



1. Description

1.1. Project

Project Name	ELOX_EDM_Controller
Board Name	custom
Generated with:	STM32CubeMX 6.16.0
Date	12/22/2025

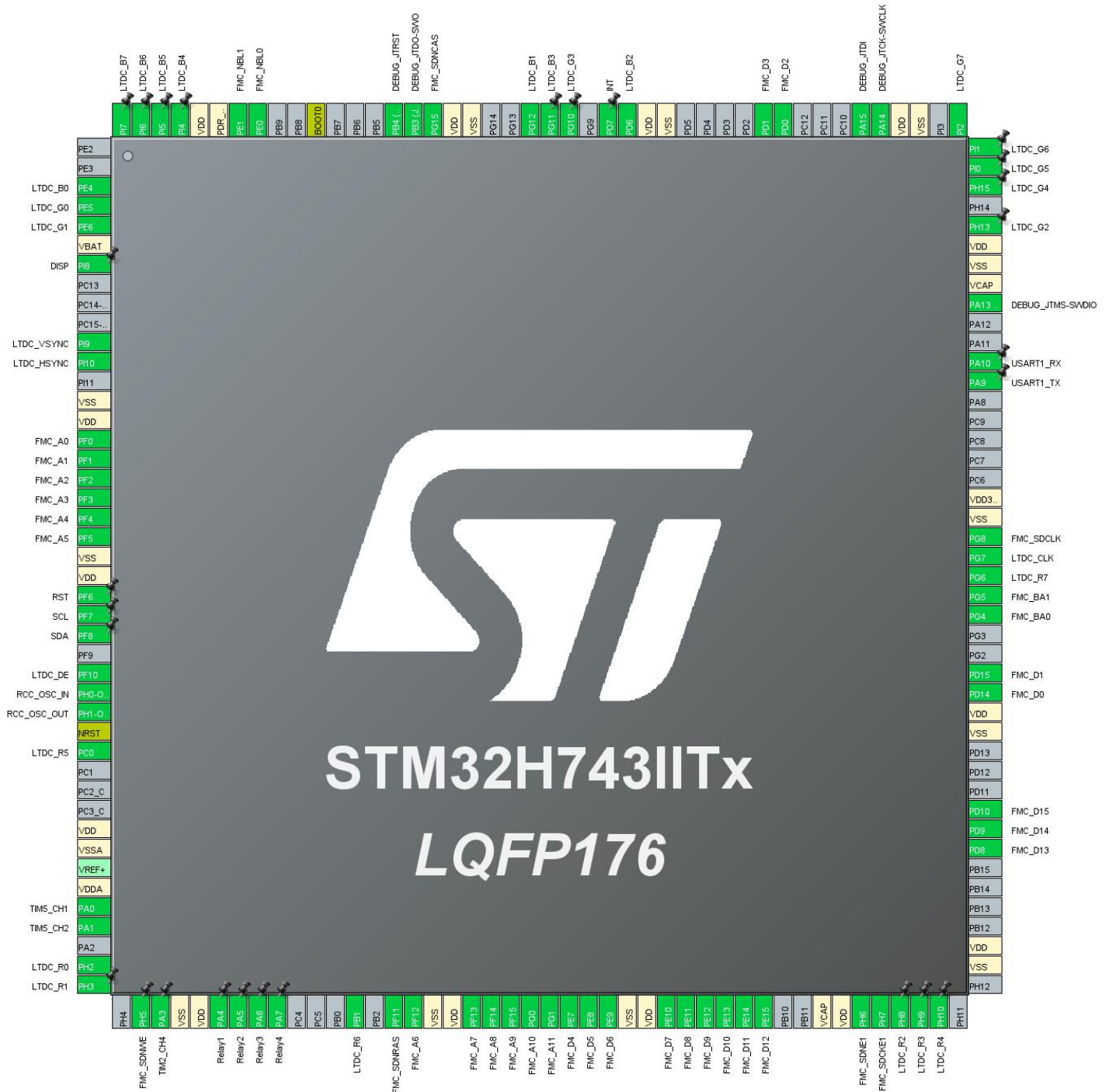
1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H743/753
MCU name	STM32H743IITx
MCU Package	LQFP176
MCU Pin number	176

