

Features

Package	CLCC type Outer dimension: 3.0 x 2.5 x 0.77mm (L x W x H)
Product features	<ul style="list-style-type: none"> • Optimum chromaticity specification for full-color display • High reliability, High flux, Low thermal resistance package • Small light emitting area that is superior for optical design • Lead-free soldering compatible • RoHS compliant

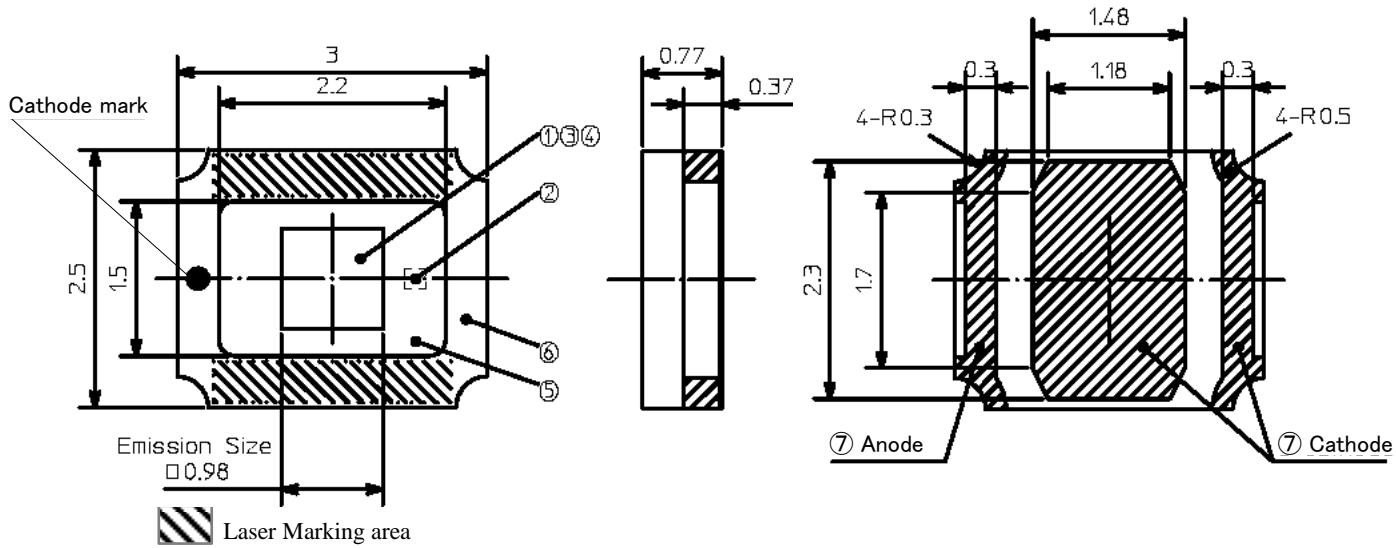
Recommended Applications

- Display back light source for Automotive, motorcycle (Head up display, etc.)
- Light source for other equipment requiring high luminance and high current drive

Outline Dimensions

VBHW1149JTE-100-TR

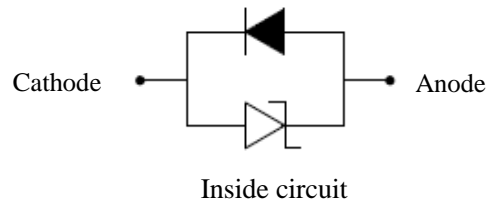
Unit : mm
Weight : 19.7mg
Tolerance : ±0.2



Top view

Side view

Bottom view

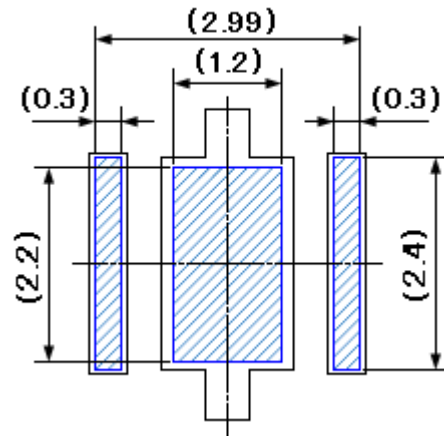
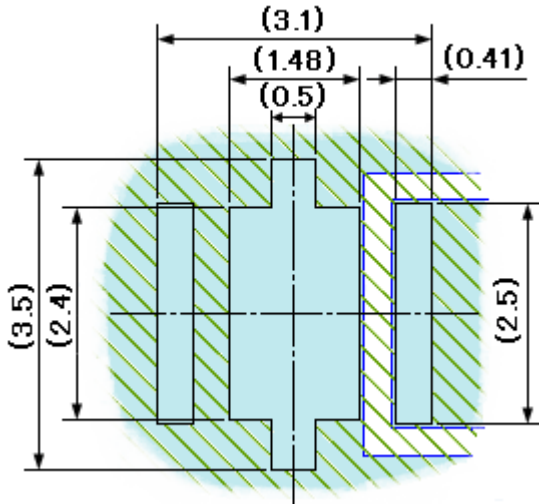


No.	Part name	Material	Qty.
①	LED Die	InGaN	1
②	Protection diode	Si	1
③	Encapsulant	Silicone resin, Phosphor	1
④	Glass plate	Silicon dioxide	1
⑤	Encapsulant	Silicone resin,	1
⑥	Lamp housing	Glass ceramic	1
⑦	Electrode	Au plating	Anode:1 Cathode:2

Recommended soldering Pattern


VBHW1149JTE-100-TR

Unit : mm

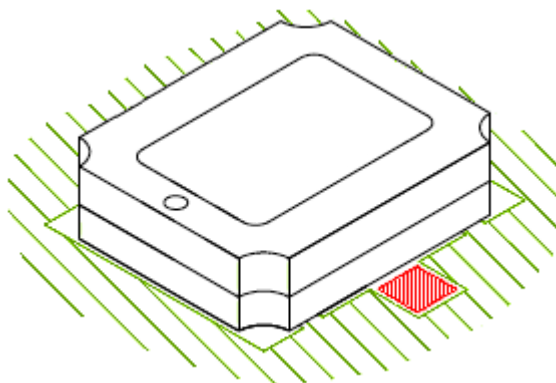



 Cu pattern

 Solder resist

 Solder stencil apertural area

Recommended solder stencil thickness : 150 μ m



 Recommended solder temp. measurement point

【 Product Overview 】

DIE MATERIAL	InGaN
EMITTING COLOR	White
EMISSION AREA COLOR	Yellow
LAMP HOUSING COLOR	White

【 Absolute Maximum Ratings 】

(Ta=25°C)

ITEM	SYMBOL	MAXIMUM RATINGS	UNITS	
Power Dissipation	P_d	5,016	mW	
Forward Current	I_F	100~1,200	mA	
I_F Max Derate Linearly from Tj=125°C	ΔI_F	8.0	mA/°C	
Repetitive Peak Forward Current "1ms, 1/20duty"	I_{FRM}	2,000	mA	
Operating Temperature	T_{opr}	-40 ~ +125	°C	Notes 1
Storage Temperature	T_{stg}	-40 ~ +125	°C	Notes 1
Electro Static Discharge Threshold "HBM"(Ta=25°C)	ESD	±8,000	V	Notes 2
Junction Temperature (1000Hr)	T_j	160	°C	
Soldering Temperature "Reflow Soldering"	T_{sld}	260	°C	Notes 3

Notes 1 The range of operating and storage temperature are not taping condition.

