

**SPI-335-34**

## Ultraminiature photoreflector (single-transistor type)

### Features

- Infrared LED plus Phototransistor (single)
- DIP type
- Compact type : 3.4 (L) × 2.7 (W) × 1.5 (H) mm
- Visible light cut type
- Lead length : (L=3.5mm)

### Absolute Maximum Ratings at Ta=25°C, 65%RH

	Parameter	Symbol	Rating	Unit
Input LED	Forward Current	I <sub>F</sub>	50	mA
	Reverse Voltage	V <sub>R</sub>	5	V
	Power Dissipation	P <sub>D</sub>	70	mW
Output Phototransistor	Collector-Emitter Voltage	V <sub>CEO</sub>	20	V
	Emitter-Collector Voltage	V <sub>ECO</sub>	5	V
	Collector Current	I <sub>C</sub>	20	mA
	Power Dissipation	P <sub>C</sub>	70	mW
Operating Temperature		T <sub>opr</sub>	-20 to +80	°C
Storage Temperature		T <sub>stg</sub>	-40 to +100	°C
Soldering Temperature *1		T <sub>sol</sub>	260	°C

\*1 Soldering conditions : time : max. 3sec; clearance : min. 1mm from lower case edge.

### Electro-Optical Characteristics at Ta=25°C, 65%RH

	Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =10mA	1.0	1.2	1.6	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	-	-	10	μA
Output	Dark Current	I <sub>CEO</sub>	I <sub>F</sub> =0mA, V <sub>CE</sub> =10V	-	10	200	nA
Coupled	Collector Output Current	I <sub>C</sub>	I <sub>F</sub> =4mA, V <sub>CE</sub> =5V*1	33	-	180	μA
	Leakage Current	I <sub>LEAK</sub>	I <sub>F</sub> =10mA, V <sub>CE</sub> =5V*2	-	-	1	μA
	Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =10mA, I <sub>C</sub> =50μA	-	-	0.5	V
	Rise Time	t <sub>r</sub>	V <sub>CC</sub> =5V, R <sub>L</sub> =100Ω	-	5	-	μs
	Fall Time	t <sub>f</sub>	I <sub>C</sub> =1mA	-	5	-	μs

\*1 Location of reflector is show in Fig. 1.

\*2 No reflector

\*3 Table of Classification of Collector Output

Class	E	F	G	H
I <sub>C</sub> (μA)	180 to 110	140 to 80	100 to 50	65 to 33
Marking color	Orange	Green	White	Silver

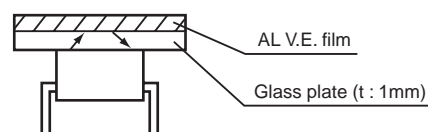


Fig. 1 Location of Reflector

## Package dimensions and Pin connection

As stated in the attached paper. (No.6029 5/6)

## Rank marking of collector output

The bottom of the package is colored following the table of classification of collector output.

## Lot marking

Color division shall be done as shown in the drawing. (Fig. 2)

Year of even number : Front side

Year of odd number : Back side

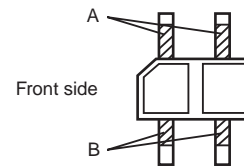


Fig. 2

Color	Black	Blue	Red	Green	Orange	Brown
Part 'A'	January	February	March	April	May	June
Part 'B'	July	August	September	October	November	December

## Soldering conditions

- (1) Temperature : Max. 260°C
- (2) Time : Max. 3sec
- (3) Clearance : Min. 1mm from the case edge. (Fig. 3)

