涂鸦智能
Tuya Smart

Tuya Smart Wi-Fi Module

1. Product Overview

TYAUX_F is a low power consumption module with built-in Wi-Fi connectivity solution designed by Hangzhou Tuya Information Technology Co., Ltd. The Wi-Fi Module consists of a highly integrated wireless radio chip W302 I2E77P1 and some extra flash that has been programed with Wi-Fi network protocol and plenty of software examples. TYAUX_F include a ARM CM4F, WLAN MAC, 1T1R WLAN, maximum frequency reaches 125MHz, 256K SRAM, 2M byte flash and various peripheral resources.

TYAUX_F 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.

1.1 Features

- ✧ Integrated low power consumption 32-bit CPU, also known as application processor
- ✧ Basic frequency of the CPU can support 125 MHz
- ✧ Supply voltage range: 3V to 3.6V
- ✧ Peripherals: 7 GPIO channels, 1 UART
- ✧ Wi-Fi connectivity:
  - 802.11 B/G/N20/N40
  - Channel 1 to 11 @ 2.4GHz
  - Support WPA/WPA2
  - Support Smart Config function for both Android and IOS devices
  - Pass CE, FCC, SRRC certifications
  - Operating temperature range: -20℃ to 85℃

1.2 Main Application Fields

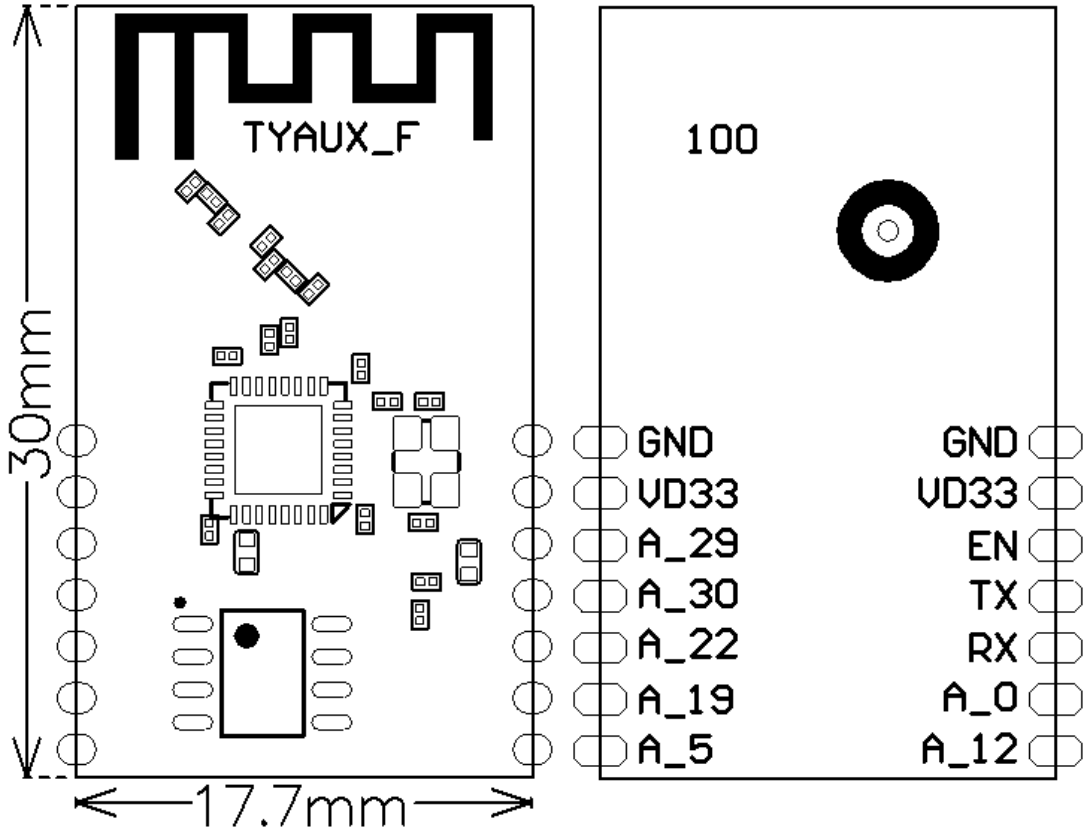
- ✧ Intelligent Building
- ✧ Intelligent home, Intelligent house hold applications
- ✧ Healthy devices
- ✧ Industrial wireless control
- ✧ Baby monitor
- ✧ Webcam
- ✧ Intelligent bus

