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STM32G0 MCU series efficiency at its best





The STM32 portfolio

Five product categories



Wireless
MCU

Short- and long-range connectivity



Ultra-low-power
MCU

32-bit general-purpose microcontrollers: from 75 to 3,224 CoreMark score



Mainstream
MCU



High-performance
MCU



Embedded
MPU

32- and 64-bit microprocessors



Enabling edge AI solutions



Scalable security



STM32G0 MCU series

1

Efficient

- Arm® Cortex®-M0+ at 64 MHz
- Compact cost: maximum I/Os count
- Best RAM/Flash Ratio
- Smallest possible package down to 8-pin
- Very low power consumption
- (3 μ A in stop, <100 μ A/MHz in Run)
- Accurate internal high-speed clock 1% RC
- Best optimization, down to each and every detail
- Offers the best value for money

2

Robust

- Low electromagnetic susceptibility, EMC
- Clock Monitoring and 2 Watchdogs
- Error correction on Flash
- IoT ready with embedded security
- Hardware AES-256 encryption or the new Securable Memory Area
- Safe Firmware upgrade / Install

3

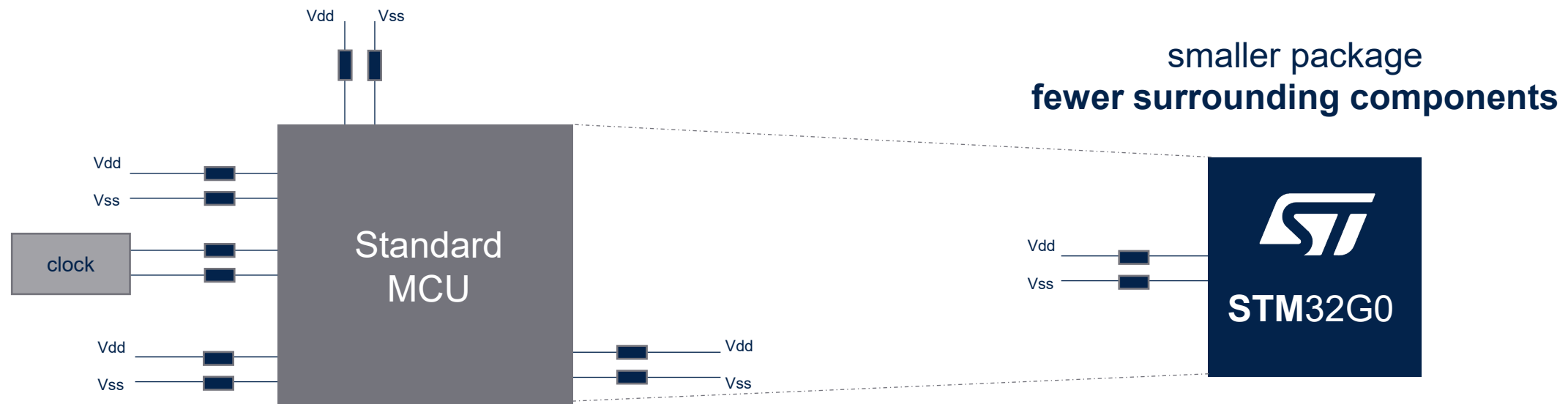
Simple

- Easy to configure thanks to the intuitive and graphic STM32CubeMX configuration tool
- Easy to develop based on the Hardware Abstraction Layer library (HAL) or the low-layer library (LL) allowing maximum re-use and faster time-to-market



Reducing BOM cost

New platform optimized with 1 power supply pair only up to 64-pin packages



Enabling cost savings

-10cts	No external clock Accurate internal high-speed clock +/-1% for 0 / 90°C
-4cts	No decoupling capacitances Remove up to 6 decoupling capacitors for supply and clocks
-1ct	Smaller PCB Smaller package, less components: save on PCB area

Additional benefits for your convenience:

-15cts	USB-C power delivery Integrated transceivers, pull-up/down resistors and digital
-25cts	Secure programming In house or at 3rd parties

