

GD Dongyi Optoelectronics Co.Ltd.

SPECIFICATION FOR APPROVAL

Customer	
Product Name	
Version number	
Dimension	
Texture of material	
Number	
Date	

Product confirm and sign

Engineering Department	Prepared Department	Quality Department	Checked	Signature

INSPECT RESULT

☐ ACCEPT☐ REJECT

Customer confirm and sign

Engineering Department	Quality Department	Checked	Approved	Signature

INSPECT RESULT

☐ ACCEPT☐ REJECT

REMARK:

■ sample

Product Name : _____ **Product Name :** _____**Quality :** _____ **Date :** _____

INFRARED RECEIVER MODULE

● Description

The Infrared Receiver is miniaturized infrared receivers for remote control and other applications requiring improved ambient light rejection.

The separate PIN diode and preamplifier IC are assembled on a single lead frame.

The epoxy package contains a special IR filter.

This module has excellent performance even in disturbed ambient light applications and provides protection against uncontrolled output pulses.



● Features

- Wide Operating Supply Voltage 2.5v - 6.0 V
- Low current consumption (Typ. 320uA @ 5V, 370uA @ 5V)
- Maximum interference safety against VCC noise & light noise
- No external components necessary
- Internal filter for a high frequency lighting fluorescent lamp
- Output active low
- High ESD level up to 8KV for HBM
- Carrier frequency 37.9khz

● Applications:

1. Optical switch
2. Light detecting portion of remote control
 - AV instruments such as Audio, TV, VCR, CD, MD, DVD, etc.
 - Home appliances such as Air-conditioner, Fan, etc.
 - CATV set top boxes
 - Multi-media Equipment

● Cautions

- store and use where there is no force causing transformation or change in quality
- store and use where there is no extreme humidity
- in order to prevent damage from static electricity make sure that the human body and the Soldering iron are connected to ground before using
- the ripple noise from power supply lines may shorten detecting distance of IR receiver module
Thus in order to ensure more reliable operating please add RC filter (R=100 Ω C=47pF) between Vcc and GND
- when a disturbance signal is applied to the series it can still receive the data signal
However the sensitivity is reduced to the level that no unexpected pulses will occur
Some examples of such disturbance signals which can be suppressed pulses by the series
 - A DC light (ex from tungsten lamp or sunlight)
 - B Continuous signal at center frequency or any other frequency
 - C Signals from fluorescent lamps with electronic ballast with high or low modulation

● **Absolute Maximum Ratings**($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Ratings	Unit	Notice
Supply Voltage	V_{CC}	-0.3 - 7.0	V	—
Supply Current	I_{CC}	0~2.5	mA	
Operating Temperature	T_{opr}	-20~+80	$^{\circ}\text{C}$	—
Storage Temperature	T_{stg}	-40~+125	$^{\circ}\text{C}$	—
Soldering Temperature	T_{sol}	260 $t < 5\text{sec}$	$^{\circ}\text{C}$	
Reflow soldering temperature	T_{sol}	260 $t < 10\text{sec}$	$^{\circ}\text{C}$	

● **Electrical And Optical Characteristics**($T_a=25^{\circ}\text{C}$)

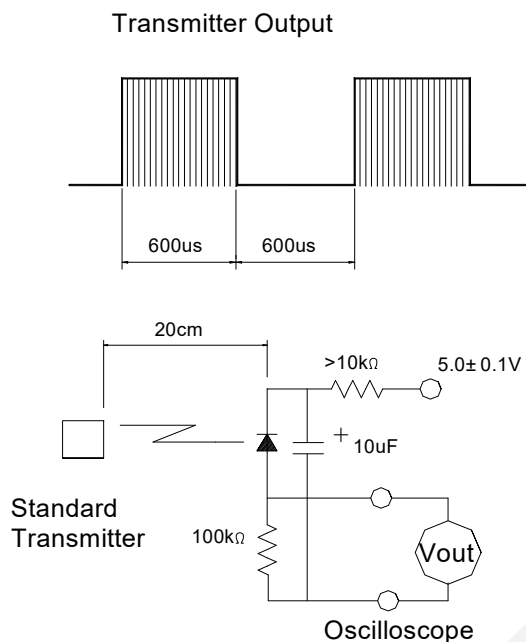
Parameter	Symbol	Ratings			Unit	Condition	
		Min.	Typ.	Max.			
Supply Voltage	V_S	2.5	--	6.0	V		
Supply Current	I_{CC}	--	50	76	μA	$V_{CC}=5\text{V}$	No signal input
Reception Distance	—	—	12	15	m	At the ray axis*1	
B.P.F Center Frequency	f_o	—	38	—	KHz		
Peak Wavelength	λ_p	—	940	—	nm		
Half Angle	θ	—	45	—	deg	At the ray axis *1	
High Level Pulse Width	T_H	450	—	800	μS	At the ray axis *2	
Low Level Pulse Width	T_L	450	—	800	μS		
High Level Output Voltage	V_H	4.7	—	—	V	$V_{CC}=5\text{V}$	
		2.7	—	—		$V_{CC}=3\text{V}$	
Low Level Output Voltage	V_L	0.0	0.2	0.4	V		

