

DATA SHEET

CITILED Standard CL-A136C Series

Mono-color Type

CL-A136C-1W6-SD-T-0000000



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1. Scope of Application

These specifications apply to chip type LED lamp, CITILED, model CL-A136C-1W6-SD-T

2. Part code

2-1. Part code



Product Nomenclature

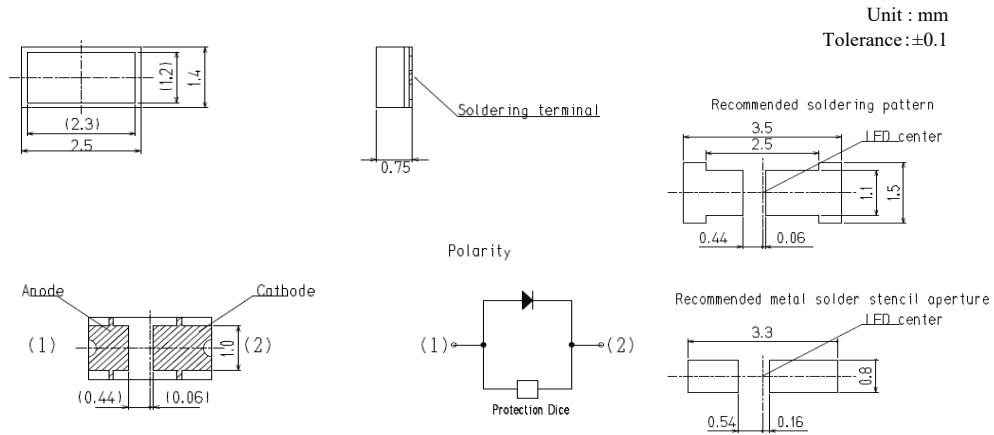
CL - A136C - 1W6 - SD - T - 0000000				
[1]	[2]	[3]	[4]	[5]
[1] Series	: A136C	Mono-color		
[2] Lighting color	: 1W6	1	: Quantity of dies	
		W6	: High brightness white	
[3] Wide color gamut	: SD	Diffused		
[4] Shipping mode	: T	Taping (standard)		
[5] Specification number	: 0	Brightness type: A~		
	0	Number of chromaticity ranks		
		(6rank : 6, ...9rank : 9, 10rank : A, 11rank : B, 12rank : C)		
	00	Chromaticity rank		

2-2. RoHS Directive

No hazardous substance designated by RoHS Directive is contained in this product.

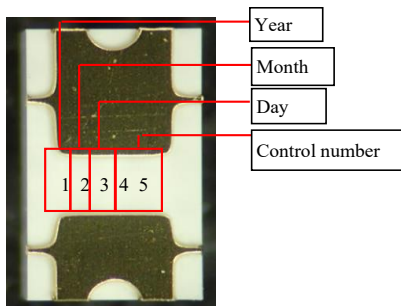
3. Outline drawing and marking descriptions

3-1. Outline drawing



※ Dimensions in parentheses are reference values.
Any resin unevenness that 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

4. Performance

4-1. Absolute Maximum Rating

Parameter	Symbol	Rating	Rating
Power Dissipation	P_d	(488)	mW
Forward Current	I_F	(150)	mA
Forward Pulse Current	I_{FP}	200	mA
Reverse Current	I_R	90	mA
Junction Temperature	T_j	140	°C
Operating Temperature	T_{OP}	-40 ~ +100	°C
Storage Temperature	T_{ST}	-40 ~ +105	°C

* Duty < 1/10, Pulse width < 0.1 msec

4-2. Electro-optical Characteristic

($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F=100\text{mA}$	(2.85)	(3.05)	(3.25)	V
Luminous Intensity	I_V	$I_F=100\text{mA}$	—	(15.05)	—	cd
Total Luminous Flux	Φ_V	$I_F=100\text{mA}$	(30.00)	(40.8)	(47.4)	lm
Chromaticity coordinates	x	$I_F=100\text{mA}$	—	(0.300)	—	
	y	$I_F=100\text{mA}$	—	(0.290)	—	

Note 1) The measurement tolerance of forward voltage is $\pm 3\%$ at our tester.

Note 2) The measurement tolerance of luminous intensity is $\pm 10\%$ at our tester.

Note 3) Based on the CIE1931 chromaticity chart.

The measurement tolerance of chromaticity is ± 0.01 .

Note 4) The total luminous flux value and chromaticity value obtained from the integrating sphere measurement are not guaranteed value but reference one.

In accordance with NIST standard.

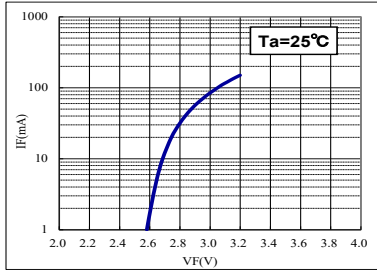
Note 5) For order quantity, the delivery ratio of rank-classified products is not taken into consideration.