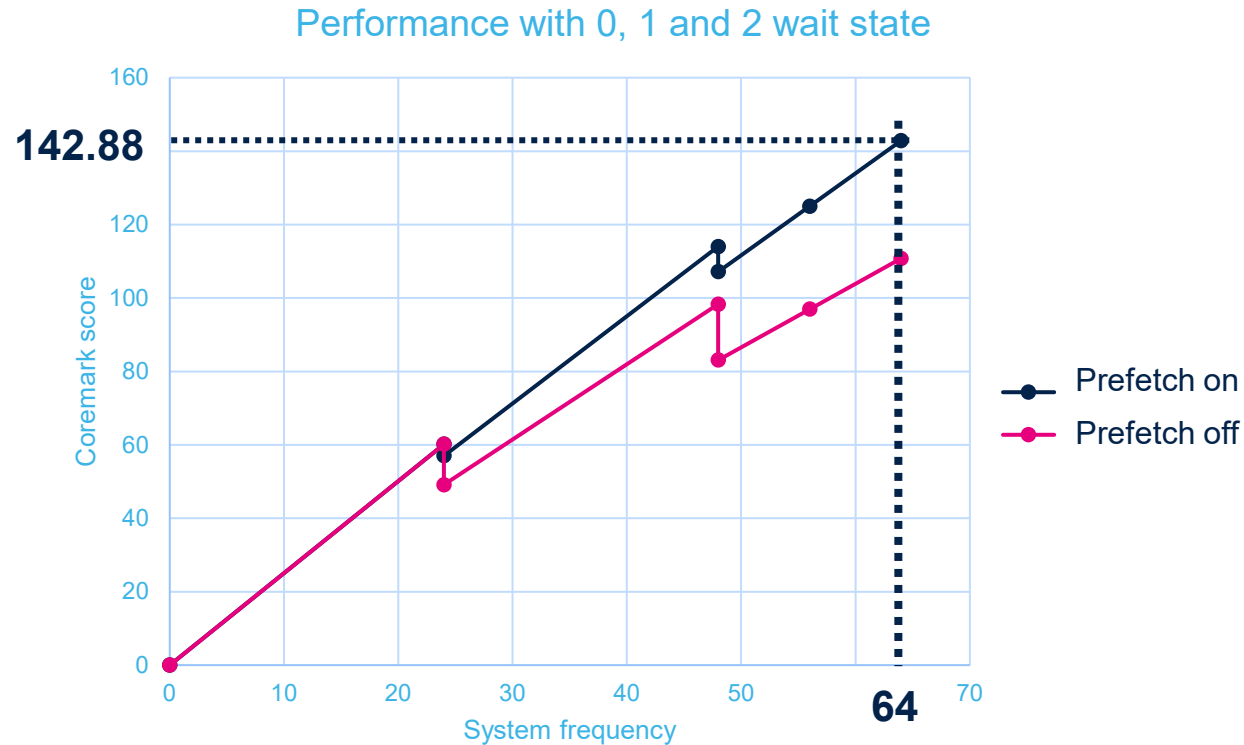


\$ You just saved -15cts!



Providing more performance

No compromise on performance with STM32G0



- **Up to 64 MHz/ 59 DMIPS**
- **Up to >142** CoreMark Result
- Arm[®] Cortex[®]-M0+ with Memory Protection Unit (MPU)
- Flexible **DMA** up to 12 channels



