BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

ISO/TS 16949:2009 BS EN ISO 14001:2004 QC 080000 IECQ HSPM

PRODUCT DATASHEET

- ► EMC 4-PINs SMD
- ► 5050 0.70t
- ► Cool White 5700K / Warm White 2700K

Release Date: 17 December 2024 Version: A1.1

N0D68S48

5050 EMC Series

RoHS Compliant

FEATURES:

- **Package:** Top View EMC Package with Duo Whites
- **Forward Current:** 300/300mA *
- **Forward Voltage (typ.):** 9.5/9.5V
- **Luminous Flux (typ.):** 420/390lm@300mA
- **Colour:** Cool White/Warm White
- **Colour Temperature (typ.):** 5700/2700K
- **Viewing Angle:** 120°
- **Materials:**
  - Die: InGaN/InGaN
  - Resin: Silicon (Yellow Diffused)
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **Grouping Parameters:**
  - Forward Voltage
  - Luminous Flux
  - CIE Chromaticity
- **Soldering Methods:** Reflow Soldering
- **MSL Level:** MSL3 according to J-STD020
- **Packing:** 12mm tape with max.2000/reel, ø178mm (7'')

* in order of Cool White/Ware White

APPLICATIONS:

- General Lighting
- Architectural Lighting
- Portable Lighting
- Commercial Lighting
- Streetlight
- Tunnel Light
- Indoor Lighting
- Downlight & Spotlight

CHARACTERISTICS:

Absolute Maximum Characteristics (T_a=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	300	mA
Pulse Forward Current (Duty 1/10, width≤100μS)	I_{PF}	450	mA
Power Dissipation	P_D	3300	mW
Reverse Voltage	V_R	7	V
Reverse Current @10V	I_R	10	μA
Junction Temperature	T_j	120	°C
Thermal Resistance (Junction to Solder Point) (5700K/2700K)	R_{THJ-SP}	6/6	°C/W
Thermal Resistance (Junction to Solder Point) (Mixed)	R_{THJ-SP}	3	°C/W
Operating Temperature	T_{OPR}	-40~+105	°C
Storage Temperature	T_{STG}	-40~+105	°C
Soldering Temperature	T_{SOL}	230/260 for 10S	°C
Colour Rendering Index	CRI	typ.82	---