4-3. Rank classification

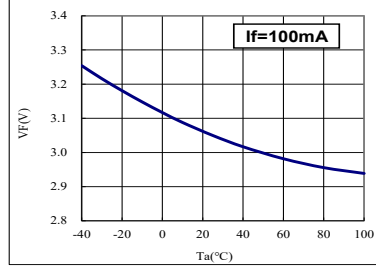
Please refer to the appendix 'CL-A136C-1W6-SD rank'.

5. Characteristic (Typical characteristics)

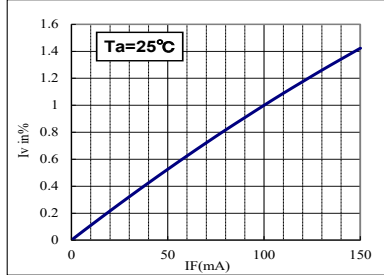
◆ IF-VF Characteristics



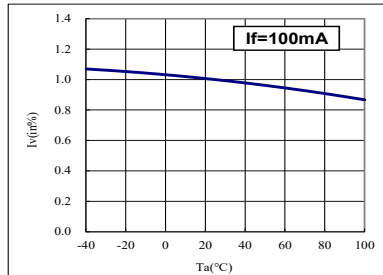
◆ VF-Ta Characteristics



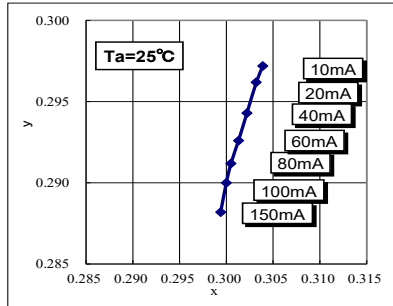
◆ ΦV-IF Characteristics



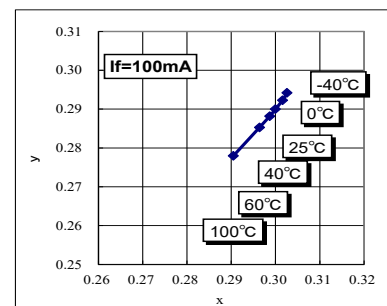
◆ ΦV-Ta Characteristics



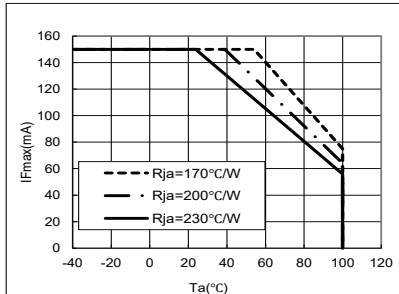
◆ IF - Chromaticity characteristics



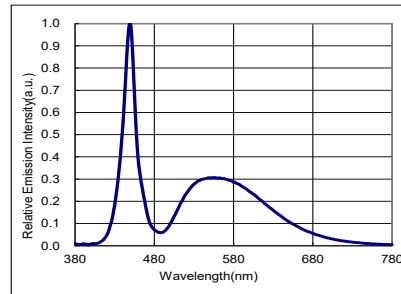
◆ Ta - Chromaticity characteristics



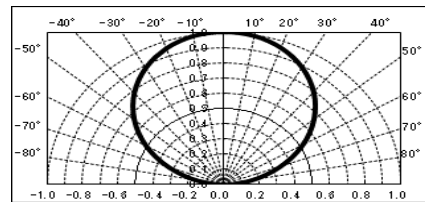
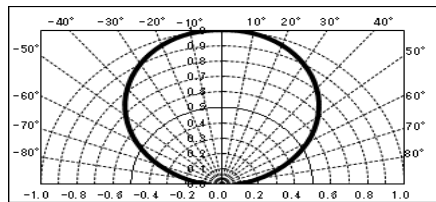
◆ IF-Max Ta Characteristics



◆ Spectral Distribution



◆ Directive Characteristics



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=100±3°C, IF=100mA	1000 ⁺²⁴ H
Low Temperature Storage Test	Ta=-40±3°C, IF=100mA	1000 ⁺²⁴ ₋₁₂ H
Wet and Hot temperature Operating Test	Ta=60±2°C 95±5%RH, IF=100mA	1000 ⁺²⁴ ₋₁₂ H
High Temperature Storage Test	Ta=105 ⁺⁵ ₋₃ °C	1000 ⁺²⁴ ₋₁₂ H
Low Temperature Storage Test	Ta=40 ⁺⁵ ₋₃ °C	1000 ⁺²⁴ ₋₁₂ H
Wet and Hot temperature Storage Test	Ta=60±2°C 95±5%RH	1000 ⁺²⁴ ₋₁₂ H
Thermal Shock Test	-40 °C × 30 minutes ~ 100°C × 30 minutes	500cycle
Solder Heat Resistance Test	Recommended temperature profile (reflow soldering) × 2, (2nd test must be started after the samples are stabilized thermally.)	2times
Static breaking test	R=1.5kΩ, C=100pF, Test Voltage=2kV	Three times for each of forward and reverse voltage
Solvent resistance test	Isopropyl alcohol (30°C for five minutes)	1 time
Vibration test	Frequency range: 8~33.3Hz, Total amplitude 1.3mm, Sweep rate: 33.3~400Hz, Acceleration: 29.2m/s ² , Cycle: 15 minutes	2 hours for each of x/y directions, 4 hours for z direction (Total: 8hours)
Shock test	980m/s ² , 6ms sine wave, ±x,±y, ±z	3 times
Drop test	100cm	3 times

