
STM32
CubeMX

1. Description

1.1. Project

Project Name	StendBolid
Board Name	custom
Generated with:	STM32CubeMX 6.2.0
Date	04/30/2021

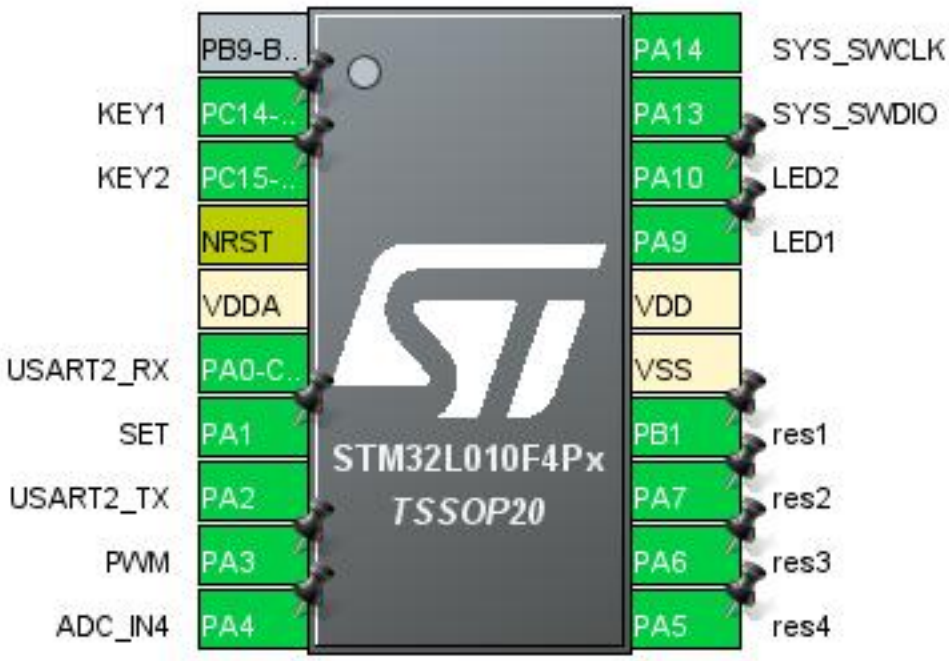
1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x0 Value Line
MCU name	STM32L010F4Px
MCU Package	TSSOP20
MCU Pin number	20

