

# IR Receiver Module

## RPM6900 series

RPM6900 series are remote control receiver modules. Small-sized and light-weight modules have been achieved by using resin mold.

### ●Applications

All household electric appliances such as TV, DVD, air conditioner and audio equipment.

### ●Features

- 1) Good EMI noise shielding characteristics.
- 2) Excellent sun light noise shielding performance.
- 3) Built-in electric-magnetic shield no requiring shield-casing.

### ●RPM6900 series list

	Height to lens	5.5mm	4.8mm
	Frequency (kHz)	Straight Type RSIP-A3	L forming RSIP-A3 V4
Product No.	33.0	RPM6933	RPM6933-V4
	36.0	RPM6936	RPM6936-V4
	36.7	RPM6937	RPM6937-V4
	37.9	RPM6938	RPM6938-V4
	40.0	RPM6940	RPM6940-V4
	56.9	RPM6957	RPM6957-V4

### ●Absolute maximum ratings (Ta = 25°C)

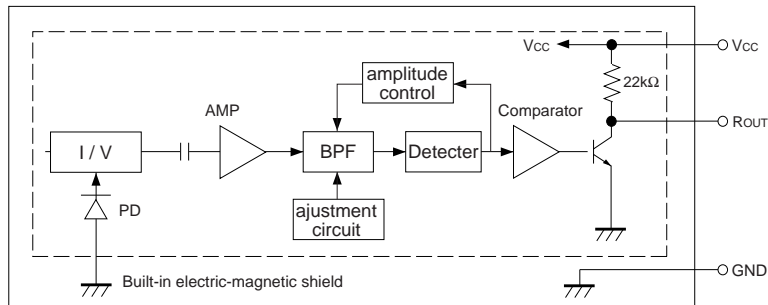
Parameter	Symbol	Limits	Unit
Supply Voltage	Vcc	6.3	V
Output Current	Io	2.5	mA
Storage temperature	Tstg	-30 to +100	°C
Operating temperature	Topr	-10 to +75	°C

### ●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	Vcc	4.5	5.0	5.5	V

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●Block diagram



●Terminal description

Pin No.	Pin name	Function
1	R <sub>OUT</sub>	OUTPUT TERMINAL
2	GND	GROUND
3	V <sub>CC</sub>	POWER SUPPLY



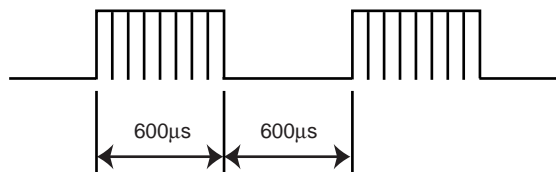
●Electrical, Optical characteristics (Unless otherwise noted, Ta = 25°C V<sub>CC</sub>=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Consumption Current	I <sub>CC</sub>	–	1.5	2.0	mA	No outside light, No signal input
Effective Distance	L	10	16	–	m	Outer light condition E <sub>e</sub> < 10 (lx) *1
High Level Output Voltage	V <sub>H</sub>	4.5	–	–	V	*1
Low Level Output Voltage	V <sub>L</sub>	–	–	0.5	V	I <sub>sink</sub> ≤ 400μA *1
ON Pulse Width	T <sub>ON</sub>	400	600	800	μs	Outer light condition E <sub>e</sub> < 10 (lx) *1
OFF Pulse Width	T <sub>OFF</sub>	400	600	800	μs	Outer light condition E <sub>e</sub> < 10 (lx) *1
Center frequency	f <sub>o</sub>	–	*3	–	kHz	
Horizontal half angle	θ 80%	–	35	–	deg	*2
Vertical half angle	θ 80%	–	30	–	deg	*2

\*1 600/600μs burst wave is transmitted by standard transmitter. However, it must be measured after the initial transmission pulse is 10 pulse.  
 \*2 It is an angle when the linear arrival distance become 80%.  
 \*3 RPM6933 33.3kHz RPM6938 37.8kHz  
 RPM6936 36.0kHz RPM6940 40.0kHz  
 RPM6937 36.7kHz RPM6957 56.9kHz

