

1. Scope of Application

These specifications apply to chip type LED lamp, CITELED, model CL-470S-3WD-D-T.

2. Part code

CL-470S-3 WD-D-T

Series

470S : Mono-color
Thin size

Quantity of dies

Lighting color

WD : High brightness white
Low current

Diffusion

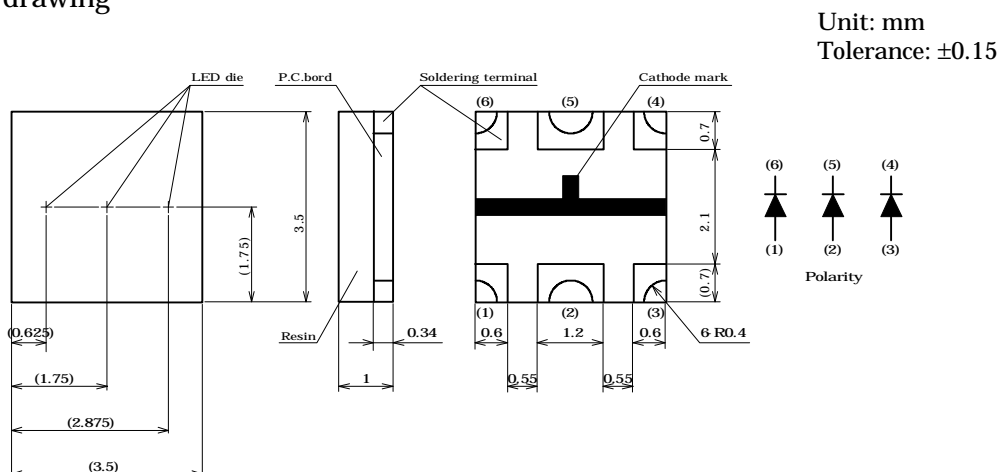
D: Diffused

Shipping mode

Non-coded: Bulk
T: Taping (standard)

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3. Outline drawing



4. Performance

(1) Absolute Maximum Rating (Ta=25°C)

Parameter	Symbol	Rating Value	Unit
Power Dissipation	Pd	78	mW
Forward Current	IF	20	mA
Forward Pulse Current *	IFP	100 *	mA
Reverse Voltage	VR	5	V
Operating Temperature	Top	-25 ~ +80	°C
Storage Temperature	Tst	-30 ~ +85	°C

* Duty ≤ 1/10, Pulse width ≤ 30 msec

Note) The values are based on 1-die performance.

(2) Electro-optical Characteristic (Ta=25°C)

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Forward Voltage *1	VF	IF=20mA	—	3.5	3.9	V
Reverse Current *1	IR	VR=5V	—	—	100	μA
Luminous Intensity *2	IV	IF=20mA	1.28	2.12	—	cd
Chromaticity coordinates *3	x,y	IF=20mA		x(±0.02)	y(±0.02)	
			a	0.27	0.22	
			b	0.27	0.29	
			c	0.35	0.40	
			d	0.35	0.33	

*1 The values are based on 1-die performance.

*2 In accordance with NIST standard

The values are based on 3-dies performance

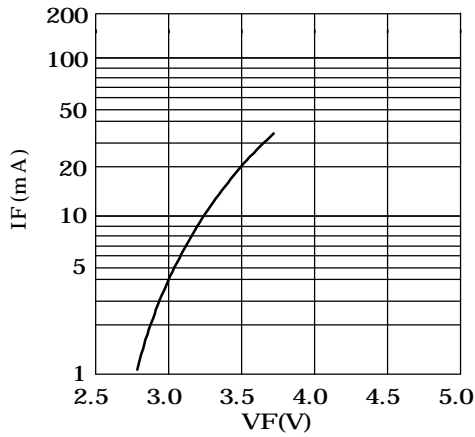
*3 Chromaticity coordinates is the area surrounded with a,b,c,d.

Note 1) For handling, please apply CMOS LSI or equivalent to prevent any electrostatic effect.

