

## Intel® Atom™ Processor Single Board Computer



### APPLICATIONS

The TR A40/30x is a PC-compatible low power 3U VPX processor 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. The TR A40/30x features an XMC site and a range of I/O interfaces including two SATA300 channels, dual Gigabit Ethernet, USB, CANbus, RS-232/422/485 and HD audio. The board provides a flexible PCI Express® (PCIe) backplane fabric interface that can be configured in several ways from 8 x1 PCIe ports to 2 x4 PCIe ports

### HIGHLIGHTS

- 3U VPX (VITA 46.0) N-Series single board computer:
  - rear plug compatible with the VPX-REDI RCx-Series
  - air-cooled
  - 0°C to +55°C operating temperature
  - use in commercial (non-rugged) applications
  - 3U VPX 0.8 inch slot
  - optional rear transition module available
- I/O interfaces compatible with several OpenVPX profiles
- 1.6 GHz Intel® Atom™ processor:
  - 512 Kbytes L2 cache
  - Intel® Hyper-Threading Technology
  - Intel® Virtualization Technology
- Up to 2 Gbytes of soldered DDR2-533 SDRAM
- Configurable PCI Express® (PCIe) fabric interface supports:
  - 8 x1 PCIe ports, 1 x4 and 4 x1 PCIe ports, or 2 x4 PCIe ports
  - compatible with OpenVPX module profiles
  - option for non-transparent link 1
- XMC module interface with front and rear I/O:
  - XMC module interface (x4 PCI Express®)
  - XMC rear I/O P2w7-X8d+X12d
- 2 x 10/100/1000Mbps Ethernet interfaces or 2 x 1000Mbps IEEE802.3z SERDES (1000 Base-BX) ports
- 2 x SATA300, 2 x RS-232/422/485, 2 x USB 2.0 interfaces
- Intel® High Definition Audio interface
- DVI-D graphics interface
- High speed CANbus controller interface
- Watchdog and long duration timers
- Optional Built-In Test (BIT) supports:
  - Power-on BIT, Initiated BIT, Continuous BIT
- Ruggedized conduction-cooled versions (RCx-Series):
  - conduction-cooled to VITA 48.2
  - -40°C to +85°C operating temperature (at card edge)
  - conformally coated
- Compatible with the FR 331/306 VPX Switch
- Support for Linux®, Windows® 7, Windows® Embedded Standard 7, Windows® XP, Windows® XP Embedded, QNX® and VxWorks®

making it suitable for use in both distributed systems and centralized switching systems as defined in OpenVPX (VITA 65). For rugged applications two VPX-REDI conduction-cooled versions are available, the TR A40/30x-RCS is VPX-REDI Type 1 Two-Level Maintenance and the TR A40/30x-RCT is VPX-REDI Type 2. The board is suitable for a range of applications within industrial control, transport, security, aerospace and defense applications. To simplify integration many standard operating systems are supported.

## VPX Single Board Computer

- 3U VPX SBC (N-Series) utilizing Intel® Atom™ processor:-
  - air-cooled
- compatible with several OpenVPX (VITA 65) module profiles
- for ruggedized VPX-REDI (RCx-Series) version:-
  - conduction-cooled to VITA 48.2
  - -40°C to +85°C at card edge
  - conformally coated
  - see TR A40/30x-RCx 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

## SDRAM

- up to 2 Gbytes soldered DDR2-533 SDRAM
- accessible from processor or VPX fabric

## XMC Interface

- 1 x XMC site, in a single VPX slot (VITA 42.0):-
  - XMC (Switched Mezzanine Card) interface supported via a x4 PCI Express (VITA 42.3)
  - rear I/O P2w7-X8d+X12d (VITA 46.9)
  - +5V powered

## Mass Storage Interfaces

- 2 x SATA300 interfaces:-
  - transfer rate up to 300 Mbytes/s
  - accessible via P1
- option for on-board 4 Gbytes EIDE NAND Flash Disk Module

## Ethernet Interfaces

- 2 x channels supporting via P1:-
  - 10 Base-T, 100 Base-TX, 1000 Base-T
  - implemented by Intel® 82576
- or optionally supported as dual 1000Mbps IEEE802.3z SERDES (1000 Base-BX) ports

