

# Infrared Receiver Module

## IRM-H538D-H4

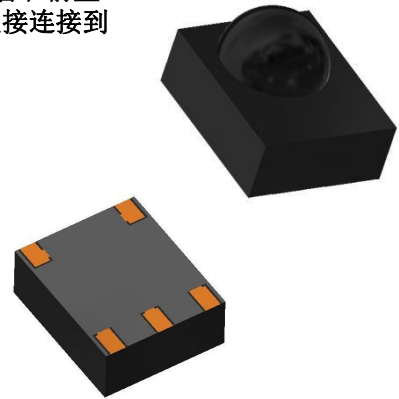
**SIVAGO**<sup>®</sup>  
SEMICONDUCTOR

### ■ 描述

IRM-H538D-H4 系列是红外线遥控系统的小型 SMD IR 接收器模块。PIN 二极管和前置放大器装配在 PCB 上，环氧封装包括 IR 滤波器。解调后的输出信号可以直接连接到微处理器进行解码。连续发送时，可能会抑制数据信号。

### ■ 主要特性

- 超薄SMD型
- 宽工作电压
- 高脉冲抑制
- 最大抗光电干扰安全裕度
- 带通滤波器的中心频率 37.9KHz
- 低电能消耗，3V (0.33mA)，5V (0.39mA)



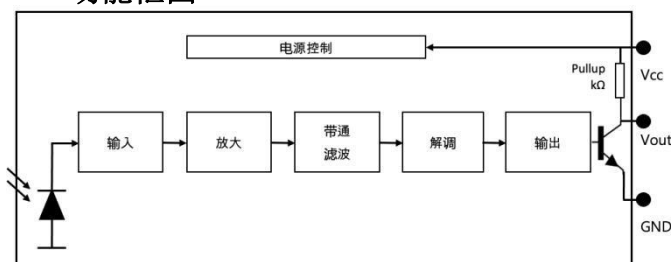
### ■ 产品应用

- 电视
- 机顶盒
- 空调 车载
- 电脑 游戏机 IOT设备
- 其他遥控设备。

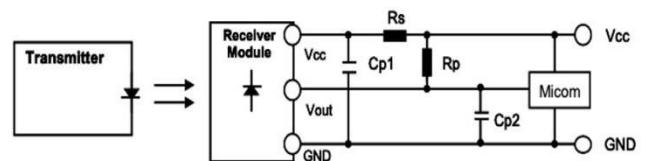
### ■ 合适的数据格式 (Data Code Reference)

解码描述	连续码专用
Minimum Burst Length $t_{burst}$ (number of pulses per burst) 最小突发长度 $t_{burst}$ (每个突发的脉冲数)	10 pulses
Minimum Burst Gap time $t_{burst\_gap}$ (number of pulses per burst) between two burst 两个突发之间的最小突发间隔时间 $t_{burst\_gap}$ 每个突发的脉冲数)	12 pulses
Minimum data pause time ( for full frame repeat code ) 最小数据暂停时间 (对于全帧重复代码)	25 msec

### ■ 功能框图



### ■ 应用电路 (测试电路)



- ✓  $R_s$  (Vcc 保护电阻) :  $100\ \Omega \sim 470\ \Omega$
- ✓  $C_{p1}$  (Vcc-GND 电容) :  $47\ \mu F \sim 100\ \mu F$
- ✓  $R_p$  (Vcc-Vout 上拉电阻) : 选项, 使用  $10k\ \Omega$  以上.  
 $R_p$  低于  $10k\ \Omega$  时, 因  $V_{ol}$  值上升, MCU 无法回应.
- ✓  $C_{p2}$  (Vout-GND 电容) : 选项 (适用时在  $100\ pF$  以下适用)  
( 建议不要使用  $R_p$  &  $C_{p2}$  )

