



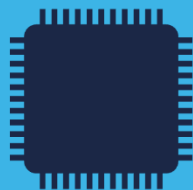
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STM32C0 MCU series

Entry level 32-bit MCU
for cost-sensitive applications



Your next 8-bit MCU is a 32-bit



It's called STM32C0!



Introducing the STM32C0

ST's most affordable 32-bit MCU

Streamline costs without comprising performance



Affordability

Helps you reduce costs thanks to an attractive price point and an optimized BOM



Reliability

Benefits from proven STM32 quality & reliability



Continuity

Consistent pinout with STM32G0
Shares same technological platform



STM32 MCU and MPU portfolio



 MPU

STM32MP1
4158 CoreMark
Up to 800 MHz Cortex-A7
209 MHz Cortex-M4

 High Perf MCUs

STM32F2 Up to 398 CoreMark 120 MHz Cortex-M3	STM32F4 Up to 608 CoreMark 180 MHz Cortex-M4	STM32F7 1082 CoreMark 216 MHz Cortex-M7	STM32H7 Up to 3224 CoreMark Up to 550 MHz Cortex -M7 240 MHz Cortex -M4
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 Mainstream MCUs

STM32F3 245 CoreMark 72 MHz Cortex-M4		STM32G4 569 CoreMark 170 MHz Cortex-M4		<i>Mixed-signal MCUs</i>	
STM32C0 114 CoreMark 48MHz Cortex M0+	STM32F0 106 CoreMark 48 MHz Cortex-M0	STM32G0 142 CoreMark 64 MHz Cortex-M0+	STM32F1 177 CoreMark 72 MHz Cortex-M3		

 Ultra-low Power MCUs

STM32L0 75 CoreMark 32 MHz Cortex-M0+	STM32L1 93 CoreMark 32 MHz Cortex-M3	STM32L4 273 CoreMark 80 MHz Cortex-M4	STM32L4+ 409 CoreMark 120 MHz Cortex-M4	STM32L5 443 CoreMark 110 MHz Cortex-M33	STM32U5 651 CoreMark 160 MHz Cortex-M33
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 Wireless MCUs

STM32WL 162 CoreMark 48 MHz Cortex-M4 48 MHz Cortex-M0+	STM32WB 216 CoreMark 64 MHz Cortex-M4 32 MHz Cortex-M0+ 
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 Latest product generation

 Radio coprocessor only

More than 60,000 customers
Over 10 billion STM32 shipped since 2007

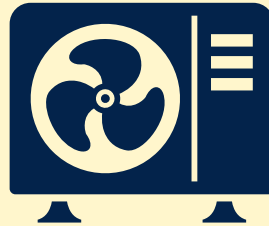
Perfect fit for applications typically served by 8-bit/16-bit MCUs

Smart homes



Fridges
Ovens
Coffee machines

Industrial devices

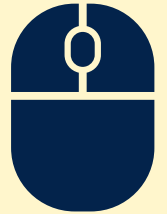


Industrial pumps
Fan control
Circuit breakers

Consumer devices



Smoke detectors
Fire detectors
Alarms



PC peripherals
& accessories

Affordability

Attractive price point

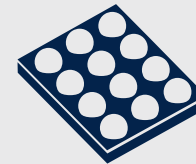
Most cost-effective STM32 MCU



Compact

9 tiny packages down to:

- 3 x 3 mm 20-pin QFN
- WLCSP12
- 8-pin SO8N



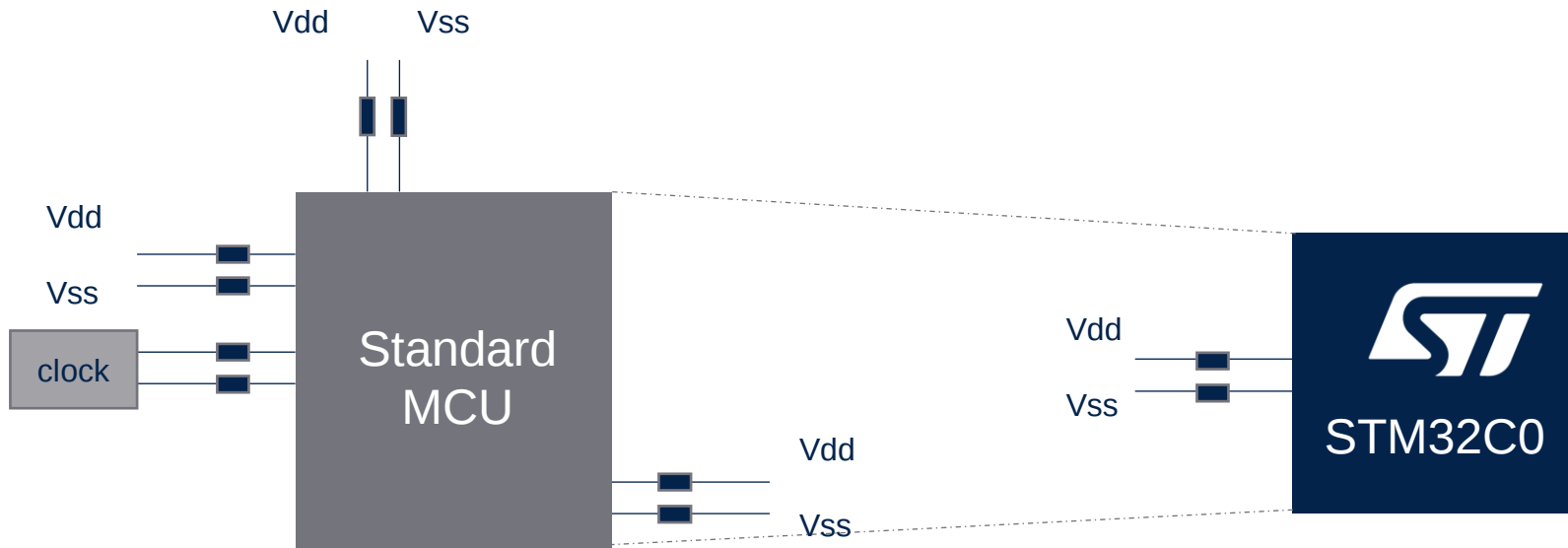
Reduced BOM costs

- Smallest package: max I/O count
- Fewer surrounding components:
 - accurate internal high-speed clock 1% RC
 - only one power supply pair



Optimized BOM cost

The STM32C0 series lets designers do more with less



- Smaller package: **fewer surrounding components**
- Platform optimized with **1 power supply pair only**
- Embedded **high-speed clock with high accuracy**

