
STM32
CubeMX

1. Description

1.1. Project

Project Name	ModuCard_nav_module
Board Name	custom
Generated with:	STM32CubeMX 6.14.0
Date	03/26/2025

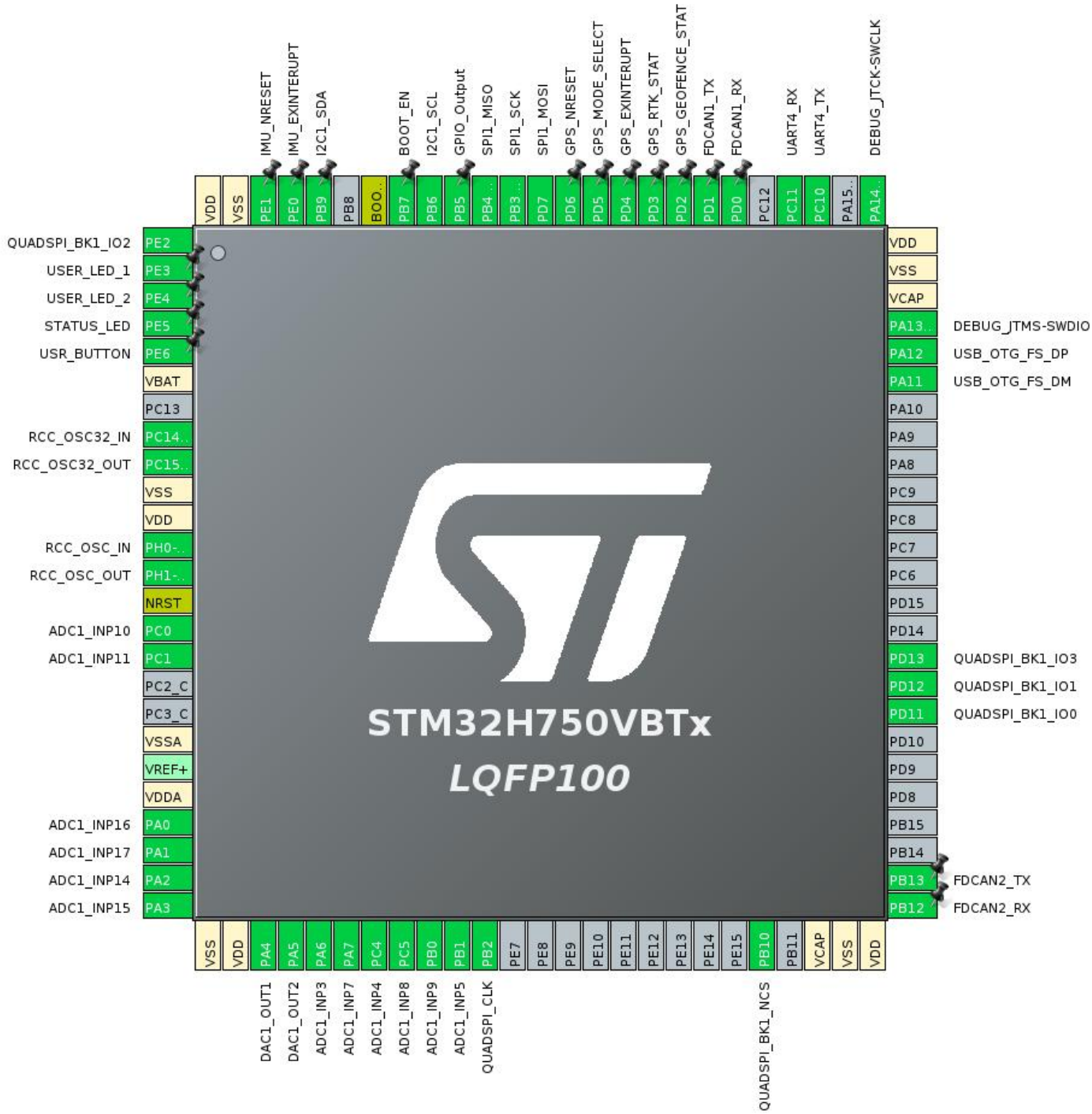
1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H750 Value line
MCU name	STM32H750VBTx
MCU Package	LQFP100
MCU Pin number	100

