



Enabling power-efficient, secure IoT applications

i.MX 7 Series Applications Processors

The i.MX 7 series is a highly integrated multi-market applications processor designed to enable secure and portable applications within the Internet of Things.

TARGET APPLICATIONS

- ▶ Building automation
- ▶ Wearables
- ▶ Point-of-sale
- ▶ Enterprise scanners and printers
- ▶ E-Readers
- ▶ Smart home controls
- ▶ Patient monitoring
- ▶ IoT solutions

The i.MX 7 series is the first device in the market utilizing both the ARM® Cortex®-A7 and Cortex-M4 cores for general-purpose programmable processing. Its heterogeneous asymmetric architecture provides the ultimate flexibility for customers by enabling a single-chip solution that can run sophisticated operating systems and provide real-time responsiveness. The i.MX 7 series incorporates four independently controlled resource domains for maximum effectiveness and security when partitioning system resources such as memory and peripherals. The i.MX 7 series is supported by NXP's companion power management ICs (PMICs).

i.MX 7 SERIES FEATURES

The features of the i.MX 7 series processors include:

- ▶ **Cortex-A7**—The Cortex-A7 core enhances the capabilities of portable, connected applications by fulfilling the ever-increasing power-efficient MIPS needs of operating systems and applications.
- ▶ **Heterogeneous processing architecture**—The dual-core architecture enables the device to run a rich operating system like Linux® on the Cortex-A7 core and an RTOS on the Cortex-M4 core.
- ▶ **Multi-level memory system**—The multi-level memory system of the Cortex-A7 processor is based on the L1 instruction and data caches, L2 cache, and internal and external memory. The processors support many types of external memory devices, including DDR3, low-voltage DDR3L, LPDDR2 and LPDDR3, NOR Flash, NAND Flash (MLC and SLC), QSPI and managed NAND including eMMC rev. 5.0.



▶ **Power efficiency**—Power management implemented throughout the IC enables multimedia features and peripherals to consume minimum power in both active and various low-power modes.

▶ **Advanced security**—The processors deliver hardware-enabled security features that enable secure e-commerce, digital rights management (DRM), information encryption and secure boot.

▶ **Multimedia**—The multimedia performance of each processor is enhanced by a multi-level cache system, NEON™ MPE (Media Processor Engine) coprocessor and a programmable smart DMA (SDMA) controller.

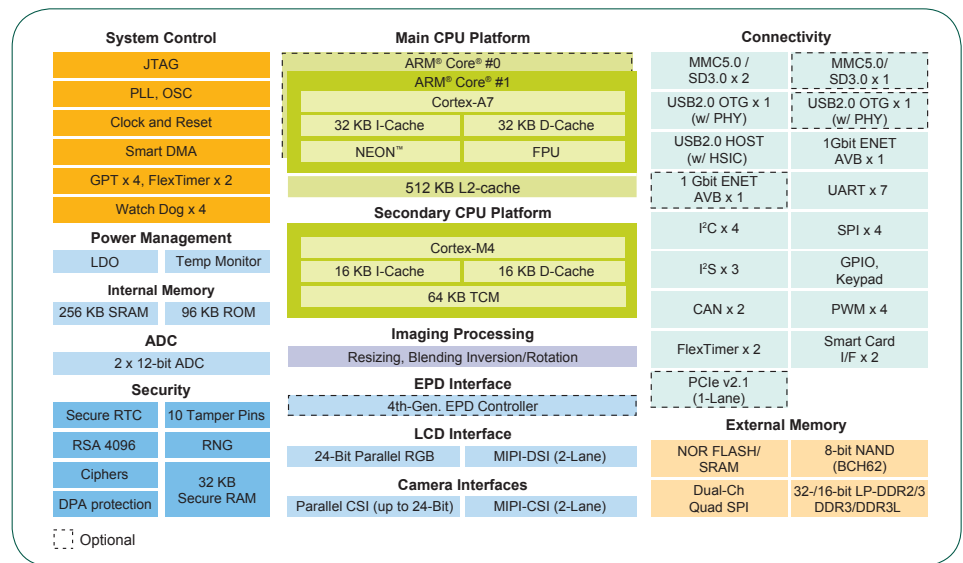
▶ **Up to 2 x Gigabit Ethernet with AVB**—2 x 10/100/1000 Mbps Ethernet controllers.

▶ **Electronic paper display controller**—The processor integrates an EPD controller that supports E-INK color and monochrome panels with up to 2048 x 1536 resolution at 106 Hz refresh, 4096 x 4096 resolution at 20 Hz refresh and 5-bit grayscale (32-levels per color channel).

▶ **Human-machine interface**—Each processor provides up to two separate display interfaces (parallel display and 2-lane MIPI DSI) and CMOS sensor interface (MIPI and parallel).

▶ **Interface flexibility**—Each processor supports connections to a variety of interfaces: high-speed USB On-The-Go with PHY, high-speed USB host with PHY, high-speed inter-chip USB, multiple expansion card ports (high-speed MMC/SDIO host and other), 2 Gigabit Ethernet controllers with support for Ethernet AVB, PCIe®-II, four single-ended-input 12-bit ADCs, two CAN ports, I²S audio interface and a variety of other popular interfaces (such as UART, I²C).

i.MX 7 SERIES APPLICATIONS PROCESSOR BLOCK DIAGRAM



SOFTWARE AND TOOLS

The i.MX 7 series processor is supported by the SABRE Board for Smart Devices and comes with an SD card pre-installed with the Linux operating system. We also offer the Android™ OS, as well as FreeRTOS for the Cortex-M4 core.

i.MX 7 SERIES ECOSYSTEM

Leveraging the broad ARM community, the i.MX 7 series builds technology alliances to enable better customer solutions and faster time to market. Partner solutions include:

- ▶ Tool chains
- ▶ Software
- ▶ Codecs
- ▶ Middleware/applications
- ▶ Embedded board solutions
- ▶ Design services
- ▶ System integrators
- ▶ Training

For development tools and third-party resources, visit www.nxp/iMX7series

Join fellow i.MX developers online at www.imxcommunity.org

i.MX 7 SERIES DEVICE OPTIONS

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i.MX 7Solo

- Single ARM® Cortex®-A7 up to 800 MHz
- Cortex-M4 up to 200 MHz
- 512 KB L2 cache
- 16-/32-bit DDR3/DDR3L and LPDDR2/3 at 533 MHz
- Single Gigabit Ethernet (AVB)
- Full security w/ tamper resist

i.MX 7Dual

- Dual ARM® Cortex®-A7 up to 1.0 GHz
- Cortex-M4 up to 200 MHz
- 512 KB L2 cache
- 16-/32-bit DDR3/DDR3L and LPDDR2/3 at 533 MHz
- Dual Gigabit Ethernet (AVB)
- Full security w/ tamper resist
- EPD controller
- PCIe (x1 lane)

