

USR-TCP232-S2 Hardware Manual

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1. Overview

1.1. Brief Introduction

TCP232-S2 is a new and tiny size serial to Ethernet module which realizes data bidirectional transparent transmission between TTL Port and RJ45 Port, it can also used in RS232/ RS485 by level shift circuit.

S2 is equipped with Cortex-M0 core. It has characters of low power, fast speed, high efficiency, strong compatibility, it is easy to use.

1.2. Pin instruction

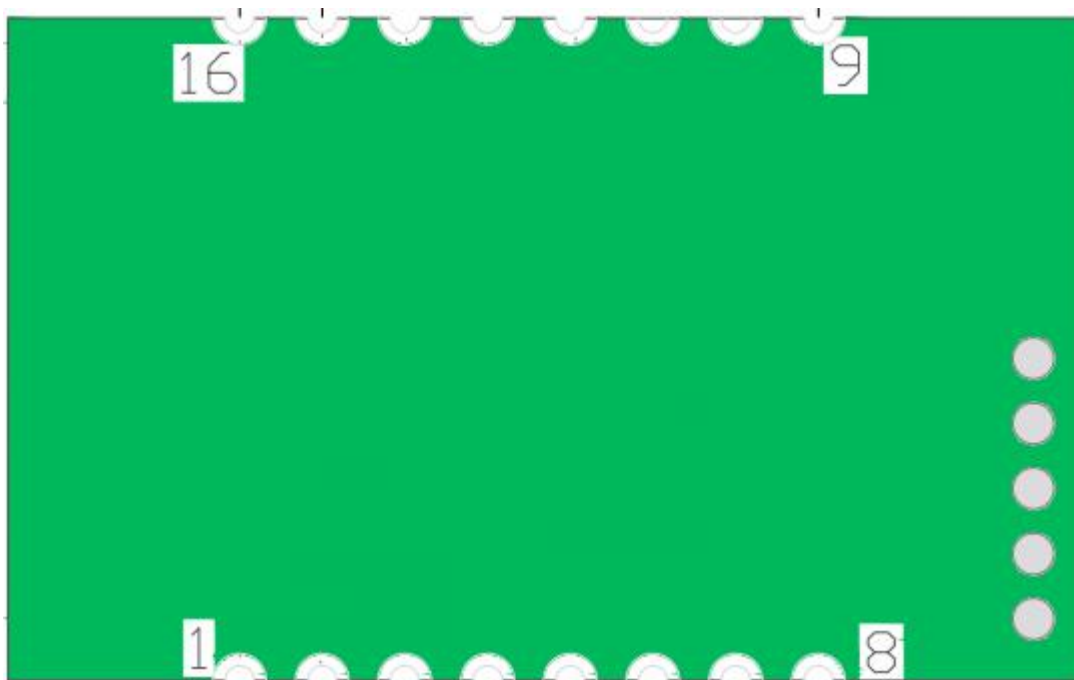


Diagram 1 USR-TCP232-S2 interface

Table 1 USR-TCP232-S2 Pin instruction

Number	Pin	Function	Instruction
1	GND	Ground signal	Connect to ground
2	RST	Reset	Pin receive current below 200ms ,it can reset module. If unneeded, don't connect the pin . (Power on , reset means restart the module. Advice connect I/O of MCU, MCU can control the module .)
3	ISP	NC	Don't connect the pin
4	RXD	Receive data	TTL connect to 3.3v MUC (For 5V, refer to Diagram 2)

5	TXD	Send data	TTL connect to 3.3v MCU (For 5V, refer to Diagram 2)
6	CFG(Reload)	For module configuration and restore factory default	When normal working , don't connect the pin or connect to high level. Under low level, the pin is used for module Configuration. When configuration, pull down Reload pin, enter into port Configuration. If choose "Reload" in webpage or setting software, it is used to restore factory default
7	LD2	Network data indication	Network data indication light, connect VCC by LED, don't need to connect current-limiting resistance.
8	LD1	Network connection indication	Network connection indication light, connect VCC by LED, don't need to connect current-limiting resistance.
9	AVDD	PHY output voltage	PHY control voltage output, connect network transformer center tap.
10	RX+	Receive signal +	Receive Data+ ,shorten the line if connect
11	RX-	Receive signal -	Receive Data- ,shorten the line if connect
12	TX+	Send signal+	Transceiver Data+ ,shorten the line if connect
13	TX-	Send signal-	Transceiver Data- ,shorten the line if connect
14	RS_485	Reserved	RS485 reserved pin
15	Link	Reserved	Used as indication pin for TCP connection status.
16	VCC	Power supply	Typical value 3.3V @ 200mA

