1. Description

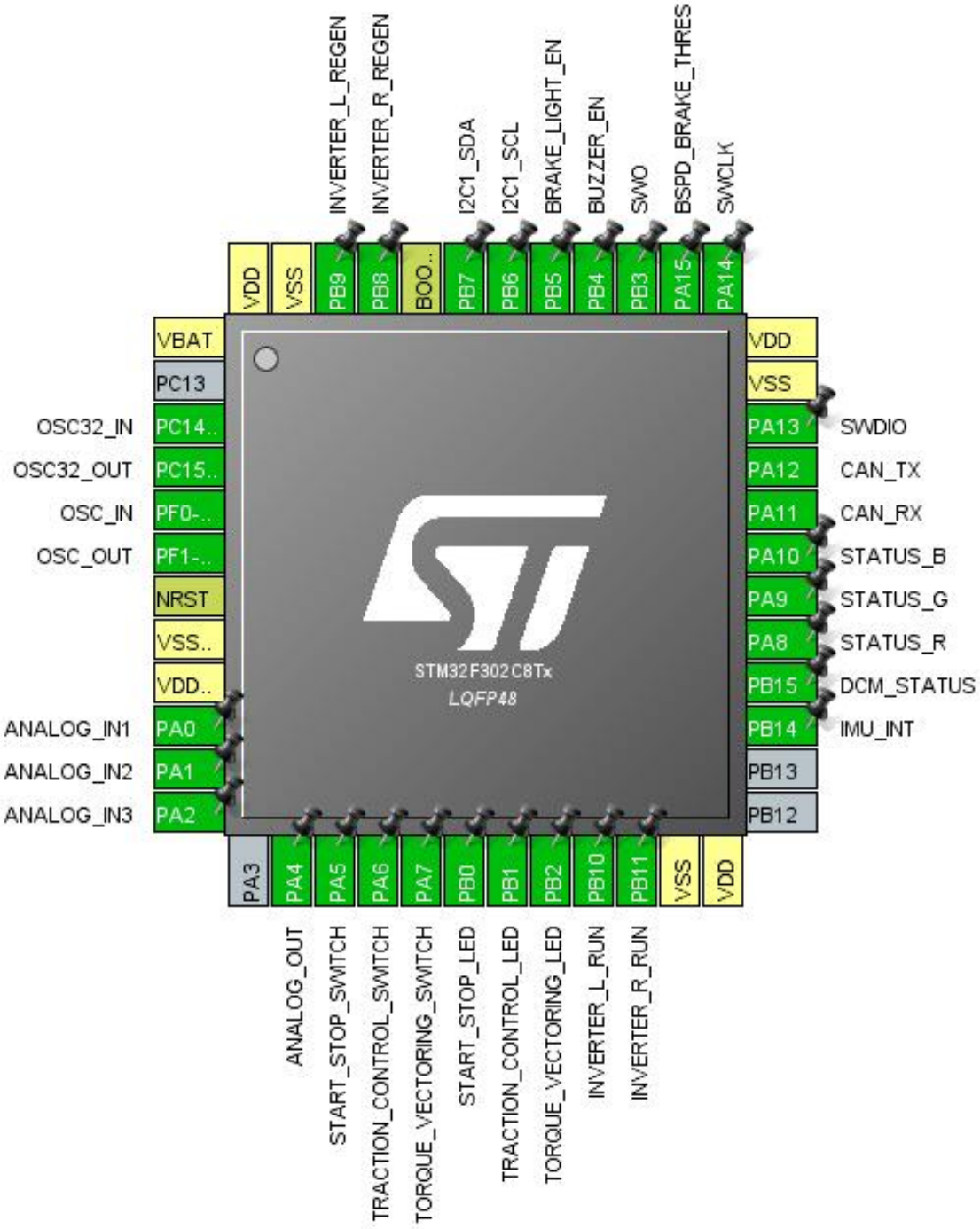
1.1. Project

Project Name	DCM
Board Name	DCM_2020
Generated with:	STM32CubeMX 5.0.0
Date	12/02/2018

