

Intel® Core™ 2 Duo Processor Single Board Computer



APPLICATIONS

The VX 541/06x is a PC-compatible high performance VXS/VME processor board supporting the Intel® Core™ 2 Duo processor up to 2.26 GHz, and the Intel® GS45 mobile class chipset with up to 8 Gbytes of DDR3-1066 SDRAM. The board features a PMC/XMC site, dual digital and analog graphics interfaces, and a variety of I/O interfaces including an option for an on-board 1.8-inch or 2.5-inch SATA300 drive and CompactFlash® socket.

HIGHLIGHTS

- 2.26 GHz or 1.86 GHz Intel® Core™ 2 Duo processor:
 - dual-core processor
 - 1066MHz Front Side Bus
 - 6 Mbytes last-level cache shared between cores
 - Intel® 64 Technology (64-bit computing)
 - passive heatsink
- Up to 8 Gbytes DDR3-1066 SDRAM
- Single PMC/XMC site:
 - supporting 33/66/100 MHz PCI/PCI-X PMC site
 - also supporting x4 PCI Express® XMC site
- 2 x SATA300 interfaces for external storage
- 1 x SATA 300 interface for optional on-board drive:
 - 1.8-inch drive (PMC/XMC site available)
 - or 2.5-inch drive (uses PMC/XMC site)
 - Hard Disk Drive or Solid State Drive (SSD)
- On-board CompactFlash® socket
- 2 x serial ports, 5 x USB 2.0 ports
- Intel® High Definition Audio via P2
- Watchdog timer and Long Duration Timer
- Keyboard and mouse interfaces



Options to operate in temperatures from -40°C to +85°C are available and ruggedized air-cooled versions planned. The VX 541/06x is suitable for a range of applications within the defense, industrial control, telecomms, telemetry, scientific and aerospace markets. To simplify integration, many industry standard operating systems are supported.

- 2 x 10/100/1000 Mbps Ethernet front panel interfaces
- Options for networking via rear I/O; either:
 - 2 x 10/100/1000 Mbps Ethernet ports via P2, or
 - 2 x 1000 Mbps baseband IEEE 802.3 backplane ports via P0 for VITA 41.3 on VXS backplane
- Dual analog and digital graphics interfaces:
 - dual front panel DVI-I connectors
 - front DVI-D interfaces also available via P2
 - dual independent display capability
- VME64 interface supporting A32/A24/A16, D64/D32/D16/D8 (EO), MBLT64 and with support for fast hardware byte-swapping
- Single slot
- Extended temperature versions available:
 - -25°C to +70°C (E-Series)
 - -40°C to +85°C (K-Series)
- Ruggedized air-cooled version planned
- Support for Linux® (32/64-bit), Windows® XP (32/64-bit), Windows Server 2003 (32/64-bit), Windows Server 2008 (32/64-bit), Windows XP® Embedded, QNX®, LynxOS®, Solaris™ (32/64-bit) and VxWorks®

Central Processor

- 2.26 GHz Intel® Core™ 2 Duo SP9300 or 1.86 GHz Intel® Core™ 2 Duo SL9400
- common processor features:-
 - 45nm process technology
 - soldered to board
 - 1066 MHz Front Side Bus
 - 6 Mbytes of shared Last-Level on-die cache
 - Intel 64 technology (64-bit computing)
 - no CPU fan
- utilizes Intel® GS45 mobile class chipset with Intel ICH9M-E I/O Controller Hub
- provision for XDP debug port

SDRAM

- supports up to 8 Gbytes DDR3-1066 SDRAM:-
 - up to 8 Gbytes soldered
 - peak bandwidth of 16 Gbytes/s
 - dual channel architecture
- accessible by CPU and from VME bus

Mass Storage Interfaces

- 2 x SATA 300 interfaces via P2
- 1 x SATA 300 interface for an on-board drive, either 1.8-inch or 2.5-inch option:-
 - 1.8-inch hard disk drive or solid-state drive, PMC/XMC site is not used
 - 2.5-inch hard disk drive, uses PMC/XMC site
- 1 x SATA 300 interface for on-board CompactFlash socket via EIDE converter

PMC/XMC Interface

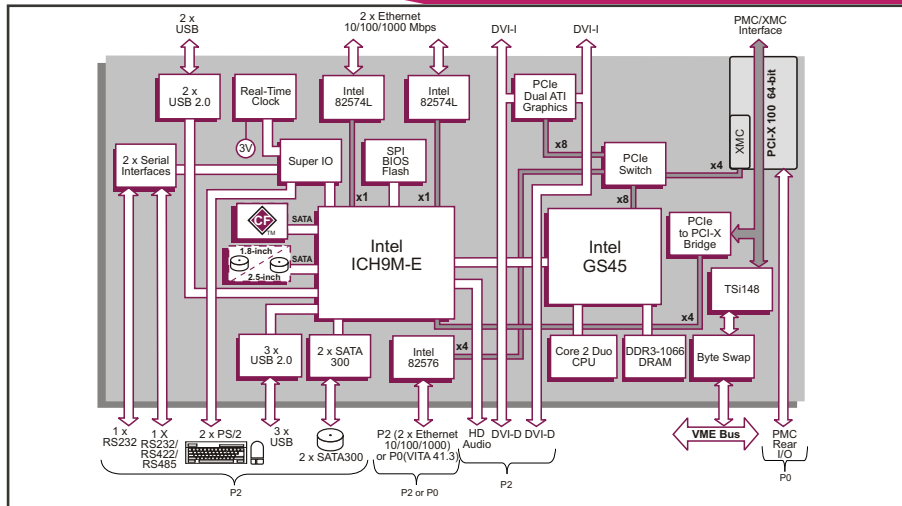
- supports 32/64-bit, 33/66MHz PCI bus
- supports 64-bit PCI-X bus up to 100MHz
- supports 5V and 3.3V signaling
- XMC site connected via PCIe x4 port to the Intel GS45 chipset
- PMC (Pn4) rear I/O via P0

