3rd Generation Intel® Core™ Processor Embedded Controller Rugged Conduction-Cooled (Bridgeless VME)
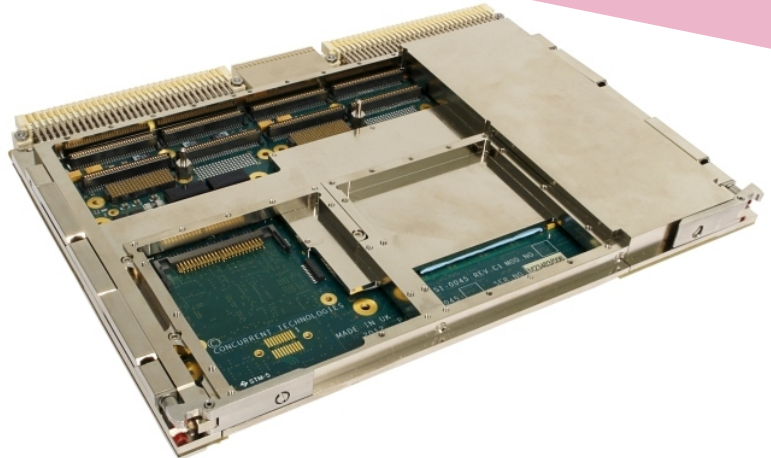

APPLICATIONS

The VP 91x/11x-RC is a PC-compatible high performance, high functionality, ruggedized conduction-cooled 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/11x-RC 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.

HIGHLIGHTS

- Ruggedized 6U single board computer:
  - conduction-cooled to IEEE 1101.2
  - removable front rib (VITA 20)
  - supports 2 conduction-cooled PMC or XMC modules conforming to ANSI/VITA 20
  - -40°C to +85°C operating temperature (at card edge)
  - conformally coated
- 3rd generation Intel® Core™ 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 Solid State Flash Disk
- Onboard CompactFlash® site
- 2 x PMC/XMC module interfaces with rear I/O:
  - 32/64-bit, 33/66/100 MHz PCI/PCI-X™
  - 2 x XMC module interfaces (x8 PCI Express®)
- 2 x 10/100/1000 Mbps Ethernet interfaces, with optional Gigabit Ethernet for VME64x backplane (VITA 31.1)
- 2 x serial channels, and up to 2 x USB interfaces
- VGA graphics, DVI-D and optional DVI-I graphics interfaces

- Keyboard and mouse interfaces
- VMEbus Bridgeless Interface supports:
  - SYSRESET, SYSFAIL, ACFAIL, GAx
  - VMEbus daisy chain
- 8 Mbytes of BIOS Flash EPROM, dual devices
- 64 Mbytes of Application Flash EPROM
- Watchdog timer; Long Duration Timer
- Air-cooled versions (N, E, K-Series and RA-Series):
  - N: 0°C to +55°C, commercial, non-ruggedized
  - E: -25°C to +75°C, extended, non-ruggedized
  - K: -40°C to +85°C, humidity-sealed, non-ruggedized
  - RA: -40°C to +75°C, conformally coated, ruggedized
- Optional support for:
  - Built-In Test (BIT) firmware and software
  - Board-level security package
  - Trusted Platform Module (TPM)
- Support for Linux®, Windows®, VXWorks® QNX®, Solaris™ and LynxOS®
- Rear plug compatibility with the popular VP 717/x8x-RC and VP 417/03x-RC families

CONCURRENT TECHNOLOGIES

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Ruggedized dual PMC/XMC controller
- conduction-cooled to IEEE 1101.2
- supports 2 x conduction-cooled PMC or XMC modules conforming to ANSI/VITA 20
- conformally coated
- ruggedized and commercial air-cooled versions, see separate datasheets:
  - → rear plug compatible
  - → rugged air-cooled: VP 91x/11x-RA
  - → commercial air-cooled: VP 91x/11x

Central Processor
- 3rd generation Intel® Core™ processors:
  - → 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 4 Mbytes of shared Last-Level cache
- utilizes Mobile Intel® QM77 Express Chipset