1.3. Core(s) information

Core(s)	ARM Cortex-M7
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2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
3	PE4	I/O	LTDC_B0	
4	PE5	I/O	LTDC_G0	
5	PE6	I/O	LTDC_G1	
6	VBAT	Power		
7	PI8 *	I/O	GPIO_Output	DISP
11	PI9	I/O	LTDC_VSYNC	
12	PI10	I/O	LTDC_HSYNC	
14	VSS	Power		
15	VDD	Power		
16	PF0	I/O	FMC_A0	
17	PF1	I/O	FMC_A1	
18	PF2	I/O	FMC_A2	
19	PF3	I/O	FMC_A3	
20	PF4	I/O	FMC_A4	
21	PF5	I/O	FMC_A5	
22	VSS	Power		
23	VDD	Power		
24	PF6 *	I/O	GPIO_Output	RST
25	PF7 *	I/O	GPIO_Output	SCL
26	PF8 *	I/O	GPIO_Output	SDA
28	PF10	I/O	LTDC_DE	
29	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
30	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
31	NRST	Reset		
32	PC0	I/O	LTDC_R5	
36	VDD	Power		
37	VSSA	Power		
39	VDDA	Power		
40	PA0	I/O	TIM5_CH1	
41	PA1	I/O	TIM5_CH2	
43	PH2	I/O	LTDC_R0	
44	PH3	I/O	LTDC_R1	
46	PH5	I/O	FMC_SDNWE	
47	PA3	I/O	TIM2_CH4	
48	VSS	Power		
49	VDD	Power		

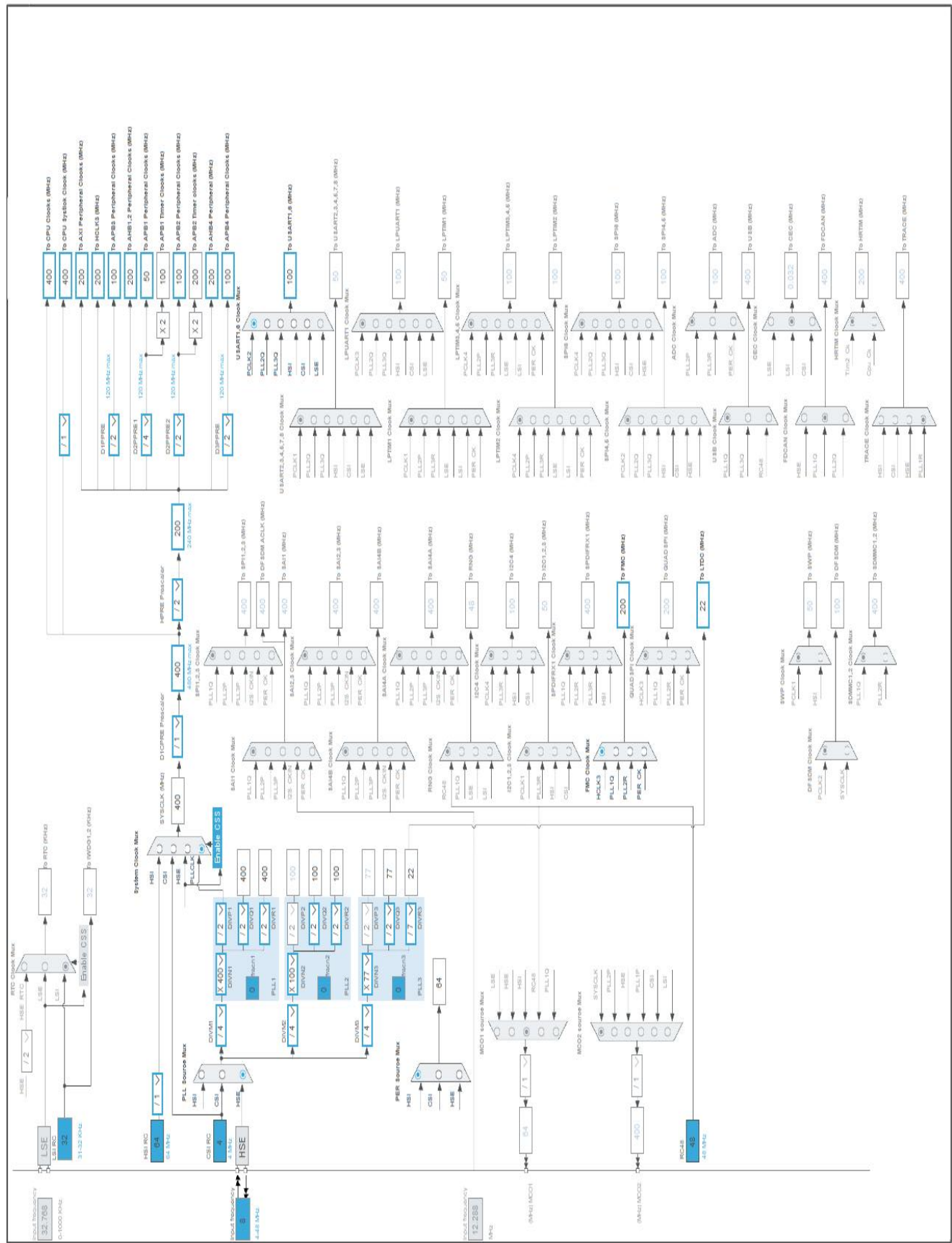
Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
50	PA4 *	I/O	GPIO_Output	Relay1
51	PA5 *	I/O	GPIO_Output	Relay2
52	PA6 *	I/O	GPIO_Output	Relay3
53	PA7 *	I/O	GPIO_Output	Relay4
57	PB1	I/O	LTDC_R6	
59	PF11	I/O	FMC_SDNRAS	
60	PF12	I/O	FMC_A6	
61	VSS	Power		
62	VDD	Power		
63	PF13	I/O	FMC_A7	
64	PF14	I/O	FMC_A8	
65	PF15	I/O	FMC_A9	
66	PG0	I/O	FMC_A10	
67	PG1	I/O	FMC_A11	
68	PE7	I/O	FMC_D4	
69	PE8	I/O	FMC_D5	
70	PE9	I/O	FMC_D6	
71	VSS	Power		
72	VDD	Power		
73	PE10	I/O	FMC_D7	
74	PE11	I/O	FMC_D8	
75	PE12	I/O	FMC_D9	
76	PE13	I/O	FMC_D10	
77	PE14	I/O	FMC_D11	
78	PE15	I/O	FMC_D12	
81	VCAP	Power		
82	VDD	Power		
83	PH6	I/O	FMC_SDNE1	
84	PH7	I/O	FMC_SDCKE1	
85	PH8	I/O	LTDC_R2	
86	PH9	I/O	LTDC_R3	
87	PH10	I/O	LTDC_R4	
90	VSS	Power		
91	VDD	Power		
96	PD8	I/O	FMC_D13	
97	PD9	I/O	FMC_D14	
98	PD10	I/O	FMC_D15	
102	VSS	Power		
103	VDD	Power		

