



## 1. Description

### 1.1. Project

Project Name	template
Board Name	custom
Generated with:	STM32CubeMX 6.12.0
Date	08/20/2024

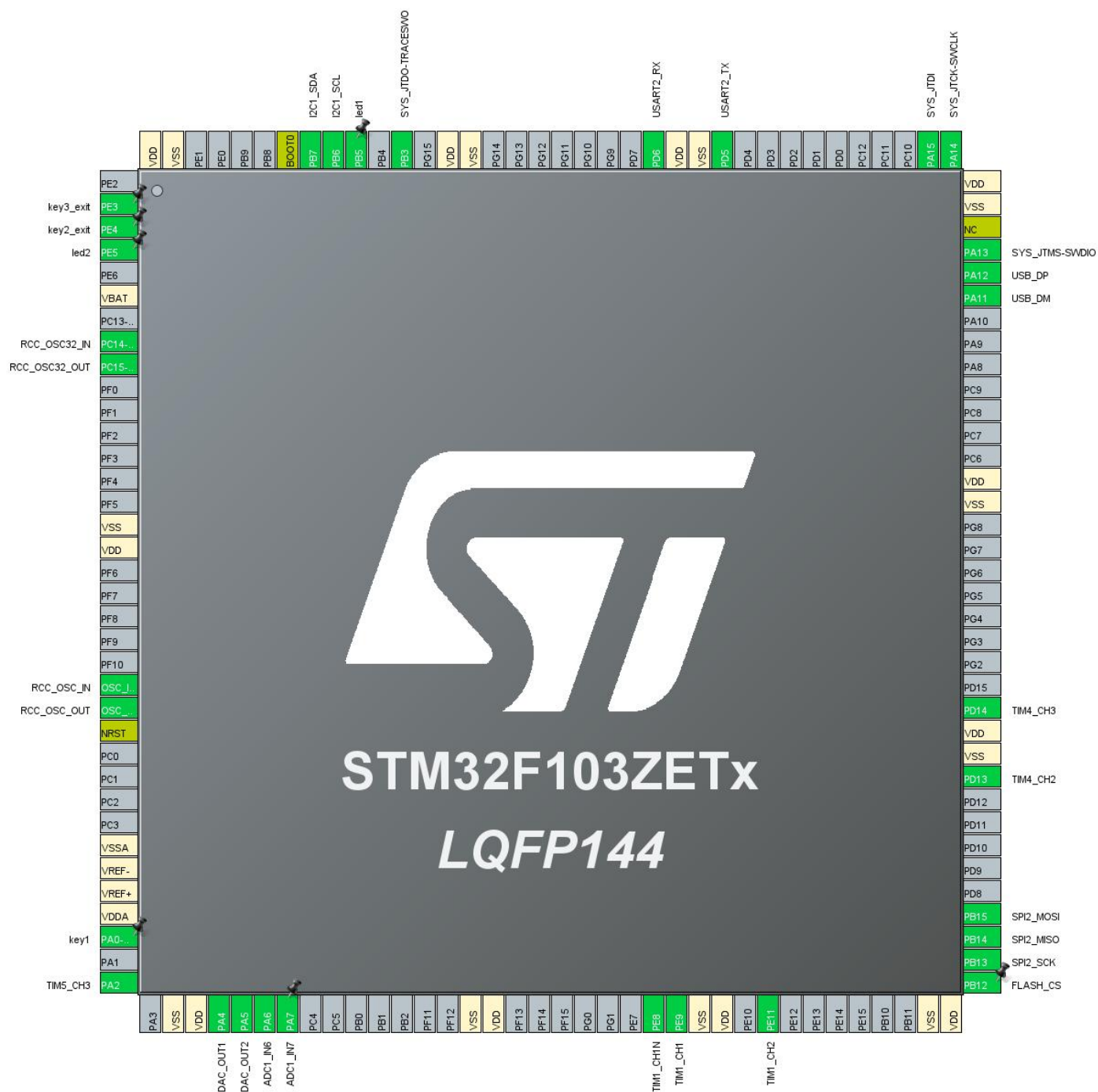
### 1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103ZETx
MCU Package	LQFP144
MCU Pin number	144