Notes 2 ESD testing method : EIAJ4701/300(304) Human Bodu Model (HBM) 1.5kΩ,100pF

Notes 3 Please refer to page 11, "Soldering Conditions".

【 Thermal Characteristics 】

ITEM	SYMBOL	TYP.	MAX.	UNITS
Thermal resistance 【Junction - Solder point】	$R_{th(j-s)}$	2.8	3.8	°C/W

【 Electro-Optical Characteristics 】

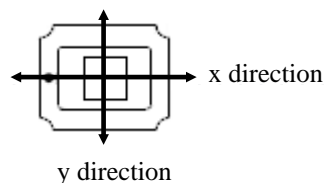
							(Ta=25°C)
ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Forward Voltage	V_F	$I_F = 1,000\text{mA}$	2.75	3.25	3.75	V	Notes4
Luminous Flux	Φ_V	$I_F = 1,000\text{mA}$	180	-	340	lm	Notes4
Chromaticity Coordinates	x	$I_F = 1,000\text{mA}$	-	0.2770	-	/	Notes4,5
	y		-	0.2435	-		
Half Intensity Angle	$2\theta_{1/2}$	$I_F = 1,000\text{mA}$	-	117(x-dir)	-	deg.	Notes6
			-	117(y-dir)	-		

Note4 Refer to the attached sheets for each sorting chart.

Note5 Chromaticity coordinates ; x and y according to CIE1931.

Note6 Full width of viewing angle at half maximum of I_V . X-dir and Y-dir are as shown in the figure below.

※ I_V =Luminous Intensity



【 Sorting Chart For Luminous Flux : Φ_V 】

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

Rank	Luminous Flux Φ_V (lm)		Conditions
	MIN.	MAX.	
CB	180	200	$I_F=1,000\text{mA}$ $T_a=25^\circ\text{C}$
CC	200	220	
CD	220	240	
CE	240	260	
CF	260	280	
CG	280	310	
CH	310	340	

Notes

Tolerance On Luminous Flux : $\pm 7\%$

Measurement Timing : Instantly After Lighting

【 Sorting Chart For Forward Voltage : V_F 】

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

Rank	Forward Voltage V_F (V)		Conditions
	MIN.	MAX.	
A	2.75	3.00	$I_F=1,000\text{mA}$ $T_a=25^\circ\text{C}$
B	3.00	3.25	
C	3.25	3.50	
D	3.50	3.75	

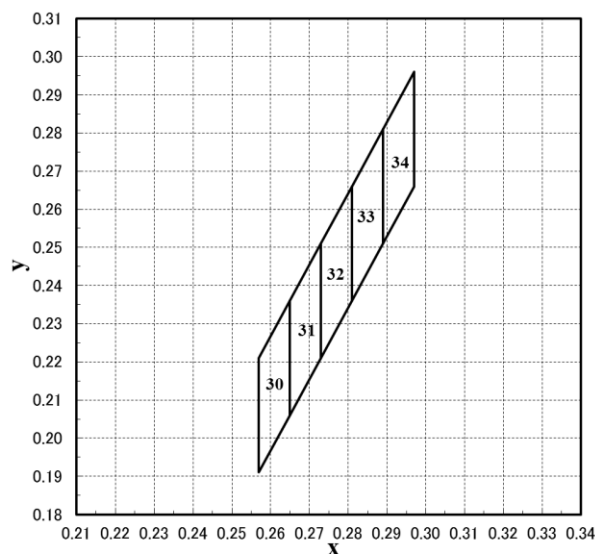
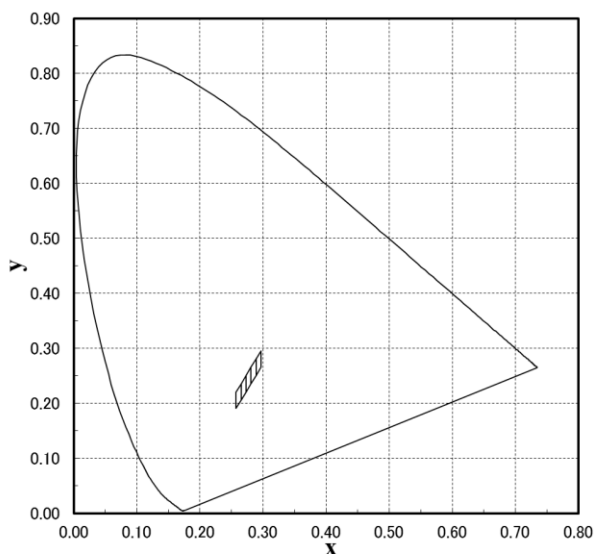
Notes

