STM32 MCU family

32-bit Flash microcontrollers powered by ARM® Cortex™-M3

September 2009

www.st.com/mcu

Welcome to the world of STM32

Releasing your creativity

The STM32 family of 32-bit Flash microcontrollers is based on the breakthrough ARM CortexTM-M3 core – a core specifically developed for embedded applications that require a combination of high-performance, real-time, low-power and low-cost operation. The STM32 family benefits from the Cortex-M3 architectural enhancements (including the Thumb-2® instruction set) that deliver improved performance combined with better code density, and a tightly coupled nested vectored interrupt controller that significantly speeds response to interrupts, all combined with industry-leading power consumption. STMicroelectronics was a lead partner in developing the Cortex-M cores and with STM32 offers a comprehensive portfolio of advanced MCUs that we are committed to extending in capability, price range and features to cover the needs of microcontroller convergence.

The STM32 family is built to offer new degrees of freedom to MCU users. It offers a complete 32-bit product range that combines high-performance, real-time, low-power and low-voltage operation, while maintaining full integration and ease of development.
It eases migration from the 16-bit world thanks to its high level of features integration, its easy-to-use architecture, its low-power capability and cost-effectiveness.
The STM32 family will enable you to create new applications, and design in the innovations you have been long dreaming about.

The STM32 key benefits

- Leading-edge architecture with the latest Cortex-M3 core from ARM
- Excellent real-time behaviour
- Outstanding power efficiency
- Superior and innovative peripherals
- Maximum integration
- Easy development, fast time to market

Cortex-M3 core

Cortex Intelligent Processors by ARM

Leading edge architecture
Excellent real-time behaviour

Outstanding power efficiency

Sub µA RTC, low voltage
0.27 mA/MHz, low-power modes

Superior and innovative peripherals

USB OTG, Ethernet, dual CAN, ADC 12-bit, advanced timers

Maximum integration

Reset circuitry clocks, oscillators, PLL regulator RTC, watchdog

Extensive tools and software

Various IDE, starter kits, libraries, RTOS and stacks

Future proof design

Environment friendly, suits low-power operation

Address all your needs and beyond

Cost and space saving

More time for innovation improved productivity

STM32 platform
more than 70 fully compatible devices

STM32, the optimal platform choice

The STM32 is an optimal choice to support many applications with the same platform:

- From reduced memory and pin requirements to larger needs
- From performance demanding to battery operated
- From simple cost-sensitive to complex high-value

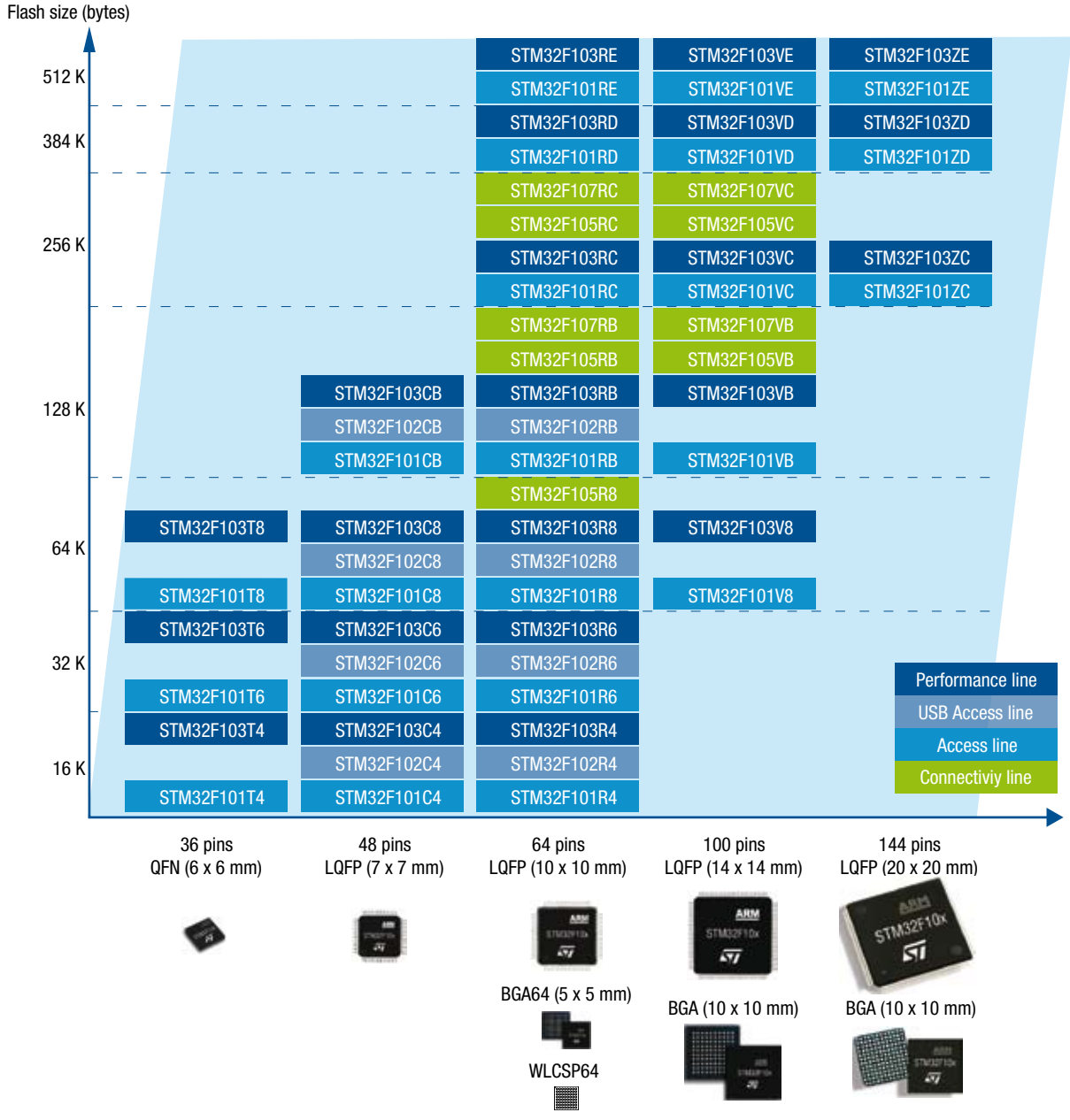
The total pin-to-pin, peripheral and software compatibility across the family gives you full flexibility across more than 70 devices.
You can upgrade to a higher or downgrade to a lower memory size, or use different packages without changing your initial layout or software.

