STM8L and STM32 L1 series

Ultra-low-power platform

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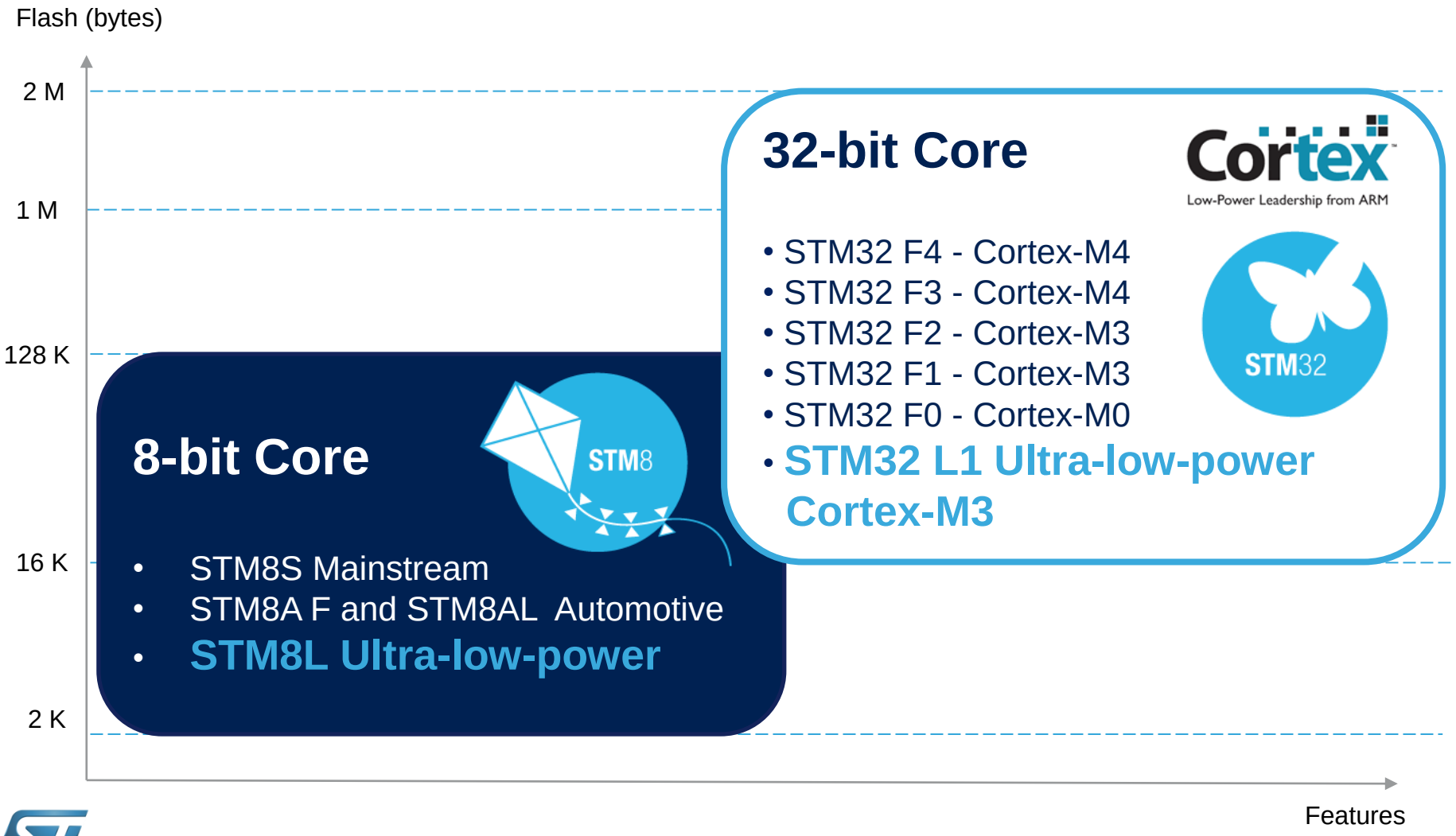
8-bit and 32-bit MCU families



