

TOSHIBA LED LAMP InGaAlP ORANGE LIGHT EMISSION

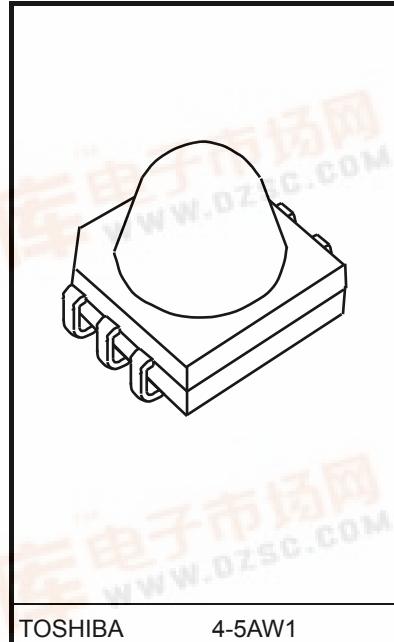
TLOH9204

AF auxiliary light source for digital still cameras

Red-eye reduction lamp

Lead(Pb)-Free

- Surface-mount and transparent epoxy package
- Compact size
- Narrow radiation pattern
Radiation angle: $\theta_{1/2} = \pm 4^\circ$
- High optical axis accuracy with excellent position accuracy of the emitting part.
- InGaAlP ultra-high brightness chip
Emission color: Orange $\lambda_P = 612\text{nm}(\text{typ.})$
On-axis luminous intensity : $I_V = 21\text{cd}(\text{typ.})$ @ $I_F = 20\text{mA}$, $T_a = 25^\circ\text{C}$
- Low forward voltage : $V_F = 2\text{V}$ (typ.) @ $I_F = 20\text{mA}$, $T_a = 25^\circ\text{C}$



TOSHIBA 4-5AW1

Weight: 0.1 g (typ.)

Absolute Maximum Ratings (Unless Otherwise Specified, $T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Forward current (Note 1)	I_F	50	mA
Reverse voltage	V_R	5	V
Forward current derating ($T_a > 60^\circ\text{C}$)	$\Delta I_F / ^\circ\text{C}$	-1.25	mA/°C
Operating temperature range	T_{opr}	-25~85	°C
Storage temperature range	T_{stg}	-40~100	°C
Soldering temperature range (5s)	T_{sol}	245 (Note 2)	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Note 1: Continuous operation time is 13h or less, $T_a = 60^\circ\text{C}$

Note 2: The reflow time and recommended temperature profile are shown in the section entitled Handling Precautions.

Electrical and Optical Characteristics ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward voltage	V_F	$I_F=20\text{mA}$	—	2	2.4	V
Reverse current	I_R	$V_R = 5\text{V}$	—	—	50	μA
Luminous intensity(On-axis)(Note 3)	I_V	$I_F=20\text{mA}$	15	21	—	cd
Peak emission wavelength	λ_p	$I_F=20\text{mA}$	—	612	—	nm
Spectrum half wavelength	$\Delta\lambda$	$I_F=20\text{mA}$	—	15	—	nm
Optical axis deviation (Note 3)	—	$I_F=20\text{mA}$	—	—	3	$^\circ$
Half-angle value (Note 3)	$\theta_{1/2}$	$I_F=20\text{mA}$	—	± 4	—	$^\circ$

Note 3: The standard surface of measurement is the shaded area in Figure 2.

Precaution

- The TLOH9204 is intended for digital still camera use only. Please do not use the device for any other purpose.
- Do not apply any mechanical stress to the device while the device's temperature is high.
- Soldering must be performed in the shaded area as shown in Figure 1 below.
- The recommended standard mounting surface for this LED is the shaded area shown in Figure 2 below.

