
STM32
CubeMX

1. Description

1.1. Project

Project Name	JN910_SwitchUnit
Board Name	custom
Generated with:	STM32CubeMX 6.6.0
Date	07/08/2022

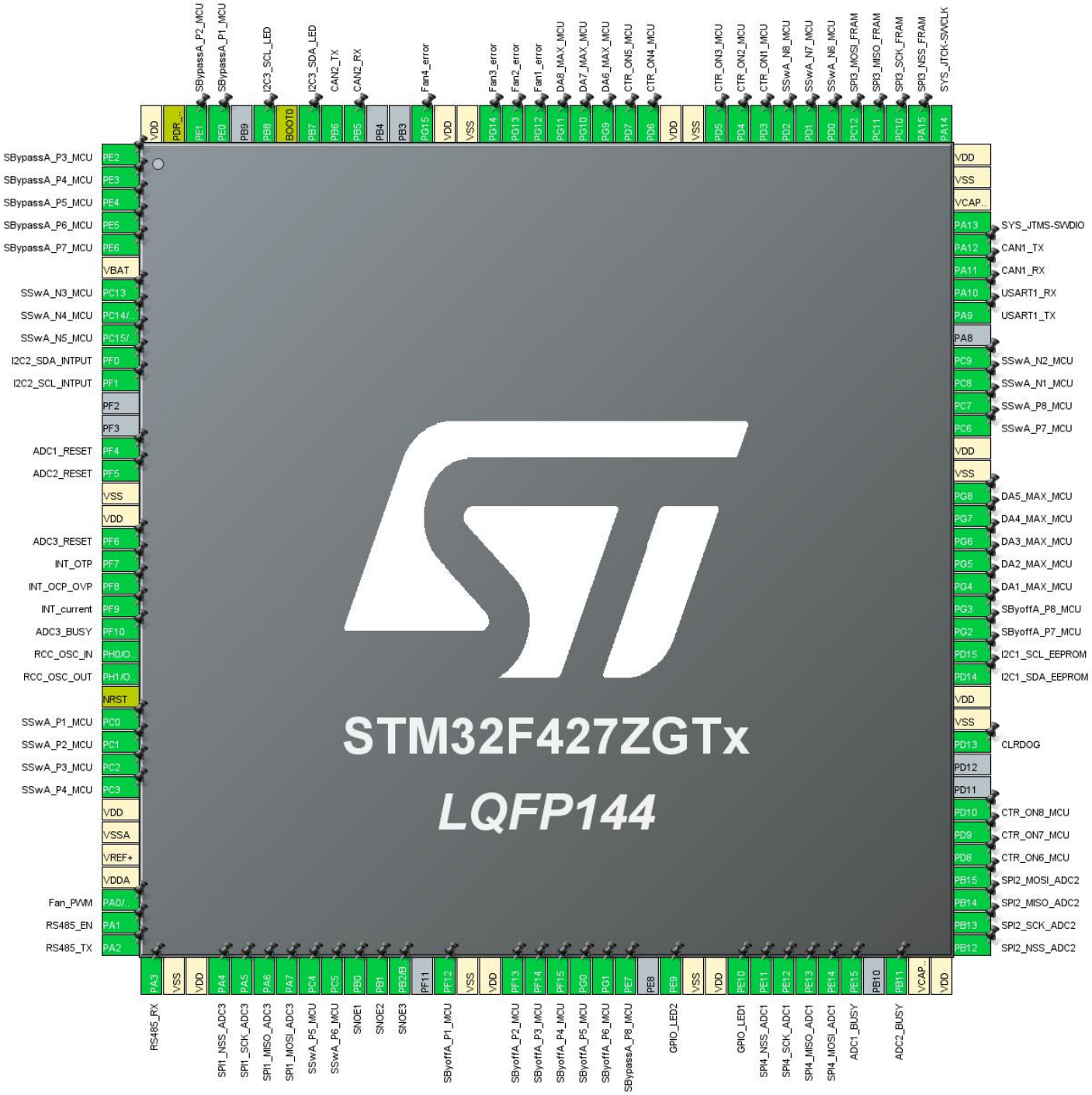
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F427/437
MCU name	STM32F427ZGTx
MCU Package	LQFP144
MCU Pin number	144

