1. Description

1.1. Project

Project Name	GAS_ALARM_BOARD
Board Name	GAS_ALARM_BOARD
Generated with:	STM32CubeMX 4.22.0
Date	08/29/2017

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F100 Value Line
MCU name	STM32F100VBTx
MCU Package	LQFP100
MCU Pin number	100

# 2. Pinout Configuration
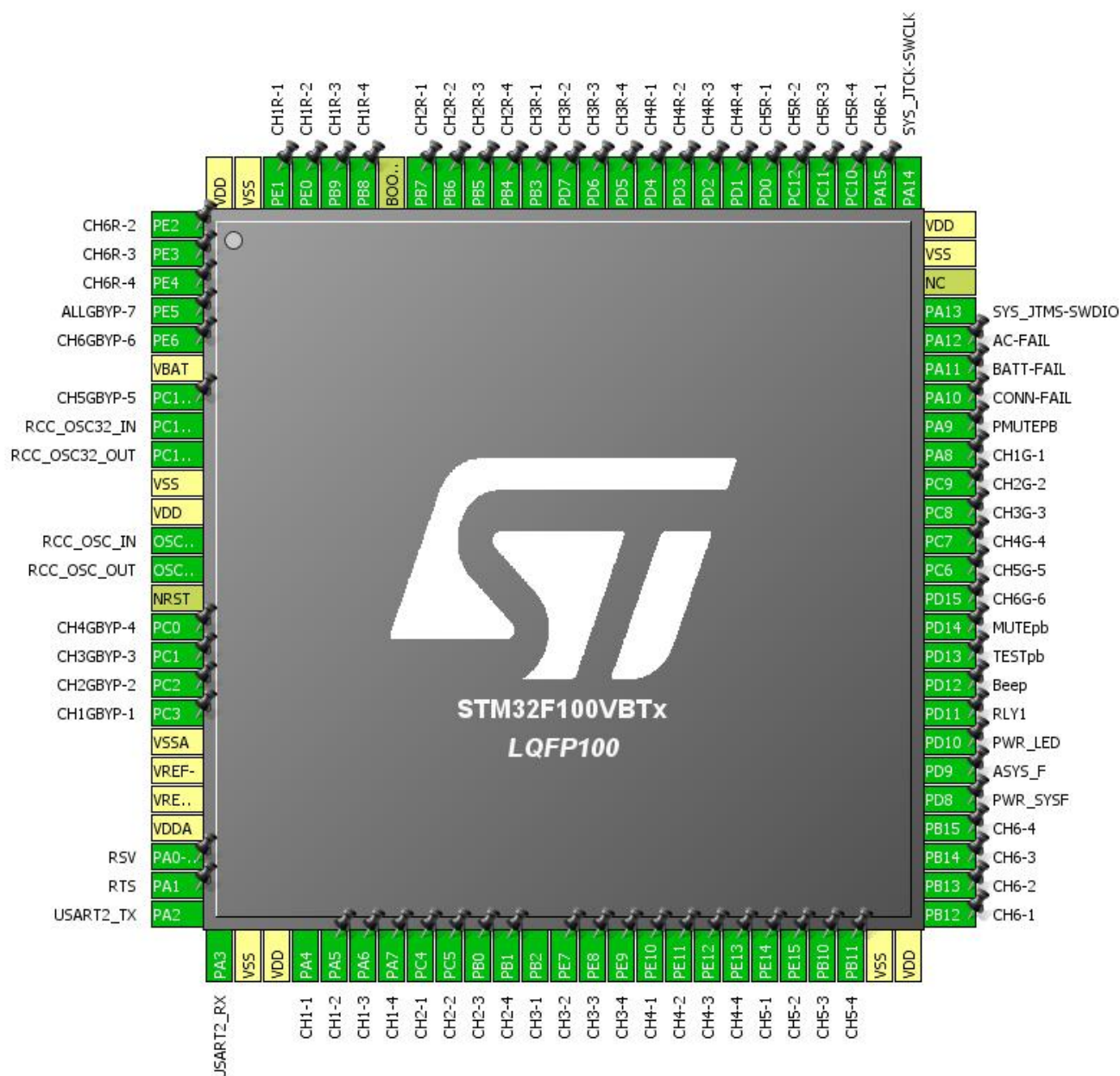
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Output	CH6R-2
2	PE3 *	I/O	GPIO_Output	CH6R-3
3	PE4 *	I/O	GPIO_Output	CH6R-4
4	PE5 *	I/O	GPIO_Output	ALLGBYP-7
5	PE6 *	I/O	GPIO_Output	CH6GBYP-6
6	VBAT	Power		
7	PC13-TAMPER-RTC *	I/O	GPIO_Output	CH5GBYP-5
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
10	VSS	Power		
11	VDD	Power		
12	OSC_IN	I/O	RCC_OSC_IN	
13	OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Output	CH4GBYP-4
16	PC1 *	I/O	GPIO_Output	CH3GBYP-3
17	PC2 *	I/O	GPIO_Output	CH2GBYP-2
18	PC3 *	I/O	GPIO_Output	CH1GBYP-1
19	VSSA	Power		
20	VREF-	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP *	I/O	GPIO_Input	RSV
24	PA1 *	I/O	GPIO_Output	RTS
25	PA2	I/O	USART2_TX	
26	PA3	I/O	USART2_RX	
27	VSS	Power		
28	VDD	Power		
29	PA4 *	I/O	GPIO_Input	CH1-1
30	PA5 *	I/O	GPIO_Input	CH1-2
31	PA6 *	I/O	GPIO_Input	CH1-3
32	PA7 *	I/O	GPIO_Input	CH1-4
33	PC4 *	I/O	GPIO_Input	CH2-1
34	PC5 *	I/O	GPIO_Input	CH2-2
35	PB0 *	I/O	GPIO_Input	CH2-3
36	PB1 *	I/O	GPIO_Input	CH2-4

