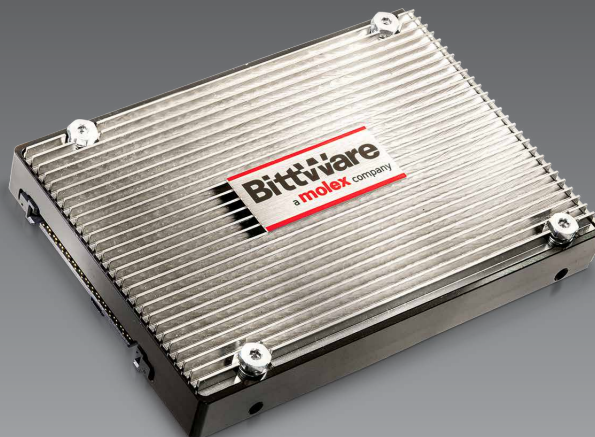**BittWare** a **molex** company
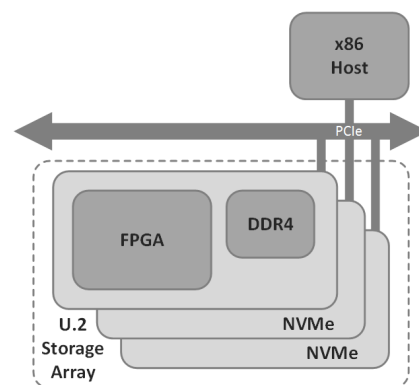
250-U2
U.2 FPGA Accelerator

UltraScale+ on U.2 Form Factor
Fully programmable FPGA processor for NVMe acceleration

BittWare's 250-U2 is a Computational Storage Processor conforming to the U.2 form factor. It features a Xilinx Kintex UltraScale+ FPGA directly coupled to local DDR4 memory. This energy-efficient, flexible compute node is intended to be deployed within conventional U.2 NVMe storage arrays (approximately 1:8 ratio) allowing FPGA-accelerated instances of:

- Erasure Coding and Deduplication
- Compression, Encryption & Hashing
- String/Image Search and Database Sort/ Join/Filter
- Machine Learning Inference

The 250-U2 can be wholly programmed by customers developing in-house capabilities or delivered as a ready-to-run pre-configured solution featuring Eideticom's NoLoad® IP. The 250-U2 is front-serviceable in a 1U chassis and can be mixed in with storage units in the same server, allowing users to mix-and-match storage and acceleration.
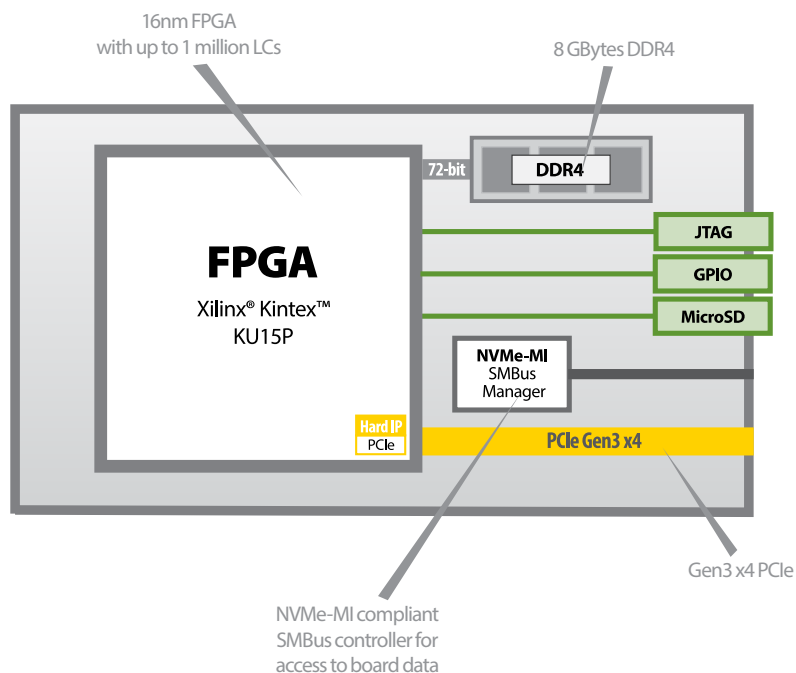
x86 Host — PCIe — FPGA / DDR4 / NVMe — U.2 Storage Array

key features

Ideal for **U.2 NVMe** storage arrays	KU15P FPGA: **1.1 million LCs** Kintex UltraScale+	Up to **16 GBytes** DDR4

