

3rd Generation Intel® Core™ Processor Embedded Controller



APPLICATIONS

The VP 91x/01x is a PC-compatible high performance, high functionality VME processor board supporting the 3rd generation Intel® Core™ processors and the Mobile Intel® QM77 Express Chipset with up to 16 Gbytes of DDR3-1600 ECC DRAM. This single slot board features 2 PMC/XMC sites and a variety of interfaces including an option for an on-board mass storage and CompactFlash® site. The VP 91x/01x 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 717/08x, VP 417/03x and VP 31x/02x families.

HIGHLIGHTS

- 3rd generation Intel® Core™ processor:
 - 4-core 2.3 GHz Intel Core i7-3615QE processor
 - 4-core 2.1 GHz Intel Core i7-3612QE processor
 - 2-core 2.5 GHz Intel Core i7-3555LE processor
 - 2-core 1.7 GHz Intel Core i7-3517UE processor
- Up to 16 Gbytes of DDR3-1600 DRAM with ECC
- Up to 3 x external SATA interfaces plus optional on-board 2.5-inch SATA600 mass storage 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
- 3 x 10/100/1000 Mbps Ethernet interfaces, with optional Gigabit Ethernet for VME64x backplane (VITA 31.1)
- 3 x serial channels, and up to 3 x USB interfaces
- VGA graphics, DVI-D and optional DVI-I graphics interfaces
- Keyboard and mouse interfaces
- VME-64 Interface:
 - A32/A24/A16/D64/D32/D16/D8(E0), MBLT64 modes
 - support for fast hardware byte-swapping
- 8 Mbytes of BIOS Flash EPROM, dual devices
- 64 Mbytes of Application Flash EPROM
- Watchdog timer; Long Duration Timer
- 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 (at card edge), conformally coated
- Optional security packages
- Optional Built-In Test (BIT) support:
 - Power-on BIT, Initiated BIT, Continuous BIT
- Support for Linux®, Windows® 7, Windows® Embedded Standard 7, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® Server 2008, VxWorks®, QNX®, Solaris™ and LynxOS®
- Single slot
- Front and rear plug compatibility with the popular VP 717/08x, VP 417/03x and VP 31x/02x families

Central Processor

- 3rd generation Intel® Core™ processors:
 - 4-core 2.3 GHz Intel Core i7-3615QE processor
 - 4-core 2.1 GHz Intel Core i7-3612QE processor
 - 2-core 2.5 GHz Intel Core i7-3555LE processor
 - 2-core 1.7 GHz Intel Core i7-3517UE processor
 - up to 6 Mbytes of shared Last-Level cache
- utilizes Mobile Intel® QM77 Express Chipset
- ruggedized versions, see separate datasheets:
 - conduction-cooled: VP 91x/01x-RC
 - air-cooled: VP 91x/01x-RA

DRAM

- up to 16 Gbytes DDR3-1600 ECC DRAM:
 - soldered
 - single bit error correction
 - peak bandwidth of 25 Gbytes/s
 - dual channel architecture
- accessible from processor or VME bus

Mass Storage Interfaces

- up to 3 x external SATA interfaces:
 - optionally 2 x SATA via P2
 - optionally 1 x SATA via P0 (see Note 1)
- 1 x EIDE interface supports on-board CompactFlash® socket via SATA converter
- optional on-board 2.5-inch SATA600 mass storage

Ethernet Interfaces

- two Gigabit Ethernet interfaces via rear panel:
 - accessed via optional P0 (see Note 1)
 - implemented by Intel® 82580DB LAN Controller via x2 PCI Express® Gen2 link
- support for VITA 31.1:
 - Gigabit Ethernet for VME64x backplanes
- one Gigabit Ethernet interface via front panel:
 - accessed via RJ45 connector
 - implemented by Intel® 82579 Ethernet PHY

