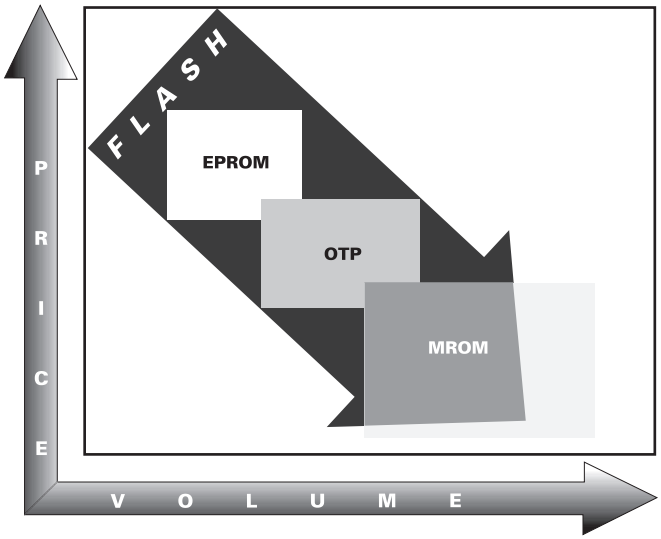
AVR® Enhanced RISC Microcontrollers

Atmel Corporation is a leading manufacturer of a broad range of high performance, low power nonvolatile memory and logic integrated circuits (ICs) that focus in the telecommunications, computer, networking, consumer and automotive markets. Atmel's Flash-based microcontroller families incorporate advanced single-voltage Flash memory technology in the industry's broadest line of Flash and EEPROM based products.

With the Flash memory-based microcontrollers from Atmel, you can achieve safe, easy reconfigurability:

-Change code in seconds, shortening the development cycle
-Stock just one part
-Zero scrap due to misprogramming
-Accelerate product testing
-Make changes remotely
-Customize each product on the line



The AVR enhanced RISC microcontrollers are based on a new RISC architecture that has been developed to take advantage of semiconductor integration and software capabilities for the 1990's. The resulting microcontrollers offer the highest MIPS/milliwatt capability available in the 8-bit MCU market.

High level languages are rapidly becoming the standard programming methodology for embedded microcontrollers due to improved time-to-market and simplified maintenance support. The AVR architecture was developed in conjunction with C language experts to ensure that the hardware and software work hand in hand to develop highly efficient, high performance code.

In order to optimize code size, performance and power consumption, the AVR architecture has incorporated a large fast-access register file and fast single-cycle instructions.

The fast-access RISC register file consists of 32 general purpose working resisters. Traditional accumulator based architectures require large amounts of program code for data transfers between the accumulator and memory. With 32 working registers (accumulators) in the AVR these data transfers are eliminated.

The AVR pre-fetches an instruction during the previous instruction execution and then executes in a single clock cycle. In other CISC- and RISC-like architectures, the external oscillator clock is divided down (by as much as 12 times) to the traditional internal execution cycle. The AVR enhanced RISC microcontrollers execute an instruction in a single clock cycle and are the first true RISC machines in the 8-bit market.

The AVR architecture supports a complete spectrum of price performance from simple small pin count controllers to high range devices with large on-chip memories. The Harvard style architecture directly addresses up to 8M bytes of program memory and 8M bytes of data memory. The register files is dual mapped and can be addresses as part of the on-chip SRAM memory to enable fast context switching.

The AVR enhanced RISC microcontroller family is manufactured with Atmel's low-power nonvolatile CMOS technology. The on-chip In-System Programmable (ISP) downloadable Flash memory allows the program memory to be reprogrammed in system through an SPI serial port or by a conventional memory programmer. By combining an enhanced RISC architecture with downloadable Flash memory on the same chip, the AVR family offers a powerful solution to embedded control applications.