### ■ 可接收代码列表 (Acceptable code list)

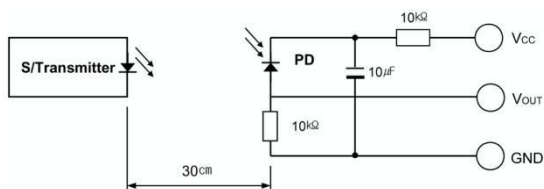
Toshiba	o	Sony 20 bit	o
NEC	o	Matsushita	-
RC5/6 Philips	o	Mitsubishi	-
RCA Thompson	-	Zenith	-
Sharp	-	JVC	-
Sony 12bit	-	Continuous code	-
Sony 20bit	o		

注意事项)

1. 该产品优化了连续码。
2. 与发信器的距离至少在 20Cm 以上的距离使用。  
如果与发信器的距离太近, 则可能无法接收。

## ■ TYPICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

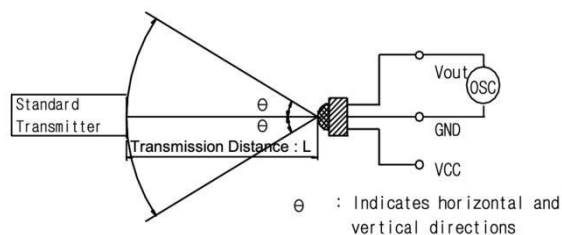
### ➤ 遥控信号测试



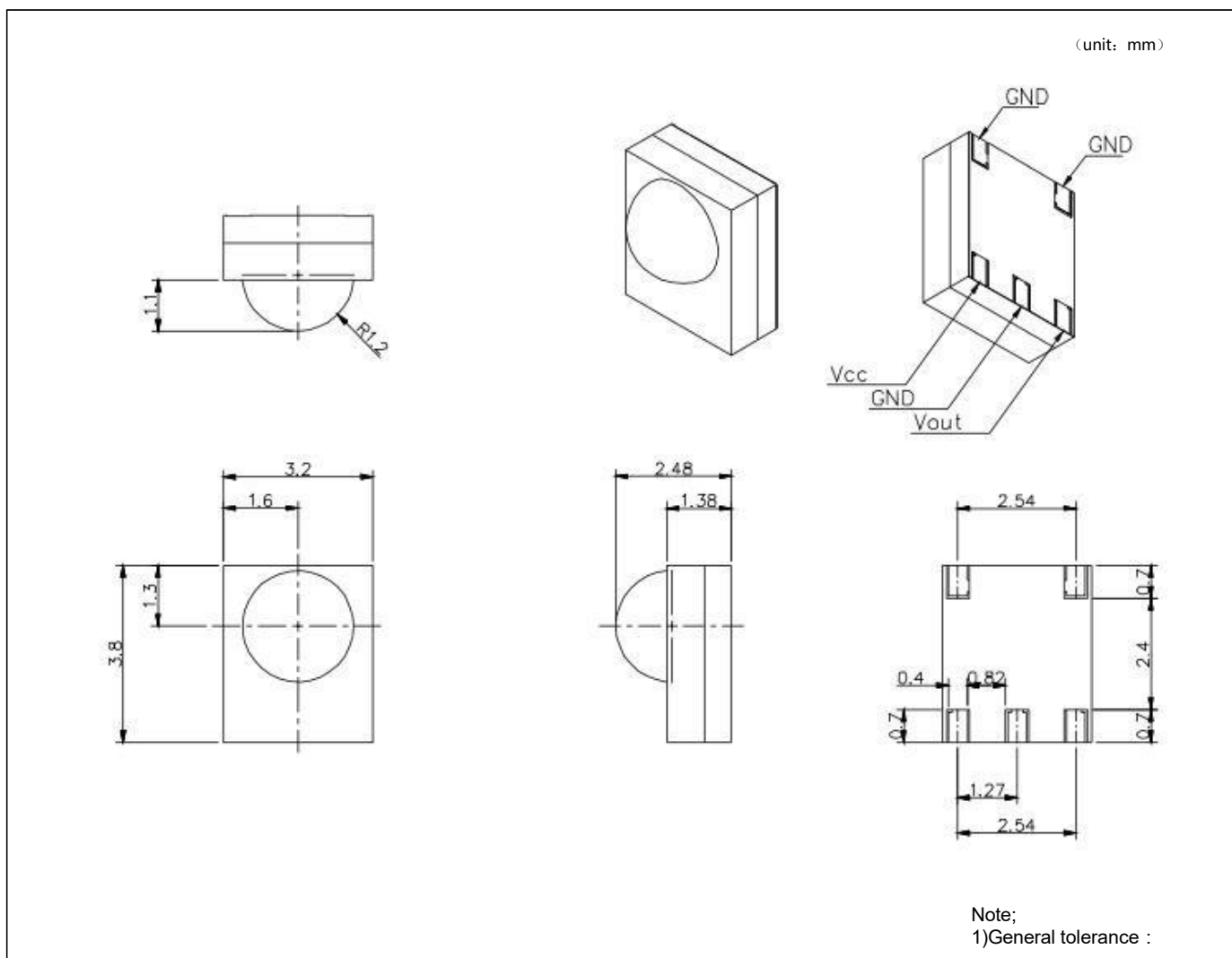
Note:

- 红外发射管 : 940nm , 发光强度 50mW/Sr
- 接收管 : 光敏二极管 ( PIN Photo Diode ) ISC=32uA / 1000Lx 基准

### ➤ 距离测试



## ■ 封装尺寸



## ■ 绝对最大额定值

Parameter 参数	Symbol 符号	Rating 额定值	Unit 单位
供电电压 Supply voltage	vcc.	7	V
输出电流 Supply current	iout.	2.5	mA
工作温度 Operating temperature range	$\tau_{opr.}$	-20°C~80°C	°C
储存温度 Storage temperature range	$\tau_{stg.}$	-25°C~85°C	°C
焊接温度 Soldering temp.	$\tau_{sol.}$	260(Max 5 sec)	°C
回流焊温度 (Pb Free)Reflow temp.	$\tau_{sol.}$	245(Max 10 sec)	°C
润湿灵敏度等级 MSL	Level-4 ( $\leq 30^{\circ}\text{C}$ / 60% RH 72hours)		
	JEDEC® standard J-STD-020 level 4		

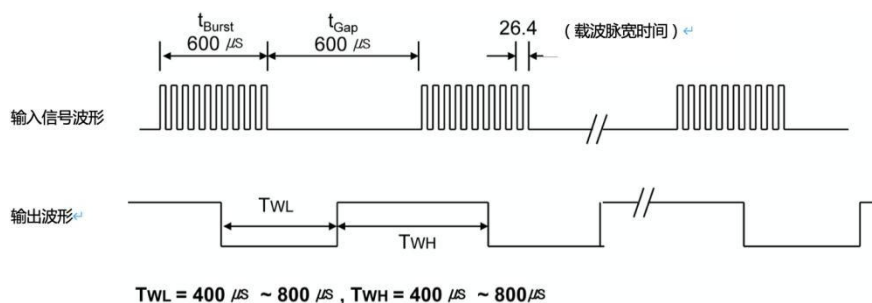
## ■ 绝对最大额定值

Parameter 参数	Symbol符号	Conditions 条件	Min.	Typ.	Max.	Unit
供电电压 Supply Voltage Range	vcc		2.7	-	5.5	V
消耗电流 Current Consumption	icc	No Signal V <sub>cc</sub> =5V	0.15	0.20	0.30	mA
峰值波长 Peak Wavelength *3	$\lambda_p$		-	940	-	nm
中心频率 B.P.F Center Frequency	$f_o$		-	37.9	-	kHz
接收距离 Arrival Distance	L	200LUX	0	12	-	m
			$\pm 75$	5	-	-
高电平输出电压 High Level Output Voltage	vOH	30cm over the ray axis	V <sub>cc</sub> -0.5	V <sub>cc</sub> -0.3	-	V
