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

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

- ▶ PLCC2 Top View SMD
- ▶ 2214 1.3t
- ▶ Natural White 4550K

Release Date: 15 July 2022 Version: A1.2

N0W51S34Z

2214 1.3t Series

2214 1.3t Series

RoHS Compliant

AUTOMOTIVE AEC-Q102

FEATURES:

- **Package:** PLCC2 Single Colour Top View SMD
- **Forward Current:** 20mA
- **Forward Voltage (typ.):** 3.0V
- **Luminous Intensity (typ.):** 2050mcd@20mA
- **Colour:** Natural White
- **Colour Temperature (CCT):** 4300~4800K
- **Viewing angle:** 120°
- **Materials:**
  - Die: InGaN
  - Resin: Silicone (Yellow Diffused)
  - Finishing: Ag plated
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **ESD (HBM):** 6KV
- **Grouping parameters:**
  - Forward voltage
  - Luminous intensity
  - CIE Chromaticity
- **Soldering methods:** Reflow
- **MSL:** acc. to JEDEC Level 2a
- **Packing:** 8mm tape with max.3000/reel, ø180mm (7'')

APPLICATIONS:

- Automotive
- Backlighting
- Indication Light
- Switch light
- Dashboard
- Decoration Lighting

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I_F	30	mA
Peak Forward Current Duty 1/10; width 0.1ms	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Junction Temperature	T_j	125	°C
Thermal Resistance Junction to Solder Point	R_{thJ-S}	130	°C/W
Thermal Resistance Junction to Ambient Point	R_{thJ-A}	260	°C/W
Operating Temperature	T_{OPR}	-40~+105	°C
Storage Temperature	T_{STG}	-40~+105	°C

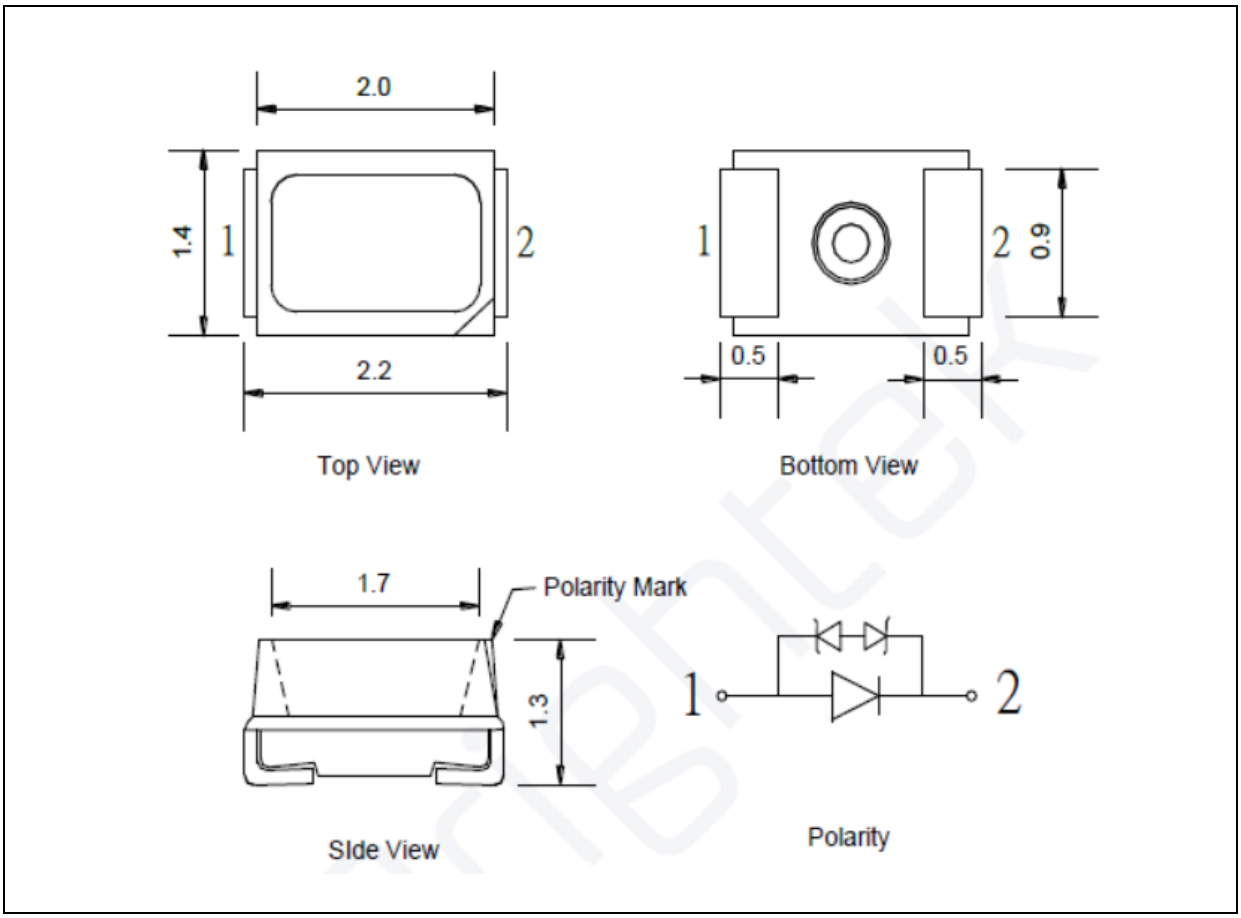
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.8	3.0	3.4	V	I_F=20mA
Luminous Intensity	I_V	1650	2050	---	mcd	I_F=20mA
Chromaticity Coordinates	X	---	0.3600	---	---	I_F=20mA
	Y	---	0.3625	---		
Peak Wavelength	λ_p	---	448	---	nm	I_F=20mA
Spectral Width 50%	$\Delta\lambda$	---	20	---	nm	I_F=20mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=20mA

