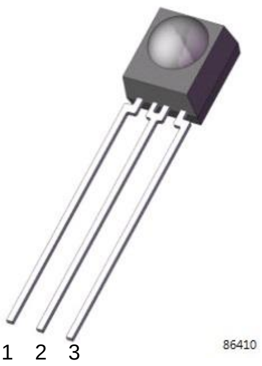
DATASHEET

Infrared Receiver Module
IRM-36xxJF Series

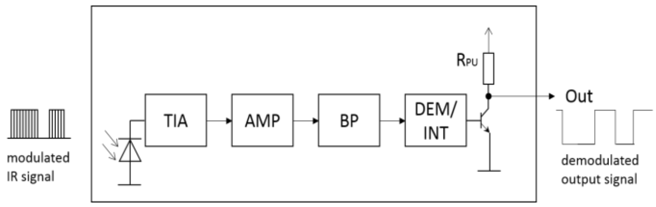
Preliminary



Pin Configuration

1. Out
2. Gnd
3. V_{CC}

Fig.1 Block Diagram



This is a preliminary specification intended for design purposes and subject to change without prior notice.

Features

- Circular lens for improved reception characteristics
- Available for various carrier frequencies
- Low operating voltage and low power consumption
- High immunity against lamp and TFT backlight noise
- Pb free and RoHS compliant
- Compliance with EU REACH
- Compliance Halogen Free (Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)

Description

The IRM-36xxJF devices are DIP type infrared receivers which have been developed and designed by using the latest IC technology, providing compatibility to most common IR protocols.
The PIN diode and preamplifier are assembled onto a lead frame and molded into a black epoxy package which operates as an IR filter. The demodulated output signal can directly be decoded by a microprocessor.

Applications

- AV equipment such as TV, VCR, DVD, CD, MD, etc.
- CATV set top boxes
- Multi-media Equipment
- Other devices using IR remote control

Part number table

Model No.	Carrier Frequency f_c
IRM-3638JF	38 kHz
IRM-3656JF	56 kHz

Absolute Maximum Ratings (T_a=25°C) (note1)

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{cc}	0 ~ 6	V
Output current	I_{OUT}	0~2.5	mA
Operating Temperature	T_{opr}	-20 ~ +80	℃
Storage Temperature	T_{stg}	-40 ~ +85	℃
Soldering Temperature (note2)	T_{sol}	260	℃

Electro-Optical Characteristics (T_a=25°C, V_{cc}=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Current consumption	I_{cc}	---	0.48	0.8	mA	No input signal
Supply voltage	V_{CC}	4.5	-	5.5	V	
Peak wavelength	λ_p	---	940	---	nm	
High level output voltage	V_{OH}	Vcc-0.3	---	---	V	Output open
Low level output voltage	V_{OL}	---	0.2	0.5	V	$I_{OUT} \leqq 2mA$
Internal pull up resistor	R_{PU}	---	50	---	kΩ	
Max Reception range	L_{0max}	---	11	---	m	Test signal according to figure 2 Output pulse width: $400us < T_L < 800us$ $400us < T_H < 800us$
	L_{45max}	---	5	---		
Min reception distance	L_{0min}	---	---	0.1		
Half angle(horizontal)	φ_h	---	±35	---	deg	
Half angle(vertical)	φ_v	---	±35	---	deg	
Output low pulse	T_L	400	---	800	us	See chapter test method, L_0 = 0.1m ~ 14m
Output high pulse	T_H	400	---	800	us	

Note1: Absolute Maximum Ratings indicate limits beyond which damage to the device may occur.
Note2: 4mm from mold body for less than 5 seconds

Test method

The specified electro-optical characteristics are valid under the following conditions.

1. Measurement environment must be a place without extreme reflections
2. Transmitter radiant intensity I_e = 80mW/sr
3. External lighting contains LED lighting with a color temperature of 6000K and illumination at the IR receiver is less than 100lux (Ev≦ 100Lux))
4. Test signal as shown below in figure 3

