1. Description

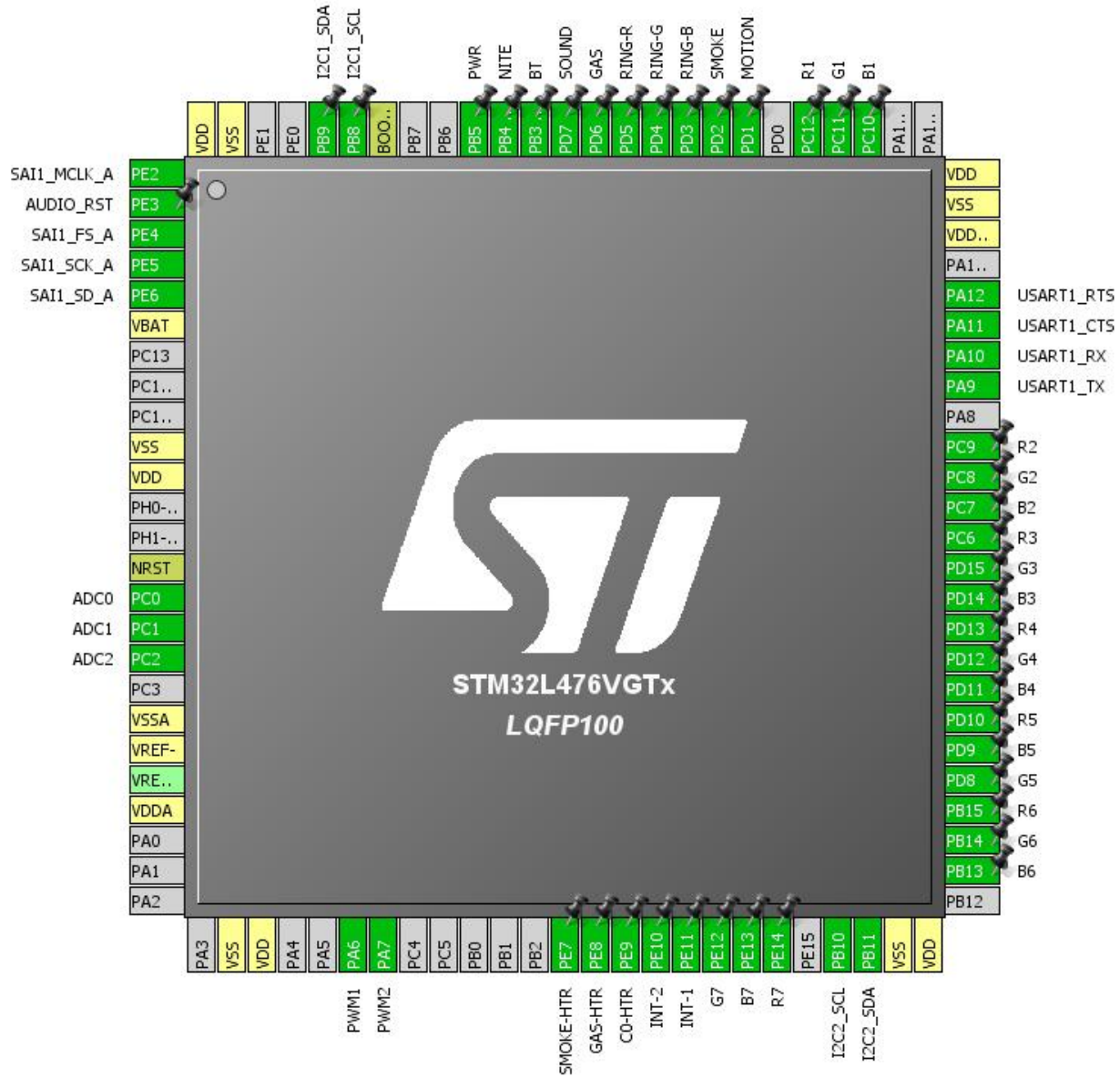
1.1. Project

Project Name	CubeMX
Board Name	custom
Generated with:	STM32CubeMX 4.26.0
Date	07/07/2018

