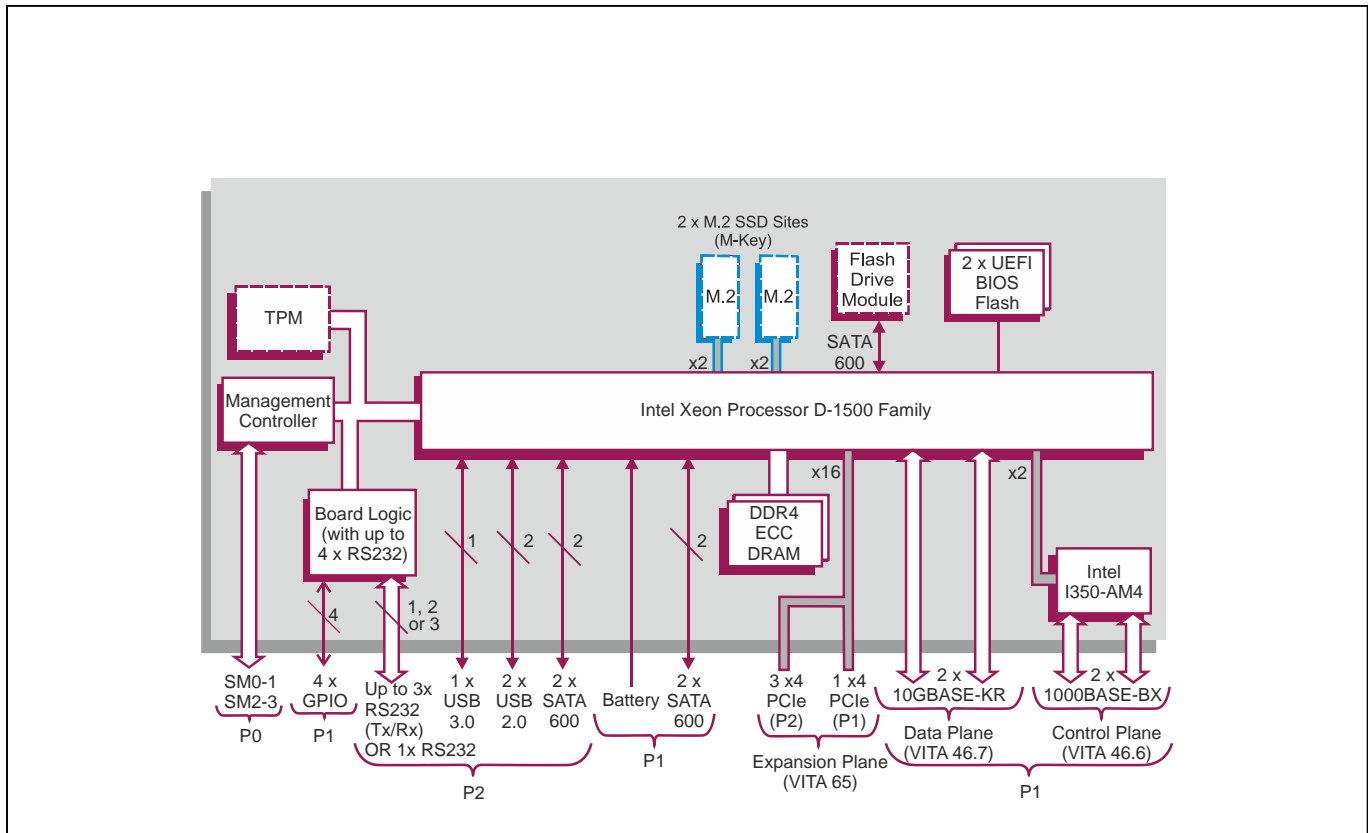


## Rugged conduction-cooled 3U VPX™ board based on Intel® Xeon® Processor D-1500 Family

### Key Features

TR G4x/3sd-RCx provides server grade performance with virtualization support and excellent storage connectivity for high performance embedded computer applications. It is designed to be suitable for rugged and extended temperature operating environments.

