

IPN254

6U VPX High Performance Computing Multiprocessor with NVIDIA Quadro Turing GPGPU and 9th Gen Intel Xeon E CPU

The IPN254 is the fourth generation 6U OpenVPX/SOSA™-aligned multiprocessor solution from Abaco. The IPN254 combines the latest NVIDIA® Turing™ GPGPU with the 9th generation Intel® Xeon® E CPU, formerly known as Coffee Lake Refresh (CFL-R), yielding maximum processing performance in a rugged, single VPX slot.

The IPN254 provides a technology insertion solution for the IPN252 on the data plane, control plane and expansion plane while innovating with the latest technology and performance as well as aligning with the most recent VPX and SOSA technical standards.

Targeting a wide range of data-intensive applications, particularly in the Intelligence, Surveillance and Reconnaissance (ISR) domain, the IPN254 delivers the highest available bandwidth between its major components.

The NVIDIA Turing GPU and the Intel Coffee Lake CPU are connected via a 16-lane PCI Express® Gen 3 switch, which also provides a 16-lane PCI Express Gen 3 port to the VPX expansion plane, and provides an 8-lane PCI Express Gen 3 port to dual-channel 10/40 Gigabit Ethernet.

The NVIDIA Turing GPU has 6 GB of GDDR6 memory to ensure high capacity and high bandwidth access to data in massively parallel GPGPU algorithm processing. Using NVIDIA's GPUDirect™, data from external sources can be streamed directly into GPU memory without the burden of multiple copy

operations through system memory, resulting in significantly lower latency and higher throughput.

Data sources may be PCI Express or the dual-channel 10/40 Gigabit Ethernet fat pipes. The 10/40 Gigabit Ethernet channels allow complex open architecture systems to be constructed, using OFED RDMA to transfer data in and out of the 64 GB system memory with very low latency and minimal CPU overhead.

With a wide range of open standard software available for the IPN254, systems integrators can rapidly port and deploy their existing code onto this rugged platform, allowing fast-to-deployment solutions.

The IPN254 is available in a range of air- and conduction-cooled extended temperature build standards, with versions to satisfy the latest VITA and SOSA profiles.

The product is designed to extend Abaco's High-Performance Embedded Computing (HPEC) solution set, allowing sophisticated application-targeted systems to be architected.

The solution set includes:

- SBC627: 5th Generation Intel Core i7 SBC
- SWE540A: 40 Gigabit Ethernet switch
- DSP282A: Dual quad-core multiprocessor
- Wide range of I/O
- AXIS multiprocessing software
- Development chassis
- Rugged deployable chassis

FEATURES:

- NVIDIA Quadro Turing RTX3000 GPU:
 - 5.3 TFLOPS peak performance
- Intel Xeon E CPU (E-2276ME):
 - 64 GB DDR4 with ECC, 32 MB Flash, up to 256 GB SSD (NVMe), Security FPGA
- FPGA (for CPU):
 - Xilinx Zynq UltraScale+ FPGA with advanced security capabilities
- Multi-fabric architecture
 - P1 data plane: 2x 10/40 GigE KX4/KR4
 - P2 expansion plane: x16 Gen 3 PCIe
 - P4 control plane: x2 10 GigE Base-KR, x2 1000BASE-T
- CPU I/O:
 - 6x USB 3.1
 - 4x SATA Gen3
 - Up to 4x serial ports
 - 10x single ended GPIO
 - 3x GPIO LVDS
 - 2x DP 1.2 4K @ 60 Hz
 - Front I/O (1x 1GigE, 1x COM port, 1x DP 1.2, 1x USB 3.1)
- GPU I/O:
 - 2x Display Port 1.4 - 4K @ 60 Hz
 - 2x SL-DVI – 1920 x 1200 @ 60 Hz
- Software:
 - UEFI, BIT, OpenGL, OpenCL™
 - Linux®, Windows®, NVIDIA CUDA®
 - AXISLib, AXIS ImageFlex

IPN254 6U VPX High Performance Computing Multiprocessor with NVIDIA Quadro Turing GPGPU and 9th Gen Intel Xeon E CPU

Specifications (VITA 65)

