

Silicon PIN Photodiode with integrated Temperature Sensor

Version 1.4

SFH 2504



Features:

- Especially suitable for applications from 740 nm to 1100 nm
- 5 mm LED plastic package
- Integrated NTC thermistor, $R_{25}=10k\Omega$

Applications

- Temperature and light intensity measurement

Ordering Information

Type:	Photocurrent I_P [μA] $V_R = 5 V, \lambda = 870 nm, E_e = 1 mW/cm^2$	Ordering Code
SFH 2504 AN23	2.7 (≥ 1.9)	Q65110A3986

Maximum Ratings ($T_A = 25\text{ °C}$)

Parameter	Symbol	Values	Unit
Operating and storage temperature range	$T_{op}; T_{stg}$	-40 ... 100	°C
Reverse voltage	V_R	30	V
Total Power dissipation	P_{tot}	30	mW
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2000	V

Characteristics (Photodiode -- $T_A = 25\text{ °C}$)

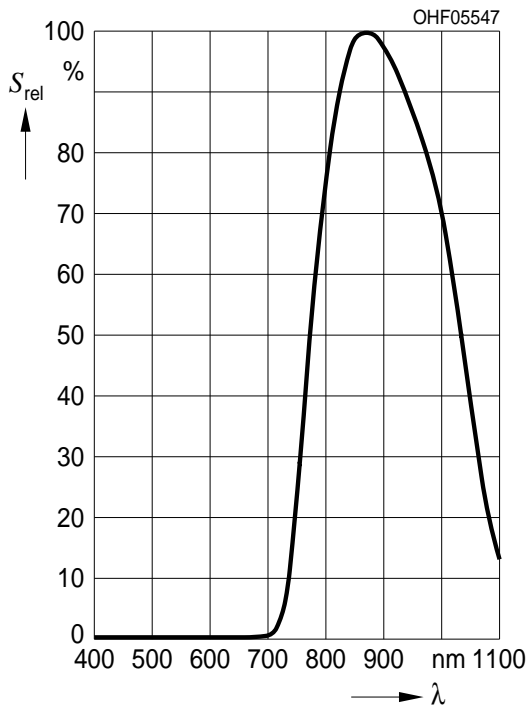
Parameter	Symbol	Values	Unit
Photocurrent ($V_R = 5\text{ V}$, $\lambda = 870\text{ nm}$, $E_e = 1\text{ mW/cm}^2$)	(typ (min)) I_P	2.7 (≥ 1.9)	μA
Wavelength of max. sensitivity	(typ) $\lambda_{S\max}$	870	nm
Spectral range of sensitivity	(typ) $\lambda_{10\%}$	(typ) 740 ... 1100	nm
Radiant sensitive area	(typ) A	0.31	mm^2
Dimensions of radiant sensitive area	(typ) $L \times W$	0.56 x 0.56	mm x mm
Half angle	(typ) φ	± 60	°
Dark current ($V_R = 10\text{ V}$)	(typ (max)) I_R	0.05 (≤ 5)	nA
Rise and fall time ($V_R = 10\text{ V}$, $R_L = 50\ \Omega$, $\lambda = 850\text{ nm}$)	(typ) t_r, t_f	0.01	μs
Forward voltage ($I_F = 100\text{ mA}$, $E = 0$)	(typ) V_F	1.2	V
Capacitance ($V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$)	(typ) C_0	13	pF
Temperature coefficient of V_O	(typ) TC_V	-2.6	mV / K

Characteristics (Thermistor (EPCOS B57860S0103A002) -- $T_A = 25\text{ °C}$)

Parameter	Symbol	Values	Unit
Resistance	(typ) R_{25}	10	k Ω
Tolerance of resistance	(typ) R_{tol}	± 3	%
Rated temperature	(typ) T_n	25	°C

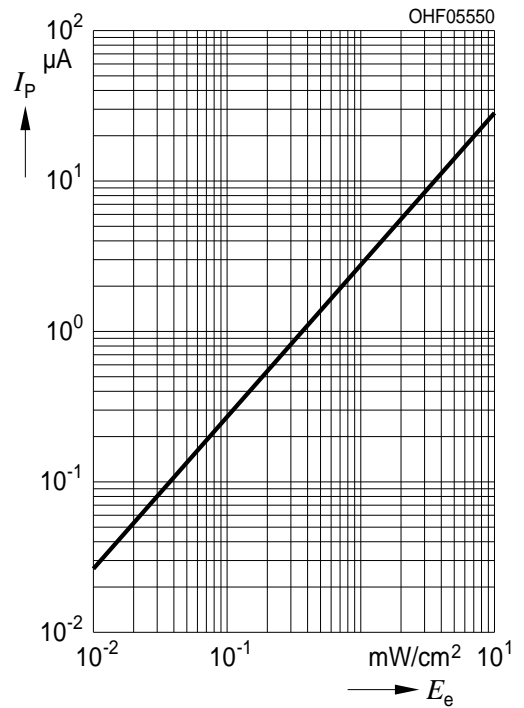
Relative Spectral Sensitivity ^{1) page 9}

