1. Description

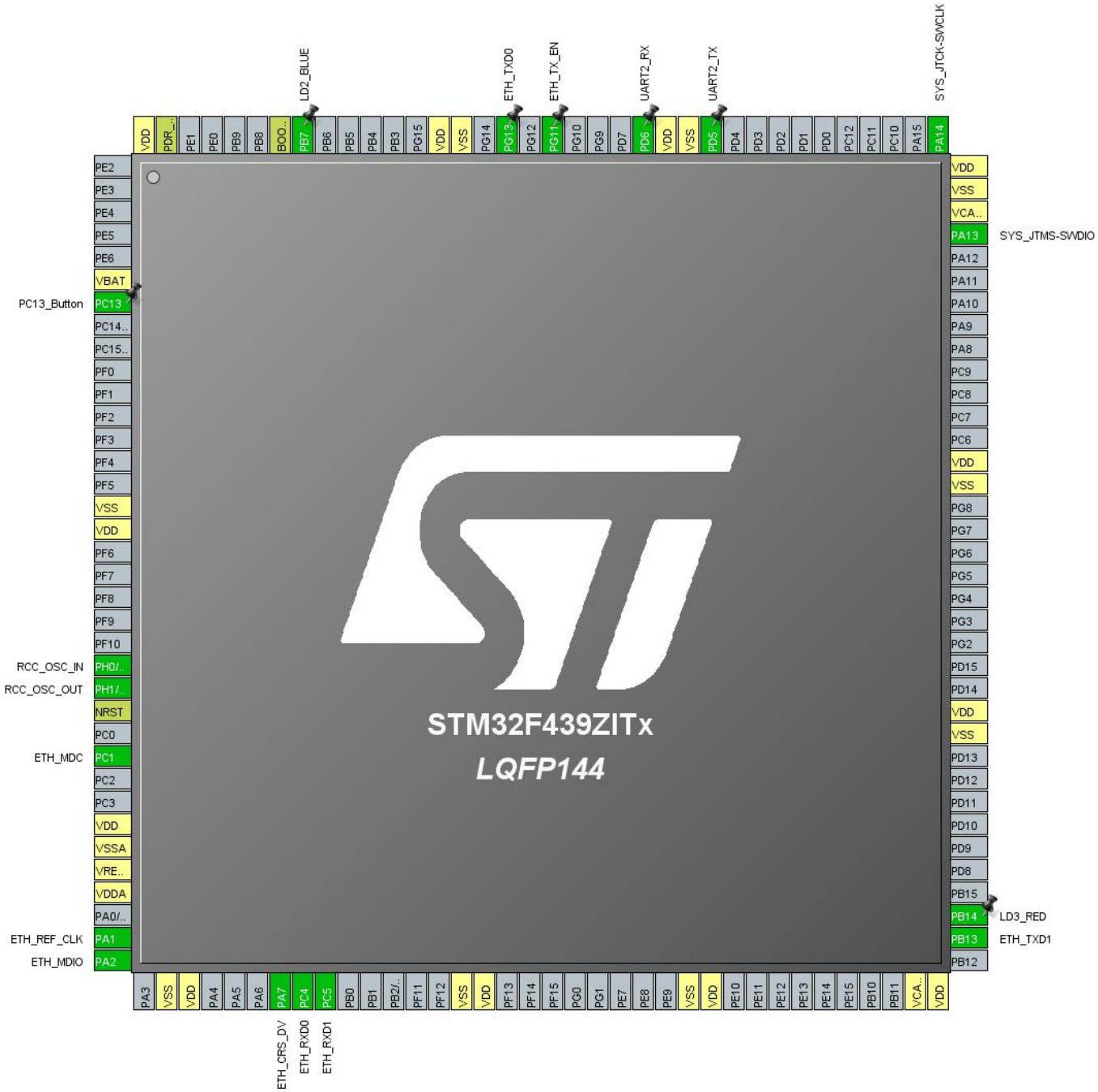
1.1. Project

Project Name	EthTest2
Board Name	custom
Generated with:	STM32CubeMX 5.0.0
Date	12/27/2018

