

1. Description

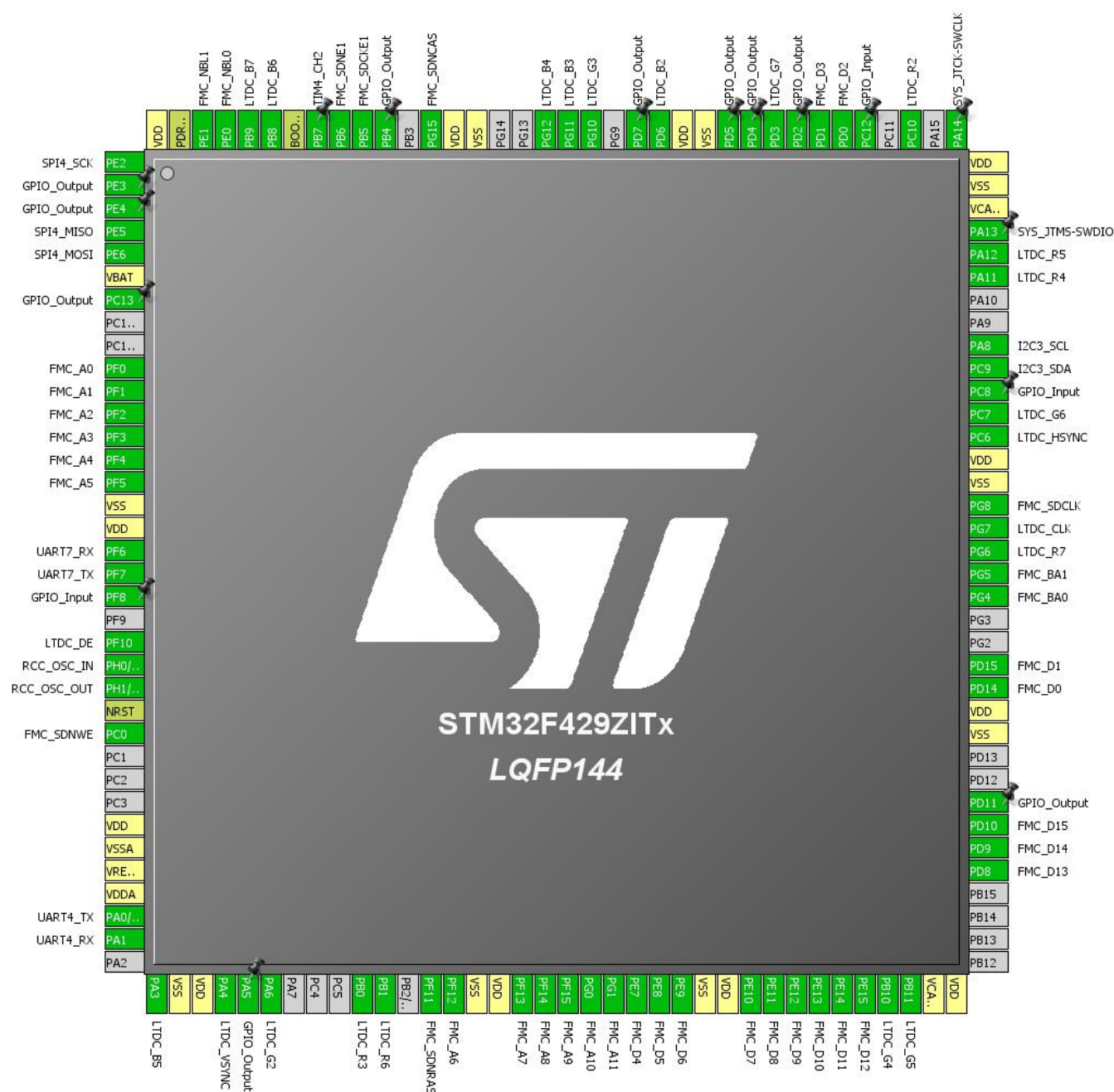
1.1. Project

Project Name	Copperfeild_II
Board Name	Copperfeild_II
Generated with:	STM32CubeMX 4.16.0
Date	08/10/2016

