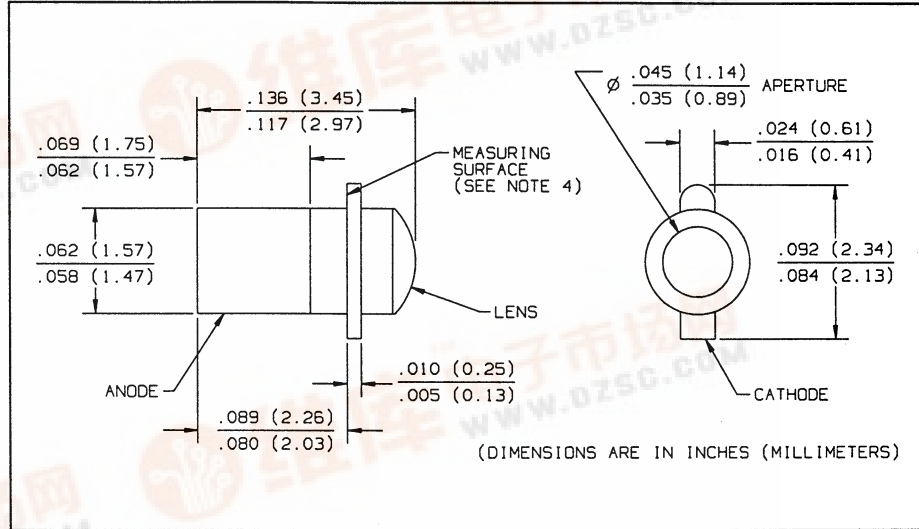
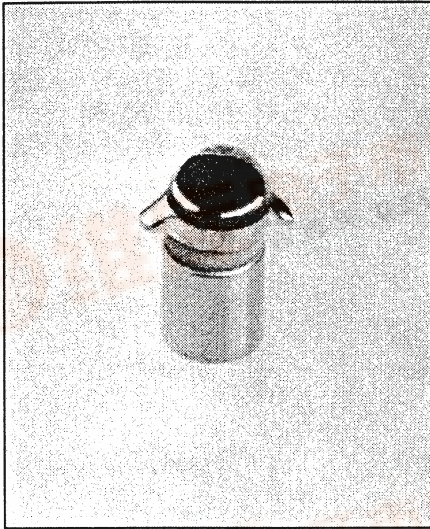


Product Bulletin OP223  
June 1996

# GaAlAs Hermetic Infrared Emitting Diodes Types OP223, OP224



## Features

- Narrow irradiance pattern
- Enhanced temperature range
- Small package size permits high device density mounting
- Mechanically and spectrally matched to the OP640SL and OP300SL series devices
- Significantly higher power output than GaAs at equivalent drive currents
- Wavelength matched to silicon's peak response

## Description

The OP223 and OP224 devices are 890nm gallium aluminum arsenide infrared emitting diodes mounted in hermetically sealed "Pill" type packages. The narrow irradiance pattern provides high on-axis intensity for excellent coupling efficiency.

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

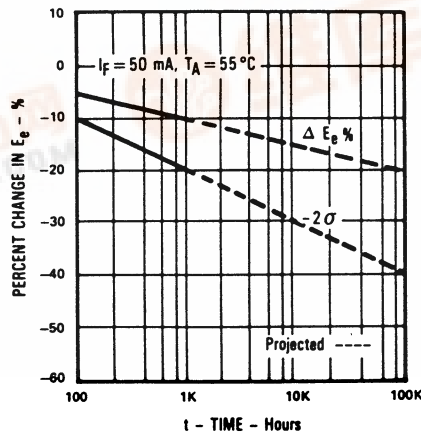
Reverse Voltage	2.0 V
Continuous Forward Current	100 mA
Peak Forward Current (2 $\mu\text{s}$ pulse width, 0.1% duty cycle)	1.0 A
Storage Temperature Range	$-65^\circ\text{C}$ to $+150^\circ\text{C}$
Operating Temperature Range	$-65^\circ\text{C}$ to $+125^\circ\text{C}$
Soldering Temperature (5 sec. with soldering iron)	$260^\circ\text{C}^{(1)(2)}$
Power Dissipation	150 mW <sup>(3)</sup>

### Notes:

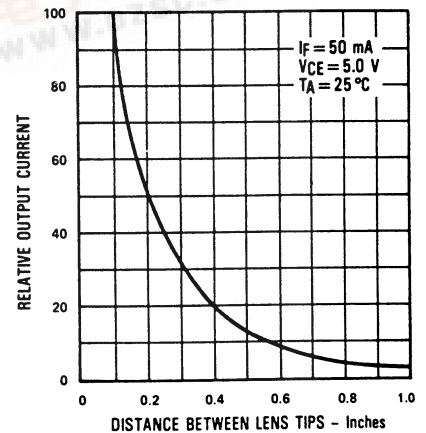
- (1) Refer to Application Bulletin 202 which discusses proper techniques for soldering Pill type devices into PC boards.
- (2) No clean or low solids, RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 1.50 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4)  $E_{e(\text{APT})}$  is measured using a 0.031" (0.787 mm) diameter apertured sensor placed 0.50" (12.7 mm) from the mounting plane.  $E_{e(\text{APT})}$  is not necessarily uniform within the measured area.

