

< Specifications (Precautions and Prohibitions) >

● **Precaution for circuit design**

- 1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment, etc.).
If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the ROHM sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
 - [a] Installation of protection circuits or other protective devices to improve system safety
 - [b] Installation of redundant circuits in the case of single-circuit failure

- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
 - [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation

- 3) The products are not radiation resistant.

- 4) The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.

- 5) The Company should be notified of any product safety issues. Moreover, product safety issues should be periodically monitored by the customer.

- 6) De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta).
When used in sealed area, confirm the actual ambient temperature.

- 7) Confirm that operation temperature is within the specified range described in product specification.

- 8) Failure induced under deviant condition from what defined in the product specification can not be guaranteed.

- 9) When product safety related problems arises, please immediately inform to ROHM, and consider technical counter measure.

UNCONTROLLED

DESIGN	CHECK	APPROVAL	DATE: 2010/2/9	SPECIFICATION No. : SALA0006E
<i>Y. Yoda</i>	<i>N. Hanafusa</i>	<i>A. Nishimura</i>	REV. 002	ROHM Co.,Ltd.

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Precaution for Mounting / Circuit board design

- 1) When a highly active halogenous (chlorine, bromine, etc.) flux is used, the remainder of flux may negatively affect product performance and reliability.
- 2) The principle of soldering will be flow solder.
- 3) Please read the Handling Precautions for Sensor as attached when you design.

Precautions Regarding Application Examples and External Circuits

- 1) If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics.
- 2) The application examples, their constants, and other types of information contained herein are applicable only when the products are used in accordance with standard methods. Therefore, if mass production is intended, sufficient consideration to external conditions must be made.

Precaution for Electrostatic

This product is Electrostatic sensitive product, which may be damaged due to Electrostatic discharge. Please take proper caution during manufacturing and storing so that voltage exceeding Product maximum rating won't be applied to products. Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

Precaution for Storage / Transportation

- 1) Product performance and soldered connections may deteriorate if the products are stored in the following places:
 - [a] Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [b] Where the temperature or humidity exceeds those recommended by the Company
Temperature: 5 - 30 , Humidity less than 60%
 - [c] Storage in direct sunshine or condensation
 - [d] Storage in high Electrostatic
- 2) Even under ROHM recommended storage condition, solderability of delivery over 1 year old may be degraded.
It is strongly recommended to confirm solderability before using products of which storage time is exceeding recommended storage time period .
 - Recommended storage condition: Temperature 5 - 30 , Humidity less than 60%
- 3) Store / transport cartons in the correct direction, which is indicated on a carton as a symbol. Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

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Precaution for product label

QR code printed on ROHM product label is only for internal use, and please do not use at customer site. It might contain a internal part number that is inconsistent with an product part number.

Precaution for disposition

When disposing products please dispose them properly with a industry waste company.

Precaution for Foreign exchange control regulation

- 1) ROHM has not determined whether or not the products are considered “a controlled product or labor ” as specified in the Foreign Exchange and Foreign Trade Control Law. Accordingly, if exportation of the products, either separately or integrated in another company’s products, is intended, or giving the products to persons who are not residents is planed, additional steps are required, based upon the appropriate regulations.

Prohibitions Regarding Industrial Property

- 1) These Specifications contain information related to the ROHM industrial property. Any use of them other than pertaining to the usage of appropriate products is not permitted. Duplication of these Specifications and its disclosure to a third party without the Company’s permission is prohibited.
- 2) Information and data on products, including application examples, contained in these specifications are simply for reference; the Company does not guarantee any industrial property rights, intellectual property rights, or any other rights of a third party regarding this information or data. Accordingly, the Company does not bear any responsibility for:
 - [a] infringement of the intellectual property rights of a third party
 - [b] any problems incurred by the use of the products listed herein.
- 3) The Company prohibits the purchaser of its products to exercise or use the intellectual property rights, industrial property rights, or any other rights that either belong to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

Precautions on Use of Products

- 1) Verification and confirmation of performance characteristics of products, after on-board mounting, is advised.
- 2) In particular, if a transient load (a large amount of load applied in a short period of time, such as pulse) is applied, confirmation of performance characteristics after on-board mounting is strongly recommended. Avoid applying power exceeding normal rated power; exceeding the power rating under steady-state loading condition may negatively affect product performance and reliability.

