
STM32
CubeMX

1. Description

1.1. Project

Project Name	STM32H743I-EVAL
Board Name	custom
Generated with:	STM32CubeMX 6.14.1
Date	05/22/2025

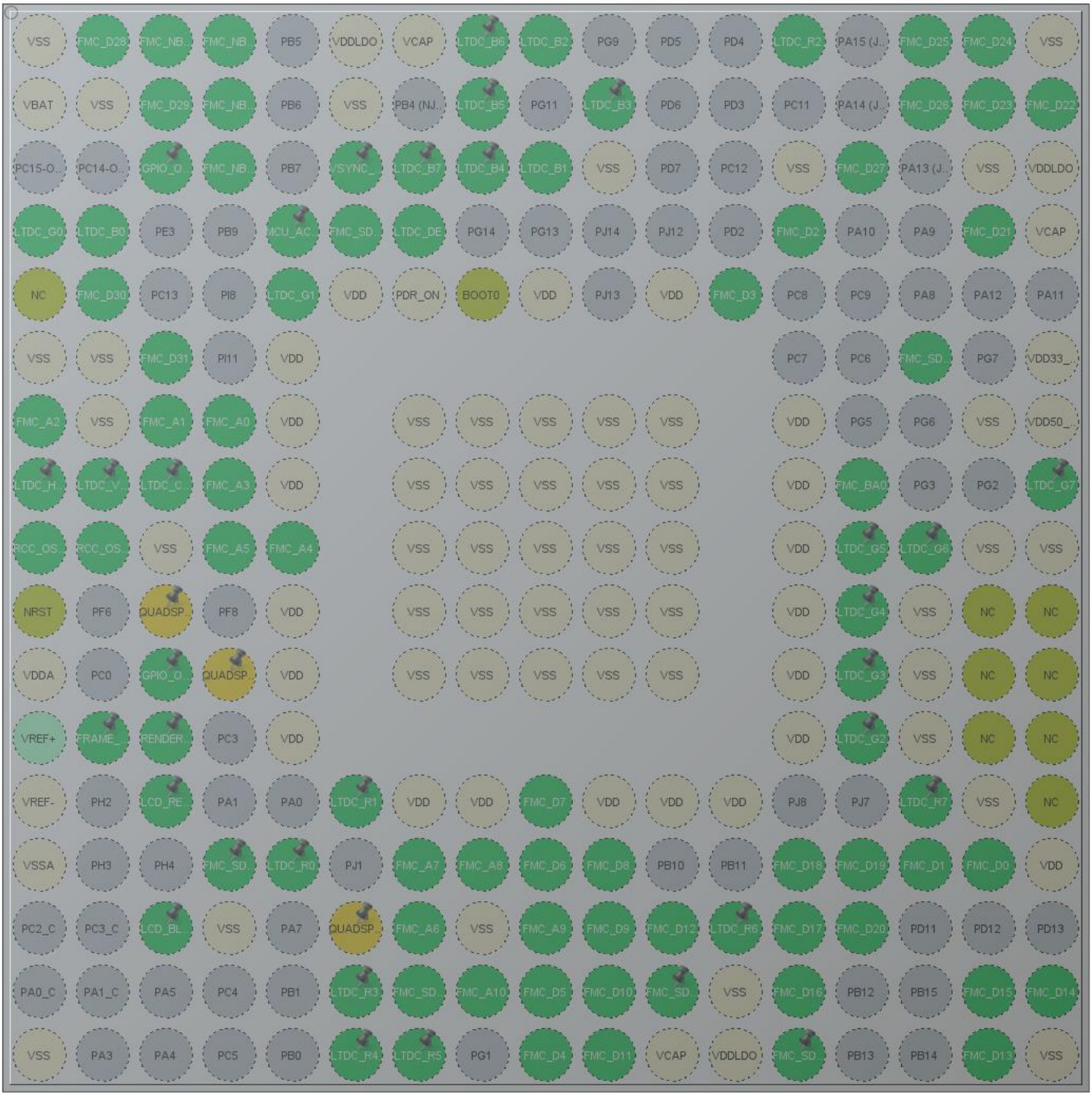
1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H743/753
MCU name	STM32H743XIHx
MCU Package	TFBGA240
MCU Pin number	265

1.3. Core(s) information

Core(s)	ARM Cortex-M7

2. Pinout Configuration



TFBGA240 +25 (Top view)

3. Pins Configuration

Pin Number TFBGA240	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
A1	VSS	Power		
A2	PI6	I/O	FMC_D28	
A3	PI5	I/O	FMC_NBL3	
A4	PI4	I/O	FMC_NBL2	
A6	VDDLDO	Power		
A7	VCAP	Power		
A8	PK5	I/O	LTDC_B6	
A9	PG10	I/O	LTDC_B2	
A13	PC10	I/O	LTDC_R2	
A15	PI1	I/O	FMC_D25	
A16	PI0	I/O	FMC_D24	
A17	VSS	Power		
B1	VBAT	Power		
B2	VSS	Power		
B3	PI7	I/O	FMC_D29	
B4	PE1	I/O	FMC_NBL1	
B6	VSS	Power		
B8	PK4	I/O	LTDC_B5	
B10	PJ15	I/O	LTDC_B3	
B15	PI2	I/O	FMC_D26	
B16	PH15	I/O	FMC_D23	
B17	PH14	I/O	FMC_D22	
C3	PE2 *	I/O	GPIO_Output	
C4	PE0	I/O	FMC_NBL0	
C6	PB3 (JTDO/TRACESWO) *	I/O	GPIO_Output	VSYNC_FREQ
C7	PK6	I/O	LTDC_B7	
C8	PK3	I/O	LTDC_B4	
C9	PG12	I/O	LTDC_B1	
C10	VSS	Power		
C13	VSS	Power		
C14	PI3	I/O	FMC_D27	
C16	VSS	Power		
C17	VDDLDO	Power		
D1	PE5	I/O	LTDC_G0	
D2	PE4	I/O	LTDC_B0	
D5	PB8 *	I/O	GPIO_Output	MCU_ACTIVE

