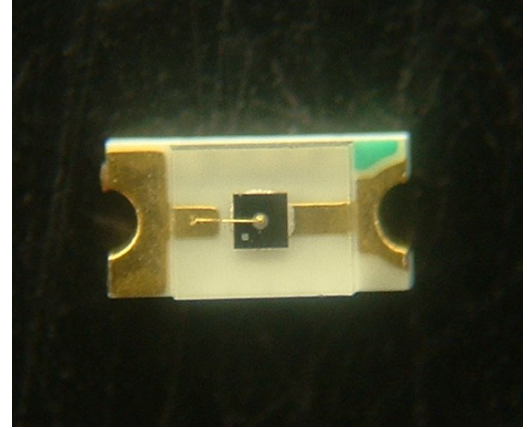


### General Description

The OST-9N15 is high sensitivity NPN silicon photo-transistor mounted in a SMD plastic package.

### Features

- Compact
- Wide angular response
- Low cost
- Meet RoHS



### Applications

- Optical counters
- Optical detectors
- Camera stroboscopes

### MAXIMUM RATINGS

(Ta=25°C)

| Item                      | Symbol | Rating     | Unit |
|---------------------------|--------|------------|------|
| Power dissipation         | Pd     | 100        | mW   |
| Operating temperature.    | Topr   | -25 ~ +75  | °C   |
| Storage temperature.      | Tstg   | -25 ~ +100 | °C   |
| Soldering temperature. *1 | Tsol   | 260        | °C   |

\* 1 For MAX. 5 seconds at the position of 5mm from the package

### ELECTRO-OPTICAL CHARACTERISTICS

(Ta=25°C)

| Item                       | Symbol               | Condition                                                                                | Min | Typ | Max | Unit |
|----------------------------|----------------------|------------------------------------------------------------------------------------------|-----|-----|-----|------|
| C-E breakdown voltage      | V <sub>(BR)CEO</sub> | I <sub>C</sub> =100uA                                                                    | 30  |     |     | V    |
| E-C breakdown voltage      | V <sub>(BR)ECO</sub> | I <sub>E</sub> =100uA                                                                    | 5   |     |     | V    |
| Collector dark current     | I <sub>CEO</sub>     | V <sub>CE</sub> =20V E <sub>e</sub> =0mW/cm <sup>2</sup>                                 |     |     | 100 | nA   |
| On state collector current | I <sub>(ON)</sub>    | V <sub>CE</sub> =5V, D=6mm,<br>P <sub>D</sub> =0.5mW, I <sub>LED</sub> =20mA,<br>λ=940nm | 1.0 | 2.0 |     | mA   |
| C-E saturatuon voltage     | V <sub>CE(sat)</sub> | I <sub>C</sub> =2mA, I <sub>B</sub> =100uA                                               |     |     | 0.3 | V    |
| Peak sensitive wavelength  | λ <sub>p</sub>       |                                                                                          |     | 800 |     | nm   |
| Switching speeds           | t <sub>r</sub>       | V <sub>CC</sub> =5V, I <sub>C</sub> =1mA                                                 |     | 15  |     | usec |
|                            | t <sub>f</sub>       | R <sub>L</sub> =1000Ω                                                                    |     | 15  |     | usec |
| Half angle                 | Δθ                   |                                                                                          |     | ±70 |     | deg. |