1.3. Core(s) information

Core(s)	Arm Cortex-M4

2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Output	SBypassA_P3_MCU
2	PE3 *	I/O	GPIO_Output	SBypassA_P4_MCU
3	PE4 *	I/O	GPIO_Output	SBypassA_P5_MCU
4	PE5 *	I/O	GPIO_Output	SBypassA_P6_MCU
5	PE6 *	I/O	GPIO_Output	SBypassA_P7_MCU
6	VBAT	Power		
7	PC13 *	I/O	GPIO_Output	SSwA_N3_MCU
8	PC14/OSC32_IN *	I/O	GPIO_Output	SSwA_N4_MCU
9	PC15/OSC32_OUT *	I/O	GPIO_Output	SSwA_N5_MCU
10	PF0 *	I/O	GPIO_Output	I2C2_SDA_INTPUT
11	PF1 *	I/O	GPIO_Output	I2C2_SCL_INTPUT
14	PF4 *	I/O	GPIO_Output	ADC1_RESET
15	PF5 *	I/O	GPIO_Output	ADC2_RESET
16	VSS	Power		
17	VDD	Power		
18	PF6 *	I/O	GPIO_Output	ADC3_RESET
19	PF7	I/O	GPIO_EXTI7	INT_OTP
20	PF8	I/O	GPIO_EXTI8	INT_OCP_OVP
21	PF9	I/O	GPIO_EXTI9	INT_current
22	PF10	I/O	GPIO_EXTI10	ADC3_BUSY
23	PH0/OSC_IN	I/O	RCC_OSC_IN	
24	PH1/OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
26	PC0 *	I/O	GPIO_Output	SSwA_P1_MCU
27	PC1 *	I/O	GPIO_Output	SSwA_P2_MCU
28	PC2 *	I/O	GPIO_Output	SSwA_P3_MCU
29	PC3 *	I/O	GPIO_Output	SSwA_P4_MCU
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0/WKUP	I/O	TIM2_CH1	Fan_PWM
35	PA1 *	I/O	GPIO_Output	RS485_EN
36	PA2	I/O	USART2_TX	RS485_TX
37	PA3	I/O	USART2_RX	RS485_RX
38	VSS	Power		

