SMT Multi TOPLED®

SFH 331

Wesentliche Merkmale
- SMT-Gehäuse mit rotem Sender (635 nm) und Si-Fototransistor
- Geeignet für SMT-Bestückung
- Gegurtet lieferbar
- Sender und Empfänger getrennt ansteuerbar
- Geeignet für IR-Reflow Löten

Features
- SMT package with red emitter (635 nm) and Si-phototransistor
- Suitable for SMT assembly
- Available on tape and reel
- Emitter and detector can be controlled separately
- Suitable for IR-reflow soldering

Anwendungen
- Datenübertragung
- Wegfahrsperre
- Infrarotschnittstelle

Applications
- Data transmission
- Lock bar
- Infrared interface

Typ Type	Bestellnummer Ordering Code
SFH 331-JK	Q62702-P1634

Grenzwerte
Maximum Ratings

Bezeichnung Parameter	Symbol Symbol	Wert Value		Einheit Unit
		LED	Transistor	
Betriebstemperatur Operating temperature range	T_{op}	– 40 … + 100	– 40 … + 100	°C
Lagertemperatur Storage temperature range	T_{stg}	– 40 … + 100	– 40 … + 100	°C
Sperrschichttemperatur Junction temperature	T_j	+ 100	+ 100	°C
Durchlaßstrom (LED) Forward current (LED)	I_F	30	–	mA
Kollektorstrom (Transistor) Collector current (Transistor)	I_C	–	15	mA
Stoßstrom Surge current $t \leq 10$ µs, $D = 0.005$	I_{FM}	500	75	mA
Sperrspannung (LED) Reverse voltage (LED)	V_R	5	–	V
Kollektor-Emitter Spannung (Transistor) Collector-emitter voltage (Transistor)	V_{CE}	–	35	V
Verlustleistung Power dissipation	P_{tot}	100	165	mW
Wärmewiderstand Sperrschicht/Umgebung Thermal resistance junction/ambient Montage auf PC-Board[1)] (Padgröße ≥ 16 mm²) mounting on pcb[1)] (pad size ≥ 16 mm²)	R_{thJA}	450	450	K/W
Sperrschicht / Lötstelle junction / soldering joint	R_{thJS}	350	–	K/W

1) PC-board: G30/FR4

Note: Die angegebenen Grenzdaten gelten für den Chip, für den sie angegeben sind, unabhängig vom Betriebszustand des anderen.
The stated max. ratings refer to the specified chip regardless of the operating status of the other one.

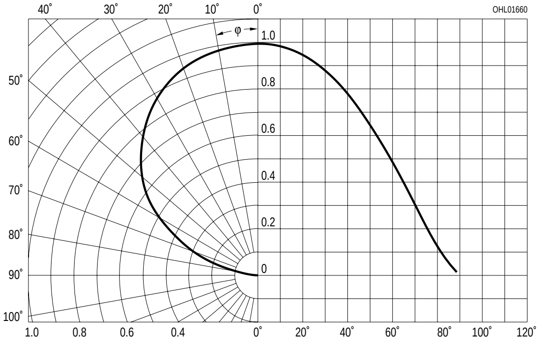
Kennwerte LED (T_A = 25 °C)
Characteristics LED

Bezeichnung **Parameter**		**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge des emittierten Lichtes Wavelength at peak emission I_F = 10 mA	(typ.) (typ.)	λ_{peak}	635	nm
Dominantwellenlänge Dominant wavelength I_F = 10 mA	(typ.) (typ.)	λ_{dom}	628	nm
Spektrale Bandbreite bei 50% von $I_{rel\ max}$ Spectral bandwidth at 50% of $I_{rel\ max}$ I_F = 10 mA	(typ.) (typ.)	$\Delta\lambda$	45	nm
Abstrahlwinkel bei 50% von I_V (Vollwinkel) Viewing angle at 50% of I_V		2φ	120	Grad deg.
Durchlaßspannung Forward voltage I_F = 10 mA	(typ.) (max.)	V_F V_F	2.0 2.6	V V
Sperrstrom Reverse current V_R = 5 V	(typ.) (max)	I_R I_R	0.01 10	µA µA
Kapazität, Capacitance V_R = 0 V, f = 1 MHz	(typ.)	C_o	12	pF
Schaltzeiten: Switching times: I_V from 10% to 90% I_V from 90% to 10% I_F = 100 mA, t_p = 10 µs, R_L = 50 Ω	 (typ.) (typ.)	 t_r t_f	 300 150	 ns ns
Lichtstärke (Gruppe JK) Luminous intensity (group JK) I_F = 10 mA	(typ.)	I_V	6 (4.0 … 12.5)	mcd

