



## 1. Description

### 1.1. Project

Project Name	B2201_DCmotorCont
Board Name	custom
Generated with:	STM32CubeMX 6.7.0
Date	02/07/2023

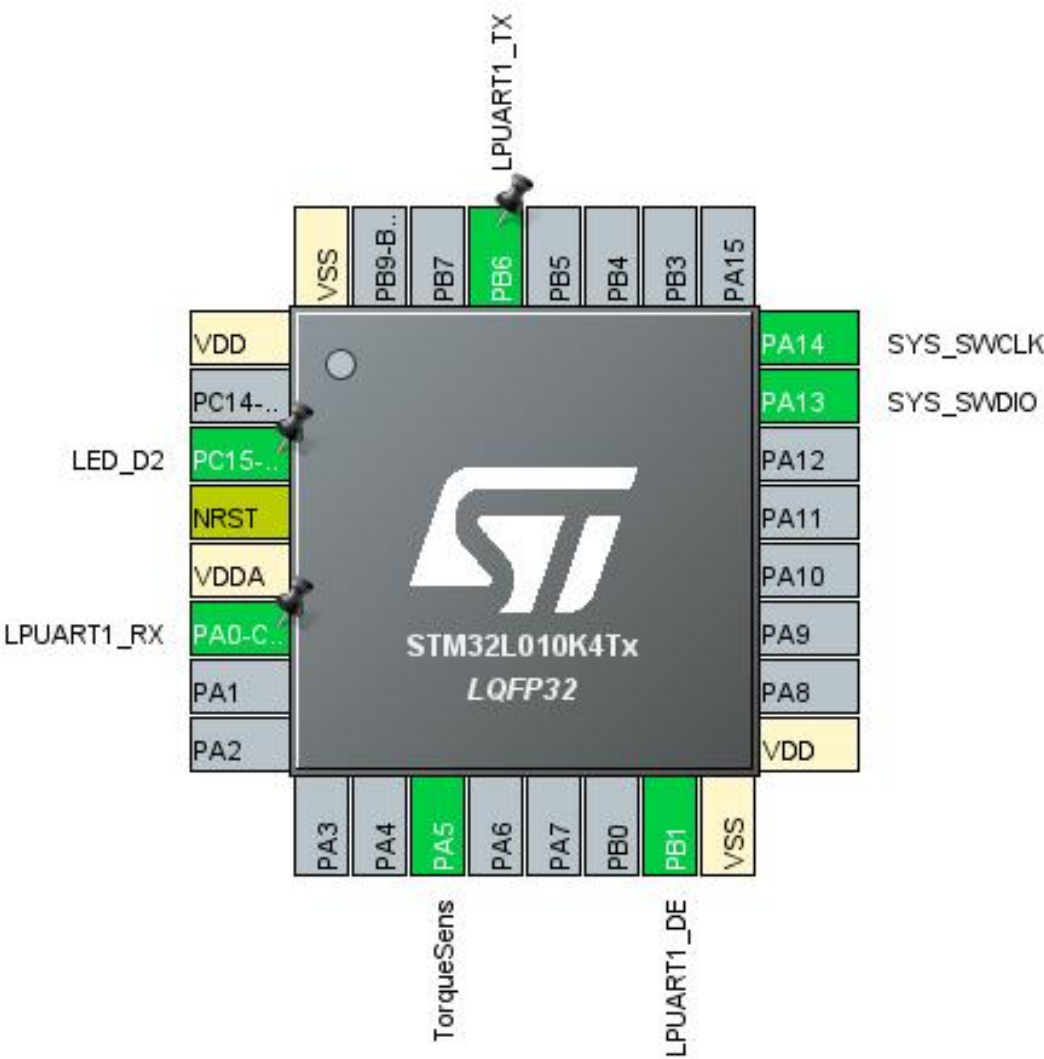
### 1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x0 Value Line
MCU name	STM32L010K4Tx
MCU Package	LQFP32
MCU Pin number	32

