Ordering number : EN6029

Infrared LED

# SPI-910-00

## 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 | $I_F$ | 50 | mA |
| | Reverse Voltage | $V_R$ | 5 | V |
| | Power Dissipation | $P_D$ | 70 | mW |
| Output Phototransistor | Collector-Emitter Voltage | $V_{CEO}$ | 20 | V |
| | Emitter-Collector Voltage | $V_{ECO}$ | 5 | V |
| | Collector Curren | $I_C$ | 20 | mA |
| | Power Dissipation | $P_C$ | 70 | mW |
| Operating Temperature | | Topr | –20 to +80 | °C |
| Storage Temperature | | Tstg | –40 to +100 | °C |
| Soldering Temperature *1 | | Tsol | 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 | $V_F$ | $I_F$=10mA | 1.0 | 1.2 | 1.6 | V |
| | Reverse Current | $I_R$ | $V_R$=5V | – | – | 10 | μA |
| Output | Dark Current | $I_{CEO}$ | $I_F$=0mA, $V_{CE}$=10V | – | 10 | 200 | nA |
| Coupled | Collector Output Current | $I_C$ | $I_F$=4mA,$V_{CE}$=5V*1 | 33 | – | 180 | μA |
| | Leakage Current | $I_{LEAK}$ | $I_F$=10mA,$V_{CE}$=5V*2 | – | – | 1 | μA |
| | Collector Emitter Saturation Voltage | $V_{CE}$(sat) | $I_F$=10mA, $I_C$=50μA | – | – | 0.5 | V |
| | Rise Time | tr | $V_{CC}$=5V, $R_L$=100Ω | – | 5 | – | μs |
| | Fall Time | tf | $I_C$=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 |
|---|---|---|---|---|
| Ic (μA) | 180 to 110 | 140 to 80 | 100 to 50 | 65 to 33 |
| Marking color | Orange | Green | White | Silver |

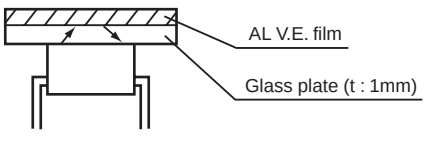



**Fig. 1 Location of Reflector**

## Package dimensions and Pin connection

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

## 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

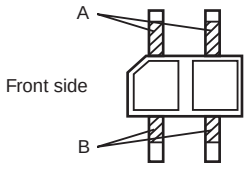



Fig. 2

| 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)

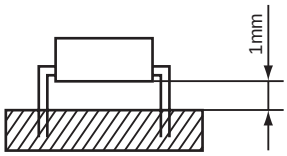
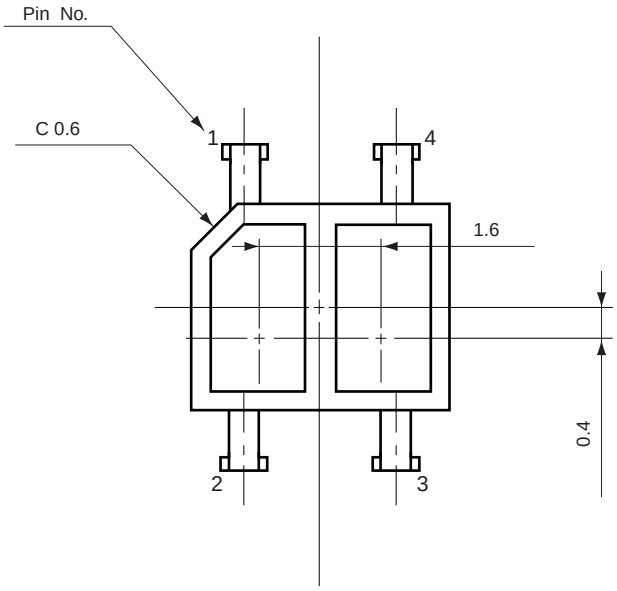


