

SUBMINIATURE, HIGH SENSITIVITY PHOTOINTERRUPTER

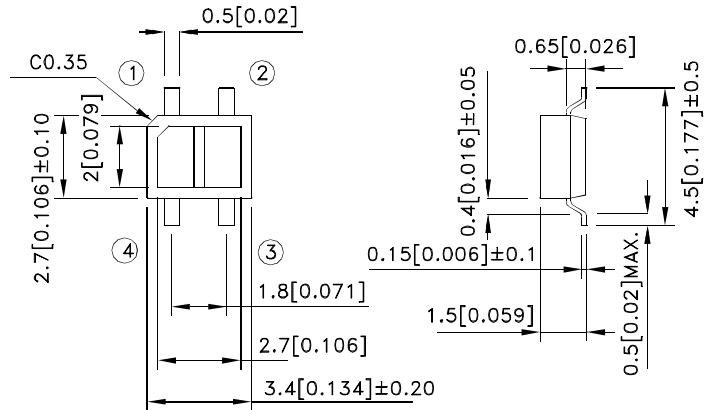
Package Dimensions

*Features

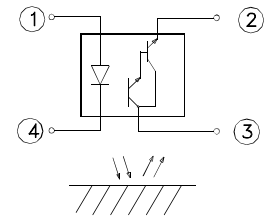
- Compact and thin.
- Visible light cut-off type.
- High sensitivity.
- Package: 1000pcs/Reel.
- MSL level: level 4
- RoHS Compliant.

*Applications

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



- ① Anode ② Emitter
③ Collector ④ Cathode



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 leads emerge from the package.
4. The specifications, characteristics and technical data described in the datasheet are subject to change without prior 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 | 6 | V |
| | Power dissipation | PD | 75 | mW |
| | Peak Forward Current (Pulse Width $\leq 100\mu\text{s}$, Duty Cycle = 1%) | I_{FP} | 1 | A |
| Output | Collector-emitter voltage | V_{CEO} | 35 | V |
| | Emitter-collector voltage | V_{ECO} | 6 | V |
| | Collector current | I_C | 50 | 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 | $^\circ\text{C}$ |

Note:

1. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.



Electro-optical Characteristics

| Parameter | | Symbol | Conditions | Min. | TYP. | Max. | Unit | |
|--------------------------|------------------------|-------------|---|--|------|-----------|---------------|-----------------|
| Input | Forward Voltage | V_F | $I_F=20\text{mA}$ | 1.0 | 1.2 | 1.5 | V | |
| | Reverse Current | I_R | $V_R=6\text{V}$ | - | - | 10 | μA | |
| | Peak Wavelength | λ_P | $I_F=20\text{mA}$ | - | 940 | - | nm | |
| Output | Collector Dark Current | I_{CEO} | $V_{CE}=10\text{V}$ $I_F=0\text{mA}$ | - | - | 10^{-6} | A | |
| Transfer characteristics | *1 Collector Current | I_C | $V_{CE}=2\text{V}$ $I_F=4\text{mA}$ | - | 3 | - | mA | |
| | *2 Leak Current | I_{LEAK} | $V_{CE}=5\text{V}$ $I_F=4\text{mA}$ | - | - | 5 | μA | |
| | Response time | Rise time | t_r | $V_{CE}=2\text{V}$ $I_C=10\text{mA}$ $R_L=100\Omega, d=1\text{mm}$ | - | 80 | 400 | μsec |
| | | Fall time | t_f | | - | 70 | 400 | μsec |

*1 Excess driving current and/or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

