1. Description

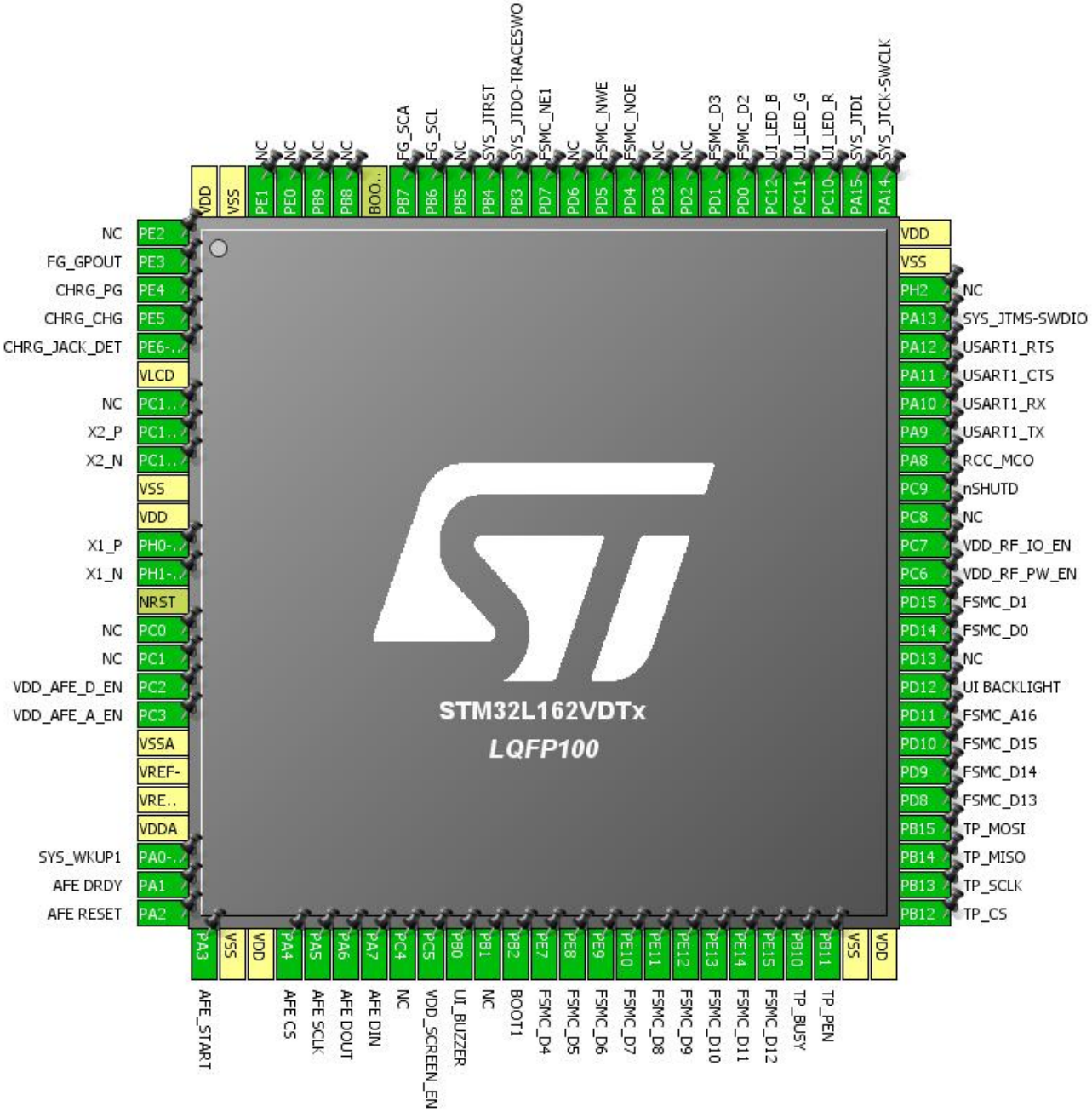
1.1. Project

Project Name	H2H_2
Board Name	H2H_2.0
Generated with:	STM32CubeMX 4.13.0
Date	04/05/2016

1.2. MCU

MCU Series	STM32L1
MCU Line	STM32L162
MCU name	STM32L162VDTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



