Data sheet

Part number : HXTW115RGSE-1100-TR

2011/65/EU, (EU)2015/863
10 Substances regulation compliant

Lead-free solder heat resistant product

Package	SMD top view package, White color emitting LED Outer dimension 3.2 x 1.4 x 0.58mm (L x W x H)
Product features	・Automotive quality standard: AEC-Q102 compliant ・Moisture sensitivity level MSL 2a ・Luminous flux 59lm (TYP.), Chromaticity coordinates x = 0.3238 y = 0.3301 @140mA ・Operating temperature : -40 to +125℃ ・RoHS:2011/65/EU, (EU)2015/863 compliant ・Lead-free soldering compatible

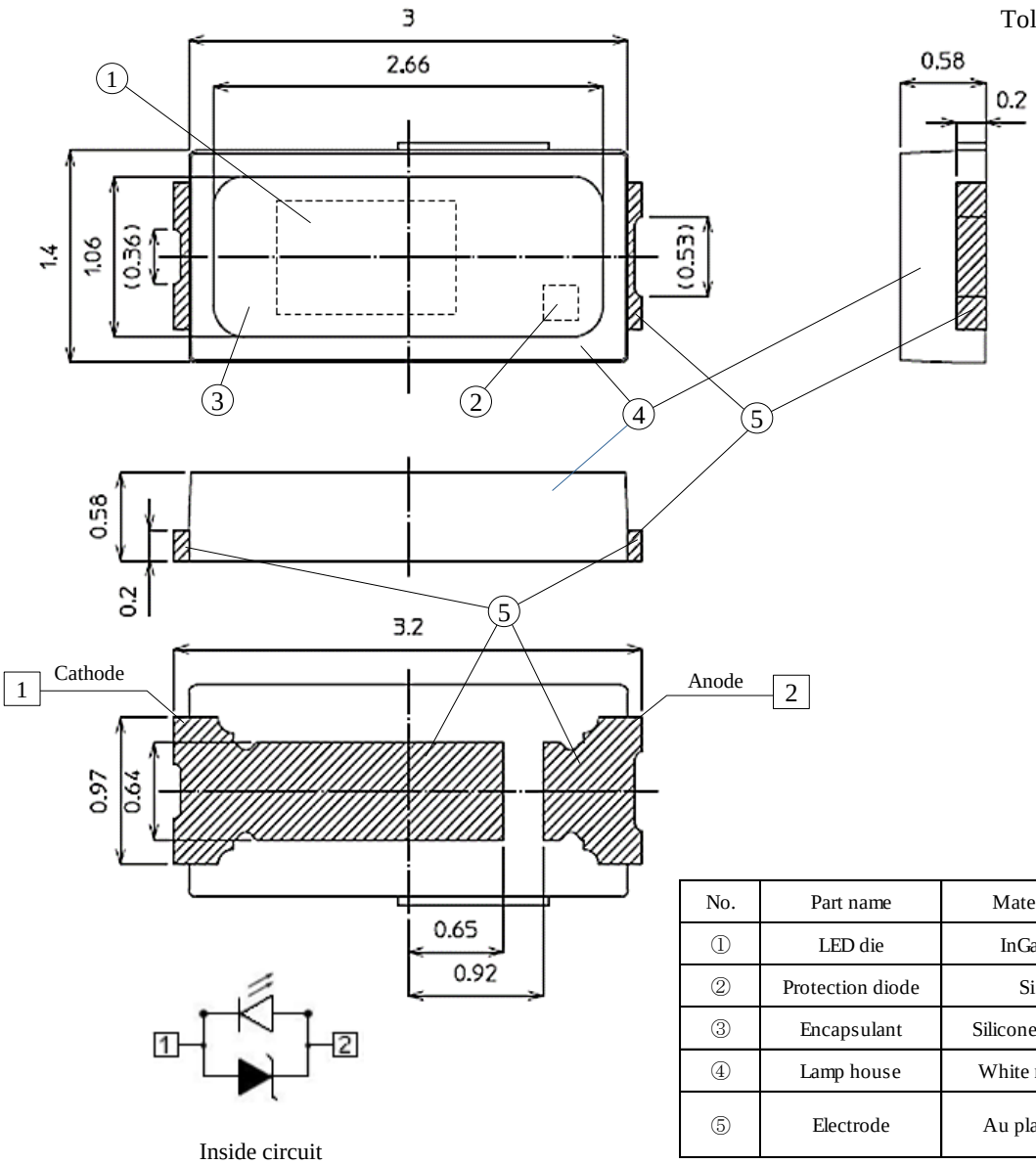
Recommended applications

・Light source for automotive : Daytime running lights, center light、etc.

Outline dimensions

HXTW115RGSE-1100-TR

Unit : mm
Weight : 7.7mg
Tolerance : ±0.1

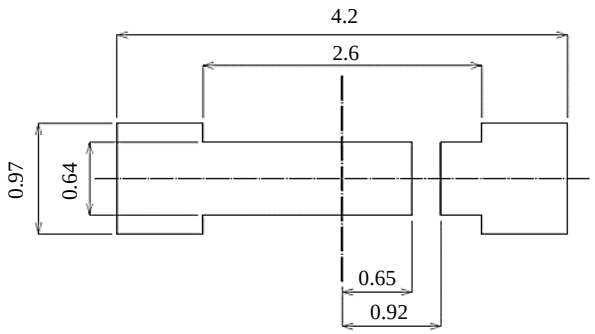


Inside circuit

No.	Part name	Material	Qty.
①	LED die	InGaN	1
②	Protection diode	Si	1
③	Encapsulant	Silicone resin	1
④	Lamp house	White resin	1
⑤	Electrode	Au plating	Anode : 1 Cathode : 2

Recommended soldering pattern

Unit : mm



Specifications HXTW115RGSE-1100-TR

【Product overview】

Die material	InGaN
Emitting color	White (Blue chip + Phosphor)
Resin color 【Emitting area】	Diffused pale yellow
Resin color 【Lamp housing】	White

【Absolute maximum ratings】

(Ta=25℃)

Item	Symbol	Maximum ratings	Units	
Power dissipation	P_d	700	mW	
Forward current	I_F	200	mA	
Repetitive peak forward current "0.5ms,1/20duty"	I_{FRM}	400	mA	
Reverse current	I_R	85	mA	
Operating temperature	T_{opr}	-40 to +125	℃	Note1
Storage temperature	T_{stg}	-40 to +125	℃	
Junction temperature	T_j	150	℃	
Electrostatic discharge threshold "HBM"	ESD	8,000	V	Note2
Soldering temperature "Reflow soldering"	T_{sld}	260	℃	Note3

Note1 Solderpoint temerature

Note2 ESD testing method : JEITA ED-4701/302A(304A)／IEC 60810 Human Body Model(HBM) 1.5kΩ,100pF

Note3 Please refer to page 9, Soldering conditions.

