

SMD ■ MID Power LED

37-21S/NKK2C-H5757M41N42936Z6/2T-FS(XY)

Preliminary



Features

- PLCC-2 package
- Top view white LED
- High luminous intensity output
- Wide viewing angle
- Pb-free
- RoHS compliant
- ANSI Binning

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

37-21S/N K K 2 C – H XX XX XX XX XXXXZ6 / 2T-FS

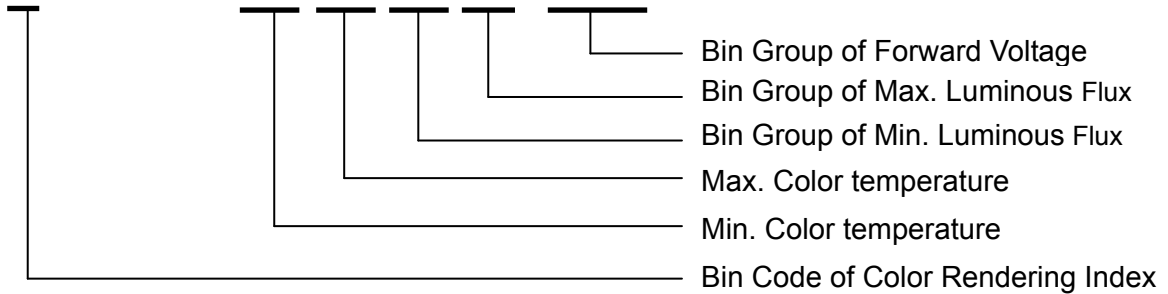


Table of Color Rendering Index

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
Z6	I _F :60mA

Example:
 37-21S/NKK2C-H5757M41N42936Z6/2T-FS(XY)

CRI	80(Min.)
CCT	5700K
Flux	22~33lm
V _F	2.9~3.6V
I _F	60mA

Mass Production List for CRI>80

Product	CRI Min. ⁽¹⁾	CCT(K)	Φ(lm) Min. ⁽²⁾	Φ(lm) Max. ⁽²⁾
37-21S/NKK2C-H5757M41N42936Z6/2T-FS(XY)	80	5700K	22	33

Note:

1. Tolerance of Color Rendering Index: ±2
2. Tolerance of Luminous flux: ±11%.

Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	Cool White	Water Clear

Absolute Maximum Ratings ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	75	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	100	mA
Power Dissipation	P_d	270	mW
Operating Temperature	T_{opr}	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +100	$^{\circ}\text{C}$
Thermal Resistance (Junction / Soldering point)	$R_{th\ J-S}$	50	$^{\circ}\text{C/W}$
Junction Temperature	T_j	125	$^{\circ}\text{C}$
Soldering Temperature	T_{sol}	Reflow Soldering : 260 $^{\circ}\text{C}$ for 10 sec. Hand Soldering : 350 $^{\circ}\text{C}$ for 3 sec.	

Note:

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

Electro-Optical Characteristics ($T_{\text{Soldering}}=25^{\circ}\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux ₍₁₎	Φ	23	-----	33	lm	$I_F=60\text{mA}$
Forward Voltage ₍₂₎	V_F	2.9	-----	3.6	V	$I_F=60\text{mA}$
Color Rendering Index ₍₃₎	R_a	80	-----	-----		$I_F=60\text{mA}$
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	$I_F=60\text{mA}$
Reverse Current	I_R	-----	-----	50	μA	$V_R=5\text{V}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux _{(1) (4)}	Φ	-----	38.8	-----	lm	$I_F=100\text{mA}$
Forward Voltage _{(2) (4)}	V_F	-----	3.3	-----	V	$I_F=100\text{mA}$

Notes:

1. Tolerance of Luminous flux: $\pm 11\%$.
2. Tolerance of Forward Voltage : $\pm 0.1\text{V}$.
3. Tolerance of Color Rendering Index: ± 2
4. $I_F=100\text{mA}$ is only for reference.

