

## STM32F103RG Mainstream Performance line, ARM Cortex-M3 MCU with 1 Mbyte Flash, 72 MHz CPU, motor control, USB and CAN

STM32F103xF and STM32F103xG enhanced series, incorporates a high-performance operating frequency is 72MHz ARM®Cortex™ -M3 32-bit RISC core, high-speed embedded memory (up to 1M bytes of Flash memory and 96K bytes of SRAM memory), and a lot of connected to two APB bus enhanced I / O and peripherals. All models are with three 12 ADC, 10 general-purpose 16-bit timers and two PWM timers, as well as standard and advanced communication interfaces: 2 Up to two I²C interfaces, three SPI interface, two I²S Interface, 21 SDIO interface, 5 USART (UART) interfaces, a USB interface and a CAN interface.

STM32F103xx large capacity enhanced product line work in -40 ~ + 105 ° C temperature range, the power supply voltage of 2.0 ~ 3.6V. A series of power-saving mode, suitable for low-power application design.

These features allow STM32F103xx large capacity Enhanced microcontroller product series, ideal for a variety of applications, such as motor drivers, application control, medical and handheld devices, PC and game peripherals, GPS platform for industrial applications, PLC, drive, printer, scanner, alarm systems and video phones.

### Technical characteristics

- Core: ARM 32 Wei Cortex™ -M3 CPU with an MPU
  - 72 MHz maximum frequency, 1.25 DMIPS/MHz (Dhrystone 2.1) performance at 0 wait state memory access
  - Single-cycle multiplication and hardware division
- Memory
  - 768 Kbytes to 1 Mbyte of Flash memory
  - 96 Kbytes of SRAM
  - Flexible static memory controller with 4 Chip Select. Supports Compact Flash, SRAM, PSRAM, NOR and NAND memories
  - LCD parallel interface, 8080/6800 modes
- Clock, reset and power management
  - 2.0 to 3.6 V application supply and I/Os
  - POR, PDR, and programmable voltage detector (PVD)
  - 4-to-16 MHz crystal oscillator
  - Internal 8 MHz factory-trimmed RC
  - Internal 40 kHz RC with calibration
  - 32 kHz oscillator for RTC with calibration
- Low power consumption
  - Sleep, Stop and Standby modes
  - VBATsupply for RTC and backup registers
- 3 12, 1µs A / D converter (up to 21 channels)
  - Conversion range: 0 to 3.6 V
  - Triple-sample and hold capability
  - Temperature sensor
- Two 12-bit D / A converter
- DMA: 12-channel DMA controller
  - Supported peripherals: timers, ADCs, DAC, SDIO, I2Ss, SPIs, I²Cs and USARTs
- Debug mode
  - Serial wire debug (SWD) & JTAG interfaces

- Cortex-M3 Embedded Trace Macrocell™
- Up to 112 high-speed I / O ports
  - 51/80/112 I/Os, all mappable on 16 external interrupt vectors and almost all 5 V-tolerant
- Up to 17 timers
  - Up to ten 16-bit timers, each with up to 4 IC/OC/PWM or pulse counter and quadrature (incremental) encoder input
  - 2 × 16-bit motor control PWM timers with dead-time generation and emergency stop
  - 2 × watchdog timers (Independent and Window)
  - SysTick timer: a 24-bit downcounter
  - 2 × 16-bit basic timers to drive the DAC
- Up to 13 communication interfaces
  - Up to 2 × I²C interfaces (SMBus/PMBus)
  - Up to 5 USARTs (ISO 7816 interface, LIN, IrDA capability, modem control)
  - Up to 3 SPIs (18 Mbit/s), 2 with I2S interface multiplexed
  - CAN interface (2.0B Active)
  - USB 2.0 full speed interface
  - SDIO interface
- CRC calculation unit, 96-bit unique ID
- ECOPACK® package

STM32F103RG Ordering Information

ORDERING	product status	USD price	Quantity	Package	package style	temperature range	Material Declaration
STM32F103RGT7	Active	5.4782	1000	LQFP 64 10x10x1.4	Tray	40 ° C-105 ° C	STM32F103RGT7
STM32F103RGT6	Active	5.1198	1000	LQFP 64 10x10x1.4	Tray	40 ° C-105 ° C	STM32F103RGT6

