/s (4-core)
  - peak bandwidth of 8.52 Gbytes/s (1-core)
  - single channel architecture
- or 8 Gbytes soldered DDR3L DRAM, no ECC:
  - 4-core processor only (build option)
  - peak bandwidth of 21.3 Gbytes/s
  - dual channel architecture
- accessible from processor or VME bus

## Mass Storage Interfaces

- up to 3 x external SATA300 interfaces:
  - 2 x SATA via P2
  - 1 x SATA (build option) via optional P0
- On-board SATA300 support for optional:
  - CFast™ Card
  - SATA Flash Drive Module
  - 2.5-inch mass storage drive (disables PMC/XMC site 2)

## 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 2.0 and DVI-I 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)
  - 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

- DVI-I interface via front panel (single site build option, disables PMC/XMC site 2):
  - DVI-D up to 1600 x 1200 @ 16M colors
  - DVI-A up to 2048 x 1536 @ 16M colors
- additional DVI-D via P2:
  - up to 1600 x 1200 @ 16M colors
- 1-core processor:
  - graphics base frequency is 400 MHz
- 4-core processor:
  - graphics base frequency is 542 MHz
  - graphics burst frequency is 792 MHz
- support for Microsoft DirectX 11.1 on Windows
- support for OpenGL 3.0 on Linux

## Other Peripheral Interfaces

- PC-compatible Real Time Clock
- watchdog timer; 1 x 32-bit Long Duration Timer with processor interrupt capability
- up to 3 x USB 2.0 interfaces:
  - 1 via a USB connector on the front panel (single site option, disables PMC/XMC site 2)
  - 2 via P2 connector
- 1 x USB 3.0/2.0 via front panel connector
- 4 x GPIO signals via P2 with processor interrupt capability
- keyboard and mouse PS/2 interfaces via P2 (build option for VP A45/01x legacy compatibility only)

## Flash EPROM

- dual 8 Mbytes of BIOS SPI Flash EPROM

## Software Support

- supports Linux, Windows and VxWorks

## Firmware Support

- Insyde Software InsydeH20™ BIOS:
  - Intel Platform Innovation Framework for EFI
- 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):
  - build option for either TPM 1.2 or 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 18W for the 1-core Intel Atom processor E3815 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
- supports fanless operation:
  - 4-core fanless operation, +60 C maximum
  - 1-core fanless operation, +70 C maximum
- for airflow graphs, see Technical Reference Manual
- 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
- rugged versions, see separate datasheet:
  - conduction-cooled: VP E2x/0sd-RC
  - rear plug compatible

## 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, sine
  - vibration - 5Hz-2000Hz at 2g, 0.38mm peak displacement