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
104	PD14	I/O	FMC_D0	
105	PD15	I/O	FMC_D1	
108	PG4	I/O	FMC_BA0	
109	PG5	I/O	FMC_BA1	
110	PG6	I/O	LTDC_R7	
111	PG7	I/O	LTDC_CLK	
112	PG8	I/O	FMC_SDCLK	
113	VSS	Power		
114	VDD33_USB	Power		
120	PA9	I/O	USART1_TX	
121	PA10	I/O	USART1_RX	
124	PA13 (JTMS/SWDIO)	I/O	DEBUG_JTMS-SWDIO	
125	VCAP	Power		
126	VSS	Power		
127	VDD	Power		
128	PH13	I/O	LTDC_G2	
130	PH15	I/O	LTDC_G4	
131	PI0	I/O	LTDC_G5	
132	PI1	I/O	LTDC_G6	
133	PI2	I/O	LTDC_G7	
135	VSS	Power		
136	VDD	Power		
137	PA14 (JTCK/SWCLK)	I/O	DEBUG_JTCK-SWCLK	
138	PA15 (JTDI)	I/O	DEBUG_JTDI	
142	PD0	I/O	FMC_D2	
143	PD1	I/O	FMC_D3	
148	VSS	Power		
149	VDD	Power		
150	PD6	I/O	LTDC_B2	
151	PD7	I/O	GPIO_EXTI7	INT
153	PG10	I/O	LTDC_G3	
154	PG11	I/O	LTDC_B3	
155	PG12	I/O	LTDC_B1	
158	VSS	Power		
159	VDD	Power		
160	PG15	I/O	FMC_SDNCAS	
161	PB3 (JTDO/TRACESWO)	I/O	DEBUG_JTDO-SWO	
162	PB4 (NJTRST)	I/O	DEBUG_JTRST	
166	BOOT0	Boot		

