



1. Description

1.1. Project

Project Name	ElbALTM1
Board Name	custom
Generated with:	STM32CubeMX 6.14.1
Date	08/07/2025

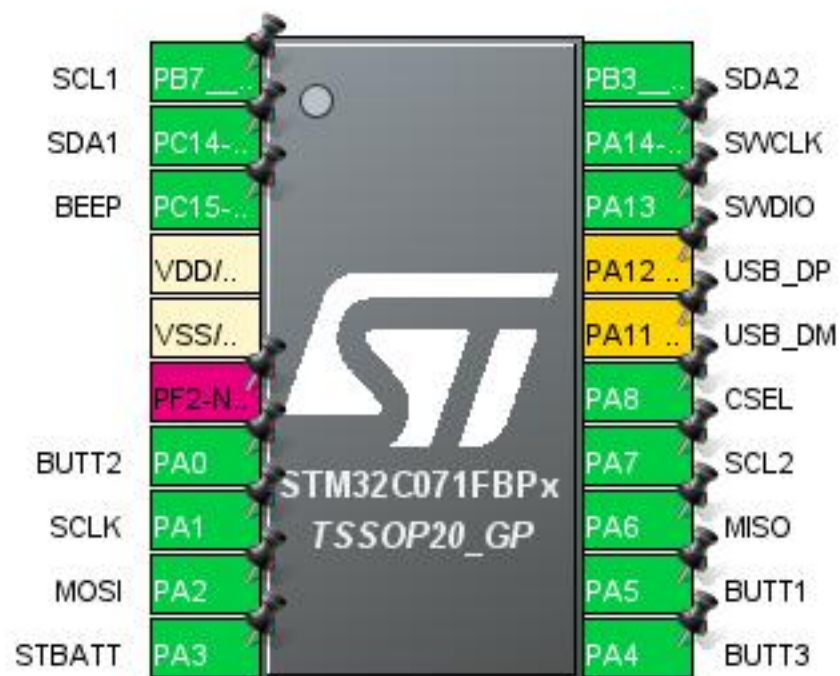
1.2. MCU

MCU Series	STM32C0
MCU Line	STM32C0x1
MCU name	STM32C071FBPx
MCU Package	TSSOP20_GP
MCU Pin number	25

1.3. Core(s) information

Core(s)	ARM Cortex-M0+
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2. Pinout Configuration



