

[Overview]

Smart Remote Control production

- Electronic fabrication of infrared transmission/reception sensors and LEDs
- Operate the remote control from your smartphone
- Usage from outside as IoT and cooperation with AI speakers

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《Overview》

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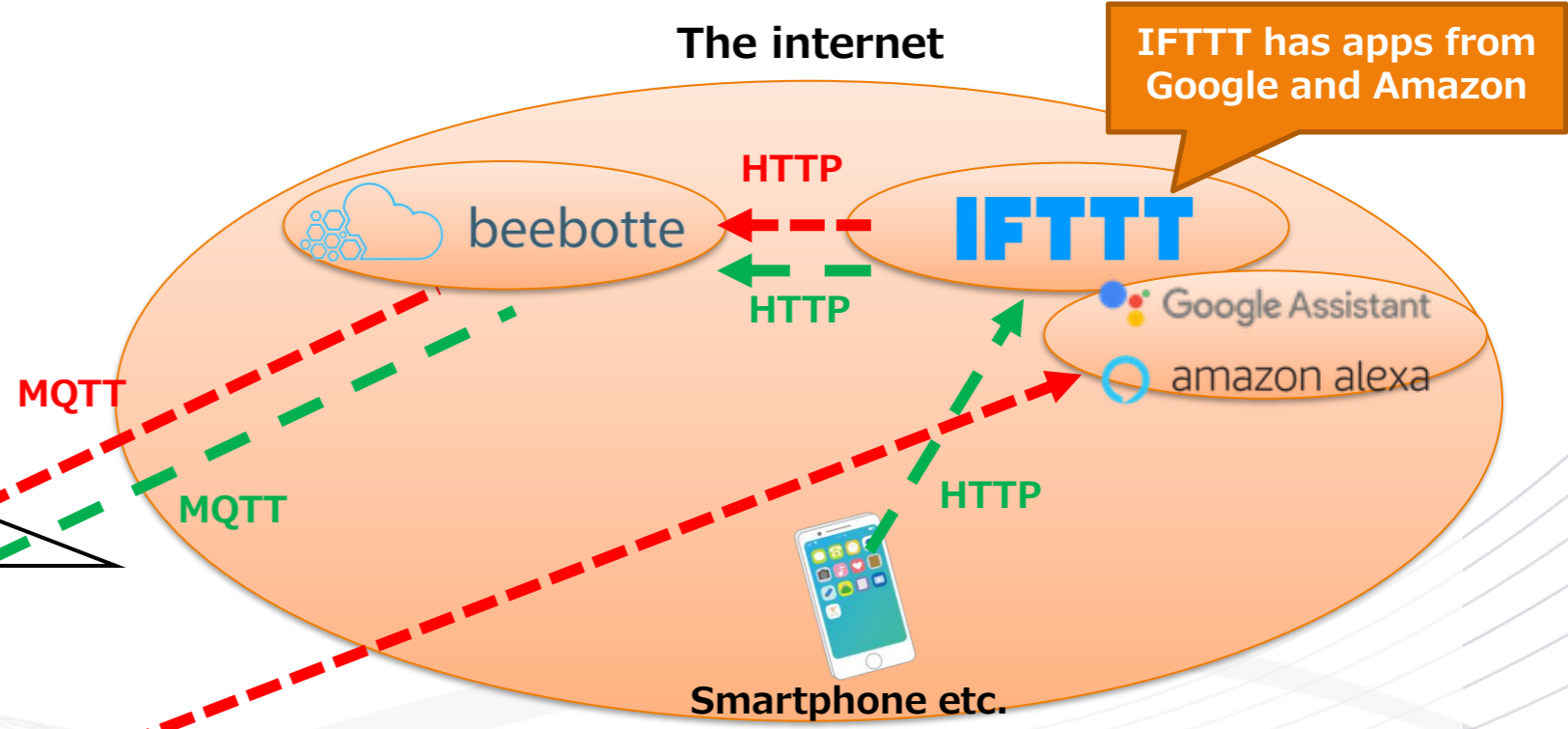
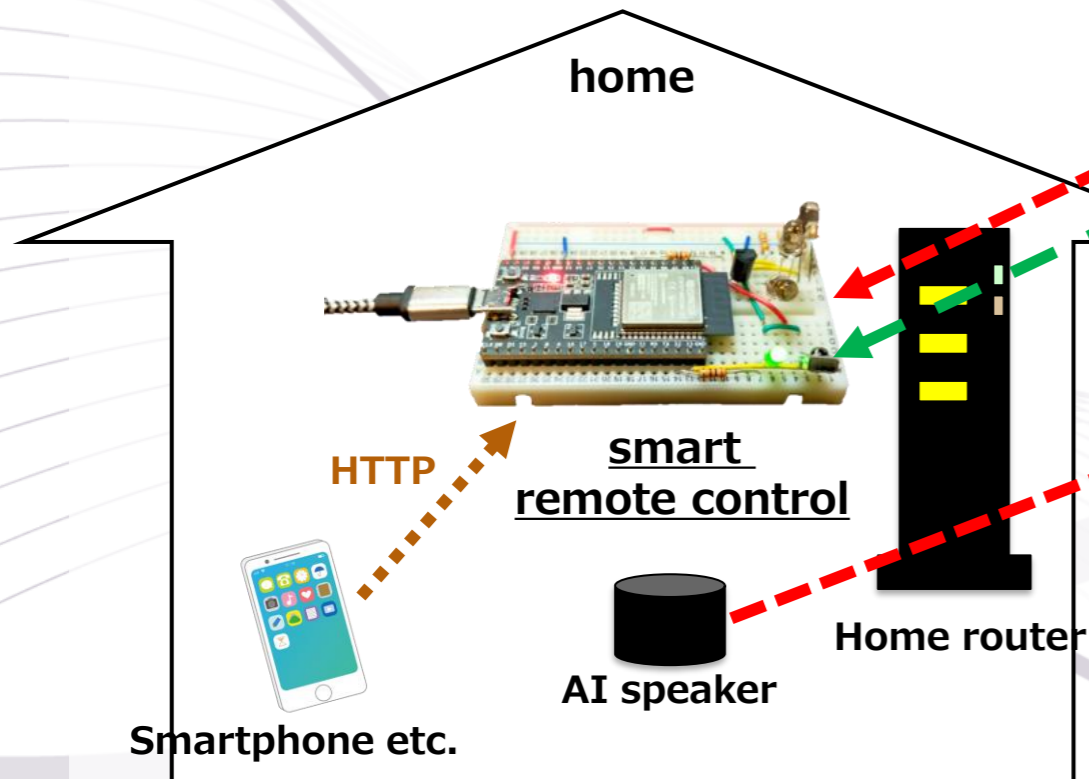
1. Overall production flow

