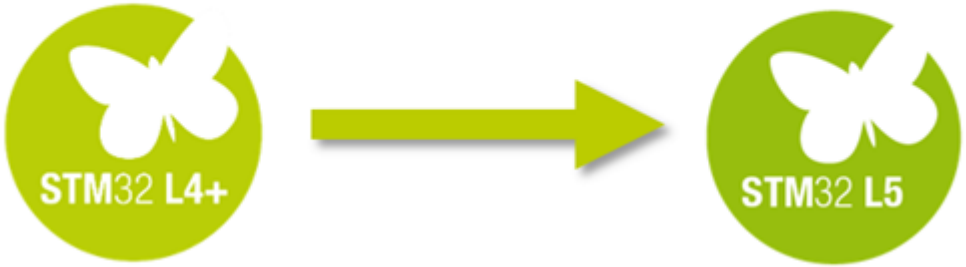
STM32L5

E.Marinoni – v 1.0 October 2018

STM32L5 series of Ultra-low-power MCUs

STM32L4+ will be expanded to create the **STM32L5x Series**

90nm
Cortex-M4 120MHz
Best-in class ULP
Rich features



90nm
M33 110MHz
Best-in class ULP
Rich features

Excellence in **ultra-low-power** with **more performance**

90 nm technology
Cortex-**M33**: the future of Cortex-M4
More performance: ***+18 %*** *in DMIPS/MHz (**1.5** DMIPS/MHz)*
More features: security (***Trust Zone***)
Up to **125°**C
Embedded **Secure Firmware Install loader**

4 keys Innovations points

1. Strong focus on Security:
- **Trust Zone**
- Active **tampering**
- **Temperature/Voltage/frequency protection** (PCI for Mobile POS)
- Elliptic curve aceleration (**PKA**)
- **Crypted Octo SPI**
- **Secured Bootloader**

2. Power consumption:
- Optimized DC/DC + LDO with switching on the fly
- Optimized RTC consumption (**100 nA** including Crystal)

3. Performance:
- **Cache for external memory**

4. New IP:
- **FD-CAN**
- **USB type C connector**

STM32L5

- ***A full set of security***

Flexible hardware and software secure isolations with TrustZone
Enhanced security services: dedicated **secure user memory space** for **Secure Boot**, **symmetric** and **asymmetric crypto accelerations**, **memory** and **IP protection**, **independent Read out protection between secure / non secure domains**, active **IO tamper detection**, certified **cryptolib**, **embedded Secure Firmware Install loader** and ecosystem.

- ***Best power consumption***

EEMBC ULPBench®: **402** ULPMark-CP score
Embedded **SMPS** step down converter (optional)
Best power consumption numbers with full flexibility:
33 nA in **shutdown mode**
3.6 µA in **stop mode** with **full SRAM** and **peripheral states retention** with **5µs wake-up time**
Down to **60 µA/MHz** in active mode

STM32L5

- ***Integration, size and performance***

Better responsiveness of the application:
New Arm **Cortex-M33** at **110 MHz performance**: **+18%** versus **Cortex-M4**
New ST **ART Accelerator**: working both on **internal** and **external Flash** (8 Kbytes of instruction cache)
Achieving **165 DMIPS** and **427 CoreMark** scores
High integration and innovation: large memory, **USB Type-C** w/power delivery controller, **CAN FD**
Large portfolio: 7 packages type (LQFP48, QFN48, LQFP64, WLCSP81, LQFP100, UFBGA132 and LQFP144) for several options

STM32L5

Arm® Cortex®-M33 (TrustZone® + DSP + FPU) – 110 MHz

- ART Accelerator™
- USART, SPI, I²C
- 16 and 32-bit timers
- SAI + audio PLL
- SHA, TRNG
- 2x 12-bit DAC
- Temperature sensor
- Low voltage 1.71V to 3.6V
- Vbat Mode
- Unique ID
- Capacitive Touch sensing