2. Dimensions and Footprint

2.1 Dimensions

TYAUX_F has 2 columns of Pins (2*7).The distance between each Pin is 2 mm.
Size of TYAUX_F: 17.7mm(W)*30mm(L)*3.6mm(H)
Figure 2.1 shows the dimensions of TYAUX_F.

Figure 2.1. The dimensions of TYAUX_F



2.2 Pin Definition

Table 1 shows the general pin attributes of TYAUX_F

Table 1. The typical pin definition of TYAUX_F

PIN NO.	NAME	TYPE	DISCREPTION
1	GND	P	Ground
2	VD33	P	Supply voltage (3.3V)
3	EN	I/O	External reset singal(low level effects)
4	TX	I/O	UART0_TXD
5	RX	I/O	UART0_RXD
6	A_0	I/O	GPIOA_0, can not be pull-up while booting, can be used as GPIO while in normal working mode

7	A_12	I/O	GPIOA_12, hardware PWM
8	A_5	I/O	GPIOA_5, hardware PWM
9	A_19	I/O	GPIOA_19
10	A_22	I/O	GPIOA_22
11	A_30	I/O	UART_Log_TXD(used to print module's internal information)
12	A_29	I/O	UART_Log_RXD (used to print module's internal information)

Note: P: Power supply pins; I/O: Digital input or output pins; AI: Analog input.

3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Table 3.1. Absolute Maximum Ratings

PARAMETERS	DESCRIPTION	MIN	MAX	UNIT
Ts	Storage temperature	-40	105	℃
VCC	Supply voltage	3.0	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 3.2. Electrical Conditions

PARAMETERS	DESCRIPTION	MIN	TYPICAL	MAX	UNIT
Ta	Working temperature	-20	-	85	℃
VCC	Working voltage	3.0	-	3.6	V
VIL	IO low level input	-0.3	-	VDD*0.25	V
VIH	IO high level input	VDD*0.75	-	3.6	V
VOL	IO low level output	-	-	VDD*0.1	V
VoH	IO high level output	VCC*0.8	-	VCC	V
Imax	IO drive current	-	-	16	mA
Cpad	Input capacitor	-	2	-	pF

3.3 Wi-Fi Transmitting Current Consumptions

Table 3.3. Wi-Fi TX current consumption

PARAMETERS	MODE	RATE	Transmitting power	TYPICAL	UNIT
IRF	11b	1Mbps	+22.00dBm	287	mA
IRF	11g	6Mbps	+24.06dBm	255	mA
IRF	11n-HT20	MCS0	+23.05dBm	244	mA
IRF	11n-HT40	MCS0	+22.76dBm	220	mA

3.4 Wi-Fi Receiving Current Consumptions

Table 3.4. Wi-Fi RX current consumption

PARAMETERS	MODE	TYPICAL	UNIT
IRF	CPU sleep	90	mA
IRF	CPU active	120	mA

3.5 Working Mode Current Consumptions

Table 3.5. The module working current consumption

WORK MODE	AT TA=25℃	TYPICAL	MAX*	UNIT
EZ Mode	TYAUX-F is under EZ paring mode, Wi-Fi indicator light flashes quickly	115	125	mA
Standby Mode	TYAUX-F is connected, Wi-Fi indicator light is on	60	209	mA
Operation Mode	TYAUX-F is connected, Wi-Fi indicator light is on	118	198	mA
Disconnection Mode	TYAUX-F is disconnected, Wi-Fi indicator light is off	34	192	mA

Note: peak continuous time is about 5us.

