

NPN-Silizium-Fototransistor mit Tageslichtsperrfilter Silicon NPN Phototransistor with Daylight-Cutoff Filter

SFH 3100 F



Wesentliche Merkmale

- Speziell geeignet für Anwendungen im Bereich von 840 nm bis 1080 nm
- Enge Empfangscharakteristik
- Geringe Außenabmessungen
- Gleiche Bauform wie IRED SFH 4110
- Hoher Koppelfaktor in Lichtschranken mit SFH 4110
- IR-Filter
- Leichte Unterscheidbarkeit zwischen SFH 3100 F (schwarzes Gehäuse) und SFH 4110 (klares Gehäuse)

Features

- Especially suitable for applications from 840 nm to 1080 nm
- Narrow half angle
- Small outline dimensions
- Same package as IRED SFH 4110
- High coupling factor in light barriers with SFH 4110
- IR filter
- Easy identification of SFH 3100 F (black package) and SFH 4110 (clear package)

Anwendungen

- Empfänger in Lichtschranken
- Bandende-Erkennung (z.B. Videorecorder)
- Datenübertragung
- Positionsüberwachung
- Barcode-Leser
- „Messen/Steuern/Regeln“
- Münzzähler

Applications

- Detector in photointerrupters
- Tape end detection
- Data transmission
- Position sensing
- Barcode reader
- For control and drive circuits
- Coin counters

Typ Type	Bestellnummer Ordering Code	Gehäuse Package
SFH 3100 F SFH 3100 F-2/3/4	Q62702-P5073 Q62702-P5475	Schwarz eingefärbtes Miniatur-Kunststoffgehäuse, Anschlüsse im 2,54-mm Raster, Emitter-Kennzeichnung: kurzer Anschluß Black-colored miniature plastic package, solder tabs 2.54-mm ($\frac{1}{10}$ "), emitter marking: short lead

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebs- und Lagertemperatur Operating and storage temperature range	$T_{op}; T_{stg}$	- 40 ... + 85	°C
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE} $V_{CE} (t < 2 \text{ min})$	30 70	V
Kollektorstrom Collector current	I_C	50	mA
Kollektorspitzenstrom, $t < 10 \mu\text{s}$ Collector surge current	I_{CS}	100	mA
Emitter-Kollektorspannung Emitter-collector voltage	V_{EC}	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	P_{tot}	150	mW
Wärmewiderstand Sperrschicht - Umgebung Thermal resistance junction - ambient	R_{thJA}	280	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	$\lambda_{S\text{ max}}$	920	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	840 ... 1080	nm
Abmessungen der Chip-Fläche Dimension of chip area	$L \times B$ $L \times W$	0.55×0.55	mm × mm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	0.11	mm ²
Halbwinkel Half angle	φ	± 14	Grad deg.
Kapazität Capacitance $V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ $V_{CE} = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_{CE}	6.5 3.0	pF
Dunkelstrom, $V_{CE} = 20\text{ V}$ Dark current	I_{CEO}	2 (≤ 50)	nA
Fotostrom Photocurrent $E_e = 0.5\text{ mW/cm}^2$, $V_{CE} = 5\text{ V}$	I_{PCE}	>0.4	mA

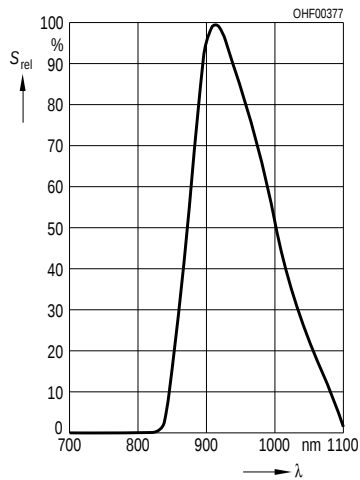
Bezeichnung Parameter	Symbol Symbol	Wert Value			Einheit Unit
		-2	-3	-4	
Fotostrom, $\lambda = 950 \text{ nm}$ Photocurrent $E_e = 0.5 \text{ mW/cm}^2$, $V_{CE} = 5 \text{ V}$	I_{PCE}	0.63 ... 1.25	1 ... 2	1.6 ... 3.2	mA
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 \text{ mA}$, $V_{CC} = 5 \text{ V}$, $R_L = 1 \text{ k}\Omega$	t_r , t_f	7 9			μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = I_{PCEmin}^{1)} \times 0.3$, $E_e = 0.5 \text{ mW/cm}^2$, $\lambda = 950 \text{ nm}$	V_{CEsat}	110 (≤ 400)			mV

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

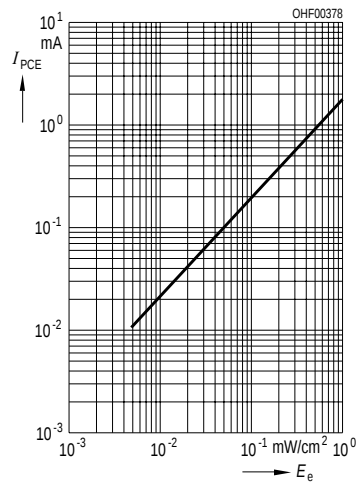
¹⁾ I_{PCEmin} is the min. photocurrent of the specified group.

