CompactPCI

TP 462/34x
N, E, K - Series

Intel® Core™ 2 Duo Processor 3U Single Board Computer

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APPLICATIONS

The TP 462/34x is a PC-compatible, high functionality, 3U CompactPCI® board supporting either the 2.16 GHz Intel® Core™ 2 Duo processor T7400 or the 1.5 GHz Intel® Core™ 2 Duo processor L7400. It utilizes the Intel® 945GME GMCH to support up to 2 Gbytes of DDR2 SDRAM. This board can support a PMC/XMC site and features a variety of interfaces including three SATA300 channels, CompactFlash® site, two Gigabit Ethernet ports, two serial channels and four USB ports. The TP 462/34x is a commercial air-cooled board, suitable for a range of environments within industrial control, transportation, security, telemetry, scientific and medical applications. Options to operate in temperatures ranging from -40°C to +85°C are available. To simplify the board's integration many industry standard operating systems are supported.

HIGHLIGHTS

- 2.16 GHz or 1.5 GHz Intel® Core™ 2 Duo processor:
  - 4 Mbytes L2 cache
  - Intel® 64 Technology (64-bit computing support)
- Up to 2 Gbytes of DDR2-667 SDRAM
- Single/dual 3U CompactPCI slot configurations available
- PMC/XMC module interface, on optional second slot board with front and rear user I/O:
  - 32-bit, 33/66MHz PCI operation
  - XMC module interface (x4 PCI Express®)
- 2 x 10/100/1000Mbps Ethernet interfaces
- 3 x SATA300 channels:
  - 2 channels accessed via J2
  - 1 channel used for SATA hard drive on optional second slot boards
- CompactFlash® site(s) on single and/or dual slot board:
  - optional second slot board provides either front loading or onboard CompactFlash
- 2 x serial channel interfaces
- 2 x analog graphics interfaces
- 4 x USB 2.0 interfaces
- CompactPCI controller:
  - operates in the system slot or in a peripheral slot
  - PICMG® 2.1 R2.0 (Hot-Swap Specification)
  - 32-bit, 33/66 MHz CompactPCI interface
  - option to bypass CompactPCI bus (Satellite Mode)
- IPMI (Intelligent Platform Management Interface):
  - PICMG 2.9 (System Management Specification)
- Watchdog and long duration timer
- Extended temperature versions available:
  - -25°C to +70°C (E-Series)
  - -40°C to +85°C (K-Series, includes humidity sealant)
  - supporting 1.5 GHz processor
- Support for Linux®, Windows® XP, Windows® XP Embedded, Windows® Server 2003, QNX® and VxWorks®

CONCURRENT TECHNOLOGIES

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Specification

Central Processor

- 2.16 GHz Intel® Core™ 2 Duo processor T7400 or 1.5 GHz Intel® Core™ 2 Duo processor L7400:-
  - → dual-core processor
  - → 4 Mbytes of secondary (L2) on-die cache
  - → 667 MHz Front Side Bus
- Intel® 64 Technology (64-bit computing)
- uses FC-BGA 478 (micro Flip-Chip Ball Grid Array) package
- utilizes 64-bit Intel® 945GME GMCH
- utilizes Intel® ICH7-R I/O Controller Hub

DRAM

- up to 2 Gbytes DDR2-667 SDRAM:-
  - → up to 2 Gbytes via SODIMM socket
  - → single channel memory
  - → peak bandwidth of up to 5.3 Gbytes/s
- accessible from processor or CompactPCI® bus

Optional Second Slot Boards

- second slot board, two options (see diagram)
- option 1 supports onboard:-
  - → PMC/XMC site or 2.5" SATA disk drive
  - → CompactFlash site
- option 2 supports onboard:-
  - → SATA disk drive (or external disk drive)
  - → CompactFlash® site, accessible via front panel (this site cannot be hot-swapped)

PMC/XMC Interface

- single PMC/XMC site available on an optional second slot board (option 1 in diagram):-
  - → 32-bit, 33/66 MHz PCI operation
  - → 3.3V and 5V PCI signaling levels
  - → XMC (Switched Mezzanine Card) interface supported via x4 PCI Express port
  - → I/O via front panel and 64 bits via J2 on optional second slot board

Hard Disk Interfaces

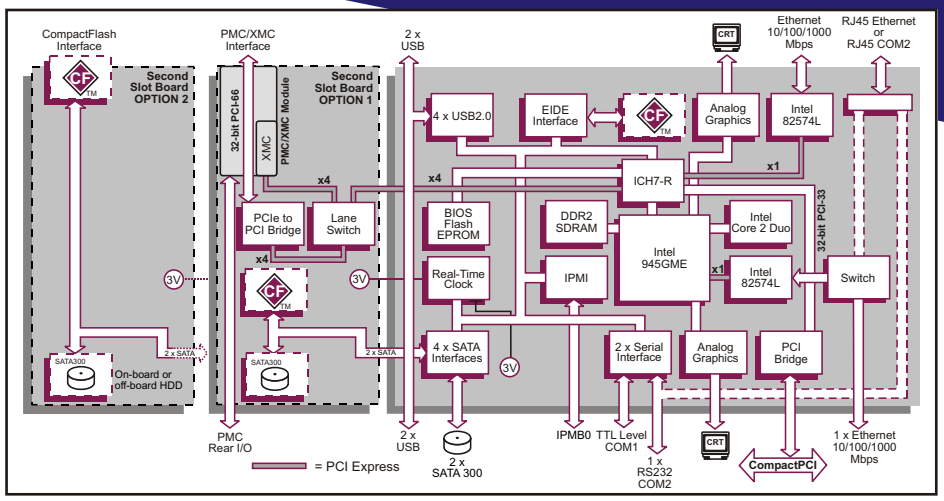
- 4 x SATA300 interfaces:-
  - → transfer rate up to 300 Mbytes/s
  - → 2 x channels accessible via J2
  - → 1 x channel routed to 2.5" SATA disk drive on both types of optional second slot board (uses PMC/XMC site on option 1)
  - → 1 x channel routed to a CompactFlash® site on both second slot board options
- 1 x EIDE interface:-
  - → supports an on-board CompactFlash site (type 1) on the single slot base board

