



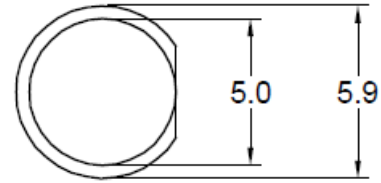
# American Opto Plus LED Corp.

## L513EC

### 5mm Red LED Lamp

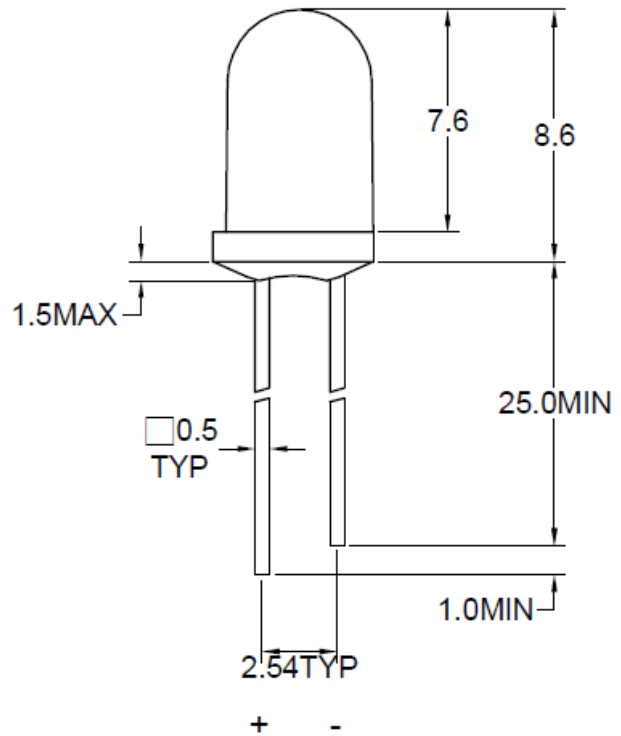
#### DESCRIPTION

- Round Type
- 5mm Diameter
- Lens Color: Water Clear
- With Flange
- Solder leads without standoff



#### FEATURES

- Emitted Color: Red
- High Luminous Intensity
- Technology: GaAsP/GaP
- Viewing Angle: 20°



#### NOTES:

1. All dimensions are in millimeters tolerance is  $\pm 0.25$ mm unless otherwise noted;

| Part Number | Material  | Lens Color |             |
|-------------|-----------|------------|-------------|
|             |           | Emitted    | Lens        |
| L513EC      | GaAsP/GaP | Red        | Water Clear |



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#### ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

| Parameter                              | Symbol | Ratings             | Unit |
|--|--------|---------------------|------|
| Forward Current                        | If     | 30                  | mA   |
| Peak Forward Current Duty (1/10@10KHz) | Ifp    | 120                 | mA   |
| Power Dissipation                      | Pd     | 100                 | mW   |
| Reverse Current @ 5V                   | Ir     | 10                  | μA   |
| Operating Temperature Range            | Topr   | -40~+85             | °C   |
| Storage Temperature Range              | Tstg   | -40~+100            | °C   |
| Soldering Temperature                  | Tsol   | Max 260°C for 5 sec |      |

#### OPTICAL-ELECTRICAL CHARACTERISTICS

(Ta=25°C)

| Parameter                | Symbol | Test Condition | Min | Typ | Max | Unit |
|--------------------------|--------|----------------|-----|-----|-----|------|
| Luminous Intensity       | Iv     | If=10mA        | 45  | 75  | --  | mcd  |
| Peak Wavelength          | λP     |                | --  | 635 | --  | nm   |
| Spectral Line Half-Width | Δλ     |                | --  | 45  | --  | nm   |
| Forward Voltage          | Vf     |                | 1.7 | --  | 2.6 | V    |
| Viewing angle            | 2θ ½   |                | --  | 20  | --  | Deg  |

- \*Note: 1. The forward voltage data did not include ±0.1V testing tolerance.  
2. The luminous intensity data did not include ±15% testing tolerance.



