

Product Specification

Number: L-KLS9-T0603CW
Name: 0603 High BrightWhite Chip LED
Customer: _____
Date: 2025-09-20



WWW.KLSELE.COM

NINGBO KLS ELECTRONIC CO; LTD

Tel : 0086-574-86828566

Fax : 0086-574-86824882

ADD : NO. 8-1, RONGXIA RD. XIAPU SHANQIAN
INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.

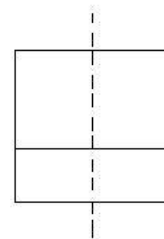
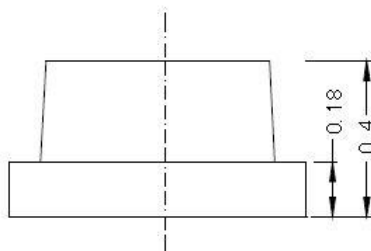
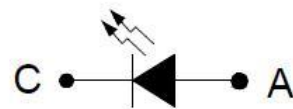
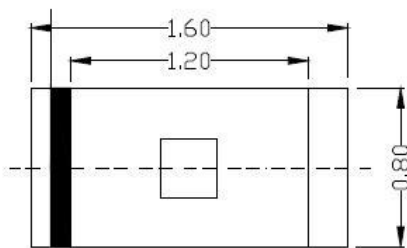
| | | | |
|-------|--------|--------|---------|
| Compi | Check | Review | Approva |
| Jenny | Jack.C | | |

| | | | |
|-------------|--------------------------------|---------|------------|
| Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| Part number | L-KLS9-T0603CW | Edition | V1 |
| Department | | Page | 3 / 11 |

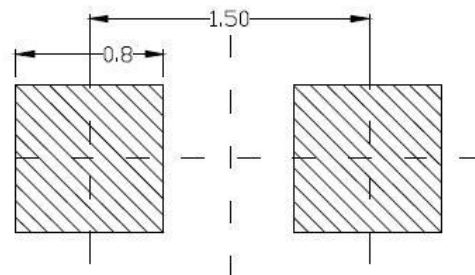
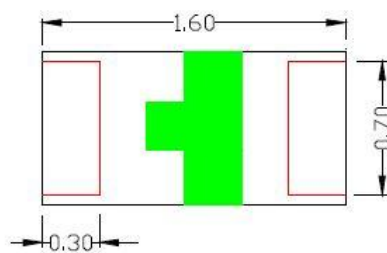
1. Features

- | Package(L/W/H) : 1.6x0.8x0.4 mm
- | Color: Ultra Bright White
- | Lens: Yellow Diffuse Flat Mold
- | EIA STD Package
- | Meet ROHS, Green Product
- | Compatible With SMT Automatic Equipment
- | Compatible With Infrared Reflow Solder And Wave Solder Process

2. Package Profile & Soldering PAD Suggested

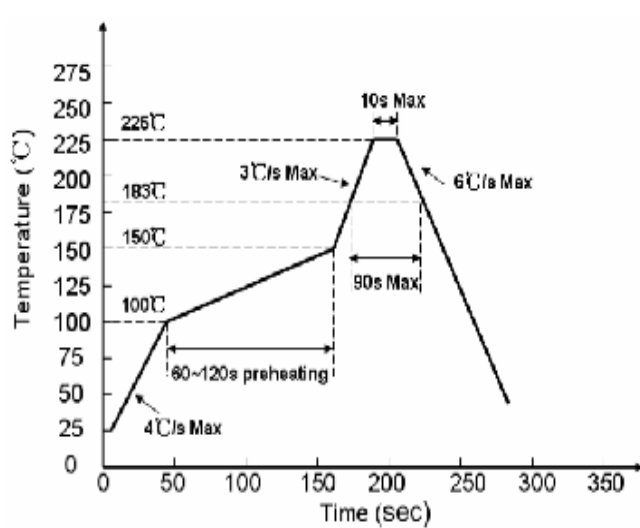


Soldering PAD Suggested:

