VPX-REDI
(OpenVPX)

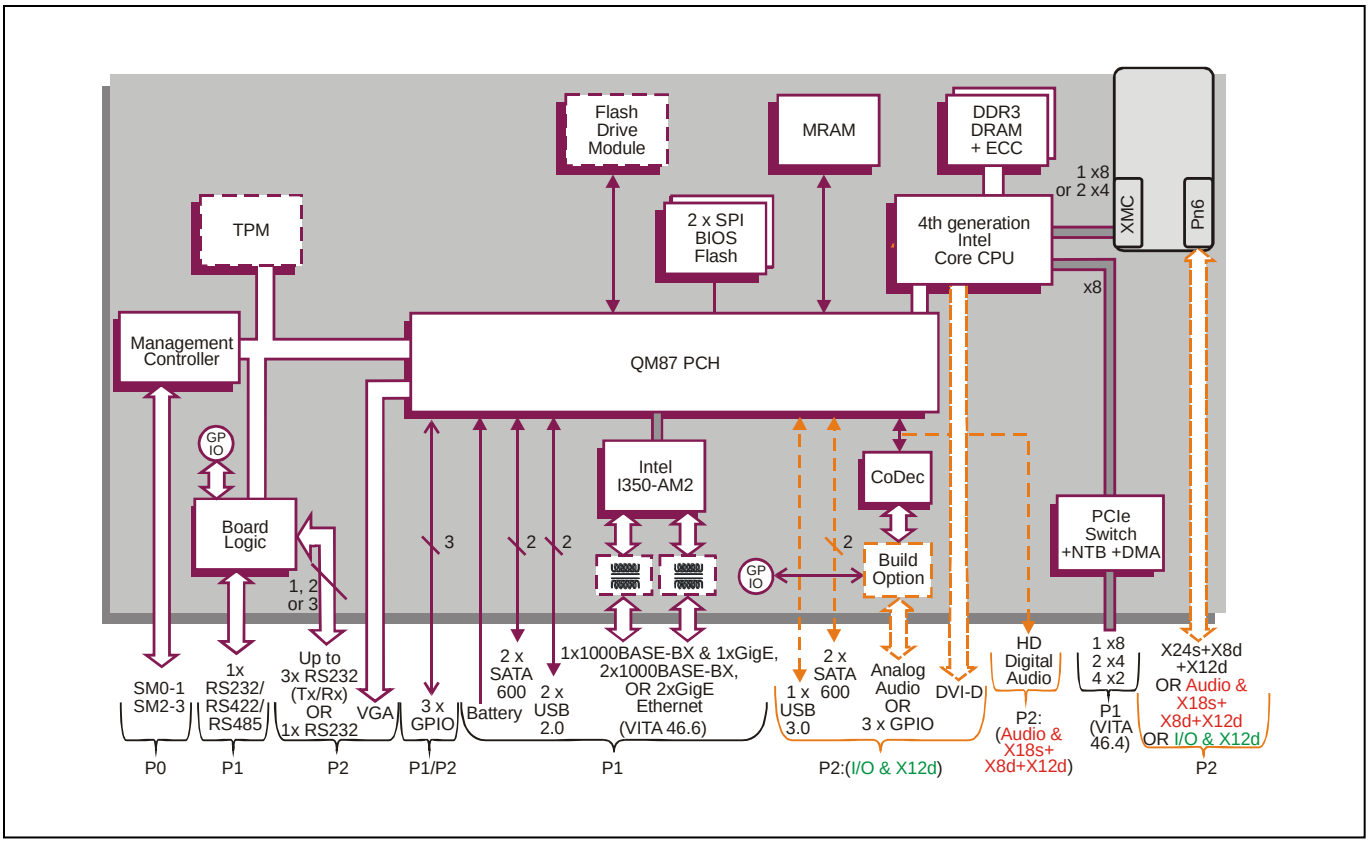
TR B1x/3sd-RCx
RCS, RCT - Series

Rugged conduction-cooled 3U VPX™ board based on 4th Generation Intel® Core™ processor

Key Features

TR B1x/msd-RCx is a ruggedized 3U VPX processor board based on a 4-core 4th Generation Intel® Core™ device for use across a range of military, aerospace, transport and test applications.