Pin Number TFBGA240	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
D6	PG15	I/O	FMC_SDNCAS	
D7	PK7	I/O	LTDC_DE	
D13	PD0	I/O	FMC_D2	
D16	PH13	I/O	FMC_D21	
D17	VCAP	Power		
E1	NC	NC		
E2	PI9	I/O	FMC_D30	
E5	PE6	I/O	LTDC_G1	
E6	VDD	Power		
E7	PDR_ON	Power		
E8	BOOT0	Boot		
E9	VDD	Power		
E11	VDD	Power		
E12	PD1	I/O	FMC_D3	
F1	VSS	Power		
F2	VSS	Power		
F3	PI10	I/O	FMC_D31	
F5	VDD	Power		
F15	PG8	I/O	FMC_SDCLK	
F17	VDD33_USB	Power		
G1	PF2	I/O	FMC_A2	
G2	VSS	Power		
G3	PF1	I/O	FMC_A1	
G4	PF0	I/O	FMC_A0	
G5	VDD	Power		
G7	VSS	Power		
G8	VSS	Power		
G9	VSS	Power		
G10	VSS	Power		
G11	VSS	Power		
G13	VDD	Power		
G16	VSS	Power		
G17	VDD50_USB	Power		
H1	PI12	I/O	LTDC_HSYNC	
H2	PI13	I/O	LTDC_VSYNC	
H3	PI14	I/O	LTDC_CLK	
H4	PF3	I/O	FMC_A3	
H5	VDD	Power		
H7	VSS	Power		

Pin Number TFBGA240	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
H8	VSS	Power		
H9	VSS	Power		
H10	VSS	Power		
H11	VSS	Power		
H13	VDD	Power		
H14	PG4	I/O	FMC_BA0	
H17	PK2	I/O	LTDC_G7	
J1	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
J2	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
J3	VSS	Power		
J4	PF5	I/O	FMC_A5	
J5	PF4	I/O	FMC_A4	
J7	VSS	Power		
J8	VSS	Power		
J9	VSS	Power		
J10	VSS	Power		
J11	VSS	Power		
J13	VDD	Power		
J14	PK0	I/O	LTDC_G5	
J15	PK1	I/O	LTDC_G6	
J16	VSS	Power		
J17	VSS	Power		
K1	NRST	Reset		
K3	PF7 **	I/O	QUADSPI_BK1_IO2	
K5	VDD	Power		
K7	VSS	Power		
K8	VSS	Power		
K9	VSS	Power		
K10	VSS	Power		
K11	VSS	Power		
K13	VDD	Power		
K14	PJ11	I/O	LTDC_G4	
K15	VSS	Power		
K16	NC	NC		
K17	NC	NC		
L1	VDDA	Power		
L3	PF10 *	I/O	GPIO_Output	
L4	PF9 **	I/O	QUADSPI_BK1_IO1	
L5	VDD	Power		

