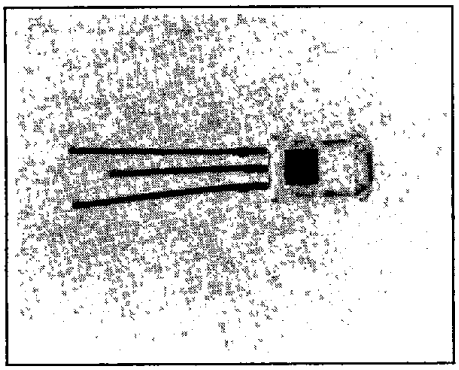
T-41-51

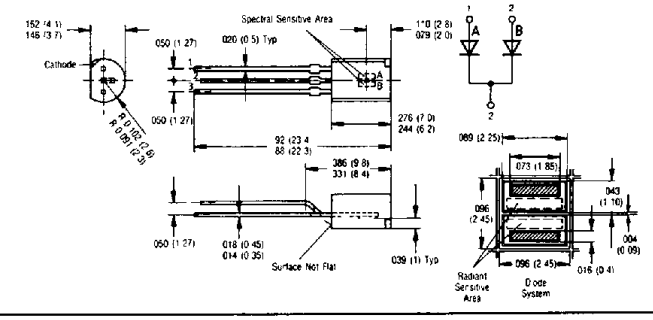
SIEMENS

SFH 248
WITH DAYLIGHT FILTER SFH 248F

SILICON DIFFERENTIAL PHOTODIODE



Package Dimensions in Inches (mm)



FEATURES

- **High Reliability**
- **Low Noise**
- **High Open-Circuit Voltage as Photovoltaic Cells**
- **Detector For Low Illuminance**
- **Short Switching Time**
- **Low Capacitance**
- **High Spectral Sensitivity**
- **Cathode Marking: Middle Solder Tab**
- **Suitable for Use in the Visible Light and Near Infrared Range**
- **Daylight Filter Option, SFH248F**

DESCRIPTION

SFH248 and SFH248F are silicon differential photodiodes fabricated in planar technology. The devices are packaged in a plastic case similar to a TO92. The terminals are solder tabs with 01" (2 54 mm) lead spacing. These photodetectors can be used as photodiodes with reverse voltage or as photovoltaic cells

Applications include edge control, path and corner scanning, industrial electronics, measuring and controlling devices

Maximum Ratings

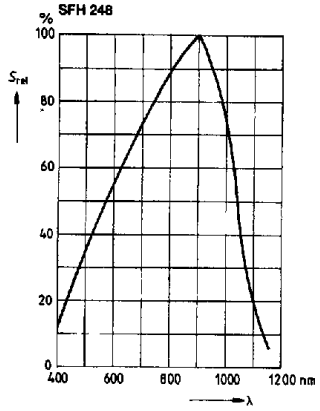
Reverse Voltage (V_R)	10 V
Storage and Operating Temperature	-40 to +80°C
Soldering Temperature in a 2 mm Distance from the Case Bottom ($t \leq 3$ s) (t_S)	230°C
Power Dissipation (P_{tot})	50 mW

Characteristics (T_{amb} = 25°C)

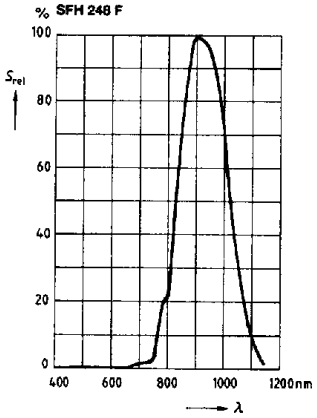
	Symbol	SFH248	SFH248F	Unit
Spectral Sensitivity (V_R = 5 V Note 1)	S	24 (≥15)		nA/lx
Spectral Sensitivity (V_R =5 V, λ = 950 nm E_e = 0 5 mW/cm²)	S		7 5 (≥4)	μA
Wavelength of Max Sensitivity	λ_{Smax}	850	950	nm
Spectral Range of Photosensitivity (S = 10% of Smax)	λ	430 to 1150	800 to 1150	nm
Radiant Sensitive Area	A	1 54	1 54	mm²
Dimensions of the Radiant Sensitive Area	L × W	0 7 × 2 2	0 7 × 2 2	mm
Distance Between Chip Surface and Package Surface	D	1	1	mm
Half Angle	φ	±60	±60	Deg
Dark Current (V_R = 10 V)	I_R	100 (≤200)	100 (≤200)	nA
Spectral Sensitivity (λ = 850 nm)	S_λ	0 55	0 55	A/W
Quantum Yield (λ = 850 nm)	η	0 80	0 80	Electrons / Photon
Open Circuit Voltage (E_e =1000 lx Note 1)	V_O	390 (≥320)		mV
(E_e = 0 5 mW/cm² λ = 950 nm)	V_O		340 (≥280)	mV
Short Circuit Current (E_e = 1000 lx Note 1)	I_K	24 (≥15)		μA
(E_e = 0 5 mW/cm² λ =950 nm)	I_K		7 5 (≥4)	μA
Rise and Fall Time of the Photocurrent from 10% to 90% and from 90% to 10% of the Final Value (R_L = 1 Ω V_R = 0 V λ = 830 nm, I_P = 20 μA)	t_r, t_f	500	500	ns
Forward Voltage (I_F = 100 mA, E_e = 0 T_{amb} = 25°C)	V_F	1 3	1 3	V
Capacitance (V_R = 0 V f = 1 MHz E_V = 0 lx)	C_0	40	40	pF
(V_R = 10 V, f = 1 MHz E_V = 0 lx)	C_{10}	10	10	pF
Temperature Coefficient V_O	TC_V	-2 6	-2 6	mV/K
Temperature Coefficient I_S	TC_I	0 18	0 18	%/K