DATASHEET

description	version	size
<a href="#">STM32F103RG</a> : DS6558: XL-density performance line ARM-based 32-bit MCU with 768 KB to 1 MB Flash, USB, CAN, 17 timers, 3 ADCs, 13 communication interfaces	3	2548KB

APPLICATION NOTES

description	version	size
<a href="#">AN2812</a> : Vocoder demonstration using a Speex audio codec on STM32F101xx and STM32F103xx microcontrollers	2	257KB
<a href="#">AN2784</a> : the use of large-capacity STM32F10xxx FSMC drive external memory	1	716KB
<a href="#">AN2784</a> : Using the high-density STM32F10xxx FSMC peripheral to drive external memories	4	299KB
<a href="#">AN2790</a> : TFT LCD interfacing with the high-density STM32F10xxx FSMC	2	823KB
<a href="#">AN2945</a> : STM8S and STM32™ MCUs: a consistent 8/32-bit product line for painless migration	1	213KB
<a href="#">AN2606</a> : STM32™ microcontroller system memory boot mode	14	877KB
<a href="#">AN3078</a> : STM32™ in-application programming over the I²C bus	1	671KB
<a href="#">AN3116</a> : STM32™'s ADC modes and their applications	1	236KB
<a href="#">AN4023</a> : STM32 secure firmware upgrade (SFU) overview	1	41KB
<a href="#">AN3429</a> : STM32 proprietary code protection overview	1	61KB
<a href="#">AN4013</a> : STM32F1xx, STM32F2xx, STM32F4xx, STM32L1xx timer overview	1	200KB
<a href="#">AN2824</a> : STM32F10xxx I²C optimized examples	4	123KB
<a href="#">AN2868</a> : STM32F10xxx internal RC oscillator (HSI) calibration	1	189KB
<a href="#">AN2557</a> : STM32F10x in-application programming using the USART	8	215KB
<a href="#">AN2629</a> : STM32F101xx, STM32F102xx and STM32F103xx low-power modes	2	496KB
<a href="#">AN2639</a> : Soldering recommendations and package information for Lead-free ECOPACK® microcontrollers	2	209KB
<a href="#">AN1015</a> : Software techniques for improving microcontroller EMC performance	1	105KB
<a href="#">AN2598</a> : Use STM32F101xx and STM32F103xx smart card interface	2	651KB

<a href="#">AN2598</a> : Smartcard interface with the STM32F10x microcontrollers	3	501KB
<a href="#">AN2867</a> : Oscillator design guide for STM8S, STM8A, and STM32F1 microcontrollers	6	280KB
<a href="#">AN3422</a> : Migration of microcontroller applications from STM32F1 to STM32L1 series	2	312KB
<a href="#">AN3364</a> : Migration and compatibility guidelines for STM32 microcontroller applications	3	128KB
<a href="#">AN4088</a> : Migrating from STM32F1 to STM32F0	1	919KB
<a href="#">AN3427</a> : Migrating a microcontroller application from STM32F1 to STM32F2 series	1	377KB
<a href="#">AN3070</a> : Managing the Driver Enable signal for RS-485 and IO-Link communications with the STM32™'s USART	1	192KB
<a href="#">AN3174</a> : Implementing receivers for infrared remote control protocols using STM32F10xxx microcontrollers	2	592KB
<a href="#">AN2953</a> : How to migrate from the STM32F10xxx firmware library V2.0.3 to the STM32F10xxx standard peripheral library V3.0.0	1	1251K
<a href="#">AN2834</a> : How to get the best accuracy ADC on STM32F10xxx	1	610KB
<a href="#">AN3307</a> : Guidelines for obtaining IEC60335 Class B certification in any STM32F1xx application	2	340KB
<a href="#">AN2586</a> : the STM32F10xxx Hardware Development Getting Started	2	682KB
<a href="#">AN2586</a> : Getting started with STM32F10xxx hardware development	7	417KB
<a href="#">AN1709</a> : EMC design guide for ST microcontrollers	1	657KB
<a href="#">AN1181</a> : Electrostatic discharge sensitivity measurement	1	59KB
<a href="#">AN2594</a> : EEPROM emulation in STM32F10x microcontrollers	3	156KB
<a href="#">AN3109</a> : Communication peripheral FIFO emulation with DMA and DMA timeout in STM32F10x microcontrollers	1	110KB
<a href="#">AN3126</a> : Audio and waveform generation using the DAC in STM32 microcontroller families	1	648KB

