USR-K7 Hardware Design

Version：V1.0.0

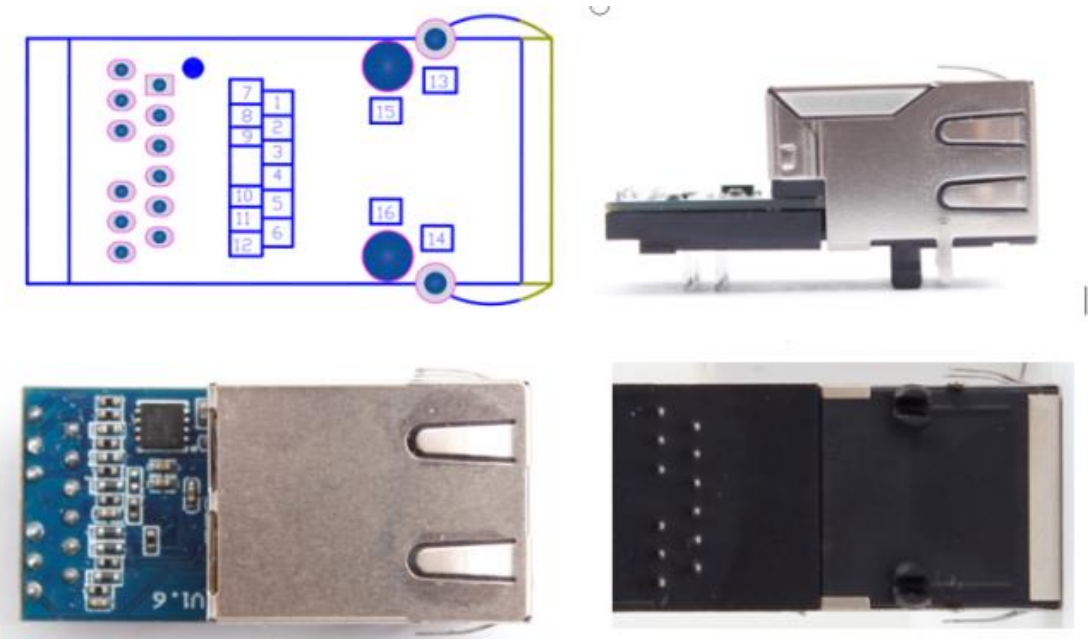


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1.Product Appearance



2.Size

2.1 Electrical Parameters

Parameters	Rated Value			Unit
	Min	Default	Max	
Work Voltage（DC）	3.0	3.3	3.6	V
Work Current	-	130	-	mA
Supply Current	-	200	-	mA
Input logic level Low（V_{IL}）	0	-	0.35 * VDD	V
Input logic level High（V_{IH}）	0.65 * VDD	-	3.6	V
Output logic level Low（V_{OL}）	-	-	0.40	V
Output logic level High（V_{OH}）	2.4	-	-	V