3. Pins Configuration

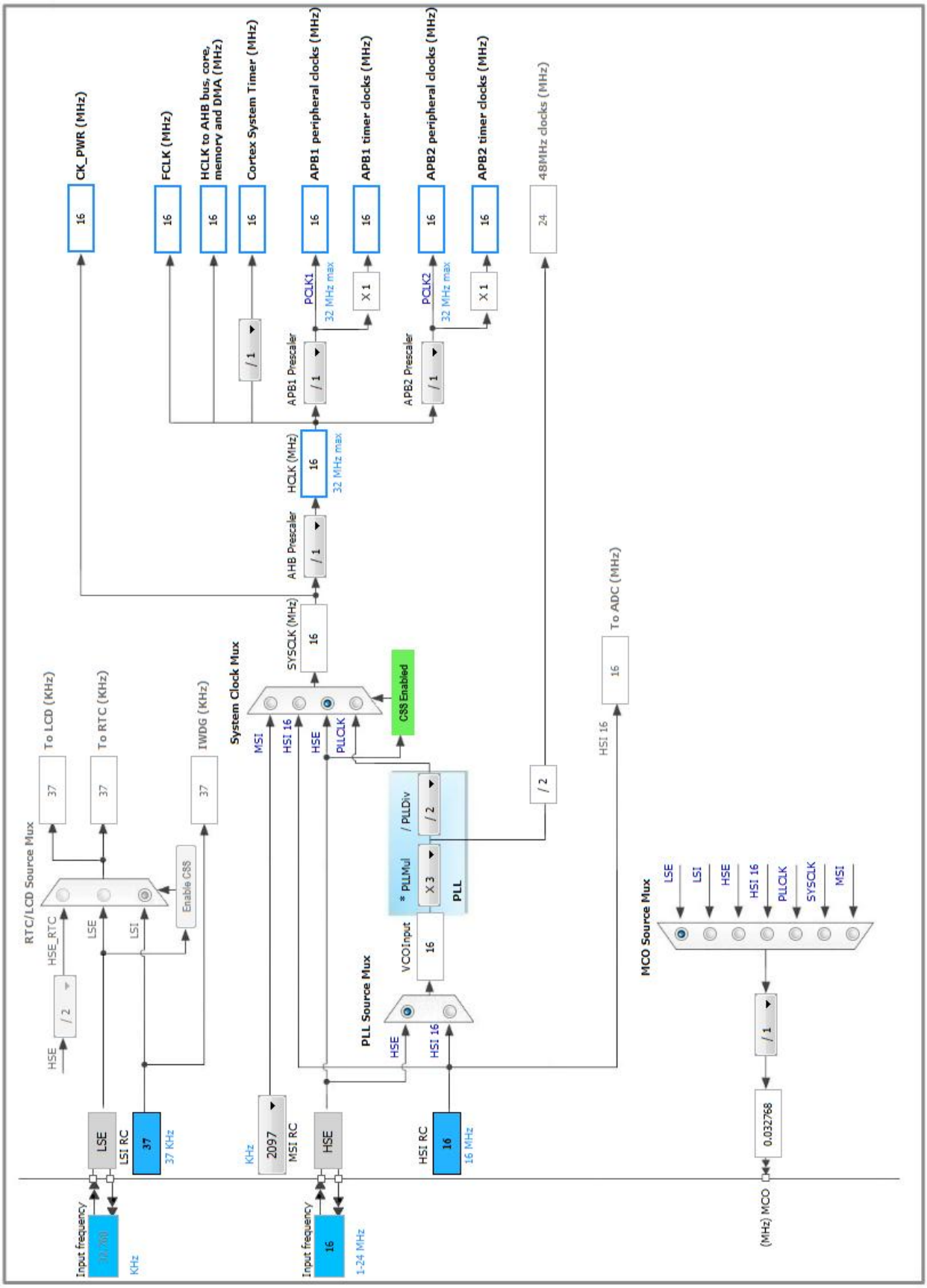
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Analog	NC
2	PE3	I/O	GPIO_EXTI3	FG_GPOUT
3	PE4	I/O	GPIO_EXTI4	CHRG_PG
4	PE5	I/O	GPIO_EXTI5	CHRG_CHG
5	PE6-WKUP3	I/O	GPIO_EXTI6	CHRG_JACK_DET
6	VLCD	Power		
7	PC13-WKUP2 *	I/O	GPIO_Analog	NC
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	X2_P
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	X2_N
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN	I/O	RCC_OSC_IN	X1_P
13	PH1-OSC_OUT	I/O	RCC_OSC_OUT	X1_N
14	NRST	Reset		
15	PC0 *	I/O	GPIO_Analog	NC
16	PC1 *	I/O	GPIO_Analog	NC
17	PC2 *	I/O	GPIO_Output	VDD_AFE_D_EN
18	PC3 *	I/O	GPIO_Output	VDD_AFE_A_EN
19	VSSA	Power		
20	VREF-	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP1	I/O	GPIO_EXTI0	SYS_WKUP1
24	PA1	I/O	GPIO_EXTI1	AFE DRDY
25	PA2	I/O	GPIO_EXTI2	AFE RESET
26	PA3 *	I/O	GPIO_Output	AFE_START
27	VSS	Power		
28	VDD	Power		
29	PA4 *	I/O	GPIO_Output	AFE CS
30	PA5	I/O	SPI1_SCK	AFE SCLK
31	PA6	I/O	SPI1_MISO	AFE DOUT
32	PA7	I/O	SPI1_MOSI	AFE DIN
33	PC4 *	I/O	GPIO_Analog	NC
34	PC5 *	I/O	GPIO_Output	VDD_SCREEN_EN
35	PB0	I/O	TIM3_CH3	UI_BUZZER
36	PB1 *	I/O	GPIO_Analog	NC

