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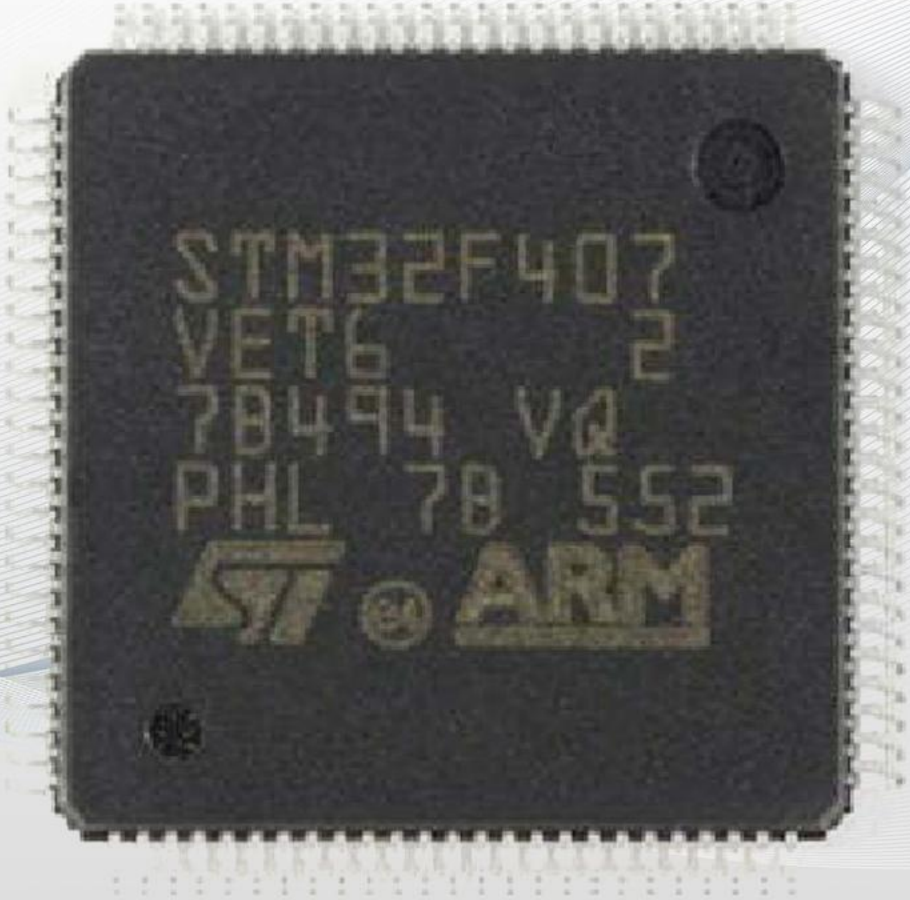

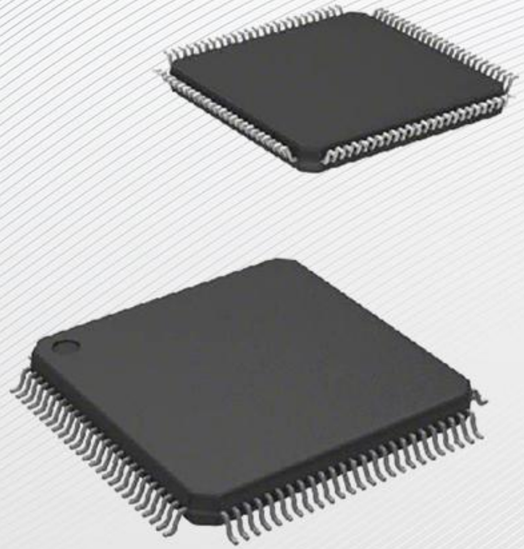

STM32F407VET6 MICROCONTROLLER OVERVIEW

Overview of STM32F407VET6

The STM32F407VET6 microcontroller is a powerful, feature-rich, and versatile device that has become a popular choice for embedded system applications. Its Cortex-M4 core provides performance capabilities for complex tasks, while its wide range of peripherals enables it to interface with a variety of external components.

What is the Frequency of STM32F407VET6?

The STM32F407VET6 is based on an ARM Cortex-M4 core, which is capable of operating at frequencies up to 168 MHz. It features 4KB of instruction and data caches, as well as a Floating Point Unit (FPU).

STM32F407VET6 Applications

Industrial automation: control machinery and processes.

Robotics: control their movements and actions.

Consumer electronics: such as smartphones, tablets, and smart home devices.

Automotive: such as engine control, anti-lock brakes, and infotainment systems.

Medical devices: such as patient monitors, infusion pumps, and diagnostic equipment.

STM32F407VET6 Applications

Communication systems: such as routers, switches, and wireless access points.

Aerospace and defense: such as navigation systems, avionics, and missile guidance systems.

Audio and video equipment: such as amplifiers, mixers, and video processors.

Gaming systems: such as consoles and handheld devices.

Internet of Things (IoT): such as smart sensors, gateways, and controllers.

