

## 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

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

### PRODUCT SUMMARY

| COMPONENT | $I_{ra}$ ( $\mu A$ ) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|----------------------|-----------------|----------------------|
| TEFD4300F | 17                   | $\pm 20$        | 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          |

#### 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 <sup>2</sup> | $R_{thJA}$ | 450         | K/W        |

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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       |      | $\mu\text{A}$ |
| 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   | $\mu\text{A}$ |
| Angle of half sensitivity                                                                           |                                                                            | $\phi$          |      | $\pm 20$ |      | deg           |
| Wavelength of peak sensitivity                                                                      |                                                                            | $\lambda_p$     |      | 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            |

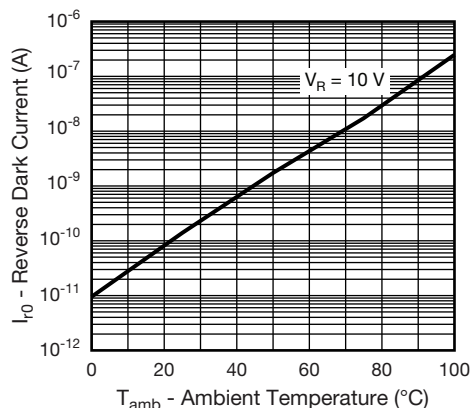
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

