



NXP 60-MHz, 32-bit ARM7TDMI-S™ processors LPC221x

ARM7-based MCUs with up to 256-KB Flash and external memory interface

These high-performance, 60-MHz microcontrollers integrate up to 256 KB of on-chip Flash, 16 KB of on-chip RAM, a 10-bit ADC, and an external memory interface.

Key features

- ▶ 60-MHz, 32-bit ARM7TDMI-S with AHB/APB interfaces
- ▶ Up to 256 KB of ISP/IAP Flash
- ▶ 16 KB of SRAM
- ▶ 8-channel, 10-bit A/D converter
- ▶ External memory interface
- ▶ Optional 16-bit Thumb Mode for code-size critical applications
- ▶ Very fast Flash programming via on-chip boot-loading software
- ▶ Two 32-bit timers and one PWM unit
- ▶ Real-time clock and Watchdog timer
- ▶ Multiple serial interfaces: two UARTs, Fast I²C-bus, two SPI
- ▶ 112 I/O pins
- ▶ Temperature range: -40 to +85 °C
- ▶ Small LQFP144 package

Applications

- ▶ Industrial control, medical systems, access control, point-of-sale
- ▶ Communication gateways, protocol converters, embedded soft modems
- ▶ General-purpose applications

These ARM7-based microcontrollers, use a 128-bit-wide memory interface and a unique accelerator architecture to enable 32-bit code execution from Flash at a maximum clock rate of 60 MHz.

Integrated features such as enhanced timing functions and power monitoring, mean these microcontrollers improve performance in a variety of industrial, medical, communication, and general-purpose applications.

For code-size critical applications, they use an alternative 16-bit Thumb Mode that reduces code by more than 30% with minimal performance penalty.

Each microcontroller is equipped with up to 256 KB of on-chip Flash and uses in-system (ISP) and in-application (IAP) software to minimize programming time. Each 512-byte line takes only 1 ms to program and a single-selector or full erase takes only 400 ms.

For extensive, real-time debug capabilities, each microcontroller uses a Vectored Interrupt Controller (VIC), along with embedded ICE-RT and ETM (Embedded Trace Macrocell).

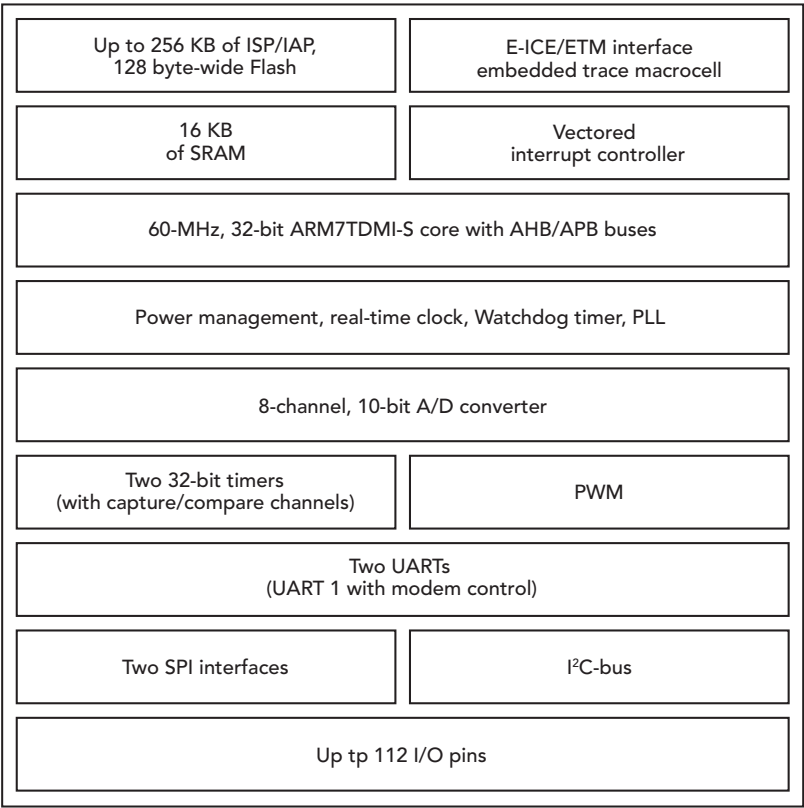
Several on-chip features combine to reduce chip count, save board space, and lower overall cost. Included are two 32-bit timers (with four capture and four compare channels each), a PWM unit (with six channels), a real-time clock, and a Watchdog timer. Each microcontroller also has a configurable external memory interface with up to four banks (each up to 16 Mb and 8/16/32-bit data width) and an 8-channel, 10-bit A/D converter (ADC) with conversion times as low as 2.44 μ s.

Multiple serial interfaces, including two UARTs (16C550), Fast I²C-bus (400 kbps), and two SPI (one with buffering and variable data-length capabilities), increase design flexibility. A CPU clock, operating at a maximum of 60 MHz, is available from the on-chip phase-locked loop (PLL).

There are up to 112 I/O, each tolerant to 5 V. 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.



LPC221x block diagram

LPC221x selection guide

Type	Memory		I/O pins	10-bit A/D converter channels	External memory interface	Serial interfaces			Temperature range (°C)	Package
	Flash	SRAM				I ² C-bus	UART	SPI		
LPC2210	0 KB	16 KB	76	8	•	1	2	2	-40 to +85	LQFP144
LPC2212	128 KB	16 KB	112	8	•	1	2	2	-40 to +85	LQFP144
LPC2214	256 KB	16 KB	112	8	•	1	2	2	-40 to +85	LQFP144