



STM32 ARM® Cortex™-M3 Microcontrollers

Core: Cortex-M3



The STM32 family of 32-bit Flash microcontrollers is based on the breakthrough ARM Cortex-M3 core specifically developed for embedded applications. The STM32 family benefits from the Cortex-M3 architectural enhancements, including the Thumb-2® instruction set to deliver

improved performance combined with better code density, a tightly coupled nested vectored interrupt controller for

excellent real-time behavior all combined with industry-leading power consumption. The STM32 is offered in two pin and software compatible product lines. The Performance line takes the 32-bit MCU world to new levels of performance and energy efficiency. With its Cortex-M3 core at 72 MHz, it is able to perform high-end computation. Its peripheral set brings superior control and connectivity. The Access line is the entry point of the STM32 family. It has the power of the 32-bit MCU but at a 16-bit MCU cost. Its peripheral set offers excellent connectivity and control.

Features ▶

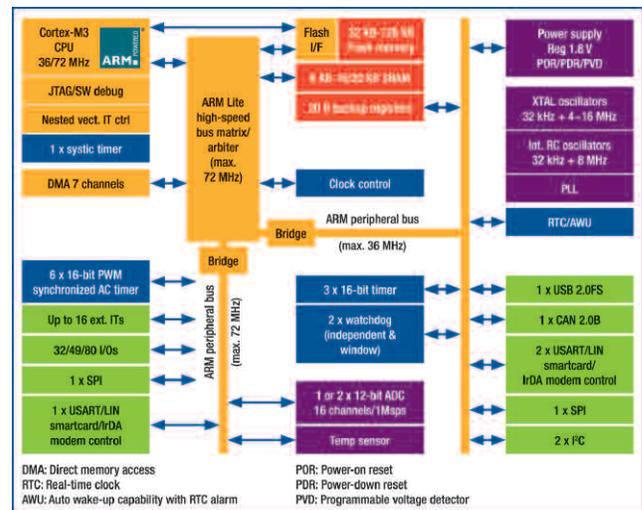
- 1.25 DMIPS/MHz Cortex-M3 Core
 - Thumb-2 instruction set brings 32-bit performance with 16-bit code density
 - Single cycle multiply and hardware division
 - Tightly coupled nested vectored interrupt controller
- 32 KB-128 KB high performance Flash (256 KB-512 KB available in Q2 2008)
- 6 KB-20 KB SRAM (32 KB-64 KB available in Q2 2008)
- Low power
 - Run mode as low as 27 mA at 72 MHz (executing from Flash)
 - Down to 2 uA in standby mode
 - Low voltage 2.0V-3.6V operation
- First class peripherals
 - 1 uS dual 12-bit A/D converter, 4 Mb/s UART, 18 Mb/s SPI, USB full-speed device, 18 MHz I/O toggling
- Maximum integration
 - Reset circuitry, LVD, voltage regulator, accurate RC
- Simple architecture and easy-to-use tools

Benefits ▶

- Up to 35 percent performance improvement and up to 45 percent better code density compared to an ARM7TDMI
- Excellent real-time performance and fast interrupt response
- Outstanding power efficiency for low power and portable applications

- Only seven external components required for a base system
- Easy development and fast time to market

STM32 Block Diagram



STM32 Evaluation Board (Order Code: STM3210B-EVAL)



