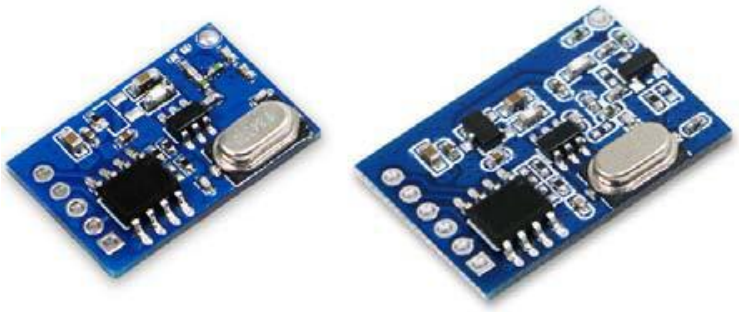
High-performance Learning Code ASK Wireless Transmitter Module

SPECIFICATION

Model No.: M-AF119M/PA

Version: V1.1



Before using this module, please read this document carefully, and pay attention to the following important matters:

This Wireless Transmitter Module is an electrostatic sensitive product. Please operate it on an anti-static workbench during installation and testing.

The module uses an external antenna by default. The antenna can be a wire antenna or a standard UHF antenna. You can choose a specific antenna according to the actual situation. If the terminal product uses a metal shell, be sure to install the antenna outside the metal shell. Otherwise, the RF signal will be seriously attenuated, which will affect the effective distance.

Metal objects and wires should be kept away from the antenna as much as possible.

When installing the module, nearby objects should be kept at a sufficient safety distance from the module to prevent short circuit damage.

This module should be used in a dry environment. Please do not make any liquid substance come into this module.

Please use an independent voltage regulator circuit to supply power to this module, and avoid sharing with other circuits. The tolerance of the power supply should not be less than 5%.

Limitations:

This module is intended to be embedded in the customer's terminal product application, and does not provide a casing itself. It is not recommended that the customer directly resell this module as a final product without permission.

This series of modules are in accordance with commonly used international standards. If there is any special certification needed, we can adjust certain indicators according to your needs.

This module cannot be applied to life rescue, life-support systems, or any occasion where personal injury or life threatening may cause by equipment failure. Any organization or individual carrying out the above-mentioned applications shall bear all risks at their own.

We will not be responsible for any direct or indirect damage, injury or loss of profits caused by products that use this module.

Brief Introduction

M-AF119M is a wireless module designed based on a high-performance superheterodyne wireless transmitter chip. It is a high-power, low-cost, small size, and coded (1527 million sets of learning codes) superheterodyne wireless transmitter module, which integrates cost-effective wireless data Transmitting chip and low-power MCU with excellent performance.

This wireless module has industry-standard transmission power and frequency stability, the data encoding rate is default 2K, transmitting cycle can be customized, and can be used with our low-power RF receiving module, which can replace the 1527 encoding remote control.

The transmitter module has 3 channel inputs and supports 3 external buttons. According to the output level of the receiving module, there are two modes can be set: latching mode and Inching mode. The module can correspond to different transmitting cycle and code format, in different modes. When it is used in conjunction with low power consumption mode, the module's code transmission time is 1 second or 2 seconds, which can ensure the receiver module to process the received data (signals sent by the transmitter module) in the normal receiving mode.

The transmitting working current is 8mA@12dBm. The high-power version can be customized. The transmitter chip adopts SOT23-6 package and supports 3 buttons (or pulse signal). To provide you the best wireless RF solution, the radio frequency communication protocol, transmission rate, carrier frequency, number of buttons, also can be customized according to your requirement.

1. Features

- Power: +12dBm, +22dBm can be customized (2kbps);
- Working frequency: 433.92M (other frequencies need to be customized)
- Working voltage: 1.8V-3.6V
- Transmission Rate (Symbol Rate): 0.5~40K
- Communication distance: 200~350m
- The transmitting cycle can be customized according to the power consumption of the receiver
- The interface adopts 3-channel inputs, local control (key signal trigger) or pulse signal (sensor signal trigger) both available;
- Standard COMS interface control and decoded data output

2. Applications

Sensor trigger signal reporting, Multi-channel switch control, Automatic data collection, Industrial remote control, telemetry, Multi-button remote control

