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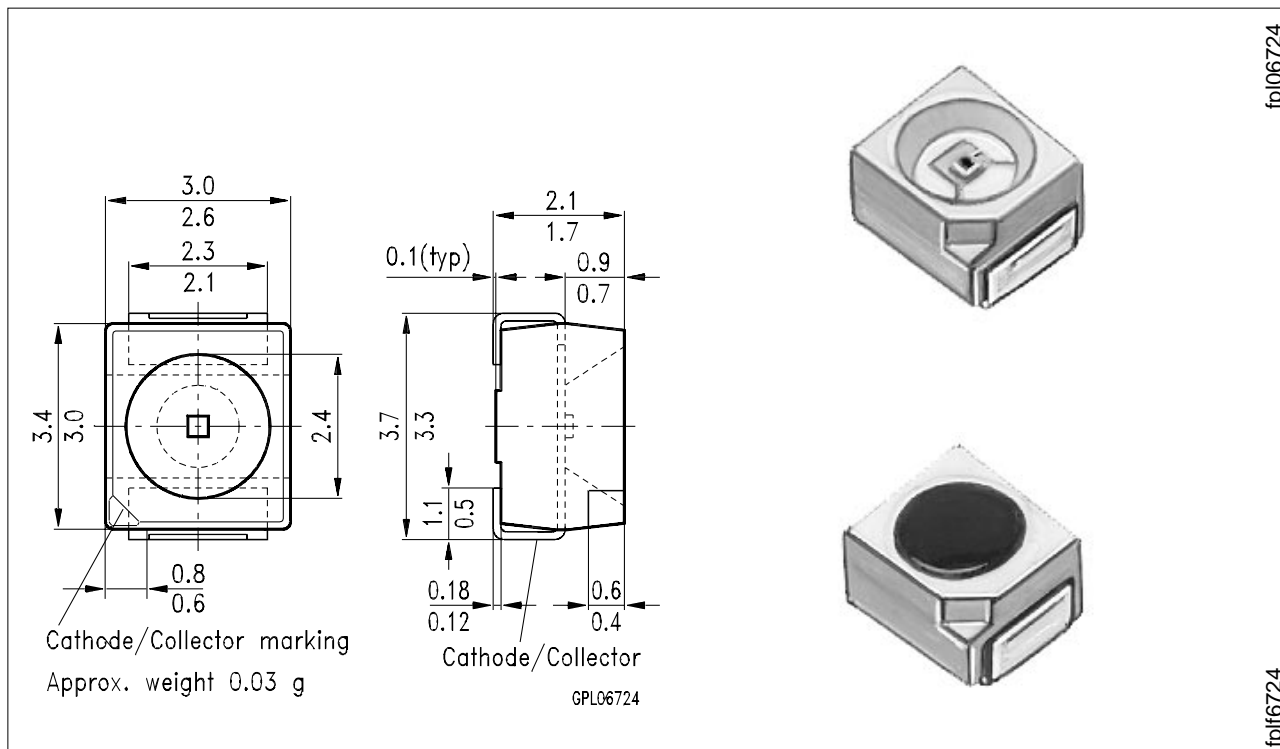
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## NPN-Silizium-Fototransistor im SMT TOPLED®-Gehäuse

## Silicon NPN Phototransistor in SMT TOPLED®-Package

SFH 320

SFH 320 FA



Maße in mm, wenn nicht anders angegeben/Dimensions in mm, unless otherwise specified.

### Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 380 nm bis 1150 nm (SFH 320) und bei 880 nm (SFH 320 FA)
- Hohe Linearität
- P-LCC-2 Gehäuse
- Gruppiert lieferbar
- für alle Lötverfahren geeignet

### Anwendungen

- Miniaturlichtschranken für Gleich- und Wechsellichtbetrieb
- Lochstreifenleser
- Industrieelektronik
- "Messen/Steuern/Regeln"

### Features

- Especially suitable for applications from 380 nm to 1150 nm (SFH 320) and of 880 nm (SFH 320 FA)
- High linearity
- P-LCC-2 package
- Available in groups
- Suitable for all soldering methods

### Applications

- Miniature photointerrupters
- punched tape readers
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Typ (*vorher) Type (*formerly)	Bestellnummer Ordering Code
SFH 320	Q62702-P0961	SFH 320 FA (*SFH 320 F)	Q62702-P0988
SFH 320-3	Q62702-P390	SFH 320 FA-3 (*SFH 320 F-3)	Q62702-P393
SFH 320-4	Q62702-P1606	SFH 320 FA-4 (*SFH 320 F-4)	Q62702-P1607

## Grenzwerte Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 55 ... + 100	°C
Kollektor-Emitterspannung Collector-emitter voltage	$V_{CE}$	35	V
Kollektorstrom Collector current	$I_C$	15	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	75	mA
Verlustleistung, $T_A = 25 \text{ }^\circ\text{C}$ Total power dissipation	$P_{tot}$	165	mW
Wärmewiderstand für Montage auf PC-Board Thermal resistance for mounting on pcb	$R_{thJA}$	450	K/W

