

# Technical Data Sheet

## Features

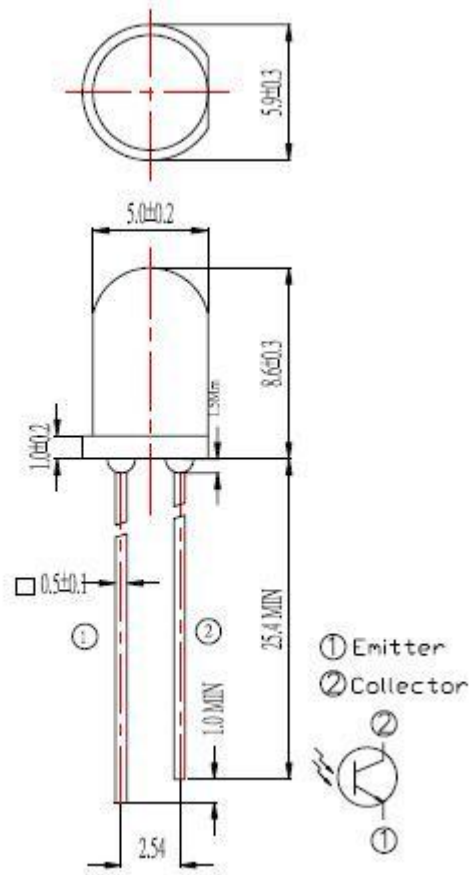
- Fast response time
- High photo sensitivity
- Pb free
- This product itself will remain within RoHS compliant version.

## Descriptions

- YG1006 is a high speed and high sensitive NPN silicon phototransistor in a standard 5mm package.

Due to its black epoxy the device is sensitive to infrared radiation.

## Package Dimensions



**Note :** 1. All dimensions are in millimeters

2. Tolerances unless dimensions  $\pm 0.25$ mm

## Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

| Parameter                                                              | Symbol    | rating                       | units            |
|------------------------------------------------------------------------|-----------|------------------------------|------------------|
| Collector-Emitter Voltage                                              | $V_{CE0}$ | 30                           | V                |
| Emitter-Collector-Voltage                                              | $V_{ECO}$ | 5                            | V                |
| Collector Current                                                      | $I_c$     | 20                           | mA               |
| Operating Temperature                                                  | $T_{opr}$ | $-25 \sim +85^\circ\text{C}$ | $^\circ\text{C}$ |
| Storage Temperature                                                    | $T_{stg}$ | $-40 \sim +85^\circ\text{C}$ | $^\circ\text{C}$ |
| Lead Soldering Temperature                                             | $T_{sol}$ | 260                          | $^\circ\text{C}$ |
| Power Dissipation at (or below) $25^\circ\text{C}$ FreeAir Temperature | $P_c$     | 75                           | mW               |

Electro-Optical Characteristics ( $T_a=25^\circ\text{C}$ )

Rankings

| Parameter                            | Symbol          | Condition                          | Min. | Typ.     | Max. | Units   |
|--------------------------------------|-----------------|------------------------------------|------|----------|------|---------|
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$      | $I_c=100\mu A$<br>$E_e=0mW/C\ m^2$ | 30   | ---      | ---  | V       |
| Emitter-Collector Saturation Voltage | $BV_{ECO}$      | $I_E=100\mu A$<br>$E_e=0mW/C\ m^2$ | 5    | ---      | ---  | V       |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$   | $I_c=2mA$<br>$E_e=1mW/C\ m^2$      | ---  | ---      | 0.4  | V       |
| Rise Time                            | $t_f$           | $V_{CE}=5V$<br>$I_c=1mA$           | ---  | 15       | ---  | $\mu S$ |
| Fall Time                            | $t_f$           | $R_L=1000\Omega$                   | ---  | 15       | ---  |         |
| Collector Dark Current               | $I_{CEO}$       | $E_e=0mW/C\ m^2$<br>$V_{CE}=20V$   | ---  | ----     | 100  | nA      |
| On State Collector Current           | $I_c(on)$       | $E_e=1mW/C\ m^2$<br>$V_{CE}=5V$    | 1.77 | ----     | 7.07 | mA      |
| Wavelength of Peak Sensitivity       | $\lambda_P$     | ---                                | ---  | 940      | ---  | nm      |
| Rang of Spectral Bandwidth           | $\lambda_{0.5}$ | ---                                | ---  | 760-1100 | ---  | nm      |

