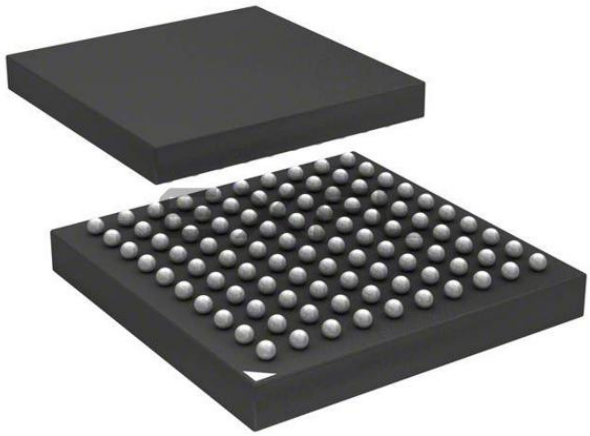

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## What is "Embedded - Microcontrollers"?

"Embedded - Microcontrollers" refer to small, integrated circuits designed to perform specific tasks within larger systems. These microcontrollers are essentially compact computers on a single chip, containing a processor core, memory, and programmable input/output peripherals. They are called "embedded" because they are embedded within electronic devices to control various functions, rather than serving as standalone computers. Microcontrollers are crucial in modern electronics, providing the intelligence and control needed for a wide range of applications.

## Applications of "Embedded - Microcontrollers"

| Details | |
|---|---|
| Product Status | Obsolete |
| Core Processor | ARM7® |
| Core Size | 32-Bit Single-Core |
| Speed | 60MHz |
| Connectivity | CANbus, I²C, SPI, SSI, SSP, UART/USART, USB |
| Peripherals | DMA, PWM, WDT |
| Number of I/O | 72 |
| Program Memory Size | 64KB (64K x 8) |
| Program Memory Type | FLASH |
| EEPROM Size | - |
| RAM Size | 16K x 8 |
| Voltage - Supply (Vcc/Vdd) | 3V ~ 5.5V |
| Data Converters | A/D 16x10b |
| Oscillator Type | Internal |
| Operating Temperature | -40°C ~ 85°C (TA) |
| Mounting Type | Surface Mount |
| Package / Case | 100-LFBGA |
| Supplier Device Package | - |
| Purchase URL | https://www.e-xfl.com/product-detail/stmicroelectronics/str750fv0h6 |

# 1 Description

The STR750 family of 32-bit microcontrollers combines the industry-standard ARM7TDMI® 32-bit RISC core, featuring high performance, very low power, and very dense code, with a comprehensive set of peripherals and ST's latest 0.18µ embedded Flash technology. The STR750 family comprises a range of devices integrating a common set of peripherals as well as USB, CAN and some key innovations like clock failure detection and an advanced motor control timer. It supports both 3.3V and 5V, and it is also available in an extended temperature range (-40 to +105°C). This makes it a genuine general purpose microcontroller family, suitable for a wide range of applications:

- Appliances, brushless motor drives
- USB peripherals, UPS, alarm systems
- Programmable logic controllers, circuit breakers, inverters
- Medical and portable equipment

# 2 Device overview

**Table 2. Device overview**

| Features | STR755FR0 STR755FR1 STR755FR2 | STR751FR0/ STR751FR1/ STR751FR2 | STR752FR0/ STR752FR1/ STR752FR2 | STR755FV0 STR755FV1/ STR755FV2 | STR750FV0/ STR750FV1/ STR750FV2 |
|---|---|---|---|---|---|
| Flash - Bank 0 (bytes) | 64K/128K/256K | | | | |
| Flash - Bank 1 (bytes) | 16K RWW | | | | |
| RAM (bytes) | 16K | | | | |
| Operating Temperature. | Ambient temp.:-40 to +85°C / -40 to +105°C (see *Table 49*)<br>Junction temp. -40 to + 125 °C (see *Table 10*) | | | | |
| Common Peripherals | 3 UARTs, 2 SSPs, 1 I2C, 3 timers 1 PWM timer, 38 I/Os 13 Wake-up lines, 11 A/D Channels | | | 3 UARTs, 2 SSPs, 1 $I^2C$, 3 timers 1 PWM timer, 72 I/Os 15 Wake-up lines, 16 A/D Channels | |
| USB/CAN peripherals | None | USB | CAN | None | USB+CAN |
| Operating Voltage | 3.3V or 5V | 3.3V | 3.3V or 5V | | |
| Packages (**x**) | **T**=LQFP64 10x10, **H**=LFBGA64 | | | **T**=LQFP100 14x14, **H**=LFBGA100 | |

### Serial memory interface (SMI)

The Serial Memory interface is directly able to access up to 4 serial FLASH devices. It can be used to access data, execute code directly or boot the application from external memory. The memory is addressed as 4 banks of up to 16 Mbytes each.

### Clocks and start-up

After RESET or when exiting from Low Power Mode, the CPU is clocked immediately by an internal RC oscillator (FREEOSC) at a frequency centered around 5 MHz, so the application code can start executing without delay. In parallel, the 4/8 MHz Oscillator is enabled and its stabilization time is monitored using a dedicated counter.

An oscillator failure detection is implemented: when the clock disappears on the XT1 pin, the circuit automatically switches to the FREEOSC oscillator and an interrupt is generated.

In Run mode, the AHB and APB clock speeds can be set at a large number of different frequencies thanks to the PLL and various prescalers: up to 60 MHz for AHB and up to 32 MHz for APB when fetching from Flash (64 MHz and 32 MHz when fetching from SRAM).

In SLOW mode, the AHB clock can be significantly decreased to reduce power consumption.

The built-in Clock Controller also provides the 48 MHz USB clock directly without any extra oscillators or PLL. For instance, starting from the 4 MHz crystal source, it is possible to obtain in parallel 60 MHz for the AHB clock, 48 MHz for the USB clock and 30 MHz for the APB peripherals.

### Boot modes

At start-up, boot pins are used to select one of five boot options:

- Boot from internal flash
- Boot from external serial Flash memory
- Boot from internal boot loader
- Boot from internal SRAM

Booting from SMI memory allows booting from a serial flash. This way, a specific boot monitor can be implemented. Alternatively, the STR750F can boot from the internal boot loader that implements a boot from UART.

### Power supply schemes

You can connect the device in any of the following ways depending on your application.

- Power Scheme 1: Single external 3.3V power source . In this configuration the $V_{CORE}$ supply required for the internal logic is generated internally by the main voltage regulator and the $V_{BACKUP}$ supply is generated internally by the low power voltage regulator. This scheme has the advantage of requiring only one 3.3V power source.
- Power Scheme 2: Dual external 3.3V and 1.8V power sources. In this configuration, the internal voltage regulators are switched off by forcing the VREG_DIS pin to high level. $V_{CORE}$ is provided externally through the $V_{18}$ and $V_{18REG}$ power pins and $V_{BACKUP}$ through the $V_{18\_BKP}$ pin. This scheme is intended to save power consumption for applications which already provide an 1.8V power supply.
- Power Scheme 3: Single external 5.0V power source. In this configuration the $V_{CORE}$ supply required for the internal logic is generated internally by the main voltage