
STM32
CubeMX

1. Description

1.1. Project

Project Name	MIO168 r2B5
Board Name	custom
Generated with:	STM32CubeMX 6.2.0
Date	03/29/2021

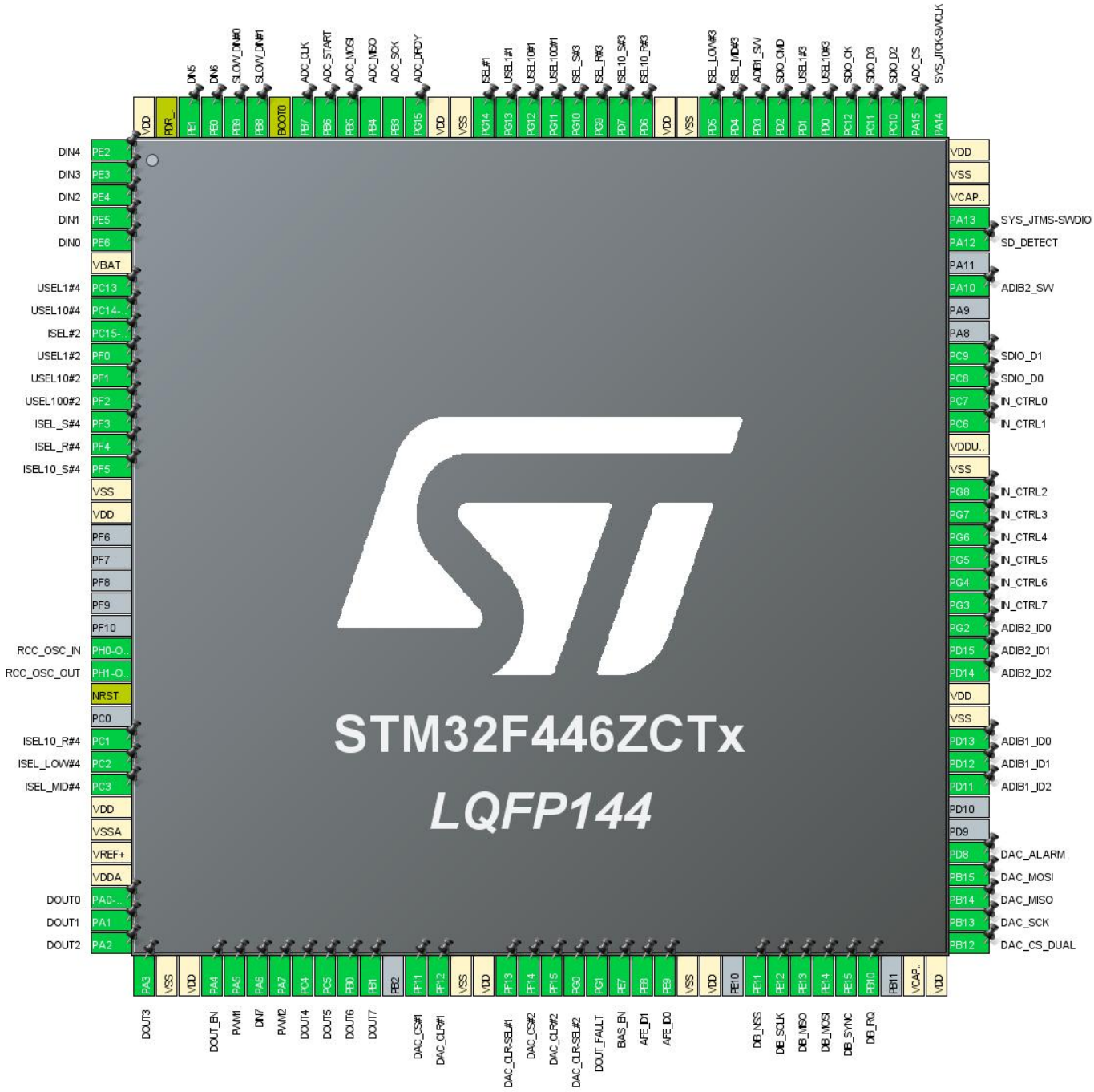
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F446
MCU name	STM32F446ZCTx
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_Input	DIN4
2	PE3 *	I/O	GPIO_Input	DIN3
3	PE4 *	I/O	GPIO_Input	DIN2
4	PE5	I/O	TIM9_CH1	DIN1
5	PE6	I/O	TIM9_CH2	DIN0
6	VBAT	Power		
7	PC13 *	I/O	GPIO_Output	USEL1#4
8	PC14-OSC32_IN *	I/O	GPIO_Output	USEL10#4
9	PC15-OSC32_OUT *	I/O	GPIO_Output	ISEL#2
10	PF0 *	I/O	GPIO_Output	USEL1#2
11	PF1 *	I/O	GPIO_Output	USEL10#2
12	PF2 *	I/O	GPIO_Output	USEL100#2
13	PF3 *	I/O	GPIO_Output	ISEL_S#4
14	PF4 *	I/O	GPIO_Output	ISEL_R#4
15	PF5 *	I/O	GPIO_Output	ISEL10_S#4
16	VSS	Power		
17	VDD	Power		
23	PH0-OSC_IN	I/O	RCC_OSC_IN	
24	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
27	PC1 *	I/O	GPIO_Output	ISEL10_R#4
28	PC2 *	I/O	GPIO_Output	ISEL_LOW#4
29	PC3 *	I/O	GPIO_Output	ISEL_MID#4
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0-WKUP *	I/O	GPIO_Output	DOUT0
35	PA1 *	I/O	GPIO_Output	DOUT1
36	PA2 *	I/O	GPIO_Output	DOUT2
37	PA3 *	I/O	GPIO_Output	DOUT3
38	VSS	Power		
39	VDD	Power		
40	PA4 *	I/O	GPIO_Output	DOUT_EN
41	PA5	I/O	TIM2_CH1	PWM1
42	PA6 *	I/O	GPIO_Input	DIN7

