

# IrDA wireless communication transceiver IC (supports Ver. 1.2 Low Power)

## RPM870-H14

The RPM870-H14 is an Module that supports IrDA Ver. 1.2 (Low Power), and is ideal for wireless communications. An infrared LED, a pin-photo diode, and LSI are all contained in a very small single package. It is also equipped with low power consumption and power down functions making this IC perfect for mobile sets.

### ●Features

- 1) Applied to IrDA Ver. 1.2. (Low Power)
- 2) Low power consumption while waiting mode. (75 $\mu$ A Typ.)
- 3) A power-down function is perfect for battery applications.
- 4) Supports a board power supply voltage range from 2.6V to 3.6V.
- 5) Only 1 external capacitor required.

### ●Applications

Mobile phones, PDAs, and others

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

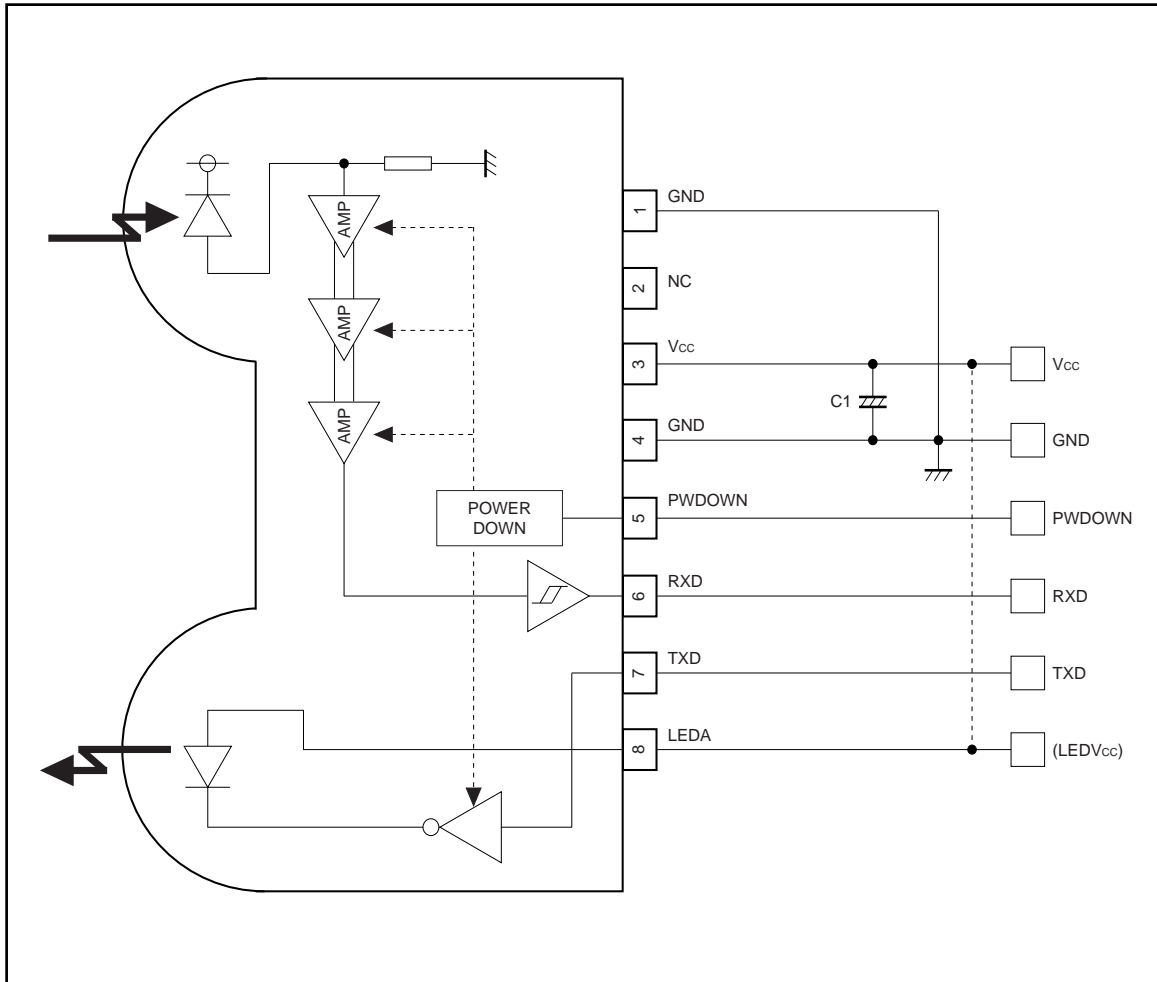
Parameter	Symbol	Limits	Unit
Supply voltage	V <sub>CC</sub>	7.0	V
Input voltage	V <sub>in</sub>	-0.3 to V <sub>CC</sub> +0.3	V
Operating temperature	T <sub>opr</sub>	-20 to +85	°C
Storage temperature	T <sub>stg</sub>	-30 to +100	°C
Power dissipation	P <sub>d</sub>	100	mW