- Intel® Xeon® processor D-1500 Family:
  - 8-core processing or 12-core processing
- Up to 64 Gbytes of DDR4 DRAM
- Direct attached storage options including:
  - Flash Drive Module
  - up to two M.2 modules
- 10 Gigabit and Gigabit Ethernet connectivity
- PCI Express® connections for point to point expansion
- Long life-cycle support



## VPX-REDI Embedded Computer Board

- conduction-cooled 3U VPX-REDI™ computing board utilizing the Intel® Xeon® processor D-1500 family
- OpenVPX™ profiles supporting 10GBASE-KR on Data Plane:
  - MOD3-PAY-2F4F2U-16.2.10-8
  - MOD3-PAY-2F1F2U-16.2.1-8

## Central Processor

- 8-core Intel® Xeon® processor D-1539:
  - 12 Mbytes Cache, 1.6 GHz
- 12-core Intel® Xeon® processor D-1559:
  - 18 Mbytes Cache, 1.5 GHz
- Intel® Advanced Vector Extensions 2
- Intel® AES New Instructions
- server class processing cores in a System-on-a-Chip package

## DRAM

- up to 64 Gbytes soldered DDR4 ECC DRAM:
  - single bit error correction and dual bit error detection
  - peak bandwidth of up to 29 Gbytes/s
  - dual channel architecture
- accessible from processor or VPX Expansion Plane

## Serial Ports

- up to three user selectable RS232 serial ports
- the first RS232 port via P2 supports either:
  - Tx/Rx CTS/RTS, DTR/DSR
  - or Tx/Rx
- when enabled, the second and third RS232 (Tx/Rx) port are switched to the P2 connector (losing the first port modem signals). 16550 compatible UARTs

## Other Peripheral Interfaces

- PC RTC, long duration timer, watchdog timer
- up to three USB ports:
  - 2 x USB 2.0 ports via P2
  - 1 x USB 3.0 port via P2
- 4 x GPIO signals via P1

## Mass Storage Interfaces

- 5 x SATA600 interfaces:
  - 2 x SATA via P1
  - 2 x SATA via P2
  - 1 x SATA routed to an optional on-board Flash Drive Module for operating system and application storage
- option for 2 x M.2 SSD sites on-board supporting:
  - 2242 and 2260 format modules
  - x2 PCIe interface (M-key)
  - NVM Express® (NVMe™) logical device interface
  - RAID 0, 1, 5 and 10 modes

## Graphics Interface

- an on-board graphics interface is not provided
- if graphics interface required, use an Expansion Plane PCI Express port via backplane to a graphics processor module

## VPX Control Plane, One Gigabit Ethernet

- VPX Control Plane supports 2 x 1000 Mbps IEEE802.3z SerDes (1000BASE-BX) ports (VITA 46.6):
  - supports IEEE 1588 "Deterministic Network Timing" (contact sales office for supported operating systems)

## VPX Data Plane, Ten Gigabit Ethernet

- VPX Data Plane interface provided by 2 x 10 Gigabit Ethernet interfaces (VITA 46.7):
  - supports 10GBASE-KR

## VPX Expansion Plane, PCI Express

- configurable PCI Express® (PCIe®) VPX Expansion Plane interface (VITA 65) supports:
  - 1 x4 PCIe port via P1 connector
  - 3 x4 PCIe ports via P2 connector
  - the 16 lanes can be configured as 4 x4 ports, 2 x8 ports or 1 x16 port
  - compatible with OpenVPX module profiles
- PCIe interface supports Gen 1, Gen 2 and Gen 3
- supports a Non-Transparent Bridge (NTB) port for multi-processing configurations
- 4 channel DMA engine for fast data block moves
- ports can be configured by the VPX Switch Configuration Tool, see separate datasheet

## System Management

- IPMI via SM0-1 and SM2-3:
  - CPU temperature and voltage monitor accessed via System Management interface
- Baseboard Management Controller (BMC)

## Board Security Features

- option for Trusted Platform Module (TPM 2.0)
- option for Sanitization Utility Software Package
- option for proprietary board-level security features

## Optional Built-In Test (BIT) Support

- Power-on BIT, Initiated BIT, Continuous BIT

## Software Support

- supports Linux® and Windows®

## Firmware Support

- UEFI boot firmware (BIOS):
  - UEFI 2.4 support
  - EDK II support
  - includes Compatibility Support Module
  - implements Secure Boot
- implements Intel® Boot Guard
- LAN boot firmware included

## Non-Volatile Memory

- 16 Mbytes of BIOS Flash EEPROM, dual devices

## Safety

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

## Electrical Specification

- typical current consumption for 8-core processor (1.6 GHz) with 64 Gbytes DRAM:
  - +5V @ 5.5A
  - +3.3V @ 1.1A; +3.3V AUX @ 0.3A

## Environmental Specification

- conduction-cooled (VITA 48.2)
- operating temperature at card edge:
  - VITA 47 Class CC4, -40°C to +85°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 non-rugged air-cooled version:
  - see TR G4x/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, 0.1g<sup>2</sup>/Hz