Xiamen Hualian Electronics Co.,Ltd.

Specification on Product

DESCRIPTION: Infrared Module for Remote Control System

MODEL: HRM157aB5400C

Issued	Verified	Approved

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更改记录表

版次	制定或更改日期	主要更改内容	更改者	确认者
1.0	2008-11-04	新版发行	危光阳	

● General:

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.

● Features：

- ◆ High reliability, Low power consumption
- ◆ No external parts, Inner discrete shield
- ◆ High sensitivity, Large transmission range
- ◆ High immunity against ambient light, power noise and electromagnetic interference
- ◆ Suitable minimum burst length≥10 cycles of carrier,
- ◆ Suitable maximum burst length <1.8ms
- ◆ Suitalbe minimum burst gap time≥14 cycles of carrier
- ◆ Suitable minimum data pause time≥4 times burst length
- ◆ At Tamb=25°C, Data transmission Rate :1404bits/s(5V),1333bits/s(3V)
- ◆ TTL＆CMOS Compatibility
- ◆ Component in accordance to RoHS 2002/95/EC
- ◆ When the number of cycle between 10 to 35,the Max.Envelope duty cycle =n/(n+14)

● Parts Table

Part	Carrier Frequency
HRM157aB5400C	**56.7kHz**

● Absolute Maximum Ratings (Ta=25°C)

Parameters	Symbol	Rated value	Unit
Supply voltage	V_{CC}	6.0	V
Supply Current	Icc	3.0	mA
Output Voltage	Vo	6.0	V
Output Current	Io	3.0	mA
Operation Temp.	T_{amb}	-25~+85	°C
Storage Temp.	T_{stg}	-25~+85	°C
Power Dissipation	P	50	mW
Soldering Temp.（10s）*	T_{sd}	+260	°C

*Dip up to 2.0~2.5mm from the terminal root

● Recommended operating conditions (Ta=25°C)

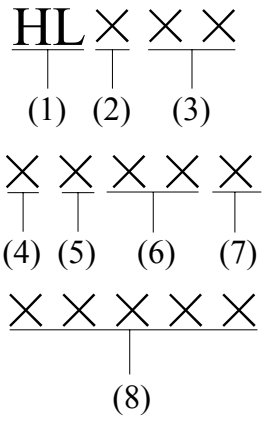
Parameter	Symbol	Operating conditions	Unit
Supply Voltage	Vcc	2.7~5.5	V

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

Parameters	symbol	Test condition	Min.	Typ.	Max.	Unit
Supply current	I_{CC}	Vcc=5V Ev=0 Ee=0	0.9	1.2	1.6	mA
		Vcc=3V Ev=0 Ee=0	0.7	1.0	1.2	
Peak wavelength	λ_P			940		nm
High output voltage	V_{0H}	Ev=(200±50)Lx Ee=0.5mw/m^2 P_{Wl}=11/fo P_{Wh}=40/fo fo=56.875kHz	Vcc-0.25		5.0	V
Low output voltage	V_{OL}				0.25	V
High output pulse width	T_{Wh}		34/fo	40/fo	44/fo	μs
Low output pulse width	T_{wl}		7/fo	11/fo	17/fo	μs
Receiving distance	L	Ev=(200±50)Lx Ee=0.5mw/m^2 Vcc=3V	15	33		m
Horizontal half angle	$\theta_{1/2}$	Ev=(200±50)Lx Ee=0.5mw/m^2 Vcc=3V L=6.5m		45		deg

● Mark

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



(1):Company logo
(2):Operation voltage
(3):Modulated frequency
(4):Packaging model
(5):Pin arrangement
(6):IC chip code
(7):Inner shield type
(8):Date code

● Characteristics Curve (Tamb=25℃)

