

IR Receiver Module

RPM7157 series

RPM7157 series are remote control receiver modules. Small-sized, light-weight, and low current consumption modules have been achieved by using resin mold.

●Center frequency

56.9kHz

●Applications

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

●Features

- 1) Low current consumption. (1.0mA Typ.)
- 2) High ripple rejection.
- 3) 5 types of holders available for each set.

●RPM7157 series

	Straight type RSIP-A3	L forming RSIP-A3 V4	with holders				
			Horizontal board (High) RSIP-A3 (H13)	Horizontal board (Low) RSIP-A3 (H5)	Vertical board RSIP-A3 (H4)	Vertical board RSIP-A3 (H8)	Vertical board RSIP-A3 (H9)
Height to lens	5.5mm	4.8mm	15.0mm	9.6mm	15.9mm	7.2mm	12.0mm
Products No.	RPM7157	RPM7157-V4	RPM7157-H13	RPM7157-H5	RPM7157-H4	RPM7157-H8	RPM7157-H9

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Supply Voltage	V _{CC}	-0.3 to +7.0	V
Storage temperature	T _{stg}	-30 to +100	°C
Operating temperature	T _{opr}	-10 to +75	°C
Soldering temperature	T _{sol}	260*	°C

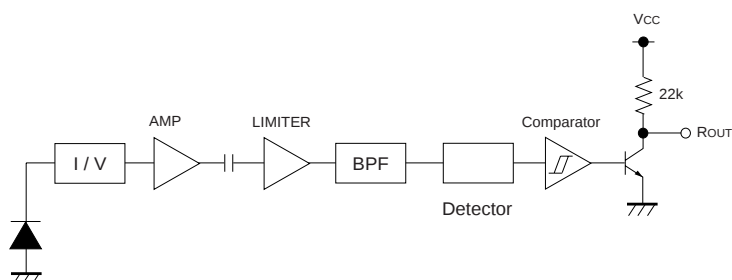
* 3mm from the lead root within 5s.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V _{CC}	4.5	5.0	5.5	V

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●Block diagram



●Terminal description

Pin No.	Pin name	Function
1	ROUT	OUTPUT TERMINAL
2	GND	GROUND
3	VCC	POWER SUPPLY



●Electrical characteristics (Unless otherwise noted, Ta = 25°C Vcc=5V)

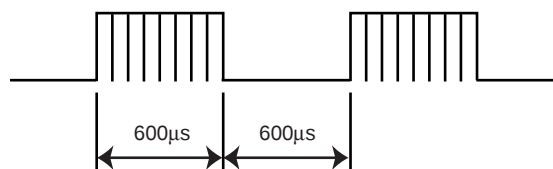
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Consumption Current	I _{CC}	—	1.0	1.6	mA	No outside light, No signal input
Effective Distance	L	8	15	—	m	Outer light condition E _e < 10 (lx) *1
High Level Output Voltage	V _H	4.5	—	—	V	*1
Low Level Output Voltage	V _L	—	—	0.5	V	I _{sink} =200μA *1
ON Pulse Width	T _{ON}	400	600	800	μs	Outer light condition E _e < 10 (lx) *1
OFF Pulse Width	T _{OFF}	400	600	800	μs	Outer light condition E _e < 10 (lx) *1
Center frequency	f _o	—	56.9	—	kHz	
Horizontal half angle	θ 1/2	—	45	—	deg	*2
Vertical half angle	θ 1/2	—	35	—	deg	*2

*1 600/600μs burst wave is transmitted by standard transmitter. However, it must be measured after the initial transmission pulse is 100 pulse.

*2 It is an angle when the linear arrival distance become half.

● Measurement Conditions

(1) Transmit signal



Carrier frequency=f_o, Duty=50%

Fig.1 Transmit signal

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(2) Standard transmitter

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

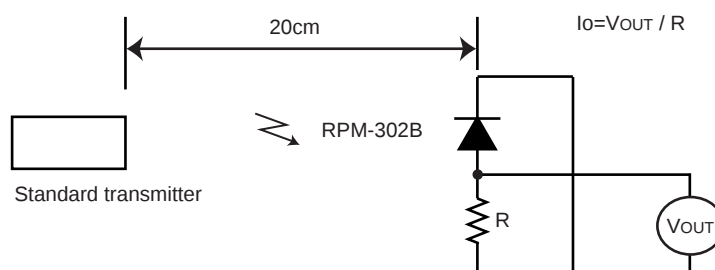


Fig.2 Measurement of standard transmitter proofreading

When standard transmitter output the signal at Fig.1 standard photodiode output become $I_o=5\mu\text{Ap-p}$ under the measurement condition Fig.2.

