

SMD ■ Middle Power LED

37-21ST/NK2C-YH35357A07A12530U0/2T(HW)



Features

- PLCC-2 package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)

Description

The Everlight 37-21S package has high efficacy, high CRI, Middle power consumption, wide viewing angle and a compact form factor. These features make this package an ideal LED for all lighting applications.

Applications

- General lighting
- Decorative and Entertainment Lighting
- Indicators
- Illumination
- Switch lights

Product Number Explanation

37-21ST/NK 2 C – YH XX XX XX XX XXU0 / 2T

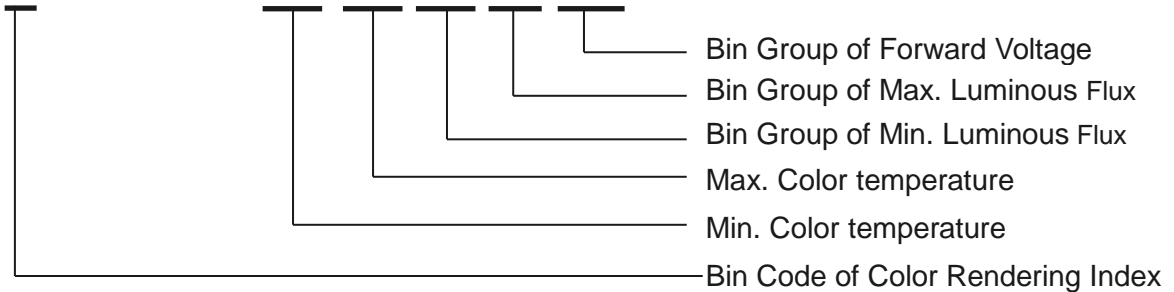


Table of Color Rendering Index

Symbol	Description
M	CRI(Min.) : 60
N	CRI(Min.) : 65
L	CRI(Min.) : 70
Q	CRI(Min.) : 75
K	CRI(Min.) : 80
H	CRI(Min.) : 90

Note:
 Tolerance of Color Rendering Index: ±2

Table of Forward Current Index

Symbol	Description
U0	I _F :5mA

Example:
 37-21ST/NK2C-YH35357A07A12530U0/2T(HW)

CRI	65(Min.)
CCT	3500K
Flux	500~700mcd
V _F	2.5~3.0
I _F	5mA

Mass Production List for CRI>70

Product	CRI Min.(1)	CCT(K)	Φ(mcd) Min. (2)	Φ(mcd) Max. (2)
37-21ST/NK2C-YH35357A07A12530U0/2T(HW)	65	3500K	500	700

Note:

1. Tolerance of Color Rendering Index: ± 2
2. Tolerance of Luminous Intensity: $\pm 11\%$.

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Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Cool White Neutral White Warm White	Water Clear

Absolute Maximum Ratings (T_{Soldering}=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I _F	30	mA
Peak Forward Current (Duty 1/10 @1KHZ)	I _{FP}	100	mA
Power Dissipation	P _d	90	mW
Operating Temperature	T _{opr}	-40 ~ +100	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C
Thermal Resistance (Junction / Soldering point)	R _{th J-S}	50	°C/W
Junction Temperature	T _j	115	°C
Soldering Temperature	T _{sol}	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

Note:

The products are sensitive to static electricity and must be carefully taken when handling products

Electro-Optical Characteristics (T_{Soldering}=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity ⁽¹⁾	Φ	500	-----	700	mcd	I _F =5mA
Forward Voltage ⁽²⁾	V _F	2.5	-----	3.0	V	I _F =5mA
Color Rendering Index ⁽³⁾	R _a	65	-----	-----		I _F =5mA
Viewing Angle	2θ _{1/2}	-----	120	-----	deg	I _F =5mA
Reverse Current	I _R	-----	-----	10	μA	V _R =5V

Notes:

1. Tolerance of Luminous Intensity: ±11%.
2. Tolerance of Forward Voltage : ±0.1V.
3. Tolerance of Color Rendering Index: ±2

Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
7A0	500	600	mcd	I _F =5mA
7A1	600	700		

Note:
Tolerance of Luminous Intensity: ±11%.