【Thermal characteristics】

(Ta=25℃, I_F=140mA)

Item	Symbol	Typ.	Units
thermal resistance 【junction - solder point】	$R_{th(j-s)}$	15	℃/W

Specifications HXTW115RGSE-1100-TR

【Electro-optical characteristics】

(Ta=25℃)

Item	Symbol	Conditions	Min.	Typ.	Max.	Units	
Forward voltage	V_F	I_F = 140mA	2.90	3.10	3.30	V	Note4
Luminous flux	φ_V	I_F = 140mA	51.1	59.0	75.0	lm	Note5
Chromaticity coordinates	x	I_F = 140mA	-	0.3238	-		Note6,7
	y		-	0.3301	-		
Half intensity angle	$\Delta\theta_X$	I_F = 140mA	-	115	-	deg.	Note8
	$\Delta\theta_Y$		-	115	-		

Note4,5,6 Please refer to the each sorting chart.

Note7 Chromaticity coordinates ; x and y according to CIE1931

Note8 Viewing angle at 50% luminous intensity I_V, $\Delta\theta_X$; housing long side axis, $\Delta\theta_Y$; housing short side axis

【Sorting chart for luminous flux】

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

Rank	Luminous flux ϕv (lm)		Conditions
	Min.	Max.	
BT	51.1	56.2	I_F =140mA Ta=25℃
BU	56.2	61.9	
BV	61.9	68.1	
BW	68.1	75.0	

Note Tolerance Each Rank; ±10%

【Sorting chart for forward voltage】

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

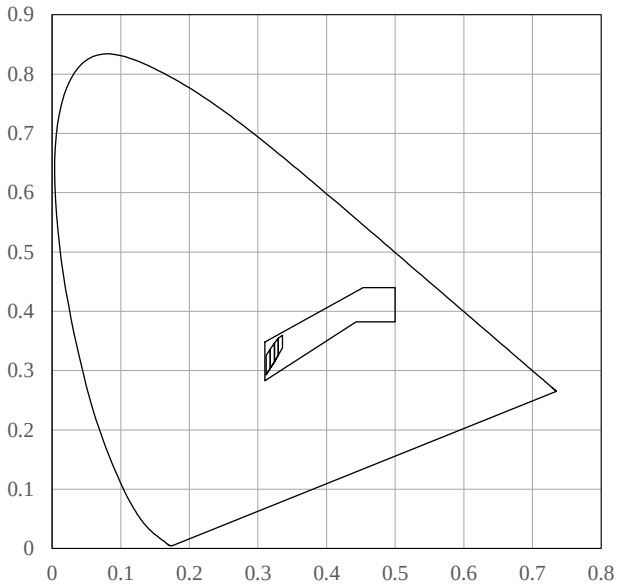
Rank	Forward voltage V_F (V)		Conditions
	Min.	Max.	
C	2.90	3.10	I_F =140mA Ta=25℃
D	3.10	3.30	

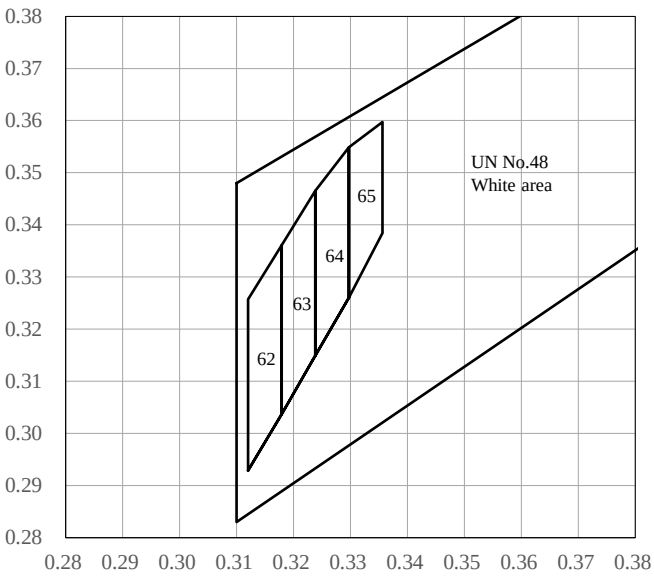
Note Tolerance : ±0.1V

Specifications HXTW115RGSE-1100-TR

【Sorting chart for chromaticity coordinates】

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





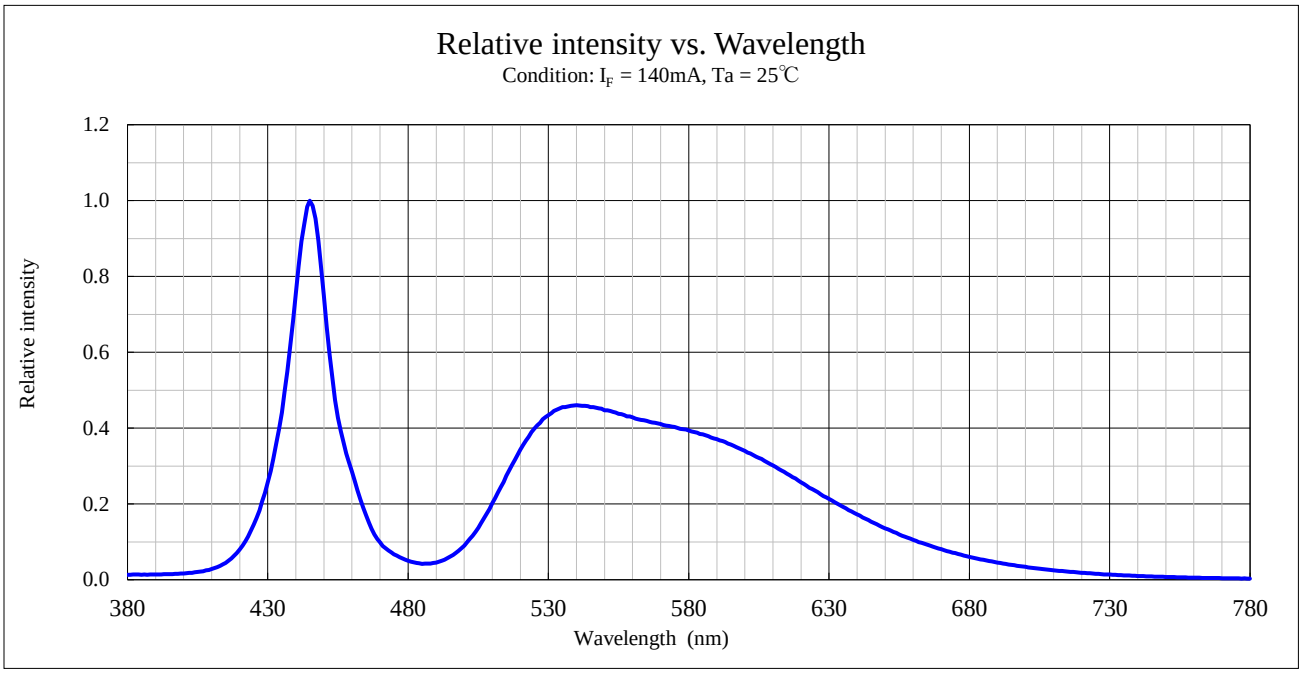
(I_F=140mA, Ta=25℃)

