



1. Description

1.1. Project

Project Name	CCTV3_F407_REV100
Board Name	custom
Generated with:	STM32CubeMX 6.5.0
Date	10/25/2022

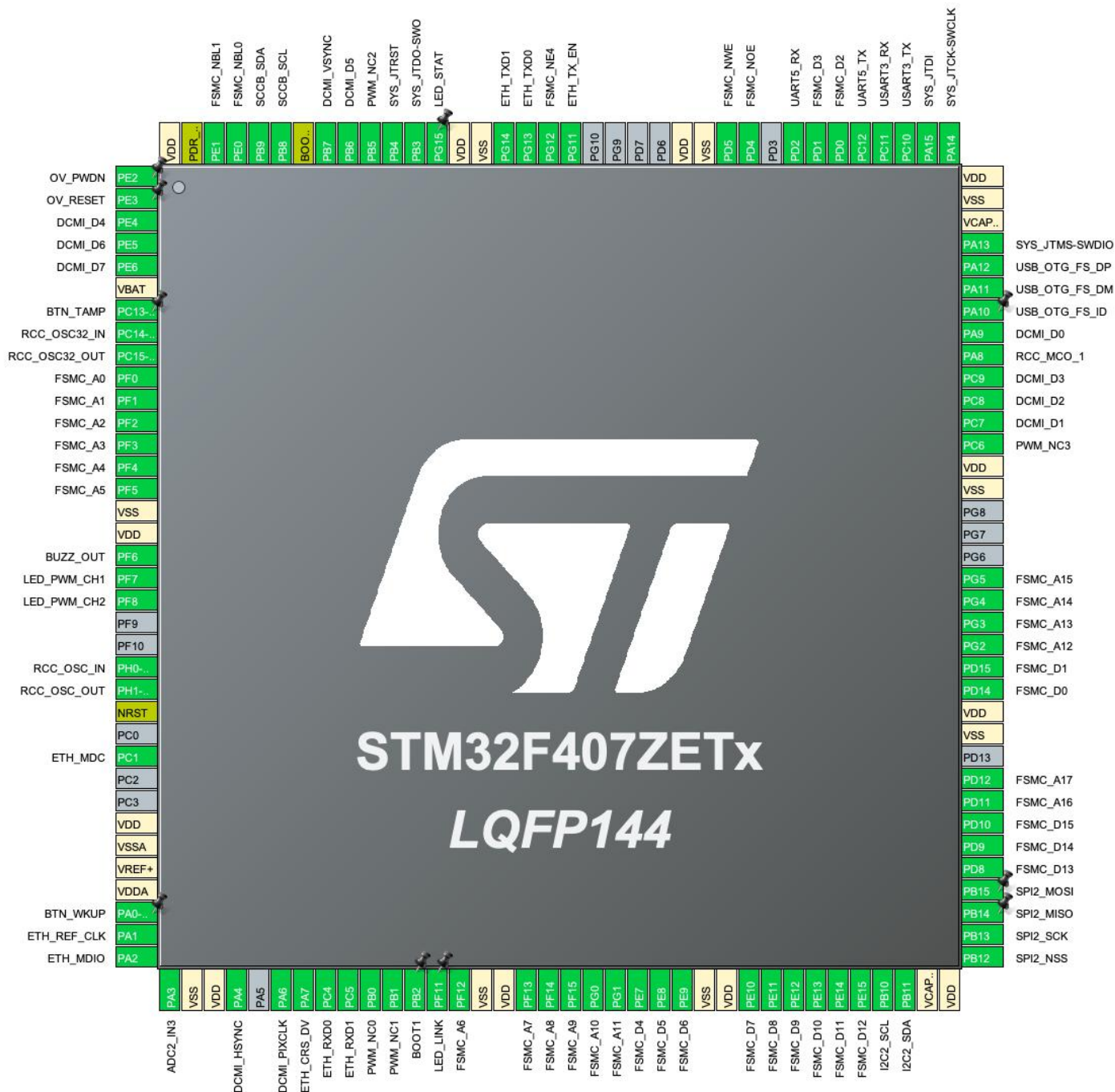
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407ZETx
MCU Package	LQFP144
MCU Pin number	144

