Remote control photosensitive IC
RPM6900 Series

The RPM6900 series are remote control photosensitive units in a compact, lightweight package made from a resin mold.

●Applications

VCRs, TVs, movies, air conditioners, audio equipment, and other household electrical appliances

●Features

1) Resin mold package enables a compact size and light weight.
2) Built-in electromagnetic shield.

●RPM6900 series models

Model	Carrier frequency
RPM6933	33.0kHz
RPM6933-V4	33.0kHz
RPM6936	36.0kHz
RPM6936-V4	36.0kHz
RPM6937	36.7kHz
RPM6937-V4	36.7kHz
RPM6938	37.9kHz
RPM6938-V4	37.9kHz
RPM6940	40.0kHz
RPM6940-V4	40.0kHz
RPM6957	56.9kHz
RPM6957-V4	56.9kHz

＊The V4 models are forming types.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit	Conditions
Supply voltage	V_{CC}	6.3	V	
Output sink current	I_O	2.5	mA	
Storage temperature	T_{stg}	−30〜+100	℃	
Soldering temperature	T_{sol}	260	℃	3mm from the lead bottom, within 5sec

●Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	4.5	5.0	5.5	V
Operating temperature	T_{opr}	−10	25	75	℃

Note: tice due to improvements in the product.

●Block diagram
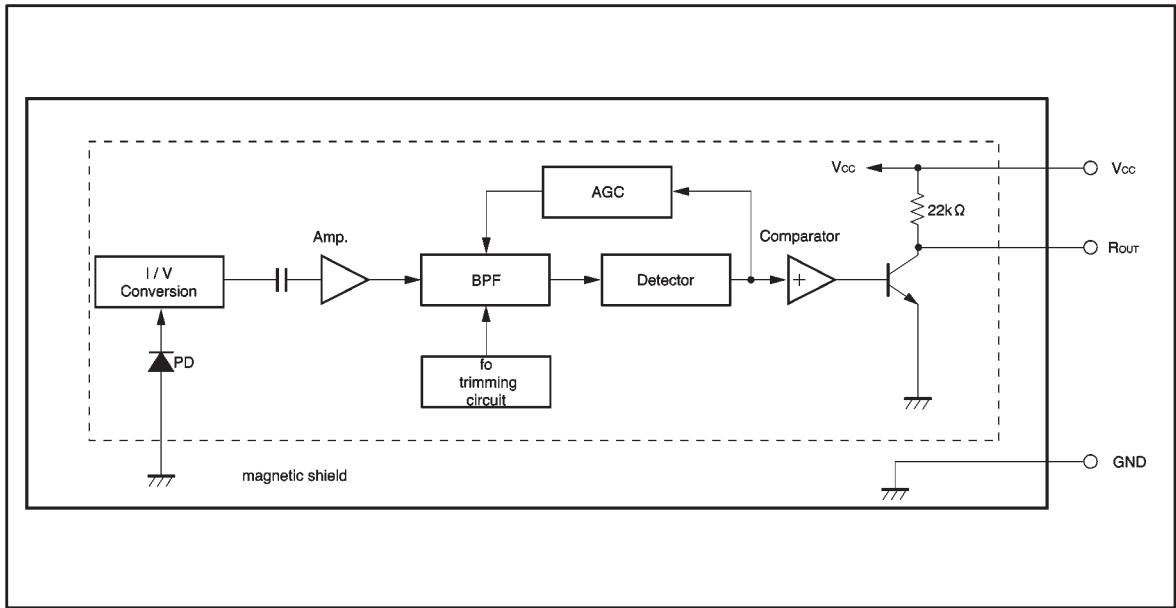
●Electrical, optical characteristics (V_{CC} = 5V, Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Consumption current	I_{CC}	—	1.5	2.0	mA	No outside light, no signal input
Arrival distance	L	8	12	—	m	*1 Outer light condition Ee＜10(lx)
High level output voltage	V_H	4.5	—	—	V	*1
Low level output voltage	V_L	—	—	0.5	V	*1 I_0＝400μA
ON pulse width	T_{ON}	400	600	800	μs	*1 Outer light condition Ee＜10(lx)
OFF pulse width	T_{OFF}	400	600	800	μs	*1 Outer light condition Ee＜10(lx)
Center frequency	fo	—	37.9	—	KHz	
Horizontal direction characteristics	θ 80%	—	35	—	deg	*2
Vertical direction characteristics	θ 80%	—	30	—	deg	*2

*1 The burst wave form mentioned in fig.1 is to be transmitted from standard transmitter (fig.2).
   Measure 10th or later pulse width after beginning of transmission.
*2 The angle which arrival distance become 80% of L. （arrival distance at θ ＝0°）.
   ON / OFF pulse width is to be satisfied within 0.5cm～ arrival distance.

