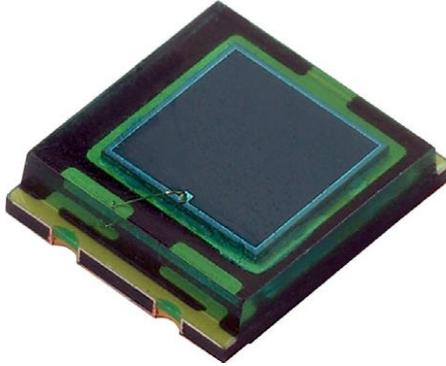


## Ambient Light Sensor



### DESCRIPTION

TEM5510FX01 ambient light sensor is a PIN photodiode with high photo sensitivity in a miniature surface mount device (SMD). The detector chip has 7.5 mm<sup>2</sup> sensitive area. It is sensitive to visible light much like the human eye and has peak sensitivity at 540 nm.

### FEATURES

- Package type: surface-mount
- Package form: top view
- Dimensions (L x W x H in mm): 5 x 4.24 x 1.12
- Radiant sensitive area (in mm<sup>2</sup>): 7.5
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Suppression filter for near infrared radiation
- Angle of half sensitivity:  $\varphi = \pm 65^\circ$
- Floor life: 72 h, MSL 4, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### APPLICATIONS

- Automotive sensors
- Ambient light sensors
- Backlight dimmers
- Notebooks
- Computers

### PRODUCT SUMMARY

COMPONENT	$I_{ra}$ ( $\mu$ A)	$\varphi$ ( $^\circ$ )	$\lambda_{0.5}$ (nm)
TEM5510FX01	1	$\pm 65$	430 to 610

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEM5510FX01	Tape and reel	MOQ: 1500 pcs, 1500 pcs/reel	Top view
TEM5510FX01-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs/reel	Top view

#### 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		$V_R$	16	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 +110	$^\circ\text{C}$
Soldering temperature	According to reflow solder profile Fig. 5	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction-to-ambient	JESD51	$R_{thJA}$	350	K/W

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Breakdown voltage	$I_R = 100\text{ }\mu\text{A}$ , $E = 0$	$V_{(BR)}$	16	-	-	V
Reverse dark current	$V_R = 10\text{ V}$ , $E = 0$	$I_{ro}$	-	2	30	nA
Diode capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$	-	1600	-	pF
	$V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$	-	730	-	pF
Reverse light current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 550\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	-	26	-	$\mu\text{A}$
	$E_v = 100\text{ lx}$ , CIE illuminant A, $V_R = 5\text{ V}$	$I_{ra}$	0.8	1	1.4	$\mu\text{A}$
Temperature coefficient of $I_{ra}$	$E_v = 100\text{ lx}$ , CIE illuminant A, $V_R = 5\text{ V}$	$TK_{I_{ra}}$	-	0.2	-	%/K
Angle of half sensitivity		$\phi$	-	$\pm 65$	-	$^{\circ}$
Wavelength of peak sensitivity		$\lambda_p$	-	540	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	430 to 610	-	nm

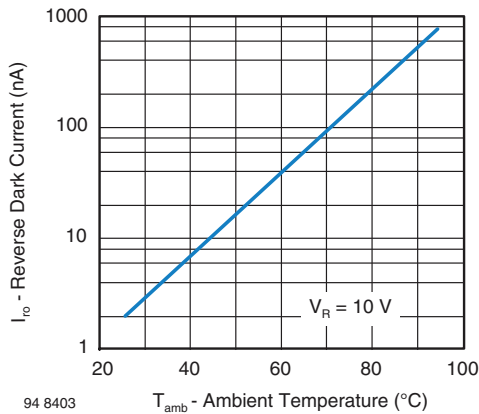
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