1.3. Core(s) information

Core(s)	Arm Cortex-M0+

2. Pinout Configuration

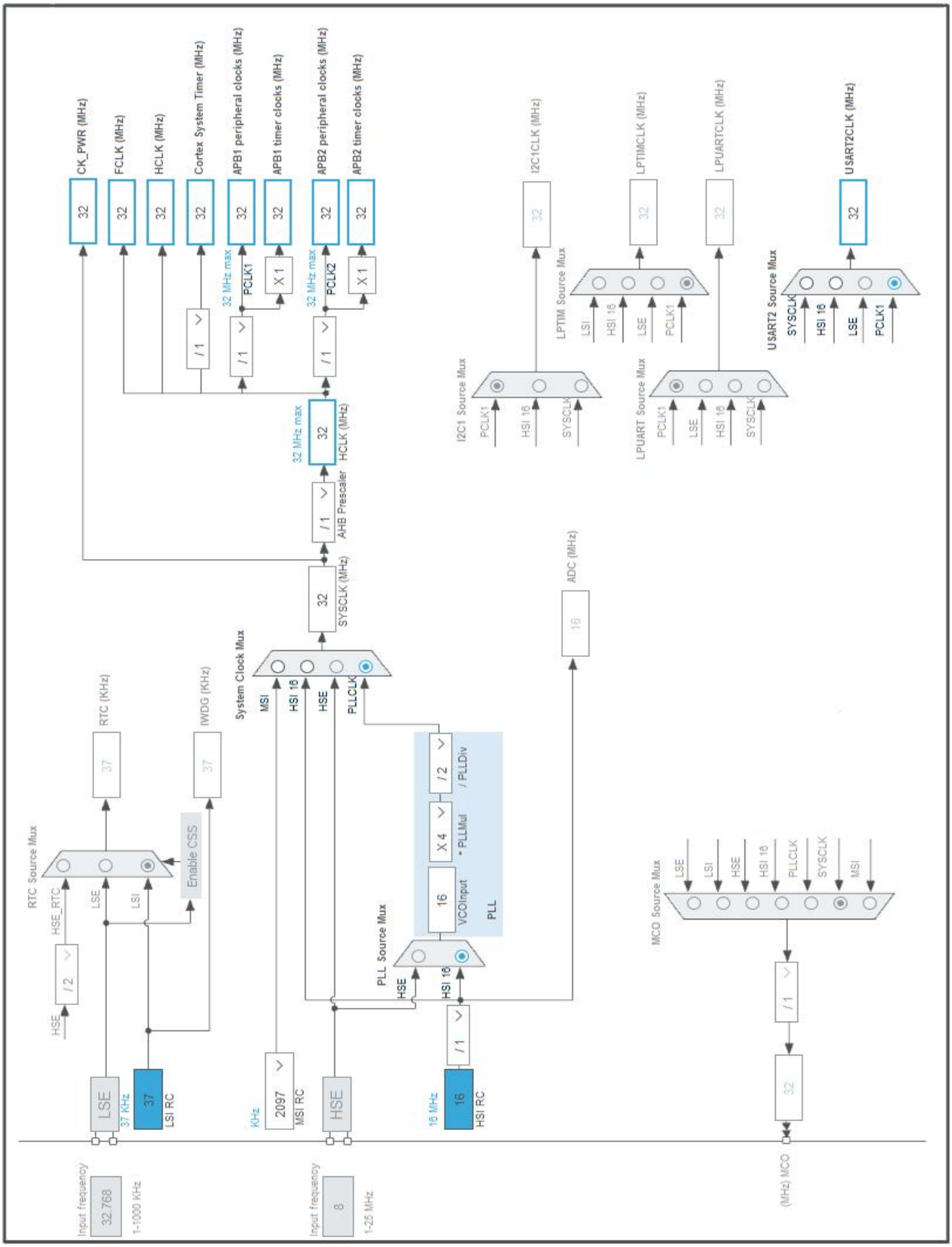


3. Pins Configuration

Pin Number TSSOP20	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
2	PC14-OSC32_IN *	I/O	GPIO_Input	KEY1
3	PC15-OSC32_OUT *	I/O	GPIO_Input	KEY2
4	NRST	Reset		
5	VDDA	Power		
6	PA0-CK_IN	I/O	USART2_RX	
7	PA1 *	I/O	GPIO_Output	SET
8	PA2	I/O	USART2_TX	
9	PA3 *	I/O	GPIO_Output	PWM
10	PA4	I/O	ADC_IN4	
11	PA5 *	I/O	GPIO_Input	res4
12	PA6 *	I/O	GPIO_Input	res3
13	PA7 *	I/O	GPIO_Input	res2
14	PB1 *	I/O	GPIO_Input	res1
15	VSS	Power		
16	VDD	Power		
17	PA9 *	I/O	GPIO_Output	LED1
18	PA10 *	I/O	GPIO_Output	LED2
19	PA13	I/O	SYS_SWDIO	
20	PA14	I/O	SYS_SWCLK	

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	StendBolid
Project Folder	D:\Works\STProj\Stend\StendBolid
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_L0 V1.12.0
Application Structure	Advanced
Generate Under Root	No
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 all used libraries into the project folder
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	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_TIM21_Init	TIM21
4	MX_USART2_UART_Init	USART2
5	MX_ADC_Init	ADC

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x0 Value Line
MCU	STM32L010F4Px
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

