

# Plastic Infrared Emitting Diode

OP165, OP166 Series



## Features:

- T-1 (3 mm) package style
- Choice of narrow or wide irradiance pattern
- Choice of dome lens or flat lens
- Mechanically and spectrally matched to other OPTEK devices
- Higher power output than GaAs at equivalent drive currents



## Description:

Each device in the **OP165** and **OP166** series is a high intensity gallium arsenide infrared emitting diode (GaAIAs) that is molded in an IR transmissive clear epoxy package with either a dome or flat lens. Devices feature narrow and wide irradiance patterns and a variety of electrical characteristics. The small T-1 package style makes these devices ideal for space-limited applications.

*OP165 and OP166 devices are mechanically and spectrally matched to the OP505 and OP535 series devices.*

*Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.*

## Applications:

- Space-limited applications
- Applications requiring coupling efficiency

| Ordering Information |                     |   |                                  |                  |             |
|----------------------|---------------------|---|----------------------------------|------------------|-------------|
| Part Number          | LED Peak Wavelength | Output Power (mW/cm <sup>2</sup> )<br>Min / Max | I <sub>F</sub> (mA)<br>Typ / Max | Total Beam Angle | Lead Length |
| OP165A               | 935 nm              | 1.95 / NA                                       | 20 / 50                          | 18°              | 0.50"       |
| OP165B               |                     | 1.40 / 2.20                                     |                                  |                  |             |
| OP165C               |                     | 0.85 / 1.60                                     |                                  |                  |             |
| OP165D               |                     | 0.28 / NA                                       |                                  | 90°              |             |
| OP165W               |                     | 0.50 / NA                                       |                                  |                  |             |
| OP166A               |                     | 1.95 / NA                                       |                                  | 18°              |             |
| OP166B               |                     | 1.40 / 2.20                                     |                                  |                  |             |
| OP166W               |                     | 0.50 / NA                                       |                                  |                  |             |



RoHS

## General Note

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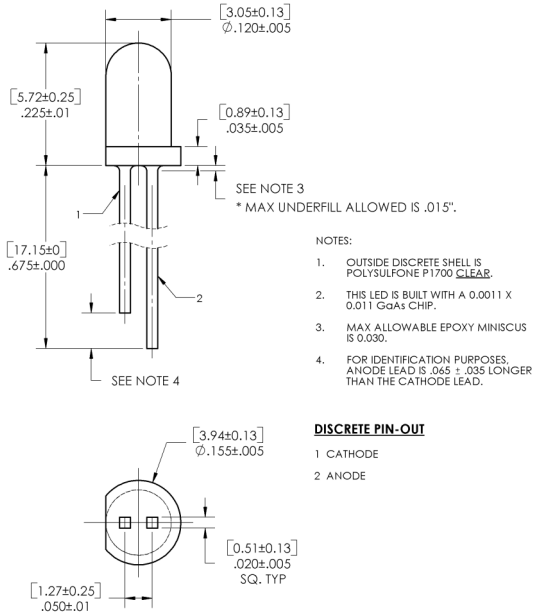
OPTEK Technology, Inc.  
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www.optekinc.com | www.ttelectronics.com