Relative Spectral Sensitivity

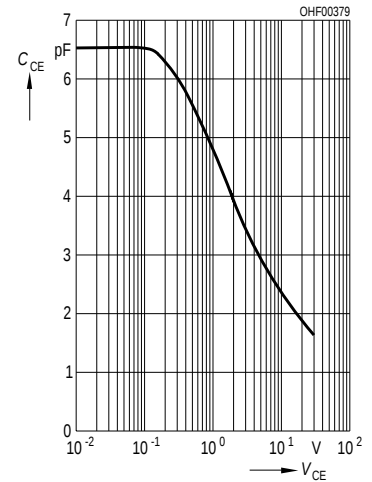
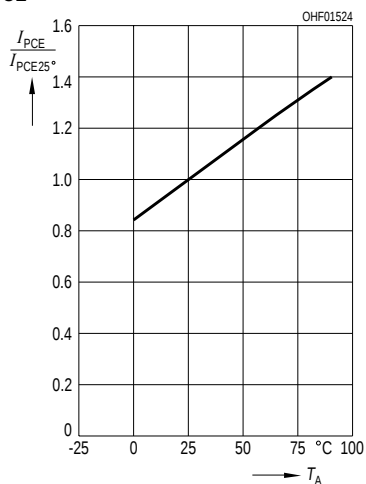
$$S_{\text{rel}} = f(\lambda)$$

**Photocurrent**

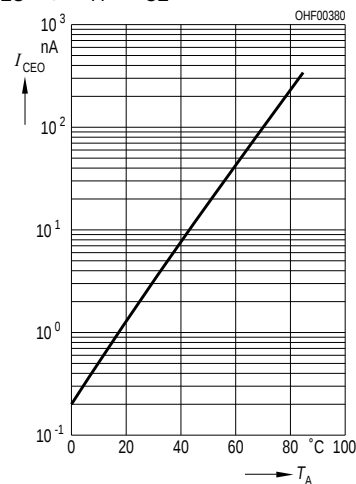
$$I_{\text{PCE}} = f(E_e), V_{\text{CE}} = 5 \text{ V}$$

**Collector-Emitter Capacitance**

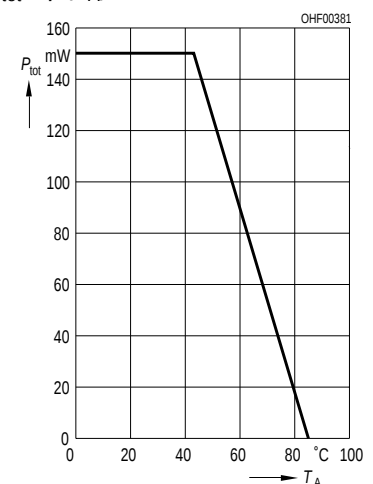
$$C_{\text{CE}} = f(V_{\text{CE}}), f = 1 \text{ MHz}, E = 0$$

**Photocurrent $I_{\text{PCE}} = f(T_A)$, $V_{\text{CE}} = 5 \text{ V}$, normalized to 25 °C****Dark Current**

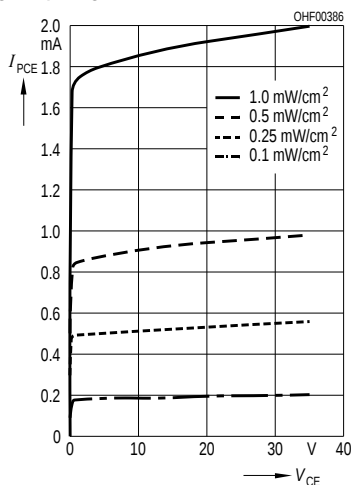
$$I_{\text{CEO}} = f(T_A), V_{\text{CE}} = 20 \text{ V}, E = 0$$

