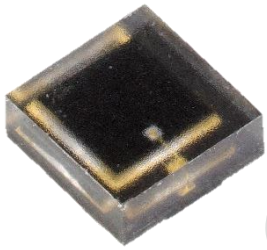
SA2020P03CV00 Datasheet



Broadband Silicon PIN Photodiode

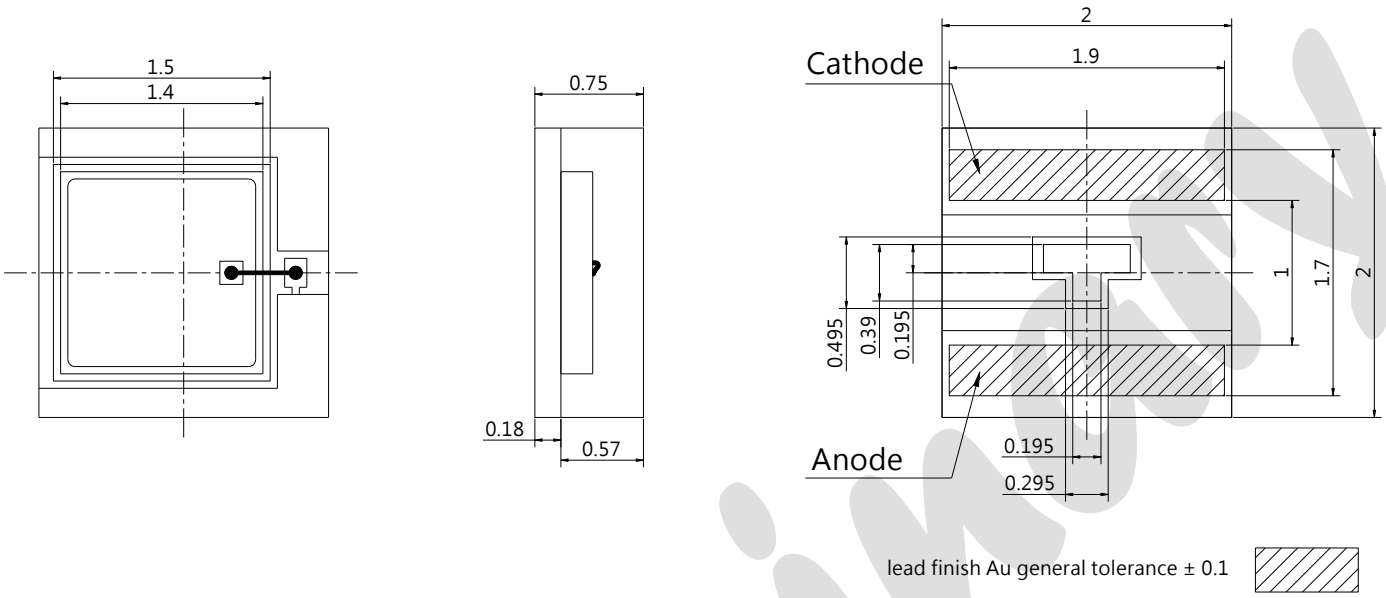
Applications

- Health Monitoring (Heart Rate Monitoring, Pulse Oximetry)

Features

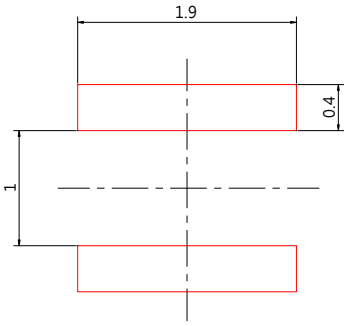
- Package: clear epoxy
- ESD: 2KV acc. to ANSI/ESDA/JEDEC JS-001 (HBM)
- Suitable for reflow soldering
- Especially suitable for applications from 400 nm to 1100 nm
- Small package (L x W x H) : 2.0 mm x 2.0 mm x 0.75 mm (W x D x H)

