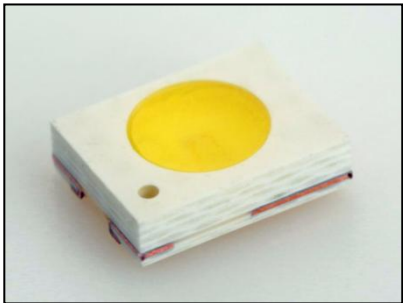




Features

Package	Outer Dimension 2.4 x 1.85 x 0.6mm (L x W x H) Diffused pale yellow color lens
Product features	•Thinner package, White color emitting LED •Lead-free soldering compatible •RoHS compliant

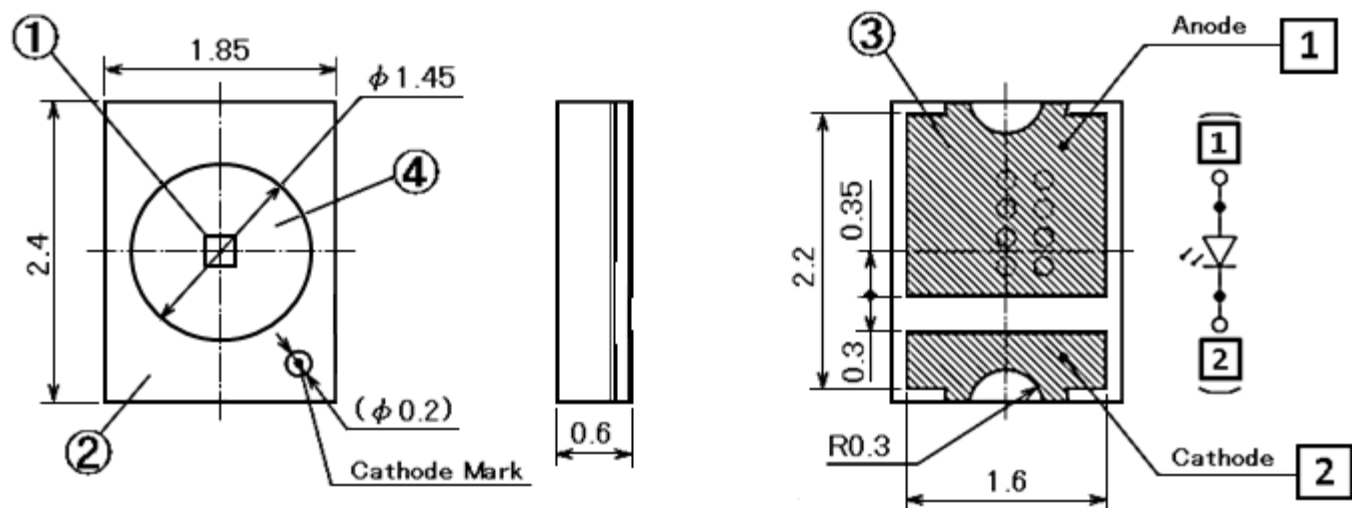
Recommended Applications

- Mainly : Flash light for mobile phone
- Others : Amusement equipment, Home appliances, OA/FA equipment, Other general lighting use, etc.

Outline Dimensions

STW1147ASK-TR

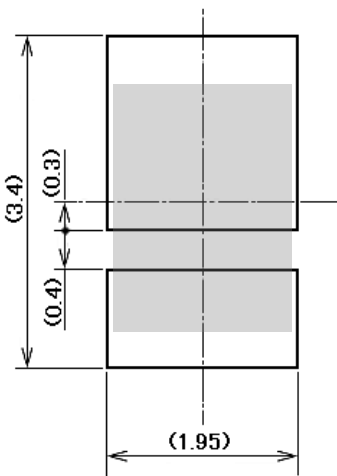
Unit :mm
Weight :5.4mg
Tolerance :±0.1mm



NO.	PART NAME	MATERIALS
①	LED Die	InGaN
②	Lamp Housing	Glass fabric
③	Terminal	Au Plating
④	Encapsulant	Silicone Resin

Recommended Soldering Pattern

Unit : mm



【 Product Overview 】

Die Material	InGaN
Emitting Color	White
Resin Color (Emitting Area)	Diffused Pale Yellow
Resin Color (Lamp Housing)	White

【 Absolute Maximum Ratings 】

(Ta=25℃)			
ITEM	SYMBOL	MAXIMUM RATINGS	UNIT
Power Dissipation	P _d	200	mW
Forward Current	I _F	50	mA
Repetitive Peak Forward Current " tw ≤ 500ms, Duty ≤ 1/5 "	I _{FRM}	100	mA
I _F Derate Linearly from "60℃"	Δ I _F	1.3	mA/℃
I _{FRM} Derate Linearly from "60℃"	Δ I _{FRM}	2.5	mA/℃
Reverse Voltage	V _R	5	V
Operating Temperature	T _{opr}	-40 ~ +85	℃
Storage Temperature	T _{stg}	-40 ~ +100	℃
Junction Temperature	T _j	100	℃
Soldering Temperature "Reflow Soldering"	T _{sld}	260	℃

Note 1 Flash frequency is within 100,000 times.

Note 2 Please refer to page 9, Soldering Conditions.

【 Thermal Characteristics 】

(Ta=25℃)				
ITEM	SYMBOL	TYP.	MAX.	UNITS
Thermal Resistance 【Junction - Ambient】	R _{th(j-a)}	200	-	℃/W
Thermal Resistance 【Junction - Solder point】	R _{th(j-s)}	80	-	℃/W

Note3

Rth(j-a) Measurement Condition

Substrate:FR4 (t=1.6mm)

Pattern Size : 16mm²

【 Electro and Optical Characteristics 】

(Ta=25°C)						
ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Forward Voltage	V _F	I _F = 40mA	-	3.5	3.9	V
Reverse Current	I _R	I _F = 40mA	-	-	50	μ A
Luminous Intensity 1	I _V	I _F = 40mA	2.7	4.2	6.8	cd
Luminous Intensity 2 500ms 1 time turn on (1 pulse)	I _V	I _F = 100mA	-	8.2	-	cd
Luminous Flux	Φ _V	I _F = 40mA	-	12.4	-	lm
Chromaticity coordinate	x	I _F = 40mA	-	0.3	-	
	y	I _F = 40mA	-	0.36	-	
Half Intensity Angle	Δθx	I _F = 40mA	-	115	-	deg.
	Δθy		-	115	-	

- Note4,6 Please refer to the following sorting charts.
- Note5 Measuring time : 500ms, 1 pulse
- Note6 Chromaticity coordinate : x,y coordinate according to CIE1931
- Note7 Viewing Angle at 50% I_v, Δ θ x ; Housing long side axis, Δ θ y ; Housing short side axis