1. R_{THJ-SP} is the thermal resistance from LED junction to solder point on MCPCB with electrical power.

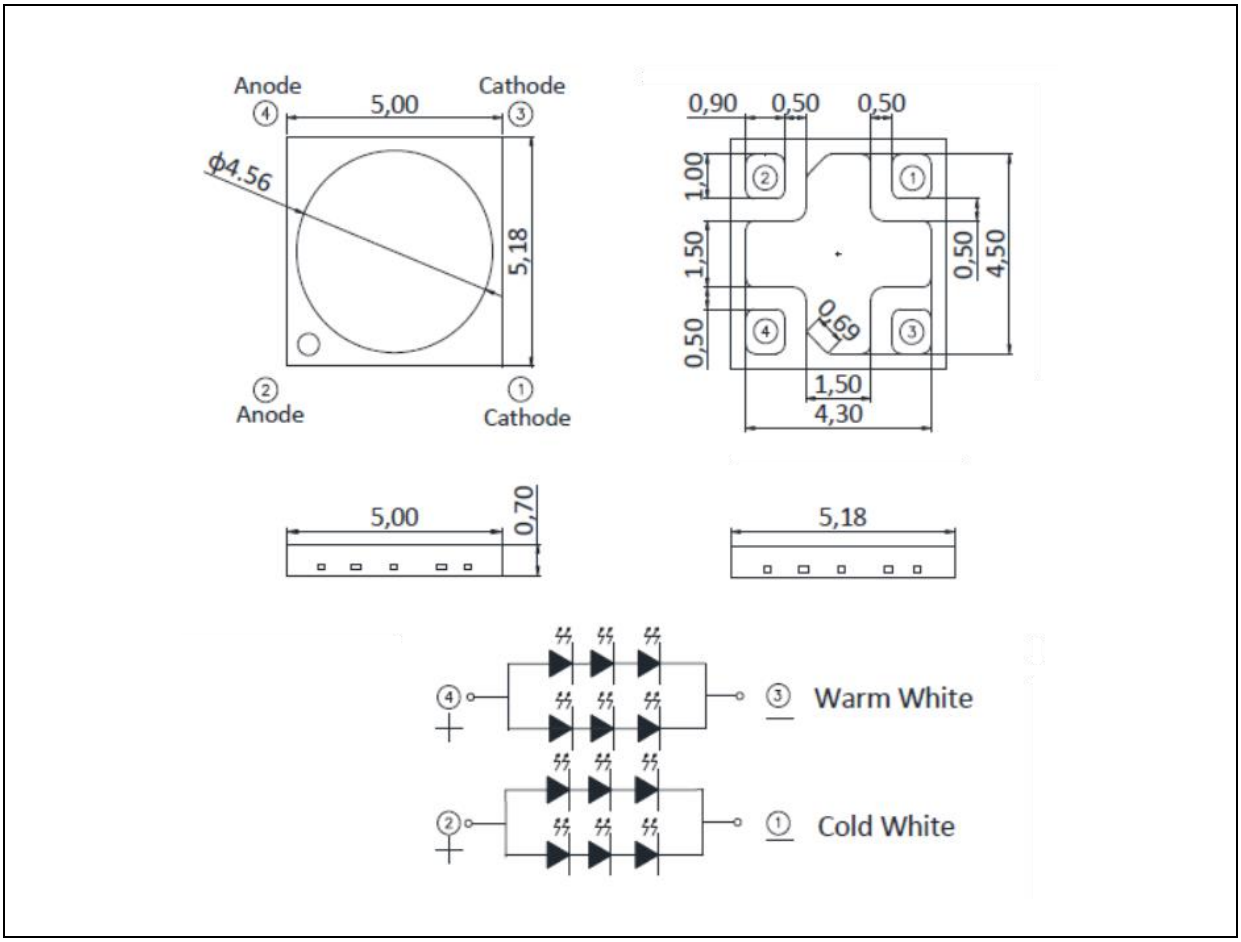
Electrical & Optical Characteristics (T_a=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	9.0/9.0 *	9.5/9.5	11.0/11.0	V	I_F=300mA
Luminous Flux	Φ_V	400/350	430/390	---/---	lm	I_F=300mA
Colour Temperature	CCT	---/---	5700/2700	---/---	K	I_F=300mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=300mA

2. Luminous flux (Φ_V) ±7%, Forward Voltage (V_F) ±0.1V, CRI ±2
3. * in order of Cool White/Ware White

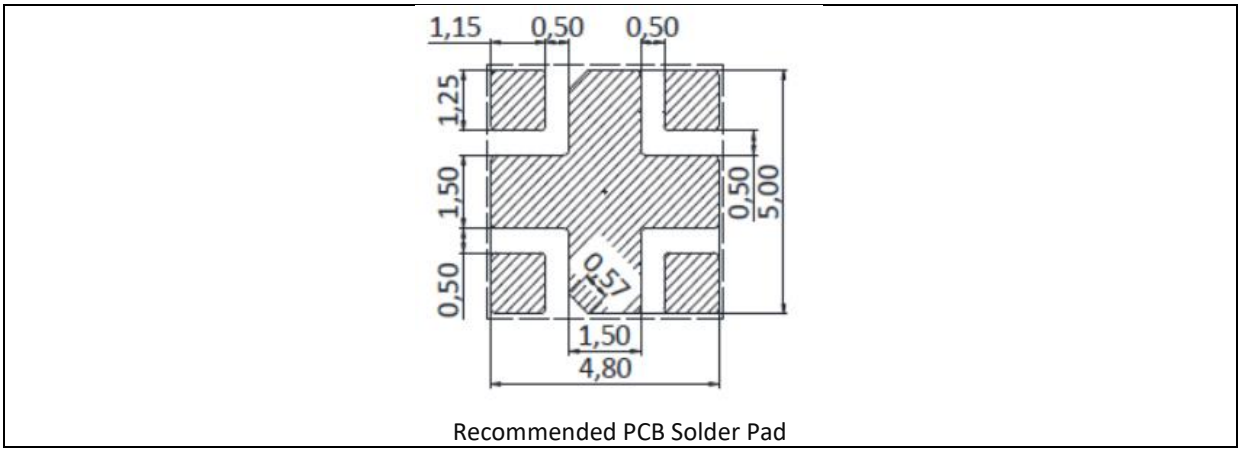
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.2mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad