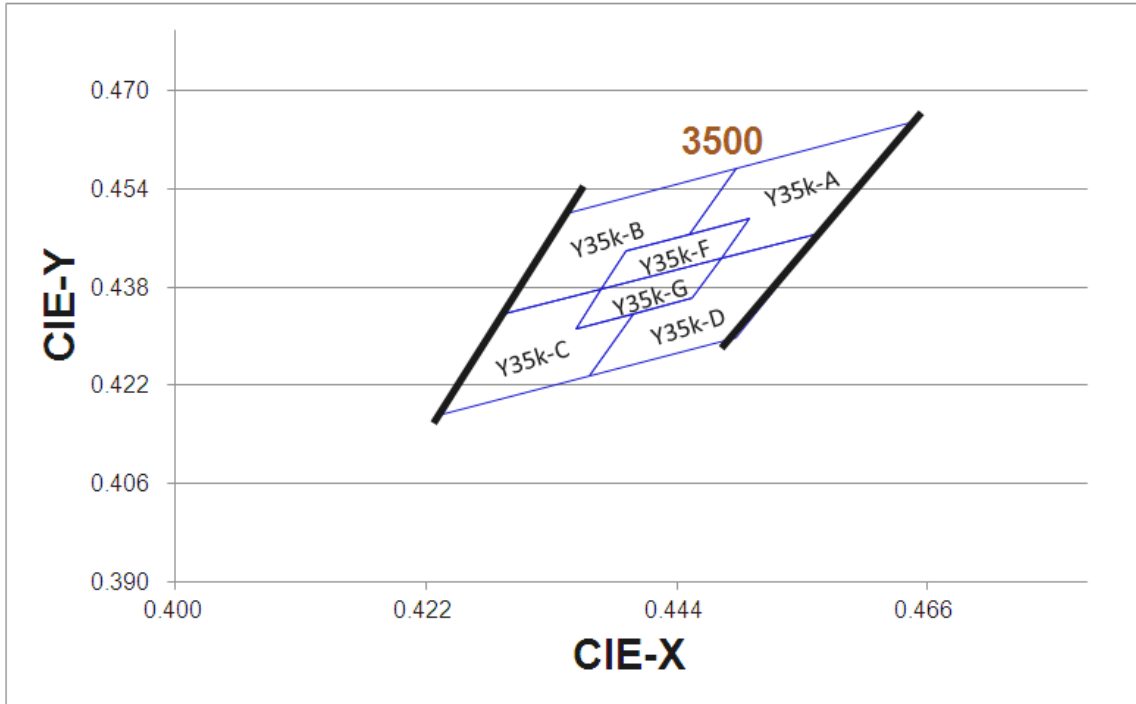
Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
32	2.5	2.6	V	I _F =5mA
33	2.6	2.7		
34	2.7	2.8		
35	2.8	2.9		
36	2.9	3.0		

Note:
Tolerance of Forward Voltage: ±0.1V

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The C.I.E. 1931 Chromaticity Diagram



