# Data sheet





RoHS 2 HEAT		<b>d</b> ,
Package	SMD Top view Package, White color emitting LED Outer dimension 3.0 x 1.4x 0.67mm ( L x W x H )	
Product features	<ul> <li>Moisture sensitive level : 2a</li> <li>Lead-free soldering compatible</li> <li>RoHS2 compliant</li> </ul>	

## Recommended applications

·Light source for automotive interior, various indicator, etc.





#### Outline dimensions

## VXLW1155GDS-3D7K3-TR



#### Recommended soldering pattern



# Specifications

VXLW1155GDS-3D7K3-TR

Die material	InGaN
Emitting color	White
Resin color [Emitting area]	Diffused pale yellow
Resin color [Lamp housing]	White

#### [ Absolute maximum ratings ]

Absolute maximum ratings			(Ta=25°C)	_
Item	Symbol	Maximum ratings	Units	
Power dissipation	P <sub>d</sub>	663	mW	
Forward current	I <sub>F</sub>	170	mA	
Repetitive peak forward current [0.5ms, 1/20Duty]	I <sub>FRM</sub>	400	mA	
$I_F$ Derate linearly $Ta=from 95^{\circ}C$	$\Delta I_{\rm F}$	5.67	mA / °C	
I <sub>FRM</sub> Derate linearly 【Ta=from 95°C】	$\Delta I_{FRM}$	13.33	mA / °C	
Reverse voltage	V <sub>R</sub>	5	V	
Operarting temperature	T <sub>opr</sub>	-40 to +100	°C	
Storage temperature	T <sub>stg</sub>	-40 to +120	°C	
Soldering point temperature	Ts	115	°C	
Junction temperature	Tj	125	°C	
Electrostatic discharge threshold 【HBM】	ESD	1,000	V	Note
Soldering temperature [Reflow soldering]	T <sub>sld</sub>	260	°C	Note2

Note 1 ESD testing method : EIAJ4701/300(304) Human Body Model(HBM)  $1.5k\Omega$ , 100pF

Note2 Please refer to page 9, soldering conditions.

#### [ Thermal characteristics ]

			(Ta=25°C)	
Item	Symbol	Typ.	Units	
Thermal resistance [Junction - ambient]	R <sub>th(j-a)</sub>	165	°C/W	Note3
Thermal resistance [Junction - solder point]	R <sub>th(j-s)</sub>	40	°C/W	

Note3 Rth(j-a) Measurement Condition

• Substrate:FR4 (t=1.6mm)

• Pattern Size : 16mm<sup>2</sup>

### Specifications

# VXLW1155GDS-3D7K3-TR

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#### 【 Electro-optical characteristics 】

						(Ta=25°C)	
Item	Symbol	Conditions	Min.	Тур.	Max.	Units	
Forward voltage	V <sub>F</sub>	$I_F = 30 \text{mA}$	2.5	2.8	3.3	V	Note4
Luminous intensity	Iv	$I_F = 30 \text{mA}$	3,300	4,000	5,600	mcd	Note5
Chromaticity coordinates	х	$I_F = 30 \text{mA}$	-	0.304	-		
	у	$I_F = 30 \text{mA}$	-	0.298	-		Noteo,/
Holf intensity on ale	Δθx	I 20ma A	-	115	-	daa	Notes
Half intensity angle	Δθy	$I_{\rm F} = 30 {\rm mA}$	-	115	-	ueg.	notes

Note4 Tolerance:±0.1V

Note5,6 Please refer to the attached sheets, each sorting chart.

Note7 Chromaticity coordinates ; x and y according to CIE1931

Note8 Viewing angle at 50% Iv,  $\Delta\theta x$ ; housing long side axis,  $\Delta\theta y$ ; housing short side axis

#### [ Sorting chart for luminous intensity, Iv ]

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

Rank	Luminous Iv	Conditions	
	Min.	Max.	
D7	3,300	3,900	
D8	3,900	4,700	$I_F = 30 \text{mA}$ Ta=25°C
D9	4,700	5,600	

Tolerance :  $\pm 10\%$ 

## Specifications

[Sorting chart for chromaticity : x , y ]



Donk	Left	down	Left	upper	Right	upper	Right	down
Kalik	Х	у	Х	У	Х	у	Х	у
5D	0.286	0.285	0.297	0.303	0.311	0.293	0.300	0.276
6D	0.297	0.303	0.309	0.320	0.323	0.311	0.311	0.293

Notes Chromaticity coordinates tolerance : each rank  $\pm 0.02$ 



### Technical Data





## Technical Data



## Technical Data

VXLW1155GDS-3D7K3-TR

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#### Soldering condition

# VXLW1155GDS-3D7K3-TR

#### [Soldering precaution]

(acc.to EIAJ-4701/300)

- 1. 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).
- 2. 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.
- 3. 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 2 times.

