

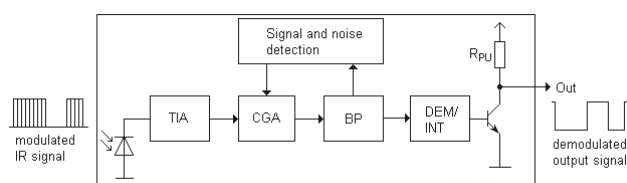
Infrared Receiver Module IRM-V8XXM3-C/TR1 Series



Pin Configuration

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

Block Diagram



Features

- High protection ability against EMI
- Available for various carrier frequencies
- min burst length: 12 cycles
- min gap length: 16 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.

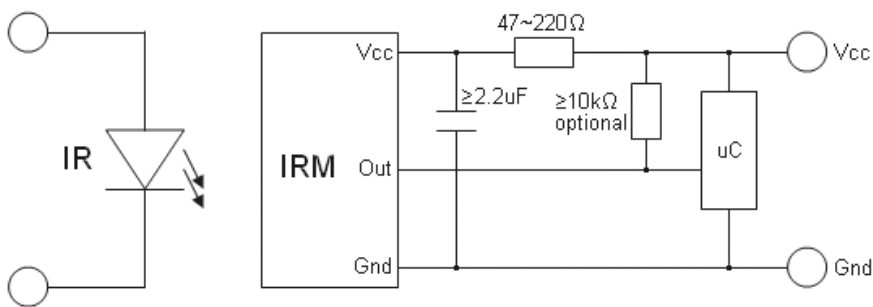
The PIN diode and preamplifier are assembled onto a lead frame and molded into an epoxy package which operated an IR filter.

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 Number Table

Model No.	Carrier Frequency
IRM-V838M3-C/TR1	38 kHz

Absolute Maximum Ratings (Ta=25°C) *1

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	6	V
Operating Temperature	Topr	-20 ~ +80	°C
Storage Temperature	Tstg	-40 ~ +85	°C
Soldering Temperature *2	Tsol	260	°C

*1 Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.

*2 Soldering time \leq 5 seconds

Electro-Optical Characteristics (Ta=25°C, and Vcc=3.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Current consumption	Icc	-	0.4	0.6	mA	No input signal
Supply voltage	Vcc	2.7	-	5.5	V	
Peak wavelength	λ_p	---	940	---	nm	
Reception range	L ₀	8	---	---	m	See chapter 'Test method' *3
	L ₄₅	5	---	---	m	
Half angle(horizontal)	ϕ_h	---	± 45	---	deg	
Half angle(vertical)	ϕ_v	---	± 45	---	deg	
High level pulse width	T _H	400	---	800	μ s	Test signal according to figure 1 *4
Low level pulse width	T _L	400	---	800	μ s	
High level output voltage	V _{OH}	Vcc-0.4	---	---	V	I _{SOURCE} \leq 1 μ A
Low level output voltage	V _{OL}	---	0.2	0.5	V	I _{SINK} \leq 2mA

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

*4 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

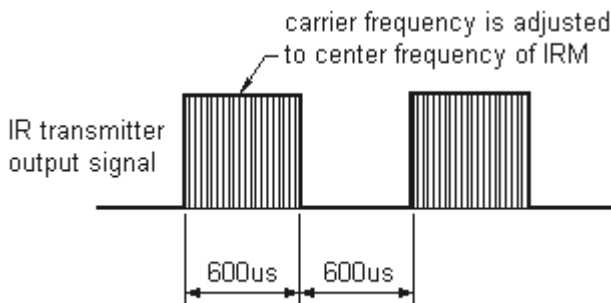
The environment contains an ordinary, white fluorescent lamp without high frequency modulation. The color temperature is 2856K and the illumination at the IR receiver is less than 10 Lux ($E_v \leq 10\text{Lux}$).

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 $V_o=400\text{mVp-p}$. Both the test transmitter and the photo diode have the peak wavelength of 940nm. The photo diode for calibration is PD438B ($\lambda_p=940\text{nm}$, $V_r=5\text{V}$).