PMC/XMC Interfaces

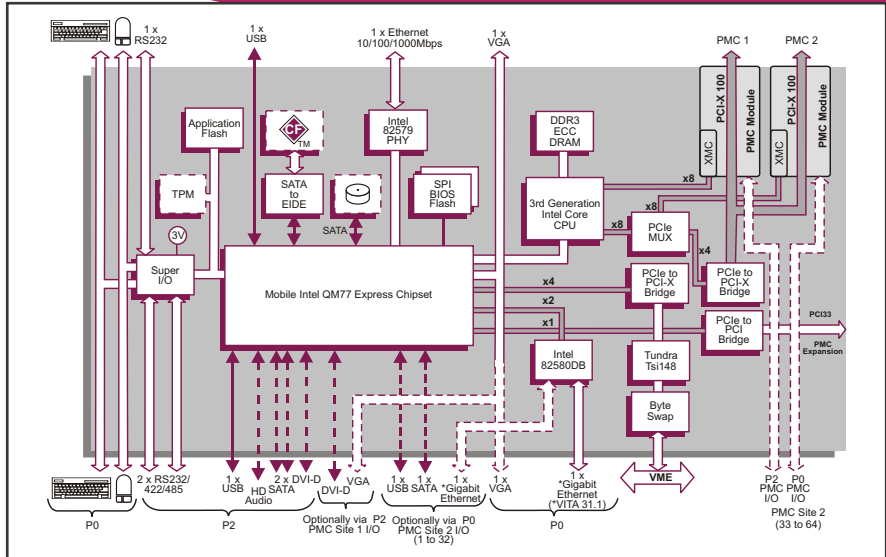
- 2 x PMC shared sites supporting:
 - 32/64-bit, 33/66/100 MHz PCI/PCI-X
 - 3.3V or 5V PCI signaling
 - I/O via front and rear panel via Pn4
- 2 x XMC (Switched Mezzanine Card) sites supporting:
 - up to x8 PCI Express link
 - optional Pn6 to Pn6 high speed interconnection bus (10 differential pairs and 8 single-ended)
 - XMC sites powered from 5V supply
- PMC Site 1 I/O via front panel and via P2:
 - build option for DVI-I graphics via P2
- PMC Site 2 I/O via front panel and via P0:
 - build options with 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)

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

Note 1:

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



Graphics Interfaces

- implemented by the integrated chipset graphics controller
- dedicated DVI-D interface via P2:
 - digital, up to 1920 x 1080
- analog VGA interface via front or rear panel:
 - analog, up to 1920 x 1200
 - accessed via front panel 26-way high-density connector, P2 or optional P0
- optional DVI-I interface via P2:
 - digital, up to 1920 x 1080
 - analog, using VGA, up to 1920 x 1200
 - this option uses I/O pins from PMC Site 1
- all interfaces support 32-bit color depth
- support for Microsoft® DirectX 10, OpenGL 2.0, Windows® and Linux®

Other Peripheral Interfaces

- PC-compatible Real Time Clock
- up to 3 x USB 2.0 interfaces:
 - 1 x USB via 26-way front panel connector
 - 1 x USB via P2 connector
 - option for USB via P0 (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, dual devices:
 - main/backup device enabled via switch
- 64 Mbytes of Application Flash EPROM

Software Support

- support for Linux®, Windows® 7, Windows® Embedded Standard 7, Windows® XP, Windows® XP Embedded, Windows® Server 2003, Windows® Server 2008, VxWorks®, QNX®, Solaris™ and LynxOS®

Security Packages (optional)

- Trusted Platform Module (TPM)
- proprietary security features:
 - contact sales for further information

Built-In Test (BIT) Support (optional)

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

Firmware Support

- Insyde® Software InsydeH20™ BIOS:
 - includes Compatibility Support Module
- based upon Intel® Platform Innovation Framework for EFI
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

Safety

- PCB (PWB) manufactured with flammability rating of 94V-0

VME Interface

- P1 and P2 connectors compatible with VME64x
- implemented using IDT®/Tundra® Tsi148™ device
- VME Master/Slave
- A32/A24/A16/D64/D32/D16/D8(E0)/MBLT64
- fast hardware byte swapping
- auto system controller detect
- full interrupter / interrupt handler support
- bus error interrupt hardware

Electrical Specification

- +5V @ 6.5A (typical with 2.5 GHz Intel Core i7-3555LE processor and 8 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: 1.7 or 2.5 GHz)
 - -40°C to +70°C (K-Series: 2.5 GHz)
 - -40°C to +85°C (K-Series: 1.7 GHz)
- storage temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or storage):
 - 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
- IEEE 1101.10 handles
- shock: 20g, 11ms, ½ sine
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement
- front and rear plug compatibility with the popular VP 717/08x, VP 417/03x and VP 31x/02x families

ORDERING INFORMATION

Order Number Product Description (Hardware)

VP 91x/01x-yz 3rd generation Intel Core i7 SBC

For the order number suffix (yz) options please contact your local sales office:
Where y = P2 and P0 I/O configurations

y - P2 and P0 I/O configurations

Where z = DRAM size

z - up to 16 Gbytes DRAM

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

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Specification subject to change; E and OE. RoHS 2002/95/EC compliant.

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