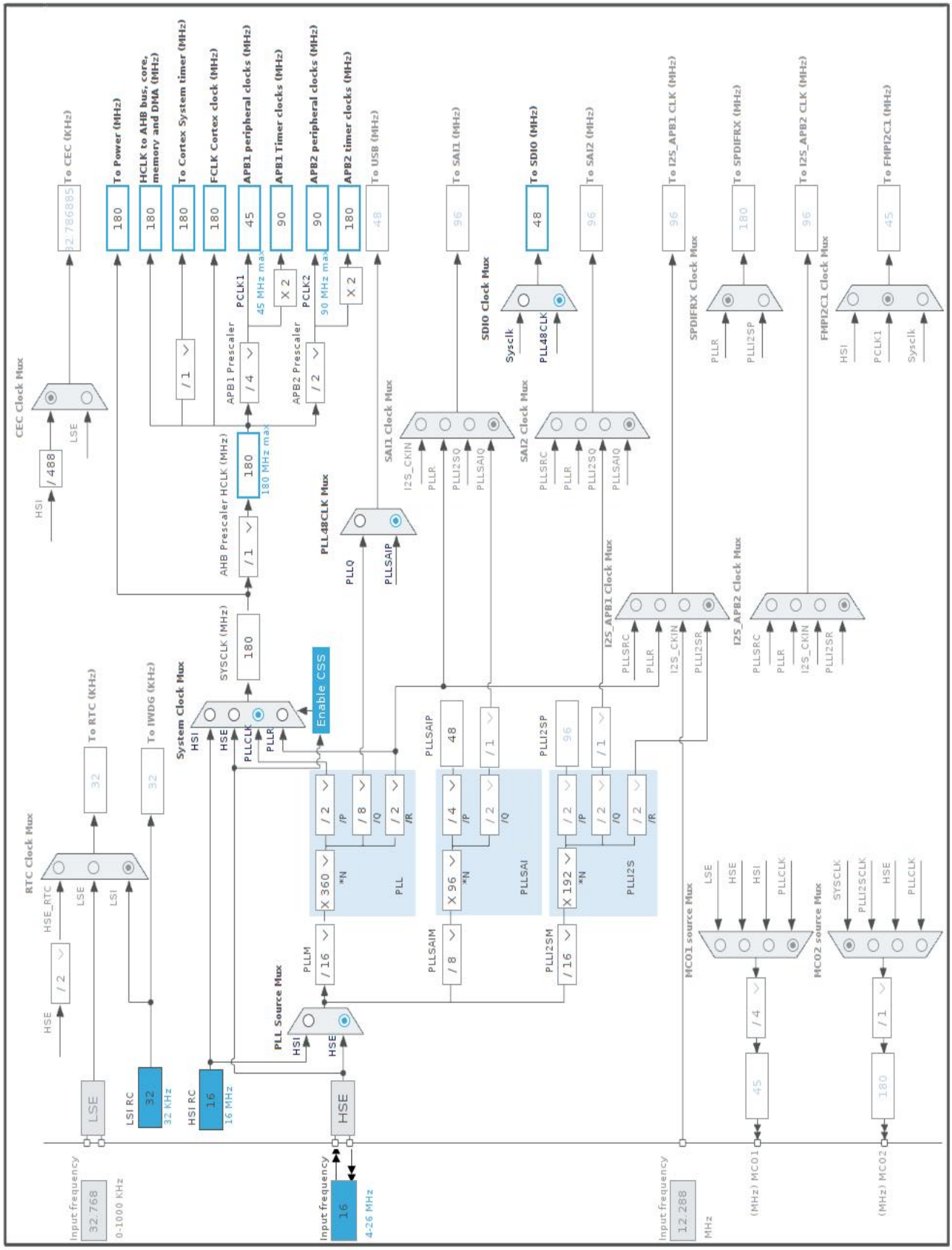
Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
43	PA7	I/O	TIM3_CH2	PWM2
44	PC4 *	I/O	GPIO_Output	DOUT4
45	PC5 *	I/O	GPIO_Output	DOUT5
46	PB0 *	I/O	GPIO_Output	DOUT6
47	PB1 *	I/O	GPIO_Output	DOUT7
49	PF11 *	I/O	GPIO_Output	DAC_CS#1
50	PF12 *	I/O	GPIO_Output	DAC_CLR#1
51	VSS	Power		
52	VDD	Power		
53	PF13 *	I/O	GPIO_Output	DAC_CLR-SEL#1
54	PF14 *	I/O	GPIO_Output	DAC_CS#2
55	PF15 *	I/O	GPIO_Output	DAC_CLR#2
56	PG0	I/O	GPIO_EXTI0	DAC_CLR-SEL#2
57	PG1 *	I/O	GPIO_Input	DOUT_FAULT
58	PE7 *	I/O	GPIO_Output	BIAS_EN
59	PE8 *	I/O	GPIO_Input	AFE_ID1
60	PE9 *	I/O	GPIO_Input	AFE_ID0
61	VSS	Power		
62	VDD	Power		
64	PE11	I/O	SPI4_NSS	DIB_NSS
65	PE12	I/O	SPI4_SCK	DIB_SCLK
66	PE13	I/O	SPI4_MISO	DIB_MISO
67	PE14	I/O	SPI4_MOSI	DIB_MOSI
68	PE15 *	I/O	GPIO_Input	DIB_SYNC
69	PB10 *	I/O	GPIO_Output	DIB_IRQ
71	VCAP_1	Power		
72	VDD	Power		
73	PB12 *	I/O	GPIO_Output	DAC_CS_DUAL
74	PB13	I/O	SPI2_SCK	DAC_SCK
75	PB14	I/O	SPI2_MISO	DAC_MISO
76	PB15	I/O	SPI2_MOSI	DAC_MOSI
77	PD8	I/O	GPIO_EXTI8	DAC_ALARM
80	PD11 *	I/O	GPIO_Input	ADIB1_ID2
81	PD12 *	I/O	GPIO_Input	ADIB1_ID1
82	PD13 *	I/O	GPIO_Input	ADIB1_ID0
83	VSS	Power		
84	VDD	Power		
85	PD14 *	I/O	GPIO_Input	ADIB2_ID2
86	PD15 *	I/O	GPIO_Input	ADIB2_ID1

