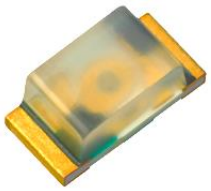
Data sheet

Part number : XPG1111C-TR



Package	SMD top view package, pale blue color emitting LED Outer dimension 1.6 x 0.8 x 0.7mm (L x W x H)
Product features	・Lead-free soldering compatible ・RoHS2 compliant

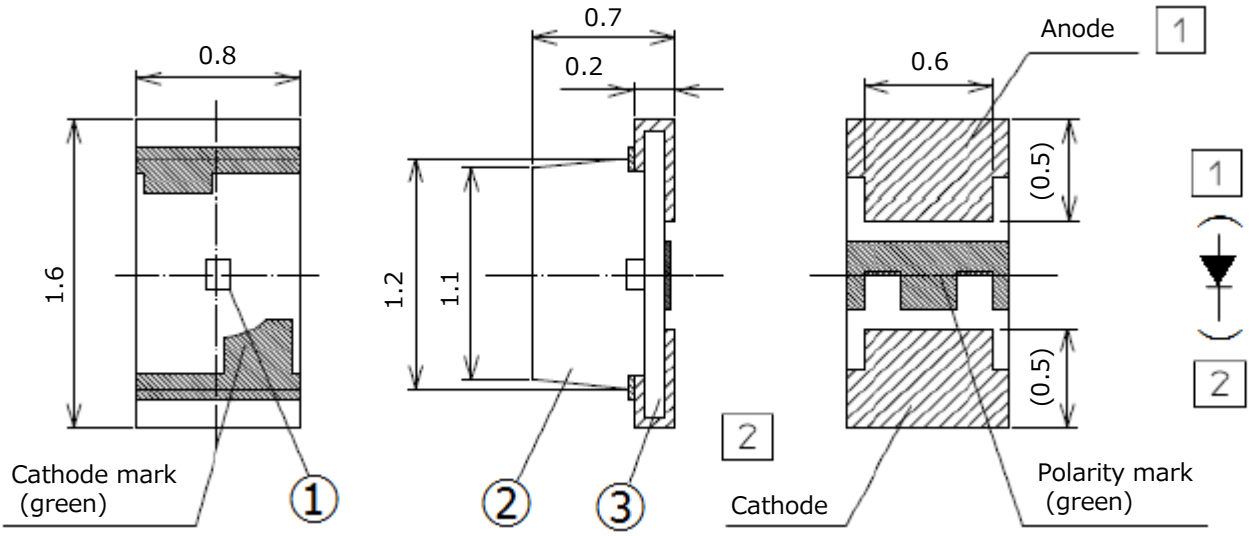
Recommended applications

・Switch lighting indicators for Mobile phone, Home appliances, OA/FA, Other general equipment etc.

Outline dimensions

XPG1111C-TR

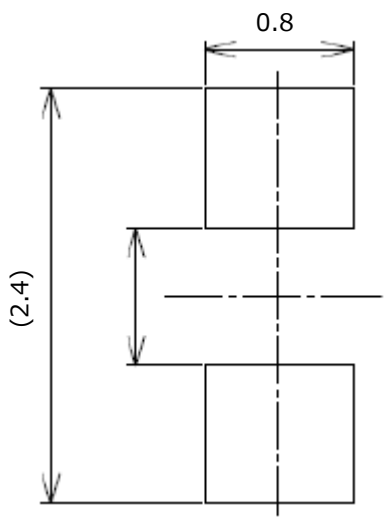
Unit : mm
Weight : 8.2mg
Tolerance : ±0.1



No	Part name	Material	Qty.
①	LED die	InGaN	1
②	Lens	Epoxy resin	1
③	Substrate	Glass fabrics	1
④	Electrode	Cu/Ni/Au	Cathode:2 Anode:1

Recommended soldering pattern

Unit : mm



※1 The cutting burr size of the substrate and pin doesn't contain it in the size of the height of the product.

※2 Please note no short-circuit when the wiring pattern is arranged between the soldering attachment pad.

Specifications XPG1111C-TR

【 Product Overview 】

Die material	InGaN
Emitting color	Green
Resin color 【emitting area】	Milky white

【 Absolute maximum ratings 】

(Ta=25℃)

Item	Symbol	Maximum ratings	Units	
Power dissipation	P_d	78	mW	
Forward current	I_F	20	mA	
Repetitive peak forward current "1ms, 1/20Duty"	I_{FRM}	48	mA	
I_F Derate linearly from 25℃	ΔI_F	0.26	mA	
I_{FRM} Derate linearly from 25℃	ΔI_{FRM}	0.64	mA	
Reverse current	I_R	5	mA	
Operarting temperature	T_{opr}	-40 to +85	℃	
Storage temperature	T_{stg}	-40 to +100	℃	
Soldering temperature 【Reflow soldering】	T_{sld}	260	℃	Note1

Note1 Please refer to page 8, Soldering Conditions.

Specifications XPG1111C-TR

【 Electro-Optical Characteristics 】

(Ta=25℃)

Item	Symbol	Conditions	Min.	Typ.	Max.	Units	
Forward voltage	V_F	I_F = 5mA	-	2.9	3.2	V	Note2
Reverse current	I_R	V_R = 5V	-	-	100	μA	
Luminous intensity	I_V	I_F = 5mA	120	170	240	mcd	Note3
Luminous flux	Φ_V	I_F = 5mA	-	940	-	mlm	
Peak wavelength	λp	I_F = 5mA	-	519	-	nm	
Dominant wavelength	λd	I_F = 5mA	514	526	539	nm	Note4
Spectral bandwidth at 50% of I_{max}	Δλ	I_F = 5mA	-	35	-	nm	
Half intensity angle	$2\theta_{1/2}$	I_F = 5mA	-	140	-	deg.	

※ Be carful of the damage by serge voltage such as static electricity during handling.

Note2 Forward voltage"V_F" value is setup value of selection machine. (torelanc:±0.2V)

Note3 Luminous intensity"I_V" value is setup value of selection machine. (torelanc:±10%)

Note4 Dominant wavelength "λd" value is setup value of selection machine. (torelanc:±3nm)

【 Sorting chart for luminous intensity, Iv & Dominant wavelength λd 】

LED's shall be sorted out into the following ranks of Luminous Intensity and Dominant Wavelength.

