

STM8 8-bit MCU family Come grow with us! Simply Smarter



Content

STM8 series
STM8 MCU Longevity Commitment 3 STM8 core 3 Top view portfolio 4 Superior and innovative capabilities 5
STM8S mainstream series6
STM8S description6STM8S block diagram6STM8S applications6STM8S product lines7STM8S portfolio7
STM8L ultra-low-power series
STM8L description8STM8L block diagram8STM8L applications8STM8L product lines9STM8L portfolio9STM8L Ultra-low-power modes10
STM8A automotive series11
STM8A description11STM8AF block diagram11STM8AF applications11STM8AF description12STM8AF product lines12STM8AF portfolio12STM8AL description13STM8AL3L68 block diagram13STM8AL applications13STM8AL product lines13STM8AL applications13STM8AL upplications13STM8AL portfolio14STM8AL Ultra-low-power modes14
STM8 tools
Ordering information



STM8 series

One million units delivered worldwide every day! We plan for longevity with a sustainable growth

STM8 MCU LONGEVITY COMMITMENT

STMicroelectronics provides a minimum longevity of 10 years for its below listed STM8 microcontrollers!

- STM8AF Series
- STM8AL Series
- STM8L Series
- STM8S Series

STM8 CORE

The STM8 core is an evolution of the industry-standard ST7. It has been significantly improved to reach 1.6 cycles per instruction and up to 24 MHz clock frequency, allowing customers to run their applications at low speed with enough performance.

The flexibility of the architecture minimizes switching noise, so improving the system robustness and power consumption.

An innovative clock implementation provides strong benefits such as fast wake-up in 4 $\mu s.$ It enables immediate clock switching on the fly to allow clock accelerations for PWM or calculation routines.

The 32-bit robust NVM memory addressed through a 3-stage pipeline interface, the 16-bit index registers and stack pointers and the advanced instruction set with hardware multiplication/division are key elements that significantly improve the efficiency of this 8-bit device family.

ST's 8-bit microcontroller platform is implemented around a high-performance 8-bit core and a state-of-the-art set of peripherals. This platform is manufactured using an ST-proprietary 130 nm embedded non-volatile

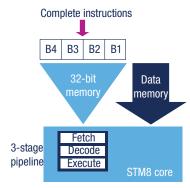
memory technology.

The STM8 allows fast and safe development through enhanced stack pointer operations, advanced addressing modes and new instructions.

The STM8 platform supports three product series:

- STM8S, mainstream MCU
- STM8AF and STM8AL, automotive MCU
- STM8L, ultra-low-power MCU