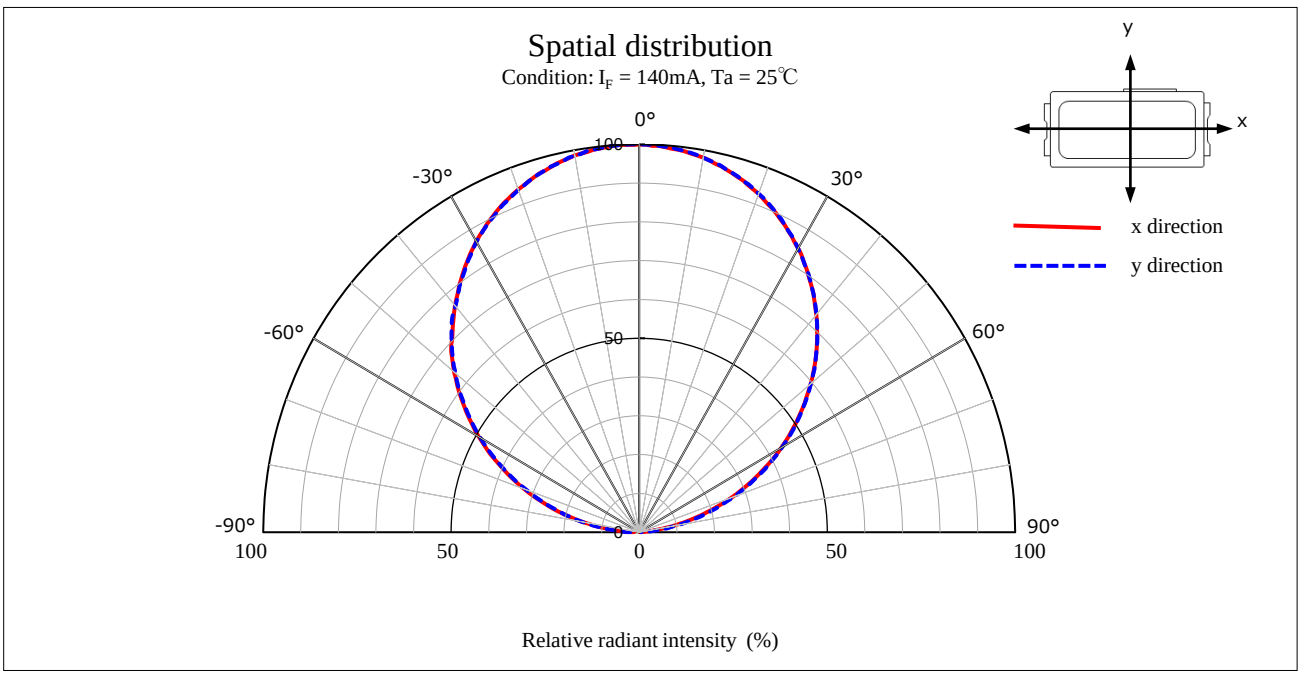
Rank	Point 1		Point 2		Point 3		Point 4	
	x	y	x	y	x	y	x	y
62	0.3120	0.2929	0.3120	0.3257	0.3179	0.3361	0.3179	0.3037
63	0.3179	0.3037	0.3179	0.3361	0.3238	0.3465	0.3238	0.3149
64	0.3238	0.3149	0.3238	0.3465	0.3297	0.3549	0.3297	0.3260
65	0.3297	0.3260	0.3297	0.3549	0.3356	0.3597	0.3356	0.3384