# Plastic Infrared Emitting Diode

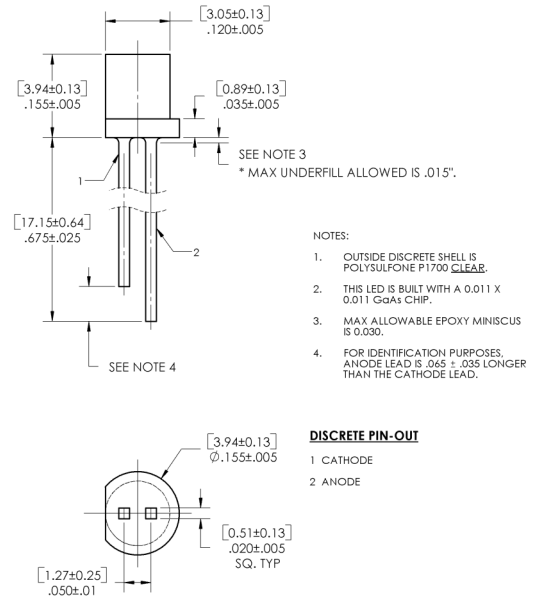
## OP165, OP166 Series



### OP165 (A, B, C, D)



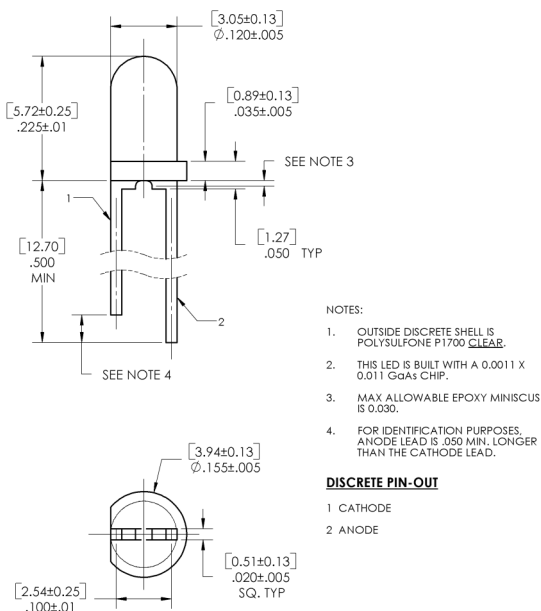
### OP165W



DIMENSIONS ARE IN: [MILLIMETERS]  
INCHES

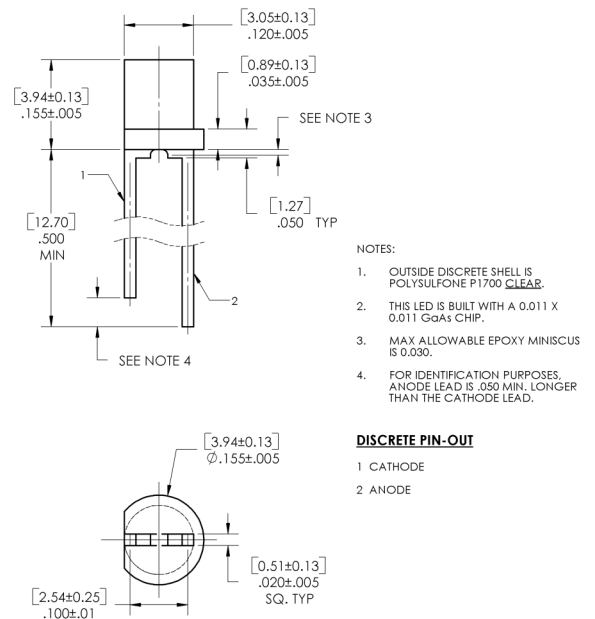
### OP166 (A, B)

\* MAX UNDERFILL ALLOWED IS .015".  
\*\* ELBOW OF LEADFRAME NOT MORE THAN .005" FROM FLANGE.



### OP166W

\* MAX UNDERFILL ALLOWED IS .015".  
\*\* ELBOW OF LEADFRAME NOT MORE THAN .005" FROM FLANGE.



| Pin # | LED     |
|-------|---------|
| 1     | Cathode |
| 2     | Anode   |

**CONTAINS POLYSULFONE**  
To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK'S molded plastics.

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OP165, OP166 Series

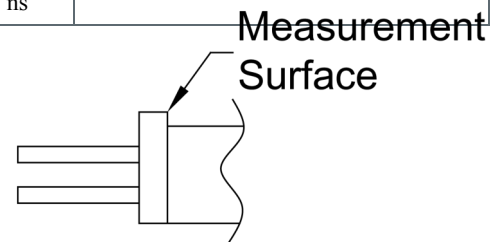


## Electrical Specifications

| Absolute Maximum Ratings (T <sub>A</sub> = 25° C unless otherwise noted)                    |                       |
|---|-----------------------|
| Storage and Operating Temperature Range   | -40° C to +100° C     |
| Reverse Voltage   | 2.0 V                 |
| Continuous Forward Current  | 50 mA                 |
| Peak Forward Current (1 μs pulse width, 300 pps)  | 3.0 A                 |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron] | 260° C                |
| Power Dissipation   | 100 mW <sup>(1)</sup> |

