1. Scope of Application

This data sheet is applied to the LED package, model CLL030-1212A1-50KL1A1.

2. Part code

CLL 030 - 12 12 A1 - 50 K L1 A1
[1] [2] [3] [4] [5] [6]

[1] Part Code

[2] Dies in series quantity

[3] Dies in parallel quantity

[4] Correlated color temperature

[5] Chromaticity range
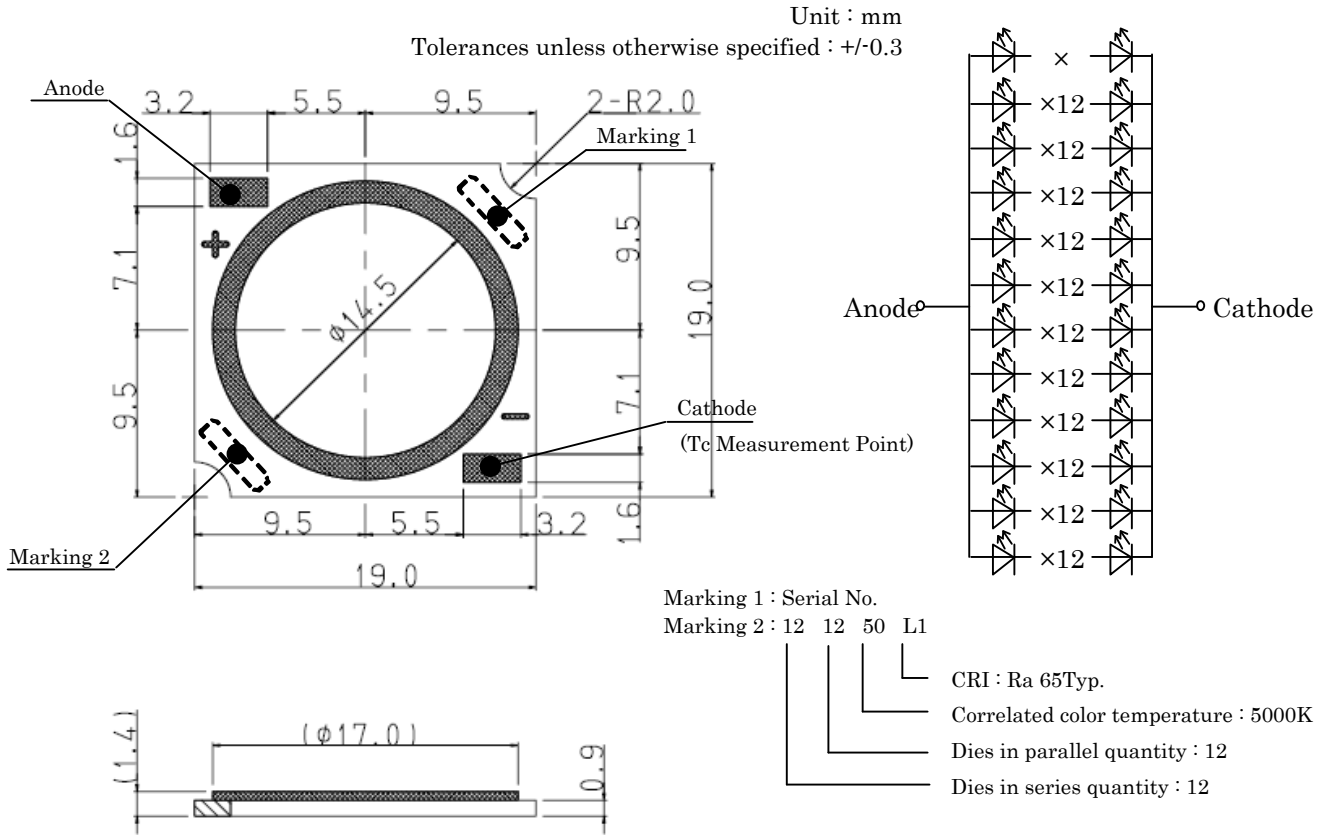
[6] CRI

< Features >

- External Dimensions: 19.0×19.0×1.4 mm
- Internal Structure: Aluminum Base Chip on Board
- Connection to Heat Sink: By M3 screw (Recommended)

