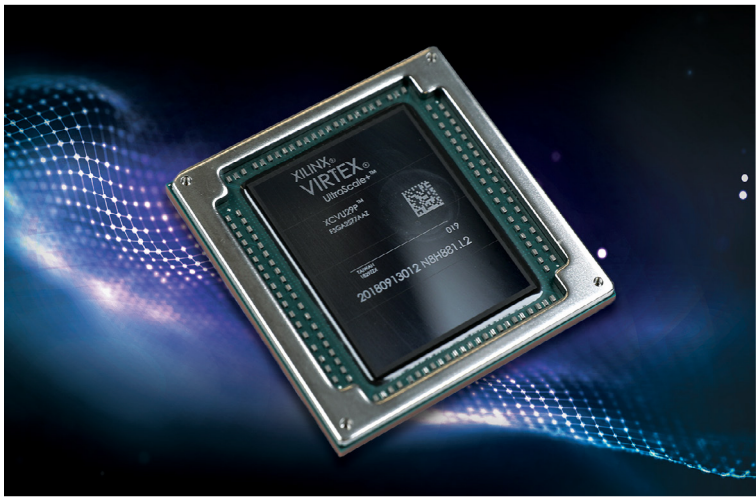
Virtex UltraScale+ 58G PAM4 FPGA

- 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 PCIe
- 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

XILINX®

Adaptable. Intelligent.

Virtex UltraScale+ 58G PAM4 FPGA

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 › KR4-FEC (Ethernet MAC) for optics error correction › KP4-FEC for PAM4 optics and backplanes
Integrated blocks for PCI Express	› Native Gen3x 16 Integrated PCIe block for 100G applications › Integrated MSI-X tables › Expanded virtualization for data center applications › Large number of tags to support more PCIe requests enabling overall system performance
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 Virtex UltraScale+ FPGA VCU129 evaluation kit 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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Printed in the U.S.A. AC062019