Luminous intensity rank (Iv)

Rank	Luminous intensity Iv / (mcd)		Conditions
	Min.	Max.	
CA	120	170	I_F = 5mA Ta=25℃
CB	170	240	

Dominant wavelength rank (λ d)

Rank	Dominant wavelength λ p / (nm)		Conditions
	Min.	Max.	
1	514	526	I_F = 5mA Ta=25℃
2	526	539	

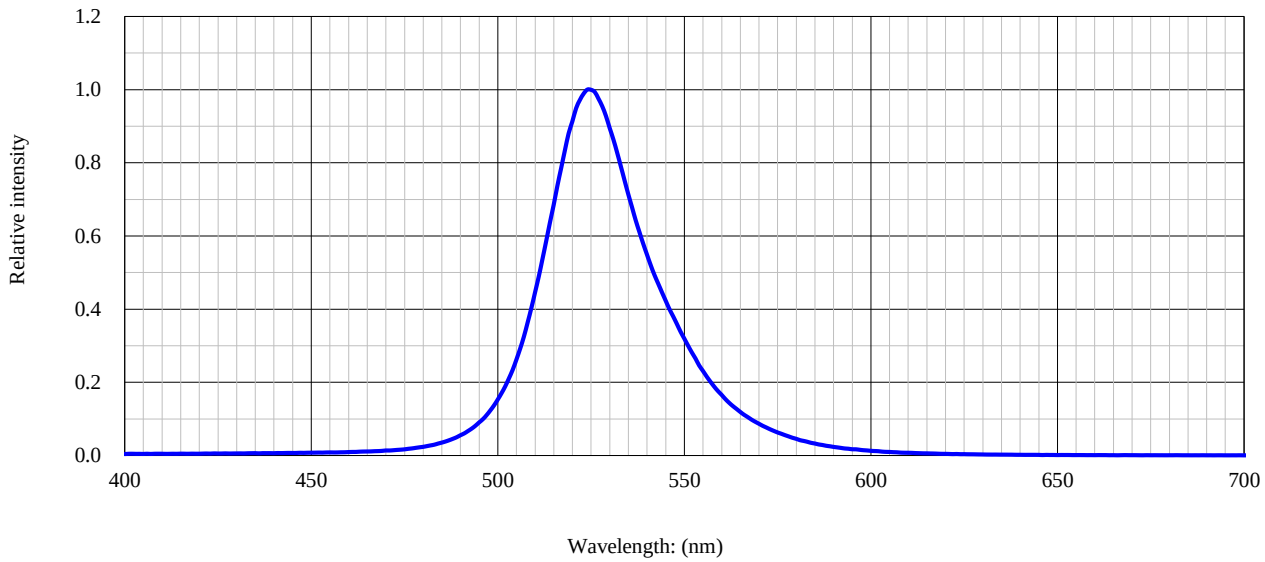
Note Above the table of luminous intensity (I_V) values and dominant wavelength (λd) values are the setup value of the selection machine.【Tolerance : I_V ±10%、λd ±3nm】