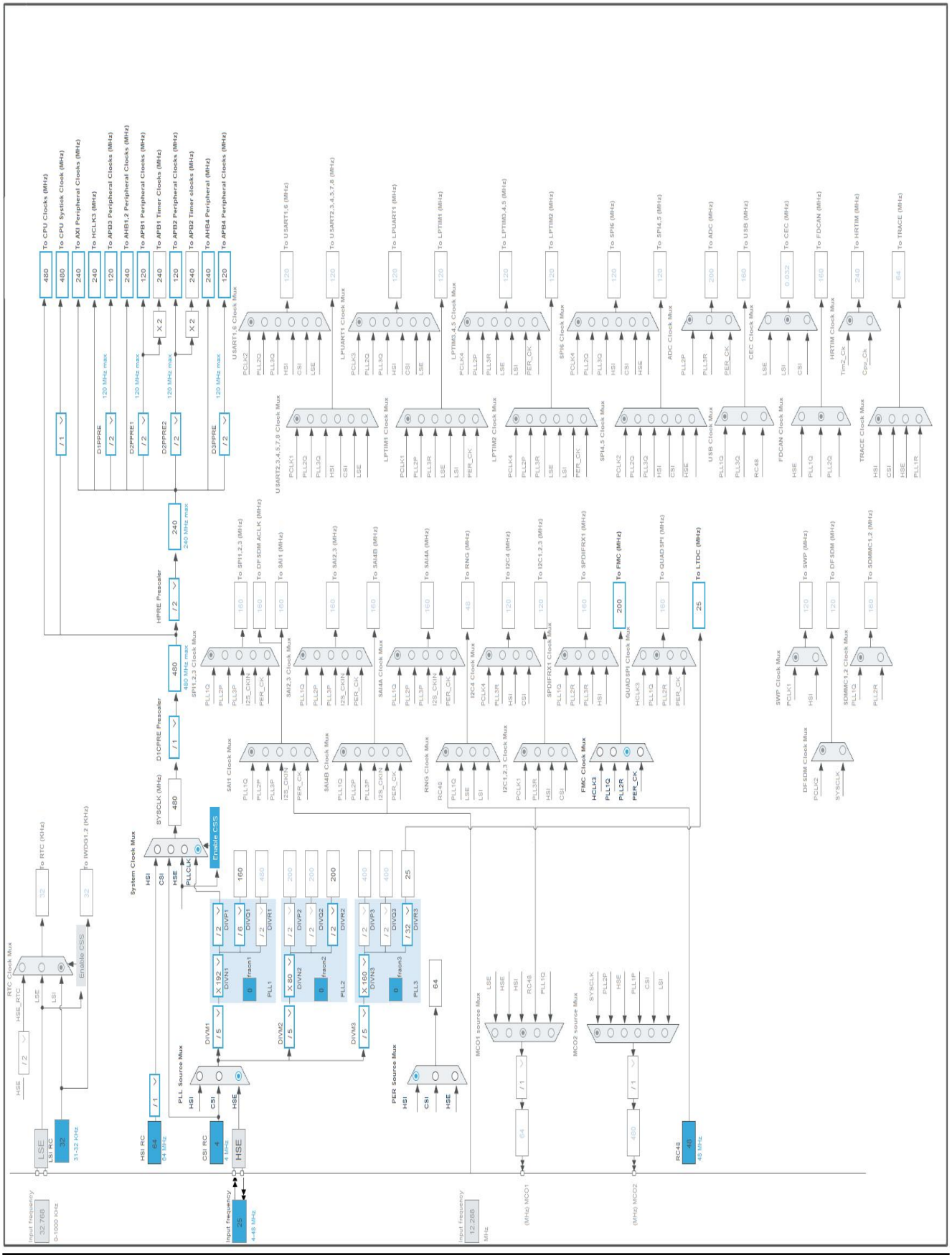
Pin Number TFBGA240	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
L7	VSS	Power		
L8	VSS	Power		
L9	VSS	Power		
L10	VSS	Power		
L11	VSS	Power		
L13	VDD	Power		
L14	PJ10	I/O	LTDC_G3	
L15	VSS	Power		
L16	NC	NC		
L17	NC	NC		
M2	PC1 *	I/O	GPIO_Output	FRAME_RATE
M3	PC2 *	I/O	GPIO_Output	RENDER_TIME
M5	VDD	Power		
M13	VDD	Power		
M14	PJ9	I/O	LTDC_G2	
M15	VSS	Power		
M16	NC	NC		
M17	NC	NC		
N1	VREF-	Power		
N3	PA2 *	I/O	GPIO_Output	LCD_RESET
N6	PJ0	I/O	LTDC_R1	
N7	VDD	Power		
N8	VDD	Power		
N9	PE10	I/O	FMC_D7	
N10	VDD	Power		
N11	VDD	Power		
N12	VDD	Power		
N15	PJ6	I/O	LTDC_R7	
N16	VSS	Power		
N17	NC	NC		
P1	VSSA	Power		
P4	PH5	I/O	FMC_SDNWE	
P5	PI15	I/O	LTDC_R0	
P7	PF13	I/O	FMC_A7	
P8	PF14	I/O	FMC_A8	
P9	PE9	I/O	FMC_D6	
P10	PE11	I/O	FMC_D8	
P13	PH10	I/O	FMC_D18	
P14	PH11	I/O	FMC_D19	

Pin Number TFBGA240	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
P15	PD15	I/O	FMC_D1	
P16	PD14	I/O	FMC_D0	
P17	VDD	Power		
R3	PA6 *	I/O	GPIO_Output	LCD_BL_CTRL
R4	VSS	Power		
R6	PB2 **	I/O	QUADSPI_CLK	
R7	PF12	I/O	FMC_A6	
R8	VSS	Power		
R9	PF15	I/O	FMC_A9	
R10	PE12	I/O	FMC_D9	
R11	PE15	I/O	FMC_D12	
R12	PJ5	I/O	LTDC_R6	
R13	PH9	I/O	FMC_D17	
R14	PH12	I/O	FMC_D20	
T6	PJ2	I/O	LTDC_R3	
T7	PF11	I/O	FMC_SDNRAS	
T8	PG0	I/O	FMC_A10	
T9	PE8	I/O	FMC_D5	
T10	PE13	I/O	FMC_D10	
T11	PH6	I/O	FMC_SDNE1	
T12	VSS	Power		
T13	PH8	I/O	FMC_D16	
T16	PD10	I/O	FMC_D15	
T17	PD9	I/O	FMC_D14	
U1	VSS	Power		
U6	PJ3	I/O	LTDC_R4	
U7	PJ4	I/O	LTDC_R5	
U9	PE7	I/O	FMC_D4	
U10	PE14	I/O	FMC_D11	
U11	VCAP	Power		
U12	VDDLDO	Power		
U13	PH7	I/O	FMC_SDCKE1	
U16	PD8	I/O	FMC_D13	
U17	VSS	Power		

