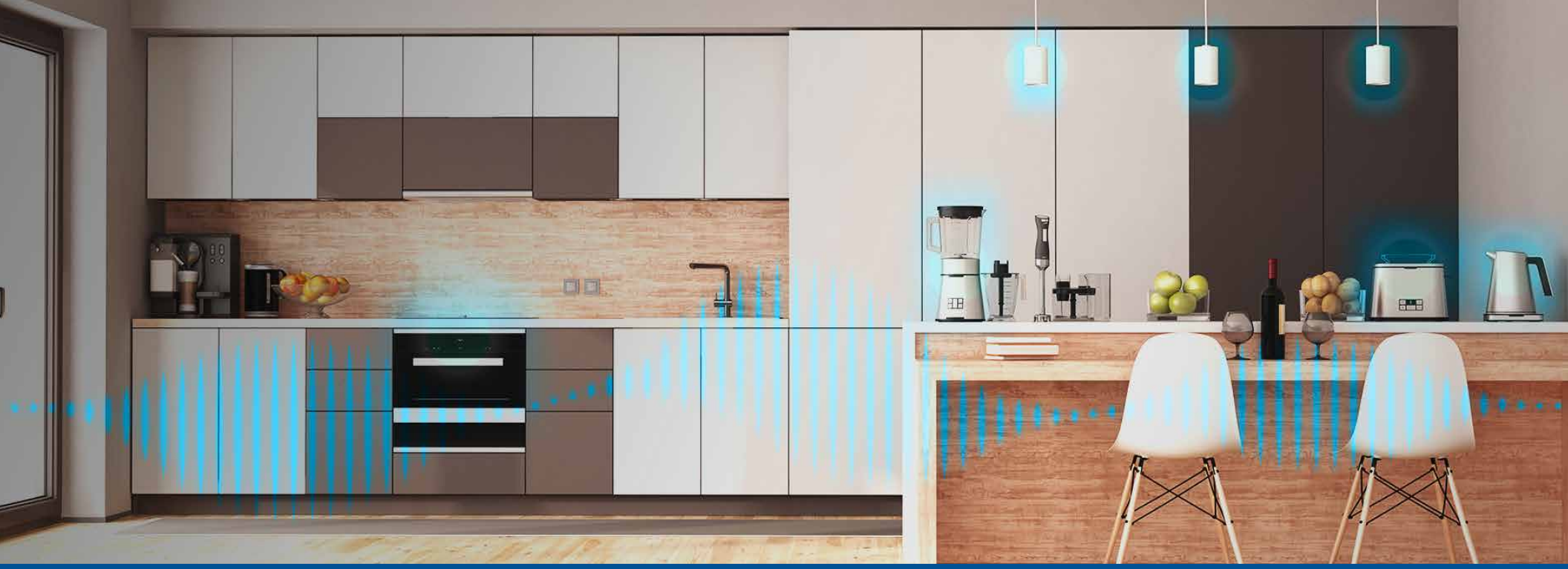
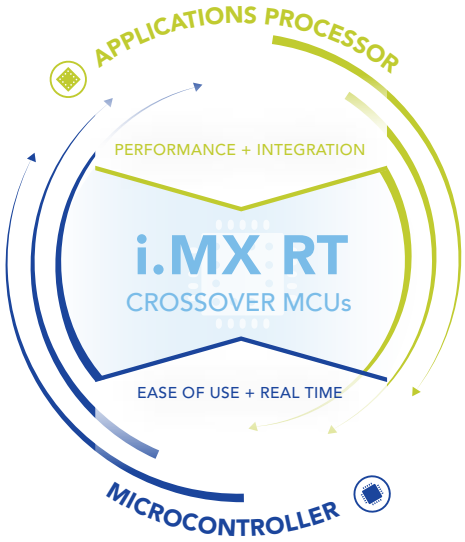


i.MX RT SERIES OF CROSSOVER MCUs

TABLE OF CONTENTS

USHERING IN THE GHZ MCU ERA

NXP's crossover processors and MCUs marry the simplicity of MCUs with the complexity of applications processors into a hybrid device designed to address the growing consumer demand for enhanced user experiences in smart and secure high-performance products. Included in this class of products is the i.MX RT series of crossover MCUs that combines unprecedented performance with reliability and high levels of integration and security to propel industrial, IoT and automotive applications.



PORTFOLIO HIGHLIGHTS

- Variety of high performing Arm® Cortex®-M and DSP cores
- Hardware accelerators (PXP, 2D GPU, PowerQuad DSP coprocessor)
- Large, low-latency on-chip SRAM memory
- Low-power operation
  - Low dynamic power with integrated DC-DC converter
  - Low-power quiescent power modes
- Highly integrated with advanced multimedia for GUI and enhanced HMI
- Extensive memory interface options, including Quad/Octal SPI and HyperFlash™/HyperRAM™, SDRAM, NAND Flash, NOR Flash, SD/eMMC
- Security
  - Hardware protected keys for secure boot
  - AES engine for data encryption
  - On-the-fly decryption for execute-in-place (XIP) from Quad/Octal SPI/HyperFlash
  - Hardware elliptic curve cryptography
  - Cryptography hardware coprocessor

