



## 1. Description

### 1.1. Project

Project Name	lcd_tsc_mpu6050_drivers
Board Name	custom
Generated with:	STM32CubeMX 6.12.0
Date	02/19/2025

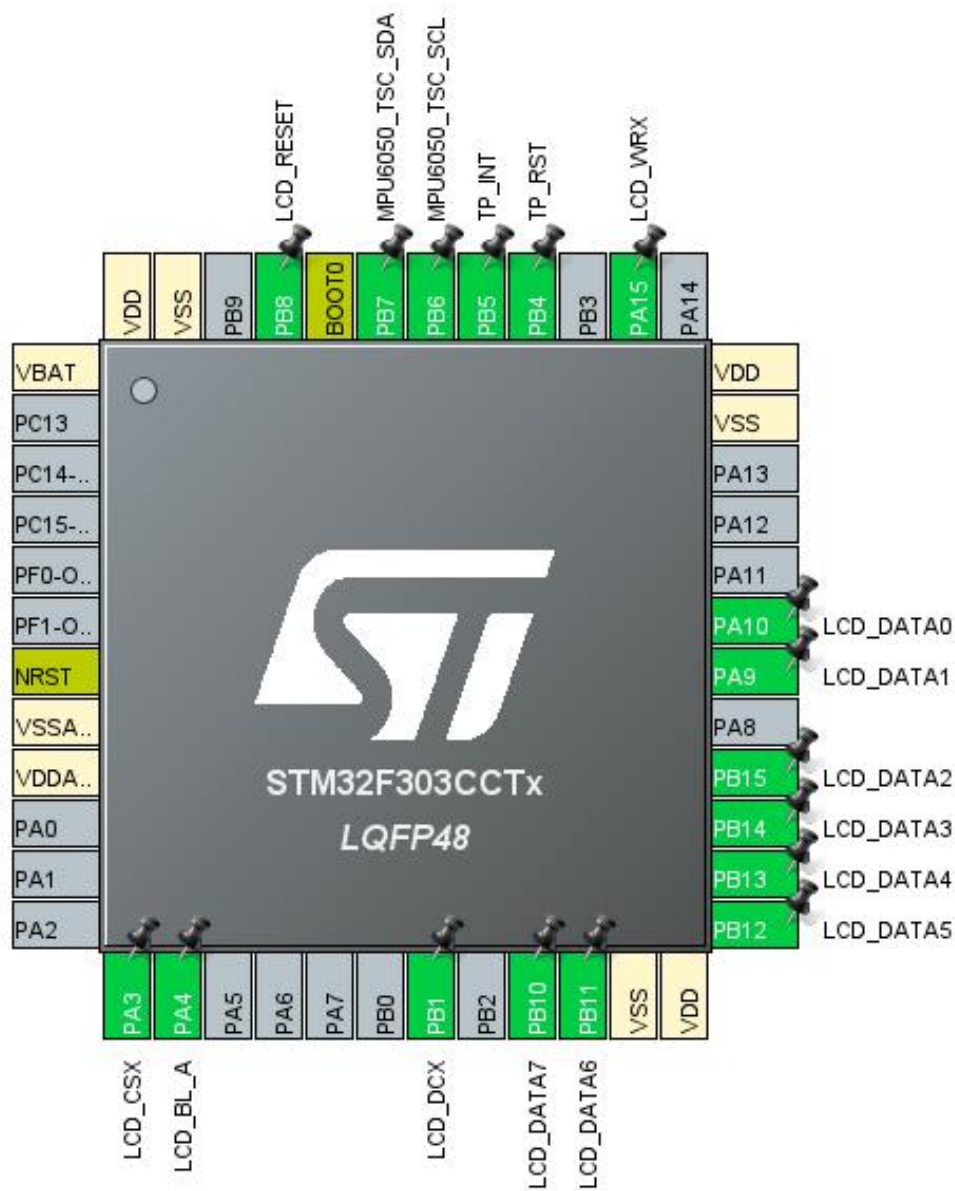
### 1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303CCTx
MCU Package	LQFP48
MCU Pin number	48

### 1.3. Core(s) information

Core(s)	Arm Cortex-M4
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## 2. Pinout Configuration

