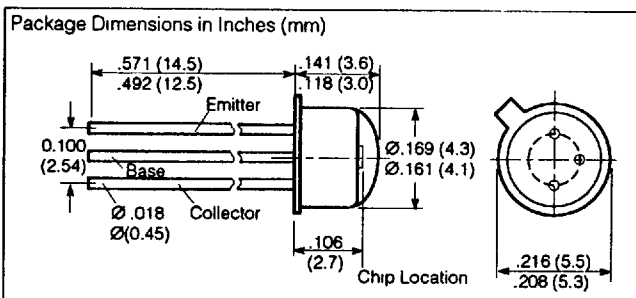
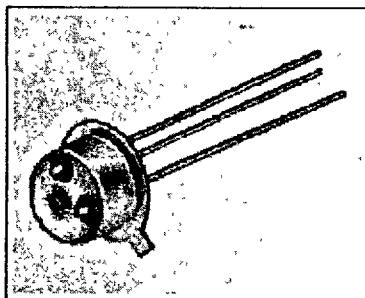


SIEMENS

BP 103 SILICON NPN PHOTOTRANSISTOR



FEATURES

- Silicon NPN Epitaxial Phototransistor
- Wide Acceptance Angle, 110°
- Five Sensitivity Ranges
- High Reliability
- Short Switching Time
- Good Linearity
- Matches IR Emitter LD242
- Package: Modified TO18
- Clear Plastic Lens

FEATURES

The BP103 is an epitaxial NPN silicon planar phototransistor in a modified TO18 (18 A 3 DIN 41876) package with a clear plastic lens. The lens provides a wide angle for incident light.

The emitter lead is marked by a tab on the case bottom. The collector is electrically connected to the metallic case.

Applications include: electronic flashes, light reflecting switches, light curtains, and measurement and control.

Maximum Ratings

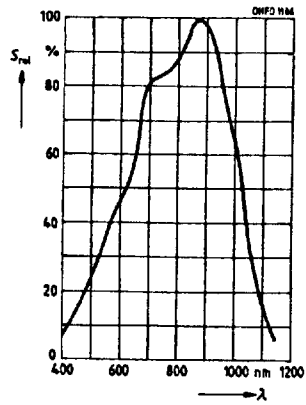
Operating and Storage Temperature Range (T_{OP} , T_{STG})		-40° to +80°C
Soldering Temperature (≥ 2 mm from case bottom)		
Dip Soldering Time (T_s) ≤ 5 s		260°C
Iron Soldering Time (T_s) ≤ 3 s		300°C
Collector Emitter Voltage (V_{CE})		50 V
Emitter Base Voltage (V_{EB})		7 V
Collector Current (I_C)		100 mA
Collector Peak Current (I_{PK}) $t < 10$ μ s		200 mA
Power Dissipation (P_{TOT}) $T_A = 25^\circ\text{C}$		150 mW
Thermal Resistance (R_{THJA})		500 K/W

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

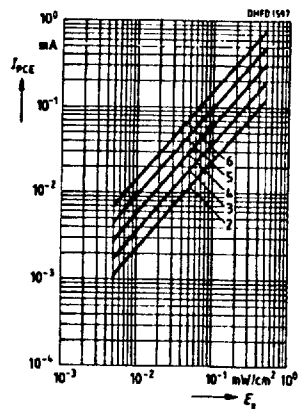
Parameter	Symbol	Value	Unit
Maximum Sensitivity Wavelength	λ_{Smax}	850	nm
Spectral Range, Photosensitivity	λ	420 to 1130	nm
Radiant Sensitive Area	A	0.12	mm ²
Die Area Dimensions	L x W	0.5 x 0.5	mm
Distance, Die Surface to Case Surface	H	0.2 to 0.8	mm
Half Angle	ϕ	± 55	Deg.
Photocurrent, Collector-Base Diode			
($E = 0.5$ mW/cm ² , $V_{CB} = 5$ V)	I_{PCB}	0.9	μ A
($E_V = 1000$ lx, std. light A, $V_{CB} = 5$ V)	I_{PCB}	2.7	μ A
Capacitance			
($V_{CE} = 0$ V, $f = 1$ MHz, $E = 0$)	C_{CE}	8	pF
($V_{CB} = 0$ V, $f = 1$ MHz, $E = 0$)	C_{CB}	11	pF
($V_{EB} = 0$ V, $f = 1$ MHz, $E = 0$)	C_{EB}	19	pF
Collector Emitter Leakage Current			
($V_{CE} = 35$ V, $E = 0$)	I_{CEO}	5 (≤ 100)	nA

Parameter	-2	-3	-4	-5	-6	Unit
Photocurrent, Collector-Emitter ⁽¹⁾						
($E_0 = 0.5$ mW/cm ² , $V_{CE} = 5$ V)	I_{PCE} 08 - 16	125 - 25	20 - 40	32 - 63	≥ 50	μ A
($E_V = 1000$ lx, standard light A, $V_{CE} = 5$ V)	I_{PCE} 0.38	0.60	0.95	1.4	1.8	mA
Rise/Fall Time ($I_C = 1$ mA, $V_{CC} = 5$ V, $R_L = 1$ k Ω)	t_R, t_F 5	7	9	12	15	μ s
Collector Emitter Saturation Voltage ($I_C = I_{PCEmin} \cdot 0.3$, $\lambda = 950$ nm)	V_{CEsat} 150	150	150	150	150	mV
Current Gain ($E = 0.5$ mW/cm ² , $\lambda = 950$ nm, $V_{CE} = 5$ V)	I_{PCE} 140	210	340	530	800	

