1. Description

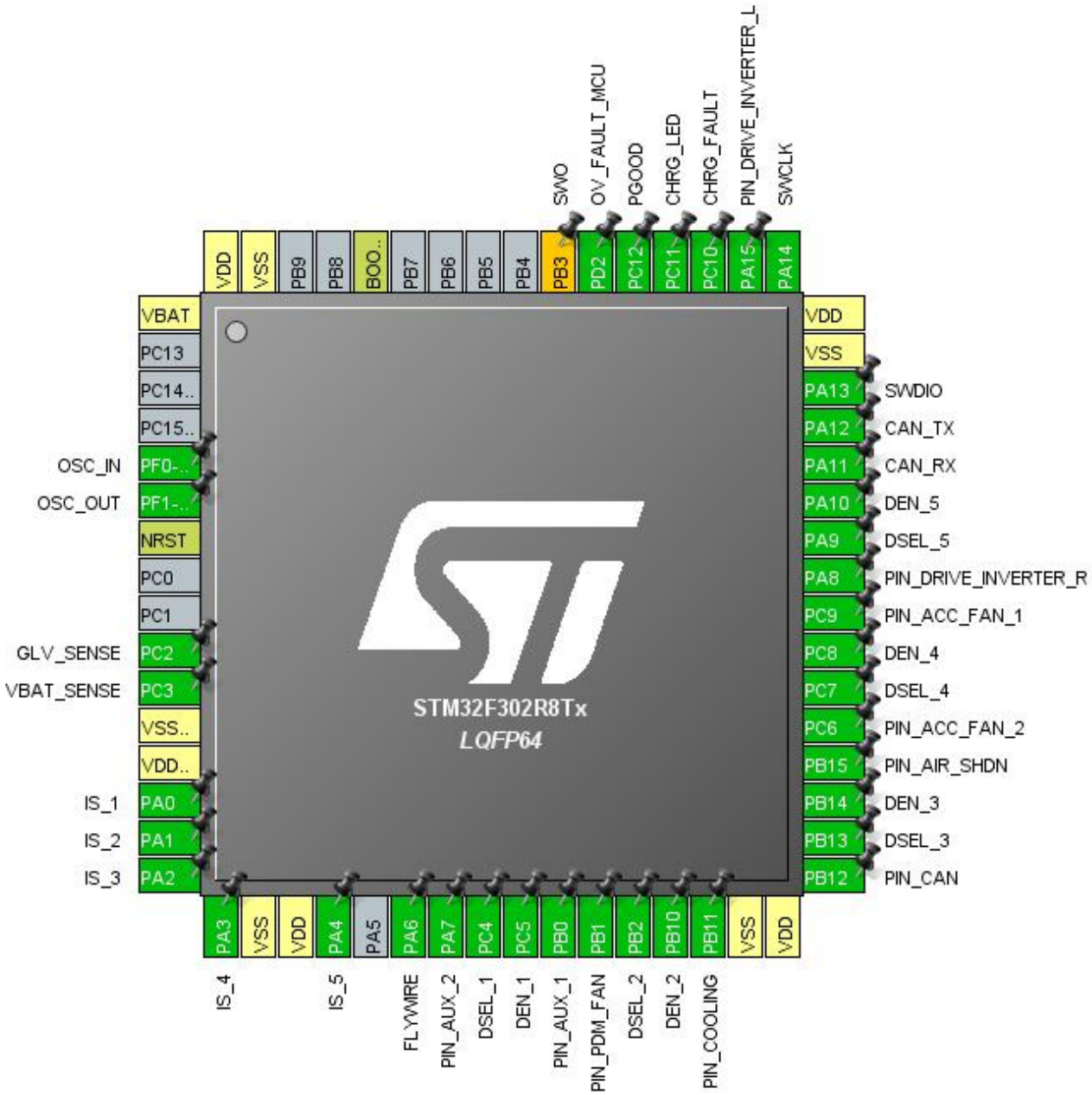
1.1. Project

Project Name	PDM
Board Name	PDM
Generated with:	STM32CubeMX 5.0.0
Date	12/14/2018

