

ST178

● Features

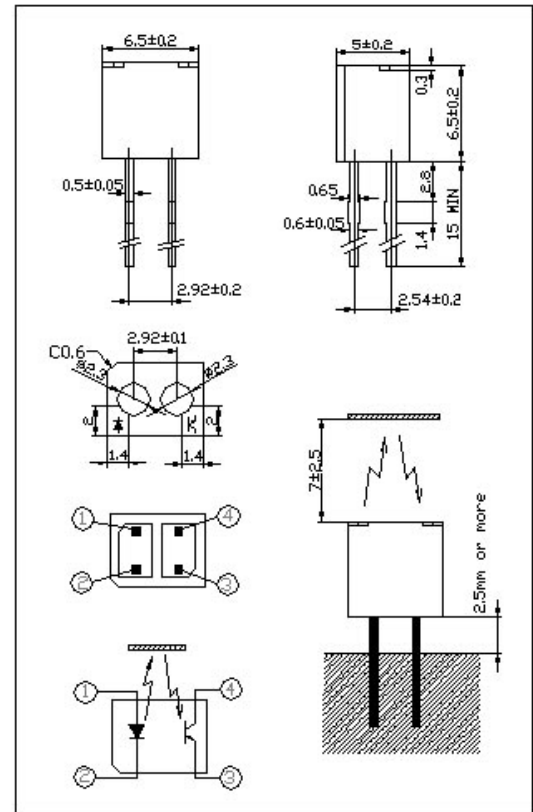
- Combines high output GaAs IRED with high sensitive phototransistor.
- The detecting range is between 4~10mm.
- Non-contact detecting manner.

● Applications

- IC card electric power meter.
- AMR system.
- Water meter.
- OA equipment: facsimile, printer, copier etc.
- Combined with direction detector IC(ST288A), it can be used as detecting moving object direction, speed of clockwise/ counterclockwise rotation and moving distance etc.

● Dimensions Unit:mm

Unless otherwise specified, the tolerances are $\pm 0.2\text{mm}$



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

| Parameter | | Symbol | Rating | Unit |
|--------------------------|-----------------------------|-----------|---------------|------------------|
| Input | Forward Current | I_F | 50 | mV |
| | Reverse Voltage | V_R | 6 | V |
| | Power Dissipation | P | 75 | mW |
| Output | Collector-Emitter Voltage | V_{CEO} | 25 | V |
| | Emitter-Collector Voltage | V_{ECO} | 6 | V |
| | Collector Power Dissipation | P_C | 50 | mW |
| *Operating Temperature | | T_{opr} | $-20 \sim 65$ | $^\circ\text{C}$ |
| Storage Temperature | | T_{stg} | $-30 \sim 75$ | $^\circ\text{C}$ |
| ** Soldering Temperature | | T_{sol} | 260 | $^\circ\text{C}$ |

*The special requirement could be met according to customer's request.

**Soldering time: 5s max. Soldering position: at least 2.5mm from the base of the package.

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

| Parameter | | Symbol | Test Condition | Min. | Typ. | Max. | Unit | |
|--------------------------------------|-------------------------|-----------------------------------------|----------------------------------------|------------------------------------------------------------|------|------|---------------|---------------|
| Input | Forward Voltage | V_F | $I_F=20\text{mA}$ | - | 1.25 | 1.5 | V | |
| | Reverse Current | I_R | $V_R=3\text{V}$ | - | - | 10 | μA | |
| Output | Collector Dark Current | I_{CEO} | $V_{CE}=20\text{V}$ | - | - | 1 | μA | |
| | Collector Light Current | I_L | $V_{CE}=5\text{V}$ $I_F=8\text{mA}$ | L3 | 0.3 | - | - | mA |
| | | | | L4 | 0.4 | - | - | |
| | | | | L5 | 0.5 | - | - | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_F=8\text{mA}$ $I_C=0.15\text{mA}$ | - | - | 0.4 | V | | |
| Transfer Character-istics | Response Time | Rise Time | T_r | $I_F=20\text{mA}$ $V_{CE}=5\text{V}$ $R_C=100\Omega$ | - | 10 | - | μS |
| | | Fall Time | T_f | - | 10 | - | | |

Notes: Collector light current I_L , Collector-emitter saturation voltage $V_{CE(SAT)}$, Relative current, Response time is measured within 2~5mm between photointerrupter's top and reflecting surface. The value is affected by the smooth of light reflecting surface.

Fig.1 Forward current vs. forward voltage

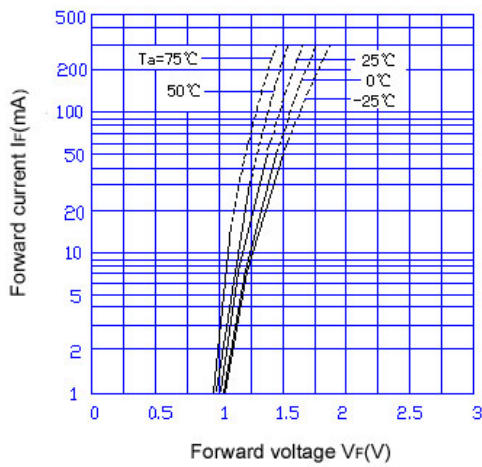
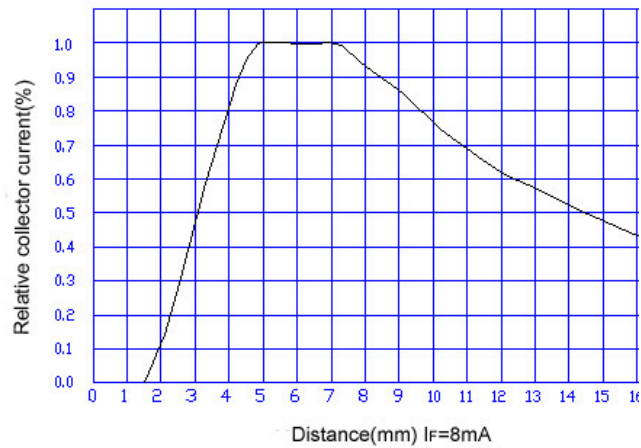


Fig.2 Relative collector current vs. distance



- Distance in Fig.2 is from photointerrupter's top to the reflecting surface.
- The reflecting surface is a sub-reflection aluminium plate. its surface is parallel to the top of photointerrupter.
- When relative collector current rises to 1.0, the conversion efficiency is the highest under this distance.
- The curves above are for you reference.