

# SPECIFICATIONS

1. Scope of Application

These specifications are applied to the chip type LED lamp , model CL-824-U1N-T

2. Part code

## CL - 824 - U1N - T

Series \_\_\_\_\_

824 : White LED for general lighting.

Watt Class \_\_\_\_\_

U1 : Under 1 watt package.

Lighting color \_\_\_\_\_

N : White Color

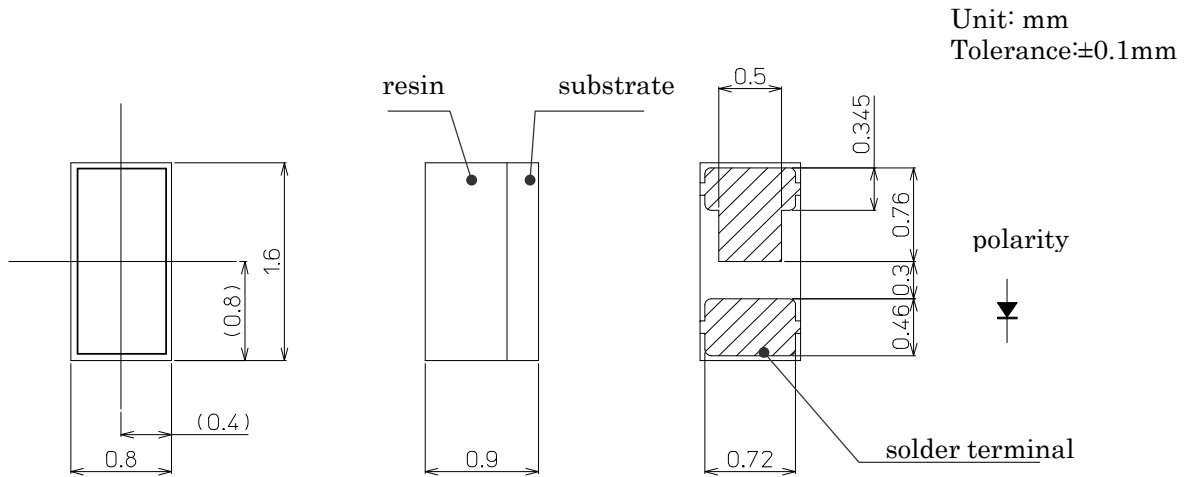
Shipping mode \_\_\_\_\_

Non-coded : Bulk

T : Taping (standard)

|      |          |                        |                              |         |       |            |            |
|------|----------|------------------------|------------------------------|---------|-------|------------|------------|
|      |          |                        | Approved                     | Checked | Drawn | Symbol     | CITILED    |
|      |          |                        |                              |         |       | Name       | CL-824-U1N |
|      |          |                        |                              |         |       | Drawing No |            |
|      | 2009/3/3 | Issue of first edition |                              |         |       |            |            |
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3. Outline drawing



4. Performance

(1) Absolute Maximum Rating

| Parameter             | Symbol             | Rating Value | Unit |
|-----------------------|--------------------|--------------|------|
| Power Dissipation     | P <sub>d</sub>     | 108          | mW   |
| Forward Current       | I <sub>F</sub>     | 30           | mA   |
| Forward Pulse Current | I <sub>FP</sub>    | 100 *        | mA   |
| Reverse Voltage       | V <sub>R</sub>     | 5            | V    |
| Operating Temperature | T <sub>OP</sub>    | -30 ~ +85    | C    |
| Storage Temperature   | T <sub>ST</sub>    | -40 ~ +100   | C    |
| Junction Temperature  | T <sub>j Max</sub> | 120          | C    |

\*1 Forward Current : Duty ≤ 1/10, Pulse Width ≤ 0.1msec

\*2 D.C. Current : T<sub>j</sub> = T<sub>c</sub> + R<sub>j-c</sub> x P<sub>d</sub>

Pulse Current : T<sub>j</sub> = T<sub>c</sub> + R<sub>j-c</sub> x P<sub>w</sub> (Power Dissipation / one-Pulse) x duty