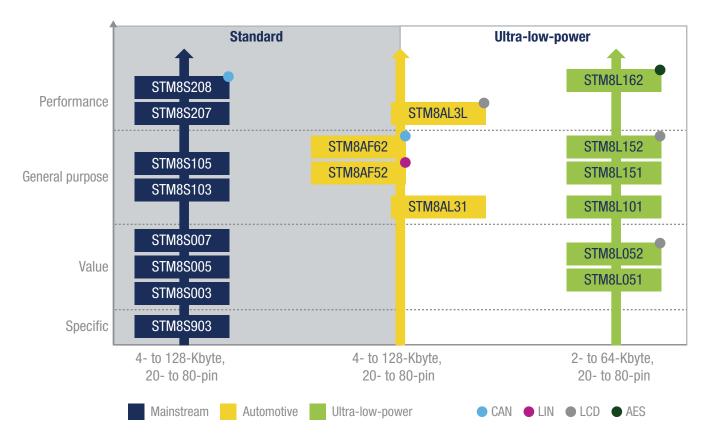






TOP VIEW PORTFOLIO

A large product portfolio to meet all your needs



SUPERIOR AND INNOVATIVE CAPABILITIES

Power consumption, Run 1.8 m Power consumption, Run 1.8 m Pata EEPROM endurance	STM8S 2.95 to 5.5 V - 40 to +125 °C RC 128 KHz 24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No 12 WHz max PWM	RC 128 KHz 16 MHz 128 KHz 2 Watchdogs 5 µA 25 µA (Run in 50 µs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	STM8AL 1.65 to 3.6 V - 40 to +125 °C p to 16 MHz 1% RC 128 KHz 16 MHz 128 KHz s (One window) 0.5 µA 0.8 µA (Run in 4 µs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes, +/- 0.5 ppm 1 Mbit/s, up to 2 UARTs	STM8L 1.65 to 3.6 V - 40 to +125 °C RC 38 KHz 16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels Yes, +/- 0.5 ppm			
Aax. temperature Max. temperature Internal clock, high speed Internal clock, low speed Max. clock speed Vatchdog Sow power, Halt Nower consumption, Run Data EEPROM endurance SAE EMI level DMA Boot ROM RTC ISART SPI C Schapes MC timer MDC Vup to AAC Scomparators	- 40 to +125 °C RC 128 KHz 24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No	3.0 to 5.5 V - 40 to +150 °C Internal RC up RC 128 KHz 16 MHz 128 KHz 2 Watchdogs 5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No Y No The need for speed 1 Mbit/s, up to 2 UARTs	- 40 to +125 °C p to 16 MHz 1% RC 128 KHz 16 MHz 128 KHz s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	- 40 to +125 °C RC 38 KHz 16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Aax. temperature Max. temperature Internal clock, high speed Internal clock, low speed Max. clock speed Vatchdog Sow power, Halt Nower consumption, Run Data EEPROM endurance SAE EMI level DMA Boot ROM RTC ISART SPI C Schapes MC timer MDC Vup to AAC Scomparators	- 40 to +125 °C RC 128 KHz 24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No	- 40 to +150 °C Internal RC up RC 128 KHz 16 MHz 128 KHz 2 Watchdogs 5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	- 40 to +125 °C p to 16 MHz 1% RC 128 KHz 16 MHz 128 KHz s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	- 40 to +125 °C RC 38 KHz 16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
nternal clock, high speed nternal clock, low speed Aax. clock speed Aax. clock speed Ain. clock speed Vatchdog ow power, Halt ow power, Active Halt ower consumption, Run 1.8 m Data EEPROM endurance GAE EMI level MA Boot ROM RTC ISART 1 M SPI CC CC Comparators Comparators	RC 128 KHz 24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No	Internal RC up RC 128 KHz 16 MHz 128 KHz 2 Watchdogs 5 µA 25 µA (Run in 50 µs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	p to 16 MHz 1% RC 128 KHz 16 MHz 128 KHz s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	RC 38 KHz 16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Internal clock, low speed Aax. clock speed Aax. clock speed Ain. clock speed Vatchdog ow power, Halt ow power, Active Halt 11 Power consumption, Run 1.8 m Data EEPROM endurance SAE EMI level DMA Boot ROM STC ISART 1 M SPI 2C C P-phase MC timer C ADC DAC Comparators	24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No	RC 128 KHz 16 MHz 128 KHz 2 Watchdogs 5 µA 25 µA (Run in 50 µs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	RC 128 KHz 16 MHz 128 KHz c (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes, +/- 0.5 ppm	16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Max. clock speed Ain. clock speed Ain. clock speed Vatchdog Sow power, Halt sow power, Active Halt Power consumption, Run Data EEPROM endurance SAE EMI level DMA Boot ROM RTC ISART Spl C Schemer SAN AN Mb C Scomparators	24 MHz 128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No	16 MHz 128 KHz 2 Watchdogs 5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No Y No The need for speed 1 Mbit/s, up to 2 UARTs	16 MHz 128 KHz s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	16 MHz 300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Alin. clock speed Image: Speed	128 KHz 0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No No	128 KHz 2 Watchdogs 5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	128 KHz s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	300 KHz 0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Vatchdog .ow power, Halt .ow power, Active Halt .ow power, Active Halt .ow power, Active Halt .ow power consumption, Run 1.8 m Data EEPROM endurance GAE EMI level DMA Boot ROM CTC ISART 1 M SPI CC CC CAPPhase MC timer CAN 1 Mb CADC COMParators COMParators	0.5 μA 0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No	2 Watchdogs 5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No Y No The need for speed 1 Mbit/s, up to 2 UARTs	s (One window) 0.5 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	0.3 μA 0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
