Ordering number : EN6027

GaAs Infrared LED

# SPI-240-15-T1

## Ultraminiature photointerrupter supporting reflow soldering (Darlington-transistor type)

### Features

- GaAs Infrared LED plus Darlington Phototransistor
- Photo-Interrupter for reflow soldering
- Compact type : H4.95 × L6.0 × W5.5mm
- Taping type

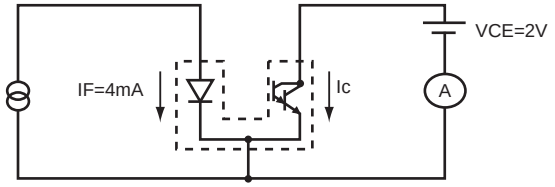
### Absolute Maximum Ratings at Ta=25°C, 65%RH

| 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 | –30 to +85 | °C |

### 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 | 1.15 | 1.4 | V |
| | Reverse Current | $I_R$ | $V_R$=5V | – | – | 10 | μA |
| Output | Dark Current | $I_{CEO}$ | $I_F$=0mA, $V_{CE}$=10V | – | – | 1 | μA |
| Coupled | Collector Output Current | $I_C$ | $I_F$=4mA, $V_{CE}$=2V*1 | 0.5 | 3 | – | mA |
| | Collector Emitter Saturation Voltage | $V_{CE}$(sat) | $I_F$=4mA, $I_C$=250μA | – | – | 1.2 | V |
| | Rise Time | tr | $V_{CC}$=5V, $R_L$=100Ω $I_C$=10mA | – | 100 | – | μs |
| | Fall Time | tf | | – | 100 | – | μs |