3. Pins Definition

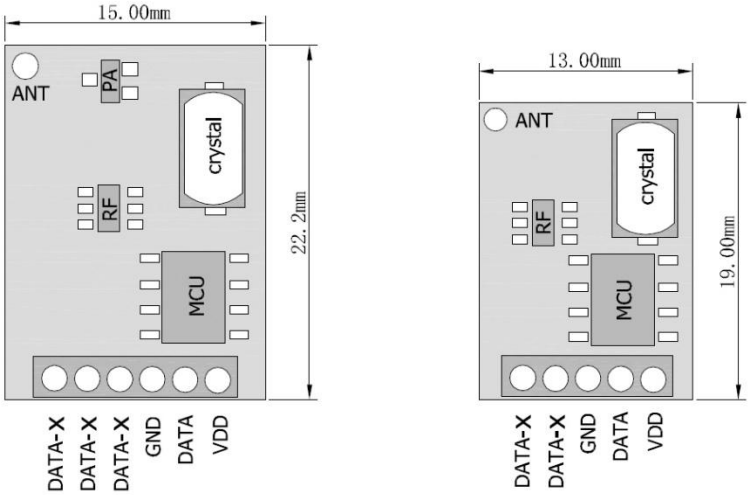


Figure 1: Pin Definition

Pin	Name	Description	Remark
1	ANT	Antenna input, single core copper wire 0.8mm (Aperture 0.85mm) is recommended	17-24cm length is recommended
2	VDD	Power supply 1.8-3.6V (reserved LDO can be customized 5V version)	662K-LDO
3	DATA	Data pin, low level trigger pulse trigger	can be customized
4	GND	Grounding, common ground with the system	Strong current isolation
5	DATA-1	Data pin 1, low level trigger pulse trigger	
6	DATA-2	Encoding time, normal is low (data lasts until key is released), pull up to change as 1.5s continuously sending	Customizable as a data port
7	DATA-3	Data pin 3, low level trigger pulse trigger	can be customized

Table 1: Pins Definition

Interface customization instructions:

As shown in the figure, the MCU is packaged in SOP8 and has more I/O port resources. According to different application scenarios, different customized specifications are recommended. Classification description as below:

① Button signal trigger type:

Customize the interface type according to the number of buttons of the product. I/O can separately support button grounding, or use I/O matrix scanning to expand the number of buttons. The key is active low.

② Sensor signal trigger type: suitable for standard smoke sensor, gas sensor, window/door sensor, vibration sensor, acceleration sensor, etc. The sensor itself generates a trigger signal (single or multiple digital pulses), and adjusts the trigger conditions of the

transmitter module, to complete wireless signal transmission, according to different signal waveforms;

4. Product Size

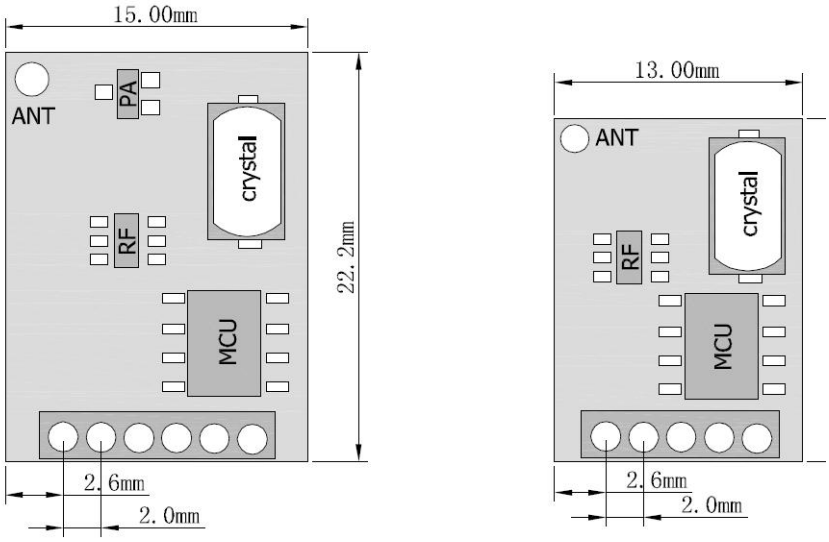


Figure 2: Module size

5. M-AF119M/PA Technical Parameter

DC characteristics

Description	Min.	Max.	Unit
Voltage	1.8	3.6	V
Working current	15mA@10dBm	56mA@22dBm Peak	Instantaneous current
Sleep standby	1uA	5uA	uA
ESD range	-2	2	KV
Operating temperature	-20	75	℃

