

## 4.11 Solder bridges

**Table 4. Solder bridges**

Bridge	State <sup>(1)</sup>	Description
SB13,14 (X2 crystal) <sup>(2)</sup>	<b>OFF</b>	X2, C14, C15, R24 and R25 provide a clock. PH0, PH1 are disconnected from P2.
	ON	PH0, PH1 are connected to P2 (R24, R25 and R68 must not be fitted).
SB3,5,7,9 (Default)	<b>ON</b>	Reserved, do not modify.
SB2,4,6,8 (Reserved)	<b>OFF</b>	Reserved, do not modify.
SB15,16 (X3 crystal)	<b>OFF</b>	X3, C16, C27, R21 and R22 deliver a 32 KHz clock. PC14, PC15 are not connected to P2.
	ON	PC14, PC15 are only connected to P2. Remove only R21, R22
SB1 (B2-RESET)	<b>ON</b>	B2 pushbutton is connected to the NRST pin of the STM32F407VGT6 MCU.
	OFF	B2 pushbutton is not connected the NRST pin of the STM32F407VGT6 MCU.
SB20 (B1-USER)	<b>ON</b>	B1 pushbutton is connected to PA0.
	OFF	B1 pushbutton is not connected to PA0.
SB17 (VDD powered from 3V)	<b>OFF</b>	VDD is not powered from 3V, depends on JP1 jumper.
	ON	VDD is permanently powered from 3V, JP1 jumper has no effect.
SB11 (NRST)	<b>ON</b>	NRST signal of the CN2 connector is connected to the NRST pin of the STM32F407VGT6 MCU.
	OFF	NRST signal of the CN2 connector is not connected to the NRST pin of the STM32F407VGT6 MCU.
SB12 (SWO)	<b>ON</b>	SWO signal of the CN2 connector is connected to PB3.
	OFF	SWO signal is not connected.
SB10 (STM_RST)	<b>OFF</b>	No incidence on STM32F103C8T6 (ST-LINK/V2) NRST signal.
	ON	STM32F103C8T6 (ST-LINK/V2) NRST signal is connected to GND.
SB18 (BOOT0)	<b>ON</b>	BOOT0 signal of the STM32F407VGT6 MCU is held low through a 510 ohm pull-down resistor.
	OFF	BOOT0 signal of the STM32F407VGT6 MCU is held high through a 10 Kohm pull-up resistor.
SB19 (BOOT1)	<b>OFF</b>	The BOOT1 signal of the STM32F407VGT6 MCU is held high through a 10 Kohm pull-up resistor.
	ON	The BOOT1 signal of the STM32F407VGT6 MCU is held low through a 510 ohm pull-down resistor.

1. Default SBx state is shown in bold.

2. SB13 and SB14 are OFF to allow the user to choose between MCO and X2 crystal for clock source.

## 4.12 Extension connectors

The male headers P1 and P2 can connect the STM32F4DISCOVERY to a standard prototyping/wrapping board. STM32F407VGT6 GPI/Os are available on these connectors. P1 and P2 can also be probed by an oscilloscope, logical analyzer or voltmeter.

**Table 5. MCU pin description versus board function**

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
BOOT0	VPP	94	-	-	-	-	-	-	-	-	-	-	-	-	-	21
NRST	-	14	-	-	-	RESET	-	NRST	-	-	-	-	-	5	6	-
PA0-WKUP	USART2_CTS/ USART4_TX/ ETH_MII_CRX/ TIM2_CH1_ETR/ TIM5_CH1/ TIM8_ETR/ ADC123_IN0/ WKUP	23	-	-	-	USER	-	-	-	-	-	-	-	-	12	-
PA1	USART2_RTS/ USART4_RX/ ETH_RMII_REF_CLK/ ETH_MII_RX_CLK/ TIM5_CH2/ TIMM2_CH2/ ADC123_IN1	24	-	-	-	-	-	-	-	-	-	-	-	-	11	-
PA2	USART2_TX/ TIM5_CH3/ TIM9_CH1/ TIM2_CH3/ ETH_MDIO/ ADC123_IN2	25	-	-	-	-	-	-	-	-	-	-	-	-	14	-

