

### KTIR0711S

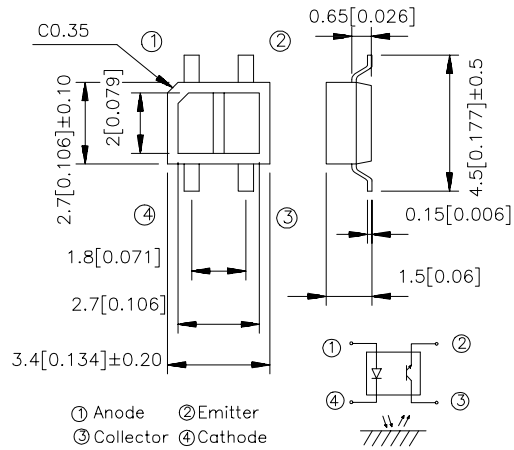
#### Features

- Compact and thin
- Visible light cut-off type
- High sensitivity

#### Applications

- Cassette tape recorders, VCRs.
- Floppy disk drives.
- Various microcomputerized control equipment.

#### Package Dimensions



#### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25(0.01")$  unless otherwise noted.
3. Lead spacing is measured where the lead emerge package.
4. Specifications are subject to change without notice.

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

| Parameter  |                             | Symbol    | Rating   | Unit             |
|--|-----------------------------|-----------|----------|------------------|
| Input  | Forward current             | $I_F$     | 50       | mA               |
|  | Reverse voltage             | $V_R$     | 5        | V                |
|  | Power dissipation           | $P$       | 75       | mW               |
| Output   | Collector-emitter voltage   | $V_{CEO}$ | 30       | V                |
|  | Emitter-collector voltage   | $V_{ECO}$ | 5        | V                |
|  | Collector current           | $I_C$     | 20       | mA               |
|  | Collector power dissipation | $P_C$     | 75       | mW               |
| Operating temperature                                    |                             | $T_{opr}$ | -25~+85  | $^\circ\text{C}$ |
| Storage temperature                                      |                             | $T_{stg}$ | -40~+100 | $^\circ\text{C}$ |
| Soldering temperature(1/16 inch from body for 5 seconds) |                             | $T_{sol}$ | 260      | $^\circ\text{C}$ |

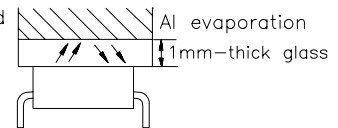
## Electro-optical Characteristics ( $T_a=25^\circ\text{C}$ )

| Parameter                |                        | Symbol    | Conditions          | Min.  | Typ.      | Max.      | Unit          |                 |
|--------------------------|------------------------|-----------|---------------------|---|-----------|-----------|---------------|-----------------|
| Input                    | Forward voltage        | $V_F$     | $I_F=20\text{mA}$   | —   | 1.2       | 1.5       | V             |                 |
|                          | Reverse current        | $I_R$     | $V_R=5\text{V}$     | —   | —         | 10        | $\mu\text{A}$ |                 |
| Output                   | Collector dark current | $I_{CEO}$ | $V_{CE}=20\text{V}$ | —   | $10^{-9}$ | $10^{-7}$ | A             |                 |
| Transfer characteristics | *1 Collector current   |           | $I_c$               | $V_{CE}=2\text{V}, I_F=4\text{mA}$  | —         | 100       | —             | $\mu\text{A}$   |
|                          | *2 Leak current        |           | $I_{LEAK}$          | $V_{CE}=2\text{V}, I_F=4\text{mA}$  | —         | —         | 0.1           | $\mu\text{A}$   |
|                          | Response time          | Rise time | $t_r$               | $V_{CE}=2\text{V}, I_C=100\mu\text{A}$<br>$R_L=1\text{K}\Omega, d=1\text{mm}$ | —         | 20        | 100           | $\mu\text{sec}$ |
|                          |                        | Fall time | $t_f$               |   | —         | 20        | 100           | $\mu\text{sec}$ |

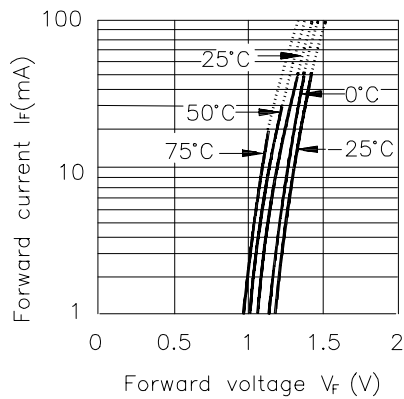
\*1 The condition and arrangement of the reflective object are shown below

\*2 Without reflective object

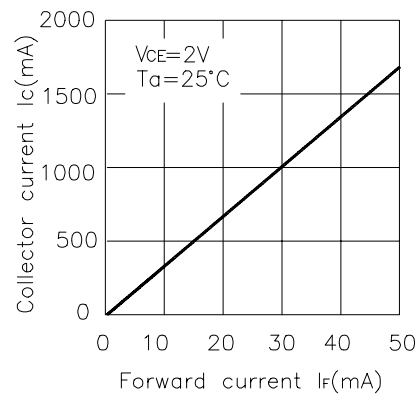
Test Condition and Arrangement for Collector Current



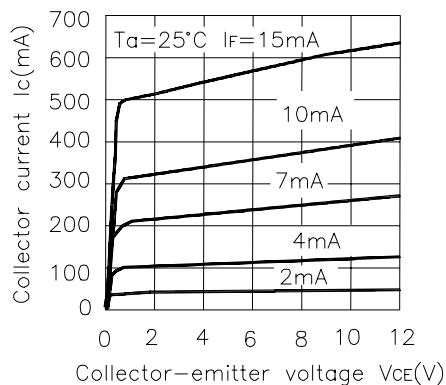
**Fig.1 Forward Current vs. Forward Voltage**



