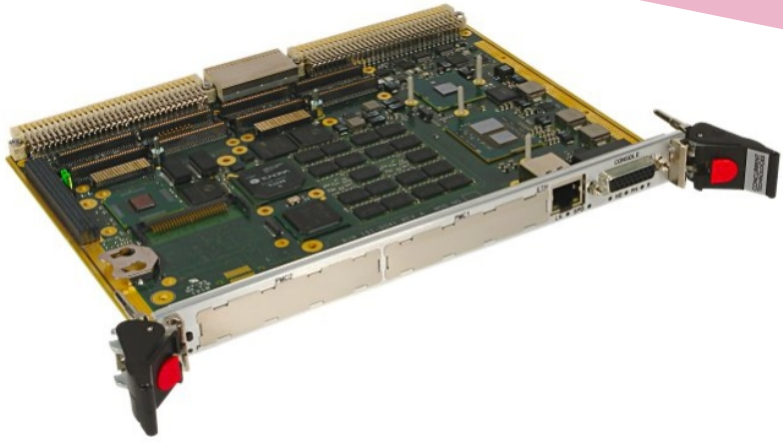
VME

VP 717/x8x
N, E, K - Series

Intel® Core™ i7 Processor Dual PMC/XMC Embedded Controller



APPLICATIONS

The VP 717/x8x is a PC-compatible high performance, high functionality VME processor board based on the Intel® Core™ i7 processor up to 2.53 GHz (32nm process technology), the Mobile Intel® QM57 Express chipset and up to 8 Gbytes of DDR3-1066 ECC DRAM. This single slot board features 2 PMC/XMC sites and a variety of interfaces including an option for an on-board Hard Disk Drive or CompactFlash™. The VP 717/x8x is suitable for a range of demanding applications within the defense, industrial control, telecomms, telemetry, scientific and aerospace markets. To simplify the board's integration many popular industry standard operating systems are supported. For harsher environments, extended temperature, ruggedized air-cooled and ruggedized conduction-cooled versions are supported. The board is plug compatible with the popular VP 417/03x and VP 31x/02x families.

HIGHLIGHTS

- 2.53 GHz, 2.0 GHz or 1.33 GHz Intel® Core™ i7 processor:
  - dual-core processor
  - 1066 MHz DRAM Bus (800 MHz for 1.33 GHz processor)
  - 4 Mbytes shared last level cache
  - Intel® Hyper-Threading Technology
  - Intel® Turbo Boost technology
  - Intel® 64 Technology (64-bit computing support)
- Up to 8 Gbytes of dual channel DDR3-1066 ECC DRAM
- High performance SATA and EIDE disk interfaces with support for optional on-board disk drive
- Onboard CompactFlash™ site
- 2 x PMC/XMC module interfaces:
  - 32/64-bit, 33/66/100 MHz PCI/PCI-X™
  - 2 x XMC module interfaces (x8 PCI Express®)
  - Expansion carrier for 2 more PMC sites
- 2 x 10/100/1000 Mbps Ethernet interfaces:
  - Gigabit Ethernet for VME64x backplane (VITA 31.1)
- 3 x serial channels and 3 x USB 2.0 interfaces
- Analog graphics, keyboard and mouse interfaces
- VME64x Interface (factory build option):
  - A32/A24/A16/D64/D32/D16/D8(EO), MBLT64 modes
  - support for fast hardware byte-swapping
- 8 Mbytes of BIOS Flash EPROM
- 64 Mbytes of Application Flash EPROM
- Watchdog timer; Long Duration Timer
- Single slot
- Extended temperature versions:
  - -25°C to +70°C (E-Series)
  - -40°C to +85°C (K-Series, includes humidity sealant)
- Ruggedized air-cooled versions (RA-Series):
  - -40°C to +75°C, conformally coated
- Ruggedized conduction-cooled versions (RC-Series):
  - conduction-cooled to ANSI/VITA 30.1-2002
  - -40°C to +85°C, conformally coated
- Optional Built-In Test (BIT) support:
  - Power-on BIT, Initiated BIT, Continuous BIT
- Support for Linux®, Windows®, VxWorks®, QNX®, Solaris™ and LynxOS®

