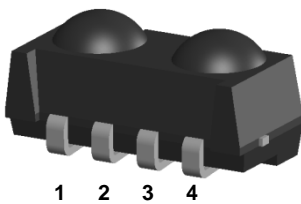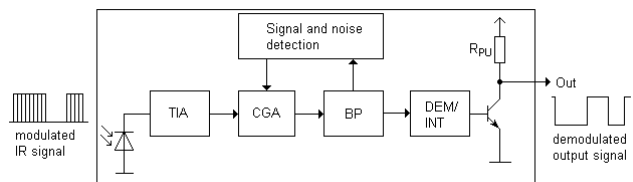# Infrared Receiver Module
IRM-H8xxM3/TR2 Series

Pin Configuration

1. GND
2. VCC
3. OUT
4. GND

1   2   3   4

Block Diagram

Features

- High protection ability against EMI
- Available for various carrier frequencies
- min burst length (36/38 kHz): 8 cycles
- min burst length (56 kHz): 10 cycles
- min gap length (36/38 kHz): 12 cycles
- min gap length (56 kHz): 14 cycles
- Low operating voltage and low power consumption
- High immunity against ambient light
- High immunity against TFT and PDP backlight
- Long reception range
- High sensitivity
- Pb free and RoHS compliant
- Compliance with EU REACH
- Compliance Halogen Free (Br < 900 ppm, Cl < 900 ppm, Br+Cl < 1500 ppm)

Description

The device is miniature SMD type infrared receiver that has been developed and designed by using the latest IC technology.
The PIN diode and preamplifier are assembled onto a lead frame and molded into an epoxy package which operated an IR filter.
The demodulated output signal can directly be decoded by a microprocessor.

Applications

- Light detecting portion of remote control
- AV instruments such as Audio, TV, VCR, CD, MD, etc
- Home appliances such as Air-conditioner, Fan, etc
- Other devices using IR remote control
- CATV set top boxes
- Multi-media Equipment

Application Circuit
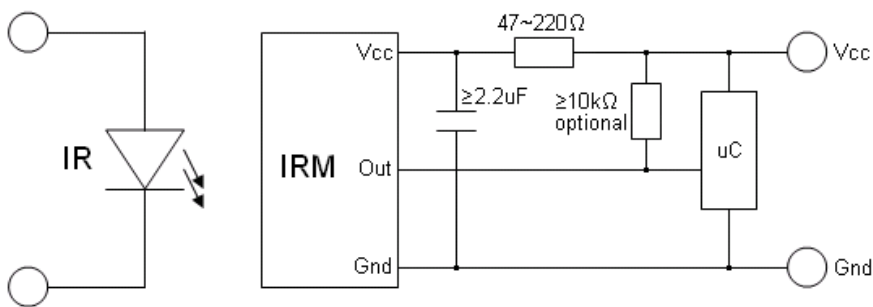
Parts Table

Model No.	Carrier Frequency
IRM-H836M3/TR2	36 kHz
IRM-H838M3/TR2	38 kHz
IRM-H856M3/TR2	56 kHz

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	6	V
Operating Temperature	Topr	-20 ~ +85	℃
Storage Temperature	Tstg	-40 ~ +85	℃
Soldering Temperature [1]	Tsol	260	℃

[1] Soldering time ≦ 5 seconds

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Current consumption	I_{cc}	-	0.4	0.6	mA	No input signal
Supply voltage	V_{CC}	2.7	-	5.5	V	
Peak wavelength	λ_p	---	940	---	nm	
Reception range	L_0	8	---	---	m	See chapter 'Test method' [2]
	L_{45}	5	---	---	m	
Half angle(horizontal)	φ_h	---	±45	---	deg	
Half angle(vertical)	φ_v	---	±45	---	deg	
High level pulse width	T_H	450	---	750	µs	Test signal according to figure 1 [3]
Low level pulse width	T_L	450	---	750	µs	
High level output voltage	V_{OH}	Vcc-0.4	---	---	V	$I_{SOURCE} \leqq 1µ$ A
Low level output voltage	V_{OL}	---	0.2	0.5	V	$I_{SINK} \leqq 2mA$

[2] The ray receiving surface at a vertex and relation to the ray axis in the range of θ=0° and θ=45°.
[3] A range from 30cm to the arrival distance. Average value of 50 pulses.