No	Item	Content	Hard	Soft	Note
1	Overview	Overall flow, system configuration, items used, reasons for selection, development environment, etc.	-	-	this time this video
2	LED	Learn the basics for beginners. We will make "L blinking" that lights up and blinks the LED.	○	○	Delivered in another video
3	Infrared receiving sensor	Description of infrared receiving sensor Schematic to Wiring, Software	○	○	
4	Infrared transmission LED	Infrared transmission LED description Schematic to Wiring, Software	○	○	
5	LED operation with smartphone(at home)	We will create software to operate the LED with smartphone. (Web server function, SPIFFS operation)	-	○	
6	Remote control with smartphone(at home)	We will create software that to operate the remote control with smartphone indoors. (Button name, signal save/read)	-	○	
7	Operate from outside And AI speaker cooperation	We will create software to operate the remote control with smartphone from the outdoors, and AI speaker cooperation.	-	○	

2. System configuration

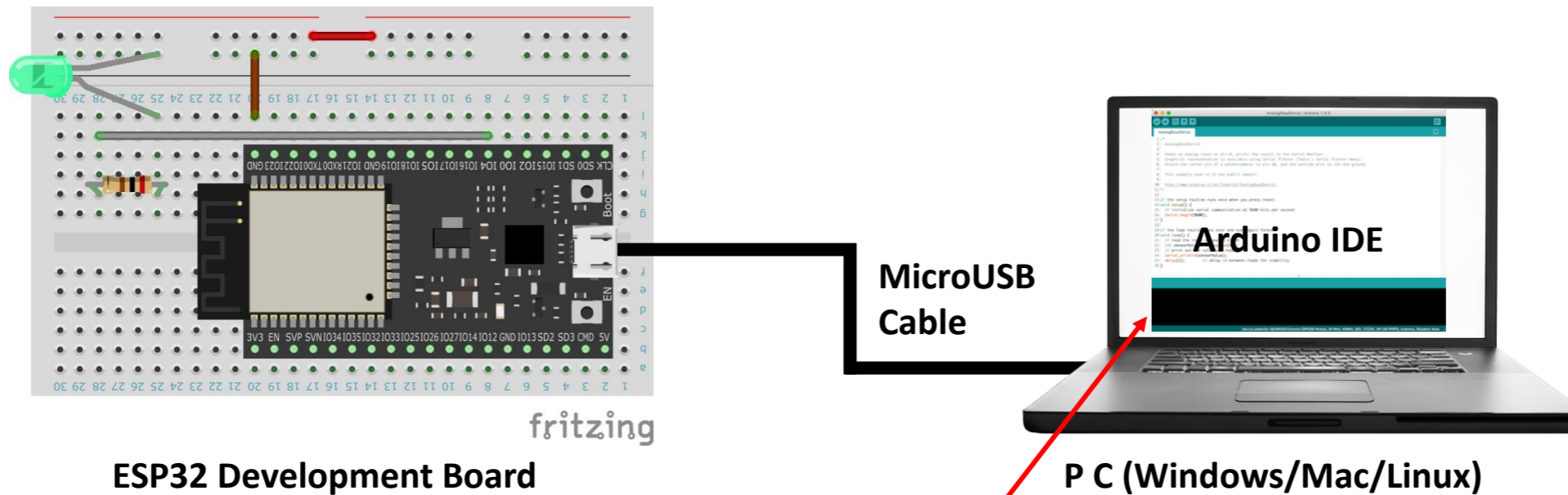
【Usage Guide】

- ⋯→ : Remote control with smartphone (at home)
- : Operate from outside with a smartphone
- - -→ : AI speaker linkage



3. the development environment “Arduino”

We will use Arduino as the development environment.