TARGET APPLICATIONS

- Audio subsystems
- Automotive graphic applications and electronic controllers
- Consumer products
- Home and building automation
- Industrial computing designs
- ML-based edge applications
- Motor control and power conversion
- Personal devices
- Personal health and fitness
- Voice-enabled IoT devices

www.nxp.com/iMXRT

MEMORY EXPANSION WITH i.MX RT MCUS

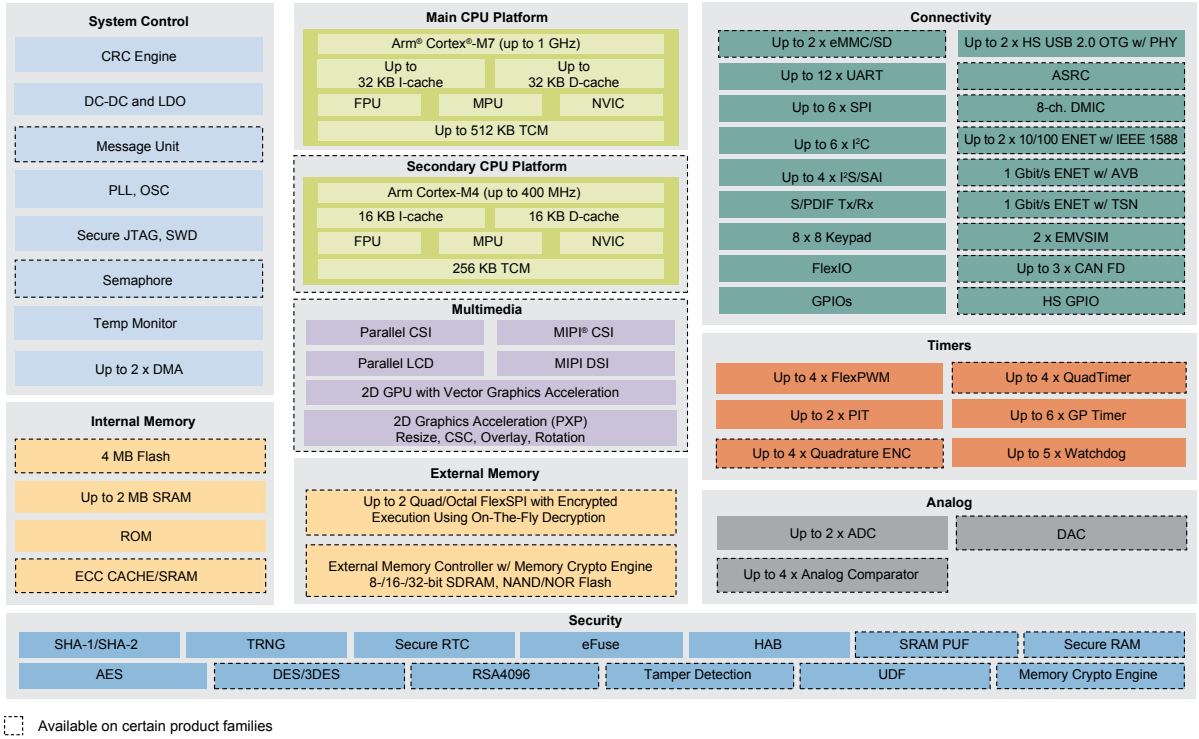
i.MX RT crossover MCUs shed the burden of on-chip flash, which helps reduce the cost and helps enable higher frequency operation for increased performance. In turn, it helps you boost capabilities, increase efficiency and add more features. The i.MX RT FlexSPI interface provides memory expansion for external memories such as serial flash/PSRAM, quad or octal data lines. This memory expansion offers increased design flexibility and helps to ensure a high level of performance and security. The i.MX RT series integrates high densities of SRAM, which is further configured within the crossover design architecture to function as TCM with "zero-wait" single-cycle access to dramatically increase system performance. This key design feature helps enable the crossover processor's effective performance to be better than the traditional MCU counterpart.

NEXT-GENERATION HMI DESIGN

The i.MX RT10xx portfolio includes scalable solutions for HMI applications with features such as parallel camera interface, dedicated LCD controllers and the PXP for 2D graphics acceleration. The PXP is a high-performance pixel processor for operations such as color-space conversion, alpha blending and rotation. It also supports traditional pixel/frame processing paths for still-image and video processing applications.

For more advanced HMI designs, the i.MX RT1160, i.MX RT1170 and i.MX RT500 devices offer additional features, including MIPI DSI and a 2D GPU with vector graphics acceleration. Additionally, NXP has partnered with several third parties to deliver embedded graphics software as part of the MCUXpresso SDK.

i.MX RT10XX AND i.MX RT11XX CROSSOVER MCUs BLOCK DIAGRAM



ADVANCED SECURITY

Secure development with the i.MX RT leverages years of experience gained from its applications processor lineage. The ROM firmware on the devices, as well as the tools used in the development and manufacturing processes, have been used and tested. With the i.MX RT and its associated software and tools for secure boot, the foundation for meeting today's security requirements can be achieved. See full security features on page 8.

LOW POWER DESIGN

The i.MX RT series is optimized for achieving the lowest possible power consumption at the required performance levels. Specifically, the i.MX RT600 and i.MX RT500 offer various reduced power modes and advanced core voltage control design techniques to enable long battery life in both active and sleep modes.

