60-MHz, 32-bit microcontroller with ARM7TDMI-S™ core LPC214x

ARM7-based microcontrollers with full-speed USB 2.0

These powerful yet cost-effective microcontrollers offer USB 2.0 full-speed (12 Mbps) capability and have up to 512 KB of ISP/IAP Flash and up to 40 KB of SRAM. Each has up to two 10-bit A/D converters, a 10-bit D/A converter, two I^{2}C-bus interfaces, and Fast I/O.

Key features

‣ 60-MHz, 32-bit ARM7TDMI-S with AHB/APB interfaces
‣ Up to 512 KB of ISP/IAP Flash
‣ Up to 40 KB of SRAM
‣ Very fast Flash programming via on-chip boot loader
‣ USB 2.0 full-speed (12 Mbps) device
‣ Up to two 10-bit A/D converters
‣ 10-bit D/A converter
‣ Multiple serial interfaces: two I^{2}C, two UARTs, one SPI, and one SSP
‣ Two 32-bit timers
‣ Real-time clock and Watchdog timer
‣ 45 Fast I/O pins (5-V tolerant) with up to 15-MHz switching rate
‣ Single 3.3-V supply
‣ LQFP64 package (10 x 10 x 1.4 mm)

Applications

‣ Automotive entertainment
‣ Connectivity
‣ Display
‣ Communications gateways and protocol converters
‣ Software modems
‣ Voice recognition
‣ Low-end imaging

The NXP microcontroller family LPC214x uses a high-performance 32-bit ARM7 core that operates at up to 60 MHz. Each device has up to 512 KB of on-chip Flash and up to 40 KB of on-chip SRAM memory.

In-System Programming (ISP) and In-Application Programming (IAP) software minimize programming time – each 256-byte line takes only 1 ms to program, and a single-sector or full-chip erase takes only 400 ms.

A 128-bit-wide memory interface and a patented memory accelerator enable 32-bit code execution from Flash with zero wait-states. For applications where code size is critical, an alternative 16-bit Thumb mode reduces code by more than 30% with minimal performance penalties.

Each microcontroller in the family includes a USB 2.0 full-speed (12 Mbps) device that supports 32 endpoints with 2 KB of endpoint RAM. In the LPC2146 and the LPC2148, up to 8 KB of the RAM can be used by the USB DMA. In all the devices, the USB function supports Control, Interrupt, Bulk, and Isochronous data-transfer modes. Designers can

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choose between GoodLink™ and SoftConnect™ functionality.

Each microcontroller is also equipped with up to two 10-bit A/D converters and a 10-bit D/A converter.

Multiple serial communications interfaces increase design flexibility, provide larger buffer size, and deliver higher processing power. There are two 16C550 UARTs, two Fast I²C-bus (400 kbps) interfaces, and two SPI interfaces (one with capabilities for buffering and variable data length).
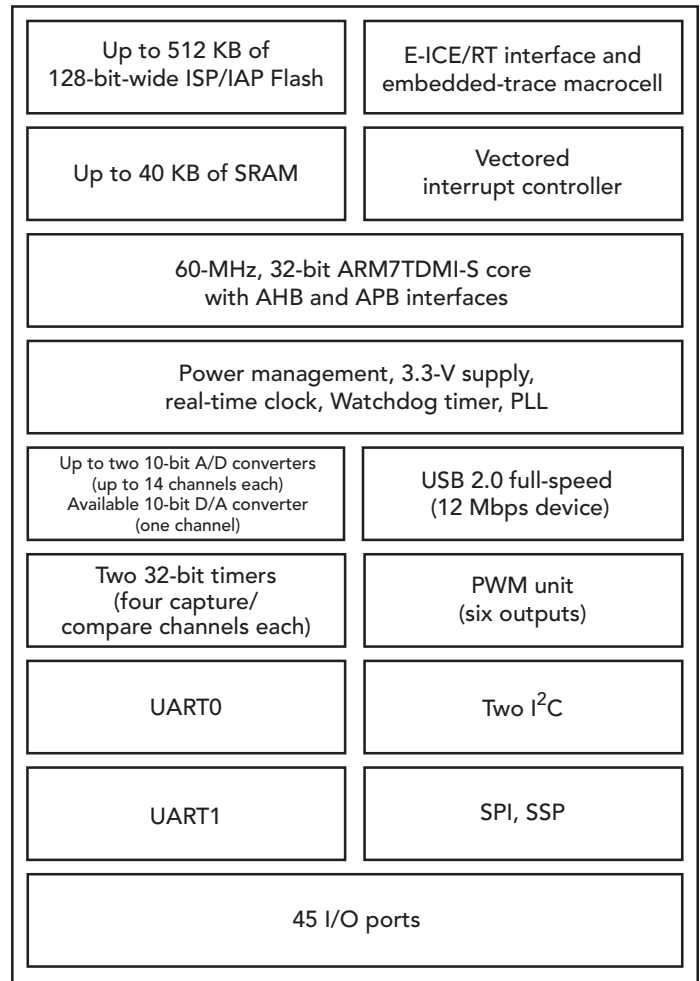
There are two 32-bit timers (each with four capture and compare channels), a PWM unit with six outputs, a real-time clock, and a Watchdog timer.

For debugging, each device supports real-time emulation and embedded trace support and has an integrated vectored interrupt controller (VIC). Also, for compatibility with existing tools, each device uses the standard ARM test/debug JTAG interface.

Other features include 45 Fast I/O pins (5-V tolerant) with switching up to 15 MHz, and an operating temperature range of -40 to 85 °C.

Third-Party Development Tools
Through third-party suppliers, we offer a range of development tools for our microcontrollers. For the most current listing, please visit www.nxp.com/microcontrollers.

Up to 512 KB of 128-bit-wide ISP/IAP Flash	E-ICE/RT interface and embedded-trace macrocell
Up to 40 KB of SRAM	Vectored interrupt controller
60-MHz, 32-bit ARM7TDMI-S core with AHB and APB interfaces	
Power management, 3.3-V supply, real-time clock, Watchdog timer, PLL	
Up to two 10-bit A/D converters (up to 14 channels each) Available 10-bit D/A converter (one channel)	USB 2.0 full-speed (12 Mbps device)
Two 32-bit timers (four capture/ compare channels each)	PWM unit (six outputs)
UART0	Two I²C
UART1	SPI, SSP
45 I/O ports	

LPC214x block diagram

LPC214x selection guide

| Type | Memory | | Serial interfaces | | | | | ADC/DAC options | | Package |
	Flash (KB)	SRAM (KB)	USB 2.0 (12 Mbps)	USB DMA	I²C	UART	SPI/SSP	ADC channels (10-bit)	DAC channels (10-bit)	
LPC2141	32	8	1		2	2	2	6		LQFP64
LPC2142	64	16	1		2	2	2	6	1	LQFP64
LPC2144	128	16	1		2	2	2	14	1	LQFP64
LPC2146	256	40	1	1	2	2	2	14	1	LQFP64
LPC2148	512	40	1	1	2	2	2	14	1	LQFP64