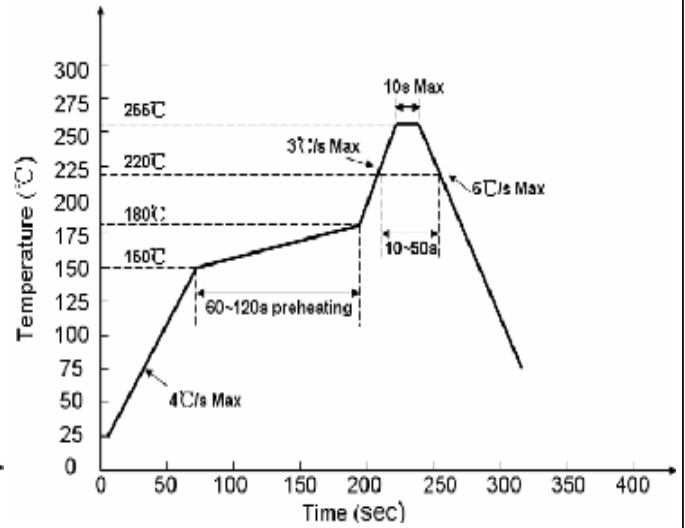


- Notes:
1. All dimensions are millimeters.
 2. Tolerance is 0.15mm unless otherwise noted.

3. Soldering Profile Suggested



For Lead Solder



For Lead Free Solder

4. Absolute Maximum Ratings At Ta=25

| Parameter | Symbol | Rating | Unit |
|---|--------|--|------|
| Power Dissipation | Pd | 90 | mW |
| Peak Forward Current (1/10 Duty Cycle, 0.1ms PulseWidth) | IFP | 100 | mA |
| DC Forward Current | IF | 30 | mA |
| Reverse Voltage | VR | 5 | V |
| Operating Temperature Range | Topr | -30 C° ~ + 85 C ° | |
| Storage Temperature Range | Tstg | -40 C° ~ + 90 C ° | |
| Soldering Condition | Tsol | Reflow soldering : 260 C For 5 Seconds Hand soldering : 300 C For 3 Seconds | |

| | | | | |
|---|-------------|--------------------------------|---------|------------|
|  | Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| | Part number | L-KLS9-T0603CW | Edition | V1 |
| | Department | | Page | 5 / 11 |

5. Electrical Optical Characteristics At Ta=25 °C

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|--------------------------|-----------------|------|------|------|------|----------------|
| Luminous Intensity | IV | 180 | 280 | -- | mcd | IF = 5mA |
| Viewing Angle | 2θ1/2 | -- | 120 | -- | deg | |
| CIE 1931 Coordinate | X | | 0.29 | -- | nm | |
| | Y | -- | 0.29 | -- | nm | |
| Spectral Line Half-Width | $\Delta\lambda$ | | -- | -- | nm | |
| Forward Voltage | VF | 2.8 | 3.2 | 3.6 | V | VR = 5V |
| Reverse Current | IR | -- | -- | 10 | μA | |