**Total Power Dissipation**

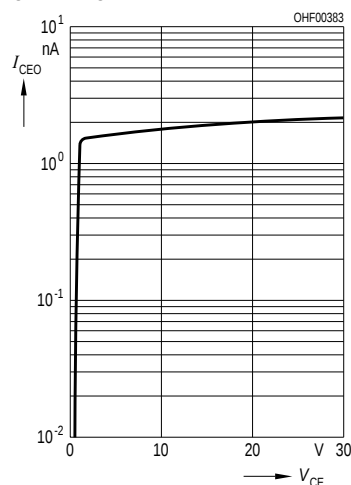
$$P_{\text{tot}} = f(T_A)$$

**Photocurrent SFH 3100 F**

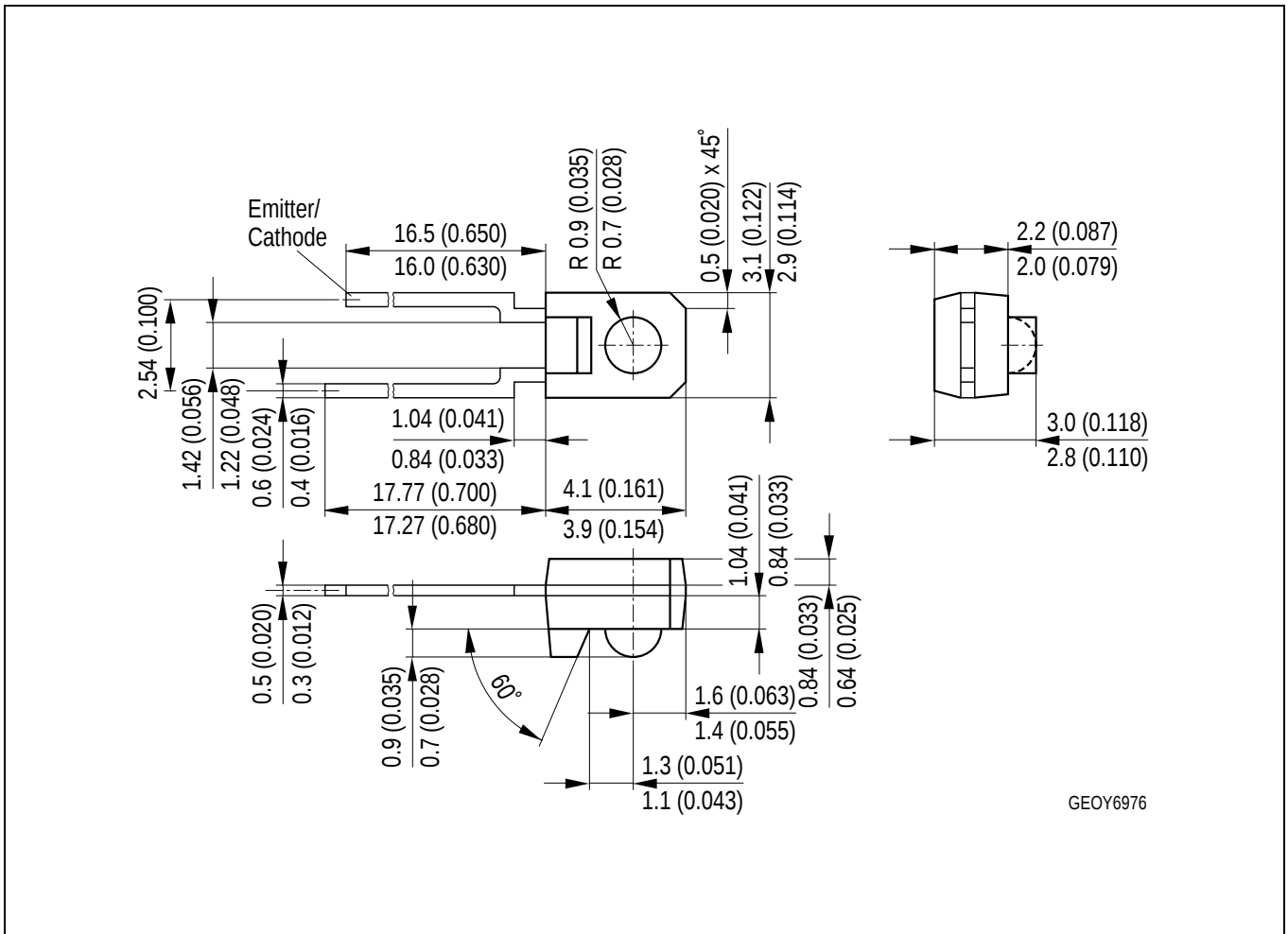
$$I_{\text{PCE}} = f(V_{\text{CE}})$$

**Dark Current**

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



Maßzeichnung Package Outlines



Maße werden wie folgt angegeben: mm (inch) / Dimensions are specified as follows: mm (inch).

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