



1. Description

1.1. Project

Project Name	BLDC_STM32F030R8T6
Board Name	custom
Generated with:	STM32CubeMX 6.8.1
Date	08/06/2023

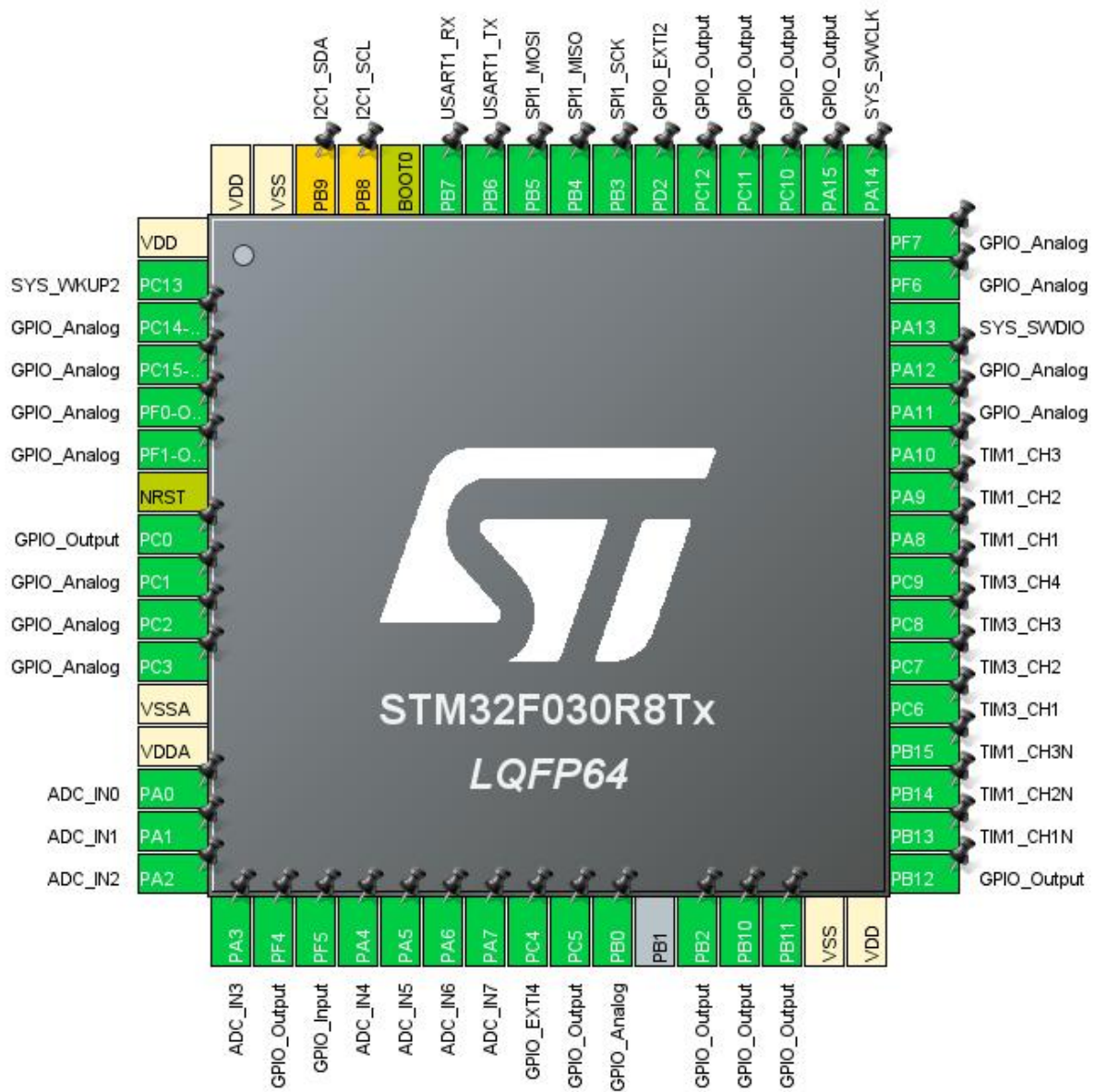
1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030R8Tx
MCU Package	LQFP64
MCU Pin number	64