*1: The ray receiving surface at a vertex and relation to the ray axis in the range of $\theta=0^{\circ}$ and $\theta=45^{\circ}$

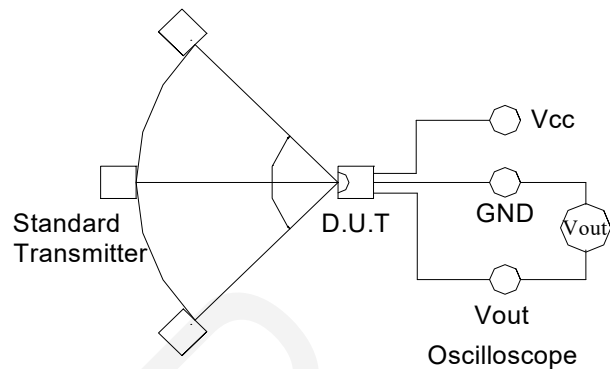
*2: A range from 30cm to the arrival distance. Average value of 50 pulses

● Test Method

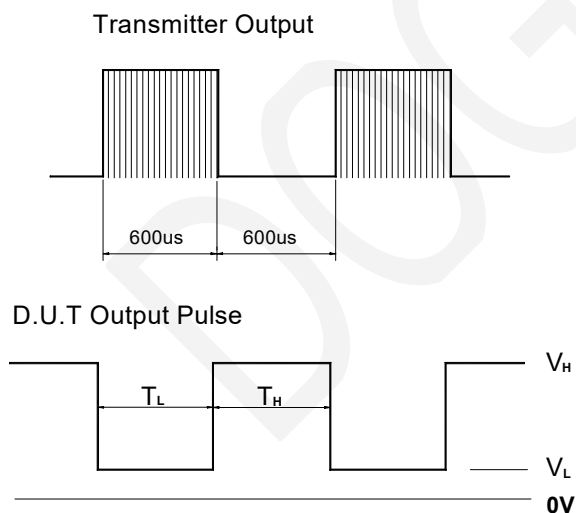
A. Standard Transmitter



B. Detection Length Test