Compact Multiple packages



Easy handling

SO8N
TSSOP-20
LQFP32/ 48



Low thickness and tiny

20-pin UFQFPN 3 x 3 mm
28/32/48-pin UFQFPN



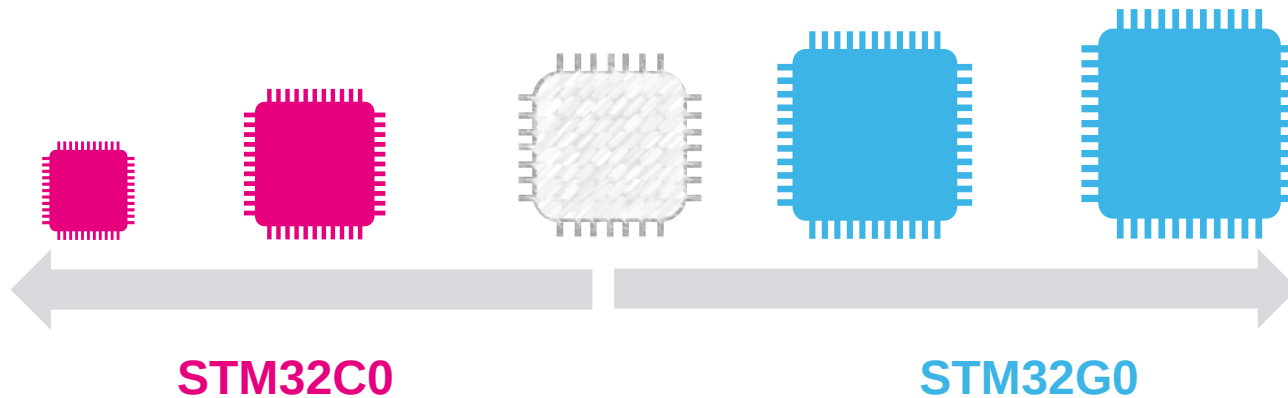
Lowest thickness, tiniest form factor

WLCSP12
1.70 x 1.42 mm

**9
packages**

The STM32 Continuum

The STM32C0 series uses the same 90nm technology as the STM32G0, ensuring high quality standards



- Arm® Cortex® -M0+ running at 48MHz
- Delivers 44DMIPS instruction throughput with 114CoreMark performance
- Continuum with STM32G0 series
 - Consistent pinout
 - Same IP platform
 - Same technology platform

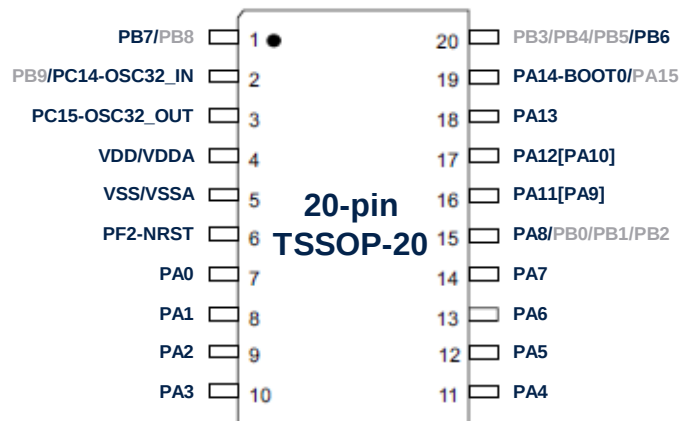
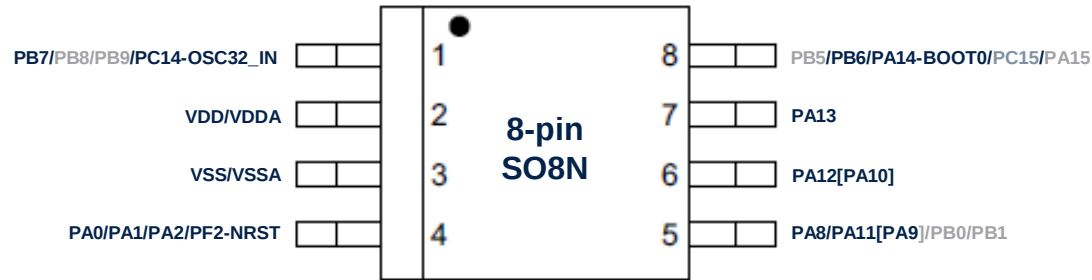