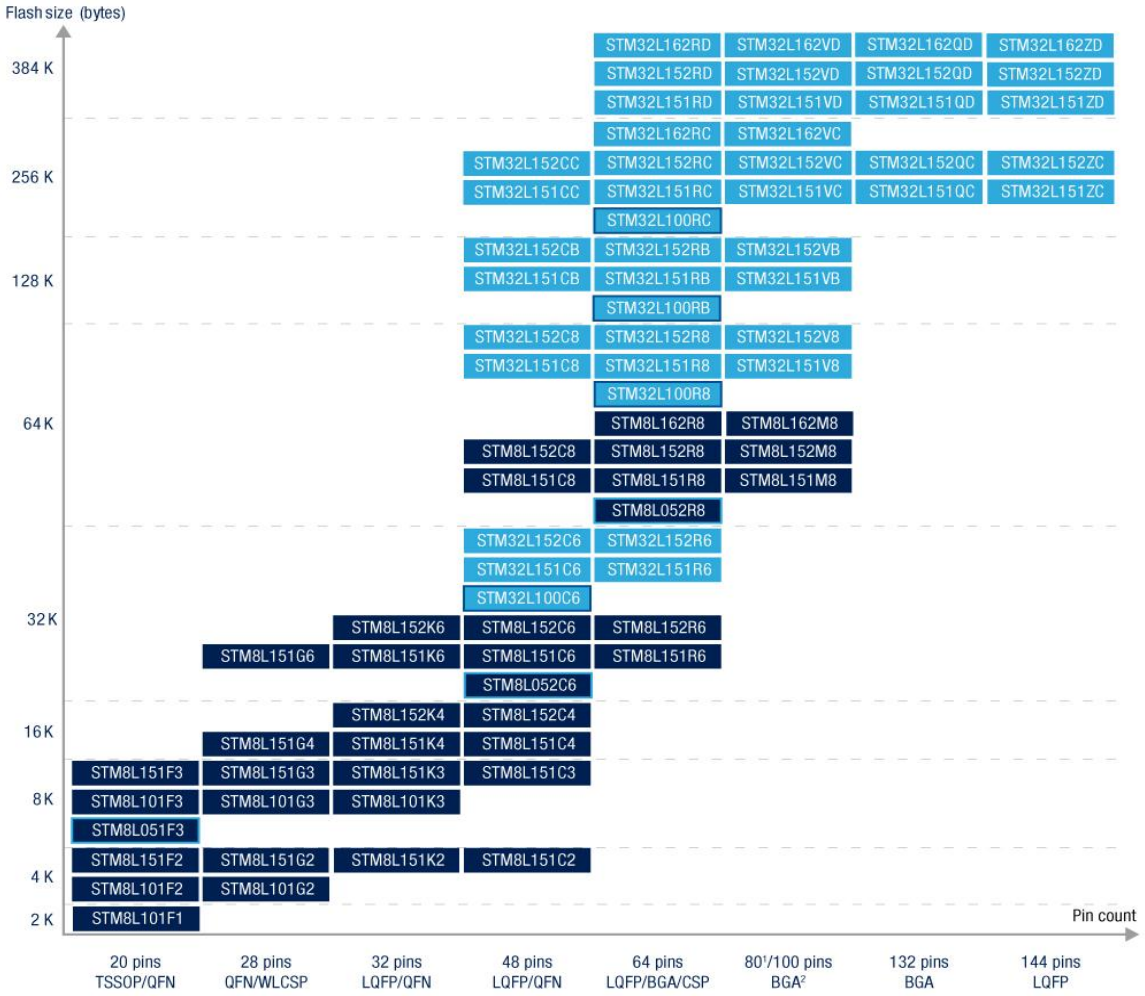
STM8L/STM32 L1 series

Highlights

- Commitment to ultra-low power
  - Ultra-low-power platform for 8-bit (STM8L) and 32-bit (STM32 L1) MCUs
  - Leveraging Ultra Low-Power ST Technology.
- Pure energy efficiency
  - High-performance combined with ultra-low power gives high energy savings
- Ultra-low-power members of the STM8 and STM32 portfolios
  - Extends both the ultra-low-power platform and STM8/STM32 portfolio
    - Enables easy access to low ultra low power from STM8 and STM32
    - One Ecosystem, platform developments benefit