- Luminous Flux: 3235 lm @ 720 mA
- CCT: 5000 K
- CRI: Ra 65 typ.
- Thermal Resistance: 0.8 C/W

- RoHS Compliant
- IEC62031 / Edition 1.0 / 2008 // LED modules for general lighting - Safety specifications Compliant
- IEC62471 / First Edition / 2006-07 // Photobiological safety of lamps and lamp systems / Exempt level
- IES LM-80

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3. Outline drawing - Marking

Unit : mm
Tolerances unless otherwise specified : +/-0.3

Anode

3.2 5.5 9.5 2-R2.0

Marking 1

Φ14.5

Anode ○————— —————○ Cathode

Cathode
(Tc Measurement Point)

Marking 2

9.5 5.5 3.2

19.0

(Φ17.0)

Marking 1 : Serial No.
Marking 2 : 12 12 50 L1

CRI : Ra 65Typ.
Correlated color temperature : 5000K
Dies in parallel quantity : 12
Dies in series quantity : 12

4. Performance

(1) Absolute Maximum Rating

Parameter	Symbol	Rating Value	Unit	
Input Power	Pi	64.2	W	*1
Forward Current	I_F	1440	mA	*1
Reverse Current	I_R	1	mA	
Operating Temperature	T_{op}	-30 ~ +85	C	
Storage Temperature	T_{st}	-40 ~ +100	C	
Case Temperature	Tc	100	C	*2
Junction Temperature	Tj	150	C	*3

*1 Input power and forward current are the values when the LED is used within the range of
   the derating curve in this data sheet.
*2 Refer to 3. Outline drawing for Tc measurement point
*3 D.C. Current : Tj = Tc + Rj-c X Pi

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DATA SHEET

(2) Electro-optical Characteristics   Tc=25C

Parameter	Symbol	Condition	Min.	Typ.	Max	Unit
Forward Voltage	V_F	I_F=720mA	33.6	36.6	39.9	V
Luminous Flux	Φv	I_F=720mA	2750	3235	-	lm
CRI	Ra	I_F=720mA	-	65	-	-
Thermal Resistance	Rj-c	Junction-Case	-	0.8	-	C/W

Chromaticity coordinates (Condition : IF=720mA, Tc = 25C)

	x	y
Center	0.3473	0.3717
a	0.3572	0.3919
b	0.3397	0.3775
c	0.3387	0.3528
d	0.3536	0.3646

x-y chart-CIE1931
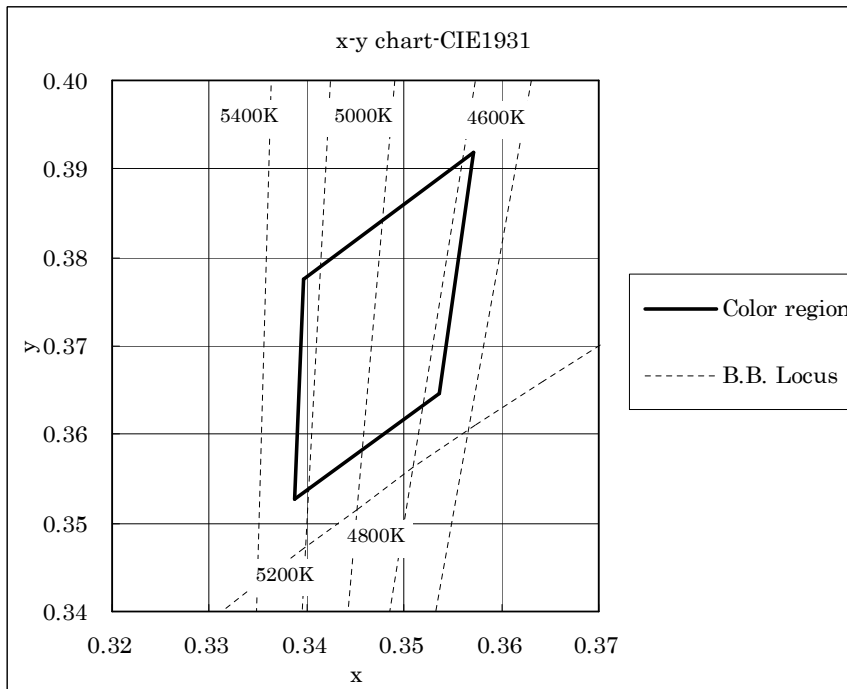
Note: The tolerance of measurement at our tester is V_F+/-3% , Φv+/-10% , Chromaticity(x,y)+/-0.005 and Ra+/-1.

