32-bit Microcontrollers

Qorivva MPC563xM Family
32-bit MCUs for entry-level powertrain applications

Target Applications
- 1–4-cylinder gasoline direct injection engines
- Entry-level diesel engines
- Entry-level transmission

Overview
The Qorivva MPC563xM is Freescale's first 32-bit, 90 nm powertrain MCU family built on Power Architecture® technology designed for up to 4-cylinder engines. It not only offers enhanced powertrain functionality, such as on-chip emission control, but addresses cost constraints for 32-bit powertrain applications. If you are currently using 16-bit solutions for powertrain, the Qorivva MPC563xM enables you to go beyond 16-bit capabilities with a family that offers up to 1.5 MB of flash, 111K of total SRAM and up to 80 MHz of CPU performance.

Go Green by Reducing Knock
- On-chip knock system makes tight emission control affordable and allows a three to five percent improvement of economy and power
- Power and memory size allow fast development of "clean sheet" solutions to meet emissions legislation
- No active external components required for on-chip knock system through variable on-chip gain and sensor bias
- Same integrated components can be used for a patented sensor diagnostics scheme that meets on-board diagnostics

Ease of Use
- Offers a 144-pin quad flat package (QFP) option. QFP has visible pins, making it easier to assemble and inspect since infrared and X-ray technology is not required
- Microsecond bus enabled for connecting ASIC with the Qorivva MPC563xM family

Mitigates Supply Risk
- The Qorivva MPC563xM family of devices offers dual-sourced solutions, enabling you to design applications with confidence that the supply will be there

Improves Performance
- Combination of hardware decimator and DMA can lead to a savings of up to five percent of the CPU load
- eTPU and I/O configured to handle electronic manual transmissions (paddle flap) applications where up to four brushless DC motors are used
- Offers 32 eTPU2 channels to handle complex timer applications and offload the CPU

Helps Save Cost
- Requires only one linear power supply (5V)
- Compatibility with existing Qorivva MPC5500 family allows code sharing and cost reduction of existing solutions into these new markets

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Qorivva MPC563xM Block Diagram
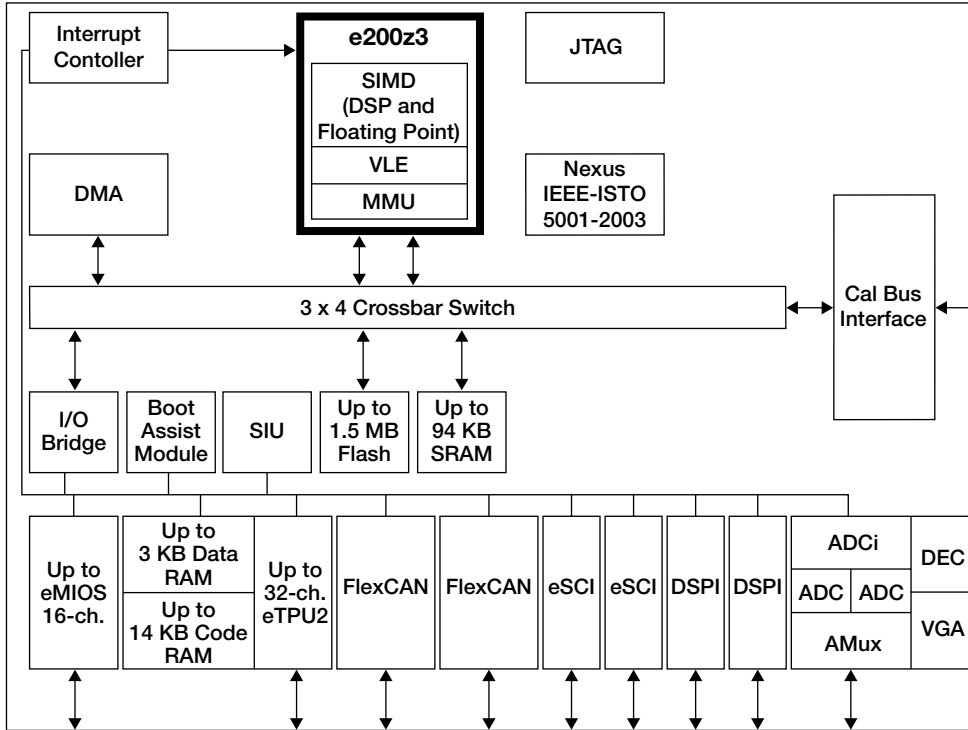
◻ Freescale Technology

Selector Guide

Product	Frequency Options	Flash	RAM	eTPU2	eMIOS	QADC	Package Options
MPC5634M	40 MHz, 60 MHz, 80 MHz	1.5 MB	94K	1 x 32-ch.	1 x 16-ch.	34-ch. dual 12-bit	144 LQFP, 176 LQFP, 208 MAPBGA
MPC5633M	40 MHz, 60 MHz, 80 MHz	1 MB	64K	1 x 32-ch.	1 x 16-ch.	34-ch. dual 12-bit	100 LQFP, 144 LQFP, 176 LQFP, 208 MAPBGA
MPC5632M	40 MHz, 60 MHz	768K	48K	1 x 32-ch.	1 x 8-ch.	32-ch. dual 12-bit	100 LQFP, 144 LQFP

Qorivva MPC563xM Key Features

- e200z3 core, built on Power Architecture technology, up to 80 MHz
- Single instruction/multiple data (SIMD) module for DSP and floating point operations
- Variable length encoding (VLE) capability to help reduce code footprint by up to 30 percent for improved code density and reduced memory requirements
- Family includes 768 KB, 1 MB and 1.5 MB flash memory options with ECC
- Up to 111 KB SRAM
- 32-channel eTPU2 to handle complex timer applications and offload the CPU
- Up to 34-channel dual analog-to-digital converter (ADC) with differential channels and input variable gain amplifiers
- 2 x FlexCAN compatible with TouCAN, 64 + 32 buffers
- 2 x eSCI
- 2 x DSPI (16 bits wide) up to six chip selects each with continuous mode mode, DMA and microsecond bus channel (MSC) support
- Die temperature sensor
- 32-channel enhanced DMA controller
- 191 source interrupt controller
- Nexus IEEE-ISTO 5001-2003 Class 2+ (eTPU2 Class 1)
- Single 5V power supply with internal regulator supporting 3.3V
- Frequency modulating phase-locked loop (FMPLL)
- 100 LQFP, 144 LQFP, 176 LQFP, 208 MAPBGA and VertiCal Calibration System package options

Learn More: For current information about the Qorivva MPC563xM family, please visit **freescale.com/Qorivva**.

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