1. Luminous intensity (I_V) ±10%, Forward Voltage (V_F) ±0.1V.

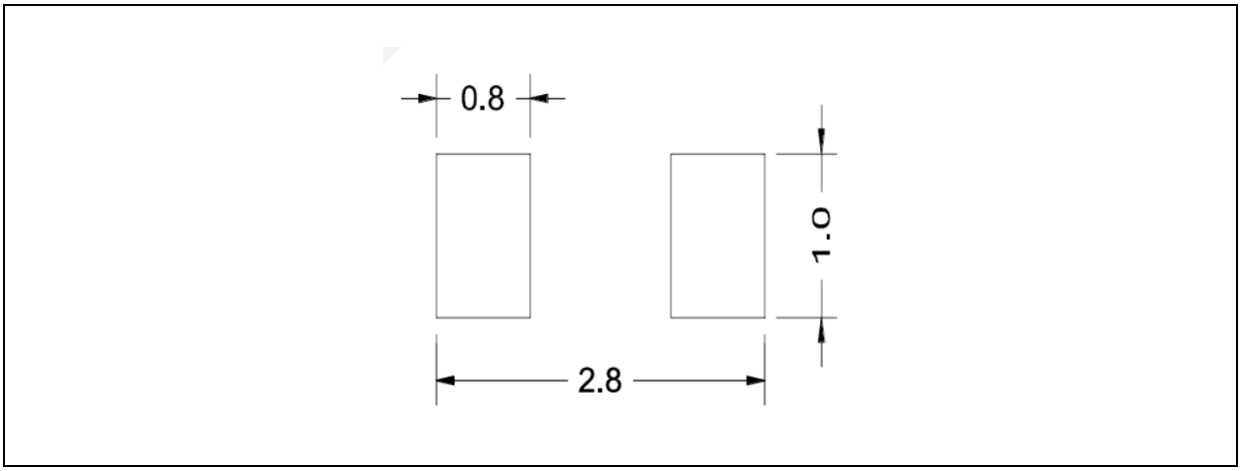
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance ±0.1mm with angle tolerance ±0.5°.