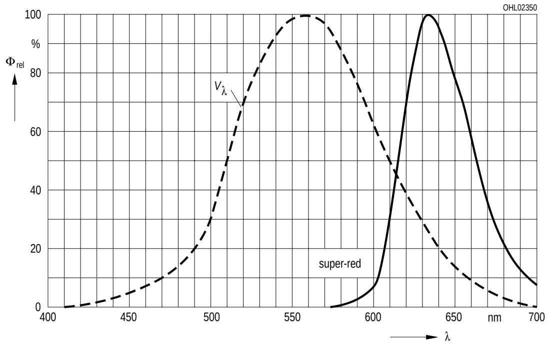
Kennwerte Fototransistor (T_A = 25 °C, λ = 950 nm)
Characteristics Phototransistor

Bezeichnung **Parameter**	**Symbol** **Symbol**	**Wert** **Value**	**Einheit** **Unit**
Wellenlänge der max. Fotoempfindlichkeit Wavelength of max. sensitivity	$\lambda_{S\ max}$	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 (∅ 240 µm) Radiant sensitive area (∅ 240 µm)	A	0.045	mm^2
Abmessungen der Chipfläche Dimensions of chip area	$L \times B$	0.45 × 0.45	mm × mm
Abstand Chipoberfläche zu Gehäuseoberfläche Distance chip surface to case surface	H	0.5 … 0.7	mm
Halbwinkel Half angle	φ	± 60	Grad deg.
Kapazität Capacitance V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CE}	5.0	pF
Dunkelstrom Dark current V_{CE} = 25 V, E = 0	I_{CEO}	1 (≤ 200)	nA
Fotostrom Photocurrent E_e = 0.1 mW/cm², V_{CE} = 5 V	I_{PCE}	≥ 16	µA
Anstiegszeit/Abfallzeit Rise time/Fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ	t_r, t_f	7	µs
Kollektor-Emitter-Sättigungsspannung Collector-emitter saturation voltage I_C = 5 µA, E_e = 0.1 mW/cm²	V_{CEsat}	150	mV

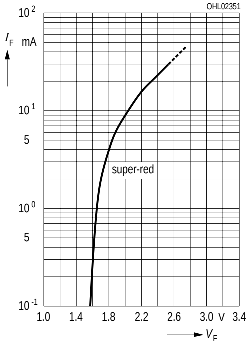
LED Radiation Characteristics $I_{rel} = f(\varphi)$
Phototransistor Directional Characteristics $S_{rel} = f(\varphi)$



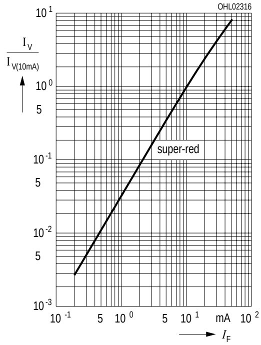
LED Relative Spectral Emission $I_{rel} = f(\lambda)$, T_A = 25 °C, I_F = 20 mA
V(λ) = **Standard Eye Response Curve**



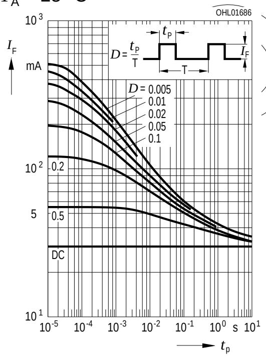
Forward Current
$I_F = f(V_F)$, T_A = 25 °C



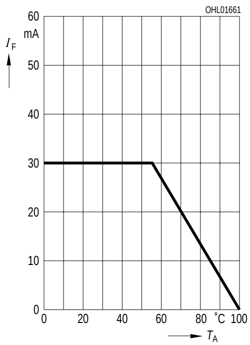
Rel. Luminous Intensity
$I_V/I_{V(10mA)} = f(I_F)$, T_A = 25 °C



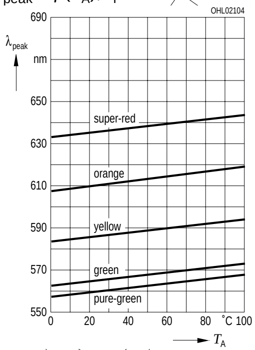
Perm. Pulse Handling Capability
$I_F = f(t_p)$, duty cycle D = parameter, T_A = 25 °C



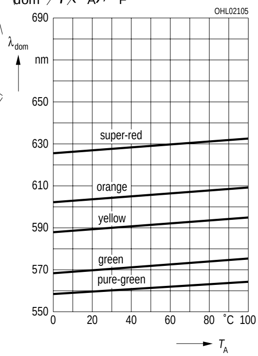
Max. Permissible Forward Current
$I_F = f(T_A)$



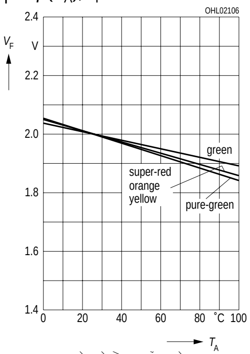
Wavelength at Peak Emission
$\lambda_{peak} = f(T_A)$, I_F = 20 mA