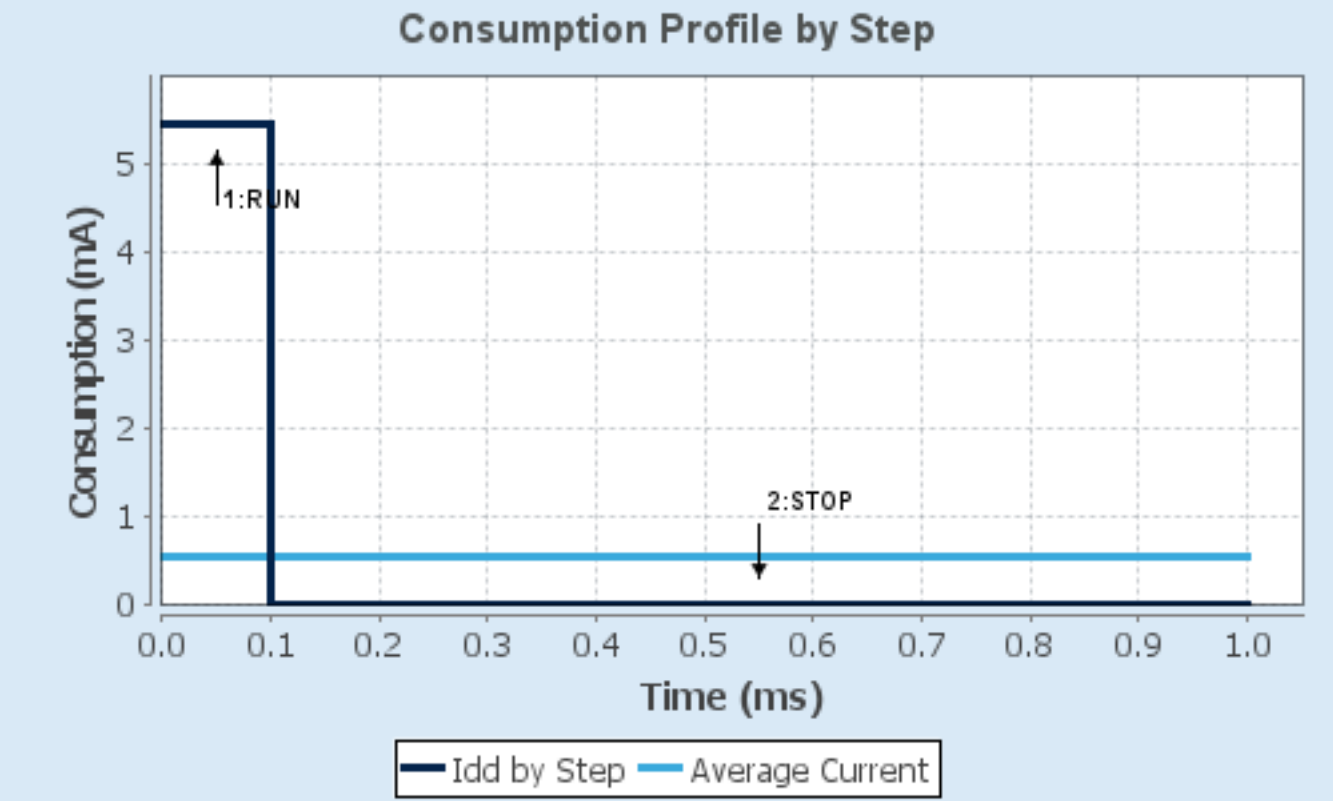
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoRange
Fetch Type	FLASH/PREFETCH	FLASH
CPU Frequency	32 MHz	0 Hz
Clock Configuration	HSI PLL2 Flash-ON	ALL CLOCKS OFF
Clock Source Frequency	16 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	5.45 mA	344 nA
Duration	0.1 ms	0.9 ms
DMIPS	30.0	0.0
Ta Max	103.79	105
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	545.31 µA
Battery Life	1 month, 22 days, 23 hours	Average DMIPS	3.04 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
0
1
2
3
4
5
1:RUN
2:STOP
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

7. Peripherals and Middlewares Configuration

7.1. ADC

mode: IN4

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Synchronous clock mode divided by 2
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	Disabled
Auto Off	Disabled
Oversampling Mode	Disabled