Other Matters

- 1) Please sign these Specifications and return one copy to the Company. If a copy is not returned within three months after the issued date specified on the front page of these Specifications, the Company will consider the Specifications accepted.
- 2) If any matter related to these Specifications needs to be clarified, discussions shall be held promptly between the two parties concerned to determine the issue.

- 1. Part number RPI-221
- 2. Construction GaAs Infrared light emitting diode, silicon planar type phototransistor
- 3. Application All kinds of controller
- 4. Outline dimensions Fig-1
- 5. Absolute max. ratings(Ta=25)

Input (infrared light emitting diode)

Forward current	I_F	• • • • •	50 mA
Reverse voltage	V_R	• • • • •	5 V
Power dissipation	P_D	• • • • •	80 mW

Output (Phototransistor)

Collector-emitter voltage	V_{CEO}	• • • • •	30 V
Emitter-collector voltage	V_{ECO}	• • • • •	4.5 V
Collector current	I_C	• • • • •	30 mA
Collector power dissipation	P_C	• • • • •	80 mW
Operating temperature	T_{opr}	• • • • •	-25 ~ +85
Storage temperature	T_{stg}	• • • • •	-30 ~ +85

6. Electrical optical characteristics(Ta=25)

1) Input characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward voltage	V_F	-	1.3	1.6	V	$I_F = 50 \text{ mA}$
Reverse current	I_R	-	-	10	μA	$V_R = 5 \text{ V}$
Peak light emitting wavelength	λ_p	-	950	-	nm	$I_F = 50 \text{ mA}$

*Non-coherent Infrared light emitting diode used.

2) Output characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Dark current	I_{CEO}	-	-	0.5	μA	$V_{CE} = 10 \text{ V}$
Peak sensitivity wavelength	λ_p	-	800	-	nm	-

*This product is not designed to be protected against electromagnetic wave.

3) Transfer characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector current	I_C	0.2	1.0	-	mA	$V_{CE} = 5 \text{ V}$ $I_F = 20 \text{ mA}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F = 20 \text{ mA}$ $I_C = 0.1 \text{ mA}$
Response time	Rise time	t_r	-	10	μs	$V_{CC} = 5 \text{ V}$ $I_F = 20 \text{ mA}$ $R_L = 100\Omega$
	Fall time	t_f	-	10	μs	

4) Classified table of rank

Rank	I_C (mA)	I_C (mA)
A	0.8 ~ 4.0	0.2 ~ 1.0
B	0.2 ~	-

(at $V_{ce}=5V, I_F=20mA$) (at $V_{ce}=5V, I_F=5mA$)

7. Weight About 0.06 g/piece

8. Recommended circuit

To protect 4 direction detector from over-load ,we recommend putting R_{If} and R_L between **Photointerrotointerrupter** and **GND(Cathode - GND, Emitter - GND)**.