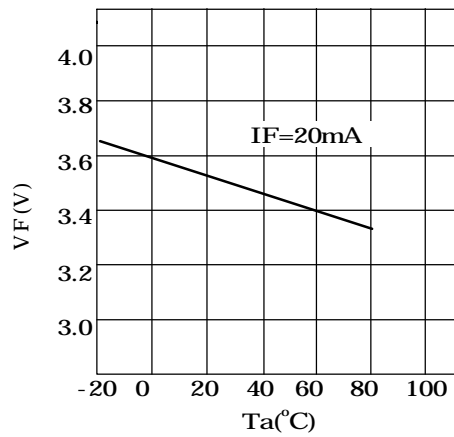
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5. Characteristic

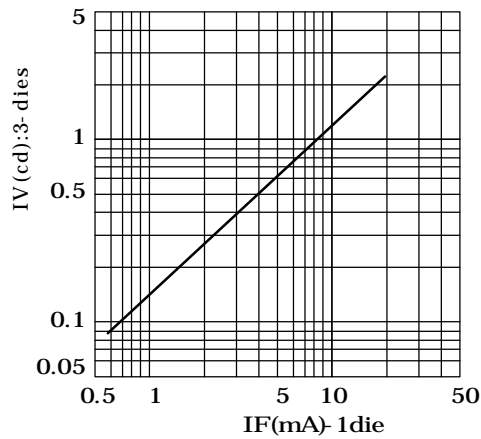
I_F - V_F Characteristics



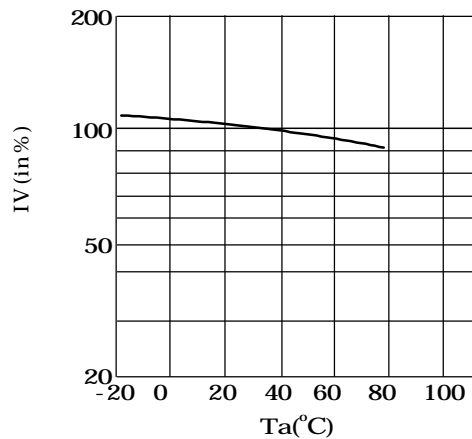
V_F - T_a Characteristics



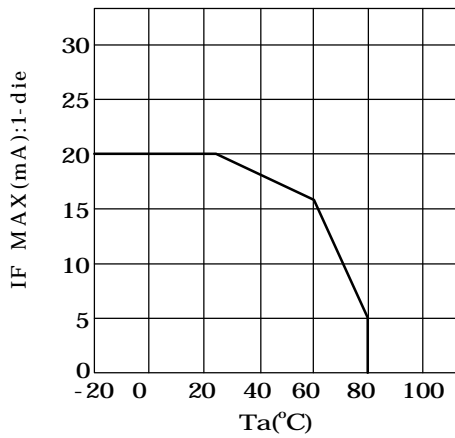
I_V - I_F Characteristics



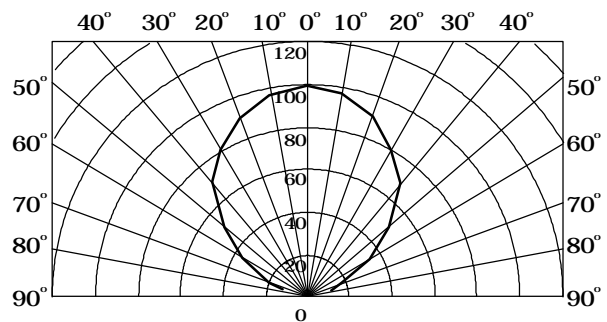
I_V - T_a Characteristics



I_F Max- T_a Characteristics



Directive Characteristics



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6. Reliability

(1) Details of the tests

Test Item	Test Condition
Life Test in Continuous Operation	$25 \pm 3^{\circ}\text{C}$, $I_F = 20 \text{ mA} \times 500^{+24}_{-12}$ hours
Low Temperature Storage Test	$-30^{+3}_{-3} \text{ }^{\circ}\text{C} \times 500^{+24}_{-12}$ hours
High Temperature Storage Test	$85^{+5}_{-3} \text{ }^{\circ}\text{C} \times 500^{+24}_{-12}$ hours
Moisture-proof Test	$60 \pm 2^{\circ}\text{C}$, $90 \pm 5\% \text{RH}$ for 500^{+24}_{-12} hours
Thermal Shock Test	$-30^{\circ}\text{C} \times 30 \text{ minutes} - 85^{\circ}\text{C} \times 30 \text{ minutes}$, 5-cycle
Solder Heat Resistance Test	Recommended temperature profile (reflow soldering) $\times 2$, (2 nd test must be started after the samples are stabilized thermally.)

