



**THE DATASHEET OF  
SFH 303 FA-3/4 RN23C**



**NPN-Silizium-Fototransistor**  
**Silicon NPN Phototransistor**  
**Lead (Pb) Free Product - RoHS Compliant**

**SFH 303 FA**



SFH 303 FA

**Wesentliche Merkmale**

- **Spektraler Bereich der Fotoempfindlichkeit:**  
730 nm ... 1100 nm
- **Gehäuse:** 5 mm Radial (T13/4), Harz
- **Besonderheit des Bauteils:**
  - mit Basisanschluss
  - hohe Fotoempfindlichkeit

**Features**

- **Spectral Range of Sensitivity:**  
730 nm ... 1100 nm
- **Package:** 5 mm Radial (T13/4), Epoxy
- **Feature of the device:**
  - with base connection
  - high photosensitivity

**Anwendungen**

- Lichtschranken
- Industrieelektronik
- „Messen/Steuern/Regeln“

**Applications**

- Photointerrupters
- Industrial electronics
- For control and drive circuits

Typ Type	Bestellnummer Ordering Code	Fotostrom, $E_e = 0.5\text{mW/cm}^2$ , $\lambda = 950\text{nm}$ , $V_{CE} = 5\text{ V}$ Photocurrent $I_{pce}$ (mA)
SFH 303 FA	Q62702P0958	$\geq 1.0$
SFH 303 FA-3/4	Q62702P3587	$\geq 1.6$

**Grenzwerte**  
**Maximum Ratings**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ...+ 100	°C
Kollektor-Emitterspannung Collector-emitter voltage	$V_{CE}$	35	V
Kollektorstrom Collector current	$I_C$	50	mA
Kollektorspitzenstrom, $\tau < 10 \mu s$ Collector surge current	$I_{CS}$	100	mA
Emitter-Basisspannung Emitter-base voltage	$V_{EB}$	7	V
Verlustleistung, $T_A = 25 \text{ }^\circ\text{C}$ Total power dissipation	$P_{tot}$	200	mW
Wärmewiderstand Thermal resistance	$R_{thJA}$	375	K/W

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

**Characteristics**

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	990	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von $S_{\text{max}}$ Spectral range of sensitivity $S = 10\%$ of $S_{\text{max}}$	$\lambda$	750 ...1120	nm
Bestrahlungsempfindliche Fläche Radiant sensitive area	$A$	0.11	mm <sup>2</sup>
Abmessung der Chipfläche Dimensions of chip area	$L \times B$ $L \times W$	$0.5 \times 0.5$	mm $\times$ mm
Halbwinkel Half angle	$\varphi$	$\pm 20$	Grad deg.
Fotostrom der Kollektor-Basis-Fotodiode Photocurrent of collector-base photodiode $E_e = 0.5\text{ mW/cm}^2$ , $V_{\text{CB}} = 5\text{ V}$ $V_{\text{CB}} = 5\text{ V}$	$I_{\text{PCB}}$	4.0	$\mu\text{A}$
Kapazität Capacitance $V_{\text{CE}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ $V_{\text{CB}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$ $V_{\text{EB}} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_{\text{CE}}$ $C_{\text{CB}}$ $C_{\text{EB}}$	7.5 14 19	pF pF pF
Dunkelstrom Dark current $V_{\text{CEO}} = 20\text{ V}$ , $E = 0$	$I_{\text{CEO}}$	1 ( $\leq 50$ )	nA
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage (threefold saturated)	$V_{\text{CEsat}}$	150	mV

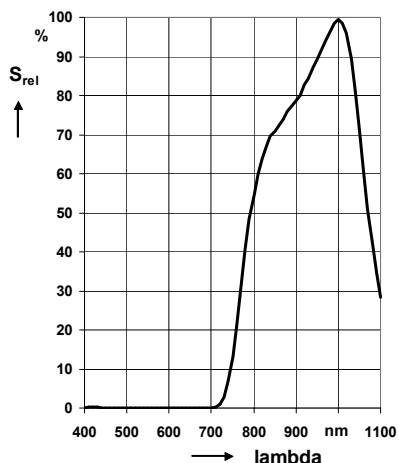
Die Fototransistoren werden nach ihrer Fotoempfindlichkeit gruppiert und mit arabischen Ziffern gekennzeichnet.

