

HDS6605

6U OpenVPX Intel® Xeon® Scalable multiprocessing board

The most processing power available in an OpenVPX form factor

- True data center, multifunction processing capability
- Unrestricted fabric bandwidth for ultra-scalable performance
- Optimized for size, weight, power and cooling
- Key building block for developing AI-capable processing systems



Transform sensor data into valuable intel anytime you need it

The 6U OpenVPX HDS6605 server provides smart, autonomous edge applications with highest performing, on-platform processing capability to solve the most complex data problems in SWaP-constrained, remote, harsh environments.

The HDS6605 features the same AI-enabling Intel® Xeon® Scalable processor that powers modern data centers and cloud-based services, and is integral to developing secure, software-agnostic, embedded AI-capable processing systems that operate at the tactical edge. Manufactured in a secure, DMEA-accredited, IPC-1791 certified U.S. facility, under a carefully managed supply chain, the HDS6605 is built to provide trusted, high-assurance performance for the most demanding mission-critical applications.

Highlights

- Manages big data workloads on physically and environmentally challenged platforms with optimized server-class processing technology
- Optimized for size, weight, power and cooling to deliver the best performance and highest MTBF for consistent and efficient operation - anywhere
- Fully designed and manufactured in the United States

Compared to Xeon D-based 6U OpenVPX boards, Xeon SP-based boards deliver:

150%
more memory bandwidth

3×
more memory

11
additional years of lifecycle support

4×
DMIPS

22%
improved power efficiency

TECHNICAL SPECIFICATIONS

Processor (default)

Intel Xeon SP 6238T 1.9 GHz 22-core server-class processor with AVX512 acceleration; 2.68 TFLOPS per blade peak performance; 2 threads per core

Memory

Up to 192 GB DDR4-2666 SDRAM with ECC

BIOS

MSPI flash: dual 8 MB partitions; 256 GB NVMe flash

PCIe to Switched Fabric Bridge

ConnectX-5 Ethernet adapter

System Management

Out-of-band VITA46.11 on-board IPMI controller running on auxiliary voltage

Ethernet

4x 10GBASE-KR Ethernet interfaces
2x 1000BASE-T Ethernet interfaces

OpenVPX Multi-Plane Architecture

System management via IPMB-A and IPMB-B link on P0 management plane

Up to 100 GB Ethernet on data plane; 10 GB Ethernet on control plane

Full x16 or dual x8 PCIe Gen3 interfaces on P2 and P5 expansion planes

Mechanical

6U OpenVPX, 1.0" slot pitch

VITA 65/48/46

MOD6-PAY-4F1Q2U2T-12.2.1-n (n based on ConnectX-5 configuration)

SOSA aligned

SLT6-PAY-4F2Q1H4U1T1S1S1TU2U2T1H-10.6.4-n

Options

[MOTS+ rugged packaging](#) for extreme environmental protection

VITA 48 cooling options: AC (48.1), CC (48.2), AFB (48.7), LFT (48.4)

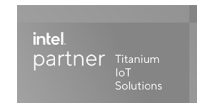
Mercury's Processing Ecosystem

To build a secure, AI-capable processing subsystem, combine:

- 1x HDS6605 (multiprocessing)
- 4x GSC6204 (GPU)
- 2x SFM6126 (network switch)
- 1x IOM-400 (I/O interface)
- 1x SMA-301 (system management)
- 2x SCM6010 (storage)
- 1x ruggedized chassis

Or, choose from our broad portfolio of hardware and software interoperable building blocks to design your own edge-ready [processing subsystem](#).

Partnering with



CLOUD COMPUTING



TACTICAL EDGE COMPUTING



ON-PLATFORM DATA CENTER PROCESSING CAPABILITY AT THE TACTICAL EDGE

Mercury's HDS6605 provides the same processing capabilities as cloud servers to bring the highest processing capability to the most environmentally challenged, space-constrained platforms.

THE PINNACLE OF PROCESSING CAPABILITY

Mercury's line of OpenVPX Xeon server-class boards enable true on-platform cloud processing capability at the tactical edge with the most powerful open system architecture (OSA) available for multifunction processing applications. The massive processing power of the HDS6605 is well suited for radar, electro-optical/infrared (EO/IR) and complex image intelligence (IMINT), artificial intelligence (AI), machine learning (ML), deep learning (DL) and converged sensor applications. The HDS6605 delivers new functionality and autonomy to modern missions through compute capabilities previously thought impossible.

The HDS6605, along with other Intel Xeon processor solutions, high-speed Ethernet and PCIe switches, I/O and storage offerings constitute Mercury's large ecosystem of OpenVPX building blocks. Driven by strategic investment in open systems architecture, harmonized with a focus on backwards compatibility, these scalable OSA building blocks can be integrated and qualified into deployable signal processing chassis solutions that meet the most challenging sensor and mission processing requirements – for both new applications and technology refreshes. For lab development, these same building blocks may be quickly configured into a variety of standard development chassis.

System Management Plane

Each HDS6605 implements an advanced system management functionality architected in the OpenVPX standard to enable remote monitoring, alarm management, hardware revision and health status.