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
87	PG2 *	I/O	GPIO_Input	ADIB2_ID0
88	PG3 *	I/O	GPIO_Output	IN_CTRL7
89	PG4 *	I/O	GPIO_Output	IN_CTRL6
90	PG5 *	I/O	GPIO_Output	IN_CTRL5
91	PG6 *	I/O	GPIO_Output	IN_CTRL4
92	PG7 *	I/O	GPIO_Output	IN_CTRL3
93	PG8 *	I/O	GPIO_Output	IN_CTRL2
94	VSS	Power		
95	VDDUSB	Power		
96	PC6 *	I/O	GPIO_Output	IN_CTRL1
97	PC7 *	I/O	GPIO_Output	IN_CTRL0
98	PC8	I/O	SDIO_D0	
99	PC9	I/O	SDIO_D1	
102	PA10 *	I/O	GPIO_Output	ADIB2_SW
104	PA12 *	I/O	GPIO_Input	SD_DETECT
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	ADC_CS
111	PC10	I/O	SDIO_D2	
112	PC11	I/O	SDIO_D3	
113	PC12	I/O	SDIO_CK	
114	PD0 *	I/O	GPIO_Output	USEL10#3
115	PD1 *	I/O	GPIO_Output	USEL1#3
116	PD2	I/O	SDIO_CMD	
117	PD3 *	I/O	GPIO_Output	ADIB1_SW
118	PD4 *	I/O	GPIO_Output	ISEL_MID#3
119	PD5 *	I/O	GPIO_Output	ISEL_LOW#3
120	VSS	Power		
121	VDD	Power		
122	PD6 *	I/O	GPIO_Output	ISEL10_R#3
123	PD7 *	I/O	GPIO_Output	ISEL10_S#3
124	PG9 *	I/O	GPIO_Output	ISEL_R#3
125	PG10 *	I/O	GPIO_Output	ISEL_S#3
126	PG11 *	I/O	GPIO_Output	USEL100#1
127	PG12 *	I/O	GPIO_Output	USEL10#1
128	PG13 *	I/O	GPIO_Output	USEL1#1