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PB2 *	I/O	GPIO_Input	BOOT1
38	PE7	I/O	FSMC_D4	
39	PE8	I/O	FSMC_D5	
40	PE9	I/O	FSMC_D6	
41	PE10	I/O	FSMC_D7	
42	PE11	I/O	FSMC_D8	
43	PE12	I/O	FSMC_D9	
44	PE13	I/O	FSMC_D10	
45	PE14	I/O	FSMC_D11	
46	PE15	I/O	FSMC_D12	
47	PB10	I/O	GPIO_EXTI10	TP_BUSY
48	PB11	I/O	GPIO_EXTI11	TP_PEN
49	VSS	Power		
50	VDD	Power		
51	PB12 *	I/O	GPIO_Output	TP_CS
52	PB13	I/O	SPI2_SCK	TP_SCLK
53	PB14	I/O	SPI2_MISO	TP_MISO
54	PB15	I/O	SPI2_MOSI	TP_MOSI
55	PD8	I/O	FSMC_D13	
56	PD9	I/O	FSMC_D14	
57	PD10	I/O	FSMC_D15	
58	PD11	I/O	FSMC_A16	
59	PD12	I/O	TIM4_CH1	UI BACKLIGHT
60	PD13 *	I/O	GPIO_Analog	NC
61	PD14	I/O	FSMC_D0	
62	PD15	I/O	FSMC_D1	
63	PC6 *	I/O	GPIO_Output	VDD_RF_PW_EN
64	PC7 *	I/O	GPIO_Output	VDD_RF_IO_EN
65	PC8 *	I/O	GPIO_Analog	NC
66	PC9 *	I/O	GPIO_Output	nSHUTD
67	PA8	I/O	RCC_MCO	
68	PA9	I/O	USART1_TX	
69	PA10	I/O	USART1_RX	
70	PA11	I/O	USART1_CTS	
71	PA12	I/O	USART1_RTS	
72	PA13	I/O	SYS_JTMS-SWDIO	
73	PH2 *	I/O	GPIO_Analog	NC
74	VSS	Power		
75	VDD	Power		

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
76	PA14	I/O	SYS_JTCK-SWCLK	
77	PA15	I/O	SYS_JTDI	
78	PC10 *	I/O	GPIO_Output	UI_LED_R
79	PC11 *	I/O	GPIO_Output	UI_LED_G
80	PC12 *	I/O	GPIO_Output	UI_LED_B
81	PD0	I/O	FSMC_D2	
82	PD1	I/O	FSMC_D3	
83	PD2 *	I/O	GPIO_Analog	NC
84	PD3 *	I/O	GPIO_Analog	NC
85	PD4	I/O	FSMC_NOE	
86	PD5	I/O	FSMC_NWE	
87	PD6 *	I/O	GPIO_Analog	NC
88	PD7	I/O	FSMC_NE1	
89	PB3	I/O	SYS_JTDO-TRACESWO	
90	PB4	I/O	SYS_JTRST	
91	PB5 *	I/O	GPIO_Analog	NC
92	PB6	I/O	I2C1_SCL	FG_SCL
93	PB7	I/O	I2C1_SDA	FG_SCA
94	BOOT0	Boot		
95	PB8 *	I/O	GPIO_Analog	NC
96	PB9 *	I/O	GPIO_Analog	NC
97	PE0 *	I/O	GPIO_Analog	NC
98	PE1 *	I/O	GPIO_Analog	NC
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. FSMC

NOR Flash/PSRAM/SRAM/ROM/LCD 1

Chip Select: set

Memory type: LCD Interface

LCD Register Select: A16

Data: 16 bits

5.1.1. NOR/PSRAM 1:

NOR/PSRAM control:

Memory type	LCD Interface
Bank	Bank 1 NOR/PSRAM 1
Write operation	Enabled
Extended mode	Disabled

NOR/PSRAM timing:

Address setup time in HCLK clock cycles	15
Data setup time in HCLK clock cycles	255
Bus turn around time in HCLK clock cycles	15

