

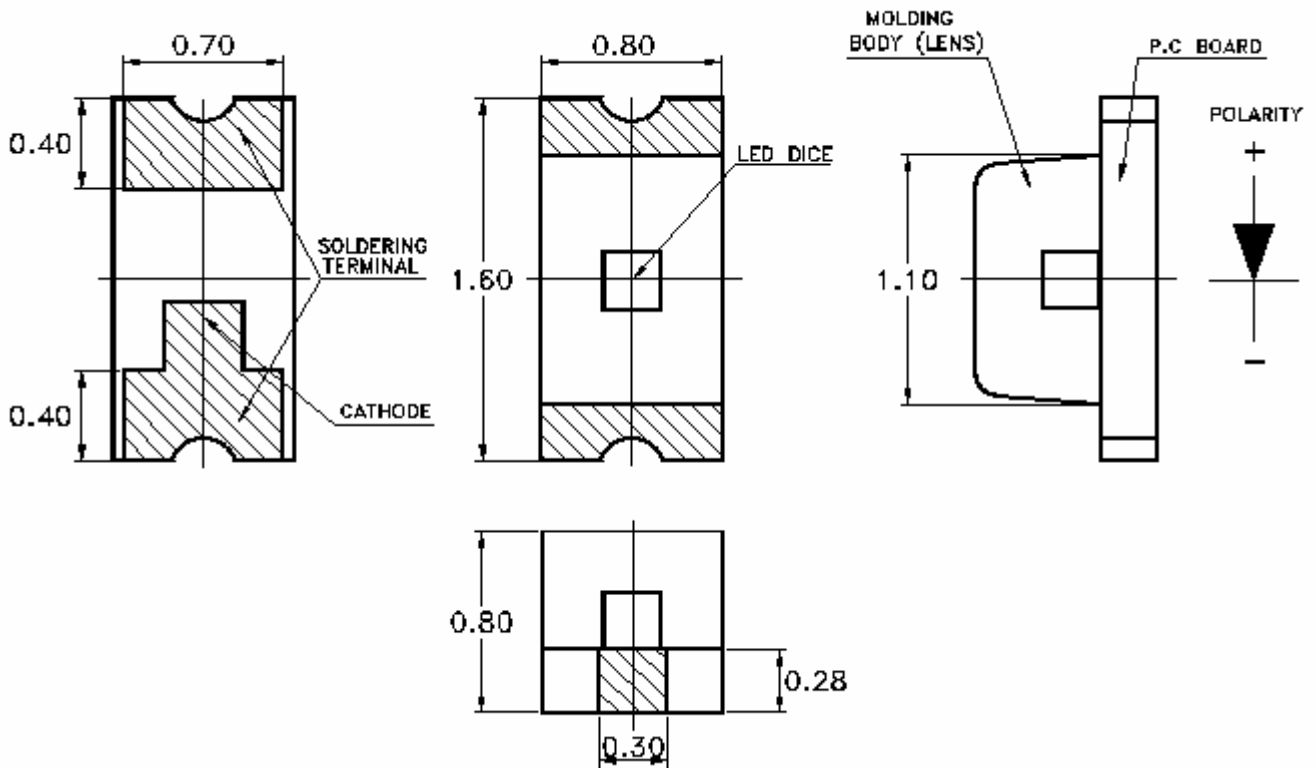
Property of Lite-On Only

Features

- * Package in 8mm tape on 7" diameter reels.
- * Compatible with automatic placement equipment.
- * Compatible with infrared and vapor phase reflow solder process.
- * EIA STD Package.
- * I.C. Compatible.



Package dimensions



| Part no. | Lens | Source Color |
|--------------|-------------|------------------|
| LTST-C190FKT | Water Clear | GaP on GaP Green |

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.1\text{mm}$ (.004") unless otherwise noted.



