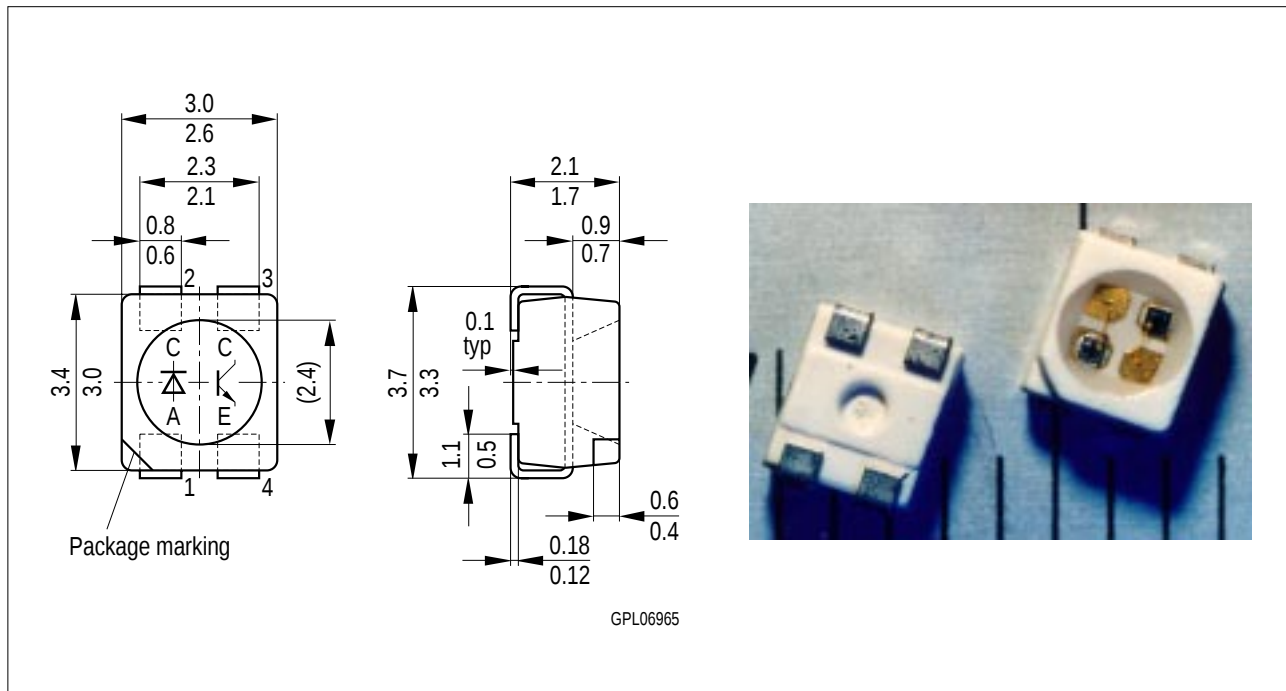


Vorläufige Daten / Preliminary Data



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

Typ Type	Bestellnummer Ordering Code
SFH 7221	on request

Wesentliche Merkmale

- Geeignet für Vapor-Phase Lötten und IR-Reflow Lötten

Features

- Suitable for vapor-phase and IR-reflow soldering

Grenzwerte Maximum Ratings

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		IRED	Transistor	
Betriebstemperatur Operating temperature range	T_{op}	– 55 ... + 100	– 55 ... + 100	°C
Lagertemperatur Storage temperature range	T_{stg}	– 55 ... + 100	– 55 ... + 100	°C
Sperrschichttemperatur Junction temperature	T_j	+ 100	+ 100	°C
Durchlaßstrom (LED) Forward current (LED)	I_F	100	–	mA
Kollektorstrom (Transistor) Collector current (Transistor)	I_C	–	15	mA
Stoßstrom Surge current $t \leq 10 \mu s, D = 0.005$	I_{FM}	2500	75	mA
Sperrspannung (LED) Reverse voltage (LED)	V_R	5	–	V
Kollektor-Emitter Spannung (Transistor) Collector-emitter voltage (Transistor)	V_{CE}	–	35	V
Verlustleistung Total power dissipation	P_{tot}	180	165	mW
Wärmewiderstand Sperrschicht / Umgebung Thermal resistance junction / ambient Montage auf PC-Board* (Padgröße $\geq 16 \text{ mm}^2$) mounting on pcb* (pad size $\geq 16 \text{ mm}^2$)	$R_{th JA}$	500	450	K/W
Sperrschicht / Lötstelle junction / soldering joint	$R_{th JS}$	400	–	K/W

