



1. Description

1.1. Project

Project Name	code
Board Name	custom
Generated with:	STM32CubeMX 6.11.1
Date	07/14/2024

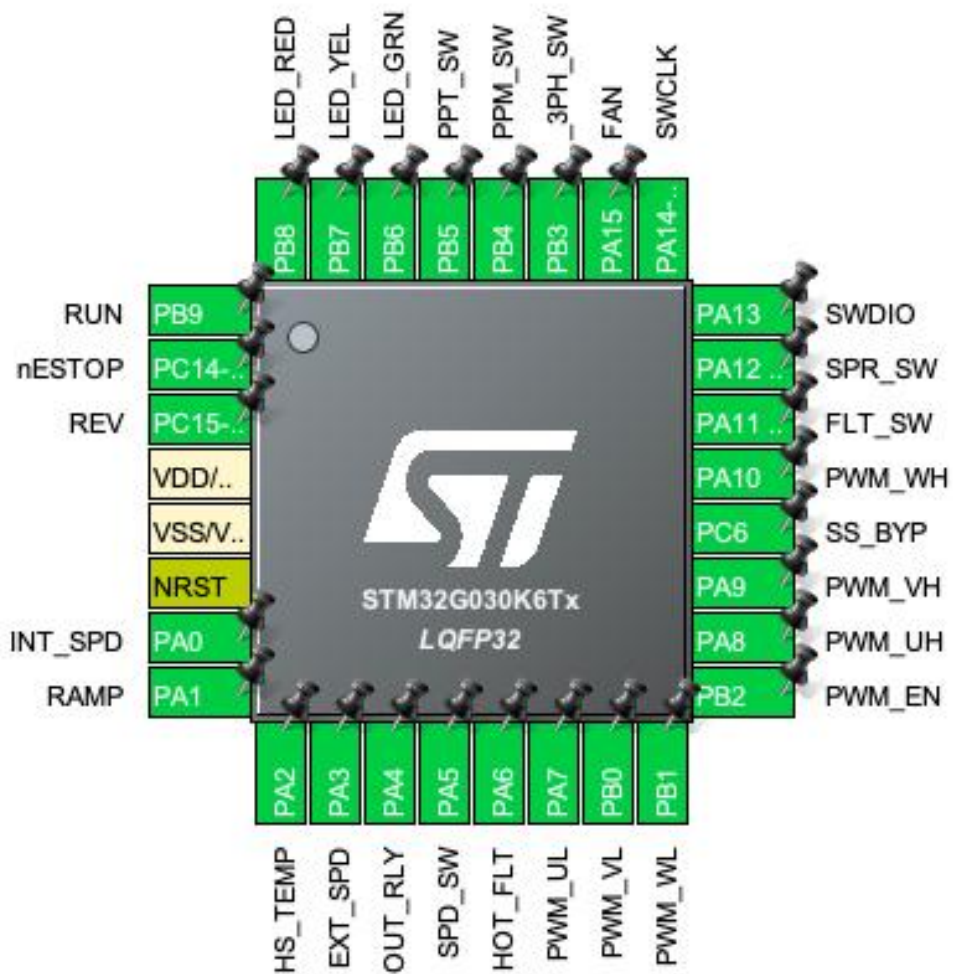
1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x0 Value line
MCU name	STM32G030K6Tx
MCU Package	LQFP32
MCU Pin number	32

1.3. Core(s) information

Core(s)	ARM Cortex-M0+
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2. Pinout Configuration