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PA3	USART2_RX/ TIM5_CH4/ TIM9_CH2/ TIM2_CH4/ OTG_HS_ULPI_D0/ ETH_MII_COL/ ADC123_IN3	26	-	-	-	-	-	-	-	-	-	-	-	-	13	-
PA4	SPI1_NSS/ SPI3_NSS/ USART2_CK/ DCMI_HSYNCR/ OTG_HS_SOF/ I2S3_WS/ ADC12_IN4/ DAC1_OUT	29	LRCK/AIN1x	-	-	-	-	-	-	-	-	-	-	-	16	-
PA5	SPI1_SCK/ OTG_HS_ULPI_CK/ TIM2_CH1_ETR/ TIM8_CHIN/ ADC12_IN5/ DAC2_OUT	30	-	-	SCL/SPC	-	-	-	-	-	-	-	-	-	15	-
PA6	SPI1_MISO/ TIM8_BKIN/ TIM13_CH1/ DCMI_PIXCLK/ TIM3_CH1/ TIM1_BKIN/ ADC12_IN6	31	-	-	SDO	-	-	-	-	-	-	-	-	-	18	-
PA7	SPI1_MOSI/ TIM8_CH1N/ TIM14_CH1TIM3_CH2/ ETH_MII_RX_DV/ TIM1_CH1N/ RMII_CRS_DV/ ADC12_IN7	32	-	-	SDA/SDI/SDO	-	-	-	-	-	-	-	-	-	17	-

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PA8	MCO1/ USART1_CK/ TIM1_CH1/ I2C3_SCL/ OTG_FS_SOF	67	-	-	-	-	-	-	-	-	-	-	-	-	-	43
PA9	USART1_TX/ TIM1_CH2/ I2C3_SMBA/ DCMI_D0/ OTG_FS_VBUS	68	-	-	-	-	GREEN	-	VBUS	-	-	-	1	-	-	44
PA10	USART1_RX/ TIM1_CH3/ OTG_FS_ID/ DCMI_D1	69	-	-	-	-	-	-	ID	-	-	-	4	-	-	41
PA11	USART1_CTS/ CAN1_RX/ TIM1_CH4/ OTG_FS_DM	70	-	-	-	-	-	-	DM	-	-	-	2	-	-	-
PA12	USART1_RTS/ CAN1_TX/ TIM1_ETR/ OTG_FS_DP	71	-	-	-	-	-	-	DP	-	-	-	3	-	-	-
PA13	JTMS-SWDIO	72	-	-	-	-	-	SWDIO	-	-	-	-	-	4	-	42
PA14	JTCK-SWCLK	76	-	-	-	-	-	SWCLK	-	-	-	-	-	2	-	39
PA15	JTDI/ SPI3_NSS/ I2S3_WS/ TIM2_CH1_ETR/ SPI1_NSS	77	-	-	-	-	-	-	-	-	-	-	-	-	-	40

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PB0	TIM3_CH3/ TIM8_CH2N/ OTG_HS_ULPI_D1/ ETH_MII_RXD2/ TIM1_CH2N/ ADC12_IN8	35	-	-	-	-	-	-	-	-	-	-	-	-	22	-
PB1	TIM3_CH4/ TIM8_CH3N/ OTG_HS_ULPI_D2/ ETH_MII_RXD3/ OTG_HS_INTN/ TIM1_CH3N/ ADC12_IN9	36	-	-	-	-	-	-	-	-	-	-	-	-	21	-
PB2	-	37	-	-	-	-	-	-	-	-	-	-	-	-	24	-
PB3	JTDO/ TRACESWO/ SPI3_SCK/ I2S3_CK/ TIM2_CH2/ SPI1_SCK	89	-	-	-	-	-	SWO	-	-	-	-	-	6	-	28
PB4	NJTRST/ SPI3_MISO/ TIM3_CH1/ SPI1_MISO/ I2S3ext_SD	90	-	-	-	-	-	-	-	-	-	-	-	-	-	25
PB5	I2C1_SMBA/ CAN2_RX/ OTG_HS_ULPI_D7/ ETH_PPS_OUT/ TIM3_CH2/ SPI1_MOSI/ SPI3_MOSI/ DCMI_D10/ I2S3_SD	91	-	-	-	-	-	-	-	-	-	-	-	-	-	26