\* T<sub>s</sub>: Temperature of anode solder terminal

|      |          |                        |                              |         |       |            |            |
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## (2) Electro-optical Characteristics (Tc=25C)

| Parameter                        | Symbol           | Condition            | MIN  | TYP   | MAX | Unit |
|----------------------------------|------------------|----------------------|------|-------|-----|------|
| Forward Voltage                  | V <sub>F</sub>   | I <sub>F</sub> =20mA | 2.8  | 3.2   | 3.5 | V    |
| Reverse Current                  | I <sub>R</sub>   | V <sub>R</sub> =5V   | -    | -     | 100 | μA   |
| Thermal resistance               | R <sub>J-s</sub> | Junction-solder      | -    | 175   | -   | C/W  |
| Luminous Intensity <sup>*1</sup> | I <sub>v</sub>   | I <sub>F</sub> =20mA | 1480 | 1980  | -   | mcd  |
| Luminous Flux                    | φ <sub>v</sub>   | I <sub>F</sub> =20mA | -    | (5.4) | -   | lm   |
| General Color Rendering Index    | R <sub>a</sub>   | I <sub>F</sub> =20mA | -    | 65    | -   | -    |

\*1 In accordance with NIST standard

### Ranking (Condition : I<sub>F</sub>=20mA , T<sub>a</sub>=25C)

| Parameter          | Symbol         | Rank | MIN  | MAX  | Unit |
|--------------------|----------------|------|------|------|------|
| Forward Voltage    | V <sub>F</sub> | Q    | 2.8  | 3.0  | V    |
|                    |                | R    | 3.0  | 3.2  |      |
|                    |                | S    | 3.2  | 3.5  |      |
| Luminous Intensity | I <sub>v</sub> | B    | 1480 | 1681 | mcd  |
|                    |                | C    | 1681 | 2275 |      |
|                    |                | D    | 2275 | 2472 |      |

### Chromaticity coordinates

(Condition : I<sub>F</sub>=20mA , T<sub>c</sub>=25C)

| Color Rank | x     | y     | Color Rank | x     | y     |
|------------|-------|-------|------------|-------|-------|
| NR1        | 0.331 | 0.358 | NR2        | 0.347 | 0.373 |
|            | 0.331 | 0.373 |            | 0.348 | 0.387 |
|            | 0.348 | 0.387 |            | 0.367 | 0.402 |
|            | 0.347 | 0.373 |            | 0.364 | 0.388 |

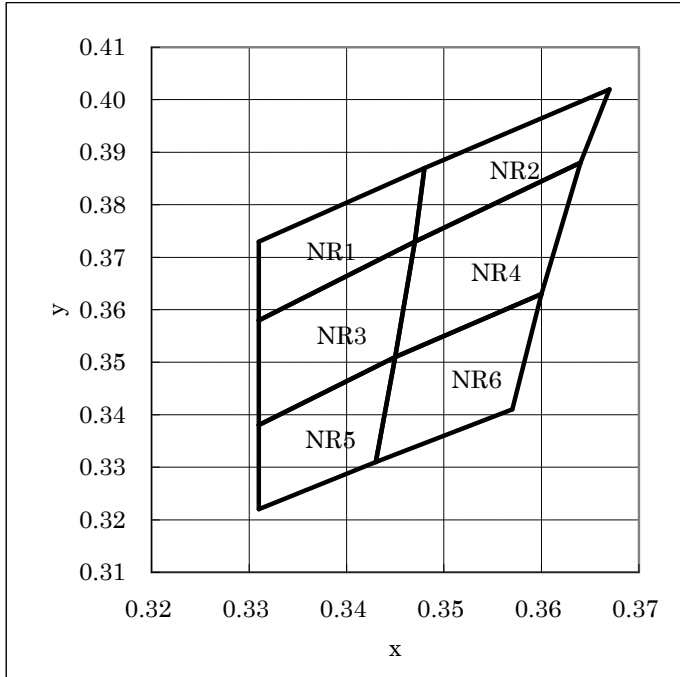
| Color Rank | x     | y     | Color Rank | x     | y     |
|------------|-------|-------|------------|-------|-------|
| NR3        | 0.331 | 0.338 | NR4        | 0.345 | 0.351 |
|            | 0.331 | 0.358 |            | 0.347 | 0.373 |
|            | 0.347 | 0.373 |            | 0.364 | 0.388 |
|            | 0.345 | 0.351 |            | 0.360 | 0.363 |

| Color Rank | x     | y     | Color Rank | x     | y     |
|------------|-------|-------|------------|-------|-------|
| NR5        | 0.331 | 0.322 | NR6        | 0.343 | 0.331 |
|            | 0.331 | 0.338 |            | 0.345 | 0.351 |
|            | 0.345 | 0.351 |            | 0.360 | 0.363 |
|            | 0.343 | 0.331 |            | 0.357 | 0.341 |

Note 1) The tolerance of measurement at our tester is VF±3% , φv±10% , Chromaticity(x,y)±0.01.


