



## Features

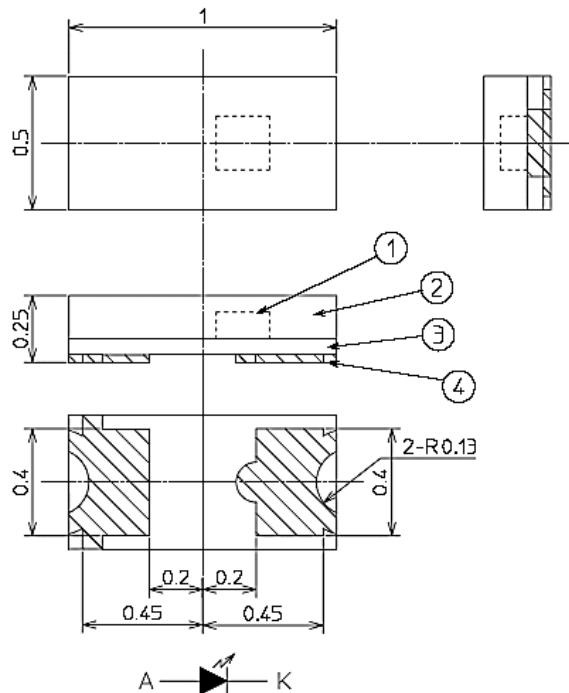
Package	1005(t=0.25mm) Type, water clear lens Outer Dimension 1.0 x 0.5 x 0.25mm ( L x W x H )
Product features	<ul style="list-style-type: none"><li>• Lead-free soldering compatible</li><li>• RoHS compliant</li></ul>

## Recommended Applications

- Communication Machine, Electric Household Appliances, OA/FA, Other General Applications

# Outline Dimensions

# FHD1105P-TR



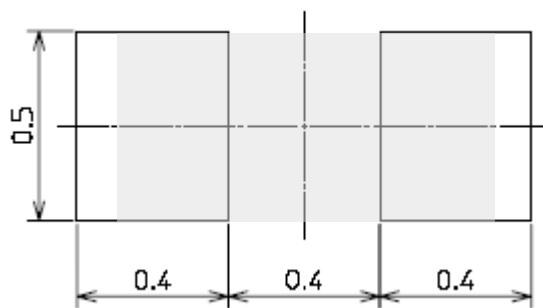
Unit :mm  
Weight :0.29mg  
Tolerance : $\pm 0.1$

NO.	PART NAME	MATERIALS	QTY.
①	LED Die	AlGaInP	1
②	Mold resin	Epoxy Resin	1
③	PCB	Glass Fabrics	1
④	Electrode	Au/Ni/Cu	2

Note: Outline Dimensions do not include the size of cutting burr around substrate and pin(electrodes)

## Recommended Pad

Unit :mm  
Tolerance : $\pm 0.1$



## 【 Product Overview 】

Die Material	AlGaInP
Emitting Color	Yellow Green
Resin Color(Emitting Area)	Water clear

## 【 Absolute Maximum Ratings 】

(Ta=25°C)

ITEM	SYMBOL	MAXIMUM RATINGS	UNITS
Power Dissipation	P <sub>d</sub>	48	mW
Forward Current	I <sub>F</sub>	20	mA
Repetitive Peak Forward Current "1ms,1/20duty"	I <sub>FRM</sub>	48	mA
I <sub>F</sub> Derate Linearly from "25°C"	ΔIF	0.27	mA/°C
I <sub>FRM</sub> Derate Linearly from "25°C"	ΔIFRM	0.64	mA/°C
Reverse Voltage	V <sub>R</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-40 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +100	°C
Soldering Temperature "Reflow Soldering"	T <sub>sld</sub>	260	°C

## 【 Electro and Optical Characteristics 】

(Ta=25°C)						
ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Forward Voltage	$V_F$	$I_F = 5\text{mA}$	-	1.9	2.4	V
Reverse Current	$I_R$	$V_R = 5\text{V}$	-	-	100	$\mu\text{A}$
Luminous Intensity	$I_V$	$I_F = 5\text{mA}$	6.3	9.0	12.6	mcd
Peak Wavelength	$\lambda_p$	$I_F = 5\text{mA}$	-	572	-	nm
Dominant Wavelength	$\lambda_d$	$I_F = 5\text{mA}$	565	570	575	nm
Spectral Line Half Width	$\Delta\lambda$	$I_F = 5\text{mA}$	-	15	-	nm

Note:

Above Luminous Intensity ( $I_V$ ) values and Dominant wavelength ( $\lambda_d$ ) values are the setup value of the selection machine. 【Tolerance :  $I_V \dots \pm 10\%$ ,  $\lambda_d \dots \pm 1\text{nm}$ 】

## 【 Sorting For Luminous Intensity and Dominant Wavelength 】

LEDs shall be sorted out into the following ranks of Luminous Intensity and Dominant Wavelength.