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x6
MCU name	STM32L476VGTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



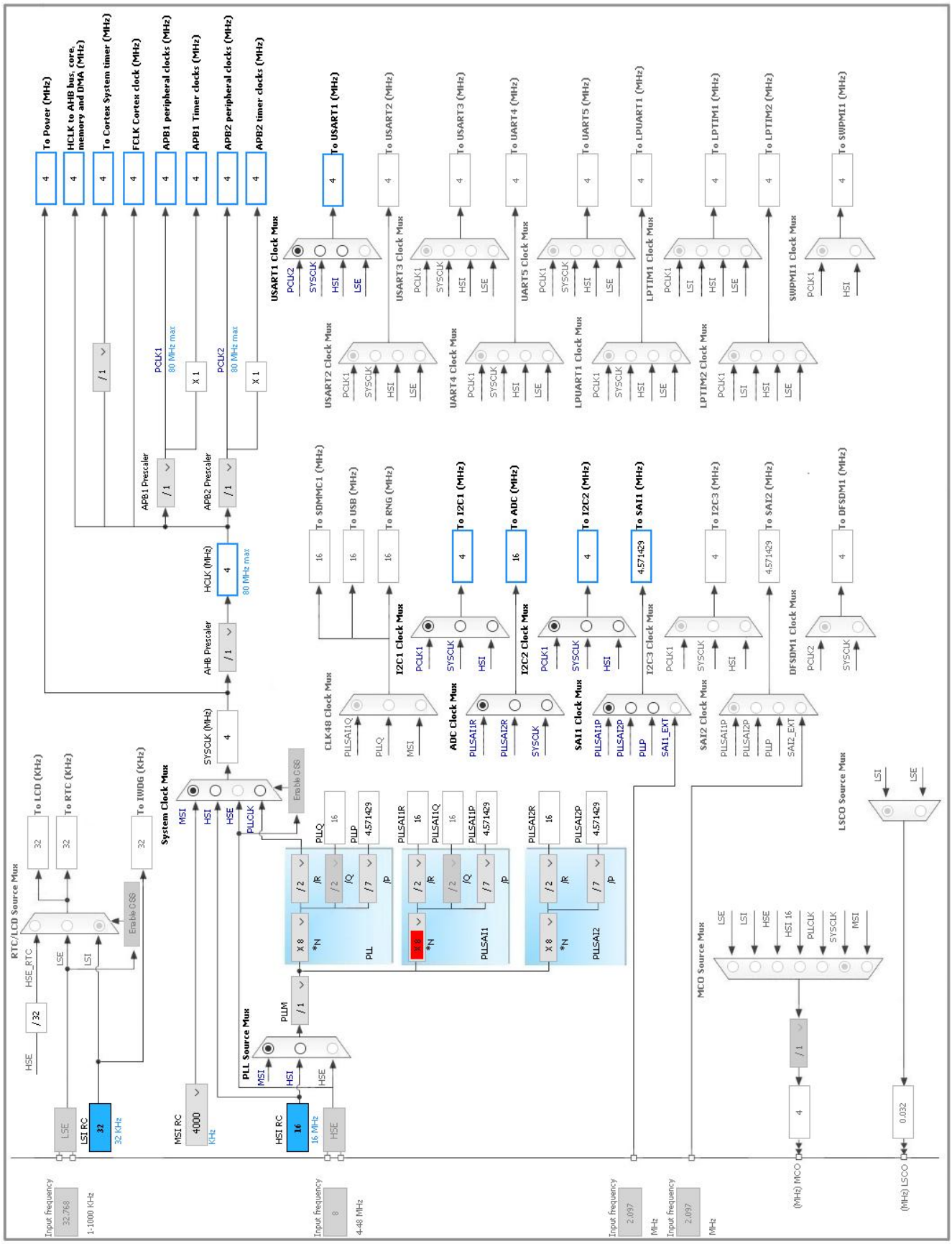
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	SAI1_MCLK_A	
2	PE3 *	I/O	GPIO_Output	AUDIO_RST
3	PE4	I/O	SAI1_FS_A	
4	PE5	I/O	SAI1_SCK_A	
5	PE6	I/O	SAI1_SD_A	
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
14	NRST	Reset		
15	PC0	I/O	ADC1_IN1	ADC0
16	PC1	I/O	ADC1_IN2	ADC1
17	PC2	I/O	ADC1_IN3	ADC2
19	VSSA	Power		
20	VREF-	Power		
22	VDDA	Power		
27	VSS	Power		
28	VDD	Power		
31	PA6	I/O	TIM16_CH1	PWM1
32	PA7	I/O	TIM17_CH1	PWM2
38	PE7 *	I/O	GPIO_Output	SMOKE-HTR
39	PE8 *	I/O	GPIO_Output	GAS-HTR
40	PE9 *	I/O	GPIO_Output	C0-HTR
41	PE10	I/O	GPIO_EXTI10	INT-2
42	PE11	I/O	GPIO_EXTI11	INT-1
43	PE12 *	I/O	GPIO_Output	G7
44	PE13 *	I/O	GPIO_Output	B7
45	PE14 *	I/O	GPIO_Output	R7
47	PB10	I/O	I2C2_SCL	
48	PB11	I/O	I2C2_SDA	
49	VSS	Power		
50	VDD	Power		
52	PB13 *	I/O	GPIO_Output	B6
53	PB14 *	I/O	GPIO_Output	G6
54	PB15 *	I/O	GPIO_Output	R6
55	PD8 *	I/O	GPIO_Output	G5
56	PD9 *	I/O	GPIO_Output	B5