STM32, the largest portfolio

The STM32 offers the widest selection of microcontroller devices:

- Up to 72 MHz Cortex-M3 CPU
- 4-Kbyte to 64-Kbyte SRAM
- Four lines: Performance, USB Access, Access and Connectivity lines
- Pin-to-pin, software and peripheral compatibility across family
- 2.0 to 3.6 V power supply, 5 V tolerant I/Os
- -40 to +85 °C or up to 105 °C operating temperature range

STM32F10x portfolio



Applications

Industrial
- PLC
- Inverters
- Printers, scanners
- Industrial networking

Building and security
- Alarm systems
- Access control
- HVAC

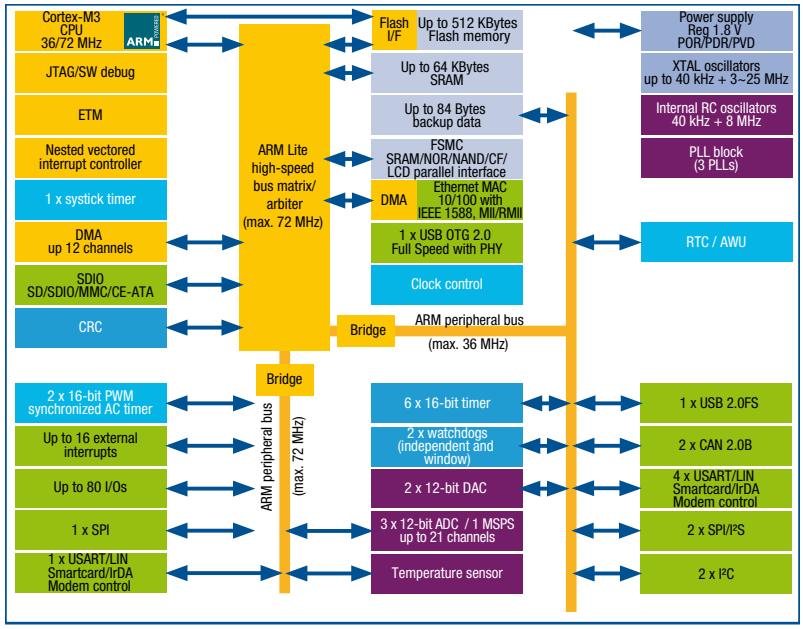
Low power
- Glucose meters
- Power meters
- Battery-operated applications

Appliances
- Motor drive
- Application control

Consumer
- PC peripherals, gaming
- Digital cameras, GPS platforms
- Home audio

STM32F10x family block diagram

This block diagram shows all the available peripherals. For exact product content, please refer to the device summary.



AWU: Auto wake-up capability with RTC alarm
CAN: Controller area network
CF: CompactFlash
CRC: Cyclic redundancy check
DMA: Direct memory access
ETM: Embedded Trace Macrocell
IrDA: Infrared Data Association
I²S: Inter-IC sound
LIN: Local interconnect network
MII: Media independent interface
MMC: MultiMediaCard
PDR: Power-down reset
POR: Power-on reset
PVD: Programmable voltage detector
RMII: Reduced media independent interface
RTC: Real-time clock
SDIO: Secure digital input output
SD: Secure digital
USART: Universal sync/async receiver transmitter

STM32, more choice with four complete lines

The four lines are pin-to-pin and software-compatible, and offer the same embedded Flash options.
The Performance line takes the 32-bit MCU world to new levels of performance and energy efficiency. With its Cortex-M3 core at 72 MHz, it is able to perform high-end computation while providing a rich set of peripherals.
The USB Access line is the intermediary between Performance and Access line. Its 48 MHz CPU maximum speed provides excellent performance while keeping the dynamic power consumption very low. It is intended for users that requires mandatorily the USB peripheral.
The Access line is the entry point of the STM32 family. It has the power of the 32-bit MCU but at a 16-bit MCU cost.
The Connectivity line adds Ethernet, USB OTG, dual CAN, audio class I²S. It is intended for applications where connectivity and real-time performances are required.

