

# SFH 2504

## Radial T1 3/4

Silicon PIN Photodiode with integrated Temperature Sensor



## Applications

- Electronic Equipment

## Features:

- Package: black epoxy
- ESD: 2 kV acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)
- Especially suitable for applications from 740 nm to 1100 nm
- 5 mm LED plastic package
- Integrated NTC thermistor,  $R_{25}=10k\Omega$

## Ordering Information

Type	Photocurrent $E_e = 1 \text{ mW/cm}^2; \lambda = 870 \text{ nm}; V_R = 5 \text{ V}$ $I_P$	Photocurrent typ. $E_e = 1 \text{ mW/cm}^2; \lambda = 870 \text{ nm}; V_R = 5 \text{ V}$ $I_P$	Ordering Code
SFH 2504 AN23	$\geq 1.9 \mu\text{A}$	$2.7 \mu\text{A}$	Q65110A3986

## Maximum Ratings

 $T_A = 25\text{ °C}$ 

Parameter	Symbol		Values
Operating Temperature	$T_{op}$	min. max.	-40 °C 100 °C
Storage temperature	$T_{stg}$	min. max.	-40 °C 100 °C
Reverse voltage	$V_R$	max.	30 V
Total power dissipation	$P_{tot}$	max.	30 mW
ESD withstand voltage acc. to ANSI/ESDA/JEDEC JS-001 (HBM, Class 2)	$V_{ESD}$		2 kV

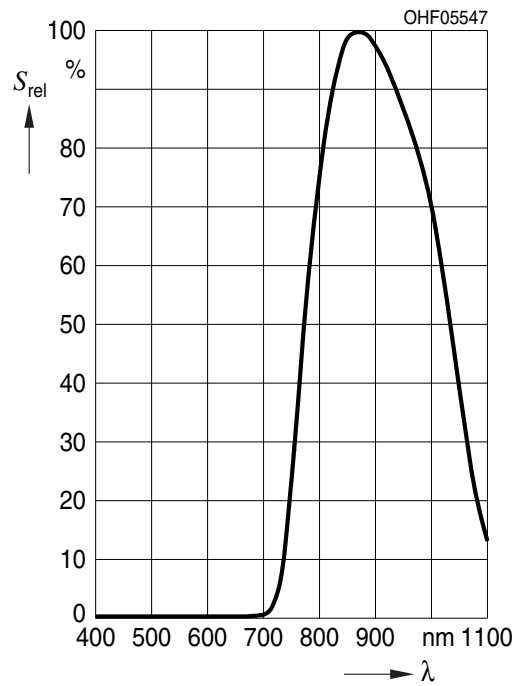
## Characteristics

$T_A = 25\text{ °C}$

Parameter	Symbol		Values
Wavelength of max sensitivity	$\lambda_{S\text{ max}}$	typ.	870 nm
Spectral range of sensitivity	$\lambda_{10\%}$	typ.	740 ... 1100 nm
Radiant sensitive area	A	typ.	0.31 mm <sup>2</sup>
Dimensions of active chip area	L x W	typ.	0.56 x 0.56 mm x mm
Half angle	$\varphi$	typ.	60 °
Dark current	$I_R$	typ.	0.05 nA
$V_R = 10\text{ V}$		max.	5 nA
Rise time	$t_r$	typ.	0.01 $\mu$ s
$V_R = 10\text{ V}; R_L = 50\ \Omega; \lambda = 850\text{ nm}$			
Fall time	$t_f$	typ.	0.01 $\mu$ s
$V_R = 10\text{ V}; R_L = 50\ \Omega; \lambda = 850\text{ nm}$			
Forward voltage	$V_F$	typ.	1.2 V
$I_F = 100\text{ mA}; E = 0$			
Capacitance	$C_0$	max.	13 pF
$V_R = 0\text{ V}; f = 1\text{ MHz}; E = 0$			
Temperature coefficient of voltage	$TC_V$	typ.	-2.6 mV / K
Resistance	$R_{25}$	typ.	10 k $\Omega$
Thermistor (EPCOS B57860S0103A002)			
Tolerance of resistance	$R_{\text{tol}}$	typ.	3 %
Thermistor (EPCOS B57860S0103A002)			
Rated temperature	$T_n$	typ.	25 °C
Thermistor (EPCOS B57860S0103A002)			

