AUTOMOTIVE

COMPLIANT

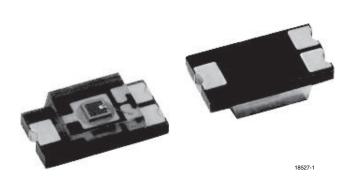
GREEN

(5-2008)



## Vishay Semiconductors

# **Ambient Light Sensor**



## DESCRIPTION

TEMD6010FX01 ambient light sensor is a PIN photodiode with high speed and high photo sensitivity in a clear, surface mount plastic package. The detector chip has 0.27 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: 1206

• Dimensions (L x W x H in mm): 4 x 2 x 1.05

• Radiant sensitive area (in mm<sup>2</sup>): 0.27

AEC-Q101 qualified

· High photo sensitivity

• Adapted to human eye responsivity

• Supression filter for near infrared radiation

• Angle of half sensitivity:  $\varphi = \pm 60^{\circ}$ 

• Floor life: 168 h, MSL 3, acc. 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 dimming
- Mobil phones
- Notebooks
- Computers

PRODUCT SUMMARY				
COMPONENT	I <sub>ra</sub> (μΑ)	φ (deg)	λ <sub>0.5</sub> (nm)	
TEMD6010FX01	0.04	± 60	430 to 610	

#### Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TEMD6010FX01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	1206	

### 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		P <sub>V</sub>	100	mW		
Junction temperature		Tj	100	°C		
Operating temperature range		T <sub>amb</sub>	- 40 to + 100	°C		
Storage temperature range		T <sub>stg</sub>	- 40 to + 100	°C		
Soldering temperature	Acc. reflow solder profile fig. 7	T <sub>sd</sub>	260	°C		
Thermal resistance junction/ambient	Soldered on PCB with pad dimensions: 4 mm x 4 mm	R <sub>thJA</sub>	450	K/W		



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<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 lx	V <sub>(BR)</sub>	16			V
Reverse dark current	V <sub>CE</sub> = 10 V, E = 0 lx	I <sub>ro</sub>		0.1	5	nA
Diode capacitance	$V_R = 0 \text{ V, } f = 1 \text{ MHz, } E = 0 \text{ Ix}$	C <sub>D</sub>		60		pF
	$V_R = 5 \text{ V}, f = 1 \text{ MHz}, E = 0 \text{ Ix}$	C <sub>D</sub>		24		pF
Reverse light current	$E_e$ = 1 mW/cm <sup>2</sup> , $\lambda$ = 550 nm, $V_R$ = 5 V	I <sub>ra</sub>		1		μΑ
	$E_V = 100 \text{ lx}$ , CIE illuminant A, $V_R = 5 \text{ V}$	I <sub>ra</sub>	0.03	0.04	0.09	μΑ
Temperature coefficient of Ira	$E_V = 100 \text{ lx}$ , CIE illuminant A, $V_R = 5 \text{ V}$	TK <sub>lra</sub>		0.2		%/K
Angle of half sensitivity		φ		± 60		deg
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)

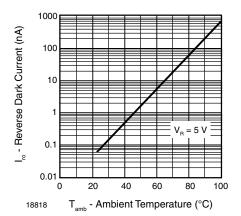


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

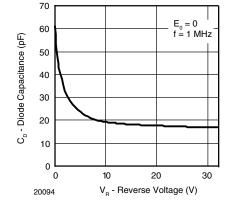


Fig. 3 - Diode Capacitance vs. Reverse Voltage

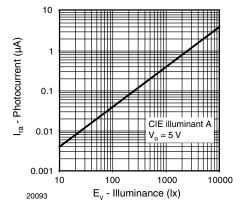


Fig. 2 - Reverse Light Current vs. Illuminance

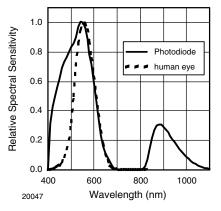


Fig. 4 - Relative Spectral Sensitivity vs. Wavelength



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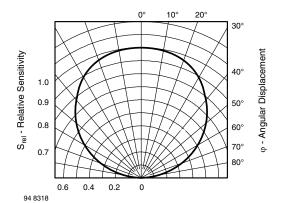


Fig. 1 - Relative Radiant Sensitivity vs. Angular Displacement

#### **REFLOW SOLDER PROFILE**

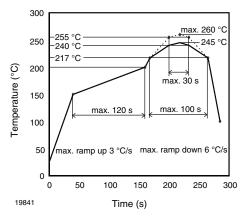


Fig. 5 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

#### **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 3

Floor life: 168 h

Conditions: T<sub>amb</sub> < 30 °C, RH < 60 %

### **DRYING**

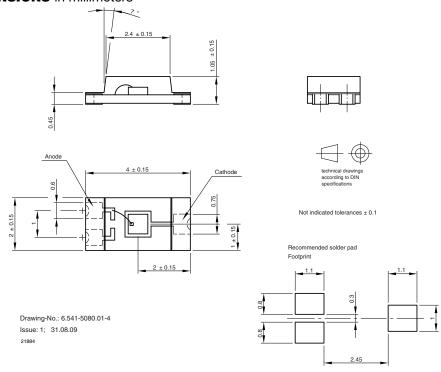
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions:

192 h at 40 °C (+ 5 °C), RH < 5 %

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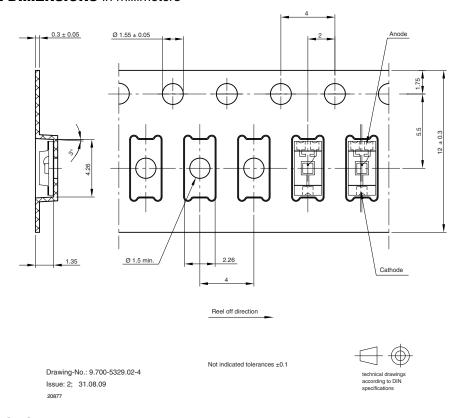
96 h at 60 °C (+ 5 °C), RH < 5 %.

### **PACKAGE DIMENSIONS** in millimeters



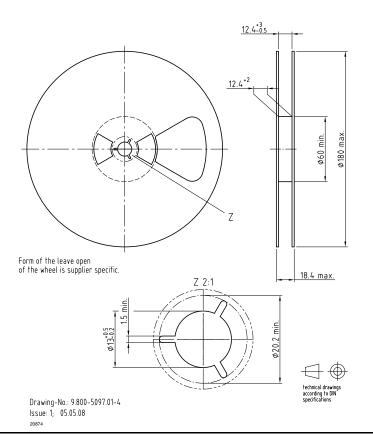
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### **BLISTER TAPE DIMENSIONS** in millimeters



## **REEL DIMENSIONS** in millimeters

Volume: 3000 pcs/reel





## **Legal Disclaimer Notice**

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Revision: 13-Jun-16 1 Document Number: 91000