



1. Description

1.1. Project

Project Name	NUC064_G0B1RET6__TIM2-PWM-DMA
Board Name	NUCLEO-G0B1RE
Generated with:	STM32CubeMX 6.10.0
Date	02/22/2024

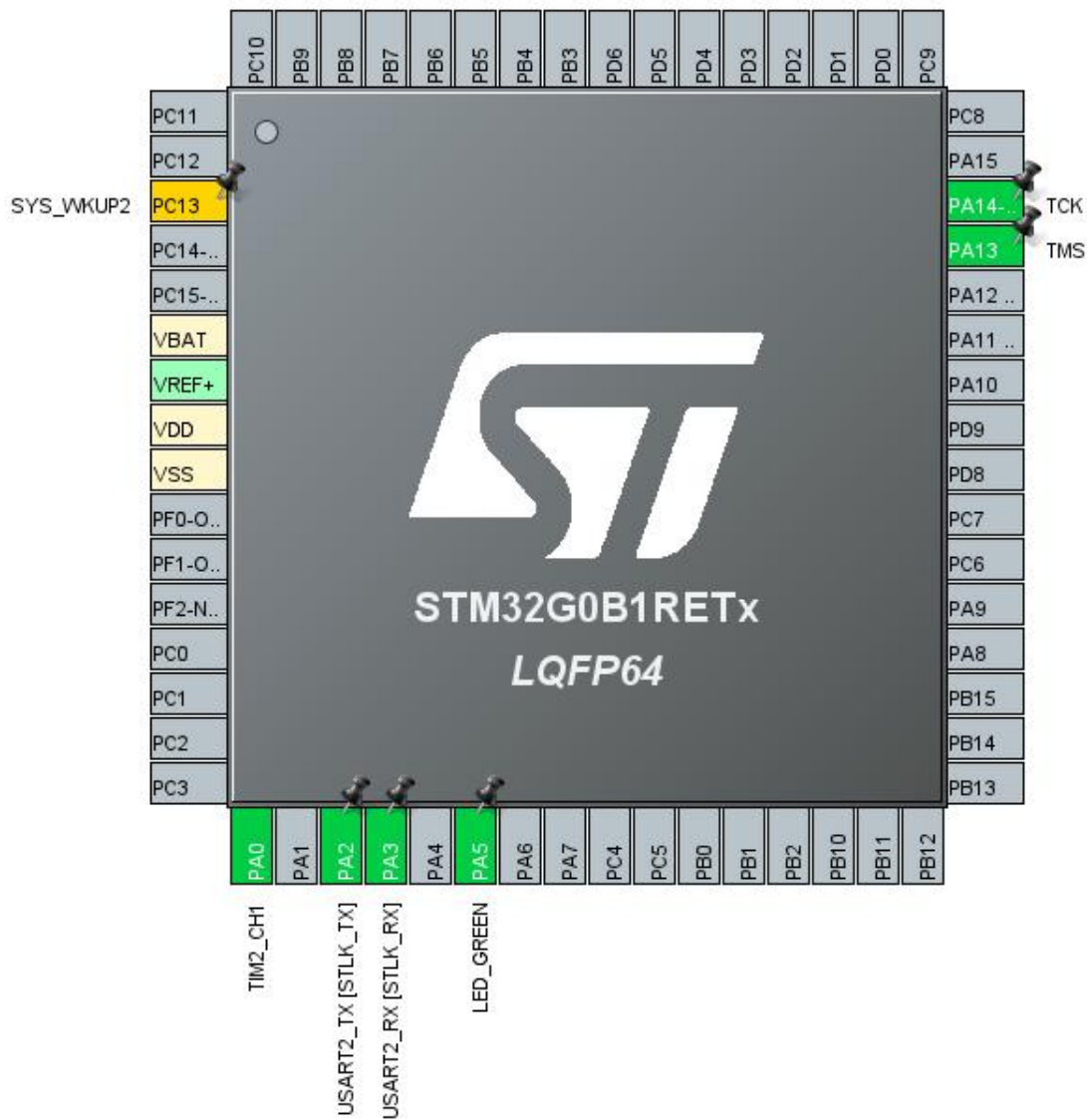
1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x1
MCU name	STM32G0B1RETx
MCU Package	LQFP64
MCU Pin number	64

