

1. Description

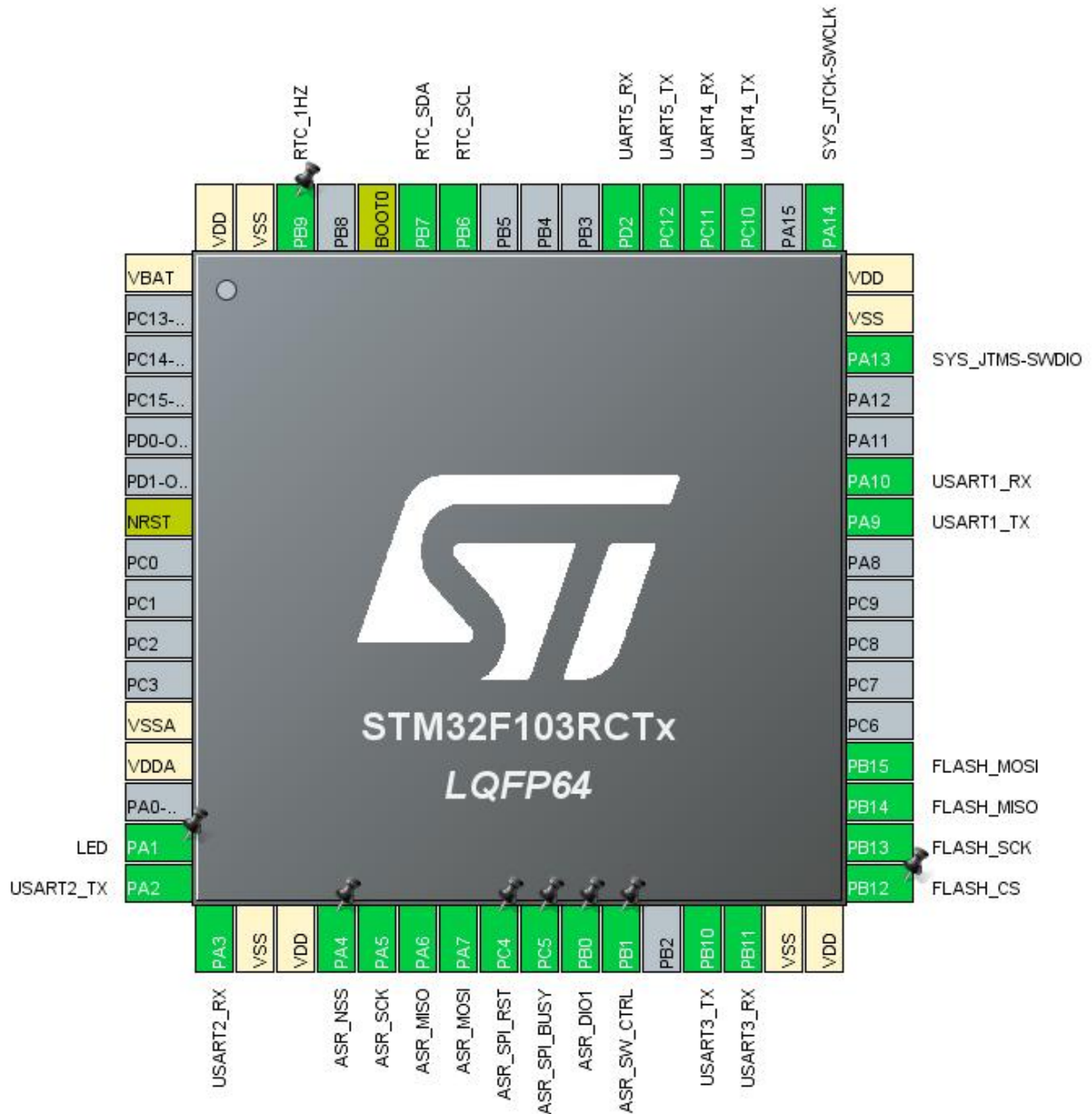
1.1. Project

Project Name	ASR6500
Board Name	custom
Generated with:	STM32CubeMX 5.6.0
Date	06/08/2020

