



WH-L101 Hardware Manual

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1. Product overview

1.1. Dimension

Module dimension diagram as follow:

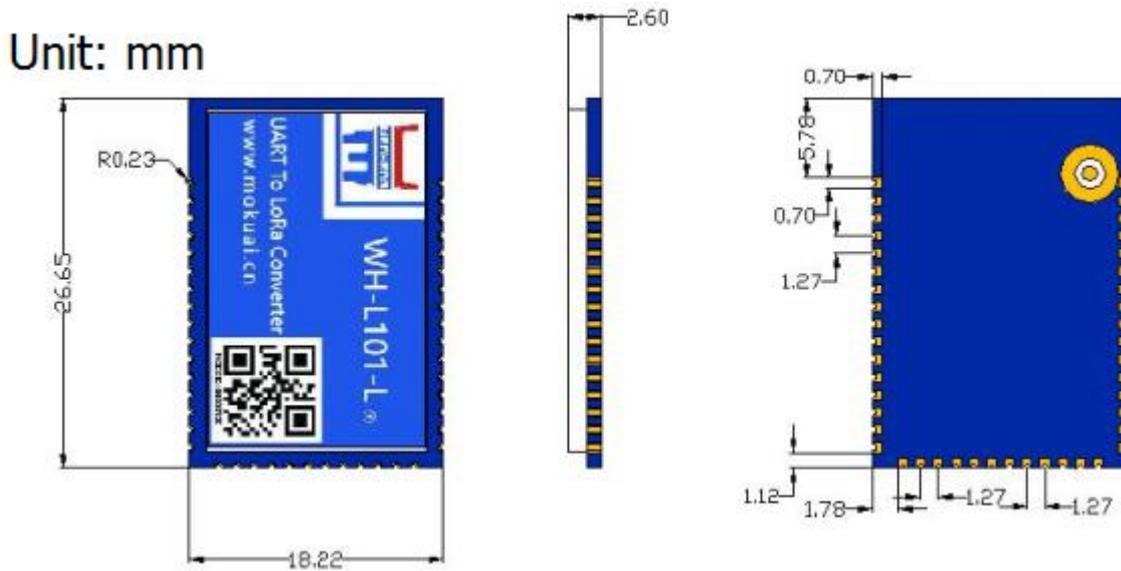


Figure 1 Dimension diagram

1.2. Encapsulation

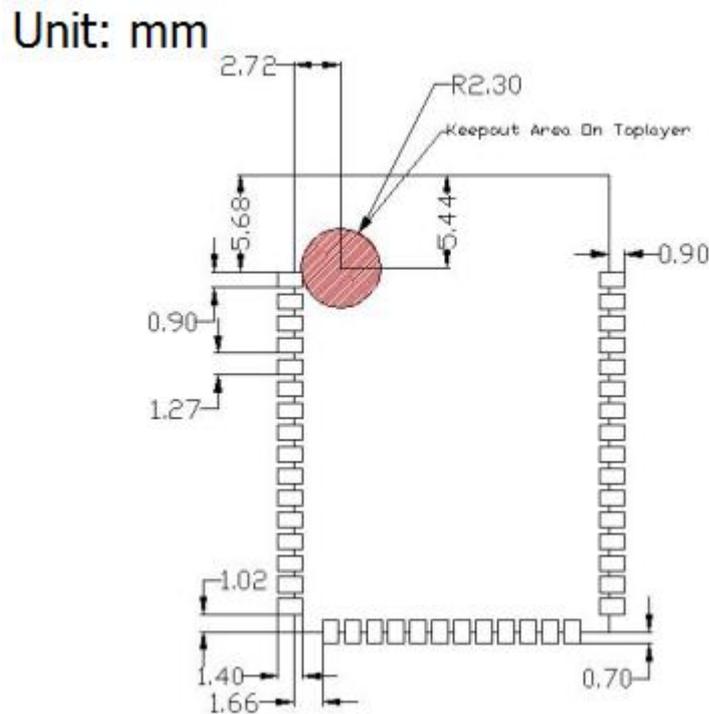
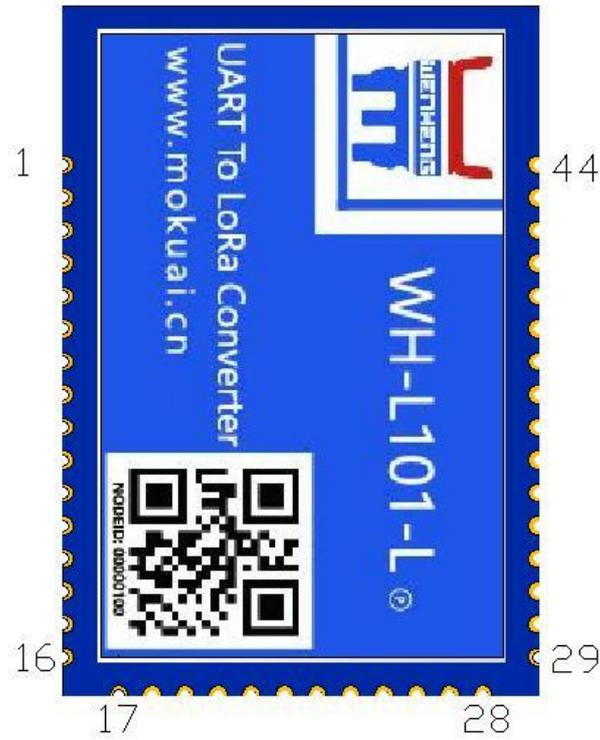


Figure 2 Encapsulation

1.3. Pin definition



PIN	Name	Signal Type	Definition
1	GND	P	Power Ground
2	RFIO	IO	RF input/output
3	GND	P	Power Ground
4	nReset	I	Restart module and take effect in low level over 5ms
5	NC	NC	Not available
6	NC	NC	Not available
7	NC	NC	Not available
8	NC	NC	Not available
9*	GPIO1	IO	General GPIO. Reserved I2C_SDA function
10*	GPIO2	IO	General GPIO. Reserved I2C_SCL function
11	GND	P	Power Ground
12	GND	P	Power Ground
13	VCC	P	Range from 1.8V to 3.6V
14	VCC	P	Range from 1.8V to 3.6V
15	NC	NC	Not available
16	NC	NC	Not available
17	GND	P	Power Ground
18	NC	NC	Not available
19	UART_TX	O	UART TX pin
20	UART_RX	I	UART RX pin

21	Reload	I	Pull down over 3s to restore default settings.
22	NC	NC	Not available
23	WAKE	I	Wake up module from sleep mode by falling edge. User should connect to 10K Ohm pull-up resistor if user uses sleep mode.
24	HOST_WAKE	O	Default is low level 1.Pull up 5ms before serial port transmitting data and pull down after data transmission. 2.Pull up when module transmits data by wireless way to indicate busy status. 3.Can enter sleep mode in pulling down status.
25*	GPIOA5	IO	General GPIO . Reserved AD function
26	NC	NC	Not available
27	NC	NC	Not available
28	GND	P	Power Ground
29	GND	P	Power Ground
30	485 control pin	IO	Control 485 chip after enabling 485 function
31*	GPIOD1	IO	General GPIO . Reserved AD function
32*	GPIOD2	IO	General GPIO . Reserved AD function
33	SWIM	IO	Download program pin and should be in not available status.
34*	GPIOB1	IO	General GPIO . Reserved AD function
35*	GPIOB2	IO	General GPIO . Reserved AD function
36*	GPIOB3	IO	General GPIO . Reserved AD function
37	NC	NC	Not available
38	NC	NC	Not available
39	NC	NC	Not available
40	NC	NC	Not available
41	NC	NC	Not available
42	NC	NC	Not available
43	NC	NC	Not available
44	NC	NC	Not available

Figure 3 Pin definition

Note: Pin with label * has reserved I2C or AD function. If user needs these function, user can contact our company technical support engineer for customization.