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

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V <sub>CC</sub>	2.6	3.0	3.6	V
	V <sub>LEDA</sub>	2.6	3.0	5.5	V

Photo Link Module

●Block diagram and application circuit



Recommended values

Part symbol	Recommended value	Notice
C1	1 $\mu$ F, tantalum Ex.) TCFGA1A105M8R (ROHM)	Bigger capacitance is recommended with much noise from power supply

## Photo Link Module

## ●Terminal description

Pin No	Terminal	Circuit	Function
1, 4	GND		GND
2	NC		This terminal must be left open.
3	Vcc		Vcc For preventing from ripple noise, connect a capacitor between Vcc (3pin) and GND (4pin).
5	PWDOWN		Power-down control terminal H : POWERDOWN L : OPERATION CMOS logic level input When input is H, it will stop the receiving circuit, Pin-PD current and transmitting LED operation.
6	RXD		Receiving data output terminal CMOS logic level input When PWDOWN (5pin) = H, the RXD output will be pulled up to Vcc at approximately 300kΩ.
7	TXD		Transmitting data input terminal H : LED Drive (PWDOWN = L) CMOS logic level output Holding TXD = "H" status, LED will be turn off approximately 48μsec.
8	LEDA		LED ANODE terminal Other power source can be used difference between LEDVcc and Vcc.

## Photo Link Module

●Electrical characteristics (Unless otherwise noted,  $V_{CC}=3V$ ,  $V_{LED}V_{CC}=3V$ ,  $T_a=25^{\circ}C$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Consumption Current 1	I <sub>cc1</sub>	–	75	99	μA	Waiting mode, no input light.
Consumption Current 2	I <sub>cc2</sub>	–	0.01	0.2	μA	PWDOWN=V <sub>CC</sub> [V], no input light.
Transmission rate		2.4	–	115.2	kbps	
PWDOWN INPUT High Voltage	VPDH	V <sub>CC</sub> -0.5	–	–	V	
PWDOWN INPUT Low Voltage	VPDL	–	–	0.55	V	
PWDOWN INPUT High Current	IPDH	-1.0	0	1.0	μA	PWDOWN=V <sub>CC</sub> [V]
PWDOWN INPUT Low Current	IPDL	-1.0	0	1.0	μA	PWDOWN=0 [V]
<b>&lt;Transmitter&gt;</b>						
TXD INPUT High Voltage	V <sub>TXH</sub>	V <sub>CC</sub> -0.5	–	–	V	
TXD INPUT Low Voltage	V <sub>TXL</sub>	–	–	0.55	V	
TXD INPUT High Current	I <sub>TXH</sub>	7.5	15	30	μA	TXD=V <sub>CC</sub> [V]
TXD INPUT Low Current	I <sub>TXL</sub>	-1.0	0	1.0	μA	TXD=0 [V]
LED ANODE Current	I <sub>LEDA</sub>	–	30.5	–	mA	
<b>&lt;Receiver&gt;</b>						
RXD OUTPUT High Voltage	V <sub>RXH</sub>	V <sub>CC</sub> -0.5	–	–	V	I <sub>RXH</sub> =-50μA
RXD OUTPUT Low Voltage	V <sub>RXL</sub>	–	–	0.4	V	I <sub>RXL</sub> =200μA
RXD OUTPUT Rise Time	t <sub>RR</sub>	–	70	–	nsec	C <sub>L</sub> =15pF
RXD OUTPUT Fall Time	t <sub>FR</sub>	–	30	–	nsec	C <sub>L</sub> =15pF
RXD OUTPUT Pulse Width	t <sub>WRXD</sub>	1.5	2.3	3.6	μsec	C <sub>L</sub> =15pF, 2.4 to 115.2Kbps
Receiver Latency Time	t <sub>RT</sub>	–	100	200	μsec	