【 Sorting For Luminous Intensity 】

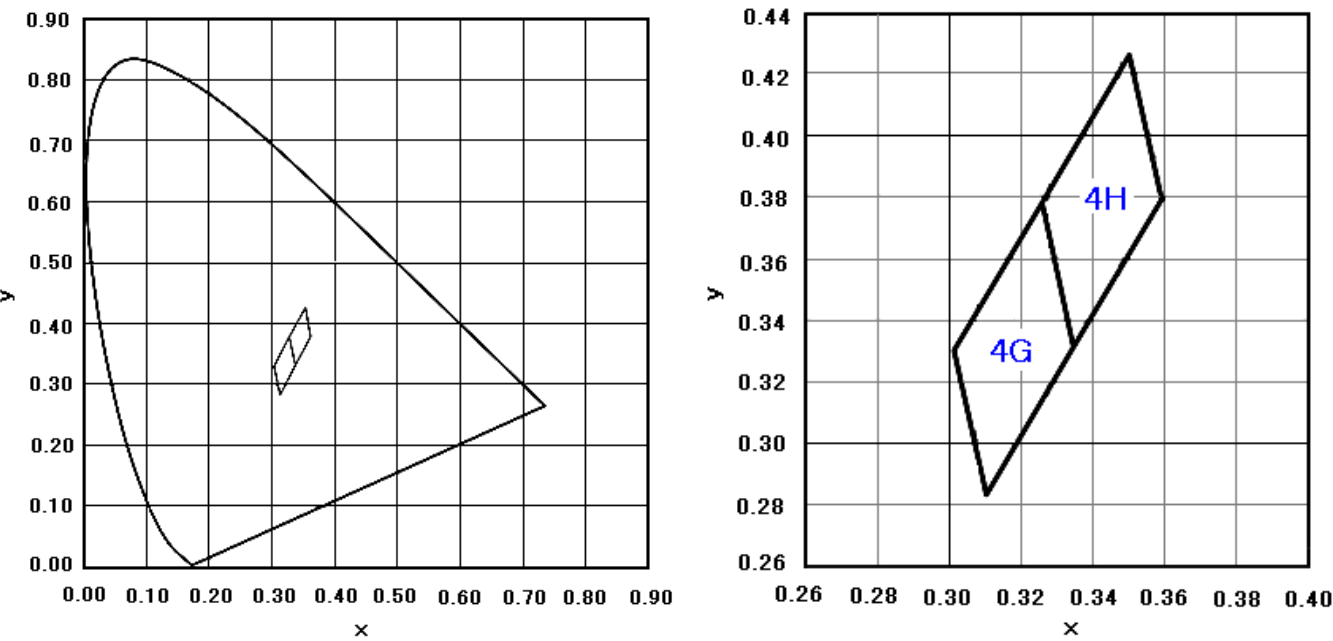
LEDs shall be sorted out into the following chart and each rank parts shall be packed separately when shipping.

Rank	I _V (cd)		Condition
	MIN.	MAX.	
DY	2.7	4.2	I _F = 40mA Ta=25°C
DZ	4.2	6.8	

Tolerance : each rank ±10%

【 Sorting chart For Chromaticity coordinates】

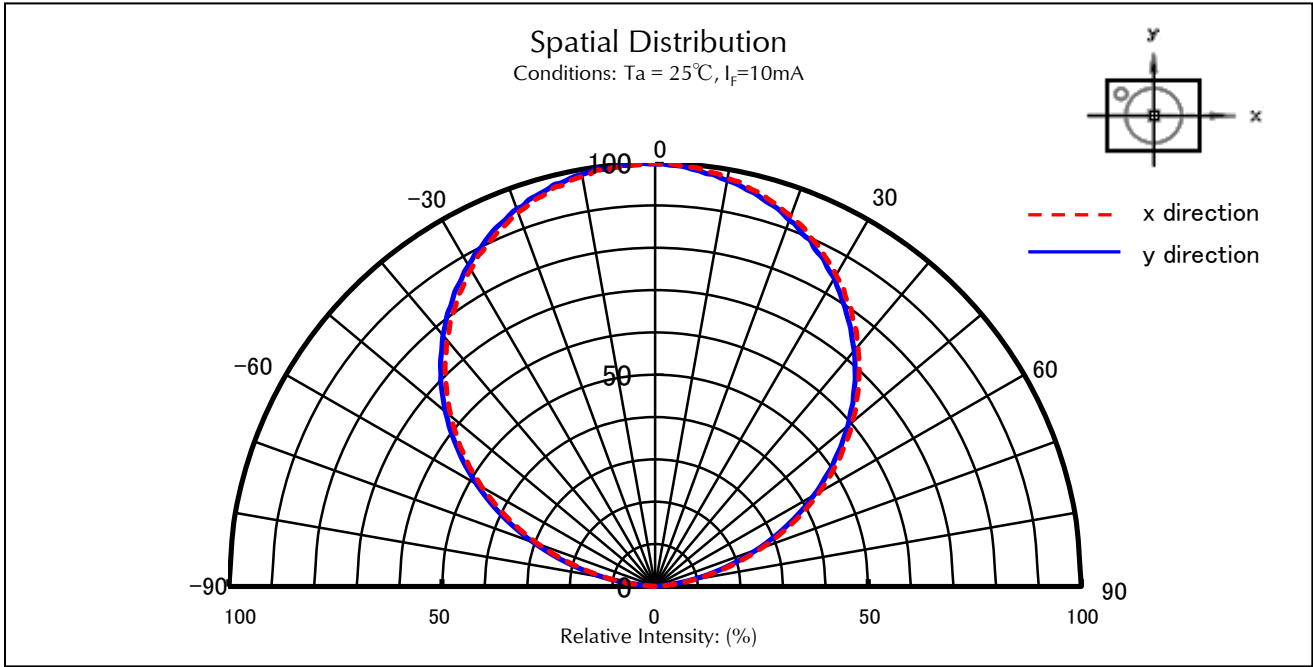
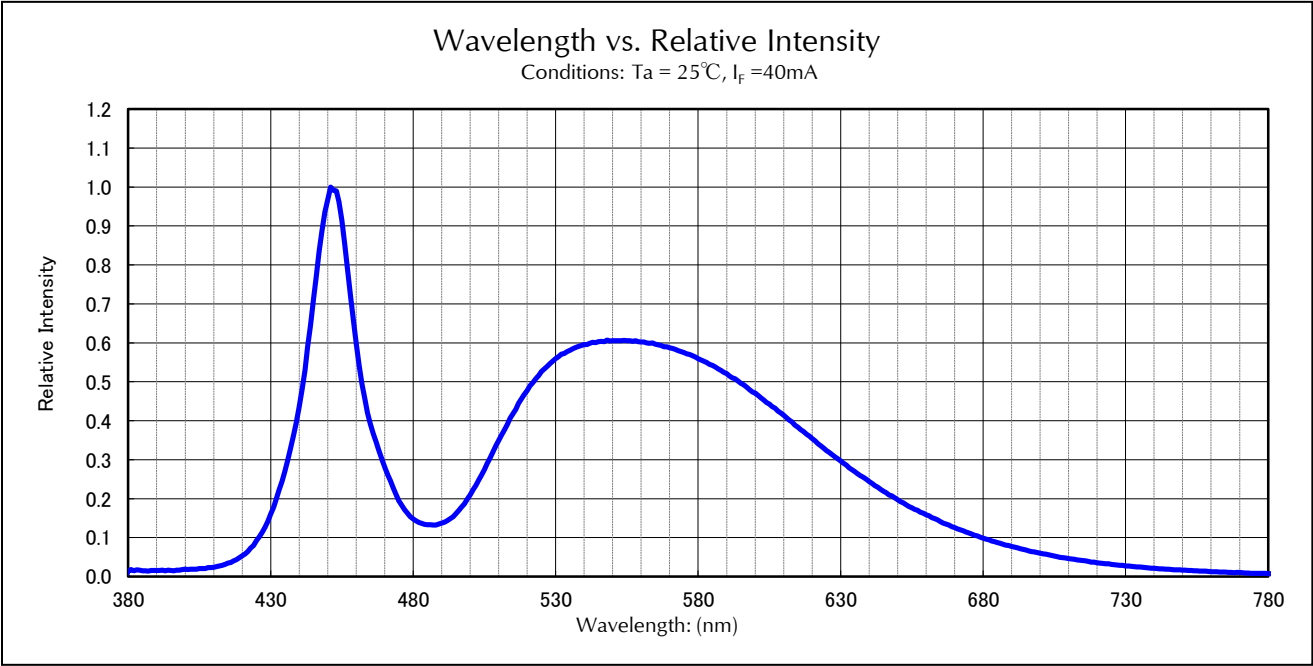
Chromaticity coordinates shall be sorted out into the following chart and each rank parts shall be packed separately when shipping.