1.3. Core(s) information

Core(s)	ARM Cortex-M7

2. Pinout Configuration



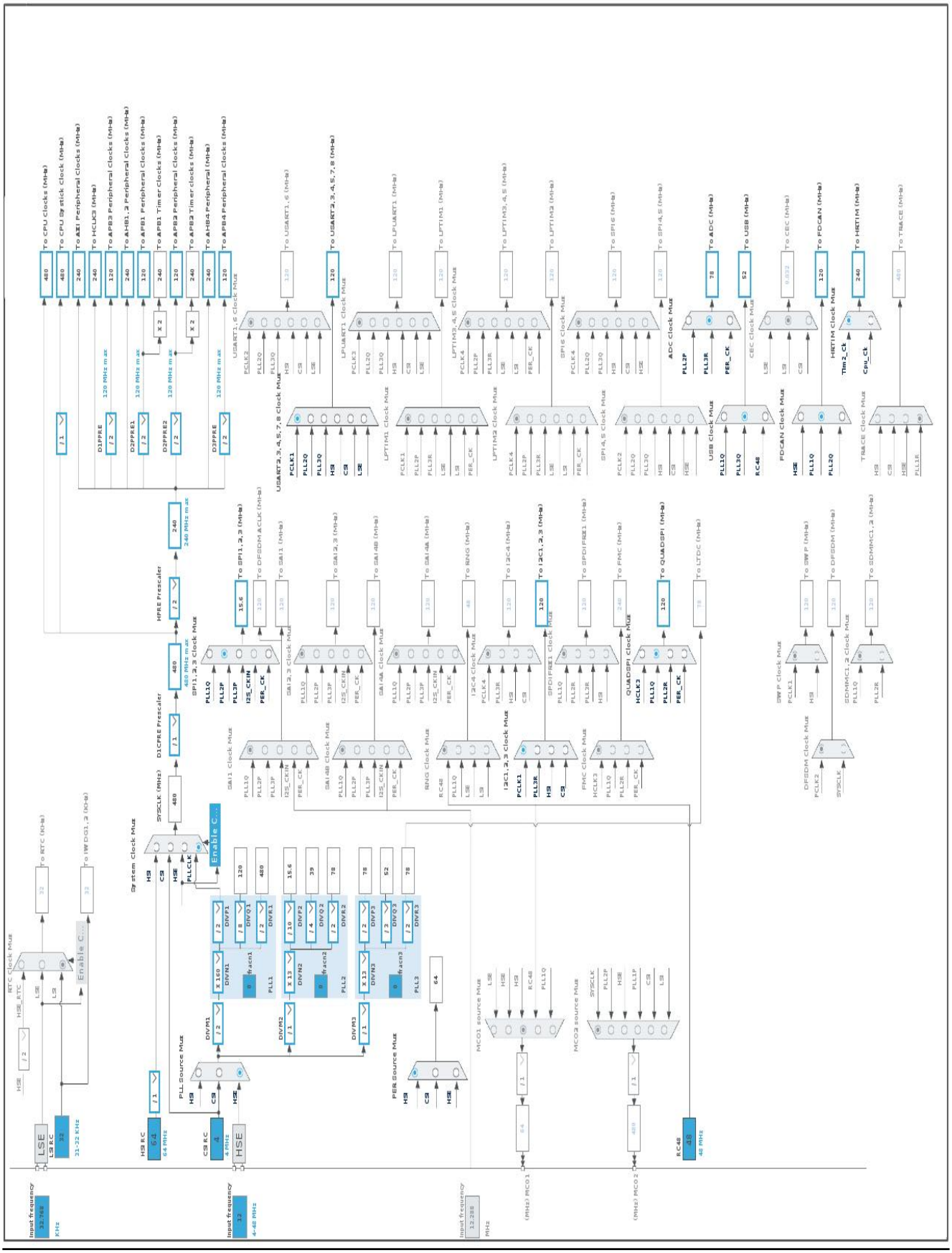
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	QUADSPI_BK1_IO2	
2	PE3 *	I/O	GPIO_Output	USER_LED_1
3	PE4 *	I/O	GPIO_Output	USER_LED_2
4	PE5 *	I/O	GPIO_Output	STATUS_LED
5	PE6 *	I/O	GPIO_Input	USR_BUTTON
6	VBAT	Power		
8	PC14-OSC32_IN (OSC32_IN)	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT (OSC32_OUT)	I/O	RCC_OSC32_OUT	
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0	I/O	ADC1_INP10	
16	PC1	I/O	ADC1_INP11	
19	VSSA	Power		
21	VDDA	Power		
22	PA0	I/O	ADC1_INP16	
23	PA1	I/O	ADC1_INP17	
24	PA2	I/O	ADC1_INP14	
25	PA3	I/O	ADC1_INP15	
26	VSS	Power		
27	VDD	Power		
28	PA4	I/O	DAC1_OUT1	
29	PA5	I/O	DAC1_OUT2	
30	PA6	I/O	ADC1_INP3	
31	PA7	I/O	ADC1_INP7	
32	PC4	I/O	ADC1_INP4	
33	PC5	I/O	ADC1_INP8	
34	PB0	I/O	ADC1_INP9	
35	PB1	I/O	ADC1_INP5	
36	PB2	I/O	QUADSPI_CLK	
46	PB10	I/O	QUADSPI_BK1_NCS	
48	VCAP	Power		

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
49	VSS	Power		
50	VDD	Power		
51	PB12	I/O	FDCAN2_RX	
52	PB13	I/O	FDCAN2_TX	
58	PD11	I/O	QUADSPI_BK1_IO0	
59	PD12	I/O	QUADSPI_BK1_IO1	
60	PD13	I/O	QUADSPI_BK1_IO3	
70	PA11	I/O	USB_OTG_FS_DM	
71	PA12	I/O	USB_OTG_FS_DP	
72	PA13 (JTMS/SWDIO)	I/O	DEBUG_JTMS-SWDIO	
73	VCAP	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14 (JTCK/SWCLK)	I/O	DEBUG_JTCK-SWCLK	
78	PC10	I/O	UART4_TX	
79	PC11	I/O	UART4_RX	
81	PD0	I/O	FDCAN1_RX	
82	PD1	I/O	FDCAN1_TX	
83	PD2 *	I/O	GPIO_Input	GPS_GEOFENCE_STAT
84	PD3 *	I/O	GPIO_Input	GPS_RTK_STAT
85	PD4	I/O	GPIO_EXTI4	GPS_EXINTERUPT
86	PD5 *	I/O	GPIO_Output	GPS_MODE_SELECT
87	PD6 *	I/O	GPIO_Output	GPS_NRESET
88	PD7	I/O	SPI1_MOSI	
89	PB3 (JTDO/TRACESWO)	I/O	SPI1_SCK	
90	PB4 (NJTRST)	I/O	SPI1_MISO	
91	PB5 *	I/O	GPIO_Output	
92	PB6	I/O	I2C1_SCL	
93	PB7 *	I/O	GPIO_Output	BOOT_EN
94	BOOT0	Boot		
96	PB9	I/O	I2C1_SDA	
97	PE0	I/O	GPIO_EXTI0	IMU_EXINTERUPT
98	PE1 *	I/O	GPIO_Output	IMU_NRESET
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32H7
Line	STM32H750 Value line
MCU	STM32H750VBTx
Datasheet	DS12556_Rev6

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Alkaline(9V)
Capacity	625.0 mAh
Self Discharge	0.3 %/month
Nominal Voltage	9.0 V
Max Cont Current	200.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1