Safe in deliveries: 10-year longevity program
Renewed commitment every year



Easy porting with STM32G0

Consistent pinout with STM32G0 leaves room for future product upgrades



Consistent I/O footprint

Common pin location
for alternate functions & system

Maximum I/O ratio vs pin count

Common signals on STM32C011 and STM32G031

Legend: common signals - STM32G031 only - STM32C011 only

Low-power modes for better efficiency

Excellent dynamic consumption

Wake-up time

385 μ s

SHUTDOWN

20 nA

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

23 μ s

STANDBY

8 μ A

Wake-up sources: + BOR, IWDG

2.7 μ s

STOP

80 μ A

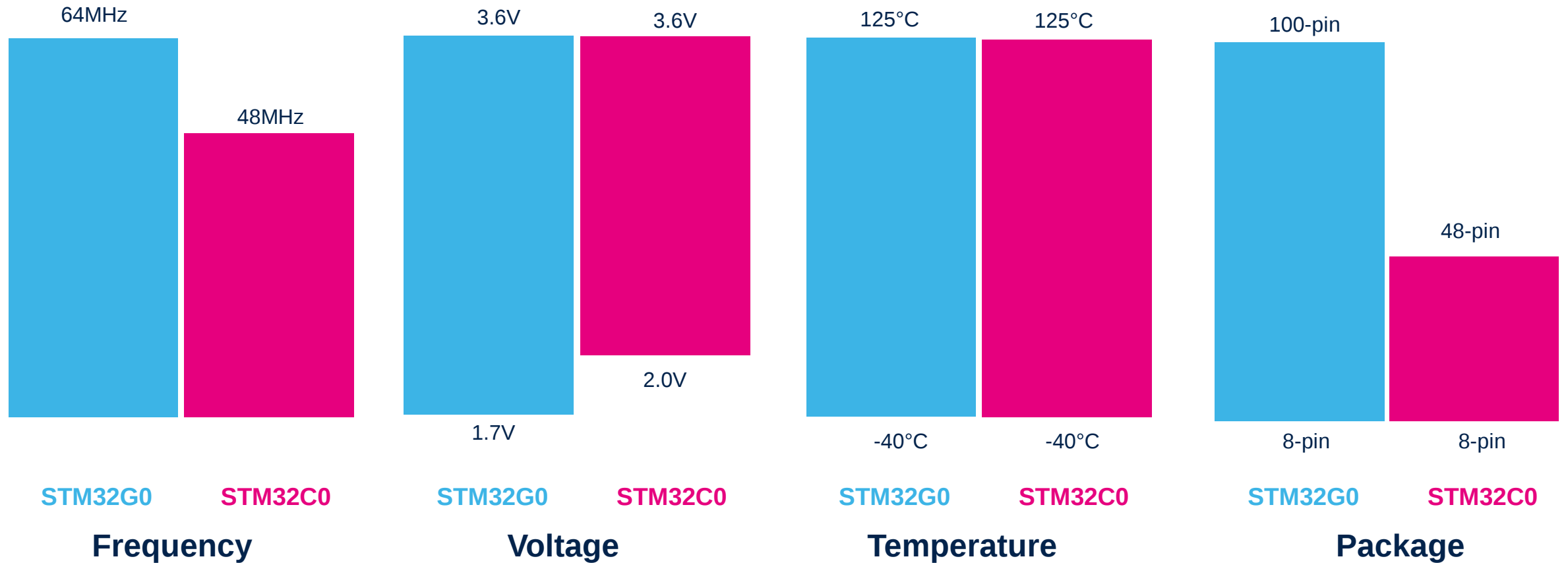
Wake-up sources:
+ RTC, all I/Os, I²C, UART

