BRIGHTEK

BRIGHTEK (EUROPE) LIMITED

Brighten Up The World With LED !

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

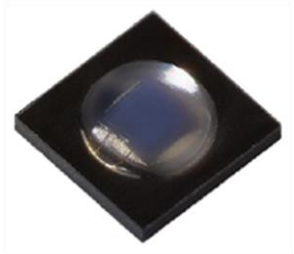
PRODUCT DATASHEET

ATTENTION
OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

- ► EMC SMD Top View
- ► 3838 1.51t Series
- ► Infrared (IR) 940nm

Release Date: 05 March 2024 Version: A1.1

N0F60S76BF



3838 1.51t Series

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RoHS Compliant

AUTOMOTIVE AEC-Q102

FEATURES:

- **Package:** Black Ceramic Dual Junction SMT Package
- **Forward Current:** 1000~1500mA
- **Forward Voltage (typ.):** 3.1V
- **Radiant Power (typ.):** 1300mW@1A; 1800mW@1.5A
- **Radiant Intensity (typ.):** 350mW/sr@1A; 480mW/sr@1.5A
- **Colour:** Infrared (IR)
- **Peak Wavelength (typ.):** 940nm
- **Viewing Angle:** 150°
- **Materials:**
  - Resin: Silicon (Water Clear)
  - L/T Finish: Ag plated
- **Operating Temperature:** -40~+125°C
- **Storage Temperature:** -40~+125°C
- **Grouping Parameters:**
  - Forward Voltage
  - Radiant Power
  - Peak Wavelength
- **Soldering Methods:** Reflow
- **MSL Level:** MSL 2 according to J-STD020
- **Packing:** 12mm tape with max.800pcs /reel, ø180mm (7'')
- **Corrosion Robustness Class:** 3B

APPLICATIONS:

- Automotive
- Security Camera
- Motion Detection
- Night Viewer
- Surveillance
- Data Communication
- Facial Recognition
- Gesture Recognition

CHARACTERISTICS:

Absolute Maximum Characteristics (Ta=25°C)

Parameter	Symbol	Ratings	Unit
DC Forward Current	I_F	1500	mA
Pulse Forward Current	I_{PF}	5	A
Power Consumption	P_{tot}	5.5	W
Reverse Voltage	V_R	5	V
Reverse Current @5V	I_R	10	μA
Junction Temperature	T_j	145	°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~+125	°C
Storage Temperature	T_{STG}	-40~+125	°C
Soldering Temperature	T_{SOL}	260	°C

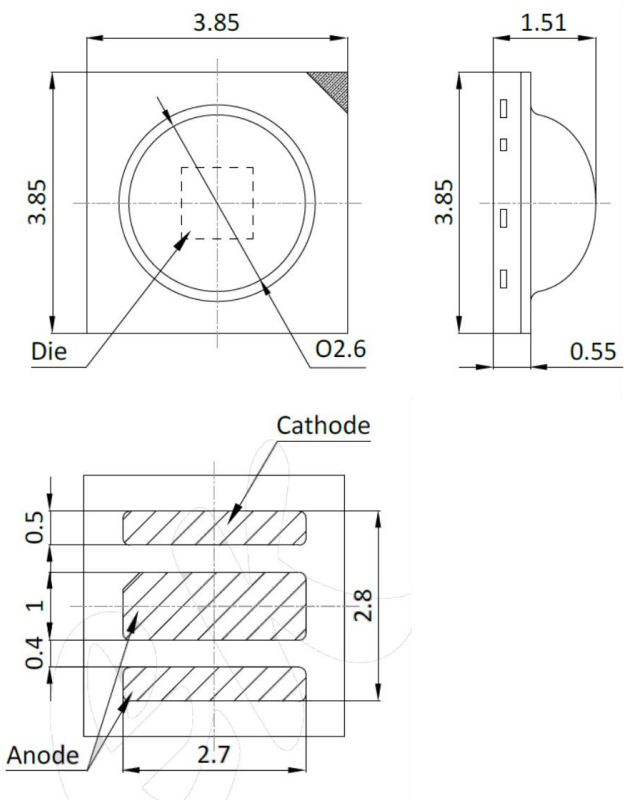
Electrical & Optical Characteristics (Ta=25°C, I_F=1A, t_p=10ms)

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Forward Voltage	V_F	2.8	3.1	3.6	V	I_F=1A
		2.85	3.25	3.65		I_F=1.5A t_p=10ms
		---	4.4	5.0		I_F=5A t_p=100μs
Radiant Power	Φ_e	1100	1300	1500	mW	I_F=1A
		1600	1800	2100		I_F=1.5A t_p=10ms
Radiant Intensity	I_e	270	350	430	mW/sr	I_F=1A
		400	480	600		I_F=1.5A t_p=10ms
Peak Wavelength	Λ_P	930	940	950	nm	I_F=1A
Spectral Bandwidth	$\Delta\lambda$	---	45	---	nm	I_F=1A
Viewing Angle	$2\theta_{1/2}$	---	150	---	deg	I_F=1A