●Measurement conditions
(1) Transmit signal

600 μs   600 μs

Carrier frequency＝fo, Duty＝50%
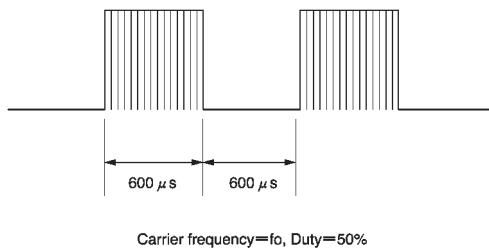
Fig.1   Transmit signal

(2) Standard transmitter
　　λ peak=940nm
　　Δ λ=40nm

Lo＝20cm

Standard transmitter

io

A

10kΩ
Standard photodiode
RPM-301B
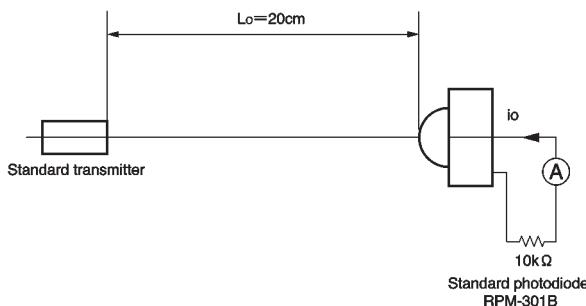
Fig.2   Measurement of standard transmitter proofreading

Signal level   io＝5 μ AP−P
i

Carrier frequency
duty 50%

ON   OFF

io

600 μs 600 μs

t
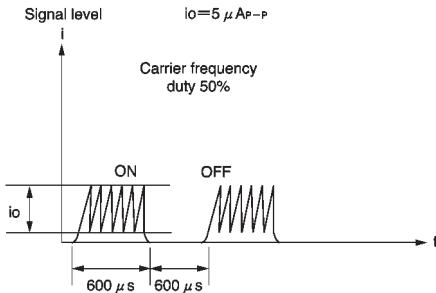
Fig.3   Standard photodiode current

When standard transmitter output the signal at Fig.1 standard photodiode output become io = 5μ AP-P under the measurement condition Fig2, Fig.3.
RPM-301B: standard photodiode has short current ISC = 27μ A at E = 10001x
(using CIE standard light source A)

(3) Measurement arrival distance, Horizontal & vertical half angle

Device under test

Standard transmitter   θ
θ

Arrival distance: L   (θ ; Indicates horizontal and vertical directions)
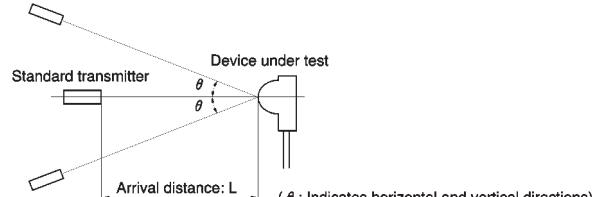
Fig.4   Measurement condition for arrival distance

Arrival distance L:
　　Arrival distance at θ = 0° Fig.4
Horizontal & vertical half angle θ:
　　The angle which arrival distance became 50% of L.

(4) High level, low level output voltage

Vcc=5.0V

VH

VL

GND
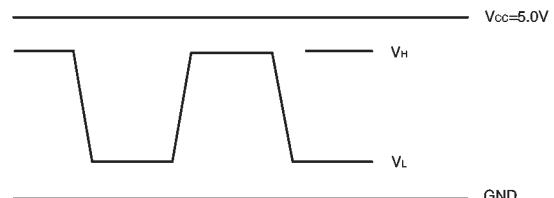
●Measurement circuit
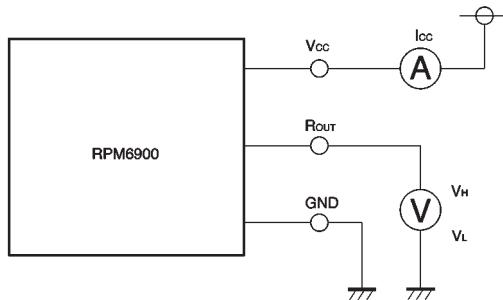
Fig.5

●Recommended application
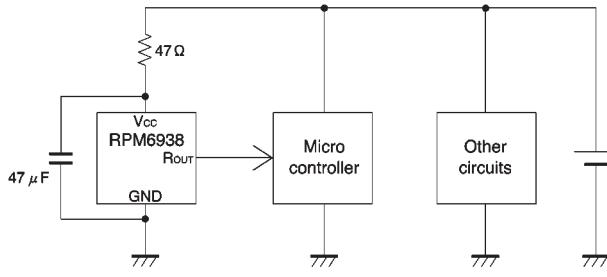
Fig.6

• Please place filter (resistors and capacitors) as close to the receiver as possible.
• In order to stable operation, using serial resistor (47Ω) on power supply line and capacitor (more than 47μF) between
  power supply and GND is recommended.
  (This reduce influence by switching power supply ripple and ripple which caused by the change of micro controller load
  and other circuits load.)
  Without the above circuit, Arrival distance might be less due to noise pulse on output wave.
  (In case even with the above mentioned value, please change bigger capacitance.)