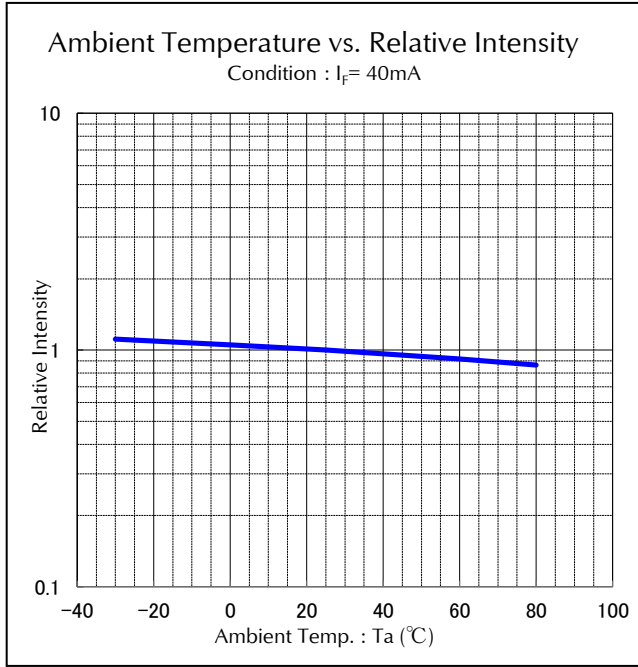
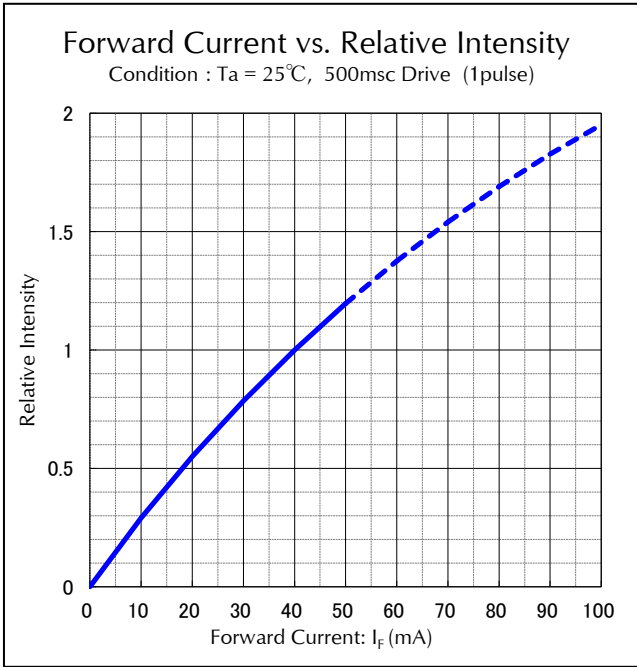
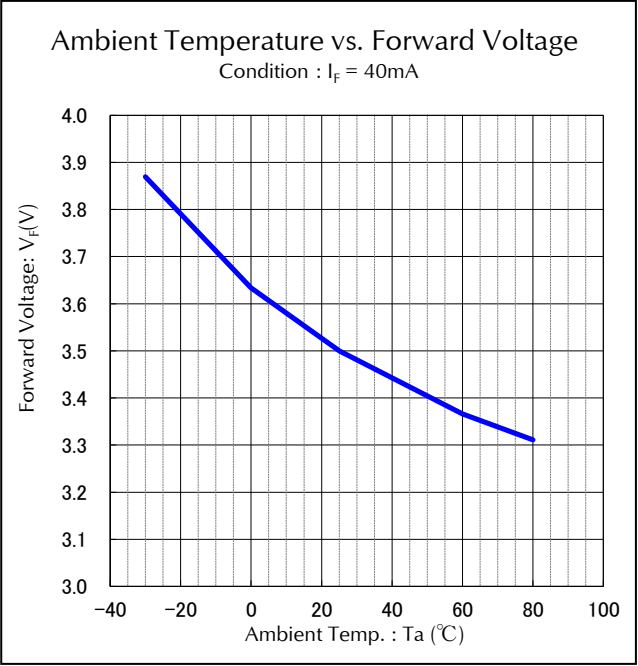
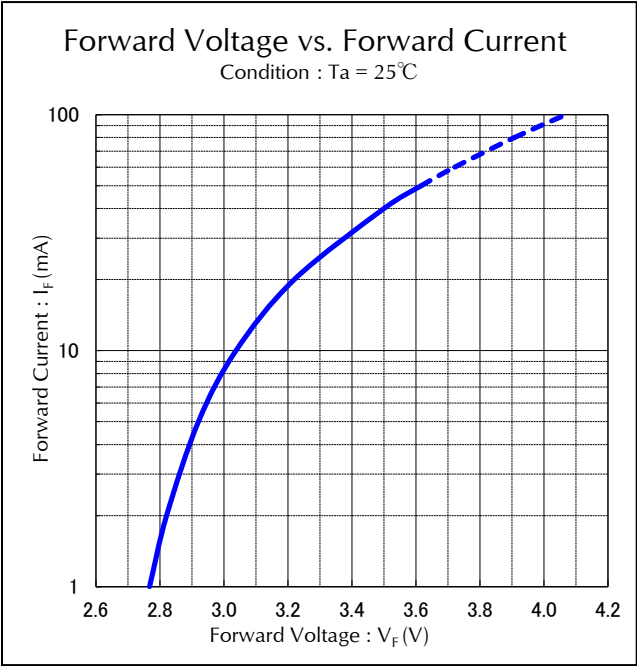


