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STM32C0 MCU series

Entry level 32-bit MCU for cost-sensitive applications

STM32

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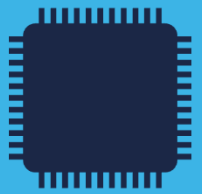
Your next 8-bit MCU is a 32-bit



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

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STM32 MCU and MPU portfolio

MPU

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

LONGEVITY 10 YEARS COMMITMENT

High Perf MCUs

STM32**F2**	STM32**F4**	STM32**F7**	STM32**H7**
Up to 398 CoreMark	Up to 608 CoreMark	1082 CoreMark	Up to 3224 CoreMark
120 MHz Cortex-M3	180 MHz Cortex-M4	216 MHz Cortex-M7	Up to 550 MHz Cortex -M7
			240 MHz Cortex -M4

Mainstream MCUs

STM32**F3**	STM32**G4**
245 CoreMark	569 CoreMark
72 MHz Cortex-M4	170 MHz Cortex-M4

Mixed-signal MCUs

STM32**C0**	STM32**F0**	STM32**G0**	STM32**F1**
114 CoreMark	106 CoreMark	142 CoreMark	177 CoreMark
48MHz Cortex M0+	48 MHz Cortex-M0	64 MHz Cortex-M0+	72 MHz Cortex-M3

Ultra-low Power MCUs

STM32**L0**	STM32**L1**	STM32**L4**	STM32**L4+**	STM32**L5**	STM32**U5**
75 CoreMark	93 CoreMark	273 CoreMark	409 CoreMark	443 CoreMark	651 CoreMark
32 MHz Cortex-M0+	32 MHz Cortex-M3	80 MHz Cortex-M4	120 MHz Cortex-M4	110 MHz Cortex-M33	160 MHz Cortex-M33

Wireless MCUs

STM32**WL**	STM32**WB**
162 CoreMark	216 CoreMark
48 MHz Cortex-M4	64 MHz Cortex-M4
48 MHz Cortex-M0+	32 MHz Cortex-M0+ ●

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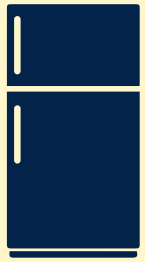
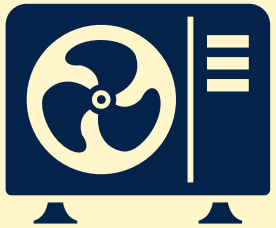
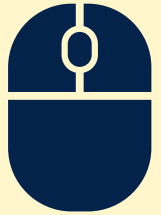
Latest product generation

● 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	Industrial devices	Consumer devices	
			
Fridges Ovens Coffee machines	Industrial pumps Fan control Circuit breakers	Smoke detectors Fire detectors Alarms	PC peripherals & accessories

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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

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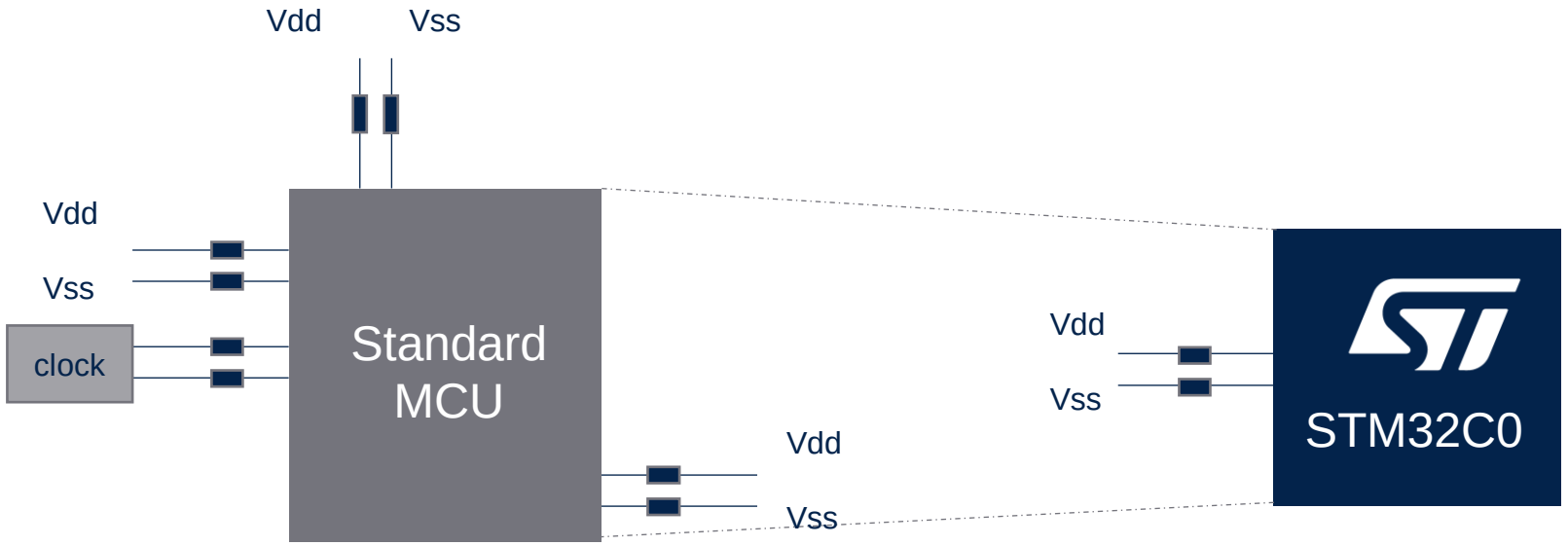
Optimized BOM cost