### 1.3. Core(s) information

Core(s)	Arm Cortex-M3
---------	---------------

## 2. Pinout Configuration



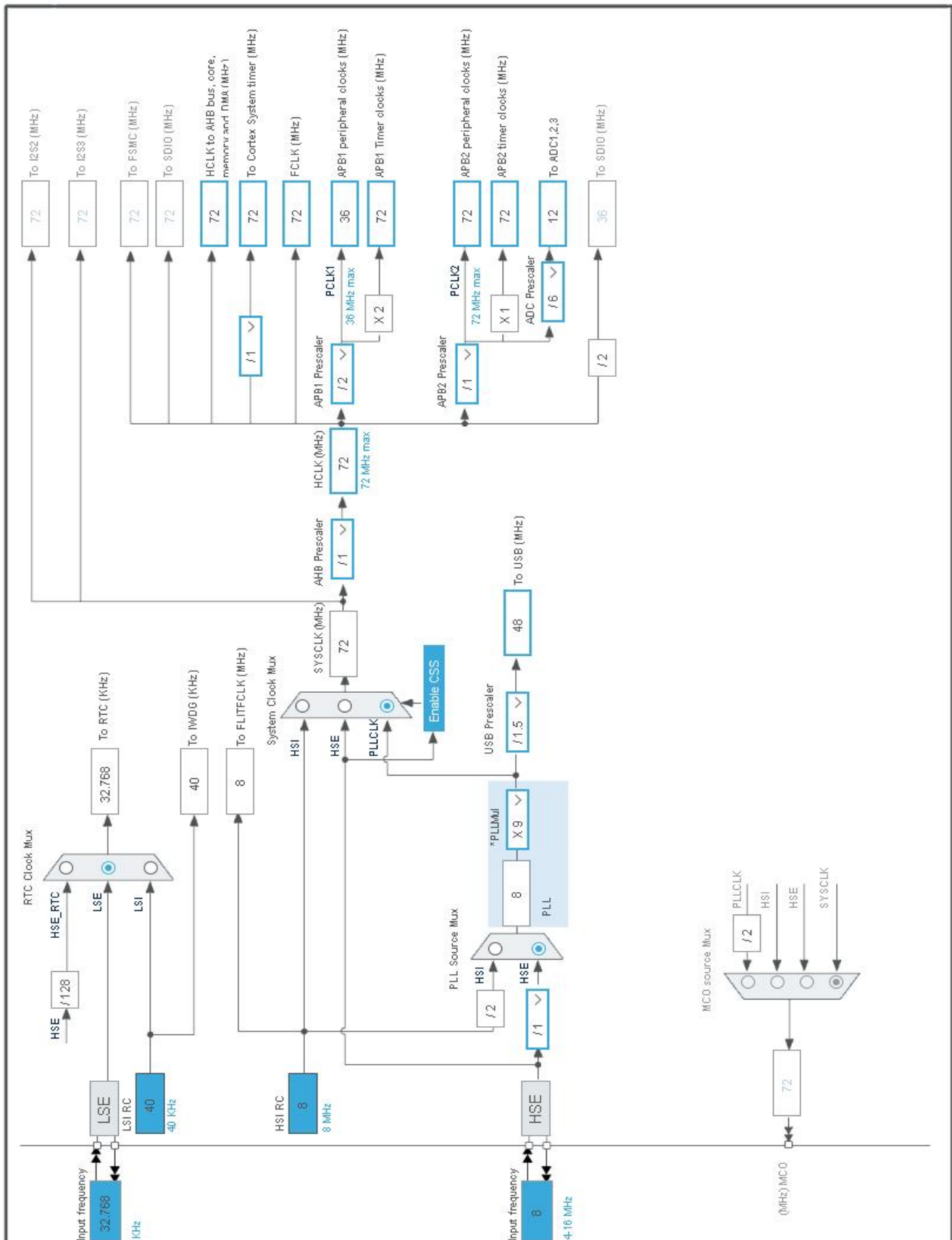
### 3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
2	PE3	I/O	GPIO_EXTI3	key3_exit
3	PE4	I/O	GPIO_EXTI4	key2_exit
4	PE5 *	I/O	GPIO_Output	led2
6	VBAT	Power		
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
16	VSS	Power		
17	VDD	Power		
23	OSC_IN	MonoIO	RCC_OSC_IN	
24	OSC_OUT	MonoIO	RCC_OSC_OUT	
25	NRST	Reset		
30	VSSA	Power		
31	VREF-	Power		
32	VREF+	Power		
33	VDDA	Power		
34	PA0-WKUP *	I/O	GPIO_Input	key1
36	PA2	I/O	TIM5_CH3	
38	VSS	Power		
39	VDD	Power		
40	PA4	I/O	DAC_OUT1	
41	PA5	I/O	DAC_OUT2	
42	PA6	I/O	ADC1_IN6	
43	PA7	I/O	ADC1_IN7	
51	VSS	Power		
52	VDD	Power		
59	PE8	I/O	TIM1_CH1N	
60	PE9	I/O	TIM1_CH1	
61	VSS	Power		
62	VDD	Power		
64	PE11	I/O	TIM1_CH2	
71	VSS	Power		
72	VDD	Power		
73	PB12 *	I/O	GPIO_Output	FLASH_CS
74	PB13	I/O	SPI2_SCK	
75	PB14	I/O	SPI2_MISO	
76	PB15	I/O	SPI2_MOSI	

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
82	PD13	I/O	TIM4_CH2	
83	VSS	Power		
84	VDD	Power		
85	PD14	I/O	TIM4_CH3	
94	VSS	Power		
95	VDD	Power		
103	PA11	I/O	USB_DM	
104	PA12	I/O	USB_DP	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	NC	NC		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
110	PA15	I/O	SYS_JTDI	
119	PD5	I/O	USART2_TX	
120	VSS	Power		
121	VDD	Power		
122	PD6	I/O	USART2_RX	
130	VSS	Power		
131	VDD	Power		
133	PB3	I/O	SYS_JTDO-TRACESWO	
135	PB5 *	I/O	GPIO_Output	led1
136	PB6	I/O	I2C1_SCL	
137	PB7	I/O	I2C1_SDA	
138	BOOT0	Boot		
143	VSS	Power		
144	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	STM32F1
Line	STM32F103
MCU	STM32F103ZETx
Datasheet	DS5792_Rev12

### 1.2. Parameter Selection

Temperature	25
Vdd	3.3

### 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

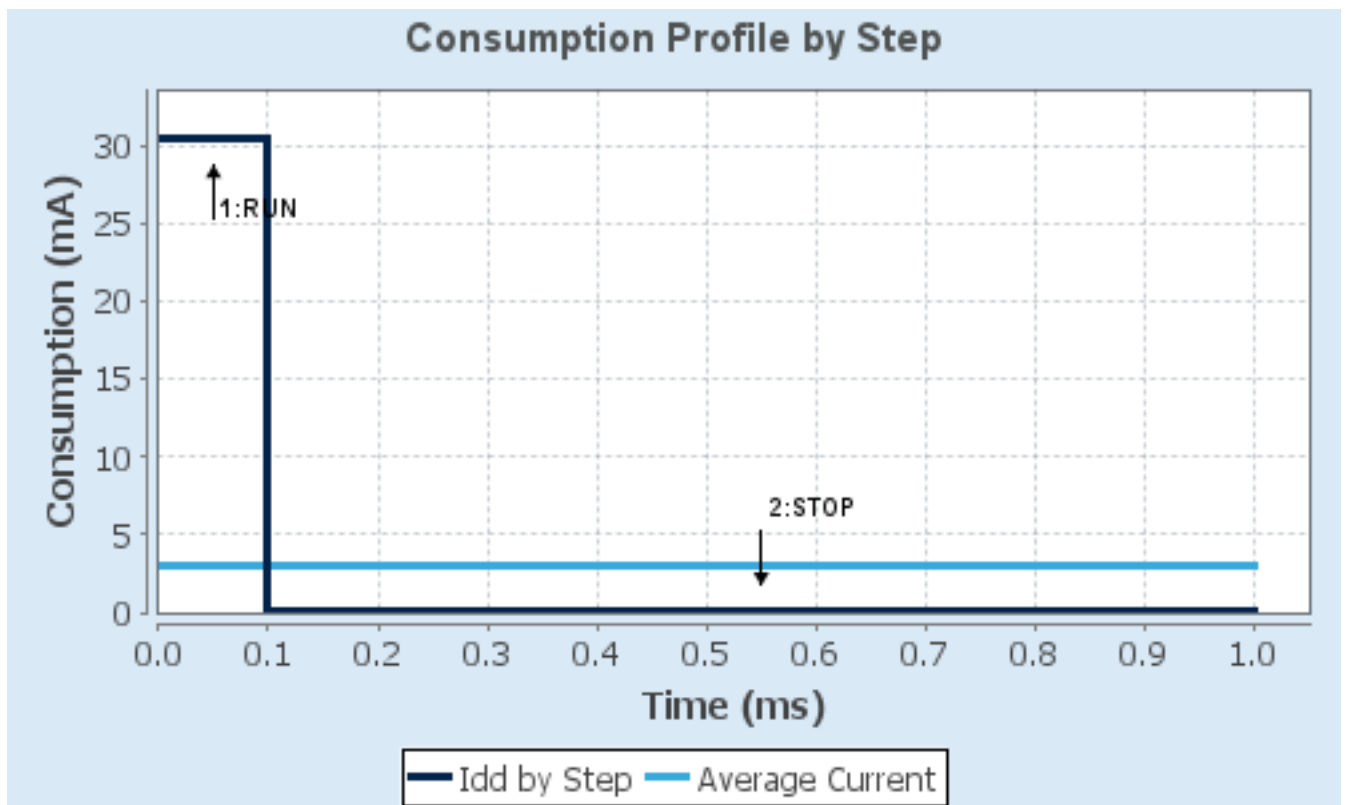
<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.3	3.3
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	No Scale	No Scale
<b>Fetch Type</b>	FLASH	n/a
<b>CPU Frequency</b>	72 MHz	0 Hz
<b>Clock Configuration</b>	HSE PLL	Regulator LP
<b>Clock Source Frequency</b>	8 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	30.5 mA	25 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	90.0	0.0
<b>Ta Max</b>	101.98	105
<b>Category</b>	In DS Table	In DS Table

