●概述 General:

红外遥控接收放大器是将光探测器与前置放大器封装在一起，以实现遥控信号的接收放大。环氧封装可滤除可见光干扰，检波输出信号可直接由微处理器译码，主要用于电视机、机顶盒、录像机、DVD、DVR、PVR、卫星接收机、空调等领域。

Infrared module for remote control system which is PIN diode and preamplifier series are assembled on lead frame, in order to realize the receiving and amplifying the infrared remote controller signal. The type of epoxy package can filter the visual interference. The demodulated output signal can directly be decoded by a microprocessor. It may be used in TV sets,STB,Video recorder，DVD，DVR，PVR，satellite receivers、air conditioners etc.

● 特点 Features:

- ◆ 可靠性高 High reliability
- ◆ 无外围元件，内部屏蔽 No external parts, Inner discrete shield
- ◆ 灵敏度高，传输范围远 High sensitivity, Large transmission range
- ◆ 对于环境光、电源杂讯和电磁场干扰有很强的抗扰性
  High immunity against ambient light, power noise and electromagnetic interference
- ◆ 低功耗 Low power consumption
- ◆ 最小脉冲宽度≥12 载波周期
  Suitable minimum burst length≥12 cycles of carrier
- ◆ 最小脉冲间隔≥16 载波周期
  Suitalbe minimum burst gap time≥16 cycles of carrier
- ◆ 最小信号间隔时间≥20 毫秒
  Suitable minimum data pause time≥20ms
- ◆ 兼容 TTL&CMOS 电平 TTL＆CMOS Compatibility
- ◆ 符合 RoHS 2002/95/EC 标准 Component in accordance to RoHS 2002/95/EC

● 型号表 Parts Table

型号 Part	载波频率 Carrier Frequency
HRM533AA5400C	32.7kHz
HRM536AA5400C	36kHz
HRM537AA5400C	36.7kHz
HRM538AA5400C	37.9kHz
HRM540AA5400C	40kHz

● 极限参数 Absolute Maximum Ratings (Ta=25°C)

参数 Parameters	符号 Symbol	额定值 Rated value	单位 Unit
电源电压 Supply voltage	V_{CC}	6.0	V
电源电流 Supply Current	Icc	3.0	mA
输出电压 Output Voltage	Vo	6.0	V
输出电流 Output Current	Io	3.0	mA
工作温度 Operation Temp.	T_{amb}	-25~+85	°C
贮存温度 Storage Temp.	T_{stg}	-25~+85	°C
功率 Power Dissipation	P	50	mW
焊接温度（10 秒） Soldering Temp.（10s）*	T_{sd}	+260	°C

*浸渍入离器件本体 2~2.5 毫米
Dip up to 2.0~2.5mm from the terminal root

● 推荐工作条件 Recommended operating conditions (Ta=25°C)

参数 Parameter	符号 Symbol	工作条件 Operating conditions	单位 Unit
电源电压 Supply Voltage	Vcc	4.5~5.5	V

● 光电参数 Opto-electric characteristics (Ta=25°C)

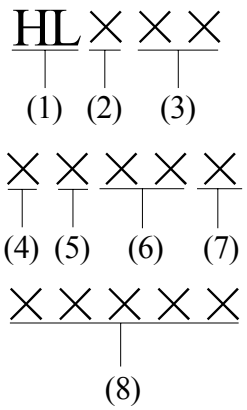
参数 Parameters	符号 symbol	测试条件 Test condition	最小值 Min.	典型值 Typ.	最大值 Max.	单位 Unit
电源电流 Supply current	I_{CC}	Vcc=5V Ev=0 Ee=0	0.8	1.1	1.4	mA
峰值波长 Peak wavelength	λ_P			940		nm

高电平输出电压 High output voltage	V_{0H}	Vcc=5V Ee=0.5mw/m^2 P_W=600μs Duty=50%	4.75		5.0	V
低电平输出电压 Low output voltage	V_{OL}				0.25	V
高电平输出脉宽 High output pulse width	T_{Wh}		450	600	750	μs
低电平输出脉宽 Low output pulse width	T_{wl}		450	600	750	μs
接收距离 Receiving distance	L	Ee=0.5mw/m^2 Vcc=5V Ev=(200±50)Lx	15	33		m
水平受控角 Horizontal half angle	$\theta_{1/2}$	Ee=0.5mw/m^2 Vcc=5V Ev=(200±50)Lx L=6.5m		45		deg

