Ambient Light Sensor

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 mm² 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 mm²): 0.27
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity: \( \phi = \pm 60° \)
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC

APPLICATIONS
- Automotive sensors
- Ambient light sensors
- Backlight dimming
- Mobil phones
- Notebooks
- Computers

PRODUCT SUMMARY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>( I_{\text{R}} ) (( \mu \text{A} ))</th>
<th>( \phi ) (deg)</th>
<th>( \lambda_{0.5} ) (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMD6010FX01</td>
<td>1</td>
<td>( \pm 60 )</td>
<td>430 to 610</td>
</tr>
</tbody>
</table>

Note
Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ORDERING CODE</th>
<th>PACKAGING</th>
<th>REMARKS</th>
<th>PACKAGE FORM</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEMD6010FX01</td>
<td>Tape and reel</td>
<td>MOQ: 3000 pcs, 3000 pcs/reel</td>
<td>1206</td>
</tr>
</tbody>
</table>

Note
MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse voltage</td>
<td></td>
<td>( V_R )</td>
<td>16</td>
<td>V</td>
</tr>
<tr>
<td>Power dissipation</td>
<td></td>
<td>( P_V )</td>
<td>100</td>
<td>mW</td>
</tr>
<tr>
<td>Junction temperature</td>
<td></td>
<td>( T_j )</td>
<td>100</td>
<td>°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td></td>
<td>( T_{\text{amb}} )</td>
<td>- 40 to + 100</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td></td>
<td>( T_{\text{stg}} )</td>
<td>- 40 to + 100</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering temperature</td>
<td>Acc. reflow solder profile fig. 7</td>
<td>( T_{\text{sd}} )</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal resistance junction/ambient</td>
<td>Soldered on PCB with pad dimensions: 4 mm x 4 mm</td>
<td>( R_{\text{th,J/A}} )</td>
<td>450</td>
<td>K/W</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITION</th>
<th>SYMBOL</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakdown voltage</td>
<td>( I_R = 100 , \mu A, , E = 0 , lx )</td>
<td>( V_{BR} )</td>
<td>16</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Reverse dark current</td>
<td>( V_{CE} = 5 , V, , E = 0 , lx )</td>
<td>( I_{ro} )</td>
<td>2</td>
<td>30</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>Diode capacitance</td>
<td>( V_R = 0 , V, , f = 1 , MHz, , E = 0 , lx )</td>
<td>( C_D )</td>
<td>60</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td>( V_R = 5 , V, , f = 1 , MHz, , E = 0 , lx )</td>
<td>( C_D )</td>
<td>24</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Reverse light current</td>
<td>( E_e = 1 , mW/cm^2, , \lambda = 550 , nm, )</td>
<td>( I_{ra} )</td>
<td>1</td>
<td></td>
<td></td>
<td>( \mu A )</td>
</tr>
<tr>
<td></td>
<td>( V_R = 5 , V )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>( E_V = 100 , lx, , CIE , \text{illuminant A,} )</td>
<td>( I_{ra} )</td>
<td>0.03</td>
<td>0.04</td>
<td></td>
<td>( \mu A )</td>
</tr>
<tr>
<td>Temperature coefficient of ( I_{ra} )</td>
<td>( E_V = 100 , lx, , CIE , \text{illuminant A,} )</td>
<td>( T_{KIra} )</td>
<td>0.2</td>
<td></td>
<td></td>
<td>%/K</td>
</tr>
<tr>
<td>Angle of half sensitivity</td>
<td>( \varphi )</td>
<td></td>
<td>± 60</td>
<td></td>
<td></td>
<td>deg</td>
</tr>
<tr>
<td>Wavelength of peak sensitivity</td>
<td>( \lambda_p )</td>
<td></td>
<td>540</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Range of spectral bandwidth</td>
<td>( \lambda_{0.5} )</td>
<td></td>
<td>430 to 610</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
</tbody>
</table>

**Note**

\( T_{amb} = 25 \, ^\circ C \), unless otherwise specified

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**BASIC CHARACTERISTICS**

\( T_{amb} = 25 \, ^\circ C \), unless otherwise specified

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**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
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: $T_{\text{amb}} < 30 \, ^\circ \text{C}, \, \text{RH} < 60 \%$

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 %  
or 96 h at 60 °C (+ 5 °C), RH < 5 %.
**TEMD6010FX01**

Vishay Semiconductors  Ambient Light Sensor

**BLISTER TAPE DIMENSIONS** in millimeters

![Blister Tape Dimensions Diagram]

**REEL DIMENSIONS** in millimeters

Volume: 3000 pcs/reel

![Reel Dimensions Diagram]
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