

Silicon PIN Photodiode



DESCRIPTION

TEFD4300F is a silicon PIN photodiode with high radiant sensitivity in black, T-1 plastic package with daylight blocking filter. Filter bandwidth is matched with 850 nm to 950 nm IR emitters.

FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm): \varnothing 3
- High radiant sensitivity
- Daylight blocking filter matched with 850 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 20^\circ$
- Package matched with IR emitter series VSLB3940, TSUS4300, and TSAL4400
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



APPLICATIONS

- High speed photo detector for data transmission
- Optical switches
- Counters and sorters
- Interrupters
- Encoders
- Position sensors

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μA) | φ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|----------------------|-----------------|----------------------|
| TEFD4300F | 17 | ± 20 | 770 to 1070 |

Note

- Test condition see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|----------------|---------------|--------------------------------|--------------|
| TEFD4300F | Bulk | MOQ: 5000 pcs, 5000 pcs/bulk | T-1 |
| TEFD4300F-QS21 | Tape and reel | MOQ: 10 000 pcs, 2000 pcs/reel | T-1 |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ C$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|---------------------------------------|--|------------|-------------|------------|
| Reverse voltage | | V_R | 60 | V |
| Power dissipation | $T_{amb} \leq 25^\circ C$ | P_V | 215 | mW |
| Junction temperature | | T_j | 100 | $^\circ C$ |
| Operating temperature range | | T_{amb} | -40 to +100 | $^\circ C$ |
| Storage temperature range | | T_{stg} | -40 to +100 | $^\circ C$ |
| Soldering temperature | $t \leq 3$ s, 2 mm from case | T_{sd} | 260 | $^\circ C$ |
| Thermal resistance junction / ambient | Connected with Cu wire, 0.14 mm ² | R_{thJA} | 450 | K/W |

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|--|-----------------|------|----------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Forward voltage | $I_F = 50\text{ mA}$ | V_F | - | 1 | - | V |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0$ | $V_{(BR)}$ | 60 | - | - | V |
| Reverse dark current | $V_R = 10\text{ V}$, $E = 0$ | I_{r0} | - | 0.15 | 3 | nA |
| Diode capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 3.3 | - | pF |
| | $V_R = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 1.2 | - | pF |
| Open circuit voltage | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | V_{OC} | - | 350 | - | mV |
| Temperature coefficient of V_O | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | TK_{V_O} | - | -2.6 | - | mV/K |
| Short circuit current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | I_k | - | 15 | - | μA |
| Temperature coefficient of I_k | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$ | TK_{I_k} | - | 0.1 | - | %/K |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | 9 | 17 | 27 | μA |
| Angle of half sensitivity | | ϕ | - | ± 20 | - | deg |
| Wavelength of peak sensitivity | | λ_p | - | 950 | - | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | 770 | - | 1070 | nm |
| Rise time | $V_R = 10\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 820\text{ nm}$ | t_r | - | 100 | - | ns |
| Fall time | $V_R = 10\text{ V}$, $R_L = 1\text{ k}\Omega$, $\lambda = 820\text{ nm}$ | t_f | - | 100 | - | ns |

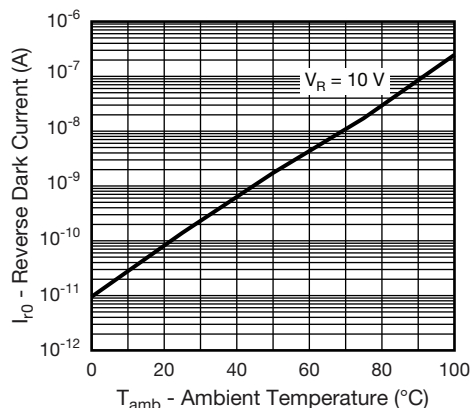
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