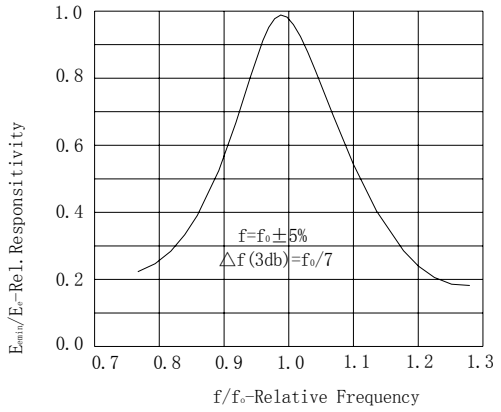


Figure 1. Frequency Dependence of Responsivity

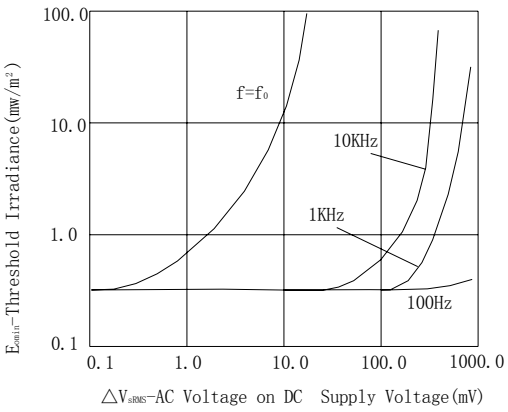


Figure 2. Sensitivity vs.SupplyVoltage Disturbances

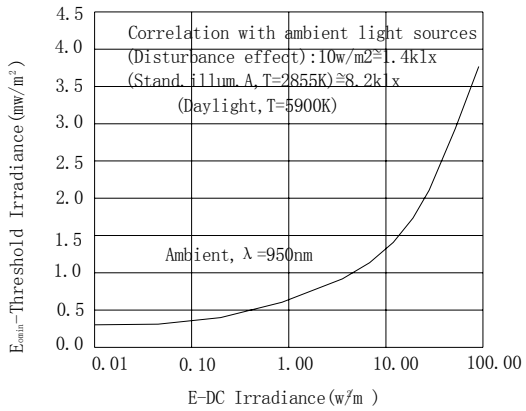


Figure 3. Sensitivity in Bright Ambient

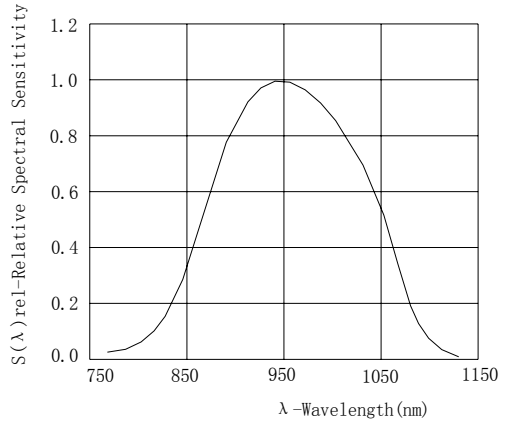


Figure 4. Relative Spectral Sensitivity vs.Wavelength

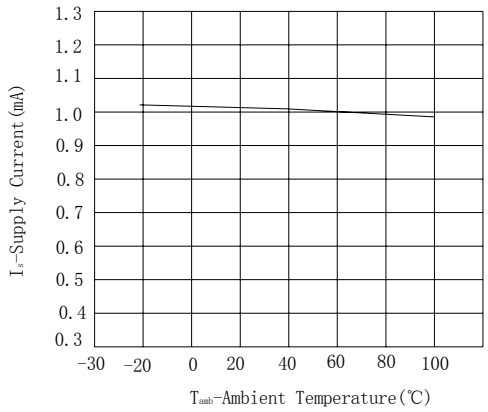


Figure 5. Supply Current vs.Ambient Temperature

