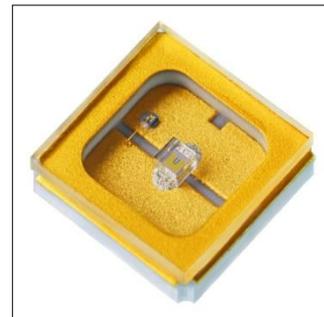




Standard product reference sheet

LKU1107EAE-275-TR



Features

Package	Wide distribution angle, low power type Deep-UV LED (UVC) Peak wavelength 275nm Outer dimension 3.5 x 3.5 x 1.2mm(L x W x H)
Product features	<ul style="list-style-type: none">•Operating temperature : -30 to +80 deg.•Total power : 3mW (Typ.) @ I_F = 20mA•Lead-free soldering compliant•RoHS2 compliant

Recommended applications

Water/liquids disinfection : House water purifier, water purification devices, humidifier (water tank disinfection)

Surface disinfection : Disinfection cabinets, bio/medical equipment

Inspection light sources : Image inspection light

Air sterilization : Germicidal equipment, etc.



WARNING

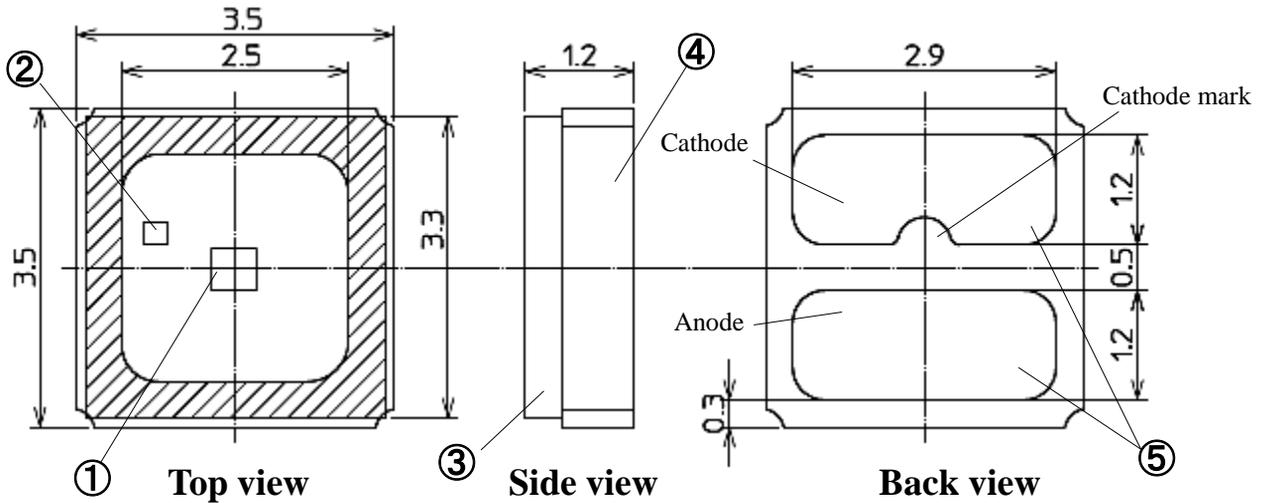
- UV LEDs **emit high intensity UV (ultraviolet) light.**
- Do not look directly into the UV light source ; this can be harmful to your eyes and skin.**
- Wear protective eyewear to avoid exposure to UV light, as well as protective masks and gloves, etc. in order not to expose your skin to the light.
- Attach warning labels to your products which contain UV LEDs.
- keep out of reach of children.



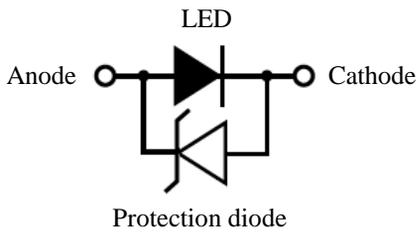
Outline dimensions

LKU1107EAE-275-TR

Unit : mm
 Weight : 53mg
 Tolerance : ±0.2



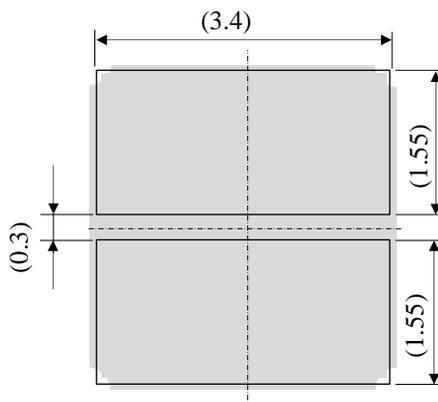
【 Internal circuit 】



No.	Part name	Materials	Qty.
①	LED die	AlGaIn	1
②	Protection diode	Si	1
③	Sealing glass	Glass	-
④	Substrate	Ceramic	1
⑤	Electrode	Au plating	Anode: 1 Cathode: 1

Recommended pad

Unit : mm





Specifications

LKU1107EAE-275-TR

【 Product overview 】

Die material	AlGaIn
Emitting color	Ultra violet

【 Absolute maximum ratings 】

Item	Symbol	Maximum ratings	Units	
Operating temperature	T_{opr}	-30 to +80	°C	Note 1
Storage temperature	T_{stg}	-40 to +100	°C	Note 1
Junction temperature	T_j	90	°C	
Forward current	I_F	50	mA	
Electrostatic discharge threshold "HBM"	V_{ESD}	2	kv	Note 2
Peak temperature of reflow soldering	T_{sld}	260	°C	

Note 1 The ranges of operating and storage temperature are not applied to taping condition.