AND C C C C C C C C C C C C C C C C C C C	0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No Ibit/s, up to 2 UARTs	5 μA 25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	0.5 µA 0.8 µA (Run in 4 µs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Accomparators	0 μA (Run in 50 μs) A @ 16 MHz from RAM 2.5 (24 MHz) No No Ibit/s, up to 2 UARTs	25 μA (Run in 50 μs) 4.4 mA @ 16 MHz from RAM Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	0.8 µA (Run in 4 µs) 1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	0.8 μA (Run in 4 μs) 1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Power consumption, Run 1.8 m Power consumption, Run 1.8 m Pata EEPROM endurance	A @ 16 MHz from RAM 2.5 (24 MHz) No No //bit/s, up to 2 UARTs	4.4 mA @ 16 MHz from RAM Independent 300 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	1.6 mA @ 16 MHz from RAM 0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	1.6 mA @ 16 MHz from RAM 1.5 (16 MHz) Yes, 4 channels			
Data EEPROM endurance SAE EMI level DMA Boot ROM Boot ROM STC ISART IN SPI C SAN 1 Mb C Up to 2 DAC Comparators	2.5 (24 MHz) No No /bit/s, up to 2 UARTs	Independent 30 2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	0-kcycle EEPROM 2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	1.5 (16 MHz) Yes, 4 channels			
AE EMI level AAE EMI level AAE EMI level AAE EMI level AAA E EMI level AAE EMI level A	No No //bit/s, up to 2 UARTs	2.5 (24 MHz) No Y No The need for speed 1 Mbit/s, up to 2 UARTs	2.5 (24 MHz) Yes, 4 channels Yes Yes, +/- 0.5 ppm	Yes, 4 channels			
MA Soot ROM Soot ROM Soot ROM StrC Somparators Soot ROM StrC Somparators Strategy St	No No //bit/s, up to 2 UARTs	No Y No The need for speed 1 Mbit/s, up to 2 UARTs	Yes, 4 channels Yes Yes, +/- 0.5 ppm	Yes, 4 channels			
Root ROM RTC ISART 1 M PI C -phase MC timer 1 ADC Up to 2 C C C C C C C C C C C C C	No /bit/s, up to 2 UARTs	No The need for speed 1 Mbit/s, up to 2 UARTs	Yes Yes, +/- 0.5 ppm	·			
ISART 1 M SPI 2C C C-phase MC timer 2 CAN 1Mb Up to 22 AC Comparators	/lbit/s, up to 2 UARTs	No The need for speed 1 Mbit/s, up to 2 UARTs	Yes Yes, +/- 0.5 ppm	·			
ISART 1 N SPI 2C B-phase MC timer 2 SAN 1Mb VDC Up to 2 DAC Comparators	/lbit/s, up to 2 UARTs	The need for speed 1 Mbit/s, up to 2 UARTs		Yes, +/- 0.5 ppm			
SPI C C C-phase MC timer CAN 1Mb Up to 2 ADC Comparators		1 Mbit/s, up to 2 UARTs					
SPI C C C-phase MC timer CAN 1Mb Up to 2 ADC Comparators		1 Mbit/s, up to 2 UARTs	1 Mbit/s, up to 2 UARTs				
SPI			7.1	1 Mbit/s			
ADC Up to 22 Comparators	12 MHz may DWM		10 Mbit/s				
AN 1Mb ADC Up to 2 AAC Comparators	12 MHz may DWM	100 and	400 Kbit/s				
AN 1Mb ADC Up to 2 AAC Comparators		12 MHz max PWM	8 MHz max PWM	8 MHz max PWM			
NDC Up to 2 DAC Comparators	it/s, up to 3 mailboxes	1Mbit/s, up to 3 mailboxes	1Mbit/s, up to 3 mailboxes	-			
AC Comparators		The need for analog					
comparators	o 16 channels, 10 bits, 2.3 μs, TUE 2.2 mV	Up to 16 channels, 10 bits, 3.5 μs,TUE 2.2 mV	28 channels, 12 bits, 1 μs, TUE 0.4 mV	28 channels, 12 bits, 1 μs, TUE 0.4 mV			
	-	-	2 channels, 12 bits, 1 MSPS, TUE 3.5 mV	2 channels, 12 bits, 1 MSPS, TUE 3.5 mV			
ouch Sensing	-	-	3 μs propagation delay, 0.2 μA consumption	3 µs propagation delay, 0.2 µA consumption			
	STM8S RC library	-	STM8L CT library	STM8L CT library			
nternal voltage reference	1.8 V or + 1.2V +/-2.5% on STM8S903	1.22V +/-2.4%	1.22 V +/-1.6%	1.22 V +/-1.6%			
emperature sensor	-	-	+/-1 °C	+/-1 °C			
		The need for connectivity					
CAN	BeCAN 2.0B	BeCAN 2.0B	BeCAN 2.0B	-			
Smar	tcard, IrDA, single wire, LIN 2.1	LIN 2.1 compliant (master/slave)	LIN 2.1 compliant (master/slave)	Smartcard, IrDA, single wire, LIN 2.0			
;PI	Yes						
2 C	Yes						
EC	Software IP						
DALI	Software IP						
SWIM		Non-intrusive debug and programming					
R interface	-	-	-	Hardware IP			
CD	Software IP	Software IP	4 x 28 (112 pixels)	4 x 44 or 8 x 40 segments (320 pixels)			
Inique ID		Individual die iden	ntification on 96 bits	· · ·			
NB STN		_	-	-			