*1 Measurement Circuit of Collector Current

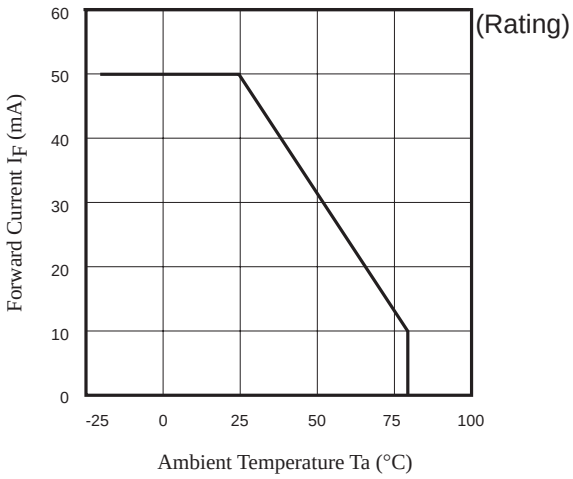


## Typical Characteristics

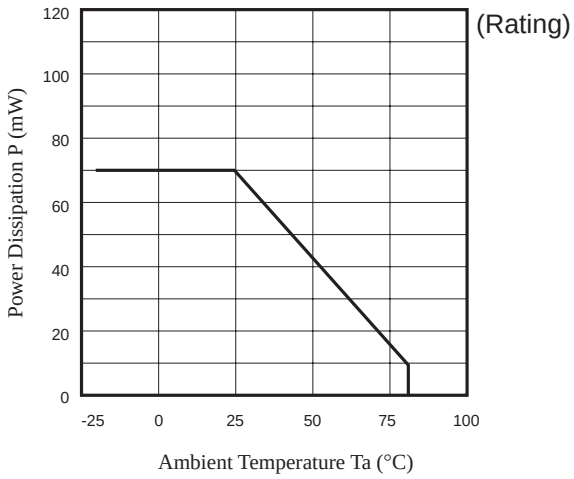
**⚠ CAUTION**

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

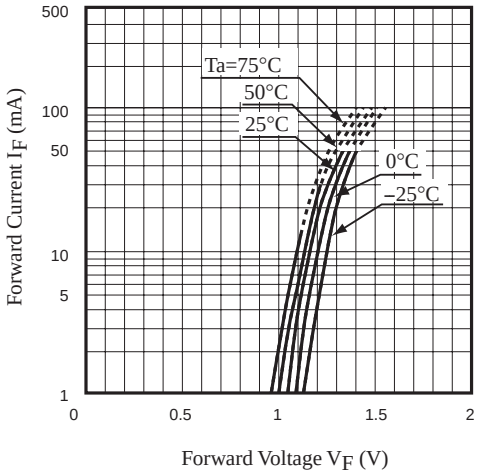
Forward Current vs. Ambient Temperature



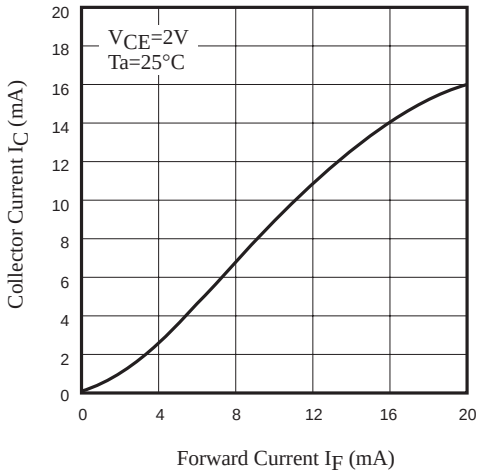

Power Dissipation vs. Ambient Temperature



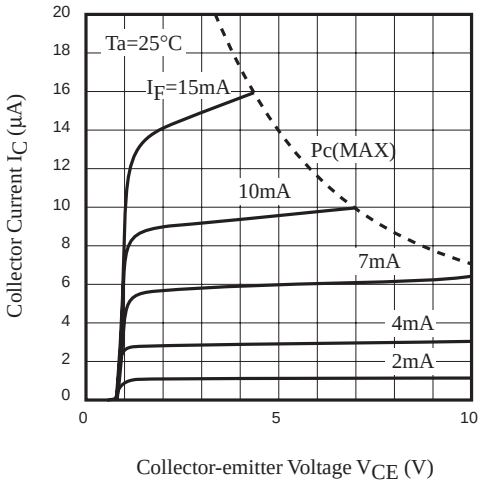

Forward Current vs. Forward Voltage



