1. Description

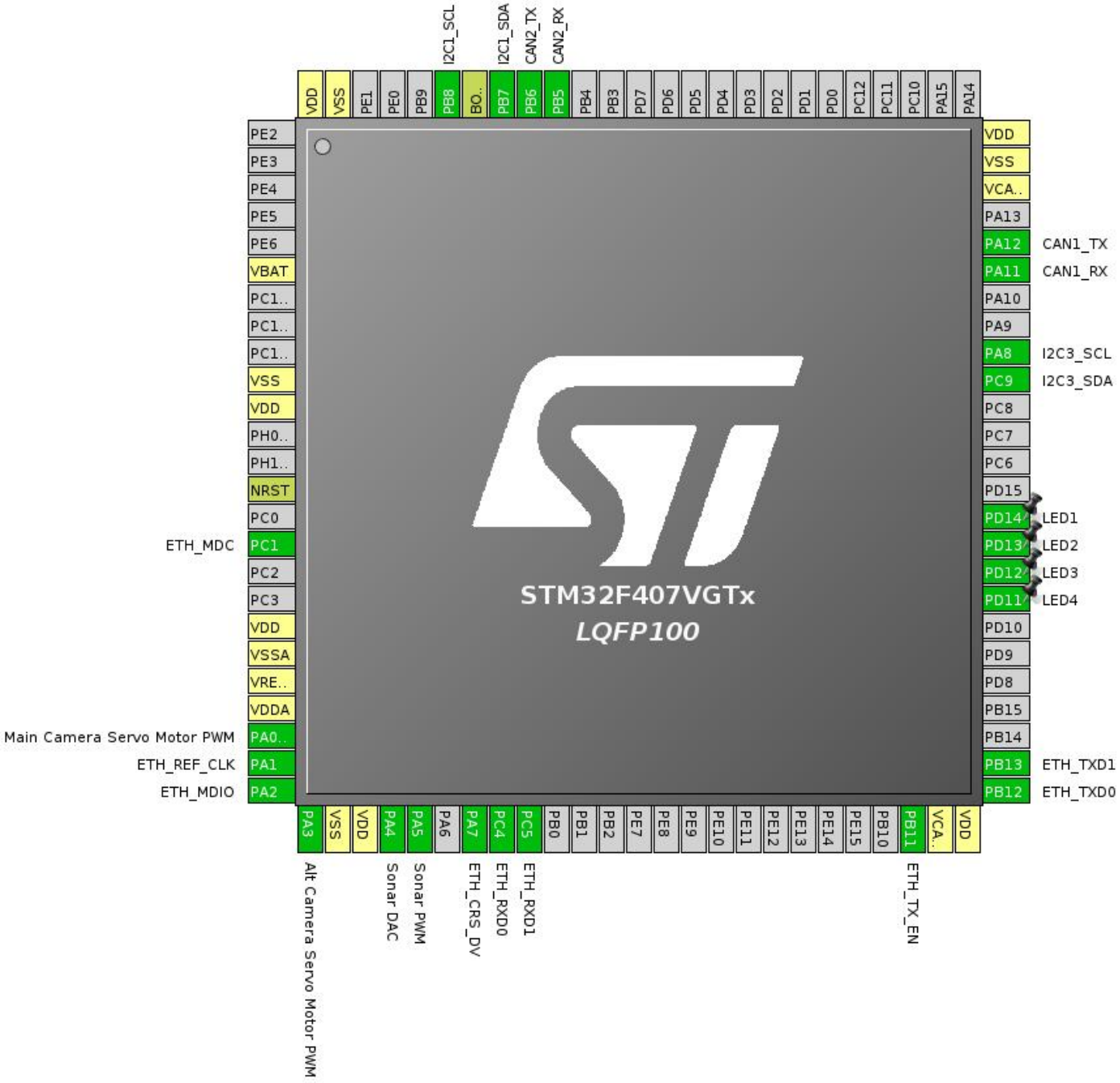
1.1. Project

Project Name	Microboard-Pinouts
Board Name	Microboard-Pinouts
Generated with:	STM32CubeMX 4.11.0
Date	12/03/2015