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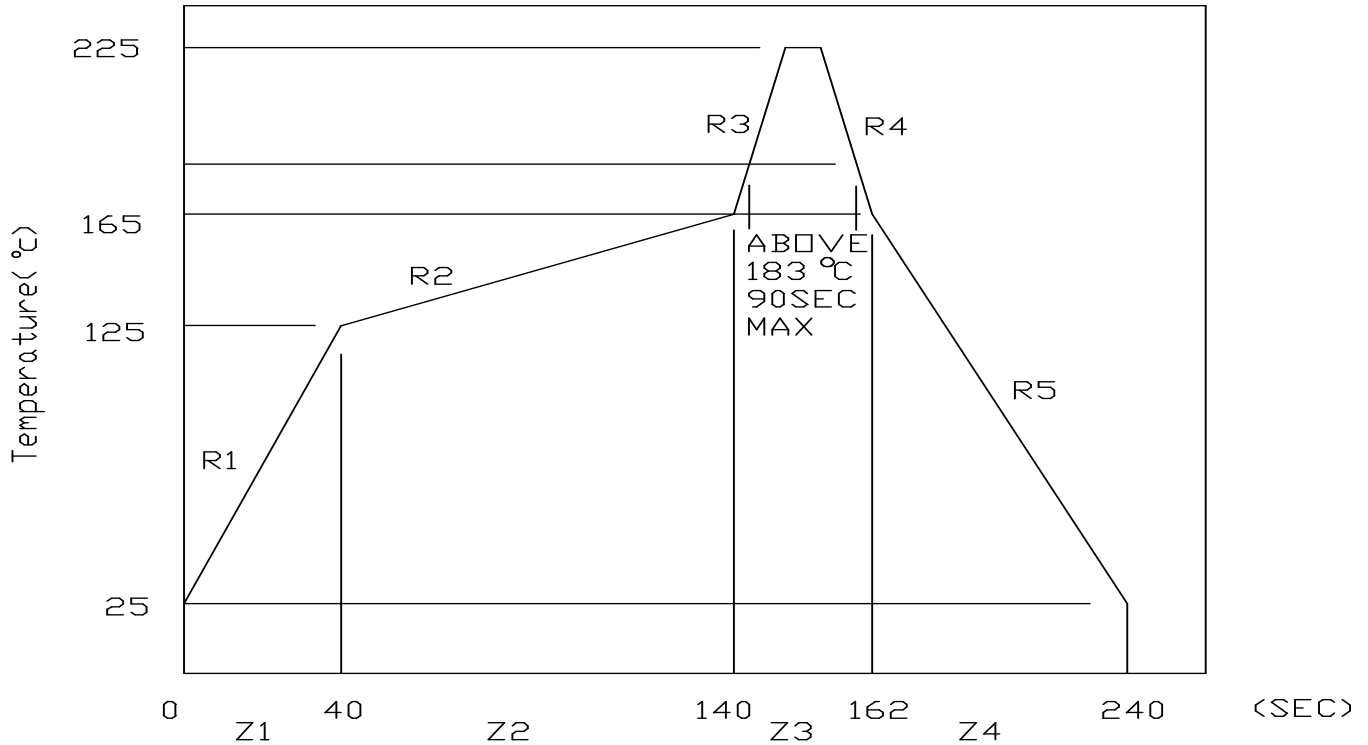
Absolute Maximum Ratings At Ta=25°C

| Parameter | LTST-C190FKT | Unit |
|--|----------------------|-------|
| Power Dissipation | 100 | mW |
| Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width) | 120 | mA |
| Continuous Forward Current | 30 | mA |
| Derating Linear From 50°C | 0.6 | mA/°C |
| Reverse Voltage | 5 | V |
| Operating Temperature Range | -55°C to +85°C | |
| Storage Temperature Range | -55°C to +85°C | |
| Wave Soldering Condition | 260°C For 5 Seconds | |
| Infrared Soldering Condition | 240°C For 10 Seconds | |
| Vapor Phase Soldering Condition | 215°C For 3 Minutes | |