【Arduino Official site】

<https://www.arduino.cc/>

Downloadable

4. Reason for selecting ESP32 microcomputer

	ArduinoUNO [Arduino genuine]	ESP32 [Arduino Compatible]	RaspberryPi
Ease of learning	○ Arduino available	○ Arduino available	× Linux
Performance (CPU, memory, functions, etc.)	△ Low compared to ESP32	○ Sufficient performance for use with IoT devices	◎ high performance
Versatility	○ Sufficient for electronic work	○ Sufficient for electronic work	◎ AI can also be developed and has high versatility

this time here

5-1. The microcomputer ESP32 development board

	Espressif System		Third-party
	ESP32-WROOM	ESP32-WROVER	ESP32
	this time here		
Legal compliance	○ Fits in most cases		△ Rare violation of law
Flash memory	○ 4Mbyte [SRAM: 512Kbyte]	◎ 8Mbyte	-
Price	○ Inexpensive compared to other products	○ Inexpensive compared to other products	◎ Cheaper than regular product

5-2. Technical Conformity Mark

Use the one with the "Technical Conformity Mark" so that it will not be illegal to use in Japan.



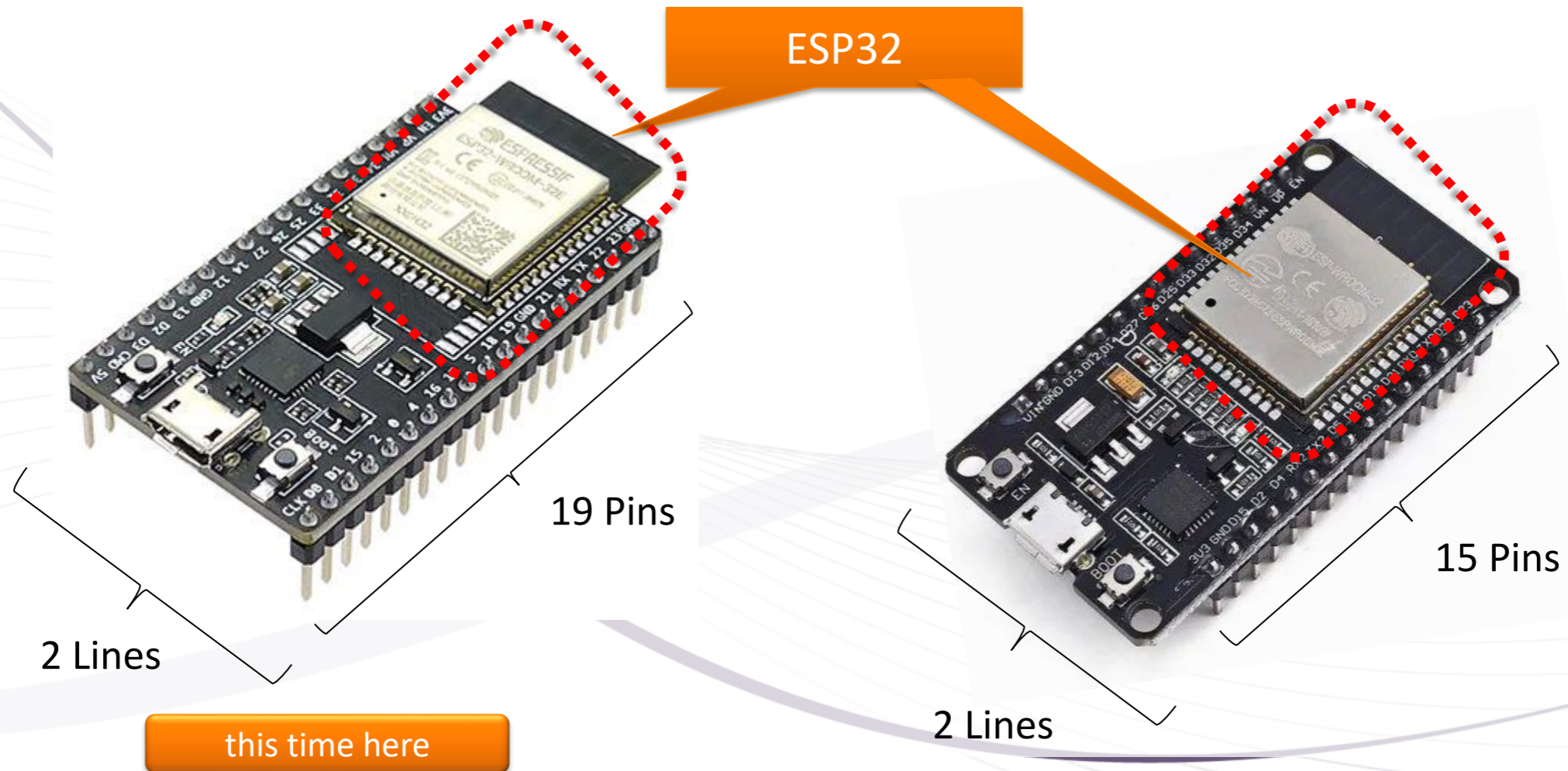
Technical Conformity Mark



5-3. The difference between genuine and third-party

《ESP32 development board (genuine)》

《ESP32 development board (other companies)》



5-4. Development board features

ESP32 – DevKitC – 32E

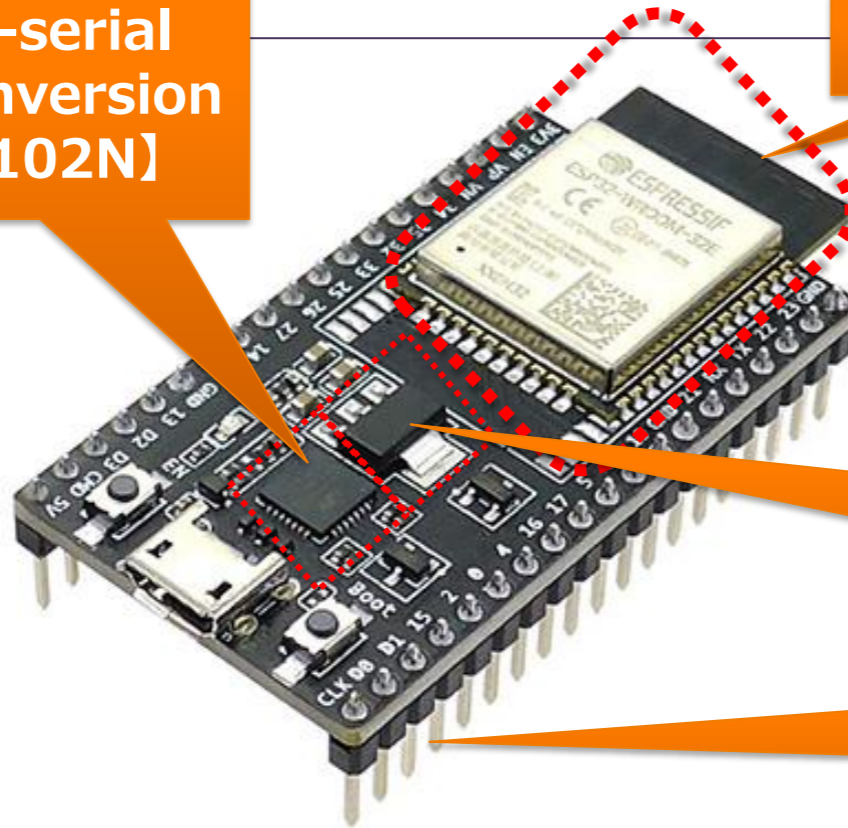
E is for versions, in alphabetical order.
The latest is better, but there is no
problem even if you don't care (for
remote control production like this time)

① USB-serial
data conversion
【 CP2102N 】

ESP32

② 3.3V voltage
regulator
【 AMS1117-3.3 】

③ Jumper pin

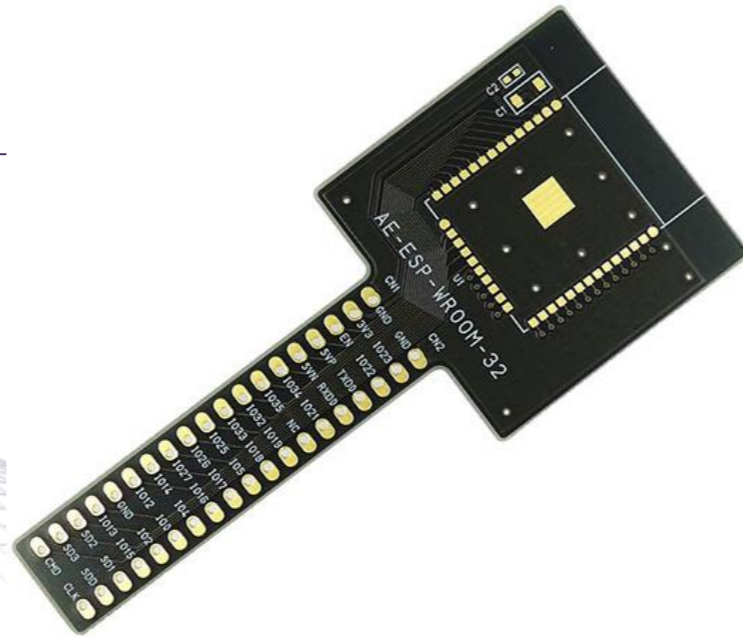


5-5. Build your own development board

If you do not purchase the ESP32 development board and use the ESP32 alone and the following products, you can make a product with the same contents as the ESP32 development board.