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

【 Thermal characteristics 】

($T_a=25^{\circ}C$)

Item	Symbol	Typ.	Max.	Units
Thermal resistance(Junction - Ambient temp.)	$R_{th(j-a)}$	46	-	°C/W



Specifications

LKU1107EAE-275-TR

【 Electro-Optical characteristics 】

(Ta=25°C)

Item	Symbol	Conditions	Min.	Typ.	Max.	Units	
Total power	P _o	I _F = 20mA	1.8	3.0	4.2	mW	Note 3
Peak wavelength	λ _p	I _F = 20mA	270	275	280	nm	Note 4
Spectral half width	Δλ	I _F = 20mA	-	11	-	nm	
Half intensity angle	2θ _{1/2}	-	-	120	-	deg.	
Forward voltage	V _F	I _F = 20mA	4.0	5.5	6.5	V	Note 5

Note 3 Total Power is measured by integrating sphere, and the Tolerance is ±10%.

Note 4 Peak Wavelength Tolerance is ±3nm.

Note 5 Forward Voltage Tolerance is ±3%.

【 Sorting chart for total power 】

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

Rank	Total power (mW)		Conditions
	Min.	Max.	
A	1.8	2.4	I _F =20mA Ta=25°C
B	2.4	3.0	
C	3.0	3.6	
D	3.6	4.2	

Notes Measurement tolerance: ±10%

【 Sorting chart for forward voltage 】

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

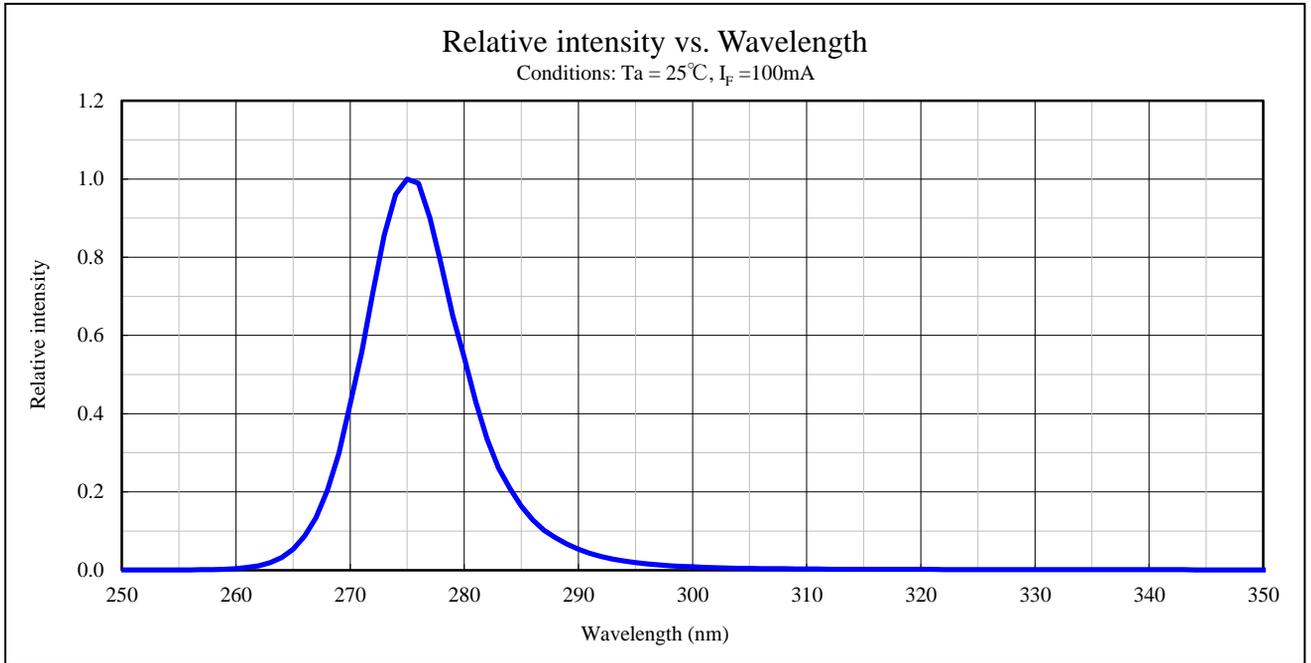
Rank	Forward voltage(V)		Conditions
	Min.	Max.	
A	4.0	4.5	I _F = 20mA Ta = 25°C
B	4.5	5.0	
C	5.0	5.5	
D	5.5	6.0	
E	6.0	6.5	