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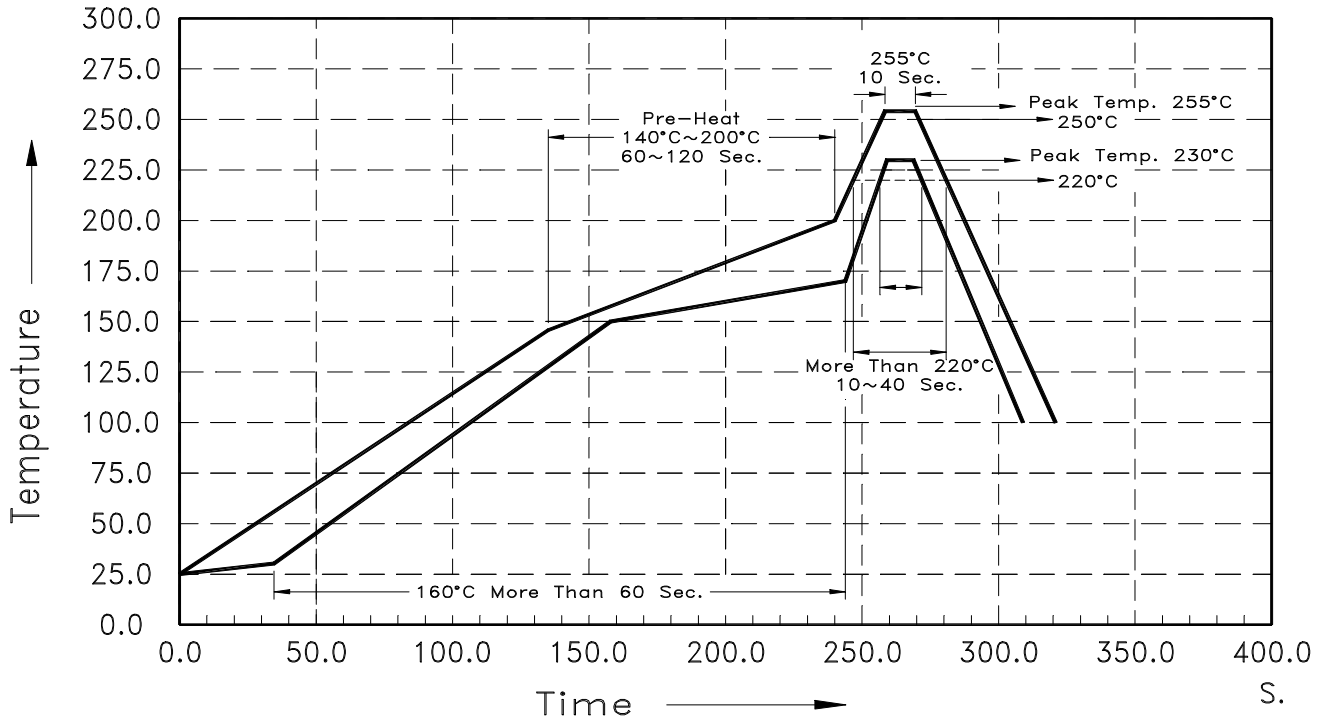
Suggestion Profile:

(1) Suggestion IR Reflow Profile For Normal Process



(2) Suggestion IR Reflow Profile For Pb Free Process

Degree C. **Recommended Profile Between Assemble And Heat-Resistance Line**



The Profile is available that must to use SnAg_(x=3.3~3.8) Cu_(y=0.2~0.7) solder paste