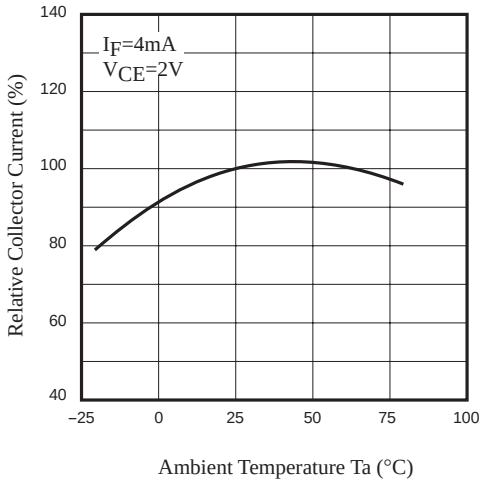

Collector vs. Forward Current




Collector Current vs. Collector-emitter Voltage




Relative Collector Current vs. Ambient Temperature



## Typical Characteristics

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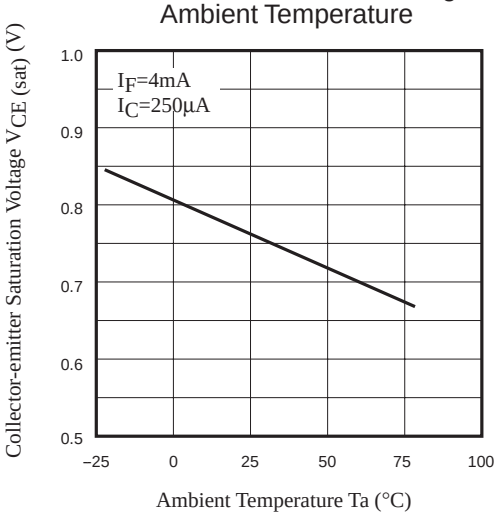
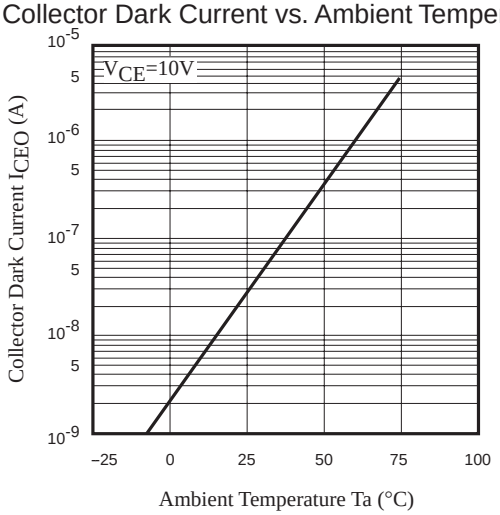
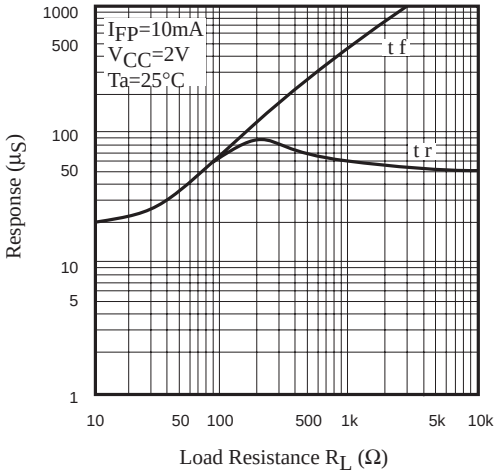
Collector-emitter Saturation Voltage vs. Ambient Temperature



