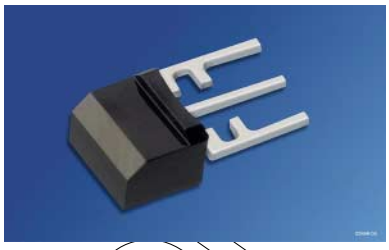
Doppel-NPN-Silizium-Fototransistor mit Tageslichtsperrfilter
Dual Silicon NPN Phototransistor with Daylight-Cutoff Filter

SFH 3160 F



Wesentliche Merkmale

- Tageslichtsperrfilter
- Doppel-Fototransistor übereinander positioniert
- Doppel-Fototransistor mit gemeisamem Kollektor
- Optimale Kombination mit SFH4111 (vertikaler Enkoder)

Features

- Daylight Filter
- Dual Phototransistor positioned one on top of each other
- Dual Phototransistor with common Collector
- Ideal combination with SFH4111 (vertical encoder)

Anwendungen

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

Applications

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

Typ **Type**	**Bestellnummer** **Ordering Code**	**$I_{ce(on)}$ [µA]** **V_{ce}=3.5V, 950nm, E_e=0.34mW/cm²**
SFH 3160 F	Q62702-P5296	90 ... 290

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
Löttemperatur bei Tauchlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 5$ s Dip soldering temperature ≥ 2 mm distance from case bottom, soldering time $t \leq 5$ s	T_S	260	°C
Löttemperatur bei Kolbenlötung Lötstelle ≥ 2 mm vom Gehäuse, Lötzeit $t \leq 3$ s Iron soldering temperature ≥ 2 mm distance from case bottom, soldering time $t \leq 3$ s	T_S	300	°C
Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	30	V
Kollektorstrom Collector current	I_C	5	mA
Kollektorspitzenstrom, $t < 10$ µs Collector surge current	I_{CS}	10	mA
Emitter-Kollektorspannung Emitter-collector voltage	V_{EC}	7	V
Verlustleistung, $T_A = 25$ °C Total power dissipation	P_{tot}	100	mW
Wärmewiderstand Sperrschicht - Umgebung Thermal resistance junction - ambient	R_{thJA}	450	K/W

Kennwerte (T_A = 25 °C, λ = 950 nm)
Characteristics

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\ max}$	920	nm
Spektraler Bereich der Fotoempfindlichkeit S = 10% von S_{max} Spectral range of sensitivity S = 10% of S_{max}	λ	780 … 1100	nm
Abmessungen der Chip-Fläche Dimension of chip area	$L \times B$ $L \times W$	0.93 × 0.48	mm × mm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	2 x 0.068	mm^2
Halbwinkel Half angle	φ	± 75	Grad deg.
Kapazität Capacitance V_{CE} = 3V, f = 1 MHz, E = 0	C_{CE}	2.2	pF
Dunkelstrom Dark current V_{CE} = 10 V	I_{CEO}	0.1 (≤ 100)	nA
Fotostrom Photocurrent E_e = 0.34 mW/cm², V_{CE} = 3.5 V	$I_{e(on)}$ [1)]	90 290	µA
Temperaturkoeffizient von $I_{e(on)}$ Temperature coefficient of $I_{e(on)}$ V_{ce} = 5 V	TC	+ 0.9	%/K

1) Ie(on) ist der Mittelwert der Emitterströme der beiden Fototransistoren.
Ie(on) is the mean value of the emitter currents of the two phototransistors.