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**

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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

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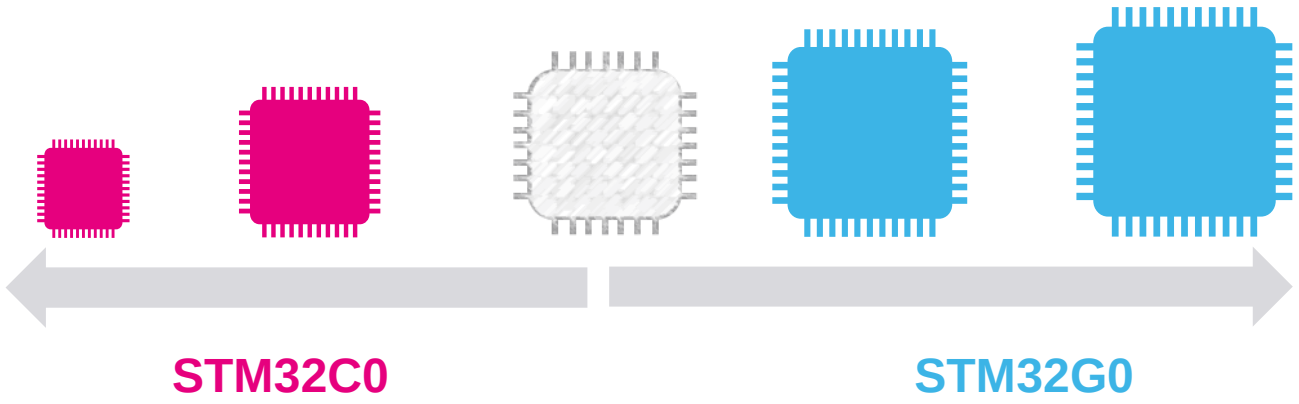
The STM32 Continuum

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

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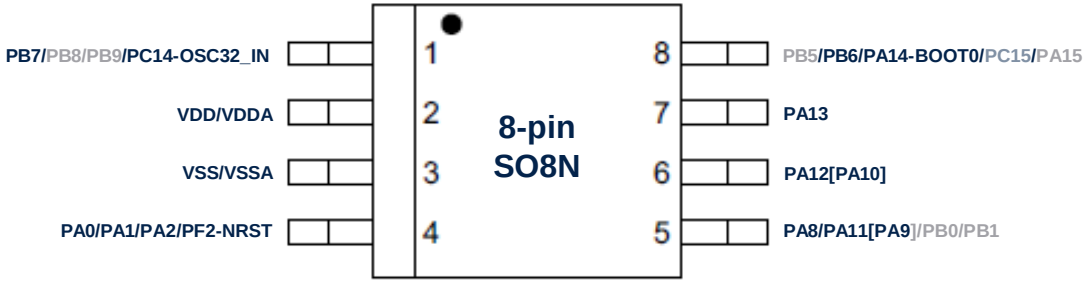
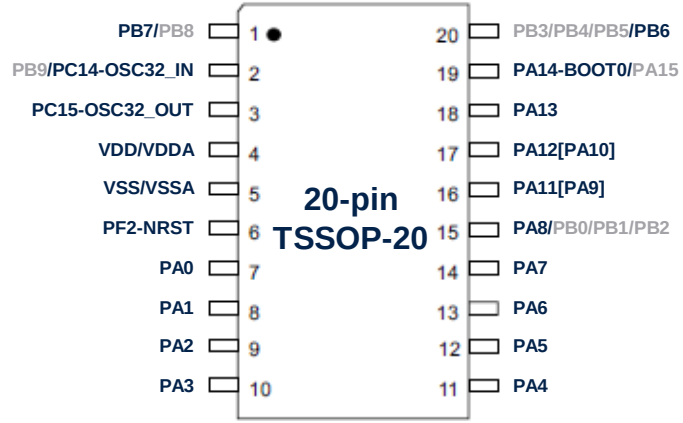
Easy porting with STM32G0