* PC-board: G30/FR4

Hinweis / Notes

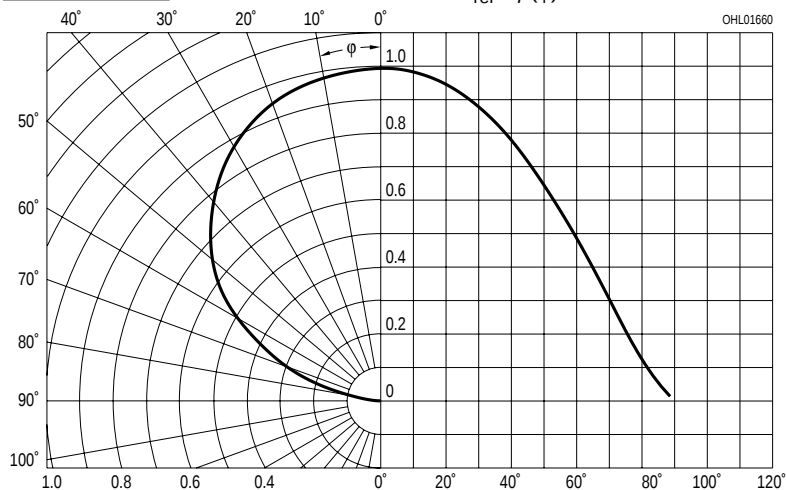
Die angegebenen Grenzdaten gelten für einen Chip.
The stated maximum ratings refer to one chip.

Kennwerte IRED ($T_A = 25^\circ\text{C}$) Characteristics IRED

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der Strahlung Wavelength of radiation $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	λ_{peak}	880	nm
Spektrale Bandbreite bei 50% von I_{max} , $I_F = 100\text{ mA}$ Spectral bandwidth at 50 % of I_{max} , $I_F = 100\text{ mA}$	$\Delta\lambda$	80	nm
Abstrahlwinkel Viewing angle	φ	± 60	Grad deg.
Aktive Chipfläche Active chip area	A	0.16	mm^2
Abmessungen der aktiven Chipfläche Dimensions of active chip area	$L \times B$ $L \times W$	0.4×0.4	mm
Schaltzeiten, I_e von 10 % auf 90 % und von 90 % auf 10 % Switching times, I_e from 10 % to 90 % and from 90 % to 10 % $I_F = 100\text{ mA}$, $R_L = 50\ \Omega$	t_r , t_f	0.5	μs
Kapazität Capacitance $V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_o	25	pF
Durchlaßspannung Forward voltage $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$ $I_F = 1\text{ A}$, $t_p = 100\ \mu\text{s}$	V_F V_F	1.5 (≤ 1.8) 3.0 (≤ 3.8)	V V
Sperrstrom Reverse current $V_R = 5\text{ V}$	I_R	0.01 (≤ 1)	μA
Gesamtstrahlungsfluß Total radiant flux $I_F = 100\text{ mA}$, $t_p = 20\text{ ms}$	Φ_e	23	mW
Temperaturkoeffizient von I_e bzw. Φ_e Temperature coefficient of I_e bzw. Φ_e $I_F = 100\text{ mA}$, $I_F = 100\text{ mA}$	TC_I	- 0.5	%/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 100\text{ mA}$	TC_V	- 2	mV/K
Temperaturkoeffizient von λ Temperature coefficient of λ $I_F = 100\text{ mA}$	TC_λ	+ 0.25	nm/K

