

Multi TOPLED mit LED und Fototransistor-Detektor

Multi TOPLED with LED and Phototransistor-Detector

SFH 7225

SFH 7226



Wesentliche Merkmale

- Anzeigefunktion kann durch eingebauten Fototransistor überwacht werden
- SFH 7225: gelbe LED
- SFH 7226: super-rote LED
- Dominantwellenlänge:
SFH 7225: 589 nm
SFH 7226: 630 nm
- Silizium-Fototransistor
- Geringe Sättigungsspannung
- Emitter und Diode galvanisch getrennt

Anwendungen

- Anzeige mit Funktionskontrolle

Features

- Display function can be controlled by built-in phototransistor
- SFH 7225: yellow LED
- SFH 7226: super-red LED
- Dominant wavelength:
SFH 7225: 589 nm
SFH 7226: 630 nm
- Silicon phototransistor
- Low saturation voltage
- Emitter and detector electrically isolated

Applications

- Display with controlling function

Typ Type	Gehäuse Package	Lichtstärke Luminous Intensity $I_F = 20 \text{ mA}$, $t_p = 20 \text{ mA}$ I_V (mcd)	Bestellnummer Ordering Code
SFH 7225-Q/R	SMT Multi TOPLED	63 ... 200	Q62702-P5319
SFH 7226-P/Q	SMT Multi TOPLED	40 ... 125	Q62702-P5320

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value	Einheit Unit
Betriebstemperatur Operating temperature range	T_{op}	– 40 ... + 100	°C
Lagertemperatur Storage temperature range	T_{stg}	– 40 ... + 100	°C

Sender
Emitter

Sperrspannung Reverse voltage	V_R	3	V
Durchlassstrom Forward current	I_F (DC)	20	mA
Verlustleistung Total power dissipation	P_{tot}	80	mW
Wärmewiderstand Thermal resistance	$R_{th\ JA}$	800	K/W
Sperrschicht/Umgebung Junction/ambient		600 ¹⁾	K/W
Sperrschicht/Lötpad Junction/solder point		500	K/W
Montage auf PC-Board FR4 Mounted on PC board FR4		340 ¹⁾	K/W

Empfänger (Si-Fototransistor)
Detector (Silicon phototransistor)

Kollektor-Emitterspannung Collector-emitter voltage	V_{CE}	35	V
Kollektorstrom Collector current	I_C	15	mA
Kollektorspitzenstrom, $t_p < 10\ \mu s$ Collector surge current	I_{CS}	75	mA
Verlustleistung Total power dissipation	P_{tot}	90	mW

¹⁾ This value is valid only when the power dissipation of the photo transistor is limited to max. 2.5 mW.

Kennwerte ($T_A = 25\text{ °C}$)**Characteristics**

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		SFH 7225	SFH 7226	

**Sender
Emitter**

Wellenlänge der Strahlung, $I_F = 20\text{ mA}$ Wavelength of peak emission	λ_{peak}	591	645	nm
Dominantwellenlänge, $I_F = 20\text{ mA}$ Dominant wavelength	λ_{peak}	589	630	nm
Spektrale Bandbreite, $I_F = 20\text{ mA}$ Spectral radiation bandwidth	$\Delta\lambda$	15	16	nm
Abstrahlwinkel Half angle	Φ	± 60	± 60	Grad Deg.
Durchlassspannung Forward voltage $I_F = 20\text{ mA}$, $t_p = 20\text{ ms}$	V_F	2.0 (≤ 2.6)	2.0 (≤ 2.6)	V
Sperrstrom, $V_R = 3\text{ V}$ Reverse current	I_R	0.01 (< 10)	0.01 (< 10)	μA
Temperaturkoeffizient von λ_{dom} Temperature coefficient of λ_{dom} $I_F = 20\text{ mA}$	$TC_{\lambda_{\text{dom}}}$	0.096	0.014	nm/K
Temperaturkoeffizient von λ_{peak} Temperature coefficient of λ_{peak} $I_F = 20\text{ mA}$	$TC_{\lambda_{\text{peak}}}$	0.13	0.14	nm/K
Temperaturkoeffizient von V_F Temperature coefficient of V_F $I_F = 20\text{ mA}$	TC_{V_F}	- 2.5	- 2.0	mV/K

**Empfänger
Detector**

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 $S = 10\%$ von S_{max}	λ	380 ... 1150	nm

