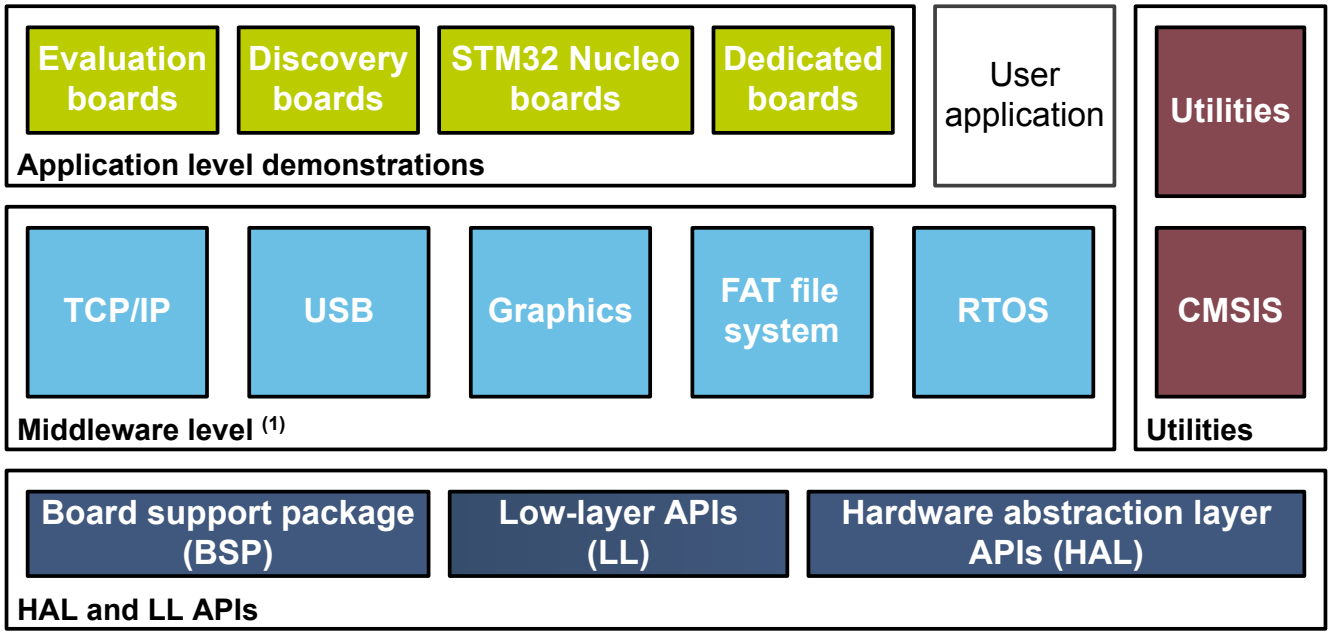
STM32Cube MCU Package for STM32F7 Series with HAL, low-layer drivers and dedicated middleware



(1) The set of middleware components depends on the product Series.

Product status link
STM32CubeF7

Features

- Consistent and complete embedded software offer that frees the user from dependency issues
- Maximized portability between all STM32 Series supported by STM32Cube
- Hundreds of examples for easy understanding
- High quality HAL and low-layer API drivers using CodeSonar® static analysis tool
- TouchGFX graphics software stack
- STM32F7-dedicated middleware including USB Host and Device, and TCP/IP
- Free user-friendly license terms
- Update mechanism that can be enabled by the user to be notified of new releases

1 Description

STM32Cube™ is an STMicroelectronics original initiative to make developers' lives easier by reducing development effort, time and cost. STM32Cube™ covers the whole STM32 portfolio.

STM32Cube™ includes STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.

It also comprises the STM32CubeF7 MCU Package composed of the STM32Cube™ hardware abstraction layer (HAL) and the low-layer (LL) APIs, plus a consistent set of middleware components (RTOS, USB, FAT file system, Graphics and TCP/IP). TouchGFX graphic software stack is also included in the STM32CubeF7 MCU Package as a part of the STM32Cube™ ecosystem. It is available free of charge for production and redistribution on STM32 microcontrollers.

