

5mm Round With Flange Type  
Infrared LED  
Technical Data Sheet

Part No.: LL-503IRT2E-2AE

## Features:

- ◇ Standard T-1 3/4 diameter package.
- ◇ Low forward voltage.
- ◇ Infrared Emitting Diode.
- ◇ Viewing angle =45°.
- ◇ Reliable and rugged
- ◇ The product itself will remain within RoHS compliant Version.

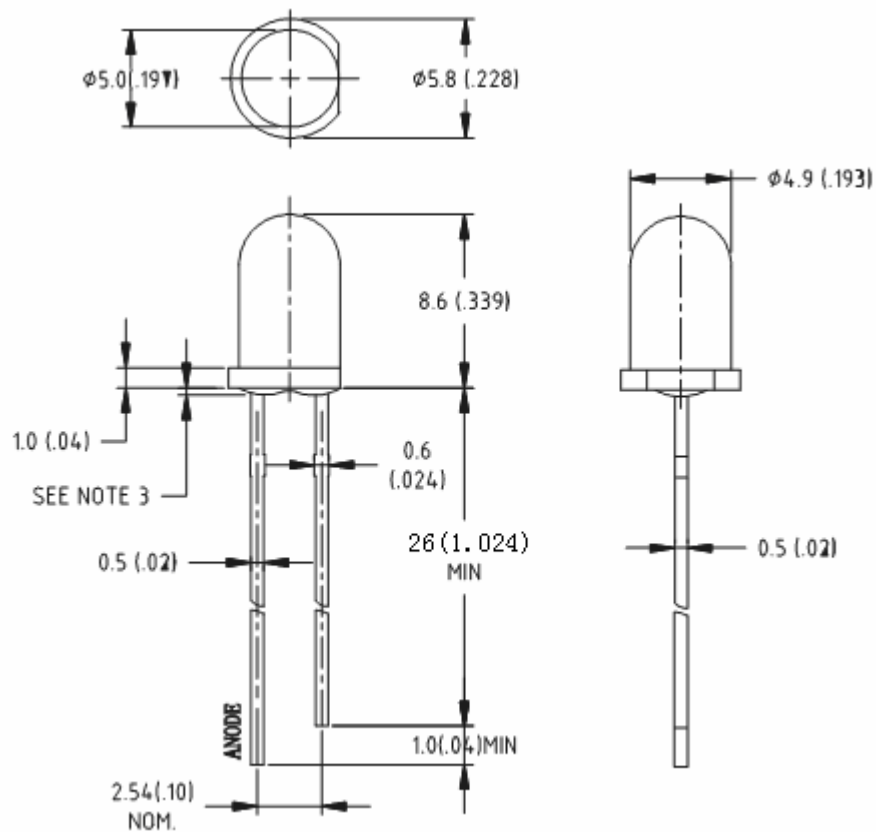
## Descriptions:

- ◇ The device is spectrally matched with silicon photodiode and phototransistor.
- ◇ The LEDs are available with different viewing angles.

## Applications:

- ◇ Floppy disk drive.
- ◇ Optoelectronic switch.
- ◇ Camera.
- ◇ VCR.
- ◇ Video.
- ◇ Smoke detector.
- ◇ Infrared applied system.
- ◇ Free air transmission system.
- ◇ Infrared remote control units.

## Package Dimension:



| Part No.        | Chip Material | Lens Color       | Source Color |
|-----------------|---------------|------------------|--------------|
| LL-503IRT2E-2AE | GaAlAs        | Blue Transparent | Infrared     |

## Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25 (.01)$  mm unless otherwise specified.
3. Protruded resin under flange is  $1.0$  mm ( $.04$  ) max.
4. Specifications are subject to change without notice.

### Absolute Maximum Ratings at Ta=25°C

| Parameters                                                   | Symbol | Max.                | Unit |
|--------------------------------------------------------------|--------|---------------------|------|
| Power Dissipation                                            | PD     | 100                 | mW   |
| Peak Forward Current<br>(1/10 Duty Cycle, 0.1ms Pulse Width) | IFP    | 1                   | A    |
| Forward Current                                              | IF     | 65                  | mA   |
| Reverse Voltage                                              | VR     | 5                   | V    |
| Operating Temperature Range                                  | Topr   | -40°C to +85°C      |      |
| Storage Temperature Range                                    | Tstg   | -40°C to +100°C     |      |
| Soldering Temperature<br>[4mm(.157" ) From Body]             | Tsld   | 260°C for 5 Seconds |      |