Tolerance On Forward Voltage : $\pm 0.1\text{V}$

Measurement Timing : Instantly After Lighting

【 Sorting Chart For Chromaticity Coordinates : x, y 】

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



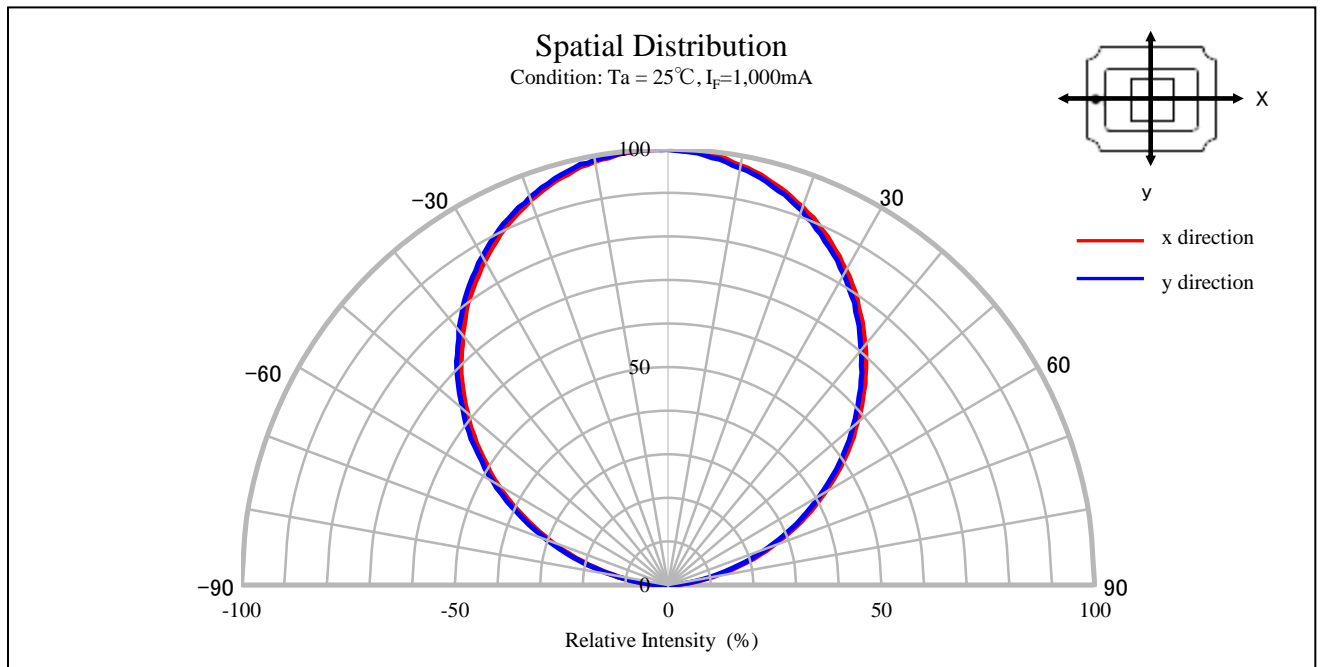
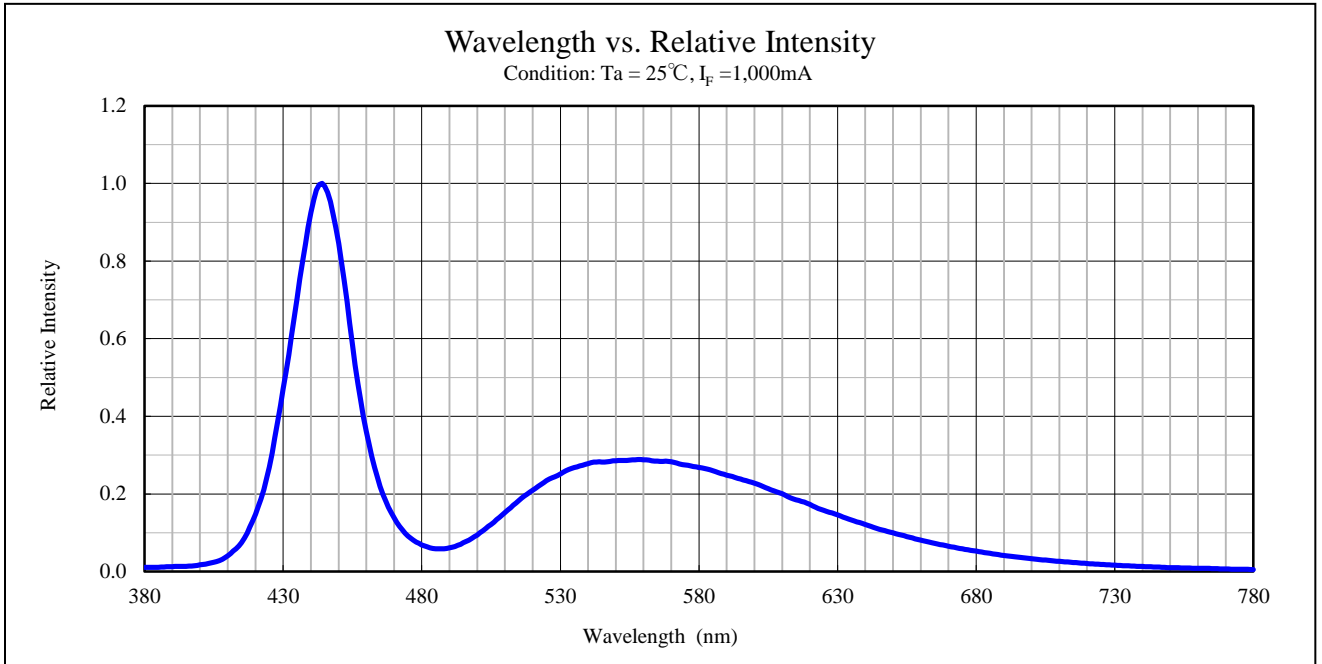
($I_F=1000\text{mA}$, $T_a=25^\circ\text{C}$)

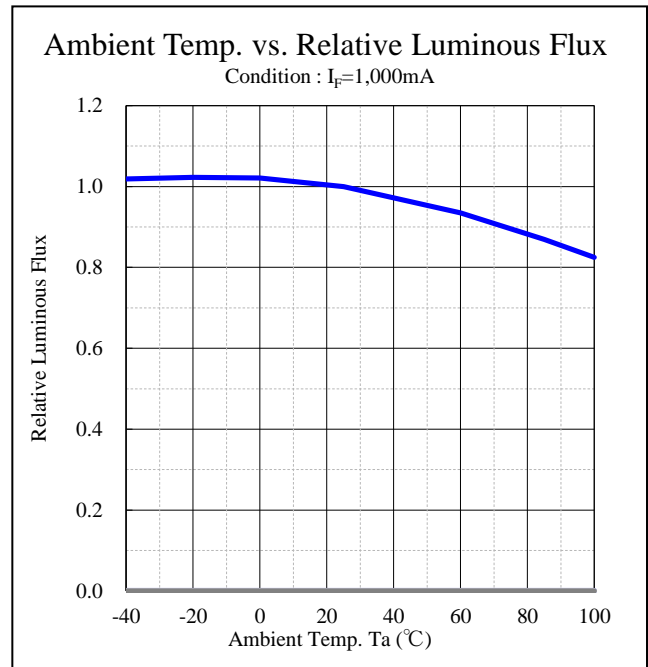
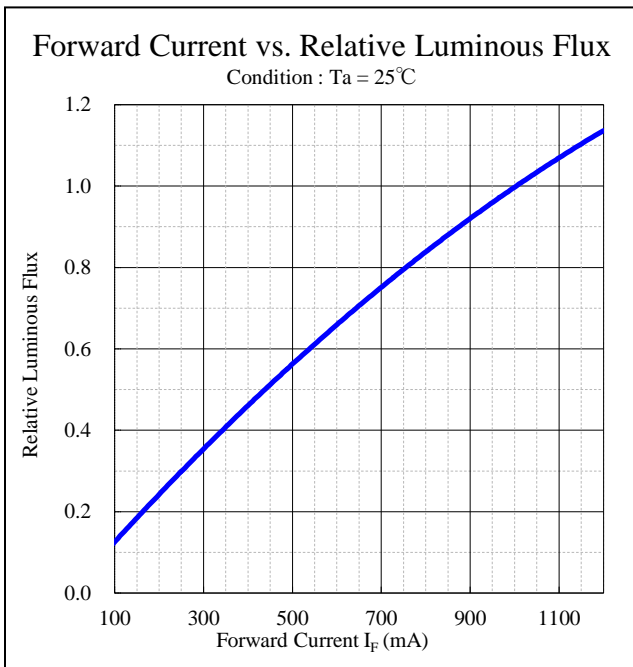
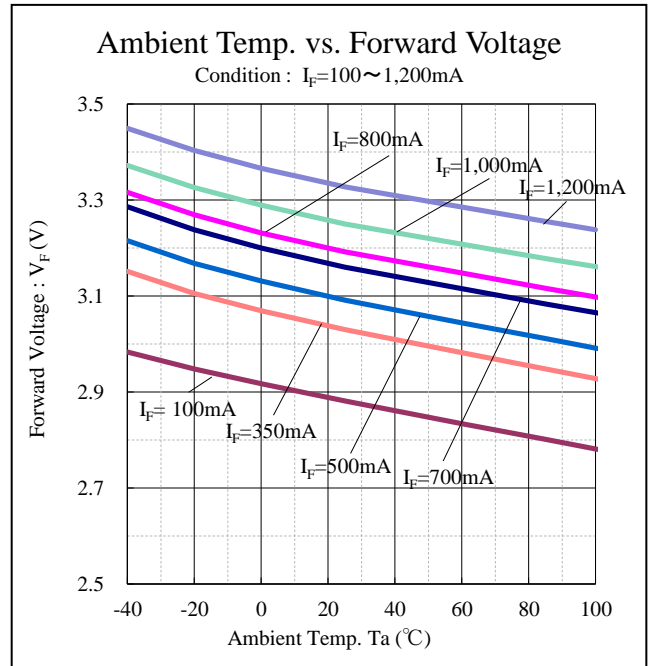
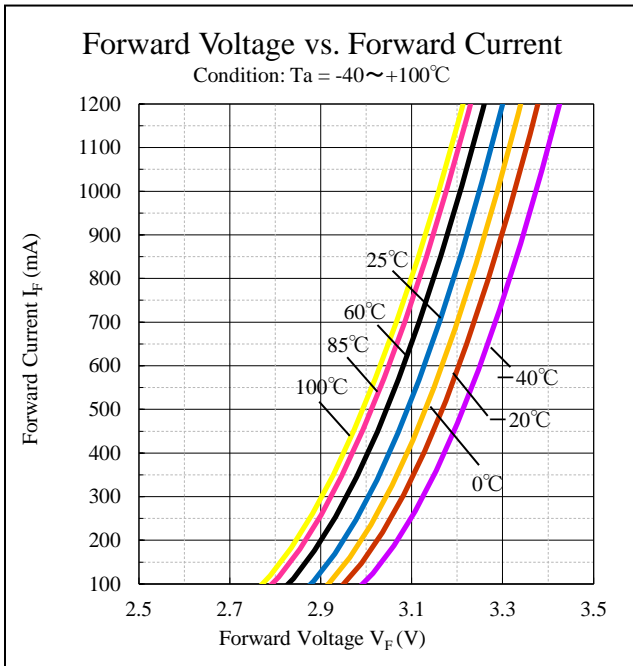
Rank	Left Down		Left Upper		Right Upper		Right Down	
	x	y	x	y	x	y	x	y
30	0.257	0.191	0.257	0.221	0.265	0.236	0.265	0.206
31	0.265	0.206	0.265	0.236	0.273	0.251	0.273	0.221
32	0.273	0.221	0.273	0.251	0.281	0.266	0.281	0.236
33	0.281	0.236	0.281	0.266	0.289	0.281	0.289	0.251
34	0.289	0.251	0.289	0.281	0.297	0.296	0.297	0.266