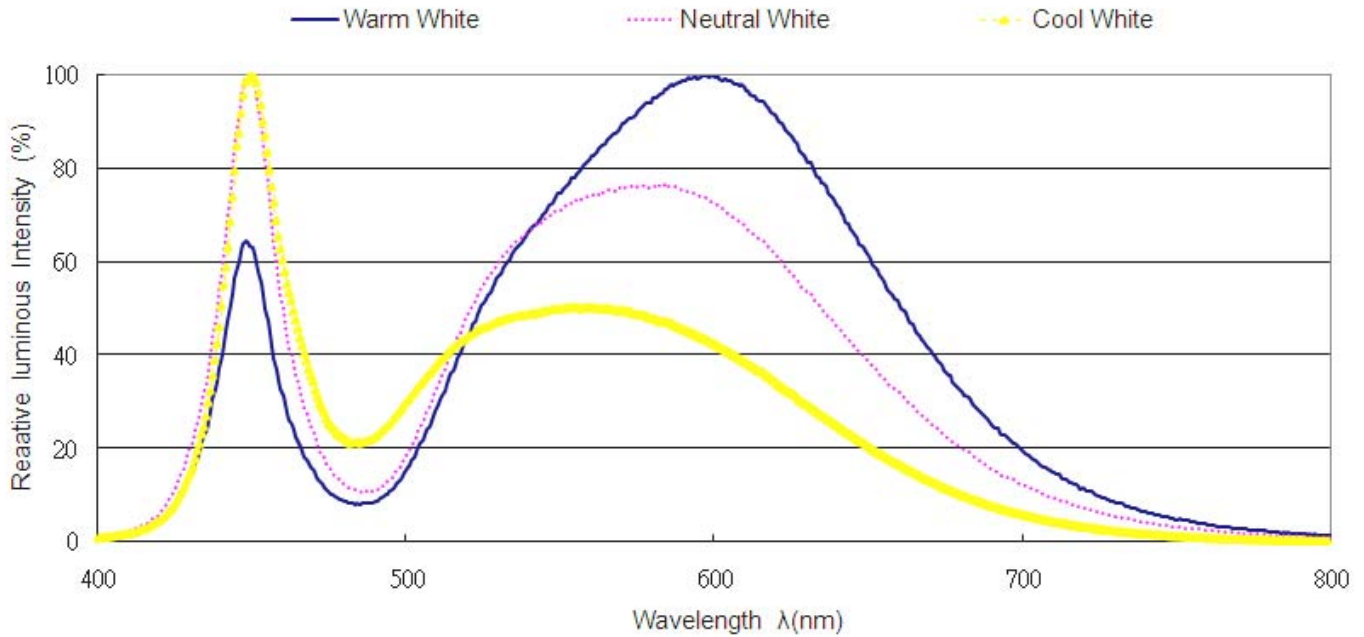
Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
3500K	Y35K-A	0.4644	0.4649	Y35K-D	0.4566	0.4468	
		0.4493	0.4574		0.4479	0.4427	
		0.4451	0.4465		0.4453	0.4362	
		0.4504	0.4491		0.4402	0.4337	
		0.4479	0.4427		0.4363	0.4236	
		0.4566	0.4468		0.4492	0.4298	
	Reference Range:3015~3205K						
	Y35K-B	0.4493	0.4574	Y35K-C	0.4288	0.4337	
		0.4341	0.4499		0.4234	0.4174	
		0.4288	0.4337		0.4363	0.4236	
		0.4374	0.4377		0.4402	0.4337	
		0.4396	0.4438		0.4351	0.4313	
		0.4451	0.4465		0.4374	0.4377	
	Reference Range:3175~3390K						
	Y35K-F	0.4504	0.4491	Y35K-G	0.4479	0.4427	
		0.4396	0.4438		0.4374	0.4377	
		0.4374	0.4377		0.4351	0.4313	
		0.4479	0.4427		0.4453	0.4362	
	Reference Range:3120K~3265K						

Note:

1. The value is based on driving current by 5mA.
2. Tolerance of Chromaticity Coordinates: ±0.01.

Spectrum Distribution



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage Shift vs. Junction Temperature