#### 1.5. Results

Sequence Time	1 ms	Average Current	3.07 mA
Battery Life	1 month, 15 days, 15 hours	Average DMIPS	61.0 DMIPS

#### 1.6. Chart





## 2. Software Project

### 2.1. Project Settings

Name	Value
Project Name	template
Project Folder	C:\Users\79371\Desktop\WorkSpace\workspace_demo\STM32_Template
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.5
Application Structure	Advanced
Generate Under Root	No
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	Yes
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_DMA_Init	DMA
4	MX_USART2_UART_Init	USART2
5	MX_USB_DEVICE_Init	USB_DEVICE
6	MX_I2C1_Init	I2C1
7	MX_CRC_Init	CRC
8	MX_SPI2_Init	SPI2
9	MX_RTC_Init	RTC
10	MX_DAC_Init	DAC
11	MX_TIM2_Init	TIM2

Rank	Function Name	Peripheral Instance Name
12	MX_TIM4_Init	TIM4
13	MX_ADC1_Init	ADC1
14	MX_TIM3_Init	TIM3
15	MX_TIM1_Init	TIM1
16	MX_IWDG_Init	IWDG
17	MX_TIM5_Init	TIM5

## 3. Peripherals and Middlewares Configuration

### 3.1. ADC1

mode: IN6

mode: IN7

#### 3.1.1. Parameter Settings:

##### ADCs\_Common\_Settings:

Mode Independent mode

##### ADC\_Settings:

Data Alignment Right alignment

Scan Conversion Mode Enabled

Continuous Conversion Mode Disabled

Discontinuous Conversion Mode Disabled

##### ADC\_Regular\_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion **2 \***

External Trigger Conversion Source **Timer 3 Trigger Out event \***

Rank 1

Channel Channel 6

Sampling Time **71.5 Cycles \***

Rank **2 \***

Channel **Channel 7 \***

Sampling Time **71.5 Cycles \***

##### ADC\_Injected\_ConversionMode:

Enable Injected Conversions Disable

##### WatchDog:

Enable Analog WatchDog Mode false

### 3.2. CRC

mode: Activated

### 3.3. DAC

mode: OUT1 Configuration

mode: OUT2 Configuration

#### 3.3.1. Parameter Settings:

#### DAC Out1 Settings:

Output Buffer	Enable
Trigger	<b>Timer 2 Trigger Out event *</b>
Wave generation mode	Disabled

#### DAC Out2 Settings:

Output Buffer	Enable
Trigger	<b>Timer 2 Trigger Out event *</b>
Wave generation mode	Disabled

### 3.4. I2C1

#### I2C: I2C

##### 3.4.1. 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

### 3.5. IWDG

#### mode: Activated

##### 3.5.1. Parameter Settings:

#### Clocking:

IWDG counter clock prescaler	<b>64 *</b>
IWDG down-counter reload value	<b>1250 *</b>

### 3.6. RCC

#### High Speed Clock (HSE): Crystal/Ceramic Resonator

## Low Speed Clock (LSE) : Crystal/Ceramic Resonator

### 3.6.1. Parameter Settings:

#### System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

#### RCC Parameters:

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

## 3.7. RTC

**mode: Activate Clock Source**

**mode: Activate Calendar**

**RTC OUT: No RTC Output**

### 3.7.1. Parameter Settings:

#### Calendar Time:

Data Format	BCD data format
Hours	<b>22 *</b>
Minutes	<b>10 *</b>
Seconds	0

#### General:

Auto Predivider Calculation	Enabled
Asynchronous Predivider value	Automatic Predivider Calculation Enabled
Output	No output on the TAMPER pin

#### Calendar Date:

Week Day	<b>Friday *</b>
Month	<b>August *</b>
Date	<b>16 *</b>
Year	<b>24 *</b>

## 3.8. SPI2

**Mode: Full-Duplex Master**

### 3.8.1. Parameter Settings:

#### **Basic Parameters:**

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

#### **Clock Parameters:**

Prescaler (for Baud Rate)	2
Baud Rate	<b>18.0 MBits/s *</b>
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

#### **Advanced Parameters:**

CRC Calculation	Disabled
NSS Signal Type	Software

### **3.9. SYS**

**Debug: JTAG (4 pins)**

**Timebase Source: SysTick**

### **3.10. TIM1**

**Clock Source : Internal Clock**

**Channel1: PWM Generation CH1 CH1N**

**Channel2: PWM Generation CH2**

#### 3.10.1. Parameter Settings:

#### **Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>71 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>999 *</b>
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	<b>Enable *</b>

