

## ITR180



### Features

- Fast response time
- High analytic
- Cut-off visible wavelength  $\lambda_p=940\text{nm}$
- High sensitivity
- Pb free
- This product itself will remain within RoHS compliant version

### Applications

- Mouse Copier
- Switch Scanner
- Floppy disk driver
- Non-contact Switching
- For Direct Board

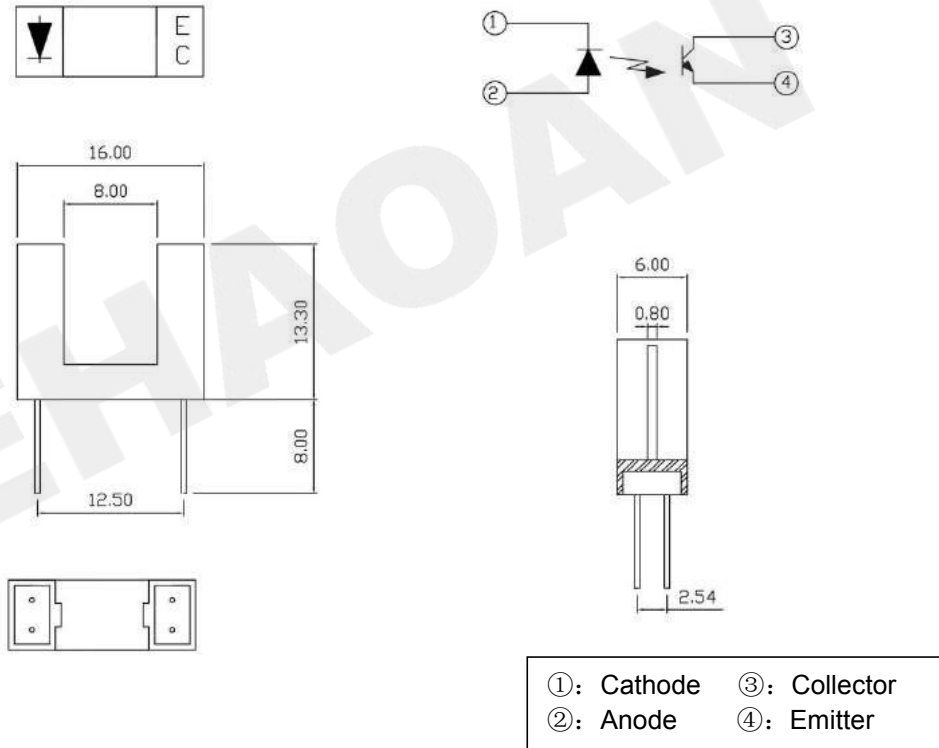
### Descriptions

The ITR180 (Slot Optical Switch) is a gallium arsenide infrared emitting diode which is coupled with a silicon photo transistor in a plastic housing. The packaging system is designed to optimize the mechanical resolution, coupling efficiency, and insulates ambient light. The slot in the housing provides a means of interrupting the signal with printer, scanner, copier, or other opaque material, switching the output from an "ON" to "OFF" state.

### Device Selection Guide

Type	Material	Lens Color	Peak Wavelength
IR	GaAlAs	Water clear	940 nm
PT	Silicon	Water clear	940 nm

Package Dimension



Note: Tolerances unless mentioned  $\pm 0.3$ mm. Unit = mm.

**Packing Quantity Specification**

1.150Pcs/1Bag

2.6Bags/1Box

3.10Boxes/1Carton

**Absolute Maximum Ratings (Ta=25°C)**

Parameter		Symbol	Ratings	Unit
Input	Power Dissipation at(or below) 25° C Free Air Temperature	<b>P<sub>d</sub></b>	75	mW
	Reverse Voltage	<b>V<sub>R</sub></b>	5	V
	Forward Current	<b>I<sub>F</sub></b>	50	mA
	Peak Forward Current (*1) Pulse width ≤ 100μs, Duty cycle=1%	<b>I<sub>FP</sub></b>	1	A
Output	Collector Power Dissipation	<b>P<sub>C</sub></b>	75	mW
	Collector Current	<b>I<sub>C</sub></b>	20	mA
	Collector-Emitter Voltage	<b>V<sub>CEO</sub></b>	30	V
	Emitter-Collector Voltage	<b>V<sub>ECO</sub></b>	5	V
Operating Temperature		<b>T<sub>opr</sub></b>	-25~+85	°C
Storage Temperature		<b>T<sub>stg</sub></b>	-40~+85	°C
Lead Soldering Temperature (*2) (1/16 inch form body for 5 seconds)		<b>T<sub>sol</sub></b>	260	°C

(\*1) Tw =100 μsec., T =10 msec. (\*2) T=5 Sec.

