Wport-W20

Embedded WiFi Module User Manual

V1.0

Overview of Characteristic

- ✧ **MIPS MCU with 4MB Flash and 8MB SRAM. Run on eCos**
- ✧ **Support TCP/IP/Telnet /Modbus TCP Protocol**
- ✧ **Support UART to Ethernet/Wi-Fi Conversion, Serial Speed Upto 230400 bps**
- ✧ **Support STA/AP/AP+STA Mode**
- ✧ **Support Router or Bridge Network Working Mode.**
- ✧ **Support 10/100M Ethernet Auto-Negotiation**
- ✧ **Support Easy Configuration Through a Web Interface or PC IOTService Tool**
- ✧ **Support Security Protocol Such As SSL/AES/DES3**
- ✧ **Support Web OTA Wirelss Upgrade**
- ✧ **Single +3.3V Power Supply**
- ✧ **Small Size: 25 x 40mm**

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1. PRODUCT OVERVIEW

1.1. General Specification

Table 1 WPORT-W20 Module Technical Specifications

Class	Item	Parameters
Wireless Parameters	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmit Power	802.11b: +20 dBm (Max.)
		802.11g: +18 dBm (Max.)
		802.11n: +15 dBm (Max.)
	Receiver Sensitivity	802.11b: -89 dBm
		802.11g: -81dBm
		802.11n: -71dBm
	Antenna Option	External:I-PEX Connector
		Internal:On-board chip antenna
Hardware Parameters	Data Interface	UART: 1200bps - 230400bps
		GPIO
		Ethernet: 100Mpbs
	Operating Voltage	3.3V (+/-5%)
	Operating Current	170mA~300mA
	Operating Temperature	-40℃- 85℃
	Storage Temperature	-45℃- 125℃
	Dimensions and Size	45 x 32 x 8（mm）
Software Parameters	Network Type	STA/AP/AP+STA
	Security Mechanisms	WEP/WPA-PSK/WPA2-PSK/WAPI
	Encryption	WEP64/WEP128/TKIP/AES
	Work Mode	Transparent Transmission and CMD
	Serial command	AT+instruction set
	Network Protocol	TCP/UDP/ARP/ICMP/DHCP/DNS/HTTP
	Max. TCP Connection	32
	User Configuration	Web Server＋AT command config.
	User Application SW	Support customized application SW Provide SDK package Provide smart link tools

1.2. Hardware Introduction

Figure 1. Wport-W20

1.2.1. Pins Definition

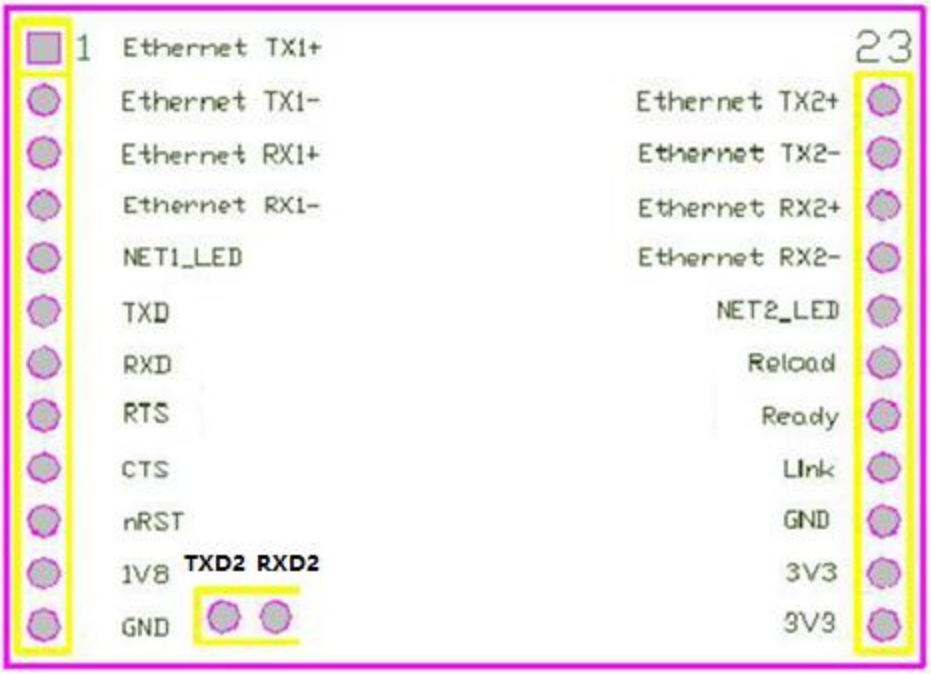

Figure 2. WPORT-W20 Pins Map

Table 2 WPORT-W20 Pins Definition

Pin	Description	Name	Direction	Note
1	Ethernet TX1+	TX1+	O	1.8V voltage. Support transformer or PHY-PHY connection
2	Ethernet TX1-	TX1-	**O**	
3	Ethernet RX1+	RX1+	**I**	
4	Ethernet RX1-	RX1-	**I**	
5	Ethernet 1 LED	NET1_LED	**I**	
6	UART_TXD	UART_TXD	O	