ADC_Regular_ConversionMode:

Sampling Time	1.5 Cycles
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false

7.2. RCC

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Buffer Cache	Enabled
Prefetch	Disabled
Preread	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0

HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

7.3. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

7.4. TIM21

Clock Source : Internal Clock

7.4.1. 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	Reset (UG bit from TIMx_EGR)

7.5. USART2

Mode: Asynchronous

7.5.1. 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

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

*** 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	PA4	ADC_IN4	Analog mode	No pull-up and no pull-down	n/a	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
USART2	PA0-CK_IN	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PC14-OSC32_IN	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	KEY1
	PC15-OSC32_OUT	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	KEY2
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SET
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	PWM
	PA5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	res4
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	res3
	PA7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	res2
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	res1
	PA9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED1
	PA10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2

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	0	0
TIM21 global interrupt	true	0	0
Flash and EEPROM global interrupt	unused		
RCC global interrupt	unused		
ADC global interrupt	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	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
TIM21 global interrupt	false	true	true

*** User modified value**

9. System Views

9.1. Category view

9.1.1. Current

10. Docs & Resources

Type	Link
Datasheet	http://www.st.com/resource/en/datasheet/DM00440565.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/DM00443854.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/DM00104451.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/DM00617842.pdf
Application note	http://www.st.com/resource/en/application_note/CD00160362.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167594.pdf
Application note	http://www.st.com/resource/en/application_note/CD00211314.pdf
Application note	http://www.st.com/resource/en/application_note/CD00259245.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264342.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00042534.pdf
Application note	http://www.st.com/resource/en/application_note/DM00072315.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073742.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00081379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00085385.pdf
Application note	http://www.st.com/resource/en/application_note/DM00087593.pdf
Application note	http://www.st.com/resource/en/application_note/DM00108286.pdf
Application note	http://www.st.com/resource/en/application_note/DM00112257.pdf
Application note	http://www.st.com/resource/en/application_note/DM00129215.pdf
Application note	http://www.st.com/resource/en/application_note/DM00145318.pdf
Application note	http://www.st.com/resource/en/application_note/DM00151811.pdf
Application note	http://www.st.com/resource/en/application_note/DM00158601.pdf
Application note	http://www.st.com/resource/en/application_note/DM00160482.pdf
Application note	http://www.st.com/resource/en/application_note/DM00150423.pdf

Application note	http://www.st.com/resource/en/application_note/DM00209725.pdf
Application note	http://www.st.com/resource/en/application_note/DM00209768.pdf
Application note	http://www.st.com/resource/en/application_note/DM00220769.pdf
Application note	http://www.st.com/resource/en/application_note/DM00206898.pdf
Application note	http://www.st.com/resource/en/application_note/DM00257177.pdf
Application note	http://www.st.com/resource/en/application_note/DM00272912.pdf
Application note	http://www.st.com/resource/en/application_note/DM00226326.pdf
Application note	http://www.st.com/resource/en/application_note/DM00236305.pdf
Application note	http://www.st.com/resource/en/application_note/DM00260952.pdf
Application note	http://www.st.com/resource/en/application_note/DM00327191.pdf
Application note	http://www.st.com/resource/en/application_note/DM00355687.pdf
Application note	http://www.st.com/resource/en/application_note/DM00354244.pdf
Application note	http://www.st.com/resource/en/application_note/DM00315319.pdf
Application note	http://www.st.com/resource/en/application_note/DM00380469.pdf
Application note	http://www.st.com/resource/en/application_note/DM00436604.pdf
Application note	http://www.st.com/resource/en/application_note/DM00395696.pdf
Application note	http://www.st.com/resource/en/application_note/DM00445657.pdf
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Application note	http://www.st.com/resource/en/application_note/DM00536349.pdf
Application note	http://www.st.com/resource/en/application_note/DM00209772.pdf
Application note	http://www.st.com/resource/en/application_note/DM00660597.pdf
Application note	http://www.st.com/resource/en/application_note/DM00725181.pdf