### 1.3. Core(s) information

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

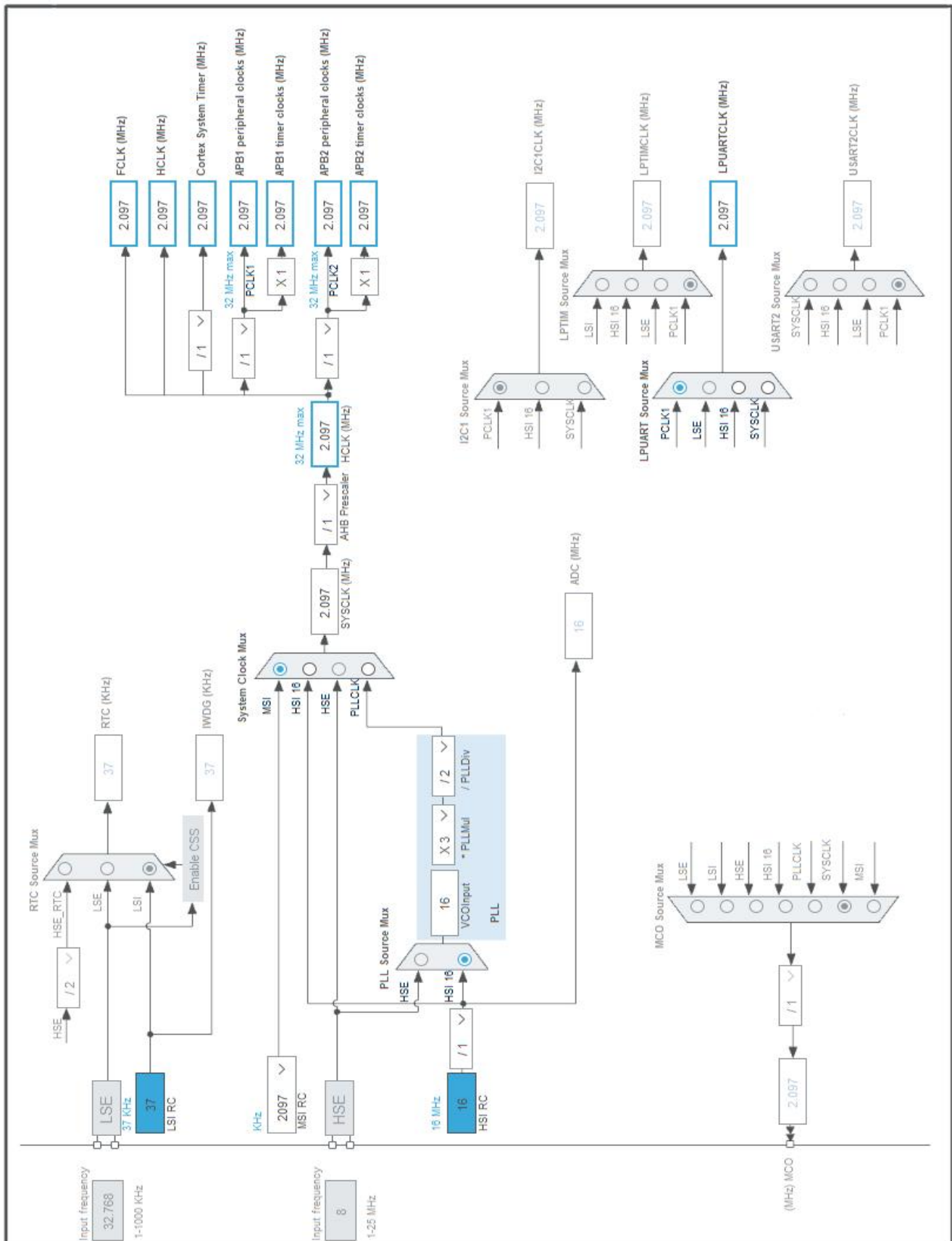


### 3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
3	PC15-OSC32_OUT *	I/O	GPIO_Output	LED_D2
4	NRST	Reset		
5	VDDA	Power		
6	PA0-CK_IN	I/O	LPUART1_RX	
11	PA5	I/O	ADC_IN5	TorqueSens
15	PB1	I/O	LPUART1_DE	
16	VSS	Power		
17	VDD	Power		
23	PA13	I/O	SYS_SWDIO	
24	PA14	I/O	SYS_SWCLK	
29	PB6	I/O	LPUART1_TX	
32	VSS	Power		