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F429/439
MCU name	STM32F439ZITx
MCU Package	LQFP144
MCU Pin number	144

2. Pinout Configuration



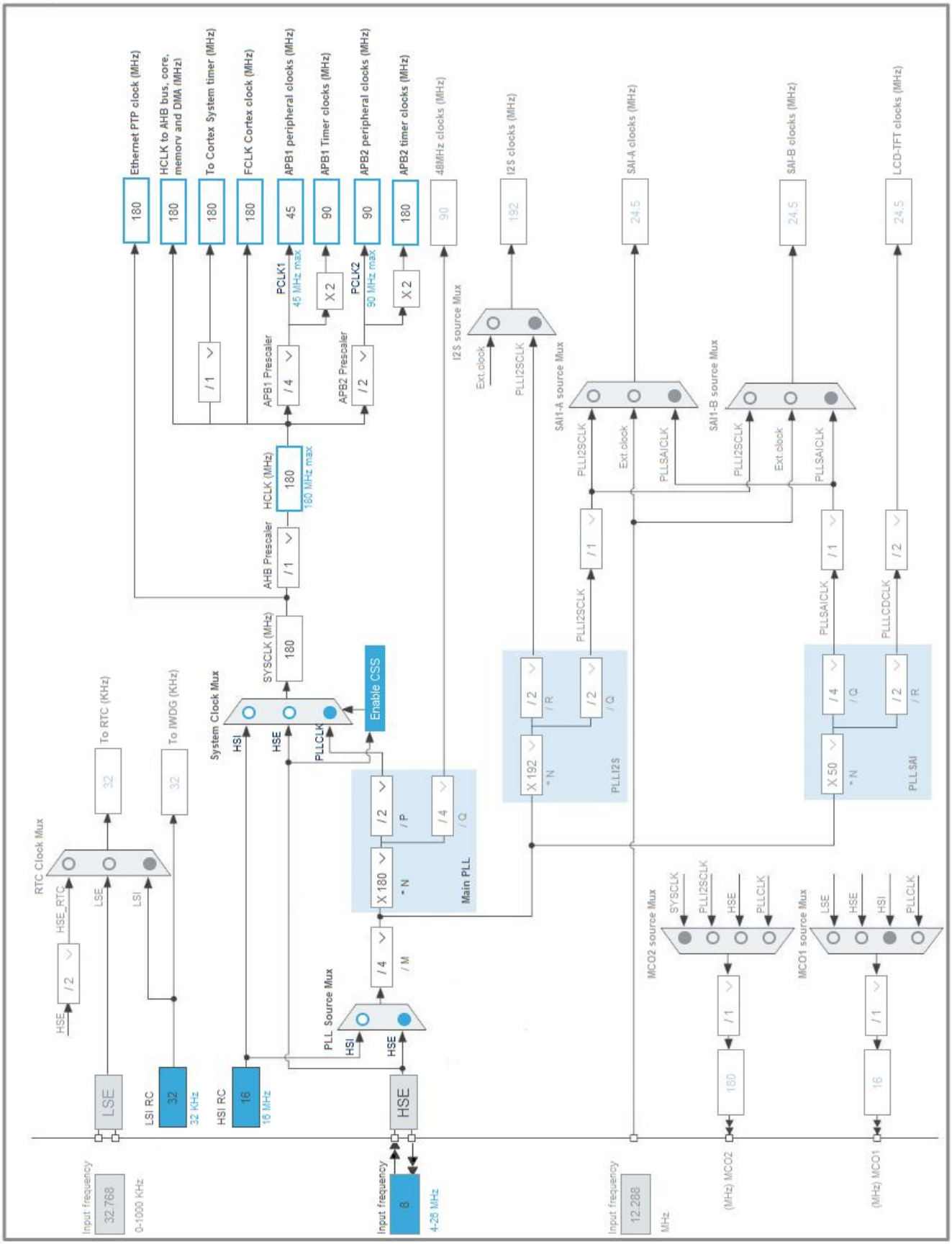
3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
7	PC13 *	I/O	GPIO_Input	PC13_Button
16	VSS	Power		
17	VDD	Power		
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		
35	PA1	I/O	ETH_REF_CLK	
36	PA2	I/O	ETH_MDIO	
38	VSS	Power		
39	VDD	Power		
43	PA7	I/O	ETH_CRS_DV	
44	PC4	I/O	ETH_RXD0	
45	PC5	I/O	ETH_RXD1	
51	VSS	Power		
52	VDD	Power		
61	VSS	Power		
62	VDD	Power		
71	VCAP_1	Power		
72	VDD	Power		
74	PB13	I/O	ETH_TXD1	
75	PB14 *	I/O	GPIO_Output	LD3_RED
83	VSS	Power		
84	VDD	Power		
94	VSS	Power		
95	VDD	Power		
105	PA13	I/O	SYS_JTMS-SWDIO	
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
119	PD5	I/O	USART2_TX	UART2_TX
120	VSS	Power		
121	VDD	Power		
122	PD6	I/O	USART2_RX	UART2_RX
126	PG11	I/O	ETH_TX_EN	
128	PG13	I/O	ETH_TXD0	
130	VSS	Power		
131	VDD	Power		
137	PB7 *	I/O	GPIO_Output	LD2_BLUE
138	BOOT0	Boot		
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	EthTest2
Project Folder	C:\Projects\Workspace_AC6\EthTest2
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F4 V1.23.0