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PB2 *	I/O	GPIO_Input	CH3-1
38	PE7 *	I/O	GPIO_Input	CH3-2
39	PE8 *	I/O	GPIO_Input	CH3-3
40	PE9 *	I/O	GPIO_Input	CH3-4
41	PE10 *	I/O	GPIO_Input	CH4-1
42	PE11 *	I/O	GPIO_Input	CH4-2
43	PE12 *	I/O	GPIO_Input	CH4-3
44	PE13 *	I/O	GPIO_Input	CH4-4
45	PE14 *	I/O	GPIO_Input	CH5-1
46	PE15 *	I/O	GPIO_Input	CH5-2
47	PB10 *	I/O	GPIO_Input	CH5-3
48	PB11 *	I/O	GPIO_Input	CH5-4
49	VSS	Power		
50	VDD	Power		
51	PB12 *	I/O	GPIO_Input	CH6-1
52	PB13 *	I/O	GPIO_Input	CH6-2
53	PB14 *	I/O	GPIO_Input	CH6-3
54	PB15 *	I/O	GPIO_Input	CH6-4
55	PD8 *	I/O	GPIO_Output	PWR_SYSF
56	PD9 *	I/O	GPIO_Output	ASYS_F
57	PD10 *	I/O	GPIO_Output	PWR_LED
58	PD11 *	I/O	GPIO_Output	RLY1
59	PD12 *	I/O	GPIO_Output	Beep
60	PD13 *	I/O	GPIO_Output	TESTpb
61	PD14 *	I/O	GPIO_Output	MUTEpb
62	PD15 *	I/O	GPIO_Output	CH6G-6
63	PC6 *	I/O	GPIO_Output	CH5G-5
64	PC7 *	I/O	GPIO_Output	CH4G-4
65	PC8 *	I/O	GPIO_Output	CH3G-3
66	PC9 *	I/O	GPIO_Output	CH2G-2
67	PA8 *	I/O	GPIO_Output	CH1G-1
68	PA9 *	I/O	GPIO_Input	PMUTEPB
69	PA10 *	I/O	GPIO_Output	CONN-FAIL
70	PA11 *	I/O	GPIO_Input	BATT-FAIL
71	PA12 *	I/O	GPIO_Input	AC-FAIL
72	PA13	I/O	SYS_JTMS-SWDIO	
73	NC	NC		
74	VSS	Power		
75	VDD	Power		