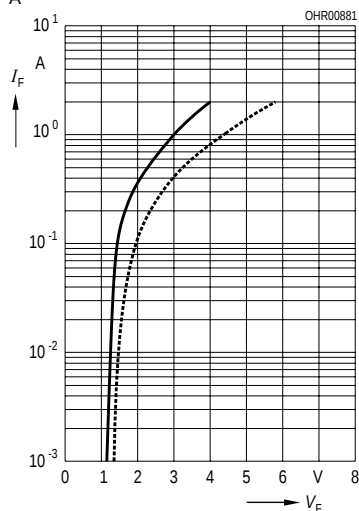
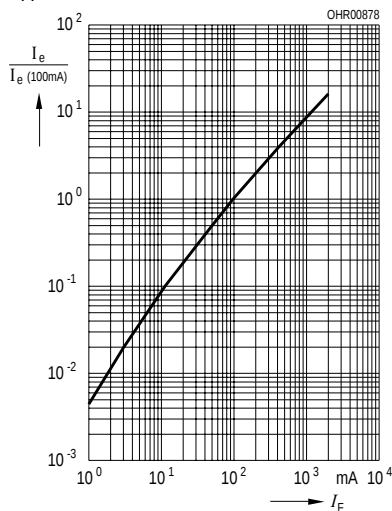
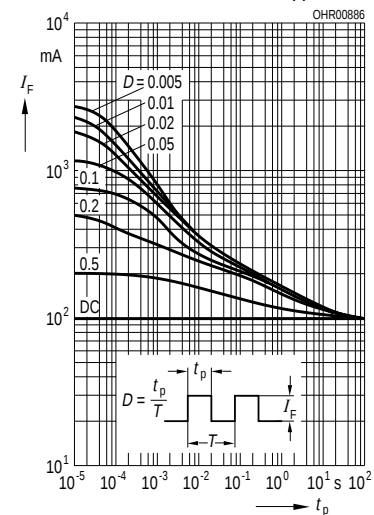
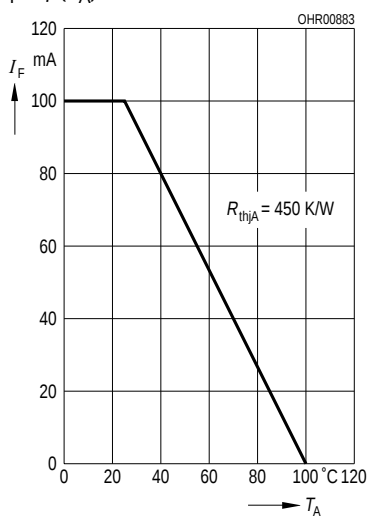
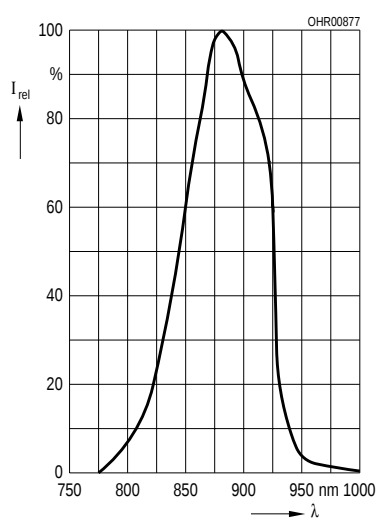
Strahlstärke I_e in Achsrichtunggemessen bei einem Raumwinkel $\Omega = 0.01$ sr**Radiant intensity I_e in axial direction**at a solid angle of $\Omega = 0.01$ sr

Bezeichnung Description	Symbol Symbol	Werte Values	Einheit Unit
Strahlstärke Radiant intensity $I_F = 100$ mA, $t_p = 20$ ms	I_e	> 4	mW/sr
Strahlstärke Radiant intensity $I_F = 1$ A, $t_p = 100$ μ s	$I_{e \text{ typ.}}$	48	mW/sr

