BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED!

PRODUCT DATASHEET

- ► Ceramic High Power
- ► 1519 0.9t Series
- ► Red (618~628nm)

Release Date: 07 September 2023 Version: A1.3

N0R51S58

1519 0.9t Series

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RoHS Compliant

AUTOMOTIVE AEC-Q102

FEATURES:

- **Package:** Ceramic High-Power SMT Package
- **Forward Current:** 500~1000mA
- **Forward Voltage (typ.):** 2.3V
- **Luminous Flux (typ.):** 57lm@500mA
- **Colour:** Red
- **Dominant Wavelength:** 618~628nm
- **Viewing Angle:** 120°
- **Materials:**
  - Resin: Silicon (Water Clear)
  - L/T Finish: Au plated
- **Operating Temperature:** -40~+125°C
- **Storage Temperature:** -40~+125°C
- **Grouping Parameters:**
  - Forward Voltage
  - Luminous Flux
  - Dominant Wavelength
- **Soldering Methods:** Reflow
- **MSL:** according to J-STD020 Level 2
- **Packing:** 8mm tape with max.3000pcs /reel, ø180mm (7'')

APPLICATIONS:

- Automotive Exterior Lighting
- Decorative Lighting
- Portable Lighting
- Outdoor Lighting
- Commercial Lighting
- Indoor Lighting
- Industrial Lighting

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	1000	mA
Pulse Forward Current Duty 1/10, Pulse Width 0.1mS	I_{PF}	1500	mA
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Junction Temperature	T_j	150	°C
Thermal Resistance Junction to Solder Point	R_{THJ-S}	6	°C/W
Electrostatic Discharge (HBM: ANSI/JEDEC JS-001 Class 2)	ESD	2000	V
Operating Temperature	T_{OPR}	-40~+125	°C
Storage Temperature	T_{STG}	-40~+125	°C
Soldering Temperature	T_{SOL}	260	°C

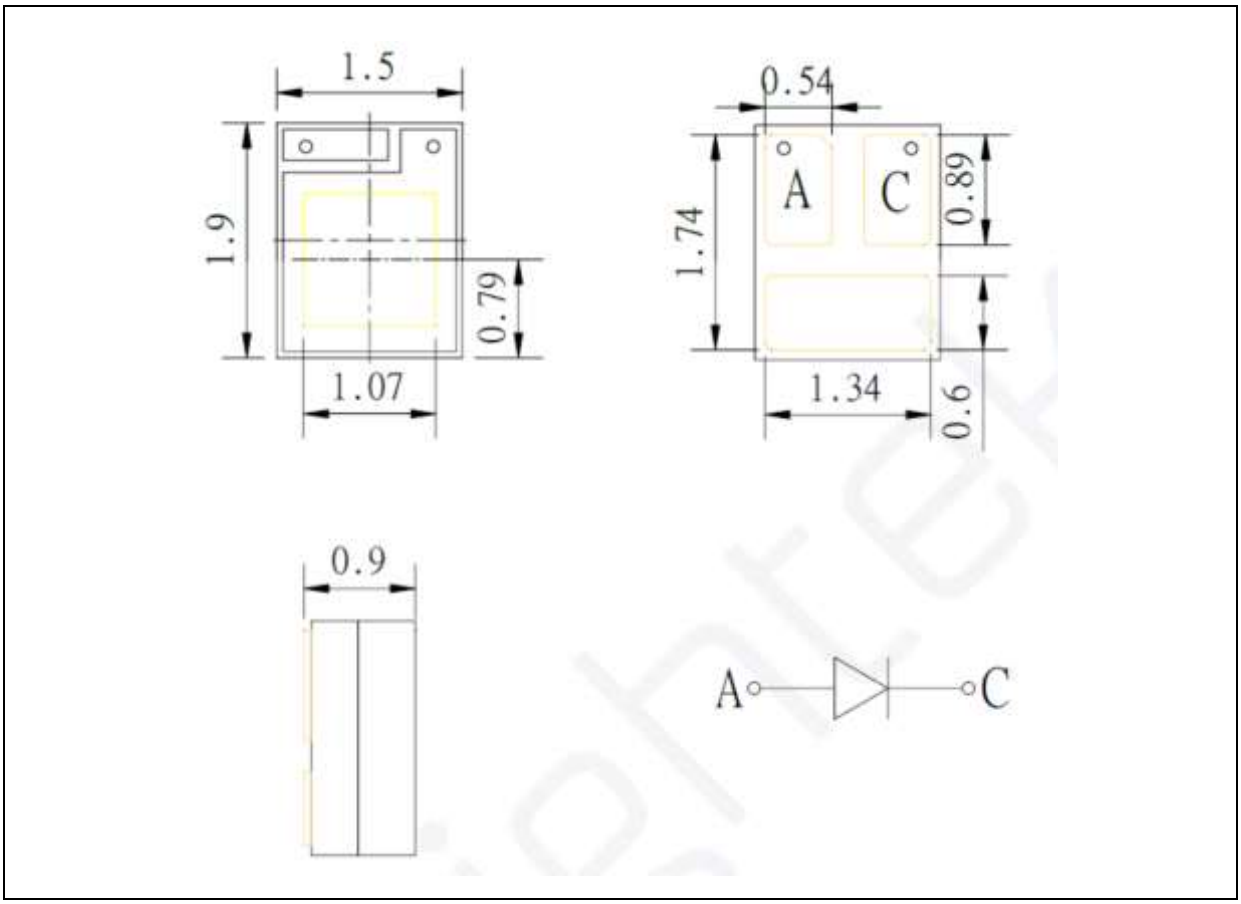
Electrical & Optical Characteristics (Ta=25°C)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	1.8	---	2.8	V	I_F=500mA
Luminous Flux	Φ_V	38	---	76	lm	I_F=500mA
Dominant Wavelength	λ_D	618	---	628	nm	I_F=500mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=500mA