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
76	PA14	I/O	SYS_JTCK-SWCLK	
77	PA15 *	I/O	GPIO_Output	CH6R-1
78	PC10 *	I/O	GPIO_Output	CH5R-4
79	PC11 *	I/O	GPIO_Output	CH5R-3
80	PC12 *	I/O	GPIO_Output	CH5R-2
81	PD0 *	I/O	GPIO_Output	CH5R-1
82	PD1 *	I/O	GPIO_Output	CH4R-4
83	PD2 *	I/O	GPIO_Output	CH4R-3
84	PD3 *	I/O	GPIO_Output	CH4R-2
85	PD4 *	I/O	GPIO_Output	CH4R-1
86	PD5 *	I/O	GPIO_Output	CH3R-4
87	PD6 *	I/O	GPIO_Output	CH3R-3
88	PD7 *	I/O	GPIO_Output	CH3R-2
89	PB3 *	I/O	GPIO_Output	CH3R-1
90	PB4 *	I/O	GPIO_Output	CH2R-4
91	PB5 *	I/O	GPIO_Output	CH2R-3
92	PB6 *	I/O	GPIO_Output	CH2R-2
93	PB7 *	I/O	GPIO_Output	CH2R-1
94	BOOT0	Boot		
95	PB8 *	I/O	GPIO_Output	CH1R-4
96	PB9 *	I/O	GPIO_Output	CH1R-3
97	PE0 *	I/O	GPIO_Output	CH1R-2
98	PE1 *	I/O	GPIO_Output	CH1R-1
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration
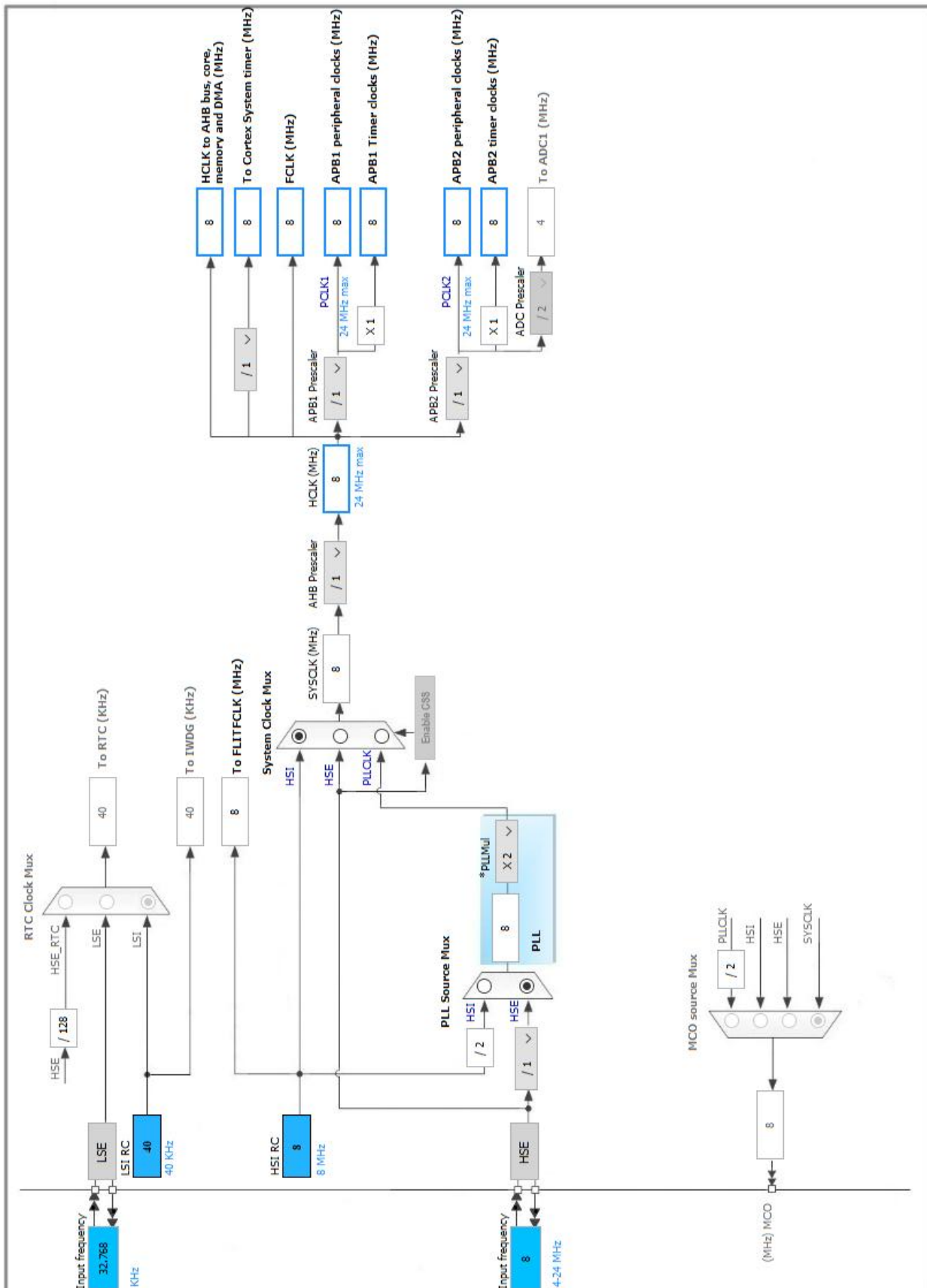
5. IPs and Middleware Configuration

5.1. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator
Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