Pin Number LQFP176	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
169	PE0	I/O	FMC_NBL0	
170	PE1	I/O	FMC_NBL1	
171	PDR_ON	Power		
172	VDD	Power		
173	PI4	I/O	LTDC_B4	
174	PI5	I/O	LTDC_B5	
175	PI6	I/O	LTDC_B6	
176	PI7	I/O	LTDC_B7	

* 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	STM32H743/753
MCU	STM32H743IITx
Datasheet	DS12110_Rev8

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

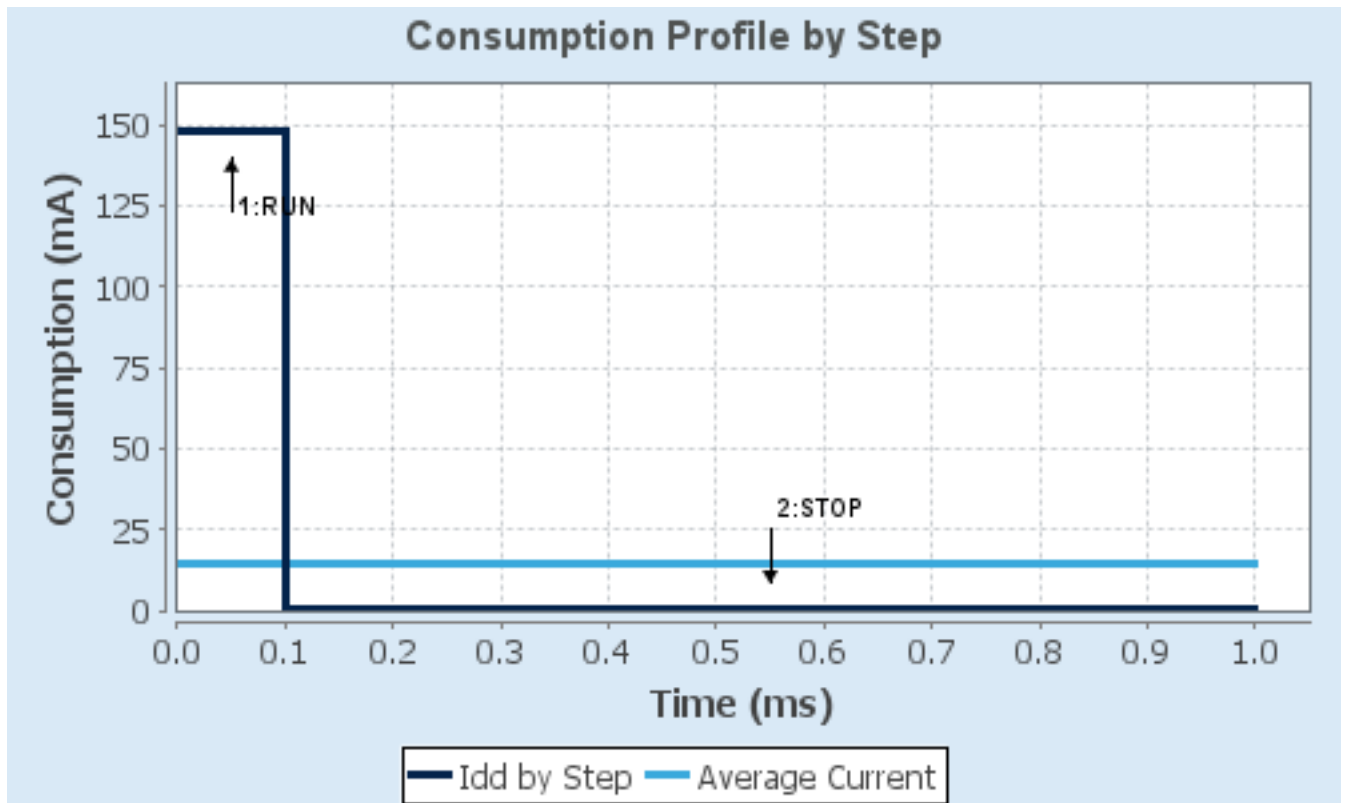
1.4. Sequence

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 μ A
Duration	0.1 ms	0.9 ms
DMIPS	1027.0	0.0
Ta Max	105.91	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



