

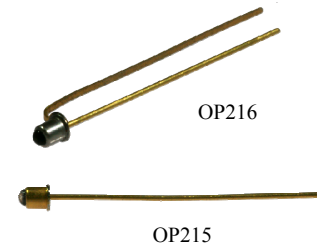
Hermetic Infrared Emitting Diode

OP215, OP216



Features:

- Hermetically sealed package
- Mechanically and spectrally matched to other OPTEK devices
- Designed for direct mount to PCBoard
- Enhanced temperature range
- Excellent coupling efficiency



Description:

Each **OP215** and **OP216** device is an 890 nm gallium aluminum arsenide infrared emitting diode (GaAlAs), mounted in a hermetically sealed “pig tale” package with an enhanced temperature range and a narrow irradiance pattern that provides high on-axis intensity for excellent coupling efficiency. These devices offer significantly higher power output than GaAs at equivalent drive currents and have a wavelength that is matched to silicon’s peak response. Their small package size permits high device density mounting.

The **OP216** series devices provide an additional mounting tab connected to the Cathode/Case.

All these LEDs are mechanically and spectrally matched to the OP300 series, OP516, OP600 series and OP640 series devices.

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data, and to Application Bulletin 202 for pill-type soldering to PCBoard.

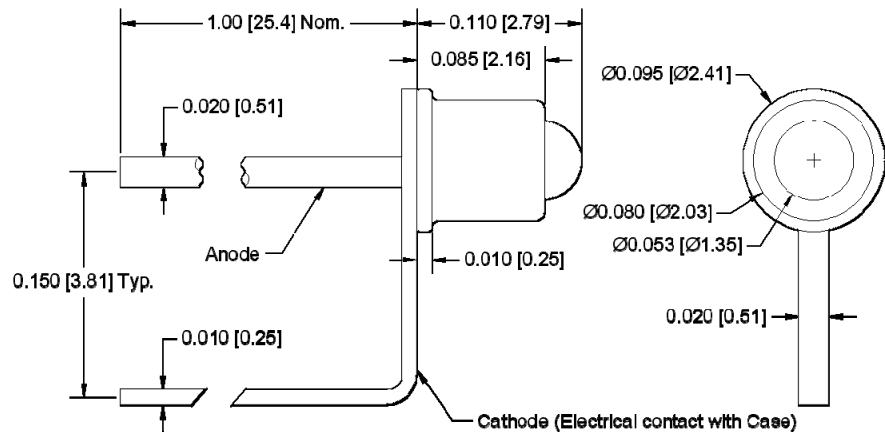
Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

| Ordering Information | | | |
|----------------------|---------------------|--|------------------|
| Part Number | LED Peak Wavelength | Optical Power mW/cm ² (Min) | Total Beam Angle |
| OP215A OP216A | 890 nm | 1.20 | 24° |
| OP215B OP216B | | 0.60 | |
| OP215C OP216C | | 0.30 | |
| OP215D OP216D | | 0.20 | |



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



General Note
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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

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Electrical Specifications

| Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted) | |
|---|-------------------------|
| Storage Temperature Range | -65°C to +150°C |
| Operating Temperature Range | -65°C to +125°C |
| Reverse Voltage | 2.0 V |
| Continuous Forward Current | 100 mA |
| Peak Forward Current (2μs pulse with 0.1% duty cycle) | 1.0 A |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron] | 260°C ⁽¹⁾⁽²⁾ |
| Power Dissipation | 150 mW ⁽³⁾ |

| Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|---|------------------------------|-------|------|--------------------|--|
| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
| Input Diode | | | | | | |
| $E_{E(APT)}^{(3)}$ | Apertured Radiant Incidence OP216A OP216B OP216C OP216D | 1.20 0.60 0.30 0.20 | - | - | mW/cm ² | $I_F = 50\text{ mA}^{(4)}$ |
| V_F | Forward Voltage | - | - | 1.80 | V | $I_F = 50\text{ mA}$ |
| I_R | Reverse Current | - | - | 100 | μA | $V_R = 2.0\text{ V}$ |
| λ_p | Wavelength at Peak Emission | - | 890 | - | nm | $I_F = 10\text{ mA}$ |
| B | Spectral Bandwidth between Half Power Points | - | 80 | - | nm | $I_F = 10\text{ mA}$ |
| $\Delta \lambda/\Delta T$ | Spectral Shift with Temperature | - | +0.18 | - | nm/°C | $I_F = \text{Constant}$ |
| θ_{HP} | Emission Angle at Half Power Points | - | 24 | - | Degree | $I_F = 50\text{ mA}$ |
| t_r | Output Rise Time | - | 500 | - | ns | $I_{F(PK)} = 100\text{ mA}$, $PW = 10\text{ }\mu\text{s}$, and D.C. = 10.0% |
| t_f | Output Fall Time | - | 250 | - | ns | |

Notes:

1. Refer to Application Bulletin 202 which reviews proper soldering techniques for pill-type devices.
2. No clean or low solids. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
3. Derate linearly 1.50 mW/°C above 25°C.
4. For OP216, $E_{E(APT)}$ is a measurement using a 0.180" (4.57 mm) diameter apertured sensor placed 0.653" (16.59 mm) from the lens tip. $E_{E(APT)}$ is not necessarily uniform within the measured area.