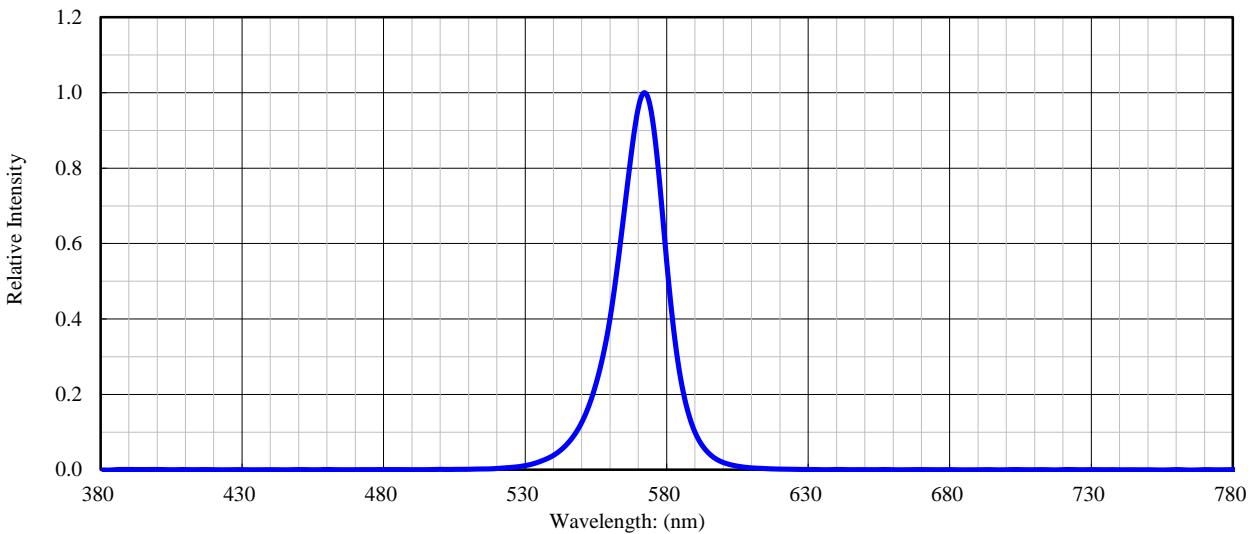
Luminous Intensity ( $I_V$ ) Rank			
Rank	Iv (mcd)		Conditions
	MIN.	MAX.	
A	6.3	9.0	$I_F = 5\text{mA}$
B	9.0	12.6	$Ta = 25^\circ\text{C}$

Note:

Above Luminous Intensity ( $I_V$ ) values are the setup value of the selection machine.  
【Tolerance :  $I_V \dots \pm 10\%$ 】