### Electrical Optical Characteristics at Ta=25°C

| Parameters               | Symbol            | Min. | Typ. | Max. | Unit  | Test Condition |
|--------------------------|-------------------|------|------|------|-------|----------------|
| Radiant Intensity        | Ee                | 5.5  | 8.5  | ---  | mW/sr | IF =20mA       |
| Viewing Angle*           | 2θ <sub>1/2</sub> | ---  | 45   | ---  | Deg   | (Note 1)       |
| Peak Emission Wavelength | λ <sub>p</sub>    | ---  | 940  | ---  | nm    | IF=20mA        |
| Spectral Bandwidth       | Δλ                | ---  | 50   | ---  | nm    | IF=20mA        |
| Forward Voltage          | VF                | 0.8  | 1.20 | 1.50 | V     | IF =20mA       |
| Reverse Current          | IR                | ---  | ---  | 10   | μA    | VR=5V          |

#### Notes:

1. θ<sub>1/2</sub> is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

## Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Forward Current vs.  
Ambient Temperature

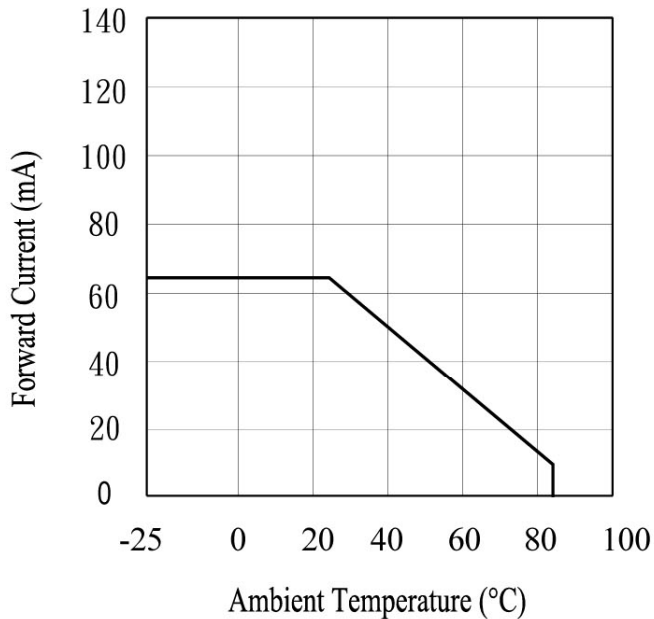


Fig.2 Spectral Distribution

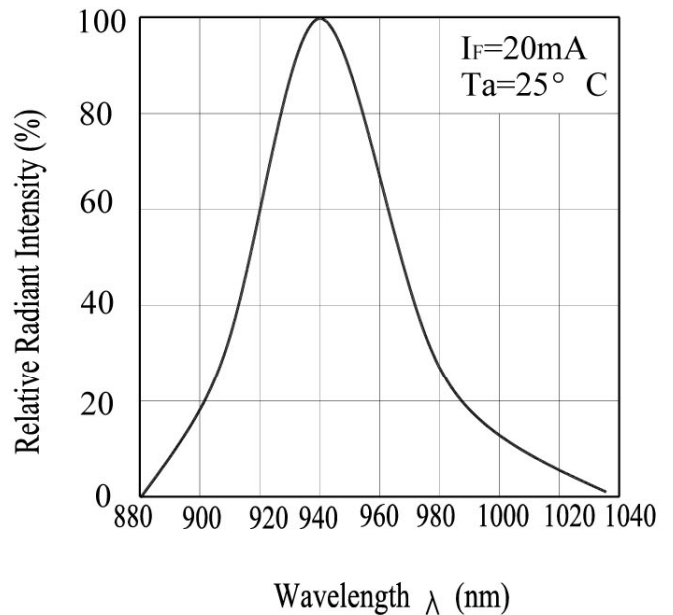


Fig.3 Peak Emission Wavelength  
Ambient Temperature

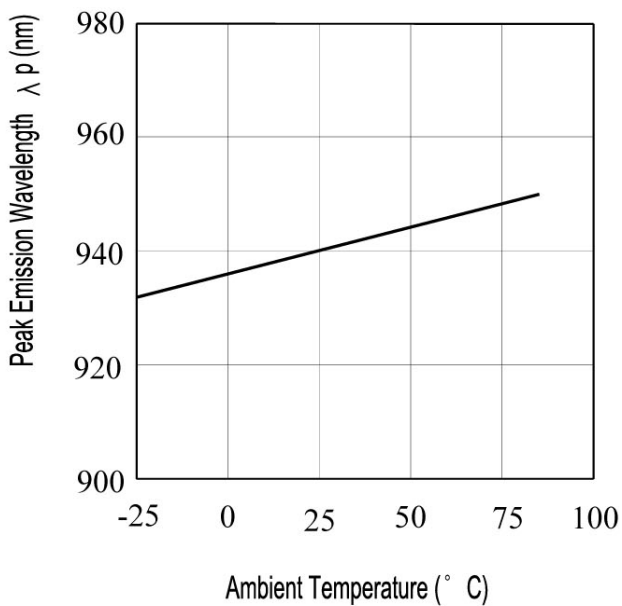


Fig.4 Forward Current  
vs. Forward Voltage

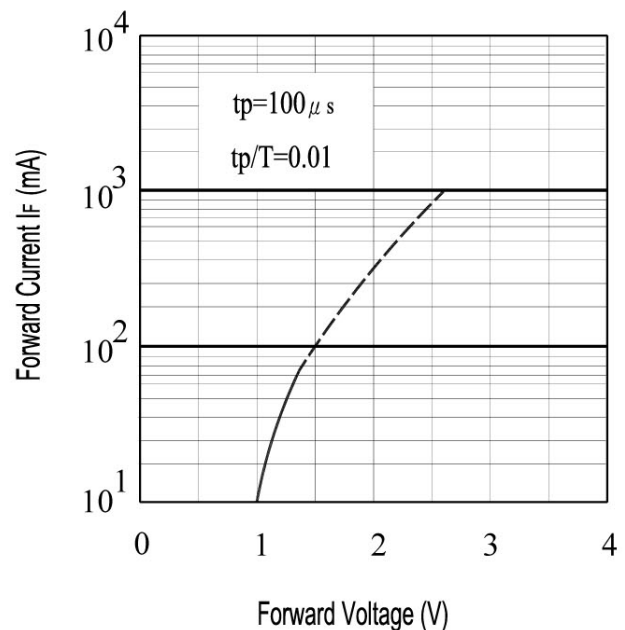


Fig.5 Relative Intensity vs.  
Forward Current

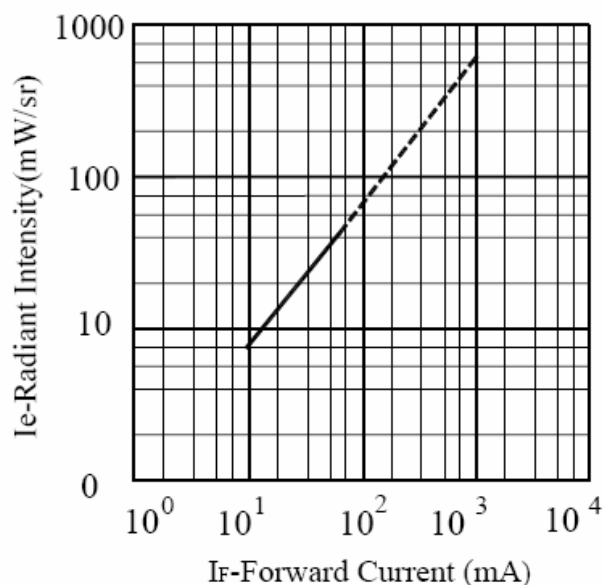


Fig.6 Relative Radiant Intensity vs.  
Angular Displacement

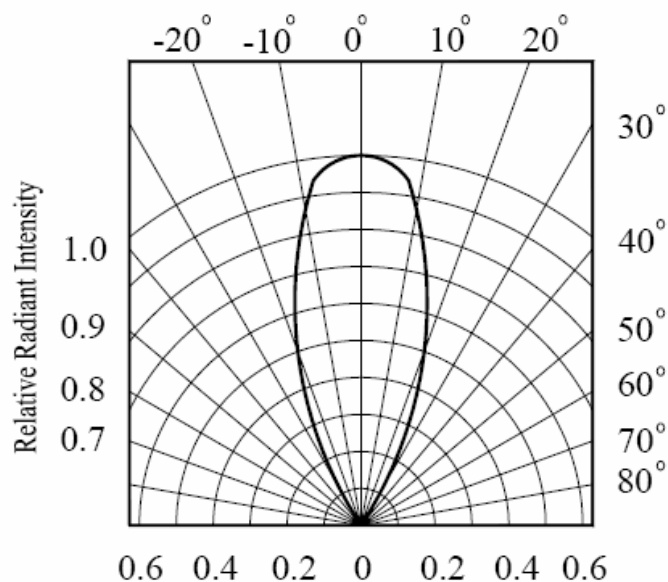


Fig.7 Relative Intensity vs.  
Ambient Temperature( $^\circ\text{C}$ )

