1. Description

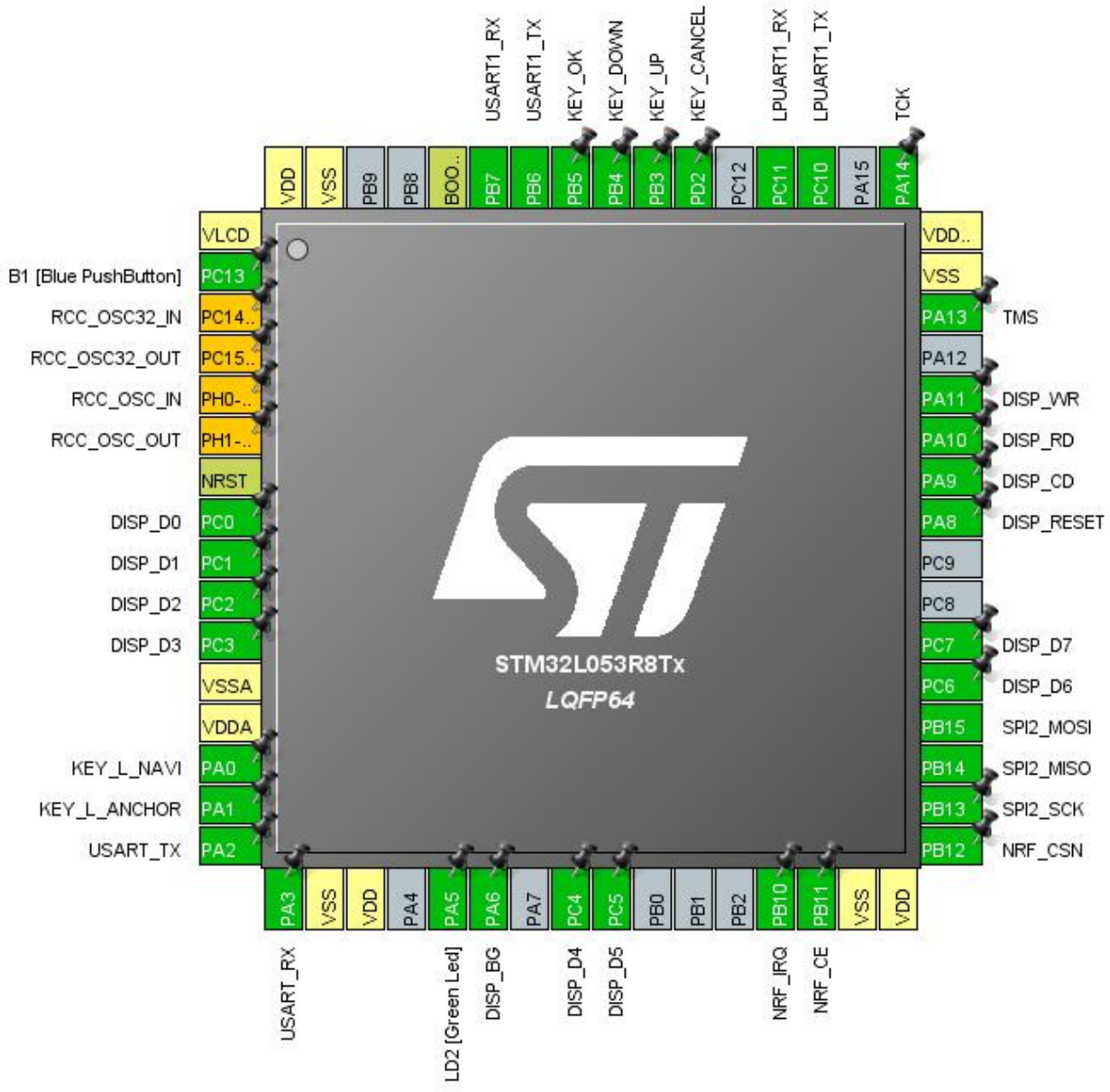
1.1. Project

Project Name	mech_deck_module
Board Name	NUCLEO-L053R8
Generated with:	STM32CubeMX 5.1.0
Date	04/21/2019

1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x3
MCU name	STM32L053R8Tx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