Notes Measurement tolerance: ±3%



Technical data

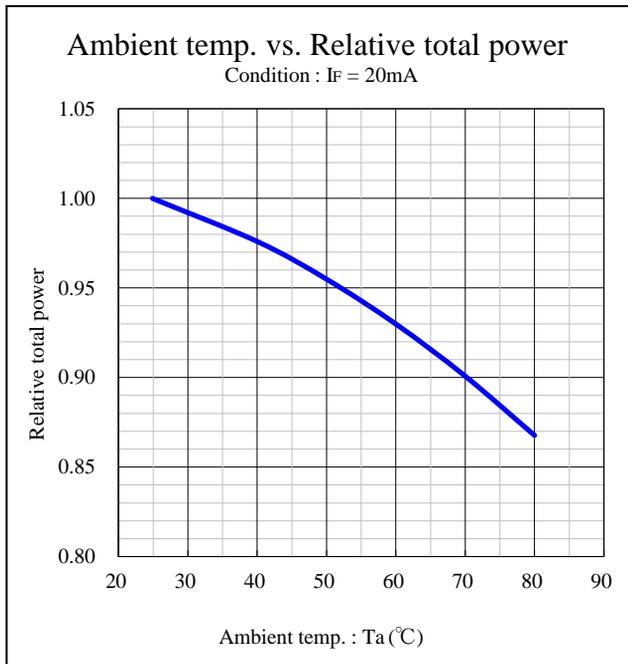
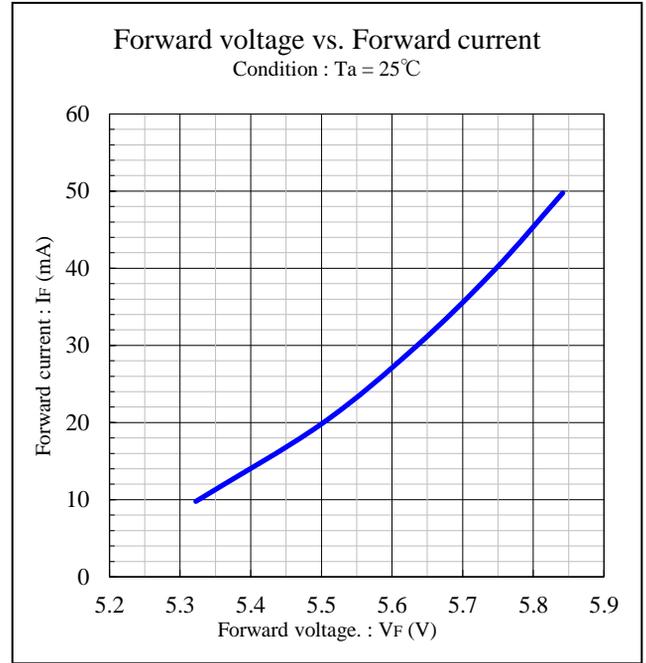
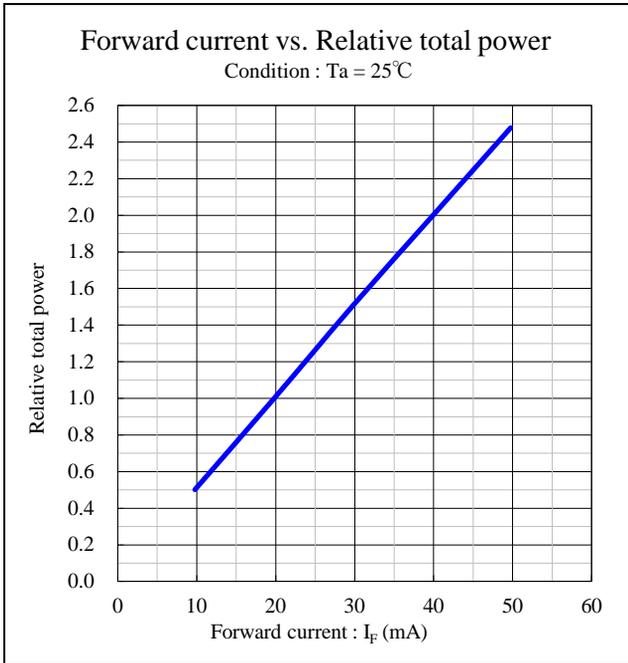
LKU1107EAE-275-TR