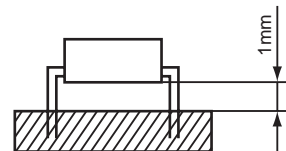
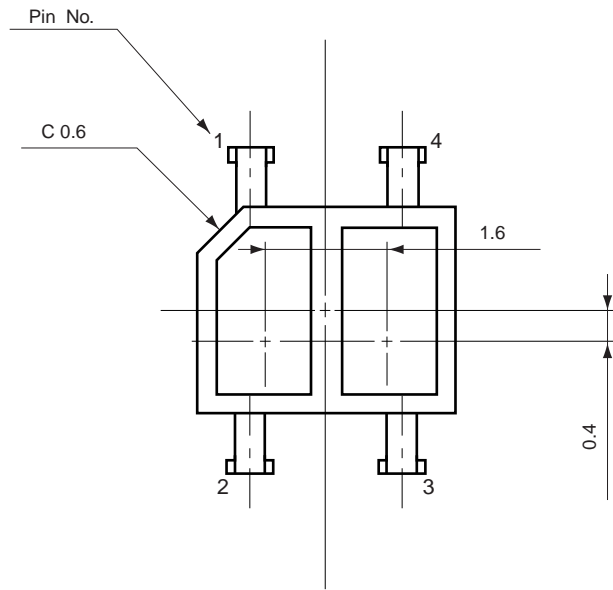


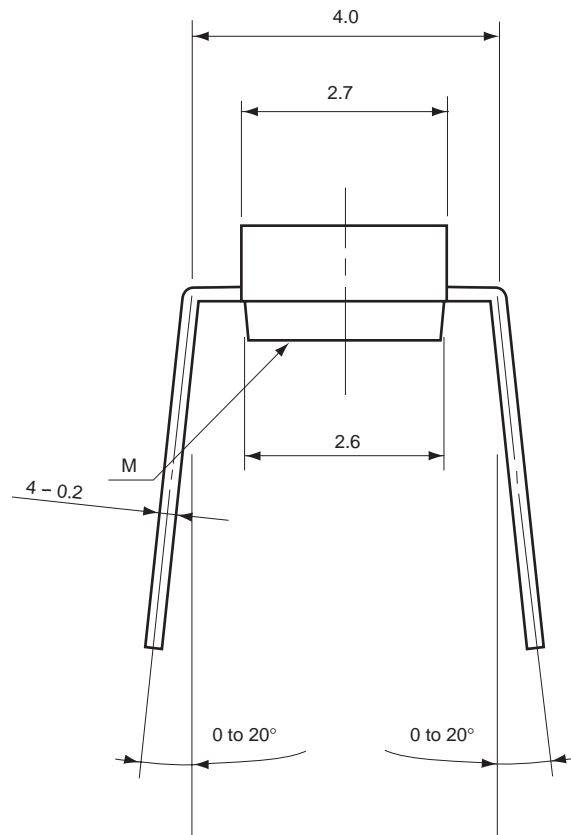
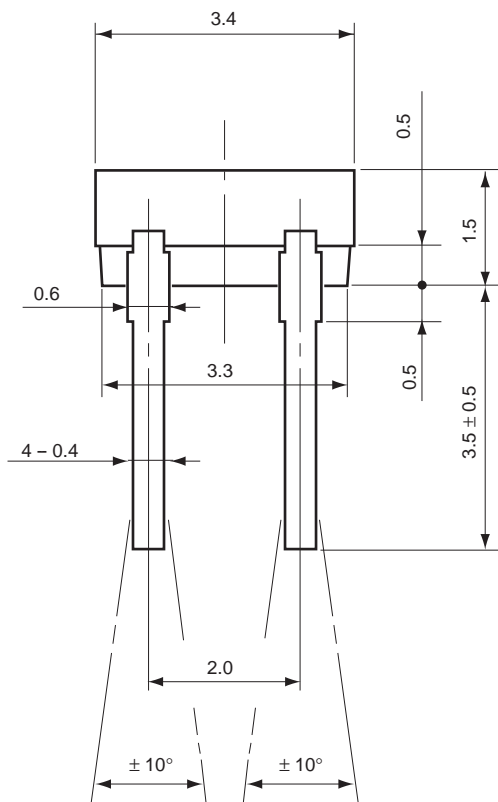
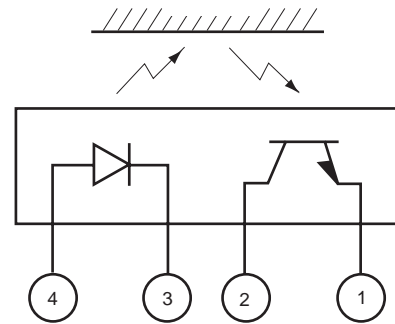
Fig. 3

