



LIGHT EMITTING DIODE SPECIFICATION

CUSTOMER NAME:

DESCRIPTION: EL4557IRC

REVISION: V2.2

ISSUE DATE: 2018-07-25

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Features:

- High reliability
- High radiant intensity
- Peak wavelength $\lambda_p=940\text{nm}$
- Low forward voltage
- Pb-Free
- This product itself will remain within RoHS compliant version.

Application:

- Mouse
- Optoelectronic switch
- Copiers
- Scanners
- Amusement machines

| Part Number | Dice Material | Emitted Color | Lens Color |
|-------------|---------------|---------------|-------------|
| EL4557IRC | GaAlAs | Infrared | Water Clear |

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

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Units |
|--------------------|-----------------|---|------|------|------|---------------|
| Radiant Intensity | Ee | $I_F=4\text{mA}$, $V_{ce}=3.5\text{V}$ | 306 | - | - | μA |
| Peak Wavelength | λ_p | $I_F=20\text{mA}$ | - | 940 | - | nm |
| Spectral Bandwidth | $\Delta\lambda$ | $I_F=20\text{mA}$ | - | 45 | - | nm |
| Forward Voltage | V_F | $I_F=20\text{mA}$ | - | 1.2 | 1.5 | V |
| Reverse Current | I_R | $V_R=5\text{V}$ | - | - | 10 | μA |
| View Angle | $2\theta_{1/2}$ | $I_F=20\text{mA}$ | - | 40 | - | deg |

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

| Parameter | Symbol | Max. | Unit |
|--|--------|---------------------------------|------------------|
| Power Dissipation | PD | 75 | mW |
| Peak Forward Current(1/10 Duty Cycle, 0.1ms Pulse Width) | IFP | 1000 | mA |
| Forward Current | IF | 50 | mA |
| Reverse Voltage | VR | 5 | v |
| Operating Temperature Range | Topr | -25to+85 | $^\circ\text{C}$ |
| Storage Temperature Range | Tstg | -40to+100 | $^\circ\text{C}$ |
| Reflow Soldering | Tsld | 260 $^\circ\text{C}$ for 10secs | |

Rank

| Parameter | Symbol | Condition | Min. | Max. | Unit |
|-----------|--------|------------------|------|------|------|
| E1 | Ee | IF=4mA, Vce=3.5V | 143 | 225 | μA |
| E2 | | | 214 | 343 | |
| E3 | | | 286 | 431 | |
| E4 | | | 357 | 519 | |
| E5 | | | 428 | 608 | |
| E6 | | | 500 | 696 | |
| E7 | | | 571 | 784 | |

Notes:

 Measurement Uncertainty of Forward Voltage: $\pm 0.1V$

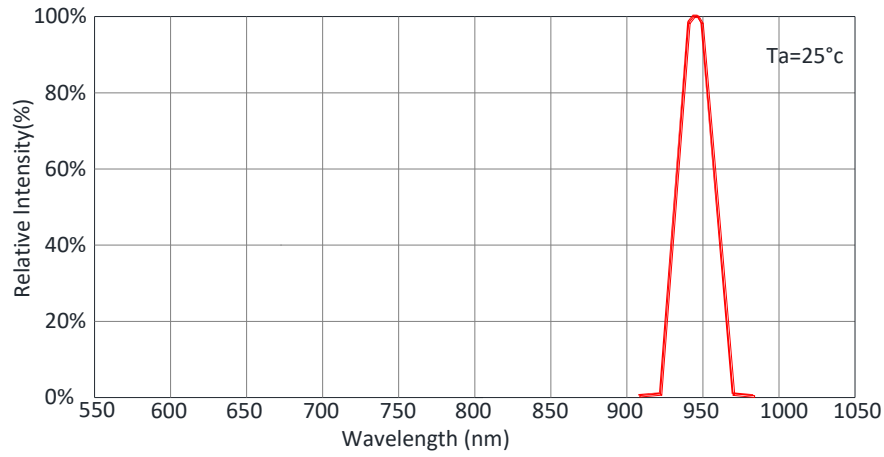
 Measurement Uncertainty of Luminous Intensity: $\pm 10\%$

