

Intel® Core™ 2 Duo Processor Single Board Computer

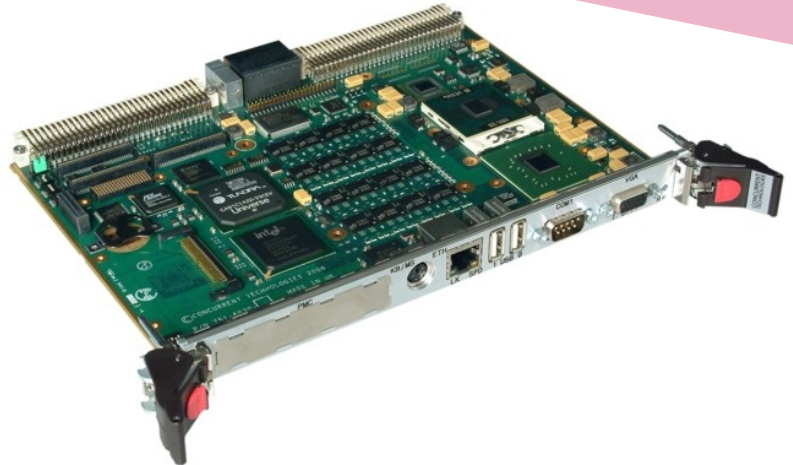


APPLICATIONS

The VX 407/04x is a PC-compatible high performance VME/VXS single board computer supporting the 2.16 GHz and 1.5 GHz Intel® Core™ 2 Duo processors which contain two CPU cores and shared L2 cache. The board features 4 Gbytes DDR2 synchronous DRAM and a variety of interfaces including an option for an on-board Hard Disk Drive, CompactFlash™ or Hitachi GST MicroDrive™. The VX 407/04x supports VITA 41.3 on VXS backplanes, or when the P0 connector is not fitted it will support dual Gigabit Ethernet on either VXS or VME64 backplanes. The

HIGHLIGHTS

- 2.16 GHz or 1.5 GHz Intel Core 2 Duo processor:
 - dual-core processor
 - 667 MHz Front Side Bus
 - 64 Kbytes L1 cache
 - 4 Mbytes shared L2 cache
 - Intel® 64 Technology (64-bit computing)
 - passive heatsink
- 4 Gbytes of 667MHz DDR2 SDRAM
- High performance SATA interface
- EIDE interfaces with support for on-board CompactFlash, MicroDrive or optional on-board disk drive (in a single slot)
- Options for networking via rear I/O; either:
 - 2 x 10/100/1000Mbps Ethernet channels via P2
 or:
 - 2 x 1000Mbps baseband IEEE 802.3 backplane ports via P0 for VITA 41.3 on VXS backplanes
- 1 x 10/100/1000Mbps front panel Ethernet interface
- 1 Mbyte of BIOS Flash EPROM
- 32/64-bit PMC module interface, operating at 33/66 MHz:
 - 1 x XMC module interface (x1 PCI Express™)
- Front panel and P2 I/O combinations available:
 - analog and digital graphics interfaces
 - keyboard and mouse interfaces
 - 2 x RS232/RS422/RS485 serial channels
 - 5 x Universal Serial Bus (USB) ports
- Floppy disk interface
- Watchdog timer and Long Duration Timer
- VME64 Interface supporting A32/A24/A16/D64/D32/D16/D8(E0), MBLT64 and with support for fast hardware byte-swapping
- Single slot
- Extended temperature version available:
 - -25°C to +70°C (E-Series)
 - supporting 1.5 GHz processor
- Support for Linux®, Windows® 2000, Windows® XP, Windows® XP Embedded, VxWorks®, Solaris™ and QNX®



Central Processor

- 2.16GHz Intel® Core™ 2 Duo processor T7400:-
 - uses FC-PGA 478 (micro Flip-Chip Pin Grid Array) package
- 1.5GHz Intel® Core™ 2 Duo processor L7400:-
 - uses FC-BGA 478 (micro Flip-Chip Ball Grid Array) package
- common dual-core processor features are:-
 - 667 MHz Front Side Bus
 - 64 Kbytes of primary (L1) on-die cache
 - 4 Mbytes of shared secondary (L2) on-die cache
 - Intel® 64 Technology (64-bit computing)
 - no CPU fan; low power processor
- utilizes mobile Intel® 945GME Express chipset
- provision for XDP debug port