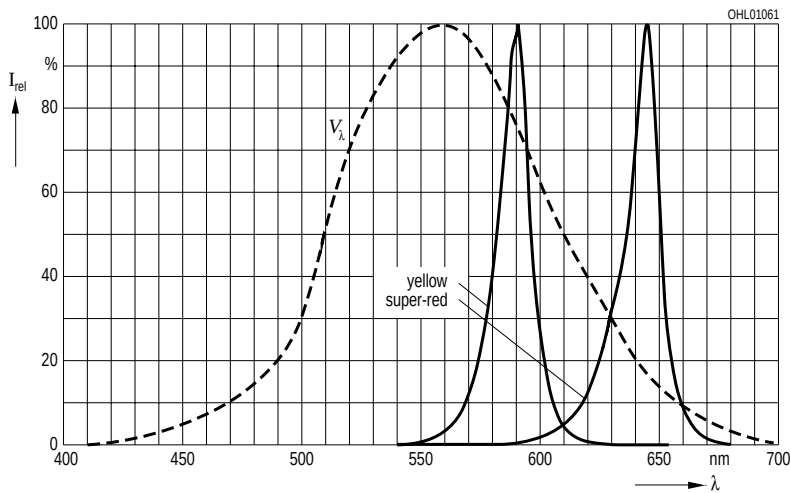
Kennwerte ($T_A = 25\text{ °C}$)**Characteristics** (cont'd)

Bezeichnung Description	Symbol Symbol	Wert Value		Einheit Unit
		SFH 7225	SFH 7226	
Dunkelstrom, $V_{CE} = 25\text{ V}$ Dark current	I_{CEO}	1 (< 200)		nA
Kapazität, $V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ Capacitance	C_{CE}	5		pF
Fremdlichtempfindlichkeit Sensitivity to ambient light $E_V = 1000\text{ lx}$, Normlicht A/standard light A, $V_{CE} = 5\text{ V}$	I_{CEtyp}	650		μA

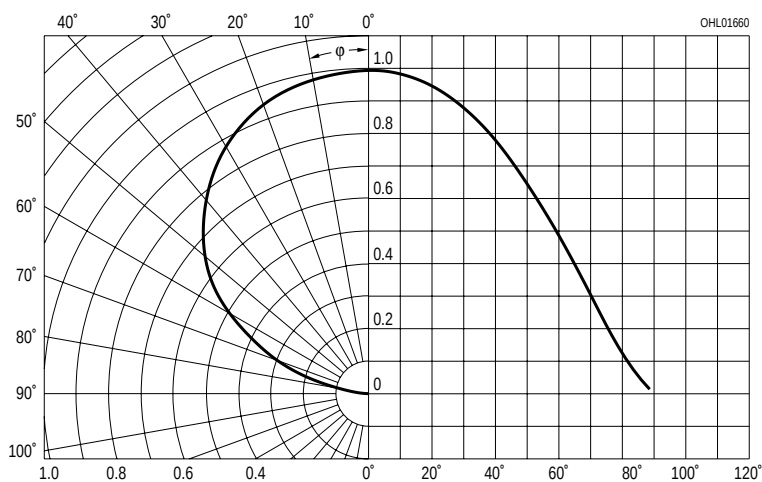
MULTILED

Übersprechen: Kollektor-Emitterstrom Crosstalk: collector-emitter current $I_F = 20\text{ mA}$, $V_{CE} = 5\text{ V}$	I_{CEtyp}	0.5 ... 5	2 ... 15	mA
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage $I_F = 20\text{ mA}$, $I_C = 0.3 \times I_{CEmin}$	V_{CEsat}	< 0.4		V

Relative Spectral Emission $I_{\text{rel}} = f(\lambda)$, $T_A = 25\text{ °C}$, $I_F = 20\text{ mA}$
 $V(\lambda)$ = Standard Eye Response Curve



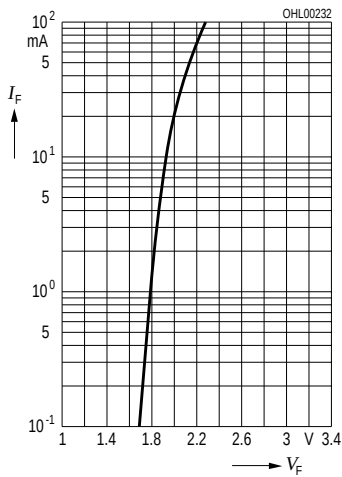
LED Radiation Characteristics $I_{\text{rel}} = f(\varphi)$
Phototransistor Directional Characteristics $S_{\text{rel}} = f(\varphi)$