## ERRATA SHEETS

description	version	size
<a href="#">ES0113</a> : STM32F101xF/G and STM32F103xF/G XL-density device limitations	3	303KB

## LICENSE AGREEMENTS

description	version	size
<a href="#">MCU software licence agreement liberty v2</a>	2.0	18KB
<a href="#">MCU software licence agreement image v2</a>	2.0	17KB

## PROGRAMMING MANUALS

description	version	size
<a href="#">PM0068</a> : STM32F10xxx XL-density Flash programming	2	225KB
<a href="#">PM0056</a> : STM32F10xxx/20xxx/21xxx/L1xxxx Cortex-M3 programming manual	4	1315KB
<a href="#">PM0075</a> : STM32F10xxx Flash memory microcontrollers	1	245KB

## REFERENCE MANUALS

description	version	size
<a href="#">RM0008</a> : STM32F101xx, STM32F102xx, STM32F103xx, STM32F105xx and STM32F107xx, ARM core high-performance 32-bit microcontrollers	10	13972KB
<a href="#">RM0008</a> : STM32F101xx, STM32F102xx, STM32F103xx, STM32F105xx and STM32F107xx advanced ARM-based 32-bit MCUs	14	9201KB

## TECHNICAL ARTICLES

description	version	size
<a href="#">STM32 More Than a Core - Circuit Cellar, Tom Cantrell</a>	1	356KB

## TECHNICAL NOTES

description	version	size
<a href="#">TN0067</a> : STM32F101xx and STM32F103xx medium-density devices: upgrading your toolchain to V5.20 of IAR EWARM	2	52KB

<a href="#">TN0072</a> : Software toolchains and STM32 features	2	100KB
<a href="#">TN0063</a> : Overview of the STM32F103xx ACIM and PMSM motor control software libraries release 2.0	3	77KB
<a href="#">TN0516</a> : Overview of the STM32F103xx/STM32F100xx PMSM single/dual FOC SDK V3.0	2	117KB
<a href="#">TN0830</a> : How to use EWARM 6.2x with projects built with EWARM 6.1 and previous versions	1	98KB

## USER MANUALS

description	version	size
<a href="#">UM0551</a> : USB HID demonstrator	1	139KB
<a href="#">UM0585</a> : STM32F10x DSP library	2	234KB
<a href="#">UM0435</a> : STM3210B-EVAL demonstration software	5	757KB
<a href="#">UM0612</a> : STEVAL-ISQ008V1, fuel gauge implementation based on the STM32F103x	1	893KB
<a href="#">UM0424</a> : STM32 USB-FS-Device development kit	11	1175KB
<a href="#">UM0462</a> : STM32™ and STM8™ Flash loader demonstrator	7	1673KB
<a href="#">UM1053</a> : Advanced developers guide for STM32F100x/103x/2x/40x/41x MCUs PMSM single/dual FOC library	3	874KB
<a href="#">UM0494</a> : STM32 PerformanceStick interconnection board	1	93KB
<a href="#">UM1052</a> : STM32F103xx/ STM32F100xx/STM32F2xx/STM32F4xx PMSM single/dual FOC SDK v3.2	3	2724KB
<a href="#">UM0574</a> : STEVAL-ILL015V1 - LED dimmer demonstration board based on the STP24DP05 and STM32	1	662KB
<a href="#">UM0412</a> : Getting started with DfuSe USB device firmware upgrade STMicroelectronics extension	4	465KB
<a href="#">UM1029</a> : Communication peripheral application library (CPAL)	2	549KB
<a href="#">UM0685</a> : CEC (consumer electronic control) C library using the STM32F101xx, STM32F102xx and STM32F103xx microcontrollers	3	874KB