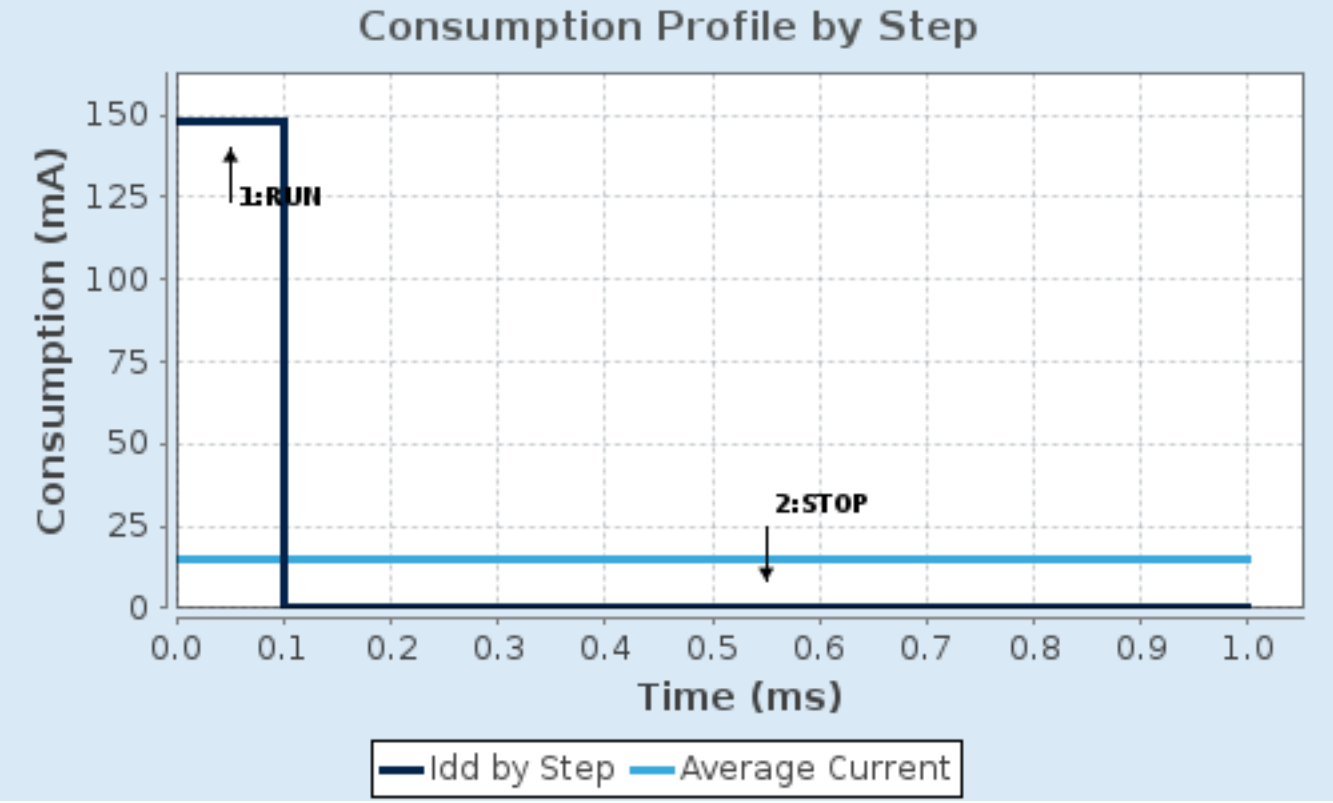
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	VOS0: Scale0-High	SVOS5: System-Scale5
D1 Mode	DRUN/CRUN	DSTANDBY
D2 Mode	DRUN	DSTANDBY
D3 Mode	DRUN	DSTOP
Fetch Type	ITCM	NA
CPU Frequency	480 MHz	0 Hz
Clock Configuration	HSE BYP PLL	Flash-OFF
Clock Source Frequency	24 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	148 mA	150 µA
Duration	0.1 ms	0.9 ms
DMIPS	1027.0	0.0
Ta Max	105.02	124.98
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	14.94 mA
Battery Life	1 day, 17 hours	Average DMIPS	1027.2001 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
150
125
100
75
50
25
0
1:RUN
2:STOP
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

2. Software Project

2.1. Project Settings

Name	Value
Project Name	ModuCard_nav_module
Project Folder	/home/lemonx/it/ModuCard-nav-module-software
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_H7 V1.12.1
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0xF00
Minimum Stack Size	0x900

2.2. 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
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_MDMA_Init	MDMA
4	MX_ADC1_Init	ADC1
5	MX_DAC1_Init	DAC1
6	MX_FDCAN1_Init	FDCAN1
7	MX_FDCAN2_Init	FDCAN2
8	MX_I2C1_Init	I2C1
9	MX_QUADSPI_Init	QUADSPI
10	MX_UART4_Init	UART4
11	MX_SPI1_Init	SPI1

Rank	Function Name	Peripheral Instance Name
12	MX_HRTIM_Init	HRTIM
13	MX_TIM2_Init	TIM2
14	MX_TIM12_Init	TIM12
15	MX_USB_DEVICE_Init	USB_DEVICE

3. Peripherals and Middlewares Configuration

3.1. ADC1

IN3: IN3 Single-ended

IN4: IN4 Single-ended

IN5: IN5 Single-ended

mode: IN7

mode: IN8

mode: IN9

IN10: IN10 Single-ended

mode: IN11

mode: IN14

mode: IN15

IN16: IN16 Single-ended

mode: IN17

3.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	Asynchronous clock mode divided by 1
Resolution	ADC 16-bit resolution
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Left Bit Shift	No bit shift
Conversion Data Management Mode	Regular Conversion data stored in DR register only
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Enable Regular Oversampling	Disable
Oversampling Ratio	1
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 3
Sampling Time	1.5 Cycles

Offset Number	No offset
Offset Signed Saturation	Disable

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

3.2. DAC1

OUT1 connected to: only external pin

OUT2 connected to: only external pin

3.2.1. Parameter Settings:

DAC Out1 Settings:

Mode selected	Normal Mode
Output Buffer	Enable
Trigger	None
User Trimming	Factory trimming

DAC Out2 Settings:

Mode selected	Normal Mode
Output Buffer	Enable
Trigger	None
User Trimming	Factory trimming

