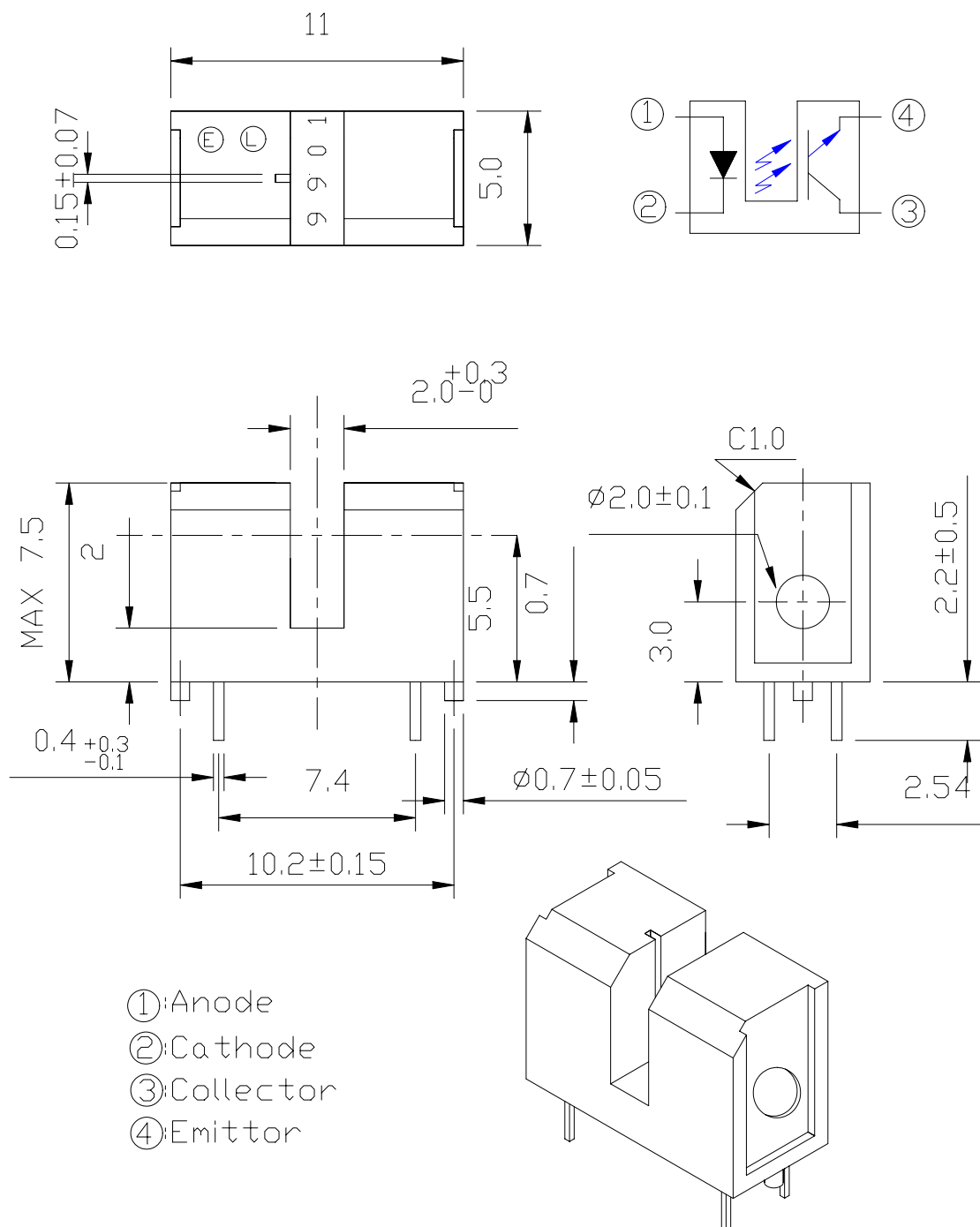




MODEL NO: DS-9901

■ Package Dimensions :





MODEL NO: DS-9901

■ Absolute Maximum Ratings (Ta=25°C)

| Parameter                                                         |                                                             | Symbol           | Ratings | Unit |
|-------------------------------------------------------------------|-------------------------------------------------------------|------------------|---------|------|
| Input                                                             | Power Dissipation at(or below)<br>25°C Free Air Temperature | Pd               | 75      | mW   |
|                                                                   | Reverse Voltage                                             | V <sub>R</sub>   | 6       | V    |
|                                                                   | Forward Current                                             | I <sub>F</sub>   | 50      | mA   |
|                                                                   | Peak Forward Current<br>Pulse width ≤100 μs, Duty cycle=1%  | I <sub>FP</sub>  | 1       | A    |
| Output                                                            | Collector Power Dissipation                                 | P <sub>C</sub>   | 75      | mW   |
|                                                                   | Collector Current                                           | I <sub>C</sub>   | 20      | mA   |
|                                                                   | Collector-Emitter Voltage                                   | V <sub>CE0</sub> | 35      | V    |
|                                                                   | Emitter-Collector Voltage                                   | V <sub>EC0</sub> | 6       | V    |
| Operating Temperature                                             |                                                             | Topr             | -25~+85 | °C   |
| Storage Temperature                                               |                                                             | Tstg             | -40~+85 | °C   |
| Lead Soldering Temperature<br>(1/16 inch from body for 5 seconds) |                                                             | Tsol             | 260     | °C   |

