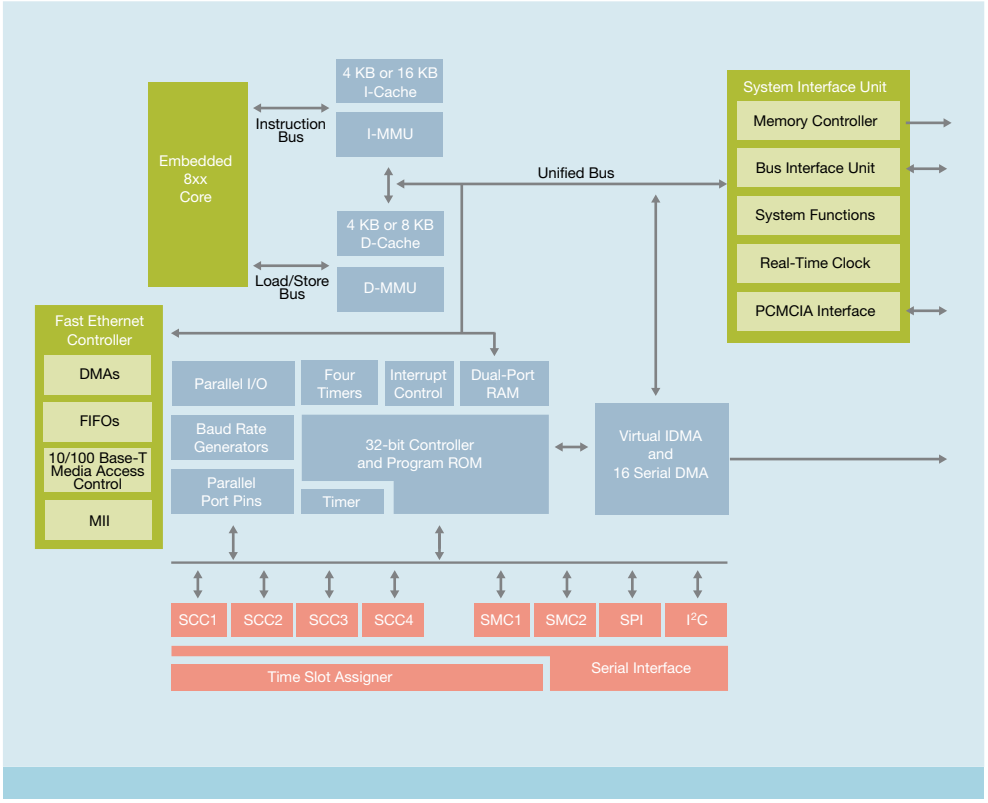
MPC860 PowerQUICC™ Family

Freescale Semiconductor's PowerQUICC™ MPC860 family is designed to deliver a versatile, on-chip integrated processor and peripheral combination that can be used in a variety of controller applications—excelling particularly in communications and networking products. Providing functionality beyond the MPC850 family, the MPC860 family and MPC855T derivative are engineered to provide higher performance in all areas of device operation including flexibility, extensions in capability and integration. The MPC860 architecture integrates two processing blocks: the embedded 8xx core compatible with the Power Architecture™ technology instruction-set architecture (ISA), and the communications processor module (CPM). The CPM is a dedicated RISC-based communications engine designed to support four serial communications controllers (SCCs), providing a total of eight serial channels: four SCCs, two serial management controllers (SMCs), one serial peripheral interface (SPI) and one I²C interface. This dual-processor architecture is designed to provide superior performance over traditional architectures because the CPM offloads communications intensive processing from the embedded 8xx core. This partitioning frees up the 8xx core to perform other system functions.

MPC860 Block Diagram



Key Features

- Power Architecture Technology
  - Embedded 8xx core
- 4 KB instruction cache and 4 KB data cache (16 KB instruction cache and 8 KB data cache available) in MPC860P and MPC860DP
- Powerful memory controller and system functions
- Efficient architecture that involves a separate RISC processor (CPM) for handling communications
- Up to four serial communications controllers (SCC)
- Support for Ethernet, Fast Ethernet, HDLC, asynchronous transfer mode (ATM) and more
- Two SMCs, one SPI and one I²C
- Additional support features, including timers, baud rate generators, etc.
- 8K dual-port RAM
- Available at 50, 66 and 80 MHz in a 357-pin RoHS compliant PBGA package
- Strong third-party tool support through Freescale's Design Alliance Program

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MPC 860 EN C VR 66 D

- MPC — Product Code: KMPC Sample Pack (2 units); MPC Fully Qualified
- 860 — 800 Series Device Number (850, 860, etc.)
- EN — Part/Module Modifier:
  - DE Dual Channel (Ethernet)
  - DT Dual Channel (10/100, Multi-HDLC, ATM)
  - DP Dual Channel (16K I-Cache and 8K D-Cache, 10/100, Multi-HDLC, ATM)
  - EN Four Channel (Ethernet)
  - SR Four Channel (Ethernet, Multi-HDLC, ATM)
  - T Four Channel (10/100, Multi-HDLC, ATM)
  - P Four Channel (16K I-Cache and 8K D-Cache, 10/100, Multi-HDLC, ATM)
- C — Temp. Range: None=0°C Ta to +95°C Tj; C=-40°C Ta to +95°C Tj
- VR — Package: VR=RoHS compliant (Pb-free) 357 PBGA; ZQ=357 PBGA
- 66 — Frequency MHz
- D — Die Mask Revision

	855T	860DE	860DT	860DP	860EN	860SR	860T	860P
Serial Communications Controllers (SCCs)	1	2	2	2	4	4	4	4
I-Cache (KB)	4	4	4	16	4	4	4	16
D-Cache (KB)	4	4	4	8	4	4	4	8
Ethernet (10T)	1	2	2	2	4	4	4	4
Ethernet (10/100)	1	-	1	1	-	-	1	1
ATM	Yes	-	Yes	Yes	-	Yes	Yes	Yes
Multi-channel HDLC	Up to 32	-	Up to 64	Up to 64	-	Up to 64	Up to 64	Up to 64

Technical Specifications

- Embedded 8xx core designed to provide 106 MIPS (using Dhrystone 2.1) at 80 MHz
  - Single-issue, 32-bit version of the embedded 8xx core with 32- x 32-bit fixed point registers
  - 4 KB instruction cache and 4 KB data cache (16 KB instruction cache and 8 KB data cache available in 860P and 860DP)
  - Memory management units with 32-entry TLBs and fully associative instruction and data TLBs
- Advanced on-chip emulation debug mode
- Data bus dynamic bus sizing for 8-, 16- and 32-bit buses
- Communications processor module
  - 8 KB dual-port RAM
  - Up to four serial communications controllers (SCCs)
  - 32-bit scaler RISC controller
  - Two serial management controllers
  - 16 serial DMA (SDMA) channels
  - One I^2C port
  - One serial peripheral interface
  - Four general-purpose timers
  - Time slot assigner
  - Interrupts
  - Four baud rate generators
  - Protocols supported
    - Ethernet IEEE® 802.3 and Fast Ethernet
    - ATM
    - HDLC
    - Asynchronous HDLC
    - Channelized HDLC
    - Multi-channel HDLC
    - Appletalk®
    - UART
    - IrDA
    - Basic rate ISDN (BRI)
    - Primary rate ISDN (PRI)
    - Totally transparent mode with/ without CRC
- System integration unit
  - Memory controller
  - Real-time clock
  - PCMCIA interface
  - System functions
  - Bus interface unit

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com**.

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