1. Luminous flux (Φ_V) ±7%, Forward Voltage (V_F) ±0.05V, Viewing angle($2\theta_{1/2}$) ±10°

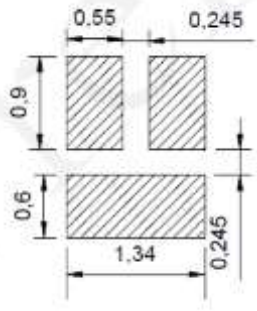
OUTLINE DIMENSION:

Package Dimension:

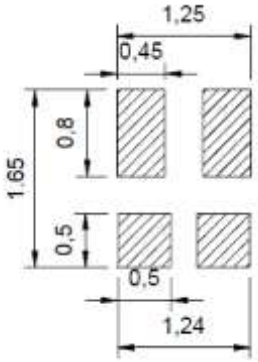


1. All dimensions are in millimetre (mm).
2. Tolerance ±0.13mm, unless otherwise noted.

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad



Recommended Stencil Pattern

1. Dimensions are in millimetre (mm).
2. Tolerance ±0.12mm with angle tolerance ±0.5°.

BINNING GROUPS:

Forward Voltage Classifications (I_F = 500mA):

Code	Min.	Max.	Unit
E	1.8	2.0	V
F	2.0	2.2	
G	2.2	2.4	
H	2.4	2.6	
J	2.6	2.8	

Luminous Flux Classifications (I_F = 500mA):

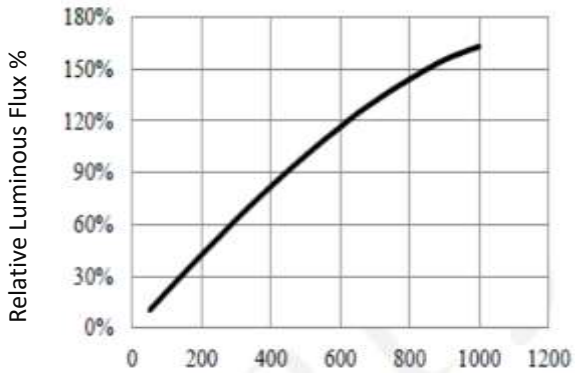
Code	Min.	Max.	Unit
19	38	44	lm
20	44	50	
21	50	58	
22	58	66	
23	66	76	

Dominant Wavelength Classifications (I_F = 500mA):