| Electrical Characteristics (T <sub>A</sub> = 25° C unless otherwise noted) |  |      |      |      |                    |   |
|--|--|------|------|------|--------------------|---|
| SYMBOL   | PARAMETER  | MIN  | TYP  | MAX  | UNITS              | TEST CONDITIONS                                       |
| <b>Input Diode</b>   |  |      |      |      |                    |   |
| E <sub>E (APT)</sub>   | Apertured Radiant Incidence<br>OP165A, OP166A                                      | 1.95 | -    | -    | mW/cm <sup>2</sup> | I <sub>F</sub> = 20 mA <sup>(2)</sup>                 |
| P <sub>O</sub>   | Radiant Power Output<br>OP165W, OP166W   | 0.50 | -    | -    | mW                 | I <sub>F</sub> = 20 mA                                |
| V <sub>F</sub>   | Forward Voltage  | -    | -    | 1.60 | V                  | I <sub>F</sub> = 20 mA                                |
| I <sub>R</sub>   | Reverse Current  | -    | -    | 100  | μA                 | V <sub>R</sub> = 2 V                                  |
| λ <sub>p</sub>   | Wavelength at Peak Emission  | -    | 935  | -    | nm                 | I <sub>F</sub> = 10 mA                                |
| B  | Spectral Bandwidth between Half Power Points                                       | -    | 50   | -    | nm                 | I <sub>F</sub> = 10 mA                                |
| Δλ <sub>p</sub> /ΔT  | Spectral Shift with Temperature<br>OP165, OP166 (A, B, C, D)<br>OP165W, OP166W     | -    | -    | -    | nm/°C              | I <sub>F</sub> = Constant                             |
| θ <sub>HP</sub>  | Emission Angle at Half Power Points<br>OP165, OP166 (A, B, C, D)<br>OP165W, OP166W | -    | 18   | -    | Degree             | I <sub>F</sub> = 20 mA                                |
| t <sub>r</sub>   | Output Rise Time   | -    | 1000 | -    | ns                 | I <sub>F(PK)</sub> = 100 mA, PW = 10 μs, D.C. = 10.0% |
| Notes:   | Output Fall Time   | -    | 500  | -    | ns                 |   |

- Derate linearly 1.33 mW/°C above 25°C
- E<sub>E(APT)</sub> is a measurement of the average apertured 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<sub>E(APT)</sub> is not necessarily uniform within the measured areas.



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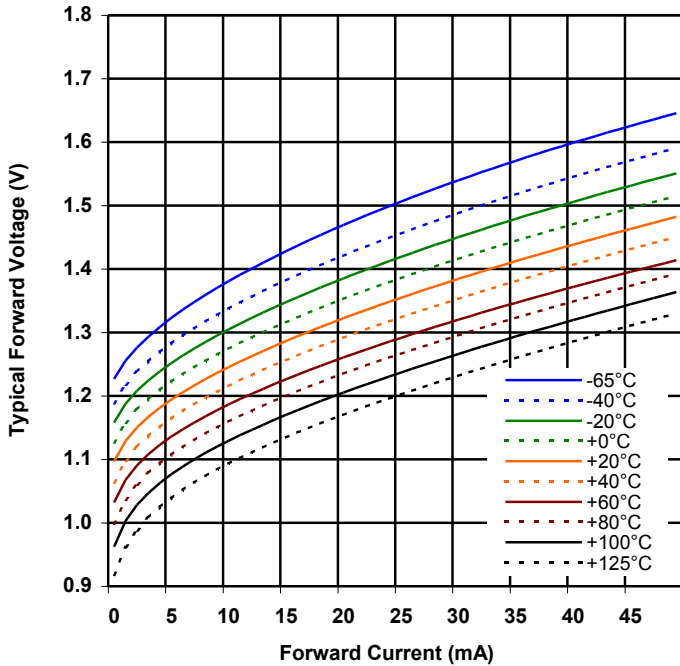
OP165, OP166 Series



