



## Features

Package	Infrared-emitting LED Φ 5type, colorless clear resin
Product features	<ul style="list-style-type: none"> <li>▪ High speed, high power, narrow spatial distribution</li> <li>▪ Lead-free soldering compatible</li> <li>▪ RoHS compliant</li> </ul>

## Recommended Applications

- Electric Household Appliances, OA/FA, PC/Peripheral Equipment, and Other General Applications

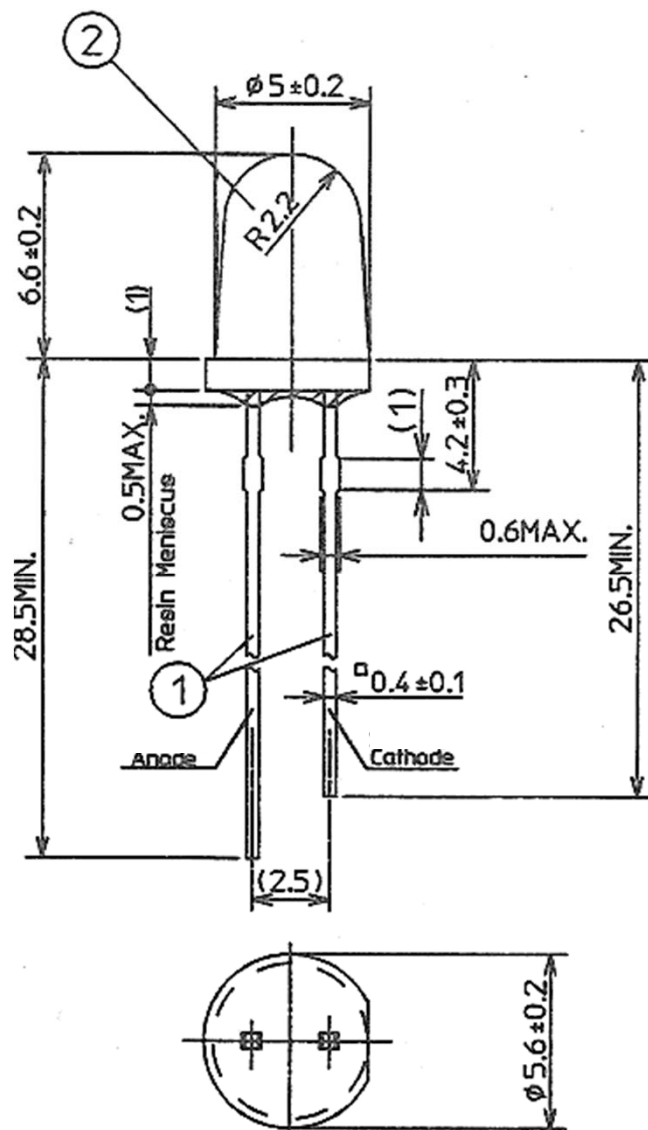
Outline Dimensions

DNK5805S

UNIT : mm

Weight : 350mg

Tolerance : ±0.2



No.	Part Name	Material	Qty.
①	Lead	Fe (Ag plating)	2
②	Encapsulant	Epoxy resin	1

# Specifications

DNK5805S

## Absolute Maximum Ratings (Ta=25 °C)

Power dissipation	$P_d$	170	mW
Forward current	$I_F$	100	mA
Forward current derating factor over 25°C	$\Delta I_F$	1.33	mA/°C
Peak forward current (0.1m sec pulse, 1/100 duty)	$I_{FRM}$	1,000	mA
Peak forward current derating factor over 25°C	$\Delta I_{FRM}$	13.3	mA/°C
Reverse voltage	$V_R$	5	V
Operating temperature	$T_{opr}$	-30~+85	°C
Storage temperature	$T_{stg}$	-30~+100	°C

## Electro-Optical Characteristics (Ta=25 °C)

Item	Condition	Symbol	Characteristics		Unit
Forward voltage	$I_F=50mA$	$V_F$	MIN.	1.3	V
			TYP.	1.5	
			MAX.	1.7	
Pulse forward voltage	$I_{FRM}=500mA$	$V_{FM}$	MAX..	3.4	V
Reverse current	$V_R=5V$	$I_R$	MAX.	100	$\mu A$
Capacitance	$V=0V, f=1MHz$	$C_O$	TYP.	70	pF
Radiant intensity	$I_F=50mA$	$I_E$	MIN.	24	mW/sr
			TYP.	60	
			MAX.	192	
Total power	$I_F=50mA$	$P_o$	TYP.	27.0	mW
Peak wavelength	$I_F=50mA$	$\lambda_p$	MIN.	850	nm
			TYP.	870	
			MAX.	890	
Spectral line half width	$I_F=50mA$	$\Delta \lambda$	TYP.	45	nm
Half intensity angle	$I_F=50mA$	$2\theta_{1/2}$	TYP.	25	deg.
Response time (Rise and Fall)	$I_F=50mA$	$t_r/t_f$	TYP.	7	ns
Cut-off frequency	$I_F=50mA_{DC} \pm 10mA, -3db$ from 0.1MHz	$f_c$	MIN.	(40)※	MHz
			TYP.	55	