FIG.1 COLLECTOR DARK CURRENT VS. AMBIENT TEMPERATURE

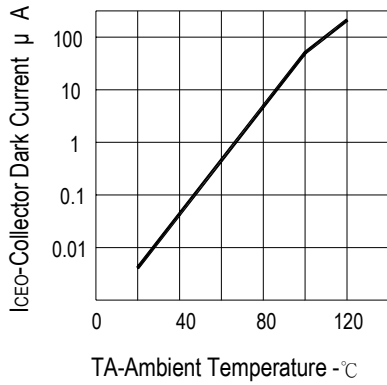


FIG.2 NORMALIZED COLLECTOR CURRENT VS. AMBIENT TEMPERATURE

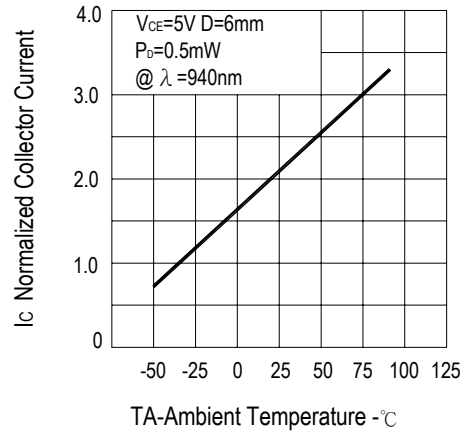


FIG.3 RISE AND FALL TIME VS. LOAD RESISTANCE

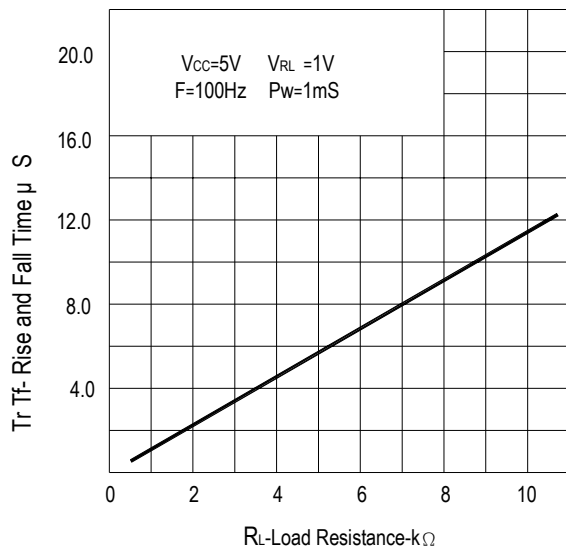
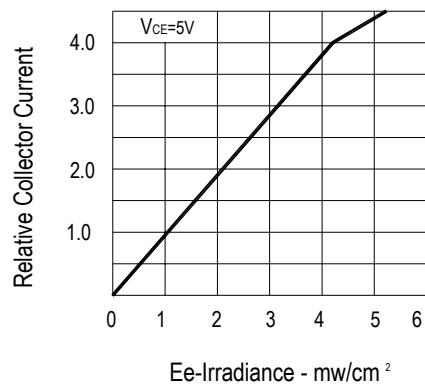
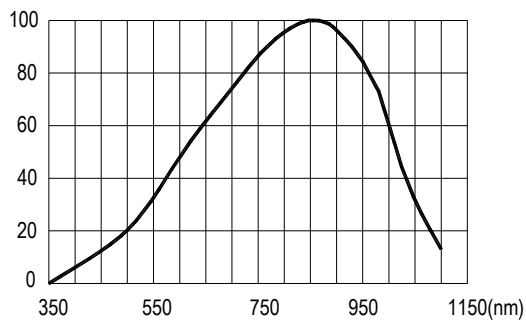


FIG.4 RELATIVE COLLECTOR CURRENT VS. IRRADIANCE

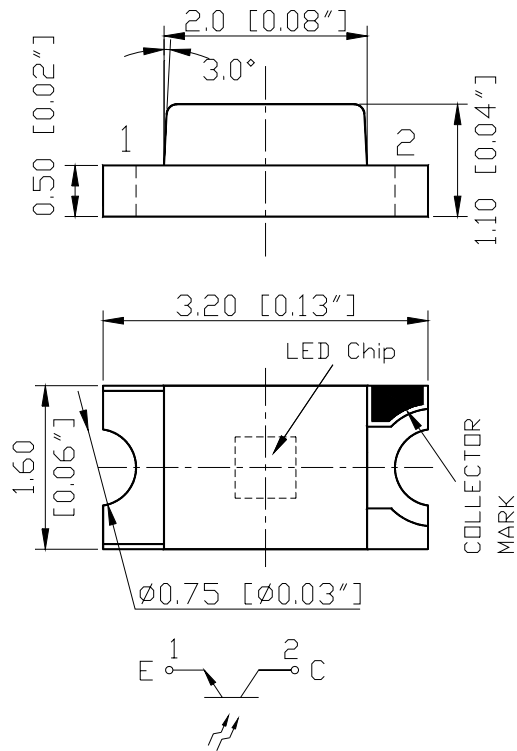


Relative Spectral Response (%)

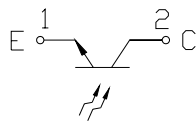
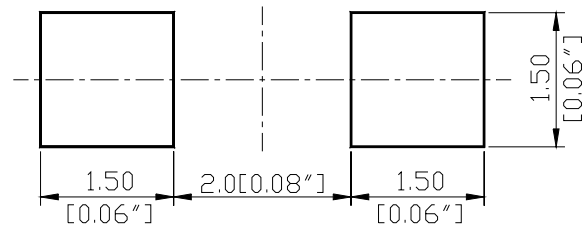


## DIMENSIONS

(Unit: mm)