LED

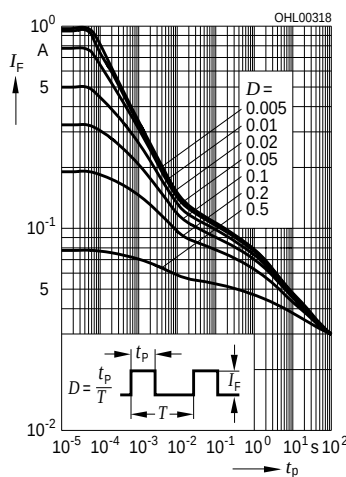
Forward Current

$$I_F = f(V_F), T_A = 25^\circ\text{C}$$



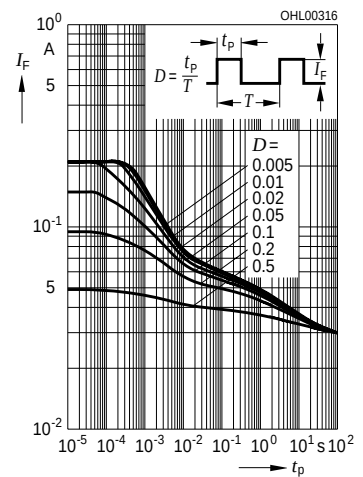
Perm. Pulse Handling Capability

$$I_F = f(t_p), \text{ duty cycle } D = \text{parameter}, T_A = 25^\circ\text{C}, \text{SFH 7225}$$



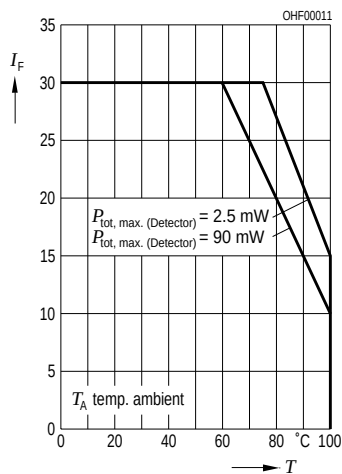
Perm. Pulse Handling Capability

$$I_F = f(t_p), \text{ duty cycle } D = \text{parameter}, T_A = 25^\circ\text{C}, \text{SFH 7226}$$



