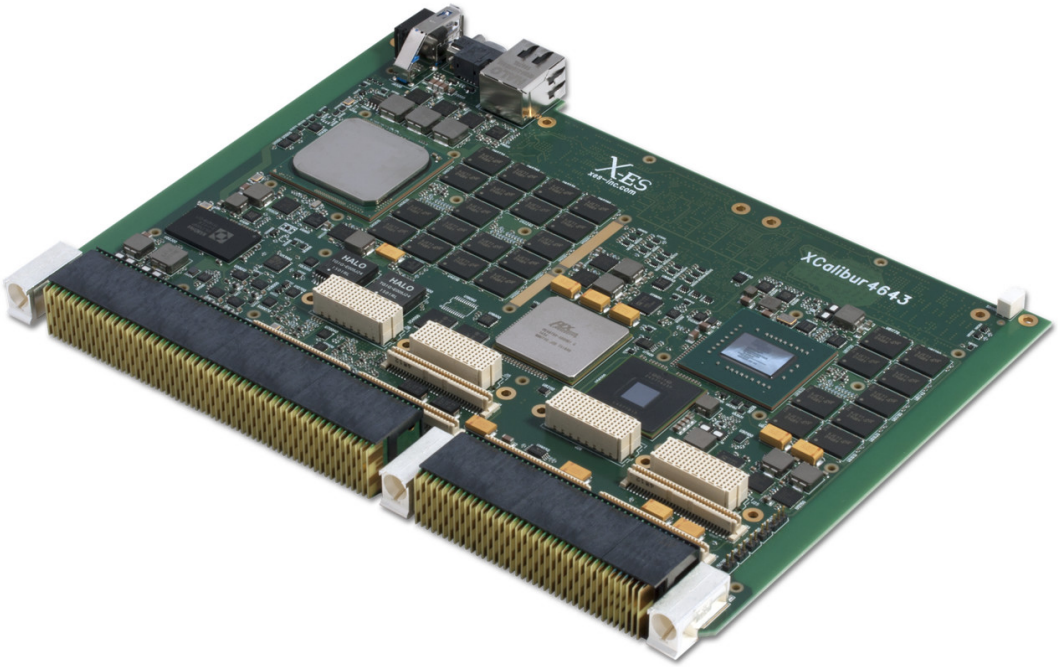
# XCalibur4643

Intel® Xeon® D Processor-Based 6U VPX Module with Quad 10GbE, Dual XMC/PMC Sites, and Onboard FPGA

- Supports Intel® Xeon® D processors (formerly Broadwell-DE)
- Xilinx Kintex UltraScale XCKU040 FPGA
- 6U OpenVPX™ (VITA 46) module
- VITA 46.11 Tier 1 and Tier 2 IPMI Controller (IPMC)
- Compatible with multiple OpenVPX™ (VITA 65) profiles
- Ruggedized Enhanced Design Implementation (REDI) per VITA 48
- Conduction or air cooling
- Supports two XMC/PrPMC modules
- Up to 16 GB of DDR3-1600 ECC SDRAM in two channels
- Contact factory for future availability of DDR4 SDRAM
- Up to 128 GB of onboard SATA NAND flash
- Four 10 Gigabit Ethernet ports and up to five Gigabit Ethernet ports
- Three x4 PCI Express Gen3-capable ports from switch to backplane
- Four SATA ports
- Three USB ports (two of which are USB 3.0-capable)
- Up to four RS-232/422/485 serial ports
- Wind River VxWorks BSP
- X-ES Enterprise Linux (XEL) BSP
- Microsoft Windows 7 BSP
- Contact factory for availability of Green Hills INTEGRITY, QNX Neutrino, and LynuxWorks LynxOS BSPs




## XCalibur4643

The XCalibur4643 is a high-performance, 6U OpenVPX™, multiprocessing, single board computer that is ideal for ruggedized systems requiring high-bandwidth processing and low power consumption. Featuring an Intel® Xeon® D (formerly Broadwell-DE) processor, a Xilinx Kintex UltraScale FPGA, four 10 Gigabit Ethernet ports on the data plane, and three x4 PCI Express Gen3-capable interfaces on the expansion plane, the XCalibur4643 delivers enhanced performance and efficiency for today's embedded computing applications.

