DATA SHEET

CITILED Standard CL-A131 Series

Mono-color Type

CL-A131-1W4-A1-T

CITILED
The Light Engine

CONTENTS

CITIZEN ELECTRONICS CO., LTD.
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1. Scope of Application

These specifications apply to chip type LED lamp, CITILED, model CL-A131-1W4-A1-T

2. Part code

Product Nomenclature

CL - A131 - 1W4 - A1 - T
[1] [2] [3] [4]

[1]	Series	: A131	Mono-color
[2]	Lighting color	: 1W4	1 : Quantity of dies W4 : High brightness white
[3]	Wide color gamut	: A1	Specification
[4]	Shipping mode	: T	Taping (standard)

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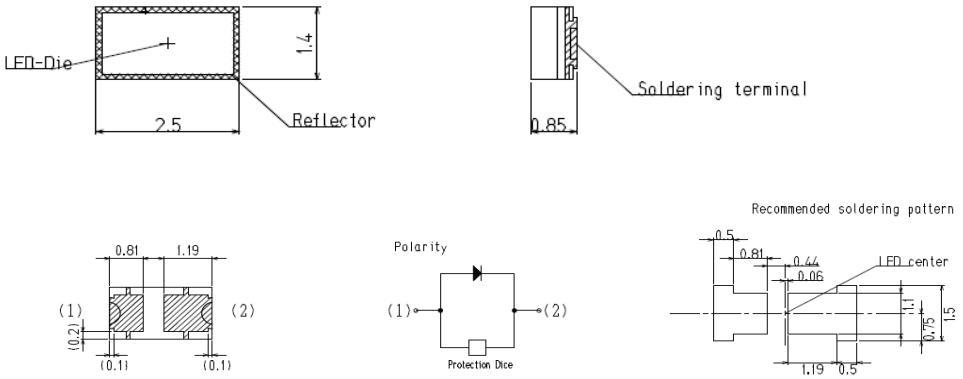
3. Outline drawing and marking descriptions

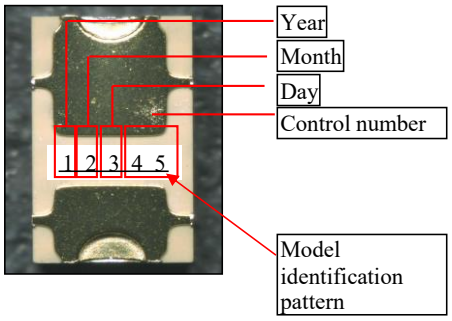
3-1. Outline drawing

Unit : mm
Tolerance : ±0.1



※ Dimensions in parentheses are reference values.
Any resin unevenness than has no effects on optical characteristics can be used without any quality problem.

3-2. Marking



[Year/Month]
Year 2024: Q, Year 2025: R, Year 2026: S ・・・
January: 1, ・・・September: 9, October: X, November: Y,
December: Z
[Day]
Production starting date
Day 1 : 1, Day 2 : 2, ・・・Day 9 : 9, Day 10 : A, Day 11 : B,
[Control number]
Serial number
[Model identification pattern]
1W4 A1: line is given over the marking numbers

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4. Performance

4-1. Absolute Maximum Rating

Parameter	Symbol	Rating	Rating
Power Dissipation	P_d	345	mW
Forward Current	I_F	100	mA
Forward Pulse Current	I_{FP}	200	mA
Reverse Current	I_R	90	mA
Junction Temperature	T_j	140	℃
Operating Temperature	T_{OP}	-40 ～ +100	℃
Storage Temperature	T_{ST}	-40 ～ +105	℃

* Duty ＜ 1/10, Pulse width ＜ 0.1 msec

4-2. Electro-optical Characteristic

(Ta=25℃)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F=10mA	2.40	2.70	3.00	V
Luminous Intensity	I_V	I_F=10mA	1210	1520	1830	mcd
Total Luminous Flux	Φ_V	I_F=10mA	—	(4.27)	—	lm
Chromaticity coordinates	x	I_F=10mA	—	0.331	—	
	y	I_F=10mA	—	0.319	—	