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F302
MCU name	STM32F302R8Tx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

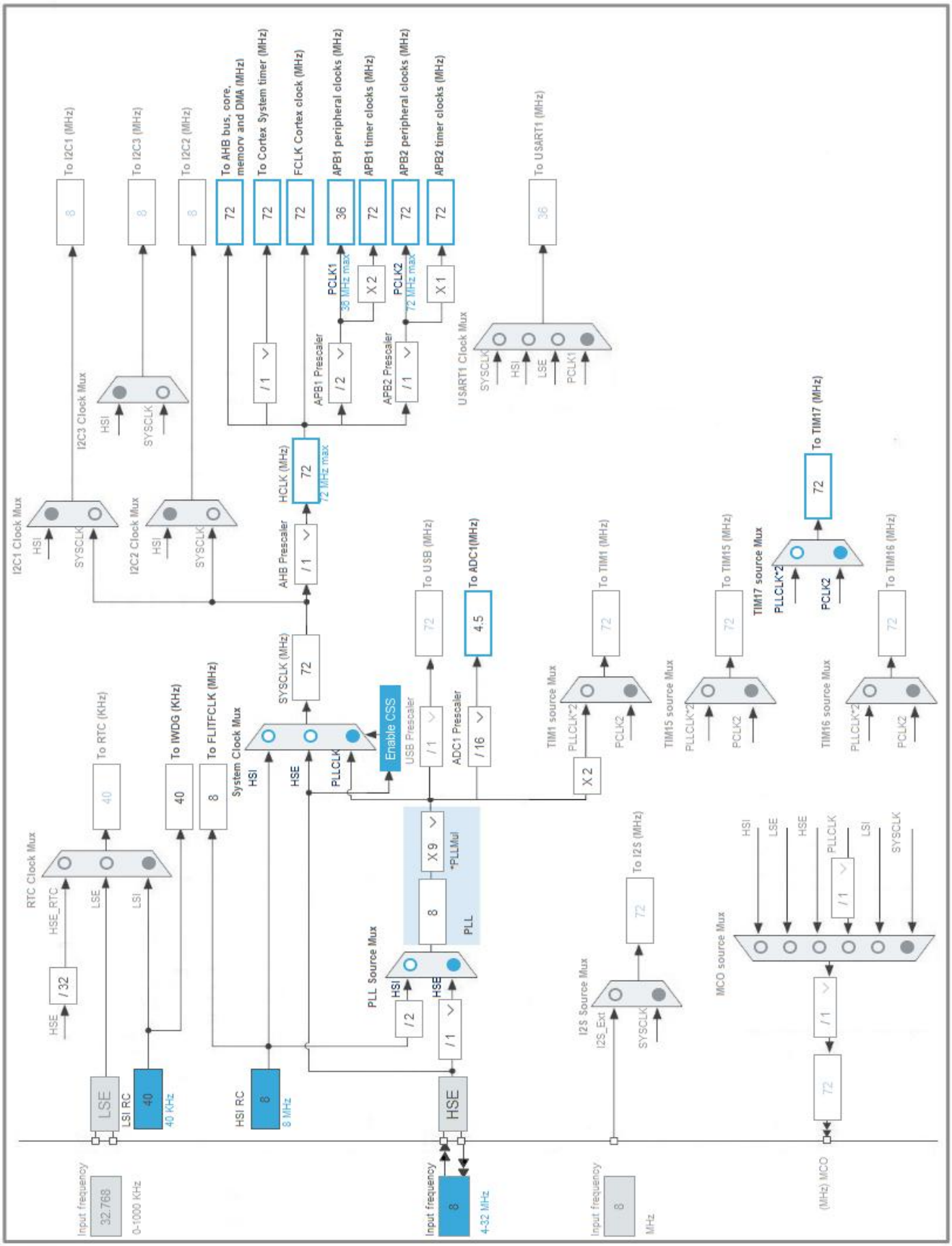
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PF0-OSC_IN	I/O	RCC_OSC_IN	OSC_IN
6	PF1-OSC_OUT	I/O	RCC_OSC_OUT	OSC_OUT
7	NRST	Reset		
10	PC2	I/O	ADC1_IN8	GLV_SENSE
11	PC3	I/O	ADC1_IN9	VBAT_SENSE
12	VSSA/VREF-	Power		
13	VDDA/VREF+	Power		
14	PA0	I/O	ADC1_IN1	IS_1
15	PA1	I/O	ADC1_IN2	IS_2
16	PA2	I/O	ADC1_IN3	IS_3
17	PA3	I/O	ADC1_IN4	IS_4
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	ADC1_IN5	IS_5
22	PA6	I/O	ADC1_IN10	FLYWIRE
23	PA7 *	I/O	GPIO_Output	PIN_AUX_2
24	PC4 *	I/O	GPIO_Output	DSEL_1
25	PC5 *	I/O	GPIO_Output	DEN_1
26	PB0 *	I/O	GPIO_Output	PIN_AUX_1
27	PB1 *	I/O	GPIO_Output	PIN_PDM_FAN
28	PB2 *	I/O	GPIO_Output	DSEL_2
29	PB10 *	I/O	GPIO_Output	DEN_2
30	PB11 *	I/O	GPIO_Output	PIN_COOLING
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	PIN_CAN
34	PB13 *	I/O	GPIO_Output	DSEL_3
35	PB14 *	I/O	GPIO_Output	DEN_3
36	PB15 *	I/O	GPIO_Output	PIN_AIR_SHDN
37	PC6 *	I/O	GPIO_Output	PIN_ACC_FAN_2
38	PC7 *	I/O	GPIO_Output	DSEL_4
39	PC8 *	I/O	GPIO_Output	DEN_4
40	PC9 *	I/O	GPIO_Output	PIN_ACC_FAN_1
41	PA8 *	I/O	GPIO_Output	PIN_DRIVE_INVERTER_R
42	PA9 *	I/O	GPIO_Output	DSEL_5