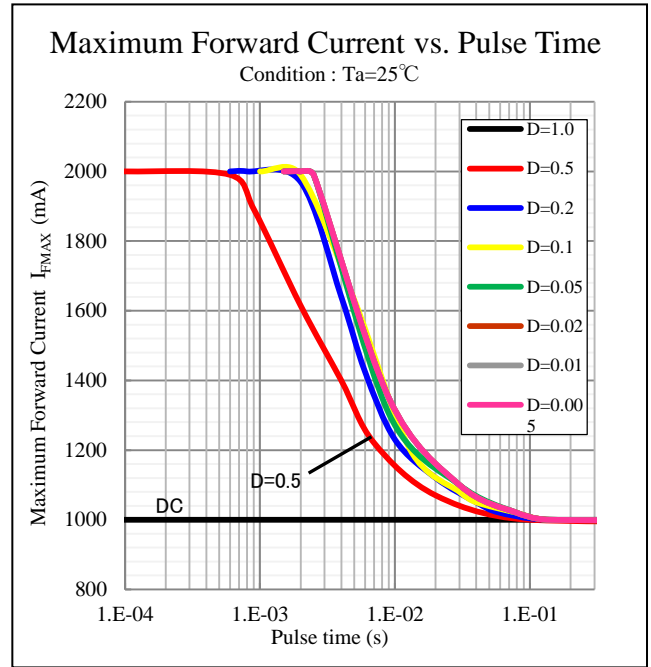
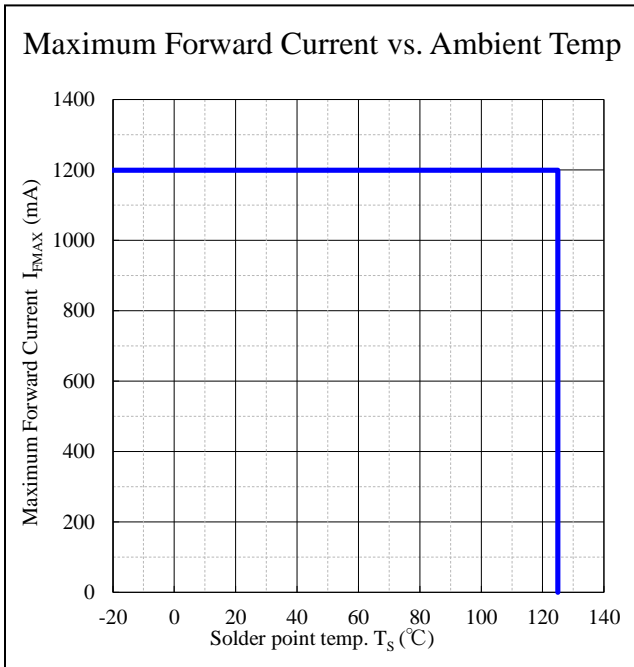
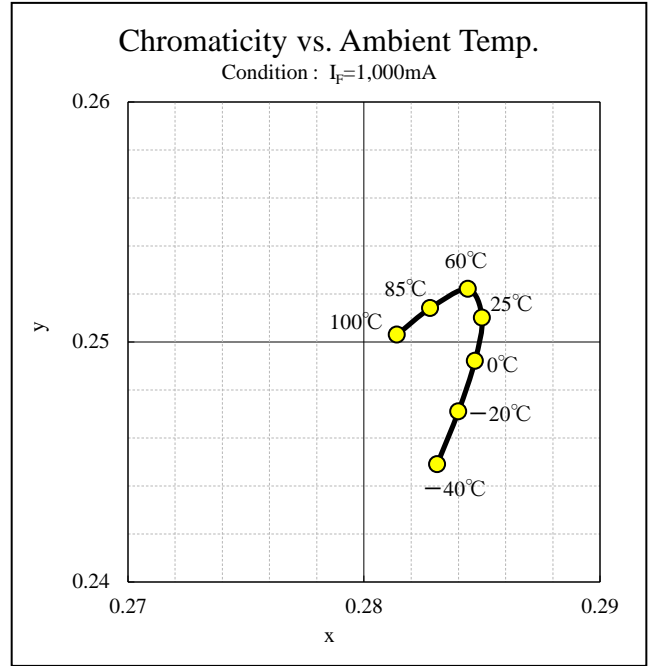
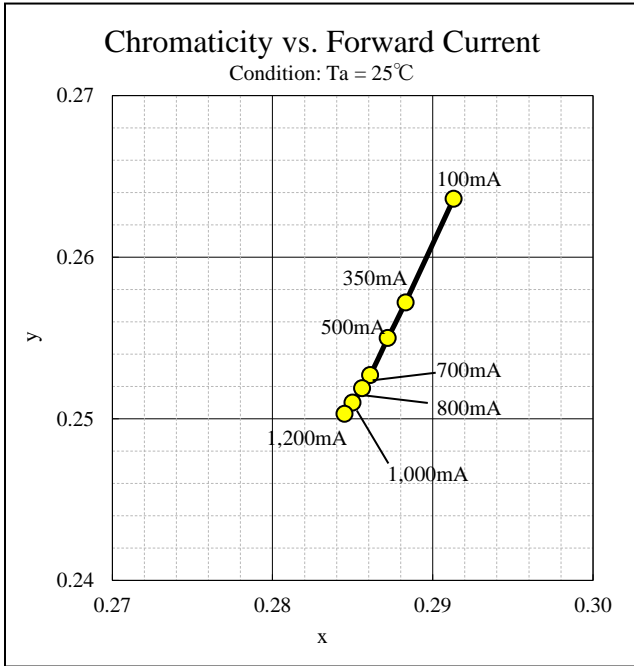
Notes

