1. Description

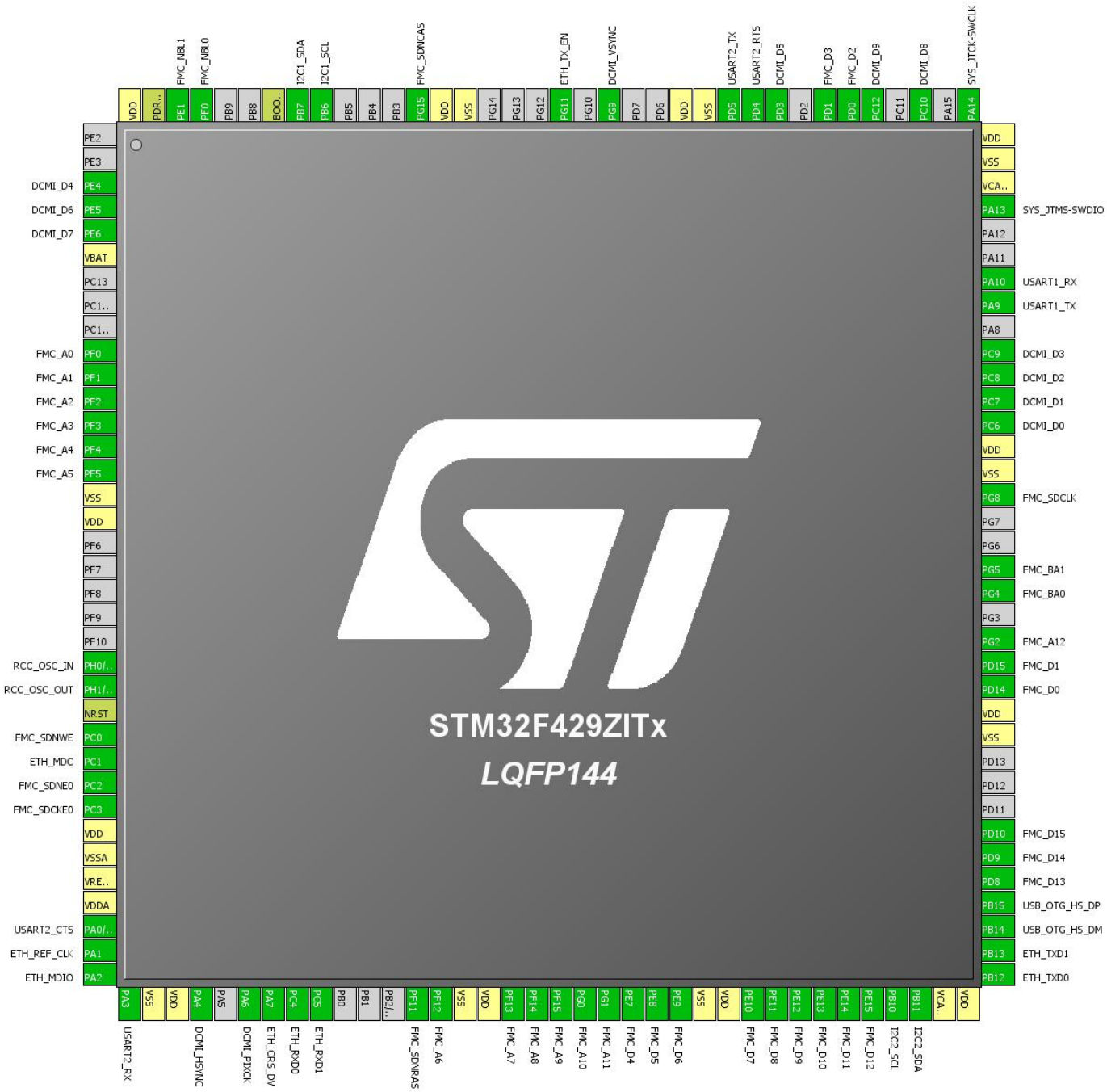
1.1. Project

Project Name	ECAM01
Board Name	ECAM01
Generated with:	STM32CubeMX 4.9.0
Date	08/13/2015