#### [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 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.



### Soldering condition

## VXLW1155GDS-3D7K3-TR

- 4. If soldering manually, the peak temperature changes according to the size of land and the shape of soldering iron tip. Therefore please confirm there is no problem before usage. Also, Stanley recommends using a soldering iron equipped with temperature control and the peak temperature to be lowered. During the actual soldering process, make sure that the soldering iron never touches the LED itself, and avoid the LED's electrode temperature reaching above the 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, then use it. Also, please avoid applying any types of pressure to the soldered components before the solder is cooling and hardening, as it may deteriorate solder performance and solder quality.

#### [Recommended manual soldering condition]

Temperature of iron tip	350°C 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.

《Curing condition, Temperature:150°C max. / Time:120sec.max.》

- 7. Flow soldering (dip soldering) is not guaranteed for this product.
- 8. Please confirm in advance there is no problem by assessment on your side if cleaning process is necessary. We can not accept any quality issues caused by the cleaning process.

As this product uses the low hardness silicone resin for the lens, please avoid cleaning

to give pressure on the surface of the resin.

Please make sure ultrasonic cleaning is not recommended for this product as well.

We will recommend isopropyl alcohol as a solvent used 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
Trichloroethylene	x Not recommended
Chlorothene	x Not recommended
Acetone	x Not recommended
Thinner	x Not recommended

#### Handling precautions

## VXLW1155GDS-3D7K3-TR

#### [ For electrostatic discharge ( ESD) ]

LED with an InGaN die 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.
- $\overline{O}$  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).

#### Handling precautions

# VXLW1155GDS-3D7K3-TR

#### [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. Please avoid to stick foreign materials because molding resin in the products has adhesiveness. And please don't touch lens portion, so it cause the wire open circuit etc. when the stress hangs to the lens portion.
- 6. To handle with tweezers, please avoid excessive stress to this part. Excessive stress may cause non-lighting due to deformation, crack and breaking. Stanley recommends the use of ceramic tweezers, and not sharp one.
- 7. Please note external stress such as dropping and hitting may cause non-lighting due to deformation, crack and breaking.
- Stanley does not recommend supersonic wave welding as it cause resonance with sealing resin and may cause breaking of conductive wire.
   Please use after affirming beforehand there is no problem.
- 9. The solder crack by the heat stress might be generated when the LED is soldered with the metal plate and go enough in a prior confirmation, please.
- 10. Please note piling PCBs may stress LEDs. It may cause non-lighting due to deformation, crack and breaking.
- 11. This part does not have proof for water, humidity and salt damage. Please use after affirming beforehand there is no problem if using on above conditions.
- Please keep in desiccator regardless of before or after mounting not to be affected by corrosive gas when keeping products. Also please make sure if there is any gas which occur in surrounding area or enter from outside when using products.
- 13. Please check the actual performance in the assembly because the Specification Sheets are described for single LED.
- 14. Please refrain from looking directly at the light source of LED at high output, as it may harm your vision.
- 15. 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.
- 16. 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).
- 17. The formal specification sheets should be exchanged and signed by both parties.



#### Handling precautions

## VXLW1155GDS-3D7K3-TR

[ Handling Precautions for Product Mounting ]

```
<Recommendation>
```

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

The pick up point is lamp housing only 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 and etc. before mounting because the over load can cause the breakage of the lamp housing.

2. Recommended nozzle shape



## VXLW1155GDS-3D7K3-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 <b>~</b> 30°C
Humidity	Under 70%

In the case of the package unopened, please use within 6 months [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 672h]**. 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 48h (min.) to 72h (max.) at  $60\pm 5$  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 672h 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.