1.3. Core(s) information

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



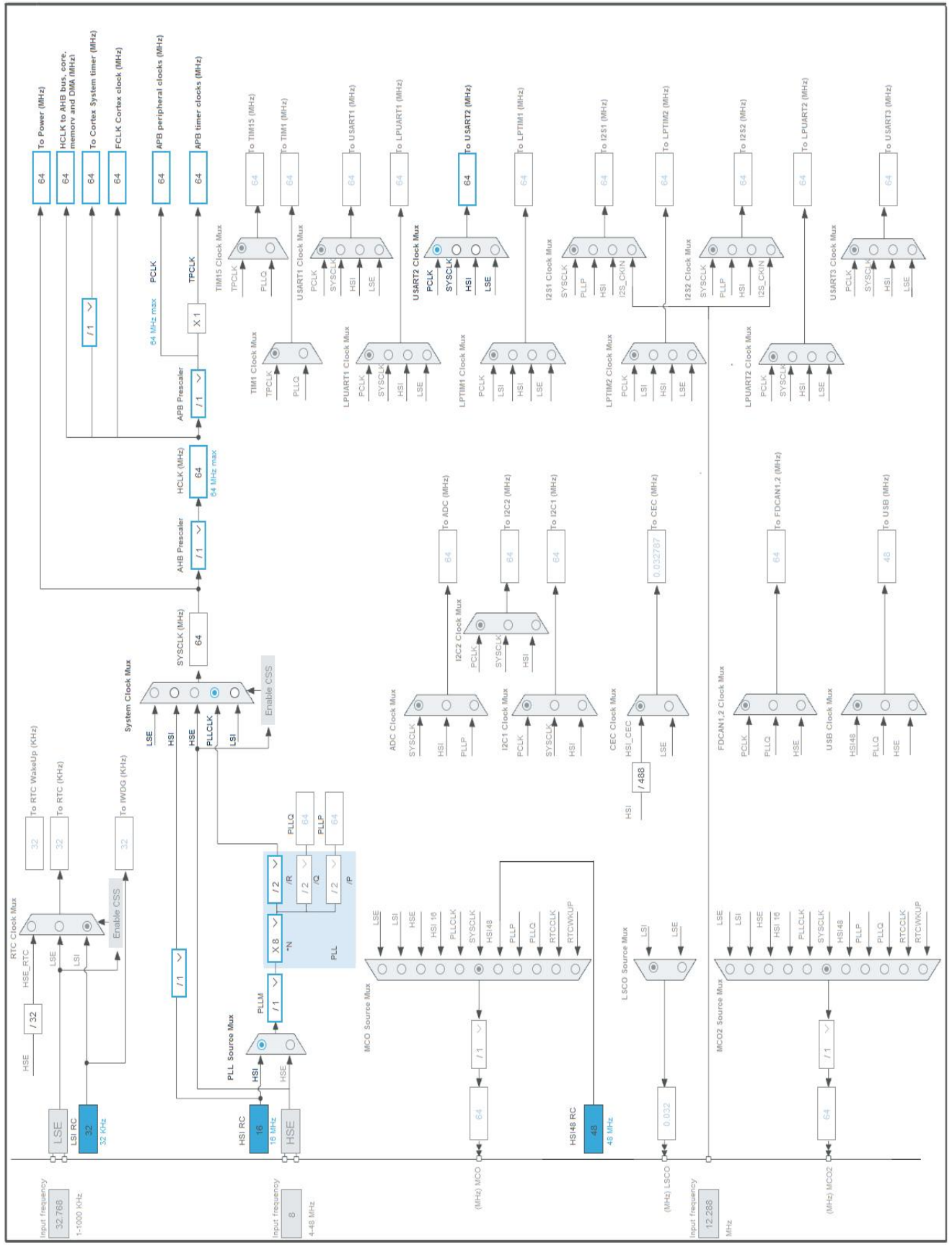
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
3	PC13 *	I/O	SYS_WKUP2	
6	VBAT	Power		
8	VDD	Power		
9	VSS	Power		
17	PA0	I/O	TIM2_CH1	
19	PA2	I/O	USART2_TX	USART2_TX [STLK_TX]
20	PA3	I/O	USART2_RX	USART2_RX [STLK_RX]
22	PA5 **	I/O	GPIO_Output	LED_GREEN
45	PA13	I/O	SYS_SWDIO	TMS
46	PA14-BOOT0	I/O	SYS_SWCLK	TCK

** 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



5. Software Project

5.1. Project Settings

Name	Value
Project Name	NUC064_G0B1RET6__TIM2-PWM-DMA
Project Folder	P:__Projekty__Konstrukce__UNI\LEO__OLED__UNI_board\G0B1CEU_LEO\S
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. 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

5.3. 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_TIM2_Init	TIM2

1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x1
MCU	STM32G0B1RETx
Datasheet	DS13560_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.0

