

# Plastic Infrared Emitting Diode

OP240 Series

OP245 Series



OP240 OP245

**Features:**

- Wide irradiance pattern
- Side-looking package for space-limited applications
- Wavelength matched to silicon’s peak response
- Mechanically and spectrally matched to other OPTEK products

**Description:**

Each device in this series is a high intensity gallium aluminum arsenide infrared emitting diode that is suited for use as a PCBoard mounted slotted switch or an easy mount PCBoard interrupter.

Each dome lens **OP240** and **OP245** device is an 890 nm diode that is molded in an IR-transmissive clear epoxy side-looking package. *OP240 is mechanically and spectrally matched to the OP550 and OP560 series of phototransistors. OP245 is mechanically and spectrally matched to the OP555 and OP565 series devices.*

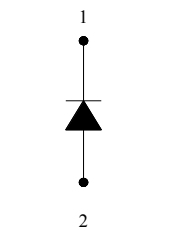
*Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.*

**Applications:**

- Space-limited applications
- PCBoard mounted slotted switch
- PCBoard interrupter

| Ordering Information |                     |           |                  |               |
|----------------------|---------------------|-----------|------------------|---------------|
| Part Number          | LED Peak Wavelength | Lens Type | Total Beam Angle | Lead Length   |
| OP240A               | 890 nm              | Dome      | 40°              | 0.50" minimum |
| OP240B               |                     |           |                  |               |
| OP240C               |                     |           |                  |               |
| OP240D               |                     |           |                  |               |
| OP245A               |                     | Recessed  |                  |               |
| OP245B               |                     |           |                  |               |

**OP240 (A, B, C, D)**



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

**OP245 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.



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.

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# Plastic Infrared Emitting Diode

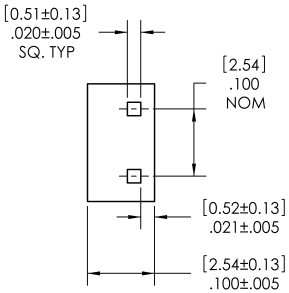
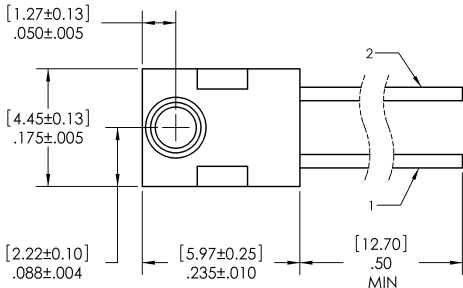
## OP240 Series



| 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.

### OP245 (A, B, C, D)



DIMENSIONS ARE [MILLIMETERS INCHES]

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OP240 Series



## Electrical Specifications

| Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)                 |                                             |
|---------------------------------------------------------------------------------------------|---------------------------------------------|
| Storage and Operating Temperature Range                                                     | $-40^\circ\text{C}$ to $+100^\circ\text{C}$ |
| Reverse Voltage                                                                             | 2.0 V                                       |
| Continuous Forward Current                                                                  | 50 mA                                       |
| Peak Forward Current                                                                        | 3.0 A                                       |
| Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron] | $260^\circ\text{C}^{(1)}$                   |
| Power Dissipation                                                                           | 100 mW <sup>(2)</sup>                       |

| Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                                              |      |            |      |                        |                                                                  |
|-------------------------------------------------------------------------------|----------------------------------------------|------|------------|------|------------------------|------------------------------------------------------------------|
| SYMBOL                                                                        | PARAMETER                                    | MIN  | TYP        | MAX  | UNITS                  | TEST CONDITIONS                                                  |
| <b>Input Diode</b>                                                            |                                              |      |            |      |                        |                                                                  |
| $E_{E(APT)}$                                                                  | Apertured Radiant Incidence                  |      |            |      |                        | $I_F = 20\text{ mA}^{(3)}$                                       |
|                                                                               | OP240A, OP245A                               | 0.60 | -          | -    | mW/<br>cm <sup>2</sup> |                                                                  |
|                                                                               | OP240B, OP245B                               | 0.40 | -          | 1.20 |                        |                                                                  |
|                                                                               | OP240C                                       | 0.20 | -          | 0.86 |                        |                                                                  |
| OP240D                                                                        | 0.05                                         | -    | -          |      |                        |                                                                  |
| $V_F$                                                                         | Forward Voltage                              | -    | -          | 1.80 | V                      | $I_F = 20\text{ mA}$                                             |
| $I_R$                                                                         | 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              | -    | $\pm 0.18$ | -    | nm/ $^\circ\text{C}$   | $I_F = \text{Constant}$                                          |
| $\theta_{HP}$                                                                 | Emission Angle at Half Power Points          | -    | 40         | -    | Degree                 | $I_F = 20\text{ mA}$                                             |
| $t_r$                                                                         | 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                     | $I_{F(PK)}=100\text{ mA}$ , PW=10 $\mu\text{s}$ , and D.C.=10.0% |

**Notes:**

1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum of 20 grams force may be applied to the leads when soldering.
2. Derate linearly 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
3.  $E_{E(APT)}$  is a measurement of the average apertured radiant energy incident upon a sensing area 0.180" (4.57 mm) in diameter perpendicular to and centered on the mechanical axis of the lens and 0.653" (6.60 mm) from the lens tip.  $E_{E(APT)}$  is not necessarily uniform within the measured area.