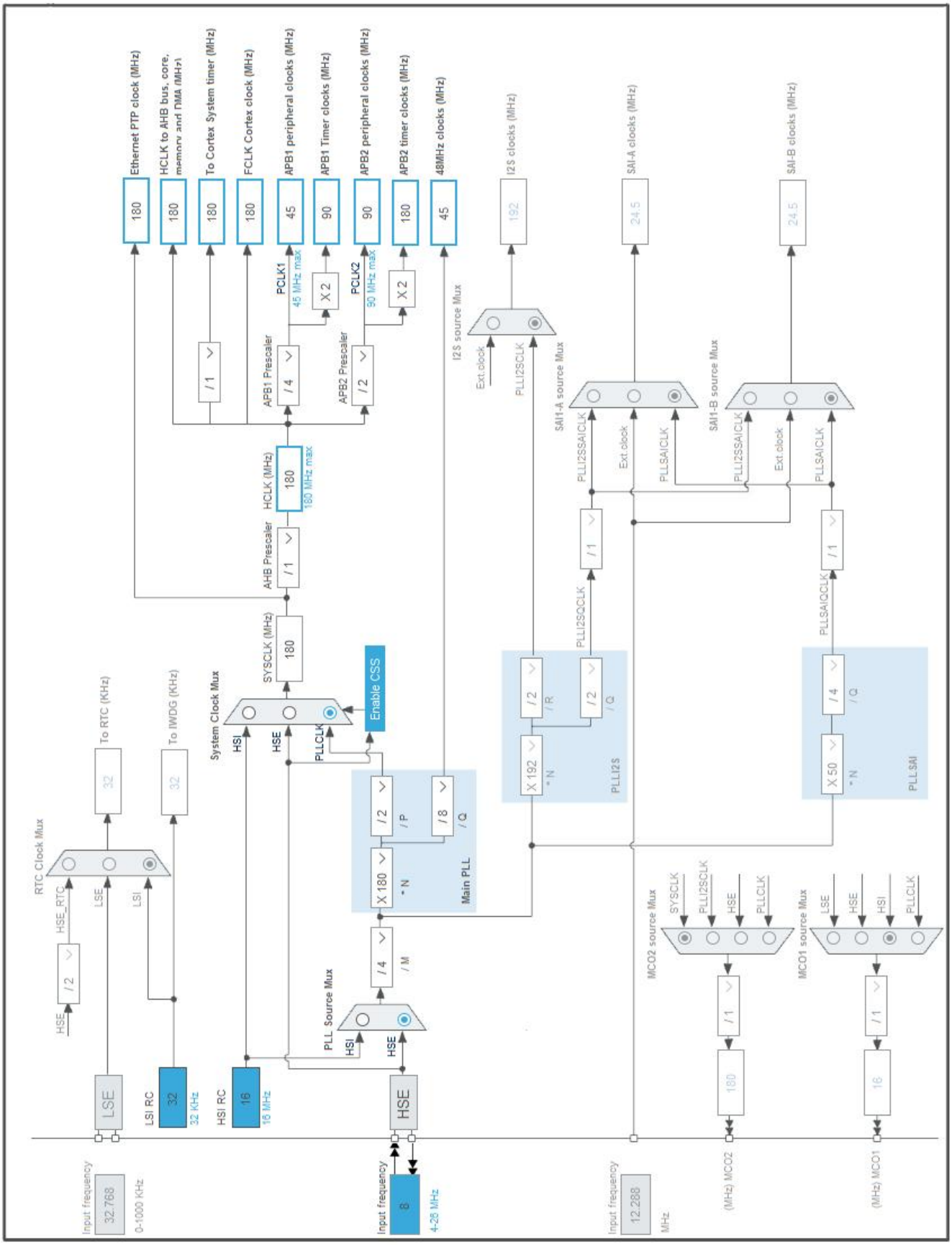
Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
39	VDD	Power		
40	PA4 *	I/O	GPIO_Output	SPI1_NSS_ADC3
41	PA5	I/O	SPI1_SCK	SPI1_SCK_ADC3
42	PA6	I/O	SPI1_MISO	SPI1_MISO_ADC3
43	PA7	I/O	SPI1_MOSI	SPI1_MOSI_ADC3
44	PC4 *	I/O	GPIO_Output	SSwA_P5_MCU
45	PC5 *	I/O	GPIO_Output	SSwA_P6_MCU
46	PB0 *	I/O	GPIO_Output	SNOE1
47	PB1 *	I/O	GPIO_Output	SNOE2
48	PB2/BOOT1 *	I/O	GPIO_Output	SNOE3
50	PF12 *	I/O	GPIO_Output	SByoffA_P1_MCU
51	VSS	Power		
52	VDD	Power		
53	PF13 *	I/O	GPIO_Output	SByoffA_P2_MCU
54	PF14 *	I/O	GPIO_Output	SByoffA_P3_MCU
55	PF15 *	I/O	GPIO_Output	SByoffA_P4_MCU
56	PG0 *	I/O	GPIO_Output	SByoffA_P5_MCU
57	PG1 *	I/O	GPIO_Output	SByoffA_P6_MCU
58	PE7 *	I/O	GPIO_Output	SBypassA_P8_MCU
60	PE9 *	I/O	GPIO_Output	GPIO_LED2
61	VSS	Power		
62	VDD	Power		
63	PE10 *	I/O	GPIO_Output	GPIO_LED1
64	PE11 *	I/O	GPIO_Output	SPI4_NSS_ADC1
65	PE12	I/O	SPI4_SCK	SPI4_SCK_ADC1
66	PE13	I/O	SPI4_MISO	SPI4_MISO_ADC1
67	PE14	I/O	SPI4_MOSI	SPI4_MOSI_ADC1
68	PE15	I/O	GPIO_EXTI15	ADC1_BUSY
70	PB11	I/O	GPIO_EXTI11	ADC2_BUSY
71	VCAP_1	Power		
72	VDD	Power		
73	PB12 *	I/O	GPIO_Output	SPI2_NSS_ADC2
74	PB13	I/O	SPI2_SCK	SPI2_SCK_ADC2
75	PB14	I/O	SPI2_MISO	SPI2_MISO_ADC2
76	PB15	I/O	SPI2_MOSI	SPI2_MOSI_ADC2
77	PD8 *	I/O	GPIO_Output	CTR_ON6_MCU
78	PD9 *	I/O	GPIO_Output	CTR_ON7_MCU
79	PD10 *	I/O	GPIO_Output	CTR_ON8_MCU
82	PD13 *	I/O	GPIO_Output	CLRDOG