Note 1) The measurement tolerance of forward voltage is ±3% at our tester.
Note 2) In accordance with NIST standard.
The measurement tolerance of luminous intensity is ±10%.
Note 3) Based on the CIE1931 chromaticity chart.
The measurement tolerance of chromaticity is ±0.01.
Note 4) Both total luminous flux and chromaticity are not guarantee values but reference values.
Adherence to CIE-127 2007
Note 5) For order quantity, the delivery ratio of rank-classified products is not taken into consideration.

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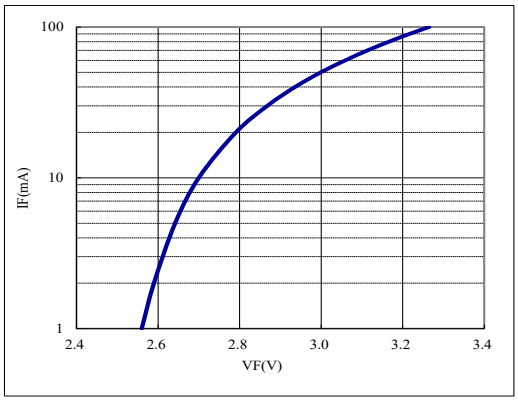
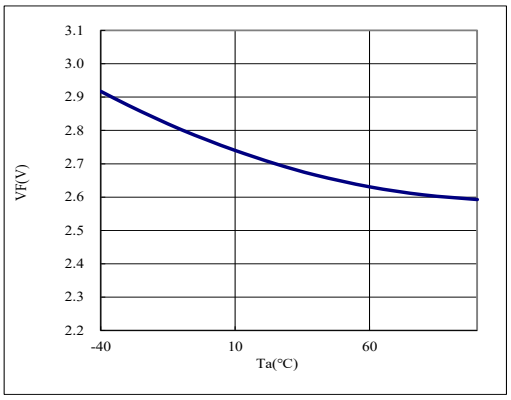
5. Characteristic (Typical characteristics)