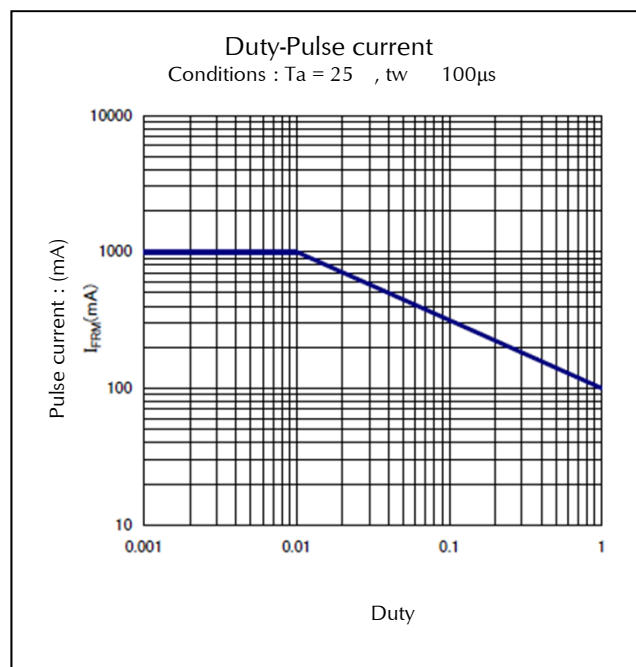
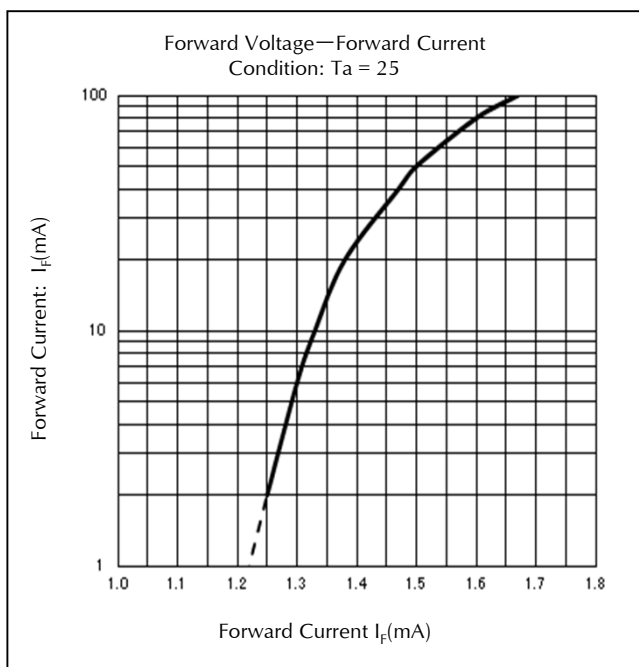
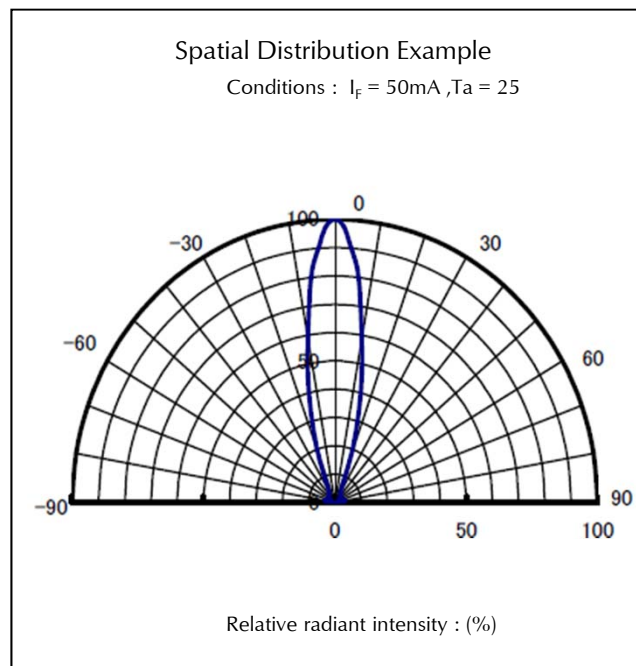
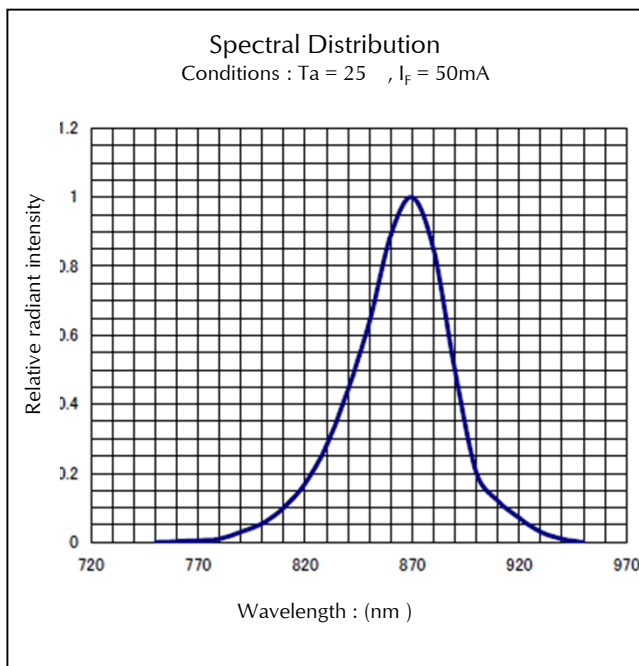
※reference

