1. Description

1.1. Project

Project Name	hello_world
Board Name	STM32L476G-DISCO
Generated with:	STM32CubeMX 4.19.0
Date	01/24/2017

1.2. MCU

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

2. Pinout Configuration
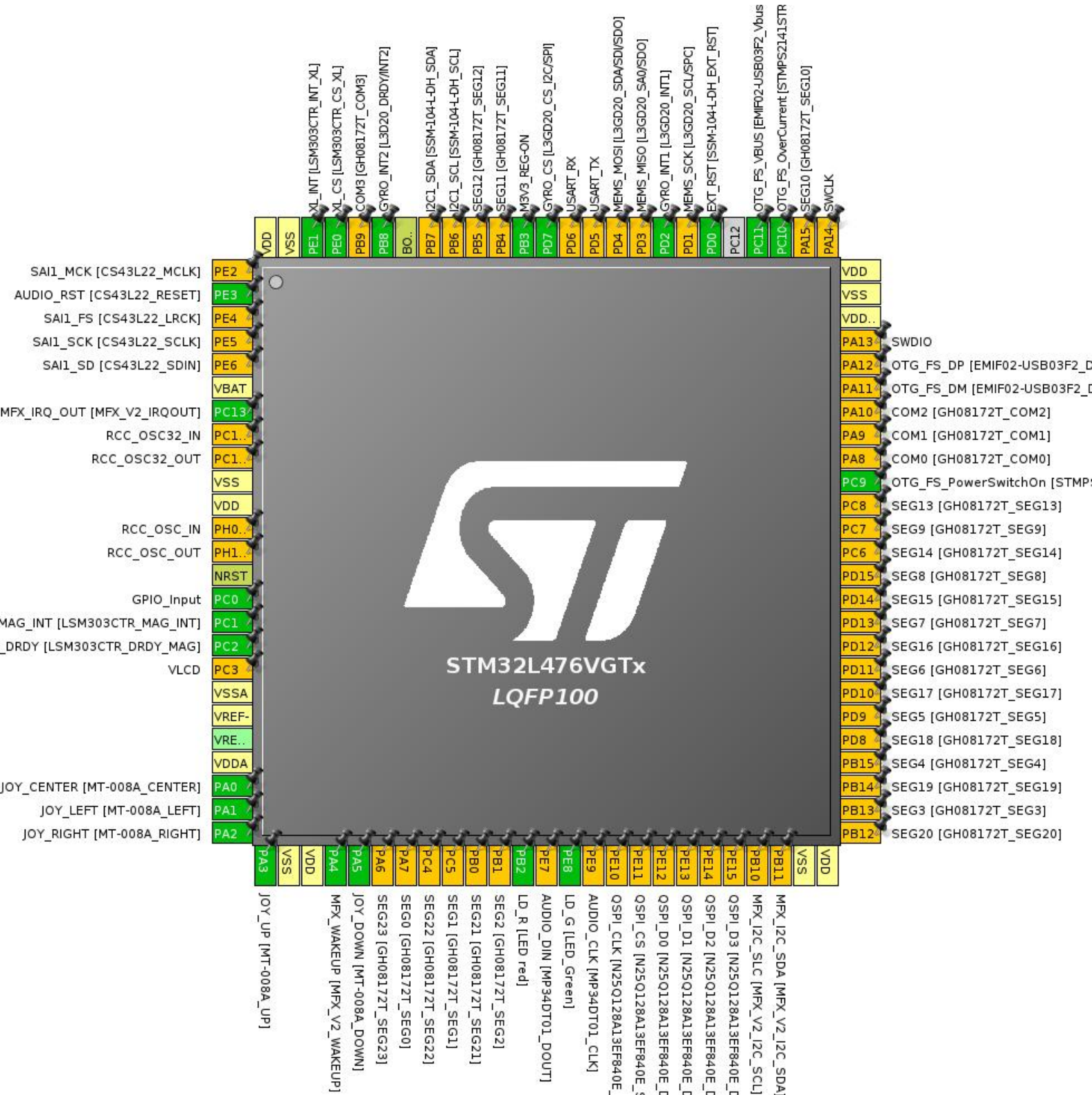
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	SAI1_MCLK_A	SAI1_MCK [CS43L22_MCLK]
2	PE3 **	I/O	GPIO_Output	AUDIO_RST [CS43L22_RESET]
3	PE4 *	I/O	SAI1_FS_A	SAI1_FS [CS43L22_LRCK]
4	PE5 *	I/O	SAI1_SCK_A	SAI1_SCK [CS43L22_SCLK]
5	PE6 *	I/O	SAI1_SD_A	SAI1_SD [CS43L22_SDIN]
6	VBAT	Power		
7	PC13	I/O	GPIO_EXTI13	MFX_IRQ_OUT [MFX_V2_IRQOUT]
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	
16	PC1 **	I/O	GPIO_Input	MAG_INT [LSM303CTR_MAG_INT]
17	PC2 **	I/O	GPIO_Input	MAG_DRDY [LSM303CTR_DRDY_MAG]
18	PC3 *	I/O	LCD_VLCD	VLCD
19	VSSA	Power		
20	VREF-	Power		
22	VDDA	Power		
23	PA0 **	I/O	GPIO_Input	JOY_CENTER [MT-008A_CENTER]
24	PA1 **	I/O	GPIO_Input	JOY_LEFT [MT-008A_LEFT]
25	PA2 **	I/O	GPIO_Input	JOY_RIGHT [MT-008A_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]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
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]
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]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
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]
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]
81	PD0	I/O	GPIO_EXTI0	EXT_RST [SSM-104-L-DH_EXT_RST]
82	PD1 *	I/O	SPI2_SCK	MEMS_SCK [L3GD20_SCL/SPC]
83	PD2	I/O	GPIO_EXTI2	GYRO_INT1 [L3GD20_INT1]
84	PD3 *	I/O	SPI2_MISO	MEMS_MISO [L3GD20_SA0/SDO]
85	PD4 *	I/O	SPI2_MOSI	MEMS_MOSI [L3GD20_SDA/SDI/SDO]
86	PD5 *	I/O	USART2_TX	USART_TX
87	PD6 *	I/O	USART2_RX	USART_RX

