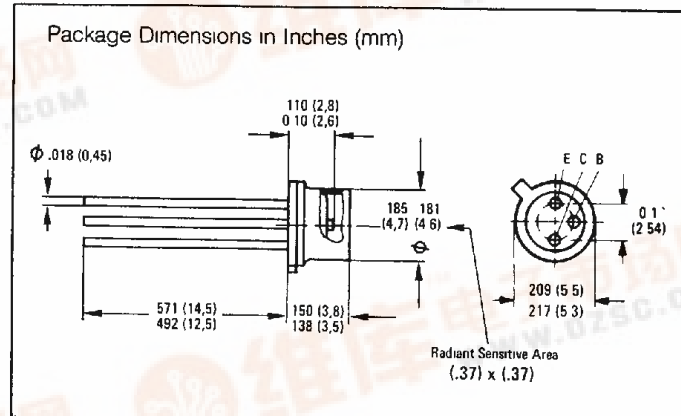


SIEMENS

SFH500

PHOTOTRANSISTOR

T-41-61



Maximum Ratings

Collector emitter voltage	V_{CEO}	15	V
Emitter base voltage	V_{EBO}	7	V
Collector current	I_C	20	mA
Junction temperature	T_j	100	°C
Storage temperature	T_s	-55 to +100	°C
Max. soldering temperature ($t \leq 5$ s)	T_L	260	°C
Power dissipation ($T_{amb} = 25^\circ\text{C}$)	P_{tot}	100	mW
Thermal resistance			
Collector junction to air	R_{thJAmb}	600	K/W
Collector junction to case	$R_{thJCase}$	250	K/W

Characteristics ($T_{amb} = 25^\circ\text{C}$)

Photocurrent			
($V_{CE} = 5$ V, $E_v = 1000$ lx) ¹	I_D	700 (≥ 450)	μA
($V_{CE} = 5$ V, $E_v = 0.5$ mW/cm ²) ²	I_D	185	μA
Wavelength of the max. sensitivity	$\lambda_{S\max}$	825	nm
Quantum yield	η	0.84	Electrons/Photon
(Electrons per photon) ($\lambda = 850$ nm)	S_λ	0.56	A/W
Spectral sensitivity ($\lambda = 850$ nm)			
Collector-emitter leakage current	I_{CEO}	20 (≤ 50)	nA
($V_{CE} = 10$ V, $E = 0$)			
Collector emitter saturation voltage	V_{CEsat}	0.8 (≤ 1.2)	V
($I_C = 500$ μA , $I_E = 25$ μA , $E = 0$)			
Range of spectral sensitivity	λ	420 to 1100	nm
($S = 0.1$ S _{m,av})			
Typ. spectral sensitivity of the collector base photodiode	S	1.17	nA/lx
Radiant sensitive area	A	0.14	mm ²
Rise and fall time of the photocurrent			
Rise time to 90% of the final value	t_r, t_f	0.25	μs
Fall time to 10% of the initial value			
($R_L = 1$ k Ω) ¹			
Capacitance			
($V_{CE} = 5$ V, $f = 1$ MHz, $E = 0$)	C_{CE}	2.7	pF
($V_{CB} = 5$ V, $f = 1$ MHz, $E = 0$)	C_{CB}	5.6	pF
Cut-off frequency			
($R_L = 50$ Ω , $V = 12$ V, $I = 5$ mA)	f_B	2	MHz
Current gain ($V_{CE} = 5$ V, $I_C = 0.1$ mA)	β	600	—

¹measured with LED $\lambda = 950$ nm)

² I_D (CE) = Photocurrent of the phototransistor

I_D (CB) = Photocurrent of the collector base photodiode

FEATURES

- TO-18 Package
- Flat Glass Lens
- Fast Speed, 2 MHz

DESCRIPTION

SFH 500 is a fast NPN silicon planar photodetector with a frequency to 2 MHz and a wide range of modulation from 10^2 to 10^4 LUX. The chip is mounted in a TO-18 package with flat glass lens window. The photodetector is especially suitable for light wave conductor application through the small cap body (up to 2 Mbits/s). Also suitable for industrial electronics and in camera applications where a wider sensitivity range is necessary. The case is electrically connected to the collector.

Phototransistor/
Photodiode

T-44-61

