Order infomation：

type	Name	description
WMFZ-RGBW	Multicolor	4-PWM, RGB+W
WMFZ-CCT	Turnable White	2-PWM, C+W
WMFZ-W	Warm White	1-PWM, W

Application infomation：

| Pin	name	WMFZ-RGBW	WMFZ-CCT	WMFZ-W
13	GPIO4	PWMR	–	–
14	GPIO12	PWMG	–	–
15	GPIO14	PWMB	PWMT	–
16	GPIO5	PWMW	PWMW	PWMW
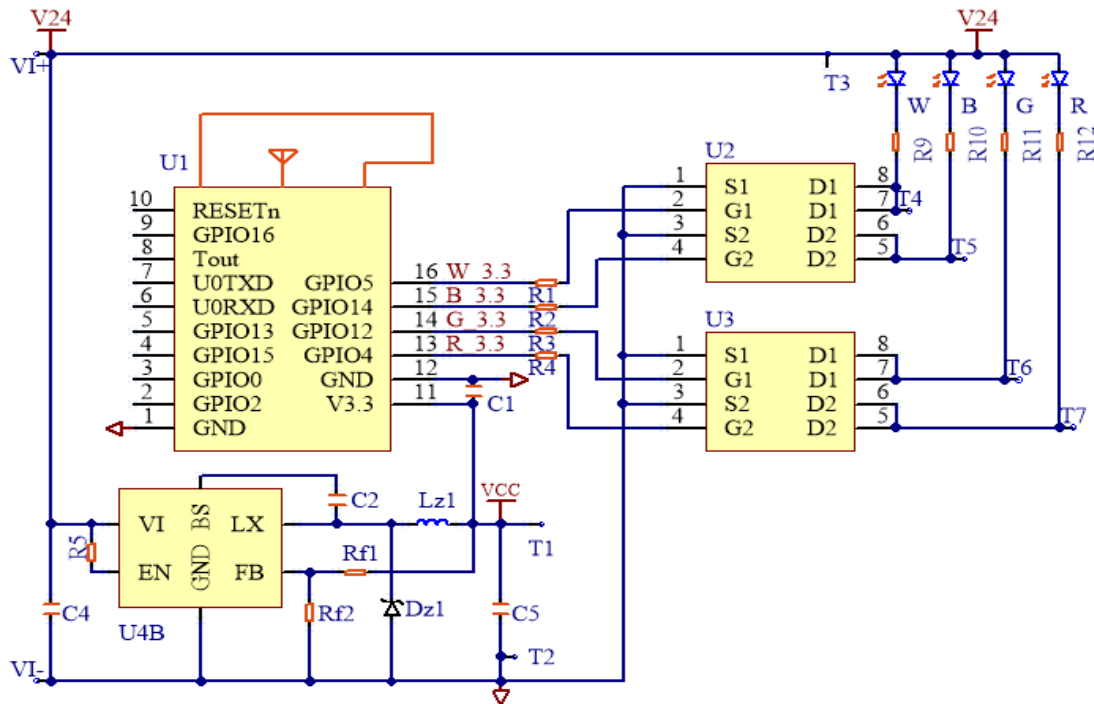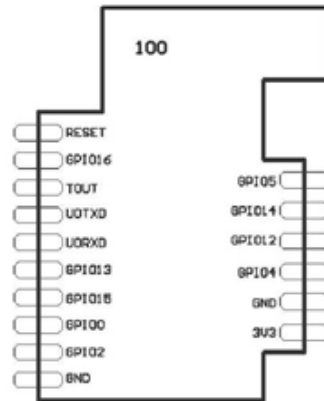
Smart Wi-Fi Module

1. Product Overview

WMFZ is a low power consumption module with built-in Wi-Fi connectivity solution. The Wi-Fi Module consists of a highly integrated wireless radio chip ESP8266 and some extra component that has been programed with Wi-Fi network protocol and plenty of software examples. WMFZ include a 32-bit CPU, 1M byte flash, 50k SRAM and various peripheral resources.

WMFZ is a RTOS platform, embedded with all the Wi-Fi MAC and TCP/IP protocol function examples, users can customize their Wi-Fi product by using these software examples.

Figure 1 shows the block diagram of the WMFZ.