## ⚠ PRECAUTIONS

- (1) Bending a lead should avoid. However, when bending is necessary, take care the next items.
  - ① Bending a lead must be done before soldering.
  - ② Bending a lead must be done in the states of fixing leads and no stress for the regin part. Because it is possible that stress for the regin part cause troubles such as gold wire breaking and so on.
  - ③ A lead must be bend at intervals of 2mm from the case edge.
  - ④ Do not bend the same position of leads more than twice.
- (2) The hole pitch of a circuit board must fit to the lead pitch.
- (3) Take care the following when soldering.
  - ① Do not heat a product under any stress (a twist and so on) to leads.
  - ② Do not heat a product in the states of operating force to the regin part.
- (4) Use the flux which contain no chlorine, have no corrosion and do not need washing.
- (5) Be careful that flux or other chemicals do not attach to the luminous surface and passive surface.



Pin Connection  
 1. Ph. Tr Emitter  
 2. Ph. Tr Collector  
 3. LED Cathode  
 4. LED Anode



\* M : Color marking of Ic class

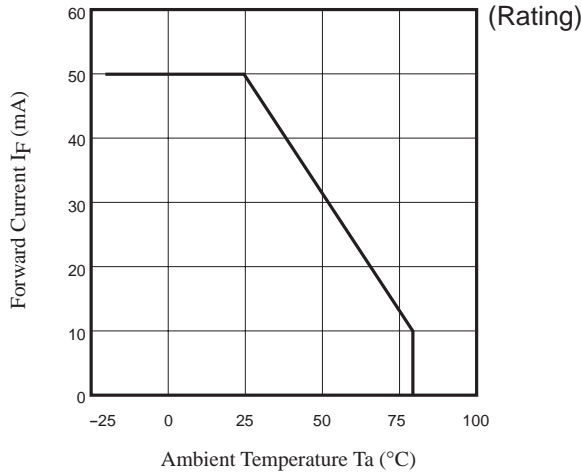
Tolerance :  $\pm 0.2$   
 Unit : mm

## Typical Characteristics

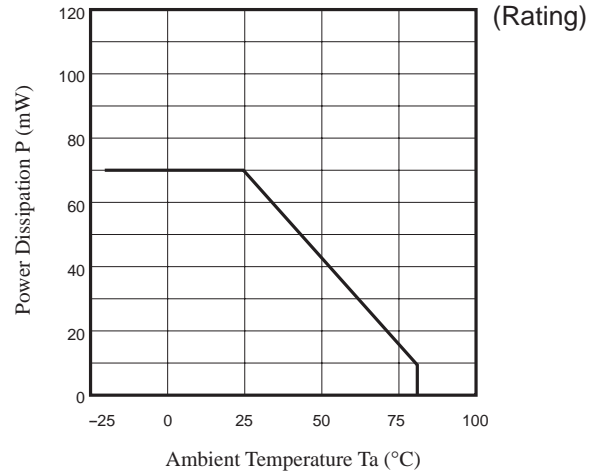


These numerical value show the electrical and optical characteristics of this product, and not assure this contents.