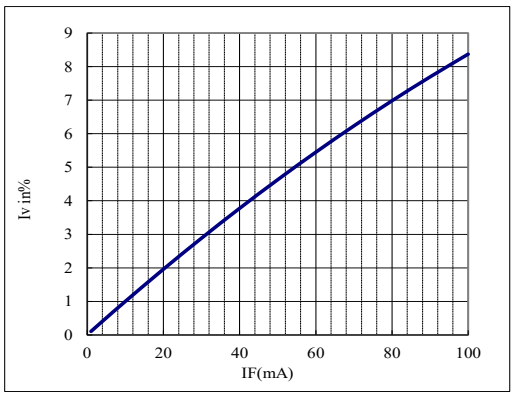
◆ IF-VF Characteristics



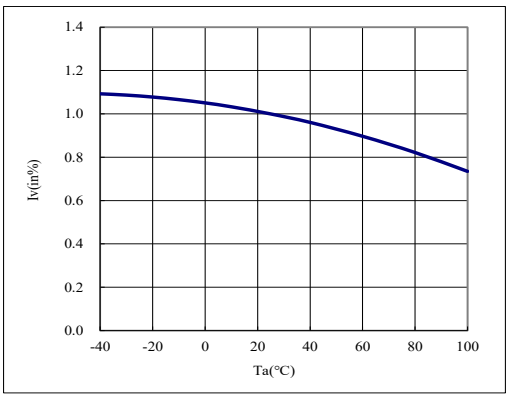
◆ VF-Ta Characteristics



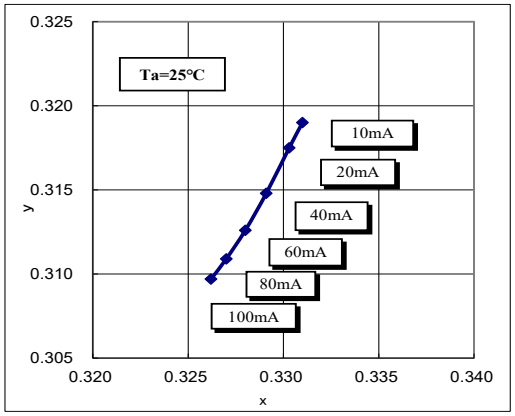
◆ IV-IF Characteristics



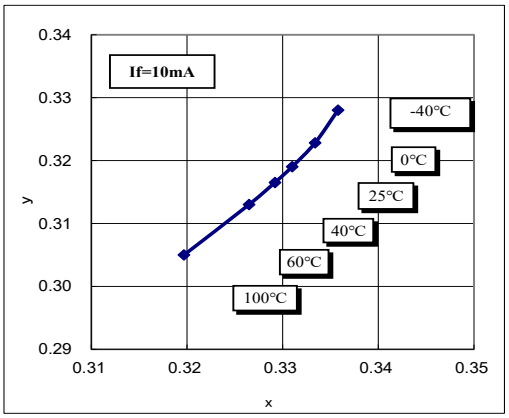
◆ IV-Ta Characteristics



◆ IF - Chromaticity characteristics



◆Ta - Chromaticity characteristics



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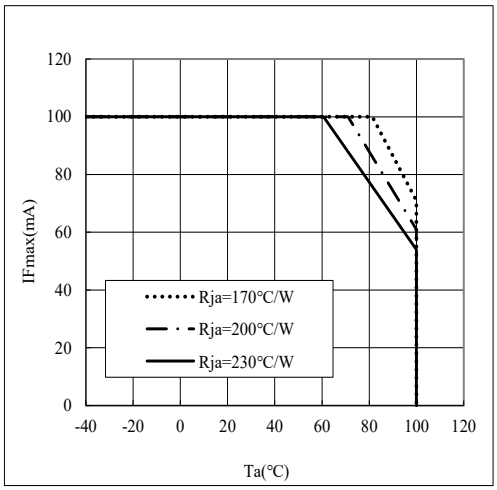
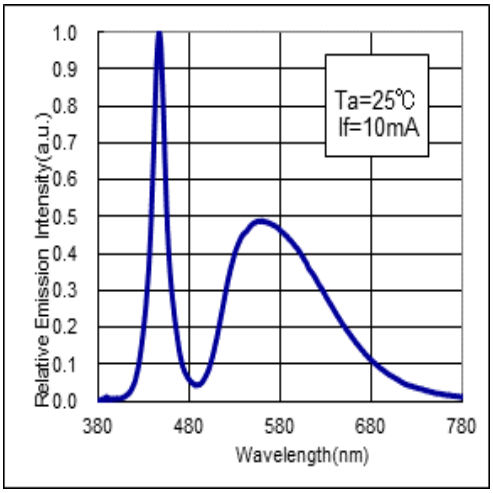
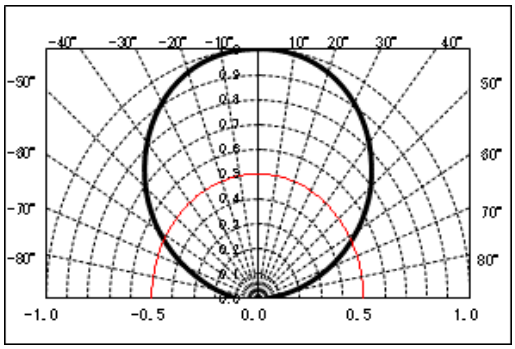
◆ IF-Max Ta Characteristics