Figure 1. The block diagram of the WMFZ
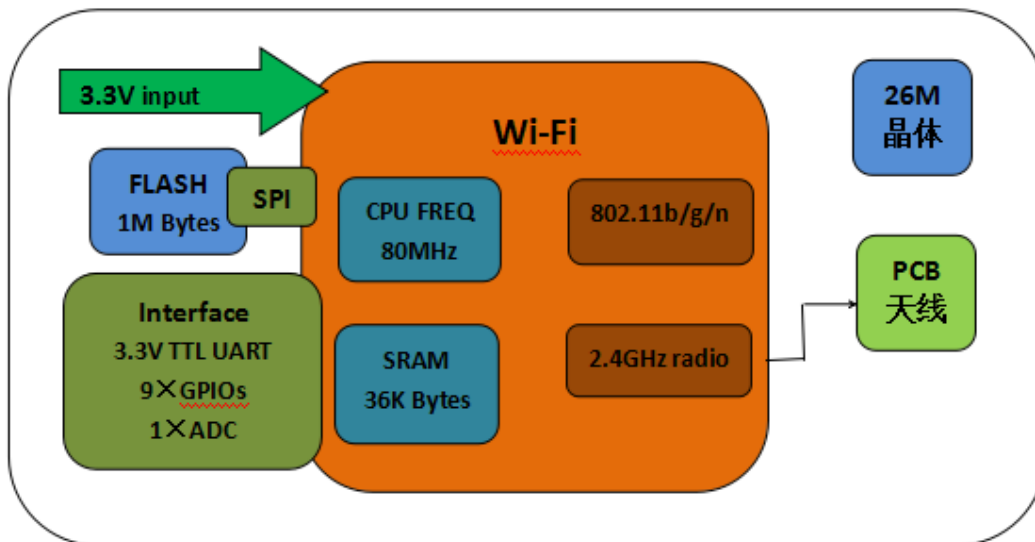
1.1 Features

✧ Integrated low power consumption 32-bit CPU, also known as application processor
✧ Basic frequency of the CPU can support both 80MHz and 160MHz
✧ Supply voltage range: 3V to 3.6V
✧ Peripherals: 9 GPIO channels, 1 UART, 1 ADC
✧ Wi-Fi connectivity:
- 802.11 b/g/n
- channel 1 to 11@2.4G for FCC,channel 1 to 13 @2.4G for EU and Japan
- Support WPA/WPA2
- Support STA/AP/STA+AP operation mode
- Support SmartConfig function for both Android and IOS devices
- On-board PCB antenna
- Operating temperature range: -20℃ to 125℃

1.2 Main Application Fields

- ✧ Intelligent Building
- ✧ Intelligent home, Intelligent household applications
- ✧ Health care
- ✧ Industrial wireless control
- ✧ Baby monitor
- ✧ Webcam
- ✧ Intelligent bus
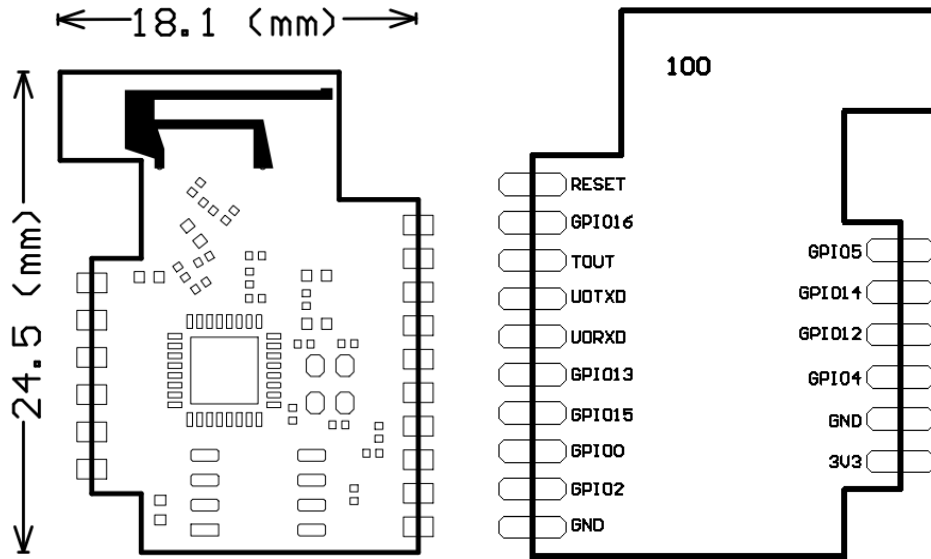
2. Dimensions and Footprint

2.1 Dimensions

TYWE3S has 2 columns of Pins. The distance between each Pin is 2mm.

Size of WMFZ : 18.1mm(W)*24.5mm(L)*2.0mm(H)

Figure 2 shows the dimensions of WMFZ .

Figure 2. The dimensions of WMFZ

2.2 Pin Definition

Table 1 shows the general pin attributes of WMFZ

Table 1. The typical pin definition of WMFZ

PIN NO.	NAME	TYPE	DISCREPTION
1	GND	I	For module production testing
2	GPIO2	O	UART0_TXD(used to print module's internal information)
3	GPIO0	I/O	GPIO_0(processing during initials, caution when used)
4	GPIO15	O	GPIO_15(processing during initials, caution when used)
5	GPIO13	I/O	GPIO_13
6	U0RXD	I/O	UART0_RXD [2]
7	U0TXD	O	UART0_TXD [2]
8	Tout	AI	ADC terminal(10-bits SAR ADC) [1]
9	GPIO16	I/O	GPIO_16 (10k pull-up resistor needed)
10	RST	I/O	External reset (low level effects, there's already had pull-up resistor)

11	3V3	P	Module voltage Pin (3.3V)
12	GND	P	Ground
13	GPIO4	I/O	GPIO_04
14	GPIO12	I/O	GPIO_12
15	GPIO14	I/O	GPIO_14
16	GPIO5	I/O	GPIO_05

Note: S: Power supply pins; I/O: Digital input or output pins; AI: Analog input. RST pin is the module hardware reset pin; it cannot eliminate module-pairing information.

