BRIGHTEK
BRIGHTEK (EUROPE) LIMITED
Brighten Up The World With LED!

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

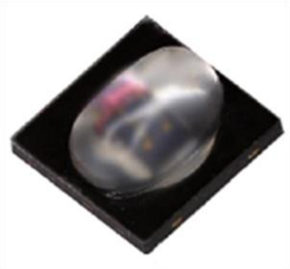
PRODUCT DATASHEET

ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE DEVICES

- ▶ EMC SMD Top View
- ▶ 3838 1.9t Series
- ▶ Infrared (IR) 850nm

Release Date: 04 September 2024 Version: A1.1

N0F60S78BF



3838 1.9t Series

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RoHS Compliant

AUTOMOTIVE AEC-Q102

FEATURES:

- **Package:** Black Ceramic Single Junction with Asymmetric Lens
- **Forward Current:** 1000mA
- **Pulse Forward Current (max.):** 3A
- **Forward Voltage (typ.):** 1.7V
- **Radiant Power (typ.):** 950mW@1A
- **Radiant Intensity (typ.):** 280mW/sr@1A
- **Colour:** Infrared (IR)
- **Peak Wavelength (typ.):** 850nm
- **Viewing Angle:** X:130° / Y: 80°
- **Operating Temperature:** -40~+105°C
- **Storage Temperature:** -40~+105°C
- **Grouping Parameters:**
  - Forward Voltage
  - Radiant Power
  - Peak Wavelength
- **Soldering Methods:** Reflow
- **MSL Level:** MSL2 according to J-STD020
- **Corrosion Robustness Class:** 3B
- **Packing:** 12mm tape with max.800/reel, ø178mm (7'')

APPLICATIONS:

- Automotive
- Security Camera
- Motion Detection
- Night Viewer
- Surveillance
- Data Communication

CHARACTERISTICS:

Absolute Maximum Characteristics (T_a=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	1000	mA
Pulse Forward Current	I_{PF}	3	A
Power Consumption	P_{tot}	2	W
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_{th}	typ. 4.5; max. 9	K/W
Electrostatic Discharge (HBM: MIL-STD-883 C 2)	ESD	2	kV
Operating Temperature	T_{OPR}	-40~+105	°C
Storage Temperature	T_{STG}	-40~+105	°C
Soldering Temperature	T_{SOL}	260	°C

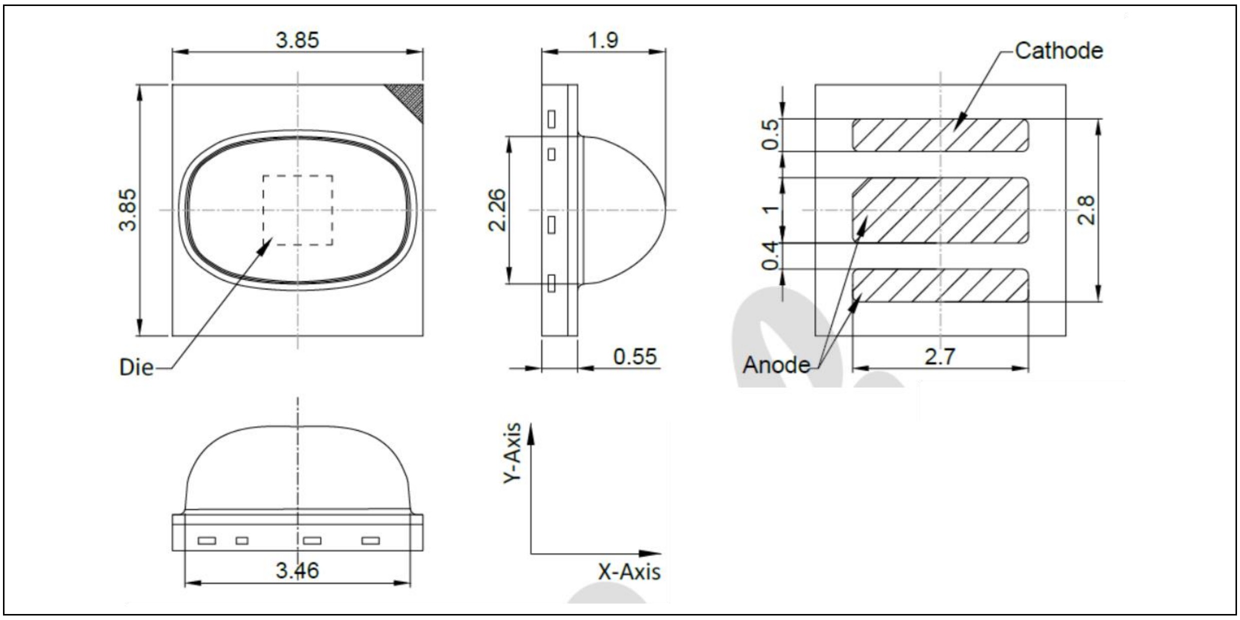
Electrical & Optical Characteristics (T_a=25°C, I_F=1A, t_p=10ms)

