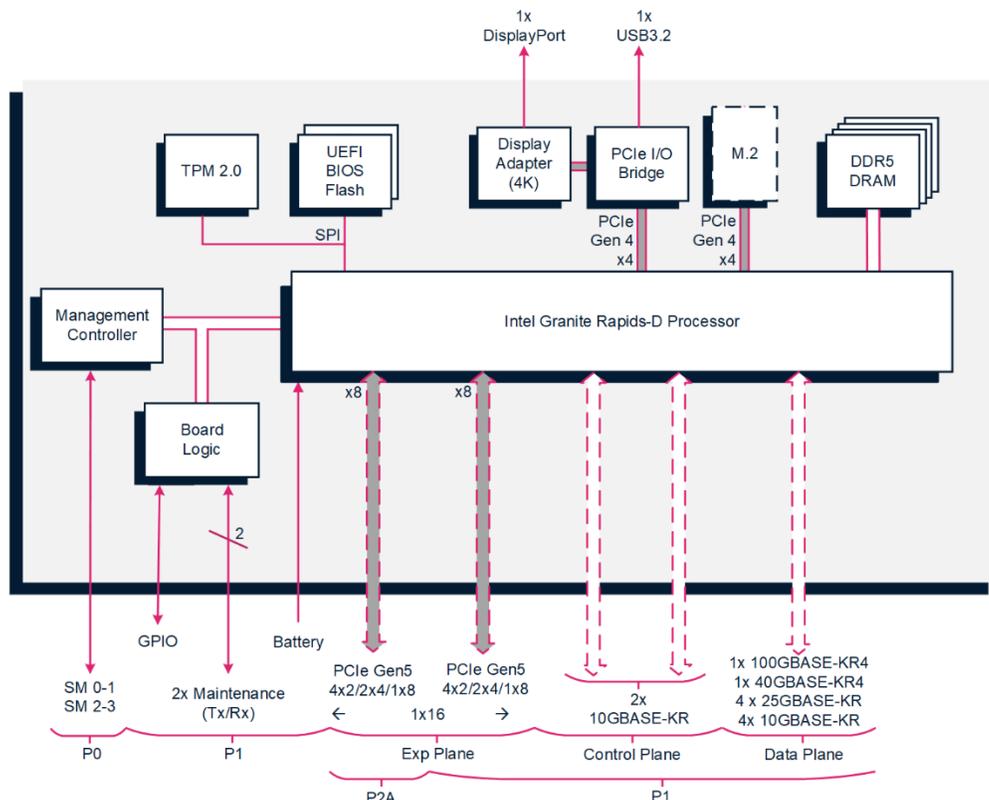


# SOSA™ Aligned Compute Intensive Intel® Granite Rapids HCC Processor based PIC

## Key Features

Kratos is a compute intensive rugged Plug in Card. It has been developed in alignment with the SOSA™ Technical Standard. It features a processor with 20 cores, large memory capacity, local storage and support for virtualization.

- 20-core processor with VRAN accelerator
- 256 Gbytes Registered DDR5 memory for server grade applications
- 40/100GBASE-KR4 Ethernet Data plane
- Up to x16 PCI Express® Gen 5 Expansion plane for high-speed communication with adjacent PIC(s)
- Optional M.2 module for storage with Write/Protect and Opal 2.0 compliance
- Optional Front DisplayPort and USB port for ease of setup



## VPX Processor PIC

- Rugged air flow through 3U VPX™ computing PIC utilizing Intel® Granite Rapids HCC Processor
- Compliant with two OpenVPX™ slot and module profiles:
  - SLT3-PAY-1F1U1S1S1U1U2F1H-14-6.11-0
  - MOD3p-PAY-1F1U1S1S1U1U2F1H-16-6.11-4
  - SLT3-PAY-1F1U1S1S1U1U4F1J-14.6.13-n
  - MOD3p-PAY-1F1U1S1S1U1U4F1J-16.6.13-1

## Central Processor

- 20-core Intel® Granite Rapids HCC Processor:
  - Up to TBD GHz
- Intel VRAN Accelerator
- Intel Advanced Vector Extensions AVX-512
- Intel Vector Neuro Network Instructions (VNNI)
- Intel Vector Byte Manipulation Instructions (VBMI)  
Server class processing cores in a System-on-a-Chip package