Test method

The specified electro-optical characteristics are valid under the following conditions.
1. Measurement environment
   A place without extreme light reflections.
2. External light
   The environment contains an ordinary, white fluorescent lamp without high frequency modulation. The color temperature is 2856K and the illumination at the IR receiver is less than 10 Lux (Ev≦10Lux).
3. Standard transmitter
   The test transmitter is calibrated by using the circuit shown in figure 2. The radiation intensity of the transmitter is adjusted until **Vo=400mVp-p.** Both, the test transmitter and the photo diode, have a peak wavelength of 940nm. The photo diode for calibration is PD438B (λp=940nm, Vr=5V).

4. The measurement system is shown in Fig.-3

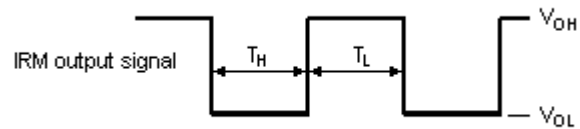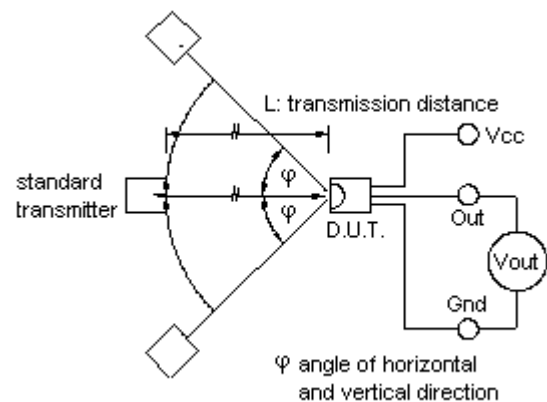Fig.-1 Transmitter Wave Form
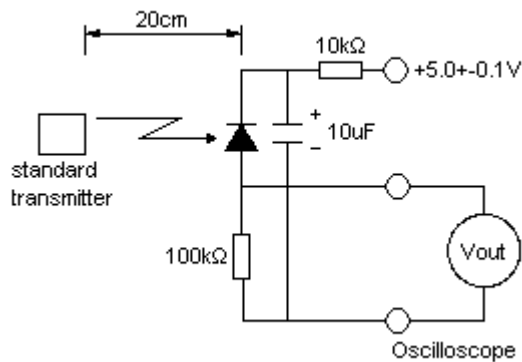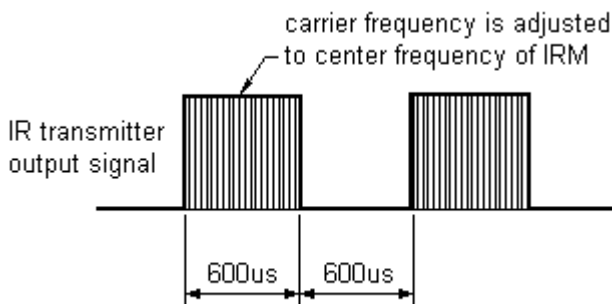
D.U.T output Pulse

