

Ameba 開發板101



AmebaIoT 官網鏈接:

<http://bit.ly/ambiot1>



AmebaIoT GitHub鏈接:

<http://bit.ly/ambiot2>



- Ameba 背景知識
 - Ameba 家族
 - RTL8722DM 硬體資訊
- Ameba 三大軟體開發平臺
 - Standard SDK
 - Arduino SDK
 - MicroPython SDK
- Ameba 小趣聞
- 如何燒錄程式碼 影片介紹
- Ameba 資源總結與分享
- 問答環節



- Ameba物聯網開發板集成了台灣瑞昱半導體“Ameba物聯網解決方案”系列的最新一代SoC。
- 每個SoC模塊將有自己的開發板和SDK。



■ Ameba1

RTL8195AM



RTL8710AF



■ AmebaZ
RTL8710BN



■ AmebaZ2
RTL8720CM



■ AmebaD

RTL8722DM / RTL8722CSM



RTL8722DM_MINI



Ameba 家族

	Ameba			Ameba Z		Ameba Z2	Ameba D
Model	RTL8195AM	RTL8711AM	RTL8710AF	RTL8711BU	RTL8710BN	RTL8720CM	RTL8722DM
CPU	Arm Cortex M3 (166MHz)		Arm Cortex M3 (83MHz)	Arm Cortex M4 (125MHz)	Arm Cortex M4 (125MHz)	Arm Real-M300 (100MHz)	Arm v8M Real-M300 (200MHz) & Arm v8M Real-M200 (20MHz)
SRAM/Flash	2.5MB / ext. flash	2.5MB / ext. flash	512KB / 1MB	256KB / ext. flash	256KB / ext. flash	4.2MB / ext. flash	4.5MB / ext. flash
XIP	No	No	No	Yes	Yes	Yes	Yes
Bluetooth/BLE	No	No	No	No	No	BLE 4.2	BLE 5
Wi-Fi	2.4G	2.4G	2.4G	2.4G	2.4G	2.4G	2.4G/5G
Ethernet MII/RMII	Yes	No	No	No	No	No	No
SDIO Master/Slave	Master & Slave	No	No	Slave	Slave	Slave	Master & Slave
USB	Host & Device	No	No	No	No	No	Host & Device
PCM	x2	x2	No	No	No	No	x1
SPI	x2	x1	x1	x2	x1	x1	x3
UART	HSx2 + Std1	HSx1 + Std1	HSx2 + Std1	x3	x2	x3	x4
I2S	x2	x1	No	x1	No	No	x1
I2C	x4	x3	x2	x2	x2	x1	x2
ADC	x2	x1	No	x2	Vbat voltage detector	No	x7
DAC	x1	No	No	No	No	No	No
PWM	x4	x4	x4	x6	x6	x8	x17
GPIO	max. 30	max. 19	max. 17	max. 39	max. 17	max. 16	max. 54
Key scan/Touch key	No	No	No	No	No	No	8*8 key scan
LCD controller	No	No	No	No	No	No	TFT color display
NFC Tag (R/W)	Yes	Yes	No	No	No	No	No





SoC

■ 雙核 CPU

- KM4 - 正常模式的高功耗核
- KM0 - 省電模式的低功耗核心

■ 内存

- SRAM 512KB 高性能
- PSRAM 4MB 大容量
- 是物聯網和音頻應用的理想選擇



CPU

32-bit Arm®Cortex®-M4, up to 200MHz

32-bit Arm®Cortex®-M0, up to 20MHz



MEMORY

512KB SRAM + 4MB PSRAM



KEY FEATURES

Integrated 802.11a/n Wi-Fi SoC
Trustzone-M Security
Hardware SSL Engine
Root Trust Secure Boot
USB Host/Device
SD Host
BLE5.0
Codec
LCDC
Key Matrix