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

5.2. SYS

Debug: Serial Wire
Timebase Source: SysTick

5.3. USART2

Mode: Asynchronous

5.3.1. 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

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	**High ***	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	**n/a**	
GPIO	PE2	GPIO_Output	Output Push Pull	n/a	Low	CH6R-2
	PE3	GPIO_Output	Output Push Pull	n/a	Low	CH6R-3
	PE4	GPIO_Output	Output Push Pull	n/a	Low	CH6R-4
	PE5	GPIO_Output	Output Push Pull	n/a	Low	ALLGBYP-7
	PE6	GPIO_Output	Output Push Pull	n/a	Low	CH6GBYP-6
	PC13-TAMPER-RTC	GPIO_Output	Output Push Pull	n/a	Low	CH5GBYP-5
	PC0	GPIO_Output	Output Push Pull	n/a	Low	CH4GBYP-4
	PC1	GPIO_Output	Output Push Pull	n/a	Low	CH3GBYP-3
	PC2	GPIO_Output	Output Push Pull	n/a	Low	CH2GBYP-2
	PC3	GPIO_Output	Output Push Pull	n/a	Low	CH1GBYP-1
	PA0-WKUP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	RSV
	PA1	GPIO_Output	Output Push Pull	n/a	Low	RTS
	PA4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH1-1
	PA5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH1-2
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH1-3
	PA7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH1-4
	PC4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH2-1
	PC5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH2-2
	PB0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH2-3
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH2-4

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH3-1
	PE7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH3-2
	PE8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH3-3
	PE9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH3-4
	PE10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH4-1
	PE11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH4-2
	PE12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH4-3
	PE13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH4-4
	PE14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH5-1
	PE15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH5-2
	PB10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH5-3
	PB11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH5-4
	PB12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH6-1
	PB13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH6-2
	PB14	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH6-3
	PB15	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	CH6-4
	PD8	GPIO_Output	Output Push Pull	n/a	Low	PWR_SYSF
	PD9	GPIO_Output	Output Push Pull	n/a	Low	ASYS_F
	PD10	GPIO_Output	Output Push Pull	n/a	Low	PWR_LED
	PD11	GPIO_Output	Output Push Pull	n/a	Low	RLY1
	PD12	GPIO_Output	Output Push Pull	n/a	Low	Beep
	PD13	GPIO_Output	Output Push Pull	n/a	Low	TESTpb
	PD14	GPIO_Output	Output Push Pull	n/a	Low	MUTEpb
	PD15	GPIO_Output	Output Push Pull	n/a	Low	CH6G-6
	PC6	GPIO_Output	Output Push Pull	n/a	Low	CH5G-5
	PC7	GPIO_Output	Output Push Pull	n/a	Low	CH4G-4
	PC8	GPIO_Output	Output Push Pull	n/a	Low	CH3G-3
	PC9	GPIO_Output	Output Push Pull	n/a	Low	CH2G-2
	PA8	GPIO_Output	Output Push Pull	n/a	Low	CH1G-1
	PA9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	PMUTEPB
	PA10	GPIO_Output	Output Push Pull	n/a	Low	CONN-FAIL
	PA11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BATT-FAIL
	PA12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	AC-FAIL
	PA15	GPIO_Output	Output Push Pull	n/a	Low	CH6R-1
	PC10	GPIO_Output	Output Push Pull	n/a	Low	CH5R-4
	PC11	GPIO_Output	Output Push Pull	n/a	Low	CH5R-3
	PC12	GPIO_Output	Output Push Pull	n/a	Low	CH5R-2
	PD0	GPIO_Output	Output Push Pull	n/a	Low	CH5R-1
	PD1	GPIO_Output	Output Push Pull	n/a	Low	CH4R-4
	PD2	GPIO_Output	Output Push Pull	n/a	Low	CH4R-3

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PD3	GPIO_Output	Output Push Pull	n/a	Low	CH4R-2
	PD4	GPIO_Output	Output Push Pull	n/a	Low	CH4R-1
	PD5	GPIO_Output	Output Push Pull	n/a	Low	CH3R-4
	PD6	GPIO_Output	Output Push Pull	n/a	Low	CH3R-3
	PD7	GPIO_Output	Output Push Pull	n/a	Low	CH3R-2
	PB3	GPIO_Output	Output Push Pull	n/a	Low	CH3R-1
	PB4	GPIO_Output	Output Push Pull	n/a	Low	CH2R-4
	PB5	GPIO_Output	Output Push Pull	n/a	Low	CH2R-3
	PB6	GPIO_Output	Output Push Pull	n/a	Low	CH2R-2
	PB7	GPIO_Output	Output Push Pull	n/a	Low	CH2R-1
	PB8	GPIO_Output	Output Push Pull	n/a	Low	CH1R-4
	PB9	GPIO_Output	Output Push Pull	n/a	Low	CH1R-3
	PE0	GPIO_Output	Output Push Pull	n/a	Low	CH1R-2
	PE1	GPIO_Output	Output Push Pull	n/a	Low	CH1R-1

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Prefetch 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
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USART2 global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F100 Value Line
MCU	STM32F100VBTx
Datasheet	16455_Rev8

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	GAS_ALARM_BOARD
Project Folder	C:\Users\Tze Wei\Desktop\GAS_ALARM_BOARD
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F1 V1.6.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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