## DRAM

- Up to 256 Gbytes soldered Registered DDR5 ECC DRAM:
  - Single bit error correction and dual bit error detection

## Maintenance Serial Ports

- 2x maintenance ports via P1:
  - Supports LVCMOS levels
  - Supports RS232 Tx/Rx signals
  - 16550 compatible UARTs

## Mass Storage Interfaces

- Optional M.2 Carrier Module supporting:
  - 1x M.2 Flash site
  - Up to 2242 format modules (with option for self-encryption)
  - PCI Express® (PCIe® Gen4 x4) interface (M-key)X
  - FIPS 140-3 Compliant option
  - Opal 2.0 security encryption
  - Hardware write protect
  - NVM Express® (NVMe®) logical device interface
  - NVMe 1.3 compatible

## Development Interfaces

- For board commissioning, on-board interfaces are available via a forward facing connectors for:
  - DisplayPort (up to 3840 x 2160 @ 60 Hz)
  - USB 3.2

## Other Peripheral Interfaces

- PC RTC, long duration timer, watchdog timer
- Build option: up to 7x GPIO signals via P1

## VPX Data Plane, 40/100 Gigabit Ethernet (optional)

- Configurable Ethernet VPX Data Plane fabric interface (VITA 46.7)
- VPX Data Plane interface supports:
  - 1x 10GBASE-KR and/or 1x 40/100GBASE-KR4
  - 1x 10GBASE-KR and/or 4x 25GBASE-KR
  - 1x 10GBASE-KR and/or 4x 10GBASE-KR
- Factory build option available to disconnect Data Plane

## VPX Control Plane, 10 Gigabit Ethernet (optional)

- Configurable Control Plane (VITA 46.6)
- VPX Control Plane interface supports:
  - 1x 10GBASE-KR
- Factory build option available to disconnect Control Plane

## Optional Built-In Test (BIT) Support

- Power-on BIT, Initiated BIT, Continuous BIT

## Software Support

- Supports Linux®

## VPX Expansion Plane, PCIe (optional)

- Configurable PCI Express (PCIe) Gen 5 VPX Expansion Plane fabric interface (VITA 46.4):
  - 1 x16 on P1 and P2A PCIe ports
  - 1 x8 on P1 and/or 1 x8 on P2A PCIe ports
  - 2 x4 on P1 and/or 2 x4 on P2A PCIe ports
  - 4 x2 on P1 and/or 4 x2 on P2A PCIe ports
- Compute Express Link (CXL) 2.0

## System Management

- On board controller:
  - SM0-1 and SM2-3
- VITA 46.11-2022 type 3 IPMC
- Option for VITA 46.11-2022 compatible Tier 1 Chassis Manager

## Board Security Features

- Trusted Platform Module (TPM 2.0)
- Supports Total Memory Encryption
- Option for Sanitization Utility Software Package
- Option for proprietary board-level security features
- Implements Intel Boot Guard and Intel SGX

## Firmware Support

- Dual BIOS SPI Flash EPROMs
- UEFI boot firmware (BIOS):
  - UEFI 2.7 support
  - Implements Secure Boot
- 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

- Typical current consumption for 20-core processor (TBD GHz):
  - +12 V VSI @ TBD
  - +3.3 V AUX @ TBD

## Environmental Specification

- Air flow thru cooled (VITA 48.8)
- Operating temperature at air inlet:
  - VITA 47.1 Class FC3, -40°C to +70°C
- Non-operating temperature:
  - VITA 47.1 Class C4, -55°C to +105°C
- 5% to 95% Relative Humidity, non-condensing

## Mechanical Specification

- 3U VPX form-factor (VITA 46.0, VITA 48.0)
- Slot width (VITA 48.8):
  - 1.5-inch Type 1 Two Level Maintenance
- Connectors to VITA 46.0 for P0, P1 and P2A
- Operating mechanical:
  - Shock - VITA 47.1 Class OS1, 20 g
  - Random vibration - VITA 47.1 Class V2, 0.04 g<sup>2</sup>/Hz