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
129	PG14 *	I/O	GPIO_Output	ISEL#1
130	VSS	Power		
131	VDD	Power		
132	PG15	I/O	GPIO_EXTI15	ADC_DRDY
133	PB3	I/O	SPI3_SCK	ADC_SCK
134	PB4	I/O	SPI3_MISO	ADC_MISO
135	PB5	I/O	SPI3_MOSI	ADC_MOSI
136	PB6 *	I/O	GPIO_Output	ADC_START
137	PB7 *	I/O	GPIO_Output	ADC_CLK
138	BOOT0	Boot		
139	PB8 *	I/O	GPIO_Output	SLOW_DIN#1
140	PB9 *	I/O	GPIO_Output	SLOW_DIN#0
141	PE0 *	I/O	GPIO_Input	DIN6
142	PE1 *	I/O	GPIO_Input	DIN5
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	MIO168 r2B5
Project Folder	/home/denis/BACKUP/EEZ/git-public/dib-mio168/CubeMX
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F4 V1.26.0
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x2000
Minimum Stack Size	0x4000

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	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	MX_GPIO_Init	GPIO
2	MX_DMA_Init	DMA
3	SystemClock_Config	RCC
4	MX_SDIO_SD_Init	SDIO
5	MX_SPI4_Init	SPI4
6	MX_CRC_Init	CRC
7	MX_SPI2_Init	SPI2
8	MX_SPI3_Init	SPI3
9	MX_TIM9_Init	TIM9
10	MX_FATFS_Init	FATFS
11	MX_TIM6_Init	TIM6

Rank	Function Name	Peripheral Instance Name
12	MX_TIM2_Init	TIM2
13	MX_TIM3_Init	TIM3

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F446
MCU	STM32F446ZCTx
Datasheet	DS10693_Rev6

