Silicon NPN Phototransistor
Version 1.3

SFH 313 FA

Features:

- **Spectral range of sensitivity:** (typ) 740 ... 1080 nm
- **Package:** 5mm Radial (T 1 ¾), Epoxy
- **Special:** 5 mm plastic package
- High photosensitivity
- Especially suitable for applications from 740 nm to 1080 nm

Applications

- Computer-controlled flashes
- Photointerrupters
- Industrial electronics
- For control and drive circuits

Ordering Information

Type:	Photocurrent I_{PCE} [µA] **λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V**	Ordering Code
SFH 313 FA	≥ 2500	Q62702P1674
SFH 313 FA-2/3	4000 ... 12500	Q62702P3597
SFH 313 FA-3/4	≥ 6300	Q62702P5196

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Maximum Ratings (T_A = 25 °C)

Parameter	Symbol	Values	Unit
Operating and storage temperature range	T_{op}; T_{stg}	-40 ... 100	°C
Collector-emitter voltage	V_{CE}	70	V
Collector current	I_C	50	mA
Collector surge current (τ < 10 µs)	I_{CS}	100	mA
Emitter-collector voltage	V_{EC}	7	V
Total Power dissipation	P_{tot}	200	mW
Thermal resistance	R_{thJA}	375	K / W
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2000	V

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

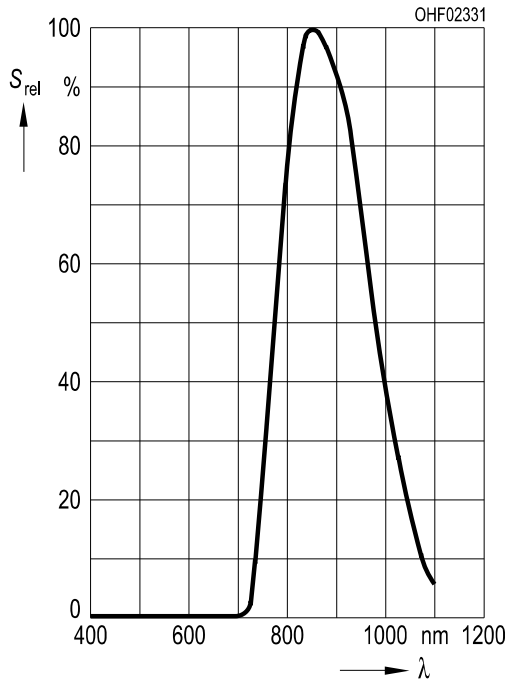
Parameter		Symbol	Values	Unit
Wavelength of max. sensitivity	(typ)	$\lambda_{S\ max}$	870	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 740 ... 1080	nm
Radiant sensitive area	(typ)	A	0.55	mm^2
Dimensions of chip area	(typ)	L x W	(typ) 1 x 1	mm x mm
Half angle	(typ)	φ	± 10	°
Capacitance (V_{CE} = 5 V, f = 1 MHz, E = 0)	(typ)	C_{CE}	10	pF
Dark current (V_{CE} = 20 V, E = 0)	(typ (max))	I_{CE0}	3 (≤ 200)	nA

Grouping (T_A = 25 °C, λ = 950 nm)

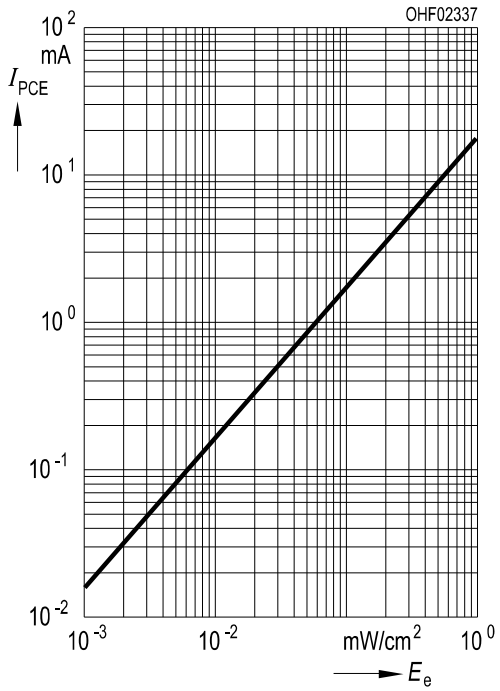
Group	Min Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V $I_{PCE, min}$ [µA]	Max Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V $I_{PCE, max}$ [µA]	Rise and fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ t_r, t_f [µs]	Collector-emitter saturation voltage $I_C = I_{PCEmin}$ x 0.3, E_e = 0.5 mW/cm² V_{CEsat} [mV]
-1	2500	5000	8	150
-2	4000	8000	10	150
-3	6300	12500	12	150
-4	10000		14	150

