NXP 50 MHz, 32-bit Cortex™-M0 MCUs LPC11A00

Cortex-M0 MCUs with Flexible Analog subsystem & UVLO

These low-power, cost-effective Cortex-M0 microcontrollers feature up to 32 KB of Flash, 8 KB of SRAM, and 4 KB of EEPROM memory. They support advanced analog features such as Under Voltage Lockout (UVLO), 0.9 V voltage reference and include an ADC, DAC, temp sensor, comparator, and several connectivity interfaces.

Key features

- ARM Cortex-M0 core operating at 50 MHz
  - Nested Vectored Interrupt Controller (NVIC)
  - Serial wire debug
  - System tick timer
  - Three reduced-power modes: Sleep, Deep-sleep, and Deep power-down
- Memories
  - Up to 32 KB on-chip Flash
  - Up to 4 KB on-chip EEPROM; byte erasable and byte programmable
  - Up to 8 KB SRAM
  - Boot ROM for ISP/IAP, software divide, power profiles and other APIs
- Serial interfaces
  - USART with internal FIFO, fractional baud rate generation, and RS-485/9-bit mode
  - Up to two SSP controllers with FIFO and multi-protocol capabilities
  - I^2C-bus interface with Fast-mode Plus (Fm+)
- Advanced analog subsystem
  - 10-bit ADC with 8 channels
  - 10-bit DAC with flexible triggering
  - Analog comparator with programmable voltage reference
  - Integrated temperature sensor
  - Internal voltage reference
- Other peripherals
  - Up to 42 GPIO (some with digital glitch filters), plus high-current source driver and two high-current sink drivers
  - Four general-purpose counter/timers with a total of 16 capture inputs and 14 match outputs
  - Programmable windowed WatchDog Timer (WDT) with dedicated low-power oscillator
  - 12 MHz internal oscillator with 1% accuracy
  - PLL allows CPU operation up to maximum CPU rate
  - Clock output function with divider
  - Brown-Out Detect (BOD) with 4 thresholds
  - Unique device serial number for identification
  - Single 3.3 V power supply (1.8 to 3.6 V)
  - Temperature range -40 to +85 °C
- Packages:
  - 48-pin LQFP, 33-pin HVQFN, or 20-pin WLCSP (25 x 25 mm)

The LPC11A1x series, which offers an enhanced set of analog peripherals, builds on NXP's market-leading Cortex-M0 core. Operating at up to 50 MHz, these low-cost, low-power devices include up to 32 KB of Flash, 8 KB of SRAM, and 4 KB of EEPROM memory.

Flexible analog subsystem featuring UVLO

The analog subsystem in the LPC11A00 microcontroller includes Under-Voltage LockOut (UVLO) protection against power-supply drops below 2.4V, an on-chip comparator with a programmable voltage reference, a 10-bit ADC with input multiplexing among 8 pins, a 10-bit DAC with flexible conversion triggering, an integrated temperature sensor, and a highly accurate 0.9 voltage reference that can be used for internal ADC calibration. By providing seamless integration of the various analog blocks, the LPC11A00 allows system designers to off-load critical tasks from the CPU.

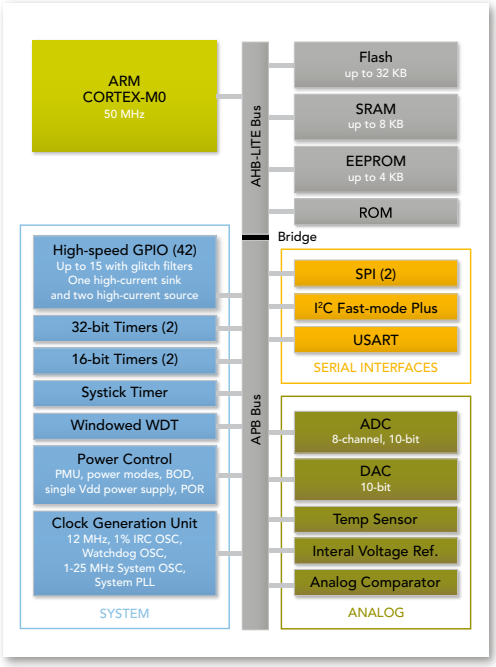
The interconnected subsystem offers flexible operation. It allows the comparator to trigger ADC and DAC operations while taking timestamps from a 32-or 16-bit timer, or lets analog operations be triggered by the timers. For efficient system monitoring, the comparator and the timers can be further configured to make time measurements of fluctuating analog signals.

Wafer-Level Chip Scale Package (WLCSP)

For designs requiring small form factor and low power, the 20-pin WLCSP package (2.5 x 2.5 mm) enables debugging and programming via the I²C-bus – a unique feature that minimizes the number of pins for system integration while simplifying board layout. On-chip ROM-based routines for the I²C interface enable seamless integration via an easy-to-use API-driven interface. The LPC11A00 WLCSP20 pin-out offers two memory configurations (16 and 32 KB) with up to 4 KB EEPROM, while supporting all peripherals including USART, SSP and 18 GPIO.

The LPC11A100 has up to 42 general-purpose I/O (GPIO) pins with configurable pull-up/pull-down resistors, a repeater mode, and open-drain mode. Up to 15 of the pins are configurable with a digital-input glitch filter that can remove glitches with widths of 10 ns or less. Two pins are configurable for 50 ns glitch filters. The GPIO pins can be used as edge- and level-sensitive interrupt sources. The GPIO include one high-current source output driver (20 mA), and two high-current sink drivers (20 mA).

LPC11A1x block diagram



LPC11A00 selector guide

Type number SPI	Flash	Total SRAM	EEPROM	10-bit ADC channels	10-bit DAC	Temperature sensor	Analog comparator	USART	SSP/SPI	I²C	GPIO	Package
LPC11A02UK	16 kB	4 kB	2 kB	8	1	1	1	1	1	1	18	WLCSP20
LPC11A04UK	32 kB	8 kB	8 kB	8	1	1	1	1	1	1	18	WLCSP20
LPC11A11FHN33/001	8 kB	2 kB	5 kB	8	1	1	1	1	2	1	28	HVQFN33
LPC11A12FHN33/101	16 kB	4 kB	1 kB	8	1	1	1	1	2	1	28	HVQFN33
LPC11A12FBD48/101	16 kB	4 kB	1 kB	8	1	1	1	1	2	1	42	LQFP48
LPC11A13FHI33/201	24 kB	6 kB	2 kB	8	1	1	1	1	2	1	28	HVQFN33
LPC11A14FHN33/301	32 kB	8 kB	4 kB	8	1	1	1	1	2	1	28	HVQFN33
LPC11A14FBD48/301	32 kB	8 kB	4 kB	8	1	1	1	1	2	1	42	LQFP48

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