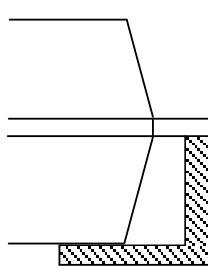


Figure 1

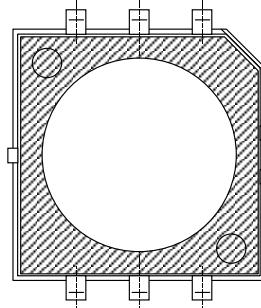


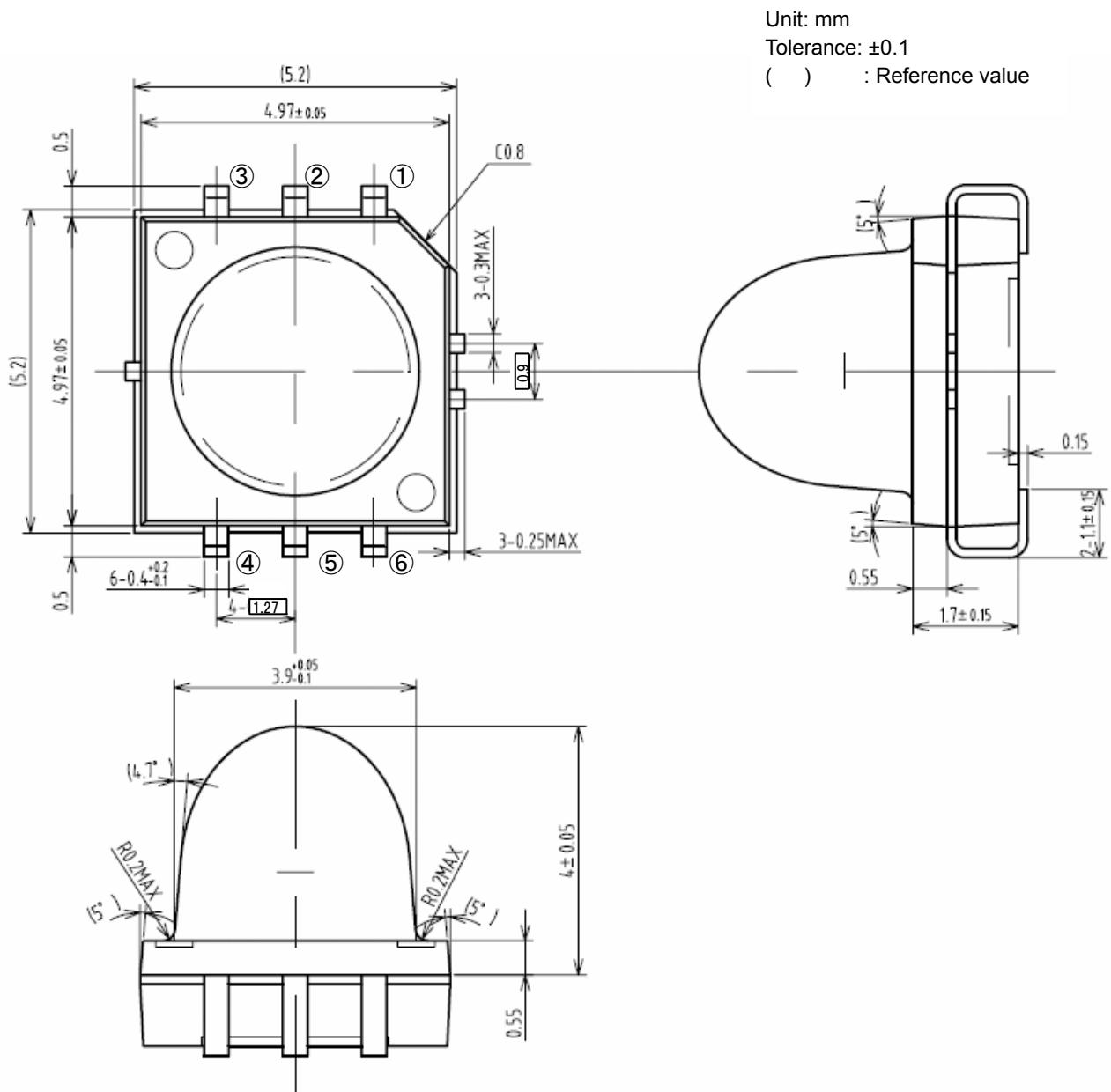
Figure 2

Device appearance:

Since this device is cast in resin, air bubbles, cracks, etc. may occur due to variations in manufacture. Please ask our sales section for details of appearance standards for the device.

(Examples of variations in device appearance)

Air bubbles: Spherical air bubbles inside the resin
 Cracks : Linear crack in the package surface

Package Dimensions

Weight: 0.1 g (typ.)