C. Pulse Width Test



● Application Circuit

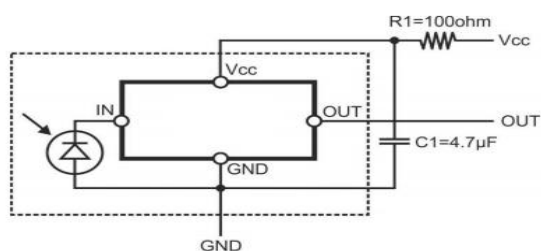
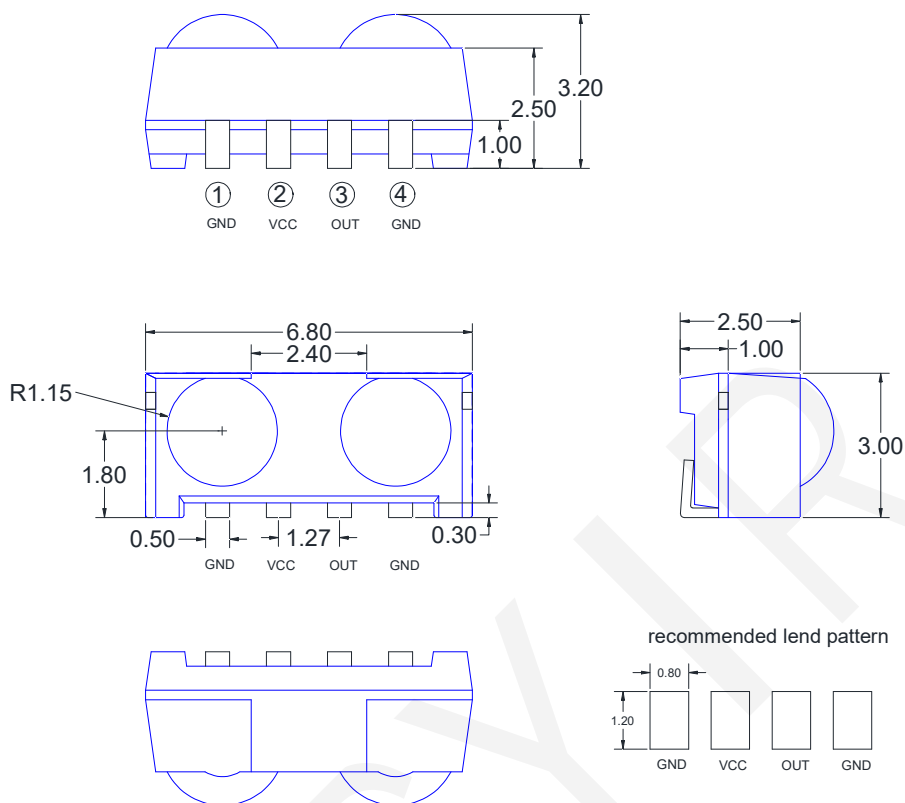


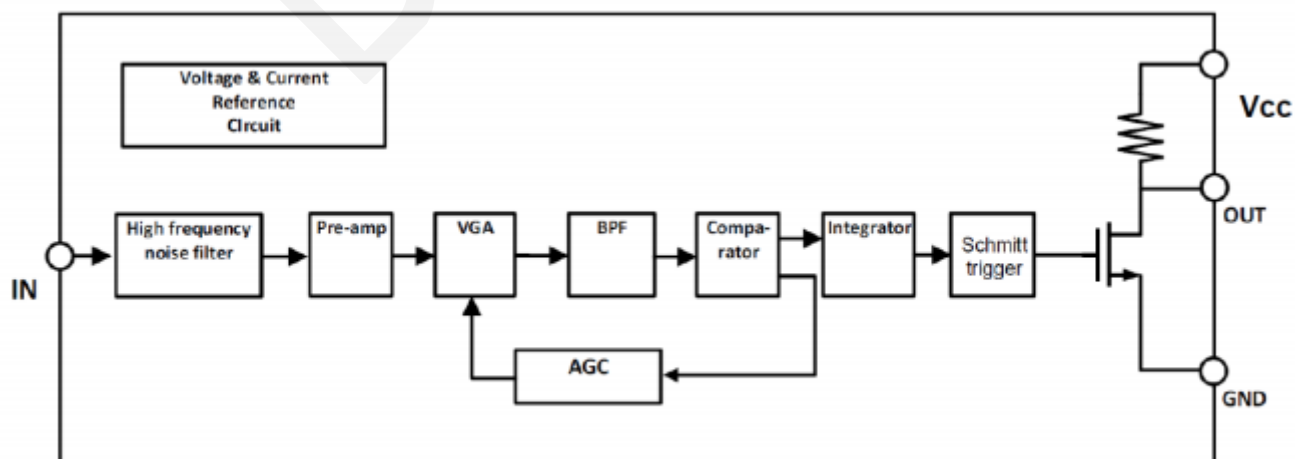
Fig. 5. Application diagram.



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.30\text{mm}$ (0.012") unless otherwise specified.
3. Specifications are subject to change without notice.

