

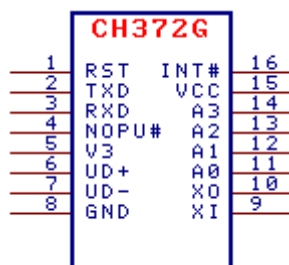
# USB Bus Interface Chip CH372G

Datasheet (III): Serial Bus Parallel Mode

Version: 1

<http://wch.cn>

## 1. Package and Pins



| Package | Width of Plastic |        | Pitch of Pin |       | Instruction of Package | Ordering Information |
|---------|------------------|--------|--------------|-------|------------------------|----------------------|
| SOP-16  | 3.9mm            | 150mil | 1.27mm       | 50mil | Standard 16-pin patch  | CH372G               |

| Pin No. | Pin Name | Pin Type   | Pin description                                                                                                                                                                      |
|---------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15      | VCC      | Power      | Positive power input, an external 0.1uF power decoupling capacitor is required.                                                                                                      |
| 8       | GND      | Power      | Common ground, shall be connected to the ground wire of the USB bus                                                                                                                  |
| 5       | V3       | Power      | Connected to the VCC input external power at the supply voltage of 3.3V<br>The external capacity is 0.1uF decoupling capacitor at 5V supply voltage                                  |
| 9       | XI       | Input      | Input terminal of the crystal oscillator, required to be connected to an external crystal and oscillation capacitor.<br>For the built-in clock mode, XI shall be connected to GND    |
| 10      | XO       | Output     | Inverted output terminal of the crystal oscillator, required to be connected to an external crystal and oscillation capacitor.<br>For the built-in clock mode, XO shall be suspended |
| 6       | UD+      | USB signal | USB bus D+data line                                                                                                                                                                  |
| 7       | UD-      | USB signal | USB bus D - data line                                                                                                                                                                |
| 14~11   | A3~A0    | Input      | 4-bit address line input, for setting the address 0A0H~0AFH of each chip,<br>Used to distinguish 16 chips on the bus, built-in weak pull-up resistor                                 |
| 16      | INT#     | Output     | Interrupt request signal output, active low                                                                                                                                          |
| 2       | TXD      | Output     | Serial data output, built-in weak pull-up resistor                                                                                                                                   |
| 3       | RXD      | Input      | Serial data input, built-in weak pull-up resistor                                                                                                                                    |
| 1       | RST      | Input      | External reset input, active high, built-in pull-down                                                                                                                                |

|   |       |       |                                                                                                                                                                                                                                    |
|---|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   |       |       | resistor                                                                                                                                                                                                                           |
| 4 | NOPU# | Input | <p>Disable pull-up resistor, active low, built-in weak pull-up resistor.</p> <p>Each input pin has a pull-up resistor by default. When NOPU# is set at low level, A3-A0, TXD and RXD and NOPU# pull-up resistor are turned off</p> |

## 2. Description of Serial Bus Parallel Mode

The serial port connection is in bus parallel mode. All RXDs of CH372G are connected to the transmitter of the main MCU after being connected in parallel, and all TXDs of CH372G are connected to the receiver of the main MCU after being connected in parallel. The serial port data is 8-bit and has no check bit.

The serial port operation process is the same as the original CH372 parallel port mode. The main difference in the data format is that the serial port shall transmit one more addressing lead byte before the original CH372 parallel port data to replace the chip selection in the original parallel port mode. Each CH372G sets its addresses (starting address 0A0H) through 4 pins A3-A0, and the addresses 0A0H-0AFH correspond to one of sixteen CH372G chips in total from 0 to 15. In addition, the address 05AH is the broadcast address. All CH372G chips will receive and execute. Note that the operation commands with returned data shall not be transmitted by broadcast when there are multiple CH372G chips connected in parallel.

Order: [leading address: 0xA0-0xAF or 0x5A broadcast], [original CH372 parallel port command], [optional original CH372 data].

## 3. Additional Commands in Serial Port Mode

| Code | Command Name  | Input Data                         | Output Data                          | Command Purpose                    |
|------|---------------|------------------------------------|--------------------------------------|------------------------------------|
| 02H  | SET_BAUDRATE  | Frequency division coefficient 03H | (Wait for 200uS)<br>Operation status | Set serial communication baud rate |
|      |               | Frequency division constant        |                                      |                                    |
| 04H  | SET_USB_SPEED | Bus speed                          |                                      | Set USB bus speed                  |

### 3.1. Command SET\_BAUDRATE

This command is used to set the serial communication baud rate of CH372G. The default communication baud rate is 1Mbps after CH372G reset. If MCU supports high communication speed, the serial communication baud rate can be dynamically regulated through this command. The serial port communication baud rate is set within 100uS. After completion, CH372G outputs the operation state at the newly set communication baud rate. Therefore, MCU shall adjust its own communication baud rate in time after sending the command. The command requires the input of two data, namely, baud rate frequency division coefficient and frequency division constant.

| Frequency division coefficient | Frequency division constant | Communication baud rate (bps) | Error |
|--------------------------------|-----------------------------|-------------------------------|-------|
| 03H                            | F4H                         | 500000                        | 0%    |
| 03H                            | F8H                         | 750000                        | 0%    |

|     |     |         |    |
|-----|-----|---------|----|
| 03H | FAH | 1000000 | 0% |
| 03H | FBH | 1200000 | 0% |
| 03H | FCH | 1500000 | 0% |
| 03H | FDH | 2000000 | 0% |
| 03H | FEH | 3000000 | 0% |

### 3.2. Command SET\_USB\_SPEED

This command is used to set the USB bus speed and must be transmitted immediately after the command SET\_USB\_MODE is completed. This command needs the input of 1 data to select the USB bus speed. 00H corresponds to 12Mbps full speed mode, and 02H corresponds to 1.5Mbps low speed mode. The USB bus speed of CH372G is 12Mbps full speed by default, and will be restored to 12Mbps full speed mode after the command SET\_USB\_MODE is executed to set USB working mode.