Technical Data

XPG1111C-TR

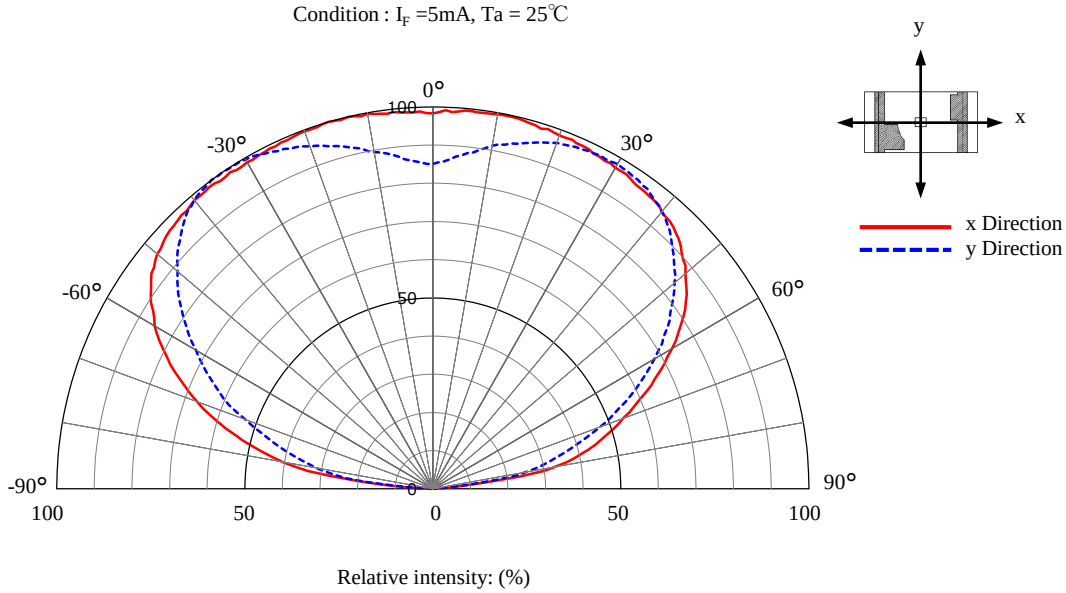
Relative intensity vs. wavelength

Condition : I_F =5mA, Ta = 25℃



Spatial Distribution

Condition : I_F =5mA, Ta = 25℃

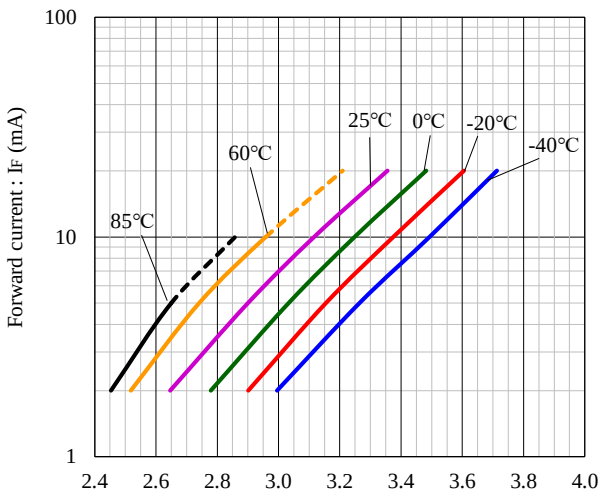


Technical Data

XPG1111C-TR

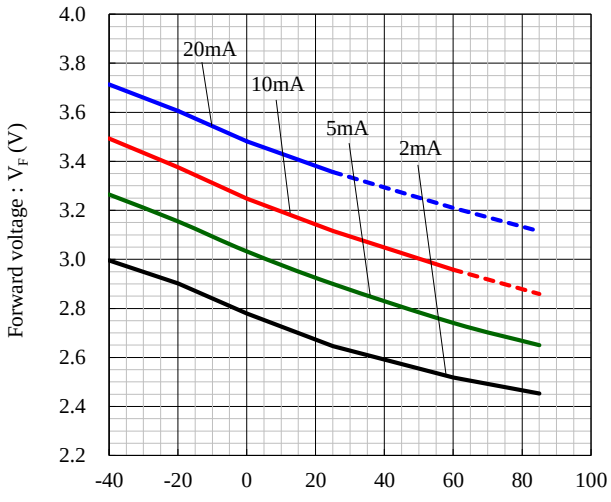
Forward voltage vs. Forward current

Condition : Ta = -40 to 85℃



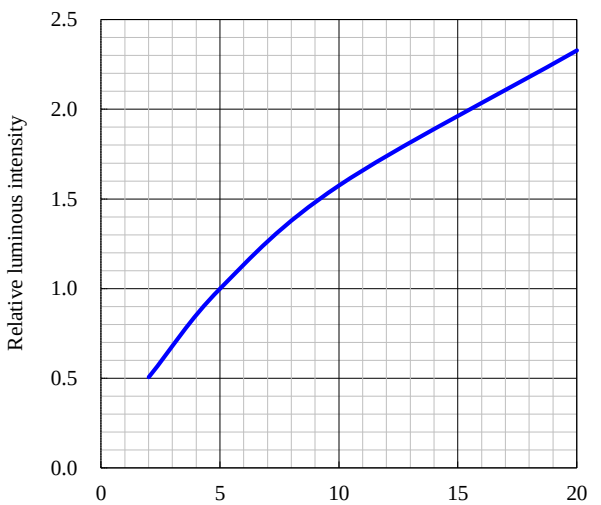
Ambient temp. vs. Forward voltage

Condition : I_F = 2 to 20mA



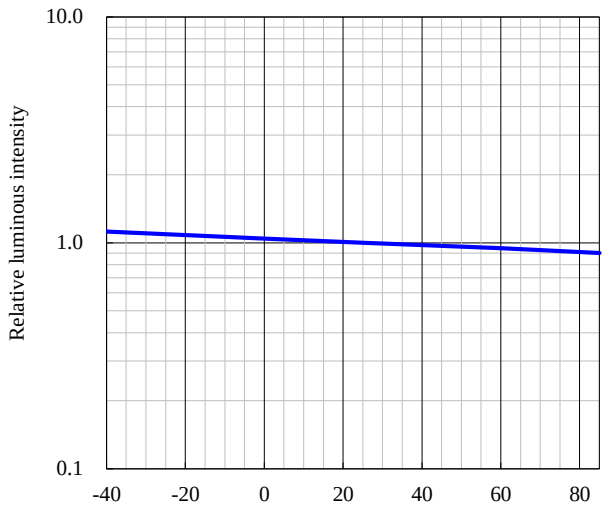
Forward current vs. Relative luminous intensity

Condition : Ta = 25℃



Ambient temp. vs. Relative luminous intensity

Condition : I_F = 5mA

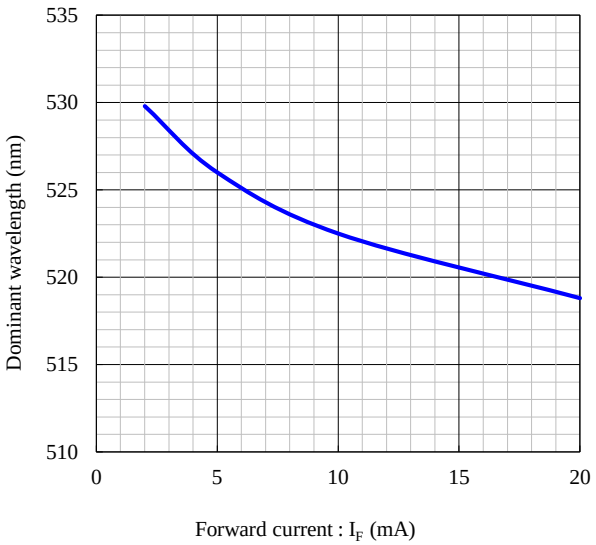


Technical Data

XPG1111C-TR

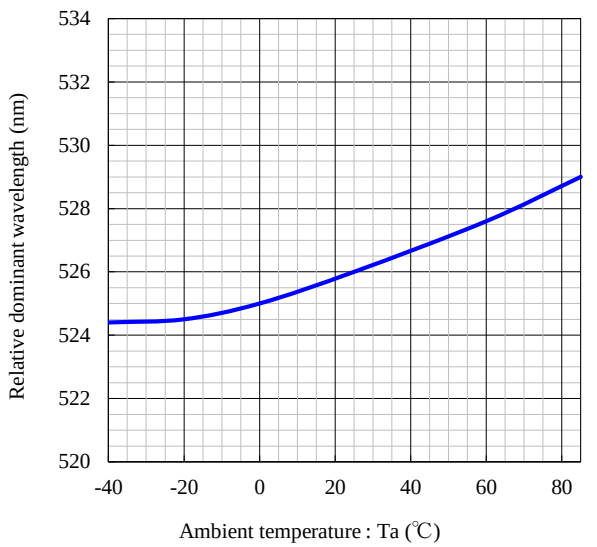
Forward current vs. Dominant wavelength

Condition : Ta=25°C



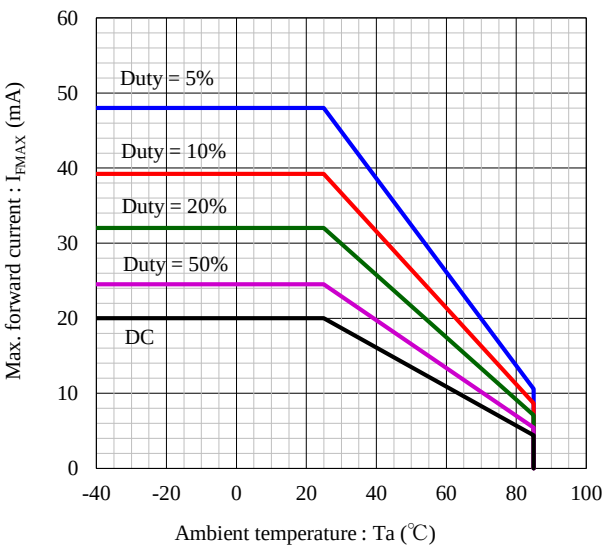
Ambient temp. vs. Relative dominant wavelength

Condition : I_F=5mA

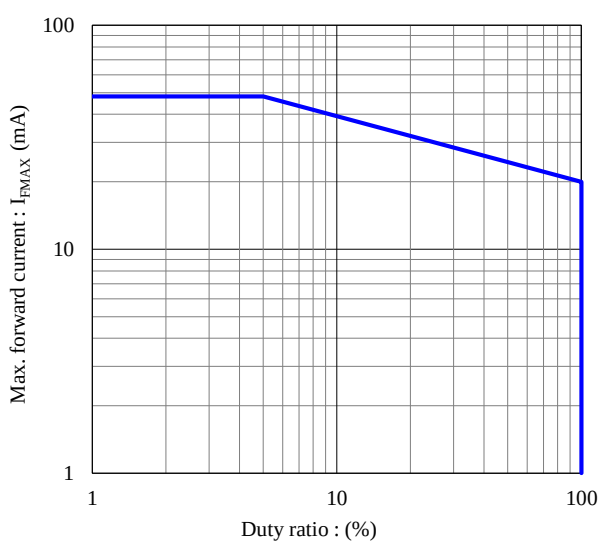


Max. forward current vs Ambient temp.