### RECOMMEND PAD LAYOUT

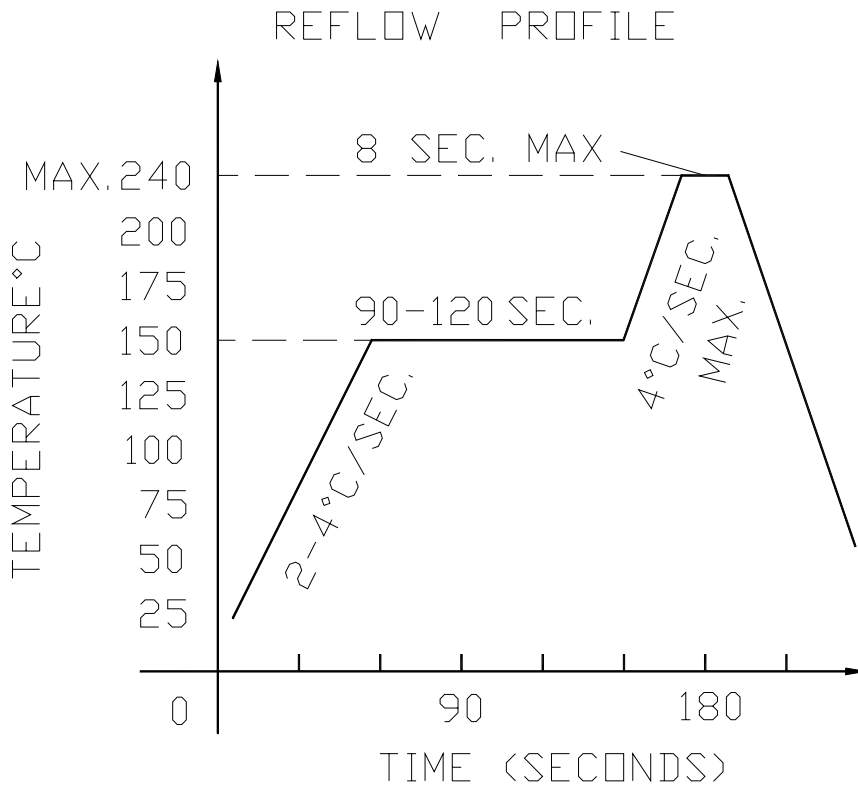


| ITEM                  | MATERIALS         |
|-----------------------|-------------------|
| Resin(mold)           | Epoxy             |
| Bonding Wire          | ↓ 30 um Au        |
| Lens color            | Water transparent |
| Printed circuit board | BT (white)        |
| Dice                  | Silicon           |

### NOTES:

1. All dimensions are in millimeters (inches)
2. Tolerances are  $\pm 0.1\text{mm}$  (0.004inch) unless otherwise noted.

■ **Reflow Temp / Time**

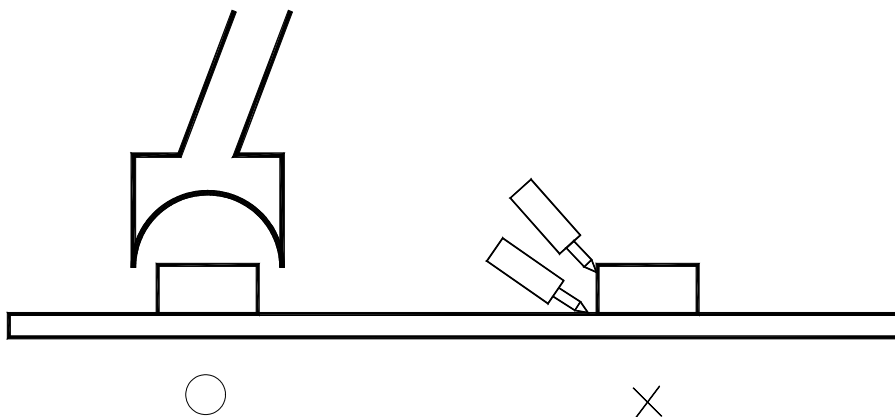


■ **Soldering iron**

Basic spec is  $\leq 5$ sec when 260°C. If temperature is higher, time should be shorter (+10°C → -1sec). Power dissipation of iron should be smaller than 15W, and temperatures should be controllable. Surface temperature of the device should be under 230°C.

■ **Rework**

1. Customer must finish rework within 5 sec under 260°C.
2. The head of iron can not touch copper foil
3. Twin-head type is preferred.



### ■ Test items and results of reliability

| Type | Test Item                              | Test Conditions                                                 | Note     | Number of Damaged |
|------|----------------------------------------|-----------------------------------------------------------------|----------|-------------------|
| 1    | Temperature Cycle                      | -20°C 30min<br>50min ↑ ↓ 100min<br>80°C 30min                   | 50 cycle | 0/22              |
| 2    | Thermal Shock                          | -20°C 15min<br>↑ ↓<br>80°C 15min                                | 50 cycle | 0/22              |
| 3    | High Temperature<br>High Humidity test | Ta=85°C RH=85%                                                  | 1000 hrs | 0/22              |
| 4    | High Temperature Storage               | Ta=80°C                                                         | 1000 hrs | 0/22              |
| 5    | Low Temperature Storage                | Ta=-30°C                                                        | 1000 hrs | 0/22              |
| 6    | DC Operating Life                      | V <sub>CE</sub> = 5V<br>Ta = 25°C<br>Ee = 1mW / cm <sup>2</sup> | 1000 hrs | 0/22              |

### ■ Handling precautions

#### 1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

#### 2. Storage

1. It is recommended to store the products in the following conditions :

Humidity: 60% R.H. Max.

Temperature : 5°C~30°C (41°F~86°F)

2. Shelf life in sealed bag: 12 month at <5°C~30°C and <30% R.H. after the package is Opened, the products should be used within a week or they should be keeping to stored at ≤20 R.H. with zip-lock sealed.

#### 3. Baking

It is recommended to baking before soldering when the pack is unsealed after 72hrs.

The Conditions are as followings :

1. 60±3°C x (12~24hrs) and < 5%RH , taped reel type

2. 100±3°C x (45min~1hr) , bulk type

3. 130±3°C x (15~30min), bulk type