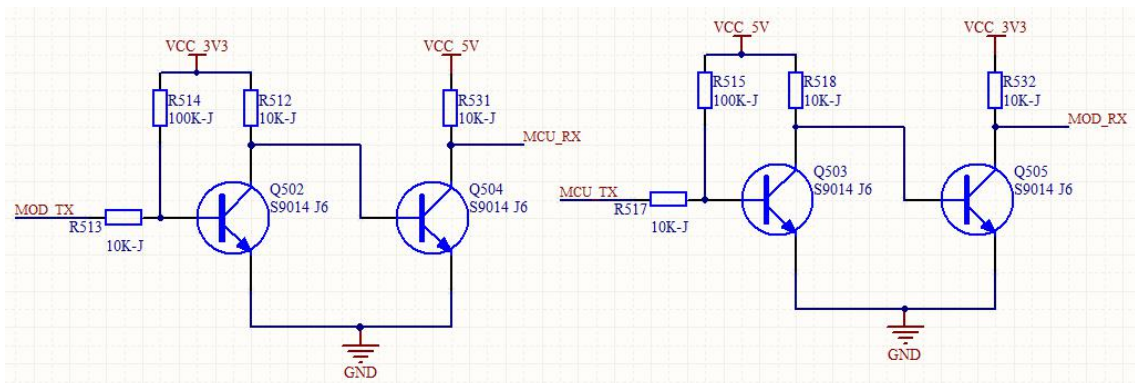


Diagram 2 3.3V to 5V voltage conversion circuit

1.3. Pin Dimension

USR-TCP232-S2 : 33.0*20.3*2.0mm (L*W*H, 2.0mm is the maximum height)

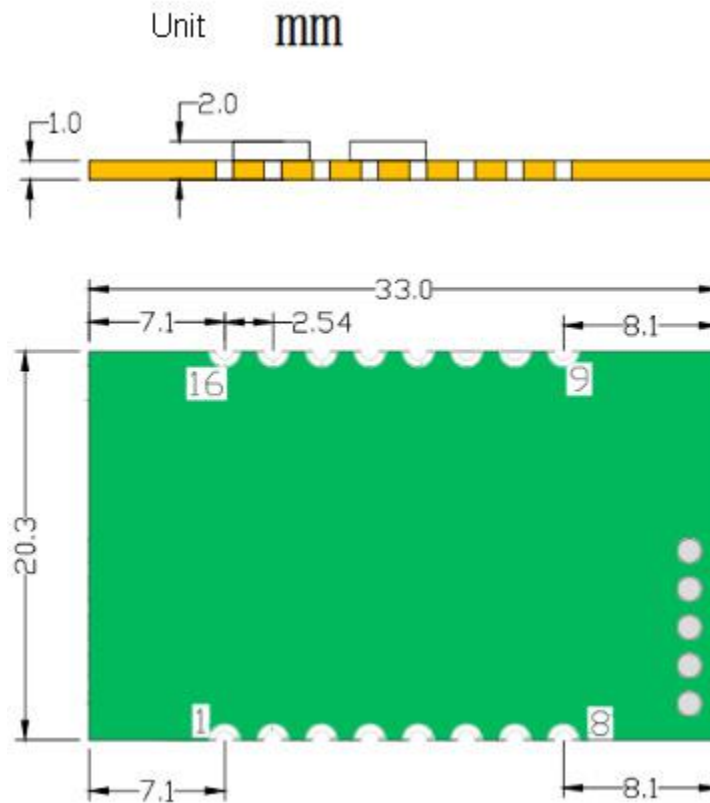


Diagram 3 S2 Dimension

1.4. Evaluation Kit

USR-TCP232-EVK evaluation board can be used for TCP232-S2, 100*76mm(L*W)