RUN at 48 MHz

80 μ A / MHz

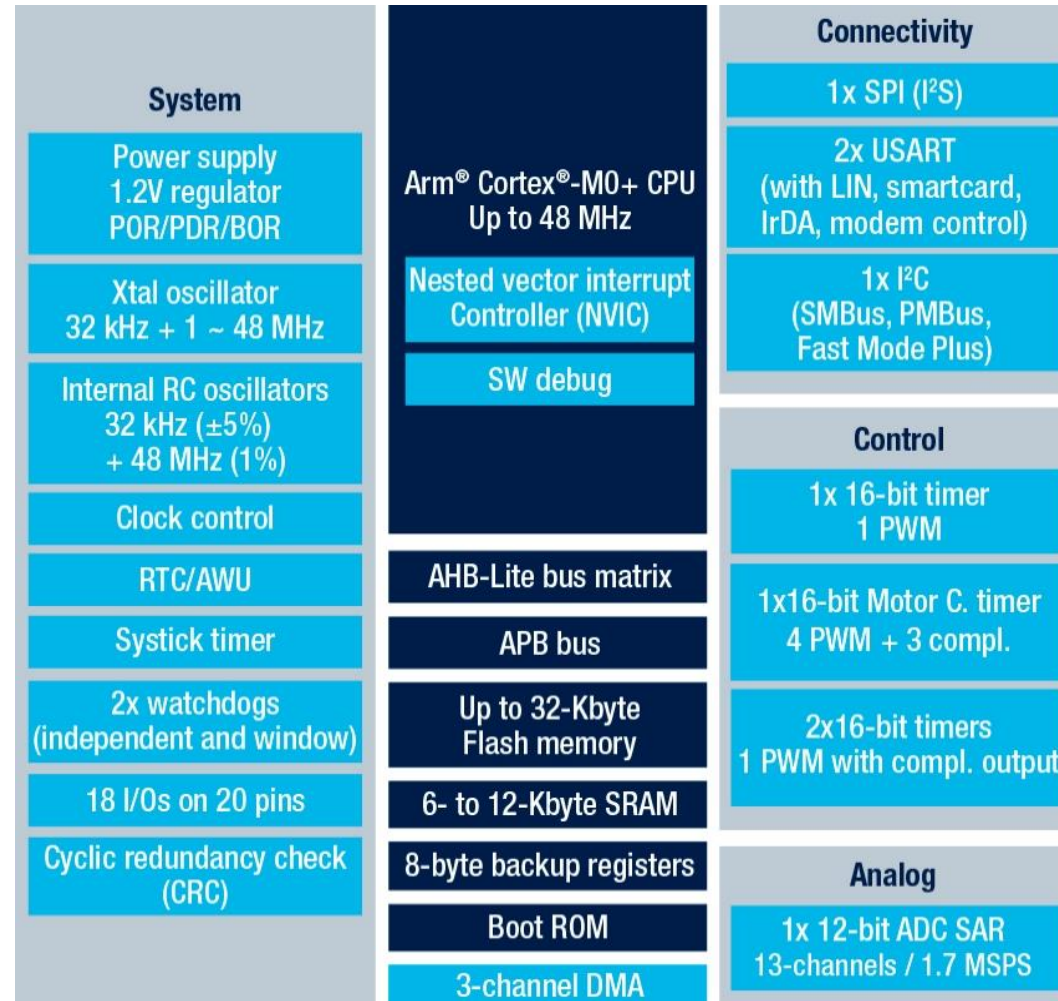
Conditions: 25°C, $V_{DD} = 3V$

Performance benchmark STM32C0 & STM32G0



STM32C011 / C031 block diagram

- 32-bit Arm® Cortex® -M0+ core
- 2 to 3.6V power supply
- I/O ports maximization
- One supply pair
- 1% internal clock
- All clock sources
 - Low speed 32 kHz
 - High speed
 - Internal / external
- Direct memory access (DMA)

