RoHS

COMPLIANT

HALOGEN FREE

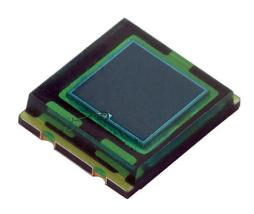
GREEN

(5-2008)



# Vishay Semiconductors

# **Ambient Light Sensor**



#### **DESCRIPTION**

TEMD5510FX01 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
- Supression 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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **APPLICATIONS**

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

PRODUCT SUMMARY				
COMPONENT	I <sub>ra</sub> (μΑ)	φ <b>(°)</b>	λ <sub>0.5</sub> (nm)	
TEMD5510FX01	1	± 65	430 to 610	

#### Note

• Test conditions see table "Basic Characteristics"

ORDERING INFORMATION					
ORDERING CODE	PACKAGING	PACKAGING REMARKS			
TEMD5510FX01	Tape and reel	MOQ: 1500 pcs, 1500 pcs/reel	Top view		
TEMD5510FX01-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs/reel	Top view		

#### Note

· MOQ: minimum order quantity

<b>ABSOLUTE MAXIMUM RATINGS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT		
Reverse voltage		$V_R$	16	V		
Power dissipation	T <sub>amb</sub> ≤ 25 °C	P <sub>V</sub>	215	mW		
Junction temperature		T <sub>j</sub>	100	°C		
Operating temperature range		T <sub>amb</sub>	-40 to +100	°C		
Storage temperature range		T <sub>stg</sub>	-40 to +110	°C		
Soldering temperature	According to reflow solder profile Fig. 5	T <sub>sd</sub>	260	°C		
Thermal resistance junction-to-ambient	JESD51	R <sub>thJA</sub>	350	K/W		



<b>BASIC CHARACTERISTICS</b> (T <sub>amb</sub> = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Breakdown voltage	I <sub>R</sub> = 100 μA, E = 0	V <sub>(BR)</sub>	16	-	-	V
Reverse dark current	V <sub>R</sub> = 10 V, E = 0	I <sub>ro</sub>	-	2	30	nA
Diode capacitance	$V_R = 0 V, f = 1 MHz, E = 0$	$C_D$	1	1600	ı	pF
	$V_R = 3 V, f = 1 MHz, E = 0$	$C_D$	ı	730	1	pF
Reverse light current	$E_e = 1 \text{ mW/cm}^2$ , $\lambda = 550 \text{ nm}$ , $V_R = 5 \text{ V}$	I <sub>ra</sub>	ı	26	-	μA
neverse light current	$E_v = 100 \text{ lx}$ , CIE illuminant A, $V_R = 5 \text{ V}$	I <sub>ra</sub>	0.8	1	1.4	μA
Temperature coefficient of Ira	$E_v = 100 lx$ , CIE illuminant A, $V_R = 5 V$	TK <sub>lra</sub>	ı	0.2	1	%/K
Angle of half sensitivity		φ	ı	± 65	-	0
Wavelength of peak sensitivity		$\lambda_{p}$		540		nm
Range of spectral bandwidth		λ <sub>0.5</sub>		430 to 610	-	nm

### BASIC CHARACTERISTICS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

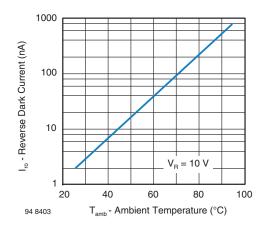


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

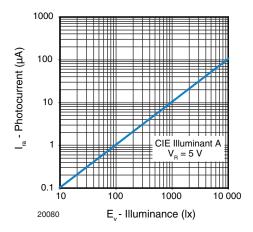


Fig. 2 - Reverse Light Current vs. Irradiance

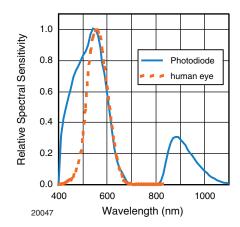


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

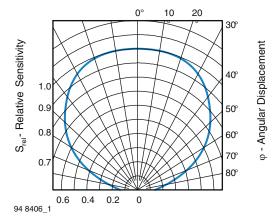
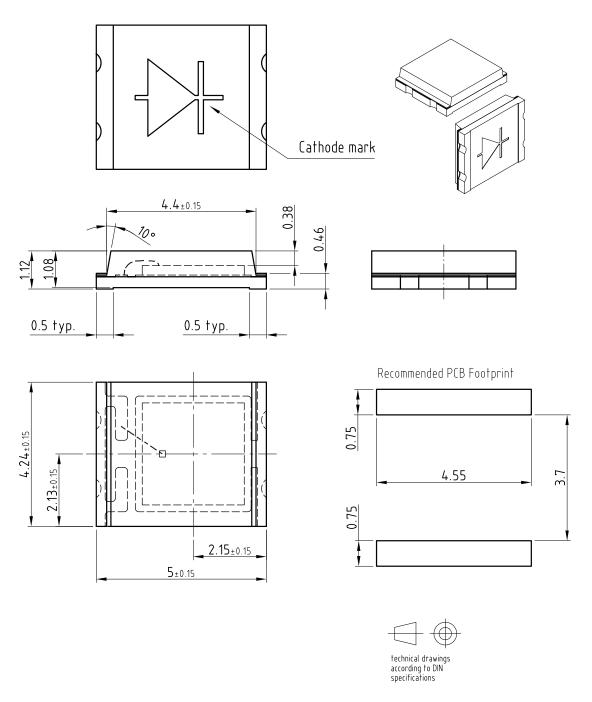


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

### **PACKAGE DIMENSIONS** in millimeters



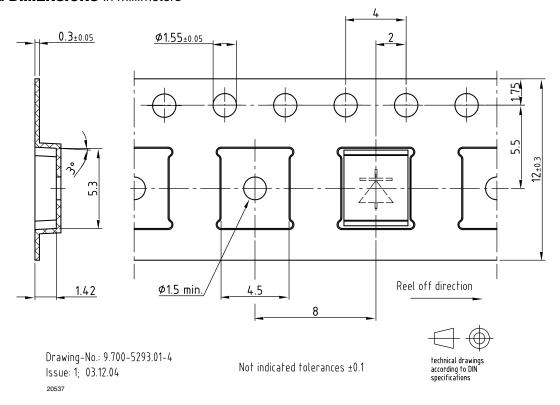
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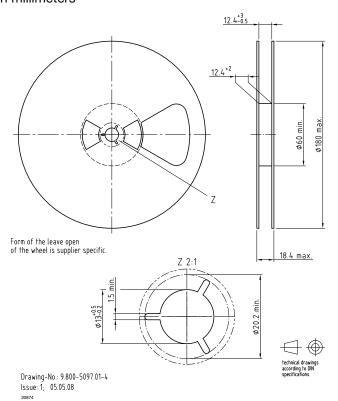
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Not indicated tolerances ± 0.1

### **TAPING DIMENSIONS** in millimeters



### **REEL DIMENSIONS** in millimeters





### **SOLDER PROFILE**

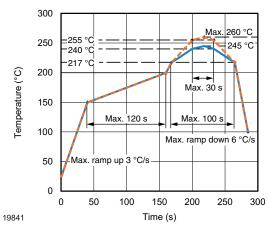


Fig. 5 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

### **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 °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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Vishay

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