Reference

1. Scope of Application
   These specifications apply to CL-963-1W-C01-TS

2. Part code

CL - 963 - 1W - C01 - TS

Series

Number of dice
1:1dice

Lighting color

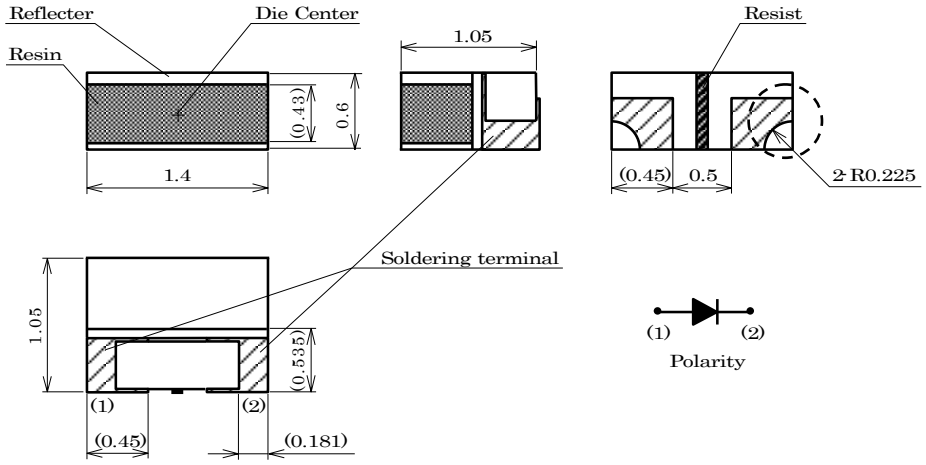
Resin color
C01:Color C,No.1

Shipping mode
Non-coded: Bulk
TS: Taping (standard)

			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

3. Outline drawing

Reference



Unit: mm
Tolerance: ±0.1
Dimensions do not include burr.

4. Performance

(1) Absolute Maximum Rating (Ta=25°C)

Parameter	Symbol	Rating Value	Unit
Power Dissipation	Pd	34	mW
Forward Current	I_F	10	mA
Forward Pulse Current *	I_{FP}	50 *	mA
Reverse Voltage	V_R	4	V
Operating Temperature	Top	-25 ~ +80	°C
Storage Temperature	Tst	-30 ~ +85	°C

* Duty ≤ 1/10, Pulse width ≤0.1 msec

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

Parameter	Symbol	Condition	MIN	TYP	MAX	Unit
Forward Voltage	V_F	I_F=7mA	2.38	2.85	3.42	V
Reverse Current	I_R	V_R=4V	—	—	2	μA
Luminous Intensity	Iv	I_F=7mA	362	520	754	mcd

Note 1) The tolerance of Forward Voltage measurement is ±3% at our tester.
Note 2) The tolerance of Luminous Intensity measurement is ±10% at our tester.
Note 3) For handling, please apply CMOS LSI or equivalent to prevent any electrostatic effect.
Note 4) Please be aware that the above electro-optical characteristics are guaranteed when applying the current values shown in the table.
Please consult us when this product is used under any other conditions.

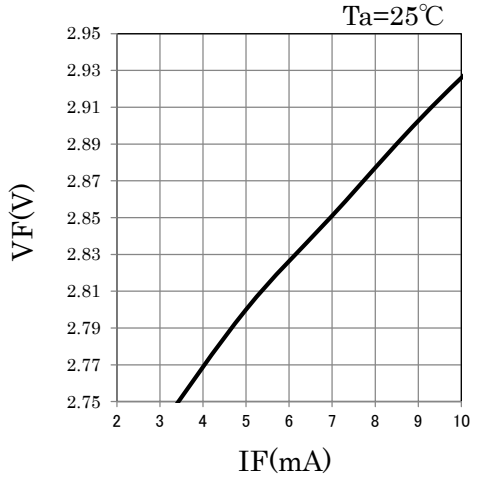
			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