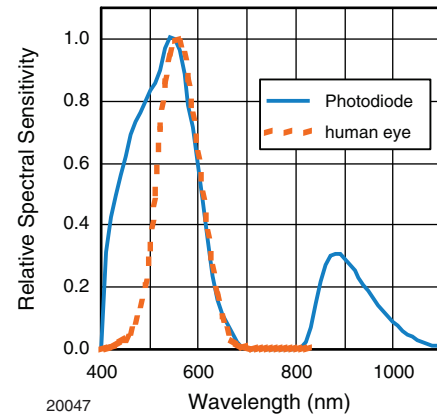


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

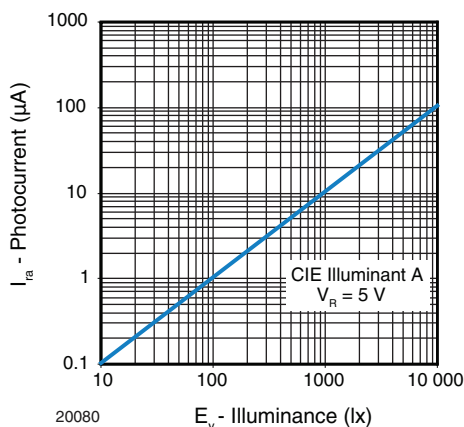


Fig. 2 - Reverse Light Current vs. Irradiance

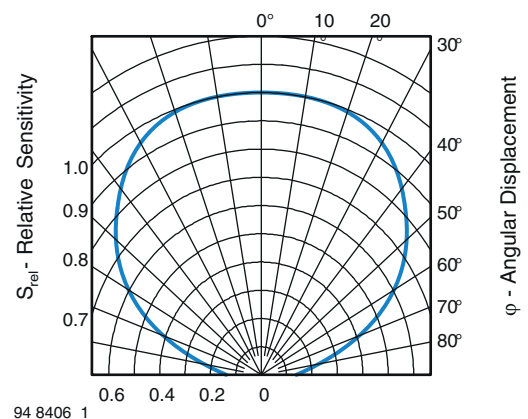
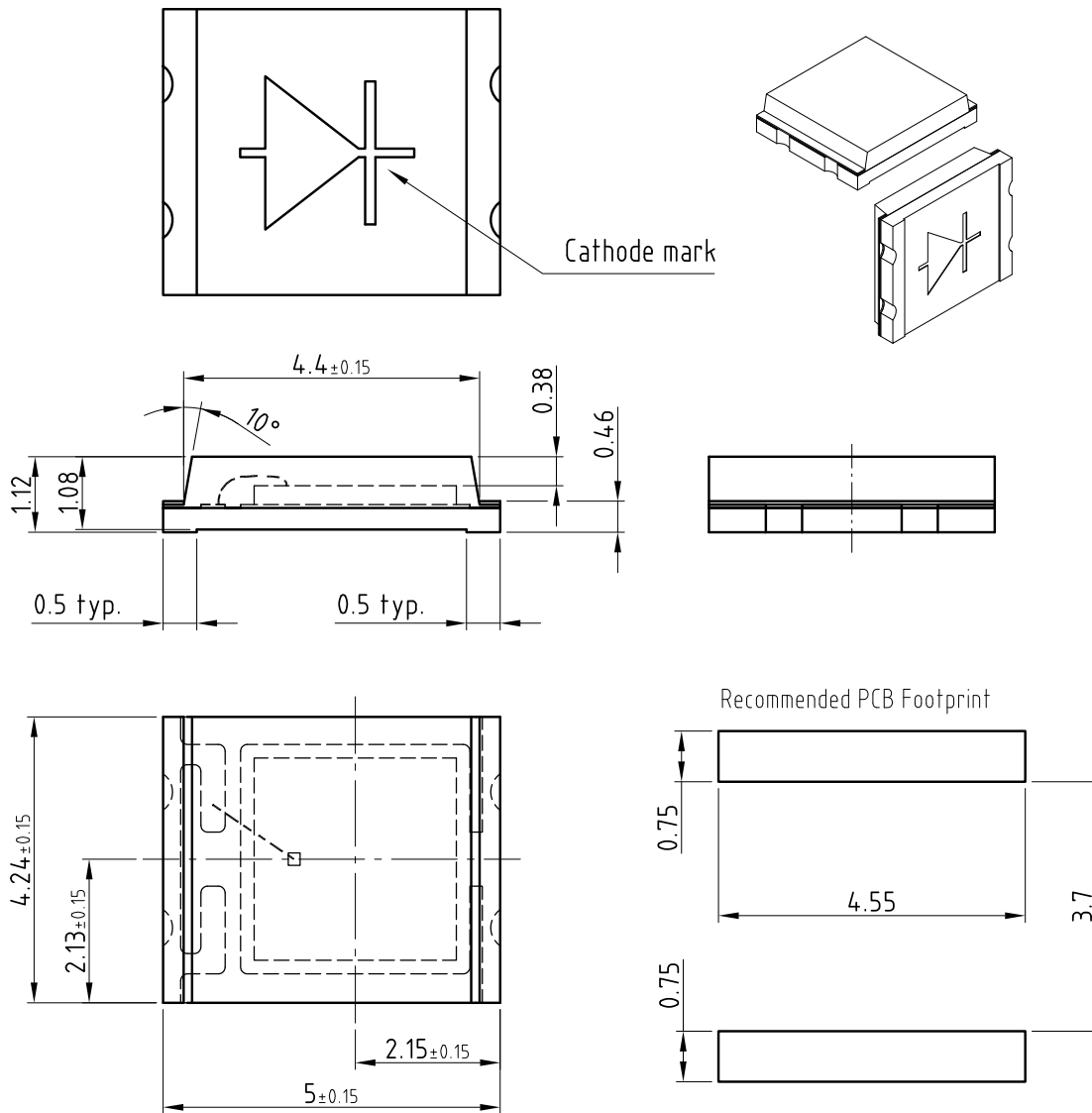


