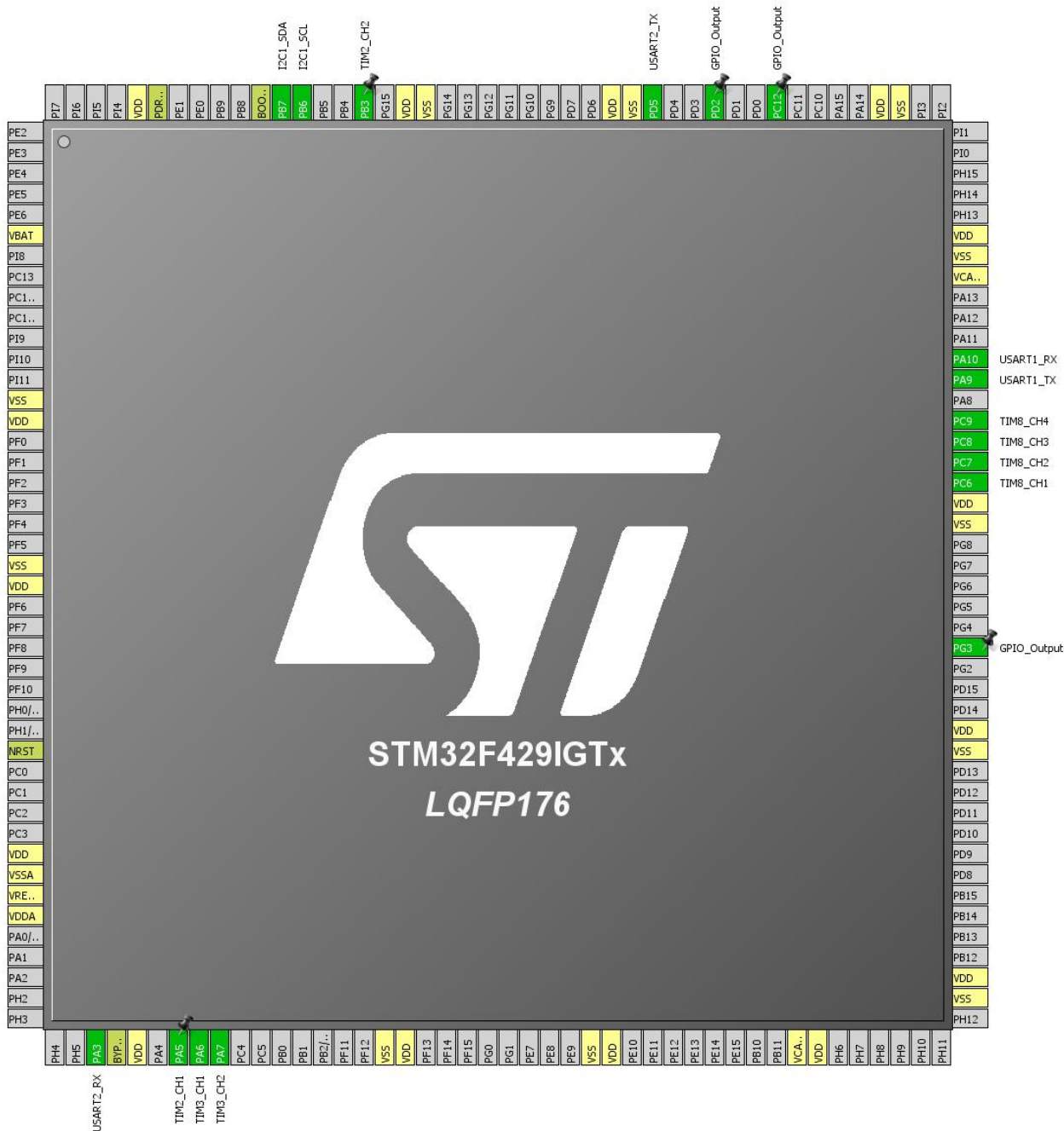# *1. Description*

1.1. Project

Project Name	express_car_control_jy901_test_f429ig
Board Name	custom
Generated with:	STM32CubeMX 4.26.1
Date	12/18/2018