- More than 100 part numbers
- From 2- to 384-Kbyte Flash
- 20 to 144 pins

Ultra-low-power portfolio



Notes:
1. 80 pins for STM8L15x/16x only
2. BGA100 on STM32L15x up to 128 Kbytes only

Legend:

STM8L:
051/52 Value line,
151 without LCD,
152 with LCD and
162 with LCD and
128-bit AES

STM32 L1:
100 Value line,
151 without LCD,
152 with LCD and
162 with LCD and
128-bit AES

STM8L/STM32 L1 series

Wide range of application

Consumer

Digital cameras
Gaming
GPS
Bar code

Industrial

Electricity meters
Home automation
Water meters

Healthcare and fitness

Glucose meters,
insulin pumps,
ECG, sports watches

Common peripherals and architecture

Shared technology, architecture and peripherals

- ST's 110 and 130 nm **ultra-low-leakage** process technology
- Multiple communication peripherals USART, SPI, I^2C
- Multiple timers
- Internal 16 MHz and 38 kHz RC oscillators
- 2x watchdogs
- Reset circuitry
  - POR/PDR
  - BOR/PDV*
- 2x comparators
- Hardware encryption AES 128-bit

Note: * Except for STM8L101 entry line

Ultra-low-power product lines

32-bit solution: STM32L151/152/162 line

32 MHz Cortex-M3 CPU	Up to 384 KB Flash / Dual bank / RWW	Up to 48-Kbyte SRAM	Up to 12 KB data EEPROM	Main osc. input 1-24 MHz	RTC with 32 kHz osc.	Up to 12 ch DMA	12-bit ADC (1 µs) 2x 12-bit DAC	LCD 8x40 4x44	AES 128-bit	MPU ETM	USB FS	FSMC	3x op-amps

32-bit solution: STM32L100 Value line

32 MHz Cortex-M3 CPU	Up to 256 KB Flash	Up to 16-KB SRAM	Up to 4KB data EEPROM	Main osc. input 1-24 MHz	RTC with 32 kHz osc.	Up to 12 ch DMA	12-bit ADC (1 µs) 2x 12-bit DAC	LCD 8x40

8-bit solution: STM8L151/152/162 line

STM8 core @ 16 MHz	Up to 64 KB Flash	Up to 4 KB SRAM	Up to 2 KB data EEPROM	Main osc. input 1-16 MHz	RTC with 32 kHz osc.	Up to 4 ch DMA	12-bit ADC (1 µs) 12-bit DAC	LCD 8x40 4x44	AES 128-bit