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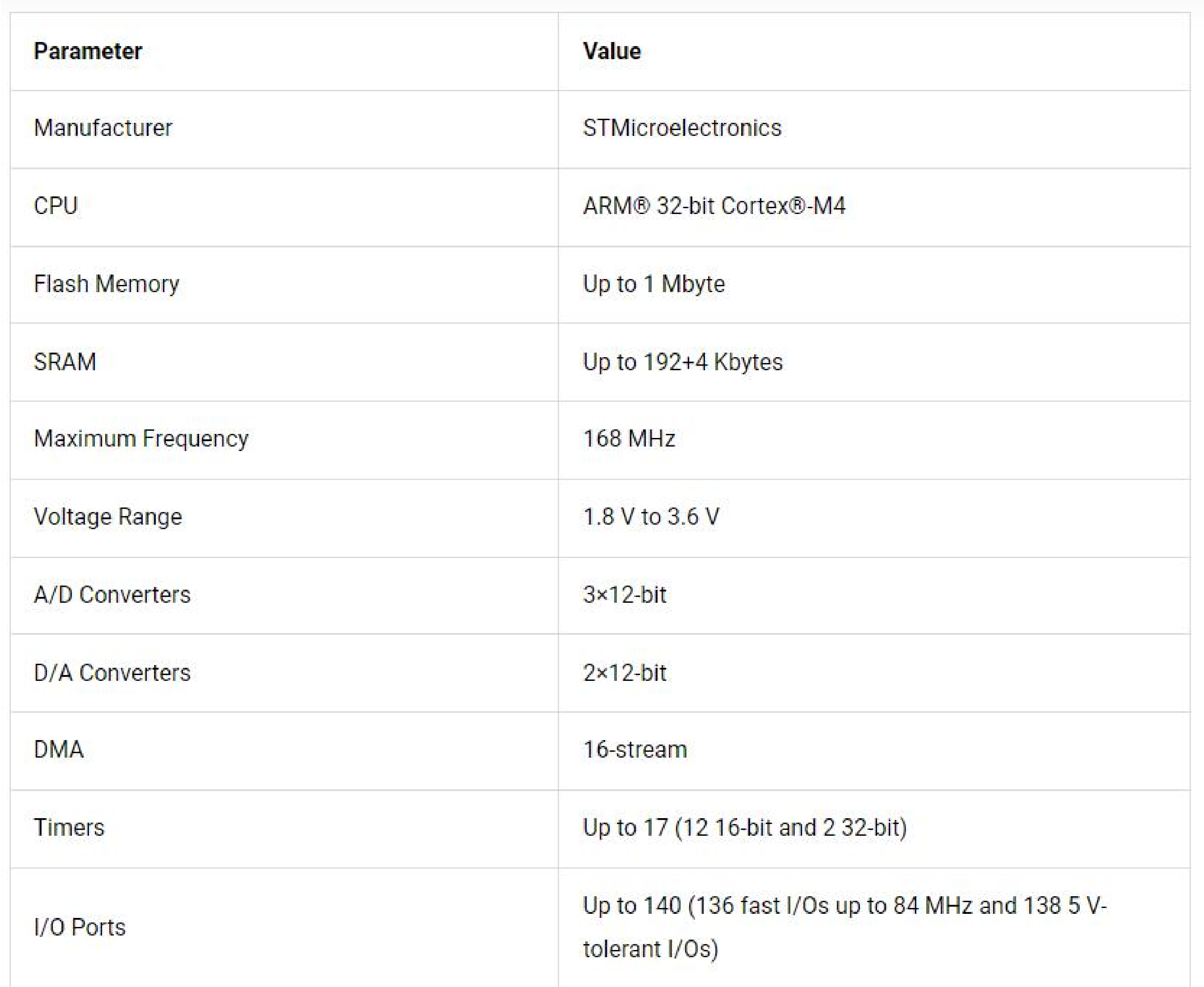
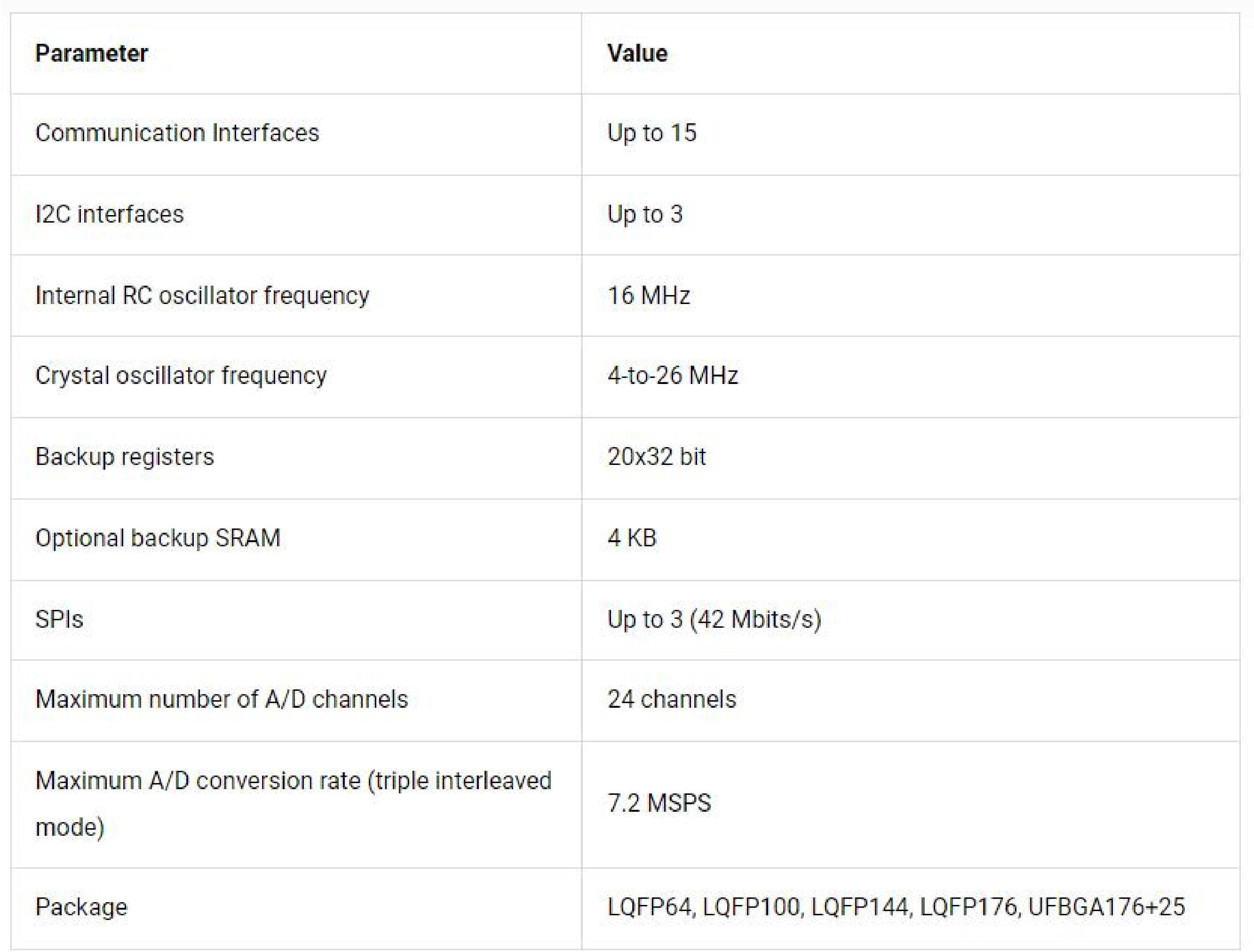
STM32F407VE Specification