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Electrical Optical Characteristics At Ta=25°C

| Parameter | Symbol | Part No. LTST- | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------|-----------------|-------------------|------|------|------|---------|------------------------------|
| Luminous Intensity | IV | C190FKT | 4.0 | 14.0 | | mcd | IF = 20mA Note 1 |
| Viewing Angle | $2\theta_{1/2}$ | C190FKT | | 130 | | deg | Note 2 (Fig.6) |
| Peak Emission Wavelength | λ_P | C190FKT | | 565 | | nm | Measurement @Peak (Fig.1) |
| Dominant Wavelength | λ_d | C190FKT | | 569 | | nm | Note 3 |
| Spectral Line Half-Width | $\Delta\lambda$ | C190FKT | | 30 | | nm | |
| Forward Voltage | VF | C190FKT | | 2.1 | 2.6 | V | IF = 20mA |
| Reverse Current | IR | C190FKT | | | 100 | μA | VR = 5V |
| Capacitance | C | C190FKT | | 35 | | PF | VF = 0 f = 1MHZ |

Notes: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. The dominant wavelength, λ_d is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.



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Bin Code List

| Luminous Intensity | | Unit : mcd @20mA |
|--------------------|------|------------------|
| Bin Code | Min. | Max. |
| J | 4.00 | 8.00 |
| K | 6.30 | 12.5 |
| L | 10.0 | 20.0 |
| M | 16.0 | 32.0 |
| N | 25.0 | 50.0 |

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Typical Electrical / Optical Characteristics Curves

(25 °C Ambient Temperature Unless Otherwise Noted)