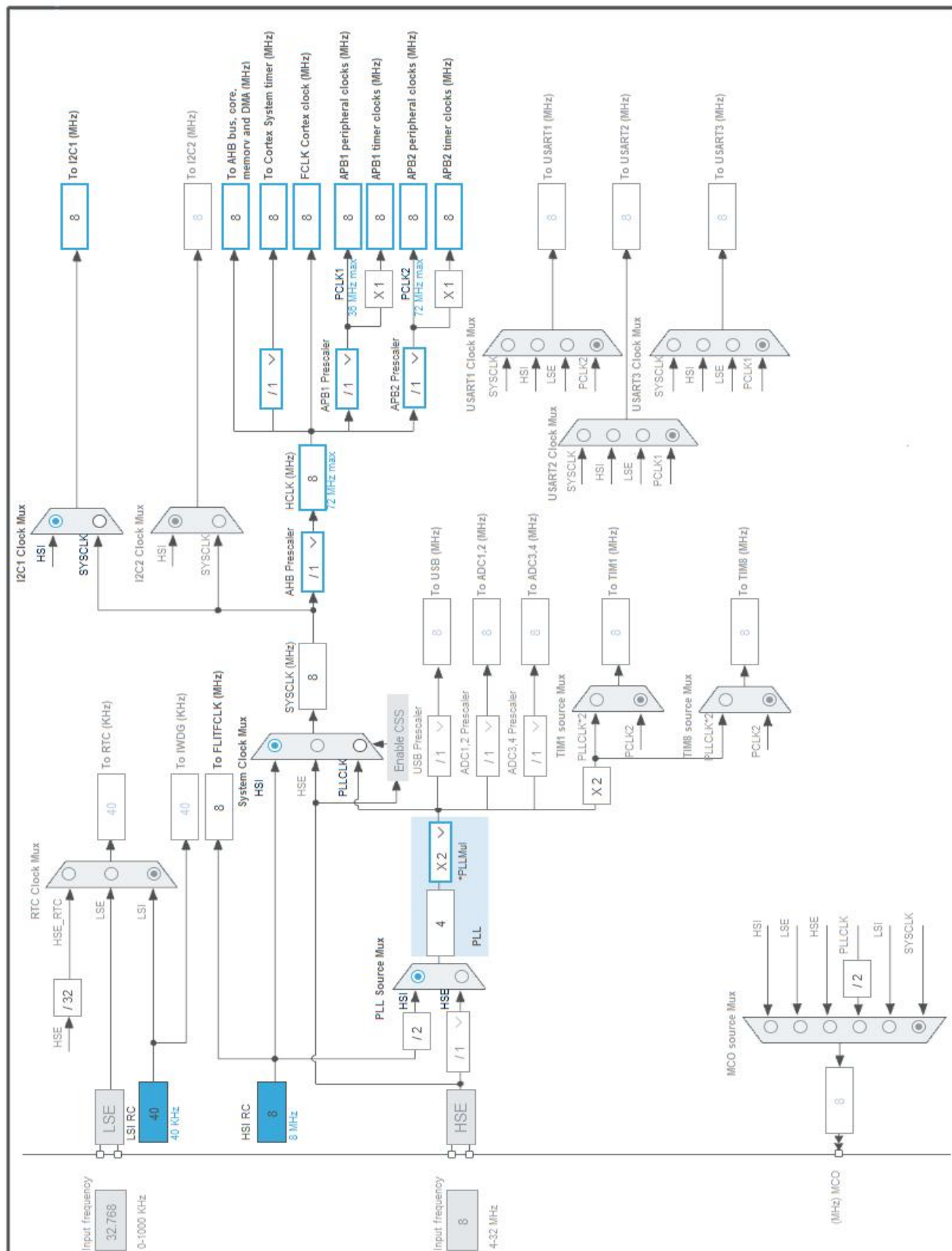


### 3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
7	NRST	Reset		
8	VSSA/VREF-	Power		
9	VDDA/VREF+	Power		
13	PA3 *	I/O	GPIO_Output	LCD_CSX
14	PA4 *	I/O	GPIO_Output	LCD_BL_A
19	PB1 *	I/O	GPIO_Output	LCD_DCX
21	PB10 *	I/O	GPIO_Output	LCD_DATA7
22	PB11 *	I/O	GPIO_Output	LCD_DATA6
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Output	LCD_DATA5
26	PB13 *	I/O	GPIO_Output	LCD_DATA4
27	PB14 *	I/O	GPIO_Output	LCD_DATA3
28	PB15 *	I/O	GPIO_Output	LCD_DATA2
30	PA9 *	I/O	GPIO_Output	LCD_DATA1
31	PA10 *	I/O	GPIO_Output	LCD_DATA0
35	VSS	Power		
36	VDD	Power		
38	PA15 *	I/O	GPIO_Output	LCD_WRX
40	PB4 *	I/O	GPIO_Output	TP_RST
41	PB5	I/O	GPIO_EXTI5	TP_INT
42	PB6	I/O	I2C1_SCL	MPU6050_TSC_SCL
43	PB7	I/O	I2C1_SDA	MPU6050_TSC_SDA
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	LCD_RESET
47	VSS	Power		
48	VDD	Power		