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#### TYPICAL ELECTRO-OPTICAL CHARACTERISTIC CURVES

Fig.1 Forward current vs. Forward Voltage

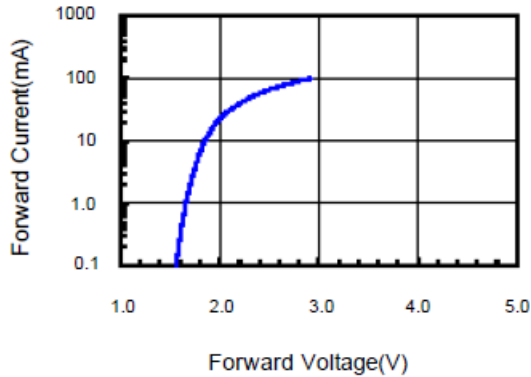


Fig.2 Relative Intensity vs. Forward Current

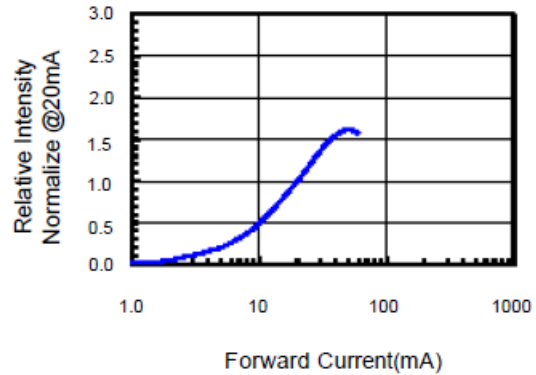


Fig.3 Forward Voltage vs. Temperature

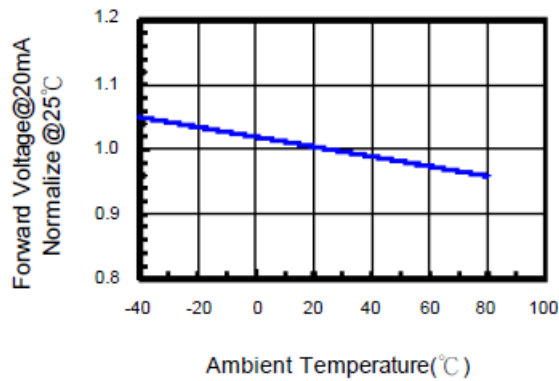


Fig.4 Relative Intensity vs. Temperature

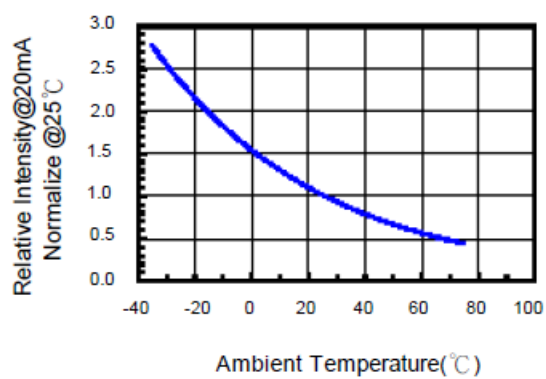


Fig.5 Relative Intensity vs. Wavelength

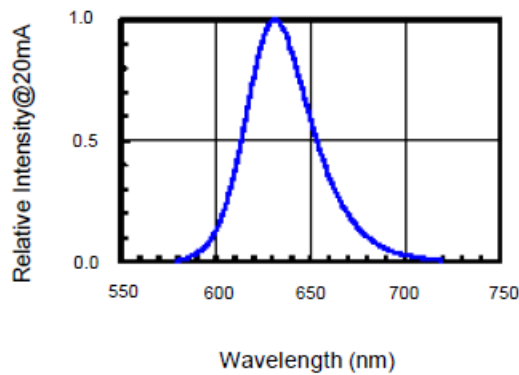
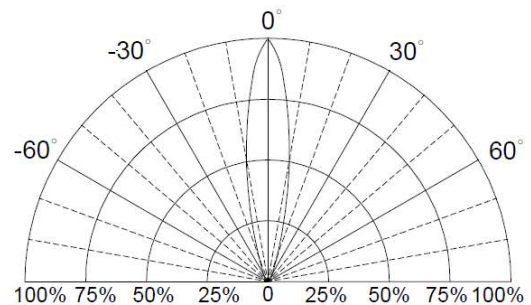


Fig.6 Directive Radiation





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### SOLDERING CONDITION (Pb-Free)

#### 1. Iron:

Soldering Iron: 30W Max

Temperature 350°C Max

Soldering Time: 3 Seconds Max (One Time)

Distance: 2mm Min (From solder joint to body)