2. Hardware design

2.1. Typical connection

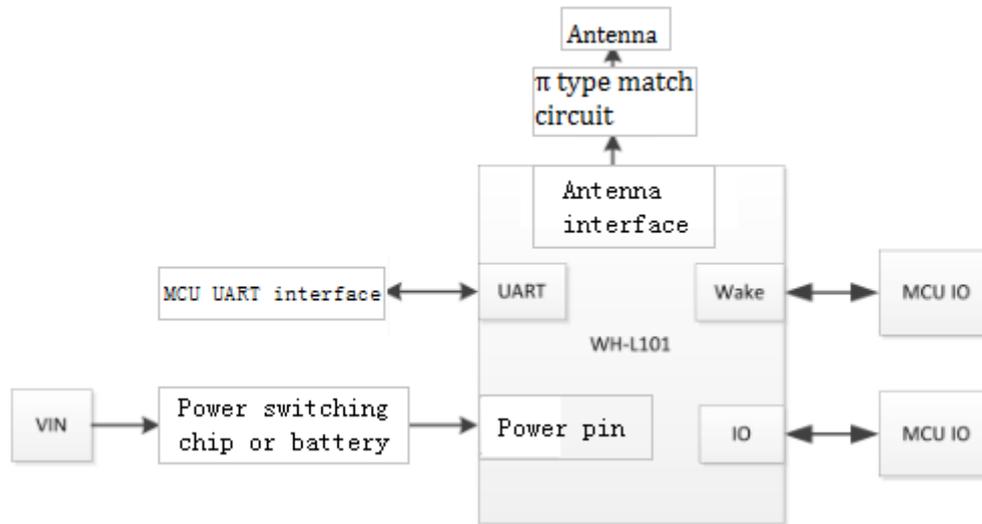


Figure 4 Typical connection

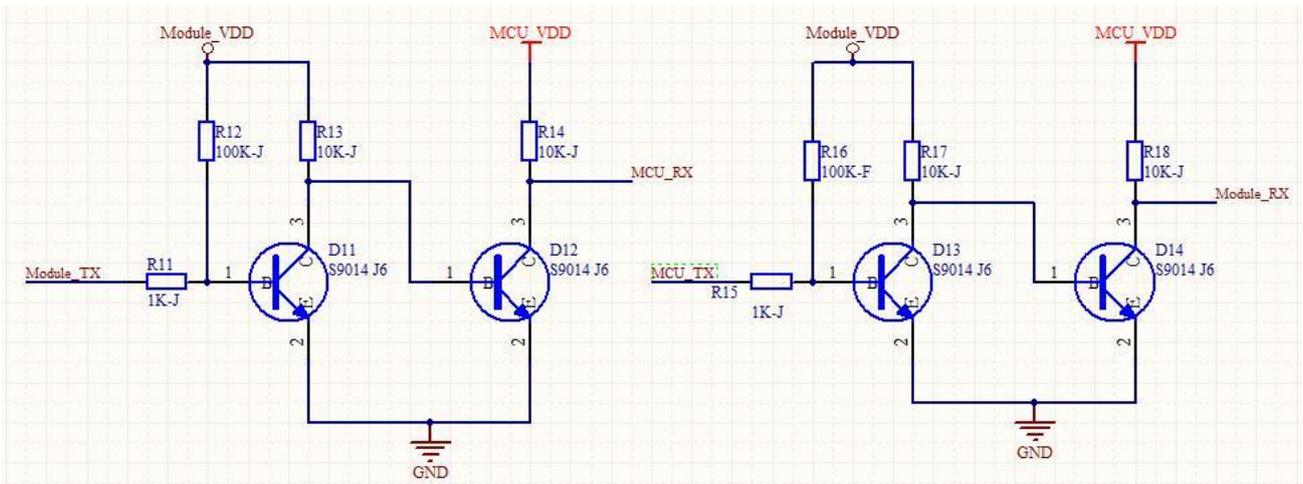
2.2. Power interface

Working voltage VCC range from 1.8V to 3.6V, 3.3V is recommended. Peak current is 125mA. Pin has reserved high frequency filter capacitance and $10\mu\text{F}+0.1\mu\text{F}+1\text{nF}+100\text{pF}$ is recommended. If the application environment is bad, module will often suffer ESD interfered or EMC requirement is high, series connection with magnetic bead or parallel connection with TVS is recommended to increase module stability.

When user designs the peripheral circuit for WH-L101, these should be ensured: 1. Provide adequate power supply. 