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5. Characteristics

Forward Current vs. Forward Voltage

Tc=25C
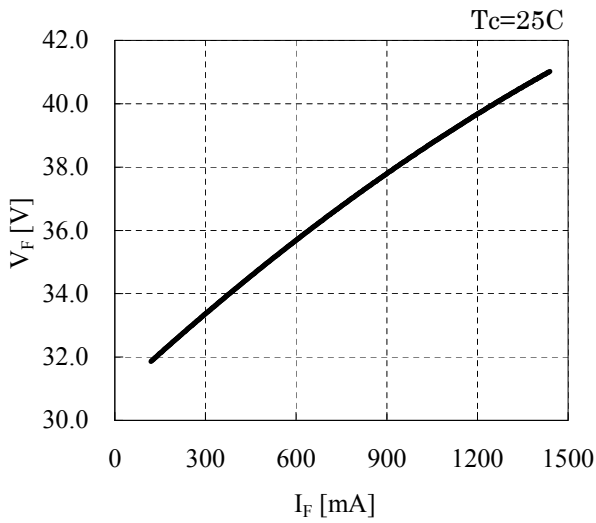
Forward Current vs. Relative Luminous Flux

Tc=25C
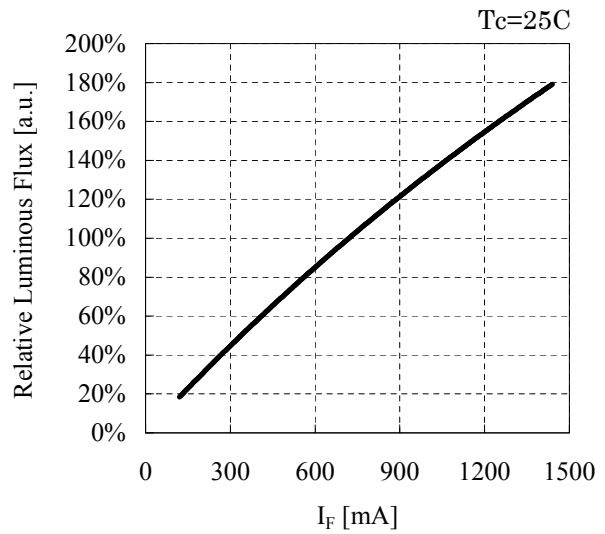
Forward Current vs. Chromaticity Coordinate

Tc=25C

Δx
Δy
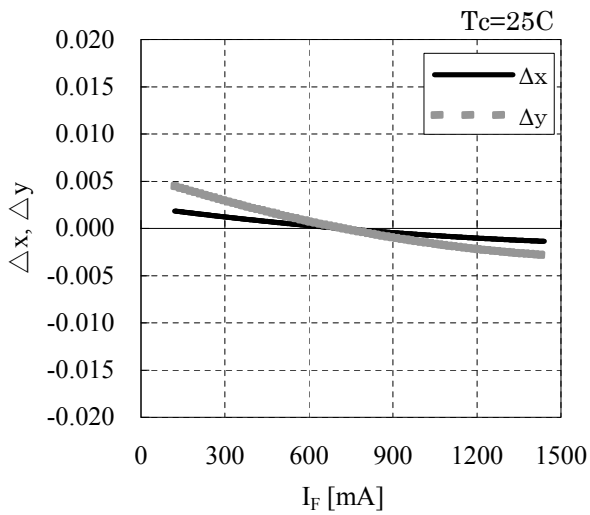
Case Temperature vs. Chromaticity Coordinate