Note Tolerance : ±0.01

Technical Data

HXTW115RGSE-1100-TR



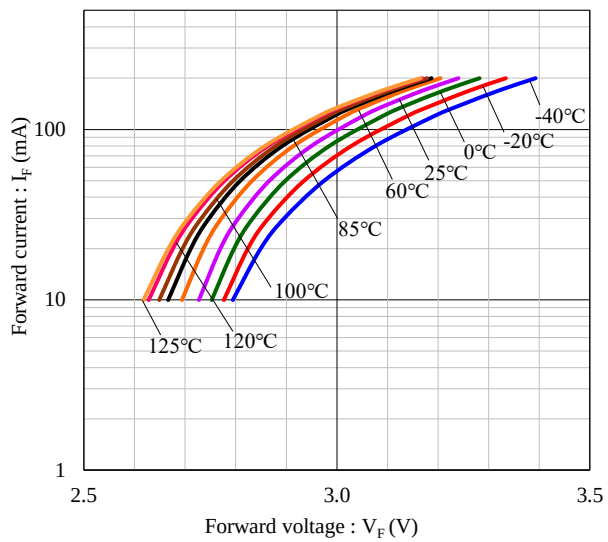


Technical Data

HXTW115RGSE-1100-TR

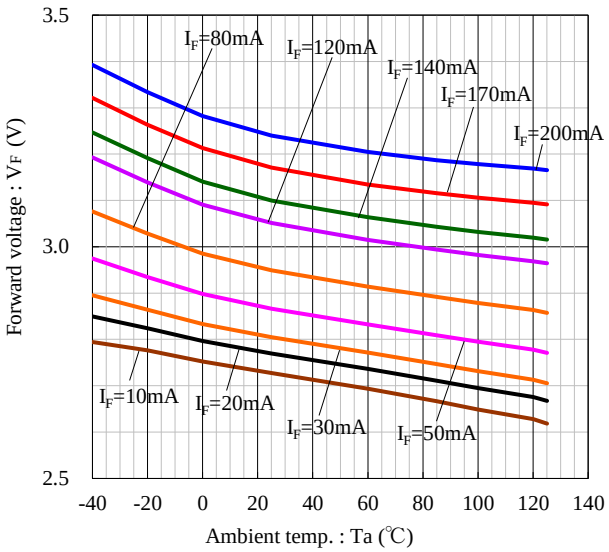
Forward voltage vs. Forward current

Condition: Ta = -40 to 125℃



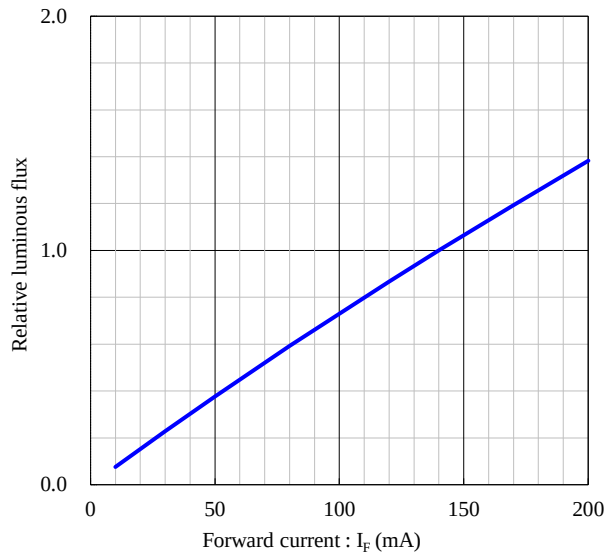
Ambient temp. vs. Forward voltage

Condition : I_F = 10 to 200mA



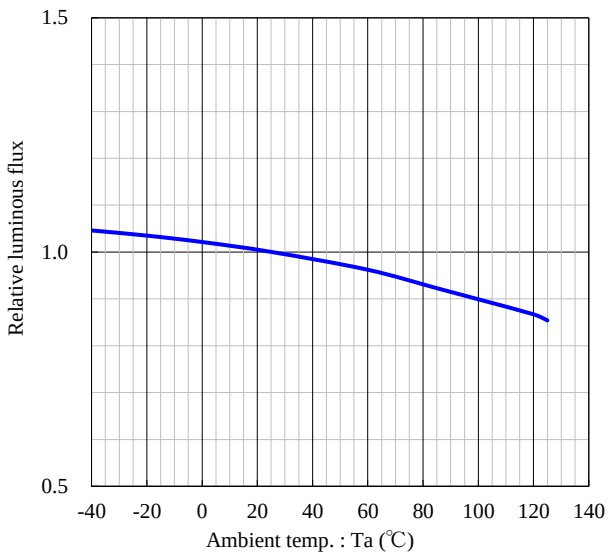
Forward current vs. Relative luminous flux

Condition : Ta = 25℃



Ambient temp. vs. Relative luminous flux

Condition : I_F = 140mA

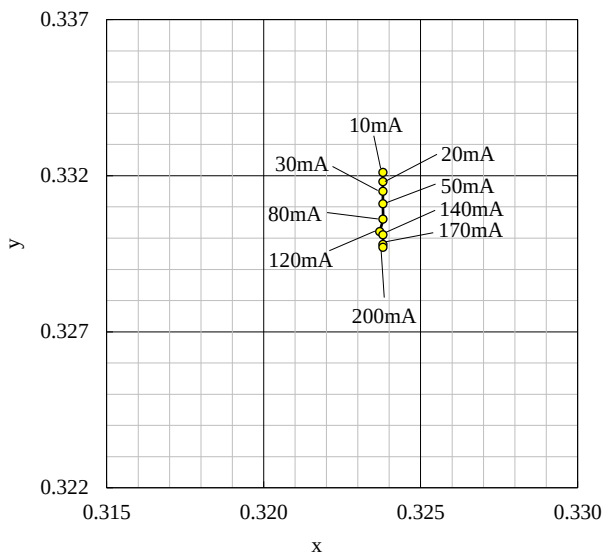


Technical Data

HXTW115RGSE-1100-TR

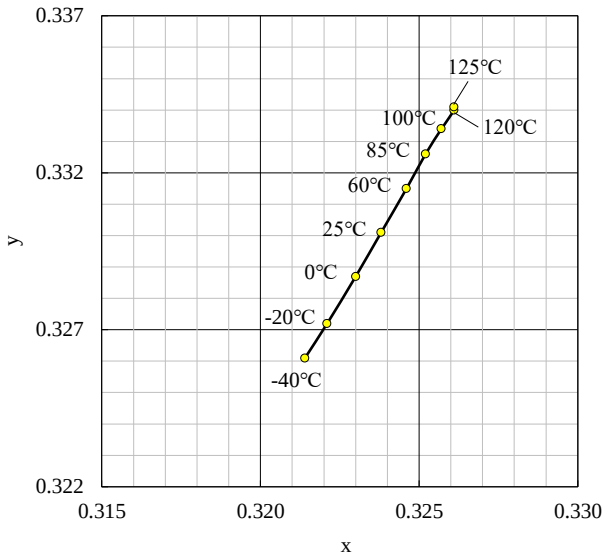
Chromaticity vs. Forward current

Condition: Ta = 25℃



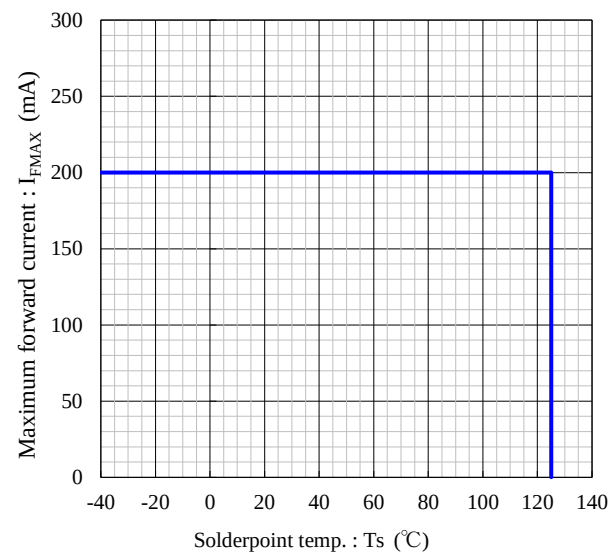
Chromaticity vs. Ambient temp.

Condition : I_F = 140mA

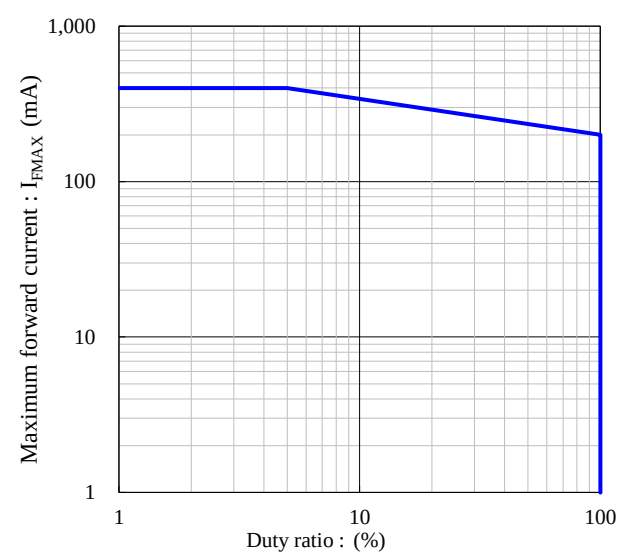


Max. forward current vs. Solderpoint temp.

Condition : Repetition frequency ≧ 100Hz



Max. forward current vs. Duty ratio



Soldering condition

HXTW115RGSE-1100-TR

【Soldering Precaution】

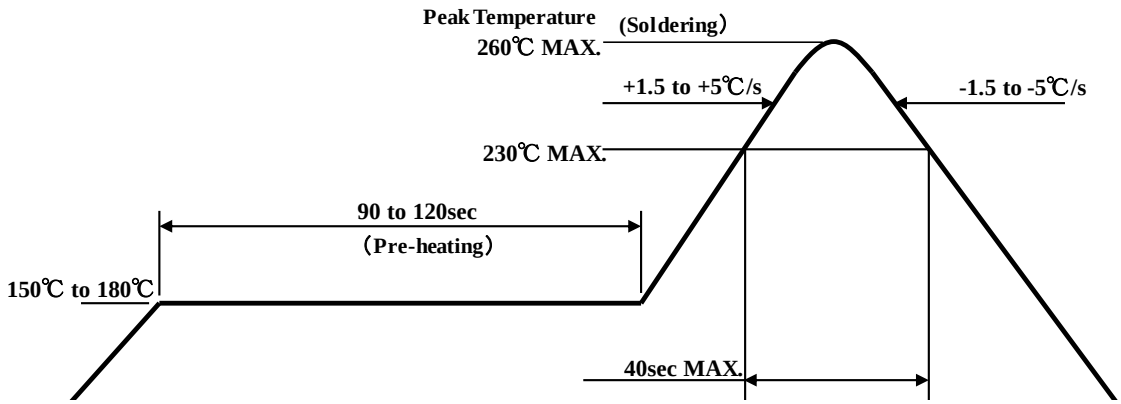
(acc.to EIAJ-4701/300)

1. Heat stress during soldering will influence the reliability of LEDs, however that effect will vary with heating method. Also, if components with different shapes need to be mounted together, it is recommended to set the soldering pad temperature according to the component most vulnerable to heat stress (ex. chip type LED).