Technical data

LKU1107EAE-275-TR





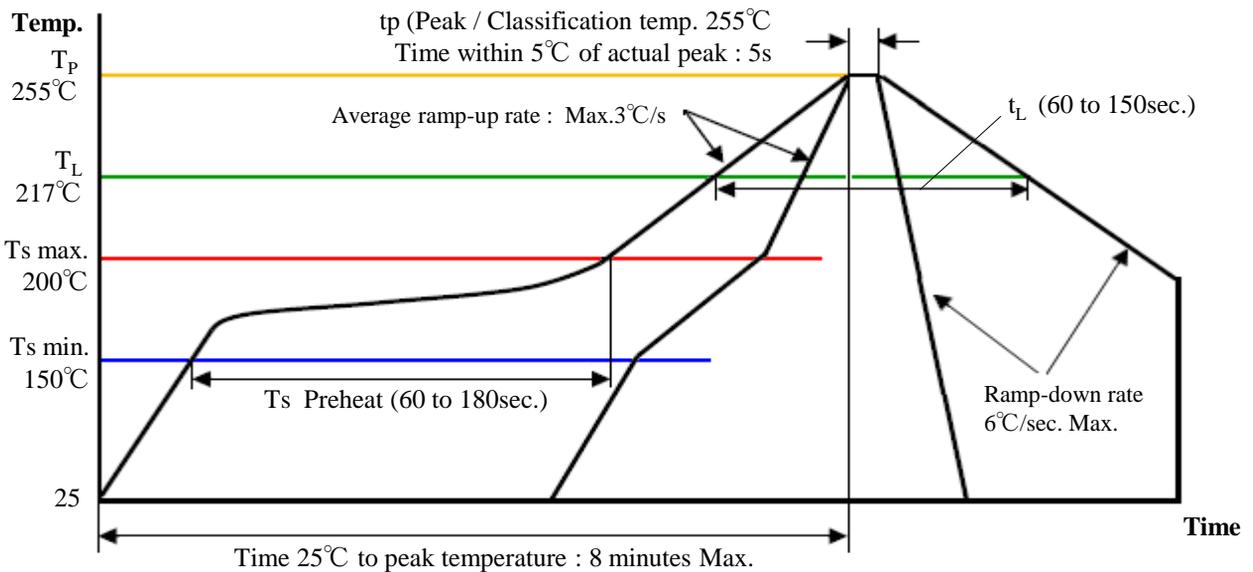
Soldering condition

LKU1107EAE-275-TR

【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).
- The LEDs constituent parts, including the resin, do not stabilize immediately after soldering. Any mechanical stress may cause damage to the products. Please avoid stacking the PCBs, or any other storage method which may cause the PCBs to bend; also, prevent contact of LED with any materials.
- The recommended temperature profile for reflow soldering is listed as the top surface temperature. This is due to the fact that temperature distribution varies on heating method, PCB material, other components in the assembly, and concentration of the parts mounted.
Please do not repeat the heating process during reflow more than two times.



Average ramp-up rate (Ts max. to Tp)	3°C/sec. max.
Preheat temperature min. (Ts min.)	150°C
Preheat temperature max. (Ts max.)	200°C
Preheat time (Ts min. to Ts max.)	60~180sec.
Time maintained above temperature (TL)	217°C
Time maintained above time (tL)	60~150sec.
Peak / classification temperature (Tp)	255°C
Time within 5°C of actual peak temperature (tp)	5sec.
Ramp-down rate	6°C/sec. max.
Time 25°C to peak temperature	8 minutes max.

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.

- The products cannot be used for hand soldering and dipping (Through the wave) soldering.



Handling precaution

LKU1107EAE-275-TR

【For electric static discharge (ESD)】

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 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.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “no light up” at low currents.

To verify for ESD damage, check for “light up” and V_F of suspect LEDs at low currents.

Please do not look directly into the light source, for it could damage your eyes.

2. Working environment

- ① 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 150V or less, which is the same value as Integrated Circuits (which are sensitive to static electricity).



Handling precaution

LKU1107EAE-275-TR

【Other precautions】

1. Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary. Do not use unspecified chemical liquid to clean LED, it could harm the package.
2. The products are designed to achieve higher performance reliability, however, they can be influenced by usage conditions.
3. Absolute maximum ratings are set to prevent LED products from failing due to excess stress (temperature, current, voltage, etc.). These ratings must never be overrun even for a moment.
4. 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.
5. 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.
6. Please avoid to using the products with materials and products that contain sulfur and chlorine elements because the reliability may be decreased. Please keep in desiccator before and after mounting, to prevent the products from being affected by corrosive gas.
Also please make sure there isn't any gas in the surrounding area or entering from outside when using the products.
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 life time performance in the assembly because the specification sheets are described for LED device only.
9. 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 make sure there is no problem before using.
10. 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 damage from these unexpected failures.
11. 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, medical applications, nuclear reactor control systems and so on).



Handling precaution

LKU1107EAE-275-TR

【Other precautions】

12. The LED should only be picked up by making contact with the side of the LED body when using tweezers. It should not put any pressure on the lens either by finger or any hand tool. Overload might cause deformation, disconnection, chip-outs and consequently lead to lighting failure. Tweezers with flat tips is recommended, please avoid using tweezers with sharp tips.
13. **This product emits strong ultraviolet rays** when it is lit up.
Please do not look directly into the light source, for it could damage your eyes.
Should it be necessary to observe the product while it is being lit, **always use protective glasses that cut ultraviolet rays, as well as protective masks and gloves etc. in order not to expose your skin to the light.**
Please also take sufficient safety measures against light leakage etc., in order to avoid any influence on the human body.
14. The formal specification sheets should be exchanged and signed by both parties.