**Kennwerte** ( $T_A = 25\text{ °C}$ ,  $\lambda = 950\text{ nm}$ )  
**Characteristics**

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		SFH 320	SFH 320 FA	
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	860	900	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	380 ... 1150	730 ... 1120	nm
Bestrahlungsempfindliche Fläche ( $\varnothing 240\text{ }\mu\text{m}$ ) Radiant sensitive area	$A$	0.045	0.045	$\text{mm}^2$
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	$0.45 \times 0.45$	$0.45 \times 0.45$	$\text{mm} \times \text{mm}$
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	$H$	0.5 ... 0.7	0.5 ... 0.7	mm
Halbwinkel Half angle	$\varphi$	$\pm 60$	$\pm 60$	Grad deg.
Kapazität, $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ Capacitance	$C_{\text{CE}}$	5.0	5.0	pF
Dunkelstrom Dark current $V_{\text{CE}} = 25\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	1 ( $\leq 200$ )	1 ( $\leq 200$ )	nA

Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

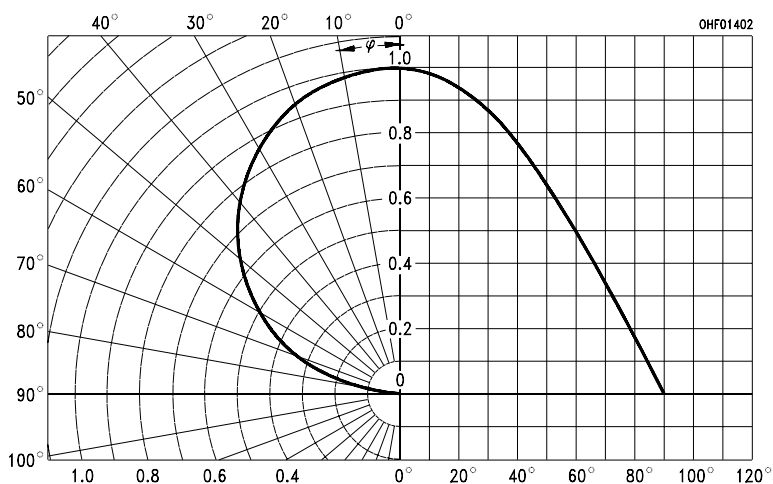
The phototransistors are grouped according to their spectral sensitivity and distinguished by arabian figures.

Bezeichnung Description	Symbol Symbol	Wert Value				Einheit Unit
		SFH 320/FA	-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.1 \text{ mW/cm}^2, V_{CE} = 5 \text{ V}$	$I_{PCE}$	$\geq 16$	16 ... 32	25 ... 50	$\geq 40$	$\mu\text{A}$
<b>SFH 320:</b> $E_v = 1000 \text{ lx}$ , Normlicht/standard light A, $V_{CE} = 5 \text{ V}$	$I_{PCE}$		420	650	1000	$\mu\text{A}$
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	$t_r, t_f$	7	6	7	8	$\mu\text{s}$
Kollektor-Emitter- Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3,$ $E_e = 0.1 \text{ mW/cm}^2$	$V_{CEsat}$	150	150	150	150	mV

1)  $I_{PCEmin}$  ist der minimale Fotostrom der jeweiligen Gruppe

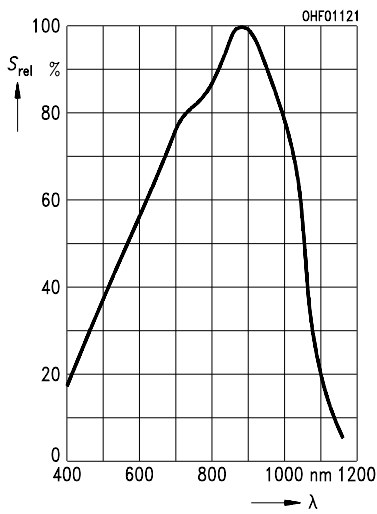
1)  $I_{PCEmin}$  is the min. photocurrent of the specified group

Directional characteristics  $S_{rel} = f(\varphi)$



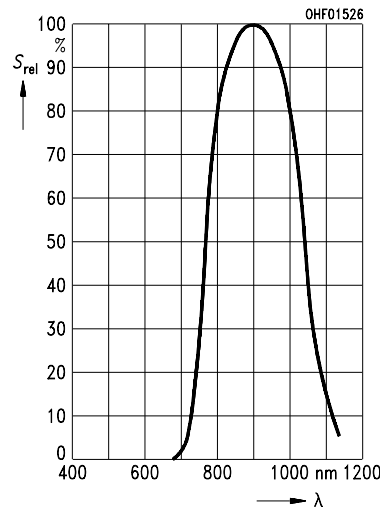
**Relative spectral sensitivity, SFH 320**

