

Driving the convergence of applications processors and MCUs

## i.MX RT Series of Crossover Processors

Combining high performance with real time functionality, the i.MX RT series of crossover processors are designed to support the next generation IoT applications with a high level of integration and security balanced with MCU-level usability at an affordable price.

### THE NEW CROSSOVER PROCESSOR MARKET

As a leading supplier of both applications processors and microcontrollers (MCUs), NXP is in a unique position to introduce a new class of embedded processors driven by the growing consumer demand for enhanced user experience in their smart, secure, high performance products.

- ▶ Greater performance
- ▶ Real-time operation
- ▶ Richer Integration
- ▶ Ease-of-use

### TARGET APPLICATIONS

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

### CROSSOVER PROCESSORS



## APPLICATIONS PROCESSOR PERFORMANCE + MCU USABILITY

- ▶ **Move Fast, React Fast** with real time, low latency response
- ▶ **Create Advanced Multimedia** with advanced on-chip integration
- ▶ **Connect and Protect** with a high level of security
- ▶ **Save Time and Money** by leveraging existing MCU toolchains

### PERFORMANCE HIGHLIGHTS

- ▶ Highest performing Arm® Cortex®-M7
  - 3015 CoreMark/1284 DMIPS @ 600 MHz
- ▶ Real-time, low-latency response
  - Up to 512KB Tightly Coupled Memory (TCM)
  - Fastest real-time response with latency as low as 20ns
- ▶ Low power Operation
  - Industry's lowest dynamic power with integrated DC-DC converter
  - Low power run modes at 24MHz

### USABILITY HIGHLIGHTS

#### Highly Integrated

- ▶ Advanced multimedia for GUI and enhanced HMI
  - 2D graphics acceleration engine
  - Parallel camera sensor interface
  - LCD display controller (up to WXGA 1366x768)
  - 3x I<sup>2</sup>S for high-performance, multichannel audio
- ▶ Extensive external memory interface options
  - NAND, eMMC, QuadSPI NOR Flash, and Parallel NOR Flash
- ▶ Wireless connectivity interface for
  - Wi-Fi®, Bluetooth®, BLE, ZigBee® and Thread™

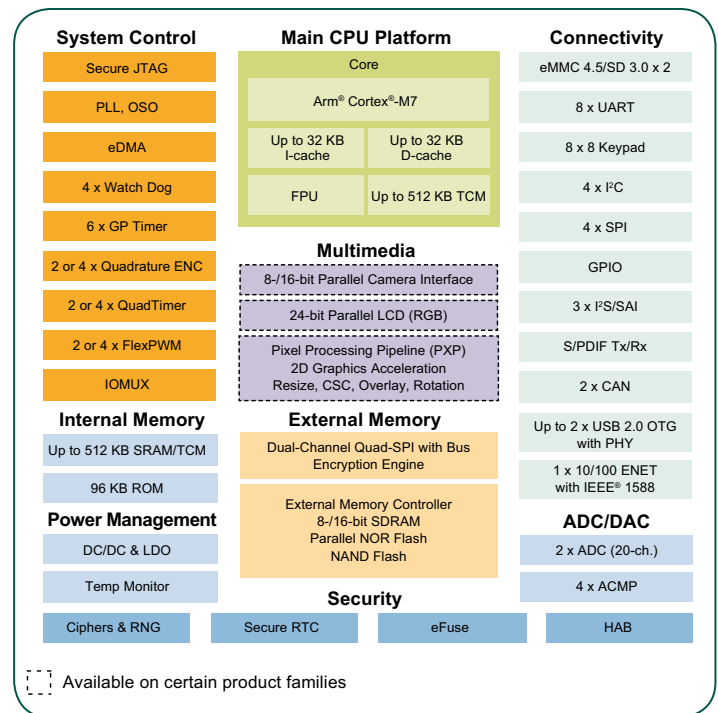
#### Easy to Use

- ▶ MCU customers can leverage current toolchain
  - MCUXpresso, IAR, Keil
- ▶ Rapid and easy prototyping and development
  - FreeRTOS, SDK, Arm® Mbed™, and the global Arm ecosystem
- ▶ Faster development using low-cost evaluation kit (EVK)
- ▶ Single voltage input simplifies power circuit design

#### Low BOM Cost

- ▶ 10k resale at sub \$2.50
- ▶ DC-DC converter—eliminates need for external PMIC
- ▶ LQFP and BGA packages with optimized pinout for low cost 2-layer and 4-layer PCB design

## i.MX RT BLOCK DIAGRAM



### i.MX RT Features

Feature	i.MX RT1020	i.MX RT1050
Core/Speed	Arm Cortex-M7 @ 500 MHz	Arm Cortex-M7 @ 600 MHz
Cache	16 KB-I, 16KB-D	32 KB-I, 32KB-D
On-chip RAM	256KB	512KB
External Memory	8/16-bit Interface for SDRAM, SRAM, NOR, NAND	8/16-bit Interface for SDRAM, SRAM, NOR, NAND
SDIO	SD3.0/eMMC4.5 x2	SD3.0/eMMC4.5 x2
QSPI / HyperBus	Dual Channel / 8-bit	Dual Channel / 8-bit
Ethernet	10/100Mbps x1	10/100Mbps x1
USB with PHY	OTG, HS/FS x 1	OTG, HS/FS x 2
CAN	FlexCAN x2	FlexCAN x2
Graphics	-	PxP for 2D acceleration
CSI	-	8/10/16-bit Parallel
LCD	-	8/16/18/24-bit Parallel
Security	TRNG, AES-128, SHA Secure Boot	TRNG, AES-128, SHA Secure Boot
UART/SPI/I <sup>2</sup> C	8/4/4	8/4/4
I <sup>2</sup> S/SPDIF/ASRC	3/1/0	3/1/0
ADC	1M sample/s x2	1M sample/s x2
ACMP/DAC	4/0	4/0
Quad ENC/Quad Timer/FlexPWM	2/2/2	4/4/4
GP Timer / WDOG	6/4	6/4
Package	LQFP-100, LQFP-144	BGA-196
Temperature	Consumer: 0C to 95C (Tj)	Consumer: 0C to 95C (Tj)
	Industrial: -40C to 105C (Tj)	Industrial: -40C to 105C (Tj)

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