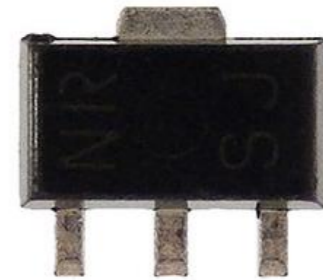
**ESP32 body
(ESP32-WROOM-32E)**



**For ESP-WROOM-32
2.54mm pitch converter board**



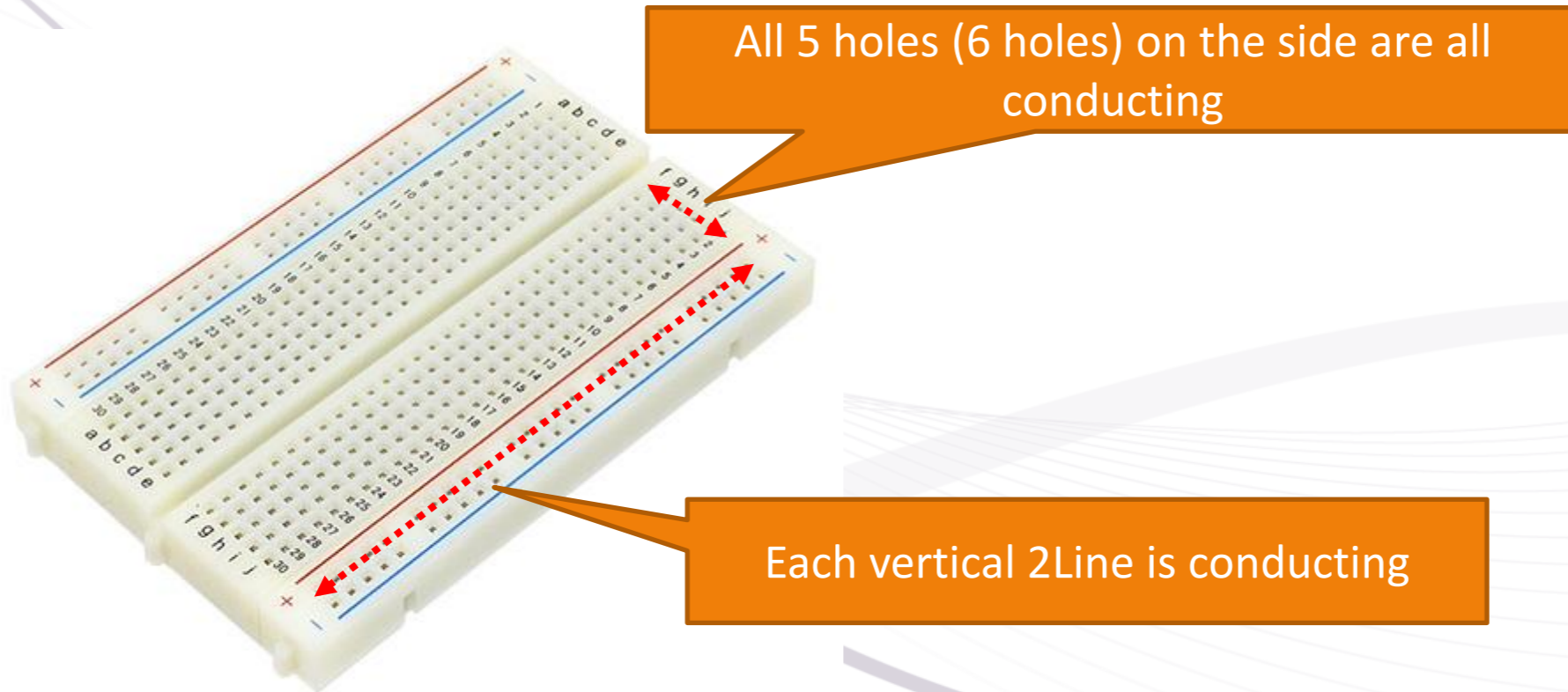
USB serial conversion module



Three terminal regulator 3.3V

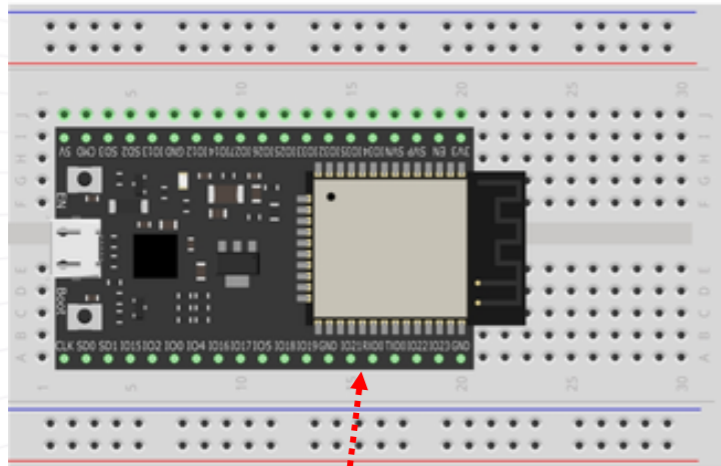
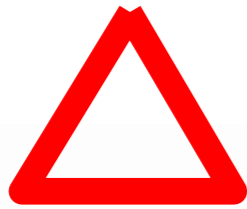
6-1. The breadboard

Since the breadboard has the same continuity in each column and row as shown by the red line in the figure below, we will make use of that wiring and insert it into the hole to perform wiring.



6-2. Breadboard selection <<ESP32 development board (genuine) 19pin * 2 lines>>

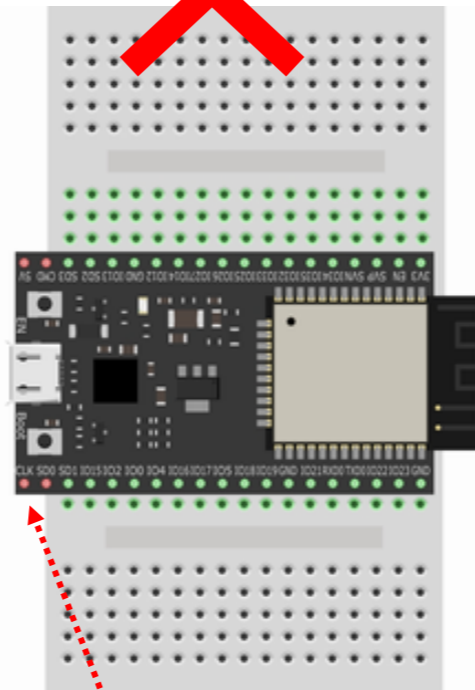
① Breadboard 5 holes * 30 rows



Since there is no empty hole for wiring on one side, the following measures are necessary

