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# Infrared Remote Control Receiver Module

## IRM-36XXL Series

### Features

- Photo detector and preamplifier in one package
- Internal filter for PCM frequency
- Improved inner shielding against electrical field disturbance
- TTL and CMOS compatibility
- Low power consumption
- Improved immunity against ambient light
- Suitable burst length  $\geq 10$  cycles/burst
- Pb free
- The product itself will remain within RoHS compliant version.
- Wide operating supply voltage 2.7V—5.5V (Min 2.3V operating)
- Output active low



### Descriptions

The IRM-36XXL is 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-36XXL is the standard IR remote control receiver series, supporting all major transmission codes.

### 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.
- The other equipments with wireless remote control.
- CATV set top boxes
- Multi-media Equipment

PART	MATERIAL	COLOR
Chip	Silicon	Black
Compound	Epoxy	Black





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

Parameter	Symbol	Rating	Unit	Notice
Supply Voltage	Vcc	0~6	V	
Operating Temperature	Topr	-20 ~ +80	°C	
Storage Temperature	Tstg	-40 ~ +85	°C	
Soldering Temperature	Tsol	260	°C	4mm from mold body less than 10

### Recommended Operating Condition

Supply Voltage Rating: Vcc 2.7V to 5.5V

### Electro-Optical Characteristics (Ta=25°C, and Vcc=3V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Consumption Current	Icc	---	0.33	0.48	mA	No signal input
Peak Wavelength	$\lambda_p$	---	940	---	nm	
Reception Distance	L <sub>0</sub>	14	---	---	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	$\mu s$	
Low Level Pulse Width	T <sub>L</sub>	400	---	800	$\mu s$	
High Level Output Voltage	V <sub>H</sub>	2.7	---	---	V	
Low Level Output Voltage	V <sub>L</sub>	---	---	0.5	V	

#### Notes:

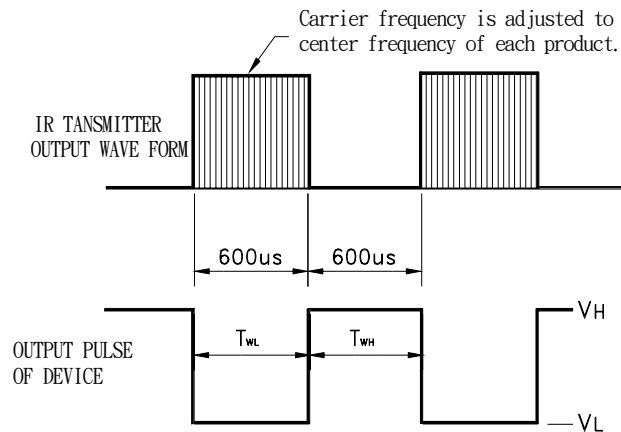
\*1: The ray receiving surface at a vertex and relation to the ray axis in the range of  $\theta = 0^\circ$  and  $\theta = 45^\circ$ .

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

Fig.-1

Transmitter Wave Form

D.U.T output Pulse



### 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 then 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  $\lambda_p=940\text{nm}, \Delta\lambda=50\text{nm}$ .

(Standard light / Light source temperature  $2856^\circ\text{K}$ ).