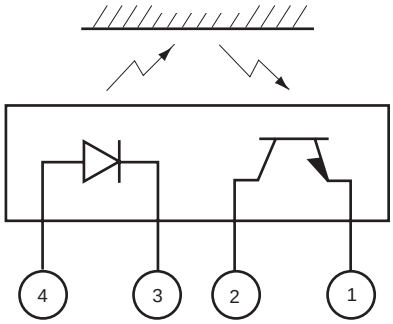

Fig. 3

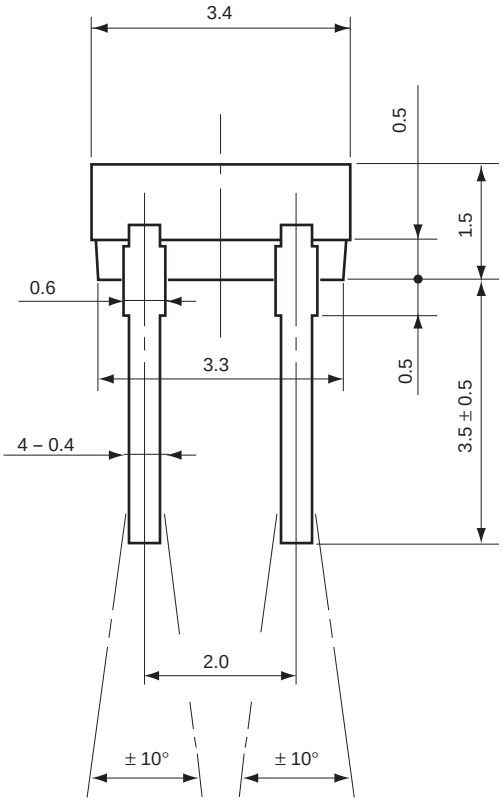
**⚠ PRECAUTIONS**

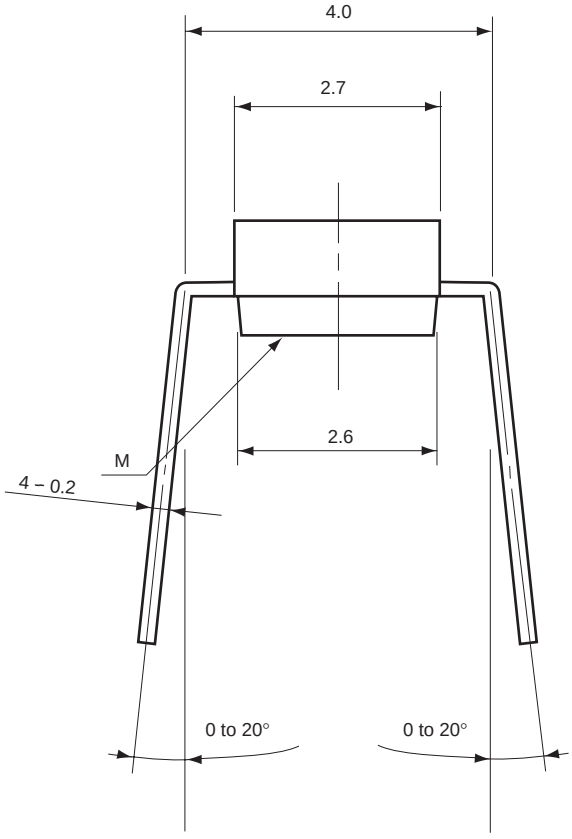
(1) Bending a lead should avoid. However, when bending is necessary, take care the next items.
  ① Bending a lead must be done before soldering.
  ② Bending a lead must be done in the states of fixing leads and no stress for the regin part. Because it is possible that stress for the regin part cause 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 core 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