- 3U VPX Form Factor
- Processor and memory options to suit both high performance and low power applications
- XMC site for application specific I/O
- Ethernet control plane and PCI Express® data plane
- Designed for deployment in challenging environments
- Built-In-Test and enhanced security package available as options
- Long life-cycle support



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Specification

VPX-REDI Embedded Computer Board

- conduction-cooled 3U VPX-REDI™ computing board utilizing the 4th generation Intel® Core™ processor
- compatible with several OpenVPX module profiles:
  - → MOD3-PAY-2F2U-16.2.3-2
  - → MOD3-PAY-2F2U-16.2.3-3
  - → MOD3-PAY-2F2T-16.2.5-2
  - → MOD3-PAY-2F2T-16.2.5-3
  - → MOD3-PAY-1D-16.2.6-1
  - → MOD3-PAY-1D-16.2.6-2
  - → MOD3-PAY-2F-16.2.7-1
  - → MOD3-PAY-2F-16.2.7-2

Central Processor

- 4th generation Intel® Core™ processor:
  - → 4-core 2.4 GHz Intel® Core™ i7-4700EQ CPU
  - → 4-core 1.7 GHz Intel® Core™ i7-4700EQ CPU
  - → Intel® Advanced Vector Extensions 2 (AVX2)
  - → Intel® AES New Instructions (AES-NI)
- utilizes the Intel® QM87 Chipset

DRAM

- up to 16 Gbytes soldered DDR3L-1600 ECC DRAM:
  - → single bit error correction
  - → dual channel architecture
  - → accessible from processor or VPX fabric

VPX Control Plane Ethernet Interfaces

- configurable control plane fabric (VITA 46.6)
- P1 factory build option for 2 x 1000 Mbps IEEE802.3z SerDes (1000BASE-BX) ports:
  - → with software switchable option for 1 x 10/100/1000 Mbps Ethernet port (with magnetics) plus 1 x SerDes port
- alternative factory build options for 2 x 10/100/1000 Mbps Ethernet ports:
  - → one port with and one port without magnetics or
  - → both ports with magnetics
- implemented by Intel® Ethernet Controller I350-AM2 via x2 PCI Express® (PCIe®) Gen 2 port

VPX Data Plane PCI Express Interface

- P0, P1 and P2 support OpenVPX configuration
- configurable PCIe fabric interface (VITA 46.4) supports:
  - → 2 x4 PCIe, 4 x2 PCIe ports, or a 1 x8 PCIe port
  - → support for Gen 1, Gen 2 and Gen 3
  - → compatible with OpenVPX module profiles
- supports a Non-Transparent Bridge (NTB) port for multi-processing configurations
- 4 channel DMA engine for fast data block moves
- PCIe ports can be configured by the VPX switch configuration tool
- supported by Fabric Interconnect Networking software (FIN-S), see separate datasheet
- support for PCIe backplane common clock options via REFCLK (VITA 65-R2012)

XMC Interface

- 1 x XMC site, in a single VPX slot (VITA 42.0):
  - → build options for P2 rear I/O
  - → 1 x8 or 2 x4 PCI Express® Gen 2 (VITA 42.3) XMC (Switched Mezzanine Card) interface
  - → +5V or +12V VPWR (build option)

XMC P2 I/O, with Additional I/O Options

- P2 factory build options, option 1 (full rear XMC I/O) or option 2, 3 or 4 (extra I/O and partial XMC I/O)
- P2 option 1 supports the following interface:
  - → full rear XMC I/O providing X24s+X8d+X12d
- P2 option 2 supports the following interfaces:
  - → partial rear XMC I/O providing X18s+X8d+X12d
  - → Intel® High Definition Audio, digital interface
- P2 option 3 supports the following extra interfaces:
  - → partial rear XMC I/O providing X12d
  - → RS232 full modem or up to 3 x RS232 (Tx/Rx)
  - → 1 x USB3.0 port
  - → 2 x SATA600 interfaces
  - → 1 x DVI-D interface (up to 1920 x 1200 @ 60Hz)
  - → Intel High Definition Audio, analog interface
- P2 option 4 supports the following interfaces:
  - → same as option 3 except three additional GPIO signals are provided instead of the analog audio