I_F=720mA

Δx
Δy
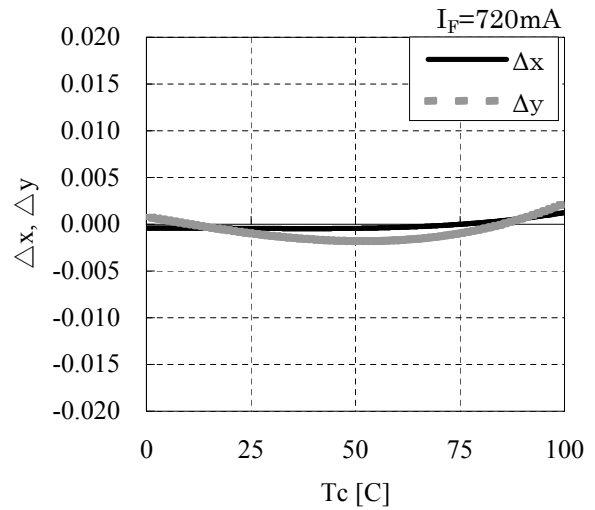
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Case Temperature vs. Forward Voltage

I_F=720mA

Y-axis: V_F [V] (33.0 to 39.0)
X-axis: Tc [C] (0 to 100)
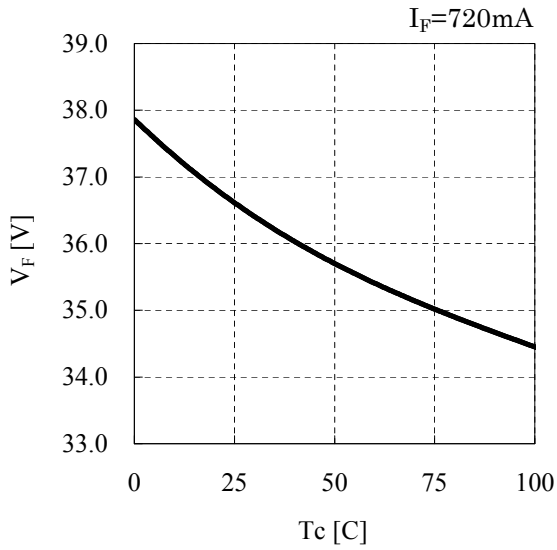
Case Temperature vs. Relative Luminous Flux

I_F=720mA

Y-axis: Relative Luminous Flux [a.u.] (0% to 120%)
X-axis: Tc [C] (0 to 100)
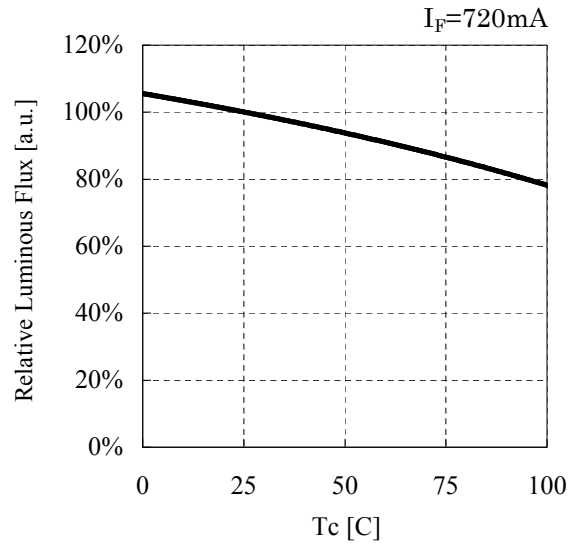
Case Temperature vs. Allowable Forward Current

Y-axis: I_F [mA] (0 to 1500)
X-axis: Tc [C] (0 to 125)

