4-Channel Switch Control RF Receiving Module with Decoding
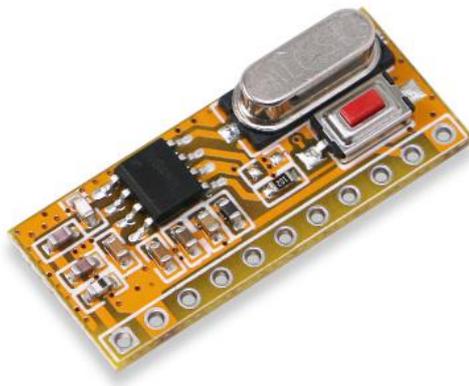
Learning Code, Superheterodyne, Switching Value, RF Receiver Module
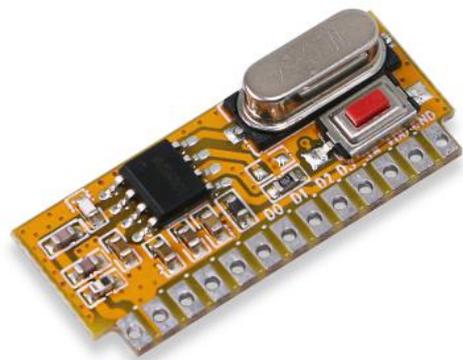
SPECIFICATION

Model No.: DL-RXC6A / DL-RXC6B

Version: V1.0

DL-RXC6A   DL-RXC6B

1. Module introduction

DL-RXC6A / RXC6B is a low cost, small size, high sensitivity super heterodyne ISM band RF receiver module, with decoding (learning code) function. It adopts cost-effective wireless data receiving chip and low power consumption MCU, with built-in image suppression function, can support 2.8V-5.5V wide voltage power supply, which performs high receiving sensitivity, as well as good anti-interference performance.

The module can meet your needs (realize the application) by setting the logic state of T1 and T2, and independently leads out three ports as following: Pairing status LED indicator, SW learning code-checking button, and VT public valid signal indication. The LED indicator and SW learning code-checking button can be led to the circuit board or casing of the product, which is convenient for you to operate.

DL-RXC6B leads out the T1 and T2 setting ends from the DL-RXC6A version, and the pins adopt a 2.0mm pitch to reduce the size of the module. It also adopts T-type board double-sided in-line pad design. Its bottom plate uses a slotted in-line method, which the module can be inserted directly on the circuit board and then wave soldering. By this way, it can save the soldering of the pin header and reduce the height of the module to 10mm.

DL-RXC6A / DL-RXC6B are compatible with PT2262 and 1527 encoding. The corresponding decoding and receiving module can also be ODM (customized) according to different remote-control encoding types.

2. Antenna Description

Antenna pin of DL-RXC6A / RXC6B module is ANT, it can be added with single-ended simple antenna (straight wire) to improve the receiving sensitivity. Its control distance depends on the receiving antenna, receiving sensitivity, remote controller's transmit power, and transmit antenna.

Recommended single-core antenna length reference:

315M == 25 CM; 433M == 18 CM (based on actual test results)

Measured reference distance:

DL-RXC6A / RXC6B plus antenna (must be straightened), with our standard four-key remote control, the test reference distance in open ground is about 200 meters.

We can optimize the performance of the on-board impedance matching network and remote controller; according to the structural space of the products (refer to the design diagram 3 for the placement of the antenna and the matching network):