■ Electro-Optical Characteristics (Ta=25°C)

| Parameter               |                        | Symbol               | Min. | Typ. | Max. | Unit | Condition                                                             |
|-------------------------|------------------------|----------------------|------|------|------|------|-----------------------------------------------------------------------|
| Input                   | Forward Voltage        | V <sub>F</sub>       | -    | 1.2  | 1.5  | V    | I <sub>F</sub> =20mA                                                  |
|                         | Reverse Current        | I <sub>R</sub>       | -    | -    | 10   | μA   | V <sub>R</sub> =3V                                                    |
|                         | Peak Wavelength        | λ <sub>p</sub>       | -    | 940  | -    | nm   | I <sub>F</sub> =20mA                                                  |
| Output                  | Collector Dark Current | I <sub>CE0</sub>     | -    | 1    | 100  | nA   | V <sub>CE</sub> =20V<br>Ee=0mW/cm <sup>2</sup>                        |
| Transfer Characteristic | C-E Saturation Voltage | V <sub>CE(sat)</sub> | -    | -    | 0.4  | V    | I <sub>C</sub> =0.25mA<br>I <sub>F</sub> =40mA                        |
|                         | Collector Current      | I <sub>C(ON)</sub>   | 0.4  | -    | -    | mA   | V <sub>CE</sub> =5V<br>I <sub>F</sub> =20mA                           |
|                         | Rise time              | t <sub>r</sub>       | -    | -    | 80   | μsec | V <sub>CE</sub> =4.4V<br>I <sub>C</sub> =13mA<br>R <sub>L</sub> =47KΩ |
|                         | Fall time              | t <sub>f</sub>       | -    | -    | 800  | μsec |                                                                       |



## MODEL NO: ITR9901

### Typical Characteristics For IR

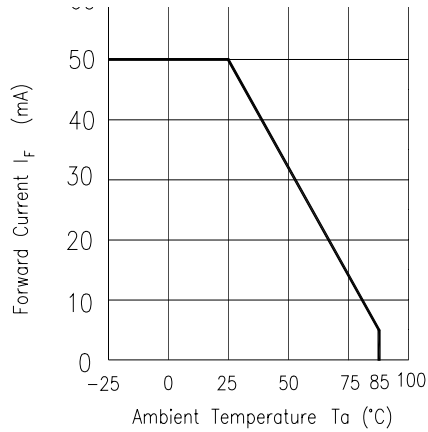


Fig. 3 Peak Emission Wavelength vs. Ambient Temperature

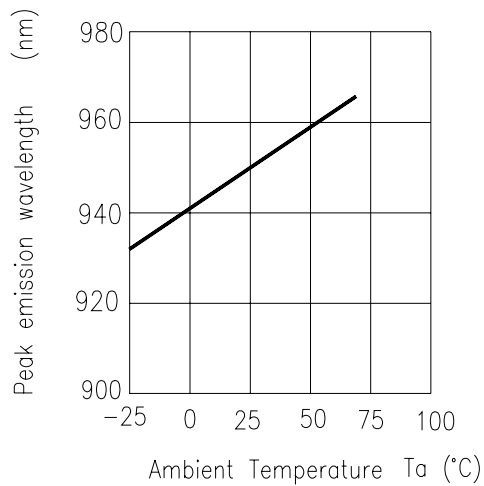


Fig. 5 Forward Voltage vs. Ambient Temperature

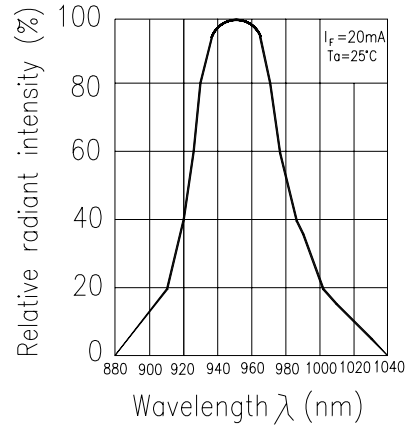
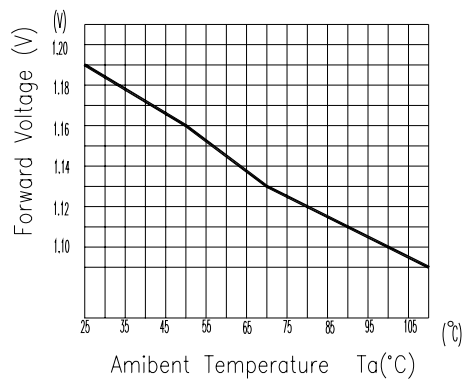