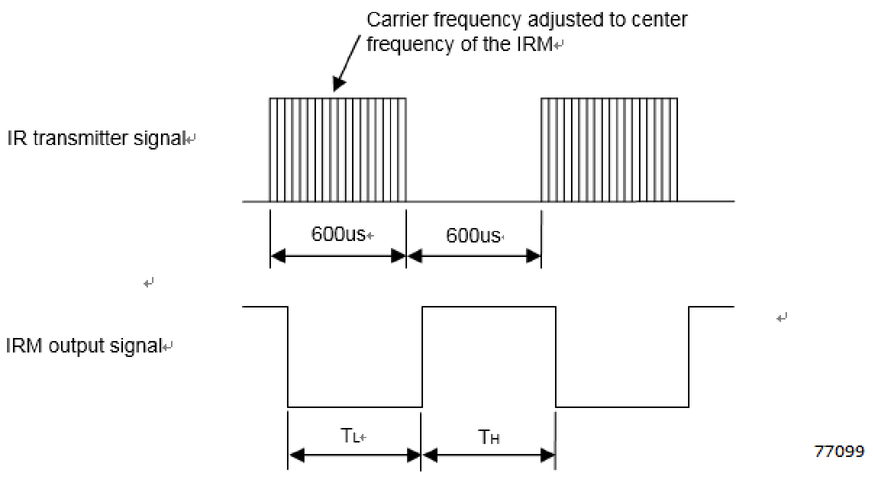


Fig.2 test signal and IRM output signal for reception distance and viewing angle test

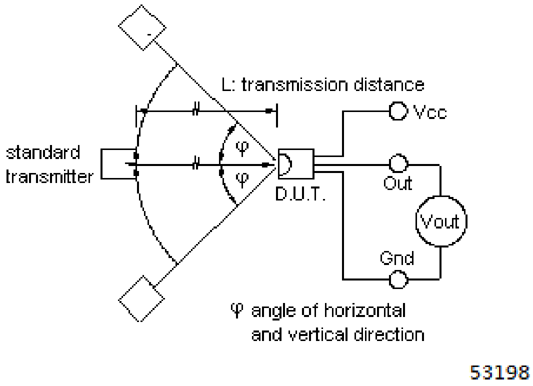
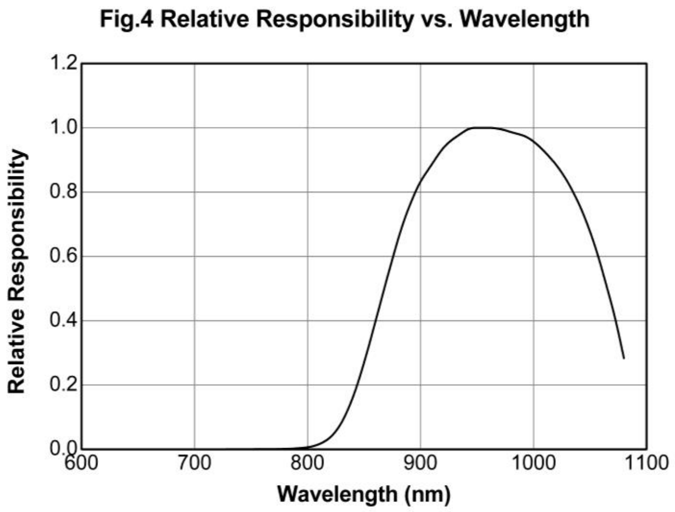


Fig.3 Measuring System

Typical Electro-Optical Characteristics Curves



Application considerations

IRM IR receiver modules are high gain analog components to reach a long reception range. However, due to the high gain, they are also sensitive to noise from the power supply like V_{cc} ripple. Noise on the power supply can reduce the reception range of the IRM or cause output glitches and corrupted data. To protect the IRM receiver from power supply noise, a RC filter must be connected as close as possible to the V_{cc} and GND pins of the IRM. The circuit below in figure 9 shows the configuration of the RC filter and the required values. Ceramic or tantalum capacitor should be used, as standard electrolytic capacitors are only suitable for low frequencies and might not be able to filter noise in the frequency range of the IRM. The IRM receiver is most sensitive to noise which is at the carrier frequency or close to the carrier frequency. When using a switching mode power supply, the switching frequency must not be the same as the carrier frequency of the IRM. A gap of at least 20kHz between the switching frequency of the power supply and the IRM carrier frequency is recommended.
If the trace from the IRM output pin to the decoder IC on the PCB is long, the parasitic capacitance might be high causing slow rise times of the IRM output signal. In such case, an additional pull up resistor of 10kOhm or higher can be added at the IRM output to reduce the influence of parasitic trace capacitance.

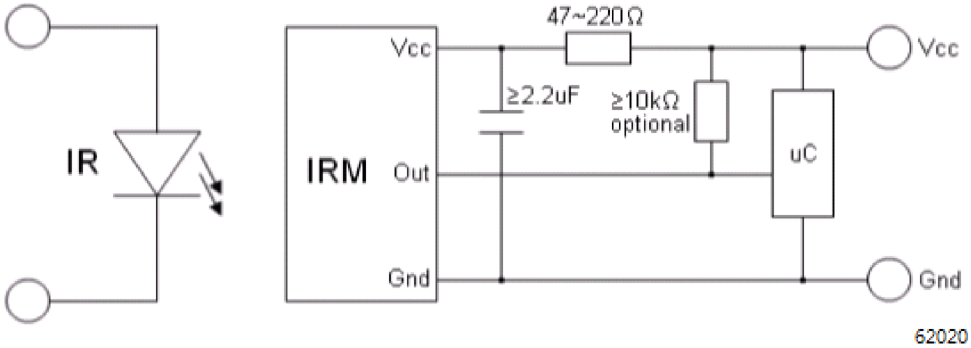
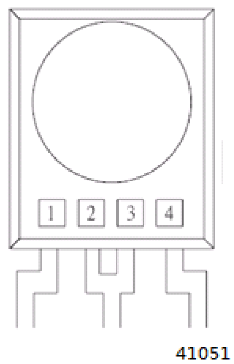