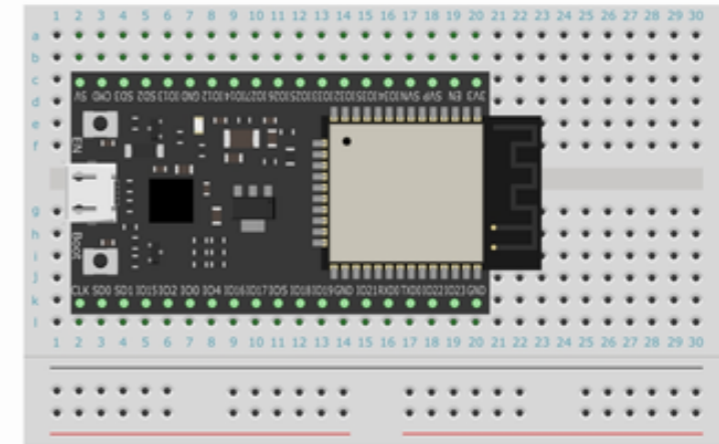
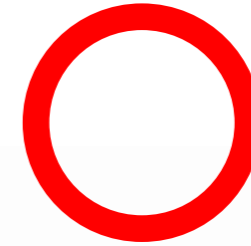
- Use only one side.
- Use by wiring under ESP32
- Use with two breadboards

② Mini breadboard



Since there are only 17 rows, 19pin cannot be entered

③ Breadboard 6 holes * 30 rows

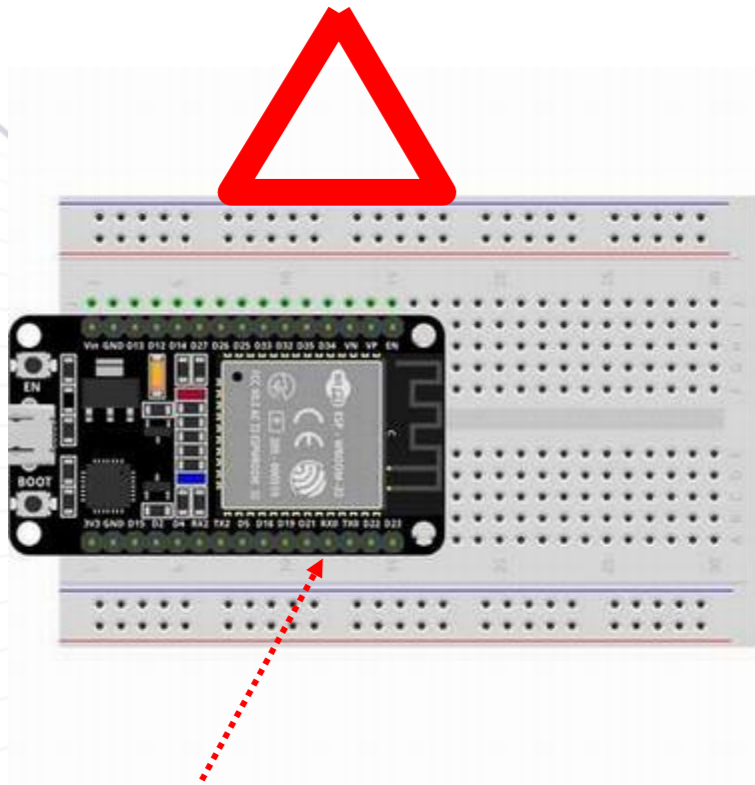


Adopted this time

fritzing

6-3. Breadboard selection <<ESP32 development board (other company) 15pin * 2 lines>>