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

Fig.-1 Transmitter Wave Form



D.U.T output Pulse

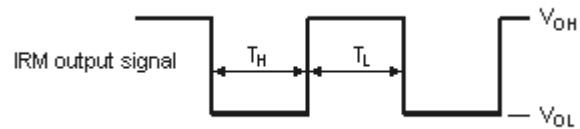


Fig.-2 Standard transmitter calibration

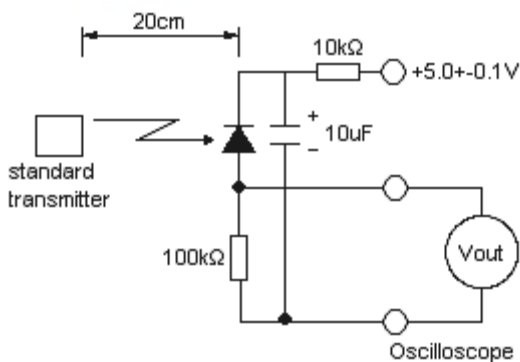
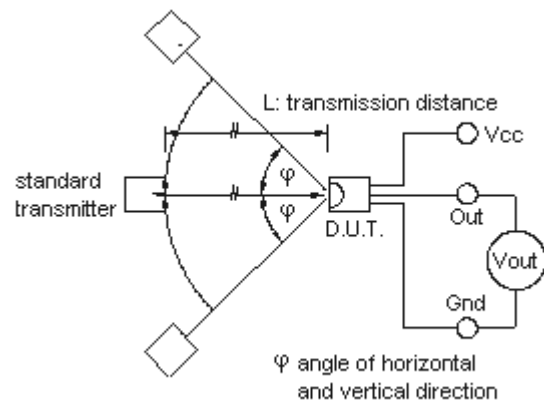