Packaging specifications

LKU1107EAE-275-TR

This product is shipped in moisture-proof packaging (as shown below) to minimize moisture absorption during shipping. However, in regards to storing the products, 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 to 30°C
Humidity	Under 60%rh

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 3**. (168h = 1 week)

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.

Please keep the time frame between package opening and soldering which is **【maximum 168h.】**

Baking conditions: **24h(min.), at +60°C** just before use

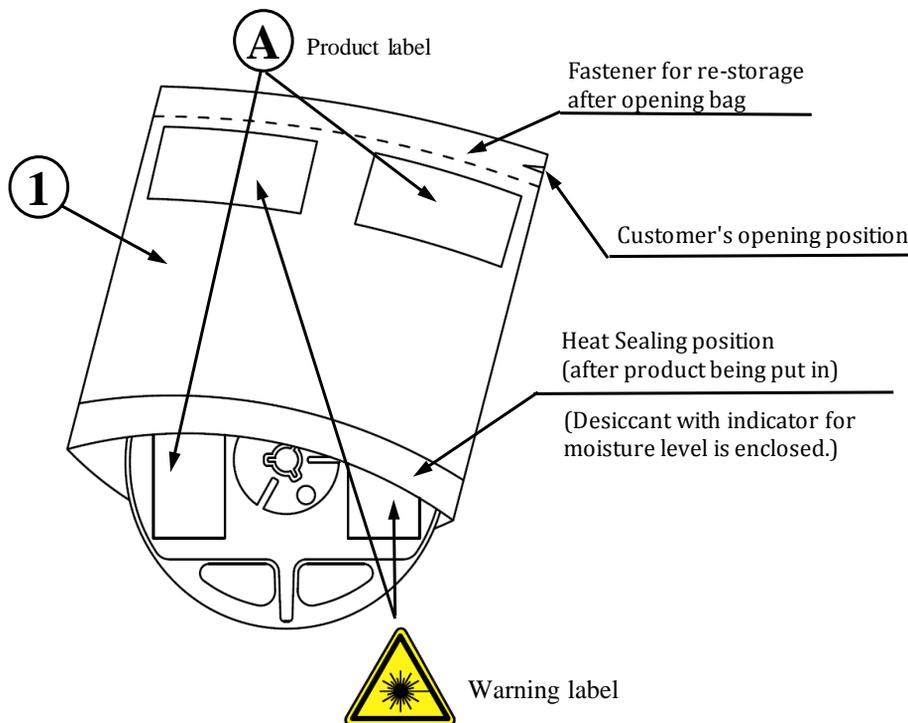
Baking may be performed in the tape-reel form, however if it is performed with the reel stacked over one another, it may cause deformation of the reels and taping materials, which may cause problems during production. Please make sure that the product has cooled to normal temperature after performing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



Packaging specifications

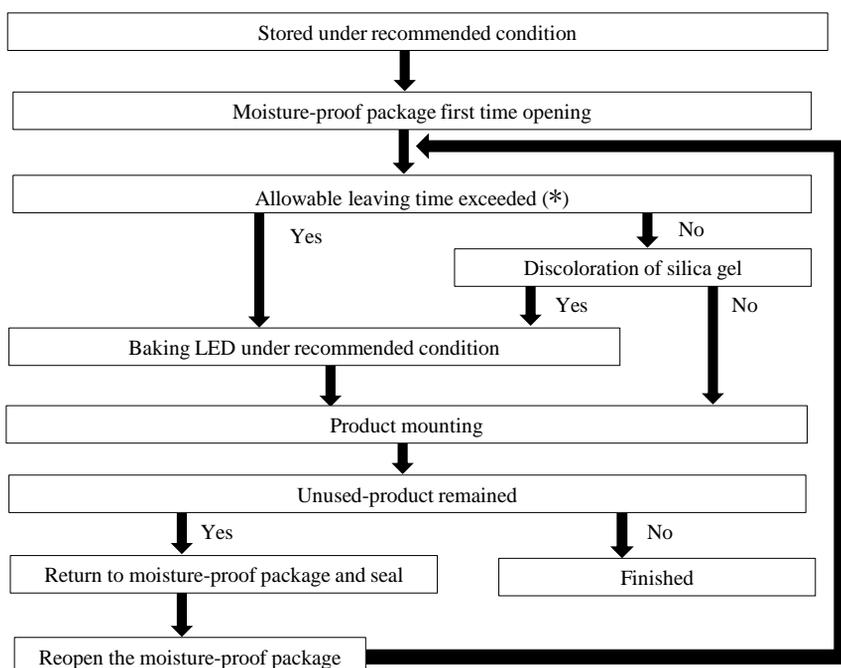
LKU1107EAE-275-TR

【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 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 after reopening should be calculated from the first opening of package, or from the time when baking process is finished.



