

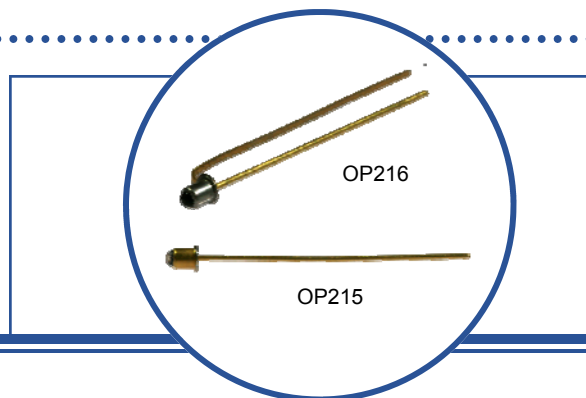
# Hermetic Infrared Emitting Diode

## 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.

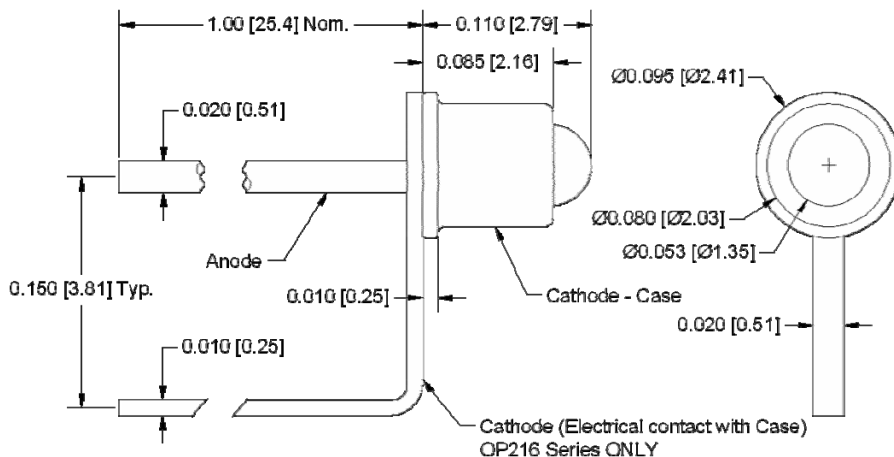
### Applications:

- 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 <sup>2</sup> (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 |



RoHS

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

# Hermetic Infrared Emitting Diode

## OP215, OP216



### 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 (2 $\mu$ s 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 <sup>(1)(2)</sup> |
| Power Dissipation                                                                           | 150 mW <sup>(3)</sup>    |

### 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<br>OP216A<br>OP216B<br>OP216C<br>OP216D | 1.20<br>0.60<br>0.30<br>0.20 | -     | -    | mW/cm <sup>2</sup> | $I_F = 50 \text{ mA}^{(4)}$                                          |
| $V_F$                        | Forward Voltage                                                     | -                            | -     | 1.80 | V                  | $I_F = 50 \text{ mA}$                                                |
| $I_R$                        | Reverse Current                                                     | -                            | -     | 100  | $\mu\text{A}$      | $V_R = 2.0 \text{ V}$                                                |
| $\lambda_P$                  | Wavelength at Peak Emission                                         | -                            | 890   | -    | nm                 | $I_F = 10 \text{ mA}$                                                |
| B                            | Spectral Bandwidth between Half Power Points                        | -                            | 80    | -    | nm                 | $I_F = 10 \text{ mA}$                                                |
| $\Delta\lambda_P / \Delta T$ | Spectral Shift with Temperature                                     | -                            | +0.18 | -    | nm/°C              | $I_F = \text{Constant}$                                              |
| $\theta_{HP}$                | Emission Angle at Half Power Points                                 | -                            | 24    | -    | Degree             | $I_F = 50 \text{ mA}$                                                |
| $t_r$                        | Output Rise Time                                                    | -                            | 500   | -    | ns                 | $I_{F(PK)}=100 \text{ mA}$ , $PW=10 \mu\text{s}$ , and $D.C.=10.0\%$ |
| $t_f$                        | Output Fall Time                                                    | -                            | 250   | -    | ns                 |                                                                      |

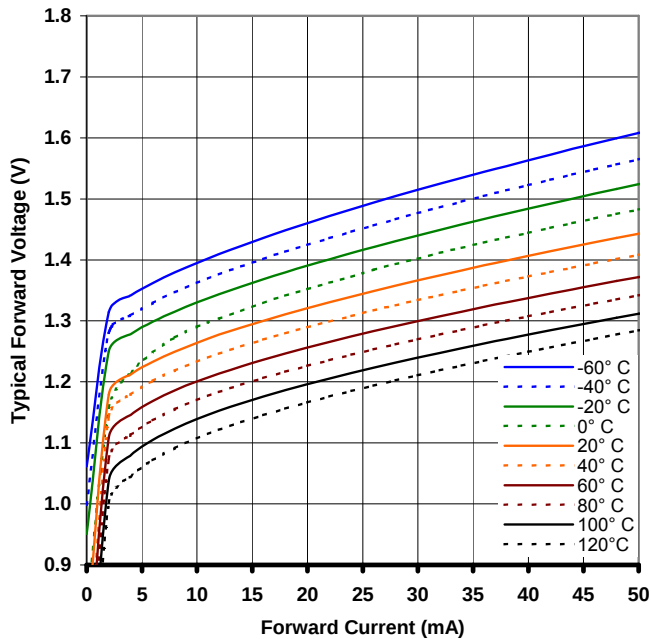
#### Notes:

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.

