Hong Ke Technology

kai

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ONE

SWITCH BETWEEN LANGUAGES/

There are now versions in two languages.

- English/
- Chinese/

You can easily change from one language to another by the panel on the sidebar like below. Just click on the Read the Docs title button on the left-bottom corner if it is folded. En is an English docs and zh_CN is a Chinese docs

Read the Docs enzh_CN

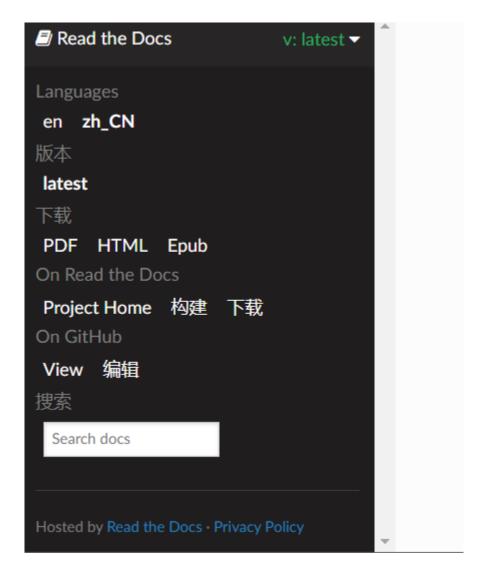


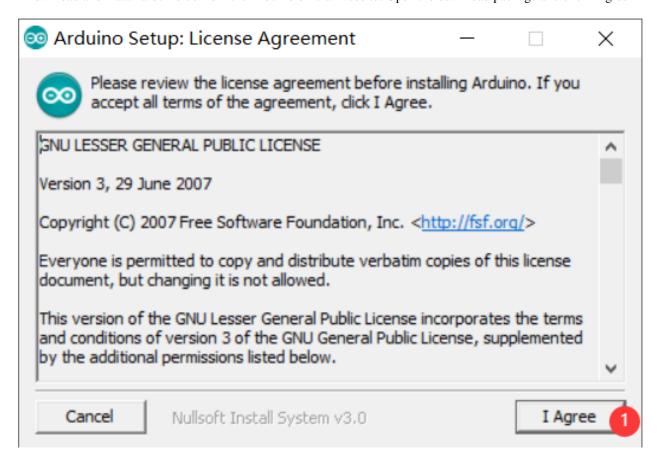
Fig. 1: Switch Between Languages/

ARDUINO CONSTRUCTION OF DEVELOPMENT ENVIRONMENT

2.1 Arduino Construction of development environment(ESP32)

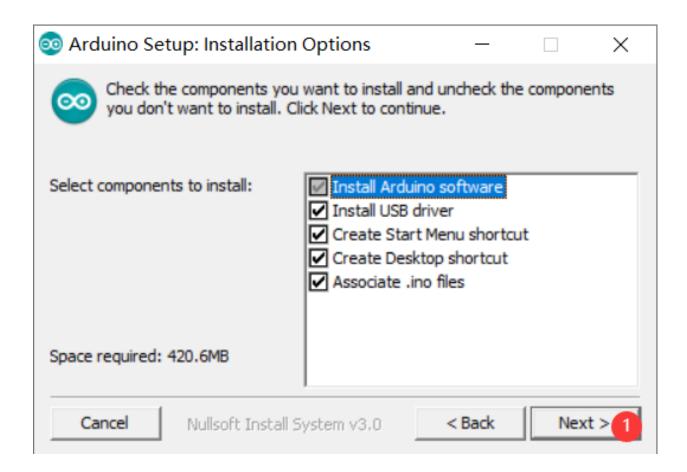
You need to install Arduino, GIT, Python and other tools on your computer. The installation software section will not cover too much.

1Download and install arduinoide from the Arduino official website. Open the download package and click I agree



2Click Next

- 3The default is to install on the C drive. You can change the installation location by clicking Browse.
- 4I installed it under the Arduino folder on disk D (remember this installation path)
- 5Wait for the installation to complete. Turn on the Hardware under the installation path



6Create a new folder espressif

7Go to espressif. Create another folder for esp32

8Open Git Bash and go to this directory (if you already have Git installed)

Note: Note that the paths are "/" delimited

9Command line inputgit clone https://github.com/espressif/arduino-esp32.git

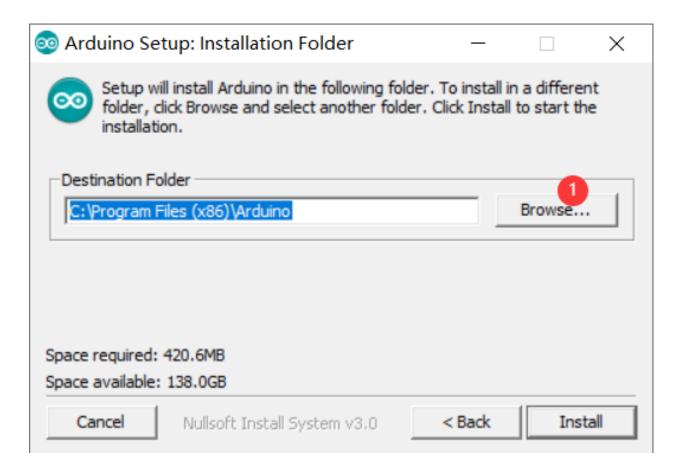
10Waiting for download to succeedOpen the arduino-esp32 in the espressif folder .open tools folder

11Double-click get.exeYou need Python installed on your computer.