Low-power modes efficiency

When a mainstream MCU series meets low-power requirements

Wake-up time

250 μ s

14 μ s

5 μ s

6 cycles

V_{BAT}^*

6nA / 400 nA*

Tamper: few I/Os, RTC

Shutdown

40 nA / 500 nA*

Wake-up sources: reset pin, few I/Os, RTC

Standby

200 nA / 500 nA*

Wake-up sources: + BOR, IWDG

Stop Flash-RTC off-off/off-on/on-off 3.0 μ A / 5 μ A / 8 μ A

Wake-up sources: + all I/Os, PVD, COMPs, LPUART, LPTIM, I²C, UART, USB

Sleep 24 MHz, V_{DD} = 3 V, PLL=on

800 μ A

Wake-up sources: any interrupt or event

Run at 64 MHz

<100 μ A / MHz

Conditions: 25°C, V_{DD} = 3V

Note : * without RTC / with RTC



Ready for tomorrow

Faster, more accurate analog and digital functions

More **RAM** for flash memory

Up to 144 Kbytes of SRAM for 512 Kbytes and 256 Kbytes of flash memory

Up to 36 Kbytes of SRAM for 128 Kbytes and 64 Kbytes of flash memory

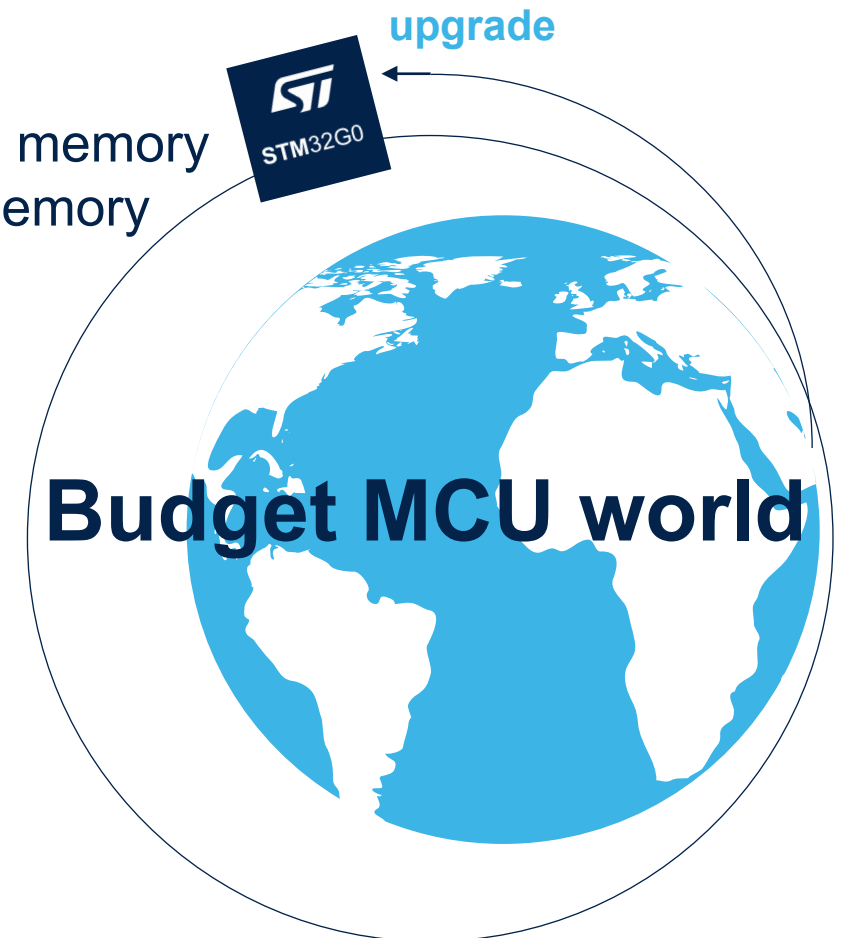
Timer frequency up to **128 MHz** resolution (**< 8 ns**)

Advanced control capabilities

12-bit ADC up to **2.5 MSPS** (0.4 μ s) conversion time

16-bit oversampling by hardware

32 Mbit/s SPI, 7 Mbaud USART, 1 Mbit/s I²C communication





Smart peripherals

FD-CAN

Up to 2 instances



ODB



V_{BAT} with RTC

for battery backup

400 nA in V_{BAT} mode for RTC and
20x 32-bit backup registers



TRNG & AES

for Security

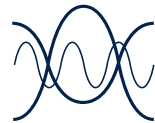
128-/256-bit AES
key encryption hardware accelerator



Comparators

2 instances

Down to 30 ns propagation delay



DAC

2x 12-bit DAC,

ADC

16x12-bit, 16-bit oversampling
2.5 MSPS (0.4μs)