\* The pin is affected with an I/O function

## 4. Clock Tree Configuration



## 1. Power Consumption Calculator report

### 1.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303CCTx
Datasheet	DS9118_Rev13

### 1.2. Parameter Selection

Temperature	25
Vdd	3.6

### 1.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

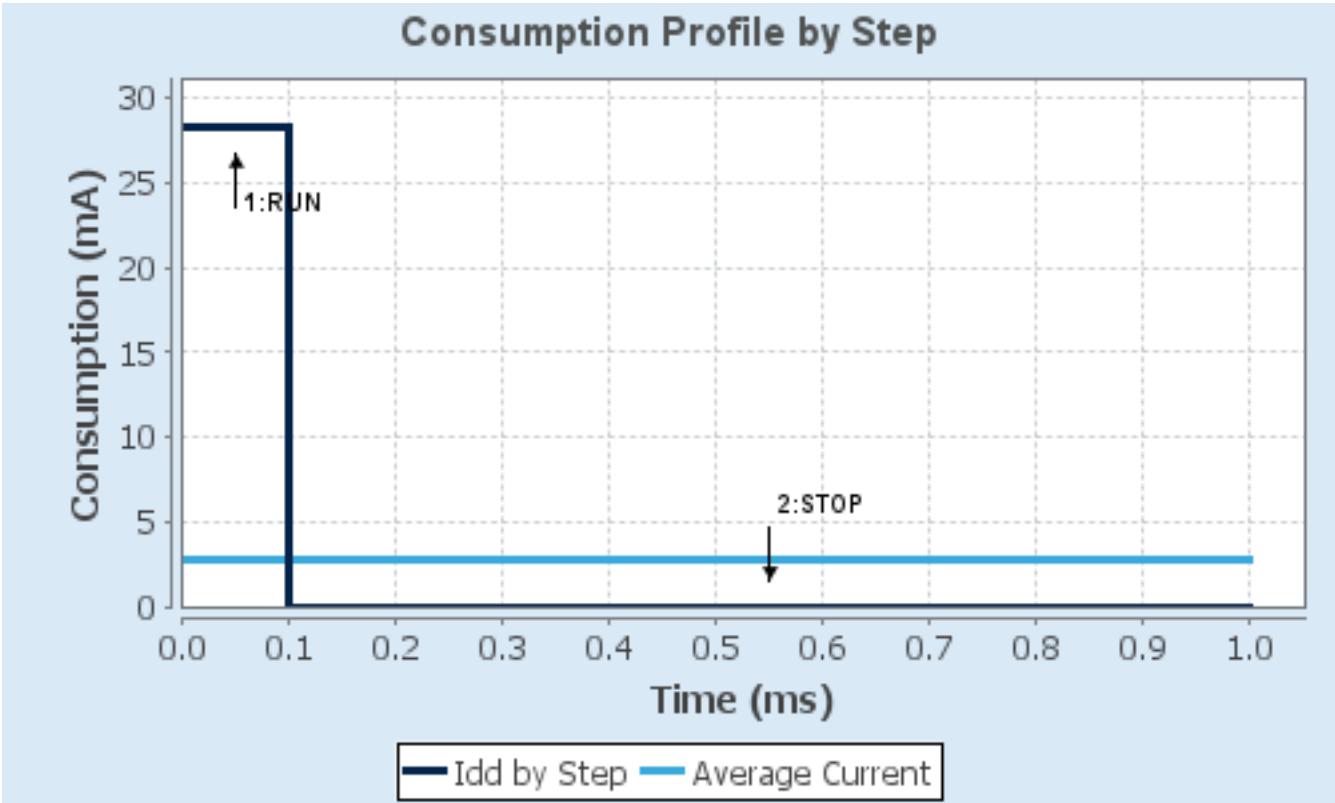
## 1.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.6	3.6
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	No Scale	No Scale
<b>Fetch Type</b>	FLASH	n/a
<b>CPU Frequency</b>	72 MHz	0 Hz
<b>Clock Configuration</b>	HSE PLL	Regulator LP
<b>Clock Source Frequency</b>	8 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	28.24 mA	10.85 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	63.0	0.0
<b>Ta Max</b>	99.41	105
<b>Category</b>	In DS Table	In DS Table