8-bit solution: STM8L101 entry line

STM8 core @ 16 MHz	Up to 8 KB Flash*	Up to 1.5-KB SRAM

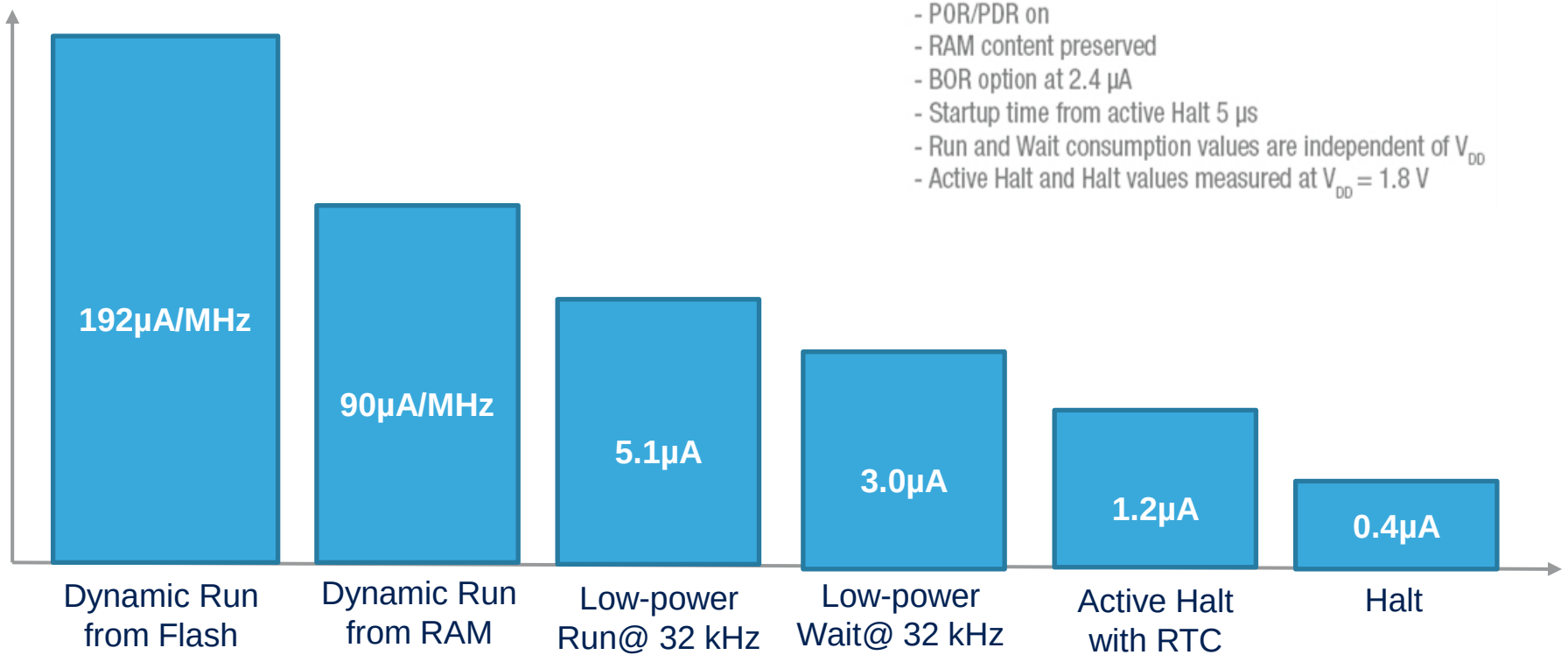
8-bit solution: STM8L051/052 Value line

STM8 core @ 16 MHz	Up to 64 KB Flash	Up to 4 KB SRAM	256-Byte data EEPROM	Main osc. input 1-16 MHz	RTC with 32 kHz osc.	4 ch DMA	12-bit ADC (1 µs) Temp. sensor	LCD 4x28 8x24

