The MPC564xL family is specifically designed to support actuator control applications for vehicle electrification. Enabled by the new cross-triggering unit, the device allows control of up to two brushless DC motors or multiple valves with only minimum interrupt load. Additional features include the fault collection unit, FlexRay™ protocol, two 12-bit ADCs, eTimer units and a built-in hardware self test.
System Challenges | MPC564xL Solution
--- | ---
Reduce system costs and simplify design | • Reduces design complexity and component count by putting key functional safety features on a single chip
• Dual processing spheres, including CPU, DMA, interrupt controller, crossbar and MPU for logic level fault detection
• Dual 4 CPU architecture provides performance to address real-time applications and cross-checking functions common in many safety strategies, which reduces hardware and software complexity used in multiple MCU designs. The architecture can be run in two statically configurable modes of operation
  ◦ Lockstep operation provides a software environment for redundant processing and calculations
  ◦ Independent core operation (dual parallel mode) provides a software environment for diverse processing and calculations to increase performance or to cross check for reliable operation
• Built-in flexible hardware self-test capabilities provide diagnostic coverage both at logic and memory level
• Fault collection and control unit manages MCU behavior in the event of internal MCU logic faults and signals these to external system components
• FlexRay protocol and safety ports for robust communications
• Probability of undetected failure per hour (PFH) = 0.1 FIT (one failure per every 10 billion hours)
• Designed to address safety requirements outlined in IEC61508 and ISO26262, which reduces system cost and effort

Precise and deterministic control timing for real-time applications, such as motor control | • e200 dual-issue 4 CPU at 120 MHz provides computational performance targeted at vector-oriented control of motor applications
• Dual-core architecture provides computation ability for complex applications or cross-checking requirements of safety applications
• Precise control of integrated electric motor control periphery
  ◦ Advanced PWM for specialized multi-phase motor control requirements
  ◦ Configurable alignment
  ◦ High frequency above 100 MHz
  ◦ Dead time insertion
  ◦ Skew correction
• Cross-triggering unit coordinates ADC, timer and PWM generation and minimizes CPU interrupt load
• eTimer units handle rotor position and speed acquisition and offer six dual-action IC/OC channels with incremental/quadrature encoder mode
• Two 12-bit ADCs offer precise conversion for improved driving experience
• FlexRay protocol for fault tolerant communications with other networked modules within the vehicle
• Up to 1 MB flash
• Up to 128K SRAM
• Motor control library of common functions
• Ability to control two 3-phase motors, ideal for electrical steering applications

Package Options
<table>
<thead>
<tr>
<th>Temp Ranges (Ta)</th>
<th>Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40ºC to +125ºC</td>
<td>144 LQFP</td>
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</tbody>
</table>

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