Family Comparative Features ▶													
Part Number	Memory		Temperature °C	Package	Core Variant	Frequency (MHz)	A/D (channel/bits)	Timers (channels/bits)	Serial Interface(s) (#/Type)	GPIO	Ethernet (#/Type)	USB (#/Type)	Other Key Peripherals
	Flash/ROM (KB)	RAM (KB)											
STM32F101T6	32k	6k	-40 to +85	36QFN	-	36	1x12-bit	2x16-bit	1xSPI, 1xI ² C, 2xUSART	26	-	-	2xWDG, Temp Sensor
STM32F101T8	64k	10k	-40 to +85	36QFN	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	26	-	-	2xWDG, Temp Sensor
STM32F101C6	32k	6k	-40 to +85	LQFP48	-	36	1x12-bit	2x16-bit	1xSPI, 1xI ² C, 2xUSART	36	-	-	2xWDG, RTC, Temp Sensor
STM32F101C8	64k	10k	-40 to +85	LQFP48	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	36	-	-	2xWDG, RTC, Temp Sensor
STM32101CB	128k	16kB	-40 to +85	LQFP48	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	36	-	-	2xWDG, RTC, Temp Sensor
STM32F101R6	32k	6k	-40 to +85	LQFP64	-	36	1x12-bit	2x16-bit	2xSPI, 2xI ² C, 3xUSART	51	-	-	2xWDG, RTC, Temp Sensor
STM32F101R8	64k	10k	-40 to +85	LQFP64	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	51	-	-	2xWDG, RTC, Temp Sensor
STM32F101RB	128k	16k	-40 to +85	LQFP64	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	51	-	-	2xWDG, RTC, Temp Sensor
STM32F101V8	64k	10k	-40 to +85	LQFP100	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	80	-	-	2xWDG, RTC, Temp Sensor
STM32F101VB	128k	16k	-40 to +85	LQFP100	-	36	1x12-bit	3x16-bit	2xSPI, 2xI ² C, 3xUSART	80	-	-	2xWDG, RTC, Temp Sensor
STM32F103T6	32k	10k	-40 to 85 or +105	36QFN	-	72	2x12-bit	3x16-bit	1xSPI, 1xI ² C, 2xUSART, USB, CAN	26	-	Device 2.0	2xWDG, Temp Sensor
STM32F103T8	64k	20k	-40 to 85 or +105	36QFN	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	26	-	Device 2.0	2xWDG, Temp Sensor
STM32F103C6	32k	10k	-40 to 85 or +105	LQFP48	-	72	2x12-bit	3x16-bit	1xSPI, 1xI ² C, 2xUSART, USB, CAN	36	-	Device 2.0	2xWDG, RTC, Temp Sensor
STM32F103C8	64k	20k	-40 to 85 or +105	LQFP48	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	36	-	Device 2.0	2xWDG, RTC, Temp Sensor
STM32F103CB	128k	20k	-40 to 85 or +105	LQFP48	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	36	-	Device 2.0	2xWDG, RTC, Temp Sensor
STM32F103R6	32k	10k	-40 to 85 or +105	LQFP64	-	72	2x12-bit	3x16-bit	1xSPI, 2xI ² C, 3xUSART, USB, CAN	51	-	Device 2.0	2xWDG, RTC, Temp Sensor
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STM32F103RB	128k	20k	-40 to 85 or +105	LQFP64	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	51	-	Device 2.0	2xWDG, RTC, Temp Sensor
STM32F103V8	64k	20k	-40 to 85 or +105	LQFP100, BGA100	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	80	-	Device 2.0	2xWDG, RTC, Temp Sensor
STM32F103VB	128k	20k	-40 to 85 or +105	LQFP100, BGA101	-	72	2x12-bit	4x16-bit	2xSPI, 2xI ² C, 3xUSART, USB, CAN	80	-	Device 2.0	2xWDG, RTC, Temp Sensor

STM32F10x: First Two Product Lines

Both lines include up to:

Up to 128 KB Flash
3 x USART
2 x SPI
2 x I ² C
3 x 16-bit timers
Main osc, 4-16 MHz
Internal 8 MHz RC and 32 kHz RC
Real-time clock
2 x watchdogs
Reset circuitry
Power on/down reset
Voltage detector
7 channels DMA
80% GPIO ratio

Performance line STM32F103

72 MHz CPU	Up to 20 KB SRAM	2 x 12-bit ADC (1 µs) Temp sensor	USB 2.0 FS	CAN 2.0 B	PWM timer
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Access line STM32F101

36 MHz CPU	Up to 16 KB SRAM	1 x 12-bit ADC (1 µs) Temp sensor			
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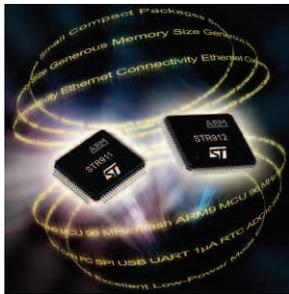
Pin compatible larger memory options of the Performance and Access lines will be available in Q2 2008 (Flash memory up to 512 KB and SRAM up to 64 KB). Selected sales types of these new versions will include a DAC, FSMC, I²S, SDIO, additional PWM timers and up to 3x A/D converter. New package options will be available in 144 LQFP.

For more information on Arrow's ARM solutions, pricing, and availability, visit www.arrow.com/arm or call 1-866-910-3650.