④ Measuring system

According to the measuring system shown in Fig.-3

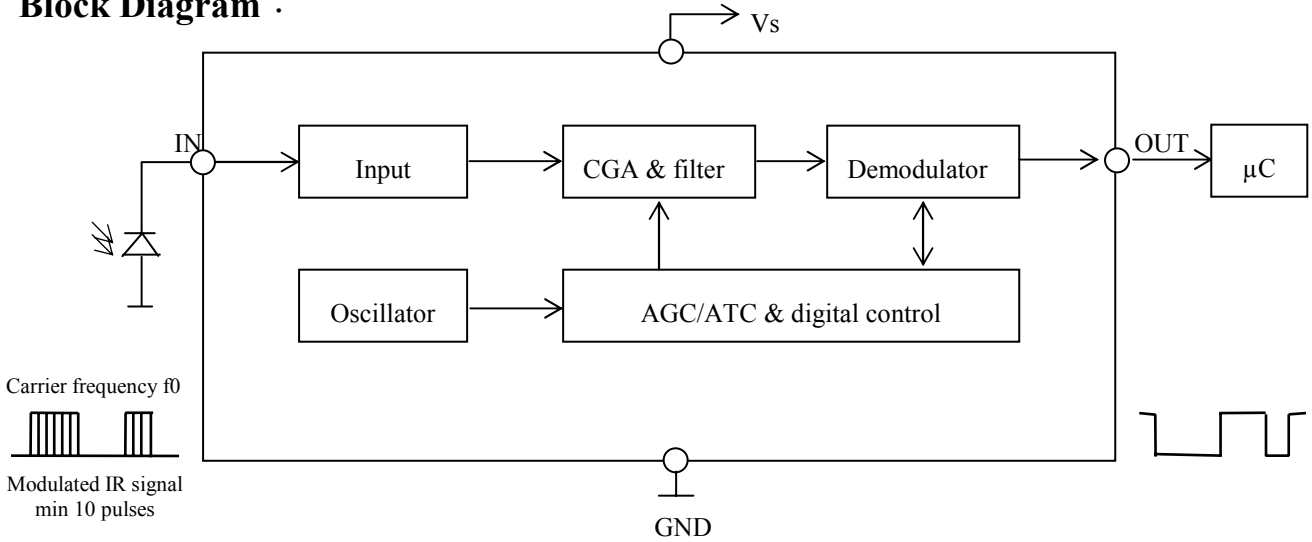


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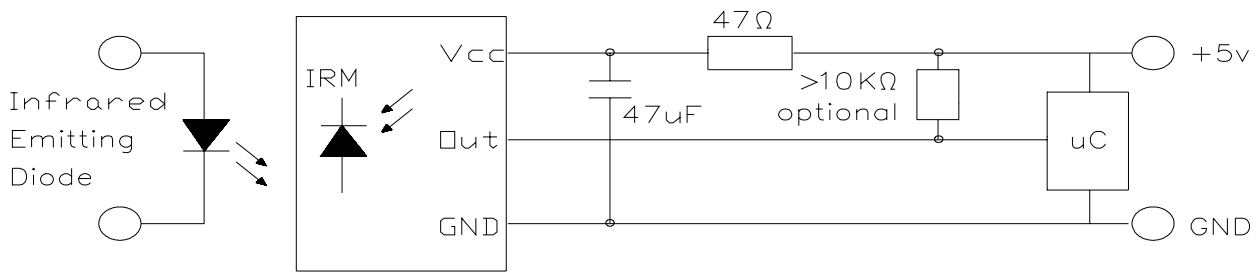
# Infrared Remote Control Receiver Module

## IRM-36XXL Series

### Block Diagram :



### Application Circuit :



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

Fig.-2 Measuring Method

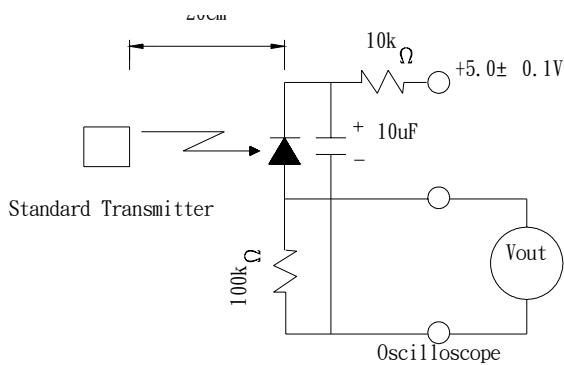
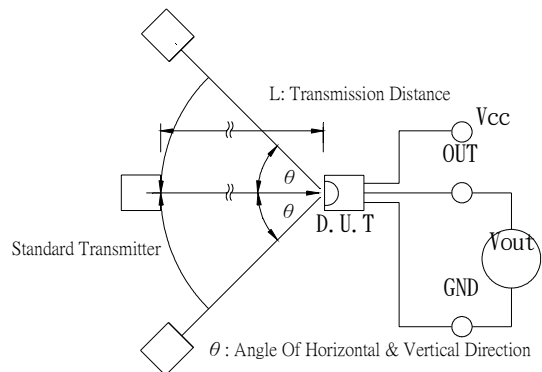