Timers

8ns PWM resolution
Advanced control
16- and 32-bit



STM32G0



USB-C Power Delivery

Up to 2 ports with dead-battery management



USB2.0 FS Dual Role

Device and Host modes
Crystal less



SPI / UART/ I²C

4x SPIs
8 USARTs (ISO 7816, LIN, IrDA, modem)
3 I²C



I/Os

Up to 92 fast I/Os



Smart integration

Save on battery life



Low consumption process and design

Low-Power UART: wake-up on frame

Low-Power timer: counts and generate signals
I²C wake-up on address

Save on BOM cost



+/-1% high speed clock internal from 0 to 90 °C

+/-2% high speed clock internal from -40 to 125 °C

IO maximization: smaller package footprint

More flexibility



More RAM or **more safety** with parity
enable/disable

Dynamic DMA assignment on **DMAMUX**

All IOs with external interrupt capability



Keep control, diagnose, react

Main Clock monitoring

Backup clock and interrupts

Voltage monitoring: programmable interrupts
and reset

Window watchdog on CPU clock

Independent watchdog on independent clock

Checksum by hardware

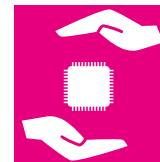
ECC on Flash, **Parity** on RAM



High temperature

from -40 °C

up to +125 °C



High robustness

Highly immune to fast-transients

Robust IOs against negative injections



Smart applications

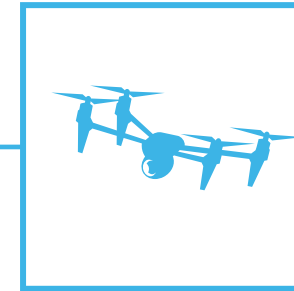
- High temperature 125 °C
- Fast CPU 64 MHz
- Advanced timers with high-resolution 7.8 ns
- Fast comparators
- ADC-12-bit, DAC-12-bit
- Low-thickness packages
- AES & security for secure upgrades

Air conditioning, e-bikes, industrial equipment

- High temperature 125 °C
- CANFD support
- SPI, USART, I²C
- Advanced timers with high-resolution 7.8 ns
- RTC with backup registers
- AES & security for secure upgrades



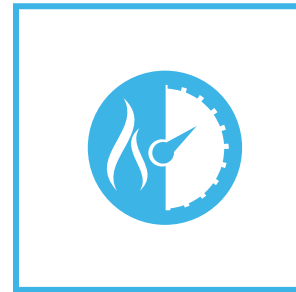
Lighting



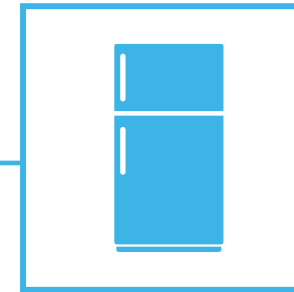
Consumer objects

Smartphones, IoT devices, rechargeable connected devices, drones, toys

- Low-thickness, small form-factor
- 64MHz CPU with DMA
- Low consumption in run and low-power, fast wake-up
- USB Type-C Power Delivery 3.0
- USB FS 2.0 dev/host crystal-less



Industrial devices
Motor control
Advanced control



Smart Home

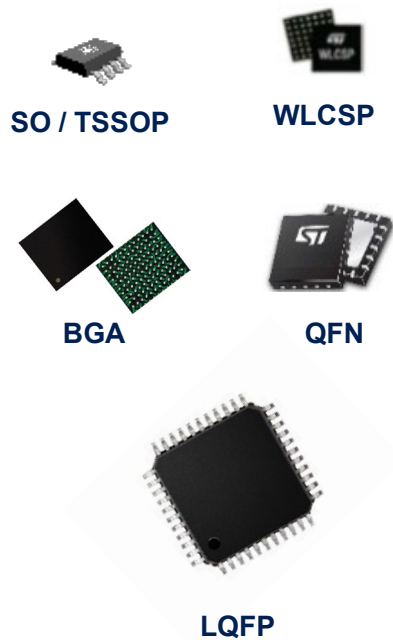
Home appliances, alarms and safety, advanced user interfaces

- High temperature 125 °C
- Safety monitoring features
- More RAM for flash
- Low consumption <100µA/MHz in run