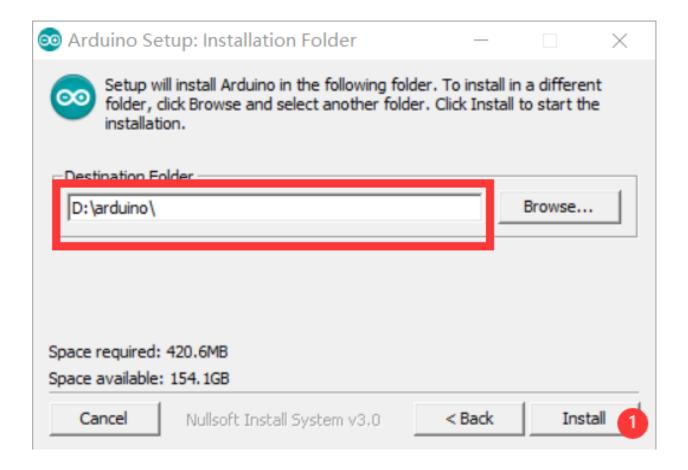
12Open ArduinoIDESelect development board

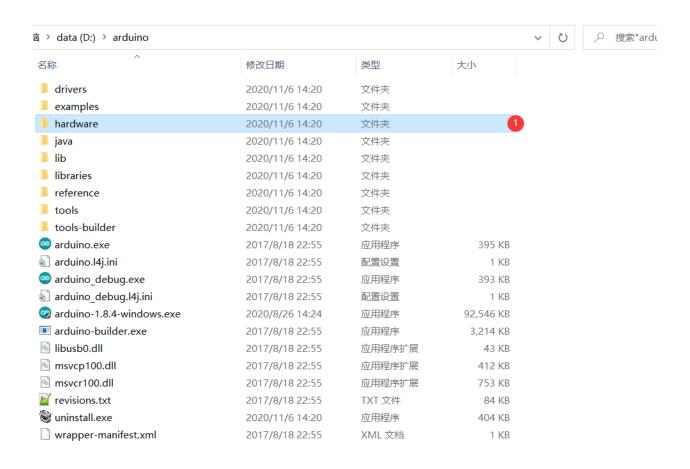
13Development board configuration

14Arduino development environment is built. You can select the appropriate example to burn to the appropriate development board

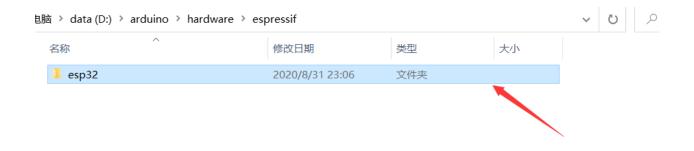


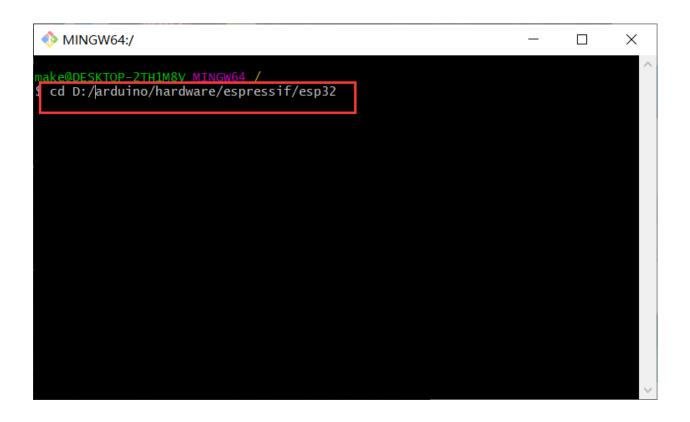
2.2 Arduino Construction of development environment(ESP8266)