Note 2) For handling ,please apply CMOS LSI or equivalent any electrostatic effect.

|          |                        |             |          |                              |       |            |            |
|----------|------------------------|-------------|----------|------------------------------|-------|------------|------------|
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|          |                        |             |          |                              |       | Drawing No |            |
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Rank information

**CUSTOMER:**  
**TYPE:** CL-824-U1N  
**P.NO:**  
**Lot No:** XXXXXX  
**Q'ty:** XXX

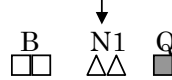


PASS



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e.g. B NR1 Q

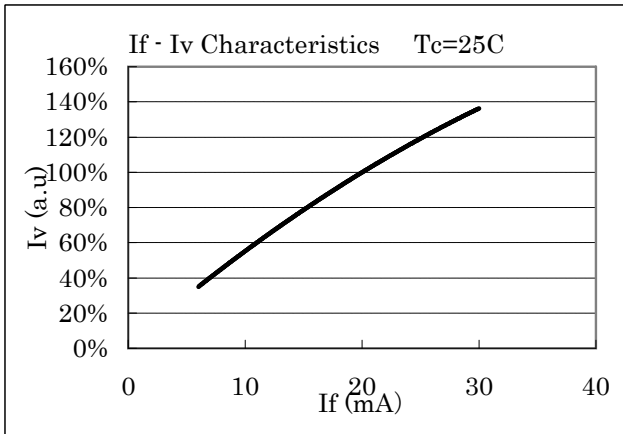


- : Ranking by Luminous Intensity
- △△ : Ranking by Chromaticity coordinates
- : Ranking by Forward Voltage

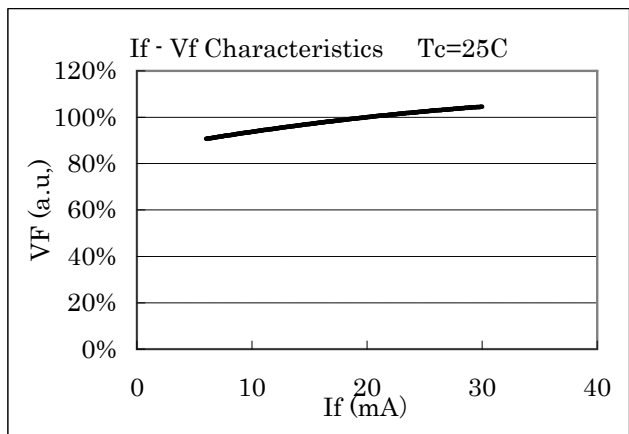
|      |          |                        |                              |         |       |            |            |
|------|----------|------------------------|------------------------------|---------|-------|------------|------------|
|      |          |                        | Approved                     | Checked | Drawn | Symbol     | CITILED    |
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5. Characteristics

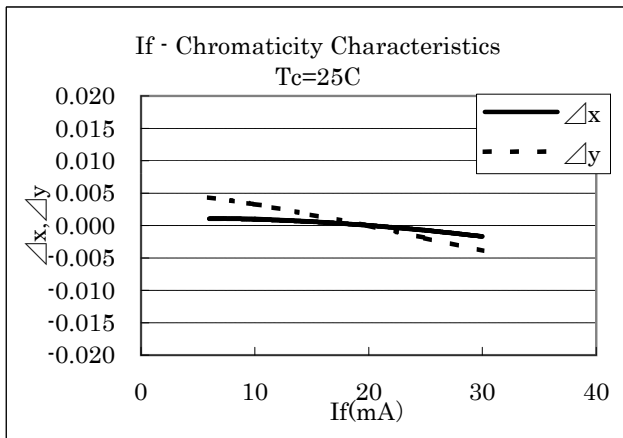
Forward Current vs. Relative Luminous Intensity



