1. Description

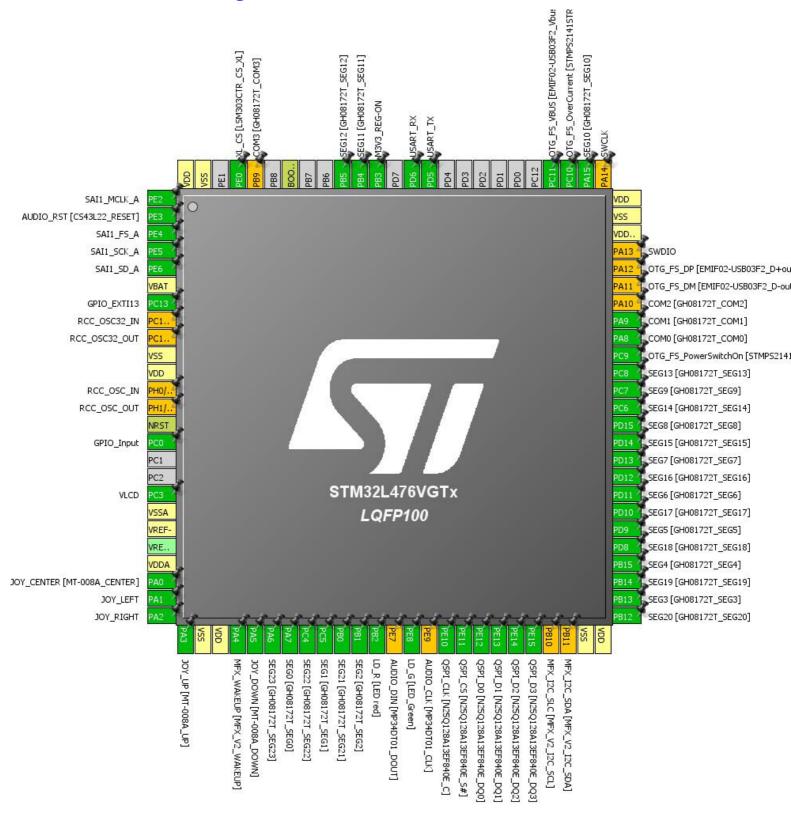
1.1. Project

Project Name	projv2
Board Name	STM32L476G-DISCO
Generated with:	STM32CubeMX 4.20.0
Date	05/28/2017

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	Pin Name	Pin Type	Alternate	Label
LQFP100	(function after reset)		Function(s)	
1	PE2	I/O	SAI1_MCLK_A	
2	PE3 *	I/O	GPIO_Output	AUDIO_RST [CS43L22_RESET]
3	PE4	I/O	SAI1_FS_A	
4	PE5	I/O	SAI1_SCK_A	
5	PE6	I/O	SAI1_SD_A	
6	VBAT	Power		
7	PC13	I/O	GPIO_EXTI13	
8	PC14/OSC32_IN **	I/O	RCC_OSC32_IN	
9	PC15/OSC32_OUT **	I/O	RCC_OSC32_OUT	
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		
15	PC0 *	I/O	GPIO_Input	
18	PC3	I/O	LCD_VLCD	VLCD
19	VSSA	Power		
20	VREF-	Power		
22	VDDA	Power		
23	PA0	I/O	GPIO_EXTI0	JOY_CENTER [MT- 008A_CENTER]
24	PA1	I/O	GPIO_EXTI1	JOY_LEFT
25	PA2	I/O	GPIO_EXTI2	JOY_RIGHT
26	PA3 *	I/O	GPIO_Input	JOY_UP [MT-008A_UP]
27	VSS	Power		
28	VDD	Power		
29	PA4	I/O	GPIO_EXTI4	MFX_WAKEUP [MFX_V2_WAKEUP]
30	PA5 *	I/O	GPIO_Input	JOY_DOWN [MT- 008A_DOWN]
31	PA6	I/O	LCD_SEG3	SEG23 [GH08172T_SEG23]
32	PA7	I/O	LCD_SEG4	SEG0 [GH08172T_SEG0]
33	PC4	I/O	LCD_SEG22	SEG22 [GH08172T_SEG22]
34	PC5	I/O	LCD_SEG23	SEG1 [GH08172T_SEG1]
35	PB0	I/O	LCD_SEG5	SEG21 [GH08172T_SEG21]