Fig.-3 Measuring System



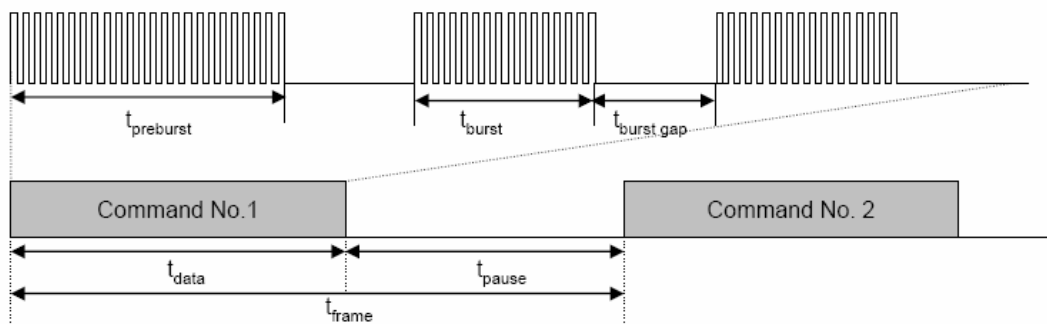
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### The Notice of Application:

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

1. When IRM-36XXL SERIES 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-36XXL SERIES device, it requires the composition of code pattern to reach the demand as follows:



Minimum $t_{burst}$ ( number of pulses per burst)	Minimum $t_{burst\_gap}$ ( number of pulses between two burst)	Minimum $t_{pause}$
10pulses	14 pulses	20 msec

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.

### IRM-36XXL SERIES Code Property:

Data format		Data format	
NEC	O	Sony 12 Bit	O
RC5_Philips	O	Sony 15 Bit	X
RC6_Philips	O	Sony 20 Bit	X
RCA_Thomson	X	Matsushita	O
Toshiba	O	Mitsubishi	O
Sharp	O	Zenith	O
JVC	O	High data rate (4000 bit/s)	X