#### **Trigger Output (TRGO) Parameters:**

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

#### **Break And Dead Time management - BRK Configuration:**

BRK State	<b>Enable *</b>
-----------	-----------------

BRK Polarity **Low \***

**Break And Dead Time management - Output Configuration:**

Automatic Output State **Enable \***  
 Off State Selection for Run Mode (OSSR) **Enable \***  
 Off State Selection for Idle Mode (OSSI) **Enable \***  
 Lock Configuration Off  
 Dead Time **0xac \***

**PWM Generation Channel 1 and 1N:**

Mode PWM mode 1  
 Pulse (16 bits value) 0  
 Output compare preload Enable  
 Fast Mode Disable  
 CH Polarity High  
 CHN Polarity High  
 CH Idle State Reset  
 CHN Idle State Reset

**PWM Generation Channel 2:**

Mode PWM mode 1  
 Pulse (16 bits value) 0  
 Output compare preload Enable  
 Fast Mode Disable  
 CH Polarity High  
 CH Idle State Reset

### 3.11. TIM2

**Clock Source : Internal Clock**

3.11.1. Parameter Settings:

**Counter Settings:**

Prescaler (PSC - 16 bits value) 0  
 Counter Mode Up  
 Counter Period (AutoReload Register - 16 bits value ) 65535  
 Internal Clock Division (CKD) No Division  
 auto-reload preload Disable

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)  
 Trigger Event Selection **Update Event \***



### 3.12. TIM3

**Clock Source : Internal Clock**

#### 3.12.1. Parameter Settings:

##### **Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>99 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>999 *</b>
Internal Clock Division (CKD)	No Division
auto-reload preload	<b>Enable *</b>

##### **Trigger Output (TRGO) Parameters:**

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	<b>Update Event *</b>

### 3.13. TIM4

**Clock Source : Internal Clock**

**Channel2: Input Capture direct mode**

**Channel3: Input Capture direct mode**

#### 3.13.1. Parameter Settings:

##### **Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>72-1 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	65535
Internal Clock Division (CKD)	No Division
auto-reload preload	<b>Enable *</b>

##### **Trigger Output (TRGO) Parameters:**

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	<b>Update Event *</b>

##### **Input Capture Channel 2:**

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	<b>8 *</b>

### Input Capture Channel 3:

Polarity Selection	<b>Falling Edge *</b>
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	<b>8 *</b>

## 3.14. TIM5

### mode: Clock Source

### Channel3: PWM Generation CH3

#### 3.14.1. Parameter Settings:

#### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>71 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	65535
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

#### Trigger Output (TRGO) Parameters:

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

#### PWM Generation Channel 3:

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

## 3.15. USART2

### Mode: Asynchronous

#### 3.15.1. 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

### 3.16. USB

#### mode: Device (FS)

##### 3.16.1. Parameter Settings:

###### Basic Parameters:

Speed	Full Speed 12MBit/s
-------	---------------------

###### Power Parameters:

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

### 3.17. USB\_DEVICE

#### Class For FS IP: Communication Device Class (Virtual Port Com)

##### 3.17.1. Parameter Settings:

###### Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

###### Class Parameters:

USB CDC Rx Buffer Size	1024
USB CDC Tx Buffer Size	1024

##### 3.17.2. Device Descriptor:

###### Device Descriptor:

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

###### Device Descriptor FS:

PID (Product Identifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort

CONFIGURATION\_STRING (Configuration Identifier)

CDC Config

INTERFACE\_STRING (Interface Identifier)

CDC Interface

**\* User modified value**

## 4. System Configuration

### 4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA6	ADC1_IN6	Analog mode	n/a	n/a	
	PA7	ADC1_IN7	Analog mode	n/a	n/a	
DAC	PA4	DAC_OUT1	Analog mode	n/a	n/a	
	PA5	DAC_OUT2	Analog mode	n/a	n/a	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	n/a	High *	
	PB7	I2C1_SDA	Alternate Function Open Drain	n/a	High *	
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	n/a	High *	
	PB14	SPI2_MISO	Input mode	No pull-up and no pull-down	n/a	
	PB15	SPI2_MOSI	Alternate Function Push Pull	n/a	High *	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PA15	SYS_JTDI	n/a	n/a	n/a	
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	
TIM1	PE8	TIM1_CH1N	Alternate Function Push Pull	n/a	Low	
	PE9	TIM1_CH1	Alternate Function Push Pull	n/a	Low	
	PE11	TIM1_CH2	Alternate Function Push Pull	n/a	Low	
TIM4	PD13	TIM4_CH2	Input mode	No pull-up and no pull-down	n/a	
	PD14	TIM4_CH3	Input mode	No pull-up and no pull-down	n/a	
TIM5	PA2	TIM5_CH3	Alternate Function Push Pull	n/a	Low	
USART2	PD5	USART2_TX	Alternate Function Push Pull	n/a	High *	
	PD6	USART2_RX	Input mode	No pull-up and no pull-down	n/a	
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PE3	GPIO_EXTI3	External Event Mode with Rising/Falling	No pull-up and no pull-down	n/a	key3_exit

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			<b>edge trigger detection</b>			
	PE4	GPIO_EXTI4	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	key2_exit
	PE5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	led2
	PA0-WKUP	GPIO_Input	Input mode	<b>Pull-down *</b>	n/a	key1
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FLASH_CS
	PB5	GPIO_Output	Output Push Pull	<b>Pull-up *</b>	Low	led1

## 4.2. DMA configuration

DMA request	Stream	Direction	Priority
DAC_CH1	DMA2_Channel3	Memory To Peripheral	Low
DAC_CH2	DMA2_Channel4	Memory To Peripheral	Low
ADC1	DMA1_Channel1	Peripheral To Memory	Low
TIM4_CH2	DMA1_Channel4	Peripheral To Memory	Low
TIM4_CH3	DMA1_Channel5	Peripheral To Memory	Low
TIM1_CH2	DMA1_Channel3	Memory To Peripheral	Low

### DAC\_CH1: DMA2\_Channel3 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: Half Word  
 Memory Data Width: Half Word

### DAC\_CH2: DMA2\_Channel4 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: Half Word  
 Memory Data Width: Half Word