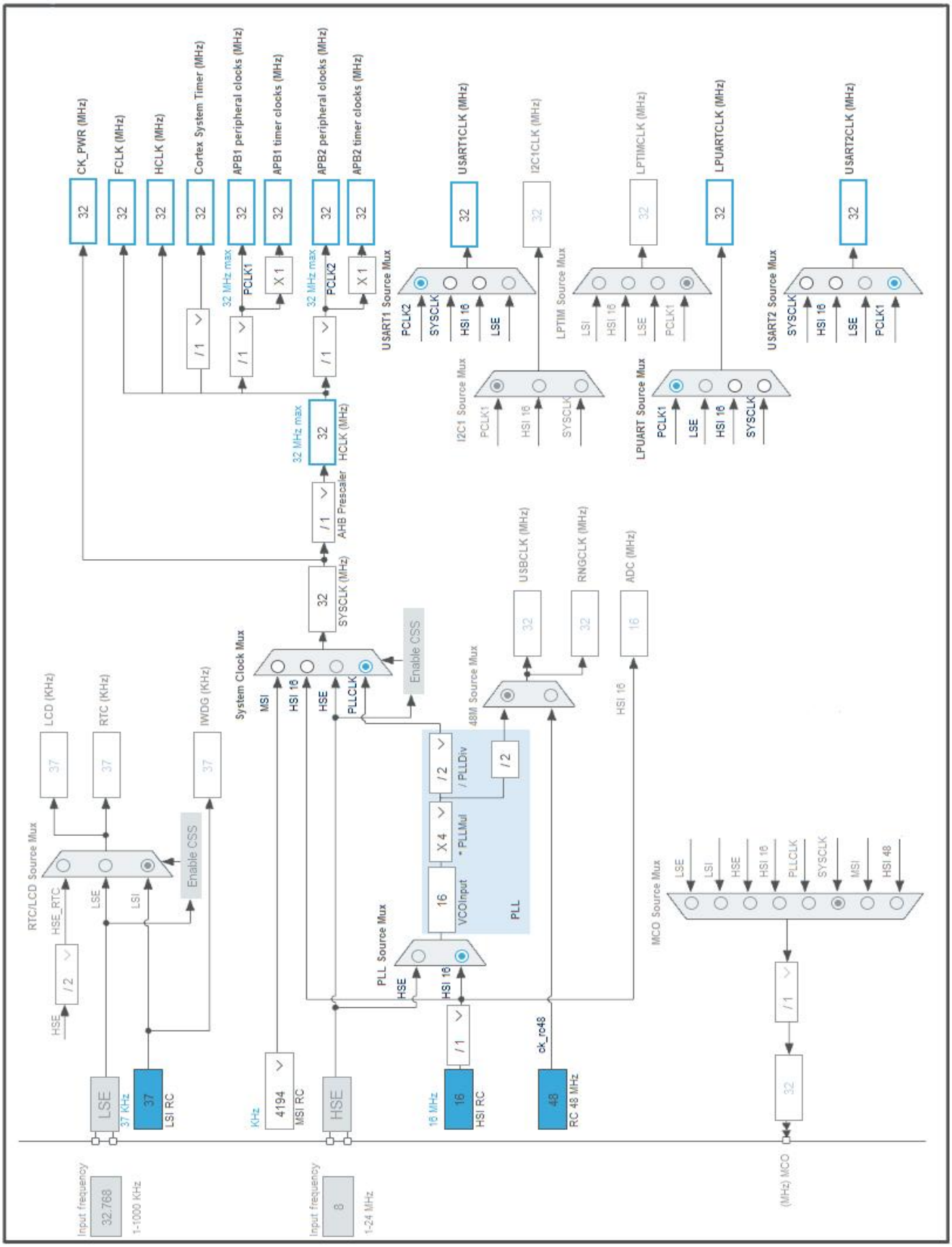
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VLCD	Power		
2	PC13	I/O	GPIO_EXTI13	B1 [Blue PushButton]
3	PC14-OSC32_IN *	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT *	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN *	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT *	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 **	I/O	GPIO_Output	DISP_D0
9	PC1 **	I/O	GPIO_Output	DISP_D1
10	PC2 **	I/O	GPIO_Output	DISP_D2
11	PC3 **	I/O	GPIO_Output	DISP_D3
12	VSSA	Power		
13	VDDA	Power		
14	PA0 **	I/O	GPIO_Input	KEY_L_NAVI
15	PA1 **	I/O	GPIO_Input	KEY_L_ANCHOR
16	PA2	I/O	USART2_TX	USART_TX
17	PA3	I/O	USART2_RX	USART_RX
18	VSS	Power		
19	VDD	Power		
21	PA5 **	I/O	GPIO_Output	LD2 [Green Led]
22	PA6	I/O	TIM22_CH1	DISP_BG
24	PC4 **	I/O	GPIO_Output	DISP_D4
25	PC5 **	I/O	GPIO_Output	DISP_D5
29	PB10	I/O	GPIO_EXTI10	NRF_IRQ
30	PB11 **	I/O	GPIO_Output	NRF_CE
31	VSS	Power		
32	VDD	Power		
33	PB12 **	I/O	GPIO_Output	NRF_CSN
34	PB13	I/O	SPI2_SCK	
35	PB14	I/O	SPI2_MISO	
36	PB15	I/O	SPI2_MOSI	
37	PC6 **	I/O	GPIO_Output	DISP_D6
38	PC7 **	I/O	GPIO_Output	DISP_D7
41	PA8 **	I/O	GPIO_Output	DISP_RESET
42	PA9 **	I/O	GPIO_Output	DISP_CD
43	PA10 **	I/O	GPIO_Output	DISP_RD