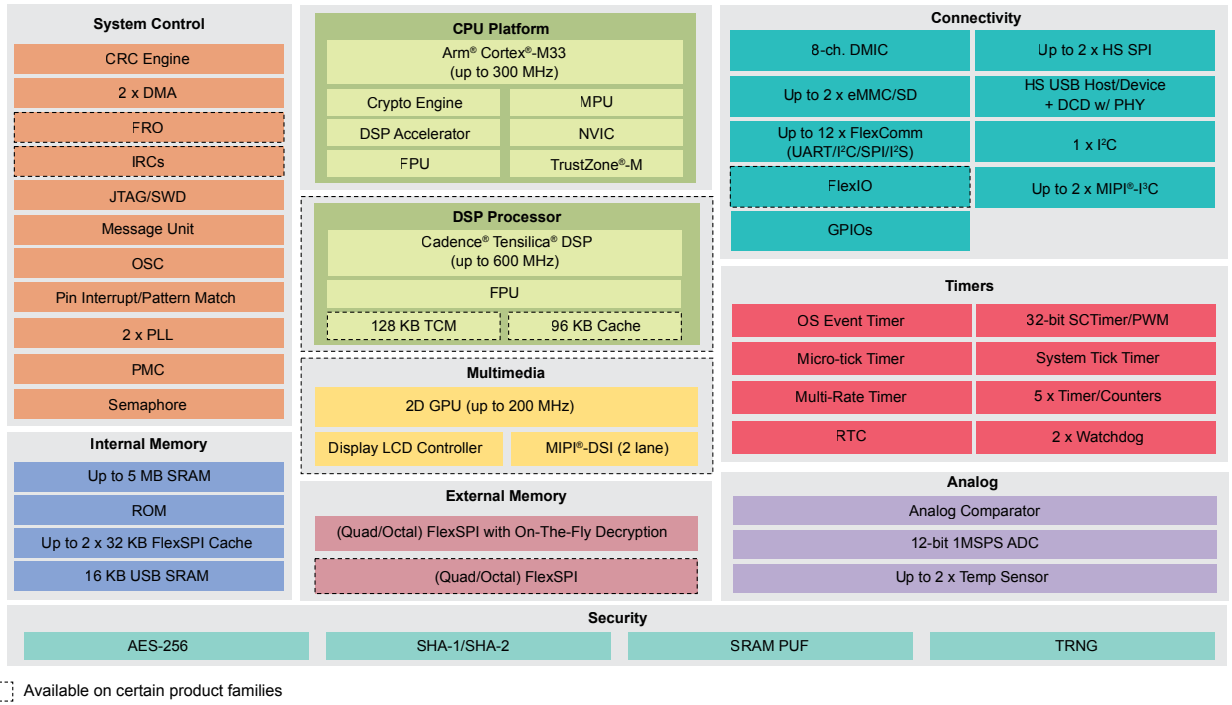
MAXIMUM FLEXIBILITY WITH FlexIO

FlexIO, on the i.MX RT500 MCU, is a highly configurable module providing a wide range of functionality, including emulation of a variety of communication protocols such as UART, I²C, SPI and I²S. This means that you have the flexibility in your design to add more of the peripherals you need. Additionally, the FlexIO module consists of a flexible 16-bit timer with support for a variety of trigger, reset, enable and disable conditions. Both i.MX RT600 and i.MX RT500 also offer several Flexcomm modules, providing even more flexibility to create the serial interfaces (USART/I²S/SPI/I²C) you need.

MCU + DSP = UNLIMITED CAPABILITIES

Take advantage of the integrated DSP technology and enhance your design with audio features, voice capabilities and sensor processing, all while maintaining low power consumption with the i.MX RT600 and i.MX RT500 MCUs. The Cadence® Tensilica® HiFi 4 and Fusion DSPs provide the right level of high-performance audio digital signal processing power and include algorithm-specific operations for a fully programmable approach that provides maximum flexibility. All Cadence Tensilica DSPs support multiple existing and developing standards, as well as specific algorithms.

i.MX RT500 AND i.MX RT600 CROSSOVER MCUs BLOCK DIAGRAM



i.MX RT10XX MCU FAMILIES | STANDARD KEY FEATURES

i.MX RT10xx MCUs are NXP's first generation crossover MCUs, which combine high performance and integration with ease of use and real-time functionality. The i.MX RT10xx MCUs run on the Arm Cortex-M7 cores up to 600 MHz.