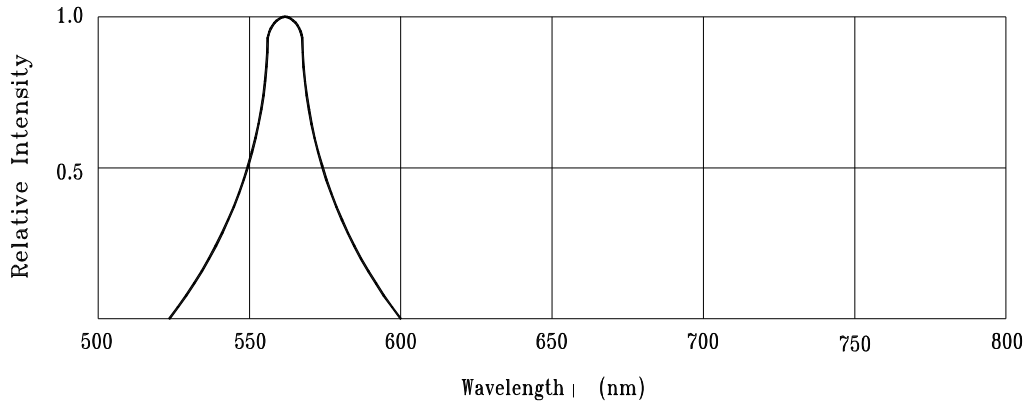


Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

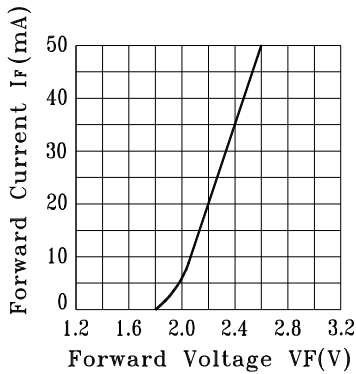


Fig.2 FORWARD CURRENT VS. FORWARD VOLTAGE

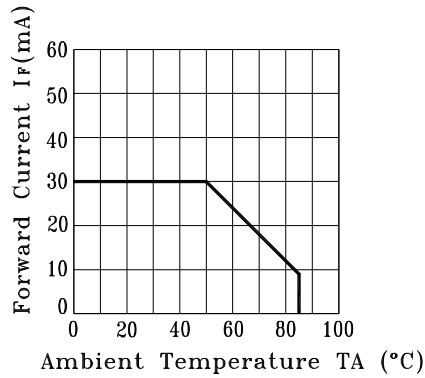


Fig.3 FORWARD CURRENT DERATING CURVE

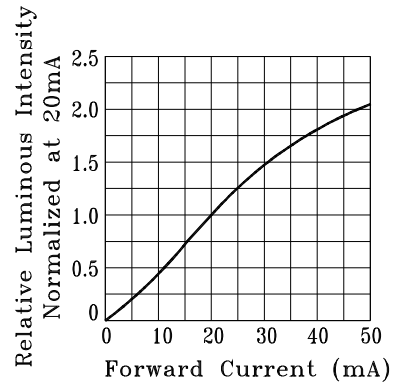


Fig.4 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

