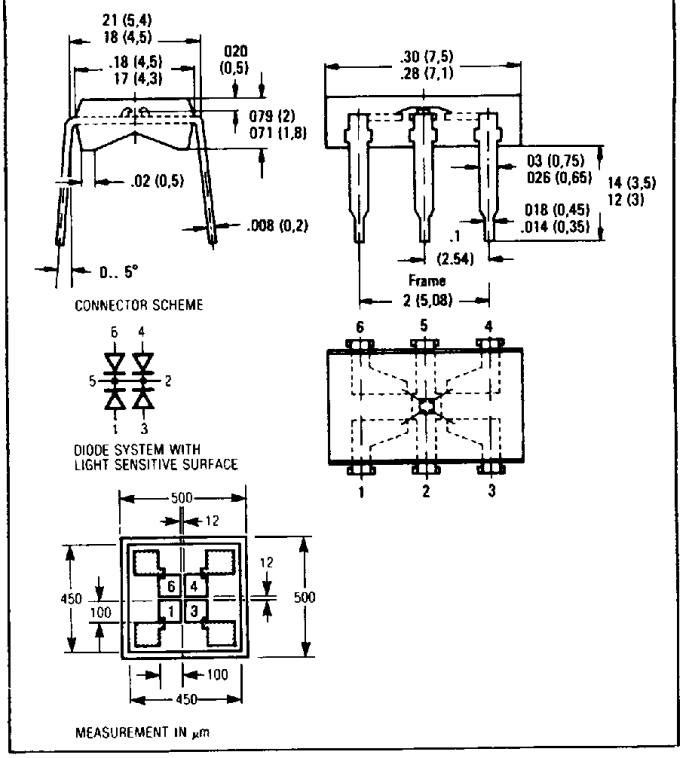
# SIEMENS

# SFH 204

## SILICON FOUR QUADRANT PHOTODIODE

T-41-51

Package Dimensions in Inches (mm)




### FEATURES

- **Miniature Size**
- **Four Quadrant Active Sections**
- **Close Spacing of Contacts, 12 µm**
- **Can Determine If and By How Much a Light Source Has Deviated**
- **SMD Package Optional**

### DESCRIPTION

The SFH 204 silicon planar miniature four quadrant photodiode has application in edge drive, positioning, and path and corner scanning control devices. The active units are spaced at only 12 µm apart from individual contacts. It is therefore possible to get exact positioning with high definition.

### Maximum Ratings

| | |
|---|---|
| Reverse Voltage ($V_R$) | 12 V |
| Operating and Storage Temperature Range ($T$ , $T_O$) | −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 ($P_{tot}$) | 40 mW |

### Characteristics ($T_{amb}$ = 25°C)

| | | | |
|---|---|---|---|
| Photosensitivity ($V_R$ = 5 V, Note 1) | S | 0 13 (≥0 08) | nA/lx |
| Wavelength of Max Photosensitivity | $\lambda_{Smax}$ | 850 | nm |
| Spectral Range of Photosensitivity (S = 10% of Smax) | $\lambda$ | 400 1100 | nm |
| Radiant Sensitive Area | A | 4 × 0 01 | mm² |
| Dimensions of the Radiant Sensitive Area | L × W | 100 × 100 | mm |
| Distance Between Chip Surface and Package Surface | H | 0 5 | mm |
| Half Angle | $\varphi$ | 60 | Deg |
| Dark Current ($V_R$ = 10 V) | $I_R$ | 0 1 (≤2) | nA |
| Spectral Photosensitivity ($\lambda$ = 850 nm) | $S_\lambda$ | 0 35 | A/W |
| Max Deviation of Photosensitivity Between Diodes | $\Delta$ | ±10 | % |
| Quantum Efficiency ($\lambda$ = 950 nm) | $\eta$ | 0 45 | $\frac{\text{Electrons}}{\text{Photon}}$ |

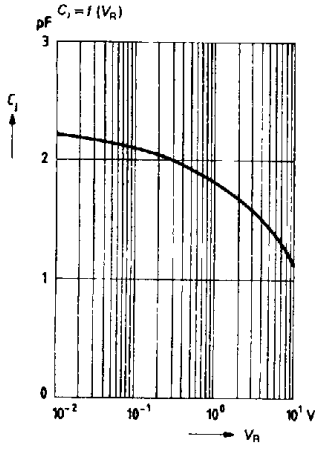
—Continued

## Characteristics ($T_{amb}$ = 25°C)

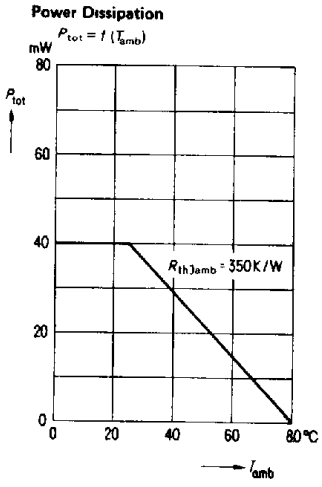
| | | | |
|---|---|---|---|
| Open Circuit Voltage ($E_V$ = 1000 lx, Note 1) | $V_O$ | 450 (≥380) | mV |
| Short Circuit Current ($E_V$ = 1000 lx, Note 1) | $I_K$ | 130 (≥80) | nA |
| Rise and Fall Time of the Photocurrent from 10% to 90% and from 90% to 10% of the Final Value ($R_L$ = 1 KΩ, $V_R$ = 5 V, λ = 830 nm $I_P$ = 45 μA) | $t_r$, $t_f$ | 3 | μs |
| Forward Voltage ($I_F$ = 100 mA, $E_e$ = 0 $T_{amb}$ = 25°C) | $V_F$ | 1 3 | V |
| Capacitance ($V_R$ = 0 V, f = 1 MHz, $E_V$ = 0 lx) | $C_O$ | 2 0 | pF |
| ($V_R$ = 10 V, f = 1 MHz, $E_V$ = 0 lx) | $C_{10}$ | 1 0 | pF |
| Temperature Coefficient $V_O$ | $TC_V$ | -2 6 | mV/K |
| Temperature Coefficient $I_O$ | $TC_I$ | 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)

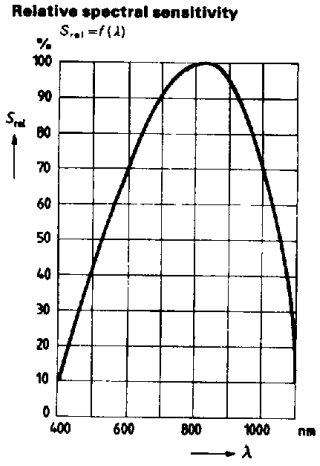
**Capacitance**



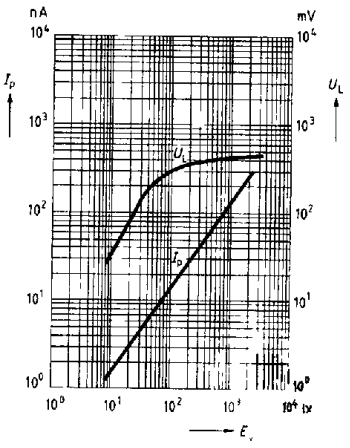

**Power Dissipation**




**Relative spectral sensitivity**




**Photocurrent $I_P = f(E_V)$**
**Open circuit voltage $V_L = f(E_V)$**




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