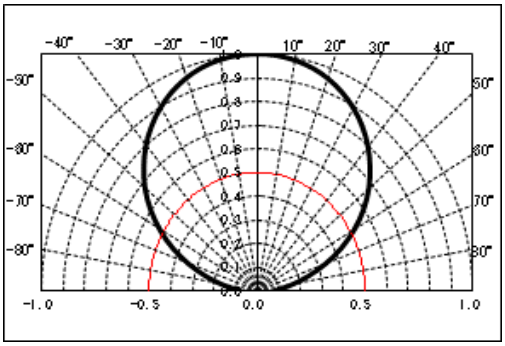


◆Spectral Distribution



◆ Directive Characteristics





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6. Reliability

6-1. Details of the tests

Test Item	Test Condition	Time
Life Test in Continuous Operation	Ta=25±3°C, IF=100mA	1000^{+24}_{-12} H
High Temperature Storage Test	Ta=115$^{+5}_{-3}$ ℃	1000^{+24}_{-12} H
Low Temperature Storage Test	Ta=40$^{+5}_{-3}$ ℃	1000^{+24}_{-12} H
Wet and Hot temperature Operating Test	Ta=60±2°C 95±5%RH	1000^{+24}_{-12} H
Temperature Cycle	Ta=-40℃×30minutes-Ta=100℃×30minutes	100cycle
Solder Heat Resistance Test	Recommended temperature profile (reflow soldering) (2nd test must be started after the samples are stabilized thermally.)	2times
Static breaking test	HBM R=1.5kΩ, C=100pF, Test Voltage=2kV R=0Ω, C=200pF, Test Voltage=200V	Three times for each of forward and reverse voltage

* The above reliability tests are performed with our standard testing board
(Material: FR-4 / Thickness: 1.2mm) Thermal resistance of the LED is checked with our standard reliability testing board: Rja≒ 140 °C/W
Rja (Thermal resistance between die's junction and ambient air)

6-2. Judgment Criteria of Failure for Reliability Test

Measuring Item	Symbol	Measuring Condition	Failure Criteria
Forward Voltage	Vf	I_F=10mA	>U × 1.2
Luminous Intensity	I_V	I_F=10mA	<S × 0.5

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

Note: With a lighting-up sample visually confirmed in the tests, the above items are checked atambient temperature between two and 24 hours after completion of each test.

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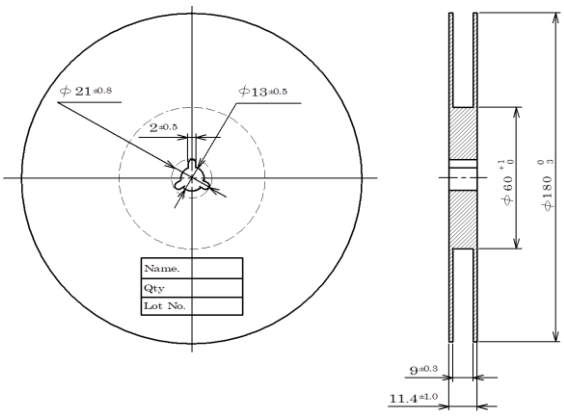
7. Taping Specifications (in accordance with JIS standard)

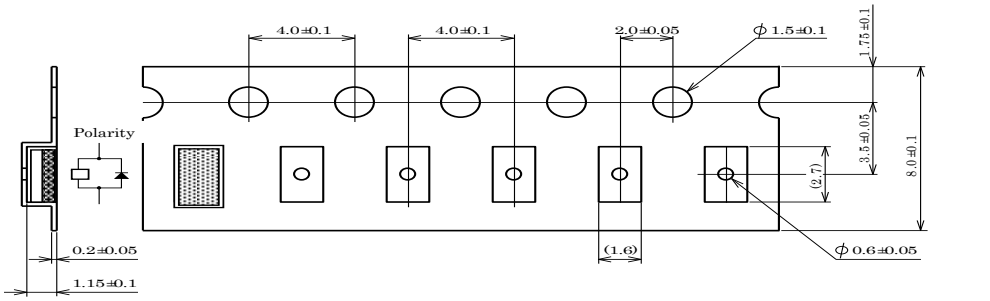
7-1. Shape and Dimensions of Reel

(Unit: mm)



