

## Technical Data Sheet

### Infrared Remote-control Receiver Module

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**IRM-2638A**

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**Features :**

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Improved shielding against electrical field disturbance
- TTL and CMOS compatibility
- Output active low
- Low power consumption
- Improved immunity against ambient light
- Pb free
- The product itself will remain within RoHS compliant version.

**Descriptions**

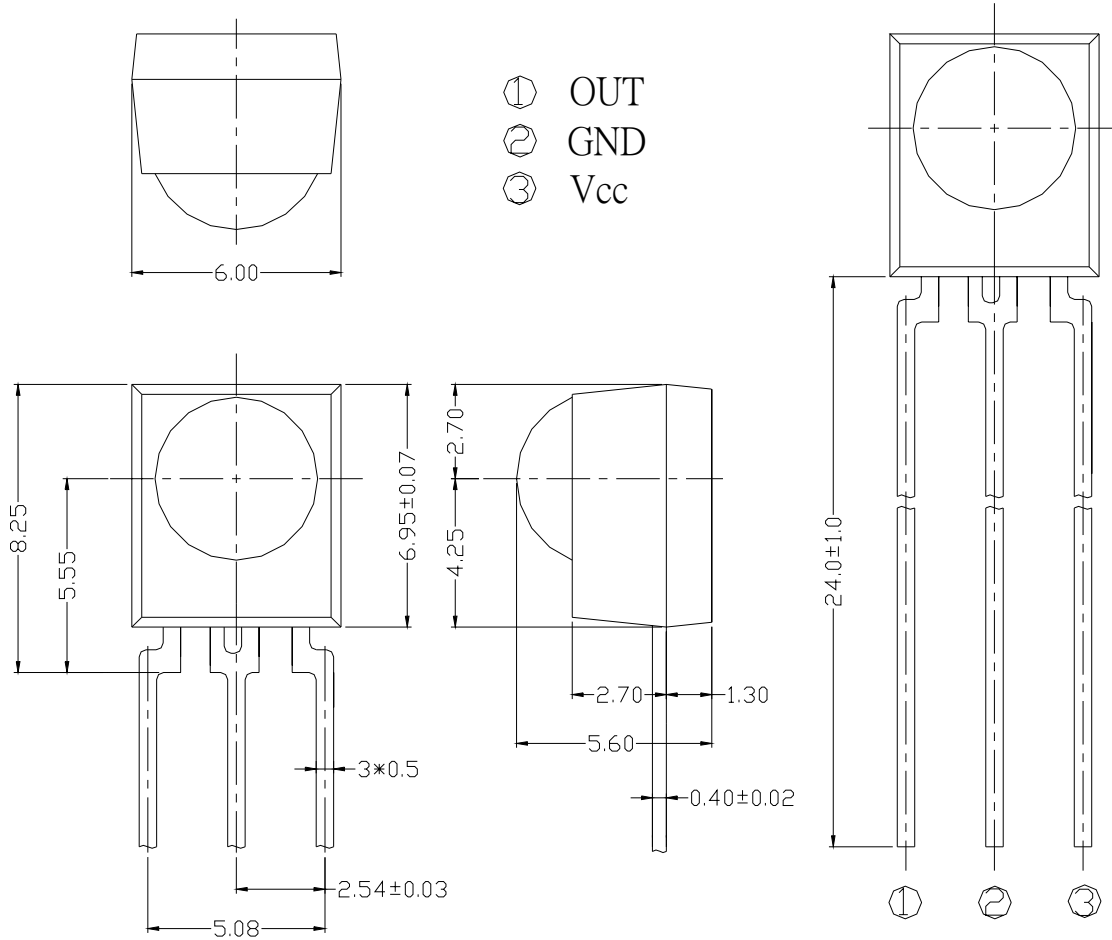
- The IRM-26xxA SERIES are miniaturized receivers for infrared remote control systems. PIN diode and preamplifier are assembled on lead frame, the epoxy package is designed as IR filter. The demodulated output signal can directly be decoded by a microprocessor. IRM-26xxA SERIES is the standard IR remote control receiver series, supporting all major transmission codes.