2. Software Project

2.1. Project Settings

Name	Value
Project Name	ELOX_EDM_Controller
Project Folder	C:\Users\gomond\OneDrive\Documents\GitHub\ELOX_EDM_Controller
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_H7 V1.12.1
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x800
Minimum Stack Size	0x1000

2.2. 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	Yes
Backup previously generated files when re-generating	Yes
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	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_FMC_Init	FMC
4	MX_USART1_UART_Init	USART1
5	MX_LTDC_Init	LTDC
6	MX_DMA2D_Init	DMA2D
7	MX_TIM2_Init	TIM2
8	MX_CRC_Init	CRC
9	MX_TIM5_Init	TIM5
11	MX_TouchGFX_Init	STMicroelectronics.X-CUBE-TOUCHGFX.4.23.0
12	MX_TouchGFX_Process	STMicroelectronics.X-CUBE-TOUCHGFX.4.23.0

3. Peripherals and Middlewares Configuration

3.1. CRC

mode: Activated

3.1.1. Parameter Settings:

Basic Parameters:

Default Polynomial State	Enable
Default Init Value State	Enable

Advanced Parameters:

Input Data Inversion Mode	None
Output Data Inversion Mode	Disable
Input Data Format	Bytes

3.2. DEBUG

Debug: JTAG (5 pins)

3.3. DMA2D

mode: Activated

3.3.1. Parameter Settings:

Basic Parameters:

Transfer Mode	Memory to Memory
Color Mode	RGB565 *
Output Offset	0

Foreground layer Configuration:

DMA2D Input Color Mode	RGB565
DMA2D ALPHA MODE	No modification of the alpha channel value
Input Alpha	0
Input Offset	0
DMA2D ALPHA Inversion	Regular Alpha
DMA2D Red and Blue swap	Regular mode (RGB or ARGB)
DMA2D Chroma Sub-Sampling Mode	No chroma sub-sampling 4:4:4

3.4. FMC

SDRAM 1

Clock and chip enable: SDCKE1+SDNE1

Internal bank number: 4 banks

Address: 12 bits

Data: 16 bits

Byte enable: 16-bit byte enable

3.4.1. SDRAM 1:

SDRAM control:

Bank	SDRAM bank 2
Number of column address bits	8 bits
Number of row address bits	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	6 *
Write recovery time	2 *
SDRAM common row precharge delay	2 *
Row to column delay	2 *

3.4.2. Bank Mapping:

Mapping parameters:

FMC bank mapping	SDRAM Bank2 remapped on FMC bank2 and still accessible at default mapping *
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3.5. LTDC

Display Type: RGB888 (24 bits)

3.5.1. Parameter Settings:

Synchronization for Width:

Horizontal Synchronization Width	30 *
Horizontal Back Porch	46 *
Active Width	1024 *
Horizontal Front Porch	6
HSync Width	29
Accumulated Horizontal Back Porch Width	75
Accumulated Active Width	1099
Total Width	1105

Synchronization for Height:

Vertical Synchronization Height	10 *
Vertical Back Porch	23 *
Active Height	600 *
Vertical Front Porch	22 *
VSync Height	9
Accumulated Vertical Back Porch Height	32
Accumulated Active Height	632
Total Height	654

Signal Polarity:

Horizontal Synchronization Polarity	Active Low
Vertical Synchronization Polarity	Active Low
Data Enable Polarity	Active Low
Pixel Clock Polarity	Normal Input

Layer Default Color:

Red	0
Green	0
Blue	0

3.5.2. Layer Settings:

Layer Default Color:

Layer 0 - Alpha	0
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	1024 *

Layer 0 - Window Vertical Start	0
Layer 0 - Window Vertical Stop	600 *
Pixel Parameters:	
Layer 0 - Pixel Format	RGB565 *
Blending:	
Layer 0 - Alpha constant for blending	0xff *
Layer 0 - Blending Factor1	Alpha constant
Layer 0 - Blending Factor2	Alpha constant
Frame Buffer:	
Layer 0 - Color Frame Buffer Start Address	0xD0000000 *
Layer 0 - Color Frame Buffer Line Length (Image Width)	1024 *
Layer 0 - Color Frame Buffer Number of Lines (Image Height)	600 *

