VERSAL™ PREMIUM

OVERVIEW

Versal™ Premium series features breakthrough integration of high-bandwidth, power-optimized networking IP cores with High-Speed Crypto Engines for the fastest, most secure networks.

As a heterogeneous compute platform, the Versal Premium series is engineered to help users reach the highest levels of acceleration for a wide range of compute-intensive data center workloads by providing the highest compute density, custom memory hierarchy, and massive on-chip memory.

With Vivado® Design Suite and the Vitis™ unified software development platform, the Versal Premium series offers a complete solution stack for hardware and software developers for maximum productivity.

HIGHLIGHTS

Enabling the Fastest, Most Secure Networks

> 112G PAM4 transceivers for next-gen 800G networks
> 600G channelized multirate Ethernet cores
> 600G Interlaken cores with FEC for chip-to-chip interconnect
> 400G High-Speed Crypto (HSC) Engines for security

Highest Compute Density with Adaptable Acceleration

> Industry’s highest logic density at 7nm for differentiation and adaptability
> AI/ML for network intelligence, e.g., anomaly detection and self-provisioning
> Industry’s highest DSP compute at 7nm for diverse workload acceleration
> Integrated PCIe® Gen5 for host CPU-to-accelerator bandwidth
> Dynamic Function eXchange (DFX) for dynamic workload provisioning

Highly Integrated HW/SW Platform for Greater Productivity

> Programmable network on chip (NoC) for guaranteed QoS
> Integrated shell for streamlined connectivity for cloud infrastructure
> Greatly simplified system design by massive IP integration
> Vivado Design Suite for hardware developers
> Vitis development platform for software developers and data scientists

ADAPTABLE TO ANY WORKLOAD

Wired Communications

> Metro/Core Transport Networks
> Data Center Interconnect
> Security Appliances

Data Center Compute

> Search
> Recommendation
> Video Analytics

Test and Measurement

> Network Tester
> Mobile Tester
> PCIe Protocol Analyzer

Aerospace and Defense

> Radar systems
> Avionics

Adaptable. Intelligent.
### FEATURES

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| **Scalar Engines** | - Complex algorithm processing and decision-making tasks  
- Dual-core Arm® Cortex®-A72 application processing unit  
- Dual-core Arm Cortex-R5F real-time processing unit |
| **Platform Management Controller** | - Boot and configuration and advanced power and thermal management  
- Security, safety, and reliability enclave  
- Integrated platform interfaces and high-speed debug |
| **Adaptable Hardware Engines** | - Re-architected for higher compute capacity and less place and route  
- High bandwidth, low latency data movement between engines and I/Os  
- Programmable memory hierarchy for optimal compute efficiency |
| **Intelligent Engines** | - Enhanced DSP58 Engines for high-precision floating point and low latency  
- Up to 99TOPs with INT8 and 23TFLOPs with FP32 of DSP compute bandwidth for acceleration |
| **Programmable Network on Chip** | - High-bandwidth multi-terabit NoC for guaranteed QoS  
- Programmable framework memory-mapped access to all resources  
- Easy IP and kernel placement |
| **On-Chip Memory** | - Up to 1Gb of tightly coupled memory for performance, power, and latency  
- Up to 123TB/s\(^1\) of on-chip memory bandwidth, 25X vs. GPU\(^2\) |
| **112G PAM4 Transceivers** | - Timed with single-lane 100G deployment in 400G infrastructure  
- Up to 9Tb/s of serial bandwidth in a smaller area with power efficiency |
| **PCle® Gen5 with DMA and CCIX, CXL** | - Host CPU-to-accelerator communication for next-generation compute applications  
- Symmetric/asymmetric access to memory with cache coherent interconnect for accelerators |
| **Integrated 600G Ethernet and 100G Multirate Ethernet Cores** | - Up to 5Tb/s of scalable Ethernet throughput  
- Multirate: 400/200/100/50/40/25/10G  
- Multi-standard: FlexE, Flex-Q, eCPRI, FCoE, and OTN |
| **Integrated 600G Interlaken Cores with FEC** | - Scalable chip-to-chip interconnect from 10Gb/s to 600Gb/s  
- Integrated RS-FEC for power-optimized error correction |
| **400G High-Speed Cryptography Engines** | - AES-GCM-256/128 engines  
- Up to 1.6Tb/s of line rate encryption throughput  
- 400G of MACsec, IPsec, and bulk encryption per engine |

**TAKE THE NEXT STEP**


1. Memory bandwidth assumes largest Versal Premium device, all available block RAM and UltraRAM at their maximum rates, 72-bit dual-port configuration