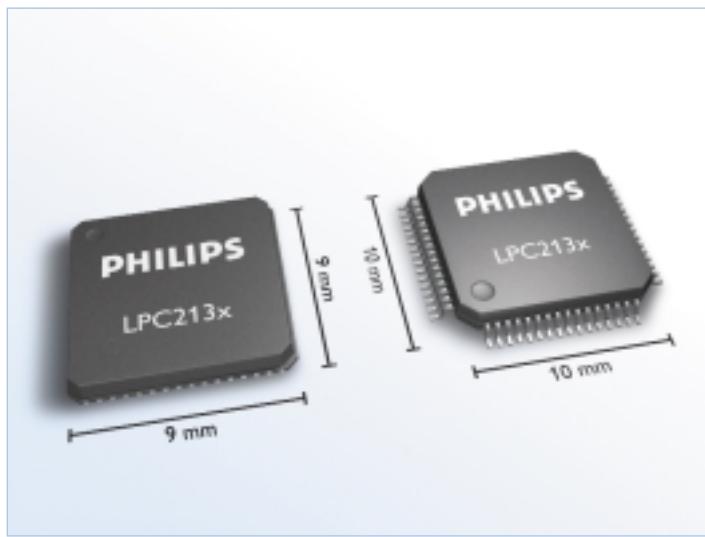


# LPC213x family

These tiny ARM-based microcontrollers, optimized for low power consumption, improve performance in a variety of industrial, medical, communication, and general-purpose applications. Integrating 512 kB of on-chip Flash, up to 32 kB of on-chip RAM, and up to two 10-bit ADCs.



## Key Features

- 60-MHz operation from single-chip 32-bit ARM7TDMI-S processor
- LPC2131 with 32KB Flash, 8KB RAM, 1x 10-bit ADC, and low-power options
- LPC2132 with 64 KB Flash, 16 KB RAM, 1x 10-bit ADC, 10-bit DAC, and low-power options
- LPC2134 with 128K Flash, 16 KB RAM, 2x 10-bit ADC, 10-bit DAC, and low power options
- LPC2136 with 256K Flash, 32 KB RAM, 2x 10-bit ADC, 10-bit DAC, and low power options
- LPC2138 with 512 KB Flash, 32 KB RAM, 2x 10-bit ADCs, 10-bit DAC, and low-power options
- Optional 16-bit Thumb Mode for critical code-size applications
- Very fast Flash programming via on-chip boot-loader software
- Two 32-bit timers, PWM unit, real-time clock, watchdog timer
- Multiple serial interfaces: two UARTs, two Fast I<sup>2</sup>C-bus, two SPI
- Temperature range: -40 °C to +85 °C
- Tiny HVQFN64 or LQFP64 package (9 mm x 9 mm or 10 mm x 10 mm)

## Applications

- Access control, point-of-sale, industrial control, medical systems
- Communication gateways, protocol converters, embedded soft modems
- General-purpose applications

## Tiny 32-bit ARM7TDMI-S™ processors with ADC and DAC

### Semiconductors

These 32-bit ARM7TDMI-S microcontrollers, housed in tiny LQFP or HVQFN packages, use a 128-bit-wide memory interface and a unique accelerator architecture to enable 32-bit code execution at a maximum clock rate of 60 MHz. For code-size critical applications, they use an alternative 16-bit Thumb Mode that reduces code by more than 30% with minimal performance penalty.

The initial part in the family is the LPC2138. Optimized for low-power operation, it has 512 kB of Flash and 32 kB of SRAM. There are two 8-channel 10-bit A/D converters (for a total of 16 analog inputs) with conversion times as low as 2.44 µs per channel. It has a 10-bit D/A converter for generating variable analog outputs and offers up to forty-seven 5V-tolerant GPIO. It uses a single power supply with POR (Power On Reset) and BOD (Brown Out Detection) circuits. The real-time clock uses independent power and clock supplies, so power consumption in the power-save modes is extremely low. It has a CPU operating voltage range of 3.0V to 3.6V (3.3V ±10%).

In-System (ISP) and In-Application (IAP) software minimize programming time — each 256-byte line takes only 1 ms to program, while single selector or full-chip erases take only 400 ms.

It has a Vectored Interrupt Controller (VIC), and uses Embedded ICE-RT and ETM (Embedded Trace Macrocell) to provide extensive, real-time debug capabilities.