Bin Range of Luminous Flux

Bin Code	Min.	Max.	Unit	Condition
M41	22	24	lm	I _F =60mA
N3	24	27		
N4	27	33		

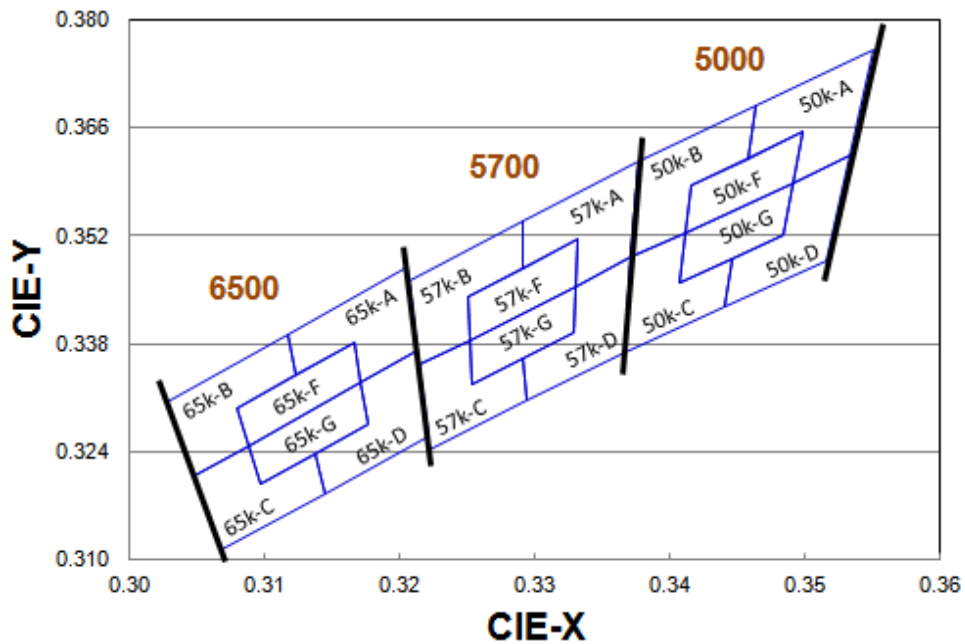
Note:
 Tolerance of Luminous flux: ±11%.

Bin Range of Forward Voltage

Bin Code	Min.	Max.	Unit	Condition
36	2.9	3.0	V	I _F =60mA
37	3.0	3.1		
38	3.1	3.2		
39	3.2	3.3		
40	3.3	3.4		
41	3.4	3.5		
42	3.5	3.6		