(*1) This pin can only be used as ADC input, cannot use it as normal I/O. when not using, just connect nothing. When used as ADC input, the input voltage range is 0~1.0V.

(*2) UART0 is serial port, during power on progress; this serial port will output something, which can be ignored.

3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Table 3. Absolute Maximum Ratings

PARAMETERS	DESCRIPTION	MIN	MAX	UNIT
Ts	Storage temperature	-20	85	℃
VCC	Supply voltage	-0.3	3.6	V
Static electricity voltage (human model)	TAMB-25℃	-	2	KV
Static electricity voltage (machine model)	TAMB-25℃	-	0.5	KV

3.2 Electrical Conditions

Table 4. Electrical Conditions

PARAMETERS	DESCRIPTION	MIN	TYPICAL	MAX	UNIT
Ta	Working temperature	-20	-	85	℃
VCC	Working voltage	3	3.3	3.6	V
VIL	IO low level input	-0.3	-	VCC*0.25	V
VIH	IO high level input	VCC*0.75	-	VCC	V
VOL	IO low level output	-	-	VCC*0.1	V
VoH	IO high level output	VCC*0.8	-	VCC	V
Imax	IO drive current	-	-	12	mA

3.3 Wi-Fi Transmitting Current Consumptions

Table 5. Wi-Fi TX current consumption

PARAMETERS	MODE	RATE	transmitting power	TYPICAL	UNIT
IRF	11b	11Mbps	22±1dBm	220	mA
IRF	11g	54Mbps	22±1dBm	110	mA
IRF	11n	MCS7	22±1dBm	100	mA

3.4 Wi-Fi Receiving Current Consumptions

Table 6. Wi-Fi RX current consumption

PARAMETERS	MODE	RATE	TYPICAL	UNIT
IRF	11b	11Mbps	76	mA
IRF	11g	54Mbps	76	mA
IRF	11n	MCS7	76	mA

3.5 Working Mode Current Consumptions

Table 7. The module working current consumption

WORK MODE	AT TA=25℃	TYPICAL	MAX*	UNIT
EZ Mode	WMFZ is under EZ paring mode, Wi-Fi indicator light flashes quickly	80	151	mA
AP Mode	WMFZ is under AP paring mode, Wi-Fi indicator light flashes slowly	90	451	mA
Operation Mode	WMFZ is connected, Wi-Fi indicator light is on	58.5	411	mA
Disconnection Mode	WMFZ is disconnected, Wi-Fi indicator light is off	80	430	mA

4. WLAN Radio Specification

4.1 Basic Radio Frequency Characteristics

Table 8. Basic Radio frequency characteristics

PARAMETERS	DESCRIPTION
Frequency band	2400MHz to 2483.5MHz
Wi-Fi standard	IEEE 802.11n/g/b (Terminal 1-14)
Data transmitting rate	11b:1,2,5.5,11(Mbps)
	11g:6,9,12,18,24,36,48,54(Mbps)
	11n:HT20, MCS0~7
Antenna type	On-board PCB Antenna

4.2 Wi-Fi Transmitting Power

Table 9. Wi-Fi transmitting power

PARAMETERS		MIN	TYPICAL	MAX	UNIT
RF average output power, 802.11b CCK Mode	11M	21.24	-	22.70	dBm
RF average output power, 802.11g OFDM Mode	54M	22.13	-	22.67	dBm
RF average output power, 802.11n OFDM Mode	MCS7	21.48	-	22.71	dBm
The Frequency error		-10	-	10	ppm

4.3 Wi-Fi Receiving Sensitivity

Table 9. Wi-Fi Receiving sensitivity

PARAMETERS		MIN	TYPICAL	MAX	UNIT
PER<8%, Receiving sensitivity, 802.11b CCK Mode	11M	-	-91	-	dBm
PER<10%, Receiving sensitivity, 802.11g OFDM Mode	54M	-	-75	-	dBm
PER<10%, Receiving sensitivity, 802.11n OFDM Mode	MCS7	-	-72	-	dBm

5. Antenna Information

5.1 Antenna Type

Antenna can be connected only using On-board PCB antenna.

5.2 Reduce Antenna Interference

While using the On-board PCB antenna, in order to have the best Wi-Fi performance, it's recommended to keep a minimum 15mm distance between the antenna part and the other metal pieces.

User's own PCBA design is recommended NOT to pass any wire, NOT do copper pour under the region of the module's antenna, to avoid interferences.

6. FCC Parts

Caution:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

MPE Reminding
To satisfy FCC RF exposure requirements, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation.
To ensure compliance, operations at closer than this distance is not recommended.

Region Selection
Limited by local law regulations, version for North America does not have region selection option.

Information for the OEM Integrators
This device is intended for OEM integrators only. Please see the full grant of equipment document for restrictions.

Label Information to the End User by the OEM or Integrators
If the FCC ID of this module is not visible when it is installed inside another device, then the outside of the device into which the module is installed must be label with
"Contains FCC ID: 2AO8JWDR001".