STM32F10x: product lines

The four lines include:

- Multiple communication peripherals Up to 5 x USART, 3 x SPI, 2 x I²C
- ETM*
- FSMC**
- 2-channel x 12-bit DAC*
- Up to 6 x 16-bit timers
- Main oscillator 4-16 MHz / 3-25 MHz***
- Internal 8 MHz and 40 kHz RC oscillators
- Real-time clock with battery domain and 32 kHz external oscillator
- 2 x watchdogs
- Reset circuitry and brown out warning
- Up to 12-channel DMA

* For part numbers starting at 256 Kbytes of embedded Flash
** For high-density Access and Performance lines
*** For Connectivity line

Performance line STM32F103

72 MHz CPU	Up to 512 Kbyte Flash / 64 Kbyte SRAM	2/3 x 12-bit ADC (1 µs) Temperature sensor	USB FS device	SDIO*	2 x I²S	CAN	PWM timer

USB Access line STM32F102

48 MHz CPU	Up to 128 Kbyte Flash / 16 Kbyte SRAM	1 x 12-bit ADC (1 µs) Temperature sensor	USB FS device

Access line STM32F101

36 MHz CPU	Up to 512 Kbyte Flash / 48 Kbyte SRAM	1 x 12-bit ADC (1 µs) Temperature sensor

Connectivity line STM32F105/STM32F107

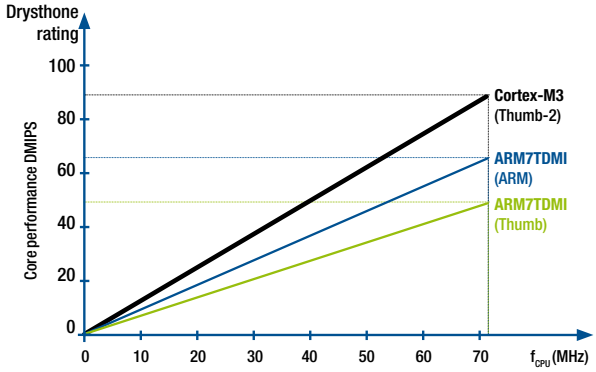
72 MHz CPU	Up to 64 Kbyte SRAM	USB 2.0 OTG FS	2 x CAN 2.0B	2 x I²S audio class	Ethernet IEEE 1588 (STM32F107 only)

STM32 key benefits

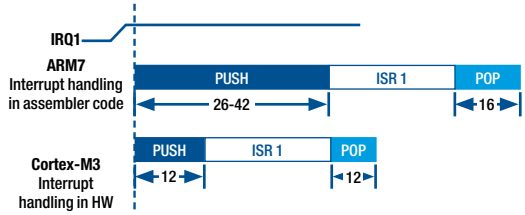
Leading-edge architecture with Cortex-M3 core

- Harvard architecture
- 1.25 DMIPS/MHz and 0.19 mW/MHz
- Thumb-2 instruction set brings 32-bit performance with 16-bit code density
- Single cycle multiply and hardware division
- Embedded, fast interrupt controller is now inside the core allowing:
  - Excellent real-time behaviour
  - Low latency down to six CPU cycles inter-interrupt
  - Six CPU cycles wake-up time from low-power mode
- Up to 35% faster and up to 45% less code than ARM7TDMI®

Cortex-M3 performance versus ARM7TDMI



Cortex-M3 interrupt versus ARM7TDMI



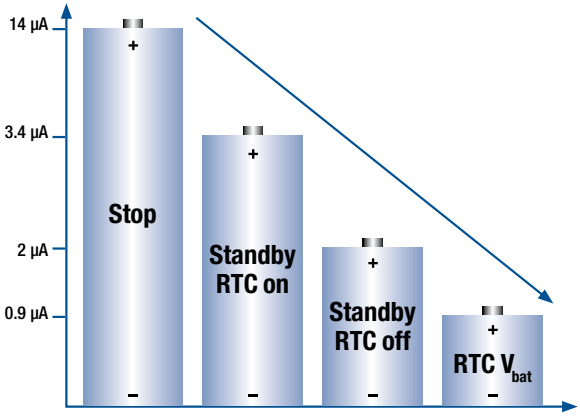
Outstanding power efficiency

High performance does not mean high power consumption. We have taken special care to address three main energy requirements driven by the market:

- High dynamic power efficiency in running mode
- Extremely low power when the application is in standby
- Low-voltage capability for direct battery operation

In run mode, executing from Flash at full 72 MHz CPU speed, the STM32 has a current consumption as low as 27 mA. In standby mode, current consumption is as low as 2 µA typical, with reset circuitry active. Finally, its 2.0 V to 3.6 V power supply enables its use for battery-operated applications.

STM32F10x typical current
(on 128-Kbyte device @ 25 °C)



The STM32 has three different low-power modes and a versatile clocking scheme so that users can optimize power consumption versus performance.