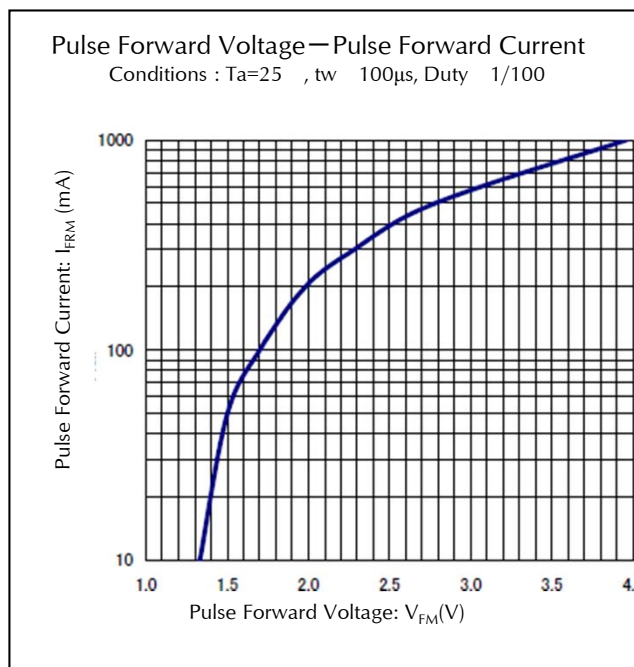
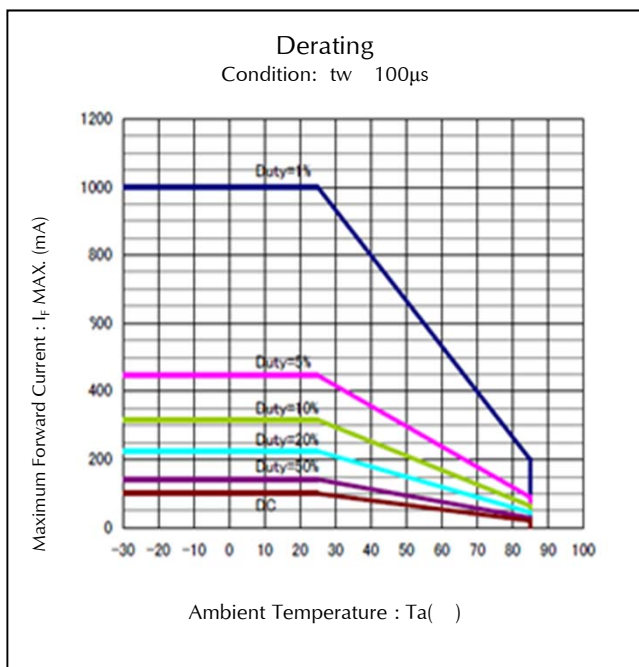
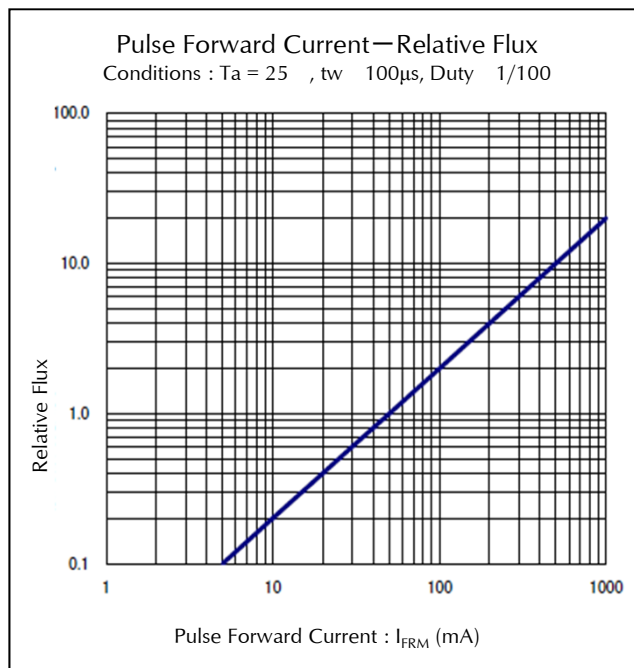
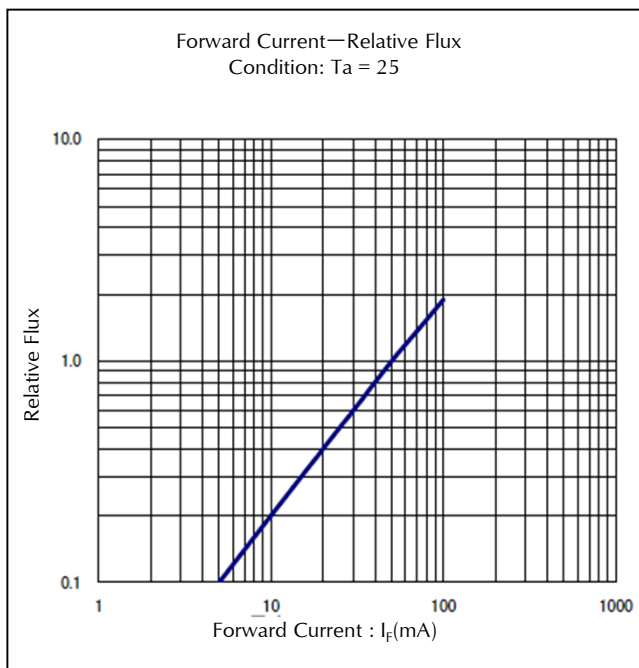
Radiant Intensity Rank

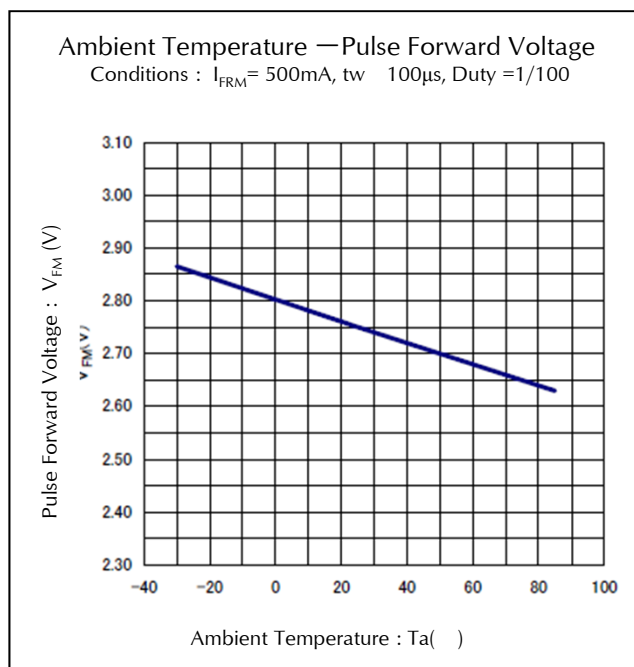
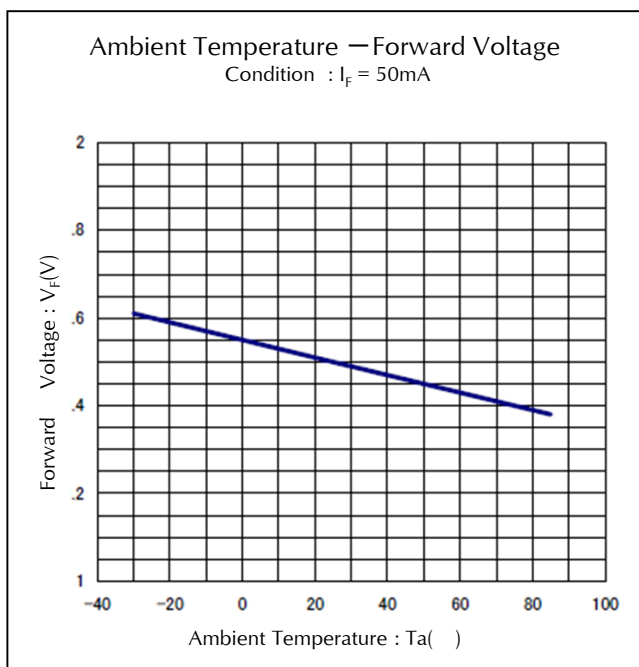
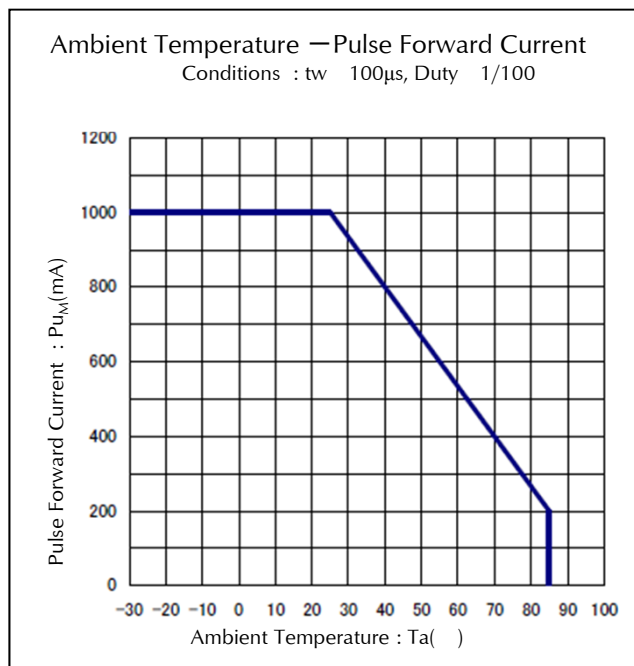
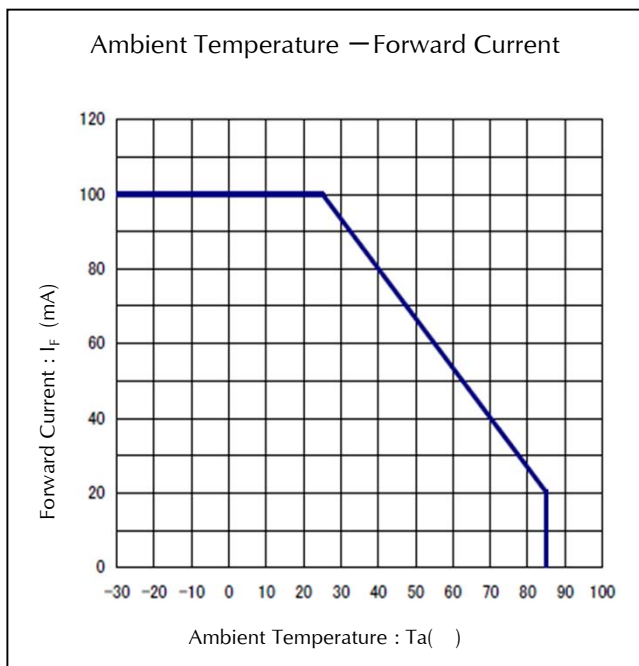
( $T_a=25$  )