### ADC1: DMA1\_Channel1 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable  
 Memory Increment: **Enable \***  
 Peripheral Data Width: Half Word  
 Memory Data Width: Half Word

### TIM4\_CH2: DMA1\_Channel4 DMA request Settings:

Mode: **Circular \***  
 Peripheral Increment: Disable

Memory Increment: **Enable \***  
Peripheral Data Width: Half Word  
Memory Data Width: Half Word

*TIM4\_CH3: DMA1\_Channel5 DMA request Settings:*

Mode: Normal  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Half Word  
Memory Data Width: Half Word

*TIM1\_CH2: DMA1\_Channel3 DMA request Settings:*

Mode: Normal  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Half Word  
Memory Data Width: Half Word



### 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
Prefetch 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	1	0
System tick timer	true	0	0
RTC global interrupt	true	0	0
RCC global interrupt	true	0	0
EXTI line4 interrupt	true	4	0
DMA1 channel1 global interrupt	true	0	0
DMA1 channel3 global interrupt	true	0	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
USB low priority or CAN RX0 interrupts	true	0	0
TIM1 update interrupt	true	0	0
TIM4 global interrupt	true	0	0
USART2 global interrupt	true	0	0
TIM5 global interrupt	true	0	0
DMA2 channel3 global interrupt	true	0	0
DMA2 channel4 and channel5 global interrupts	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
ADC1 and ADC2 global interrupts	unused		
USB high priority or CAN TX interrupts	unused		
TIM1 break interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI2 global 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
Prefetch 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
RTC global interrupt	false	true	true
RCC global interrupt	false	true	false
EXTI line4 interrupt	false	true	true
DMA1 channel1 global interrupt	false	true	true
DMA1 channel3 global interrupt	false	true	true
DMA1 channel4 global interrupt	false	true	true
DMA1 channel5 global interrupt	false	true	true
USB low priority or CAN RX0 interrupts	false	true	true
TIM1 update interrupt	false	true	true
TIM4 global interrupt	false	true	true
USART2 global interrupt	false	true	true
TIM5 global interrupt	false	true	true
DMA2 channel3 global interrupt	false	true	true
DMA2 channel4 and channel5 global interrupts	false	true	true

\* User modified value

## 5. System Views

### 5.1. Category view

#### 5.1.1. Current

Middleware					
USB_DEVICE ✓					
System Core	Analog	Timers	Connectivity	Multimedia	Computing
DMA ✓	ADC1 ✓	RTC ✓	I2C1 ✓		CRC ✓
GPIO ✓	DAC ✓	TIM1 ✓	SPI2 ✓		
IWDG ✓		TIM2 ✓	USART2 ✓		
NVIC ✓		TIM3 ✓	USB ✓		
RCC ✓		TIM4 ✓			
SYS ✓		TIM5 ✓			

## 6. Docs & Resources

Type	Link
BSDL files	<a href="https://www.st.com/resource/en/bsdl_model/stm32f1_bsd.zip">https://www.st.com/resource/en/bsdl_model/stm32f1_bsd.zip</a>
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32ibis.zip">https://www.st.com/resource/en/ibis_model/stm32ibis.zip</a>
System View Description	<a href="https://www.st.com/resource/en/svd/stm32f1_svd.zip">https://www.st.com/resource/en/svd/stm32f1_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>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf">https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf</a>
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/fldpstpfc11120.pdf">https://www.st.com/resource/en/flyer/fldpstpfc11120.pdf</a>
Product Certifications	<a href="https://www.st.com/resource/en/certification_document/1239988349.pdf">https://www.st.com/resource/en/certification_document/1239988349.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/an2586-getting-started-with-stm32f10xxx-hardware-development-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an2586-getting-started-with-stm32f10xxx-hardware-development-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 [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)
- Application Notes [https://www.st.com/resource/en/application\\_note/an2784-using-the-highdensity-stm32f10xxx-fsmc-peripheral-to-drive-external-memories-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2784-using-the-highdensity-stm32f10xxx-fsmc-peripheral-to-drive-external-memories-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an2945-stm8s-and-stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2945-stm8s-and-stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3070-managing-the-driver-enable-signal-for-rs485-and-iolink-communications-with-the-stm32s-usart-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3070-managing-the-driver-enable-signal-for-rs485-and-iolink-communications-with-the-stm32s-usart-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3095-stevalisv002v1-stevalisv002v2-3-kw-gridconnected-pv-system-based-on-the-stm32f103xx-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3095-stevalisv002v1-stevalisv002v2-3-kw-gridconnected-pv-system-based-on-the-stm32f103xx-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3108-stlm75-firmware-library-for-the-stm32f10x-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3108-stlm75-firmware-library-for-the-stm32f10x-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](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/an3128-stm32-embedded-graphic-objectstouchscreen-library-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3128-stm32-embedded-graphic-objectstouchscreen-library-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3154-can-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3154-can-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf](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](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/an3165-digital-pfc-and-dual-foc-mc-integration-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3165-digital-pfc-and-dual-foc-mc-integration-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3364-migration-and-compatibility-guidelines-for-stm32-microcontroller-applications-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3364-migration-and-compatibility-guidelines-for-stm32-microcontroller-applications-stmicroelectronics.pdf)