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

## 4. Clock Tree Configuration



## 5. Software Project

### 5.1. Project Settings

Name	Value
Project Name	B2201_DCmotorCont
Project Folder	C:\Sandbox\B2201_DCmotorCont
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_L0 V1.12.1
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_LPUART1_UART_Init	LPUART1
4	MX_ADC_Init	ADC

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x0 Value Line
MCU	STM32L010K4Tx
Datasheet	DS12323_Rev1

### 6.2. Parameter Selection

Temperature	25
Vdd	3.0

### 6.3. 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

#### 6.4. Sequence

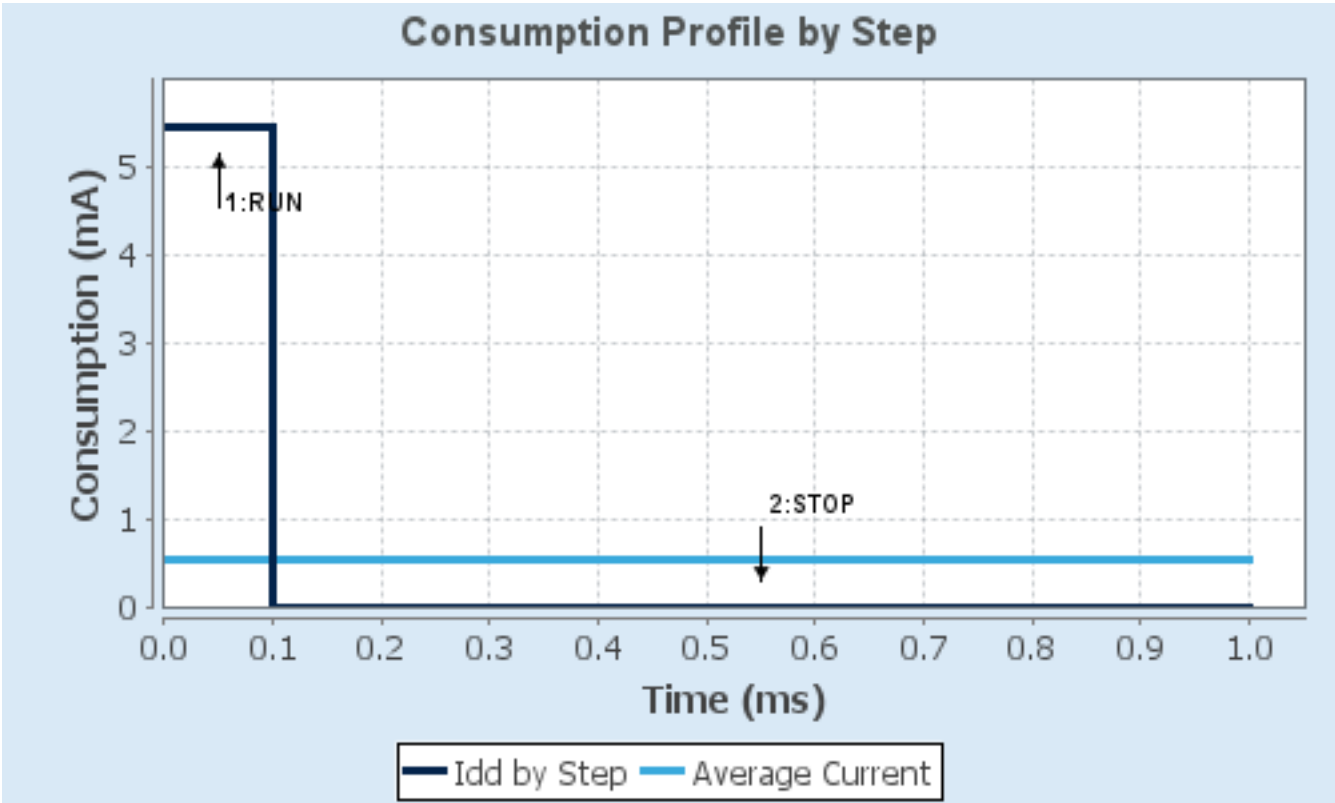
<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	Range1-High	NoRange
<b>Fetch Type</b>	FLASH/PREFETCH	FLASH
<b>CPU Frequency</b>	32 MHz	0 Hz
<b>Clock Configuration</b>	HSI PLL2 Flash-ON	ALL CLOCKS OFF
<b>Clock Source Frequency</b>	16 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	5.45 mA	344 nA
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	30.0	0.0
<b>Ta Max</b>	104.02	105
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	545.31 $\mu$ A
Battery Life	1 month, 22 days, 23 hours	Average DMIPS	3.04 DMIPS