2. Voltage range from 1.8V to 3.6V. 3. Peak power supply voltage is less than 300mV. 4. Place large capacitance after DC/DC or LDO to prevent external power supply voltage dropping during pulse current period.

2.3. UART Interface

If module adopts 3.3V power supply and communicates to MCU with 3.3V, user just needs to connect TXD of module to RXD of MCU and RXD of module to TXD of MCU. When communicate to MCU with unmatched level (such as 5V), switching circuit is necessary. Switching circuit diagram as follow:


Figure 5 Switching circuit

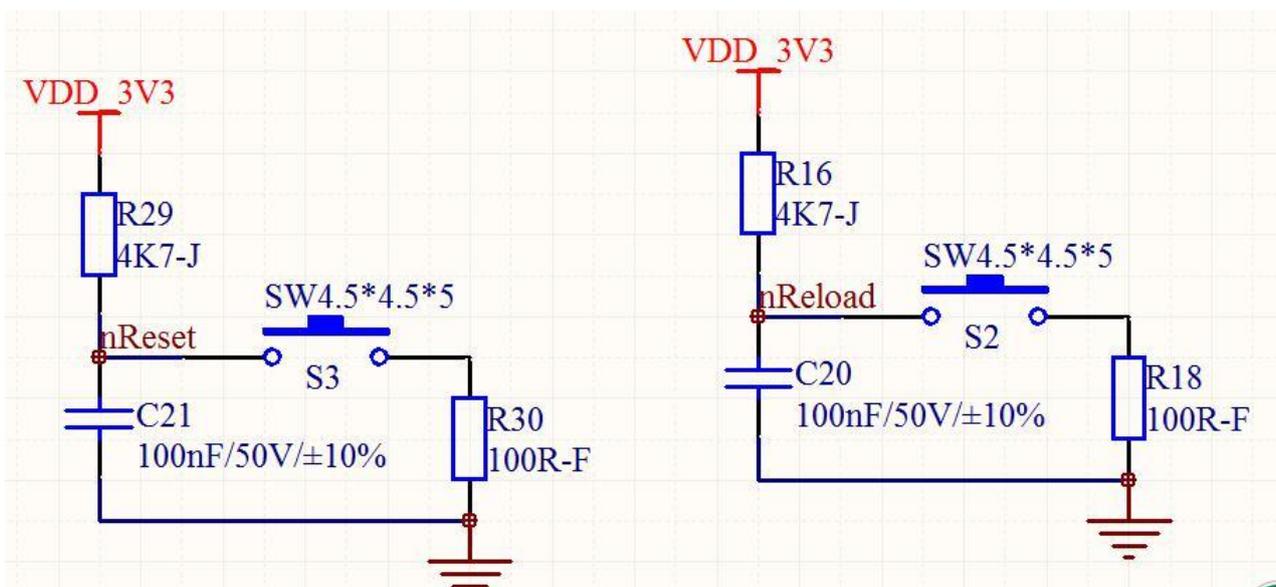
This level switching circuit can support baud rate to 230400. If user adopts 460800 or above baud rate, user needs to use high speed optocoupler or specialized level switch chip to establish level switching circuit.