Using the standard I2C bus, intelligent platform management controller (IPMC) and IPMI protocol, the on-board system-management block implementation is designed to comply with VITA 46.11 to allow:

- Read sensor values
- Read and write sensor thresholds for application reaction to thermal, voltage, or current exceedance
- Reset of the entire blade
- Power up/down of the entire blade
- Retrieval of blade field replaceable unit (FRU) information
- Remote management by a chassis management controller at the system level

Additional Features

In addition to the sophisticated management subsystem and fabric interconnect, each HDS6605 provides users with a toolkit enabling multiple application features including:

- Dual 10GBASE-KR Ethernet and dual 10GBASE-KR control plane interfaces
- Dual 1000BASE-T external Ethernet interfaces
- Backplane USB and SATA interfaces for alternate boot or storage paths
- Thermal and voltage sensors integrated on board
- Real-time clock with accuracy better than 10 ppm < 1 second/day
- General-purpose timers
- Global clock synchronization capabilities via the OpenVPX utility plane
- Watchdog timer to support interrupt or reset
- Multiple boot paths (netboot, USB boot, boot from SATA or from the on-board flash device)

Open Software Environment

The HDS6605 leverages 40 years of multicomputing software expertise, including the same Linux® development and run-time environment implemented on other Intel-based Mercury OpenVPX modules. Off-the-shelf open software such as OFED and OpenMPI are fully supported by the ConnectX-5 data plane.

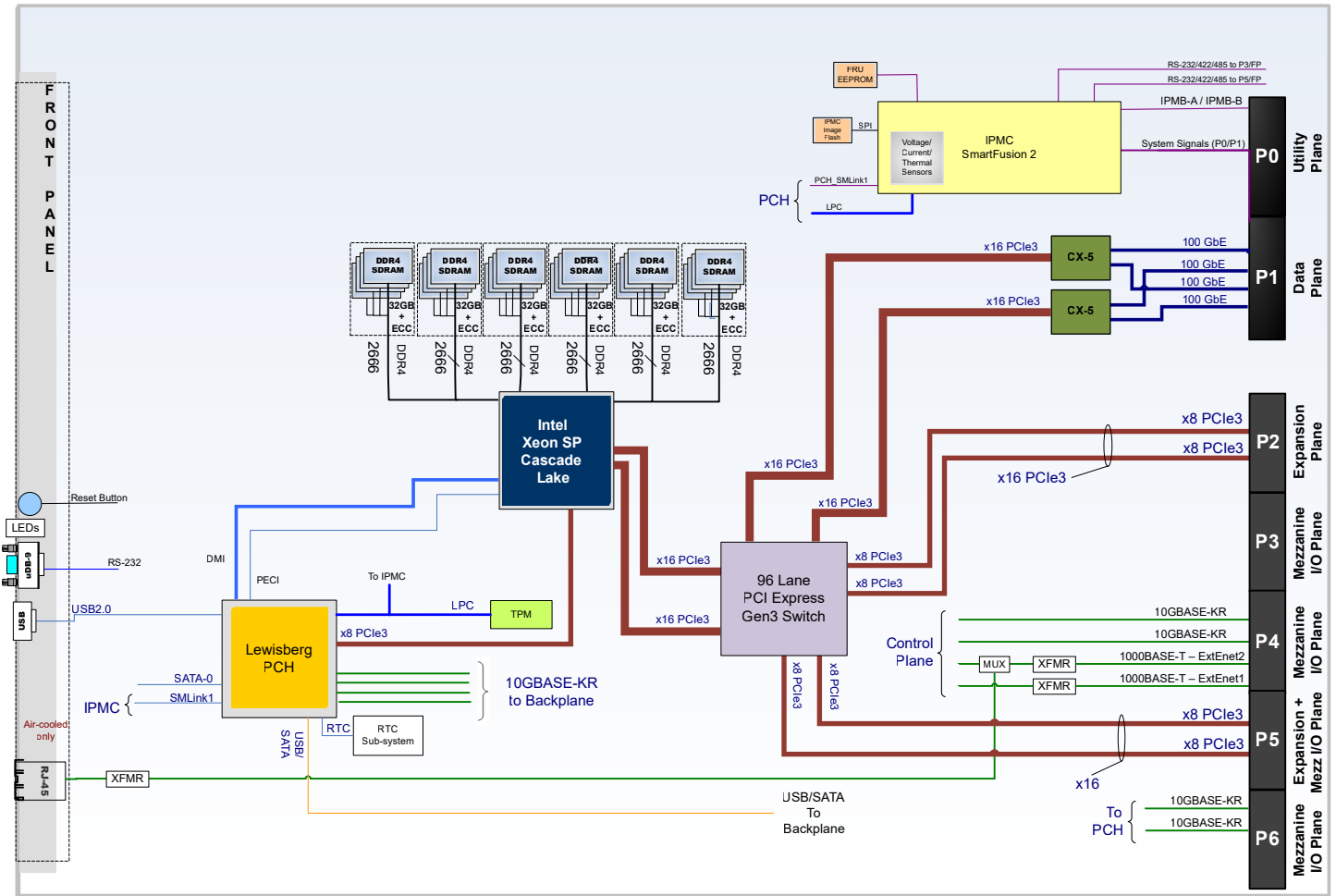
System Bandwidth

Bandwidth is critical and especially applicable to switched fabric resources that dictate the responsiveness of an entire subsystem. To address the limitations of interconnect technology within modular solutions, Mercury fabricates system interconnections with innovative technology to mitigate insertion loss and cross talk—all while maintaining full VITA/OpenVPX compliance—enabling the latest fabrics to run unencumbered at full speed.

VPX-REDI

To perform in harsh embedded environments, the HDS6605 is VPX-REDI compatible when configured as conduction-cooled, Air Flow-By™ or Liquid Flow-Through. Air cooled equivalents are suitable for less challenging environments.

HDS6605 functional block diagram



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