Consistent pinout with STM32G0 leaves room for future product upgrades





Consistent I/O footprint

Common pin location
for alternate functions & system

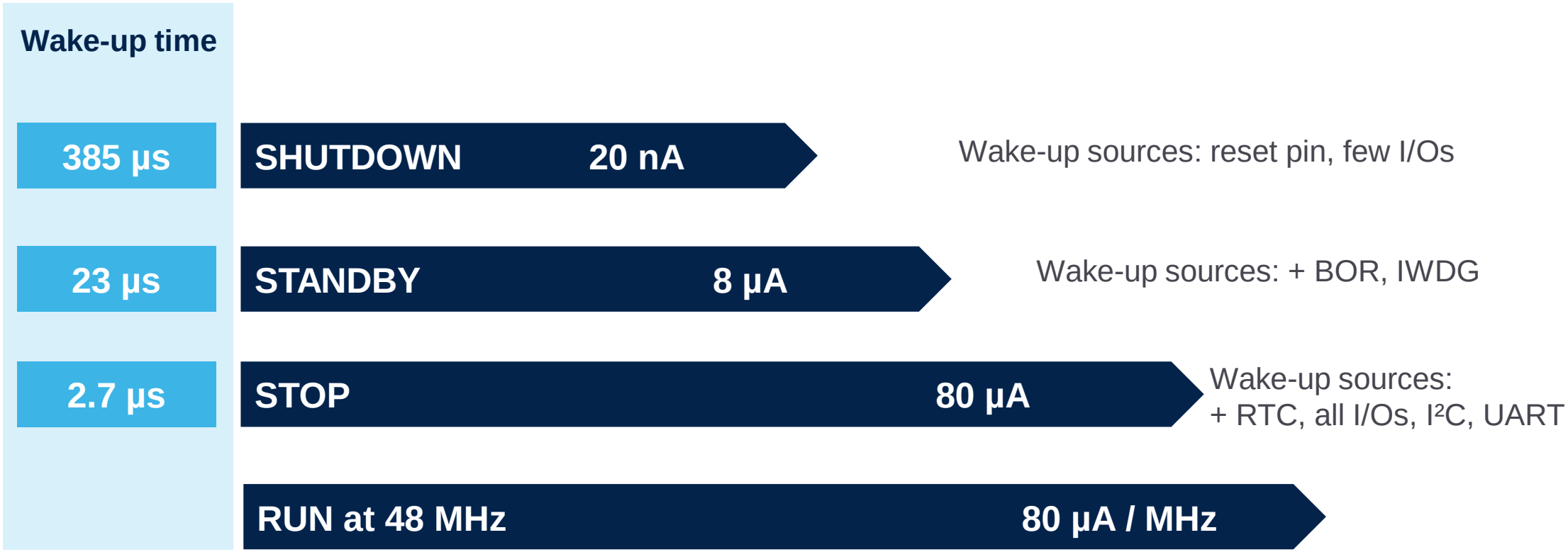
Maximum I/O ratio vs pin count

Common signals on STM32C011 and STM32G031