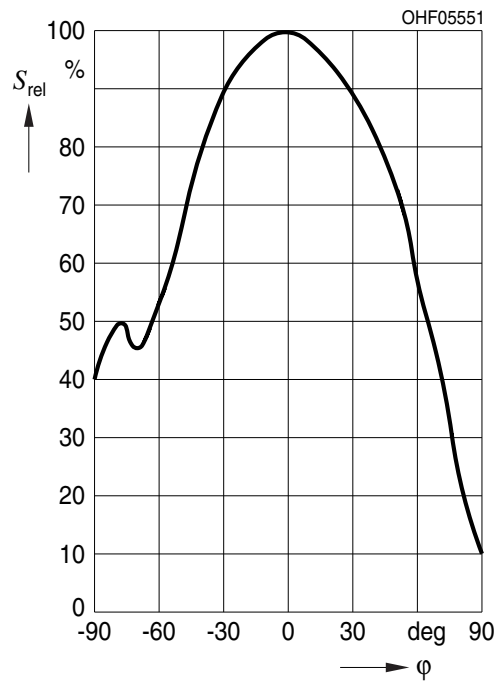
## Relative Spectral Sensitivity <sup>1), 2)</sup>

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



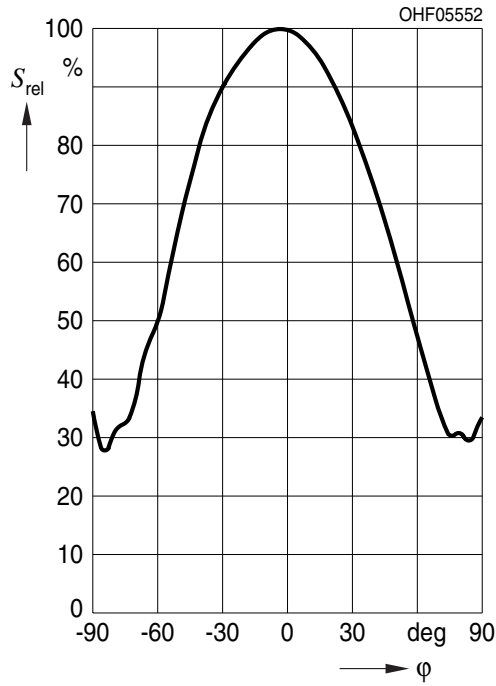
## Directional Characteristics <sup>1), 2)</sup>

$$S_{rel} = f(\varphi) \text{ perpendicular to leads}$$



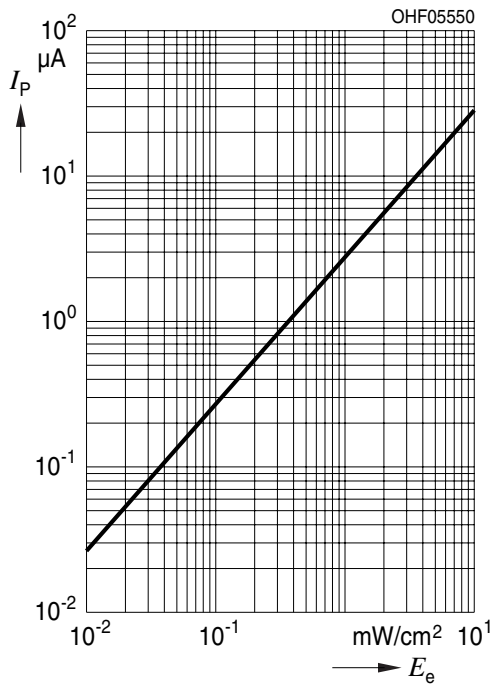
**Directional Characteristics** <sup>1), 2)</sup>