Fig.-3   Measuring System

Typical Electro-Optical Characteristics Curves

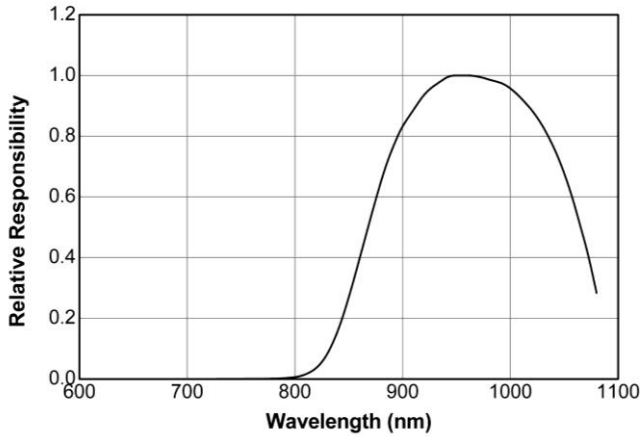Fig.4 Relative Responsibility vs. Wavelength

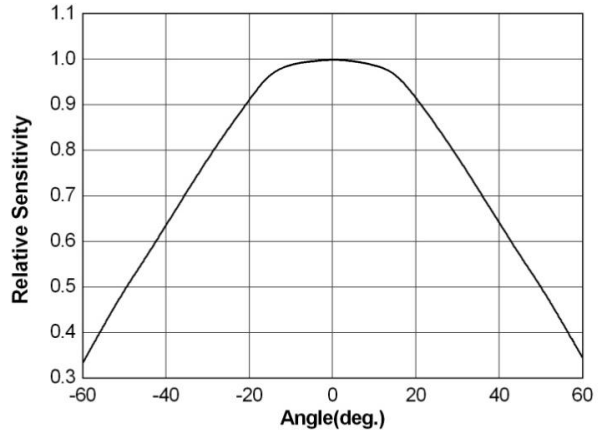Fig.-5 Relative Sensitivity vs. Angle

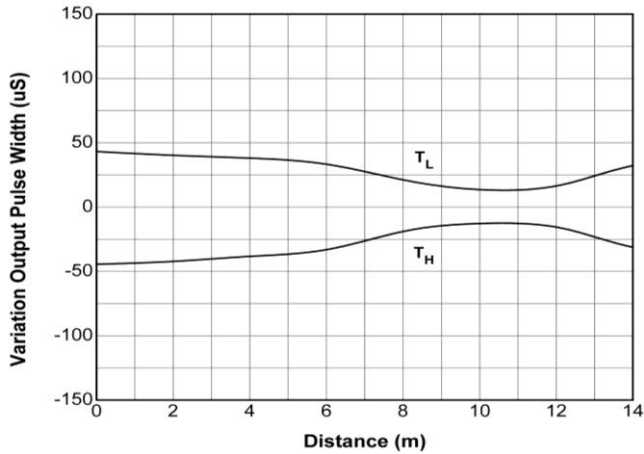
Fig.6 Variation Output Pulse Width vs. Distance
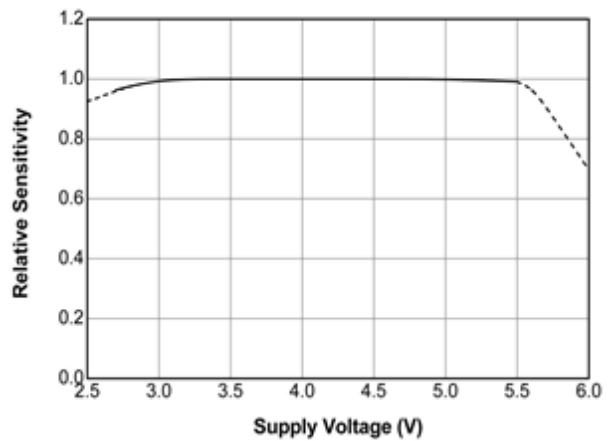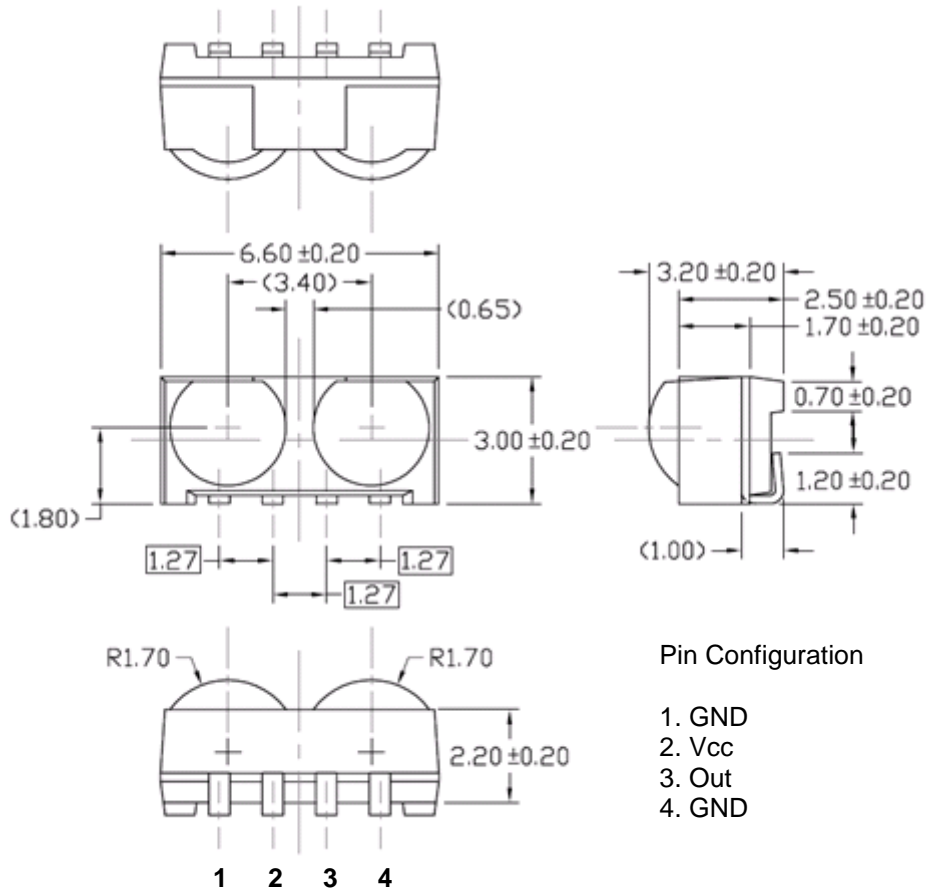

Fig.7 Relative Sensitivity vs. Supply Voltage

Fig.8 Relative Sensitivity vs. Carrier Frequency