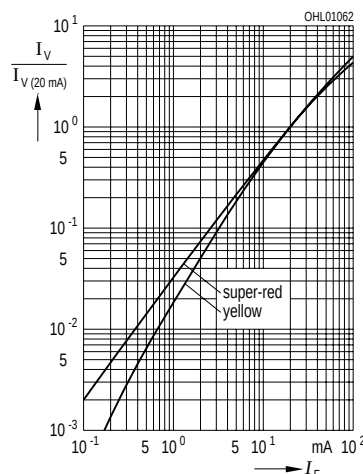
Max. Permissible Forward Current

$$I_F = f(T_A)$$



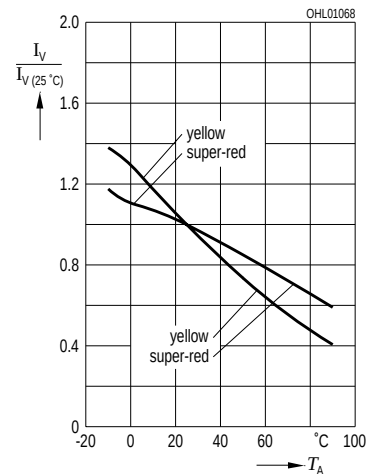
Relative Luminous Intensity

$$I_V/I_V(10\text{ mA}) = f(I_F), T_A = 25^\circ\text{C}$$



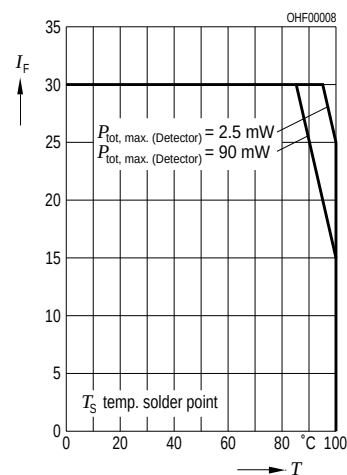
Rel. Luminous Intensity

$$I_V/I_V(25^\circ\text{C}) = f(T_A), I_F = 10\text{ mA}$$



Max. Permissible Forward Current

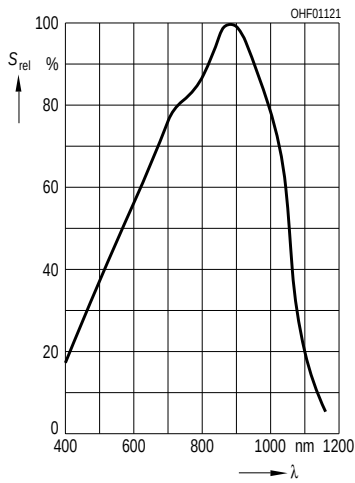
$$I_F = f(T_S)$$



Phototransistor

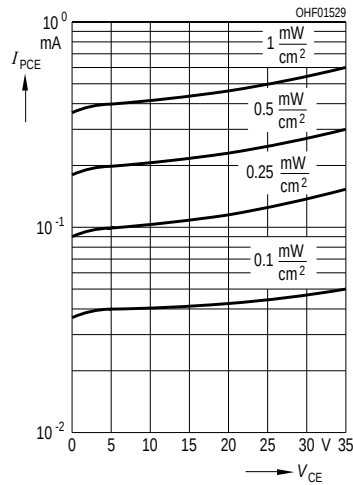
Rel. spectral sensitivity

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



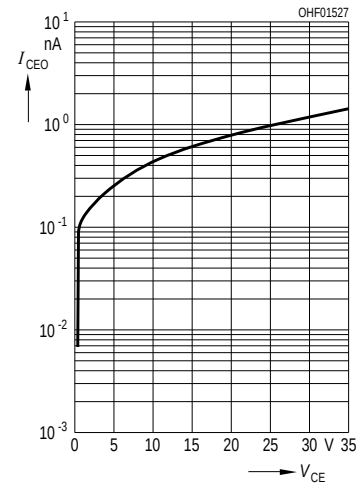
Photocurrent

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



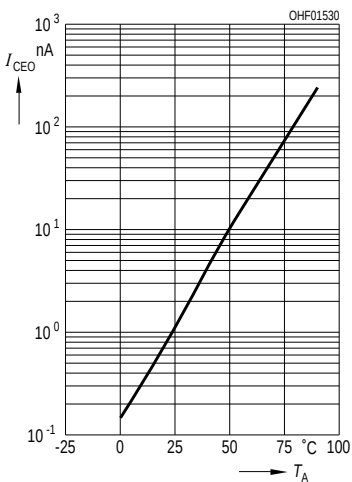
Dark current

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



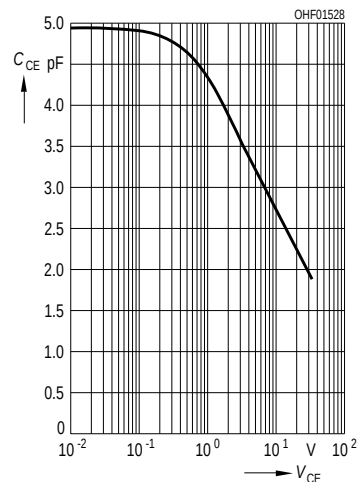
Dark current

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



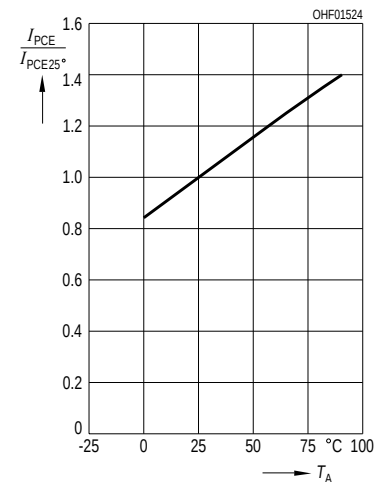
Capacitance

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

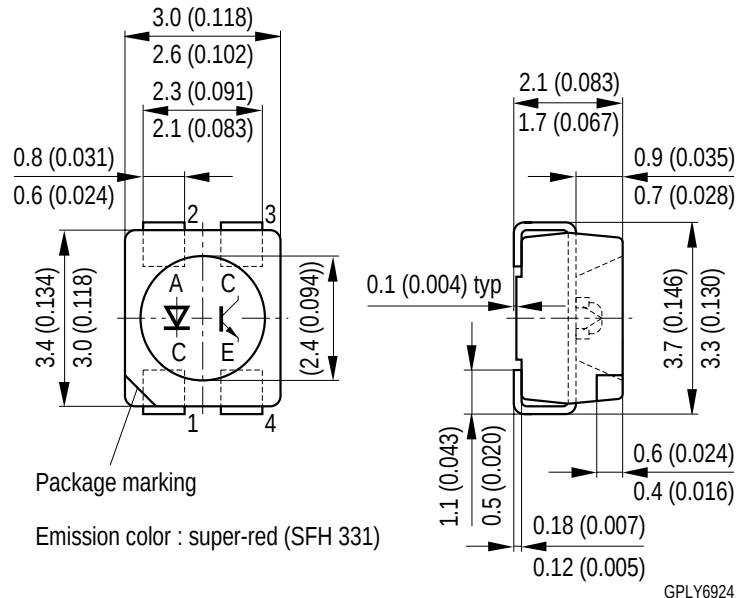


Photocurrent

$$I_{\text{PCE}}/I_{\text{PCE}25^\circ} = f(T_A), V_{\text{CE}} = 5 \text{ V}$$



Maßzeichnung Package Outlines



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

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Attention please!

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Packing

Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office. By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose! Critical components¹, may only be used in life-support devices or systems² with the express written approval of OSRAM OS.

¹ 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.

² Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health of the user may be endangered.