IrDA Infrared Communication Module RPM873

RPM873 is an infrared communication module for IrDA Ver. 1.2 (Low Power). The infrared LED, PIN photo diode, and LSI are all integrated into one single package. This module is designed for low power consumption. The very small package makes it a perfect fit for mobile devices.

Features

- 1) Infrared LED, PIN photo diode, LED driver and built-in receiver frequency formation circuit.
- 2) Applied to SIR (2.4 to 115.2kbps) low power standard.
- 3) Supply voltage range is from Vcc=2.0 to 3.6V, VLEDA=2.6 to 5.5V.
- 4) Surface mounting type.
- 5) Built-in power down function.

Applications

Cellular phones, PDA, DVC, digital still cameras, printers, handy terminals and etc.

● Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	Vcc/VLEDA	7.0 *1	V
Input voltage	Vin(5,6,7pin)	-0.3 to Vcc+0.3	V
Operation temperature	Topr	-25 to 85	°C
Storage temperature	Tstg	-30 to 100	°C
Power dissipation	Pd	100 *2	mW

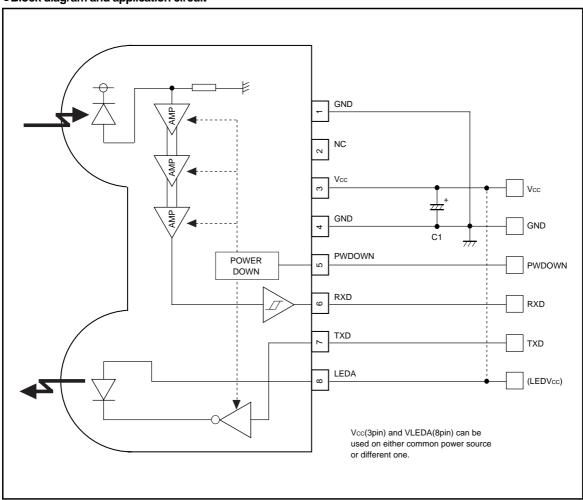
st1) This applies to all pins on the basis of ground pins (1,4pin).

●Recommended operating conditions (Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Units
Supply voltage	Vcc	2.0	3.0	3.6	V
	VLEDA	2.6	3.0	5.5	V

^{*2)} In case of operating environment is over 25°C, 1.33mW would be reduced per each 1°C stepping up.

●Block diagram and application circuit



Recommended values

Part symbol	Recommended	Notice				
C1	1μF, tantalum or ceramic Ex.) TCFGA1A105M8R(ROHM)	Bigger capacitance is recommended with much noise from power supply.				

Terminal description

Pin No.	Terminal	Circuiit	Funciton
1	GND		GND
2	NC		This terminal must be left open.
3	Vcc		Vcc For preventing from infection, connect a capacitor between Vcc(3pin) and GND(4pin).
4	GND		GND
5	PWDOWN	Vcc Vcc	Power-down control terminal H: Power down 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	PWDOWN Vcc Vcc	Receiving data output teminal CMOS logic level output When PWDOWN (5pin) = H, the RXD output will be pulled up to Vcc at approximately $300k\Omega$.
7	TXD	Vcc 600k	Transmitting data input terminal H: LED (PWDOWN = L) CMOS logic level input Holding TXD = H status, LED will be turned off at approximately 48μs.
8	LEDA	LED	LED ANODE terminal Other power source can be used difference between VLEDA and Vcc. This can be connected to battery kinds of unregulated voltage source by internal constant current driver.

