

# STM32 MCU family



STM32 Releasing your creativity









STMicroelectronics

32-bit Flash microcontrollers powered by the ARM<sup>®</sup>  
Cortex<sup>™</sup> -M processor

# Welcome to the world of STM32

The STM32 family of 32-bit Flash microcontrollers based on the ARM Cortex™-M processor is designed to offer new degrees of freedom to MCU users. By bringing 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, the STM32 family helps you create new applications and design in the innovations you have long been dreaming about.

## Five reasons to chose the STM32 platform

<p><b>Real-time performance</b></p>  <p>Intelligent Processors by ARM</p>  <p>+ ART Accelerator, Multi-AHB bus matrix, Excellent real-time up to 168 MHz/210 DMIPS zero-wait state execution performance from Flash</p>	<p><b>Outstanding power efficiency</b></p>  <p>&lt; 1 <math>\mu\text{A}</math> RTC in <math>V_{\text{BAT}}</math> mode, ultra-low dynamic power consumption 188 <math>\mu\text{A}/\text{MHz}</math> 1.65/1.7 to 3.6 V <math>V_{\text{DD}}</math>, 0.45 <math>\mu\text{A}</math> STOP mode and 0.3 <math>\mu\text{A}</math> Standby mode</p>	<p><b>Superior and innovative peripherals</b></p>  <p>USB-OTG High Speed, camera interface, Ethernet, CAN, crypto/hash processor, external memory interface, CEC</p>	<p><b>Maximum integration</b></p>  <p>Reset circuitry, voltage regulator, internal RC oscillator, PLL</p>	<p><b>Extensive tools and software</b></p>  <p>Various IDE, starter kits, libraries, RTOS and stacks, CMSIS, DSP library</p>
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# STM32 platform

More than 250 compatible devices

## Addressing the three dimensions of microcontroller content

With its broad range of products, the STM32 addresses the three dimensions of microcontrollers: performance, low power and cost sensitiveness.



- High-performance MCUs with DSP and FPU
  - STM32 F4 series based on Cortex-M4 with up to 168 MHz/210 DMIPS
  - ART Accelerator™ and 7-layer bus matrix
  - Low dynamic consumption: 230  $\mu\text{A}/\text{MHz}$
  - HS-USB, IEEE 1588 Ethernet, camera interface



- High-performance MCUs
  - STM32 F2 based on Cortex-M3 up to 120 MHz/150 DMIPS
  - ART Accelerator™ and 7-layer bus matrix
  - Low dynamic consumption: 188  $\mu\text{A}/\text{MHz}$
  - HS-USB, IEEE 1588 Ethernet, camera interface



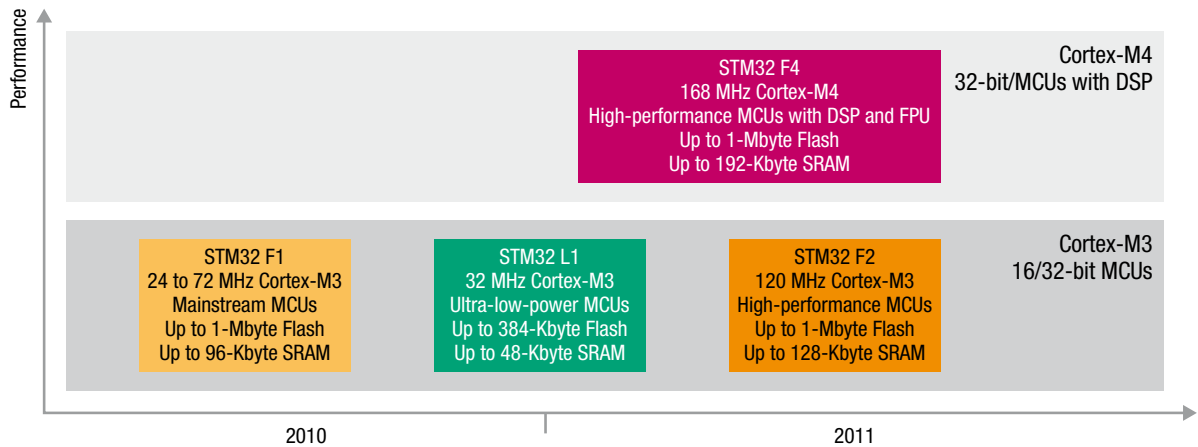
- Mainstream MCUs
  - Based on Cortex-M3 running up to 72 MHz
  - Large peripheral set: ADC and DAC 12-bit, comm peripherals (USART, USB, SPI, I<sup>2</sup>C and more...), multiple timers, maximum integration
  - STM32 F1 series down to \$ 0.85



- Ultra-low-power MCUs
  - STM32L EnergyLite™ platform
  - Low voltage down to 1.65 V
  - 32 MHz processing performance
  - Ultra-low static consumption
    - 0.45  $\mu\text{A}$  Stop mode
    - 0.3  $\mu\text{A}$  Standby mode

# STM32, a solid foundation for growth

With the STM32, STMicroelectronics offers a comprehensive portfolio of advanced MCUs that we are committed to extending in capability, competitive pricing and features to cover the needs type of developers.



## STM32 product lines

Common core peripherals and architecture:

Communication peripherals: USART, SPI, I <sup>2</sup> C
Multiple general-purpose timers
Integrated reset and brown-out warning
Multiple DMA
2x watchdogs Real-time clock
Integrated regulator PLL and clock circuit
External memory interface (FSMC)
Dual 12-bit DAC
Up to 3x 12-bit ADC (up to 0.41 μs)
Main oscillator and 32 kHz oscillator
Low-speed and high-speed internal RC oscillators
-40 to +85 °C and up to 105 °C operating temperature range
Low voltage 2.0 to 3.6 V or 1.65/1.7 to 3.6 V (depending on series) 5.0 V tolerant I/Os
Temperature sensor

### STM32 F4 series - High performance with DSP (STM32F405/415/407/417)

168 MHz Cortex-M4 with DSP and FPU	Up to 192-Kbyte SRAM	Up to 1-Mbyte Flash	2x USB 2.0 OTG FS/HS	3-phase MC timer	2x CAN 2.0B	SDIO 2x I <sup>2</sup> S audio Camera IF	Ethernet IEEE 1588	Crypto/hash processor and RNG
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### STM32 F2 series - High performance (STM32F205/215/207/217)

120 MHz Cortex-M3 CPU	Up to 128-Kbyte SRAM	Up to 1-Mbyte Flash	2x USB 2.0 OTG FS/HS	3-phase MC timer	2x CAN 2.0B	SDIO 2x I <sup>2</sup> S audio Camera IF	Ethernet IEEE 1588	Crypto/hash processor and RNG
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### STM32 F1 series - Connectivity line (STM32F105/107)