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



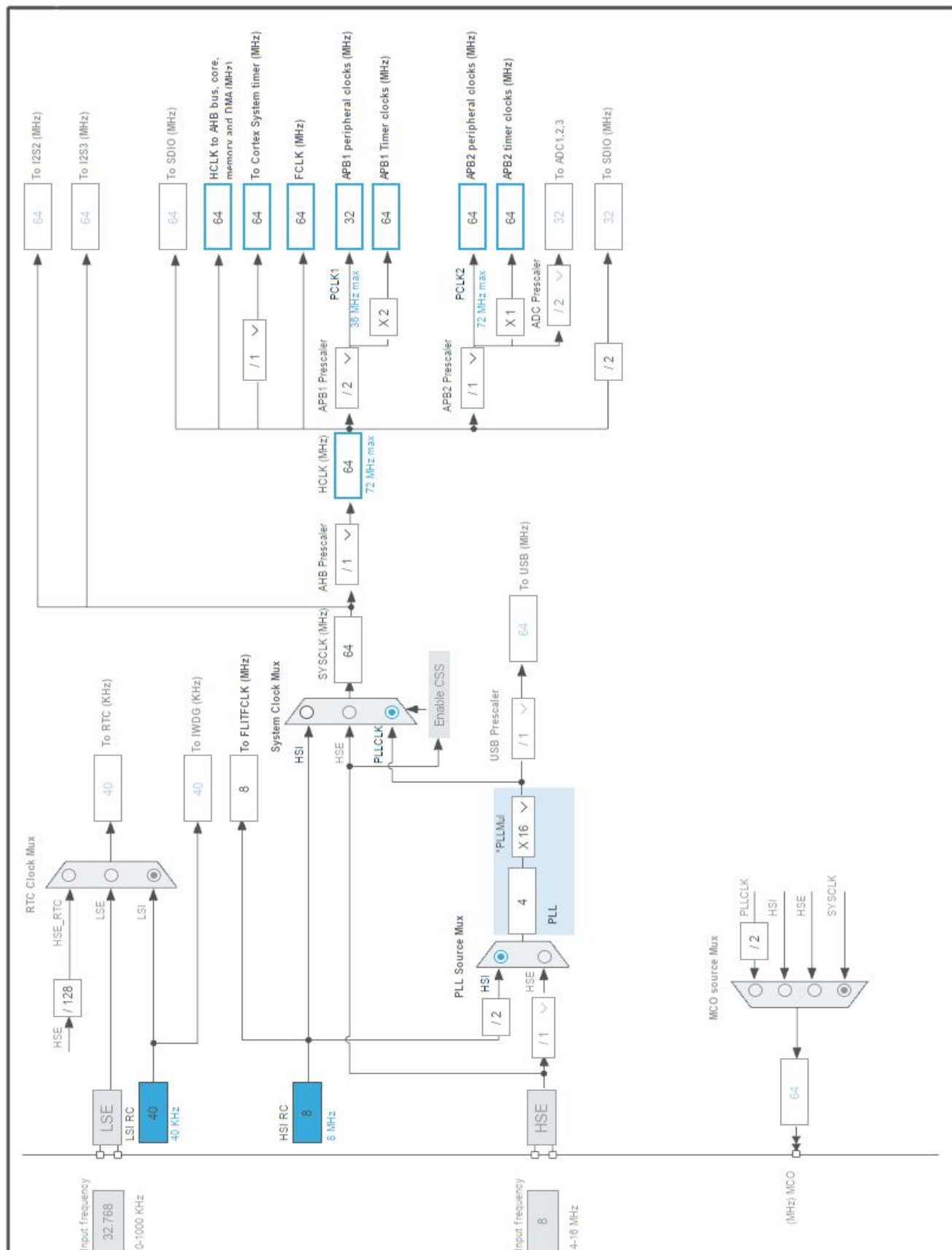
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
15	PA1 *	I/O	GPIO_Output	LED
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
20	PA4 *	I/O	GPIO_Output	ASR_NSS
21	PA5	I/O	SPI1_SCK	ASR_SCK
22	PA6	I/O	SPI1_MISO	ASR_MISO
23	PA7	I/O	SPI1_MOSI	ASR_MOSI
24	PC4 *	I/O	GPIO_Output	ASR_SPI_RST
25	PC5 *	I/O	GPIO_Input	ASR_SPI_BUSY
26	PB0	I/O	GPIO_EXTI0	ASR_DIO1
27	PB1 *	I/O	GPIO_Output	ASR_SW_CTRL
29	PB10	I/O	USART3_TX	
30	PB11	I/O	USART3_RX	
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	FLASH_CS
34	PB13	I/O	SPI2_SCK	FLASH_SCK
35	PB14	I/O	SPI2_MISO	FLASH_MISO
36	PB15	I/O	SPI2_MOSI	FLASH_MOSI
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
51	PC10	I/O	UART4_TX	
52	PC11	I/O	UART4_RX	
53	PC12	I/O	UART5_TX	
54	PD2	I/O	UART5_RX	
58	PB6	I/O	I2C1_SCL	RTC_SCL