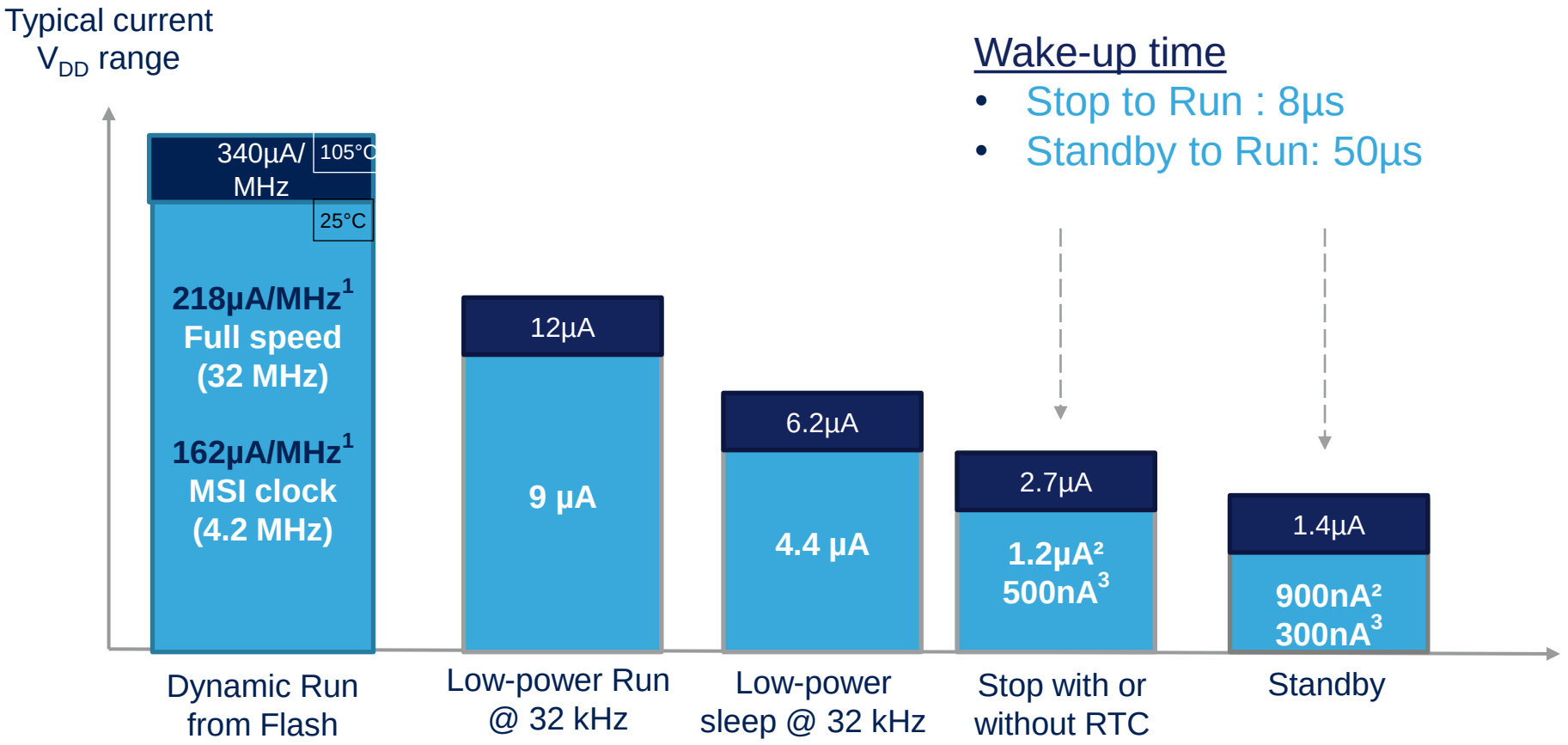
Note: * Embedded EEPROM in the Flash

STM8L Ultra-low-power modes

Typical current
@25 °C



STM32 L1 Ultra-low-power modes

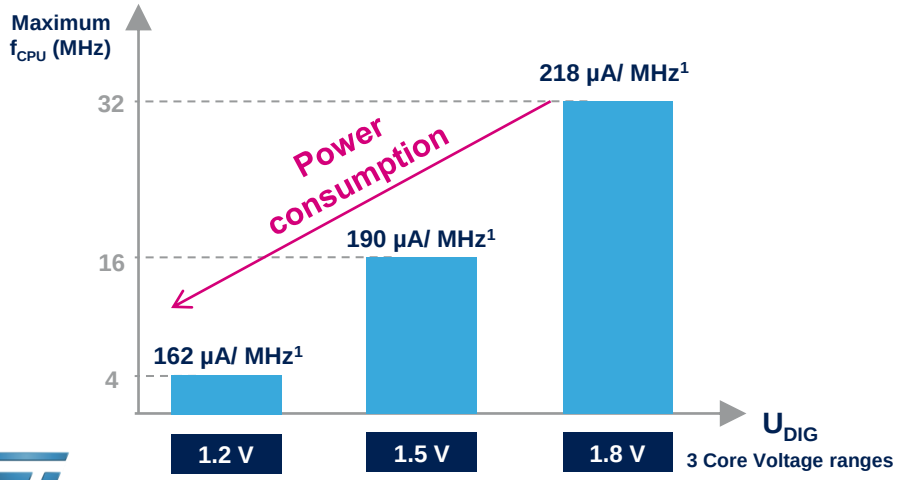


1. Dhrystone power consumption value executed from Flash with V_{DD} = 3V
2. Stop and Stand by with RTC given with V_{DD} = 1.8V
3. Stop and Stand by without RTC given with V_{DD} = 3V

STM32L1 Polyvalent Platform

- Ultra-low-power and efficient with 1.65V to 3.6V VDD range
  - Run on Multispeed Internal Clock (MSI) : **162 µA/MHz** (Most power efficient ACTIVE mode)
  - Run full speed (32 MHz): **218 µA/MHz** with **2.61** CoreMark/MHz
  - Run low-power (32 kHz – 137 kHz): from **9 µA** to 37 µA (down to 4.4 µA in Low-power Sleep)