低电平输出电压 Low Level Output Voltage	vOL		0.2	0.5	V	
高电平输出脉冲宽度 High Level Output Pulse Width	$\tau_{WH}$	f <sub>in</sub> =37.9 kHz, 600us burst wave V <sub>in</sub> =500 $\mu$ Vp-p Period = 1.2ms	500	600	800	$\mu$ s
低电平输出脉冲宽度 Low Level Output Pulse Width	$\tau_{WL}$		500	600	800	$\mu$ s
输出方式 Output Form		Active Low Output				

### Note;

- 1) 测试场所:在光线不反射的室内环境中
- 2) 周边光源:在无高频干扰的白色 LED 或在荧光灯下测试。测试环境照度:
- 3) 标准信号发送器:采用标准 NEC 编码。

## ■ 测试条件



Note: 载波频率 : 37.9KHz

## ■ 焊接参考

### ✓ 回流焊

- 回流焊接必须在72H内进行，在打开干包装封套后，在最高温度30℃、60%RH下进行。
- 根据图中所示的回流温度分布来设定预热和加热炉温度。要特别小心，将最高温度控制在摄氏245度以下。剖面图中所示的温度意味着设备表面的温度。由于元件与电路板之间存在温差，应核实器件的温度是否准确
- 回流后的处理应待工作面冷却后方可进行。

### ✓ 手工焊接

- 使用25W或以下的烙铁。将烙铁温度调校至摄氏300度以下
- 在3秒内完成焊接工作
- 只待温度降温后才可处理产品

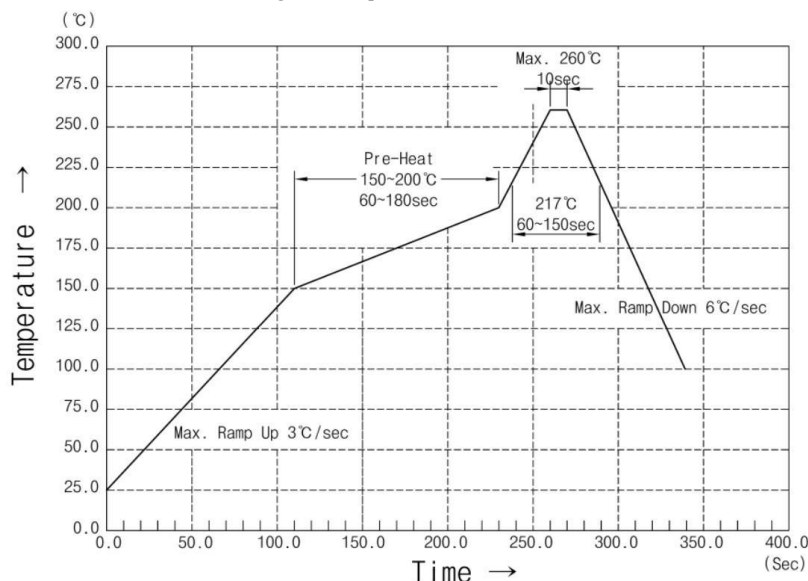
### ➢ 产品规格

JEDEC 规格	Moisture Sensitivity	Level 4
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FLOOR LIFE	Condition	Time
MBB(Moisture Barrier Bag) 开封后Reflow有效时间	≤30℃ / 60% RH	72 Hour's