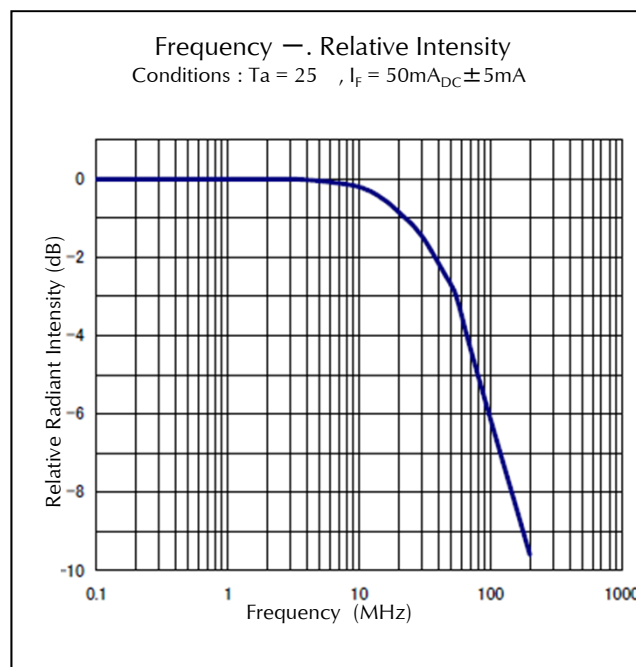
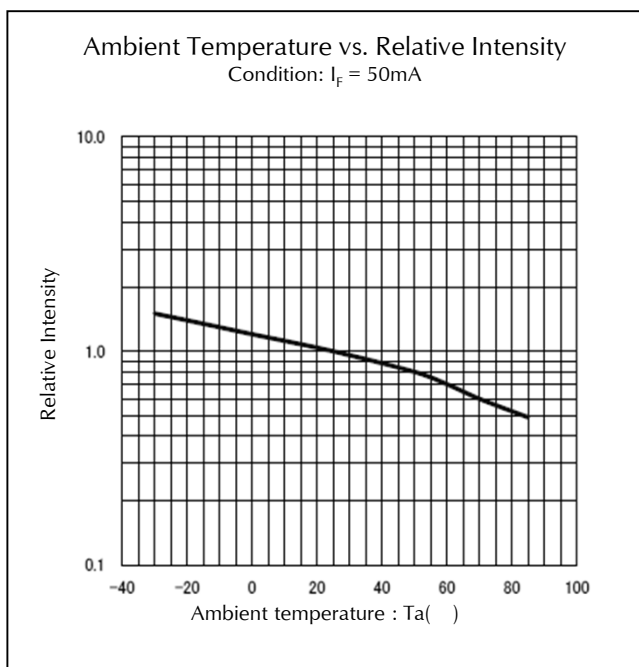
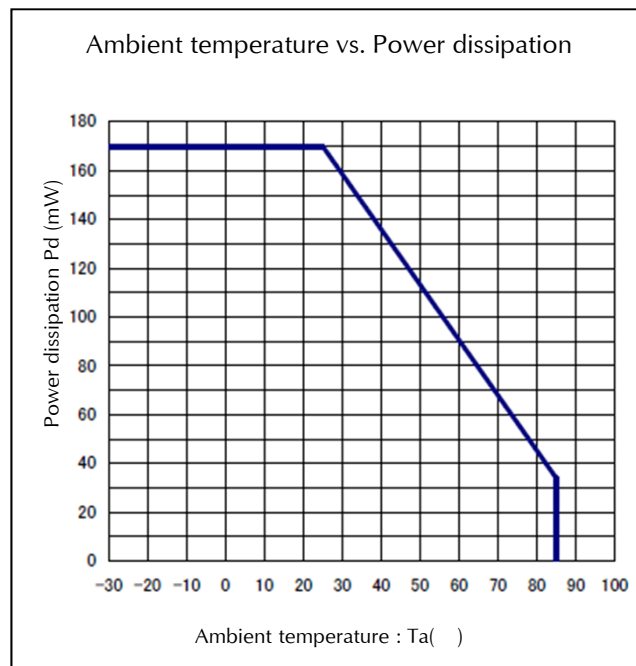
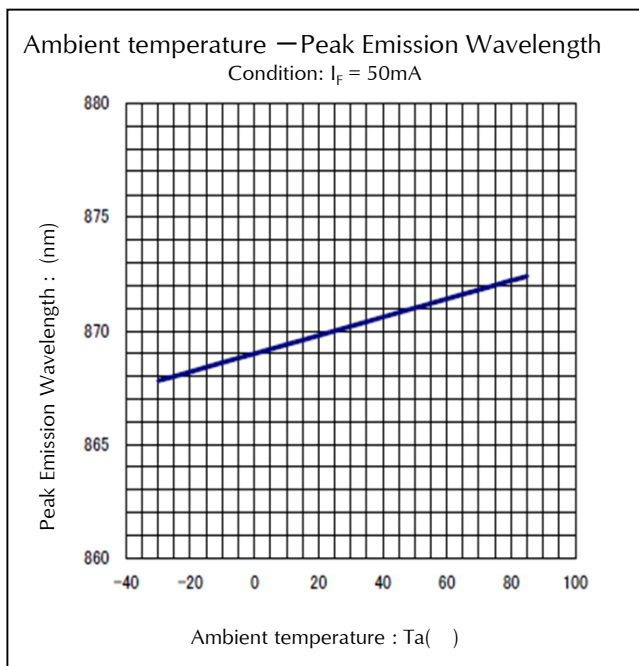
Ranks	$I_E(\text{mW}/\text{sr})$		Conditions
	MIN.	MAX.	
B2	40.0	67.2	$I_F = 50\text{mA}$
C	48.0	96.0	
D	67.2	134.4	
E	96.0	192.0	