The parameter shown above will vary depending on different firmware functions.

4. WLAN Radio Specification

4.1 Basic Radio Frequency Characteristics

Table 4.1.Basic Radio frequency characteristics

PARAMETERS	DESCRIPTION
Frequency band	2.412GHz to 2.462GHz
Wi-Fi standard	IEEE 802.11n/g/b (Terminal 1-11)
Data transmitting rate	11b:1,2,5.5,11(Mbps)
	11g:6,9,12,18,24,36,48,54(Mbps)
	11n:HT20,MCS0~7
	11n:HT40,MCS0~7
Antenna type	On-board PCB Antenna

4.2Wi-Fi Receiving Sensitivity

Table 4.2. 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 using On-board PCB antenna.

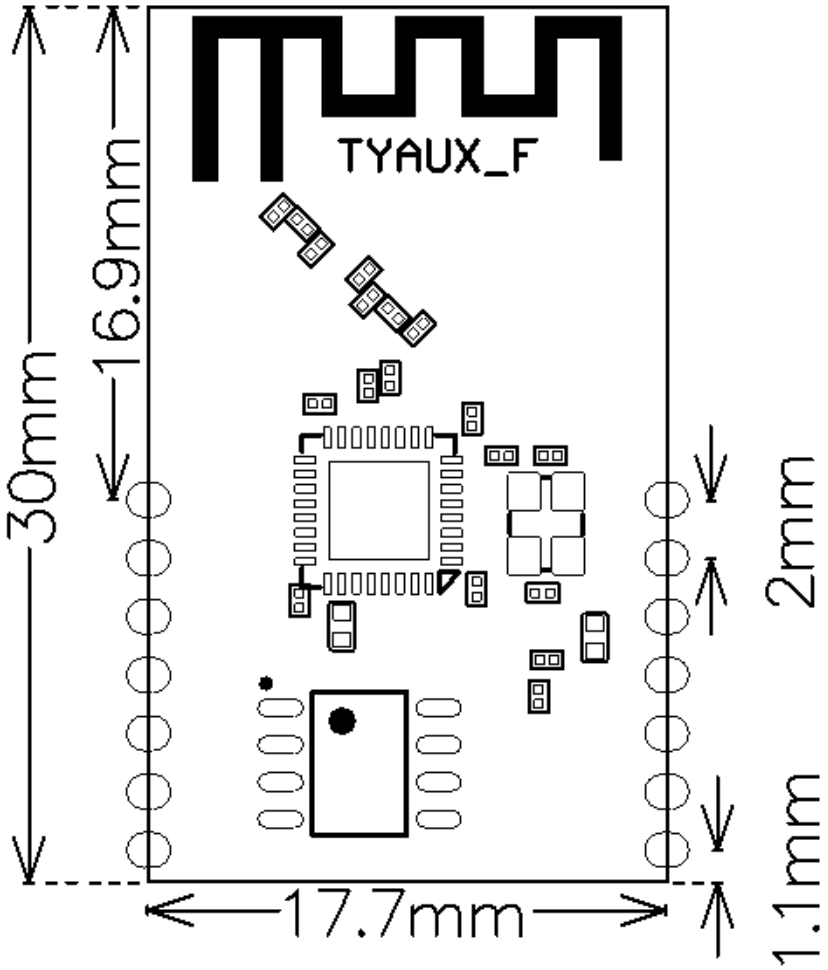
5.2 Reduce Antenna Interference

While using the On-board PCB antenna, in order to have the best Wi-Fi performance, it’s recommended to keep a minimum15mm distance between the antenna part and the other metal pieces.