Pin connection

2. Anode
5. Cathode
Other pins: NC

Handling Precautions**Moisture-Proof Packing**

- (1) To avoid moisture absorption by the resin, the product is packed in an aluminum envelope with silica gel and moisture indicator.
- (2) The optical characteristics of the device can be affected during soldering by vaporization resulting from prior absorption of moisture.

Conditions for storing and handling the device are as follows:

1. Storage period is 6 months after the seal date when the package remains unopened. The seal date is printed on the label.
2. Conditions after opening: Temperature: 5deg to 30 deg, Relative humidity:70%(max), Time:48h(max)
3. Baking in tape reel is required if the devices have been store unopened for more than 6 months, or if the aluminum envelope has been opened for more than 48h, or the moisture indicator card shows humidity of 30% or above (the indicator color changes to pink).
These devices are packed on tapes; hence, avoid baking at high temperature.
Recommended baking conditions: 60deg for 48h or longer. Perform baking only once.
Use within 3 hours of baking.
4. Repeat baking may cause the tape strength change. Prevent exposure to static electricity when baking.
5. Handle with care to prevent mechanical damage to package and to maintain moisture-proof condition.

Mounting Precautions

- (1) Do not apply stress to the resin at high temperature.
- (2) The resin part is easily scratched, so avoid friction with hard materials.
- (3) When installing the assembly board in equipment, ensure that this product does not come into contact with other components.
- (4) Expansion of the resin generated by the heat of reflow may alter the optical characteristics of this device.
Please take into account changes in luminous intensity during the design phase.

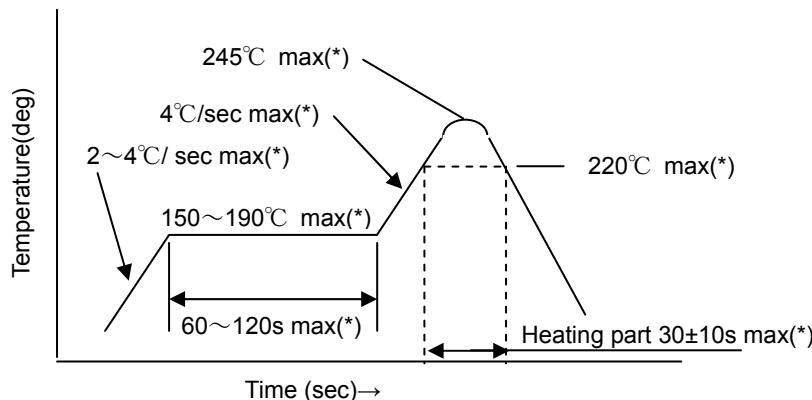
Mounting Methods

Reflow soldering

Temperature profile example

- Package surface temperature: 245°C(max)

- Perform reflow soldering no more than twice.



(*)The product is evaluated using the above reflow soldering conditions. No additional evaluation test is performed exceeding these conditions .

Please perform reflow soldering under the above conditions. Perform reflow soldering no more than twice.

- Please perform the first reflow soldering within 48h of opening the package, with reference to the above temperature profile.

- Second reflow soldering:

Second reflow soldering should be performed within 48h of the first reflow, under the above conditions. Storage conditions before second reflow soldering: 30°C, 70% RH or lower

- Do not mount with manual soldering.