2. LED parts including the resin has not stabilized immediately after the soldering. Any mechanical stress may cause damage to the product. Please avoid these stresses, especially stacking the boards, or any other storage method which may cause the boards to warp. Also please avoid the boards from sliding against hard materials.

3. The recommended temperature profile for reflow soldering is listed as the pad temperature of soldering point. 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.

【Recommended reflow soldering condition 】



Note 1 Temperature Profile for the reflow should be set to pad temperature of soldering point, which is 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 max2 times. The interval between first and second process should be as short as possible to prevent absorption of moisture to LED resin.
Please cool down the LED temperature at room temperature after soldering, then start the second process.

Soldering condition

HXTW115RGSE-1100-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℃ 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℃ 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 HXTW115RGSE-1100-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 charged, sudden surge voltage will most likely damaged 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).

Handling precautions HXTW115RGSE-1100-TR

【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 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.

8. 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.

12. 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

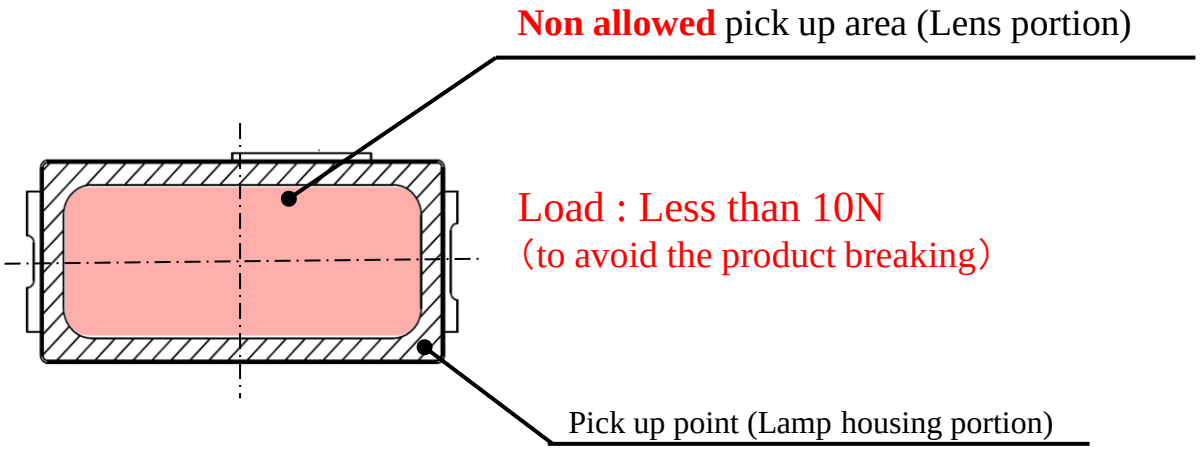
HXTW115RGSE-1100-TR

【Handling precautions for product mounting】

＜Recommendation＞

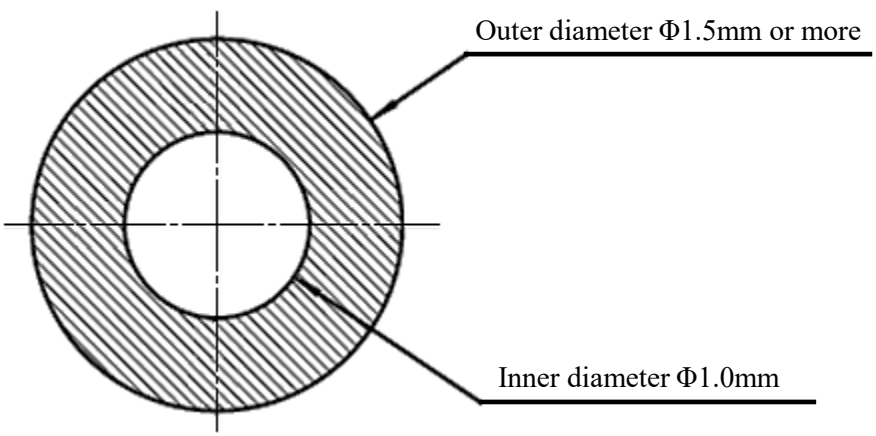
1. Picking up point with nozzle : Lamp housing of the product (▨ area : Shown below)

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



Packaging specifications

HXTW115RGSE-1100-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 to 30℃
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 672h.

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±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.

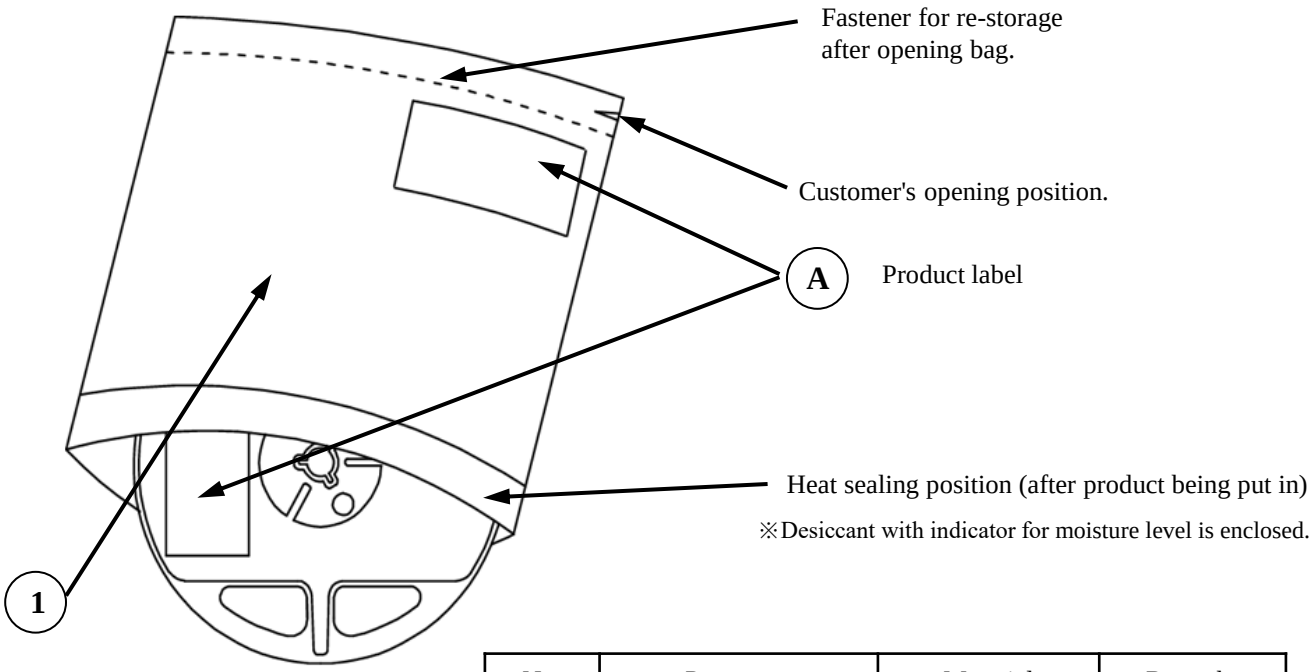
Baking process should be performed after LED having been taken out of the package.