1.3. Core(s) information

Core(s)	Arm Cortex-M4
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2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Output	OV_PWDN
2	PE3 *	I/O	GPIO_Output	OV_RESET
3	PE4	I/O	DCMI_D4	
4	PE5	I/O	DCMI_D6	
5	PE6	I/O	DCMI_D7	
6	VBAT	Power		
7	PC13-ANTI_TAMP *	I/O	GPIO_Input	BTN_TAMP
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
10	PF0	I/O	FSMC_A0	
11	PF1	I/O	FSMC_A1	
12	PF2	I/O	FSMC_A2	
13	PF3	I/O	FSMC_A3	
14	PF4	I/O	FSMC_A4	
15	PF5	I/O	FSMC_A5	
16	VSS	Power		
17	VDD	Power		
18	PF6	I/O	TIM10_CH1	BUZZ_OUT
19	PF7	I/O	TIM11_CH1	LED_PWM_CH1
20	PF8	I/O	TIM13_CH1	LED_PWM_CH2
23	PH0-OSC_IN	I/O	RCC_OSC_IN	
24	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
27	PC1	I/O	ETH_MDC	
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0-WKUP *	I/O	GPIO_Input	BTN_WKUP
35	PA1	I/O	ETH_REF_CLK	
36	PA2	I/O	ETH_MDIO	
37	PA3	I/O	ADC2_IN3	
38	VSS	Power		
39	VDD	Power		
40	PA4	I/O	DCMI_HSYNC	
42	PA6	I/O	DCMI_PIXCLK	