7	UART_RXD	UART_RXD	I	
8	UART_RTS	UART_RTS	O	
9	UART_CTS	UART_CTS	I	
10	RESET	RESET	I	Effective low reset, >300ms
11	Output 1.8V	1.8V	O	1.8V@300mA for Ethernet
12	GND	GND	Power	
13/ 14	VCC	3.3V	Power	3.3V@350mA
15	GND	GND	Power	
16	WiFi status Indication	nLink	O	"1"- WIFI connection available, "0"- No WIFI connection Can be configured as GPIO.
17	Indicate the module status of power on process	nReady	O	"0" or "Palmodic Signal" - Finish module boot up process; "1" - Module boot up not finish. Can be configured as GPIO.
18	Restore configuration	nReload	I	Module will Restore factory default configuration after set this pin "0" more than 3s, then set "1".
19	Ethernet 2 LED	NET2_LED	I/O	
20	Ethernet RX2-	RX2-	I	1.8V voltage. Support transformer or PHY-PHY connection
21	Ethernet RX2+	RX2+	I	
22	Ethernet TX2-	TX2-	O	
23	Ethernet TX2+	TX2+	O	
24	TXD2	TXD2	O	
25	RXD2	RXD2	I	

1.2.2. Mechanical Size

WPORT-W20 modules physical size as follows:

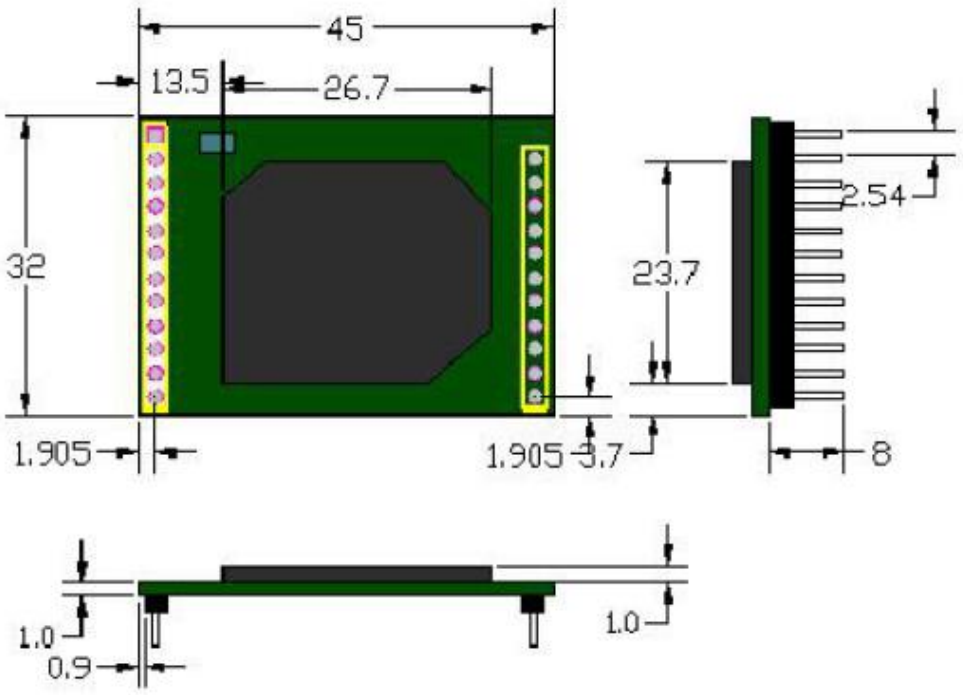

Figure 3. WPORT-W20 Mechanical Dimension

1.2.3. On-board Chip Antenna

WPORT-W20 module supports internal on-board chip antenna option. When costomer select internal antenna, you shall comply with following antenna design rules and module location suggestions:

- For customer PCB, RED color region (6x8mm) can't put componet or paste GND net;
- Antenna must be away from metal or high components at least 10mm;
- Antenna can't be shielded by any metal enclosure; All cover, including plastic, shall be away from antenna at least 10mm;