## Typical Performance Curves

### Percent Changes in Radiant Intensity vs Time



### Coupling Characteristics of OP223 and OP600



# Types OP223, OP224

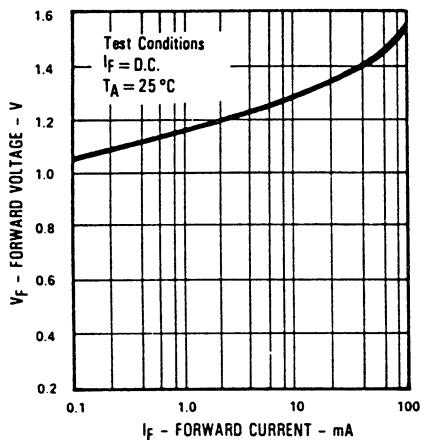
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$E_e(\text{APT})$	Apertured Radiant Incidence	OP223 1.00			$\text{mW}/\text{cm}^2$ $\text{mW}/\text{cm}^2$	$I_F = 50\text{ mA}^{(4)}$ $I_F = 50\text{ mA}^{(4)}$
$V_F$	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 Eission		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		$\text{nm}/^\circ\text{C}$	$I_F = \text{Constant}$
$\theta_{\text{HP}}$	Emission Angle at Half Power Points		24		Deg.	$I_F = 50\text{ mA}$
$t_r$	Output Rise Time		500		ns	$I_{F(\text{PK})} = 100\text{ mA}$ , $\text{PW} = 10\ \mu\text{s}$ , D.C. = 10.0%
$t_f$	Output Fall Time		250		ns	$I_{F(\text{PK})} = 100\text{ mA}$ , $\text{PW} = 10\ \mu\text{s}$ , D.C. = 10.0%

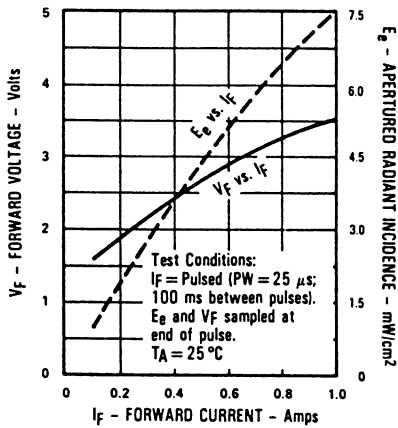
INFRARED  
EMITTING  
DIODES

## Typical Performance Curves

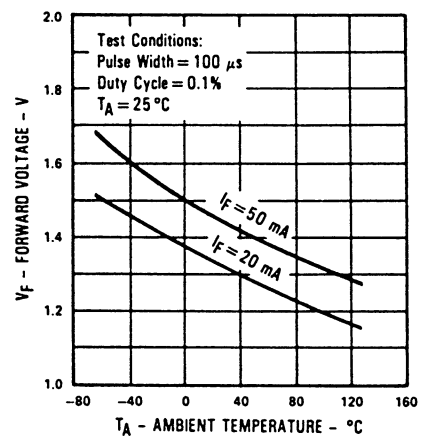
Forward Voltage vs Forward Current



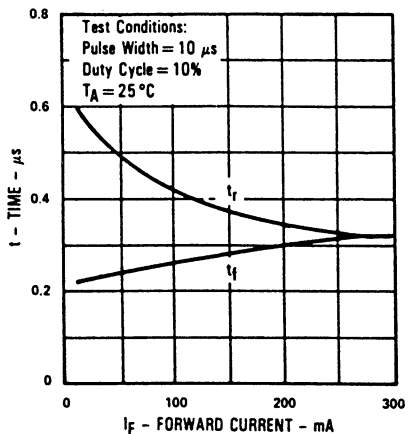
Forward Voltage and Radiant Incidence vs Forward Current



Forward Voltage vs Ambient Temperature



Rise Time and Fall Time vs Forward Current



Normalized Power Output vs Ambient Temperature

