NXP 150 MHz, 32-bit
Cortex-M3™ microcontrollers
LPC1800

Fastest Cortex-M3 MCU, Largest SRAM, High Speed USB

The LPC1800 series of low power, high-performance Cortex-M3 MCUs features frequencies up to 150 MHz and flexible Dual-Bank Flash for the highest reliability in-application re-programming.

Key features
▶ 150 MHz, 32-bit ARM Cortex-M3
▶ Up to 1 MB Flash
▶ Up to 200 KB SRAM
▶ Memory Protection Unit (MPU)
▶ Two High-speed USB 2.0 interfaces –
   On-chip High-speed PHY
▶ Ethernet MAC
▶ LCD Interface
▶ Quad-SPI Flash Interface
▶ State Configurable Timer Subsystem
▶ Up to 80 GPIO

Additional features
▶ 8-channel GPDMA controller
▶ Two 8-channel 10-bit ADCs and 10-bit DAC
   (400 K samples per second)
▶ Motor Control PWM and Quadrature Encoder Interface
▶ Four UARTs
▶ Smart card interface
▶ Two Fast-mode I^{2}C
▶ I^{2}S interface
▶ Two SSP/SPI
▶ Temperature range: –40 °C to +85 °C

Lower power and high performance
The LPC1800 - designed using NXP's ultra low-leakage 90 nm process technology - is optimized for low power operation at very low frequencies all the way through to 150 MHz maximum performance from either Flash or RAM. This performance provides maximum connectivity and bandwidth options for a wide range of demanding applications including power conversion, lighting, motor control and audio applications.

Large internal memory
The LPC1800 offers the industry's largest on-chip SRAM for a Cortex-M3 with up to 200 KB provided in multiple banks. A flexible dual-bank Flash architecture offers the highest reliability in-application re-programming, and allows for non-stop Flash operation.

Extensive peripheral set
The LPC1800 also features two new innovative peripherals: a flexible quad-SPI interface and a State Configurable Timer subsystem. The LPC1800 is the first microcontroller to provide a seamless high-speed interface that will connect with virtually all SPI and quad-SPI manufacturers. The LPC1800's State Configurable Timer Subsystem comprises of a timer array with a state machine enabling complex functionality including

event controlled PWM waveform generation, ADC synchronization and dead time control. This timer subsystem gives embedded designers increased flexibility to create user-defined wave-forms and control signals.

Additional peripherals available on the LPC1800 include two HS USB controllers, an on-chip HS PHY, a 10/100T Ethernet controller with hardware enabled TCP/IP checksum calculation, a high-resolution color LCD controller, and AES decryption including two 128-bit secure OTP memories for key storage. Versions with AES encryption are available on request.

For more information, please visit www.nxp.com/microcontrollers

LPC1800 block diagram
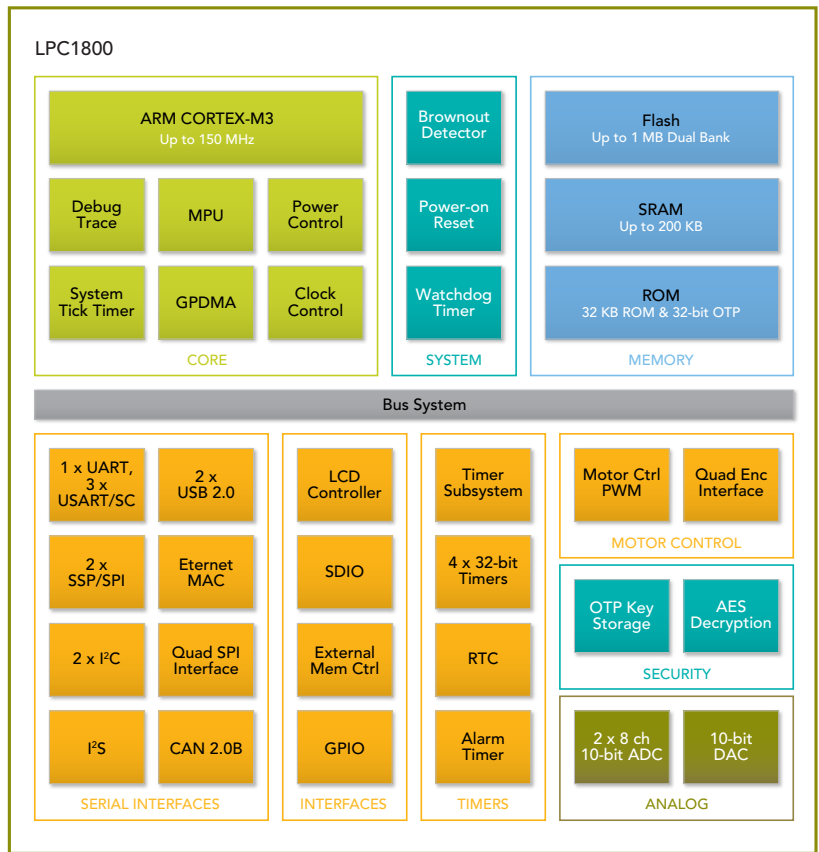
Selection guide

Type	Memory		LCD	Ethernet	USB	SPI Flash Interface	State Config Timer Subsys	ADC	I/O pins	Ext bus interface	Temp. range options	Package
	FLASH	RAM										
LPC1810		136				•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1812	512 (1x512)	104				•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1813	512 (2x256)	104				•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1815	768 (2x384)	136				•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1817	1024 (2x512)	136				•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1820		168			1	•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1822	512 (1x512)	104			1	•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1823	512 (2x256)	104			1	•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1825	768 (2x384)	136			1	•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1827	1024 (2x512)	136			1	•	•	2x 4-6ch 10b	17-64	8	-40 to +85 °C	LQFP144, TBGA100
LPC1830		200		•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180
LPC1833	512 (2x256)	136		•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180
LPC1837	1024 (2x512)	136		•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180
LPC1850		200	•	•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180
LPC1853	512 (2x256)	136	•	•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180
LPC1857	1024 (2x512)	136	•	•	2	•	•	2x 8ch 10b	80	16-32	-40 to +85 °C	LQFP208, BGA256, BGA180