STM32 F4VE

STM32F407VET6

Board

Name	STM32 F4VE
Part	STM32_F4VE
Brand	Unknown
Origin	China

Microcontroller

Part	STM32F407VET6
Manufacturer	ST-Microelectronics
Core	Arm Cortex-M4
Max. Clock Speed	168MHz
Package	LQFP 100 pins

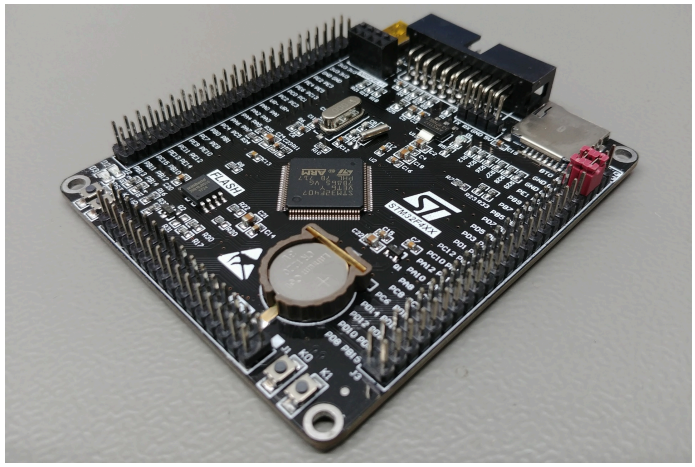
Internal memories

FLASH	512KiB
SRAM	192KiB
Backup SRAM	4KiB

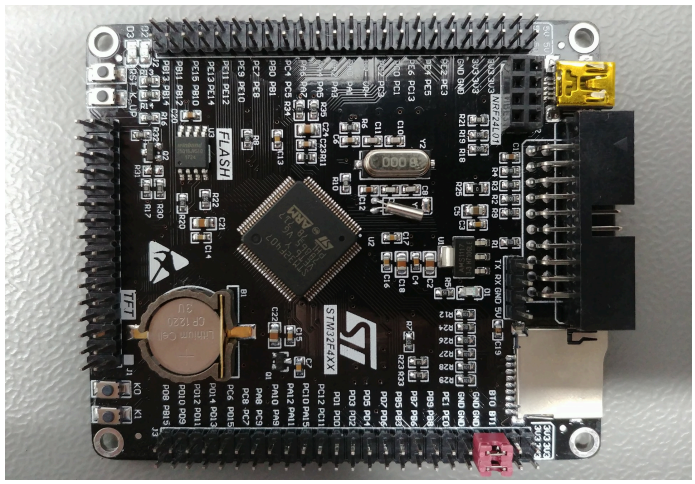
Oscillators

HSI	16MHz
LSI	32kHz

Pictures



STM32 F4VE: Perspective view



STM32 F4VE: Top view

HSE	8MHz
LSE	32.768kHz

Power

Sources	Any +3.3V pin (+3.3V) Any +5V pin (+5V) USB connector (+5V)
V_{DDA} pin	No
V_{SSA} pin	No
V_{REF-} pin	Yes
V_{REF+} pin	Yes
Backup battery	Holder (12.5mm / 12)

Regulator

Manufacturer	Advanced Monolithic Systems Inc.
Part	AMS1117 (AMS1117)
Package	SOT223 3 pins
Input	+4.6V to +15V
Output	+3.3V @ 1A
Datasheet	AMS1117.pdf

PCB

Color	Black
Size (w x l)	62mm x 85mm
Mounting	4x mounting hole (M3)

Remarks

- **Warning:** The +5V pins on this board are directly connected to the +5V pin of the USB connector. There is no protection in place. Do not power this board through

STM32 F4VE: Bottom view

Resources

- Perspective view
- Top view
- Bottom view
- Original schematic

USB and an external power supply at the same time.

- **Warning:** The microcontroller on this board features internal pull-up resistors for the USB data lines. However, this board has an additional pull-up resistor on D+ (R21). This resistor is not needed and violates the USB specification when the internal pull-up resistors are also used. This may cause errors while using USB on this board.

Inputs

- Reset button
- User button 1
- User button 2
- User button 3
- BOOT0 jumper
- BOOT1 jumper

Outputs

- Power LED
- User LED 1
- User LED 2

Connectors

- Header 1
- Header 2
- USB connector
- JTAG header
- SD-card connector
- TFT LCD header
- nRF24L01 module header
- Serial header

Devices

- W25Q16JV

Inputs & outputs

Reset button

Name	RST
Reference	-
Type	Button
Connected to	$\overline{\text{NRST}}$
Mode	Active low

Power LED

Name	-
Reference	D0
Type	LED
Connected to	+3.3V rail
Mode	N.A.

