



## NXP 80C51-based microcontrollers LPC90x

# Accelerated 8-bit MCUs in 8-pin packages for high performance

Designed for highly integrated, low-cost applications requiring advanced peripherals in 8-pin packages, these accelerated microcontrollers deliver performance six times that of standard 80C51-based MCUs

### Key features

- ▶ Accelerated 80C51 CPU
- ▶ 1 KB of Code Flash
- ▶ 128 bytes of Data RAM
- ▶ System supervisory functions (POR, brownout reset)
- ▶ Two 16-bit timers
- ▶ Very fast Flash programming via on-chip boot-loader software
- ▶ Real Time Clock, Watchdog timer, analog comparators
- ▶ Enhanced UART (LPC903/907/908)
- ▶ Internal RC oscillator trimmed to a  $\pm 2.5\%$  accuracy
- ▶ 6 configurable I/O pins
- ▶ Temperature range: -40 to +85 °C
- ▶ Small, 8-pin packages: SO8, DIP8

### Applications

- ▶ Consumer
- ▶ Automotive
- ▶ Industrial products
- ▶ Battery-powered devices to white goods

These 8-bit microcontrollers use an accelerated architecture that executes instructions in two to four clocks, delivering performance that is six times higher than that of a standard 80C51 device.

Integrated features such as byte-erasable Flash memory, enhanced timing functions, and power monitoring, make these microcontrollers well suited to a very wide range of applications, from battery-powered systems to white goods. They bring significant benefits to applications that demand low voltage, high integration, and high performance in a cost-effective package.

Each LPC90x microcontroller has 1 KB of byte-erasable Flash code memory divided into 256-byte sectors and 16-byte pages. The byte-erase function can be used to simulate an EEPROM, with a full erase or program taking only 2 ms and individual sector or page erases requiring just 6 ms.

The optional serial interface (LPC903/907/908) is an enhanced UART with fractional baud-rate generator, break detect, framing

error detection, automatic address detection, and versatile interrupt capabilities.

Several on-chip features combine to reduce chip count, save board space, and lower overall cost. There are two 16-bit counter/timers, each configurable to toggle a port output on timer overflow or to become a PWM output.

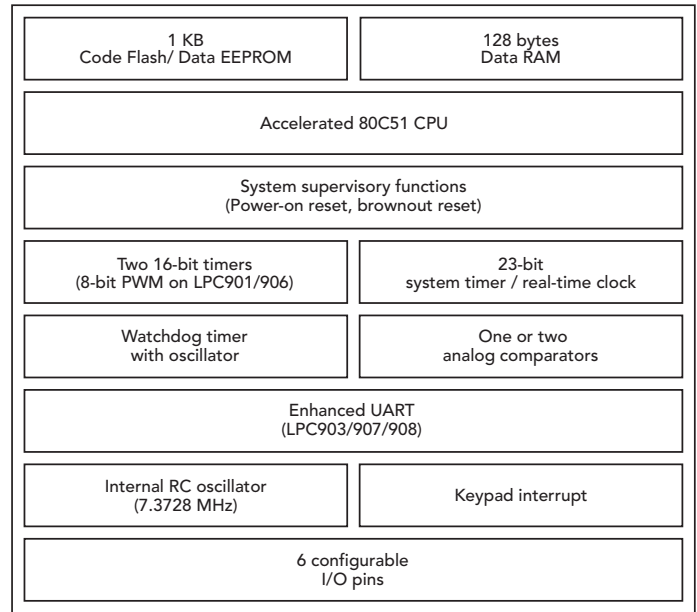
A configurable on-chip oscillator with programmable options supports frequencies from 20 kHz to the maximum operating frequency of 18 MHz (LPC901/906 only). A 7.37-MHz internal RC oscillator with a  $\pm 2.5\%$  tolerance over temperature and voltage lets the microcontroller operate without external oscillator components. The on-chip Watchdog timer has a separate on-chip oscillator (nominal 400 kHz), requires no external components, and is selectable from eight values.

The integrated real-time clock can also be used as a system timer and is equipped with independent power and clock supplies, permitting extremely low power consumption in power-save modes. To reduce power consumption further, each processor supports an idle mode and two different power-down modes. Typical power-down current is less than 1  $\mu$ A. System supervisory functions include Power-on reset (POR) and brownout detection (BOD), which enables a reliable system shutdown in the event of a power failure.

There are up to six I/O, each with a  $V_{DD}$  operating range of 2.4 to 3.6 V and are 5 V tolerant. The operating temperature range is -40 to +85 °C.

### Third-party development tools

Through third-party suppliers, we offer a range of development and evaluation tools for our microcontrollers. For the most current listing, please visit [www.nxp.com/microcontrollers](http://www.nxp.com/microcontrollers).



P89LPC90x block diagram

### P89LPC90x selection guide

Type	Memory		PWM	I/O pins	Enhanced UART	Temperature range (°C)	Package
	Flash	RAM					
P89LPC901	1 K	128 B	•	6		-40 to +85	SO8, DIP8
P89LPC902	1 K	128 B		6		-40 to +85	SO8, DIP8
P89LPC903	1 K	128 B		6	•	-40 to +85	SO8
P89LPC906	1 K	128 B	•	6		-40 to +85	SO8
P89LPC907	1 K	128 B		6	•	-40 to +85	SO8
P89LPC908	1 K	128 B		6	•	-40 to +85	SO8

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