Repetition frequency : f≧50Hz, plus width : tw≦1ms



Maximum forward current vs Duty ratio



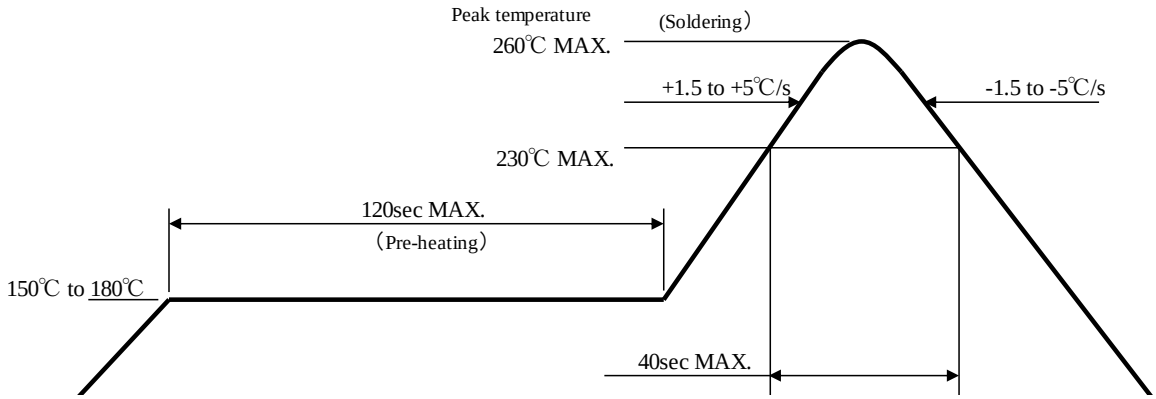
Soldering condition

XPG1111C-TR

(acc.to EIAJ-4701/300)

1. Reflow soldering

【Recommended reflow soldering condition】



1) The above temp. profile shall be at the surface of LED resin.

2) The number of reflow process shall be 2 time MAX. If second reflow process would be performed, intervals between first and second process shall be as short as possible to prevent absorption of moisture to resin of LED. Cooling process to normal temp. shall be required between first and second reflow process.

3) Temp. fluctuation to LED at pre-heat process shall be minimized.

2. Manual soldering (soldering iron)

Temperature of iron tip	350℃ Max.
Soldering duration, time	3sec. Max., 1 time

※ The number of manual soldering process shall be 1 time.

3. Other caution

1) As manual soldering, please heat the solder pad, should not contact a tip of iron to a product (especially resin).

2) Heat or UV(or both) curing resin shall used for preliminary fixing.
Curing condition temp. : 150 ℃ Max. , time : 120s Max.

3) After soldering, any mechanical force or any excess vibration shall not be accepted to apply during cooling process to normal temp.

Handling precautions

XPG1111C-TR

Cleaning

1) Special care shall be taken when applying the chemicals listed below for cleaning because certain chemicals may damage the surface of lens or care and cause discoloration.

Cleaning agents	Recommended / Not recommended
Ethyl alcohol	✓**Recommended**
Isopropyl alcohol	✓**Recommended**
Pure water	✓**Recommended**
Trichloroethylene	x **Not recommended**
Chlorothene	x **Not recommended**
Acetone	x **Not recommended**
Thinner	x **Not recommended**

2) Effect of ultrasonic cleaning on the LED resin body differs depending on such factors as the oscillator output, size of P.C.B. and LED mounting method. So the use of ultrasonic cleaning is strongly recommended after confirming that there is no problem.

3) When using Freon equivalent solvent, discoloration on the LED surface may be caused by one of the first confirming that there is no problem.

4) In the case of water-washing , ensure to use pure water (not city water) and , immediately after the washing is over, apply forced drying to remove all the moisture from the LED.

Handling precautions

XPG1111C-TR

【 Other precautions 】

1. Stanley LED has semiconductor characteristics and are designed to ensure high reliability. However, the performance may vary depending on usage conditions.

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

3. In order to ensure high reliability from LED, variable factors that arise in actual usage conditions should be taken it to account for designing. (Derating of TYP., MAX Forward Voltage, etc.)

4. Please insert Straight Protective Resistors into the circuit in order to stabilize LED operation and to prevent the device from igniting due to excess current.

5. Please check the actual performance in the assembly because the Specification Sheets are described for LED device only.

6. Please refrain from looking directly at the light source of LED at high output, as it may harm your vision.

7. . The products are designed to operate without failure in recommended usage conditions. However, please take the necessary precautions to prevent fire, injury, and other damages should any malfunction or failure arise.

8. 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).

9. It is not recommended supersonic wave welding etc. after mounting the product. There is a possibility of affecting on the junction part in package (junction part of die bonding and wire bonding). Please make sure there is no problem before using.

10. The formal specification sheets shall be valid only by exchange of documents signed by both parties.

Packaging specifications

XPG1111C-TR

This product is baked (moisture removal) before packaging, and is shipped in moisture-proof packaging (as shown below) to minimize moisture absorption during transportation and storage. However, with regard to storing the products, Stanley recommends the use of dry-box under the following conditions is recommended. Moisture-proof bag as the packaging is made of anti-static material but packaging box is not.

【Recommended storage condition / Products warranty period】

Temperature	+5～30℃
Humidity	Under 70%

In the case of the package unopened , 6 months under【 Recommended storage condition 】.
Please avoid rapid transition from low temp. condition to high temp. condition
and storage in corroding and dusty environment.

【Time elapsed after package opening】

The package should not be opened until immediately prior to its use, and please keep the time frame between package opening and soldering which is【Maximum 72h】.
If the device needs to be soldered twice, both soldering operations must be completed within the 72h.

If any components should remain unused, please reseal the package and store them under the conditions described in the【 Recommended Storage Condition 】above.

This product must be required to perform baking process (moisture removal) for
at 10h(MIN.). to 12h(MAX.) at 60±5 degrees Celsius if following conditions apply.

1. In the case of silica gel (blue) which indicates the moisture level within the package, changes or loses its blue color.
2. In the case of time passes for 72h after the package is opened once.