OTHER FEATURES

1 PCM interface
4 UART interface
1 I2S Interface
2 I2C interface
7 ADC
17 PWM
Max 54 GPIO



5.0



2.4G/5G

Module

■ 無線網絡 + 藍牙低功耗模組

- 模組核心功能
- PCB板載 / IPEX天綫
- 模組自帶 Flash

■ 2.4GHz / 5GHz 双频

- 为用户提供更多选择

■ BLE5.0

- 低功耗
- 傳輸速率和距離提升
- 廣播模式信息容量提升



■ 三大開源軟體開發工具包

Standard SDK

- ✓ 支持功能全面
- ✓ 支持多種調試工具

Arduino SDK

- ✓ 易於使用，並與Arduino UNO兼容
- ✓ 易於客制化的程式碼

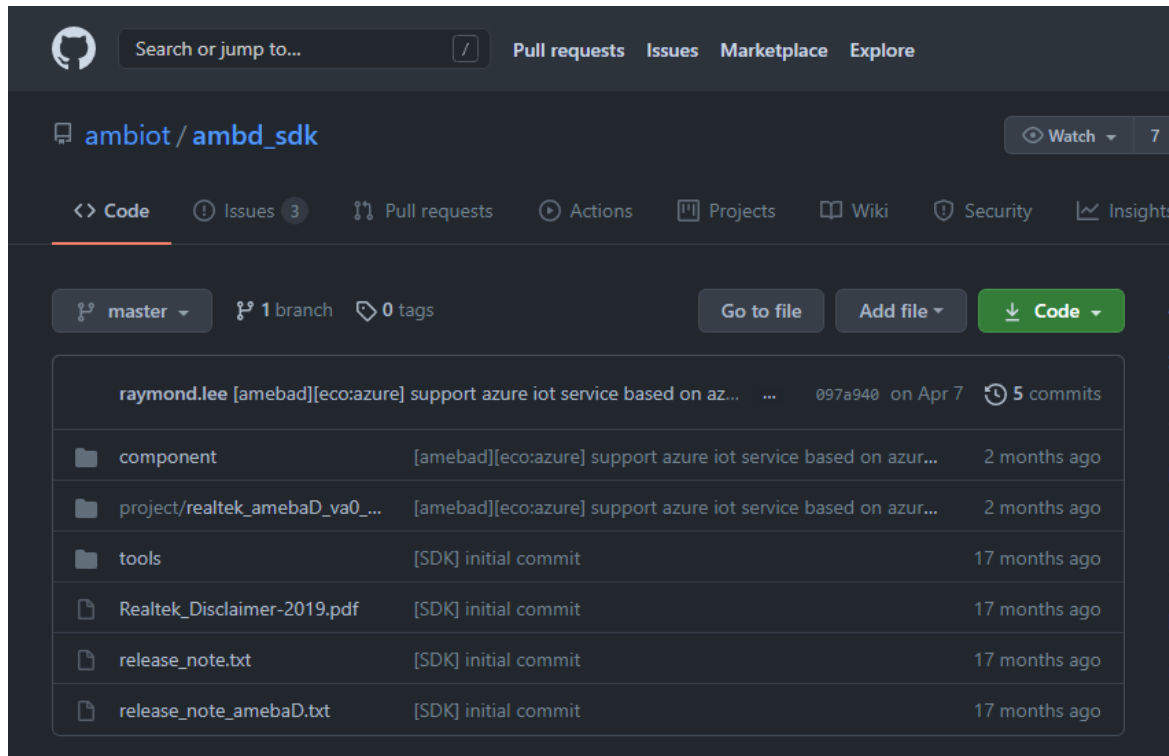
MicroPython SDK

- ✓ 易於上手 只需要上傳一次固件
- ✓ 使用Python腳本編程

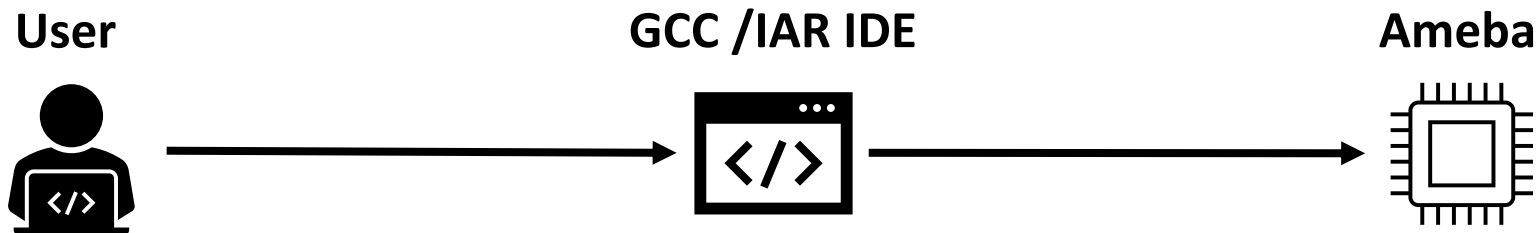


■ Standard SDK Release Version (GCC or IAR)

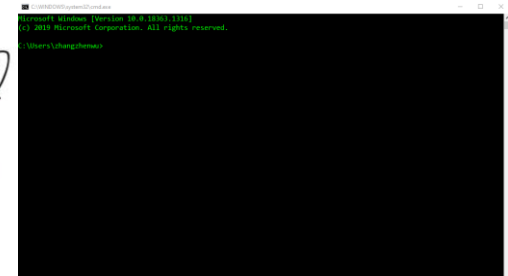
- 支持功能全面
- 擁有大部分的源代碼和開發工具



■ Standard SDK Release Version (GCC or IAR)



- 開發語言：C 和 C++
- 除錯工具：
 - IAR / GCC
 - JLINK / GDB (GNU Debugger)