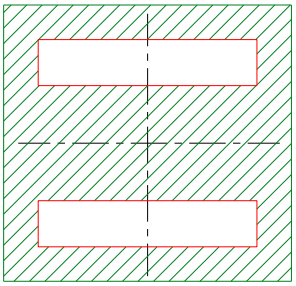
Dimensional Drawing

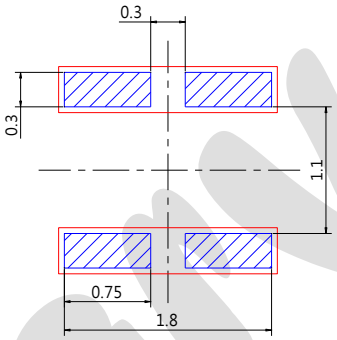


1. Dimensions are in millimeters.
2. General tolerance is ± 0.1 mm.

Recommended Solder Pad





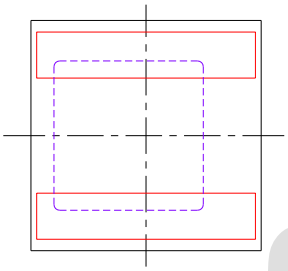


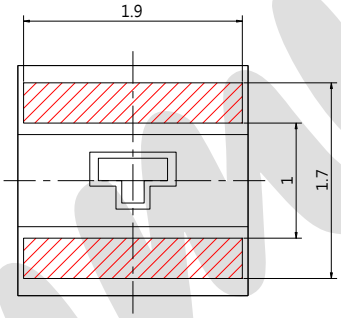
foot print

Solder resist

Solder stencil recommended stencil thickness 120 um

Component Location on Pad





Maximum Ratings

T_A : 25 °C

Parameter	Symbol		Values
Operating temperature	T_{op}	Min.	- 40 °C
		Max.	85 °C
Storage temperature	T_{stg}	Min.	- 40 °C
		Max.	85 °C
Reverse voltage	V_R	Max.	6 V
ESD withstand voltage acc. to ANSI/ESDA/JEDC JS-001 (HBM, Class 2)	V_{ESD}	Max.	2 kV

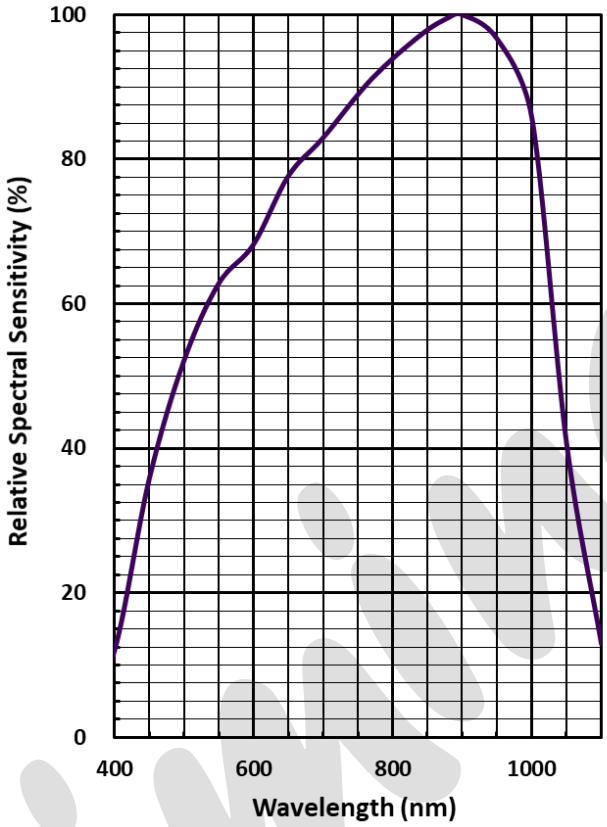
Characteristics

T_A : 25 °C

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\,max}$	Typ.	900 nm
Spectral range of sensitivity	$\lambda_{10\,\%}$	Typ.	400 ... 1100 nm
Photocurrent E_e = 0.1 mW/cm²; λ = 530 nm; V_R = 5 V	I_P	Typ.	0.69 µA
Photocurrent E_e = 1 mW/cm²; λ = 530 nm; V_R = 5 V	I_P	Typ.	6.79 µA
Photocurrent E_e = 0.1 mW/cm²; λ = 660 nm; V_R = 5 V	I_P	Typ.	0.96 µA
Photocurrent E_e = 1 mW/cm²; λ = 660 nm; V_R = 5 V	I_P	Typ.	9.73 µA
Photocurrent E_e = 0.1 mW/cm²; λ = 940 nm; V_R = 5 V	I_P	Typ.	1.19 µA
Photocurrent E_e = 1 mW/cm²; λ = 940 nm; V_R = 5 V	I_P	Typ.	12.08 µA
Radiant sensitive area	A	Typ.	1.49 mm²
Dimensions of active chip area	L x W	Typ.	1.22 x 1.22 mm x mm
Half angle	φ	Typ.	60 °
Dark current V_R = 5 V	I_R	Typ. Max.	0.17 nA 25 nA
Rise time V_R = 5 V; R_L = 50 Ω; λ = 530 nm; I_p = 600 µA	t_r	Typ.	47 ns
Fall time V_R = 5 V; R_L = 50 Ω; λ = 530 nm; I_p = 600 µA	t_f	Typ.	67 ns
Forward voltage I_F = 10 mA; E = 0	V_F	Typ.	0.89 V
Capacitance V_R = 0 V; f = 1 MHz; E = 0	C	Typ.	13.4 pF

