



NXP 180 MHz  
Cortex-M3  
32-bit MCUs  
LPC18Sxx

## Microcontrollers with integrated security to protect code and data

These high-performance microcontrollers offer high-speed connectivity, advanced peripherals, and integrated security features including AES encryption, OTP key storage, and true random number generation.

### KEY FEATURES

- ▶ 180 MHz, 32-bit ARM Cortex-M3
- ▶ Memories
  - Up to 1 MB Flash
  - Up to 200 kB RAM
- ▶ Memory expansion
  - SPI Flash interface (SPIFI)
  - 8/16/32-bit external memory controller (EMC)
- ▶ Security features
  - AES-128 encryption engine
  - True random number generator (TRNG)
  - OTP key storage
  - Code read protection (CRP)
- ▶ Hi-Speed USB 2.0 interface, with on-chip Hi-Speed PHY
- ▶ Hi-Speed USB 2.0 with ULPI interface
- ▶ 10/100 Ethernet
- ▶ Graphic LCD up to 1024 x 768 pixel resolution
- ▶ Innovative SPI Flash Interface (SPIFI)
- ▶ SCTimer/PWM
- ▶ 8-channel GPDMA controller
- ▶ Two 8-channel, 10-bit, 400 ksps ADCs and one 10-bit DAC
- ▶ Two Fast-mode I<sup>2</sup>C, three SPI, four UARTs, smart card interface

- ▶ Two I<sup>2</sup>S, audio PLL
- ▶ Temperature range
  - 40 to +85 °C (Flashless)
  - 40 to +105 °C (Flash)
- ▶ Pin-compatible with LPC4300 and LPC1800 Series microcontrollers

### APPLICATIONS

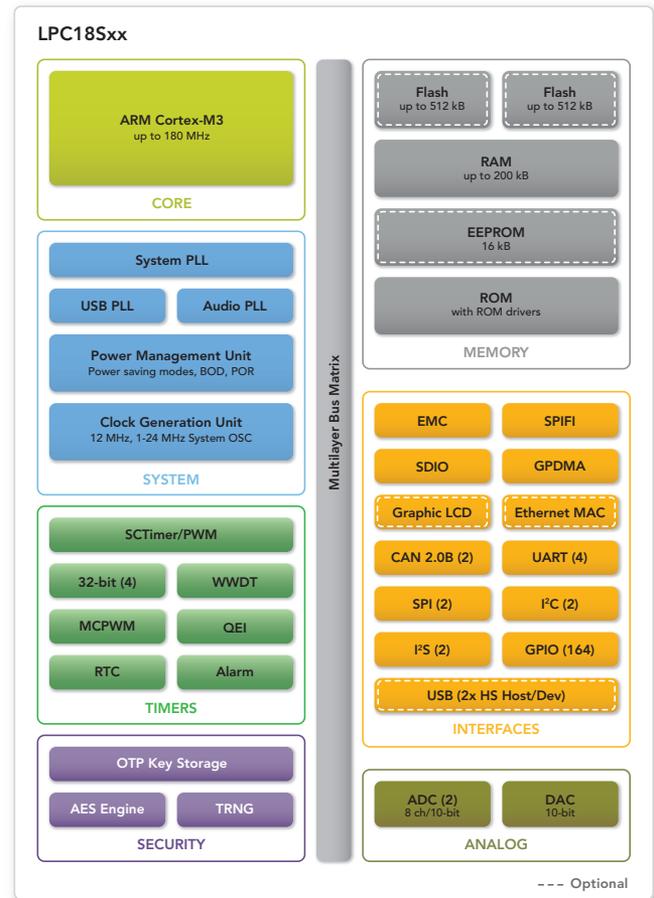
- ▶ Secure industrial gateways
- ▶ Automotive aftermarket, including telematics
- ▶ Smart meters
- ▶ Industrial controls
- ▶ Industrial automation
- ▶ Diagnostic equipment
- ▶ White goods HMI
- ▶ Data collectors and navigation
- ▶ Electronic instruments



NXP's high-performance LPC18Sxx microcontrollers offer CPU speeds up to 180 MHz with added security features to enable designers to protect application IP and prevent unauthorized access to data messages. With hardware-accelerated AES encryption and decryption, two 128-bit non-volatile OTP memories for encrypted, hardware-randomized key storage, and a true random-number generator for unique key creation, the LPC18Sxx family enables applications to implement secure boot, secure messaging, and more.

Peripherals for high-speed internet connectivity include a 10/100 Ethernet controller with hardware enabled TCP/IP checksum calculation and SDIO for interfacing to WiFi modules. Other peripherals include Hi-Speed USB with integrated PHY or ULPI, and CAN 2.0. An optimized graphic LCD display controller supports vivid color and monochrome LCD panels with resolutions up to 1024 x 768 pixels. The expandable memory architecture gives developers powerful options for scaling memory to the ideal requirements. In addition, Flashless options with SPIFI lower cost and maximize internal RAM.

LPC18Sxx microcontrollers are supported by a wide range of software solutions available from ecosystem partners that include secure firmware updates, secure IoT connectivity, and secure networking stacks (SSL, TLS). For applications requiring total device integrity, LPC18Sxx microcontrollers can be paired with an NXP A-Series secure element to add tamper detection, secure authentication with hardware accelerated RSA and ECC, extraction proof keys using banking grade security, and more.



LPC18Sxx block diagram

## Selection guide

Part number	Flash (kB)	RAM (kB)	SPIFI	SDIO	CAN	USB	LCD	Ethernet	AES engine	OTP key storage	TRNG	Packages
LPC18S10		136	1	1	2				•	•	•	LQFP144, BGA100, BGA180
LPC18S30		200	1	1	2	2 x HS		1	•	•	•	LQFP144, BGA100, BGA256
LPC18S37	1024	136	1	1	2	2 x HS		1	•	•	•	LQFP144, BGA100
LPC18S50		200	1	1	2	2 x HS	1	1	•	•	•	BGA180, BGA256
LPC18S57	1024	136	1	1	2	2 x HS	1	1	•	•	•	LQFP208, BGA256