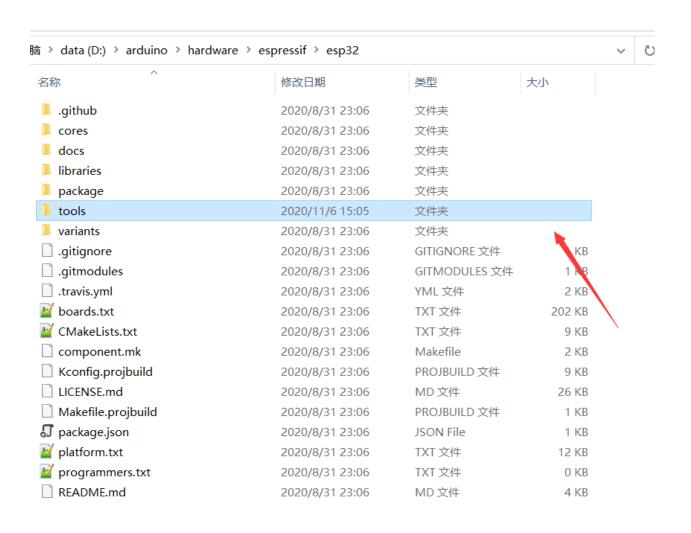


```
MINGW64:/d/arduino/hardware/espressif

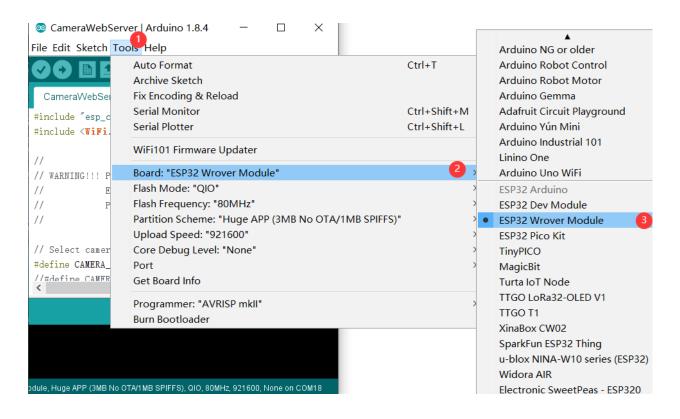
make@DESKTOP-2TH1M8V MINGW64 /
$ cd D:/arduino/hardware/espressif

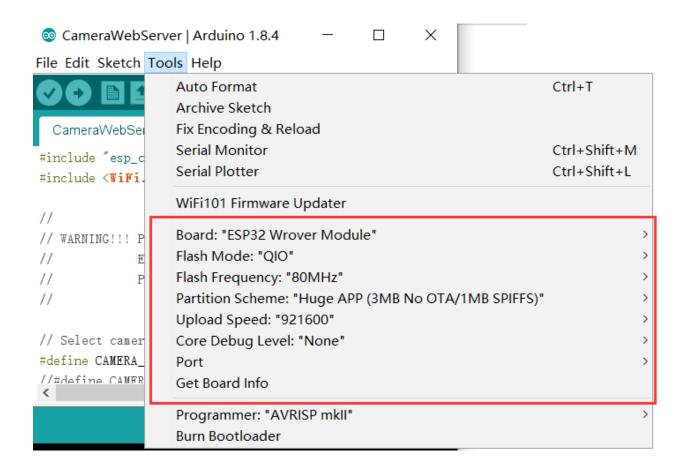
make@DESKTOP-2TH1M8V MINGW64 /d/arduino/hardware/espressif

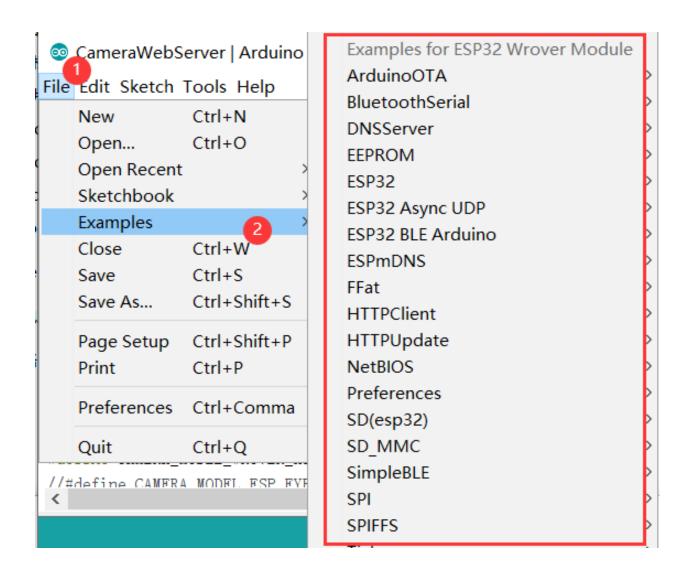
git clone https://github.com/espressif/arduino-esp32.git
```



5称	修改日期	类型	大小
dist	2020/11/6 15:05	文件夹	
esptool	2020/11/6 15:05	文件夹	
partitions	2020/8/31 23:06	文件夹	
sdk	2020/8/31 23:06	文件夹	
xtensa-esp32-elf	2020/11/6 15:05	文件夹	
🛂 espota.exe	2020/8/31 23:06	应用程序	3,936 KB
🗹 espota.py	2020/8/31 23:06	PY 文件	10 KB
iggies esptool.py	2020/8/31 23:06	PY 文件	141 KB
🛂 gen_esp32part.exe	2020/8/31 23:06	应用程序	3,262 KB
gen_esp32part.py	2020/8/31 23:06	PY 文件	20 KB
🛂 get.exe	2020/8/31 23:06	应用程序	5,090 KB
get.py	2020/8/31 23:06	PY 文件	« КВ
🗹 platformio-build.py	2020/8/31 23:06	PY文件	11 KB







CHAPTE	F
TUDE	_

ESP-IDF CONSTRUCTION OF DEVELOPMENT ENVIRONMENT

3.1 ESP-IDF Construction of development environment(ESP32)

W800 CONSTRUCTION OF DEVELOPMENT ENVIRONMENT

4.1 SDK Command Line Compilation Guide

4.1.1 (1)Get Software Tools

Go get SDK.