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
1	PE2	I/O	SPI4_SCK	
2	PE3 *	I/O	GPIO_Output	
3	PE4 *	I/O	GPIO_Output	
4	PE5	I/O	SPI4_MISO	
5	PE6	I/O	SPI4_MOSI	
6	VBAT	Power		
7	PC13 *	I/O	GPIO_Output	
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		
18	PF6	I/O	UART7_RX	
19	PF7	I/O	UART7_TX	
20	PF8 *	I/O	GPIO_Input	
22	PF10	I/O	LTDC_DE	
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	
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0/WKUP	I/O	UART4_TX	
35	PA1	I/O	UART4_RX	
37	PA3	I/O	LTDC_B5	
38	VSS	Power		
39	VDD	Power		
40	PA4	I/O	LTDC_VSYNC	
41	PA5 *	I/O	GPIO_Output	
42	PA6	I/O	LTDC_G2	
46	PB0	I/O	LTDC_R3	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
47	PB1	I/O	LTDC_R6	
49	PF11	I/O	FMC_SDNRAS	
50	PF12	I/O	FMC_A6	
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	LTDC_G4	
70	PB11	I/O	LTDC_G5	
71	VCAP_1	Power		
72	VDD	Power		
77	PD8	I/O	FMC_D13	
78	PD9	I/O	FMC_D14	
79	PD10	I/O	FMC_D15	
80	PD11 *	I/O	GPIO_Output	
83	VSS	Power		
84	VDD	Power		
85	PD14	I/O	FMC_D0	
86	PD15	I/O	FMC_D1	
89	PG4	I/O	FMC_BA0	
90	PG5	I/O	FMC_BA1	
91	PG6	I/O	LTDC_R7	
92	PG7	I/O	LTDC_CLK	
93	PG8	I/O	FMC_SDCLK	
94	VSS	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
95	VDD	Power		
96	PC6	I/O	LTDC_HSYNC	
97	PC7	I/O	LTDC_G6	
98	PC8 *	I/O	GPIO_Input	
99	PC9	I/O	I2C3_SDA	
100	PA8	I/O	I2C3_SCL	
103	PA11	I/O	LTDC_R4	
104	PA12	I/O	LTDC_R5	
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	LTDC_R2	
113	PC12 *	I/O	GPIO_Input	
114	PD0	I/O	FMC_D2	
115	PD1	I/O	FMC_D3	
116	PD2 *	I/O	GPIO_Output	
117	PD3	I/O	LTDC_G7	
118	PD4 *	I/O	GPIO_Output	
119	PD5 *	I/O	GPIO_Output	
120	VSS	Power		
121	VDD	Power		
122	PD6	I/O	LTDC_B2	
123	PD7 *	I/O	GPIO_Output	
125	PG10	I/O	LTDC_G3	
126	PG11	I/O	LTDC_B3	
127	PG12	I/O	LTDC_B4	
130	VSS	Power		
131	VDD	Power		
132	PG15	I/O	FMC_SDNCS	
134	PB4 *	I/O	GPIO_Output	
135	PB5	I/O	FMC_SDCKE1	
136	PB6	I/O	FMC_SDNE1	
137	PB7	I/O	TIM4_CH2	
138	BOOT0	Boot		
139	PB8	I/O	LTDC_B6	
140	PB9	I/O	LTDC_B7	
141	PE0	I/O	FMC_NBL0	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
142	PE1	I/O	FMC_NBL1	
143	PDR_ON	Reset		
144	VDD	Power		

* The pin is affected with an I/O function



5. IPs and Middleware Configuration

5.1. FMC

SDRAM 2

Clock and chip enable: SDCKE1+SDNE1

Internal bank number: 4 banks

Address: 12 bits

Data: 16 bits

Byte enable: set

5.1.1. SDRAM 2:

SDRAM control:

Bank	SDRAM bank 2
Column bit number	8 bits
Row bit number	12 bits *
CAS latency	3 memory clock cycles *
Write protection	Disabled
SDRAM common clock	2 HCLK clock cycles *
SDRAM common burst read	Disabled
SDRAM common read pipe delay	1 HCLK clock cycle *

SDRAM timing in memory clock cycles:

Load mode register to active delay	2 *
Exit self-refresh delay	7 *
Self refresh time	4 *
SDRAM common row cycle delay	7 *
Write recovery time	7 *
SDRAM common row precharge delay	2 *
Row to column delay	2 *

5.2. I2C3

I2C: I2C

5.2.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

5.3. LTDC

Display Type: RGB666 (18 bits)

5.3.1. Parameter Settings:

Synchronization for Width:

Horizontal Synchronization Width	3 *
Horizontal Back Porch	3 *
Active Width	320 *
Horizontal Front Porch	3 *
HSync Width	2
Accumulated Horizontal Back Porch Width	5
Accumulated Active Width	325
Total Width	328

Synchronization for Height:

Vertical Synchronization Height	1 *
Vertical Back Porch	2
Active Height	480
Vertical Front Porch	2
VSynch Height	0
Accumulated Vertical Back Porch Height	2
Accumulated Active Height	482
Total Height	484

Signal Polarity:

Horizontal Synchronization Polarity	Active Low
Vertical Synchronization Polarity	Active Low

Data Enable Polarity	Active Low
Pixel Clock Polarity	Normal Input

BackGround Color:

Red	0
Green	0
Blue	0

5.3.2. Layer Settings:

BackGround Color:

Layer 0 - Blue	0
Layer 0 - Green	0
Layer 0 - Red	0

Number of Layers:

Number of Layers	1 layer *
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Windows Position:

Layer 0 - Window Horizontal Start	0
Layer 0 - Window Horizontal Stop	319 *
Layer 0 - Window Vertical Start	0
Layer 0 - Window Vertical Stop	479 *

Pixel Parameters:

Layer 0 - Pixel Format	ARGB8888
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Blending:

Layer 0 - Alpha constant for blending	0
Layer 0 - Default Alpha value	0
Layer 0 - Blending Factor1	Alpha constant
Layer 0 - Blending Factor2	Alpha constant

Frame Buffer:

Layer 0 - Color Frame Buffer Start Adress	0xD0000000 *
Layer 0 - Color Frame Buffer Line Length (Image Width)	320 *
Layer 0 - Color Frame Buffer Number of Lines (Image Height)	480 *

5.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.4.1. 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 Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

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

5.5. SPI4

Mode: Full-Duplex Master

5.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	45.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.6. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.7. TIM4

Channel2: PWM Generation CH2

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 2:

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

5.8. UART4

Mode: Asynchronous

5.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.9. UART7

Mode: Asynchronous

5.9.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
FMC	PF0	FMC_A0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF1	FMC_A1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF2	FMC_A2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF3	FMC_A3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF4	FMC_A4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF5	FMC_A5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC0	FMC_SDNWE	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF11	FMC_SDNRAS	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF12	FMC_A6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF13	FMC_A7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF14	FMC_A8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PF15	FMC_A9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG0	FMC_A10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG1	FMC_A11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE7	FMC_D4	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE8	FMC_D5	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE9	FMC_D6	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE10	FMC_D7	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE11	FMC_D8	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE12	FMC_D9	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE13	FMC_D10	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE14	FMC_D11	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE15	FMC_D12	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD8	FMC_D13	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD9	FMC_D14	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD10	FMC_D15	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD14	FMC_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD15	FMC_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG4	FMC_BA0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG5	FMC_BA1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG8	FMC_SDCLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD0	FMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD1	FMC_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PG15	FMC_SDNCAS	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
	PB5	FMC_SDCKE1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PB6	FMC_SDNE1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE0	FMC_NBL0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PE1	FMC_NBL1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
I2C3	PC9	I2C3_SDA	Alternate Function Open Drain	Pull-up	Very High *	
	PA8	I2C3_SCL	Alternate Function Open Drain	Pull-up	Very High *	
LTDC	PF10	LTDC_DE	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA3	LTDC_B5	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA4	LTDC_VSYNC	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA6	LTDC_G2	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB0	LTDC_R3	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB1	LTDC_R6	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB10	LTDC_G4	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB11	LTDC_G5	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PG6	LTDC_R7	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PG7	LTDC_CLK	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PC6	LTDC_HSYNC	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PC7	LTDC_G6	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA11	LTDC_R4	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PA12	LTDC_R5	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PC10	LTDC_R2	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PD3	LTDC_G7	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PD6	LTDC_B2	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PG10	LTDC_G3	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PG11	LTDC_B3	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PG12	LTDC_B4	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB8	LTDC_B6	Alternate Function Push Pull	No pull-up and no pull-down	High *	
	PB9	LTDC_B7	Alternate Function Push Pull	No pull-up and no pull-down	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	
SPI4	PE2	SPI4_SCK	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
	PE5	SPI4_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PE6	SPI4_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	
TIM4	PB7	TIM4_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
UART4	PA0/WKUP	UART4_TX	Alternate Function Push Pull	Pull-up	Very High *	
	PA1	UART4_RX	Alternate Function Push Pull	Pull-up	Very High *	
UART7	PF6	UART7_RX	Alternate Function Push Pull	Pull-up	Very High *	
	PF7	UART7_TX	Alternate Function Push Pull	Pull-up	Very High *	
GPIO	PE3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PE4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PF8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PD2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

6.2. DMA configuration

nothing configured in DMA service

6.3. 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
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM4 global interrupt	unused		
FMC global interrupt	unused		
UART4 global interrupt	unused		
I2C3 event interrupt	unused		
I2C3 error interrupt	unused		
FPU global interrupt	unused		
UART7 global interrupt	unused		
SPI4 global interrupt	unused		
LTDC global interrupt	unused		
LTDC global error interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F429/439
MCU	STM32F429ZITx
Datasheet	024030_Rev8

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	Copperfeild_II
Project Folder	C:\chendong\My document\code\STM32\JZHTFT\Copperfeild_II
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F4 V1.13.0

8.2. 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	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