1. Description

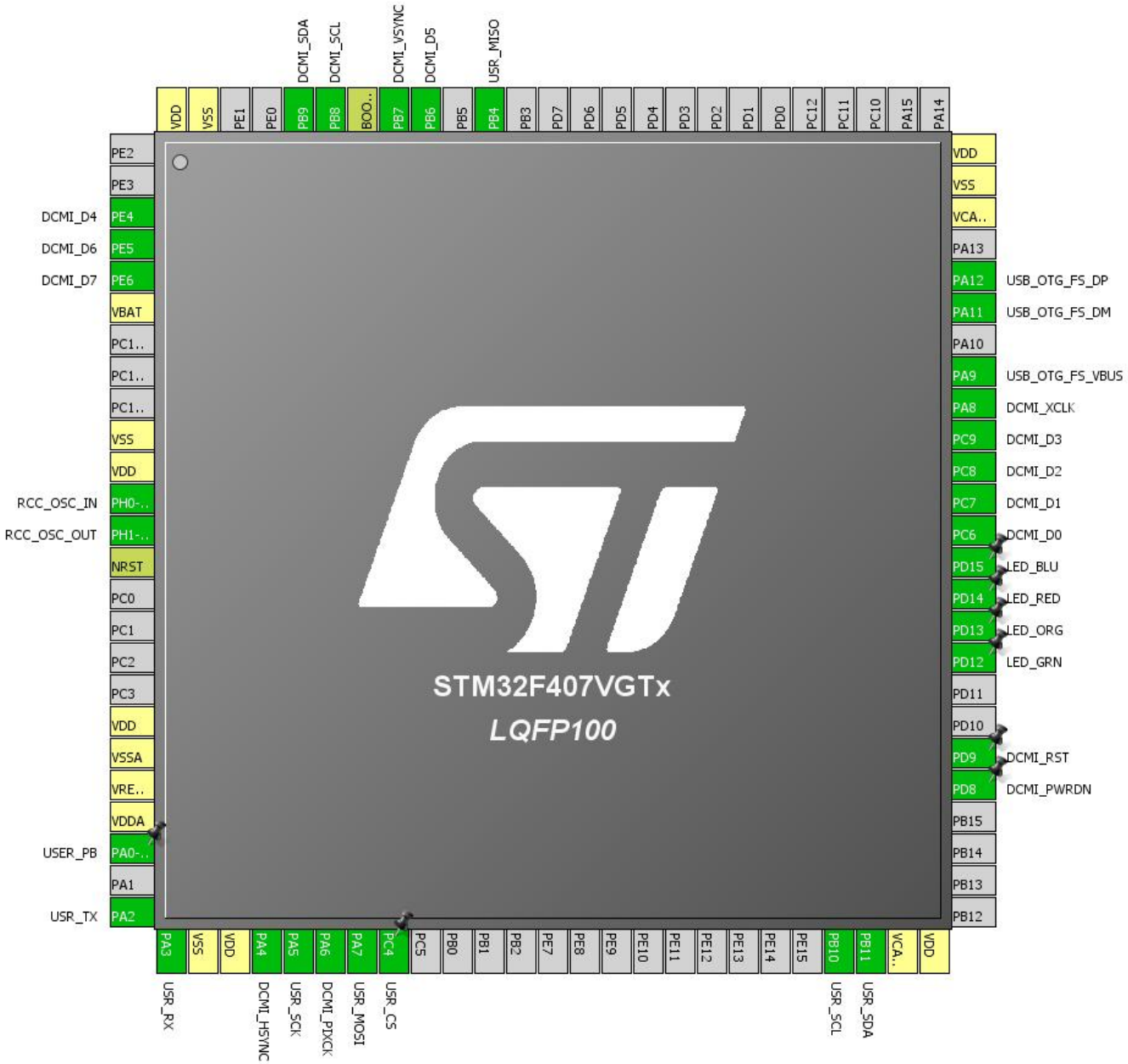
1.1. Project

Project Name	camera2640
Board Name	camera2640
Generated with:	STM32CubeMX 4.12.0
Date	02/01/2016

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407VGTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