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
83	VSS	Power		
84	VDD	Power		
85	PD14 *	I/O	GPIO_Output	I2C1_SDA_EEPROM
86	PD15 *	I/O	GPIO_Output	I2C1_SCL_EEPROM
87	PG2 *	I/O	GPIO_Output	SByoffA_P7_MCU
88	PG3 *	I/O	GPIO_Output	SByoffA_P8_MCU
89	PG4 *	I/O	GPIO_Output	DA1_MAX_MCU
90	PG5 *	I/O	GPIO_Output	DA2_MAX_MCU
91	PG6 *	I/O	GPIO_Output	DA3_MAX_MCU
92	PG7 *	I/O	GPIO_Output	DA4_MAX_MCU
93	PG8 *	I/O	GPIO_Output	DA5_MAX_MCU
94	VSS	Power		
95	VDD	Power		
96	PC6 *	I/O	GPIO_Output	SSwA_P7_MCU
97	PC7 *	I/O	GPIO_Output	SSwA_P8_MCU
98	PC8 *	I/O	GPIO_Output	SSwA_N1_MCU
99	PC9 *	I/O	GPIO_Output	SSwA_N2_MCU
101	PA9	I/O	USART1_TX	
102	PA10	I/O	USART1_RX	
103	PA11	I/O	CAN1_RX	
104	PA12	I/O	CAN1_TX	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
110	PA15 *	I/O	GPIO_Output	SPI3_NSS_FRAM
111	PC10	I/O	SPI3_SCK	SPI3_SCK_FRAM
112	PC11	I/O	SPI3_MISO	SPI3_MISO_FRAM
113	PC12	I/O	SPI3_MOSI	SPI3_MOSI_FRAM
114	PD0 *	I/O	GPIO_Output	SSwA_N6_MCU
115	PD1 *	I/O	GPIO_Output	SSwA_N7_MCU
116	PD2 *	I/O	GPIO_Output	SSwA_N8_MCU
117	PD3 *	I/O	GPIO_Output	CTR_ON1_MCU
118	PD4 *	I/O	GPIO_Output	CTR_ON2_MCU
119	PD5 *	I/O	GPIO_Output	CTR_ON3_MCU
120	VSS	Power		
121	VDD	Power		
122	PD6 *	I/O	GPIO_Output	CTR_ON4_MCU

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
123	PD7 *	I/O	GPIO_Output	CTR_ON5_MCU
124	PG9 *	I/O	GPIO_Output	DA6_MAX_MCU
125	PG10 *	I/O	GPIO_Output	DA7_MAX_MCU
126	PG11 *	I/O	GPIO_Output	DA8_MAX_MCU
127	PG12 *	I/O	GPIO_Input	Fan1_error
128	PG13 *	I/O	GPIO_Input	Fan2_error
129	PG14 *	I/O	GPIO_Input	Fan3_error
130	VSS	Power		
131	VDD	Power		
132	PG15 *	I/O	GPIO_Input	Fan4_error
135	PB5	I/O	CAN2_RX	
136	PB6	I/O	CAN2_TX	
137	PB7 *	I/O	GPIO_Output	I2C3_SDA_LED
138	BOOT0	Boot		
139	PB8 *	I/O	GPIO_Output	I2C3_SCL_LED
141	PE0 *	I/O	GPIO_Output	SBypassA_P1_MCU
142	PE1 *	I/O	GPIO_Output	SBypassA_P2_MCU
143	PDR_ON	Reset		
144	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	JN910_SwitchUnit
Project Folder	F:\Program\JN910\JN910_SwitchUnit_20220705\JN910_SwitchUnit
Toolchain / IDE	MDK-ARM V5.32
Firmware Package Name and Version	STM32Cube FW_F4 V1.27.0
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	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_RNG_Init	RNG
4	MX_CAN1_Init	CAN1
5	MX_CAN2_Init	CAN2
6	MX_SPI1_Init	SPI1
7	MX_SPI2_Init	SPI2
8	MX_SPI3_Init	SPI3
9	MX_SPI4_Init	SPI4
10	MX_USART1_UART_Init	USART1
11	MX_USART2_UART_Init	USART2