Graphics Interfaces

- 2 x independent graphics interfaces supported:
  - → DVI-D interface via P2 (P2 option 3 or 4)
  - → analog VGA via P2 (up to 1920 x 1200 @ 60Hz)
- support for Microsoft® DirectX 11
- support for OpenGL 2.0 under Windows® and Linux

Stereo Audio

- two build options using XMC I/O pins
- Intel High Definition Digital Audio (P2 option 2):
  - → requires a suitable CoDec fitted to the system backplane or the RTM
- alternatively, Intel High Definition Analog Audio with on-board CoDec (P2 option 3):
  - → line level stereo input and line level stereo output
  - → or microphone input and headphone output

Serial Ports

- 1 x RS232 (full) or 3 x RS232 (Tx/Rx) ports via P2 (P2 option 3 or 4):
  - → the RS232 port's type/routing is user selectable
- 1 x RS232/422/485 port accessed via P1:
  - → supporting Tx/Rx CTS/RTS in RS232 only
- 16550 compatible UARTs

Other Peripheral Interfaces

- PC RTC; long duration timer; watchdog timer
- CPU temperature monitor and voltages monitor accessed via System Management interface
- up to 3 x USB ports:
  - → 2 x USB2.0 ports via P1
  - → 1 x USB 3.0 port via P2 (P2 option 3 or 4)
- up to 6 x GPIO signals:
  - → 3 x GPIO signals via P1 and P2
  - → 3 x GPIO signals via P2 (P2 option 4)

Mass Storage Interfaces

- up to 5 x SATA600 interfaces:
  - → 2 x SATA interfaces via P1
  - → 2 x SATA interfaces via P2 (P2 option 3 or 4)
  - → optional onboard SATA Flash Drive Module

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

Optional Built-In Test (BIT) Support

- Power-on BIT (PBIT), Initiated BIT (IBIT), Continuous BIT (CBIT)

Software Support

- supports Linux®, Windows®, VxWorks® and QNX®

Firmware Support

- Insyde Software InsydeH20™ BIOS:
  - → includes Compatibility Support Module
  - → Intel® Platform Innovation Framework for EFI
- comprehensive Power-On Self-Test (POST)
- LAN boot firmware included

System Management

- IPMI via SM0-1 and SM2-3
- Baseboard Management Controller (BMC)

Non-Volatile Memory

- 8 Mbytes of BIOS Flash EPROM, dual devices
- 128 Kbytes MagnetoResistive RAM (MRAM)

Safety

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

Electrical Specification

- typical current consumption (4-core 2.4 GHz processor with 8 Gbytes DRAM):
  - → +5V @ 6.0A
  - → +3.3V @ 2.2A; +3.3V AUX @ 0.4A
- +12V AUX and -12V AUX routed to XMC site

Environmental Specification

- conduction-cooled (VITA 48.2)
- operating temperature at card edge (4-core 1.7 GHz processor):
  - → VITA 47 Class CC4, -40°C to +85°C
- operating temperature at card edge (4-core 2.4 GHz processor):
  - → VITA 47 Class CC3, -40°C to +70°C
- 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
- option for VPX commercial air-cooled version:
  - → see TR B1x/msd datasheet

Mechanical Specification

- 3U VPX form-factor (VITA 46.0, VITA 48.0): 3.9 inches x 6.3 inches (100mm x 160mm)
- slot widths (VITA 48.0):
  - → 0.8 inches VPX-REDI Type 2, RCT-Series
  - → 0.85 inches VPX-REDI Type 1, RCS-Series, Type 1 Two Level Maintenance (VITA 48.2)
- connectors to VITA 46.0 for P0, P1 and P2
- captive screws available to secure front handles
- operating mechanical:
  - → shock - VITA 47 Class OS2, 40g
  - → random vibration - VITA 47 Class V3, 0.1g²/Hz

Optional VPX-REDI Fabric Switch

- board compatible with FR 331/x06-RCx or FR 341/x06-RCx VPX-REDI Switch

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

Datasheet Code 1715/0318