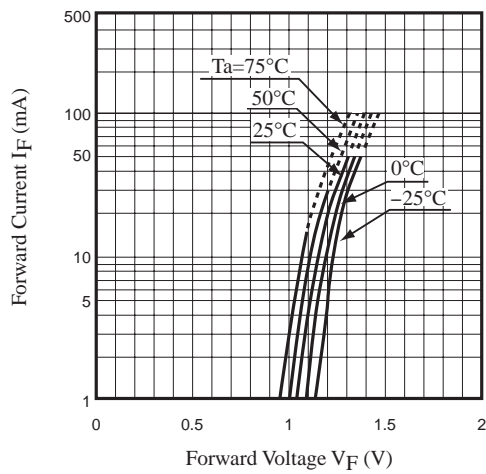
Forward Current vs. Ambient Temperature



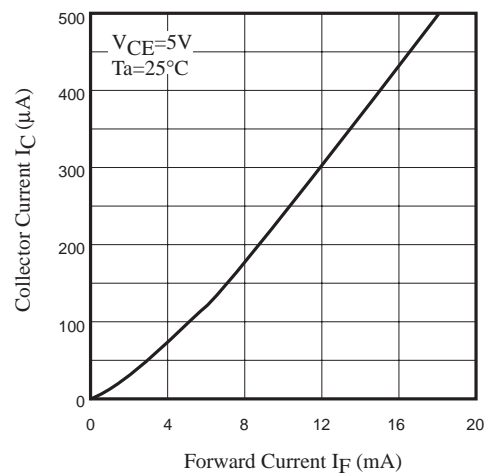
Power Dissipation vs. Ambient Temperature