1. Dimensions are in millimetre (mm).
2. Tolerance ±0.2mm with angle tolerance ±0.5°.

BINNING GROUPS:

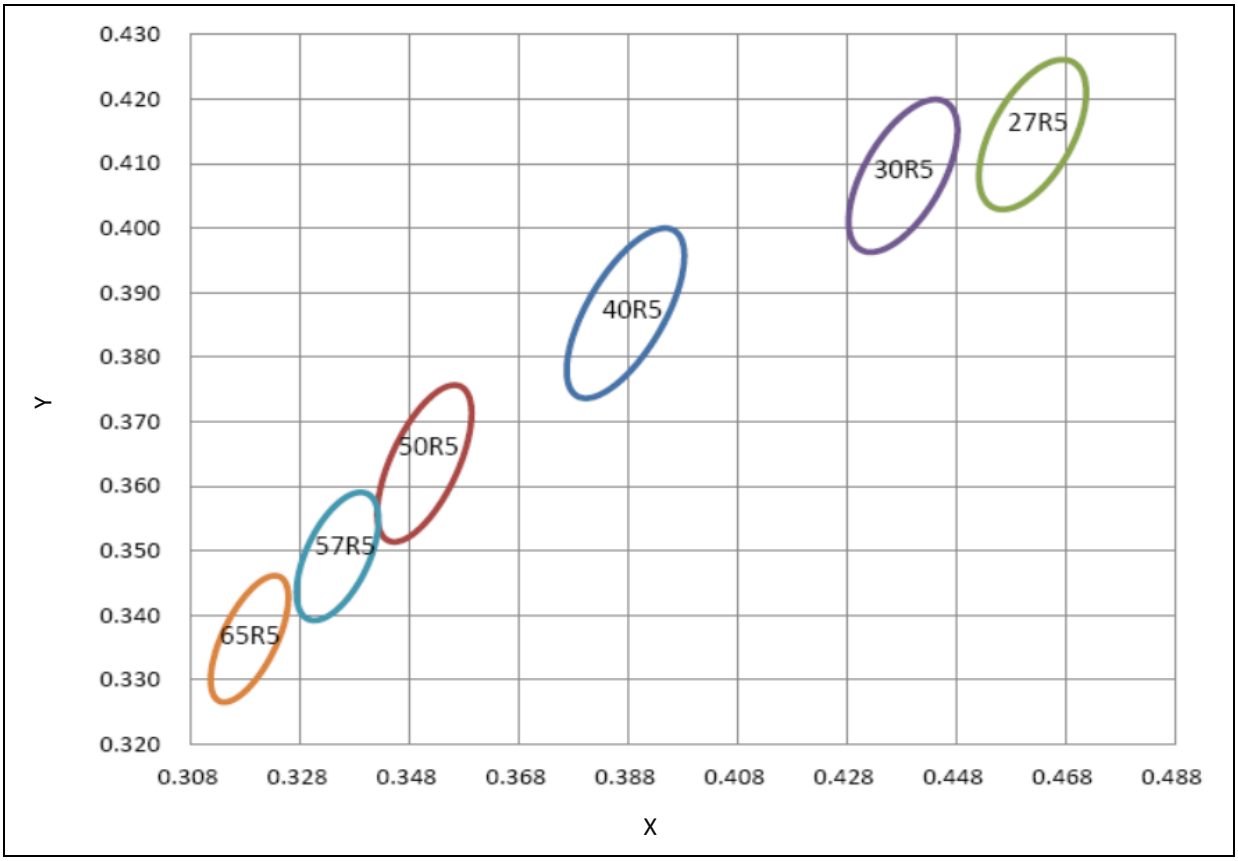
Forward Voltage Classifications (I_F = 300mA):