6. Typical Electrical-Optical Characteristics Curves

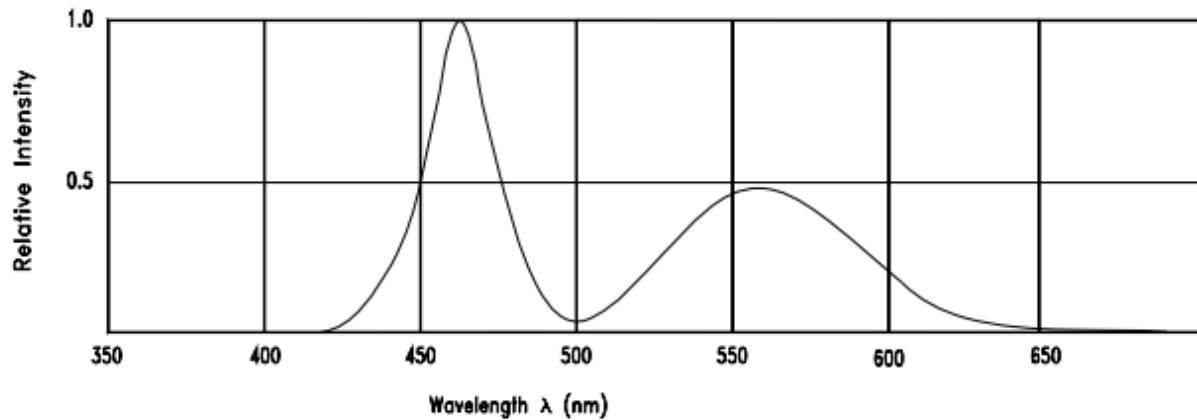


Fig.1 Relative Intensity vs. Wavelength

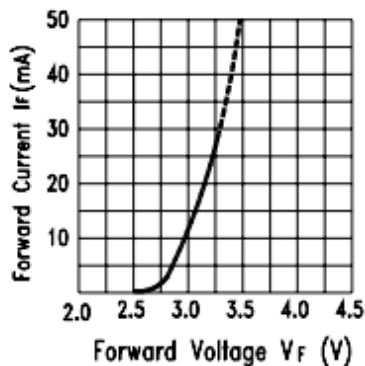


Fig.2 Forward Current vs. Forward Voltage

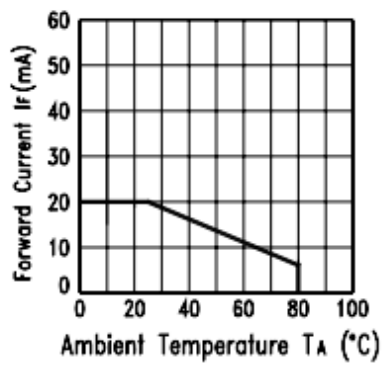


Fig.3 Forward Current Derating Curve

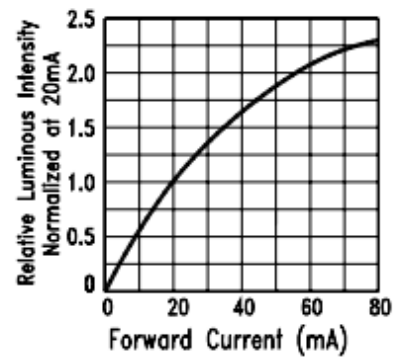


Fig.4 Relative Luminous Intensity vs. Forward Current

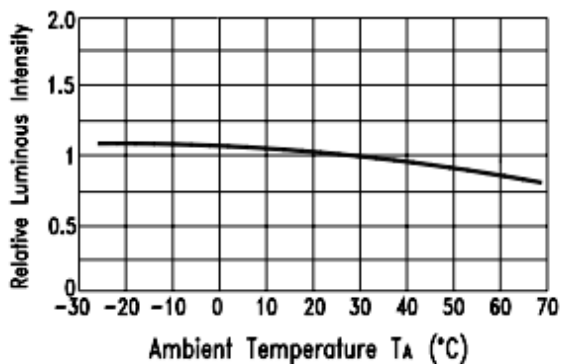


Fig.5 Luminous Intensity vs. Ambient Temperature

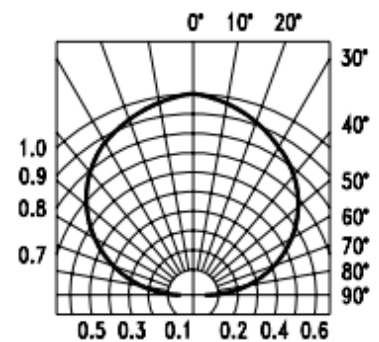


Fig.6 Spatial Distribution

| | | | |
|-------------|--------------------------------|---------|------------|
| Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| Part number | L-KLS9-T0603CW | Edition | V1 |
| Department | | Page | 7 / 11 |

7. Label Explanation

CAT : Luminous Intensity Rank(unit:mcd)

HUE: Dominant Wavelength Rank(unit:nm)

REF : Forward Voltage Rank(unit:V)