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



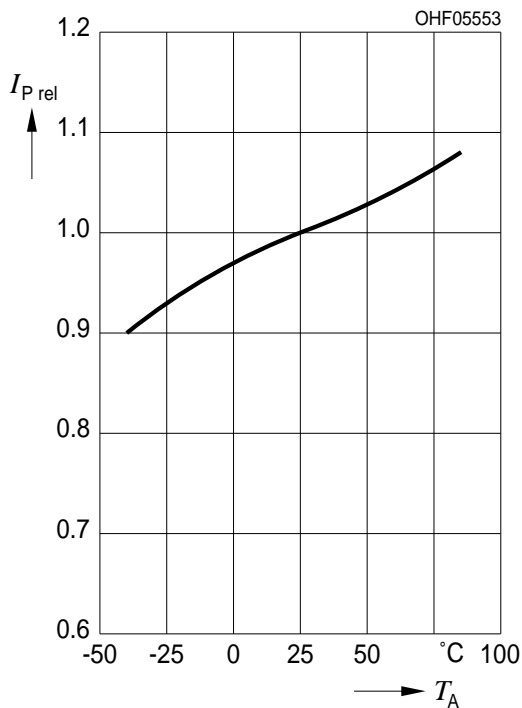
Photocurrent / Open-Circuit Voltage ^{1) page 9}