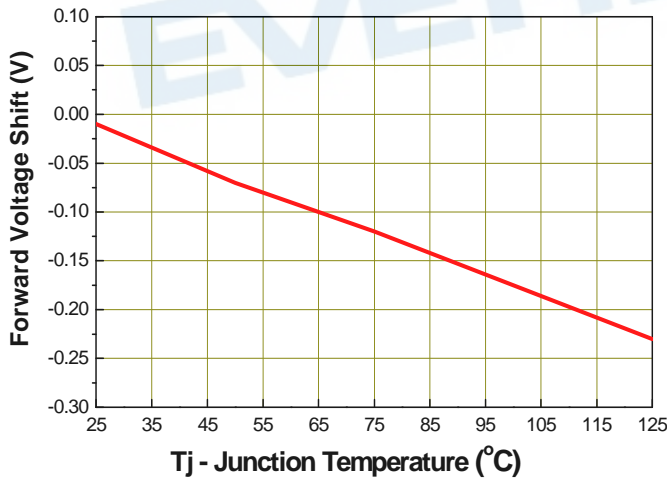
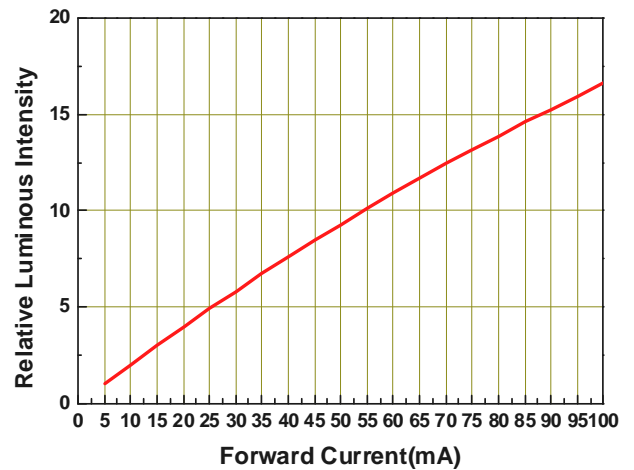