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F429/439
MCU name	STM32F429ZITx
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
3	PE4	I/O	DCMI_D4	
4	PE5	I/O	DCMI_D6	
5	PE6	I/O	DCMI_D7	
6	VBAT	Power		
10	PF0	I/O	FMC_A0	
11	PF1	I/O	FMC_A1	
12	PF2	I/O	FMC_A2	
13	PF3	I/O	FMC_A3	
14	PF4	I/O	FMC_A4	
15	PF5	I/O	FMC_A5	
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		
26	PC0	I/O	FMC_SDNWE	
27	PC1	I/O	ETH_MDC	
28	PC2	I/O	FMC_SDNE0	
29	PC3	I/O	FMC_SDCKE0	
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0/WKUP	I/O	USART2_CTS	
35	PA1	I/O	ETH_REF_CLK	
36	PA2	I/O	ETH_MDIO	
37	PA3	I/O	USART2_RX	
38	VSS	Power		
39	VDD	Power		
40	PA4	I/O	DCMI_HSYNC	
42	PA6	I/O	DCMI_PIXCK	
43	PA7	I/O	ETH_CRS_DV	
44	PC4	I/O	ETH_RXD0	
45	PC5	I/O	ETH_RXD1	
49	PF11	I/O	FMC_SDNRAS	
50	PF12	I/O	FMC_A6	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
51	VSS	Power		
52	VDD	Power		
53	PF13	I/O	FMC_A7	
54	PF14	I/O	FMC_A8	
55	PF15	I/O	FMC_A9	
56	PG0	I/O	FMC_A10	
57	PG1	I/O	FMC_A11	
58	PE7	I/O	FMC_D4	
59	PE8	I/O	FMC_D5	
60	PE9	I/O	FMC_D6	
61	VSS	Power		
62	VDD	Power		
63	PE10	I/O	FMC_D7	
64	PE11	I/O	FMC_D8	
65	PE12	I/O	FMC_D9	
66	PE13	I/O	FMC_D10	
67	PE14	I/O	FMC_D11	
68	PE15	I/O	FMC_D12	
69	PB10	I/O	I2C2_SCL	
70	PB11	I/O	I2C2_SDA	
71	VCAP_1	Power		
72	VDD	Power		
73	PB12	I/O	ETH_TXD0	
74	PB13	I/O	ETH_TXD1	
75	PB14	I/O	USB_OTG_HS_DM	
76	PB15	I/O	USB_OTG_HS_DP	
77	PD8	I/O	FMC_D13	
78	PD9	I/O	FMC_D14	
79	PD10	I/O	FMC_D15	
83	VSS	Power		
84	VDD	Power		
85	PD14	I/O	FMC_D0	
86	PD15	I/O	FMC_D1	
87	PG2	I/O	FMC_A12	
89	PG4	I/O	FMC_BA0	
90	PG5	I/O	FMC_BA1	
93	PG8	I/O	FMC_SDCLK	
94	VSS	Power		
95	VDD	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
96	PC6	I/O	DCMI_D0	
97	PC7	I/O	DCMI_D1	
98	PC8	I/O	DCMI_D2	
99	PC9	I/O	DCMI_D3	
101	PA9	I/O	USART1_TX	
102	PA10	I/O	USART1_RX	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
111	PC10	I/O	DCMI_D8	
113	PC12	I/O	DCMI_D9	
114	PD0	I/O	FMC_D2	
115	PD1	I/O	FMC_D3	
117	PD3	I/O	DCMI_D5	
118	PD4	I/O	USART2_RTS	
119	PD5	I/O	USART2_TX	
120	VSS	Power		
121	VDD	Power		
124	PG9	I/O	DCMI_VSYNC	
126	PG11	I/O	ETH_TX_EN	
130	VSS	Power		
131	VDD	Power		
132	PG15	I/O	FMC_SDNCAS	
136	PB6	I/O	I2C1_SCL	
137	PB7	I/O	I2C1_SDA	
138	BOOT0	Boot		
141	PE0	I/O	FMC_NBL0	
142	PE1	I/O	FMC_NBL1	
143	PDR_ON	Reset		
144	VDD	Power		