STR910FA

Core: [ARM966E-S](#)



The STR910FA family of MCUs delivers up to 96 MIPS peak performance while executing code directly from its Flash memory, executes single-cycle DSP instructions within its ARM966E-S® core, and includes Ethernet, USB, and CAN interfaces. These features, combined with Flash memory

sizes reaching 2.1 MB and a vast 96 KB SRAM, make the STR910FA an ideal single-chip solution to transform embedded control applications into low-cost nodes on a local network, or on the Internet.

Based on Autobench™ test suite from Embedded Microprocessor Benchmark Consortium (EEMBC®), STR9 registered more than 36 percent performance gain over high-end Flash ARM7-based MCUs for the same Autobench tests. Refer to www.eembc.org.

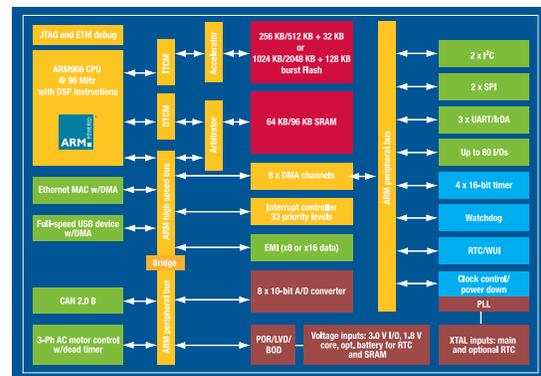
Features ▶

- 96 MHz ARM966E-S core with single-cycle DSP instructions and independent 32-bit code and data buses
- 10/100 Ethernet connectivity with optimized DMA data flow
- Up to 96 KB SRAM and up to 2176 KB of dual bank Flash
- BGA144 package supports synchronous and asynchronous memories
- USB, CAN, SPI, I²C, UART/IrDA, timers, and up to 80 5V-tolerant GPIO. 10-bit A/D converter and full supervisor functions
- Flexible power and clock management including a low-power (<1 µA typ, 1.2 µA max) real-time clock
- Extensive firmware support and tools offering

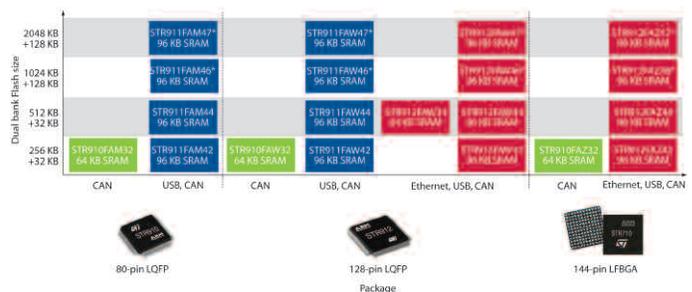
Benefits ▶

- 96 MIPS peak performance executing code from Flash memory
- 384 MB/s DMA data flow between peripherals and SRAM
- Network connectivity with CPU performance available for application
- Plentiful memory for complex applications, RTOSs, communication stacks, and data storage; dual bank Flash for IAP and EEPROM emulation
- Enhanced data transfer through burst mode support
- Broad connectivity to meet application needs today and tomorrow while minimising overall component count
- Balance performance and power consumption as needed
- Dramatically reduces development time

STR910FA Block Diagram



From 288 KB up to 2176 KB Flash memory, all devices are pin-to-pin compatible



For more information on Arrow's ARM solutions, pricing, and availability, visit www.arrow.com/arm or call 1-866-910-3650.



STM32 and STR910FA ARM Microcontroller Development Tool Overview

Core: Cortex-M3 and ARM966



STMicroelectronics' STM32 and STR910FA families of 32-bit ARM core-based microcontrollers are supported by a complete range of high-end and low-cost Evaluation, Software, Debugging and Programming tools. This complete line includes

third-party solutions that come complete with an integrated development environment and in-circuit debugger/programmer

featuring JTAG application interface. Developers who are new to these families and the Cortex™-M3 and ARM966 cores can also benefit from the range of starter kits that are specially designed to help developers evaluate device features and start their own applications. Thanks to ST firmware libraries and a comprehensive set of application notes, the STM32 and STR910FA microcontrollers offer total software control and improved time to market. The superb combination of the state-of-the-art and efficient library of software drivers and extensive support for all major tool providers offers a fast route to best-fit and an optimized development process.



