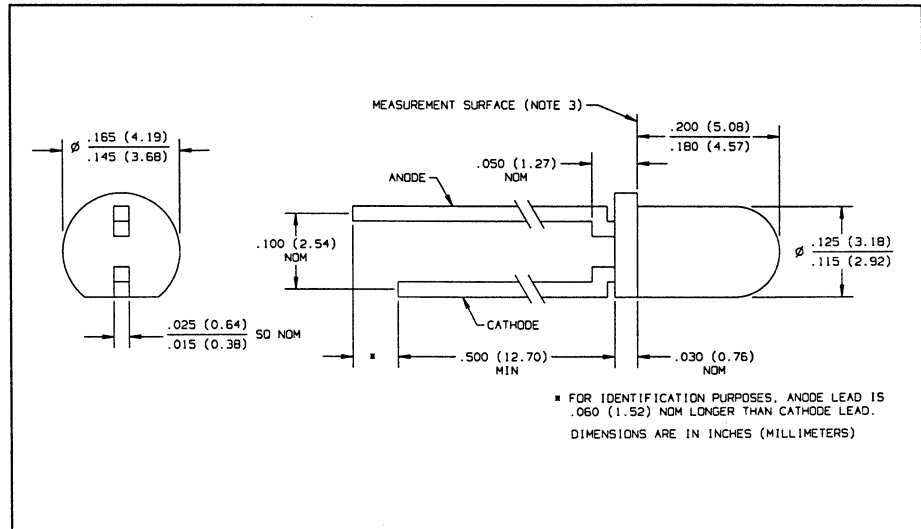
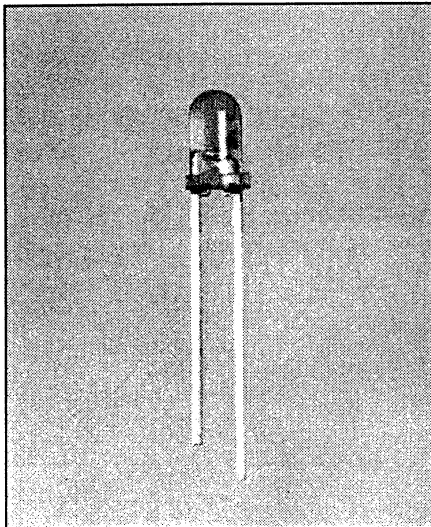


# GaAs Plastic Infrared Emitting Diodes Types OP166A, OP166B, OP166C, OP166D



## Features

- Narrow irradiance pattern
- Mechanically and spectrally matched to the OP506 series phototransistors
- Variety of Sensitivity ranges
- Small package size for space limited applications
- T-1 package style

## Description

The OP166 series devices are 935 nm high intensity gallium arsenide infrared emitting diodes molded in IR transmissive amber tinted plastic packages. The narrow irradiance pattern provides high on-axis intensity for excellent coupling efficiency. Lead spacing on this series is 0.100 inch (2.54 mm).

## Replaces

OP161SL series  
OP164 Series

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

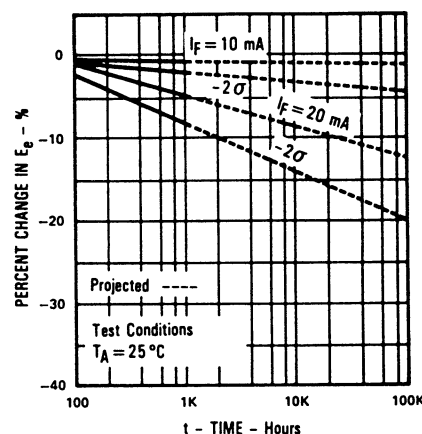
Reverse Voltage	2.0 V
Continuous Forward Current	50 mA
Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)	3.0 A
Storage and Operating Temperature Range	$-40^\circ\text{C}$ to $+100^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6mm) from case for 5 sec. with soldering iron]	$260^\circ\text{C}^{(1)}$
Power Dissipation	$100\text{ mW}^{(2)}$

### Notes:

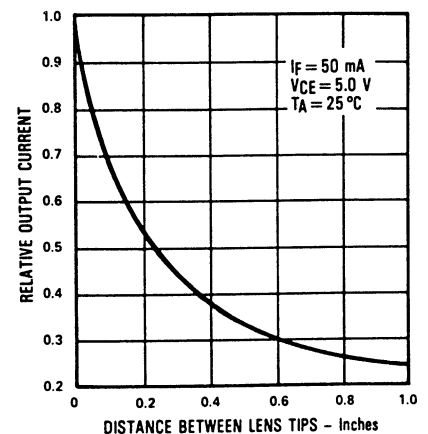
- (1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. A max. of 20 grams force may be applied to the leads when soldering.
- (2) Derate linearly  $1.33\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3)  $E_e(\text{APT})$  is a measurement of the average apertured radiant incidence upon a sensing area  $0.081''$  (2.06 mm) in diameter, perpendicular to and centered on the mechanical axis of the lens, and  $0.590''$  (14.99 mm) from the measurement surface.  $E_e(\text{APT})$  is not necessarily uniform within the measured area.

