1. Description

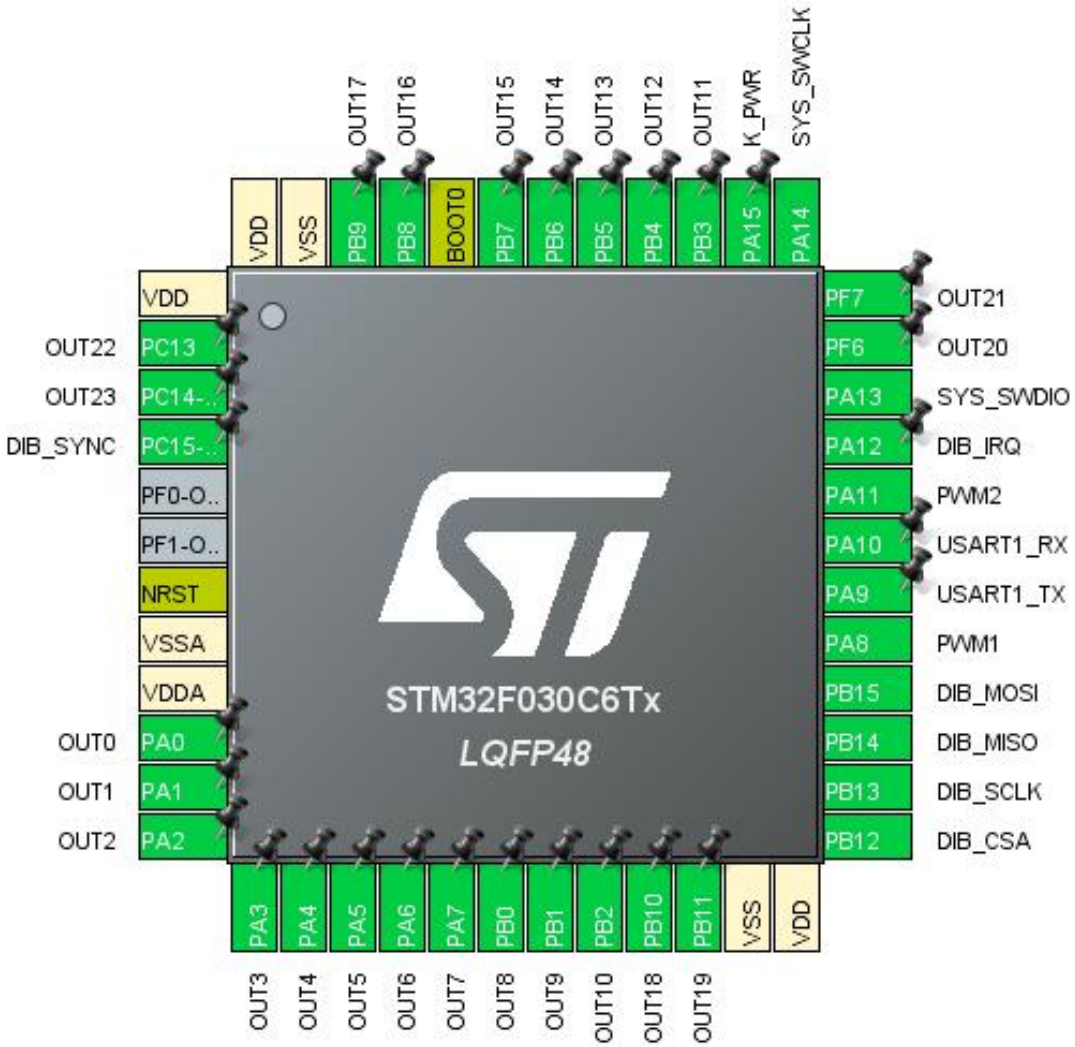
1.1. Project

Project Name	SMX46
Board Name	custom
Generated with:	STM32CubeMX 5.6.1
Date	09/22/2020

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x0 Value Line
MCU name	STM32F030C6Tx
MCU Package	LQFP48
MCU Pin number	48