* 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: R_{ja} ≒ 140 °C/W

6-2. Judgment Criteria of Failure for Reliability Test

Measuring Item	Symbol	Measuring Condition	Failure Criteria
Forward Voltage	V _f	IF=100mA	>U × 1.1
Luminous Intensity	I _v	IF=100mA	<S × 0.7

U means the upper limit of the specified characteristics.

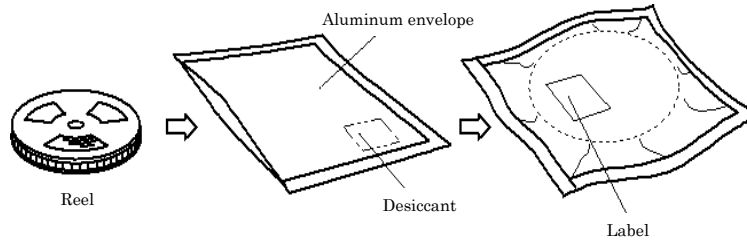
S means the initial value.

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

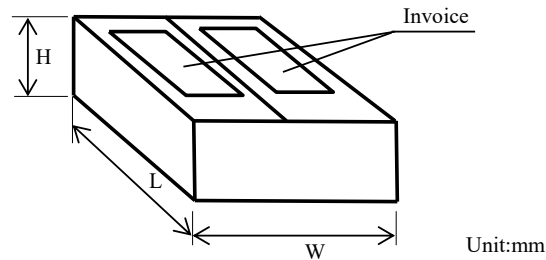
8. Packing Specifications

8-1. Moisture-proof Packing

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



8-2. Packing figure



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

CUSTOMER:	
TYPE:	CL-A136C-1W6-SD-T00000000
P. No:	*1
Lot No:	*2
Q'ty:	*3
	*4
PASS	
CITIZEN ELECTRONICS	

*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

Described chromaticity rank
and VF rank, in this order

e.g. Chromaticity rank '08', VF rank 'W' [08W]

This label is attached to both reel and aluminum bag.

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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°C
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 envelope 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 °C × 12~24 hours or more (reeled one)
Baking times: Up to one time

9. Precautions

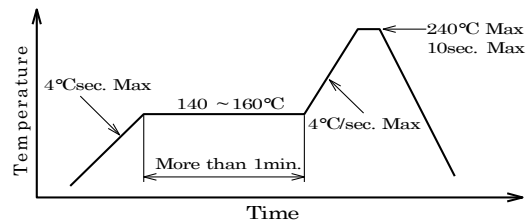
9-1. Soldering

(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°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

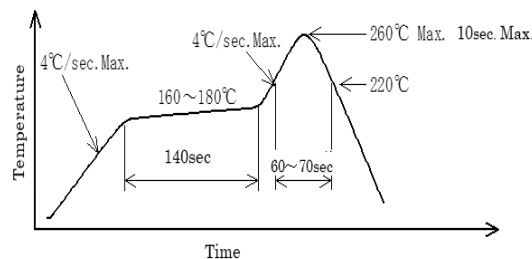
- 1) Following soldering paste is recommended
Melting temperature : 178 ~ 192°C
Composition : Sn 63 %, Pb 37 %
- 2) The temperature profile at the top surface of the parts is recommended as shown below.
- 3) It is requested that products should be handled after their temperature has dropped down to the normal room temperature.



Reflow soldering of the above profile is allowed two times.

(3) Lead free soldering

- 1) Following soldering paste is recommended
Melting temperature : 216 ~ 220°C
Composition : 96.5Sn,3Ag,0.5Cu
- 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

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 inspection 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

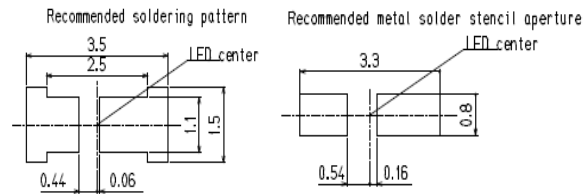
Please be aware that heat can be produced when using an LED. As the LED die temperature (junction temperature) varies depending on surroundings such as the thermal resistance of an assembly board, ambient environment and so on, it is required to make a heat dissipation design and environmental setting that prevent junction temperature from exceeding a maximum rating.

[Reference value: R_{js} (thermal resistance between an LED die junction and soldering portion) ≒ 54 °C/W]

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>

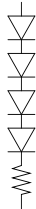


he above dimensions do not necessarily guarantee mountability.

