

Intel® Atom™ Processor
Dual PMC Controller
Rugged
Conduction-Cooled



APPLICATIONS

The VP A45/01x-RC is a PC-compatible low power, high functionality, ruggedized conduction-cooled 6U VME board supporting the 1.6 GHz Intel® Atom™ processor N270. It utilizes the Intel® 945GSE mobile chipset to support 2 Gbytes of DDR2-533 SDRAM. This single slot board features 1 PMC/XMC site and 1 PMC site, an on-board CompactFlash™ site and a range of I/O including two Ethernet interfaces. The VP A45/01x-RC

is a ruggedized conduction-cooled board, operating in temperatures from -40°C to +85°C, making it suitable for a range of applications within the industrial control, transport, security, aerospace and defense industries. The board is rear I/O plug compatible with the commercial and the ruggedized air-cooled versions. To simplify the board's integration many industry standard operating systems are supported.

HIGHLIGHTS

- Ruggedized 6U single board computer:
 - conduction cooled to IEEE 1101.2
 - supports 2 conduction-cooled PMC modules conforming to ANSI/VITA 20
 - -40°C to +85°C operating temperature
 - conformally coated
- 1.6 GHz Intel® Atom™ processor:
 - 512 Kbytes L2 cache
 - Intel® Hyper-Threading Technology supports 2 execution threads
- 2 Gbytes of DDR2-533 SDRAM
- Dual SATA150 drive interfaces
- Option for an on-board SATA 2.5-inch solid state drive
- EIDE interface for an on-board CompactFlash® socket
- 1 x PMC/XMC and 1 x PMC module interfaces:
 - 1 x 32-bit, 33MHz PCI PMC site
 - 1 x 32/64-bit, 33/66 MHz PCI/PCI-X™ PMC site
 - 1 x XMC module interface (x1 PCI Express™)
- Keyboard, mouse and DVI-D graphics interfaces via P2
- 1 x serial channel and 2 x USB 2.0 interfaces
- 2 x Ethernet interfaces:
 - 2 x 10/100/1000Mbps Ethernet channels via PO
- Built-In Test (BIT) support planned:
 - Power-on BIT, Initiated BIT, Continuous BIT
- Watchdog and long duration timer
- 4 Mbytes of BIOS Flash EPROM
- VME64 interface supporting A32/A24/A16/D64/D32/D16/D8(E0), MBLT64
- Ruggedized air-cooled version:
 - -40°C to +75°C, conformally coated
 - see separate VP A45/01x-RA datasheet
- Non-ruggedized air-cooled versions:
 - rear plug compatible with ruggedized version
 - useful for bench development
 - useful in commercial (non-rugged) applications
 - see separate VP A45/01x datasheet
- Support for Linux®, Windows® XP, Windows® XP Embedded, QNX® and VxWorks®

Ruggedized Dual PMC Controller

- conduction cooled to IEEE 1101.2
- supports 2 x conduction-cooled PMC modules conforming to ANSI/VITA 20
- conformally coated
- ruggedized air-cooled version available:-
→ see VP A45/01x-RA datasheet
- non-ruggedized commercial version available:-
→ see VP A45/01x datasheet

Central Processor

- 1.6 GHz Intel® Atom™ processor N270:-
→ 512 Kbytes of secondary (L2) on-die cache
→ 533 MHz Front Side Bus
→ Intel Hyper-Threading Technology supporting 2 execution threads
- uses 437 pin FC-BGA (Flip-Chip Ball Grid Array) package
- utilizes Intel® 945GSE mobile class chipset:-
→ uses Intel® ICH7M I/O Hub

SDRAM

- 2 Gbytes soldered DDR2-533 SDRAM
- accessible from processor or VME bus

Mass Storage Interfaces

- 1 x EIDE interface supports on-board CompactFlash™ socket
- 2 x Serial ATA150 interfaces:-
→ transfer rate up to 150 Mbytes/s
→ accessed via P2 connector
→ one channel switchable to optional on-board SATA 2.5-inch solid state drive

Ethernet Interfaces

- 2 x 10/100/1000 Mbps interfaces via P0:-
→ implemented by 2 x Intel® 82574 LAN Controllers via x1 PCI Express® links

