

# Readme

**APM32E10x SDK**

**Rev: V1.3.1**

# 1 Introduction

The Geehy Semiconductor APM32E10x software development kit includes a series driver library, a group of example applications that demonstrate key peripheral functionality, and other development files.

Software development kit have a hierarchy as follows:

- SDK directory
  - \* Boards
  - \* Documents
  - \* Examples
  - \* Libraries
  - \* Middlewares
  - \* Package

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## 2 About SDK

### 2.1 SDK files

The complete SDK directory:

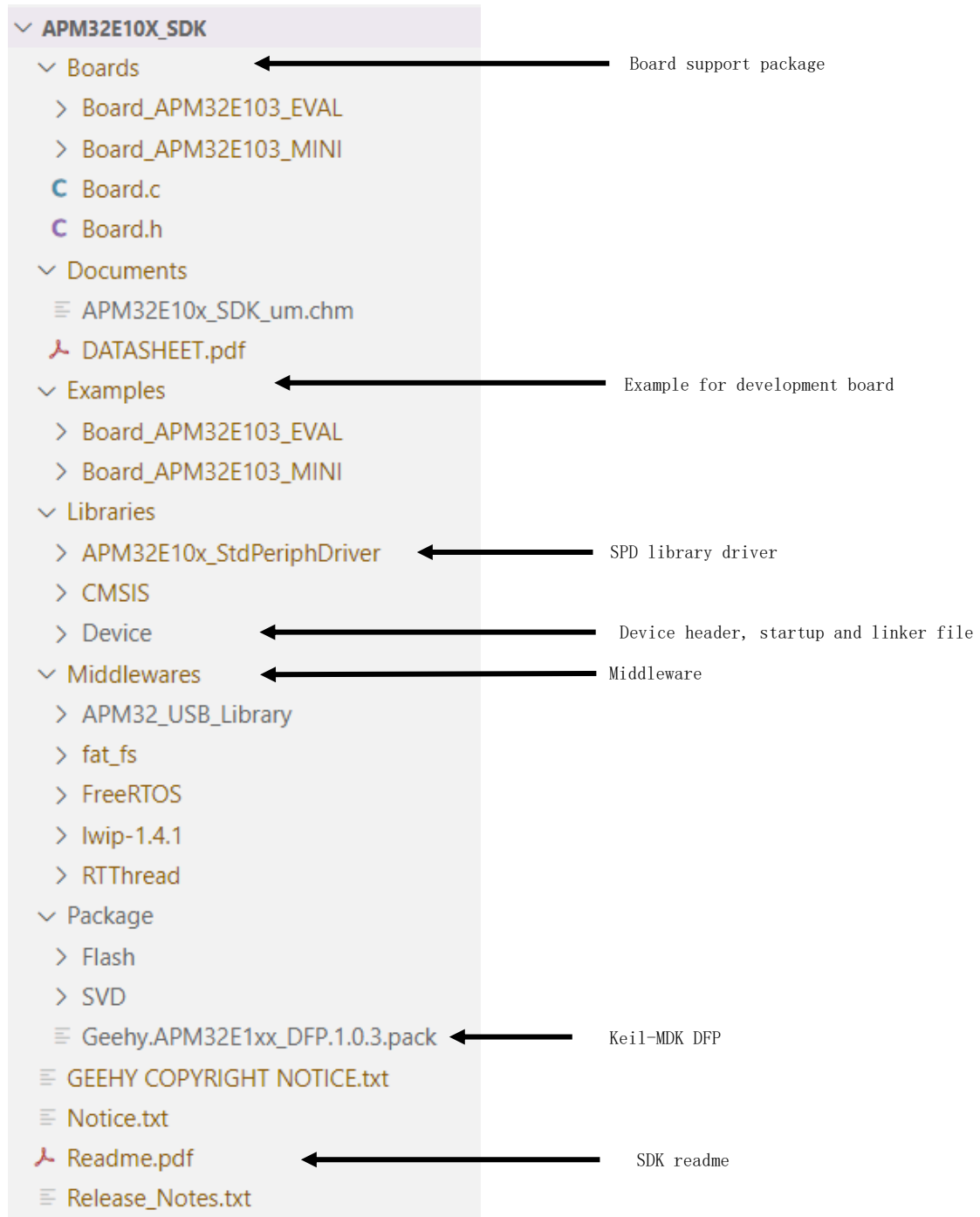


Figure 1 SDK of APM32E10x

## 2.2 Devices supported by SPD drivers

Table 1 List of devices supported by SPD driver

IP / Module	APM32E103xx	NA	NA	NA	NA	NA	NA	NA	NA	NA
apm32e10x_adc.c	√									
apm32e10x_bakpr.c	√									
apm32e10x_can.c	√									
apm32e10x_crc.c	√									
apm32e10x_dac.c	√									
apm32e10x_dbgmcu.c	√									
apm32e10x_dma.c	√									
apm32e10x_dmc.c	√									
apm32e10x_eint.c	√									
apm32e10x_fmc.c	√									
apm32e10x_gpio.c	√									
apm32e10x_i2c.c	√									
apm32e10x_iwdt.c	√									
apm32e10x_misc.c	√									
apm32e10x_pmu.c	√									
apm32e10x_rcm.c	√									
apm32e10x_rtc.c	√									
apm32e10x_sci2c.c	√									
apm32e10x_sdio.c	√									
apm32e10x_smc.c	√									
apm32e10x_spi.c	√									
apm32e10x_tmr.c	√									
apm32e10x_usart.c	√									
apm32e10x_usb.c	√									
apm32e10x_usb_device.c	√									
apm32e10x_wwdt.c	√									

### 3 About Boards

The boards folder includes a board support package for APM32E10x board. It can help drive the peripheral circuit or components on the board quickly. The BSP can be found in the ~/Boards directory.

The BSP provided are built for APM32E10x board. For other user development board use, some minor modifications may be required.

Boards have a hierarchy as follows:

- \* Board.c
- \* Board.h
- Board\_APM32E103\_Eval folder
- Board\_APM32E103\_Mini folder