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
43	PA10 *	I/O	GPIO_Output	DEN_5
44	PA11	I/O	CAN_RX	
45	PA12	I/O	CAN_TX	
46	PA13	I/O	SYS_JTMS-SWDIO	SWDIO
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	SWCLK
50	PA15 *	I/O	GPIO_Output	PIN_DRIVE_INVERTER_L
51	PC10	I/O	GPIO_EXTI10	CHRG_FAULT
52	PC11	I/O	GPIO_EXTI11	CHRG_LED
53	PC12	I/O	GPIO_EXTI12	PGOOD
54	PD2	I/O	GPIO_EXTI2	OV_FAULT_MCU
55	PB3 **	I/O	SYS_JTDO-TRACESWO	SWO
60	BOOT0	Boot		
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	PDM
Project Folder	C:\Users\thekenu\UBC Formula Electric\Consolidated-Firmware\src\PDM
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F3 V1.10.0

5.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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
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	STM32F3
Line	STM32F302
MCU	STM32F302R8Tx
Datasheet	025147_Rev7

6.2. Parameter Selection

Temperature	25
Vdd	3.6

7. IPs and Middleware Configuration

7.1. ADC1

IN1: IN1 Single-ended
IN2: IN2 Single-ended
IN3: IN3 Single-ended
IN4: IN4 Single-ended
IN5: IN5 Single-ended
IN8: IN8 Single-ended
IN9: IN9 Single-ended
IN10: IN10 Single-ended
mode: Temperature Sensor Channel
mode: Vrefint Channel
mode: Vbat Channel

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	ADC Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Enabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	**8 ***
External Trigger Conversion Source	**Timer 2 Trigger Out event ***
External Trigger Conversion Edge	Trigger detection on the rising edge
Rank	**2 ***
Channel	**Channel 2 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**3 ***
Channel	

	Channel 3 *
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**4 ***
Channel	**Channel 4 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**5 ***
Channel	**Channel 5 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**6 ***
Channel	**Channel 8 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**7 ***
Channel	**Channel 9 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	**8 ***
Channel	**Channel 10 ***
Sampling Time	**4.5 Cycles ***
Offset Number	No offset
Offset	0
Rank	1
Channel	Channel 1
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