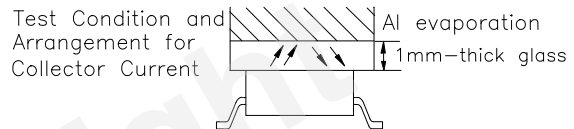


Fig. 1 Forward Current vs. Forward Voltage

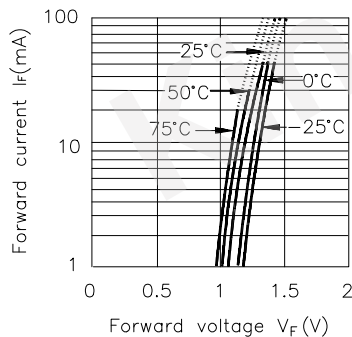


Fig. 2 Collector Current vs. Forward Current

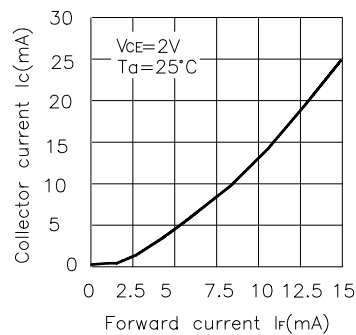


Fig. 3 Collector Current vs. Collector-emitter Voltage

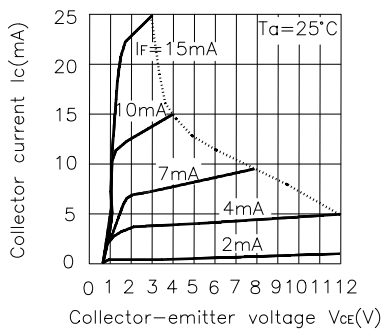


Fig. 4 Relative Collector Current vs. Ambient Temperature

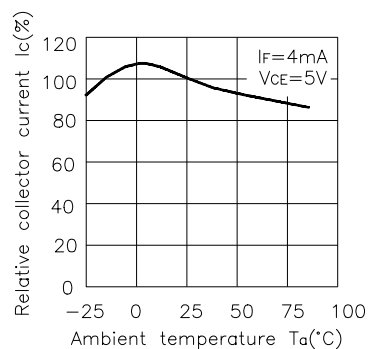
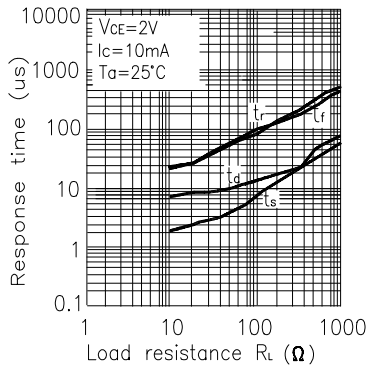


Fig. 5 Response Time vs. Load Resistance



Test Circuit for Response Time

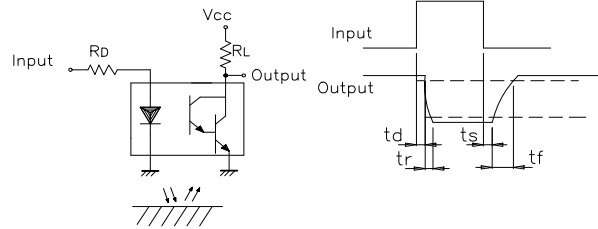


Fig. 6 Collector Dark Current vs. Ambient Temperature

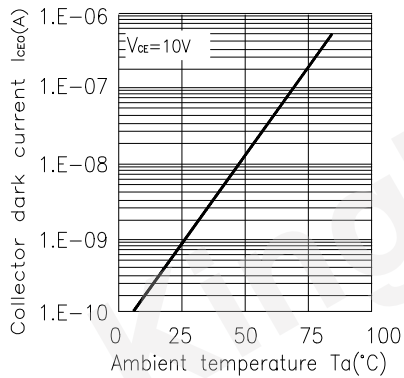


Fig. 7 Relative Collector Current vs. Distance between Sensor and Al Evaporation Glass

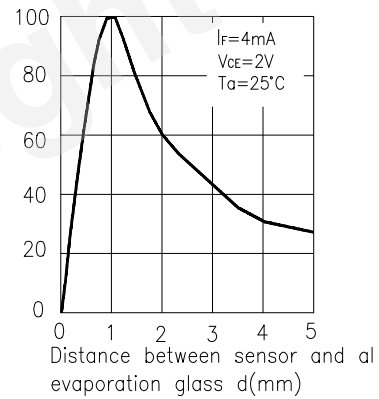


Fig. 8 Relative Collector Current vs. Card Moving Distance (1)

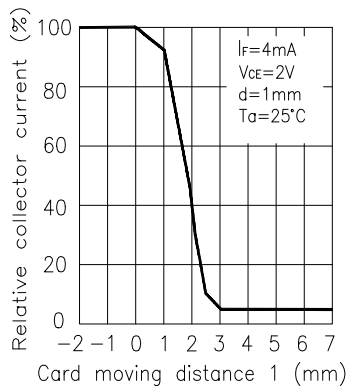
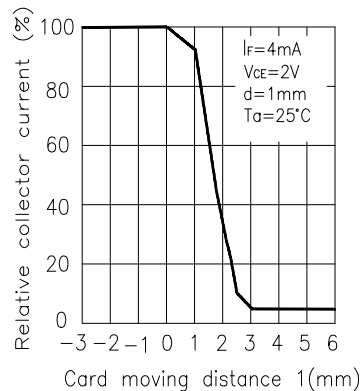
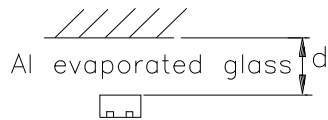