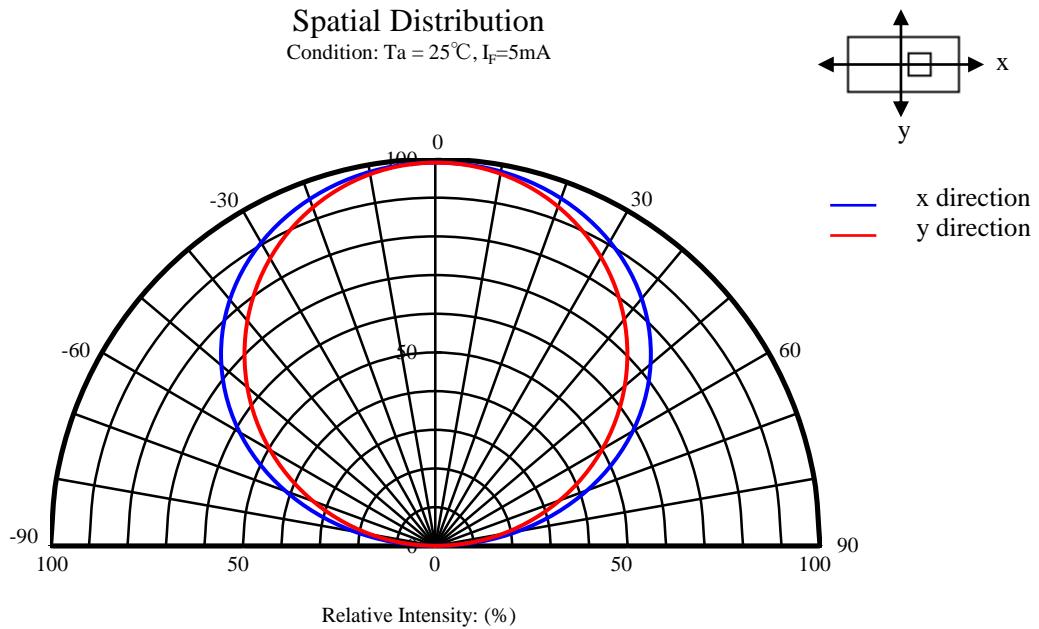
## Spectral Distribution

Condition:  $T_a = 25^\circ\text{C}$ ,  $I_F = 5\text{mA}$



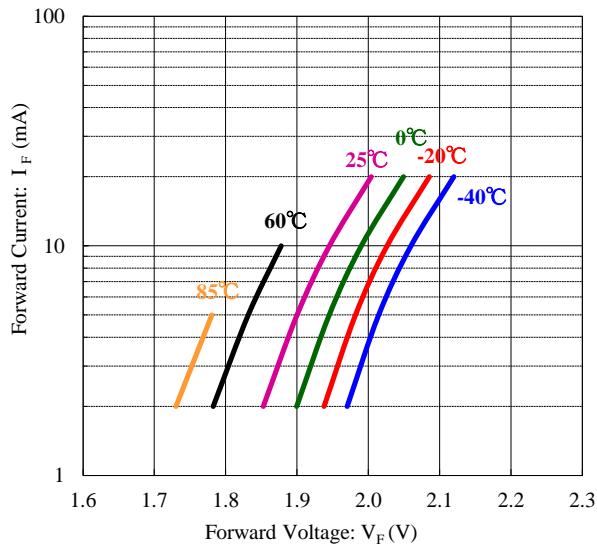
## Spatial Distribution

Condition:  $T_a = 25^\circ\text{C}$ ,  $I_F = 5\text{mA}$



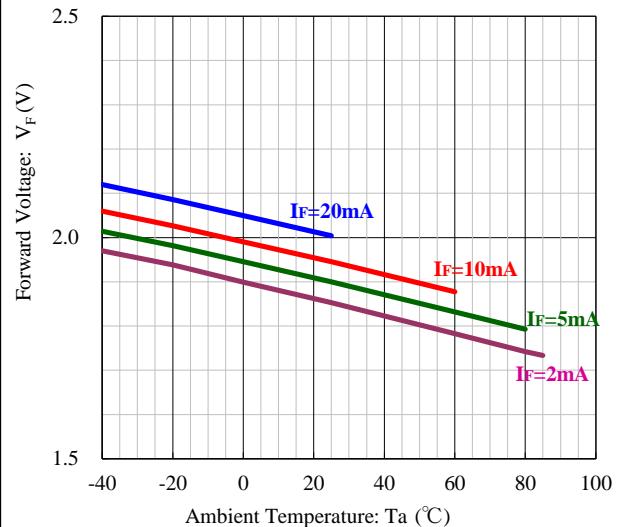
## Forward Voltage vs. Forward Current

Condition :  $T_a = -40 \sim 85^\circ\text{C}$



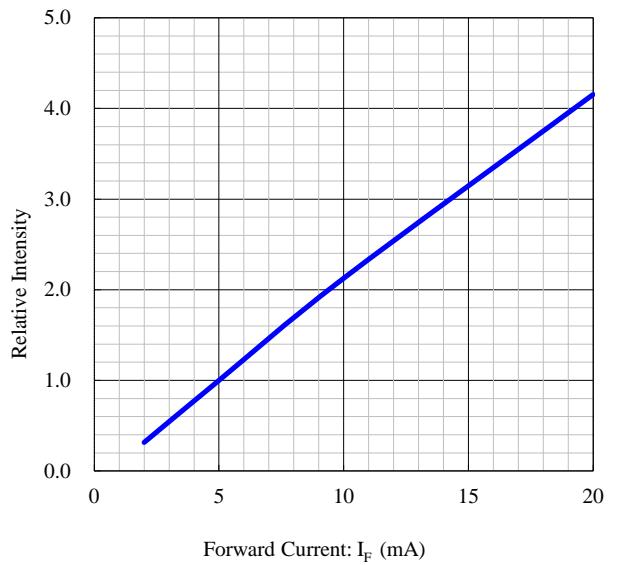
## Ambient Temperature vs. Forward Voltage

Condition:  $I_F = 2 \sim 20\text{mA}$



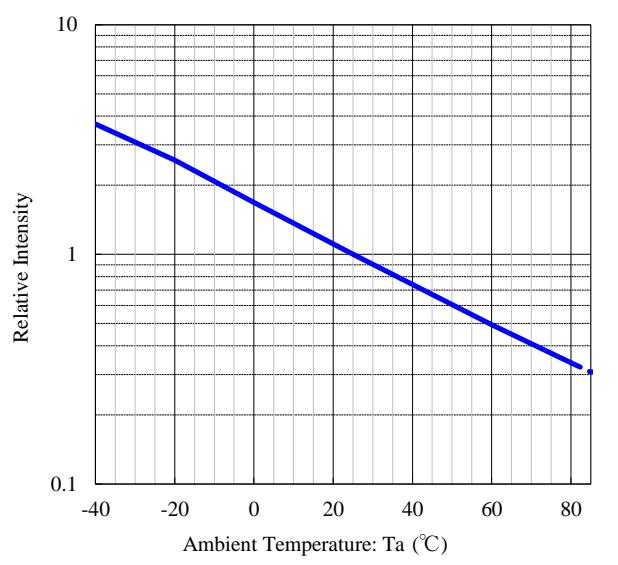
## Forward Current vs. Relative Intensity