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F429/439
MCU name	STM32F429IGTx
MCU Package	LQFP176
MCU Pin number	176

2. Pinout Configuration

STM32F429IGTx
LQFP176

3. Pins Configuration

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
14	VSS	Power		
15	VDD	Power		
22	VSS	Power		
23	VDD	Power		
31	NRST	Reset		
36	VDD	Power		
37	VSSA	Power		
38	VREF+	Power		
39	VDDA	Power		
47	PA3	I/O	USART2_RX	
48	BYPASS_REG	Reset		
49	VDD	Power		
51	PA5	I/O	TIM2_CH1	
52	PA6	I/O	TIM3_CH1	
53	PA7	I/O	TIM3_CH2	
61	VSS	Power		
62	VDD	Power		
71	VSS	Power		
72	VDD	Power		
81	VCAP_1	Power		
82	VDD	Power		
90	VSS	Power		
91	VDD	Power		
102	VSS	Power		
103	VDD	Power		
107	PG3 *	I/O	GPIO_Output	
113	VSS	Power		
114	VDD	Power		
115	PC6	I/O	TIM8_CH1	
116	PC7	I/O	TIM8_CH2	
117	PC8	I/O	TIM8_CH3	
118	PC9	I/O	TIM8_CH4	
120	PA9	I/O	USART1_TX	
121	PA10	I/O	USART1_RX	
125	VCAP_2	Power		

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
126	VSS	Power		
127	VDD	Power		
135	VSS	Power		
136	VDD	Power		
141	PC12 *	I/O	GPIO_Output	
144	PD2 *	I/O	GPIO_Output	
147	PD5	I/O	USART2_TX	
148	VSS	Power		
149	VDD	Power		
158	VSS	Power		
159	VDD	Power		
161	PB3	I/O	TIM2_CH2	
164	PB6	I/O	I2C1_SCL	
165	PB7	I/O	I2C1_SDA	
166	BOOT0	Boot		
171	PDR_ON	Reset		
172	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration
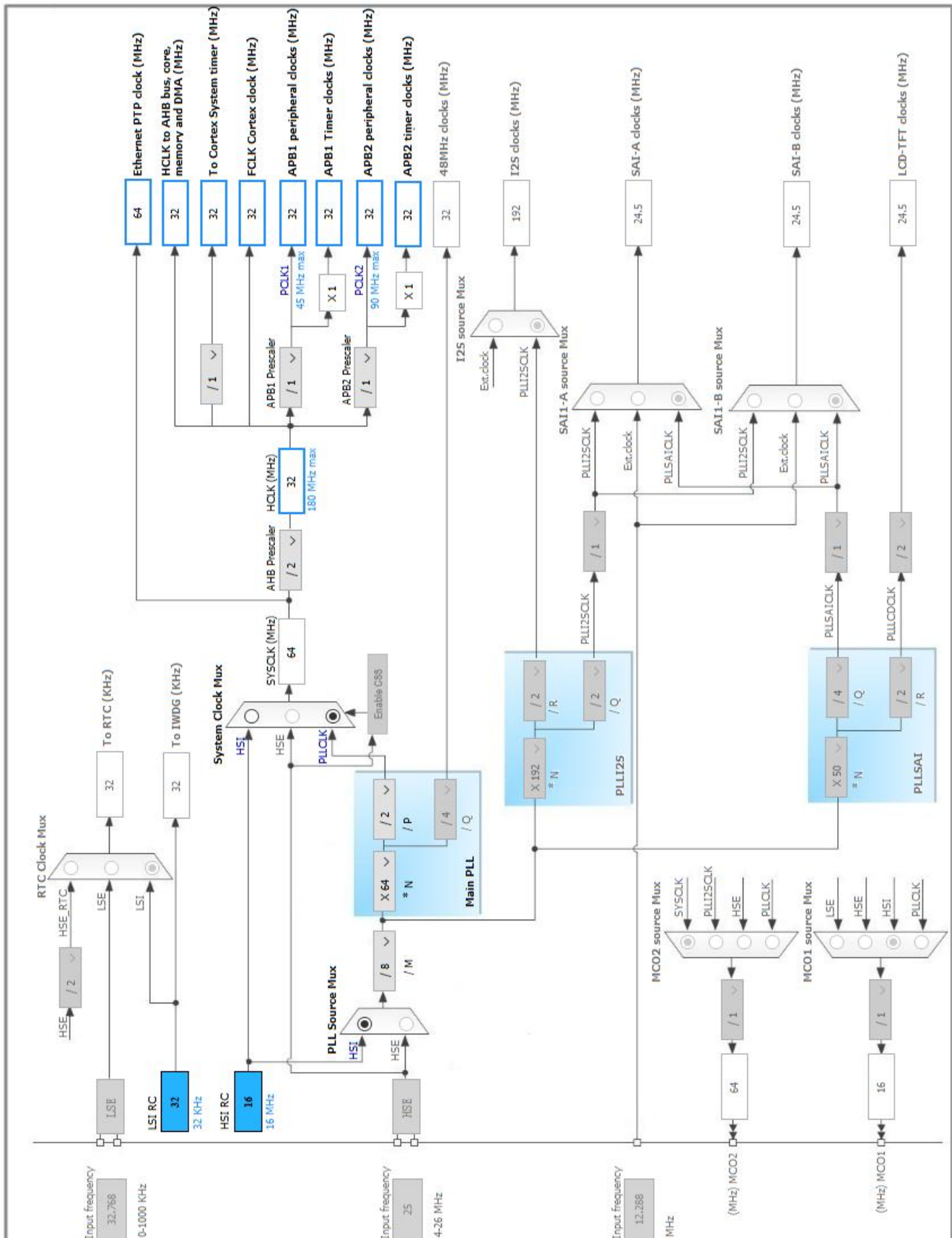
5. IPs and Middleware Configuration