Tolerance On Chromaticity Coordinates : ± 0.01

Measurement Timing : Instantly After Lighting





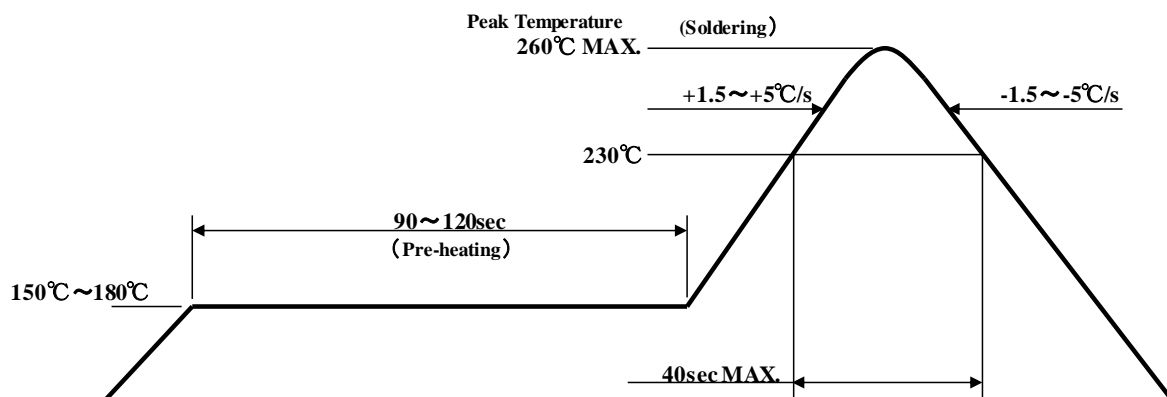


【Soldering Precaution】

(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 on the top surface. This is due to the fact that temperature distribution varies on heating method, PCB material, other components in the assembly, and concentration other parts mounted. Typically, when FR-4 PCB is mounted with one with component, and heated via Far infrared and Heated Air, the temperature difference between PCB and device resin will be around 5~10°C.
Please do not repeat the heating process in Reflow process more than twice.
- When using a metal PCB, the solder may crack and problems may occur due to major stress on the soldered portion caused by thermal shock. Please carry out a thorough advance verification before use. For the metal PCB's insulation, it is recommended to use stress-reducing materials.

【Recommended Reflow Soldering Condition】



Note 1 Temperature Profile for the reflow should be set to the surface temperature of resin which is on the top of LED. 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.

5. 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°C Max. / Time : 300 sec Max.)
6. These products can not be used for hand soldering and dipping (Through the Wave) soldering.
7. 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.

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

【For Electric Static Discharge (ESD)】

This product is sensitive to voltage surges generated by On/Off status change and friction 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, deterioration in optical characteristics.

Stanley InGaN products are packed with anti-static components. However, following precautions must be taken into account upon product shipment.

1. Electrification/Static Electricity protection

In order to avoid product (die) damage from static electricity caused by unprotected handling by operator and other charged materials 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 into contact with metallic materials.(Should the metallic material be electrified , the sudden surge voltage will most likely damage the product.)
- ② Avoid a working process which may cause the LED product to rub against other materials.
- ③ Install ground wires for any equipment, where they can be installed, with measures to avoid static electricity surges.
- ④ Prepare a ESD protective area by placing a Conductive Mattress (1MΩ MAX.) and Ionizer to remove any static electricity.
- ⑤ Operators should wear a protective wrist-strap.
- ⑥ Operators should wear conductive work-clothes and shoes.
- ⑦ To handle the products directly, Stanley recommends the use of ceramic, and not metallic, tweezers.

2. Working Environment

- ① A dry environment is more likely to cause static electricity. Although a dry environment is ideal for storage state of LED products, Stanley recommends an environment with approximately 50% humidity after the soldering process.
- ② Recommended static electricity level in the working environment is less than 150V, which is the same value as Integrated Circuits (which are sensitive to static electricity).

【Other Precautions】

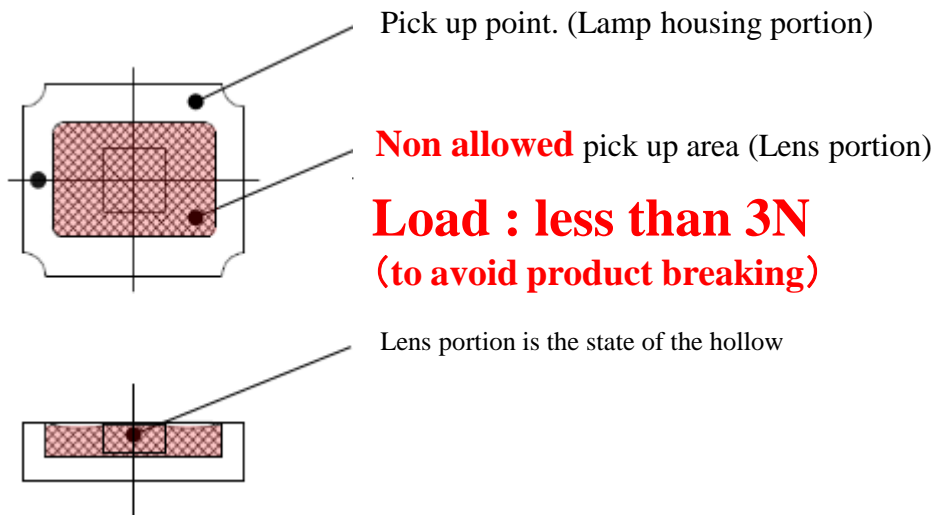
1. The products are designed to achieve higher performance reliability, however, they can be influenced by usage conditions.
2. Absolute maximum ratings are set to prevent LED products from breaking due to extreme stress (temperature, current, voltage, etc.). These ratings must never be overrun even 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. Also please make sure there isn't any gas in the surrounding area or entering from outside when using the products.
6. Please avoid to stick foreign materials because molding resin in the products has adhesiveness. And please do not touch emission area..
7. Supersonic wave welding is not recommended because wire open circuit may occur.
ex) bonding outer lens to this product or housing
8. Please check the actual performance in the assembly because the specification sheets are described only for LED device.
9. Please refrain from looking directly at the light source of the LED at high output, as it may harm your vision.
10. The products are designed to perform without failure in the recommended usage conditions.
However, please take the necessary precautions to prevent from a fire, injury, and other unexpected failures.
11. 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, medical applications, nuclear reactor control systems and so on).
12. The formal specification sheets shall be exchanged and signed by both parties.
13. Supersonic wave welding is not recommended when bonding outer lens to this product. There is a possibility that wire open circuit occurs in supersonic wave welding.

【Handling Precautions for Product Mounting】

<Recommendation>

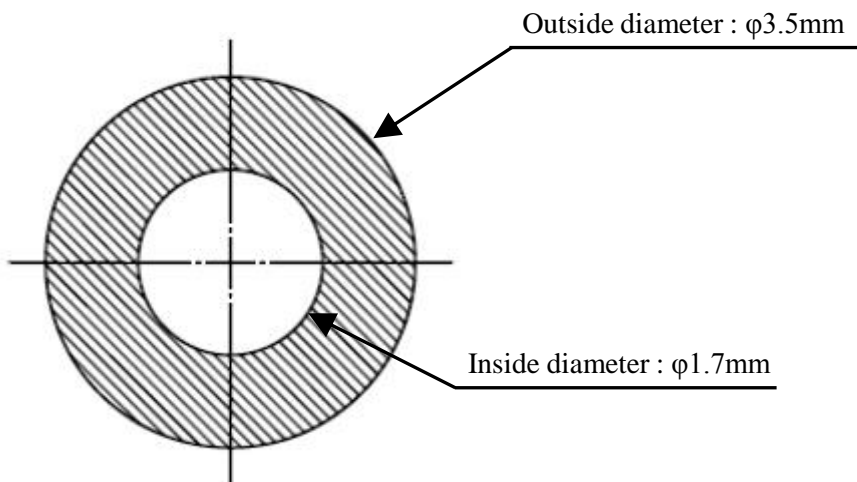
1. Picking up point with nozzle: Lamp housing of the product (Shown below)

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.