5. Characteristic

Reference

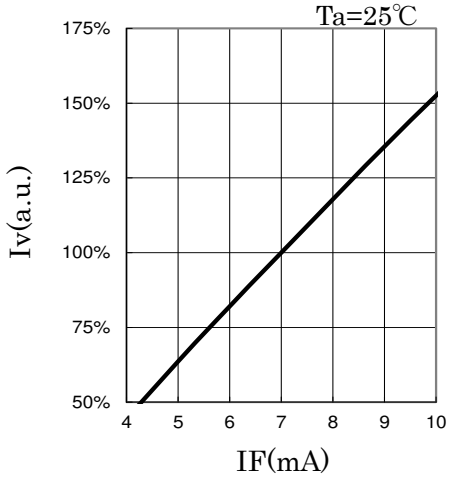
Forward Current vs. Forward Voltage

Ta=25℃



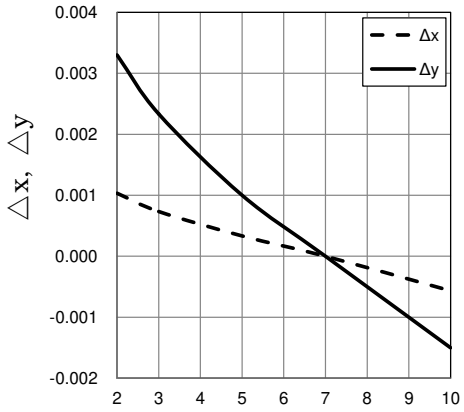
Forward Current vs. Relative Luminous Intensity

Ta=25℃



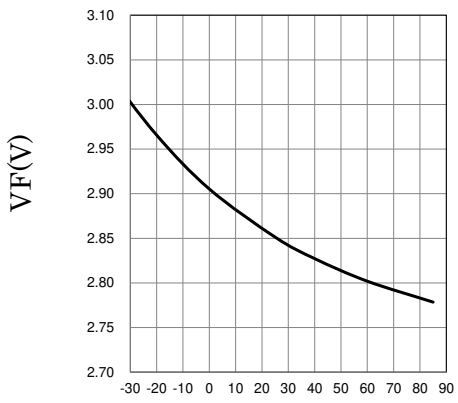
Forward Current vs. Chromaticity Coordinate

Ta=25℃



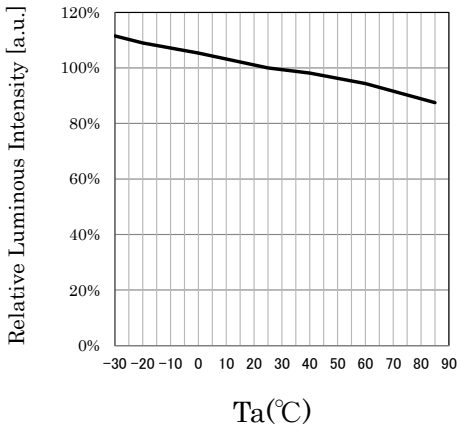
Ta vs. Forward Voltage

IF=7mA



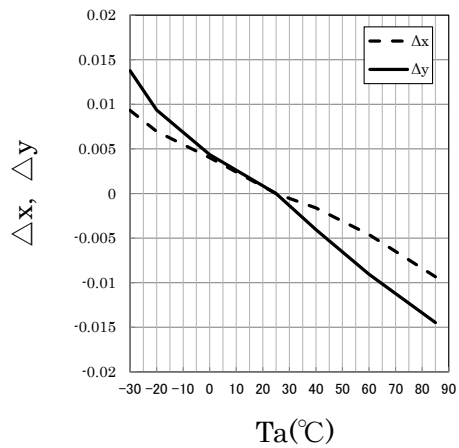
Case Temperature vs. Relative Luminous Intensity

IF=7mA



Ta vs. Chromaticity Coordinate

IF=7mA

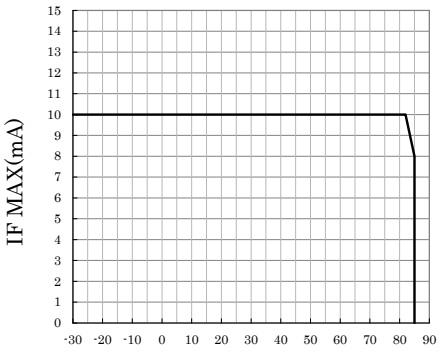


			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

5. Characteristic

Reference

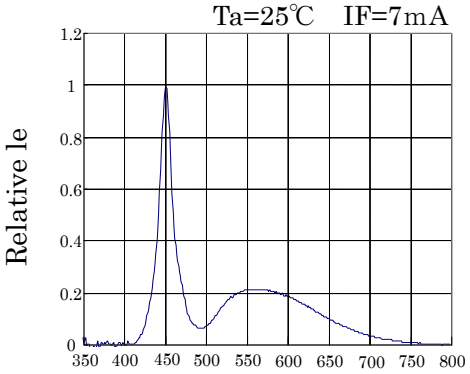
Case Temperature vs. Allowable Forward Current