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

Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-2	-3	-4	
Fotostrom Photocurrent $E_e = 0.5 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_{CE} = 5 \text{ V}$	$I_{PCE}$	1.0 .. 2.0	1.6 .. 3.2	$\geq 2.5$	mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ k}\Omega$	$t_r, t_f$	11	13	15	$\mu\text{s}$

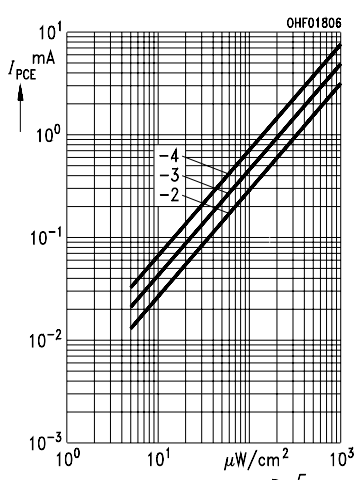
**Relative Spectral Sensitivity,**

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



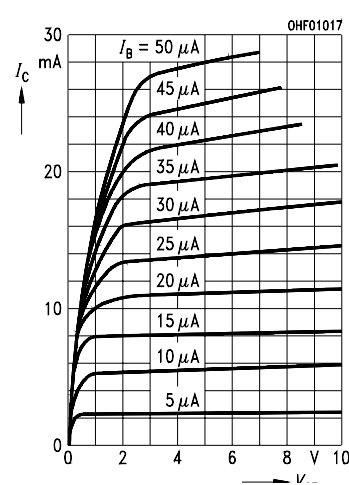
**Photocurrent**

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