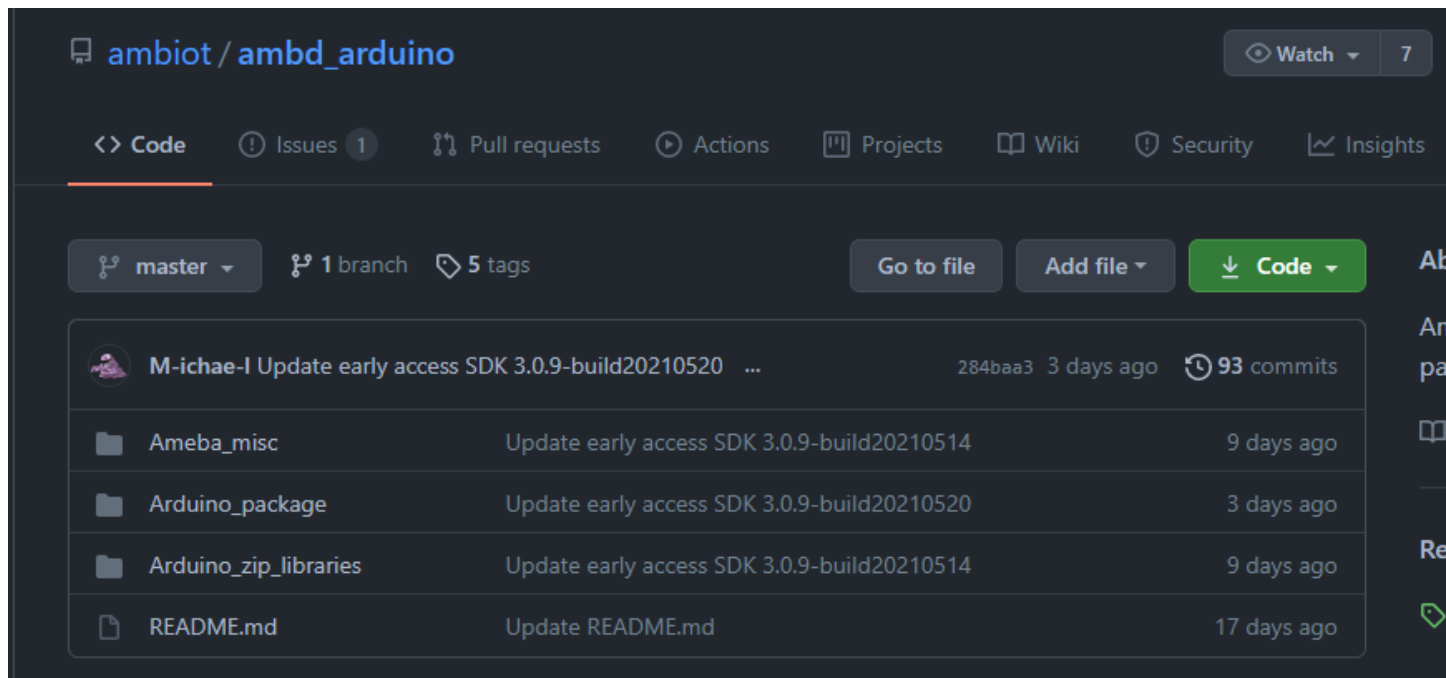
小結

- 開源SDK
- 發布了大部分範例和源代碼
- 供專業的開發者使用



■ Arduino SDK (Arduino IDE)