(2) Judgment Criteria of Failure for Reliability Test

Measuring Item	Symbol	Measuring Condition	Judgement Criteria for Failure
Forward Voltage	V_F	$I_F = 20 \text{ mA}$	$>U \times 1.2$
Reverse Current	I_R	$V_R = 5 \text{ V}$	$>U \times 2$
Luminous Intensity	I_V	$I_F = 20 \text{ mA}$	$<S \times 0.5$

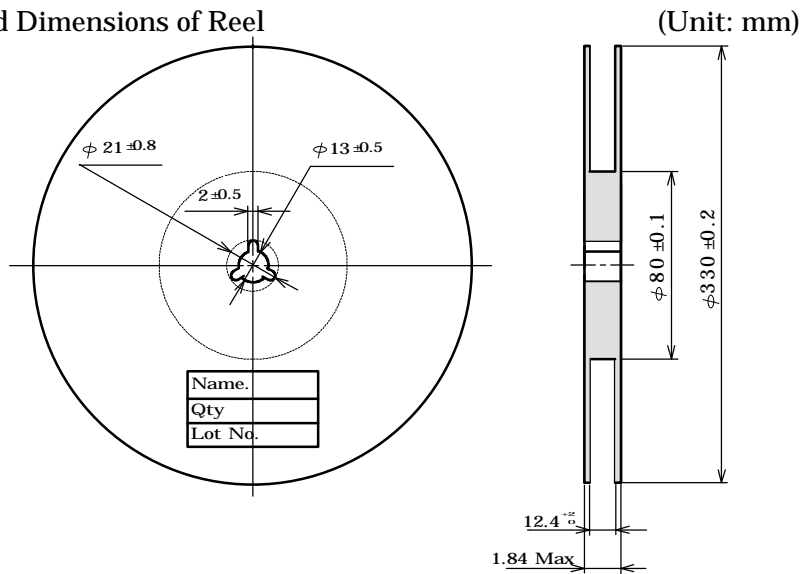
U means the upper limit of the specified characteristics. S means the initial value.

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

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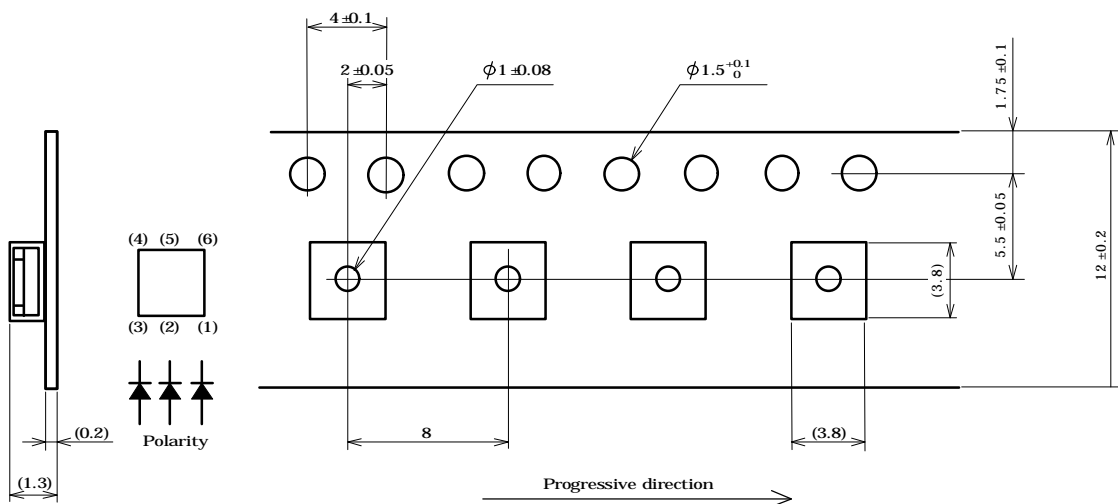
7. Taping Specifications (in accordance with JIS standard)