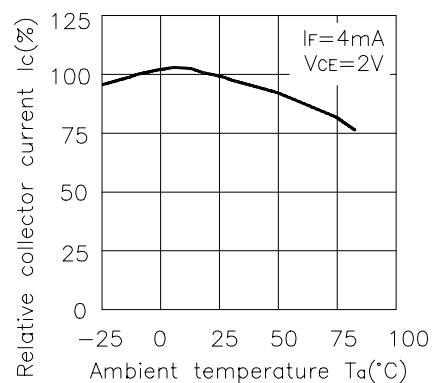
**Fig.2 Collector Current vs. Forward Current**



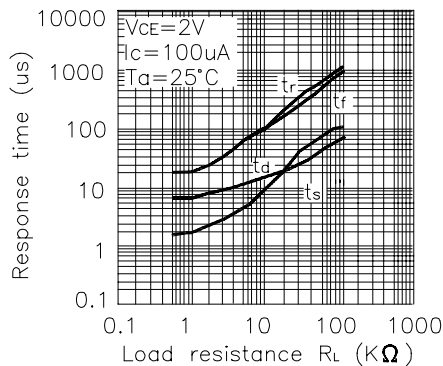
**Fig.3 Collector Current vs. Collector-emitter Voltage**



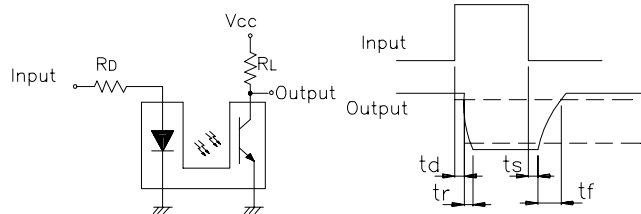
**Fig.4 Relative Collector Current vs. Ambient Temperature**



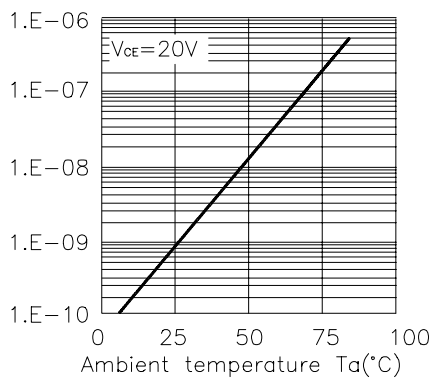
**Fig.5 Response Time vs. Load Resistance**



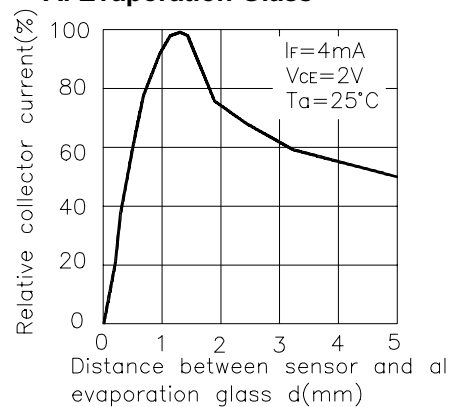
**Test Circuit for Response Time**



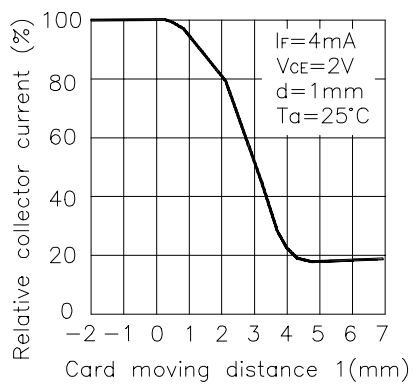
**Fig.6 Collector Dark Current vs. Ambient Temperature**



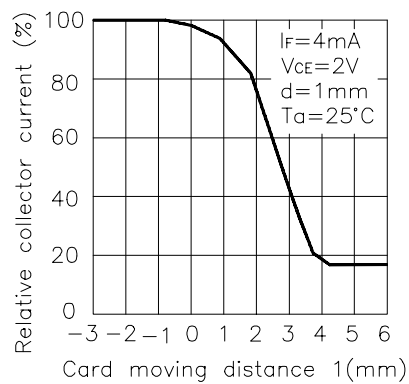
**Fig.7 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass**



**Fig.8 Relative Collector Current vs. Card Moving Distance (1)**

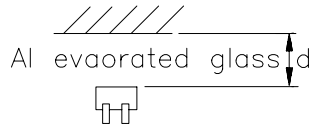


**Fig.9 Relative Collector Current vs. Card Moving Distance (2)**



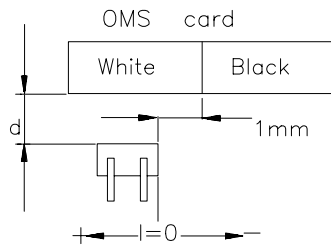
## The Condition for Distance&Detecting Position Characteristics

Correpond to Fig.7



Correpond to Fig.8  
Test condition

$I_F = 4\text{mA}$   
 $V_{CE} = 2\text{V}$   
 $d = 1\text{mm}$



Correpond to Fig.9  
Test condition

$I_F = 4\text{mA}$   
 $V_{CE} = 2\text{V}$   
 $d = 1\text{mm}$

