Motorola's ColdFire® MCF5307 Integrated Microprocessor

Freescale Semiconductor, Inc.

The MCF5307 provides a compelling upgrade path for existing 68K or ColdFire designs. Combining a low-cost general purpose peripheral set with the Version 3 (V3) ColdFire® core, this device achieves a 70 Dhrystone 2.1 MIPS performance level at 90 MHz. The capabilities of the single pipeline in the V3 microarchitecture deliver an attractive 1.3 MIPS/MHz without the additional cost of a second pipeline. This mid-range performance level, code compatibility and award-winning[1] integration comes at a very aggressive price level. The MCF5307 combines better mathematical performance and basic DSP functions with a comprehensive peripheral set to provide a single-chip system, while decreasing overall time to market.
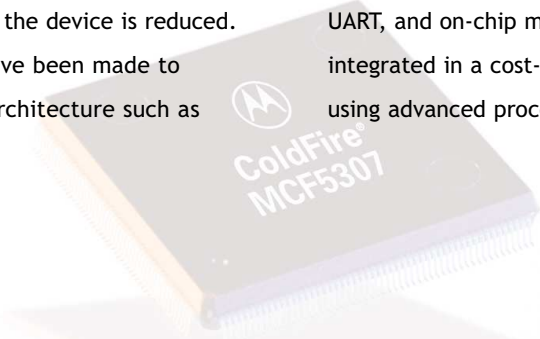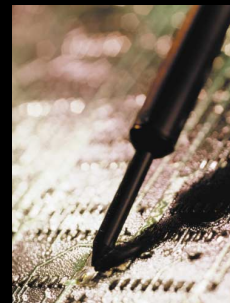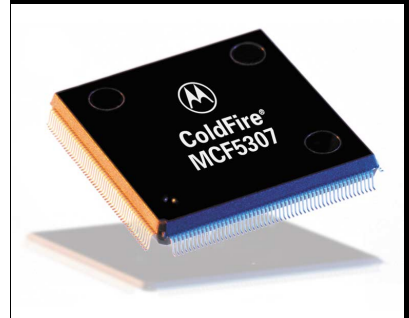
High System Performance

The MCF5307 clock multiplied core boosts CPU performance while maintaining a low-frequency domain for on-chip peripherals and external interfaces. This results in simplified integration of on-chip functions and the overall power consumption of the device is reduced. Refinements have been made to the Version 3 architecture such as incorporating powerful branch-acceleration capabilities to speed up change-of-flow operations in the instruction execution stream. The MCF5307 offers a progressive roadmap for 68K users offering more than ten times the performance of the M68EC020, twice the performance of the M68EC040 and a comparable performance level with the MC68LC060. These performance levels are combined with a broad array of integration not available with the 680x0 family, all at a fraction of the price. The package, pinout and integration mix of the MCF5307 creates an upgrade path with three times the performance for current MCF5206 designs.

Integrated Peripherals

To speed system design and reduce system cost, the MCF5307 offers a rich array of memory and peripheral integration that has been well received in the market place. Features common to many embedded applications, such as DMAs, Timers, an SDRAM interface, UART, and on-chip memories are integrated in a cost-effective manner using advanced process technologies.

For More Information On This Product,
Go to: www.freescale.com

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Contact Information:

Motorola offers user's manuals, product briefs and application notes for all of its ColdFire microprocessors. In addition, local support is also provided for these products. This information can be found at **http://www.motorola.com/ColdFire**

For all other inquiries about Motorola products, please contact the Motorola Customer Response Center at: 800-521-6274 or **http://www.motorola.com/semiconductors**

Fast Time to Market

The MCF5307 builds on and extends the successful 68K family by providing a compatible path for 68K and ColdFire microprocessor customers in which development tools, software and programmer's familiarity are quickly leveraged. In fact, customers moving from 68K to ColdFire microprocessors can use code translation and emulation tools, free of charge, subject to a licensing agreement, to facilitate modifying and reusing 68K assembly code. By delivering on the development roadmap for the 100% synthesizable ColdFire family, Motorola provides room to grow and powerful new capabilities to designers eager to create new classes of electronic products, while leveraging their previous investments.
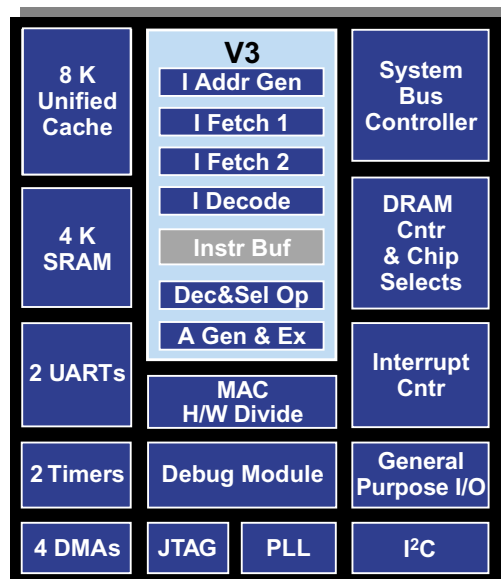
Features

- Version 3 ColdFire processor core with clock multiplied core, and branch cache acceleration logic.
- Fully Code Compatible with Version 2 ColdFire processor Core.
- 8K Unified Cache.
- 4KByte SRAM.
- Multiply and Accumulate Unit (MAC).
- Industry leading debug module offering both background and real time capability.
- Hardware integer divide unit.
- Integrated Processor
  – DRAM Controller: (glueless interface to SDRAM, FPM and EDO)
  – 2 UARTs
  – 4 fully programmable DMA Channels
  – 8 Chip Selects
  – 16-bit General Purpose I/O

  – Dual 16-bit General purpose Multi-mode Timers
  – I^2 C module
  – System Integration (PLL, SW Watchdog)
  – User defined bus speed @ 1/2, 1/3 or 1/4 of processor clock
- Doze Mode & Variable frequency operation.

Product Specifications

- 70 Dhrystone 2.1 MIPS at 90 MHz.
- 0°-70°C operating temperature.
- Implemented in 0.35µm, TLM.
- 3.3-V supply / 5.0-V tolerant I/O.
- 208-pin plastic QFP package.
- Pin compatible with MCF5407 (note voltage and timing changes).
- -40°-85°C operating temperature (66MHz).
- Available at 66MHz and 90MHz.

8 K Unified Cache	V3		System Bus Controller
	I Addr Gen		
	I Fetch 1		
	I Fetch 2		
4 K SRAM	I Decode		DRAM Cntr & Chip Selects
	Instr Buf		
	Dec&Sel Op		
2 UARTs	A Gen & Ex		Interrupt Cntr
	MAC H/W Divide		
2 Timers	Debug Module		General Purpose I/O
4 DMAs	JTAG	PLL	I²C

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(1) The MCF5307 won the Editor's Choice Award for "1998 Microprocessor of the Year" from Microprocessor report.

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