**Applications**

1. Optical switch
2. Light detecting portion of remote control
  - AV instruments such as Audio, TV, VCR, CD, MD, etc.
  - Home appliances such as Air-conditioner, Fan , etc.
  - The other equipments with wireless remote control.
  - CATV set top boxes
  - Multi-media Equipment

<b>PART</b>	<b>MATERIAL</b>	<b>COLOR</b>
Chip	Silicon	Black
Compound	Epoxy	Black

Package Dimensions



- Notes:**
- 1.All dimensions are in millimeters.
  - 2.Tolerances unless dimensions  $\pm 0.3$ mm.

Available Types For Different Carrier Frequencies

Type	Carrier Frequencies(Typ)
IRM-2633A	32.7 kHz
IRM-2636A	36.7 kHz
IRM-2638A	37.9 kHz
IRM-2640A	40.0 kHz
IRM-2656A	56.7 kHz

**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Rating	Unit	Notice
Supply Voltage	V <sub>cc</sub>	0~6	V	
Operating Temperature	T <sub>opr</sub>	-25 ~ +80	°C	
Storage Temperature	T <sub>stg</sub>	-40 ~ +85	°C	
Soldering Temperature	T <sub>sol</sub>	260	°C	4mm from mold body less than 10 seconds

**Recommended Operating Condition**

Supply Voltage Rating: V<sub>cc</sub> 4.5V to 5.5V

**Electro-Optical Characteristics (Ta=25°C, and V<sub>cc</sub>=5 V)**

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Consumption Current	I <sub>cc</sub>	---	1.1	2.5	mA	No signal input
Peak Wavelength	$\lambda_p$	---	940	---	nm	
Reception Distance	L <sub>0</sub>	12	---	---	m	At the ray axis *1
	L <sub>45</sub>	6	---	---		
Half Angle(Horizontal)	$\Theta_h$	---	45	---	deg	
Half Angle(Vertical)	$\Theta_v$	---	45	---	deg	
High Level Pulse Width	T <sub>H</sub>	400	---	800	$\mu s$	At the ray axis *2
Low Level Pulse Width	T <sub>L</sub>	400	---	800	$\mu s$	
High Level Output Voltage	V <sub>H</sub>	4.5	---	---	V	
Low Level Output Voltage	V <sub>L</sub>	---	0.2	0.5	V	

\*1:The ray receiving surface at a vertex and relation to the ray axis in the range of  $\theta=0^\circ$  and  $\theta=45^\circ$ .

\*2:A range from 30cm to the arrival distance. Average value of 50 pulses.

### Test Method :

The specified electro-optical characteristics is satisfied under the following Conditions at the controllable distance.

① Measurement place

A place that is nothing of extreme light reflected in the room.

② External light

Project the light of ordinary white fluorescent lamps which are not high frequency lamps and must be less than 10 Lux at the module surface.  
( $E_e \leq 10 \text{Lux}$ )

③ Standard transmitter

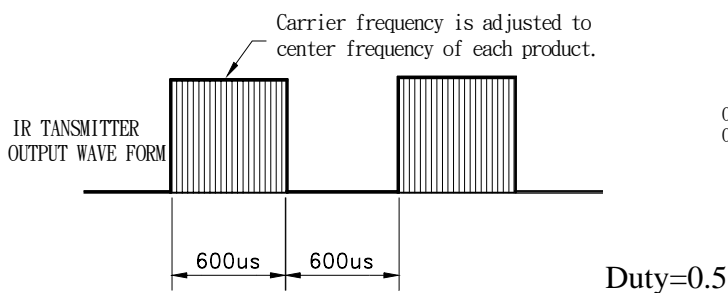
A transmitter whose output is so adjusted as to  $V_o = 400 \text{mVp-p}$  and the output Wave form shown in Fig.-1. According to the measurement method shown in Fig.-2 the standard transmitter is specified.

However, the infrared photodiode to be used for the transmitter should be  $\lambda_p = 940 \text{nm}$ ,  $\Delta\lambda = 50 \text{nm}$ . Also, photodiode is used of PD438B ( $V_r = 5 \text{V}$ ).