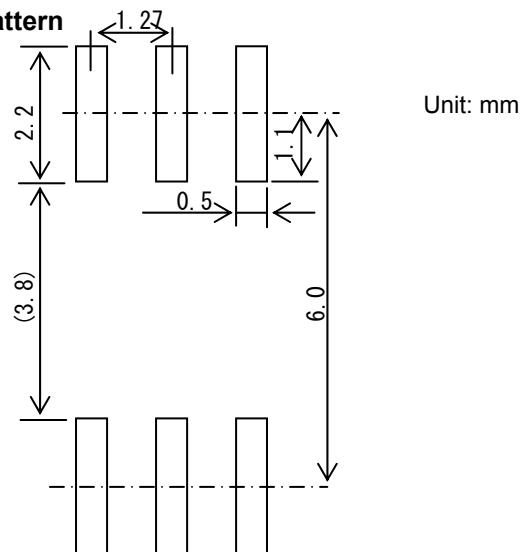
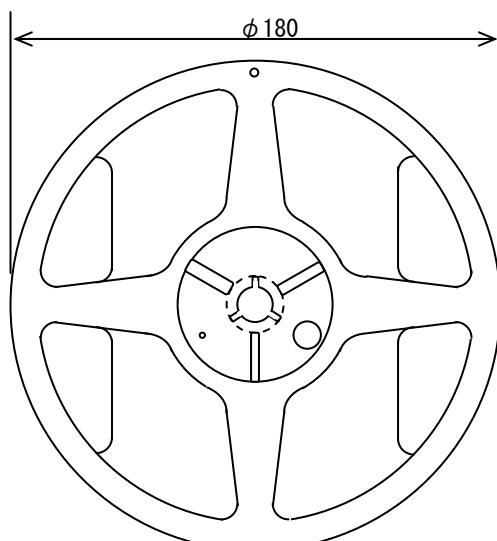
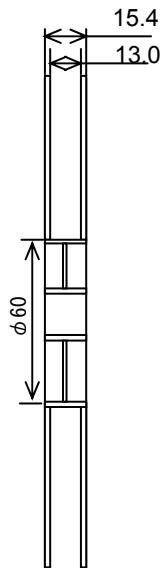
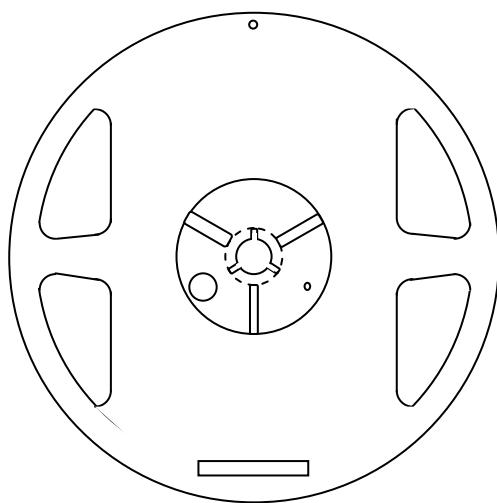
- Only when the correction is needed, the manual soldering is possible only once a place.

Manual soldering conditions:

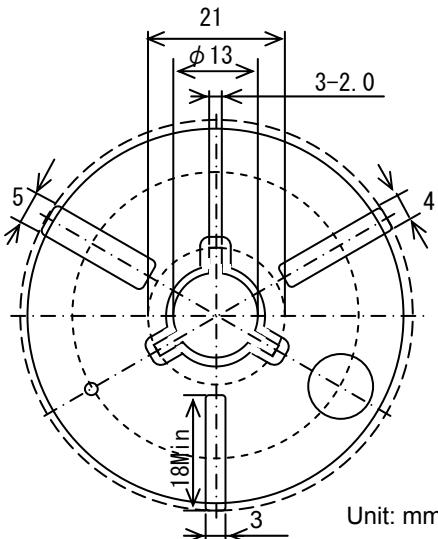
Temperature: less than 300°C (50 W for soldering iron)