3.6. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

3.6.1. Parameter Settings:

Power Parameters:	
SupplySource	PWR_LDO_SUPPLY
Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
RCC Parameters:	
TIM Prescaler Selection	Disabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000
CSI Calibration Value	32
HSI Calibration Value	64
System Parameters:	
VDD voltage (V)	3.3
Flash Latency(WS)	2 WS (3 CPU cycle)
Product revision	rev.V
PLL range Parameters:	
PLL1 clock Input range	Between 2 and 4 MHz
PLL3 input frequency range	Between 2 and 4 MHz
PLL1 clock Output range	Wide VCO range
PLL3 clock Output range	MEDIUM VCO range

3.7. SYS

Timebase Source: SysTick

3.8. TIM2

Channel4: PWM Generation CH4

3.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	100-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	1000-1 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Enable *

Trigger Output (TRGO) Parameters:

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

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (32 bits value)	500 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

3.9. TIM5

Combined Channels: Encoder Mode

3.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
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)	Disable (Trigger input effect not delayed)
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)

Encoder:

Encoder Mode

____ Parameters for Channel 1 ____

Polarity

IC Selection

Prescaler Division Ratio

Input Filter

____ Parameters for Channel 2 ____

Polarity

IC Selection

Prescaler Division Ratio

Input Filter

Encoder Mode TI1 and TI2 *

Rising Edge

Direct

No division

10 *

Rising Edge

Direct

No division

0

3.10. USART1

Mode: Asynchronous

3.10.1. 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	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

3.11. STMicroelectronics.X-CUBE-TOUCHGFX.4.23.0

mode: GraphicsJApplication

3.11.1. TouchGFX Generator:

Display:

Interface

Framebuffer Pixel Format (LTDC)

Width (LTDC)

Height (LTDC)

Framebuffer Strategy

Buffer Location

Start Address

Parallel RGB (LTDC) *

RGB565

1024

600

Single Buffer

By Address *

0xD0000000 *

Driver:

Application Tick Source

Use DMA2D Accelerator (ChromART)

Real-Time Operating System

LTDC *

Yes *

No OS

Additional Features:

External Data Reader

Vector Rendering

Disabled

Disabled

Video Decoding:

Type

Disabled

* User modified value

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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	
	PA15 (JTDI)	DEBUG_JTDI	n/a	n/a	n/a	
	PB3 (JTDO/TRACESWO)	DEBUG_JTDO-SWO	n/a	n/a	n/a	
	PB4 (NJTRST)	DEBUG_JTRST	n/a	n/a	n/a	
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	
	PH5	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	
	PH6	FMC_SDNE1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH7	FMC_SDCKE1	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	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	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	
	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	
LTDC	PE4	LTDC_B0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE5	LTDC_G0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PE6	LTDC_G1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI9	LTDC_VSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PI10	LTDC_HSYNC	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PF10	LTDC_DE	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC0	LTDC_R5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH2	LTDC_R0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH3	LTDC_R1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB1	LTDC_R6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH8	LTDC_R2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH9	LTDC_R3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH10	LTDC_R4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG6	LTDC_R7	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG7	LTDC_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PH13	LTDC_G2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PH15	LTDC_G4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI0	LTDC_G5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI1	LTDC_G6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI2	LTDC_G7	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD6	LTDC_B2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG10	LTDC_G3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG11	LTDC_B3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PG12	LTDC_B1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI4	LTDC_B4	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
	PI5	LTDC_B5	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI6	LTDC_B6	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI7	LTDC_B7	Alternate Function Push Pull	No pull-up and no pull-down	Low	
RCC	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	
TIM2	PA3	TIM2_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM5	PA0	TIM5_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Medium *	
	PA1	TIM5_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Medium *	
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PI8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DISP
	PF6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RST
	PF7	GPIO_Output	Output Push Pull	Pull-up *	Low	SCL
	PF8	GPIO_Output	Output Push Pull	Pull-up *	Low	SDA
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Relay1
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Relay2
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Relay3
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	Relay4
	PD7	GPIO_EXTI7	External Interrupt Mode with Falling edge trigger detection	Pull-up *	n/a	INT