- 具有獨立API的SDK
- 支持大部分Standard SDK中的功能
- 支持的功能隨時間增加

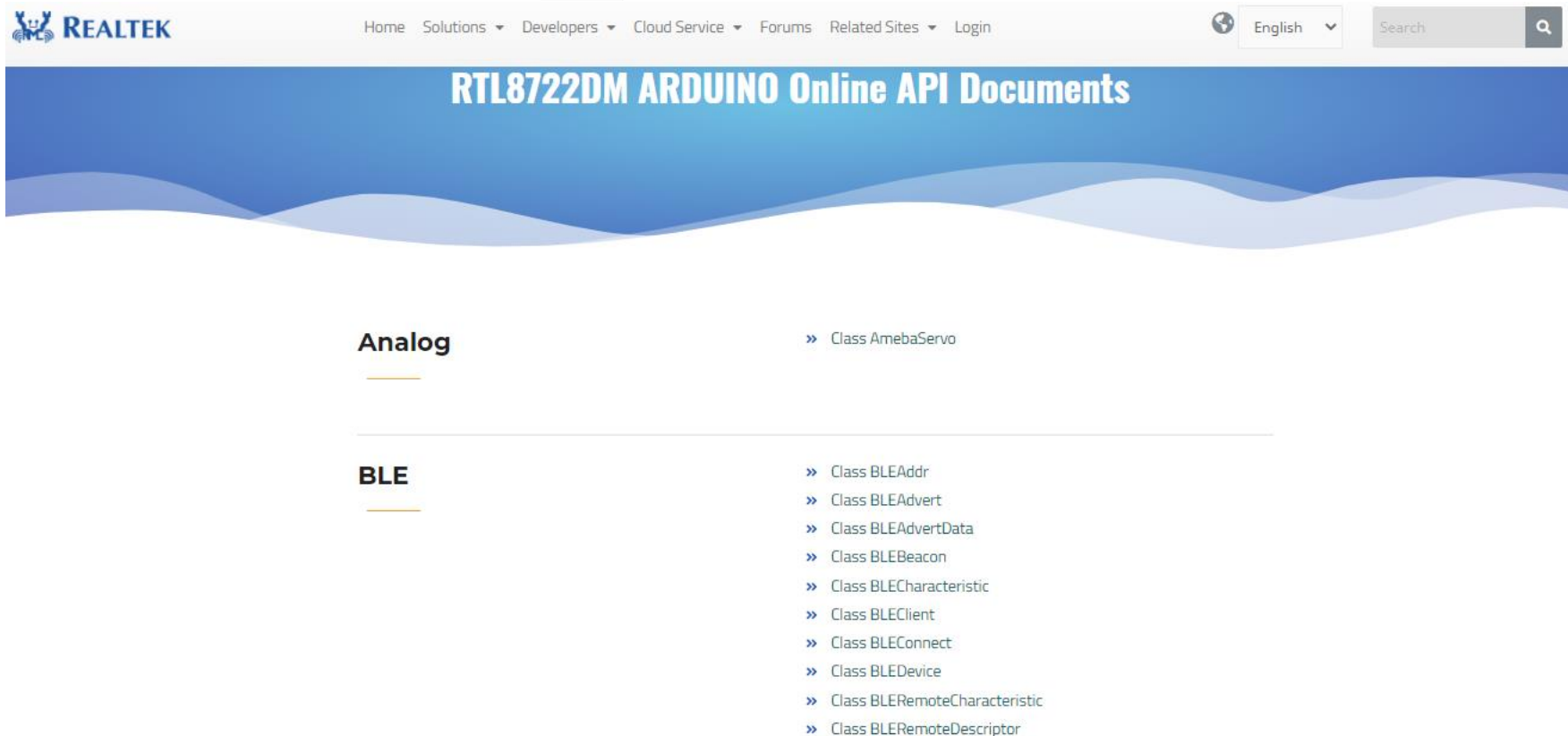


■ 詳細的在線文檔支持

- Arduino SDK API

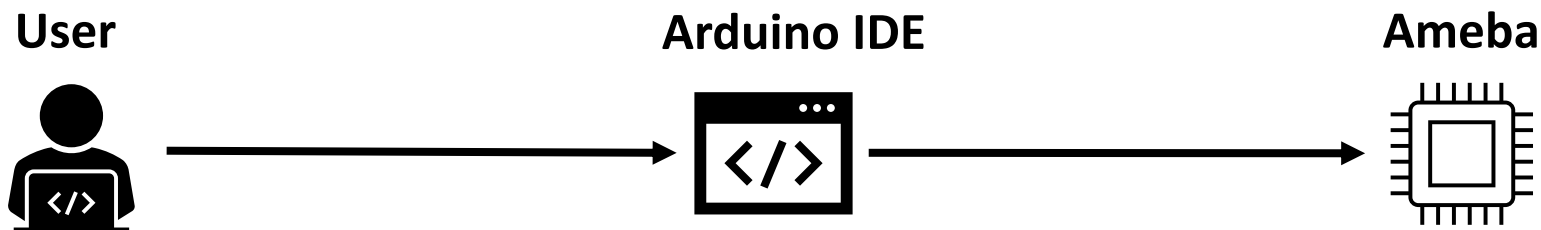


- Arduino 範例

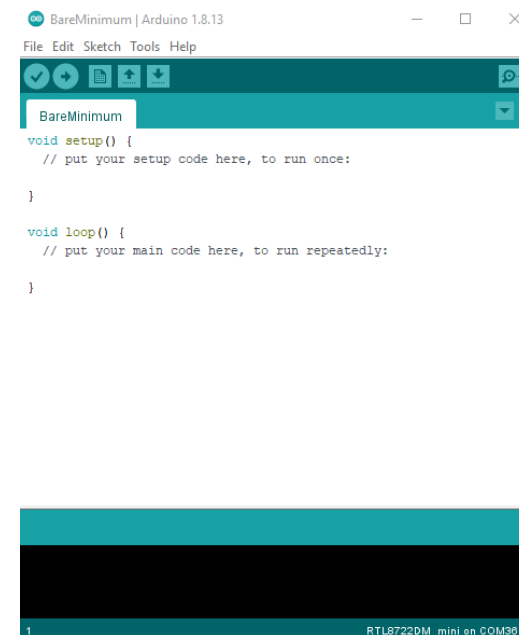


The screenshot shows the RTL8722DM ARDUINO Online API Documents website. The header includes the Realtek logo, navigation links (Home, Solutions, Developers, Cloud Service, Forums, Related Sites, Login), a language selector (English), and a search bar. The main title is "RTL8722DM ARDUINO Online API Documents". Below the title, there are two sections: "Analog" and "BLE". The "Analog" section has a link to "Class AmebaServo". The "BLE" section has a list of links: "Class BLEAddr", "Class BLEAdvert", "Class BLEAdvertData", "Class BLEBeacon", "Class BLECharacteristic", "Class BLEClient", "Class BLEConnect", "Class BLEDevice", "Class BLERemoteCharacteristic", and "Class BLERemoteDescriptor".