● 印章 Mark

在产品背面按如下打印产品型号和生产批号，

Print type model and LOT.NO. on the back of product as follow:



(1):公司标志Company logo
(2):工作电压Operation voltage
(3):调制频率Modulated frequency
(4):封装形式Packaging model
(5):引脚排列Pin arrangement
(6):IC芯片代码IC chip code
(7):内屏蔽形式Inner shield type
(8):生产日期代码Date code

●特性曲线 Characteristics Curve (环境温度 Tamb=25℃)

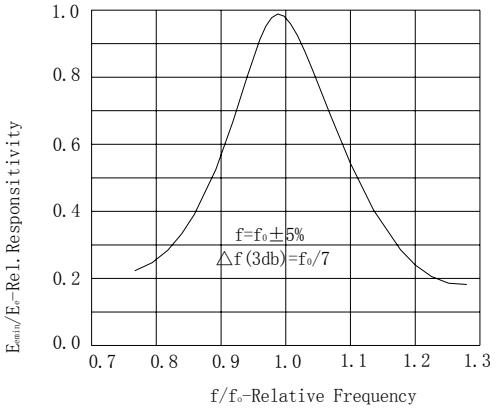


Figure 1. Frequency Dependence of Responsivity

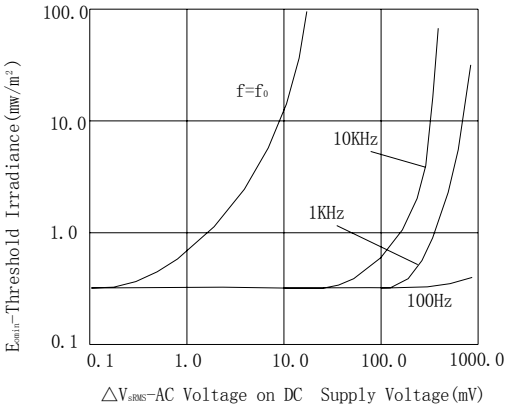


Figure 2. Sensitivity vs.SupplyVoltage Disturbances

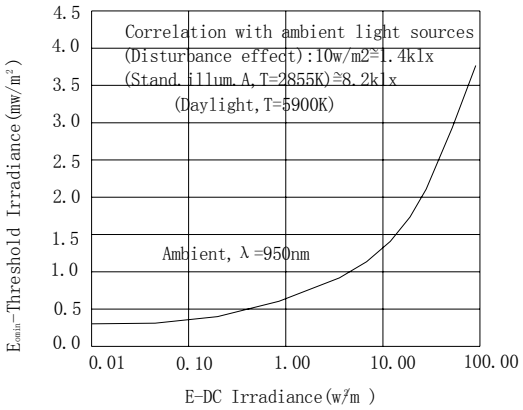


Figure 3. Sensitivity in Bright Ambient

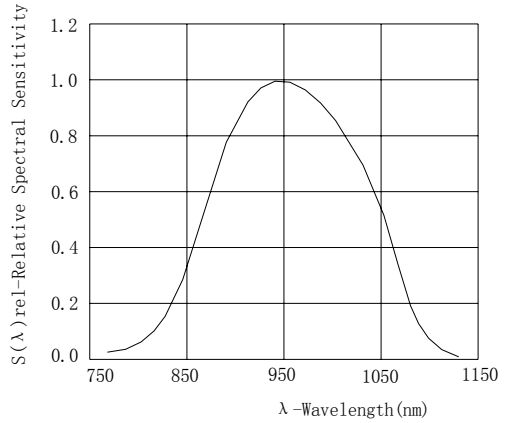