5.1. I2C1

I2C: I2C

5.1.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

5.2. SYS

Timebase Source: SysTick

5.3. TIM2

Combined Channels: Encoder Mode

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**4-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**65536-1 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Encoder:

Encoder Mode	**Encoder Mode TI1 and TI2 ***

_____ Parameters for Channel 1 _____

Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division

Input Filter	0
_____ Parameters for Channel 2 _____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

5.4. TIM3

Combined Channels: Encoder Mode

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**4-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**65536-1 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Encoder:

Encoder Mode	**Encoder Mode TI1 and TI2 ***
_____ Parameters for Channel 1 _____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0
_____ Parameters for Channel 2 _____	
Polarity	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter	0

5.5. TIM4

Clock Source   : Internal Clock

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**32-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**10000-1 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.6. TIM8

Channel1: PWM Generation CH1
Channel2: PWM Generation CH2
Channel3: PWM Generation CH3
Channel4: PWM Generation CH4
5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**16-1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**100-1 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0

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

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.7. USART1

Mode: Asynchronous

5.7.1. 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

5.8. USART2

Mode: Asynchronous

5.8.1. 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
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High** *	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High** *	
TIM2	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB3	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM3	PA6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA7	TIM3_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM8	PC6	TIM8_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC7	TIM8_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC8	TIM8_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC9	TIM8_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
USART2	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
GPIO	PG3	GPIO_Output	**Output Open Drain ***	**Pull-up ***	Low	
	PC12	GPIO_Output	**Output Open Drain ***	**Pull-up ***	Low	
	PD2	GPIO_Output	**Output Open Drain ***	**Pull-up ***	Low	

6.2. DMA configuration

DMA request	Stream	Direction	Priority
I2C1_RX	DMA1_Stream0	Peripheral To Memory	**Medium ***

I2C1_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

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
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
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
USART2 global interrupt	unused		
TIM8 break interrupt and TIM12 global interrupt	unused		
TIM8 update interrupt and TIM13 global interrupt	unused		
TIM8 trigger and commutation interrupts and TIM14 global interrupt	unused		
TIM8 capture compare interrupt	unused		
FPU global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F429/439
MCU	STM32F429IGTx
Datasheet	024030_Rev9

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	express_car_control_jy901_test_f429ig
Project Folder	H:\Courses\\\express_car_control_jy901_test_f429ig
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F4 V1.21.0

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	Yes
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

9. Software Pack Report