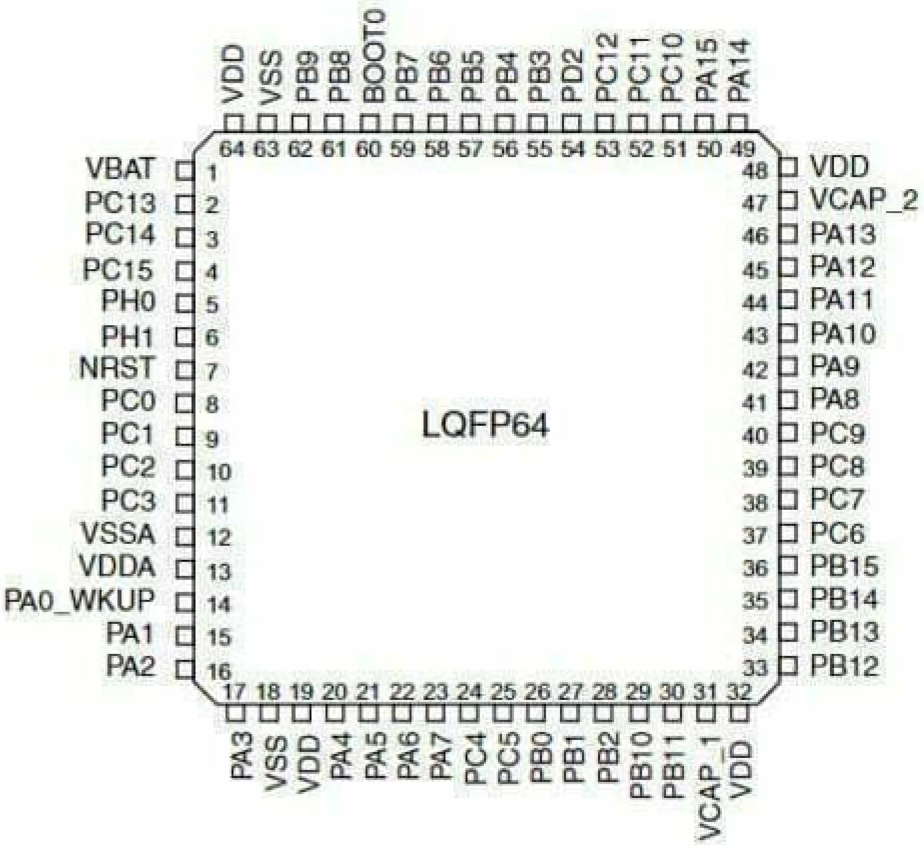
Parameter	Value
Manufacturer	STMicroelectronics
CPU	ARM® 32-bit Cortex®-M4
Flash Memory	Up to 1 Mbyte
SRAM	Up to 192+4 Kbytes
Maximum Frequency	168 MHz
Voltage Range	1.8 V to 3.6 V
A/D Converters	3×12-bit
D/A Converters	2×12-bit
DMA	16-stream
Timers	Up to 17 (12 16-bit and 2 32-bit)
I/O Ports	Up to 140 (136 fast I/Os up to 84 MHz and 138 5 V-tolerant I/Os)