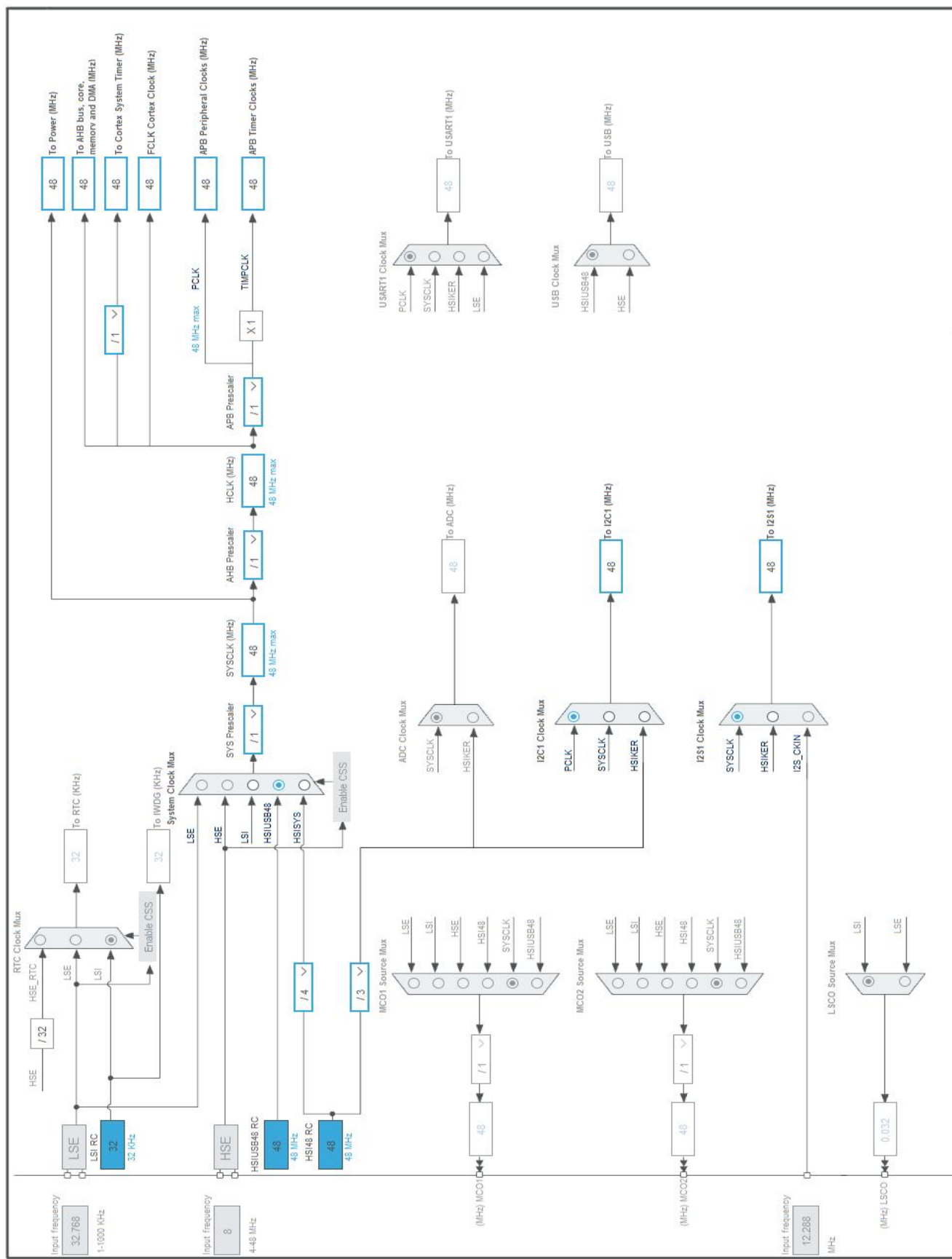
3. Pins Configuration

Pin Number TSSOP20_GP	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PB7	I/O	I2C1_SCL	SCL1
2	PC14-OSCX_IN(PC14)	I/O	I2C1_SDA	SDA1
3	PC15-OSCX_OUT(PC15)	I/O	TIM3_CH3	BEEP
4	VDD/VDDA	Power		
5	VSS/VSSA	Power		
6	PF2-NRST	I/O		
7	PA0 *	I/O	GPIO_Input	BUTT2
8	PA1	I/O	SPI1_SCK	SCLK
9	PA2	I/O	SPI1_MOSI	MOSI
10	PA3 *	I/O	GPIO_Input	STBATT
11	PA4 *	I/O	GPIO_Input	BUTT3
12	PA5 *	I/O	GPIO_Input	BUTT1
13	PA6	I/O	SPI1_MISO	MISO
14	PA7	I/O	I2C2_SCL	SCL2
15	PA8 *	I/O	GPIO_Output	CSEL
16	PA11 [PA9] **	I/O	USB_DM	
17	PA12 [PA10] **	I/O	USB_DP	
18	PA13	I/O	DEBUG_SWDIO	SWDIO
19	PA14-BOOT0	I/O	DEBUG_SWCLK	SWCLK
20	PB4	I/O	I2C2_SDA	SDA2

* 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	STM32C0
Line	STM32C0x1
MCU	STM32C071FBPx
Datasheet	DS00000_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