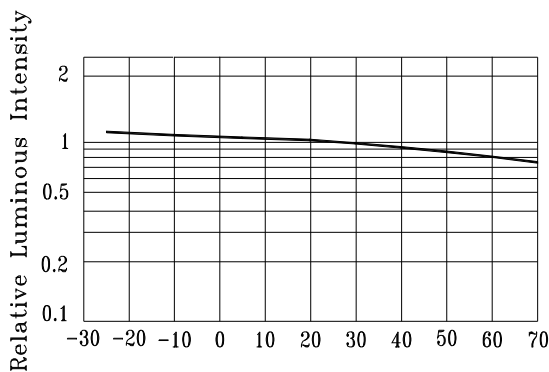


Fig.5 LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE.

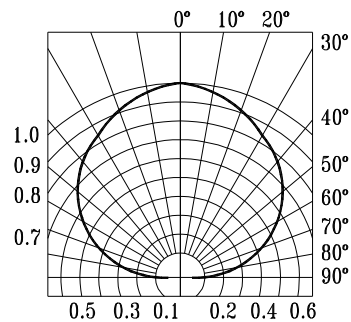


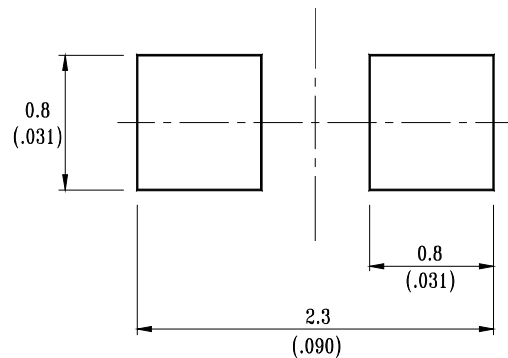
Fig.6 SPATIAL DISTRIBUTION

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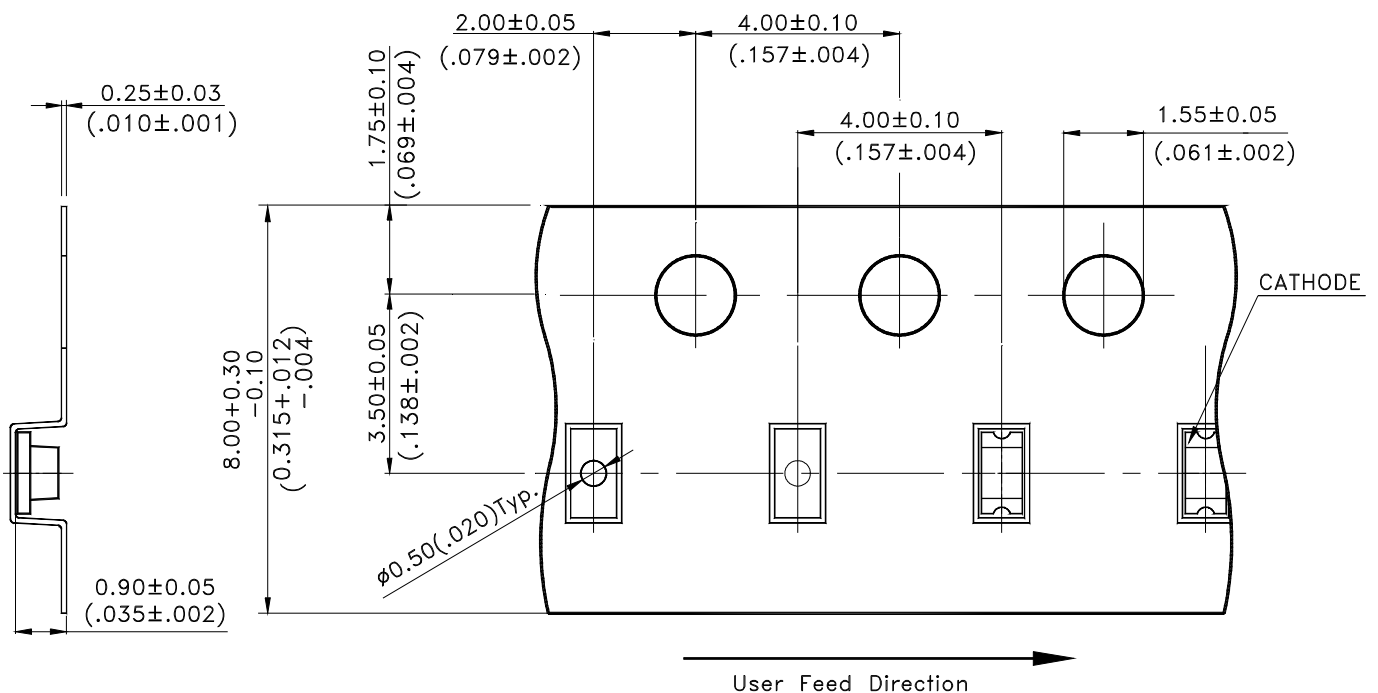
Cleaning

