NXP Flashless 32-bit ARM7TDMI-S™ processors LPC22x0

ARM7-based MCUs for memory-intensive applications

Designed for applications that use large external memories, these high-performance, these Flashless microcontrollers deliver performance up to 75 MHz, have up to 64 KB of on-chip RAM, and have an external memory interface. There are options for up to two CAN buses.

Key features

- Up to 75-MHz, 32-bit ARM7TDMI-S with AHB/APB interfaces
- Up to 64 KB of SRAM
- 8-channel, 10-bit A/D converter
- Two CAN buses (LPC2290 only)
- External memory interface
- Optional 16-bit Thumb Mode for code-size critical applications
- Two 32-bit timers and one PWM unit
- Real-time clock and Watchdog timer
- Multiple serial interfaces: two UARTs, one Fast I²C-bus, two SPI
- 76 I/O pins
- Temperature range: -40 to +85 °C
- Small packages
  - LQFP144
  - TFBGA144 (LPC2220)

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 at a maximum clock rate of up to 75 MHz.

Designed as a low-cost solution for applications that require large amount of external memory, the LPC22x0 series eliminates on-chip Flash and offers up to 64 KB of on-chip RAM. There is also a configurable external bus interface with up to four banks, each up to 16 Mb and 8/16/32-bit data width.
High-speed operation, large on-chip RAM, and the external bus interface make the LPC22x0 series an excellent choice for applications that run complex real-time operating systems like µCLinux.

Other integrated features, including enhanced timing functions and power monitoring, mean the LPC22x0 series also improves performance in medical, communication, and general-purpose applications.

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

For extensive, real-time debug capabilities, it 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

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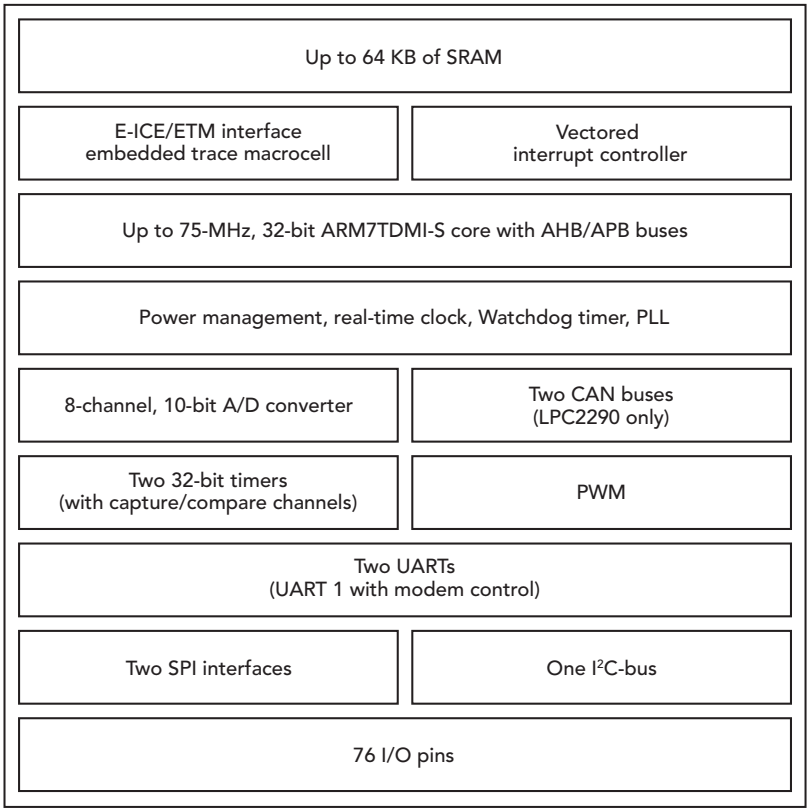
four compare channels each), a PWM unit (with six channels), a real-time clock, and a Watchdog timer. There is also an 8-channel, 10-bit A/D converter that offers conversion times as low as 2.44 µs.

Multiple serial interfaces, including two UARTs (16C550), one 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 75 MHz, is available from the on-chip phase-locked loop (PLL). There are up to 76 I/O, each tolerant to 5 V.

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.



LPC22x0 block diagram

LPC22x0 selection guide

Type	SRAM	I/O pins	A/D converter (channel x bit)	CAN bus	Serial interfaces			Temperature range (°C)	Package
					I²C-bus	UART	SPI		
LPC2220	64 KB	76	One (8 x 10)	0	1	2	2	-40 to +85	LQFP144 TFBGA144
LPC2290	16 KB	76	One (8 x 10)	2	1	2	2	-40 to +85	LQFP144
LPC2210	16 KB	76	One (8 x 10)	0	1	2	2	-40 to +85	LQFP144

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Date of release: March 2007
Document order number: 9397 750 15915
Printed in the USA