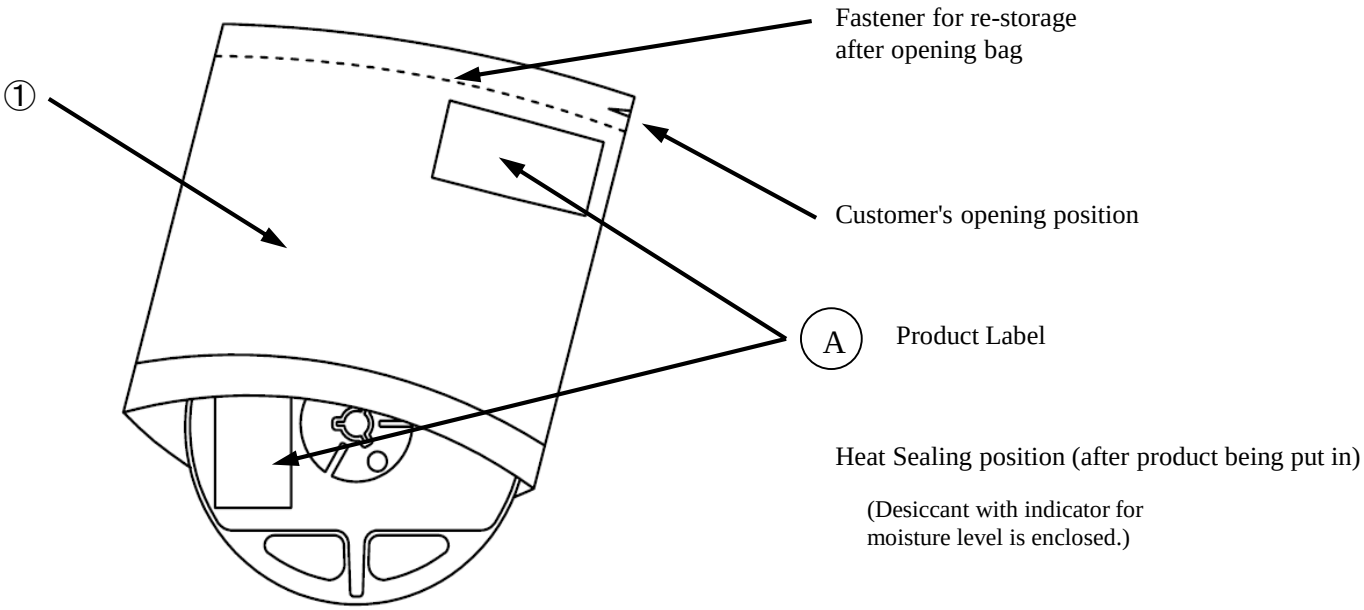
Baking process should be performed after LED having been taken out of the package.

Baking may be performed in the tape-reel form , however if it is performed with the reel stacked over one another, it may cause deformation of the reels and taping materials and later obstruct mounting.
Please handle only once it has returned to room temperature.
Provided that, baking process shall be 2 times Max.

Packaging specifications

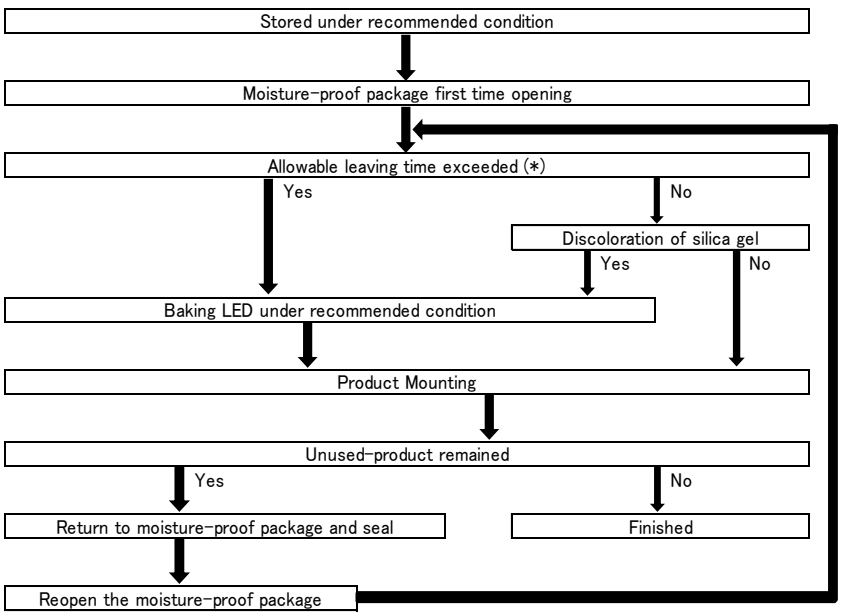
XPG1111C-TR

【Moisture-proof packaging specification】



No.	Part name	Material	Remarks
①	Moisture-proof bag with aluminum layer	PET+Al+PE	with ESD protection

【Flow chart-package opening to mounting】



Allowable leaving time means the maximum allowable leaving time after opening package, which depends on each LED type.
The allowable leaving time should be calculated form the first opening of package to the time when soldering process is finished.
When judging if the allowable leaving time has exceeded or not, please subtract the soldering time. The allowable leaving time after reopening should be calculated form the first opening of package, or from the time when baking process is finished.