72 MHz Cortex-M3 CPU	Up to 64-Kbyte SRAM	Up to 256-Kbyte Flash	USB 2.0 OTG FS	3-phase MC timer	2x CAN 2.0B	2x I <sup>2</sup> S audio	Ethernet IEEE 1588
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### STM32 F1 series - Performance line (STM32F103)

72 MHz Cortex-M3 CPU	Up to 96-Kbyte SRAM	Up to 1-Mbyte Flash	USB FS device	3-phase MC timer	CAN 2.0B	SDIO 2x I <sup>2</sup> S
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### STM32 F1 series - USB Access line (STM32F102)

48 MHz Cortex-M3 CPU	Up to 16-Kbyte SRAM	Up to 128-Kbyte Flash	USB FS device
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### STM32 F1 series - Access line (STM32F101)

36 MHz Cortex-M3 CPU	Up to 80-Kbyte SRAM	Up to 1-Mbyte Flash
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### STM32 F1 series - Value line (STM32F100)

24 MHz Cortex-M3 CPU	Up to 32-Kbyte SRAM	Up to 512-Kbyte Flash	3-phase MC timer	CEC
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### STM32 L1 series - Ultra-low-power (STM32F151/152)

32 MHz Cortex-M3 CPU	Up to 48-Kbyte SRAM	Up to 384-Kbyte Flash	USB FS device	Data EEPROM up to 12 Kbytes	LCD 8x40 4x44	Comparator	BOR MSI VScal
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#### Abbreviations:

FS: Full speed  
HS: High speed  
MC: Motor control

MSI: Multi-speed internal oscillator  
RNG: Random number generator  
SDIO: Secure digital input/output

VScal: Voltage scaling  
FPU: Floating point unit  
DSC: Digital signal controller

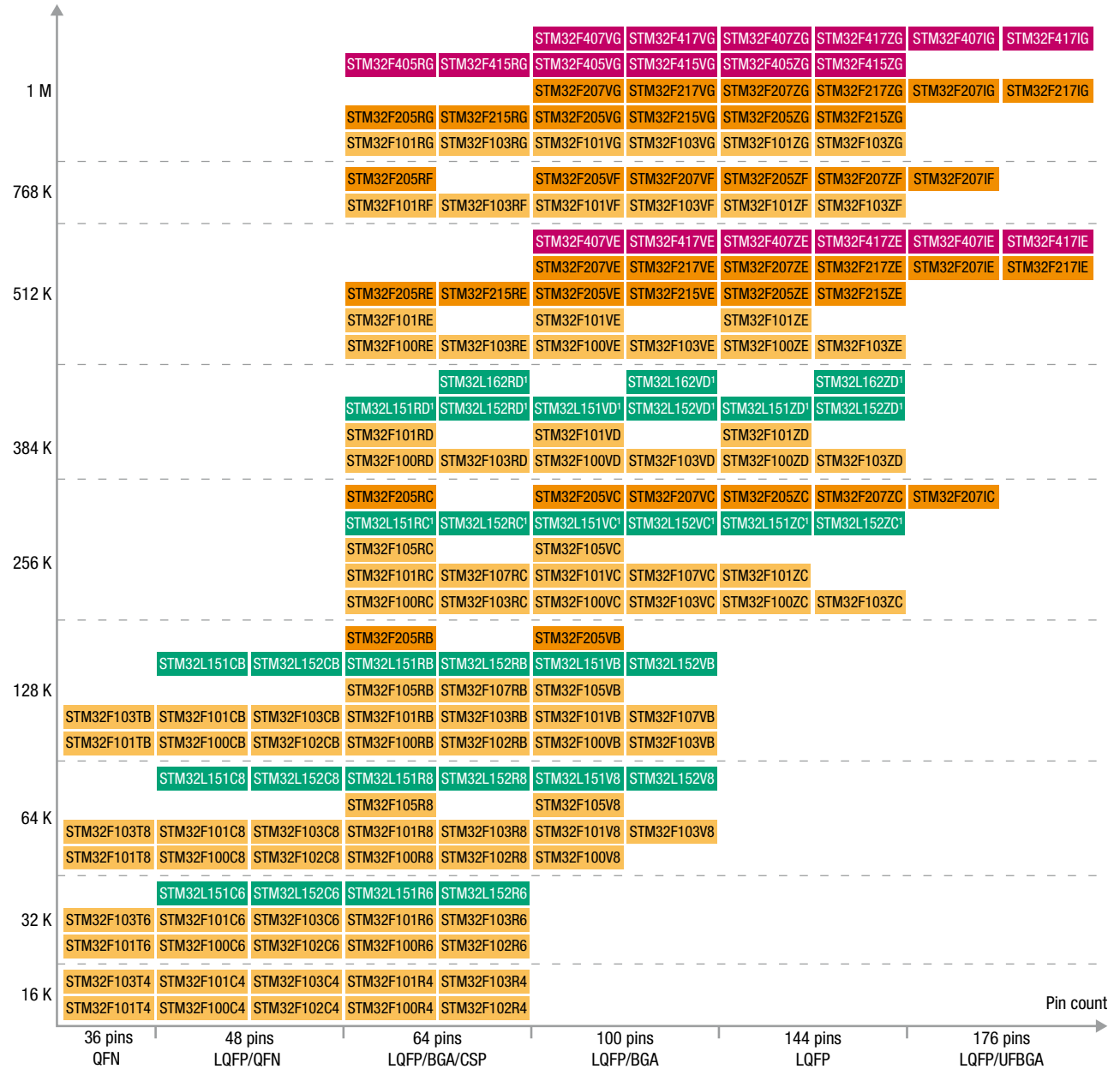
# STM32, the optimal platform choice

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

All product lines in the three series are pin-to-pin and software compatible, making it easy to upgrade to a higher or downgrade to a lower memory size. Numerous applications may be addressed using the sole STM32 platform.