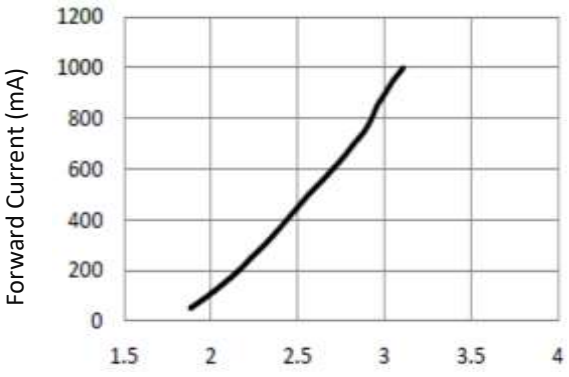
Code	Min.	Max.	Unit
V1	618	623	nm
V2	623	628	

ELECTRO-OPTICAL CHARACTERISTICS:

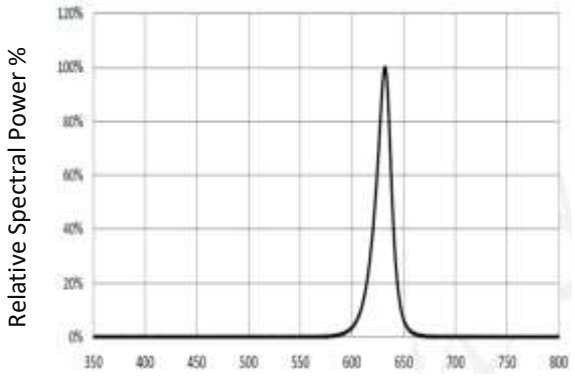
Relative Luminous Flux v.s. Forward Current



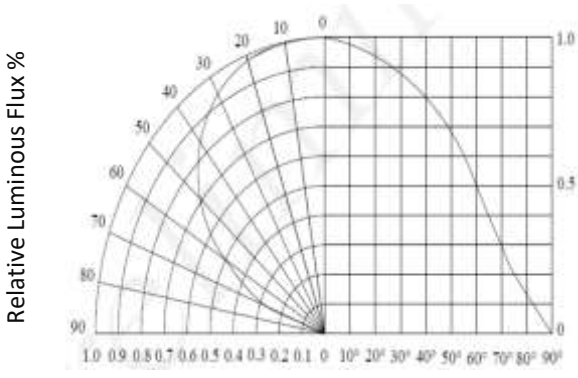
Forward Current v.s. Forward Voltage



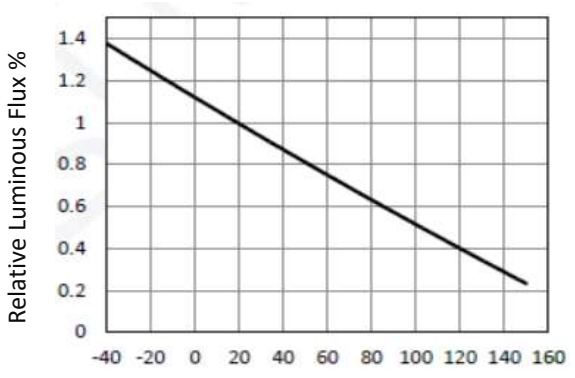
Relative Spectral Power v.s. Wavelength



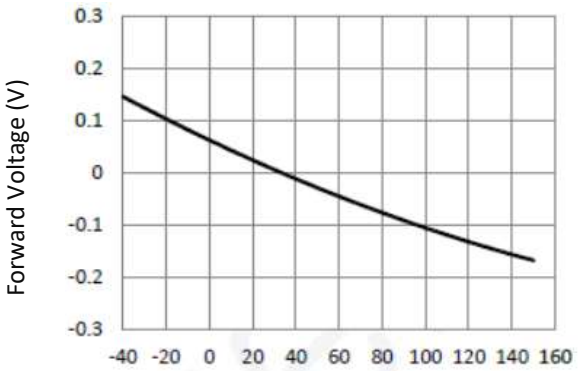
Directive Radiation



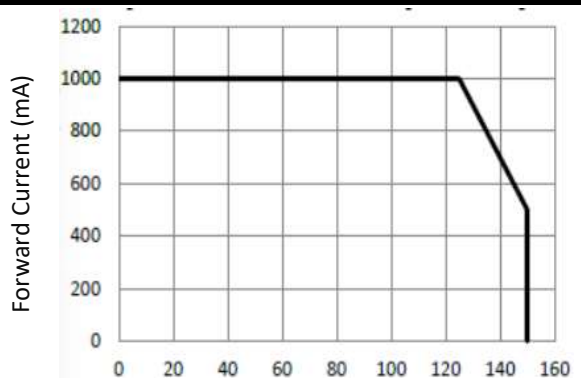
Relative Luminous Flux v.s. Solder Temperature

