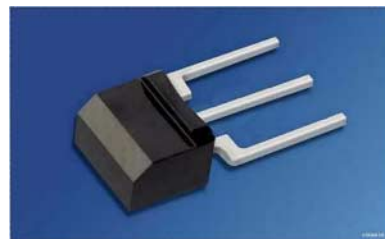


Doppel-NPN-Silizium-Fototransistor mit Tageslichtsperrfilter

Dual Silicon NPN Phototransistor with Daylight-Cutoff Filter

Lead (Pb) Free Product - RoHS Compliant

SFH 3163 F



Nicht für Neuentwicklung / Not for new design

Wesentliche Merkmale

- Tageslichtsperrfilter
- Doppel-Fototransistor nebeneinander positioniert
- Doppel-Fototransistor mit gemeinsamem Kollektor
- Optimale Kombination mit SFH4113 (horizontaler Encoder)

Anwendungen

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

Features

- Daylight Filter
- Dual Phototransistor positioned side by side
- Dual Phototransistor with common Collector
- Ideal combination with SFH4113 (horizontal encoder)

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] ($V_{ce}=3.5V$, $950nm$, $E_e=0.34mW/cm^2$)
SFH 3163 F	Q65110A0353	185 ... 585

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	10	mA
Kollektorspitzenstrom, $t < 10 \mu s$ Collector surge current	I_{CS}	20	mA
Emitter-Kollektorspannung Emitter-collector voltage	V_{EC}	7	V
Verlustleistung, $T_A = 25 \text{ °C}$ Total power dissipation	P_{tot}	100	mW
Wärmewiderstand Sperrschicht - Umgebung Thermal resistance junction - ambient	R_{thJA}	450	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	780 ... 1100	nm
Abmessungen der Chip-Fläche Dimension of chip area	$L \times B$ $L \times W$	1.23×0.66	mm × mm
Bestrahlungsempfindliche Fläche Radiant sensitive area	A	2×0.15	mm ²
Halbwinkel Half angle	φ	± 75	Grad deg.
Kapazität Capacitance $V_{CE} = 3\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_{CE}	3.2	pF
Dunkelstrom Dark current $V_{CE} = 10\text{ V}$	I_{CEO}	$0.1 (\leq 100)$	nA
Fotostrom Photocurrent $E_e = 0.34\text{ mW/cm}^2$, $V_{CE} = 3.5\text{ V}$	$I_{e(\text{on})}^{1)}$	185 585	μA
Temperaturkoeffizient von $I_{e(\text{on})}$ Temperature coefficient of $I_{e(\text{on})}$ $V_{ce} = 5\text{ V}$	TC	+ 0.9	%/K

¹⁾ $I_{ce(\text{on})}$ ist der Mittelwert der Emitterströme der beiden Fototransistoren. $I_{ce(\text{on})}$ 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 $V_{eco} = 3.5V, E_e = 0.34mW/cm^2$	$R^{1)}$	1 ... 1.1	
Übersprechen zwischen T1 und T2 Crosstalk between T1 and T2 $E_e = 0.34 mW/cm^2, \lambda = 950nm, V_{CE} = 3.5 V$	$(I_{e1}-I_{e1'})/I_{e1}^{2)}$	3	%
Anstiegszeit/Abfallzeit Rise and fall time $I_C = 1 mA, V_{CC} = 5 V, R_L = 1 k\Omega$	t_r t_f	11 11	μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = 50\mu A,$ $E_e = 0.5 mW/cm^2, \lambda = 950 nm$	V_{CEsat}	0.1 (≤ 0.4)	V

¹⁾ $I_{e(max)}/I_{e(min)}$

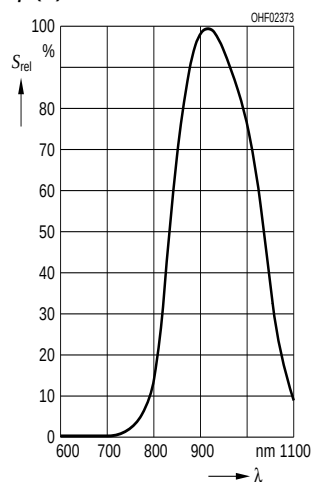
²⁾ Testing condition

a) I_{e1} measured while the emitter of T2 is grounded

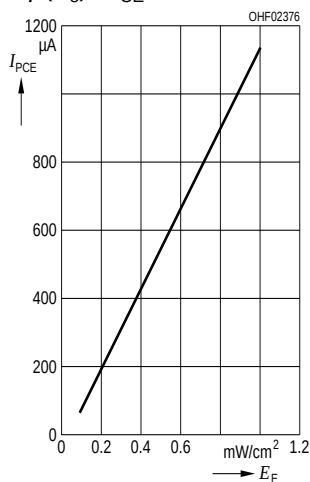
b) $I_{e1'}$ is the I_{e1} reading while the emitter of T2 is not connected