	i.MX RT1010	i.MX RT1015	i.MX RT1020	i.MX RT1024	i.MX RT1050	i.MX RT1060	i.MX RT1064
Core/Speed	Arm Cortex-M7 @ 500 MHz	Cortex-M7 @ 500 MHz	Cortex-M7 @ 500 MHz	Cortex-M7 @ 500 MHz	Cortex-M7 @ 600 MHz	Cortex-M7 @ 600 MHz	Cortex-M7 @ 600 MHz
Cache	16 KB-I, 8 KB-D	16 KB-I, 16 KB-D	16 KB-I, 16 KB-D	16 KB-I, 16 KB-D	32 KB-I, 32 KB-D	32 KB-I, 32 KB-D	32 KB-I, 32 KB-D
TCM	Up to 128 KB	Up to 128 KB	Up to 256 KB	Up to 256 KB	Up to 512 KB	Up to 512 KB	Up to 512 KB
On-chip RAM	128 KB	128 KB	256 KB	256 KB	512 KB	1 MB	1 MB
On-chip flash	-	-	-	4 MB	-	-	4 MB
External memory	-	-	8-/16-bit interface for SDRAM, SRAM, NOR, NAND	8-/16-bit interface for SDRAM, SRAM, NOR, NAND	8-/16-bit interface for SDRAM, SRAM, NOR, NAND	8-/16-bit interface for SDRAM, SRAM, NOR, NAND	8-/16-bit interface for SDRAM, SRAM, NOR, NAND
Quad/Octal SPI/ HyperBus™	Dual-channel/ 8-bit	Dual-channel/ 8-bit	Dual-channel/ 8-bit	Up to 2 x dual-channel/ 8-bit	Dual-channel/ 8-bit	Up to 2 x dual-channel/ 8-bit	Up to 2 x dual-channel/ 8-bit
SDIO	-	-	SD 3.0/eMMC 4.5 x 2	SD 3.0/eMMC 4.5 x 2	SD 3.0/eMMC 4.5 x 2	SD 3.0/eMMC 4.5 x 2	SD 3.0/eMMC 4.5 x 2
Ethernet	-	-	10/100 Mbit/s x 1 w/ IEEE 1588	10/100 Mbit/s x 1 w/ IEEE 1588	10/100 Mbit/s x 1 w/ IEEE 1588	10/100 Mbit/s x 2 w/ IEEE 1588	10/100 Mbit/s x 2 w/ IEEE 1588
USB with PHY	OTG, HS/FS x 1	OTG, HS/FS x 1	OTG, HS/FS x 1	OTG, HS/FS x 1	OTG, HS/FS x 2	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	-	-	FlexCAN x 2	FlexCAN x 2	FlexCAN x 2	FlexCAN x 2 + CAN FD x 1	FlexCAN x 2 + CAN FD x 1
Graphics	-	-	-	-	PxP for 2D acceleration	PxP for 2D acceleration	PxP for 2D acceleration
CSI	-	-	-	-	8-/10-/16-bit parallel	8-/10-/16-bit parallel	8-/10-/16-bit parallel
LCD	-	-	-	-	8-/16-/18-/24-bit parallel	8-/16-/18-/24-bit parallel	8-/16-/18-/24-bit parallel
Security	TRNG, AES-128, SHA, Secure Boot, Boot, OTFAD	TRNG, AES-128, SHA, Secure Boot, BEE	TRNG, AES-128, SHA, Secure Boot, BEE	TRNG, AES-128, SHA, Secure Boot, BEE	TRNG, AES-128, SHA, Secure Boot, BEE	TRNG, AES-128, SHA, Secure Boot, BEE	TRNG, AES-128, SHA, Secure Boot, BEE
UART/SPI/I²C/ FlexIO	4/2/2/1	4/2/2/1	8/4/4/1	8/4/4/1	8/4/4/2	8/4/4/3	8/4/4/3
I²S/SPDIF	2/1	3/1	3/1	3/1	3/1	3/1	3/1
ADC	1M sample/s x 1	1M sample/s x 1	1M sample/s x 2	1M sample/s x 2	1M sample/s x 2	1M sample/s x 2	1M sample/s x 2
Analog Comparator	-	-	4	4	4	4	4
FlexPWM/quad timer/quad ENC	1/0/0	1/1/1	2/2/2	2/2/2	4/4/4	4/4/4	4/4/4
GPT/PIT/WDOG	2/1/4	2/1/4	2/1/4	2/1/4	2/1/4	2/1/4	2/1/4
Package	80 LQFP	100 LQFP	100 LQFP, 144 LQFP	144 LQFP	196 BGA	196 BGA	196 BGA
Temperature (T_j)	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C

i.MX RT11XX MCU FAMILIES | STANDARD KEY FEATURES

The i.MX RT1170 MCU family is setting speed records at 1GHz. This ground-breaking family combines superior computing power and multiple media capabilities with ease of use and real-time functionality. The dual core i.MX RT1170 runs on the Arm® Cortex®-M7 core at 1 GHz and Cortex-M4 core at 400 MHz. The dual core i.MX RT1160 runs on the Cortex-M7 core at 600 MHz and Cortex-M4 core at 240 MHz. Both product families provide advanced security in addition to support over a wide temperature range making it ideal for several markets.