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

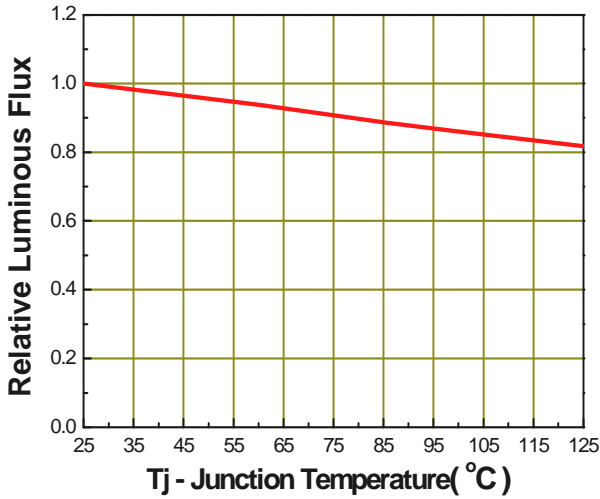


Fig.4 - Forward Current vs. Forward Voltage

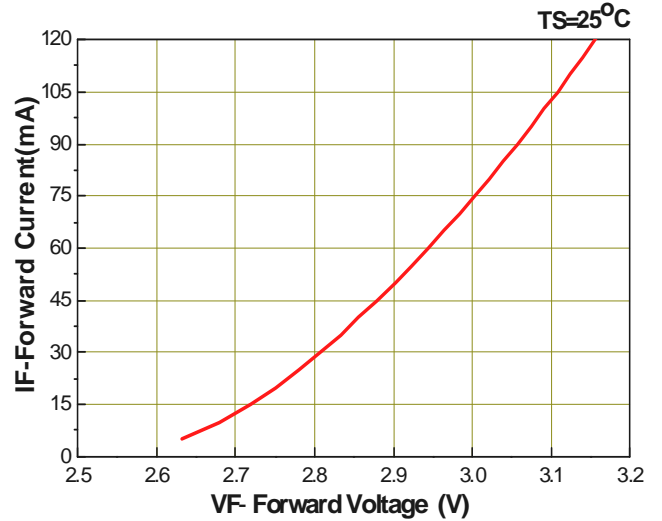


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

$R_{th\ j-s} = 50\ ^\circ\text{C/W}$

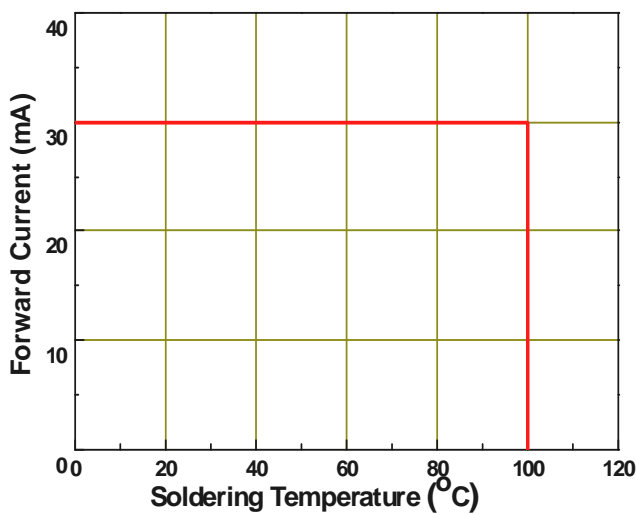
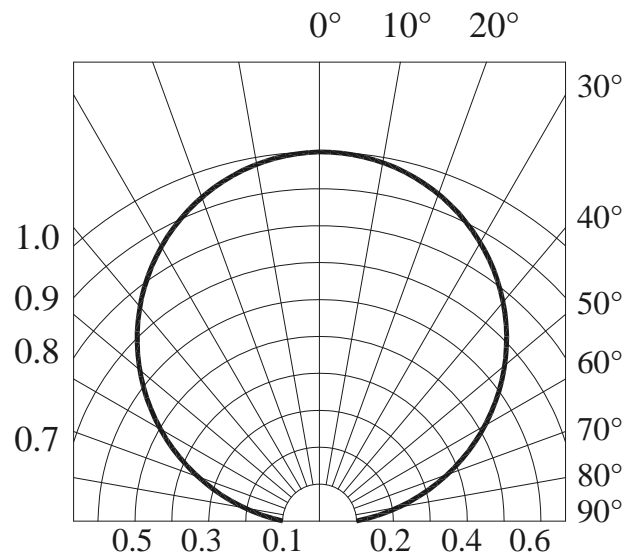
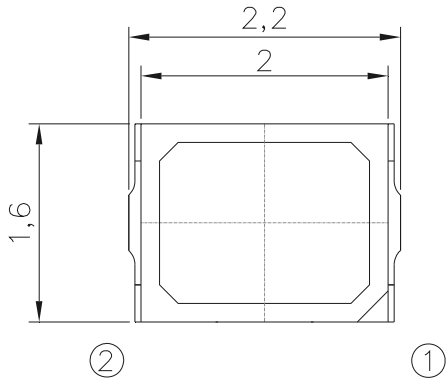


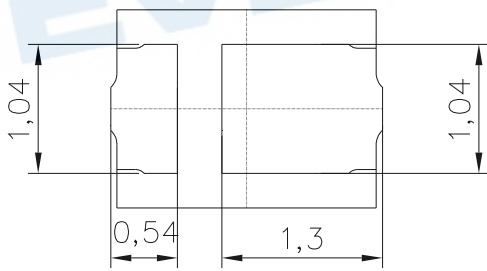
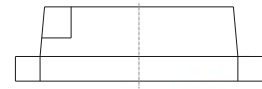
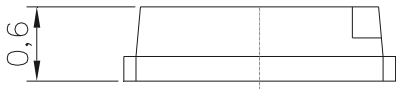
Fig.6 – Radiation Diagram