4. IPs and Middleware Configuration

4.1. CRC

mode: Activated

4.2. DCMI

DCMI: Slave 10 bits External Synchro

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

4.3. ETH

Mode: RMII

Advanced : Ethernet Media Configuration:

Auto Negotiation	Enabled

General : Ethernet Configuration:

Ethernet MAC Address	00:80:E1:00:00:00
PHY Address	1

Ethernet Basic Configuration:

Rx Mode	Polling Mode
TX IP Header Checksum Computation	By hardware

4.4. FMC

4.4.1. [SDRAM 1]

Clock and chip enable: SDCKE0+SDNE0
Internal bank number: 4 banks

Address: 13 bits
Data: 16 bits
mode: Byte enable

SDRAM control:

Bank	SDRAM bank 1
Column bit number	8 bits
Row bit number	11 bits
CAS latency	1 memory clock cycle
Write protection	Disabled
SDRAM common clock	Disabled
SDRAM common burst read	Disabled
SDRAM common read pipe delay	0 HCLK clock cycle

SDRAM timing in memory clock cycles:

Load mode register to active delay	16
Exit self-refresh delay	16
Self refresh time	16
SDRAM common row cycle delay	16
Write recovery time	16
SDRAM common row precharge delay	16
Row to column delay	16

4.5. I2C1

I2C: I2C

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

4.6. I2C2

I2C: I2C

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

4.7. IWDG

mode: Activated

Clocking:

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

4.8. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

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

Power Parameters:

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

4.9. RNG

mode: Activated

4.10. SYS

Debug: Serial Wire Debug (SWD)

4.11. USART1

Mode: Asynchronous

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

4.12. USART2

Mode: Asynchronous

Hardware Flow Control (RS232): CTS/RTS

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

4.13. USB_OTG_HS

Internal Phy: Device_Only

Speed	Device Full Speed 12MBit/s
Endpoint 0 Max Packet size	64 Bytes
Enable internal IP DMA	Enabled
Physical interface	Internal Phy
Low power	Disabled

Link Power Management	Disabled
Use dedicated end point 1 interrupt	Disabled
VBUS sensing	Disabled

4.14. LWIP

mode: Enabled

Advanced parameters are not listed except if modified by user.

LwIP Version:

LwIP Version (Version of LwIP supported by CubeMX)	1.4.1

DHCP Option:

LWIP_DHCP (DHCP Module)	Enabled

RTOS Settings:

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

Platform Specific Locking:

SYS_LIGHTWEIGHT_PROT (Memory Functions Protection)	Disabled
NO_SYS (LwIP Facilities)	LwIP Facilities Disabled
NO_SYS_NO_TIMERS (Drop Support For sys_timeout)	Disabled

Memory Options:

MEM_SIZE (Heap Memory Size)	1600

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

ARP Options:

LWIP_ARP (ARP Functionality)	Enabled

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

SNMP Options:

LWIP_SNMP (SNMP Module)	Disabled

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
LWIP_NETIF_LOOPBACK (NETIF Loopback)	Disabled

Sequential Layer options:

LWIP_NETCONN (NETCONN API)	Disabled

Socket Options:

LWIP_SOCKET (Socket API)	Disabled
LWIP_COMPAT_SOCKETS (BSD-style Socket Functions Names)	Enabled

Statistics Options:

LWIP_STATS (Statictics Collection)	Disabled

Checksum Options:

CHECKSUM_BY_HARDWARE (Hardware Checksum ** CubeMX specific **)	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_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

Debugging Options:

LWIP_DBG_MIN_LEVEL (Minimum Level)	All

4.15. USB_DEVICE

Class For HS IP: Mass Storage Class

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_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

Device Descriptor:

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

Device Descriptor HS:

PID (Product IDentifier)	22314
PRODUCT_STRING (Product Identifier)	STM32 Mass Storage
SERIALNUMBER_STRING (Serial number)	00000000001A
CONFIGURATION_STRING (Configuration Identifier)	MSC Config
INTERFACE_STRING (Interface Identifier)	MSC Interface

Class Parameters:

MSC_MEDIA_PACKET (Media I/O buffer Size)	512

* User modified value

5. System Configuration

5.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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_PIXCK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC6	DCMI_D0	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	
	PC10	DCMI_D8	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC12	DCMI_D9	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD3	DCMI_D5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG9	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	**High ***	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA7	ETH_CRS_DV	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB12	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB13	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
FMC	PF0	FMC_A0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF1	FMC_A1	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF2	FMC_A2	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF3	FMC_A3	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF4	FMC_A4	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF5	FMC_A5	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PC0	FMC_SDNWE	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PC2	FMC_SDNE0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PC3	FMC_SDCKE0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF11	FMC_SDNRAS	Alternate Function Push Pull	No pull-up and no pull-down	High	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PF12	FMC_A6	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF13	FMC_A7	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF14	FMC_A8	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PF15	FMC_A9	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG0	FMC_A10	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG1	FMC_A11	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE7	FMC_D4	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE8	FMC_D5	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE9	FMC_D6	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE10	FMC_D7	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE11	FMC_D8	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE12	FMC_D9	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE13	FMC_D10	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE14	FMC_D11	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE15	FMC_D12	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD8	FMC_D13	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD9	FMC_D14	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD10	FMC_D15	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD14	FMC_D0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD15	FMC_D1	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG2	FMC_A12	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG4	FMC_BA0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG5	FMC_BA1	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG8	FMC_SDCLK	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD0	FMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PD1	FMC_D3	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PG15	FMC_SDNCAS	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE0	FMC_NBL0	Alternate Function Push Pull	No pull-up and no pull-down	High	
	PE1	FMC_NBL1	Alternate Function Push Pull	No pull-up and no pull-down	High	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**High ***	
I2C2	PB10	I2C2_SCL	Alternate Function Open Drain	Pull-up	**High ***	
	PB11	I2C2_SDA	Alternate Function Open Drain	Pull-up	**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-	n/a	n/a	n/a	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
		SWDIO				
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	
USART2	PA0/WKUP	USART2_CTS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	**High ***	
	PD4	USART2_RTS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**High ***	
USB_OTG_HS	PB14	USB_OTG_HS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PB15	USB_OTG_HS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	