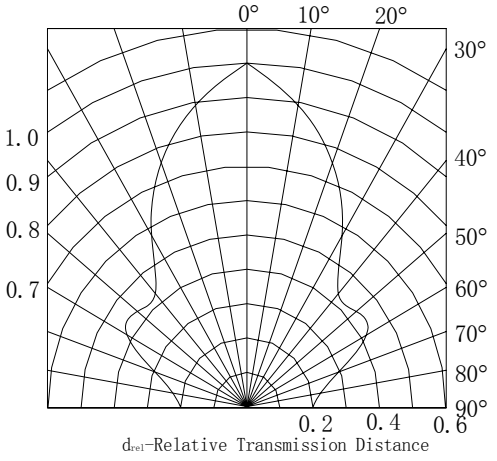
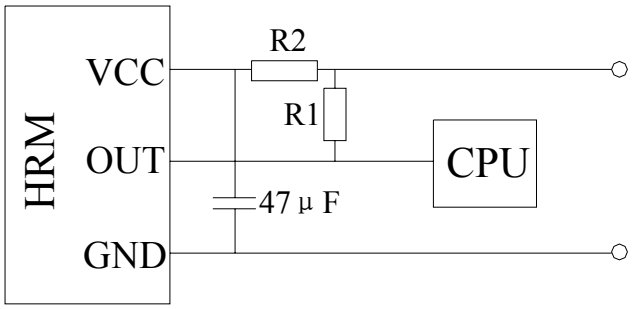


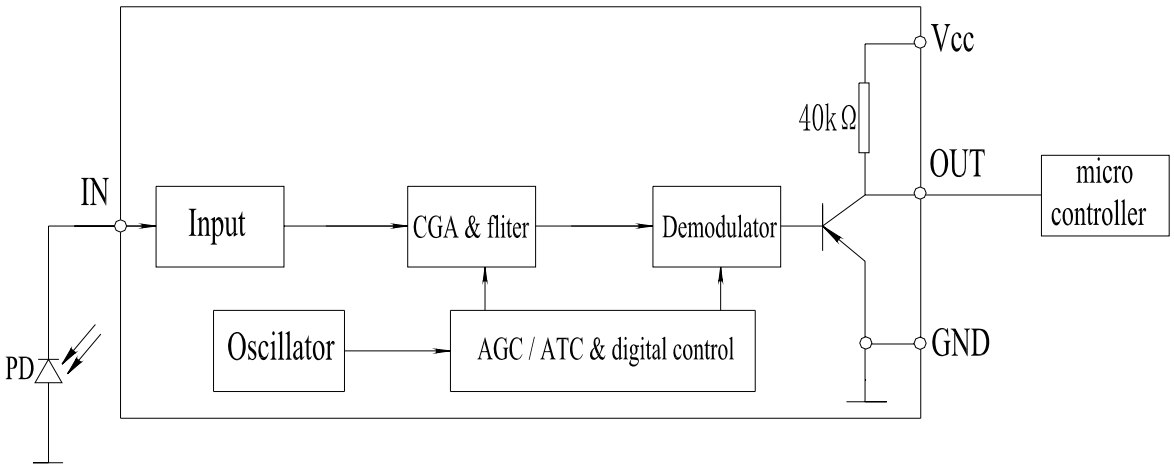
Figure 6. Directivity

● Recommended circuit



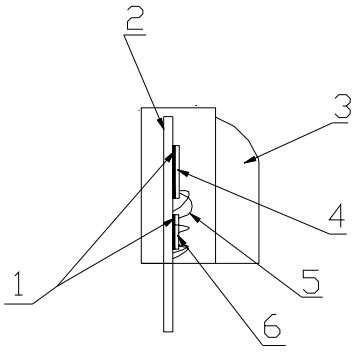
Note: 1、When load is 32.4kΩ ,1.6kΩ to 8.5kΩ
external pull-up resister(R1) is recommended.
2、R1 shall be adjusted with changing of load.
3、100Ω for current limited resistor(R2) is recommended,
and shall be adjusted after considering the real condition.

