

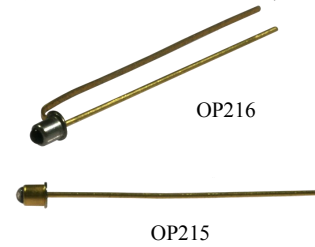
# Hermetic Infrared Emitting Diode



## OP215, OP216

### Features:

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



### 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 **OP216A** device provide an additional mounting tab connected to the Cathode/Case.

*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

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°



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.

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## Electrical Specifications

Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)	
Storage Temperature Range	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Operating Temperature Range	$-65^\circ\text{C}$ to $+125^\circ\text{C}$
Reverse Voltage	2.0 V
Continuous Forward Current	100 mA
Peak Forward Current (2 $\mu\text{s}$ 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]	$260^\circ\text{C}^{(1)(2)}$
Power Dissipation	$150\text{ mW}^{(3)}$

Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
$E_{E(APT)}^{(3)}$	Apertured Radiant Incidence OP216A	1.20	-	-	$\text{mW}/\text{cm}^2$	$I_F = 50\text{ mA}^{(4)}$
$V_F$	Forward Voltage	-	-	1.80	V	$I_F = 50\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
$\lambda_P$	Wavelength at Peak Emission	-	890	-	nm	$I_F = 10\text{ mA}$
B	Spectral Bandwidth between Half Power Points	-	80	-	nm	$I_F = 10\text{ mA}$
$\Delta\lambda/\Delta T$	Spectral Shift with Temperature	-	+0.18	-	$\text{nm}/^\circ\text{C}$	$I_F = \text{Constant}$
$\theta_{HP}$	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  $1.50\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
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.

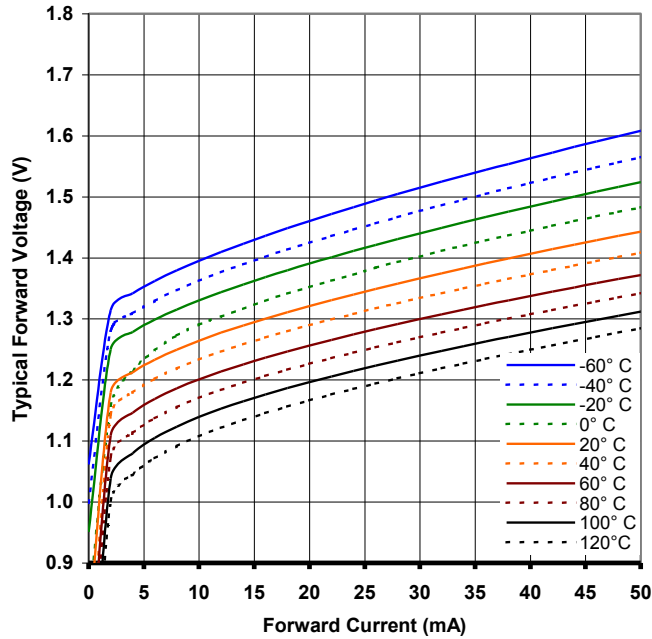
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## Performance OP215 & OP216

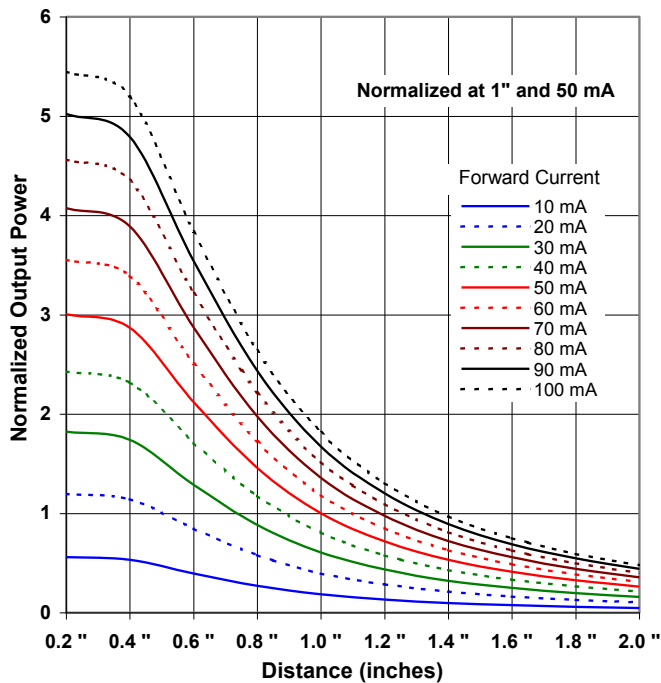
Forward Voltage vs Forward Current vs Temperature



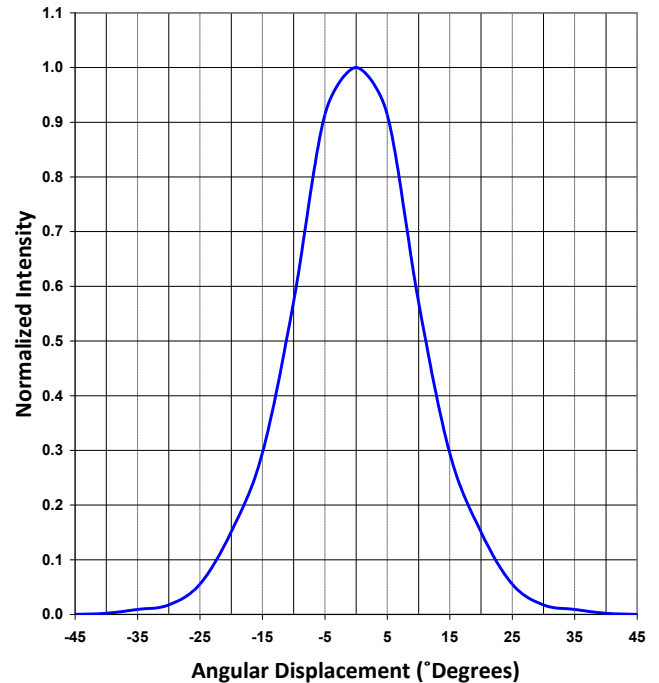
Optical Power vs  $I_F$  vs Temperature



Distance vs Output Power vs Forward Current



Normalized Intensity vs Beam Angle



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