Time: within 3 s

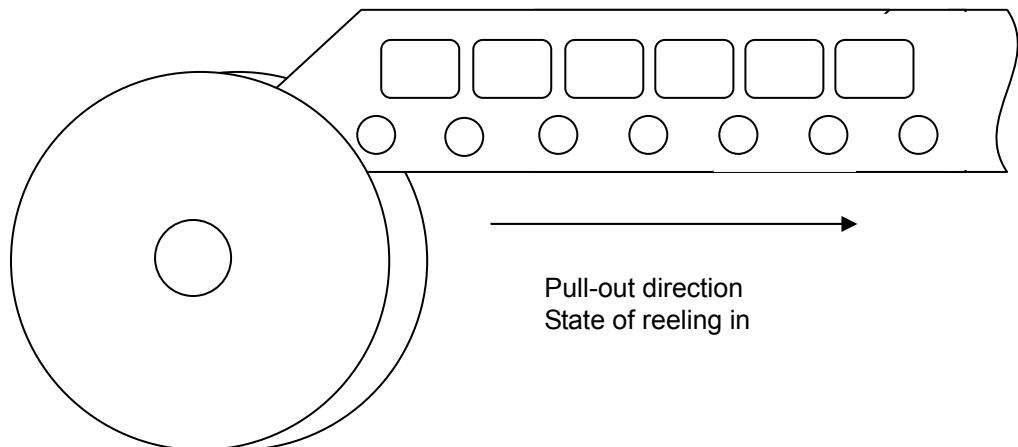
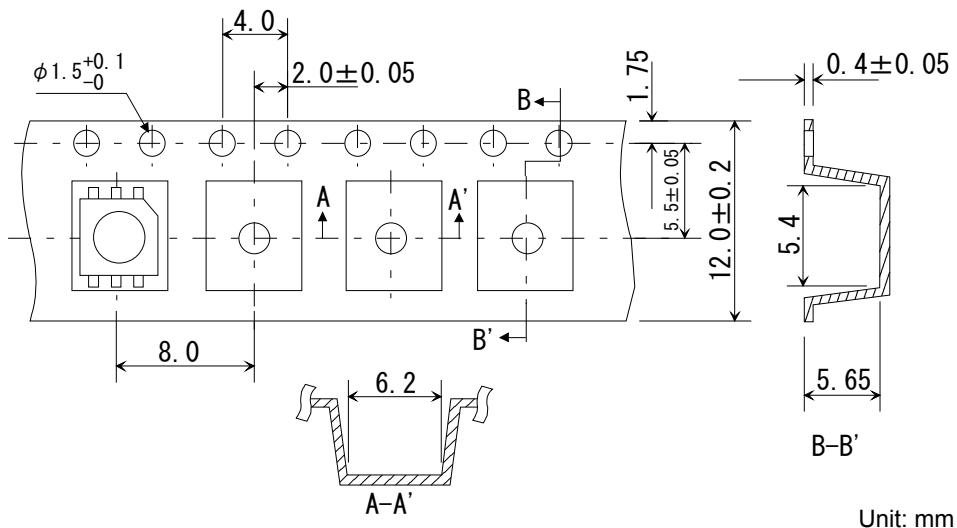
- Do not perform flow soldering

Recommended soldering pattern**Tape Packing Specifications****Reel dimensions**

Enlarged view of reel center



Unit: mm

Tape dimensions

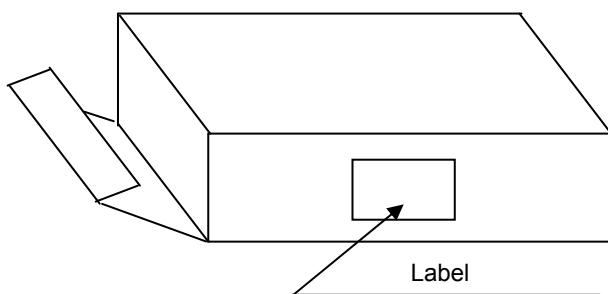
• Packing Specification**(1)Packing quantity**

Reel(minimum packing quantity)	400devices
Carton	5reels(2000devices)

