STM8S MCU family
8-bit microcontroller

STM8 Simply **smarter**

September 2008

STMicroelectronics' STM8S family of general-purpose 8-bit Flash microcontrollers offers ideal solutions for industrial and appliance market requirements. An advanced core version combined with a 3-stage pipeline ranks the STM8S microcontroller in the top position for performance. The true embedded EEPROM and the calibrated RC oscillator bring a significant cost effectiveness to the majority of applications. An easy-to-use and intuitive development environment contributes to improving time to market.

Applications

- Home appliances
- HVAC
- User interfaces
- Factory automation
- Motor control
- Sensors
- Lighting
- Personal care
- Power tools
- E-bikes
- Circuit breakers
- Rechargeable battery operated devices
- Toys and game accessories
- Power supplies and power management

STM8S block diagram
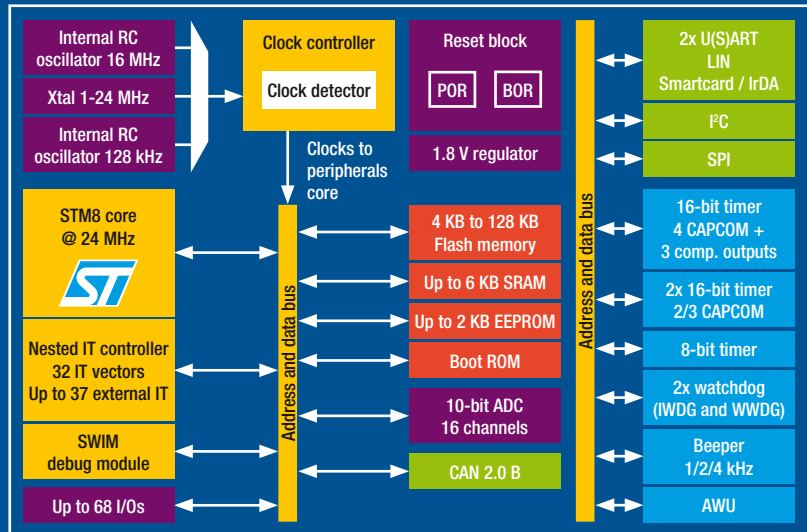
STM8S: robust and reliable

In addition to performance, comprehensive design specifications and specific peripheral features make the STM8S robust and reliable:
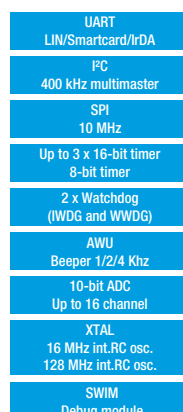
- 2 internal RC oscillators with dual independent watchdogs
- Clock security system (CSS) to monitor the failure of external clock source
- Complementary copy of configuration option bytes and EMS reset
- Low emission in accordance with the IEC 61967 standards
- Outstanding robustness performance according to IEC 1000-4-2 and IEC 1000-4-4 standards
- High current injection immunity (1 µA leakage current when 4 mA current is injected in adjacent pin)
- Dedicated firmware library compliant to Class B of IEC 60335

STM8 core

- 1.6 CPI average
- 20 MIPs peak @ 24 MHz
- 32-bit memory interface
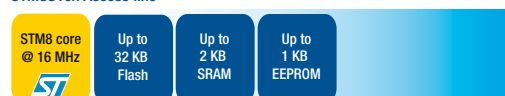- 3-stage pipeline
- 16-bit index registers
- 20 addressing modes
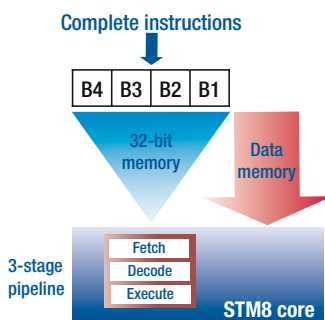
STM8S product lines

STM8S MCU family

Features and benefits

Features	Benefits
3.0 to 5.5 V, -40 to +125° C range	Ideal for industrial and appliance requirements
Up to 20 MIPS @ 24 MHz, Harvard architecture	Optimized core performance and code-size efficiency
16-bit advanced control timer	Satisfies all needs with configurable modes, motor control, capture, compare, PWM, and others
Embedded true EEPROM, 300 Kcycles	Lower system cost
CAN, 2xU(S)ART, SPI, I2C	All essential communication peripherals supporting various protocols
Single-voltage Flash memory with single-byte programming granularity	In-application programming (IAP), in-circuit programming (ICP)
4 low-power modes	Efficient power management
Trimmable 16 MHz and 128 kHz internal RC oscillators with dual independent watchdogs and 2 µs fast switching between clock sources	Reduced cost, robust clock architecture, optimized power consumption
Integrated POR and BOR	Reliable reset mechanism during power up and down
Low emission and high current injection immunity	Outstanding EMC, no need for extra protection
4 to 128 Kbyte Flash in 20 to 80 pin packages	Package-in-package compatible across family, ideal choice of platform
On-chip debugging and programming through single-wire interface, SWIM	Easy to use, non-intrusive and low-cost development environment
Up to 16-channel 10-bit ADC ±1 LSB with scan mode, conversion time < 3 µs	Fast and accurate A/D converter

