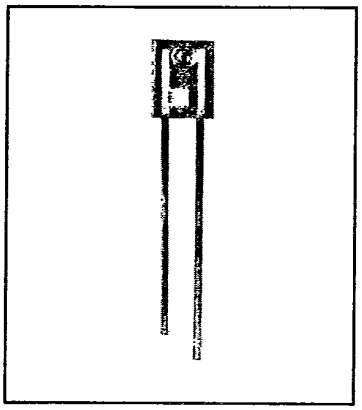
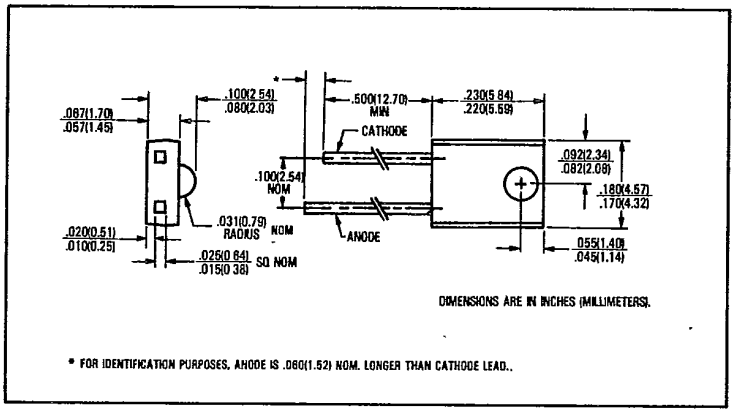
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5039
January 1985

GaAs Plastic Infrared Emitting Diodes
Types OP140SL, OP140SLD, OP140SLC, OP140SLB, OP140SLA





Features
- Selected to specific on-line intensity and radiant intensity ranges
- Low cost, miniature plastic side-looking package
- Mechanically and spectrally matched to the OP550 series of phototransistors and the OP560 series of photodarlingtons

Description
The OP140SL series devices are high intensity gallium arsenide infrared emitting diodes mounted in clear plastic side looking packages. TRW engineers originated the side-looking or "lateral" package for use in PC board mounted slotted switches or as an easy mount PC board interrupter. The OP140SL series provides a broad range of intensity selection.

The OP140SL series devices are mechanically and spectrally matched to OP550 and OP560 series photosensors. Please refer to photosensor data sheets for additional spectral characterization data.

The OP140SL is equivalent to TRW's earlier part number OP140.

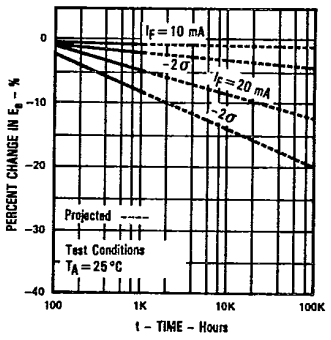
Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Reverse Voltage	2.0 V
Continuous Forward Current	50 mA
Peak Forward Current (Pulse Width = 1 μsec., 300 pps)	3.0 A
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]

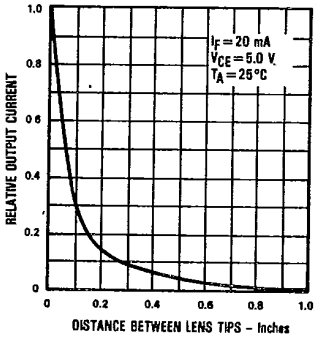
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering.
(2) Derate linearly 1.33 mW/°C above 25°C.
(3) $E_{e(APT)}$ is a measurement of the average apertured radiant incidence upon a sensing area 0.180" (4.57 mm) in diameter perpendicular to and centered on 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 OP140SL and OP550



Types OP140SL, OP140SLD, OP140SLC, OP140SLB, OP140SLA

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

Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
PO	Radiant Power Output	OP140SL		0.50		mW	I_F = 40 mA
E_e(APT)[3]	Apertured Radiant Incidence	OP140SL	0.020			mW/cm²	I_F = 20 mA
		OP140SLD	0.100		0.30	mW/cm²	I_F = 20 mA
		OP140SLC	0.20		0.40	mW/cm²	I_F = 20 mA
		OP140SLB	0.30		0.55	mW/cm²	I_F = 20 mA
		OP140SLA	0.40			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			40		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			550		ns	

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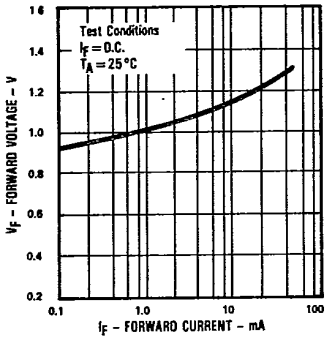
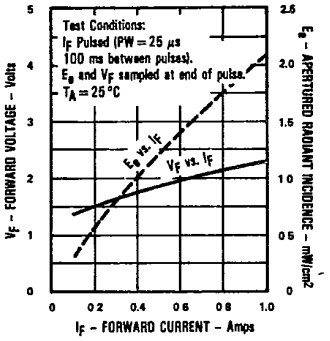
Typical Performance Curves

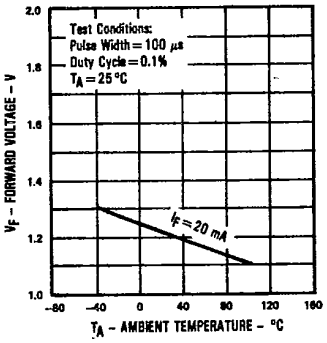
Forward Voltage vs Forward Current



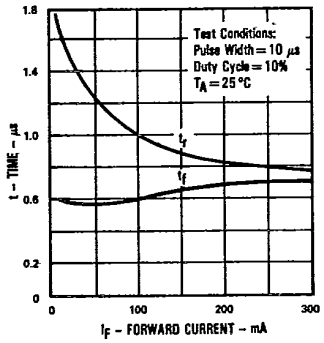
Forward Voltage and Radiant Incidence vs Forward Current



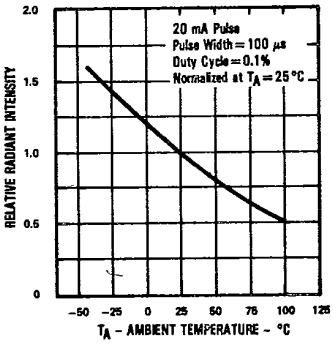
Forward Voltage vs Ambient Temperature



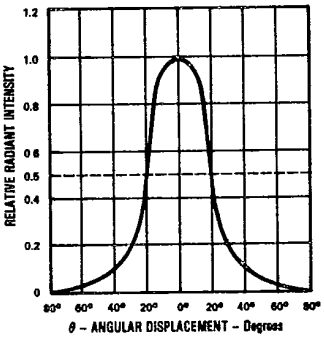
Rise Time and Fall Time vs Forward Current



Relative Radiant Intensity vs Ambient Temperature



Relative Radiant Intensity vs Angular Displacement



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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