Forward Current vs. Forward Voltage



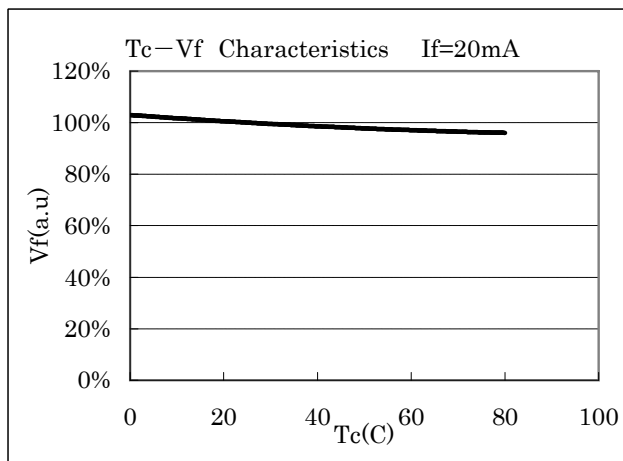
Forward Current vs. Chromaticity Coordinate



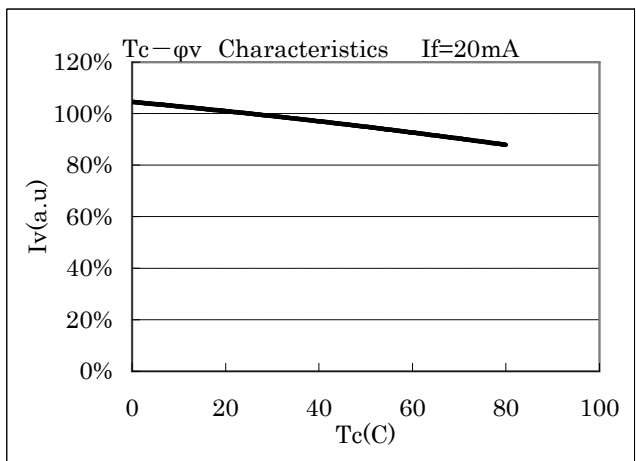
Case Temperature vs. Chromaticity Coordinate