| Parameter | Symbol    | Min  | Max  | Unit | Test Condition                  |
|-----------|-----------|------|------|------|---------------------------------|
|           | $I_c(on)$ |      |      | mA   | $V_{CE}=5V$<br>$E_e=1mW/C\ m^2$ |
| J         |           | 1.77 | 3.61 |      |                                 |
| K         |           | 2.67 | 5.07 |      |                                 |
| L         |           | 4.18 | 7.07 |      |                                 |

Typical Electro-Optical Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature

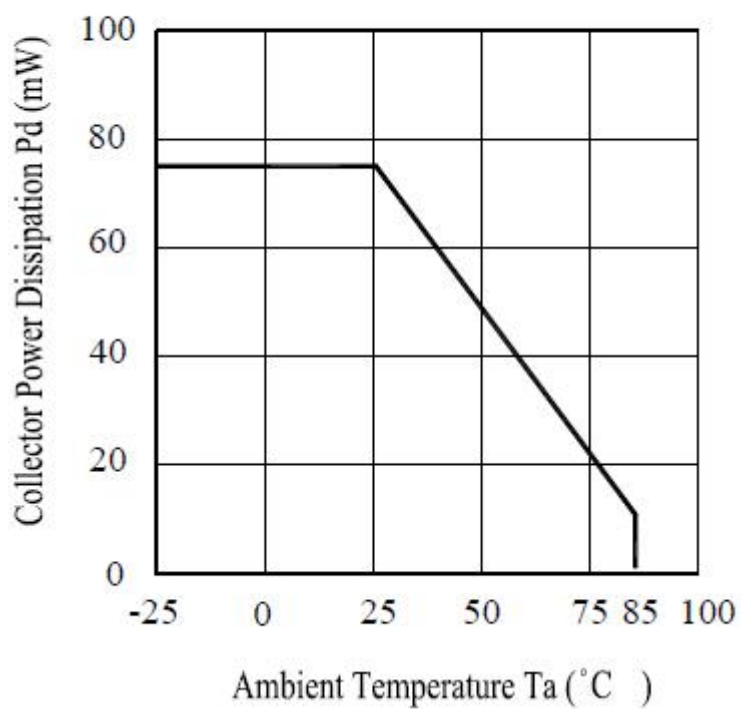


Fig.2 Spectral Sensitivity

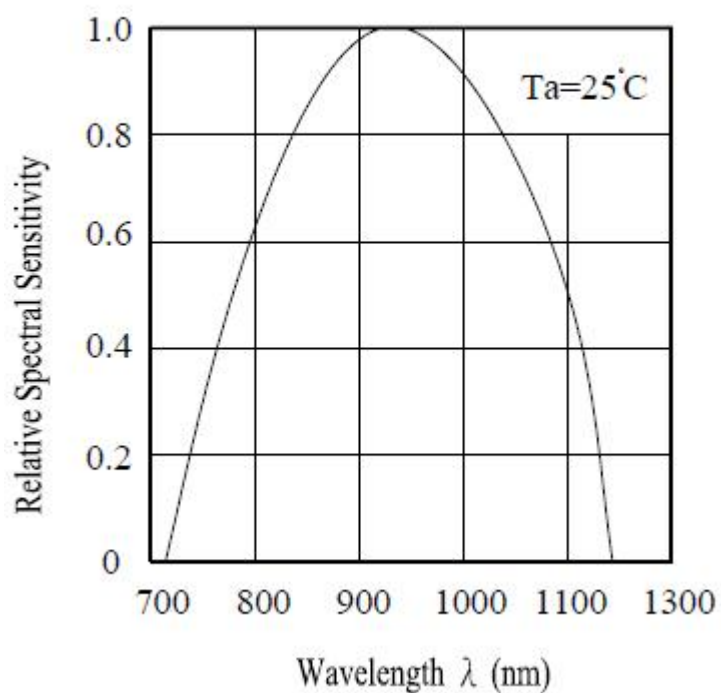


Fig.3 Relative Collector Current vs.  
Ambient Temperature

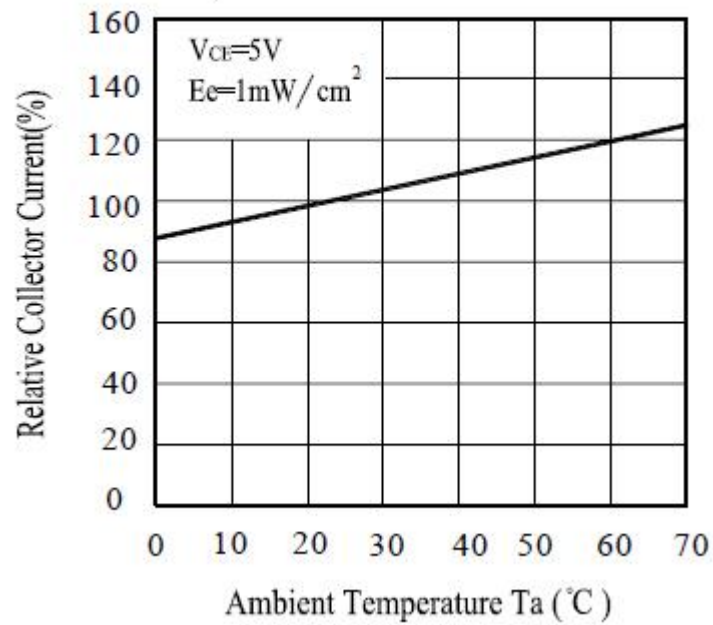
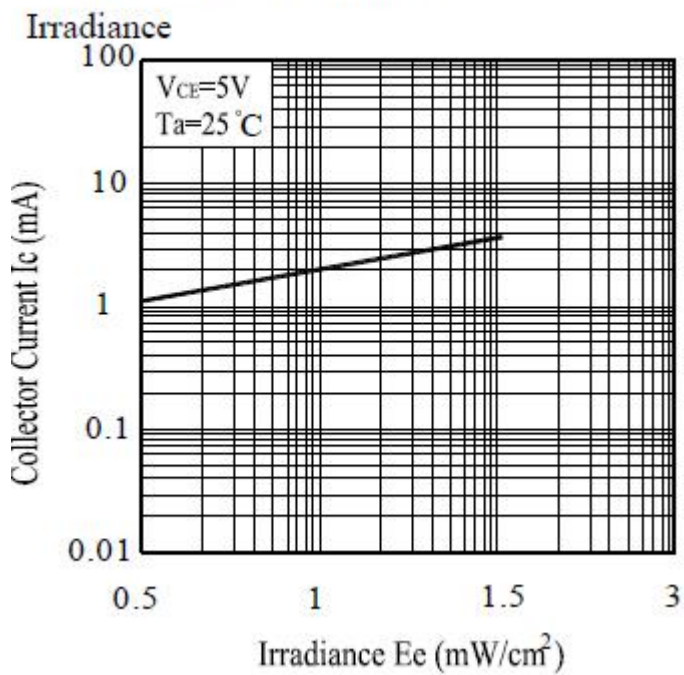


Fig.4 Collector Current vs.