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

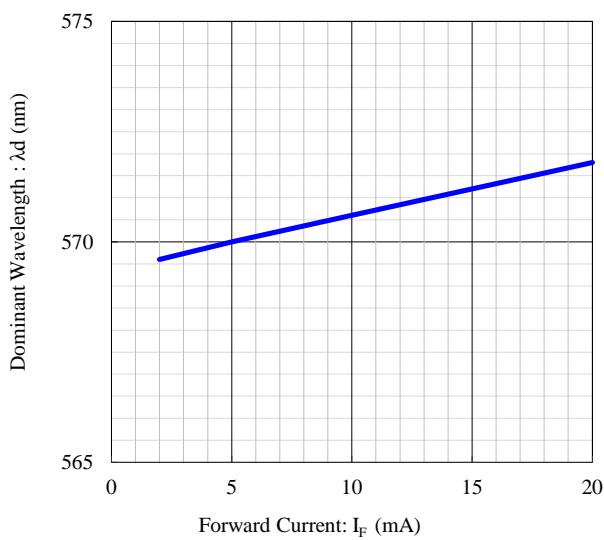


## Ambient Temperature vs. Relative Intensity

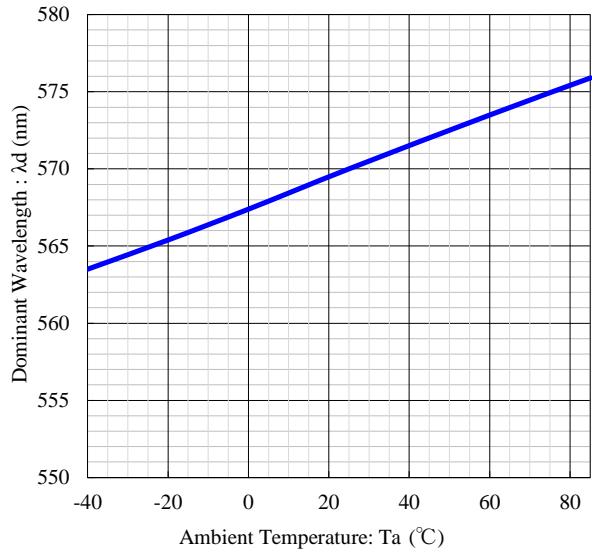
Condition:  $I_F = 5\text{mA}$



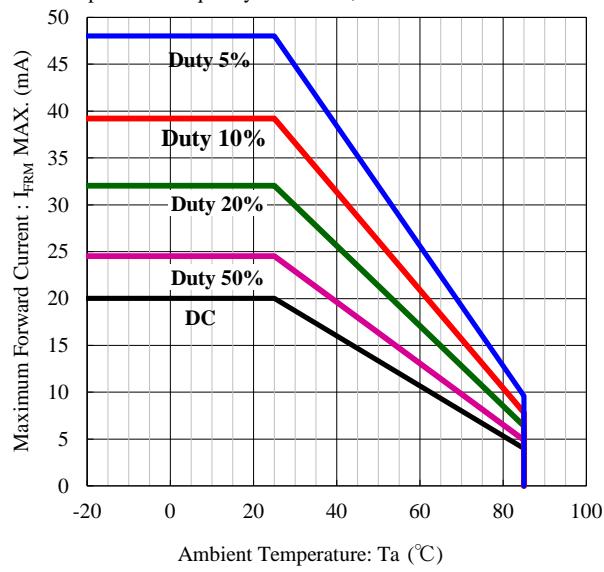
Forward Current vs. Dominant Wavelength  
Condition:  $T_a = 25^\circ\text{C}$



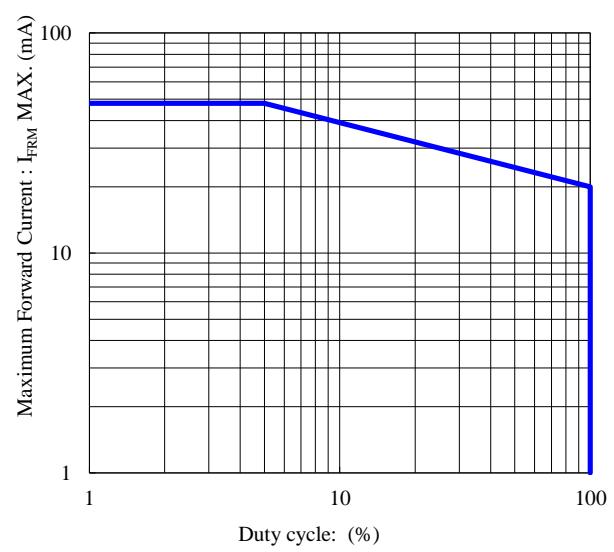
Ambient Temperature vs. Dominant Wavelength  
Condition:  $I_F = 5\text{mA}$



Max. Forward Current vs. Ambient Temperature  
Repetition Frequency:  $f \geq 50\text{Hz}$ , Pulse Width:  $t_w \leq 1\text{ms}$



Max. Forward Current vs. Duty Cycle  
Condition:  $T_a = 25^\circ\text{C}$

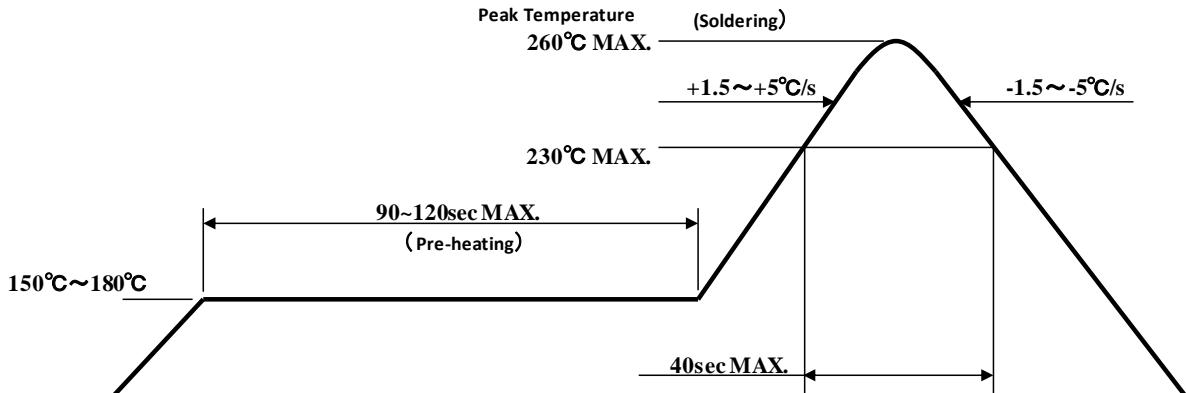


## 【Soldering Precaution】

(acc.to EIAJ-4701/300)

1. Heat stress during soldering will greatly 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 stress (ex. SMT LED). (Recommended Condition: Soldering Pad temp. > Package temp.)
2. Because 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 twice.

## 【Recommended Reflow Soldering Condition.】



Note 1 Temperature Profile for the reflow soldering is listed as the temperature of resin surface. This represents the maximum temperature ratings for soldering. Lowering the heating temperature and decreasing heating time is very effective in ensuring 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.

## Soldering condition

FHD1105P-TR

4. 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°CMax./Time:120sec.Max.』
5. Manual soldering, dipping ( through the wave ) soldering cannot be used for this product.
6. Isopropyl alcohol is recommended for cleaning. Some chemicals, including Freon substitute detergent could corrode or affect the optical characteristics of the lens or the casing surface. Please review the reference chart below for cleaning. Cleaning with ultrasonic shall not be recommended.

