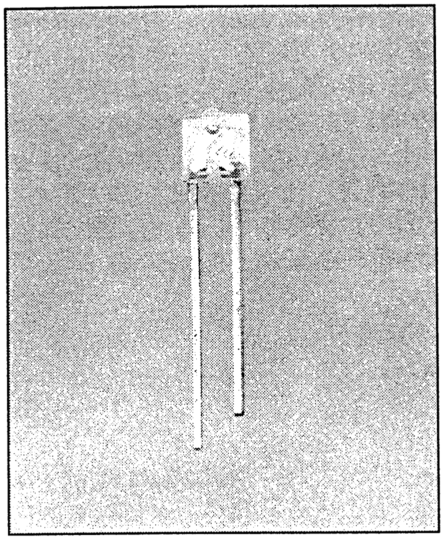
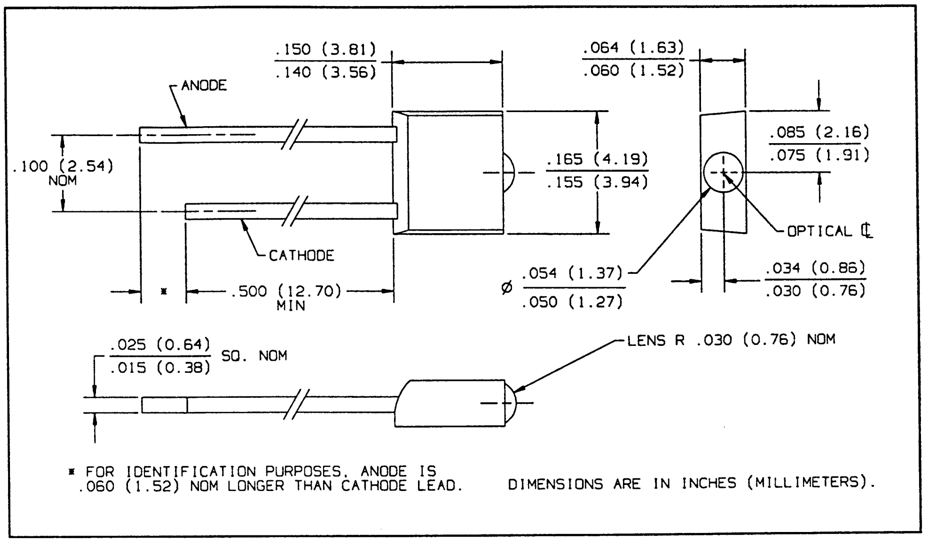
OPTEK

Product Bulletin OP169
June 1996

GaAs Plastic Infrared Emitting Diodes
Types OP169A, OP169B, OP169C





* FOR IDENTIFICATION PURPOSES, ANODE IS .060 (1.52) NOM LONGER THAN CATHODE LEAD.

DIMENSIONS ARE IN INCHES (MILLIMETERS).

Features

- Integral lens for narrow beam angle
- Easily stackable on 0.100 inch (2.54 mm) hole centers
- Mechanically and spectrally matched to the OP509 phototransistor series

Description

The OP169 series are gallium arsenide infrared emitting diodes molded in “end looking” miniature clear packages. The molded lens insures improved uniformity of lens magnification from unit to unit. The OP169 series provides a broad range of on-line and radiant intensities and has considerable design flexibility due to its small size. These devices are mechanically and spectrally matched to the OP509 series phototransistors.

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Continuous Forward Current	50 mA
Peak Forward Current (Pulse Width = 1 µsec, 300pps)	3.0 A
Reverse Voltage	2.0 V
Storage and Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6mm) from case for 5 sec. with soldering iron)	260° C(1)
Power Dissipation	100 mW(2)

Notes:

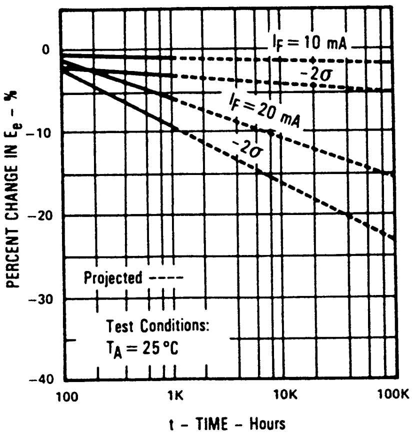
(1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering. Maximum 20 grams force may be applied to the leads when soldering.

(2) Derate linearly 1.33 mW/° C above 25° C.

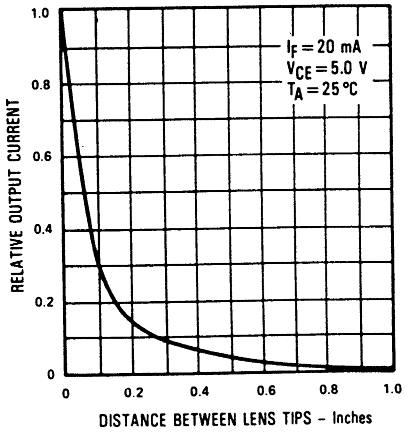
(3) $E_{e(APT)}$ is a measurement of the average apertured radiant incidence upon a sensing area 0.180" (4.57 mm) in diameter, perpendicular to and centered on the mechanical axis of the lens, and 0.653" (16.6 mm) from the lens tip. $E_{e(APT)}$ is a measurement of the average radiant intensity within the cone formed by the above conditions. $E_{e(APT)}$ is not necessarily uniform within the measured area.