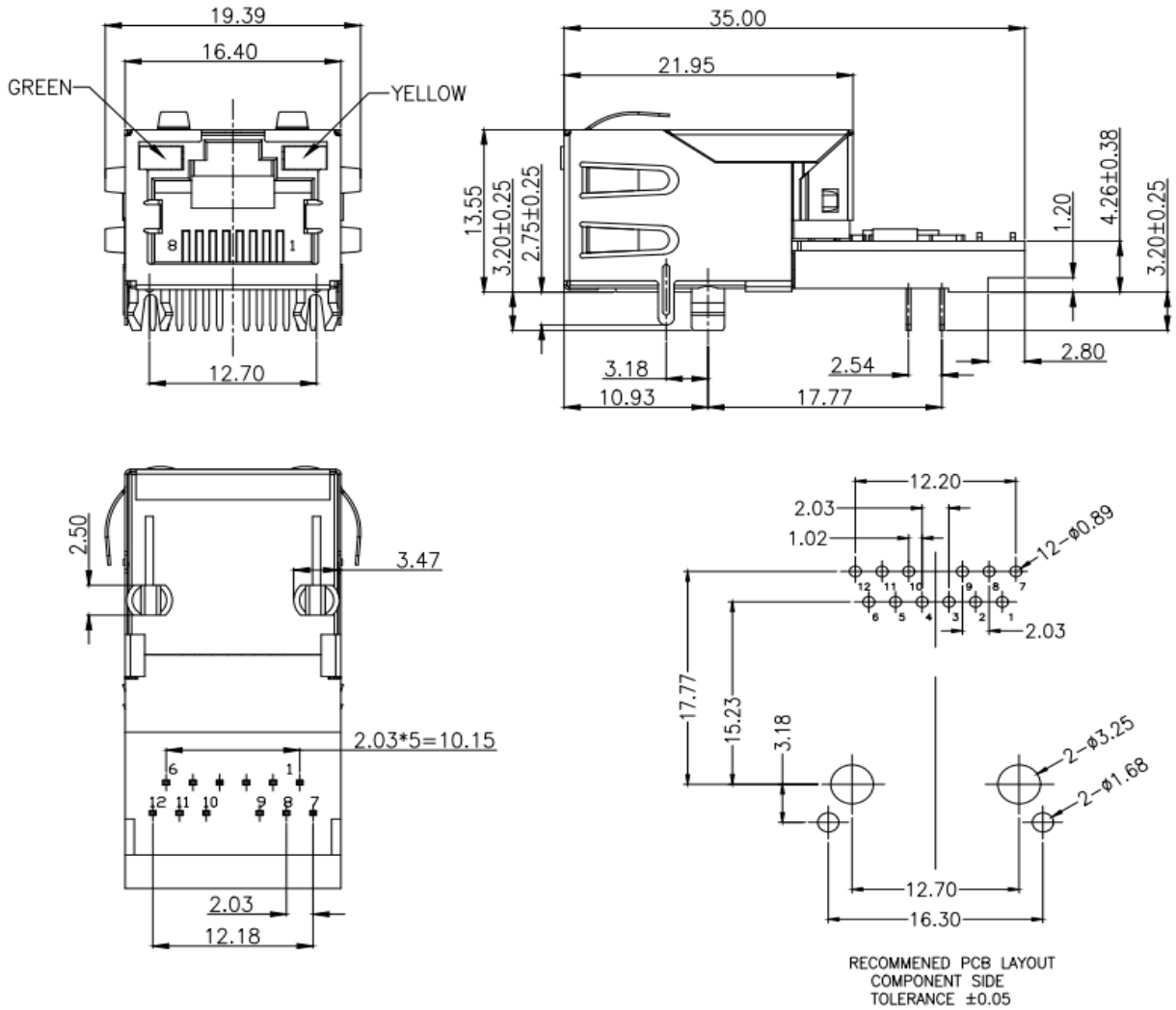
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2.2 Work Temp

Parameters	Rated Value		
	Min	Max	
Work Temp	-40	85	℃
Storage Temp	-40	105	℃

2.3 Size

Module size: 35.00*19.00*19.20 mm, error ±0.2mm, pin size as follows:

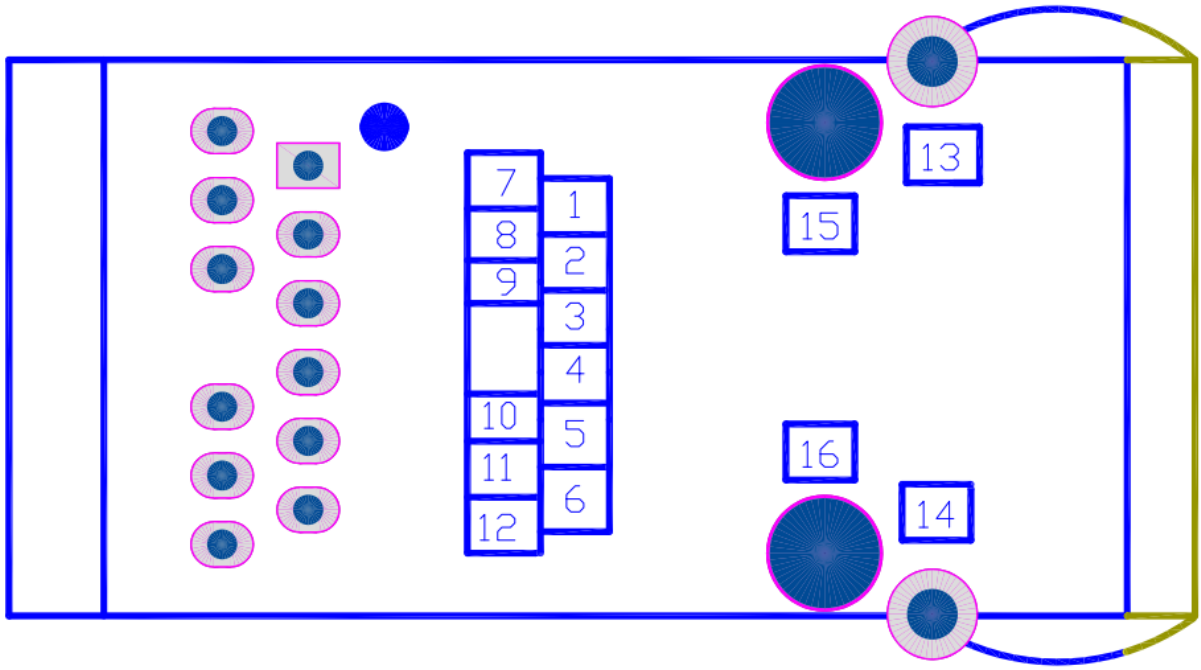


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3.Hardware Interface

3.1 Pin Definition

USR-K7 module has 16 external pins: two of which are fixed pins and two of which are metal shell pins. About the unused pins marks as NC which can be hanged in the application.



PIN	NAME	Signal Type	Definition
1	NC	NC	Not available
2	NC	NC	Not available
3	CTS	I	Can be used as hardware flow control CTS pin (Clear to send). Default not available.
4	RST	I	reset the module（Inputting low level over 200ms to reset the module）
5	RTS	O	Can be used as hardware flow control RTS pin (request to send). Default is RS485 receive/send controlling pin, high level to send.
6	Reload	I	Module can restore the factory settings, in the case of module power off (or reset), pull down Reload, then power on, keep Reload 5S pull down, after more than 5S pull up, restore the factory settings successfully.
7	NC	\	Not available
8	RXD	I	Serial port receiving pin(3.3V, TTL level)
9	TXD	O	Serial port receiving pin(3.3V, TTL level)
10	GND	Power	Ground (including power ground and power ground)

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11	VDD	Power	Power （external demand for pin DC 3.3V power supply）
12	NC	\	Not available
13	ETH	\	Mesh port shielding shell pin
14	ETH	\	Mesh port shielding shell pin
15	Fixed column	\	Modular Fixed Column
16	Fixed column	\	Modular Fixed Column