DRAM

- supporting 4 Gbytes of 667MHz DDR2 SDRAM soldered on-board:-
 - peak bandwidth of 10.6 Gbytes/s
 - dual channel architecture
- accessible from processor and VME bus

Hard Disk Interfaces

- 2 x EIDE interfaces:-
 - supports up to Ultra-DMA 100 for high performance drives
 - second EIDE interface can be used for on-board 2.5 inch disk drive or CompactFlash™ or Microdrive™ Type II drive
 - primary channel supports up to two off-board EIDE drives via P2 connector
- 1 x Serial ATA150 interface:-
 - accessible via VXS P0 connector
 - transfer rate up to 150 Mbytes/s

Ethernet Interfaces

- 2 x rear I/O interfaces:-
 - implemented by Intel® 82571EB Controller
 - 2 x 10/100/1000Mbps Ethernet channels when P0 not fitted, accessed via P2 for either VME64x or VXS backplanes; or
 - 2 x 1000Mbps baseband IEEE 802.3 backplane ports, accessed via VXS P0 connector for VITA 41.3 on a VXS backplane
- 1 x Ethernet channel accessed via front panel RJ45 connector:-
 - implemented by Intel® 82573L Controller
 - supports 10/100/1000Mbps

Graphics Interface

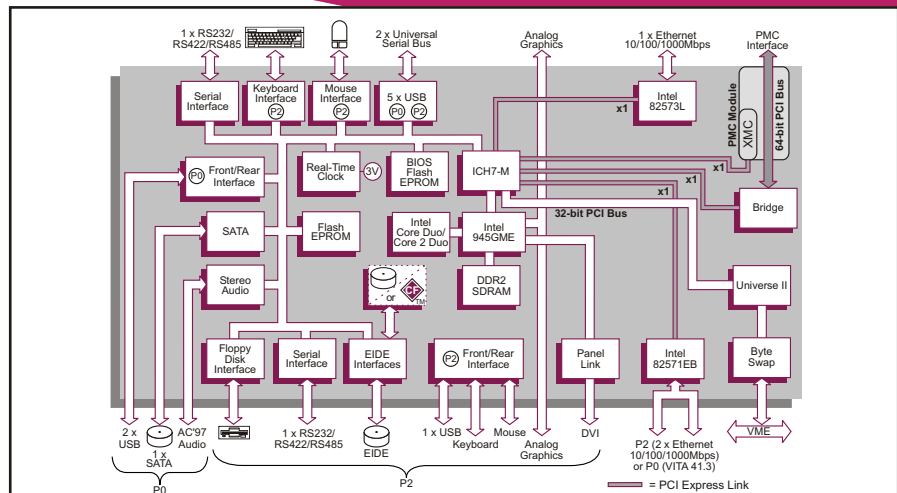
- implemented by Intel 945GME Express chipset
- analog VGA accessed via a 15-way high density connector on front panel or P2:-
 - resolutions up to 2048 x 1536 @ 16M colors
- flat panel supported by a Panel Link interface via P2 connector:-
 - resolutions up to 1600 x 1200 @ 16M colors

Stereo Audio

- AC'97 interface on VXS P0 supports High Definition Audio (HDA) Codec on breakout
- independent legacy speaker output via P2

Flash EPROM

- 1 Mbyte of BIOS Flash EPROM
- 1 Mbyte of Flash EPROM



PMC/XMC Interface

- 1 x PMC slot supporting:-
 - I/O via front panel
 - 32/64-bit, 33/66 MHz PCI operation
 - 3.3V or 5V PCI signaling
 - XMC (PCI-Express Mezzanine Card) interface supported via x1 PCI Express® Link
- option for dual PMC carrier board using baseboard XMC connector (uses PMC site)