User button 1

Name	WK_UP
Reference	-
Type	Button

User LED 1

Name	-
Reference	D1
Type	LED

Connected to	PA0
Mode	Active high

Connected to	PA6
Mode	Sink

User button 2

Name	-
Reference	K0
Type	Button
Connected to	PE4
Mode	Active low

User LED 2

Name	-
Reference	D3
Type	LED
Connected to	PA7
Mode	Sink

User button 3

Name	-
Reference	K1
Type	Button
Connected to	PE3
Mode	Active low

BOOT0 jumper

Name	-
Reference	-
Type	2-way jumper
Connected to	BOOT0
Mode	N.A.

- **Note:** This jumper is part of Header 2.

BOOT1 jumper

Name	-
Reference	-
Type	2-way jumper
Connected to	PB2
Mode	N.A.

- **Note:** This jumper is part of Header 2.

Connectors & headers

⇄ Header 1 properties

Name	Unknown
Reference	J2
Type	Pin header (2.54mm, 24x2, male)

⇄ Header 1 pins

#	Name	Function	Connected to
1	5V	-	+5V rail
2	5V	-	+5V rail
3	5V	-	+5V rail
4	5V	-	+5V rail
5	3V3	-	+3.3V rail
6	3V3	-	+3.3V rail
7	3V3	-	+3.3V rail
8	3V3	-	+3.3V rail
9	GND	-	Ground plane
10	GND	-	Ground plane
11	PE2	-	PE2
12	PE3	-	PE3
13	PE4	-	PE4
14	PE5	-	PE5
15	PE6	-	PE6
16	PC13	-	PC13
17	PC0	-	PC0
18	PC1	-	PC1
19	PC2	-	PC2
20	PC3	-	PC3
21	VR-	-	VR-
22	VR+	-	VR+
23	PA0	-	PA0
24	PA1	-	PA1

25	PA2	-	PA2
26	PA3	-	PA3
27	PA4	-	PA4
28	PA5	-	PA5
29	PA6	-	PA6
30	PA7	-	PA7
31	PC4	-	PC4
32	PC5	-	PC5
33	PB0	-	PB0
34	PB1	-	PB1
35	PE7	-	PE7
36	PE8	-	PE8
37	PE9	-	PE9
38	PE10	-	PE10
39	PE11	-	PE11
40	PE12	-	PE12
41	PE13	-	PE13
42	PE14	-	PE14
43	PE15	-	PE15
44	PB10	-	PB10
45	PB11	-	PB11
46	PB12	-	PB12
47	PB13	-	PB13
48	PB14	-	PB14

⇄ Header 2 properties

Name	Unknown
Reference	J3
Type	Pin header (2.54mm, 24x2, male)

⇄ Header 2 pins

#	Name	Function	Connected to
1	3V3	-	+3.3V rail
2	3V3	-	+3.3V rail
3	3V3	-	+3.3V rail
4	3V3	-	+3.3V rail

5	BT0	-	BOOT0
6	BT1	-	PE2
7	GND	-	Ground plane
8	GND	-	Ground plane
9	GND	-	Ground plane
10	GND	-	Ground plane
11	PE1	-	PE1
12	PE0	-	PE0
13	PB9	-	PB9
14	PB8	-	PB8
15	PB7	-	PB7
16	PB6	-	PB6
17	PB5	-	PB5
18	PB3	-	PB3
19	PD7	-	PD7
20	PD6	-	PD6
21	PD5	-	PD5
22	PD4	-	PD4
23	PD3	-	PD3
24	PD2	-	PD2
25	PD1	-	PD1
26	PD0	-	PD0
27	PC12	-	PC12
28	PC11	-	PC11
29	PC10	-	PC10
30	PA15	-	PA15
31	PA12	-	PA12
32	PA11	-	PA11
33	PA10	-	PA10
34	PA9	-	PA9
35	PA8	-	PA8

36	PC9	-	PC9
37	PC8	-	PC8
38	PC7	-	PC7
39	PC6	-	PC6
40	PD15	-	PD15
41	PD14	-	PD14
42	PD13	-	PD13
43	PD12	-	PD12
44	PD11	-	PD11
45	PD10	-	PD10
46	PD9	-	PD9
47	PD8	-	PD8
48	PB15	-	PB15

USB connector properties

Name	Unknown
Reference	J4
Type	USB Mini

USB connector pins

#	Name	Function	Connected to
1	-	VCC	+5V rail
2	-	D-	PA11
3	-	D+	PA12
4	-	ID	N.C.
5	-	GND	Ground plane

JTAG header properties

Name	Unknown
Reference	P1
Type	IDC (2.54mm, 10x2, male)

