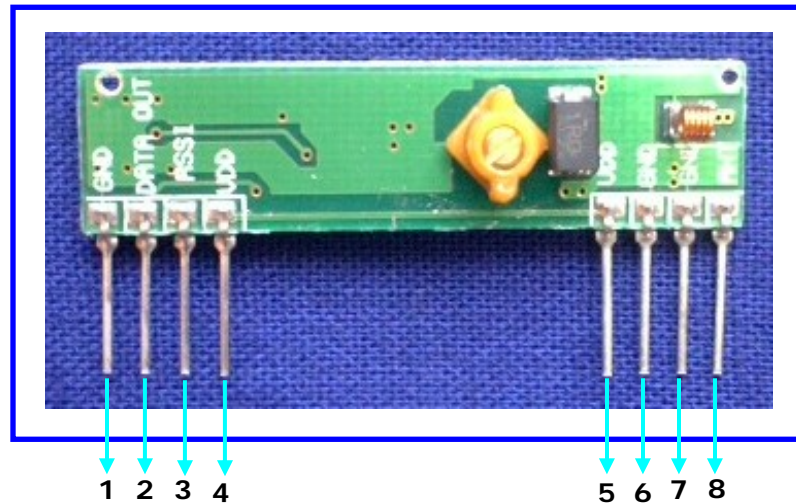


Wireless Receiver Module - RX1- 433.92 MHZ

1. Introduction:

This is the Radio Frequency Receiver Module, which can facilitate the designers to design their remote control applications in the quickest way. The circuit is designed with SMD components and the module size is small enough to fit in to any application. This Receiver Module is Super-Regenerative Version Without Decoder using Amplitude Modulation or in other words ON-OFF Keyed Modulation (OOK)



Pin Definition:

- PIN 1: GND**
- PIN 2: DATA OUT**
- PIN 3: RSSI**
- PIN 4: VCC (5V DC)**
- PIN 5: VCC (5V DC)**
- PIN 6: GND**
- PIN 7: GND**
- PIN 8: ANTENNA (About 30 to 35 cm)**

Dimension of RX1: 43.2 mm X 10.1 mm

Specifications of RX1:

Model	SR Mode	Power	Data Rate (bps)	Sensitivity (dbm)	Power Consumption	Modulation	Channel Width
RX1	SR	+5V DC	300~5K	- 106 dbm	3.23 mA (5V)	AM	1 MHZ

Notes:

SR: Super-Regenerative; AM: Amplitude Modulation

2. Application Areas:

- Automotive Remote entry systems
- Automotive alarm systems
- Gate and garage door openers
- Wireless Data Transmission / Sensor Network
- Electronic Door locks
- Burglar alarm & Security System

3. Application Details:

Above RF module does not include the decoder IC, thus you have to either add the decoder IC in your circuit or implement the decoder software in micro controller by yourself. Our Rolling Code Decoder choices are available for your design. For Rolling Code application, you may use Microchip's Keeloq Encoder IC – HCS 301/P (8 Pin DIP) on the transmitter side and HCS 512/P Keeloq Decoder IC on the Receiver side. However, we can provide you software implemented Decoder on PIC16F628A-I/P that will provide the same functionality like HCS512/P.

On the PCB layout of your control board, be very careful in the following point so that no data loss can happen:

During PCB layout stage, be sure that the ground of the Micro controller and the Receiver Module are not looped. Draw out separate PCB tracks from the Ground to the MCU ground and the Receiver Ground. Keep the ground line as short as possible to the receiver. Also ensure that the MCU is located at about an inch away from the Receiver Module. This is to avoid any data loss due to frequency interference.

Check with our Sales People for your requirements of programmed Rolling Code Encoder / Decoder ICs Low Cost RF two button Remote Control with Decoder PCB, 12 output decoder, RF Relay Switch unit and Antenna. We can supply these to you as ready to use OE sub-assemblies for integrating into your designs.

4. Noise Immunization

This RF receiver is sensitive to RF noise in the pass band because the desired transmitter signals are at very low power levels. Some common noise sources are microprocessors, brush-type motors and high-speed logic circuits. If the rise time and fall time of the clock in a microprocessor are fast enough to produce harmonics in the frequency range of the receiver input and the harmonics fall within the pass band of the receiver, then special care must be taken to reduce the level of the harmonic at the antenna port of the receiver.

Based on above analysis, the following actions have to be taken:

- Microprocessor choice:
Choose those microprocessors that has lowest rise time and lowest fall time, if available.
- Brush-type motor choice:
Choose that brush-type motor, which has spark suppression built in or better not to use such type of motors.
- Logic circuits choice:
High-speed logic circuits generate noise similar to microprocessors. Thus better to choose those circuits with the lowest rise time and the lowest fall time, if available.
- Place the receiver and its antenna as far from the noise source as possible.
- During PCB layout, keep line lengths at a minimum that carry high-speed logic signals or supply brush type motors. Such lines work like antennas that radiate the unwanted noise.
- If possible, enclose the noise source in a grounded metal box and use RF-decoupling on the input/output lines.
- It is advisable to use separate voltage regulator for the RF receiver. If the same voltage regulator has to be used for cost purpose, then a decoupler circuit is recommended so that high frequency noise can be screened.
- The ground path from the receiver module should go directly to the power ground, in between, no other ground paths can join in, otherwise, noise will be introduced in and receiver function will be greatly influenced.

5. Recommended Antenna:

Suitable antennas are required to the success of low-power wireless application. There are some key points on applying the antennas:

- Antenna should be placed on the outside of the product. And try to place the antenna on the top of the product.
- Antenna can't be placed inside a metal case because of its shielding effect.
- Antenna design involves expensive test equipments such as vector network analyzer and calibrated test antenna. Unless you have access to these equipments, use the recommended ones.
- In most indoor locations, dead spots can be found where reception is difficult. These dead spots are due to multiple transmission paths existing between two points because of reflections off metal objects such as steel beams or metal doors. They happen when the path lengths effectively differs by an odd half-wavelength. This explains the phenomenon when you find that at some locations the reception effect is very poor, but beyond that the reception becomes normal.
- 50-Ohm antenna is recommended for the best matching.
- For RX1 - 433.92MHz operation, Whip antenna length of about 30 to 35 Cm is recommended.