All embedded software utilities are delivered with a full set of examples running on STMicroelectronics boards.

The STM32Cube™ HAL is an STM32 embedded software layer that ensures maximized portability across the STM32 portfolio, while the LL APIs make up a fast, light-weight, expert-oriented layer which is closer to the hardware than the HAL. HAL and LL APIs can be used simultaneously with a few restrictions.

Both the HAL and LL APIs are production-ready and have been developed in compliance with MISRA-C®:2004 guidelines with some documented exceptions (reports available on demand) and ISO/TS 16949. Furthermore, ST-specific validation processes add a deeper-level qualification.

The STM32CubeF7 gathers in one single package all the generic embedded software components required to develop an application on STM32F7 microcontrollers. Following STM32Cube™ initiative, this set of components is highly portable, not only within the STM32F7 Series but also to other STM32 Series. In addition, the low-layer APIs provide an alternative, high-performance, low-footprint solution to the STM32CubeF7 HAL at the cost of portability and simplicity.

HAL and LL APIs are available in open-source BSD license for user convenience.

2 License

STM32CubeF7 is delivered under the *Mix Ultimate Liberty+OSS+3rd-party V1* software license agreement (SLA0048).

The software components provided in this package come with different license schemes as shown in Table 1.

A set of application projects implementing all the middleware components is also provided in the STM32CubeF7 MCU Package.

Table 1. Software component license agreements

Software component	Owner	License
Board Support Package (BSP)	STMicroelectronics	BSD 3-Clause
Cortex®-M CMSIS v4.5.0	Arm®	BSD 3-Clause
FreeRTOS™	Real Time Engineers Ltd.	Modified GNU GPL(1)
STM32F7 HAL/LL APIs	STMicroelectronics	BSD 3-Clause
LwIP	Swedish Institute of Computer Science	BSD 3-Clause
mbedTLS	Arm®	Apache License - Version 2.0
Application projects	STMicroelectronics	SLA0044 (source release)
Example projects	STMicroelectronics	BSD 3-Clause
Demonstration projects	STMicroelectronics	SLA0044 (source release)
STemWin	Segger	SLA0047 (binary release)
PDM2PCM Library	STMicroelectronics	SLA0047 (binary release)
USB Host library	STMicroelectronics	SLA0044 (source release)
USB Device library	STMicroelectronics	SLA0044 (source release)
TouchGFX	STMicroelectronics	SLA0044 (binary release)
FatFS	Portions ST	SLA0044 (source release)
	Portion ChaN	FatFS License(2)
LibJPEG	Portions STMicroelectronics	BSD 3-Clause
	Thomas G. Lane, Guido Vollbeding	Independent JPEG Group License(2)
Utilities (CPU - Fonts - JPEG - Log)	STMicroelectronics	BSD 3-Clause

1. *The FreeRTOS™ source code is licensed by a modified GNU General Public License, the modification taking the form of an exception. The exception permits the source code of applications that use FreeRTOS™ and are distributed as executables to remain closed source, thus permitting the use of FreeRTOS™ in commercial applications without necessitating that the whole application to be open sourced.*
2. *The FatFS License and Independent JPEG Group License are business friendly and permissive open source licenses.*

Note: Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

3 Ordering information

The STM32CubeF7 is available for free download from http://www.st.com/stm32cubefw.

Revision history

Table 2. Document revision history

Date	Version	Changes
28-May-2015	1	Initial release.
23-Jun-2017	2	Updated STM32CubeF7 firmware component schematic on cover page. Added low-layer API drivers. Updated document title.
1-Dec-2017	3	Updated title and schematic. Updated Section Features, Section 1 Description and Section 2 License to introduce the 'STM32CubeF7 MCU Package' denomination.
30-Jan-2019	4	Added TouchGFX in Section Features, Section 1 Description and Section 2 License. Updated Section 1 Description to latest version. Renamed STM32CubeF7 MCU Package into Section 2 License and updated content to describe all software component license agreements. Added Arm notice in Section 2 License.