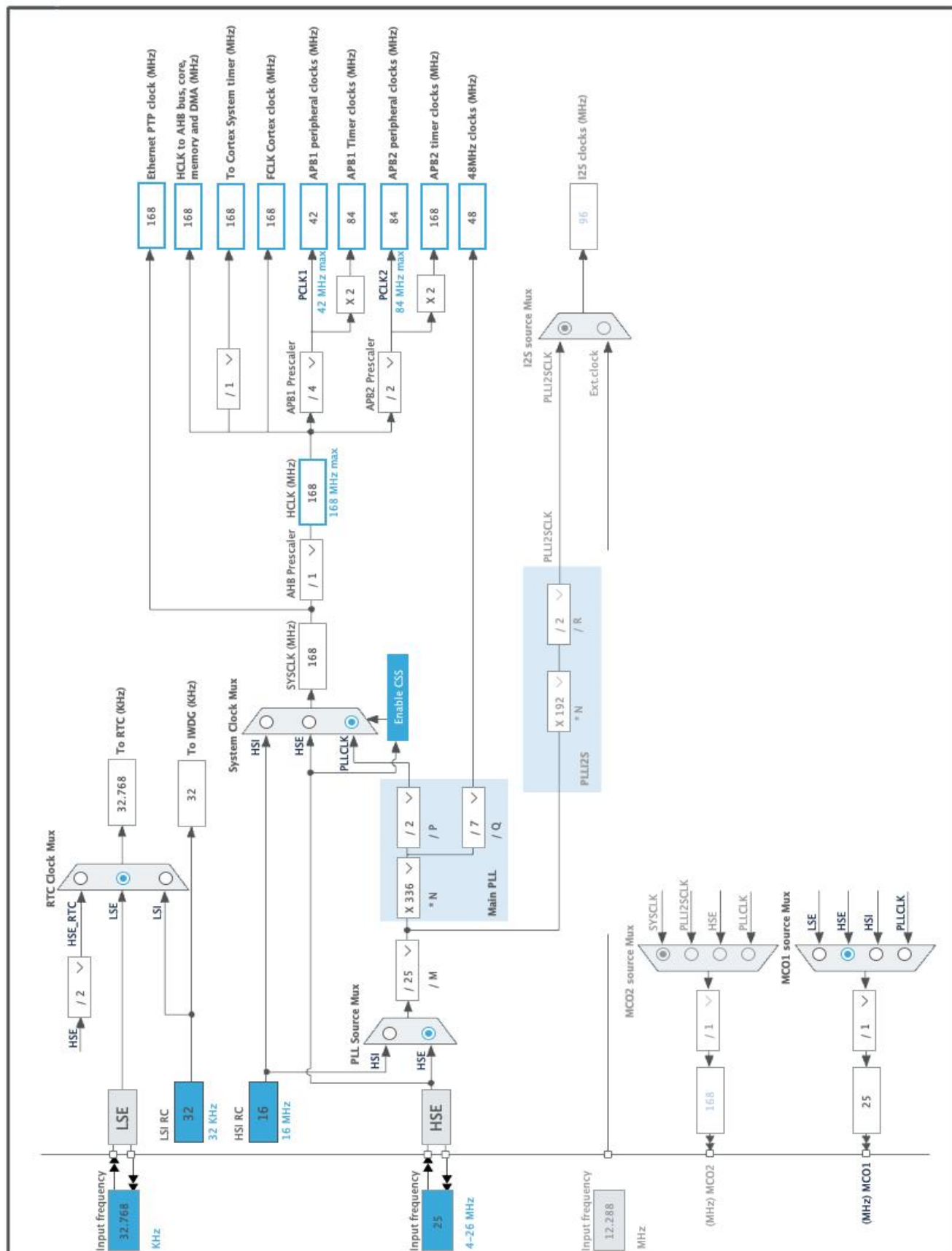
Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
43	PA7	I/O	ETH_CRSDV	
44	PC4	I/O	ETH_RXD0	
45	PC5	I/O	ETH_RXD1	
46	PB0	I/O	TIM3_CH3	PWM_NC0
47	PB1	I/O	TIM3_CH4	PWM_NC1
48	PB2 *	I/O	GPIO_Input	BOOT1
49	PF11 *	I/O	GPIO_Output	LED_LINK
50	PF12	I/O	FSMC_A6	
51	VSS	Power		
52	VDD	Power		
53	PF13	I/O	FSMC_A7	
54	PF14	I/O	FSMC_A8	
55	PF15	I/O	FSMC_A9	
56	PG0	I/O	FSMC_A10	
57	PG1	I/O	FSMC_A11	
58	PE7	I/O	FSMC_D4	
59	PE8	I/O	FSMC_D5	
60	PE9	I/O	FSMC_D6	
61	VSS	Power		
62	VDD	Power		
63	PE10	I/O	FSMC_D7	
64	PE11	I/O	FSMC_D8	
65	PE12	I/O	FSMC_D9	
66	PE13	I/O	FSMC_D10	
67	PE14	I/O	FSMC_D11	
68	PE15	I/O	FSMC_D12	
69	PB10	I/O	I2C2_SCL	
70	PB11	I/O	I2C2_SDA	
71	VCAP_1	Power		
72	VDD	Power		
73	PB12	I/O	SPI2_NSS	
74	PB13	I/O	SPI2_SCK	
75	PB14	I/O	SPI2_MISO	
76	PB15	I/O	SPI2_MOSI	
77	PD8	I/O	FSMC_D13	
78	PD9	I/O	FSMC_D14	
79	PD10	I/O	FSMC_D15	
80	PD11	I/O	FSMC_A16	
81	PD12	I/O	FSMC_A17	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
83	VSS	Power		
84	VDD	Power		
85	PD14	I/O	FSMC_D0	
86	PD15	I/O	FSMC_D1	
87	PG2	I/O	FSMC_A12	
88	PG3	I/O	FSMC_A13	
89	PG4	I/O	FSMC_A14	
90	PG5	I/O	FSMC_A15	
94	VSS	Power		
95	VDD	Power		
96	PC6	I/O	TIM3_CH1	PWM_NC3
97	PC7	I/O	DCMI_D1	
98	PC8	I/O	DCMI_D2	
99	PC9	I/O	DCMI_D3	
100	PA8	I/O	RCC_MCO_1	
101	PA9	I/O	DCMI_D0	
102	PA10 *	I/O	GPIO_Output	USB_OTG_FS_ID
103	PA11	I/O	USB_OTG_FS_DM	
104	PA12	I/O	USB_OTG_FS_DP	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
110	PA15	I/O	SYS_JTDI	
111	PC10	I/O	USART3_TX	
112	PC11	I/O	USART3_RX	
113	PC12	I/O	UART5_TX	
114	PD0	I/O	FSMC_D2	
115	PD1	I/O	FSMC_D3	
116	PD2	I/O	UART5_RX	
118	PD4	I/O	FSMC_NOE	
119	PD5	I/O	FSMC_NWE	
120	VSS	Power		
121	VDD	Power		
126	PG11	I/O	ETH_TX_EN	
127	PG12	I/O	FSMC_NE4	
128	PG13	I/O	ETH_TXD0	
129	PG14	I/O	ETH_TXD1	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
130	VSS	Power		
131	VDD	Power		
132	PG15 *	I/O	GPIO_Output	LED_STAT
133	PB3	I/O	SYS_JTDO-SWO	
134	PB4	I/O	SYS_JTRST	
135	PB5	I/O	TIM3_CH2	PWM_NC2
136	PB6	I/O	DCMI_D5	
137	PB7	I/O	DCMI_VSYNC	
138	BOOT0	Boot		
139	PB8	I/O	I2C1_SCL	SCCB_SCL
140	PB9	I/O	I2C1_SDA	SCCB_SDA
141	PE0	I/O	FSMC_NBL0	
142	PE1	I/O	FSMC_NBL1	
143	PDR_ON	Reset		
144	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	CCTV3_F407_REV100
Project Folder	/Users/aiox718/Private/Workspace/CCTV3.0-
Toolchain / IDE	MDK-ARM V5.32
Firmware Package Name and Version	STM32Cube FW_F4 V1.27.1
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy only the necessary library files
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