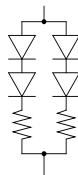
This pattern needs to have comprehensive preliminary studies done on usage.

- (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.

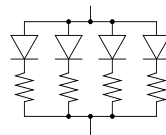
(ex-1)



(ex-2)



(ex-3)

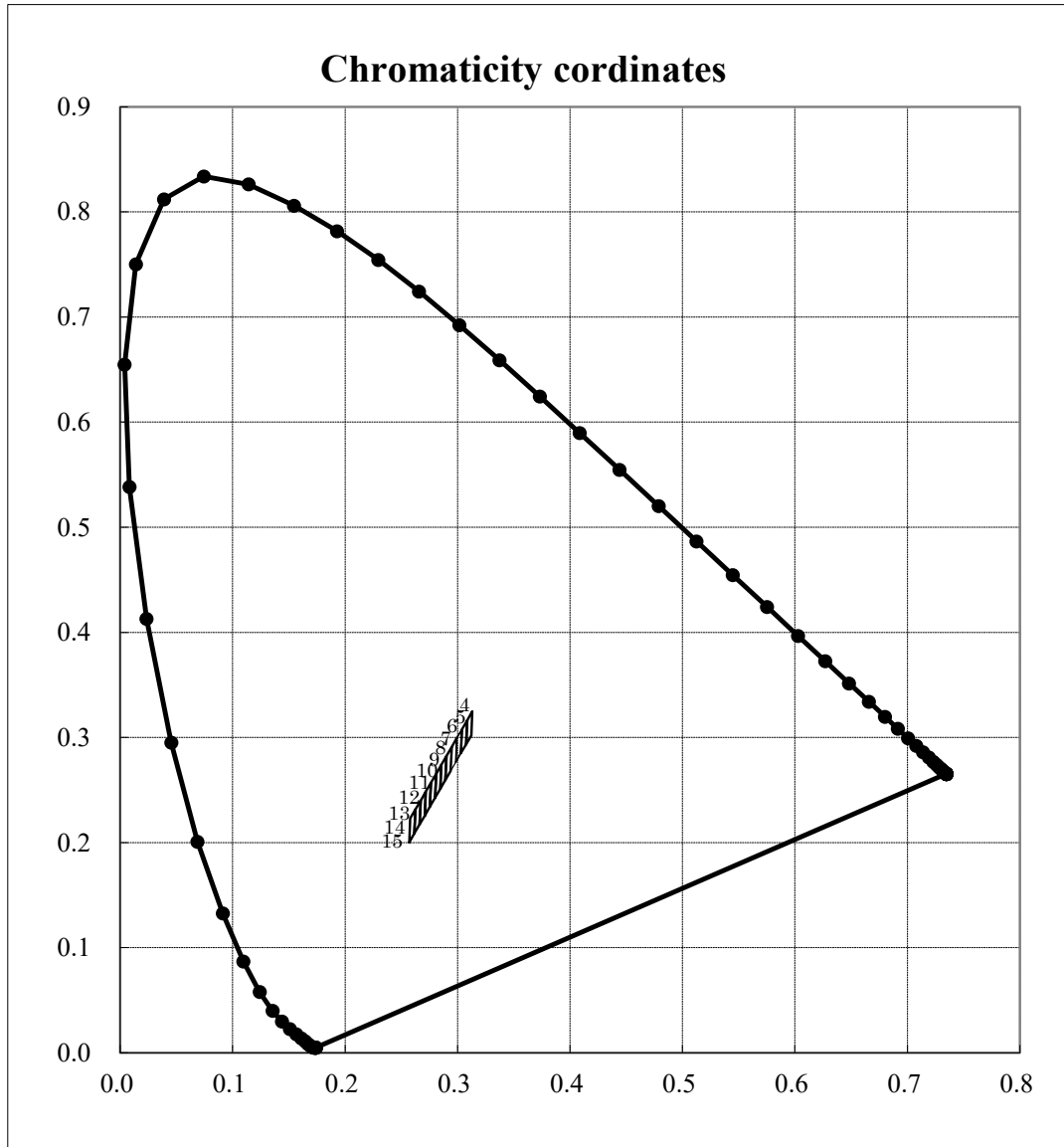


11. Other precautions

- (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 lighting, 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 returned 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.
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- (13) 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.
- (14) 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 Coordinates



13. CL-A136C-1W6-SD-T Rank

13-1. CL-A136C-1W6-SD-TA3040506 Rank

< Φv Rank >

@If=100mA

Φv rank	Chromaticity Rank	Min	Max
A	04	(38.80)	(47.40)
B	05	(37.90)	(46.30)
C	06	(37.00)	(45.20)

Tolerance:±10% (lm)

