



**BRIGHTTEK**  
**BRIGHTTEK (EUROPE) LIMITED**

*Brighten Up The World With LED!*



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 080000 IECQ HSPM

## PRODUCT DATASHEET



- ▶ PLCC4 SMD
- ▶ 3528 1.9t Series
- ▶ Yellow (590nm)

# NOY60S54-50MA



Release Date: 04 June 2022 Version: A1.1



### 3528 1.9t Series

**RoHS Compliant**



**AUTOMOTIVE AEC-Q102**

#### FEATURES:

- **Package:** PLCC4 Top View White SMT Package
- **Forward Current:** 50mA
- **Forward Voltage (typ.):** 2.3V
- **Luminous Intensity (typ.):** 3000mcd@50mA
- **Colour:** Yellow
- **Wavelength:** 585~594nm
- **Viewing angle:** 120°
- **Materials:**
  - Resin: Silicon (Water Clear)
  - L/T Finish: Ag plated
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **ESD (HBM):** 2kV
- **Grouping parameters:**
  - Forward voltage
  - Luminous intensity
  - Dominant Wavelength
- **Soldering methods:** IR Reflow
- **MSL:** acc. to JEDEC Level 2a (J-STD20D)
- **Packing:** 8mm tape with max.2000/reel, ø180mm (7")

#### APPLICATIONS:

- Automotive
- Decorative Lighting
- Indicator
- Backlighting
- Dashboard
- Display
- Information Board
- Light Strip

## CHARACTERISTICS:

### Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
Forward Current	I <sub>F</sub>	70	mA
Pulse Forward Current Duty 1/10, width 0.1mS	I <sub>PF</sub>	150	mA
Reverse Voltage	V <sub>R</sub>	10	V
Reverse Current @10V	I <sub>R</sub>	10	μA
Junction Temperature	T <sub>J</sub>	125	°C
Thermal Resistance Junction to Solder Point	R <sub>thJ-S</sub>	100	°C/W
Thermal Resistance Junction to Ambient Point	R <sub>thJ-A</sub>	200	°C/W
Electrostatics Discharge (HBM)	ESD	2000	V
Operating Temperature	T <sub>OPR</sub>	-40~+105	°C
Storage Temperature	T <sub>STG</sub>	-40~+105	°C
Soldering Temperature	T <sub>SD</sub>	260	°C