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_ADC1_Init	ADC1
4	MX_ADC2_Init	ADC2
5	MX_DCMI_Init	DCMI
6	MX_FSMC_Init	FSMC
7	MX_I2C1_Init	I2C1
8	MX_I2C2_Init	I2C2
9	MX_IWDG_Init	IWDG
10	MX_RNG_Init	RNG
11	MX_RTC_Init	RTC

Rank	Function Name	Peripheral Instance Name
12	MX_SPI2_Init	SPI2
13	MX_TIM3_Init	TIM3
14	MX_TIM10_Init	TIM10
15	MX_UART5_Init	UART5
16	MX_USART3_UART_Init	USART3
17	MX_FATFS_Init	FATFS
18	MX_LWIP_Init	LWIP
19	MX_USB_DEVICE_Init	USB_DEVICE
20	MX_TIM11_Init	TIM11
21	MX_TIM13_Init	TIM13

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407ZETx
Datasheet	DS8626_Rev8

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

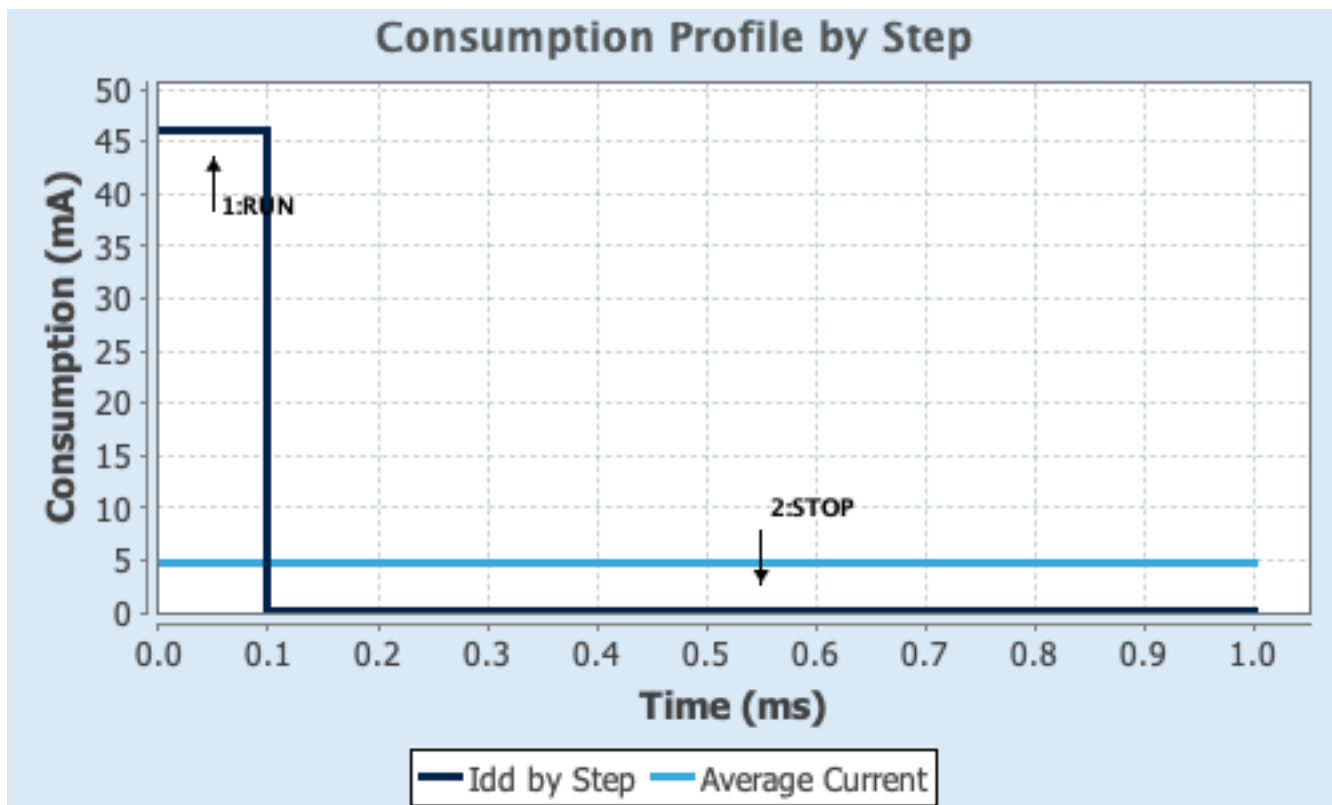
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	168 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator LP Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	46 mA	280 μ A
Duration	0.1 ms	0.9 ms
DMIPS	210.0	0.0
Ta Max	98.93	104.96
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	4.85 mA
Battery Life	29 days, 4 hours	Average DMIPS	210.0 DMIPS