● Function block diagram



● Electrical And Optical Curves(Ta=25°C)

Fig.1 Relative Spectral Sensitivity vs. Wavelength

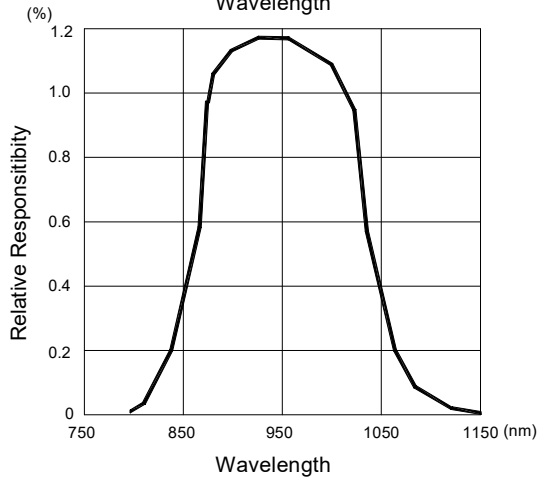


Fig.2 Relative Transmission Distance Vs. Direction

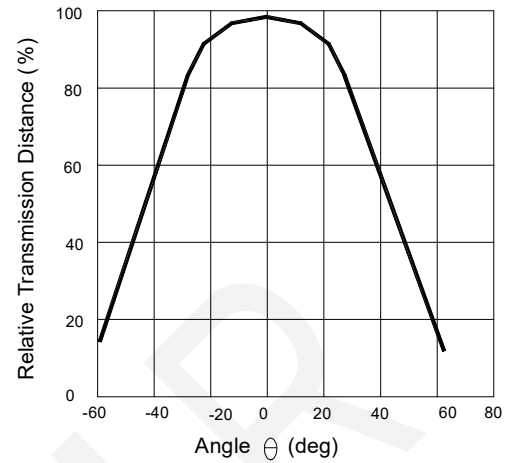


Fig.3 Frequency Dependence of Responsivity

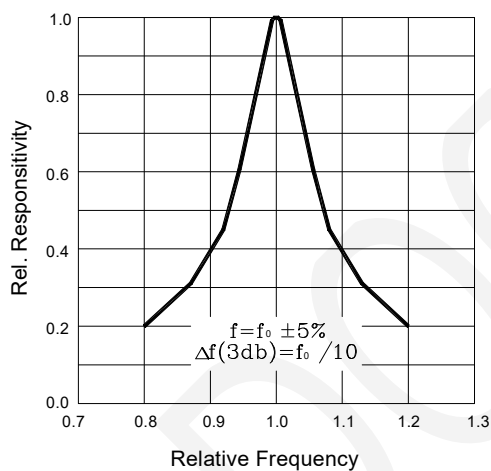


Fig.4 Supply Current vs. Ambient Temperature

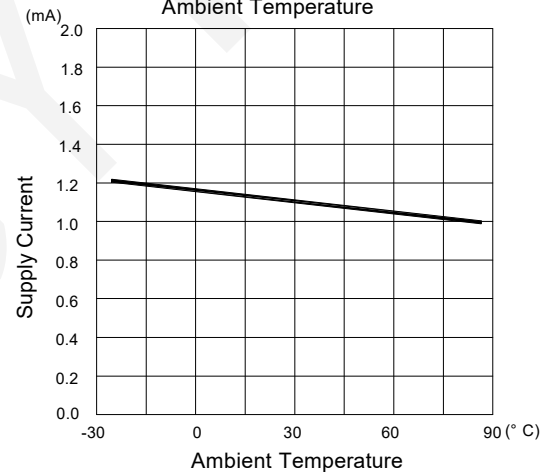
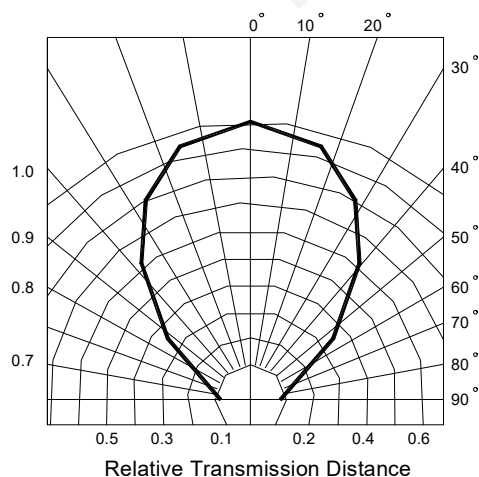


Fig.5 Relative Transmission Distance vs. Direction



ESD Test Results

Parameter	Specification	Results
Machine Model	Min ±200V	> ±400V
Human Body Model	Min ±2000V	> ±4000V
Charged Device Model	Min ±400V	> ±600V

● Suitable Data format

Item	Symbol	Time
Minimum burst length	tBurst	8 pulses
Minimum gap time after each burst	tGap	12 pulses
Minimum pause time in the data stream	t _{pause_min}	25 msec

t_{Pause_min} Could be changed by different data word format. Therefore, for new application on sets please refer to "Required data pause time(t_{Pause})" on above.