BINNING GROUPS:

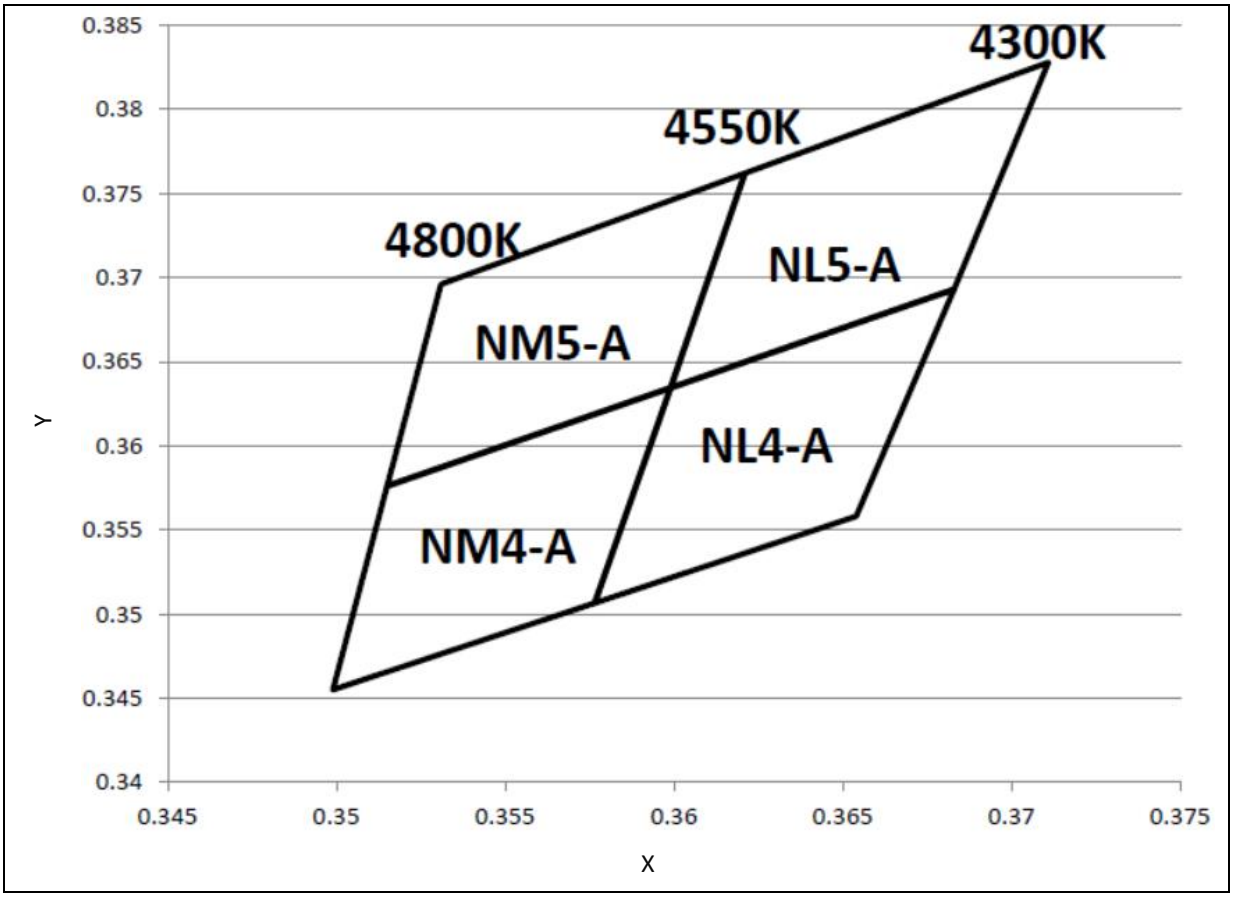
Forward Voltage Classifications (I_F = 20mA):

Code	Min.	Max.	Unit
B	2.8	2.9	V
C	2.9	3.0	
D	3.0	3.1	
E	3.1	3.2	
F	3.2	3.3	
G	3.3	3.4	

Luminous Intensity Classifications (I_F = 20mA):

Code	Min.	Max.	Unit
4	1650	1850	mcd
5	1850	2050	
6	2050	2250	
7	2250	2450	

CIE CHROMATICITY DIAGRAM:

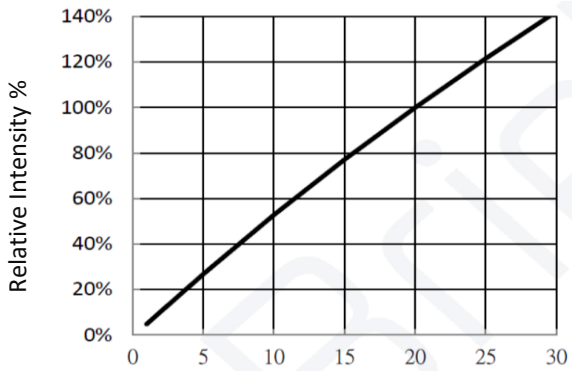


Chromaticity Coordinates Classifications (I_F = 20mA):

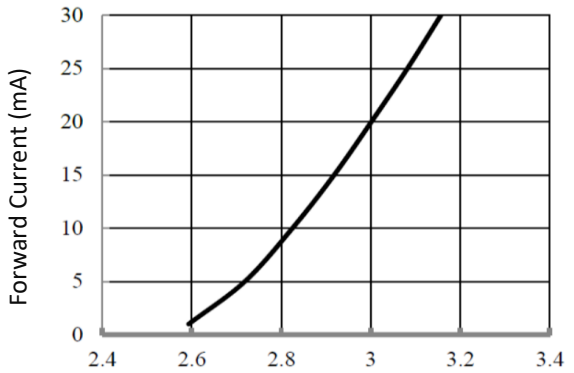
	1		2		3		4	
	X	Y	X	Y	X	Y	X	Y
NM5-A	0.3531	0.3696	0.3621	0.3762	0.3599	0.3634	0.3515	0.3576
NL5-A	0.3621	0.3762	0.3711	0.3828	0.3683	0.3693	0.3599	0.3634
NM4-A	0.3515	0.3576	0.3599	0.3634	0.3576	0.3506	0.3499	0.3455
NL4-A	0.3576	0.3506	0.3599	0.3634	0.3683	0.3693	0.3654	0.3558

ELECTRO-OPTICAL CHARACTERISTICS:

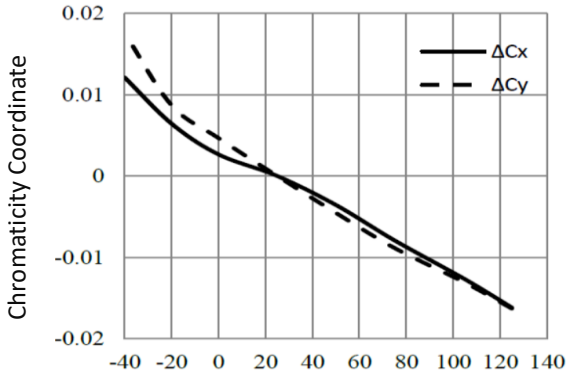
Relative Intensity v.s. Forward Current



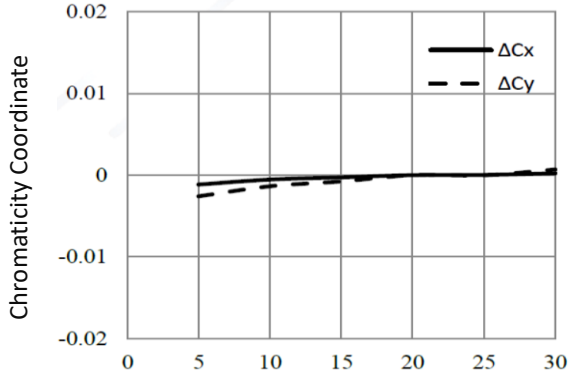
Forward Current v.s. Forward Voltage



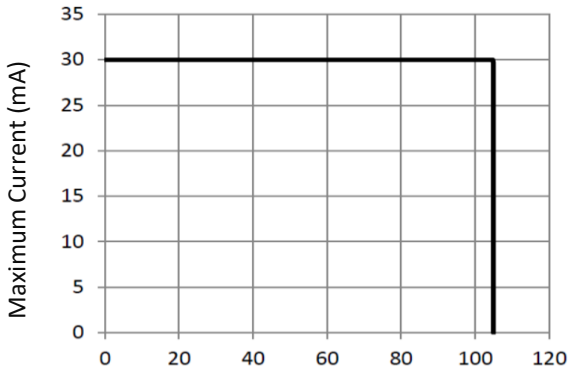
Temperature v.s. Chromaticity Coordinate