Packaging specifications

LKU1107EAE-275-TR

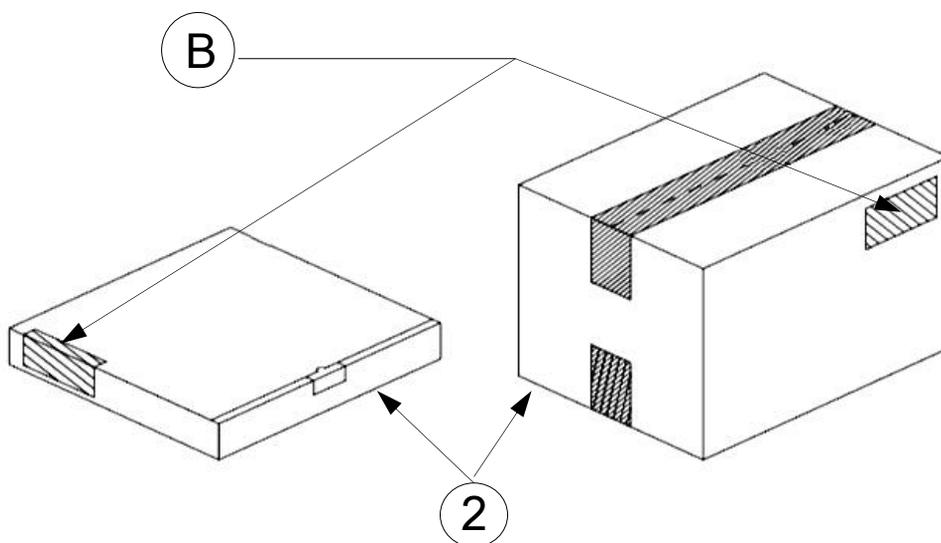
【Packing box】

(RoHS2 / ELV Compliant)

Box type	Outline dimension L x W x H (mm)	Capacity of the box
Type A	280 x 265 x 45 (mm)	2 reels
Type B	310 x 235 x 265 (mm)	10 reels
Type C	440 x 310 x 265 (mm)	20 reels

The above measures are all the 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 K5AF

NO.	PART NAME	MATERIAL	REMARKS
②	Packing box	Corrugated cardboard	without ESD protection



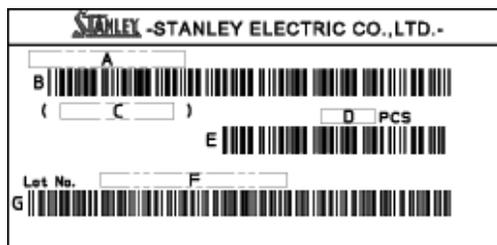
Packaging specifications

LKU1107EAE-275-TR

【Label specification】

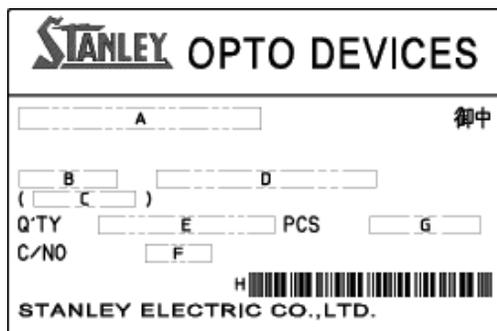
(acc.to JIS-X0503(Code-39)