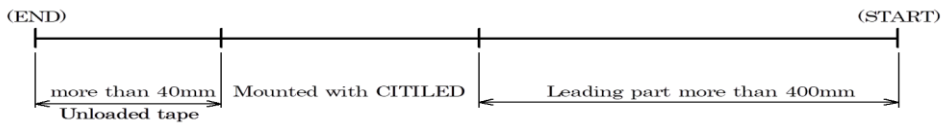
7-2. Dimensions of Tape

Unit : mm



※ Dimensions in parentheses are reference values.

7-3. Configuration of Tape



7-4. Quantity:3,000 pcs/reel

Please note that the quantity can be a fraction of a 100-piece basis depending on rank.
(Minimum quantity: 100 pieces)

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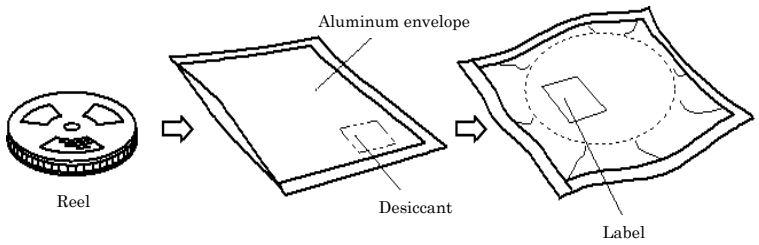
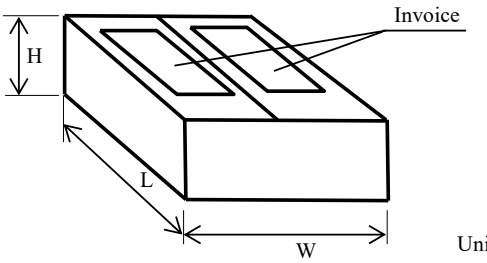
8. Packing Specifications

8-1. Moisture-proof Packing

To prevent moisture absorption during transportation and storage, reels are packed in aluminum envelopes.



8-2. Packing figure



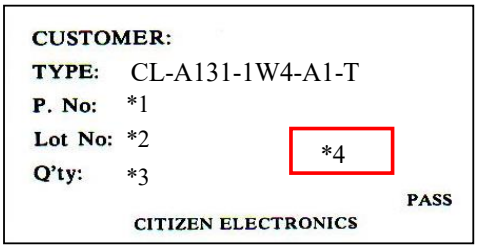
Unit:mm

Note: The size of a carton box depends on delivery quantity.

e.g. Packing size

(W × L × H)	Quantity
320×320×200	~ 10reels
300×380×300	~ 18reels
400×460×180	~ 20reels
400×460×330	~ 34reels
440×440×520	~ 64reels
440×440×650	~ 84reels
600×600×360	~ 124reels

8-3. Label Description



*1 Code No.(Customer's part number)
e.g. 2411001
241(Production starting date),
5(Production sites･･･1=Japan,5=China),
Under 3-digit(Serial number)
*2 CE's lot No.
*3 Q'ty
*4 Rank
Please refer to '12.CL-A131-1W4-A1 Rank'.

This label is attached to both reel and aluminum bag.

8-4. 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℃
Humidity: 90%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.

8-5. Baking

If the devices have been stored over 1 year or unpacked over 7 days, it should be baked under the following conditions.

Baking conditions: 55 ℃ × 12～24 hours or more (reeled one)
Baking times: Up to one time

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9. Precautions

9-1. Soldering

(1) Manual soldering

1) Use 6/4 solder or solder containing silver (Ag)
If using Pb-free solder, solder of 96.5Sn,3Ag,0.5Cu is recommended.

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 350℃.

4) Force or stress must not be applied to the resin portion while soldering.

5) Finish soldering within 3 seconds.

