# IR Receiver Module

# RPM7100 series

RPM7100 series are remote control receiver modules. Small-sized, light-weight, and low current consumption modules have been achieved by using resin mold.

#### Applications

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

#### ● Features

- 1) Low current consumption. (0.95mA Typ.)
- 2) High ripple rejection.
- 3) 3 types of holders available for each set.

#### ●RPM7100 series

	Straight type	L forming RSIP-A3 V4	with holders			
Carrier frequency	RSIP-A3		Horizontal board (High) RSIP-A3 (H3)	Vertical board RSIP-A3 (H4)	Horizontal board (Low) RSIP-A3 (H5)	
36.0kHz	RPM7136	RPM7136-V4	RPM7136-H3	RPM7136-H4	RPM7136-H5	
36.7kHz	RPM7137	RPM7137-V4	RPM7137-H3	RPM7137-H4	RPM7137-H5	
37.9kHz	RPM7138	RPM7138-V4	RPM7138-H3	RPM7138-H4	RPM7138-H5	
40.0kHz	RPM7140	RPM7140-V4	RPM7140-H3	RPM7140-H4	RPM7140-H5	

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

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Parameter	Symbol	Limits	Unit	
Supply Voltage	Vcc	-0.3~+7.0	V	
Storage temperature	Tstg	-30~+100	°C	
Operating temperature	Topr	<b>−10~+75</b>	°C	
Soldering temperature	Tsol	260*	°C	

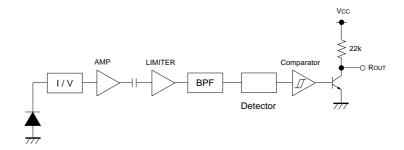
<sup>\* 3</sup>mm from the lead root within 5s.

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

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



# ●Block diagram



#### Terminal description

Pin No.	Pin name	Function		
1	Rоит	OUTPUT TERMINAL		
2	GND	GROUND		
3 Vcc		POWER SUPPLY		



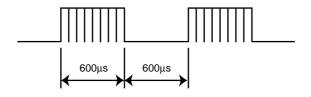
#### ● Electrical characteristics (Unless otherwise noted, Ta = 25°C Vcc=5V)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Consumption Current	Icc	_	0.95	1.5	mA	No outside light, No signal input
Effective Distance	L	8	15	_	m	Outer light condition Ee < 10 (lx) *1
High Level Output Voltage	Vн	4.5	_	-	V	*1
Low Level Output Voltage	VL	-	-	0.5	V	Isink=200μA *1
ON Pulse Width	Ton	400	600	800	μs	Outer light condition Ee < 10 (Ix) *1
OFF Pulse Width	Toff	400	600	800	μs	Outer light condition Ee < 10 (Ix) *1
Center frequency	fo	-	*3	-	kHz	
Horizontal half angle	θ 1/2	_	45	-	deg	*2
Vertical half angle	θ 1/2	_	35	_	deg	*2

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

# Measurement Conditions

# (1) Transmit signal



Carrier frequency=fo, Duty=50%

Fig.1 Transmit signal



<sup>\*2</sup> It is an angle when the linear arrival distance become half. \*3 Four types of frequencies : 36, 36.7, 37.9, 40kHz.

#### (2) Standard transmitter

 $\lambda$  peak=940nm  $\lambda$   $\Delta$ =40nm

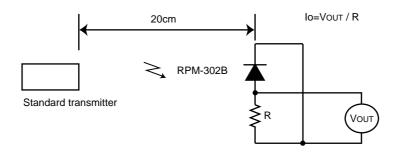


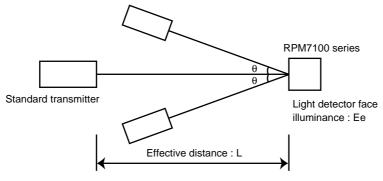
Fig.2 Measurement of standard transmitter proofreading

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

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

RPM-302B : standard photodiode has short current lsc=27 $\mu$ A at E=1000(lx) (using CIE standard light source A)

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



 $(\theta; Indicates horizontal and vertical directions)$ 

Fig.3 Measurement condition for effective distance

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

Horizontal & vertical half angle  $\,\,\theta\,\,\,\,\,\,$  : The angle which effective distance became 50% of L.



#### (4) Output signal

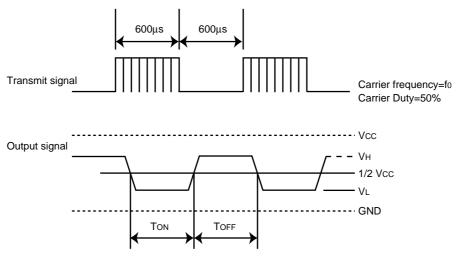


Fig.4

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

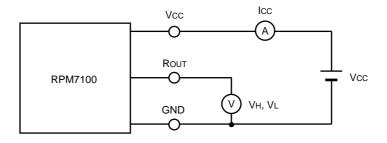


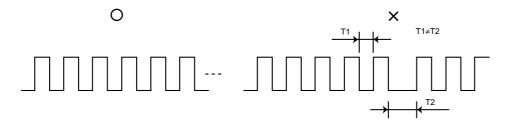
Fig.5

#### ●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 mulfunctioning 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 fo 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.

### Electrical and optical characteristics curves

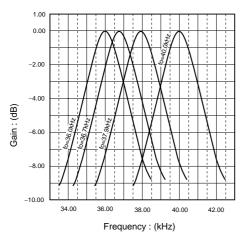


Fig.6 BPF characteristic

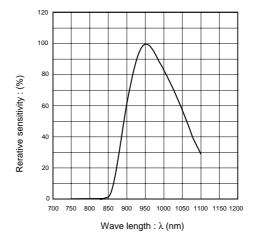


Fig.7 Optical bandwidth of the photo-diode encapsulation

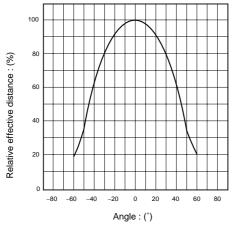


Fig.8 Direction characteristic (Horizontal direction)

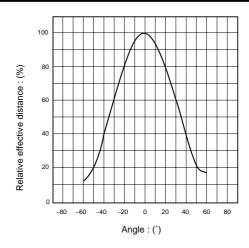
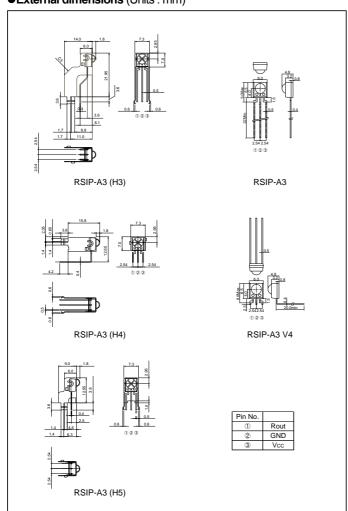


Fig.9 Direction characteristic (Vertical direction)

#### ●External dimensions (Units : mm)



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