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32H7
Line	STM32H743/753
MCU	STM32H743XIHx
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

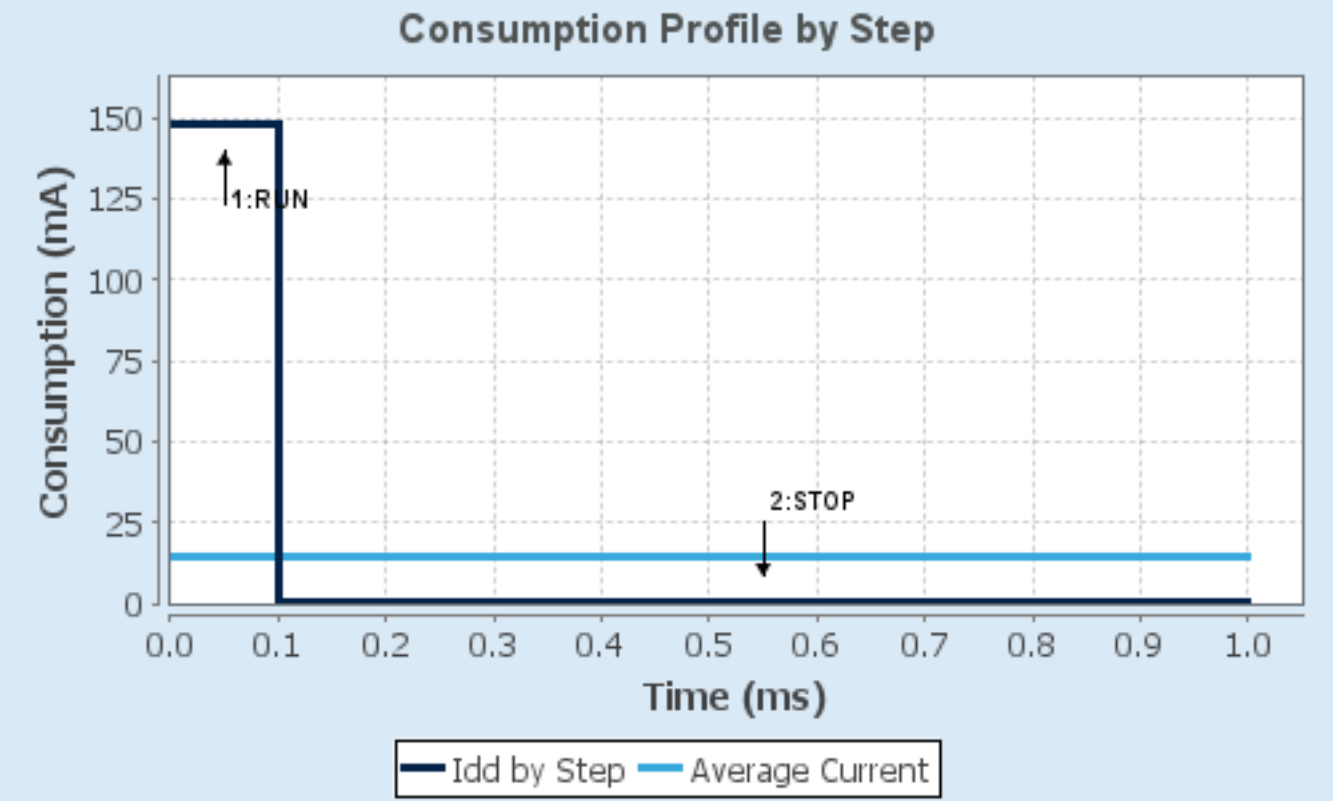
1.4. Sequence

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 µA
Duration	0.1 ms	0.9 ms
DMIPS	1027.0	0.0
Ta Max	108.57	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


Consumption Profile by Step
Consumption (mA)
150
125
100
75
50
25
0
1:RUN
2:STOP
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

2. Software Project

2.1. Project Settings

Name	Value
Project Name	STM32H743I-EVAL
Project Folder	C:\Users\zblhaj\Desktop\MyApplication\MyApplication
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_H7 V1.12.1
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x1000
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	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

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_CRC_Init	CRC
4	MX_LTDC_Init	LTDC
5	MX_FMC_Init	FMC
6	MX_DMA2D_Init	DMA2D
8	MX_TouchGFX_Init	STMicroelectronics.X-CUBE-TOUCHGFX.4.25.0
9	MX_TouchGFX_Process	STMicroelectronics.X-CUBE-TOUCHGFX.4.25.0

3. Peripherals and Middlewares Configuration

3.1. CORTEX_M7

3.1.1. Parameter Settings:

Speculation default mode Settings:

Speculation default mode	Disabled

Cortex Interface Settings:

CPU ICache	**Enabled ***
CPU DCache	**Enabled ***

Cortex Memory Protection Unit Control Settings:

MPU Control Mode	**Background Region Privileged accesses only + MPU Disabled during hard fault, NMI and FAULTMASK handlers ***

Cortex Memory Protection Unit Region 0 Settings:

MPU Region	**Enabled ***
MPU Region Base Address	**0x24000000 ***
MPU Region Size	**512KB ***
MPU SubRegion Disable	**0x0 ***
MPU TEX field level	level 0
MPU Access Permission	**ALL ACCESS PERMITTED ***
MPU Instruction Access	**DISABLE ***
MPU Shareability Permission	DISABLE
MPU Cacheable Permission	**ENABLE ***
MPU Bufferable Permission	**ENABLE ***

Cortex Memory Protection Unit Region 1 Settings:

MPU Region	**Enabled ***
MPU Region Base Address	**0xD0000000 ***
MPU Region Size	**512MB ***
MPU SubRegion Disable	**0x0 ***
MPU TEX field level	level 0
MPU Access Permission	ALL ACCESS NOT PERMITTED
MPU Instruction Access	**DISABLE ***
MPU Shareability Permission	DISABLE
MPU Cacheable Permission	DISABLE
MPU Bufferable Permission	DISABLE

Cortex Memory Protection Unit Region 2 Settings:

MPU Region	**Enabled ***
MPU Region Base Address	**0xD0000000 ***

MPU Region Size	**32MB ***
MPU SubRegion Disable	**0x0 ***
MPU TEX field level	level 0
MPU Access Permission	**ALL ACCESS PERMITTED ***
MPU Instruction Access	**DISABLE ***
MPU Shareability Permission	DISABLE
MPU Cacheable Permission	**ENABLE ***
MPU Bufferable Permission	**ENABLE ***

Cortex Memory Protection Unit Region 3 Settings:

MPU Region	**Enabled ***
MPU Region Base Address	**0x90000000 ***
MPU Region Size	**512MB ***
MPU SubRegion Disable	**0x0 ***
MPU TEX field level	level 0
MPU Access Permission	ALL ACCESS NOT PERMITTED
MPU Instruction Access	**DISABLE ***
MPU Shareability Permission	DISABLE
MPU Cacheable Permission	DISABLE
MPU Bufferable Permission	DISABLE

Cortex Memory Protection Unit Region 4 Settings:

MPU Region	**Enabled ***
MPU Region Base Address	**0x90000000 ***
MPU Region Size	**128MB ***
MPU SubRegion Disable	**0x0 ***
MPU TEX field level	level 0
MPU Access Permission	**ALL ACCESS PERMITTED ***
MPU Instruction Access	**DISABLE ***
MPU Shareability Permission	DISABLE
MPU Cacheable Permission	**ENABLE ***
MPU Bufferable Permission	DISABLE

Cortex Memory Protection Unit Region 5 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 6 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 7 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 8 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 9 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 10 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 11 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 12 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 13 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 14 Settings:

MPU Region	Disabled

Cortex Memory Protection Unit Region 15 Settings:

MPU Region	Disabled

3.2. CRC

mode: Activated

3.2.1. 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

3.3. DMA2D

mode: Activated

3.3.1. Parameter Settings:

Basic Parameters:

Transfer Mode	**Register to Memory ***
Color Mode	**RGB888 ***
Output Offset	0

3.4. FMC

SDRAM 1

Clock and chip enable: SDCKE1+SDNE1

Internal bank number: 2 banks

Address: 11 bits

Data: 32 bits

Byte enable: 32-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	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

3.4.2. Bank Mapping:

Mapping parameters:

FMC bank mapping	Default mapping

3.5. LTDC

Display Type: RGB888 (24 bits)

3.5.1. Parameter Settings:

Synchronization for Width:

Horizontal Synchronization Width	**30 ***
Horizontal Back Porch	**114 ***
Active Width	**1024 ***
Horizontal Front Porch	**24 ***
HSync Width	29
Accumulated Horizontal Back Porch Width	143
Accumulated Active Width	1167
Total Width	1191

Synchronization for Height:

Vertical Synchronization Height	**3 ***
Vertical Back Porch	**32 ***
Active Height	**600 ***
Vertical Front Porch	**10 ***
VSync Height	2
Accumulated Vertical Back Porch Height	34
Accumulated Active Height	634
Total Height	644

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 ***

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	**RGB888 ***

Blending:

Layer 0 - Alpha constant for blending	**32 ***
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)	**1024 ***
Layer 0 - Color Frame Buffer Number of Lines (Image Height)	**600 ***

3.6. MEMORYMAP
mode: Activated

3.7. RCC
High Speed Clock (HSE): Crystal/Ceramic Resonator
3.7.1. Parameter Settings:

Power Parameters:

SupplySource	PWR_LDO_SUPPLY
Power Regulator Voltage Scale	Power Regulator Voltage Scale 0

RCC Parameters:

TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000
CSI Calibration Value	32
HSI Calibration Value	64

System Parameters:

VDD voltage (V)	3.3
Flash Latency(WS)	4 WS (5 CPU cycle)
Product revision	rev.V

PLL range Parameters:

PLL1 clock Input range	Between 4 and 8 MHz
PLL2 input frequency range	Between 4 and 8 MHz
PLL3 input frequency range	Between 4 and 8 MHz
PLL1 clock Output range	Wide VCO range
PLL2 clock Output range	Wide VCO range
PLL3 clock Output range	Wide VCO range

3.8. SYS

Timebase Source: TIM6

3.9. FREERTOS

Interface: CMSIS_V2

3.9.1. Config parameters:

API:

FreeRTOS API	CMSIS v2

Versions:

FreeRTOS version	10.3.1
CMSIS-RTOS version	2.00

MPU/FPU:

ENABLE_MPU	Disabled
ENABLE_FPU	Disabled

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	56
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Enabled
USE_COUNTING_SEMAPHORES	Enabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	**Enabled ***
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled

USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled

Memory management settings:

Memory Allocation	Dynamic / Static
TOTAL_HEAP_SIZE	**32768 ***
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	**Enabled ***
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Enabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Enabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

Added with 10.2.1 support:

MESSAGE_BUFFER_LENGTH_TYPE	size_t
USE_POSIX_ERRNO	Disabled

CMSIS-RTOS V2 flags:

USE_OS2_THREAD_SUSPEND_RESUME	Enabled
USE_OS2_THREAD_ENUMERATE	Enabled
USE_OS2_EVENTFLAGS_FROM_ISR	Enabled
USE_OS2_THREAD_FLAGS	Enabled
USE_OS2_TIMER	Enabled
USE_OS2_MUTEX	Enabled

3.9.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Enabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Enabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Enabled
xTaskGetCurrentTaskHandle	Enabled
eTaskGetState	Enabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Enabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled
uxTaskGetStackHighWaterMark2	Disabled

3.9.3. Advanced settings:

Newlib settings (see parameter description first):

USE_NEWLIB_REENTRANT	Disabled

Project settings (see parameter description first):

Use FW pack heap file	Enabled

3.10. STMicroelectronics.X-CUBE-TOUCHGFX.4.25.0 mode: GraphicsJjApplication

3.10.1. TouchGFX Generator:

Display:

Interface	**Parallel RGB (LTDC) ***
Framebuffer Pixel Format (LTDC)	RGB888
Width (LTDC)	1024

Height (LTDC)	600
Use Larger Framebuffer Stride	No
Framebuffer Strategy	**Double Buffer ***
Buffer Location	By Allocation
Driver:	
Application Tick Source	**LTDC ***
Use DMA2D Accelerator (ChromART)	**Yes ***
Real-Time Operating System	CMSIS_RTOS_V2
Additional Features:	
Vector Rendering	**Software ***
Vector Font Rendering	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
FMC	PI6	FMC_D28	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI5	FMC_NBL3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI4	FMC_NBL2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI1	FMC_D25	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI0	FMC_D24	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI7	FMC_D29	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	
	PI2	FMC_D26	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH15	FMC_D23	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH14	FMC_D22	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	
	PI3	FMC_D27	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	
	PD0	FMC_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH13	FMC_D21	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PI9	FMC_D30	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	
	PI10	FMC_D31	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	
	PF2	FMC_A2	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	
	PF0	FMC_A0	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	
	PG4	FMC_BA0	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	
	PF4	FMC_A4	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	
	PH5	FMC_SDNWE	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	
	PE9	FMC_D6	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	
	PH10	FMC_D18	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH11	FMC_D19	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	
	PD14	FMC_D0	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
	PF12	FMC_A6	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	
	PE12	FMC_D9	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	
	PH9	FMC_D17	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PH12	FMC_D20	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	
	PG0	FMC_A10	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	
	PE13	FMC_D10	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	
	PH8	FMC_D16	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	
	PD9	FMC_D14	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	
	PE14	FMC_D11	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	
LTDC	PK5	LTDC_B6	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PG10	LTDC_B2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC10	LTDC_R2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PK4	LTDC_B5	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PJ15	LTDC_B3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PK6	LTDC_B7	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PK3	LTDC_B4	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PG12	LTDC_B1	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	
	PE4	LTDC_B0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PK7	LTDC_DE	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PE6	LTDC_G1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PI12	LTDC_HSYNC	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PI13	LTDC_VSYNC	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
					*	
	PI14	LTDC_CLK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PK2	LTDC_G7	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PK0	LTDC_G5	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PK1	LTDC_G6	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ11	LTDC_G4	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ10	LTDC_G3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ9	LTDC_G2	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ0	LTDC_R1	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ6	LTDC_R7	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PI15	LTDC_R0	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ5	LTDC_R6	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ2	LTDC_R3	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ3	LTDC_R4	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PJ4	LTDC_R5	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
RCC	PH1-OSC_OUT (PH1)	RCC_OSC_OUT	n/a	n/a	n/a	
	PH0-OSC_IN (PH0)	RCC_OSC_IN	n/a	n/a	n/a	
Single Mapped Signals	PF7	QUADSPI_BK1_IO2	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	
	PF9	QUADSPI_BK1_I	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
		O1			*	
	PB2	QUADSPI_CLK	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	
	PB3 (JTDO/TRACESWO)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	VSYNC_FREQ
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	MCU_ACTIVE
	PF10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	FRAME_RATE
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	RENDER_TIME
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RESET
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	LCD_BL_CTRL

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	15	0
System tick timer	true	15	0
TIM6 global interrupt, DAC1_CH1 and DAC1_CH2 underrun error interrupts	true	0	0
LTDC global interrupt	true	15	0
DMA2D global interrupt	true	5	0
PVD and AVD interrupts through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
FMC global interrupt	unused		
FPU global interrupt	unused		
LTDC global error interrupt	unused		
HSEM1 global interrupt	unused		