## PRODUCT PRESENTATIONS

description	version	size
<a href="#">Smart street lighting solutions</a>	1.0.0	1597KB
<a href="#">LED solutions for LCD backlighting</a>	1.0	1396KB
<a href="#">STM32 motor control firmware library</a>	1.0.0	1315KB
<a href="#">STM32 F1 firmware library for easySPIN (L6474) motor driver - quick guide</a>	1.0.0	383KB
<a href="#">STM32 - 32-bit ARM Cortex-M MCUs marketing presentation</a>	1.2	2282KB

## BOARDS AND TOOLS

Part Number	description
<a href="#">STM-STUDIO</a>	STM Studio run-time variables monitoring and visualization tool
<a href="#">STVP</a>	ST Visual Programmer for programming ST7, STM8, STM8T and STM32
STM3210E-SK / IAR	IAR starter kit for STM32 F1 series Performance and Access Line microcontrollers (STM32F103RG MCU)
<a href="#">STM3210B-EVAL</a>	Evaluation board for STM32F (128KB Flash) MCUs; it is replaced by STM3210E-EVAL
<a href="#">STEVAL-IFS015V1</a>	Smart monitoring node based on the STM32F103xx and LIS331DLH
STM3210E-SK / KEI	Keil starter kit for STM32 F1 series Performance and Access Line microcontrollers (STM32F103RG MCU)
<a href="#">STM32-SK/HIT</a>	Hitex starter kit for STM32 F1 series Performance and Access Line microcontrollers
<a href="#">STEVAL-IFR002V1</a>	RTC calibration daughterboard based on the M41T83SQA6F to be used with STEVAL-IFS012V1
<a href="#">ST-LINK</a>	In-circuit debugger and programmer for STM8 and STM32 MCUs; with IAR EWARM and Keil RVMDK and ST toolset
<a href="#">STX-</a>	

<a href="#">PRO/RAIS</a>	Unlimited in-circuit debugging/programming tool for STM32, STR7 and STR9
<a href="#">MicroXplorer</a>	MCU graphical configuration tool
<a href="#">STMPRIMER</a>	EvoPrimer components to build your own EvoPrimer for easy evaluation and development with STM32 and STM8 MCUs
<a href="#">STM3210B-MCKIT</a>	Motor control starter kit for STM32 (128KB flash) Performance and Access Line microcontrollers
<a href="#">STM3210B-PFSTICK</a>	Hitex Performance Stick for STM32 (128KB Flash) Performance and Access Line MCUs
<a href="#">STEVAL-ISQ008V1</a>	Fuel gauge implementation based on the STM32F103x
<a href="#">STM32-D/RAIS</a>	STM32 MCU daughter board for use with Raisonance REva starter kits
<a href="#">STEVAL-IFR003V1</a>	RTC calibration daughterboard based on the M41T83SMY6E to be used with STEVAL-IFS012V1
<a href="#">STEVAL-IFR001V1</a>	RTC calibration demonstration daughter card based on the M41T82SM6E to be used in connection with STEVAL-IFS012V1
<a href="#">STEVAL-IHP003V1</a>	Remote control network based on PLM ST7540 and STM32
<a href="#">ST-LINK/V2</a>	ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32
<a href="#">STVD</a>	ST Visual develop IDE for developing ST7 and STM8 applications
<a href="#">STX-RLINK</a>	In-circuit debugger/programmer supporting JTAG and ICC protocols for STM8, ST7, uPSD, STM32, STR7 and STR9 microcontrollers
<a href="#">STM32-SK/RAIS</a>	Raisonance REva starter kit for STM32 MCUs, includes RLink
<a href="#">STM32-PRIMER</a>	Complete Primer ready to use from Raisonance for easy evaluation and development with STM32 MCUs
<a href="#">STM3210E-EVAL</a>	Evaluation board for STM32 F1 series - with STM32F103 MCU

## CONFIGURATION UTILITIES

description	version	size
<a href="#">ST MC Workbench (PC GUI configuration tool for the STM32 PMSM FOC SDK motor control firmware library)</a>	2.0.0	12338KB

## DEVICE PROGRAMMERS

description	version	size
<a href="#">Production programming solutions for the STM32</a>	1.0.3	155KB