## Stereo Audio

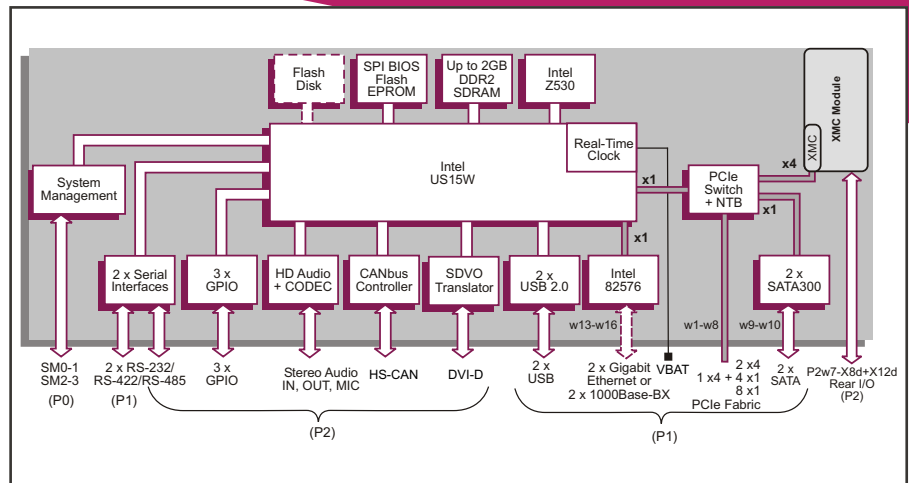
- Intel® High Definition Audio interface via P2:-
  - includes Stereo Audio Codec
  - stereo input
  - stereo output
  - microphone input

## Graphics Interface

- implemented by the Intel® US15W SCH
- DVI-D accessed via P2:-
  - resolutions up to 1600 x 1200 @ 16M colors

## Serial Interfaces

- 1 x RS232/422/485 channel accessed via P2:-
  - supporting CTS, RTS, DSR, DTR, DCD and RI
- 1 x RS-232/422/485 channel accessed via P1:-
  - supporting RTS and CTS in RS232 mode
- both support Transmit Control in RS485 mode
- 16550 compatible UARTs



## VPX Backplane Interface

- P0, P1 and P2 support OpenVPX configuration
- configurable PCI Express® (PCIe) fabric interface supports:-
  - 8 x1 PCIe ports, 1 x4 and 4 x1 PCIe ports, or 2 x4 PCIe ports
  - compatible with OpenVPX module profiles
  - PCI Express Gen 1 and Gen 2
- optional non-transparent link 1 to support multi-processing configuration
- 4 channel DMA engine for fast data block moves

## Optional VPX Switch Support

- SBC compatible with the FR 331/306 VPX Switch

## Other Peripheral Interfaces

- PC Real Time Clock
- long duration timer; watchdog timer
- CPU temperature monitor; voltages monitor; accessed via System Management interface
- 2 x USB 2.0 interfaces accessed via P1
- 3 x GPIO signals via P2
- High Speed CANbus controller via P2

## Software Support

- supports Linux®, Windows® 7, Windows® XP, Windows® Embedded Standard 7, Windows® XP Embedded, QNX®, and VxWorks®

## Optional 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

## Flash EPROM

- 2 Mbytes of BIOS Flash EPROM

## System Management

- System Management interface:-
  - implements SMO-1 and SM2-3 hardware
- on-board System Management Controller
- supports 8 Kbytes of non-volatile memory

## Electrical Specification

- typical current figures (1 Gbyte SDRAM)
- +5V@ 1.2A, voltage +5% / -2.5%
- +3.3V@ 1.8A, voltage +5% / -2%
- +12V AUX and -12V AUX routed to the XMC site

## Safety

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

## Environmental Specification

- operating temperature:-
  - VITA 47 Class AC1, 0°C to +55°C
  - air-cooled
- storage temperature:-
  - VITA 47 Class C1, -40°C to +85°C
- operating altitude:-
  - 0 to 15,000 feet (0 to 4,572 meters)
- 5% to 95% Relative Humidity, non condensing (operating/storage)

## Mechanical Specification

- 3U VPX form-factor (VITA 46.0, VITA 48.0):
- 3.9 inches x 6.3 inches (100mm x 160mm)
- slot width (VITA 46.0):-
  - 0.8 inches VPX N-Series
- connectors to VITA 46.0 for P0, P1 and P2
- operating mechanical:-
  - shock - VITA 47 Class OS1, 20g
  - random vibration - 0.002g<sup>2</sup>/Hz

## ORDERING INFORMATION

Order Number Product Description (Hardware)

For the order number suffix (xy) options please contact your local sales office:  
where x = P1 I/O where y = SDRAM size

TR A40/303-xy 1.6 GHz Atom processor Z530, 3U VPX, N-Series

x - Ethernet or 1000Base-BX via P1

y - up to 2 Gbytes SDRAM

For accessories please contact your local sales office.

For further information on the VPX (N-Series) and VPX-REDI (RCx-Series) boards please contact your local sales office.