■ Arduino SDK (Arduino IDE)



- 開發語言：C 和 C++
- 開發工具：Arduino IDE
 - Arduino IDE 2.0 支持除錯



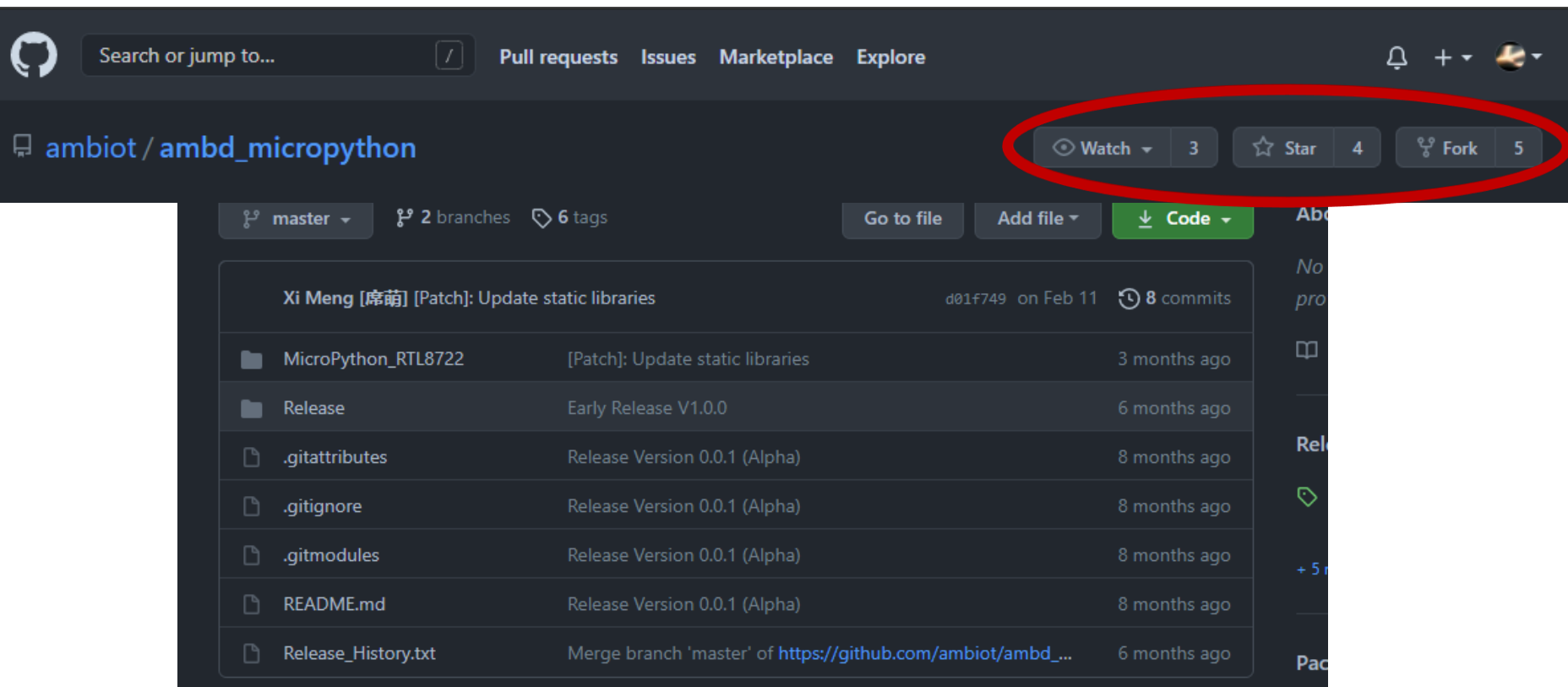
小結

- 開源
- 支持 Standard SDK中的大部分範例
- 供發燒友使用
- 易於學習上手，擴展性強
- 強大的社群支持和幫助



■ MicroPython (MP) SDK

- 具有獨立API
- 無需平台支持的開源SDK



Search or jump to... Pull requests Issues Marketplace Explore

ambiot / ambd_micropython

Watch 3 Star 4 Fork 5

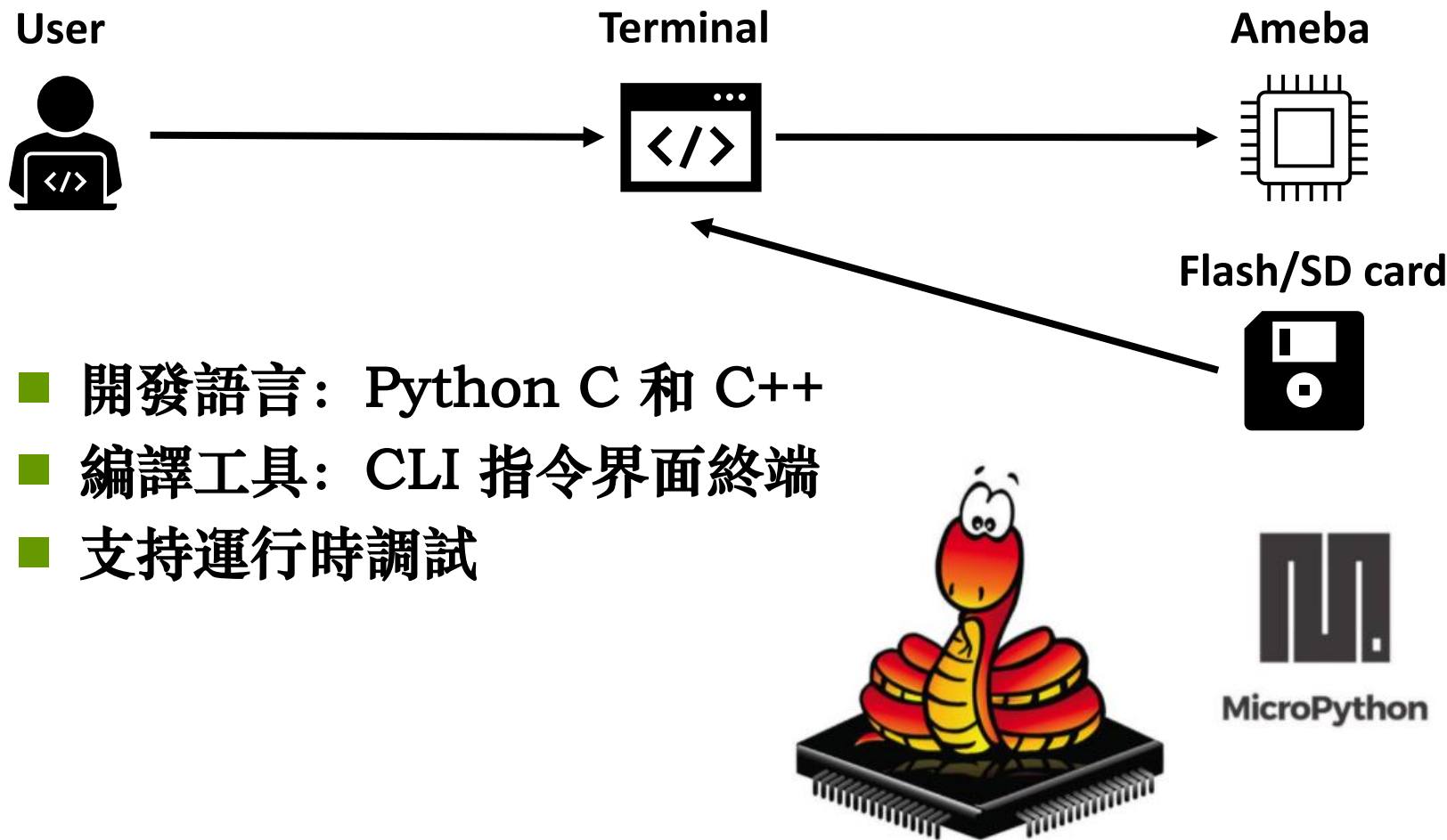
master 2 branches 6 tags

Go to file Add file Code

Xi Meng [席萌] [Patch]: Update static libraries d01f749 on Feb 11 8 commits

File	Description	Time
MicroPython_RTL8722	[Patch]: Update static libraries	3 months ago
Release	Early Release V1.0.0	6 months ago
.gitattributes	Release Version 0.0.1 (Alpha)	8 months ago
.gitignore	Release Version 0.0.1 (Alpha)	8 months ago
.gitmodules	Release Version 0.0.1 (Alpha)	8 months ago
README.md	Release Version 0.0.1 (Alpha)	8 months ago
Release_History.txt	Merge branch 'master' of https://github.com/ambiot/ambd_micropython	6 months ago