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.

Packaging specifications

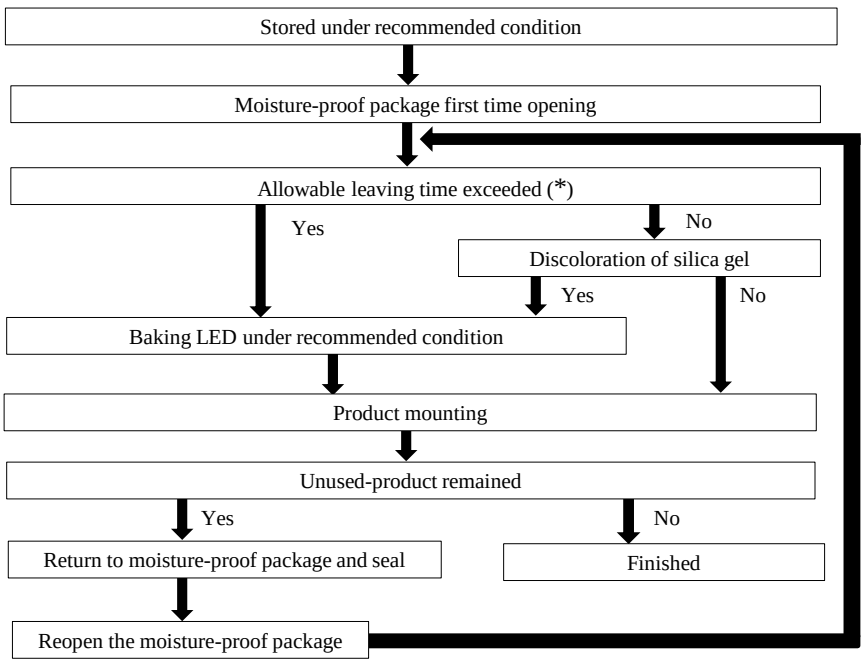
HXTW115RGSE-1100-TR

【Moisture-proof packaging specification】



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

【Flow chart-package opening to mounting】



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

Packaging specifications HXTW115RGSE-1100-TR

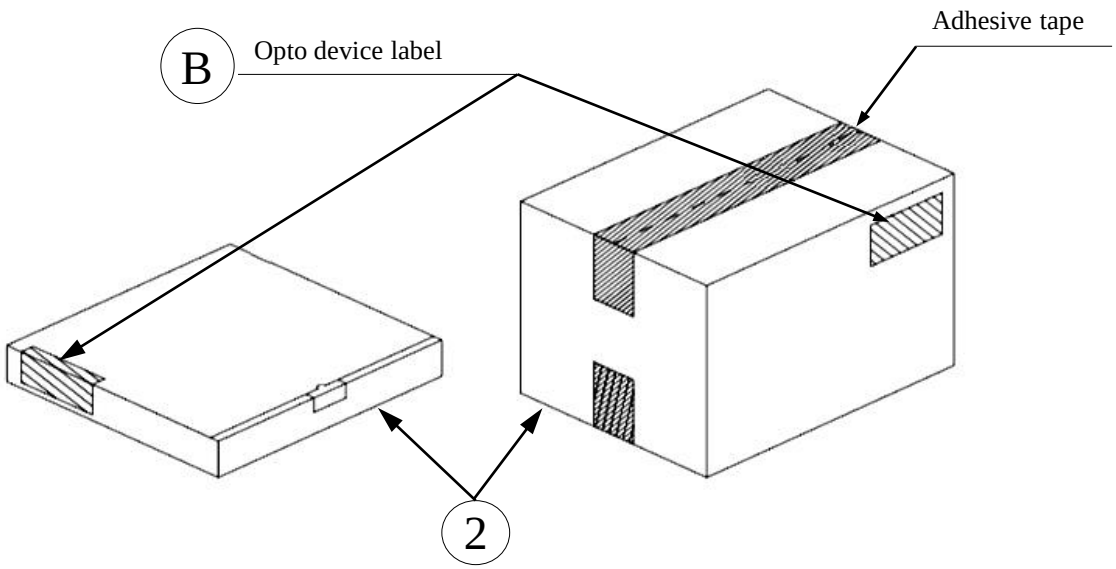
【Packing box】

(RoHS / ELV Compliant)

Box type	Outline dimension L × W × H (mm)	Capacity of the box
Type A	280 × 265 × 45 (mm)	2 reels
Type B	310 × 235 × 265 (mm)	10 reels
Type C	440 × 310 × 265 (mm)	20 reels
Type D	305 × 270 × 65 (mm)	2 reels
Type E	370 × 280 × 270 (mm)	20 reels
Type F	530 × 380 × 270 (mm)	40 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

Type B, C

Material / Box : Cardboard, Partition : Cardboard

Type D

Material / Box : Cardboard

Type E, F

Material / Box : Cardboard

NO.	Part name	Material	Remarks
②	Packing box	Corrugated cardbord	without ESD protection

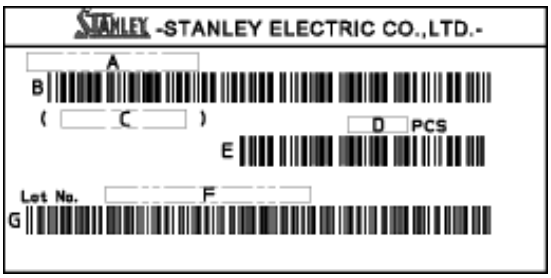
Packaging specifications

HXTW115RGSE-1100-TR

(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

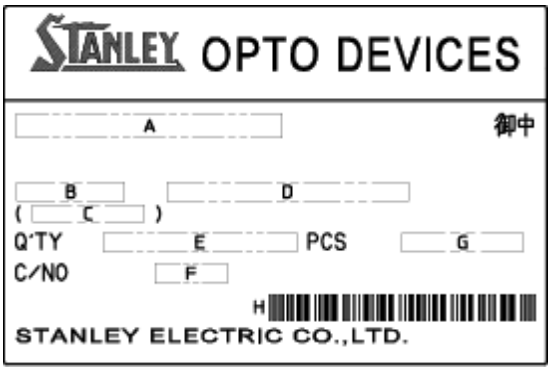
E. Bar-Code for packed parts quantity

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

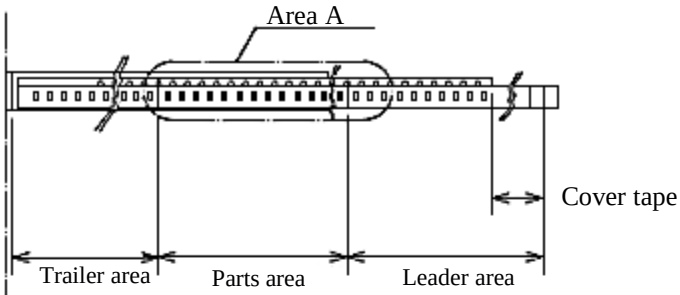
<Remarks> Bar-code font : acc.to Code-39(JIS-X0503)