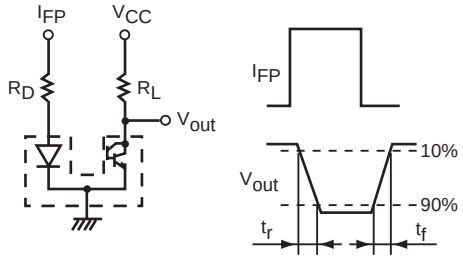

Collector Dark Current vs. Ambient Temperature



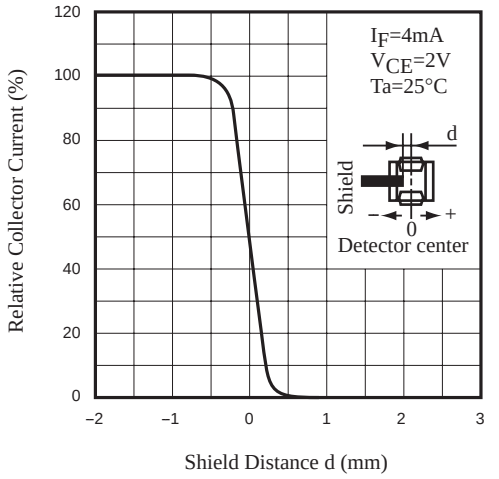

Response Time vs. Load Resistance



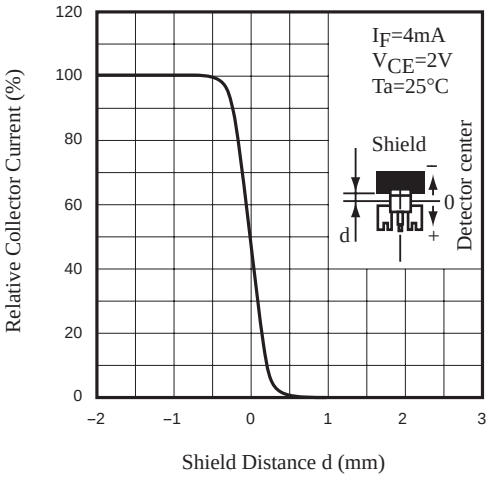

Test Circuit for Response Time

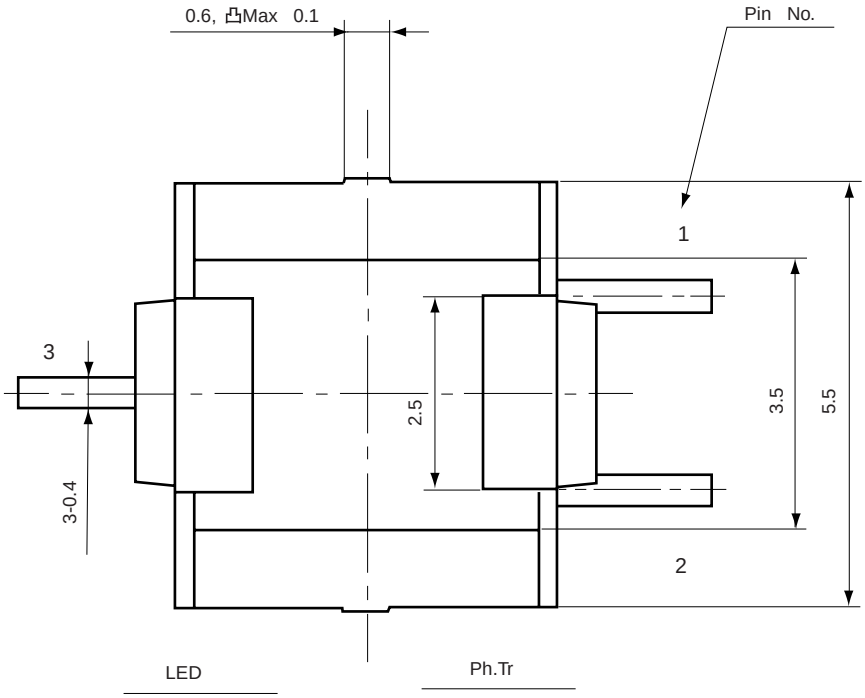



Relative Collector Current vs. Shield Distance (1)

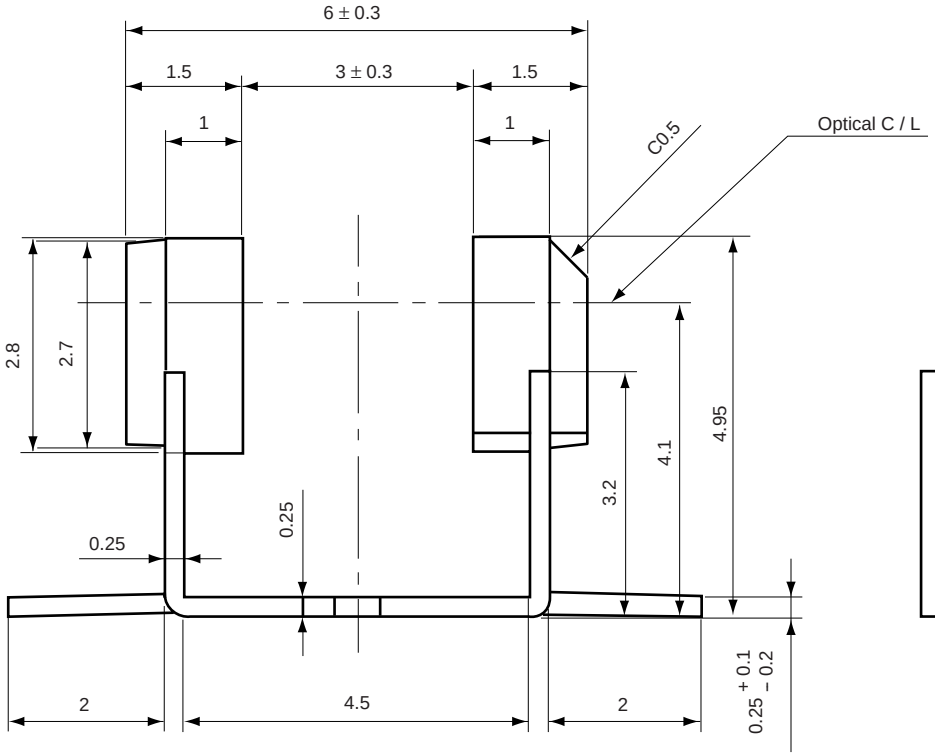


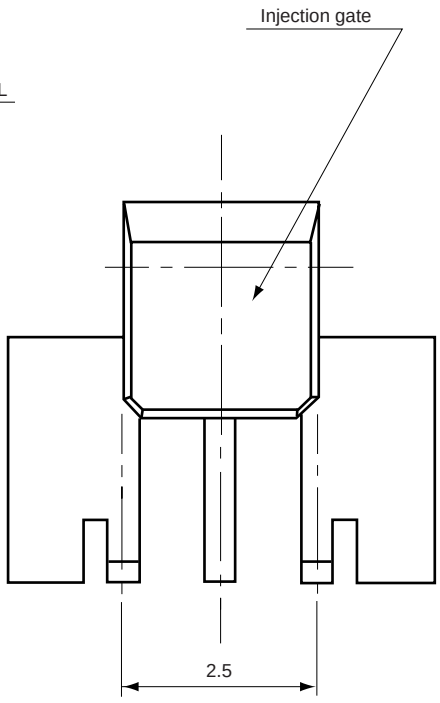

Relative Collector Current vs. Shield Distance (2)