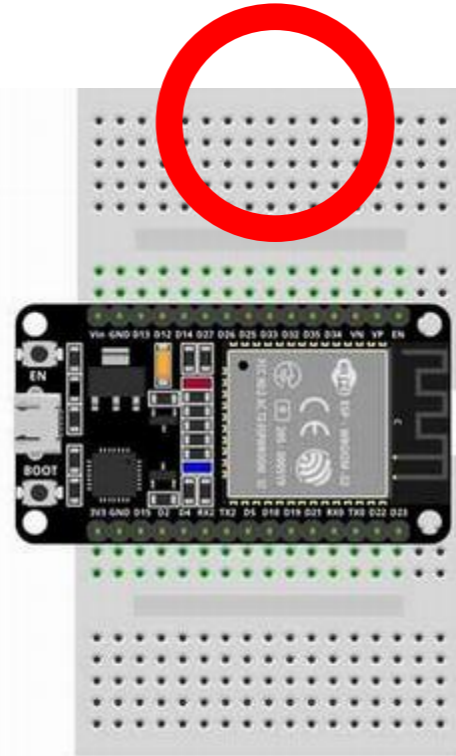
① Breadboard 5 holes * 30 rows



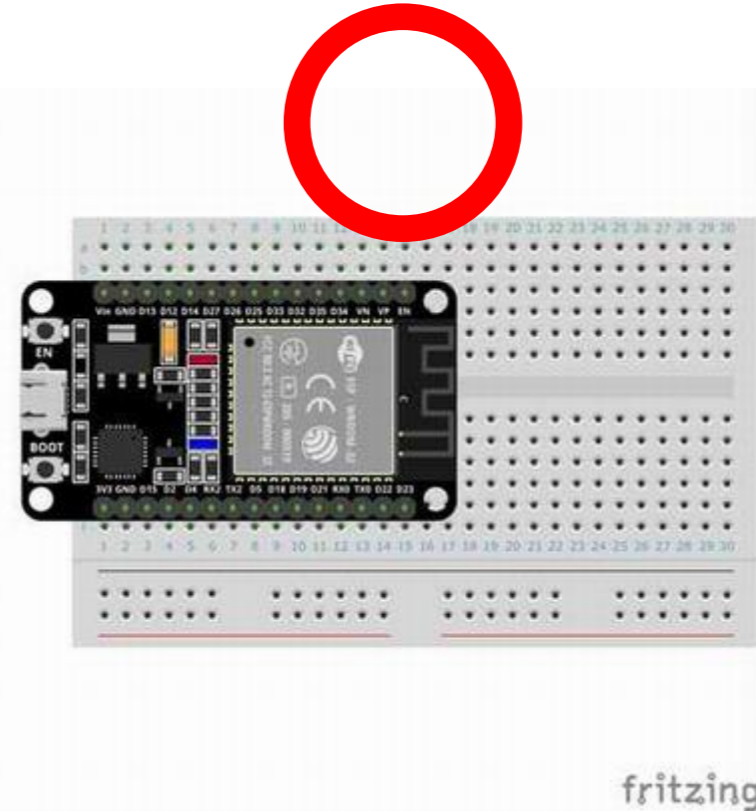
Since there is no empty hole for wiring on one side, the following measures are necessary