$S_{rel} = f(\varphi)$  parallel to leads



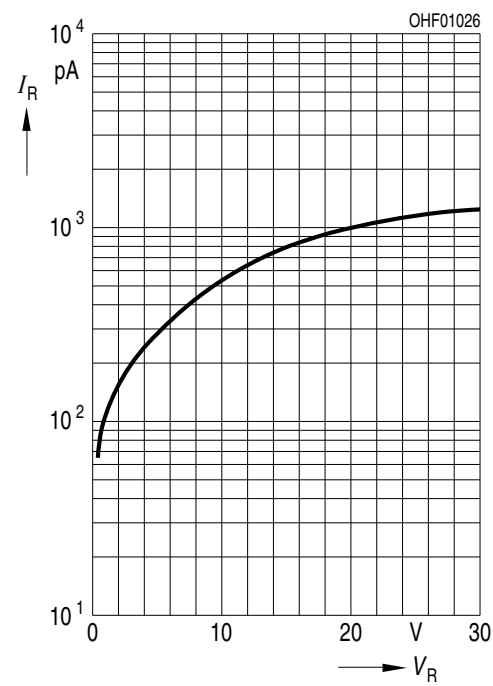
**Photocurrent/Open-Circuit Voltage** <sup>1), 2)</sup>

$I_P = f(E_e), \lambda = 870 \text{ nm}, V_R = 5 \text{ V}$



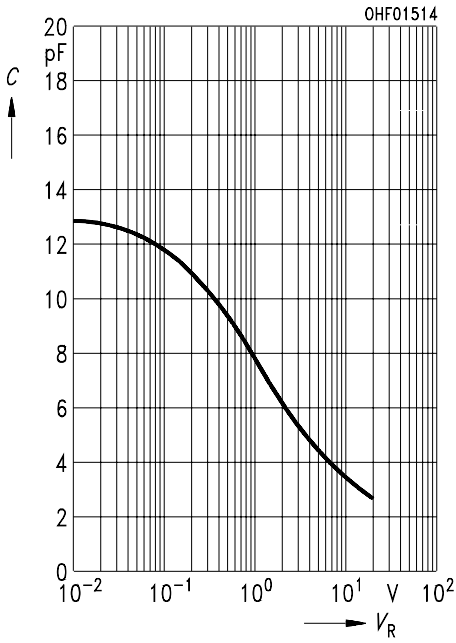
**Dark Current** <sup>1), 2)</sup>

$I_R = f(V_R); E = 0$



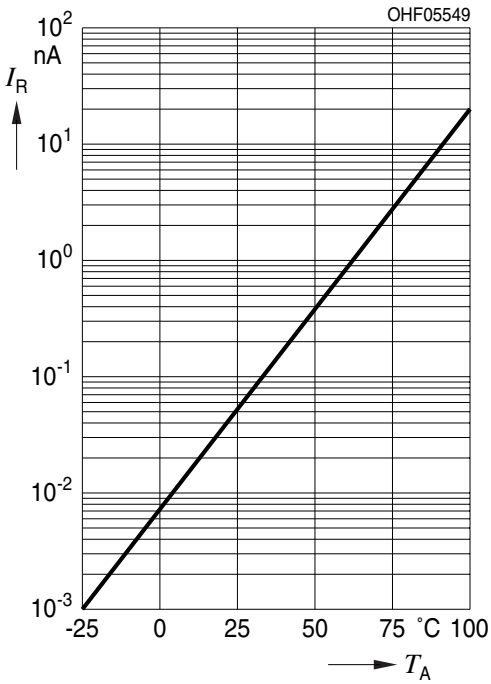