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

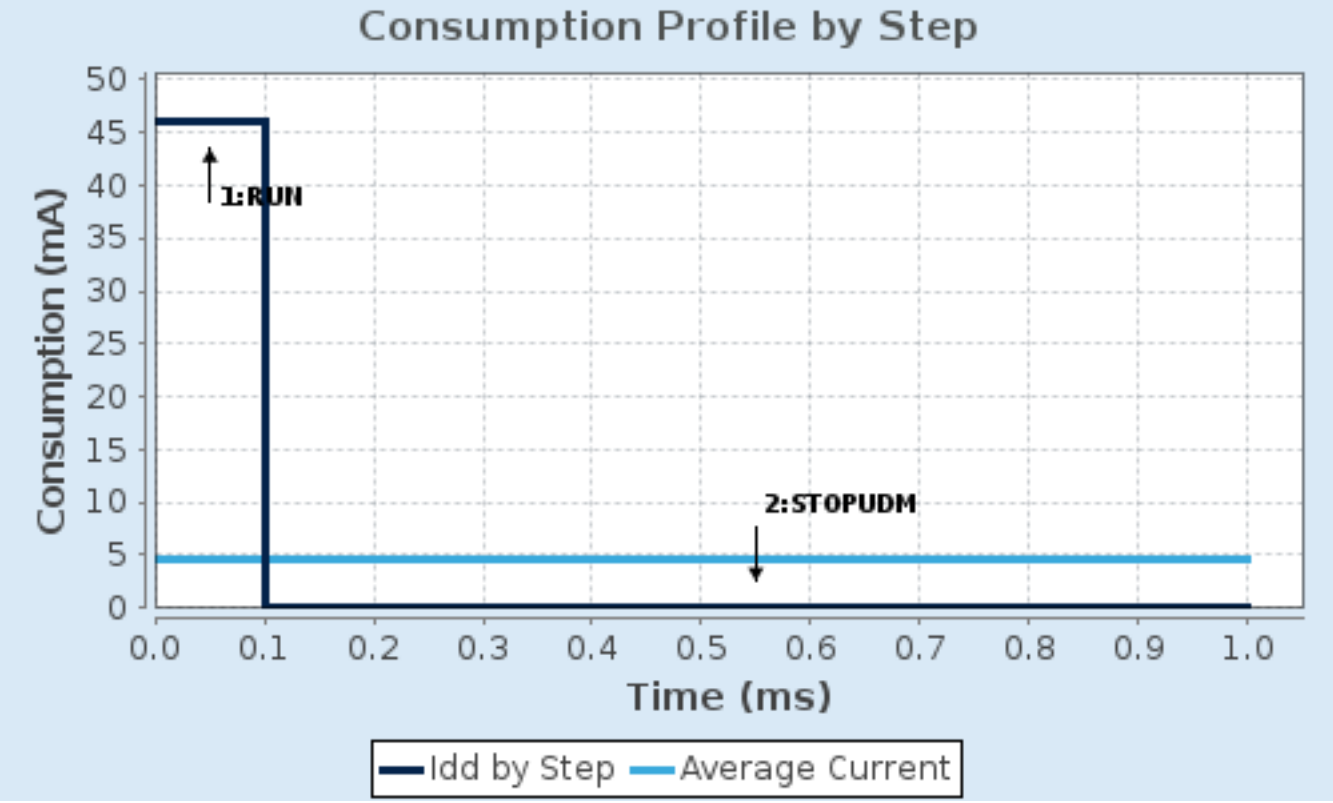
6.4. Sequence

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	RAM/FLASH/REGON/ART/PREFETCH	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	46 mA	55 µA
Duration	0.1 ms	0.9 ms
DMIPS	225.0	0.0
Ta Max	99.99	104.99
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	4.65 mA
Battery Life	1 month	Average DMIPS	225.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
50
45
40
35
30
25
20
15
10
5
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. CRC

mode: Activated

7.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.2.1. 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

7.3. SDIO

Mode: SD 4 bits Wide bus

7.3.1. Parameter Settings:

SDIO parameters:

Clock transition on which the bit capture is made	Rising transition
SDIO Clock divider bypass	**Enable ***
SDIO Clock output enable when the bus is idle	Disable the power save for the clock
SDIO hardware flow control	**The hardware control flow is enabled ***
SDIOCLK clock divide factor	**3 ***

7.4. SPI2

Mode: Full-Duplex Master

7.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**4 ***
Baud Rate	**11.25 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.5. SPI3

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)	**4 ***
Baud Rate	**11.25 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	**2 Edge ***

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.6. SPI4

Mode: Full-Duplex Slave
Hardware NSS Signal: Hardware NSS Input Signal

7.6.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

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

Advanced Parameters:

CRC Calculation	**Enabled ***
CRC Polynomial	**X0+X1+X2 ***
NSS Signal Type	Input Hardware

7.7. SYS
Debug: Serial Wire
Timebase Source: SysTick

7.8. TIM2
Channel1: PWM Generation CH1

7.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**0 ***
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 (32 bits value)	0
Output compare preload	Enable

Fast Mode	Disable
CH Polarity	High

7.9. TIM3

Channel2: PWM Generation CH2

7.9.1. 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
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 2:

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

7.10. TIM6

mode: Activated

7.10.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**8 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**999 ***
auto-reload preload	**Enable ***

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.11. TIM9

Channel1: Input Capture direct mode

Channel2: Input Capture direct mode

7.11.1. 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
auto-reload preload	Disable

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.12. FATFS

mode: SD Card

7.12.1. Set Defines:

Version:

FATFS version	R0.12c

Function Parameters:

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled

USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Latin 1
USE_LFN (Use Long Filename)	**Enabled with dynamic working buffer on the STACK ***
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
FS_REENTRANT (Re-Entrancy)	Disabled
FS_TIMEOUT (Timeout ticks)	1000
FS_LOCK (Number of files opened simultaneously)	2

7.12.2. Advanced Settings:

SDIO/SDMMC:

SDIO instance	SDIO
Use dma template	Disabled
BSP code for SD	Generic

7.12.3. Platform Settings:

Detect_SDIO	PA12

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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	
SDIO	PC8	SDIO_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC9	SDIO_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC10	SDIO_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC11	SDIO_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC12	SDIO_CK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD2	SDIO_CMD	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DAC_SCK
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DAC_MISO
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DAC_MOSI
SPI3	PB3	SPI3_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	ADC_SCK
	PB4	SPI3_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	ADC_MISO
	PB5	SPI3_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	ADC_MOSI
SPI4	PE11	SPI4_NSS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DIB_NSS
	PE12	SPI4_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DIB_SCLK
	PE13	SPI4_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DIB_MISO
	PE14	SPI4_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	DIB_MOSI
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM2	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM1

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
TIM3	PA7	TIM3_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM2
TIM9	PE5	TIM9_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	DIN1
	PE6	TIM9_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	DIN0
GPIO	PE2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN4
	PE3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN3
	PE4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN2
	PC13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL1#4
	PC14-OSC32_IN	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL10#4
	PC15-OSC32_OUT	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL#2
	PF0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL1#2
	PF1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL10#2
	PF2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL100#2
	PF3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_S#4
	PF4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_R#4
	PF5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL10_S#4
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL10_R#4
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_LOW#4
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_MID#4
	PA0-WKUP	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT0
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT1
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT2
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT3
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT_EN
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN7
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT4
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT5
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT6
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DOUT7
	PF11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DAC_CS#1
	PF12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DAC_CLR#1
	PF13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DAC_CLR-SEL#1
	PF14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DAC_CS#2
	PF15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DAC_CLR#2
	PG0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	**Pull-up ***	n/a	DAC_CLR-SEL#2
	PG1	GPIO_Input	Input mode	**Pull-up ***	n/a	DOUT_FAULT
	PE7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BIAS_EN

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE8	GPIO_Input	Input mode	**Pull-up ***	n/a	AFE_ID1
	PE9	GPIO_Input	Input mode	**Pull-up ***	n/a	AFE_ID0
	PE15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIB_SYNC
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DIB_IRQ
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DAC_CS_DUAL
	PD8	GPIO_EXTI8	External Interrupt Mode with Rising edge trigger detection	**Pull-up ***	n/a	DAC_ALARM
	PD11	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB1_ID2
	PD12	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB1_ID1
	PD13	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB1_ID0
	PD14	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB2_ID2
	PD15	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB2_ID1
	PG2	GPIO_Input	Input mode	**Pull-up ***	n/a	ADIB2_ID0
	PG3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL7
	PG4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL6
	PG5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL5
	PG6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL4
	PG7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL3
	PG8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL2
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL1
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CTRL0
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADIB2_SW
	PA12	GPIO_Input	Input mode	**Pull-up ***	n/a	SD_DETECT
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC_CS
	PD0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL10#3
	PD1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL1#3
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADIB1_SW
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_MID#3
	PD5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_LOW#3
	PD6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL10_R#3
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL10_S#3
	PG9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_R#3
	PG10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL_S#3
	PG11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL100#1
	PG12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL10#1
	PG13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USEL1#1
	PG14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ISEL#1
	PG15	GPIO_EXTI15	**External Interrupt Mode with Falling**	**Pull-up ***	n/a	ADC_DRDY

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			edge trigger detection			
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC_START
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ADC_CLK
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SLOW_DIN#1
	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SLOW_DIN#0
	PE0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN6
	PE1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIN5

8.2. DMA configuration

DMA request	Stream	Direction	Priority
SPI4_RX	DMA2_Stream0	Peripheral To Memory	Low
SPI4_TX	DMA2_Stream1	Memory To Peripheral	Low
SPI2_RX	DMA1_Stream3	Peripheral To Memory	Low
SPI2_TX	DMA1_Stream4	Memory To Peripheral	Low
SDIO_RX	DMA2_Stream3	Peripheral To Memory	Low
SDIO_TX	DMA2_Stream6	Memory To Peripheral	Low
SPI3_RX	DMA1_Stream0	Peripheral To Memory	Low
SPI3_TX	DMA1_Stream5	Memory To Peripheral	Low

SPI4_RX: DMA2_Stream0 DMA request Settings:

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

SPI4_TX: DMA2_Stream1 DMA request Settings:

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

SPI2_RX: DMA1_Stream3 DMA request Settings:

Mode:	**Circular ***
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Half Word ***
Memory Data Width:	**Half Word ***

