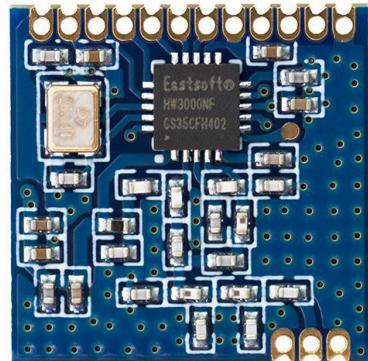




HW3000

433MHZ FSK/GFSK wireless data transceiver module (V3.0)



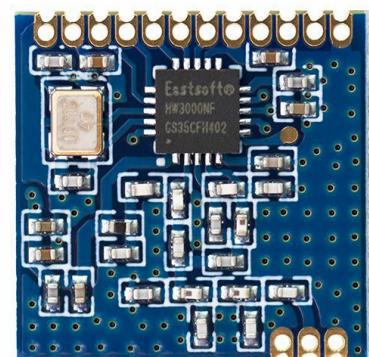
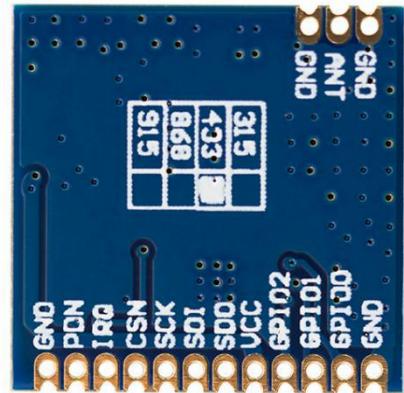
1. Description

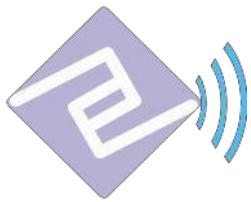
This module adopts Neusoft carrier HW3000 series RF device, which is a wireless transceiver chip with high cost performance and high integration in the industry. This module is an industrial-grade low-power sub-1G RF transceiver module. The extremely low receiving current (8mA, low-power receiving mode) plus the industry-leading 0dBm output power can fully guarantee the link performance and products of user communications Low power consumption requirements. At the same time, this module can support the hardware frequency hopping reception function, which can effectively reduce the interference of the environmental radio to the communication signals of this module.



2. Features

- ① Working frequency band: 433MHz
- ① Maximum output power: 0dBm
- ① 90mA@0dBm (transmit)
- ① Data transmission rate: 10–100kbps
- ① FSK, GFSK modulation mode
- ① 2.0–3.6V power supply
- ① Ultra-low power shutdown mode
- ① Digital Received Signal Strength Indication (RSSI)
- ① Support auto answer and auto retransmit function
- ① Configurable data packet structure (enhanced frame data structure and direct FIFO frame structure)
- ① Preamble detection
- ① 256 bytes send and receive data FIFO
- ① Integrated voltage regulator
- ① Hardware frequency hopping reception function
- ① Support data whitening, FEC, CRC check
- ① Multiple PIPE logic channels





3. Application

- ① Remote control
- ① Industrial control
- ① Toy control
- ① Wireless PC peripheral equipment