(I_F=40mA, T_a=25°C)

Rank	Left Down		Left Up		Right Up		Right Down	
	x	y	x	y	x	y	x	y
4G	0.3128	0.2834	0.3038	0.3304	0.3282	0.3783	0.3372	0.3312
4H	0.3372	0.3312	0.3282	0.3783	0.3527	0.4261	0.3617	0.3791

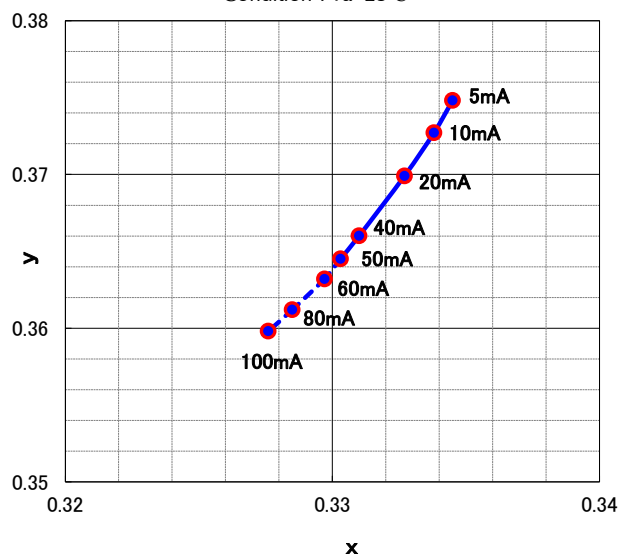
Tolerance : each rank ±0.02





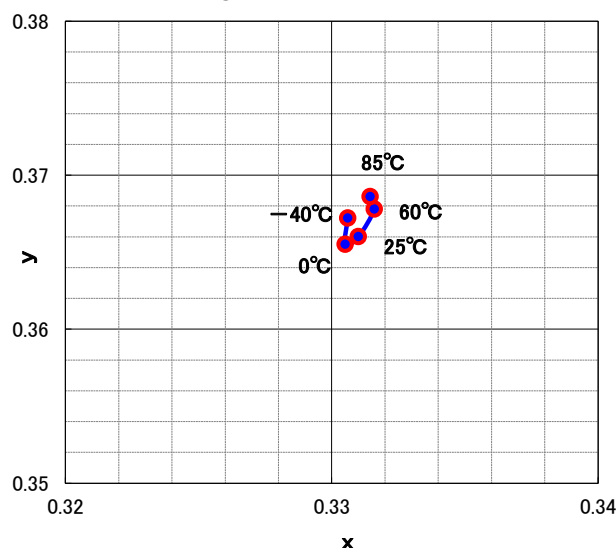
Chromaticity coordinates vs. Forward Current

Condition : $T_a = 25^\circ\text{C}$



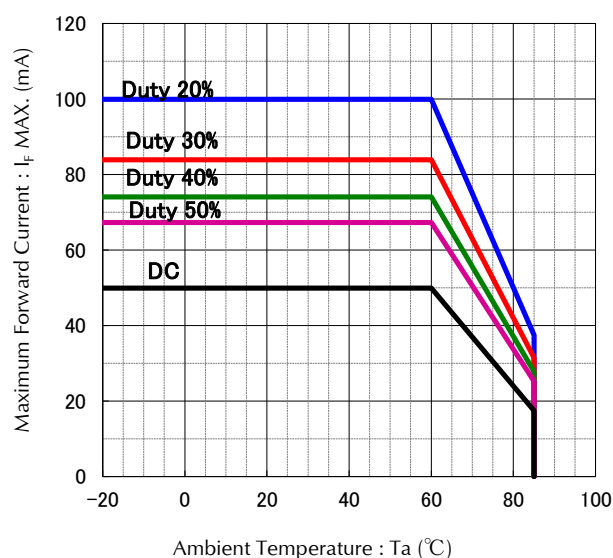
Chromaticity coordinates vs. Ambient Temp.

Condition : $I_f = 40\text{mA}$



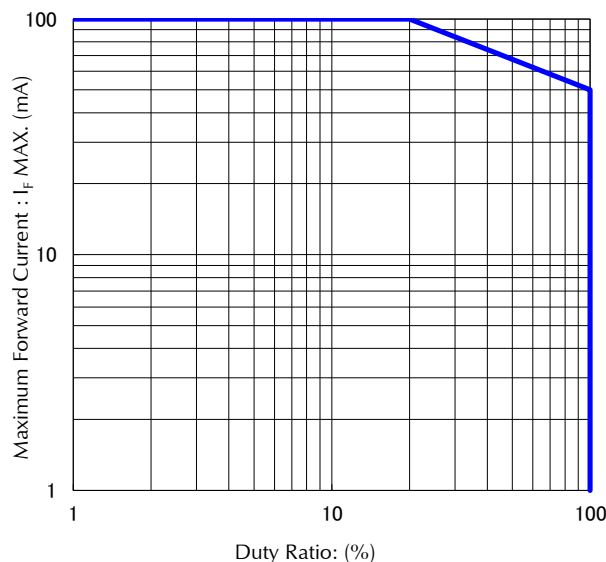
Maximum Forward Current vs. Ambient Temp.

Condition : $R_{th(j-a)} = 200^\circ\text{C/W}$, Pulse width < 500msec



Duty Ratio vs. Max. Forward Current

Condition : $T_a = 25^\circ\text{C}$

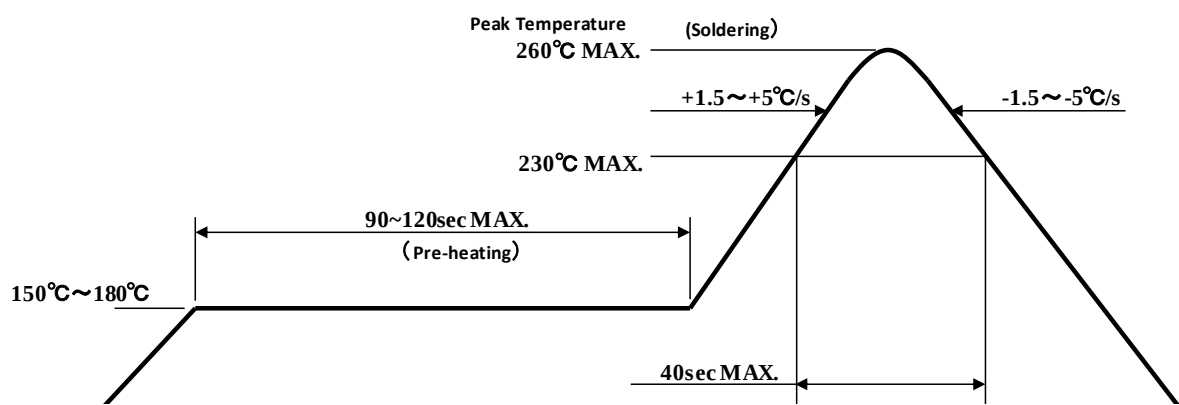


【Soldering Precaution】

(acc.to EIAJ-4701/300)

- Heat stress during soldering will influence the reliability of LEDs, however that effect will vary on heating method. Also, if components of varying shape are soldered together, it is recommended to set the soldering pad temperature according to the component most vulnerable to heat (e.g., surface mount LED).
- LED parts including the resin are not stable immediately after soldering (when they are not at room temperature), any mechanical stress may cause damage to the product. Please avoid such stress after soldering, especially stacking of the boards which may cause the boards to warp and any other types of friction with hard materials.
- Recommended temperature profile for the Reflow soldering is listed as the temperature of the resin surface. Temperature distribution varies on heating method, PCB material, other components in the assembly, and mounting density.
Please do not repeat the heating process in Reflow process more than twice.

