

i.MX RT Series

NXP Communicator

Expanding the i.MX RT Series

i.MX RT1020

High-performance features set in low-cost LQFP package

Featuring ARM Cortex-M7 core with up to 500 MHz frequency, the i.MX RT1020 expands the popular i.MX RT Series with an LQFP package option.



Crossover Processors

Crossover processors are built using applications processors chassis, delivering a high level of integration, high speed peripherals, enhanced security, and engines for enhanced user experience (for example, 2D/3D graphics); but powered by a low-power MCU core running a real-time operating system like RTOS. Crossover processing helps MCU customers move up to applications processor-level of performance while staying with their current tool chain—and potentially without having to add time, cost, or complexity of Linux (or other higher level operating systems) software development to their product design cycle.

Crossover processors is a term defined by NXP in June 2017, with the first i.MX RT processor (the i.MX RT1050) launched in October 2017.



i.MX RT Series

i.MX RT series is NXP's line of real-time applications processors. Products are built using i.MX technology and have performance over 400 MHz. The wider Cortex-M portfolio from NXP is still readily available and continues to grow, especially within the popular LPC and Kinetis portfolios of microcontrollers. i.MX RT series bridges the gap between the traditional MCUs and the i.MX space, allowing MCU customers a path for significant performance and integration improvements, without sacrificing ease-of-use.

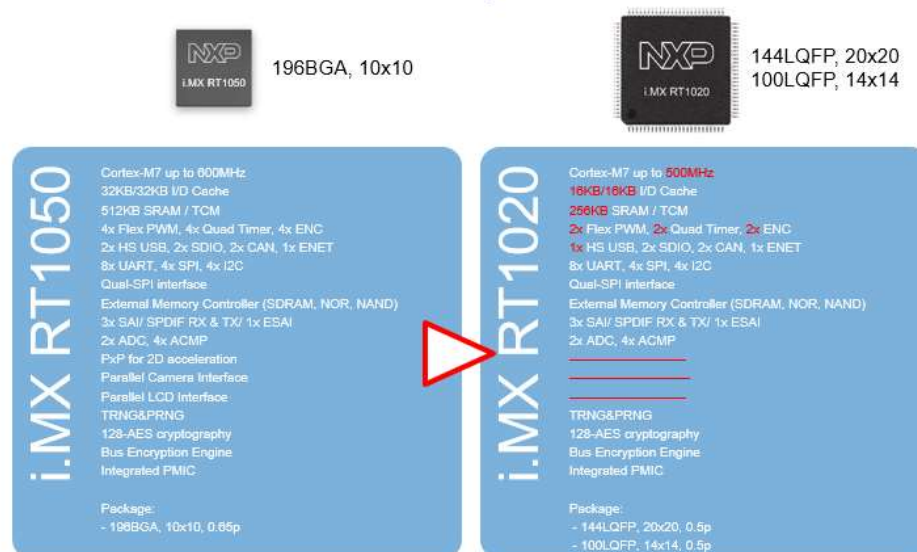
The i.MX RT series was announced in June 2017 and includes products like the i.MX RT1050 (announced June 2017, launched October 2017), i.MX RT1020 (announcement in October 2017, launch in June 2018) and the i.MX RT1060 (announced in February 2018, launch in October 2018).

i.MX RT1020

i.MX RT1020 is the latest product in the i.MX RT series.

The i.MX RT1020 expands the i.MX RT crossover processor families by providing high-performance feature set in low-cost LQFP packages, further simplifying board design and layout for customers. The i.MX RT1020 runs on the Arm® Cortex-M7® core at up to 500 MHz. Below is the product comparison between the i.MX RT1020 and i.MX RT1050.

