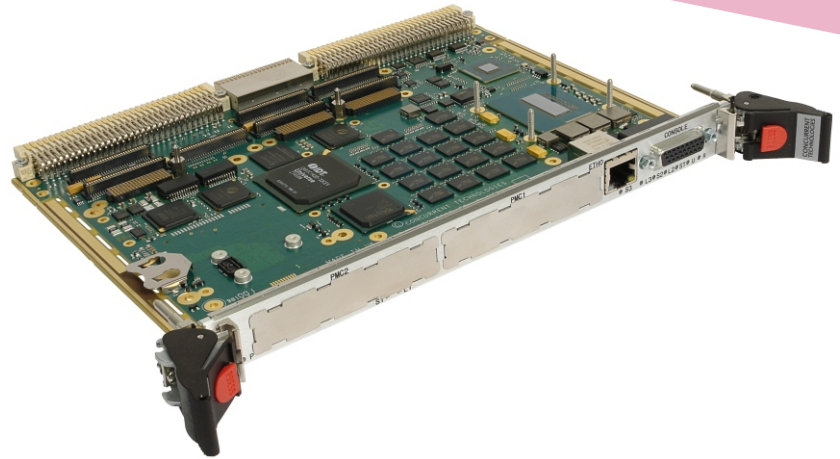


4th Generation Intel® Core™ i7/i5 SBC, Dual or Single PMC/XMC sites



APPLICATIONS

VP B1x/msd is a VME board based on the 4th generation Intel® Core™ processor range providing improved processing and graphics capabilities. Designed as a successor to the VP 92x/x1x family, VP B1x/msd provides one or two PMC/XMC sites for local expansion combined with compatible front panel connections for ease of migration. The VMEbus interface is implemented using the Universe II bridge device with the expectation

that VP B1x/msd will sustain existing VME solutions for many years. VP B1x/msd also has build options for additional video, Ethernet, audio and GPIO on the P0 connector making it suitable for applications in the defense, industrial control, telecoms, scientific and aerospace markets. A conduction-cooled variant is also available to cater for highly rugged situations requiring zero airflow.

HIGHLIGHTS

- 4th generation Intel® Core™ processor:
 - 4-core or 2-core Intel processor
 - includes Intel® Advanced Vector Extensions 2 (AVX2)
 - includes Intel® AES New Instructions (AES-NI)
- Up to 32 Gbytes of soldered DDR3L-1600 DRAM with ECC
- Dual or single PMC/XMC module sites:
 - 32/64-bit, 33/66 MHz PCI™, up to 100 MHz PCI-X™
 - XMC module interface, x8 PCI Express® (Gen 1, Gen 2)
- up to 4 x 10/100/1000 Mbps Ethernet interfaces:
 - supports VME64x backplane (VITA 31.1)
- Up to 4 x external SATA interfaces via the rear
- Option for an on-board SATA 2.5-inch mass storage drive and option for an on-board CFast™ or SATA Flash Module
- 3 x serial interfaces and up to 12 x USB interfaces
- 1 x VGA and up to 2 x DVI-D graphics interfaces plus option for 1 x DisplayPort interface
- Up to 12 x GPIO signals
- 8 Mbytes of BIOS Flash EPROM, dual devices
- Watchdog timer; Long Duration Timer
- VME-64 Interface:
 - A32/A24/A16/D64/D32/D16/D8(E0), MBLT
- Optional Fast Boot solution based on the Intel® Firmware Support Package (Intel® FSP)
- Optional High Definition stereo audio (on-board CoDec)
- Optional support for:
 - Built-In Test (BIT) firmware and software
 - board-level security package
 - Trusted Platform Module (TPM)
 - rear I/O via Rear Transition Module (RTM)
- Extended temperature versions (E and K-Series):
 - E: -25°C to +70°C
 - K: -40°C to +85°C, humidity sealant
- Rugged conduction-cooled versions (RC-Series):
 - conduction-cooled to ANSI/VITA 30.1-2002
 - -40°C to +85°C (at card edge), conformally coated
- Support for Linux®, Windows® and VxWorks®

Central Processor

- 4th generation Intel® Core™ CPU:
 - 4-core Intel® Core™ i7-4700EQ CPU up to 3.4 GHz, 6M Last Level cache
 - 2-core Intel® Core™ i5-4410E CPU 2.9 GHz, 3M Last Level cache
 - 2-core Intel® Core™ i5-4422E CPU up to 2.9 GHz, 3M 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, Intel Core i5 CPU):
 - single bit error correction
 - peak bandwidth of 25.6 Gbytes/s
 - dual channel architecture
- accessible from processor or VME bus

Mass Storage Interfaces

- up to 4 x external SATA interfaces:
 - 2 x SATA300 via P2
 - 2 x SATA300 (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 drive (voids PMC/XMC site 2)