SPI2_TX: DMA1_Stream4 DMA request Settings:

Mode:	**Circular ***
Use fifo:	Disable
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Half Word ***
Memory Data Width:	**Half Word ***

SDIO_RX: DMA2_Stream3 DMA request Settings:

Mode:	**Peripheral Flow Control ***
Use fifo:	**Enable ***
FIFO Threshold:	Full
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	Word
Peripheral Burst Size:	**4 Increment ***
Memory Burst Size:	4 Increment

SDIO_TX: DMA2_Stream6 DMA request Settings:

Mode:	**Peripheral Flow Control ***
Use fifo:	**Enable ***
FIFO Threshold:	Full
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	Word
Peripheral Burst Size:	**4 Increment ***
Memory Burst Size:	4 Increment

SPI3_RX: DMA1_Stream0 DMA request Settings:

Mode:	Normal
Use fifo:	Disable

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

SPI3_TX: DMA1_Stream5 DMA request Settings:

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

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
DMA1 stream0 global interrupt	true	0	0
DMA1 stream3 global interrupt	true	0	0
DMA1 stream4 global interrupt	true	0	0
DMA1 stream5 global interrupt	true	0	0
EXTI line[15:10] interrupts	true	0	0
SDIO global interrupt	true	0	0
TIM6 global interrupt and DAC1, DAC2 underrun error interrupts	true	0	0
DMA2 stream0 global interrupt	true	0	0
DMA2 stream1 global interrupt	true	0	0
DMA2 stream3 global interrupt	true	0	0
DMA2 stream6 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line 0 interrupt	unused		
EXTI line[9:5] interrupts	unused		
TIM1 break interrupt and TIM9 global interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
SPI2 global interrupt	unused		
SPI3 global interrupt	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

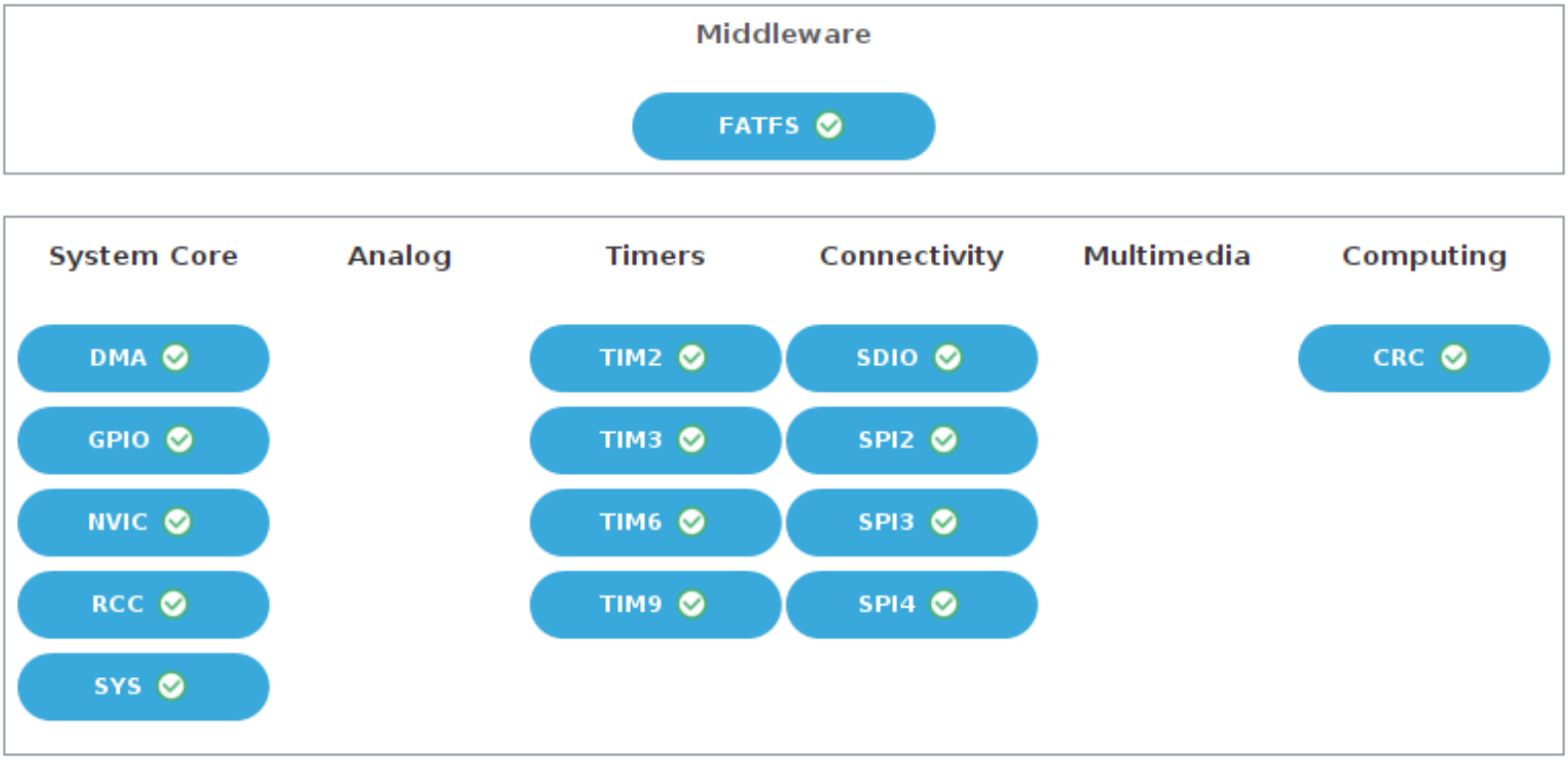
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal 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
DMA1 stream0 global interrupt	false	true	true
DMA1 stream3 global interrupt	false	true	false
DMA1 stream4 global interrupt	false	true	false
DMA1 stream5 global interrupt	false	true	true
EXTI line[15:10] interrupts	false	true	true
SDIO global interrupt	false	true	true
TIM6 global interrupt and DAC1, DAC2 underrun error interrupts	false	true	true
DMA2 stream0 global interrupt	false	true	true
DMA2 stream1 global interrupt	false	true	true
DMA2 stream3 global interrupt	false	true	true
DMA2 stream6 global interrupt	false	true	true