4.2. DMA configuration

nothing configured in DMA service

4.3. BDMA configuration

nothing configured in DMA service

4.4. MDMA configuration

nothing configured in DMA service

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	0	0
System tick timer	true	15	0
EXTI line[9:5] interrupts	true	6	0
FMC global interrupt	true	0	0
TIM5 global interrupt	true	0	0
LTDC global interrupt	true	0	0
DMA2D global interrupt	true	0	0
PVD and AVD interrupts through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
USART1 global interrupt	unused		
FPU global interrupt	unused		
LTDC global error 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	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
EXTI line[9:5] interrupts	false	true	true
FMC global interrupt	false	true	true

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
TIM5 global interrupt	false	true	true
LTDC global interrupt	false	true	true
DMA2D 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. Software Pack Report

6.1. Software Pack selected

Vendor	Name	Version	Component
STMicroelectronics	X-CUBE-TOUCHGFX	4.23.0	Class : Graphics Group : Application Variant : TouchGFX Generator Version : 4.23.0

7. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32h7_bsd1.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
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
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/flpowerstbd.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32h7rs.pdf
Security Bulletin	https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-stmicroelectronics.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/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

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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/an4936-migration-of-microcontroller-applications-from-stm32f7-series-to-stm32h743753-line-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/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/an5293-migration-guide-from-stm32f7-series-to-stmh74x75x-stm32h72x73x-and-stmh7a37bx-devices-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
- Application Notes https://www.st.com/resource/en/application_note/an5225-introduction-to-usb-typec-power-delivery-for-stm32-mcus-and-mpus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5342--how-to-use-error-correction-code-ecc-management-for-internal-memories-protection-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4938-getting-started-with-stm32h74xig-and-stm32h75xig-mcu-hardware-development-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5537-how-to-use-adc-oversampling-techniques-to-improve-signal-to-noise-ratio-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5036-guidelines-for-thermal-management-on-stm32-applications-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5405-how-to-use-fdcan-bootloader-protocol-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5690-how-to-use-vrefbuf-peripheral-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4230-introduction-to-random-number-generation-validation-using-the-nist-statistical-test-suite-for-stm32-mcus-and-mpus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an2867-guidelines-for-oscillator-design-on-stm8afals-and-stm32-mcus-mpus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4013-introduction-to-timers-for-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4277-how-to-use-pwm-shutdown-for-motor-control-and-digital-power-conversion-on-stm32-mcus-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an4635-how-to-optimize-lpuart-power-consumption-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4759-introduction-to-using-the-hardware-realtime-clock-rtc-and-the-tamper-management-unit-tamp-with-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4861-introduction-to-lcdtft-display-controller-ltcd-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4908-getting-started-with-uart-automatic-baud-rater-detection-for-stm32-mcus-stmicroelectronics.pdf
- 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/an5224-introduction-to-dmamux-for-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5507-how-to-use-crc-to-check-the-integrity-of-the-internal-flash-memory-on-stm32h7-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
- Application Notes https://www.st.com/resource/en/application_note/an5337-guidelines-for-estimating-stm32h7-mcus-lifetime-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4996-how-to-use-the-jpeg-codec-peripheral-on-stm32-mcus-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

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Application Notes https://www.st.com/resource/en/application_note/an4566-how-to-extend-the-dac-performance-on-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5647-the-goertzel-algorithm-to-compute-individual-terms-of-the-discrete-fourier-transform-dft-in-stm32-products-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an2606-introduction-to-system-memory-boot-mode-on-stm32-mcus-stmicroelectronics.pdf

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& Software

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Application Notes for related Tools & Software https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf

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for related Tools & Software	lines-and-stm32h7b0-value-line-smart-power-management-expansion-package-for-stm32cube-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4502-stm32-smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an6088-how-to-use-mce-for-encryptiondecryption-on-stm32-mcus-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an6179-how-to-integrate-the-stl-firmware-into-a-time-critical-user-application-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an6127-getting-started-with-stm32h7rx7sx-mcus-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an6265-getting-started-with-stm32n6-mcus-in-stm32cubeide-stmicroelectronics.pdf
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Errata Sheets	https://www.st.com/resource/en/errata_sheet/es0392-stm32h742xig-stm32h743xig-stm32h750xb-stm32h753xi-device-errata-stmicroelectronics.pdf
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