Rank Tolerance

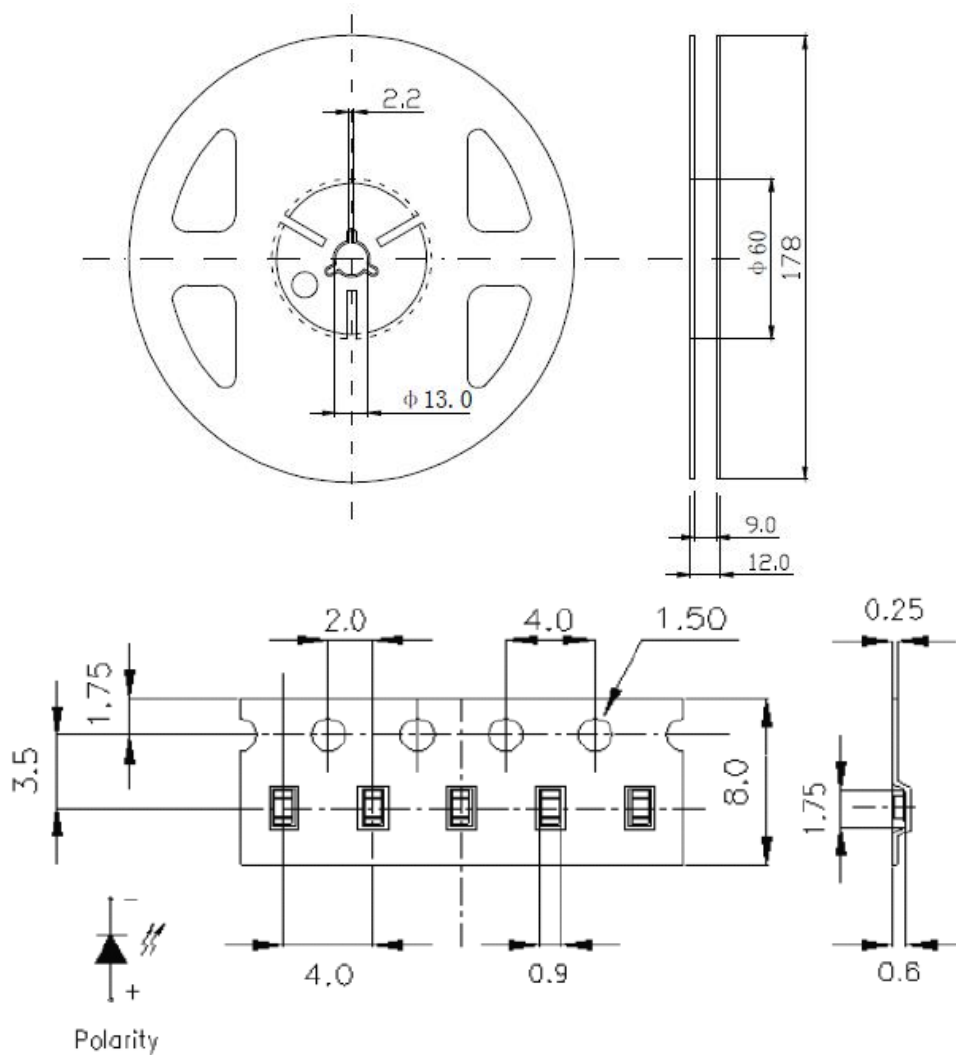
a.Luminous Intensity: $\pm 15\%$

b.HUE: $\pm 1\text{nm}$

c.Forward Voltage: $\pm 0.1\text{V}$

| | | | |
|---------------------------------|--|--|--|
| KLS electronic | | KLS ELECTRONIC CO.,LTD. No.:8-1,Rongxia road,Xiapu shanqian industrial zone,beilun, Ningbo,Zhejiang,China. 315807 Tel: +86-574-86828566 www.klsele.com www.cnkls.com | |
| ITEM | | | |
| P/N | | | |
| Q'TY | | PCS | |
| PO | | RoHS | |