● Block diagram

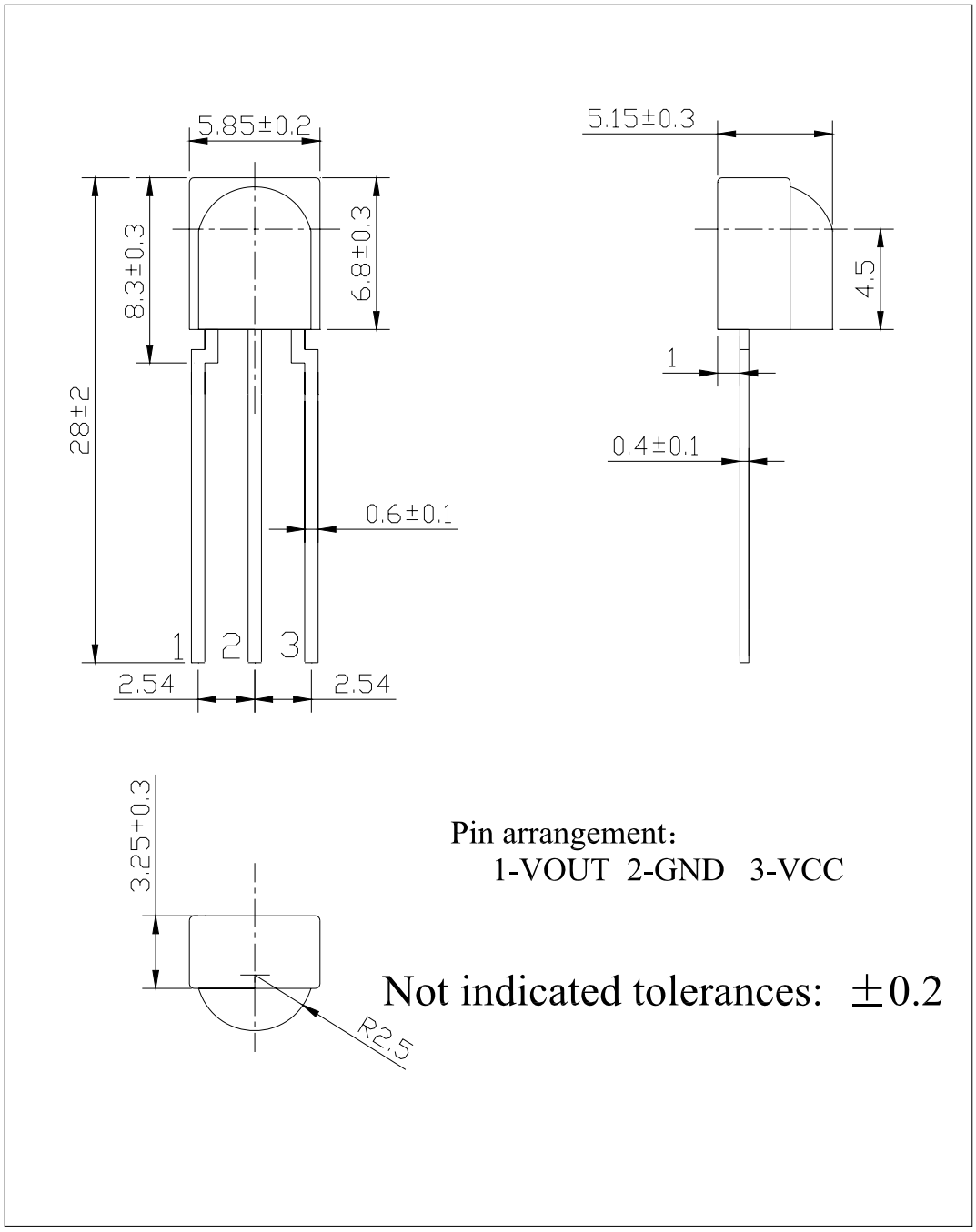


● Construction＆Materials

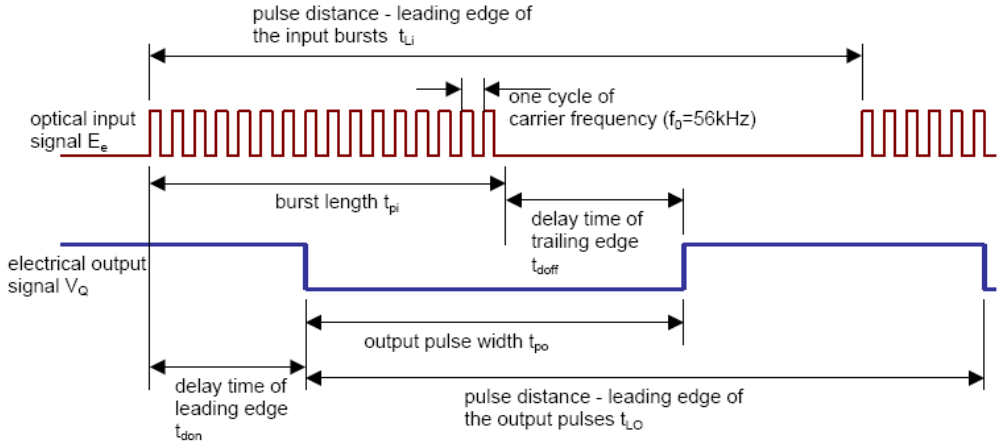
No.	Name	Material
1	Bond	Ag Paste
2	Lead Frame	SPCC-SB
3	Molding	Epoxy Resin
4	Photo diode	Silicon
5	Bond Wire	Au Wire
6	IC chip	Silicon(Germany)



- **Outline(unit: mm)**



- **Out put active low**



① Meet output pulse width tolerance (Tpo) :Tpi - 4/Fo < Tpo < Tpi +6/Fo

② Meet the delay time of leading edge (Tdon):3/Fo < Tdon < 9/Fo

③ Meet output leading edge to leading edge tolerance (Tlo) :Tli - 3/Fo < Tlo < Tli + 3/Fo

- **Package**

The parts are put into antistatic plastic tubes which are packed in 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.

- **Precautions for use**

1. 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. Do not apply unnecessary stress to lead.

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

5. Suitable IR data format: NEC code, RC5 code；Grundig code；R-2000

code；RCA code；Zenith code；Sony 12-bit Code；

- **Reliability Test**

<table>
<tr><th>No.</th><th>TEST ITEM</th><th>TEST CONDITIONS</th><th>NUMBER</th></tr>
<tr><td>1</td><td>Resistance to soldering heat</td><td>Dip up to 2.0~2.5mm from the terminal root at 260±5℃ for 10±1seconds.</td><td>16</td></tr>
<tr><td>2</td><td>Temperature cycles</td><td>Repeat the temperature cycles for 5 cycles.
<table>
<tr><th>Order</th><th>Temperature(℃)</th><th>Time (min)</th></tr>