Ethernet Interfaces

- up to 2 x Gigabit Ethernet interfaces via front panel RJ45 connectors:
 - 1 x interface via front panel or via P0
- up to 3 x Gigabit Ethernet interfaces via optional P0:
 - 1 x interface via P0 (build option 2) or as an option via front panel (voids PMC/XMC site 2)
 - 2 x interfaces via P0 to optional RTM or utilize VITA 31.1 connectivity (Gigabit Ethernet for VME64x backplanes)
 - on-board magnetics (50V isolation via P0)
- Ethernet interfaces implemented by an Intel® i350-AM4 LAN controller via a x4 PCI Express® port (Gen 2)

PMC/XMC Interfaces

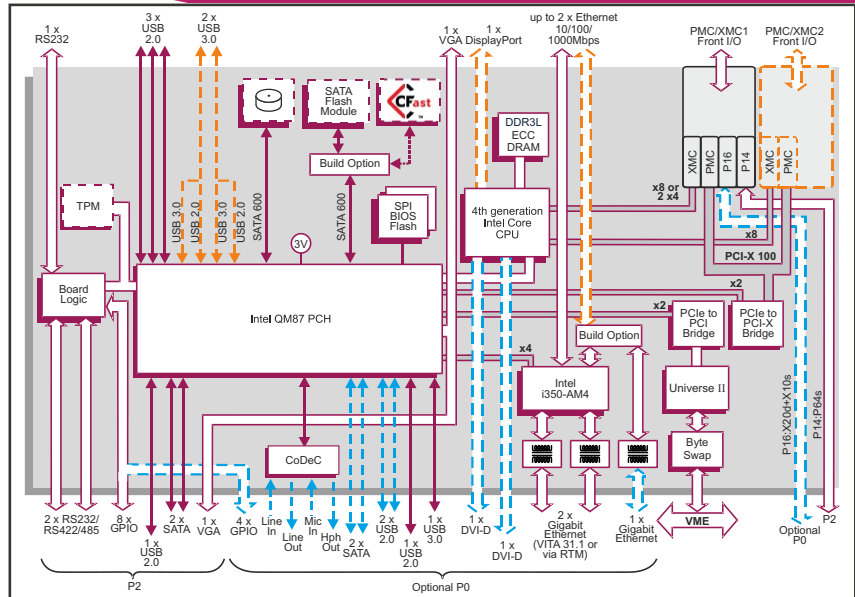
- single or dual PMC/XMC interfaces
- PMC/XMC I/O site 1:
 - front panel I/O
 - PMC P14 rear I/O (P64s) via P2
 - XMC P16 rear I/O (X20d+X10s) via optional P0 (this build option replaces build option 1 & 2)
- PMC/XMC I/O site 2 (or additional front I/O):
 - front panel I/O: option for PMC/XMC site or extra front panel I/O connectors (DisplayPort, USB 3.0/2.0 and Gigabit Ethernet interfaces)
 - 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:
 - support x8 PCI Express (Gen 1, Gen 2)
 - XMC site 1 can also support 2 x4 PCI Express
 - both powered from 5V supply

Serial Interfaces

- 3 x serial channel interfaces:
 - 1 x RS232 accessed via 26-way high density connector on front panel
 - 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
 - line level stereo output
 - line level microphone input
 - headphone output



Graphics Interfaces

- 1 x VGA interface via front panel 26-way high-density connector or via P2:
 - up to 1920 x 1200 @ 16M colors
 - switchable between front panel and P2
- 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
- option for DisplayPort interface via front panel (voids PMC/XMC site 2):
 - resolutions up to 2560 x 1600 @ 60 Hz
- support for Microsoft® DirectX 11.1 on Windows® and OpenGL 3.0 on Linux®

Other Peripheral Interfaces

- PC Real Time Clock
- watchdog timer; 32-bit Long Duration Timer with processor interrupt ability; chipset timer
- up to 5 x USB ports via the front panel I/O:
 - 3 x USB 2.0 ports accessed via a 26-way high-density connector
 - option for 2 x USB 3.0/2.0 ports accessed via USB connectors (voids PMC/XMC site 2)
- 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 and External Reset (both 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® and VxWorks®

Firmware Support

- Insyde® Software InsystemH20™ 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)
- 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 hardware

Electrical Specification

- +5V @ 8.5A (typical with 2.4 GHz 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 temperatures:
 - 0°C to +55°C (N-Series)
 - -25°C to +70°C (E-Series: selected CPU)
 - -40°C to +70°C (K-Series: selected CPU)
 - -40°C to +85°C (K-Series: selected CPU)
- non-operating temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or non-operating):
 - K-Series includes humidity sealant
- rugged versions, see separate datasheet:
 - conduction-cooled: VP B1x/Osd-RC

Mechanical Specification

- 6U form-factor
- single slot, 0.8-inch (20.3mm)
- utilizes 160-way connectors for P1 and P2
- optional P0 connector
- IEEE 1101.10 VME64x handles, alternatively with option for VME32 handles
- shock: 20g, 11ms, 1/2 sine
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement

ORDERING INFORMATION

Order Number	Product Description (Hardware)
VP B1x/msd-yz	4 th generation Intel Core SBC where x = 2-core or 4-core processor where s = processor performance

For the order number suffix (d-yz) options please contact your local sales office:
where d = DRAM size
d = up to 32 Gbytes DRAM
where yz = I/O Configuration
yz = rear I/O configuration