## FIRMWARE

description	version	size
<a href="#">EEPROM emulation in STM32F101xx and STM32F103xx microcontrollers</a>	3.1.0	1026KB
<a href="#">Smartcard interface with the STM32F101xx and STM32F103xx</a>	1.0	1098KB
<a href="#">Improving STM32F101xx and STM32F103xx ADC resolution by oversampling</a>	1.0	1129KB
<a href="#">Driving bipolar stepper motors using a medium-density STM32F103xx microcontroller</a>	2.0.0	1039KB
<a href="#">How to achieve 32-bit timer resolution using the link system in STM32F101xx and STM32F103xx microcontrollers</a>	3.0.0	1108KB
<a href="#">STM32F101xx and STM32F103xx low-power modes</a>	2.0.0	1394KB
<a href="#">STM3210B-EVAL demonstration firmware</a>	2.0.0	2308KB
<a href="#">STM32F101xx and STM32F103xx medium- and high-density devices: advanced I<sup>2</sup>C examples</a>	4.0	1506KB
<a href="#">Patch to fix STM32F10xxx frmware library V2.0.3 limitations</a>	2.0.3	143KB

<a href="#">STM32 PMSM FOC SDK motor control firmware library (web distribution version)</a>	3.2	36400KB
<a href="#">Using the STM32F101xx and STM32F103xx DMA controller</a>	2.0.0	1118KB
<a href="#">How to migrate from the STM32F10xxx firmware library V2.0.3 to the STM32F10xxx standard peripheral library V3.0.0</a>	0.0.6	871KB
<a href="#">STM32F10xxx Speex library firmware STM32, StdPeriph Lib, speex, audio</a>	2.0.0	1786KB
<a href="#">STM32F10xxx DSP library firmware</a>	2.0.0	1392KB
<a href="#">Archive for legacy STM32F10xxx Firmware Library V2.0.3 and all related Firmware packages</a>	2.0.3	23428KB
<a href="#">CEC (consumer electronic control) C library using the STM32F101xx, STM32F102xx and STM32F103xx microcontrollers</a>	2.0.0	1692KB
<a href="#">STM32F10x standard peripheral library</a>	3.5.0	21617KB
<a href="#">STM32F1xx motor control firmware library for the L6470 dSPIN IC</a>	1.0.0	675KB
<a href="#">Implementing receivers for infrared remote control protocols using STM32F1 microcontrollers</a>	2.0	12984KB
<a href="#">STM32 I²C Communication peripheral application library</a>	1.1.0	1960KB
<a href="#">STM32 embedded GUI library</a>	2.0.0	25243KB
<a href="#">STM32F1xx motor control firmware for easySPIN L6474</a>	1.0.1	1353KB
<a href="#">STM8 and STM32 embedded software solutions</a>	1.0.1	1139KB
<a href="#">STM32F10x and STM32L1xx USB full-speed device library</a>	3.4.0	4030KB

IBIS MODELS

description	version	size
<a href="#">STM32 IBIS files</a>	1.0	309KB

SW DEMOS

description	version	size
<a href="#">STM32 TFT-LCD direct drive demonstration firmware</a>	1.0.0	7345KB
<a href="#">DfuSe USB device firmware upgrade STMicroelectronics extension: contains the demo GUI, debugging GUI, all sources files and the protocol layer</a>	3.0.2	17034KB
<a href="#">STM32 and STM8 Flash loader demonstrator</a>	2.5.0	6449KB

SW DRIVERS

description	version	size
<a href="#">Communication peripheral FIFO emulation with DMA and DMA timeout in STM32F10x microcontrollers</a>	1.0	1224KB
<a href="#">STM32 Virtual COM Port Driver</a>	1.3.1	11516KB
<a href="#">USB HID Demonstrator Release 1.0.2</a>	1.0.2	4875KB

BSDL MODELS

description	version	size
<a href="#">STM32 Boundary Scan Description Language (BSDL) files</a>	3.0.0	196KB

MARKETING BROCHURES

description	version	size
<a href="#">BRSTM32MC1211</a> : STM32 Motor control	1.0.0	976KB
<a href="#">BRSTM320512</a> : STM32 MCU family	1.0	1064KB

Brand manufacturers Manufacturers					Services Products		Contact Sales for later
ADI	Avago	Cypress	DIODES	EXAR	microprocessor	Power	QQ:800164444 ; TradeManager
infineon	Intersil	Linear	maxim	Microchip		management	Micro letter: BDTICnet
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