Code	Min.	Max.	Unit
1D	9	10	V
1E	10	11	

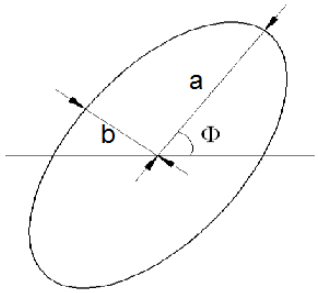
Luminous Flux Classifications (I_F = 300mA):

Code	Min.	Max.	Unit
3P	350	450	lm
3M	400	500	

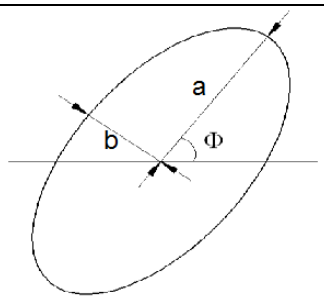
CIE CHROMATICITY DIAGRAM:



Chromaticity Coordinates Classifications (I_F = 300mA):



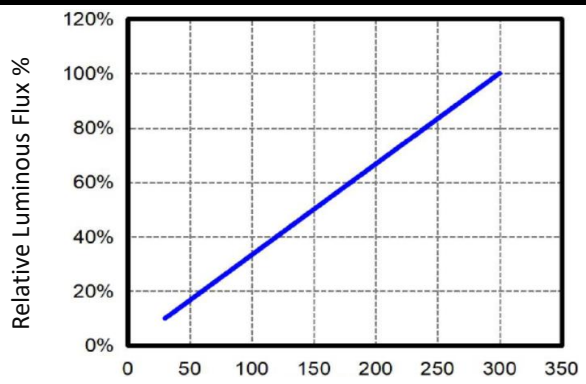
Code	Centre		Radius		Angle
	X	Y	a	b	Φ
5700K-3STEP	0.3290	0.3417	0.006705	0.003300	58.35
5700K-5STEP	0.3290	0.3417	0.011175	0.005500	58.35



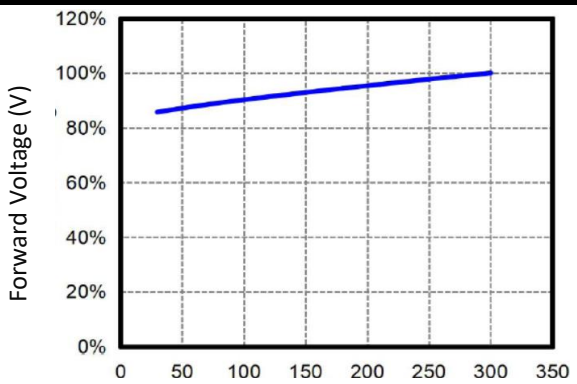
Code	Centre		Radius		Angle
	X	Y	a	b	Φ
2700K-3STEP	0.4582	0.4099	0.008100	0.004200	53.42
2700K-5STEP	0.4582	0.4099	0.013500	0.007000	53.42

ELECTRO-OPTICAL CHARACTERISTICS:

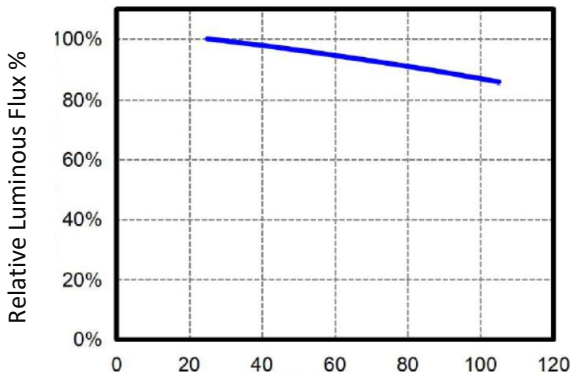
Relative Luminous Flux v.s. Forward Current