④ Measuring system

According to the measuring system shown in Fig.-3

Fig.-1 Transmitter Wave Form



D.U.T output Pulse

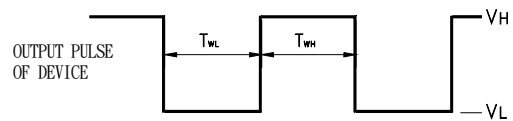


Fig.-2 Measuring Method

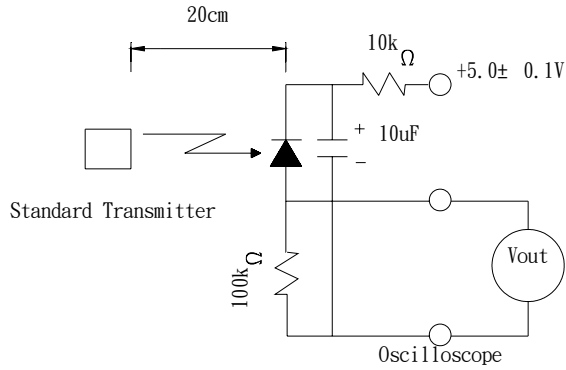
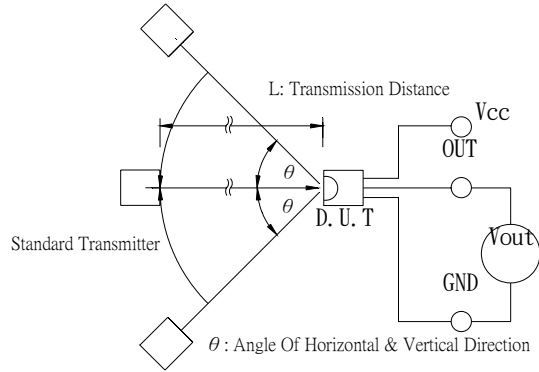
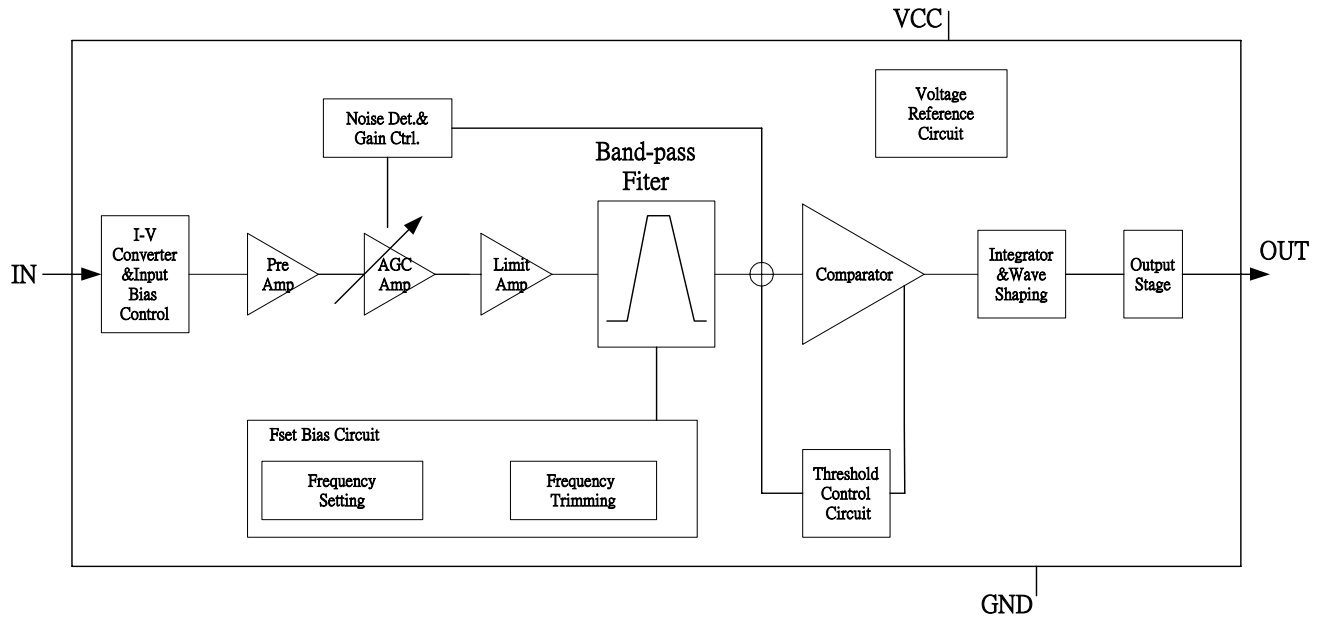


