

Virtex UltraScale+ 58G PAM4 FPGA

- > Fastest transceiver in a programmable device
- > Enables scalable adoption of emerging optics and protocols
- > Doubles performance on legacy equipment

OVERVIEW

The Virtex® UltraScale+™ 58G PAM4 FPGA implements the latest 50G/100G/200G/400G optics and protocols with superior port density and performance-per-watt while minimizing system-level cost. It enables new and existing platforms to meet ever increasing demand for bandwidth.

Integrated 58G PAM4 transceiver technology provides flexible connectivity to backplanes, optical modules, and chip-to-chip interfaces. Further integration of KP4-FEC for 50 to 400G Ethernet, 100G Ethernet with KR4-FEC, 150G Interlaken, and up to 500Mb of on-chip RAM enables footprint and BOM cost reductions.

Users can double transmission rates on legacy 25G backplanes and extend ASIC lifetimes by using Virtex UltraScale+ 58G PAM4 FPGAs to bridge to the latest optics modules such as QSFP-DD. Logic and I/O resources are adaptable to evolving optics form factors and standards, enabling you to future-proof your system.

HIGHLIGHTS

Increased System Performance

- > 48 transceivers running up to 58Gb/s PAM4 for multi-terabit systems
- > 32 transceivers operating at 32.75Gb/s for 25G interoperability
- > 38 TOPs (22 TeraMACs) DSP compute performance
- > 2,666Mb/s DDR4 in the mid speed grade

Adaptable System Integration

- > Integrated 100G Ethernet MAC with KR4-FEC and 150G Interlaken cores
- Integrated blocks for PCI Express® Gen3 x16
- > Up to 3.8M system logic cells
- > Up to 500Mb of total on-chip integrated memory

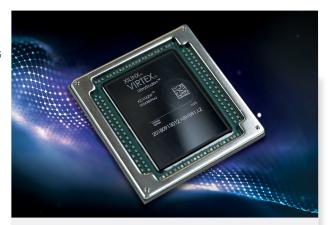
BOM Cost Reduction

- > Eliminates discrete ICs for Ethernet, gearboxes, memory, and PCle
- > VCXO and fractional PLL integration reduces clocking component cost

Total Power Reduction

- > Up to 50% lower system power vs. a 28G discrete gearbox solution
- Voltage scaling options for performance and power
- > Tighter CLB packing reduces dynamic power





TARGET APPLICATIONS

- Transport and Metro Networks
- > Routers and Switches
- > Network Test Equipment
- > Military Communications
- Network Security/Firewalls

FEATURES

16nm low power FinFET+ process technology from TSMC	 Industry-leading process from the #1 service foundry delivers a step function increase in performance-per-watt The same scalable architecture and tools as Virtex UltraScale™ FPGAs
Massive I/O bandwidth and dramatic latency reduction	 28G and 58G backplane support 32.75G and 58G chip-to-chip and chip-to-optics support High-density I/O for smaller area and greater power efficiency per pin
Integrated 100G Ethernet MAC and 150G Interlaken Cores	 Saves 60K-100K system logic cells per port Up to 90% dynamic power savings vs. soft implementation Built-in KR4-FEC (Ethernet MAC) for optics error correction Optional built-in KP4-FEC for PAM4 optics and backplanes
Integrated blocks for PCI Express® with cache coherent CCIX ports	 Complete end-to-end solution for multi-100G ports Gen3 x16 for 100G bandwidth per block Expanded virtualization for data center applications Cache coherent acceleration using CCIX ports
UltraRAM for deep memory buffering	 Up to 360Mb on-chip UltraRAM for SRAM device integration 8X capacity-per-block vs. traditional embedded memory Deep-sleep power modes
Enhanced DSP slices for diverse applications	 Up to 22 TeraMACs (38 TOPs) of DSP compute bandwidth Double-precision floating point using 30% fewer resources Complex fixed-point arithmetic in half the resources
Massive memory interface bandwidth	 DDR4 support of up to 2,666Mb/s Support for server-class DIMMs (8X capacity vs. Virtex-7 FPGAs) Support for DDR3, DDR3L, QDR-IV, and LPDDR3 memory types
UltraScale enhanced clocking and routing	 Lower skew, faster performing clock networks Up to one speed grade advantage vs. comparable solutions Efficient CLB use and placement for reduced interconnect delay

TAKE THE NEXT STEP

For more information about Xilinx Virtex UltraScale+ 58G PAM4 FPGAs, go to www.xilinx.com/virtex-ultrascale-plus-58g.

Virtex UltraScale+ 58G PAM4 FPGAs are supported by comprehensive developments tools, reference designs, an IP catalog, and evaluation platforms. Visit <u>Virtex UltraScale+ FPGA VCU129 evaluation kit</u> page to start evaluating the latest Virtex UltraScale+ 58G PAM4 FPGAs.

Start by contacting your Xilinx Sales Representative to arrange an on-premises transceiver performance evaluation.

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