Spectrum

Tc=25C I_F=720mA

Y-axis: Relative Emission Intensity [a.u.] (0% to 120%)
X-axis: λ [nm] (350 to 850)
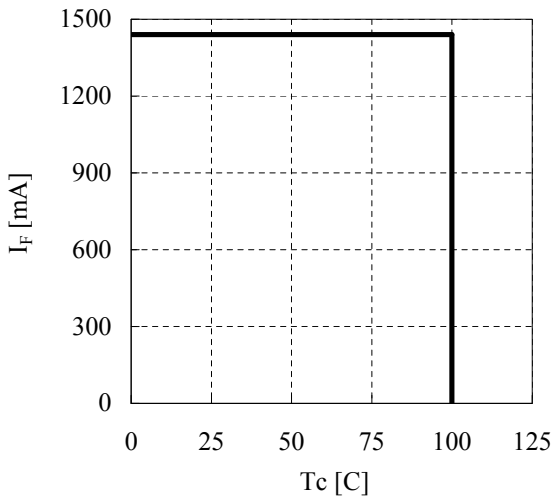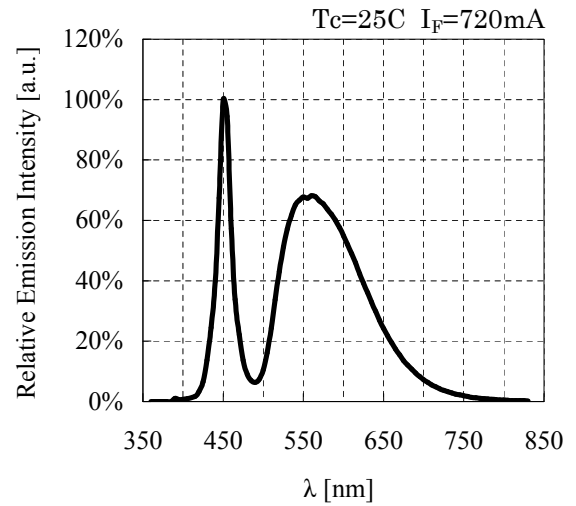
Directive Characteristic

-40° -30° -20° -10°   10° 20° 30° 40°
-50°   50°
-60°   60°
-70°   70°
-80°   80°
-90°   90°

100% 80% 60% 40% 20% 0%

—— X direction
···· Y direction

Y
X
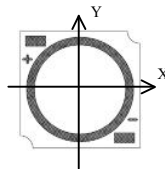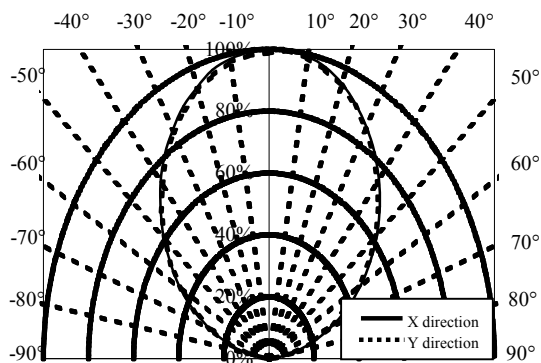
Symbol	CITILED
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6. Reliability

（1）Datails of the tests

Test Item	Test Condition
Continuous Operation Test	Ta=25 C, I_F=720mA× 1000 hours(with Al-fin)
	I_{Fmax}=1440 mA Tjmax=150C× 1000 hours(with Al-fin)
Low Temperature Storage Test	-40 C × 1000 hours
High Temperature Storage Test	100 C × 1000 hours
Moisture-proof Test	85 C, 85 %RH for 500 hours
Thermal Shock Test	-40 C × 30 minutes – 100 C × 30 minutes, 100 cycle

(2)Judgement Criteria of Failure for Reliability Test

(Ta=25C)

Measuring Item	Symbol	Measuring Condition	Judgement Criteria for Failure
Forward Voltage	VF	I_F=720mA	>U X 1.1
Total Luminous Flux	Φv	I_F=720mA	<S X 0.85

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 return to the normal ambient conditions after the completion of each test.

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7. Packing Specifications

(1) Packing

An empty tray is placed on top of a six-tier tray which contain 48 pieces each. The set of seven trays is banded together with two rubber bands.
(Smallest packing unit: 288 pieces)
 A label with product name, quantity, lot number is placed on the upper empty tray.

Tray (Dimensions: 310 × 210 × 12 mm / Materials: Electrically conductive PS)