2. Recommended Nozzle Shape



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°C
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】

This product is **equivalent to IPC/JEDEC J-STD-020D MSL 2.**
 Please keep the time frame between package opening and soldering which is **【maximum 1 year.】**
 If the device needs to be soldered twice, both soldering must be completed within the 1 year.

The package should not be opened until immediately prior to its use.

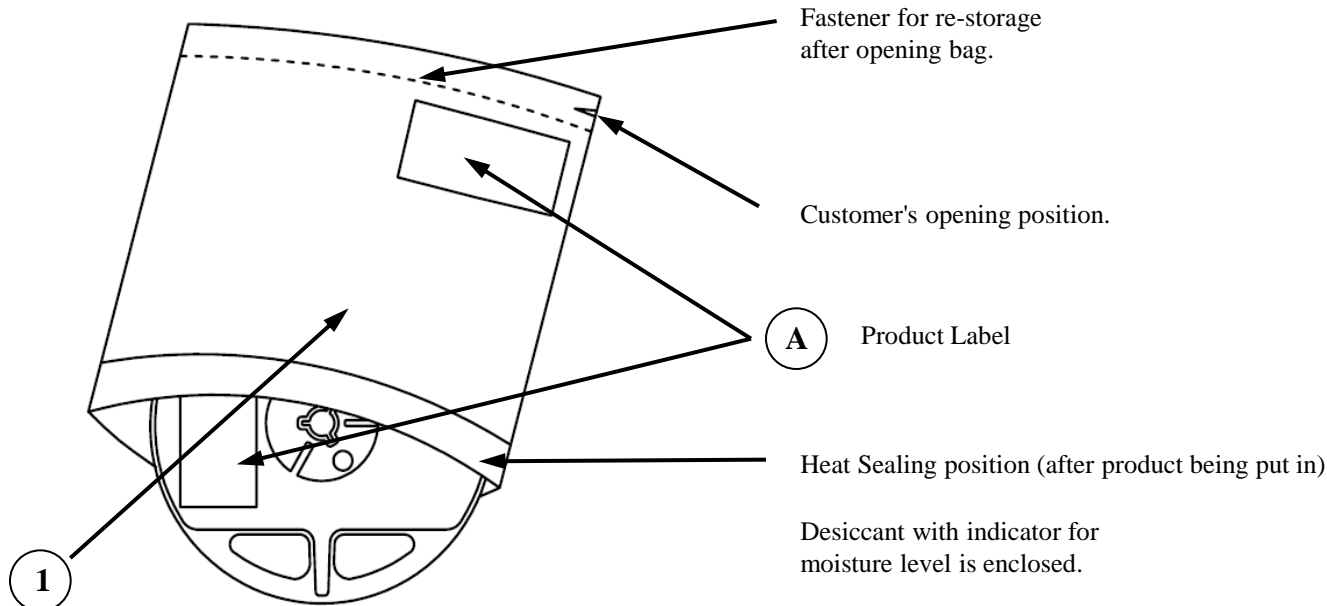
If any components should remain after their use, please seal the package and store them under the conditions described in the above 【Recommended Storage Condition】.

Baking process should be performed after putting out from package.

Baking conditions: **10h(min.), at +60±5°C** just before use

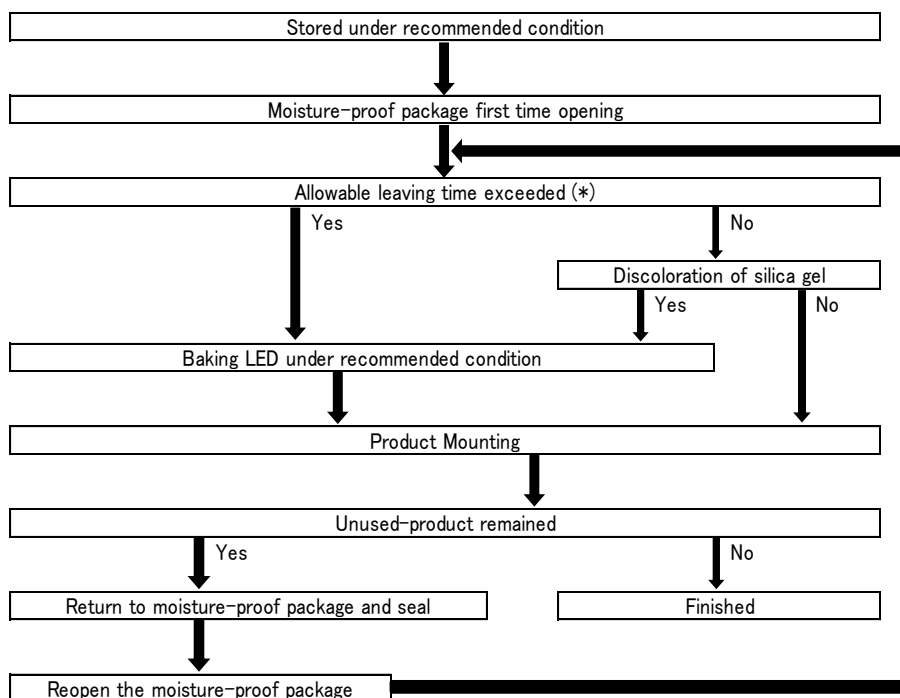
Baking may be performed in the tape-reel form, however if it is performed with the reel stacked over one another, it may cause deformation of the reels and taping materials, which may cause problems during production. Please make sure that the product has cooled to normal temperature after performing the baking process. Provided that, baking process shall be 2 times MAX.

【Moisture-proof Packaging Specification】



NO.	PART NAME	MATERIALS	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 from 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 from the first opening of package, or from the time when baking process is finished.

Packaging Specifications

VBHW1149JTE-100-TR

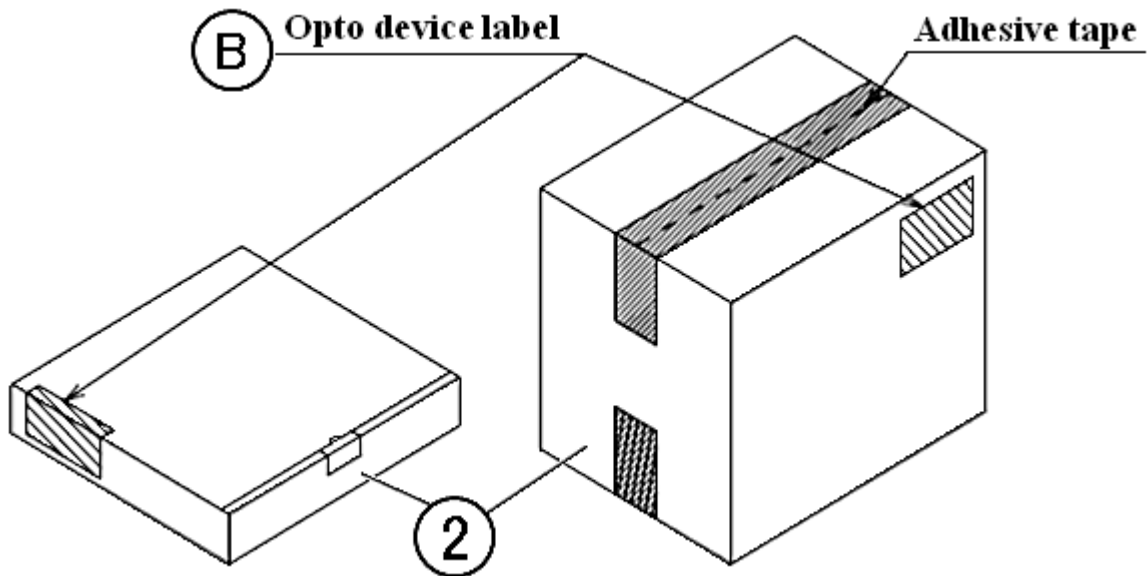
【Packing box】

(RoHS・ELV Compliant)