Fig. 4 Forward Current vs. Forward Voltage

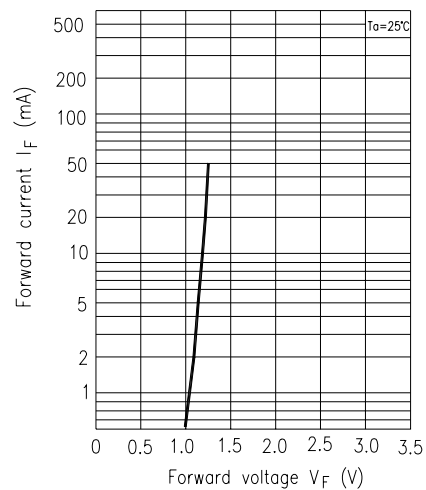


Fig. 6 Relative Radiant Intensity vs. Angular Displacement



## MODEL NO: DS-9901

### ■ Typical Characteristics For PT

Fig.1 Collector Power Dissipation vs. Ambient Temperature

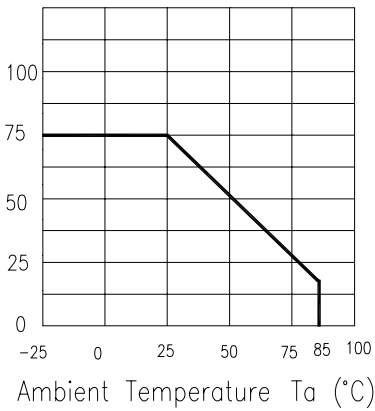


Fig.2 Collector Dark Current vs. Ambient Temperature

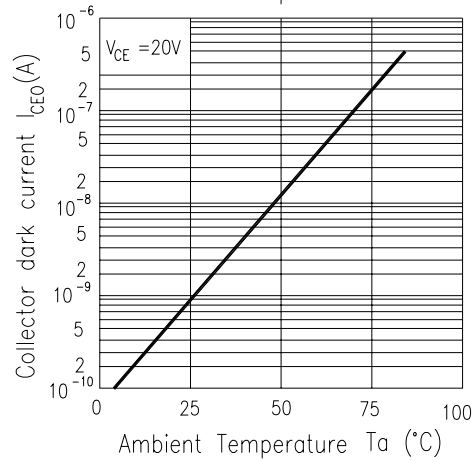


Fig.3 Spectral Sensitivity

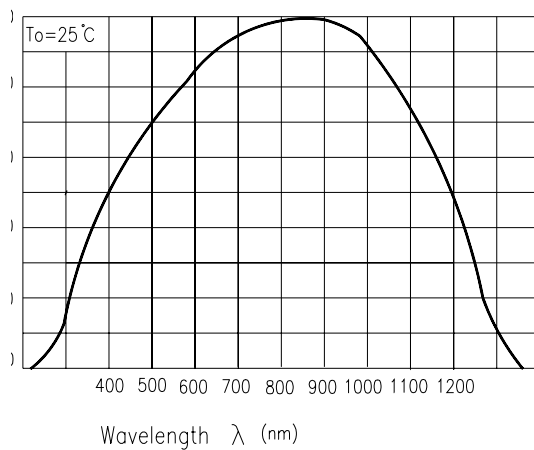
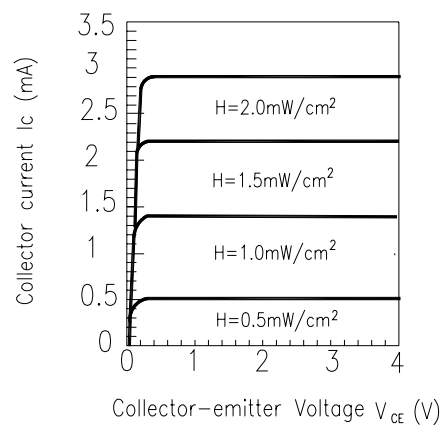


Fig.4 Collector Current vs. Collector-emitter Voltage



### ■ Typical Characteristics For ITR

Fig.1 Relative Collector Current vs. Shield Distance(1)