3.3. DEBUG

Debug: Serial Wire

3.4. FDCAN1

mode: Activated

3.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Classic mode

Mode	Normal mode
Auto Retransmission	Disable
Transmit Pause	Disable
Protocol Exception	Disable
Nominal Sync Jump Width	1
Data Prescaler	1
Data Sync Jump Width	1
Data Time Seg1	1
Data Time Seg2	1
Message Ram Offset	0
Std Filters Nbr	0
Ext Filters Nbr	0
Rx Fifo0 Elmts Nbr	0
Rx Fifo0 Elmt Size	8 bytes data field
Rx Fifo1 Elmts Nbr	0
Rx Fifo1 Elmt Size	8 bytes data field
Rx Buffers Nbr	0
Rx Buffer Size	8 bytes data field
Tx Events Nbr	0
Tx Buffers Nbr	0
Tx Fifo Queue Elmts Nbr	0
Tx Fifo Queue Mode	FIFO mode
Tx Elmt Size	8 bytes data field

Clock Calibration Unit:

Clock Calibration	Disable

Bit Timings Parameters:

Nominal Prescaler	**8 ***
Nominal Time Quantum	**66.66666666666667 ***
Nominal Time Seg1	1
Nominal Time Seg2	1
Nominal Time for one Bit	**200 ***
Nominal Baud Rate	**5000000 ***

3.5. FDCAN2

mode: Activated

3.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Classic mode

Mode	Normal mode
Auto Retransmission	Disable
Transmit Pause	Disable
Protocol Exception	Disable
Nominal Sync Jump Width	1
Data Prescaler	1
Data Sync Jump Width	1
Data Time Seg1	1
Data Time Seg2	1
Message Ram Offset	0
Std Filters Nbr	0
Ext Filters Nbr	0
Rx Fifo0 Elmts Nbr	0
Rx Fifo0 Elmt Size	8 bytes data field
Rx Fifo1 Elmts Nbr	0
Rx Fifo1 Elmt Size	8 bytes data field
Rx Buffers Nbr	0
Rx Buffer Size	8 bytes data field
Tx Events Nbr	0
Tx Buffers Nbr	0
Tx Fifo Queue Elmts Nbr	0
Tx Fifo Queue Mode	FIFO mode
Tx Elmt Size	8 bytes data field

Clock Calibration Unit:

Clock Calibration	Disable

Bit Timings Parameters:

Nominal Prescaler	**40 ***
Nominal Time Quantum	**333.33333333333337 ***
Nominal Time Seg1	1
Nominal Time Seg2	1
Nominal Time for one Bit	1000
Nominal Baud Rate	**999999 ***

3.6. HRTIM

Timer A: No external Output

3.6.1. HRTIM Interrupt Configuration:

Sources:

1st Source of interrupt	No interrupt enabled
2nd Source of interrupt	No interrupt enabled

3rd Source of interrupt	No interrupt enabled
4th Source of interrupt	No interrupt enabled
5th Source of interrupt	No interrupt enabled
6th Source of interrupt	No interrupt enabled
7th Source of interrupt	No interrupt enabled
8th Source of interrupt	No interrupt enabled

3.6.2. Synchro Configuration:

Master Timer Synchronization:

Sync Options	HRTIM instance doesn't handle external synchronization signals (SYNCIN, SYNCOUT)

3.6.3. External Event Configuration:

External Event 1:

Event Configuration	Disable

External Event 2:

Event Configuration	Disable

External Event 3:

Event Configuration	Disable

External Event 4:

Event Configuration	Disable

External Event 5:

Event Configuration	Disable

External Event 6:

Event Configuration	Disable

External Event 7:

Event Configuration	Disable

External Event 8:

Event Configuration	Disable

External Event 9:

Event Configuration	Disable

External Event 10:

Event Configuration	Disable

3.6.4. Fault Lines Configuration:

Fault Line 1:

Line Configuration	No Configuration of Fault Line

Fault Line 2:

Line Configuration	No Configuration of Fault Line

Fault Line 3:

Line Configuration	No Configuration of Fault Line

Fault Line 4:

Line Configuration	No Configuration of Fault Line

Fault Line 5:

Line Configuration	No Configuration of Fault Line

3.6.5. ADC Triggers Configuration:

ADC Trigger 1:

ADC Trigger Configuration	Disable

ADC Trigger 2:

ADC Trigger Configuration	Disable

ADC Trigger 3:

ADC Trigger Configuration	Disable

ADC Trigger 4:

ADC Trigger Configuration	Disable

3.6.6. Burst Mode Configuration:

Burst Mode Enabling:

Burst Mode	Burst mode disabled

3.6.7. Timer A:

General:

Timer Idx	Timer A
Basic/Advanced Configuration	Advanced (using HAL_Waveform methods)

Time Base Setting:

Prescaler Ratio	HRTIM Clock (HRTIM Clock is set in Clock Configuration Tab with Max Value = 400MHz)
fHRCK Equivalent Frequency	2.4E8
Period	**0xFFFD ***
Resulting PWM Frequency	3662
Repetition Counter	**0x00 ***
Mode	The timer operates in continuous (free-running) mode

Timing Unit:

Half Mode Enable - The Compare Value of CP Unit 1 is set automatically to half the Timer Period -	Half mode is disabled
Start On Sync	Synchronization input event has no effect on the timer
Reset On Sync	Synchronization input event has no effect on the timer
Dac Synchro	No DAC synchronization event generated
Preload Enable	Preload disabled: the write access is directly done into the active register
Update Gating	Update done independently from the DMA burst transfer completion
Repetition Update	Update on repetition disabled
Burst Mode	Timer counter clock is maintained and the timer operates normally
Push Pull	Push-Pull mode disabled
Number of Faults to enable	0
Fault Lock	Timer fault enabling bits are read/write
Dead Time Insertion	Output 1 and output 2 signals are independent
Delayed Protection Mode	No action
Update Trigger Sources Selection : Please enter the number of Triggers to select	0
Reset Update	Update by Timer reset / roll-over disabled
Reset Trigger Sources Selection : Please enter the number of Triggers to select	0
Interrupt Requests Sources Selection : Please enter the number of Active Interrupt Requests	0
Number of Timer A Internal DMA Request Sources - you first have to enable the Timer A DMA Request in the DMA Settings Tab	0

Compare Unit 1:

Compare Unit 1 Configuration	Disable

Compare Unit 2:

Compare Unit 2 Configuration	Disable

Compare Unit 3:

Compare Unit 3 Configuration	Disable

Compare Unit 4:

Compare Unit 4 Configuration	Disable

Capture Unit 1:

Capture Unit 1 Configuration	Disable

Capture Unit 2:

Capture Unit 2 Configuration	Disable

External Event 1 Filtering:

Filtering Configuration	Disable

External Event 2 Filtering:

Filtering Configuration	Disable

External Event 3 Filtering:

Filtering Configuration	Disable

External Event 4 Filtering:

Filtering Configuration	Disable

External Event 5 Filtering:

Filtering Configuration	Disable

External Event 6 Filtering:

Filtering Configuration	Disable

External Event 7 Filtering:

Filtering Configuration	Disable

External Event 8 Filtering:

Filtering Configuration	Disable

External Event 9 Filtering:

Filtering Configuration	Disable

External Event 10 Filtering:

Filtering Configuration	Disable

Burst DMA Controller:

Burst DMA Configuration	Disable

3.7. I2C1

I2C: I2C

3.7.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	**Fast Mode ***
I2C Speed Frequency (KHz)	400
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	**0x00B03FDB ***

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

3.8. MEMORYMAP

mode: Activated

3.9. QUADSPI

QuadSPI Mode: Bank1 with Quad SPI Lines

3.9.1. Parameter Settings:

General Parameters:

Clock Prescaler	**1 ***
Fifo Threshold	1
Sample Shifting	No Sample Shifting
Flash Size	**23 ***
Device Type	**Flash ***
Chip Select High Time	**8 Cycles ***
Clock Mode	Low
Flash ID	Flash ID 1
Dual Flash	Disabled

3.10. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

3.10.1. Parameter Settings:

Power Parameters:

SupplySource	PWR_LDO_SUPPLY
Power Regulator Voltage Scale	Power Regulator Voltage Scale 0

RCC Parameters:

TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000
CSI Calibration Value	32
HSI Calibration Value	64

System Parameters:

VDD voltage (V)	3.3
Flash Latency(WS)	4 WS (5 CPU cycle)

Product revision	rev.V

PLL range Parameters:

PLL1 clock Input range	Between 4 and 8 MHz
PLL2 input frequency range	Between 8 and 16 MHz
PLL3 input frequency range	Between 8 and 16 MHz
PLL1 clock Output range	Wide VCO range
PLL2 clock Output range	MEDIUM VCO range
PLL3 clock Output range	MEDIUM VCO range

3.11. SPI1

Mode: Full-Duplex Master

3.11.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**128 ***
Baud Rate	**121.875 KBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software
Fifo Threshold	Fifo Threshold 01 Data
Tx Crc Initialization Pattern	All Zero Pattern
Rx Crc Initialization Pattern	All Zero Pattern
Nss Polarity	Nss Polarity Low
Master Ss Idleness	00 Cycle
Master Inter Data Idleness	00 Cycle
Master Receiver Auto Susp	Disable
Master Keep Io State	Master Keep Io State Disable
IO Swap	Disabled

3.12. SYS

Timebase Source: TIM7

3.13. TIM2

Clock Source : Internal Clock

3.13.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**480 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	4294967295
Internal Clock Division (CKD)	No Division
auto-reload preload	**Enable ***

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	**Enable (Trigger delayed for master/slaves simultaneous start) ***
Trigger Event Selection TRGO	**Update Event ***

3.14. TIM12

Slave Mode: External Clock Mode 1

Trigger Source: ITR0

3.14.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable
Slave Mode Controller	ETR mode 1

Trigger Output (TRGO) Parameters:

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

3.15. UART4

Mode: Asynchronous

3.15.1. 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
ClockPrescaler	1
Fifo Mode	FIFO mode disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

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

3.16. USB_OTG_FS

Mode: Device_Only

3.16.1. Parameter Settings:

Speed	Full Speed 12MBit/s
Enable internal IP DMA	Disabled
Low power	Disabled
Battery charging	Disabled
Link Power Management	Disabled
Use dedicated end point 1 interrupt	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

3.17. FREERTOS

Interface: CMSIS_V2

3.17.1. Config parameters:

API:	
FreeRTOS API	CMSIS v2
Versions:	
FreeRTOS version	10.3.1
CMSIS-RTOS version	2.00
MPU/FPU:	
ENABLE_MPU	Disabled
ENABLE_FPU	**Enabled ***
Kernel settings:	
USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	56
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	**32 ***
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Enabled
USE_COUNTING_SEMAPHORES	Enabled
QUEUE_REGISTRY_SIZE	**32 ***
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled
Memory management settings:	
Memory Allocation	Dynamic / Static
TOTAL_HEAP_SIZE	**511000 ***
Memory Management scheme	heap_4
Hook function related definitions:	
USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled

USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Enabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Enabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	**32 ***
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

Added with 10.2.1 support:

MESSAGE_BUFFER_LENGTH_TYPE	size_t
USE_POSIX_ERRNO	Disabled

CMSIS-RTOS V2 flags:

USE_OS2_THREAD_SUSPEND_RESUME	Enabled
USE_OS2_THREAD_ENUMERATE	Enabled
USE_OS2_EVENTFLAGS_FROM_ISR	Enabled
USE_OS2_THREAD_FLAGS	Enabled
USE_OS2_TIMER	Enabled
USE_OS2_MUTEX	Enabled

3.17.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Enabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Enabled

xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Enabled
xTaskGetCurrentTaskHandle	Enabled
eTaskGetState	Enabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Enabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled
uxTaskGetStackHighWaterMark2	Disabled

3.17.3. Advanced settings:

Newlib settings (see parameter description first):

USE_NEWLIB_REENTRANT	**Enabled ***

Project settings (see parameter description first):

Use FW pack heap file	Enabled

3.18. USB_DEVICE

Class For FS IP: Communication Device Class (Virtual Port Com)

3.18.1. Parameter Settings:

Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message
USBD_LPM_ENABLED (Link Power Management)	1: Link Power Management supported

Class Parameters:

USB CDC Rx Buffer Size	2048
USB CDC Tx Buffer Size	2048

3.18.2. Device Descriptor:

Device Descriptor:

VID (Vendor IDentifier)	1155
LANGID_STRING (Language Identifier)	English(United States)

MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

Device Descriptor FS:

PID (Product IDentifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC0	ADC1_INP10	Analog mode	No pull-up and no pull-down	n/a	
	PC1	ADC1_INP11	Analog mode	No pull-up and no pull-down	n/a	
	PA0	ADC1_INP16	Analog mode	No pull-up and no pull-down	n/a	
	PA1	ADC1_INP17	Analog mode	No pull-up and no pull-down	n/a	
	PA2	ADC1_INP14	Analog mode	No pull-up and no pull-down	n/a	
	PA3	ADC1_INP15	Analog mode	No pull-up and no pull-down	n/a	
	PA6	ADC1_INP3	Analog mode	No pull-up and no pull-down	n/a	
	PA7	ADC1_INP7	Analog mode	No pull-up and no pull-down	n/a	
	PC4	ADC1_INP4	Analog mode	No pull-up and no pull-down	n/a	
	PC5	ADC1_INP8	Analog mode	No pull-up and no pull-down	n/a	
	PB0	ADC1_INP9	Analog mode	No pull-up and no pull-down	n/a	
	PB1	ADC1_INP5	Analog mode	No pull-up and no pull-down	n/a	
DAC1	PA4	DAC1_OUT1	Analog mode	No pull-up and no pull-down	n/a	
	PA5	DAC1_OUT2	Analog mode	No pull-up and no pull-down	n/a	
DEBUG	PA13 (JTMS/SWDIO)	DEBUG_JTMS-SWDIO	n/a	n/a	n/a	
	PA14 (JTCK/SWCLK)	DEBUG_JTCK-SWCLK	n/a	n/a	n/a	
FDCAN1	PD0	FDCAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD1	FDCAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
FDCAN2	PB12	FDCAN2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB13	FDCAN2_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	Low	
	PB9	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Low	
QUADSPI	PE2	QUADSPI_BK1_IO2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB2	QUADSPI_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB10	QUADSPI_BK1_NCS	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD11	QUADSPI_BK1_IO0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD12	QUADSPI_BK1_IO1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD13	QUADSPI_BK1_I	Alternate Function Push Pull	No pull-up and no pull-down	Low	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
		O3				
RCC	PC14-OSC32_IN (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 (PH0)	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT (PH1)	RCC_OSC_OUT	n/a	n/a	n/a	
SPI1	PD7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB3 (JTDO/TRACESWO)	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB4 (NJTRST)	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Low	
UART4	PC10	UART4_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC11	UART4_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USER_LED_1
	PE4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USER_LED_2
	PE5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	STATUS_LED
	PE6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USR_BUTTON
	PD2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	GPS_GEOFENCE_STAT
	PD3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	GPS_RTK_STAT
	PD4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	GPS_EXINTERUPT
	PD5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GPS_MODE_SELECT
	PD6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GPS_NRESET
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	BOOT_EN
	PE0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	IMU_EXINTERUPT
	PE1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IMU_NRESET

4.2. DMA configuration

nothing configured in DMA service

4.3. BDMA configuration

nothing configured in DMA service

4.4. MDMA configuration

MDMA Request	Channel	Trigger Mode	Priotity
QUADSPI_TC	MDMA_Channel0	**Full transfer ***	**Very High ***

QUADSPI_TC: MDMA_Channel0 DMA request Settings:

Buffer Transfer Length:	1
Data Mask:	0
Source Burst Size:	Single transfer
Destination Burst Size:	Single transfer
Block Data Length:	0
Destination Address:	0
Destination Block Address Offset:	0
Address Mask:	0
Data Alignement:	N/A
Source Block Address Offset:	0
Endianness:	Little endianness preserved
Source Address:	0
Source Increment mode:	Increment by a byte
Block Count:	0
Destination Increment mode:	Increment by a byte
Source Data Width:	Byte
Destination Data Width:	Byte

4.5. NVIC configuration

4.5.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Pre-fetch 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	15	0
System tick timer	true	15	0
TIM7 global interrupt	true	15	0
USB On The Go FS global interrupt	true	5	0
MDMA global interrupt	true	5	0
PVD and AVD interrupts through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line0 interrupt	unused		
EXTI line4 interrupt	unused		
ADC1 and ADC2 global interrupts	unused		
FDCAN1 interrupt 0	unused		
FDCAN2 interrupt 0	unused		
FDCAN1 interrupt 1	unused		
FDCAN2 interrupt 1	unused		
TIM2 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
TIM8 break interrupt and TIM12 global interrupt	unused		
UART4 global interrupt	unused		
TIM6 global interrupt, DAC1_CH1 and DAC1_CH2 underrun error interrupts	unused		
FDCAN calibration unit interrupt	unused		
FPU global interrupt	unused		
QUADSPI global interrupt	unused		
USB On The Go FS End Point 1 Out global interrupt	unused		
USB On The Go FS End Point 1 In global interrupt	unused		
HRTIM master timer global interrupt	unused		
HRTIM timer A global interrupt	unused		

Interrupt Table	Enable	Preenmption Priority	SubPriority
HRTIM fault global interrupt	unused		
HSEM1 global interrupt	unused		