【Recommended Reflow Soldering Condition】



Note 1 Recommended temperature profile for the reflow soldering is listed as the temperature of the resin surface. This should be the maximum temperature for soldering. Lowering the heating temperature and decreasing heating time is very effective in achieving higher reliability.

Note 2 The reflow soldering process should be done up to twice(2 times Max). When second process is performed, interval between first and second process should be as short as possible to prevent absorption of moisture to resin of LED. The second soldering process should not be done until LEDs have returned to room temperature (by nature-cooling) after first soldering process.

4. If soldering manually, Stanley recommends using a soldering iron equipped with temperature control. During the actual soldering process, make sure that the soldering iron never touches the LED itself, and avoid the LED's electrode heating temperature reaching above the heating temperature of the solder pad. All repairs must be performed only once in the same spot, and please avoid reusing components.
5. In soldering process, immediately after iron tip is cleaned, please make sure that the soldering iron reaches the appropriate temperature before using. Also, please avoid applying any types of pressure to the soldered components before the solder has been cooled and hardened, as it may deteriorate solder performance and solder quality.

【Recommended Manual Soldering Condition】

Temperature of Iron Tip	350℃MAX.
Soldering Duration, Time	3sec.Max.,1 time

6. When using adhesive material for tentative fixatives, thermosetting resin or Ultraviolet radiation (UV) setting resin with heat shall be recommended.
《The curing condition, Temperature:150℃Max./Time:120sec.Max.》
7. Flow soldering (dip soldering) is not recommended for this product.
8. Isopropyl alcohol is recommended for cleaning. Some chemicals, including Freon substitute detergent could corrode the lens or the casing surface, which cause discoloration, cloud, crack and so on. Please review the reference chart below for cleaning. If water is used to clean (including the final cleaning process), please use pure water (not tap water), and completely dry the component before using.

Chemical	Adaptability
Isopropyl Alcohol	○
Trichloroethylene	×
Chloroethene	×
Acetone	×
Thinner	×

【 For Electric Static Discharge (ESD) 】

LED with an InGaN die is sensitive to voltage surges generated by On/Off status change and frictions with synthetic materials, which may cause severe damage to the die or undermine its reliability.

Damaged products may experience conditions such as extremely high reverse voltage, decrease of forward rise voltage, deteriorating its optical characteristic.

Stanley InGaN products are packed with anti-static components.

However, following precautions must be taken in to account upon product shipment.

1. Electrification/Static Electricity protection

In order to avoid product (die) damage from static electricity caused by electrified operator and other materials electrified friction coming in contact with the product, Stanley recommends taking the following precautions.

- ① Do not place electrified non-conductive materials near the LED product.
(Avoid LED products from coming in contact with metallic materials, should the metallic material be electrified, sudden surge voltage will most likely damaged the product.)
- ② Avoid working process which may cause the LED product slide/rub against other materials.
- ③ Install ground wires for any equipment, which can be installed with such measures to avoid static electricity.
- ④ Prepare a ESD protective area by placing Conductive Mattress ($1\text{M}\Omega$) and Ionizer to remove any static electricity.
- ⑤ Operators should wear a protective wrist-strap.
(Typically, protective wrist-strap will be equipped with $1\text{M}\Omega$ resistors in series connection.)
- ⑥ Operators should wear conductive work-clothes, shoes and work on a conductive floor.
- ⑦ To handle the products directly, Stanley recommends the use of ceramic, and not metallic, tweezers.

2. Working Environment

- ① Dry environment is more likely to cause static electricity.
Although dry environment is ideal during storage state of LED products, during the soldering process, Stanley recommends an environment with approximately 50% humidity.
- ② Recommended static electricity level in the working environment is 150V, which is the same value as Integrated Circuits.

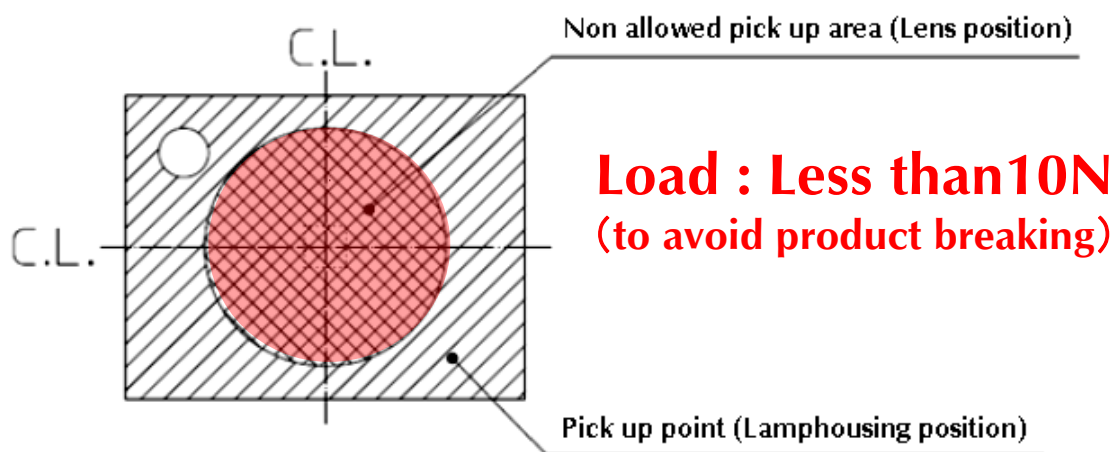
【 Other Precautions 】

1. The products are designed to achieve the highest performance reliability, however they can be influenced by usage conditions.
2. Absolute Maximum Ratings are set to prevent LED products from breaking due to extreme stress (temperature, current, voltage, etc.). These ratings must never be overrun even for a moment.
3. To achieve the highest performance reliability, it is necessary to take into account, factors such as forward voltage adjusted to the usage temperature condition, derating of the power consumption, and other variable factors.
4. Please insert Straight Protective Resistors into the circuit in order to stabilize LED operation and to prevent the device from overheating.
5. Please avoid to stick foreign material because molding resin in the products has adhesiveness. And please don't touch lens portion.
6. Please check the actual performance in the assembly because the Specification Sheets are described for single LED.
7. Please refrain from looking directly at the light source of LED at high output, as it may harm your vision.
8. The products are designed to perform without failure in the recommended usage conditions. However, please take the necessary precautions to prevent fire, injury, and other damages from these unexpected failures.
9. The products are manufactured to be used for ordinary electronic equipment. Please contact our sales staff in advance when exceptional quality and reliability are required, when 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.)
10. When there is a process of supersonic wave welding etc. after mounting the product, there is a possibility of affecting on the reliability of junction part in package (junction part of die bonding and wire bonding). Please use after affirming beforehand there is no problem.
11. The formal specification sheets should be exchanged and signed by both parties.