Windows OS Windows OS by default does not support compilation of GNU - based Makefiles, so you need to build an environment that supports GNU - compiler toolchains Click Download.Cygwin-based compilation environment. Unzip the file, open the executable, and the installation is complete

Linux OS Linux OS compiles directly in the shell, requiring the installation of common development libraries and tools on Linux.

4.1.2 (2)Connect Board

4.1.3 (3)Open Cygwin for WinnerMicro.Switch the path to the SDK root

4.1.4 (4)Make compiles complete firmware

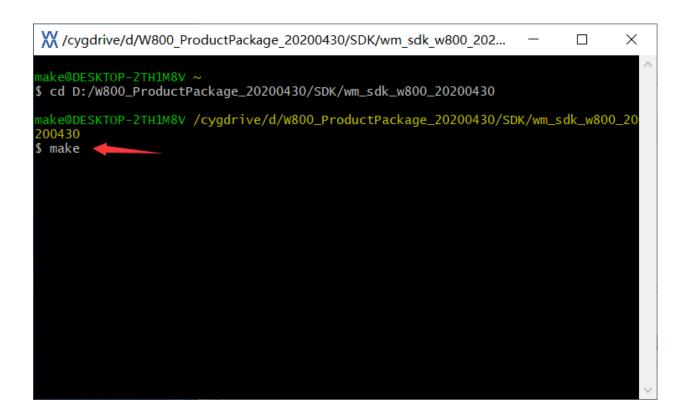
4.1.5 (5) Wait for the firmware to compile successfully

4.1.6 (6)Configuration parameter

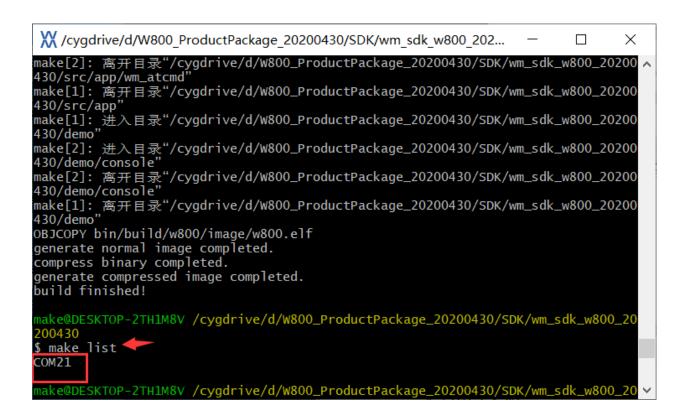
View serial port, command line inputmake list My serial port here is COM21.

Command line inputmake menuconfig

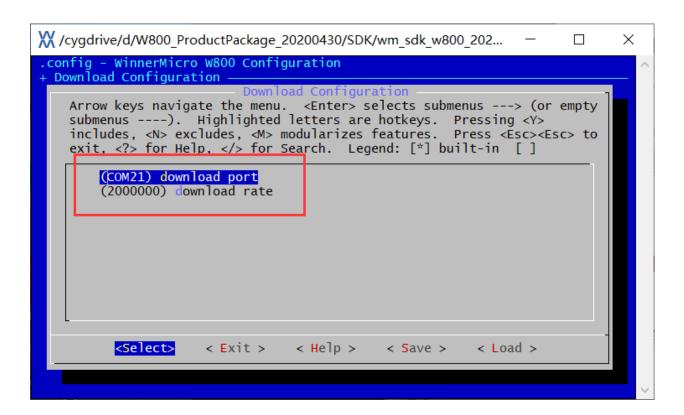
Configure the "Download Configuration" option in the compilation parameter, enter the serial number and the supported Baud rate. I configure serial port number COM21 here, baud rate 2000000, save and exit. The default serial port download baud rate of SDK is 115200. When the user's download device supports 2M Baud rate, the baud rate is set to 2000000 to experience a faster download speed.



```
XX /cygdrive/d/W800 ProductPackage 20200430/SDK/wm sdk w800 202...
                                                                        ×
430/src/app/web"
make[2]: 进入目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/src/app/wm_atcmd"
make[2]: 离开目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/src/app/wm_atcmd"
make[1]: 离开目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/src/app
make[1]: 进入目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/demo
make[2]: 进入目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/demo/console
make[2]: 离开目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/demo/console"
make[1]: 离开目录"<u>/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200</u>
430/demo
OBJCOPY bin/build/w800/image/w800.elf
generate normal image completed.
compress binary completed.
generate compressed image completed.
build finished!
make@DESKTOP-2TH1M8V /cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20
200430
```



```
XX /cygdrive/d/W800 ProductPackage 20200430/SDK/wm sdk w800 202...
                                                                                       Х
.config - WinnerMicro W800 Configuration
                          WinnerMicro W800 Configuration
    Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
    submenus ----). Highlighted letters are hotkeys. Pressing <Y>
    includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </>> for Search. Legend: [*] built-in []
             Firmware Configuration --->
             Download Configuration --->
             Compile Configuration -
             Toolchain Configuration --->
           <Select>
                                                                 < Load >
                         < Exit >
                                      < Help >
                                                    < Save >
```