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
88	PD7 **	I/O	GPIO_Output	GYRO_CS [L3GD20_CS_I2C/SPI]
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]
92	PB6 *	I/O	I2C1_SCL	I2C1_SCL [SSM-104-L-DH_SCL]
93	PB7 *	I/O	I2C1_SDA	I2C1_SDA [SSM-104-L-DH_SDA]
94	BOOT0	Boot		
95	PB8	I/O	GPIO_EXTI8	GYRO_INT2 [L3D20_DRDY/INT2]
96	PB9 *	I/O	LCD_COM3	COM3 [GH08172T_COM3]
97	PE0 **	I/O	GPIO_Output	XL_CS [LSM303CTR_CS_XL]
98	PE1	I/O	GPIO_EXTI1	XL_INT [LSM303CTR_INT_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
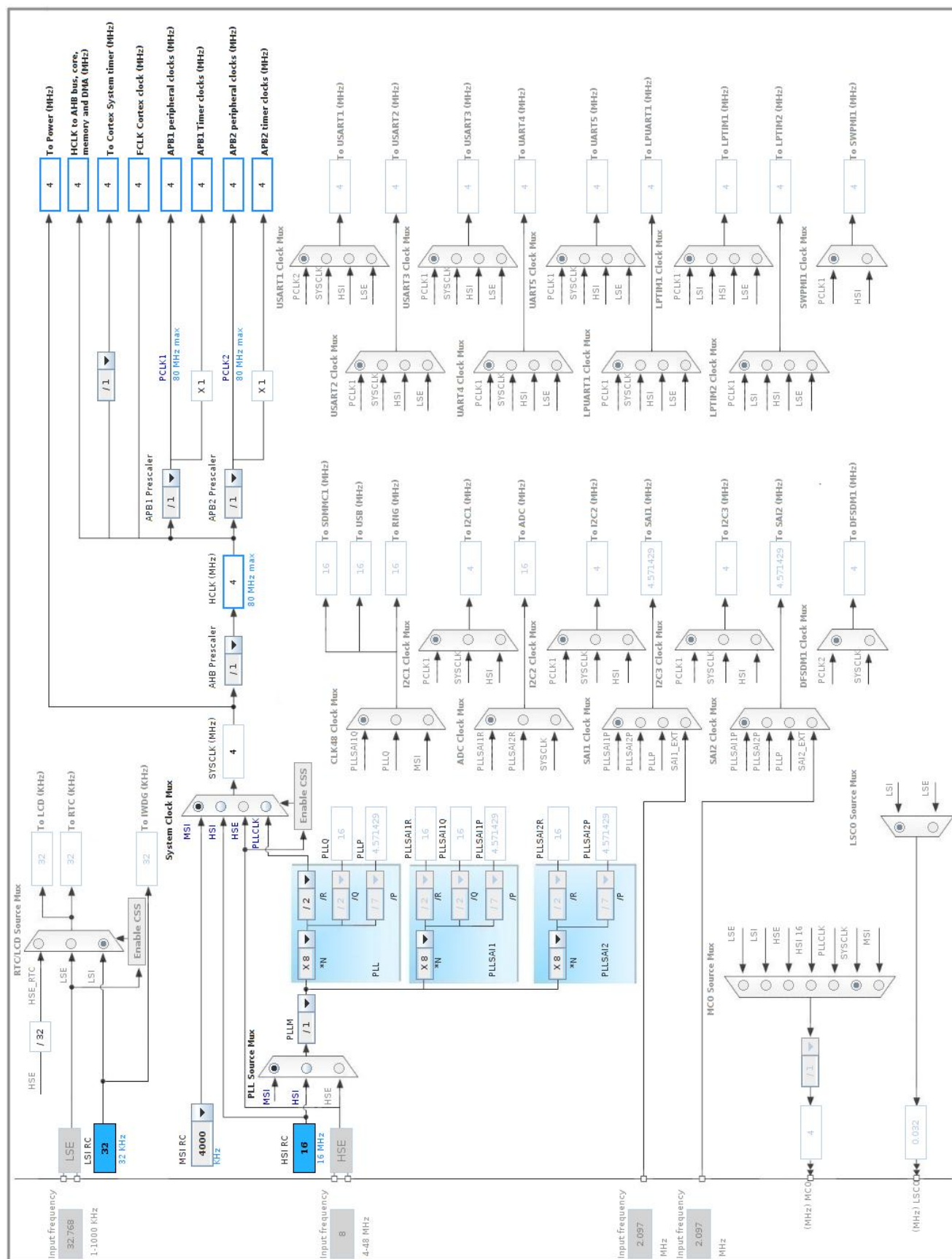
5. IPs and Middleware Configuration