Case Temperature vs. Forward Voltage



Case Temperature vs. Relative Luminous Intensity

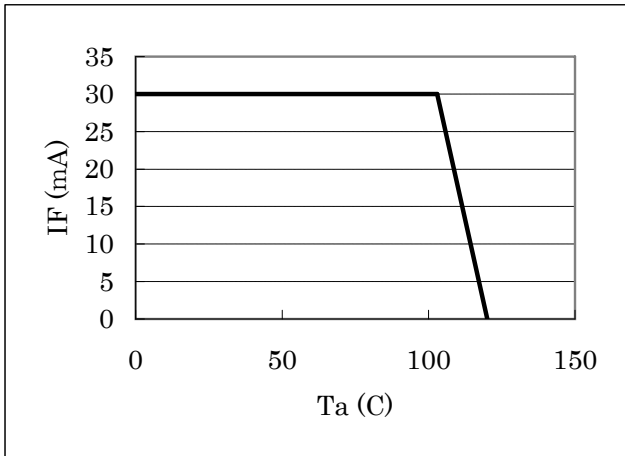


|          |                        |             |          |                              |       |            |            |
|----------|------------------------|-------------|----------|------------------------------|-------|------------|------------|
|          |                        |             | Approved | Checked                      | Drawn | Symbol     | CITILED    |
|          |                        |             |          |                              |       | Name       | CL-824-U1N |
|          |                        |             |          |                              |       | Drawing No |            |
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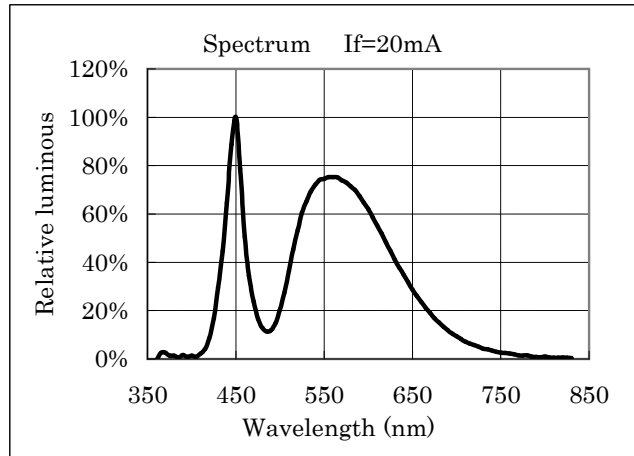
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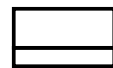
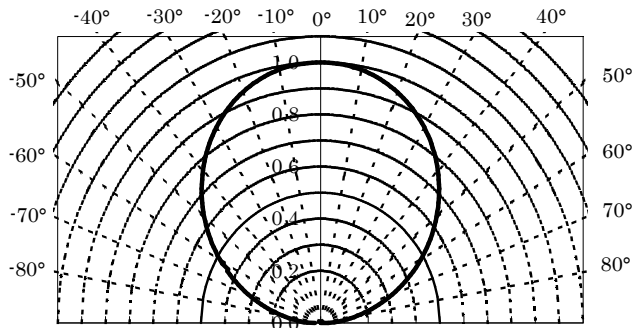
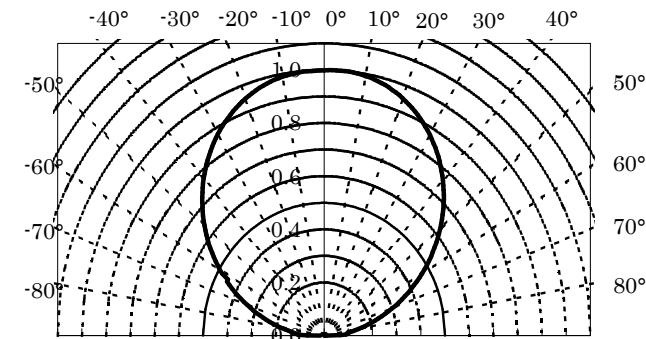
Case Temperature vs. Allowable Forward Current



Spectrum



Directive Characteristic



|          |                        |             |          |                              |       |            |            |
|----------|------------------------|-------------|----------|------------------------------|-------|------------|------------|
|          |                        |             | Approved | Checked                      | Drawn | Symbol     | CITILED    |
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## 6. Reliability

### (1)Details of the tests

| Test Item                         | Test Condition                                                                                                                 |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Life Test in Continuous Operation | 25±3C, I <sub>F</sub> =20 mA , 1000+24/-12hours                                                                                |
| Low Temperature Storage Test      | -40+3/-5C, 1000+24/-12hours                                                                                                    |
| High Temperature Storage Test     | 100+5/-3C, 1000+24/-12hours                                                                                                    |
| Moisture-proof Test               | 60 ±2C, 90 ±5%RH for 1000+24/-12hours                                                                                          |
| Thermal Shock Test                | -40C ,30 minutes and 100C , 30 minutes, 100cycle                                                                               |
| Solder Heat Resistance Test       | Recommended temperature profile (reflow soldering) x 2, (2nd test must be started after the samples are stabilized thermally.) |

### (2)Judgment Criteria of Failure for Reliability Test (Ta=25C)

| Measuring Item     | Symbol         | Measuring Condition  | Judgment Criteria for Failure |
|--------------------|----------------|----------------------|-------------------------------|
| Forward Voltage    | V <sub>F</sub> | I <sub>F</sub> =20mA | >U×1.2                        |
| Reverse Current    | I <sub>R</sub> | V <sub>R</sub> =5V   | >U×2                          |
| Luminous Intensity | I <sub>V</sub> | I <sub>F</sub> =20mA | <Sx0.7                        |

U defines the upper limit of the specified characteristics.S defines the initial value.

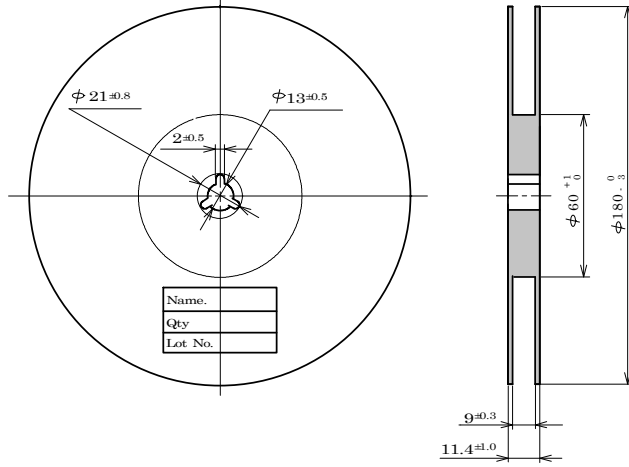
Note: Measurement shall be taken between 2 hours and 24 hours, and the test pieces should be returned to the normal ambient conditions after the completion of each test.

