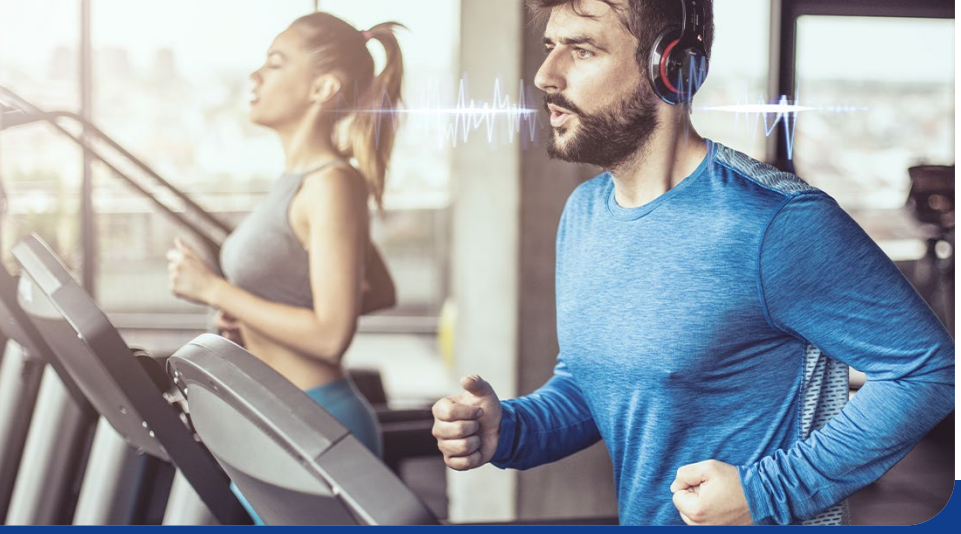


Powering the next generation of ML/AI, voice and audio applications

i.MX RT600 Family of Crossover MCUs

The i.MX RT600 family of secure and embedded crossover MCUs pairs a high-performance Cadence® Tensilica® HiFi 4 DSP core with the real-time functionality of an Arm® Cortex®-M33 core to help unlock the potential of ML/AI end nodes.

THE CROSSOVER MCU MARKET

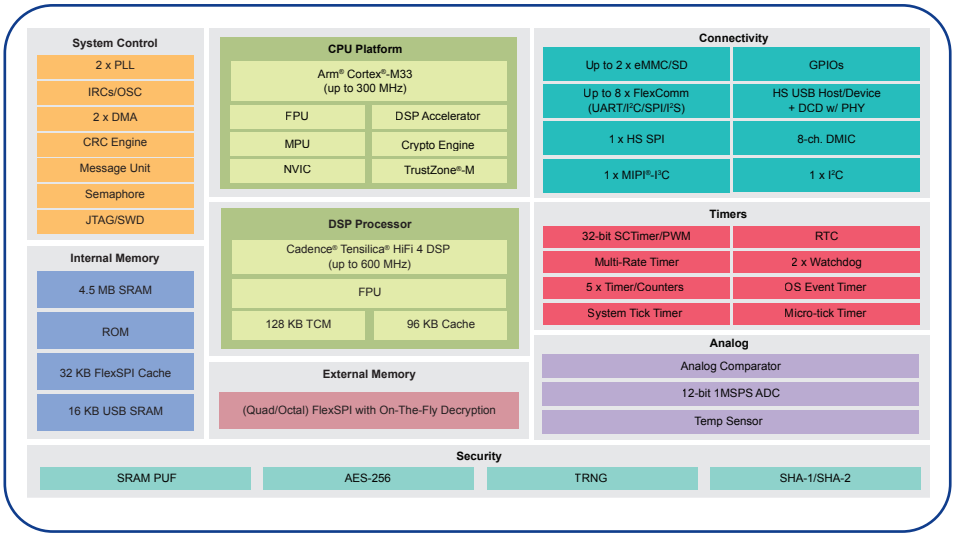
Drawing on its expertise as a leading supplier of both applications processors and microcontrollers (MCUs), NXP introduces the i.MX RT600 family, a new class of crossover MCUs that strikes balance between power optimization and high-performance capabilities.