CONCURRENT TECHNOLOGIES

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Specification

Central Processor

- 2.53 GHz Intel® Core™ i7-610E processor, 2.0 GHz Intel® Core™ i7-620LE processor or 1.33 GHz Intel® Core™ i7-660UE processor
- common processor features are:
  - 32nm process technology
  - dual-core processor
  - 4 Mbytes shared last level cache
  - Intel® Hyper-Threading Technology
  - Intel® 64 Technology (64-bit computing)
  - Intel® Turbo Boost technology
  - uses Ball Grid Array package
- processor to DRAM memory, bus speed:
  - 610E and 620LE - 1066MHz
  - 660UE - 800MHz
- graphics engine, core clock speed:
  - 610E - 500MHz
  - 620LE - 266MHz
  - 660UE - 166MHz
  - Intel Turbo Boost technology allows faster graphics engine speed depending on the CPU loading
- utilizes Intel® Platform Controller Hub (PCH):
  - Mobile Intel® QM57 Express chipset

DRAM

- up to 8 Gbytes DDR3-1066 ECC DRAM:
  - up to 8 Gbytes soldered on-board
  - single bit error correction
  - peak bandwidth of 17 Gbytes/s
  - dual channel architecture
- accessible from processor or VME bus

Mass Storage Interfaces

- 2 x external drive interfaces supporting:
  - single EIDE drive via P2 connector
  - single SATA300 drive via P0 (see Note 1)
- optional on-board 2.5 inch SATA300 disk drive
- 1 x EIDE interface supports on-board CompactFlash™ socket

Ethernet Interfaces

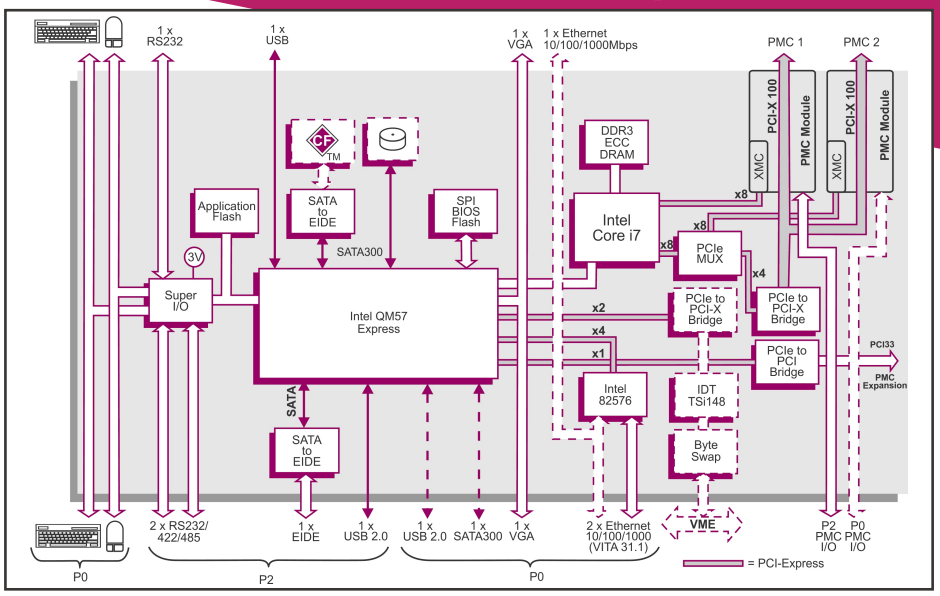
- two interfaces supporting 10/100/1000 Mbps:
  - implemented by Intel® 82576EB LAN Controller via x4 PCI Express® link
  - both interfaces accessed via optional P0 (see Note 1)
  - 1 channel switchable to front panel RJ45
- support for VITA 31.1:
  - Gigabit Ethernet for VME64x backplanes