## 4     **About Documents**

The documents folder includes a link file that can be redirected to the technical support center of Geehy semiconductor. The document can be found in the ~/Documents directory.

## 5 About Examples

The example applications can be found in the ~/Examples directory.

The examples provided are built for APM32E10x board. For other user development board use, some minor modifications may be required.

Example projects have a hierarchy as follows:

- Example folder
  - \* Include
  - \* Project
    - Eclipse
    - IAR
    - MDK
  - \* Source

All example applications tested with: **APM32E10x StdPeriphDriver V1.0.3**, include the following examples:

Table 2 List of examples supported for evaluation board

IP / Module	Example	APM32E103_MINI	APM32E103_EVAL	NA	NA	NA	NA	NA	NA	NA
ADC	ADC_AnalogWindowWatchdog	√								
	ADC_ContinuousConversion	√								
	ADC_DualRegulSimulMode	√								
	ADC_MultiChannelScan	√								
	ADC_InjectionRegularSampling	√								
	ADC_Potentiometer		√							
	ADC_DMA	√								
BAKPR	BAKPR_Tamper	√								
CAN	CAN_LoopBack	√								
	CAN_Normal	√								
	CAN_Dual		√							



IP / Module	Example	APM32E103_MINI	APM32E103_EVAL	NA	NA	NA	NA	NA	NA	NA
CRC	CRC_Calculation	√								
DAC	DAC_ADC	√								
	DAC_NoiseWave	√								
DMA	DMA_ADCMultiChannel	√								
	DMA_MemoryToMemory	√								
	DMA_UsartToMemory	√								
EINT	EINT_Config	√								
EMMC	DMC_SDRAM	√	√							
FMC	FMC_Program	√								
	FMC_Protection	√								
GPIO	GPIO_Toggle	√								
I2C	I2C_TwoBoards_Master	√								
	I2C_TwoBoards_Slave	√								
	I2C_EEPROM		√							
IAP	Application1	√								
	Application2	√								
	Bootloader	√								
I2S	I2S_Interrupt	√								
IWDT	IWDT_Reset	√								
NVIC	NVIC_Priority	√								
	NVIC_WFI	√								
PMU	PMU_Standby	√								
	PMU_Stop	√								
RCM	RCM_ClockConfig	√								
RTC	RTC_Alarm	√								
	RTC_Clock		√							
	RTC_Second	√								
RTOS	FreeRTOS	√								