Cleaning Agents	Recommended / Not recommended
Isopropyl Alcohol	✓ Recommended
Ethyl Alcohol	✓ Recommended
Pure water	✓ Recommended
Trichloroethylene	✗ Not recommended
Chlorothene	✗ Not recommended
Acetone	✗ Not recommended
Thinner	✗ Not recommended

## 【 Other Precautions 】

1. Stanley LED Lamps have semiconductor characteristics and are designed to ensure high reliability. However, the performance may vary depending on usage conditions.
2. Absolute Maximum Ratings are set to prevent LED lamps from failing due to excess stress( temperature, current, voltage, etc.). Usage conditions must not exceed the ratings for a moment, nor do reach one item of absolute maximum rating s simultaneously.
3. In order to ensure high reliability from LED Lamps, variable factors that arise in actual usage conditions should be taken it to account for designing. ( Derating of TYP., MAX Forward Voltage, etc.)
4. 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.
5. Please avoid using the products with materials and products that contain sulfur and chorine element which will decrease the reliability of LED. Please keep LED in desiccator to protect them from corrosive gas regardless of whether mounting is finished or not. Also please make sure there is no gas occurs around or gas inflows from outside when using LED.
6. Please check the actual performance in the assembly because the Specification Sheets are described for LED device only.
7. Please refrain from looking directly at the light source of LED at high output, as it may harm your vision.
8. The products are designed to operate without failure in recommended usage conditions. However, please take the necessary precautions to prevent fire, injury, and other damages should any malfunction or failure arise
9. 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, transport equipment, medical applications, nuclear reactor control systems and so on).
10. The formal specification sheets shall be valid only by exchange of documents signed by both parties.

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.】

The package should not be opened until immediately prior to its use, and please keep the time frame between package opening and soldering which is **【maximum 72h.】**

If the device needs to be soldered twice, both soldering must be completed within the 72h.

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

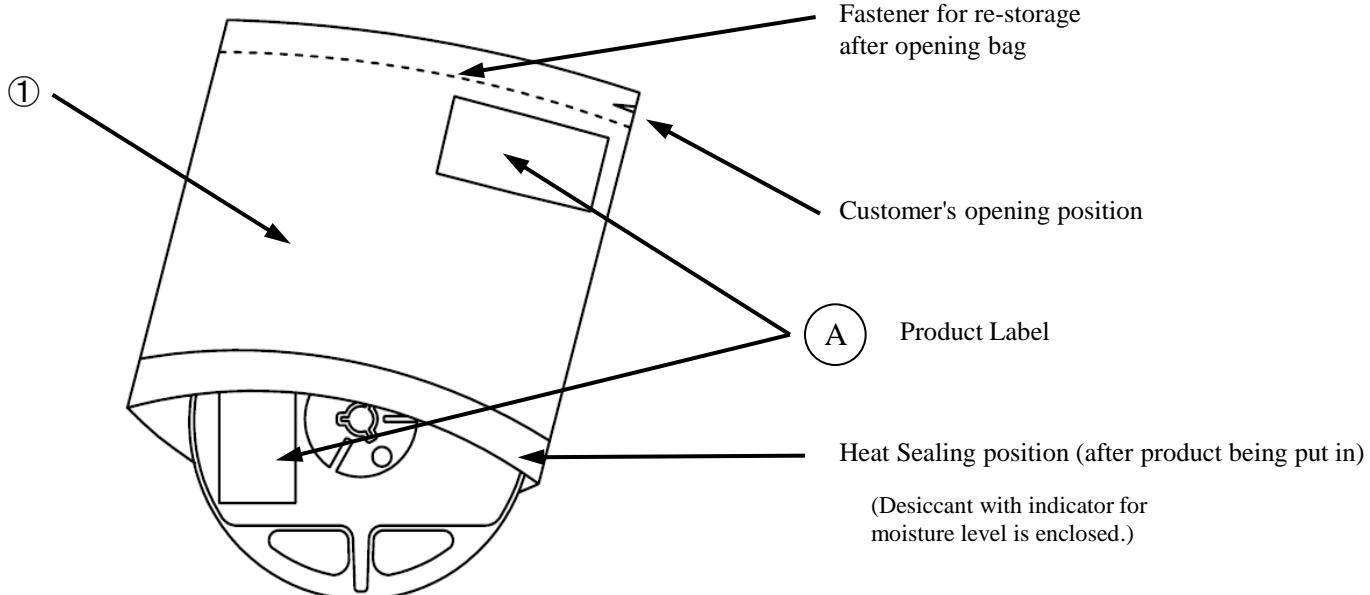
This product must be required to perform baking process (moisture removal) **for at least 23h,not exceed for 48h, at 60+±5 degrees Celsius** if following conditions apply.

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 is passed for 72h after the package is opened once.

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

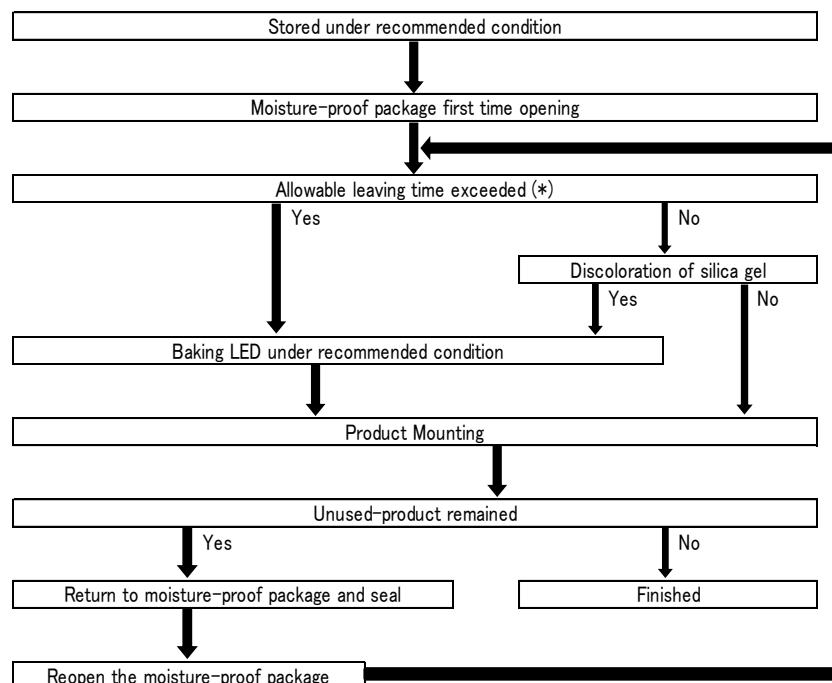
Baking may be performed in the tape-reel form , however if it is performed with the reel stacked over one another, it may cause deformation of the reels and taping materials and later obstruct mounting. Please handle only once it has returned to room temperature. Provided that, baking process shall be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