PMC/XMC Interfaces

- 2 x PMC/XMC shared sites:
  - PMC sites support 32/64-bit, 33/66/100MHz PCI-X operation
  - PCI 3.3V or 5V signaling
  - XMC (Switched Mezzanine Card) sites support x8 PCI Express® links
  - XMC sites powered from 5V supply
- PMC Site 1 I/O via front panel and P2
- PMC Site 2 I/O via front panel and optional P0 (see Note 1)
- expansion to optional dual PMC carrier board:
  - via expansion connector (32-bit/33 MHz)
  - or via PMC/XMC site 2 (64-bit/66 MHz)

Graphics Interface

- implemented by the integrated chipset graphics controller
- resolutions up to 1920 x 1200 @ 16M colors
- analog graphics accessed via front panel 26-way high-density connector or optional P0



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

Other Peripheral Interfaces

- PC-compatible Real Time Clock
- 3 x USB 2.0 interfaces:
  - 1 x USB via a 26-way high-density connector on front panel
  - 1 x USB via P2 connector
  - option for USB via P0 connector (see Note 1)
- keyboard and mouse interfaces accessed via a 26-way high-density connector on front panel or optionally via P0 connector
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability

Flash EPROM

- 8 Mbytes of BIOS Flash EPROM
- 64 Mbytes of Application Flash EPROM

Software Support

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

Firmware Support

- UEFI-compliant BIOS with legacy mode support
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

Built-In Test (BIT) Support (optional)

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

Safety

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

VME Interface

- P1 and P2 connectors compatible with VME64x
- with IDT® TSi148™ VME Bridge (build option):
  - VME Master/Slave
  - A32/A24/A16/D64/D32/D16/D8(EO)/MBLT64
  - fast hardware byte swapping
  - auto system controller detect
  - full interrupter / interrupt handler support
  - bus error interrupt hardware
- or without VME Bridge (build option):
  - consult Technical Reference Manual

Electrical Specification

- +5V @ 10.2A (typical with 2.53 GHz processor and 4 Gbytes DRAM)
- +12V@0.0A; -12V@0.0A; 3.3V not required
- +12V and -12V routed to both PMC/XMC sites and PMC expansion connector

Environmental Specification

- operating temperatures:
  - 0°C to +55°C (N-Series)
  - -25°C to +70°C (E-Series: 2.0 GHz or 1.33 GHz)
  - -40°C to +70°C (K-Series: 2.0 GHz)
  - -40°C to +85°C (K-Series: 1.33 GHz)
- non-operating temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or non-operating):
  - K-Series includes humidity sealant
- ruggedized versions, see separate datasheets:
  - conduction-cooled: VP 717/x8x-RC
  - air-cooled: VP 717/x8x-RA

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
- IEEE 1101.10 handles
- shock: 20g, 11ms, ½ sine
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement

- **Note 1:** The optional P0 connector supports either PMC Site 2 I/O x64 and 1 x Ethernet or PMC Site 2 I/O x32, SATA, USB and 2 x Ethernet

ORDERING INFORMATION

Order Number	Product Description (Hardware)	For the order number suffix (yz) options please contact your local sales office: Where y = P2 and P0 I/O configurations	Where z = DRAM size
VP 717/x80-yz	1.33 GHz Intel® Core™ i7-660UE processor	y - P2 and P0 I/O configurations	z - up to 8 Gbytes DRAM
VP 717/x82-yz	2.0 GHz Intel® Core™ i7-620LE processor		
VP 717/x83-yz	2.53 GHz Intel® Core™ i7-610E processor		

For accessories please contact your local sales office.
For extended temperature E and K-Series, or ruggedized RA and RC-Series, please contact your local sales office.

Datasheet Code 1620/1114