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



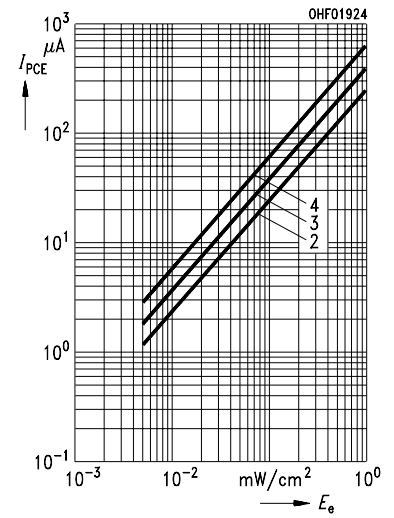
**Relative spectral sensitivity, SFH 320 FA**

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



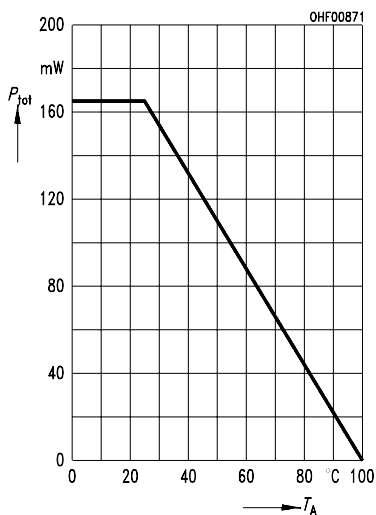
**Photocurrent**

$$I_{PCE} = f(E_e), V_{CE} = 5 V$$



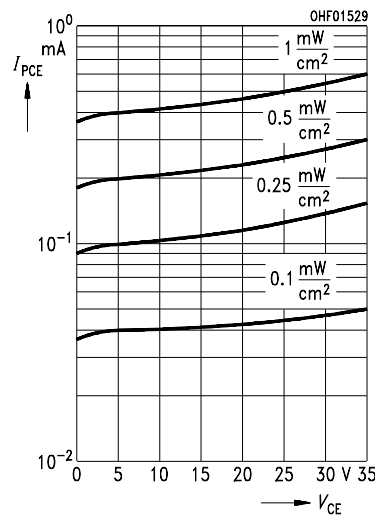
**Total power dissipation**

$$P_{tot} = f(T_A)$$



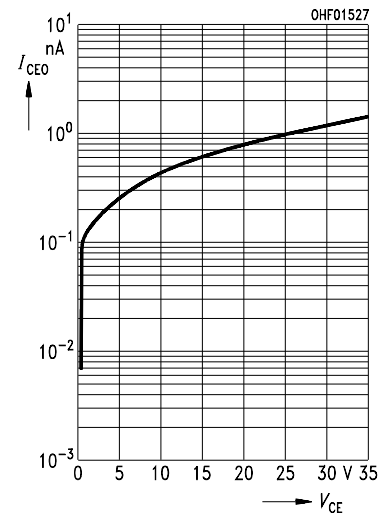
**Photocurrent**

$$I_{PCE} = f(V_{CE}), E_e = \text{Parameter}$$



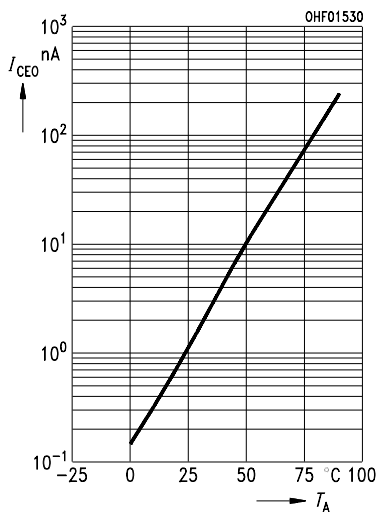
**Dark current**

$$I_{CEO} = f(V_{CE}), E = 0$$



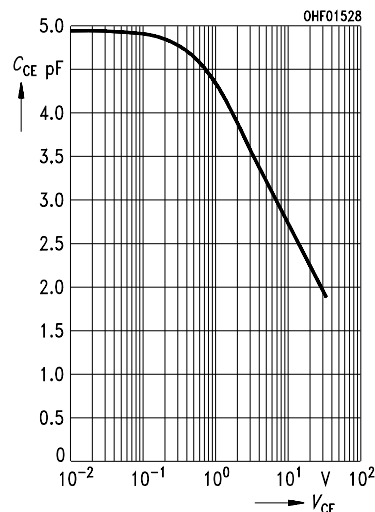
**Dark current**

$$I_{CEO} = f(T_A), V_{CE} = 5 V, E = 0$$



**Capacitance**

$$C_{CE} = f(V_{CE}), f = 1 \text{ MHz}, E = 0$$



**Photocurrent**

$$I_{PCE} / I_{PCE25^\circ} = f(T_A), V_{CE} = 5 V$$