  - Additional 2 ultra-low-power modes
    - Stop mode: down to **500 nA** with Full RAM retention (1.2 µA with RTC, 16 wakeup line)
    - Standby mode: down: 300 nA (with POR, PDR, 3 wakeup pins and 20byte of backup RAM retention)

- Dynamic voltage scaling



Value given for V_{DD}=3V @ 25°C – Execution from Flash
1/ Run from Flash with int. osc. at min values

- Security and safety
  - **Clock Security System**
  - Reset circuitry
  - **Unique ID**
  - Dual watchdog
  - **JTAG fuse**
  - Supply monitoring
  - Memory protection unit
  - **Anti tamper**
  - Back-up clock
  - AES Encryption
  - Back-up register
  - **Flash & E^2 with ECC**

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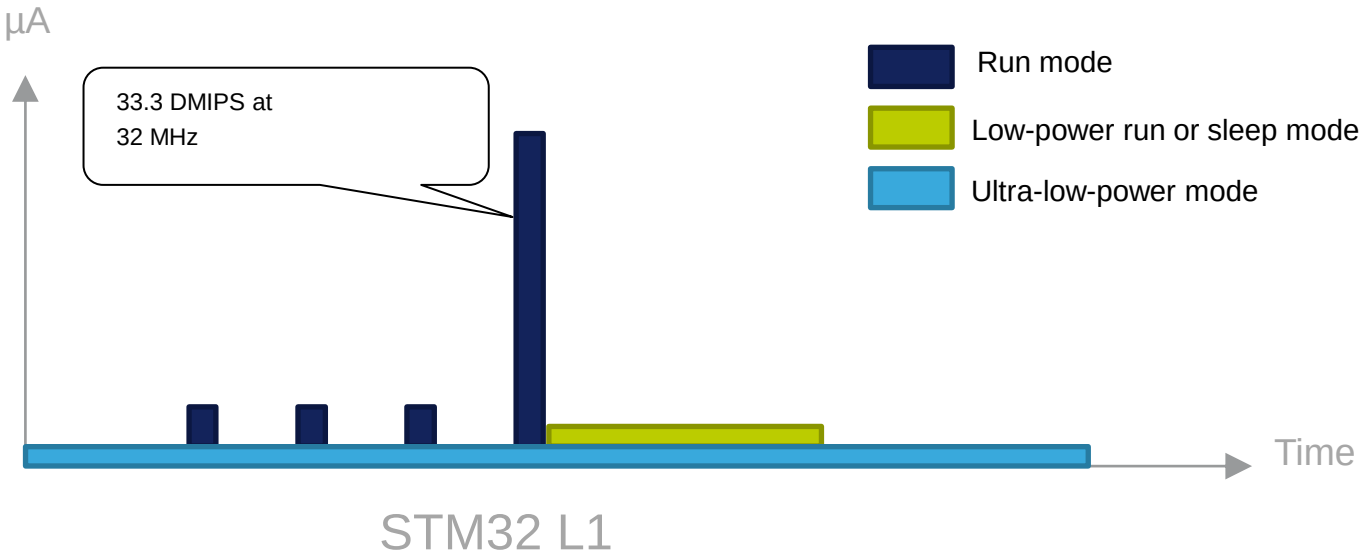
Save energy with STM32 L1 MCUs