5.1. SYS

Timebase Source: SysTick

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
Single Mapped Signals	PE2	SAI1_MCLK_A	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SAI1_MCK [CS43L22_MCLK]
	PE4	SAI1_FS_A	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SAI1_FS [CS43L22_LRCK]
	PE5	SAI1_SCK_A	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SAI1_SCK [CS43L22_SCLK]
	PE6	SAI1_SD_A	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	SAI1_SD [CS43L22_SDIN]
	PC14/OSC32_IN	RCC_OSC32_IN	n/a	n/a	**n/a**	
	PC15/OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	**n/a**	
	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	**n/a**	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	**n/a**	
	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]
	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]
	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#]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE12	QUADSPI_BK1_IO0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	QSPI_D0 [N25Q128A13EF840E_DQ 0]
	PE13	QUADSPI_BK1_IO1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	QSPI_D1 [N25Q128A13EF840E_DQ 1]
	PE14	QUADSPI_BK1_IO2	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	QSPI_D2 [N25Q128A13EF840E_DQ 2]
	PE15	QUADSPI_BK1_IO3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	QSPI_D3 [N25Q128A13EF840E_DQ 3]
	PB10	I2C2_SCL	Alternate Function Open Drain	Pull-up	**Very High** *	MFX_I2C_SLC [MFX_V2_I2C_SCL]
	PB11	I2C2_SDA	Alternate Function Open Drain	Pull-up	**Very High** *	MFX_I2C_SDA [MFX_V2_I2C_SDA]
	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]
	PA10	LCD_COM2	Alternate Function Push Pull	No pull-up and no pull-down	Low	COM2 [GH08172T_COM2]
	PA11	USB_OTG_FS_	Alternate Function Push Pull	No pull-up and no pull-down	**Very High**	OTG_FS_DM [EMIF02-

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
		DM			*	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
	PA15	LCD_SEG17	Alternate Function Push Pull	No pull-up and no pull-down	Low	SEG10 [GH08172T_SEG10]
	PD1	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	MEMS_SCK [L3GD20_SCL/SPC]
	PD3	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	MEMS_MISO [L3GD20_SA0/SDO]
	PD4	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	MEMS_MOSI [L3GD20_SDA/SDI/SDO]
	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
	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]
	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**Very High** *	I2C1_SCL [SSM-104-L-DH_SCL]
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very High** *	I2C1_SDA [SSM-104-L-DH_SDA]
	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 Event Mode with Rising edge trigger detection ***	No pull-up and no pull-down	**n/a**	MFX_IRQ_OUT [MFX_V2_IRQOUT]
	PC0	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	
	PC1	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	MAG_INT [LSM303CTR_MAG_INT]
	PC2	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	MAG_DRDY [LSM303CTR_DRDY_MAG]
	PA0	GPIO_Input	Input mode	**Pull-down ***	**n/a**	JOY_CENTER [MT-

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
						008A_CENTER]
	PA1	GPIO_Input	Input mode	**Pull-down ***	**n/a**	JOY_LEFT [MT-008A_LEFT]
	PA2	GPIO_Input	Input mode	**Pull-down ***	**n/a**	JOY_RIGHT [MT-008A_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 ***	LD_R [LED red]
	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 with Rising edge trigger detection ***	No pull-up and no pull-down	n/a	OTG_FS_OverCurrent [STMPS2141STR_FAULT]
	PC11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OTG_FS_VBUS [EMIF02-USB03F2_Vbus]
	PD0	GPIO_EXTI0	**External Event Mode with Rising edge trigger detection ***	No pull-up and no pull-down	n/a	EXT_RST [SSM-104-L-DH_EXT_RST]
	PD2	GPIO_EXTI2	**External Event Mode with Rising edge trigger detection ***	No pull-up and no pull-down	n/a	GYRO_INT1 [L3GD20_INT1]
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	GYRO_CS [L3GD20_CS_I2C/SPI]
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	M3V3_REG-ON
	PB8	GPIO_EXTI8	**External Event Mode with Rising edge trigger detection ***	No pull-up and no pull-down	n/a	GYRO_INT2 [L3D20_DRDY/INT2]
	PE0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	XL_CS [LSM303CTR_CS_XL]
	PE1	GPIO_EXTI1	**External Event Mode with Rising edge trigger detection ***	No pull-up and no pull-down	n/a	XL_INT [LSM303CTR_INT_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
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC 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	hello_world
Project Folder	/home/peter/repos/stm32/L476G-DISCO/hello_world
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L4 V1.6.0

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