Note: Typical values are indicated. Depending on part numbers, other characteristics may be found, refer to datasheet.

STM8S mainstream series

ST's STM8S series of mainstream 8-bit microcontrollers covers a large variety of applications in the industrial, consumer and computer markets, particularly where large volumes are concerned. Based on the STM8 proprietary core, the STM8S series benefits from ST`s 130 nm technology and advanced core architecture performing up to 20 MIPS at 24 MHz. Embedded EEPROM, RC oscillators and a full set of standard peripherals provide a robust and reliable solution for designers.

The associated toolchain, from affordable Discovery kits to more complex evaluation kits and third-party tools, make it easy to develop with STM8S microcontrollers.

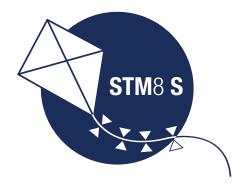
STM8S DESCRIPTION

Upgrade to a higher or downgrade to a lower memory size, or use a different package across lines without changing the initial layout or software.

- STM8 24 MHz CPU
- 4 to128 Kbytes of embedded Flash, up to 6 Kbytes of SRAM
- Supply voltage: 2.95 to 5.5 V
- Up to four low-power modes: down to 4 μA with complete context retention
- State-of-the-art digital and analog peripherals
- · Specific interfaces such as IrDA and smartcard for support of consumer applications
- -40 to +85 °C, or up to 125 °C temperature range
- Free class B self-diagnostic library for IEC 60335/IEC 60730 compliant applications
- Many software libraries and examples for download

STM8S BLOCK DIAGRAM

	•	
System		4- to 128-Kbyte Flash memory
Power supply 2.95 to 5.5 V		Up to 6-Kbyte SRAM
(1.8 V internal regulator) POR / BOR		Up to 2-Kbyte EEPROM
Xtal oscillator 1-24 MHz		Boot ROM
Internal RC oscillators 128 kHz and 16 MHz		Connectivity
Clock control	STM8 CPU Up to 24 MHz	CAN 2.0 B
Clock detector		2xU(S)ART
AWU		LÍŇ Smartcard / IrDA
2x watchdogs (independent and window)		SPI
Up to 68 I/Os		l²C
Control 16-bit timer, 4 CAPCOM +		
3 comparator outputs		
2x16-bit timer 2/3 CAPCOM	Nested vector	Analog
8-bit timer	interrupt controller (NVIC)	10-bit ADC 16 channels
Beeper 1/2/4 kHz	SWIM debug module	
1/2/4 KIIZ	mouule	



STM8S APPLICATIONS

- Appliances, power tools
- HVAC
- · Power management
- Lighting
- Factory automation
- Devices with rechargeable batteries
- Motor control
- e-vehicles
- Toys and games
- Sensors
- Power supplies
- User interfaces

STM8S PRODUCT LINES

The STM8S series consists of four lines with differentiated features with full compatibility and upgradability to simplify design changes.

- The STM8S003/005/007 Value line is the entry-level series with a basic features set.
- The STM8S103/105 Access line offers more features and a larger variety of packages.
- The STM8S207/208 Performance line features a full set of peripherals and provides performance for medium to higher-end applications.
- The STM8S Application specific line provides more analog features and dedicated firmware solutions.