## STM32 portfolio

Flash size (bytes)

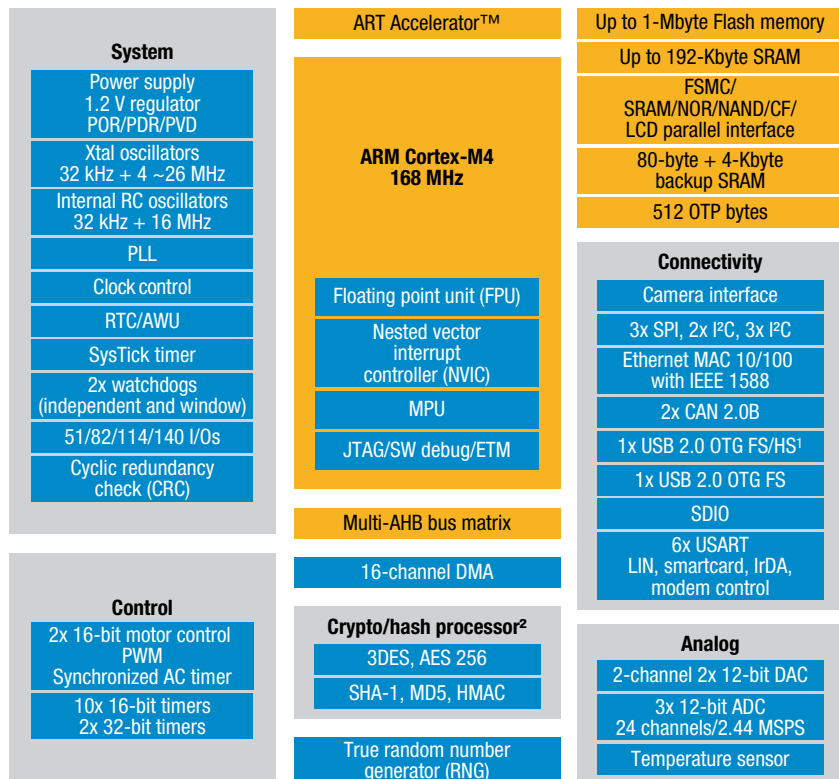


Legend: STM32 L1 (green), STM32 F1 (orange), STM32 F2 (yellow), STM32 F4 (purple)

Note: 1. Available in Q4/2011 for all 256- and 384-Kbyte STM32L devices

## STM32 F4 series block diagram

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



Notes:

- HS requires an external PHY connected to the ULPI interface
- Crypto/hash processor on STM32F417 and STM32F415

## Applications

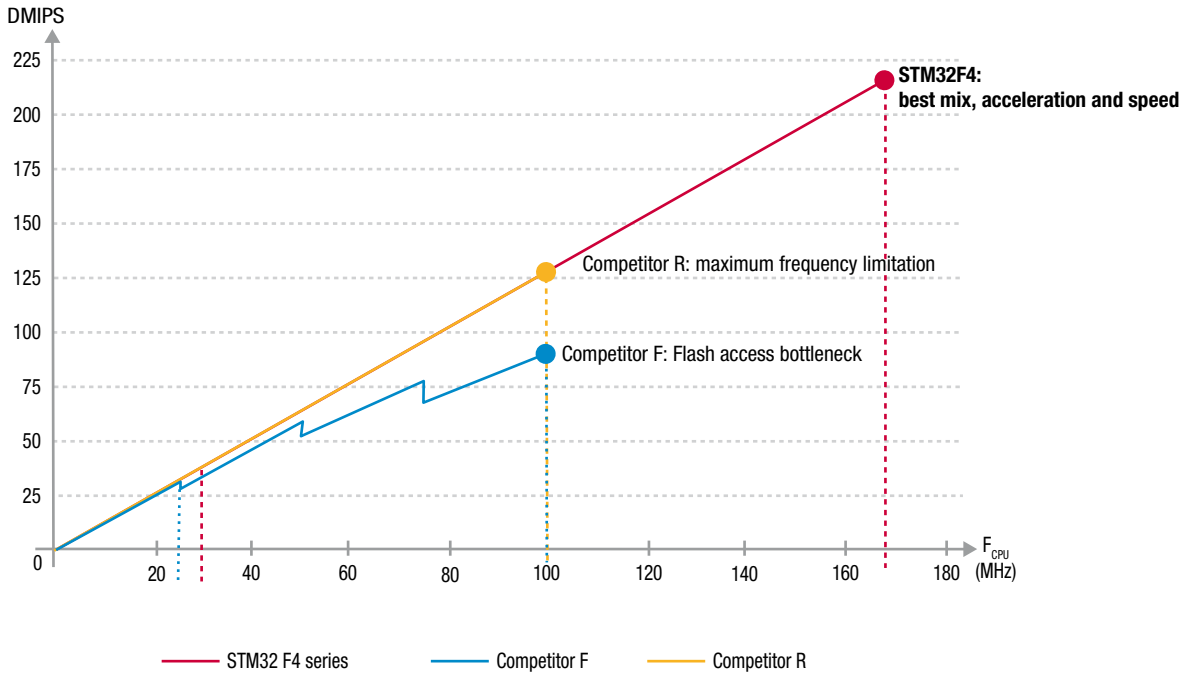
- Industrial
  - PLC
  - Inverters
  - Printers, scanners
  - Industrial networking
  - Solar inverters
- Building and security
  - Alarm systems
  - Access control
  - HVAC
  - Power meters
- Medical
  - Glucose meters
  - Portable medical care
  - VPAP, CPAP
  - Patient monitoring
- Appliances
  - 3-phase motor drives
  - Application control
  - User interfaces
  - Induction cooking
- Consumer
  - Home audio
  - Gaming
  - PC peripherals
  - Digital cameras, GPS

