

# STM32™ 32-bit MCU family

## Leading supplier of ARM® Cortex®-M microcontrollers



# Releasing your creativity

By choosing one of ST's microcontrollers for your embedded application, you gain from our leading expertise in MCU architecture, technology, multi-source manufacturing and long-term supply

The STM32® portfolio offers an extraordinary variety of options, now including ARM® Cortex®-M cores (M0, M0+, M3, M4 and M7), giving developers flexibility to find the perfect STM32 for their applications. Particular attention is paid to accommodate porting of applications from one device to another. The binary compatibility combined with the similar pinout assignment, hardware IPs proliferation and higher level programming language makes the development job far more convenient when dealing with the STM32 families.

## HIGH-PERFORMANCE



## HIGH DEGREE OF INTEGRATION AND RICH CONNECTIVITY

- **STM32F7**: very high performance MCUs with advanced features Cortex®-M7 with 512 Kbytes to 1 Mbyte of Flash
- **STM32F4**: from access to the high performance up to advanced features with DSP and FPU instructions Cortex®-M4 with 64 Kbytes to 2 Mbytes of Flash
- **STM32F2**: mid-range MCUs with excellent price-performance ratio Cortex®-M3 with 128 Kbytes to 1 Mbyte of Flash

## MAINSTREAM



## SCALABLE SET OF MCUS FOR A LARGE VARIETY OF APPLICATIONS

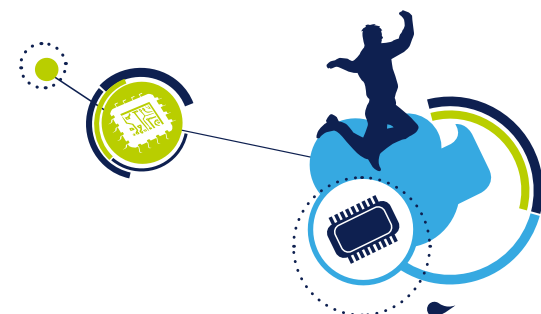
- **STM32F3**: upgraded F1 series with various level of advanced analog peripherals Cortex®-M4 with 16 to 512 Kbytes of Flash
- **STM32F1**: foundation series based on Cortex-M3 from 16 Kbytes to 1 Mbyte of Flash
- **STM32F0**: entry-level MCUs extending to 8-/16-bit world Cortex®-M0 with 16 to 256 Kbytes of Flash

## ULTRA-LOW-POWER



## TINY POWER BUDGET APPLICATIONS

- **STM32L4**: excellence in ultra-low-power with performance Cortex®-M4 with 128 Kbytes to 1 Mbyte of Flash (100 DMIPS/273 CoreMark)
- **STM32L1**: market-proven answer for 32-bit applications Cortex®-M3 with 32 to 512 Kbytes of Flash
- **STM32L0**: perfect fit for 8-/16-bit applications and cost-down designs Cortex®-M0+ with 8 to 192 Kbytes of Flash



Functional Safety Design Packages for STM32  
(including SIL and CLASSB standards)



[www.st.com/stm32safety](http://www.st.com/stm32safety)

## STM32® THE LEADING CORTEX-M PORTFOLIO

Common core peripherals and architecture:

Communication peripherals: USART, SPI, I²C

Multiple general-purpose timers

Integrated reset and brown-out warning

Multiple DMA

2x watchdogs Real-time clock

Integrated regulator PLL and clock circuit

Up to 3x 12-bit DAC

Up to 4x 12-bit ADC (Up to 5 MSPS)

Main oscillator and 32 kHz oscillator

Low-speed and high-speed internal RC oscillator

-40 to +85 °C and up to 125 °C operating temperature range

Low voltage 2.0 to 3.6 V or 1.65/1.7 to 3.6 V (depending on series)

Temperature sensor

## High-performance

STM32F7 series – High performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

216 MHz Cortex-M7 L1-Cache	Up to 2-Mbytes dual-bank Flash	Up to 512-Kbyte SRAM	2x USB 2.0 OTG FS/HS	2x 16-bit advanced MC timer	DFSDM CEC Ethernet S/PDIF	Quad-SPI FMC MDIO Camera IF SDIO	Crypto-hash TRNG MIPI-DSI	2x SAI 2x I²S Up to 3x CAN LCD-TFT	STM32 F7
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STM32F4 series – High performance with DSP, FPU, ART Accelerator™ and Chrom-ART Accelerator™

Up to 180 MHz Cortex-M4	Up to 2-Mbytes dual-bank Flash	Up to 384-Kbyte SRAM	2x USB 2.0 OTG FS/HS	2x 16-bit advanced MC timer	DFSDM CEC Ethernet S/PDIF	Quad-SPI FMC Camera IF SDIO	Crypto-hash TRNG MIPI-DSI	2x SAI 5x I²S Up to 2x CAN LCD-TFT	STM32 F4
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STM32F2 series – High performance with ART Accelerator™

120 MHz Cortex-M3 CPU	Up to 1-Mbyte Flash	Up to 128-Kbyte SRAM	2x USB 2.0 OTG FS/HS	2x 16-bit advanced MC timer	Ethernet	FSMC Camera IF SDIO	Crypto-Hash TRNG	2x I²S Up to 2x CAN	STM32 F2
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## Mainstream