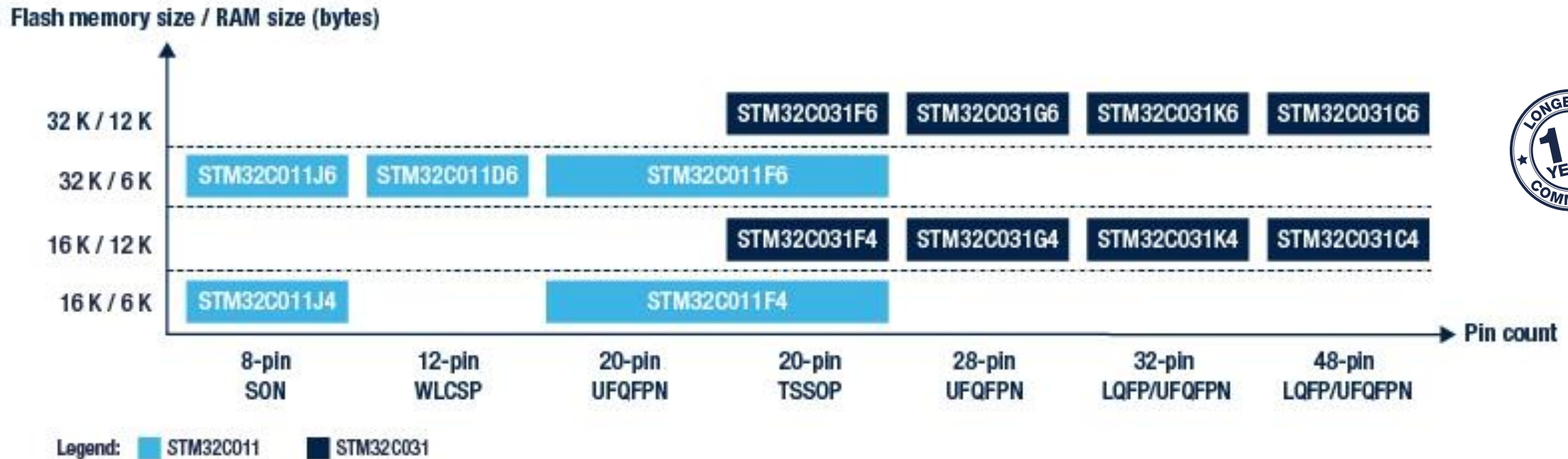


- Timers 16-bit with Motor Control feature
- Communication peripherals incl.
 - 2 x USART
- Real-time clock
- 12-bit ultra-fast ADC
- Safety features
- Excellent dynamic consumption 80µA/MHz
- SRAM size:
 - STM32C011: 6 Kbytes
 - STM32C031: 12 Kbytes



STM32C0 portfolio

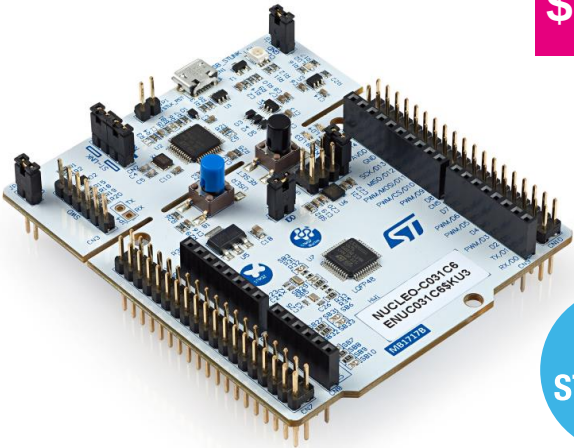
Same feature-set, different RAM size and packages



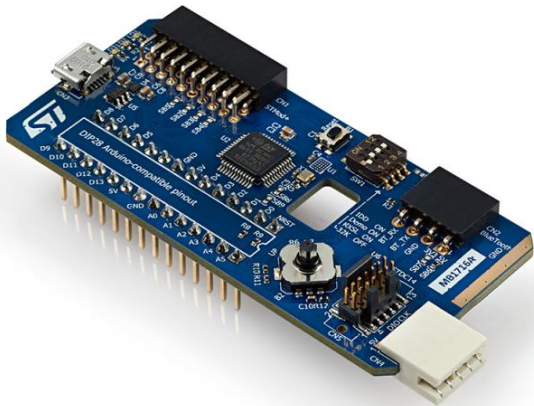


Development tools for the STM32C0 series

Speed-up evaluation, prototyping, and design



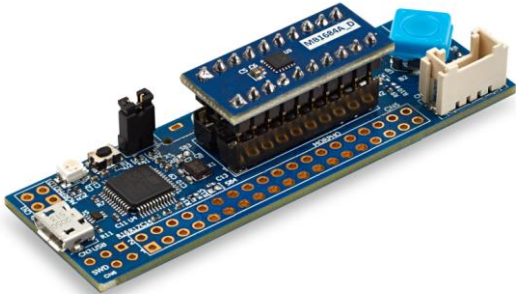
\$10.32



\$17



\$11



STM32 Nucleo with C031

Prototyping QFP48
NUCLEO-C031C6

Discovery kit for C031

Mini evaluation board
Full voltage range 2.0 ~ 3.6 V
Standalone, fast STLINK-V3MINIE