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## IRM-36XXL Series

### Typical Electro-Optical Characteristics Curves

Fig.-4 Relative Spectral Sensitivity vs. Wavelength

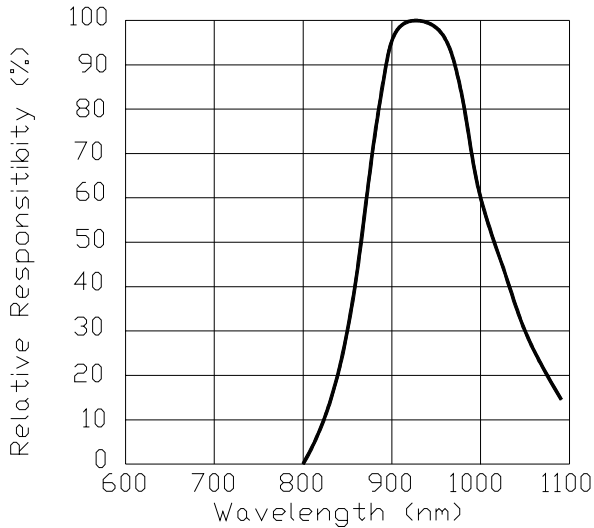


Fig.-5 Relative Transmission Distance vs. Direction

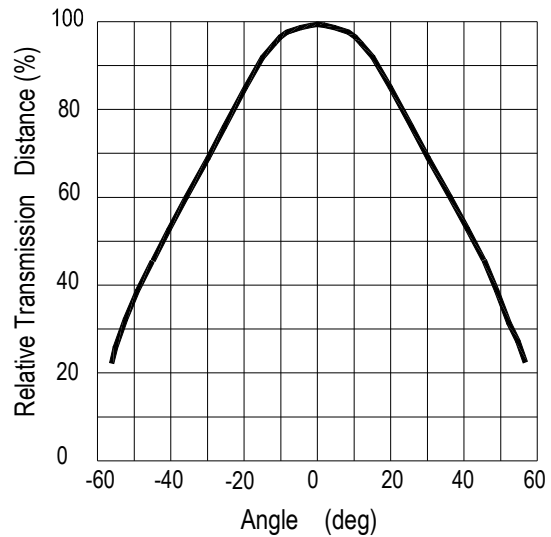


Fig.-6 Output Pulse Length vs. Arrival Distance

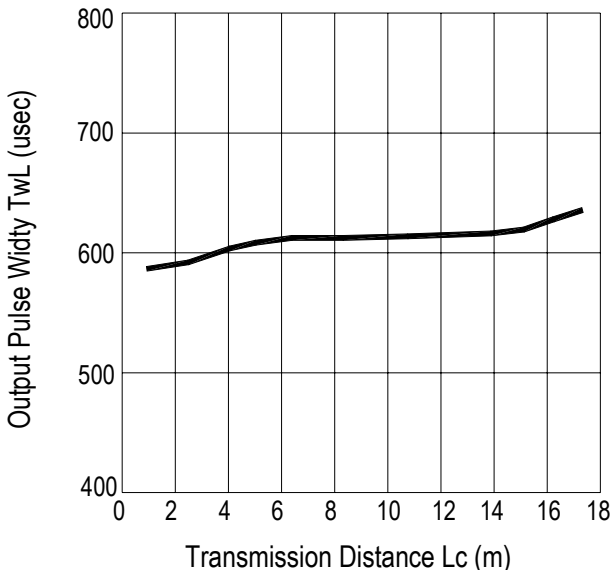
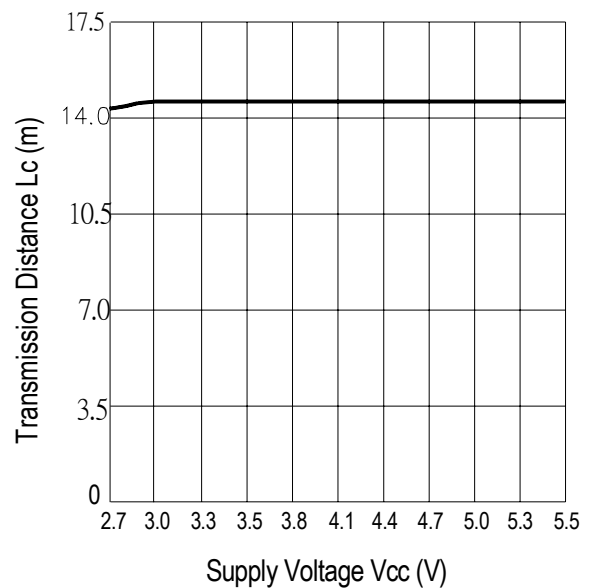


