Ruggd Conduction-Cooled 3U CompactPCI® board based on 4th Generation Intel® Core™ Processor

Key Features
TP B1x/3sd-RC is designed to be used in challenging environments for defense, transportation and aerospace applications.

- Dual-core processor variants available
- Up to 16 Gbytes DRAM with built in error correction for reliable operation
- XMC site
- Built in I/O interfaces including SATA, USB, Ethernet, graphics, GPIO and serial
- On board solid state disk option for reliable boot image and data storage
- Off the shelf board support packages available for Linux®, Windows® and VxWorks®
- Optional software packages for Built-In-Test and security
- Plug compatible with the popular TP 702/38x-RC family

TPM
Board Logic
1 x RS232/ RS422/RS485
1 x RS232
4 x GPIO
SPI BIOS Flash
DDR3L ECC DRAM
4th Generation Intel Core CPU
4th Generation Intel Core CPU
x2 Gen 2
x4
SATA
USB2.0
Ethernet
VGA
PCIe Switch + DMA
PCIe to PCI Bridge
x8 or 2 x4 Gen 2
2 x SATA 300
2 x Ethernet 10/100/1000Mbps
Inte! QM87 PCH
XMC Module
x2 Gen 2
9 x I/O
Build Option
Compact PCI 32 bit 66 MHz
XMC Rear I/O or VGA or Not Connected
RS232/ RS422/RS485
1 x RS232
4 x GPIO
IPMB0
Speaker
Battery
1 x XMC Module
4th
Generation
Intel Core
CPU
RS232/1 x RS422/RS485
Rugged CompactPCI SBC
- utilizing 4th generation Intel® Core™ processor:
  - conduction-cooled to ANSI/VITA 30.1-2002
  - conformally coated

Central Processor
- 4th generation Intel® Core™ CPU:
  - 2-core Intel® Core™ i5-4422E CPU
  - 1.8 GHz, 3M Last Level cache
- Intel® Advanced Vector Extensions 2 (AVX2)
- Intel® AES New Instructions (AES-NI)
- utilizes the Intel® QM87 Platform Controller Hub

DRAM
- up to 16 Gbytes soldered DDR3L-1600 ECC DRAM:
  - single bit error correction
  - peak bandwidth of 25.6 Gbytes/s
  - dual channel architecture
- accessible from processor or CompactPCI® bus

XMC Interface
- XMC (Switched Mezzanine Card) site:
  - 1 x 8 or 2 x PCIe Express® (Gen 1, Gen 2)
  - build option for 9x XMC I/O signals via J2 (disables the option for VGA graphics)

Mass Storage Interfaces
- 2 x SATA300 interfaces accessible via J2
- 1 x optional SATA300/600 Flash Drive Module:
  - write protect signal from backplane available (dependent on Flash Module selected)

Ethernet Interfaces
- 2 x Ethernet interfaces via J2 supporting:
  - 10BASE-T, 100BASE-TX, 1000BASE-T
  - implemented by an Intel® I350-AM2 Ethernet controller via a 1 x 2 PCIe Express® port

Graphics Interface
- build option for VGA graphics interface via J2:
  - resolutions up to 1920 x 1200
  - disables the option for XMC rear I/O
- support for Microsoft® DirectX 11.1 on Windows® and OpenGL 3.0 on Linux®
- implemented by the Intel® HD Graphics 4600

Serial Interfaces
- 2 serial interfaces accessible via J2
- 1 x RS232 interface supporting Tx and Rx
- 1 x RS232 interface supporting Tx, Rx, RI, CTS, RTS, DSR, DTR and DCD or 1 x RS422/RS485 supporting Tx and Rx
- 16550 compatible UARTs

Other Peripheral Interfaces
- PC-compatible Real Time Clock
- watchdog timer: 32-bit Long Duration Timer with processor interrupt ability; chipset timer
- legacy speaker interface via J2
- 2 x USB 2.0 interfaces via J2
- 4 x GPIO signals via J2
- external battery supply for the RTC
- CPU temperature monitor; board temperature monitor; voltages monitor:
  - all accessible via IPMI

IPMI
- PICMG 2.9 R1.0 (System Management Spec.):
  - implements the IPMB0 interface
- on-board Baseboard Management Controller
- supports 8 Kbytes of non-volatile memory

CompactPCI Interface
- universal signaling support, compliant with PICMG® 2.0 R3.0; 3.3V or 5V signaling levels
- 33/66 MHz; 32-bit interface via J1
- PCI Express link from processor via PCIe-PCI bridge for off-board accesses:
  - DMA hardware support included
  - operates as a System Slot controller (supporting up to 7 peripheral slots) or operates in a Peripheral Slot:
    - supports hot-swapping peripheral boards
    - PICMG 2.1 R2.0 Hot Swap Specification
  - user option to disable CompactPCI interface (Satellite Mode):
    - receives power from CompactPCI bus
    - board can be hot swapped

Flash EPROM
- 8 Mbytes of BIOS Flash EPROM, dual devices:
  - main/backup device enabled via switch

Software Support
- support for Linux®, Windows® and VxWorks®

Firmware Support
- Insyde® Software InsydeH20™ BIOS:
  - includes Compatibility Support Module
- optional Fast Boot solution using the Intel® Firmware Support Package (FSP)
  - based upon Intel® Platform Innovation Framework for EFI
- LAN boot firmware included

Optional Built-In Test (BIT) Support
- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

Optional Board Security Features
- Trusted Platform Module (TPM):
  - build option for either TPM 1.2 or TPM 2.0
- option for Sanitization Utility Software Package
- proprietary board-level security features

Safety
- PCB (PWB) manufactured with flammability rating of UL94V-0

Electrical Specification
- typical current consumption (2-core processor with 8 Gbytes DRAM):
  - +5V @ 3.5A
  - +3.3V @ 2.2A
  - voltages +5%/−3%
- XMC site +5V VPWR only
- build option for +12V and -12V power rails to the XMC site:
  - +12V @ 0.5A max.
  - -12V @ -0.2A max.
  - voltages +5%/−5%
  - hot-swap is not supported with this build option

Environmental Specification
- operating temperature (at card edge):
  - VITA 47 Class CC4, -40°C to +85°C
  - conduction-cooled (VITA 48.2)
- non-operating temperature:
  - VITA 47 Class C4, -55°C to +105°C
- operating altitude:
  - -1,000 to 50,000 feet (-305 to 15,240 meters)
- 5% to 95% Relative Humidity, non condensing (operating/non-operating)
- commercial versions, see separate datasheet:
  - air-cooled: TP B1x/mss
  - rear plug compatible
  - XMC module site is not supported

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 mechanical:
  - shock - VITA 47 Class OS2, 40g
  - random vibration - VITA 47 Class V3, 0.1g²/Hz

Legacy SBC Compatibility
- compatible with the popular TP 702/38x/RC

Please contact your local Concurrent Technologies sales office for further details on board build options and accessories.