STM32U5 SERIES

The flagship of ultra-low power MCUs with advanced performance and security

Discover the secure, high-performance, and ultra-low power STM32 microcontrollers that will revolutionize your design.

The STM32U5 microcontrollers combine the Arm® Cortex®-M33 core with power-saving features and advanced security to meet the most demanding power/performance requirements for smart applications, including wearables, personal medical devices, home automation, and industrial sensors.

Offering up to 2 Mbytes of Flash (dual bank) memory and 786 Kbytes of SRAM, the STM32U5 microcontrollers take performance to the next level.

The STM32U5 offers 8 packages (from 48 to 169 pins) and supports up to 125°C ambient temperature.

BEST-IN-CLASS POWER CONSUMPTION

- Energy benchmark:
  - 535 ULPMark-CP
  - 149 ULPMark-PP
  - 58 ULPMark-CM
  - 133,000 SecureMark-TLS
- LPBAM (Low Power Background Autonomous Mode), an innovative autonomous power mode, with peripherals and DMA working in stop mode
- Key performance indicators include:
  - 110 nA in shutdown mode
  - 300 nA in standby mode
  - 1.7 µA in stop mode 3 with 16 Kbytes of SRAM
  - 6.6 µA in stop mode 2 with 786 Kbytes of SRAM
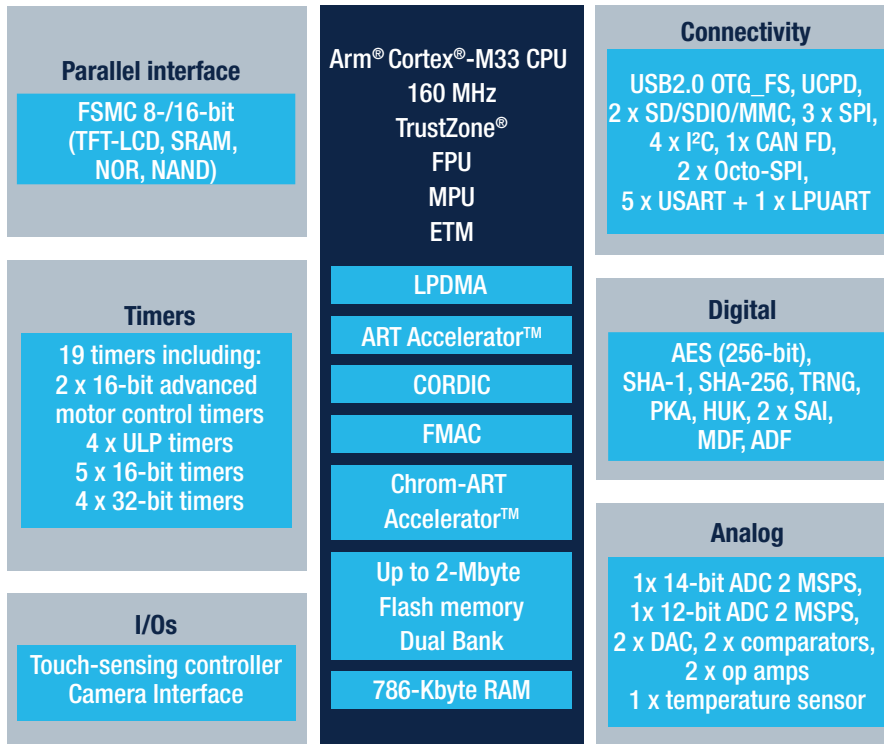 - Down to 19 µA/MHz in active mode

ENHANCED SECURITY

- Arm's TrustZone® technology
- AES encryption and Public Key Accelerator (PKA) side-channel hardware-resistant
- Secure data storage with a Hardware Unique Key (HUK)
- Active tamper detection
- PSA and SESIP level 3 certified

ENHANCED PERFORMANCE

- Arm Cortex-M33 running at 160 MHz
- 240 DMIPS and 651 CoreMark scores
- Mathematic accelerators FMAC and Cordic

www.st.com/stm32u5

STM32U585 block diagram

Parallel interface

FSMC 8-/16-bit
(TFT-LCD, SRAM,
NOR, NAND)

Timers

19 timers including:
2 x 16-bit advanced
motor control timers
4 x ULP timers
5 x 16-bit timers
4 x 32-bit timers

