# Qorivva MPC560xP Family

## MCUs built on Power Architecture® technology for safety and chassis applications

### Applications

- Electronic power steering
- Active suspension
- Electromechanical braking
- Electric motor control
- Brushless DC motors
- Electric hybrid car engines
- Airbags

### Overview

The Qorivva MPC560xP family is the latest MCU solution built on Power Architecture® technology for sophisticated chassis applications. It can enable electronic replacement for heavy hydraulic and engine-driven applications to help improve fuel efficiency and reduce greenhouse gas emissions, while meeting the latest safety requirements for functional safety applications. The Qorivva MPC560xP family is part of the Freescale SafeAssure portfolio of solutions.

### SafeAssure Program: Functional Safety. Simplified.

Freescale's SafeAssure functional safety program is designed to help system manufacturers more easily achieve system compliance with functional safety standards: International Standards Organization (ISO) 26262 and International Electrotechnical Commission (IEC) 61508. The program highlights Freescale solutions—hardware and software—that are optimally designed to support functional safety implementations and come with a rich set of enablement collateral. For more information, visit **freescale.com/SafeAssure**.

### Fully Integrated System on Chip (SoC) Design

- Reduces board size, chip count and logistics/support costs
- Reduces systems complexity and bill of materials
- Widely supported ecosystem, built on Power Architecture technology, minimizes development investment (suppliers, compilers, debuggers and modeling tools)
- Freescale AUTOSAR and motor control libraries reduce development time and optimize performance

### Electronic Control Improves Efficiency and Mileage

- Lightweight electronic steering system consumes energy only when steering support is needed

- Computation performance, pulse width modulation (PWM), analog-to-digital conversion (ADC) and timers for complex field-oriented control algorithms improve electric motor efficiency and reliability
- Cross triggering units enable deterministic control of events and offloads CPU of expensive context switches
- PWM with high-resolution 120 MHz timers and protection features specific to electric motor control

### Addresses Latest Functional Safety Standards

- Fault collection unit monitors and manages fault events
- FlexRay™ option and CAN networking for robust, high-speed, low-latency messaging
- Error correction coding (ECC) on RAM and flash memory allows memory error detection/correction

**freescale**™
Qorivva

## Development Tools

### Software

- CodeWarrior Development Studio V10.1
- Lauterbach debugger patch for MPC560XP
- RAppID initialization tool includes pin allocation wizard
- Green Hills MULTI (compiler/debugger)
- Wind River compiler
- P&E Micro debug/flash tool
- iSYSTEM debugger

### Runtime Software

- AUTOSAR 3.x OS
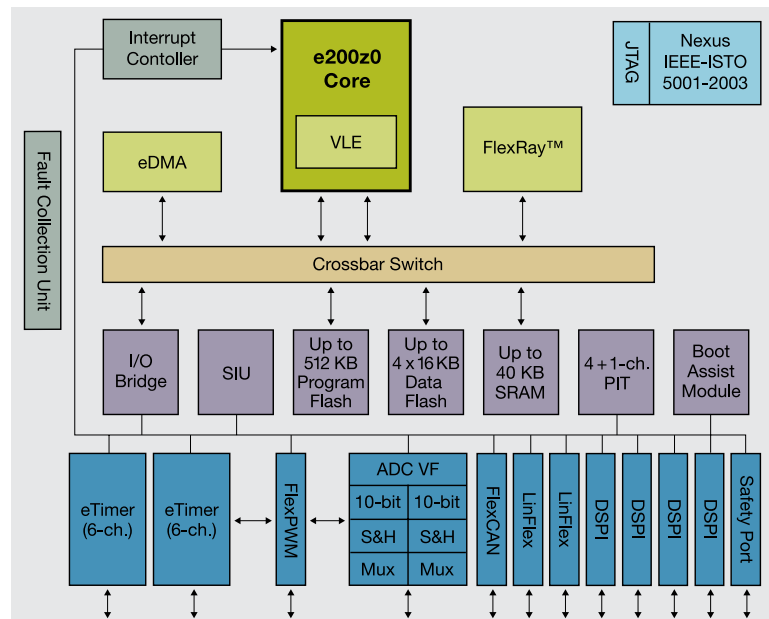- AUTOSAR 3.x MCAL

### Tools

- Evaluation board kit (main module, mini-module and P&E Micro multilink)
- Adapters (mini-module)

## Key Features

- Up to 64 MHz e200z0 core built on Power Architecture technology
- Up to 512 KB program flash with ECC
- Up to 4 x 16 KB DataFlash® with ECC
- Up to 40 KB SRAM with ECC
- Cross triggering unit manages sample timing and offloads CPU from frequent interrupts
- High-precision PWM
- 2 x eTimer
- 2 x ADC
- Up to 2 x PLL

## Qorivva MPC5604P Block Diagram



## Qorivva MPC560xP Family Comparison

| Device | MPC5601P | MPC5602P | MPC5603P | MPC5604P |
|---|---|---|---|---|
| Program flash with ECC | 192 KB | 256 KB | 384 KB | 512 KB |
| Data flash (option) | 64 KB | 64 KB | 64 KB | 64 KB |
| RAM with ECC | 12 KB | 20 KB | 36 KB | 40 KB |
| 32-bit core | e200z0 | e200z0 | e200z0 | e200z0 |
| CPU performance | Up to 64 MHz | Up to 64 MHz | Up to 64 MHz | Up to 64 MHz |
| Interrupt controller | 120 channels | 120 channels | 147 channels | 147 channels |
| FlexRay (option) | No | No | Dual channel | Dual channel |
| Periodic interrupt timer | 4 x 32-bit | 4 x 32-bit | 4 x 32-bit | 4 x 32-bit |
| eDMA | 16 channels | 16 channels | 16 channels | 16 channels |
| FlexCAN | 1 | 2 | 2 | 2 |
| eTimer | 1 x 6-channel | 1 x 6-channel | 2 x 6-channel | 2 x 6-channel |
| FlexPWM | No | 1 x 8-channel | 1 x 8-channel | 1 x 8-channel |
| ADC | 1 x 10-bit | 1 x 10-bit | 2 x 10-bit | 2 x 10-bit |
| LINFlex | 1 | 2 | 2 | 2 |
| DSPI | 1 | 3 | 4 | 4 |
| Temperature sensor | No | No | Yes | Yes |
| Package options | 64/100 LQFP | 64/100 LQFP | 100/144 LQFP | 100/144 LQFP |

## For more information, visit freescale.com/Qorivva