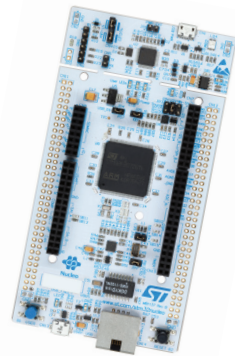


STM32F7 Ecosystem

HARDWARE TOOLS

www.st.com/stm32hardwaretools

STM32 Nucleo boards



The highly affordable STM32 144-pin Nucleo boards allow anyone to try out new ideas and to quickly create prototypes with any STM32 MCU.

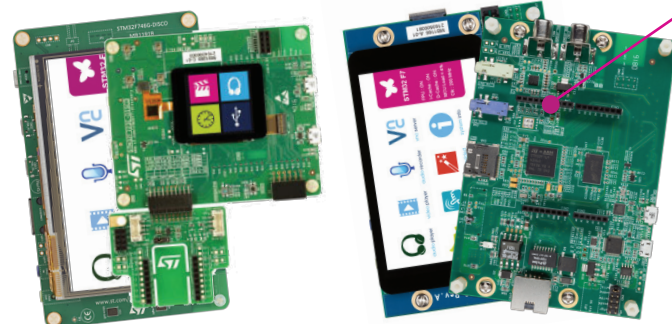
Flexible prototyping

NUCLEO-F746ZG
NUCLEO-F756ZG*

NUCLEO-F722ZE
NUCLEO-F767ZI

Note: * Hardware crypto/Hash device

Discovery kits



Creative demos

STM32F746G-DISCO
STM32F723E-DISCO

STM32F769I-DISCO
STM32F769I-DISC1

STM32F769 Discovery Kit accessories

B-LCD40-DSI1*
4" WVGA TFT LCD with MIPI-DSI interface and capacitive touch

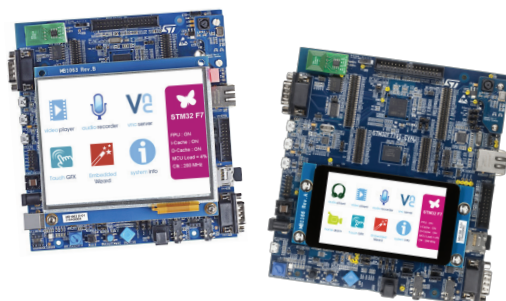
Note: * for STM32F769I-DISC1 only

B-LCDAD-HDMI1
DSI to HDMI adapter

Note: on STM32F769 Discovery kits use the dual-row 8-way connector to host a 3rd-party Wi-Fi module available on the market

B-LCDAD-RP11
15-pin single-row flexible printed circuit DSI adapter board

Evaluation boards



The STM32 eval boards have been designed as a complete demonstration and development platform for the Arm® Cortex STM32 MCUs.

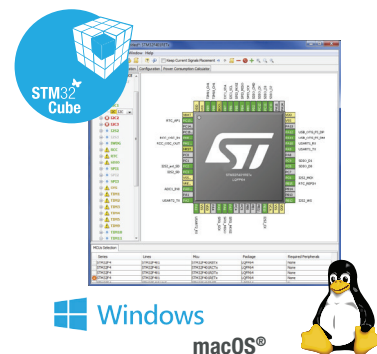
Full-feature evaluation
STM32746G-EVAL2
STM32F769I-EVAL

Hardware Crypto/Hash devices
STM32756G-EVAL2
STM32F779I-EVAL

SOFTWARE TOOLS

www.st.com/stm32softwaretools

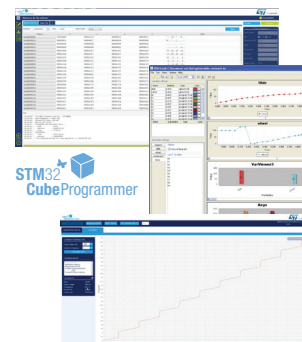
STM32CubeMX



Partner IDEs



STM32CubeMonitor-Power STMStudio



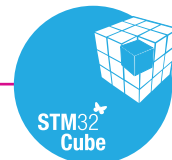
Configure and generate code

Compile and debug

Monitor & Program

EMBEDDED SOFTWARE

www.st.com/stm32embeddedsoftware



STM32Cube LL
(low-layer APIs)

STM32Cube HAL and middleware
STM32 Std Peripherals Libraries



CMSIS and
mbed SDK



Virtual machines
and models

High optimization
low portability

Average optimization
STM32 portability

Low optimization
Arm portability

Low optimization
large portability



ST COMMUNITY

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STM32 EDUCATION

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STM32F7 series

Arm® Cortex®-M7 powered

Releasing your creativity

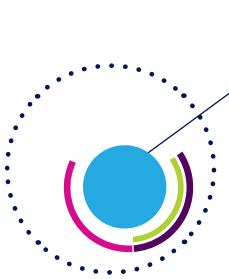


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Order code: BRSTM32F70718

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STM32F7 high performance

32-bit MCU with DSP and FPU

The STM32F7 with its ARM® Cortex®-M7 core is the smartest MCU and has the best performance of the 32-bit STM32 family.