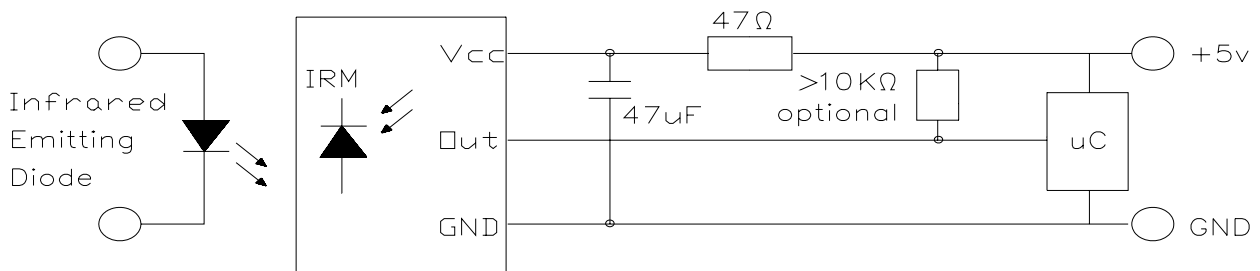
Fig.-3 Measuring System



### Block Diagram :



### Application Circuit :



RC Filter should be connected closely between Vcc pin and GND pin.

**The Notice of Application:**

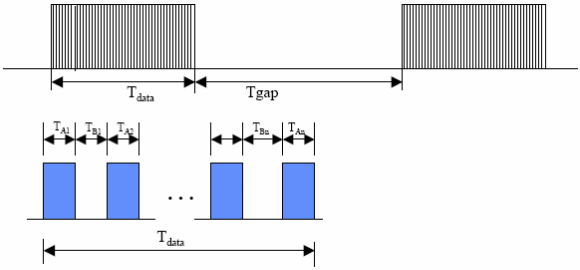
Transmission o remote control signal consist of four parts: Encode Part, IR Transmitter Source, IRM device, Decode Part

1. When IRM-26xxA code select frequency, it need to well understand the center system of encode part.
2. Strong or weak light of IR Transmitter can affect distance of transmission.
3. When using IRM-26xxA device, it requires the composition of code pattern to reach the demand as follows:

Minimum Burst Length tburst (number of pulses per burst) : 10 cycles

Minimum data pause time:

Remocon Tx code with Full frame Repeat



Remocon TX code with Repeat key



Remocon TX repeat Code with minimum burst length



$$T_{actual,data} = T_{data} - \sum_n (T_{Bn} - 150\mu s)$$

$$T_{actual,gap} = T_{gap} - \sum_n (T_{Bn} - 150\mu s)$$

$$T_{actual,gap} \geq 2.0 * T_{actual,data}$$

$$T_{gap} \geq 2.0 * (T_r + 150\mu s)$$

4. It needs to ensure the translation range of decode part if it is applied to the pulse-width range.

If the above items hardly assure of its application, it'll cause NG(no good) message from the edge of signal.