I/Os

Touch-sensing controller
Camera Interface

Arm® Cortex®-M33 CPU
160 MHz
TrustZone®
FPU
MPU
ETM

LPDMA

ART Accelerator™

CORDIC

FMAC

Chrom-ART
Accelerator™

Up to 2-Mbyte
Flash memory
Dual Bank

786-Kbyte RAM

Connectivity

USB2.0 OTG_FS, UCPD,
2 x SD/SDIO/MMC, 3 x SPI,
4 x I²C, 1x CAN FD,
2 x Octo-SPI,
5 x USART + 1 x LPUART

Digital

AES (256-bit),
SHA-1, SHA-256, TRNG,
PKA, HUK, 2 x SAI,
MDF, ADF

Analog

1x 14-bit ADC 2 MSPS,
1x 12-bit ADC 2 MSPS,
2 x DAC, 2 x comparators,
2 x op amps
1 x temperature sensor

Hardware tools

Evaluation board
Full-featured development plaform

STM32U575I-EV

Discovery kit
Flexible prototyping with wireless connectivity

B-U585I-IOT02A

STM32 Nucleo board
An affordable and flexible way to try out new concepts

NUCLEO-U575ZI-Q

STM32Cube ecosystem

The STM32Cube ecosystem is a complete software solution for STM32 MCUs and MPUs, including STM32CubeMX to configure, generate code, calculate power consumption; STM32CubeIDE to configure, develop, compile and debug; STM32CubeProgrammer to program internal or external memories through JTAG or bootloader interfaces; and STM32CubeMonitor-Power to display power consumption.
A one-stop-shop solution, STM32Cube embedded software package includes MCU drivers, middleware including Azure RTOS (USB, TLS, Crypto, touch sensing, file system, TF-M, RTOS), as well as project examples for IAR, Keil and STM32CubeIDE. TF-M is an open-source reference code to implement a Trusted Execution Environment (TEE) as specified in Arm PSA.

The STM32Trust framework combines ST's knowledge, design tools, and ready-to-use software to build strong cyber-protection into new IoT devices, leveraging industry best practices.
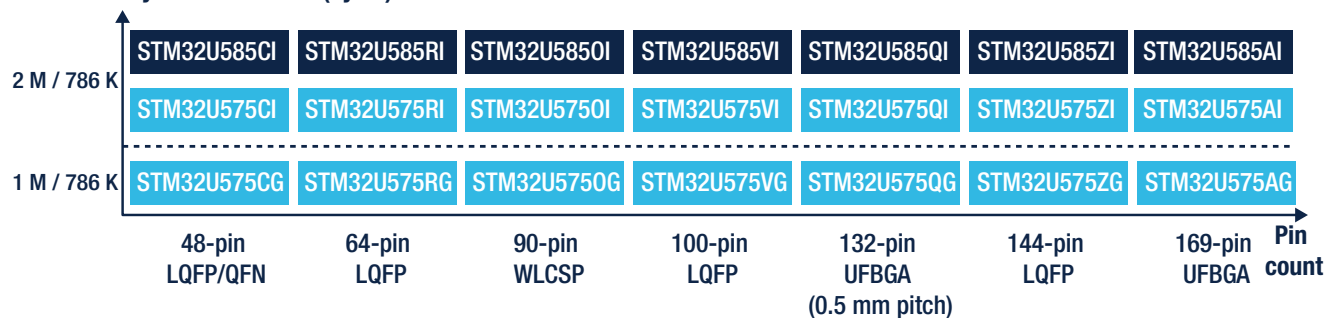**www.st.com/stm32trust**

STM32 COMMUNITY
community.st.com/stm32

STM32U5 Portfolio

Flash memory size / RAM size (bytes)

	48-pin LQFP/QFN	64-pin LQFP	90-pin WLCSP	100-pin LQFP	132-pin UFBGA (0.5 mm pitch)	144-pin LQFP	169-pin UFBGA
2 M / 786 K	STM32U585CI	STM32U585RI	STM32U585OI	STM32U585VI	STM32U585QI	STM32U585ZI	STM32U585AI
	STM32U575CI	STM32U575RI	STM32U575OI	STM32U575VI	STM32U575QI	STM32U575ZI	STM32U575AI
1 M / 786 K	STM32U575CG	STM32U575RG	STM32U575OG	STM32U575VG	STM32U575QG	STM32U575ZG	STM32U575AG

Pin count

Legend: without HW crypto   with HW crypto