## 【Moisture-proof Packaging Specification】



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.

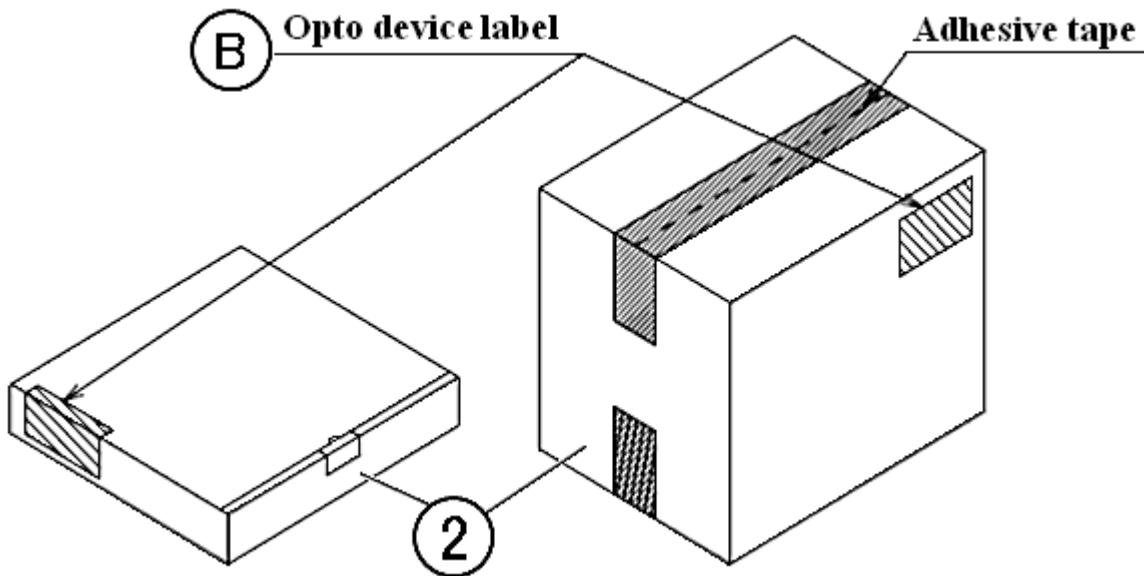
## 【Packing box】

(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.

Box for shipment is selected out of the above table, according to the shipping quantity.



Type A

Material / box : Cardboard C5BF

Type B,C

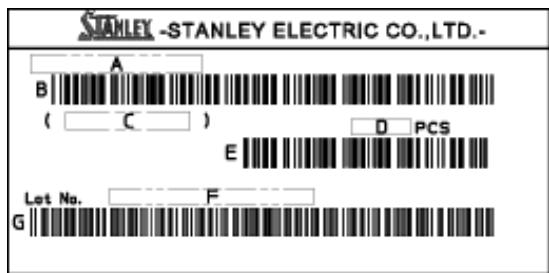
Material / box : Cardboard K5AF  
Partition : Cardboard K5BF

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

## 【Label Specification】

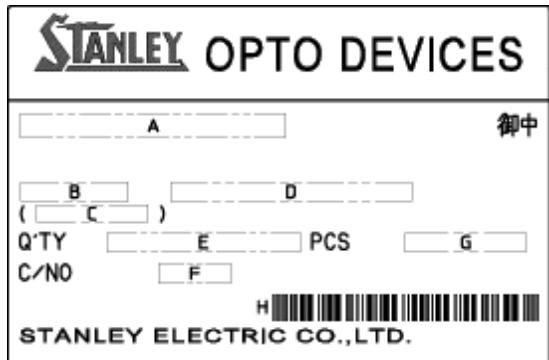
( acc.to JIS-X0503(Code-39) )

### A Product label



- A. Parts number
- B. Bar-code for parts number
- C. Parts code (In-house identification code for each parts number)
- D. Packed parts quantity
- E. Bar-Code for packed parts quantity
- F. Lot number & Rank  
(refer to Lot Number Notational System for details )
- G. Bar-Code for Lot number & Rank