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



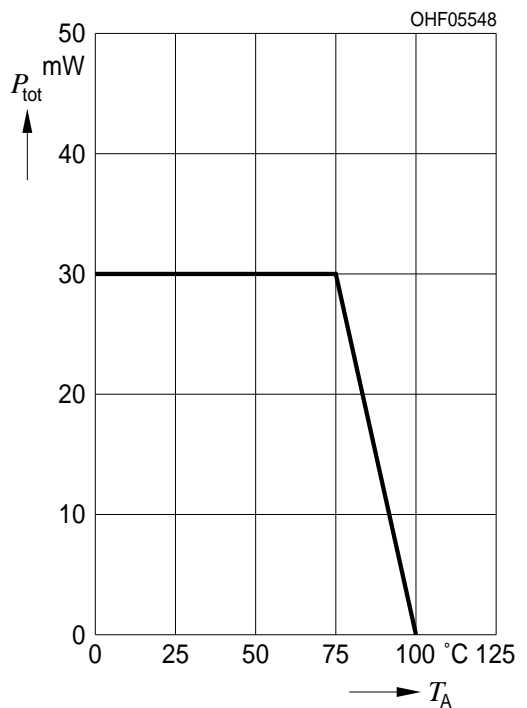
Photocurrent ^{1) page 9}

$I_P/I_{P25^\circ} = f(T_A), \lambda = 870\text{nm}, V_{CE} = 5\text{ V}$



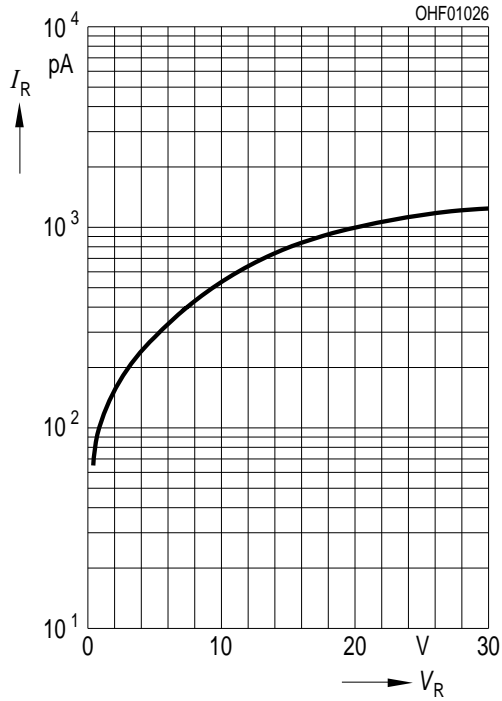
Power Consumption

$P_{tot} = f(T_A)$



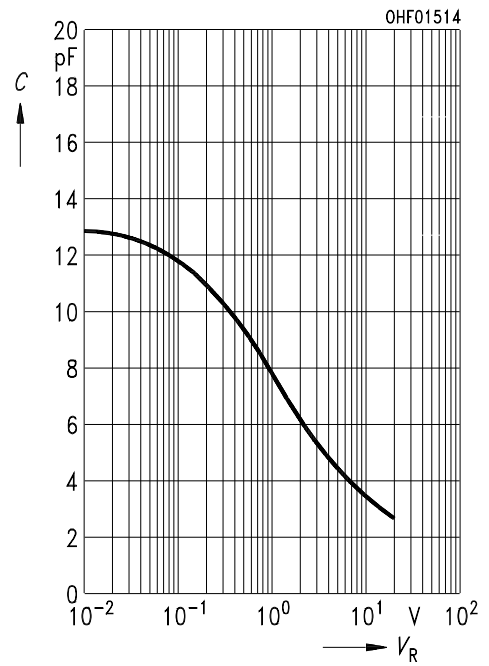
Dark Current ^{1) page 9}

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



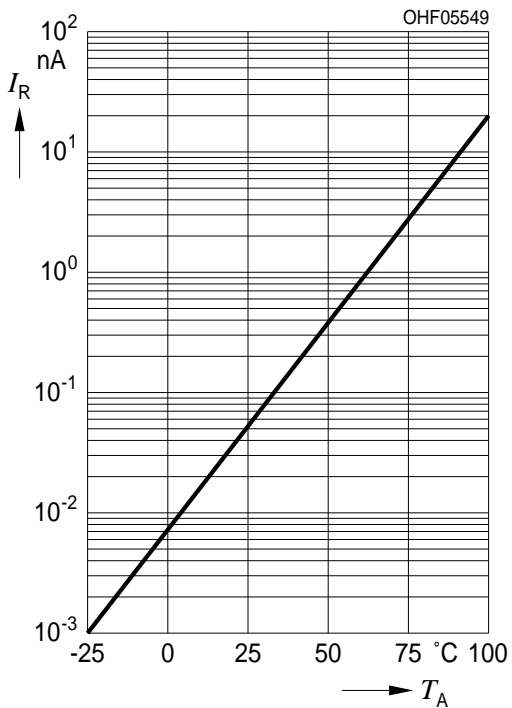
Capacitance ^{1) page 9}

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



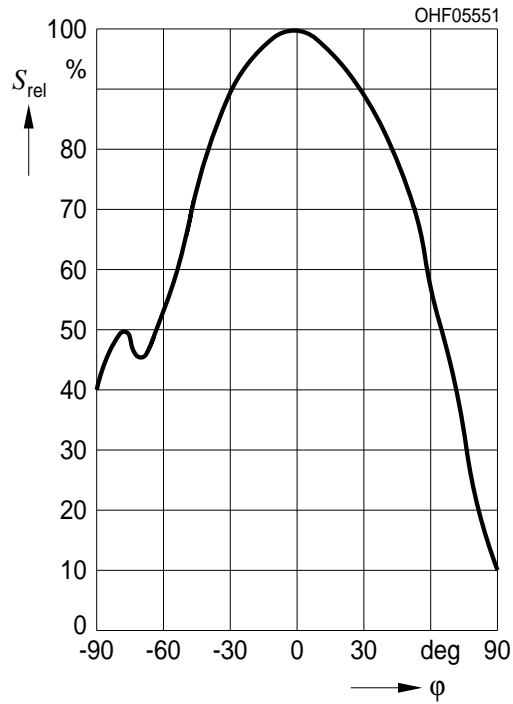
Dark Current ^{1) page 9}

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



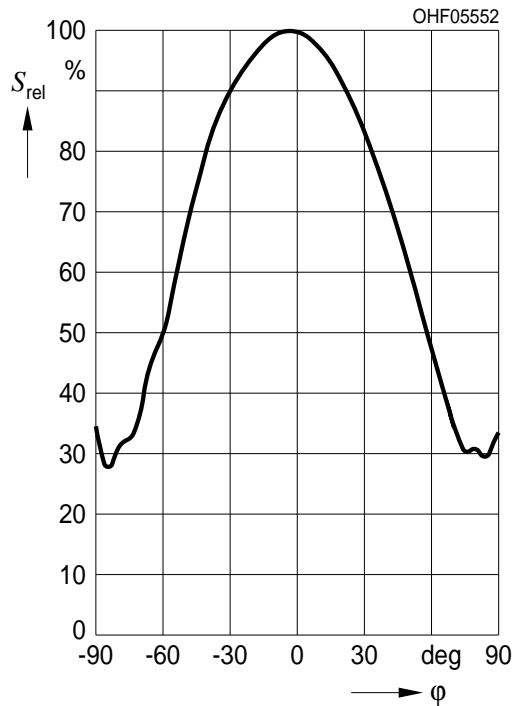
Directional Characteristics ^{1) page 9}