STM32C0316-DK

Discovery kit for C011

Ready to use wired sample
Daughter board QFN20/DIP20
STM32C0116-DK

Recommended resell price (RRP)

Leveraging STM32Cube software suite

Software tools



Embedded software



Complemented with
Microsoft Azure RTOS

STM32
CubeMX

Configuration

STM32
CubeIDE

Development

STM32
CubeProgrammer

Programming

STM32
CubeMonitor

Monitor



STM32
CubeMCU Packages

Packages



User application

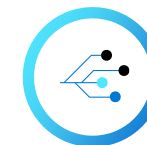
Middleware

Drivers

Expansions

STM32
CubeExpansion

Azure RTOS



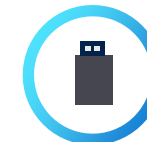
Azure RTOS ThreadX
Real-time operating system



Azure RTOS FileX
FAT file system, fault tolerant



Azure RTOS NetX/NetX Duo
TCP/IP stacks

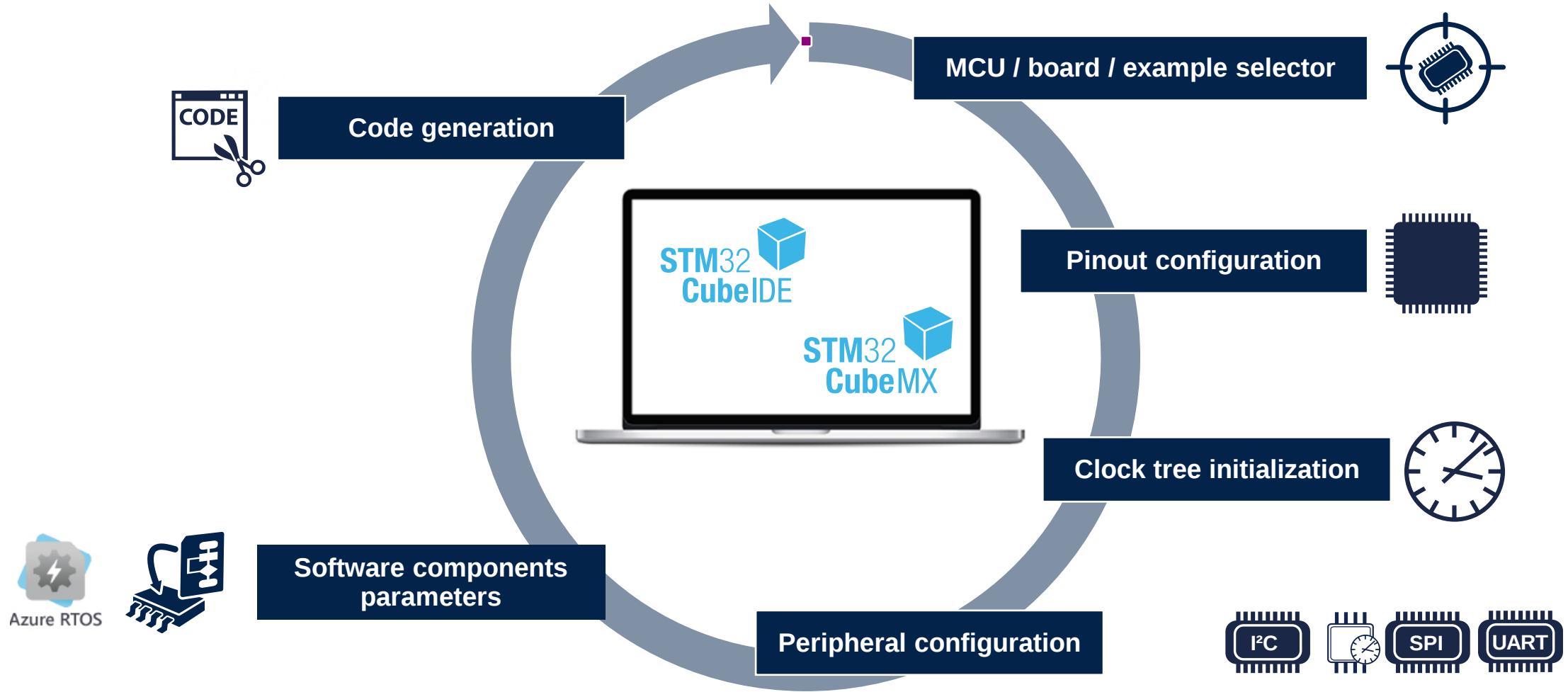


Azure RTOS USBX
USB stack, host, and device

Free-of-charge production license



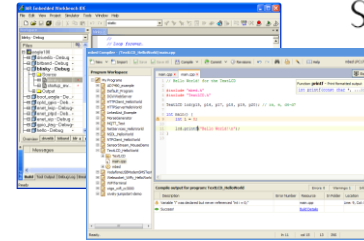
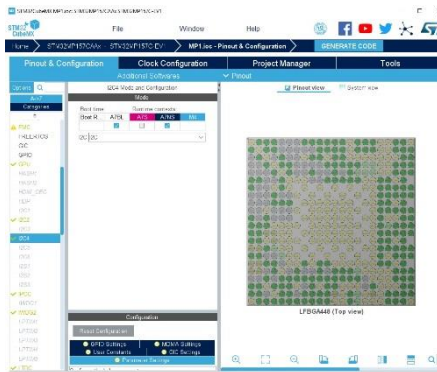