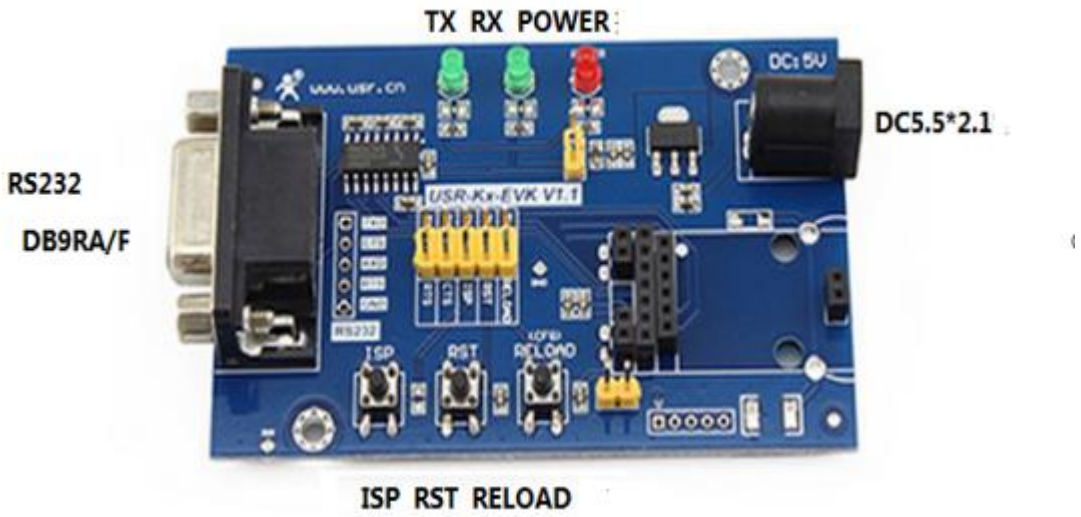
3.2 Ethernet interface LED

LED	Function	Description
Green	Indicating connection status	Green LED will light after module connecting to network
Yellow	Indicating data transmission	Yellow LED will blink when module has data transmission

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4.Development Kit

USR-Kx-EVK development kit is used for testing and developing USR-K7 module

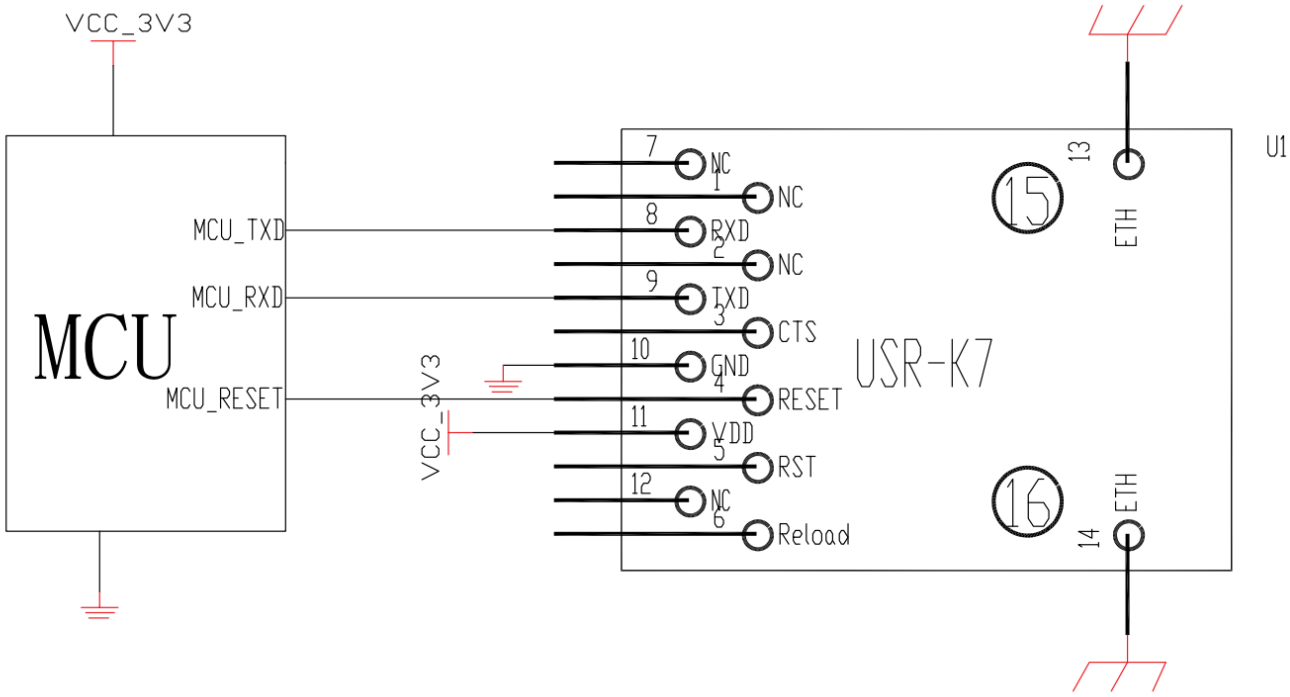


Parameter	Name	Description
Interface	DC 5.5*2.1 Power supply	5V DC Power supply
	DB9RA/F	9-Pin serial port
	Module	Put K7 module
LED	Power	3.3V power supply
	TXD	TXD Send data
	RXD	RXD Receive data
Button	RST	Rest
	Reload	Restore factory setting
	ISP	Not available