Hz	• 10-bit ADC	Droduct line	FCPU (MHz)	FLASH (KB)	RAM (KB)	Data EEPROM (bytes)	CAN 2.0B	2 nd UART	Additional analog channels	LNB firmware
- Up to 24 MHz	 USART, SPI, I²C 8- and 16-bit timers 	STM8S003/005/007 Value line	16	8 to 64	1 to 6	128				
STM8 core -	Crystal 16 MHz and 128 KHz internal RC oscillators	STM8S103/105	16	4 to 32	1 to 2	640 to 1024				
ST	SWIM debug module	STM8S207/208	24	32 to 128	6	1024 to 2048	•	•	•	
		STM8S Application Specific Line	16	8	1	640			•	•

STM8S PORTFOLIO

Flash size (bytes) STM8S208SB STM8S208CB STM8S208RB STM8S208MB 128K STM8S207SB STM8S207CB STM8S207RB STM8S207MB STM8S208S8 STM8S208C8 STM8S208R8 STM8S208M8 64 K STM8S207K8 STM8S207S8 STM8S207C8 STM8S207R8 STM8S207M8 STM8S007C8 STM8S208S6 STM8S208C6 STM8S208R6 STM8S207K6 STM8S207S6 STM8S207C6 STM8S207R6 32 K STM8S105K6 STM8S105C6 STM8S005K6 STM8S005C6 16K STM8S105K4 STM8S105S4 STM8S903F3 STM8S903K3 8 K STM8S103F3 STM8S103K3 STM8S003F3 STM8S00KF3 4 K STM8S103F2 Pin count 20 pins 32 pins 44 pins 48 pins 64 pins 80 pins TSSOP/QFN/SO LQFP/QFN/SDIP LQFP LQFP LQFP LQFP Leaend: Performance line Application specific line Value line Access line

STM8L ultra-low-power series

STMicroelectronics proposes an ultra-low-power series of MCUs based on 8-bit and 32-bit cores. The STM8L MCU series is based on the STM8 proprietary core and is the entry point of our low-power MCU solutions.

The STM8L series combines high performance and ultra-low power consumption using a new proprietary ultra low leakage process and optimized architecture. This series is declined in four different lines, making the STM8L an optimal series to support many applications with special care on power savings. The STM8L101 is the entry-line for the ultra low power 8-bit portfolio. It is cost optimized and offers a high level of integration in an ultra small footprint. The STM8L151/152 and STM8L162 performance lines offer more features with advanced digital and analog features. The STM8L051/52 value line is a streamlined version of STM8L151 series, offering the best price/performance ratio.

STM8L DESCRIPTION

Upgrade or downgrade to a different memory size, or package across lines without changing your initial design or software.

- STM8 16 MHz CPU
- 2 to 64 Kbytes of embedded Flash, up to 4 Kbytes of SRAM and up to 2 Kbytes of EEPROM
- Four lines: pin-to-pin, software and peripheral compatibility
- Supply voltage: 1.65 to 3.6 V
- Up to four ultra-low-power modes: down to 350 nA with SRAM and context retention
- Run mode dynamic consumption down to 150 µA/MHz
- State-of-the-art digital and analog peripherals
- -40 to +85 °C, or up to 125 °C operating temperature range
- · Free touch-sensing library
- LCD driver
- AES 128 encryption

STM8L BLOCK DIAGRAM

System Power supply 1.8 V regulator POR/PDR/PVD/BOR Xtal oscillator 32 kHz + 1~16 MHz Internal RC oscillators 38 kHz + 16 MHz Clock control	STM8 CPU Up to 16 MHz	2- to 64-Kbyte Flash memory 1.5- to 4-Kbyte SRAM 1- to 2-Kbyte EEPROM* Boot ROM* Connectivity 1 to 3x USART
RTC*/AWU 2x watchdogs (independent and window) 18/26/30/41/54/68 I/Os	Nested vector interrupt controller (NVIC)	1 to 2x COANT 1 to 2x SPI I ² C Touch sensing Charge-transfer driver
Control 1x 16-bit PWM Synchronized AC timer 2 to 3x 16-bit timers	SWIM debug module 4-channel DMA	up to 16 channels Analog
1x 8-bit timer Encryption AFS (128 bits)	Display LCD driver (4 x 28 or 8 x 40)	1 to 2x 12-bit DAC 12-bit ADC 25 channels 2x comparators Temperature sensor