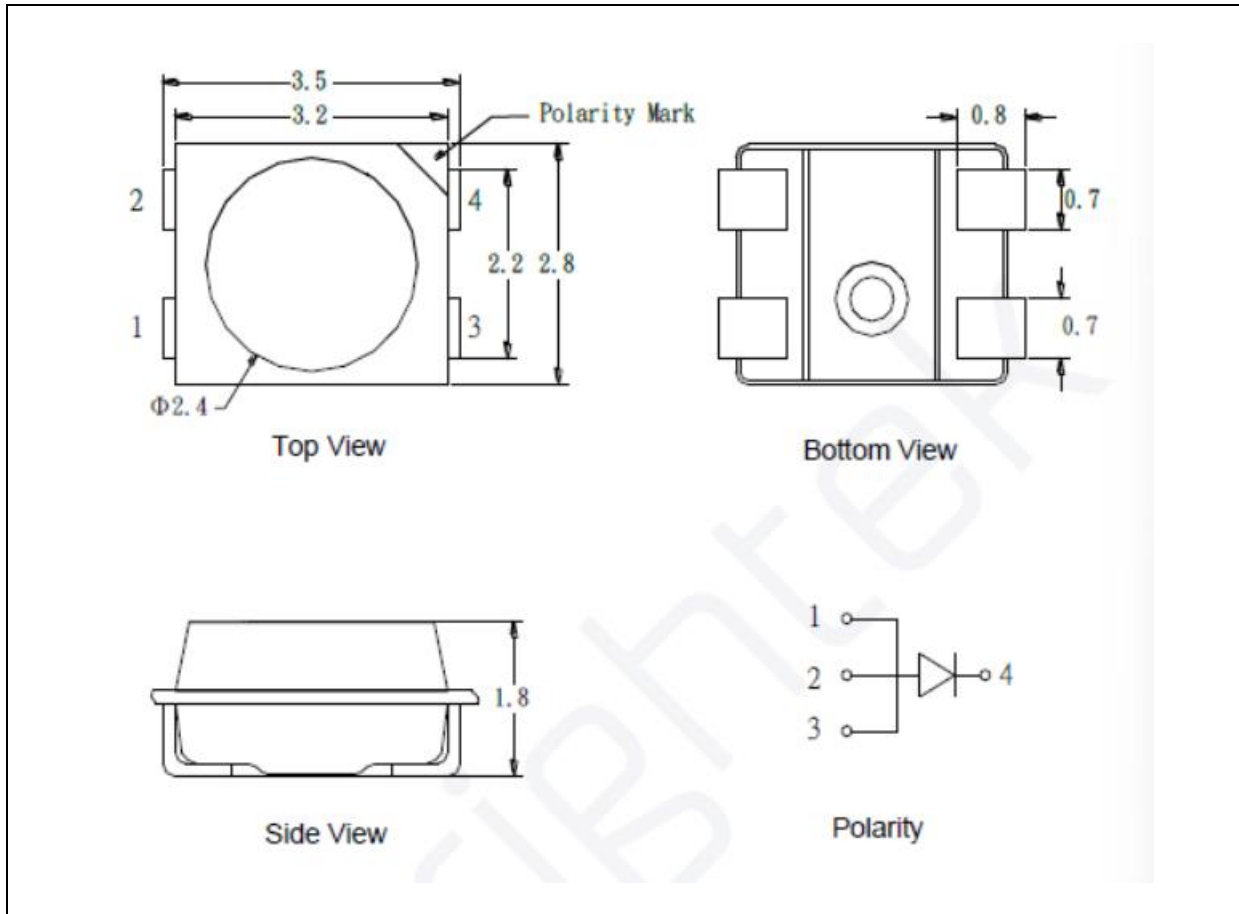
### Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V <sub>F</sub>	2.0	---	2.6	V	I <sub>F</sub> =50mA
Luminous Intensity	I <sub>v</sub>	2000	3000	---	mcd	I <sub>F</sub> =50mA
Dominant Wavelength	λ <sub>D</sub>	585	---	594	nm	I <sub>F</sub> =50mA
Peak Wavelength	λ <sub>P</sub>	---	593	---	nm	I <sub>F</sub> =50mA
Spectral Width 50%	Δλ	---	14	---	nm	I <sub>F</sub> =50mA
Viewing Angle	2θ <sub>1/2</sub>	---	120	---	deg	I <sub>F</sub> =50mA

1. Luminous intensity (I<sub>v</sub>) ±10%, Forward Voltage (V<sub>F</sub>) ±0.1V, Viewing angle(2θ<sub>1/2</sub>) ±5%, Wavelength ±1nm

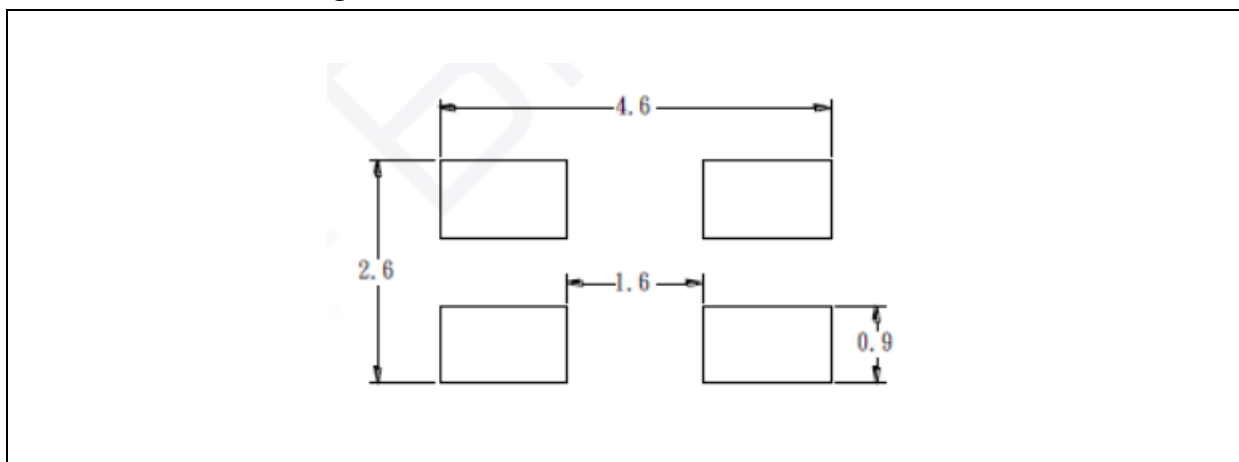
## OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