*** User modified value**

9. System Views

9.1. Category view

9.1.1. Current



10. Docs & Resources

Type	Link
Datasheet	http://www.st.com/resource/en/datasheet/DM00141306.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/DM00135183.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/DM00046982.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/DM00155929.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167594.pdf
Application note	http://www.st.com/resource/en/application_note/CD00211314.pdf
Application note	http://www.st.com/resource/en/application_note/CD00249778.pdf
Application note	http://www.st.com/resource/en/application_note/CD00259245.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264321.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264342.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00024853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00040802.pdf
Application note	http://www.st.com/resource/en/application_note/DM00040808.pdf
Application note	http://www.st.com/resource/en/application_note/DM00042534.pdf
Application note	http://www.st.com/resource/en/application_note/DM00046011.pdf
Application note	http://www.st.com/resource/en/application_note/DM00072315.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073742.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00080497.pdf
Application note	http://www.st.com/resource/en/application_note/DM00081379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00115714.pdf
Application note	http://www.st.com/resource/en/application_note/DM00129215.pdf
Application note	http://www.st.com/resource/en/application_note/DM00154959.pdf
Application note	http://www.st.com/resource/en/application_note/DM00160482.pdf

Application note	http://www.st.com/resource/en/application_note/DM00161778.pdf
Application note	http://www.st.com/resource/en/application_note/DM00213525.pdf
Application note	http://www.st.com/resource/en/application_note/DM00220769.pdf
Application note	http://www.st.com/resource/en/application_note/DM00227538.pdf
Application note	http://www.st.com/resource/en/application_note/DM00257177.pdf
Application note	http://www.st.com/resource/en/application_note/DM00272912.pdf
Application note	http://www.st.com/resource/en/application_note/DM00226326.pdf
Application note	http://www.st.com/resource/en/application_note/DM00236305.pdf
Application note	http://www.st.com/resource/en/application_note/DM00281138.pdf
Application note	http://www.st.com/resource/en/application_note/DM00296349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00327191.pdf
Application note	http://www.st.com/resource/en/application_note/DM00354244.pdf
Application note	http://www.st.com/resource/en/application_note/DM00373474.pdf
Application note	http://www.st.com/resource/en/application_note/DM00315319.pdf
Application note	http://www.st.com/resource/en/application_note/DM00380469.pdf
Application note	http://www.st.com/resource/en/application_note/DM00395696.pdf
Application note	http://www.st.com/resource/en/application_note/DM00431633.pdf
Application note	http://www.st.com/resource/en/application_note/DM00493651.pdf
Application note	http://www.st.com/resource/en/application_note/DM00536349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00725181.pdf