- High performance, real-time processing
- Low power
- Rich integration
- Hardened security

TARGET APPLICATIONS

- Audio subsystem
- ML-based edge applications
- Voice recognition consumer electronics
- Voice-enabled IoT devices

i.MX RT600 CROSSOVER MCU FAMILY BLOCK DIAGRAM



PERFORMANCE HIGHLIGHTS

- Highly optimized Cadence Tensilica HiFi 4 DSP engine
  - Featuring emerging multichannel object-based audio standards
  - Ideal for DSP-intensive applications
- High-performing Arm® Cortex®-M33 core
  - Next-generation core based on the ARMv8-M architecture
  - Hardware co-processors provide accelerated support for additional DSP algorithms and cryptography
- Extensive memory resources
  - 4.5 MB SRAM accessible to both cores and both DMA engines to simplify development complexity

USABILITY HIGHLIGHTS

Design Flexibility

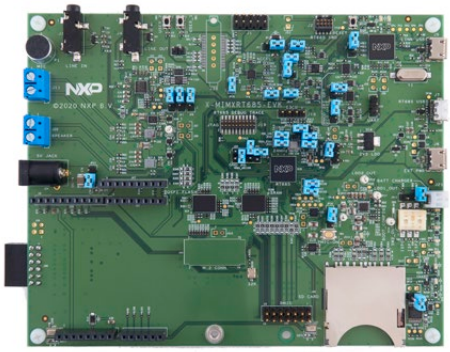
- Improved power efficiency
  - Wide dynamic voltage and performance range
  - Simplified power modes with fast wake-up and low leakage
  - Configurable blocks of memory for individual power gating and retention
- Advanced audio subsystem interfaces
  - DMIC interface supporting eight channels and voice activation detect
  - Up to 8 x I^2S interfaces for high-performance, multichannel audio
- External memory interface options
  - Octal/Quad SPI with cache and dynamic decryption
- Numerous connectivity and communication interfaces
  - SDIO for Wi-Fi®-enabled streaming
  - High-speed USB device/host and high-speed SPI interfaces

i.MX RT600 MCU FAMILY OPTIONS

Part Number	Control Processor	DSP Processor	SRAM	Temp (Ta)	Package
MIMXRT685SFVKB	300 MHz Cortex-M33	Up to 600 MHz HiFi 4 DSP	4.5 MB	-20 to 70 °C	176 VFBGA
MIMXRT685SFFOB*	300 MHz Cortex-M33	Up to 600 MHz HiFi 4 DSP	4.5 MB	-20 to 70 °C	249 FOWLP
MIMXRT685SFAWBR*	300 MHz Cortex-M33	Up to 600 MHz HiFi 4 DSP	4.5 MB	-20 to 70 °C	114 WLCSP

* Part number coming soon

MIMXRT685-EVK



Advanced Security

- Arm TrustZone®-M for asset protection
  - System-wide, secure resource isolation for trusted hardware
- Secure boot mechanism with SRAM PUF or OTP-based unique key for hardware-based root of trust
- Symmetric and asymmetric cryptography acceleration
  - AES-256, SHA2-256
  - ECC and RSA
- Secure debug authentication

MIMXRT685-EVK | DEVELOPMENT HIGHLIGHTS

- Supports development of MIMXRT685
- Octal SPI Flash and PSRAM memories
- Audio codec with stereo line in and line out
- Dual DMICs
- DMIC expansion connector supporting up to 8 DMICs
- Micro USB supporting host or device operation
- Arduino® interface
- 10-pin and 20-pin SWD connectors
- On-board debug probe
- MCUXpresso software and tools support, including SDK with FreeRTOS
- Cadence Tensilica Xplorer tools support for HiFi 4 DSP development

www.nxp.com/iMXRT600

Document Number: IMXRT600FAMILYFS REV 6