< Packing figure >
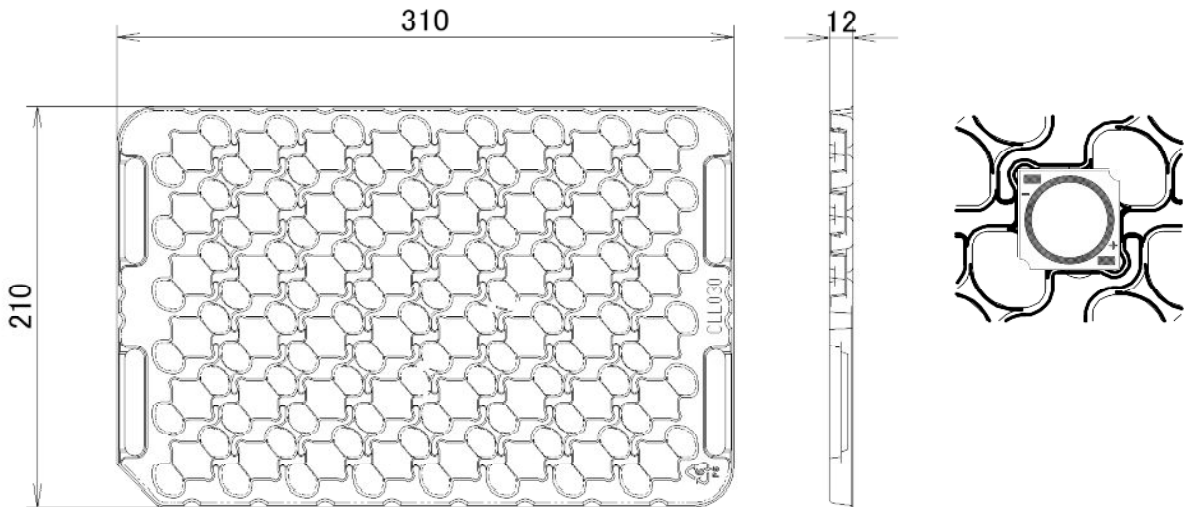
Product 48pcs/tray

< Example of indication label >

CUSTOMER
 TYPE : CLL030-******-*******-(1)
 P. NO : ******   ---(2)
 Lot No: *******   ---(3)
 Q'ty   : ***   ---(4)
                                        PASS

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1. TYPE   e.g. CLL030-1212A1-50KL1A1
2. P.No. (Cutomer's P/N)   e.g. 50008-010-1203303M1
3. Lot No.
  - First and second letter: Last digit of the year   e.g. 11 : year 2011
  - Third letter: Production month   e.g. 8 : August
    Note: October, November and December are designated
  - Forth letter: CE's control number   e.g. 5035
4. Quantity

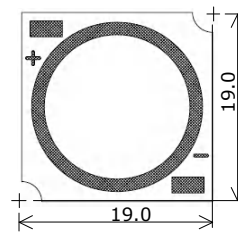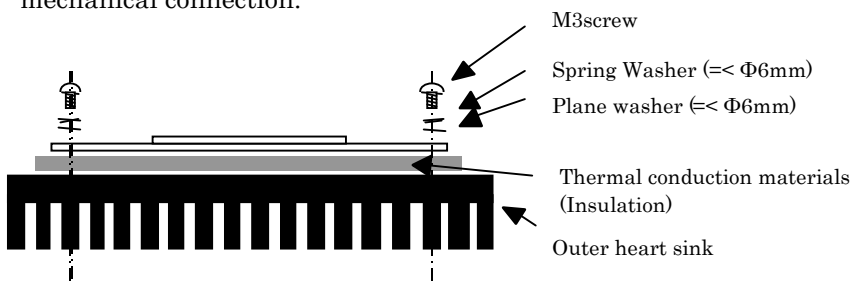| Symbol	CITILED
Name	CLL030-1212A1-50KL1A1
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8. Precautions

1. Avoid the application of any stress to the resin portion.
2. Avoid any contact by a sharp metal nail or other materials with the resin portion.
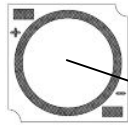
Resin portion (including white resin)

3. Precautions for product assembly
-When the LED package is attached to the heat sink by M3 screws, please be careful not to apply
 too much stress to the LED package. For example, fix the screws firmly after temporarily fixing them.
-Attachment to heat sink conditions such as tightening torque for screws should be optimized in accordance
  with the specifications for heat sinks. In addition, asperity or burrs harms the thermal connection between
  the LED package and heat sink. So please ensure correct contact to keep both thermal and
  mechanical connection.