Rank	Function Name	Peripheral Instance Name
12	MX_TIM2_Init	TIM2

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F427/437
MCU	STM32F427ZGTx
Datasheet	DS9405_Rev9

6.2. Parameter Selection

Temperature	25
Vdd	3.3

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

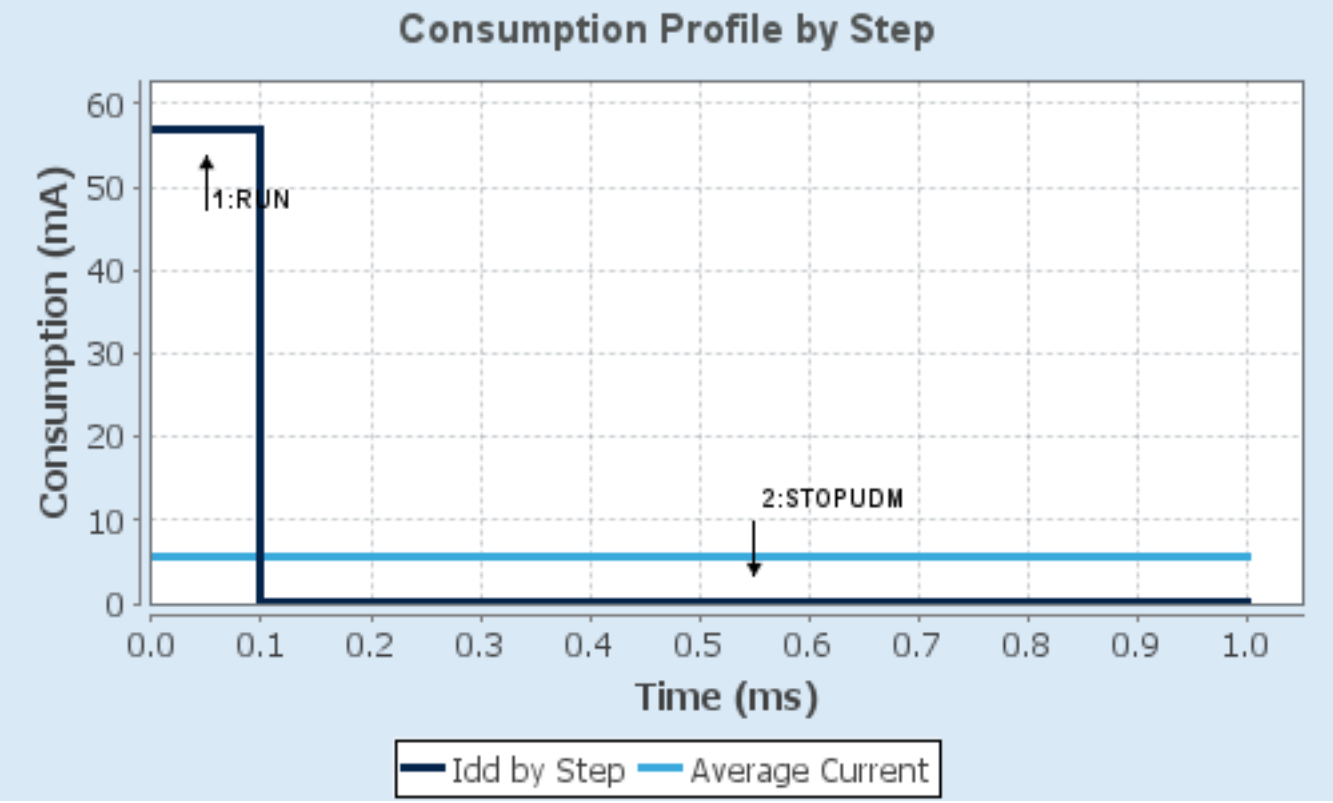
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP_UDM (Under Drive)
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	180 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LP Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	57 mA	100 µA
Duration	0.1 ms	0.9 ms
DMIPS	225.0	0.0
Ta Max	97.48	104.99
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	5.79 mA
Battery Life	24 days, 10 hours	Average DMIPS	225.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
60
50
40
30
20
10
0
1:RUN
2:STOPUDM
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