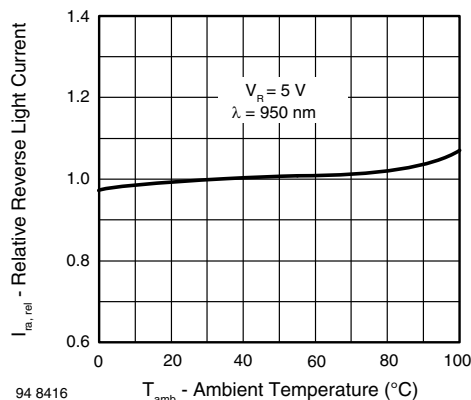


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

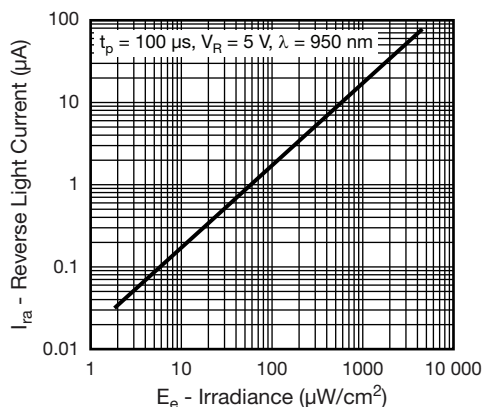


Fig. 3 - Reverse Light Current vs. Irradiance

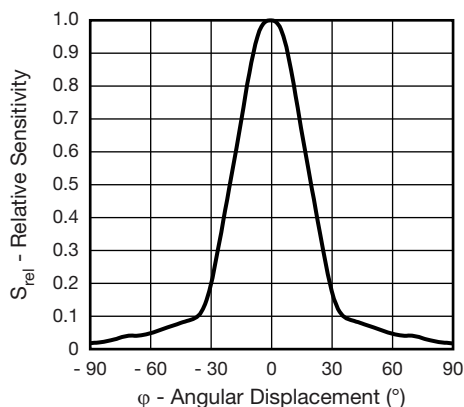


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement

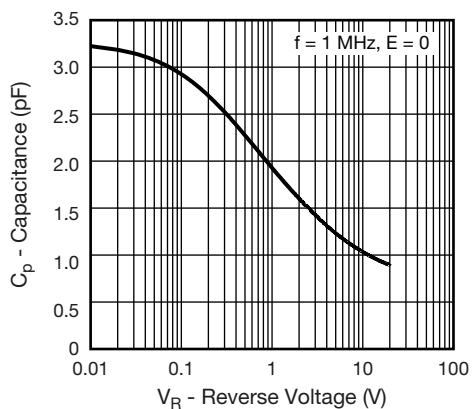


Fig. 4 - Diode Capacitance vs. Reverse Voltage

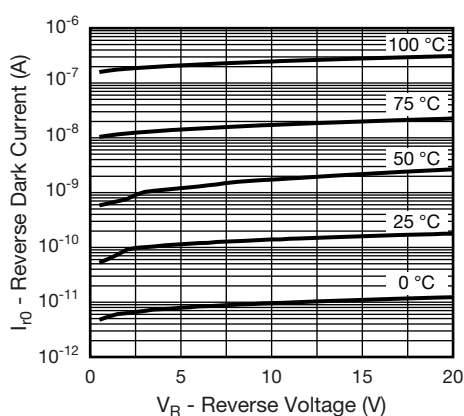


Fig. 7 - Dark Current vs. Reverse Voltage

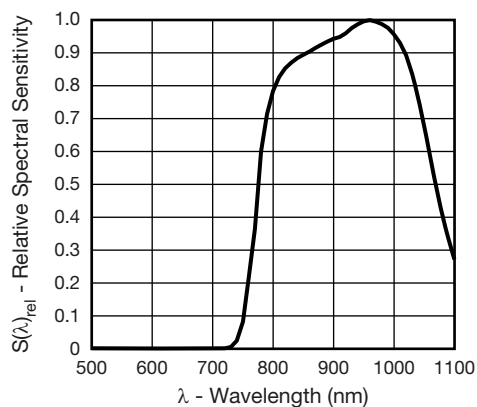
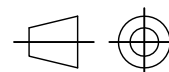
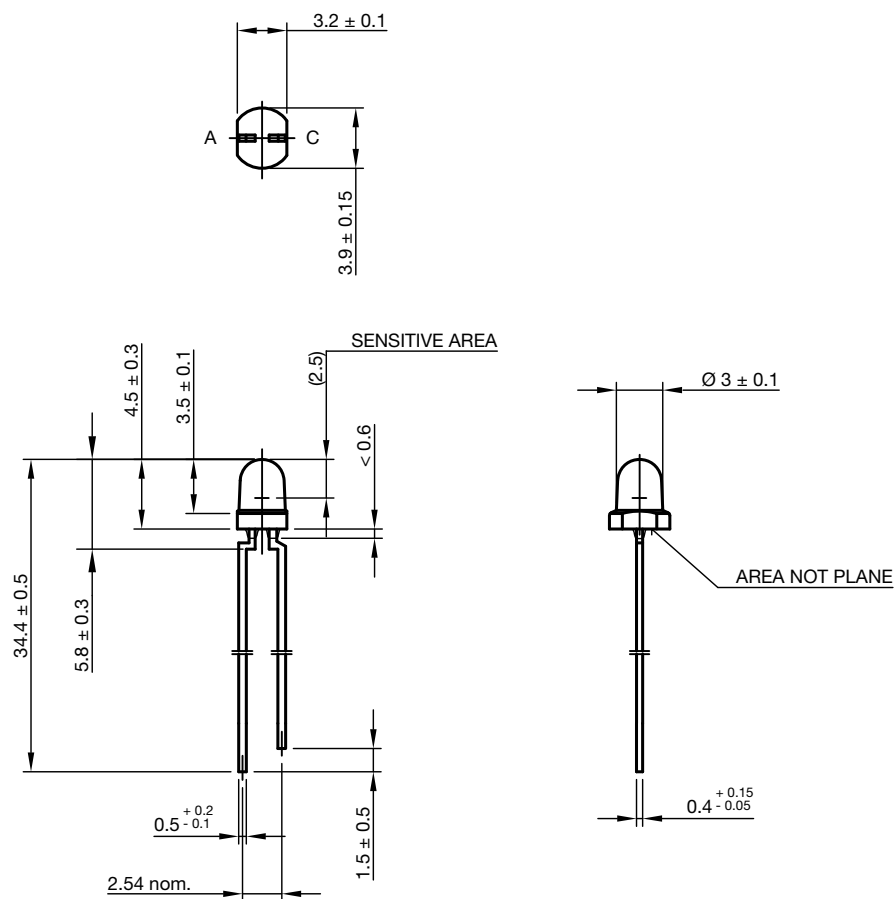


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

**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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