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. RCC

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

5.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

5.4. SPI1

Mode: Full-Duplex Master

5.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**8 ***
Baud Rate	**2.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled

NSS Signal Type	Software

5.5. SPI2

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)	**8 ***
Baud Rate	**2.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.6. SYS

Debug: JTAG(5-pin)

Timebase Source: SysTick

5.7. TIM3

Clock Source : Internal Clock

Channel3: PWM Generation CH3

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**36 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**1000 ***
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 3:

Mode	PWM mode 1
Pulse (16 bits value)	**500 ***
Fast Mode	Disable
CH Polarity	High

5.8. TIM4

Channel1: PWM Generation CH1

5.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 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 (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.9. USART1

Mode: Asynchronous

Hardware Flow Control (RS232): CTS/RTS

5.9.1. 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
FSMC	PE7	FSMC_D4	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE8	FSMC_D5	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE9	FSMC_D6	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE10	FSMC_D7	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE11	FSMC_D8	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE12	FSMC_D9	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE13	FSMC_D10	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE14	FSMC_D11	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE15	FSMC_D12	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD8	FSMC_D13	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD9	FSMC_D14	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD10	FSMC_D15	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD11	FSMC_A16	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD14	FSMC_D0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD15	FSMC_D1	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD0	FSMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD1	FSMC_D3	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD4	FSMC_NOE	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD5	FSMC_NWE	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD7	FSMC_NE1	Alternate Function Push Pull	No pull-up and no pull-down	High	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	FG_SCL
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**High ***	FG_SCA
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	X2_P
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	X2_N
	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	X1_P
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	X1_N
	PA8	RCC_MCO	Alternate Function Push Pull	No pull-up and no pull-down	Very Low	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	AFE SCLK

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	AFE DOUT
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	AFE DIN
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	TP_SCLK
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	TP_MISO
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	TP_MOSI
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PA15	SYS_JTDI	n/a	n/a	n/a	
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	
	PB4	SYS_JTRST	n/a	n/a	n/a	
TIM3	PB0	TIM3_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Very Low	UI_BUZZER
TIM4	PD12	TIM4_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Very Low	UI BACKLIGHT
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	
	PA11	USART1_CTS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA12	USART1_RTS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
GPIO	PE2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PE3	GPIO_EXTI3	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	FG_GPOUT
	PE4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	CHRG_PG
	PE5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	CHRG_CHG
	PE6-WKUP3	GPIO_EXTI6	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	CHRG_JACK_DET
	PC13-WKUP2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC0	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	VDD_AFE_D_EN
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	VDD_AFE_A_EN
	PA0-WKUP1	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	SYS_WKUP1
	PA1	GPIO_EXTI1	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	AFE DRDY
	PA2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	AFE RESET
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	AFE_START

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	AFE CS
	PC4	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	VDD_SCREEN_EN
	PB1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BOOT1
	PB10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	TP_BUSY
	PB11	GPIO_EXTI11	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	TP_PEN
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	TP_CS
	PD13	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	VDD_RF_PW_EN
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	VDD_RF_IO_EN
	PC8	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very Low	nSHUTD
	PH2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PC10	GPIO_Output	Output Push Pull	**Pull-down ***	Very Low	UI_LED_R
	PC11	GPIO_Output	Output Push Pull	**Pull-down ***	Very Low	UI_LED_G
	PC12	GPIO_Output	Output Push Pull	**Pull-down ***	Very Low	UI_LED_B
	PD2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PD3	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PD6	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PB5	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PB8	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PB9	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PE0	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC
	PE1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	NC

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
System tick timer	true	0	0
Hard fault interrupt	unused		
Memory management fault	unused		
Pre-fetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug monitor	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line0 interrupt	unused		
EXTI line1 interrupt	unused		
EXTI line2 interrupt	unused		
EXTI line3 interrupt	unused		
EXTI line4 interrupt	unused		
EXTI line[9:5] interrupts	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
USART1 global interrupt	unused		
EXTI line[15:10] interrupts	unused		

*** User modified value**

7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32L1
Line	STM32L162
MCU	STM32L162VDTx
Datasheet	022268_Rev8

7.2. Parameter Selection

Temperature	25
Vdd	3.0

7.3. Battery Selection

Battery	Ni-MH(AAA800)
Capacity	800.0 mAh
Self Discharge	30.0 %/month
Nominal Voltage	1.2 V
Max Cont Current	160.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1

8. Software Project

8.1. Project Settings

Name	Value
Project Name	H2H_2.0
Project Folder	C:\Users\carpanta\Documents\GitHub\tiic-2015\code\v2.0 Persimmon
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_L1 V1.4.0

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)	Yes