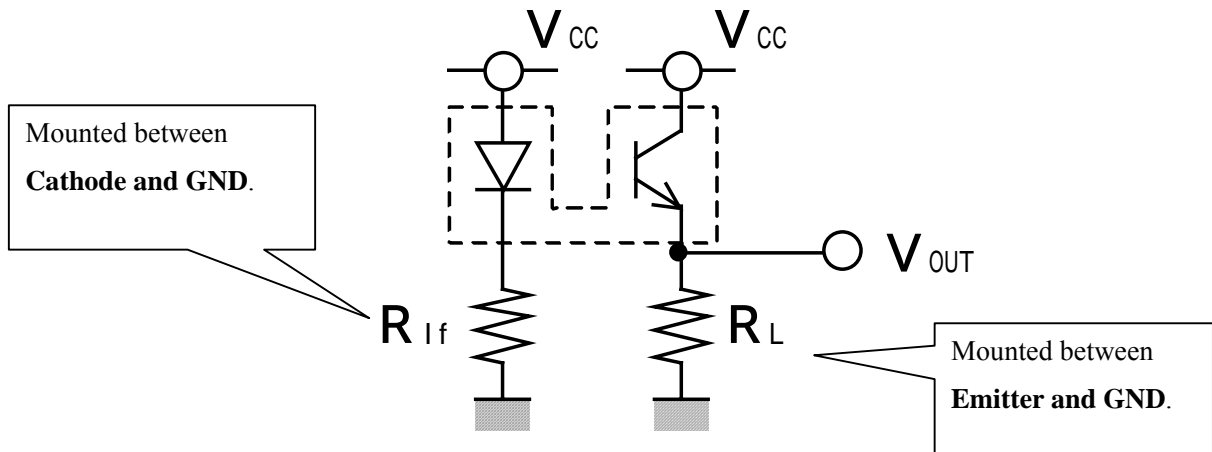
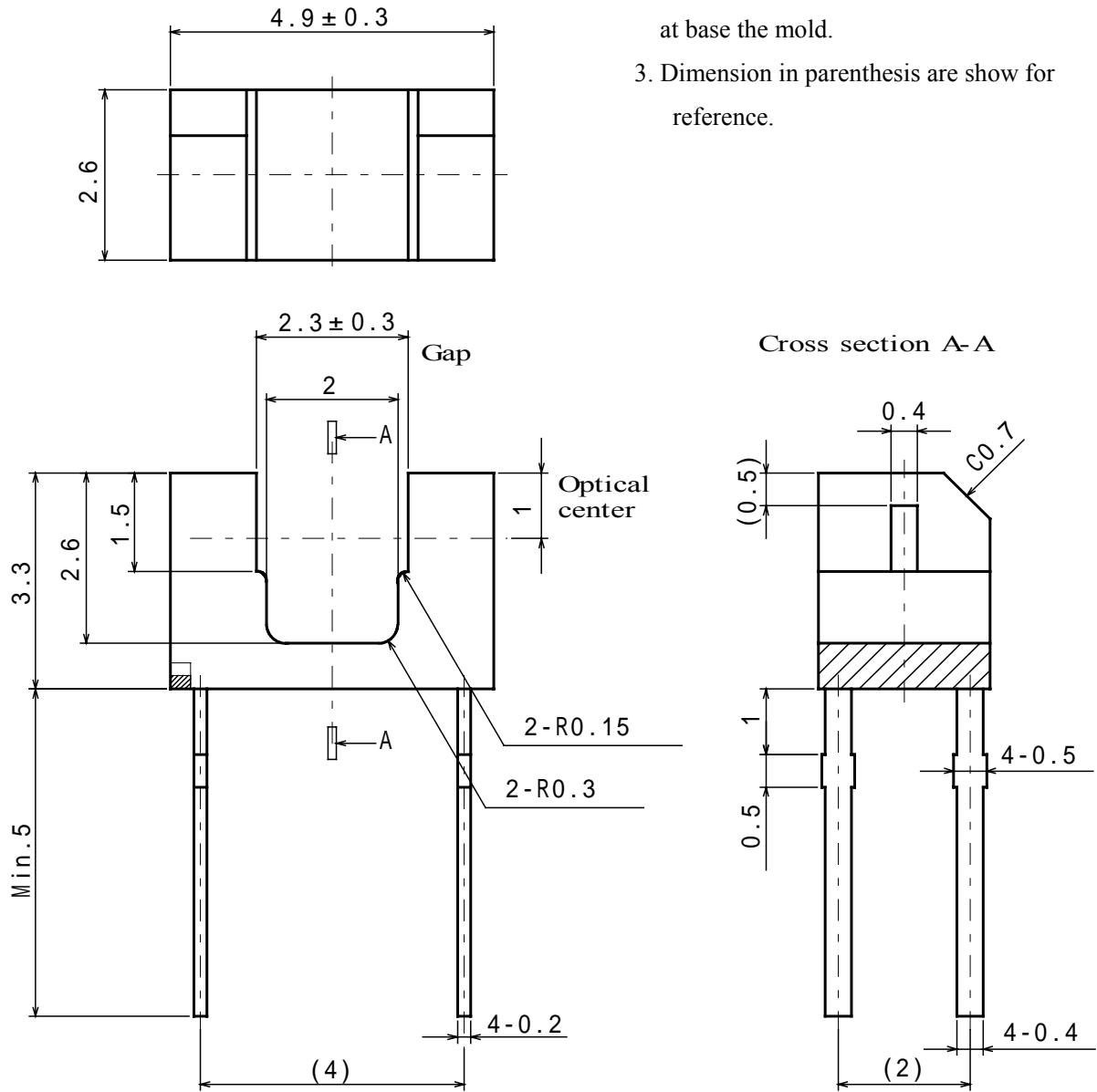