i.MX RT1020 - From i.MX RT1050 to Low Cost LQFP Solutions



Red indicates change from i.MX RT1050

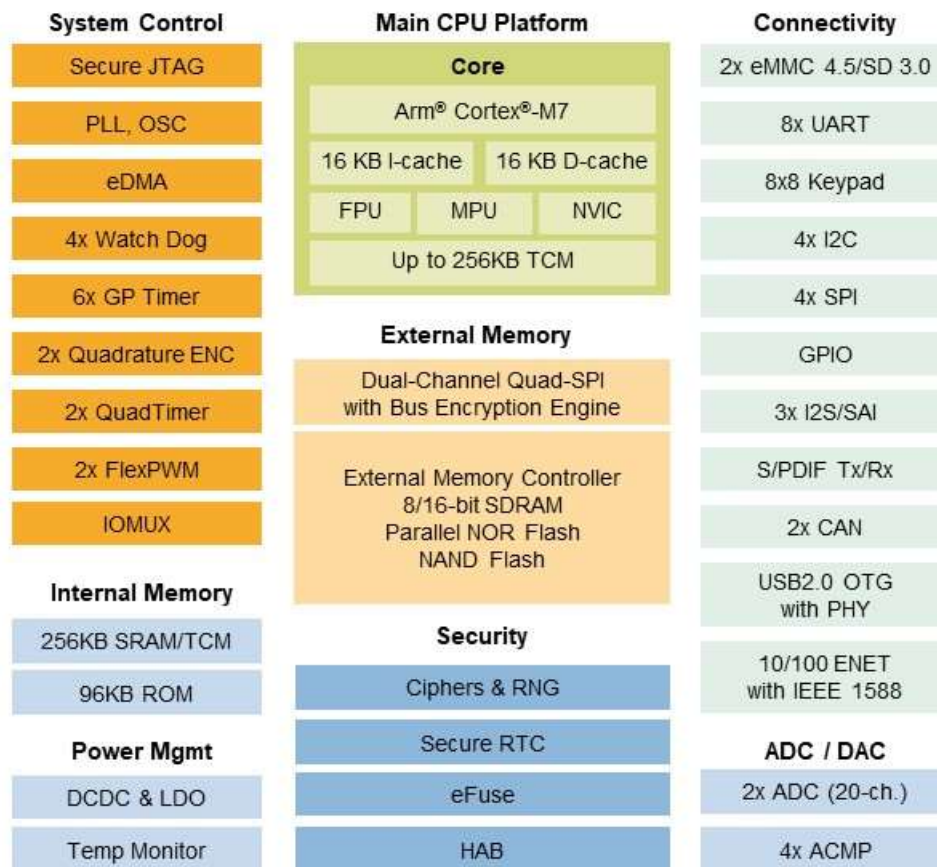


Target Applications (similar to i.MX RT1050)

- **Audio Subsystem**—professional microphone, guitar pedals
- **Consumer Products**—Smart appliances
- **Home and Building Automation**—HVAC climate control, security, lighting control panels, IoT gateways
- **Industrial Computing Designs**—EBS, PLCs, factory automation, test and measurement, M2M, assembly line robotics
- **Motor Control and Power Conversion**—3D printers, thermal printers, unmanned autonomous vehicles, robotic vacuum cleaners

i.MX RT1020 Product Overview

Block Diagram



PERFORMANCE AND INTEGRATION HIGHLIGHTS

- ARM® Cortex®-M7 up to 500 MHz with 16KB/16KB I/D cache
- High Speed USB with PHY
- Multi PWM for dual motor control
- Security (on-the-fly FlexSPI decryption)
- Rich audio features

LOW COST AND EASY TO DEVELOP

- Starting from \$2.18 @ 10Ku
- LQFP packages enable low-cost 2-layer PCB design
- Integrated power management module reduces complexity of external power supply
- FreeRTOS with SDK
- MCUXpresso / Keil / IAR

SPECIFICATIONS

- Package:
 - 100 LQFP, 14x14 ← Launching in June 2018
 - 144 LQFP, 20x20 ← follow-up launch in Q4 2018
- Temp/Qual:
 - -40 to 105 C (Tj), Industrial
 - 0 to 95 C (Tj) Consumer

Development tools and Ecosystem

MIMXRT1020-EVK

The MIMXRT1020-EVK development board is orderable now and has a distributor cost of \$41.65 USD. This board provides true MCU-usability and the out-of-box experience (OOBE) will follow the popular Kinetis format with the Getting Started information and videos online at time of launch.



Processor

- NXP Semiconductors MIMXRT1021, 500MHz ARM Cortex-M7, 144 LQFP

Memory

- 256 Mbit SDRAM memory
- 512Mbit Hyper Flash
- Footprint for QSPI Flash
- TF socket for SD card

Audio

- Audio Codec
- 4-pole Audio Headphone Jack
- External speaker connection
- Microphone

Connectivity

- Micro USB OTG connector
- Ethernet (10/100T) connector
- CAN transceivers
- ARDUINO interface

Sensor

- 6-axis ecompass (3-axis Mag, 3-axis Accel) sensor (FXOS8700CQ)

Debug

- JTAG connector
- On-board DAP-Link debugger

2 layer through hole PCB

Software Enablement

- MCUXpresso SDK
 - Extensive suite of robust peripheral drivers, stacks, and middleware
 - Includes software examples demonstrating use of peripheral drivers and middleware
- ARM® Mbed®-enabled
- Free RTOS
- Integrated Development Environments (IDE)
 - IAR Embedded Workbench
 - ARM Keil Microcontroller Development Kit
 - MCUXpresso IDE