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F302
MCU name	STM32F302C8Tx
MCU Package	LQFP48
MCU Pin number	48

2. Pinout Configuration



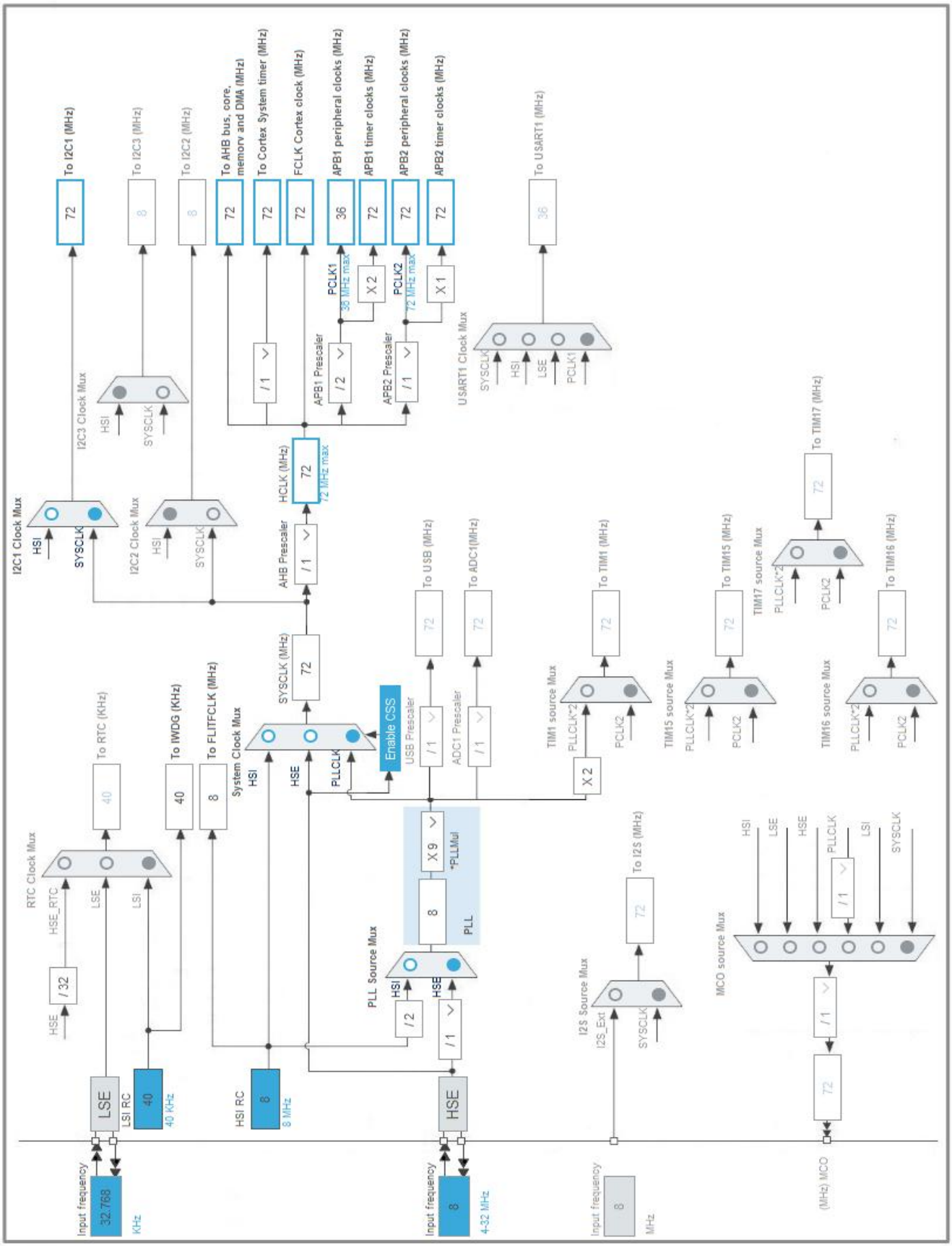
3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14 - OSC32_IN	I/O	RCC_OSC32_IN	OSC32_IN
4	PC15 - OSC32_OUT	I/O	RCC_OSC32_OUT	OSC32_OUT
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		
8	VSSA/VREF-	Power		
9	VDDA/VREF+	Power		
10	PA0 *	I/O	GPIO_Analog	ANALOG_IN1
11	PA1 *	I/O	GPIO_Analog	ANALOG_IN2
12	PA2 *	I/O	GPIO_Analog	ANALOG_IN3
14	PA4 *	I/O	GPIO_Analog	ANALOG_OUT
15	PA5	I/O	GPIO_EXTI5	START_STOP_SWITCH
16	PA6	I/O	GPIO_EXTI6	TRACTION_CONTROL_SWITCH
17	PA7	I/O	GPIO_EXTI7	TORQUE_VECTORING_SWITCH
18	PB0 *	I/O	GPIO_Output	START_STOP_LED
19	PB1 *	I/O	GPIO_Output	TRACTION_CONTROL_LED
20	PB2 *	I/O	GPIO_Output	TORQUE_VECTORING_LED
21	PB10 *	I/O	GPIO_Output	INVERTER_L_RUN
22	PB11 *	I/O	GPIO_Output	INVERTER_R_RUN
23	VSS	Power		
24	VDD	Power		
27	PB14	I/O	GPIO_EXTI14	IMU_INT
28	PB15 *	I/O	GPIO_Output	DCM_STATUS
29	PA8 *	I/O	GPIO_Output	STATUS_R
30	PA9 *	I/O	GPIO_Output	STATUS_G
31	PA10 *	I/O	GPIO_Output	STATUS_B
32	PA11	I/O	CAN_RX	
33	PA12	I/O	CAN_TX	
34	PA13	I/O	SYS_JTMS-SWDIO	SWDIO
35	VSS	Power		
36	VDD	Power		