Packaging specifications

XPG1111C-TR

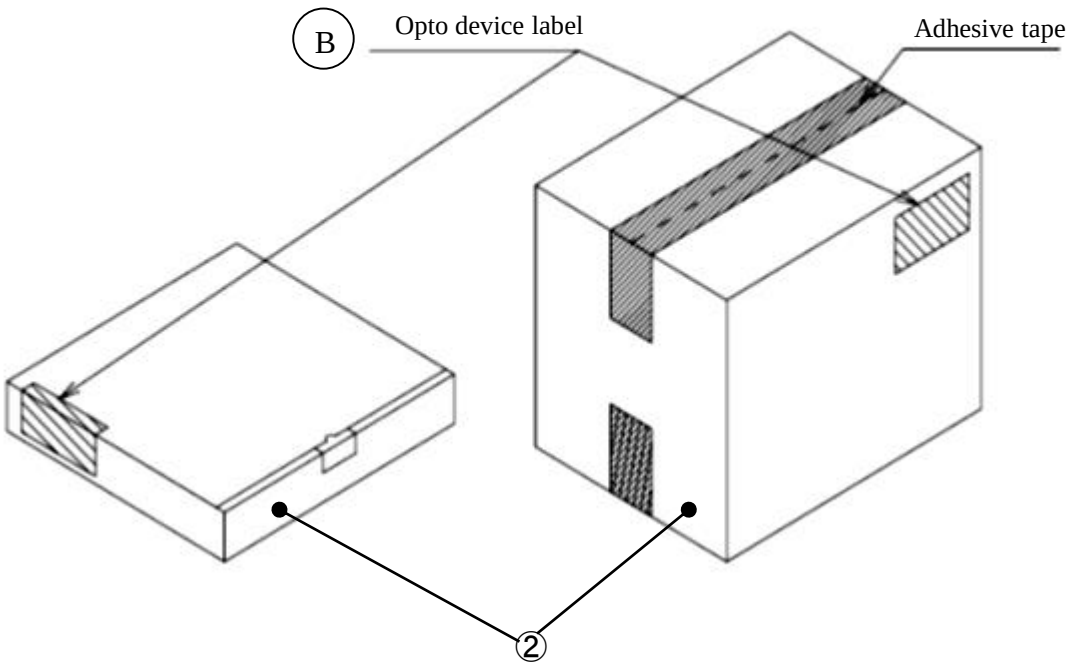
【 Packing box 】

(RoHS2/ELV compliant)

Box type	Outline dimension L × W × H (mm)	Capacity of the box
Type A	280 × 265 × 45	3 reels
Type B	310 × 235 × 265	15 reels
Type C	440 × 310 × 265	30 reels
Type D	305 × 270 × 65	3 reels
Type E	370 × 280 × 270	30 reels
Type F	530 × 380 × 270	60 reels

The above measurements are reference values.

The box is selected out of the above table by shipping quantity.



Type A

Material / box : Cardboard C5BF

Type B, C

Material / box : Cardboard K5AF

Partition : Cardboard K5BF

Type D

Material / box : Cardboard C5WF

Type E, F

Material / box : Cardboard BC-KA125/3CA125/KA125

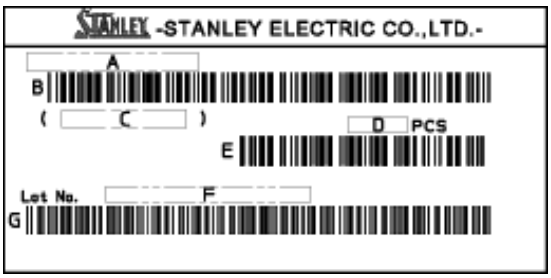
No.	Part name	Material	Remarks
②	Packing box	Corrugated Cardboard	without ESD protection

Packaging specifications

XPG1111C-TR

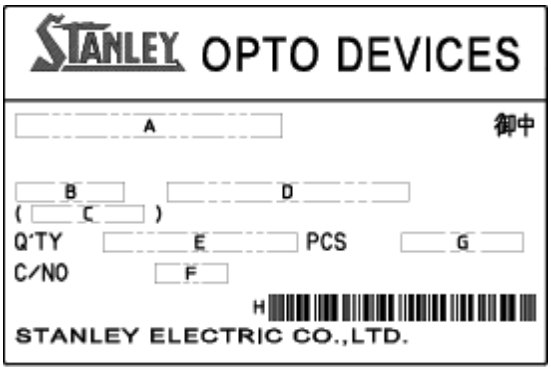
【Label specification】
(acc.to JIS-X0503(Code-39))

A Product label



A. Parts number
B. Bar-code for parts number
C. Parts code (In-house identification code for each parts number)
D. Packed parts quantity
E. Bar-code for packed parts quantity
F. Lot number & rank
(refer to lot number notational system for details)
G. Bar-code for lot number & rank

B Opto device label



A. Customer name
B. Parts type
C. Parts code
D. Parts number
E. Packed parts quantity
F. Carton number
G. Shipping date
H. Bar-code for In-house identification number

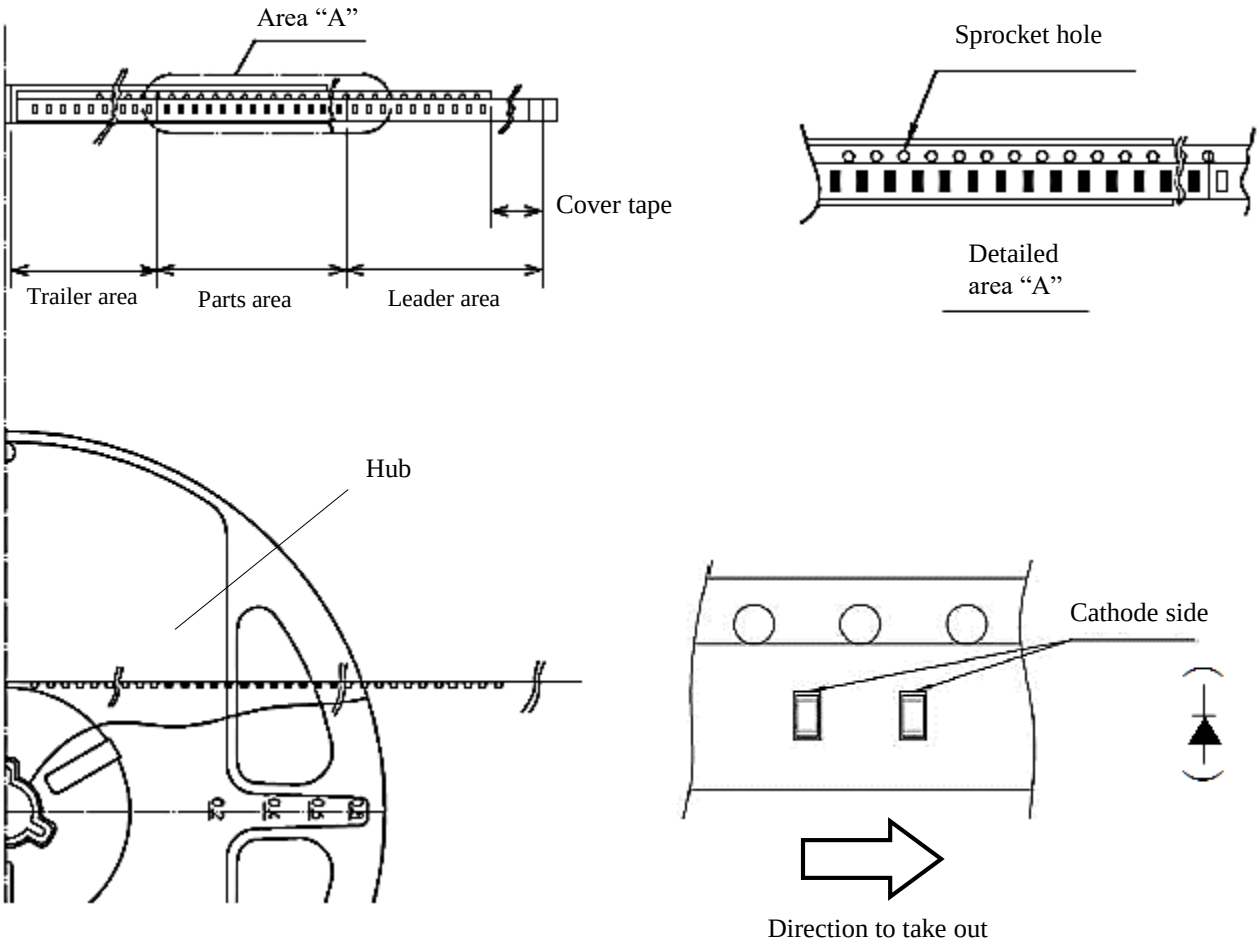
<Remark> Bar-code font : acc.to Code-39(JIS-X0503)

Taping and reel specifications

XPG1111C-TR

(acc.to JIS-C0806-03)

【Appearance】



Note

"-TR" means Cathode Side of LEDs should be placed on the sprocket-hole side.