2. Pinout Configuration



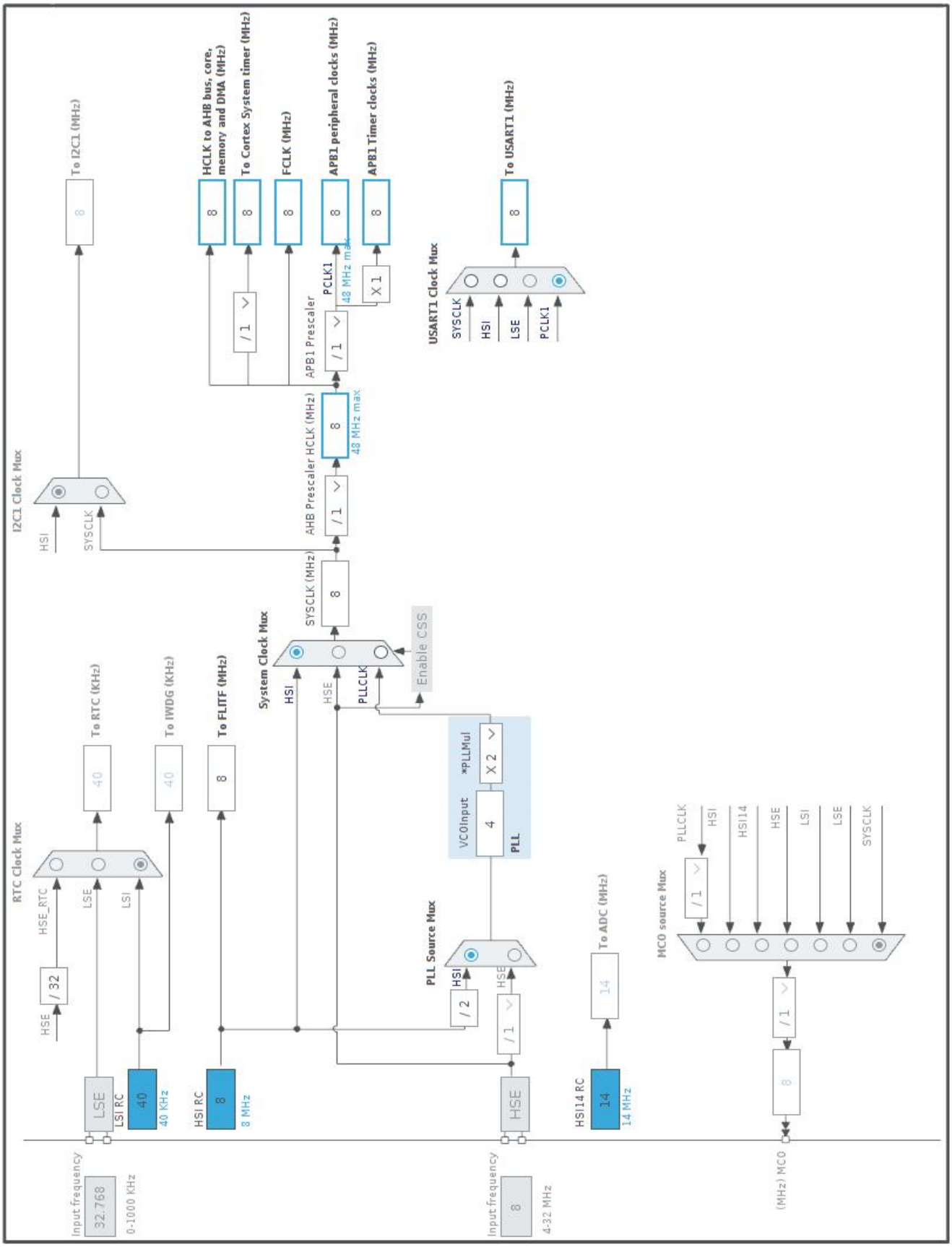
3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC13 *	I/O	GPIO_Output	OUT22
3	PC14-OSC32_IN *	I/O	GPIO_Output	OUT23
4	PC15-OSC32_OUT *	I/O	GPIO_Input	DIB_SYNC
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
10	PA0 *	I/O	GPIO_Output	OUT0
11	PA1 *	I/O	GPIO_Output	OUT1
12	PA2 *	I/O	GPIO_Output	OUT2
13	PA3 *	I/O	GPIO_Output	OUT3
14	PA4 *	I/O	GPIO_Output	OUT4
15	PA5 *	I/O	GPIO_Output	OUT5
16	PA6 *	I/O	GPIO_Output	OUT6
17	PA7 *	I/O	GPIO_Output	OUT7
18	PB0 *	I/O	GPIO_Output	OUT8
19	PB1 *	I/O	GPIO_Output	OUT9
20	PB2 *	I/O	GPIO_Output	OUT10
21	PB10 *	I/O	GPIO_Output	OUT18
22	PB11 *	I/O	GPIO_Output	OUT19
23	VSS	Power		
24	VDD	Power		
25	PB12	I/O	SPI1_NSS	DIB_CSA
26	PB13	I/O	SPI1_SCK	DIB_SCLK
27	PB14	I/O	SPI1_MISO	DIB_MISO
28	PB15	I/O	SPI1_MOSI	DIB_MOSI
29	PA8	I/O	TIM1_CH1	PWM1
30	PA9	I/O	USART1_TX	
31	PA10	I/O	USART1_RX	
32	PA11	I/O	TIM1_CH4	PWM2
33	PA12 *	I/O	GPIO_Output	DIB_IRQ
34	PA13	I/O	SYS_SWDIO	
35	PF6 *	I/O	GPIO_Output	OUT20
36	PF7 *	I/O	GPIO_Output	OUT21
37	PA14	I/O	SYS_SWCLK	
38	PA15 *	I/O	GPIO_Output	K_PWR