STM32 L5 Product	FLASH (KB)	RAM (KB)	Memory I/F	2 x Op-Amp	2 x Comp	4ch / 2x Sigma Delta Interface	12- bit ADC 5 Msps 16 bit HW oversampling	USB2.0 Device XTAL-less USB Type-C and Power Delivery	CAN-FD	AES 128/256-bit, PKA, OTFDEC
STM32L552 USB Device & CAN-FD	512 to 256	256	SDIO FSMC Octo SPI	•	•	•	2	•	•	
STM32L562 USB Device & CAN-FD & AES, PKA, OTFDEC	512	256	SDIO FSMC Octo SPI	•	•	•	2	•	•	•

STM32L5 - Main Markets targeted

- Wellness / Fitness / Lifestyle
  - Activity trackers, GPS, Smart watch, glasses

- Home automation
  - Thermostat, alarm detector, in-home display

- Metering
  - Gas, water, Electricity

- Industrial
  - Sensors, 4-20 mA loop

- Medical
  - Insulin pump, Glucosemeter

- Safety
  - Mobile POS

extra information

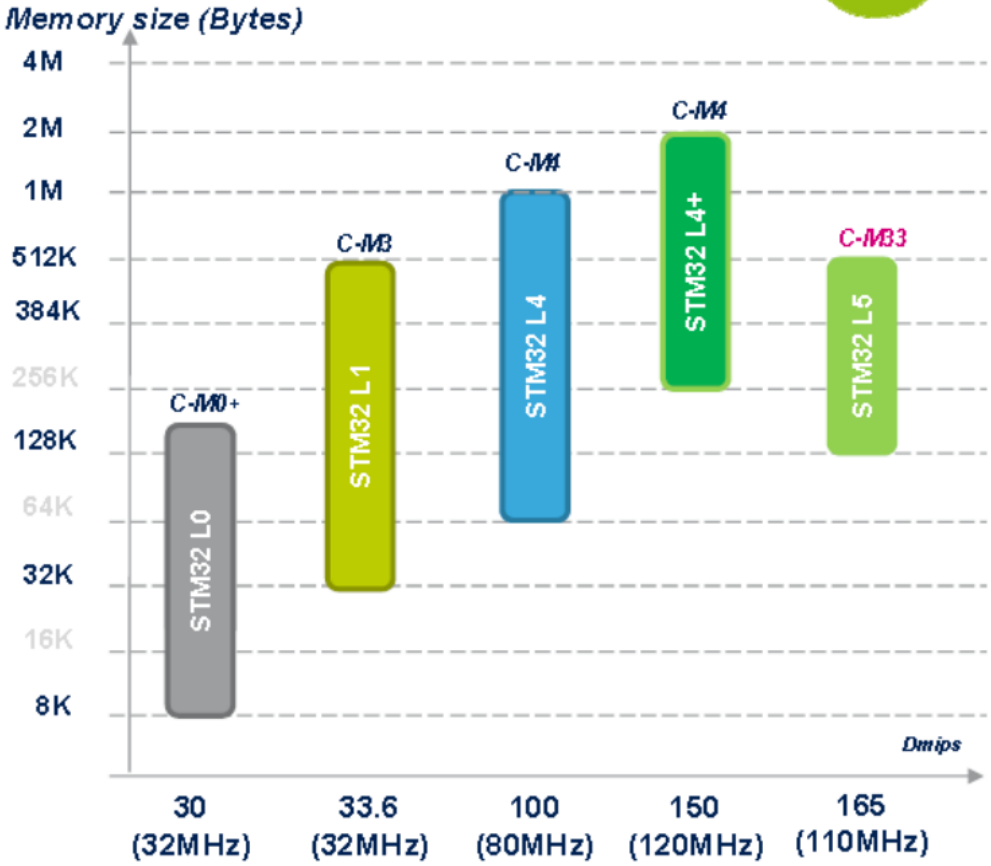
STM32L5

Cortex M33 vs M4

Cortex-M4	Cortex-M33
	TrustZone
	Stack limit checking
	Co-processor interface
	Enhanced debug
	MTB
ETM	ETM
NVIC (max 240 IRQs)	NVIC (max 480 IRQs)
MPU (PMSAv7)	MPU (PMSAv8)
AHB Lite	AHB5
FPU	FPU
SIMD/ DSP	SIMD/ DSP
WIC	WIC
Serial wire / JTAG	Serial wire / JTAG
ARMv7-M	ARMv8-M mainline