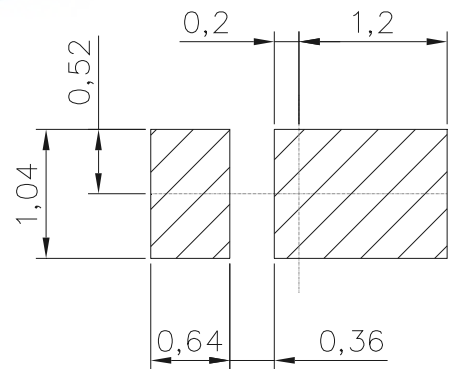
Package Dimension



Polarity



Bot. view

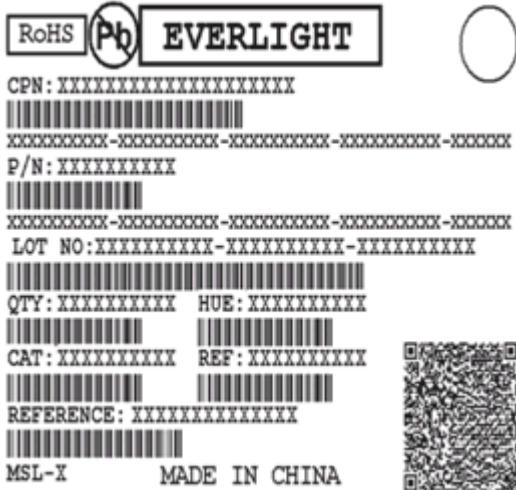


Soldering patterns

Note:
 Tolerance unless mentioned is $\pm 0.2\text{mm}$; Unit = mm

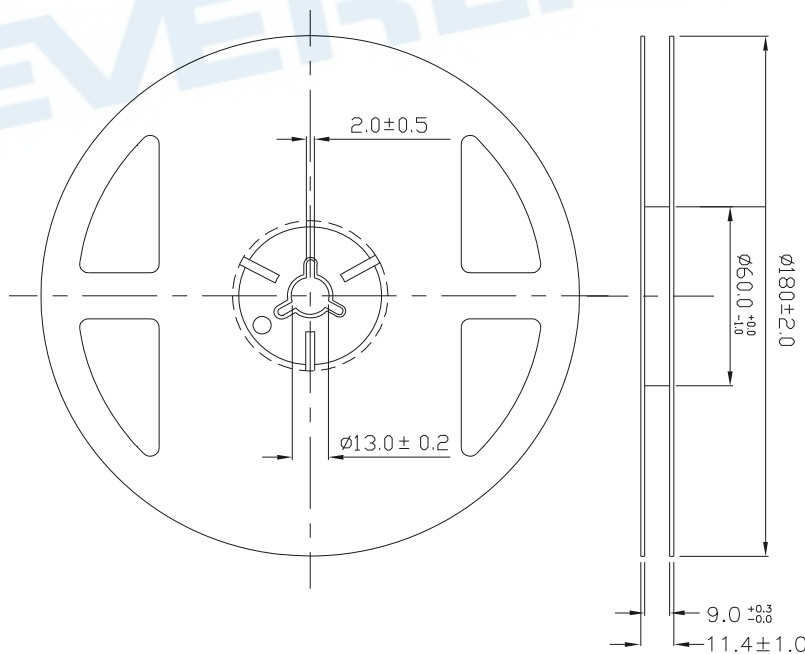