1. Dimensions are in millimetre (mm).
2. Tolerance  $\pm 0.1$ mm with angle tolerance  $\pm 0.5^\circ$ .

**BINNING GROUPS:**


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 Forward Voltage Classifications ( $I_F = 50\text{mA}$ ):

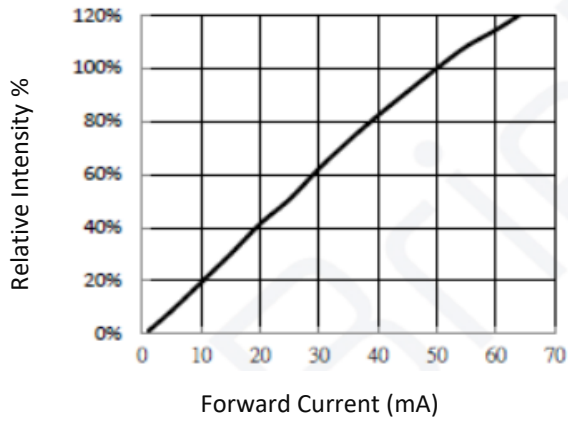
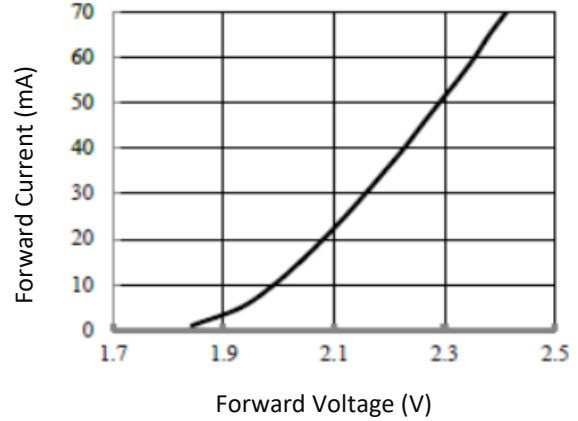
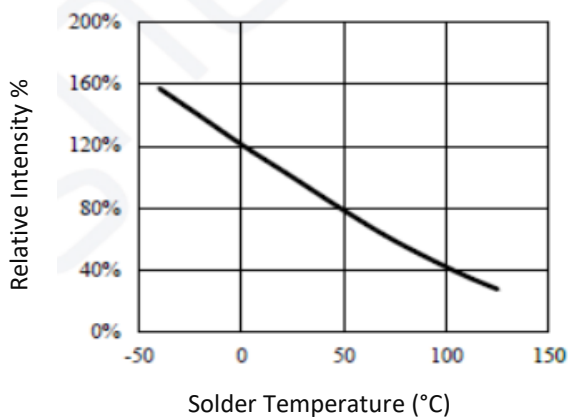
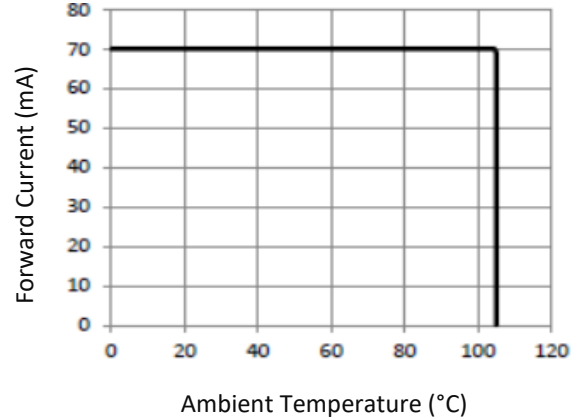
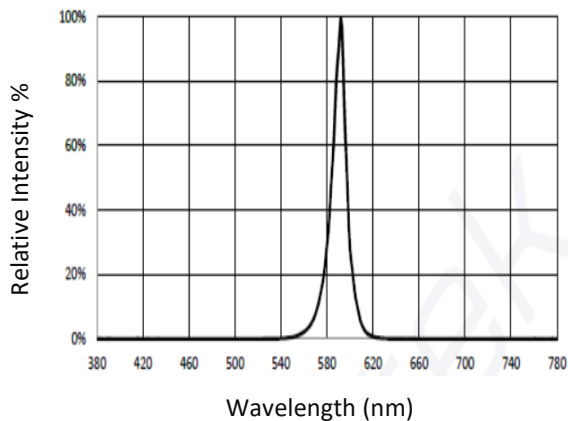
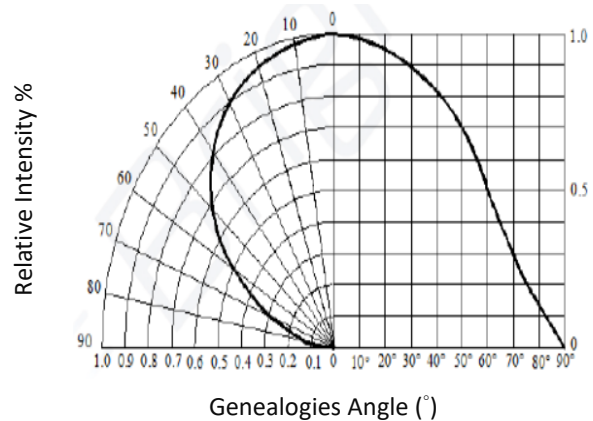
Code	Min.	Max.	Unit
F	2.0	2.2	V
G	2.2	2.4	
H	2.4	2.6	