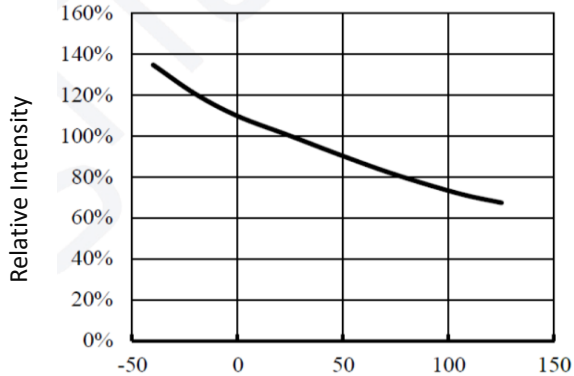
Current v.s. Chromaticity Coordinate



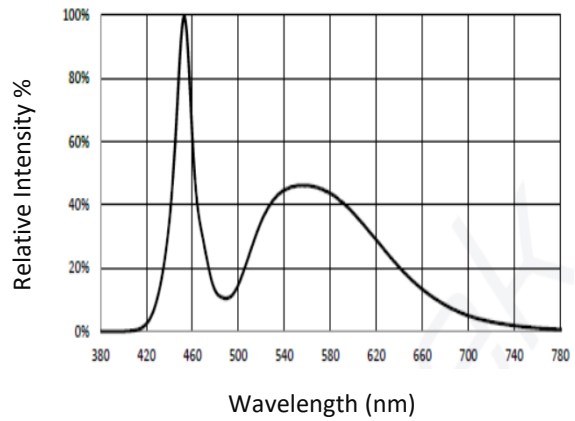
Temperature Derating Chart



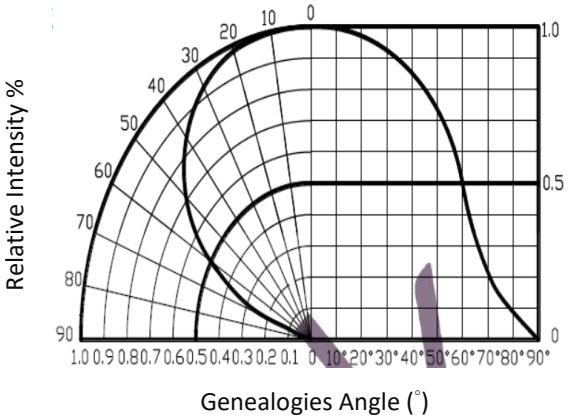
Relative Intensity Flux v.s. Ambient Temperature