ShenZhen Dreamlnk Technology Co., Ltd   **Tel:** 86-755-29369047   **E-mail:** james@dreamlnk.com   www.iot-rf.com
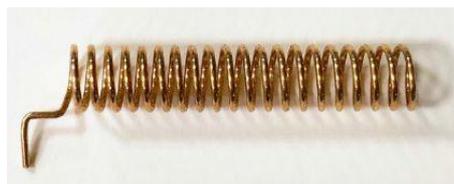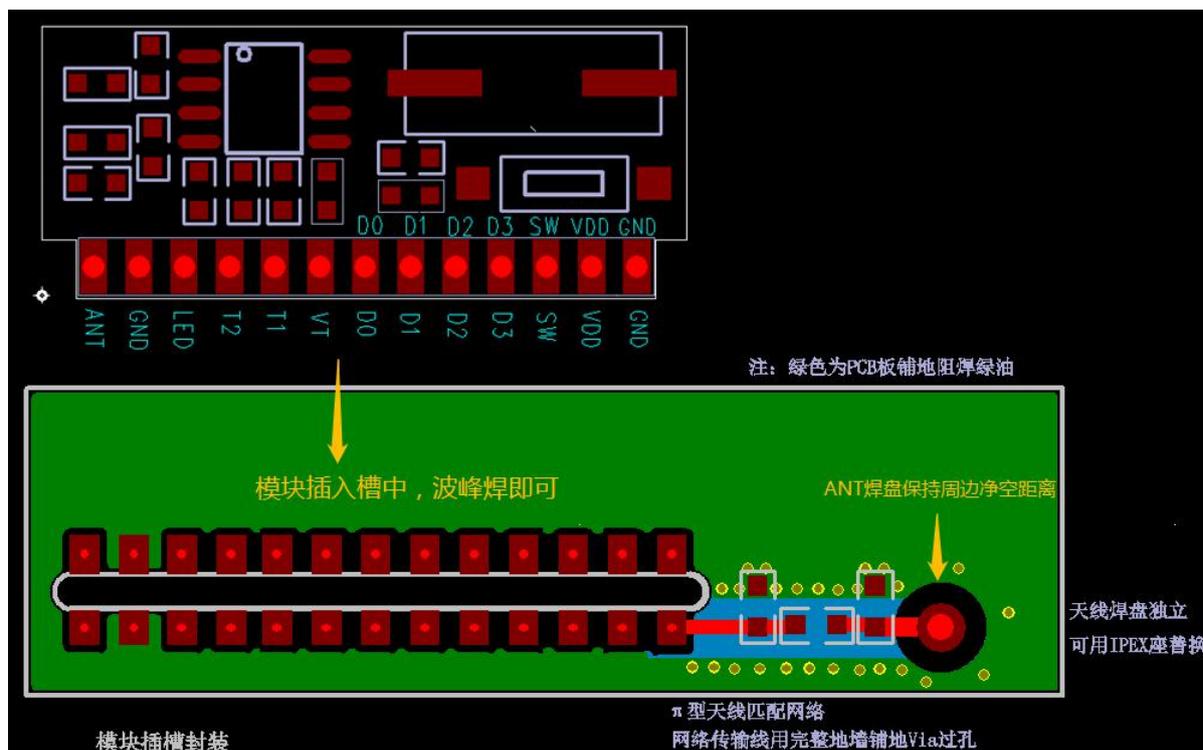
2

Figure 1: T15

Figure 2: T14

Figure 3：Schematic diagram of module insertion and antenna layout

Note: It is not recommended to weld the spring antenna directly to the ANT pin of the module. Coupling to the antenna feed point through a π-type network, when welding spring antennas (as Diagram 1 and 2) on the pads of the feed point, keep the height of the antenna from the floor as far as possible, and away from the high-frequency interference sources, so that the antenna maintains a certain clear space. To achieve the best antenna effect, please provide the complete product structure, housing, PCBA, etc. Our antenna engineer will match the best π-type impedance for you.

3. Applications

- ● Multi-channel controller for electric vehicles
- ● Multi-channel input and output switching control
- ● Remote control of multi-channel chandelier and lighting
- ● Wireless multi-channel opening and closing controller
- ● Standard 1527 protocol remote control
- ● Energy control and management
- ● Multi-level control circuit
- ● D1-D4 can directly drive Darlington and relay circuits;
- ● Intelligent buildings

ShenZhen Dreamlnk Technology Co., Ltd **Tel:** 86-755-29369047 **E-mail:** james@dreamlnk.com www.iot-rf.com

3

● Multi-channel on-off control of motors

4. Features & Brief Introduction:

● Frequency range: 315MHz, 433.92MHz (special frequency can be customized)

● Sensitivity: Up to -112 dBm

● Power supply voltage input range: 2.8V-5.5V (recommended working voltage 3.3V or 5.0V)

● Latch and non-latching mode selection: Set T1/ T2 decoding, output latch / unlatching

● It can be used to learn PT2260, 2262, 1527 remote controllers with good rate compatibility

● Encoded data transmission rate 2.5K bps (Manchester encoding)

● OOK modulation mode, can work with PT4450, 115H, 113, R25 (2SK3356) and other transmitting circuits

● Module size 28.5 × 12 × 6mm (A version), 28.5 × 12 × 6mm (B version, T type plate)