STM8L APPLICATIONS

- Medical equipment
 - Glucose meters, insulin pumps

STM8

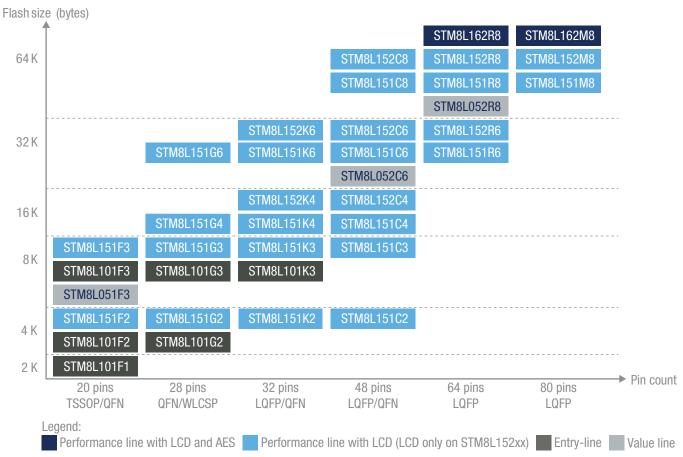
- Blood pressure and colesterol monitors
- Patient monitoring
- Metering (electricity/gas/water/ heat meters, scales)
- Alarm systems (central units, sensors, door locks, fire alarms)
- GP portable devices
 - Mobile phones, accessories
 - Gaming, remote controls
- GPS watches, sports equipment

8

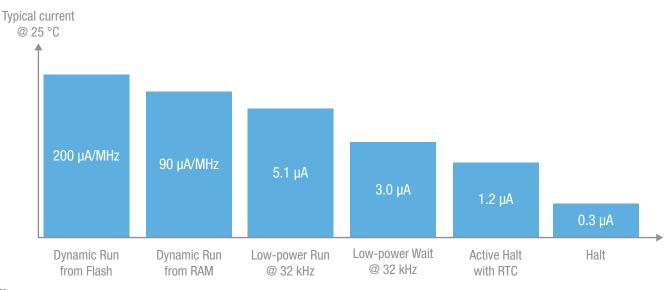
STM8L PRODUCT LINES

	• 12-bit ADC	Product line	FLASH (KB)	RAM (KB)	Data EEPROM (bytes)	Four DMA channels	LCD interface	AES 128-bit crypto
to 16 MHz	 12-bit DAC USART, SPI, I²C 	STM8L051/052 Value line	8 to 64	1 to 4	256	•	•	
core – Up (RTC with 32 KHz oscillator 8- and 16-bit timers 	STM8L101	2 to 8	1.5				
STM8	Temperature sensor Comparators SWIM dobus module	STM8L151/152	4 to 64	1 to 4	256 to 2048	•	•	
	 SWIM debug module 	STM8L162	64	2	2048	•	•	•

STM8L PORTFOLIO



STM8L ULTRA-LOW-POWER MODES



Notes:

- POR/PDR on - RAM content preserved
- BOR option at 2.4 µA
- Startup time from active Halt 5 µs



The STM8L series is available in four different lines making the STM8L an optimal series to support many applications requiring special care on power savings.

- STM8L101 line
 - Lowest power mode: 0.30 µA
 - Dynamic run mode: 150 µA/MHz
- STM8L151/152 line
 - Lowest power mode: 0.35 µA
 - Dynamic run mode: 180 µA/MHz
- STM8L162 line
 - Lowest power mode: 0.35 µA
 - Dynamic run mode: 180 µA/MHz
- STM8L051/052 Value line
 - Lowest power mode: 0.35 µA
 - Dynamic run mode: 180 µA/MHz

STM8A automotive series

This series of 8-bit Flash microcontrollers responds to the specific needs of automotive applications. From product specifications on through design and manufacturing, the focus is on reliability, application robustness and system cost improvement.

The integrated true data EEPROM features top notch endurance and data retention throughout the full temperature range. With its extended temperature range up to 150 °C ambient temperature, the STM8A is the ideal and economic solution for the growing market of 8-bit automotive applications.

The ultra-low-power STM8AL is now available . With the multiplication of electronic subsystems, saving power is becoming a key consideration, and this series responds to the specific needs of low power in automotive applications.

STM8A DESCRIPTION

Upgrade to a higher or downgrade to a lower memory size or use a different package across lines without changing the initial layout or software.