Pin connection
1. Ph. Tr Collector
2. Common (Cathode)
3. LED Anode




Tolerance : ±0.2
Unit : mm

## Package dimensions and Pin connection

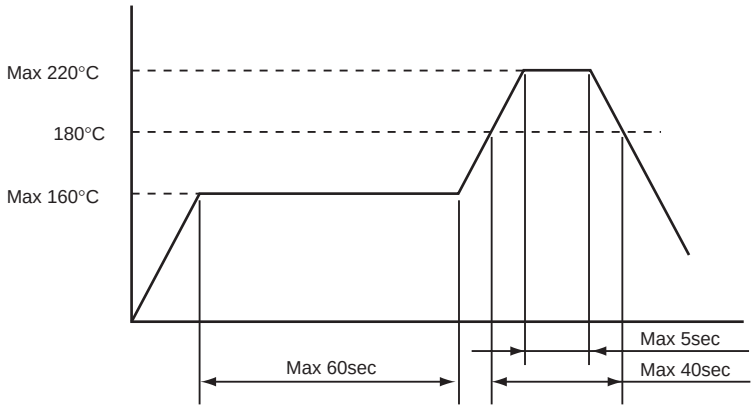
As stated in the sttached paper. (No.6027 4/7)

## Soldering conditions

(1) Reflow soldering

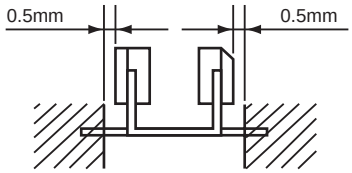
The temperature of the reflow furnace is to be set in accordance with the following temperature profile.
Soldering must be done only one time.

Temperature : On the topsurface of product
Reflow type : Hot air




(2) Manusl soldering

Temperature : Max. 290°C (Soldering iron tip temperature)
Time : Max. 3 sec
Clearance : Min. 0.5mm from package