4.5.2. NVIC Code generation

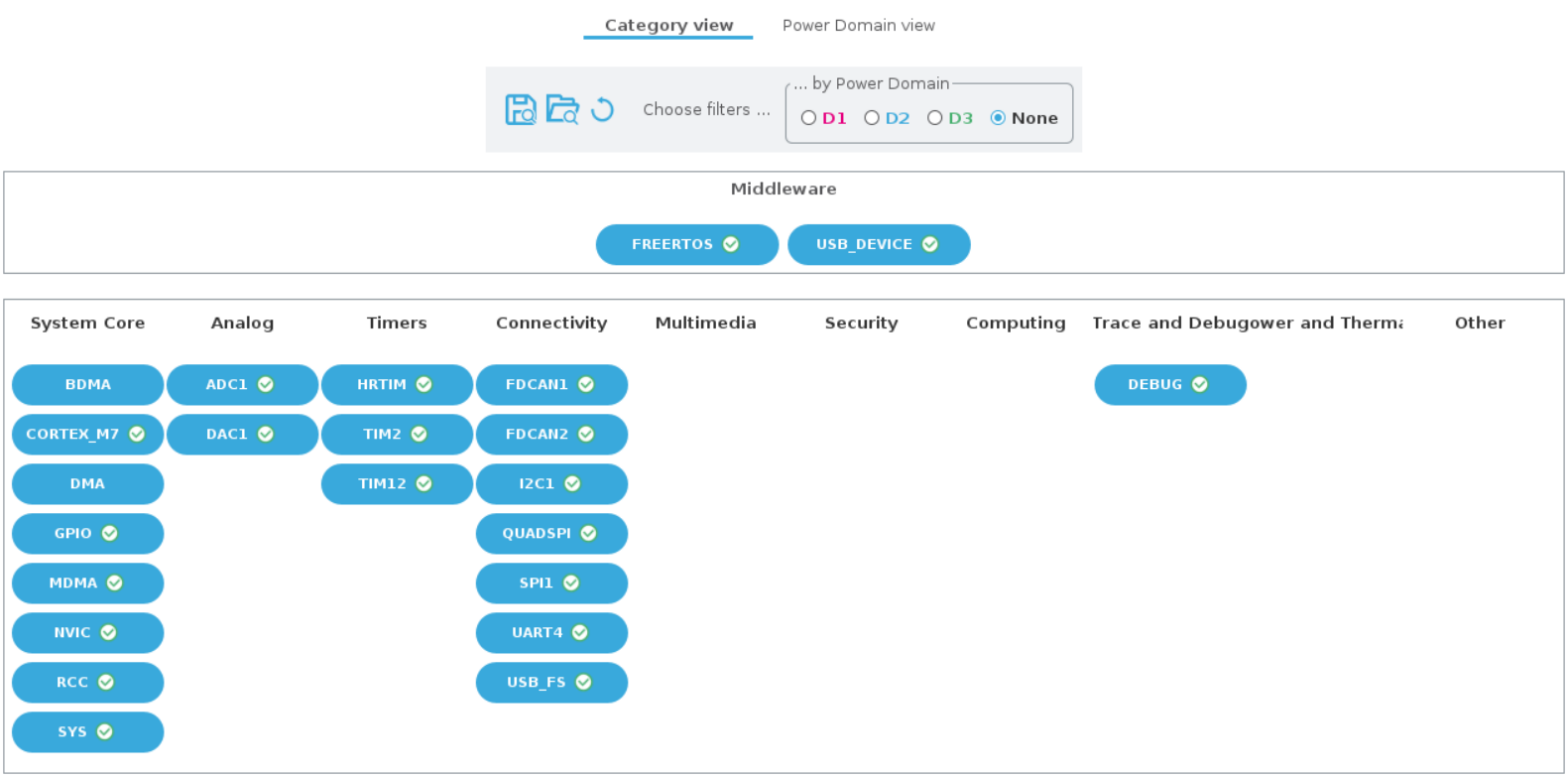
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	false	false
Debug monitor	false	true	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
TIM7 global interrupt	false	true	true
USB On The Go FS global interrupt	false	true	true
MDMA global interrupt	false	true	true