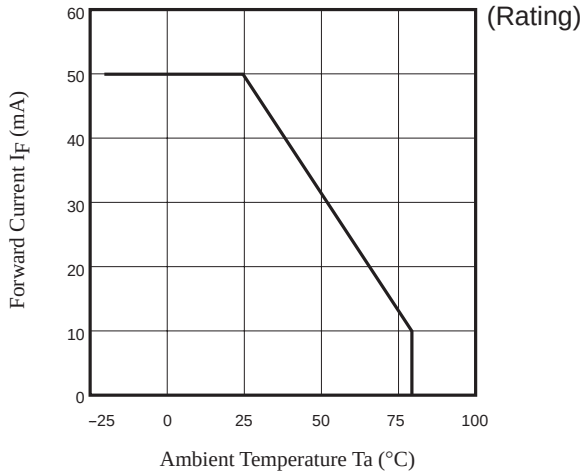
Tolerance : ± 0.2
Unit : mm

## Typical Characteristics

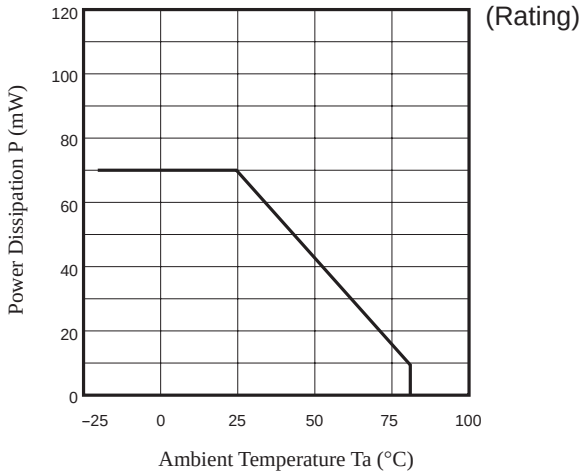
**⚠ CAUTION**

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

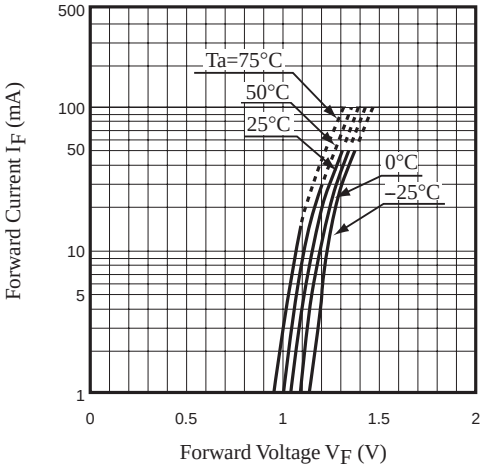
Forward Current vs. Ambient Temperature



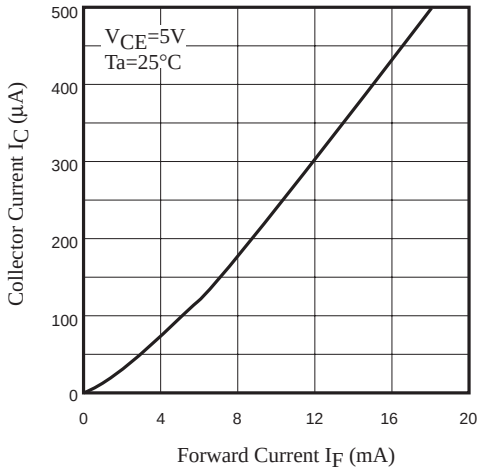

Power Dissipation vs. Ambient Temperature



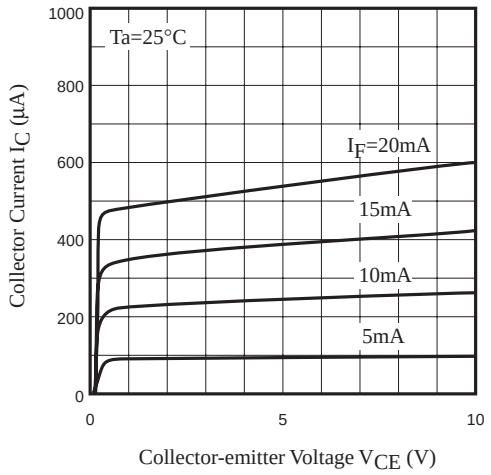

Forward Current vs. Forward Voltage



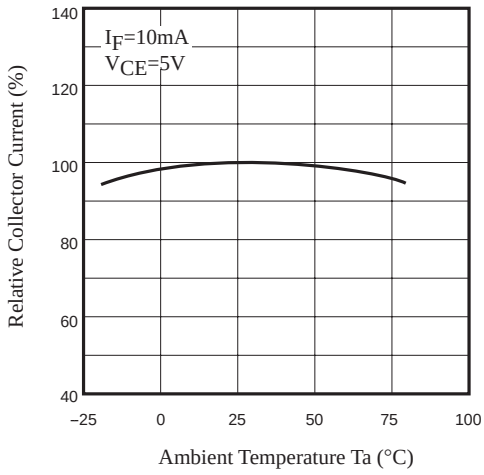

Collector vs. Forward Current




Collector Current vs. Collector-emitter Voltage




Relative Collector Current vs. Ambient Temperature