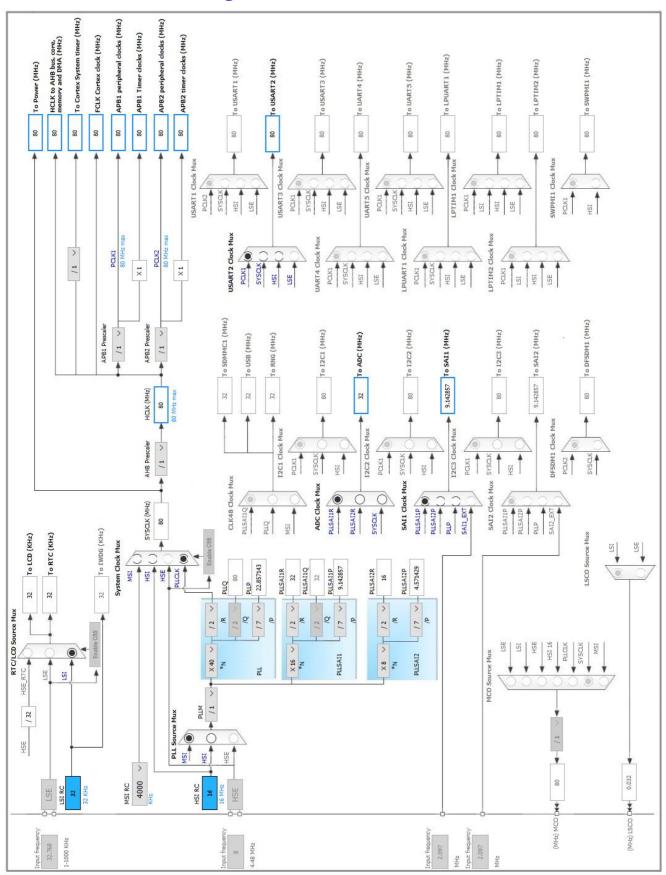
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
36	PB1	I/O	LCD_SEG6	SEG2 [GH08172T_SEG2]
37	PB2 *	I/O	GPIO_Output	LD_R [LED red]
38	PE7 **	I/O	SAI1_SD_B	AUDIO_DIN [MP34DT01_DOUT]
39	PE8 *	I/O	GPIO_Output	LD_G [LED_Green]
40	PE9 **	I/O	SAI1_FS_B	AUDIO_CLK [MP34DT01_CLK]
41	PE10	I/O	QUADSPI_CLK	QSPI_CLK [N25Q128A13EF840E_C]
42	PE11	I/O	QUADSPI_NCS	QSPI_CS [N25Q128A13EF840E_S#]
43	PE12	I/O	QUADSPI_BK1_IO0	QSPI_D0 [N25Q128A13EF840E_DQ0]
44	PE13	I/O	QUADSPI_BK1_IO1	QSPI_D1 [N25Q128A13EF840E_DQ1]
45	PE14	I/O	QUADSPI_BK1_IO2	QSPI_D2 [N25Q128A13EF840E_DQ2]
46	PE15	I/O	QUADSPI_BK1_IO3	QSPI_D3 [N25Q128A13EF840E_DQ3]
47	PB10 **	I/O	I2C2_SCL	MFX_I2C_SLC [MFX_V2_I2C_SCL]
48	PB11 **	I/O	I2C2_SDA	MFX_I2C_SDA [MFX_V2_I2C_SDA]
49	VSS	Power		
50	VDD	Power		
51	PB12	I/O	LCD_SEG12	SEG20 [GH08172T_SEG20]
52	PB13	I/O	LCD_SEG13	SEG3 [GH08172T_SEG3]
53	PB14	I/O	LCD_SEG14	SEG19 [GH08172T_SEG19]
54	PB15	I/O	LCD_SEG15	SEG4 [GH08172T_SEG4]
55	PD8	I/O	LCD_SEG28	SEG18 [GH08172T_SEG18]
56	PD9	I/O	LCD_SEG29	SEG5 [GH08172T_SEG5]
57	PD10	I/O	LCD_SEG30	SEG17 [GH08172T_SEG17]
58	PD11	I/O	LCD_SEG31	SEG6 [GH08172T_SEG6]
59	PD12	I/O	LCD_SEG32	SEG16 [GH08172T_SEG16]
60	PD13	I/O	LCD_SEG33	SEG7 [GH08172T_SEG7]
61	PD14	I/O	LCD_SEG34	SEG15 [GH08172T_SEG15]
62	PD15	I/O	LCD_SEG35	SEG8 [GH08172T_SEG8]
63	PC6	I/O	LCD_SEG24	SEG14 [GH08172T_SEG14]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
64	PC7	I/O	LCD_SEG25	SEG9 [GH08172T_SEG9]
65	PC8	I/O	LCD_SEG26	SEG13 [GH08172T_SEG13]
66	PC9 *	I/O	GPIO_Output	OTG_FS_PowerSwitchOn [STMPS2141STR_EN]
67	PA8	I/O	LCD_COM0	COM0 [GH08172T_COM0]
68	PA9	I/O	LCD_COM1	COM1 [GH08172T_COM1]
69	PA10 **	I/O	LCD_COM2	COM2 [GH08172T_COM2]
70	PA11 **	I/O	USB_OTG_FS_DM	OTG_FS_DM [EMIF02- USB03F2_D-out]
71	PA12 **	I/O	USB_OTG_FS_DP	OTG_FS_DP [EMIF02- USB03F2_D+out]
72	PA13 **	I/O	SYS_JTMS-SWDIO	SWDIO
73	VDDUSB	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14 **	I/O	SYS_JTCK-SWCLK	SWCLK
77	PA15	I/O	LCD_SEG17	SEG10 [GH08172T_SEG10]
78	PC10	I/O	GPIO_EXTI10	OTG_FS_OverCurrent [STMPS2141STR_FAULT]
79	PC11 *	I/O	GPIO_Output	OTG_FS_VBUS [EMIF02- USB03F2_Vbus]
86	PD5	I/O	USART2_TX	USART_TX
87	PD6	I/O	USART2_RX	USART_RX
89	PB3 *	I/O	GPIO_Output	M3V3_REG-ON
90	PB4	I/O	LCD_SEG8	SEG11 [GH08172T_SEG11]
91	PB5	I/O	LCD_SEG9	SEG12 [GH08172T_SEG12]
94	BOOT0	Boot		
96	PB9 **	I/O	LCD_COM3	COM3 [GH08172T_COM3]
97	PE0 *	I/O	GPIO_Output	XL_CS [LSM303CTR_CS_XL]
99	VSS	Power		
100	VDD	Power		