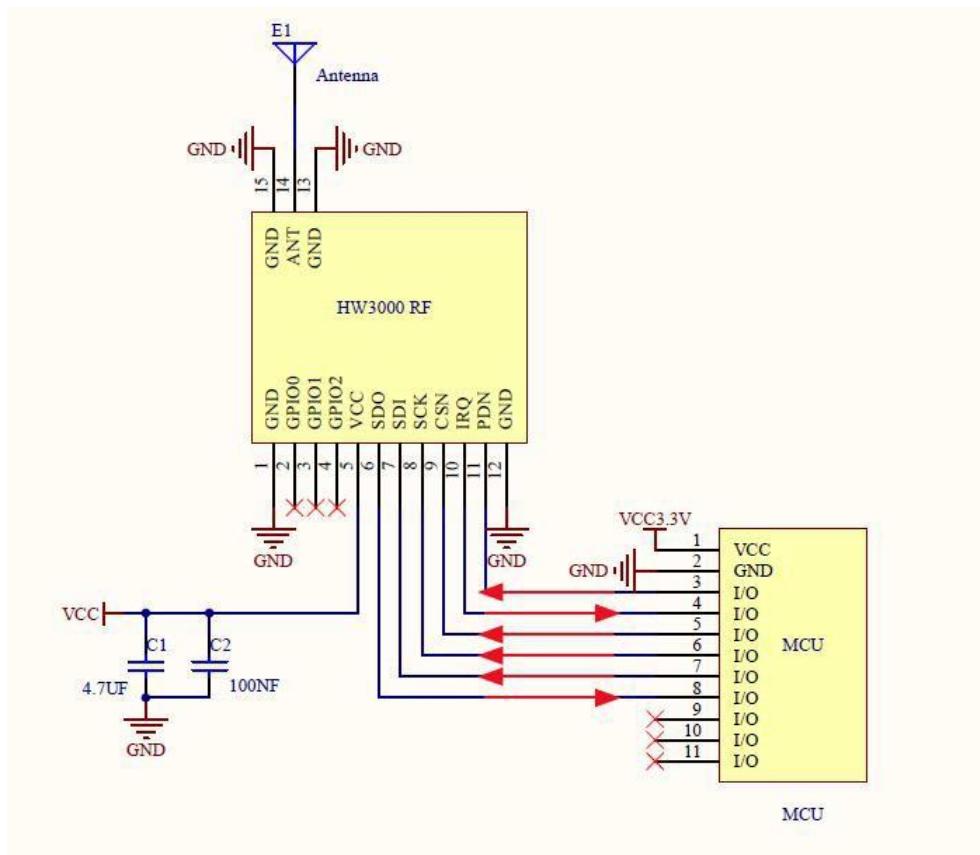


4. performance parameters

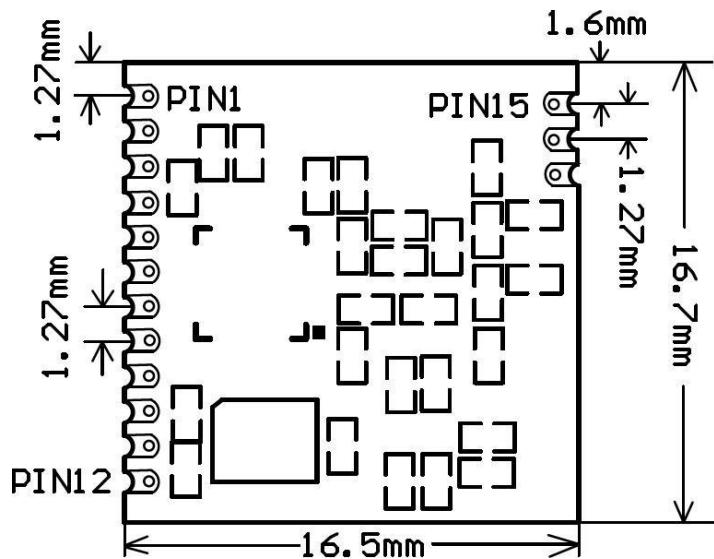
Parameter	Minimal	Typical	Max	Unit	Condition
Working voltage range	2.0	3.3	3.6	V	
range of working temperature	-40		+85	°C	
Current consumption					
Receive current		18		mA	Non-low-consumption receiving mode
		8		mA	Low-power receiving mode
Emission current		90		mA	@0dBm
Sleep current		3		uA	
Shutdown current		100		nA	
RF parameters					
Module frequency range	433.92			MHz	
Modulation rate	10		100	Kbps	ASK
Transmit power range	-20		+20	dBm	
Receive sensitivity		-114		dBm	@data=10kbps, Fdev=25kHz



5. Typical application circuit



6. pin description and size





Pin sequence	Pin definition	I/O	描述
PIN1	GND		Power ground
PIN2	GPIO0	I/O	General-purpose digital I/O (see the GPIO part of the register description in Chapter 13 of the HW3000 Datasheet for details)
PIN3	GPIO1	I/O	
PIN4	GPIO2	I/O	
PIN5	VCC		Power supply 3.3V, power supply voltage range 2.0V~3.6V
PIN6	SD0	0	SPI serial data output
PIN7	SDI	I	SPI serial data input
PIN8	SCK	I	SPI clock signal
PIN9	CSN	I	SPI chip select signal (active low)
PIN10	IRQ	0	Interrupt output pin (polarity can be configured, the default low level is effective)
PIN11	PDN	I	POWER DOWN mode enable input pin (active high), and module hardware reset pin Power ground
PIN12	GND		Power ground
PIN14	ANT		RF antenna output, connect to 50 ohm 433 antenna
PIN15	GND		Power ground

Note: (If the user MCU pin number is really tight, GPIO0, GPIO1, GPIO2 can not be connected; if the number of pins allows, GPIO0, GPIO1, GPIO2 are recommended to receive one of them, but SD0, SDI, SCK, CSN, IRQ, PDN must be connected.)

FCC Statement

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.

NOTE: 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.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AYEO-HW3000 Or Contains FCC ID: 2AYEO-HW3000"

when the module is installed inside another device, the user manual of this device must contain below warning statements;

1. 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.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product

Any company of the host device which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C : 15.231 and 15.209 requirement, Only if the test result comply with FCC part 15C : 15.231 and 15.209 requirement, then the host can be sold legally.

The FCC rule/s for this module are CFR 47 Part 15 Subpart C.

This modular transmitter is only FCC authorized for the specific rule parts listed on its grant. The host product manufacturer is responsible to any other FCC rules that apply to the host not covered by the modular. transmitter grant of certification. The final host product will require Part 15 Subpart B compliance when the modular transmitter is installed.

The module may be operated only with the integral chip antenna with which it is authorized.

Additional testing and certification may be necessary when multiple modules are used.

Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user shall have no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.