4.5.2. NVIC Code generation

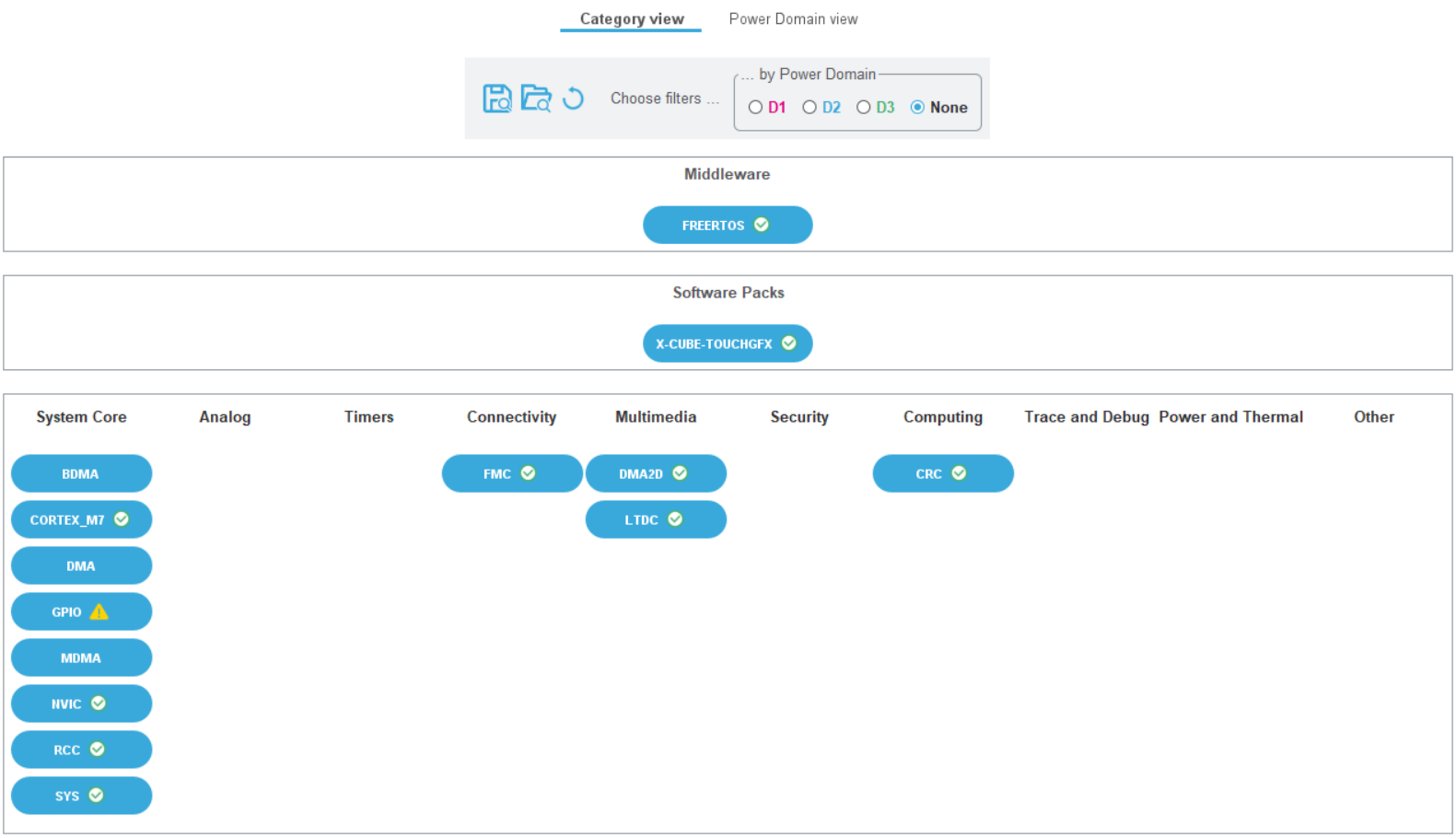
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	false	false
Debug monitor	false	true	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
TIM6 global interrupt, DAC1_CH1 and DAC1_CH2 underrun error interrupts	false	true	true
LTDC global interrupt	false	true	true
DMA2D global interrupt	false	true	true