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

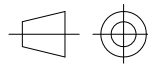


### PACKAGE DIMENSIONS in millimeters



Cathode mark

Recommended PCB Footprint

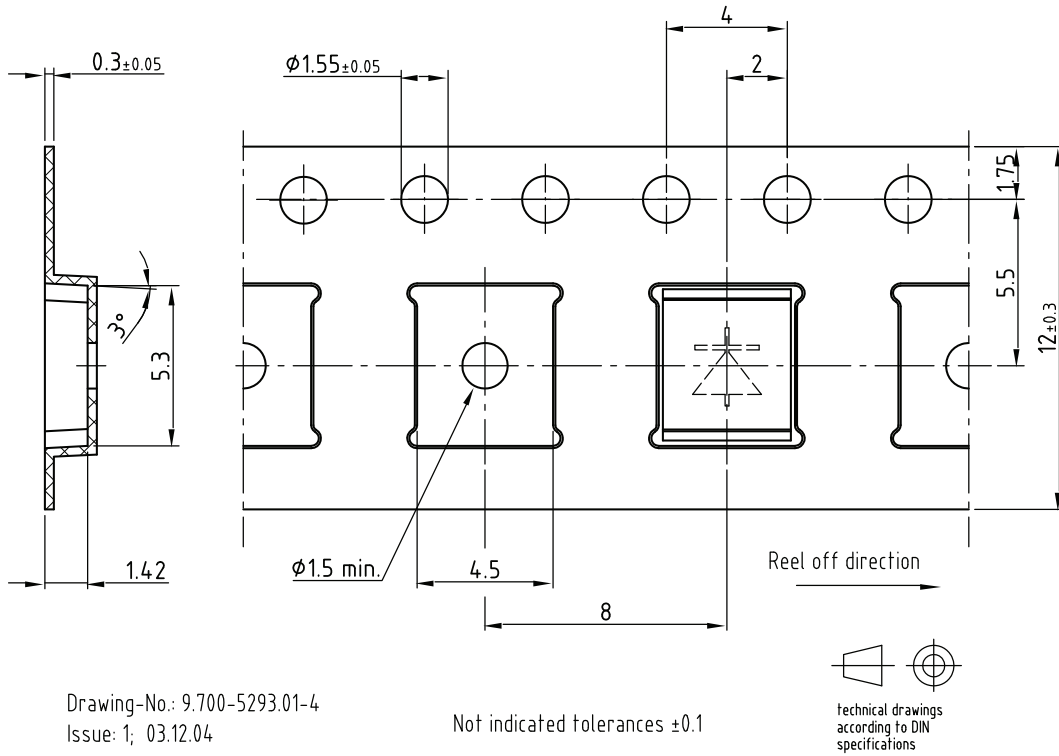


technical drawings according to DIN specifications

Drawing-No.: 6.541-5060.01-4  
Issue: 3; 05.02.08  
20536

Not indicated tolerances  $\pm 0.1$

**TAPING DIMENSIONS** in millimeters

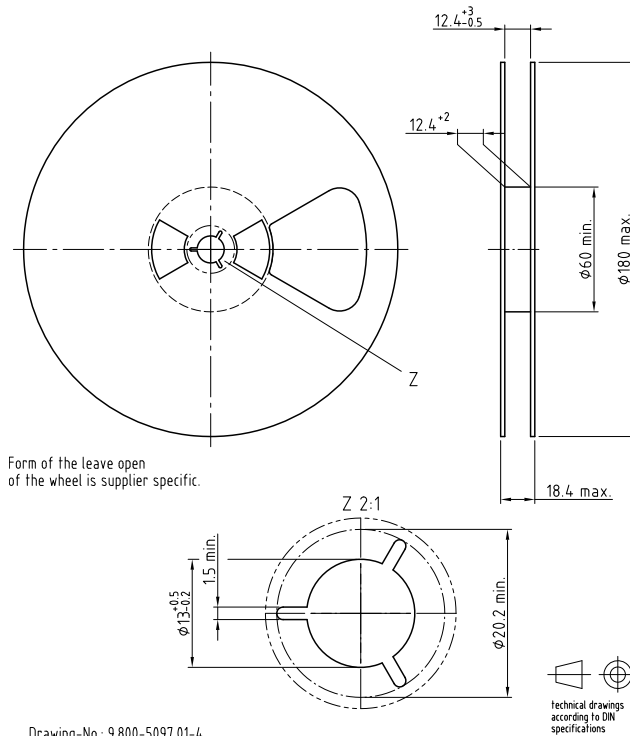


Drawing-No.: 9.700-5293.01-4  
 Issue: 1; 03.12.04  
 20537

Not indicated tolerances ±0.1

technical drawings according to DIN specifications

**REEL DIMENSIONS** in millimeters



Form of the leave open of the wheel is supplier specific.

Drawing-No.: 9.800-5097.01-4  
 Issue: 1; 05.05.08  
 20874

technical drawings according to DIN specifications



### SOLDER PROFILE



19841

Fig. 5 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

### DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

### FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 4

Floor life: 72 h

Conditions:  $T_{amb} < 30\text{ °C}$ ,  $RH < 60\%$

### DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or recommended conditions:

192 h at 40 °C (+ 5 °C),  $RH < 5\%$

or

96 h at 60 °C (+ 5 °C),  $RH < 5\%$ .



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