5. Technical Parameter

Parameter	Symbol	State	Reference Value			Unit
			Min.	Typ.	Max.	
Working frequency	Fc			315 , 433.92		MHz
Modulation Mode				ASK		
Receiving sensitivity		50 ohm antenna direct input /1k Kbps		-112		dBm
RF Receive bandwidth				300		KHz
Data demodulation bandwidth		Demodulation pulse width is 0.2-1ms	1	2.5		K
System Start-up time	Ton					ms
Supply Voltage	VDD		2.8	3.3 or 5.0	5.5	V
Working Current	IRC	VDD=3.3V/315M		3.9		mA
		VDD=3.3V/433M		6		mA

Logic Truth Table	T1	T2	State description
Inching (M) mode	High level (NC)	High level (NC)	The two setting ports of T1 and T2 are suspended, and no level is connected.
Self-locking (L) mode	High level (NC)	Low level (GND)	D0-D3 independently output latch state, flipping when valid signal detected
Interlocking (H) mode	Low level (GND)	High level (NC)	D0-D3 interlock output, the current signal output remains unique
Reserved mode	Low level (GND)	Low level (GND)	Other function modes can be customized (not used yet)

Note: To confirm that the setting is valid, the red DK tool board needs to be powered on and reset, every time after setting the T1 and T2 states
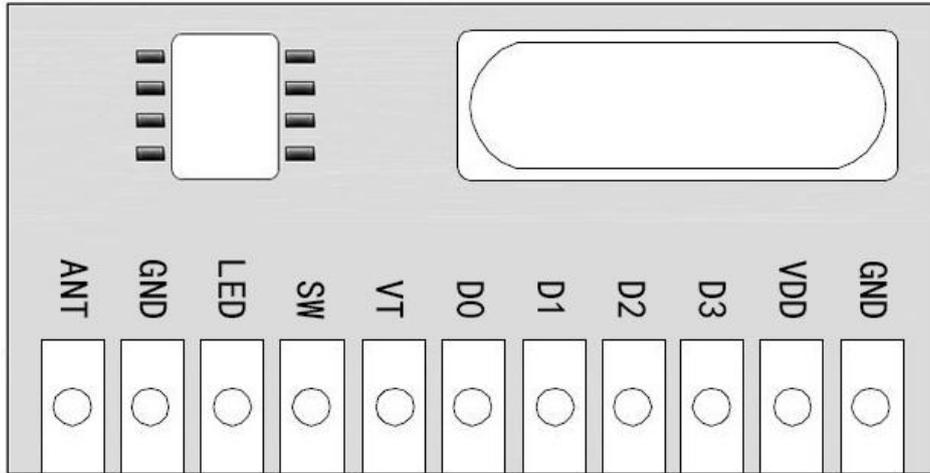
6. Pin Definitions
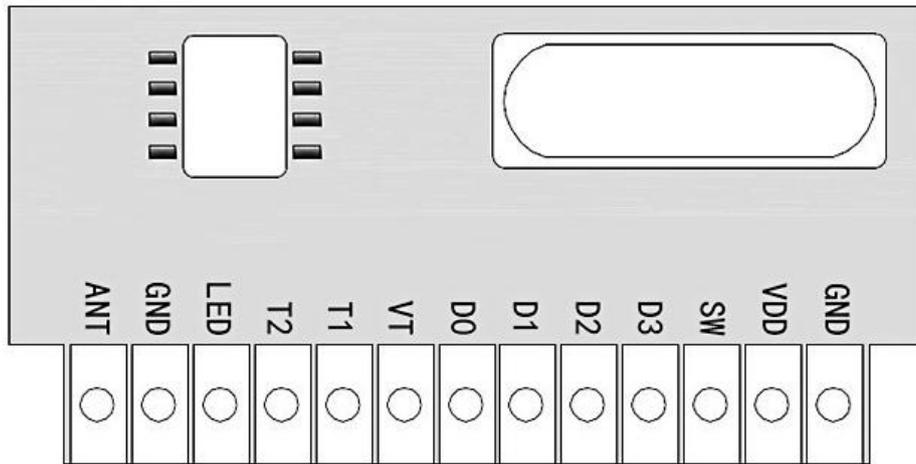

Figure4   DL-RXC6A Module interface definition diagram

Figure 5   DL-RXC6B Module interface definition diagram

Pin	Description
VDD	Power supply 2.8-5.5V, it is recommended to use LDO or battery output, Standard voltage 3.3V or 5.0V
GND	Module grounding , Reliably grounded and close to the system filter capacitor
LED	External pairing LED indicator, press 2S for pairing, light on and flashes 3 times quickly means matching succeed, 8S long press until light off to clear the code
VT	Common signal terminal, high level output (signal status indication) when valid signal detected
T1、T2	Working mode setting pins, detailed setting refers to the Logic Truth Table: 11, 10, 01 state only, 00 state is not used
D0-D3	D0, D1, D2, and D3 correspond to four key values of 1000, 0100, 0010, and 0001 of the standard remote control respectively
ANT	Antenna (Refer to Figure 3 to design the patch cord and signal feed point)

Description: D0-D3 data output, corresponding to different remote-control key values, can output 0000-1111 BCD code.