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PA14	I/O	SYS_JTCK-SWCLK	SWCLK
38	PA15	I/O	GPIO_EXTI15	BSPD_BRAKE_THRES
39	PB3	I/O	SYS_JTDO-TRACESWO	SWO
40	PB4 *	I/O	GPIO_Output	BUZZER_EN
41	PB5 *	I/O	GPIO_Output	BRAKE_LIGHT_EN
42	PB6	I/O	I2C1_SCL	
43	PB7	I/O	I2C1_SDA	
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	INVERTER_R_REGEN
46	PB9 *	I/O	GPIO_Output	INVERTER_L_REGEN
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	DCM
Project Folder	C:\Users\thekenu\UBC Formula Electric\Consolidated-Firmware\src\DCM
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	STM32F302C8Tx
Datasheet	025147_Rev7

6.2. Parameter Selection

Temperature	25
Vdd	3.6

7. IPs and Middleware Configuration

7.1. CAN

mode: Mode

7.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	**9 ***
Time Quantum	**250.0 ***
Time Quanta in Bit Segment 1	**6 Times ***
Time Quanta in Bit Segment 2	1 Time
ReSynchronization Jump Width	**4 Times ***

Basic Parameters:

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

Advanced Parameters:

Operating Mode	Normal

7.2. I2C1

I2C: I2C

7.2.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	**Fast Mode ***
I2C Speed Frequency (KHz)	400
Rise Time (ns)	**100 ***
Fall Time (ns)	**10 ***
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	**0x00E0257A ***

Slave Features:

Clock No Stretch Mode	Disabled

General Call Address Detection	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0