Legend: common signals - STM32G031 only - STM32C011 only

Low-power modes for better efficiency

Excellent dynamic consumption



Conditions: 25°C, V_{DD} = 3V

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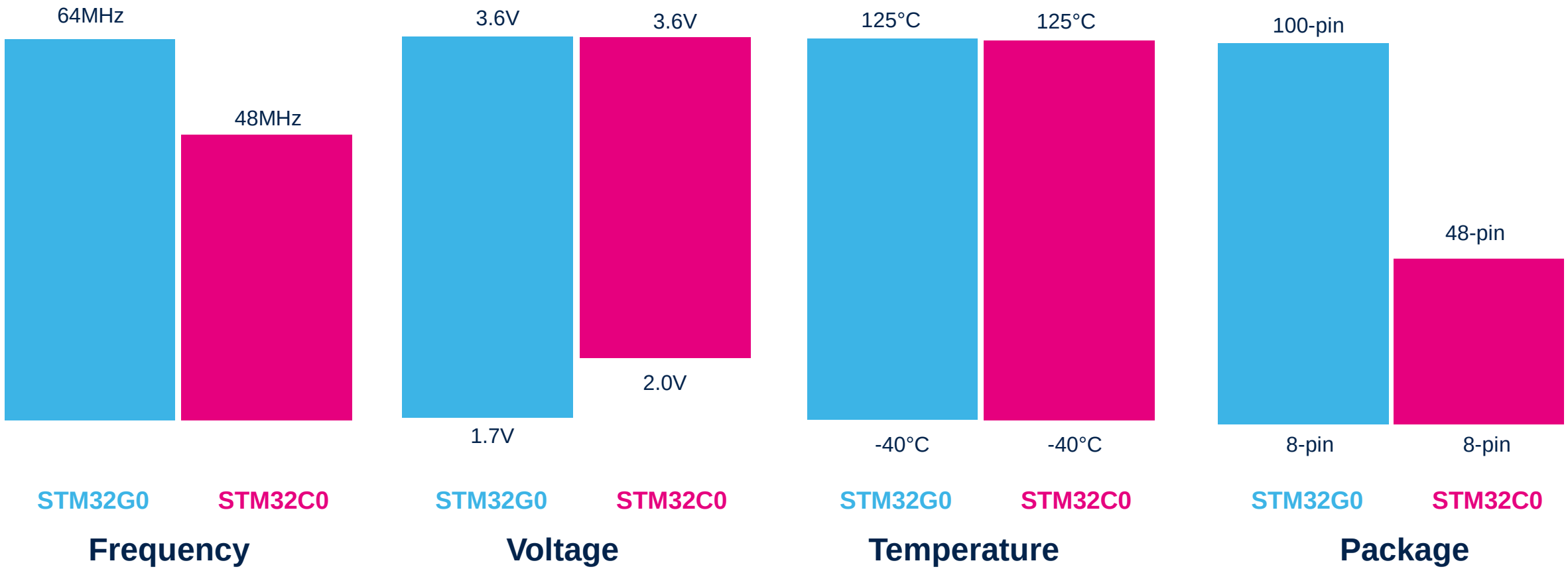
Performance benchmark STM32C0 & STM32G0