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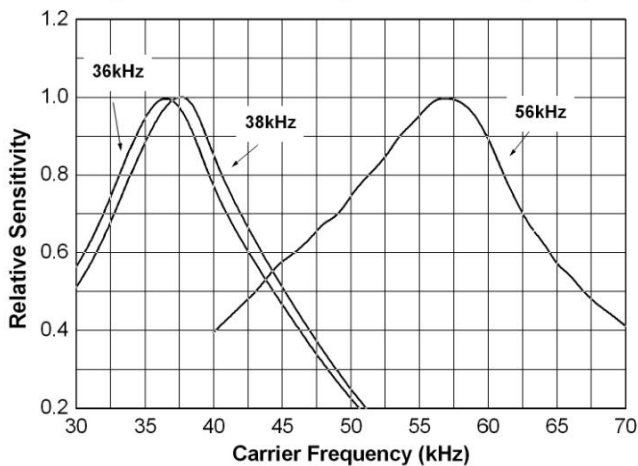
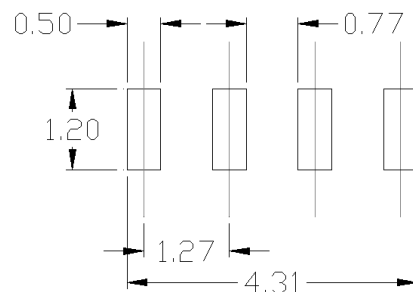## Package Dimension
(Dimensions in mm)

Pin Configuration

1. GND
2. Vcc
3. Out
4. GND

Note: Tolerances unless mentioned ±0.2mm. Unit: mm

Recommend soldering patterns
The following soldering patterns are recommended for reflow-soldering

Notice: Suggested pad dimension is just for reference only.
Please modify the pad dimension based on individual need.