**Capacitance** <sup>1), 2)</sup>

$C = f(V_R); f = 1 \text{ MHz}; E = 0;$



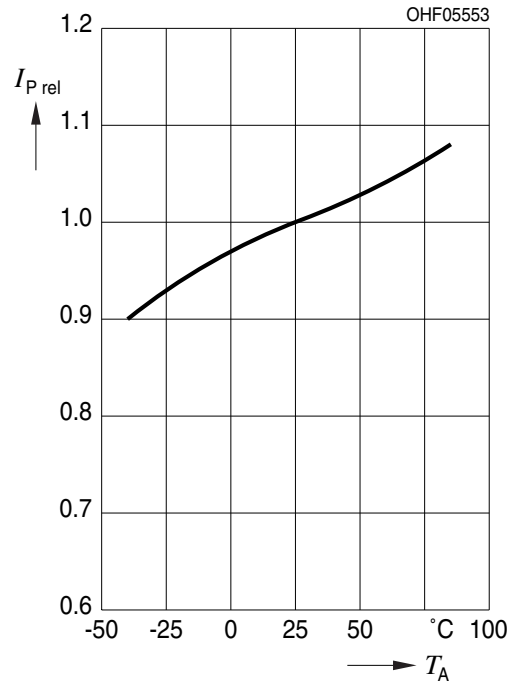
**Dark Current** <sup>2)</sup>

$I_R = f(T_A); E = 0; V_R = 10 \text{ V}$



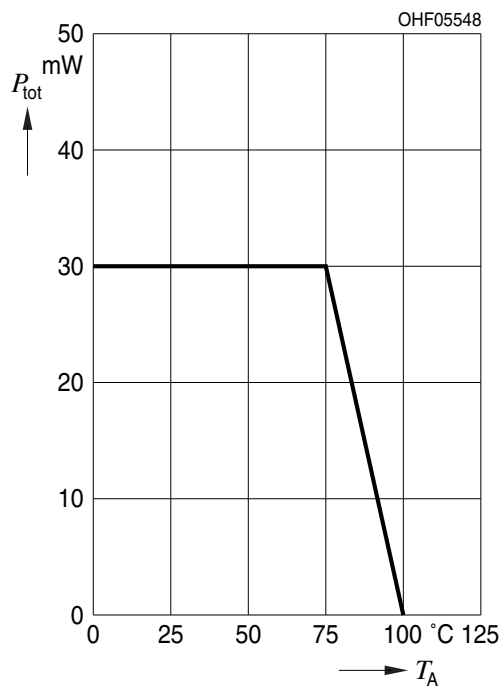
**Photocurrent**

$I_P/I_{P(25^\circ\text{C})} = f(T_A), \lambda = 870 \text{ nm}, V_{CE} = 5 \text{ V}$