Fig.9: application circuit

Operation under noisy environment

The IRM-36xxJF receiver modules are designed for high light noise immunity, especially for noise from fluorescent and energy saving lamps and noise from TFT TVs with CCFL backlight. The receiver is able to suppress most optical noise, but the presence of any kind of optical noise will cause shorter reception range because the AGC will reduce the gain to suppress the noise.
The presence of noise can also affect the output pulse jitter. In such case, the output pulse jitter shown in the electro-optical specification above, might not be valid anymore and bigger pulse jitter can occur. This behavior needs to be considered when tuning the timing limits of the decoder. It is recommended to use the output pulse variation shown in the electro-optical specifications above as a base to set the timing limits of the decoder. However, due to different protocols and environmental conditions, other timing limits might result in better performance and decoding security. This needs to be verified for the specific application by testing under different noise conditions.

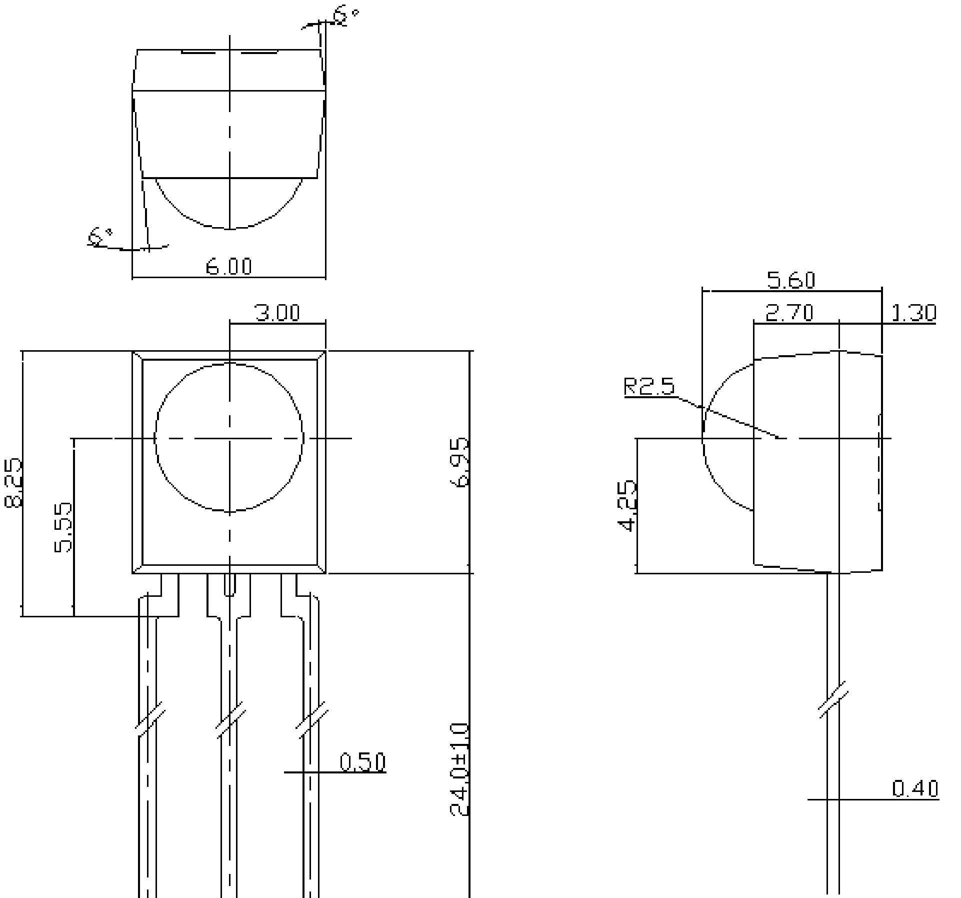
Device Marking



Notes

1 denotes Year code
2 denotes Month code
3 denotes Device number
4 denotes Carrier frequency

Package Dimension



Pin Configuration

1. Out
2. Gnd
3. V_{CC}

Notes:

1. Tolerances unless mentioned ±0.5mm. Unit: mm
2. Dimensions in mm

Packing Quantity

250 pcs / Bag
6 Bags / 1Box
10 Boxes / Carton

Application Restrictions

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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