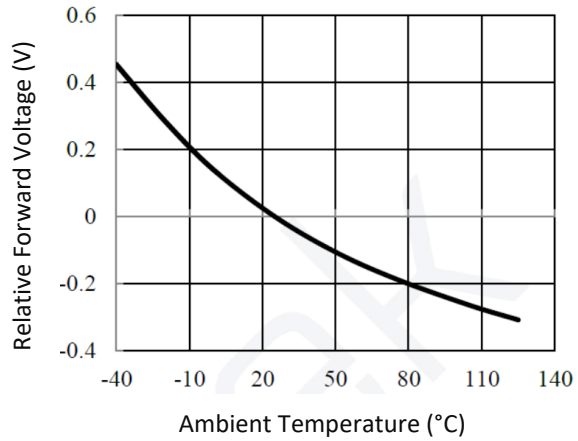
Relative Intensity v.s. Wavelength



Relative Intensity v.s. Angular Displacement

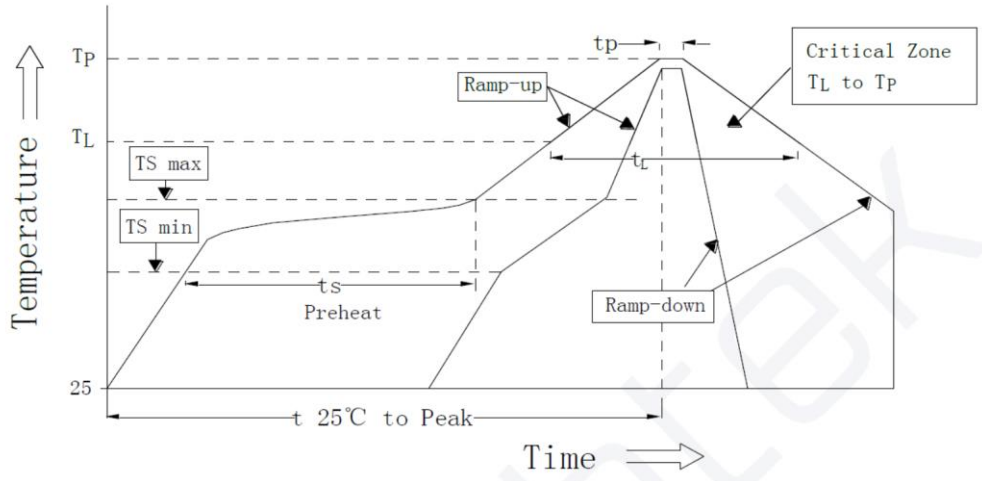


Relative Forward Voltage v.s. Temperature



RECOMMENDED SOLDERING PROFILE:

Reflow solder:



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Min.	Recommendation	Max.	
Ramp-up rate to preheat (25°C to 150°C)	-	-	2	3	K/s
Time t_S ($T_{S\ min}$ to $T_{S\ max}$)	t_S	60	100	120	s
Ramp-up rate to peak ($T_{S\ max}$ to T_P)	-	-	2	3	K/s
Liquidus temperature	T_L	-	217	-	°C
Time above liquidus temperature	t_L	-	80	100	s
Peak temperature	T_P	-	245	260	°C
Time within 5 °C of the specified peak temperature T_P - 5 K	t_P	-	-	10	s
Ramp-down Rate (T_P to 100 °C)	-	-	3	4	K/s
Time 25 °C to T_P	-	-	-	480	s

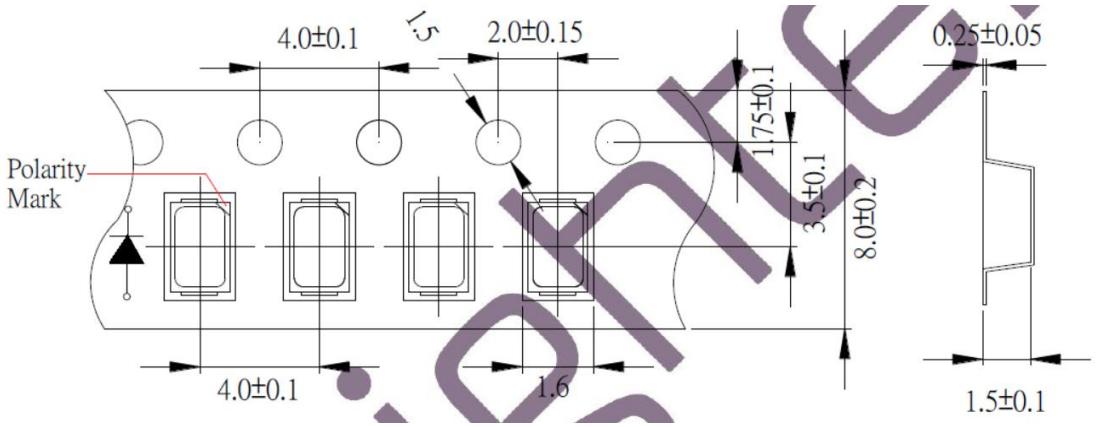
Note:

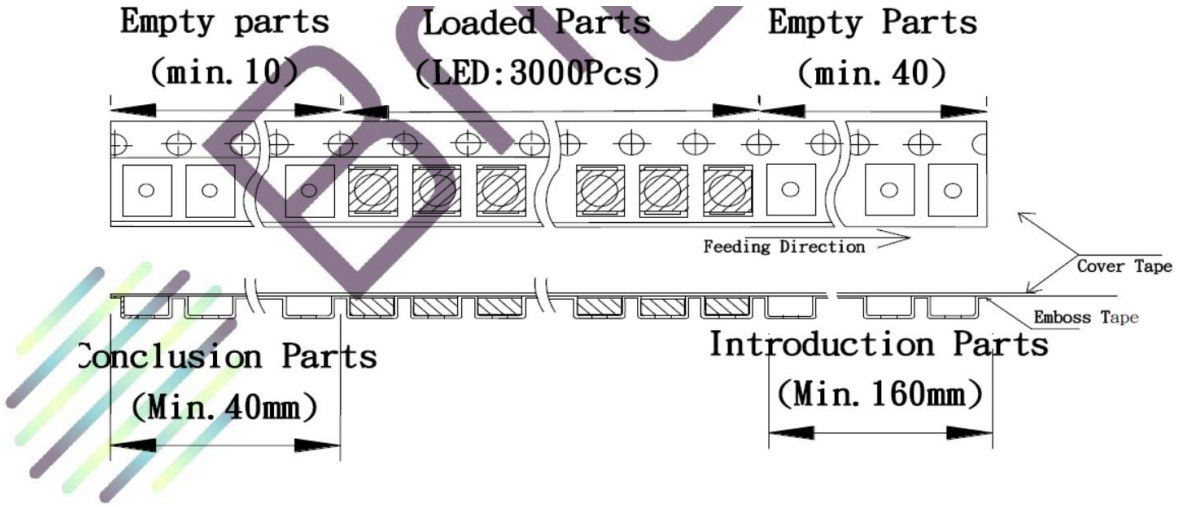
1. Recommend reflow temperature 240°C. The maximum soldering temperature should be limited to 260°C.
2. Maximum reflow soldering: 3 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

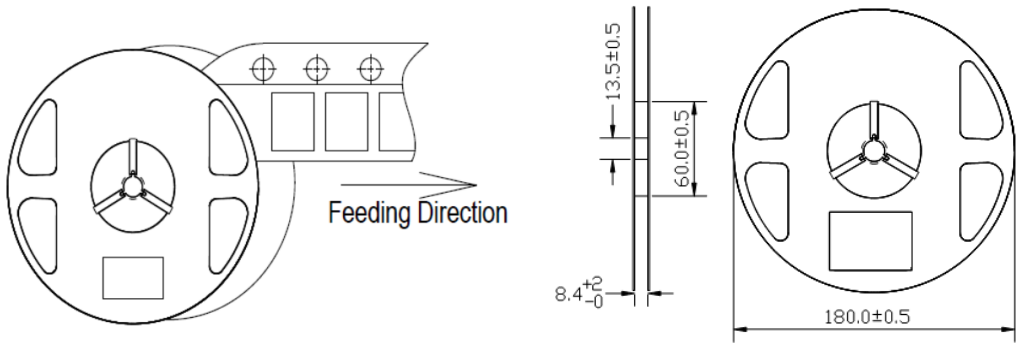
PACKING SPECIFICATION:

Reel Dimension:

Max.3000pcs/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 4 weeks. Otherwise, they should be kept in a damp-proof box with descanting agent <10% R.H. and apply baking before use.

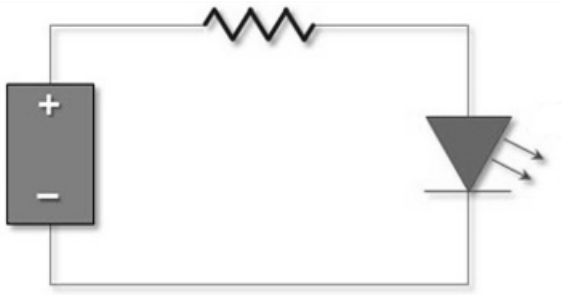
Baking:

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±3°C x 6hrs 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	27/04/2020	Datasheet set-up.
A1.1	28/05/2022	New datasheet format.
A1.2	15/07/2022	Add thermal resistance data.

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