【 Handling Precautions for Product Mounting 】

<Recommendation>

1. Picking up point with nozzle: Lamp housing of the product ( area)
(Shown below)
The picking up point should be within lamp housing portion, because the silicone resin used for the lens is soft. (If the nozzle makes contact with the lens, the products might be destroyed)



Please adjust the load, the pick up point, the nozzle diameter, etc. before mounting because the over load can cause the breakage of the lamp housing.

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 3days(72h).

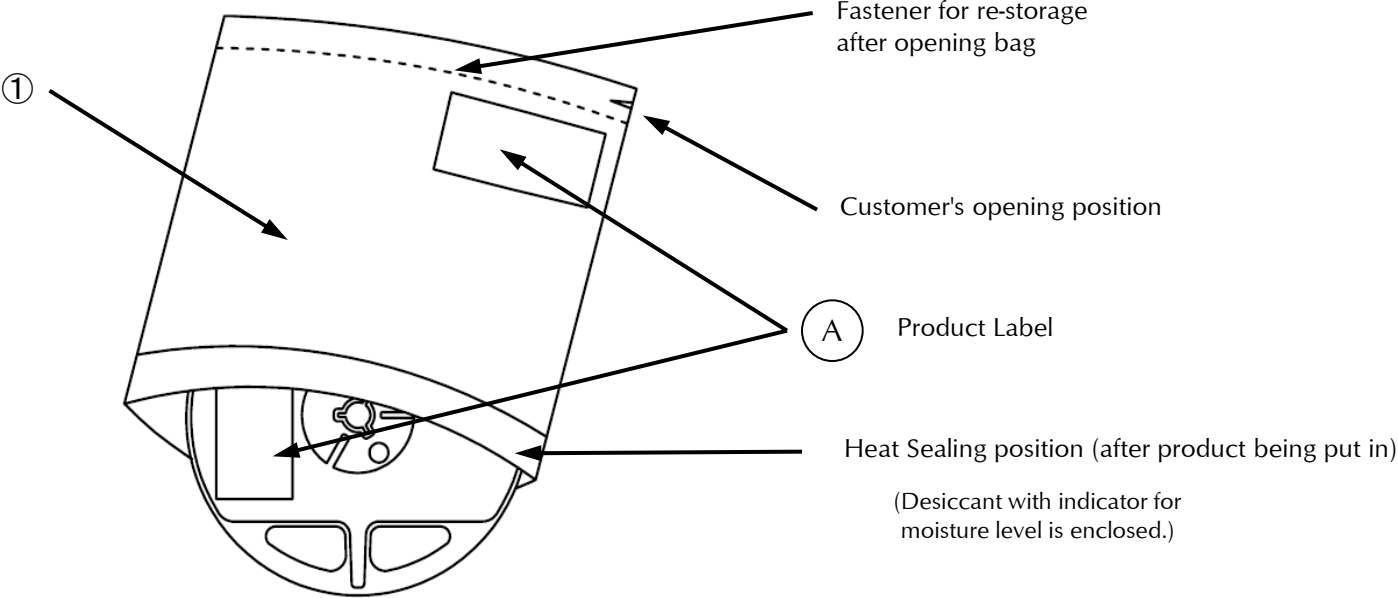
If any components should remain unused, please reseal the package and store them under the conditions described in the 【 Recommended Storage Condition 】 above.

This product must be required to perform baking process (moisture removal)
for **at least 48h(MIN.) and not exceed for 72h(MAX.)** at 60 ± 5 degrees Celsius if following conditions apply.
1.In the case of color indicators (those are in the package of desiccant) change or lose its blue color.
2. In the case of time passed for 72h after the package is opened once.

Baking process should be performed after putting out from package.

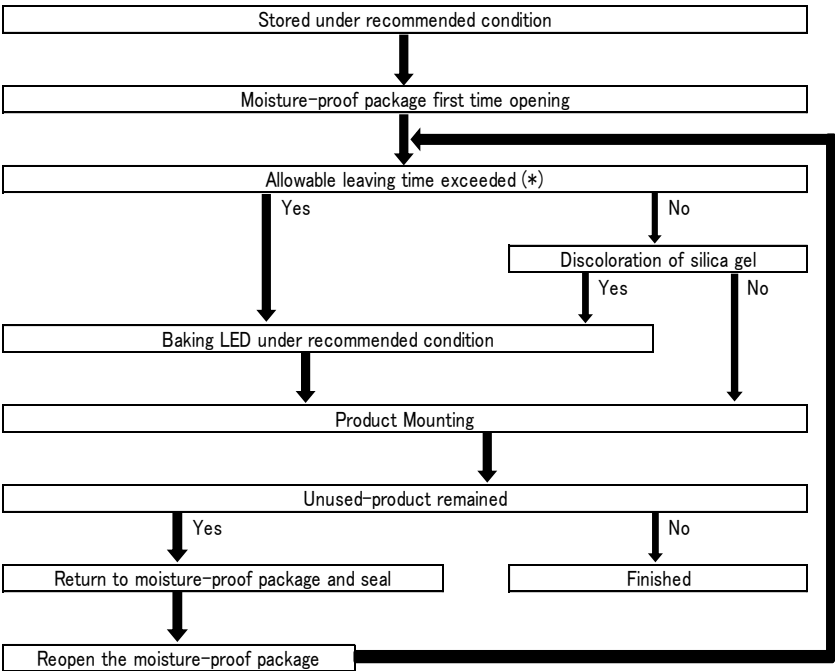
Baking may be performed in the tape-reel form , however if it is performed with the reel stacked over one another, it may cause deformation of the reels and taping materials and later obstruct mounting.
Please handle only once it has returned to room temperature.
Provided that, baking process shall be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

【Moisture-proof Packaging Specification】



SYM.	PART NAME	MATELRIAL	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.