	i.MX RT1170	i.MX RT1160
Core/Speed	Arm Cortex-M7 @ 1 GHz, Cortex-M4 @ 400 MHz	Cortex-M7 @ 600 MHz, Cortex-M4 @ 240 MHz
Cache	32 KB-I, 32 KB-D	32 KB-I, 32 KB-D
TCM	Up to 512 KB	Up to 512 KB
On-chip RAM	2 MB	1 MB
On-chip flash	-	-
External memory	8-/16-/32-bit interface for SDRAM, SRAM, NOR, NAND	8-/16-/32-bit interface for SDRAM, SRAM, NOR, NAND
Quad/Octal SPI/HyperBus™	1 x dual-channel/8-bit 1 x dual-channel/ 16-bit	1 x dual-channel/8-bit 1 x dual-channel/ 16-bit
SDIO	SD 3.0/eMMC 5.0 x 2	SD 3.0/eMMC 5.0 x 2
Ethernet	1 Gbit/s w/ AVB + 1Gbit/s w/ TSN + 10/100 Mbit/s w/ IEEE 1588	1 Gbit/s w/ AVB + 10/100 Mbit/s w/ IEEE 1588
USB with PHY	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	CAN FD x 3	CAN FD x 3
Graphics	PxP for 2D acceleration, 2D GPU with vector graphics acceleration	PxP for 2D acceleration, 2D GPU with vector graphics acceleration
Camera interface	8-/10-/16- bit parallel, 2-lane MIPI CSI	8-/10-/16- bit parallel, 2-lane MIPI CSI
LCD	8-/16-/18-/24-bit parallel, 2-lane MIPI DSI	8-/16-/18-/24-bit parallel, 2-lane MIPI DSI
Security	TRNG, AES-128/256, SHA1/SHA2, Secure Boot, RSA4096, DES/3DES, Tamper Detection PUF, UDF, Secure RAM, Elliptic Curve Cryptography	TRNG, AES-128/256, SHA1/SHA2, Secure Boot, RSA4096, DES/3DES, Tamper Detection PUF, UDF, Secure RAM, Elliptic Curve Cryptography
UART/SPI/I²C/FlexIO	12/6/6/2	12/6/6/2
I²S/SPDIF	4/1	4/1
ADC	4.2M sample/s x 2	4.2M sample/s x 2
Analog Comparator/DAC	4/1	4/1
FlexPWM/quad timer/quad ENC	4/4/4	4/4/4
GPT/PIT/WDOG	6/2/6	6/2/6
Package	289 BGA	289 BGA
Temperature (T_j)	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C Automotive -40 °C to 125 °C	Commercial: 0 °C to 95 °C Industrial: -40 °C to 105 °C Extended Industrial: -40 °C to 125 °C

i.MX RT500 and i.MX RT600 MCU FAMILIES | STANDARD KEY FEATURES

The i.MX RT500 and i.MX RT600 families of secure and embedded crossover MCUs pair a high-performance DSP core with the real-time functionality of an Arm Cortex-M33 core to help unlock the potential of IoT edge applications.

	i.MX RT500	i.MX RT600
Core/Speed	Arm Cortex-M33 @ 200 MHz + Cadence® Tensilica® Fusion F1 DSP* @ 200 MHz	Arm Cortex-M33 @ 300 MHz + Cadence Tensilica HiFi 4 DSP @ 600 MHz
Cache	2 x 32 KB (FlexSPI)	32 KB (FlexSPI), 96 KB (DSP)
SRAM	Up to 5 MB	4.5 MB
Quad/Octal SPI HyperBus	2 x dual-channel, on-the-fly decryption (on 1 x FlexSPI)	1 x dual-channel, on-the-fly decryption
SDIO	2 x eMMC 5.0/SD 3.0	2 x eMMC 5.0/SD 3.0
USB with PHY	1 x HS/FS	1 x HS/FS
Graphics*	2D GPU with vector graphics acceleration	-
CSI	8/10/16-bit parallel (FlexIO)	-
LCD	8/10/16/18/24-bit parallel (FlexIO) + LCD Interface + MIPI DSI	-
Security	AES-256, SHA1/SHA2, secure boot, SRAM PUF, TRNG, cryptography hardware coprocessor attached to Cortex-M33 CPU	AES-256, SHA1/SHA2, secure boot, SRAM PUF, TRNG, cryptography hardware coprocessor attached to Cortex-M33 CPU
FlexComm	Up to 17 x FlexComm (14x config. as I^2C/UART/SPI/I^2S + 2 x HS SPI + 1 x I^2C)	Up to 10 x FlexComm (8 x config. as I^2C/UART/SPI/I^2S + 1 x HS SPI + 1 x I^2C)
FlexIO/HS SPI/I^2C/I^3C	1/2/1/2	0/1/1/1
ADC	1M sample/s	1M sample/s
Analog Comparator	1	1
PWM	10 GP/PWM outputs + 8 GP inputs	10 GP/PWM outputs + 8 GP inputs
DMIC	8 channels w/ decimators and voice activation detect	8 channels w/ decimators and voice activation detect
GPT/SCT/WDOG	5/1/2	5/1/2
GPIOs	Up to 136	Up to 147
Packages	249 FOWLP, 141 CSP	249 FOWLP, 176 BGA, 114 CSP
Temperature (T_a)	Commercial: -20 °C to 70 °C	Commercial: -20 °C to 85 °C

*Product variants without integrated DSP and/or graphics are also available.

i.MX RT SERIES | ADVANCED SECURITY FEATURES

Security is essential in today's world as the number of intelligent, connected devices continue to grow, increasing data privacy and security concerns. Secure development with the i.MX RT series leverages years of experience gained from its applications processor lineage. With the combination of integrated security and associated software and tools for secure boot, the foundation for meeting today's security requirements can be achieved with i.MX RT series MCUs.