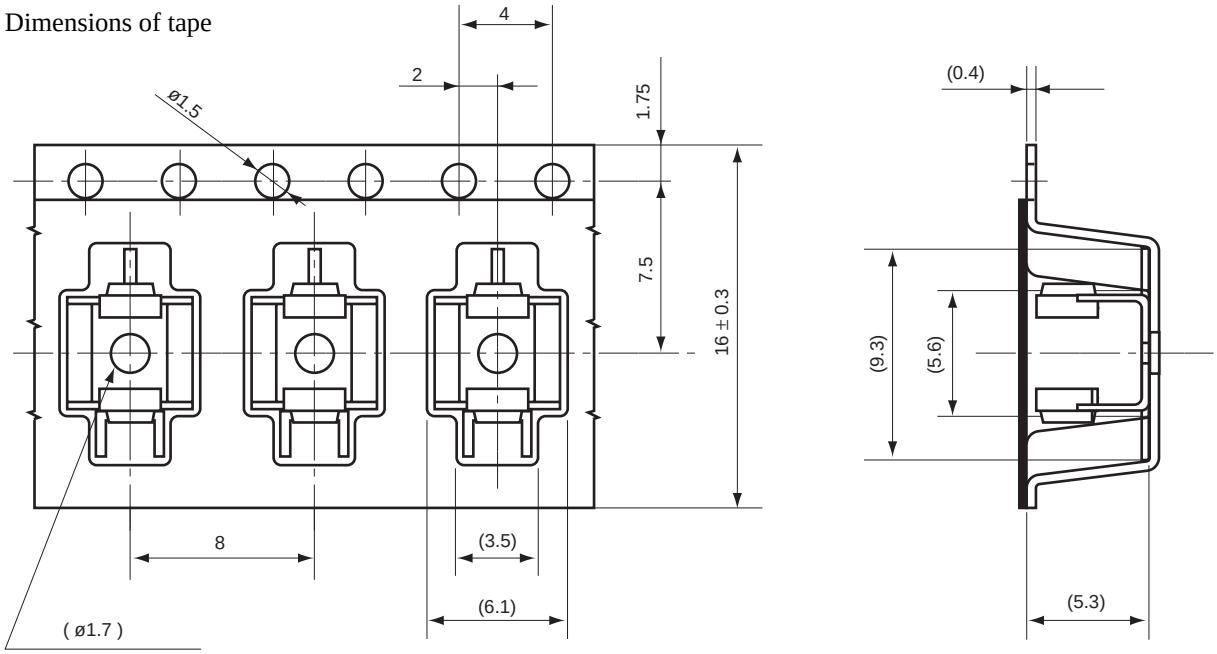



**⚠ PRECAUTIONS**

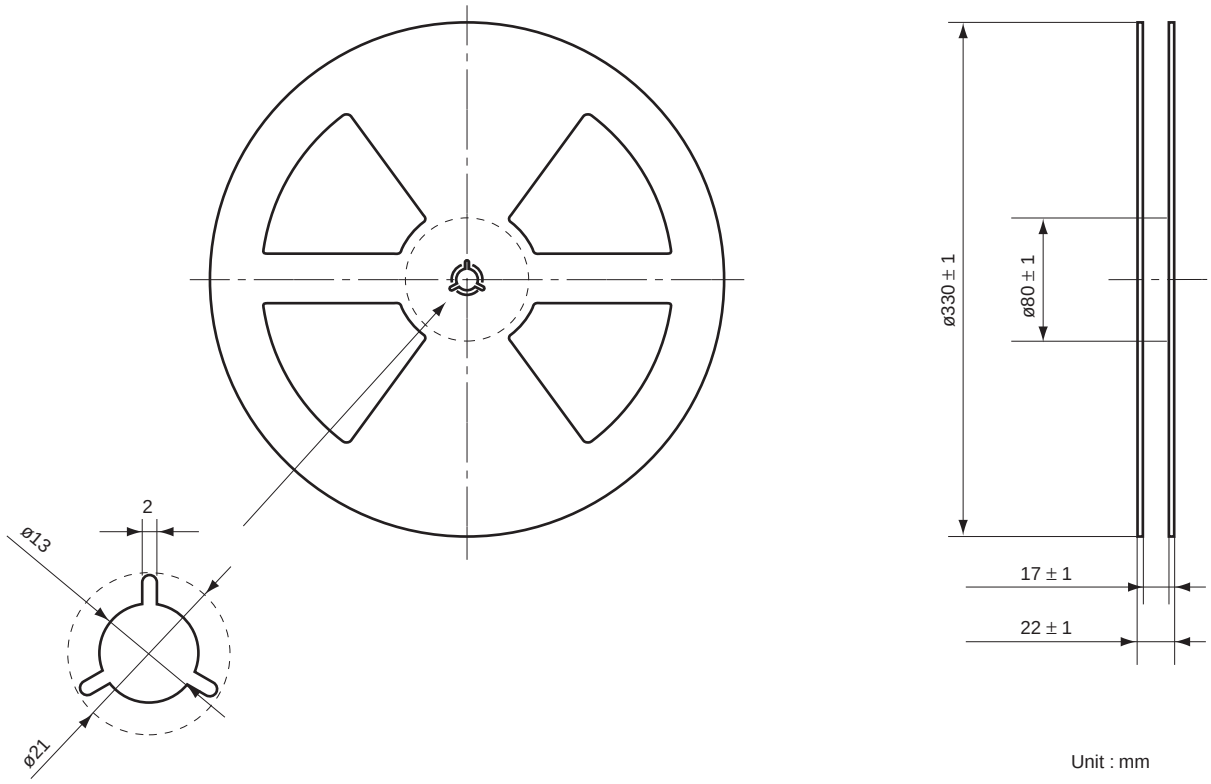
(1) Bending a lead should avoid. However, when bending is necessary, take care the next items.
① Bending a lead must be done before soldering.
② Bending a lead must be done in the states of fixing leads and no stress for the regin part. Because it is possible that stress for the regin part cause troubles such as gold wire breaking and so on.
③ A lead must be bend under the stay.
④ Do not bend the same position of leads more than twice.
(2) The hole pitch of a circuit board must fit to the recommended mounting dimension.
(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.
(6) Precautions of the product after the open dry packing
① The product after the open dry packing should be stored in the dry packing again.
The product should be kept under the conditions below, if the product is not stored in the dry paking.
Temperature : 5 to 30°C
Humidity : Max 70%RH
Term : Max 7days
② The product to be out the term without dry packing must be practiced baking.
Baking conditions : +60±5°C, 10 to 20Hr
(7) The reflow conditions must be confirmed that no problem by your reflow furnace.

## Taping Specifications

(1) Dimensions of tape




(2) Dimensions of reel




Unit : mm

# ⚠ CAUTION

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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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