Fig.-7 Arrival Distance vs. Supply Voltage

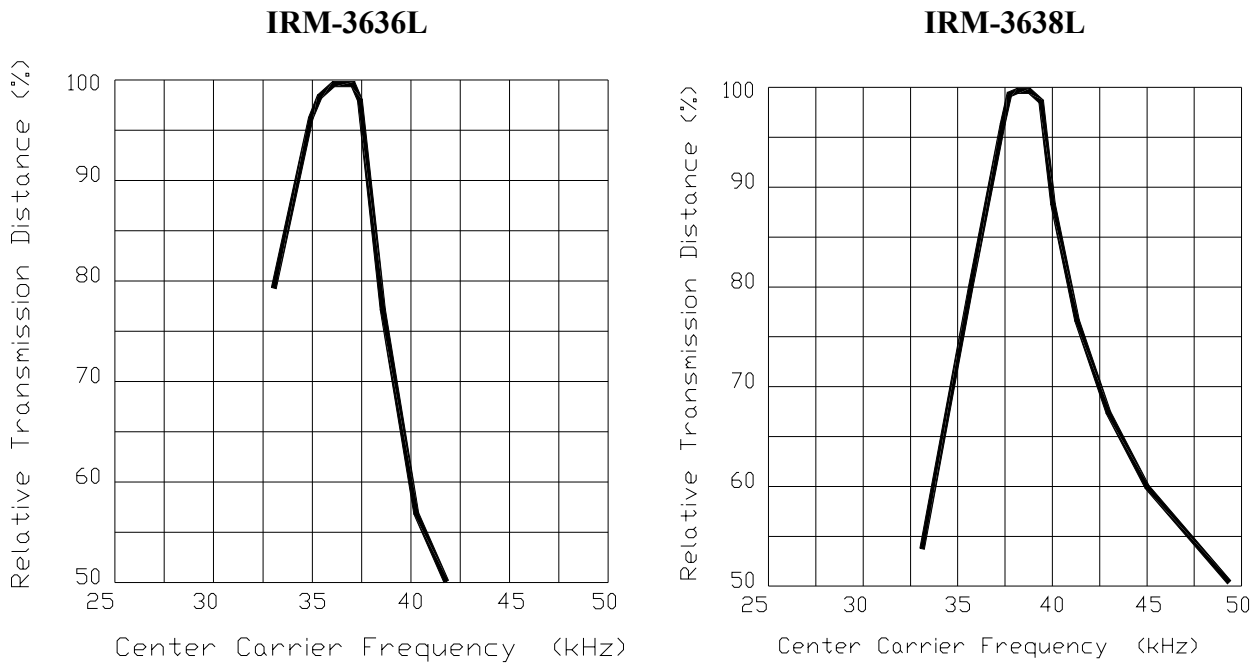


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## IRM-36XXL Series

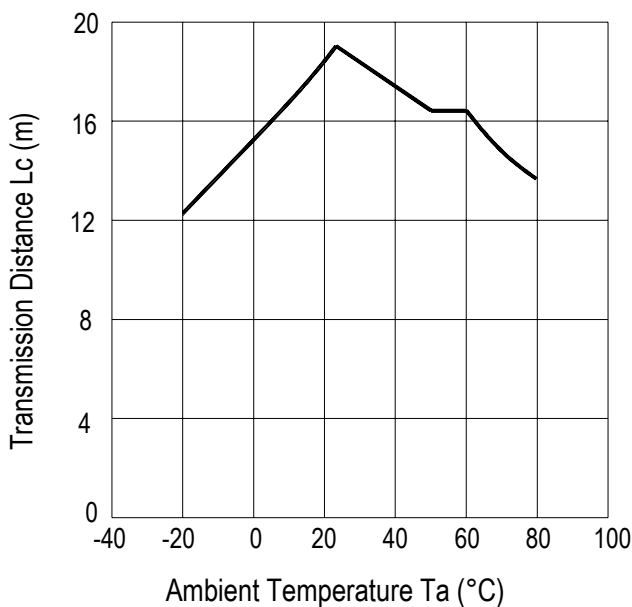
### Typical Electro-Optical Characteristics Curves

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



### Typical Electro-Optical Characteristics Curves

Fig.-9 Arrival Distance vs. Ambient Temperature







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## IRM-36XXL Series

### 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	<u>Samples(n)</u> Defective(c)
Temperature cycle	1 cycle -40°C ↔ +100°C (15min)(5min)(15min) 300 cycle test	$L_0 \leq L \times 0.8$ $L_{45} \leq L \times 0.8$  L: Lower specification limit	n=22,c=0
High temperature test	Temp: +100°C Vcc:6V 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



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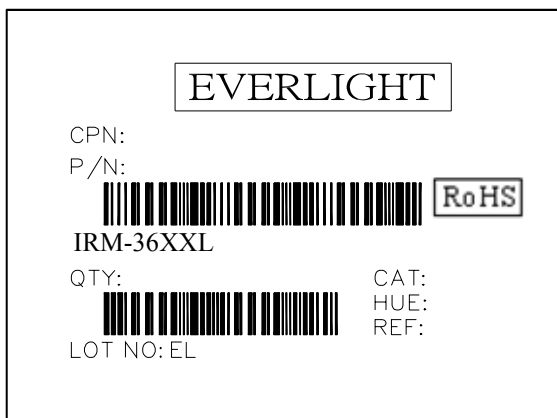
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## IRM-36XXL Series

### Packing Quantity Specification

1. 1500 PCS/1Box
2. 10 Boxes/1Carton

### Label Form Specification



CPN: Customer's Production Number  
P/N : Production Number  
QTY: Packing Quantity  
CAT: Ranks  
HUE: None  
REF: Reference  
LOT No: Lot Number  
MADE IN TAIWAN: Production Place

### Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. 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 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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