4.8mm Semi-Lens Silicon PIN Photodiode PD438C

Features
• Fast response times
• High photo sensitivity
• Small junction capacitance
• Pb free
• The product itself will remain within RoHS compliant version.
• Compliance with EU REACH

Description
• PD438C is a high speed and sensitive PIN photodiode in a cylindrical side view plastic package. The epoxy package itself is an IR filter, spectrally matched to IR emitter.

Applications
• High speed photo detector
• Camera
• Optoelectronic switch
• VCRs, Video camera
**Device Selection Guide**

<table>
<thead>
<tr>
<th>Chip Materials</th>
<th>Lens Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicon</td>
<td>Water clear</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>32</td>
<td>mA</td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>$P_d$</td>
<td>150</td>
<td>mW</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{opr}$</td>
<td>-40 ~ +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{sig}$</td>
<td>-40 ~ +100</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature(*1)</td>
<td>$T_{sol}$</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Notes:** *1: Soldering time $\leq$ 5 seconds.*
## Electro-Optical Characteristics (Ta=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rang of Spectral Bandwidth</td>
<td>$\lambda_{0.5}$</td>
<td>400</td>
<td>-----</td>
<td>1100</td>
<td>nm</td>
<td>-----</td>
</tr>
<tr>
<td>Wavelength of Peak Sensitivity</td>
<td>$\lambda_p$</td>
<td>-----</td>
<td>940</td>
<td>-----</td>
<td>nm</td>
<td>-----</td>
</tr>
</tbody>
</table>
| Open-Circuit Voltage             | VOC    | ----- | 0.35 | ----- | V    | $E_e=5\text{m W/cm}^2$ \ 
\ $\lambda_p=940\text{nm}$  |
| Short-Circuit Current            | ISC    | ----- | 18   | ----- | uA   | $E_e=1\text{m W/cm}^2$ \ 
\ $\lambda_p=940\text{nm}$  |
| Reverse Light Current            | $I_L$  | 10.2 | 18   | ----- | uA   | $E_e=1\text{m W/cm}^2$ \ 
\ $\lambda_p=940\text{nm}$ \ 
\ $VR=5\text{V}$  |
| Dark Current                     | $I_d$  | ----- | 5    | 30   | nA   | $E_e=0\text{m W/cm}^2$ \ 
\ $VR=10\text{V}$  |
| Reverse Breakdown                | BVR    | 32   | 170  | ----- | V    | $E_e=0\text{m W/cm}^2$ \ 
\ $IR=100\mu\text{A}$  |
| Total Capacitance                | $C_t$  | ----- | 25   | ----- | pF   | $E_e=0\text{m W/cm}^2$ \ 
\ $VR=3\text{V}$ \ 
\ $f=1\text{MHz}$  |
| Rise/Fall Time                   | $tr/tf$ | ----- | 50/50 | ----- | nS   | $VR=10\text{V}$ \ 
\ $RL=1\text{K}\Omega$  |

Note:
- Tolerance of Luminous Intensity: ±10%
- Tolerance of Dominant Wavelength: ±1nm
- Tolerance of Forward Voltage: ±0.1V
Typical Electro-Optical Characteristics Curves

<table>
<thead>
<tr>
<th>Power Dissipation vs. Ambient Temperature</th>
<th>Spectral Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="#" alt="Power Dissipation Graph" /></td>
<td><img src="#" alt="Spectral Sensitivity Graph" /></td>
</tr>
</tbody>
</table>

- **Ambient Temperature $T_a$ ($^\circ$C)**
- **Power Dissipation $P_c$ (mW)**
- **Relative Spectral Sensitivity**
- **Wavelength $\lambda$ (nm)**
- **$T_a=25^\circ$C**

**Dark Current vs. Ambient Temperature**

- **Ambient Temperature $T_a$ ($^\circ$C)**
- **Reversal Dark Current (uA)**
- **$V_R=10V$**

**Reverse Light Current vs. Ee**

- **Ee (mW/cm$^2$)**
- **Reverse Light Current (uA)**
- **$V_R=5V$**
- **$\lambda=940$nm**
### Terminal Capacitance vs. Reverse Voltage

<table>
<thead>
<tr>
<th>Reverse Voltage (V)</th>
<th>Terminal Capacitance C (pF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>80</td>
</tr>
<tr>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>100</td>
<td>20</td>
</tr>
</tbody>
</table>

- f=1MHz
- Ec=0mW/cm²

### Response Time vs. Load Resistance

<table>
<thead>
<tr>
<th>Load Resistance R&lt;sub&gt;L&lt;/sub&gt; (Ω)</th>
<th>Response Time t&lt;sub&gt;rf&lt;/sub&gt; (μs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&lt;sup&gt;-3&lt;/sup&gt;</td>
<td>10&lt;sup&gt;-2&lt;/sup&gt;</td>
</tr>
<tr>
<td>10&lt;sup&gt;-2&lt;/sup&gt;</td>
<td>10&lt;sup&gt;-1&lt;/sup&gt;</td>
</tr>
<tr>
<td>10&lt;sup&gt;-1&lt;/sup&gt;</td>
<td>10&lt;sup&gt;0&lt;/sup&gt;</td>
</tr>
<tr>
<td>10&lt;sup&gt;0&lt;/sup&gt;</td>
<td>10&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

- V<sub>R</sub>=10V
- Ta=25°C
Package Dimension

Note: Tolerances unless dimensions ±0.25mm
Packing Specification

- Packing Quantity
  1. 500 PCS/1 Bag, 6 Bags/1 Inner Carton
  2. 10 Inner Cartons/1 Outside Carton

Label Form Specification

- CPN: Customer’s Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number
- Reference: Identify Label Number

DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
5. These specification sheets include materials protected under copyright of EVERLIGHT. Reproduction in any form is prohibited without obtaining EVERLIGHT’s prior consent.
6. This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or life saving applications or any other application which can result in human injury or death. Please contact authorized Everlight sales agent for special application request.