The XCalibur4643 provides up to 16 GB of DDR3-1600 ECC SDRAM in two channels, two XMC/PrPMC slots, and up to 128 GB of SATA NAND flash. The XCalibur4643 also supports up to five Gigabit Ethernet ports, four SATA ports, three USB ports, and up to four RS-232/422/485 serial ports out the front panel and/or backplane.

The XCalibur4643 is a powerful, feature-rich solution for the next generation of compute-intensive embedded applications. Wind River VxWorks, X-ES Enterprise Linux (XEL), and Microsoft Windows 7 BSPs are available.

X-ES
Extreme Engineering Solutions

*...Always Fast*

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## Processor

- Intel® Xeon® D (formerly Broadwell-DE)
- Up to eight Xeon®-class cores in a single, power-efficient SoC package

## Memory

- Up to 16 GB of DDR3-1600 ECC SDRAM in two channels (available now)
- Up to 32 GB of DDR4-2133 ECC SDRAM in two channels (available in Q1 2016 when industrial DDR4 is available)
- Up to 128 GB of NAND flash
- 32 MB NOR boot flash
- 64 kB EEPROM

## OpenVPX™

- VITA 46.11 (System Management on VPX)
- Compatible with multiple OpenVPX™ (VITA 65) profiles
- Four 10 Gigabit Ethernet ports to P1
- Three x4 PCI Express Gen3-capable ports to P2
- Two 10/100/1000BASE-T Ethernet ports
- XMC and PMC I/O to P3, P4, P5, P6, mapping P3w1P4-P64s+X12d+X8d

## Front Panel I/O (Optional)

- One 10/100/1000BASE-T Ethernet port
- One USB 3.0 port
- One RS-232/422/485 serial port
- General-purpose LEDs

## PrPMC

- PCI (32-bit, 66/33 MHz)
- Pn4 I/O per VITA 46.9 P64s

## XMC

- x4 PCI Express Gen3-capable port to XMC site 0
- x8 PCI Express Gen3-capable port to XMC site 1
- Pn6 I/O per VITA 46.9 X12d+X8d

## Back Panel I/O

- Four SATA ports capable of 6 Gb/s
- One USB 2.0 port and one USB 3.0 port
- Up to four RS-232/422/485 serial ports
- Pn6 I/O per VITA 46.9 X12d+X8d
- Pn4 I/O per VITA 46.9 P64s
- Four 10 Gigabit Ethernet SerDes ports
- Two 1000BASE-BX Ethernet ports
- Two 10/100/1000BASE-T Gigabit Ethernet ports
- Control plane Ethernet via CPU or FPGA MAC

## FPGA

- Xilinx Kintex UltraScale XCKU040 FPGA
- 64 MB configuration flash
- 509,000 effective LEs
- 424,000 logic cells
- 21.1 Mb total block RAM
- 1,920 DSP slices
- One x8 PCI Express Gen3-capable interface
- One x1 PCI Express Gen2-capable interface

## Additional Features

- Non-volatile memory write protection
- Optional Trusted Platform Module (TPM)
- VITA 46.11 Tier 1 and Tier 2 IPMI Controller (IPMC)
- IEEE 1588 support (optional)

## Software Support

- Wind River VxWorks BSP
- X-ES Enterprise Linux (XEL) BSP
- Microsoft Windows 7 BSP
- Contact factory for availability of Green Hills INTEGRITY, QNX Neutrino, and LynuxWorks LynxOS BSPs

## Physical Characteristics

- 6U VPX-REDI conduction- or air-cooled form factor
- Dimensions: 233 mm x 160 mm
- 0.8 in. pitch
- 1.0 in. pitch Two-Level Maintenance (2LM)