4.1.7 (7)Upload the firmware

Command line inputmake flash (Once the compilation is complete, burn the second Boot and user code, the firmware in .fls format)

```
XX /cygdrive/d/W800 ProductPackage 20200430/SDK/wm sdk w800 202...
                                                                          X
                                                                   430/demo/console'
make[2]: 离开目录"/cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/demo/console"
make[1]:离开目录"/cygdrive/d/w800_ProductPackage_20200430/SDK/wm_sdk_w800_20200
430/demo"
OBJCOPY bin/build/w800/image/w800.elf
generate normal image completed.
compress binary completed.
generate compressed image completed.
build finished!
connecting serial...
serial connected.
wait serial sync...
serial sync sucess.
mac FF-FF-FF-FF-FF.
start download.
download completed.
please manually reset the device.
nake@DESKTOP-2TH1M8V /cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_20
```

Other commands.

make image Once the compilation is complete, only the user code, the firmware in .img format, is burned

Note: If this operation is performed and requires secondary boot file support, you will also need to burn secondary boot firmware.

make down Do not compile, directly burn firmware in .flS format.

4.1.8 (8)Run the firmware

It captures the logs generated when the device is working properly and outputs them to the screen.

Command line inputmake run Press reset to view the output

Note: Type Make help from the command line to see what the command does.

```
XX /cygdrive/d/W800_ProductPackage_20200430/SDK/wm_sdk_w800_202...
                                                              X
build finished!
connecting serial...
serial connected.
wait serial sync...
serial sync sucess.
mac FF-FF-FF-FF-FF.
start download.
download completed.
please manually reset the device.
HR\_MAC\_AFE\_CTRL = 7
user task
HR\_MAC\_AFE\_CTRL = 0
HR\_MAC\_AFE\_CTRL = 7
user task
HR\_MAC\_AFE\_CTRL = 0
HR\_MAC\_AFE\_CTRL = 7
 user task
```

FIVE

WIFI

5.1 HK-01

5.1.1

5.2 HK-01B

5.2.1

5.3 HK-01S

5.3.1

5.4 HK-03

5.4.1

5.5 HK-05

5.5.1

5.6 HK-07

5.6.1

5.7 HK-07S

5.7.1

5.8 HK-12E

5.8.1

5.9 HK-12F-L2

Chapter 5. WiFi

SIX

BLUETOOTH

- 6.1 HK-BT01
- 6.1.1
- 6.2 HK-BT12
- 6.2.1

SEVEN

ZIGBEE

7.1 HK-ZB12

7.1.1

7.2 HK-ZB01

7.2.1

28 Chapter 7. Zigbee

EIGHT

LORA

- 8.1 HK-Ra07
- 8.1.1
- 8.2 HK-Ra07-I
- 8.2.1

30 Chapter 8. LoRa

NINE

SUB1G

- 9.1 HK-Si01
- 9.1.1
- 9.2 HK-Si12
- 9.2.1

32 Chapter 9. Sub1G

CHAPTER TEN

2.4G

10.1 HK-24DP

10.2 HK-24MiNi

34 Chapter 10. 2.4G

CHAPTER

ELEVEN

MULTI-PROTOCOL

- 11.1 HK-32D
- 11.1.1
- 11.2 HK-32U
- 11.2.1
- 11.3 HK-32S
- 11.3.1
- 11.4 HK-32S-I
- 11.4.1
- 11.5 HK-32B
- 11.5.1
- 11.6 HK-WROVER
- 11.6.1
- 11.7 HK-WROVER-I
- 11.7.1

CHAPTER TWELVE

HK-D1-MINIPRO4M

CHAPTER THIRTEEN

HK-D1-MINIPRO16M

CHAPTER

FOURTEEN

HK-ESP32-CAM

14.1 Product Overview

The HK-ESP32-CAM module is a 39.8*27* small camera module designed by Hongke. This module can work independently as the minimum system. New WiFi+ Bluetooth dual mode development board based on ESP32, with PCB onboard antenna, with two high-performance 32-bit LX6Cpus, at level 7 Pipeline architecture, main frequency adjustment range from 80MHz to 240Mhz. Ultra-low power consumption, deep sleep current as low as 6mA.Ultra-small 802.11b/g/ N Wi-Fi + BT/BLE SoC module.