STM32F407VE Specification



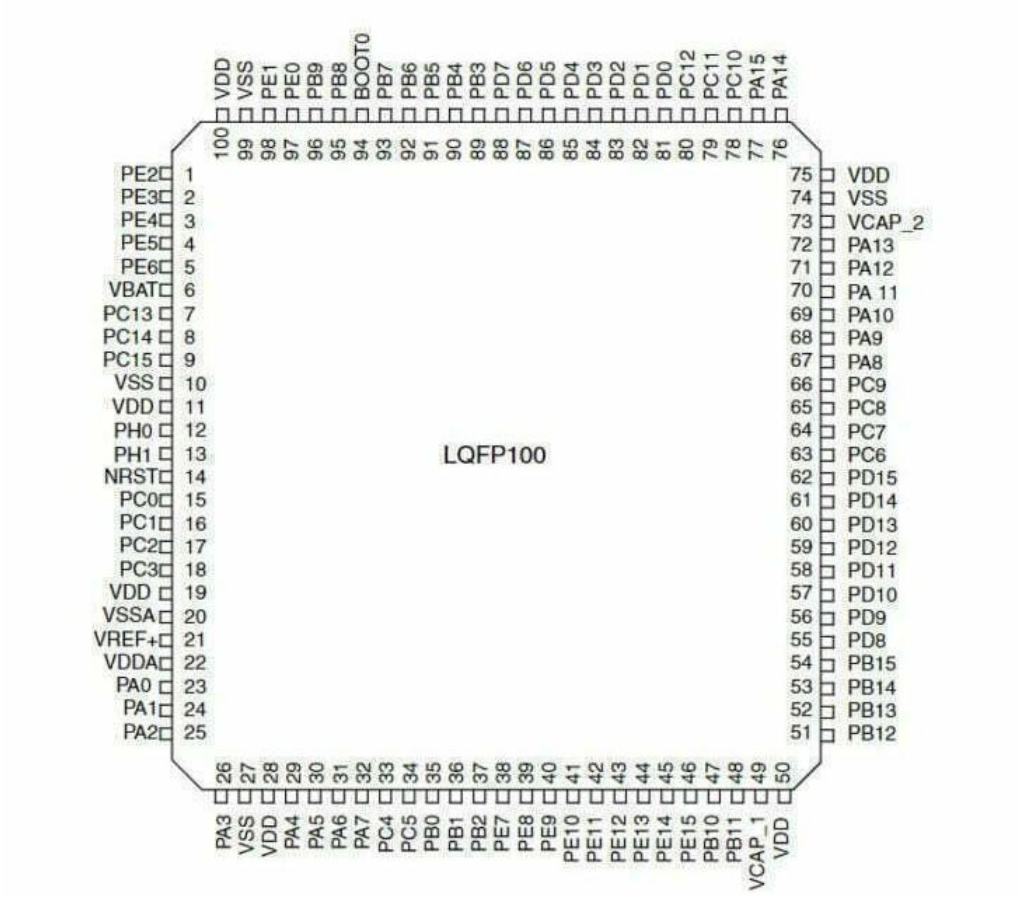
Parameter	Value
Communication Interfaces	Up to 15
I2C interfaces	Up to 3
Internal RC oscillator frequency	16 MHz
Crystal oscillator frequency	4-to-26 MHz
Backup registers	20x32 bit
Optional backup SRAM	4 KB
SPIs	Up to 3 (42 Mbits/s)
Maximum number of A/D channels	24 channels
Maximum A/D conversion rate (triple interleaved mode)	7.2 MSPS
Package	LQFP64, LQFP100, LQFP144, LQFP176, UFBGA176+25