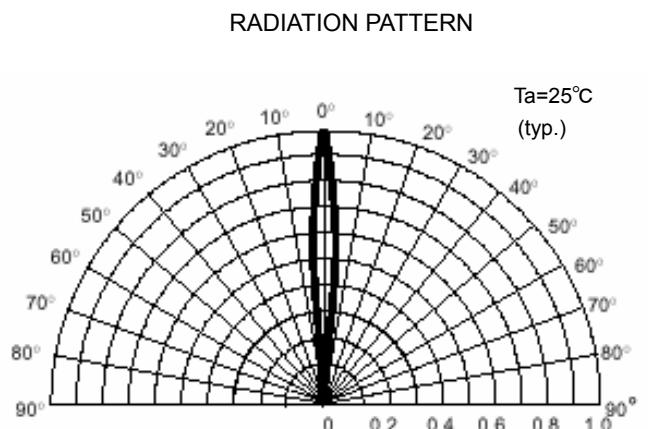
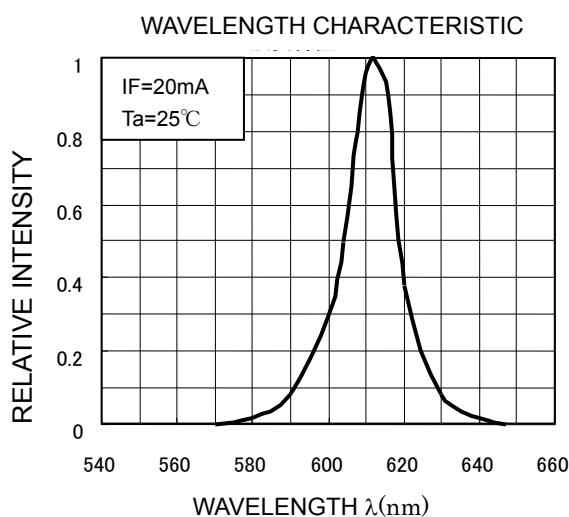
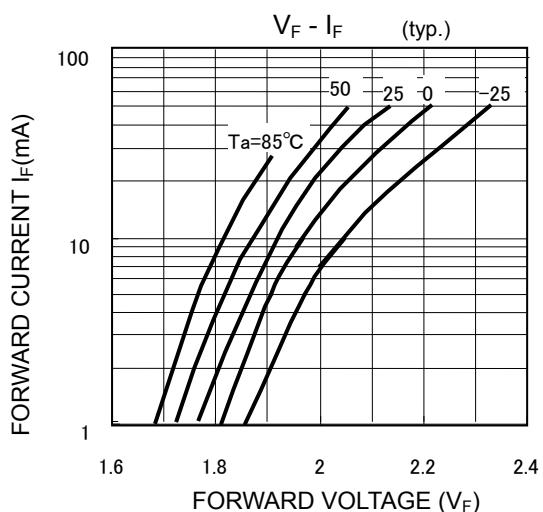
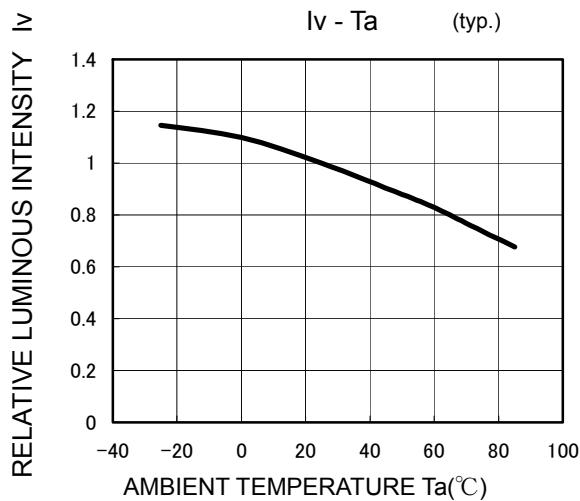
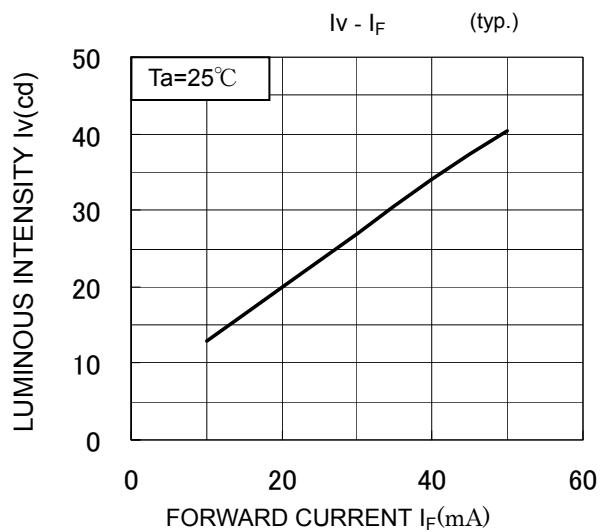
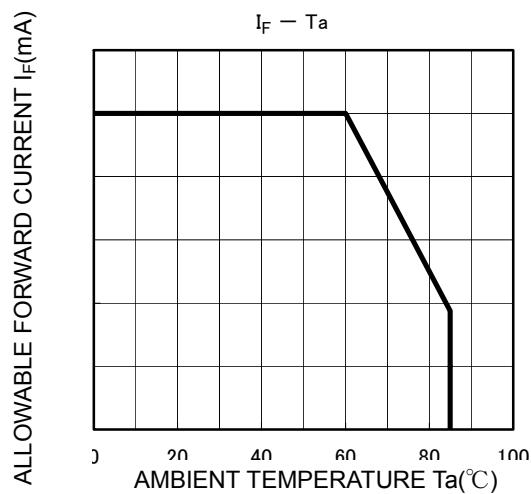
(2)Packing format

An aluminum envelope containing silica gel and the reel is deaerated and sealed.

Shock-absorbent materials are packed around the aluminum envelopes in the cartons to cushion them.

• Carton specification**Carton dimensions**

(W)81mm×(L)280mm×(H)280mm



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20070701-EN

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