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

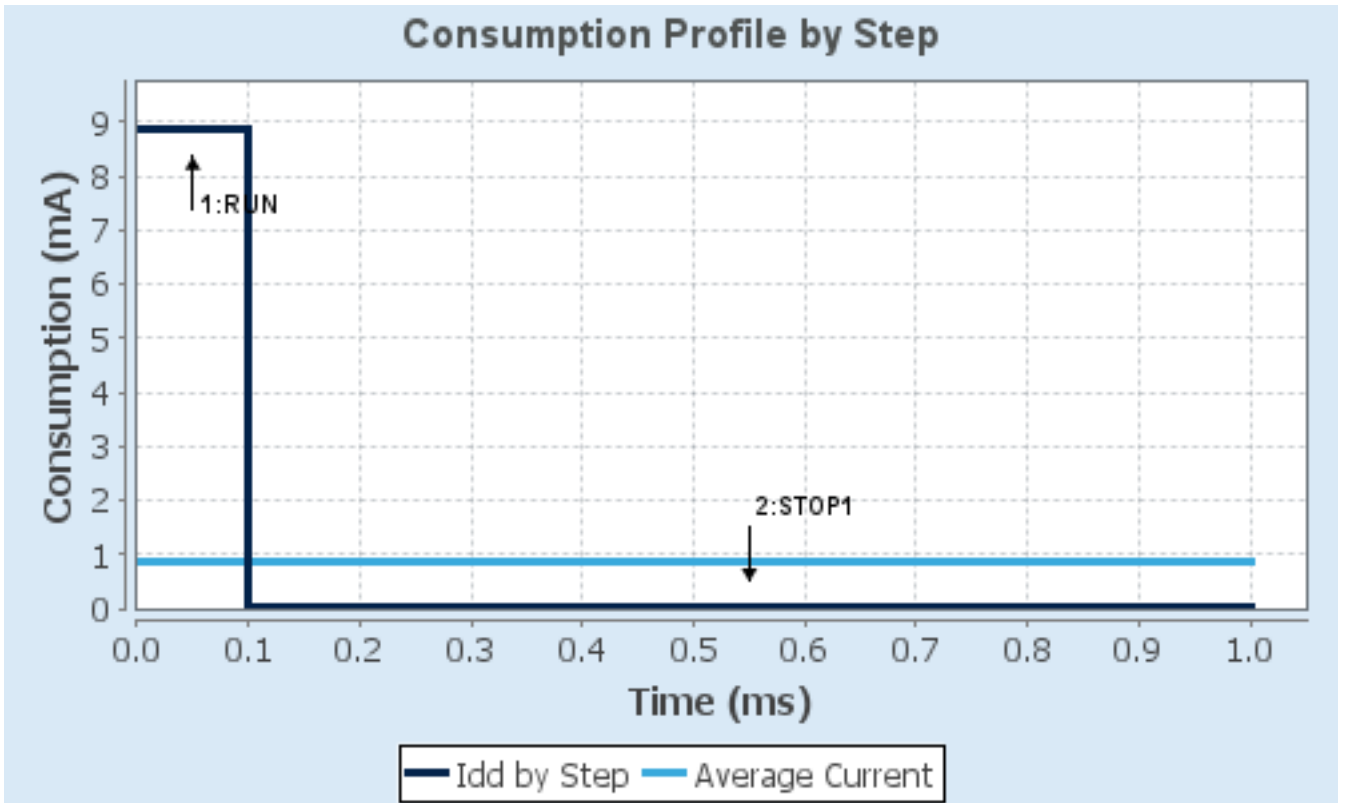
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	Range1-High
Fetch Type	SRAM1/Flash- PowerDown/D_SRAM1	Flash- PowerDown/D_SRAM1/Cach e
CPU Frequency	64 MHz	16 MHz
Clock Configuration	HSI PLL	HSI
Clock Source Frequency	16 MHz	16 MHz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	8.85 mA	7.05 μ A
Duration	0.1 ms	0.9 ms
DMIPS	80.0	20.0
Ta Max	127.77	130
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	891.34 μ A
Battery Life	5 months, 6 days, 4 hours	Average DMIPS	26.0 DMIPS

1.6. Chart



2. Peripherals and Middlewares Configuration

2.1. RCC

2.1.1. Parameter Settings:

System Parameters:

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

RCC Parameters:

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

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE
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2.2. SYS

mode: Debug

Timebase Source: SysTick

mode: save power of non-active UCPD - deactivate Dead Battery pull-up

2.3. TIM2

Clock Source : Internal Clock

Channel1: PWM Generation CH1

2.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	80-1 *
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)
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Trigger Event Selection TRGO Reset (UG bit from TIMx_EGR)

Clear Input:

Clear Input Source Disable

PWM Generation Channel 1:

Mode PWM mode 1
Pulse (32 bits value) 0
Output compare preload Enable
Fast Mode **Enable ***
CH Polarity High

2.4. USART2

Mode: Asynchronous

2.4.1. Parameter Settings:

Basic Parameters:

Baud Rate 115200
Word Length 8 Bits (including Parity)
Parity None
Stop Bits 1

Advanced Parameters:

Data Direction Receive and Transmit
Over Sampling 16 Samples
Single Sample Disable
ClockPrescaler 1
Fifo Mode Disable
Txfifo Threshold 1 eighth full configuration
Rxfifo Threshold 1 eighth full configuration

Advanced Features:

Auto Baudrate Disable
TX Pin Active Level Inversion Disable
RX Pin Active Level Inversion Disable
Data Inversion Disable
TX and RX Pins Swapping Disable
Overrun Enable
DMA on RX Error Enable
MSB First Disable

* User modified value

3. System Configuration

3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	TMS
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	TCK
TIM2	PA0	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	High *	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	USART2_TX [STLK_TX]
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	USART2_RX [STLK_RX]
Single Mapped Signals	PC13	SYS_WKUP2	n/a	n/a	n/a	
GPIO	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	High *	LED_GREEN

3.2. DMA configuration

DMA request	Stream	Direction	Priority
TIM2_CH1	DMA1_Channel1	Memory To Peripheral	Low

TIM2_CH1: DMA1_Channel1 DMA request Settings:

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

3.3. NVIC configuration

3.3.1. 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	0	0
DMA1 channel 1 interrupt	true	0	0
TIM2 global interrupt	true	0	0
PVD through EXTI line 16, PVM (monit. VDDIO2) through EXTI line 34		unused	
Flash global interrupt		unused	
RCC global Interrupt		unused	
USART2 + LPUART2 Interrupt		unused	

3.3.2. 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
DMA1 channel 1 interrupt	false	true	true
TIM2 global interrupt	false	true	true

* User modified value

4. System Views

4.1. Category view

4.1.1. Current

Middleware

System Core

Analog

Timers

Connectivity

Multimedia

Computing

Utilities

DMA ✓

GPIO ⚠

NVIC ✓

RCC ✓

SYS ✓

TIM2 ✓

USART2 ✓

5. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32g0_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
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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
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/flstm32g0.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstmcsuite.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Flyers	https://www.st.com/resource/en/flyer/fldpstpfc11120.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-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/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-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
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- Application Notes https://www.st.com/resource/en/application_note/an4013-stm32-crossseries-timer-overview-stmicroelectronics.pdf
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- Application Notes 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/an4277-using-stm32-device-pwm-shutdown-features-for-motor-control-and-digital-power-conversion-stmicroelectronics.pdf
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- Application Notes https://www.st.com/resource/en/application_note/an4759-using-the-hardware-realtime-clock-rtc-and-the-tamper-management-unit-tamp-with-stm32-microcontrollers-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
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- Application Notes https://www.st.com/resource/en/application_note/an5036-thermal-management-guidelines-for-stm32-applications-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5096-getting-started-with-stm32g0-series-hardware-development-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5110-stm32cube-firmware-examples-for-stm32g0-series-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5145-migration-of-applications-from-stm32f0-series-to-stm32g0-series--stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5224-stm32-dmamux-the-dma-request-router-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5405-fdcan-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5543-enhanced-methods-to-handle-spi-communication-on-stm32-devices-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5690-vrefbuf-peripheral-applications-and-trimming-technique-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
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- 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
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf
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Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4502-stm32-smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5952-how-to-use-cmake-in-stm32cubeide-stmicroelectronics.pdf
Device Option Lists	https://www.st.com/resource/en/device_option_list/opl_stm32g0b1.txt
Errata Sheets	https://www.st.com/resource/en/errata_sheet/es0548-stm32g0b1xbxcxe-

	device-errata-stmicroelectronics.pdf
Datasheet	https://www.st.com/resource/en/datasheet/dm00748675.pdf
Programming Manuals	https://www.st.com/resource/en/programming_manual/pm0223-stm32-cortexm0-mcus-programming-manual-stmicroelectronics.pdf
Reference Manuals	https://www.st.com/resource/en/reference_manual/rm0444-stm32g0x1-advanced-armbased-32bit-mcus-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1163-description-of-wlcsp-for-microcontrollers-and-recommendations-for-its-use-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1204-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf
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User Manuals	https://www.st.com/resource/en/user_manual/um3083-stm32g0-series-iec-60730-selftest-library-user-guide-stmicroelectronics.pdf