Figure 4. Relative Spectral Sensitivity vs.Wavelength

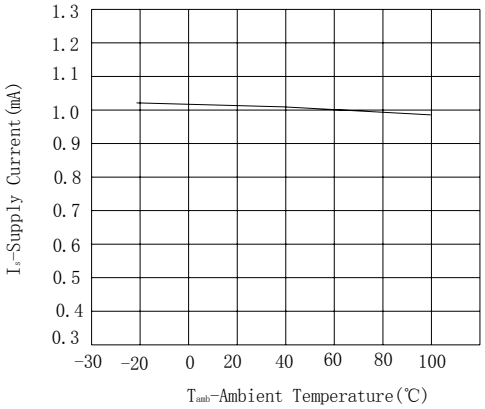


Figure 5. Supply Current vs.Ambient Temperature

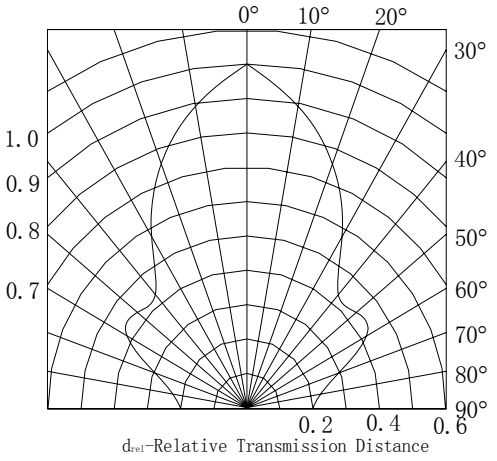
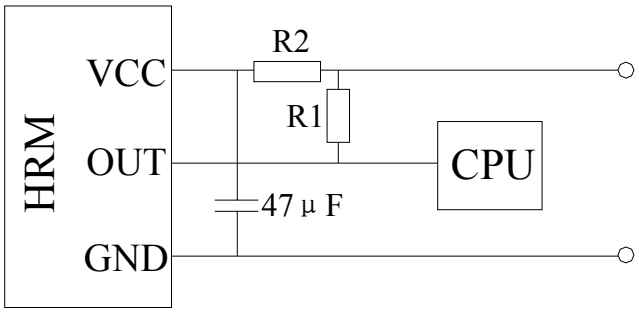


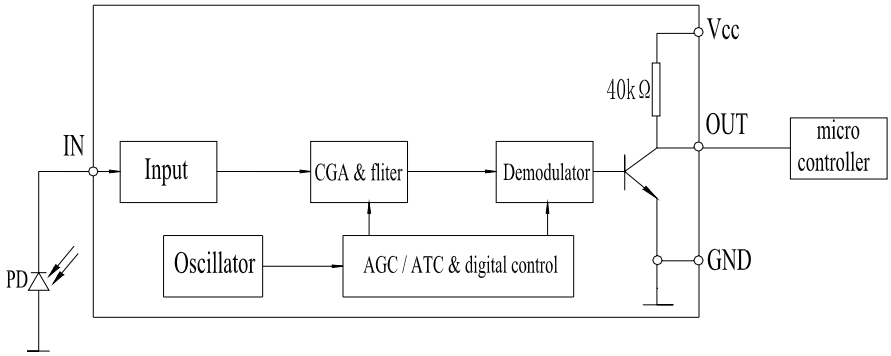
Figure 6. Directivity

● 推荐电路 Recommended circuit



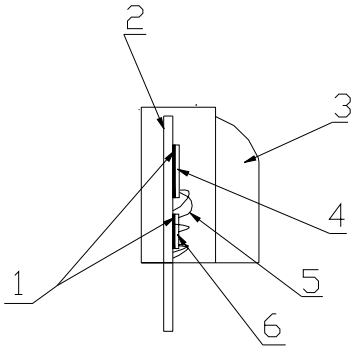
Note: 1、When load is 32.4kΩ ,1.6kΩ to 8.5kΩ
external pull-up resister(R1) is recommended.
当负载是32.4kΩ，推荐外部上拉电阻R1为1.6kΩ到8.5kΩ。
2、R1 shall be adjusted with changing of load.
当负载改变，上拉电阻R1也必须做相应的调整。
3、100Ω for current limited resistor(R2) is recommended,
and shall be adjusted after considering the real condition.
限流电阻R2推荐使用100Ω，可以根据实际电路调整。