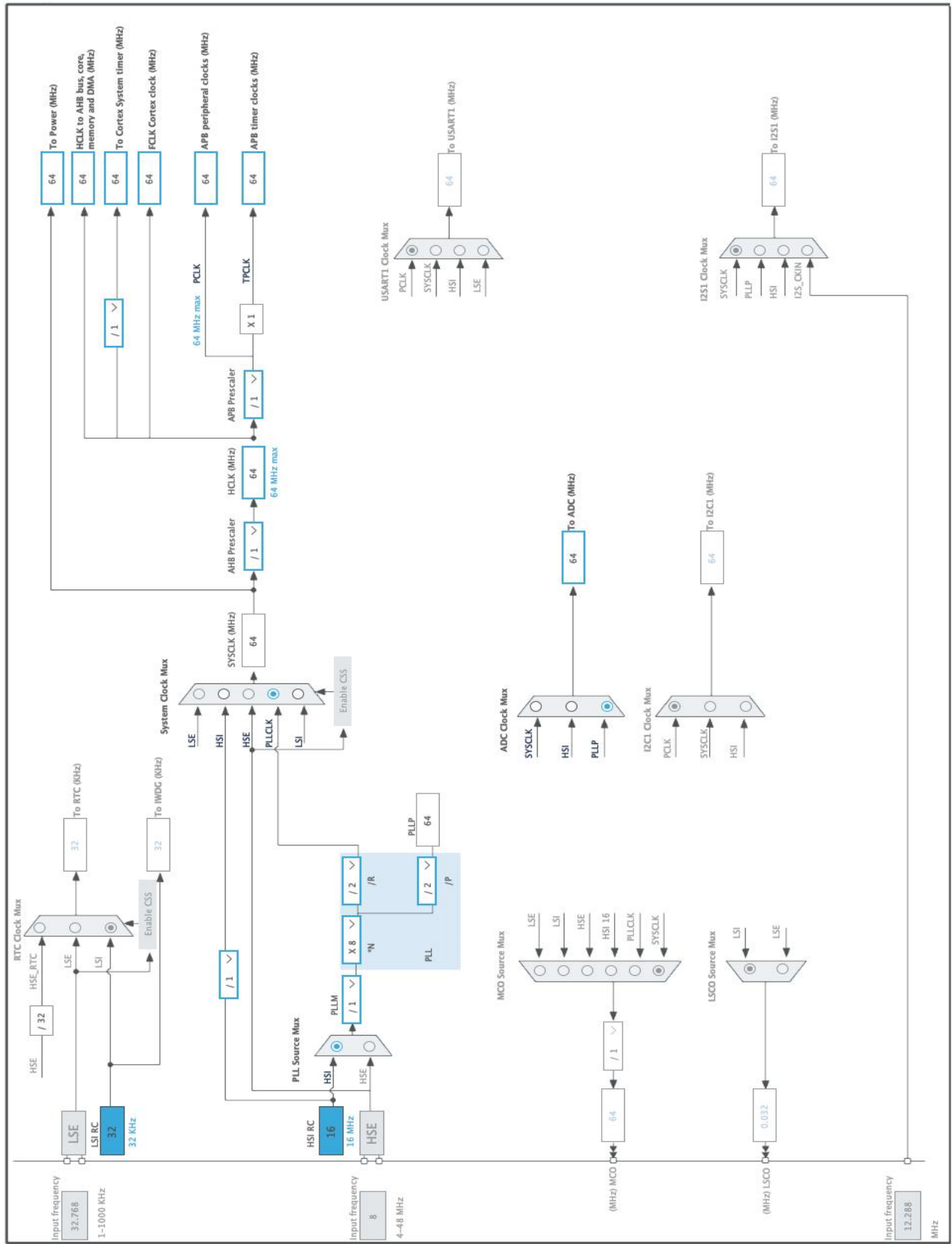


3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PB9 *	I/O	GPIO_Input	RUN
2	PC14-OSC32_IN (PC14) *	I/O	GPIO_Input	nESTOP
3	PC15-OSC32_OUT (PC15) *	I/O	GPIO_Input	REV
4	VDD/VDDA	Power		
5	VSS/VSSA	Power		
6	NRST	Reset		
7	PA0	I/O	ADC1_IN0	INT_SPD
8	PA1	I/O	ADC1_IN1	RAMP
9	PA2	I/O	ADC1_IN2	HS_TEMP
10	PA3	I/O	ADC1_IN3	EXT_SPD
11	PA4 *	I/O	GPIO_Output	OUT_RLY
12	PA5 *	I/O	GPIO_Input	SPD_SW
13	PA6	I/O	TIM1_BK	HOT_FLT
14	PA7	I/O	TIM1_CH1N	PWM_UL
15	PB0	I/O	TIM1_CH2N	PWM_VL
16	PB1	I/O	TIM1_CH3N	PWM_WL
17	PB2 *	I/O	GPIO_Output	PWM_EN
18	PA8	I/O	TIM1_CH1	PWM_UH
19	PA9	I/O	TIM1_CH2	PWM_VH
20	PC6 *	I/O	GPIO_Output	SS_BYP
21	PA10	I/O	TIM1_CH3	PWM_WH
22	PA11 [PA9] *	I/O	GPIO_Input	FLT_SW
23	PA12 [PA10] *	I/O	GPIO_Input	SPR_SW
24	PA13	I/O	SYS_SWDIO	SWDIO
25	PA14-BOOT0	I/O	SYS_SWCLK	SWCLK
26	PA15 *	I/O	GPIO_Output	FAN
27	PB3 *	I/O	GPIO_Input	_3PH_SW
28	PB4 *	I/O	GPIO_Input	PPM_SW
29	PB5 *	I/O	GPIO_Input	PPT_SW
30	PB6 *	I/O	GPIO_Output	LED_GRN
31	PB7 *	I/O	GPIO_Output	LED_YEL
32	PB8 *	I/O	GPIO_Output	LED_RED