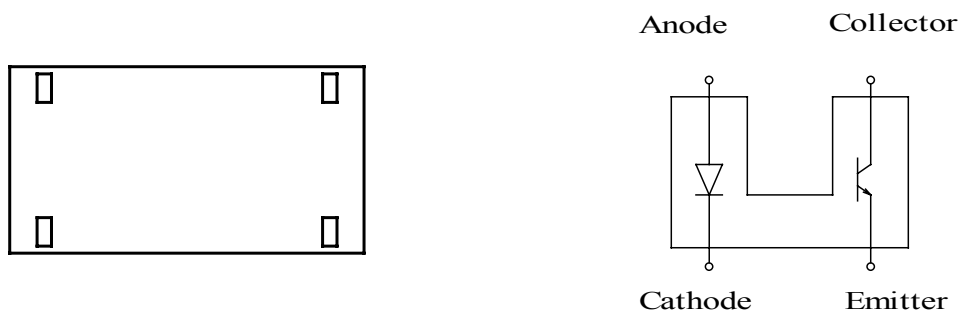
Fig-1 Outline dimension

Unit: mm

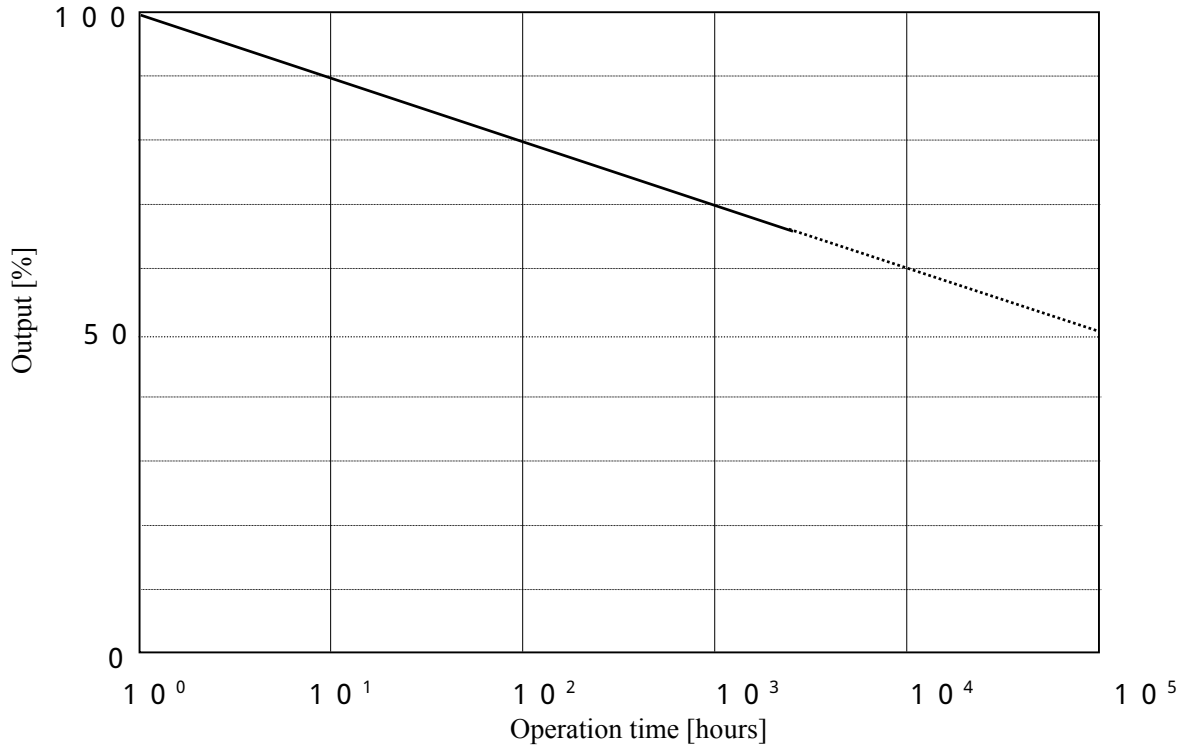
- Note) 1. Unspecified tolerance shall be ± 0.2 .
 2. Measurement in the bracket is that of lead pin at base the mold.
 3. Dimension in parenthesis are show for reference.