● Measurement Conditions

(1) Transmit signal



Carrier frequency=f<sub>o</sub>, Duty=50%

Fig.1 Transmit signal

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(2) Standard transmitter

$\lambda_{\text{peak}}=940\text{nm}$   
 $\lambda_{\Delta}=40\text{nm}$

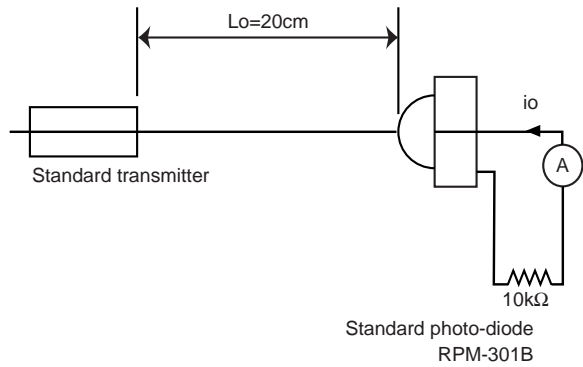


Fig.2 Measurement of standard transmitter proofreading

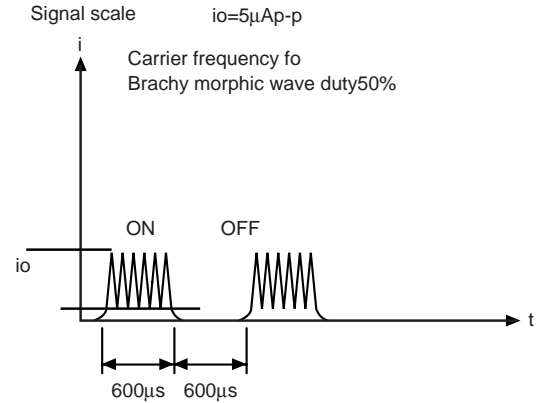


Fig.3 Standard photo diode current

When standard transmitter output the signal at Fig.1 standard photodiode output become  $i_o=5\mu\text{A}_{p-p}$  (Fig.3) under the measurement condition Fig.2.

(The radiant intensity of standard transmitter :  $50\text{mW} / \text{sr}$ )

RPM-301B : standard photodiode has short current  $I_{sc}=27\mu\text{A}$  at  $E=1000(\text{lx})$   
 (using CIE standard light source A)

(3) Measurement effective distance, horizontal & vertical half angle

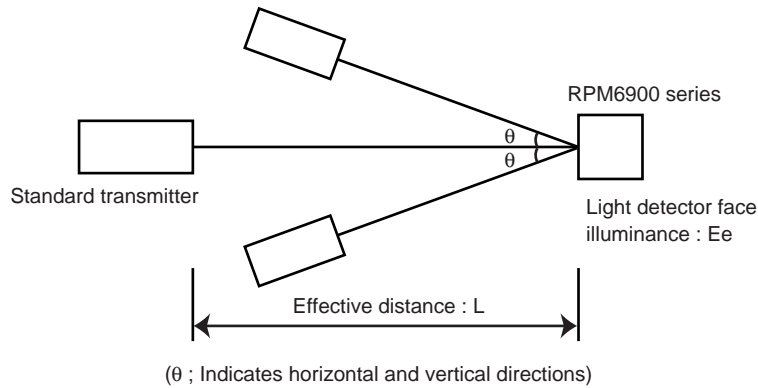


Fig.4 Measurement condition for effective distance

Effective distance L : Effective distance at  $\theta=0^\circ$  Fig.4  
 Horizontal & vertical half angle  $\theta$  : The angle which effective distance became 50% of L.