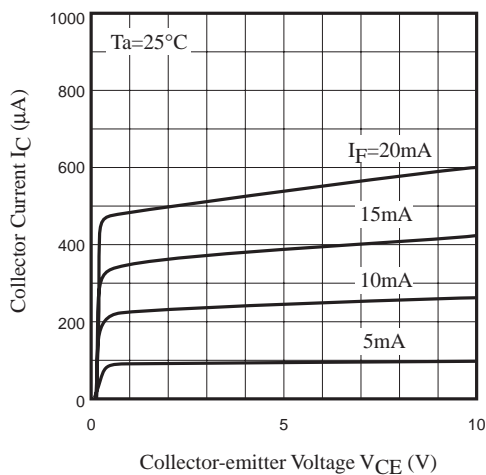
Forward Current vs. Forward Voltage



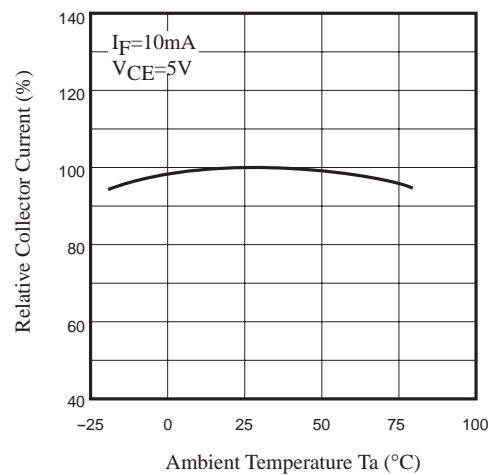
Collector vs. Forward Current



Collector Current vs. Collector-emitter Voltage



Relative Collector Current vs. Ambient Temperature

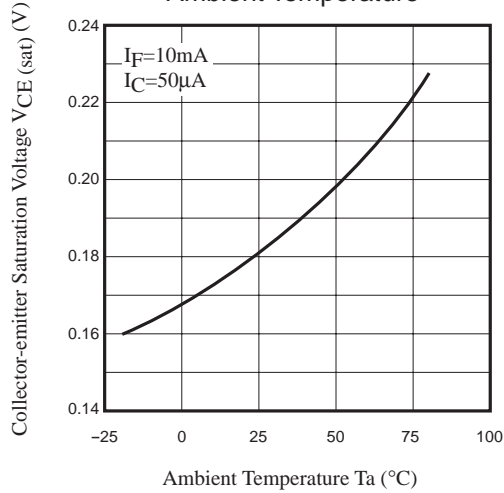


## Typical Characteristics

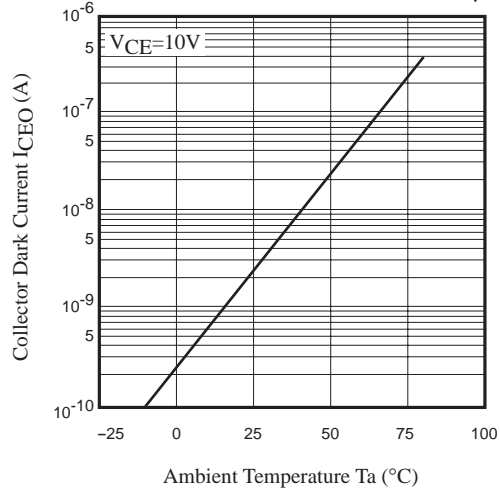


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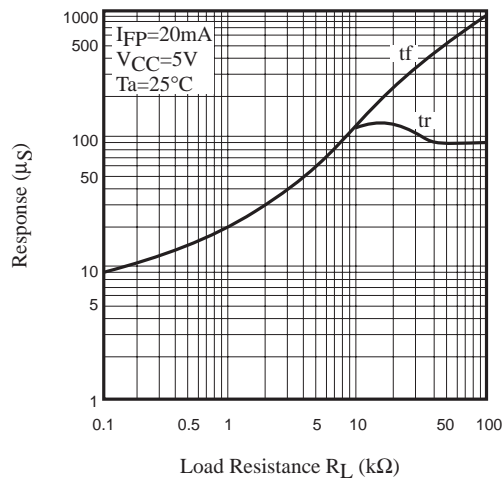
Collector-emitter Saturation Voltage vs. Ambient Temperature



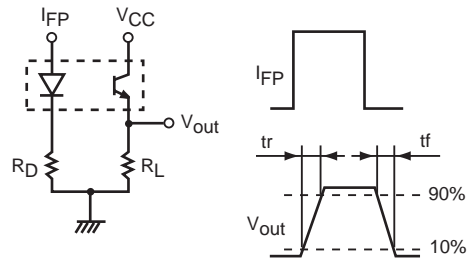
Collector Dark Current vs. Ambient Temperature



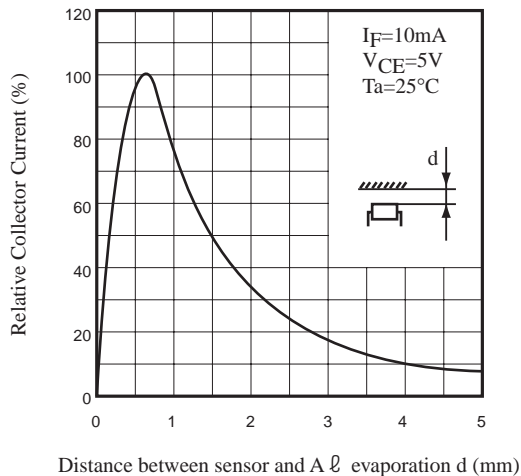
Response Time vs. Load Resistance



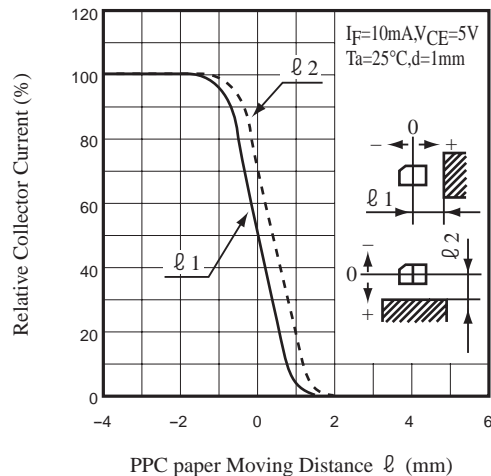
Test Circuit for Response Time



Relative Collector Current vs. Distance



Relative Collector Current vs. PPC paper Moving Distance





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## Precautionary instructions in handling gallium arsenic products

Special precautions must be taken in handling this product because it contains, gallium arsenic, which is designated as a toxic substance by law. Be sure to adhere strictly to all applicable laws and regulations enacted for this substance, particularly when it comes to disposal.

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