■ MicroPython SDK



- 開發語言：Python C 和 C++
- 編譯工具：CLI 指令界面終端
- 支持運行時調試



MicroPython



ARDUINO

Download once and change code on the go

No compilation needed, changes to code
take effect immediately

Libraries written in **Python3** and are
compatible across all hardware platforms

No need to download IDE

Compile, link and flash **every time** code
changes

Compilation and flashing may **take very long**
if include many libraries

Libraries written in a C/C++ and often face
compatibility issues

IDE requires

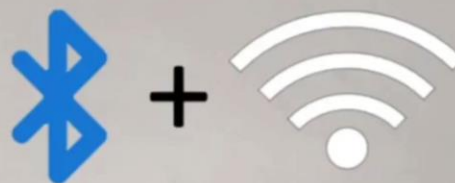
小結

- 開源
- 繼承了Standard SDK中的部分範例
- 新手友好：供初學者/非技術人員使用
- 容易學習 使用方便 不需要額外安裝IDE

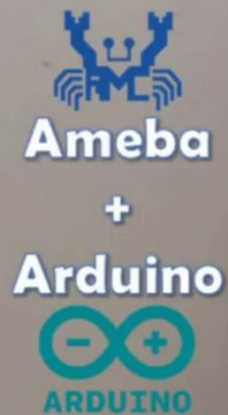
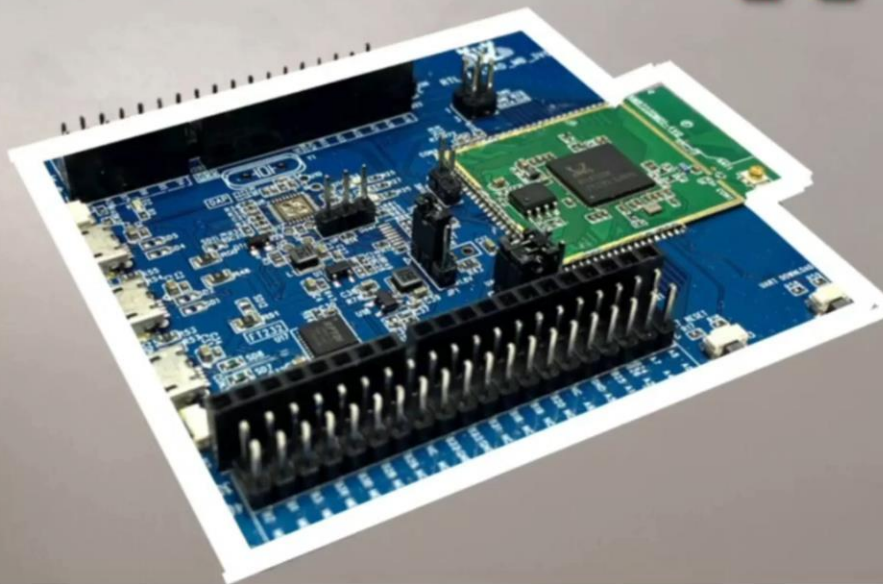
- Ameba是變形蟲的意思，Google搜索Ameba，最先出來的一定和Realtek Ameba沒有關係 😊
- Ameba D是目前所有IoT MCU裏面少見的音頻功能強大的SOC，但是它的第一塊開發板RTL8722DM沒有MIC和耳機接口 😊
- RTL8722DM的開發板雖然很大，但是還是不夠大，因此有些功能還是需要增加外設部件來實現，例如：SD卡模組 😊

那麼，開始燒錄你的第一個程式吧！

BLE Configure



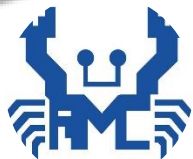
WiFi



內容總結：Ameba 資源哪裏找？

相關資料

- Ameba IoT 官方網站



程式碼

- Ameba IoT GitHub



提問通道

- Facebook
- Ameba IoT Forum



社交媒體

- YouTube
- Bilibili





感謝聆聽



AmebaIoT官網鏈接:

<http://bit.ly/ambiot1>



AmebaIoT GitHub鏈接:

<http://bit.ly/ambiot2>