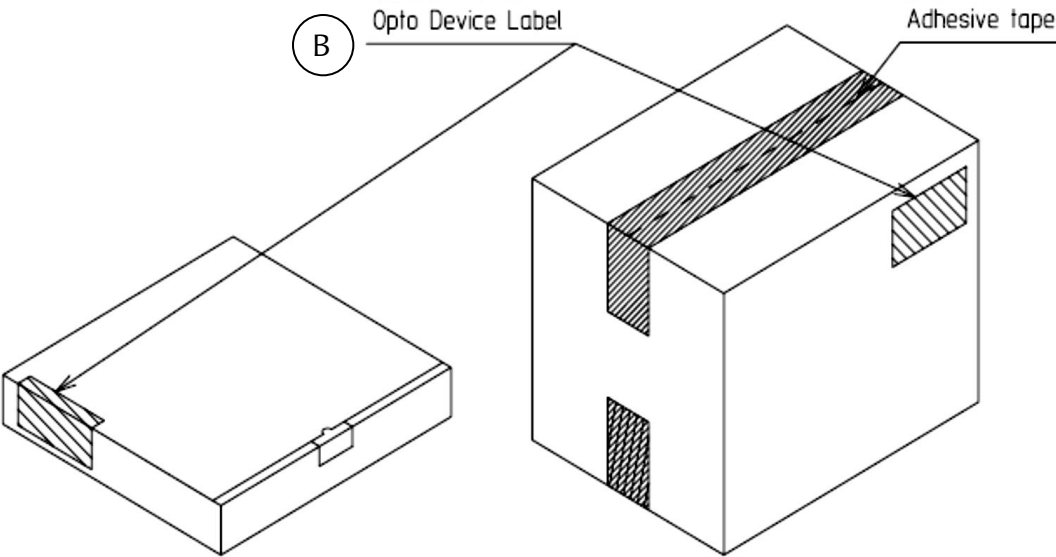
When judging if the allowable leaving time has exceeded or not, please subtract the soldering time. The allowable leaving time after reopening should be calculated form the first opening of package, or from the time when baking process is finished.

【 Packing box 】

(RoHS・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

The above measure is all the reference value.
The box is selected out of the above table by shipping quantity.



Type A

Material / box : Cardboard C5BF

Type B,C

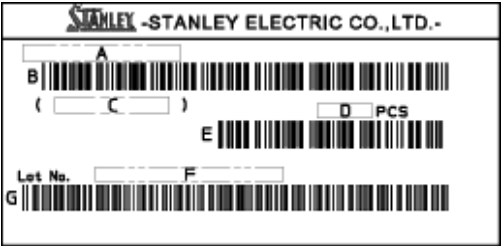
Material / box : Cardboard K5AF

Partition : Cardboard K5AF

【 Label Specification】

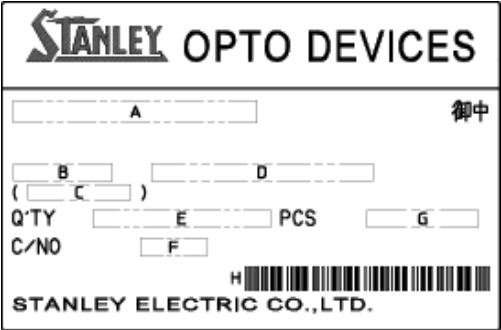
(acc.to JIS-X0503(Code-39)

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

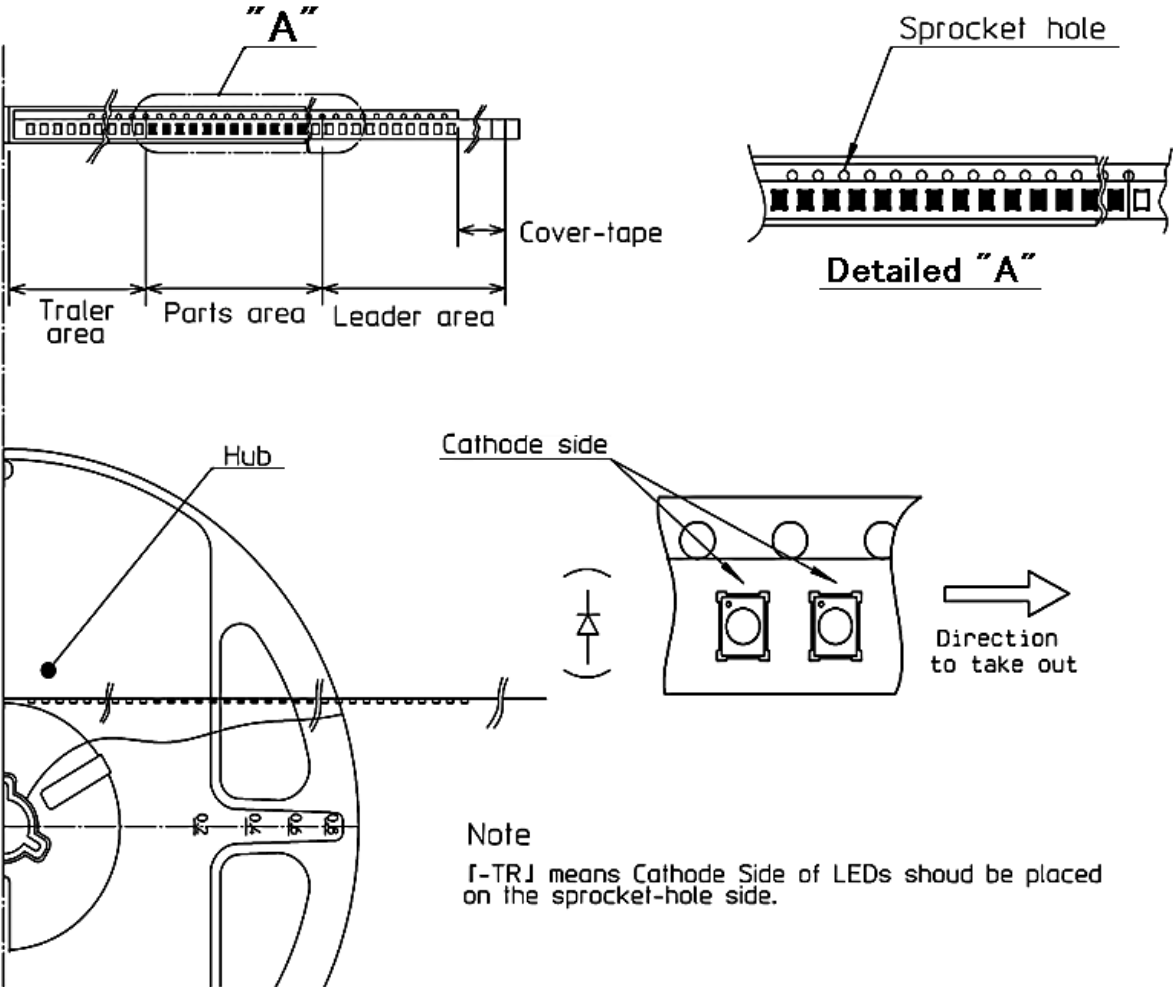


- A. Customer Name
- B. Parts Type
- C. Parts Code
- D. Parts Number
- E. Packed Parts Quantity
- F. Carton Number
- G. Shipping Date
- H. Bar-Code for In-house identification Number

<Remark> Bar-code font : acc.to Code-39(JIX0503)

(acc.to JIS-C0806-03)

【Appearance】



Items		Specifications	Remarks
Leader area	Cover-tape	Cover-tape shall be longer than 320mm 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.