- Application Notes [https://www.st.com/resource/en/application\\_note/an3422-migration-of-microcontroller-applications-from-stm32f1-to-stm32l1-series-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3422-migration-of-microcontroller-applications-from-stm32f1-to-stm32l1-series-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3427-migrating-a-microcontroller-application-from-stm32f1-to-stm32f2-series-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3427-migrating-a-microcontroller-application-from-stm32f1-to-stm32f2-series-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an3429-stm32-proprietary-code-protection-overview-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3429-stm32-proprietary-code-protection-overview-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4070-250-w-grid-connected-microinverter-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4070-250-w-grid-connected-microinverter-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4076-two-or-three-shunt-resistor-based-current-sensing-circuit-design-in-3phase-inverters-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4076-two-or-three-shunt-resistor-based-current-sensing-circuit-design-in-3phase-inverters-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4088-migrating-between-stm32f1-and-stm32f0-series-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4088-migrating-between-stm32f1-and-stm32f0-series-microcontrollers-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4228-migrating-from-stm32f1-series-to-stm32f3-series-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4228-migrating-from-stm32f1-series-to-stm32f3-series-microcontrollers-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4229-how-to-implement-a-vocoder-solution-using-stm32-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4229-how-to-implement-a-vocoder-solution-using-stm32-microcontrollers-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf](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/an4649-migrating-from-stm32f1-series-to-stm32l4-series--stm32l4-series-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4649-migrating-from-stm32f1-series-to-stm32l4-series--stm32l4-series-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](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/an4724-stm32cube-firmware-examples-for-stm32f1-series-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4724-stm32cube-firmware-examples-for-stm32f1-series-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf](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](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](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/an4904-migration-of-microcontroller-applications-from-stm32f1-series-to-stm32f4-access-lines-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4904-migration-of-microcontroller-applications-from-stm32f1-series-to-stm32f4-access-lines-stmicroelectronics.pdf)
- Application Notes [https://www.st.com/resource/en/application\\_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf](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/an5027-interfacing-pdm-digital-microphones-using-stm32-mcus-and-mpus-stmicroelectronics.pdf](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/an4899-stm32-microcontroller-gpio-hardware-settings-and-lowpower-consumption-stmicroelectronics.pdf](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](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/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf](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/an4879-introduction-to-usb-hardware-and-pcb-guidelines-using-stm32-mcus-stmicroelectronics.pdf](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](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/an2834-how-to-optimize-the-adc-accuracy-in-the-stm32-mcus-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2834-how-to-optimize-the-adc-accuracy-in-the-stm32-mcus-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](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](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/an2548-introduction-to-dma-controller-for-stm32-mcus-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2548-introduction-to-dma-controller-for-stm32-mcus-stmicroelectronics.pdf)

Application Notes [https://www.st.com/resource/en/application\\_note/an4013-introduction-to-timers-for-stm32-mcus-stmicroelectronics.pdf](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](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/an4908-getting-started-with-uart-automatic-baud-rater-detection-for-stm32-mcus-stmicroelectronics.pdf](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/an5156-introduction-to-security-for-stm32-mcus-stmicroelectronics.pdf](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/an5543-guidelines-for-enhanced-spi-communication-on-stm32-mcus-and-mpus-stmicroelectronics.pdf](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/an1202\\_freertos\\_guide-for\\_related\\_Tools\\_freertos-guide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an1202_freertos_guide-for_related_Tools_freertos-guide-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an1602\\_semihosting\\_in\\_for\\_related\\_Tools\\_truestudio-how-to-do-semihosting-in-truestudio-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an1602_semihosting_in_for_related_Tools_truestudio-how-to-do-semihosting-in-truestudio-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an1801\\_stm32cubeprog\\_for\\_related\\_Tools\\_rammer\\_in\\_truestudio-installing-stm32cubeprogrammer-in-truestudio-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an1801_stm32cubeprog_for_related_Tools_rammer_in_truestudio-installing-stm32cubeprogrammer-in-truestudio-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/atollic\\_editing\\_keyboard\\_for\\_related\\_Tools\\_shortcuts-atollic-editing-keyboard-shortcuts-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/atollic_editing_keyboard_for_related_Tools_shortcuts-atollic-editing-keyboard-shortcuts-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/iar\\_to\\_atollic\\_truestudio\\_for\\_related\\_Tools\\_migration\\_guide-truestudio-for-arm-migration-guide-iar-embedded-workbench-to-truestudio-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/iar_to_atollic_truestudio_for_related_Tools_migration_guide-truestudio-for-arm-migration-guide-iar-embedded-workbench-to-truestudio-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/stm32cubemx\\_installatio\\_for\\_related\\_Tools\\_n\\_in\\_truestudio-stm32cubemx-installation-in-truestudio-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/stm32cubemx_installatio_for_related_Tools_n_in_truestudio-stm32cubemx-installation-in-truestudio-stmicroelectronics.pdf)  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an2557-stm32f10x-](https://www.st.com/resource/en/application_note/an2557-stm32f10x-)



for related Tools    inapplication-programming-using-the-usart-stmicroelectronics.pdf  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2592-achieving-32bit-timer-resolution-with-software-expansion-for-stm32cube-and-standard-peripheral-library-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2592-achieving-32bit-timer-resolution-with-software-expansion-for-stm32cube-and-standard-peripheral-library-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2594-eeeprom-emulation-in-stm32f10x-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2594-eeeprom-emulation-in-stm32f10x-microcontrollers-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2598-smartcard-interface-with-stm32f10x-and-stm32l1xx-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2598-smartcard-interface-with-stm32f10x-and-stm32l1xx-microcontrollers-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2629-stm32f101xx-stm32f102xx-and-stm32f103xx-lowpower-modes-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2629-stm32f101xx-stm32f102xx-and-stm32f103xx-lowpower-modes-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2656-stm32f10xxx-lcd-glass-driver-firmware-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2656-stm32f10xxx-lcd-glass-driver-firmware-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2668-improving-stm32f1-series-stm32f3-series-and-stm32lx-series-adc-resolution-by-oversampling-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2668-improving-stm32f1-series-stm32f3-series-and-stm32lx-series-adc-resolution-by-oversampling-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2739-how-to-use-the-highdensity-stm32f103xx-microcontroller-to-play-audio-files-with-an-external-is-audio-codec-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2739-how-to-use-the-highdensity-stm32f103xx-microcontroller-to-play-audio-files-with-an-external-is-audio-codec-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2784-using-the-highdensity-stm32f10xxx-fsmc-peripheral-to-drive-external-memories-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2784-using-the-highdensity-stm32f10xxx-fsmc-peripheral-to-drive-external-memories-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2790-tft-lcd-interfacing-with-the-highdensity-stm32f10xxx-fsmc-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2790-tft-lcd-interfacing-with-the-highdensity-stm32f10xxx-fsmc-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2820-driving-bipolar-stepper-motors-using-a-mediumdensity-stm32f103xx-microcontroller-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2820-driving-bipolar-stepper-motors-using-a-mediumdensity-stm32f103xx-microcontroller-stmicroelectronics.pdf)  
for related Tools     
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an2821-clockcalendar-implementation-on-the-stm32f10xxx-microcontroller-rtc-](https://www.st.com/resource/en/application_note/an2821-clockcalendar-implementation-on-the-stm32f10xxx-microcontroller-rtc-)  
for related Tools