 Measurement Uncertainty of Dominant Wavelength $\pm 1.0nm$

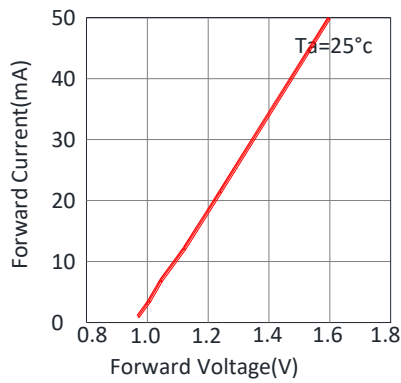


Optical & Electrical Characteristics

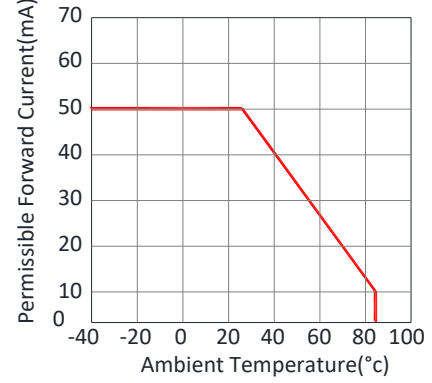
Relative Intensity vs. Wavelength



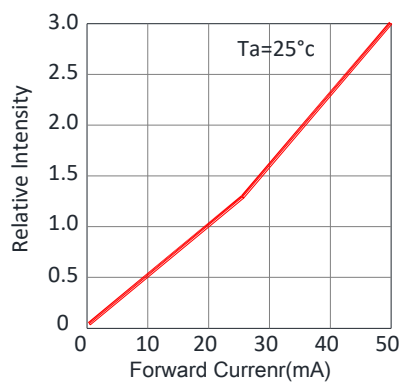
Forward Current vs. Forward Voltage



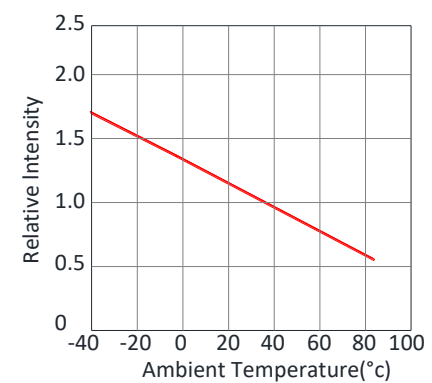
Forward Current vs. Ambient Temperature



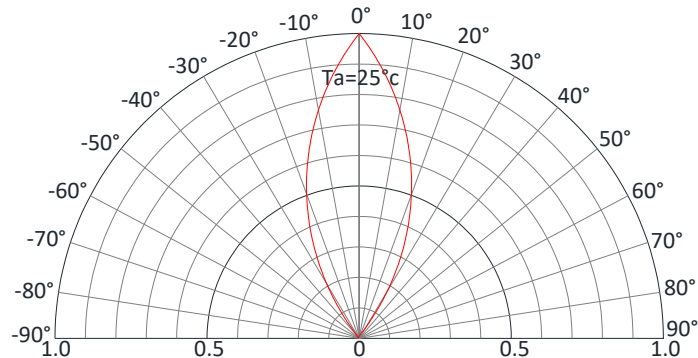
Relative Intensity vs. Forward Current



Relative Intensity vs. Ambient Temperature



Radiation Pattern

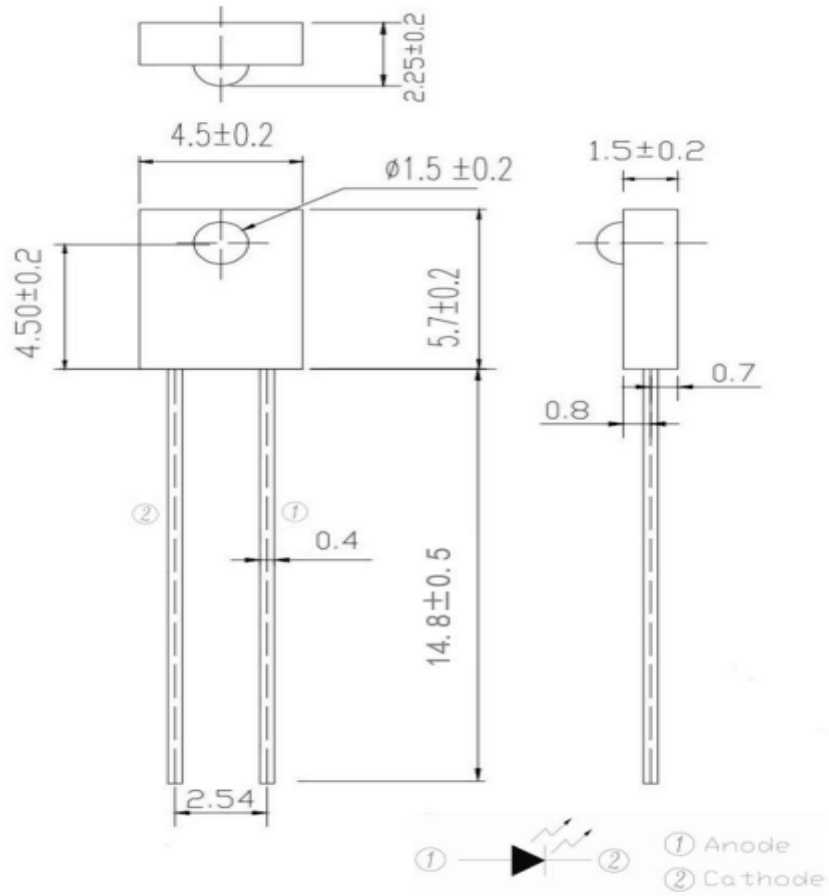


Reliability Test Items And Conditions

| Test Items | Reference | Test Conditions | Time | Quantity | Criterion |
|---|----------------------------|---------------------------------|---------------|----------|-----------|
| Thermal Shock | MIL-STD-202G | -40°C (30min) -100°C (30min) | 100 Cycles | 22 | 0/22 |
| Temperature And Humidity Cyclic | JEITA ED-4701 200 203 | -10°C~65°C ; 0%~90%RH | 10cycles | 22 | 0/22 |
| High Temperature Storage | JEITA ED -4071 200 201 | Ta=100°C | 1000H | 22 | 0/22 |
| Low Temperature Storage | JEITA ED -4071 200 202 | Ta=-40°C | 1000H | 22 | 0/22 |
