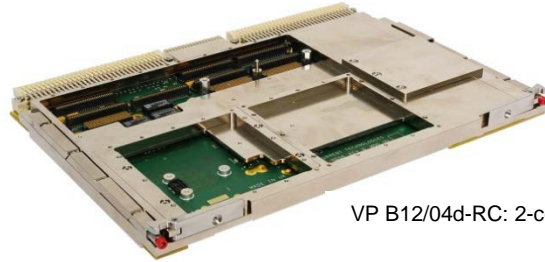


Rugged conduction-cooled VME board based on 4th Generation Intel® Core™ i7/i5 processor

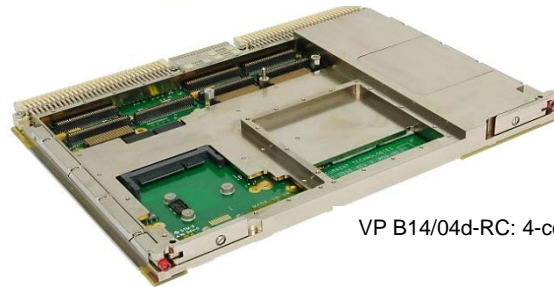
Key Features

VP B1x/0sd-RC is a high performance VMEbus board suitable for deployment in challenging environments for defense and aerospace applications.

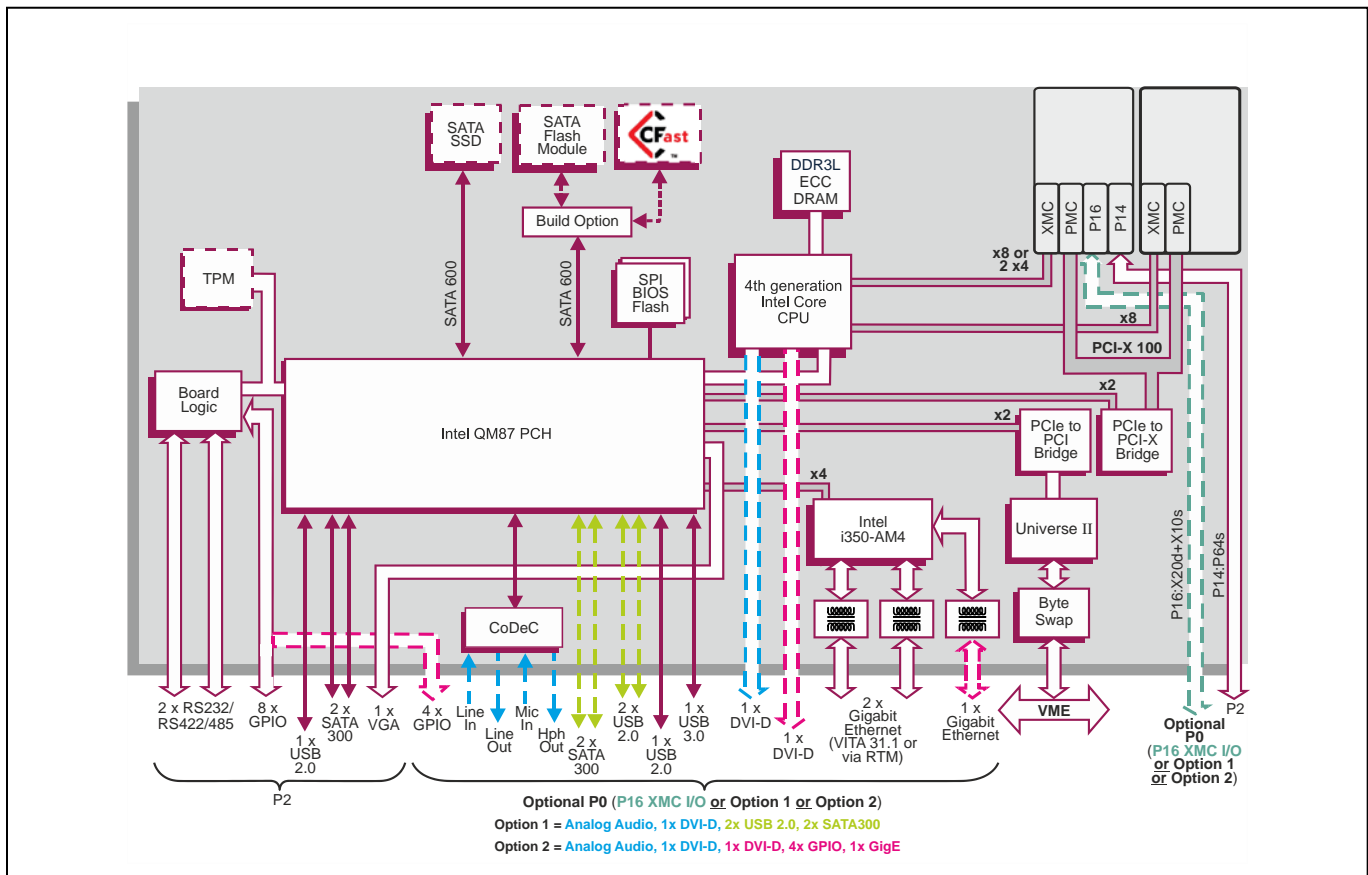
- Tried and tested conduction-cooled, ruggedized design
- Quad and dual-core processor variants available to match application performance and power requirements
- Up to 32 Gbytes DRAM with built in error correction for reliable operation
- Dual PMC/XMC sites for local expansion
- Wide variety of built in I/O interfaces including SATA, USB, Ethernet, graphics and serial
- On board solid state disk options for operating system, application and data use
- Off the shelf board support packages available for Linux®, Windows®, VxWorks® and Solaris™