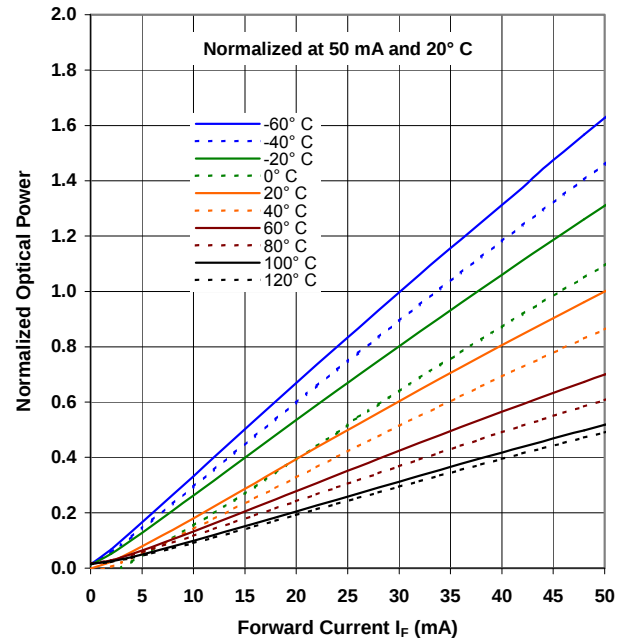
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### OP215 & OP216

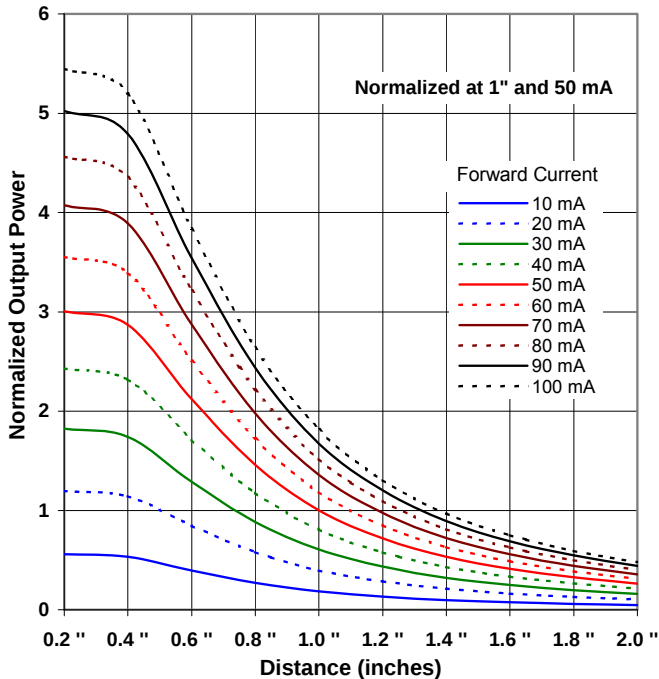
Forward Voltage vs Forward Current vs Temperature



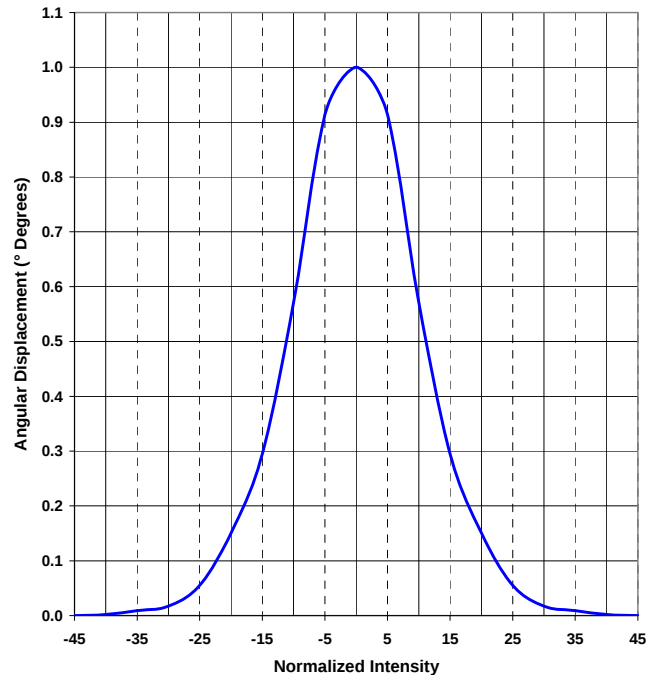
Optical Power vs  $I_F$  vs Temperature



Distance vs Output Power vs Forward Current



Normalized Intensity vs Beam Angle



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