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

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

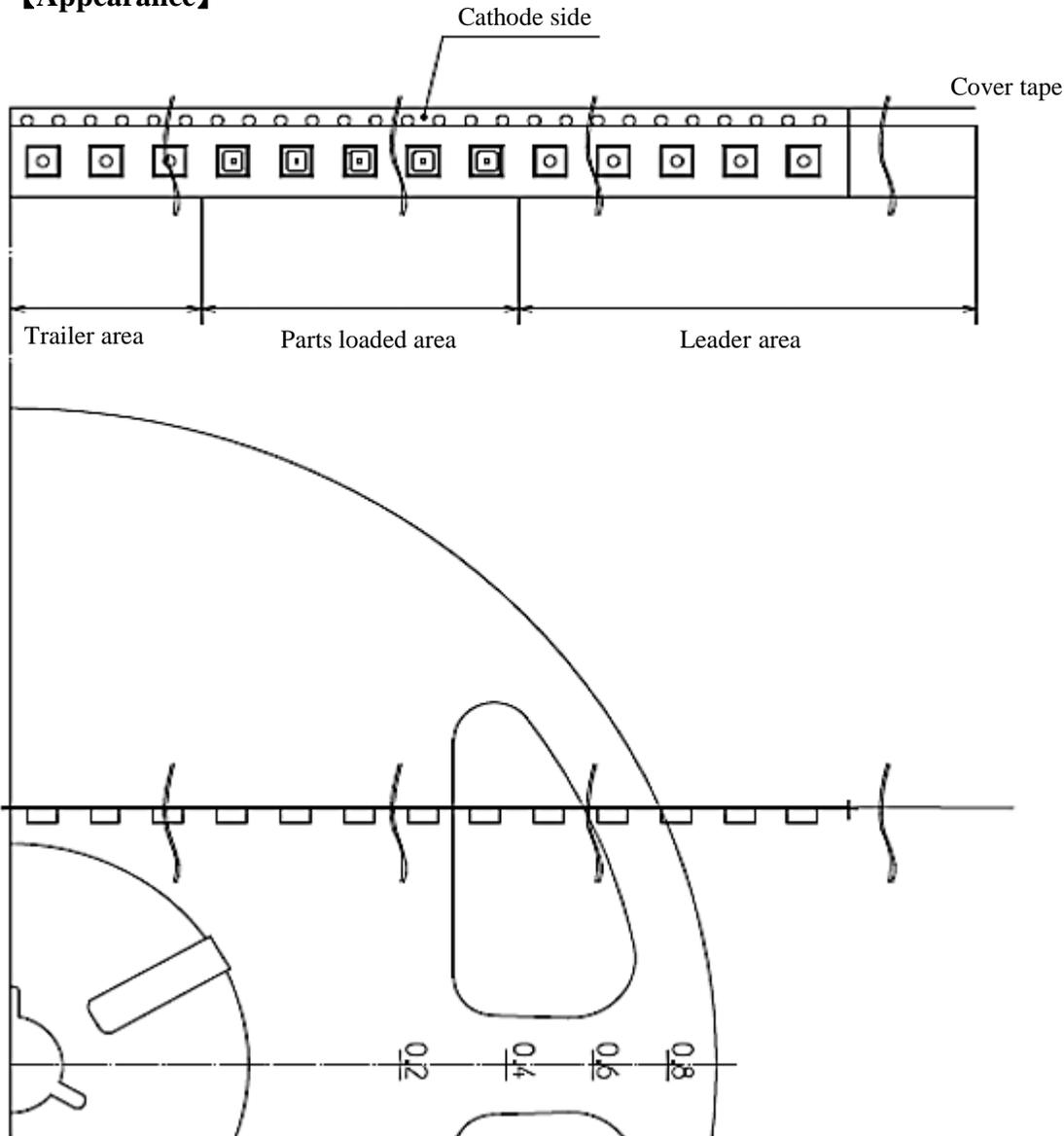


Taping and reel specifications

LKU1107EAE-275-TR

(acc.to JIS-C0806)

【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 200mm without carrier-tape	The end of cover-tape shall be held with adhesive tape.
	Carrier-tape	Empty pocket shall be more than 55 pieces.	Please refer to the above figure for Taping & reel orientation .
Trailer area		Empty pocket shall be more than 25 pieces.	The end of taping shall be inserted into a slit of the hub.



Taping and reel specifications

LKU1107EAE-275-TR

(acc.to JIS-C0806-03)

【Qty. per reel】

1,000parts/reel

Minimum Qty. per reel might be 100 parts when getting less than 1,000 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 0.1~1.0N (an angle between carrier-tape and cover-tape shall be 165 to 180 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. Empty pocket per reel is assumed until 1 piece.