STM8S portfolio

Memory size

	20 pins TSSOP20	32 pins LQFP32	44 pins LQFP44	48 pins LQFP48	64 pins LQFP64	80 pins LQFP80
				STM8S208RB	STM8S208MB	
			STM8S207CB	STM8S207RB	STM8S207MB	
128 KB			STM8S207S8	STM8S207C8	STM8S207R8	
64 KB		STM8S207K6	STM8S207S6	STM8S207C6	STM8S207R6	
32 KB		STM8S105K6	STM8S105S6	STM8S105C6		
16 KB		STM8S105K4	STM8S105S4	STM8S105C4		
8 KB	STM8S103F3	STM8S103K3				
4 KB	STM8S103F2					

Pin count

VQFN20, VQFN32 and VQFN48 packages are under qualification

- Performance line
- Access line (*)
- Under development

(*) w/wo EEPROM

Device summary

Part number	Flash memory (Bytes)	RAM (Bytes)	Data EEPROM (Bytes)	A/D converter	Timer functions (IC/OC/ PWM)	Serial interfaces	Packages	I/Os (high sink)	Others	V$_{DD}$
STM8S208MB	128 K	6 K	2 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	CAN, SPI, 2xUART, I²C	LQFP80	68(11)		
STM8S208RB	128 K	6 K	2 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	CAN, SPI, 2xUART, I²C	LQFP64	52(9)		
STM8S207MB	128 K	6 K	2 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP80	68(11)		
STM8S207RB	128 K	6 K	2 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP64	52(9)		
STM8S207R8	64 K	4 K	1.5 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP64	52(9)	16 MHz RC[1] 128 kHz RC WWDG IWDG CSS	3.0 to 5.5 V
STM8S207R6	32 K	2 K	1 K	16x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP64	52(9)		
STM8S207CB	128 K	6 K	2 K	10x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP48	38(9)		
STM8S207C8	64 K	4 K	1.5 K	10x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP48	38(9)		
STM8S207C6	32 K	2 K	1 K	10x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, 2xUART, I²C	LQFP48	38(9)		
STM8S207S8	64 K	4 K	1.5 K	9x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, 2xUART, I²C	LQFP44	34(8)		
STM8S207S6	32 K	2 K	1 K	9x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, 2xUART, I²C	LQFP44	34(8)		
STM8S207K6	32 k	2 K	1 K	7x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, UART, I²C	LQFP32, VQFN32	25(8)		
STM8S105C6	32 K	2 K	1 K	10x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, UART, I²C	LQFP48	38(9)		
STM8S105C4	16 K	2 K	1 K	10x10-bit	1x8-bit, 3x16-bit (9/9/12)	SPI, UART, I²C	LQFP48	38(9)		
STM8S105S6	32 K	2 K	1 K	9x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, UART, I²C	LQFP44	34(8)		
STM8S105S4	16 K	2 K	1 K	9x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, UART, I²C	LQFP44	34(8)		
STM8S105K6	32 k	2 K	1 K	7x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, UART, I²C	LQFP32, VQFN32	25(8)		
STM8S105K4	16 K	2 K	1 K	7x10-bit	1x8-bit, 3x16-bit (8/8/11)	SPI, UART, I²C	LQFP32, VQFN32	25(8)		

[1] Accuracy (factory calibarated) 2% for STM8S20x, 5% for STM8S10x

Hardware and software development tools

MCU	Starter kit	Evaluation board	In-circuit debugger	Emulator	3rd-party programmer	
STM8S20x STM8S10x	STM8/128-SK/RAIS	STM8/128-EVAL	STX-RLINK	STICE-SYS001	BP Microsystems Data I/O Segger Softec Microsystems	www.bpmicro.com www.data-io.com www.segger.com www.softecmicro.com

Product	Description		Supplier	
IDE	ST MCU toolset ST Visual Develop (STVD) ST Visual Programmer (STVP), free		STMicroelectronics	www.st.com/mcu
	RIDE Raisonance RIDE with RBuilder and Rflasher, free		Raisonance	www.raisonance.com
Complier	Cosmic C Compiler, free up to 16 Kbytes		Cosmic Software	www.cosmic-software.com
	Raisonance C complier, free up to 16 Kbytes		Raisonance	www.raisonance.com

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