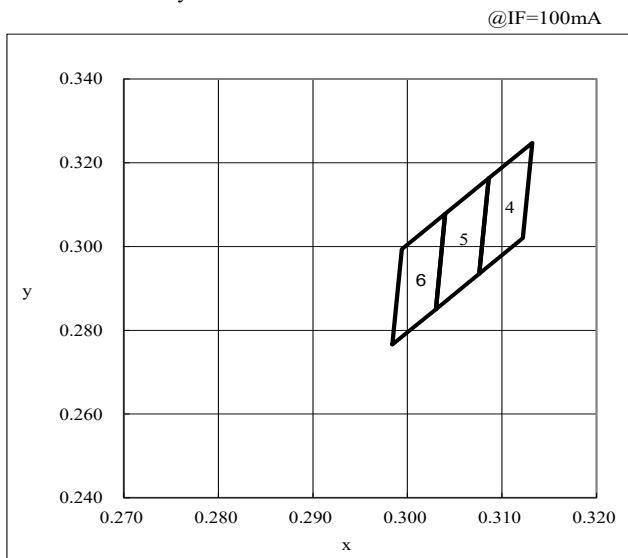
< VF Rank >

@If=100mA

rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3% (V)

< Chromaticity Rank >



rank 4	x	y
a	0.308	0.294
b	0.309	0.316
c	0.313	0.325
d	0.312	0.302

rank 5	x	y
a	0.303	0.285
b	0.304	0.308
c	0.309	0.316
d	0.308	0.294

rank 6	x	y
a	0.298	0.277
b	0.299	0.299
c	0.304	0.308
d	0.303	0.285

13-2. CL-A136C-1W6-SD-TA3050607 Rank

< Φv Rank >

@If=100mA

Φv rank	Chromaticity Rank	Min	Max
B	05	(37.90)	(46.30)
C	06	(37.00)	(45.20)
D	07	(36.10)	(44.20)

Tolerance:±10% (lm)

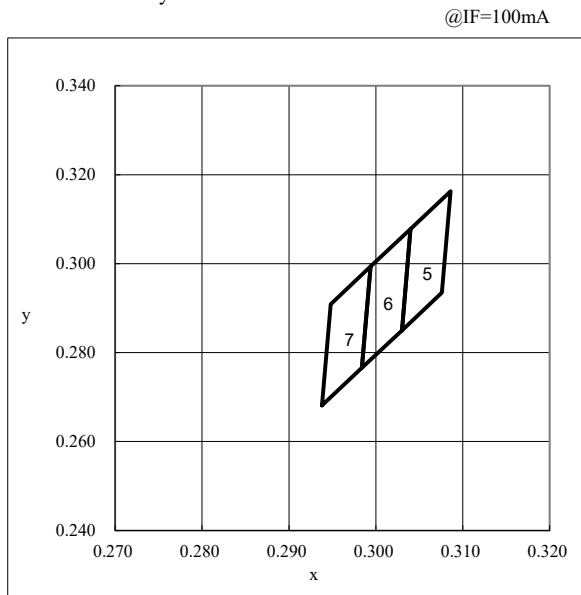
< VF Rank >

@If=100mA

rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3% (V)

< Chromaticity Rank >



rank 5	x	y
a	0.303	0.285
b	0.304	0.308
c	0.309	0.316
d	0.308	0.294

rank 6	x	y
a	0.298	0.277
b	0.299	0.299
c	0.304	0.308
d	0.303	0.285

rank 7	x	y
a	0.294	0.268
b	0.295	0.291
c	0.299	0.299
d	0.298	0.277

Tolerance:±0.01

13-3. CL-A136C-1W6-SD-TA3060708 Rank

< Φ_v Rank >

@If=100mA

Φ_v rank	Chromaticity Rank	Min	Max
C	06	(37.00)	(45.20)
D	07	(36.10)	(44.20)
E	08	(35.30)	(43.20)

Tolerance:±10% (lm)

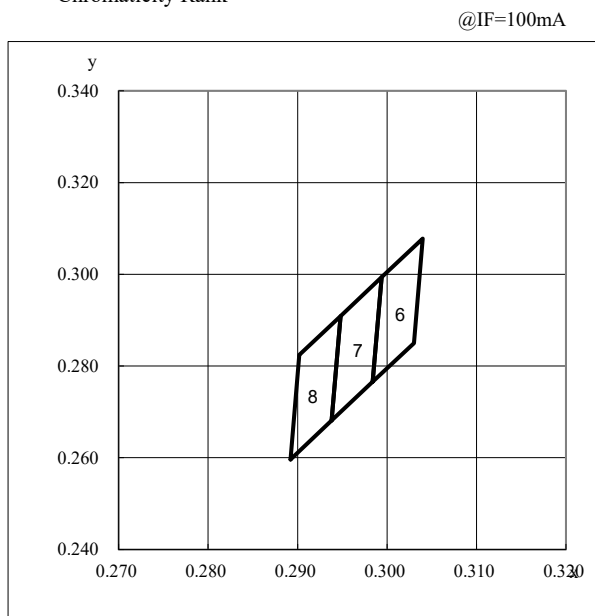
< VF Rank >

@If=100mA

rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3% (V)