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. ADC1

mode: Temperature Sensor Channel

mode: Vbat Channel

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode
ADC_Settings:	
Clock Prescaler	PCLK2 divided by 4
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
<u>Rank</u>	1
Channel	Channel Temperature Sensor
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0
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WatchDog:

Enable Analog WatchDog Mode	false
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7.2. ADC2

mode: IN3

7.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode
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ADC_Settings:

Clock Prescaler	PCLK2 divided by 4
Resolution	12 bits (15 ADC Clock cycles)

Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

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	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0
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WatchDog:

Enable Analog WatchDog Mode	false
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7.3. DCMI

DCMI: Slave 8 bits External Synchro

7.3.1. Parameter Settings:

Mode Config:

Pixel clock polarity	Active on Falling edge
Vertical synchronization polarity	Active Low
Horizontal synchronization polarity	Active Low
Frequency of frame capture	All frames are captured
JPEG mode	Disabled

7.4. ETH

Mode: RMII

7.4.1. Parameter Settings:

General : Ethernet Configuration:

Note	PHY Driver must be configured from the LwIP 'Platform Settings' top right tab
Ethernet MAC Address	00:80:E1:00:00:00
Rx Buffers Length	1536

7.5. FSMC

NOR Flash/PSRAM/SRAM/ROM/LCD 1

Chip Select: NE4

Memory type: SRAM

Address: 18 bits

Data: 16 bits

Byte enable: set

7.5.1. NOR/PSRAM 1:

NOR/PSRAM control:

Memory type	SRAM
Bank	Bank 1 NOR/PSRAM 4
Write operation	Disabled
Extended mode	Disabled

NOR/PSRAM timing:

Address setup time in HCLK clock cycles	15
Data setup time in HCLK clock cycles	255
Bus turn around time in HCLK clock cycles	15

7.6. I2C1

I2C: I2C

7.6.1. 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

7.7. I2C2

I2C: I2C

7.7.1. 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

7.8. IWDG

mode: Activated

7.8.1. Parameter Settings:

Clocking:

IWDG counter clock prescaler	4
IWDG down-counter reload value	4095

7.9. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

mode: Master Clock Output 1

7.9.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale

Power Regulator Voltage Scale 1

7.10. RNG

mode: Activated

7.11. RTC

mode: Activate Clock Source

7.11.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

7.12. SPI2

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Input Signal

7.12.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	21.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Input Hardware

7.13. SYS

Debug: JTAG (5 pins)

Timebase Source: SysTick

7.14. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

Channel4: PWM Generation CH4

7.14.1. 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

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)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	0

Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.15. TIM10

mode: Activated

Channel1: PWM Generation CH1

7.15.1. 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

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.16. TIM11

mode: Activated

Channel1: PWM Generation CH1

7.16.1. 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

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable

Fast Mode	Disable
CH Polarity	High

7.17. TIM13

mode: Activated

Channel1: PWM Generation CH1

7.17.1. 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

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.18. UART5

Mode: Asynchronous

7.18.1. 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

7.19. USART3

Mode: Asynchronous

7.19.1. 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

7.20. USB_OTG_FS

Mode: Device_Only

7.20.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

7.21. FATFS

mode: User-defined

7.21.1. Set Defines:

Version:

FATFS version	R0.12c
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Function Parameters:

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_EXPAND (Use f_expand function)	Disabled
USE_CHMOD (Change attributes function)	Disabled

USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Latin 1
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_EXFAT (Support of exFAT file system)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
FS_REENTRANT (Re-Entrancy)	Disabled
FS_TIMEOUT (Timeout ticks)	1000
FS_LOCK (Number of files opened simultaneously)	2

7.22. LWIP

mode: Enabled

Advanced parameters are not listed except if modified by user.

7.22.1. General Settings:

LwIP Version:

LwIP Version (Version of LwIP supported by CubeMX ** CubeMX specific **)	2.1.2
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IPv4 - DHCP Options:

LWIP_DHCP (DHCP Module)	Enabled
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RTOS Dependency:

WITH_RTOS (Use FREERTOS ** CubeMX specific **)	Disabled
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Platform Settings:

PHY Driver	Choose/LAN8742/DP83848
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Protocols Options:

LWIP_ICMP (ICMP Module Activation)	Enabled
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LWIP_IGMP (IGMP Module)	Disabled
LWIP_DNS (DNS Module)	Disabled
LWIP_UDP (UDP Module)	Enabled
MEMP_NUM_UDP_PCB (Number of UDP Connections)	4
LWIP_TCP (TCP Module)	Enabled
MEMP_NUM_TCP_PCB (Number of TCP Connections)	5

7.22.2. Key Options:

Infrastructure - OS Awareness Option:

NO_SYS (OS Awareness)	OS Not Used
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Infrastructure - Timers Options:

LWIP_TIMERS (Use Support For sys_timeout)	Enabled
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Infrastructure - Core Locking and MPU Options:

SYS_LIGHTWEIGHT_PROT (Memory Functions Protection)	Disabled
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Infrastructure - Heap and Memory Pools Options:

MEM_SIZE (Heap Memory Size)	1600
LWIP_RAM_HEAP_POINTER (RAM Heap Pointer)	0x30044000 *

Infrastructure - Internal Memory Pool Sizes:

MEMP_NUM_PBUF (Number of Memory Pool struct Pbufs)	16
MEMP_NUM_RAW_PCB (Number of Raw Protocol Control Blocks)	4
MEMP_NUM_TCP_PCB_LISTEN (Number of Listening TCP Connections)	8
MEMP_NUM_TCP_SEG (Number of TCP Segments simultaneously queued)	16
MEMP_NUM_LOCALHOSTLIST (Number of Host Entries in the Local Host List)	1

Pbuf Options:

PBUF_POOL_SIZE (Number of Buffers in the Pbuf Pool)	16
PBUF_POOL_BUFSIZE (Size of each pbuf in the pbuf pool)	592

IPv4 - ARP Options:

LWIP_ARP (ARP Functionality)	Enabled
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Callback - TCP Options:

TCP_TTL (Number of Time-To-Live Used by TCP Packets)	255
TCP_WND (TCP Receive Window Maximum Size)	2144
TCP_QUEUE_OOSEQ (Allow Out-Of-Order Incoming Packets)	Enabled
LWIP_TCP_SACK_OUT (Allow Sending Selective Acknowledgements)	Disabled
TCP_MSS (Maximum Segment Size)	536
TCP_SND_BUF (TCP Sender Buffer Space)	1072
TCP_SND_QUEUELEN (Number of Packet Buffers Allowed for TCP Sender)	9

Network Interfaces Options:

LWIP_NETIF_STATUS_CALLBACK (Callback Function on Interface Status Changes)	Disabled
LWIP_NETIF_EXT_STATUS_CALLBACK (Extended Callback Function for several netif)	Disabled

LWIP_NETIF_LINK_CALLBACK (Callback Function on Interface Link Changes)

Enabled

NETIF - Loopback Interface Options:

LWIP_NETIF_LOOPBACK (NETIF Loopback)

Disabled

Thread Safe APIs - Socket Options:

LWIP_SOCKET (Socket API)

Disabled

7.22.3. PPP:

PPP Options:

PPP_SUPPORT (PPP Module)

Disabled

7.22.4. IPv6:

IPv6 Options:

LWIP_IPV6 (IPv6 Protocol)

Disabled

7.22.5. HTTPD:

HTTPD Options:

LWIP_HTTPD (LwIP HTTPD Support ** CubeMX specific **)

Disabled

7.22.6. SNMP:

SNMP Options:

LWIP_SNMP (LwIP SNMP Agent)

Disabled

7.22.7. SNTP/SMTP:

SNTP Options:

LWIP_SNTP (LWIP SNTP Support ** CubeMX specific **)

Disabled

SMTP Options:

LWIP_SMTP (LWIP SMTP Support ** CubeMX specific **)

Disabled

7.22.8. MDNS/TFTP:

MDNS Options:

LWIP_MDNS (Multicast DNS Support ** CubeMX specific **)

Disabled

TFTP Options:

LWIP_TFTP (TFTP Support ** CubeMX specific **)	Disabled
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7.22.9. Perf/Checks:

Sanity Checks:

LWIP_DISABLE_TCP_SANITY_CHECKS (TCP Sanity Checks)	Disabled
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LWIP_DISABLE_MEMP_SANITY_CHECKS (MEMP Sanity Checks)	Disabled
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Performance Options:

LWIP_PERF (Performance Testing for LwIP)	Disabled
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7.22.10. Statistics:

Debug - Statistics Options:

LWIP_STATS (Statistics Collection)	Disabled
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7.22.11. Checksum:

Infrastructure - Checksum Options:

CHECKSUM_BY_HARDWARE (Hardware Checksum ** CubeMX specific **)	Enabled
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LWIP_CHECKSUM_CTRL_PER_NETIF (Generate/Check Checksum per Netif)	Disabled
--	----------

CHECKSUM_GEN_IP (Generate Software Checksum for Outgoing IP Packets)	Disabled
--	----------

CHECKSUM_GEN_UDP (Generate Software Checksum for Outgoing UDP Packets)	Disabled
--	----------

CHECKSUM_GEN_TCP (Generate Software Checksum for Outgoing TCP Packets)	Disabled
--	----------

CHECKSUM_GEN_ICMP (Generate Software Checksum for Outgoing ICMP Packets)	Enabled
--	---------

CHECKSUM_GEN_ICMP6 (Generate Software Checksum for Outgoing ICMP6 Packets)	Disabled
--	----------

CHECKSUM_CHECK_IP (Generate Software Checksum for Incoming IP Packets)	Disabled
--	----------

CHECKSUM_CHECK_UDP (Generate Software Checksum for Incoming UDP Packets)	Disabled
--	----------

CHECKSUM_CHECK_TCP (Generate Software Checksum for Incoming TCP Packets)	Disabled
--	----------

CHECKSUM_CHECK_ICMP (Generate Software Checksum for Incoming ICMP Packets)	Enabled
--	---------

CHECKSUM_CHECK_ICMP6 (Generate Software Checksum for Incoming ICMP6 Packets)	Disabled
--	----------

7.22.12. Debug:

LwIP Main Debugging Options:

LWIP_DBG_MIN_LEVEL (Minimum Level)	All
------------------------------------	-----

7.22.13. Platform Settings:

Driver_PHY

LAN8742

7.23. USB_DEVICE

Class For FS IP: Mass Storage Class

7.23.1. 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

Class Parameters:

MSC_MEDIA_PACKET (Media I/O buffer Size)	512
--	-----

7.23.2. 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)	22314
PRODUCT_STRING (Product Identifier)	STM32 Mass Storage
CONFIGURATION_STRING (Configuration Identifier)	MSC Config
INTERFACE_STRING (Interface Identifier)	MSC Interface