Do not use unspecified chemical liquid to clean LED they could harm the package.
If clean is necessary, immerse the LED in ethyl alcohol or in isopropyl alcohol at normal temperature for less one minute.

Suggest Soldering Pad Dimensions



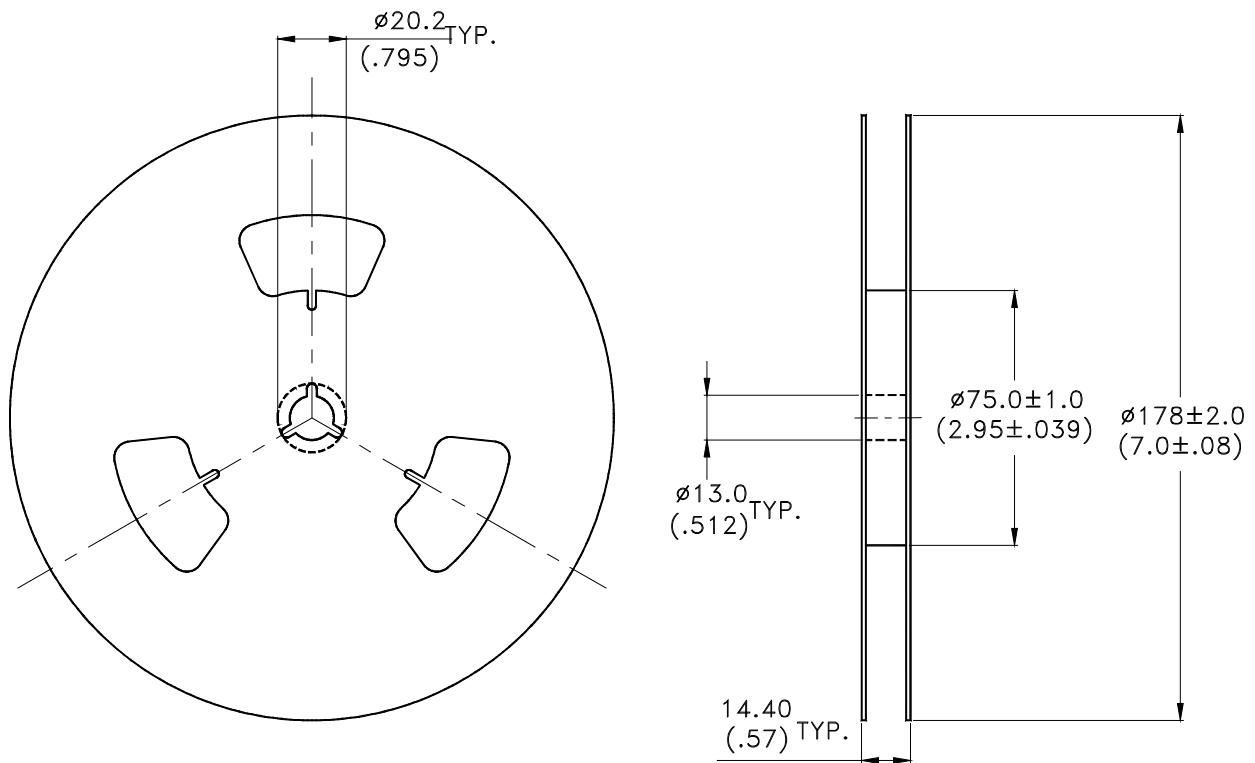
Package Dimensions Of Tape And Reel



Notes:

1. All dimensions are in millimeters (inches).

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Notes:

1. Empty component pockets sealed with top cover tape.
2. 7 inch reel-3000 pieces per reel.
3. Minimum packing quantity is 500 pcs for remainders.
4. The maximum number of consecutive missing lamps is two.
5. In accordance with ANSI/EIA 481-1-A-1994 specifications.

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CAUTIONS

1. Application limitation

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household application.) Consult Liteon's sales in advance for information on application in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as airplanes, automobiles, traffic control equipment, life support system and safety devices).

2. Storage

Before opening the package : The LEDs should be kept at 30°C or less and 85%RH or less. The LEDs should be used within a year.

After opening the package : The LEDs should be kept at 30°C or less and 70%RH or less. The LEDs should be soldered within 168 hours(7 days) after opening the package.

Please avoid rapid transitions in ambient temperature in high humidity environments where condensation may occur.

3. Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED.

4. Soldering

Do not apply any stress to the lead frame during soldering while the LED is at high temperature.

Recommended soldering condition

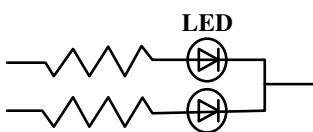
| Reflow soldering | | Soldering iron | | Wave soldering | |
|------------------|---------------|----------------|--------------------------------|----------------|--------------|
| Pre-heat | 120~150°C | Temperature | 300°C Max. | Pre-heat | 100°C Max. |
| Pre-heat time | 120 sec. Max. | Soldering time | 3 sec. Max. (one time only) | Pre-heat time | 60 sec. Max. |
| Peak temperature | 260°C Max. | | | Solder wave | 260°C Max. |
| Soldering time | 5 sec. Max. | | | Soldering time | 10 sec. Max. |

5. Drive Method

LED is a current operated device, and therefore, requires some kind of current limiting incorporated into the drive circuit. This current limiting typically takes the form of a current limiter resistor placed in series with the LED.

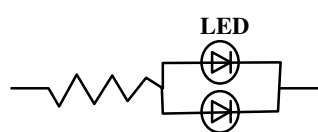
Consider worst case voltage variations that could occur across the current limiting resistor. The forward current should not be allowed to change by more than 40% of its desired value.

Circuit model A



(A) Recommended circuit.

Circuit model B



(B) The difference of brightness between LEDs could be found due to the Vf-If characteristics of LED.

Property of Lite-On Only

6. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded.