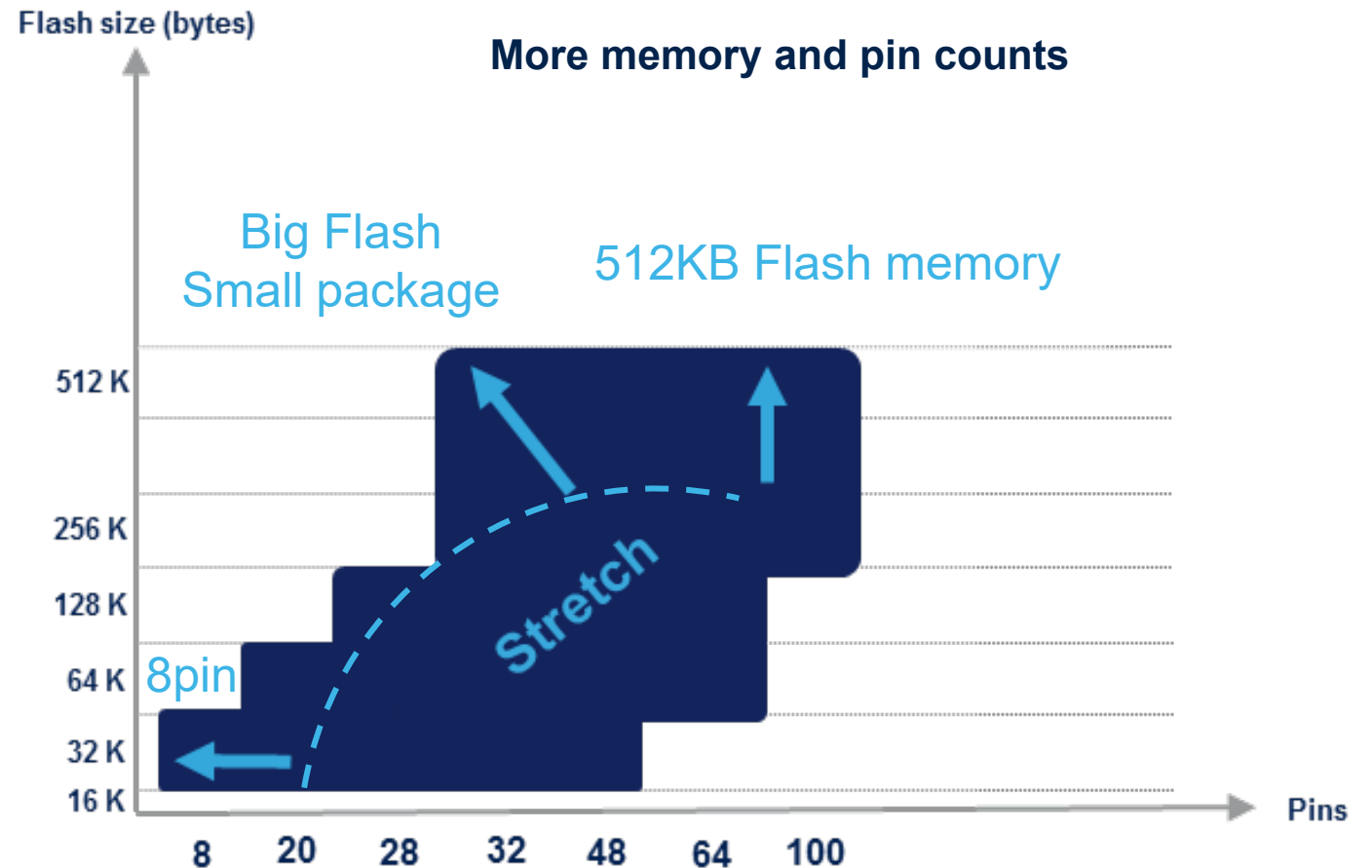


Portfolio stretched for efficient budget applications

More packages



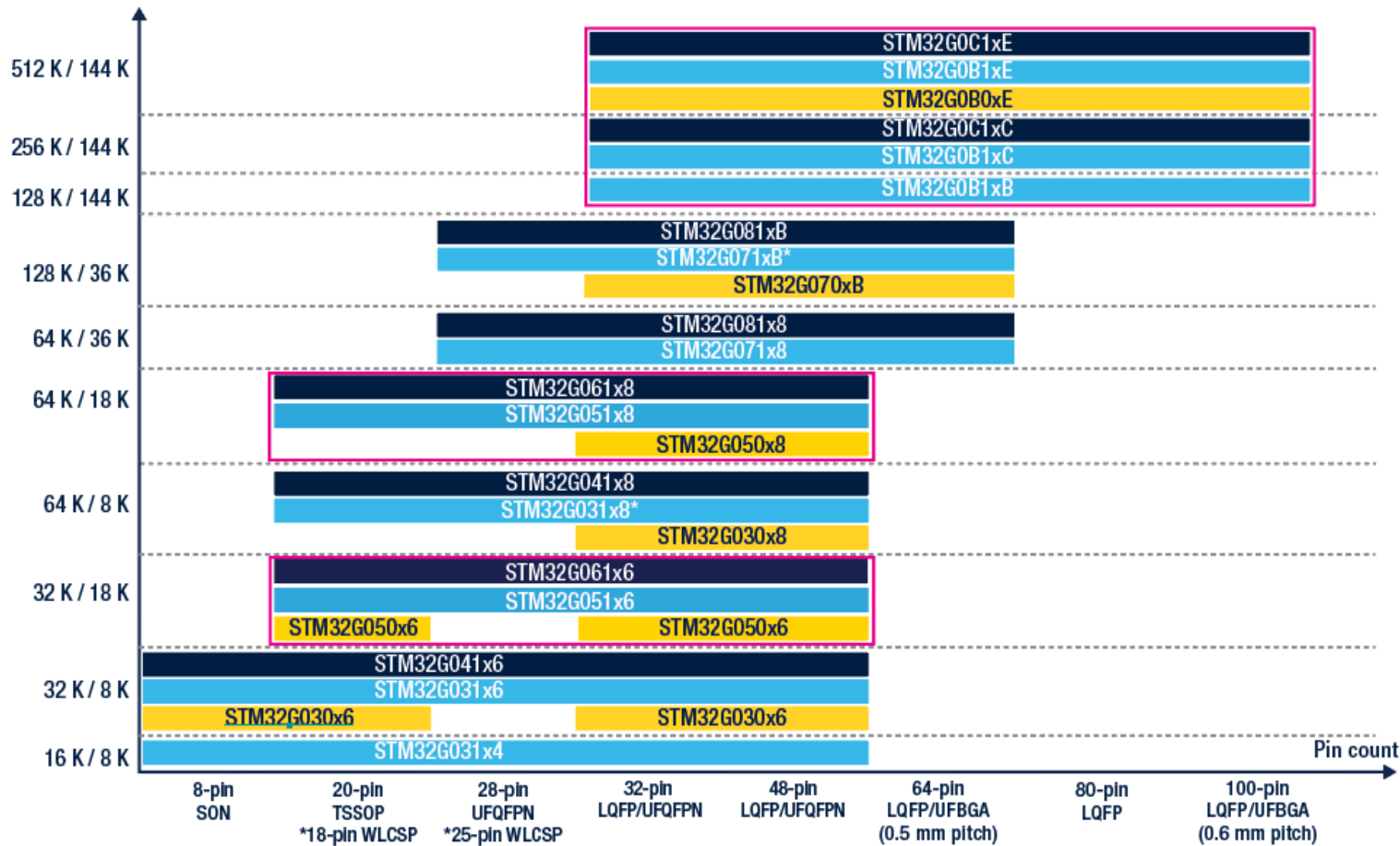
More memory and pin counts





STM32G0 portfolio

Flash memory size / RAM size (bytes)



Legend :

- STM32G0x1 Access line With 128-/256-bit AES Hardware Encryption
- STM32G0x1 Access line Without 128-/256-bit AES Hardware Encryption
- STM32G0x0 Value line
- New product introduction





Advanced features and solutions

- 32-bit Arm® Cortex®-M0+ core
- 1.7 to 3.6V power supply
- RAM maximization
- 1% internal clock
- Direct Memory Access (DMA)
- Communication peripherals
- FDCAN peripherals
- USB-C Power Delivery
- USB FS 2.0 Device (crystal-less) and Host