STM32F407VET6 Pinout



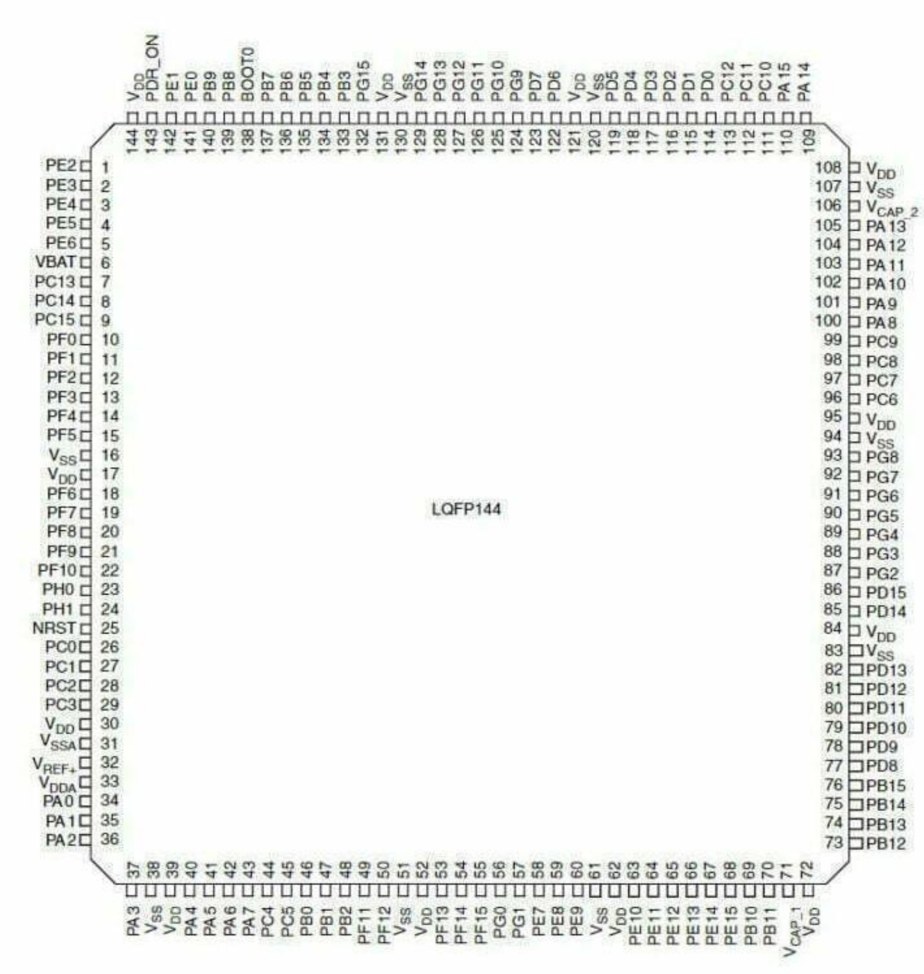
STM32F407VET6 Pinout (LQFP64)

STM32F407VET6 Pinout



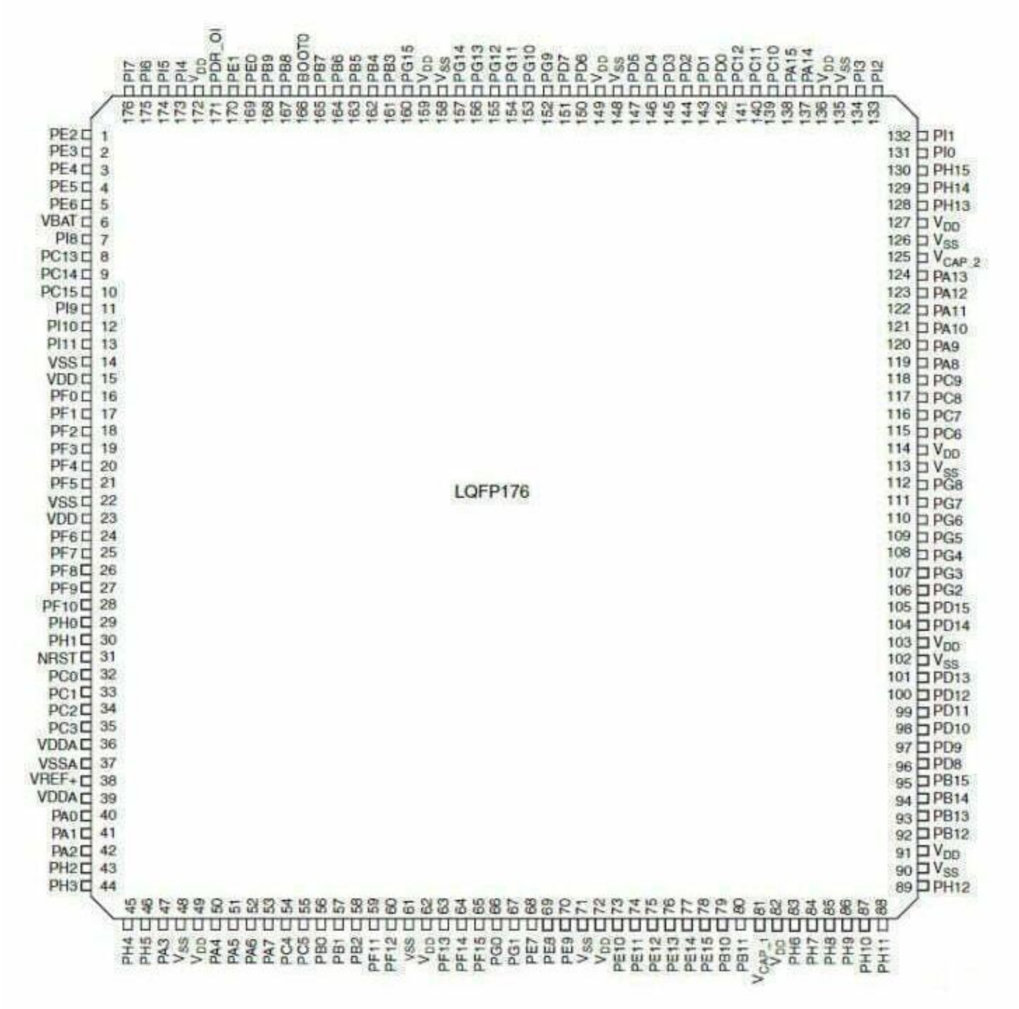
STM32F407VET6 Pinout (LQFP100)