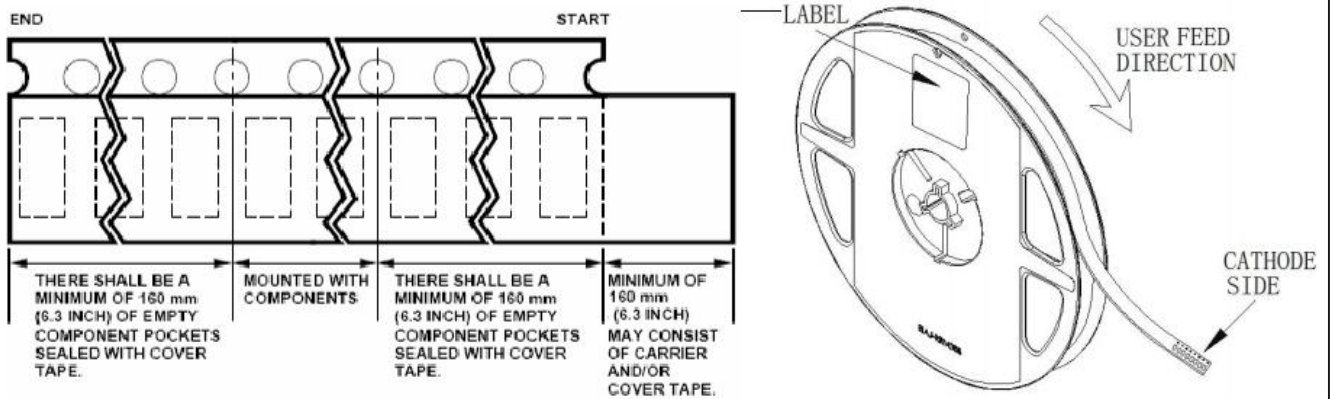
8.Reel And Tape Dimensions:



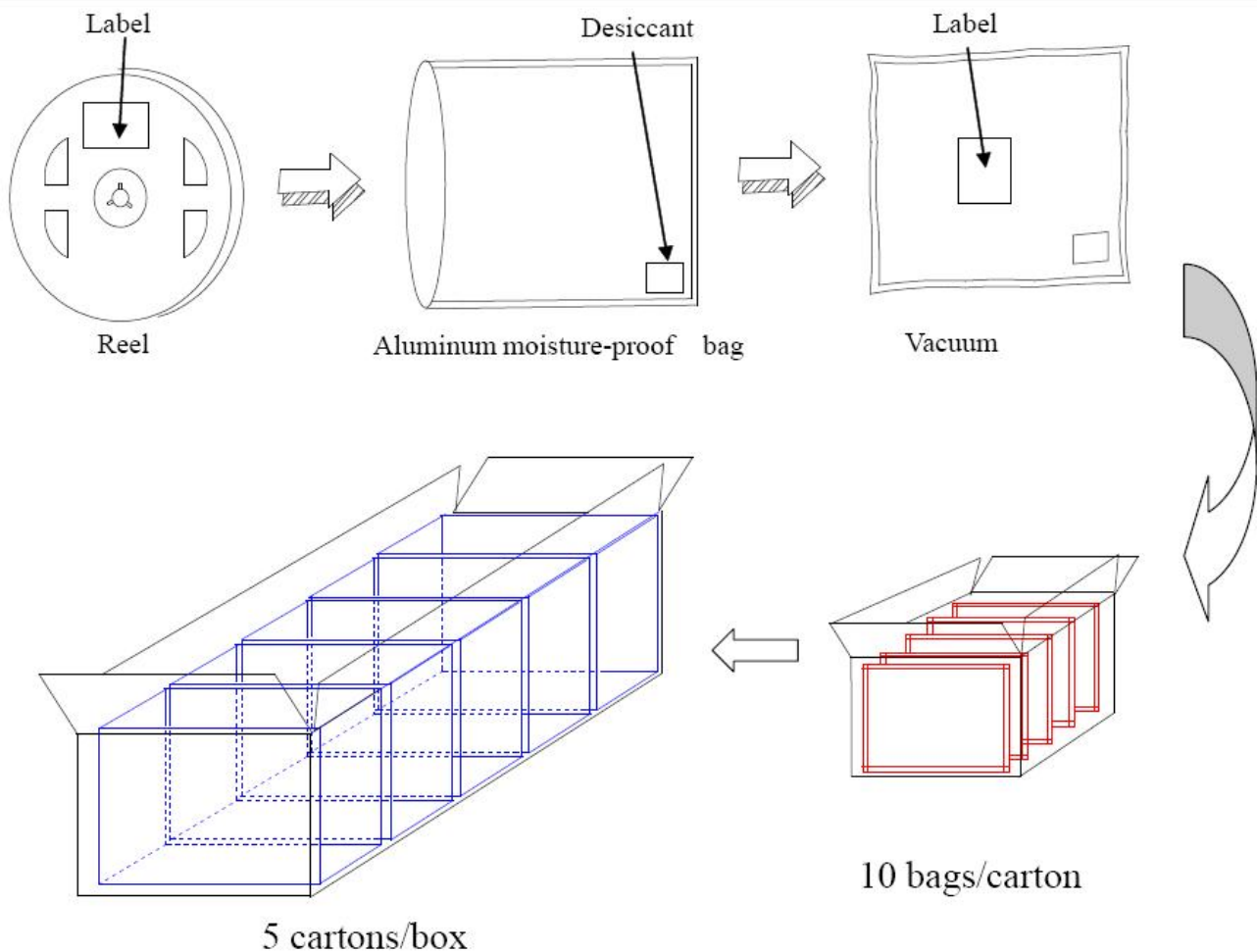
- Notes:
- 1.All dimensions are in millimeters;
 2. Tolerance is $\pm 0.15\text{mm}$ unless otherwise noted.