Note.: I_{PCEmin} *is the min. photocurrent of the specified group.*

Relative Spectral Sensitivity [1] *page 9*
SFH 313 FA $S_{rel} = f(\lambda)$



Photocurrent [1] *page 9*
$I_{PCE} = f(E_e)$, V_{CE} = 5 V



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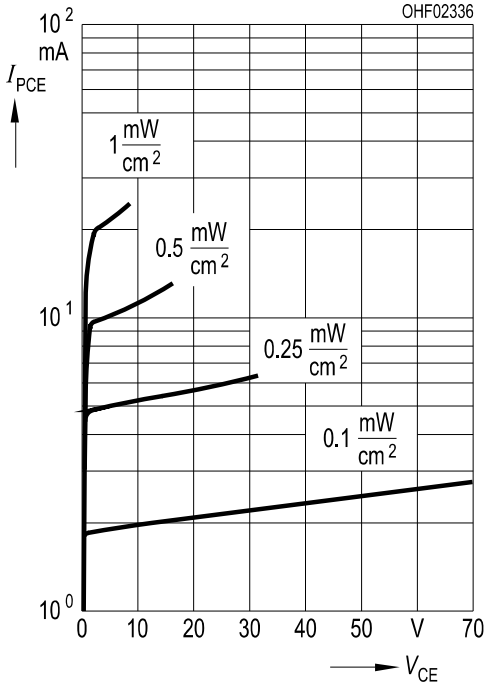
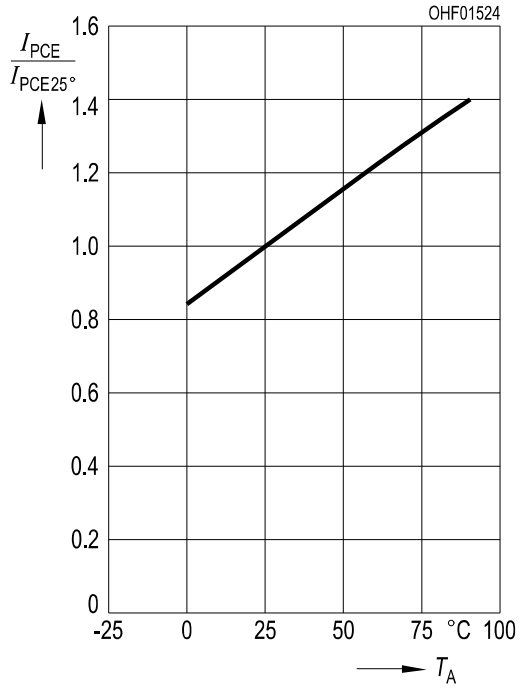
Photocurrent [1] *page 9*