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

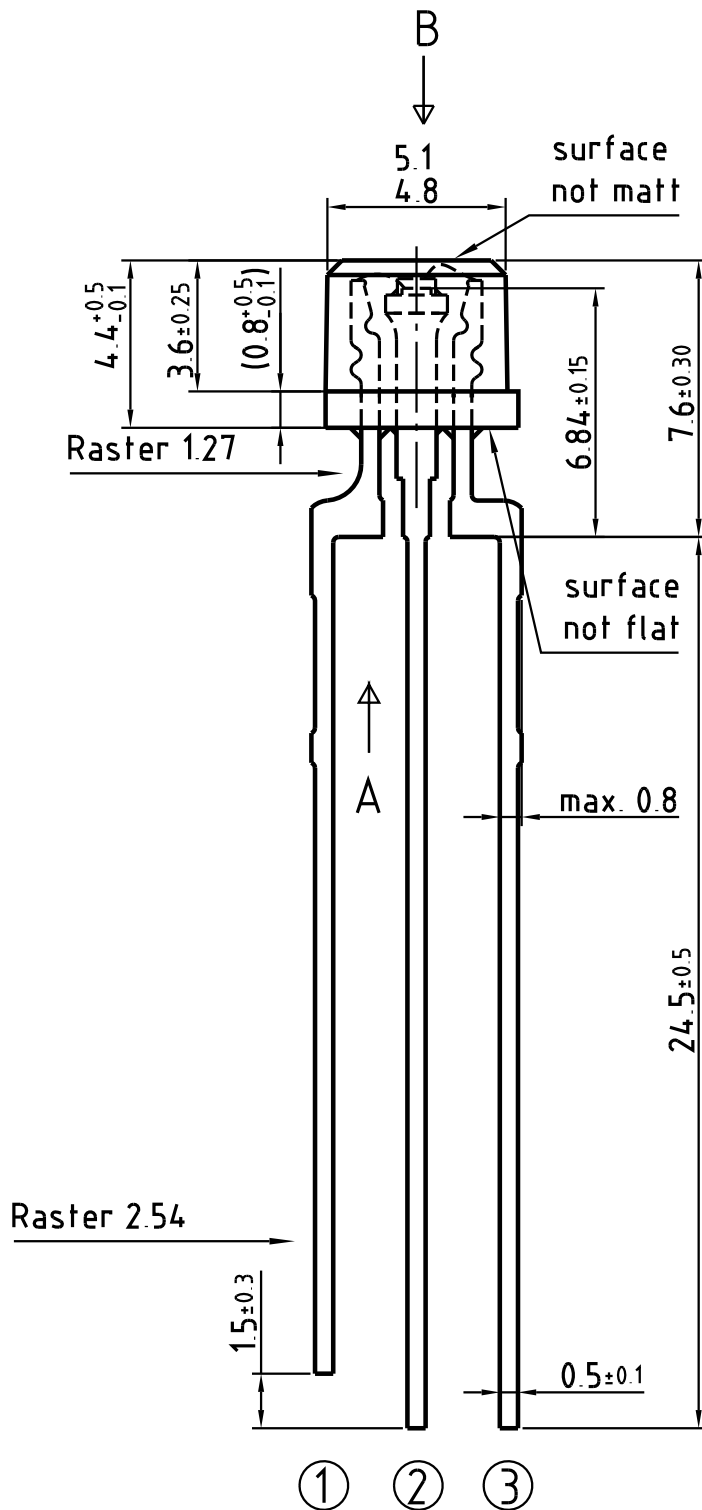


Directional Characteristics ^{1) page 9}

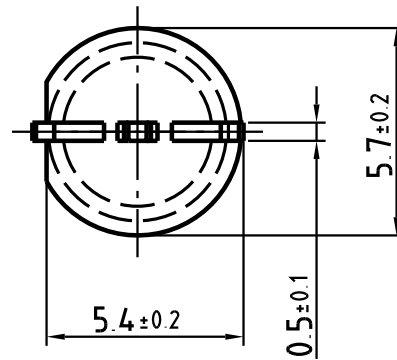
$S_{rel} = f(\phi)$ parallel to leads



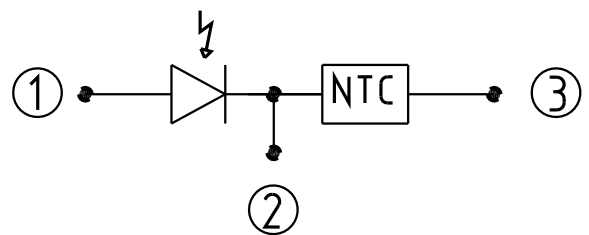
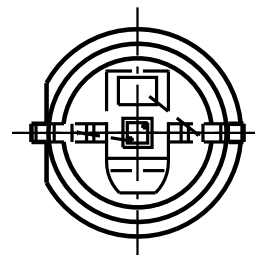
Package Outline



view from A



view from B



C63062-A3913-A1-03

Dimensions in mm (inch).