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
59	PB7	I/O	I2C1_SDA	RTC_SDA
60	BOOT0	Boot		
62	PB9	I/O	GPIO_EXTI9	RTC_1HZ
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	ASR6500
Project Folder	C:\keilp\ASR6500
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.0

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	No
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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RCTx
Datasheet	14611_Rev12

6.2. Parameter Selection

Temperature	25
Vdd	3.3

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

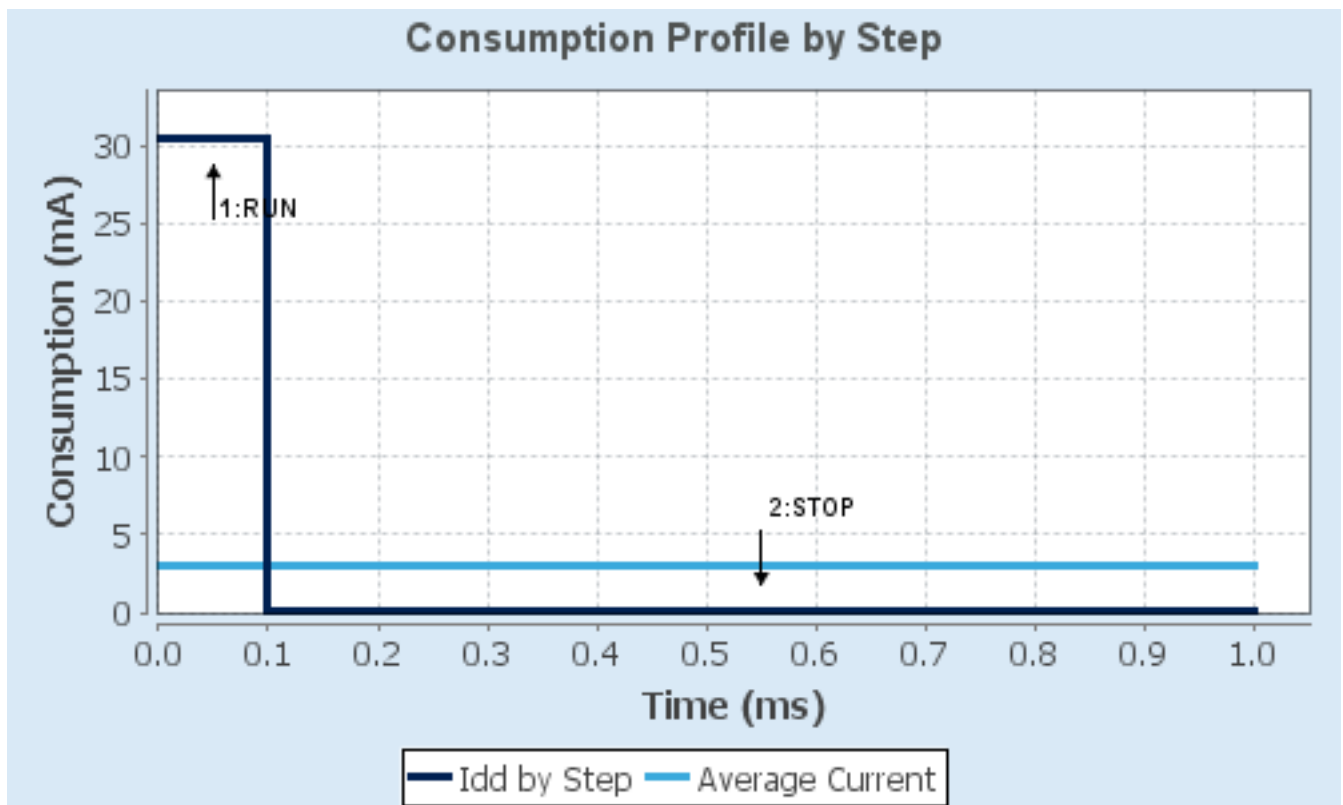
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	72 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	30.5 mA	25 μ A
Duration	0.1 ms	0.9 ms
DMIPS	90.0	0.0
Ta Max	100.47	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	3.07 mA
Battery Life	1 month, 15 days, 15 hours	Average DMIPS	61.0 DMIPS