| High Temperature High Humidity Storage | JEITA ED -4071 100 103 | Ta=60°C ; RH=90% | 1000H | 22 | 0/22 |
| High Temperature Life Test | JESD22-A108D | Ta=80°C | 1000H | 22 | 0/22 |
| Life Test | JESD22-A108D | Ta=25°C IF=20mA | 1000H | 22 | 0/22 |
| Resistance to Soldering Heat | GB/T 4937, II , 2.2&2.3 | Tsol*=(240±5) °C 10secs | 2 times | 22 | 0/22 |

Criteria For Judging Damage

| Test Items | Symbol | Test Conditions | Criteria For Judging Damage |
|---------------------------------|----------------|---------------------------------|---|
| Forward Voltage | V _F | I _F =I _{FT} | Initial Data±10% |
| Reverse Current | I _R | V _R =5V | I _R ≤10uA |
| Luminous Intensity | I _V | I _F =I _{FT} | Average I _V degradation≤30% ; Single LED I _V degradation≤50% |
| Resistance to Soldering Heat | - | - | Material without internal cracks,no material between stripped,no deaded light |

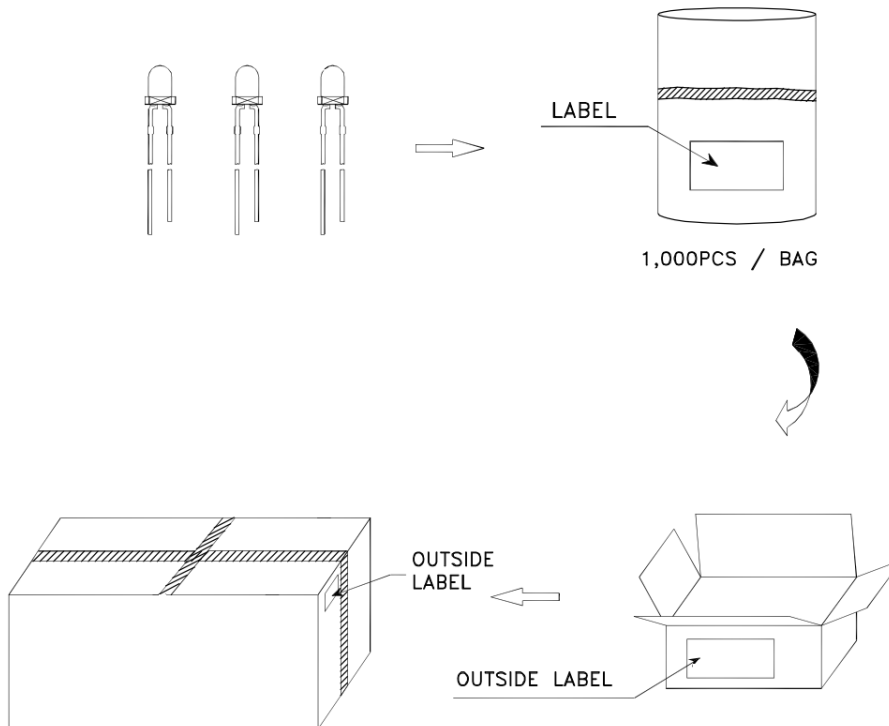
Product size (Unit:mm)

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 (0.01") unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.