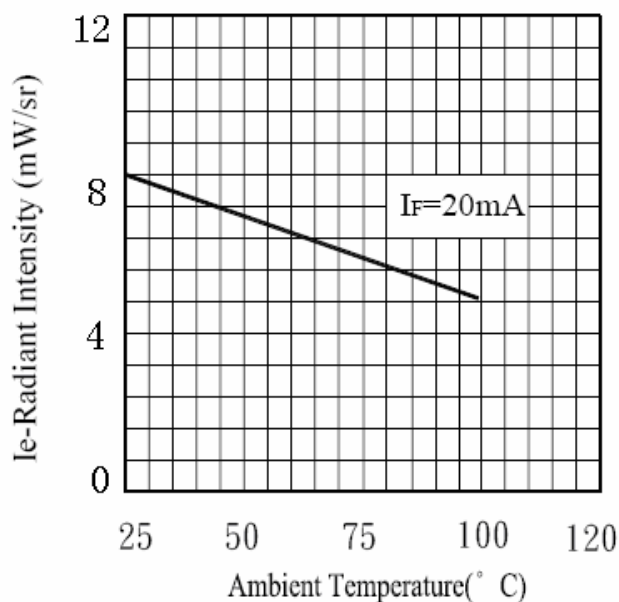
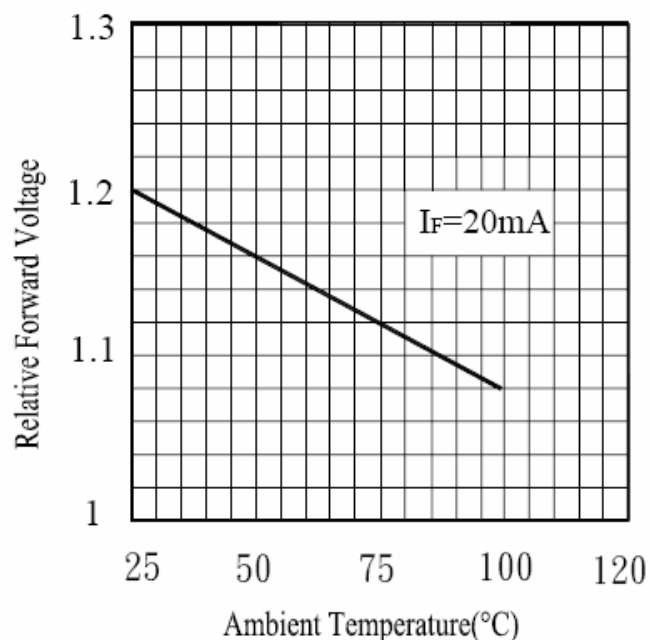


Fig.8 Forward Current vs.  
Ambient Temperature( $^\circ\text{C}$ )



## Reliability Test Items And Conditions:

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

### 1) Test Items and Results:

| No. | Test Item                       | Test Hours/Cycles | Test Conditions                         | Sample Size | Ac/Re |
|-----|---------------------------------|-------------------|-----------------------------------------|-------------|-------|
| 1   | Resistance to Soldering Heat    | 6 Min             | Tsld=260±5℃, Min. 5sec                  | 25pcs       | 0/1   |
| 2   | Thermal Shock                   | 300 Cycles        | H: +100℃ 5min<br>10 sec<br>L: -10℃ 5min | 25pcs       | 0/1   |
| 3   | Temperature Cycle               | 300 Cycles        | H: +100℃ 15min<br>5min<br>L: -40℃ 15min | 25pcs       | 0/1   |
| 4   | High Temperature Storage        | 1000Hrs.          | Temp: 100℃                              | 25pcs       | 0/1   |
| 5   | DC Operating Life               | 1000Hrs.          | If=20mA                                 | 25pcs       | 0/1   |
| 6   | Low Temperature Storage         | 1000Hrs.          | Temp: -40℃                              | 25pcs       | 0/1   |
| 7   | High Temperature/ High Humidity | 1000Hrs.          | 85℃/85%RH                               | 25pcs       | 0/1   |

### 2) Criteria For Judging The Damage:

| Item            | Symbol | Test Conditions | Criteria for Judgment |            |
|-----------------|--------|-----------------|-----------------------|------------|
|                 |        |                 | Min                   | Max        |
| Forward Voltage | VF     | IF=20mA         | —                     | F.V.*)×1.1 |
| Reverse Current | IR     | VR=5V           | —                     | F.V.*)×2.0 |

\*) F.V.: First Value.

Please read the following notes before using the product:

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

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.

2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

3. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

4. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.