7. Peripherals and Middlewares Configuration

7.1. CAN1

mode: Activated

7.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16
Time Quantum	**355.55555555555554 ***
Time Quanta in Bit Segment 1	**3 Times ***
Time Quanta in Bit Segment 2	**7 Times ***
Time for one Bit	**3911 ***
Baud Rate	**255681 ***
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	Disable
Automatic Wake-Up Mode	Disable
Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	Disable

Advanced Parameters:

Operating Mode	Normal

7.2. CAN2

mode: Activated

7.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16
Time Quantum	**355.55555555555554 ***
Time Quanta in Bit Segment 1	**3 Times ***
Time Quanta in Bit Segment 2	**7 Times ***
Time for one Bit	**3911 ***
Baud Rate	**255681 ***
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	Disable
Automatic Wake-Up Mode	Disable
Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	Disable

Advanced Parameters:

Operating Mode	Normal

7.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
Power Over Drive	Enabled

7.4. RNG

mode: Activated

7.5. SPI1

Mode: Full-Duplex Master

7.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola

Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**45.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.6. SPI2

Mode: Full-Duplex Master

7.6.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**22.5 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.7. SPI3

Mode: Full-Duplex Master

7.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**22.5 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.8. SPI4

Mode: Full-Duplex Master

7.8.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**45.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.9. SYS

Debug: Serial Wire

Timebase Source: TIM14

7.10. TIM2

Channel1: PWM Generation CH1

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**9-1 ***
Counter Mode	Up

Counter Period (AutoReload Register - 32 bits value)	**1000-1 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	**Enable ***

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 (32 bits value)	**20 ***
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.11. USART1

Mode: Asynchronous

7.11.1. 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

7.12. USART2

Mode: Asynchronous

7.12.1. 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

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
CAN1	PA11	CAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PA12	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
CAN2	PB5	CAN2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PB6	CAN2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
RCC	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI1_SCK_ADC3
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI1_MISO_ADC3
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI1_MOSI_ADC3
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI2_SCK_ADC2
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI2_MISO_ADC2
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI2_MOSI_ADC2
SPI3	PC10	SPI3_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI3_SCK_FRAM
	PC11	SPI3_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI3_MISO_FRAM
	PC12	SPI3_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI3_MOSI_FRAM
SPI4	PE12	SPI4_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI4_SCK_ADC1
	PE13	SPI4_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SPI4_MISO_ADC1

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE14	SPI4_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	SPI4_MOSI_ADC1
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM2	PA0/WKUP	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	Fan_PWM
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	RS485_TX
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	RS485_RX
GPIO	PE2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P3_MCU
	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P4_MCU
	PE4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P5_MCU
	PE5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P6_MCU
	PE6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P7_MCU
	PC13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N3_MCU
	PC14/OSC32_IN	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N4_MCU
	PC15/OSC32_OUT	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N5_MCU
	PF0	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C2_SDA_INTPUT
	PF1	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C2_SCL_INTPUT
	PF4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC1_RESET
	PF5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC2_RESET
	PF6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC3_RESET
	PF7	GPIO_EXTI7	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	INT_OTP
	PF8	GPIO_EXTI8	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	INT_OCP_OVP
	PF9	GPIO_EXTI9	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	INT_current
	PF10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	ADC3_BUSY
	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P1_MCU
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P2_MCU
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P3_MCU

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P4_MCU
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485_EN
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	SPI1_NSS_ADC3
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P5_MCU
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P6_MCU
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SNOE1
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SNOE2
	PB2/BOOT1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SNOE3
	PF12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P1_MCU
	PF13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P2_MCU
	PF14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P3_MCU
	PF15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P4_MCU
	PG0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P5_MCU
	PG1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P6_MCU
	PE7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P8_MCU
	PE9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GPIO_LED2
	PE10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GPIO_LED1
	PE11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	SPI4_NSS_ADC1
	PE15	GPIO_EXTI15	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	**n/a**	ADC1_BUSY
	PB11	GPIO_EXTI11	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	**n/a**	ADC2_BUSY
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	SPI2_NSS_ADC2
	PD8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON6_MCU
	PD9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON7_MCU
	PD10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON8_MCU
	PD13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CLRDOG
	PD14	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C1_SDA_EEPROM
	PD15	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C1_SCL_EEPROM
	PG2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P7_MCU
	PG3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SByoffA_P8_MCU
	PG4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA1_MAX_MCU
	PG5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA2_MAX_MCU
	PG6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA3_MAX_MCU
	PG7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA4_MAX_MCU
	PG8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA5_MAX_MCU
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P7_MCU
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_P8_MCU
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N1_MCU
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N2_MCU