HK-ESP32-CAM can be widely used in a variety of Internet of Things occasions, suitable for home smart devices, industrial wireless control, wireless monitoring, QR wireless identification, Wireless positioning system signal and other iot applications are ideal solutions for iot applications.

The HK-ESP32-CAM is DIP encapsulated and can be used by directly plugging into the bottom plate. The reliable connection mode is convenient for all kinds of Internet of Things hardware terminals.

Ultra-small 802.11b/g/ N Wi-Fi + BT/BLE SoC module.

14.2 Product Characteristics

Using low power dual core 32-bit CPU, it can be used as application processor

The main frequency is up to 240mhz, and the computing power is up to 600 DMIPS

Built in 520kb SRAM and external 8MB PSRAM

Support UART/SPI/I2C/PWM/ADC/DAC interfaces

Support ov2640 and ov7670 cameras with built-in flash

Support image WiFi upload

Support TF Card

Support multiple sleep modes

Embedded LwIP and FreeRTOS

Support STA/AP/sta+AP working mode

Support smart config / airkiss one click distribution network

Support secondary development

14.3 Application Scenarios

Picture transmission of home intelligent equipment

Wireless monitoring

Smart agriculture

QR wireless identification

Wireless positioning system signal

And other Internet of things applications

pera-

14.4 Technical Specifications

A75-5.25v				
ter Work- ling volt- age Spi- The default of 32 mbit flash RAM Internal 520kb + External SMB PSRAM Wi-Fi 802.11b/g/ne/ri Blue- tooth Sup- port inter- face(2Mps) Sup- port TF card IO 9 Serial 115200bps by default 100 9 Serial 115200bps by default PCB antenna on board, gain 2dBI tenna form format Pack- age utput rane Pack- age UPF-16 age 802.11b:17±2dBm (@11Mbps) 802.11g:14±2dBm (@MCS7) ECK,11 Mbps:-90dBm CCK,11 Mbps:-90dBm CCK,11 Mbps:-90dBm CCK,11 Mbps:-85dBm Sensi- tivity Power consumption turn off flash:180mA@5V Turn on the flash and turn on the maximum brightness:310mA@5V Deep sleep: the minimum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V WPA/WPAZ/WPAZ enterprise/WPS Light sleep: up to 6 7mA@5V Secu- rity WPA/WPAZ/WPAZ enterprise/WPS Light sleep: up to 6 7mA@5V WPA/WPAZ/WPAZ enterprise/WPS Light sleep: up to 6 7mA@5V WPA/WPAZ/WPAZ enterprise/WPS Light sleep: up to 6 7mA@5V Chapter 14. HK-ESP32-CAM Light sleep: up to 6 7mA@5V Chapter 14. HK-ESP32-CAM Light sleep: up to 6 7mA@5V Chapter 14. HK-ESP32-CAM Light sleep: up to 6 7mA@5V Light sl	Pa-	description		
Work- ing work	rame-			
Spi	ter			
voltage age Spi- flash Spi- flash Mr-Fi Spi- Blue- tooth Sup- port inter- face(2Mbps) Sup- port inter- face(2Mbps) Maximum 4G support Maximum 4G support TF card IO 9 Serial 115200bps by default for rate Spec- tral Range An- tenna form Image JPEG (ov2640 only), BMP, grayscale UP-16 age DIP-16 age DIP-16 age CCK,11 Mbps:-90dBm C	Work-	4.75-5.25v		
age Spi- Biash RAM Internal 520kb + External 8MB PSRAM Wi-Fi Blue- tooth UART, SPI, 12C, PWM UART, SPI, 12C, PWM UART, SPI, 12C, PWM Maximum 4G support Maximum 4G support TF card I15200bps by default D Serial I15200bps by default PCB antenna on board, gain 2dBI Image output Image output Image output Image Pack age Trans- mit- tenna Fack age Trans- mit- ting Brans	ing			
The default of 32 mbit	volt-			
The default of 32 mbit	age			
RAM		The default of 32 mbit		
RAM				
Wi-Fi Blue Bluetooth 4.2br/edr and ble		Internal 520kb + External 8MB PSRAM		
Blue-tooth tooth UART, SPI, I2C, PWM UART, SPI, I2C, PWM UART, SPI, I2C, PWM UART, SPI, I2C, PWM Waximum 4G support TF card 10 9 Serial port rate Spectral Range An- tenna form Image output Image output Image output Image output Spectral Racy Rec age Trans- mit- ting power Re- ceiv- ting power Res ceiv- ting Spensit Spensit Vity Watter Res Spensit Vity Vity Spensit Spensit Vity Vity Spensit Sp				