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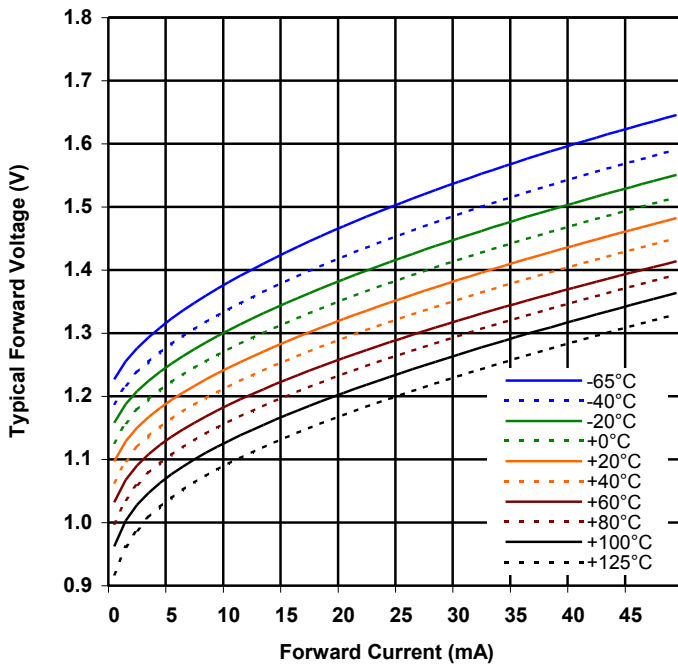
# Plastic Infrared Emitting Diode

OP240 Series



## Performance OP240, OP245 (A, B, C, D)

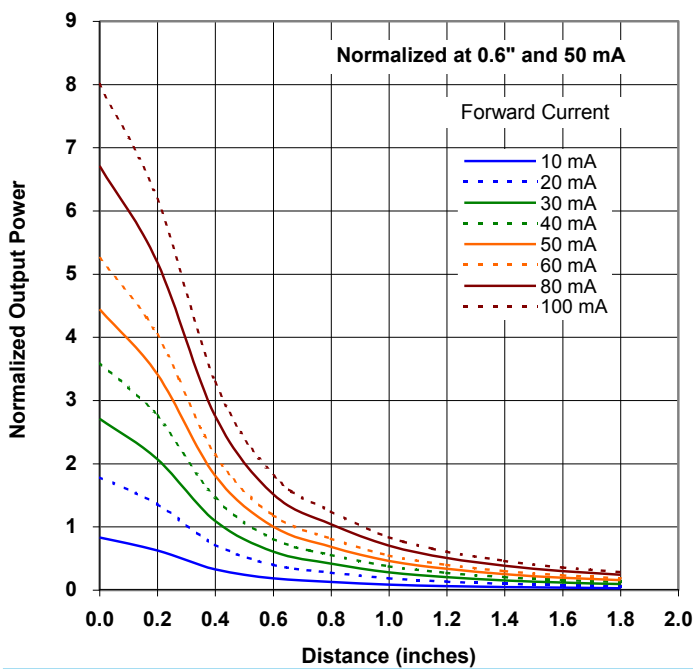
Forward Voltage vs Forward Current vs Temperature



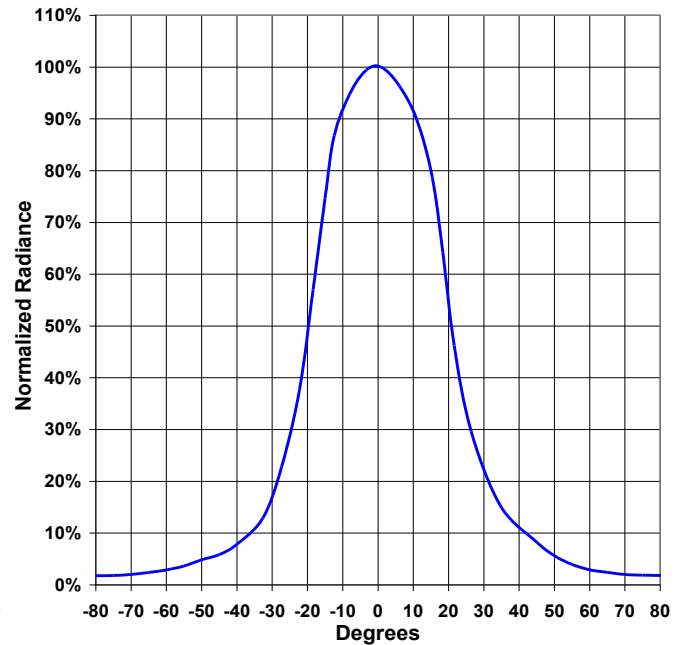
Optical Power vs  $I_F$  vs Temp



Distance vs Output Power vs Forward Current



Beam Angle



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