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	Yes
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	STM32F4
Line	STM32F429/439
MCU	STM32F439ZITx
Datasheet	024244_Rev10

6.2. Parameter Selection

Temperature	25
Vdd	null

7. IPs and Middleware Configuration

7.1. ETH

Mode: RMII

7.1.1. Parameter Settings:

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled

General : Ethernet Configuration:

Ethernet MAC Address	**00:80:E1:00:00:02 ***
PHY Address	**0 ***

Ethernet Basic Configuration:

Rx Mode	Polling Mode
TX IP Header Checksum Computation	By hardware

7.1.2. Advanced Parameters:

External PHY Configuration:

PHY	LAN8742A_PHY_ADDRESS
PHY Address Value	0
PHY Reset delay these values are based on a 1 ms Systick interrupt	**0x000000FF ***
PHY Configuration delay	**0x00000FFF ***
PHY Read TimeOut	**0x0000FFFF ***
PHY Write TimeOut	**0x0000FFFF ***

Common : External PHY Configuration:

Transceiver Basic Control Register	**0x00 ***
Transceiver Basic Status Register	**0x01 ***
PHY Reset	**0x8000 ***
Select loop-back mode	**0x4000 ***
Set the full-duplex mode at 100 Mb/s	**0x2100 ***
Set the half-duplex mode at 100 Mb/s	**0x2000 ***
Set the full-duplex mode at 10 Mb/s	**0x0100 ***
Set the half-duplex mode at 10 Mb/s	**0x0000 ***
Enable auto-negotiation function	**0x1000 ***
Restart auto-negotiation function	**0x0200 ***
Select the power down mode	**0x0800 ***
Isolate PHY from MII	

	0x0400 *
Auto-Negotiation process completed	**0x0020 ***
Valid link established	**0x0004 ***
Jabber condition detected	**0x0002 ***

Extended : External PHY Configuration:

PHY special control/status register Offset	**0x10 ***
PHY Speed mask	**0x0002 ***
PHY Duplex mask	**0x0004 ***
PHY Interrupt Source Flag register Offset	**0x000B ***
PHY Link down inturrupt	**0x000B ***

7.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.2.1. 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
TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1
Power Over Drive	Enabled

7.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.4. USART2

Mode: Asynchronous

7.4.1. 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

7.5. LWIP

mode: Enabled

Advanced parameters are not listed except if modified by user.