● 内部框图 Block diagram

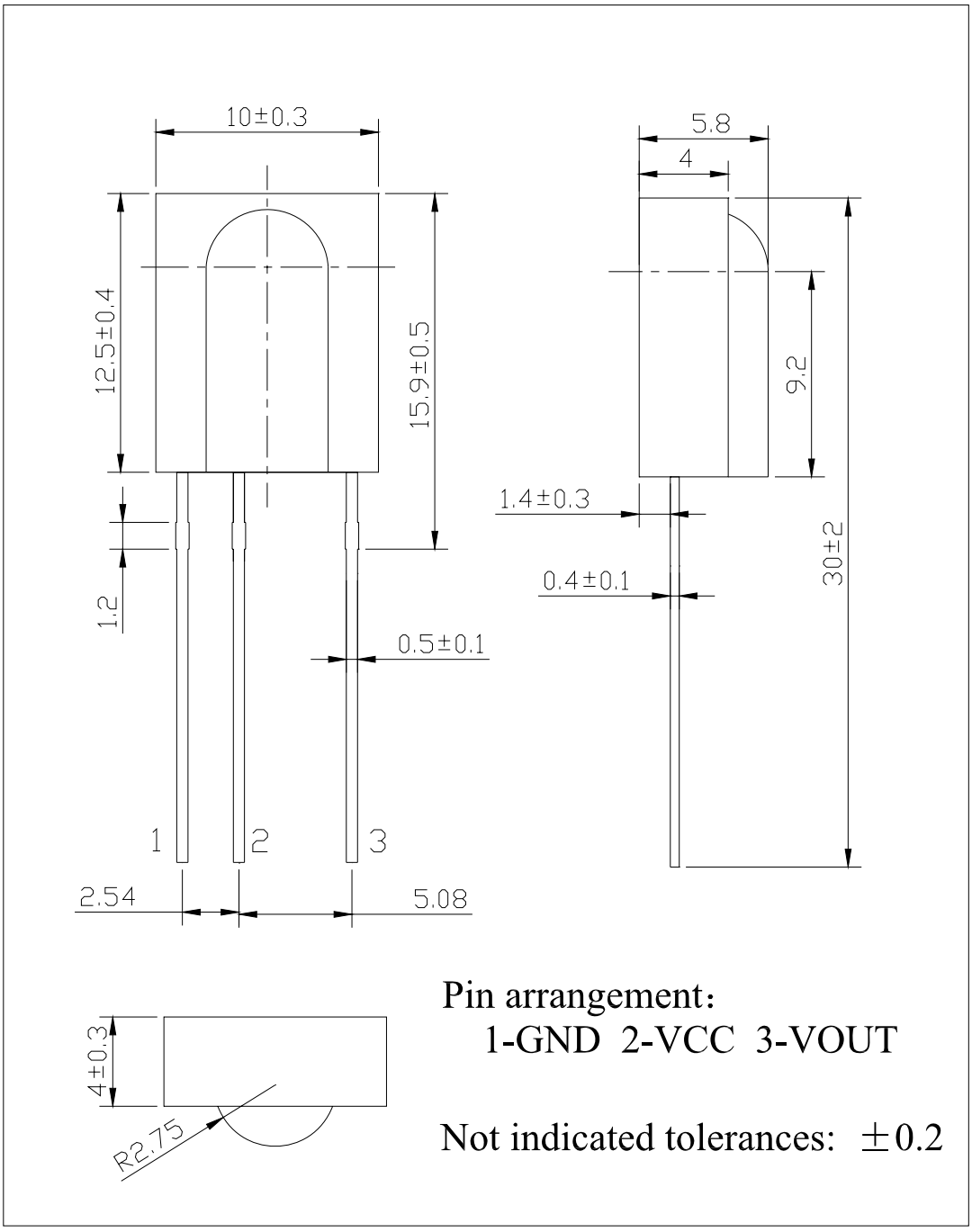


● 结构和材料 Construction＆Materials

序号 No.	名称 Name	材料 Material
1	粘合剂 Bond	银胶 Ag Paste
2	支架 Lead Frame	铁材 SPCC-SB
3	塑封料 Molding	环氧材料 Epoxy Resin
4	光敏芯片 Photo diode	硅 Silicon
5	焊线 Bond Wire	金丝 Au Wire
6	IC 芯片 IC chip	硅 Silicon