Serial Interfaces

- 2 x RS232/RS422/RS485 serial channels:-
 - 1 x channel accessed via a 9-way D-type connector on the front panel
 - 1 x channel via P2 connector
- 16550 compatible UARTs
- both channels can be user configured for RS232, RS422 or RS485

Other Peripheral Interfaces

- keyboard and mouse interfaces via a single PS/2™ connector on front panel and via P2 connector
- floppy disk interface via P2 connector
- 5 x USB 2.0 (Universal Serial Bus) interfaces:-
 - 2 x USB interfaces accessed via USB connectors on front panel
 - 1 x USB interface via P2 connector
 - 2 x USB interfaces via VXS P0 connector
- 3 x General Purpose I/O bits via P2 connector
- PC Real Time Clock (Year 2000 compliant)
- 1 x 32-bit Long Duration Timer with processor interrupt capability; watchdog timer

Firmware Support

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

Software Support

- support for Linux®, Windows® 2000, Windows® XP, Windows® XP Embedded, VxWorks®, Solaris™ and QNX®

Safety

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

VME Interface

- compatible with VME, VME64x and VXS:-
 - P1 and P2 connectors compatible with VME (1.5 GHz only), VME64x and VXS systems
 - P0 connector compatible with VXS systems
- uses the Tundra® Universe IID™ 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@6.1A (typical at 2.16 GHz with 4 Gbytes SDRAM)
- +3.3V, +12V and -12V not utilized
- +12V and -12V routed to PMC expansion slot

Environmental Specification

- operating temperatures:-
 - 0°C to +55°C (N-Series: 1.5 GHz / 2.16 GHz)
 - -25°C to +70°C (E-Series: 1.5 GHz)
- storage temperature: -40°C to +85°C
- 5% to 95% Relative Humidity, non condensing (operating or storage)

Mechanical Specification

- 6U form-factor 9.2 inches x 6.3 inches (233mm x 160mm)
- single slot: 0.8 inches (20.3mm)
- utilizes 160-way connectors for P1 and P2
- optional P0 (for VXS backplanes only)
- shock: 20g, 11ms, ½ sine (operating); 30g, 11ms, ½ sine (non-operating)
- vibration: 5Hz-2000Hz at 2g, 0.38mm peak displacement (operating); 5Hz-2000Hz at 5g, 0.76mm peak displacement (non-operating)

Note 1: selected variants (1, 2 and 5) are supplied with VME64x handles

Note 2: 5-row backplane is required to provide P2 access to dual Ethernet, CRT, keyboard, mouse, USB, legacy speaker and GP I/O ports

ORDERING INFORMATION

Order Number	Product Description (Hardware)
VX 407/041-xy	1.5 GHz Core 2 Duo Processor L7400
VX 407/042-xy	2.16 GHz Core 2 Duo Processor T7400

AD VP2/015-10	RTM for VME64x or VXS backplane: use when x=2
AD VP2/015-30	RTM (with HDA Codec) for VXS backplane: use when x=5
AD CR3/PMC-zz	PMC Carrier Board for 2 PMC modules (front/rear I/O)
AD CP1/DR1-z0	2.5 inch Hard Disk Drive (HDD) assembly
DS MSS/00x-zzU	Board with HDD, CD-RW/DVD, CompactFlash, FDD

For z options please contact your local sales office.

Replace the order number suffix (xy) with selections from the following:
Where x = P2/P0 Breakout combinations **Where y = memory size**

1 - Same as x = 2. Also includes AD VP2/009-10 breakout	1 - reserved
2 - 5-row only: P2 I/O = 2 x 10/100/1000 Ethernet ++	2 - reserved
4 - 3-row, EIDE, FDC, 1xRS232/422/485 (1.5 GHz only)**	3 - reserved
5 - 5 row only: VXS P0 I/O = VITA 41.3, 2 x USB, 1 x SerialATA, AC'97 audio. P2 I/O ++	4 - 4 Gbytes

++ when x = 1, 2 or 5, P2 I/O = EIDE, FDC, keyboard, mouse, 1xUSB DVI-D, VGA, speaker, 3xGPIO and 1xRS232

** when x = 4, also includes AD VP2/006-40 breakout

For extended temperature, 1.5 GHz E-Series, please contact your local sales office