### Typical Electro-Optical Characteristics Curves

Fig.-4 Relative Spectral Sensitivity vs. Wavelength

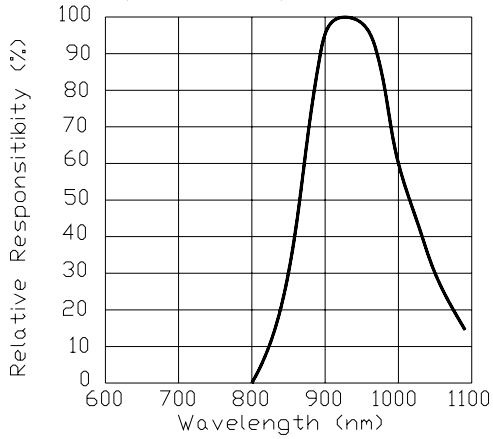


Fig.-5 Relative Transmission Distance vs. Direction

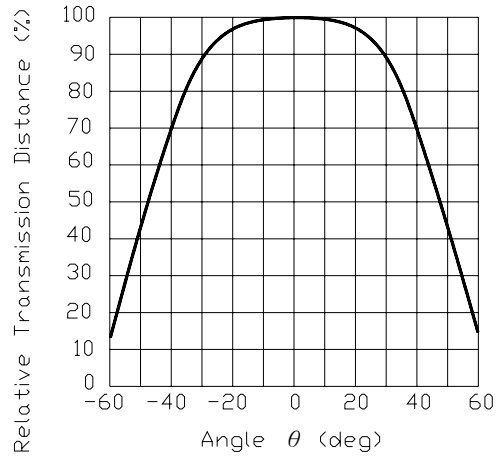


Fig.-6 Arrival Distance vs. Ambient Temperature

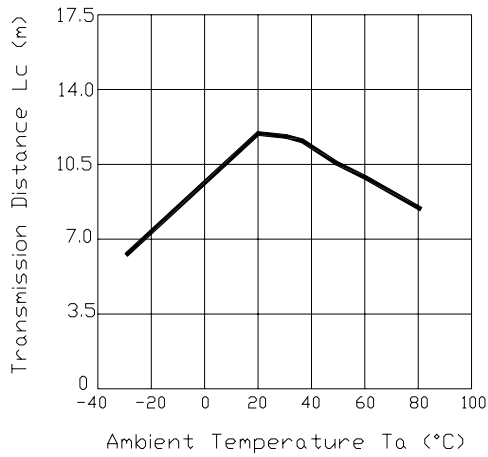


Fig.-7 Arrival Distance vs. Supply Voltage

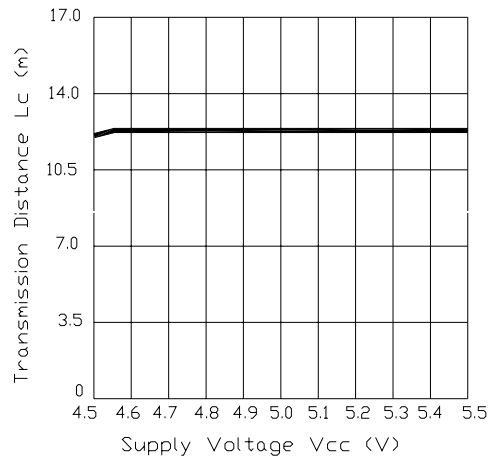
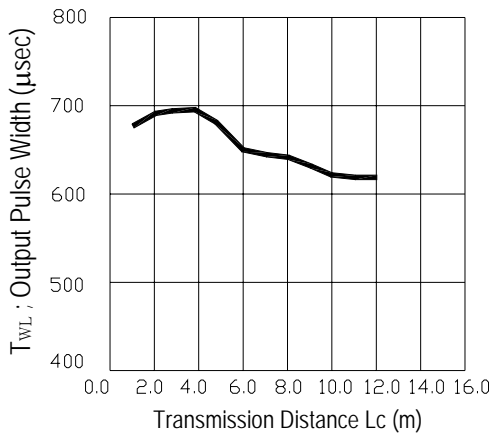
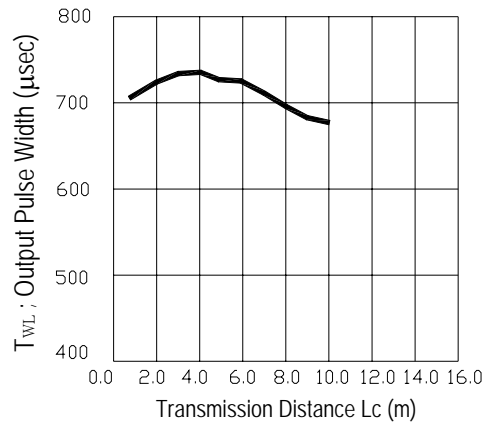