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	SPI3_NSS_FRAM
	PD0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N6_MCU
	PD1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N7_MCU
	PD2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SSwA_N8_MCU
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON1_MCU
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON2_MCU
	PD5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON3_MCU
	PD6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON4_MCU
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CTR_ON5_MCU
	PG9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA6_MAX_MCU
	PG10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA7_MAX_MCU
	PG11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DA8_MAX_MCU
	PG12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Fan1_error
	PG13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Fan2_error
	PG14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Fan3_error
	PG15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	Fan4_error
	PB7	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C3_SDA_LED
	PB8	GPIO_Output	**Output Open Drain ***	**Pull-up ***	**High ***	I2C3_SCL_LED
	PE0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P1_MCU
	PE1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SBypassA_P2_MCU

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
Memory management fault	true	0	0
Pre-fetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
CAN1 RX0 interrupts	true	1	0
CAN1 RX1 interrupt	true	1	0
EXTI line[9:5] interrupts	true	1	0
USART1 global interrupt	true	1	0
USART2 global interrupt	true	1	0
EXTI line[15:10] interrupts	true	1	0
TIM8 trigger and commutation interrupts and TIM14 global interrupt	true	0	0
CAN2 RX0 interrupts	true	1	0
CAN2 RX1 interrupt	true	1	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
CAN1 TX interrupts	unused		
CAN1 SCE interrupt	unused		
TIM2 global interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
SPI3 global interrupt	unused		
CAN2 TX interrupts	unused		
CAN2 SCE interrupt	unused		
HASH and RNG global interrupts	unused		
FPU global interrupt	unused		
SPI4 global interrupt	unused		

8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler

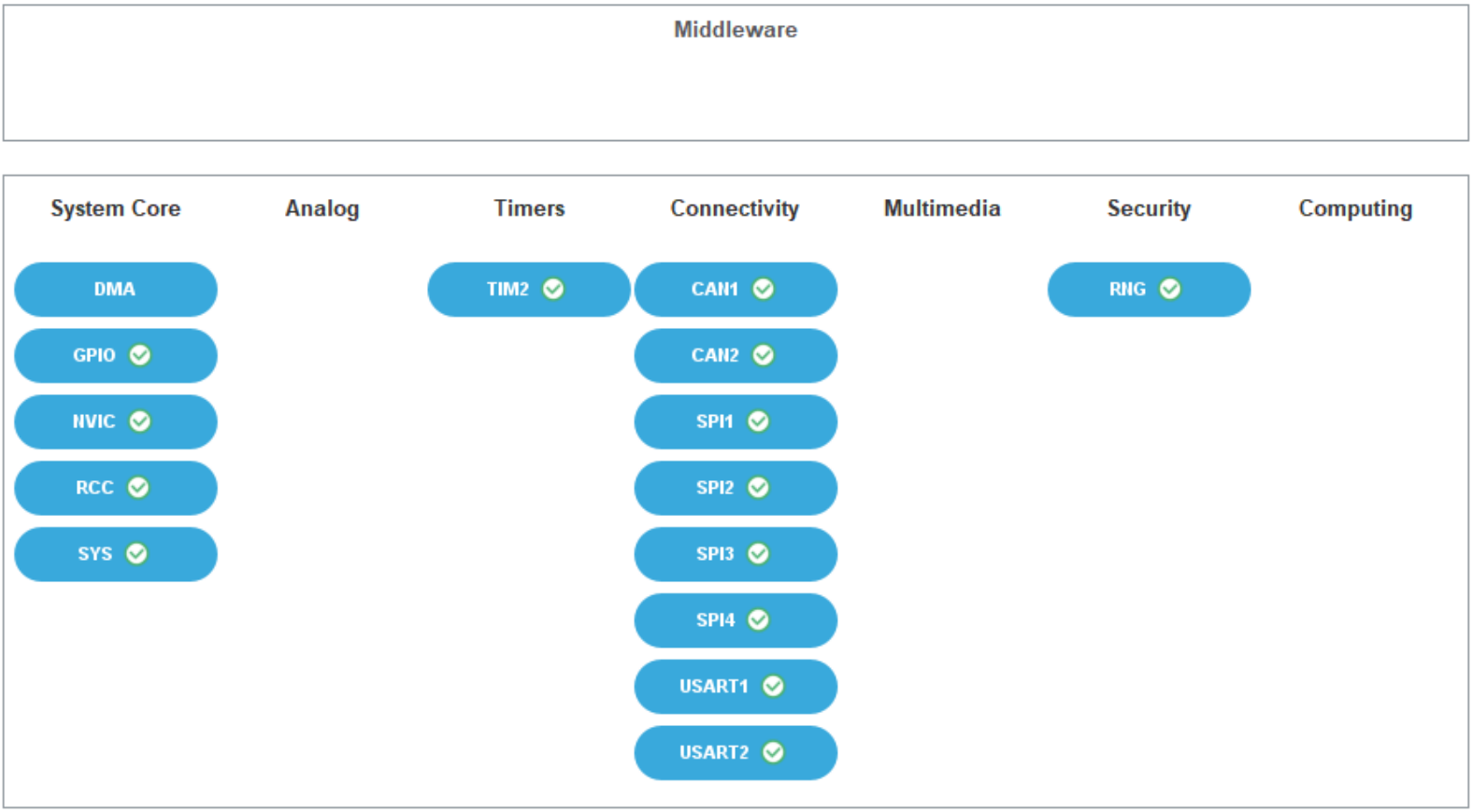
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
CAN1 RX0 interrupts	false	true	true
CAN1 RX1 interrupt	false	true	true
EXTI line[9:5] interrupts	false	true	true
USART1 global interrupt	false	true	true
USART2 global interrupt	false	true	true
EXTI line[15:10] interrupts	false	true	true
TIM8 trigger and commutation interrupts and TIM14 global interrupt	false	true	true
CAN2 RX0 interrupts	false	true	true
CAN2 RX1 interrupt	false	true	true