1.2. MCU

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

2. Pinout Configuration



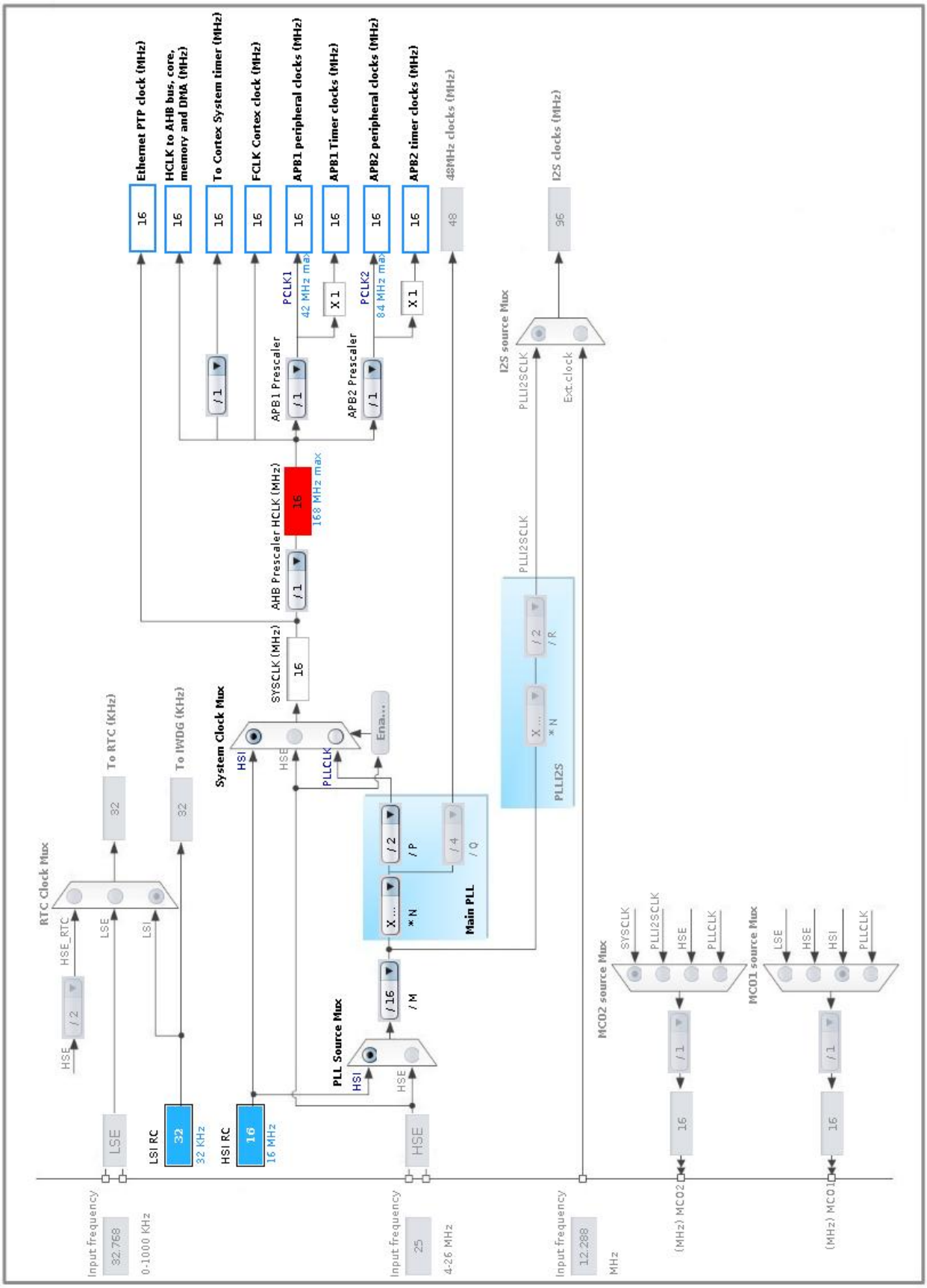
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
14	NRST	Reset		
16	PC1	I/O	ETH_MDC	
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP	I/O	TIM5_CH1	Main Camera Servo Motor PWM
24	PA1	I/O	ETH_REF_CLK	
25	PA2	I/O	ETH_MDIO	
26	PA3	I/O	TIM5_CH4	Alt Camera Servo Motor PWM
27	VSS	Power		
28	VDD	Power		
29	PA4	I/O	DAC_OUT1	Sonar DAC
30	PA5	I/O	TIM2_CH1	Sonar PWM
32	PA7	I/O	ETH_CRS_DV	
33	PC4	I/O	ETH_RXD0	
34	PC5	I/O	ETH_RXD1	
48	PB11	I/O	ETH_TX_EN	
49	VCAP_1	Power		
50	VDD	Power		
51	PB12	I/O	ETH_TXD0	
52	PB13	I/O	ETH_TXD1	
58	PD11 *	I/O	GPIO_Output	LED4
59	PD12 *	I/O	GPIO_Output	LED3
60	PD13 *	I/O	GPIO_Input	LED2
61	PD14 *	I/O	GPIO_Output	LED1
66	PC9	I/O	I2C3_SDA	
67	PA8	I/O	I2C3_SCL	
70	PA11	I/O	CAN1_RX	
71	PA12	I/O	CAN1_TX	
73	VCAP_2	Power		

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
74	VSS	Power		
75	VDD	Power		
91	PB5	I/O	CAN2_RX	
92	PB6	I/O	CAN2_TX	
93	PB7	I/O	I2C1_SDA	
94	BOOT0	Boot		
95	PB8	I/O	I2C1_SCL	
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. CAN1

mode: Mode

5.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16
Time Quantum	**1000.0 ***
Time Quanta in Bit Segment 1	1 Time
Time Quanta in Bit Segment 2	1 Time
Time for one Bit	**3000 ***
ReSynchronization Jump Width	1 Time