* User modified value

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC2	PA3	ADC2_IN3	Analog mode	No pull-up and no pull-down	n/a	
DCMI	PE4	DCMI_D4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE5	DCMI_D6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE6	DCMI_D7	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA4	DCMI_HSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA6	DCMI_PIXCLK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC7	DCMI_D1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC8	DCMI_D2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC9	DCMI_D3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA9	DCMI_D0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB6	DCMI_D5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB7	DCMI_VSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
ETH	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA7	ETH_CRS_DV	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PG13	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PG14	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
FSMC	PF0	FSMC_A0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF1	FSMC_A1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF2	FSMC_A2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF3	FSMC_A3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PF4	FSMC_A4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF5	FSMC_A5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF12	FSMC_A6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF13	FSMC_A7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF14	FSMC_A8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF15	FSMC_A9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG0	FSMC_A10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG1	FSMC_A11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE7	FSMC_D4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE8	FSMC_D5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE9	FSMC_D6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE10	FSMC_D7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE11	FSMC_D8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE12	FSMC_D9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE13	FSMC_D10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE14	FSMC_D11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE15	FSMC_D12	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD8	FSMC_D13	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD9	FSMC_D14	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD10	FSMC_D15	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD11	FSMC_A16	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD12	FSMC_A17	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD14	FSMC_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD15	FSMC_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG2	FSMC_A12	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG3	FSMC_A13	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG4	FSMC_A14	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG5	FSMC_A15	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD0	FSMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD1	FSMC_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD4	FSMC_NOE	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD5	FSMC_NWE	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG12	FSMC_NE4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE0	FSMC_NBL0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE1	FSMC_NBL1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	SCCB_SCL
	PB9	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	SCCB_SDA
I2C2	PB10	I2C2_SCL	Alternate Function Open	No pull-up and no pull-down	Very High	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			Drain		*	
	PB11	I2C2_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Very High *	
RCC	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	
	PA8	RCC_MCO_1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
SPI2	PB12	SPI2_NSS	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	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_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PA15	SYS_JTDI	n/a	n/a	n/a	
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	
	PB4	SYS_JTRST	n/a	n/a	n/a	
TIM3	PB0	TIM3_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_NC0
	PB1	TIM3_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_NC1
	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_NC3
	PB5	TIM3_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	PWM_NC2
TIM10	PF6	TIM10_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	BUZZ_OUT
TIM11	PF7	TIM11_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	LED_PWM_CH1
TIM13	PF8	TIM13_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	LED_PWM_CH2
UART5	PC12	UART5_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PD2	UART5_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
USART3	PC10	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PC11	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
GPIO	PE2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OV_PWDN
	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OV_RESET
	PC13-ANTI_TAMP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN_TAMP
	PA0-WKUP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN_WKUP
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BOOT1
	PF11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_LINK
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USB_OTG_FS_ID
	PG15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_STAT

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

8.3.1. 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	0	0
System tick timer	true	15	0
USB On The Go FS global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
TIM1 update interrupt and TIM10 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
I2C2 event interrupt	unused		
I2C2 error interrupt	unused		
SPI2 global interrupt	unused		
USART3 global interrupt	unused		
TIM8 update interrupt and TIM13 global interrupt	unused		
UART5 global interrupt	unused		
Ethernet global interrupt	unused		
Ethernet wake-up interrupt through EXTI line 19	unused		
DCMI global interrupt	unused		
HASH and RNG global interrupts	unused		
FPU global interrupt	unused		

8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
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	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
USB On The Go FS global interrupt	false	true	true

* User modified value

9. System Views

9.1. Category view

9.1.1. Current

Middleware						
FATFS ✓ LWIP ✓ USB_DEVICE ✓						
System Core	Analog	Timers	Connectivity	Multimedia	Security	Computing
DMA	ADC1 ✓	RTC ✓	ETH ✓	DCMI ✓	RNG ✓	
GPIO ✓	ADC2 ✓	TIM3 ✓	FSMC ✓			
IWDG ✓		TIM10 ✓	I2C1 ✓			
NVIC ✓		TIM11 ✓	I2C2 ✓			
RCC ✓		TIM13 ✓	SPI2 ✓			
SYS ✓			UART5 ✓			
			USART3 ✓			
			USB_FS ✓			

10. Docs & Resources

Type	Link
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
Training Material	https://www.st.com/resource/en/sales_guide/sg_sc2154.pdf
Flyers	https://www.st.com/resource/en/flyer/flnucleolrwan.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstmcsuite.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-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/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2834-how-to-get-the-best-adc-accuracy-in-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2867-oscillator-design-guide-for-stm8afals-stm32-mcus-and-mpus-stmicroelectronics.pdf
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stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf

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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/an3364-migration-and-compatibility-guidelines-for-stm32-microcontroller-applications-stmicroelectronics.pdf

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