STM32F407VET6 Pinout



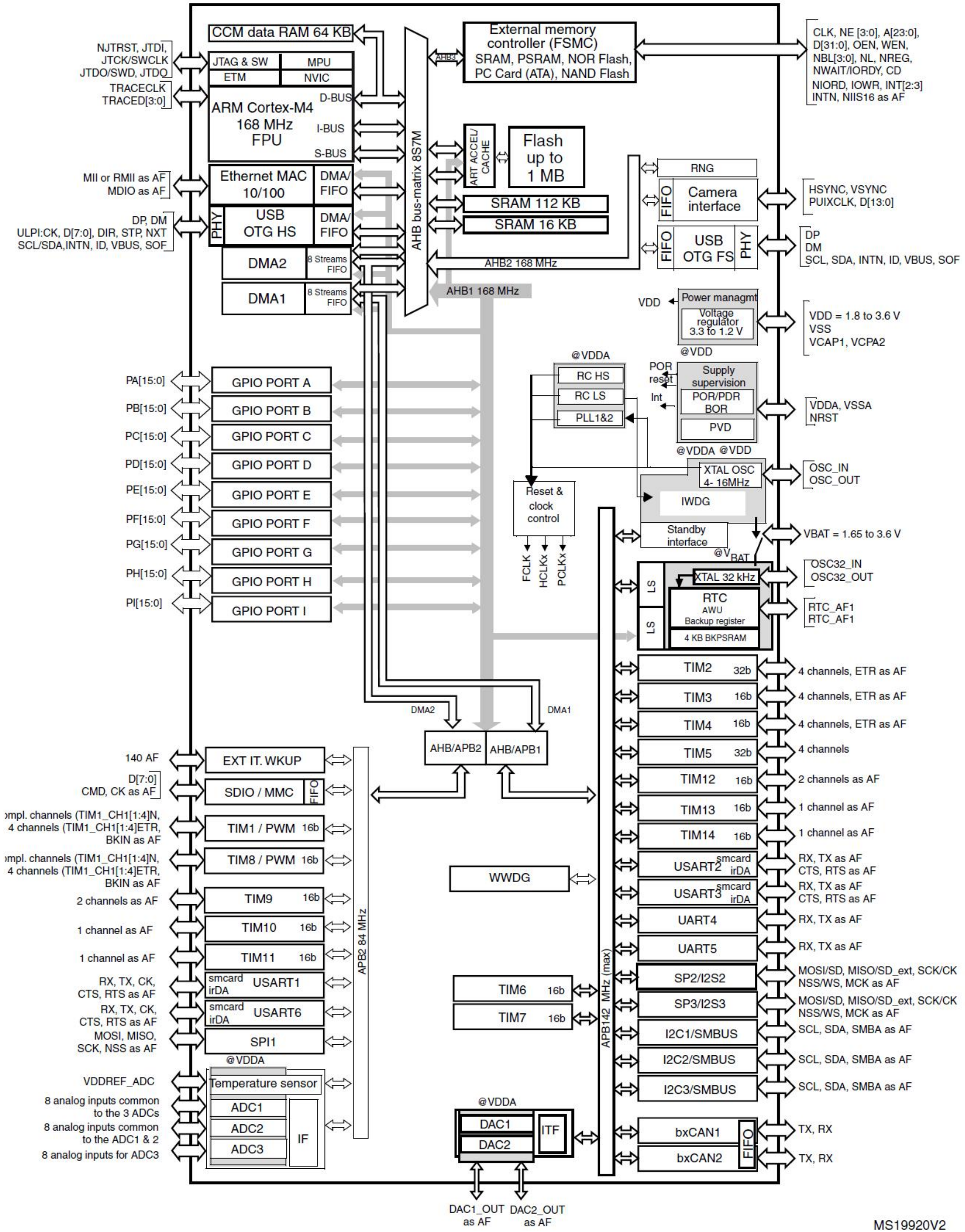
STM32F407VET6 Pinout (LQFP144)

STM32F407VET6 Pinout



STM32F407VET6 Pinout (LQFP176)