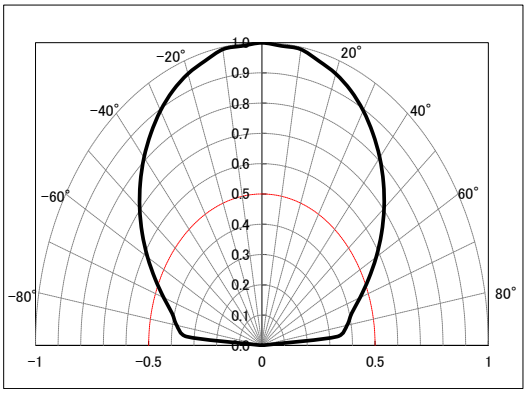
Ta(℃)

Spectrum

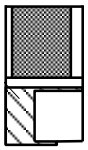
Ta=25℃ IF=7mA

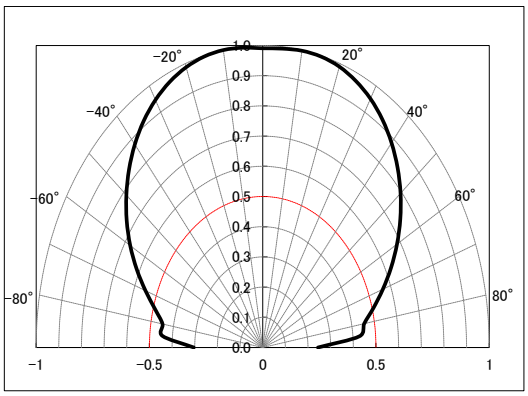


Wavelength(nm)

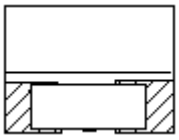


Directive Characteristic





Directive Characteristic



			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

6. Reliability

Reference

(1) Details of the tests

Test Item	Test Condition
Life Test in Continuous Operation	25±3°C, IF=10 mA × 500 $^{+24}_{-12}$ hours
High Temperature Storage Test	85 $^{+5}_{-3}$ °C × 500 $^{+24}_{-12}$ hours
Low Temperature Storage Test	-30 $^{+3}_{-5}$ °C × 500 $^{+24}_{-12}$ hours
Moisture-proof Test	60 ±2°C, 90 ±5%RH for 500 $^{+24}_{-12}$ hours
Thermal Shock Test	-30°C × 30 minutes → 85°C × 30 minutes, 5cycle
Solder Heat Resistance Test	Recommended temperature profile (reflow soldering) after pretreatment* × 2, (2nd test must be started after the samples are stabilized thermally.)

(2) Judgment Criteria of Failure for Reliability Test

Measuring Item	Symbol	Measuring Condition	Judgment Criteria for Failure
Forward Voltage	V_F	I_F= 7 mA	>U×1.2
Reverse Current	I_R	V_R=4 V	>U×2
Luminous Intensity	Iv	I_F=7mA	<S×0.5

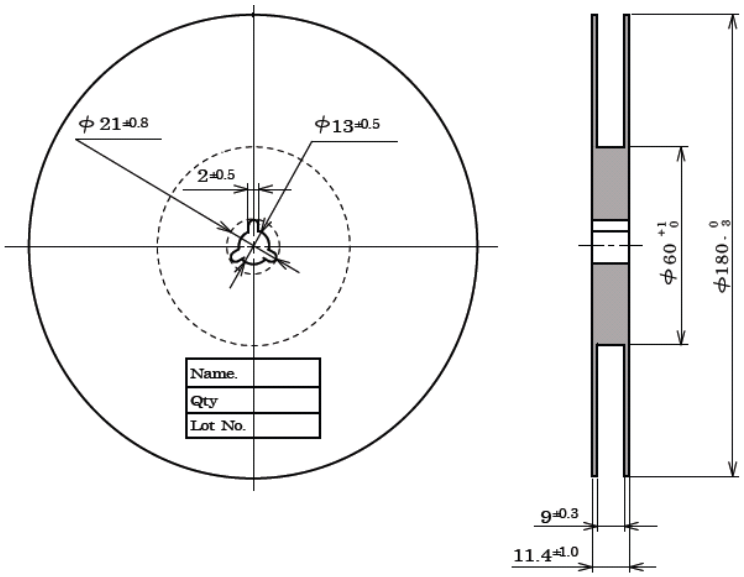
U means the upper limit of the specified characteristics. S means the initial value.

Note 1: 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.

