

## 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**  
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(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
TEFD4300F-QS21	Tape and reel	MOQ: 10 000 pcs, 2000 pcs/reel	T-1

#### Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		$V_R$	60	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	$P_V$	215	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Operating temperature range		$T_{amb}$	-40 to +100	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-40 to +100	$^\circ\text{C}$
Soldering temperature	$t \leq 3$ s, 2 mm from case	$T_{sd}$	260	$^\circ\text{C}$
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 $V_{OC}$	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 950\text{ nm}$	$TK_{V_{OC}}$	-	-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

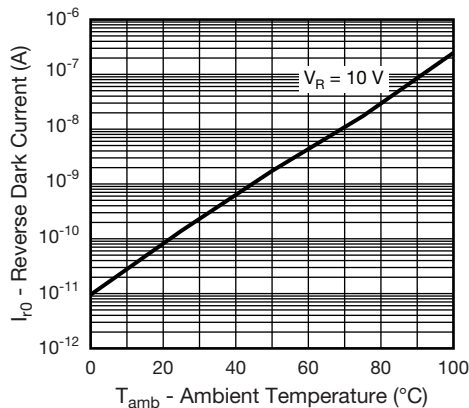
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

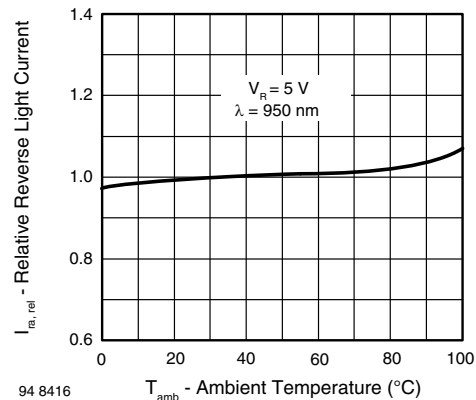


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



Fig. 3 - Reverse Light Current vs. Irradiance

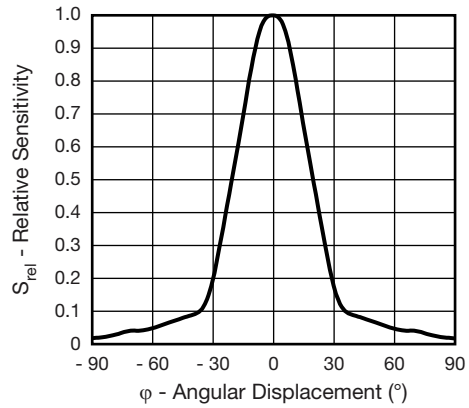


Fig. 6 - Relative Radiant Intensity vs. Angular Displacement



Fig. 4 - Diode Capacitance vs. Reverse Voltage

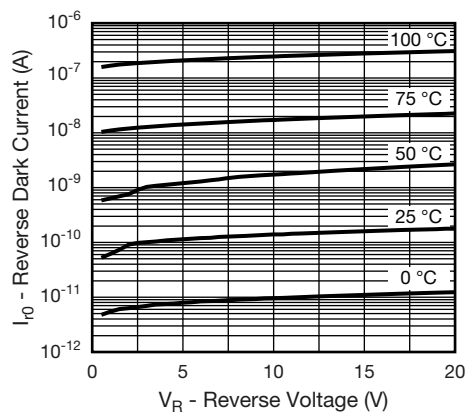


Fig. 7 - Dark Current vs. Reverse Voltage

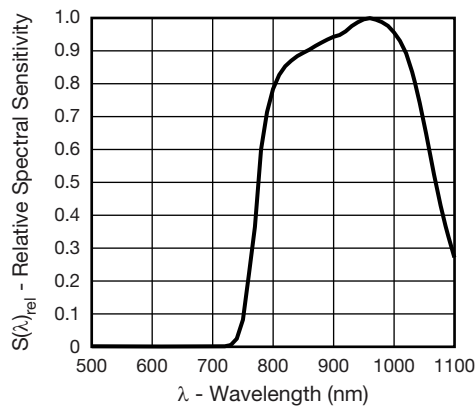
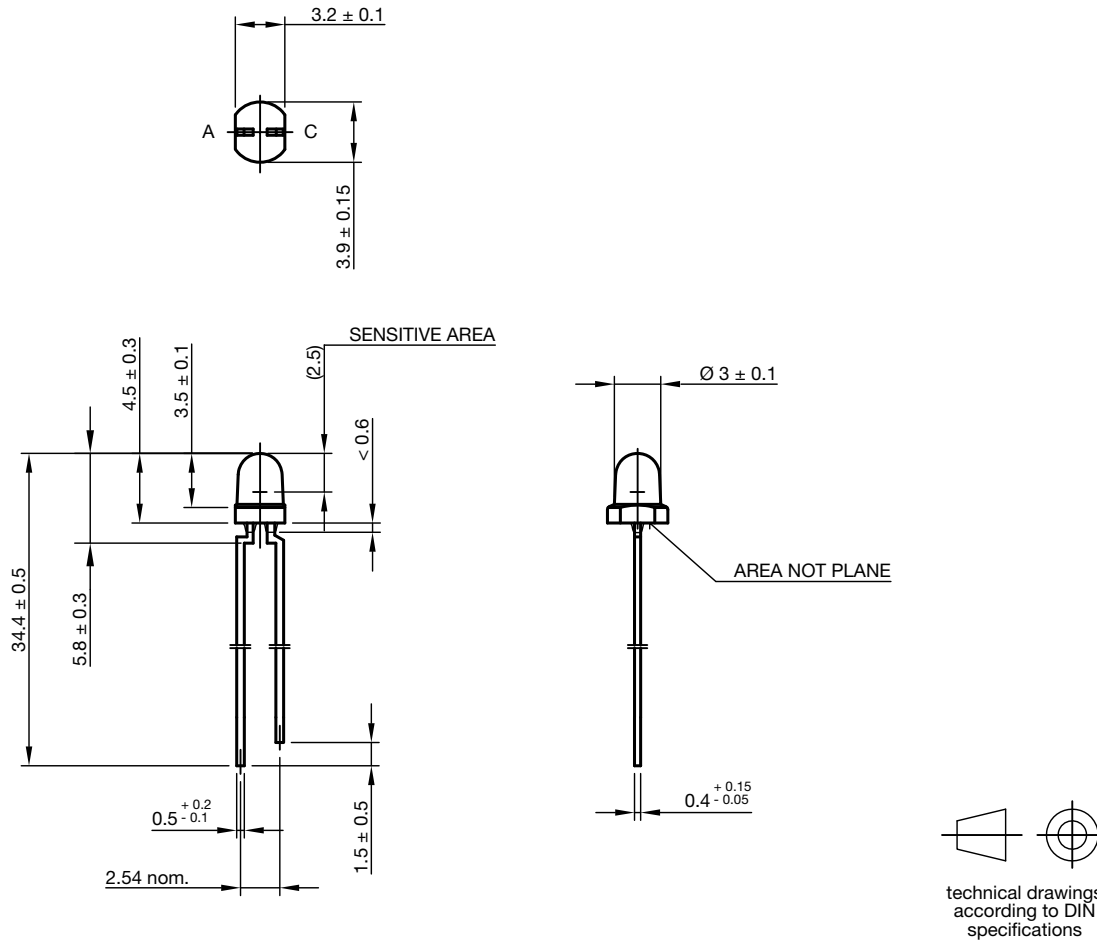


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength



PACKAGE DIMENSIONS in millimeters



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