NXP 72 MHz, 32-bit Cortex-M3™ microcontrollers LPC1300

Low-power Cortex-M3 based microcontrollers simplify USB designs

These new, low-power MCUs consume approximately 200 µA/MHz, for power savings in a wide range of 16/32-bit applications. The LPC1340 includes on-chip USB drivers for mass storage class (MSC) and human interface device (HID). This greatly simplifies USB implementations since the USB drivers are incorporated in ROM, and saves around 5-6 Kbytes of user code.

Key features

▶ ARM Cortex-M3 processor
  - 72 MHz operation
  - Nested Vectored Interrupt Controller for fast deterministic interrupts
  - Wakeup Interrupt Controller allows automatic wake from an priority interrupt
  - Three reduced-power modes: Sleep, Deep-sleep, and Deep power-down
▶ Memories
  - Up to 32 KB Flash memory
  - Up to 8 KB SRAM
▶ Serial peripherals
  - USB 2.0 full-speed device controller with on-chip PHY
  - UART with fractional baud rate generation, internal FIFO, and RS-485 support
  - SSP/SPI controller with FIFO and multi-protocol capabilities
  - I²C-bus interface supporting full I²C-bus specification and Fast mode plus with a data rate of 1 Mbit/s, multiple address recognition, and monitor mode

▶ Analog peripherals:
  - 10-bit analog-to-digital converter (ADC) with eight channels and conversion rates up to 400 K samples per second
▶ Other peripherals:
  - Up to 42 General Purpose I/O (GPIO) pins with configurable pull-up/down resistors and a new, configurable open-drain operating mode
  - Four general-purpose counter/timers, with a total of four capture inputs and 13 match outputs
  - Programmable Watchdog timer (WDT) with lock-out feature
  - System tick timer
  - Each peripheral has its own clock divider for power savings

Applications

▶ White goods
▶ e-Metering
▶ Consumer peripherals
▶ Remote sensors
▶ 16/32-bit applications

Built around a Cortex-M3 Rev2 processor core, the LPC1300 is equipped with up to 32 KB of Flash and up to 8 KB of SRAM, uses a single 3.3 V power supply (for operation between 2.0 and 3.6 V), and is available in LQFP48 or HVQFN33 packages.

The LPC1300 series is pin-to-pin compatible with the LPC1100 series, NXP's new family of Cortex-M0 MCUs, so it gives designers a straightforward migration path to the even lower-power features of the Cortex-M0 architecture.

Also, in keeping with NXP's existing line of more than 50 USB-equipped ARM MCUs, the LPC1340 offers support for USB full-speed operation. HID and mass storage USB driver software is included in a dedicated on-chip ROM, maximizing the amount of Flash memory available for user code.

Third-party development tools

The LPC1100 family is supported by LPCXpresso, an easy-to-use, comprehensive development tool platform for under US$30. It's also supported by development tools from IAR, Keil, Hitex, Code Red, and many others. For the most current listing, please visit www.nxp.com/microcontrollers.

Additional features

▸ Serial wire debug and serial wire trace port
▸ High-current output driver (20 mA) on one pin
▸ High-current sink drivers (20 mA) on two pins
▸ Integrated power management unit (PMU) minimize power consumption during Sleep, Deep-sleep, and Deep power-down modes
▸ Single 3.3 V power supply (2.0 to 3.6 V)
▸ 15 GPIO pins can be used as edge- and level-sensitive interrupt sources
▸ Clock generation unit with divider that can reflect the main oscillator, IRC, CPU, and Watchdog clocks
▸ Processor wake-up from Deep-sleep mode via interrupts from various peripherals
▸ Brownout detect with four separate thresholds for interrupt and forced reset
▸ Power-on reset (POR)
▸ Crystal oscillator with an operating range of 1 to 25 MHz
▸ 12 MHz internal RC oscillator, trimmed to 1% accuracy, that can optionally be used as a system clock
▸ PLL supports maximum CPU rate without a high-frequency crystal and can be run from the main, internal RC, or Watchdog oscillator
▸ Available in 48-pin LQFP package or 33-pin HVQFN package

LPC1300 selection guide

Type number	Flash	Total SRAM	USB	UART RS-485	I2C/Fast+	SSP/SPI	ADC channels	Packages
LPC1343	32 KB	8 KB	Device	1	1	1	8	LQFP48, HVQFN33
LPC1342	16 KB	4 KB	Device	1	1	1	8	HVQFN33
LPC1313	32 KB	8 KB	-	1	1	1	8	LQFP48, HVQFN33
LPC1311	8 KB	2 KB	-	1	1	1	8	HVQFN33