|      |          |                        |          |                              |       |            |            |
|------|----------|------------------------|----------|------------------------------|-------|------------|------------|
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|      |          |                        |          |                              |       | Name       | CL-824-U1N |
|      |          |                        |          |                              |       | Drawing No |            |
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7. Taping Specifications (in accordance with JIS standard)

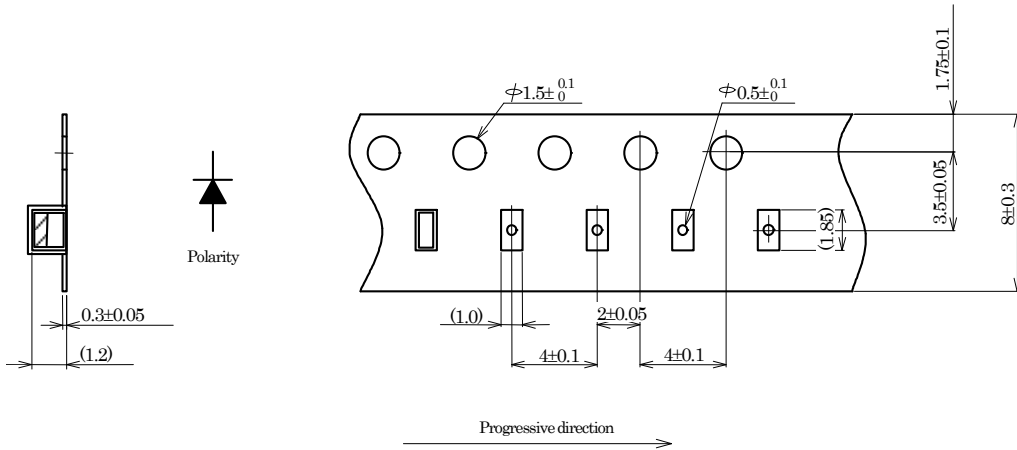
(1) Shape and Dimensions of Reel

(Unit: mm)

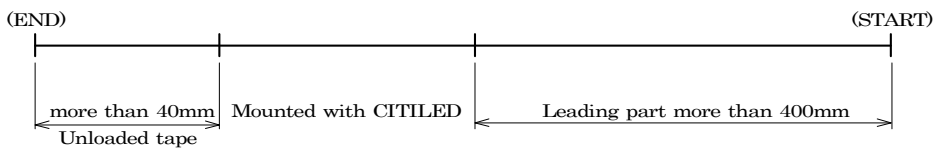


(2) Dimensions of Tape

(Unit: mm)



(3) Configuration of Tape



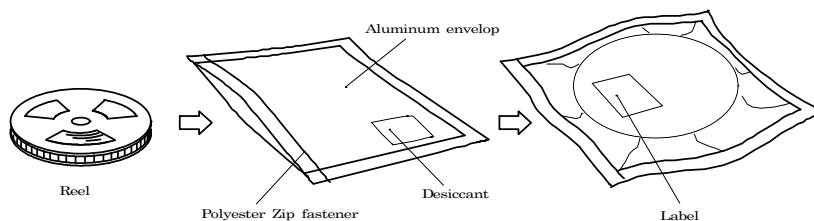
(4) Quantity: 2500pcs/reel

|          |      |                        |          |                              |       |             |            |
|----------|------|------------------------|----------|------------------------------|-------|-------------|------------|
|          |      |                        | Approved | Checked                      | Drawn | Symbol      | CITEDLED   |
|          |      |                        |          |                              |       | Name        | CL-824-U1N |
|          |      |                        |          |                              |       | Drawing No. |            |
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8. Packing Specifications

8-1. Moisture-proof Packing

To prevent moisture absorption during transportation and storage, reels are packed in aluminum envelopes which contain a desiccant with a humidity indicator.



8-2. Storage

To prevent moisture absorption, it is strongly recommended that reels (in bulk or taped) should be stored in the dry box (or the desiccator) with a desiccant as the appropriate storage place. If not, the following is recommended.

Temperature: 5 ~ 30 C  
 Humidity: 60%RH max

The devices should be mounted as soon as possible after unpacking. If you store the unpacked reels, please store them in the dry box or seal them into the envelop again.