Ethernet Interfaces

- 2 x 10/100/1000 Mbps Ethernet interfaces via front panel RJ45 connectors
- factory configuration options for either:-
 - 2 x 10/100/1000 Mbps Ethernet interfaces via P2, or:
 - 2 x 1000 Mbps baseband IEEE 802.3 backplane ports via VXS P0 (VITA 41.3)

Graphics Interfaces

- implemented with ATI Radeon E2400
- 128 Mbytes of 64-bit dual channel GDDR3 DRAM
- dual independent display supported for both outputs in analog or digital mode
- dual DVI-I connectors via front panel:-
 - digital, up to 1600 x 1200 @ 16M colors
 - analog, up to 2048 x 1536 @ 1073M colors
- front panel DVI-D interfaces repeated via P2:-
 - digital, up to 1600 x 1200 @ 16M colors
- support for Microsoft® DirectX 10
- support for OpenGL 2.0 under Windows® and Linux®



Serial Interfaces

- 2 x 16550 compatible ports via P2:-
 - 1 x RS232 only, supporting Tx/D, Rx/D, CTS, RTS, DTR, DSR, DCD, RI
 - 1 x RS232/RS422/RS485

Other Peripheral Interfaces

- PC Real-Time Clock (Year 2000 compliant)
- 5 x USB 2.0 interfaces:-
 - 2 x ports on front panel
 - 3 x ports via P2
- legacy speaker output via P2
- Intel High Definition Audio output via P2
- PS/2 keyboard and mouse interfaces via P2

BIOS EPROM

- 4 Mbytes of BIOS SPI Flash EPROM

Firmware Support

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

Software Support

- support for Linux® (32/64-bit), Windows Server 2003 (32/64-bit), Windows Server 2008 (32/64-bit), Windows® XP (32/64-bit), Windows XP® Embedded, QNX®, LynxOS®, Solaris™ (32/64-bit) and VxWorks®

Electrical Specification

- +5V @ 8.4 A (typical at 1.86 GHz, 4G SDRAM)
- +3.3V, +12V and -12V supplies not utilized
- voltages +5/-3%

Safety

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

VME/VXS Interface

- P1 and P2 connectors compatible with VME64x and VXS
- implemented using Tundra® Tsi148 device:-
 - connected via 64-bit PCI-X 100 bus
- VME Master/Slave
- A32/A24/A16/D64/D32/D16/D8(E0)/MBL64
- fast hardware byte swapping
- auto system controller detect
- full interrupter/interrupt handler support
- optional VXS P0 connector provides dual 1000 Mbps IEEE 802.3 VITA 41.3 packet switched backplane

Environmental Specification

- operating temperatures:-
 - 0°C to +55°C (N-Series)
 - -25°C to +70°C (E-Series, 1.86 GHz only)
 - -40°C to +85°C (K-Series, 1.86 GHz only)
- storage temperature - VITA 47 Class C1
- operating altitude - 0 to 15,000 feet (0 to 4,572 meters)
- 5% to 95% Relative Humidity, non condensing (operating or storage):-
 - K-Series includes humidity sealant
- ruggedized version planned, see separate datasheet:-
 - rear plug compatible
 - air-cooled: VX 541/06x-RA

Mechanical Specification

- 6U form factor: 9.2 inches x 6.3 inches (233mm x 160mm)
- single slot, front panel width 0.8 inch (20.3mm)
- utilizes 160-way connectors for P1 and P2
- optional VXS P0
- IEEE 1101.10 handles
- operating shock - VITA 47 Class OS1
- operating vibration - VITA 47 Class V1

ORDERING INFORMATION

Order Number	Product Description (Hardware)	Replace the order number suffix (-xy) with selections from the following: Where x = VXS P0 combination	Where y = SDRAM
VX 541/062-xy	1.86 GHz Core 2 Duo processor, Dual PMC, VXS/VME SBC	2 - VXS P0 not fitted, dual Gigabit Ethernet via P2	1 - reserved
VX 541/063-xy	2.26 GHz Core 2 Duo processor, Dual PMC, VXS/VME SBC	5 - VXS P0 fitted, 2 x 1000 Mbps IEEE 802.3 (VITA 41.3)	2 - 4 Gbytes SDRAM
AD VP2/022-zz	RTM for VME64x or VXS backplane, includes stereo audio CODEC		3 - 8 Gbytes SDRAM
AD VP2/023-zz	RTM, with option for VXS P0 for VXS backplane, includes PIM site (for PMC Pn4 I/O) and stereo audio CODEC		
AD VP2/025-00	RTM for VME64x or VXS backplane, includes stereo audio CODEC and 3.5mm stereo audio jacks (in, out and mic)		
AD 110/002-z1	2.5 inch SATA300 Hard Disk Drive assembly		
AD 120/001-zz	1.8 inch SATA300 Hard Disk Drive or Solid State Drive assembly		

For z options please contact your local sales office

For extended temperature, E and K-Series, please contact your local sales office
For ruggedized versions see separate datasheets