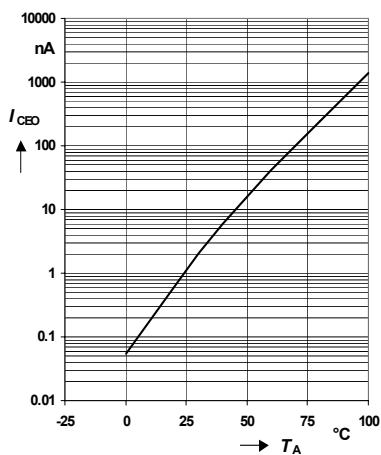
**Output Characteristics**

$I_C = f(V_{CE}), I_B = \text{Parameter}$



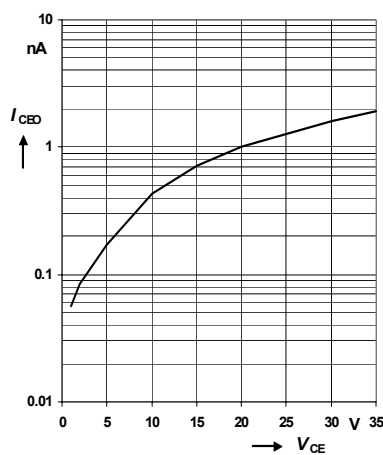
**Dark Current**

$I_{CEO} = f(T_A), V_{CE} = 20 V, E = 0$



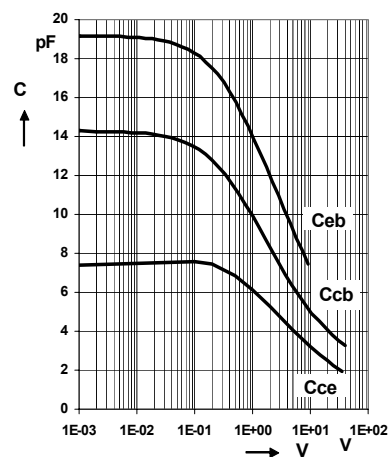
**Dark Current**

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



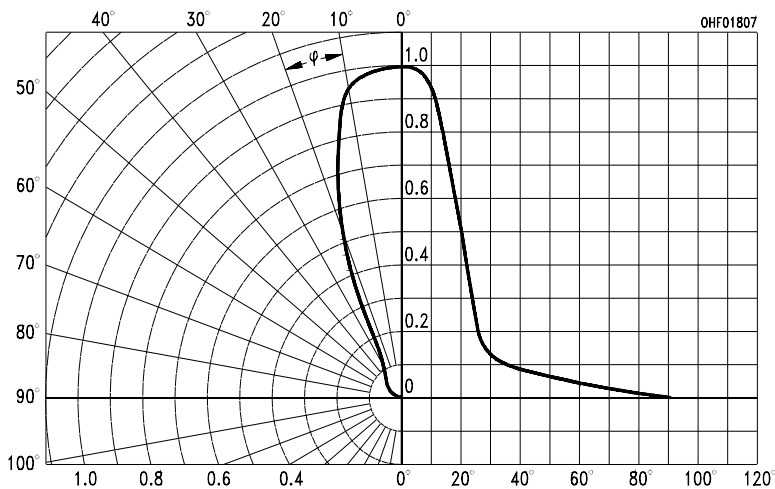
**Capacitance**

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

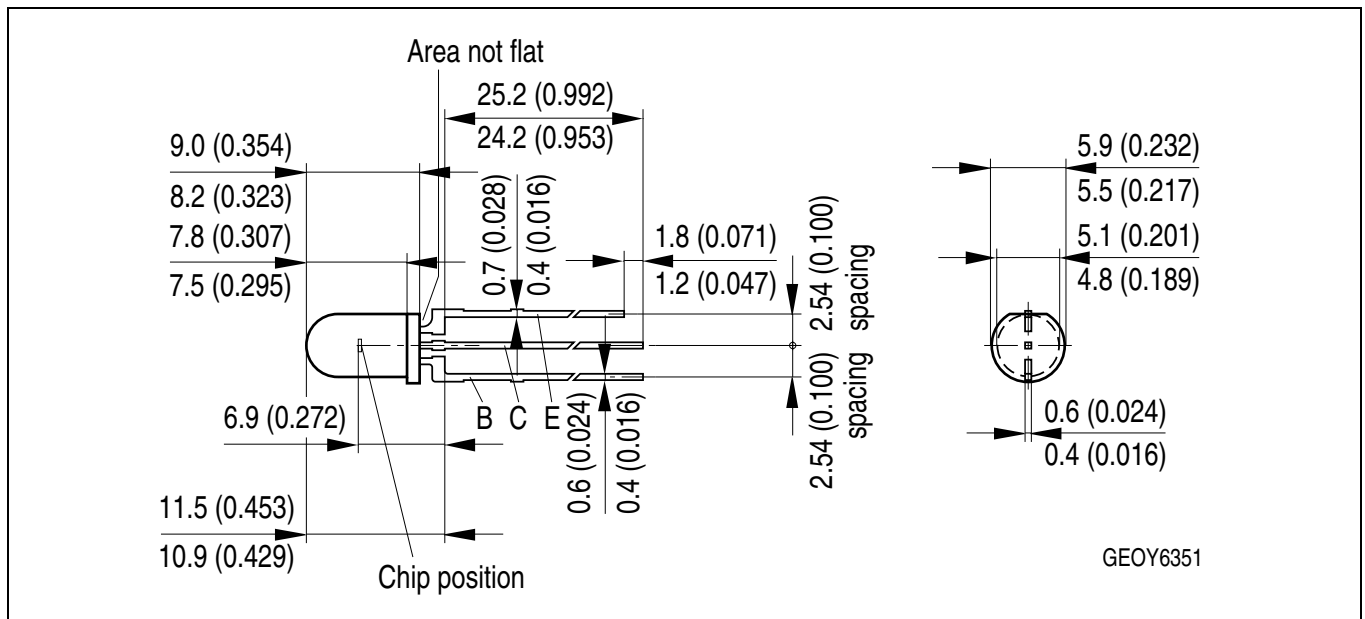


**Directional Characteristics**

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