(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 be 170 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】

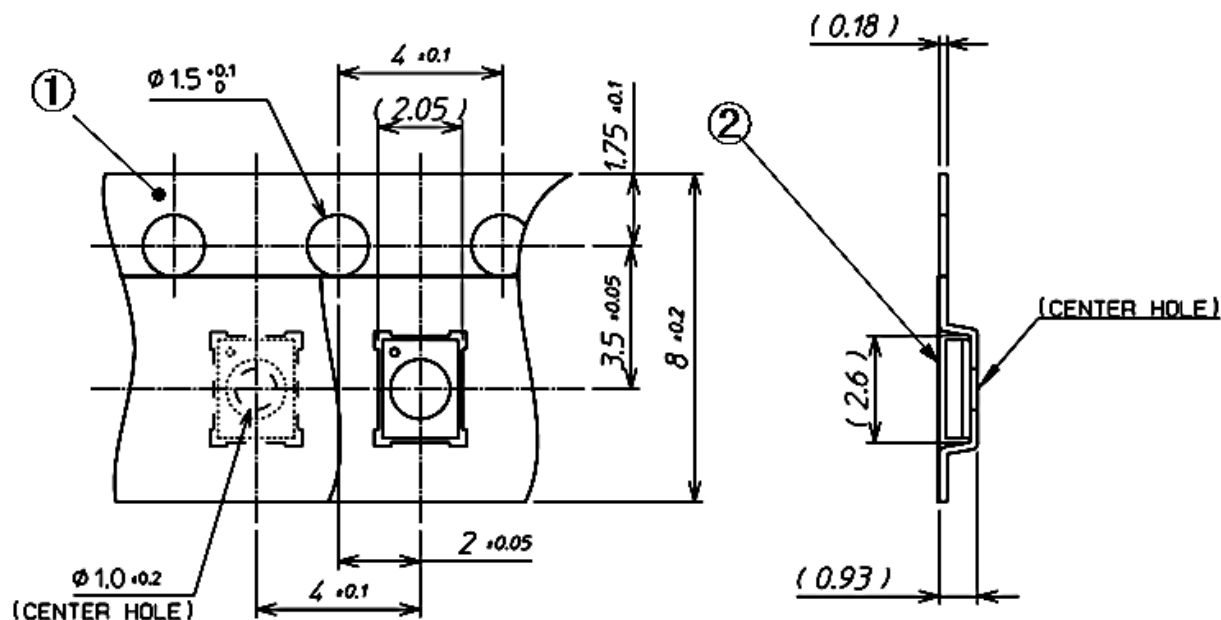
Reversed-orientation, Up-side down placing, side placing and out of spec. parts mixing shall not be held. Max. qty. of empty pocket per reel shall be defined as follows.

Qty./reel	Max.qty. of empty pocket	Remarks
500	1	—
1,000	1	—
1,500	1	—
2,000	2	No continuance
2,500	2	No continuance
3,000	3	No continuance
3,500	3	No continuance
4,000	4	No continuance

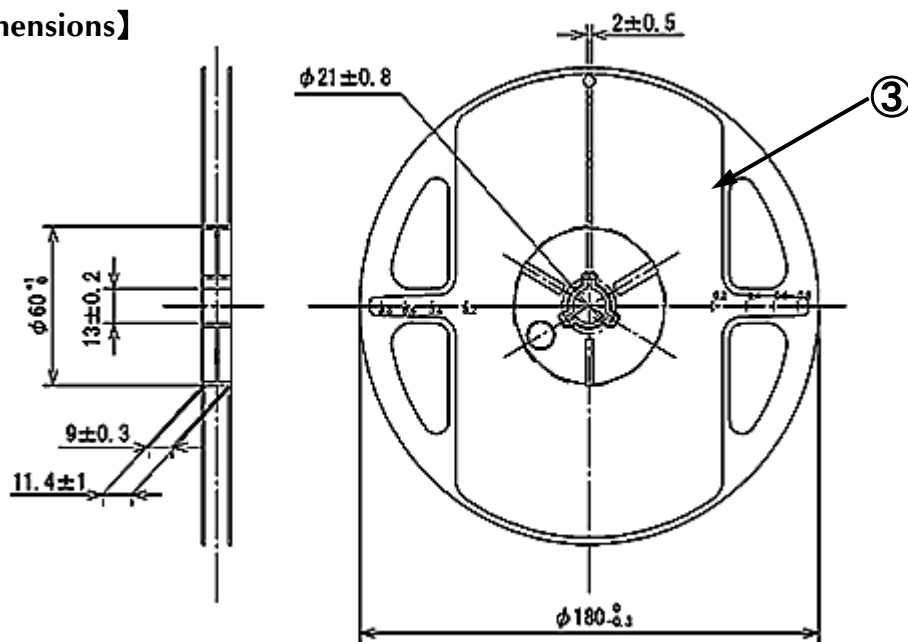
(acc.to JIS-C0806-03)

Unit : mm

【Taping Dimensions】



【Reel Dimensions】



NO.	PART NAME	REMARKS
①	Carrier-tape	Anti-static Grade
②	Cover-tape	Conductive Grade
③	Carrier-reel	Conductive Grade

①	②	③	④	⑤	⑥	⑦	⑧	⑨							

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)

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

1. Reliability Testing Result

Test Item	Criteria	Test Condition	Duration	Failure
Operating Life	EIAJ ED-4701 /100(101)	Ta=25°C Maximum Rated Current	1,000h	0 /20
High Temperature Operating Life	EIAJ ED-4701 /100(101)	Ta=85°C Maximum Rated Current	1,000h	0 /20
Low Temperature Operating Life	EIAJ ED-4701 /100(101)	Ta=-40°C Maximum Rated Current	1,000h	0 /20
Wet High Temperature Operating Life	EIAJ ED-4701 /100(102)	Ta=60°C Rh=90% Maximum Rated Current	1,000h	0 /20
Thermal Shock	EIAJ ED-4701 /100(105)	Ta= Tstg max. ~ Tstg min. (each 15min)	200 cycles	0 /20
Resistance to Reflow Soldering	EIAJ ED-4701 /300(301)	Moisture Soak : 30°C 70% 72h Preheating : 150~180°C 90~120sec. Soldering : 260°C MAX	2times	0 /20
Electric Static Discharge (ESD) ※	EIAJ ED-4701 /300(304)	C=100pF R2=1.5KΩ ±1,000V	once of each polarity	0 / 10

※ Reference Test

2. Failure Criteria

Item	Symbol	Condition	Failure Criteria
Luminous Intensity	I _v	I _f =20mA	Testing Min. Value < Standard Min. Value × 0.5
Forward Voltage	V _F	I _f =20mA	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 discoloration, deformation and cracking

Special Notice to Customers Using the Products and Technical Information Shown in This Data Sheet

- 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.
- 6) No part of this data sheet may be reprinted or reproduced without prior written permission from Stanley Electric Co., Ltd.
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