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Emitterstrom-Verhältnis der 2 Fototransistoren Emitter current ratio of the 2 phototransistors V_{ce} = 3.5V, E_e = 0.34mW/cm²	R [1)]	1 ... 1.1	
Übersprechen zwischen T1 und T2 Crosstalk between T1 and T2 E_e = 0.34 mW/cm², λ = 950nm, V_{CE} = 3.5 V	$(Ie1-Ie1')/Ie1$ [2)]	3	%
Anstiegszeit/Abfallzeit Rise and fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ	t_r t_f	7 9	µs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage I_C = 50µA, E_e = 0.5 mW/cm², λ = 950 nm	V_{CEsat}	0.1 (≤ 0.4)	V

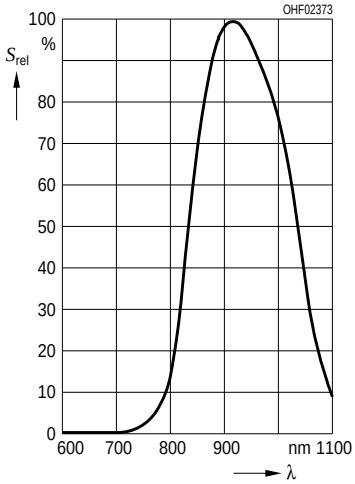
1) Ie(max)/ Ie(min)

2) Testing condition

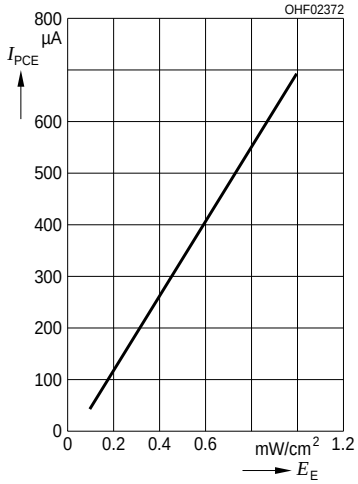
a) Ie1 measured while the emitter of T2 is grounded

b) Ie1' is the Ie1 reading while the emitter of T2 is not connected

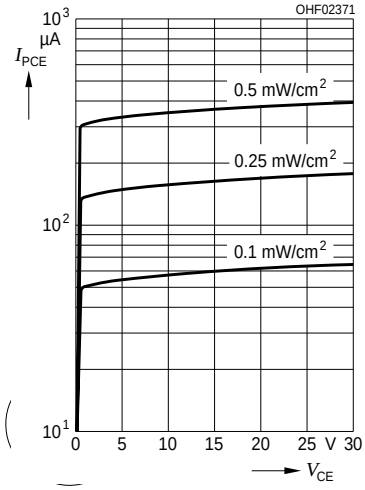
Relative Spectral Sensitivity
$S_{rel} = f(\lambda)$



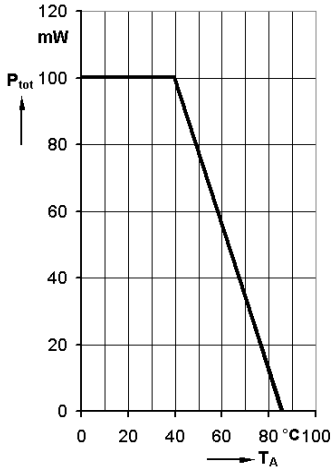
Photocurrent
$I_{PCE} = f(E_e)$, V_{CE} = 5 V



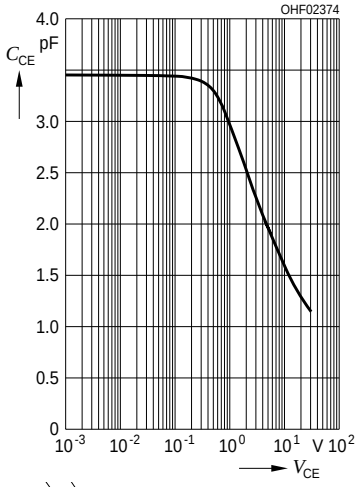
Photocurrent SFH 3160 F
$I_{PCE} = f(V_{CE})$



