LPC214x family

Full-speed USB 2.0 Microcontroller

These 32/16-bit ARM7TDMI-S™ processors offer USB 2.0 full-speed capability, Fast I/O, 32 end points, 1 KB x 2 buffer, and flexible DMA. They have up to 512 KB of on-chip Flash and up to 40 KB of on-chip SRAM.

The LPC214x family is based on a 32/16-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support. The architecture combines a microcontroller with up to 512 KB of embedded high-speed Flash memory and up to 40 KB of on-chip SRAM.

The architecture includes a full-speed USB 2.0 device, two 16C550 UARTs, two Fast I^{2}C-bus (400 kbps) interfaces, and two SPI interfaces (one with capabilities for buffering and variable data length). There are also up to 2 x 10-bit ADCs with result registers for each channel.

The full-speed USB 2.0 device supports 32 end points with two KB of endpoint RAM with 8 KB of RAM usable by the USB DMA (LPC2146/2148 only). USB supports Control, Interrupt, Bulk and Isochronous data transfer modes. Customers can choose between Good Link™ or Soft Connect™ functionality.

A 128-bit wide memory interface and a unique accelerator structure enable 32-bit code execution at the maximum clock rate. For critical code-size applications, an alternative 16-bit Thumb mode reduces code by more than 30% with minimal performance penalties.

Multiple serial communications interfaces increase design flexibility, provide larger buffer size, and deliver high processing power. This makes the LPC214x family well suited to a variety of applications, including communications gateways and protocol converters, software modems, voice recognition, and low-end imaging.

In-system (ISP) and In-application (IAP) software minimize programming time. Each 256-byte line takes only one millisecond to program, and single selector or full-chip erases take only 400 ms.
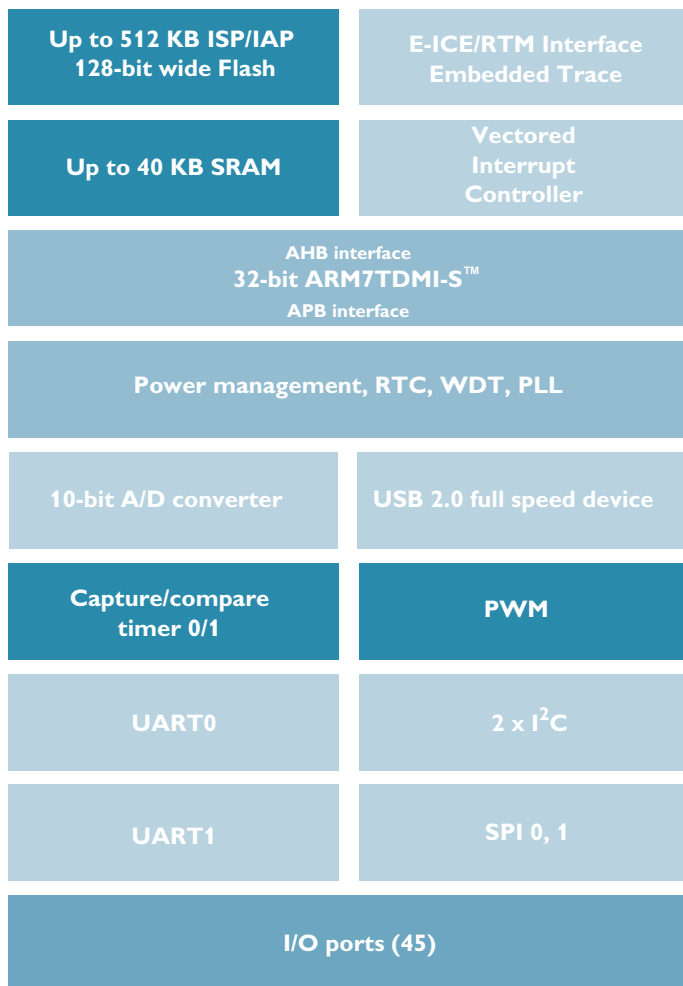
A Vectored Interrupt Controller (VIC), along with Embedded ICE-RT and Embedded Trace Macrocell (ETM), provide extensive real-time debug capabilities.

Additional features include two 32-bit timers (each with four capture and four compare channels), a PWM unit with six outputs, a real-time clock, and a Watchdog timer.

Key Features
- 60-MHz operation
- On-chip Flash and SRAM memory
  - LPC2141: 32 KB Flash, 8 KB SRAM
  - LPC2142: 64 KB Flash, 16 KB SRAM
  - LPC2144: 128 KB Flash, 16 KB SRAM
  - LPC2146: 256 KB Flash, 40 KB SRAM
  - LPC2148: 512 KB Flash, 40 KB SRAM
- Very fast Flash programming via on-chip boot-loader software
- 45 Fast I/O pins (5-V tolerant) – up to 15-MHz switching
- Temperature range: -40 to +85 °C
- LQFP64 package (10 x 10 mm), HVQFN (9 x 9 mm)

Applications
- Automotive (entertainment only)
- Connectivity
- Display

PHILIPS

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Full-speed USB 2.0 Microcontroller

www.semiconductors.philips.com

Up to 512 KB ISP/IAP 128-bit wide Flash	**E-ICE/RTM Interface Embedded Trace**
Up to 40 KB SRAM	**Vectored Interrupt Controller**

AHB interface
32-bit ARM7TDMI-S™
APB interface

Power management, RTC, WDT, PLL

10-bit A/D converter	**USB 2.0 full speed device**
Capture/compare timer 0/1	**PWM**
UART0	**2 x I^{2}C**
UART1	**SPI 0, 1**

I/O ports (45)

LPC214x block diagram

CERTIFIED USB

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.philips.com/standardics for the most current list of available tools.

Development tool support

Tool name	Vendor	Tool name	Vendor
Emulators		**Integrated development environment**	
Multi-ICE	ARM	ADS	ARM
MultiTrace	ARM	RealView	ARM
RealView ICE	ARM	AsIDE ARM	Ashling
Genia	Ashling	Embedded Workbench	IAR Systems
Opella	Ashling	µVision3	Keil
Vitra	Ashling	Crossworks	Rowley
Tanto	Hitex	**Monitors/debuggers/simulators**	
j-link	IAR Systems	PathFinder-2100	Ashling
ULINK	Keil	C-SPY	IAR Systems
TRACE32-ICD	Lauterbach	µVision3	Keil
TRACE32-PowerTrace	Lauterbach	'Seehau'	Nohau
EMUL-ARM-PC	Nohau	Universal Debug Engine	PLS
JTAGjet	Signum	Chameleon	Signum Systems
Development & evaluation boards		**Real-time operating systems**	
MCB214x	Keil	ChronOS	Interniche
KS214x	IAR	µC/OSII	Micrium
In-system programming software		**TCP/IP stacks**	
Flash ISP Utility	Philips	NicheStack	Interniche

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