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	code
Project Folder	/Users/andrew/Dropbox/-projects/9048-IMSC/02/code
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
Application Structure	Advanced
Generate Under Root	No
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 all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	No
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_DMA_Init	DMA
4	MX_ADC1_Init	ADC1
5	MX_TIM1_Init	TIM1
6	MX_TIM17_Init	TIM17

1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x0 Value line
MCU	STM32G030K6Tx
Datasheet	DS12991_Rev1

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

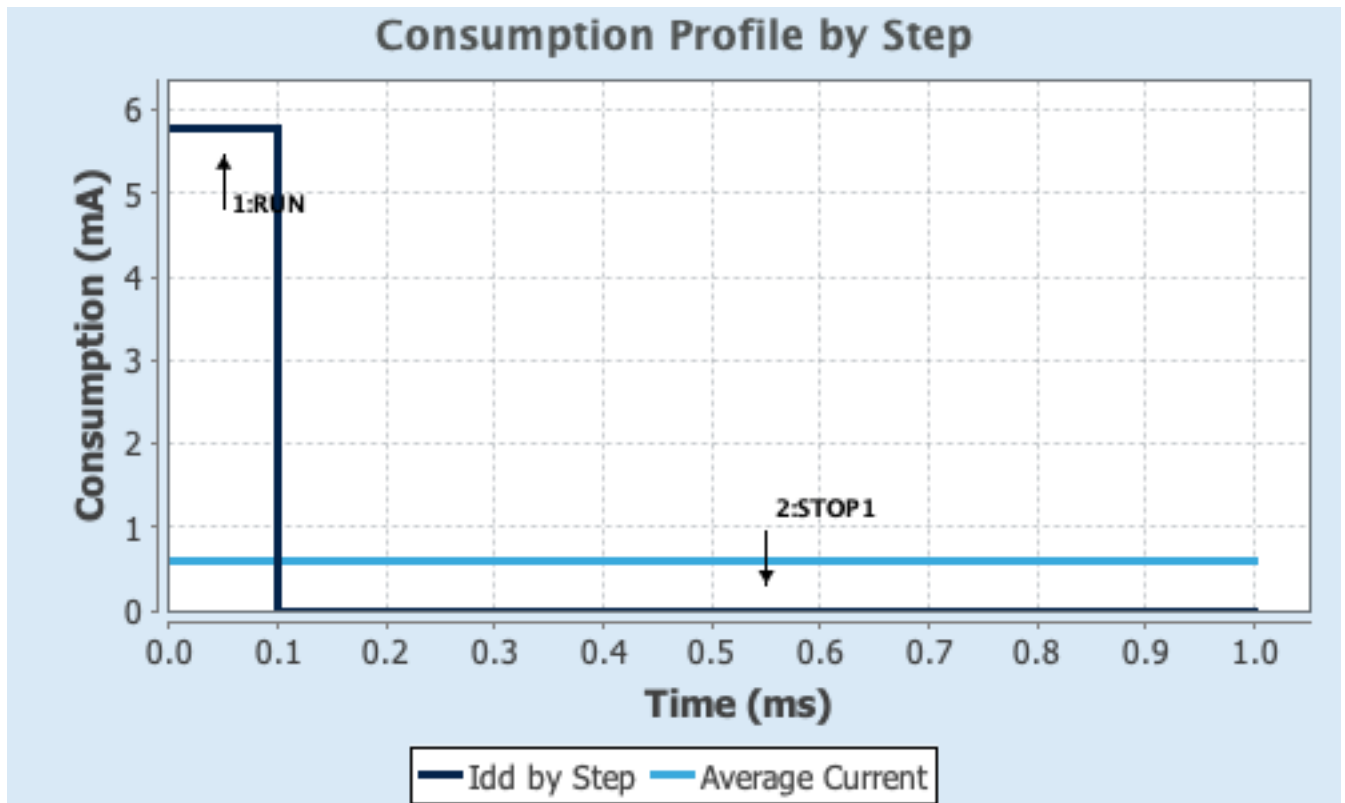
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoRange
Fetch Type	FLASH	Flash-PowerDown
CPU Frequency	64 MHz	16 MHz
Clock Configuration	HSI PLL	HSI
Clock Source Frequency	16 MHz	16 MHz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	5.77 mA	3.7 μ A
Duration	0.1 ms	0.9 ms
DMIPS	80.0	0.0
Ta Max	128.68	130
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	580.33 μ A
Battery Life	1 month, 19 days, 18 hours	Average DMIPS	80.0 DMIPS