PERFORMANCE

The STM32F7 delivers 1082 CoreMark/462 DMIPS executing from embedded Flash thanks to the ST ART Accelerator™ at 216 MHz and up to twice the DSP performance, without compromising on power efficiency. External memory can be used with no performance penalty thanks to the L1 cache (up to I/D 16KB+16KB). Fully pin-to-pin and code compatible with the STM32F4 and the STM32 ecosystem.

Benefits: Allows creation of more responsive, innovative applications, running on either on-chip or off-chip memories. Easy upgrade for existing designs based on STM32F4.



POWER EFFICIENT

- Up to 6 CoreMark/mW at 1.8 V
- 100 µA typical in Stop mode with all SRAM saved

Benefit: Put more innovation and creativity in power-constrained applications.

	LQFP64	10 x 10 x 1.4 mm
	LQFP100	14 x 14 x 1.4 mm
	LQFP144	20 x 20 x 1.4 mm
	LQFP176	24 x 24 x 1.4 mm
	LQFP208	28 x 28 x 1.4 mm

	UFBGA144	7 x 7 x 0.6 mm (pitch 0.5)
	UFBGA176	10 x 10 x 0.6 mm (pitch 0.65)
	TFBGA216	13 x 13 x 1.2 mm (pitch 0.8)

	WLCSP100	< 4.3 x 4.7 mm
	WLCSP143	< 5.9 x 4.6 mm
	WLCSP180	< 6.2 x 5.6 mm

SMART ARCHITECTURE WITH NEW PERIPHERAL SET

The STM32F7 optimizes the system performance by combining brand-new peripherals around the Cortex-M7, with a superior interconnect architecture with AXI and multi AHB bus matrix, multiple DMA and the Chrom-ART Accelerator™ hardware.

Benefits: Concurrent, high-speed data transfers between bus masters and slaves without loading the CPU.

Large SRAM with overloading architecture

- Up to 512 Kbytes including 128 Kbytes of Data TCM RAM
- 16 Kbytes of instruction TCM RAM
- 4 Kbytes of backup SRAM

Benefits: Support for large data buffers, critical real-time data routines and backup.

New peripheral sets

- Two SAI (with SPDIF output support), three I²S half-duplex and SPDIF input
Benefit: Multiple audio channel input and output support.
- 2x USB OTG with dedicated power supply
Benefit: Enables USB communication even when the MCU is powered at 1.8 V.
- Dual QuadSPI interface:
Benefit: Connect cost-effective memories with only 1, 4 or 8 data pins.
- On-Chip USB High Speed Phy (on some variants):
Benefit: More integration on high-speed USB communication

Power efficiency

- Up to 125°C supported as maximum junction temperature
Benefit: leverage the full core and peripherals performance even when ambient temperature increases.

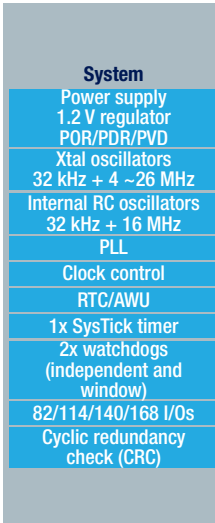
UP TO SEVEN LINES FOR MORE PERFORMANCE

Arm® Cortex®-M7 – 216 MHz

ACCELERATION • ART Accelerator™ • L1 cache: data and instruction cache • Chrom-ART Accelerator™ (except. STM32F7x3/F7x2/F730) • Floating Point Unit	 Product		F _{CPU} (MHz)	L1 cache (I/D)	FPU	Flash (bytes)	RAM (KB) + 16K ITCM + 4K backup	JPEG codec	CAN	DF SDM	TFT LCD controller	MIPI®-DSI	
	Advanced lines												
	STM32F7x9 ² STM32F7x8 ¹		216	16K+16K	Double Precision	1M to 2M (RWW)	512K (incl.128K DTCM)	•	3	•	•	•	
	STM32F7x7 ²		216	16K+16K	Double Precision	1M to 2M (RWW)		•	3	•	•		
	STM32F7x6 ²		216	4K+4K	Single Precision	512K to 1M	320K (incl.64K DTCM)		2		•		
	STM32F7x5	765	216	16K+16K	Double Precision	1M to 2M (RWW)	512K (incl.128K DTCM)		3	•			
		745	216	4K+4K	Single Precision	512K to 1M	320K (incl.64K DTCM)		2				
	Foundation lines												
		Product lines		F _{CPU} (MHz)	L1 cache (I/D)	FPU	Flash (bytes)	RAM (KB) + 16K ITCM + 4K backup		CAN	PC- ROP	TFT LCD controller	USB HS PHY
	OTHER	STM32F7x3 ²		216	8K+8K	Single Precision	256K to 512K	256K (incl.64K DTCM)		1	•		•
STM32F7x2 ²		216	8K+8K	Single Precision	256K to 512K		1		•				
Value lines													
	STM32F7x0	730	216	8K+8K	Single Precision	64K	256K (incl.64K DTCM)		1	•		•	
		750	216	4K+4K	Single Precision	64K	320K (incl.64K DTCM)		2		•		