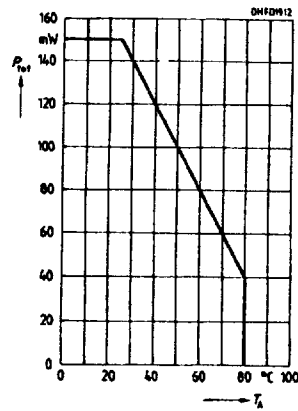
Relative spectral sensitivity
 $S_{REL}=f(\lambda)$



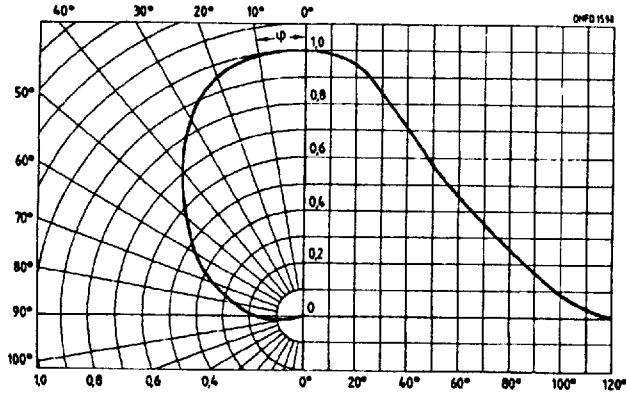
Photocurrent $I_{PCE}=f(E_s), V_{CE}=5\text{ V}$



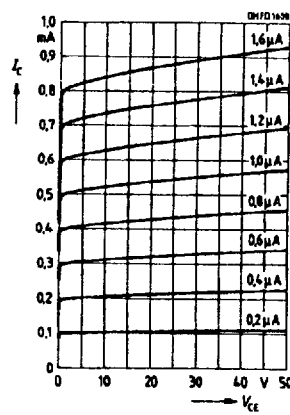
Total power dissipation
 $P_{TOT}=f(T_A)$



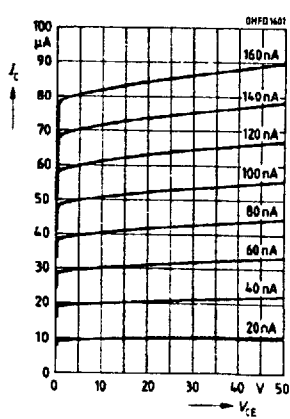
Directional characteristic
 $S_{REL}=f(\varphi)$



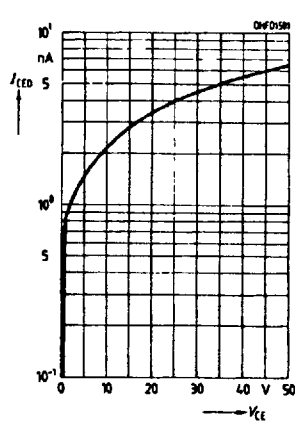
Output characteristics
 $I_C=f(V_{CE}), I_B=\text{Parameter}$



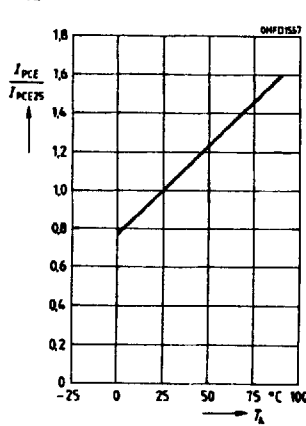
Output characteristics
 $I_C=f(V_{CE}), I_B=\text{Parameter}$



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

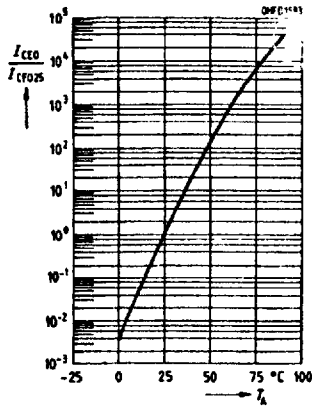


Photocurrent $I_{PCE}/I_{PCE25}=f(T_A), V_{CE}=5\text{ V}$

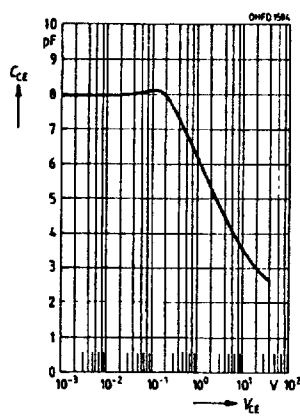


Phototransistors/
PhotoDarlington

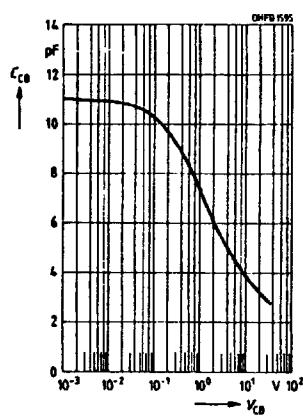
Dark current $I_{CEO}/I_{CEO25}=f(T_A)$,
 $V_{CE}=25\text{ V}$, $E=0$



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



Collector base capacitance
 $C_{CB}=f(V_{CB})$, $f=1\text{ MHz}$, $E=0$



Emitter base capacitance
 $C_{EB}=f(V_{EB})$, $f=1\text{ MHz}$, $E=0$