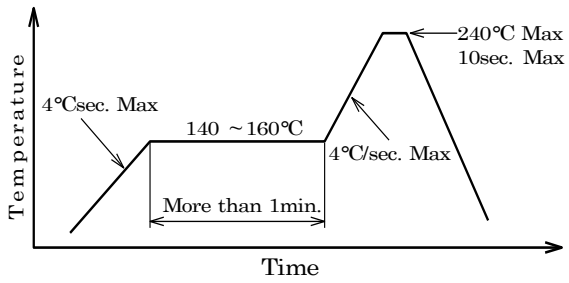
6) Handle the devices only after temperature is cooled down.

(2) Reflow soldering

1) Following soldering paste is recommended
Melting temperature : 178 ~ 192℃
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.



Reflow soldering of the above profile is allowed two times.

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9-2. Washing

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

9.3 Handling of static

(1) As the performance of this product can be damaged by static or surge voltage effects, some static measurements equal to CMOS LSI level (e.g. wearing of a wristband) are required when handling this product.

(2) As some unusual modes (e.g. decrease in the rise current in a forward voltage direction, lighting failure with low current and so on) occur in the LED damaged by static, the lighting inspection should be performed according to the following inpsection criterion.

CE's lighting inspection criterion

Condition	Judgmental criterion
IF=1mA	VF＞2.0V

9.4 Handling

Please avoid the application of any stress to this product.
Also, please avoid the application of any friction by a sharp metal nail or other materials.

9.5 Consideration for heat generation

Please be aware that heat can be produced when using an LED. As the LED die temperature (junction temperature) varies depending on surroundings such as the thermal resistance of an assembly board, ambient environment and so on, it is required to make a heat dissipation design and environmental setting that prevent junction temperature from exceeding a maximum rating.
[Reference value: Rjs (thermal resistance between an LED die junction and soldering portion) ≒ 64 °C/W]

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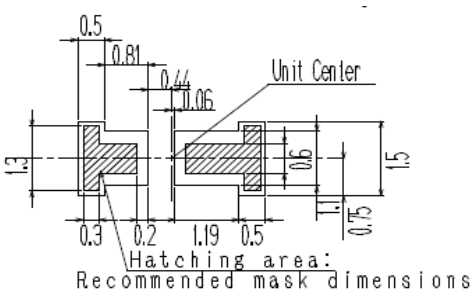
10. Designing precautions

(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

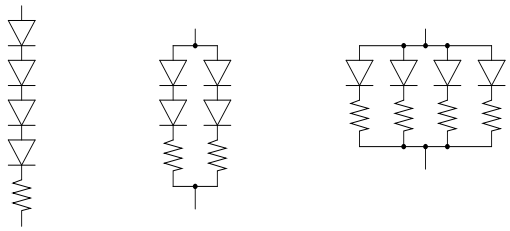


he above dimensions do not necessarily guarantee mountability.
This pattern needs to have comprehensive preliminary studies done on usage.

(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.

(ex-1) **(ex-2)** **(ex-3)**



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11. Other precautions

(1) Please be aware that looking directly at a high-powered LED over a prolonged period may result in discomfort or harm to your eyes.

(2) Our warranty does not cover situations where this product undergoes secondary fabrication such as changes in shape.

(3) Warranty period is half a year from the day we delivered the product.

(4) If any defect is found during the warranty period, do not disassemble or dismantle the product but contact our sales window to follow its instruction.

(5) Do not reverse-engineer the product including disassemble or analyze without our approval.

(6) The product is intended to be used for general electronic equipment such as general lighing, home appliances, and information-communication equipment.
It is not designed or manufactured to be used for special application (eg. automobiles, trains, ships, airplanes, spaceships, submarine repeaters, atomic energy control systems, combustion equipment, life-support systems, safety devices).
We will not guarantee any application suitability for goods like those described above that require special quality and reliability.
In cases where the product is used in special applications and it causes an extensive property damage, threatens human life or damages the human body, we will not be held liable.