Package


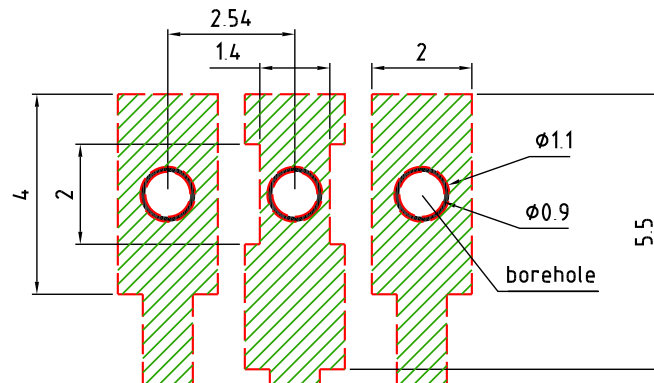
5mm Radial (T 1 3/4), Epoxy

Approximate Weight:

0.3 g

Note

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

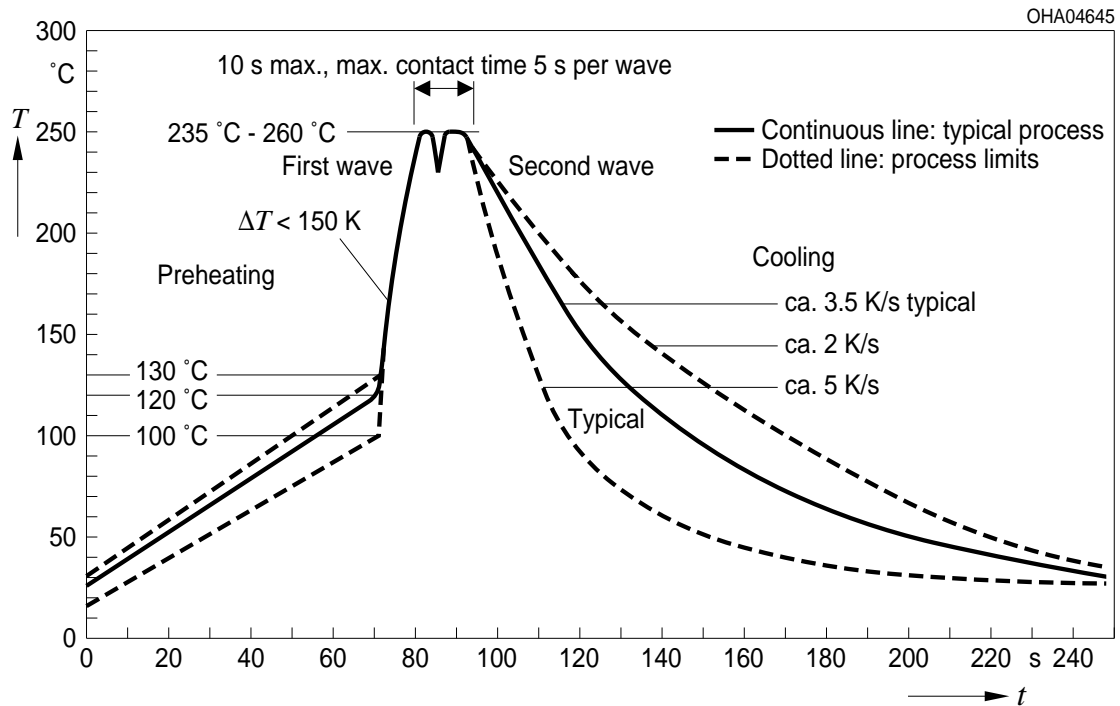
Recommended Solder Pad Cu area appr. 8mm² per pad and side with solder resist Cu without solder resist

Dimensions in mm.

E062 3010.24-01

TTW Soldering

IEC-61760-1 TTW

**Disclaimer**

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

Attention please!

The information describes the type of component and shall not be considered as assured characteristics.

Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.

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

If printed or downloaded, please find the latest version in the Internet.

Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose!

Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.

**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

Glossary

- ¹⁾ **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.

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