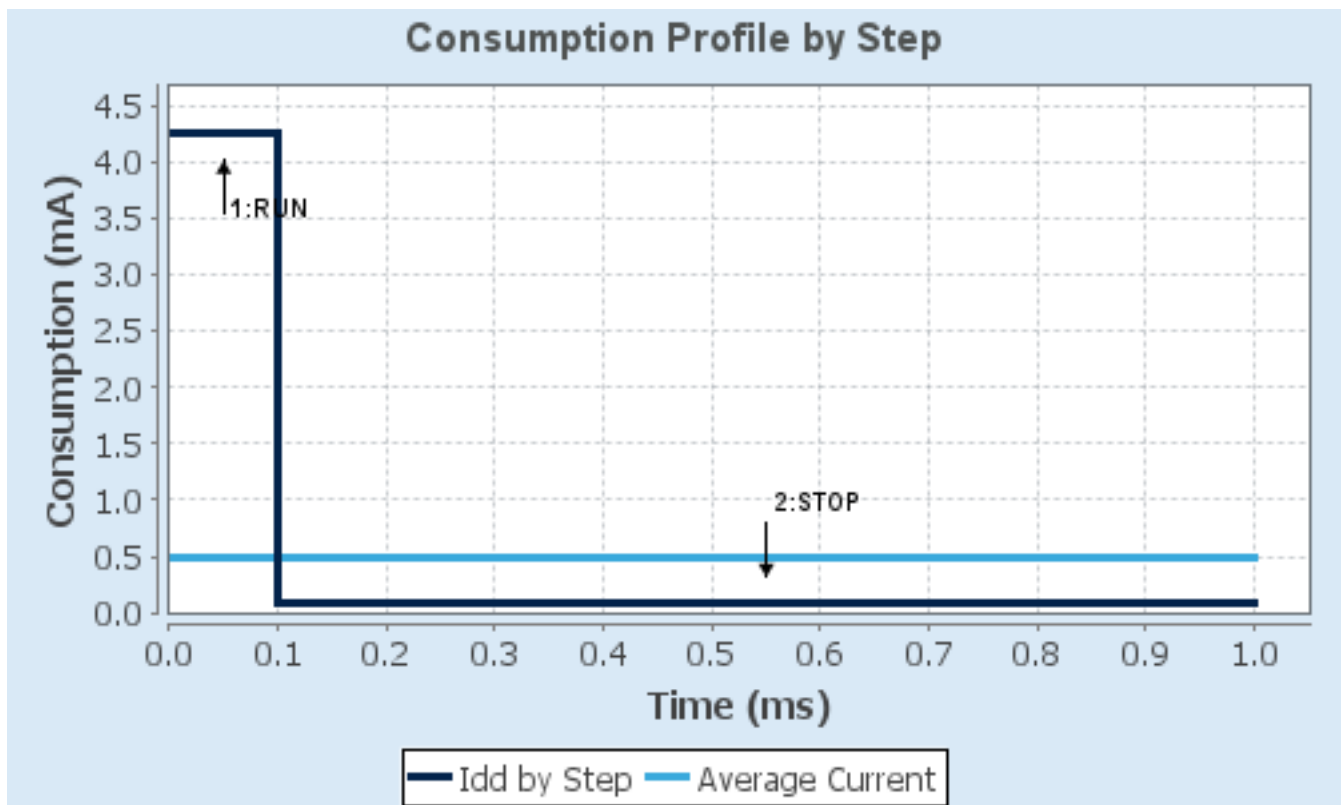
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	NaN/SMPS	NaN/SMPS
Fetch Type	FLASH/Cache/PREFETCH	Flash-PowerDownStop
CPU Frequency	48 MHz	0 Hz
Clock Configuration	HSI48	LSE
Clock Source Frequency	48 MHz	32.768 kHz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	4.25 mA	79.5 μ A
Duration	0.1 ms	0.9 ms
DMIPS	60.0	0.0
Ta Max	104.41	104.99
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	496.55 μ A
Battery Life	1 month, 28 days, 5 hours	Average DMIPS	60.0 DMIPS