New or updated

Ultra-low-power Family



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Click below to see a presentation on STM32L5

STM32L5


From STM32 tool installation
your own IoT application
Getting Started
STM32 step-by-step


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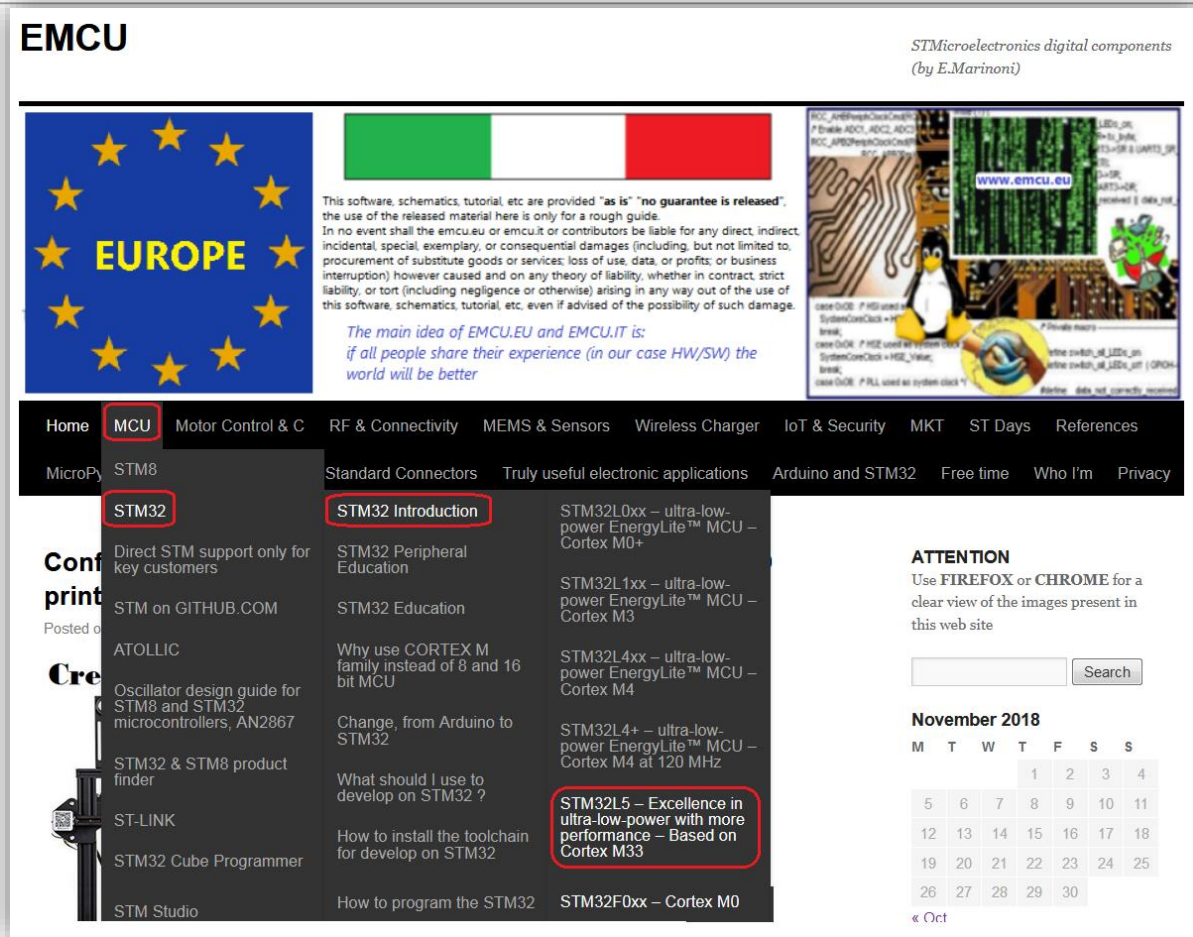
Simplified clock tree
STM32 Online Training
In depth education


EMCU.EU

STM32L5 – for more info…



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Thank you!