VP B12/04d-RC: 2-core processor



VP B14/04d-RC: 4-core processor



Rugged dual PMC/XMC controller

- utilizing 4th generation Intel® Core™ processor:
 - conduction-cooled to IEEE 1101.2
 - conformally coated
- supports 2 conduction-cooled PMC or XMC modules
- air-cooled (N, E, K-Series) versions:
 - see VP B1x/msd datasheet

Central Processor

- 4th generation Intel® Core™ processor:
 - 4-core Intel® Core™ i7-4700EQ processor 2.4 GHz, 6MB Last Level cache
 - 2-core Intel® Core™ i5-4422E processor 1.8 GHz, 3MB Last Level cache
 - Intel® Advanced Vector Extensions 2 (AVX2)
 - Intel® AES New Instructions (AES-NI)
- utilizes the Intel® QM87 Platform Controller Hub

DRAM

- up to 32 Gbytes soldered DDR3L-1600 ECC DRAM (16 Gbytes maximum, 2-core processor):
 - single bit error correction
 - peak bandwidth of 25.6 Gbytes/s
 - dual channel architecture
- accessible from processor or VME bus

PMC/XMC Interfaces

- dual PMC/XMC interfaces
- PMC/XMC I/O site 1:
 - PMC P14 rear I/O (P64s) via P2
 - XMC P16 rear I/O (X12d+X8d+X10s) (this build option replaces build option 1 & 2) via optional P0
- PMC/XMC I/O site 2:
 - rear I/O: none
- PMC PCI/PCI-X interfaces:
 - 32/64-bit, 33/66 MHz PCI bus
 - 64-bit PCI-X bus up to 100 MHz
 - 5V and 3.3V signaling
- XMC PCI Express interfaces:
 - both support x8 PCI Express (Gen 1, Gen 2)
 - XMC site 1 can also support 2 x4 PCI Express
 - both powered from 5V supply

Ethernet Interfaces

- up to 3 x Gigabit Ethernet interfaces via optional P0:
 - 1 x GigE via P0 (build option 2)
 - 2 x GigE via P0 support VITA 31.1 (Gigabit Ethernet for VME64x backplanes)
 - on-board magnetics (50V isolation via P0)
- Ethernet implemented by an Intel® I350-AM4 LAN controller via a x4 PCI Express® port (Gen 2)

Mass Storage Interfaces

- up to 4 x external SATA300 interfaces:
 - 2 x SATA via P2
 - 2 x SATA (build option 1) via optional P0
- 2 x SATA600 support for optional on-board:
 - SATA Flash or CFast™ module (a build option)
 - 2.5-inch SATA SSD (disables PMC/XMC site 2)

Serial Interfaces

- 2 x serial channel interfaces:
 - 2 x RS232/422/485 accessed via P2
- 16550 compatible UARTs

Stereo Audio

- Intel® High Definition Audio interface with CoDeC (build options 1 & 2) via optional P0:
 - line level stereo input and output
 - line level microphone input
 - headphone output

Graphics Interfaces

- 1 x VGA interface via P2:
 - up to 1920 x 1200 @ 16M colors
- 1 x DVI-D interface (build option 1) or 2 x DVI-D interfaces (build option 2) via optional P0:
 - up to 1920 x 1200 @ 16M colors
- support for Microsoft® DirectX 11.2/12 on Windows® and OpenGL 4.3 on Linux®

Other Peripheral Interfaces

- PC Real Time Clock
- watchdog timer; 32-bit Long Duration Timer with processor interrupt ability; chipset timer
- up to 4 x USB ports accessed via optional P0:
 - 1 x USB 2.0 port and 1 x USB 3.0 port
 - 2 x USB 2.0 ports (build option 1)
- 1 x USB 2.0 port via P2
- 8 x GPIO signals via P2 plus 4 x GPIO signals (build option 2) via optional P0:
 - supports processor interrupt capability
- Write Protect (build option 2) and External Reset (build option 2) via optional P0

Flash EPROM

- 8 Mbytes of BIOS Flash EPROM, dual devices:
 - main/backup device enabled via switch

Software Support

- support for Linux®, Windows®, VxWorks® and Solaris™

Firmware Support

- Insyde® Software InsydeH20™ BIOS:
 - includes Compatibility Support Module
- based upon 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 Packages

- Trusted Platform Module (TPM):
 - build option either for TPM 1.2 or TPM 2.0
- option for Sanitization Utility Software Package
- proprietary board-level security features

Safety

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

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 support

Electrical Specification

- +5V @ 8.5A (typical with Intel Core i7-4700EQ processor and 16 Gbytes DRAM)
- +12V @ 0.0A; -12V @ 0.0A; 3.3V not required
- +12V and -12V routed to both PMC/XMC sites

Environmental Specification

- operating temperature (at card edge):
 - VITA 47 Class CC4, -40°C to +85°C
 - conduction-cooled (VITA 48.2)
- non-operating temperature:
 - VITA 47 Class C4, -55°C to +105°C
- operating altitude:
 - -1,000 to 50,000 feet (-305 to 15,240 meters)
- 5% to 95% Relative Humidity, non-condensing

Mechanical Specification

- 6U form-factor
- single slot, width 0.8 inch (20.3mm)
- utilizes 160-way connectors for P1 and P2
- optional P0 connector
- operating mechanical:
 - shock - VITA 47 Class OS2, 40g
 - random vibration - VITA 47 Class V3, 0.1g²/Hz displacement