STM32F407VET6 Block Diagram

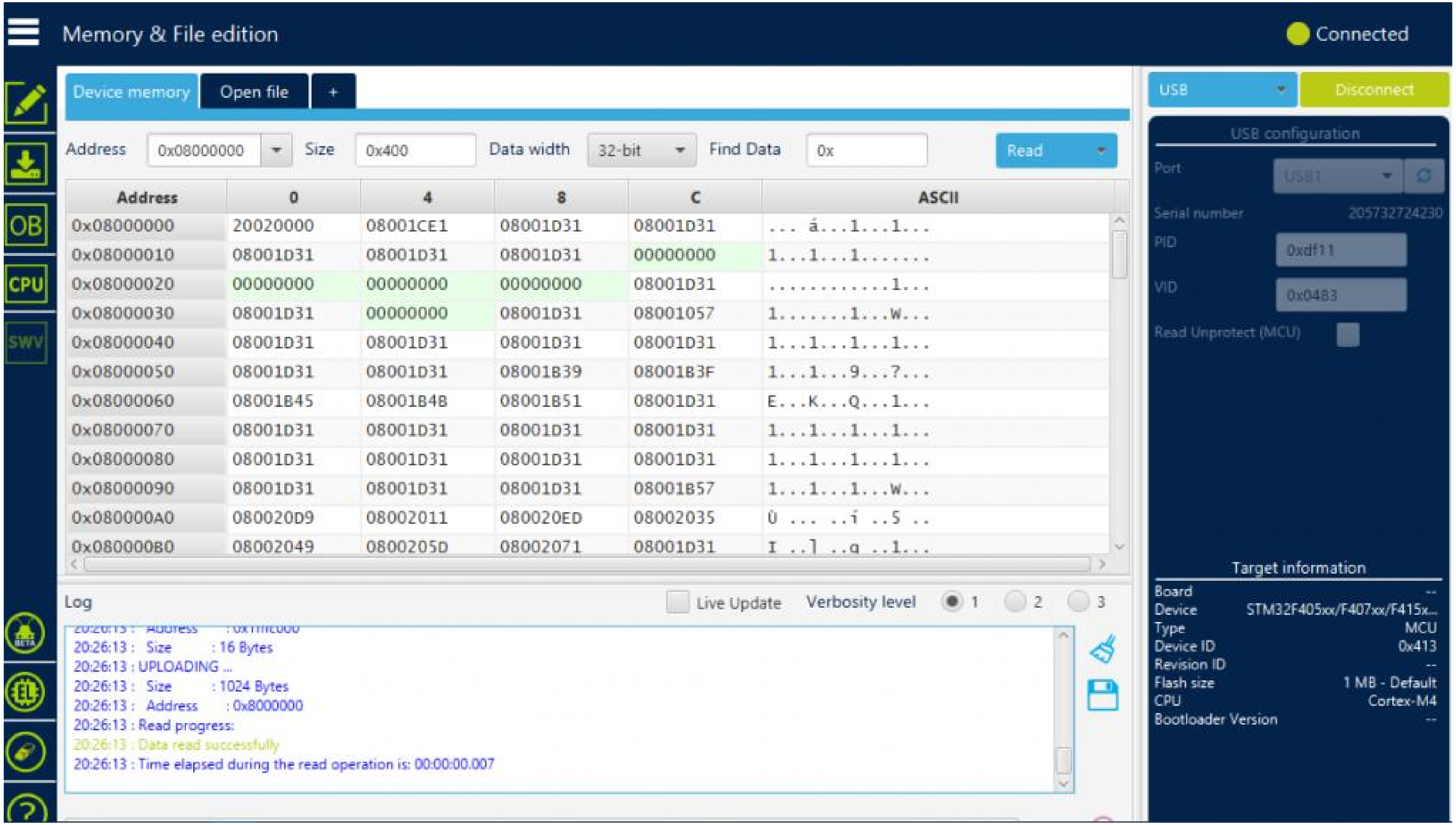


Programming STM32F407VET6 using Arduino IDE

Procedure:

1. STM32CubeProgrammer software: Install STM32CubeProg software tool.
2. Install Arduino IDE.
3. Add this package in the preference of Arduino IDE.
4. Go to Board Manager and Install STM32 Core Boards.
5. Install DfuSe on your pc.
6. Update driers for STM boot Loader through device manager.
7. DFU mode is often selected by connecting Boot0 pin to 3.3v and Boot1 pin to GND.
8. Select USB for communication using STMCubeMX software.

Programming STM32F407VET6 using Arduino IDE



Address 0x08000000 Size 0x400 Data width 32-bit Find Data 0x

Address	0	4	8	C	ASCII
0x08000000	20020000	08001CE1	08001D31	08001D31	... á...1...1...
0x08000010	08001D31	08001D31	08001D31	00000000	1...1...1.......
0x08000020	00000000	00000000	00000000	08001D31	............1...
0x08000030	08001D31	00000000	08001D31	08001057	1.......1...W...
0x08000040	08001D31	08001D31	08001D31	08001D31	1...1...1...1...
0x08000050	08001D31	08001D31	08001B39	08001B3F	1...1...9...?...
0x08000060	08001B45	08001B4B	08001B51	08001D31	E...K...Q...1...
0x08000070	08001D31	08001D31	08001D31	08001D31	1...1...1...1...
0x08000080	08001D31	08001D31	08001D31	08001D31	1...1...1...1...
0x08000090	08001D31	08001D31	08001D31	08001B57	1...1...1...W...
0x080000A0	080020D9	08002011	080020ED	08002035	Ù ... ..í ..5 ..
0x080000B0	08002049	0800205D	08002071	08001D31	I ..] ..q ..1...

Log □ Live Update Verbosity level ● 1 ○ 2 ○ 3

```
20:26:13 :   Address      : 0x1fffc000
20:26:13 :   Size         : 16 Bytes
20:26:13 : UPLOADING ...
20:26:13 :   Size         : 1024 Bytes
20:26:13 :   Address      : 0x8000000
20:26:13 : Read progress:
20:26:13 : Data read successfully
20:26:13 : Time elapsed during the read operation is: 00:00:00.007
```