The each shipping lot shall consist of mixed ranks(B2C,D,E), and the quantity of photo transistors in each rank can not be specified.









## 1 Soldering precaution

- 1) Please avoid dipping the resin directly into the soldering bath.
- 2) Please do not apply the heat of 100 °C or more to the resin.
- 3) Any shock or vibration to the LED resin body should be avoided after soldering for the resin is soft and easily to be damaged until it return to room temperature.
- 4) Heating up for temporarily fix of other surface-mounting device should be done under 100 °C . Avoid any pressure to the frame and resin part of LED.
- 5) The tie-bar cutting part might get oxidized because iron has been exposed. Please avoid soldering on the tie-bar part, because the solderability decreases when oxidization occurs. When the soldering part and die-bar cutting part overlaps, please confirm the solderability before using.

## 2 Recommendation Condition of Soldering

Soldering iron

Temperature at tip of iron : 360 °C MAX.

Soldering time : 3s MAX.

Position : At least 1.6mm away from the root of lead

The number of manual soldering process shall be 2 times Max.

Cooling process to room temp. is required between first and second manual soldering process.

## 2) Dip Soldering

Pre-heating : Resin surface temperature should be set under 100 °C .

Bath temperature : 265 °C MAX.

Dipping time : 5s MAX.

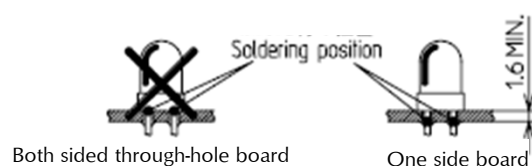
Position : At least 1.6mm away from the root of lead.

The number of dip soldering process shall be 2 times Max.

Cooling process to room temp. is required between first and second dip soldering process.

Soldering positioning

Note Through hole board is not recommended because soldering position will become 0 mm.



## Soldering conditions

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### 3) Reflow Soldering

Not recommended

(However, if LED lamp and other electronic components are soldered together and the temperature of resin can be controlled within 100 , reflow soldering is acceptable.)

## 【 1. Cleaning 】

- 1) Some chemicals could corrode, oxidize cloud or crack the optical characteristics of the lens.  
Please review the reference chat below carefully before cleaning.

Solvent	Adaptability
Isopropyl alcohol	○
Pure water	○
Acetone	×
Thinner	×

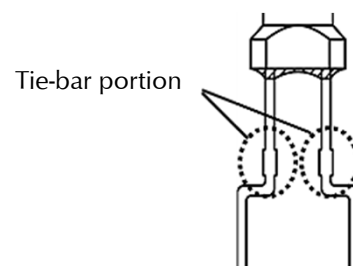
NOTE

- Dipping time is 3 minutes MAX.(at room temperature)
- If pure water is used , please refer to 4).

- 2) Effect of ultrasonic cleaning on the LED will vary on such factors as the oscillator output, capacity ,size of P.C.B and LED mounting method, etc.  
Cleaning should be done after confirming that there is no problem during actual usage with ultrasonic cleaning .
- 3) Freon substitute detergent could corrode, oxidize, cloud or crack the resin of LED, please ensure that there is no problem before using it.
- Freon substitute detergent
- Clean through-750H
  - Pine alpha ST-100S
- 4) If water needs to be used for cleaning, please use pure water(not tap water), and completely dry the component.

## 【 2. Lead Forming 】

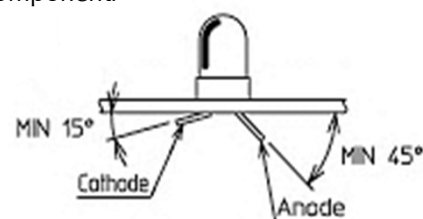
- 1) The lead frame should be bent at a point 2mm away from the root of lead.  
Please perform at room temperature.
- 2) During forming, a jig or radio pliers should be firmly fixed to the root of lead, to which no mechanical stress should be applied.
- 3) All forming must be performed prior to soldering.
- 4) Forming pitch should be adjusted to the device insertion hole-pitch on the PCB.
- 5) Please avoid bending at the tie-bar part of lead during foaming because there is possibility that the stable forming shape can not be formed.



