STM32 F0 series
Entry-level Cortex™-M0 MCU

STM32 Releasing your **creativity**

STM32 F0

STMicroelectronics

STM32® DNA at budget price

The STM32 F0 delivers 32-bit performance and STM32 DNA essentials into applications typically addressed by 8- or 16-bit microcontrollers.

The STM32 F0 benefits from the combination of real-time performance, low-power operation, advanced architecture and peripherals associated to the STM32 ecosystem. All these have made the well-known STM32 a reference in the market. Now all this is accessible for cost-sensitive applications.

The STM32 F0 offers unparalleled flexibility and scalability for home-entertainment products, appliances and industrial equipment.

Key features

- Core and operating conditions
  - ARM® Cortex™-M0
    0.9 DMIPS/MHz up to 48 MHz
  - 1.8/2.0 to 3.6 V supply range
- High-performance connectivity
  - 6 Mbit/s USART
  - 18 Mbit/s SPI with 4- to 16-bit data frame
  - 1 Mbit/s I²C fast-mode plus
  - HDMI CEC
- Enhanced control
  - 16-bit 3-phase PWM motor control timer
  - 5x 16-bit PWM timers
  - 16-bit basic timer
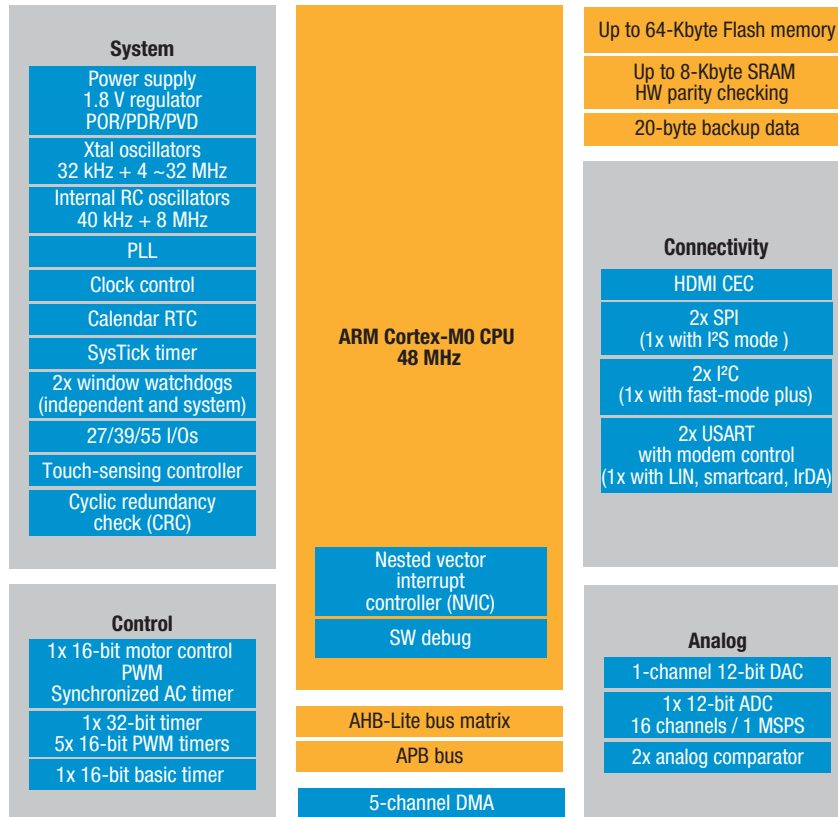 - 32-bit PWM timer
  - 12 MHz I/O toggling

Key benefits

- Superior code execution for higher performance and excellent code efficiency for reduced embedded memory usage
- High-performance connectivity and advanced analog peripherals to support a wide range of applications
- Flexible clock options and low-power modes with fast wake-up for low power consumption

Targeted applications

- Home automation
- Home appliances
- Motor control
- Sensors
- A/V receivers, TVs
- Remote controls
- Gaming

Block diagram

System

Power supply 1.8 V regulator POR/PDR/PVD
Xtal oscillators 32 kHz + 4 ~32 MHz
Internal RC oscillators 40 kHz + 8 MHz
PLL
Clock control
Calendar RTC
SysTick timer
2x window watchdogs (independent and system)
27/39/55 I/Os
Touch-sensing controller
Cyclic redundancy check (CRC)

Control

1x 16-bit motor control PWM Synchronized AC timer
1x 32-bit timer 5x 16-bit PWM timers
1x 16-bit basic timer

ARM Cortex-M0 CPU 48 MHz

Nested vector interrupt controller (NVIC)

SW debug

AHB-Lite bus matrix

APB bus

5-channel DMA

Up to 64-Kbyte Flash memory

Up to 8-Kbyte SRAM HW parity checking

20-byte backup data

Connectivity

HDMI CEC
2x SPI (1x with I²S mode)
2x I²C (1x with fast-mode plus)
2x USART with modem control (1x with LIN, smartcard, IrDA)

Analog

1-channel 12-bit DAC
1x 12-bit ADC 16 channels / 1 MSPS
2x analog comparator

Development tools

A complete development tool offer is available, including the following kits:

- Low-cost STM32 F0 Discovery kit (order code: STM32F0DISCOVERY)

- STM32 F0 evaluation board (order code: STM320518-EVAL)

- STM32 F0 starter kits from IAR will be available in Q3/2012

Device summary

Part number	Package	Flash size (Kbytes)	Internal RAM size (Kbytes)	16-bit timers	32-bit timers	Others	ADC 12-bit	DAC 12-bit	I/Os	Serial interface
STM32F051 - 48 MHz CPU with DAC										
STM32F051R8	LQFP64	64	8	8	1		16	1	55	1xSPI/I²S, 1xSPI, 2xI²C, 2xUSART (IrDA, ISO 7816), CEC
STM32F051C8	LQFP48	64	8	8	1		10	1	39	
STM32F051K8	UFQFPN32	64	8	8	1		10	1	27	
STM32F051R6	LQFP64	32	4	8	1	2 x WDG, RTC, 24-bit down counter	16	1	55	1xSPI/I²S, 1xI²C, 2xUSART (IrDA, ISO 7816), CEC
STM32F051C6	LQFP48	32	4	8	1		10	1	39	
STM32F051K6	UFQFPN32	32	4	8	1		10	1	27	
STM32F051R4	LQFP64	16	4	8	1		16	1	55	1xSPI/I²S, 1xI²C, 1xUSART (IrDA, ISO 7816), CEC
STM32F051C4	LQFP48	16	4	8	1		10	1	39	
STM32F051K4	UFQFPN32	16	4	8	1		10	1	27	
STM32F050 - 48 MHz CPU										
STM32F050C6	LQFP48	32	4	5	1	2 x WDG, RTC, 24-bit down counter	10	-	39	1xSPI, 1xI²S, 1xI²C, 1xUSART (IrDA, ISO 7816)
STM32F050K6	UFQFPN32	32	4	5	1		10	-	27	
STM32F050C4	LQFP48	16	4	5	1		10	-	39	
STM32F050K4	UFQFPN32	16	4	5	1		10	-	27	

Note: supply voltage 1.8/2.0 to 3.6 V for all devices