6.6. Chart



7. IPs and Middleware Configuration

7.1. GPIO

7.2. I2C1

I2C: I2C

7.2.1. 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

7.3. SPI1

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	8.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.4. SPI2

Mode: Full-Duplex Master

7.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	16.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

7.5. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.6. TIM5

mode: Clock Source

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	63 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535 *
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)

7.7. UART4

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

7.8. UART5

Mode: Asynchronous

7.8.1. 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

7.9. USART1

Mode: Asynchronous

7.9.1. 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

7.10. USART2

Mode: Asynchronous

7.10.1. 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

7.11. USART3

Mode: Asynchronous

7.11.1. 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

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	n/a	High *	RTC_SCL
	PB7	I2C1_SDA	Alternate Function Open Drain	n/a	High *	RTC_SDA
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	n/a	High *	ASR_SCK
	PA6	SPI1_MISO	Input mode	No pull-up and no pull-down	n/a	ASR_MISO
	PA7	SPI1_MOSI	Alternate Function Push Pull	n/a	High *	ASR_MOSI
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	n/a	High *	FLASH_SCK
	PB14	SPI2_MISO	Input mode	No pull-up and no pull-down	n/a	FLASH_MISO
	PB15	SPI2_MOSI	Alternate Function Push Pull	n/a	High *	FLASH_MOSI
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
UART4	PC10	UART4_TX	Alternate Function Push Pull	n/a	High *	
	PC11	UART4_RX	Input mode	No pull-up and no pull-down	n/a	
UART5	PC12	UART5_TX	Alternate Function Push Pull	n/a	High *	
	PD2	UART5_RX	Input mode	No pull-up and no pull-down	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	High *	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	n/a	
USART3	PB10	USART3_TX	Alternate Function Push Pull	n/a	High *	
	PB11	USART3_RX	Input mode	No pull-up and no pull-down	n/a	
GPIO	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ASR_NSS
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ASR_SPI_RST
	PC5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ASR_SPI_BUSY
	PB0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	ASR_DIO1
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	ASR_SW_CTRL
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FLASH_CS
	PB9	GPIO_EXTI9	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	RTC_1HZ

8.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART3_RX	DMA1_Channel3	Peripheral To Memory	Low
UART4_RX	DMA2_Channel3	Peripheral To Memory	Low

USART2_RX: DMA1_Channel6 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART1_RX: DMA1_Channel5 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

USART3_RX: DMA1_Channel3 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

UART4_RX: DMA2_Channel3 DMA request Settings:

Mode: Normal
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: Byte
 Memory Data Width: Byte

8.3. 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
EXTI line0 interrupt	true	0	0
DMA1 channel3 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
DMA1 channel6 global interrupt	true	0	0
EXTI line[9:5] interrupts	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
USART3 global interrupt	true	0	0
UART4 global interrupt	true	0	0
UART5 global interrupt	true	0	0
DMA2 channel3 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
SPI2 global interrupt	unused		
TIM5 global interrupt	unused		

* User modified value

9. Predefined Views - Category view : Current

Middleware

System Core

DMA ✓

GPIO ✓

NVIC ✓

RCC ✓

SYS ✓

Analog

Timers

TIM5 ✓

Connectivity

I2C1 ✓

SPI1 ✓

SPI2 ✓

UART4 ✓

UART5 ✓

USART1 ✓

USART2 ✓

USART3 ✓

Multimedia

Computing

10. Software Pack Report