1.3. Core(s) information

Core(s)	Arm Cortex-M0
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2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC13	I/O	SYS_WKUP2	
3	PC14-OSC32_IN *	I/O	GPIO_Analog	
4	PC15-OSC32_OUT *	I/O	GPIO_Analog	
5	PF0-OSC_IN *	I/O	GPIO_Analog	
6	PF1-OSC_OUT *	I/O	GPIO_Analog	
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	
9	PC1 *	I/O	GPIO_Analog	
10	PC2 *	I/O	GPIO_Analog	
11	PC3 *	I/O	GPIO_Analog	
12	VSSA	Power		
13	VDDA	Power		
14	PA0	I/O	ADC_IN0	
15	PA1	I/O	ADC_IN1	
16	PA2	I/O	ADC_IN2	
17	PA3	I/O	ADC_IN3	
18	PF4 *	I/O	GPIO_Output	
19	PF5 *	I/O	GPIO_Input	
20	PA4	I/O	ADC_IN4	
21	PA5	I/O	ADC_IN5	
22	PA6	I/O	ADC_IN6	
23	PA7	I/O	ADC_IN7	
24	PC4	I/O	GPIO_EXTI4	
25	PC5 *	I/O	GPIO_Output	
26	PB0 *	I/O	GPIO_Analog	
28	PB2 *	I/O	GPIO_Output	
29	PB10 *	I/O	GPIO_Output	
30	PB11 *	I/O	GPIO_Output	
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	
34	PB13	I/O	TIM1_CH1N	
35	PB14	I/O	TIM1_CH2N	
36	PB15	I/O	TIM1_CH3N	
37	PC6	I/O	TIM3_CH1	

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
38	PC7	I/O	TIM3_CH2	
39	PC8	I/O	TIM3_CH3	
40	PC9	I/O	TIM3_CH4	
41	PA8	I/O	TIM1_CH1	
42	PA9	I/O	TIM1_CH2	
43	PA10	I/O	TIM1_CH3	
44	PA11 *	I/O	GPIO_Analog	
45	PA12 *	I/O	GPIO_Analog	
46	PA13	I/O	SYS_SWDIO	
47	PF6 *	I/O	GPIO_Analog	
48	PF7 *	I/O	GPIO_Analog	
49	PA14	I/O	SYS_SWCLK	
50	PA15 *	I/O	GPIO_Output	
51	PC10 *	I/O	GPIO_Output	
52	PC11 *	I/O	GPIO_Output	
53	PC12 *	I/O	GPIO_Output	
54	PD2	I/O	GPIO_EXTI2	
55	PB3	I/O	SPI1_SCK	
56	PB4	I/O	SPI1_MISO	
57	PB5	I/O	SPI1_MOSI	
58	PB6	I/O	USART1_TX	
59	PB7	I/O	USART1_RX	
60	BOOT0	Boot		
61	PB8 **	I/O	I2C1_SCL	
62	PB9 **	I/O	I2C1_SDA	
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

5. Software Project

5.1. Project Settings

Name	Value
Project Name	BLDC_STM32F030R8T6
Project Folder	C:\Users\kzhou\Desktop\RF projects\Git\STM32\STM32-
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F0 V1.11.4
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	Yes
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_ADC_Init	ADC
4	MX_SPI1_Init	SPI1
5	MX_TIM1_Init	TIM1
6	MX_TIM3_Init	TIM3
7	MX_USART1_UART_Init	USART1
8	MX_TIM6_Init	TIM6

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030R8Tx
Datasheet	DS9773_Rev2