System	Arm® Cortex®-M0+ CPU	Connectivity
Power supply POR/PDR/PVD/BOR	Up to 64 MHz	3x SPI (I²S)
Xtal oscillator 32 kHz + 4 to 48 MHz	Nested vector interrupt Controller (NVIC)	6x USART (3x with LIN, smartcard, IrDA, modem control)
Internal RC oscillators 32 kHz (±5%) + 16 MHz (±1%)	SW debug	2x LPUART
Internal RC oscillator 48 MHz (auto trimming on ext. synchro)	Memory Protection Unit	3x I²C Fast Mode Plus (2x SMBus, PMBus)
PLL + Prescaler	AHB-Lite bus matrix	2x FDCAN
Clock control	APB bus	USB FS 2.0 Device (crystal less) Host
RTC/AWU	Up to 512-Kbyte Flash memory	USB Power Delivery (incl. BMC + PHY)
Systick timer	Up to 144-Kbyte SRAM	
2x watchdogs (independent and window)	Boot ROM	
94 I/Os on 100 pins	12-channel DMA	
Cyclic redundancy check (CRC)		
Encryption	Analog	Control
AES (256-bit)	Temp. sensor	1x 32-bit timer
True RNG	1x 12-bit ADC SAR 16-channels / 2.5 MSPS	1x 16-bit Motor C. timer $f_{MAX} = 128$ MHz 4 PWM + 3 compl.
	1x 12-bit DAC 2ch	6x 16-bit timers one with $f_{MAX} = 128$ MHz
	3x comparators	2x Low-power timers

- Timers up to 2xfcpu resolution
- Real-time Clock
- I/O ports maximization
- 12-bit Ultra-fast ADC
- 12-bit DAC
- Comparators
- Safety features
- Advanced Security features

- | System | | Analog |
|--|--|--|
| Power supply
POR/PDR | Arm® Cortex®-M0+ CPU
Up to 64 MHz | Temp. sensor |
| Xtal oscillator
32 kHz + 4 to 48 MHz | Nested vector interrupt
Controller (NVIC) | 1x 12-bit ADC SAR
16-channels / 2.5 MSPS |
| Internal RC oscillators
32 kHz + 16 MHz | SW debug | Connectivity |
| PLL + Prescaler | Memory Protection Unit | 3x SPI (I²S) |
| Clock control | AHB-Lite bus matrix | 6x USART
(3x with LIN, smartcard,
IrDA, modem control) |
| RTC/AWU | APB bus | 3x I²C
Fast Mode Plus
(2x SMBus, PMBus) |
| Systick timer | Up to 512-Kbyte
Flash memory | USB FS 2.0
Device / Host |
| 2x watchdogs
(independent and window) | Up to 144-Kbyte SRAM | Control |
| 93 I/Os on 100 pins | 20-byte backup registers | 1x 16-bit Motor C. timer
4 PWM + 3 compl. |
| Cyclic redundancy check
(CRC) | Boot ROM | 6x 16-bit timers |
| | 12-channel DMA | |

- 

Integrated security features, ready for tomorrow's needs

Firmware IP protection

Mutual distrustful

Secret key storage

Authentication

Secure firmware upgrade

STM32G0

Securable Memory Area
Execute-only Protection
Read-out Protection
Write Protection
Memory Protection Unit (MPU)
AES-256 / SHA-256 Encryption
True Random Number Generator
Unique ID

User Flash

**Securable
Memory Area**



Standard user flash by default

Can be secured once exiting
No more access nor debug

Configurable size

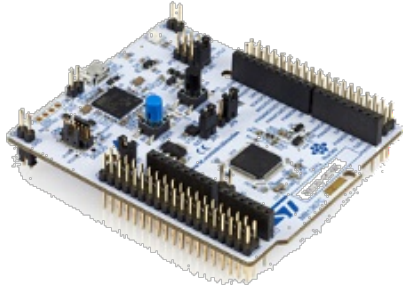
Good fit to store critical data

- Critical routines
- Keys

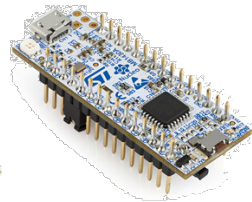


STM32G0 hardware solutions

Jump-start your evaluation, prototype, and design



64-pin



32-pin*

*** \$10.32**

STM32 Nucleo

Flexible prototyping

- [NUCLEO-G031K8*](#)
- [NUCLEO-G070RB](#)
- [NUCLEO-G071RB](#)
- [NUCLEO-G0B1RE](#)



*** Starting
at \$304**

Evaluation boards

Full feature STM32G0 evaluation

- [STM32G081B-EVAL](#)
- [STM32G0C1E-EV](#)