	i.MX RT1011	i.MX RT1015/2x	i.MX RT105x	i.MX RT106x	i.MX RT116x	i.MX RT117x*	i.MX RT5xx*	i.MX RT6xx*	MCUXpresso SW and Tools Enablement
Crypto HW Accelerator	DCP	DCP	DCP	DCP	CAAM	CAAM	HASHCRYPT Casper	HASHCRYPT Casper	MCUXpresso SDK Examples
AES	AES128	AES128	AES128	AES128	AES128/ 192/256	AES128/ 192/256	AES128/ 192/256	AES128/ 192/256	MCUXpresso SDK Examples
SHA	SHA1/256	SHA1/256	SHA1/256	SHA1/256	SHA1/224/256/ 384/512, MD5	SHA1/224/256/ 384/512, MD5	SHA1/256	SHA1/256	MCUXpresso SDK Examples
DES/3DES	—	—	—	—	√	√	—	—	
Elliptic Curve	—	—	—	—	Modulus up to 1024	Modulus up to 1024	Modulus up to 1024	Modulus up to 1024	
RSA	—	—	—	—	Up to 4096	Up to 4096	Up to 4096	Up to 4096	
Trust Zone	—	—	—	—	—	—	√	√	MCUXpresso SDK Examples, MCUXpresso IDE Project Templates, MCUXpresso Config Tools (TEE), MCUXpresso Secure Provisioning Tool (TrustZone Config)
True RNG	√	√	√	√	√	√	√	√	MCUXpresso SDK Examples
Run Time Integrity Protection (RTIC)	—	—	—	—	√	√	—	—	
Access Control	CSU	CSU	CSU	CSU	RDC / XRDC	RDC / XRDC	TEE	TEE	MCUXpresso Config Tools (TEE Tool currently supports TEE and XRDC)
XIP Encryption	OTFAD	BEE	BEE	BEE	IEE, OTFAD	IEE, OTFAD	OTFAD	OTFAD	MCUXpresso Secure Provisioning Tool (Currently supports BEE)
Secure Boot	HAB (High Assurance Boot)	HAB (High Assurance Boot)	HAB (High Assurance Boot)	HAB (High Assurance Boot)	HAB (High Assurance Boot)	HAB (High Assurance Boot)	RSA2048/ 4096	RSA2048/ 4096	
Authenticated Boot	RSA	RSA	RSA	RSA	RSA, ECDSA	RSA, ECDSA	RSA	RSA	MCUXpresso Secure Provisioning Tool (Generation of authenticated images)
Secure Key Storage	eFUSE	eFUSE	eFUSE	eFUSE	PUF, eFUSE	PUF, eFUSE	PUF, eFUSE	PUF, eFUSE	MCUXpresso Secure Provisioning Tool (Programming of eFUSE values)
Tamper Detection (Passive/Active)	—	—	—	—	—	√ 10 / 5 volt, temp, freq (RT1173 only)	—	—	
Battery Domain	SNVS (Secure Non-volatile Storage)	SNVS (Secure Non-volatile Storage)	SNVS (Secure Non-volatile Storage)	SNVS (Secure Non-volatile Storage)	SNVS (Secure Non-volatile Storage)	SNVS (Secure Non-volatile Storage)	—	—	
Secure Debug	Challenge-response (64-bit)	Challenge-response (56-bit)	Challenge-response (56-bit)	Challenge-response (56-bit)	Challenge-response (128-bit)	Challenge-response (128-bit)	Certificate-based	Certificate-based	Secure Provisioning SDK (Support Certificate-based authenticated debug)
Secure Manufacturing	—	—	—	—	Manufacturing protection	Manufacturing protection	—	—	

*These devices are part of the EdgeLock™ Assurance program. To learn more visit www.nxp.com/EdgeLockAssurance.

GET STARTED NOW

Take advantage of the broad software and tools enablement available from NXP's MCU ecosystem to reduce development effort and speed time-to-market.

NXP's MCUXpresso software and tools offer comprehensive development solutions designed to optimize, ease and accelerate embedded system development of applications based on Cortex-M core devices, including i.MX RT crossover MCUs. Tools and middleware from our partners complement the elements of MCUXpresso, allowing maximum focus on your product differentiation.

i.MX RT evaluation kits (EVKs) help take your design from concept to prototype quickly by reducing complexity, providing an ideal springboard to your product design. Expanding upon this feature-rich EVK is simplified with the Arduino® UNO compatible hardware shields site.

A cohesive approach shared across the MCUXpresso SDK, IDE, secure provisioning tool, and configuration tools brings inherent compatibility. The configuration tools, secure provisioning tool and SDK offer the same synergistic development flow when using select third-party partner IDEs. Augmented by enabling tools and software technologies from NXP and its lead partners, MCUXpresso provides enhanced efficiency from evaluation through product development to production and deployment.