6.2. Parameter Selection

Temperature	25
Vdd	3.6

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

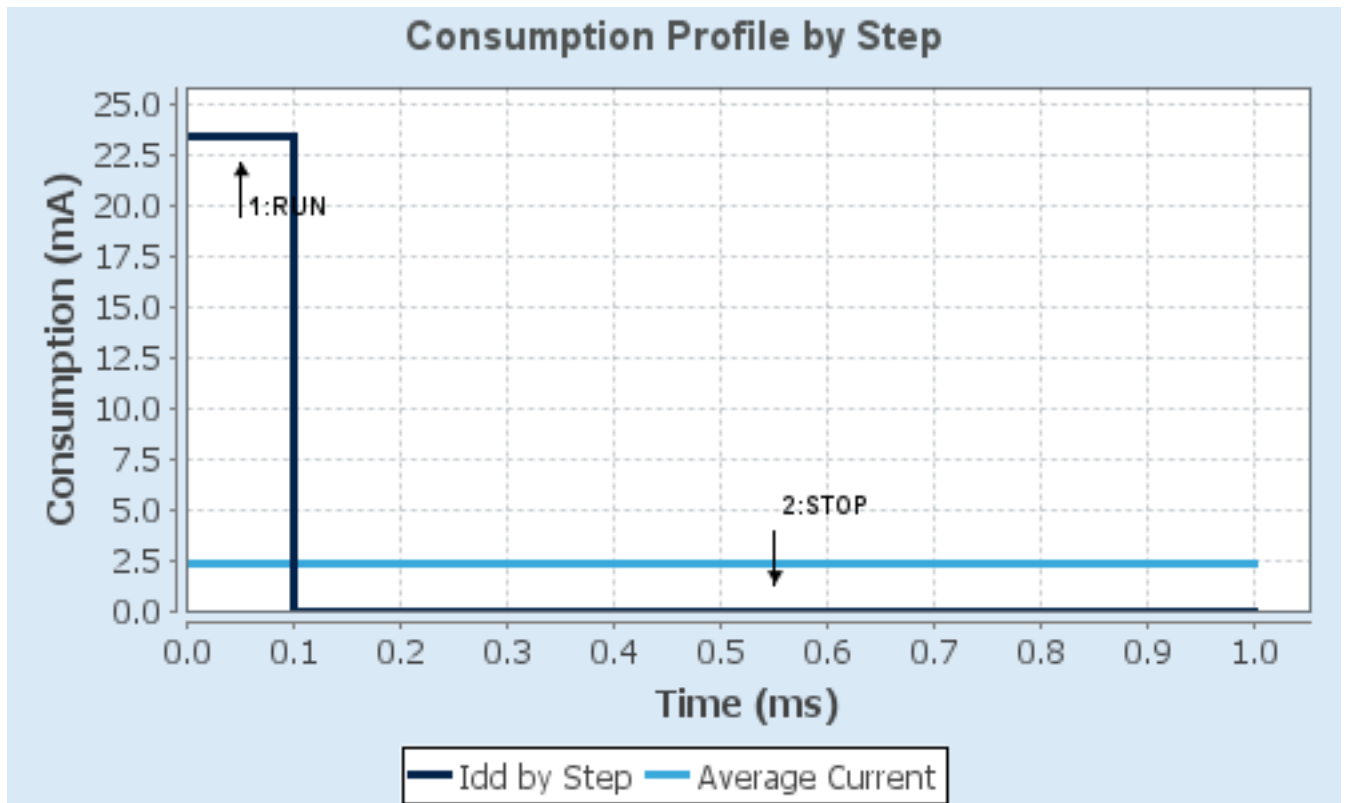
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.6	3.6
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	48 MHz	0 Hz
Clock Configuration	HSE PLL All IPs ON	Regulator LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	23.46 mA	7.9 μ A
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	101.28	105
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	2.35 mA
Battery Life	1 month, 29 days, 16 hours	Average DMIPS	0.0 DMIPS

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. ADC

mode: IN0

mode: IN1

mode: IN2

mode: IN3

mode: IN4

mode: IN5

mode: IN6

mode: IN7

mode: Vrefint Channel

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 8-bit resolution *
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Enabled *
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of sequence of conversion *
Overrun behaviour	Overrun data overwritten *
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	41.5 Cycles *
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false
Low Threshold	0

7.2. RCC

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSI14 Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

7.3. SPI1

Mode: Full-Duplex Master

7.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	24.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

7.4. SYS

mode: Debug Serial Wire

mode: System Wake-Up 2

Timebase Source: SysTick

7.5. TIM1

Clock Source : Internal Clock

Channel1: PWM Generation CH1 CH1N

Channel2: PWM Generation CH2 CH2N

Channel3: PWM Generation CH3 CH3N

Channel4: PWM Generation No Output

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	23 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	100-1 *
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off
Dead Time	49 *

PWM Generation Channel 1 and 1N:

Mode	PWM mode 1
Pulse (16 bits value)	20 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CHN Polarity	High
CH Idle State	Reset
CHN Idle State	Reset

PWM Generation Channel 2 and 2N:

Mode	PWM mode 1
Pulse (16 bits value)	20 *
Output compare preload	Enable

Fast Mode	Disable
CH Polarity	High
CHN Polarity	High
CH Idle State	Reset
CHN Idle State	Reset

PWM Generation Channel 3 and 3N:

Mode	PWM mode 1
Pulse (16 bits value)	20 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CHN Polarity	High
CH Idle State	Reset
CHN Idle State	Reset

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

7.6. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

Channel4: PWM Generation CH4

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	4800-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	100 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	10 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	15 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	10 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	10 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.7. TIM6

mode: Activated

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48000-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	1000-1 *
auto-reload preload	Enable *

7.8. USART1

Mode: Asynchronous

7.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200 *
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

* User modified value

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PA0	ADC_IN0	Analog mode	No pull-up and no pull-down	n/a	
	PA1	ADC_IN1	Analog mode	No pull-up and no pull-down	n/a	
	PA2	ADC_IN2	Analog mode	No pull-up and no pull-down	n/a	
	PA3	ADC_IN3	Analog mode	No pull-up and no pull-down	n/a	
	PA4	ADC_IN4	Analog mode	No pull-up and no pull-down	n/a	
	PA5	ADC_IN5	Analog mode	No pull-up and no pull-down	n/a	
	PA6	ADC_IN6	Analog mode	No pull-up and no pull-down	n/a	
	PA7	ADC_IN7	Analog mode	No pull-up and no pull-down	n/a	
SPI1	PB3	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB4	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB5	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	High *	
SYS	PC13	SYS_WKUP2	n/a	n/a	n/a	
	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM1	PB13	TIM1_CH1N	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB14	TIM1_CH2N	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB15	TIM1_CH3N	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA10	TIM1_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC7	TIM3_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC8	TIM3_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC9	TIM3_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USART1	PB6	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB7	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	High *	
Single Mapped Signals	PB8	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	High *	
	PB9	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	High *	
GPIO	PC14-OSC32_IN	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PC15-OSC32_OUT	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PF0-OSC_IN	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PF1-OSC_OUT	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PC0	GPIO_Output	Output Push Pull	Pull-down *	Low	
	PC1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PC2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PC3	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PF4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PF5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB0	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA11	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PA12	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PF6	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PF7	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

8.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
TIM6 global interrupt	true	0	0
USART1 global interrupt	true	0	0
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line 2 and 3 interrupts	unused		
EXTI line 4 to 15 interrupts	unused		
ADC global interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM3 global interrupt	unused		
SPI1 global interrupt	unused		

8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
TIM6 global interrupt	false	true	true
USART1 global interrupt	false	true	true

* User modified value

9. System Views

9.1. Category view

9.1.1. Current

Middleware				
System Core	Analog	Timers	Connectivity	Computing
DMA	ADC	TIM1	SPI1	
GPIO		TIM3	USART1	
NVIC		TIM6		
RCC				
SYS				

10. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32f0_svd.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32f0_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/gt_stm32f0-io.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-usb-c-pd-solutions-presentation.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
Training Material	https://www.st.com/resource/en/sales_guide/sg_sc2155.pdf
Brochures	https://www.st.com/resource/en/brochure/breveco0518.pdf
Brochures	https://www.st.com/resource/en/brochure/brstm32f0.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstmcsuite.pdf
Flyers	https://www.st.com/resource/en/flyer/fldpstpfc11120.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design-

[guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf](#)

Application Notes https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2834-how-to-get-the-best-adc-accuracy-in-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2945-stm8s-and-stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3070-managing-the-driver-enable-signal-for-rs485-and-iolink-communications-with-the-stm32s-usart-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3156-usb-dfu-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3236-increase-the-number-of-touchkeys-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3364-migration-and-compatibility-guidelines-for-stm32-microcontroller-applications-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3371-using-the-hardware-realtime-clock-rtc-in-stm32-f0-f2-f3-f4-and-l1-series-of-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3960-esd-considerations-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an4013-stm32-crossseries-timer-overview-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4088-migrating-between-stm32f1-and-stm32f0-series-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4099-implementation-of-transmitters-and-receivers-for-infrared-remote-control-protocols-with-mcus-of-the-stm32f0-and-stm32f3-series-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4229-how-to-implement-a-vocoder-solution-using-stm32-microcontrollers-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4277-using-stm32-device-pwm-shutdown-features-for-motor-control-and-digital-power-conversion-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4299-improve-conducted-noise-robustness-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4310-sampling-capacitor-selection-guide-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4312-design-with-surface-sensors-for-touch-sensing-applications-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4316-tuning-a-touch-sensing-application-on-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4325-getting-started-with-stm32f030xx-and-stm32f070xx-series-hardware-development-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf
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