## Superior and innovative peripherals

Peripherals	STM32 L1 series	STM32 F1 series	STM32 F2 series	STM32 F4 series
<b>The need for speed</b>				
USB FS	12 Mbit/s	12 Mbit/s	12 Mbit/s	12 Mbit/s
USB HS	-	-	480 Mbit/s	480 Mbit/s
USART	Up to 4 Mbit/s	-	Up to 7.5 Mbit/s	Up to 10.5 Mbit/s
SPI	Up to 16 Mbit/s	Up to 18 Mbit/s	Up to 30 Mbit/s	Up to 37.5 Mbit/s
I <sup>2</sup> C	400 kHz	400 kHz	400 kHz	400 kHz
GPIO	Up to 16 MHz	Up to 18 MHz	Up to 60 MHz	Up to 60 MHz
3-phase MC timer	-	72 MHz PWM timer clock input	120 MHz PWM timer clock input	168 MHz PWM timer clock input
SDIO	Up to 48 MHz	Up to 48 MHz	Up to 48 MHz	Up to 48 MHz
I <sup>2</sup> S	From 8 kHz to 96 kHz sampling frequencies	From 8 kHz to 96 kHz sampling frequencies	From 8 kHz to 96 kHz sampling frequencies	From 8 kHz to 96 kHz sampling frequencies
Camera interface	-	-	Up to 48 Mbyte/s at 48 MHz	Up to 67.2 Mbyte/s at 67.2 MHz
Crypto/hash processor	AES-128 up to 2.4 Mbyte/s	-	AES-256 up to 106 Mbyte/s	AES-256 up to 149.33 Mbyte/s
FSMC	Up to 32 MHz	Up to 36 MHz	Up to 60 MHz	Up to 60 MHz
<b>The need for analog</b>				
ADC conversion time	1 μs (1 MSPS)	1 μs (1 MSPS)	0.5 μs (2 MSPS)	0.41 μs (2.44 MSPS)
DAC	2-channel, 12-bit	2-channel, 12-bit	2-channel, 12-bit	2-channel, 12-bit
<b>The need for connectivity</b>				
CAN	-	Up to 2 independent CAN	Up to 2 independent CAN	Up to 2 independent CAN
Ethernet	-	10/100 Mbit/s MAC with hardware IEEE 1588	10/100 Mbit/s MAC with hardware IEEE 1588	10/100 Mbit/s MAC with hardware IEEE 1588
USB OTG	-	Full speed host, device or OTG	Full speed and high speed host, device or OTG	Full speed and high speed host, device or OTG
CEC bus	-	Consumer electronics control for consumer devices	-	-
Flexible static memory	4 independent banks, 8/16-bit data bus, supports SRAM, PSRAM, NAND and NOR Flash, parallel graphic LCD	4 independent banks, 8/16-bit data bus, supports SRAM, PSRAM, NAND and NOR Flash, parallel graphic LCD	4 independent banks, 8/16-bit data bus, supports SRAM, PSRAM, NAND and NOR Flash, parallel graphic LCD	4 independent banks, 8/16-bit data bus, supports SRAM, PSRAM, NAND and NOR Flash, parallel graphic LCD
Camera interface	-	8- to 14-bit parallel	8- to 14-bit parallel	8- to 14-bit parallel

## Outstanding performance

### ART Accelerator™ performance result

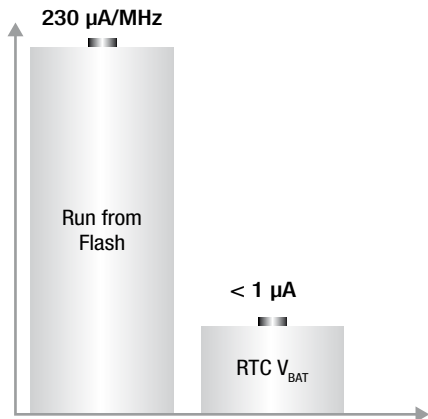


## Outstanding low-power performance

### STM32 F4 series power consumption

#### Typical current

(on 1-Mbyte device @ 25 °C)

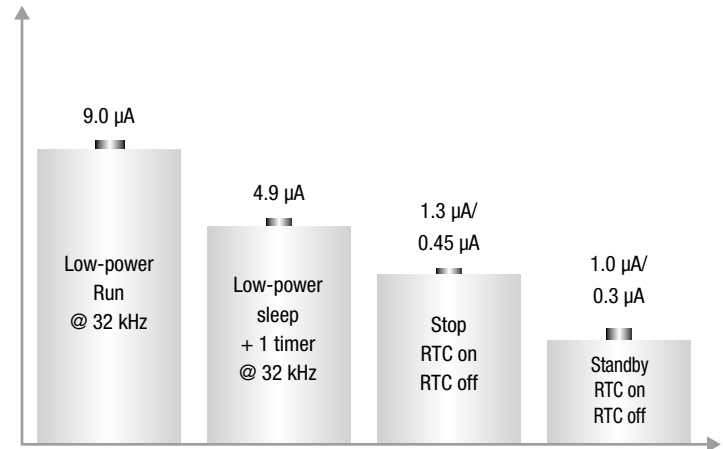


Note:  
- Executing Coremark benchmark from Flash with peripherals disabled

### STM32 L1 series power consumption

#### Typical current

(@ 25 °C)



Notes:  
- POR/PDR on  
- RAM content preserved  
- BOR option at 2.4 µA  
- Startup time from Stop 8 µs  
- Run and Sleep consumption value are independent of V<sub>DD</sub>  
- Stop and standby values measured at V<sub>DD</sub> = 1.8 V  
- Low-power Run and low-power Sleep are measured with Flash off

## Motor control

The STM32 is perfectly suited to 3-phase brushless motor control:

- Advanced PWM timer, fast ADC, high-performance core
- Class B compliancy with the EN/IEC 60335-1 norm
- Single or dual motor control

The STM32's motor control ecosystem brings:

- Free 3-phase motor control software development kit (firmware and graphical customization tool) supporting AC induction motors (sensored) and PMSM motors (sensorless, Hall-sensor or encoder) for vector control (field oriented control)
- Full developer vector drive PMSM motor control kits (hardware and firmware) based on the STM32F103 or STM32F100
- Digital PFC and dual FOC drive demo, free RTOS example
- STM Studio tool to monitor data in the user code when the motor control algorithm is running



## STM32 L1 series device summary

Part number <sup>1</sup>	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Data EEPROM (Bytes)	Timer functions		ADC	DAC	Comparator	I/Os (high current)	Serial interface	Supply current (I <sub>cc</sub> )		Display controller (LCD)	
					16-bit (IC/OC/PWM)	Others						Supply Voltage (V <sub>cc</sub> ) (V)	Lowest power mode (μA)		Run mode (μA/MHz)
<b>STM32L151 without LCD - 32 MHz CPU</b>															
STM32L151C8	LQFP48 (7x7), VFQFPN48 (7x7)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	16x12-bit	2x12-bit	2	37(37)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
STM32L151CB	LQFP48 (7x7), VFQFPN48 (7x7)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	16x12-bit	2x12-bit	2	37(37)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
STM32L151R8	LQFP64 (10x10), TFBGA64 (5x5)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	20x12-bit	2x12-bit	2	51(51)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
STM32L151RB	LQFP64 (10x10), TFBGA64 (5x5)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	20x12-bit	2x12-bit	2	51(51)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
STM32L151V8	LQFP100 (14x14), UFBGA100 (7x7)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	24x12-bit	2x12-bit	2	83(83)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
STM32L151VB	LQFP100 (14x14), UFBGA100 (7x7)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	24x12-bit	2x12-bit	2	83(83)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	-
<b>STM32L152 with LCD - 32 MHz CPU</b>															
STM32L152C8	LQFP48 (7x7), VFQFPN48 (7x7)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	16x12-bit	2x12-bit	2	37(37)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x16
STM32L152CB	LQFP48 (7x7), VFQFPN48 (7x7)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	16x12-bit	2x12-bit	2	37(37)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x16
STM32L152R8	LQFP64 (10x10), TFBGA64 (5x5)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	20x12-bit	2x12-bit	2	51(51)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x32, 8x28
STM32L152RB	LQFP64 (10x10), TFBGA64 (5x5)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	20x12-bit	2x12-bit	2	51(51)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x32, 8x28
STM32L152V8	LQFP100 (14x14), UFBGA100 (7x7)	64	10	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	24x12-bit	2x12-bit	2	83(83)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x44, 8x40
STM32L152VB	LQFP100 (14x14), UFBGA100 (7x7)	128	16	4096	8x16-bit (16/16/16)	SysTick, 2xWDG, RTC	24x12-bit	2x12-bit	2	83(83)	2xSPI, 2xPC, 3xUSART (IrDa, ISO 7816), 1xUSB	1.65 to 3.6	0.27	230	4x44, 8x40