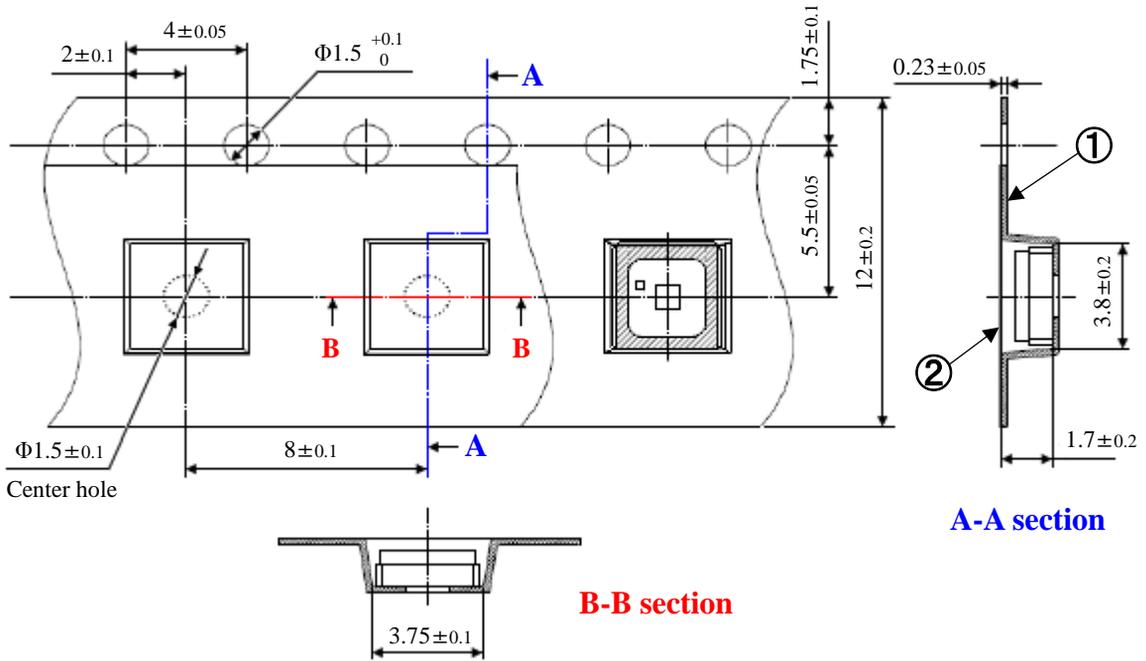


Taping and reel specifications

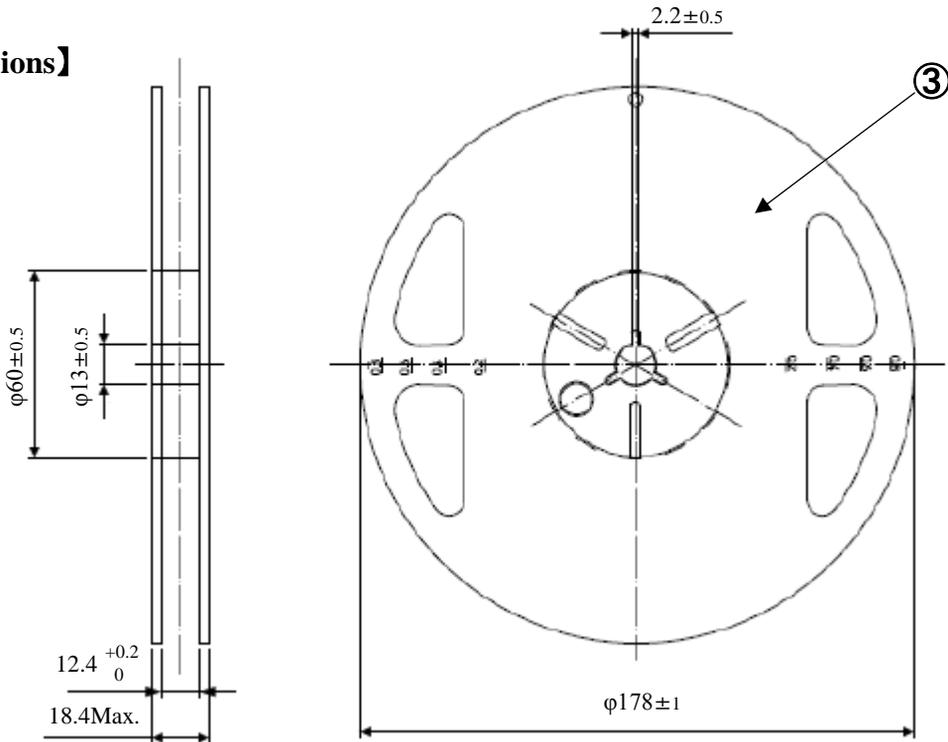
LKU1107EAE-275-TR

【Taping dimensions】

Unit : mm



【Reel dimensions】

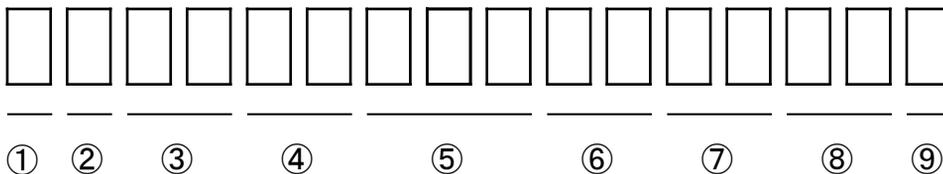


No.	Part name	Remarks
①	Carrier-tape	with ESD protection
②	Cover-tape	with ESD protection
③	Carrier-reel	with ESD protection



Lot number notational system

LKU1107EAE-275-TR



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

② - 1digit : Production year (The last digit of production year 2020→0, 2021→1, 2022→2, 2023→3 …)

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 : Chromaticity rank

(If chromaticity 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 : VF Rank (If rank is not defined, "-" is described.)



Correspondence to RoHS2 / ELV instruction

LKU1107EAE-275-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

LKU1107EAE-275-TR

Test item	Test condition	Duration	Failure
Room temperature operating life	Ta = 25°C I _F = 20mA	1,000h	0 / 12
High temperature operating life ※	Ta = 85°C I _F = 20mA	1,000h	0 / 12
Low temperature operating life ※	Ta = -40°C I _F = 20mA	1,000h	0 / 12
Wet high temperature operating life	Ta = 60°C 90% I _F = 20mA	1,000h	0 / 12
Thermal shock	Ta = -40°C to 100°C (each 30min)	200 cycles	0 / 12

※ Reference test

Failure criteria

Item	Symbol	Condition	Failure criteria
Total power	P _O	I _F =20mA	Testing min. value < Standard min. value × 0.7
Forward voltage	V _F	I _F =20mA	Testing max. value ≥ Standard max. value × 1.1
Cosmetic appearance	-	-	Remarkable 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, 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.
- 7) The most updated edition of this data sheet can be obtained from the address below:
<http://www.stanley-components.com/en/>



WARNING

- **UV LEDs emit high intensity UV (ultraviolet) light.**
- **Do not look directly into the UV light source ; this can be harmful to your eyes and skin.**
- **Wear protective eyewear to avoid exposure to UV light, as well as protective masks and gloves, etc. in order not to expose your skin to the light.**
- **Attach warning labels to your products which contain UV LEDs.**
- **keep out of reach of children.**