Relative Spectral Sensitivity

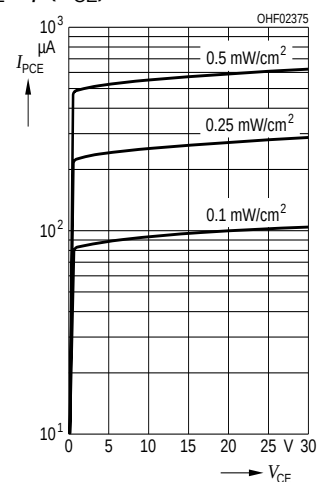
$$S_{\text{rel}} = f(\lambda)$$

**Photocurrent**

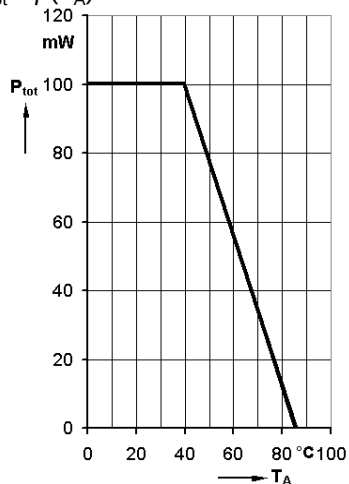
$$I_{\text{PCE}} = f(E_e), V_{\text{CE}} = 5 \text{ V}$$