Note:

1. Touch-sensing FW library available for all part numbers



## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)		
<b>STM32F100 Value line - 24 MHz CPU</b>														
STM32F100C4	LQFP48 (7x7)	16	4	6x16-bit (16/16/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	10x12-bit	2x12-bit	37(37)	1xSPI, 1xI <sup>2</sup> C, CEC, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100C6	LQFP48 (7x7)	32	4	6x16-bit (16/16/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	10x12-bit	2x12-bit	37(37)	1xSPI, 1xI <sup>2</sup> C, CEC, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100C8	LQFP48 (7x7)	64	8	7x16-bit (18/18/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	10x12-bit	2x12-bit	37(37)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100CB	LQFP48 (7x7)	128	8	7x16-bit (18/18/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	10x12-bit	2x12-bit	37(37)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100R4	LQFP64 (10x10), TFPGA64 (5x5)	16	4	6x16-bit (16/16/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	1xSPI, 1xI <sup>2</sup> C, CEC, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100R6	LQFP64 (10x10), TFPGA64 (5x5), Unseen wafer V.I. 100%	32	4	6x16-bit (16/16/21)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	1xSPI, 1xI <sup>2</sup> C, CEC, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100R8	LQFP64 (10x10), TFPGA64 (5x5)	64	8	7x16-bit (20/20/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100RB	LQFP64 (10x10), TFPGA64 (5x5)	128	8	7x16-bit (20/20/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100RC	LQFP64 (10x10)	256	24	11x16-bit (26/26/27)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100RD	LQFP64 (10x10)	384	32	11x16-bit (26/26/27)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100RE	LQFP64 (10x10)	512	32	11x16-bit (26/26/27)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100V8	LQFP100 (14x14)	64	8	7x16-bit (20/20/26)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100VB	LQFP100 (14x14)	128	8	7x16-bit (20/20/26)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	2xSPI, 2xI <sup>2</sup> C, CEC, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	358	-	-40 to +85 or -40 to +105
STM32F100VC	LQFP100 (14x14)	256	24	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100VD	LQFP100 (14x14)	384	32	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100VE	LQFP100 (14x14)	512	32	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)		
STM32F100ZC	LQFP144 (20x20)	256	24	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100ZD	LQFP144 (20x20)	384	32	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
STM32F100ZE	LQFP144 (20x20)	512	32	11x16-bit (28/28/31)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, CEC, 5xUSART (IrDa, ISO 7816)	2 to 3.6	2.2	396	LCD parallel interface	-40 to +85 or -40 to +105
<b>STM32F101 Access line - 36 MHz CPU</b>														
STM32F101C4	LQFP48 (7x7)	16	4	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101C6	LQFP48 (7x7)	32	6	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101C8	LQFP48 (7x7), VFQFPN48 (7x7)	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101CB	LQFP48 (7x7)	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101R4	LQFP64 (10x10)	16	4	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101R6	LQFP64 (10x10)	32	6	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101R8	LQFP64 (10x10)	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85
STM32F101RB	LQFP64 (10x10), TFBGA64 (5x5)	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85
STM32F101RC	LQFP64 (10x10)	256	32	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101RD	LQFP64 (10x10)	384	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101RE	LQFP64 (10x10)	512	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101RF	LQFP64 (10x10)	768	80	12x16-bit (19/19/19)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101RG	LQFP64 (10x10)	1024	80	12x16-bit (19/19/19)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101T4	VFQFPN36 (6x6) Pitch 0.50	16	4	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101T6	VFQFPN36 (6x6) Pitch 0.50	32	6	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	363	-	-40 to +85
STM32F101T8	VFQFPN36 (6x6) Pitch 0.50	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)		
STM32F101TB	VFQFPN36 (6x6) Pitch 0.50	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85
STM32F101V8	LQFP100 (14x14)	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	80(80)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85
STM32F101VB	LQFP100 (14x14)	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	80(80)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816)	2 to 3.6	1.7	391	-	-40 to +85
STM32F101VC	LQFP100 (14x14)	256	32	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101VD	LQFP100 (14x14)	384	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101VE	LQFP100 (14x14)	512	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101VF	LQFP100 (14x14)	768	80	12x16-bit (23/23/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101VG	LQFP100 (14x14)	1024	80	12x16-bit (23/23/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101ZC	LQFP144 (20x20)	256	32	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101ZD	LQFP144 (20x20)	384	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101ZE	LQFP144 (20x20)	512	48	6x16-bit (16/16/16)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101ZF	LQFP144 (20x20)	768	80	12x16-bit (23/23/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
STM32F101ZG	LQFP144 (20x20)	1024	80	12x16-bit (23/23/23)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART	2 to 3.6	1.9	433	-	-40 to +85
<b>STM32F102 USB Access line - 48 MHz CPU</b>														
STM32F102C4	LQFP48 (7x7)	16	4	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.55	348	-	-40 to +85
STM32F102C6	LQFP48 (7x7)	32	6	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.55	348	-	-40 to +85
STM32F102C8	LQFP48 (7x7)	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.7	373	-	-40 to +85
STM32F102CB	LQFP48 (7x7)	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.7	373	-	-40 to +85