** Recommended Resale Price (RRP)*



*** Starting
at \$9.90**

Discovery kits

Key feature prototyping

- [STM32G0316-DISCO](#)
- [STM32G071B-DISCO*](#)

*(USB-PD Analyser)



STM32G0 software tools

Tools and software supporting you during all your design steps

Evaluation,
prototyping
and selection

Hardware and
software
configuration

Application development and debug

Code and hardware
options
programming

Run-time
application
monitoring



STM32
Finder

STM32
evaluation
Tools



STM32
CubeMX



STM32
Cube MCU Packages



STM32
Cube Expansion
&
Verticals and
partner solutions



STM32
Cube IDE
&
Partner IDEs



STM32
Cube Programmer
&
Programmers from partners

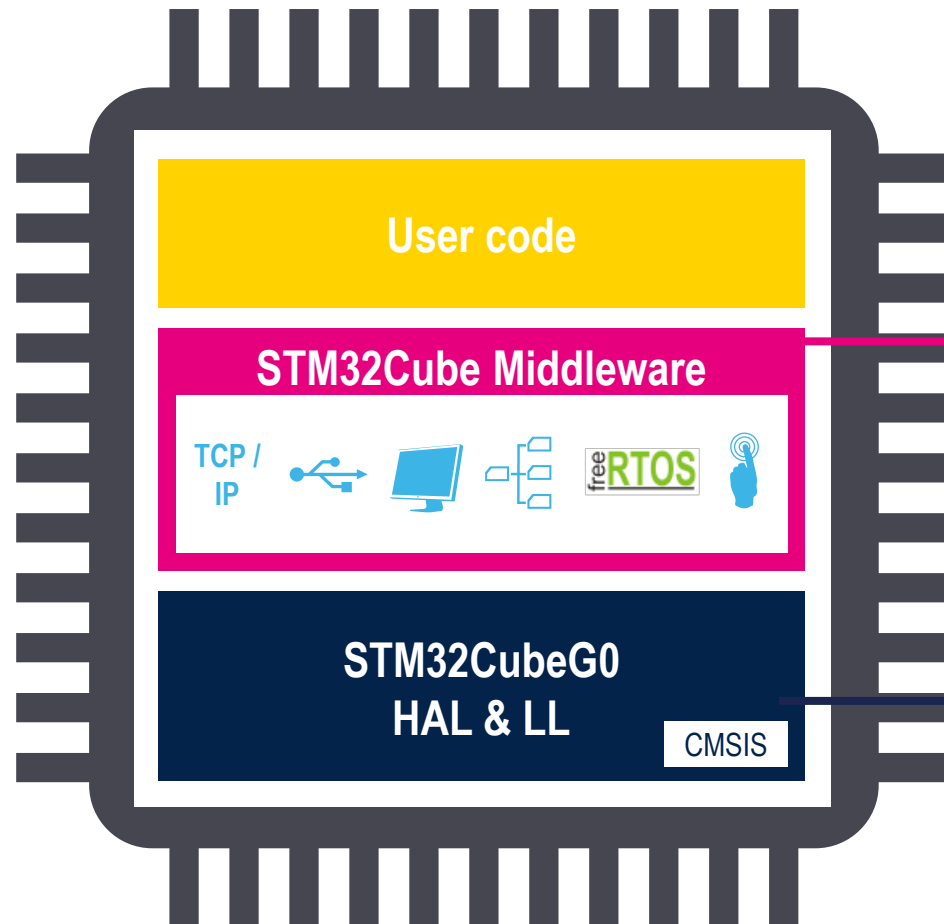


STM32
Cube Monitor

Worldwide support channels

STM32G0 ecosystem

Platform approach or custom code: you choose



EMBEDDED SOFTWARE

- Open-source TCP/IP stack (lwIP)
- USB Host and Device library from ST
- STemWin graphical stack library from ST and SEGGER
- Open-source FAT file system (FatFs)
- Open-source real-time OS (FreeRTOS)
- Dozens of examples

- STM32G0 Hardware Abstraction Layer (HAL) portable APIs
- **High-performance, light-weight low-layer (LL) APIs**
- High coverage for most STM32 peripherals
- Production-ready and fully qualified
- Dozens of usage examples
- Open-source BSD license



Releasing your creativity



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Our technology starts with You



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