IP / Module	Example	APM32E103_MINI	APM32E103_EVAL	NA	NA	NA	NA	NA	NA	NA
	RT-thread	√								
	CMSIS_RTXX	√								
<b>SDIO</b>	SDIO_SDCard	√								
<b>SPI</b>	SPI_FullDuplex	√								
	SPI_Flash		√							
	SPI_LCD		√							
<b>Template</b>	Template	√	√							
<b>TMR</b>	TMR_6Steps	√								
	TMR_32BitCount	√								
	TMR_CascadeSynchro	√								
	TMR_EncoderInterface	√								
	TMR_ExtTriggerSynchro	√								
	TMR_OCAActive	√								
	TMR_OCInactive	√								
	TMR_OCToggle	√								
	TMR_PWMInput	√								
	TMR_PWMOutput	√								
	TMR_SinglePulse	√								
	TMR_TimeBase	√								
	TMR_TMR1DMABurst	√								
	TMR_TMR1DMA	√								
<b>USART</b>	USART_Interrupt	√								
	USART_IrDA	√								
	USART_LIN	√								
	USART_Printf	√	√							
	USART_Smartcard	√								
<b>USB</b>	USBD_CDC	√	√							

IP / Module	Example	APM32E103_MINI	APM32E103_EVAL	NA	NA	NA	NA	NA	NA	NA
	USBD_Composite_CDC	√	√							
	USBD_Composite_CDC_HID	√	√							
	USBD_Composite_CDC_MSC	√	√							
	USBD_Composite_CDC_WINUSB	√	√							
	USBD_Composite_HID_MSC	√	√							
	USBD_Composite_HID_WINUSB	√	√							
	USBD_Composite_MSC_WINUSB	√	√							
	USBD_Composite_WINUSB	√	√							
	USBD_CUSTOM_HID	√	√							
	USBD_CUSTOM_HID_Keyboard	√	√							
	USBD_HID	√	√							
	USBD_HID_WakeUp_LowPower	√	√							
	USBD_MSC	√	√							
	USBD_MSC_LowPower	√	√							
	USBD_WINUSB	√	√							
<b>WWDT</b>	WWDT_Reset	√	√							

## 6 About Libraries

The libraries folder includes a series library. It can provide supports for APM32E10x MCU such as device support and standard peripheral etc. The libraries can be found in the ~/Libraries directory.

APM32E10x MCU include following library:

- Libraries folder
  - \* APM32E10x\_StdPeriphDriver
  - \* CMSIS
  - \* Device

## 7 About Middlewares

The middlewares folder includes a series third-party middleware. The middlewares can be found in the ~/Middlewares directory.

The middlewares used by APM32E10x include following:

- Middlewares folder
  - \* APM32\_USB\_Library
  - \* Fat\_Fs
  - \* FreeRTOS
  - \* Lwip-1.4.1
  - \* RTThread

## 8 About Package

The Package folder includes Geehy APM32E10x DFP Package. The Package can be found in the ~/Package directory.

The package used by APM32E10x include following:

- Package folder
  - \* SVD
  - \* Flash
  - \* Geehy.APM32E10x\_DFP.1.0.3.pack

## 9 Revision History

Table 1 File Revision History

Date	Rev	Description
2021.07.29	1.0	First release version of APM32E10x SDK V1.0
2022.08.08	1.1	Update Package for 1.0.1. Update the folder directory structure. Update EMMC and TMR Example. Added IAR Support. Added USART and RTOS Example.
2022.12.31	1.2	Update Package for 1.0.2. Update Library for 1.0.2. Update Examples. Added Eclipse Support.
2025.06.30	1.3	Update Library for 1.0.3. Update Package for 1.0.3. Fix some existing bugs. Added some Example.
2025.08.15	1.3.1	Fix some existing bugs

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