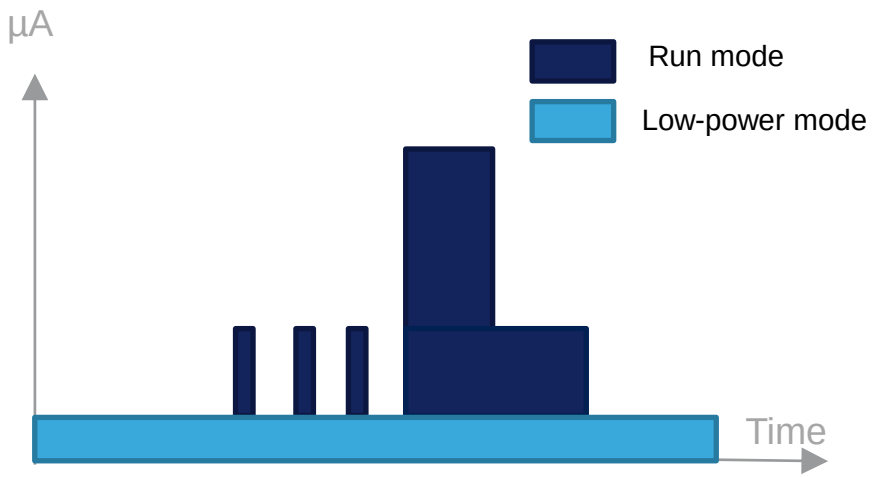


→ Energy saving (µA/DMIPS)

- Ultra-low-power static modes (nA)
  - Stop 450 nA, Standby 300 nA
- Optimized dynamic modes (µA)
- High performance (DMIPS)

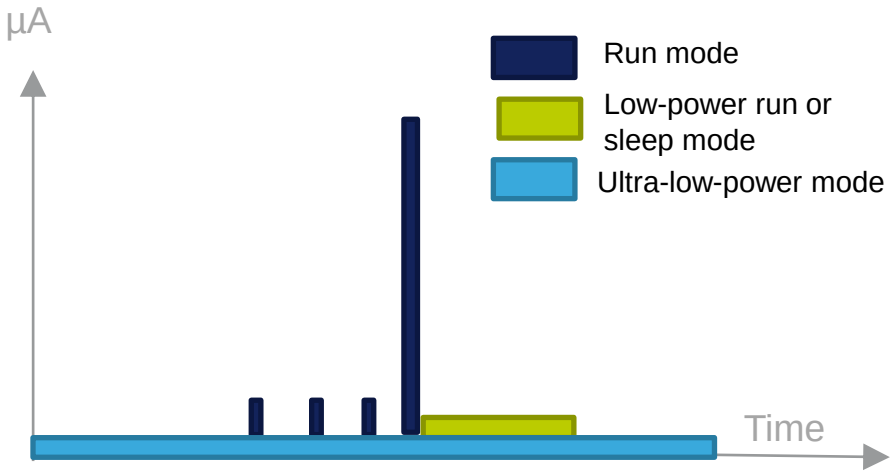
Down to 162 µA/DMIPS
from Flash memory in Run mode

More than ultra-low-power: energy saving!