Typical Performance Curves

Percent Changes in Radiant Intensity vs Time



Coupling Characteristics of OP169 and OP509



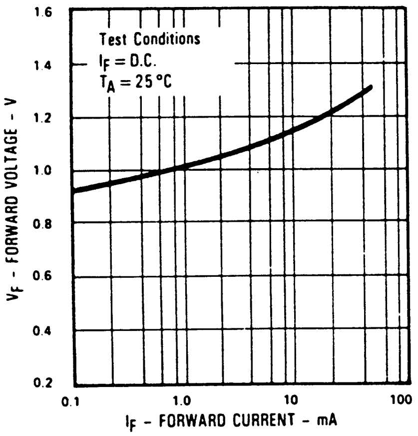
Types OP169A, OP169B, OP169C

Electrical Characteristics (T_A = 25° C unless otherwise noted)

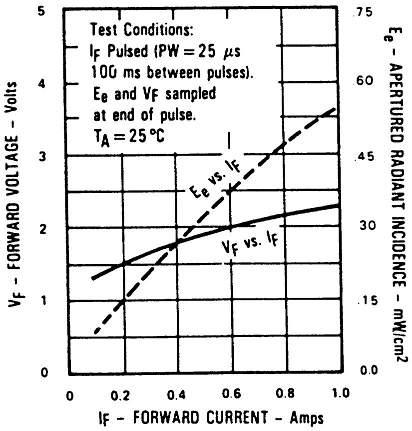
SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
$E_{e(APT)}$	Apertured Radiant Incidence	OP169C OP169B OP169A	0.027 0.108 0.180		0.220	mW/cm^2	I_F = 20 mA[3]
V_F	Forward Voltage				1.60	V	I_F = 20 mA
I_R	Reverse Current				100	µA	V_R = 2.0 V
λp	Wavelength at Peak Emission			935		nm	I_F = 20 mA
B	Bandwidth Between Half Power Points			50		nm	I_F = 10 mA
$\Delta\lambda p/\Delta T$	Spectral Shift with Temperature			+0.30		nm/°C	I_F = Constant
θ_{HP}	Emission Angle at Half Power Points			46		Deg.	I_F = 20 mA
t_r	Output Rise Time			1000		ns	$I_{F(PK)}$ = 100 mA, PW = 10 µs, D.C. = 10.0%
t_f	Output Fall Time			500		ns	

Typical Performance Curves

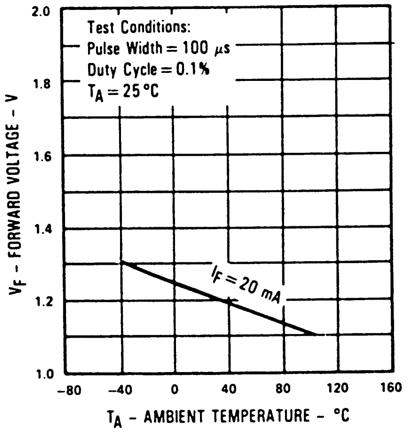
Forward Voltage vs Forward Current



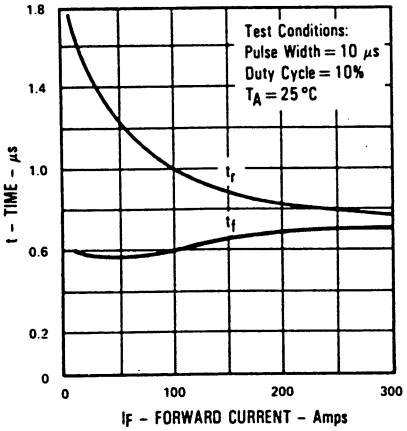
Forward Voltage and Radiant Incidence vs Forward Current



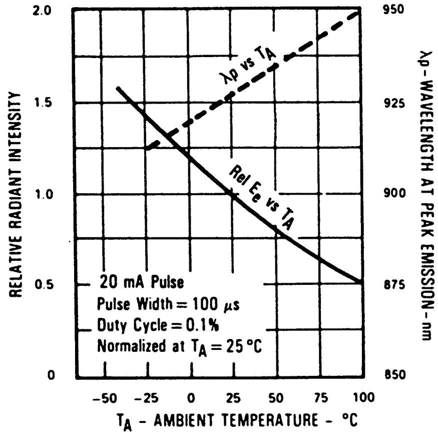
Forward Voltage vs Ambient Temperature



Rise Time and Fall Time vs Forward Current



Relative Radiant Intensity and Wavelength at Peak Emission vs Ambient Temperature



Relative Radiant Intensity vs Angular Displacement