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port inter- face(2Mbps) Sup- port TF card IO 9 Serial port rate 2400 ~ 2483.5mhz Tall port rate PCB antenna on board, gain 2dBI tenna form PCB antenna on board, gain 2dBI Image output format IPEG (ov2640 only), BMP, grayscale Uput format Pack- age Trans- 302.11b:17±2dBm (@11Mbps) mit- mit- mit- mit- mit- mit- mit- mit-		IIART SPI I2C PWM		
inter- face(2Mbps) Sup- port TF card IO 9 Serial I15200bps by default port rate Spec- An- tenna form Image output format Pack- age Pack- age 802.11b:17±2dBm (@11Mbps) 802.11g:14±2dBm (@54Mbps) 802.11g:13±2dBm (@MCS7) power Re- ceiv- ing Sensi- tivity W XS7(6SMbps,7.2Mbps)-67dBm CCK,11 Mps:-85dBm 6Mbps(1/2BPSK)-88dBm 54Mbps(3/464-QAM):-70dBm MCS7(6SMbps,7.2Mbps)-67dBm Power consumption turn off flash :180mA@5V Turn on the flash and turn on the maximum brightness :310mA@5V Deep sleep: the minimum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V Secu- rity WPA/WPA2/WPA2 enterprise/WPS Chapter 14. HK-ESP32-CAM In Serial In Summary In Sum	_	OAKI, 51 1, 120, 1 WH		
Maximum 4G support	_			
Sup- port TF card 10 9 115200bps by default port rate Spec- tral Range An- tenna form Image JPEG (ov2640 only), BMP, grayscale output format Pack- age Trans- mit- ting B02.11g:14±2dBm (@11Mbps) 802.11g:14±2dBm (@54Mbps) 802.11r:13±2dBm (@65Mbps) 802.11r:13±2dBm (%65Mbps) 802.1		hnel		
port TF card IO 9 Serial port rate Spectral Range An-tenna form IPEG (ov2640 only), BMP, grayscale output format Trans-mitting Spower Re-ceiv- ceiv- civity IVIN Sensitivity Power consumption turn of flash :180mA@5V Deep sleep: the mininum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V CCA Chapter 14. HK-ESP32-CAM ISPG (Ov2640 only), BMP, grayscale 115200bps by default 9 2400 ~ 2483.5mhz 2400 ~ 2483.5mhz 15200bps by default 9 2400 ~ 2483.5mhz 16200 ~ 2480.5mhz 16200 ~ 2483.5mhz 16200 ~ 2480.5mhz 16200 ~ 2480.				
TF card Tild Ti	_	Maximum 40 support		
card IO 9 Serial port rate Spec- 2400 ~ 2483.5mhz Tal Range An- PCB antenna on board, gain 2dBI Image output format Pack- age Trans- 802.11b:17±2dBm (@11Mbps) mit- ting 802.11s:13±2dBm (@54Mbps) 802.11s:13±2dBm (@654Mbps) 802.11s:13±2dBm (@MCS7) power Re- CCK,11 Mbps:-90dBm CCK,11 Mbps:-90dBm GMbps(1/2BPSK):-88dBm GMbps(1/2BPSK):-88dBm GMbps(3/464-QAM):-70dBm MCS7(65Mbps,72.2Mbps):-67dBm Power consumption turn off flash:180mA@5V Turn on the flash and turn on the maximum brightness:310mA@5V Deep sleep: the minimum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V Secu- WPA/WPA2/WPA2 enterprise/WPS rity 44Work- ing 115200bps by default 9 44Work- ing CAGO C Chapter 14. HK-ESP32-CAM				
Internation				
Serial port rate Spectral Range Antenna PCB antenna on board, gain 2dBI Transborn DIP-16 age Transborn S02.11b:17±2dBm (@11Mbps) mit-mit-mit-mit-mit-mit-mit-mit-mit-mit-		0		
port rate Spectral Range Antenna FCB antenna on board, gain 2dBI Faras Bigoutput format Trans- age Trans- mit- num 802.11b:17±2dBm (@11Mbps) 802.11g:14±2dBm (@54Mbps) 802.11n:13±2dBm (@MCS7) Fower Re- ceiv- CCK,1 Mbps:-90dBm CCK,11 Mbps:-85dBm 6Mbps(1/2BPSK):-88dBm Sensi- tivity MCS7(65Mbps,72.2Mbps):-67dBm Power consumption turn off flash :180mA@5V Deep sleep: the minimum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V Secu- WPA/WPA2/WPA2 enterprise/WPS rity 4Work- ing PCB antenna on board, gain 2dBI Cov2640 only), BMP, grayscale (B11Mbps) BOP- COV2640 only), BMP, grayscale (B11Mbps) BOP- COV2640 only), BMP, grayscale (B11Mbps) BOP- CCK,11 Mbps: BOP- CCK,11 Mbps: BOP- COCK,11 Mbps: BOP- BOP- BOP- BOP- BOP- BOP- BOP- BOP-				
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tivity MCS7(65Mbps,72.2Mbps):-67dBm Power consumption turn off flash :180mA@5V Turn on the flash and turn on the maximum brightness :310mA@5V Deep sleep: the minimum power consumption can reach 6mA@5V Modem sleep: lowest attainable 20mA@5V Light sleep: up to 6 7mA@5V Secu- rity WPA/WPA2/WPA2 enterprise/WPS 44Work- ing Chapter 14. HK-ESP32-CAN		54Mbps(3/464-QAM):-70dBm		
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14.5 Pin definition