M3screw

Spring Washer (=< Φ6mm)
Plane washer (=< Φ6mm)

Thermal conduction materials
(Insulation)

Outer heart sink

19.0

19.0

Recommended installation screw pitch

4. Insulation of the thermal section from the heat sink section of the LED has been confirmed
   up to 500V. However, for voltages higher than 500V, the customer should confirm the level of insulation
   themselves or contact Citizen Electronics. With regard to insulation after this product has been
   assembled in an apparatus, preventive action should be carried out by the customer.
5. For fixing this product to the outer heat sink, heat grease should be applied to the whole rear
   deformation when conducting the clamping operation with heat grease in sheet form.
6. Handling of static electricity
 - These products are sensitive to static electricity charge.
   Please take measures to prevent any static electricity being produced such as the wearing of a
   wristband or anti-static gloves when handling this product.
 - All devices, equipment and machinery must be properly grounded. It is recommended that precautions
   be taken against surge voltage to the equipment that mounts the LEDs.
 - ESD sensitivity of this product is 1000V (HBM, based on JEITA ED-4701/304).
 - When inspecting the final products in which LEDs were assembled, it is recommended to check
    whether the assembled LEDs are damaged by static electricity or not.
 - It is easy to find static-damaged LEDs by a light-on test.

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8. Precautions (continued)

7. Lighting at a low current
  A minimum current value of lighting of all dice is 60mA.
  When a minimum current is applied, LED dice may look different in their brightness due to
  the individual difference of the LED element, and it is not a failed product.

8. Please be aware that this product should not come into contact with any other parts
    in assembled status.

9. Drive circuit
 - A constant current circuit is recommended as a drive circuit.
   And when two or more LED packages are connected, the series connection
   between each package is recommended.
 - Please design a circuit that prevents any reverse voltage (excess current) from being
   applied to this product instantaneously when the circuit is ON or OFF.

10. Heat generation
 - As this product is designed with consideration of the heat release property of module,
    a heat release design is required to use this product efficiently.
    Please ensure that heat generation is not in excess of the absolute maximum rating.
    (Refer to 4-1 Performance)
 - Factors responsible for an increase in temperature include heat generation attributed to
    ambient temperature conditions or power dissipation. Thus, drive conditions should be
    taken into consideration, depending on ambient temperature (Ta).

11. Recommended soldering condition (This product is not adaptable to reflow process)
 - Manual soldering
  - Soldering shall be implemented using a soldering bit of 40W or less with a temperature
    350°C or less within 3.5 seconds for one land.
    (Recommended condition in a case of lead-free solder condition)
  - No external force shall be applied to resin part during soldering.
  - Next process of soldering should be carried out after the product has returned to ambient temperature.
 - For soldering correction
  - Regarding soldering correction, above conditions shall be used.
  - Contacts number of soldering bit should be within twice for each terminal as a correction.

* Citizen Electronics cannot guarantee if usage exceeds this recommended conditions.
  Please use it after sufficient verification is carried out on your own risk if necessary.

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8. Precautions (continued)

12. Eye Safety
- The International Electrical Commission (IEC) published in 2006 IEC 62471
  "2006 Photobiological safety oflamps and lamp systems" which includes LEDs within its scope.
  When sorting single LEDs according to IEC 62471, most white LEDs can be classified as belonging to
  either Exempt Group or Risk Group 1.
- However, Optical characteristics of LEDs such as radiant flux, spectrum and light distribution are factors
  that affect the risk group determination of the LED, and especially a high-power LED,
  that emits light containing blue wavelengths, may have properties equivalent to those of Risk Group 2.
- Great care should be taken when directly viewing an LED that is driven at high current,
  has multiple uses as a module or when focusing the light with optical instruments,
  as these actions may greatly increase the hazard to your eyes.
- It is recommended to regard the evaluation of stand-alone LED packages as a reference and to evaluate
  the customer's final product.

13. The use of Class 2 power supply is assumed for this product.

14. If the product might to be used under the following conditions, the customer must evaluate
    its approproateness them. This product is not designed for use under the following conditions.
    in places where the product might:
    - get wet due to rain
    - suffer from damage caused by salt.
    - be exposed to corrosive gas such as Cl, H2S, NH3, SO2, Nox and so on.
    - be exposed to dust, fluid or oil.

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9. Precautions with regard to product use

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