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PB6	I2C1_SCL/ TIM4_CH1/ CAN2_TX/ OTG_FS_INTN/ DCMI_D5/ USART1_TX	92	SCL	-	-	-	-	-	-	-	-	-	-	-	-	23
PB7	I2C1_SDA/ FSMC_NL/ DCMI_VSYNC/ USART1_RX/ TIM4_CH2	93	-	-	-	-	-	-	-	-	-	-	-	-	-	24
PB8	TIM4_CH3/ SDIO_D4/ TIM10_CH1/ DCMI_D6/ OTG_FS_SCL/ ETH_MII_TXD3/ I2C1_SCL/ CAN1_RX	95	-	-	-	-	-	-	-	-	-	-	-	-	-	19
PB9	SPI2_NSS/ I2S2_WS/ TIM4_CH4/ TIM11_CH1/ OTG_FS_SDA/ SDIO_D5/ DCMI_D7/ I2C1_SDA/ CAN1_TX	96	SDA	-	-	-	-	-	-	-	-	-	-	-	-	20
PB10	SPI2_SCK/ I2S2_CK/ I2C2_SCL/ USART3_TX/ OTG_HS_ULPI_D3/ ETH_MII_RX_ER/ OTG_HS_SCL/ TIM2_CH3	47	-	CLK	-	-	-	-	-	-	-	-	-	-	34	-

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PB11	I2C2_SDA/ USART3_RX/ OTG_HS_ULPI_D4/ ETH_RMII_TX_EN/ ETH_MII_TX_EN/ OTG_HS_SDA/ TIM2_CH4	48	-	-	-	-	-	-	-	-	-	-	-	-	35	-
PB12	SPI2_NSS/ I2S2_WS/ I2C2_SMBA/ USART3_CK/ TIM1_BKIN/ CAN2_RX/ OTG_HS_ULPI_D5/ ETH_RMII_TXD0/ ETH_MII_TXD0/ OTG_HS_ID	51	-	-	-	-	-	-	-	-	-	-	-	-	36	-
PB13	SPI2_SCK/ I2S2_CK/ USART3_CTS/ TIM1_CH1N/ CAN2_TX/ OTG_HS_ULPI_D6/ ETH_RMII_TXD1/ ETH_MII_TXD1/ OTG_HS_VBUS	52	-	-	-	-	-	-	-	-	-	-	-	-	37	-
PB14	SPI2_MISO/ TIM1_CH2N/ TIM12_CH1/ OTG_HS_DMUSART3_RTS/ TIM8_CH2N/ I2S2ext_SD	53	-	-	-	-	-	-	-	-	-	-	-	-	38	-

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PB15	SPI2_MOSI/ I2S2_SD/ TIM1_CH3N/ TIM8_CH3N/ TIM12_CH2/ OTG_HS_DP	54	-	-	-	-	-	-	-	-	-	-	-	-	39	-
PC0	OTG_HS_ULPI_STP/ ADC123_IN10	15	-	-	-	-	-	-	PowerOn	-	-	-	-	-	8	-
PC1	ETH_MDC/ ADC123_IN11	16	-	-	-	-	-	-	-	-	-	-	-	-	7	-
PC2	SPI2_MISO/ OTG_HS_ULPI_DIR/ TH_MII_TXD2/ I2S2ext_SD/ ADC123_IN12	17	-	-	-	-	-	-	-	-	-	-	-	-	10	-
PC3	SPI2_MOSI/ I2S2_SD/ OTG_HS_ULPI_NXT/ ETH_MII_TX_CLK/ ADC123_IN13	18	-	DOU/AIN4x	-	-	-	-	-	-	-	-	-	-	9	-
PC4	ETH_RMII_RX_D0/ ETH_MII_RX_D0/ ADC12_IN14	33	-	-	-	-	-	-	-	-	-	-	-	-	20	-
PC5	ETH_RMII_RX_D1/ ETH_MII_RX_D1/ ADC12_IN15	34	-	-	-	-	-	-	-	-	-	-	-	-	19	-
PC6	I2S2_MCK/ TIM8_CH1/ SDIO_D6/ USART6_TX/ DCMI_D0/ TIM3_CH1	63	-	-	-	-	-	-	-	-	-	-	-	-	-	47



Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PC7	I2S3_MCK/ TIM8_CH2/ SDIO_D7/ USART6_RX/ DCMI_D1/ TIM3_CH2	64	MCLK	-	-	-	-	-	-	-	-	-	-	-	-	48
PC8	TIM8_CH3/ SDIO_D0/ TIM3_CH3/ USART6_CK/ DCMI_D2	65	-	-	-	-	-	-	-	-	-	-	-	-	-	45
PC9	I2S_CKIN/ MCO2/ TIM8_CH4/ SDIO_D1/ I2C3_SDA/ DCMI_D3/ TIM3_CH4	66	-	-	-	-	-	-	-	-	-	-	-	-	-	46
PC10	SPI3_SCK/ I2S3_CK/ UART4_TX/ SDIO_D2/ DCMI_D8/ USART3_TX	78	SCLK	-	-	-	-	-	-	-	-	-	-	-	-	37
PC11	UART4_RX/ SPI3_MISO/ SDIO_D3/ DCMI_D4/ USART3_RX/ I2S3ext_SD	79	-	-	-	-	-	-	-	-	-	-	-	-	-	38
PC12	UART5_TX/ SDIO_CK/ DCMI_D9/ SPI3_MOSI/ I2S3_SD/ USART3_CK	80	SDIN	-	-	-	-	-	-	-	-	-	-	-	-	35

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PC13	RTC_AF1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	12
PC14	OSC32_IN	8	-	-	-	-	-	-	-	OSC32_IN	-	-	-	-	-	9
PC15	OSC32_OUT	9	-	-	-	-	-	-	-	OSC32_OUT	-	-	-	-	-	10
PD0	FSMC_D2/ CAN1_RX	81	-	-	-	-	-	-	-	-	-	-	-	-	-	36
PD1	FSMC_D3/ CAN1_TX	82	-	-	-	-	-	-	-	-	-	-	-	-	-	33
PD2	TIM3_ETR/ UART5_RXSDIO_CMD / DCMI_D11	83	-	-	-	-	-	-	-	-	-	-	-	-	-	34
PD3	FSMC_CLK/ USART2_CTS	84	-	-	-	-	-	-	-	-	-	-	-	-	-	31
PD4	FSMC_NOE/ USART2_RTS	85	RESET	-	-	-	-	-	-	-	-	-	-	-	-	32
PD5	FSMC_NWE/ USART2_TX	86	-	-	-	-	RED	-	OverCurrent	-	-	-	-	-	-	29
PD6	FSMC_NWAIT/ USART2_RX	87	-	-	-	-	-	-	-	-	-	-	-	-	-	30
PD7	USART2_CK/ FSMC_NE1/ FSMC_NCE2	88	-	-	-	-	-	-	-	-	-	-	-	-	-	27

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PD8	FSMC_D13/ USART3_TX	55	-	-	-	-	-	-	-	-	-	-	-	-	40	-
PD9	FSMC_D14/ USART3_RX	56	-	-	-	-	-	-	-	-	-	-	-	-	41	-
PD10	FSMC_D15/ USART3_CK	57	-	-	-	-	-	-	-	-	-	-	-	-	42	-
PD11	FSMC_A16/ USART3_CTS	58	-	-	-	-	-	-	-	-	-	-	-	-	43	-
PD12	FSMC_A17/ TIM4_CH1/ USART3_RTS	59	-	-	-	-	GREEN	-	-	-	-	-	-	-	44	-
PD13	FSMC_A18/ TIM4_CH2	60	-	-	-	-	ORANGE	-	-	-	-	-	-	-	45	-
PD14	FSMC_D0/ TIM4_CH3	61	-	-	-	-	RED	-	-	-	-	-	-	-	46	-
PD15	FSMC_D1/ TIM4_CH4	62	-	-	-	-	BLUE	-	-	-	-	-	-	-	47	-
PE0	TIM4_ETR/ FSMC_NBL0/ DCMI_D2	97	-	-	INT1	-	-	-	-	-	-	-	-	-	-	17
PE1	FSMC_NBL1/ DCMI_D3	98	-	-	INT2	-	-	-	-	-	-	-	-	-	-	18
PE2	TRACECLK/ FSMC_A23/ ETH_MII_TXD3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	15
PE3	TRACED0/ FSMC_A19	2	-	-	CS_12C/SPI	-	-	-	-	-	-	-	-	-	-	16