| | | | |
|-------------|--------------------------------|---------|------------|
| Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| Part number | L-KLS9-T0603CW | Edition | V1 |
| Department | | Page | 8 / 11 |

9. Tape Leader&Trailer Dimensions And Reel



10. Packaging



| | | | | |
|---|-------------|--------------------------------|---------|------------|
|  | Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| | Part number | L-KLS9-T0603CW | Edition | V1 |
| | Department | | Page | 9 / 11 |

11. Reliability Test

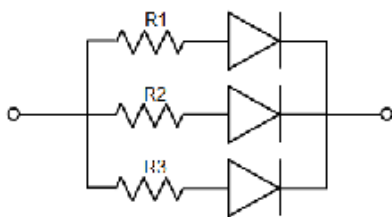
| Classification | Test Item | Test Condition | Reference Standard | Reference Standard |
|--------------------|---|--|--------------------------------|---|
| Endurance Test | Operation Life | Ta= Under Room Temperature As Per Data Sheet Maximum Rating | 1000HRS (-24HRS,+72HRS)*@ 20mA | MIL-STD-750D:1026 MIL-STD-883D:1005 JIS C 7021:B-1 |
| | High Temperature, High Humidity Storage | IR-Reflow In-Board, 2 Times Ta=65±5°C, RH=90-95% | 240HRS±2HRS | MIL-STD-202F:103B JIS C 7021:B-11 |
| | High Temperature Storage | Ta= 105±5°C | 1000HRS (-24HRS,+72HRS) | MIL-STD-883D:1008 JIS C 7021:B-10 |
| | Low Temperature Storage | Ta= -55±5°C | 1000HRS (-24HRS,+72HRS) | JIS C 7021:B-12 |
| Environmental Test | Temperature Cycling | 105°C ~ 25°C ~ -55°C ~ 25°C 30mins 5mins 30mins 5mins | 10 Cycles | MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1010 JIS C 7021:A-4 |
| | Thermal Shock | IR-Reflow In-Board, 2 Times 85 ± 5°C ~ -40°C ± 5°C 10mins 10mins | 10 Cycles | MIL-STD-202F:107D MIL-STD-750D:1051 MIL-STD-883D:1011 |
| | Solder Resistance | T.sol= 260 ± 5°C | 10 ± 1secs | MIL-STD-202F:210A MIL-STD-750D:2031 JIS C 7021:A-1 |
| | IR-Reflow Normal Process | 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 J-STD-020C |
| | IR-Reflow Pb Free Process | Ramp-up rate(217°C to Peak) +3°C/ second max Temp. maintain at 175(±25)°C 180 seconds max Temp. maintain above 217°C 60-150 seconds Peak temperature range 260°C+0/-5°C Time within 5°C of actual Peak Temperature (tp) 20-40 seconds Ramp-down rate +6°C/second max | ----- | MIL-STD-750D:2031.2 J-STD-020C |
| | Solderability | T.sol= 235 ± 5°C Immersion rate 25±2.5 mm/sec Coverage ≥ 95% of the dipped surface | Immersion time 2±0.5sec | MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 IEC 68 Part 2-20 JIS C 7021:A-2 |