[Moisture-proof packaging specification]





#### [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.



### VXLW1155GDS-3D7K3-TR

[Packing box]

(RoHS2 / ELV Compliant)

Box type	Outline dimension $L \times W \times H$ (mm)	Capacity of the box
Туре А	280 x 265 x 45	3 reels
Туре В	310 x 235 x 265	15 reels
Туре С	440 x 310 x 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 K5BF

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

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

#### [Label specification]

Product label

# Image: stanley electric co., Ltd. A B C C C C F G

#### 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



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

- 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



VXLW1155GDS-3D7K3-TR

# Taping and reel specifications

(acc.to JIS-C0806-03)



#### Note

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

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



## Taping and reel specifications

## VXLW1155GDS-3D7K3-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 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  $0.1 \sim 1.0$ N (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 shall be defined as follows.

Qty./reel	Max. qty. of empty pocket	Remaks
500	1	-
1,000	1	-
1,500	1	-
2,000	2	No continuance
2,500	2	No continuance
3,000	3	No continuance



(acc.to JIS-C0806-03)

[Taping dimensions]



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

2020.10.30

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## VXLW1155GDS-3D7K3-TR

Unit: mm



- (3) 2digits : Production month (Jan. to Sep. , should be 01,02,03  $\cdots$ )
- (4) 2digits : Production date
- ⑤ 3digits : Serial number
- (6) 2digits : Tape and reel following number
- $\overline{O}$  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 : VF Rank (If rank is not defined, "-" is described.)



#### Compliance with RoHS2/ELV

## VXLW1155GDS-3D7K3-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

# VXLW1155GDS-3D7K3-TR

#### 1. Reliability testing result

Test item Standa		Test condition	Duration	Failure
Room temperature operating life	EIAJ ED-4701 /100(101)	Ta=25°C I <sub>F</sub> =170mA	1,000h	0 / 20
High temperature operating life	EIAJ ED-4701 /100(101)	Ta=85°C I <sub>F</sub> =110mA (Tj=125°C)	1,000h	0 / 20
Low temperature operating life	EIAJ ED-4701 /100(101)	Ta=-40°C I <sub>F</sub> =170mA	1,000h	0 / 20
Wet high temperature operating life	EIAJ ED-4701 /100(102)	Ta=85°C Rh=85% $I_F$ =110mA (Tj=125°C)	1,000h	0 / 20
High temperature storage life	EIAJ ED-4701 /200(201)	Ta=120°C	1,000h	0 / 20
Low temperature storage life	EIAJ ED-4701 /200(202)	Ta=-40°C	1,000h	0 / 20
Wet high temperature storage life	EIAJ ED-4701 /100(101)	Ta=60°C Rh=90%	1,000h	0 / 20
Thermal shock	EIAJ ED-4701 /100(105)	Ta=-40°C to 120°C (each 15min)	1,000 cycles	0 / 20
Thermal shock operating	EIAJ ED-4701 /100(105)	Ta=-40°C(OFF) to 85°C ( $I_F$ =110mA ON) (each 15min)	1,000 cycles	0 / 20
Cycled temperature humidity operating life	EIAJ ED-4701 /200(203)	Ta=-30°C to 80°C 95% 8h/cycle $I_F$ =80mA 5min on-off	30 cycles	0 / 20
Resistance to reflow soldering	EIAJ ED-4701 /300(301)	Moisture soak : 30°C 70% 672h Preheating : 150 to 180°C 90-120sec Soldering : 260°C peak	2times	0/20
Electrostatic Discharge(ESD)	EIAJ ED-4701 /300(304)	C=100pF R2=1.5kΩ±1,000V	3 times of each polarity	0 / 20
Vibration, Variable frequency	EIAJ ED-4701 /400(403)	98.1m/s <sup>2</sup> (10G) 100~2,000Hz 20min sweep XYZ direction	2h of each direction	0 / 20
Solderability test	EIAJ ED-4701 /300(303)	Pb free 245°C Solder adhesion rate 95% or more	3sec	0 / 20

#### 2. Failure criteria

Item	Symbol	Conditions	Failure criteria
Luminous intensity	$I_V$	I <sub>F</sub> =80mA	Testing min. value $<$ Standard min. value $\times 0.5$
Forward voltage	V <sub>F</sub>	I <sub>F</sub> =80mA	Testing max. value $\geq$ Standard max. value $\times 1.2$
Appearance	-	-	Notable discoloration, deformation and crack



#### VXLW1155GDS-3D7K3-TR

### 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.

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