## ■ Reflow 设备管理 (SMT 装备 温度 Profile 设置)

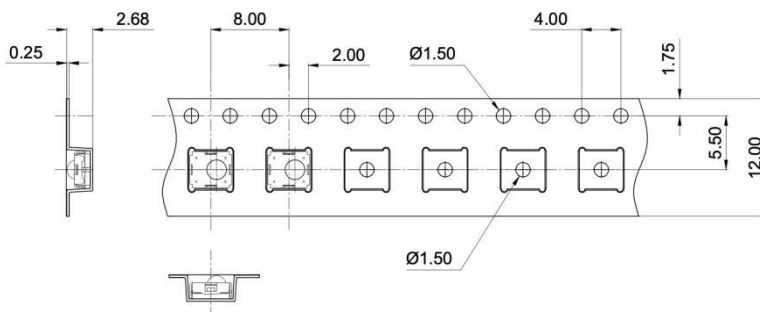
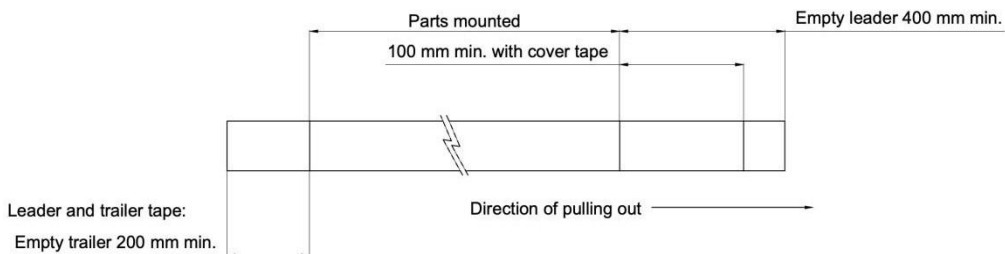
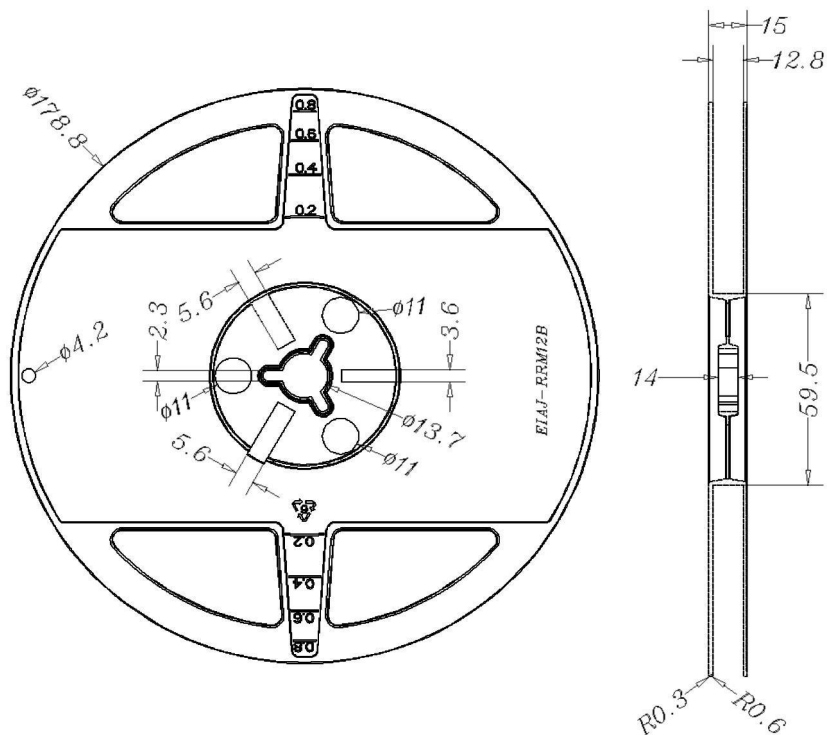
### ➢ 建议以下 Lead-free reflow soldering 温度 profile.