& Software      stmicroelectronics.pdf

Application Notes   [https://www.st.com/resource/en/application\\_note/an2824-stm32f10xxx-ic-](https://www.st.com/resource/en/application_note/an2824-stm32f10xxx-ic-for-related-Tools-optimized-examples-stmicroelectronics.pdf)  
for related Tools   [optimized-examples-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2824-stm32f10xxx-ic-for-related-Tools-optimized-examples-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an2841-led-dimming-](https://www.st.com/resource/en/application_note/an2841-led-dimming-implemented-on-stm32-microcontroller-stmicroelectronics.pdf)  
for related Tools   [implemented-on-stm32-microcontroller-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2841-led-dimming-implemented-on-stm32-microcontroller-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an2868-stm32f10xxx-](https://www.st.com/resource/en/application_note/an2868-stm32f10xxx-internal-rc-oscillator-hsi-calibration-stmicroelectronics.pdf)  
for related Tools   [internal-rc-oscillator-hsi-calibration-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2868-stm32f10xxx-internal-rc-oscillator-hsi-calibration-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an2931-implementing-](https://www.st.com/resource/en/application_note/an2931-implementing-the-adpcm-algorithm-in-highdensity-stm32f103xx-microcontrollers-stmicroelectronics.pdf)  
for related Tools   [the-adpcm-algorithm-in-highdensity-stm32f103xx-microcontrollers-](https://www.st.com/resource/en/application_note/an2931-implementing-the-adpcm-algorithm-in-highdensity-stm32f103xx-microcontrollers-stmicroelectronics.pdf)  
& Software      [stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2931-implementing-the-adpcm-algorithm-in-highdensity-stm32f103xx-microcontrollers-stmicroelectronics.pdf)

Application Notes   [https://www.st.com/resource/en/application\\_note/an2953-how-to-migrate-](https://www.st.com/resource/en/application_note/an2953-how-to-migrate-from-the-stm32f10xxx-firmware-library-v203-to-the-stm32f10xxx-standard-peripheral-library-v300-stmicroelectronics.pdf)  
for related Tools   [from-the-stm32f10xxx-firmware-library-v203-to-the-stm32f10xxx-standard-](https://www.st.com/resource/en/application_note/an2953-how-to-migrate-from-the-stm32f10xxx-firmware-library-v203-to-the-stm32f10xxx-standard-peripheral-library-v300-stmicroelectronics.pdf)  
& Software      [peripheral-library-v300-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an2953-how-to-migrate-from-the-stm32f10xxx-firmware-library-v203-to-the-stm32f10xxx-standard-peripheral-library-v300-stmicroelectronics.pdf)

Application Notes   [https://www.st.com/resource/en/application\\_note/an3012-getting-started-](https://www.st.com/resource/en/application_note/an3012-getting-started-with-uclinux-for-stm32f10x-highdensity-devices-stmicroelectronics.pdf)  
for related Tools   [with-uclinux-for-stm32f10x-highdensity-devices-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3012-getting-started-with-uclinux-for-stm32f10x-highdensity-devices-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an3078-stm32-](https://www.st.com/resource/en/application_note/an3078-stm32-inapplication-programming-over-the-ic-bus-stmicroelectronics.pdf)  
for related Tools   [inapplication-programming-over-the-ic-bus-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3078-stm32-inapplication-programming-over-the-ic-bus-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an3109-communication-](https://www.st.com/resource/en/application_note/an3109-communication-peripheral-fifo-emulation-with-dma-and-dma-timeout-in-stm32f10x-microcontrollers-stmicroelectronics.pdf)  
for related Tools   [peripheral-fifo-emulation-with-dma-and-dma-timeout-in-stm32f10x-](https://www.st.com/resource/en/application_note/an3109-communication-peripheral-fifo-emulation-with-dma-and-dma-timeout-in-stm32f10x-microcontrollers-stmicroelectronics.pdf)  
& Software      [microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3109-communication-peripheral-fifo-emulation-with-dma-and-dma-timeout-in-stm32f10x-microcontrollers-stmicroelectronics.pdf)

Application Notes   [https://www.st.com/resource/en/application\\_note/an3116-stm32s-adc-](https://www.st.com/resource/en/application_note/an3116-stm32s-adc-modes-and-their-applications-stmicroelectronics.pdf)  
for related Tools   [modes-and-their-applications-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3116-stm32s-adc-modes-and-their-applications-stmicroelectronics.pdf)

& Software

Application Notes   [https://www.st.com/resource/en/application\\_note/an3174-implementing-](https://www.st.com/resource/en/application_note/an3174-implementing-receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-microcontrollers-stmicroelectronics.pdf)  
for related Tools   [receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-](https://www.st.com/resource/en/application_note/an3174-implementing-receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-microcontrollers-stmicroelectronics.pdf)  
& Software      [microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3174-implementing-receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-microcontrollers-stmicroelectronics.pdf)

Application Notes   [https://www.st.com/resource/en/application\\_note/an3240-ultrasound-hv-](https://www.st.com/resource/en/application_note/an3240-ultrasound-hv-pulser-demonstration-board-stmicroelectronics.pdf)  
for related Tools   [pulser-demonstration-board-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3240-ultrasound-hv-pulser-demonstration-board-stmicroelectronics.pdf)

& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an3241-qvga-tftlcd-direct-drive-using-the-stm32f10xx-fsmc-peripheral-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3241-qvga-tftlcd-direct-drive-using-the-stm32f10xx-fsmc-peripheral-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an3307-guidelines-for-obtaining-iec-60335-class-b-certification-for-any-stm32-application-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3307-guidelines-for-obtaining-iec-60335-class-b-certification-for-any-stm32-application-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an3970-plm-smartplug-v2-getting-started-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3970-plm-smartplug-v2-getting-started-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an3991-how-to-drive-multiple-stepper-motors-with-the-l6470-motor-driver-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an3991-how-to-drive-multiple-stepper-motors-with-the-l6470-motor-driver-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4075-stevalifp016v2-iolink-communication-master-transceiver-demonstration-board-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4075-stevalifp016v2-iolink-communication-master-transceiver-demonstration-board-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4323-getting-started-with-stemwin-library-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4323-getting-started-with-stemwin-library-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4453-implementing-the-adpcm-algorithm-in-stm32l1xx-microcontrollers-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4453-implementing-the-adpcm-algorithm-in-stm32l1xx-microcontrollers-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4499-stm32--nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4499-stm32--nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4578-16channels-led-driver-with-independent-pwm-dimming-control-based-on-led7708-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4578-16channels-led-driver-with-independent-pwm-dimming-control-based-on-led7708-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [https://www.st.com/resource/en/application\\_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf)  
for related Tools  
& Software

