Ambient Light Sensor

Description
TEPT5600 is a silicon NP N epitaxial planar photo transistor in a standard T-1 3/4" plastic package. Peak of responsivity is in the visible spectrum. Infra-red spectrum is suppressed.

Features
- Responsivity adapted to human eye
- Wide angle of half sensitivity $\phi = \pm 20^\circ$
- Lead (Pb)-free component
- Component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

Applications
- Replacement of cadmium sulfide (CdS) photo resistors
- Ambient light sensor

Absolute Maximum Ratings
$T_{\text{amb}} = 25 ^\circ \text{C}$, 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>Collector emitter voltage</td>
<td></td>
<td>$V_{\text{CEO}}$</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>Emitter collector voltage</td>
<td></td>
<td>$V_{\text{ECO}}$</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Collector current</td>
<td></td>
<td>$I_{\text{C}}$</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>Total power dissipation</td>
<td>$T_{\text{amb}} \leq 55 ^\circ \text{C}$</td>
<td>$P_{\text{tot}}$</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 +85</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>2 mm distance to package, $t \leq 3$ s</td>
<td>$T_{\text{sd}}$</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Thermal resistance junction/ambient</td>
<td></td>
<td>$R_{\text{th,JA}}$</td>
<td>450</td>
<td>K/W</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>Collector emitter breakdown voltage</td>
<td>$I_{\text{C}} = 0.1$ mA</td>
<td>$V_{\text{CEO}}$</td>
<td>6</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Collector dark current</td>
<td>$V_{\text{CE}} = 5$, $E = 0$</td>
<td>$I_{\text{CEO}}$</td>
<td>3</td>
<td>50</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>Collector-emitter capacitance</td>
<td>$V_{\text{CE}} = 0$, $f = 1$ MHz, $E = 0$</td>
<td>$C_{\text{CEO}}$</td>
<td>16</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Photo current</td>
<td>$E_{\text{v}} = 20$ lx, CIE illuminant A, $V_{\text{CE}} = 5$ V</td>
<td>$I_{\text{PCE}}$</td>
<td>25</td>
<td>70</td>
<td>140</td>
<td>µA</td>
</tr>
<tr>
<td></td>
<td>$E_{\text{v}} = 100$ lx, CIE illuminant A, $V_{\text{CE}} = 5$ V</td>
<td>$I_{\text{PCE}}$</td>
<td></td>
<td>350</td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td>Angle of half sensitivity</td>
<td></td>
<td>$\phi$</td>
<td>±20</td>
<td></td>
<td></td>
<td>deg</td>
</tr>
<tr>
<td>Wavelength of peak sensitivity</td>
<td></td>
<td>$\lambda_p$</td>
<td>570</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Range of spectral bandwidth</td>
<td></td>
<td>$\lambda_{0.1}$</td>
<td>360 to 970</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
</tbody>
</table>
Typical Characteristics

$T_{\text{amb}} = 25 \, ^\circ\text{C}$, unless otherwise specified

Figure 1. Collector Dark Current vs. Ambient Temperature

Figure 2. Relative Photo Current vs. Ambient Temperature

Figure 3. Photo Current vs. Collector Emitter Voltage

Figure 4. Photo Current vs. Illuminance

Figure 5. Collector Emitter Capacitance vs. Collector Emitter Voltage

Figure 6. Relative Spectral Sensitivity vs. Wavelength
Figure 7. Relative Radiant Sensitivity vs. Angular Displacement

Package Dimensions

Drawing refers to following types: TEPT 5600
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It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.

2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

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