Internal connection diagram

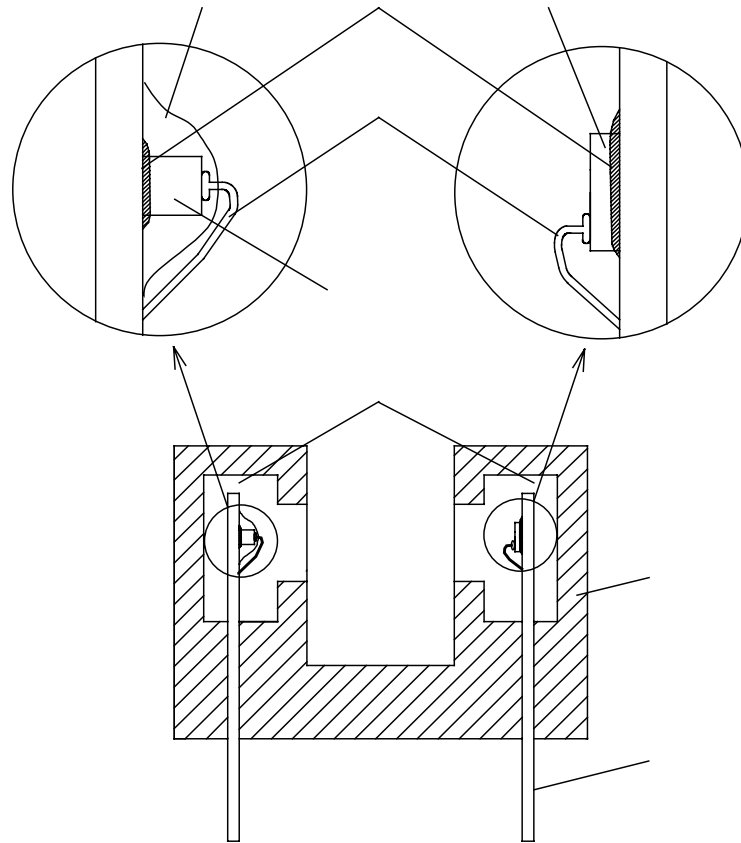


Part number	RPI-221
Data	Operation life
Condition	$I_F = 20 \text{ mA}$ $V_{CE} = 5 \text{ V}$ $T_a = 25$



Note: This curve is maximum degradation. In circuit designing, make allowance for the degradation of the light emitting diode output.

Structure fig.