2.4. nReset and nReload

nReset: Restart the module and take effect in inputting low level. nReset pin connects to internal 100K Ohm pull-up resistor to 3.3V. Press over 0.5s and release to restart the module.

nReload: nReload pin can connect to external button or configuration pin. Press 3s-10s to restore default settings. nReload pin needs to connect to external 4.7K-10K Ohm pull-up resistor.

Circuit diagram as follows:


Figure 6 nReset and nReload circuit

2.5. Wake up pin

23 pin of module is wake up pin. User needs to connect to pull-up resistor to VCC to use sleep mode function.

2.6. RF interface

RF interface adopt external bonding pad pin antenna. User needs reserved π type match circuit on PCB board. RF line need guarantee 50ohm impedance matching and try to be short to reduce attenuation of signal. User can refer to below reserved match circuit:

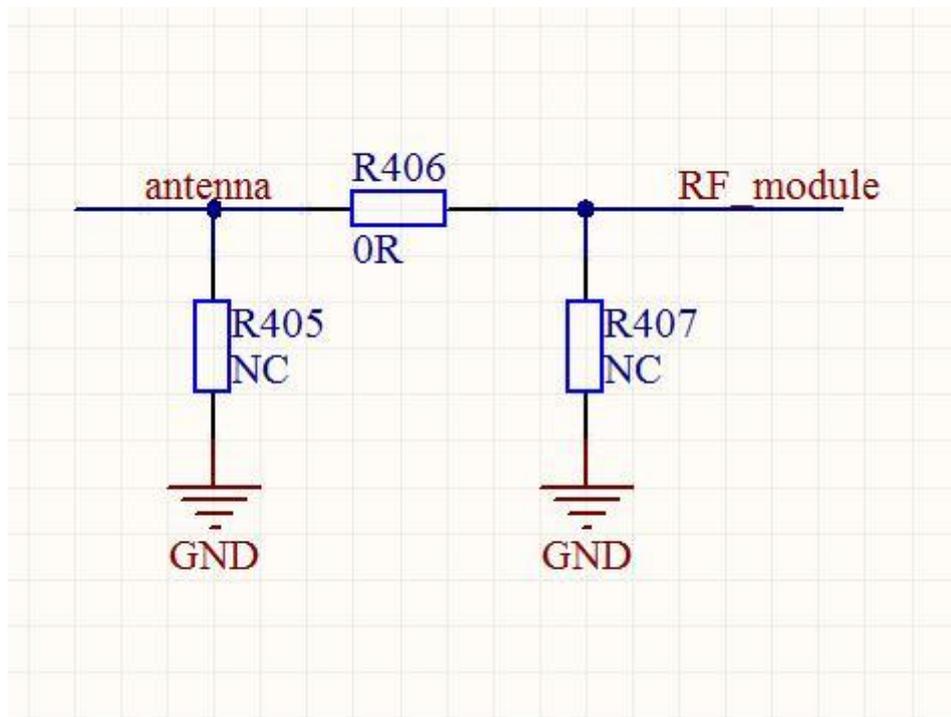


Figure 7 WH-L101 reserved match circuit

Note:

1. Module is recommended to be placed on edge of PCB board to shorten the distance to antenna and this can help to reduce attenuation of signal. RF line need guarantee 50ohm impedance matching to avoid lowering signal quality.
2. Keep RF line away from power supply, clock signal and other signal source which maybe cause interference.
3. When user places antenna, it is necessary to ensure antenna in exposed status and it would better be vertically upward. User can't place antenna in metal shell which can greatly reduce transmission distance.



3. Contact

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4. Disclaimer

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5. Update History

2018-03-08 V1.0.2.01 established.

2018-04-17 V1.0.2.02 updated. Modified manual template. Optimized the manual arrangement.