Note:
 Tolerance of Forward Voltage: ±0.1V

The C.I.E. 1931 Chromaticity Diagram

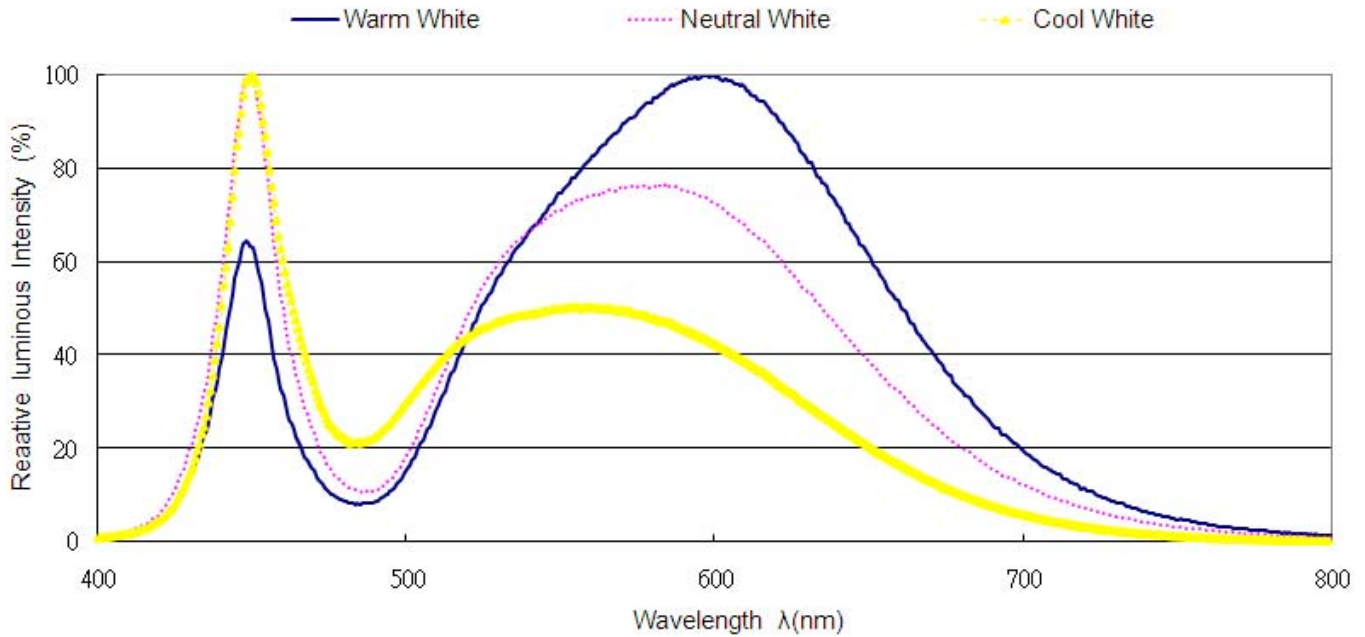


Bin Range of Chromaticity Coordinates

CCT	Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	
5700K	57K-A	0.3376	0.3616	57K-D	0.3371	0.3493	
		0.3292	0.3539		0.3321	0.3447	
		0.3292	0.3464		0.3320	0.3401	
		0.3321	0.3490		0.3293	0.3377	
		0.3321	0.3447		0.3294	0.3306	
		0.3371	0.3493		0.3366	0.3369	
	Reference Range:5310K~5700K						
	57K-B	0.3292	0.3539	57K-C	0.3215	0.3353	
		0.3207	0.3462		0.3222	0.3243	
		0.3215	0.3353		0.3294	0.3306	
		0.3262	0.3395		0.3293	0.3377	
		0.3261	0.3436		0.3263	0.335	
		0.3292	0.3464		0.3262	0.3395	
	Reference Range:5700K~6020K						
	57K-F	0.3321	0.3490	57K-G	0.3321	0.3447	
		0.3261	0.3436		0.3262	0.3395	
		0.3262	0.3395		0.3263	0.3350	
		0.3321	0.3447		0.3320	0.3401	
	Reference Range:5520K~5780K						

Note:
 1. The value is based on driving current by 60mA.
 2. Tolerance of Chromaticity Coordinates: ±0.01.

Spectrum Distribution



Typical Electro-Optical Characteristics Curves

Fig.1 – Forward Voltage XYift vs. Junction Temperature

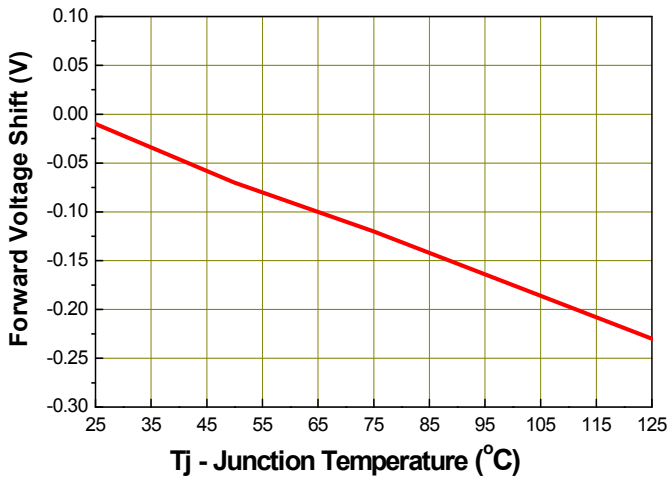
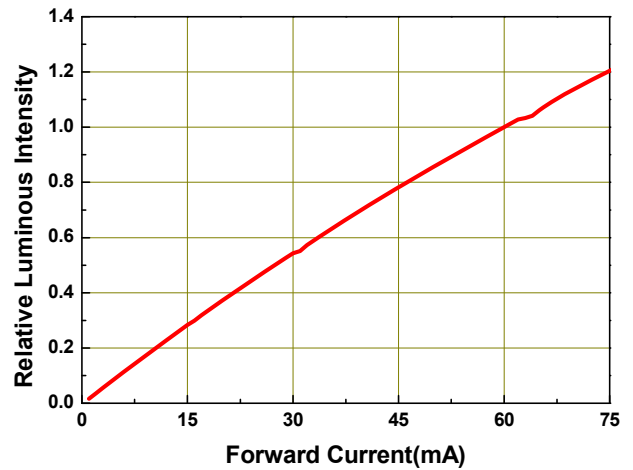