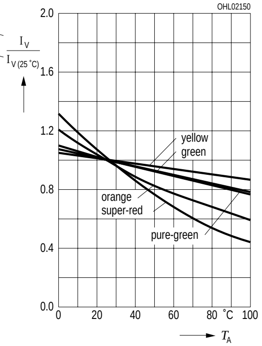
Dominant Wavelength
$\lambda_{dom} = f(T_A)$, I_F = 20 mA



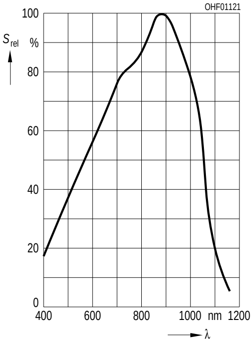
Forward Current
$V_F = f(T_A)$, I_F = 10 mA



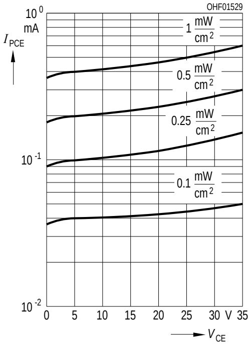
Rel. Luminous Intensity
$I_V/I_{V(25\,°C)} = f(T_A)$, I_F = 10 mA



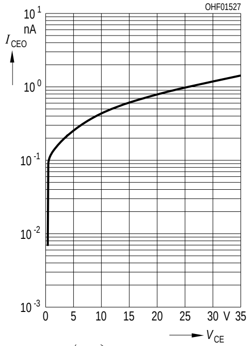
Phototransistor
Rel. Spectral Sensitivity $S_{rel} = f(\lambda)$



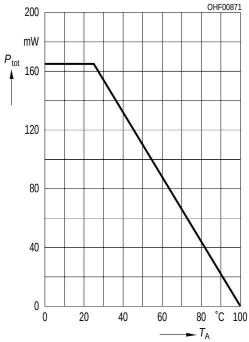
Photocurrent
$I_{PCE} = f(V_{CE})$, E_e = Parameter



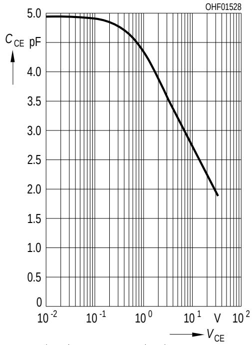
Dark Current
$I_{CEO} = f(V_{CE})$, $E = 0$



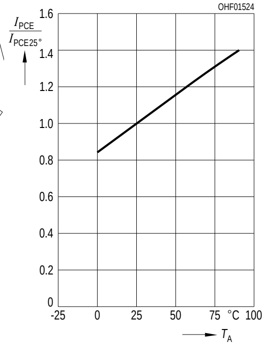
Total Power Dissipation
$P_{tot} = f(T_A)$



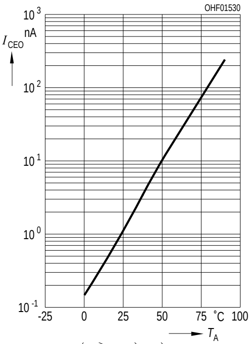
Capacitance
$C_{CE} = f(V_{CE})$, f = 1 MHz, $E = 0$



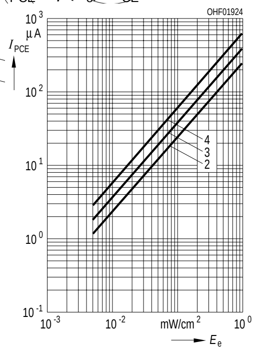
Photocurrent
$I_{PCE}/I_{PCE25°} = f(T_A)$, V_{CE} = 5 V



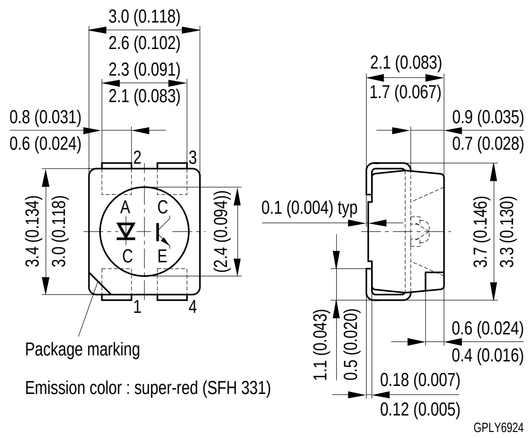
Dark Current
$I_{CEO} = f(T_A)$, V_{CE} = 5 V, $E = 0$



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



Maßzeichnung
Package Outlines



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

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