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
Forward Voltage		V_F	1.5	1.7	2.0	V	I_F=1A t_p=100µs
Radiant Power		Φ_e	800	950	1100	mW	I_F=1A t_p=100µs
Radiant Intensity		I_e	200	280	380	mW/sr	I_F=1A t_p=100µs
Peak Wavelength		Λ_P	---	850	---	nm	I_F=1A
Spectral Bandwidth		Δλ	---	40	---	nm	I_F=1A
Viewing Angle	X	$2\theta_{1/2}$	---	130	---	deg	I_F=1A
	Y		---	80	---		

1. Radiant Power (P_O) ±10%, Forward Voltage (V_F) ±0.1V, Viewing angle($2\theta_{1/2}$) ±10°

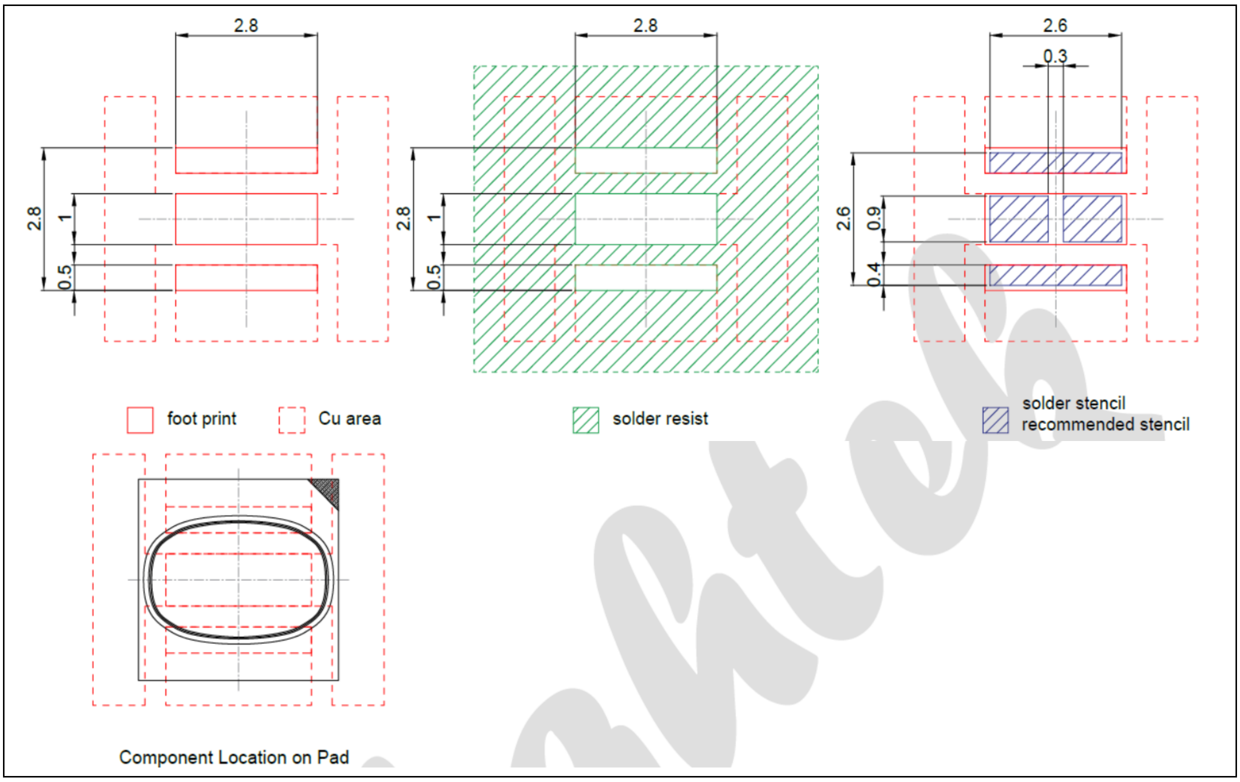
OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).
2. Tolerance ±0.1mm, 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=1A; t_p=10ms):

