

i.MX 937 applications processor for advanced Edge AI processing



The i.MX 937 applications processor extends the [i.MX 95](#) and [i.MX952](#) families with cost and power optimized performance Edge AI capabilities, delivering advanced Arm® Cortex®A55 application processing, an AI NPU providing up to 2 eTOPs and support for next generation memory to address more demanding industrial, smart home and IoT workloads. The i.MX 937 processor scales compute and power capability while maintaining pin to pin compatibility with the i.MX 95 and i.MX 952 families, enabling a smooth migration path to higher end platforms and protecting customer platform investments.

Target applications

- **Automotive:** standalone clusters, secondary displays and two-wheeler digital connected clusters
- **Industrial:** building automation systems, factory automation equipment
- **Consumer:** home controllers, smart appliances, conferencing systems, printers and scanners

High-performance compute

The i.MX 937 family capabilities include a multi-core application domain with four Arm Cortex-A55 cores, as well as two independent

real-time domains for system management, low-power and high-performance real-time use, consisting of high-performance Arm Cortex-M7 and Arm Cortex-M33 CPUs (system manager core).

Display capabilities

A rich, vibrant graphics experience for the user is enabled by Arm Mali GPU capabilities, scaling from multi-display automotive infotainment centers to industrial and IoT HMI based applications. The i.MX 937 applications processors contain a 4-lane MIPI-DSI and 1x 8-lane LVDS display interface capable of 1080p60 resolution.

High-speed connectivity

The next generation of edge platforms for Industry 4.0, automotive connectivity domain controllers and IoT smart home gateways will benefit from the integrated two 1-gigabit Ethernet ports, with TSN capabilities. Adding wireless connectivity such as Wi-Fi®, Bluetooth® LE, satellite radio or 5G, is simple thanks to the PCIe Gen 3.0 port, two USB 2.0 ports and integrated BSP-level drivers for NXP's wide array of wireless connectivity solutions. With expansive capabilities and robust processing, next-generation platforms based on i.MX 937 processors will be capable of securely processing local and network data.

Energy flex architecture

The i.MX 937 family is designed to be configurable and scalable, with multiple heterogeneous processing domains. This includes an application domain with 4 Arm Cortex A55 cores, a high-performance real-time domain with Arm Cortex M7 and low-power system management with Arm Cortex M33, each able to access interfaces including CAN-FD, 1GbE networking, PCIe Gen 3 x1 interfaces and accelerators such as V2X and VPU.

Advanced security, simplified

Security is an essential foundation for edge applications. The i.MX 937 family integrates a secure enclave to simplify implementation of security critical functions like secure boot, cryptography, trust provisioning, run-time attestation and post-quantum cryptography (PQC) services. Combined with NXP's EdgeLock® 2GO key management services, manufacturers can securely provision i.MX 937 SoC-based products for secure remote management of devices deployed in the field, including secure over-the-air updates (OTA). The i.MX 937 platform features a dedicated cryptographic engine with support for a wide range of standards to enable next-generation automotive V2X applications and more.

Display and multimedia

The Arm Mali GPU supports OpenGL® ES 3.2, Vulkan® 1.2 and OpenCL 3.0 to enable rich graphical experiences or compute acceleration. The independent 2D GPU is part of the real-time domain and can blend graphics overlays for conveying critical information in real-time applications. Additionally, the display controller enables two independent display output streams. It is capable of image rotation (90°, 180°, 270°), image resize, color space conversion, copy, blend, ROP, scale,

rotate, warp/de-warp, affine transformations, linear light and offers multiple pixel format support (GPU-Tile, Super-Tile, VPU-tile, RGB, YUV, RGBA), plus standard 2D-DMA operations.

Enhanced reliability

The i.MX 937 platform contains error correcting codes (ECC) in most of the internal memories such as L1, L2, L3 caches of the Arm Cortex-A55, the TCM of the Cortex-M33, Cortex-M7 and internal on-chip memory as well as in-line memory correction on the LPDDR interface for enhanced reliability of key application memory regions. On-the-fly memory encryption enables secure data processing to ensure privacy and security in a wide range of applications.

Rich set of high-speed and memory interfaces

The i.MX 937 processors offer high-speed interfaces for connectivity and fast data transfer with USB 2.0, 3x SD/SDIO 3.01 and 2x Gigabit Ethernet, each with EEE, AVB, IEEE 1588 and TSN for precise, low latency control loops, in addition to 3x CAN-FD interfaces. The memory interfaces supported are 32/16-bit LPDDR5/LPDDR4X and eMMC 5.1.

Automotive edge

With its powerful 3D capable GPU, the i.MX 937 processor is a perfect fit in applications like standalone head units, secondary displays and two-wheeler connected clusters.

Industry 4.0

The i.MX 937 family of applications processors offer high-performance graphics and scalable connectivity with support for pre-emption and TSN. Featuring a flexible architecture with real-time domain, command and control of automated production lines is enabled with ruggedized HMI featuring multiple displays, touch-screen control and real-time critical alerts.