The STM32 also embeds a real-time clock (RTC) running either from a 32 kHz quartz oscillator or an internal RC oscillator. The RTC has a separate power domain, with an embedded switchover to run either from a dedicated coin cell battery or from the main supply. On 128-Kbytes devices, typical current consumption is 0.9 µA at 2.0 V. It embeds up to 84 bytes for data backup. Start-up time from low-power modes is lower than 6 µs typical from stop mode, and 50 µs typical from standby mode and reset.

- Low voltage **2.0 V to 3.6 V** operation
- Down to 27 mA in run mode from Flash at 72 MHz
- Startup time from stop **< 6 µs**
- Startup time from standby **50 µs**
- Reset circuitry always active

High level of integration

- Built-in supervisor reduces need for external components:
  - Power-on reset, low-voltage detect, brown-out detect, watchdog timer with independent clock
- One main crystal drives entire system:
  - Inexpensive 4-16 MHz / 3-25 MHz crystal drives CPU, USB and all peripherals
  - Embedded PLL generates multiple frequencies
  - Flexible PLL to clock simultaneously USB, CAN, Ethernet and audio class I²S
  - Optional 32 kHz crystal for RTC
- Embedded factory trimmed 8 MHz RC oscillator can be used as main clock
- Additional low-frequency RC oscillator for RTC or watchdog
- Only 7 external passive components required for base system on LQFP100 package

Superior and innovative peripherals

The need for speed	
USB	12 Mbit/s
USART	Up to 4.5 Mbit/s
SPI	18 MHz master and slave
I²C	400 kHz
GPIO	18 MHz maximum toggle
PWM timer	72 MHz clock input
SDIO	Up to 48 MHz
I²S	From 8 kHz to 96 kHz sampling frequencies

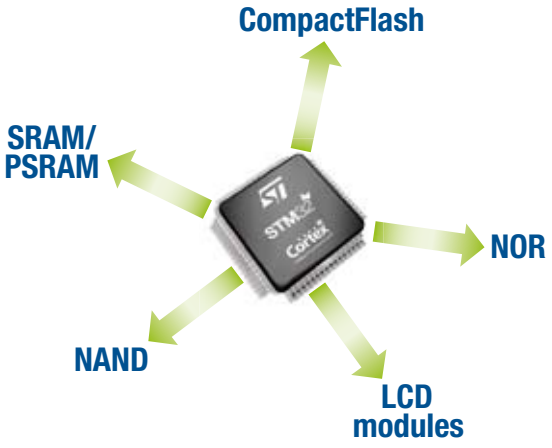
The need for analog	
ADC	Up to 3x 12-bit ADC, 1 µs conversion time
DAC	2-channel, 12-bit

The need for connectivity	
Dual CAN	Up to 2 independent CAN
Ethernet	10/100 Mbit/s MAC with hardware IEEE 1588
USB OTG	Full speed host, device or OTG

Flexible static memory controller (FSMC)

The flexible static memory controller offers:

- 4 independent banks to support external memory with frequency up to 36 MHz when system is at 72 MHz
- CompactFlash, SRAM, PSRAM, NOR and NAND memory support
- Programmable timings to support a wide range of devices
- Code execution from external memory
- Parallel interface to LCD controllers, Intel 8080 / Motorola 6800 modes support



Motor control

- The STM32 Performance and Connectivity lines embed features that are perfectly suited to three-phase brushless motor control:
  - Powerful Cortex-M3 core
  - 6 PWM advanced control timers with embedded dead-time generation
  - Numerous PWM outputs allowing multiple DC-brush, stepper or universal motor drives
  - Dual sample and hold ADC, 12-bit resolution, 1 µs conversion time
- Free motor control firmware libraries supporting AC induction motor (sensored) and PMSM motor (sensorless, Hall-sensor or encoder) vector control
- Less than 21 µs for sensorless vector control loop
- Class B compliancy with the EN/IEC 60335-1 norm:
  - Pre-certified full set of self-test routines
- Run your motor in just a few steps:
  - STM3210B-MCKIT full developer kit for vector drives
- For STM32 Performance line devices starting at 256 Kbytes of Flash, two advanced control PWM timers and three ADCs are on board for dual motor control, triple sample and hold capabilities.

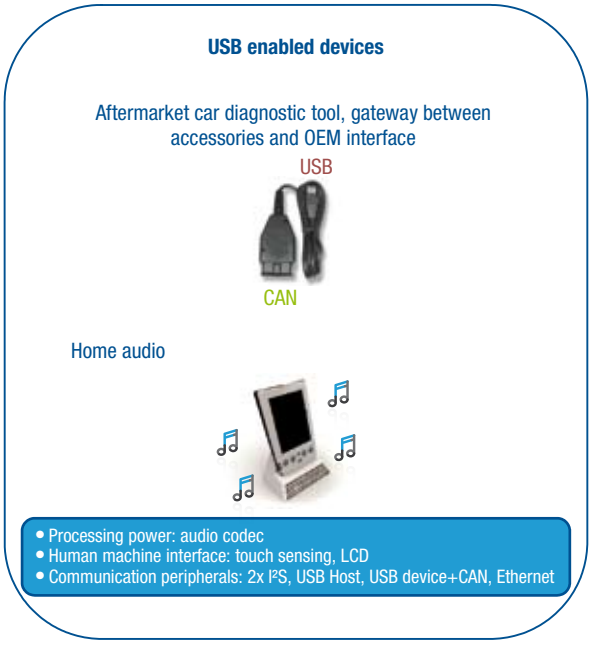
Superior connectivity: Ethernet with IEEE 1588, USB OTG and dual CAN