STM32Cube configuration tool





Software tools for STM32C0

Complete support of Arm® Cortex®-M0+ architecture



STM32CubeMX

**Graphical tool
for easy configuration**

- Configure and generate code
- Peripherals and middleware configuration

IDEs Compile and debug

**Simple,
powerful solutions**

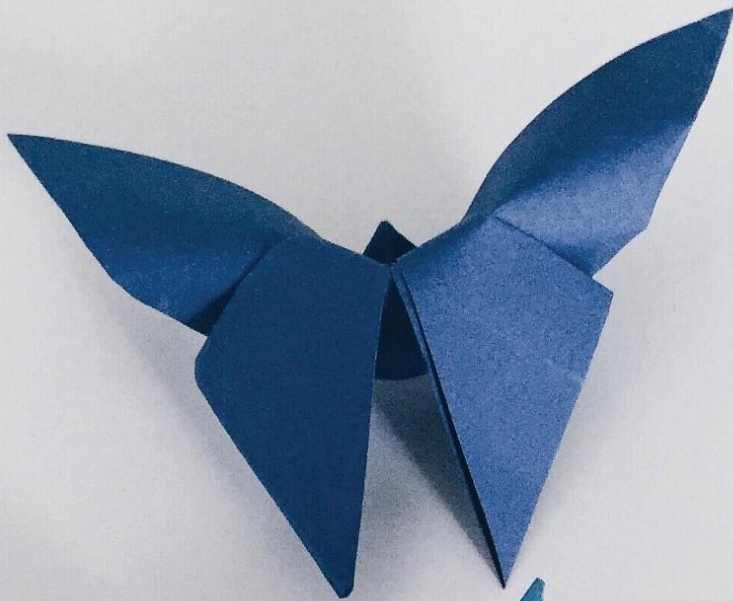
- Partners IDE (Arm® Keil®) **FREE**
- IDE based on Eclipse **FREE**
- RTOS aware debug

STM32 programming & monitoring tools

**STM32CubeProg
STM32CubeMonitor**

- Device and memory configuration
- Program the application
- Monitor variables at runtime

Releasing your creativity



[/STM32](#)



[@ST_World](#)



[community.st.com](#)



[www.st.com/STM32C0](#)



[wiki.st.com/stm32mcu](#)



[github.com/stm32-hotspot](#)



[www.st.com/stm32-mcu-developer-zone](#)



Our technology starts with You

Find out more at www.st.com/STM32C0

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