# 32-bit MCUs

Qorivva MPC564xB/C Family

Secure automotive body and gateway applications

Overview

The Qorivva MPC564xB/C family of 32-bit MCUs is designed for secure, next-generation, high-end automotive body control module (BCM) and gateway applications. It offers a superior level of integration to address the growing need for enhanced feature sets and increased memory space of EOM and tier 1 networks. From a security standpoint, the MPC564xB/C includes an innovative cryptographic security engine (CSE)—a set of cryptographic hardware features that allow the transmission of information in a secure and trusted manner between parties. The MPC564xB/C family also features dual Power Architecture® core options for nearly 300 DMIPs of processing capability, low-power standby/wait modes to aid in reduced power consumption and a wide communications peripheral set offering to address the range of subsystems that interface with a BCM/ gateway module. These scalable devices are supported by an enablement ecosystem that includes software drivers, operating systems and configuration code for quick design implementation.

Qorivva MPC564xB/C Block Diagram
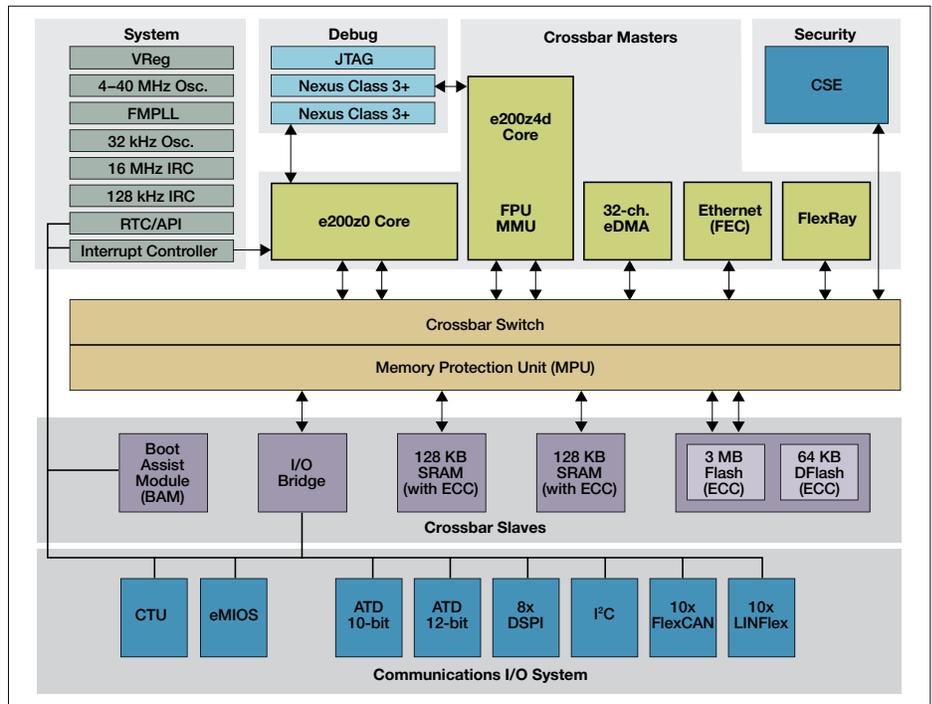
256 BGA
17 mm x 17 mm
1 mm pitch

208 LQFP
28 mm x 28 mm
.5 mm pitch

176 LQFP
24 mm x 24 mm
.5 mm pitch

Applications

- High-end body control modules
- Automotive gateway controllers

Qorivva MPC564xB/C Key Features

- The CSE hardware module is used to encode and decode data in a secure and reliable manner. Many body control modules on the market support security through software encryption capabilities. The MPC564xB/C offers this unique CSE module to move the control of cryptographic keys from the software domain to the hardware domain and significantly reduce security risks. The CSE module helps protect the security keys from software attack, provides an authentic software environment and allows for distributed key ownership. This enhanced security is ideal for a range of BCM/gateway use cases, such as immobilizers, component protection, secure flash updates, protecting data sets (mileage), digital rights management, secure communication and IP protection.

- Dual-core options feature e200z4 and e200z0 cores for maximum performance and optimal power management through use of the secondary core as an I/O manager. The e200z4 core offers up to 120 MHz of performance and the e200z0 offers up to 80 MHz.

- 3 MB of flash and 256 KB of RAM, both of which include error code correction, efficiently manage message handling and autocoding requirements.

- Optimization for communication data management:
  - Ethernet and FlexRay supporting high-speed flash programming, vehicle diagnostics and safety/chassis network interfacing
  - FlexCAN module supporting both FIFO and mailbox data storage, ideal for CAN gateways to manage event-driven vs. periodic bus traffic
  - LINFlex module providing fully automated LIN message management, reducing CPU load intervention and message latencies

- eMIOS timer combines multiple counter sources, including input capture, output compare and pulse width modulation (PWM) capabilities into one very flexible module. PWM function supports shifted signal output to improve electromagnetic compatibility.

- Cross triggering unit (CTU) synchronizes PWM output signals with analog-to-digital conversion and control capabilities.

- Offers scalability and pin and software compatibility with the MPC560xB/C family of products.

Selector Guide

Product Number	Core(s)	Flash	RAM	CSE	FlexRay	Ethernet	LINFlex	SPI	FlexCAN	Packages	Temp. Range
MPC5646C	e200z4+ e200z0	3 MB	256 KB	Optional	Yes	Yes	10	8	6	176/208 LQFP, 256 BGA	–40 ºC to +125 ºC
MPC5646B	e200z4	3 MB	192 KB	Optional	Yes	No	10	8	6	176/208 LQFP	–40 ºC to +125 ºC
MPC5645C	e200z4+ e200z0	2 MB	256 KB	Optional	Yes	Yes	10	8	6	176/208 LQFP, 256 BGA	–40 ºC to +125 ºC
MPC5645B	e200z4	2 MB	160 KB	Optional	Yes	No	10	8	6	176/208 LQFP	–40 ºC to +125 ºC
MPC5644C	e200z4+ e200z0	1.5 MB	192 KB	Optional	Yes	Yes	10	8	6	176/208 LQFP, 256 BGA	–40 ºC to +125 ºC
MPC5644B	e200z4	1.5 MB	128 KB	Optional	Yes	No	10	8	6	176/208 LQFP	–40 ºC to +125 ºC

Development Tools

Part Number	Description	Pricing*
XPC56XXMB2	Development Motherboard	$375
XDC564B256BSB3M	256 MAPBGA Socketed Daughter Card	$120
XDC564B208QSB3M	208 LQFP Socketed Daughter Card	$120
XDC564B176QSB3M	176 LQFP Socketed Daughter Card	$120
XKT564B176QSB3M	176 LQFP Socket	$497
XKT564B208QSB3M	208 LQFP Socket	$497
XKT564B256BSB3M	256 BGA Socket	$497

*Manufacturer Suggested Resale Price

For more information on Qorivva MPC564xB/C family solutions, visit freescale.com/Qorivva