

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 I²C-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 onchip 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 I²C, 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 256byte 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



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

LPC214x selection guide

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)								
UARTO	Two I ² C								
UART1	SPI, SSP								
45 I/O ports									

LPC214x block diagram

	Memory		Serial interfaces				ADC/DAC options			
Туре	Flash (KB)	SRAM (KB)	USB 2.0 (12 Mbps)	USB DMA	l²C	UART	SPI/SSP	ADC channels (10-bit)	DAC channels (10-bit)	Package
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

www.nxp.com



© 2007 NXP N.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and Document order number: 9397 750 15816 may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: January 2007 Printed in the USA