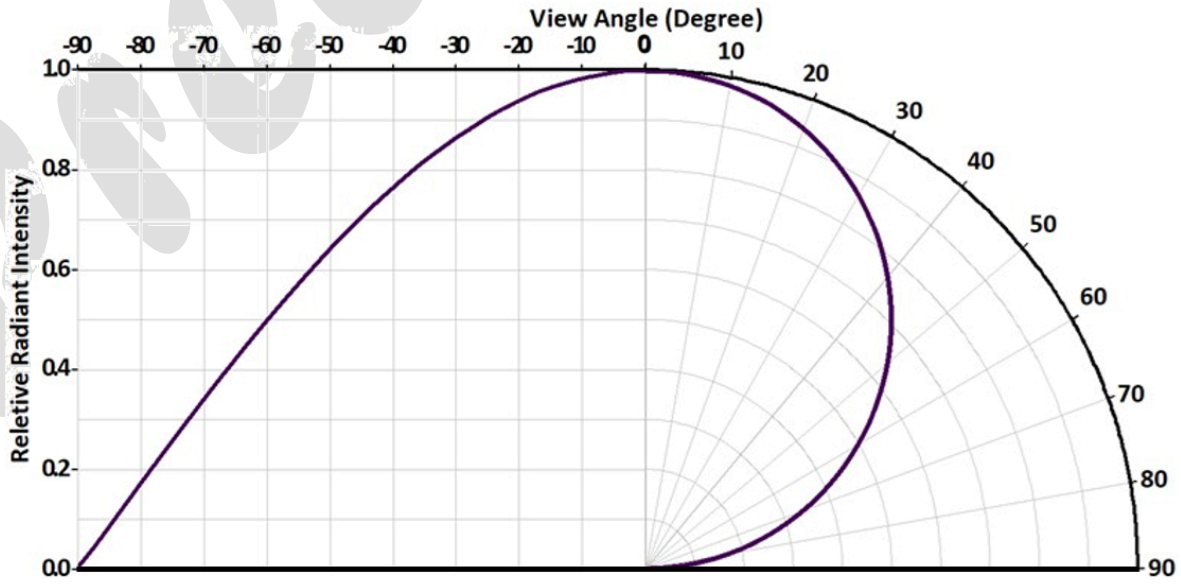
Relative Spectral Sensitivity

$S_{rel} = f(\lambda)$



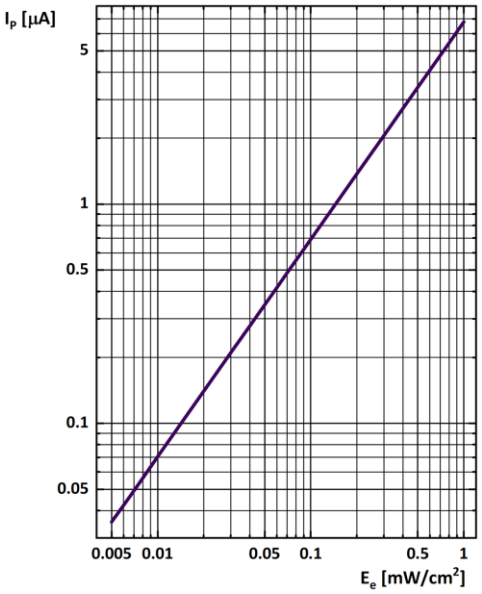
Directional Characteristics

$S_{rel} = f(\lambda)$



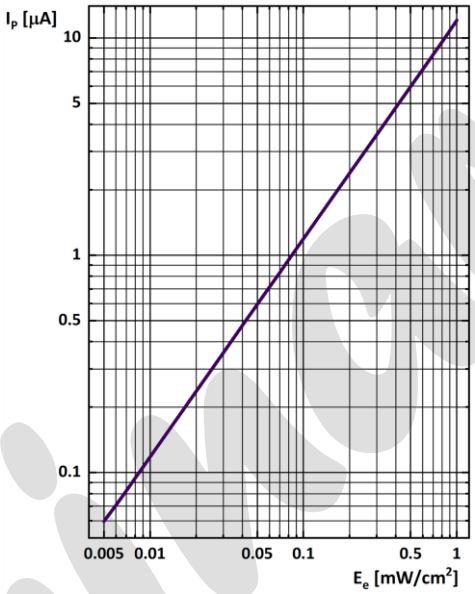
Photocurrent

$I_P = f (E_e)$; λ = 530 nm; V_R = 5 V



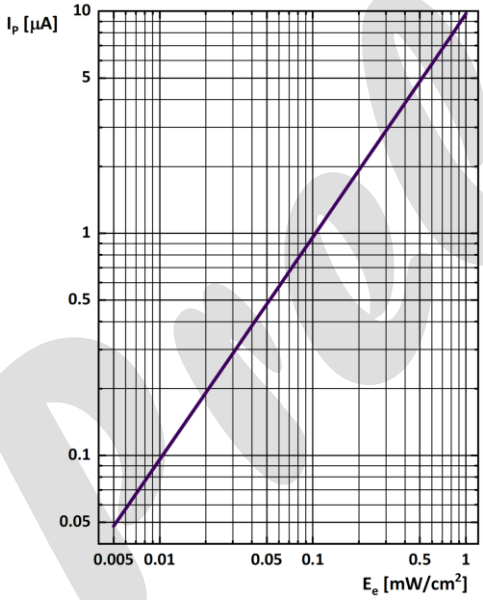
Photocurrent

$I_P = f (E_e)$; λ = 940 nm; V_R = 5 V



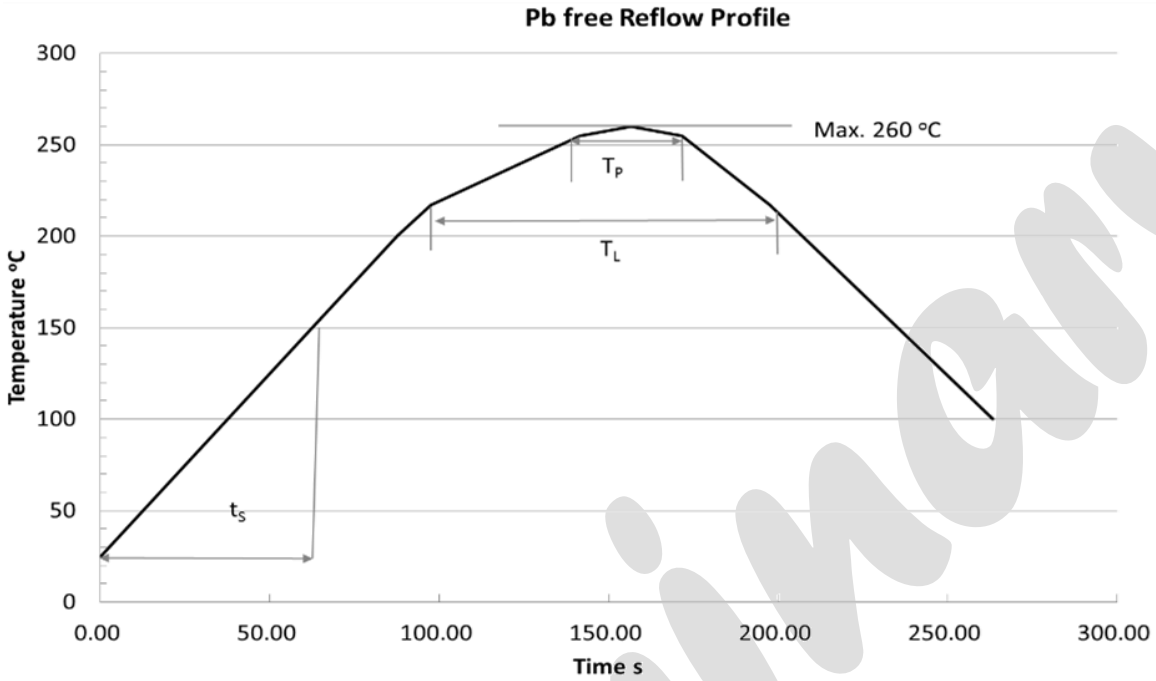
Photocurrent

$I_P = f (E_e)$; λ = 660 nm; V_R = 5 V



Reflow Soldering Profile

Product complies to MSL Level 3 acc. to JEDEC J-STD-020E



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

1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 2 times.

Disclaimer

1. Brightek reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets Brightek published specification for a period of one year from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. Brightek assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
5. These specification sheets include materials protected under copyright of Brightek. Reproduction in any form is prohibited without obtaining Brightek's prior consent.
6. This product is not intended to be used for military, aircraft, life sustaining or life saving applications or any other application which can result in human injury or death. Please contact authorized Brightek sales agent for special application request.