Items		Specifications	Remarks
Leader area	Cover-tape	Cover-tape shall be longer than 300mm without carrier-tape	The end of cover-tape shall be held with adhesive tape.
	Carrier-tape	Empty pocket shall be more than 25 pieces.	Please refer to the above figure for Taping & reel orientation .
Trailer area		Empty pocket shall be more than 40 pieces.	The end of taping shall be inserted into a slit of the hub.

Taping and reel specifications

XPG1111C-TR

(acc.to JIS-C0806-03)

【Qty. per reel】

4,000parts/reel
Minimum Qty. per reel might be 500 parts when getting less than 4,000 parts. In such case, parts of 500-unit-qty. shall be packed in a reel and the qty. shall be identified on the label.

【Mechanical strength】

Cover-tape adhesive strength shall be 0.1～1.0N (An angle between carrier-tape and cover-tape shall be170 deg.). Both tapes shall be so sealed that the contained parts will not come out from the tape when it is bent at a radius of 15mm.

【Others】

Reversed-orientation, Up-side down placing, side placing and out of spec. parts mix shall not be held. Max qty. of empty pocket per reel shall be defined as follows.

Max, qty. of empty pocket per reel shall be defined as follows.

Qty./Reel	Max.Qty. of empty pocket	Remarks
500	1	-
1,000	1	-
1,500	2	-
2,000	2	No continuance
2,500	3	No continuance
3,000	3	No continuance
3,500	4	No continuance
4,000	4	No continuance

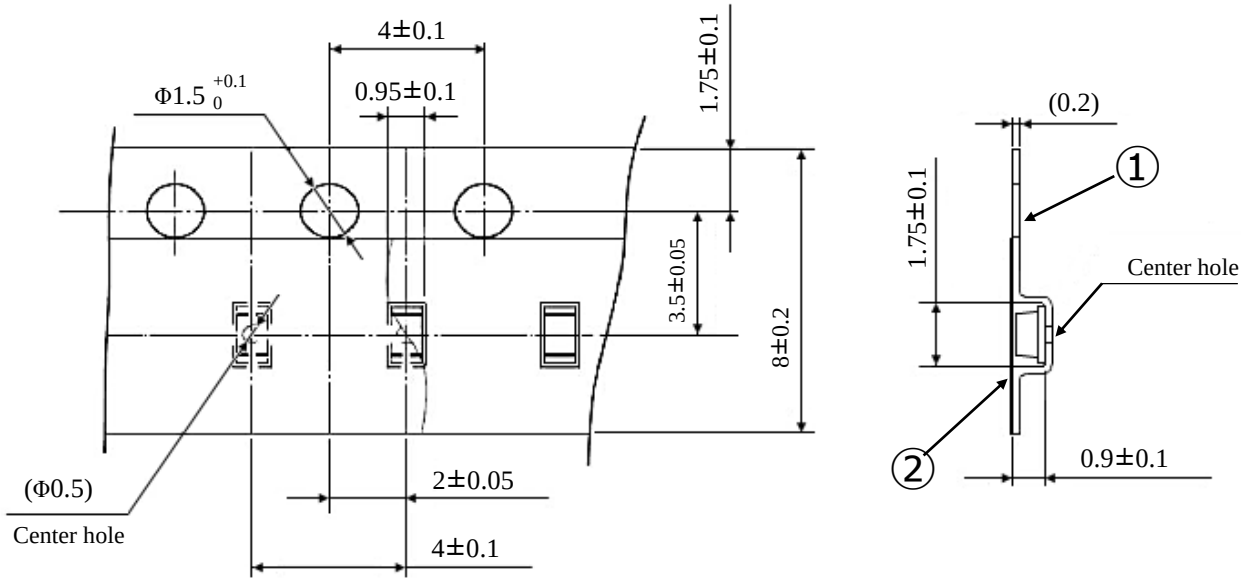
Taping and reel specifications

XPG1111C-TR

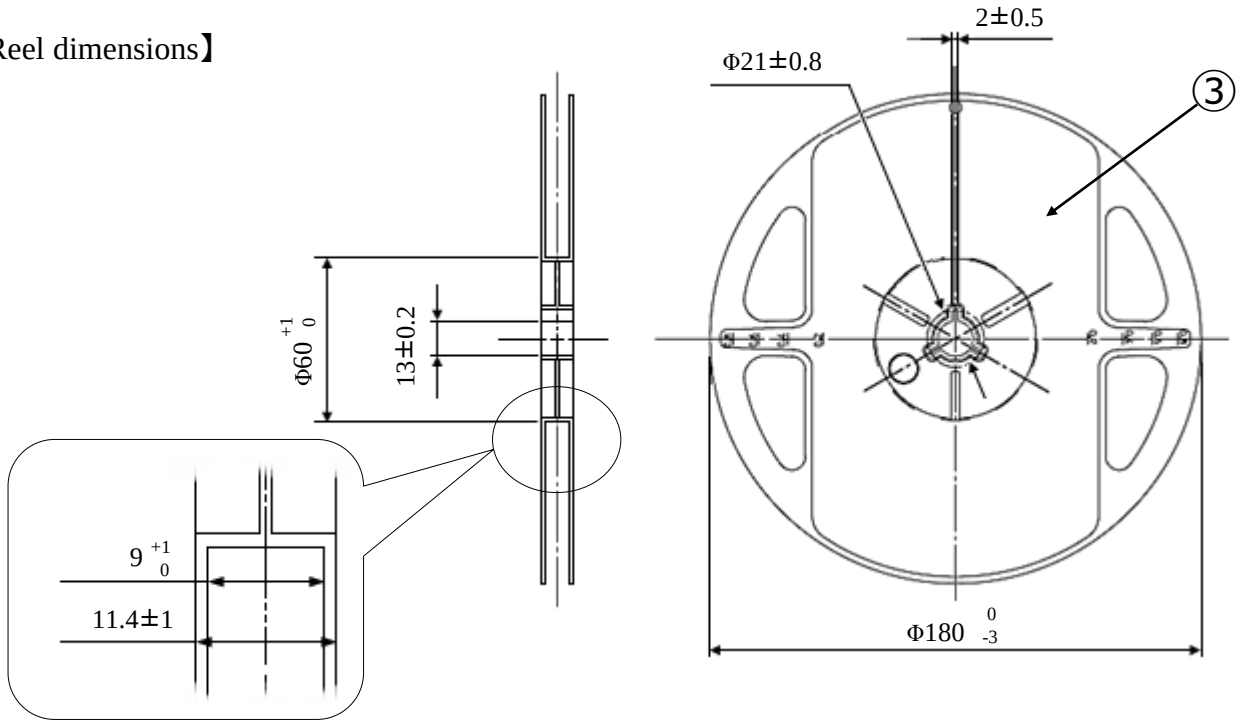
(acc.to JIS-C0806-03)