JTAG header pins

#	Name	Function	Connected to
1	-	VCC	+3.3V rail
2	-	VCC	+3.3V rail
3	-	TRST	PB4
4	-	GND	Ground plane
5	-	TDI	PA15
6	-	GND	Ground plane

7	-	TMS / SWDIO	PA13
8	-	GND	Ground plane
9	-	TCLK / SWCLK	PA14
10	-	GND	Ground plane
11	-	RTCK	N.C.
12	-	GND	Ground plane
13	-	TDO / SWO	PB3
14	-	GND	Ground plane
15	-	RESET	$\overline{\text{NRST}}$
16	-	GND	Ground plane
17	-	N.C.	N.C.
18	-	GND	Ground plane
19	-	N.C.	N.C.
20	-	GND	Ground plane

SDIO: Secure Digital Input Output

SD-card connector properties

Name	Unknown
Reference	U5
Type	microSD

SD-card connector pins

#	Name	Function	Connected to
1	-	DAT2	PC10
2	-	CD/DAT3	PC11
3	-	CMD	PD2
4	-	VDD	+3.3V rail
5	-	CLK	PC12
6	-	VSS	Ground plane
7	-	DAT0	PC8
8	-	DAT1	PC9
9	-	CD	N.C.
10	-	Body	Ground plane

Data line 2, used in 4-bit SDIO mode

Card detect/data line 3 - 4 bit

command line for sd card

power supply

Clock for SDIO communication

DMA: Direct memory access. No need to wait for CPU to read and write bytes - higher performance and lower CPU load

1-bit and 4-bit modes

4-bit mode

Card detect (optional)

Not Connected

TFT LCD header properties

TFT LCD header pins

#	Name	Function	Connected to

Name	TFT
Reference	J1
Type	Pin header (2.54mm, 16x2, female)

1	-	GND	Ground plane
2	-	RST	Reset button
3	-	FSMC D15	PD10
4	-	FSMC D14	PD9
5	-	FSMC D13	PD8
6	-	FSMC D12	PE15
7	-	FSMC D11	PE14
8	-	FSMC D10	PE13
9	-	FSMC D9	PE12
10	-	FSMC D8	PE11
11	-	FSMC D7	PE10
12	-	FSMC D6	PE9
13	-	FSMC D5	PE8
14	-	FSMC D4	PE7
15	-	FSMC D3	PD1
16	-	FSMC D2	PD0
17	-	FSMC D1	PD15
18	-	FSMC D0	PD14
19	-	FSMC NOE	PD4
20	-	FSMC NWE	PD5
21	-	FSMC A18	PD13
22	-	FSMC NE1	PD7
23	-	Touch CLK	PB13
24	-	Touch CS	PB12
25	-	Touch MOSI	PB15
26	-	Touch MISO	PB14
27	-	Touch PEN	PC5
28	-	LCD Backlight	PB1
29	-	VBAT	N.C.
30	-	GND	Ground plane
31	-	3V3	+3.3V rail

32	-	GND	Ground plane

⇄ nRF24L01 module header properties

Name	nRF24L01
Reference	JP2
Type	Pin header (2.54mm, 4x2, female)

⇄ nRF24L01 module header pins

#	Name	Function	Connected to
1	-	GND	Ground plane
2	-	VCC	+3.3V rail
3	-	CE	PB6
4	-	CSN	PB7
5	-	SCK	PB3
6	-	MOSI	PB5
7	-	MISO	PB4
8	-	IRQ	PB8

⇄ Serial header properties

Name	Unknown
Reference	J6
Type	Pin header (2.54mm, 4x1, male)

⇄ Serial header pins

#	Name	Function	Connected to
1	-	VCC	+5V rail
2	-	GND	Ground plane
3	-	RX	PA10
4	-	TX	PA9

Devices

W25Q16JV properties

Name	FLASH
Reference	U3
Manufacturer	Winbond Electronics Corporation
Part	W25Q16JV
Marking	W25Q16JVSIQ

W25Q16JV pins

#	Name	Function	Connected to
1	-	/CS	PB0
2	-	DO	PB4
3	-	/WP	+3.3V rail
4	-	GND	Ground plane
5	-	DI	PB5

Datasheet	W25Q16JV.pdf	6	-	CLK	PB3
Package	SOIC 8 pins	7	-	/HOLD	+3.3V rail
Description	2MiB Dual/Quad SPI FLASH	8	-	VCC	+3.3V rail

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