● Reliability Test Items

Parameter	Test conditions	Remark
High Temperature	Ta=+85, VCC=5.0V t=240h	※1, ※2
Low Temperature	Ta=-30, VCC=5.0V t=240h	※1, ※2
High Temp./ High Humidity	Ta=+85℃ 85%RH, VCC=5.0V t=240h	※1, ※2
Heat Cycle	Ta=-20℃(0.5h) to +85℃(0.5h) 20 cycle	※2, ※3
Fall Test	Height=75cm, 3 times	※4

※ 1. Supply voltage of load test is 5V.

※ 2. Electro-optical characteristics shall be satisfied after leaving 2 hours in the normal condition.

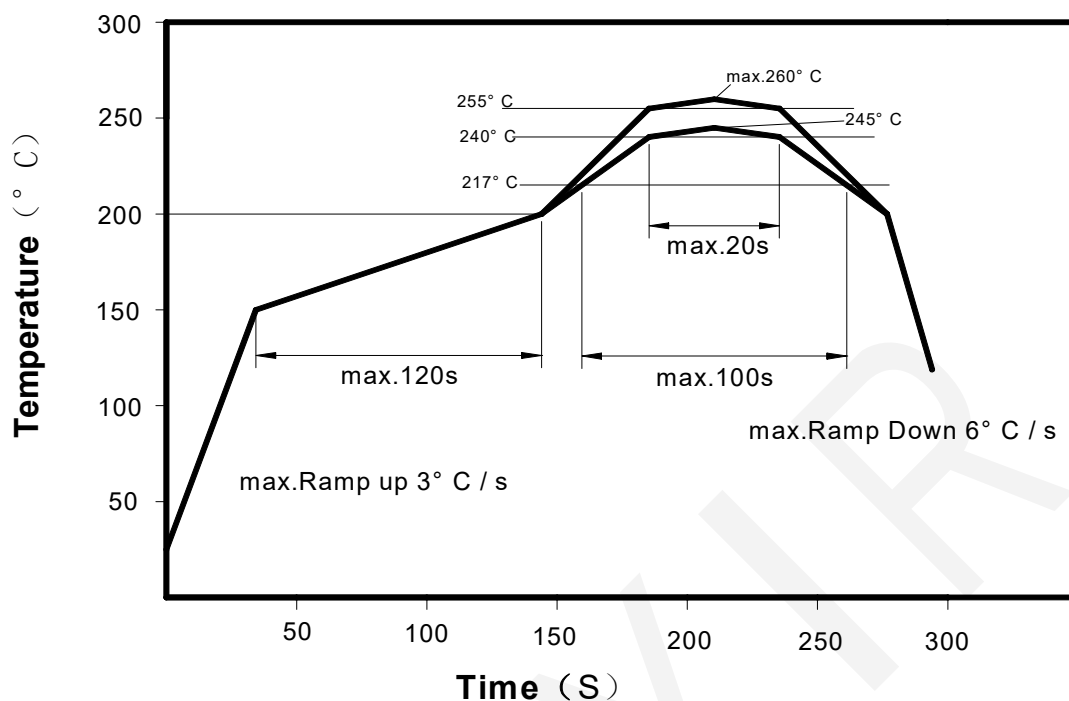
※ 3. Heat cycle test shall repeat above condition 20 times under no load.

※ 4. The test devices shall be dropped three time on the hard wooden board from a height of 75cm.