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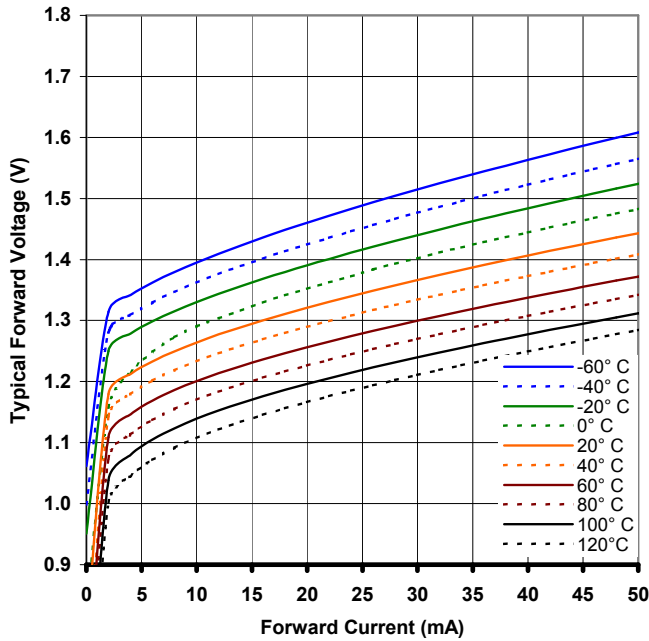
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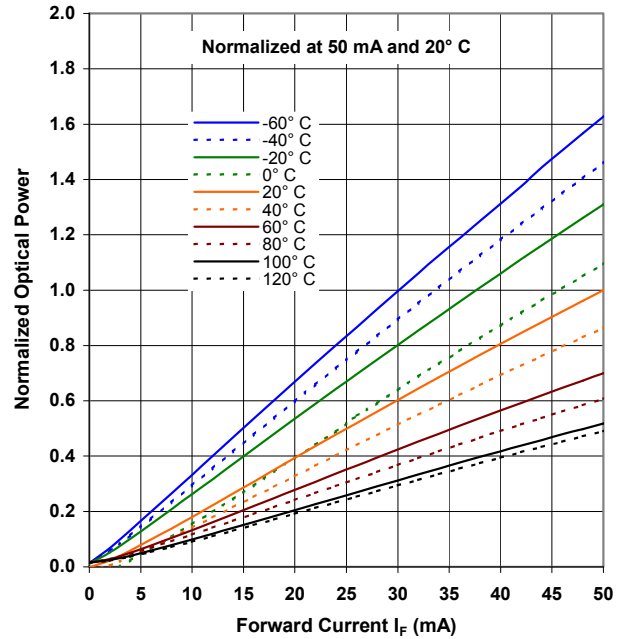


Performance OP215 & OP216

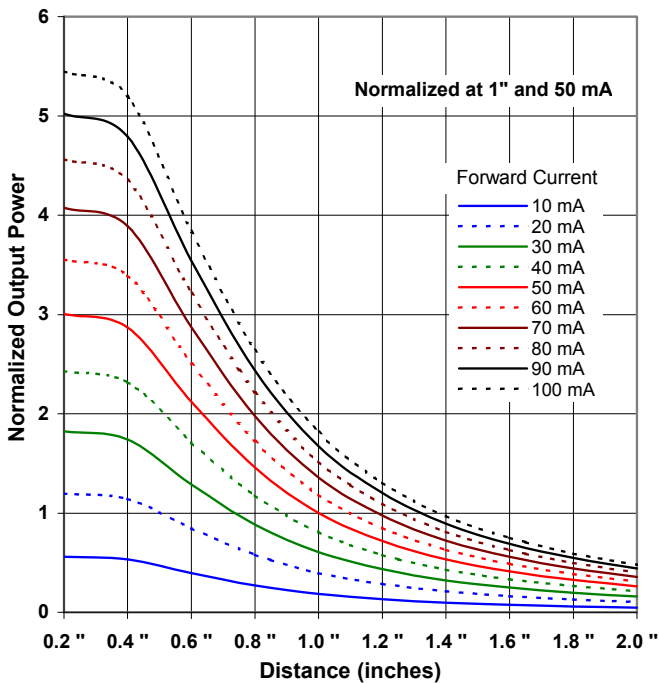
Forward Voltage vs Forward Current vs Temperature



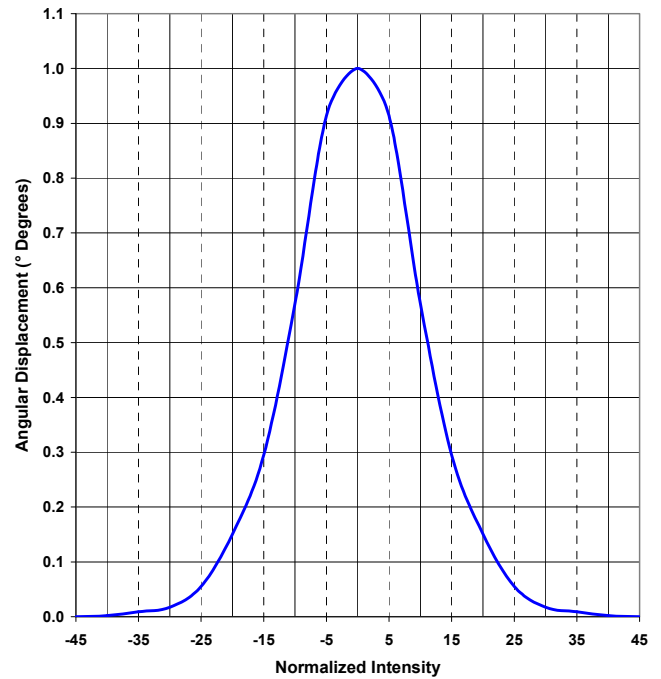
Optical Power vs I_F vs Temperature



Distance vs Output Power vs Forward Current



Normalized Intensity vs Beam Angle



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