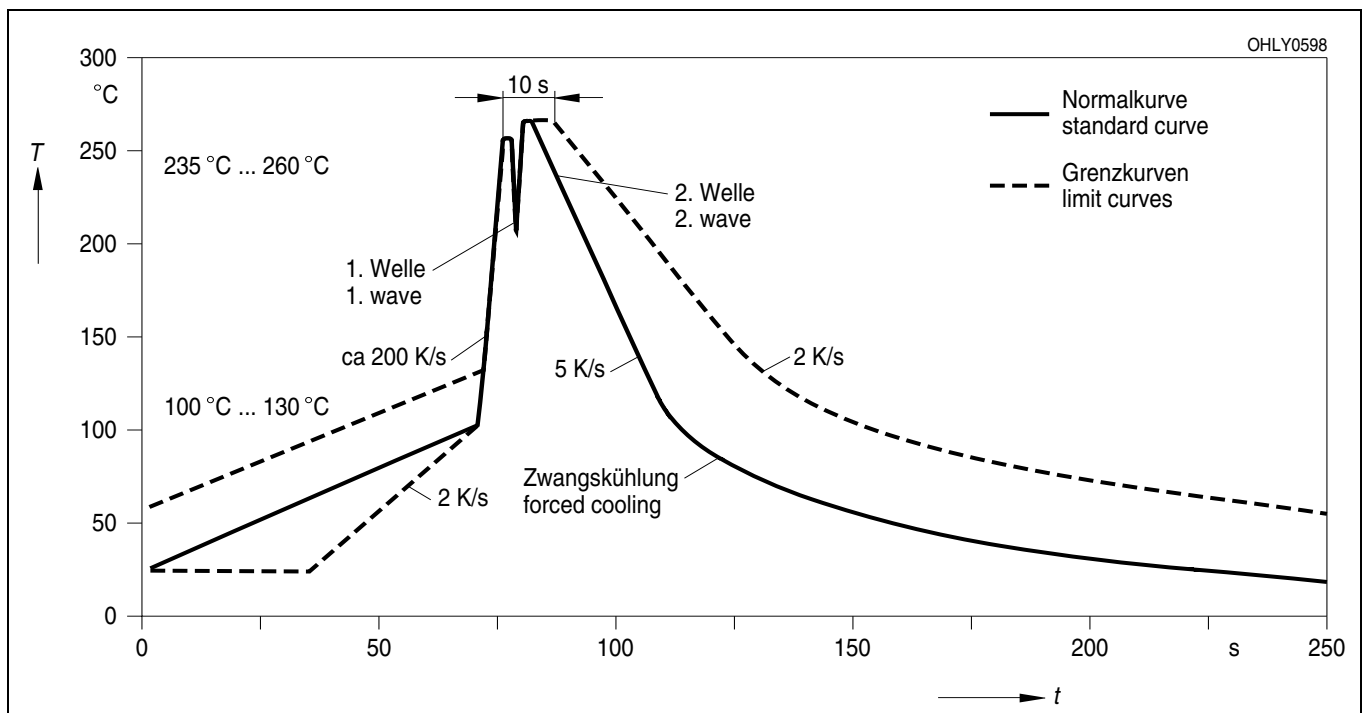
**Maßzeichnung  
Package Outlines**



Maße in mm (inch) / Dimensions in mm (inch).

**Lötbedingungen  
Soldering Conditions  
Wellenlöten (TTW)  
TTW Soldering**

(nach CECC 00802)  
(acc. to CECC 00802)



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<sup>1</sup> 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 effectiveness of that device or system.

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EU RoHS and China RoHS compliant product



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