



NXP 80C51-based microcontrollers LPC910x

Accelerated 8-bit MCU in a tiny 10-pin package (3 x 3 mm)

Measuring only 3 x 3 mm, and designed for highly integrated, low-cost applications requiring advanced peripherals in 10-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
- ▶ System timer, RTC, Watchdog timer, analog comparators
- ▶ 4-channel, 8-bit A/D and 1-channel, 8-bit D/A converter
- ▶ Enhanced UART (LPC9103/9107)
- ▶ Internal RC oscillator trimmed to $\pm 2.5\%$ accuracy
- ▶ 8 configurable I/O pins
- ▶ Temperature range: -40 to +85 °C
- ▶ Small packages:
 - HVSON10 (3 x 3 mm) – LPC9102/9103
 - TSSOP14 (4.4 x 4.4 mm) – LPC9107

Applications

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

These 8-bit microcontrollers, housed in a 10-pin package that measures only 3 x 3 mm, 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. Each LPC910x 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 (LPC9103/9107) 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 (LPC9102/9107).

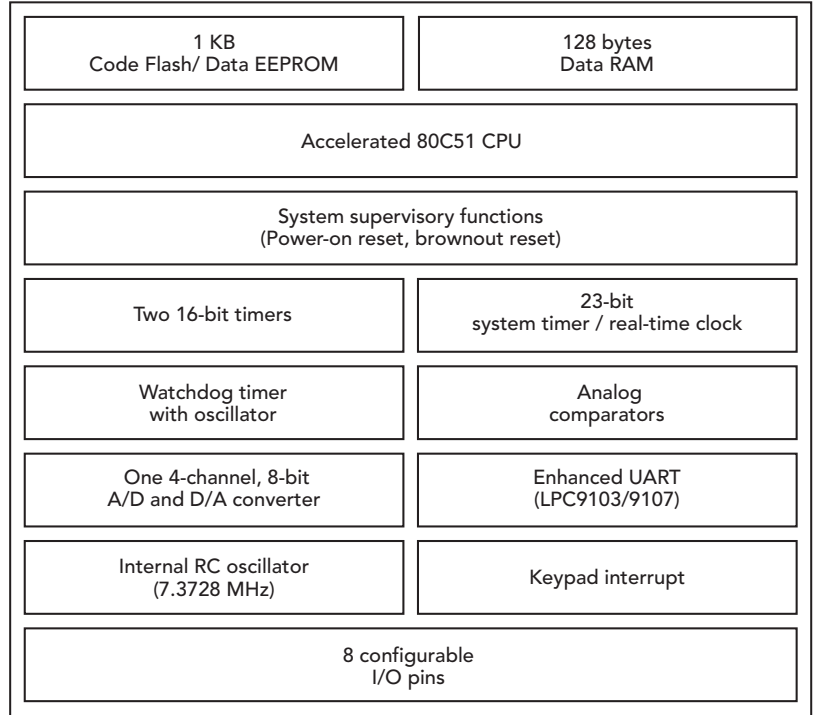
A 7.37-MHz internal RC oscillator with a $\pm 2.5\%$ tolerance over temperature and voltage lets the microcontroller operate without external oscillator components. The on-chip Watchdog timer has a separate on-chip oscillator (nominal 400 kHz), requires no external components, and is selectable from 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 μ 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 8 I/O, each with a V_{DD} operating range of 2.4 to 3.6 V and are 5V tolerant. The operating temperature range is -40 to +85 °C. The LPC9107 is available in a TSSOP14 package for ease in prototyping.

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.



P89LPC910x block diagram

P89LPC910x selection guide

Type	Memory		I/O pins	ADC (channel x bit)	DAC (channel x bit)	Enhanced UART	Temperature range (°C)	Package
	Flash	RAM						
P89LPC9102	1 K	128 B	8	One (4 x 8)	One (4 x 8)		-40 to +85	HVSON10
P89LPC9103	1 K	128 B	8	One (4 x 8)	One (4 x 8)	•	-40 to +85	HVSON10
P89LPC9107	1 K	128 B	8	One (4 x 8)	One (4 x 8)	•	-40 to +85	TSSOP14

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