12. Cautions

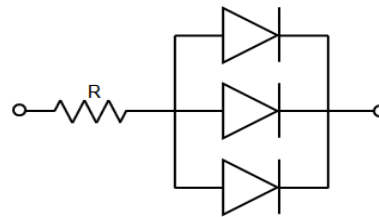
Application

1. A LED is a current-operated device. The slight shift of voltage will cause big change of current, which will damage LEDs. Customer should use resistors in series for the Over-Current-Proof.

2. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended to use individual resistor separately, as shown in Circuit A below. The brightness of each LED shown in Circuit B might appear difference due to the differences in the I-V characteristics of those LEDs.



Circuit model
A



Circuit model
B

3. High temperature may reduce LEDs' intensity and other performances, so keeping it away from heat source to get good performance is necessary.

Storage


1. Before opening original package, it is recommended to store them in the following environment:
 Temperature: 5°C~30°C Humidity: 85%RH max.

2. After opening original package, the storage ambient for the LEDs should be in 5~30°C temperature and 60% or less relative humidity.

3. In order to avoid moisture absorption, it is recommended that the LEDs that out of the original package should be stored in a sealed container with appropriate desiccant, or in desiccators with nitrogen ambient.

4. The LEDs should be used within 168hrs (7 days) after opening the package. Once been mounted, soldering should be quick.

5. If the moisture absorbent material (silica gel) has faded away or the LEDs stored out of original package for more than 168hrs (7 days), baking treatment should be performed using the conditions: 60°C at least 24 hours.

| | | | | |
|---|-------------|--------------------------------|---------|------------|
|  | Part name | 0603 High BrightWhite Chip LED | Date | 2025-09-20 |
| | Part number | L-KLS9-T0603CW | Edition | V1 |
| | Department | | Page | 11 / 11 |

ESD (Electrostatic Discharge)-Protection

A LED (especially the Blue、 White and Green product) is an ESD sensitive component, and static electricity or power surge will damage the LED. ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “no light-up” at low currents, etc. Some advice as below should be noticed:

1. A conductive wrist strap or anti-electrostatic glove should be worn when handling these LEDs.
2. All devices, equipment, machinery, work tables and storage racks, etc. must be properly grounded.
3. Use anti-static package or boxes to carry and storage LEDs. And ordinary plastic package or boxes is forbidden to use.
4. Use ionizer to neutralize the static charge during handling or operating.
5. All surfaces and objects within 1 ft close to LEDs measure less than 100V.

Cleaning

Use alcohol-based cleaning solvents such as IPA (isopropyl alcohol) to clean LEDs if necessary.

Soldering

1. Soldering condition refer to the draft “Soldering Profile Suggested” on page 1.
2. Reflow soldering should not be done more than 2 times.
3. Manual soldering is only suggested on repair and rework. The maximum soldering temperature should not exceed 300°C within 3 sec. And the maximum capacity of soldering iron is 30W in power.
4. During the soldering process, do not touch the lens at high temperature.
5. After soldering, any mechanical force on the lens or any excessive vibration shall not be accepted to apply,also the circuit board shall not be bent as well.