



NXP 120 MHz, 32-bit
Cortex-M4 DSC
LPC407x/LPC408x

Cortex-M4 DSC with FPU, Ethernet, USB, optional LCD, and NXP's SPIFI

The LPC407x / LPC408x series of low-power, cost-effective digital signal controllers feature up to 512 KB Flash, 96 KB SRAM, 4 KB EEPROM, NXP's unique SPI Flash Interface (SPIFI), two analog comparators, and a wide assortment of connectivity peripherals, including up to five UARTS, three SPI/SSP, and three I²C interfaces.

Key Features

- ▶ ARM Cortex-M4 Core
 - Up to 120 MHz operation
 - Nested Vectored Interrupt Controller (NVIC) for fast deterministic interrupts
 - Wakeup interrupt controller
 - Floating Point Unit (FPU)
 - Memory Protection Unit (MPU)
 - Four reduced-power modes
- ▶ Memories
 - Up to 512 KB Flash memory
 - Up to 96 KB SRAM
 - Up to 4 KB EEPROM
- ▶ Serial Peripherals
 - LCD controller with 1024 x 768 pixel display resolution
 - 10/100 Ethernet MAC
 - USB 2.0 full-speed device/host/OTG controller with on-chip PHY
 - Innovative Quad SPI Flash Interface (SPIFI)
 - Four UARTs & one USART with fractional baud rate generation, RS-485, smart card (ISO7816-3) mode, modem control I/O, and IrDA
 - Two CAN 2.0B controllers
 - Three SSP/SPI controllers
 - Three I²C-bus interfaces with one supporting Fast-mode Plus (1 Mbit/s data rates)
 - I²S interface for digital audio
- ▶ Analog Peripherals
 - 12-bit analog-to-digital converter with eight channels
 - 10-bit digital-to-analog converter
- ▶ Other Peripherals
 - Low-power real-time clock (RTC) with event recorder for tamper detection
 - Eight-channel, general-purpose DMA controller
 - Up to 165 GPIO
 - Motor-control PWM and quadrature encoder interface
 - Four 32-bit general-purpose timers/counters with eight capture and ten compare outputs
 - 12 MHz internal RC oscillator trimmed to 1% accuracy

The NXP LPC407x and LPC408x series use Cortex-M4 signal processing instructions and an optional FPU core that operates at up to 120 MHz. Each device has up to 512 KB of Flash and up to 96 KB of SRAM.



The LPC407x/LPC408x series features a multi-layer AHB bus that allows high-bandwidth peripherals such as Ethernet and USB to run simultaneously, without impacting performance. The LPC407x/8x devices are available in LQFP packages with 80, 144 or 208 pins and in TFBGA packages with 180 or 208 pins. LPC407x/8x series devices are pin-compatible with the

NXP LPC24xx/23xx and the LPC178x/7x families.

The LPC40xx architecture, with the signal processing capabilities of the Cortex-M4 and a wide array of peripherals, is ideal for displays, scanners, industrial networking, alarm systems, medical diagnostics, and motor-control applications.

Selector Guide

Typenumber	FPU	Flash (KB)	SRAM (KB)	EEPROM (KB)	Ethernet	USB	UART	EMC ⁽¹⁾	LCD	CAN	I ² S	QEI	SD/MMC	SPIFI	Comparators
LPC408x															
LPC4088FBD208	Y	512	96	4	Y	H/O/D	5	32	Y	2	Y	Y	Y	Y	2
LPC4088FET208	Y	512	96	4	Y	H/O/D	5	32	Y	2	Y	Y	Y	Y	2
LPC4088FET180	Y	512	96	4	Y	H/O/D	5	16	Y	2	Y	Y	Y	Y	2
LPC4088FBD144	Y	512	96	4	Y	H/O/D	5	8	Y	2	Y	Y	Y	Y	2
LPC407x															
LPC4078FBD208	Y	512	96	4	Y	H/O/D	5	32	N	2	Y	Y	Y	Y	2
LPC4078FET208	Y	512	96	4	Y	H/O/D	5	32	N	2	Y	Y	Y	Y	2
LPC4078FET180	Y	512	96	4	Y	H/O/D	5	16	N	2	Y	Y	Y	Y	2
LPC4078FBD144	Y	512	96	4	Y	H/O/D	5	8	N	2	Y	Y	Y	Y	2
LPC4078FBD80	Y	512	96	4	Y	H/O/D	5	8	N	2	Y	Y	Y	Y	2
LPC4076FET180	Y	256	80	4	Y	H/O/D	5	16	N	2	Y	Y	Y	Y	2
LPC4076FBD144	Y	256	80	4	Y	H/O/D	5	8	N	2	Y	Y	Y	Y	2
LPC4074FBD144	N	128	40	2	N	D	4	8	N	2	N	N	N	Y	-
LPC4074FBD80	N	128	40	2	N	D	4	8	N	2	N	N	N	Y	-
LPC4072FET180	N	64	32	2	N	D	4	8	N	2	N	N	N	Y	-
LPC4072FBD80	N	64	32	2	N	D	4	8	N	2	N	N	N	Y	-

All parts include two CAN channels, a SPIFI interface, three SSP interfaces, three I²C interfaces, one I²S interface, one DAC, and an 8-channel, 12-bit ADC.

⁽¹⁾ Maximum data bus width of the External Memory Controller (EMC) depends on package size. Smaller widths may be used.

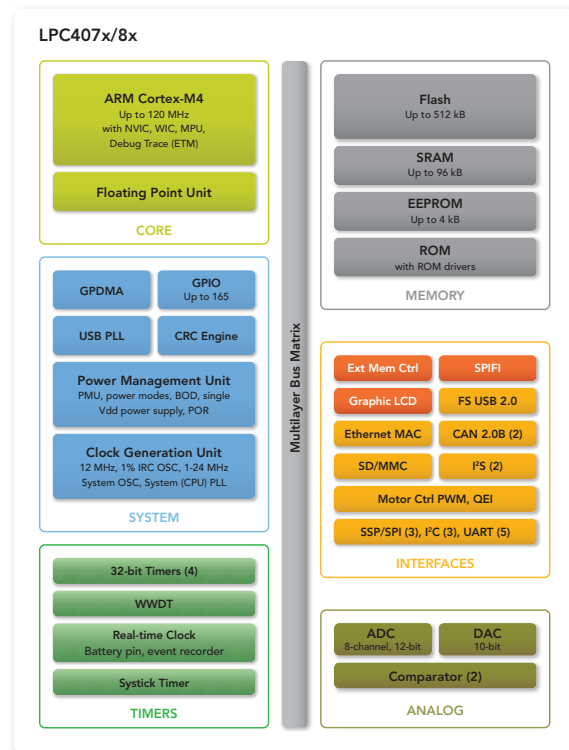
Third-party development tools

The following featured development tools support the LPC407x/8x series:

- ▶ Evaluation boards
 - Code Red RDB4078
 - Embedded Artists
 - IAR KSDK-LPC408x
- ▶ IDEs
 - NXP LPCXpresso
 - IAR Embedded Workbench for ARM (EWARM)
 - Keil μVision3
 - CodeRed Eclipse-based Red Suite
- ▶ JTAG debuggers
 - All debuggers supporting Cortex-M4

For more information about our development tools please visit www.nxp.com/microcontrollers

LPC407x/8x block diagram



www.nxp.com

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