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(4) Output signal

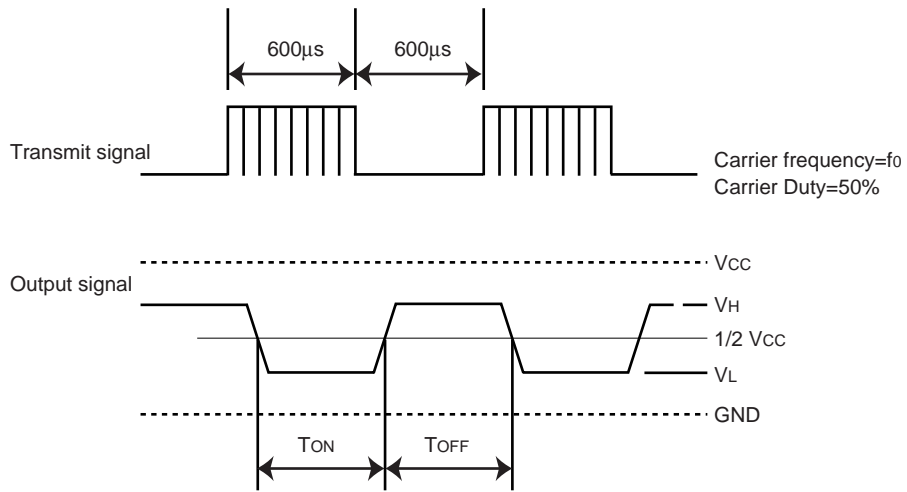


Fig.5

(5) Measurement circuit for the output voltage and the consumption current

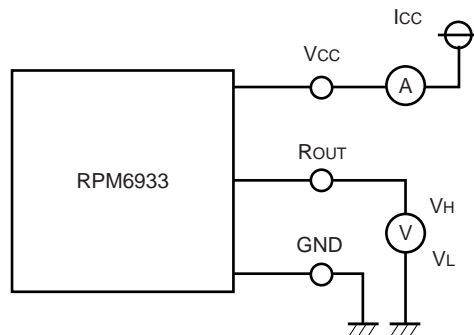
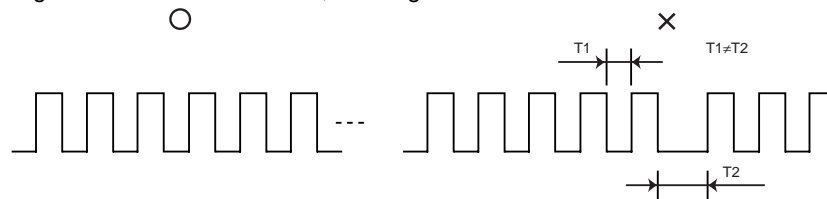


Fig.6

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## ●Notes

- (1) All characteristics of the receiver in this specification are specified by supplying burst wave form (Fig.1) with ROHM standard transmitter (Fig.2).  
If in case of other burst wave form will be used, please check these spec. Carefully under the evaluations.
- (2) When the receiver will be used as the wire-less remote controller, please use the signal method the signal format which refer to "Measures to prevent malfunctioning of IR remote-controlled electric home appliances". (Published July 1987 by Association of Electric Home Appliances)  
If using other signal method, signal format, (ex: signal format which not including the leader signal) the receiver might have chances to miss-function.
- (3) Please set up transmitter's carrier frequency as same as the receiver's  $f_0$  frequency. Otherwise error might be occurred.
- (4) If transmission signal has non-continues carrier, error might be occurred. Continuous carrier is necessary.



- (5) The receiver was designed to use as in-door use only.  
Therefore, please understand that the receiver cannot cover all characteristics, in case of using it out-door.
- (6) Noise environment (Light noise from inverter Lamp, and other kind of Lamps, Power ripple, electromagnetic noise from power circuit, and etc) may cause a reduced effective distance.
- (7) The receiver may not work properly if receiving signal judgment is done by single pulse due to the surrounding / environmental noises.  
To prevent such misjudgment, please make sure that the receiver is set up to work only when receiving series of coded signal.
- (8) Emitting unit (remote control transmitter) has to be considered about its emitting device function, characteristics and characteristics of the receiver.
- (9) Do not supply unnecessary stress to lead.
- (10) Please pay careful attention to the lens.  
It might have a chance to miss-function when the lens get dust or dirty. And also please do not touch the lens.
- (11) In order to prevent products from ESD, human body and solder iron, etc. are required to be grounded.

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●Electrical and optical characteristics curves