(7) The product is not in conformity to ISO/TS16949 or intended to be used for in-vehicle application.

(8) This specification will become void if it is not retured or if no purchase order is made within one year from the issued date.

(9) We will not be liable for any disadvantage, damage or cause of legal action, or any other damage or loss that arise from the use or nonuse of technical information or data of this specification.

(10) This technical information and data is provided for users as is, and Citizen Elecrronics Co., Ltd. does not guarantee that it is free from errors or defect in technical information and data, or this technical information and data conform to special applications, or this technical information and data does not infringe any rights of the user or third parties other than the user, or any other contents thereof.

(11) Citizen Elecrronics Co., Ltd. reserves a right to modify technical information and data without notice.

(12) When exporting our products, please ensure conformance with applicable laws and regulations and take appropriate actions such as obtaining an export license.

(13) Please do not use or supply our products for any weapons of mass destruction (WMD) or for any other military purposes.

(14) If we do not receive standing orders, we may recommend another product. If this product is to be used for a different model or for a succeeding model continuously, please contact our sales staff.

(15) The contents of this document is not guaranteed because the specification and appearance of the product may change without notice for improvement.
Please exchange formal specifications with us when adopting the product for mass production.

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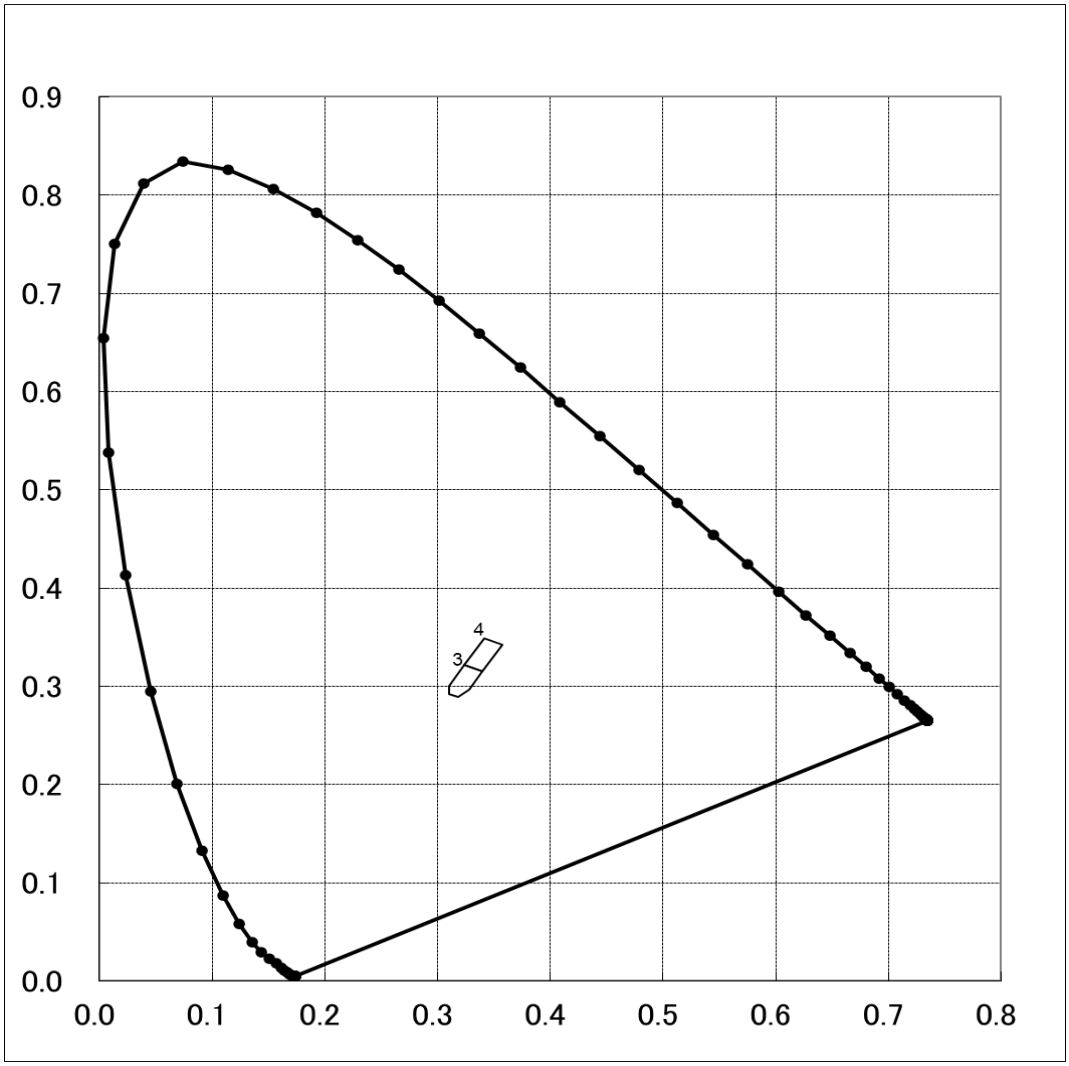
12. Chromaticity Cordinates