IRED Radiation characteristics $I_{rel} = f(\varphi)$ **Phototransistor Directional characteristics $S_{rel} = f(\varphi)$** 

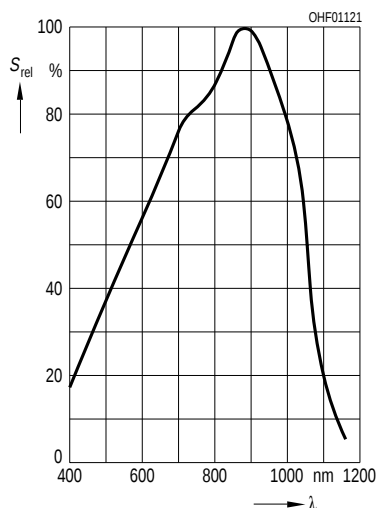
Kennwerte Fototransistor ($T_A = 25\text{ °C}$, $\lambda = 880\text{ nm}$) Characteristics Phototransistor

Bezeichnung Description	Symbol Symbol	Wert Value	Einheit Unit
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\text{ max}}$	860	nm
Spektraler Bereich der Fotoempfindlichkeit $S = 10\%$ von S_{max} Spectral range of sensitivity $S = 10\%$ of S_{max}	λ	380 ... 1150	nm
Bestrahlungsempfindliche Fläche ($\varnothing 240\text{ }\mu\text{m}$) Radiant sensitive area ($\varnothing 240\text{ }\mu\text{m}$)	A	0.045	mm^2
Abmessung der Chipfläche Dimensions of chip area	$L \times B$	0.45 x 0.45	$\text{mm} \times \text{mm}$
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip front to case surface	H	0.5 ... 0.7	mm
Halbwinkel Half angle	φ	± 60	Grad deg.
Kapazität Capacitance $V_{\text{CE}} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_{CE}	5.0	pF
Dunkelstrom Dark current $V_{\text{CE}} = 25\text{ V}$, $E = 0$	I_{CEO}	1 (≤ 200)	nA
Fotostrom Photocurrent $E_e = 0.1\text{ mW/cm}^2$, $V_{\text{CE}} = 5\text{ V}$	I_{PCE}	≥ 16	μA
Anstiegszeit/Abfallzeit Rise time/Fall time $I_C = 1\text{ mA}$, $V_{\text{CC}} = 5\text{ V}$, $R_L = 1\text{ k}\Omega$	t_r, t_f	7	μs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_C = 5\text{ }\mu\text{A}$, $E_e = 0.1\text{ mW/cm}^2$	V_{CEsat}	150	mV

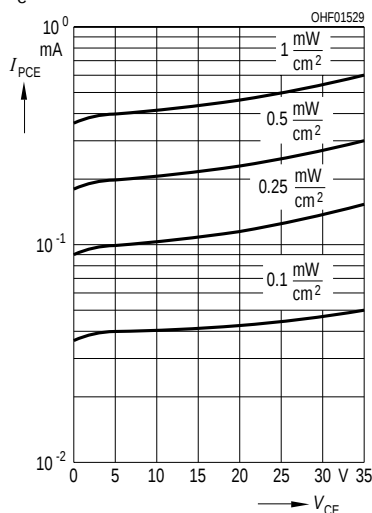
IRED**Forward current** $I_F = f(V_F)$ $T_A = 25\text{ °C}$ **Rel luminous intensity** $I_V / I_{V(10\text{ mA})} = f(I_F)$ $T_A = 25\text{ °C}$ **Perm. pulse handling capability** $I_F = f(t_p)$ Duty cycle D = parameter, $T_A = 25\text{ °C}$ **Max. permissible forward current** $I_F = f(T_A)$ **Relative spectral emission** $I_{rel} = f(\lambda)$ 