Fig.2 - Relative Luminous Intensity vs. Forward Current



Typical Electro-Optical Characteristics Curves

Fig.3 - Relative Luminous Intensity vs. Junction Temperature

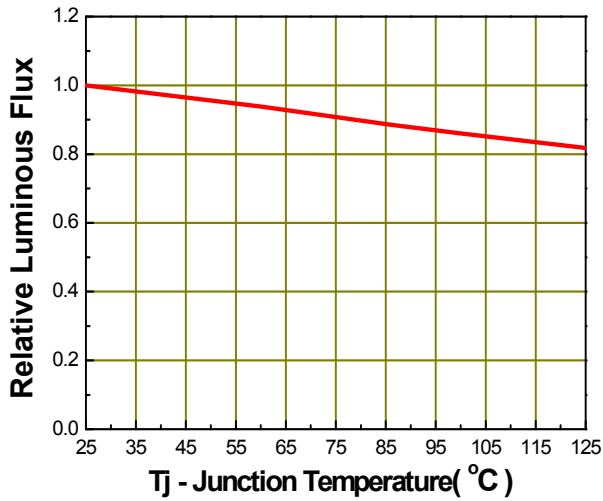


Fig.4 - Forward Current vs. Forward Voltage

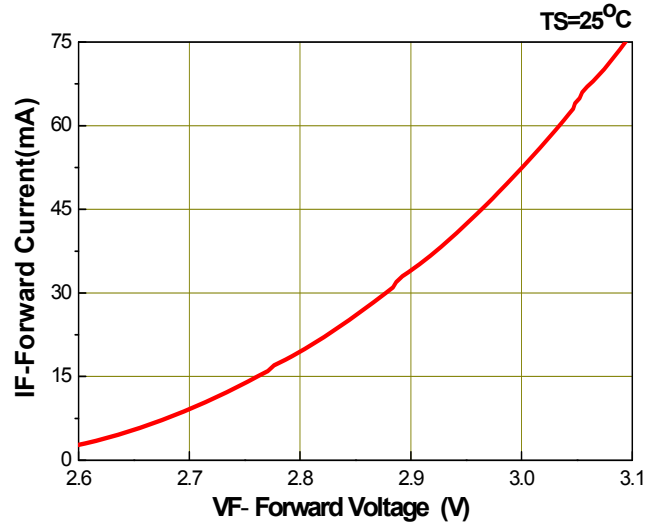


Fig.5 – Max. Driving Forward Current vs. Soldering Temperature

R_{th j-s}=50 °C/W

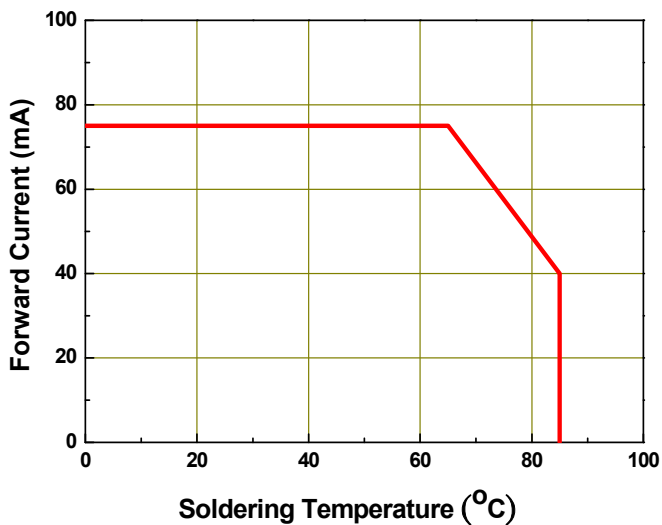
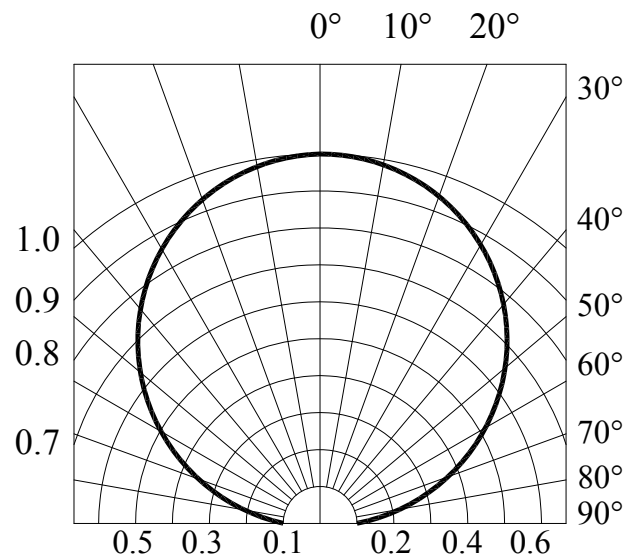
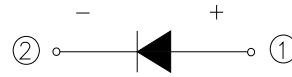
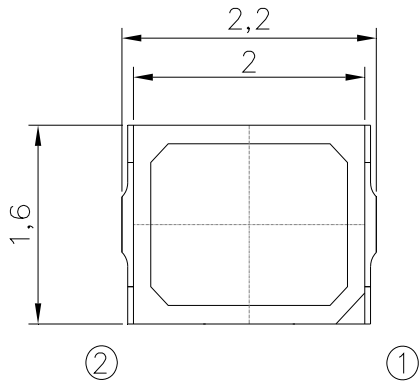


