VPX
(OpenVPX)

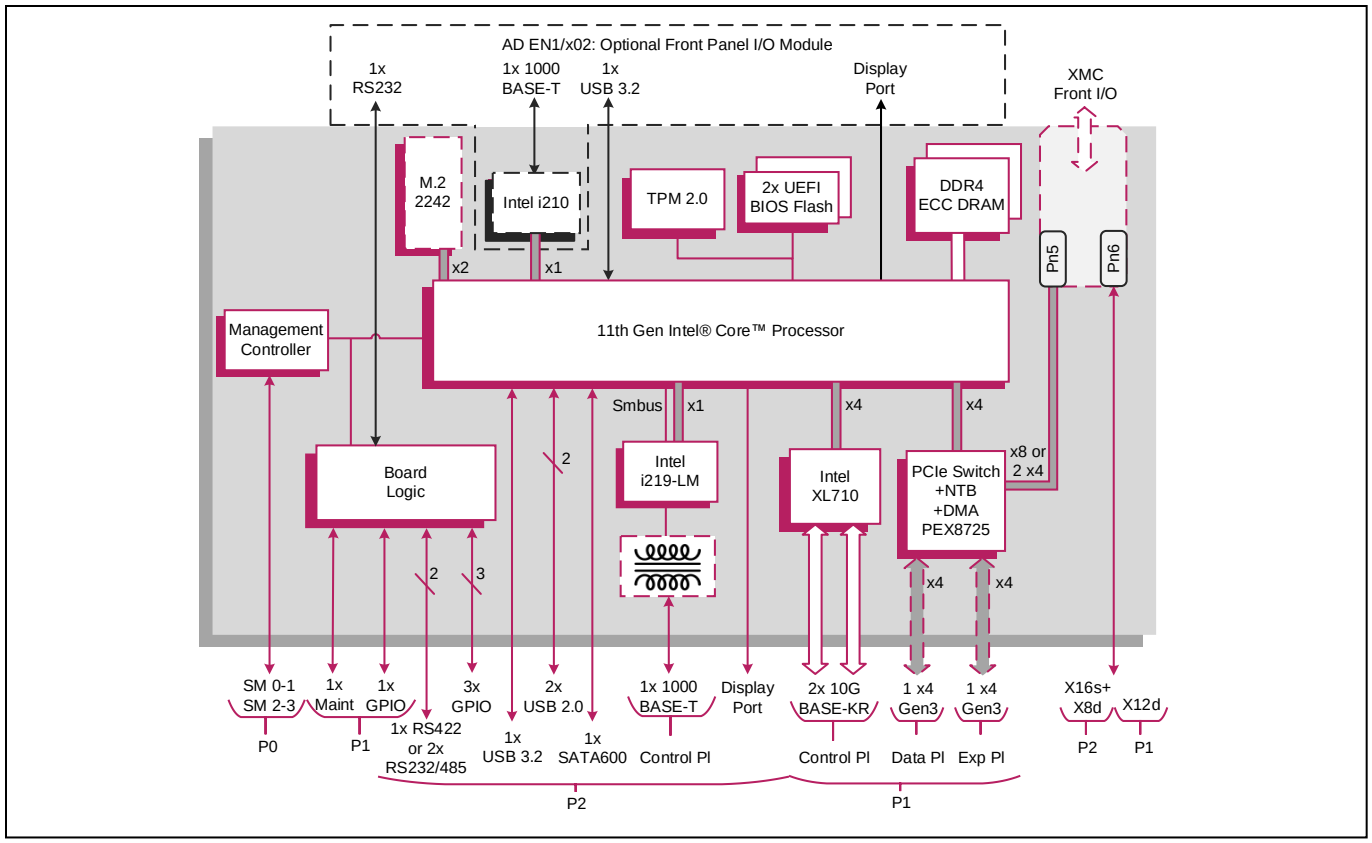
TR K9x/6sd
N - Series

3U VPX™ Plug In Card (PIC) based on 11th Gen Intel® Core™ Processor

Key Features

TR K9x/6sd is a 3U VPX™ Plug In Card based on the 11th Gen Intel® Core™ Processor and is designed in alignment with the SOSA™ Technical Standard for I/O intensive processor PICs.

- 4-core (28W) 11th Gen Intel® Core™ Processor
- PCI Express data and expansion planes for direct connection to accelerator boards
- XMC site for additional compute or I/O resources
- Optional front panel I/O module on air-cooled variants
- Direct-attached solid-state storage option
- Air-cooled and rugged conduction-cooled variants



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Specification

VPX Processor Plug In Card
- air-cooled 3U VPX™ Plug In Card utilizing processors based on 11th Gen Intel® Core™ Processor
- optional Rear Transition Module (RTM) available: AD TR1/612-10
- compliant with VITA65.1 module and slot profiles:
  - → SLT3-PAY-1F1F2U1TU1T1U1T-14.2.16
  - → MOD3-PAY-1F1F2U1TU1T1U1T-16.2.15-2
- rugged conduction-cooled variants available

Central Processor
- 4-core 2.8 GHz (4.4 GHz) (28 W) Intel® Core™ i7-1185GRE Processor
- 2-core 3.0 GHz (3.9 GHz) (28 W) Intel® Core™ i3-1115GRE Processor
- Intel® UHD Graphics
- range of performance/power factory build options

DRAM
- 16 Gbytes soldered DDR4 IBECC DRAM:
  - → in-band ECC
  - → single bit error correction
  - → dual channel architecture
- accessible from processor or VPX fabric

