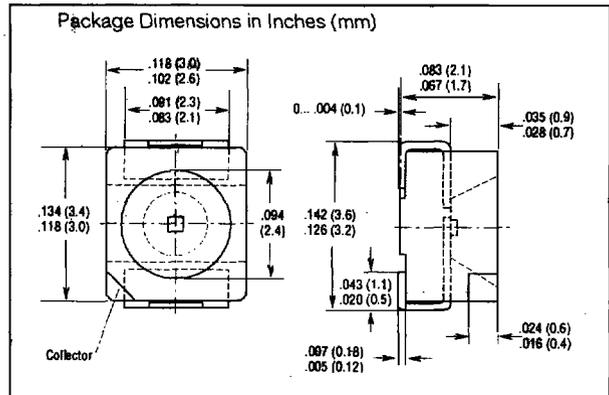
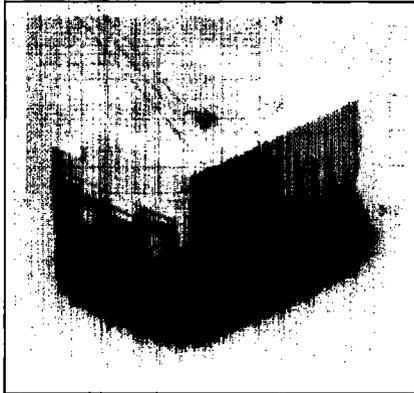


SIEMENS

SFH320 DAYLIGHT FILTER SFH320F NPN Silicon Phototransistor SMT-TOPLED™



FEATURES

- NPN Silicon Phototransistor
- Daylight Filter Option—SFH320F
- Suitable for Vapor-Phase Reflow, Infrared Reflow, Wave Solder Processes
- Compatible with Automatic Placement Equipment
- High Photosensitivity
- High Reliability
- No Measurable Degradation
- Three Photocurrent Bin Options
- Matches with SFH420—SMT IRED
- Surface Mountable PL-CC-2 Package
- Applications
 - Measurement and Control
 - Touch Screens
 - Miniature Light Curtains

DESCRIPTION

The SFH320/320F are high-sensitivity NPN silicon phototransistors in a compact surface-mountable package. Available with or without a daylight filter, they are compatible with automatic placement equipment and can withstand IR reflow, vapor phase reflow, and wave solder processes. Their small size makes them suitable for dense packaging in array applications such as touch screens and precise position measurement.

Maximum Ratings

Operating & Storage Temperature (T_A, T_{STG})	.....	-55 to +100°C
Collector-Emitter Voltage (V_{CE})	.....	35 V
Collector Current (I_C)	.....	15 mA
Peak Collector Current (I_{CS}) $\tau < 10 \mu s$	.....	75 mA
Power Dissipation (P_{tot}) $T_A = 25^\circ C$	.....	165 mW
Thermal Resistance, Junction to Ambient Mounting on PC Board (R_{thJA})	.....	450 K/W

Characteristics ($T_A = 25^\circ C, \lambda = 950 \text{ nm}$)

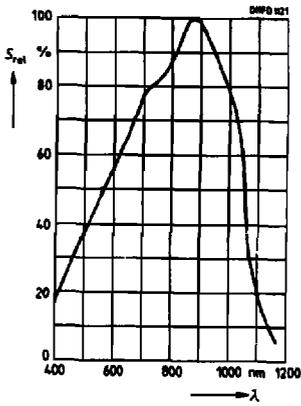
Parameter	Symbol	SFH320	SFH320F	Unit
Maximum Sensitivity Wavelength	λ_{Cmax}	860	900	nm
Spectral Range, Photosensitivity ($S = 10\%$ of S_{max})	λ	380 to 1150	730 to 1120	nm
Radiant Sensitive Area	A	0.045	0.045	mm ²
Radiant Sensitive Area Dimensions	L x W	0.45 x 0.45	0.45 x 0.45	mm
Distance, Chip Surface to Case Surface	H	0.5 to 0.7	0.5 to 0.7	mm
Half Angle	ϕ	± 60	± 60	Deg
Capacitance ($V_{CE} = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$)	C_{CE}	5.0	5.0	pF
Dark Current ($V_{CE0} = 25 \text{ V}, E = 0$)	I_{CEO}	1 (≤ 200)	1 (≤ 200)	nA

Photosensitivity ranges by dash numbers.