Code information

Protocol	Suitable	Protocol	Suitable
JVC	Yes	Sharp	Yes
Matsushita	Yes	Sony 12 bit[2]	Yes
Mitsubishi	No	Sony 15 bit	No
NEC	Yes	Sony 20 bit	No
RC5	Yes	Toshiba	Yes
RC6[1]	Yes	Continuous Code	No
RCA	No		

1) Best choice depends on RC6 mode. If data low time is below 22ms, M2 is the best choice, otherwise M3.
2) If only Sony 12 bit version is used, M3 is recommended otherwise M2 is the best choice.

Tape & Reel Packing Specifications
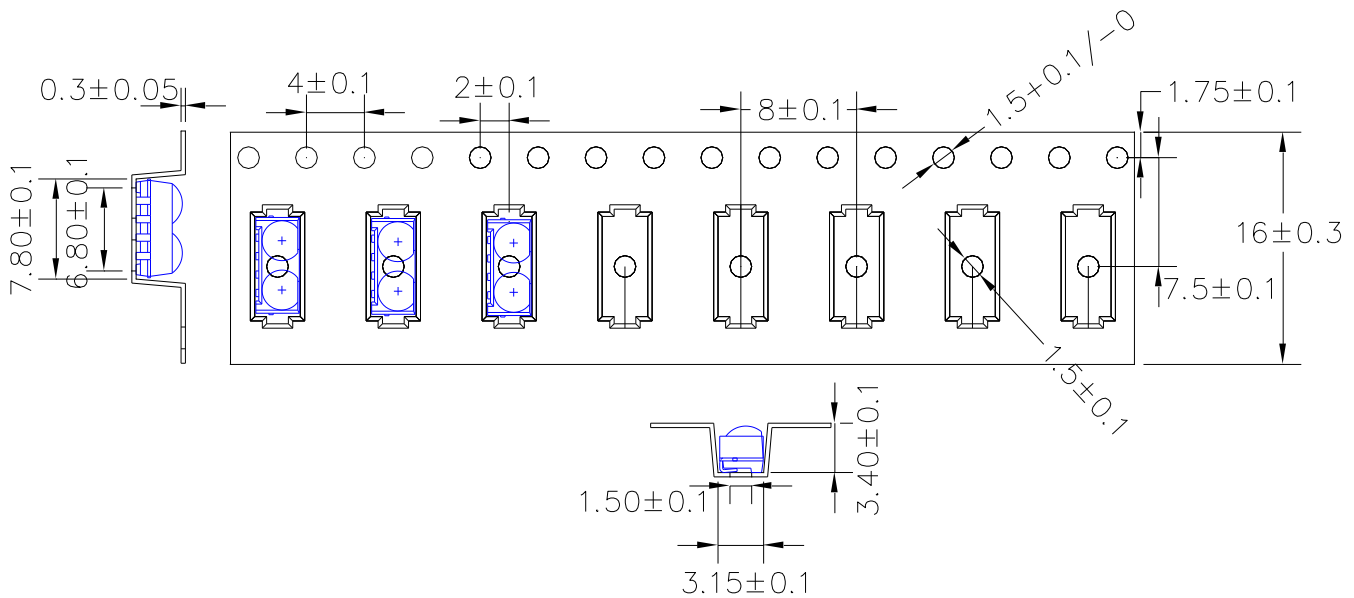
Packing Quantity

2000 pcs / Reel

5 Reels / Carton

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2. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.

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