Phototransistor

Rel.spectral sensitivity $S_{rel} = f(\lambda)$

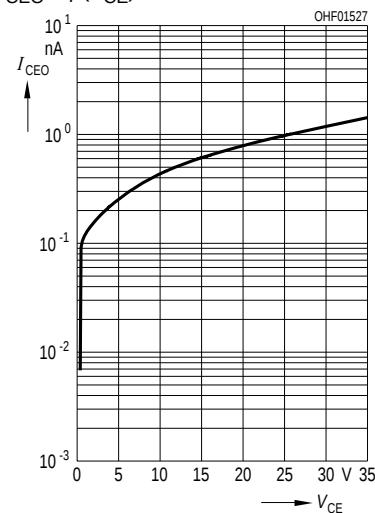


Photocurrent $I_{PCE} = f(V_{CE})$,
 $E_e = \text{Parameter}$



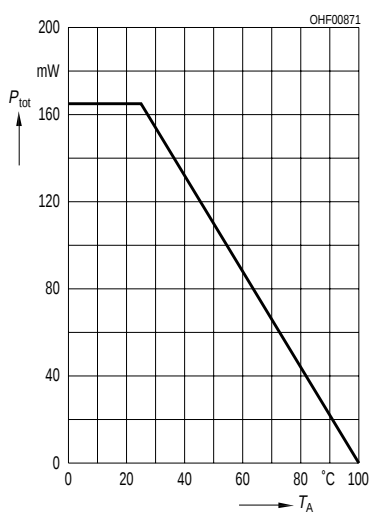
Dark current

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



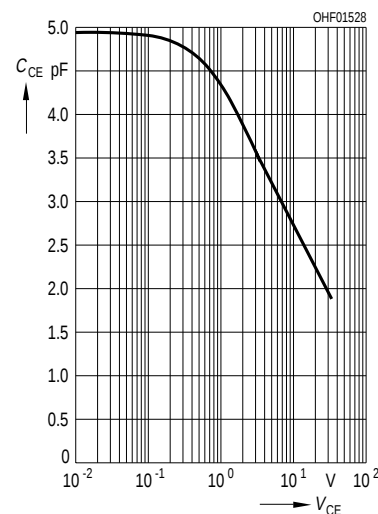
Total power dissipation

$P_{tot} = f(T_A)$

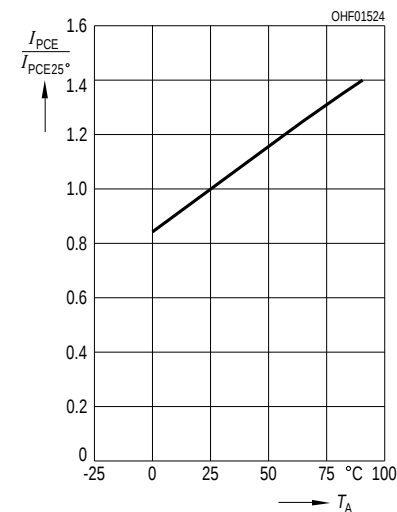


Capacitance

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

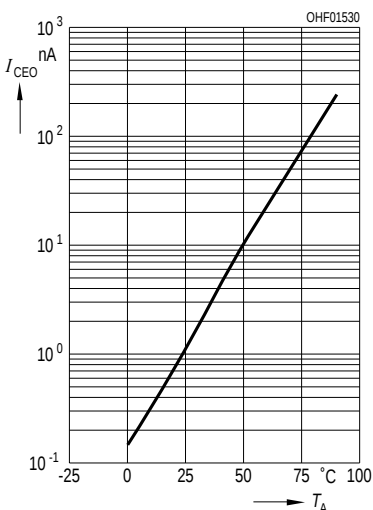


Photocurrent $I_{PCE}/I_{PCE25^\circ} = f(T_A)$,
 $V_{CE} = 5 \text{ V}$



Dark current

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



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