GPU Node:

- NVIDIA Turing RTX3000 (TU106)
- 5.3 TFLOPs peak performance
- 1920 CUDA cores
- 240 Tensor Cores
- Deep Learning Accelerators (DLAs)
- 36 RT cores
- GPUDirect
- 6 GB GDDR6 (192-bit wide / up to 336 GB/s)

CPU Node:

- Xeon E CPU (E-2276ME)
- 6-cores (12-thread) at 2.8 GHz with Turbo up to 4.5 GHz
- CM246 PCH (Platform Controller Hub)
- 64 GB DDR4 (dual channel) with ECC
- 32 MB Flash (BIOS/BIT)
- Up to 256 GB SSD (NVMe)
- TPM 2.0

FPGA (for CPU node):

- Xilinx® Zynq® UltraScale+™ FPGA with advanced security capabilities

Multi-Fabric Architecture:

- P1 data plane: 2x 10/40 GigE KX4/KR4
- P2 expansion plane: x16 Gen 3 PCIs
- P4 control plane: x2 10GigE Base-KR; 2x 1000BASE-T

CPU Rear I/O:

- 6x USB 3.1 Gen 1
- 4x SATA 3
- 2x serial ports
- 10x single ended GPIO
- 3x GPIO LVDS
- 2x DisplayPort™ 1.2 - 4K @ 60Hz

CPU Front I/O:

- 1x 1GBase-T
- 1x COM port
- 1x USB 3.1 Gen 1
- 1x DP 1.2 - 4k @ 60 Hz

GPU I/O:

- 2x DisplayPort™ 1.4 - 4K @ 60 Hz
- 2x SL-DVI – 1920 x 1200 @ 60 Hz

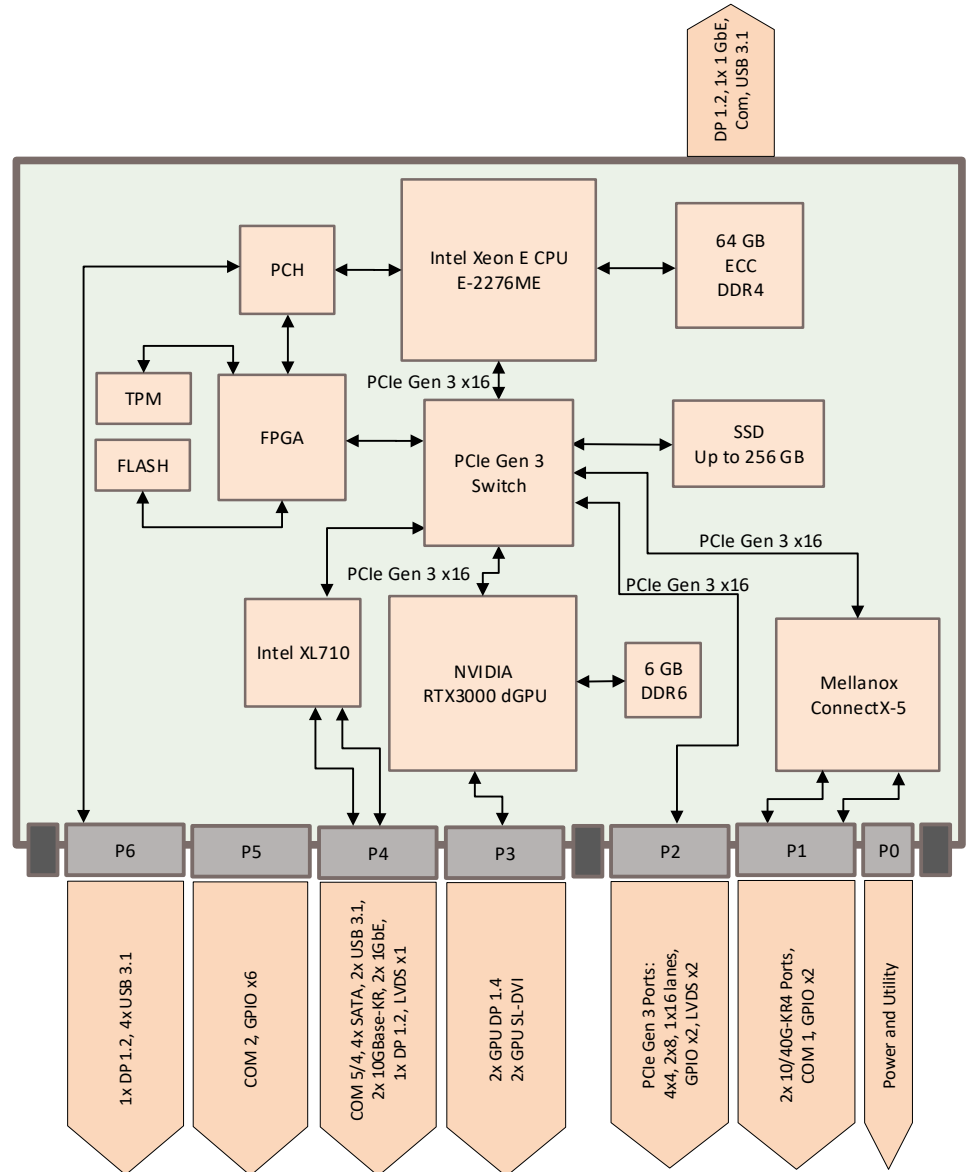
6U OpenVPX:

- OpenVPX Profile: SLT6-PAY-4F1Q2U2T-10.2.1
- Module Profile: MOD6-PAY-4F1Q2U2T-12.2.1-19
- Air and Conduction cooled – LA, LC, L4

Software:

- UEFI, BIT
- Linux, Windows, NVIDIA CUDA SDK
- OpenGL, OpenCL
- AXISLib, AXIS ImageFlex, AXIS EventView

Block diagram (VITA 65)



IPN254 6U VPX High Performance Computing Multiprocessor with NVIDIA Quadro Turing GPGPU and 9th Gen Intel Xeon E CPU

Specifications (SOSA-Aligned)

GPU Node:

- NVIDIA Turing RTX3000 (TU106)
- 5.3 TFLOPs peak performance
- 1920 CUDA cores
- 240 Tensor Cores
- Deep Learning Accelerators (DLAs)
- 36 RT cores
- GPUDirect
- 6 GB GDDR6 (192-bit wide / up to 336 GB/s)

CPU Node:

- Xeon E CPU (E-2276ME)
- 6-cores (12-thread) at 2.8 GHz with Turbo up to 4.5 GHz
- CM246 PCH (Platform Controller Hub)
- 64 GB DDR4 (dual channel) with ECC
- 32 MB Flash (BIOS/BIT)
- Up to 256 GB SSD (NVMe)
- TPM 2.0

FPGA (for CPU node):

- Xilinx® Zynq® UltraScale+™ FPGA with advanced security capabilities

Multi-Fabric Architecture:

- P1 data plane: 2x 40/10 GigE KX4/KR4
- P2 expansion plane: x16 Gen 3 PCIe
- P4 control plane: x2 10GigE Base-KR; 2x 1G Base-T

CPU Rear I/O:

- 2x USB 3.1 Gen 1
- 4x SATA 3
- 2x serial ports
- 10x single ended GPIO
- 3x GPIO LVDS
- 1x DisplayPort™ 1.2 - 4K @ 60Hz

CPU Front I/O:

- 1x 1GBase-T
- 1x COM port
- 1x USB 3.1 Gen 1
- 1x DP 1.2 - 4k @ 60 Hz

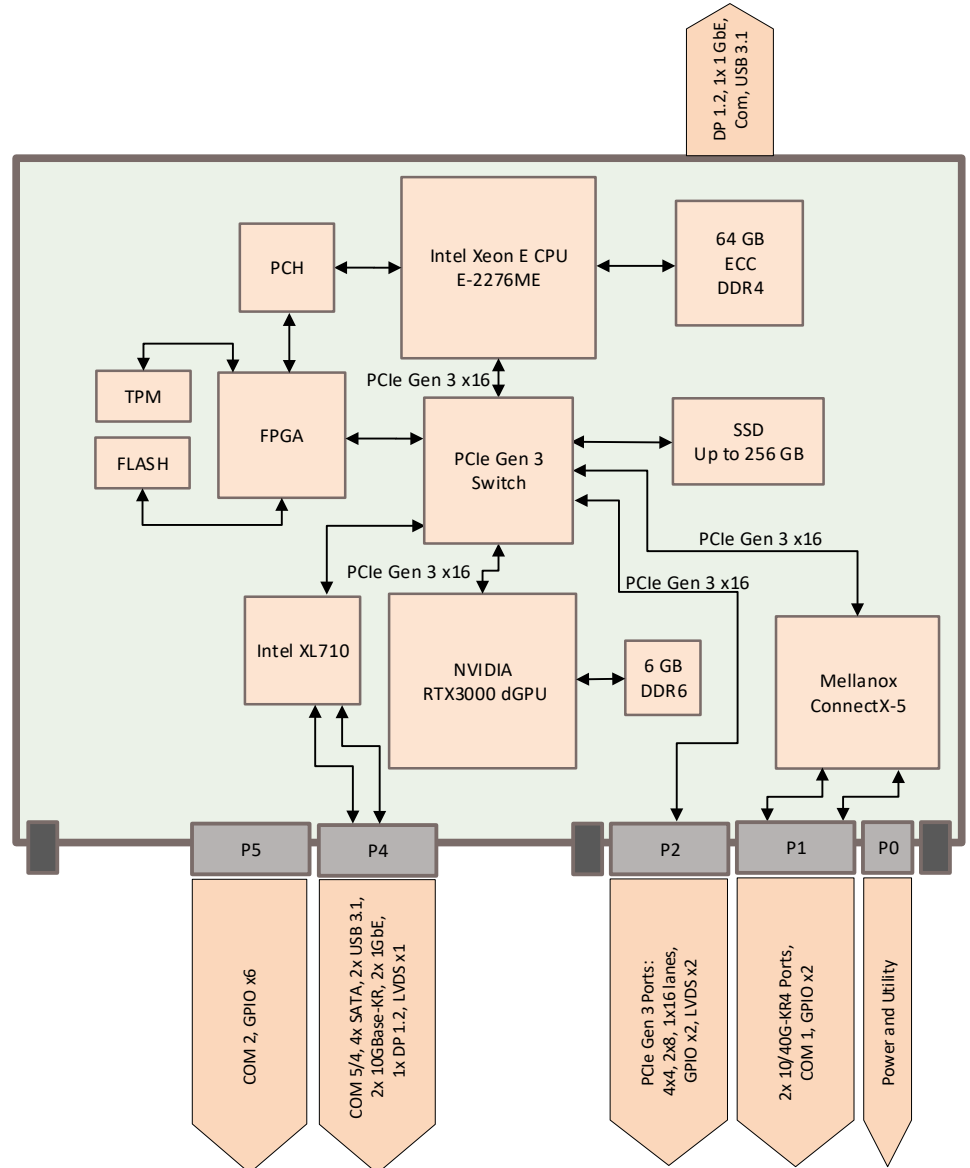
SOSA aligned:

- SOSA profile: SLT6-PAY-4F1Q1H4U1T1S1 S1TU2U2T1H-10.6.3-0
- Module Profile: MOD6-PAY-4F1Q1H4U1T1 S1S1TU2U2T1H-12.6.3-2
- Air and Conduction cooled – LA, LC, L4

Software:

- UEFI, BIT
- Linux, Windows, NVIDIA CUDA SDK
- OpenGL, OpenCL
- AXISLib, AXIS ImageFlex, AXIS EventView

Block diagram (SOSA-Aligned)





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Americas: 866-OK-ABACO or +1-866-652-2226 | Europe, Africa, Middle East, & Asia Pacific: +44 (0) 1327-359444

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Abaco Systems is a global leader in commercial open architecture computing and rugged embedded electronics. With more than 30 years of experience in aerospace & defense, industrial, energy, medical, communications and other critical sectors, Abaco's innovative solutions align with open standards to accelerate customer success.

Abaco Systems is a business unit of AMETEK, Inc., a leading global manufacturer of electronic instruments and electromechanical devices with 2021 sales of more than \$5.5 billion.