## 1.5. Results

Sequence Time	1 ms	Average Current	2.83 mA
Battery Life	1 month, 19 days, 12 hours	Average DMIPS	63.0 DMIPS

## 1.6. Chart





## 2. Software Project

### 2.1. Project Settings

Name	Value
Project Name	lcd_tsc_mpu6050_drivers
Project Folder	D:\fastbit\courses\embedded-
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F3 V1.11.5
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

### 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	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_I2C1_Init	I2C1

## 3. Peripherals and Middlewares Configuration

### 3.1. I2C1

#### I2C: I2C

##### 3.1.1. Parameter Settings:

###### Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	<b>0x00201D2B *</b>

###### Slave Features:

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

### 3.2. RCC

##### 3.2.1. Parameter Settings:

###### System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

###### RCC Parameters:

HSI Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

### 3.3. SYS

**Timebase Source: SysTick**

\* User modified value

## 4. System Configuration

### 4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	<b>High *</b>	MPU6050_TSC_SCL
	PB7	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	<b>High *</b>	MPU6050_TSC_SDA
GPIO	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_CSX
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_BL_A
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DCX
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA7
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA6
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA5
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA4
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA3
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA2
	PA9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA1
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_DATA0
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_WRX
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	TP_RST
	PB5	GPIO_EXTI5	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	TP_INT
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RESET

### 4.2. DMA configuration

nothing configured in DMA service

### 4.3. NVIC configuration

#### 4.3.1. 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
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line[9:5] interrupts	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C1 error interrupt	unused		
Floating point unit interrupt	unused		

#### 4.3.2. 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

\* User modified value

## 5. System Views

### 5.1. Category view

#### 5.1.1. Current

Middleware

System Core	Analog	Timers	Connectivity	Multimedia	Computing
DMA			I2C1 ✓		
GPIO ✓					
IVVIC ✓					
RCC ✓					
SYS ✓					

## 6. Docs & Resources

Type	Link
BSDL files	<a href="https://www.st.com/resource/en/bsdl_model/stm32f3_bsd.zip">https://www.st.com/resource/en/bsdl_model/stm32f3_bsd.zip</a>
System View Description	<a href="https://www.st.com/resource/en/svd/stm32f3-svd.zip">https://www.st.com/resource/en/svd/stm32f3-svd.zip</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf">https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf">https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf">https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf</a>
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Presentations	<a href="https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf</a>
Brochures	<a href="https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf">https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32nucleo.pdf">https://www.st.com/resource/en/flyer/flstm32nucleo.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstmcsuite.pdf">https://www.st.com/resource/en/flyer/flstmcsuite.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flpowerstbd.pdf">https://www.st.com/resource/en/flyer/flpowerstbd.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/fldpstpf11120.pdf">https://www.st.com/resource/en/flyer/fldpstpf11120.pdf</a>
Product Certifications	<a href="https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf">https://www.st.com/resource/en/certification_document/stm32_authentication_can.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an3126-audio-and-">https://www.st.com/resource/en/application_note/an3126-audio-and-</a>

waveform-generation-using-the-dac-in-stm32-products-  
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Application Notes [https://www.st.com/resource/en/application\\_note/an4099-implementation-of-transmitters-and-receivers-for-infrared-remote-control-protocols-with-mcus-of-the-stm32f0-and-stm32f3-series-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4099-implementation-of-transmitters-and-receivers-for-infrared-remote-control-protocols-with-mcus-of-the-stm32f0-and-stm32f3-series-stmicroelectronics.pdf)

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- Application Notes [https://www.st.com/resource/en/application\\_note/an5612-esd-protection-of-stm32-mcus-and-mpus-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5612-esd-protection-of-stm32-mcus-and-mpus-stmicroelectronics.pdf)
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Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1205-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-fpn-packages-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1205-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-fpn-packages-stmicroelectronics.pdf</a>

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