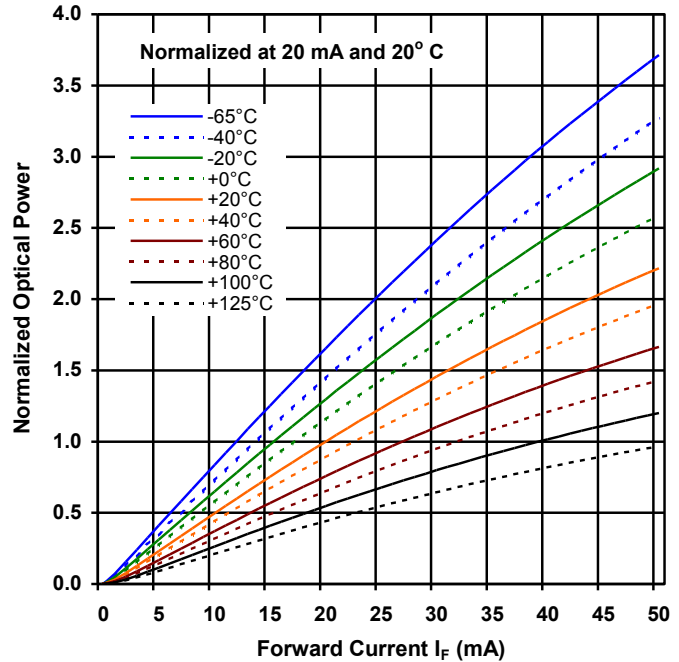
## Performance

OP165, OP166 (A, B, C, D, W)

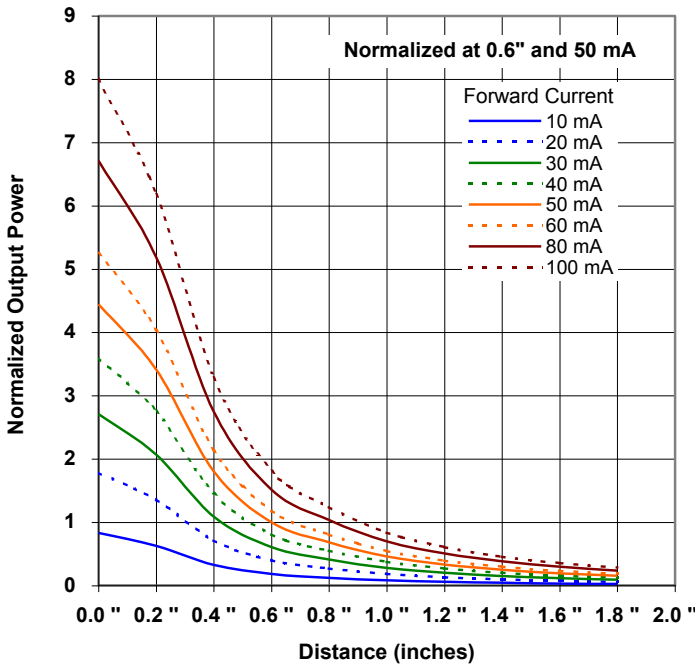
Forward Voltage vs Forward Current vs Temperature



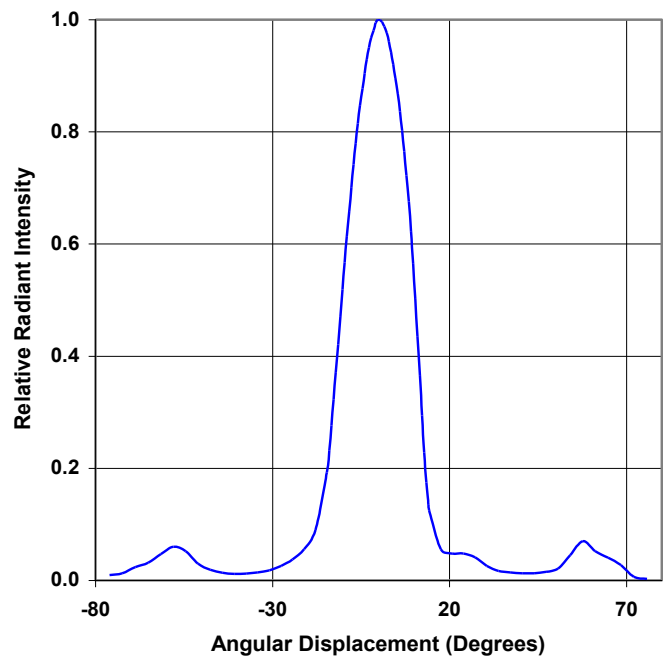
Optical Power vs  $I_F$  vs Temp



Distance vs Output Power vs Forward Current



Relative Radiant Intensity vs Angular Displacement



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- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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