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5.Hardware Design

5.1 Typical Connection



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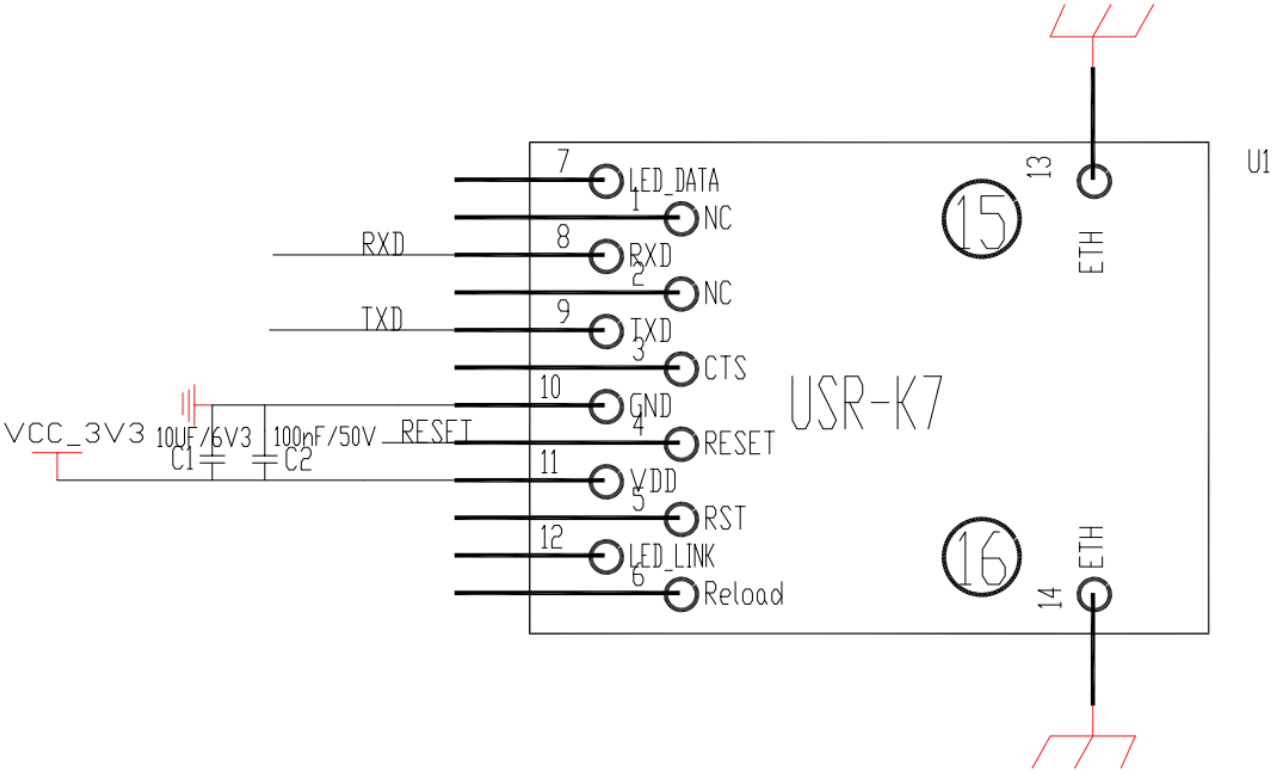
1.RST: Reset signal. It will be effective when this pin under low level. There is a 10K resistor in the module which is pulled up to 3.3V. When the module is powered on or failure occur, MCU needs to reset the module and pull it down for at least 300 ms and then pull it up.

2.TXD/RXD: Signal of receiving or sending data. The module has been connected with 10K pull-up resistance.