7.2. CAN

mode: Mode

7.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	**8 ***
Time Quantum	**222.22222222222223 ***
Time Quanta in Bit Segment 1	**7 Times ***
Time Quanta in Bit Segment 2	1 Time
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	**Enable ***
Automatic Wake-Up Mode	Disable
No-Automatic Retransmission	**Enable ***
Receive Fifo Locked Mode	**Enable ***
Transmit Fifo Priority	**Enable ***

Advanced Parameters:

Operating Mode	Normal

7.3. IWDG

mode: Activated

7.3.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescaler	**256 ***
IWDG window value	**31 ***
IWDG down-counter reload value	**31 ***

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

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

RCC Parameters:

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

7.5. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.6. TIM2

Clock Source : Internal Clock

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**14400 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**1 ***
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 TRGO	**Update Event ***

7.7. TIM17

mode: Activated

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**65535 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	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
ADC1	PC2	ADC1_IN8	Analog mode	No pull up pull down	n/a	GLV_SENSE
	PC3	ADC1_IN9	Analog mode	No pull up pull down	n/a	VBAT_SENSE
	PA0	ADC1_IN1	Analog mode	No pull up pull down	n/a	IS_1
	PA1	ADC1_IN2	Analog mode	No pull up pull down	n/a	IS_2
	PA2	ADC1_IN3	Analog mode	No pull up pull down	n/a	IS_3
	PA3	ADC1_IN4	Analog mode	No pull up pull down	n/a	IS_4
	PA4	ADC1_IN5	Analog mode	No pull up pull down	n/a	IS_5
	PA6	ADC1_IN10	Analog mode	No pull up pull down	n/a	FLYWIRE
CAN	PA11	CAN_RX	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA12	CAN_TX	Alternate Function Push Pull	No pull up pull down	**High ***	
RCC	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	OSC_IN
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	OSC_OUT
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
Single Mapped Signals	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	SWO
GPIO	PA7	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_AUX_2
	PC4	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DSEL_1
	PC5	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DEN_1
	PB0	GPIO_Output	Output Push Pull	No pull up pull down	Low	PIN_AUX_1
	PB1	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_PDM_FAN
	PB2	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DSEL_2
	PB10	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DEN_2
	PB11	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_COOLING
	PB12	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_CAN
	PB13	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DSEL_3
	PB14	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DEN_3
	PB15	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_AIR_SHDN
	PC6	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_ACC_FAN_2
	PC7	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DSEL_4

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC8	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DEN_4
	PC9	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_ACC_FAN_1
	PA8	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	PIN_DRIVE_INVERTER_R
	PA9	GPIO_Output	**Output Open Drain ***	**Pull up ***	Low	DSEL_5
	PA10	GPIO_Output	Output Push Pull	**Pull up ***	Low	DEN_5
	PA15	GPIO_Output	Output Push Pull	**Pull up ***	Low	PIN_DRIVE_INVERTER_L
	PC10	GPIO_EXTI10	**External Interrupt Mode with Falling edge trigger detection**	No pull up pull down	n/a	CHRG_FAULT
	PC11	GPIO_EXTI11	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	CHRG_LED
	PC12	GPIO_EXTI12	**External Interrupt Mode with Rising/Falling edge**	No pull up pull down	n/a	PGOOD
	PD2	GPIO_EXTI2	**External Interrupt Mode with Falling edge trigger detection**	No pull up pull down	n/a	OV_FAULT_MCU

8.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA1_Channel1	Peripheral To Memory	**High ***

ADC1: DMA1_Channel1 DMA request Settings:

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

8.3. 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
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
EXTI line2 and Touch Sense controller	true	0	0
DMA1 channel1 global interrupt	true	0	0
CAN TX and USB high priority interrupts	true	0	0
CAN RX0 and USB low priority interrupts	true	0	0
CAN RX1 interrupt	true	0	0
TIM1 trigger, commutation and TIM17 interrupts	true	0	0
TIM2 global interrupt	true	0	0
EXTI line[15:10] interrupts	true	0	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 interrupt	unused		
CAN SCE interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

9. Software Pack Report