**Photocurrent**

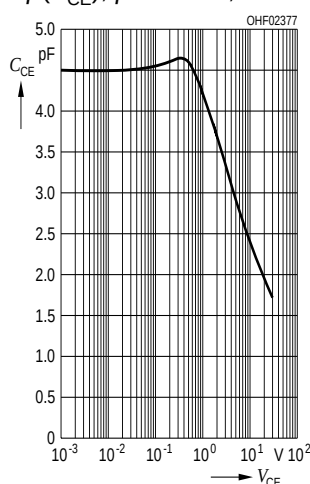
$$I_{\text{PCE}} = f(V_{\text{CE}})$$

**Total Power Dissipation**

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

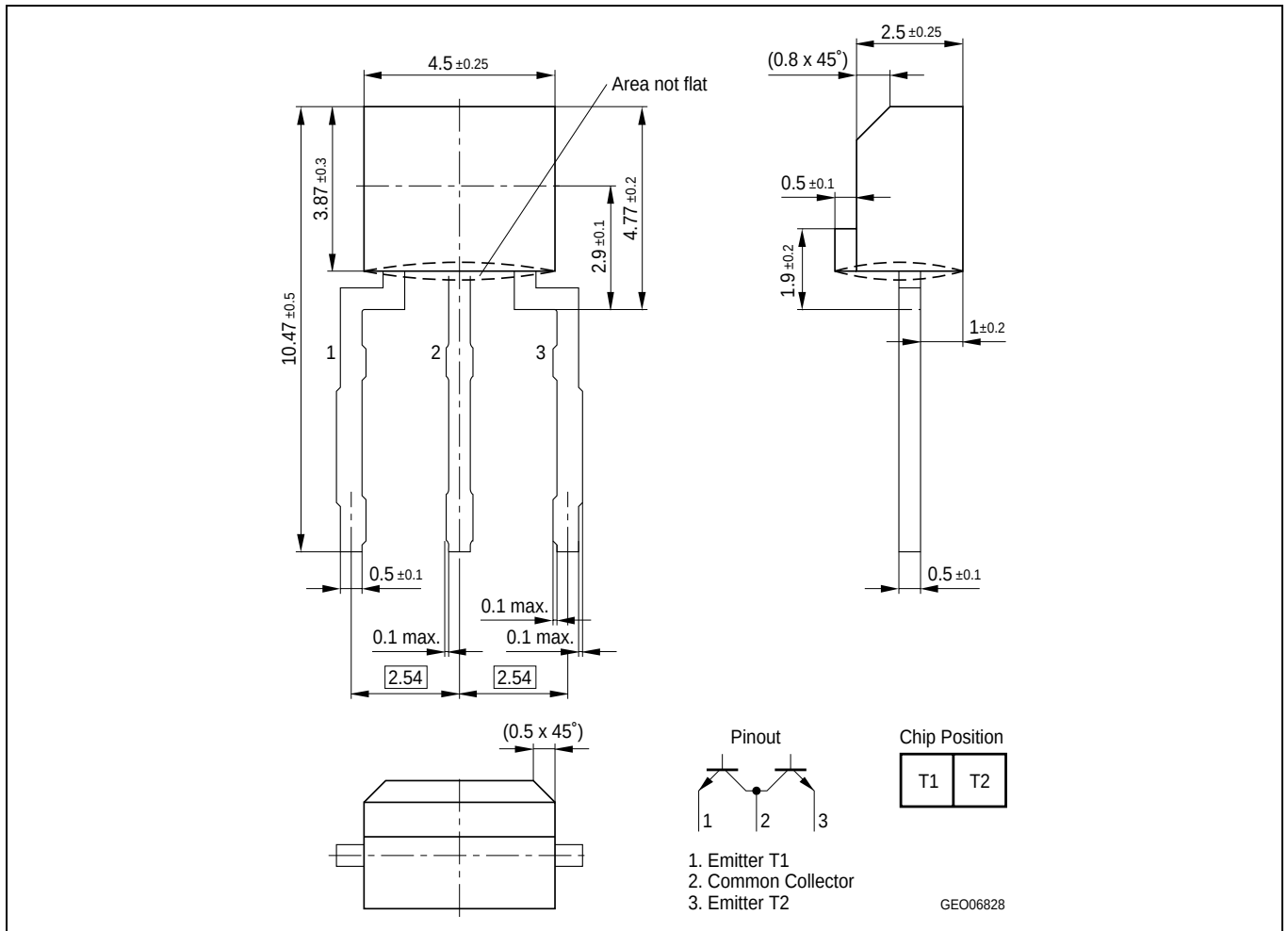
**Collector-Emitter Capacitance**

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



T

Maßzeichnung Package Outlines



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

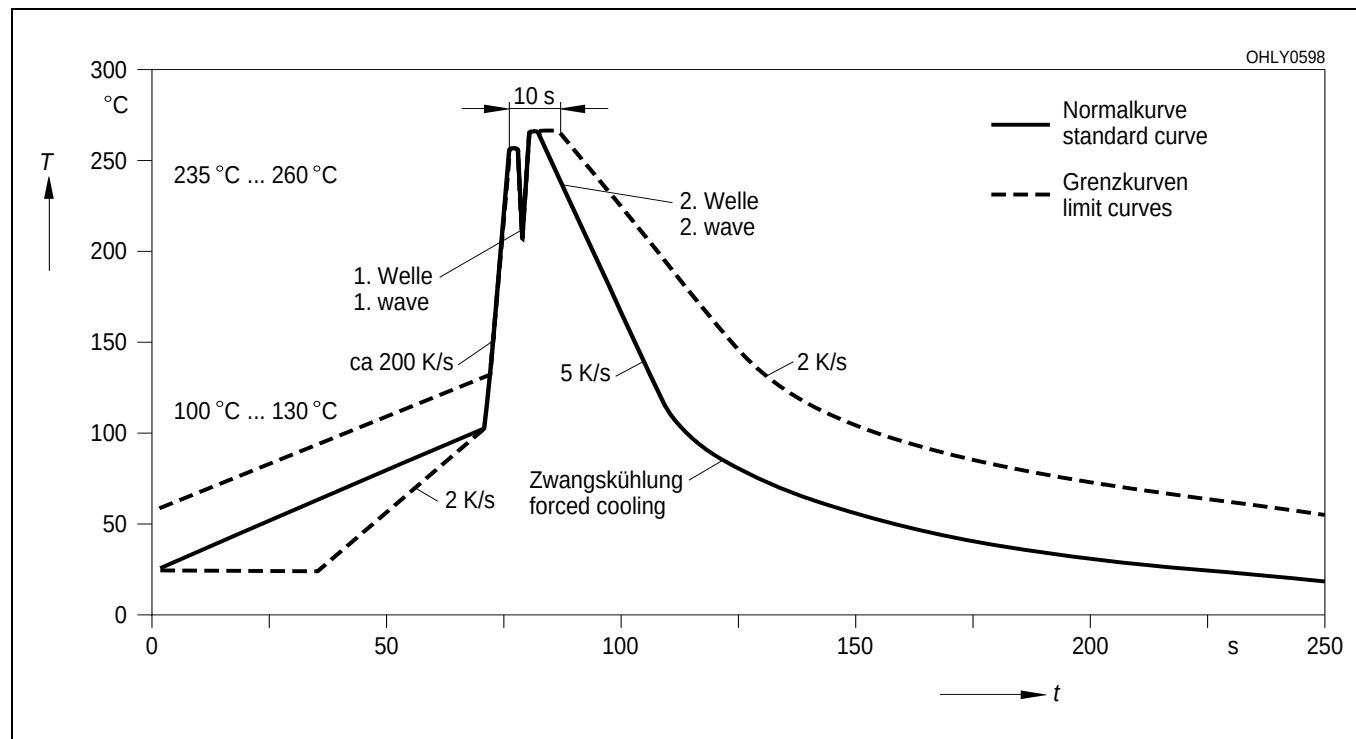
Lötbedingungen Soldering Conditions

Wellenlöten (TTW)

TTW Soldering

(nach CECC 00802)

(acc. to CECC 00802)



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