## Typical Characteristics

**⚠ CAUTION**

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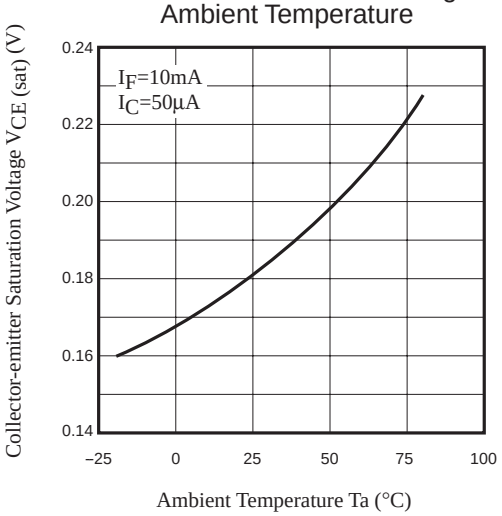
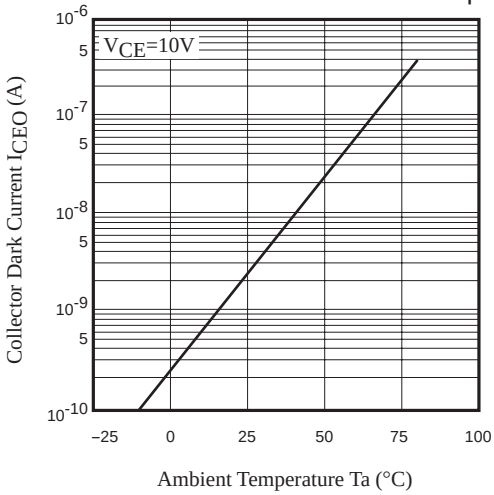
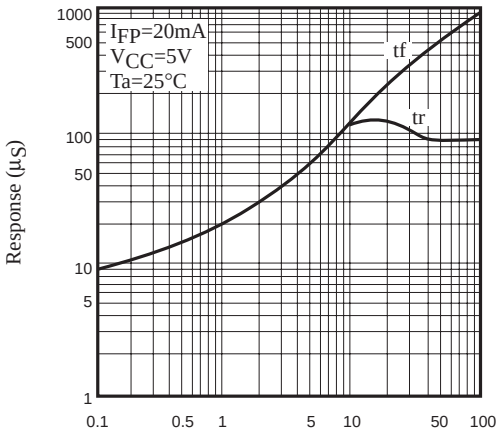
Collector-emitter Saturation Voltage vs. Ambient Temperature



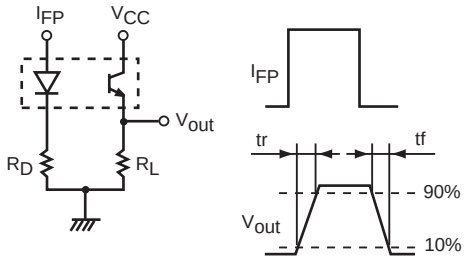

Collector Dark Current vs. Ambient Temperature



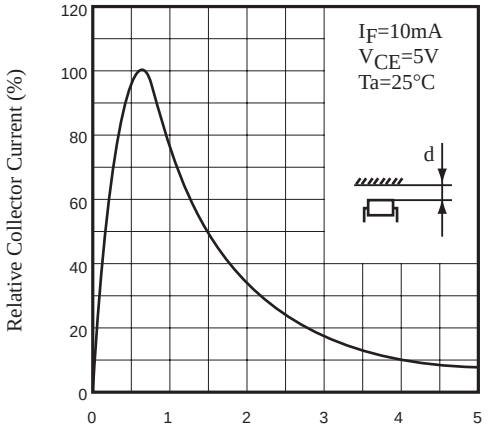

Response Time vs. Load Resistance




Test Circuit for Response Time




Relative Collector Current vs. Distance




Relative Collector Current vs. PPC paper Moving Distance