16nm FPGA with up to 1 million LCs

8 GBytes DDR4

72-bit | DDR4

FPGA Xilinx® Kintex™ KU15P

JTAG
GPIO
MicroSD

NVMe-MI SMBus Manager

Hard IP PCIe | PCIe Gen3 x4

Gen3 x4 PCIe

NVMe-MI compliant SMBus controller for access to board data

EIDETICOM

Order your 250-U2 pre-configured with Eideticom's NoLoad®:

- Plug-and-play solution
- NVMe compatible and standards-based with no OS changes
- Reduced TCO/TCA - lower power and reduced IO
- CPU offload improves QoS up to 40x
- Disaggregates compute and storage into independently scalable resources
- CPU agnostic
- Reconfigurable accelerators, enabling scalable compute architectures

Learn more at www.eideticom.com

Additional Services

Take advantage of BittWare's range of design, integration, and support options
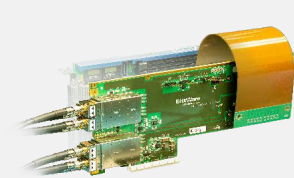
Customization
[Additional specification options or accessory boards](#) to meet your exact needs.
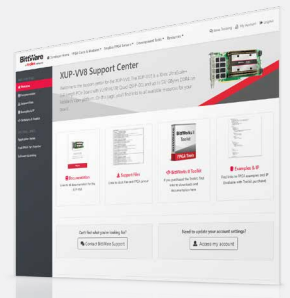
Server Integration
Available pre-integrated in our [TeraBox servers](#) in a range of configurations.

Application Optimization
Ask about our services to help you port, optimize, and benchmark your application.

Service and Support
BittWare Developer Site provides online documentation and issue tracking.

Specifications

FPGA	• Xilinx Kintex UltraScale+
	  • KU15P in an FFVA1156 package
	  • Core speed grade -2
	• Contact BittWare for KU11P FPGA option

On-board DDR4 SDRAM	• One bank of DDR4 SDRAM x 72 bits • 8GB bank (16GB version also available) • Transfer Rate: 2400 MT/s
Host interface	• U.2 Connector • Compliant to SFF-8639
Datacenter deployment	• On-board NVMe-MI compliant SMBUs controller (Spec. 1.0a) • Field flash update via software or SMBus • SMBus FPGA flash control: anti-bricking, fallback and multiboot • SMBus access to unique board data and temperature sensor
Back panel features	• User LEDs accessible • Reset switch to restore factory settings
Development features	• JTAG connector for access to the FPGA, flash and debug tools • GPIO connector • MicroSD connector
Power supply monitoring & reporting	• Voltage monitoring • Temperature monitoring • Fault condition reporting to FPGA

Cooling	• U.2 drive case optimized for cooling with passive heatsink
Electrical	• Hot swapping tolerant • On-card power derived from U.2 supplies • Power dissipation is application dependent • Typical FPGA power consumption ~20W • Card designed to deliver up to 25W power consumption
Environmental	• Operating temperature: 5℃ to 35℃ • Cooling: air convection
Quality	• Manufactured to IPC-A-610 Class 2 • RoHS compliant
Form factor	• U.2 compliant 2.5" Drive Form Factor • Height: 15mm

Development Tools

FPGA development	BIST - Built-In Self-Test for CentOS 7 provided with source code (pinout, gateware, PCIe driver and host test application)
Application development	Xilinx Tools - Vivado Design Suite HLx Editions: HDL and C/C++ with HLS

Deliverables

- 250-U2 FPGA board
- Built-In Self-Test (BIST)
- Eideticom NoLoad® pre-installed (optional)
- 1-year access to online Developer Site
- 1-year hardware warranty
- Contact BittWare for extended warranty and support options

To learn more, visit **www.BittWare.com**

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