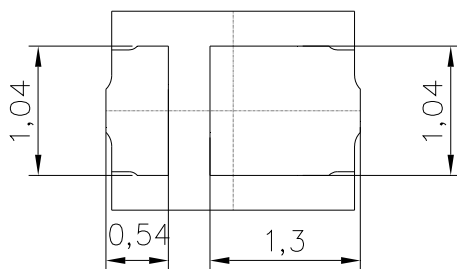
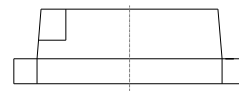
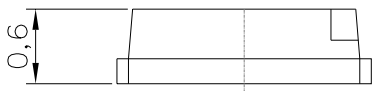
Fig.6 – Radiation Diagram



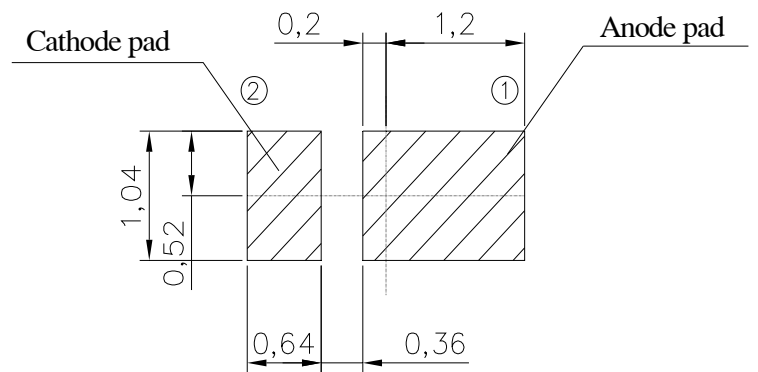
Package Dimension



Polarity



Bot. view



Soldering patterns

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

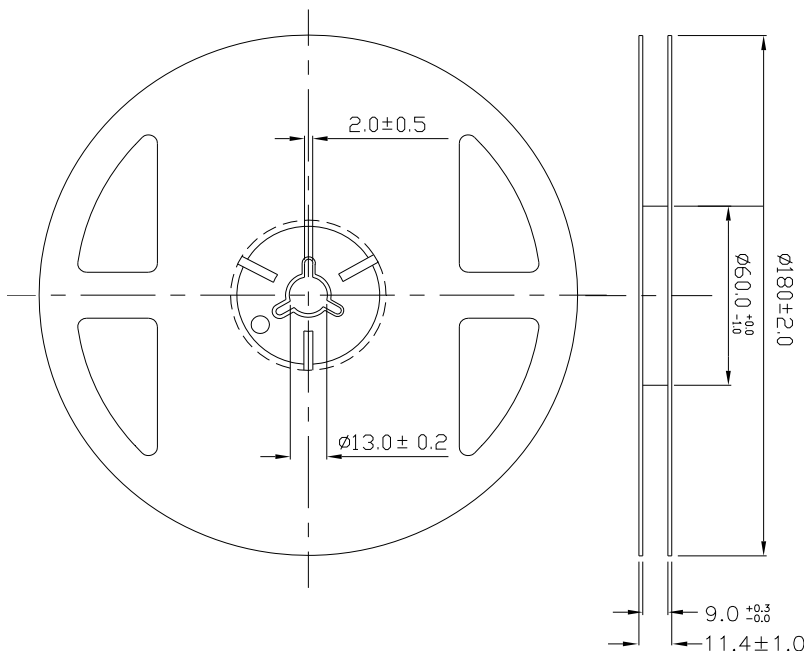
Moisture Resistant Packing Materials

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