Code	Min.	Max.	Unit
DF	1.5	2.0	V

Radiant Power Classifications (I_F=1A; t_p=10ms):

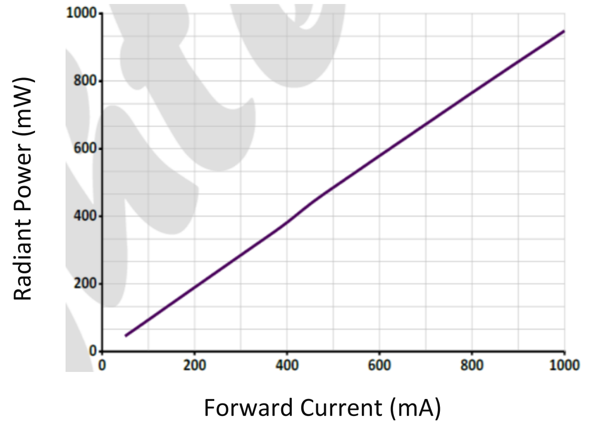
Code	Min.	Max.	Unit
PA8	800	900	mW
PA9	900	1000	
PB0	1000	1100	

Peak Wavelength Classifications (I_F=1A; t_p=10ms):

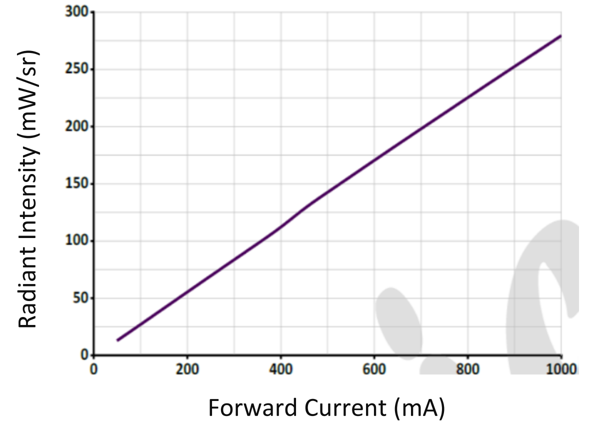
Code	Min.	Max.	Unit
F3	840	870	nm

ELECTRO-OPTICAL CHARACTERISTICS:

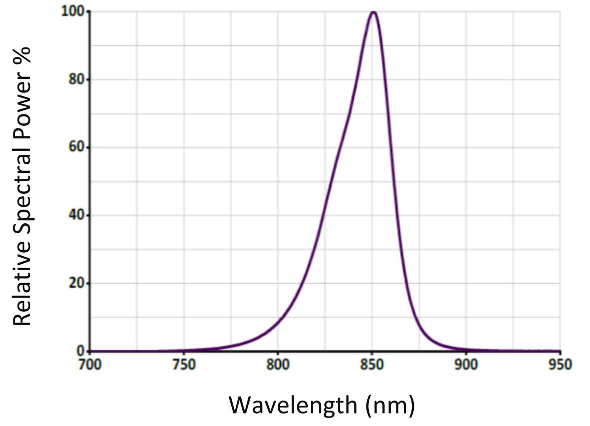
Radiant Power v.s. Forward Current



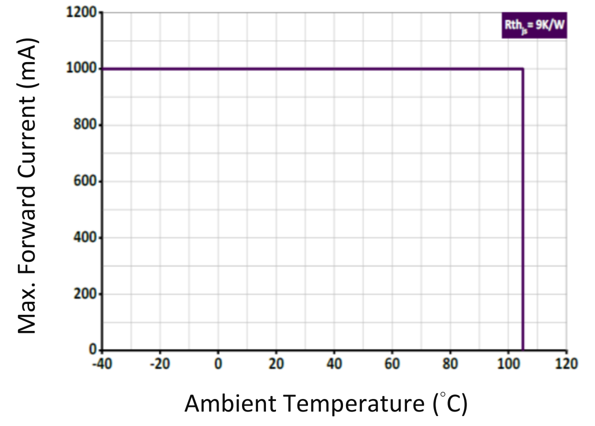
Radiant Intensity v.s. Forward Current



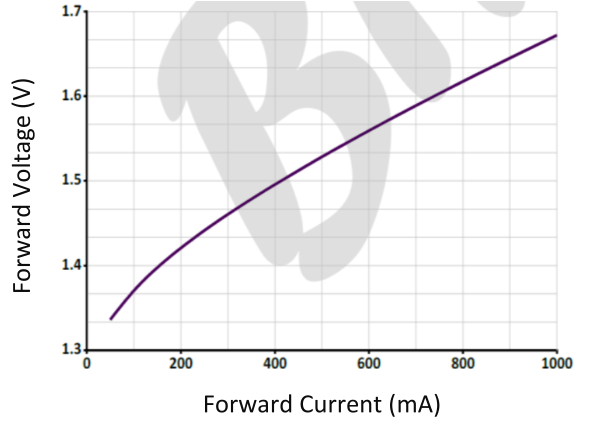
Relative Spectral Power v.s. Wavelength



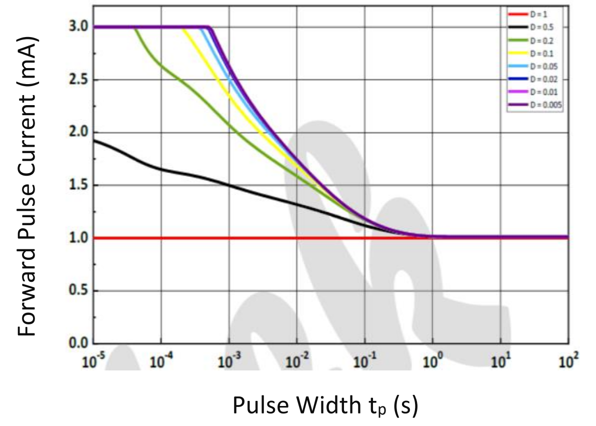
Permissible Forward Current
$I_{F(max)}=f(T_s)$; R_{thjs}=9K/W



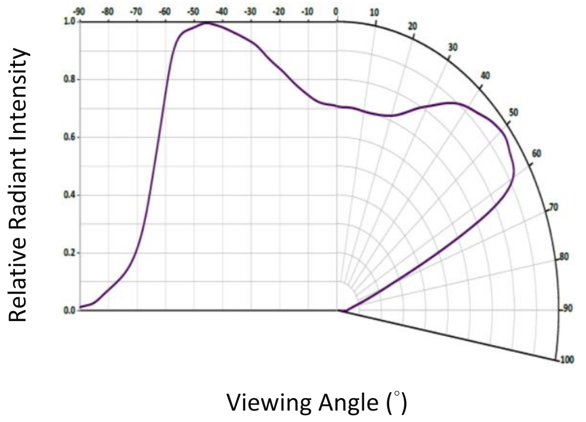
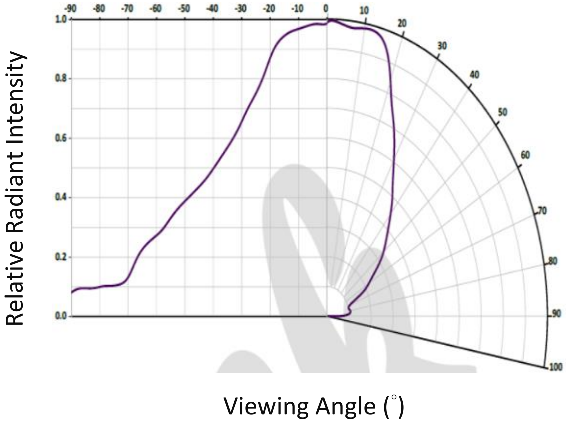
Forward Current v.s. Forward Voltage