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



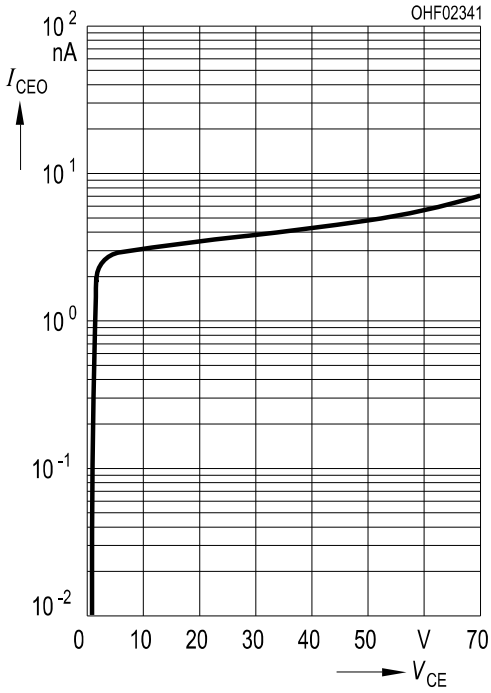
Photocurrent [1] *page 9*

$I_{PCE} / I_{PCE}(25°C) = f(T_A)$, V_{CE} = 5 V



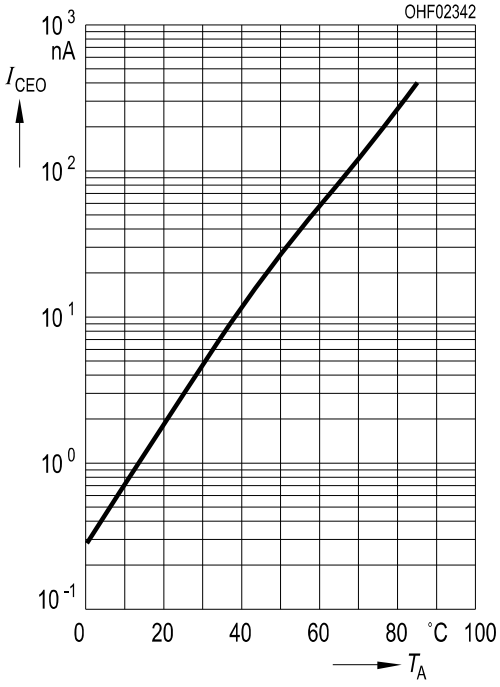
Dark Current [1] *page 9*

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



Dark Current [1] *page 9*

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



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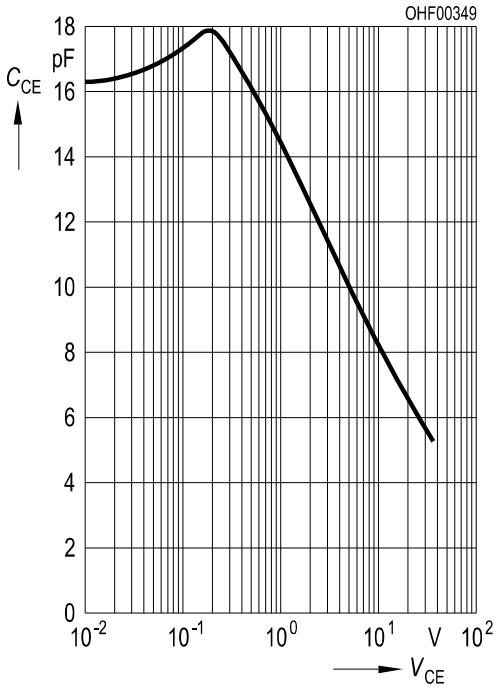
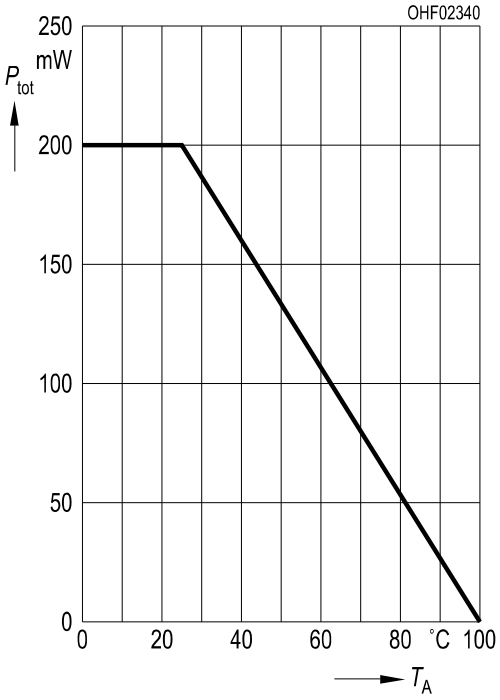
Collector-Emitter Capacitance [1] page 9