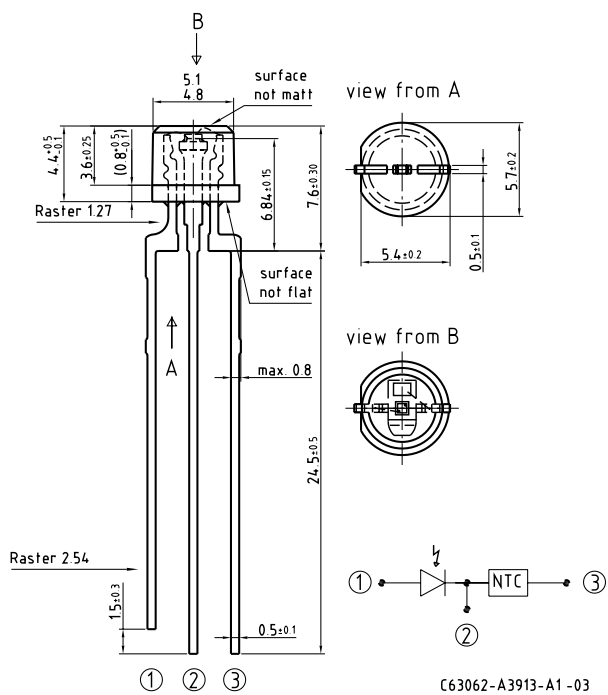


## Power Consumption

$$P_{\text{tot}} = f(T_A);$$



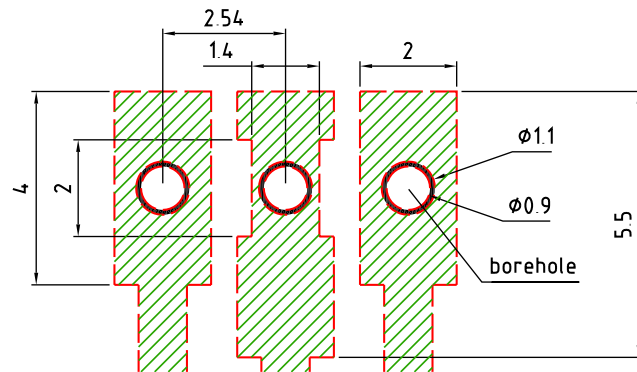
## Dimensional Drawing <sup>3)</sup>





Approximate Weight: 337.0 mg



**Recommended Solder Pad** <sup>3)</sup>

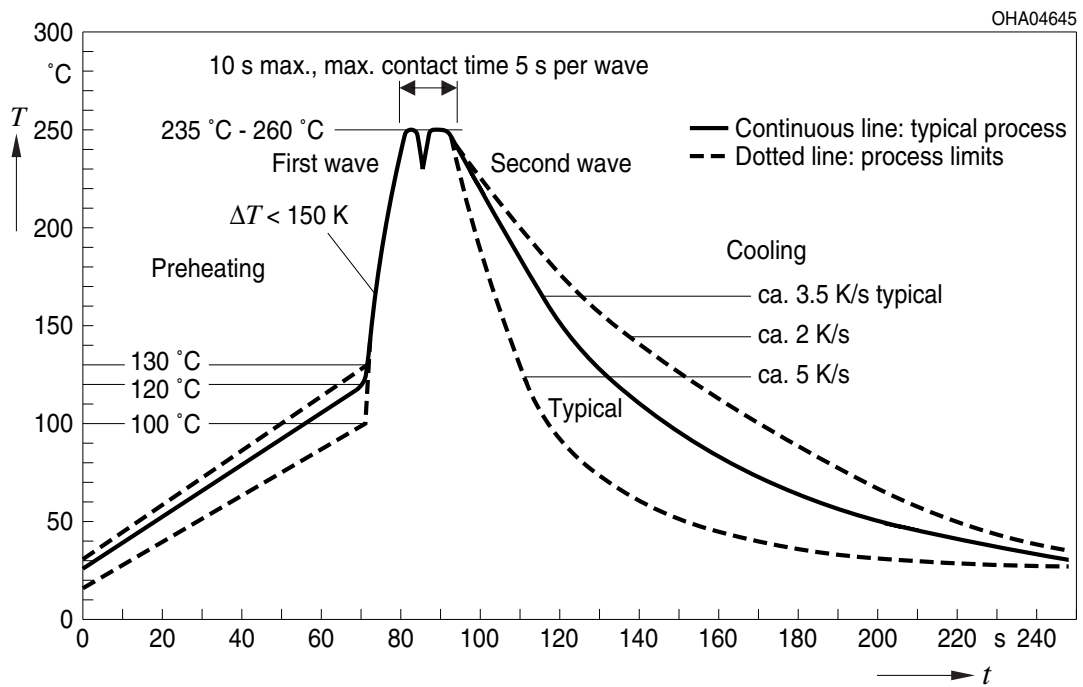


-  Cu area appr. 8mm<sup>2</sup> per pad and side with solder resist
-  Cu without solder resist

E062.3010.24-01

## TTW Soldering

IEC-61760-1 TTW



## Notes

The evaluation of eye safety occurs according to the standard IEC 62471:2006 (photo biological safety of lamps and lamp systems). Within the risk grouping system of this IEC standard, the LED specified in this data sheet fall into the class **exempt group (exposure time 10000 s)**. Under real circumstances (for exposure time, conditions of the eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. When looking at bright light sources (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Packing information is available on the internet (online product catalog).

For further application related informations please visit [www.osram-os.com/appnotes](http://www.osram-os.com/appnotes)

## Disclaimer

### Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

### Attention please!

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For information on the types in question please contact our Sales Organization.

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## Glossary

- 1) **Testing temperature:**  $T_A = 25^\circ\text{C}$
- 2) **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.
- 3) **Tolerance of Measure:** Unless otherwise noted in drawing, tolerances are specified with  $\pm 0.1$  and dimensions are specified in mm.

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