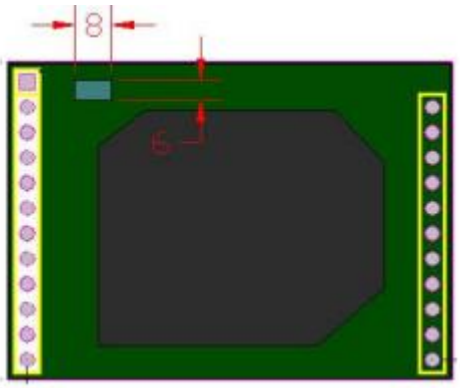

Figure 4. WPORT-W20 Chip Antenna Keep Out Region

High-Flying suggests WPORT-W20 module better locate in following region at customer board, which is to reduce the effect to antenna and wireless signal. And it is better to consult High-Flying technical engineer when you structure your module placement and PCB layout.

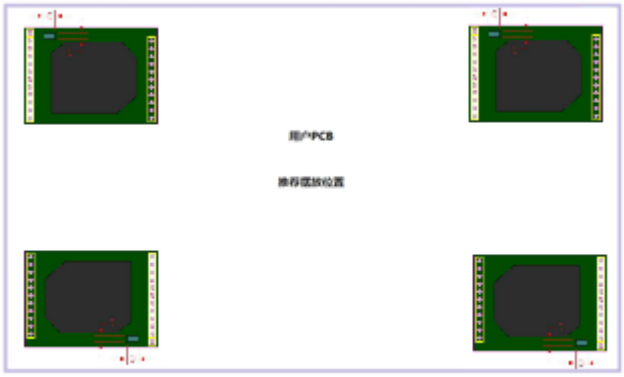

Figure 5. Suggested Module Placement Region

1.2.4. External Antenna

Wport-W10 modules support internal antenna and external antenna option for user dedicated application. If user select external antenna, Wport-W10 modules must be connected to the 2.4G antenna according to IEEE 802.11b/g/n standards.

The antenna parameters required as follows:

Table 3 WPORT-W20 External Antenna Parameters

Item	Parameters
Frequency range	2.4~2.5GHz
Impedance	50 Ohm
VSWR	2 (Max)
Return Loss	-10dB (Max)
Connector Type	I-PEX or populate directly

As the figure shown,in the normal situation, the red area is to exchange resistor.If needs external antenna,please replace the resistor from the red to the blue.

Figure 6. Exchange Resistor between Internal and External Antenna

1.2.5. Order Information

Base on customer detailed requirement, WPORT-W20 series modules provide different variants and physical type for detailed application.