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

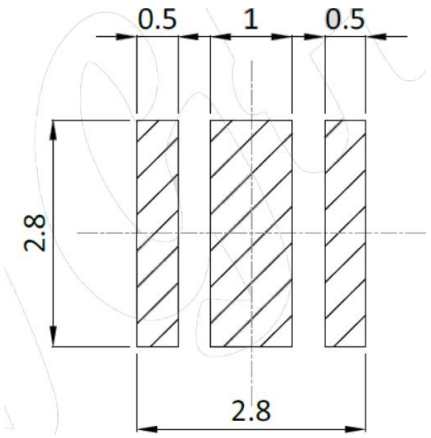
OUTLINE DIMENSION:

Package Dimension:



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

Recommended Soldering Pad Dimension:



Recommended PCB Solder Pad

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

BINNING GROUPS:

Forward Voltage Classifications (I_F = 1A):

Code	Min.	Max.	Unit
KN	2.8	3.6	V

Radiant Power Classifications (I_F = 1A):

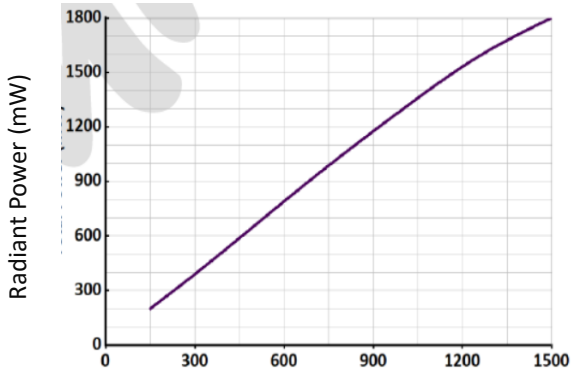
Code	Min.	Max.	Unit
PB1A	1100	1300	mW
PB3A	1300	1500	

Peak Wavelength Classifications (I_F = 1A):

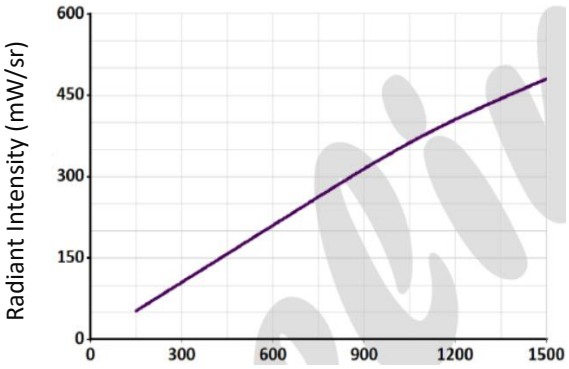
Code	Min.	Max.	Unit
F1	930	950	nm

ELECTRO-OPTICAL CHARACTERISTICS:

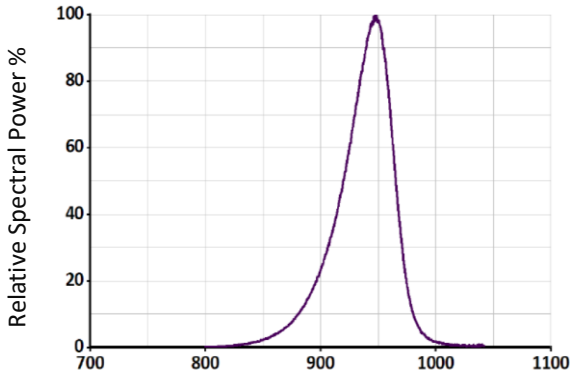
Radiant Power v.s. Forward Current



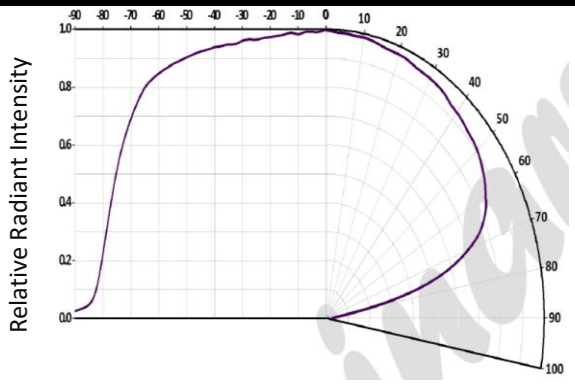
Radiant Intensity v.s. Forward Current



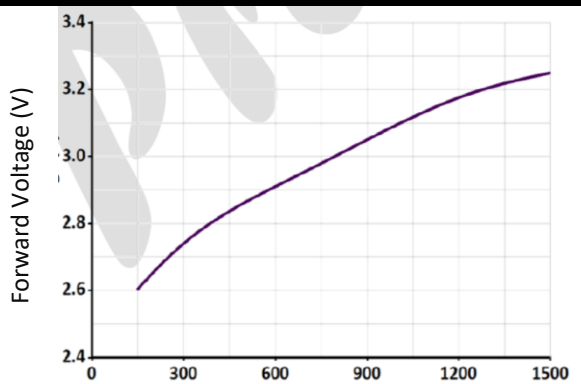
Relative Spectral Power v.s. Wavelength



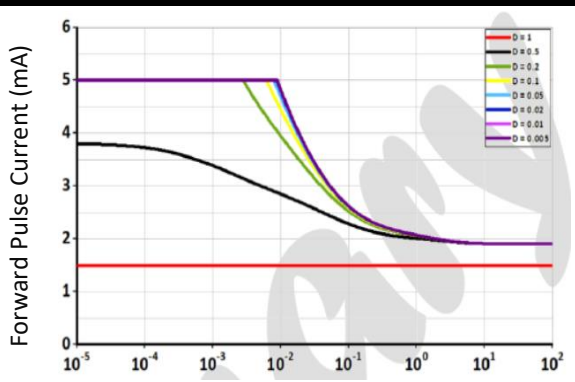
Directive Radiation



Forward Current v.s. Forward Voltage

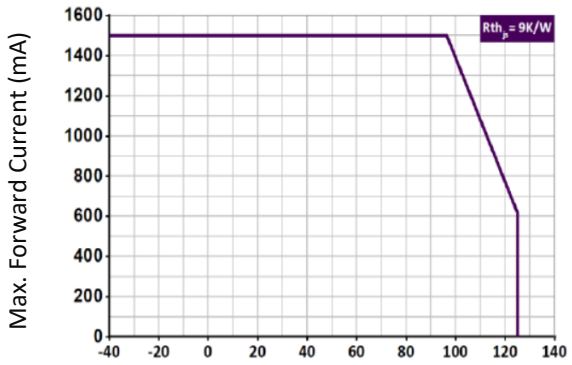


Permissible Pulse Handling Capability



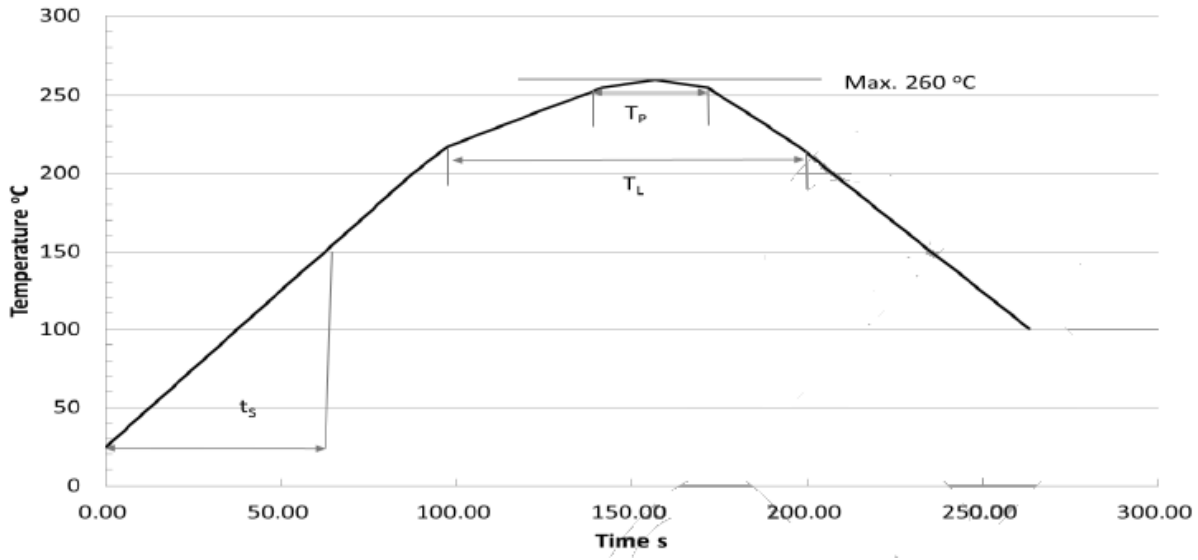
ELECTRO-OPTICAL CHARACTERISTICS:

Permissible Forward Current



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 peaktemperature 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