Fig.-8 Relative Transmission Distance vs. Center Carrier Frequency

IRM-2633A, 2636A, 2638A, 2640A

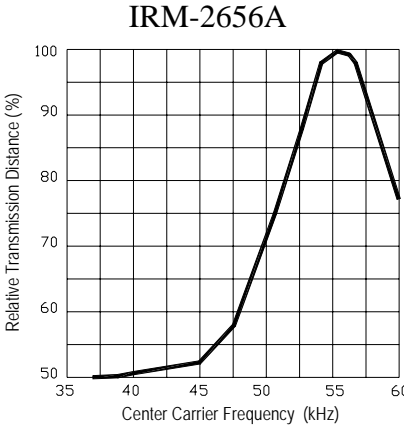
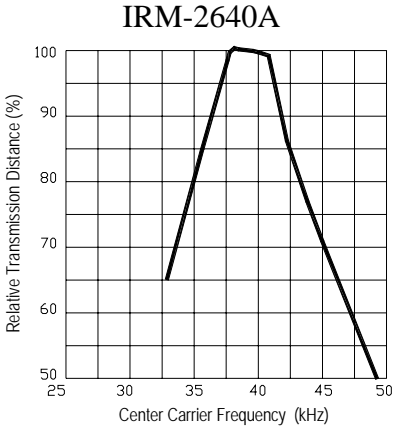
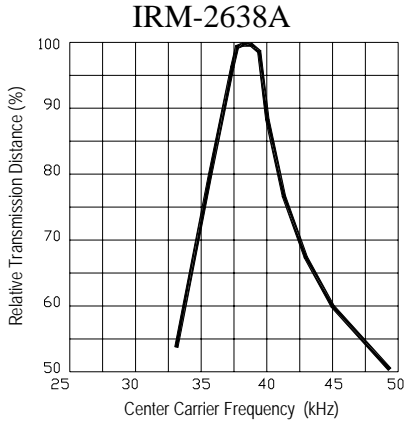
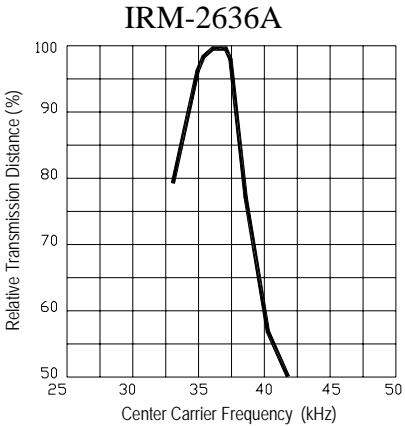
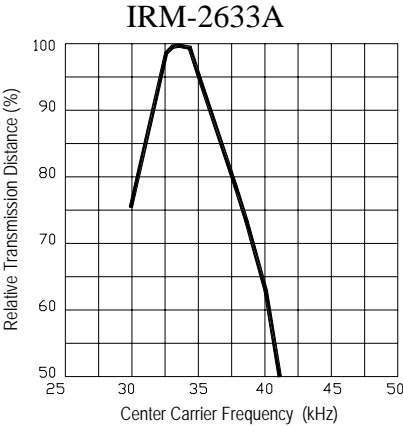


IRM-2656A



**Typical Electro-Optical Characteristics Curves**

Fig.-9 Relative Transmission Distance vs. Center Carrier Frequency





### ■ Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level: 90%

LTPD: 10%

Test Items	Test Conditions	Failure Judgement Criteria	Samples(n) Defective(c)
Temperature cycle	1 cycle -40°C +25°C +85°C (30min)(5min)(30min) 300 cycle test	$L0 \leq L \times 0.8$ $L45 \leq L \times 0.8$  L: Lower specification limit	n=22,c=0
High temperature test	Temp: +85°C Vcc:5V 1000hrs		n=22,c=0
Low temperature storage	Temp: -40°C 1000hrs		n=22,c=0
High temperature High humidity	Ta: 85°C ,RH: 85% 1000hrs		n=22,c=0
Solder heat	Temp: 260±5°C 10sec 4mm From the bottom of the package.		n=22,c=0