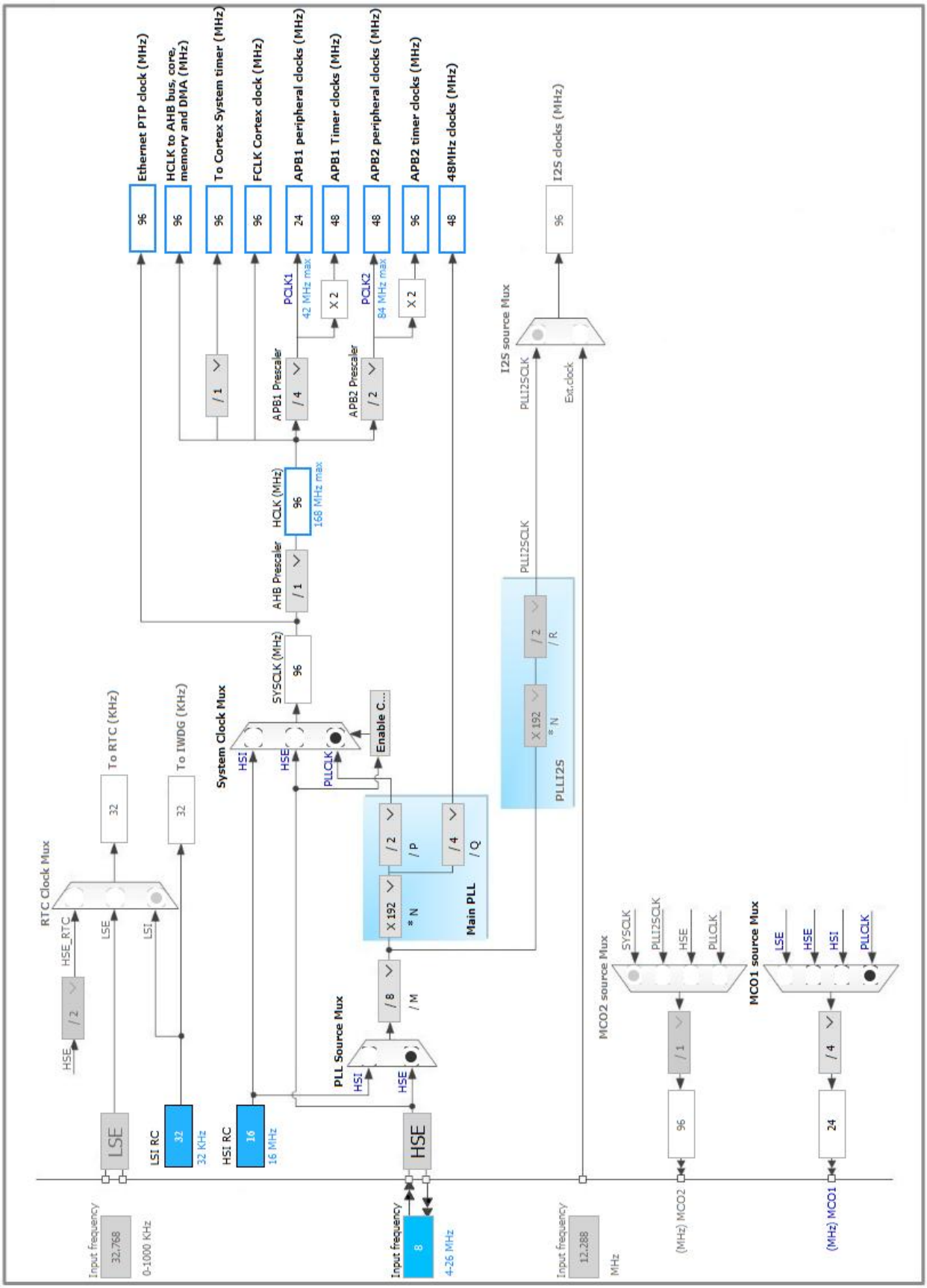
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
3	PE4	I/O	DCMI_D4	
4	PE5	I/O	DCMI_D6	
5	PE6	I/O	DCMI_D7	
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP *	I/O	GPIO_Input	USER_PB
25	PA2	I/O	USART2_TX	USR_TX
26	PA3	I/O	USART2_RX	USR_RX
27	VSS	Power		
28	VDD	Power		
29	PA4	I/O	DCMI_HSYNC	
30	PA5	I/O	SPI1_SCK	USR_SCK
31	PA6	I/O	DCMI_PIXCK	
32	PA7	I/O	SPI1_MOSI	USR_MOSI
33	PC4 *	I/O	GPIO_Output	USR_CS
47	PB10	I/O	I2C2_SCL	USR_SCL
48	PB11	I/O	I2C2_SDA	USR_SDA
49	VCAP_1	Power		
50	VDD	Power		
55	PD8 *	I/O	GPIO_Output	DCMI_PWRDN
56	PD9 *	I/O	GPIO_Output	DCMI_RST
59	PD12 *	I/O	GPIO_Output	LED_GRN
60	PD13 *	I/O	GPIO_Output	LED_ORG
61	PD14 *	I/O	GPIO_Output	LED_RED
62	PD15 *	I/O	GPIO_Output	LED_BLU
63	PC6	I/O	DCMI_D0	
64	PC7	I/O	DCMI_D1	
65	PC8	I/O	DCMI_D2	

