



**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



- ▶ Photodiode
- ▶ 1208 (3220) 0.75t
- ▶ Broadband Silicon PIN

NOP60S86



Release Date: 05 June 2022 Version: A1.0



**1208 (3220) 0.75t**

**RoHS**  
Compliant



### FEATURES:

- **Package:** CHIP Top View Broadband Silicon Pin Photodiode
- **Lens Colour:** Clear epoxy
- **ESD:** 2KV (HBM, acc. To ANSI/ESDA/JEDEC JS-001)
- **Soldering:** Suitable for reflow
- **Spectral Range of Sensitivity:** 400~1100nm
- **Wavelength of max. Sensitivity:** 890nm
- **Viewing angle:** 120°
- **Radiant Sensitive Area:** 2.81mm<sup>2</sup>
- **Active Chip Area:** 1.75x1.23mm
- **Operating Temperature:** -40~+85°C
- **Storage Temperature:** -40~+85°C
- **Packing:** 8mm tape with min.100pcs/reel, ø180mm (7")

### APPLICATIONS:

- Health Monitor
- Heart Rate Monitor
- Pulse Oximetry



**CHARACTERISTICS:**

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

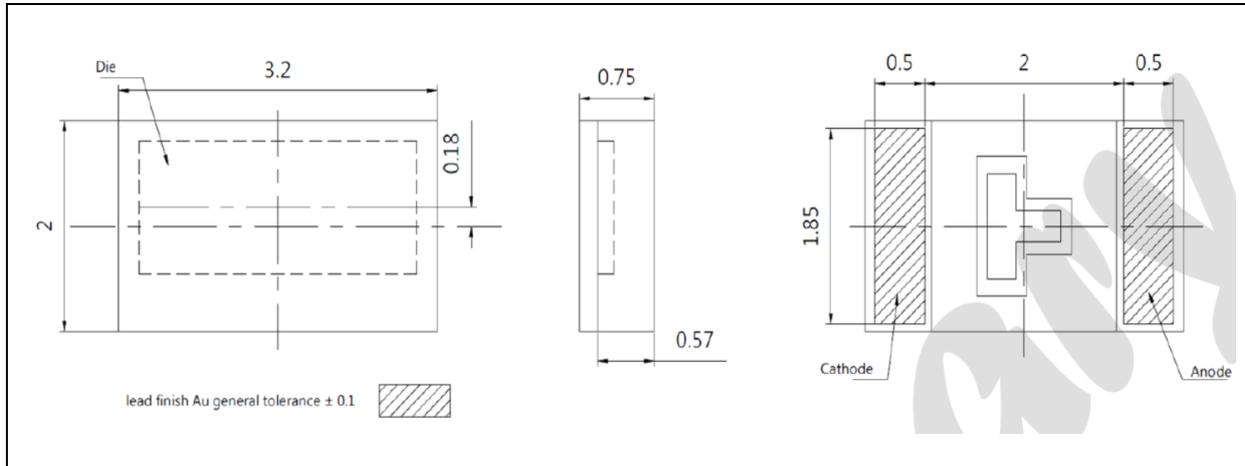
Parameter	Symbol	Ratings	Unit
Reverse Voltage	V <sub>R</sub>	16	V
ESD Withstand Voltage	V <sub>ESD</sub>	2	kV
Operating Temperature	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature	T <sub>STG</sub>	-40~+85	°C