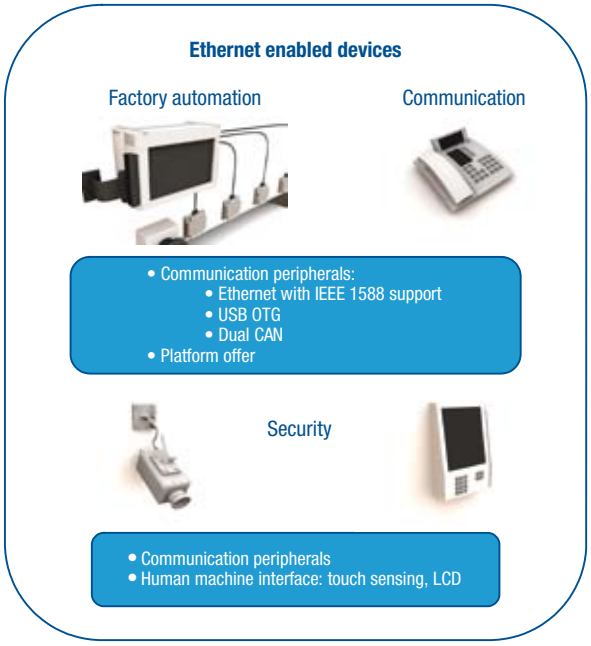
The STM32 Connectivity line makes networking economical with a central system or other devices for a wide range of products, as a result of an embedded Ethernet MAC peripheral with dedicated DMA controller.
The IEEE 1588 precision time protocol hardware support provides accurate clock synchronization over the network and retains ample CPU bandwidth to implement the embedded application.
The USB 2.0 OTG makes the STM32 Connectivity line a turnkey solution to add a USB device, host or OTG function to a product. Firmware upgrade in the field, data logging or data storage are now as easy as connecting a standard USB mass storage device to the STM32. Adding a USB keyboard, mouse or any other device is just as easy.
The dual CAN 2.0B makes the STM32 Connectivity line a turnkey solution to implement a CAN gateway. Also since dual CAN and USB peripherals can be used simultaneously, the STM32 is the perfect fit to connect a computer or USB device to CAN networks.

Superior audio: audio class I²S

The two audio class I²S of the STM32 Connectivity line, combined with the embedded Ethernet and USB OTG peripherals, address the connectivity and features required of many home-audio applications.
The new PLL block clocking the two I²S peripherals provides less than 0.5% error on the master clock connected to the external audio DAC.
The USB 2.0 OTG controller can connect any USB device, including USB mass storage devices and portable audio players. The powerful Cortex-M3 core running at 72 MHz is able to handle not only the audio decoding of music files stored on an SD card or USB mass storage device connected to the STM32, but also the user interface.