1.6. Chart



2. Peripherals and Middlewares Configuration

2.1. ADC1

mode: IN0

mode: IN1

mode: IN2

mode: IN3

2.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler

Asynchronous clock mode divided by 8 *

Resolution

ADC 12-bit resolution

Data Alignment

Left alignment *

Sequencer

Sequencer set to not fully configurable *

Scan Conversion Mode

Forward

Continuous Conversion Mode

Enabled *

DMA Continuous Requests

Enabled *

End Of Conversion Selection

End of sequence of conversion *

Overrun behaviour

Overrun data preserved

Low Power Auto Wait

Disabled

Auto Off

Disabled

Oversampling Mode

Disabled

ADC_Regular_ConversionMode:

SamplingTime Common 1

19.5 Cycles *

External Trigger Conversion Source

Regular Conversion launched by software

External Trigger Conversion Edge

None

Trigger Frequency

High frequency

Analog Watchdog 1:

Enable Analog WatchDog1 Mode

false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode

false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode

false

2.2. RCC

2.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE
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2.3. SYS

mode: Debug

Timebase Source: SysTick

2.4. TIM1

Clock Source : Internal Clock

Channel1: PWM Generation CH1 CH1N

Channel2: PWM Generation CH2 CH2N

Channel3: PWM Generation CH3 CH3N

mode: Activate-Break-Input

2.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Center Aligned mode1 *
Counter Period (AutoReload Register - 16 bits value)	IMSC_PWM_RELOAD *
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	1 *
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
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Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Enable
BRK Polarity	Low *
BRK Filter (4 bits value)	IMSC_PWM_FILT *
BRK Sources Configuration	
- Digital Input	Enable
Break_IO mode selection	Break IO is an Input
Digital Input Polarity	Polarity High

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0
BRK2 Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - Output Configuration:

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

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 1 and 1N:

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

2.5. TIM17

mode: Activated

2.5.1. Parameter Settings:

Counter Settings:

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

*** User modified value**

3. System Configuration

3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA0	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	INT_SPD
	PA1	ADC1_IN1	Analog mode	No pull-up and no pull-down	n/a	RAMP
	PA2	ADC1_IN2	Analog mode	No pull-up and no pull-down	n/a	HS_TEMP
	PA3	ADC1_IN3	Analog mode	No pull-up and no pull-down	n/a	EXT_SPD
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	SWDIO
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	SWCLK
TIM1	PA6	TIM1_BK	Alternate Function Open Drain	Pull-up	Low	HOT_FLT
	PA7	TIM1_CH1N	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_UL
	PB0	TIM1_CH2N	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_VL
	PB1	TIM1_CH3N	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_WL
	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_UH
	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_VH
	PA10	TIM1_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_WH
GPIO	PB9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	RUN
	PC14-OSC32_IN (PC14)	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	nESTOP
	PC15-OSC32_OUT (PC15)	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	REV
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_RLY
	PA5	GPIO_Input	Input mode	Pull-up *	n/a	SPD_SW
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	PWM_EN
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SS_BYP
	PA11 [PA9]	GPIO_Input	Input mode	Pull-up *	n/a	FLT_SW
	PA12 [PA10]	GPIO_Input	Input mode	Pull-up *	n/a	SPR_SW
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FAN
	PB3	GPIO_Input	Input mode	Pull-up *	n/a	_3PH_SW
	PB4	GPIO_Input	Input mode	Pull-up *	n/a	PPM_SW
	PB5	GPIO_Input	Input mode	Pull-up *	n/a	PPT_SW
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Medium *	LED_GRN
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Medium *	LED_YEL
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Medium *	LED_RED

3.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA1_Channel1	Peripheral To Memory	Low

ADC1: DMA1_Channel1 DMA request Settings:

Mode: Normal
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Half Word
Memory Data Width: Half Word

3.3. NVIC configuration

3.3.1. 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
DMA1 channel 1 interrupt	true	0	0
TIM1 break, update, trigger and commutation interrupts	true	0	0
TIM17 global interrupt	true	2	0
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 interrupt	unused		
TIM1 capture compare interrupt	unused		

3.3.2. 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
DMA1 channel 1 interrupt	false	true	true
TIM1 break, update, trigger and commutation interrupts	false	true	false
TIM17 global interrupt	false	true	false

* User modified value

4. System Views

4.1. Category view

4.1.1. Current

5. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32g0-svd.zip
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
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Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-entry-level-graphics.pdf
Brochures	https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf
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microcontroller-system-memory-boot-mode-stmicroelectronics.pdf

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Application Notes https://www.st.com/resource/en/application_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf

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Application Notes https://www.st.com/resource/en/application_note/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf

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