



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.



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 (LQFP64)





STM32F407VET6 Pinout (LQFP100)



		Vpp	PDR_ON	PE1	PEO	DHO		PD0	ROOID	PB7	PB6	PB5	PB4	PB3	PG15	Vpo	Vss	PG14	PG13	PG12	PG11	PG10	PG9	PD7	PD6	Vnn	Ves	PD5	PD4	PD3	PD2	PD1	PDO	PC12	PC11	PC10	PA 15	PA 14			
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STM32F407VET6 Pinout (LQFP144)



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PI10 12																								1	121 D PA10
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PF2L 10																									15 L PC6
PF3L 19																									14 E VDD
PF4 L 20																								1	13 PVSS
PF5 [21									10	OFF	176														12 p PG8
VSS Q 22									200		1003														111 P PG7
VDD C 23																								1	10 D PG6
PF6 C 24																								1	109 D PG5
PF7 C 25																								1	108 b PG4
PF8C 26																								1	107 D PG3
PF9 27																									106 D PG2
PF10 28																								-	105 FIPO15
PHOE 29																									104 FIPD14
PH1 0 30																								-	Ing EV-
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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 0x080	00000 - Size	0x400	Data width	32-bit •	Find Data	Ox	Read •		B configuration
1								Port	USB1 -
Address	0	4	8	c	li i	ASCI	1	Serial number	205732
0x08000000	20020000	08001CE1	08001D31	0800103		a11		PID	Constant.
0x08000010	08001D31	08001D31	08001D31	0000000	1	.11			UXUFF
0x08000020	00000000	00000000	00000000	08001D3		1		VID	0x0483
0x08000030	08001D31	00000000	08001D31	0800105	7 1	l		Read Universited	+ (MCU)
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0x08000060	08001B45	08001B4B	08001B51	08001D3	E	.KQ1			
0x08000070	08001D31	08001D31	08001D31	08001D3	1 1	.111			
0x08000080	08001D31	08001D31	08001D31	0800103	1 1	.111			
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Programming STM32F407VET6 using Arduino IDE

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

🥺 Blink Arduino 1.8.13			×
File Edit Sketch Tools Help		and other	
Blink§			
modified 8 May 2014			
Done uploading.			
USB speed : Full Speed (12HBit/s)			
Manuf. ID : STMicroelectronics			
Product ID : STM32 BOOTLOADER			
an : 20972724230			
Device ID = 0:00413			
Device name : STM33F405xx/F417xx			
Flash size : 1 MBytes (default)			
Device type : HCU			
Device CPU : Cortex-N4			
Memory Programming			
Opening and parsing file: Blink inc.bin			
File : Blink.ing.bin			
Size : 12560 Bytes			
Addzess : Gx08000000			
Frasing semony corresponding to segment 0:			
Erasing internal memory sector 0			
erasing sector 0000 8: 0x00000000 done			
Download in Progress:			
terrar and another a			
File advanded complete			
RUNNING Program			
Address: : 0x8000000			
Start operation achieved successfully			
.24 Ge	heric STM32F4	series on C	OMB



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.