Fig. 9 Relative Collector Current vs. Card Moving Distance (2)



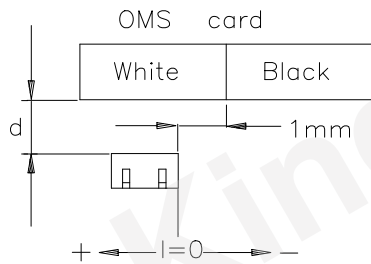
Test Condition for Distance & Detecting Position Characteristics

Correpond to Fig. 7



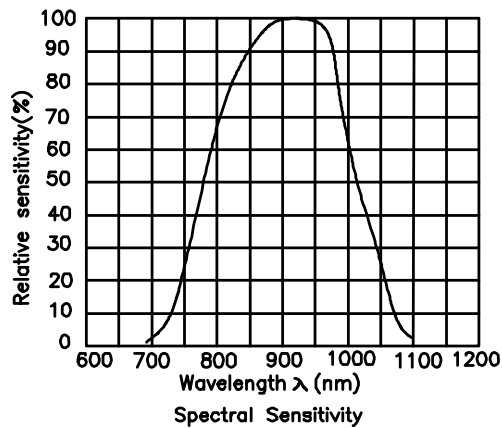
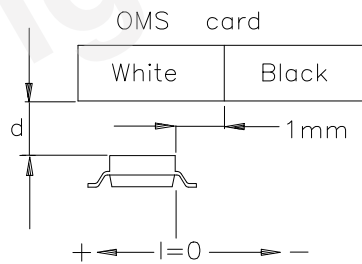
Correpond to Fig. 8
Test condition

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



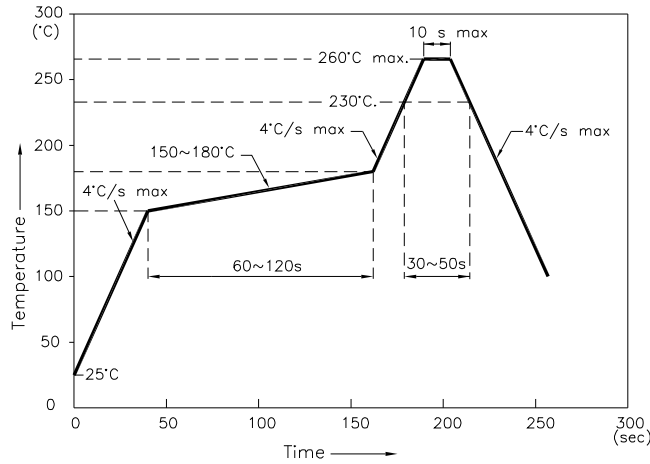
Correpond to Fig. 9
Test condition

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



KTIR0721DS

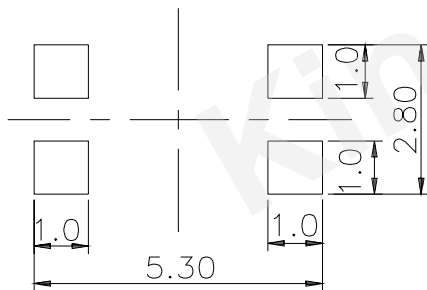
Reflow Soldering Profile For Lead-free SMT Process.



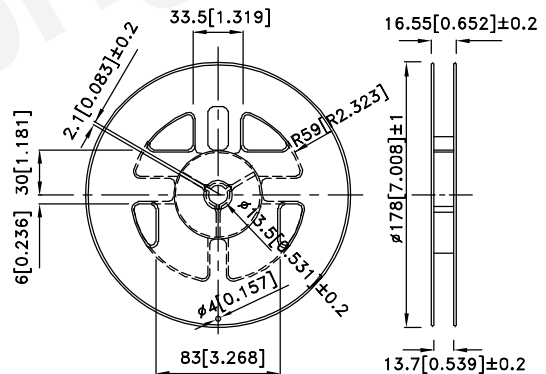
NOTES:

1. We recommend the reflow temperature 245°C(+/-5°C). The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

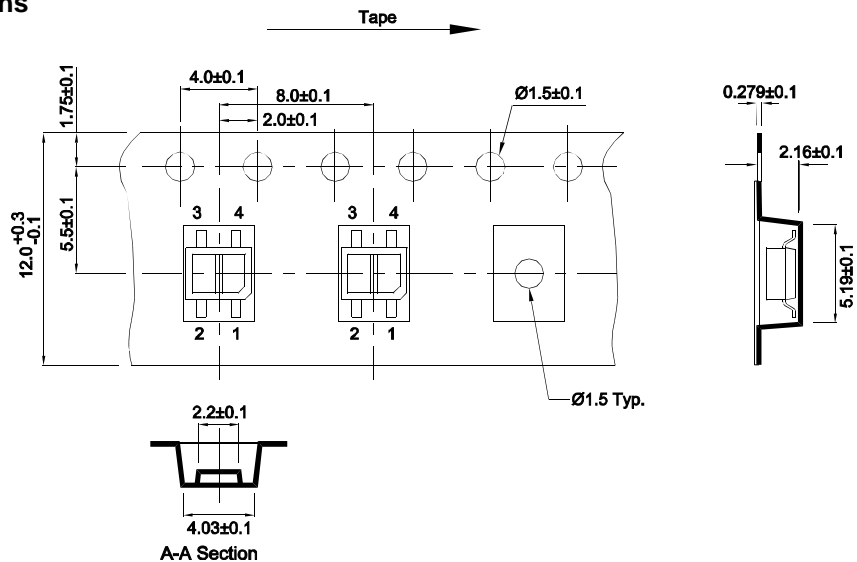
Recommended Soldering Pattern
(Units : mm; Tolerance: ±0.1)



Reel Dimension

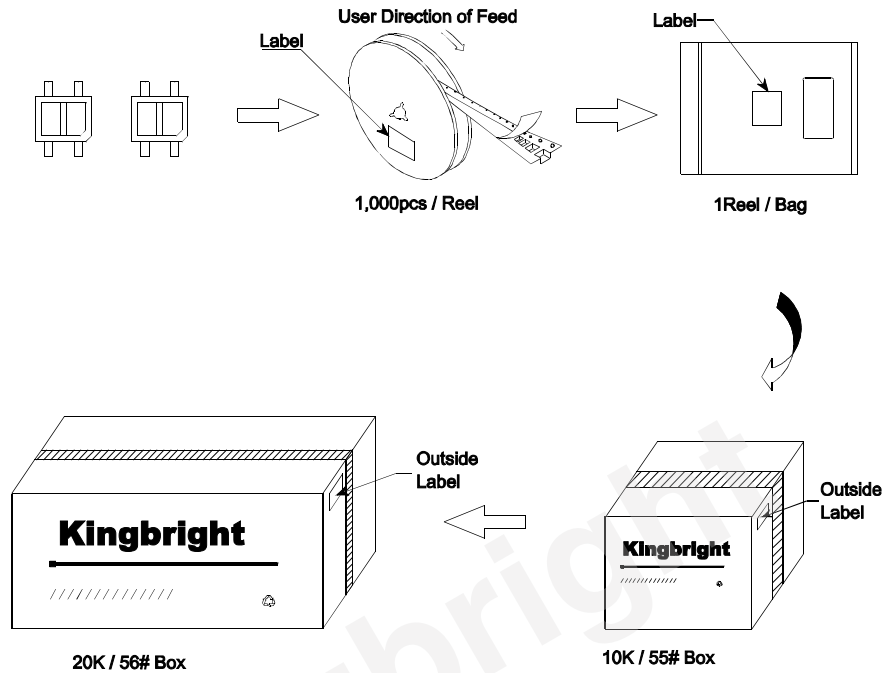


Tape Specifications
(Units : mm)



PACKING & LABEL SPECIFICATIONS

KTIR0721DS



| | |
|--|--|
| <h2 style="margin: 0;">Kingbright</h2> | |
| P/NO: KTIRXXX | |
| QTY: 1,000 pcs | Q.C. |
| S/N: XXXX | <div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> Q C XXXX PASSED </div> |
| CODE: XXX | |
| LOT NO: | |
| | |
| XXXXXXXXXXXXXXXXXXXXXXXXXXXX | |
| RoHS Compliant | |

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