## 【 3. LED Mounting method 】

- 1) Please avoid excessive stress to lead frames during mounting. Mounting should be performed at room temperature.
- 2) To determine mount positions of LEDs using a case, please take into account the dimensions of the casing, board, device to avoid excessive stress on the lead.
- 3) Please fix the LED within the casing using the lead, and do not use adhesives, resin, or any other materials to fix the LED position.
- 4) With regard to using an inserter (automation), please adjust the insertion pressure to the lowest possible setting, and minimize the clinch angle as for as it can hold the component.

<ex.> Clinch angle : Cathode 15° MIN.  
Anode 45° MIN.  
Pusher pressure : 0.2MPa MAX.



Lead width	Holes between pitches on board
0.4mm	φ0.7~1.0mm

## Handling precaution

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### 【 Basic design 】

#### 1.1 Designing for Safety

All LED Lamps are designed to operate without failure in recommended usage conditions. However, all semiconductor components are prone to unexpected malfunctions and failures. Please take the necessary precautions to prevent fire, injury and other damage should any malfunction or failure arise.

#### 1.2 Absolute Maximum Rating

Absolute Maximum Ratings are set to prevent LED Lamps from failing due to excess stress (temperature, current, voltage, etc.). Usage conditions must not exceed the ratings for a moment, nor do reach one items of Absolute Maximum Rating simultaneously.

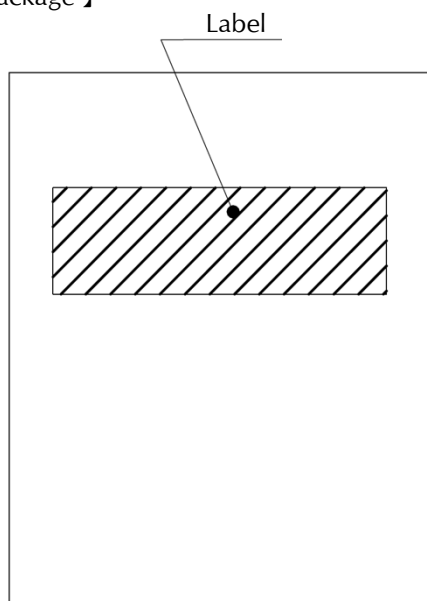
#### 1.3 Actual Usage Design

- 1) In order to ensure high reliability from LED lamps, variable factors that arise in actual usage conditions should be taken in account for designing.( Derating of TYP., MAX Forward Voltage, etc.)
- 2) Please insert straight protective resistors into the circuit in order to stabilize LED lamp operation and also to prevent the device from igniting due to excess current. If LEDs need to be used in a matrix circuit, a fully understanding of LEDs' characteristics is required for designing..
- 3) This LED lamps should be used with current of 2mA or more. If using LED lamps with current over 2 mA, it might vary considerably in chromaticity, luminous intensity, forward current. So current of 2mA or more is recommended considering the optimization of product selection and protective resistors.

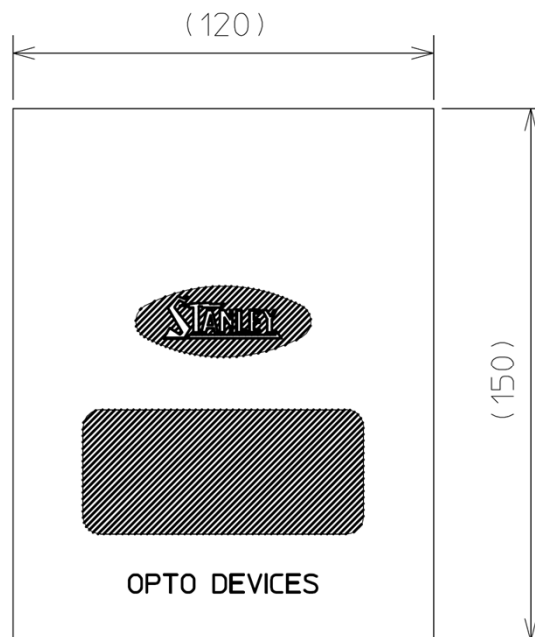
### 【 The others 】

- 1) Once the package is open, please use as soon as possible, as keeping an opened package for a long time could cause the lead frame to oxidize. For storage, please avoid wetness and humidity, while taking care to avoid condensation caused by rapid temperature changes.
- 2) In case of product failures, the lot number on the product package label will be helpful in speeding up our response action.
- 3) Please refrain from looking directly at the light source of LED Lamp at high output, as it may harm your vision.
- 4) Stanley LED Lamps have semiconductor characteristics and are designed to ensure high reliability. However, the performance may vary depending on usage conditions
- 5) Please check the actual performance in the assembly because the Specification Sheets are described for single LED.
- 6) The products are manufactured to be used for ordinary electronic equipment. Please contact our sales staff beforehand when exceptional quality and reliability are required, and the failure or malfunction of the products might directly jeopardize life or health ( such as for airplanes, aerospace, transport equipment, medical applications, nuclear reactor control systems and so on).
- 7) If the actual using condition is different from Stanley's recommended conditions on this specification, please verify LED lamp's performance under actual conditions to ensure there is no problem before actual use.
- 8) The formal specification sheets shall be valid only by exchange of documents signed by both parties.
- 9) Any information not listed on this specification shall be separately discussed and determined by both parties.

【 Package 】



The front

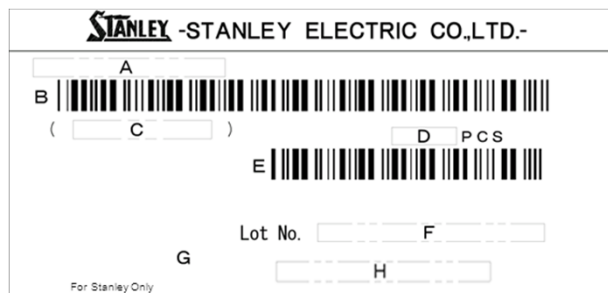


The back

【 Label Specification 】

[acc.to : JIS-X0503(Code-39)]

Product label



- A. Parts number (Indicated the whole parts number)
- B. Bar-code for parts number
- C. Parts code (In-house identification code for each parts number)
- D. Packed parts quantity (Indicated Parts Qty in the packing)
- E. Bar-Code for packed parts quantity
- F. Lot number & Rank (indicated the following 16 digits)
- G. QR-Code for In-House identification number
- ★ H. Customer Parts number

Note "★" will be marked when customer parts number is different from Stanley parts number.