USB configuration

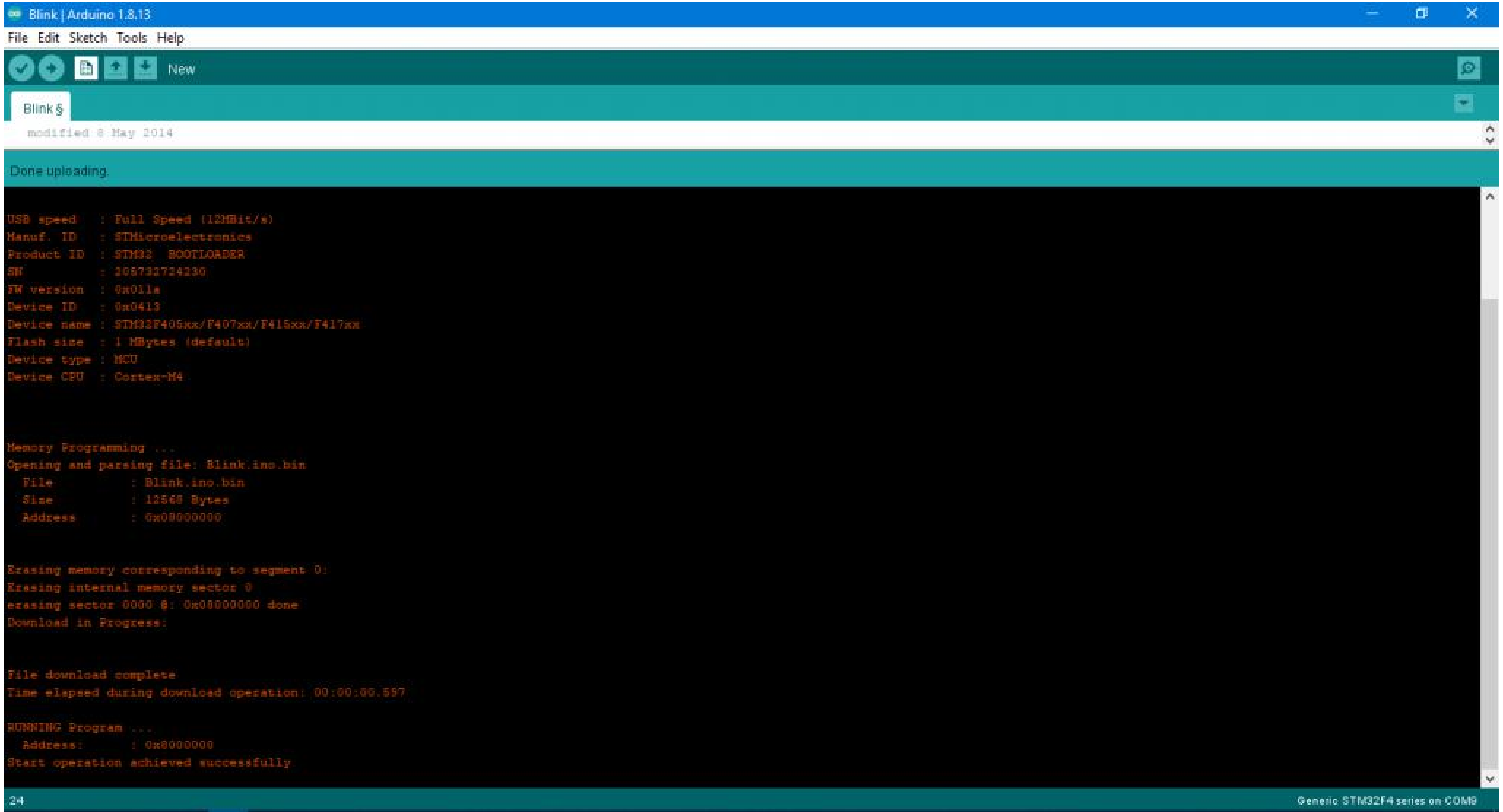
Port: USB1
Serial number: 205732724230
PID: 0xdf11
VID: 0x0483
Read Unprotect (MCU) □

Target information

Board	--
Device	STM32F405xx/F407xx/F415x...
Type	MCU
Device ID	0x413
Revision ID	--
Flash size	1 MB - Default
CPU	Cortex-M4
Bootloader Version	--

Programming STM32F407VET6 using Arduino IDE

9. Select proper board, port and upload method as DFU in Arduino IDE.



Done uploading.

```
USB speed    : Full Speed (12MBit/s)
Manuf. ID    : STMicroelectronics
Product ID   : STM32  BOOTLOADER
SN           : 205732724230
FW version   : 0x011a
Device ID    : 0x0413
Device name  : STM32F405xx/F407xx/F415xx/F417xx
Flash size   : 1 MBytes (default)
Device type  : MCU
Device CPU   : Cortex-M4



Memory Programming ...
Opening and parsing file: Blink.ino.bin
  File          : Blink.ino.bin
  Size          : 12568 Bytes
  Address       : 0x08000000



Erasing memory corresponding to segment 0:
Erasing internal memory sector 0
erasing sector 0000 @: 0x08000000 done
Download in Progress:



File download complete
Time elapsed during download operation: 00:00:00.557

RUNNING Program ...
  Address:      : 0x8000000
Start operation achieved successfully
```

Programming STM32F407VET6 using Arduino IDE

Procedure:

10. Define the inbuilt LEDs. Onboard LEDs on STM32F407VET6 are PA6, PA7.
11. Upload the Blink Code.
12. Now you are all set to program STM through Arduino IDE.