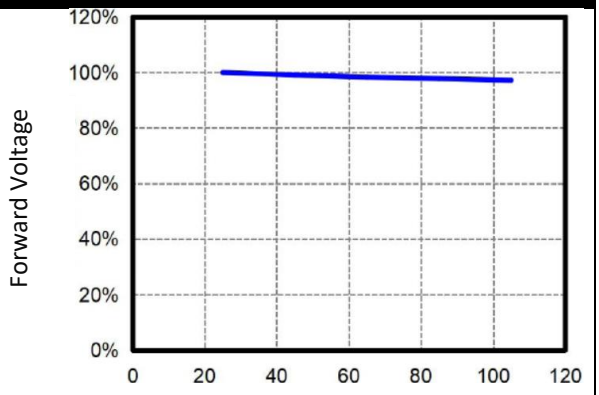
Forward Current v.s. Forward Voltage



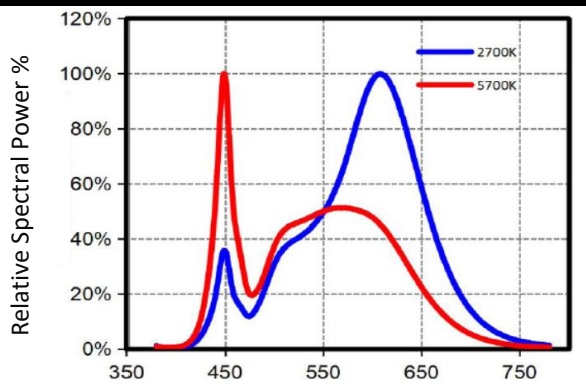
Relative Luminous Flux v.s. Solder Temperature