Package

1. Package conditions: Clear plastic bag , 200pcs. / bag.
2. Warranty period: Within 12 months under following conditions.  
Un-opened, at normal temperature / Normal relative humidity ( +5~+30 / 70%Rh.max. ).

Note1

The solderability of terminals of LED might decrease if above warranty period expired.

Note2

Terminals of LED might get oxidized which will decrease the solderability of terminals if the products are stored with cardboard and rubber. The products should be isolated from these in keeping.

Note3

Due to convenience of shipping and transportation, Stanley use cardboard box to shipping products during transportation. Cardboard contains sulfur element which will corrode silver plating. Please take the products out of the cardboard box for long term storage.

Note4

Excess press to the package bag which might deform the lead part of LEDs should be avoided.

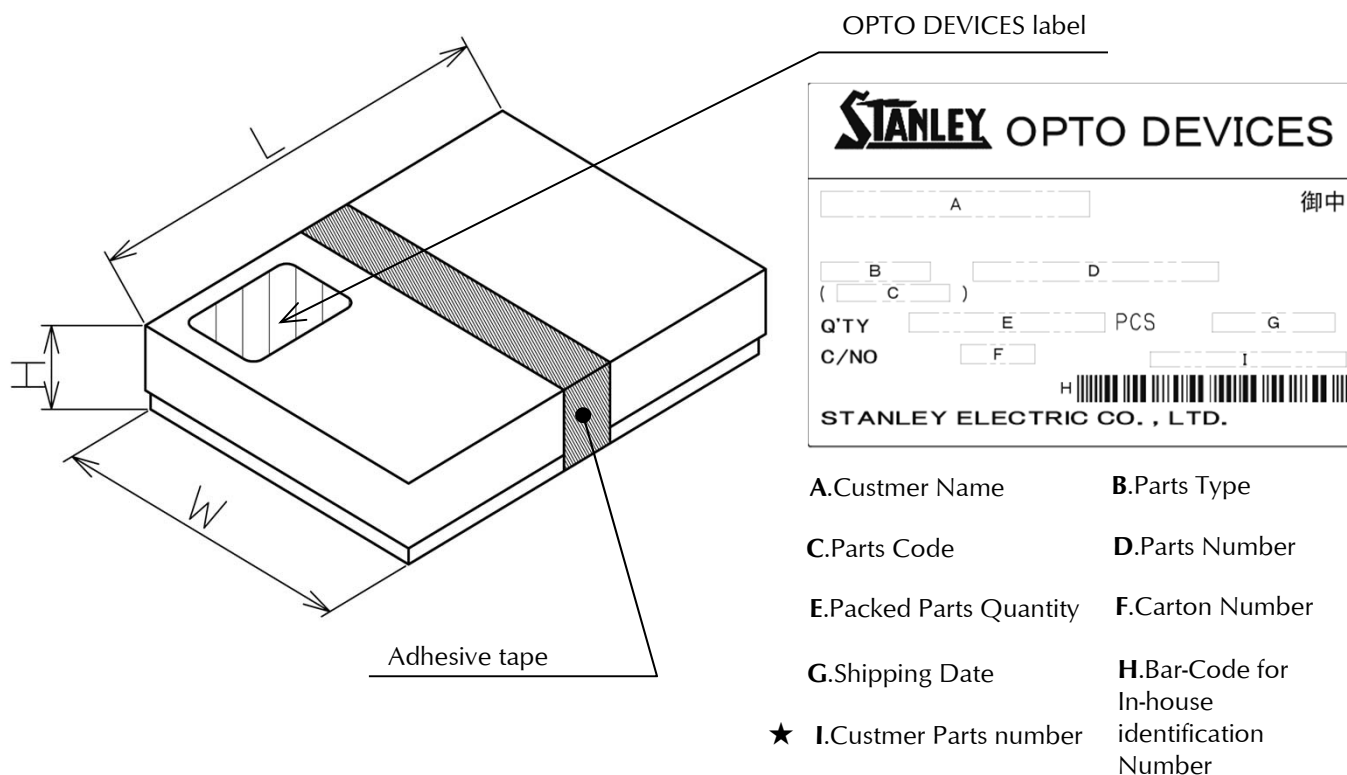
# Packaging Specifications

DNK5805S

### 3. Inner packing box.

Box Type	Outline dimension L × W × H ( mm )	Box Type	Outline dimension L × W × H ( mm )
A1	195 × 117 × 38	B2	310 × 225 × 105
A4	304 × 224 × 46	B3	495 × 230 × 150
HEAD	390 × 210 × 65		

- Note
- The above measure is all the reference value.
  - The optimal box is selected out of the above table, by the packing quantity and also product size.
  - In the case that there is a space in the packing box after packing, a packing is put in.

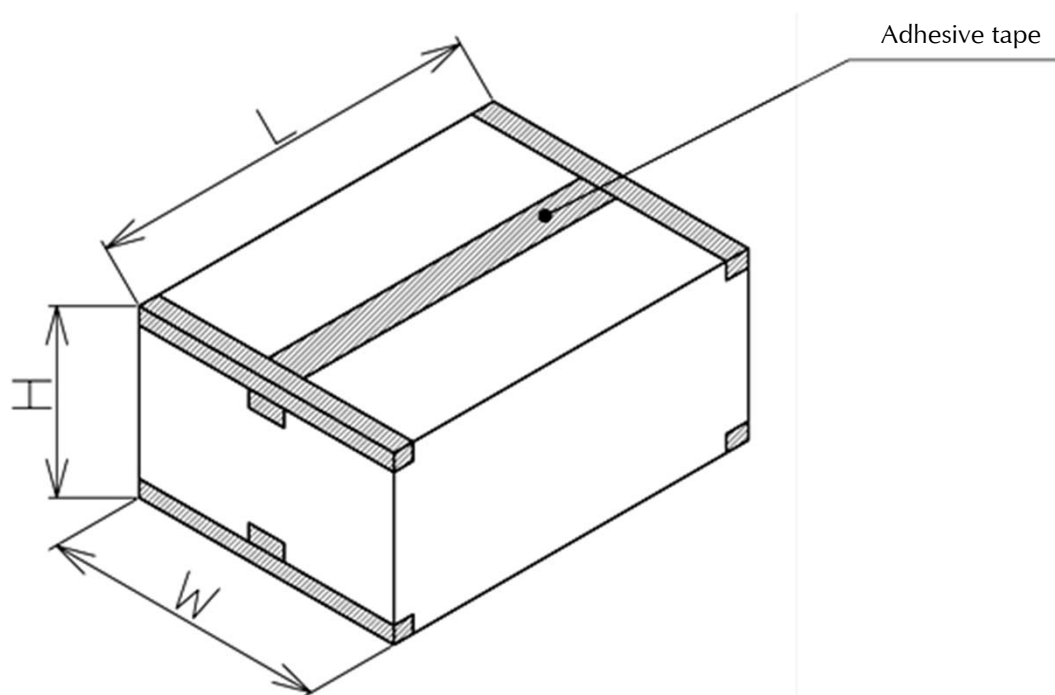


- Notes
- The above figure is a representative example. The way that the adhesive tape on the box differs by the kind of a box.
  - "★" will be marked when customer parts number is different from Stanley parts number.