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

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Wavelength of Max. Sensitivity	$\lambda_{smax}$	---	890	---	nm	---
Spectral Range of Sensitivity	$\Lambda_{10\%}$	400	---	1100	nm	---
Photocurrent	I <sub>P</sub>	---	1.1	---	$\mu$ A	E <sub>e</sub> =0.1mW/cm <sup>2</sup> ; $\lambda$ =530nm; V <sub>R</sub> =5V
		---	1.6	---		E <sub>e</sub> =0.1mW/cm <sup>2</sup> ; $\lambda$ =655nm; V <sub>R</sub> =5V
		---	1.8	---		E <sub>e</sub> =0.1mW/cm <sup>2</sup> ; $\lambda$ =940nm; V <sub>R</sub> =5V
Radiant Sensitive Area	A	---	2.81	---	mm <sup>2</sup>	---
Dimensions of Active Chip Area	LxW	---	2.75x1.23	---	mm <sup>2</sup>	---
Half Angle	$\varphi$	---	60	---	deg	---
Dark Current	I <sub>R</sub>	---	0.3	5	nA	V <sub>R</sub> =5V
Rise Time	t <sub>r</sub>	---	0.063	---	$\mu$ s	V <sub>R</sub> =5V; R <sub>L</sub> =50 $\Omega$ ; $\lambda$ =530nm
		---	3.6	---		V <sub>R</sub> =5V; R <sub>L</sub> =50 $\Omega$ ; $\lambda$ =940nm
Fall Time	t <sub>f</sub>	---	0.07	---	$\mu$ s	V <sub>R</sub> =5V; R <sub>L</sub> =50 $\Omega$ ; $\lambda$ =530nm
		---	3.5	---		V <sub>R</sub> =5V; R <sub>L</sub> =50 $\Omega$ ; $\lambda$ =940nm
Forward Voltage	V <sub>F</sub>	---	2.91	---	V	I <sub>F</sub> =10mA; E=0
Capacitance	C	---	15.7	---	pF	V <sub>R</sub> =5V; f=1MHz; E=0

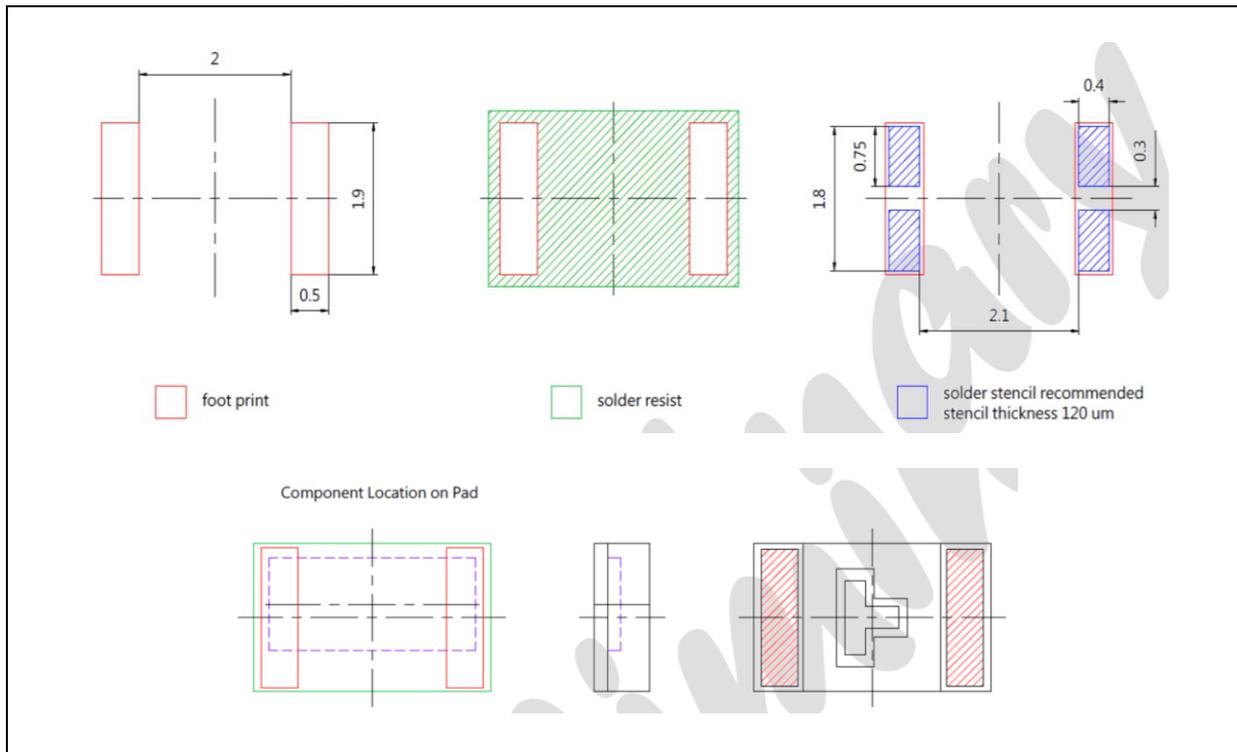
## OUTLINE DIMENSION:

### Package Dimension:



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

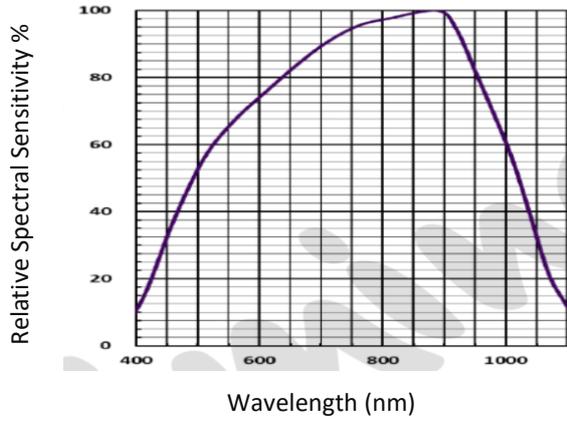
### Recommended Soldering Pad Dimension:



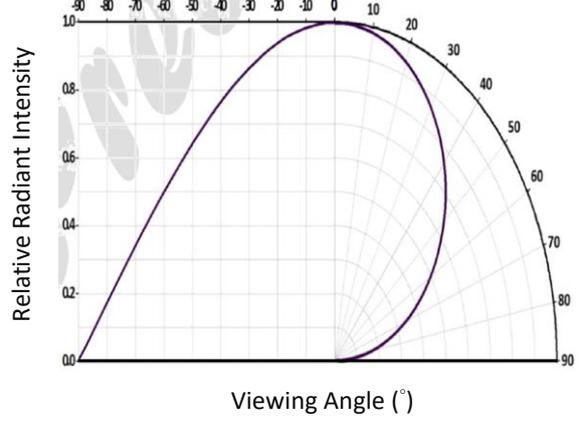
1. Dimensions are in millimetre (mm).
2. Tolerance  $\pm 0.1$ mm with angle tolerance  $\pm 0.5^\circ$ .

**ELECTRO-OPTICAL CHARACTERISTICS:**

**Relative Spectral Sensitivity**

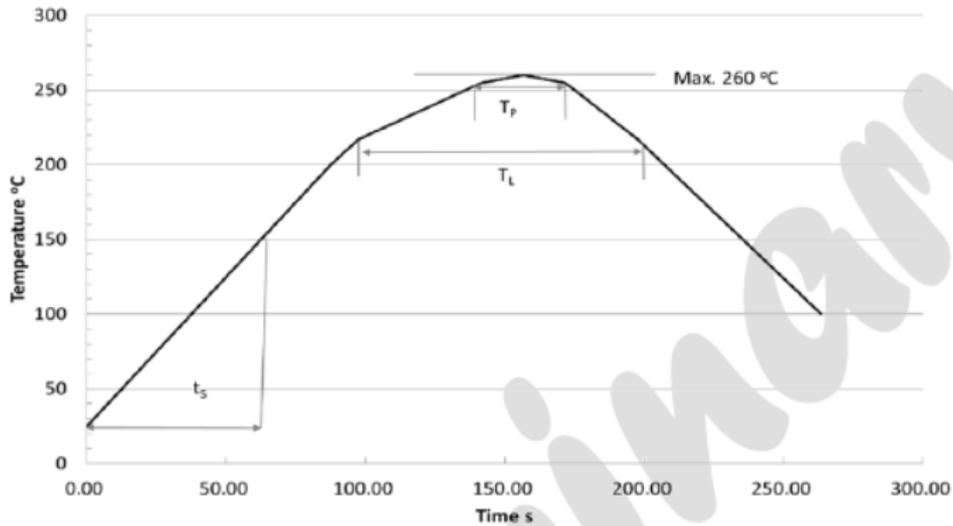


**Directional Characteristics**



## RECOMMENDED SOLDERING PROFILE:

Lead-free Solder IR Reflow:



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 $T_P - 5$ 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. We recommend the reflow temperature 245°C ( $\pm 5^\circ\text{C}$ ). The maximum soldering temperature should be limited to 260°C.
2. Maxima reflow soldering: 2 times.
3. Before, during, and after soldering, should not apply stress on the components and PCB board.

## 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 24 hours. Otherwise, they should be kept in a damp-proof box with desiccating agent <10% R.H. and apply baking.

### Over-Current Proof:

Must apply resistors for protection otherwise slight voltage shift will cause big current change and burn-out will happen.

### 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.

### 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 handling the LED all time. All devices, equipment, machinery, work tables, and storage racks must be properly grounded.

**REVISION RECORD:**

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Version	Date	Summary of Revision
A1.0	04/06/2022	Datasheet set-up.