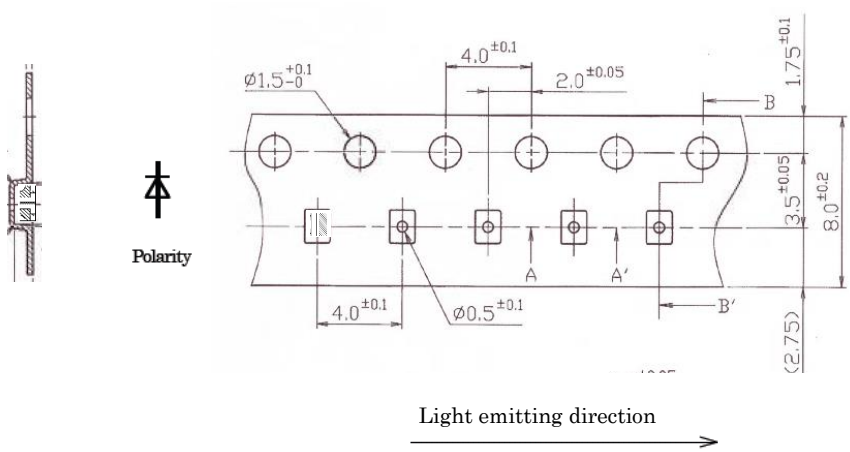
Reference

7. Taping Specifications (in accordance with JIS standard)

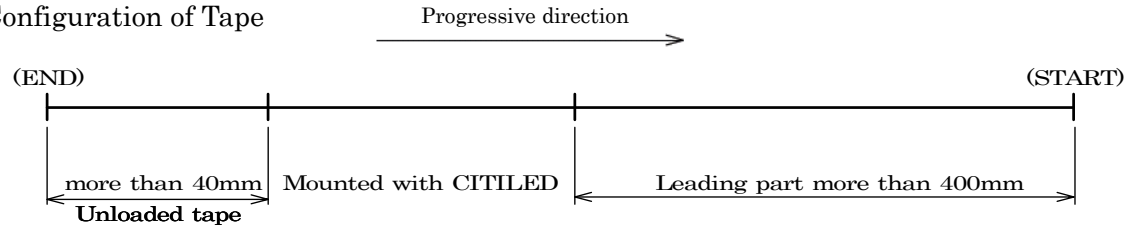
(1) Shape and Dimensions of Reel (Unit: mm)



(2) Dimensi (Unit: mm)



(3) Configuration of Tape



(4) Quantity: 3,000pcs/reel

(Please note that the shipping quantity of this product may be less than 3,000 pieces per reel (minimum quantity: 100 pieces) depending on the shipping quantity, shipping delivery date and other conditions. However, in this case, we will announce to you in advance.)

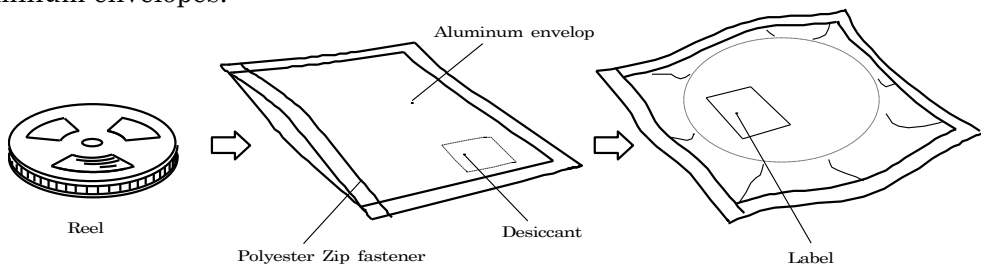
			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

Reference

8. Packing Specifications

8-1. Moisture-proof Packing

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



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. Backing

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

Baking conditions: 55°C × 12 hours ~ 24 hours

Reference

9. Precautions

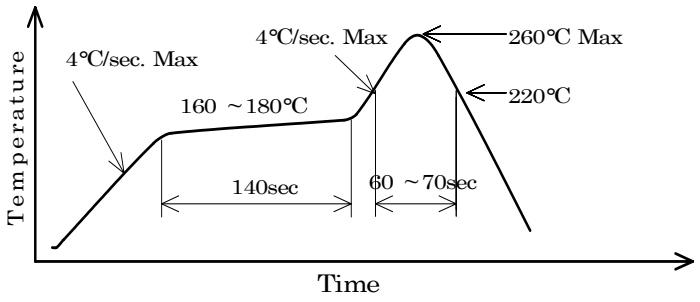
9-1. Soldering

(1) Manual soldering

1) 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.