### ➢ 产品管理 (操纵时注意)

- (1) Reflow时最高温度245+0/-5℃, 设定时间10秒以内, 产品开封后30℃/60%环境里 24小时内进行作业。
- (2) 建议产品开封后30℃/60%环境里24小时内进行工作, 温度和湿度条件或开封后24小时以后再次烘烤 ( 55℃ / 168小时以上)
- (3) Reflow时产品不要叠放。
- (4) 第二次Reflow进行时第一次Reflow完后4小时以内进行。  
第一次, 第二次Reflow是30℃/60%环境里24小时以内工作。  
如果超过4小时情况如以下再次烘烤后进行。
  - 80℃, 126小时
  - 100℃, 96小时
  - 125℃, 48小时
 不建议第三次以上, 会产生 Rework时 不良原因, 工作时请注意。
- (5) Reflow后, 表面完全凉了再移动。

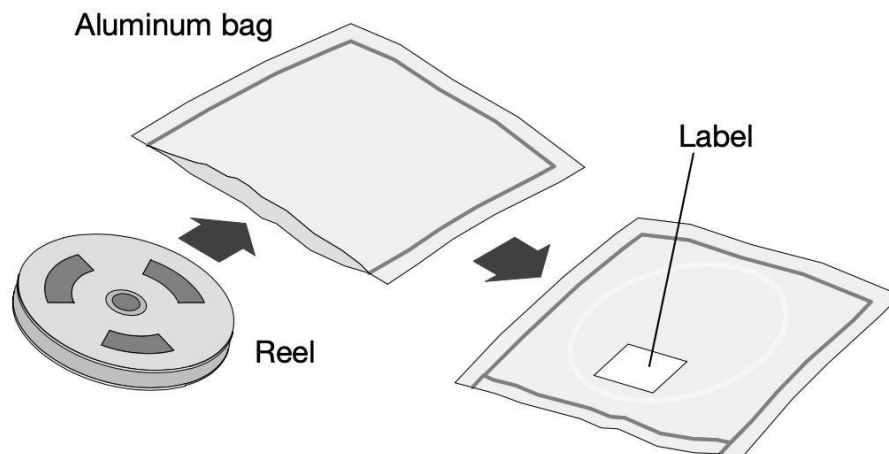
■ 包装 (Reel Tape)



Not indicated tolerances  $\pm 0.1$

## ■ 包装

卷筒被包装在防潮袋中，防止装置在运输和保管过程中吸收水分。



### ➤ Level

	<b>Caution</b> This bag contains <b>MOISTURE-SENSITIVE DEVICES</b>	LEVEL <b>4</b> <small>If blank, see adjacent bar code label</small>
	<p>1. Calculated shelf life in sealed bag: 12 months at &lt;40°C and &lt;90% relative humidity (RH)</p> <p>2. Peak package body temperature: <u>260</u> °C <small>If blank, see adjacent bar code label</small></p> <p>3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be</p> <p>a) Mounted within: <u>72</u> hours of factory conditions <small>If blank, see adjacent bar code label</small>                  ≤30°C/60% RH, or                  b) Stored per J-STD-033</p> <p>4. Devices require bake, before mounting, if:</p> <p>a) Humidity Indicator Card reads &gt; 10% for level 2a - 5a devices or &gt;60% for level 2 devices when read at 23±5°C                  b) 3a or 3b are not met</p> <p>5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure</p> <p>Bag Seal Date: _____ <small>If blank, see adjacent bar code label</small></p> <p style="text-align: center;"><small>Note: Level and body temperature defined by IPC/JEDEC J-STD-020</small></p>	

EIA JEDEC standard J-STD-020 level 4 label is included on all dry bags

## Packing Quantity Specification

1. 2500Pcs/1Reel,10 Reel/1Box
2. 4Boxes/1Carton

## Label Form Specification

製品名 PRODUCT	
コードNo. CODE No.	
数量 Q'TY	
ロットNo. LOT No.	
備考 REMARKS	
	

- PRODUCT: Part Number
- CODE NO.: Product Serial Number
- QTY: Packing Quantity
- LOT No: Lot Number
- REMARKS:Remarks

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