NXP 60-MHz, 32-bit ARM7TDMI-S™ processors with up to 4x CAN LPC229x

ARM7-based MCUs with up to 256-KB Flash and 4x CAN

These high-performance, 60-MHz microcontrollers have up to four CAN interfaces and provide optional support for extended temperature range. They 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
‣ Up to four CAN buses
‣ External memory interfaces
‣ 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 I^{2}C-bus, two SPI
‣ 112 I/O pins
‣ Optional extended temperature range: -40 to +125 °C (LPC2294 only)
‣ Small packages
 – LQFP144
 – TFBGA144 (LPC2292 only)

Applications
‣ Automotive (CAN gateways, CAN bridges, multi-CAN interfaces)
‣ 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.

Up to four interconnected CAN interfaces with advanced acceptance filters and an optional extended temperature range of -40 to +125 °C (LPC2294 only), mean these microcontrollers are especially well suited to automotive and industrial applications that use the CAN bus. Other integrated features, including enhanced timing functions and power monitoring, mean the LPC229x 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.

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, it uses a Vectored Interrupt

founded by Philips

Controller (VIC), along with embedded ICE-RT and ETM (Embedded Trace Macrocell).
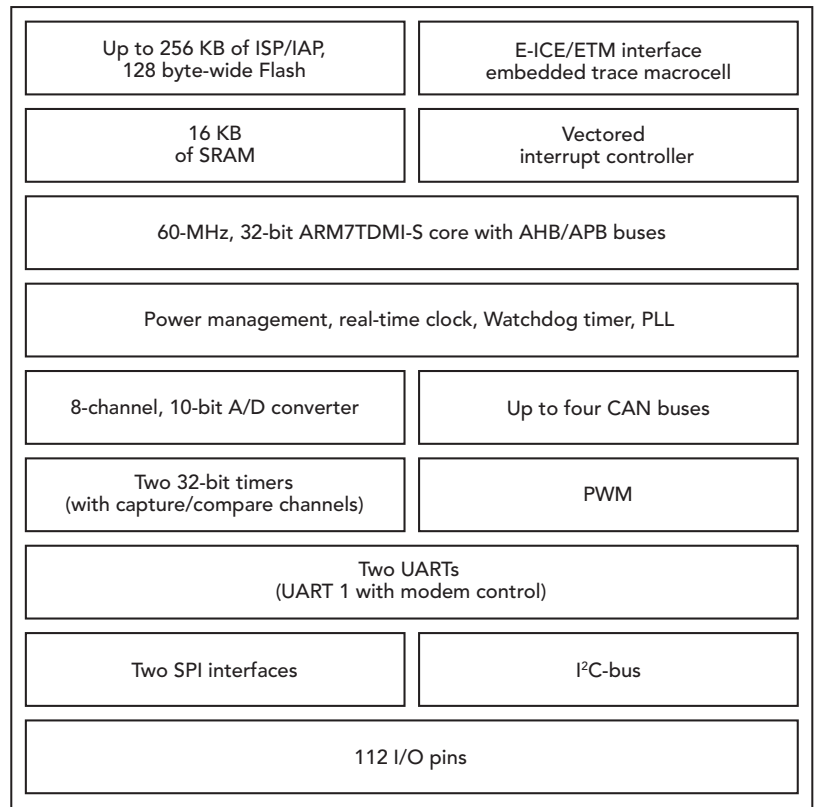
Each microcontroller has a configurable external memory interface with up to four banks (each up to 16 Mb and 8/16/32-bit data width), and an 8-channel, 10-bit A/D converter that offers conversion times as low as 2.44 µs.

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.

Multiple serial interfaces, including two UARTs (16C550), two 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, and there are up to nine edge- or level-sensitive interrupt pins.

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.

Up to 256 KB of ISP/IAP, 128 byte-wide Flash	E-ICE/ETM interface embedded trace macrocell
16 KB of SRAM	Vectored interrupt controller
60-MHz, 32-bit ARM7TDMI-S core with AHB/APB buses	
Power management, real-time clock, Watchdog timer, PLL	
8-channel, 10-bit A/D converter	Up to four CAN buses
Two 32-bit timers (with capture/compare channels)	PWM
Two UARTs (UART 1 with modem control)	
Two SPI interfaces	I²C-bus
112 I/O pins	

LPC229x block diagram

LPC229x selection guide

Type	Memory		I/O pins	10-bit A/D converter channels	CAN bus	Serial interfaces			Temperature range (°C)	Package
	Flash	SRAM				I²C-bus	UART	SPI		
LPC2290	0 KB	16 KB	76	8	2	1	2	2	-40 to +85	LQFP144
LPC2292	256 KB	16 KB	112	8	2	1	2	2	-40 to +85	LQFP144 TFBGA144
LPC2294	256 KB	16 KB	112	8	4	1	2	2	-40 to +125	LQFP144