Optional XMC Site
- 1 x XMC site, in a single VPX slot (VITA 42.0):
  - → front I/O aperture, options for P1 and P2 rear I/O
  - → XMC rear I/O, providing X12d+x16s+X8d
  - → 1 x8 or 2 x4 PCI Express® (PCIe®)
  - → PCIe Gen 1, Gen 2 and Gen 3
- XMC connector type (build option):
  - → up to Gen 2, VITA 42 XMC (black color)
  - → up to Gen 3, VITA 61 XMC 2.0 (white color)
- XMC VPWR +12V
- VITA 46.9 XMC I/O pin-out

Optional Front I/O Module
- the optional Front I/O Module supports:
  - → 10/100/1000 Mbps Ethernet port via RJ45, implemented by Intel® Ethernet Controller i210
  - → 1 x USB 3.2 Gen 1 @ 5 Gbps/2.0 port via Type A USB
  - → 1 x maintenance port via an RJ45
  - → 1 x DisplayPort v1.2 with audio interface
- module is only available for use with TR K9x/6sd air-cooled PICs (N-Series)

Serial Ports
- 2x RS232 or 1x RS422 full duplex or 2x RS485 half-duplex ports accessed via P2
- 1 x RS232 port accessed via front panel when fitted with Optional Front I/O module
- 1 x maintenance port accessed via P1
- Maintenance port on P1 supports RS232 or LVCMOS levels
- 16550 compatible UARTs

Graphics/Audio Interfaces
- up to 2 x independent graphics/audio interfaces:
  - → DisplayPort v1.2 interface, supporting audio and video, via P2
  - → DisplayPort v1.2 interface via front panel when fitted with Optional Front I/O module
  - → up to 3840 x 2160 @ 60Hz, driver dependent
- support for Microsoft® DirectX 12
- support for OpenGL 4.x under Windows® and Linux® and support for OpenCL 2.0

Other Peripheral Interfaces
- PC RTC, long duration timer, watchdog timer
- 1 x USB 3.2 Gen 1 @ 5 Gbps port via front panel when fitted with Optional Front I/O module
- 2 x USB 2.0 and 1 x USB 3.2 Gen 1 @ 5 Gbps ports via P2
- 3 x GPIO signals via P2
- 1 x GPIO signal via P1

Mass Storage Interfaces
- 1 x SATA600 via P2
- 1 x M.2 SSD site supports:
  - → 2230 or 2242 format module
  - → x2 PCIe interface (M-key)
  - → Opal security encryption
  - → Write Protect
  - → NVM Express® (NVMe™) logical device interface

VPX Control Plane, Ethernet
- up to 2 x 10 Gigabit Ethernet ports via P1 (VITA 46.7):
  - → supports 2 x 10GBASE-KR
  - → implemented by Intel® Ethernet Controller XL710 via x4 PCIe
- 1 x 10/100/1000BASE-T Ethernet port via P2:
  - → option for with or without magnetics
  - → implemented by Intel® Ethernet Controller i219-LM
- supports IEEE 1588 Precision Time Protocol

VPX Data/Expansion Plane, PCI Express
- PCI Express® on the VPX Fabric Connector (VITA 46.4)
- 1 x4 PCIe Data Plane via P1:
  - → factory build options available to disable the Data Plane
- 1 x4 PCIe Expansion Plane via P1:
  - → factory build options available to disable the Expansion Plane
- PCIe interfaces support Gen 1, Gen 2 and Gen 3
- PCIe switch supports two non-transparent ports 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
- support for PCIe backplane common clock options

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

System Management
- VITA 46.11 IPMC on board controller:
  - → SM0-1 and SM2-3
  - → CPU temperature and voltage monitor accessed via System Management interface
- option for VITA 46.11 compatible Tier 1 Chassis Manager

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

Software Support
- supports Linux® and Windows®
- for other operating systems such as VxWorks®, contact Concurrent Technologies for further information
- options available for enhanced PCIe drivers

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

Datasheet Code 1832/Jan22

Specification

Firmware Support

- dual 32 Mbyte BIOS SPI Flash EPROMs
- UEFI boot firmware (BIOS):
  - UEFI 2.7 support
  - implements Secure Boot
- implements Intel® Boot Guard
- optional Fast Boot solution using the Intel® Slim Bootloader
- LAN boot firmware included

Safety

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

Electrical Specification (Estimated)

- typical current figure for Intel® i7-1185GRE Processor with 16 Gbytes DRAM:
  - +12V VS1 @ 2.0A
  - +3.3V AUX @ 0.3A
- +12V AUX and -12V AUX routed to XMC site
- +5V and +3.3V are not connected

Environmental Specification

- standard operating temperature:
  - VITA 47 Class AC1, 0°C to +55°C (N-Series)
  - for bench development only
- non-operating temperature:
  - VITA 47 Class C1, -40°C to +85°C
- operating altitude:
  - 0 to 15,000 feet (0 to 4,572 meters)
- relative humidity: 5% to 95%, non-condensing

Mechanical Specification

- 3U VPX form-factor (VITA 46.0, VITA 48.0)
- 3.9 inches x 6.3 inches (100mm x 160mm)
- slot width 1.0-inch air cooled:
  - VITA 48.0 as per VITA 65
- connectors to VITA 46.0 for P0, P1 and P2
- operating mechanical:
  - shock - VITA 47 Class OS1, 20g
  - random vibration - 0.002g²/Hz