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
  - I²C-bus interface supporting the full I²C-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

**LPC11U1x**

- **ARM Cortex-M0**
- **Up to 30 MHz**
- **High-speed GPIO (Up to 42)**
- **32-bit Timers (2)**
- **16-bit Timers (2)**
- **Systick Timer**
- **Windowed WDT**
- **Power Control**
  - PMU, power modes, BOD, single V dd power supply, POR
- **Clock Generation Unit**
  - 12 MHz, 1% IRC OSC, Watchdog OSC, 1-25 MHz System OSC, System PLL
- **System Analog**
- **Power Control**
- **PMU, power modes, BOD, single V dd power supply, POR**
- **ADC**
  - 8-channel, 10-bit
- **Clock Generation Unit**
  - 12 MHz, 1% IRC OSC, Watchdog OSC, 1-25 MHz System OSC, System PLL
- **System Analog**
- **SERIAL INTERFACES**
- **2 SSP**
- **I2C**
- **USB**
- **USART / SMARTCARD INTERFACE**
- **Flash**
  - 16/24/32 kB
- **SRAM**
  - 6 kB
- **ROM**
- **Bridge**
  - AHB-LITE Bus
  - APB Bus

**Type number** | **Flash** | **Total SRAM** | **USB** | **USART/Smart Card Interface** | **I2C / Fm+** | **ADC channels** | **SSP** | **Package**
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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

**Maximizing connectivity, minimizing power**

Connectivity options on the LPC11U00 series include two Synchronous Serial Port (SSP) interfaces, I2C 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.