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



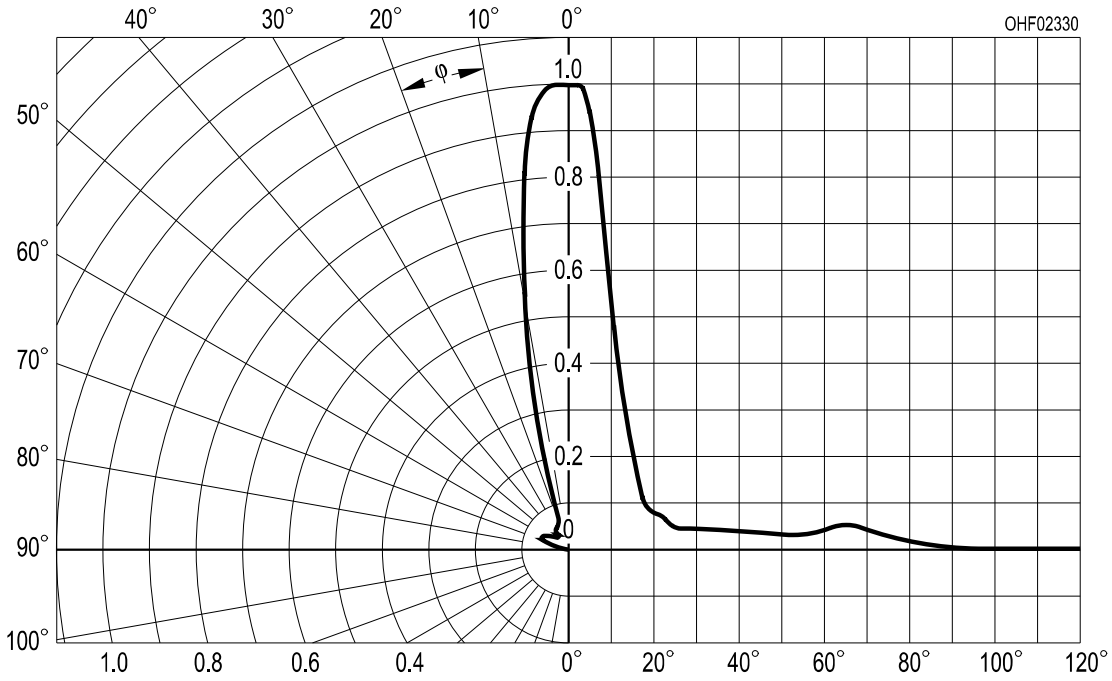
Power Consumption

$P_{tot} = f(T_A)$



Directional Characteristics [1] page 9

$S_{rel} = f(\phi)$



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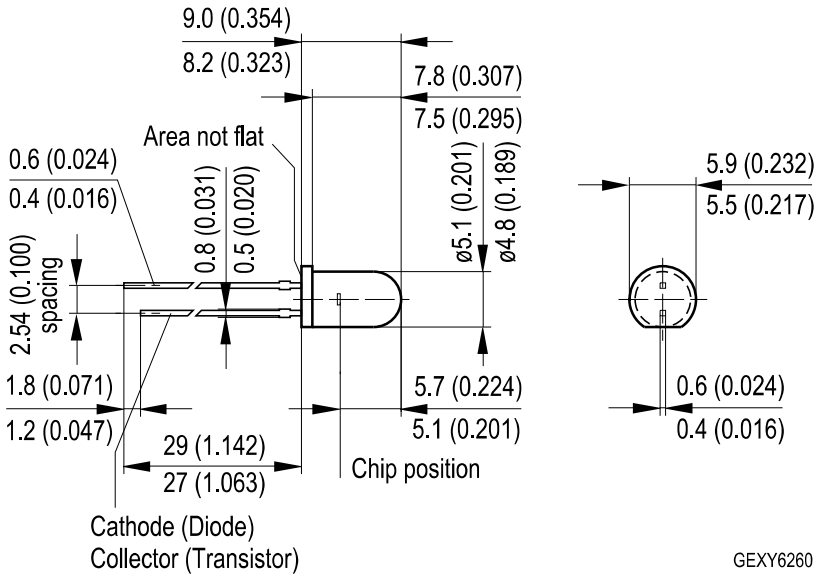
Package Outline



Dimensions in mm (inch).