Competitor Y

- Low-power mode (nA)
- Medium performance (DMIPS)



STM8L

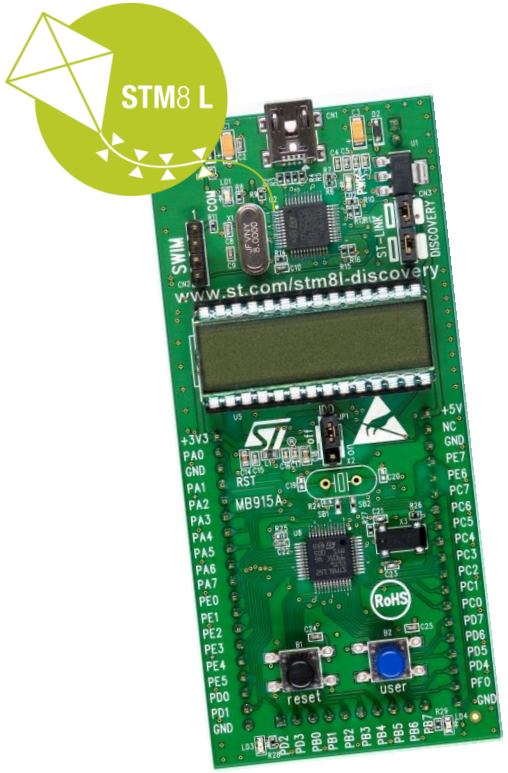
- Ultra-low-power static modes (nA)
- Optimized dynamic modes (µA)
- High performance (DMIPS)

STM8L/STM32 L1 - Ultra-low-power MCUs

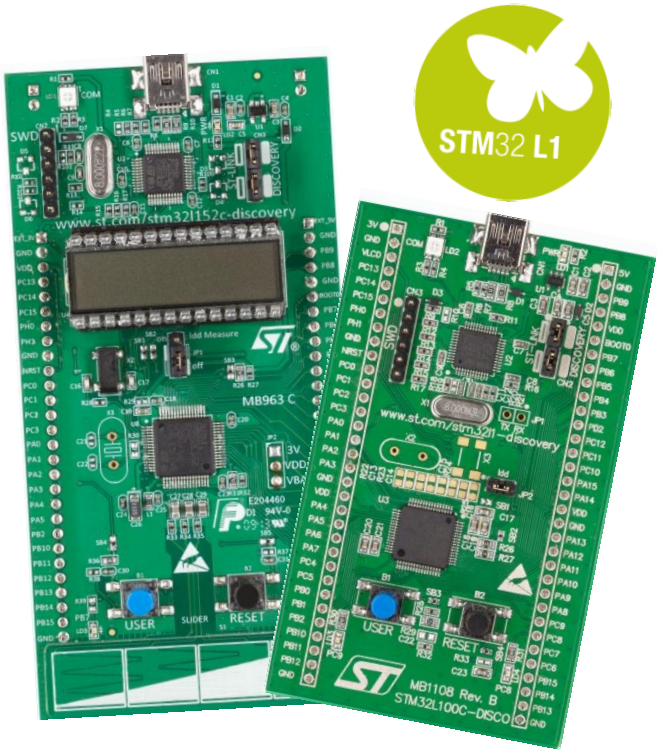
- With the ultra-low-power platform, STMicroelectronics is strongly committed to ultra-low-power MCUs
- Energy saving
  - Ultra-low-power advanced architecture
  - High-performance core
  - Ultra-low-power in dynamic and static modes

- New STM8L/STM32 L1 series increase STM8/STM32 offer
  - Enriches both the ultra-low-power platform and STM8/STM32 portfolio
  - More than 100 part numbers for ultra-low-power lines

Ultra-low-power discovery kits



www.st.com/stm8l-discovery



www.st.com/stm32l1-discovery

For more information

www.st.com/stm8l

www.st.com/stm32l1