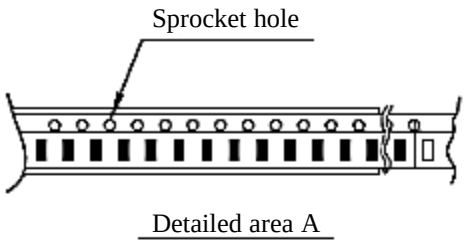
Taping and reel specifications

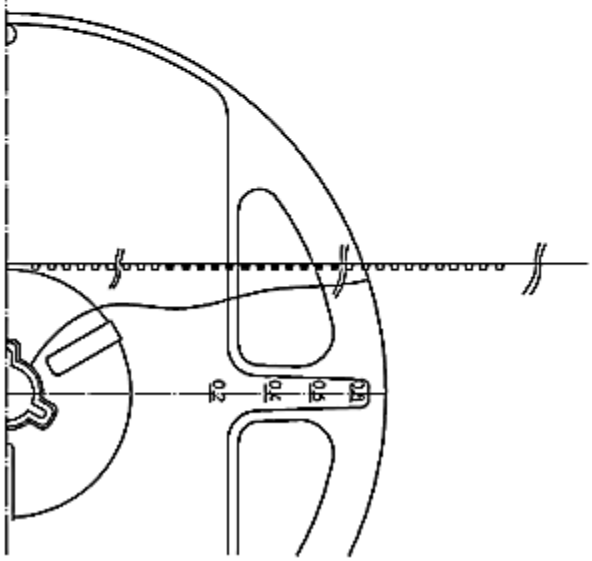
HXTW115RGSE-1100-TR

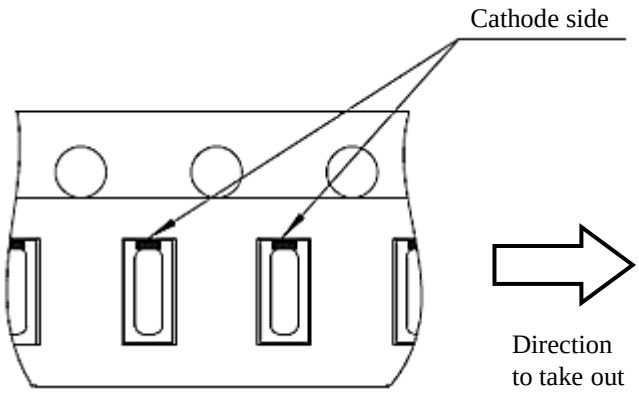
(acc.to JIS-C0806-03)

【Appearance】









Note

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

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

Taping and reel specifications

HXTW115RGSE-1100-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 to 1.0N (An angle between carrier-tape and cover-tape shall be170 deg.).
Both tapes shall be so sealed that the contained parts will not come out from the tape when it is bent at a radius of 15mm.

【 Others】

Reversed-orientation, Up-side down placing, side placing and out of spec. parts mix shall not be held.
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