●Optical characteristics (Unless otherwise noted,  $V_{CC}=3V$ ,  $V_{LED}V_{CC}=3V$ ,  $T_a=25^{\circ}C$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Peak wave length	λ <sub>P</sub>	850	870	900	nm	
Intensity	I <sub>E1</sub>	4.0	10	26	mW / Sr	-15° ≤ θ <sub>L</sub> ≤ 15°
Half-Angle	θ <sub>L</sub> / 2	–	±18	–	deg	
Rise time / Fall time	T <sub>r</sub> / T <sub>f</sub>	–	–	100	nsec	10% to 90%
Optical over shoot		–	–	25	%	
Edge jitter	T <sub>j</sub>	-40	–	40	nsec	
Irradiance in angular	E <sub>e</sub>	0.0068	–	500	mW / cm <sup>2</sup>	-15° ≤ θ <sub>L</sub> ≤ 15°
INPUT Half-Angular	θ <sub>D</sub> / 2	±15	–	–	deg	
Maximum Emitting Time	T <sub>LEDmax</sub>	16	48	90	μsec	TXD=V <sub>CC</sub>

1.This product is not designed for protection against radioactive rays.

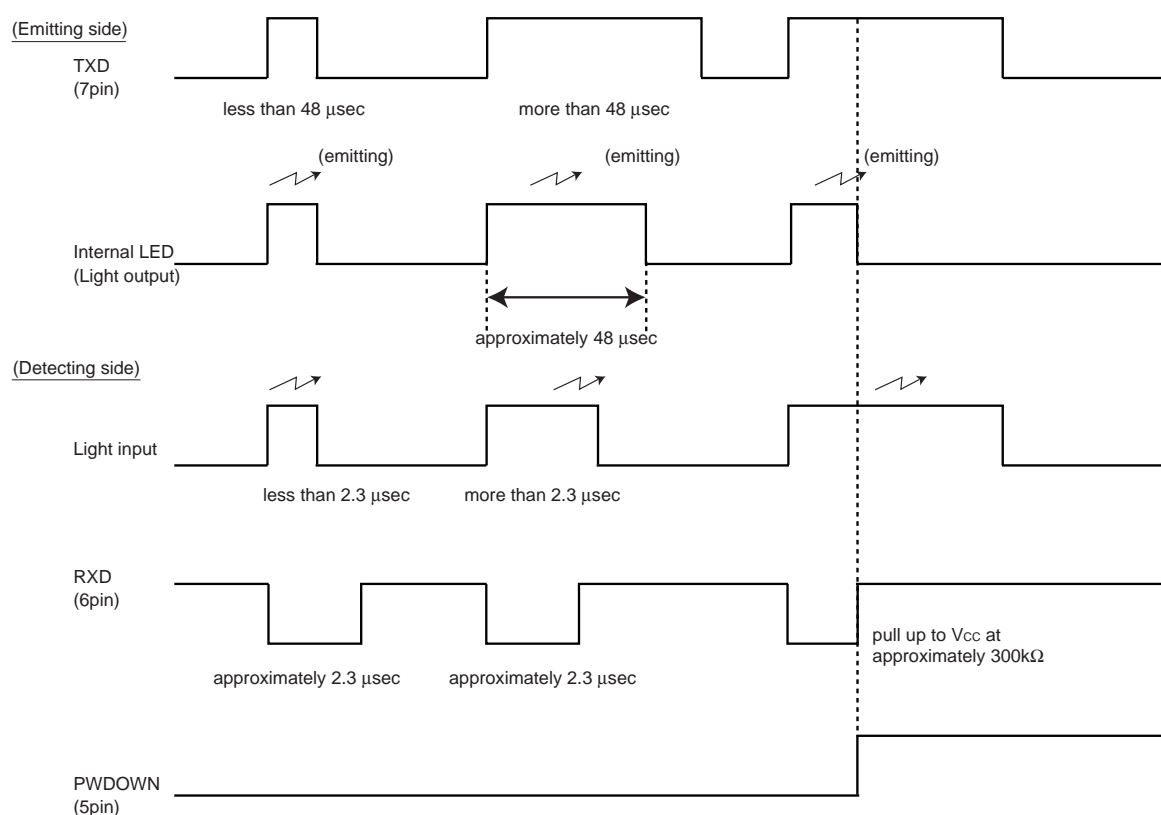
2.This product dose not include laser transmitter.

3.This product includes one pin photo diode.

4.This product dose not include optical load.