Moisture Resistant Packing Materials

Label Explanation



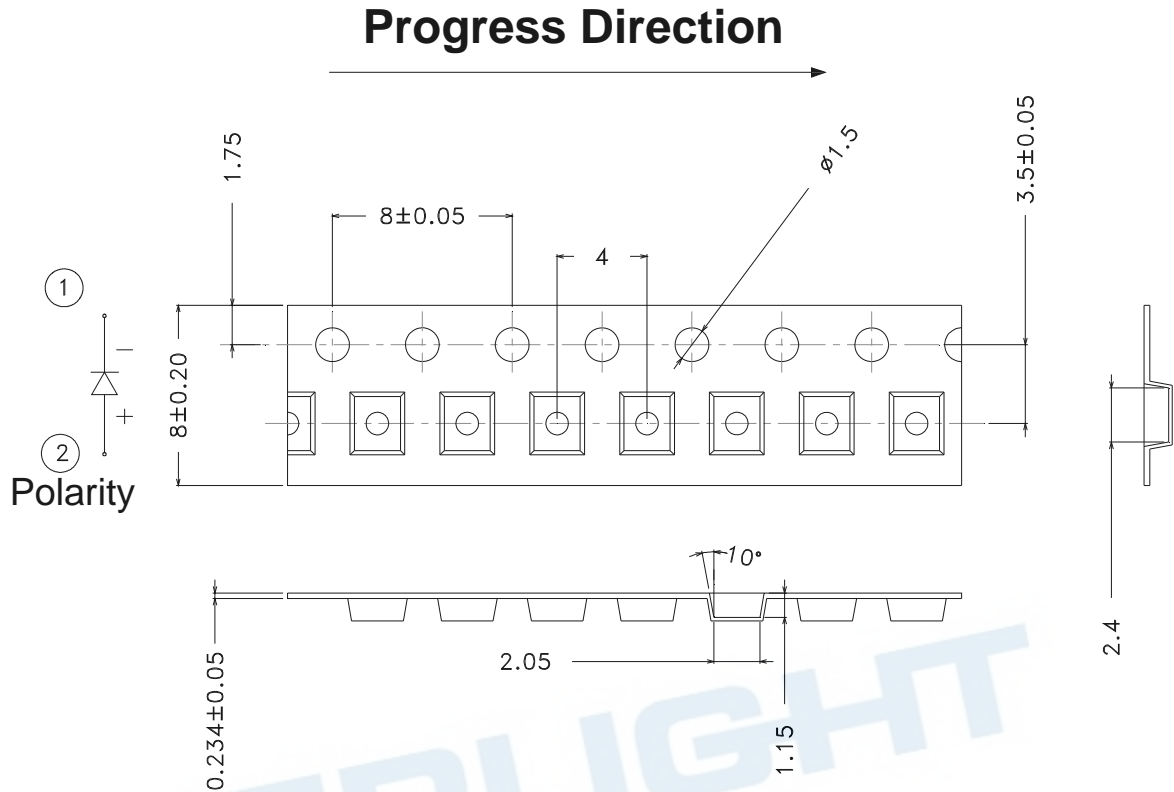
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions



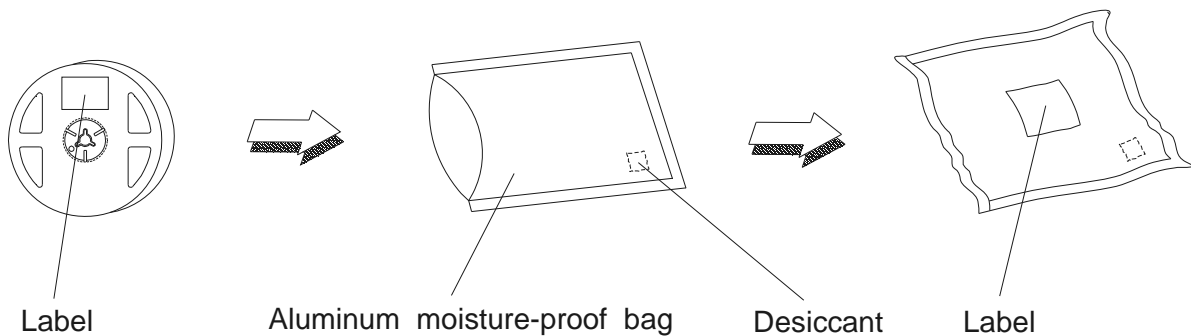
Note:
 Tolerances unless mentioned ± 0.1 mm. Unit = mm