Permissible Pulse Handling Capability
$I_F=f(t_p)$; D=Duty Cycle; T_s=85°C

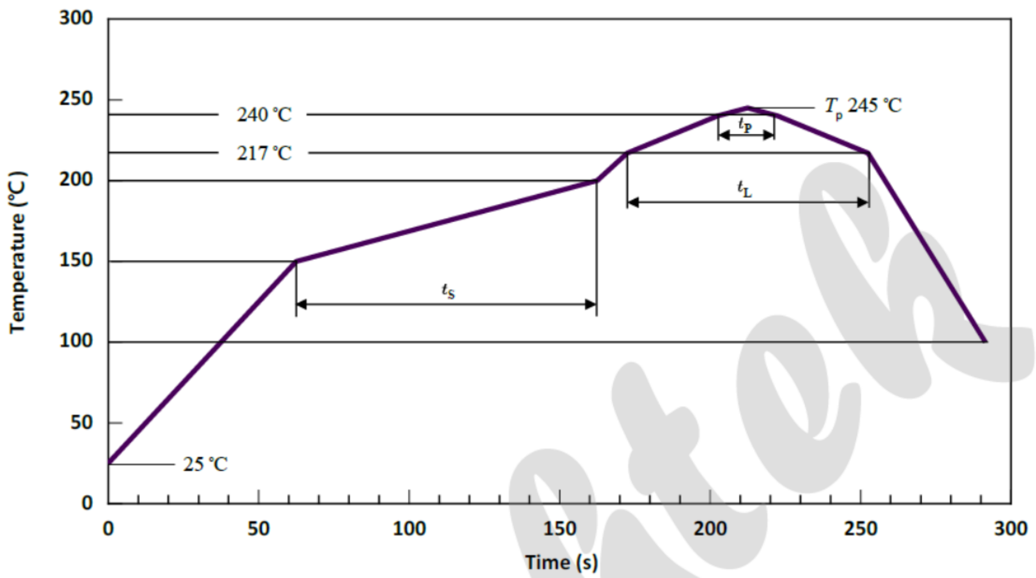


ELECTRO-OPTICAL CHARACTERISTICS:

Directive Radiation X-Axis	Directive Radiation Y-Axis
	

RECOMMENDED SOLDERING PROFILE:

Reflow Lead-free Solder:



Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Minimum	Recommendation	Maximum	
Ramp-up rate to preheat 25 °C to 150 °C			2	3	K/s
Time t_S T_{Smin} to T_{Smax}	t_S	60	100	120	s
Ramp-up rate to peak T_{Smax} 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 TP - 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

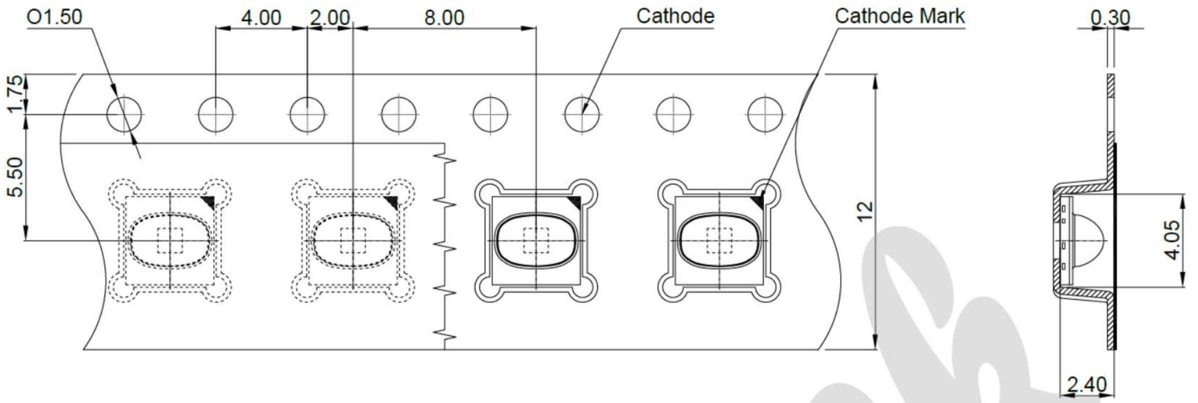
Note:

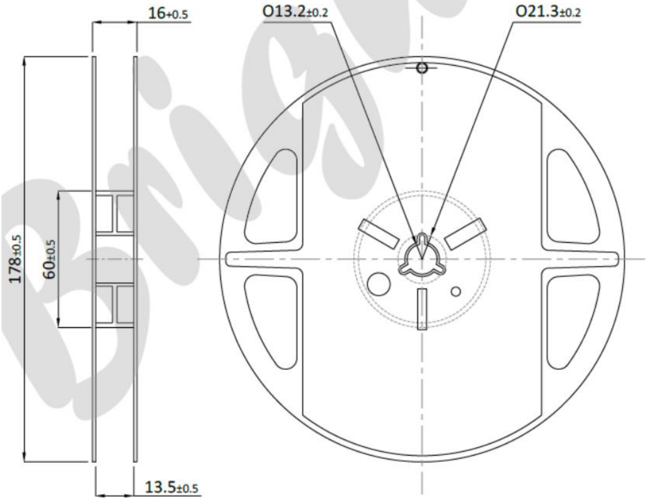
1. Maximum reflow soldering: 2 times.
2. Recommended soldering temperature is 245°C. The maximum soldering temperature should be limited to 260°C.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

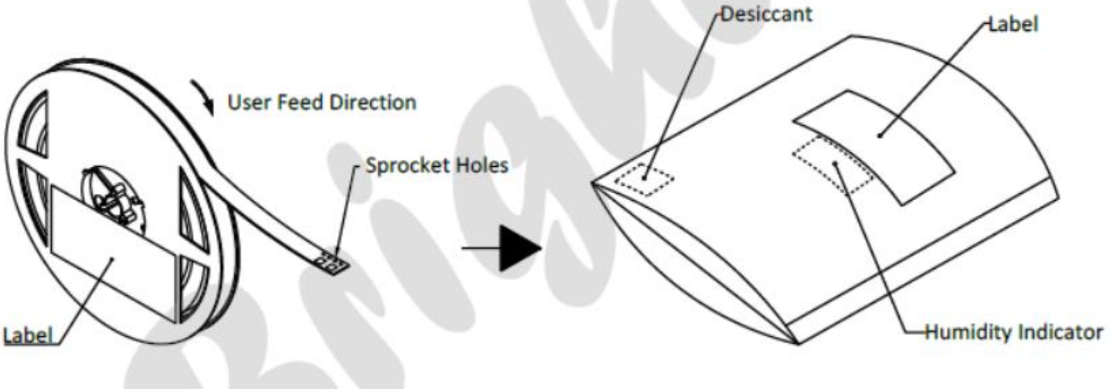
PACKING SPECIFICATION:

Reel Dimension:

Max.800pcs/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.

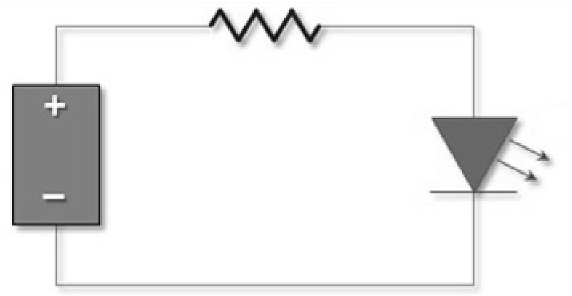
Baking:

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	22/05/2022	Datasheet set-up.
A1.1	04/09/2024	Add packing and binning information.