

## STM32L0X0 VALUE LINE

# Ultra-low-power MCUs



# Simple, affordable ultra-low-power STM32 MCUs with an Arm® Cortex® -M0+ core

The ultra-low-power STM32L0 Value line incorporates the efficient 32-bit Arm® Cortex®-M0+ core operating at 32 MHz, embedded memories (128 Kbytes of Flash program memory, 512 bytes of data EEPROM and 20 Kbytes of RAM).

This STM32L0 Value line provides high power efficiency over a wide performance range. This is achieved with a large choice of internal and external clock sources, internal voltage adaptation, and several low-power modes.

#### **CORE**

- From 32 kHz to 32 MHz
- 0.95 DMIPS/MHz

## **MEMORIES**

- Up to 128 Kbytes of Flash memory
- Up to 20 Kbytes of RAM
- Up to 512 bytes of data EEPROM
- 20-byte backup register
- Sector protection against R/W operations

## **ULTRA-LOW-POWER PLATFORM**

- 1.8 to 3.6 V power supply
- -40 to 85 °C temperature range
- Down to 0.23 µA Standby mode (2 wakeup pins)
- Down to 0.29 μA Stop mode (16 wakeup lines)
- 0.54 μA Stop mode + RTC + 2-Kbyte RAM retention
- Down to 49 μA/Mhz in Run mode (with external SMPS)
- 5 µs wakeup time (from Flash memory)
- 41 µA 12-bit ADC conversion at 10 ksps

#### **CLOCK SOURCES**

- 0 to 32 MHz external clock
- 32 kHz oscillator for real-time-clock (RTC) with calibration
- High-speed internal 16 MHz factorytrimmed RC oscillator (±1%)
- Internal low-power 37 kHz RC oscillator
- Internal multispeed low-power 65 kHz to 4.2 MHz RC oscillator
- PLL for CPU clock

#### **OTHER**

- 7-channel DMA controller, supporting ADC, SPI, I2C, USART and timers
- 4x peripheral communication interfaces
- 1x USART (ISO 7816), 1x LPUART
- (low power)
   1x SPI (16 Mbit/s)
- 1x I2C (SMBus/PMBus)
- 8x timers: 1x 16-bit with up to 4 channels, 2x 16-bit with up to 2 channels, 1x 16-bit ultra-low-power timer, 1x SysTick, 1x RTC and 2x watchdogs (independent/window)

## STM32L010RB block diagram

#### **System**

**Power supply** 1.8 V regulator POR/PDR/BOR Xtal oscillators 32 kHz + 1 to 32 MHz Internal RC oscillators 38 kHz + 16 MHz **PLL** Internal multispeed **ULP RC oscillator** 64 kHz to 4 MHz **Clock control** RTC/AWU SysTick timer 2x watchdogs (independent and window) 51 I/0s Cyclic redundancy check (CRC) Voltage scaling

3 modes

## Arm® Cortex®-M0+ CPU 32 MHz

Nested Vector Interrupt Controller (NVIC)

SW debug

AHB-Lite+ bus matrix

AHB-bus - I/O port Bus
Up to 7-channel DMA

to 7-channel DIVIA

**Analog** 

1x 12-bit ADC SAR

### 128-Kbyte Flash memory

20-Kbyte SRAM

512-bytes EEPROM

20-bytes backup data

BOOT ROM

### Connectivity

1x SPI, 1x I<sup>2</sup>C 1x USART

1x ULP UART

## Control

1x ultra-low-power 16-bit timer 3x 16-bit timers

#### Hardware tools





NUCLEO-L010RB Nucleo-64 development board

## Software development tools





STM32CubeMonitor helps to fine-tune and diagnose STM32 applications at run-time by reading and visualizing their variables in real-time.

STM32CubeMX enables fast development thanks to its MCU clock configurator, power consumption calculator and code generation tools.

## STM32Cube MCUs Packages



The STM32CubeL0 package includes the STM32Cube HAL and low-layer (LL) APIs peripheral drivers, plus a consistent set of middleware components (RTOS, USB, FatFS, graphics and STM32 touch sensing).

All embedded software utilities come with a full set of examples running on STMicroelectronics boards.

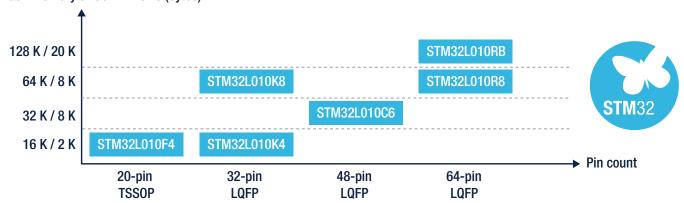
#### **ST COMMUNITY**



Engage with the community of STM32 enthusiasts on **community.st.com/stm32** 

## STM32L010 value line portfolio

Flash memory size / RAM size (bytes)





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