Application Notes [---

Page 34](https://www.st.com/resource/en/application_note/an4724-stm32cube-</a></p></div><div data-bbox=)

for related Tools    [firmware-examples-for-stm32f1-series-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an4841-digital-signal-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4841-digital-signal-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf)  
for related Tools    [processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5360-getting-started-with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5360-getting-started-with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf)  
for related Tools    [with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5361-getting-started-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5361-getting-started-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf)  
for related Tools    [with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf)  
for related Tools    [with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5418-how-to-build-a-simple-usbp-d-sink-application-with-stm32cubemx-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5418-how-to-build-a-simple-usbp-d-sink-application-with-stm32cubemx-stmicroelectronics.pdf)  
for related Tools    [simple-usbp-d-sink-application-with-stm32cubemx-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf)  
for related Tools    [graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5564-getting-started-with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5564-getting-started-with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf)  
for related Tools    [with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5698-adapting-the-xcubestl-functional-safety-package-for-stm32-iec-61508-compliant-to-other-safety-standards-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5698-adapting-the-xcubestl-functional-safety-package-for-stm32-iec-61508-compliant-to-other-safety-standards-stmicroelectronics.pdf)  
for related Tools    [xcubestl-functional-safety-package-for-stm32-iec-61508-compliant-to-other-safety-standards-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf)  
for related Tools    [and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an4502-stm32-smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4502-stm32-smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf)  
for related Tools    [smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf](#)  
& Software

Application Notes    [https://www.st.com/resource/en/application\\_note/an5952-how-to-use-cmake-in-stm32cubeide-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an5952-how-to-use-cmake-in-stm32cubeide-stmicroelectronics.pdf)  
for related Tools    [cmake-in-stm32cubeide-stmicroelectronics.pdf](#)

## & Software

Application Notes for related Tools & Software	<a href="https://www.st.com/resource/en/application_note/an5054-how-to-perform-secure-programming-using-stm32cube-programmer-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an5054-how-to-perform-secure-programming-using-stm32cube-programmer-stmicroelectronics.pdf</a>
Device Option Lists	<a href="https://www.st.com/resource/en/device_option_list/opl_stm32f103_512k.zip">https://www.st.com/resource/en/device_option_list/opl_stm32f103_512k.zip</a>
Errata Sheets	<a href="https://www.st.com/resource/en/errata_sheet/es0340-stm32f101xcde-stm32f103xcde-device-errata-stmicroelectronics.pdf">https://www.st.com/resource/en/errata_sheet/es0340-stm32f101xcde-stm32f103xcde-device-errata-stmicroelectronics.pdf</a>
Datasheet	<a href="https://www.st.com/resource/en/datasheet/cd00191185.pdf">https://www.st.com/resource/en/datasheet/cd00191185.pdf</a>
Programming Manuals	<a href="https://www.st.com/resource/en/programming_manual/pm0056-stm32f10xxx20xxx21xxx1xxxx-cortexm3-programming-manual-stmicroelectronics.pdf">https://www.st.com/resource/en/programming_manual/pm0056-stm32f10xxx20xxx21xxx1xxxx-cortexm3-programming-manual-stmicroelectronics.pdf</a>
Programming Manuals	<a href="https://www.st.com/resource/en/programming_manual/pm0075-stm32f10xxx-flash-memory-microcontrollers-stmicroelectronics.pdf">https://www.st.com/resource/en/programming_manual/pm0075-stm32f10xxx-flash-memory-microcontrollers-stmicroelectronics.pdf</a>
Reference Manuals	<a href="https://www.st.com/resource/en/reference_manual/rm0008-stm32f101xx-stm32f102xx-stm32f103xx-stm32f105xx-and-stm32f107xx-advanced-armbased-32bit-mcus-stmicroelectronics.pdf">https://www.st.com/resource/en/reference_manual/rm0008-stm32f101xx-stm32f102xx-stm32f103xx-stm32f105xx-and-stm32f107xx-advanced-armbased-32bit-mcus-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn0516-overview-of-the-stm32f0xf100xxf103xx-and-stm32f2xxf30xf4xx-mcus-pmsm-singledual-foc-sdk-v40-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn0516-overview-of-the-stm32f0xf100xxf103xx-and-stm32f2xxf30xf4xx-mcus-pmsm-singledual-foc-sdk-v40-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1163-description-of-wlcsp-for-microcontrollers-and-recommendations-for-its-use-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1163-description-of-wlcsp-for-microcontrollers-and-recommendations-for-its-use-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1204-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1204-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf</a>
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>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1206-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-qfp-packages-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1206-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-qfp-packages-stmicroelectronics.pdf</a>
Technical Notes	<a href="https://www.st.com/resource/en/technical_note/tn1207-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1207-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf</a>

& Articles	<a href="#">shipping-media-for-stm8-and-stm32-microcontrollers-in-so-packages-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1208-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-tssop-and-ssop-packages-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1208-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-tssop-and-ssop-packages-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1433-reference-device-marking-schematics-for-stm32-microcontrollers-and-microprocessors-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1433-reference-device-marking-schematics-for-stm32-microcontrollers-and-microprocessors-stmicroelectronics.pdf</a>
Technical Notes & Articles	<a href="https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-stmicroelectronics.pdf">https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-stmicroelectronics.pdf</a>
User Manuals	<a href="https://www.st.com/resource/en/user_manual/um1561-stevalisv003v1-firmware-user-manual-stmicroelectronics.pdf">https://www.st.com/resource/en/user_manual/um1561-stevalisv003v1-firmware-user-manual-stmicroelectronics.pdf</a>
User Manuals	<a href="https://www.st.com/resource/en/user_manual/um1573-st7540-power-line-modem-firmware-stack-stmicroelectronics.pdf">https://www.st.com/resource/en/user_manual/um1573-st7540-power-line-modem-firmware-stack-stmicroelectronics.pdf</a>