Connectivity line application highlights





Device summary

	Part number	Program memory Type Flash	Program memory Size (Kbytes)	RAM (bytes)	A/D inputs	Timer functions 12 or 16-bit (IC/OC/PWM)	Timer functions Others	Serial interface	I/Os (high current)	Packages
STM32F101 Access Line: 36 MHz CPU speed, EMI (100 and 144 pins), 2-channel DAC, Vbat pin, low-power features, embedded POR, PDR and PVD, 8 MHz and 40 kHz internal RC oscillator, 4-16 MHz main oscillator, dedicated 32 kHz oscillator, -40 to 85 °C, 2.0 to 3.6 supply voltage										
36 pins	STM32F101T4	●	16	4 K	10x12-bit	2x16-bit (8/8/8)	2xWDG, 24-bit down counter	1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	26(26)	QFN36
	STM32F101T6	●	32	6 K	10x12-bit	2x16-bit (8/8/8)			26(26)	
	STM32F101T8	●	64	10 K	10x12-bit	3x16-bit (12/12/12)			26(26)	
48 pins	STM32F101C4	●	16	4 K	10x12-bit	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	36(36)	LQFP48
	STM32F101C6	●	32	6 K	10x12-bit	2x16-bit (8/8/8)			36(36)	
	STM32F101C8	●	64	10 K	10x12-bit	3x16-bit (12/12/12)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	36(36)	
	STM32F101CB	●	128	16 K	10x12-bit	3x16-bit (12/12/12)		1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	36(36)	
64 pins	STM32F101R4	●	16	4 K	16x12-bit	2x16-bit (8/8/8)		1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	51(51)	LQFP64
	STM32F101R6	●	32	6 K	16x12-bit	2x16-bit (8/8/8)			51(51)	
	STM32F101R8	●	64	10 K	16x12-bit	3x16-bit (12/12/12)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	51(51)	
	STM32F101RB	●	128	16 K	16x12-bit	3x16-bit (12/12/12)			51(51)	
	STM32F101RC	●	256	32 K	16x12-bit	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	3xSPI, 2xI²C, 5xUSART/UART (IrDA, ISO 7816)	51(51)	
	STM32F101RD	●	384	48 K	16x12-bit	6x16-bit (16/16/16)			51(51)	
	STM32F101RE	●	512	48 K	16x12-bit	6x16-bit (16/16/16)			51(51)	
100 pins	STM32F101V8	●	64	10 K	16x12-bit	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	80(80)	LQFP100
	STM32F101VB	●	128	16 K	16x12-bit	3x16-bit (12/12/12)			80(80)	
	STM32F101VC	●	256	32 K	16x12-bit	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	3xSPI, 2xI²C, 5xUSART/UART (IrDA, ISO 7816)	80(80)	
	STM32F101VD	●	384	48 K	16x12-bit	6x16-bit (16/16/16)			80(80)	
	STM32F101VE	●	512	48 K	16x12-bit	6x16-bit (16/16/16)			80(80)	
144 pins	STM32F101ZC	●	256	32 K	16x12-bit	6x16-bit (16/16/16)		3xSPI, 2xI²C, 5xUSART/UART (IrDA, ISO 7816)	112(112)	LQFP144
	STM32F101ZD	●	384	48 K	16x12-bit	6x16-bit (16/16/16)			112(112)	
	STM32F101ZE	●	512	48 K	16x12-bit	6x16-bit (16/16/16)			112(112)	
STM32F102 USB Access Line: 48 MHz CPU speed, Vbat pin, low-power features, embedded POR, PDR and PVD, 8 MHz and 40 kHz internal RC oscillator, 4-16 MHz main oscillator, dedicated 32 kHz oscillator, -40 to 85 °C, 2.0 to 3.6 supply voltage										
48 pins	STM32F102C4	●	16	4 K	10x12-bit	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	36(36)	LQFP48
	STM32F102C6	●	32	6 K	10x12-bit	2x16-bit (8/8/8)			36(36)	
	STM32F102C8	●	64	10 K	10x12-bit	3x16-bit (12/12/12)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	36(36)	
	STM32F102CB	●	128	16 K	10x12-bit	3x16-bit (12/12/12)			36(36)	
64 pins	STM32F102R4	●	16	4 K	16x12-bit	2x16-bit (8/8/8)		1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	51(51)	LQFP64
	STM32F102R6	●	32	6 K	16x12-bit	2x16-bit (8/8/8)			51(51)	
	STM32F102R8	●	64	10 K	16x12-bit	3x16-bit (12/12/12)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	51(51)	
	STM32F102RB	●	128	16 K	16x12-bit	3x16-bit (12/12/12)			51(51)	
STM32F103 Performance Line: 72 MHz CPU speed, EMI (100 and 144 pins), 2-channel DAC, Vbat pin, low-power features, embedded POR, PDR and PVD, 8 MHz and 40 kHz internal RC oscillator, 4-16 MHz main oscillator, dedicated 32 kHz oscillator, 1 x high-speed USART 4.5 Mbit/s, motor control oriented PWM, 3 x ADC (triple sample and hold capability), -40 to 85 °C or -40 to 105 °C										
36 pins	STM32F103T4	●	16	6 K	10x12-bit	3x16-bit (12/12/14)	2xWDG, 24-bit down counter	1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816), USB, CAN	26(26)	QFN36
	STM32F103T6	●	32	10 K	10x12-bit	3x16-bit (12/12/14)			26(26)	
	STM32F103T8	●	64	20 K	10x12-bit	4x16-bit (16/16/18)			26(26)	
48 pins	STM32F103C4	●	16	6 K	10x12-bit	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	36(36)	LQFP48
	STM32F103C6	●	32	10 K	10x12-bit	3x16-bit (12/12/14)			36(36)	
	STM32F103C8	●	64	20 K	10x12-bit	4x16-bit (16/16/18)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	36(36)	
	STM32F103CB	●	128	20 K	10x12-bit	4x16-bit (16/16/18)			36(36)	
64 pins	STM32F103R4	●	16	6 K	16x12-bit	3x16-bit (12/12/14)		1xSPI, 1xI²C, 2xUSART (IrDA, ISO 7816)	51(51)	LQFP64, TFBGA64
	STM32F103R6	●	32	10 K	16x12-bit	3x16-bit (12/12/14)			51(51)	
	STM32F103R8	●	64	20 K	16x12-bit	4x16-bit (16/16/18)		2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	51(51)	
	STM32F103RB	●	128	20 K	16x12-bit	4x16-bit (16/16/18)			51(51)	
	STM32F103RC	●	256	48 K	16x12-bit	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	3xSPI, 2xI²S, 2xI²C, 5xUSART/UART (IrDA, ISO 7816), SDIO, USB, CAN	51(51)	LQFP64, WLCSP64
	STM32F103RD	●	384	64 K	16x12-bit	8x16-bit (24/24/28)			51(51)	
	STM32F103RE	●	512	64 K	16x12-bit	8x16-bit (24/24/28)			51(51)	
100 pins	STM32F103V8	●	64	20 K	16x12-bit	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	2xSPI, 2xI²C, 3xUSART (IrDA, ISO 7816)	80(80)	LQFP100, LFBGA100
	STM32F103VB	●	128	20 K	16x12-bit	4x16-bit (16/16/18)			80(80)	
	STM32F103VC	●	256	48 K	16x12-bit	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	3xSPI, 2xI²C, 5xUSART/UART (IrDA, 5xUSART/UART (IrDA, ISO 7816), SDIO, USB, CAN	80(80)	
	STM32F103VD	●	384	64 K	16x12-bit	8x16-bit (24/24/28)			80(80)	
	STM32F103VE	●	512	64 K	16x12-bit	8x16-bit (24/24/28)			80(80)	
144 pins	STM32F103ZC	●	256	48 K	21x12-bit	8x16-bit (24/24/28)			112(112)	LQFP144, LFBGA144
	STM32F103ZD	●	384	64 K	21x12-bit	8x16-bit (24/24/28)			112(112)	
	STM32F103ZE	●	512	64 K	21x12-bit	8x16-bit (24/24/28)			112(112)	
STM32F105/107 Connectivity Line: 72 MHz CPU speed, 2-channel DAC, Vbat pin, low power features, embedded POR, PDR and PVD, internal RC 8 MHz and 40 kHz internal RC oscillator, 3-25 MHz main oscillator, dedicated 32 kHz oscillator, 1 x high-speed USART 4.5 Mbit/s, motor control oriented PWM, 2 x ADC (double sample and hold capability), advanced PLL schemes for audio class I²S communication, -40 to 85 °C or -40 to 105 °C										
64 pins	STM32F105R8	●	64	20 K	16x12-bit	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	3xSPI, 2xI²S, 2xI²C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN	51(51)	LQFP64
	STM32F105RB	●	128	32 K	16x12-bit	7x16-bit (20/20/22)			51(51)	
	STM32F105RC	●	256	64 K	16x12-bit	7x16-bit (20/20/22)			51(51)	
	STM32F107RB	●	128	48 K	16x12-bit	7x16-bit (20/20/22)		3xSPI, 2xI²S, 2xI²C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN, Ethernet MAC10/100	51(51)	
	STM32F107RC	●	256	64 K	16x12-bit	7x16-bit (20/20/22)			51(51)	
100 pins	STM32F105V8	●	64	20 K	16x12-bit	7x16-bit (20/20/22)		3xSPI, 2xI²S, 2xI²C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN	80(80)	LQFP100
	STM32F105VB	●	128	32 K	16x12-bit	7x16-bit (20/20/22)			80(80)	
	STM32F105VC	●	256	64 K	16x12-bit	7x16-bit (20/20/22)			80(80)	
	STM32F107VB	●	128	48 K	16x12-bit	7x16-bit (20/20/22)		3xSPI, 2xI²S, 2xI²C, 3xUSART (IrDA, ISO 7816), 2xUART, USB OTG FS, 2xCAN, Ethernet MAC10/100	80(80)	
	STM32F107VC	●	256	64 K	16x12-bit	7x16-bit (20/20/22)			80(80)	