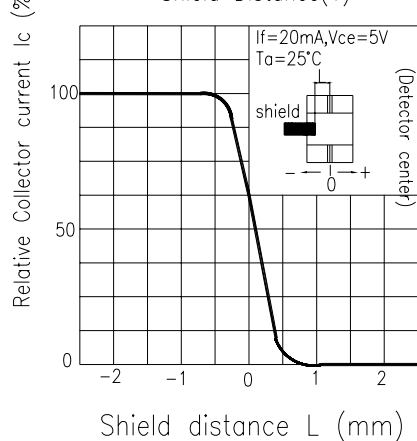
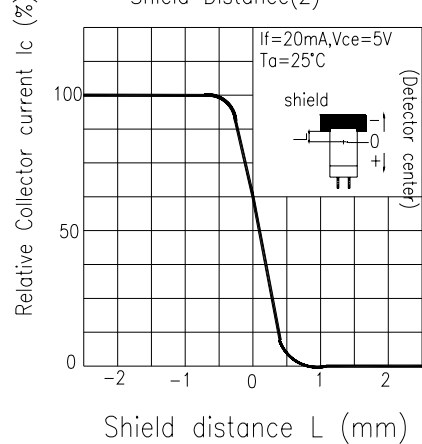


Fig.2 Relative Collector Current vs. Shield Distance(2)





# MODEL NO: DS-9901

## ■ Reliability test item and condition

The reliability of products shall be satisfied with item listed below:

| Parameter                | Purpose & Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Failure Judgement Criteria                                                                                                                    | Samples(n)<br>Defective(c) |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Temperature Cycle        | Evaluates product's ability to withstand exposure to high temperature, low temperature, and temperature variation between two limit temperature. Standard test Condition:<br>$\begin{array}{cccc} 85^{\circ}\text{C} & \sim & 25^{\circ}\text{C} & \sim & -55^{\circ}\text{C} & \sim & 25^{\circ}\text{C} \\ \downarrow & & \downarrow & & \downarrow & & \downarrow \\ 30\text{min} & & 5\text{min} & & 30\text{min} & & 5\text{min} \\ & & & & & & 50\text{ cycle} \end{array}$ | $I_R \geq U \times 2$ $I_{c(on)} \leq L \times 0.8$ $V_F \geq U \times 1.2$<br>U : Upper specification limit<br>L : Lower specification limit | n =22 , c=0                |
| Thermal Shock            | Evaluates product's ability to withstand rapid temperature change Standard test Condition: $85^{\circ}\text{C} \sim -55^{\circ}\text{C}$<br>$\begin{array}{cc} 5\text{min} & 5\text{min} \\ & 50\text{cycle} \end{array}$                                                                                                                                                                                                                                                         |                                                                                                                                               | n =22 , c=0                |
| High Temperature Storage | Evaluates product's ability to withstand prolonged storage at high temperature Standard test Condition:<br>Temperature : $100^{\circ}\text{C}$<br>Time : 1000hrs                                                                                                                                                                                                                                                                                                                  |                                                                                                                                               | n =22 , c=0                |
| Low Temperature Storage  | Evaluates product's ability to withstand prolonged storage at low temperature Standard test Condition:<br>Temperature : $-55^{\circ}\text{C}$<br>Time : 1000hrs                                                                                                                                                                                                                                                                                                                   |                                                                                                                                               | n =22 , c=0                |



MODEL NO: DS-9901

| Parameter                             | Purpose & Condition                                                                                                                                                                        | Failure Judgement Criteria                                                                                             | Samples(n)<br>Defective(c) |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Operating Life Test                   | Evaluates product's endurance to prolonged electrical or temperature stresses. Standard test Condition:<br><br>$V_{CE}=5V$<br>$I_F=20mA$<br>Time : 1000hrs                                 | $I_R \geq U \times 2$<br>$I_{c(on)} \leq L \times 0.8$<br>$V_F \geq U \times 1.2$<br><br>U : Upper specification limit | n =22 , c=0                |
| High Temperature<br><br>High Humidity | Evaluates product's ability to withstand prolonged storage at high temperature and high humidity. Standard test Condition:<br>Temperature: 85°C<br>Relative humidity:85%<br>Time : 1000hrs | L : Lower specification limit                                                                                          | n =22 , c=0                |
| Soldering Heat                        | Evaluates product's ability to withstand soldering heat<br>Standard test conditions<br>Solder temperature : 260±5°C<br>Solder time : 10 seconds                                            |                                                                                                                        | n =22 , c=0                |

## ■Supplements

### 1.Parts

#### (1) Chip

| Type | Material | Peak Wavelength |
|------|----------|-----------------|
| DR   | GaAs     | 940 nm          |
| DT   | Silicon  | 860 nm          |

#### (2)Material

| Type     | Lead frame | Wire | Part Package | Holder |
|----------|------------|------|--------------|--------|
| Material | SPCC       | Gold | Epoxy        | Noryl  |