ShenZhen Dreamlnk Technology Co., Ltd   Tel: 86-755-29369047   **E-mail:** james@dreamlnk.com   www.iot-rf.com

5

EV1527 million group learning code encoding IC chip pin correspondence table: K0-K3 key combination

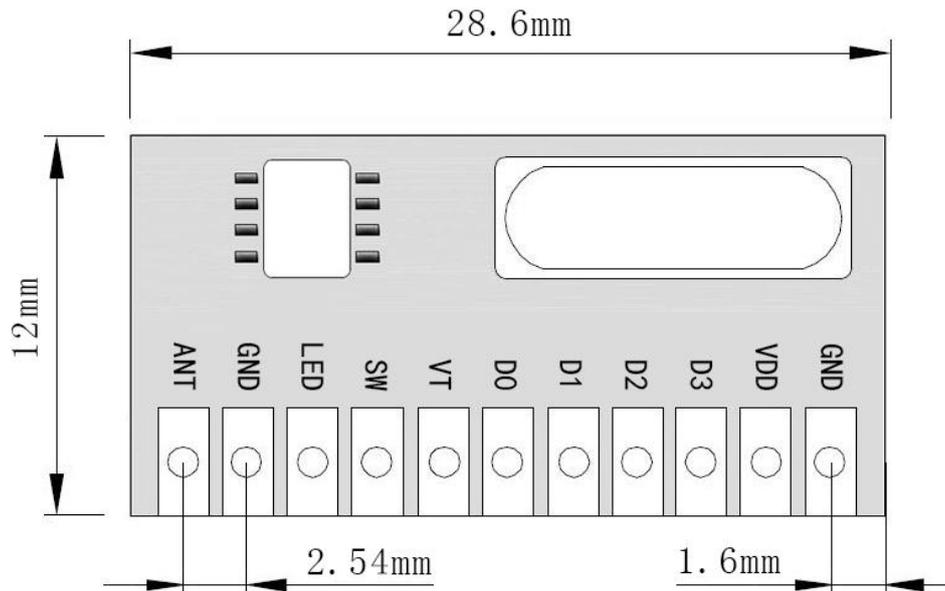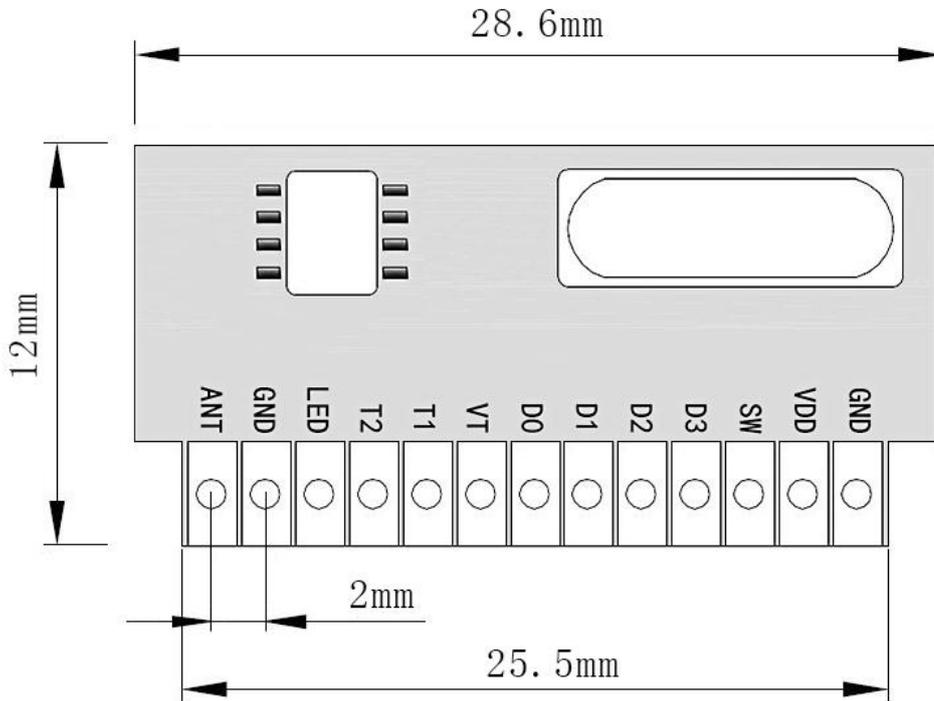| K3	K2	K1	K0		D3	D2	D1	D0
0	0	0	1		0	0	0	1
0	0	1	0		0	0	1	0
0	0	1	1		0	0	1	1
0	1	0	0		0	1	0	0
0	1	0	1		0	1	0	1
0	1	1	0		0	1	1	0
0	1	1	1		0	1	1	1
1	0	0	0		1	0	0	0
1	0	0	1		1	0	0	1
1	0	1	0		1	0	1	0
1	0	1	1		1	0	1	1
1	1	0	0		1	1	0	0
1	1	0	1		1	1	0	1
1	1	1	0		1	1	1	0
1	1	1	1		1	1	1	1