- STM8 up to 24 MHz CPU
- 8 to 128 Kbytes of embedded Flash, up to 6 Kbytes of SRAM and up to 2 Kbytes of data EEPROM
- Packages up to 80 pins
- Supply voltage: 2.95 to 5.5 V for STM8AF, 1.65 to 3.6 V for STM8AL
- Up to four low-power modes: down to 1 µA with complete context retention
- State-of-the-art digital and analog peripherals
- Up to 150 °C ambient temperature
- Qualified to AEC-Q100
- Certified CAN drivers
- Free certified LIN drivers
- Touch-sensing and LCD lines

STM8AF BLOCK DIAGRAM

STRICAL DECON DIAULA		
System		4- to 128-Kbyte Flash memory
Power supply 2.95 to 5.5 V (1.8 V internal regulator)		Up to 6-Kbyte SRAM
(1.8 V internal regulator) POR / BOR		Up to 2-Kbyte EEPROM
Xtal oscillator 1-24 MHz		Boot ROM
Internal RC oscillators 128 kHz and 16 MHz Clock control	STM8 CPU	Connectivity
Clock detector	Up to 24 MHz	CAN 2.0 B
AWU		UART LIN-UART
2x watchdogs (independent and window)		Smartcard / IrDA SPI
Up to 68 I/Os		I ² C
Control		
16-bit timer, 4 CAPCOM + 3 comparator outputs		
2x16-bit timer 2/3 CAPCOM	Nested vector interrupt controller (NVIC)	Analog
8-bit timer	SWIM debug	10-bit ADC 16 channels
Beeper 1/2/4 kHz	module	



STM8AF APPLICATIONS

- CAN controllers
- LIN nodes
- Actuators
- Sensors
- · Safety microcontrollers
- Car radios
- Immobilizers
- DC motor control
- HVAC

STM8AF DESCRIPTION

STM8AF62 is the mainstay of the STM8A multi-purpose 8-bit microcontrollers for automotive applications. Based on our proprietary STM8 core able to deliver up to 20 MIPS at 24MHz, the STM8AF62 line features a full set of timers, interfaces (LIN 2.1, UART, SPI, I²C), 10-bit ADC, internal and external clock control system, watchdogs, auto wake-up unit, and an integrated single-wire debug module.

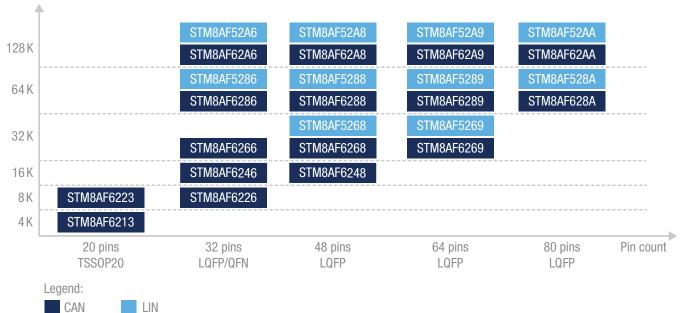
Conceived to offer a smart combination of features, to be easy to use and reliable, it covers a wide-range of operating conditions such as up to 150 °C ambient temperature and down to 3.0 V supply. It is the perfect solution for automotive applications where no compromises can be made.

STM8AF PRODUCT LINES

		Product line	FLASH (KB)	RAM (KB)	Data EEPROM (bytes)	CAN 2.0B	LIN 2.1	Additional analog channels	Automotive Grade 0 (150 °C)
STM8 core - 24 MHz	 USARI, SPI, I²C 8- and 16-bit timers Crystal 16 MHz and 128 KHz internal RC 	STM8AF52	32 to 128	6	1024 to 2048	•	•		•
	oscillators • SWIM debug module	CTMOAFCO	4 to 128	1 to 6	640 to 2048		•	•	•

STM8AF PORTFOLIO

Flash size (bytes)



STM8AL DESCRIPTION

ST's STM8AL ultra-low-power series for automotive applications puts green energy, application safety and power efficiency at the forefront. It is particularly suited to battery-operated functions such as remote keyless entry and tire pressure monitoring, as well as for applications where power consumption is critical over time: companion microcontroller, immobilizers and sensors.

Based on the STM8A embedded features for system cost reduction and reliability, the STM8AL series supports LIN communications and offers more features to increase computation performance, save power consumption and save memory space, using the LCD driver, RTC, DMA, comparators, 12-bit ADC and DAC. It offers a unique combination of flexible, innovative and cost-effective solutions for automotive applications.