(1) Shape and Dimensions of Reel

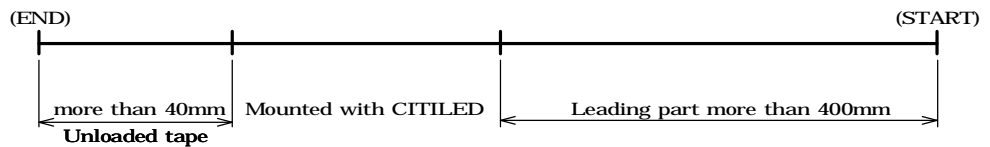


(2) Dimensions of Tape

(Unit: mm)



(3) Configuration of Tape



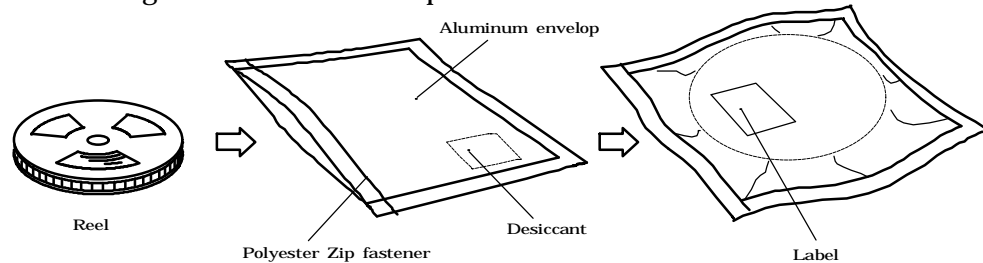
(4) Quantity: 5,000pcs/reel

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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. The indicator changes color from blue to pink as moisture is absorbed.



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.

8-3. Baking

If the devices have been stored over 6 months or unpacked over 7 days, it should be baked under the following conditions.

Baking conditions: 60°C × 12 hours or more (reeled one)
 100°C × 45 minutes or more (loose one)
 150°C × 15 minutes or more (loose one)

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9. Precautions

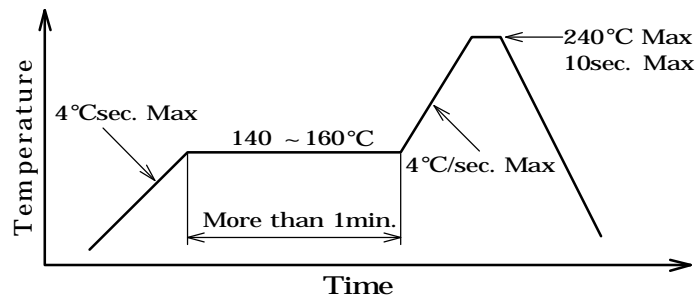
9-1. Soldering

(1) Manual soldering

- 1) Use 6/4 solder or solder containing silver (Ag)
- 2) Before soldering every time, make baking to units. By manual soldering, it is the possibility of crack due to the moisture absorption in the resin portion.
- 3) Use a soldering iron of 25W or smaller. Adjust the temperature of the soldering iron below 300°C.
- 4) Force or stress must not be applied to the resin portion while soldering.
- 5) Finish soldering within 3 seconds.
- 6) Handle the devices only after temperature is cooled down.

(2) Reflow soldering

- 1) Following soldering paste is recommended
 Melting temperature: 178 ~ 192°C.
 Composition: Sn 63 %, Pb 37 %
- 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.



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9-2. Washing

(1) When washing after soldering is needed, following conditions are requested.

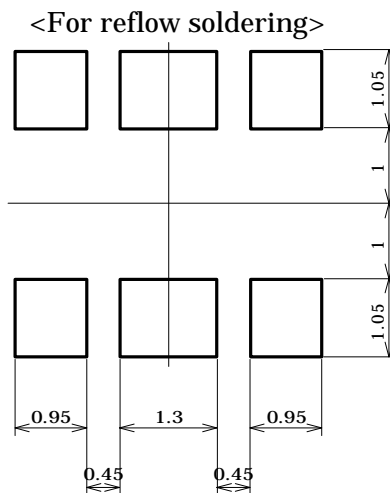
- a) Washing solvent: AK-225 Alcohol
- b) Temperature, time: 50°C or less × 30 seconds max.
or 30°C or less × 3 minutes max.
- c) Ultrasonic washing: 300W or less

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.

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



Unit : mm

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.

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