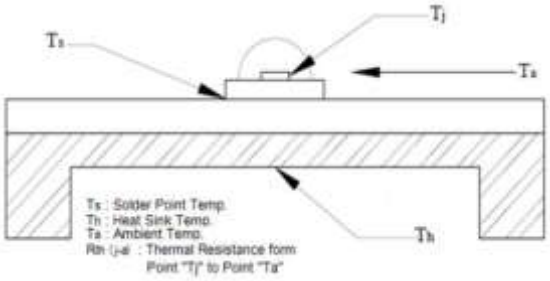


Forward Voltage v.s. Solder Temperature



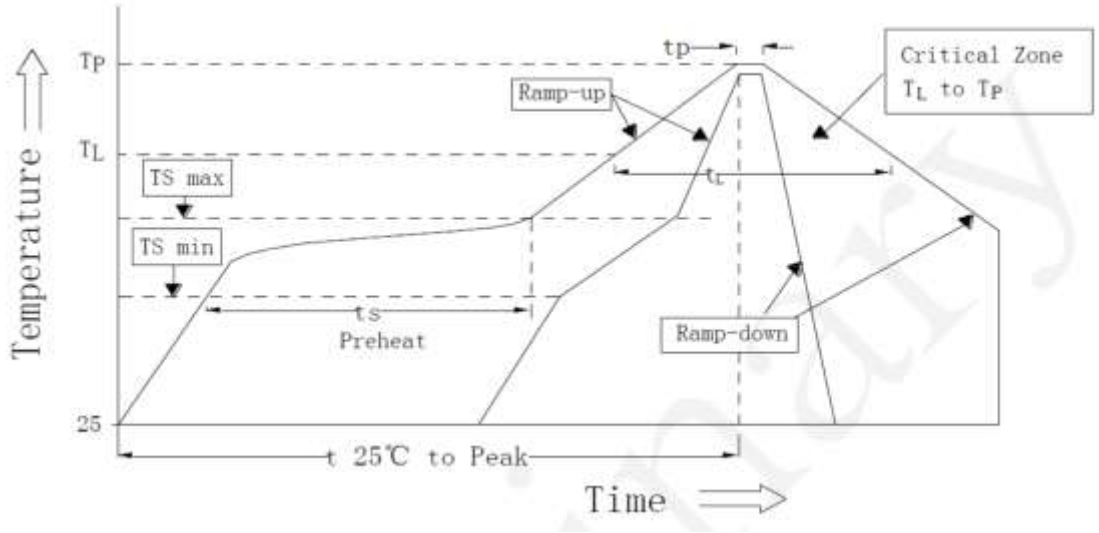
Forward Current Derating Curve





RECOMMENDED SOLDERING PROFILE:

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	20	30	s
Ramp-down Rate (T_P to 100 °C)			3	4	K/s
Time 25 °C to T_P				480	s