5.2. Power Supply Interface

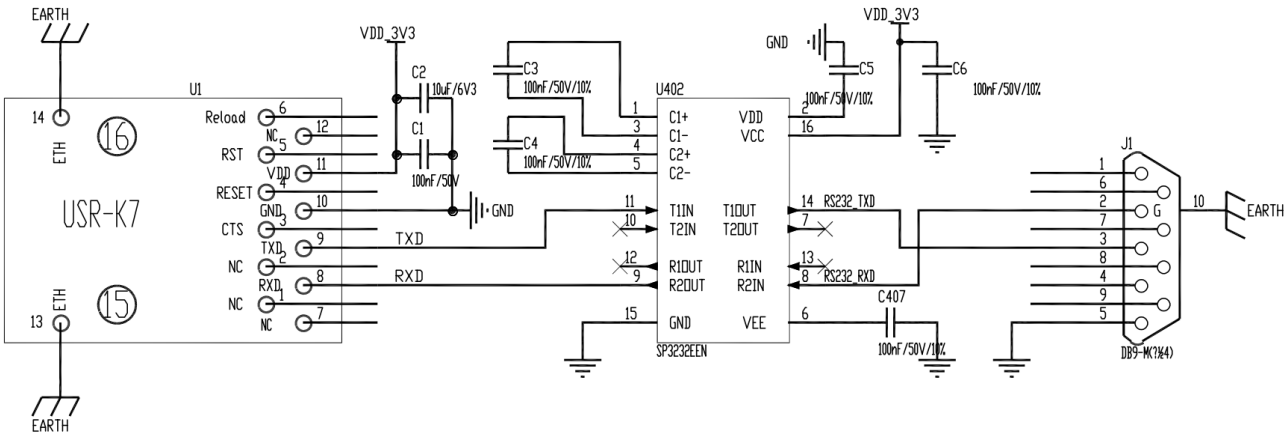
USR-K7 adopts 3.3V power supply and working current is 130mA@3.3V. Pin 11 is VCC 3.3V pin which can connect to 10UF/6V3/10% and 100nF/50V/10% bypass capacitor to make module work stably. Circuit diagram as follow:

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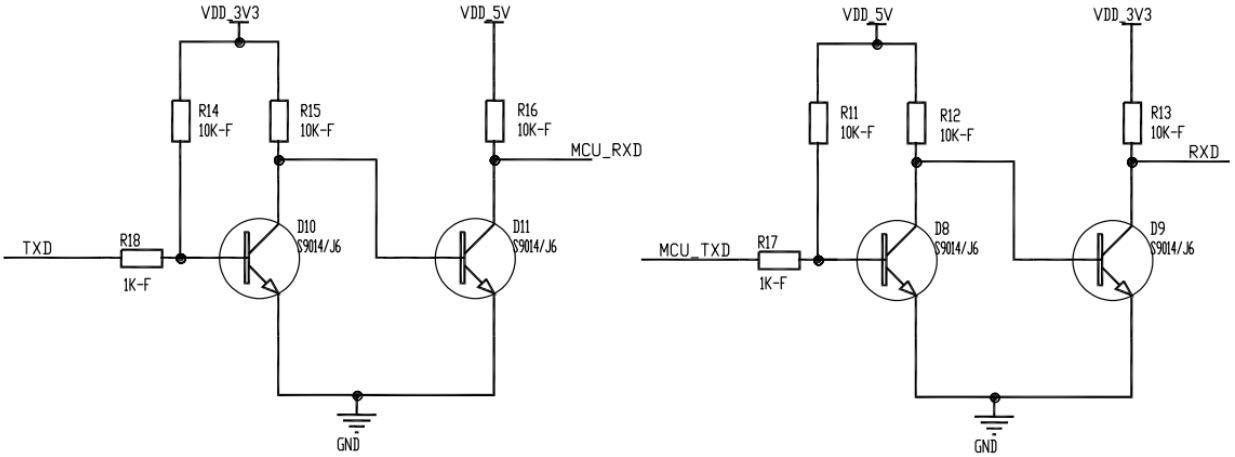
5.3.UART

UART,which only support TTL3.3.level, is serial data interface that can connect to the RS-232 chip and transfer to the RS-232 level. UART interface includes TXD/RXD.Taking the RS-232 level as a reference circuit diagram as follow:



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When communicating to MCU with 3.3V directly, just connecting TXD of module to RXD of MCU and RXD of module to TXD of MCU. When communicating to MCU with 5V, switching circuit is necessary.
Switching circuit diagram (3.3V~5V) as follow:



5.4. PCB Library

Please refer to PCB library of USR-K7
https://www.usriot.com/support/downloads/usr-kx-pcb-library-ad-version.html

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8.Update History

2019-5-8 version V1.0.0.

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