CAM PIN	ESP32 PIN
D0	PIN5
D1	PIN18
D2	PIN19
D3	PIN21
D4	PIN36
D5	PIN39
D6	PIN34
D7	PIN0
XCLK	PIN22
PCLK	PIN25
VSYNC	PIN23
SDA	PIN26
SCL	PIN27
POWER PIN	PIN32

SD PIN	ESP32 PIN	
CLK	PIN14	
CMD	PIN15	
DATA0	PIN2	
DATA1/flash lamp	PIN4	
DATA2	PIN12	
DATA3	PIN13	

14.5. Pin definition 45

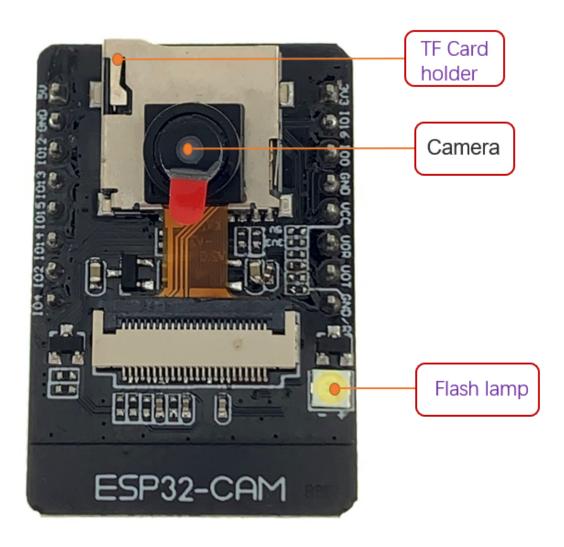


Fig. 1: HK-ESP32-CAM

HK-ESP32-CAM-MB

HK-ESP32-CAM-MB is a base designed by Hongke for hk-esp32-cam small camera module.

ESP32-CAM-MB is equipped with USB to serial interface, which is convenient for users to burn programs. This base and HK-ESP32-CAM can form a module which can work independently as the minimum system.

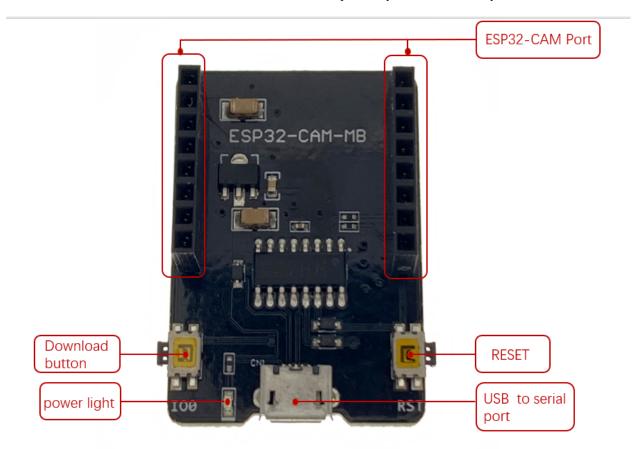


Fig. 1: HK-ESP32-CAM-MB

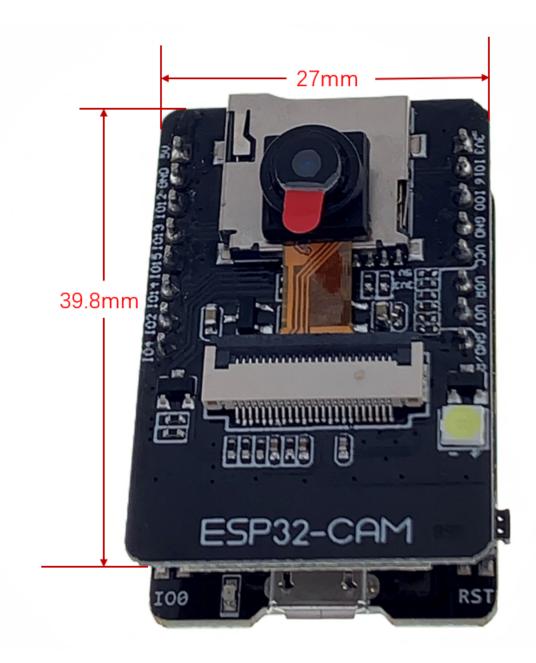


Fig. 2: HK-ESP32-CAM module

CHAPTER SIXTEEN

HK-ESP32-MINIKIT(BLACK)

CHAPTER SEVENTEEN

HK-ESP32-MINIKIT(BLUE)

CHAPTER EIGHTEEN

HK-ESPTB

CHAPTER NINETEEN

HK-RFTB