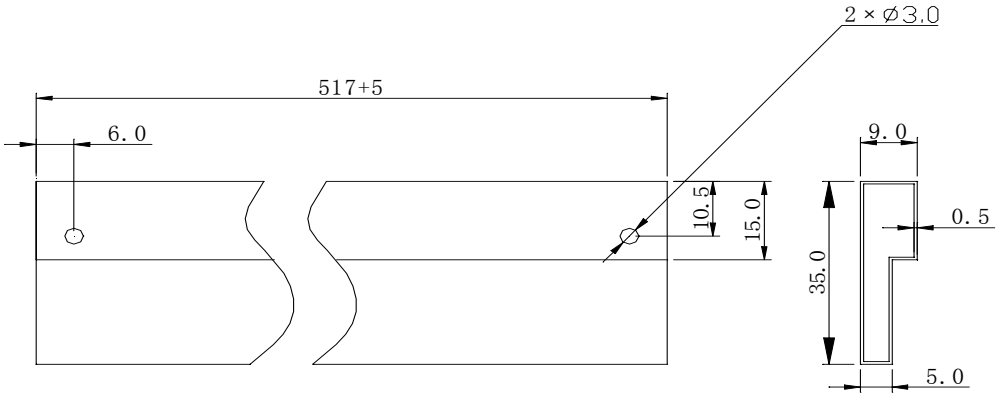


● 外形图 **Outline(单位 unit: 毫米 mm)**



cartons. On the carton, followings are printed: mark of transportation stipulated in GB191,Company Name ,Trade mark ,Address ,Product Description,Model and Quantity.Sealing mark is sticked on the carton too.Inside the carton there are qualification certificate,stated model, production date and inspector's code.

1. 条管尺寸 Tube size (单位 unit: 毫米 mm)



2. 包装数量 Packing quantity

50 只/条管，1000 只/盒

50pcs/1tube, 1000pcs/box

● 注意事项 Precautions for use

1. 该产品为静电敏感元件，要求使用时人机器、桌子、地面等都必须采取防静电措施。

Since the device is static sensitive，it is requested that anti-static measures should be taken on human body and all devices（including soldering iron）and equipment,

machinery, desk and ground.

2. 不要对引脚施加不必要的外力。Do not apply unnecessary stress to lead.

3. 注意保护接收器的接收面，沾污后会影响接收性能，同时不要触碰接收表面。

Please pay attention to the lens of receivers, It might affect the performance if it gets dirty,don't touch the receiving surface either.

4. 在外部电路上必须加上限流电阻，避免出现浪涌电流对器件造成破坏。

Current limited resistor should be added to the peripheral circuit to avoid shock of powerful current.

5. 适合的红外编码格式：NEC code, RC5 code；Grundig code；R-2000 code；RCA code；Zenith code；Sony 12-bit Code；

Suitable IR data format: NEC code, RC5 code；Grundig code；R-2000 code；RCA code；Zenith code；Sony 12-bit Code；

● 推荐焊接条件Recommend soldering conditions

1.施加在环氧树脂上的温度不要超过最高贮存温度。

Not to apply high temperature exceeding the maximum storage temperature to the epoxy resin.

2.在高温下不要对环氧树脂施加压力

Not to apply any force to the epoxy resin at high temperature.

3.焊接过程Soldering process

(1)元器件的焊盘焊接区的插孔间距必须一致，以避免在焊接过程中出现应力，这会导致器件开路。并且必须在焊接前进行器件引脚成形，引脚成形过程中不要对环氧体内部施加压力。

The distance between holes should be the same as that of between terminal lands of the component to avoid any stress during the soldering process.This may lead to the open circuit. Also,lead forming should be done before soldering process not to apply any stress to the inside of the epoxy resin.

(2)在焊接过程中不要对器件施加任何压力

Not to apply any stress to the component during the soldering process.

(3)推荐焊接条件Recommended soldering conditon

	条件Condition
预热温度和焊锡槽温度 Pro-heating &solder bath	预热：小于90度 Pro-heating:less than 90℃ 焊锡槽温度：260度 Solder bath:260℃

	浸渍入离器件环氧体底部3毫米；浸渍时间：小于5s；次数小于2次 Soldering area: 3mm away from the bottom the epoxy resin. Dip time:less than 5 seconds, less than twice.
烙铁焊接 Soldering iron	烙铁温度小于350度，次数2次，每次时间3秒 Temperature:Less than 350℃,within 3 seconds, 2 times 烙铁离环氧体底部3毫米 Soldering area: 3mm away from the bottom of the epoxy resin.

(4)清洗Washing

一些化学试剂会破坏环氧树脂

Some chemicals may damage the epoxy resin.

推荐按下列条件使用乙醇清洗

Ethyl alcohol is recommended under the fellowing condition.

化学清洗 Chemical washing	温度小于45度 Temperature: less than 45℃ 清洗时间小于3分钟 Wash time: less than 3 minutes.
超声波清洗 Ultrasound washing	功率小于15 W/L Power: less than 15W/L 清洗时间小于3分钟 Wash time: Less than 3 minutes