^{*} The pin is affected with an I/O function

^{**} The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



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5. IPs and Middleware Configuration

5.1. ADC1

mode: Temperature Sensor Channel

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode Independent mode

ADC_Settings:

Clock Prescaler Asynchronous clock mode divided by 8 *

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 Temperature Sensor

Sampling Time 640.5 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. LCD

Mode: 1/2 Duty Cycle mode: Multiplex Mode

mode: SEG3 mode: SEG4 mode: SEG5 mode: SEG6 mode: SEG8 mode: SEG9 mode: SEG12 mode: SEG13 mode: SEG14 mode: SEG15 mode: SEG17 mode: SEG22 mode: SEG23 mode: SEG24 mode: SEG25 mode: SEG26 mode: SEG28 mode: SEG29 mode: SEG30 mode: SEG31 mode: SEG32 mode: SEG33 mode: SEG34

5.2.1. Parameter Settings:

Clock Parameters:

mode: SEG35

Clock Prescaler 1
Clock Divider 16

Basic Parameters:

Duty Selection1/2Bias Selector1/4Multiplex modeEnable

Advanced Parameters:

Voltage Source Selection Internal
Contrast Control 2.60V

Dead Time Duration

High Drive

Disable

Pulse ON Duration

Disabled

Blink Mode

Disabled

Blink Frequency

fLCD/8

5.3. QUADSPI

Single Bank: Quad SPI Line

5.3.1. Parameter Settings:

General Parameters:

Clock Prescaler 255
Fifo Threshold 1

Sample Shifting No Sample Shifting

Flash Size 1
Chip Select High Time 1 Cycle
Clock Mode Low

5.4. RTC

mode: Activate Clock Source mode: Activate Calendar Alarm A: Internal Alarm A

5.4.1. Parameter Settings:

General:

Hour Format Hourformat 24

Asynchronous Predivider value 127 Synchronous Predivider value 255

Calendar Time:

Data Format BCD data format

 Hours
 0

 Minutes
 0

 Seconds
 0

Day Light Saving: value of hour adjustment Daylightsaving None Store Operation Storeoperation Reset

Calendar Date:

Week Day Monday
Month January
Date 1
Year 0

Alarm A:

Hours 0
Minutes 0
Seconds 0
Sub Seconds 0

Alarm Mask Date Week day

Alarm Mask Hours

Enable *

Alarm Mask Minutes

Enable *

Alarm Mask Seconds

Disable

Alarm Sub Second Mask

All Alarm SS fields are masked.

Alarm Date Week Day Sel Date
Alarm Date 1

5.5. SAI1

Mode: Master with Master Clock Out

5.5.1. 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

5.6. SYS

Timebase Source: SysTick

5.7. USART2

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
Single Sample Disable

Advanced Features:

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

^{*} User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull	Max	User Label
				down	Speed	
LCD	PC3	LCD_VLCD	Alternate Function Push Pull	No pull-up and no pull-down	Low	VLCD
	PA6	LCD_SEG3	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG23 [GH08172T_SEG23]
	PA7	LCD_SEG4	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG0 [GH08172T_SEG0]
	PC4	LCD_SEG22	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG22 [GH08172T_SEG22]
	PC5	LCD_SEG23	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG1 [GH08172T_SEG1]
	PB0	LCD_SEG5	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG21 [GH08172T_SEG21]
	PB1	LCD_SEG6	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG2 [GH08172T_SEG2]
	PB12	LCD_SEG12	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG20 [GH08172T_SEG20]
	PB13	LCD_SEG13	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG3 [GH08172T_SEG3]
	PB14	LCD_SEG14	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG19 [GH08172T_SEG19]
	PB15	LCD_SEG15	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG4 [GH08172T_SEG4]
	PD8	LCD_SEG28	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG18 [GH08172T_SEG18]
	PD9	LCD_SEG29	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG5 [GH08172T_SEG5]
	PD10	LCD_SEG30	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG17 [GH08172T_SEG17]
	PD11	LCD_SEG31	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG6 [GH08172T_SEG6]
	PD12	LCD_SEG32	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG16 [GH08172T_SEG16]
	PD13	LCD_SEG33	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG7 [GH08172T_SEG7]
	PD14	LCD_SEG34	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG15 [GH08172T_SEG15]
	PD15	LCD_SEG35	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG8 [GH08172T_SEG8]
	PC6	LCD_SEG24	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG14 [GH08172T_SEG14]
	PC7	LCD_SEG25	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG9 [GH08172T_SEG9]
	PC8	LCD_SEG26	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG13 [GH08172T_SEG13]
	PA8	LCD_COM0	Alternate Function Push Pull	No pull-up and no pull-down	Low	COM0 [GH08172T_COM0]
	PA9	LCD_COM1	Alternate Function Push Pull	No pull-up and no pull-down	Low	COM1 [GH08172T_COM1]
	PA15	LCD_SEG17	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG10