Comprehensive software support

NXP's software enablement package includes Linux® and Android™ support to provide flexibility for our customers to customize the BSPs to their specific needs. NXP provides quarterly releases with the latest kernel patches and bug fixes to support customers in their designs. NXP also provides precompiled packages for all advanced IPs to enable a seamless experience for customers while porting and integrating their applications and offloading their workloads to these IPs. Additionally, NXP also

supports FreeRTOS and a plethora of commercial RTOS from partners to address real-time customer applications enabling developers a quick and easy migration path. Join fellow i.MX developers online at NXP i.MX community. NXP's eIQ® Neutron NPU and machine learning application development are supported by the award-winning eIQ® ML Software Development Environment, a collection of libraries and development tools for building machine learning applications targeting i.MX applications processors and MCUs. The eIQ Toolkit leverages open-source technologies and is fully integrated into NXP's Yocto development environments, allowing the development of complete system level applications with ease.

Hardware tools

The i.MX 937 FRDM board will enable SoC evaluation and system prototyping. Multiple accessory boards are planned to facilitate i.MX 937 processors evaluation for applications such as camera modules and display panels. NXP wireless connectivity solutions enable seamless Wi-Fi and Bluetooth capabilities for easy development and integrated platform design.

Expert package design for simplified system design

The i.MX 937 family will have two package offerings

- 19x19 mm, 0.7 mm pitch
- 15x15 mm, 0.5 mm pitch

Extended industrial, consumer and automotive qualified

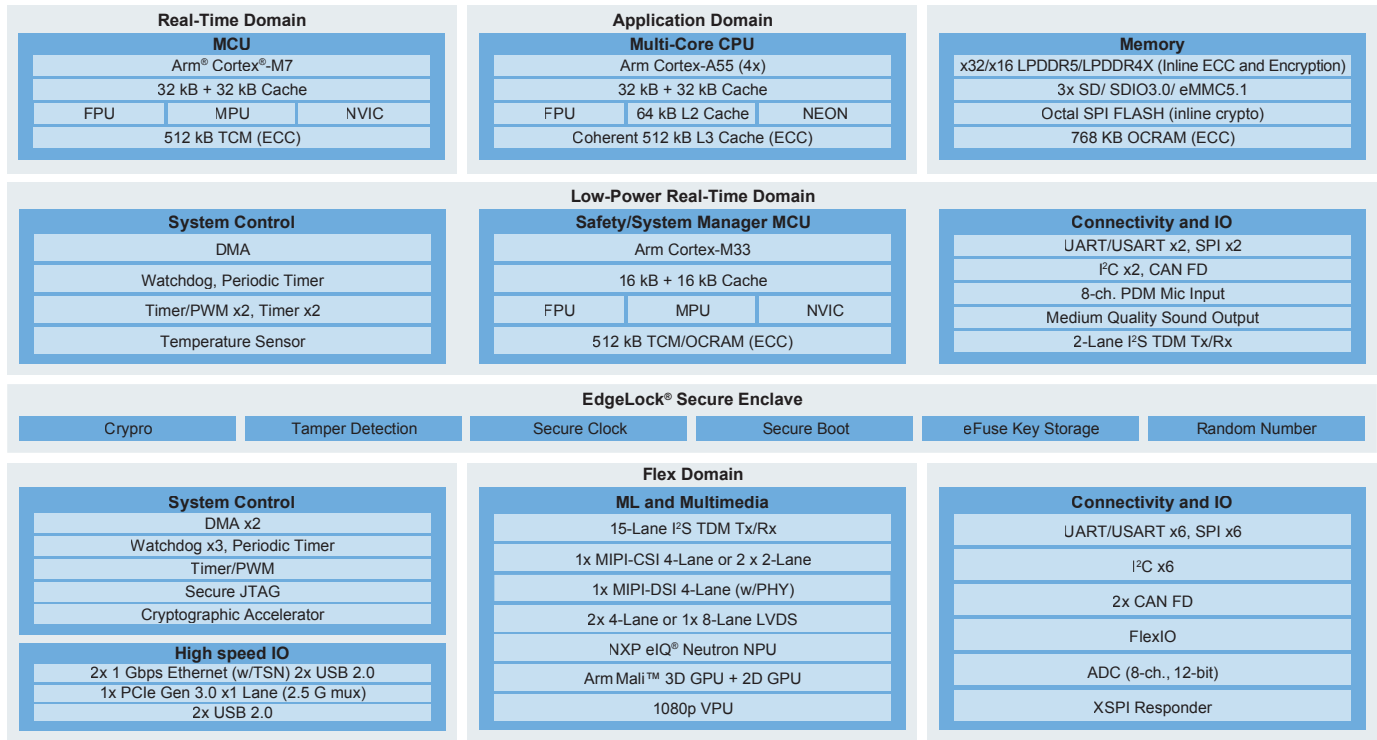
i.MX 937 applications processors supports the following qualifications

- automotive temperature range (-40 °C to 125 °C Tj)
- consumer application temperature range (0 °C to 95 °C Tj)
- extended industrial temperature range (-40 °C to 125 °C Tj)
- standard industrial temperature range (-40 °C to 105 °C Tj)

Supply longevity

i.MX 937 processors will be part of the NXP Product Longevity program ensuring supply continuity and preserves your engineering investment for embedded designs for 15 years.

i.MX 937 block diagram



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