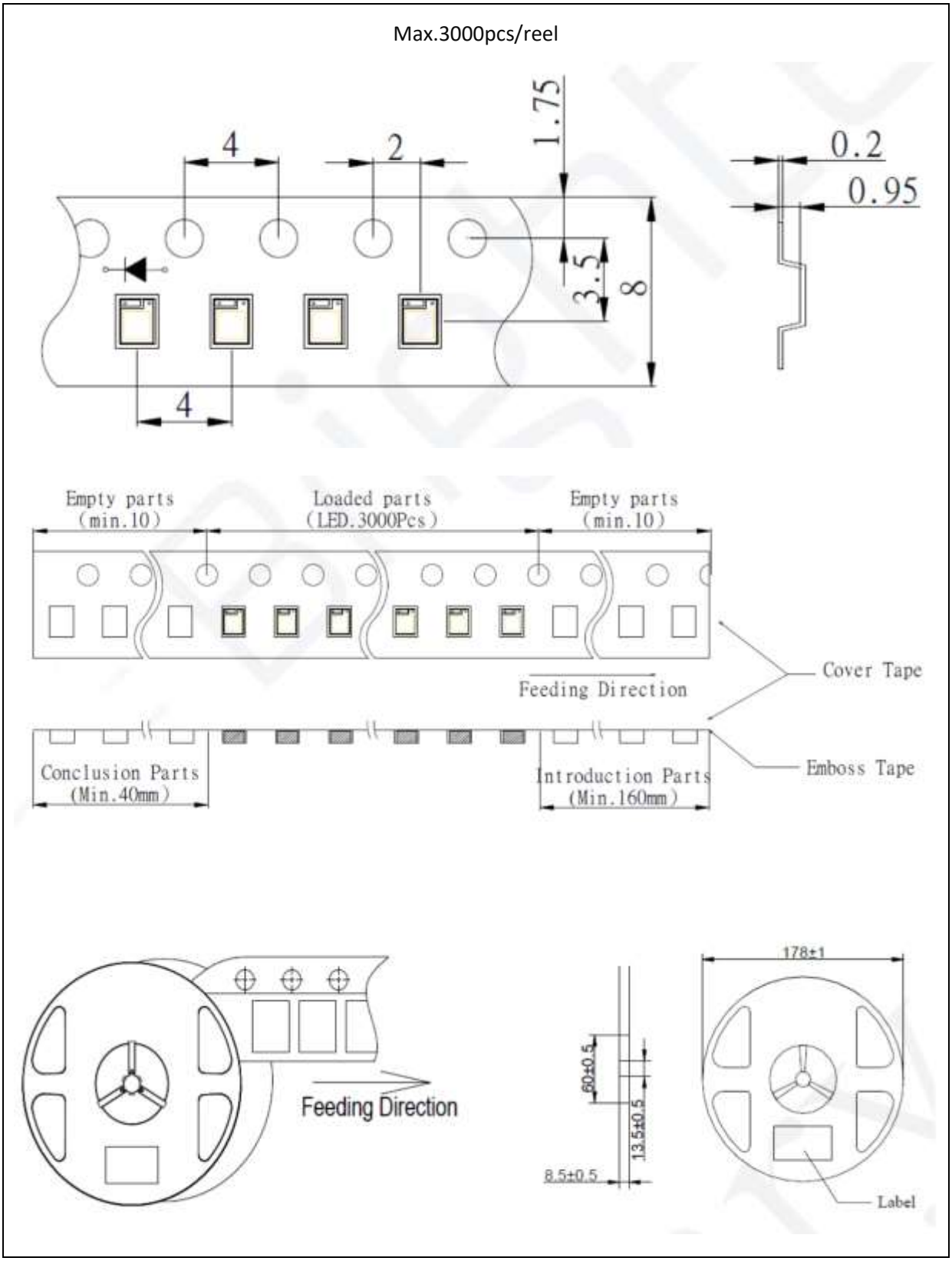
Note:

1. Maximum reflow soldering: 2 times.
2. The recommended reflow temperature is 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:

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 a week. Otherwise, they should be kept in a damp-proof box with descanting agent <10% R.H. and apply baking before use.

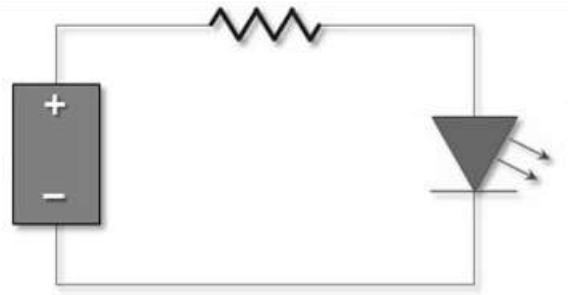
Baking:

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±3°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	16/06/2020	Datasheet set-up.
A1.1	22/04/2022	New datasheet format.
A1.2	15/12/2022	Revise voltage and wavelength range.
A1.3	07/09/2023	Revise junction temperature.