2. Hardware Reference Design

2.1. Typical Application Connection

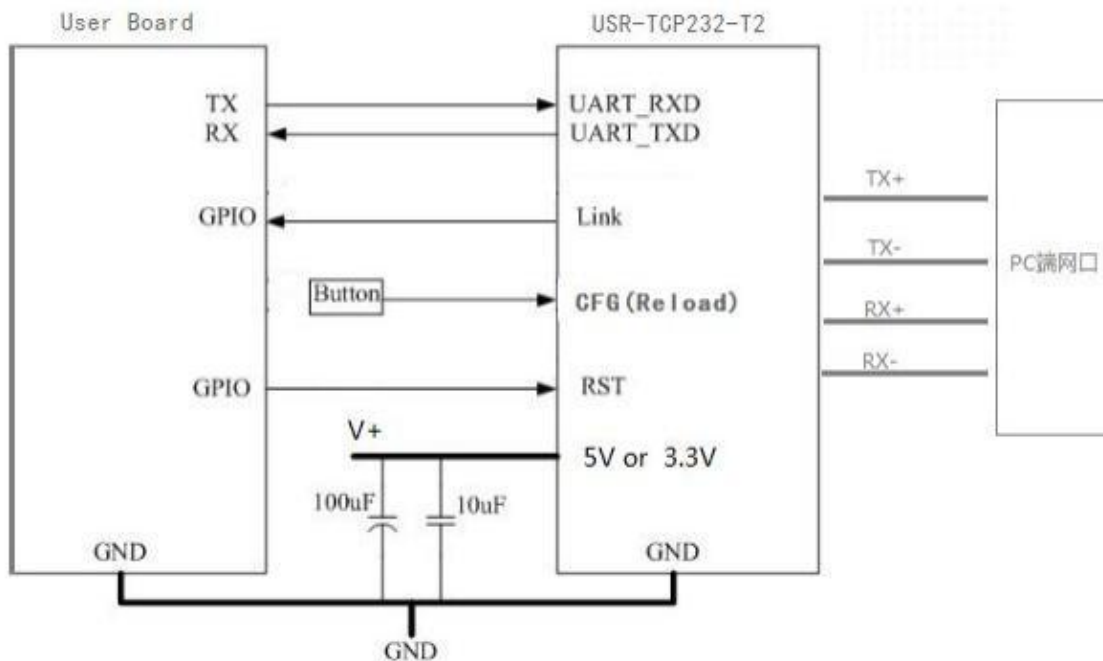


Diagram 5 Typical Application Connection

Note:

- 1) RST: Restart button. It works at low level, 3.3V, 10K pull-up resistor inside. When it access to power or breakdown, pull down 300ms then high level.
- 2) Link: connection indication.Can be used as indication pin for net connection, when connected, it outputs low level; When unconnected, it output high level.
- 3) CFG(Reload): connect to external button or configuration pin. 3.3V, 10K pull-up resistor inside. Press it and pull to low level, then release hands after 3 seconds, module restores factory default and restart.
- 4) UART_TXD/RXD: data send/ receive signal(10K pull-up resistor inside)
- 5) S2 need to connect network voltage changer ,RJ45 Port .

2.2. Power Interface

USR-TCP232-S2 : typical value DC 3.3V, 3V~3.6 V . Working current is 150mA, max current is 200mA

2.3. UART Interface

UART is Serial data interface , only support TTL-3.3V. UART can connect RS232 chip ,then convert into

RS232 Level. UART has TXD/RXD signal wire. Take RS232 Level for example:

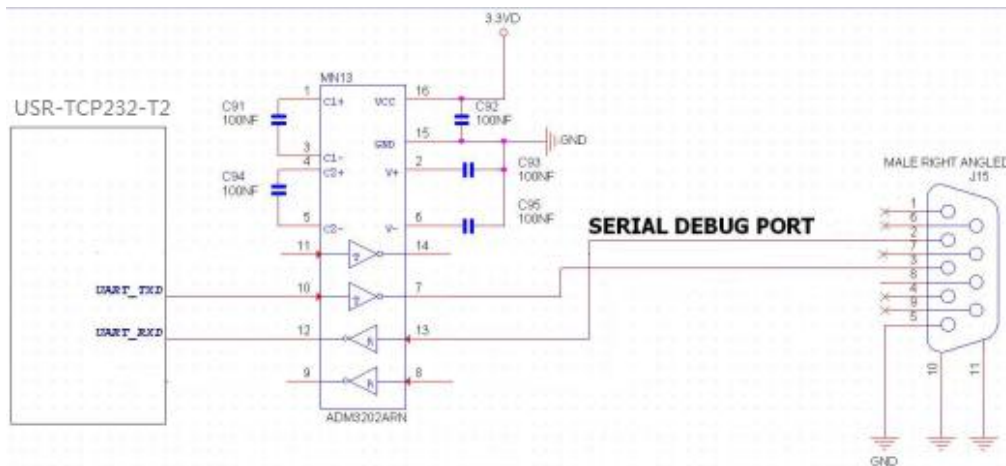


Diagram 6 UART Interface Design

If communicated with MCU (3.3V TTL), connect module's TXD to MCU'S RXD, modules' RXD to MCU'S TXD. If MCU 5V TTL, need voltage conversion circuit, as follows:

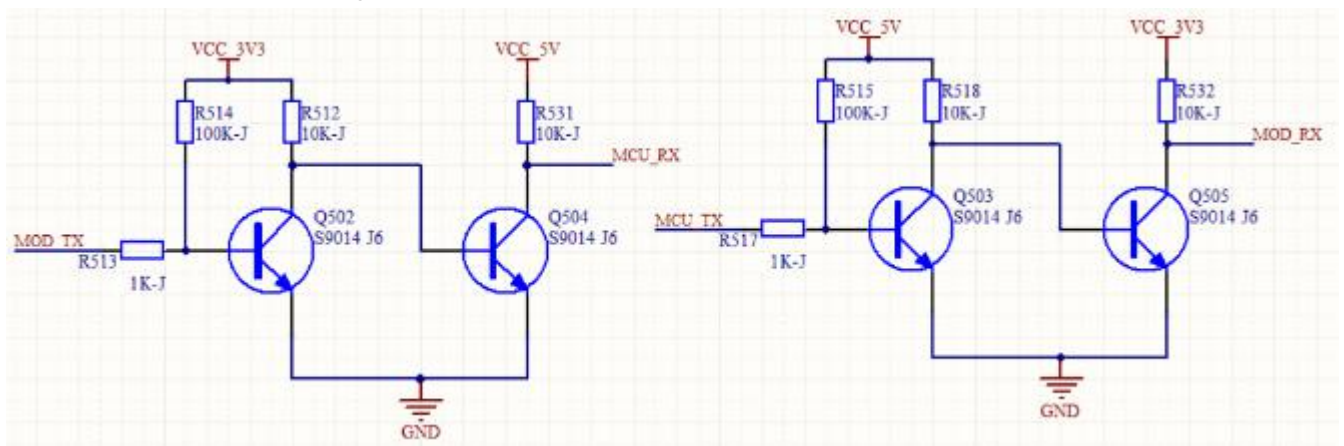


Diagram 7 UART Level Switch Design

2.4. 10/100M LAN interface

2.4.1. External voltage changer of LAN interface

USR-TCP232-S2 can connect 10/100M LAN interface, supports RJ45 connector and network voltage changer interconnection. network voltage changer and RJ45 connector combined into a typical 10/100M LAN Port, then connects to USR-TCP232-S2 . RX+ and RX-Differential Pairs, TX+ and TX-Differential Pairs. AVDD connects S2 9th Pin, it is output interface of PHY chip voltage. reference circuit as follows:

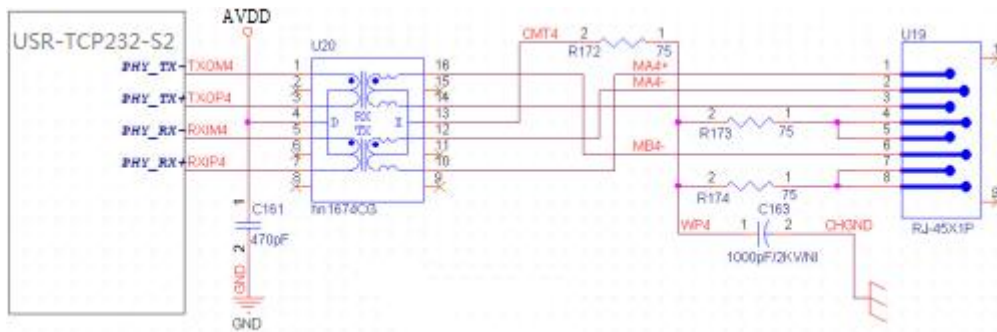


Diagram 8 RJ45 interface external voltage changer circuit

2.4.2. Internal voltage changer of LAN interface

RJ45 has 2KV Electromagnetic isolation network voltage changer. It is AC coupled connection. RX+ and RX-Differential Pairs, TX+ and TX-Differential Pairs. AVDD is S2 9th Pin, output interface of PHY chip voltage.

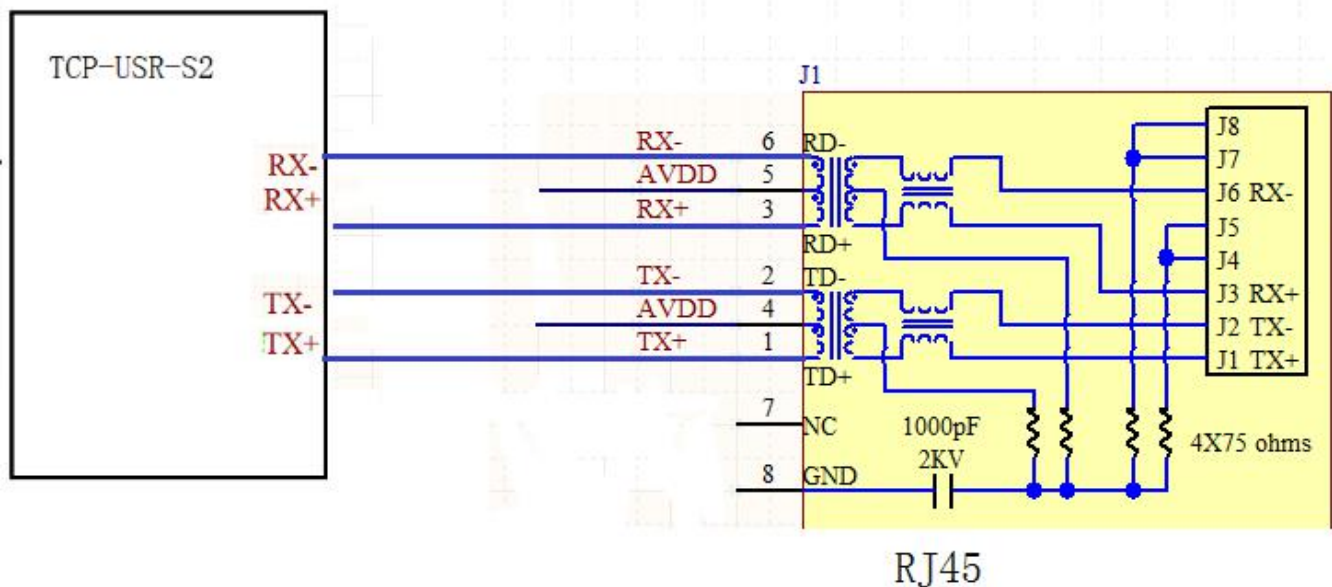


Diagram 9 RJ45 interface internal voltage changer circuit

2.4.3. Reference package

For principle package library and PCB package library, please download from <http://www.usriot.com/>

3. Contact information

Company: Jinan USR IOT Technology Limited.

Address: Floor 11, Building 1, No. 1166 Xinluo Street, Gaoxin Distric, Jinan, Shandong, 250101 China.

Tel: 86-531-55507297 86-531-88826739-803

Web: <http://www.usriot.com/>

Support:<http://h.usriot.com/>

Email: sales@usr.cn

4. Disclaimer

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5. Undated History

V 1.0.12016-7-8 First Version