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (μA)	Run mode (μA/MHz)		
STM32F102R4	LQFP64 (10x10)	16	4	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.55	348	-	-40 to +85
STM32F102R6	LQFP64 (10x10)	32	6	2x16-bit (8/8/8)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.55	348	-	-40 to +85
STM32F102R8	LQFP64 (10x10)	64	10	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.7	373	-	-40 to +85
STM32F102RB	LQFP64 (10x10)	128	16	3x16-bit (12/12/12)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB	2 to 3.6	1.7	373	-	-40 to +85
<b>STM32F103 Performance line - 72 MHz CPU</b>														
STM32F103C4	LQFP48 (7x7)	16	6	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	337	-	-40 to +85 or -40 to +105
STM32F103C6	LQFP48 (7x7), VFQFPN48 (7x7)	32	10	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	337	-	-40 to +85 or -40 to +105
STM32F103C8	LQFP48 (7x7)	64	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103CB	LQFP48 (7x7)	128	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	36(36)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103R4	LQFP64 (10x10), TFPGA64 (5x5)	16	6	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	337	-	-40 to +85 or -40 to +105
STM32F103R6	LQFP64 (10x10), TFPGA64 (5x5)	32	10	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	337	-	-40 to +85 or -40 to +105
STM32F103R8	LQFP64 (10x10), TFBGA64 (5x5)	64	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103RB	LQFP64 (10x10), TFBGA64 (5x5)	128	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	51(51)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103RC	LQFP64 (10x10), WLCSP64 (4.4x4.5)	256	48	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103RD	LQFP64 (10x10), WLCSP64 (4.4x4.5)	384	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103RE	LQFP64 (10x10), WLCSP64 (4.4x4.5)	512	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (μA)	Run mode (μA/MHz)		
STM32F103RF	LQFP64 (10x10)	768	96	12x16-bit (27/27/29)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103RG	LQFP64 (10x10)	1024	96	12x16-bit (27/27/29)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103T4	VFQFPN36 (6x6) Pitch 0.50	16	6	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	337	-	-40 to +85 or -40 to +105
STM32F103T6	VFQFPN36 (6x6) Pitch 0.50	32	10	3x16-bit (12/12/14)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.55	373	-	-40 to +85 or -40 to +105
STM32F103T8	VFQFPN36 (6x6) Pitch 0.50	64	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103TB	VFQFPN36 (6x6) Pitch 0.50	128	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	10x12-bit	-	26(26)	1xSPI, 1xI <sup>2</sup> C, 2xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103V8	LFBGA100 (10x10), LQFP100 (14x14)	64	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	80(80)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103VB	LFBGA100 (10x10), LQFP100 (14x14)	128	20	4x16-bit (16/16/18)	2xWDG, RTC, 24-bit down counter	16x12-bit	-	80(80)	2xSPI, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), USB, CAN	2 to 3.6	1.7	373	-	-40 to +85 or -40 to +105
STM32F103VC	LFBGA100 (10x10), LQFP100 (14x14)	256	48	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103VD	LFBGA100 (10x10), LQFP100 (14x14)	384	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103VE	LFBGA100 (10x10), LQFP100 (14x14)	512	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103VF	LQFP100 (14x14)	768	96	14x16-bit (29/29/33)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103VG	LQFP100 (14x14)	1024	96	14x16-bit (29/29/33)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)		
STM32F103ZC	LFBGA100 (10x10), LQFP144 (20x20)	256	48	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	21x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103ZD	LFBGA100 (10x10), LQFP144 (20x20)	384	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	21x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103ZE	LFBGA100 (10x10), LQFP144 (20x20)	512	64	8x16-bit (24/24/28)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	21x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103ZF	LQFP144 (20x20)	768	96	14x16-bit (33/33/35)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	21x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
STM32F103ZG	LQFP144 (20x20)	1024	96	14x16-bit (33/33/35)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	21x12-bit	2x12-bit	112(112)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 2xUART, SDIO, USB, CAN	2 to 3.6	1.9	421	-	-40 to +85 or -40 to +105
<b>STM32F105/107 Connectivity line - 72 MHz CPU</b>														
STM32F105R8	LQFP64 (10x10)	64	20	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F105RB	LQFP64 (10x10)	128	32	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F105RC	LQFP64 (10x10)	256	64	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F105V8	LQFP100 (14x14)	64	20	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F105VB	LFBGA100 (10x10), LQFP100 (14x14)	128	32	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F105VC	LQFP100 (14x14)	256	64	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F107RB	LQFP64 (10x10)	128	48	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN, Ethernet MAC10/100	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105

## STM32 F1 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Display controller (LCD)	Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)		
STM32F107RC	LQFP64 (10x10)	256	64	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, USB OTG FS, 2xCAN, Ethernet MAC10/100	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F107VB	LQFP100 (14x14)	128	48	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN, Ethernet MAC10/100	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105
STM32F107VC	LFBGA100 (10x10), LQFP100 (14x14), Unsaanwafer V.I. 100%	256	64	7x16-bit (20/20/22)	2xWDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	80(80)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART, 2xUART, USB OTG FS, 2xCAN, Ethernet MAC10/100	2 to 3.6	1.9	393	-	-40 to +85 or -40 to +105

## STM32 F2 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)	
<b>STM32F205/215: 1x USB OTG (FS/HS)<sup>1</sup>, crypto/hash processor<sup>2</sup></b>													
STM32F205RB	LQFP64 (10x10)	128	64	12x16-bit (24/24/30)	2x32-bit timers (8/8/8), 2x WDG, XRTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 3xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 3xUART, 1xUSB OTG FS/HS, 2xCAN, SDIO	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205RC	LQFP64 (10x10)	256	96	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205RE	LQFP64 (10x10), WLCSP64	512	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215RE <sup>2</sup>	LQFP64 (10x10)	512	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205RF	LQFP64 (10x10)	768	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205RG	LQFP64 (10x10), WLCSP64	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215RG <sup>2</sup>	LQFP64 (10x10)	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205VB	LQFP100 (14x14)	128	64	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205VC	LQFP100 (14x14)	256	96	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205VE	LQFP100 (14x14)	512	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215VE <sup>2</sup>	LQFP100 (14x14)	512	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205VF	LQFP100 (14x14)	768	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205VG	LQFP100 (14x14)	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215VG <sup>2</sup>	LQFP100 (14x14)	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205ZC	LQFP144 (20x20)	256	96	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205ZE	LQFP144 (20x20)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215ZE <sup>2</sup>	LQFP144 (20x20)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205ZF	LQFP144 (20x20)	768	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F205ZG	LQFP144 (20x20)	1024	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F215ZG <sup>2</sup>	LQFP144 (20x20)	1024	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207VC	LQFP100 (14x14)	256	128	12x16-bit (24/24/30)	16x12-bit	2x12-bit	82(82)	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105		
STM32F207VE	LQFP100 (14x14)	512	128	12x16-bit (24/24/30)	16x12-bit	2x12-bit	82(82)	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105		