Box TYPE	Outline dimension L × W × H (mm)	Capacity of the box
Type A	280 × 265 × 45	3 reel
Type B	310 × 235 × 265	15 reel
Type C	440 × 310 × 265	30 reel

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

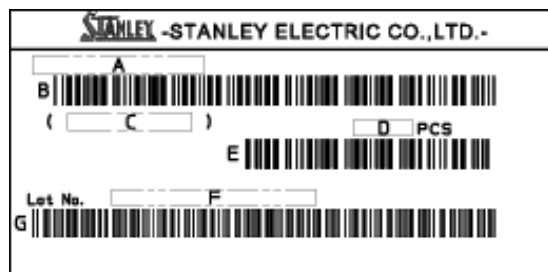
Partition : Cardboard K5BF

NO.	PART NAME	MATERIAL	REMARKS
②	Packing Box	Corrugated Cardboard	without ESD protection

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

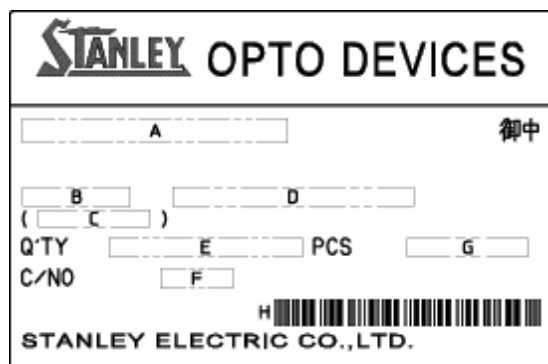
【Label Specification】

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
- (Please 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

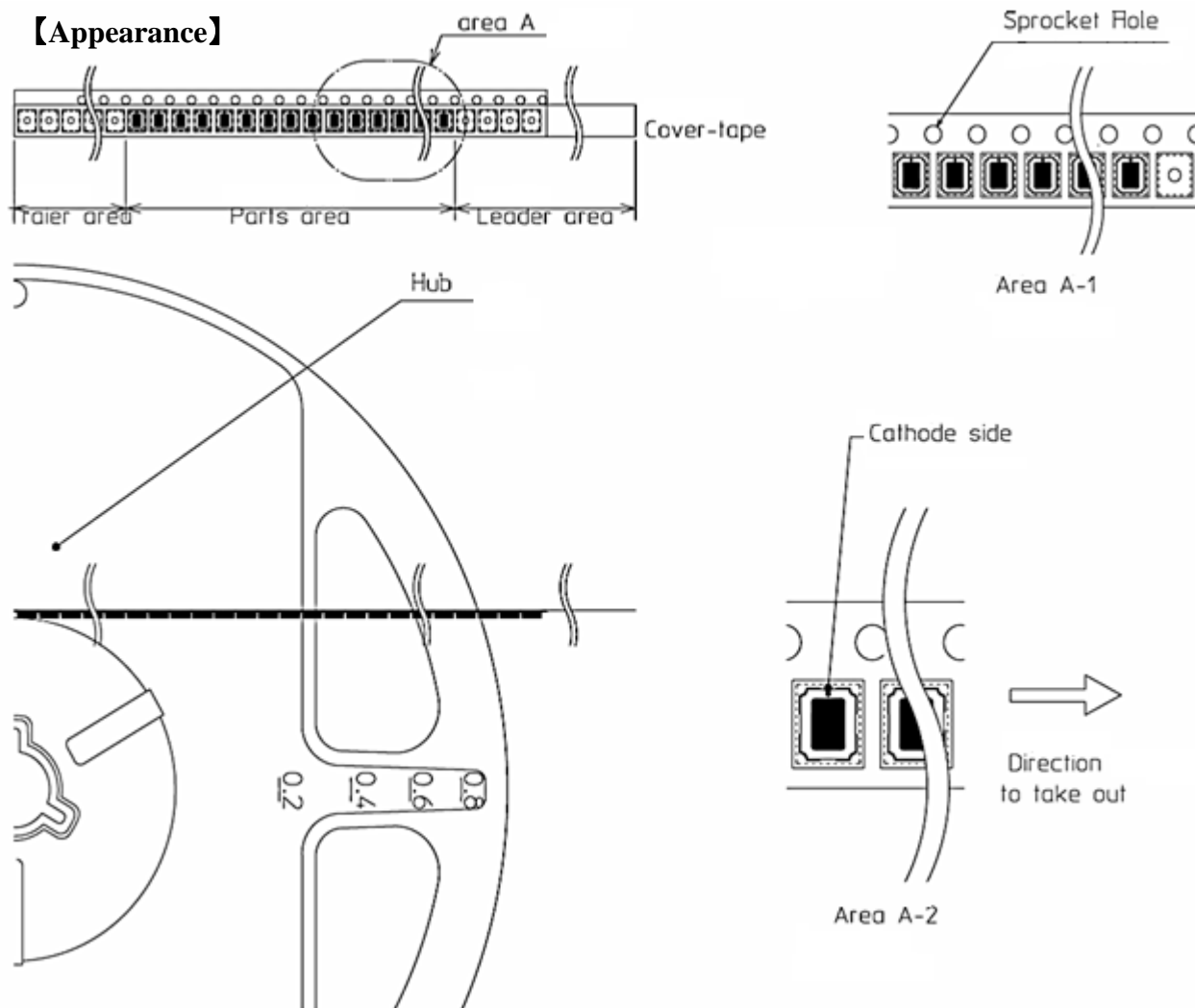
<Remark> Bar-code font : acc.to Code-39(JIX0503)

Taping and Reel Specifications

VBHW1149JTE-100-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 (100mm) .	Please refer to the above figure for Taping & reel orientation .
Trailer area		Empty pocket shall be more than 40 pieces (160mm) .	The end of taping shall be inserted into a slit of the hub.

Taping and Reel Specifications

VBHW1149JTE-100-TR

(acc.to JIS-C0806-03)

【 Qty. per Reel】

3,000parts/reel

Minimum Qty. per reel might be 500 parts when getting less than 3,000 parts. In such case, parts of 100-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 0.1~1.3N (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 mix shall not be held. Empty Pocket per reel is assumed until 1 piece.