#### 6.6. Chart





## 7. Peripherals and Middlewares Configuration

### 7.1. ADC

**mode: IN5**

#### 7.1.1. Parameter Settings:

##### **ADC\_Settings:**

Clock Prescaler	Synchronous clock mode divided by 1
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Direction	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Frequency Mode	Enabled
Auto Off	Disabled
Oversampling Mode	Disabled

##### **ADC\_Regular\_ConversionMode:**

Sampling Time	<b>160.5 Cycles *</b>
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

##### **WatchDog:**

Enable Analog WatchDog Mode	false
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### 7.2. LPUART1

**Mode: Asynchronous**

**mode: Hardware Flow Control (RS485)**

#### 7.2.1. Parameter Settings:

##### **Basic Parameters:**

Baud Rate	<b>9600 *</b>
Word Length	<b>8 Bits (including Parity) *</b>
Parity	None
Stop Bits	1

##### **Advanced Parameters:**

Data Direction	Receive and Transmit
Single Sample	Disable
Polarity	High
Assertion Time	0
Deassertion Time	0

**Advanced Features:**

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

## 7.3. RCC

### 7.3.1. Parameter Settings:

**System Parameters:**

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

**RCC Parameters:**

HSI Calibration Value	16
MSI Calibration Value	0
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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## 7.4. SYS

**mode: Debug Serial Wire**

**Timebase Source: SysTick**

**\* User modified value**

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PA5	ADC_IN5	Analog mode	No pull-up and no pull-down	n/a	TorqueSens
LPUART1	PA0-CK_IN	LPUART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PB1	LPUART1_DE	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PB6	LPUART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
GPIO	PC15-OSC32_OUT	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_D2

### 8.2. DMA configuration

nothing configured in DMA service

### 8.3. NVIC configuration

#### 8.3.1. 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 and EEPROM global interrupt	unused		
RCC global interrupt	unused		
ADC global interrupt	unused		
LPUART1 global interrupt / LPUART1 wake-up interrupt through EXTI line 28	unused		

#### 8.3.2. 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

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

## 10. Docs & Resources

Type	Link
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32l0_ibis.zip">https://www.st.com/resource/en/ibis_model/stm32l0_ibis.zip</a>
System View	<a href="https://www.st.com/resource/en/svd/stm32l0_svd.zip">https://www.st.com/resource/en/svd/stm32l0_svd.zip</a>
Description	
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32l0_ibis.zip">https://www.st.com/resource/en/ibis_model/stm32l0_ibis.zip</a>
System View	<a href="https://www.st.com/resource/en/svd/stm32l0_svd.zip">https://www.st.com/resource/en/svd/stm32l0_svd.zip</a>
Description	
Presentations	<a href="https://www.st.com/resource/en/product_presentation/gt_stm32f0-l0.pdf">https://www.st.com/resource/en/product_presentation/gt_stm32f0-l0.pdf</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_stm32l0x0_value_line_product_overview.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers_stm32l0x0_value_line_product_overview.pdf</a>
Training Material	<a href="https://www.st.com/resource/en/sales_guide/sg_sc2157.pdf">https://www.st.com/resource/en/sales_guide/sg_sc2157.pdf</a>
Brochures	<a href="https://www.st.com/resource/en/brochure/brstm32l0.pdf">https://www.st.com/resource/en/brochure/brstm32l0.pdf</a>
Brochures	<a href="https://www.st.com/resource/en/brochure/brstm32ulp.pdf">https://www.st.com/resource/en/brochure/brstm32ulp.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32l0vline.pdf">https://www.st.com/resource/en/flyer/flstm32l0vline.pdf</a>
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Magazine Articles	<a href="https://www.st.com/resource/en/magazine/design-elektronik_october2016.pdf">https://www.st.com/resource/en/magazine/design-elektronik_october2016.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an1181-electrostatic-discharge-sensitivity-measurement-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an1709-emc-design-">https://www.st.com/resource/en/application_note/an1709-emc-design-</a>

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