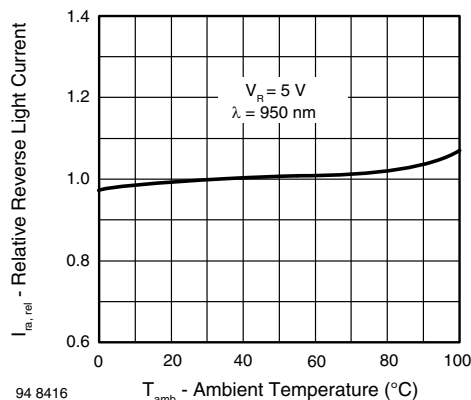


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

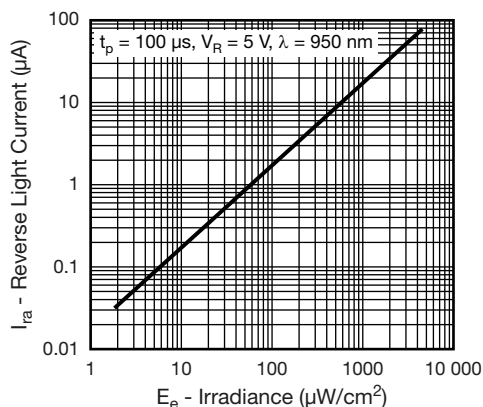


Fig. 3 - Reverse Light Current vs. Irradiance

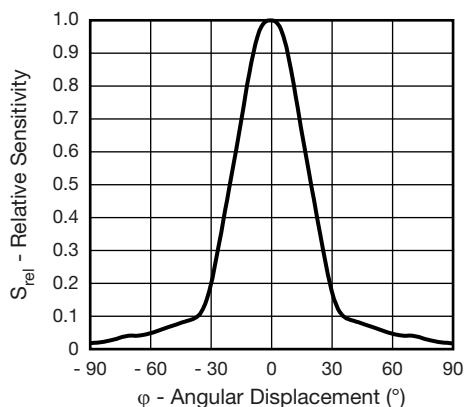


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

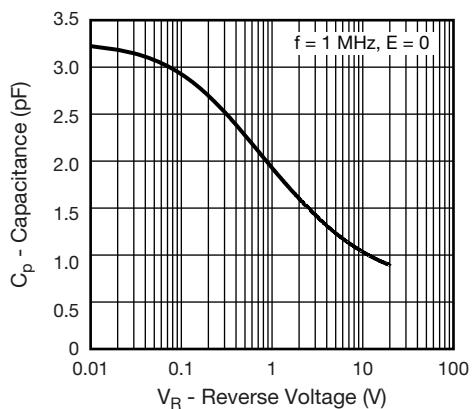


Fig. 4 - Diode Capacitance vs. Reverse Voltage

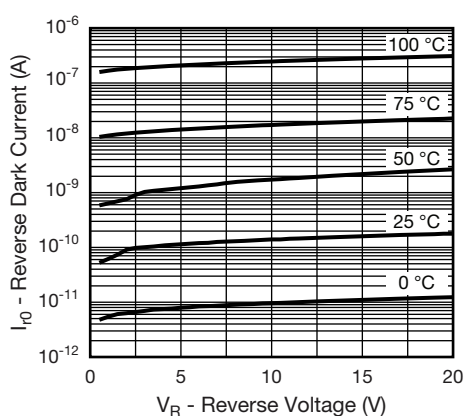


Fig. 7 - Dark Current vs. Reverse Voltage

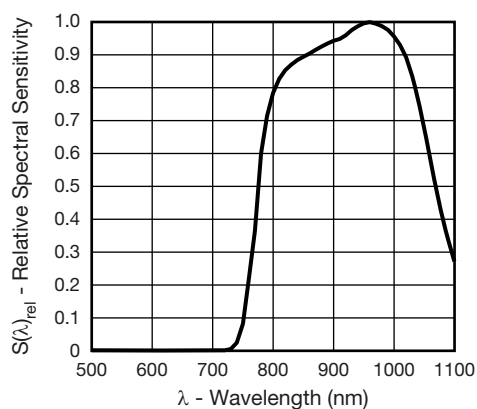
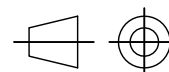
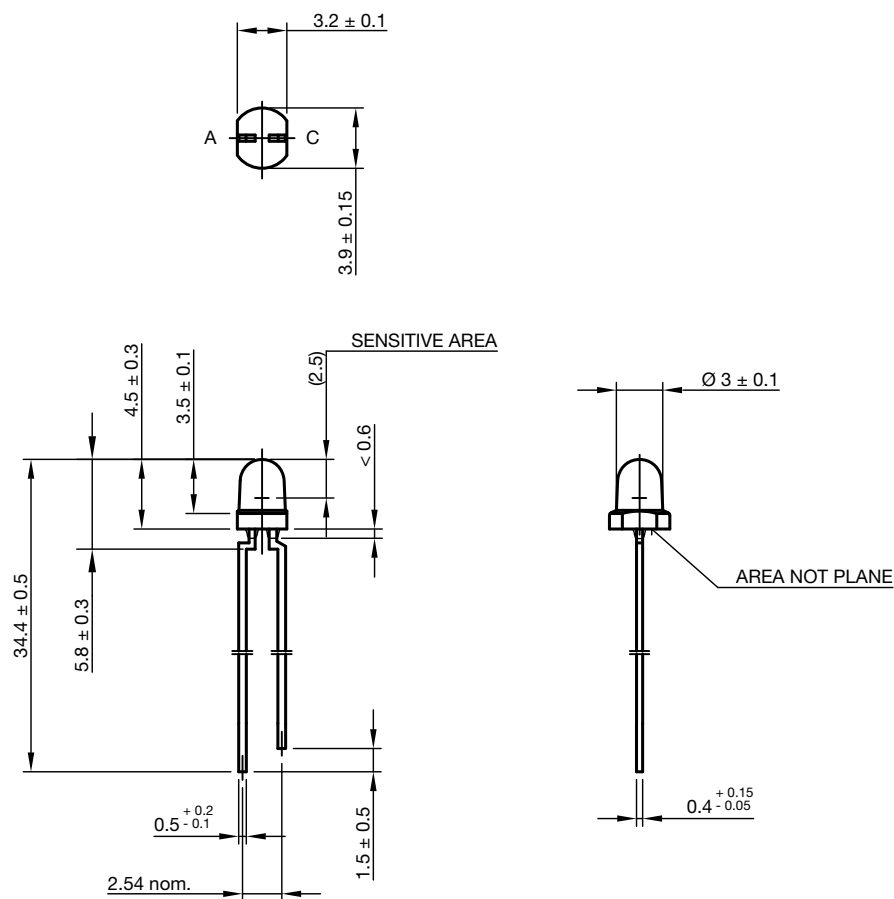


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

PACKAGE DIMENSIONS in millimeters


technical drawings
according to DIN
specifications

Drawing-No.: 6.544-5411.01-4

Issue: 2; 28.07.14



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