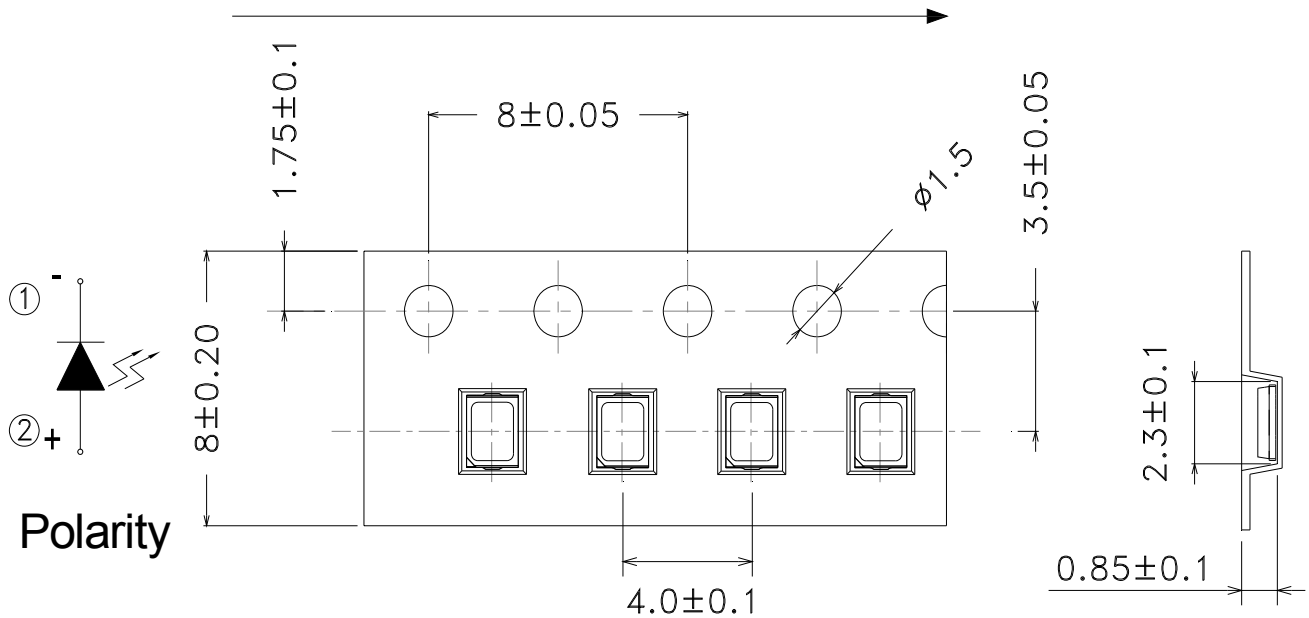
Reel Dimensions



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

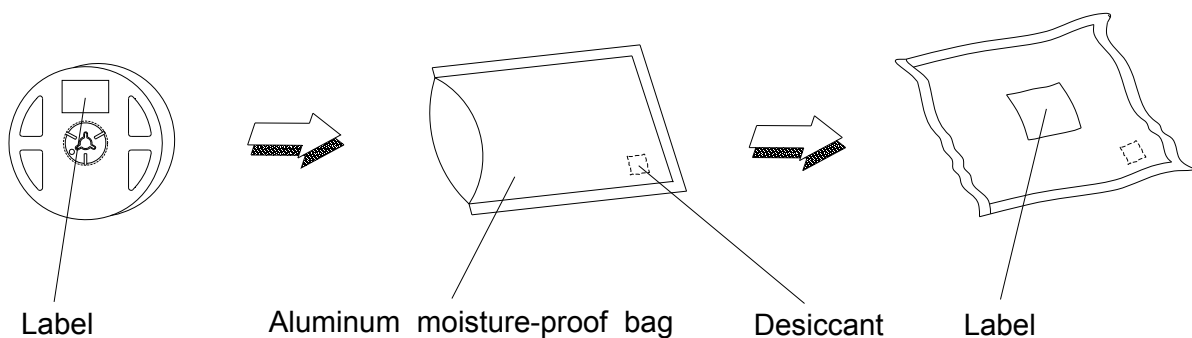
Carrier Tape Dimensions: Loaded Quantity 250 /500/1000/2000 pcs. Per Reel

Progress Direction



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

Moisture Resistant Packing Process



Reliability Test Items and Conditions

The reliability of products XYall be satisfied with items listed below.