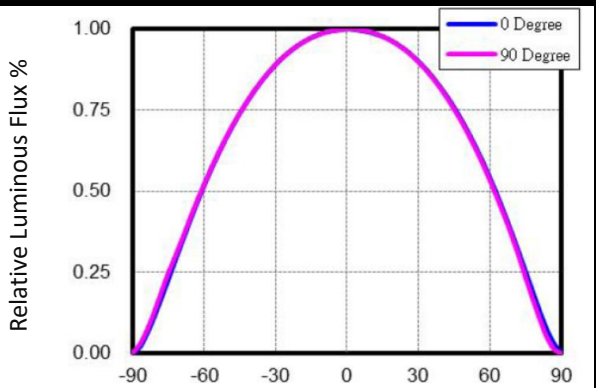
Forward Voltage v.s. Solder Temperature



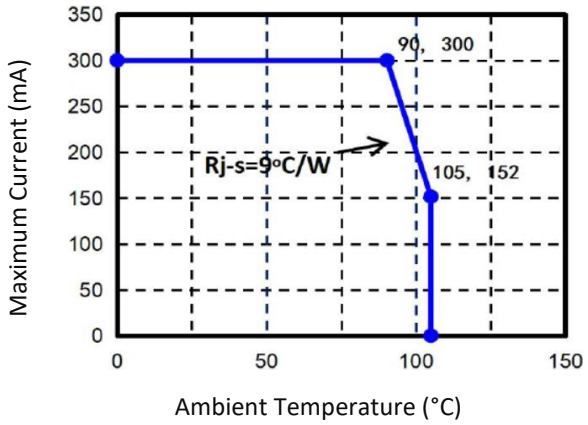
Relative Spectral Power v.s. Wavelength



Directive Radiation

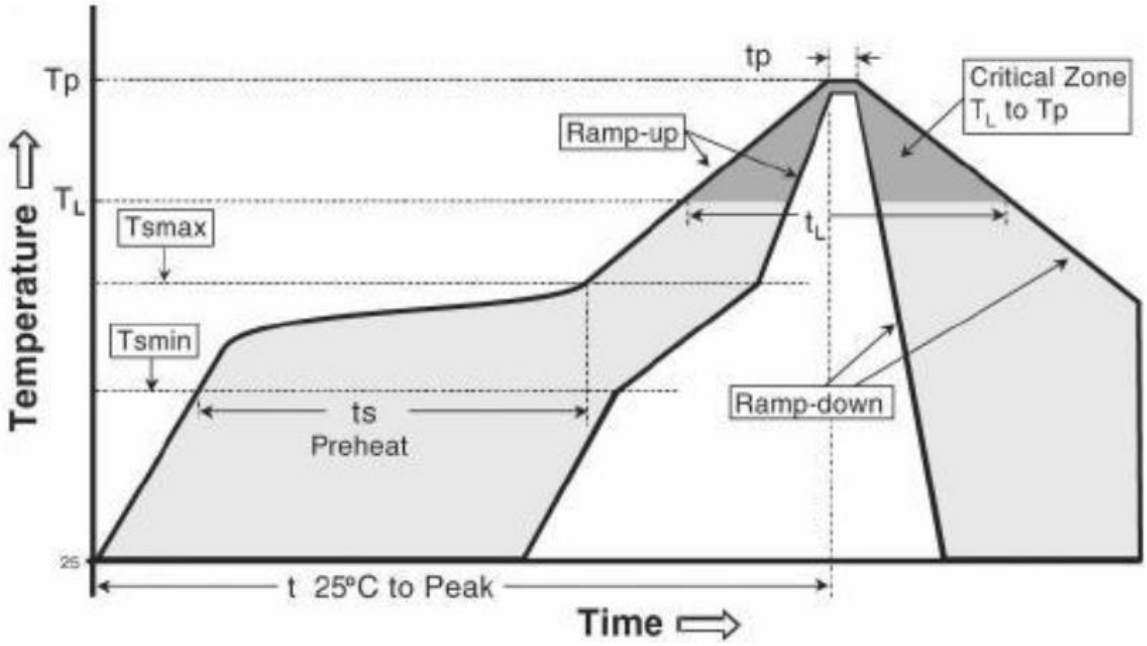


Forward Current Derating Curve



RECOMMENDED SOLDERING PROFILE:

Reflow Lead-free Solder:



Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Period from T_{smin} to T_{smax}	60-120 seconds
Ramp-up Rate (T_L to T_P)	Max. 3°C/second
Liquidous Temperature (T_L)	217°C
Time Maintained above T_L	60-150 seconds
Peak Package Temperature (T_P)	Max. 260°C
Time within 5°C of the Specified Classification Temperature T_C	Max. 30 seconds
Ramp-down Rate (T_P to T_L)	Max. 6°C/second
Time from 25°C to Peak Temperature	Max. 8 mins

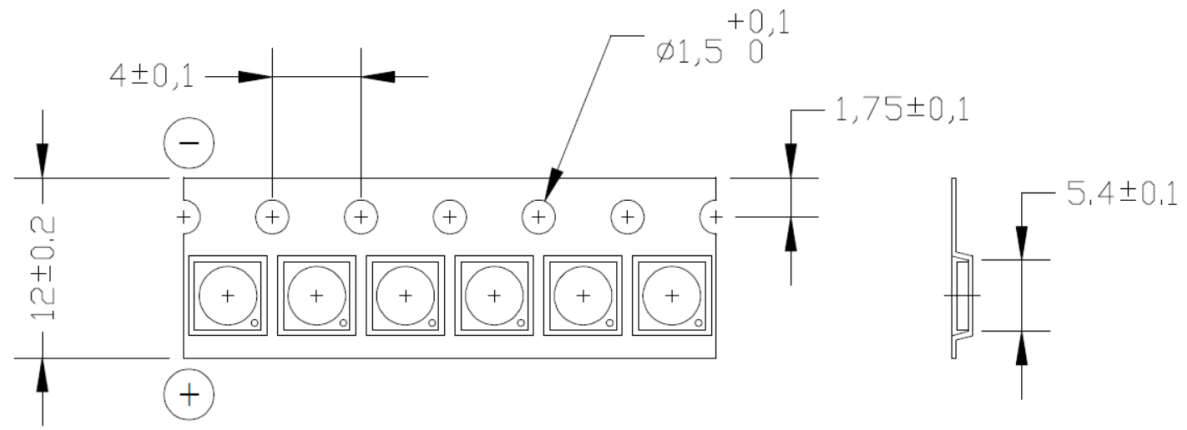
Note:

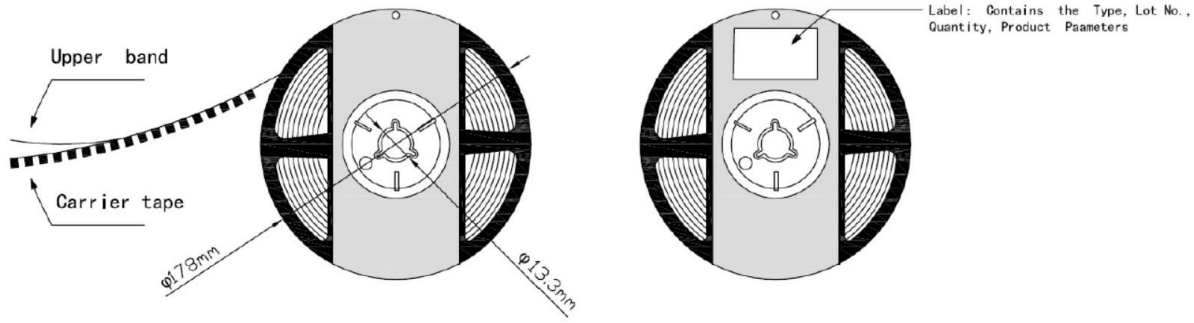
1. Maximum reflow soldering: 2 times.
2. Before, during, and after soldering, should not apply stress on the components and PCB board.
3. Recommended soldering temperature: 230°C. The maximum soldering temperature should be limited to 260°C for max. 10seconds.

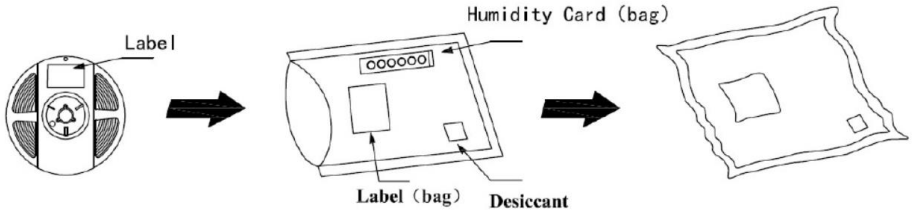
PACKING SPECIFICATION:

Reel Dimension:

Max.2000pcs/reel







PRECAUTIONS OF USE:

Storage:

It is recommended to store the products in the following conditions:

- Humidity: 60% R.H. Max.
- Temperature: 5°C~30°C (41°F ~86°F).

Shelf life in sealed bag: 12 months at 5°C~30°C and <60% R.H.

Once the package is opened, the products should be used within a week. Otherwise, they should be kept in a damp-proof box with descanting agent <10% R.H. and apply baking before use.

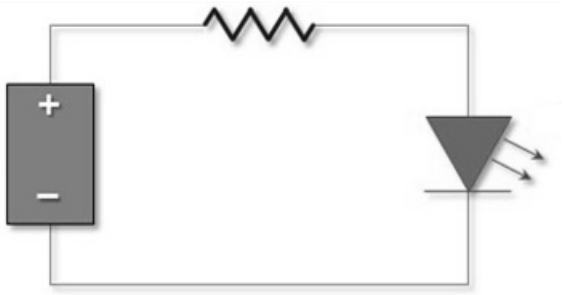
Baking:

It is recommended to bake the LED before soldering if the pack has been unsealed for longer than 24hrs. The suggested baking conditions are as followings:

- 60±5°C x 24hrs and <5%RH, taped / reel package.

It's normal to see slight color fading of carrier (light yellow) after baking in process.

Testing Circuit:



Must apply resistor(s) for protection (over current proof).

Cleaning:

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED carrier / package. Avoid putting any stress force directly on to the LED lens.

ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrosatic glove is recommended when handing the LED all time. All devices, equipment, machinery, work tables, and storage racks must be properly grounded.

In the events of manual working in process, make sure the devices are well protected from ESD at any time.

REVISION RECORD:

Version	Date	Summary of Revision
A1.0	24/03/2023	Datasheet set-up.
A1.1	17/12/2024	New datasheet format.