Ambient Light Sensor

DESCRIPTION
TEM6200FITX01 is a high speed and high sensitive PIN photodiode in a miniature flat plastic package. It is spectral sensitivity is closely matched to the human eye.

FEATURES
- Package type: surface-mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- Radiant sensitive area (in mm²): 0.27
- AEC-Q101 qualified
- Adapted to human eye responsivity
- Angle of half sensitivity: $\phi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, according to J-STD-020
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS
- Automotive sensors
- Ambient light sensors
- Backlight dimming

PRODUCT SUMMARY

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>$I_{ra}$ (µA)</th>
<th>$\phi$ (°)</th>
<th>$\lambda_{0.5}$ (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEM6200FITX01</td>
<td>0.04</td>
<td>± 60</td>
<td>430 to 610</td>
</tr>
</tbody>
</table>

Note
- Test condition 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>TEM6200FITX01</td>
<td>Tape and reel</td>
<td>MOQ: 3000 pcs, 3000 pcs/reel</td>
<td>0805</td>
</tr>
</tbody>
</table>

Note
- MOQ: Minimum order quantity

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

<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>Operating temp.</td>
<td></td>
<td>$T_{amb}$</td>
<td>-40 to +110</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temp.</td>
<td></td>
<td>$T_{stg}$</td>
<td>-40 to +110</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering temp.</td>
<td>In accordance with Fig. 6</td>
<td>$T_{sd}$</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>
### BASIC CHARACTERISTICS (\( T_{\text{amb}} = 25 \, ^\circ\text{C} \), unless otherwise specified)

<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\text{A}, E = 0 , \text{lx} )</td>
<td>( V_{\text{BR}} )</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>Reverse dark current</td>
<td>( V_R = 10 , \text{V}, E = 0 , \text{lx} )</td>
<td>( I_{\text{ro}} )</td>
<td>-</td>
<td>0.1</td>
<td>5</td>
<td>nA</td>
</tr>
<tr>
<td>Diode capacitance</td>
<td>( V_R = 0 , \text{V}, f = 1 , \text{MHz}, E = 0 , \text{lx} )</td>
<td>( C_D )</td>
<td>-</td>
<td>60</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td>( V_R = 5 , \text{V}, f = 1 , \text{MHz}, E = 0 , \text{lx} )</td>
<td>( C_D )</td>
<td>-</td>
<td>24</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>Reverse light current</td>
<td>( E_a = 1 , \text{mW/cm}^2, \lambda = 550 , \text{nm}, V_R = 5 , \text{V} )</td>
<td>( I_{\text{ra}} )</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>( \mu\text{A} )</td>
</tr>
<tr>
<td></td>
<td>( E_V = 100 , \text{lx}, \text{CIE} ) illuminant A</td>
<td>( I_{\text{ra}} )</td>
<td>0.03</td>
<td>0.04</td>
<td>0.09</td>
<td>( \mu\text{A} )</td>
</tr>
<tr>
<td>Angle of half sensitivity</td>
<td>( \phi )</td>
<td>-</td>
<td>± 60</td>
<td>-</td>
<td>-</td>
<td>°</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>

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**Fig. 1 - Reverse Dark Current vs. Ambient Temperature**

- **Graph:**
  - X-axis: \( T_{\text{amb}} \) - Ambient Temperature (°C)
  - Y-axis: \( I_{\text{ro}} \) - Reverse Dark Current (nA)

**Fig. 2 - Reverse Light Current vs. Illuminance**

- **Graph:**
  - X-axis: \( E_V \) - Illuminance (lx)
  - Y-axis: \( I_{\text{ra}} \) - Photocurrent (µA)

**Fig. 3 - Diode Capacitance vs. Reverse Voltage**

- **Graph:**
  - X-axis: \( V_R \) - Reverse Voltage (V)
  - Y-axis: \( C_D \) - Diode Capacitance (pF)

**Fig. 4 - Relative Spectral Sensitivity vs. Wavelength**

- **Graph:**
  - X-axis: Wavelength (nm)
  - Y-axis: Relative Spectral Sensitivity

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For technical questions, contact: detectortechsupport@vishay.com

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**SOLDER PROFILE**

![Graph showing solder profile](image)

**Fig. 6 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020**

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

**DRYING**

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D 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 %.
**REEL DIMENSIONS** in millimeters

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

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