#### 2. Wave Soldering Profile

Dip Soldering

Preheat: 120°C Max

Preheat time: 60 seconds Max

Ramp-up

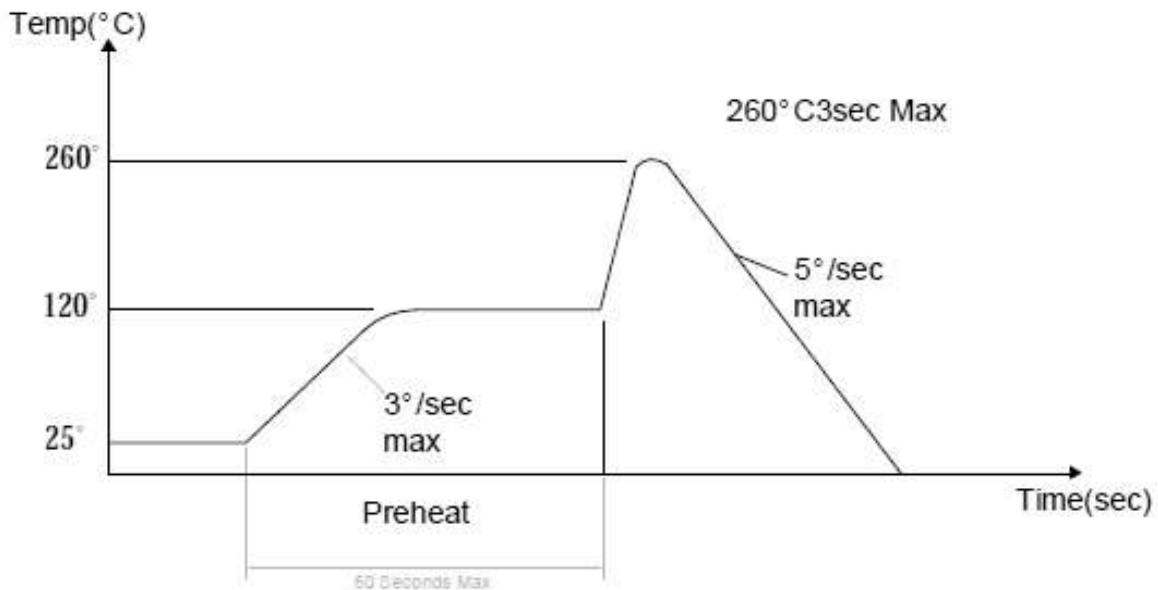
2°C/sec (Max)

Ramp-Down: -5°C/sec (Max)

Solder Bath: 260°C Max

Dipping Time: 3 seconds Max

Distance: 2mm Min (from solder joint to body)





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#### RELIABILITY TEST:

| Test Item                           | Test Condition   | Description   | Reference Standard   |
|-------------------------------------|--|---|--|
| Operating Life Test                 | 1.Under Room Temperature<br>2.If=20mA<br>3.t=1000 hrs (-24hrs, +72hrs) | This test is conducted for the purpose of determining the resistance of a part in electrical and thermal stressed.  | MIL-STD-750: 1026<br>MIL-STD-883: 1005<br>JIS C 7021: B-1                      |
| High Temperature Storage Test       | 1.Ta=105 °C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                       | The purpose of this is the resistance of the device which is laid under condition of high temperature for hours.  | MIL-STD-883:1008<br>JIS C 7021: B-10   |
| Low Temperature Storage Test        | 1.Ta=-40 °C±5°C<br>2.t=1000 hrs (-24hrs, +72hrs)                       | The purpose of this is the resistance of the device which is laid under condition of low temperature for hours.   | JIS C 7021: B-12   |
| High Temperature High Humidity Test | 1.Ta=65 °C±5°C<br>2.RH=90%~95%<br>3.t=240hrs ±2hrs                     | The purpose of this test is the resistance of the device under tropical for hours.  | MIL-STD-202:103B<br>JIS C 7021: B-11   |
| Thermal Shock Test                  | 1.Ta=105 °C±5°C & -40°C±5°C<br>(10min) (10min)<br>2.total 10 cycles    | The purpose of this is the resistance of the device to sudden extreme changes in high and low temperature.  | MIL-STD-202: 107D<br>MIL-STD-750: 1051<br>MIL-STD-883: 1011                    |
| Solder Resistance Test              | 1.T.Sol=260 °C±5°C<br>2.Dwell time= 10 ±1sec.                          | This test intended to determine the thermal characteristic resistance of the device to sudden exposures at extreme changes in temperature when soldering the lead wire. | MIL-STD-202: 210A<br>MIL-STD-750: 2031<br>JIS C 7021: A-1                      |
| Solderability Test                  | 1.T.Sol=230 °C±5°C<br>2.Dwell time=5 ±1sec                             | This test intended to see soldering well performed or not.  | MIL-STD-202: 208D<br>MIL-STD-750: 2026<br>MIL-STD-883: 2003<br>JIS C 7021: A-2 |