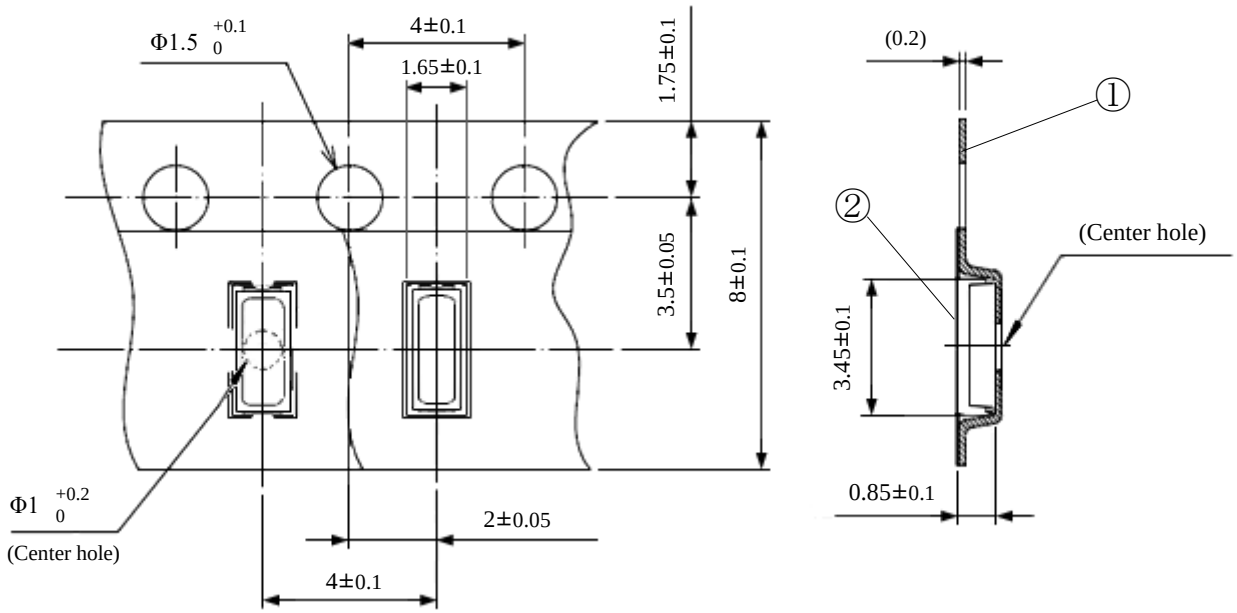
Taping and reel specifications

HXTW115RGSE-1100-TR

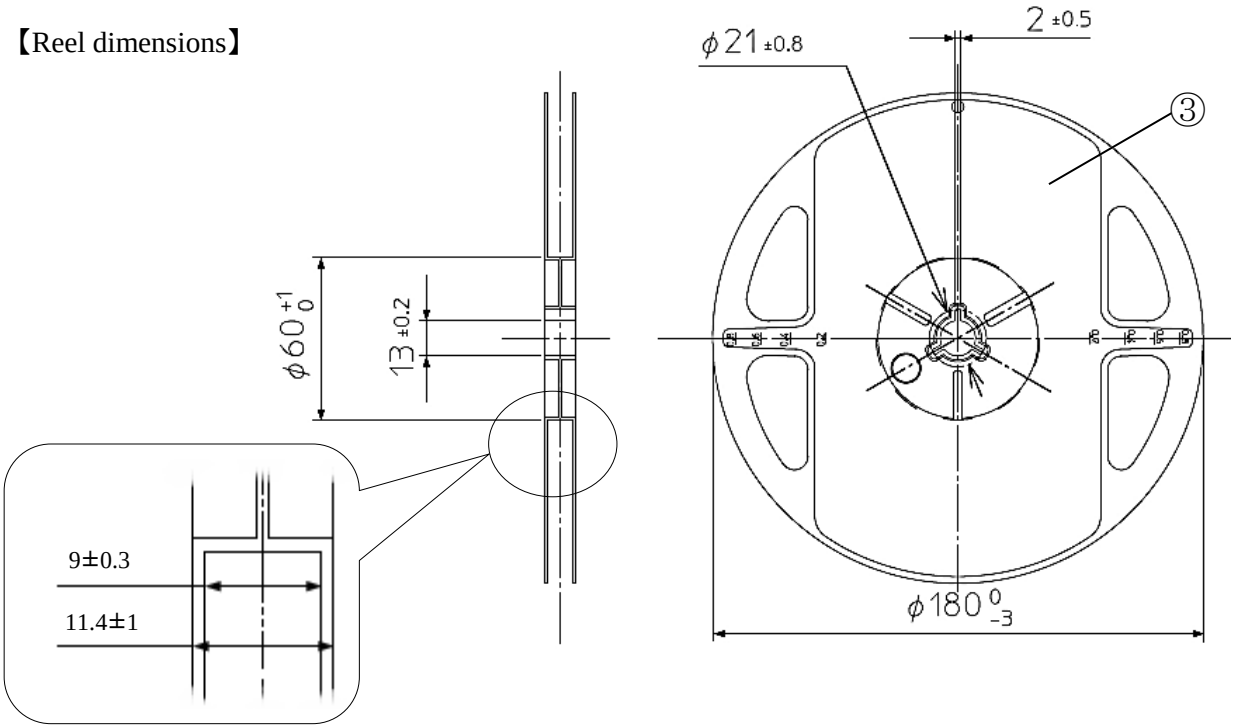
(acc.to JIS-C0806-03)

Unit: mm

【Taping dimensions】



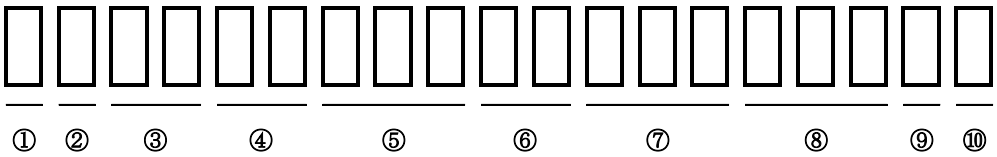
【Reel dimensions】



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

HXTW115RGSE-1100-TR



① - 1digit : Production location (indicated by alphabetical characters)

② - 1digit : Production year (the last digit of production year 2025→5, 2026→6, 2027→7, 2028→8 ・・・)

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 - 3digits : Luminous flux rank

(if only 2 digits, third digit must be dash "-"and if not identified rank, its"- - -")

⑧ - 3digits : Chromaticity rank

(if only 2 digits, third digit must be dash "-"and if not identified rank, its"- - -")

⑨ - 1digit : V_F rank (if not identified rank, its"-")

⑩ - 1digit : Peak wavelength rank (if not identified rank, its"-")

Compliance with RoHS / ELV

HXTW115RGSE-1100-TR

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

2011/65/EU, (EU)2015/863

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

Reliability testing result HXTW115RGSE-1100-TR

1. Reliability testing result

Test item	Standard	Test condition	Duration	Failure
Wet high temperature operating life	AEC-Q102 No.A2a	Ta=85℃ Rh=85% I_F=170mA 30min ON/OFF	1,000 h	0 / 78
Wet high temperature operating life	AEC-Q102 No.A2a	Ta=85℃ Rh=85% I_F=10mA	1,000 h	0 / 78
high temperature operating life	AEC-Q102 No.B1a	Tj=150℃ I_F=200mA	1,000 h	0 / 78
Pulsed operating life	AEC-Q102 No.B3	Ta=55℃ tw=100μs Duty=3% I_F=400mA	1,000 h	0 / 78
Thermal shock	AEC-Q102 No.A4	Ta=−40℃ to 125℃ (each 15min)	1,000 cycles	0 / 78
Thermal shock operating	AEC-Q102 No.A3a	Ta=-40℃ (OFF) to 125℃ (I_F=40mA ON) (each 15min)	1,000 cycles	0 / 78
Vibration variable frequency	AEC-Q102 No.G2	200m/s^2 or 1.5mm amplitude 20Hz to 2,000Hz to 20Hz 4min sweep	4 cycles of each direction	0 / 30
Mechanical shock	AEC-Q102 No.G3	15,000m/s^2 0.5ms 6 orientations	5 blows of each direction	0 / 30
Dew	AEC-Q102 No.C7	Refer to AEC-Q102-001 10mA 65h	1,000 cycles	0 / 78
Electrostatic Discharge(HBM)	AEC-Q102 No.E3	Human Body Model ±8kV(H2)	3 times of each polarity	0 / 30
Electrostatic Discharge(CDM)	AEC-Q102 No.E4	Charged Device Model ±1kV(C5)	3 times of each polarity	0 / 30
Resistance to reflow soldering	AEC-Q102 No.C8	Moisture soak : 30℃ 70% 672h Preheating : 150 to 180℃ 90-120sec Soldering : 260℃ peak	5 times	0 / 30
Solederability	AEC-Q102 No.C10	245℃ 5sec Sn-3.0Ag-0.5Cu wetting rate of 95% or more	-	0 / 30
Hydrogen sulphide	AEC-Q102 No.C12	H_2S 15ppm Ta=40℃ Rh=90%	336 h	0 / 78
Flowing mixed gas	AEC-Q102 No.C13	H_2S 0.01ppm SO_2 0.2ppm NO_2 0.2ppm Cl_2 0.01ppm Ta=25℃ Rh=75%	500 h	0 / 78
Bending	AEC-Q102 No.C14	Soldering in the longitudinal direction of the board and push until it bends 3mm from the back side	-	0 / 30

2. Failure criteria

Item	Symbol	Condition	Failure criteria
Luminous intensity	I_V	I_F=80mA	Measured value ＜ Initial value × 0.8, Measured value ≧ Initial value × 1.2
Color coordinates	ccx & ccy	I_F=80mA	Measured value ＜ Initial value ± 0.01
Forward voltage	V_F	I_F=80mA	Measured value ＜ Initial value × 0.9, Measured value ≧ Initial value × 1.1
Cosmetic appearance	-	-	Notable discoloration, deformation and cracking

HXTW115RGSE-1100-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.

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:
en https://www.stanley-electric.com/en/products/

cn https://www.stanley-electric.cn/cn/products/