Package

5mm Radial (T 1 ¾), Epoxy

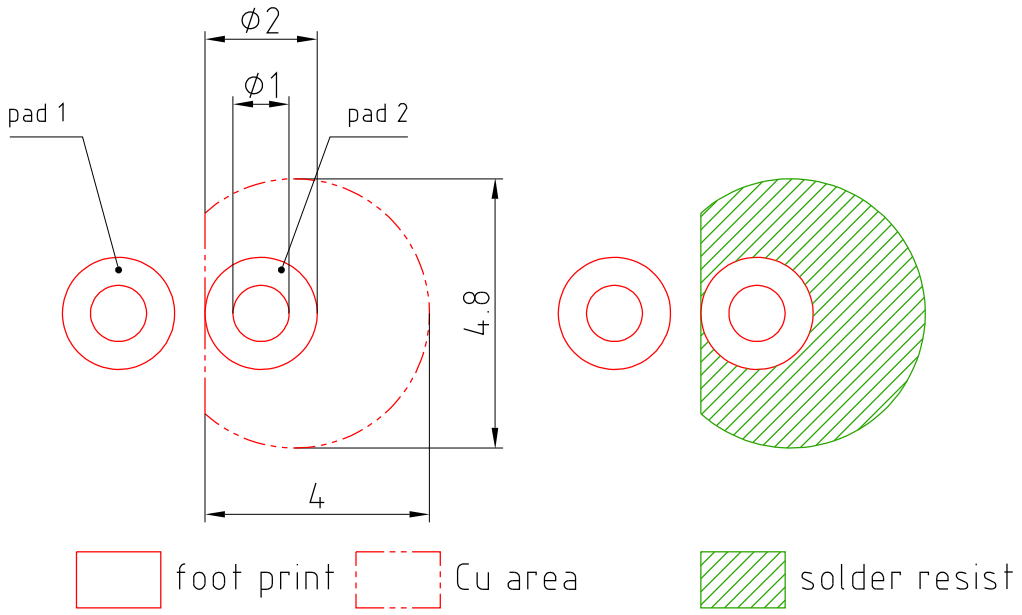
Approximate Weight:

0.4 g

Note

Packing information is available on the internet (online product catalog).

Recommended Solder Pad



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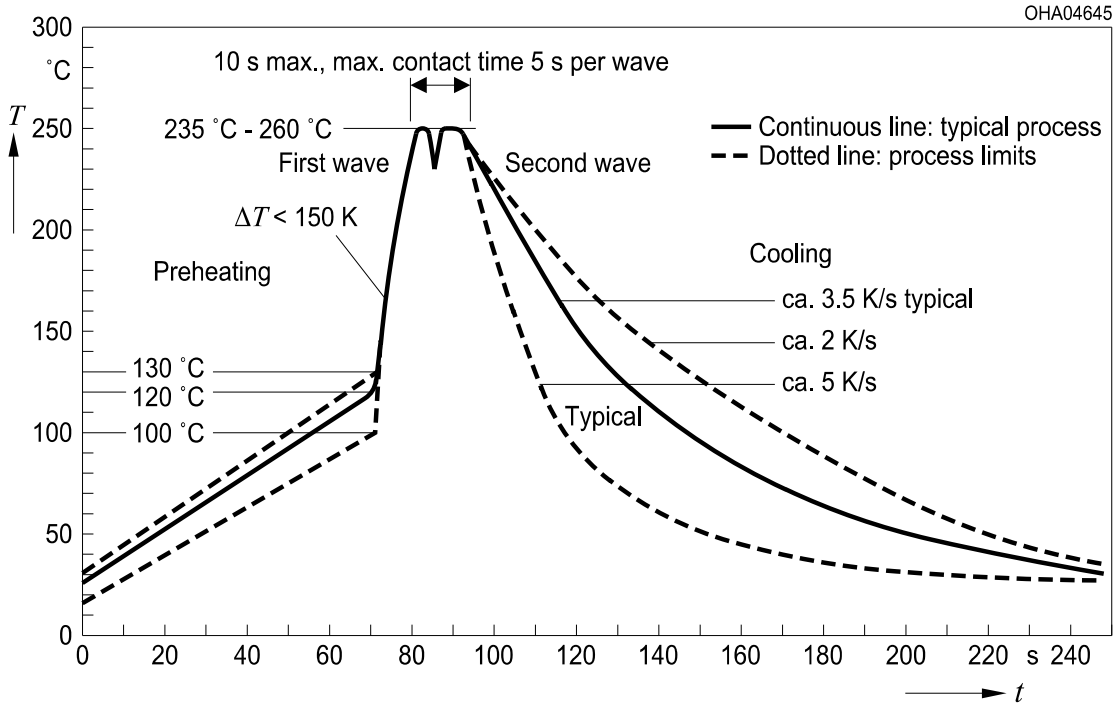
Dimensions in mm.

Note:
pad 1: emitter

TTW Soldering
IEC-61760-1 TTW



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Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

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For information on the types in question please contact our Sales Organization.
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Glossary

[1] **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.

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