## STM32 F2 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (high current)	Serial interface	Supply voltage (V <sub>CC</sub> ) (V)	Supply current (I <sub>CC</sub> )		Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (µA)	Run mode (µA/MHz)	
<b>STM32F207/217: 2x USB OTG (FS + /HS<sup>1</sup>), camera IF, crypto/hash processor<sup>2</sup></b>													
STM32F217VE <sup>2</sup>	LQFP100 (14x14)	512	128	12x16-bit (24/24/30)	2x32-bit timers (8/8/8), 2x WDG, XRTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	82(82)	3xSPI, 2xI <sup>2</sup> S, 3xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 3xUART, 1xUSB OTG FS/HS, 2xCAN, SDIO	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207VF	LQFP100 (14x14)	768	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207VG	LQFP100 (14x14)	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F217VG <sup>2</sup>	LQFP100 (14x14)	1024	128	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207ZC	LQFP144 (20x20)	256	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207ZE	LQFP144 (20x20)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F217ZE <sup>2</sup>	LQFP144 (20x20)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207ZF	LQFP144 (20x20)	768	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207ZG	LQFP144 (20x20)	1024	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F217ZG <sup>2</sup>	LQFP144 (20x20)	1024	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207IC	UFBGA176 (10x10) LQFP176 (24x24)	256	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207IE	UFBGA176 (10x10) LQFP176 (24x24)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F217IE <sup>2</sup>	UFBGA176 (10x10) LQFP176 (24x24)	512	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207IF	UFBGA176 (10x10) LQFP176 (24x24)	768	128	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105
STM32F207IG	UFBGA176 (10x10) LQFP176 (24x24)	1024	128	12x16-bit (24/24/30)	24x12-bit	2x12-bit	140(140)	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105		
STM32F217IG <sup>2</sup>	UFBGA176 (10x10) LQFP176 (24x24)	1024	128	12x16-bit (24/24/30)	24x12-bit	2x12-bit	140(140)	1.8 to 3.6	2.5	188	-40 to +85 or -40 to +105		

### Notes:

- HS requires an external PHY connected to ULPI interface
- Crypto/hash processor on STM32F217 and STM32F115
- 1.7 V min on WLCSP64 package only, 1.8 V min on other packages



## STM32 F4 series device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	Timer functions		ADC	DAC	I/Os (High current)	Serial interface	Supply Voltage (V <sub>cc</sub> ) (V)	Supply current (I <sub>cc</sub> )		Temperature (°C)
				16-bit (IC/OC/PWM)	Others						Lowest power mode (μA)	Run mode (μA/MHz)	
<b>STM32F405/415: 1x USB OTG (FS/HS)<sup>1</sup>, crypto/hash processor<sup>2</sup></b>													
STM32F405RG	LQFP64 (10x10) WLCSPP64	1024	192	12x16-bit (24/24/30)	2x32-bit timers (8/8/8), 2 x WDG, RTC, 24-bit down counter, 2x16-bit basic timers	16x12-bit	2x12-bit	51(51)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 3xUART, 1xUSB OTG FS/HS, 2xCAN, SDIO	1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	-40 to +85 or -40 to +105
STM32F415RG <sup>2</sup>	LQFP64 (10x10) WLCSPP64	1024	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	51(51)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F405VG	LQFP100 (14x14)	1024	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F415VG <sup>2</sup>	LQFP100 (14x14)	1024	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F405ZG	LQFP144 (20x20)	1024	192	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F415ZG <sup>2</sup>	LQFP144 (20x20)	1024	192	12x16-bit (24/24/30)		24x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
<b>STM32F407/417: 2x USB OTG (FS + /HS)<sup>1</sup>, camera IF, crypto/hash processor<sup>2</sup></b>													
STM32F407IE	UFBGA176 (10x10) LQFP176 (24x24)	512	192	12x16-bit (24/24/30)	2x32-bit timers (8/8/8), 24-bit WDG, RTC, 2x16-bit basic timers	24x12-bit	2x12-bit	140(140)	3xSPI, 2xI <sup>2</sup> S, 2xI <sup>2</sup> C, 3xUSART (IrDa, ISO 7816), 3xUART, 2xUSB OTG FS/HS, 2xCAN, Ethernet MAC10/100, SDIO	1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	-40 to +85 or -40 to +105
STM32F417IE <sup>2</sup>	UFBGA176 (10x10) LQFP176 (24x24)	512	192	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F407IG	UFBGA176 (10x10) LQFP176 (24x24)	1024	192	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F417IG <sup>2</sup>	UFBGA176 (10x10) LQFP176 (24x24)	1024	192	12x16-bit (24/24/30)		24x12-bit	2x12-bit	140(140)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F407VE	LQFP100 (14x14)	512	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F417VE <sup>2</sup>	LQFP100 (14x14)	512	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F407VG	LQFP100 (14x14)	1024	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F417VG <sup>2</sup>	LQFP100 (14x14)	1024	192	12x16-bit (24/24/30)		16x12-bit	2x12-bit	82(82)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F407ZE	LQFP144 (20x20)	512	192	12x16-bit (24/24/30)		2x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F417ZE <sup>2</sup>	LQFP144 (20x20)	512	192	12x16-bit (24/24/30)		2x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F407ZG	LQFP144 (20x20)	1024	192	12x16-bit (24/24/30)		2x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	
STM32F417ZG <sup>2</sup>	LQFP144 (20x20)	1024	192	12x16-bit (24/24/30)		2x12-bit	2x12-bit	114(114)		1.7 <sup>3</sup> /1.8 to 3.6	2.5	230	

### Notes:

1. HS requires an external PHY connected to ULPI interface
2. Crypto/hash processor on STM32F417 and STM32F415
3. Available on all packages except LQFP64. 1.7 V requires external reset circuitry

# Development tools

STMicroelectronics' STM32 family of 32-bit ARM Cortex™-M-core-based microcontrollers are supported by a complete range of high-end and low-cost evaluation, software, debugging and programming tools.

This complete line includes third-party solutions that come complete with C/C++ compiler, integrated development environment and in-circuit debugger/programmer featuring a JTAG application interface. Developers can also explore and start applications easily with any of a range of affordable, easy-to-use starter kits.

The superb combination of a state-of-the-art and efficient library of software drivers and extensive support for all major tool providers offers a fast route to best-fit and an optimized development process.

## Start today with STM32-Discovery kits

Discovery kits are the cheapest and quickest way to discover the STM32 family. These quick-start evaluation boards embed an ST-LINK or ST-LINK/V2 debug probe and are supported by IDE from Atollic, Keil, IAR and Tasking.

### STM32 F1 series (order code: STM32VLDISCOVERY)

Based on the STM32 F1 series Value Line, the **STM32 Value line Discovery** kit will satisfy hobbyists, first-time developers and students.

### STM32 L1 series (order code: STM32L-DISCOVERY)

Based on the STM32 L1 series, the **STM32L-Discovery** kit includes a 6-digit LCD display, a touch-sensing slider, 2 LEDs, a user button and current measurement.

### STM32 F4 series (order code: STM32F4DISCOVERY<sup>1</sup>)

To start with the STM32 F4 series, the STM32F4-Discovery highlights the performances of the F4 series with audio (input, output) and USB Host capabilities.