### B Opto device label

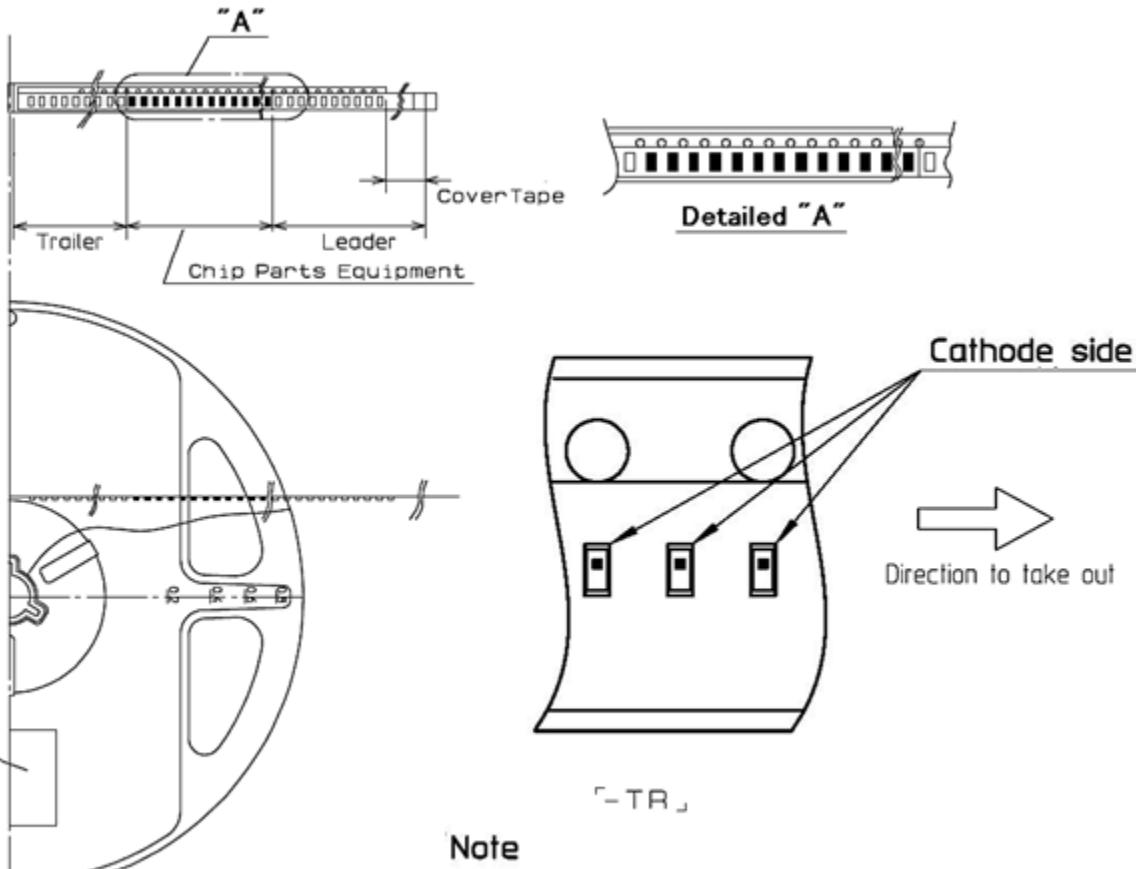


- A. Customer Name
- B. Parts Type
- C. Parts Code
- D. Parts Number
- E. Packed Parts Quantity
- F. Carton Number
- G. Shipping Date
- H. Bar-Code for In-house identification Number

<Remark> Bar-code font : acc.to Code-39(JISX0503)

(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 320mm without carrier-tape	The end of cover-tape shall be held with adhesive tape.
	Carrier-tape	Empty pocket shall be more than 20 pieces.	Please refer to the above figure for Taping & reel orientation .
Trailer area		Empty pocket shall be more than 15 pieces.	The end of taping shall be inserted into a slit of the hub.

# Taping and Reel Specifications

**FHD1105P-TR**

(acc.to JIS-C0806-03)

## 【Qty. per Reel】

10,000parts/reel

Minimum Qty. per reel might be 500 parts when getting less than 10,000 parts. In such case, parts of 500-unit-qty. shall be packed in a reel and the qty. shall be identified on the label

## 【Mechanical strength】

Cover-tape adhesive strength shall be 0.1~1.0N ( An angle between carrier-tape and cover-tape shall be 170 deg. ) Both tapes shall be so sealed that the contained parts will not come out from the tape when it is bent at a radius of 15mm.

## 【Others】

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

Qty./reel	Max. qty. of empty pocket	Remarks
1,000	1	-
2,000	2	No continuance
3,000	3	No continuance
4,000	4	No continuance
5,000	5	No continuance
6,000	6	No continuance
7,000	7	No continuance
8,000	8	No continuance
9,000	9	No continuance
10,000	10	No continuance