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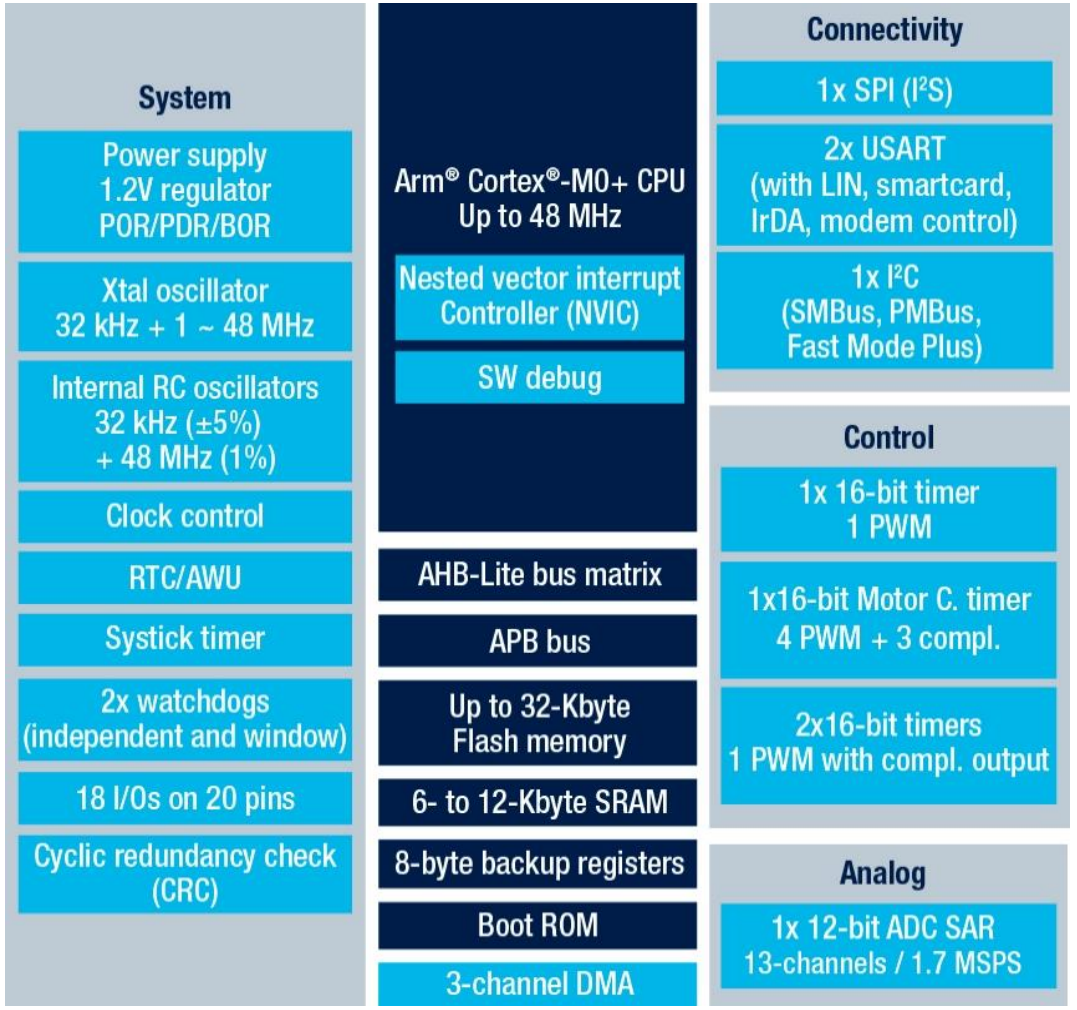
STM32C011 / C031 block diagram

- 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

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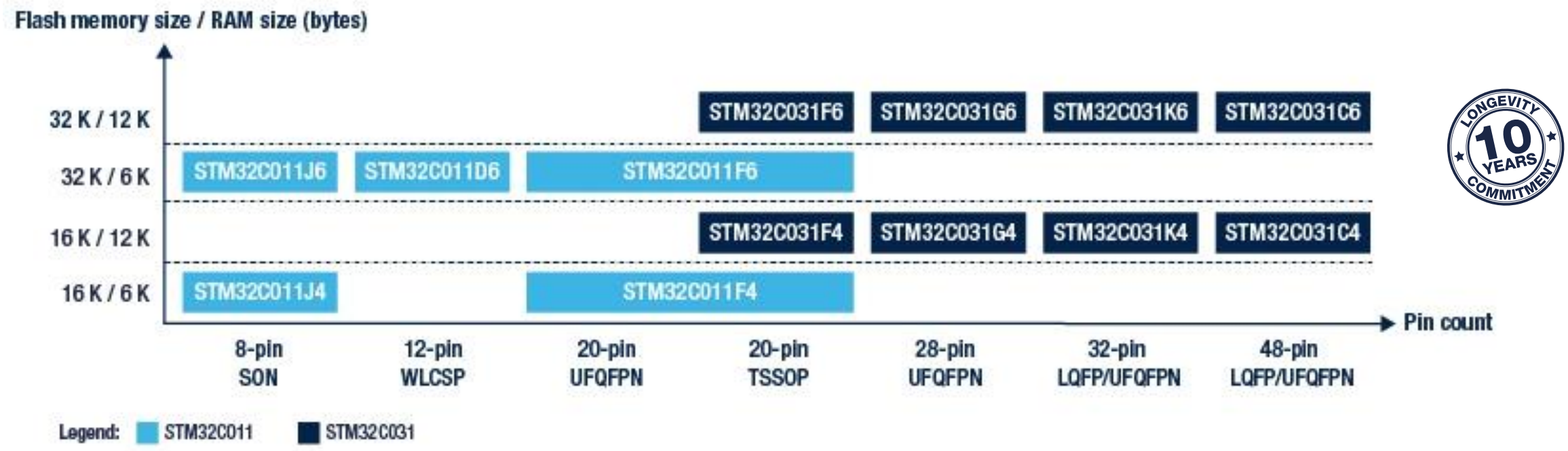
STM32C0 portfolio