MCUXpresso development tools

- MCUXpresso IDE
- MCUXpresso peripheral, pin, clock & security configuration tools
- IAR Embedded Workbench® IDE
- Arm Keil IDE
- Cadence® Tensilica® Xplorer IDE
- NXP, P&E Micro and SEGGER debug probe support
- FreeMASTER data visualization and debug tool
- MCUXpresso Secure Provisioning tools (SEC)

MCUXpresso SDK

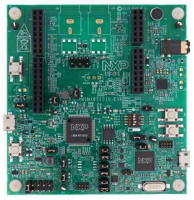
A software framework and reference for application development, MCUXpresso SDK includes production-grade software with optional Azure RTOS ThreadX or FreeRTOS, integrated enabling software technologies (stacks and middleware) from NXP and its partners, reference software, wired and wireless connectivity and USB stacks, file systems, security libraries, cloud connectivity examples and more.

Enabling Software Technologies from NXP and partners

- eIQ™ machine learning
  The eIQ software development environment is fully integrated into NXP's MCUXpresso SDK and encompasses inference engines, neural network compilers and optimized libraries, including:
  - TensorFlow Lite inference engine
  - Arm CMSIS-NN kernels
  - Glow neural network compiler
- Graphics
  - Crank and TARA evaluation versions are integrated into MCUXpresso SDK, with SDK compatible solutions from Qt, MicroEJ and Korulab
  - Free to use emWin libraries with AppWizard design tool

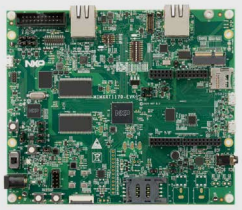
  - Free to use, safety certified Azure RTOS GUI-X library and design tool
  - Open source LVGL library with free NXP GUI Guider design tool
- Audio and Voice
  NXP provides audio and voice codecs and DSP libraries for free customer production use on i.MX RT devices with DSP cores, with the frameworks for integration. Audio frameworks are available for Arm and DSPs in i.MX RT MCUs.
  - Cadence® Xtensa® Audio Framework (XAF)
  - NatureDSP Library
  - AAC, MP3 and Ogg/Vorbis decoder
  - SBC and Opus codecs (encoder/decoder)
  - Synchronous and asynchronous sample rate converters
- Motor control
- Sensory processing
- Zephyr RTOS, MQX and NuttX support available (selected platforms)

FEATURES OF i.MX RT10XX EVALUATION KITS

Part Number	MIMXRT1010-EVK	MIMXRT1015-EVK	MIMXRT1020-EVK	MIMXRT1024-EVK	IMXRT1050-EVKB	MIMXRT1060-EVK MIMXRT1060-EVKB	MIMXRT1064-EVK
Processor	MIMXRT1011DAE5A	MIMXRT1015DAF5A	MIMXRT1021DAG5A	MIMXRT1024DAG5A	MIMXRT1052DVL6B	MIMXRT1062DVL6AVA/B	MIMXRT1064DVL6A
Memory	128 Mbit QSPI Flash	128 Mbit QSPI Flash	256 Mbit SDRAM memory 64 Mbit QSPI Flah	256 Mbit SDRAM memory 64 Mbit QSPI Flah	256 Mbit SDRAM memory 512 Mbit HyperFlash™ 64 Mbit QSPI Flah	256 Mbit SDRAM memory 512 Mbit HyperFlash 64 Mbit QSPI Flah	256 Mbit SDRAM memory 512 Mbit HyperFlash 64 Mbit QSPI Flah
Debug Capabilities	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger
Expansion Connectors	Arduino expansion	Arduino expansion	Arduino expansion	Arduino expansion	Arduino expansion Parallel LCD connector Camera connector	Arduino expansion Parallel LCD connector Camera connector	Arduino expansion Parallel LCD connector Camera connector
User Interface	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs
Connectivity	Micro USB OTG connector	Micro USB OTG connector	Micro USB OTG connector Micro USB host connector Ethernet (10/100T) connector CAN transceivers TF socket for SD card	Micro USB OTG connector Micro USB host connector Ethernet (10/100T) connector CAN transceivers TF socket for SD card	Micro USB OTG connector Micro USB host connector Ethernet (10/100T) connector CAN transceivers TF socket for SD card	Micro USB OTG connector Micro USB host connector Ethernet (10/100T) connector CAN transceivers TF socket for SD card M.2 interface (included with MIMXRT1060-EVKB only) Mfi interface (included with MIMXRT1060-EVKB only)	Micro USB OTG connector Micro USB host connector Ethernet (10/100T) connector CAN transceivers TF socket for SD card
Sensor	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ
Audio	Audio codec 4-pole audio External speaker connection Microphone	Audio codec 4-pole audio External speaker connection Microphone	Audio codec 4-pole audio External speaker connection Microphone	Audio codec 4-pole audio External speaker connection Microphone	Audio codec 4-pole audio External speaker connection Microphone SPDIF connector	Audio codec 4-pole audio External speaker connection Microphone SPDIF connector Audio extension support (included with MIMXRT1060-EVKB only)	Audio codec 4-pole audio External speaker connection Microphone SPDIF connector
Included Camera	N/A	N/A	N/A	N/A	N/A	MT9M114 image sensor (included with MIMXRT1060-EVK only)	MT9M114 image sensor (included)
Supported LCDs	N/A	N/A	N/A	N/A	RK043FN02H-CT* (4.3”)	RK043FN02H-CT* (4.3”)	RK043FN02H-CT* (4.3”)
Board Image							