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
66	PC9	I/O	DCMI_D3	
67	PA8	I/O	RCC_MCO_1	DCMI_XCLK
68	PA9	I/O	USB_OTG_FS_VBUS	
70	PA11	I/O	USB_OTG_FS_DM	
71	PA12	I/O	USB_OTG_FS_DP	
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		
90	PB4	I/O	SPI1_MISO	USR_MISO
92	PB6	I/O	DCMI_D5	
93	PB7	I/O	DCMI_VSYNC	
94	BOOT0	Boot		
95	PB8	I/O	I2C1_SCL	DCMI_SCL
96	PB9	I/O	I2C1_SDA	DCMI_SDA
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. DCMI

DCMI: Slave 8 bits External Synchro

5.1.1. Parameter Settings:

Mode Config:

Pixel clock polarity	Active on Falling edge
Vertical synchronization polarity	Active Low
Horizontal synchronization polarity	Active Low
Frequency of frame capture	All frames are captured
JPEG mode	Disabled

5.2. I2C1

I2C: I2C

5.2.1. 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

5.3. I2C2

I2C: I2C

5.3.1. 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

5.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator
mode: Master Clock Output 1

5.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	3 WS (4 CPU cycle)

RCC Parameters:

HSI Calibration Value	16

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

5.5. SPI1

Mode: Full-Duplex Master

5.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits

First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**24.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.6. USART2

Mode: Asynchronous

5.6.1. 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

5.7. USB_OTG_FS

Mode: Device_Only

mode: Activate_VBUS

5.7.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Endpoint 0 Max Packet size	64 Bytes
Enable internal IP DMA	Disabled
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	Enabled

5.8. USB_DEVICE

Class For FS IP: Communication Device Class (Virtual Port Com)

5.8.1. Parameter Settings:

Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

Class Parameters:

USBD_CDC_INTERVAL (Number of micro-frames interval)	1000

5.8.2. Device Descriptor:

Device Descriptor:

VID (Vendor IDentifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

Device Descriptor FS:

PID (Product IDentifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
SERIALNUMBER_STRING (Serial number)	00000000001A
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DCMI	PE4	DCMI_D4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE5	DCMI_D6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE6	DCMI_D7	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA4	DCMI_HSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA6	DCMI_PIXCK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC6	DCMI_D0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC7	DCMI_D1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC8	DCMI_D2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC9	DCMI_D3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB6	DCMI_D5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB7	DCMI_VSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	DCMI_SCL
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	**High ***	DCMI_SDA
I2C2	PB10	I2C2_SCL	Alternate Function Open Drain	Pull-up	**High ***	USR_SCL
	PB11	I2C2_SDA	Alternate Function Open Drain	Pull-up	**High ***	USR_SDA
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	
	PA8	RCC_MCO_1	Alternate Function Push Pull	No pull-up and no pull-down	Low	DCMI_XCLK
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	USR_SCK
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	USR_MOSI
	PB4	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	USR_MISO
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	**High ***	USR_TX
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	**High ***	USR_RX
USB_OTG_FS	PA9	USB_OTG_FS_VBUS	Input mode	No pull-up and no pull-down	n/a	
	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
GPIO	PA0-WKUP	GPIO_Input	Input mode	**Pull-down ***	n/a	USER_PB
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USR_CS
	PD8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DCMI_PWRDN
	PD9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DCMI_RST
	PD12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_GRN
	PD13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_ORG
	PD14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_RED
	PD15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_BLU

6.2. DMA configuration

DMA request	Stream	Direction	Priority
DCMI	DMA2_Stream1	Peripheral To Memory	Low

DCMI: DMA2_Stream1 DMA request Settings:

Mode:	**Circular ***
Use fifo:	**Enable ***
FIFO Threshold:	Full
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	**Word ***
Memory Data Width:	Word
Peripheral Burst Size:	Single
Memory Burst Size:	Single

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
DMA2 stream1 global interrupt	true	0	0
USB On The Go FS global interrupt	true	0	0
Non maskable interrupt	unused		
Hard fault interrupt	unused		
Memory management fault	unused		
Pre-fetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug monitor	unused		
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
I2C2 event interrupt	unused		
I2C2 error interrupt	unused		
SPI1 global interrupt	unused		
USART2 global interrupt	unused		
DCMI global interrupt	unused		

*** User modified value**

7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407VGTx
Datasheet	022152_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	camera2640
Project Folder	C:\Users\ap\git\SeniorDesign\camera2640
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F4 V1.10.1

8.2. 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	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