Same feature-set, different RAM size and packages



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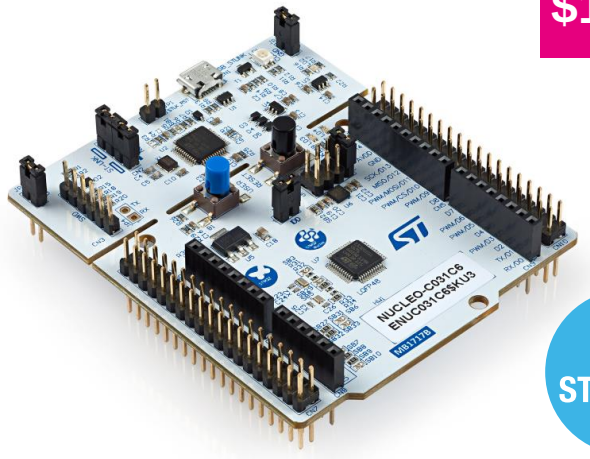
Development tools for the STM32C0 series

Speed-up evaluation, prototyping, and design

$10.32



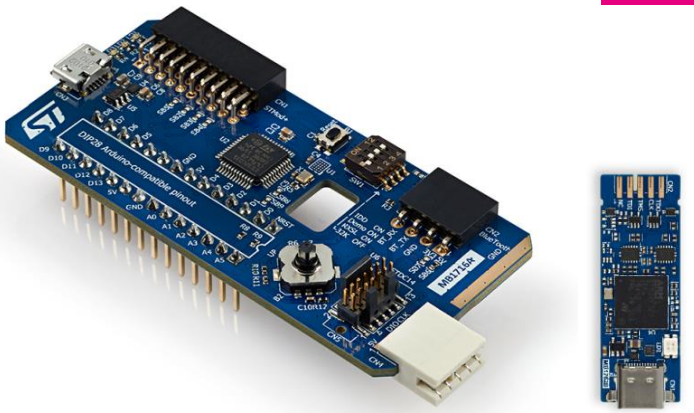
STM32 Nucleo

STM32 Nucleo with C031

Prototyping QFP48

NUCLEO-C031C6

$17

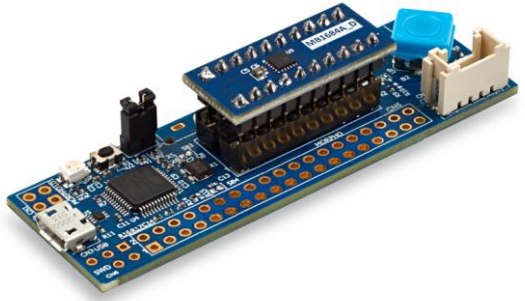


Discovery kit for C031

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

STM32C0316-DK

$11



Discovery kit for C011

Ready to use wired sample
Daughter board QFN20/DIP20

STM32C0116-DK

Recommended resell price (RRP)

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Leveraging STM32Cube software suite