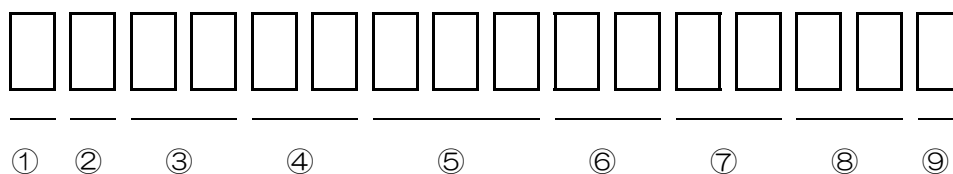
## 4. Outer packing box.

Box Type	Outline dimension L × W × H (mm)	Box Type	Outline dimension L × W × H (mm)
HEAD	390 × 210 × 65	G1	480 × 340 × 225
G4	320 × 230 × 150	LED-C	505 × 255 × 315
2P	410 × 150 × 230	G2	480 × 340 × 320
SH-1	510 × 255 × 165	10P	400 × 335 × 450
5P	400 × 335 × 225		

- Note
- The above measure are all reference value.
  - The box is selected out of the above table by shipping quantity and product size.
  - Package materials are filled into the box to keep products form moving



- Note
- The above figure is a representative example. The way that how adhesive tape is applied on the box differs by the box type.



- ① - 1digit : Production Location (Mark identify alphabet) . . . . .
- ② - 1digit : Production Year (Last Digit of Production Year 2009 9,2010 0,2011 1,····)
- ③ - 2digits : Production Month (Jan. to Sep. ,Should be 01,02,03,·····)
- ④ - 2digits : Production Date
- ⑤ - 3digits : Serial Number
- ⑥ - 2digits : Tape and Reel following Number
- ⑦ - 2digits : Luminous Intensity Rank.  
(If luminous intensity rank is 1 digit, "-" shall be dashed on the place for the second digit.  
If there is no identified intensity rank, "- -" is used to indicate.)
- ⑧ - 2digits : Chromaticity Rank  
(If chromaticity rank is 1 digit, "-" shall be dashed on the place for the second digit.  
If there is no identified intensity rank, "- -" is used to indicate.)
- ⑨ - 1digit : Option Rank (Stanley normally print "-" to indicate)

## Correspondence to RoHS • ELV instruction

DNK5805S

This product is in compliance with RoHS • ELV.

Prohibition substance and it's criteria value of RoHS • ELV are as follows.

- RoHS instruction ..... Refer to following (1)~(6).
- ELV instruction ..... Refer to following (1)~(4).

	Substance Group Name	Criteria Value
(1)	Lead and its compounds	1,000ppm Max
(2)	Cadmium and its compounds	100ppm Max
(3)	Mercury and its compounds	1,000ppm Max
(4)	Hexavalent chromium	1,000ppm Max
(5)	PBB	1,000ppm Max
(6)	PBDE	1,000ppm Max

# Reliability Testing Result

DNK5805S

## 1. Reliability Testing Result

Testing Items	Applicable Standard	Testing Conditions	Duration	Failure
Room Temp. Operating Life	EIAJ ED-4701/100(101)	Ta = 25°C, I <sub>F</sub> = Maximum Rated Current	1,000 h	0/25
Resistance to Soldering Heat	EIAJ ED-4701/300(302)	260±2°C, 3mm from package base	10±1s	0/25
Temperature Cycling	EIAJ ED-4701/100(105)	Minimum Rated Storage Temperature(30min) ~Normal Temperature(15min) ~Maximum Rated Storage Temperature(30min) ~Normal Temperature(15min)	5 cycles	0/25
Wet High Temp. Storage Life	EIAJ ED-4701/100(103)	Ta = 60±2°C, RH = 90±5%	1,000 h	0/25
High Temp. Storage Life	EIAJ ED-4701/200(201)	Ta = Maximum Rated Storage Temperature	1,000 h	0/25
Low Temp. Storage Life	EIAJ ED-4701/200(202)	Ta = Minimum Rated Storage Temperature	1,000 h	0/25
Lead Tension	EIAJ ED-4701/400(401)	10N, 1time	10s	0/10
Vibration, Variable Frequency	EIAJ ED-4701/400(403)	98.1m/s <sup>2</sup> (10G), 100 ~ 2KHz sweep for 20min., XYZ each direction	2 h	0/10

## 2. Failure Criteria

Items	Symbol	Conditions	Failure criteria
Luminous Intensity	I <sub>v</sub>	Ta=25°C I <sub>F</sub> =10mA	Testing Min. Value < Spec. Min. Value x 0.5
Forward Voltage	V <sub>F</sub>	Ta=25°C I <sub>F</sub> =10mA	Testing Max. Value ≥ Spec. Max. Value x 1.2
Reverse Current	I <sub>R</sub>	Ta=25°C V <sub>R</sub> =4V	Testing Max. Value ≥ Spec. Max. Value x 2.5
Cosmetic Appearance	-	-	Occurrence of notable decoloration, deformation and cracking

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- 2) For the purpose of product improvement, the specifications, characteristics and technical data described in the data sheets are subject to change without prior notice. Therefore it is recommended that the most updated specifications be used in your design.
- 3) When using the products described in the data sheets, please adhere to the maximum ratings for operating voltage, heat dissipation characteristics, and other precautions for use. We are not responsible for any damage which may occur if these specifications are exceeded.
- 4) The products that have been described to this catalog are manufactured so that they will be used for the electrical instrument of the benchmark (OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument).

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