Table 2: DC characteristics of the Module

RF characteristics (Unless otherwise stated, the temperature is 25 ℃, and VCC is 3.3V)

No	Characteristics	Index Parameter Range			Unit
		Min.	Typi.	Max.	
1	Application frequency range	250	433.92	500	MHz
2	Maximum transmit power		12	22	dBm
3	Frequency synthesizer (Frequency resolution)		198		Hz
4	Data rate (Symbol Rate)	0.5	——	40	K
5	Harmonic level	-52		-60	dBm
6	Communication distance	200		350	M
7	Code time	0.1s		2s	customizable
8	Transmission bandwidth @ 433.92MHz	6		7	KHz
9	Crystal accuracy		10		PPM

Table 3: High frequency characteristic table of the module

6. Product Description

M-AF119M can be used with the same frequency 1527 decoding receiving board, and the same frequency low-power decoding receiver module DL-RXC6 series. It can learn and store the address code of the remote control. The same address code of the remote control does not limit the number of pairs.

But there are many types of remote controllers on the market, and the encoding methods are also different, even the same encoding method may also cause the difference in the oscillation resistance of the chip, which will also lead to the failure to pair (the oscillation resistance matching determines the encoding period of the transmitter and the receiver).

Our low-power wireless receiver module (DL-RXC6 series) adopts WOR function to reduce the average power consumption of the module. Working together with this transmitter module can achieve a good performance of radio frequency transmission and reception. It

can also meet a series of technical indicators, such as communication protocol, pairing rate, carrier center frequency, transmit and receive bandwidth, etc.

The data format is: synchronization bit + address bit + data bit + check code.

Figure 3: Module connect to buttons

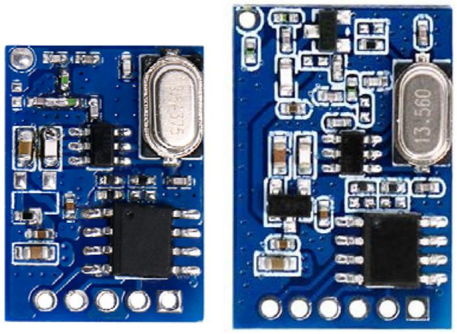


Figure 4: M-AF119M/PA two versions

If the product has more than 3 buttons, the SOC transmitter chip with SOP16 package can be customized (above MOQ)

Low-power Receiver Instructions:

The M-AF119M/PA adopt high-performance MCU, it can be customized according to your special requirements, include transmission power, transmission center frequency, transmission rate, code transmission duration, key matrix scanning, and even customized communication protocol and data definition, whether it is encrypted or not.

Learning Function Instructions:

Functions of the M-AF119M/PA transmitter (for all keys) can be one key paired by pressing any key in the code matching mode. It is also possible to pair each individual button of the transmitter with different receiving terminals. Achieve one-to-many remote control.

Hardware Instructions:

The M-AF119M/PA module adopts Through-hole technology, and the PINs adopt a standard 2.00mm pin header. When you use the module, the module package can be designed as a flat-mount type, and you can request *.asc or *.dxf Format module package file from us.

7. Notices in module application

Considering the complexity of data transmission over the air, the radio frequency modulation method of the data, and some inherent characteristics of electromagnetic waves, the following issues should be considered during the application process.

1. The electromagnetic interference of the application environment will affect the actual distance of the remote control. Electromagnetic wave interference is divided into mainboard power supply interference, TFT screen data cable interference, Flash data exchange interference; and airborne carrier frequency interference, noise interference, high-power signal source interference, etc.
2. Factors such as product size, internal space, and coating of the shell will cause the attenuation of the wireless signal, which will affect the remote-control distance. Usually the narrow internal space of the product is not conducive to the extension of the antenna. The outer shell should avoid metal or metal plating as much as possible.
3. To choose a proper antenna is very important. The antenna is an important part of the communication system, and its performance directly affects the indicators of the communication system. We must pay attention to its performance (antenna type, antenna electrical performance) when selecting the antenna. Please feel free to contact us for consultation or recommendation, if you need.

8. Contact us

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★ Data collection, Smart home, Internet of Things applications, Wireless remote-control technology, Remote active RFID, Antennas ★

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