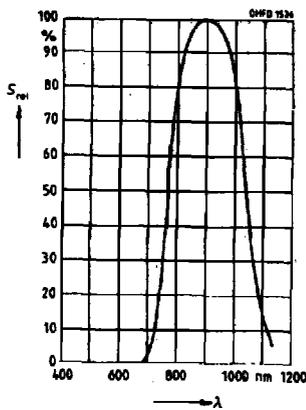
Parameter	Symbol	-1	-2	-3	Unit
Photocurrent ($E_E = 0.5 \text{ mW/cm}^2, V_{CE} = 5 \text{ v}$)	I_{PCE}	10-20	16-32	≥ 25	μA
SFH320: ($E_V = 1000 \text{ lx, std. light A}, V_{CE} = 5 \text{ v}$)	I_{PCE}	260	420	650	μA
Rise Time/Fall Time ($I_C = 1 \text{ mA}, V_{CC} = 5 \text{ V}, R_L = 1 \text{ K}\Omega$)	t_r, t_f	5	6	7	μs
Collector-emitter Saturation Voltage ($I_{PCE} = I_{PCEmin}^{(1)} \cdot 0.3, E_E = 0.1 \text{ mW/cm}^2$)	V_{CEsat}	150	150	150	mV

Note: 1. I_{PCEmin} is the minimum photocurrent for each group.

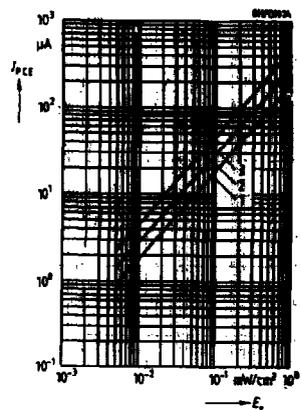
Relative spectral sensitivity—SFH320
 $S_{REL} = f(\lambda)$



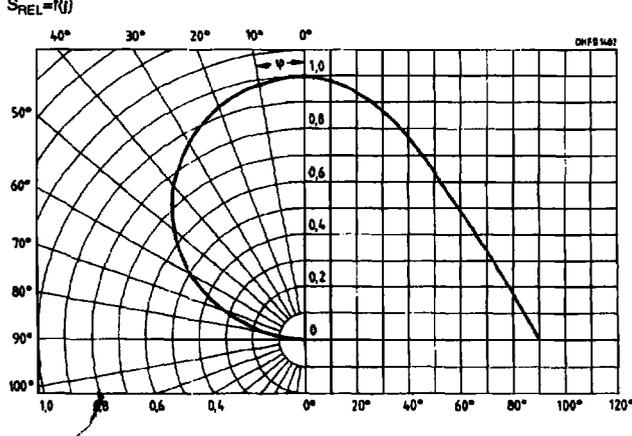
Relative spectral sensitivity—SFH320F
 $S_{REL} = f(\lambda)$



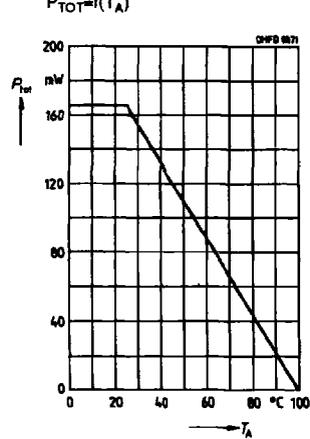
Photocurrent $I_{PCE} = f(E_E), V_{CE} = 5 \text{ V}$



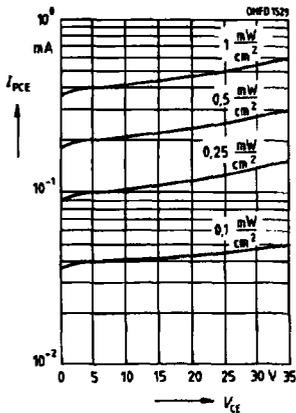
Directional characteristic
 $S_{REL} = f(\psi)$



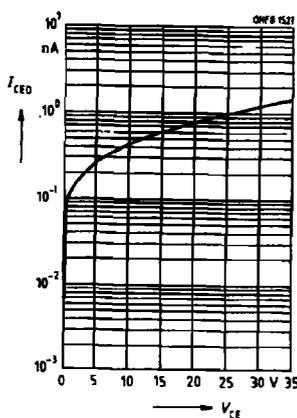
Total power dissipation
 $P_{TOT} = f(T_A)$



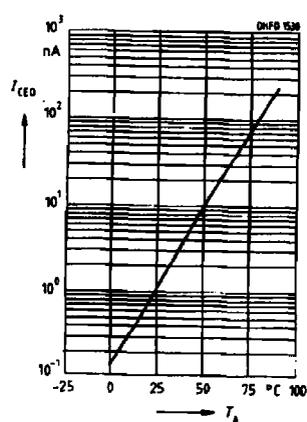
Photocurrent
 $I_{PCE} = f(V_{CE}), E_E = \text{Parameter}$



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

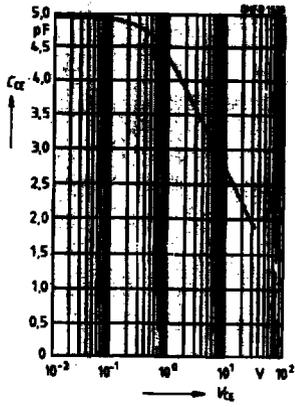


Dark current $I_{CEO} = f(T_A), V_{CE} = 25 \text{ V}, E = 0$



Phototransistor/
Photoerdlempfänger

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



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