●Operation notes

(1) All characteristics of the receiver in this specification
are specified by supplying burst wave form 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 re-
mote controller, please use the signal method the signal
format which refer to "Measures to prevent miss-func-
tioning of IR remote-controlled electric home ap-
pliances".
(Published July 1987 by Association of Electric Home

Appliances)
However, please use the standard pulse width (T) of
greater than 0.4ms and less than 0.6ms (0.4ms < T <
0.6ms)
If using other signal method, signal format, (ex: signal for-
mat 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 f0 frequency. Otherwise error might be occurred.

(4) If transmission signal has non-continues carrier, error might be occurred. Continuous carrier is necessary.
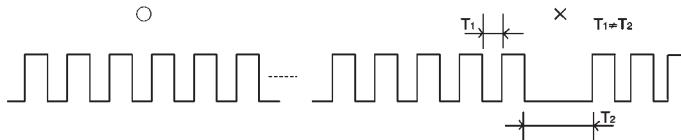
(5) The receiver was designed to use as in-door use only. Therefore, please understand that the receiver cannot cover all characteristics, in case of using it out-door.
(6) Emitting unit (remove control transmitter) has to be considered about its emitting device function, characteristics and characteristics of the receiver.

(7) Do not supply unnecessary stress to lead and holder.
(8) Please pay careful attention to the lens.
It might has a chance to miss-function when the lens get dust or dirty. And also please do not touch the lens.
(9) In order to prevent IC from ESD, human body, solder iron, etc are required to be grounded.

●Electrical, optical characteristics curves
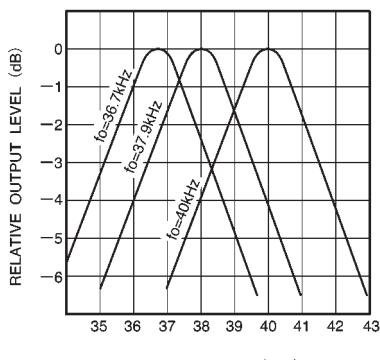

Fig.7 B.P.F. characteristics
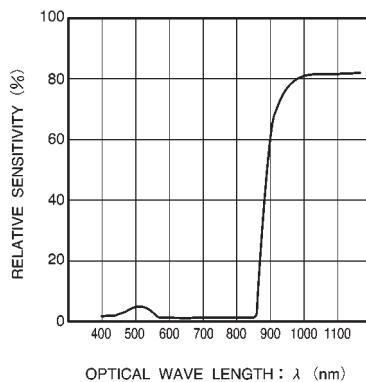
Fig.8 Package transmittance
(measured on flat board at t＝3.5 mm)
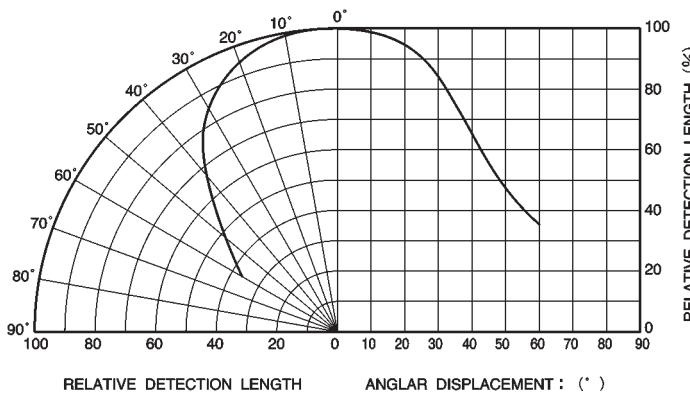
Fig.9   Directional characteristics in vertical direction
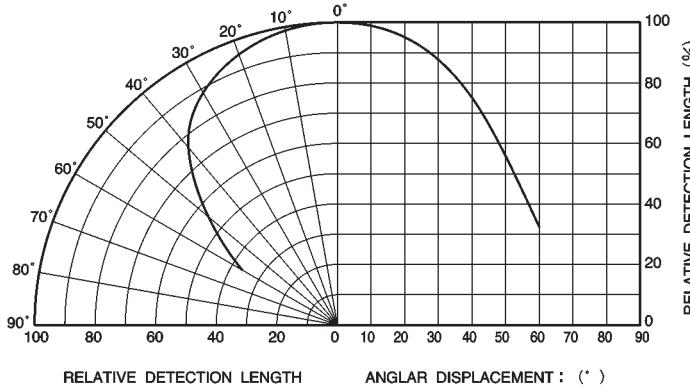
Fig.10   Directional characteristics in horizontal direction

●External dimensions (Units: mm)

Straight type

4.8±0.2
3.2
0.8
6.0±0.2
9.0Max.
6.5±0.2
4.0
1.5
0.4
0.5±0.1
2.54 2.54

(1) Rout
(2) GND
(3) Vcc

RSIP-A3

Forming type

0.5±0.1
4.8±0.2
3.2
0.8
6.0
9.0Max.
6.5
4.0
1.5
2.54 2.54
2.5±0.5
0.4
90 +10° −5°
20Min.

(1) Rout
(2) GND
(3) Vcc

RSIP-A3（V4）