Note: 1. Available in Q4/2011

### STM32 EvoPrimer

Play, explore and develop applications on the **EvoPrimer** with Raisonance toolset, free demos and an online community at [www.stm32circle.com](http://www.stm32circle.com) to stimulate creative designs.

Order codes:

- STM3210CPRIMER (STM32 F1 series Connectivity line)
- STM3210EPRIMER (STM32 F1 series Performance line)
- STM32L15PRIMER (STM32 L1 series)
- STM3220GPRIMER (STM32 F2 series)

### STM32-PerformanceStick and STM32-ComStick

Evaluate STM32 performance in real time with the innovative **STM32-PerformanceStick** (order code: STM3210B-PFSTICK) and the networking features of the STM32 Connectivity line with **STM32-ComStick** (order code: STM32-COMSTICK).

These kits include an integrated debugging/programming capability via USB and unlimited Hitex HiTOP5 and Tasking VX C compiler.

## Micrium books

### Micrium µC/OS-III evaluation kit - STM32CMICOS-EVAL

Micrium's latest real-time µC/OS-III kernel designed to save time on embedded system projects. A two-part book dedicated to µC/OS-III is accompanied by an STM32 Connectivity line evaluation board.

### Micrium book

µC/TCP-IP: The Embedded Protocol Stack - STM32CMICTCP-BK.

Understand how a TCP/IP stack works. Examples run on the STM32 Connectivity line evaluation board available with the book µC/OS-III.



STM32F4DISCOVERY



STM32VLDISCOVERY



STM32L-DISCOVERY



STM32CMICOS-EVAL



STM32CMICTCP-BK

## Starter kits for STM32

Part number	Featured product	Description
STM3210B-SK/HIT STM3210E-SK/HIT	STM32F103RBT6 STM32F103VET6	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
STM3210C-SK/IAR STM3210E-SK/IAR STM32L152-SK/IAR STM3220G-SK/IAR STM3240G-SK/IAR	STM32F107RCT6 STM32F103RET6 STM32L152VBT61 STM32F207ZGT6 STM32F407ZGT6	IAR Embedded Workbench for ARM (for up to 32 Kbytes of code), IAR C/C++ compiler, J-Link (USB/JTAG), evaluation board
STM3210C-SK/KEIL STM3210E-SK/KEIL STM3220G-SK/KEIL STM3240G-SK/KEIL	STM32F107RCT6 STM32F103RET6 STM32F207IGH6 STM32F407IGH6	Keil RealView MDK with µVision 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 STM32100B-MCKIT	STM32F103RBT6 STM32F100VBT6B	ST motor control starter kit with complete sensor and sensorless libraries, evaluation hardware platform for vector drive of 3-phase brushless magnet synchronous motors, plus Segger J-LINK for host PC interface

## Evaluation board for STM32

Evaluation boards from ST implement the complete range of device peripherals for STM32 devices.

Part number	Featured product
STM3210C-EVAL	STM32F107VCT6
STM3210E-EVAL	STM32F103ZGT6
STM32100B-EVAL	STM32F100VBT6
STM32100E-EVAL	STM32F100ZET6
STM32L152-EVAL	STM32L152VBT6
STM3220G-EVAL	STM32F207IGH6
STM3240G-EVAL	STM32F407IGH6

## STM32 software development tools

Third-party solutions come complete with IDE, C/C++ compiler and JTAG debug probes. Development and debug of STM32 applications is made even easier with **MicroXplorer**, a free graphical tool to configure ST MCUs, and **STM-STUDIO**, a free tool to monitor and visualize variables at run-time.

## Java for STM32

Start developing applications for the STM32 in Java. Benefit from Java and the highly-optimized STM32 Java virtual machine to increase software engineering productivity. Ideal for feature-rich applications with human-machine interfaces and Internet protocol connectivity.

ST Order code: STM3220G-JAVA<sup>2</sup> (STM32 F2 series)

Note: 2. Available in Q4-2011.

## STM32 software solutions

From the hardware abstraction layer, through middleware and up to the application field, the STM32 software ecosystem is extensive, providing a consistent set of solutions, coming

from more than 20 partners, based on open-source, or even built in-house.

All STM32 peripherals are functionally covered, including peripheral library, DSP library, crypto library, file systems, USB, Ethernet, Bluetooth, Wi-Fi, display, industrial, audio, motor control, and medical applications.

Contact your local ST sales and marketing office for more information on the solutions described in this document.

## Hardware abstraction layer

### STM32 standard peripheral library:

Complete set of device drivers for all the standard device peripherals, with many examples.

**CMSIS DSP library:** Standardized interface, with more than 50 math operations (FIR, FFT, matrix, and more) accelerated with DSP instructions.

**STM32 crypto library:** Software implementation of cryptographic algorithms, optimized for STM32.

**STM32 Class B self-test routines ready for certification:** Speech codec software to compress/decompress speech data.

**STM32 self-test routines Class B norm certification:** Complete software for EN/IEC 60335-1 Class B norm.

## Middleware

**STM32 USB libraries:** Complete firmware packages for USB, slave and host, with many covered classes.

**STM32 TCP/IP stacks:** Several stacks are available, such as LwIP or NicheLite. Partners offer more extensive protocol support, or other communication means such as Wi-Fi.

**STM32 graphical library:** Basic blocks to build a graphical interface (including combo boxes, textboxes, slide bars).

Comes with a PC wizard to build your screens.

**STM32 Bluetooth stack:** iAnywhere full Bluetooth stack with many different profiles. With our partner Alpwis.

**STM32 industrial protocols:** Full range of supported industrial protocols: Profinet, EtherCAT, Modbus, DeviceNet, CANopen, and more, via our partner network.

## Application fields

**STM32 audio solutions:** Full range of audio software bricks, optimized for STM32: MP3 codec, MP3 decoder, WMA decoder, Speex speech codec, ADPCM compression, audio algorithms such as loudness control, channel mixer, 5-band equalizer, iPod/iPhone/iPad interface through iAP (iPod Application Protocol) interface, USB synchronisation methods for streaming, and more. Contact your sales office for information on availability for specific STM32 part numbers.

**STM32 motor control software:** Complete 3-phase motor-control software development Kit (firmware and graphical customization tool) supporting single or dual PMSM motors in sensored and sensorless mode and AC induction motors in sensored mode, plus a patented single-shunt algorithm. This SDK is included in the STM32 motor control kit.

**STM32 Continua certified solution:** Software bricks to build up your Continua medical solution. Provided bricks are USB PHDC class (personal health device class), base framework protocol, glucose agent and thermometer agent. Further agents can be implemented on demand.