*** User modified value**

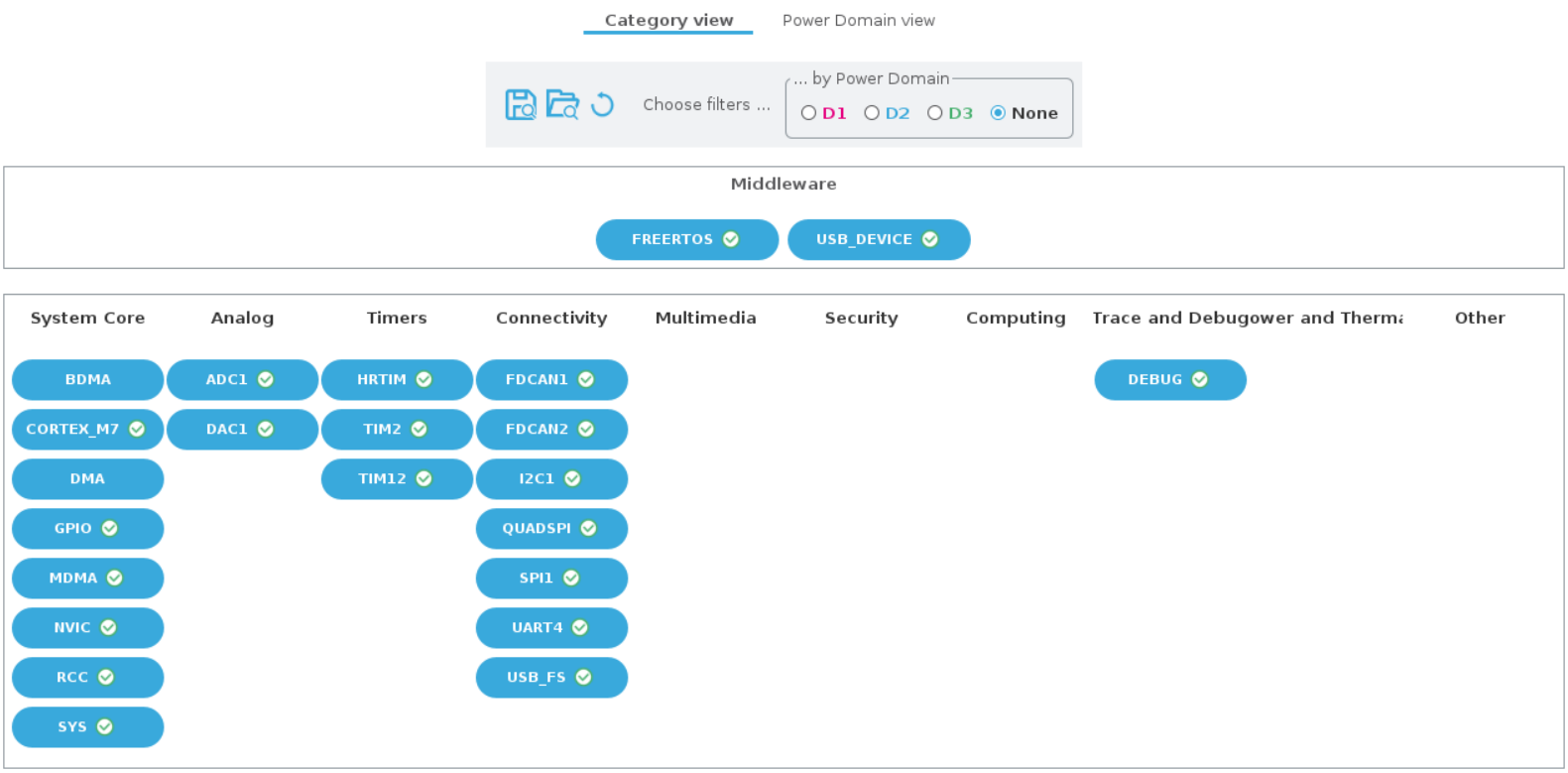
5. System Views

5.1. Category view

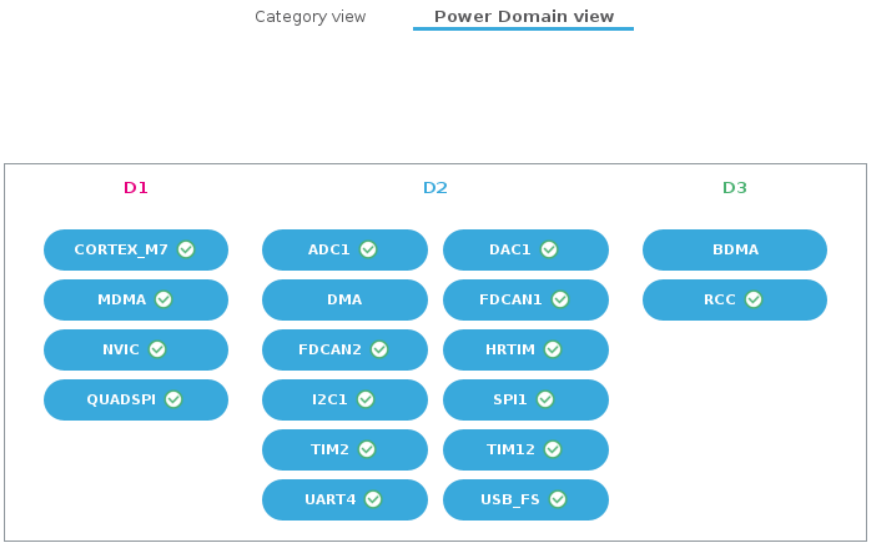
5.1.1. Current



5.1.2. Without filters



5.2. Power Domain view



6. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32h7_bsdl.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32h7_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32h7-svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers_stm32h7_series_product_overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
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Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32h7rs-lines-overview.pdf
Brochures	https://www.st.com/resource/en/brochure/brstm32h7.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32f7h7.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32h7vl.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32h7rs.pdf
Security Bulletin	https://www.st.com/resource/en/security_bulletin/sb0023-eucleak-protection-statement-for-stmicroelectronics-certified-products-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf

Application Notes	https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3156-usb-dfu-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4286-spi-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4539-hrtim-cookbook-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4776-generalpurpose-timer-cookbook-for-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4803-highspeed-si-simulations-using-ibis-and-boardlevel-simulations-using-hyperlynx-si-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4839-level-1-cache-on-stm32f7-series-and-stm32h7-series-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4891-stm32h72x-stm32h73x-and-singlecore-stm32h74x75x-system-architecture-and-performance-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4989-stm32-

	microcontroller-debug-toolbox-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4990-getting-started-with-sigmadelta-digital-interface-on-applicable-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5027-interfacing-pdm-digital-microphones-using-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5033-stm32cube-mcu-package-examples-for-stm32h7-series-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5073-receiving-spdif-audio-stream-with-the-stm32f4f7h7-series-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5188-external-memory-code-execution-on-stm32f7x0-value-line-stm32h750-value-line-stm32h7b0-value-line-and-stm32h730-value-line-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5312-migration-from-revy-to-revv-for-stm32h743753-and-stm32h750-value-line-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5354-getting-started-with-the-stm32h7-series-mcu-16bit-adc-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4760-quadspi-interface-on-stm32-microcontrollers-and-microprocessors--stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4899-stm32-microcontroller-gpio-hardware-settings-and-lowpower-consumption-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5612-esd-protection-of-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4991-how-to-wake-up-an-stm32-microcontroller-from-lowpower-mode-with-the-usart-or-the-lpuart-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf

Application Notes	https://www.st.com/resource/en/application_note/an5927-i3c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4879-introduction-to-usb-hardware-and-pcb-guidelines-using-stm32-mcus-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/an2867-guidelines-for-oscillator-design-on-stm8afals-and-stm32-mcusmpus-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/an4943-how-to-use-chromart-accelerator-to-refresh-an-lcdtft-display-on-stm32-mcus-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/an5996-migrating-from-stm32h730-and-stm32h750-to-stm32h7rx7sx-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5543-guidelines-for-enhanced-spi-communication-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/cd00211314-how-to-optimize-the-adc-accuracy-in-the-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack2-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5020-introduction-to-digital-camera-interface-dcmi-for-stm32-mcus-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4323-getting-started-with-stemwin-library-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4841-digital-signal-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4891-stm32h72x-stm32h73x-and-singlecore-stm32h74x75x-system-architecture-and-performance-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5001-stm32cube-expansion-package-for-stm32h7-series-mdma-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5014-stm32h7x3-smart-power-management-expansion-package-for-stm32cube-stmicroelectronics.pdf
Application Notes for related Tools	https://www.st.com/resource/en/application_note/an5033-stm32cube-mcu-package-examples-for-stm32h7-series-stmicroelectronics.pdf

& Software	
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5056-integration-guide-for-the-xcubesbsfu-stm32cube-expansion-package-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5360-getting-started-with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5361-getting-started-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5418-how-to-build-a-simple-usbpd-sink-application-with-stm32cubemx-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5564-getting-started-with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
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