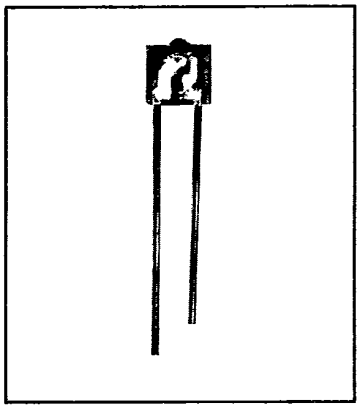
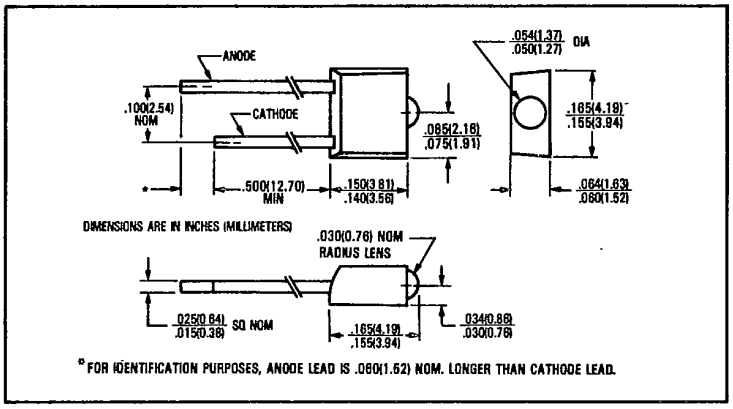
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5054
January 1985

GaAs Plastic Infrared Emitting Diodes
Types OP169SL, OP169SLD, OP169SLC





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 OP169SL series are gallium arsenide infrared emitting diodes molded in "end-emitting" miniature clear packages. The molded lens insures improved uniformity of lens magnification from unit to unit. The OP169SL 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 of phototransistors. For additional information on spectral emission characteristics, please refer to the OP509 data sheet.

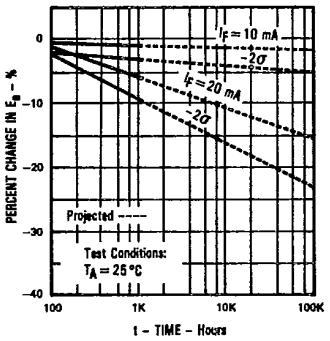
Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Continuous Forward Current	50 mA
Peak Forward Current (Pulse Width = 1 μsec, 300 pps)	3.0 A
Reverse Voltage	2.0 V
Storage and Operating Temperature Range	−40°C to +100°C
Lead Soldering Temperature (1/16 inch (1.6 mm) from Case for 5 sec. with soldering iron)[1]	240°C
Power Dissipation	100 mW[2]

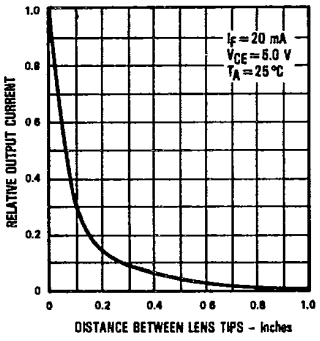
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
(2) Derate linearly 1.33 mW/°C above 25°C.
(3) $E_{e(APT)}$ is a measurement of the average apertured radiant incidence upon a sensing area 0.180" (4.57 mm) in diameter perpendicular to and centered on the 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 OP169SL and OP509



Types OP169SL, OP169SLD, OP169SLC

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

Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
P_O	Radiant Power Output	OP169SL		0.20		mW	I_F = 20 mA
$E_e(APT)$[3]	Apertured Radiant Incidence	OP169SL	0.020			mW/cm²	I_F = 20 mA
		OP169SLD	0.116		0.24	mW/cm²	I_F = 20 mA
		OP169SLC	0.195			mW/cm²	I_F = 20 mA
V_F	Forward Voltage				1.60	V	I_F = 20 mA
I_R	Reverse Current				100	μA	V_R = 2.0 V
λ_P	Wavelength at Peak Emission			930		nm	I_F = 20 mA
B	Spectral Bandwidth Between Half Power Points			50		nm	I_F = 20 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			48		Deg.	I_F = 20 mA
t_r	Output Rise Time			1550		ns	$I_{F(PK)}$ = 20 mA, PW = 10.0 μs, D.C. = 10.0%
t_f	Output Fall Time			580		ns	

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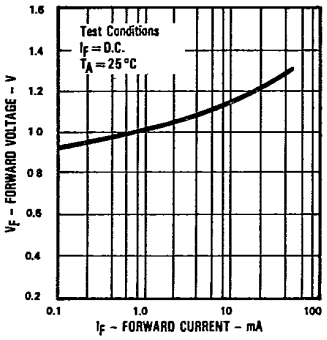
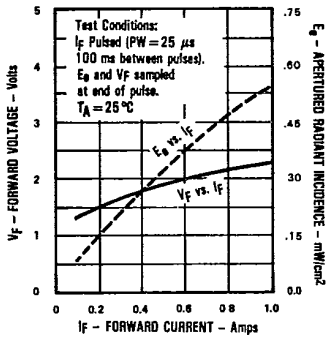
Typical Performance Curves

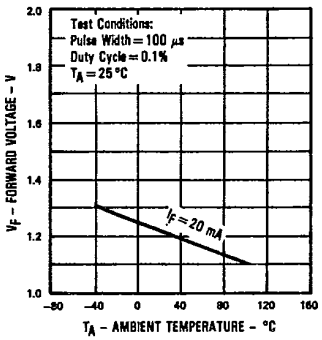
Forward Voltage vs Forward Current



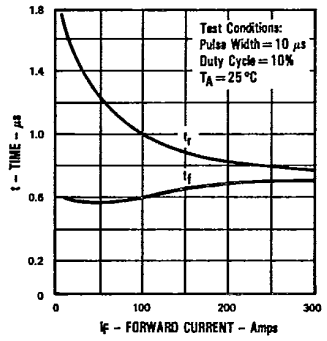
Forward Voltage and Radiant Incidence vs Forward Current



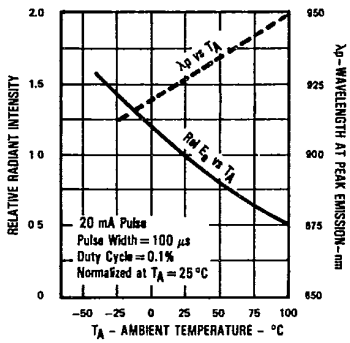
Forward Voltage vs Ambient Temperature



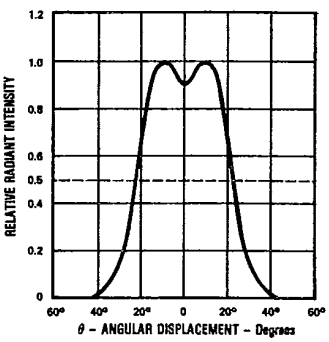
Rise Time and Fall Time vs Forward Current



Relative Radiant Intensity and Wavelength at Peak Emission vs Ambient Temperature



Relative Radiant Intensity vs Angular Displacement



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