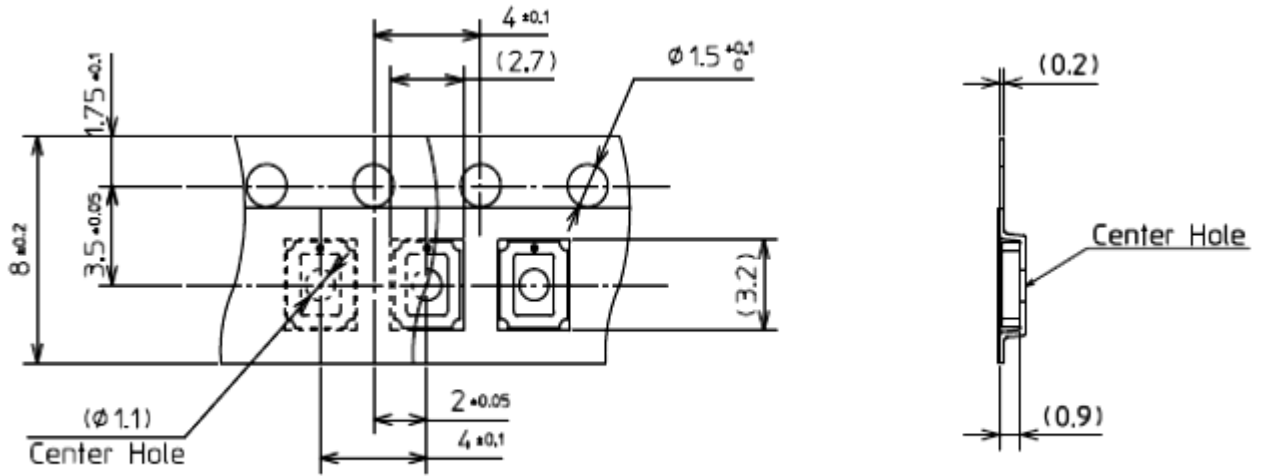
Taping and Reel Specifications

VBHW1149JTE-100-TR

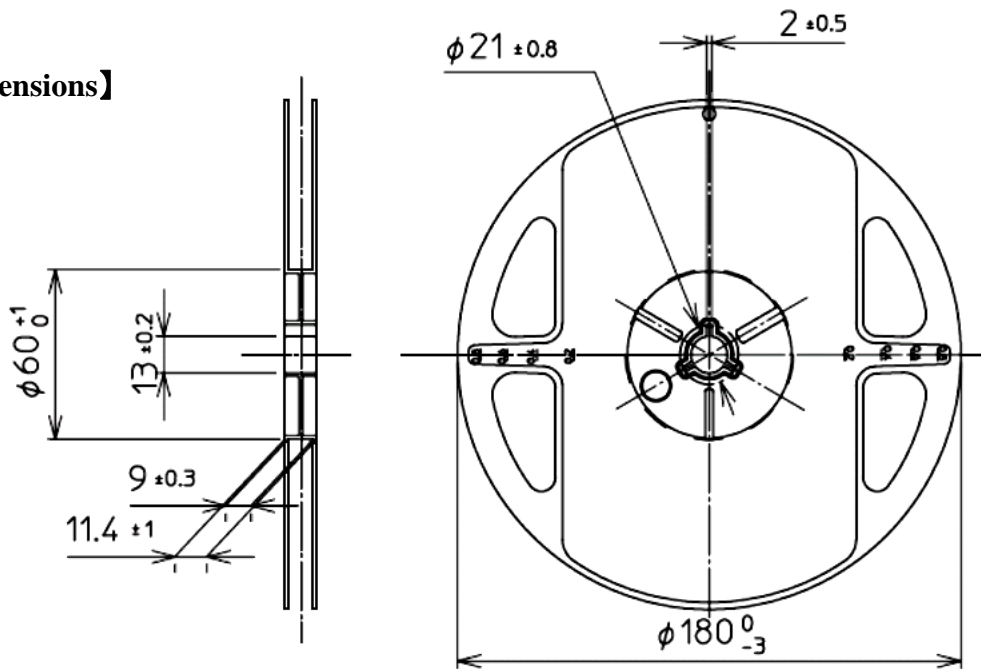
(acc.to JIS-C0806-03)

Unit :mm

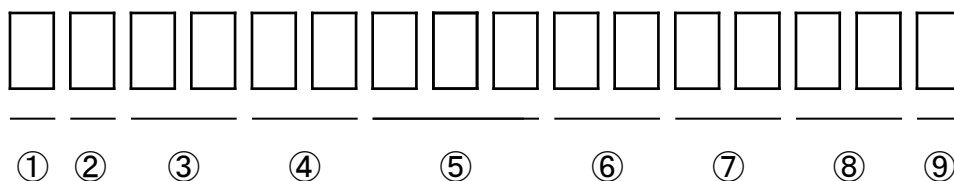
【Taping Dimensions】



【Reel Dimensions】



SYM.	PART NAME	REMARKS
①	Carrier-tape	with ESD protection
②	Cover-tape	with ESD protection
③	Carrier-reel	with ESD protection



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: V_F rank

If there is no identified V_F rank, “ - ” is used 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

Reliability Testing Result

VBHW1149JTE-100-TR

1. Reliability Testing Result

Test Item	Test Condition	Duration	Failuer
High Temp. Operating Life 1	Tj=150°C I _F =1,000mA	5,500h	0 / 18
High Temp. Operating Life 2	Tj=160°C IF=1,000mA	1,000h	0 / 18
High Temp. Intermission Operating Life	Ta=85°C Tj=150°C 5min/ON↔5min/OFF	1,000h	0 / 18
Low Temp. Operating Life	Ta=-40°C I _F =1,000mA	1,000h	0 / 18
Low Temp. Intermission Operating Life	Ta=-40°C I _F =1,000mA 5min/ON↔5min/OFF	1,000h	0 / 18
High Temp. Strage Life	Ta=125°C	3,000h	0 / 18
Low Temp. Strage Life	Ta=-40°C	1,000h	0 / 18
High Temp. Humidity Bias	Ta=85°C Rh=85% Tj=150°C I _F =1,000mA	2,000h	0 / 18
Thermal Shock Cycle	Ta=-40°C (15min.) ~ 125°C (15min.)	1,000 cycles	0 / 18
Thermal Shock Operating Cycle	Ta=-40°C (15min.) ~ 125°C (15min) I _F =1,000mA	1,000 cycles	0 / 18
Thermal & High Temp. Cycle	Ta=-30°C ~ 80°C Rh=90% I _F =1,000mA 5min/ON↔5min/OFF	30 cycles	0 / 18
Electrostatic Discharge (ESD) : HBM	C=100pF R2=1.5kΩ ±8,000V (Each polarity)	Each 3times	0 / 18
Electrostatic Discharge (ESD) : MM	C=200PF R2=0kΩ ±250V (Each polarity)	Each 1times	0 / 18
Vibration Test	10~50Hz: 2mm amplitude, 50~500Hz: 20G (Each direction)	Each 20h	0 / 18
Variable Frequency Test	5~33Hz: 2mm amplitude, 33~2,000Hz: 20G (Each direction)	Each 2h	0 / 18
Resistance Reflow Soldering	Moisture soak : JEDEC Level2 Preheating : 150~180°C 90~120sec MAX. Soldering : 260°C 5sec	5times	0 / 18
Climing Test	Adding 10 N to the side of LED package (LED mounted on the test board)	10s	0 / 10
Deflection Test	Adding a load 10sec. from the back of the board until the board deflects 3mm (LED mounted in the longitudinal direction of the test board)	1time	0 / 18

2. Failure Criteria

Item	Symbol	Conditions	Acceptance Criteria
Luminous Intensity	I _V	I _F =1000mA Ta=25°C	Initial Value × 0.8 > Measured Value Initial Value × 1.2 ≤ Measured Value
Chromaticity Coordinates	ccx, ccy	I _F =1000mA Ta=25°C	Measured Value < Initial Value - 0.02 Measured Value > Initial Value + 0.02
Forward Voltage	V _F	I _F =1000mA Ta=25°C	Measured Value < Initial Value × 0.9 Measured Value > Initial Value × 1.1
Appearance	—	—	Notable discoloration, deformation and crack

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