6. Packaging Information And Production Guide

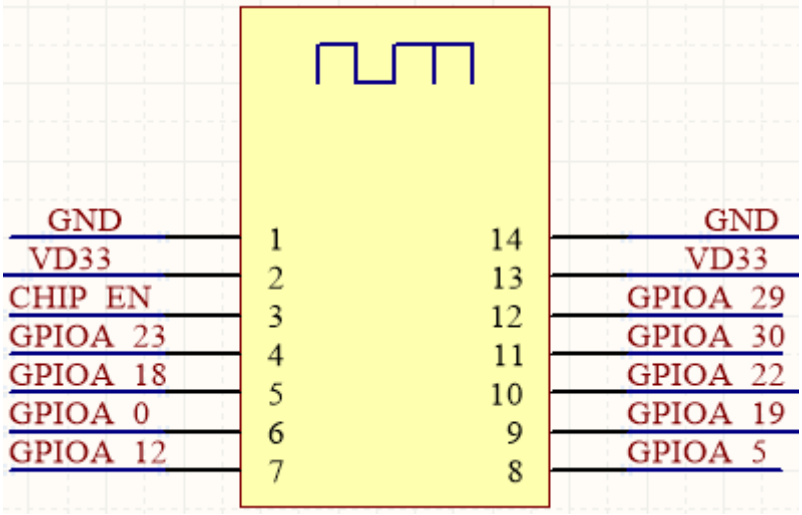
6.1 Mechanical Dimensions

Figure 6.1. Top view of the module



6.2.PCB Recommended Package

Figure 6.3. PCB schematic Drawing



6.3 Production Guide

✧ The storage for the delivered module should meet the following condition:

1. The anti-moisture bag should be kept in the environment with temperature< 30℃ and humidity< 85% RH.

2. The expiration date is 6 months since the dry packaging products was sealed.

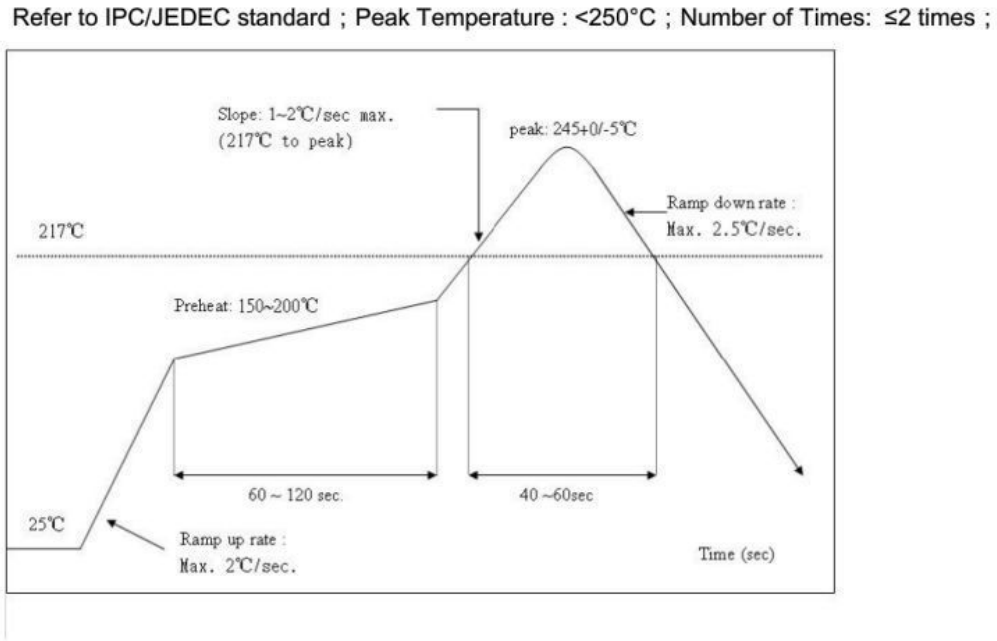
✧ Cautions:

1. All the operators should wear electrostatic ring in the whole process of production.

2. While operating, water and dirt should not have any contact with the modules.

6.4 Recommended furnace temperature curve

Figure 6.4. PCB Package Drawing Recommended furnace temperature curve



FCC Statement

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

FCC Label Instructions:

The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as: "Contains Transmitter Module FCC ID: 2ANDL-TYAUXF",or "Contains FCC ID: 2ANDL-TYAUXF",

Any similar wording that expresses the same meaning may be used.