Basic Parameters:

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

Advanced Parameters:

Operating Mode	Normal

5.2. CAN2

mode: Mode

5.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16
Time Quantum	**1000.0 ***
Time Quanta in Bit Segment 1	1 Time
Time Quanta in Bit Segment 2	1 Time
Time for one Bit	**3000 ***
ReSynchronization Jump Width	1 Time

Basic Parameters:

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

Advanced Parameters:

Operating Mode	Normal

5.3. DAC

mode: OUT1 Configuration

5.3.1. Parameter Settings:

DAC Out1 Settings:

Output Buffer	Enable
Trigger	None

5.4. ETH

Mode: RMII

5.4.1. Parameter Settings:

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled

General : Ethernet Configuration:

Ethernet MAC Address	00:80:E1:00:00:00
PHY Address	1

Ethernet Basic Configuration:

Rx Mode	Polling Mode
TX IP Header Checksum Computation	By hardware

5.4.2. Advanced Parameters:

External PHY Configuration:

PHY Reset delay these values are based on a 1 ms Systick interrupt	**0x000000FF ***
PHY Configuration delay	**0x00000FFF ***
PHY Read TimeOut	**0x0000FFFF ***
PHY Write TimeOut	**0x0000FFFF ***

Common : External PHY Configuration:

Transceiver Basic Control Register	**0x00 ***
Transceiver Basic Status Register	**0x01 ***
PHY Reset	**0x8000 ***
Select loop-back mode	**0x4000 ***
Set the full-duplex mode at 100 Mb/s	**0x2100 ***
Set the half-duplex mode at 100 Mb/s	**0x2000 ***
Set the full-duplex mode at 10 Mb/s	**0x0100 ***
Set the half-duplex mode at 10 Mb/s	**0x0000 ***
Enable auto-negotiation function	**0x1000 ***
Restart auto-negotiation function	**0x0200 ***
Select the power down mode	**0x0800 ***
Isolate PHY from MII	**0x0400 ***
Auto-Negotiation process completed	**0x0020 ***
Valid link established	**0x0004 ***
Jabber condition detected	**0x0002 ***

Extended : External PHY Configuration:

PHY status register Offset	**0x10 ***
MII Interrupt Control Register	**0x11 ***
MII Interrupt Status and Misc. Control Register	**0x12 ***
PHY Link mask	**0x0001 ***
PHY Speed mask	**0x0002 ***
PHY Duplex mask	**0x0004 ***
PHY Enable interrupts	**0x0002 ***
PHY Enable output interrupt events	**0x0001 ***
Enable Interrupt on change of link status	**0x0020 ***
HY link status interrupt mask	**0x2000 ***

5.5. I2C1

I2C: I2C

5.5.1. 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

5.6. I2C3

I2C: I2C

5.6.1. 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

5.7. TIM2

Channel1: PWM Generation CH1

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0

Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	0
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (32 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.8. TIM5

mode: Clock Source

Channel1: PWM Generation CH1

Channel4: PWM Generation CH4

5.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	0
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (32 bits value)	0
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (32 bits value)	0
Fast Mode	Disable
CH Polarity	High

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
CAN1	PA11	CAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA12	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
CAN2	PB5	CAN2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB6	CAN2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
DAC	PA4	DAC_OUT1	Analog mode	No pull-up and no pull-down	n/a	Sonar DAC
ETH	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA7	ETH_CRS_DV	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB12	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB13	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
I2C1	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**High ***	
	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	
I2C3	PC9	I2C3_SDA	Alternate Function Open Drain	Pull-up	**High ***	
	PA8	I2C3_SCL	Alternate Function Open Drain	Pull-up	**High ***	
TIM2	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	Sonar PWM
TIM5	PA0-WKUP	TIM5_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	Main Camera Servo Motor PWM
	PA3	TIM5_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	Alt Camera Servo Motor PWM
GPIO	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED4
	PD12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED3
	PD13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	LED2
	PD14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED1

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
Non maskable 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		
CAN1 TX interrupts	unused		
CAN1 RX0 interrupts	unused		
CAN1 RX1 interrupt	unused		
CAN1 SCE interrupt	unused		
TIM2 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
TIM5 global interrupt	unused		
TIM6 global interrupt, DAC1 and DAC2 underrun error interrupts	unused		
Ethernet global interrupt	unused		
Ethernet wake-up interrupt through EXTI line 19	unused		
CAN2 TX interrupts	unused		
CAN2 RX0 interrupts	unused		
CAN2 RX1 interrupt	unused		
CAN2 SCE interrupt	unused		
I2C3 event interrupt	unused		
I2C3 error 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	Microboard-Pinouts
Project Folder	/home/lukeinator/Documents/Microboard-Pinouts
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F4 V1.9.0

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