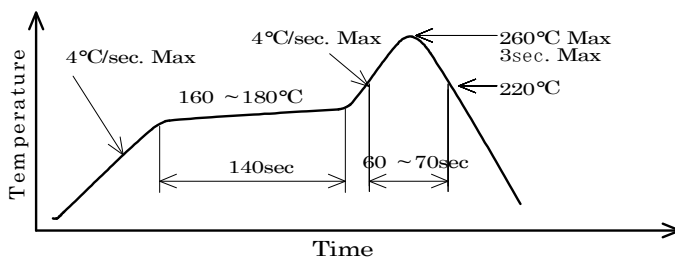
|      |          |                        |                              |         |       |            |            |
|------|----------|------------------------|------------------------------|---------|-------|------------|------------|
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9. Precautions

9-1. Soldering

(1) Lead free solderin

- 1) Following soldering paste is recommended  
 Melting temperature: 216 ~ 220C.  
 Composition: Sn 3.5Ag 0.75Cu
- 2) The temperature profile at the top surface of the parts is recommended as shown below.
- 3) It is requested that products should be handled after their temperature has dropped down to the normal room temperature



9-2. Washing

- (1) When washing after soldering is needed, following conditions are requested.
  - a) Washing solvent: Pure Water
  - b) Temperature, time: 50C or less × 30 seconds max.  
 or 30C or less × 3 minutes max.
  - c) Ultrasonic washing: 300W or less

9-3. Other directions

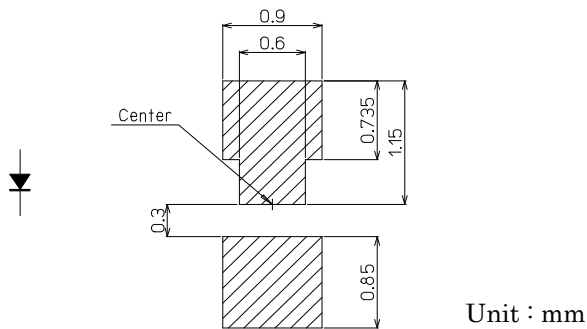
- (1) It is requested to avoid any stress added to the resin portion while it is heated.
- (2) It is requested to avoid any friction by sharp metal nail etc. to the resin portion.

|      |          |                        |                              |         |       |            |            |
|------|----------|------------------------|------------------------------|---------|-------|------------|------------|
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10. Designing precautions

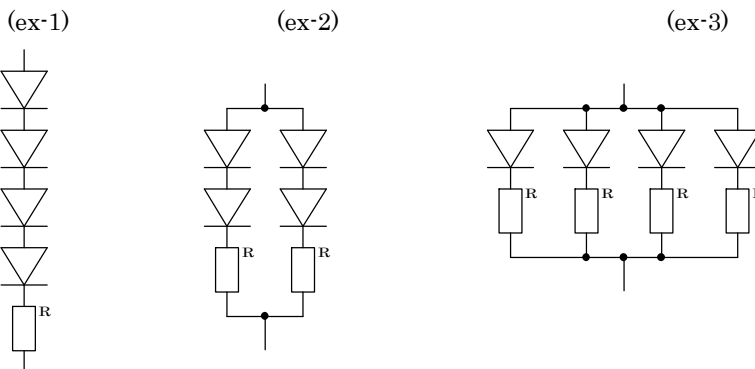
- (1) The current limiting resistor should be placed in the circuit so that is driven within its rating. Also avoid reverse voltage (over-current) applied instantaneously when ON or OFF.
- (2) When pulse driving current is applied, average current consumption should be within the rating. Also avoid reverse voltage applied when put off.
- (3) Recommended soldering pattern

<For reflow soldering>



The above dimensions are not the one which guarantee the performance of mountability. The use of the above pattern is recommended to use after deep study at your site.

- (4) When assembling the circuit board into the finished products, care must be taken to avoid the component parts from touching other parts.
- (5) When using multiple LEDs, it is required to connect a current limiting resistor on each path which the current flows to the LEDs.



- (6) Other
  - 1) This product complies with RoHS directives.
  - 2) When this product is secondarily fabricated such as change in shape, it is not included in our warranty.
  - 3) The agreement of formal product specifications is required prior to mass production.

|          |      |                        |          |                              |       |            |            |
|----------|------|------------------------|----------|------------------------------|-------|------------|------------|
|          |      |                        | Approved | Checked                      | Drawn | Symbol     | CITILED    |
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