STM32 Development Tools Matrix ▶

Tool Name	Description	Part Number
STM32 Evaluation Board	ST evaluation board implementing the complete range peripherals and features for the STM32F10x (128K) devices	STM3210B-EVAL
STM32 Primer	STM32 Primer is a unique, fun introductory development tool package with RIDE development environment, GNU C/C++ compiler, and stimulating learning and development platform with integrated debugging/programming capability via USB	STM3210B-PRIMER
STM32 Performance Stick	STM32-PerformanceStick is an innovative, low cost evaluation and development tool that offers a window on the performance of the STM32. It includes integrated debugging/programming capability via USB and unlimited Hitex HiTOP5 and Tasking VX C compiler	STM3210B-PFSTICK
STM32 Motor Control Starter Kit	STM32 Motor control starter kit complete development kit with ready to run vector motor control demo includes firmware, control board, three-phase inverter board, isolation board (AI-JTAG/OPTO-1), Segger J-Link debugger/programmer and 24 V DC Shinano PMSM motor	STM3210B-MCKIT
Hitex STM32 Starter Kit	Hitex STM32 starter kit with HiTOP5, Tasking VX C/C++ compiler, USB stick with integrated in-circuit debugging/programming capabilities and extension board with evaluation features	STM3210B-SK/HIT
IAR Kit Start Kit	IAR KickStart Kit™ for STM32 with IAR Embedded Workbench for ARM, IAR C/C++ compiler, J-Link (USB/JTAG) in-circuit debugger/programmer and evaluation board	STM3210B-SK/IAR
Keil STM32 Starter Kit	Keil STM32 starter kit with RealView Microcontroller Development Kit for ARM (uVision3 and ARM C/C++ compiler), ULINK (USB/JTAG) in-circuit debugger/programmer and evaluation board	STM3210B-SK/KEIL
Reva STM32 Starter Kit	Raisonance REva starter kit for STM32 with RIDE, GNU C/C++ compiler, RLink (USB/JTAG) in-circuit debugger/programmer, demonstration mother board and daughter board with target MCU	STM3210B-SK/RAIS
STM32 Firmware Library	Implements all standard STM32 peripherals and features	Download www.st.com/mcu
STM32 USB Developers Kit	A complete firmware package for painless implementation of USB interfaces in any STM32 application	Download www.st.com/mcu
Embedded Operating Systems	STM32 is supported by a range of small-footprint operating systems to meet a variety of applications from low-cost to high-security. This also includes a range of embedded stack solutions for the implementation of USB, graphical interfaces and much more	See www.st.com/mcu for up-to-date listing of RTOSs

STM91XFA Development Tools Matrix ▶

Type	Description	Part Number
STR910 Evaluation Board	STR91xF board with Ethernet, USB, CAN, ADC, IrDA, motor control and more	STR910-EVAL
Hitex STR910 Starter Kit	Full-featured evaluation board with a STR912 microcontroller, ULINK in-circuit debugger/programmer, uVision3 development environment, RealView Compilation Tools (RVCT) (output of code up to 16 KB), sample projects for a range of device peripherals	STR91X-SK/HIT
IAR STR910 Starter Kit	The KickStart tool packages include a full-featured evaluation board with a STR912 microcontroller, J-Link in-circuit debugger/programmer, Embedded Workbench® for ARM (EWARM), IAR C/C++ Compiler (output of code up to 32 KB), sample projects for a range of device peripherals	STR91X-SK/IAR
Keil STR910 Starter Kit	Full-featured evaluation board with a STR912 microcontroller, ULINK in-circuit debugger/programmer, uVision3 development environment, RealView Compilation Tools (RVCT) (output of code up to 16 KB)	STR91X-SK/IAR
Reva STR910 Starter Kit	Raisonance REva starter kit for STM32 with RIDE, GNU C/C++ compiler for output and debug of code up to 16 KB, RLink (USB/JTAG) in-circuit debugger/programmer, demonstration mother board and daughter board with target MCU for output and debug of code up to 16 KB	STR91X-SK/RAI
STR9-Comstick	Low-cost evaluation and development kit for networked embedded applications (Ethernet, USB)	STR9-COMSTICK
STM91X Standard Firmware Library	Implements all standard STR91XFA peripherals and features	Download www.st.com/mcu
STM91X USB Developers Kit	A complete firmware package for painless implementation of USB interfaces in any STR91X application	Download www.st.com/mcu
Embedded Operating Systems	STM91X is supported by a range of small-footprint operating systems to meet a variety of applications from low-cost to high-security. This also includes a range of embedded stack solutions for the implementation of USB, graphical interfaces and much more	See www.st.com/mcu for an up-to-date listing of RTOSs

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