7.5.1. General Settings:

LwIP Version:

LwIP Version (Version of LwIP supported by CubeMX ** CubeMX specific **)	2.0.3

IPv4 - DHCP Options:

LWIP_DHCP (DHCP Module)	Enabled

RTOS Dependency:

WITH_RTOS (Use FREERTOS ** CubeMX specific **)	Disabled

Protocols Options:

LWIP_ICMP (ICMP Module Activation)	Enabled
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

7.5.2. Key Options:

IPv4 - DHCP Options:

LWIP_DHCP_CHECK_LINK_UP (DHCP with Link Up Check)	**Enabled ***

Infrastructure - OS Awarness Option:

NO_SYS (OS Awarness)	OS Not Used

Infrastructure - Timers Options:

LWIP_TIMERS (Use Support For sys_timeout)	Enabled

Infrastructure - Core Locking and MPU Options:

SYS_LIGHTWEIGHT_PROT (Memory Functions Protection)	Disabled

Infrastructure - Heap and Memory Pools Options:

MEM_SIZE (Heap Memory Size)	1600

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

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
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_LINK_CALLBACK (Callback Function on Interface Link Changes)	Disabled

NETIF - Loopback Interface Options:

LWIP_NETIF_LOOPBACK (NETIF Loopback)	Disabled

Thread Safe APIs - Socket Options:

LWIP_SOCKET (Socket API)	Disabled

7.5.3. PPP:

PPP Options:

PPP_SUPPORT (PPP Module)	Disabled

7.5.4. IPv6:

IPv6 Options:

LWIP_IPV6 (IPv6 Protocol)	Disabled

7.5.5. HTTPD:

HTTPD Options:

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

7.5.6. SNMP:

SNMP Options:

LWIP_SNMP (LwIP SNMP Agent)	Disabled

7.5.7. SNTP:

SNTP Options:

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

7.5.8. MDNS/TFTP:

MDNS Options:

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

TFTP Options:

LWIP_TFTP (TFTP Support ** CubeMX specific **)	Disabled

7.5.9. Perf/Checks:

Sanity Checks:

LWIP_DISABLE_TCP_SANITY_CHECKS (TCP Sanity Checks)	Disabled
LWIP_DISABLE_MEMP_SANITY_CHECKS (MEMP Sanity Checks)	Disabled

Performance Options:

LWIP_PERF (Performace Testing for LwIP)	Disabled

7.5.10. Statistics:

Debug - Statistics Options:

LWIP_STATS (Statictics Collection)	Disabled

7.5.11. Checksum:

Infrastructure - Checksum Options:

CHECKSUM_BY_HARDWARE (Hardware Checksum ** CubeMX specific **)	Disabled
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)	Disabled
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)	Disabled
CHECKSUM_CHECK_ICMP6 (Generate Software Checksum for Incoming ICMP6 Packets)	Disabled

7.5.12. Debug:

LwIP Main Debugging Options:

LWIP_DBG_MIN_LEVEL (Minimum Level)	All
ETHARP_DEBUG (Debug in Ethernet ARP)	**Enabled ***
NETIF_DEBUG (Debug in NETIF)	**Enabled ***
PBUF_DEBUG (Debug in Pbuf)	**Enabled ***
ICMP_DEBUG (Debug in ICMP)	**Enabled ***
SYS_DEBUG (Debug in System)	**Enabled ***
UDP_DEBUG (Debug in UDP)	**Enabled ***
DHCP_DEBUG (Debug in DHCP)	**Enabled ***

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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** *	
	PB13	ETH_TXD1	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** *	
RCC	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High** *	UART2_TX
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High** *	UART2_RX
GPIO	PC13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	PC13_Button
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3_RED
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2_BLUE

8.2. DMA configuration

DMA request	Stream	Direction	Priority
MEMTOMEM	DMA2_Stream0	Memory To Memory	Low

MEMTOMEM: DMA2_Stream0 DMA request Settings:

Mode:	Normal
Use fifo:	**Enable ***
FIFO Threshold:	Full
Src Memory Increment:	**Enable ***
Dst Memormy Increment:	**Enable ***
Src Memory Data Width:	Byte
Dst Memormy Data Width:	Byte
Src Memory Burst Size:	Single
Dst Memormy Burst Size:	Single

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
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	0	0
USART2 global interrupt	true	0	0
Ethernet global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
DMA2 stream0 global interrupt	unused		
Ethernet wake-up interrupt through EXTI line 19	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report