STM32F3 series – Mixed-signal with DSP and FPU

72 MHz Cortex-M4	Up to 512-Kbyte Flash	Up to 80-Kbyte SRAM CCM-RAM	USB 2.0 FS	3x 16-bit advanced MC timer	3x DAC 7x comp. 4x PGA	FSMC CAN	HR-Timer	ADC 3x 16-bit $\Sigma\Delta$ 4x 12-bit (5 MSPS)	STM32 F3
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STM32F1 series – Mainstream

Up to 72 MHz Cortex-M3 CPU	Up to 1-Mbyte Flash	Up to 96-Kbyte SRAM	USB 2.0 OTG FS	2x 16-bit advanced MC timer	Ethernet CEC	SDIO FSMC	2x I²S 2x CAN		STM32 F1
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STM32F0 series – Entry-level

48 MHz Cortex-M0 CPU	Up to 256-Kbyte Flash	Up to 32-Kbyte SRAM 20-byte backup data	USB 2.0 FS device Crystal less	Comp. CEC	CAN DAC				STM32 F0
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## Ultra-Low-Power

STM32L4 series – Ultra-Low-Power and Performance with DSP, FPU and ART Accelerator™

80 MHz Cortex-M4 CPU	Up to 1-Mbyte dual-bank Flash	Up to 128-Kbyte SRAM	USB 2.0 OTG FS	2x 16-bit advanced MC timer	DFSDM Op-amps comp.	Quad-SPI FSMC SDIO	AES-256 TRNG	2x SAI CAN Up to LCD 8x40	STM32 L4
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STM32L1 series – Ultra-Low-Power

32 MHz Cortex-M3 CPU	Up to 512-Kbyte Flash	Up to 80-Kbyte SRAM	Up to 16-Kbyte EEPROM	USB 2.0 FS Device	Op-amps comp.	FSMC SDIO	AES-128	Up to LCD 8x40	STM32 L1
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STM32L0 series – Ultra-Low-Power

32 MHz Cortex-M0+ CPU	Up to 192-Kbyte SRAM	Up to 20-Kbyte SRAM	Up to 6-Kbyte EEPROM	USB 2.0 FS device Crystal less	DAC comp.	LP Timer LP-UART	TRNG AES-128	LP ADC 12-/16-bit LCD 8x40 / 4x52	STM32 L0
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## ST MCU Finder

Free mobile application to find the right STM32 MCU

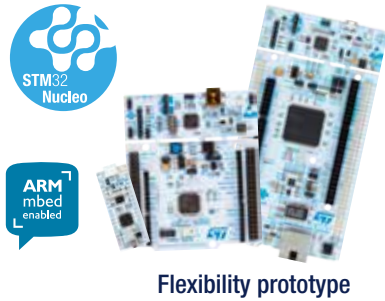
[www.st.com/stmcfinder](http://www.st.com/stmcfinder)



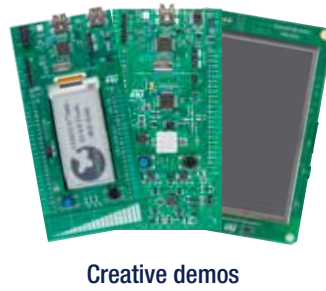
# STM32 ECOSYSTEM

## Hardware tools

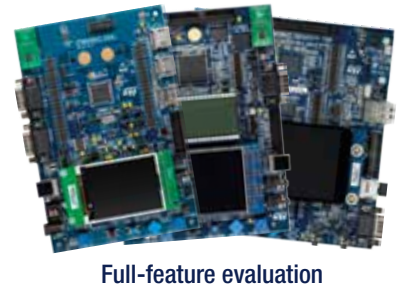
STM32 Nucleo board



Discovery kit

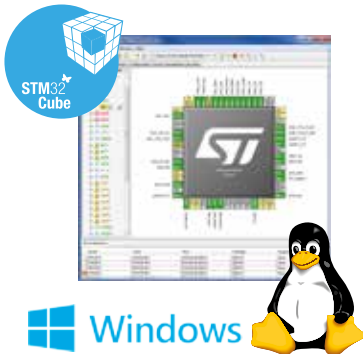


Evaluation board



## Software tools

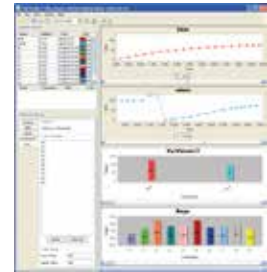
STM32CubeMX



Partners IDEs



STMStudio



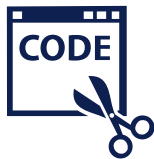
Note: Free full version of Keil MDK-ARM on all STM32F0 and STM32L0

Configure and generate code

Compile and debug

Monitor

## Embedded Software



STM32Snippets  
[www.st.com/stm32snippets](http://www.st.com/stm32snippets)

High optimization  
low portability



STM32Cube  
and Std Libraries  
[www.st.com/stm32cube](http://www.st.com/stm32cube)

Average optimization  
STM32 portability

ARM mbed™

CMSIS and  
Mbed SDK  
[www.mbed.org](http://www.mbed.org)

Low optimization  
ARM portability

STM32Java



Virtual machines  
and models  
[www.st.com/stm32](http://www.st.com/stm32)

Low optimization  
large portability



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