- Use only one side.
- Use by wiring under ESP32
- Use with two breadboards

② Mini breadboard



③ Breadboard 6 holes * 30 rows

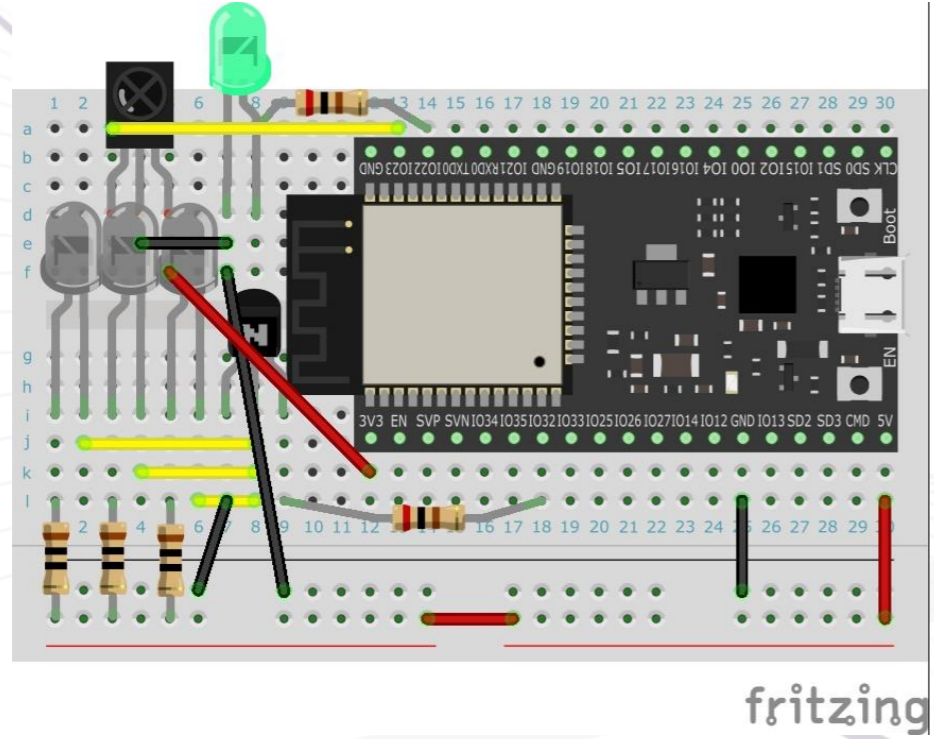


Available

If you want to finish it cheaply, a mini breadboard is recommended

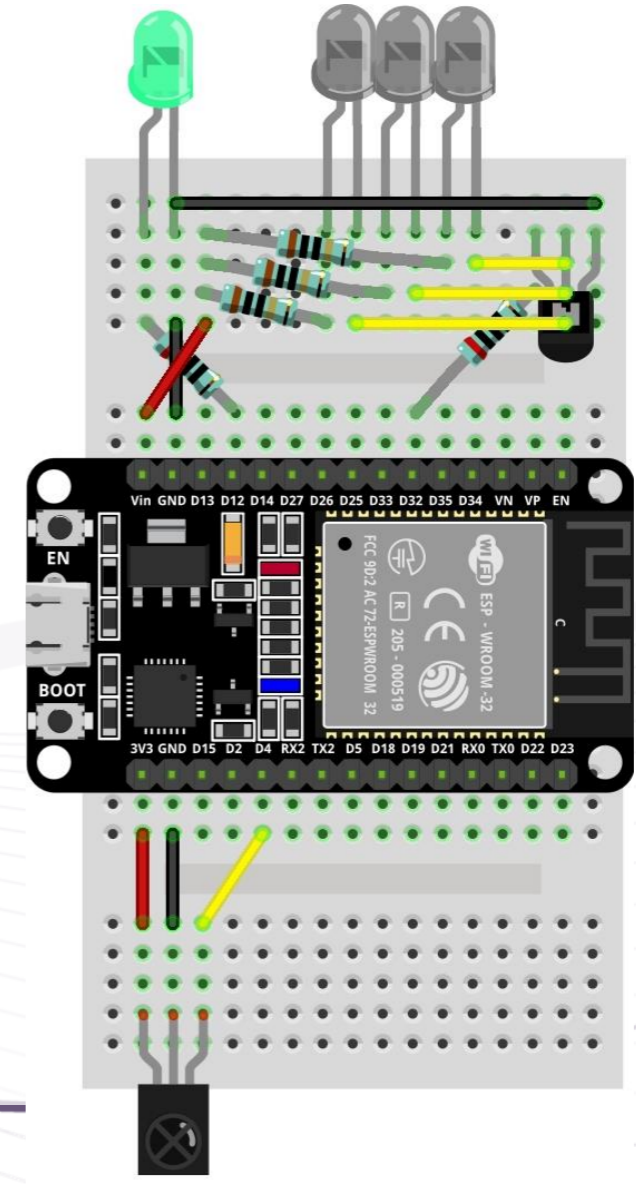
6-4. Wiring diagram

ESP32 development board (genuine)
[19pin * 2 lines]



this time here

ESP32 development board (other company)
[15pin * 2 lines]



Reference 1. List of Parts (genuine ESP32 development board version)

NO	Item	quantity	Image	Item	URL(Japanese Shop)	Price(yen)	Note
1	ESP32 development board	1		ESP32-DevKitC-32E ESP32-WROOM-32E development board 4MB	https://akizukidenshi.com/catalog/g/gM-15673/	1600	19Pin x 2 rows
2	Breadboard 6 hole [EIC-3901]	1		Breadboard 6 hole plate EIC-3901	https://akizukidenshi.com/catalog/g/gP-12366/	460	
3	Resistor 10 Ω	3		Carbon resistor (carbon film resistor) 1/2W 10Ω (100 pieces)	https://akizukidenshi.com/catalog/g/gR-07795/	100	For infrared transmission LED
4	Resistor 200 Ω	2		Carbon resistor (carbon film resistor) 1/2W 200Ω (100 pieces)	https://akizukidenshi.com/catalog/g/gR-07807/	100	For green LED and transistor
5	Green LED	1		3mm yellow-green LED 570nm 70 degrees OSG8HA3Z74A	https://akizukidenshi.com/catalog/g/gI-11637/	10	For status display
6	Infrared receiving sensor	1		Infrared remote control receiver module OSRB38C9AA (2 pieces)	https://akizukidenshi.com/catalog/g/gI-04659/	100	
7	Infrared transmission LED	3		5mm infrared LED 940nm OSI5LA5113A gray (10 pieces)	https://akizukidenshi.com/catalog/g/gI-12612/	100	For infrared transmission LED
8	Transistor	1		Transistor 2SC2655L-Y-T9N-B 50V2A (10 pieces included)	https://akizukidenshi.com/catalog/g/gI-08746/	130	For infrared transmission LED
9	Bread board Jumper	1		Breadboard jumper wire 14 types x 5	https://akizukidenshi.com/catalog/g/gP-02315/	300	
total						2,900	Postage +500 yen required

Reference 2. List of Parts (ESP32 development board version made by another company)

NO	Item	quantity	Image	Item	URL(Japanese Shop)	Price(yen)	Note
1	ESP32 development board	1		ESP-32S NodeMCU Micro USB Dual Core Development Board Module	https://www.amazon.co.jp/dp/B07MH58JS2	1200	15Pin x 2 rows
2	Mini breadboard	2		Mini breadboard BB-601 (white)	https://akizukidenshi.com/catalog/g/g/gP-05155/	260	When using ESP32 15pin and mini breadboard for low cost production
3	Resistor 10 Ω	3		Carbon resistor (carbon film resistor) 1/2W 10Ω (100 pieces)	https://akizukidenshi.com/catalog/g/g/gR-07795/	100	For infrared transmission LED
4	Resistor 200 Ω	2		Carbon resistor (carbon film resistor) 1/2W 200Ω (100 pieces)	https://akizukidenshi.com/catalog/g/g/gR-07807/	100	For green LED and transistor
5	Green LED	1		3mm yellow-green LED 570nm 70 degrees OSG8HA3Z74A	https://akizukidenshi.com/catalog/g/g/gI-11637/	10	for status display
6	Infrared receiving sensor	1		Infrared remote control receiver module OSRB38C9AA (2 pieces)	https://akizukidenshi.com/catalog/g/g/gI-04659/	100	
7	Infrared transmission LED	3		5mm infrared LED 940nm OSI5LA5113A gray (10 pieces)	https://akizukidenshi.com/catalog/g/g/gI-12612/	100	For infrared transmission LED
8	Transistor	1		Transistor 2SC2655L-Y-T9N-B 50V2A (10 pieces included)	https://akizukidenshi.com/catalog/g/g/gI-08746/	130	For infrared transmission LED
9	Bread board Jumper	1		Breadboard jumper wire 14 types x 5	https://akizukidenshi.com/catalog/g/g/gP-02315/	300	
total						2,300	Postage +500 yen required