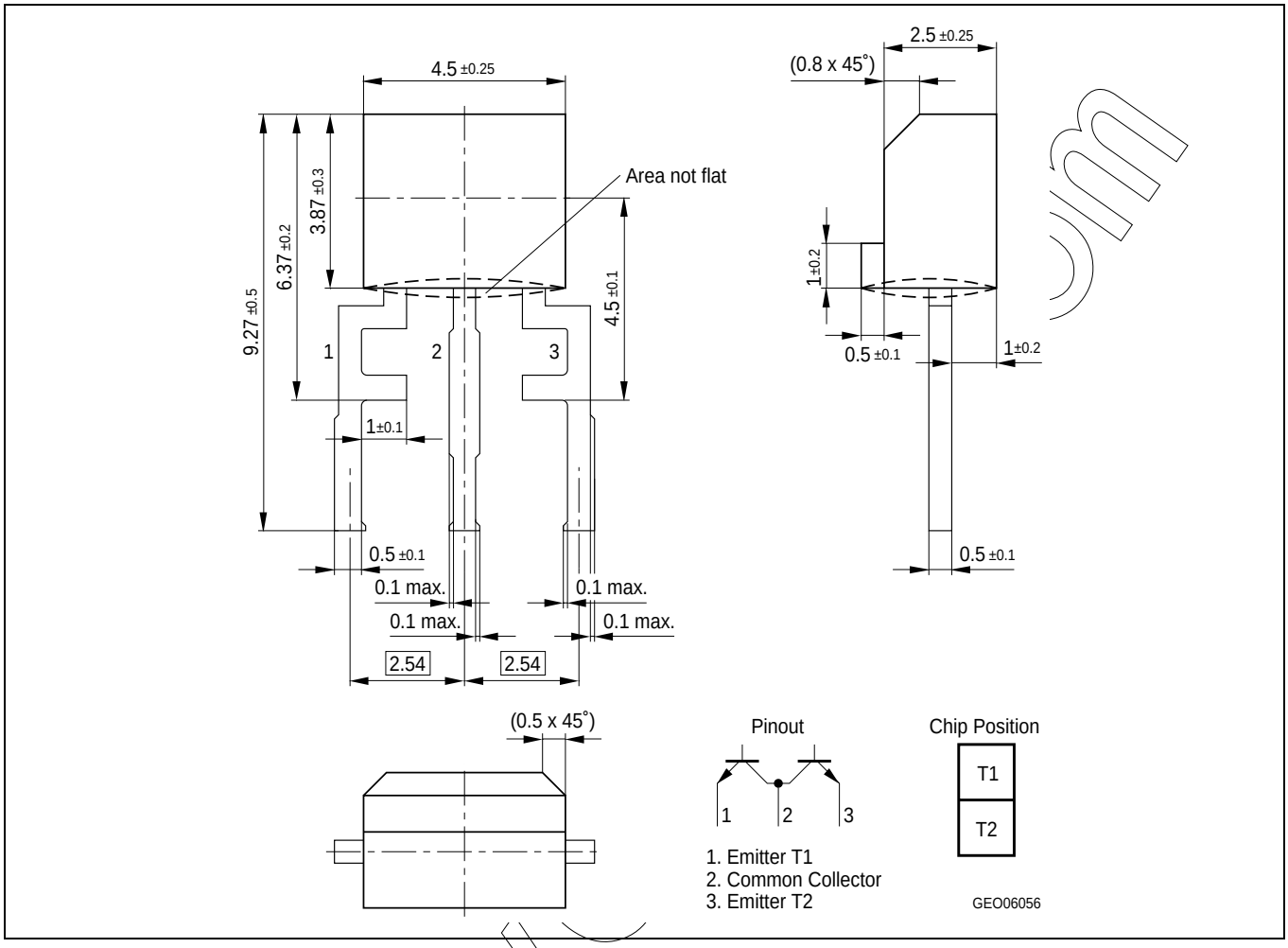
Total Power Dissipation
$P_{tot} = f(T_A)$



Collector-Emitter Capacitance
$C_{CE} = f(V_{CE})$, f = 1 MHz, E = 0



Maßzeichnung
Package Outlines



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

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