(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.



			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

Reference

9-2. Washing

(1) 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.

c) Ultrasonic washing: 300W or less

9-3. Other directions

(1) Avoid the application of any stress to the resin portion and reflector portion.

(2) Avoid any contact by a sharp metal nail or other materials with the resin portion and reflector portion.

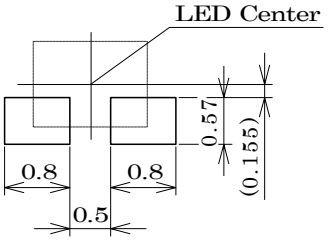
10. Designing precautions

(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

<For reflow soldering>



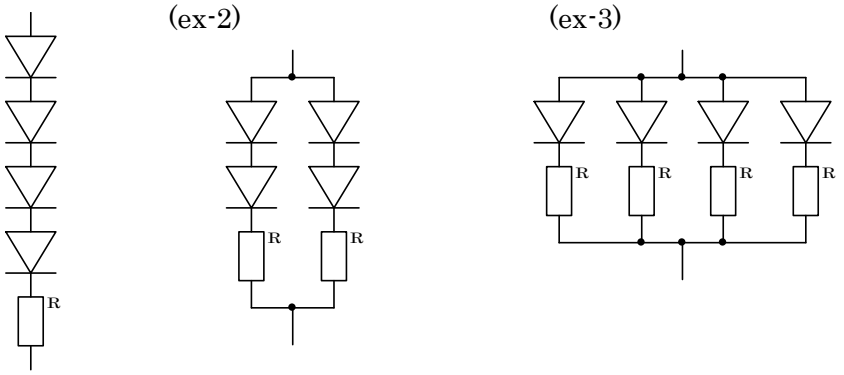
Unit : mm

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.

(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)



			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				

CL-963-1W-C01-TS rank

Reference

1.Rank data

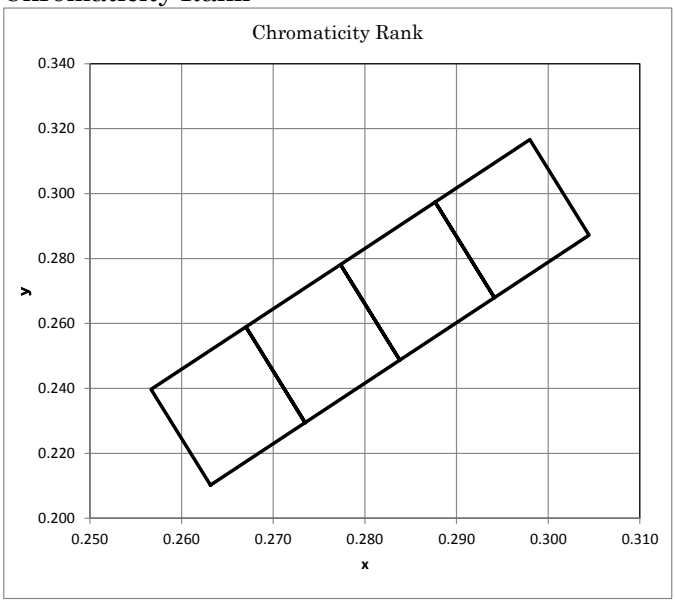
Iv Rank — Ta=25℃, IF=7mA

Rank	Iv(mcd)
A	362-754

VF Rank — Ta=25℃, IF=7mA

Rank	VF(V)
W	2.38-3.42

Chromaticity Rank



Ta=25℃, IF=7mA

Rank 1	x	y
a	0.263	0.210
b	0.257	0.240
c	0.267	0.259
d	0.273	0.229

Rank 2	x	y
a	0.273	0.229
b	0.267	0.259
c	0.277	0.278
d	0.284	0.249

Rank 3	x	y
a	0.284	0.249
b	0.277	0.278
c	0.288	0.297
d	0.294	0.268

Rank 4	x	y
a	0.294	0.268
b	0.288	0.297
c	0.298	0.317
d	0.304	0.287

Chromaticity coordinates are within the area surrounded by a, b, c and d.(Tolerance:±0.02)

2.Rank notation

Luminance intensity rank is mentioned first ,
Followed by chromaticity rank second and VF rank third.
Eg “A1W”

			Approved	Checked	Drawn	Symbol	CITILED
						Name	CL-963-1W-C01-TS
						Drawing No	
Mark	Date	Description Appro.	CITIZEN ELECTRONICS CO.,LTD.				