PNZ150 (PN150)
Silicon NPN Phototransistor

For optical control systems

- **Features**
  - High sensitivity
  - Wide spectral sensitivity, suited for detecting GaAs LEDs
  - Low dark current
  - Side-view type package

### Absolute Maximum Ratings (Ta = 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector to emitter voltage</td>
<td>$V_{CEO}$</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>Collector current</td>
<td>$I_C$</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>Collector power dissipation</td>
<td>$P_C$</td>
<td>100</td>
<td>mW</td>
</tr>
<tr>
<td>Operating ambient temperature</td>
<td>$T_{opr}$</td>
<td>–25 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{stg}$</td>
<td>–30 to +100</td>
<td>°C</td>
</tr>
</tbody>
</table>

### Electro-Optical Characteristics (Ta = 25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark current</td>
<td>$I_{CEO}$</td>
<td>$V_{CE} = 10V$</td>
<td>0.01</td>
<td>1</td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td>Collector photo current</td>
<td>$I_{CE(L)}$</td>
<td>$V_{CE} = 10V, L = 500 \text{lx}^1$</td>
<td>1</td>
<td>3</td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Peak sensitivity wavelength</td>
<td>$\lambda_p$</td>
<td>$V_{CE} = 10V$</td>
<td></td>
<td>800</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Acceptance half angle</td>
<td>$\theta$</td>
<td>Measured from the optical axis to the half power point</td>
<td>35</td>
<td></td>
<td></td>
<td>deg.</td>
</tr>
<tr>
<td>Response time</td>
<td>$t_d, t_r^2$</td>
<td>$V_{CC} = 10V, I_{CE(L)} = 5mA, R_L = 100\Omega$</td>
<td>4</td>
<td>10</td>
<td></td>
<td>µs</td>
</tr>
<tr>
<td>Collector saturation voltage</td>
<td>$V_{CE(sat)}$</td>
<td>$I_{CE(L)} = 1mA, L = 1000 \text{lx}^1$</td>
<td>0.2</td>
<td>0.5</td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

1: Measurements were made using a tungsten lamp (color temperature $T = 2856K$) as a light source.

2: Switching time measurement circuit

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Note) The part number in the parenthesis shows conventional part number.
**Phototransistors PNZ150**

**Collector power dissipation** $P_C$ (mW)

![Graph](image)

- Ambient temperature $Ta$ (°C)
- Collector to emitter voltage $V_{CE}$ (V)
- Collector photo current $I_{CE(L)}$ (mA)
- Fall time $t_f$ (µs)
- VCC = 10V
- Ta = 25°C
- T = 2856K

**Collector power dissipation** $P_C$ (mW)

![Graph](image)

- Ambient temperature $Ta$ (°C)
- Collector to emitter voltage $V_{CE}$ (V)
- Collector photo current $I_{CE(L)}$ (mA)
- Fall time $t_f$ (µs)
- VCC = 10V
- Ta = 25°C
- T = 2856K

**Spectral sensitivity characteristics**

![](image)

- Wavelength $\lambda$ (nm)
- Relative sensitivity $S$ (%)
- VCC = 10V
- Ta = 25°C

**Directivity characteristics**

![Graph](image)

- Illuminance $L$ (lx)
- Relative sensitivity $S$ (%)
- VCC = 10V
- Ta = 25°C

**Spectral sensitivity characteristics**

![Graph](image)

- Wavelength $\lambda$ (nm)
- Relative sensitivity $S$ (%)
- VCC = 10V
- Ta = 25°C

**Directivity characteristics**

![Graph](image)

- Illuminance $L$ (lx)
- Relative sensitivity $S$ (%)
- VCC = 10V
- Ta = 25°C
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