< Chromaticity Rank >



rank 6	x	y
a	0.298	0.277
b	0.299	0.299
c	0.304	0.308
d	0.303	0.285

rank 7	x	y
a	0.294	0.268
b	0.295	0.291
c	0.299	0.299
d	0.298	0.277

rank 8	x	y
a	0.289	0.260
b	0.290	0.282
c	0.295	0.291
d	0.294	0.268

Tolerance:±0.01

13-4. CL-A136C-1W6-SD-TA3070809Rank

< Φ_v Rank >

		@If=100mA	
Φ_v rank	Chromaticity Rank	Min	Max
D	07	(36.10)	(44.20)
E	08	(35.30)	(43.20)
F	09	(34.50)	(42.20)

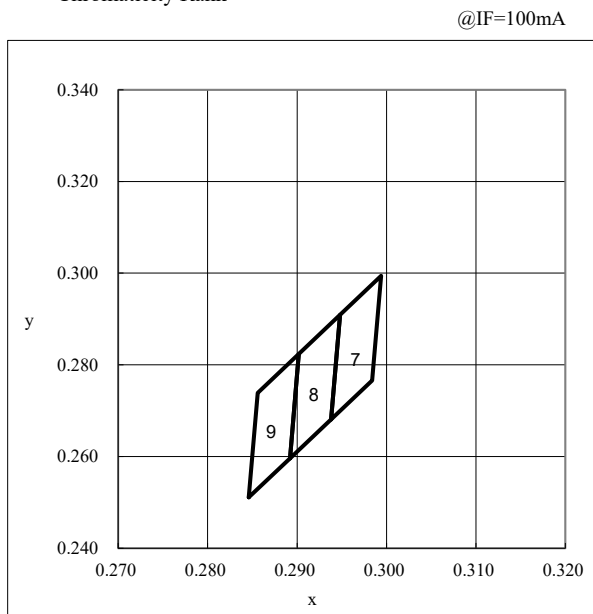
Tolerance:±10% (lm)

< VF Rank >

		@If=100mA	
rank	Min	Max	
W	2.85	2.95	
X	2.95	3.05	
Y	3.05	3.15	
Z	3.15	3.25	

Tolerance:±3% (V)

< Chromaticity Rank >



rank 7	x	y
a	0.294	0.268
b	0.295	0.291
c	0.299	0.299
d	0.298	0.277

rank 8	x	y
a	0.289	0.260
b	0.290	0.282
c	0.295	0.291
d	0.294	0.268

rank 9	x	y
a	0.285	0.251
b	0.286	0.274
c	0.290	0.282
d	0.289	0.260

Tolerance:±0.01

13-5. CL-A136C-1W6-SD-TA3080910 Rank

< Φ_v Rank >

@If=100mA

Φ_v rank	Chromaticity Rank	Min	Max
E	08	(35.30)	(43.20)
F	09	(34.50)	(42.20)
G	10	(33.70)	(41.20)

Tolerance:±10%

(lm)

< VF Rank >

@If=100mA

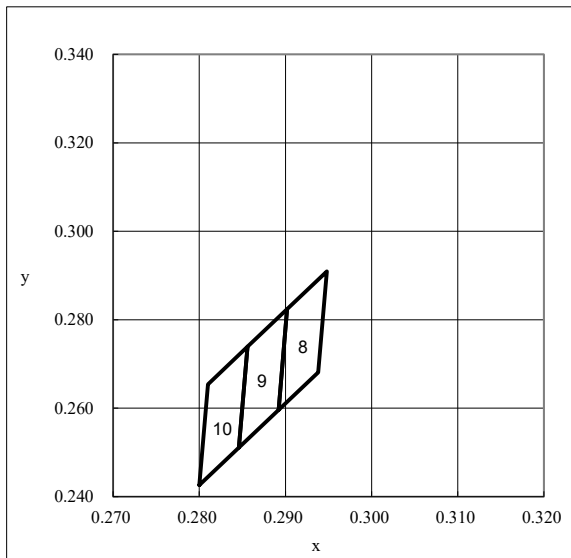
rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3%

(V)

< Chromaticity Rank >

@IF=100mA



Tolerance:±0.01

rank 8	x	y
a	0.289	0.260
b	0.290	0.282
c	0.295	0.291
d	0.294	0.268

rank 9	x	y
a	0.285	0.251
b	0.286	0.274
c	0.290	0.282
d	0.289	0.260

rank10	x	y
a	0.280	0.243
b	0.281	0.265
c	0.286	0.274
d	0.285	0.251

13-6. CL-A136C-1W6-SD-TA3091011 Rank

< Φ_v Rank >

Φ_v rank	Chromaticity Rank	@If=100mA	
		Min	Max
F	09	(34.50)	(42.20)
G	10	(33.70)	(41.20)
H	11	(32.90)	(40.20)

