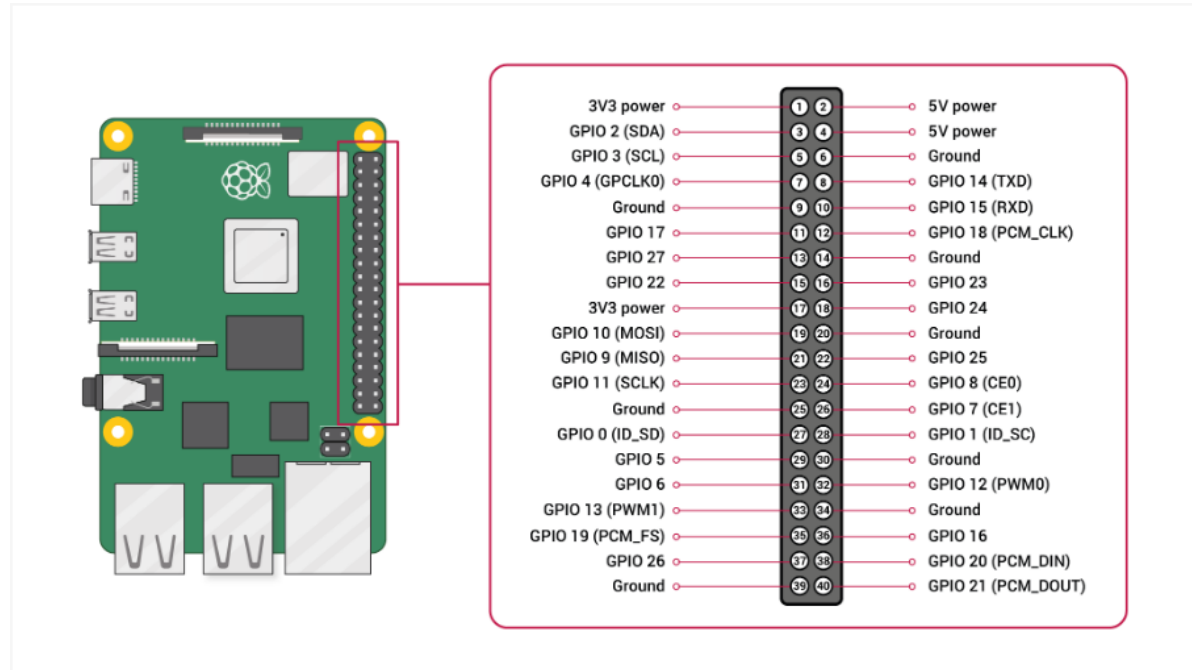


6.GPIO and 40-pin pins

6.1、Raspberry PI 5 pin diagram



6.2、GPIO pin action

• Voltages

Two 5V pins and two 3.3V pins are present on the board, as well as a number of ground pins (0V), which are unconfigurable. The remaining pins are all general purpose 3.3V pins, meaning outputs are set to 3.3V and inputs are 3.3V-tolerant.

Outputs

A GPIO pin designated as an output pin can be set to high (3.3V) or low (0V).

Inputs

A GPIO pin designated as an input pin can be read as high (3.3V) or low (0V). This is made easier with the use of internal pull-up or pull-down resistors. Pins GPIO2 and GPIO3 have fixed pull-up resistors, but for other pins this can be configured in software.

More

As well as simple input and output devices, the GPIO pins can be used with a variety of alternative functions, some are available on all pins, others on specific pins.

- PWM (pulse-width modulation)
 - Software PWM available on all pins
 - Hardware PWM available on GPIO12, GPIO13, GPIO18, GPIO19
- SPI
 - SPI0: MOSI (GPIO10); MISO (GPIO9); SCLK (GPIO11); CE0 (GPIO8), CE1 (GPIO7)

- SPI1: MOSI (GPIO20); MISO (GPIO19); SCLK (GPIO21); CE0 (GPIO18); CE1 (GPIO17); CE2 (GPIO16)
- I2C
 - Data: (GPIO2); Clock (GPIO3)
 - EEPROM Data: (GPIO0); EEPROM Clock (GPIO1)
- Serial
 - TX (GPIO14); RX (GPIO15)

6.3、 GPIO pinout

Open a terminal window and run the following command:

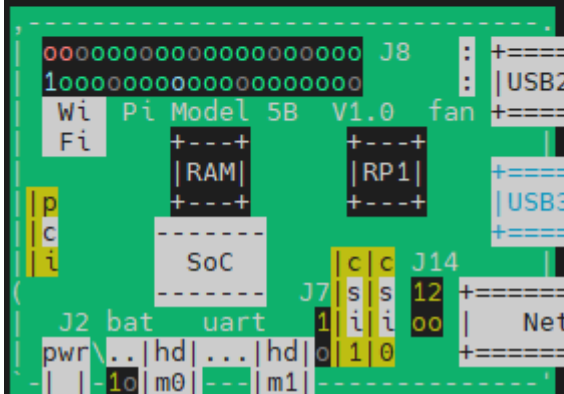
```
pinout
```

A handy reference can be accessed on the Raspberry Pi by opening a terminal window and running the command `pinout`. This tool is provided by the [GPIO Zero](#) Python library, which is installed by default in Raspberry Pi OS.

```

Description      : Raspberry Pi 5B rev 1.0
Revision        : d04170
SoC             : BCM2712
RAM             : 8GB
Storage         : MicroSD
USB ports       : 4 (of which 2 USB3)
Ethernet ports  : 1 (1000Mbps max. speed)
Wi-fi          : True
Bluetooth       : True
Camera ports (CSI) : 2
Display ports (DSI): 2

```



J8:

3V3	(1)	(2)	5V
GPI02	(3)	(4)	5V
GPI03	(5)	(6)	GND
GPI04	(7)	(8)	GPI014
GND	(9)	(10)	GPI015
GPI017	(11)	(12)	GPI018
GPI027	(13)	(14)	GND
GPI022	(15)	(16)	GPI023
3V3	(17)	(18)	GPI024
GPI010	(19)	(20)	GND
GPI09	(21)	(22)	GPI025
GPI011	(23)	(24)	GPI08
GND	(25)	(26)	GPI07
GPI00	(27)	(28)	GPI01
GPI05	(29)	(30)	GND
GPI06	(31)	(32)	GPI012
GPI013	(33)	(34)	GND
GPI019	(35)	(36)	GPI016
GPI026	(37)	(38)	GPI020
GND	(39)	(40)	GPI021

For more details on the advanced capabilities of the GPIO pins see gadgetoid's [interactive pinout diagram](#).

Warning:

while connecting up simple components to the GPIO pins is perfectly safe, it's important to be careful how you wire things up. LEDs should have resistors to limit the current passing through them. Do not use 5V for 3.3V components. Do not connect motors directly to the GPIO pins, instead use an H-bridge circuit or a motor controller board.