## Typical Performance Curves

Percent Changes in Radiant Intensity vs Time



Coupling Characteristics OP166 and OP506



# Types OP166A, OP166B, OP166C, OP166D

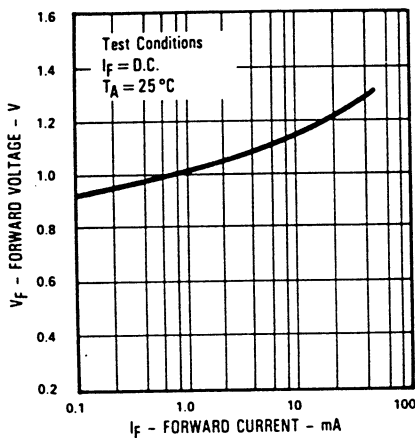
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS	
E <sub>e</sub> (APT)	Apertured Radiant Incidence	OP166D	0.28			mW/cm <sup>2</sup>	I <sub>F</sub> = 20 mA <sup>(3)</sup>
		OP166C	0.85		1.60	mW/cm <sup>2</sup>	I <sub>F</sub> = 20 mA <sup>(3)</sup>
		OP166B	1.40		2.20	mW/cm <sup>2</sup>	I <sub>F</sub> = 20 mA <sup>(3)</sup>
		OP166A	1.95			mW/cm <sup>2</sup>	I <sub>F</sub> = 20 mA <sup>(3)</sup>
V <sub>F</sub>	Forward Voltage			1.60	V	I <sub>F</sub> = 20 mA	
I <sub>R</sub>	Reverse Current			100	μA	V <sub>R</sub> = 2.0 V	
λ <sub>p</sub>	Wavelength at Peak Emission		935		nm	I <sub>F</sub> = 10 mA	
B	Spectral Bandwidth Between Half Power Points		50		nm	I <sub>F</sub> = 10 mA	
Δλ <sub>p</sub> /ΔT	Spectral Shift with Temperature		+0.30		nm/°C	I <sub>F</sub> = Constant	
θ <sub>HP</sub>	Emission Angle at Half Power Points		18		Deg.	I <sub>F</sub> = 20 mA	
t <sub>r</sub>	Output Rise Time		1000		ns	I <sub>F</sub> (PK) = 100 mA, PW = 10 μs, D.C. = 10.0%	
t <sub>f</sub>	Output Fall Time		500		ns		

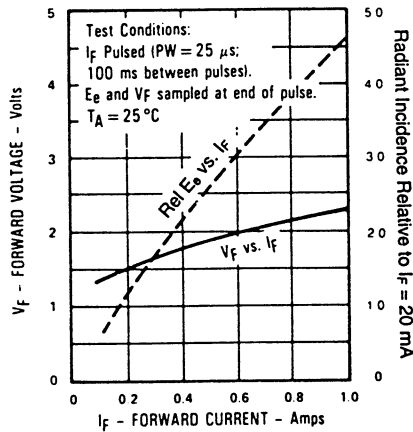
INFRARED  
EMITTING  
DIODES

## Typical Performance Curves

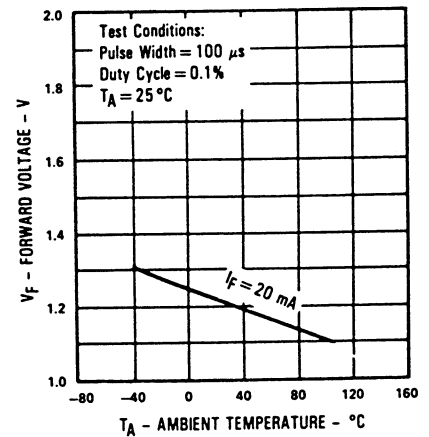
**Forward Voltage vs Forward Current**



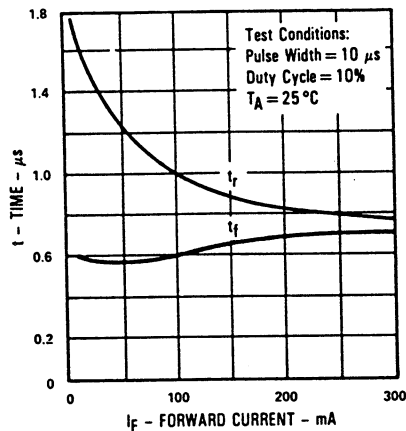
**Forward Voltage and Relative Radiant Incidence vs. Forward Current**



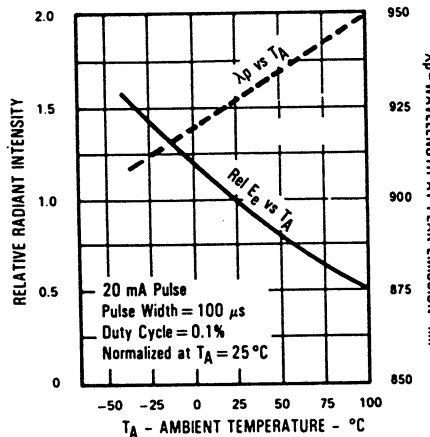
**Forward Voltage vs Ambient Temperature**



**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**