*** User modified value**

9. System Views

9.1. Category view

9.1.1. Current



10. Docs & Resources

Type	Link
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
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Product Certifications	https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf
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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/an2867-oscillator-design-guide-for-stm8afals-stm32-mcus-and-mpus-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/an3154-can-protocol-used-in-the-stm32-bootloader-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/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/an3997-audio-playback-and-recording-using-the-stm32f4discovery-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/an4031-using-the-stm32f2-stm32f4-and-stm32f7-series-dma-controller-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4073-how-to-improve-adc-accuracy-when-using-stm32f2xx-and-stm32f4xx-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4221-i2c-protocol-

	used-in-the-stm32-bootloader-stmicroelectronics.pdf
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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/an4286-spi-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4488-getting-started-with-stm32f4xxxx-mcu-hardware-development-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4547-migrating-from-stm32f407xx417xx-to-stm32f427xx429xx437xx439xx-stmicroelectronics.pdf
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4499-stm32--nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4502-stm32-smbuspmbus-embedded-software-expansion-for-stm32cube-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4666-parallel-synchronous-transmission-using-gpio-and-dma-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4678-full-duplex-spi-emulation-for-stm32f4-microcontrollers-stmicroelectronics.pdf

Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4701-proprietary-code-readout-protection-on-microcontrollers-of-the-stm32f4-series-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4739-stm32cube-firmware-examples-for-stm32f4-series-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4758-proprietary-code-readout-protection-on-stm32l4-stm32l4-stm32g4-and-stm32wb-series-mcus-stmicroelectronics.pdf
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4968-proprietary-code-read-out-protection-pcrop-on-stm32f72xxx-and-stm32f73xxx-microcontrollers-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5054-secure-programming-using-stm32cubeprogrammer-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5056-integration-guide-for-the-xcubesbsfu-stm32cube-expansion-package-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5360-getting-started-with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5361-getting-started-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5418-how-to-build-a-

for related Tools & Software	simple-usbpd-sink-application-with-stm32cubemx-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5464-position-control-of-a-threephase-permanent-magnet-motor-using-xcubemcsdk-or-xcubemcsdkful-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5564-getting-started-with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5698-adapting-the-xcubestl-functional-safety-package-for-stm32-iec-61508-compliant-to-other-safety-standards-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf
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Programming Manuals	https://www.st.com/resource/en/programming_manual/pm0214-stm32-cortexm4-mcus-and-mpus-programming-manual-stmicroelectronics.pdf
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