i.MX 94 Applications Processor — Safe and Secure Industrial and Automotive Connectivity with Real-Time Control

i.MX94

Preproduction
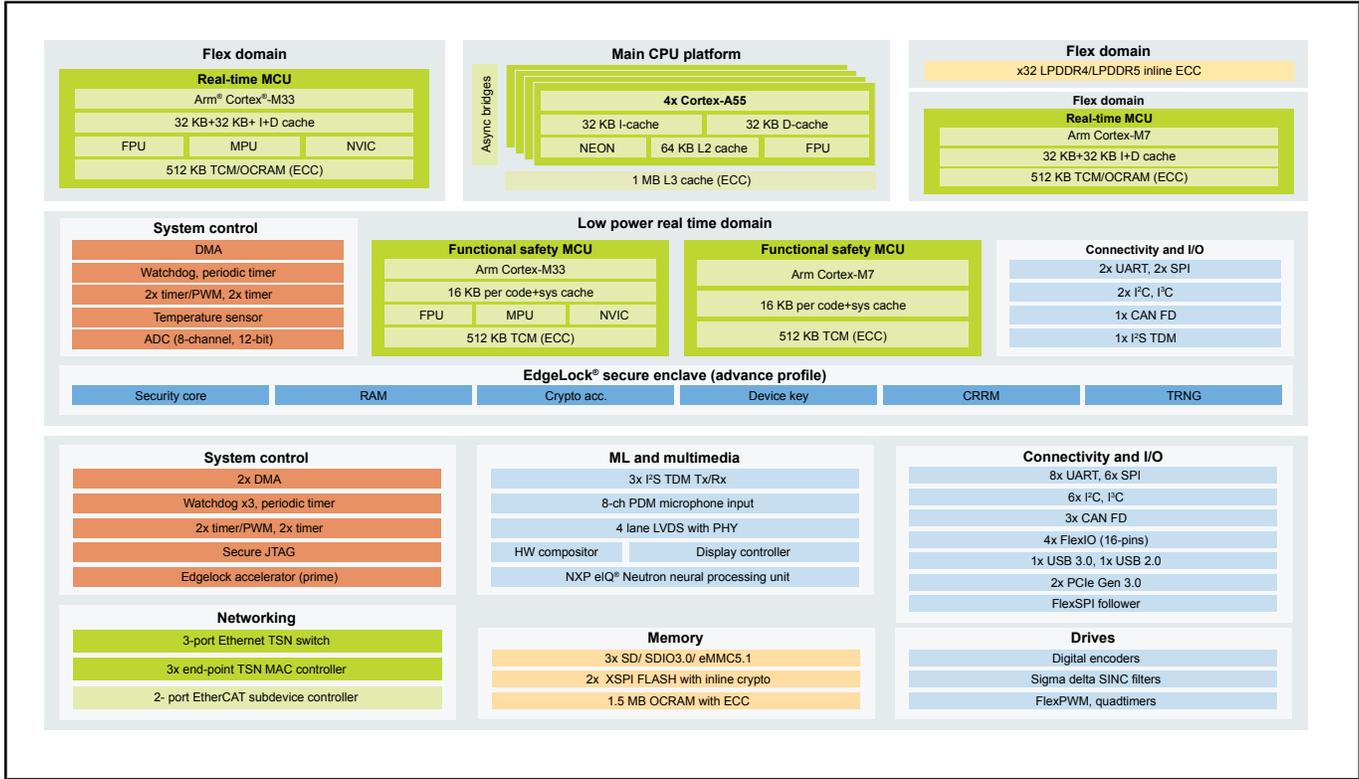
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The i.MX 94 family is an i.MX MPU with an integrated time-sensitive networking (TSN) switch, enabling configurable, secure communications with rich protocol support in industrial and automotive environments. This is also NXP's first chip supporting future-proof, postquantum cryptography. The multicore design of the i.MX 94 family delivers high-performance and low latency across both application and real-time domains, with an integrated functional safety island.

The EdgeLock® Secure Enclave (Advanced Profile) provides advanced, future-proof security capabilities, enabling a post-quantum hardware root-of-trust and supporting hybrid mode (ML-DSA, ECDSA) for NXP signed Secure Enclave Firmware. It also enables fast secure boot, secure debug and update, real-time message signing, authentication and encryption for secure communications, and more. Learn more about our post-quantum cryptography (PQC) strategy.

i.MX 94 Family Block Diagram Block Diagram

Flex domain

Real-time MCU
- Arm® Cortex®-M33
- 32 KB+32 KB+ I+D cache
- FPU | MPU | NVIC
- 512 KB TCM/OCRAM (ECC)

Main CPU platform

Async bridges

4x Cortex-A55
- 32 KB I-cache | 32 KB D-cache
- NEON | 64 KB L2 cache | FPU
- 1 MB L3 cache (ECC)

Flex domain
- x32 LPDDR4/LPDDR5 inline ECC

Flex domain

Real-time MCU
- Arm Cortex-M7
- 32 KB+32 KB I+D cache
- 512 KB TCM/OCRAM (ECC)

System control
- DMA
- Watchdog, periodic timer
- 2x timer/PWM, 2x timer
- Temperature sensor
- ADC (8-channel, 12-bit)

Low power real time domain

Functional safety MCU
- Arm Cortex-M33
- 16 KB per code+sys cache
- FPU | MPU | NVIC
- 512 KB TCM (ECC)

Functional safety MCU
- Arm Cortex-M7
- 16 KB per code+sys cache
- 512 KB TCM (ECC)

Connectivity and I/O
- 2x UART, 2x SPI
- 2x I²C, I³C
- 1x CAN FD
- 1x I²S TDM

EdgeLock® secure enclave (advance profile)
- Security core | RAM | Crypto acc. | Device key | CRRM | TRNG

System control
- 2x DMA
- Watchdog x3, periodic timer
- 2x timer/PWM, 2x timer
- Secure JTAG
- Edgelock accelerator (prime)

ML and multimedia
- 3x I²S TDM Tx/Rx
- 8-ch PDM microphone input
- 4 lane LVDS with PHY
- HW compositor | Display controller
- NXP eIQ® Neutron neural processing unit

Connectivity and I/O
- 8x UART, 6x SPI
- 6x I²C, I³C
- 3x CAN FD
- 4x FlexIO (16-pins)
- 1x USB 3.0, 1x USB 2.0
- 2x PCIe Gen 3.0
- FlexSPI follower

Networking
- 3-port Ethernet TSN switch
- 3x end-point TSN MAC controller
- 2- port EtherCAT subdevice controller

Memory
- 3x SD/ SDIO3.0/ eMMC5.1
- 2x XSPI FLASH with inline crypto
- 1.5 MB OCRAM with ECC

Drives
- Digital encoders
- Sigma delta SINC filters
- FlexPWM, quadtimers

View additional information for i.MX 94 Applications Processor — Safe and Secure Industrial and Automotive Connectivity with Real-Time Control.

Note: The information on this document is subject to change without notice.