Carrier Tape Dimensions: Loaded Quantity 1000/2000 pcs. Per Reel



Note:
 Tolerances unless mentioned ± 0.1 mm. Unit = mm

Moisture Resistant Packing Process



Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.
 Confidence level : 90%
 LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C/10sec.	6 Min.	22 PCS.	0/1
2	Thermal Shock	H : +100°C 20min ∩ 10 sec L : -10°C 20min	200 Cycles	22 PCS.	0/1
3	Temperature Cycle	H : +100°C 30min ∩ 5 min L : -40°C 30min	200 Cycles	22 PCS.	0/1
4	High Temperature/Humidity	Ta=85°C,85%RH	1000 Hrs.	22 PCS.	0/1
5	HTHH Operational Life	Ta=85°C,85%RH, If = 15 mA	1000 Hrs.	22 PCS.	0/1
6	Low Temperature Storage	Ta=-40°C	1000 Hrs.	22 PCS.	0/1
7	High Temperature Storage	Ta=85°C	1000 Hrs.	22 PCS.	0/1
8	Low Temperature Operation Life	Ta=-40°C, If = 30 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25°C, If = 30 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55°C, If =30 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85°C, If = 15 mA	1000 Hrs.	22 PCS.	0/1
12	Solderability	Reflow / 245°C / 10 sec / 1Times	6 Min.	22 PCS.	0/1

Reliability Test Items and Conditions of HW

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Thermal Shock	H : +100°C 5min ∩ 10 sec L : 20°C 5min	300 Cycles	76 PCS.	0/1
2	Temperature Cycle	H : +100°C 15min ∩ 5min L : -40°C 15min	300 Cycles	76 PCS.	0/1
3	ESD-HBM	Ta = 25 °C 参考 JESD22-A114	参考 JESD22-A114	6pcs	0/1
4	High Temperature Operation/ Life	Ta=100°C, If = 30 mA	1000 Hrs.	76 PCS.	0/1

Precautions for Use

1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

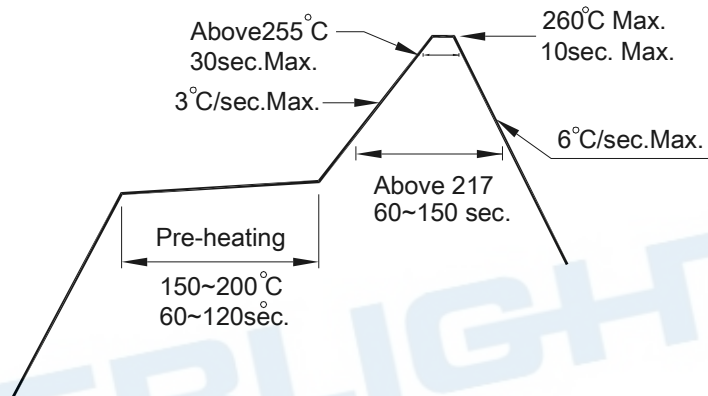
2.3 After opening the package: The LED's floor life is 168 Hrs under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment: 60±5°C for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

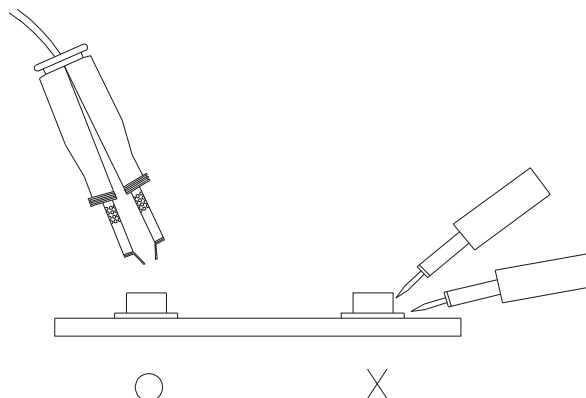
3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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