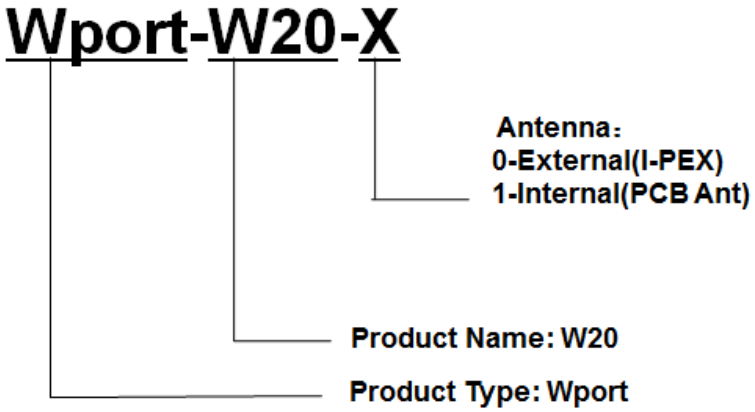

Figure 7. WPORT-W20 Order Information

1.3. Hardware Reference Design

1.3.1. Hardware Typical Application

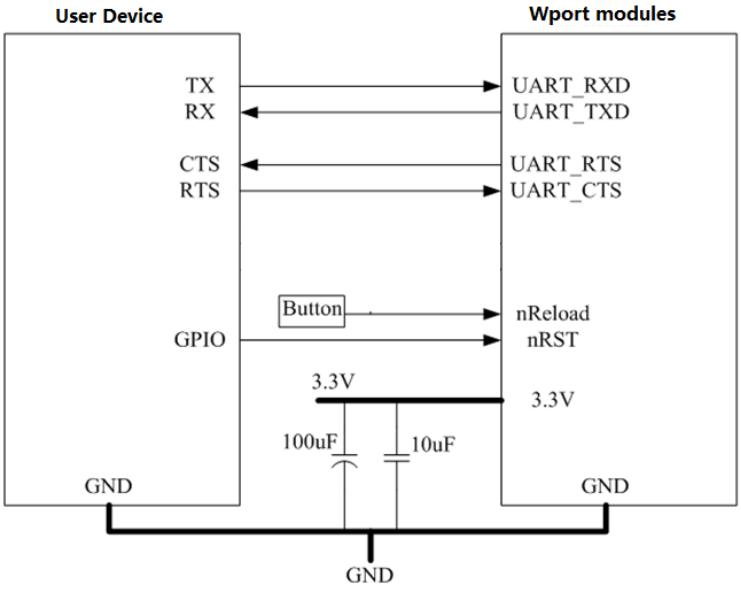

Figure 8. WPORT-W20 Hardware Typical Application

Notes:

nRST- Module hardware reset signal. Input. Logics “0” effective.
There is 100K Ohm pull-up resister internal. When module power up or some issue happened, MCU need assert nRST signal “0” at least 300ms, then set” 1” to keep module fully reset.

nLink- Module WIFI connection indication. Output.

There is 4.7K Ohm pull-up resister internal. When module connect to AP (STA mode) or some WiFi STA connect to module (AP mode), the module will output “0”. This signal is used to judge if module already at WiFi connection status.

nReload- Module restore to factory default configuration.Input. Logics “0” effective.
User can assert nReload signal “0” more than 3’s through button or MCU pin, then release, module will restore to factory default configuration and re-start boot up process. **User need add 4.7K~10K Ohm pull-up resister external the module.**

UART_TXD/RXD- UART port data transmit and receive signal.
There is 1K Ohm pull-down resister internal. User can’t add pull-up resister at these pins.

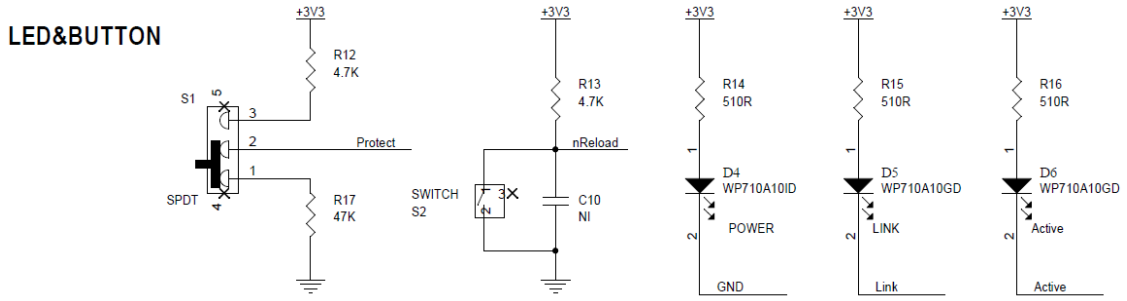

Figure 9. LED&BUTTON Reference

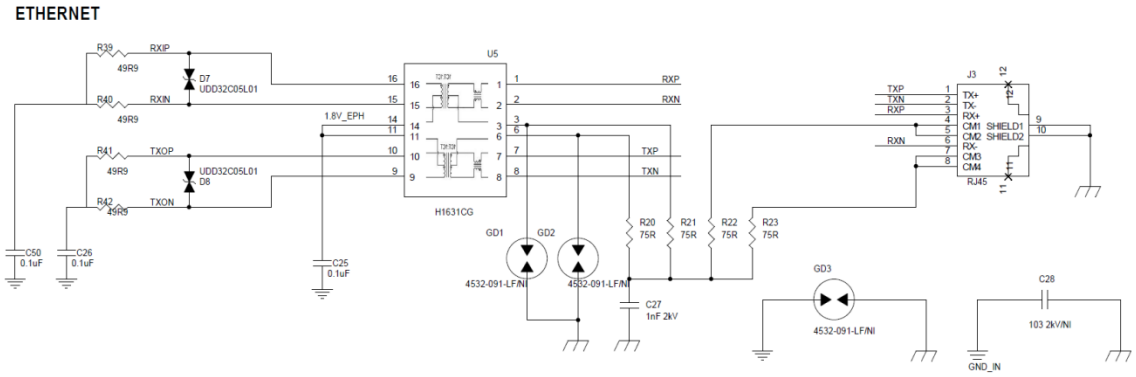

Figure 10. Ethernet Reference

1.4. Module Usage

This module is used in HF2221, see HF2221 manual for detailed usage.