GaAs Plastic Infrared Emitting Diodes
Types OP166A, OP166B, OP166C, OP166D

Features
- Narrow irradiance pattern
- Mechanically and spectrally matched to the OP506 series phototransistors
- Variety of Sensitivity ranges
- Small package size for space limited applications
- T-1 package style

Description
The OP166 series devices are 935 nm high intensity gallium arsenide infrared emitting diodes molded in IR transmissive amber tinted plastic packages. The narrow irradiance pattern provides high on-axis intensity for excellent coupling efficiency. Lead spacing on this series is 0.100 inch (2.54 mm).

Absolute Maximum Ratings \(T_A = 25^\circ C\) unless otherwise noted

- Reverse Voltage: 2.0 V
- Continuous Forward Current: 50 mA
- Peak Forward Current (1 \(\mu\)s pulse width, 300 ppjs): 3.0 A
- Storage and Operating Temperature Range: \(-40^\circ C\) to \(+100^\circ C\)
- Lead Soldering Temperature [1/16 inch (1.6mm) from case for 5 sec. with soldering iron]: \(260^\circ C\)
- Power Dissipation: 100 mW

Notes:
1. RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. A max. of 20 grams force may be applied to the leads when soldering.
2. Derate linearly 1.33 mW/\(^\circ C\) above 25\(^\circ C\).
3. \(E_{\text{ave}}(\text{APT})\) is a measurement of the average aperture radiant incidence upon a sensing area 0.081" (2.06 mm) in diameter, perpendicular to and centered on the mechanical axis of the lens, and 0.590" (14.99 mm) from the measurement surface. \(E_{\text{ave}}(\text{APT})\) is not necessarily uniform within the measured area.

Typical Performance Curves

Coating Characteristics

Replaces
OP161SL series
OP164 Series
Types OP166A, OP166B, OP166C, OP166D

Electrical Characteristics (T_A = 25° C unless otherwise noted)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>TEST CONDITIONS</th>
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<tbody>
<tr>
<td>Ee(APT)</td>
<td>Apertured Radiant Incidence</td>
<td>OP166D</td>
<td>0.28</td>
<td>1.60</td>
<td>mW/cm²</td>
<td>I_F = 20 mA (3)</td>
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<td></td>
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<td>OP166C</td>
<td>0.85</td>
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<td>mW/cm²</td>
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<td></td>
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<td>OP166B</td>
<td>1.40</td>
<td>2.20</td>
<td>mW/cm²</td>
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<td></td>
<td>OP166A</td>
<td>1.95</td>
<td></td>
<td>mW/cm²</td>
<td>I_F = 20 mA (3)</td>
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<tr>
<td>V_F</td>
<td>Forward Voltage</td>
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<td></td>
<td>1.60</td>
<td>V</td>
<td>I_F = 20 mA</td>
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<tr>
<td>I_R</td>
<td>Reverse Current</td>
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<td></td>
<td>100</td>
<td>μA</td>
<td>V_R = 2.0 V</td>
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<tr>
<td>λ_p</td>
<td>Wavelength at Peak Emission</td>
<td></td>
<td>935</td>
<td></td>
<td>nm</td>
<td>I_F = 10 mA</td>
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<td>B</td>
<td>Spectral Bandwidth Between Half Power Points</td>
<td>50</td>
<td></td>
<td></td>
<td>nm</td>
<td>I_F = 10 mA</td>
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<td>Δλp/ΔT</td>
<td>Spectral Shift with Temperature</td>
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<td>+0.30</td>
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<td>nm/°C</td>
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<td>θ_HP</td>
<td>Emission Angle at Half Power Points</td>
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<td>18</td>
<td></td>
<td>Deg.</td>
<td>I_F = 20 mA</td>
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<tr>
<td>t_R</td>
<td>Output Rise Time</td>
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<td>1000</td>
<td></td>
<td>ns</td>
<td>I_F(PK) = 100 mA, PW = 10μS, D.C. = 10.0%</td>
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<tr>
<td>t_f</td>
<td>Output Fall Time</td>
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<td>500</td>
<td></td>
<td>ns</td>
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</table>

Typical Performance Curves

**Forward Voltage vs Forward Current**

**Forward Voltage and Relative Radiant Incidence vs. Forward Current**

**Forward Voltage vs Ambient Temperature**

**Relative Radiant Intensity vs Angular Displacement**

**Rise Time and Fall Time vs Forward Current**

**Relative Radiant Intensity at Peak Emission vs Ambient Temperature**

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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