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function													
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PE4	TRACED1/ FSMC_A20/ DCMI_D4	3	-	-	-	-	-	-	-	-	-	-	-	-	-	13
PE5	TRACED2/ FSMC_A21/ TIM9_CH1/ DCMI_D6	4	-	-	-	-	-	-	-	-	-	-	-	-	-	14
PE6	TRACED3/ FSMC_A22/ TIM9_CH2/ DCMI_D7	5	-	-	-	-	-	-	-	-	-	-	-	-	-	11
PE7	FSMC_D4/ TIM1_ETR	38	-	-	-	-	-	-	-	-	-	-	-	-	25	-
PE8	FSMC_D5/ TIM1_CH1N	39	-	-	-	-	-	-	-	-	-	-	-	-	26	-
PE9	FSMC_D6/ TIM1_CH1	40	-	-	-	-	-	-	-	-	-	-	-	-	27	-
PE10	FSMC_D7/ TIM1_CH2N	41	-	-	-	-	-	-	-	-	-	-	-	-	28	-
PE11	FSMC_D8/ TIM1_CH2	42	-	-	-	-	-	-	-	-	-	-	-	-	29	-
PE12	FSMC_D9/ TIM1_CH3N	43	-	-	-	-	-	-	-	-	-	-	-	-	30	-
PE13	FSMC_D10/ TIM1_CH3	44	-	-	-	-	-	-	-	-	-	-	-	-	31	-
PE14	FSMC_D11/ TIM1_CH4	45	-	-	-	-	-	-	-	-	-	-	-	-	32	-
PE15	FSMC_D12/ TIM1_BKIN	46	-	-	-	-	-	-	-	-	-	-	-	-	33	-
PH0	OSC_IN	12	-	-	-	-	-	-	-	OSC_IN	-	-	-	-	-	7

Table 5. MCU pin description versus board function (continued)

MCU pin			Board function														
Main function	Alternate functions		LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2
PH1	OSC_OUT	13	-	-	-	-	-	-	-	-	OSC_OUT	-	-	-	-	-	8
-	-	-	-	-	-	-	-	-	-	-	-	-	5V	-	-	-	3
-	-	-	-	-	-	-	-	-	-	-	-	-	5V	-	-	-	4
-	-	-	-	-	-	-	-	-	-	-	-	-	3V	-	-	-	5
-	-	-	-	-	-	-	-	-	-	-	-	-	3V	-	-	-	6
-	-	-	-	-	-	-	-	-	-	-	-	-	VDD	-	-	3	-
-	-	-	-	-	-	-	-	-	-	-	-	-	VDD	-	-	4	-
-	-	-	-	-	-	-	-	-	-	-	-	-	VDD	-	-	-	22
-	-	-	-	-	-	-	-	-	GND	GND	-	-	GND	5	3	1	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	2	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	5	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	23	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	49	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	50	-
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	-	1
-	-	-	-	-	-	-	-	-	-	-	-	-	GND	-	-	-	2

Table 5. MCU pin description versus board function (continued)

MCU pin		Board function															
Main function	Alternate functions	LQFP100	CS43L22	MP45DT02	LIS302DL or LIS3DSH	Pushbutton	LED	SWD	USB	OSC	Free I/O	Power supply	CN5	CN2	P1	P2	
		-	-	-	-	-	-	-	-	-	-	GND	-	-	-	49	
		-	-	-	-	-	-	-	-	-	-	GND	-	-	-	50	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

## 5 Mechanical drawing

Figure 10. STM32F4DISCOVERY mechanical drawing