 Luminous Intensity Classifications ( $I_F = 50\text{mA}$ ):

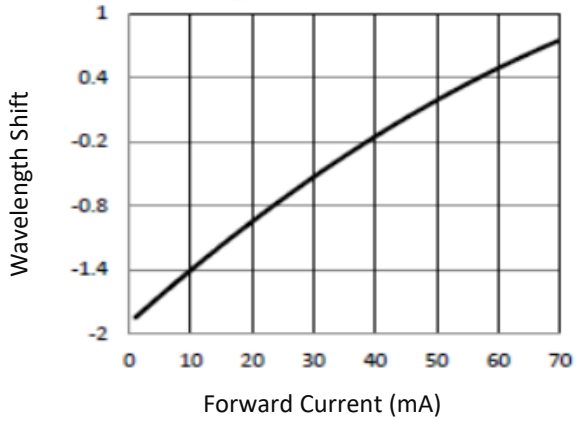
Code	Min.	Max.	Unit
25	2000	2500	mcd
26	2500	3200	
27	3200	4000	

 Dominant Wavelength Classifications ( $I_F = 50\text{mA}$ ):

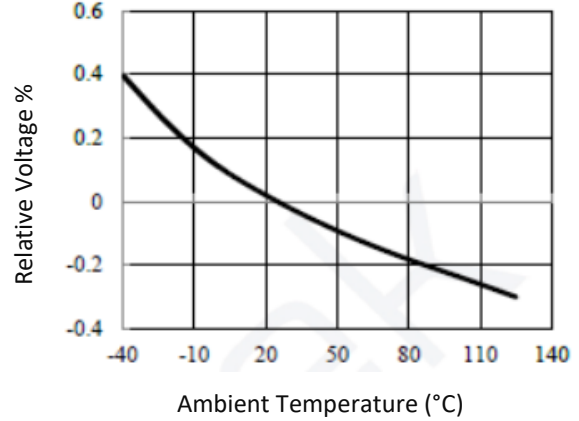
Code	Min.	Max.	Unit
C	585	588	nm
D	588	591	
E	591	594	