## Photo Link Module

## ●Timing chart



## ●Notes

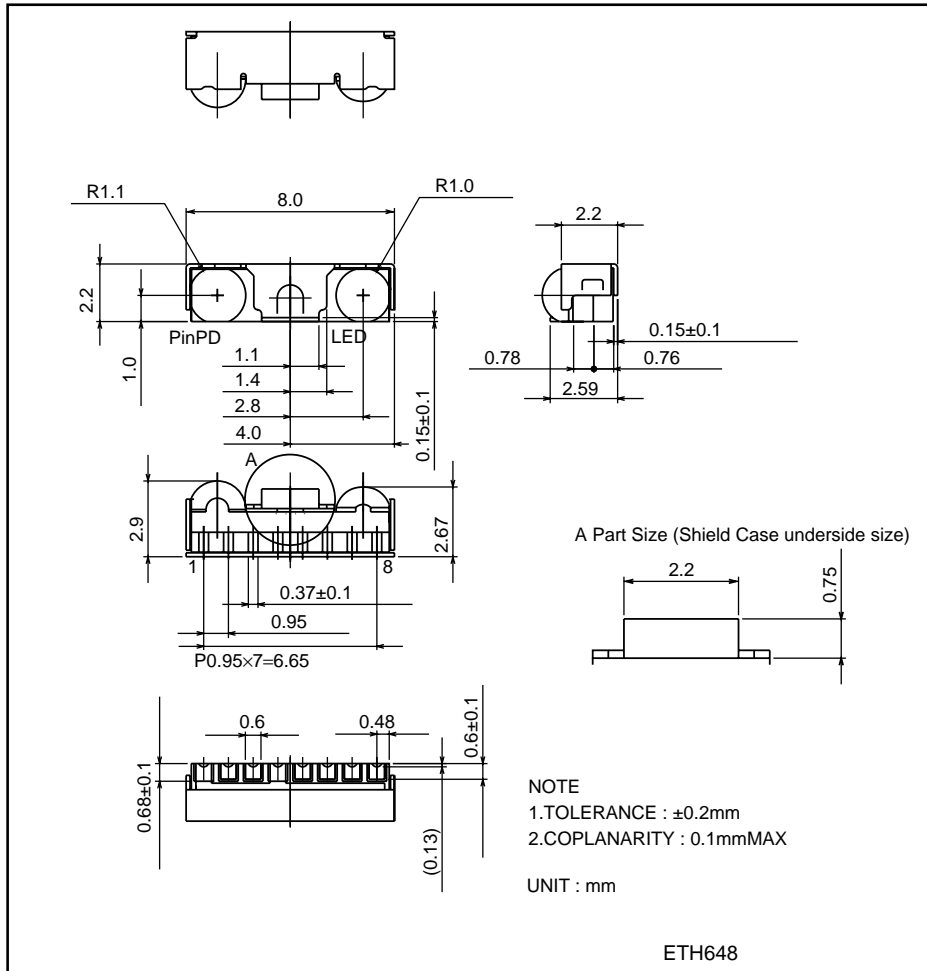
- 1) LEDV<sub>CC</sub> (8pin) and V<sub>CC</sub> (3pin)
  - Other power source can be used difference between LEDV<sub>CC</sub> and V<sub>CC</sub>.
- 2) Caution in designing board lay-out
 

To get maximum potential from RPM870-H14, please keep in mind following instruction.

  - The line of RXD (6pin) should be connected at backside via through hole close to RPM870-H14 pin lead. Better not to be close to photo diode side (1pin).
  - ⇒ This is to minimize feedback supplied to photo diode from RXD.
  - As for C1 between 3-4 pin should be placed close to RPM870-H14.
  - Better to be placed more than 1.0cm in radius from photo diode (pin1 side) and also away from the parts which generates noise, such as DC / DC converter.
- 3) Others
  - Please be sure to set up the TXD (7pin) input to be "L" (under 0.5V) except transmitting data (for < 90μsec. on duty < 20%).
  - Powerdown current might increase if exposed by strong light (ex. direct sunlight) at powerdown mode.
  - Please use by the signal format which is specified by IrDA Ver1.2 (Low Power). There might be on error if used by different signal format.
  - Please pay attention to the lens carefully. Dusts of scratch on the lens may effect the characteristics of product. Please handle it with care.
- 4) Eye Safe
  - IEC825-1 (EN60825-1) Class 1 Eye Safe.

Photo Link Module

●External dimensions (Unit : mm)



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