Software tools

Embedded software

Complemented with Microsoft Azure RTOS

STM32 CubeMX
Configuration

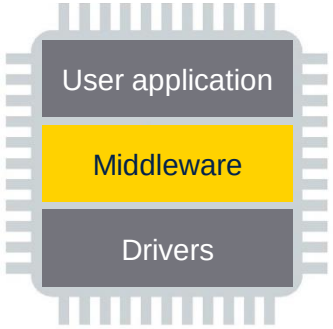
STM32 CubeIDE
Development

STM32 CubeProgrammer
Programming

STM32 CubeMonitor
Monitor

STM32 CubeMCU Packages
Packages

Github



Expansions

STM32 CubeExpansion

Azure RTOS

Azure RTOS ThreadX
Real-time operating system

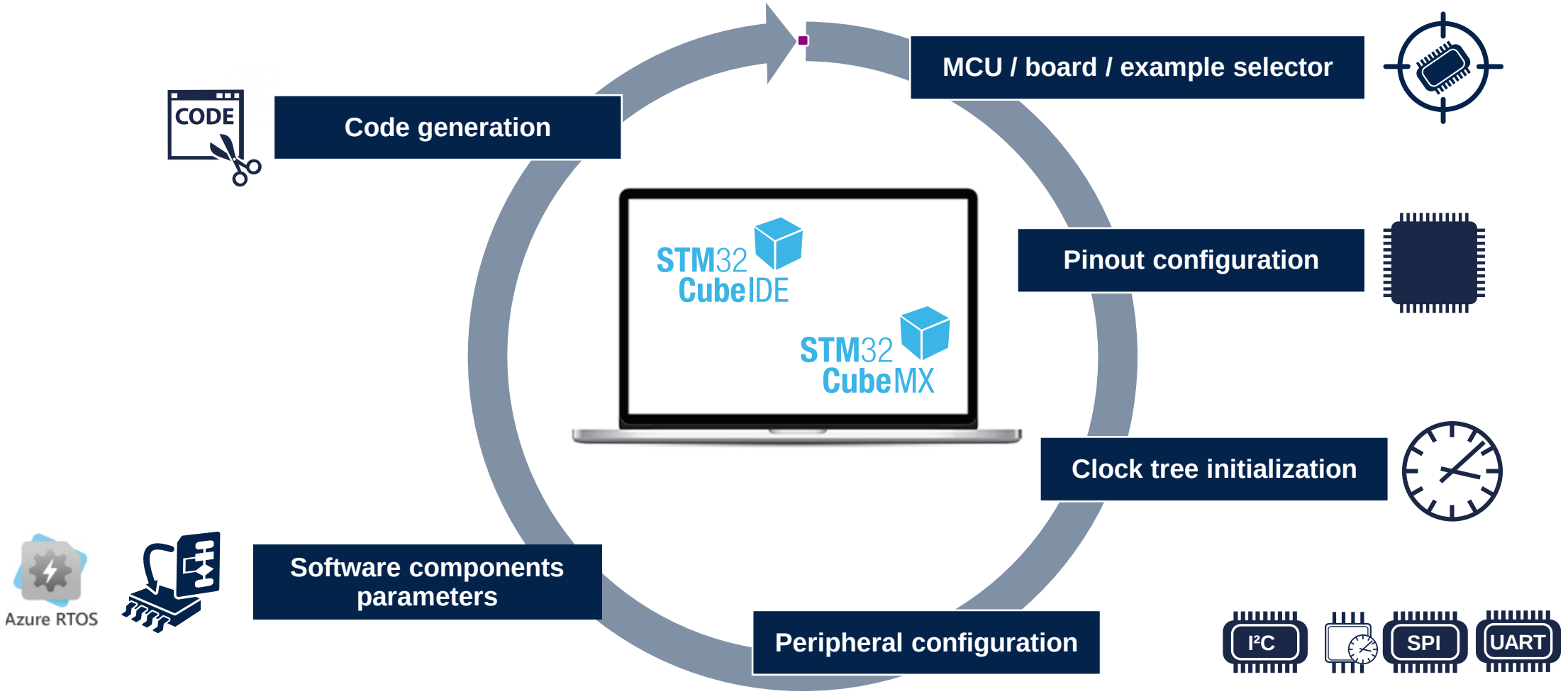
Azure RTOS FileX
FAT file system, fault tolerant

Azure RTOS NetX/NetX Duo
TCP/IP stacks

Azure RTOS USBX
USB stack, host, and device

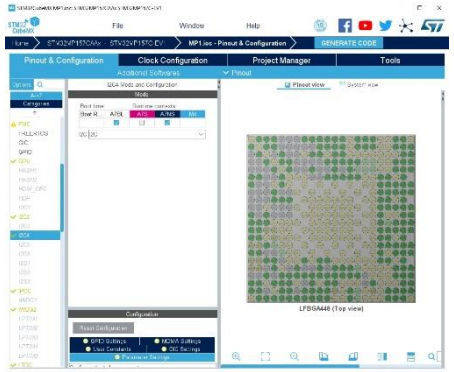
Free-of-charge production license

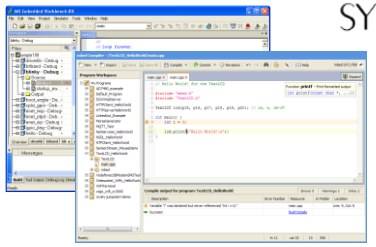
STM32Cube configuration tool



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

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community.st.com

www.st.com/STM32C0

wiki.st.com/stm32mcu

github.com/stm32-hotspot

www.st.com/stm32-mcu-developer-zone

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Our technology starts with You

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