7.3. IWDG

mode: Activated

7.3.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescaler	4
IWDG window value	4095
IWDG down-counter reload value	**LSI_FREQUENCY / IWDG_PRESCALER / IWDG_RESET_FREQUENCY ***

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : 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: Trace Asynchronous Sw

Timebase Source: SysTick

7.6. TIM6

mode: Activated

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**TIM6_PRESCALER ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**(APB1_TIMER_CLOCK / ((TIM6_PRESCALER + 1) * CONTROL_LOOP_FREQUENCY)) - 1 ***
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
CAN	PA11	CAN_RX	Alternate Function Push Pull	No pull up pull down	**Medium ***	
	PA12	CAN_TX	Alternate Function Push Pull	No pull up pull down	**Medium ***	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	**No pull up pull down ***	**High ***	
	PB7	I2C1_SDA	Alternate Function Open Drain	**No pull up pull down ***	**High ***	
RCC	PC14 - OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	OSC32_IN
	PC15 - OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	OSC32_OUT
	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
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	SWO
GPIO	PA0	GPIO_Analog	Analog mode	No pull up pull down	n/a	ANALOG_IN1
	PA1	GPIO_Analog	Analog mode	No pull up pull down	n/a	ANALOG_IN2
	PA2	GPIO_Analog	Analog mode	No pull up pull down	n/a	ANALOG_IN3
	PA4	GPIO_Analog	Analog mode	No pull up pull down	n/a	ANALOG_OUT
	PA5	GPIO_EXTI5	**External Interrupt Mode with Rising/Falling edge**	**Pull up ***	n/a	START_STOP_SWITCH
	PA6	GPIO_EXTI6	**External Interrupt Mode with Rising/Falling edge**	**Pull up ***	n/a	TRACTION_CONTROL_SWITCH
	PA7	GPIO_EXTI7	**External Interrupt Mode with Rising/Falling edge**	**Pull up ***	n/a	TORQUE_VECTORING_SWITCH
	PB0	GPIO_Output	Output Push Pull	No pull up pull down	Low	START_STOP_LED
	PB1	GPIO_Output	Output Push Pull	No pull up pull down	Low	TRACTION_CONTROL_LED
	PB2	GPIO_Output	Output Push Pull	No pull up pull down	Low	TORQUE_VECTORING_L

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
						ED
	PB10	GPIO_Output	Output Push Pull	No pull up pull down	Low	INVERTER_L_RUN
	PB11	GPIO_Output	Output Push Pull	No pull up pull down	Low	INVERTER_R_RUN
	PB14	GPIO_EXTI14	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	IMU_INT
	PB15	GPIO_Output	Output Push Pull	No pull up pull down	Low	DCM_STATUS
	PA8	GPIO_Output	**Output Open Drain ***	No pull up pull down	Low	STATUS_R
	PA9	GPIO_Output	**Output Open Drain ***	No pull up pull down	Low	STATUS_G
	PA10	GPIO_Output	**Output Open Drain ***	No pull up pull down	Low	STATUS_B
	PA15	GPIO_EXTI15	**External Interrupt Mode with Rising/Falling edge**	**Pull up ***	n/a	BSPD_BRAKE_THRES
	PB4	GPIO_Output	Output Push Pull	No pull up pull down	Low	BUZZER_EN
	PB5	GPIO_Output	Output Push Pull	No pull up pull down	Low	BRAKE_LIGHT_EN
	PB8	GPIO_Output	Output Push Pull	No pull up pull down	Low	INVERTER_R_REGEN
	PB9	GPIO_Output	Output Push Pull	No pull up pull down	Low	INVERTER_L_REGEN

8.2. DMA configuration

nothing configured in DMA service

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
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
EXTI line[9:5] interrupts	true	1	0
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	true	0	0
EXTI line[15:10] interrupts	true	1	0
TIM6 global interrupt, DAC interrupts	true	1	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
CAN SCE interrupt	unused		
I2C1 error interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

9. Software Pack Report