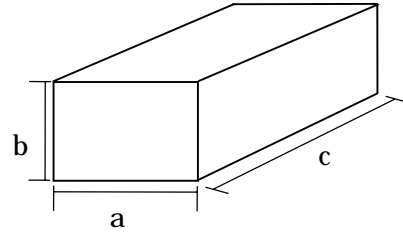
No.	Name	Material
1	Infrared light emitting diode	GaAs
2	Silicone	Silicone
3	Phototransistor	Si
4	Conductive epoxy resin	Ag+Epoxy resin
5	Bonding wire	Au
6	Mold resin	Epoxy resin
7	Mold resin	PPS
8	Lead	Material : Fe Plating : Sn-Ag-Cu

Packaging requirements

1. Packaging

- (1) A poly-bag pack of 250pcs.
- (2) A paper box pack of 8poly-bags.

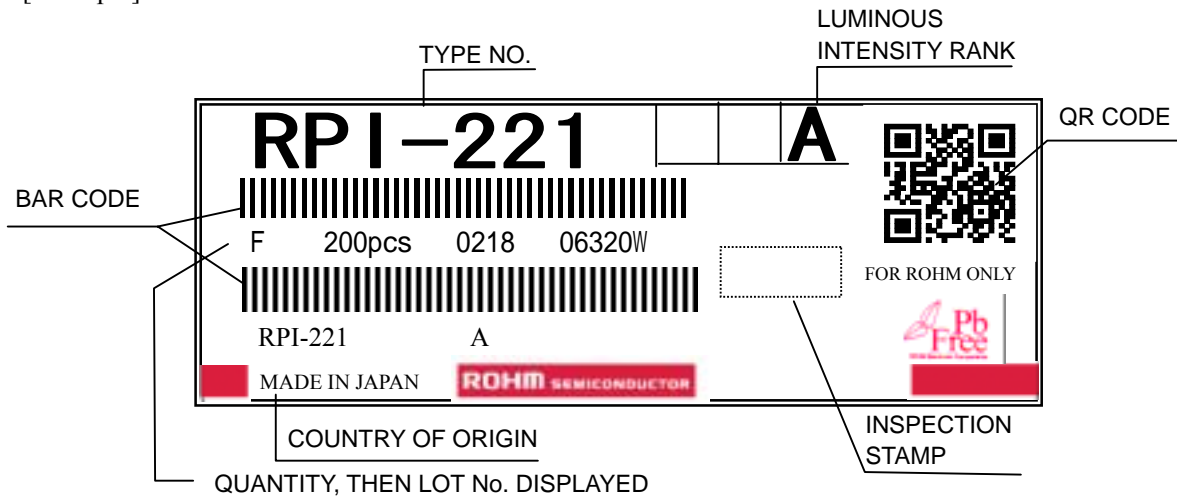
Paper box size;(a)×(b)×(c)=100×70×170(mm)



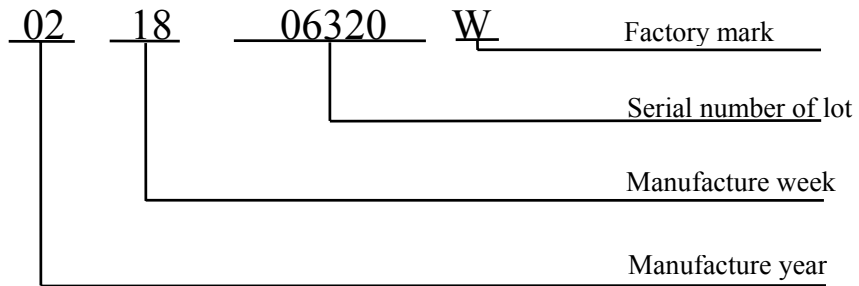
2. Label indication

The following information shall be described on a boxlabel; ROHM type number, packaging quantity,lot number,inspevtion stamp.

[Example]



[Example of lot number marking]



3. Factory

- ROHM· WAKO CO.,LTD.
- ROHM SEMICONDUCTOR (CHINA) CO.,LTD.

单击下面可查看定价，库存，交付和生命周期等信息

[>>ROHM Semiconductor \(罗姆\)](#)