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
44	PA11 **	I/O	GPIO_Output	DISP_WR
46	PA13	I/O	SYS_SWDIO	TMS
47	VSS	Power		
48	VDD_USB	Power		
49	PA14	I/O	SYS_SWCLK	TCK
51	PC10	I/O	LPUART1_TX	
52	PC11	I/O	LPUART1_RX	
54	PD2 **	I/O	GPIO_Input	KEY_CANCEL
55	PB3 **	I/O	GPIO_Input	KEY_UP
56	PB4 **	I/O	GPIO_Input	KEY_DOWN
57	PB5 **	I/O	GPIO_Input	KEY_OK
58	PB6	I/O	USART1_TX	
59	PB7	I/O	USART1_RX	
60	BOOT0	Boot		
63	VSS	Power		
64	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. Software Project

5.1. Project Settings

Name	Value
Project Name	mech_deck_module
Project Folder	D:\projects\windsensor\mech_deck_module
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L0 V1.11.2

5.2. 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)	Yes

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x3
MCU	STM32L053R8Tx
Datasheet	025844_Rev7

6.2. Parameter Selection

Temperature	25
Vdd	null

7. IPs and Middleware Configuration

7.1. LPUART1

Mode: Asynchronous

7.1.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate Mode	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

7.2. RCC

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Buffer Cache	Enabled
Prefetch	Disabled
Preread	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

7.3. SPI2

Mode: Full-Duplex Master

7.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**8 ***
Baud Rate	**4.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.4. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

7.5. TIM22

Clock Source : Internal Clock

Channel1: PWM Generation CH1

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**320 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**99 ***
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	**99 ***
Fast Mode	Disable
CH Polarity	High

7.6. USART1

Mode: Asynchronous

7.6.1. 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

7.7. USART2

Mode: Asynchronous

7.7.1. 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
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
LPUART1	PC10	LPUART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PC11	LPUART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	TMS
	PA14	SYS_SWCLK	n/a	n/a	n/a	TCK
TIM22	PA6	TIM22_CH1	**Alternate Function Open Drain ***	No pull-up and no pull-down	**Medium ***	DISP_BG
USART1	PB6	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB7	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USART_TX
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	USART_RX
Single Mapped Signals	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	
GPIO	PC13	GPIO_EXTI13	**External Interrupt Mode with Falling edge trigger detection**	No pull-up and no pull-down	n/a	B1 [Blue PushButton]
	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down		DISP_D0

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
					Very High *	
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D1
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D2
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D3
	PA0	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_L_NAVI
	PA1	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_L_ANCHOR
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2 [Green Led]
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D4
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D5
	PB10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	**n/a**	NRF_IRQ
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	NRF_CE
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	NRF_CSN
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D6
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_D7
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_RESET
	PA9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_CD
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_RD
	PA11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	DISP_WR
	PD2	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_CANCEL
	PB3	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_UP
	PB4	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_DOWN
	PB5	GPIO_Input	Input mode	**Pull-up ***	**n/a**	KEY_OK

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash and EEPROM global interrupt	unused		
RCC and CRS global interrupt	unused		
EXTI line 4 to 15 interrupts	unused		
TIM22 global interrupt	unused		
SPI2 global interrupt	unused		
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	unused		

*** User modified value**

9. Software Pack Report