[1]The illuminance indicated refers to unfiltered radiation of a tungsten filament lamp at a color temperature of 2856 K (Standard light A in accordance with DIN 5033 and IEC publ 306 1)

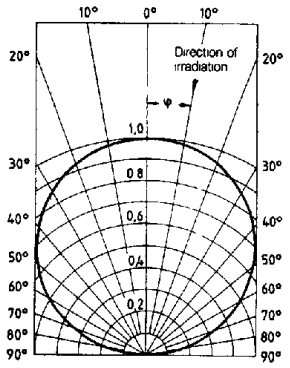
Relative spectral sensitivity versus wavelength
SFH 248



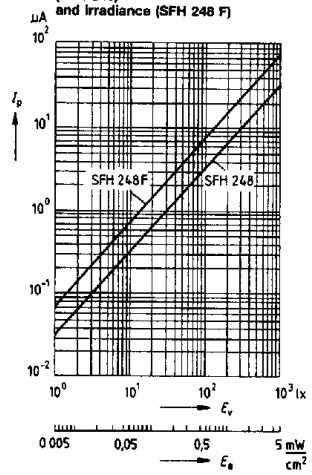
Relative spectral sensitivity versus wavelength
% SFH 248 F



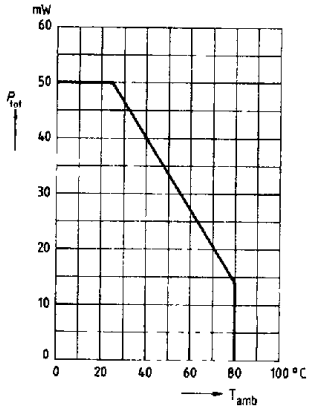
Directional characteristic
Relative spectral sensitivity versus half angle



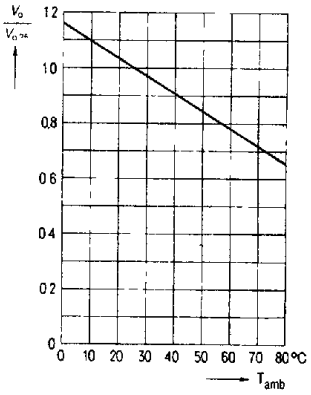
Photocurrent versus illuminance (SFH 248) and irradiance (SFH 248 F)



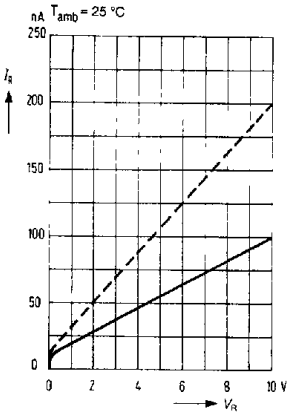
Total power dissipation versus ambient temperature



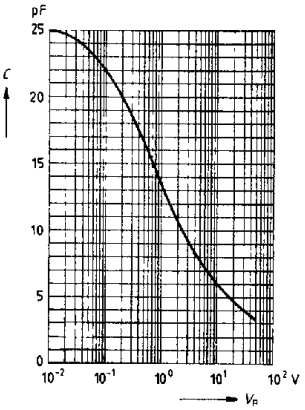
Open-circuit voltage versus ambient temperature



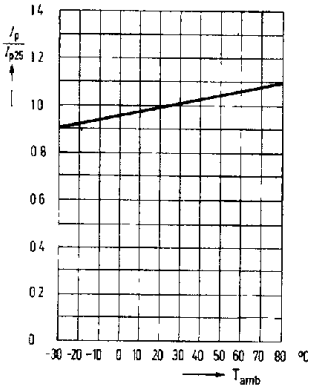
Dark current versus reverse voltage



Diode capacitance versus reverse voltage



Photocurrent versus ambient temperature



Dark current versus ambient temperature
V_R = 10 V