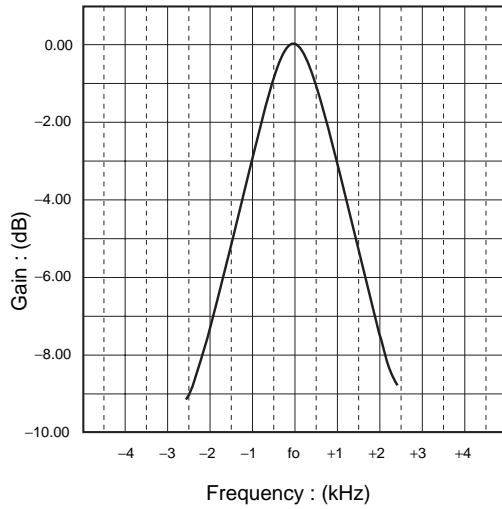


Fig.7 BPF characteristic

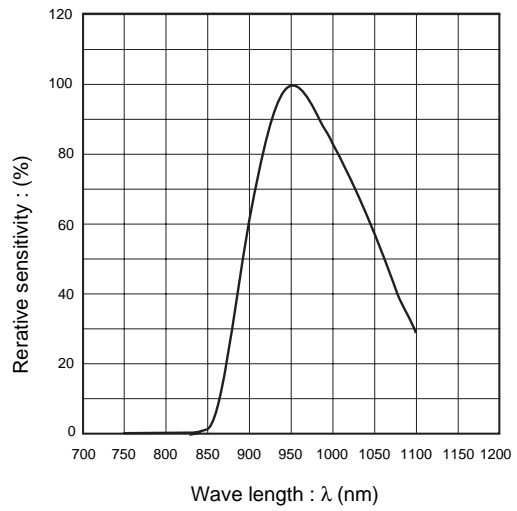


Fig.8 Optical bandwidth of the photo-diode encapsulation

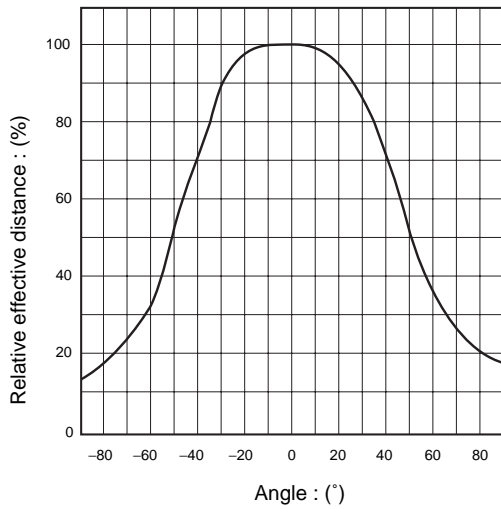


Fig.9 Direction characteristic (Horizontal direction)

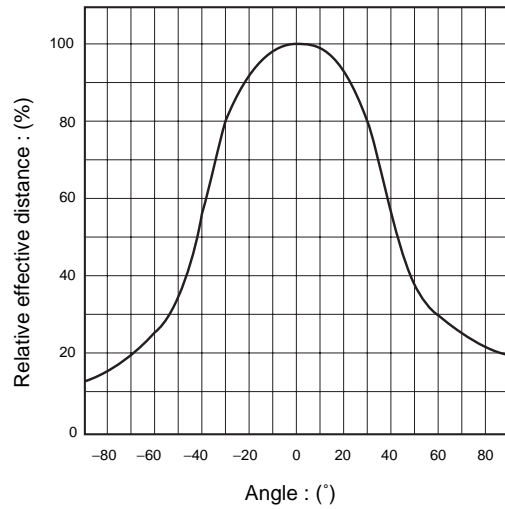
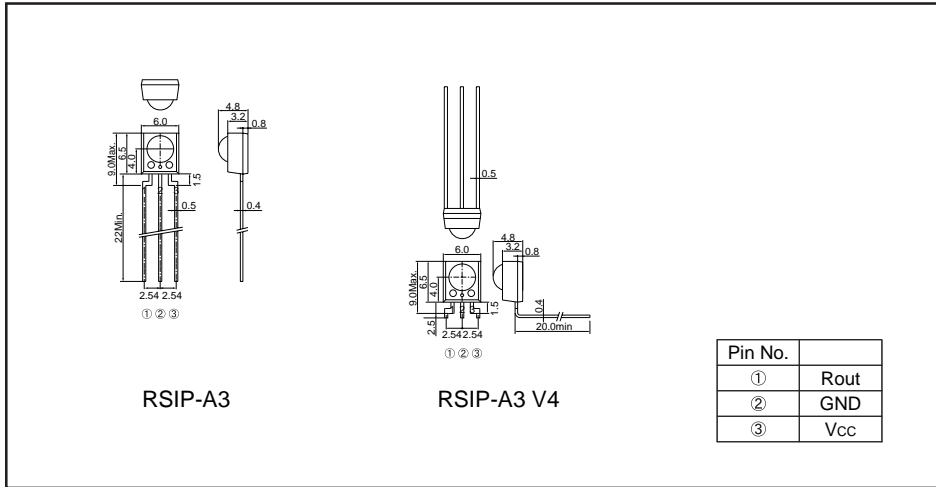


Fig.10 Direction characteristic (Vertical direction)

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●Dimensions (Unit : mm)



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