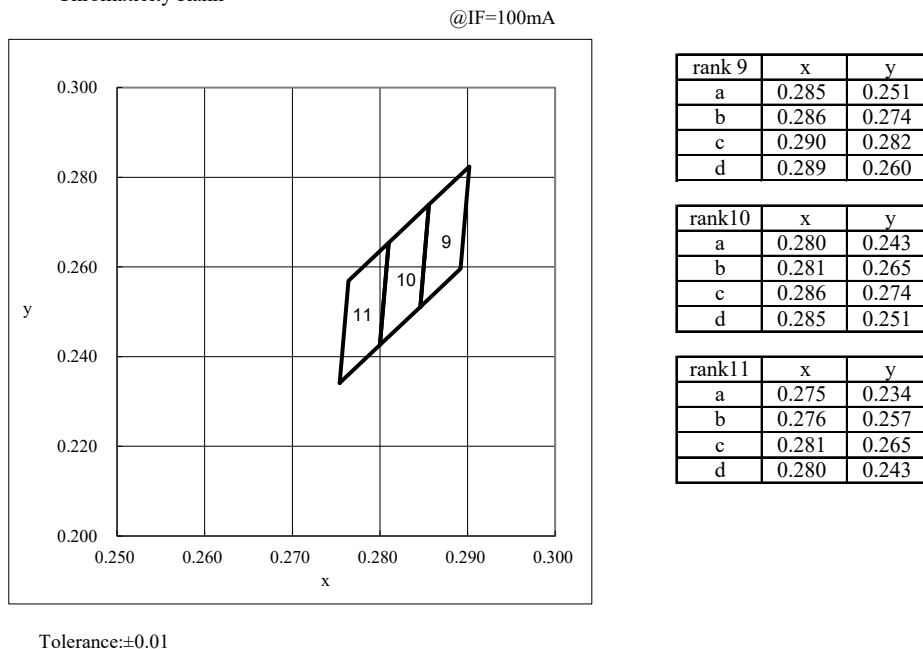
Tolerance:±10% (lm)

< VF Rank >

rank	@If=100mA	
	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3% (V)

< Chromaticity Rank >



13-7. CL-A136C-1W6-SD-TA3101112 Rank

< Φ_v Rank >

		@If=100mA	
Φ_v rank	Chromaticity Rank	Min	Max
G	10	(33.70)	(41.20)
H	11	(32.90)	(40.20)
I	12	(32.20)	(39.30)

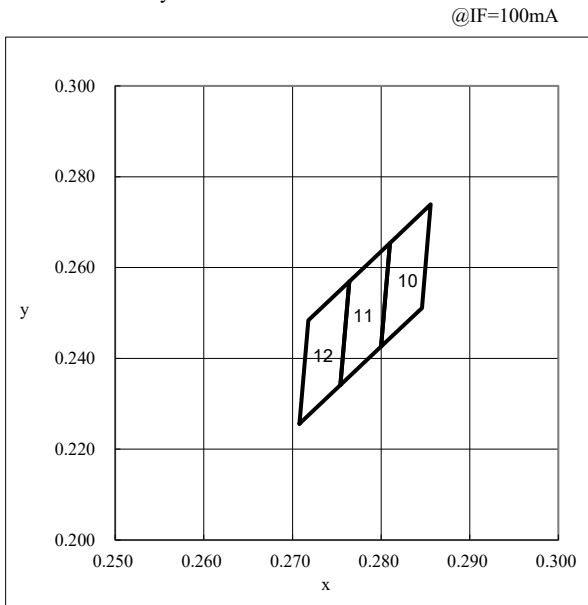
Tolerance:±10% (lm)

< VF Rank >

		@If=100mA	
rank	Min	Max	
W	2.85	2.95	
X	2.95	3.05	
Y	3.05	3.15	
Z	3.15	3.25	

Tolerance:±3% (V)

< Chromaticity Rank >



rank10	x	y
a	0.280	0.243
b	0.281	0.265
c	0.286	0.274
d	0.285	0.251

rank11	x	y
a	0.275	0.234
b	0.276	0.257
c	0.281	0.265
d	0.280	0.243

rank12	x	y
a	0.271	0.226
b	0.272	0.248
c	0.276	0.257
d	0.275	0.234

Tolerance:±0.01

13-8. CL-A136C-1W6-SD-TA3111213 Rank

< Φ_v Rank >

@If=100mA

Φ_v rank	Chromaticity Rank	Min	Max
H	11	(32.90)	(40.20)
I	12	(32.20)	(39.30)
J	13	(31.40)	(38.40)

Tolerance:±10%

(lm)

< VF Rank >

@If=100mA

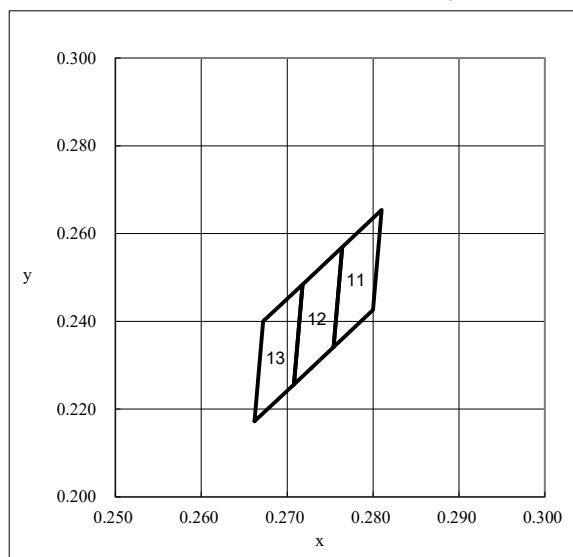
rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3%

