72-MHz, 32-bit microcontroller with ARM7TDMI-S™ core LPC24xx

ARM7 MCU with Ethernet, USB OTG, CAN, and optional LCD controller

Built for connectivity, these powerful yet cost-effective microcontrollers support 10/100 Ethernet, full-speed (12 Mbps) USB 2.0, USB OTG, and CAN 2.0B. They have 512 KB of ISP/IAP Flash, 98 KB of SRAM, an external memory interface, 10-bit A/D and D/A converters, an Internal RC oscillator, and an SD memory-card interface on two high-speed buses to eliminate communication bandwidth bottlenecks. The LPC247x adds a QVGA LCD controller.

Key features

- 72-MHz, 32-bit ARM7TDMI-S with dual AHB buses
- 512 KB of ISP/IAP Flash and 98 KB of SRAM
- External memory interface for SDRAM, SRAM, and Flash
- 10/100 Ethernet MAC with DMA and MII/RMII interface
- USB 2.0 full-speed OTG/Device/OHCI plus PHY and DMA
- Two CAN 2.0B controllers with acceptance filtering
- General-purpose DMA controller
- 10-bit A/D converter and 10-bit D/A converter
- Quarter VGA LCD controller with dedicated DMA for TFT and STN panels (LPC247x only)
- Multiple serial interfaces: three I^2C, one I^2S, four UARTs, three SPI/SSP
- Two PWM units
- Four 32-bit timers, a low-power real-time clock, and a Watchdog timer
- 4-MHz internal RC (IRC) oscillator trimmed to 1% accuracy
- 160 general-purpose Fast I/O pins
- Single 3.3-V power supply
- Boundary scan
- Packages:
  - LQFP208 (28 x 28 x 1.4 mm)
  - TFBGA208 (15 x 15 x .08 mm)

The NXP microcontroller series LPC24xx uses a high-performance 32-bit ARM7 core that operates at up to 72 MHz. Each device has 512 KB of on-chip Flash and 98 KB of on-chip SRAM. Each LPC24xx has two AHB buses, so high-bandwidth peripherals like Ethernet and USB can run simultaneously, without impacting the main application.

A 128-bit-wide memory interface and a patented memory accelerator enable 32-bit code execution from Flash with zero wait-states.

Each microcontroller in the series is equipped with a 10/100 Ethernet MAC, a USB 2.0 full-speed (12 Mbps) peripheral that supports OTG, host (OHCI) and device operation, two CAN 2.0B channels, a general-purpose DMA controller, a 10-bit A/D converter and a 10-bit D/A converter. The Ethernet MAC has 16 KB of SRAM and an associated

NXP founded by Philips

DMA controller on an independent AHB bus. It also has a Media Independent Interface (MII) and Reduced MII (RMII) interface. The USB controller has access to 20 KB SRAM and a dedicated DMA.

The LPC247x has an LCD controller that provides all the necessary control signals for interfacing directly to a variety of color and monochrome panels in STN (single- and dual-panel) and TFT formats. The display resolution is selectable up to 1024 x 768 pixels. The LCD interface has its own DMA controller, for operation independent of the CPU and other system functions.

Multiple serial communications interfaces and large peripheral buffers increase design flexibility. There are four 16C550 UARTs (one with IrDA), three I²C-bus interfaces, three SPI/SSP interfaces, an I²S interface, and an interface for SD/MMC memory cards.

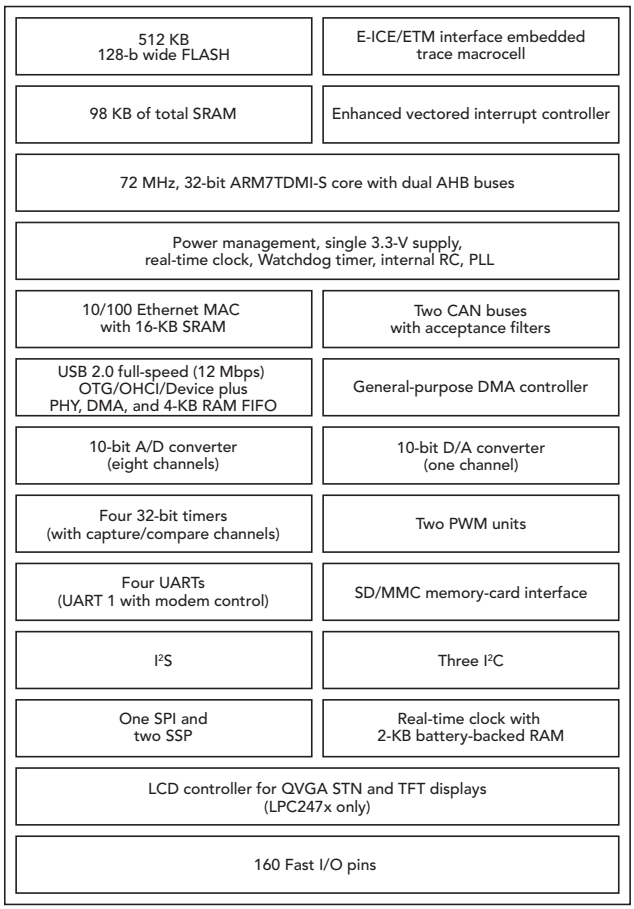
There are four 32-bit capture/compare timers, two PWM units for three-phase motor control, a low-power real-time clock with 2 KB of battery-backed SRAM, a Watchdog timer with multiple-clock source options, and a 4 MHz internal RC oscillator that can be used as the main system clock.

An independent clock divider for each peripheral lets the designer minimize power consumption. Also, each pin of Port 0 and Port 2 can be used as an external interrupt. There are 160 general-purpose I/O lines that toggle at rates up to 18 MHz. The operating temperature range for each microcontroller in the series is -40 to 85 °C.

The external memory controller (EMC) supports asynchronous static memory devices such as RAM, ROM, and Flash, a well as dynamic memories such as SDRAM. There are four chip-selects for static memories and four for synchronous memory devices.

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.



LPC24xx block diagram

LPC24xx selection guide

Type	Memory			Serial interfaces								LCD controller	ADC/DAC options		Package
	Flash (KB)	SRAM (KB)	External interface	10/100 Ethernet	USB 2.0 (OTG/OHCI/DEV)	CAN	UART	I²C	I²S	SPI/ SSP	SD/ MMC		ADC channels (10-bit)	DAC channels (10-bit)	
LPC2468FBD208	512	98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1		8	1	LQFP208
LPC2468FET208	512	98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1		8	1	TFBGA208
LPC2470FBD208		98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1	1	8	1	LQFP208
LPC2470FET208		98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1	1	8	1	TFBGA208
LPC2478FBD208	512	98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1	1	8	1	LQFP208
LPC2478FET208	512	98	Full 32-bit	1 (MII/RMII)	1	2	4	3	1	3	1	1	8	1	TFBGA208

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