Intel® Atom™ Processor 3U Single Board Computer, Rugged Conduction-Cooled

RoHS
2002/95/EC

APPLICATIONS

The TP A41/30x-RC is a PC-compatible low power, high functionality, ruggedized 3U CompactPCI® board supporting the 1.6 GHz Intel® Atom™ processor Z530. It utilizes the Intel® System Controller Hub US15W to support up to 2 Gbytes of DDR2 SDRAM. This board features a variety of interfaces including two SATA300 channels, dual Gigabit Ethernet, RS232/422/485, USB, CANbus and HD audio. The TP A41/30x-RC is a ruggedized conduction-cooled board operating in temperatures ranging from -40°C to +85°C making it suitable for a range of applications within industrial control, transport, security, aerospace and defense applications. Commercial air-cooled versions are available and ruggedized air-cooled versions are planned. To simplify the board's integration many industry standard operating systems are supported.

HIGHLIGHTS

- Ruggedized 3U single board computer:
  - conduction-cooled to ANSI/VITA 30.1-2002
  - -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
  - Intel® Virtualization Technology
- Up to 2 Gbytes of soldered DDR2-533 SDRAM
- Single 3U CompactPCI slot
- 2 x 10/100/1000Mbps Ethernet interfaces
- 2 x SATA300 channels
- CompactFlash® site
- 2 x serial channel interfaces
- 3 x USB 2.0 interfaces
- High definition stereo audio
- Analog graphics interface
- High speed CANbus controller

- Watchdog and long duration timer
- 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)
- Ruggedized air-cooled version (RA-Series) planned:
  - -40°C to +75°C
  - conformally coated
  - see separate TP A41/30x-RA datasheet
- Non-ruggedized air-cooled versions available:
  - rear plug compatible with the ruggedized version
  - useful for bench development
  - use in commercial (non-rugged) applications
  - see separate TP A41/30x datasheet
- Support for Linux®, Windows® XP, Windows® XP Embedded, QNX® and VxWorks®

Ruggedized Single Board Computer
- conduction-cooled to ANSI/VITA 30.1-2002
- conformally coated
- ruggedized air-cooled version planned:-
  - → see TP A41/30x-RA datasheet
- non-ruggedized version also available:-
  - → see TP A41/30x datasheet

Central Processor
- 1.6 GHz Intel® Atom™ processor Z530:-
  - → 512 Kbytes of secondary (L2) on-die cache
  - → 533 MHz Front Side Bus
  - → Intel Hyper-Threading Technology supporting 2 execution threads
  - → Intel® Virtualization Technology
- uses Small Form Factor packaging (micro Flip-Chip Ball Grid Array) package
- utilizes Intel® System Controller Hub US15W

DRAM
- up to 2 Gbytes soldered DDR2-533 SDRAM
- accessible from processor or CompactPCI® bus

Mass Storage Interfaces
- 2 x SATA300 interfaces:-
  - → transfer rate up to 300 Mbytes/s
  - → accessible via J2
- 1 x EIDE interface:-
  - → supports an on-board CompactFlash® site (type 1)

Ethernet Interfaces
- 2 x channels supporting:-
  - → 10 Base-T, 100 Base-TX, 1000 Base-T
  - → implemented by Intel® 82546GB via PCI-X 66 bus
  - → both channels accessed via J2

Stereo Audio
- Intel® High Definition Audio interface via J2:-
  - → requires external Stereo Audio Codec

Flash EPROM
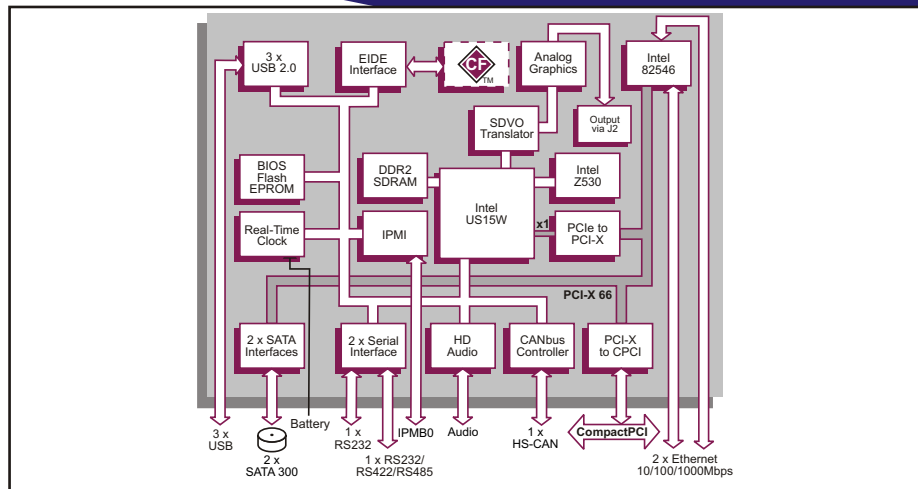- 1 Mbyte of BIOS Flash EPROM

Graphics Interface
- implemented by the Intel® US15W SCH
- analog VGA accessed via J2:-
  - → resolutions up to 1920 x 1080 @ 16M colors

Serial Interfaces
- 1 x RS232 serial channel accessed via J2:-
  - → supporting CTS, RTS, DSR, DTR, DCD and RI
- 1 x RS232/422/485 serial channel accessed via J2:-
  - → supporting RTS, DTR and CTS in RS232 mode
  - → supporting Transmit Control in RS485 mode
- 16550 compatible UARTs

Other Peripheral Interfaces
- PC Real Time Clock (Year 2000 compliant)
- long duration timer; watchdog timer
- legacy speaker interface
- 3 x USB 2.0 interfaces accessed via J2
- 2 x GPIO signals via J2
- High Speed CANbus controller:-
  - → up to 1 Mbps

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, QNX®, and VxWorks®

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

Electrical Specification
- typical current figures (1 Gbyte SDRAM)
- +5V@ 1.2A
- +3.3V@ 1.8A
- +12V@ 0.01 A
- -12V not required
- all voltages are tolerant to +5% / -3%

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

Environmental Specification
- operating temperatures (VITA 47 Class CC4):-
  - → -40°C to +85°C
- storage temperatures (VITA 47 Class C4)
  - → -55°C to +105°C
- 5% to 95% Relative Humidity, non condensing (operating and storage)
- altitude (operating):- -1,000 to 50,000 feet (-305 to 15,240 metres)
- ruggedized and commercial air-cooled versions, see separate datasheets:-
  - → rear plug compatible
  - → air-cooled: TP A41/30x-RA (planned)
  - → commercial: TP A41/30x (available)

Mechanical Specification
- 3U form-factor: 3.9 inches x 6.3 inches (100mm x 160mm)
- single slot
- connectors: IEC-1076-4-101 for J1-J2
- operating shock (VITA 47, conduction-cooled): 40g, 11ms, ½ sine
- operating random vibration (VITA 47 Class V3):- PSD increasing at +3dB/octave (5Hz to 100Hz) PSD = 0.1 g²/Hz (100Hz to 1kHz) PSD decreasing at -6dB/octave (1kHz to 2kHz)

(PSD = Power Spectral Density)

ORDERING INFORMATION

Order Number	Product Description (Hardware)	where y = SDRAM
TP A41/303-1yRC	1.6 GHz Atom processor Z530	3 - 1 Gbyte 4 - 2 Gbytes

For more information on the ruggedized air-cooled version see separate TP A41/30x-RA datasheet
or the commercial non-rugged version then see separate TP A41/30x datasheet, alternatively please contact your local sales office