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13. CL-A131-1W4-A1 Rank

< IV Rank >

@If=80mA

Iv rank	Min	Max
B	1210	1830

Tolerance:±10% (mcd)

< VF Rank >

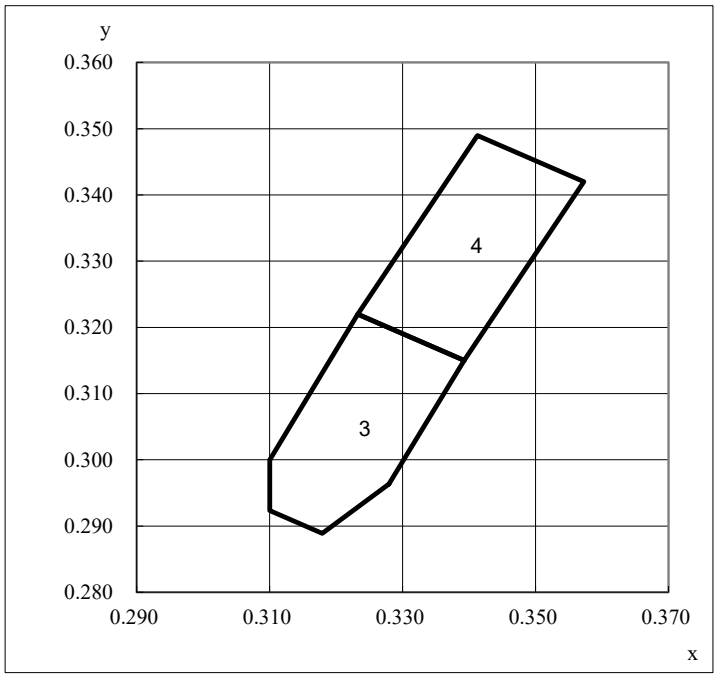
@If=80mA

rank	Min	Max
U	2.40	3.00

Tolerance:±3% (V)

< Chromaticity Rank >

@IF=10mA



rank 3	x	y
a	0.328	0.296
b	0.318	0.289
c	0.310	0.292
d	0.310	0.300
e	0.323	0.322
f	0.339	0.315

rank 4	x	y
a	0.339	0.315
b	0.323	0.322
c	0.341	0.349
d	0.357	0.342

Tolerance:±0.01

<Rank Descriptions>

Example) B 3 U

IV — B

Chromaticity — 3

VF — U

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- ・Lighting LED
- ・Chip LED
- ・Tactile switch

Application
- ・Mobile device
- ・Lighting device
- ・In-vehicle device
- ・Healthcare device
- ・Industrial device

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Requests / Inquiries
cej-inquiry@ml.citizen.co.jp

Website for LEDs for lighting
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