Unit : mm

【Taping dimensions】



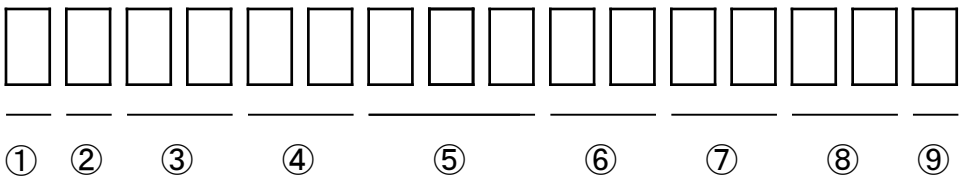
【Reel dimensions】



No.	Part name	Remarks
①	Carrier-tape	Conductive grade
②	Cover-tape	Conductive grade
③	Carrier-reel	Conductive grade

Lot number notational system

XPG1111C-TR



① - 1digit : Production location (mark identify alphabet)

② - 1digit : Production year (The last digit of production year 2024→4, 2025→5, 2026→6, 2027→7 ･･･)

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 : Total power rank.

(If total power rank is 1 digit, "-" shall be dashed on the place for the second digit.

If there is no identified rank, "- -" is used to indicate.)

⑧ - 2digits : Wavelength rank

(If wavelength rank is 1 digit, "-" shall be dashed on the place for the second digit.

If there is no identified rank, "- -" is used to indicate.)

⑨ - 1digit : V_F Rank (If rank is not defined, "-" is described.)

Compliance with RoHS2/ELV

XPG1111C-TR

This product is in compliance with RoHS2 / ELV.
Prohibition substance and it's criteria value of RoHS2 / ELV are as follows.

- RoHS2 instruction … Refer to following 1 to 10.
- ELV instruction … Refer to following 1 to 4.

No.	Substances	Threshold
1	Lead and its compounds	0.1% (1,000ppm)
2	Mercury and its compounds	0.1% (1,000ppm)
3	Cadmium and its compounds	0.01% (100ppm)
4	Hexavalent chromium compounds	0.1% (1,000ppm)
5	PBB : Polybrominated Biphenyls	0.1% (1,000ppm)
6	PBDE : Polybrominated Biphenyl Ethers	0.1% (1,000ppm)
7	DEHP : Bis (2-ethylhexyl) phthalate	0.1% (1,000ppm)
8	BBP : Butyl benzyl phthalate	0.1% (1,000ppm)
9	DBP : Dibutyl phthalate	0.1% (1,000ppm)
10	DIBP : Diisobutyl phthalate	0.1% (1,000ppm)

Reliability testing result

XPG1111C-TR

1. Reliability testing result

Test item	Standard	Test condition	Duration	Failure
Operating life	EIAJ ED-4701 /100(101)	Ta=25℃ Maximum rated current	1,000h	0 / 20
High temperature operating life	EIAJ ED-4701 /100(101)	Ta=85℃ Maximum rated current ※1	1,000h	0 / 20
Low temperature operating life	EIAJ ED-4701 /100(101)	Ta=-40℃ Maximum rated current	1,000h	0 / 20
Wet high temperature operating life	EIAJ ED-4701 /100(102)	Ta=60℃ Rh=90% Maximum rated current ※1	1,000h	0 / 20
High temperature storage life	EIAJ ED-4701 /200(201)	Ta=Tstg Max. Maximum storage temperature	1,000h	0 / 20
Low temperature storage life	EIAJ ED-4701 /200(202)	Ta=Tstg Min. Minimum storage temperature	1,000h	0 / 20
Wet high temperature storage life	EIAJ ED-4701 /100(103)	Ta=60℃ Rh=90%	1,000h	0 / 20
Thermal shock	EIAJ ED-4701 /100(105)	Ta=T_{stg} Max. to T_{stg} Min. (each 15min)	1,000 cycles	0 / 20
Resistance to reflow soldring	EIAJ ED-4701 /300(301)	Moisture soak : 30℃ 70% 72h Preheating : 150 to 180℃ 120sec Max. Soldering : 230℃ 40sec Max., 260℃ Peak.	2 times	0 / 20
Electric Static Discharge(ESD) ※2	EIAJ ED-4701 /300(304)	C=100pF R2=1.5kΩ ±2,000V	once of each polarity	0 / 10

※1 Maximum rated current at maximum rated operating temperature

※2 Reference test

2. Failure criteria

Item	Symbol	Condition	Failure criteria
Luminous intensity	I_V	I_F Value of each product's luminous intensity	Testing Min. Value ＜ Standard Min. Value × 0.5
Forward voltage	V_F	I_F Value of each product's forward voltage	Testing Max. Value ≧ Standard Max. Value × 1.2
Reverse current	I_R	V_R=5V	Testing Max. Value ≧ Standard Max. Value × 2.5
Cosmetic appearance	-	-	Notable, decolation, deformation and cracking

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1) The technical information shown in the data sheets are limited to the typical characteristics and circuit examples of the referenced products. It does not constitute the warranting of industrial property nor the granting of any license.

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).
The application of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. needs a high reliability and safety, and the breakdown and the wrong operation might influence the life or the human body. Please consult us beforehand if you plan to use our product for the usages of aircrafts, space borne application, transportation equipment, medical equipment and nuclear power control equipment, etc. except OA equipment, telecommunications equipment, AV machine, home appliance and measuring instrument.

5) In order to export the products or technologies described in this data sheet which are under the "Foreign Exchange and Foreign Trade Control Law," it is necessary to first obtain an export permit from the Japanese government.

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7) The most updated edition of this data sheet can be obtained from the address below:
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