Fig.-3 Measuring System



Typical Electro-Optical Characteristics Curves

Fig.4 Relative Responsibility vs. Wavelength

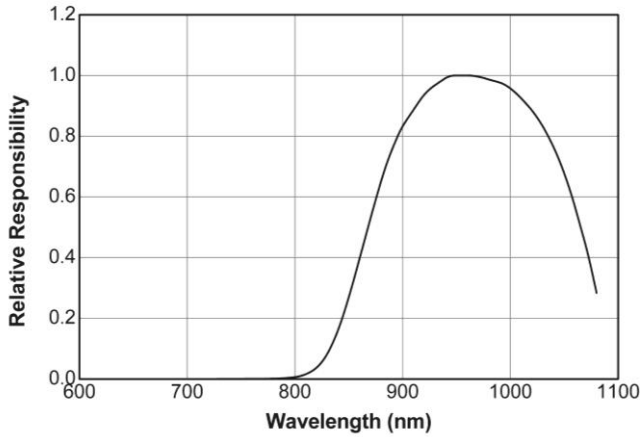


Fig.-5 Relative Sensitivity vs. Angle

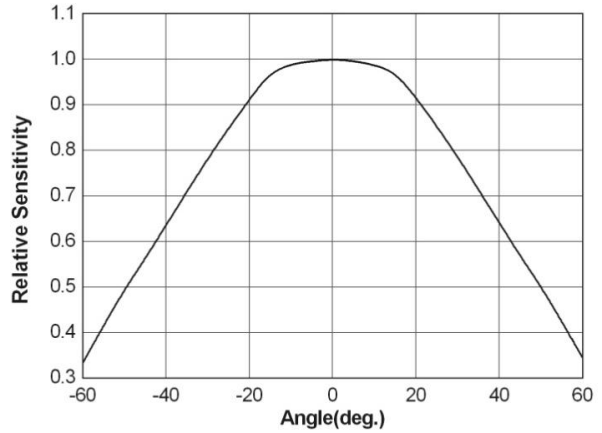


Fig.6 Variation Output Pulse Width vs. Distance

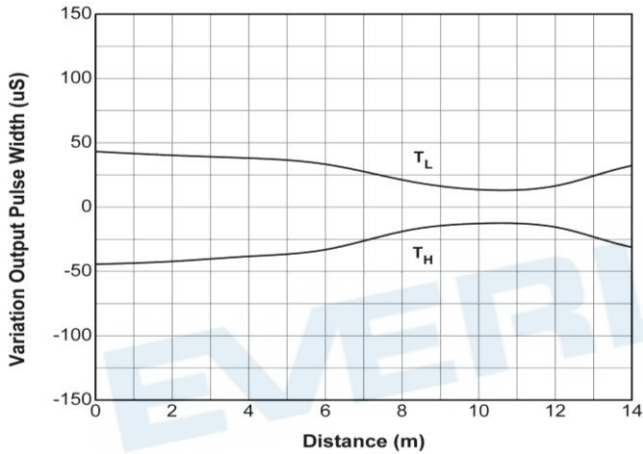


Fig.7 Relative Sensitivity vs. Supply Voltage

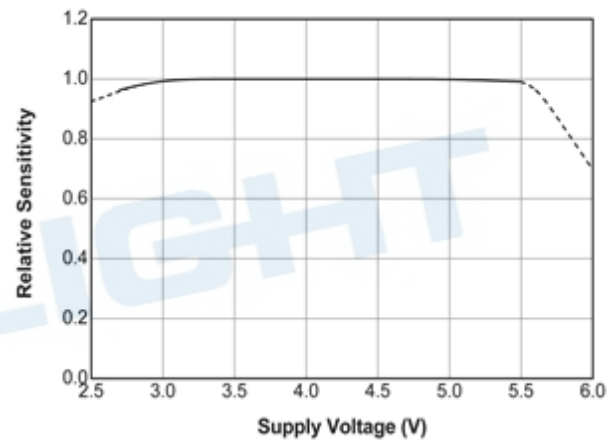
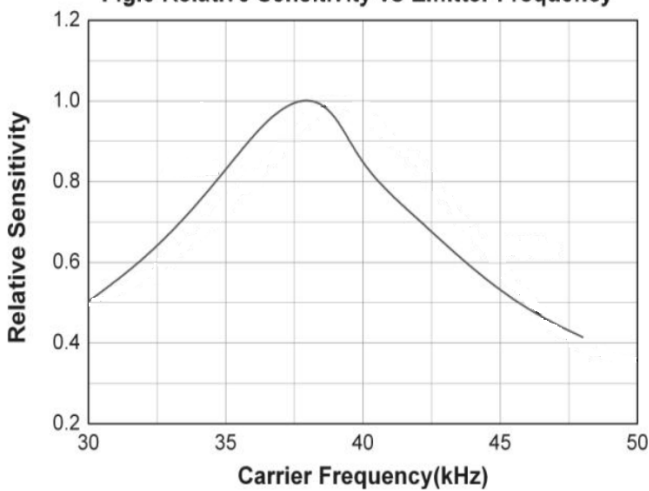
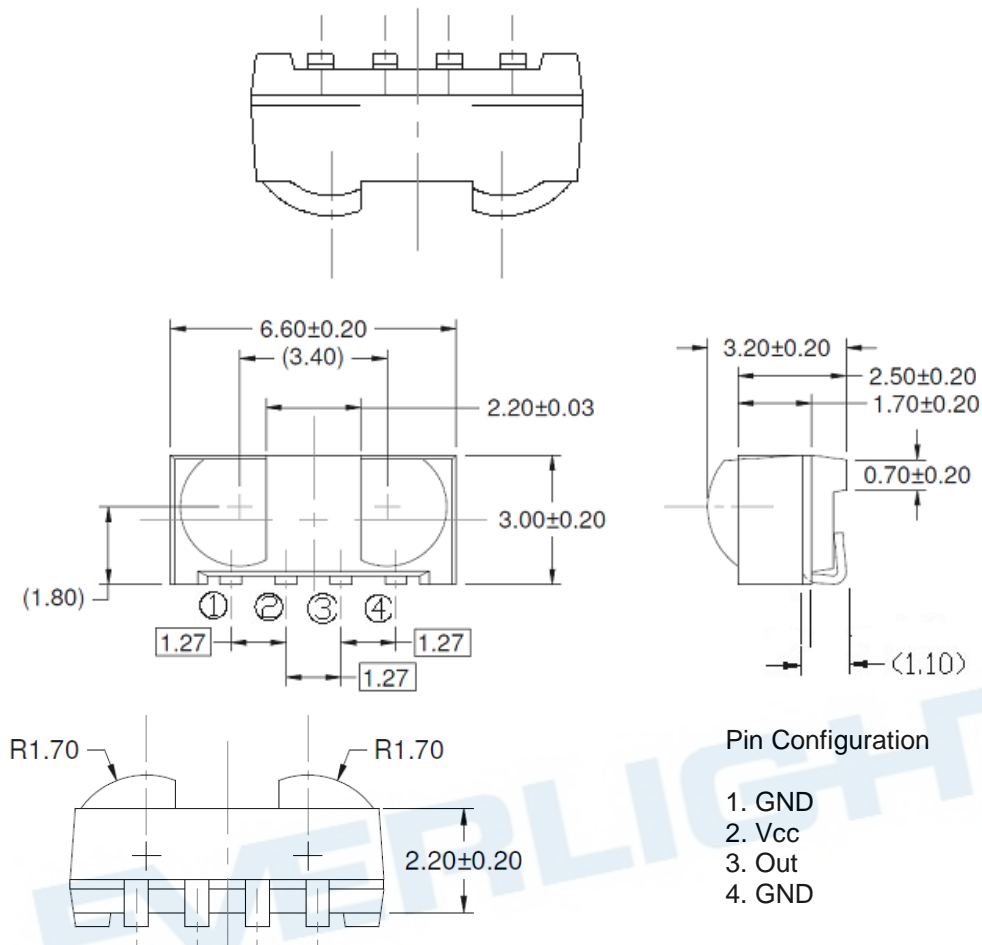