<tr><td>1</td><td>85±5</td><td>10</td></tr>
<tr><td>2</td><td>5~35</td><td>2~3</td></tr>
<tr><td>3</td><td>-25±5</td><td>10</td></tr>
<tr><td>4</td><td>5~35</td><td>2~3</td></tr>
</table></td><td>12</td></tr>
<tr><td>3</td><td>The steady state operating life</td><td>Continuously impress for 1000hours.</td><td>25</td></tr>
<tr><td>4</td><td>High temperature storage</td><td>Storage at 85±5℃ for 1000hours.</td><td>16</td></tr>
<tr><td>5</td><td>Low temperature storage</td><td>Storage at -25±5℃ for 168hours.</td><td>16</td></tr>
</table>

- **Recommend soldering conditions**

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

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

3.Soldering process

(1)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)Not to apply any stress to the component during the soldering process.

(3)Recommended soldering conditon

	condition
Pro-heating	Pro-heating:less than 90℃

&solder bath	Solder bath:260℃ Soldering area: 3mm away from the bottom the epoxy resin. Dip time:less than 5 seconds, less than twice.
Soldering iron	Temperature:Less than 350℃,within 3 seconds, 2 times Soldering area: 3mm away from the bottom of the epoxy resin.

(4)Washing

Some chemicals may damage the epoxy resin.

Ethyl alcohol is recommended under the fellowing condition.

Chemical washing	Temperature: less than 45℃ Wash time: less than 3 minutes.
Ultrasound washing	Power: less than 15W/L Wash time: Less than 3 minutes