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
						[GH08172T_SEG10]
	PB4	LCD_SEG8	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG11 [GH08172T_SEG11]
	PB5	LCD_SEG9	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG12 [GH08172T_SEG12]
QUADSPI	PE10	QUADSPI_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	QSPI_CLK [N25Q128A13EF840E_C]
	PE11	QUADSPI_NCS	Alternate Function Push Pull	No pull-up and no pull-down	Very High	QSPI_CS [N25Q128A13EF840E_S#]
	PE12	QUADSPI_BK1_I O0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	QSPI_D0 [N25Q128A13EF840E_DQ 0]
	PE13	QUADSPI_BK1_I O1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE14	QUADSPI_BK1_I O2	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	QSPI_D2 [N25Q128A13EF840E_DQ 2]
	PE15	QUADSPI_BK1_I O3	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	QSPI_D3 [N25Q128A13EF840E_DQ 3]
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	
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	Very High	USART_TX
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	Very High	USART_RX
Single Mapped	PC14/OSC3 2_IN	RCC_OSC32_IN	n/a	n/a	n/a	
Signals	PC15/OSC3 2_OUT	RCC_OSC32_O UT	n/a	n/a	n/a	
	PH0/OSC_I N	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_O UT	RCC_OSC_OUT	n/a	n/a	n/a	
	PE7	SAI1_SD_B	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	AUDIO_DIN [MP34DT01_DOUT]
	PE9	SAI1_FS_B	Alternate Function Push Pull	No pull-up and no pull-down	Low	AUDIO_CLK [MP34DT01_CLK]
	PB10	I2C2_SCL	Alternate Function Open Drain	Pull-up	Very High	MFX_I2C_SLC [MFX_V2_I2C_SCL]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull	Max	User Label
				down	Speed	
	PB11	I2C2_SDA	Alternate Function Open Drain	Pull-up	Very High	MFX_I2C_SDA [MFX_V2_I2C_SDA]
	PA10	LCD_COM2	Alternate Function Push Pull	No pull-up and no pull-down	Low	COM2 [GH08172T_COM2]
	PA11	USB_OTG_FS_ DM	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	OTG_FS_DM [EMIF02- USB03F2_D-out]
	PA12	USB_OTG_FS_ DP	Alternate Function Push Pull	No pull-up and no pull-down	Very High	OTG_FS_DP [EMIF02- USB03F2_D+out]
	PA13	SYS_JTMS- SWDIO	n/a	n/a	n/a	SWDIO
	PA14	SYS_JTCK- SWCLK	n/a	n/a	n/a	SWCLK
	PB9	LCD_COM3	Alternate Function Push Pull	No pull-up and no pull-down	Low	COM3 [GH08172T_COM3]
GPIO	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	High *	AUDIO_RST [CS43L22_RESET]
	PC13	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	
	PC0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	JOY_CENTER [MT- 008A_CENTER]
	PA1	GPIO_EXTI1	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	JOY_LEFT
	PA2	GPIO_EXTI2	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	JOY_RIGHT
	PA3	GPIO_Input	Input mode	Pull-down *	n/a	JOY_UP [MT-008A_UP]
	PA4	GPIO_EXTI4	External Event Mode with Rising edge trigger detection *	No pull-up and no pull-down	n/a	MFX_WAKEUP [MFX_V2_WAKEUP]
	PA5	GPIO_Input	Input mode	Pull-down *	n/a	JOY_DOWN [MT- 008A_DOWN]
	PB2	GPIO_Output	Output Push Pull	Pull-up *	Very High	
	PE8	GPIO_Output	Output Push Pull	Pull-up *	Very High	LD_G [LED_Green]
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OTG_FS_PowerSwitchOn [STMPS2141STR_EN]
	PC10	GPIO_EXTI10	External Event Mode	No pull-up and no pull-down	n/a	OTG_FS_OverCurrent [STMPS2141STR_FAULT]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull	Max	User Label
				down	Speed	
			with Rising edge trigger detection *			
	PC11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OTG_FS_VBUS [EMIF02- USB03F2_Vbus]
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	M3V3_REG-ON
	PE0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	XL_CS [LSM303CTR_CS_XL]

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	
ADC1 and ADC2 interrupts	true	0	0	
USART2 global interrupt	true	0	0	
RTC alarm interrupt through EXTI line 18	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 line0 interrupt		unused		
EXTI line1 interrupt		unused		
EXTI line2 interrupt		unused		
EXTI line[15:10] interrupts	unused			
QUADSPI global interrupt	unused			
SAI1 global interrupt	unused			
LCD global interrupt		unused		
FPU global interrupt		unused		

^{*} User modified value

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 Project

8.1. Project Settings

Name	Value
Project Name	projv2
Project Folder	C:\Users\Ada\Documents\STM\projv2
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L4 V1.7.0

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	No
Set all free pins as analog (to optimize the power	No
consumption)	