Fig.8 Relative Sensitivity vs Emitter Frequency



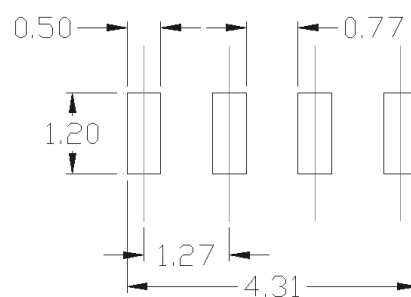
Package Dimension
(Dimensions in mm)



Note: Tolerances unless mentioned ± 0.5 mm. Unit: mm

Recommend soldering patterns

The following soldering patterns are recommended for reflow-soldering



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

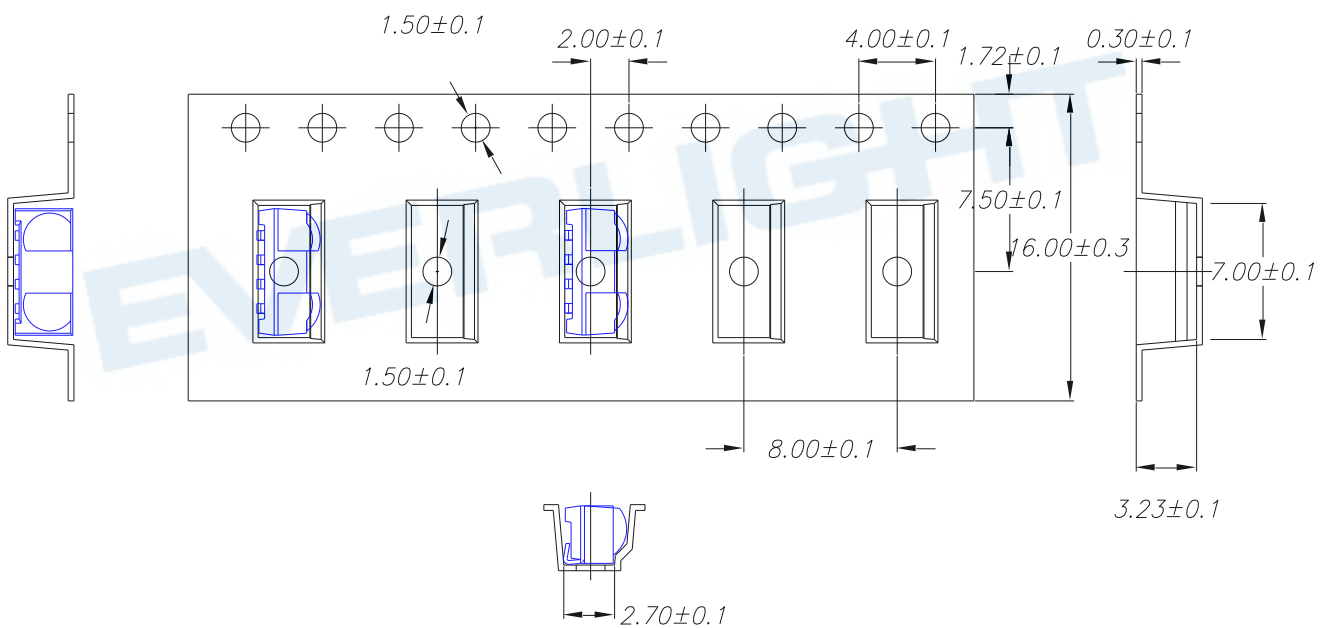
Code information

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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