5.2. DMA configuration

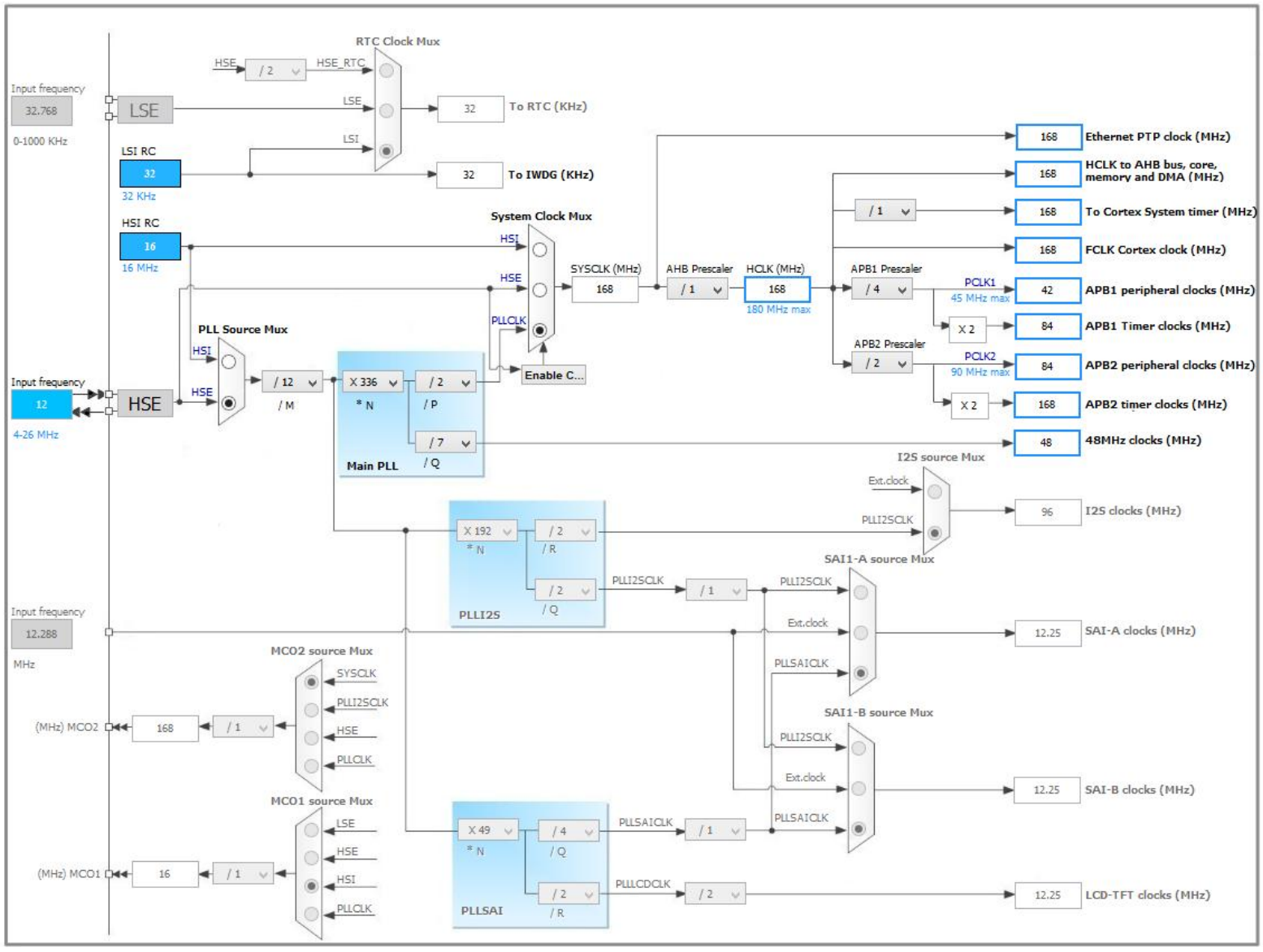
nothing configured in DMA service

5.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
USB On The Go HS global interrupt	true	0	0
Non Maskable Interrupt	unused		
Memory management fault	unused		
Pre-fetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug Monitor	unused		
PVD through EXTI Line16 interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
I2C2 event interrupt	unused		
I2C2 error interrupt	unused		
USART1 global interrupt	unused		
USART2 global interrupt	unused		
FMC global interrupt	unused		
Ethernet global interrupt	unused		
Ethernet Wakeup through EXTI Line19 interrupt	unused		
USB On The Go HS End Point 1 Out global interrupt	unused		
USB On The Go HS End Point 1 In global interrupt	unused		
DCMI global interrupt	unused		
HASH and RNG global interrupt	unused		

*** User modified value**

6. Clock Tree Configuration



7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F429/439
MCU	STM32F429ZITx
Datasheet	024030_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	ECAM01
Project Folder	C:\Users\flyinglotus1983\Dropbox\github\fpd-firmware\STMcube\ECAM01
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F4 V1.7.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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

8.3. Toolchains Settings

Name	Value
Compiler Optimizations	Balanced Size/Speed