7. Reliability Test

| Classification | Test Item | Test Condition | Reference Standard |
|--------------------|--|--|---|
| Endurance Test | Operation Life | Ta= Under Room Temperature As Per Data Sheet Maximum Rating *Test Time= 1000HRS (-24HRS,+72HRS)*@20mA. | MIL-STD-750D:1026 (1995) MIL-STD-883D:1005 (1991) JIS C 7021:B-1 (1982) |
| | High Temperature High Humidity Storage | IR-Reflow In-Board, 2 Times Ta= 65±5°C ,RH= 90~95% *Test Time= 1000HRS±2HRS | MIL-STD-202F:103B(1980) JIS C 7021:B-11(1982) |
| | High Temperature Storage | Ta= 105±5°C *Test Time= 1000HRS (-24HRS,+72HRS) | MIL-STD-883D:1008 (1991) JIS C 7021:B-10 (1982) |
| | Low Temperature Storage | Ta= -55±5°C *Test Time=1000HRS (-24HRS,+72H RS) | JIS C 7021:B-12 (1982) |
| Environmental Test | Temperature Cycling | 105°C ~ 25°C ~ -55°C ~ 25°C 30mins 5mins 30mins 5mins 10 Cycles | MIL-STD-202F:107D (1980) MIL-STD-750D:1051(1995) MIL-STD-883D:1010 (1991) JIS C 7021:A-4(1982) |
| | Thermal Shock | IR-Reflow In-Board, 2 Times 105 ± 5°C ~ -55°C ± 5°C 10mins 10mins 10 Cycles | MIL-STD-202F:107D(1980) MIL-STD-750D:1051(1995) MIL-STD-883D:1011 (1991) |
| | Solder Resistance | T.sol= 260 ± 5°C Dwell Time= 10 ± 1secs | MIL-STD-202F:210A(1980) MIL-STD-750D:2031(1995) JIS C 7021:A-1(1982) |
| | IR-Reflow | Ramp-up rate(183°C to Peak) +3°C second max Temp. maintain at 125(±25)°C 120 seconds max Temp. maintain above 183°C 60-150 seconds Peak temperature range 235°C +5/-0°C Time within 5°C of actual Peak Temperature (tp) 10-30 seconds Ramp-down rate +6°C/second max | MIL-STD-750D:2031.2(1995) J-STD-020(1999) |
| | Solderability | T.sol= 235 ± 5°C Immersion time 2±0.5 sec Immersion rate 25±2.5 mm/sec Immersion rate 25±2.5 mm/sec Coverage ≥ 95% of the dipped surface | MIL-STD-202F:208D(1980) MIL-STD-750D:2026(1995) MIL-STD-883D:2003(1991) IEC 68 Part 2-20 JIS C 7021:A-2(1982) |

8. Others

The appearance and specifications of the product may be modified for improvement without notice.

9. Suggested Checking List

Training and Certification

1. Everyone working in a static-safe area is ESD-certified?
2. Training records kept and re-certification dates monitored?

Static-Safe Workstation & Work Areas

1. Static-safe workstation or work-areas have ESD signs?
2. All surfaces and objects at all static-safe workstation and within 1 ft measure less than 100V?
3. All ionizer activated, positioned towards the units?
4. Each work surface mats grounding is good?

Personnel Grounding

1. Every person (including visitors) handling ESD sensitive (ESDS) items wears wrist strap, heel strap or conductive shoes with conductive flooring?
2. If conductive footwear used, conductive flooring also present where operator stand or walk?
3. Garments, hairs or anything closer than 1 ft to ESD items measure less than 100V*?
4. Every wrist strap or heel strap/conductive shoes checked daily and result recorded for all DLs?
5. All wrist strap or heel strap checkers calibration up to date?

Note: *50V for Blue LED.

Device Handling

1. Every ESDS items identified by EIA-471 labels on item or packaging?
2. All ESDS items completely inside properly closed static-shielding containers when not at static-safe workstation?
3. No static charge generators (e.g. plastics) inside shielding containers with ESDS items?
4. All flexible conductive and dissipative package materials inspected before reuse or recycles?

Others

1. Audit result reported to entity ESD control coordinator?
2. Corrective action from previous audits completed?
3. Are audit records complete and on file?