Development tools

A complete range of high-end and low-cost development tools is available, including complete tool solutions, easy-to-use starter kits, embedded operating systems and software, all tailored to the STM32.

Promotion kits

Play, explore and develop applications on the **STM32 Primer** and **Primer 2** with Raisonance toolset, free demos and an online community at **www.stm32circle.com** to stimulate creative designs.

Evaluate STM32 performance in real time, with the innovative **STM32-PerformanceStick** and DashBoard performance evaluation GUI, sample applications and unlimited Hitex toolset.
STM32-ComStick allows you to easily evaluate the networking features of the STM32 Connectivity line, Ethernet, USB Host and OTG. It includes integrated debugging/programming capability via USB and unlimited Hitex HiTOP5 and Tasking VX C compiler

Starter kits

Starter kits include an evaluation board, JTAG in-circuit debugger/programmer, integrated development environment, C/C++ compiler and sample applications with source code.

Part number	Featured product	Description
STM3210B-SK/HIT	STM32F103RBT6	Hitex kit with unlimited HiTOP5, Tasking VX compiler, STM32-PerformanceStick with integrated debugging/programming via USB, extension I/O board with peripheral evaluation features, DashBoard GUI
STM3210B-SK/IAR STM3210C-SK/IAR STM3210E-SK/IAR	STM32F103RBT6 STM32F107RCT6 STM32F103RET6	IAR Embedded Workbench for ARM (for up to 32 Kbytes of code), IAR C/C++ compiler, J-Link (USB/JTAG), evaluation board
STM3210B-SK/KEIL STM3210C-SK/KEIL STM3210E-SK/KEIL	STM32F103RBT6 STM32F107RCT6 STM32F103RET6	Keil RealView MDK with uVision 3 (for up to 16 Kbytes of code), ARM C/C++ compiler, ULINK (USB/JTAG), evaluation board
STM3210B-SK/RAIS STM3210C-SK/RAIS	STM32F103RBT6 STM32F107RCT6	Raisonance REva kit with RIDE (debug up to 32 Kbytes of code), GNU C/C++ compiler, modular evaluation hardware with integrated RLink (USB/JTAG)
STM3210B-MCKIT	STM32F103RBT6	ST motor-control starter kit with complete sensor and sensorless libraries, evaluation hardware platform for vector drive of three-phase PMSM and induction motors, plus Segger J-Link for host PC interface