DRAM
- up to 16 Gbytes soldered DDR3-1600 ECC DRAM:
  - → single bit error correction
  - → peak bandwidth of 25 Gbytes/s
  - → dual channel architecture

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

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
- 2 x XMC (Switched Mezzanine Card) sites supporting:
  - → up to x8 PCI Express port
  - → XMC sites powered from 5V supply
- PMC/XMC Site 1 I/O via P2:
  - → P14 rear I/O via P2 or factory build option for reduced P14 I/O plus DVI-I graphics via P2
- PMC/XMC Site 2 I/O via optional P0:
  - → rear I/O via P24 to optional P0 includes factory build I/O options with P0 (see Note 1)
- XMC Pn6 rear I/O (P16 and P26) not connected

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

Note 1:
The optional P0 connector supports either
1) PMC Site 2 P24 I/O x64 and 1 x Ethernet or
2) PMC Site 2 P24 I/O x32, SATA, USB and 2 x Ethernet
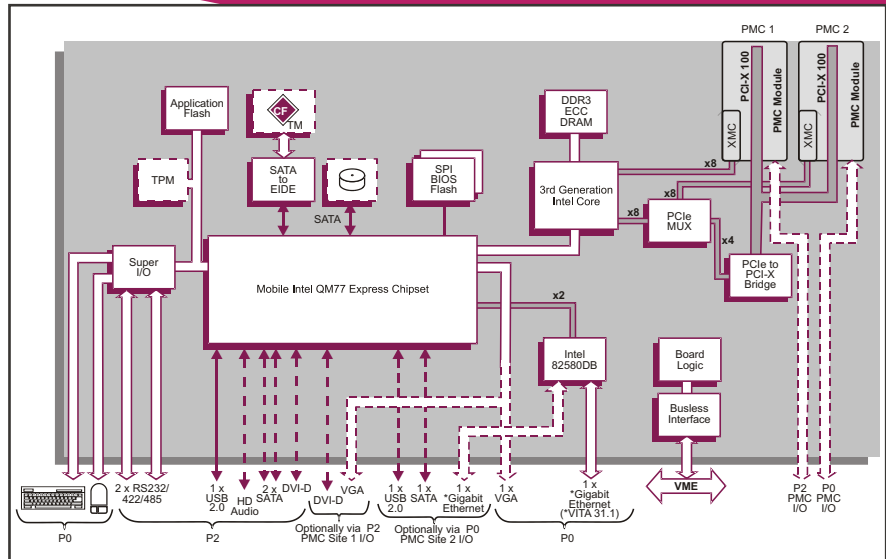
Graphics Interfaces
- implemented by the integrated chipset graphics controller
- optional DVI-D interface via P2:
  - → digital, up to 1920 x 1080
- analog VGA interface via P2 or P0:
  - → analog, up to 1920 x 1200
- optional DVI-I interface via P2:
  - → digital, up to 1920 x 1080
  - → analog, using 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 2 x USB 2.0 interfaces:
  - → 1 x USB via P2 connector
  - → option for USB via P0 (see Note 1)
- keyboard and mouse interfaces accessed via optional P0 connector
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability

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

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

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

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 UL94V-0

VMEbus Bridgeless Interface
- P1 and P2 connectors compatible with VME64x
- busless VME interface supports:
  - → SYSRESET, SYSFAIL, ACFAIL, GAx
  - → VMEbus daisy chain

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

Environmental Specification
- operating temperature (at card edge):
  - → VITA 47 Class CC4, -40°C to +85°C
  - → conduction-cooled
- 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
- removable front rib (VITA 20)
- operating mechanical:-
  - → shock - VITA 47 Class OS2, 40g
- random vibration - VITA 47 Class V3, 0.1g²/Hz displacement
- rear plug compatibility with the popular VP 717/x8x-RC and VP 417/03x-RC families

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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 91x/11x-yzRC	3rd generation Intel Core i7 SBC (RC-Series)	y - P2 and P0 I/O configurations	z - up to 16 Gbytes DRAM

For accessories, commercial air-cooled N, E and K-Series, or ruggedized air-cooled RA-Series, please contact your local sales office.