* Purchased separately from NXP

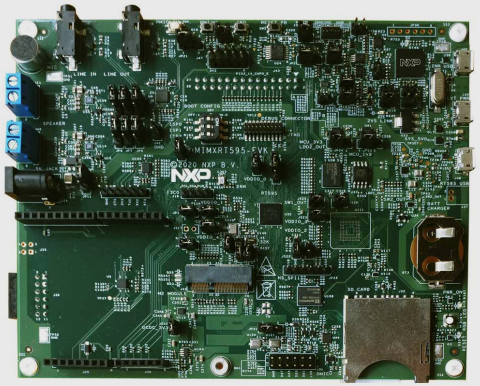
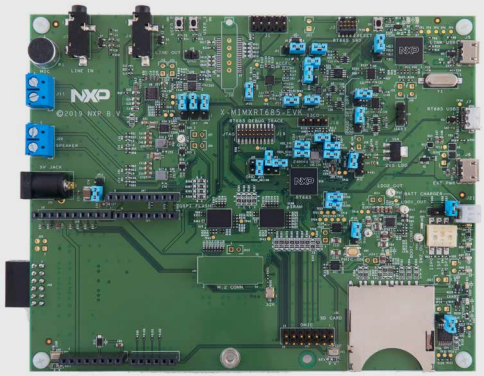
FEATURES OF i.MXRT11XX EVALUATION KITS

Part Number	MIMXRT1160-EVK	MIMXRT1170-EVK
Processor	MIMXRT1166DVM6A	MIMXRT1176DVMAA
Memory	512 Mbit SDRAM memory 512 Mbit Octal Flash 128 Mbit QSPI Flash	512 Mbit SDRAM memory 512 Mbit Octal Flash 128 Mbit QSPI Flash 2 Gbit Raw NAND Flash 64 Mbit LPSPI Flash
Debug Capabilities	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger
Expansion Connectors	Arduino interface MIPI® LCD connector MIPI camera sensor connector	Arduino interface MIPI® LCD connector MIPI camera sensor connector
User Interface	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs
Connectivity	2x Micro-USB OTG connectors Ethernet (10/100/1000M) connector Ethernet (10/100M) connector M.2 connector CAN transceivers FRDM motor control interface TF socket for SD card	2x Micro-USB OTG connectors Ethernet (10/100/1000M) connector Ethernet (10/100M) connector M.2 connector CAN transceivers FRDM motor control interface TF socket for SD card SIM card slot
Sensor	N/A	6-axis ecompass sensor NXP FXOS8700CQ
Audio	Audio codec 4-Pole audio headphone jack External speaker connection Microphone (analog and digital) SPDIF Connector	Audio codec 4-Pole audio headphone jack External speaker connection Microphone (analog and digital) SPDIF Connector
Power	5V/3A power adaptor	5V/3A power adaptor
Included Camera	N/A	OV5640 MIPI camera module (included)
Supported LCD	RK05HDMIPI4M* (MIPI I/F, 5.5", 720x1280)	RK05HDMIPI4M* (MIPI I/F, 5.5", 720x1280)
Board Image		

*Purchased separately from NXP

www.nxp.com/iMXRT

FEATURES OF i.MX RT500 AND i.MX RT600 EVALUATION KITS

Part Number	MIMXRT595-EVK	MIMXRT685-EVK
Processor	MIMXRT595SFFOC	MIMXRT685SFVKB
Memory	64 MB Octal SPI Flash 8 MB PSRAM 16 GB eMMC	64 MB Octal SPI Flash 8 MB PSRAM
Debug Capabilities	JTAG connector On-board DAP-Link debugger	JTAG connector On-board DAP-Link debugger
Expansion Connectors	Arduino expansion PMOD expansion Expansion connector for 8-channel microphone board I³C header Flexcomm header FlexIO display header MIPI display connector	Arduino expansion PMOD expansion Expansion connector for 8-channel microphone board I³C header Flexcomm header
User Interface	Reset and user buttons for easy testing of software functionality User LEDs	Reset and user buttons for easy testing of software functionality User LEDs
Connectivity	High/full-speed USB port with micro-A/B connector for the host or device functionality SD Card slot	High/full-speed USB port with micro-A/B connector for the host or device functionality SD Card slot
Sensor	6-axis ecompass sensor NXP FXOS8700CQ	6-axis ecompass sensor NXP FXOS8700CQ
Audio	DMIC header Dual Knowles SPH0641lM4H digital microphone Stereo audio codec with audio line In/out Dual Class-D amplifiers with speaker connectors	DMIC header Dual Knowles SPH0641lM4H digital microphone Stereo audio codec with audio line in/out Dual Class-D amplifiers with speaker connectors
Supported LCDs	RK05HDMIPI4M* (MIPI I/F, 5.5”, 720 x 1280) G1120B0MIPI* (MIPI I/F, 390 x 390) MIKROE-2406** (FlexIOI/F, 800 x 480, capacitive touch)	N/A
Board Image		

* Purchased separately from NXP

** Purchased separately from third party

nxp.com/iMXRT and community.nxp.com/community/iMXRT

Document Number: IMXRTPORTBR REV 2

Product Longevity