Typical Electro-Optical Characteristics

Fig.5 Collector Dark Current vs.  
Ambient Temperature

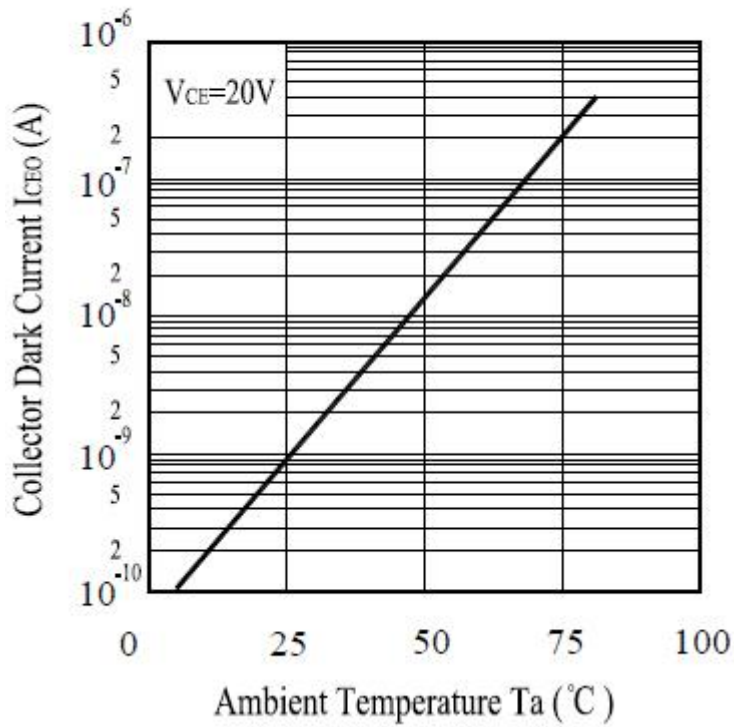
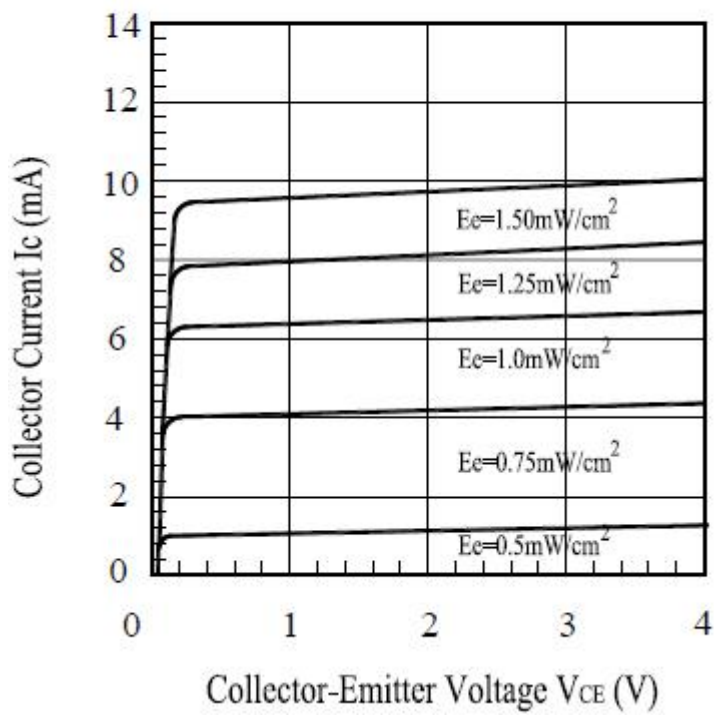


Fig.6 Collector Current vs.  
Collector-Emitter Voltage



## Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| NO. | Item                               | Test Conditions                                                     | Test Hours/<br>Cycles | Sample<br>Sizes | Failure<br>Judgement<br>Criteria                                   | Ac/Re |
|-----|------------------------------------|---------------------------------------------------------------------|-----------------------|-----------------|--------------------------------------------------------------------|-------|
| 1   | Solder Heat                        | TEMP. : 260°C±5°C                                                   | 10secs                | 22pcs           | $I_{c(ON)} \leq L \times 0.8$<br><br>L : the initial test<br>value | 0/1   |
| 2   | Temperature Cycle                  | H : +100°C    15mins<br>$\updownarrow$ 5mins<br>L : -40°C    15mins | 300Cycles             | 22pcs           |                                                                    | 0/1   |
| 3   | Thermal Shock                      | H : +100°C    5mins<br>$\updownarrow$ 10secs<br>L : -10°C    5mins  | 300Cycles             | 22pcs           |                                                                    | 0/1   |
| 4   | High Temperature<br>Storage        | TEMP. : +100°C                                                      | 1000hrs               | 22pcs           |                                                                    | 0/1   |
| 5   | Low Temperature<br>Storage         | TEMP. : -40°C                                                       | 1000hrs               | 22pcs           |                                                                    | 0/1   |
| 6   | DC Operating Life                  | $V_{CE}=5V$                                                         | 1000hrs               | 22pcs           |                                                                    | 0/1   |
| 7   | High Temperature/<br>High Humidity | 85°C / 85% R.H                                                      | 1000hrs               | 22pcs           |                                                                    | 0/1   |