



## NXP 50-MHz, 32-bit ARM Cortex-M0™ microcontrollers LPC11U00

# Low-cost Cortex-M0 USB solutions with Smart Card interface

Delivering robust USB performance at a low price point, these low-cost devices are compelling replacements for 8/16-bit USB microcontrollers. The highly flexible USB architecture is, quite simply, a better approach to USB. NXP offers the widest range of ARM-based USB solutions, as well as easy-to-use software and integrated development platforms that make NXP a one-stop shop for USB.

### Features

- ▶ ARM Cortex-M0 processor, running at frequencies of up to 50 MHz
- ▶ Memory:
  - Up to 32 kB on-chip flash program memory
  - Total of 6 kB SRAM data memory (4 kB main SRAM and 2 kB USB SRAM)
  - 16 kB boot ROM
  - In-System Programming (ISP) and In-Application Programming (IAP) via on-chip bootloader software
- ▶ Debug options:
  - Standard JTAG test/debug interface. Serial Wire Debug
  - Boundary scan for simplified board testing
- ▶ Up to 40 General-Purpose I/O (GPIO) pins with configurable pull-up/pull-down resistors, repeater mode, and open-drain mode
  - Two GPIO grouped interrupt modules enable an interrupt based on a programmable pattern of input states of a group of GPIO pins
  - High-current source output driver (20 mA) on one pin (P0\_7)
  - High-current sink driver (20 mA) on two true open-drain pins (P0\_4 and P0\_5)
- ▶ Four general-purpose counter/timers with a total of up to 5 capture inputs and 13 match outputs
- ▶ Programmable Windowed WatchDog Timer (WWDT) with a dedicated, internal low-power WatchDog Oscillator (WDO)
- ▶ Analog peripherals:
  - 10-bit ADC with input multiplexing among eight pins
- ▶ Serial interfaces:
  - USB 2.0 full-speed device controller
  - USART with fractional baud-rate generation
  - USART supports an asynchronous Smart Card interface (ISO 7816-3)
  - Two SSP controllers with FIFO and multi-protocol capabilities
  - I<sup>2</sup>C-bus interface supporting the full I<sup>2</sup>C-bus specification and Fast-mode Plus (Fm+)



- ▶ Clock generation:
  - Crystal oscillator with an operating range of 1 to 25 MHz (system oscillator)
  - 12 MHz high-frequency Internal RC oscillator (IRC)
  - Internal low-power, low-frequency WatchDog Oscillator
  - PLL allows CPU operation up to the maximum CPU rate with the system oscillator or the IRC as clock sources
    - A second, dedicated PLL is provided for USB
  - Clock output function
- ▶ Power control:
  - Four reduced power modes: Sleep, Deep-sleep, Power-down, and Deep power-down
  - Power profiles residing in boot ROM
  - Processor wake-up from Deep-sleep and Power-down modes via reset, selectable GPIO pins, watchdog interrupt, or USB port activity
- ▶ Power-On Reset (POR)
- ▶ Brownout detect with four separate thresholds for interrupt and forced reset

- ▶ Unique device serial number for identification
- ▶ Single 3.3 V power supply (1.8 to 3.6 V)
- ▶ Temperature range -40 to +85°C
- ▶ Available in 48-pin LQFP, 48-pin TFBGA, and 33-pin HVQFN package
- ▶ Pin-compatible with the LPC134x series

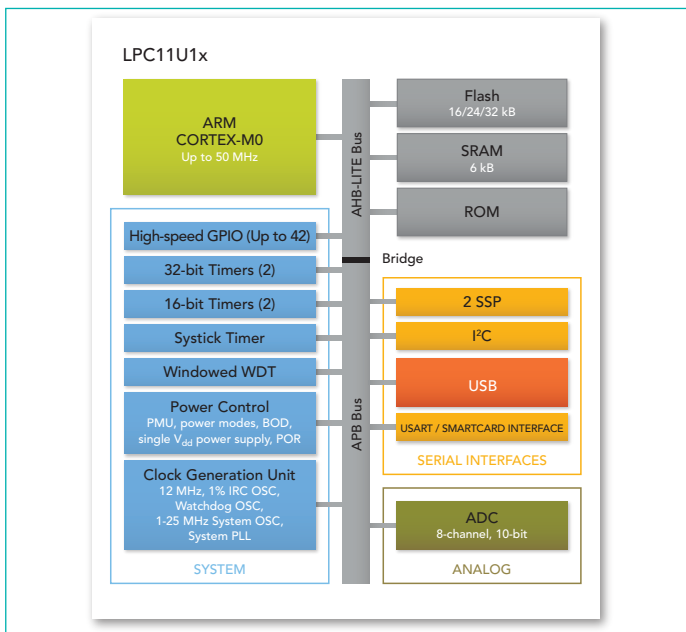
### Maximizing connectivity, minimizing power

Connectivity options on the LPC11U00 series include two Synchronous Serial Port (SSP) interfaces, I<sup>2</sup>C with Fast-mode Plus feature for 10x higher bus-drive capability, a Universal Synchronous-Asynchronous Receiver/Transmitter (USART) and a Smart Card interface. The Smart Card interface (ISO7816-3) provides a plug-and-play interface for Smart Cards, making the LPC11U00 a good fit for e-commerce applications.

### Small form-factor mobile & consumer apps

As an extension of NXP's proven LPC1100 family, the LPC11U00 series delivers up to 32 kB Flash, 6 kB SRAM, a variety of serial interfaces, four system timers with PWM functionality, an 8-channel, 10-bit ADC, and up to 40 GPIOs. In addition to several standard package offerings, the LPC11U00 series is offered in a miniature 4.5 x 4.5 mm TFBGA48 package, making it especially suited for small form-factor mobile and consumer applications.

## LPC11U1x



Type number	Flash	Total SRAM	USB	USART/Smart Card Interface	I <sup>2</sup> C / Fm+	ADC channels	SSP	Package
LPC11U12FHN33/201	16 kB	6 kB	1	1	1	8	2	HVQFN33
LPC11U12FBD48/201	16 kB	6 kB	1	1	1	8	2	LQFP48
LPC11U13FBD48/201	24 kB	6 kB	1	1	1	8	2	LQFP48
LPC11U14FHN33/201	32 kB	6 kB	1	1	1	8	2	HVQFN33
LPC11U14FBD48/201	32 kB	6 kB	1	1	1	8	2	LQFP48
LPC11U14FET48/201	32 kB	6 kB	1	1	1	8	2	TFBGA48

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