(The radiant intensity of standard transmitter : 50mW / sr)

RPM-302B : 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

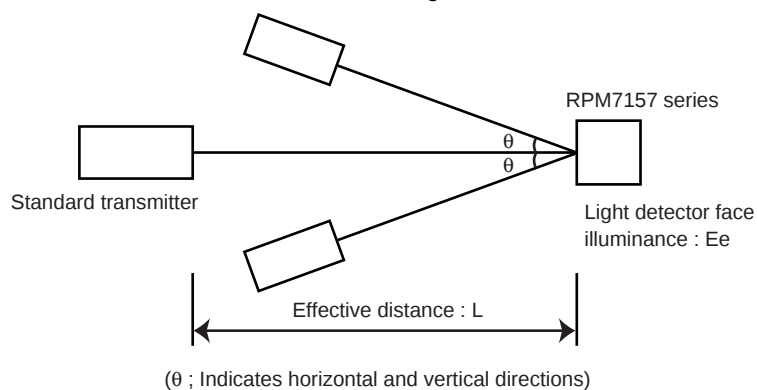


Fig.3 Measurement condition for effective distance

Effective distance L : Effective distance at $\theta=0^\circ$ Fig.3

Horizontal & vertical half angle θ : The angle which effective distance became 50% of L.

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(4) Output signal

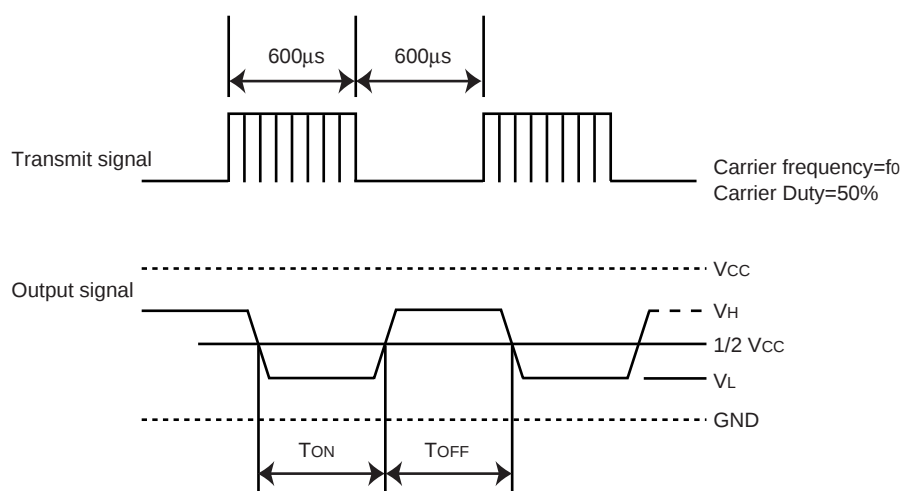


Fig.4

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

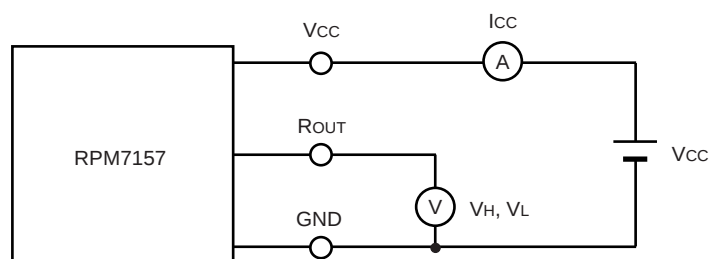
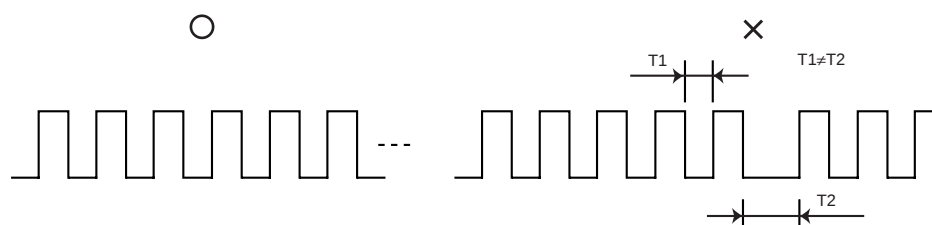


Fig.5

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●Notes

- (1) All characteristics of the receiver in this specification are specified by supplying burst wave form with ROHM standard transmitter (Shown as 8 (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) Emitting unit (remote control transmitter) has to be considered about its emitting device function, characteristics and characteristics of the receiver.
- (8) Please connect "Holder" on to the "Ground (GND)" of PCB.
If the holder is not connected to the GND, there is a possibility of worsening the characteristics of product.
- (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 IC from ESD, human body and solder iron, etc. are required to be grounded.