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
57	PD10 *	I/O	GPIO_Output	R5
58	PD11 *	I/O	GPIO_Output	B4
59	PD12 *	I/O	GPIO_Output	G4
60	PD13 *	I/O	GPIO_Output	R4
61	PD14 *	I/O	GPIO_Output	B3
62	PD15 *	I/O	GPIO_Output	G3
63	PC6 *	I/O	GPIO_Output	R3
64	PC7 *	I/O	GPIO_Output	B2
65	PC8 *	I/O	GPIO_Output	G2
66	PC9 *	I/O	GPIO_Output	R2
68	PA9	I/O	USART1_TX	
69	PA10	I/O	USART1_RX	
70	PA11	I/O	USART1_CTS	
71	PA12	I/O	USART1_RTS	
73	VDDUSB	Power		
74	VSS	Power		
75	VDD	Power		
78	PC10 *	I/O	GPIO_Output	B1
79	PC11 *	I/O	GPIO_Output	G1
80	PC12 *	I/O	GPIO_Output	R1
82	PD1	I/O	GPIO_EXTI1	MOTION
83	PD2	I/O	GPIO_EXTI2	SMOKE
84	PD3 *	I/O	GPIO_Output	RING-B
85	PD4 *	I/O	GPIO_Output	RING-G
86	PD5 *	I/O	GPIO_Output	RING-R
87	PD6	I/O	GPIO_EXTI6	GAS
88	PD7	I/O	GPIO_EXTI7	SOUND
89	PB3 (JTDO-TRACESWO)	I/O	GPIO_EXTI3	BT
90	PB4 (NJTRST)	I/O	GPIO_EXTI4	NITE
91	PB5	I/O	GPIO_EXTI5	PWR
94	BOOT0	Boot		
95	PB8	I/O	I2C1_SCL	
96	PB9	I/O	I2C1_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. ADC1

IN1: IN1 Single-ended

IN2: IN2 Single-ended

IN3: IN3 Single-ended

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	Asynchronous clock mode divided by 1
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Enable Regular Oversampling	Disable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 1
Sampling Time	2.5 Cycles
Offset Number	No offset

ADC_Injected_ConversionMode:

Enable Injected Conversions	Disable

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.2. I2C1

I2C: I2C

5.2.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x00000E14

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

5.3. I2C2

I2C: I2C

5.3.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x00000E14

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

5.4. SAI1

Mode: Master with Master Clock Out

5.4.1. Parameter Settings:

SAI A:

Basic Parameters	
Protocol	Free
Audio Mode	Master Transmit
Frame Length	8 bits
Data Size	24 Bits
Slot Size	DataSize
Output Mode	Stereo
Companding Mode	No companding mode
SAI SD Line Output Mode	Driven
Frame Parameters	
First Bit	MSB First
Frame Synchro Active Level Length	1
Frame Synchro Definition	Start Frame
Frame Synchro Polarity	Active Low
Frame Synchro Offset	First Bit
Slot Parameters	
First Bit Offset	0
Number of Slots	1
Slot Active Final Value	0x00000000
Slot Active	Neither
Clock Parameters	
Master Clock Divider	Enabled
Audio Frequency	192 KHz
Real Audio Frequency	0
Error between Selected	0
Clock Strobing	Falling Edge
Advanced Parameters	
Fifo Threshold	Empty
Output Drive	Disabled
Synchronization External	Disabled

5.5. SYS

Timebase Source: SysTick

5.6. TIM16

mode: Activated

Channel1: PWM Generation CH1

5.6.1. 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
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable
- DFSDM	Disable

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

5.7. TIM17

mode: Activated
Channel1: PWM Generation CH1
5.7.1. 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
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable
- DFSDM	Disable

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

5.8. USART1
Mode: Asynchronous
Hardware Flow Control (RS232): CTS/RTS
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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

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6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC0	ADC1_IN1	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	ADC0
	PC1	ADC1_IN2	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	ADC1
	PC2	ADC1_IN3	Analog mode for ADC conversion	No pull-up and no pull-down	n/a	ADC2
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	
I2C2	PB10	I2C2_SCL	Alternate Function Open Drain	Pull-up	**Very High ***	
	PB11	I2C2_SDA	Alternate Function Open Drain	Pull-up	**Very High ***	
SAI1	PE2	SAI1_MCLK_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE4	SAI1_FS_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE5	SAI1_SCK_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE6	SAI1_SD_A	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM16	PA6	TIM16_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM1
TIM17	PA7	TIM17_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM2
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA11	USART1_CTS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA12	USART1_RTS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	AUDIO_RST
	PE7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SMOKE-HTR
	PE8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GAS-HTR
	PE9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	C0-HTR
	PE10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	INT-2
	PE11	GPIO_EXTI11	External Interrupt Mode with	No pull-up and no pull-down	n/a	INT-1

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			Rising edge trigger detection			
	PE12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G7
	PE13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B7
	PE14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R7
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B6
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G6
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R6
	PD8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G5
	PD9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B5
	PD10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R5
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B4
	PD12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G4
	PD13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R4
	PD14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B3
	PD15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G3
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R3
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B2
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G2
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R2
	PC10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	B1
	PC11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G1
	PC12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	R1
	PD1	GPIO_EXTI1	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	MOTION
	PD2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	SMOKE
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RING-B
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RING-G
	PD5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RING-R
	PD6	GPIO_EXTI6	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	GAS
	PD7	GPIO_EXTI7	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	SOUND
	PB3 (JTDO-TRACESWO)	GPIO_EXTI3	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	BT
	PB4 (NJTRST)	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	NITE
	PB5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	PWR

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
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Prefetch 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
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line1 interrupt	unused		
EXTI line2 interrupt	unused		
EXTI line3 interrupt	unused		
EXTI line4 interrupt	unused		
ADC1 and ADC2 interrupts	unused		
EXTI line[9:5] interrupts	unused		
TIM1 update interrupt and TIM16 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM17 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
I2C2 event interrupt	unused		
I2C2 error interrupt	unused		
USART1 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
SAI1 global interrupt	unused		
FPU global interrupt	unused		

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7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x6
MCU	STM32L476VGTx
Datasheet	025976_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Pack Report