● Material Configuration

Parameter	Configuration	Remark
IC	Silicon(99%)	
Photo diode	Silicon(99%)	
Epoxy resin	Resin(55.5%), Hardener(45.5%)	
Silver epoxy	Silver(80%), Resin(10%), Hardener(10%)	
Bond wire	Gold(99.99%)	

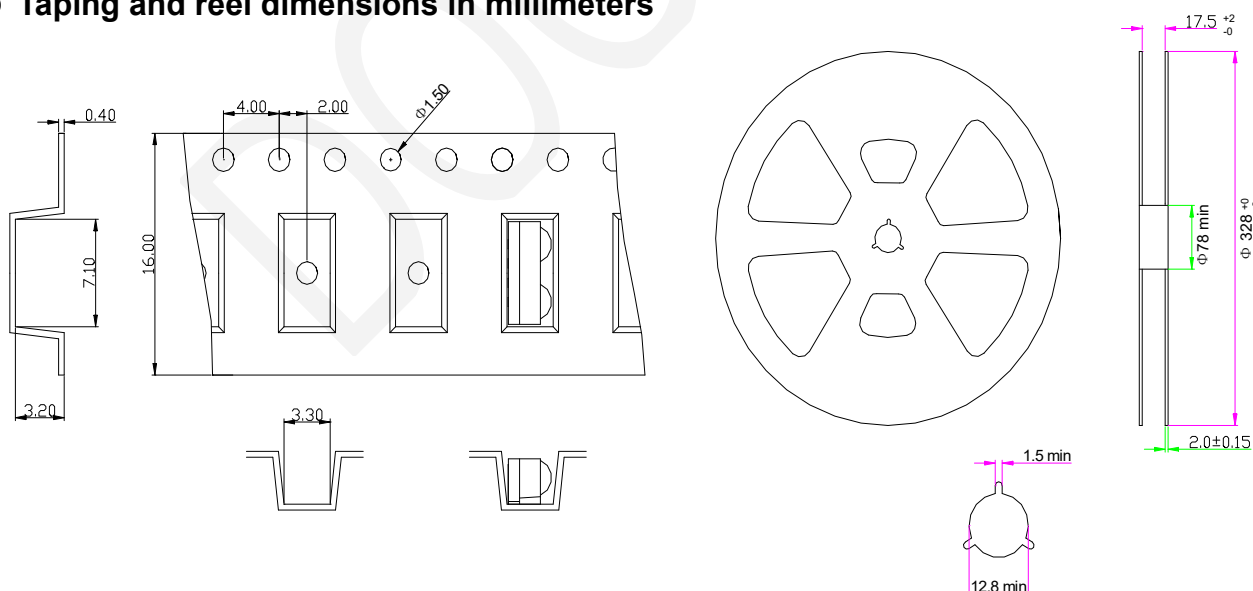
● Lead(Pb)-Free Reflow Solder Profile



● Manual soldering

Use a soldering iron of 25W or less. Adjust the temperature of the soldering iron below 260°C.

● Taping and reel dimensions in millimeters



NOTES:

1. 2000 PCS per reel
2. All dimensions are in millimeters (inches).
3. Tolerance is ± 0.30 mm (0.012") unless otherwise specified.
4. Specifications are subject to change without notice.

Decoding Protocol

Data Format	
Toshiba	√
NEC	√
RC5_Philips	√
RC6_Philips	√
RCA_Thomson	×
Sony 12bit	√
Sony 15bit or 20bit	×
XMP/RCMM	×
Continuous code	×
Power meter (>200“0”bit)	×

Precautions

1.Keep in storage

Storage environment of Infrared receiver head with temperature not exceeding 30℃ and relative humidity not exceeding 70%.It is recommended that Infrared receiver head be used in the original box for no more than three months. If longer storage time is required, put it in the drying box and add desiccant or filled with nitrogen.

2.Clean

Special care must be taken when cleaning colloids with chemicals, as some chemicals have damage to the colloidal surface and cause fading such as trichloroethylene, propylene, ketone, etc.It can be wiped and soaked with ethanol for no more than 3 minutes at room temperature.

3.Feet assembly

- (1) It must be 2 mm from the colloid to bend the bracket.
- (2) Support forming must be done with fixtures or by a professional.
- (3) Support forming must be completed before welding.
- (4) The pins and spacing are the same as on the circuit board.
- (5) Welding must be performed at normal temperature and when Infrared receiver head is normally welded to the PCB plate, avoid applying mechanical pressure at LED pins at a minimum.

4.Electrostatic protection

High increase of static electricity and current will damage Infrared receiver head. Use antistatic devices such as protective belts and gloves. Note: human discharge mode HBM <1000V; machine discharge mode <100V.

5.Other

Do not apply unnecessary external force to the pins of the infrared receiver head;Pay attention to protecting the receiving surface of the infrared receiver head,Staining can affect reception function。