**ELECTRO-OPTICAL CHARACTERISTICS:**
**Relative Intensity v.s. Forward Current**

**Forward Current v.s. Forward Voltage**

**Relative Intensity v.s. Temperature**

**Forward Current Derating Curve**

**Relative Intensity v.s. Wavelength**

**Directive Radiation**


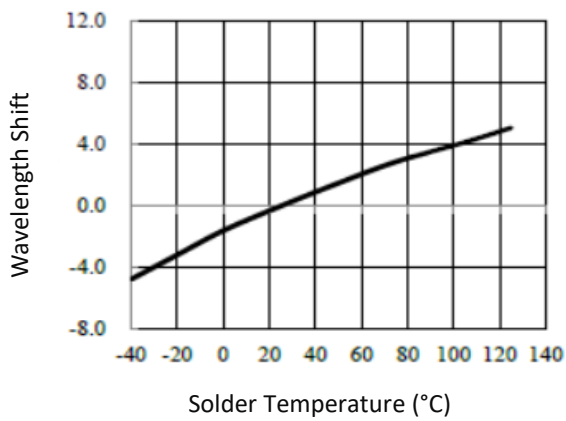
Wavelength Shift v.s. Forward Current



Relative Voltage v.s. Temperature

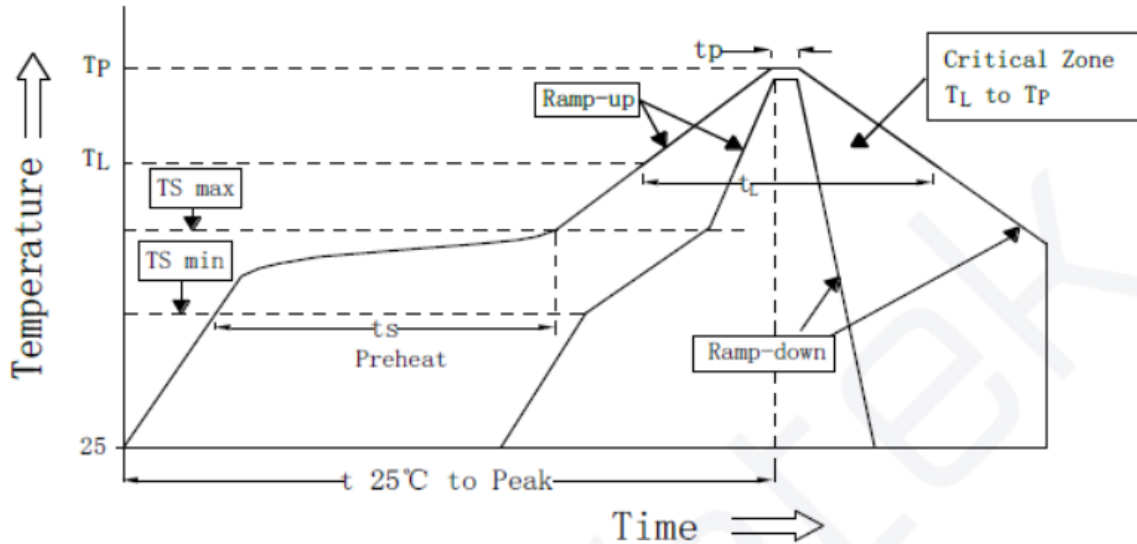


Wavelength Shift v.s. Temperature



## RECOMMENDED SOLDERING PROFILE:

IR Reflow Lead-free Solder:



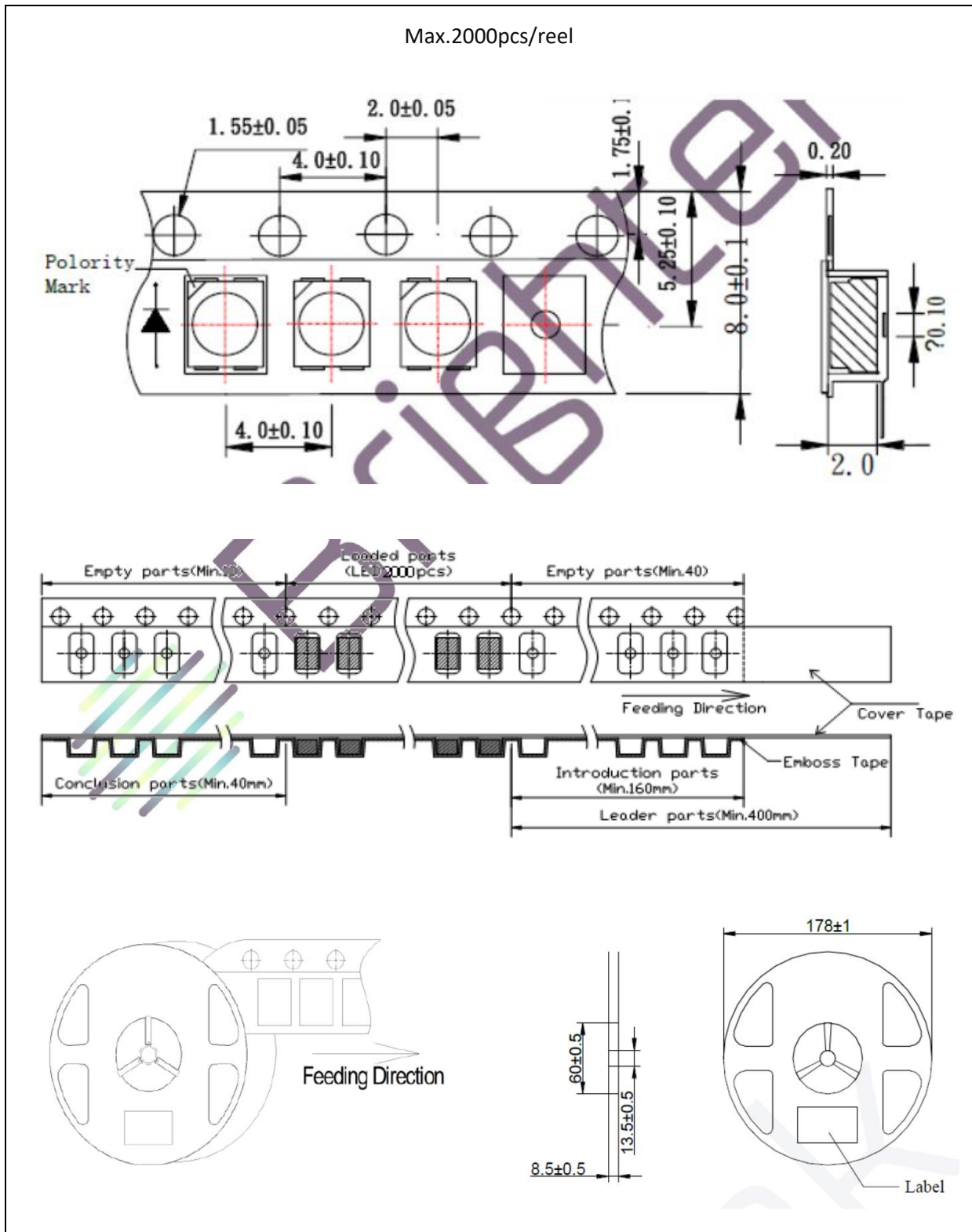
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Min.	Recommendation	Max.	
Ramp-up rate to preheat (25°C to 150°C)	-	-	2	3	K/s
Time $t_s$ ( $T_{S\ min}$ to $T_{S\ max}$ )	$t_s$	60	100	120	s
Ramp-up rate to peak ( $T_{S\ max}$ to $T_P$ )	-	-	2	3	K/s
Liquidus temperature	$T_L$	-	217	-	°C
Time 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. Maximum reflow soldering: 3 times.
2. Recommended reflow temperature 240°C. The maximum soldering temperature should be limited to 260°C.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

**PACKING SPECIFICATION:**

Reel Dimension:





## PRECAUTIONS OF USE:

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### 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 desiccating 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 24hrs and <5%RH, for 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-electrostatic glove is recommended when handling 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:**

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Version	Date	Summary of Revision
A1.0	15/05/2020	Datasheet set-up.
A1.1	04/06/2022	New datasheet format.