PMC/XMC Interfaces

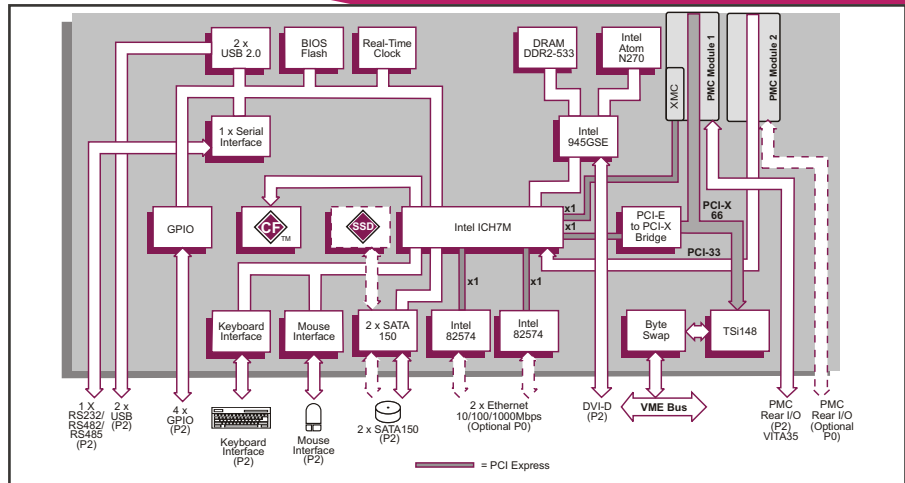
- 1 x PMC/XMC site and 1 x PMC site
- PMC site 1 supports:-
→ 32/64-bit, 33/66 MHz PCI/PCI-X
→ 3.3V or 5V signaling
→ XMC interface via x1 PCI Express port
→ I/O via P2 (VITA 35 P4V2-64ac pinout)
- PMC site 2 supports:-
→ 32-bit, 33MHz PCI only
→ 3.3V or 5V signaling
→ I/O via optional P0

Graphics Interface

- implemented by Intel 945GSE:-
→ resolutions up to 1600 x 1200 @ 16M colors
- DVI-D graphics accessed via P2 connector

Serial Interfaces

- 1 x RS232/422/485 serial channel accessed via P2:-
→ supporting RI, CTS, RTS, DSR, DTR, DCD and RI
- 16550 compatible UART



Flash EPROM

- 4 Mbytes of BIOS Flash EPROM

Software Support

- supports Linux®, Windows® XP, Windows® XP Embedded, QNX®, and VxWorks®

Built-In Test (BIT) Support

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

Firmware Support

- Phoenix™ TrustedCore BIOS
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

Other Peripheral Interfaces

- PC-compatible Real Time Clock
- 2 x USB 2.0 interfaces via P2 connector
- keyboard and mouse interfaces accessed via P2 connector
- watchdog timer
- 1 x 32-bit Long Duration Timer with processor interrupt capability
- 4 x GPIO signals via P2
- P1 and P2 connectors compatible with VME64x
- implemented using 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

VME Interface

- P1 and P2 connectors compatible with VME64x
- implemented using 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

Electrical Specification

- typical current figure (2 Gbytes SDRAM)
- +5V @ 4.4A; voltage +5% / -3%
- +12V @ 0.0A; -12V @ 0.0A; 3.3V not required
- +12V and -12V routed to both PMC sites

Safety

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

Environmental Specification

- operating temperature:-
→ VITA 47 Class CC4, -40°C to +85°C
→ conduction-cooled (VITA 48.2)
- storage temperature:-
→ VITA 47 Class C4, -55°C to +105°C
- operating and storage altitude:
-1,000 to 50,000 feet (-305 to 15,240 meters)
- 5% to 95% Relative Humidity, non condensing (operating/storage)
- ruggedized and commercial air-cooled versions:-
→ rear plug compatible
→ air-cooled: VP A45/01x-RA
→ commercial: VP A45/01x

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
- operating mechanical:-
→ shock - VITA 47 Class OS2, 40g
→ random vibration - VITA 47 Class V3, 0.1g²/Hz

ORDERING INFORMATION

Order Number Product Description (Hardware)

VP A45/013-x2RC 1.6 GHz Atom processor N270

AD 110/001-z2RC SATA 2.5-inch Solid State Drive kit

Replace the order number suffix (-xy) with selections from the following:

Where x = P2/P0 Breakout combinations

Where y = SDRAM size

5 - No P0, 3.3V PMC, PMC (VITA35 P4V2-64ac)
6 - P0 fitted, 3.3V PMC, PMC (VITA35 P4V2-64ac)
7 - No P0, 5V PMC, PMC (VITA35 P4V2-64ac)
8 - P0 fitted, 5V PMC, PMC (VITA35 P4V2-64ac)

1 - reserved
2 - 2 Gbytes