1.6. Chart



2. Software Project

2.1. Project Settings

Name	Value
Project Name	ElbALTM1
Project Folder	C:\dirpers\Progetti x MCU\ElbALTM\fw\ElbALTM1
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_C0 V1.4.0
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	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	Yes

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
4	MX_TIM3_Init	TIM3
5	MX_I2C2_Init	I2C2
6	MX_SPI1_Init	SPI1

3. Peripherals and Middlewares Configuration

3.1. DEBUG

mode: Debug

3.2. I2C1

I2C: I2C

3.2.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Fast Mode *
I2C Speed Frequency (KHz)	400
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x0090194B *

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

3.3. I2C2

mode: I2C

3.3.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Fast Mode *
I2C Speed Frequency (KHz)	400
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x0090194B *

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

3.4. RCC

3.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	1 WS (2 HCLK cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

3.5. SPI1

Mode: Full-Duplex Master

3.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	24.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled

NSS Signal Type

Software

3.6. SYS

Timebase Source: SysTick

3.7. TIM3

Clock Source : Internal Clock

Channel3: PWM Generation CH3

3.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	4000 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Enable *

Trigger Output (TRGO) Parameters:

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

Clear Input:

Clear Input Source	Disable
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PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	2000 *
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DEBUG	PA13	DEBUG_SWDIO	n/a	n/a	n/a	SWDIO
	PA14-BOOT0	DEBUG_SWCLK	n/a	n/a	n/a	SWCLK
I2C1	PB7	I2C1_SCL	Alternate Function Open Drain	Pull-up *	Very High *	SCL1
	PC14-OSCX_IN(P C14)	I2C1_SDA	Alternate Function Open Drain	Pull-up *	Very High *	SDA1
I2C2	PA7	I2C2_SCL	Alternate Function Open Drain	Pull-up *	Very High *	SCL2
	PB4	I2C2_SDA	Alternate Function Open Drain	Pull-up *	Very High *	SDA2
SPI1	PA1	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	SCLK
	PA2	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	MOSI
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	MISO
TIM3	PC15-OSCX_OUT(PC15)	TIM3_CH3	Alternate Function Push Pull	Pull-down *	Very High *	BEEP
Single Mapped Signals	PA11 [PA9]	USB_DM	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA12 [PA10]	USB_DP	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PA0	GPIO_Input	Input mode	Pull-up *	n/a	BUTT2
	PA3	GPIO_Input	Input mode	Pull-up *	n/a	STBATT
	PA4	GPIO_Input	Input mode	Pull-up *	n/a	BUTT3
	PA5	GPIO_Input	Input mode	Pull-up *	n/a	BUTT1
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	CSEL

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
Flash global interrupt	unused		
RCC global Interrupt + CRS global interrupt	unused		
TIM3 global interrupt	unused		
I2C1 interrupt (combined with EXTI 23)	unused		
I2C2 interrupt	unused		
SPI1 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
System service call via SWI instruction	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

6. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32c0-ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32c0-svd.zip
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_software_development_tools.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32c0-series-overview.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-stm32-entry-level-graphics.pdf
Brochures	https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/fldpstpfc11120.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32c0.pdf
Security Bulletin	https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-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
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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

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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/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

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/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/an5780-migration-of-applications-from-atmega328-family-to-stm32c0-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5857-using-

xcuberccalib-software-to-calibrate-stm32c0-series-internal-rc-oscillator-stmicroelectronics.pdf

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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/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

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/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/an4908-getting-started-with-usart-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

Application Notes https://www.st.com/resource/en/application_note/an5224-introduction-to-dmamux-for-stm32-mcus-stmicroelectronics.pdf

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Application Notes https://www.st.com/resource/en/application_note/an5775-migrating-from-

stm8l-and-stm8s-to-stm32c0-mcus-stmicroelectronics.pdf

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for related Tools & Software	calibrate-internal-rc-oscillators-on-stm32h5-mcus-stmicroelectronics.pdf
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Datasheet	https://www.st.com/resource/en/datasheet/dm01085881.pdf
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