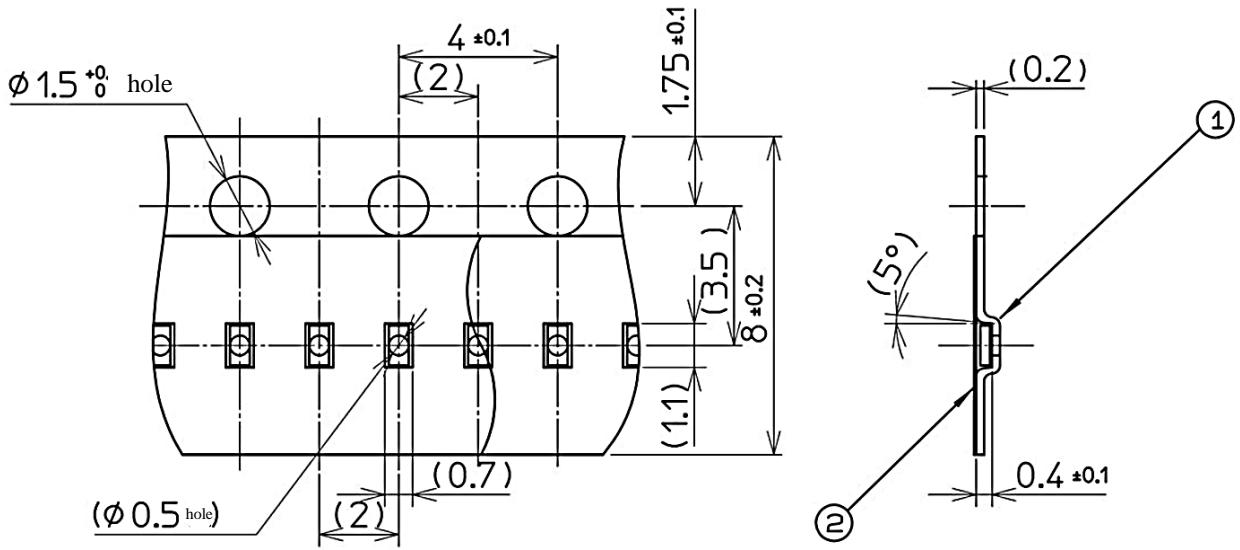
# Taping and Reel Specifications

FHD1105P-TR

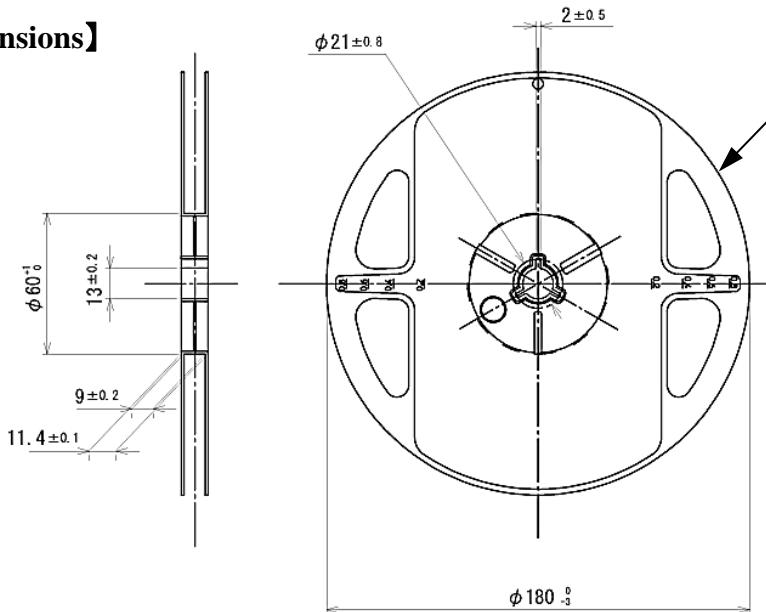
(acc.to JIS-C0806-03)

Unit :mm

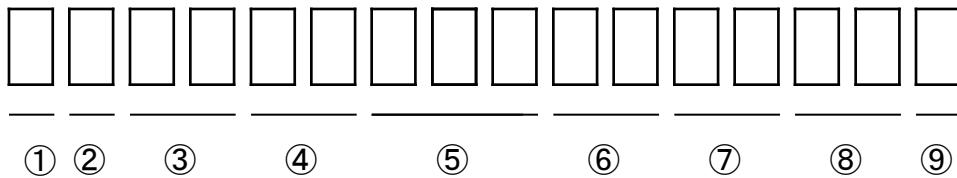
## 【Taping Dimensions】



## 【Reel Dimensions】



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



① - 1digit : Production Location (Mark identify alphabet)

② - 1digit : Production Year (Last digit of production Year 2017→7, 2018→8, 2021→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 : Color Rank

(If color rank is 1 digit, "-" shall be dashed on the place for the second digit.

If there is no identified intensity rank, " - " is used to indicate.)

⑨ - 1digit : Option Rank (Stanley normally print "-" to indicate)

This product is in compliance with RoHS・ELV.

Prohibition substance and it's criteria value of RoHS・ELV are as follows.

•RoHS instruction ..... Refer to following (1)～(6).

•ELV instruction ..... Refer to following (1)～(4).

	Substance Group Name	Criteria Value
(1)	Lead and its compounds	1,000ppm Max
(2)	Cadmium and its compounds	100ppm Max
(3)	Mercury and its compounds	1,000ppm Max
(4)	Hexavalent chromium	1,000ppm Max
(5)	PBB	1,000ppm Max
(6)	PBDE	1,000ppm Max

# Reliability Testing Result

FHD1105P-TR

## 1. Reliability Testing Result

Test Item	Reference Standard	Test Condition	Duration	Failure
Room Temperature Operating Life	EIAJ ED-4701/100(101)	Ta = 25°C, I <sub>F</sub> = 20mA	1,000 h	0/20
High Temperature Operating Life	EIAJ ED-4701/100(101)	Ta = 85°C, I <sub>F</sub> = 8mA	1,000 h	0/20
Low Temperature Operating Life	EIAJ ED-4701/100(101)	Ta = -40°C, I <sub>F</sub> = 20mA	1,000 h	0/20
Wet High Temperature Operating Life	EIAJ ED-4701/100(102)	Ta = 60°C, RH = 90±5%, I <sub>F</sub> =14.6mA	1,000 h	0/20
Thermal Shock	EIAJ ED-4701/100(105)	Ta = -40°C~100°C(each 15min)	1,000 cycles	0/20
Resistance to Reflow Soldering	EIAJ ED-4701/300(301)	Moisture Soak: 30°C 70% 96h Preheating: 150~180°C 120sec Max Soldering: 260 Peak	2times	0/20
Electrostatic Discharge(ESD)	EIAJ ED-4701/300(304)	C=100pF R2=1.5kΩ±1000V	once each polarity	0/20

## 2. Failure Criteria

Item	Symbol	Condition	Failure Criteria
Luminous Intensity	I <sub>V</sub>	I <sub>F</sub> =5mA	Testing Min. Value < Standard Min. Value × 0.5
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> =5mA	Testing Max. Value ≥ Standard Max. Value × 1.2
Cosmetic appearance	-	-	Notable, discoloration, deformation and cracking

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- 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).  
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