

Zynq-7000 All Programmable SoC First Generation Architecture

The Zynq[®]-7000 family is based on the Xilinx All Programmable SoC architecture. These products integrate a feature-rich dual-core ARM[®] Cortex[™]-A9 based processing system (PS) and 28 nm Xilinx programmable logic (PL) in a single device. The ARM Cortex-A9 CPUs are the heart of the PS and also include on-chip memory, external memory interfaces, and a rich set of peripheral connectivity interfaces.

Processing System (PS)

Dual-core ARM[®] Cortex[™]-A9 Based Application Processor Unit (APU)

- 2.5 DMIPS/MHz per CPU
- CPU frequency: Up to 1 GHz
- Coherent multiprocessor support
- ARMv7-A architecture
 - TrustZone[®] security
 - Thumb[®]-2 instruction set
- Jazelle[®] RCT execution Environment Architecture
- NEON[™] media-processing engine
- Single and double precision Vector Floating Point Unit (VFPU)
- CoreSight[™] and Program Trace Macrocell (PTM)
- Timer and Interrupts
 - Three watchdog timers
 - One global timer
 - Two triple-timer counters

Caches

- 32 KB Level 1 4-way set-associative instruction and data caches (independent for each CPU)
- 512 KB 8-way set-associative Level 2 cache (shared between the CPUs)
- Byte-parity support

On-Chip Memory

- On-chip boot ROM
- 256 KB on-chip RAM (OCM)
- Byte-parity support

External Memory Interfaces

- Multiprotocol dynamic memory controller
- 16-bit or 32-bit interfaces to DDR3, DDR3L, DDR2, or LPDDR2 memories
- ECC support in 16-bit mode
- 1GB of address space using single rank of 8-, 16-, or 32-bit-wide memories
- Static memory interfaces
 - 8-bit SRAM data bus with up to 64 MB support
 - Parallel NOR flash support
 - ONFI1.0 NAND flash support (1-bit ECC)
 - 1-bit SPI, 2-bit SPI, 4-bit SPI (quad-SPI), or two quad-SPI (8-bit) serial NOR flash

8-Channel DMA Controller

- Memory-to-memory, memory-to-peripheral, peripheral-to-memory, and scatter-gather transaction support

I/O Peripherals and Interfaces

- Two 10/100/1000 tri-speed Ethernet MAC peripherals with IEEE Std 802.3 and IEEE Std 1588 revision 2.0 support
 - Scatter-gather DMA capability
 - Recognition of 1588 rev. 2 PTP frames
 - GMII, RGMII, and SGMII interfaces
- Two USB 2.0 OTG peripherals, each supporting up to 12 Endpoints
 - USB 2.0 compliant device IP core
 - Supports on-the-go, high-speed, full-speed, and low-speed modes
 - Intel EHCI compliant USB host
 - 8-bit ULPI external PHY interface
- Two full CAN 2.0B compliant CAN bus interfaces
 - CAN 2.0-A and CAN 2.0-B and ISO 118981-1 standard compliant
 - External PHY interface
- Two SD/SDIO 2.0/MMC3.31 compliant controllers
- Two full-duplex SPI ports with three peripheral chip selects
- Two high-speed UARTs (up to 1 Mb/s)
- Two master and slave I2C interfaces
- GPIO with four 32-bit banks, of which up to 54 bits can be used with the PS I/O (one bank of 32b and one bank of 22b) and up to 64 bits (up to two banks of 32b) connected to the Programmable Logic
- Up to 54 flexible multiplexed I/O (MIO) for peripheral pin assignments

Interconnect

- High-bandwidth connectivity within PS and between PS and PL
- ARM AMBA[®] AXI based
- QoS support on critical masters for latency and bandwidth control

Programmable Logic (PL)

Configurable Logic Blocks (CLB)

- Look-up tables (LUT)
- Flip-flops
- Cascadeable adders

36 Kb Block RAM

- True Dual-Port
- Up to 72 bits wide
- Configurable as dual 18 Kb block RAM

DSP Blocks

- 18 x 25 signed multiply
- 48-bit adder/accumulator
- 25-bit pre-adder