PRODUCT BRIEF

Virtex UltraScale+ FPGA

- 3D-on-3D integration for high logic density
- Portfolio's highest processing and serial I/O bandwidth
- Breakout integration of networking cores
- Industry-leading performance-per-watt

OVERVIEW

Based on the UltraScale™ architecture, the latest Virtex® UltraScale+™ devices provide the highest performance and bandwidth in a 16nm FinFET node.

Virtex UltraScale+ FPGAs are capable of pushing the system performance-per-watt envelope, enabling breakthrough speeds with high utilization. High system performance and multiple power reduction innovations make Virtex UltraScale+ FPGAs the logical choice for compute intensive applications.

The foundation of Virtex UltraScale+ FPGAs has been extended by leveraging Xilinx's modular chip architectures. Xilinx also provides scalability and package migration for the lowest risk and the highest value programmable technology to maximize your return on investment.

HIGHLIGHTS

Programmable System Integration

- Up to 9M system logic cells
- Up to 16GB in-package HBM DRAM
- Up to 500Mb of total on-chip integrated memory
- Integrated 100G Ethernet MAC with KR4 RS-FEC and 150G Interlaken cores
- Integrated blocks for PCI Express® Gen3 x16 and Gen4 x8

Increased System Performance

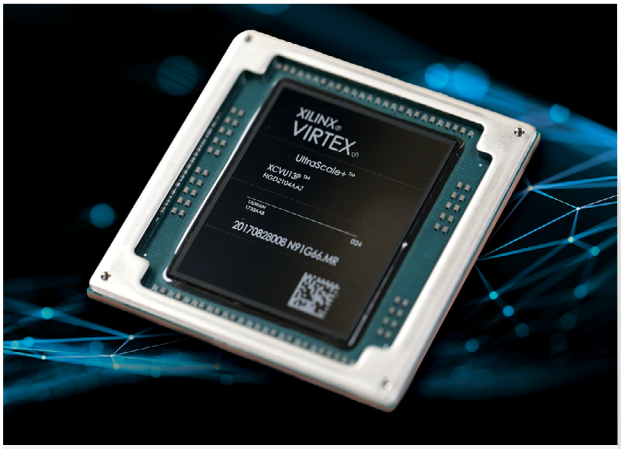
- Up to 38 TOPs (22 TeraMACs) of DSP compute performance
- Up to 128 transceivers operating at 32.75Gb/s or 58Gb/s
- 2,666Mb/s DDR4 in the mid speed grade

Total Power Reduction

- Industry's most energy-efficient machine learning inference
- Voltage scaling options to tune for performance and power

Accelerated Design Productivity

- Seamless footprint migration from 20nm planar to 16nm FinFET+
- Co-optimized with Vivado® Design Suite for rapid design closure



TARGET APPLICATIONS

- Compute Acceleration
- Machine Learning and AI
- Network Acceleration
- Wired Communications
- 5G Baseband
- Radar
- Test and Measurement
- Emulation and Prototyping

Adaptable. Intelligent.

FEATURES

FEATURE	DESCRIPTION
16nm low power FinFET+ process technology from TSMC	> Over 2X performance-per-watt over 7 series devices > The same scalable architecture and tools as Virtex UltraScale FPGAs
Enhanced DSP slices for diverse applications	> Up to 38 TOPs (22 TeraMACs) of DSP compute bandwidth > Double-precision floating point using 30% fewer resources > Complex fixed-point arithmetic using half the resources
Massive memory interface bandwidth	> DDR4 support of up to 2,666Mb/s > Support for server-class DIMMs > Latest DDR and serial memory support such as DDR3, DDR3L, QDR-IV, and LPDDR3
Integrated HBM (Gen2): 20X more bandwidth than a DDR4 DIMM	> Up to 16GB in-package HBM DRAM with 460GB/s bandwidth > 4X less power per bit vs. competing memory technologies > Assembled using proven, 3rd generation 3D IC technology (SSI Technology)
Integrated blocks for PCI Express® with cache coherent CCIX ports	> Complete end-to-end solution for multi-100G ports > Gen3 x16 and Gen4 x8 for 128Gb/s bandwidth > Expanded virtualization for data center applications > Acceleration for cache coherent compute using CCIX ports
Integrated 100G Ethernet MAC and 150G Interlaken cores	> 60K–100K system logic cell savings per port > Up to 90% dynamic power savings vs. soft implementation > KR4 RS-FEC (Ethernet MAC) for optics error correction > KP4-FEC for PAM4 optics and backplanes
Massive I/O bandwidth and dramatic latency reduction	> 16G, 28G, or 58G backplane support > 32.75G or 58G chip-to-chip and chip-to-optics support > High-density I/O for smaller area and greater power efficiency
UltraRAM for deep memory buffering	> Up to 360Mb on-chip UltraRAM for SRAM device replacement > 8X capacity-per-block vs. traditional embedded memory > Deep-sleep power modes

PORTFOLIO

	FOUNDATION	58G	HBM	VU19P
System Logic Cells (K)	862–3,780	2,835–3,780	962–2,852	8,938
GTY/GTM Transceivers (Number of 32.75Gb/s and 58.0Gb/s)	40–128 / 0	32 / 48	32–96 / 32	80 / 0
PCIe Interfaces	6 Gen3 x16	1 Gen3 x16, 4 Gen4 x8/CCIX	2 Gen3 x16, 4 Gen4 x 8/CCIX	8 Gen4 x 8/CCIX
In-package Memory	127–500Mb	377–500Mb	32,894 – 131,449Mb	224Mb
DSP Slices	2,280–12,288	9,216–12,288	2,880–9,024	3,840
I/O	520–832	676	208–624	2,072

TAKE THE NEXT STEP

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

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Printed in the U.S.A. AC0616