*** User modified value**

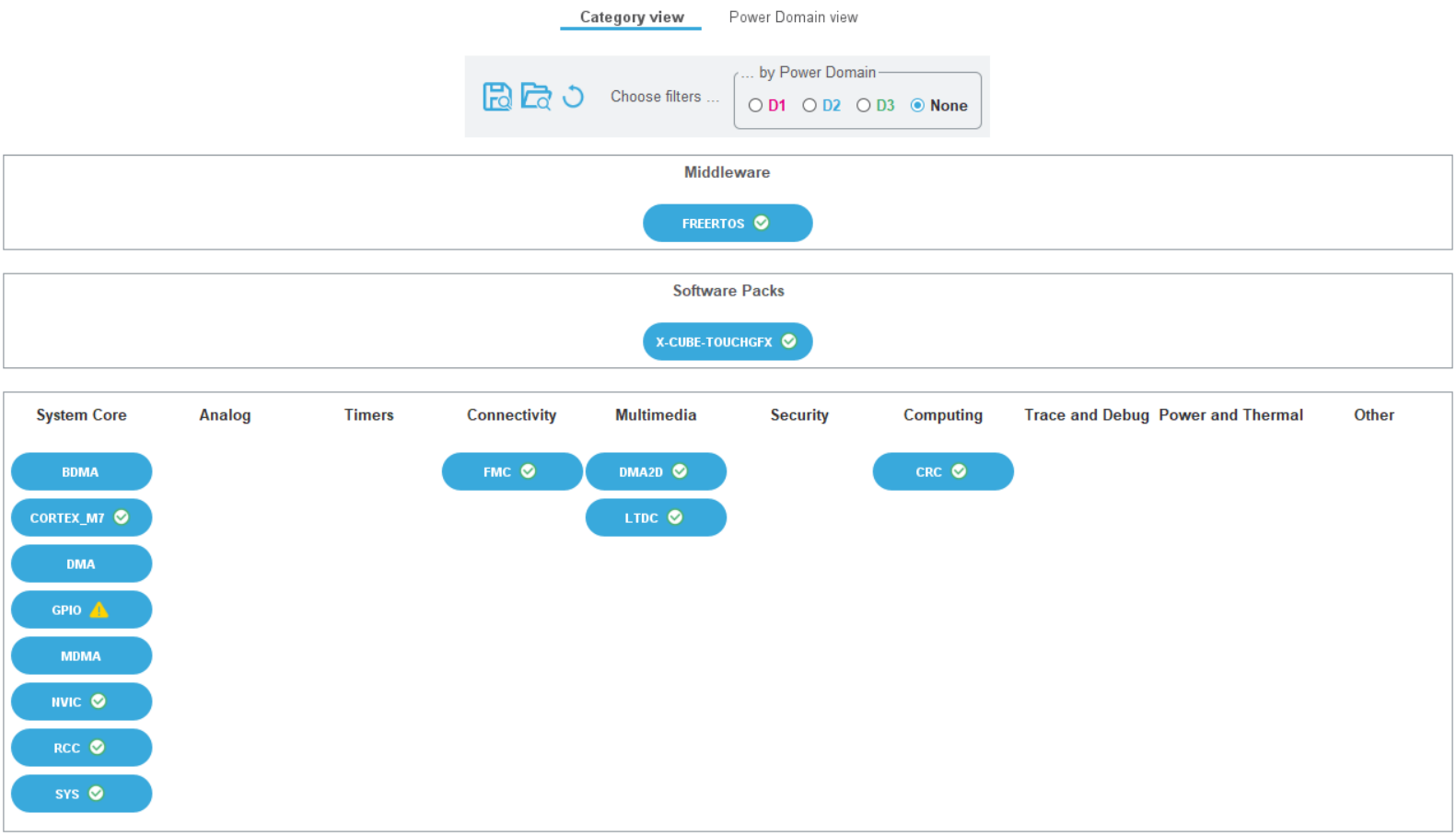
5. System Views

5.1. Category view

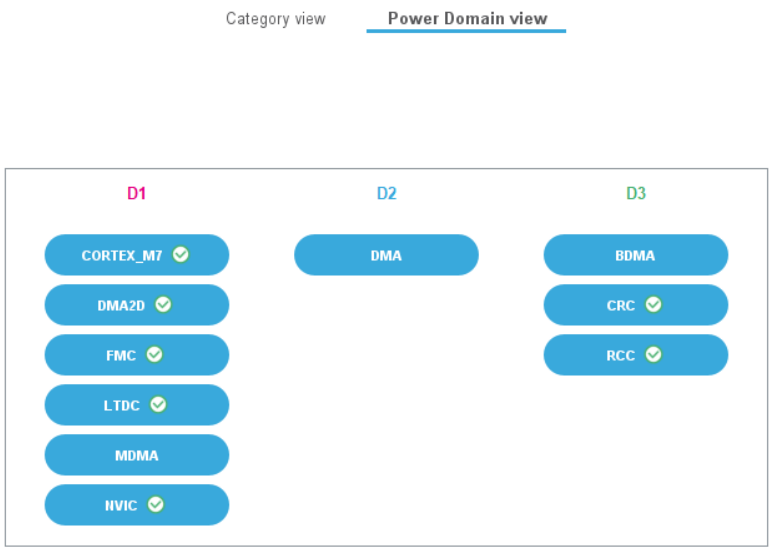
5.1.1. Current



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	4.25.0	Class : Graphics Group : Application Variant : TouchGFX Generator Version : 4.25.0

7. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32h7_bsdl.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/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/an2606-stm32-

	microcontroller-system-memory-boot-mode-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
Application Notes	https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf
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-signaltonoise-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-mcusmpus-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-ltdc-on-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4908-getting-started-with-usart-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
Application Notes	https://www.st.com/resource/en/application_note/an5156-introduction-to-security-for-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5200-getting-started-with-stm32h7-mcus-sdmmc-host-controller-stmicroelectronics.pdf
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
Application Notes	https://www.st.com/resource/en/application_note/an5348-introduction-to-

	fdcan-peripherals-for-stm32-mcus-stmicroelectronics.pdf
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
Application Notes	https://www.st.com/resource/en/application_note/an5020-introduction-to-digital-camera-interface-dcmi-for-stm32-mcus-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4323-getting-started-with-stemwin-library-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4841-digital-signal-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf
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