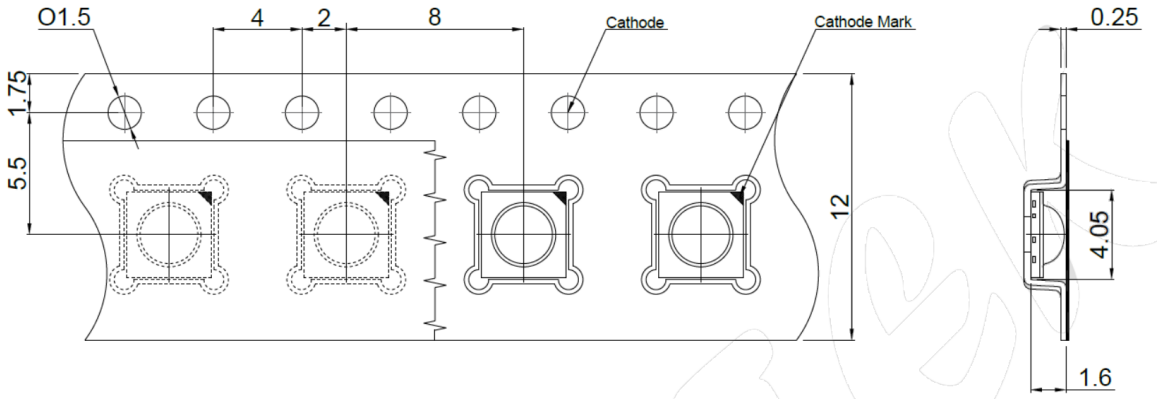
Note:

1. Maximum reflow soldering: 2 times.
2. 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.

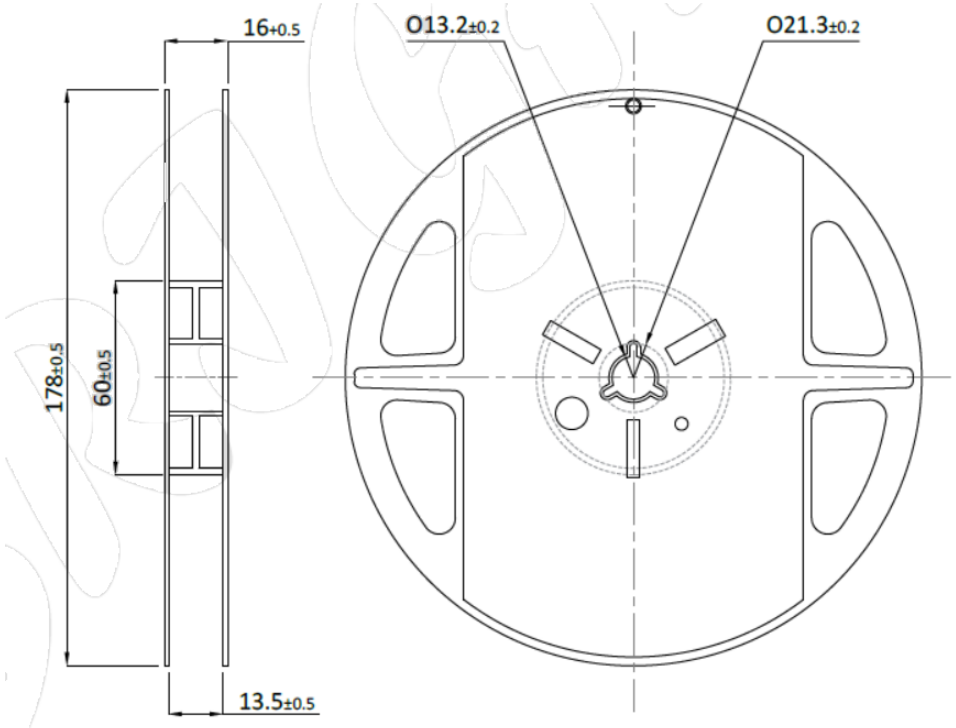
PACKING SPECIFICATION:

Reel Dimension:

Max.4000pcs/reel



1. Dimensions are in millimeters.
2. General tolerance is ± 0.1mm.



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.

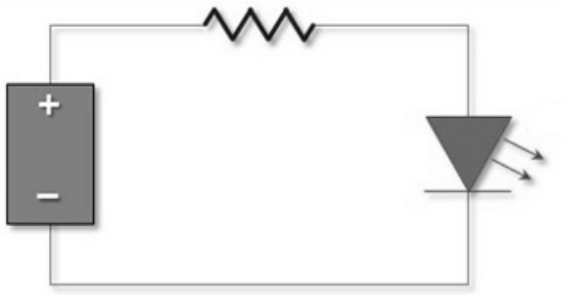
Baking:

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	05/03/2024	Add bin table and packing dimensions.