LabelStyle



Packaging



Precautions

1. Lead Forming

- 1.1 During lead formation, the leads should be bent at a point at least 3mm from the base of the epoxy bulb.
- 1.2 Lead forming should be done before soldering.
- 1.3 Avoid stressing the LED package during leads forming. The stress to the base may damage the LED's characteristics or it may break the LEDs.
- 1.4 Cut the LED lead frames at room temperature. Cutting the lead frames at high temperatures may cause failure of the LEDs.
- 1.5 When mounting the LEDs onto a PCB, the PCB holes must be aligned exactly with the lead position of the LED. If the LEDs are mounted with stress at the leads, it causes deterioration of the epoxy resin and this will degrade the LEDs.

2. Storage

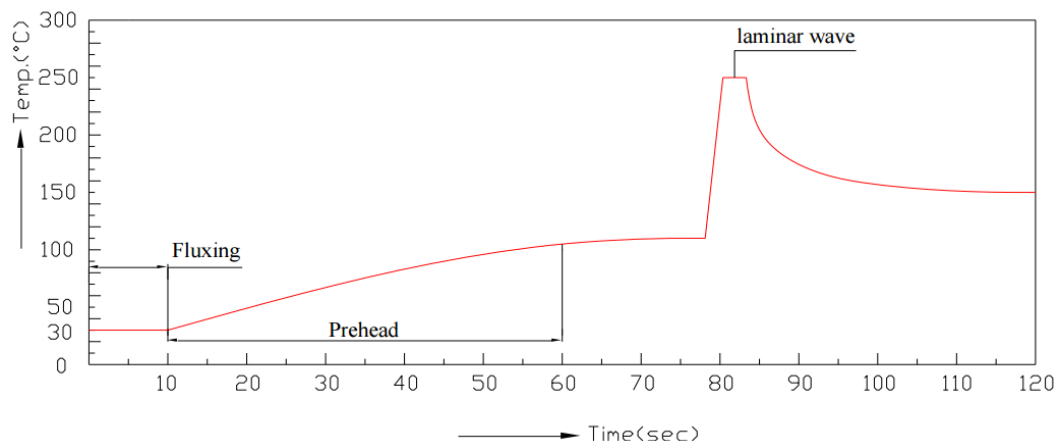
- 2.1 The LEDs should be stored at 30°C or less and 70%RH or less after being shipped from Everlight and the storage life limits are 3 months. If the LEDs are stored for 3 months or more, they can be stored for a year in a sealed container with a nitrogen atmosphere and moisture absorbent material.
- 2.2 Please avoid rapid transitions in ambient temperature, especially, in high humidity environments where condensation can occur.

3. Soldering

- 3.1 Careful attention should be paid during soldering. When soldering, leave more than 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.
- 3.2 Recommended soldering conditions:

| Hand Soldering | | DIP Soldering | |
|----------------------|--|-------------------|--|
| Temp. at tip of iron | 300°C Max. (30W Max.) | Preheat temp. | 100°C Max. (60 sec Max.) |
| Soldering time | 3 sec Max. | Bath temp. & time | 260 Max., 5 sec Max |
| Distance | 3mm Min. (From solder joint to epoxy bulb) | Distance | 3mm Min. (From solder joint to epoxy bulb) |

3.3 Recommended soldering profile



- 3.4 Avoiding applying any stress to the lead frame while the LEDs are at high temperature particularly when soldering.
- 3.5 Dip and hand soldering should not be done more than one time
- 3.6 After soldering the LEDs, the epoxy bulb should be protected from mechanical shock or vibration until the LEDs return to room temperature.
- 3.7 A rapid-rate process is not recommended for cooling the LEDs down from the peak temperature.
- 3.8 Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the LEDs.
- 3.9 Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

4. Cleaning

- 4.1 When necessary, cleaning should occur only with isopropyl alcohol at room temperature for a duration of no more than one minute. Dry at room temperature before use.
- 4.2 Do not clean the LEDs by the ultrasonic. When it is absolutely necessary, the influence of ultrasonic cleaning on the LEDs depends on factors such as ultrasonic power and the assembled condition. Ultrasonic cleaning shall be pre-qualified to ensure this will not cause damage to the LED