Ethernet Interfaces

- 2 x Ethernet channels supporting:-
  - → 10 Base-T, 100 Base-TX, 1000 Base-T
  - → implemented by 2 x Intel® 82574L via two x1 PCI Express® ports
- first channel accessed via front panel RJ45
- second channel accessed via J2 and can be switched to an optional RJ45 on front panel
- wake on LAN on both channels

Graphics Interface

- implemented by the Intel® 945GME GMCH
- dual independent analog graphics outputs:-
  - → VGA1 resolutions up to 2048 x 1536 @ 16M colors accessed via a 15-way high density connector on front panel
  - → VGA2 resolutions up to 1600 x 1200 @ 16M colors accessed via J2



Serial Interfaces

- 2 x serial channels
- COM1 accessed via J2:-
  - → TTL level (shifted to RS-232/422/485 on the AD TP1/006 RTM)
  - → supporting RI, CTS, RTS, DSR, DTR and DCD
- COM2 accessed via J2 and via an optional RJ45 on the front panel :-
  - → RS-232 line level
  - → supporting CTS, RTS, DSR, DTR and DCD via J2 and front panel, RI also via J2
- 16550 compatible UARTs

Other Peripheral Interfaces

- power management signals via J2:-
  - → output: sleep status
  - → inputs: power button, +5V standby voltage
- PC Real Time Clock
- long duration timer; watchdog timer
- legacy speaker interface
- 4 x USB 2.0 interfaces:-
  - → 2 channels accessed via J2
  - → 2 channels accessed via front panel
- 3 x GPO signals via J2
- 5 x GPI signals via J2

CompactPCI Interface

- universal signaling support, compliant with PICMG® 2.0 R3.0; 3.3V or 5V signaling levels
- 33/66 MHz; 32-bit interface accessed via J1
- operates as a System Slot controller (supporting up to 7 peripheral slots) or operates in a Peripheral Slot
- PICMG 2.1 R2.0 Hot Swap Compliant
- option to disable CompactPCI interface (Satellite Mode):-
  - → receives power from CompactPCI bus
  - → board can be hot swapped

IPMI

- PICMG 2.9 R1.0 (System Management Specification):-
  - → implements the IPMB0 interface
- on-board Baseboard Management Controller
- monitors CPU temperature, voltages and fan
- supports 8 Kbytes of non-volatile memory

Software Support

- supports Linux®, Windows® XP, Windows® XP Embedded, Windows® Server 2003, QNX® and VxWorks®

SPI Flash EPROM

- 2 Mbytes of BIOS SPI Flash EEPROM

Firmware Support

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

Electrical Specification

- +5V @ 3.4A (typical 1.5 GHz, 2 Gbytes SDRAM)
- +3.3V @ 2.4A
- +12V and -12V not required
- all voltages are tolerant to +5% / -3%

Safety

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

Environmental Specification

- operating temperatures:-
  - → 0°C to +55°C (N-Series: 2.16 GHz, 1.5 GHz)
  - → -25°C to +70°C (E-Series: 1.5 GHz)
  - → -40°C to +85°C (K-Series: 1.5 GHz)
- 5% to 95% Relative Humidity, non condensing (operating):-
  - → K-Series includes humidity sealant
- -40°C to +85°C (storage)
- 5% to 95% Relative Humidity, non condensing (storage)

Mechanical Specification

- 3U form-factor: 3.9 inches x 6.3 inches (100mm x 160mm)
- single or dual slot
- connectors: IEC-1076-4-101 for J1-J2
- 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)

ORDERING INFORMATION

Order Number	Product Description (Hardware)
TP 462/341-xy	1.5 GHz Core 2 Duo processor L7400
TP 462/342-xy	2.16 GHz Core 2 Duo processor T7400
AD TP1/006-10	Rear Transition Module (RTM)
AD 110/002-z1	Hard disk interface where 'x' = 2
AD 110/003-z1	Hard disk interface where 'x' = 5

For z options please contact your local sales office

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

where x = width and rear I/O options	where y = SDRAM size, front panel comms
1 - 1-slot	2 - 1 Gbyte, 2 x Ethernet
2 - 2-slot, option 1	3 - 2 Gbytes, 2 x Ethernet
5 - 2-slot, option 2	5 - 1 Gbyte, 1 x Ethernet and 1 x RS-232
note: options 1 and 2 refer to the 2nd slot options in the block diagram	6 - 2 Gbytes, 1 x Ethernet and 1 x RS-232

For extended temperature, E-Series or K-Series, please contact your local sales office.

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