There are two 32-bit timers (with four capture and four compare channels each), a PWM unit (with 6 outputs), a real-time clock, and a watchdog timer. Multiple serial interfaces, including two UARTs (16C550), two Fast I<sup>2</sup>C (400 kbps) and two SPI serial interfaces (one with buffering and variable data-length capabilities), increase design flexibility.

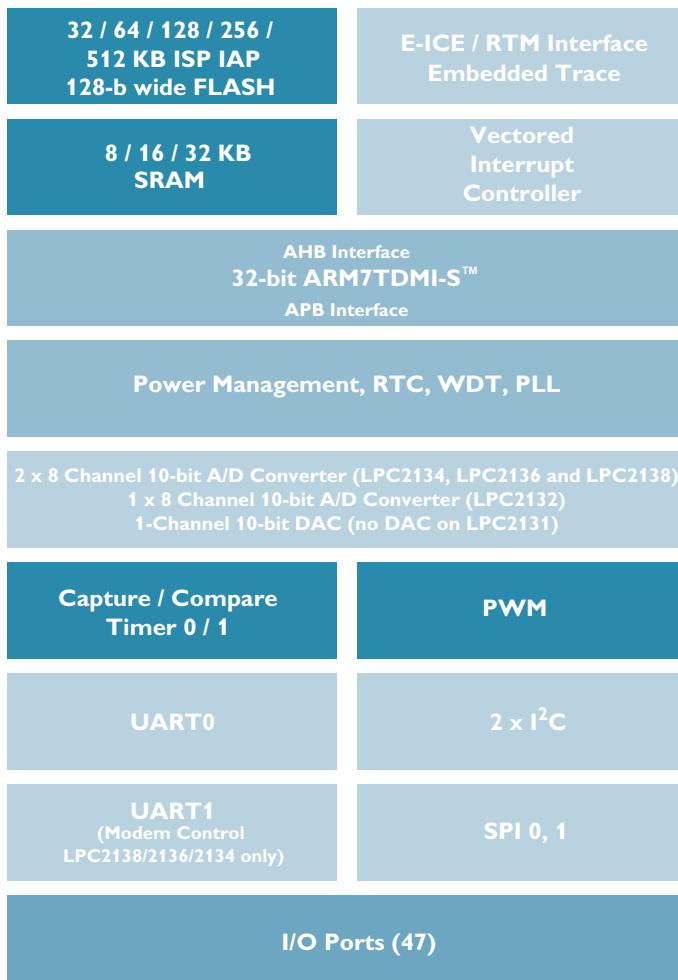
**PHILIPS**

# LPC213x family

## Tiny 32-bit ARM7TDMI-S processors with ADC and DAC



[www.semiconductors.philips.com](http://www.semiconductors.philips.com)



LPC213x block diagram



Purchase of Philips I<sup>2</sup>C components conveys a license under the Philips' patent to use the components in the I<sup>2</sup>C system provided the system conforms to the I<sup>2</sup>C specification defined by Philips.



### Third-party development tools

Through third-party suppliers, Philips offers an extensive portfolio of development tools for these microcontrollers. For the most current listing, please visit [www.semiconductors.philips.com/markets/mms/products/microcontrollers/support/development\\_tools/](http://www.semiconductors.philips.com/markets/mms/products/microcontrollers/support/development_tools/) for the most current list of available tools.

### Development tool support selection

Tool Name	Vendor
<b>Emulators</b>	
Multi-ICE	ARM
MultiTrace	ARM
RealView ICE	ARM
Genia	Ashling
Opella	Ashling
Vitra	Ashling
Tanto	Hitex
j-link	IAR Systems
ULINK	Keil
TRACE32-ICD	Lauterbach
TRACE32-PowerTrace	Lauterbach
EMUL-ARM-PC	Nohau
JTAGjet	Signum
<b>Development &amp; Evaluation Boards</b>	
MCB2130	Keil
<b>In-Systems Programming Software</b>	
Flash ISP Utility	Philips
<b>Integrated Development Environment</b>	
ADS	ARM
RealView	ARM
AslIDE ARM	Ashling
MULTI	Green Hills
Embedded Workbench	IAR Systems
Vision3	Keil
Crossworks	Rowley
<b>Monitors/Debuggers/Simulators</b>	
PathFinder-2100	Ashling
C-SPY	IAR Systems
Vision3	Keil
'Seehau'	Nohau
Universal Debug Engine	PLS
Chameleon	Signum Systems
<b>Real-Time Operating Systems</b>	
ChronOS	Interniche
C/OSII	Micrium
<b>TCP/IP Stacks</b>	
NicheStack	Interniche

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