Evaluation board STM3210B-EVAL, STM3210C-EVAL and STM3210E-EVAL

Complete hardware evaluation platform with the STM32F103, implementing the full range of device peripherals and features.
For more information, visit **www.st.com/stm32**

STM32 embedded firmware

- **STM32 firmware library:** Complete packages consisting of device drivers for all the standard device peripherals. Each device driver includes a set of functions covering full peripheral functionality.
- **STM32 USB developer kit**: Complete firmware package that makes implementation of the USB slave interface in STM32 applications quick and painless.
- **DSP Software Library**: the STM32 DSP (digital signal processor) software library provides a set of functions well suited for digital signal processing applications.
- **STM32 Speech Codec Software Library**: STM32 Speech Codec software library enables you to transmit long messages and store more speech data.
- **STM32 self-test routines Class B norm certification**: A full set of ready-to-use self-test routines for home appliance certification under EN/IEC 60335-1 Class B norm (functional safety).
- **STM32 motor control software**: Complete 3-phase motor control library supporting PMSM motors in sensored and sensorless mode and AC induction motors in sensored mode, and a patented single-shunt algorithm. This software is included in the STM32 motor control starter kit.

Third-party development solutions

Choose from a full range of solutions that offer start-to-finish control of application development from a single environment that includes development environment, C/C++ compiler and in-circuit emulator.

Supplier	IDE	Supported compilers	In-circuit debuggers, emulators
Aiji System	OPENice-EDS	Supports a variety of images Dwarf1/2, ELF, AxF, Keil, GCC, ARM (ADS, RVDS)	OPENice-A1000
Altium / TASKING	EDE	TASKING C/C++	Tantino, Tanto, J-Link
Green Hills Software	MULTI	Green Hills	Green Hills Probe
Hitex	HITOP5	GNU C/C++, Tasking, ARM, and IAR	Tantino for Cortex
IAR[1]	EWARM	IAR's ISO C/C++ and Extended Embedded C++	AnbyICE, ARM RealView ICE, J-Link, Macraigor Wiggler and other RDI-based JTAG interfaces
iSYSTEM	WinIdea	ARM, GHS, GNU, IAR, Keil, Tasking	iONE
Keil	uVision3	Keil, GNU C/C++, ARM (ADS and RVDS)	Keil ULink, Hitex Tanto, iSYSTEM iC3000, Nohau EMUL-ARM
Lauterbach	TRACE32 PowerView	IAR, MetaWare, High C/C++, ARM (ADS and RVDS), Windriver, GNU C/C++	TRACE32 – Power Tool, TRACE32 – ICD
Raisonance [2]	RIDE	GNU C/C++	RLink
Rowley	CrossWorks	GNU C/C++	CrossConnect, Macraigor Wiggler, IAR, J-Link
Signum	Chameleon	Compatible with all major C/C++ ARM compilers	JTAGjet, JTAGjet-Trace (ETM)

For information about compatibility with other tools, refer to the relevant third-party internet site.

Operating systems, solution stacks and more

Company	RTOS	TCP/IP solutions	USB solutions			Website
			Device	Host	OTG	
CMX Systems	CMX-RTX	-	-	-	-	www.cmx.com
eCosCentric	eCosPro	-	-	-	-	www.ecoscentric.com
Express Logic	ThreadX	-	-	-	-	www.rtos.com
FreeRTOS	FreeRTOS	-	-	-	-	www.FreeRTOS.org
HCC-Embedded	-	-	EUSBD	EUSBH	EUSB-OTG	www.hcc-embedded.com,/www.hcc-embedded.com/en/solution/st_micro
IAR	PowerPac	PowerPac TCP/IP	PowerPac USB	PowerPac USB	PowerPac USB	www.iar.com, www.iar.com/st
Interniche		NicheLite	-	-	-	www.iniche.com, www.st.com/mcu
Keil	ARTX-ARM	RL-TCPnet	RL-USB	-	-	www.keil.com
Micrium	µC/OS-II, µC/OS-III	µC/TCP-IP	uC/USB Device	uC/USB Host	uC/USB OTG	www.micrium.com, www.micrium.com/st/index.html
Micro Digital	smxARM	smxNS	smxUSBD	smxUSBH	smxUSBO	www.smxrtos.com, www.smxrtos.com/stmicro.htm
Quadros Systems	RTXC Quadros	RTXC Quadnet RTXC Quark	RTXCusb	RTXCusb	RTXCusb	www.quadros.com
Segger	embOS	embOS/IP	emUSB Device	emUSB Host	emUSB OTG	www.segger.com

For more information on ST products and solutions,
visit **www.st.com**

Order code: BRSTM320909