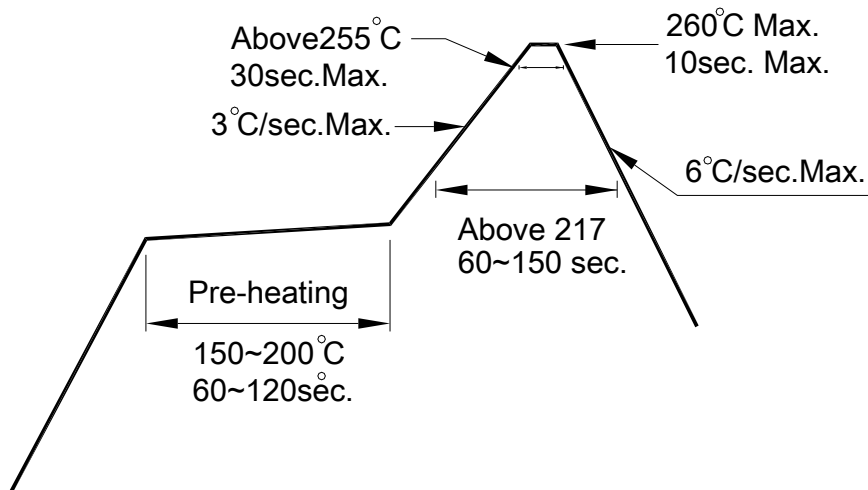
Confidence level : 90%

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 Reverse Bias	Ta=85°C,85%RH	1000 Hrs.	22 PCS.	0/1
5	High Temperature/Humidity Operation	Ta=85°C,85%RH, I _F = 40 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, I _F = 75 mA	1000 Hrs.	22 PCS.	0/1
9	High Temperature Operation/ Life#1	Ta=25°C, I _F = 75 mA	1000 Hrs.	22 PCS.	0/1
10	High Temperature Operation/ Life#2	Ta=55°C, I _F =75 mA	1000 Hrs.	22 PCS.	0/1
11	High Temperature Operation/ Life#3	Ta=85°C, I _F = 40 mA	1000 Hrs.	22 PCS.	0/1

Precautions for Use

1. Over-current-proof
Customer must apply resistors for protection; otherwise slight voltage XYift 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 XYould 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 XYould 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 XYould be performed using the following conditions.
Baking treatment: 60±5°C for 24 hours.
3. Soldering Condition
 - 3.1 Pb-free solder temperature profile



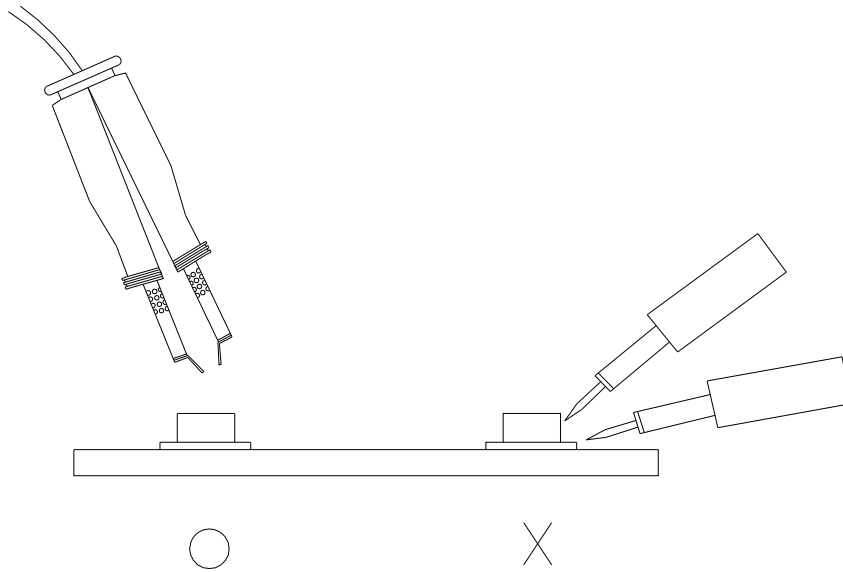
- 3.2 Reflow soldering XYould not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

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



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