(V)

< Chromaticity Rank >

@IF=100mA



rank11	x	y
a	0.275	0.234
b	0.276	0.257
c	0.281	0.265
d	0.280	0.243

rank12	x	y
a	0.271	0.226
b	0.272	0.248
c	0.276	0.257
d	0.275	0.234

rank13	x	y
a	0.266	0.217
b	0.267	0.240
c	0.272	0.248
d	0.271	0.226

Tolerance:±0.01

13-9. CL-A136C-1W6-SD-TA3121314 Rank

< Φ_v Rank >

@If=100mA

Φ_v rank	Chromaticity Rank	Min	Max
I	12	(32.20)	(39.30)
J	13	(31.40)	(38.40)
K	14	(30.70)	(37.50)

Tolerance:±10% (lm)

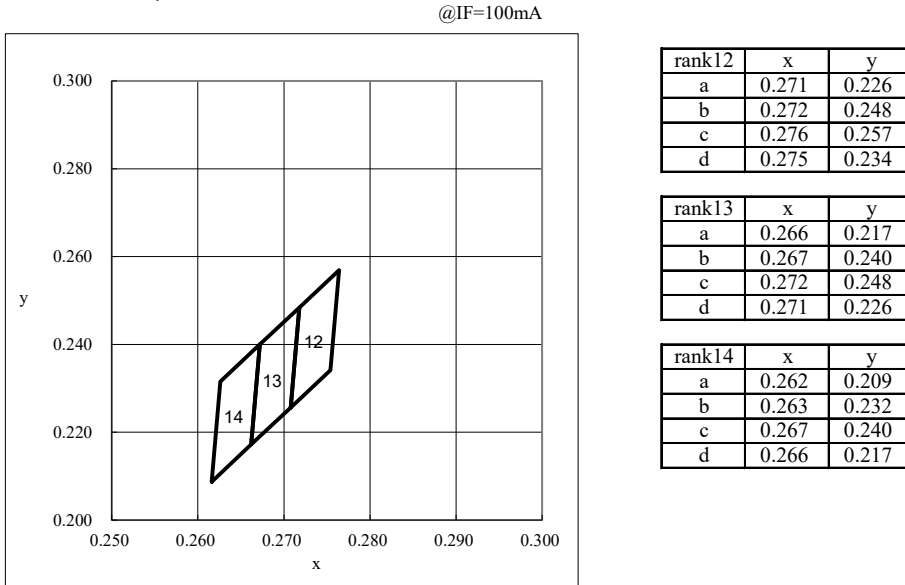
< VF Rank >

@If=100mA

rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

Tolerance:±3% (V)

< Chromaticity Rank >



Tolerance:±0.01

13-10. CL-A136C-1W6-SD-TA3131415 Rank

< Φ_v Rank >

Φ_v rank	Chromaticity Rank	Min	Max
J	13	(31.40)	(38.40)
K	14	(30.70)	(37.50)
L	15	(30.00)	(36.70)

@If=100mA

Tolerance:±10%

(lm)

< VF Rank >

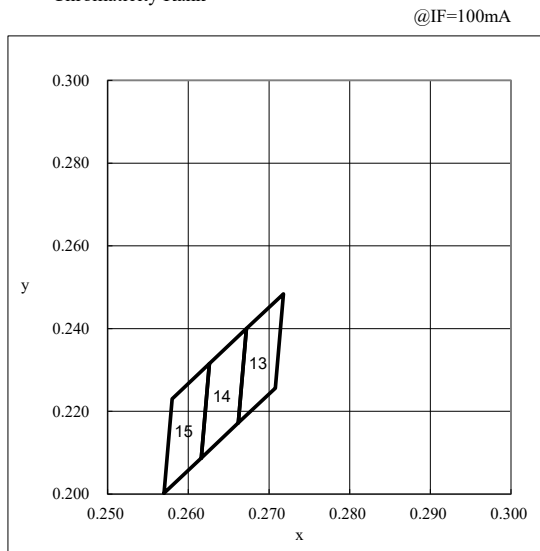
rank	Min	Max
W	2.85	2.95
X	2.95	3.05
Y	3.05	3.15
Z	3.15	3.25

@If=100mA

Tolerance:±3%

(V)

< Chromaticity Rank >



rank13	x	y
a	0.266	0.217
b	0.267	0.240
c	0.272	0.248
d	0.271	0.226

rank14	x	y
a	0.262	0.209
b	0.263	0.232
c	0.267	0.240
d	0.266	0.217

rank15	x	y
a	0.257	0.200
b	0.258	0.223
c	0.263	0.232
d	0.262	0.209

Tolerance:±0.01

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