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●Electrical and optical characteristics curves

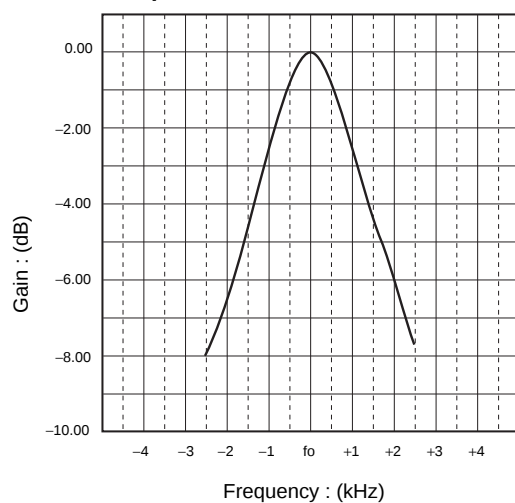


Fig.6 RPM7157 Series BPF Characteristics

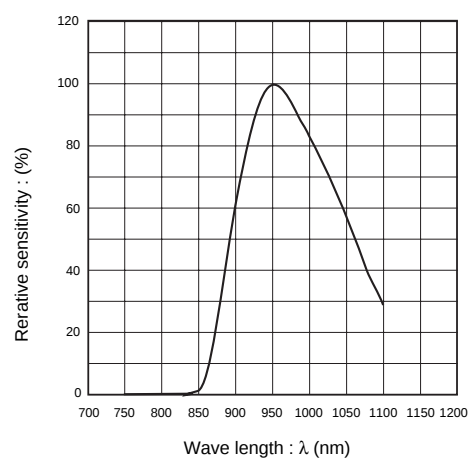
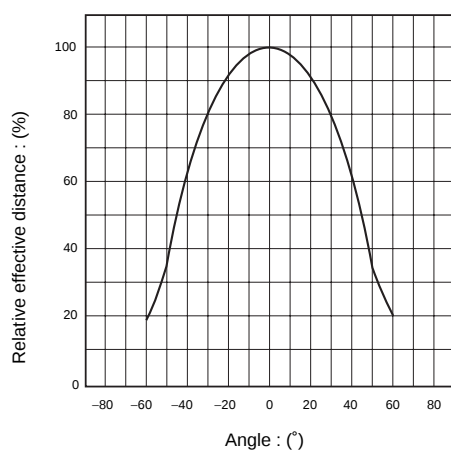
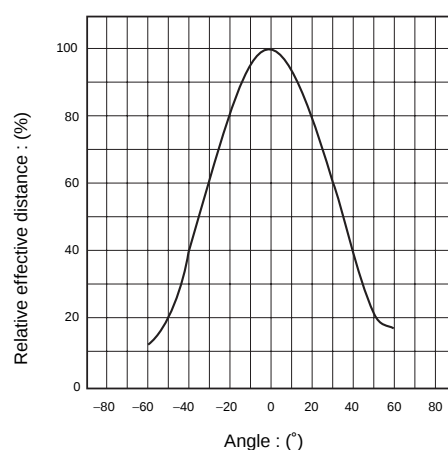


Fig.7 Optical bandwidth of the photo-diode encapsulation

Fig.8 Direction characteristic
(Horizontal direction)Fig.9 Direction characteristic
(Vertical direction)

The figure displays five sets of technical drawings for the RSIP-A3 component, each showing top, side, and front views with dimensions in millimeters. The components are labeled RSIP-A3 (H13), RSIP-A3 (H8), RSIP-A3 (H4), RSIP-A3 (H9), and RSIP-A3 (H5). The dimensions for each component are as follows:

- RSIP-A3 (H13):** Top view shows a 9.0mm x 1.8mm footprint with a 6.0mm x 7.3mm central area. Side view shows a height of 17.95mm. Front view shows a 2.54mm pitch and 0.6mm width.
- RSIP-A3 (H8):** Top view shows a 7.30mm x 2.54mm footprint. Side view shows a height of 7.20mm. Front view shows a 0.30mm width and 0.60mm pitch.
- RSIP-A3 (H4):** Top view shows a 15.9mm x 1.8mm footprint with a 12.65mm x 7.0mm central area. Side view shows a height of 12.65mm. Front view shows a 0.6mm width and 0.6mm pitch.
- RSIP-A3 (H9):** Top view shows a 7.30mm x 2.54mm footprint. Side view shows a height of 12.00mm. Front view shows a 0.30mm width and 0.60mm pitch.
- RSIP-A3 (H5):** Top view shows a 9.0mm x 1.8mm footprint with a 6.0mm x 7.3mm central area. Side view shows a height of 12.55mm. Front view shows a 2.54mm pitch and 0.6mm width.

A pinout table is provided for the RSIP-A3 V4 component:

Pin No.	Rout
①	Rout
②	GND
③	Vcc

Notes

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