7. Module size

Figure6:   DL-RXC6A Dimensions

Figure 7: DL-RXC6B Dimensions (Recommended slot length 26mm, slot width 1.1mm)

8. Remote control matching instructions

● DL-RXC6A / DL-RXC6B can be used with 2260 and 2262 coded remote controllers of the same frequency, which can learn and store 12 kinds of coded addresses, by matching the corresponding vibration resistance. You can use it, by learning just one remote control.

● 1527 million coded remote controllers, each remote controller has an address, up to 14 remote controllers can be matched at the same time. The 15th can also be paired successfully, but the first remote controller that was successfully paired will be invalid; the 16th will make the 2nd invalid; the 17th will make the 3rd invalid…

● DL-RXC6A / DL-RXC6B can receive 1527, 2260, 2262 coded pulses with a learning code width period of 1.56ms (± 20%), and vibration resistance needs to be adjusted beyond this range

9. Code matching

DL-RXC6A/DL-RXC6B has a pairing key and pairing LED, the receive module needs to be powered on to match the code, press the receive pairing key (must be released), the LED is on, press any button to transmit, when the light flashes quickly and goes out, the code is successfully paired. Then you can use the 4 buttons on the remote control to control the output of the 4 output ports to output high levels, see the test circuit.

If the LED of the receiving module is off, the code cannot be matched. You need to check whether the receiving power is normal, the remote control is normal, whether it belongs to 2262, 1527 encoding; if you can match the code, but cannot remote control, you need to

confirm whether the code width is within the range, DL-RXC6A / DL-RXC6B does not support other format encoding (except 2262, 1527 encoding).

10. Problems in module application

The communication distance is too close, and the ideal distance is not reached at all	
Interference source	Temperature, humidity, and co-channel interference will increase the communication packet loss rate (seawater absorbs radio waves, so the test effect
Antenna	There is a metal object near the antenna, or placed in a metal shell, the signal attenuation will be very serious, keep the antenna clear distance
Setting pins	T1 and T2 are output modes; they are setting pins of the module, which are commonly used in application. Please refer to the interface definition for correct
Parameter values	The module was default as 433.92MHz, 2.5Kbps rate, sensitivity is -112dBm; and the output signal state is determined by T1, T2 level
Low voltage	The power supply voltage is lower than 2.8V, the lower the voltage, the lower the receiving sensitivity. When the voltage is lower than 2.8V, the RF chip does not
The module is hot and easily damaged	
Power supply	Please check the power supply to ensure that it is between 2.8V ~ 5.5V, 3.3V is recommended
Stability	Please check the power supply stability, the voltage should not fluctuate significantly and frequently
Anti-static	Please ensure anti-static operation during installation and use, high-frequency devices have electrostatic sensitivity

11. Contact us

Shenzhen DreamLnk Technology Co., Ltd

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

Office Add.: Room 603, Unit C, Zone A, Huameiju Business Center, Xinhu Rd., Bao'an District, Shenzhen, Guangdong Province, China
Factory Add.: 5th Floor, Building B, Huazhi Innovation Valley, No. 7 Yuhua Street, 138 Industrial Zone, Tangxia Town, Dongguan, Guangdong Province, China
TEL.: +86-755-29369047   **FAX**: +86-755-27844601
Mobile: +86 13760215716   **Wechat**: wsj_james
E-mail: james@dreamlnk.com   **Web**: www.iot-rf.com