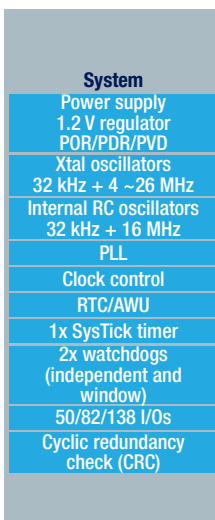
Notes: 1. Voltage Regulator Off mode available for WLCSP180 package (STM32F778AIY6TR)
2. Only STM32F730, STM32F750, STM32F732, STM32F733, STM32F756, STM32F777 and STM32F779 include HW crypto/hash functions

STM32F779 BLOCK DIAGRAM

	System Power supply 1.2 V regulator POR/PDR/PVD Xtal oscillators 32 kHz + 4 ~26 MHz Internal RC oscillators 32 kHz + 16 MHz PLL Clock control RTC/AWU 1x SysTick timer 2x watchdogs (independent and window) 82/114/140/168 I/Os Cyclic redundancy check (CRC)		Chrom-ART Accelerator™ JPGEC Codec Acceleration ART Accelerator™		2-Mbyte dual bank Flash 512-Kbyte SRAM + 16-Kbyte ITCM RAM FMC/SRAM/NOR/NAND/SDRAM Dual Quad-SPI 32 registers + 4-KByte backup RAM 1024-byte OTP	
	Cache I/D 16+16 Kbytes		Arm® Cortex®-M7 216 MHz		Connectivity TFT LCD controller MIPI®-DSI HDMI-CEC 6x SPI, 3x I²S, 4x I²C Camera interface Ethernet MAC 10/100 with IEEE 1588 MDIO slave 3x CAN 2.0B 1x USB 2.0 OTG FS/HS 1x USB 2.0 OTG FS	
	Control 2x 16-bit motor control PWM synchronized AC timer 10x 16-bit timers 2x 32-bit timers LP timer		Floating point unit (FPU) Nested vector interrupt controller (NVIC) JTAG/SW debug/ETM Memory Protection Unit (MPU)		2x SDMMC 4x USART + 4 UART LIN, smartcard, IrDA, modem control 2x SAI (Serial audio interface) SPDIF input x4 DFSDM	
	Crypto/Hash processor 3DES, AES 256, GCM, CCM SHA-1, SHA-256, MD5, HMAC		AXI and Multi-AHB bus matrix 16-channel DMA True random number generator (RNG)		Analog 2x 12-bit, 2-channel DACs 3x 12-bit ADC 24 channels / 2.4 MSPS Temperature sensor	



STM32F750 VALUE LINE BLOCK DIAGRAM

	System Power supply 1.2 V regulator POR/PDR/PVD Xtal oscillators 32 kHz + 4 ~26 MHz Internal RC oscillators 32 kHz + 16 MHz PLL Clock control RTC/AWU 1x SysTick timer 2x watchdogs (independent and window) 50/82/138 I/Os Cyclic redundancy check (CRC)		ART Accelerator™		64-Kbyte Flash 256-Kbyte SRAM + 16-Kbyte ITCM RAM FMC/NOR/NAND/SDRAM Dual Quad-SPI 32 registers + 4-KByte backup RAM 528-byte OTP	
	Cache I/D 8+8 Kbytes		Arm® Cortex®-M7 216 MHz		Connectivity 5x SPI, 3x I²S, 3x I²C Camera interface 1x CAN 2.0B 1x USB 2.0 OTG FS/HS USB HS Phy* 1x USB 2.0 OTG FS 2x SDMMC 4x USART + 4 UART LIN, smartcard, IrDA, modem control 2x SAI (Serial audio interface)	
	Control 2x 16-bit motor control PWM synchronized AC timer 10x 16-bit timers 2x 32-bit timers LP timer		Floating point unit (FPU) Nested vector interrupt controller (NVIC) JTAG/SW debug/ETM Memory Protection Unit (MPU) PC-ROP			
	Crypto AES-256		AXI and Multi-AHB bus matrix 16-channel DMA True random number generator (RNG)		Analog 2x 12-bit, 2-channel DACs 3x 12-bit ADC 24 channels / 2.4 MSPS Temperature sensor	

Note (*) : only available on LQFP144 and UFBGA176 packages

STM32F7 ON-LINE TRAINING

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