STM8AL3L68 BLOCK DIAGRAM

System		32-Kbyte Flash memory
Power supply 1.8 to 3.6 V		2-Kbyte SRAM
Power supply 1.8 to 3.6 V (1.8 V internal regulator POR/PDR/PVD/BOR		1-Kbyte EEPROM
Xtal oscillator	STM8 CPU	Boot ROM
1-16 MHz	16 MHz	
Internal low power		Connectivity
RC oscillators 38 kHz and 16 MHz (2%)		41 I/Os (with HS)
RTC +/- 0.5 ppm	Low power implementaion	UART
32.768 kHz oscillator	ппретентают	LIN-UART Smartcard / IrDA
Clock detection		1x SPI
Auto wake-up		1x l ² C
2x watchdogs (HS/LS)	Nested vector interrupt controller (NVIC)	
	SWIM debug module	Analan
Digital		Analog
1x 16-bit timer, 4 CAPCOM 3 complemented outputs	4-channel DMA	2x ULP comparators
	Memory to memory	12-bit ADC (1 µs) 25 channels
2x 16-bit timers, 4 CAPCOM	Peripherals to memory	12-bit DAC
1x 8-bit timers	Dioplay	1 channel
IR I/F	Display LCD driver 4 x 28	Temperature sensor
	Internal booster	Internal voltage reference
Beeper 1/2/4 kHz	Active in Halt mode	



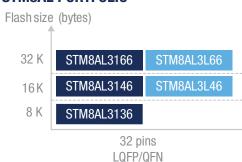
STM8AL APPLICATIONS

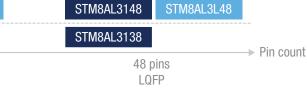
- Remote keyless entry
- Tire pressure monitors
- Alarms
- BLDC electric motor control
- Sensors

STM8AL PRODUCT LINES

	• 12-bit ADC	Product line	FLASH (KB)	RAM (KB)	Data EEPROM (bytes)	Four DMA channels	LCD interface
STM8 core - 16 MHz		STM8AL31	16 to 32	2	2048	•	
STM	 Temperature sensor Comparators SWIM debug module STM8AL3L 	16 to 32	2	2048	•	•	

STM8AL PORTFOLIO



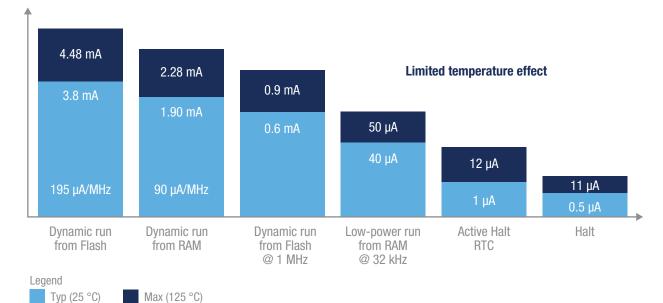


STM8AL3168

Legend: General purpose

Performance with LCD

STM8AL ULTRA-LOW-POWER MODES



Notes:

- POR/PDR on

- RAM content preserved

- BOR option at 2.4 µA

- Startup time from active Halt 5 µs

- Run and Wait consumption values are independent of V_{DD}

- Active Halt and Halt values measured at $V_{DD} = 1.8 V$



All families are supported with affordable kits and hardware solutions



STM8S-DISCOVERY STM8SVLDISCOVERY

ORDERING INFORMATION

Order number	Description
STM8S-DISCOVERY	Discovery kit for STM8S series with STM8S105C6 MCU
STM8SVLDISCOVERY	Discovery kit for STM8S Value Line with STM8S105C6 MCU
STM8L-DISCOVERY	Discovery kit for STM8L series with STM8L152C6 MCU
STM8A-DISCOVERY	Discovery kit for STM8A Automotive series with STM8AF52C6 and STM8AL3L68 MCUs

STM8A-DISCOVERY

FREE TOOLS SUITES, SOFTWARE LIBRARIES AND EXAMPLES

Development environment	C-Compilers	IDE
life.augmented	NA	STVD
	Free up to 32-Kbyte One year renewable	IDEA
IAR SYSTEMS	Free up to 8-Kbyte One month full size	EWSTM8

STM8L-DISCOVERY

life.augmented





© STMicroelectronics - September 2014 - Printed in United Kingdom - All rights reserved The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies All other names are the property of their respective owners