

MSC8103

The Network DSP

The MSC8103, Freescale's second StarCore® architecture-based DSP, is an integrated network-ready processor that enables systems designers to build new capabilities into a broader range of products with higher performance than ever before. With its unique combination of a SC140 DSP core, programmable Communications Processor Module (CPM) and PowerPC® bus interface, the MSC8103 offers advanced signal processing performance, flexible network connectivity and seamless system integration.

The MSC8103 is designed for demanding network infrastructure applications requiring very high performance, large amounts of on-chip memory and networking capabilities such as 2.5G and 3G wireless infrastructure systems, packet telephony solutions voice-over-Internet Protocol (VoIP), and packet aggregation. It can also provide a network interface for a DSP farm of MSC8102 devices.

Next-generation networking infrastructure systems are based on a configurable open architecture platform that supports real-time voice, fax and data on a packet-switched network. Through its integrated CPM, the MSC8103 has the unique ability to connect to the network, manage the Layer 2 and Layer 3 protocols, and extract data directly from the network.

Low-Cost Networking Performance

The MSC8103 is aggressively priced and offers an optimal solution for applications

that do not require the EFCOP found on the MSC8101. The MSC8103 provides up to 1200 MMACS of signal processing performance in a low-power, 17mm x 17mm package.

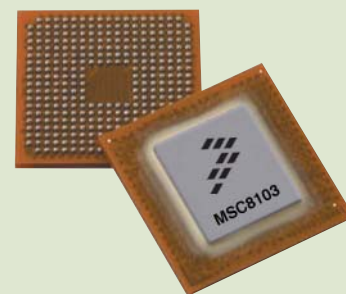
The MSC8103 CPM is a programmable 32-bit RISC protocol machine that allows connectivity to standard network backbones: ATM, Fast Ethernet and fast TDM highways. This 200 MHz CPM engine is derived from Freescale's popular MPC8260 PowerQUICC II™ microprocessor. An integrated, 100 MHz, 64-bit PowerPC bus interface allows easy connection to multimaster PowerPC-based systems and direct connectivity to PowerPC bus peripherals.

The MSC8103 contains 512 KB of static RAM and a powerful 16-channel DMA controller to facilitate data transfers between the SC140 core, internal memory, CPM and PowerPC bus interface. In addition, the programmable MSC8103 memory controller integrates support for a variety of external memory devices and peripherals.

The MSC8103 also is designed to provide cost-effective solution networking infrastructure applications that enable Freescale's customers to bring these products to market quickly, providing more time-in-market and minimizing development costs. Taking full advantage of the scalable StarCore architecture, the MSC8103 is pin-compatible with the MSC8101 and utilizes proven development tools for the MSC8101.

Product Features

- > Up to 300 MHz SC140 Core
 - Up to 1200 MMACS, 3000 RISC MIPS
- > Up to 100 MHz 64/32-bit, 60x bus
- > Up to 200 MHz CPM supporting:
 - 155 Mbps ATM
 - 10/100 Mbps Ethernet
 - Up to four E1/T1
- > 512 KB (256K words) of on-chip SRAM
- > 16-channel DMA Controller
- > Eight-bank memory controller
 - SDRAM, SRAM, DRAM, EPROM, Flash
- > 16-bit host interface
- > Low power consumption—0.86W
- > Enhanced On-Chip Emulation (EOnCE)
- > Space-saving 17mm x 17mm FC-PBGA package



Time-to-Market...Time-to-Money

In order to minimize development time, a comprehensive set of software, hardware and development tools and application software modules supports the MSC8103. Baseline development tools include the assembler, linker, C compiler, optimizer, simulator and other utilities—all supplied by Metrowerks.

The StarCore SC140 core was designed with C compilation in mind, and the compiler provides efficient code optimization while maintaining optimum code density. In addition, Freescale offers a wide choice of integrated development environments (IDE)

and real-time operating systems (RTOSes) through third-party suppliers. Another key factor in accelerating time-to-market is the availability of optimized application software modules, both in C code and assembly, for use in the customer's application. Freescale is working with a variety of third-party developers to develop complete packet telephony solutions and along with individual software examples, including speech coders, echo cancellers, fax and modem modules. In addition to low-cost EVMs, Freescale offers complete Application Development Systems and MSC8103- and PowerQUICC II-based reference designs.

Key Advantages

High Performance

- > High-speed 275, 300 MHz SC140 core yields 1100–1200 MMACS
- > Four orthogonal data ALUs provide excellent flexibility
- > Efficiently executes up to six parallel instructions in one clock cycle
- > Excellent channel density-to-power ratio

Compatibility

- > C programming supports fast time-to-market
- > High code density results in lower system costs
- > Highly maintainable due to use of C code
- > Software compatibility across the StarCore family

Low Power Dissipation

- > Supports plastic packaging
- > Enables a variety of applications

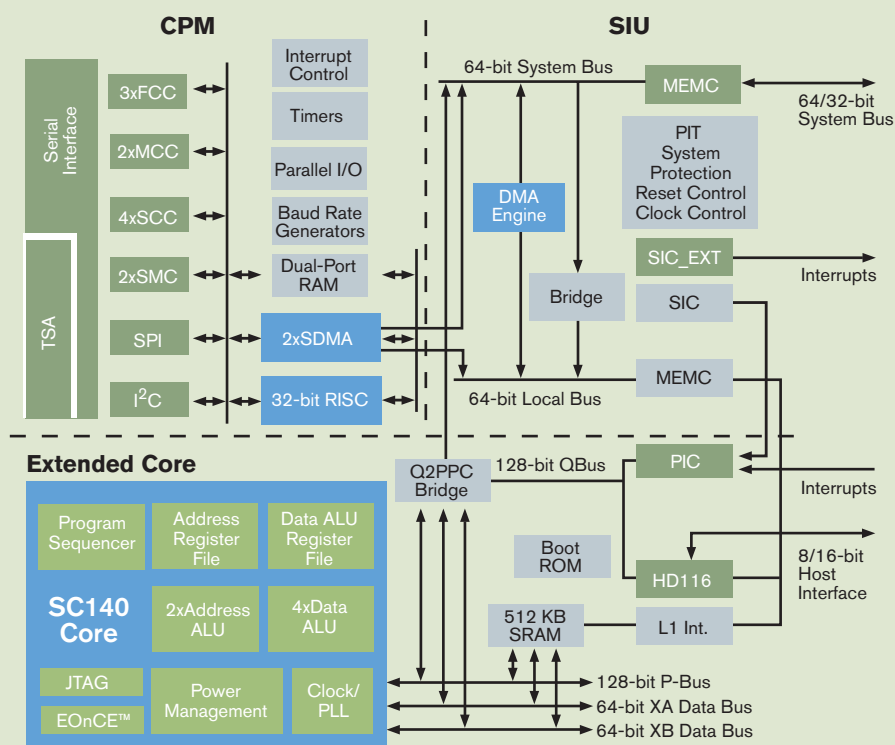
Software Development Tools

- > Tools integrated under an IDE
- > Real-time debug capability
- > Optimized C compiler generates efficient control and DSP code
- > Low overhead operating systems

Learn More

For more information about Freescale's products, please visit our Web site at www.freescale.com/smartnetworks.

MSC8103 BLOCK DIAGRAM



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