## Environmental Requirements

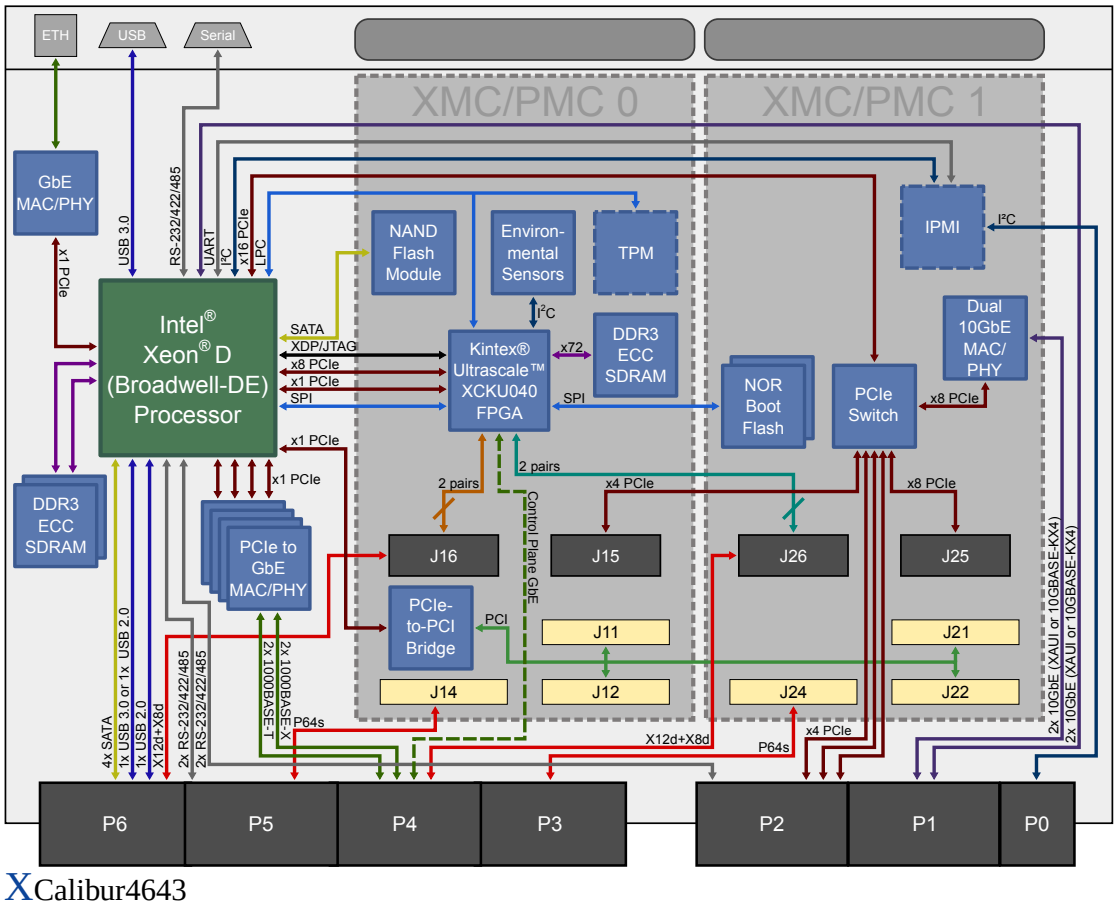
Contact factory for appropriate board configuration based on environmental requirements.

- Supported ruggedization levels (see chart below): 1, 3, 5
- Conformal coating available as an ordering option
- Thermal performance will vary based on CPU frequency and application

## Power Requirements

- Power will vary based on configuration and usage. Please consult factory.

| Ruggedization Level | Level 1 | Level 3 | Level 5 |
|---|---|---|---|
| **Cooling Method** | Standard Air-Cooled | Rugged Air-Cooled | Conduction-Cooled |
| **Operating Temperature** | 0 to +55°C ambient (300 LFM) | -40 to +70°C (600 LFM) | -40 to +85°C (board rail surface) |
| **Storage Temperature** | -40 to +85°C ambient | -55 to +105°C ambient | -55 to +105°C ambient |
| **Vibration** | 0.002 g²/Hz, 5 to 2000 Hz | 0.04 g²/Hz (maximum), 5 to 2000 Hz | 0.1 g²/Hz (maximum), 5 to 2000 Hz |
| **Shock** | 20 g, 11 ms sawtooth | 30 g, 11 ms sawtooth | 40 g, 11 ms sawtooth |
| **Humidity** | 0% to 95% non-condensing | 0% to 95% non-condensing | 0% to 95% non-condensing |

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