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions
Input	Forward Voltage	<b>V<sub>F</sub></b>	----	1.2	1.6	V	I <sub>F</sub> =20mA
	Reverse Current	<b>I<sub>R</sub></b>	----	----	10	μA	V <sub>R</sub> =5V
	Peak Wavelength	<b>λ<sub>P</sub></b>	----	940	----	nm	I <sub>F</sub> =20mA
Output	Collector Dark Current	<b>I<sub>CEO</sub></b>	----	----	100	nA	V <sub>CE</sub> =10V, Ee=0mW/cm <sup>2</sup>
	C-E Saturation Voltage	<b>V<sub>CE(sat)</sub></b>	----	----	0.4	V	I <sub>C</sub> =0.5mA, Ee=1mW/cm <sup>2</sup>
	Collect Current	<b>I<sub>C(ON)</sub></b>	0.5	4.5	----	mA	V <sub>CE</sub> =5V, I <sub>F</sub> =20mA
Transfer Characteristics	Rise time	<b>t<sub>r</sub></b>	----	15	----	μsec	V <sub>CE</sub> =5V I <sub>C</sub> =1mA R <sub>L</sub> =1KΩ
	Fall time	<b>t<sub>f</sub></b>	----	15	----	μsec	

**Typical Electrical/Optical/Characteristics Curves for IR**

Fig.1 Forward Current vs. Ambient Temperature

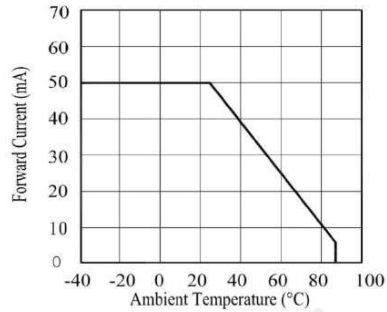


Fig.2 Spectral Distribution

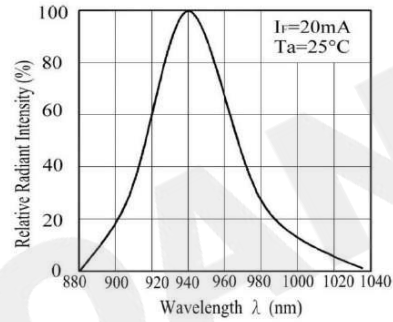


Fig.3 Forward Current vs. Forward Voltage

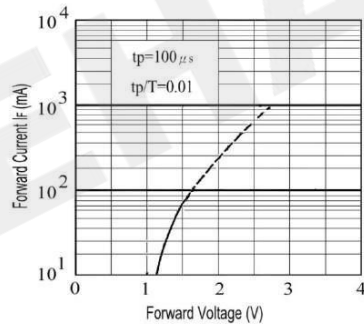
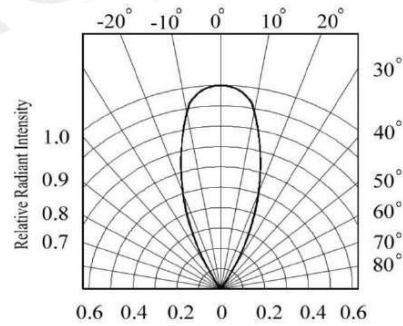


Fig. 4 Relative Radiant Intensity vs. Angular Displacement



**Typical Electrical/Optical/Characteristics Curves for PT**

Fig.1 Spectral Sensitivity

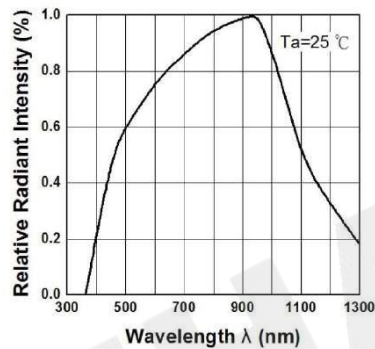


Fig.2 Collector Current vs. Irradiance

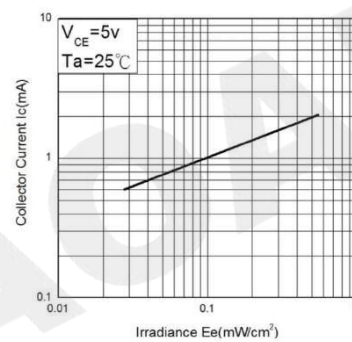
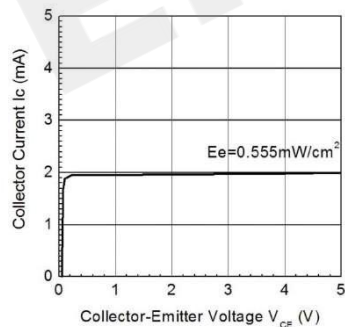


Fig.3 Collector Current vs. Collector-Emitter Voltage



**Reliability test item and condition**

The reliability of products shall be satisfied with item listed below: Confidence level :90%  
 LTPD:10%

Parameter	Purpose & Condition	Failure Judgement Criteria	Samples(n) 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: 85°C~25°C~-55°C~25°C 30min 5min 30min 5min 50 cycle	$IR \geq U \times 2$ $IC(on) \leq L \times 0.8$ $VF \geq U \times 1.2$ U: Upper specification Limit  L: Lower specification limit	n =22,c=0
Thermal Shock	Evaluates product's ability to withstand rapid temperature change Standard test Condition: 85°C ~ -55°C 5 min 5 min 50cycle		n =22,c=0
High Temperature Storage	Evaluates product's ability to withstand prolonged storage at high temperature Standard test Condition: Temperature : 100 °C Time : 1000hrs		n =22,c=0
Low Temperature Storage	Evaluates product's ability to Storage withstand prolonged storage at low temperature Standard test Condition: Temperature : -55 °C Time : 1000hr		n =22,c=0
Operating Life Test	Evaluates product's endurance to prolonged electrical or temperature stresses. Standard test Condition: VCE =5V IF =20mA Time : 1000hrs		n =22,c=0
High Temperature High Humidity	Evaluates product's ability to withstand prolonged storage at high temperature and high humidity. Standard test Condition: Temperature: 85°C Relative humidity:85% Time : 1000hrs		n =22,c=0
Soldering Heat	Evaluates product's ability to withstand soldering heat Standard test conditions Solder temperature : 260±5°C Solder time : 10 seconds		n =22,c=0