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
39	PB3 *	I/O	GPIO_Output	OUT11
40	PB4 *	I/O	GPIO_Output	OUT12
41	PB5 *	I/O	GPIO_Output	OUT13
42	PB6 *	I/O	GPIO_Output	OUT14
43	PB7 *	I/O	GPIO_Output	OUT15
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	OUT16
46	PB9 *	I/O	GPIO_Output	OUT17
47	VSS	Power		
48	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	SMX46
Project Folder	/home/denis/BACKUP/EEZ/Digital control/MCU/STM32/Projects/SMX46
Toolchain / IDE	EWARM V8.32
Firmware Package Name and Version	STM32Cube FW_F0 V1.11.0

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
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x0 Value Line
MCU	STM32F030C6Tx
Datasheet	024849_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

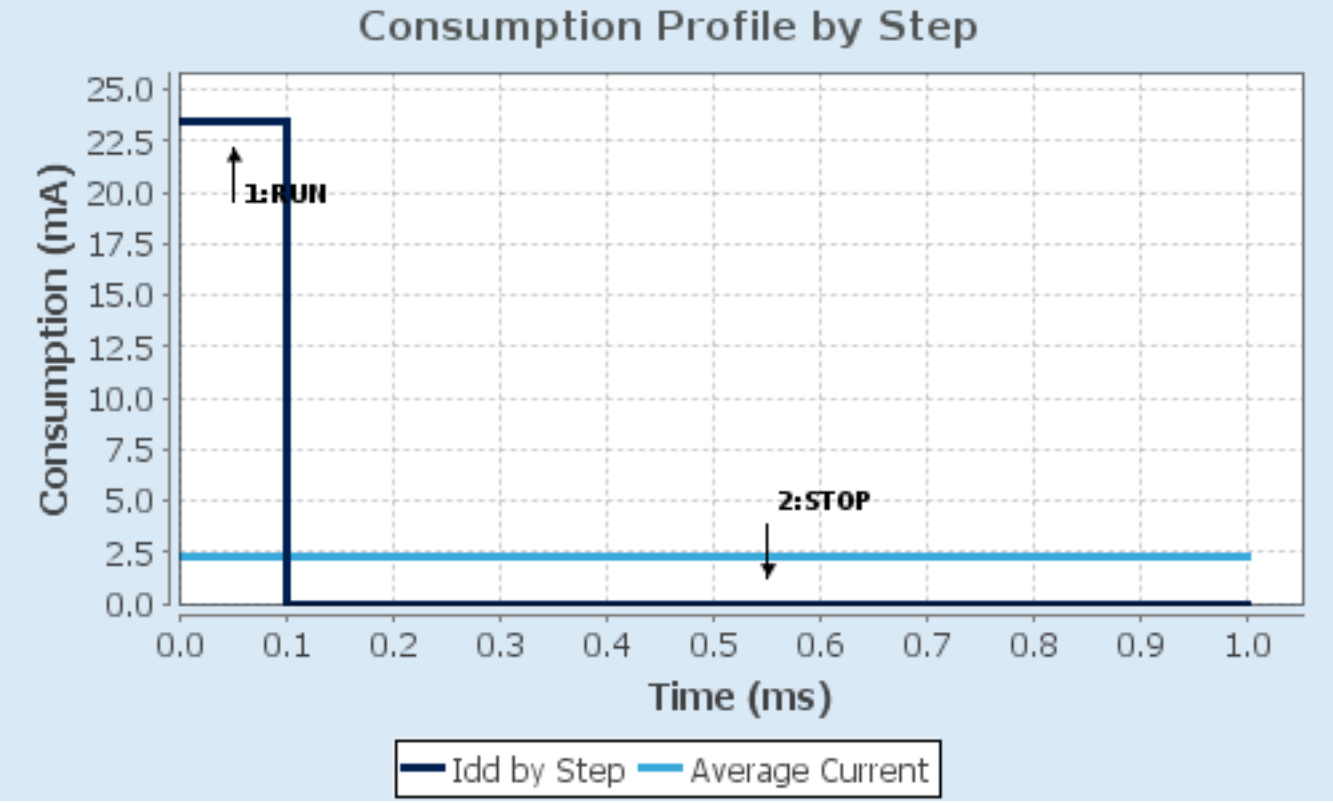
6.4. Sequence

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 µA
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	100.36	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


Consumption Profile by Step
Consumption (mA)
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
1:RUN
2:STOP
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. IPs and Middleware Configuration

7.1. CRC

mode: Activated

7.1.1. Parameter Settings:

Basic Parameters:

Default Polynomial State	Enable
Default Init Value State	Enable

Advanced Parameters:

Input Data Inversion Mode	None
Output Data Inversion Mode	Disable
Input Data Format	Bytes

7.2. GPIO

7.3. SPI1

Mode: Full-Duplex Slave

Hardware NSS Signal: Hardware NSS Input Signal

7.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Input Hardware

7.4. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

7.5. TIM1

Channel1: Output Compare CH1

Channel4: PWM Generation CH4

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
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

Output Compare Channel 1:

Mode	Frozen (used for Timing base)
Pulse (16 bits value)	0
Output compare preload	Disable
CH Polarity	High
CH 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. USART1

Mode: Asynchronous

7.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	38400
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
SPI1	PB12	SPI1_NSS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	DIB_CSA
	PB13	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	DIB_SCLK
	PB14	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	DIB_MISO
	PB15	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	DIB_MOSI
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM1
	PA11	TIM1_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM2
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
GPIO	PC13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT22
	PC14-OSC32_IN	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT23
	PC15-OSC32_OUT	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIB_SYNC
	PA0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT0
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT1
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT2
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT3
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT4
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT5
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT6
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT7
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT8
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT9
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT10
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT18
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT19
	PA12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DIB_IRQ
	PF6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT20
	PF7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT21
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	K_PWR
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT11
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT12

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT13
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT14
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT15
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT16
	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT17

8.2. DMA configuration

DMA request	Stream	Direction	Priority
SPI1_RX	DMA1_Channel2	Peripheral To Memory	Low
SPI1_TX	DMA1_Channel3	Memory To Peripheral	Low

SPI1_RX: DMA1_Channel2 DMA request Settings:

Mode:	Normal
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

SPI1_TX: DMA1_Channel3 DMA request Settings:

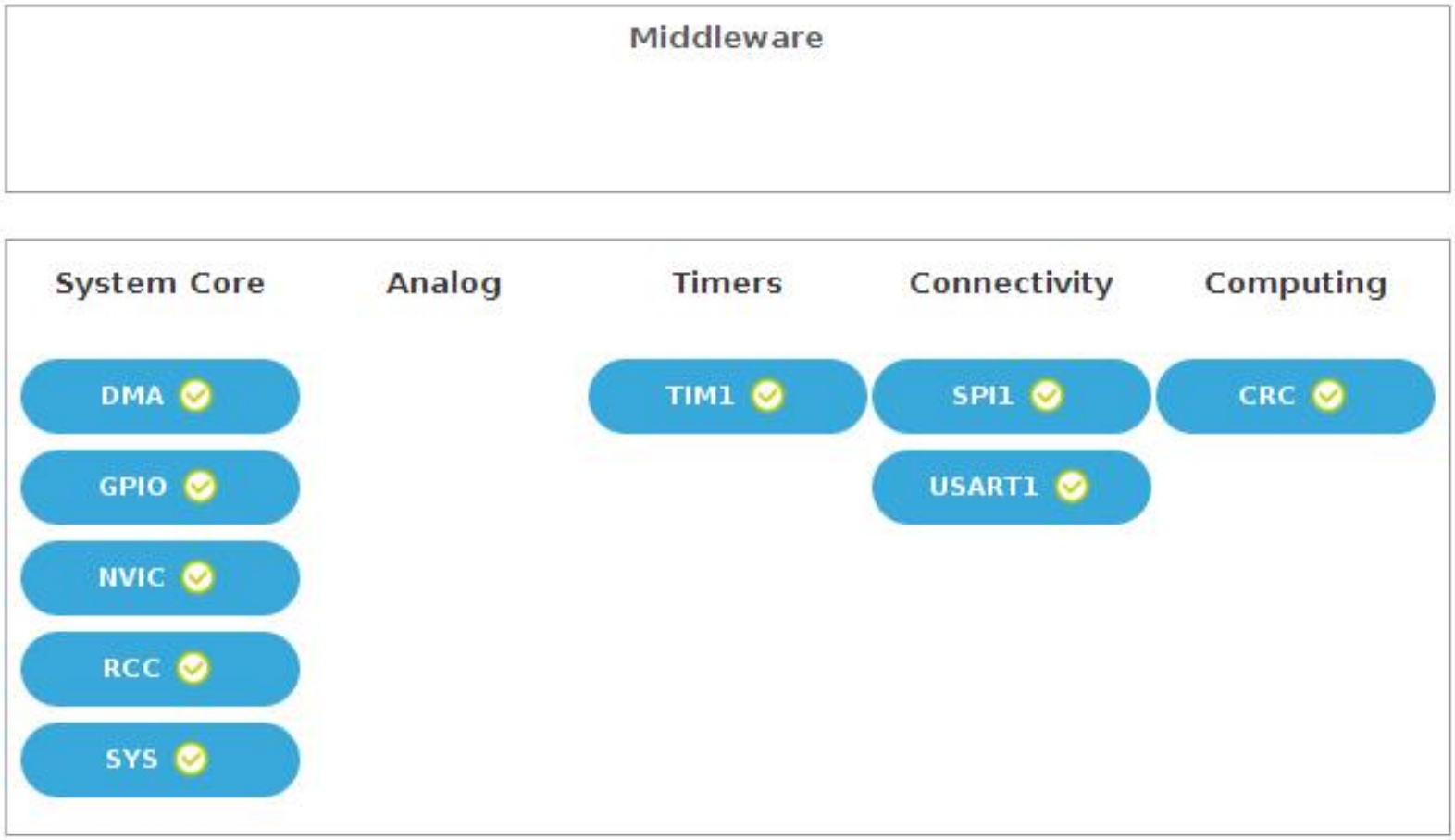
Mode:	Normal
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

8.3. NVIC configuration

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	0	0
DMA1 channel 2 and 3 interrupts	true	0	0
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
SPI1 global interrupt	unused		
USART1 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current



10. Software Pack Report