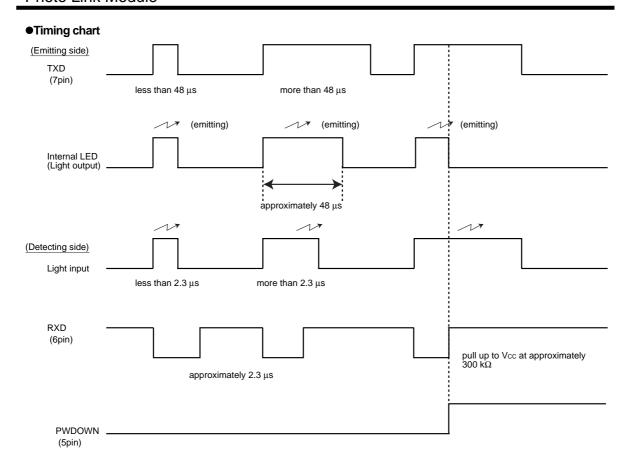
●Electrical characteristics (Vcc=3V, VLEDA=3V, Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Consumption current 1	Icc1	-	75	99	μΑ	Waiting mode, At no input light
Consumption current 2	Icc2	_	0.01	0.2	μА	PWDOWN mode, At no input light
Transmission rate		2.4	_	115.2	kbps	
PWDOWN input high voltage	VPDH	Vcc-0.55	_	_	V	
PWDOWN input low voltage	VPDL	0	_	0.55	V	
PWDOWN input high current	IPDH	-1.0	0	1.0	μΑ	PWDOWN=Vcc [V]
PWDOWN input low current	IPDL	-1.0	0	1.0	μА	PWDOWN=0 [V]
<transmitter></transmitter>						
TXD input high voltage	VTXH	Vcc-0.55	_	_	V	
TXD input low voltage	VTXL	0	_	0.55	V	
TXD input high current	ITXH	2.5	5	10	μА	TXD=Vcc [V]
TXD input low current	ITXL	-1.0	0	1.0	μА	TXD=0 [V]
LED anode current	ILEDA	-	30.5	_	mA	
<receiver></receiver>				•		
RXD output high voltage	VRXH	Vcc-0.4	_	_	V	IRXH= –200μA
RXD output low voltage	VRXL	0	-	0.4	V	IRXL= 200μA
RXD output rise time	tRR	-	35	_	ns	C _L =15pF
RXD output fall time	tFR	-	35	_	ns	C _L =15pF
RXD output pulse width	twRXD	1.5	2.3	4.2	μs	C _L =15pF, 2.4 to 115.2kbps
Receiver latency time	tRT	_	100	200	μs	

●Optical characteristics (Vcc=3V, VLEDA=3V, Ta=25°C)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Peak wave length	λP	850	870	900	nm	
Intensity 1	IE1	4	10	26	mW / Sr	-15°≤ θ∟≤15°
Half-angle	θL/2	-	±18	±30	°C	
Opticcal pulse width	TWLED	1.42	1.63	2.02	μs	TXD=1.63μs pulse input
Rise time / Fall time	Tr / Tf	_	-	100	ns	10% to 90%
Optical over shoot		_	-	25	%	
Edge jitter	Tj	-40	-	40	ns	
Minimum irradiance in angular range	Eemin	-	-	6.8	μW / cm ²	-15°≤ θ∟≤15°
Maximum irradiance in angular range	Eemax	500	-	_	mW / cm ²	-15°≤θ∟≤15°
Half-angle	θD / 2	±15	-	_	°C	
Maximum emitting time	TLEDmax	10	48	120	μs	TXD=Vcc

This product is not designed for protection against radioactive rays.
 This product does not include laser transmitter.
 This product include one PIN photo diode.
 This product does not include optical load.



●Notes

- 1) VLEDA (8pin) and Vcc (3pin)
 - •Other power source can be used difference between VLEDA and Vcc.

2) Caution in designing board lay-out

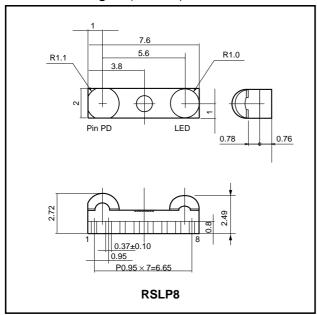
To get maximum potential from RPM873, please keep in mind following instruction.

- •The line of RXD (6pin) should be connected at backside via through hole close to RPM873 pin lead. Better not to be close to photo diode side (1pin).
- ⇒This is to minimize feedback supplied to photo diode from RXD.
- •Better to be placed more than 1.0cm in radius from photo diode (pin1 side) and also away from the parts which generate noise, such as DC / DC converter.
- •As for C1 between 3-4pin should be placed close to RPM873.

3) Notes

- •Please be sure to set up the TXD (7pin) input to be "L" (under 0.55V) except transmitting data (for <90 μ s, ON duty <20%)
- •Power down current might increase if exposed by strong light (ex. direct sunlight) at power down mode.
- •Please use by the signal format which is specified by IrDA Ver1.2 (2.4k to 115.2kbps). There might be on error if used by different signal format.
- 4) Eye Safe
 - •IEC825-1 (EN60825-1) Class 1 Eye Safe.

• Dimensions Diagram (Unit : mm)



ROHM

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