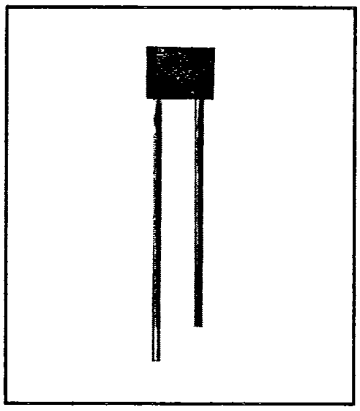
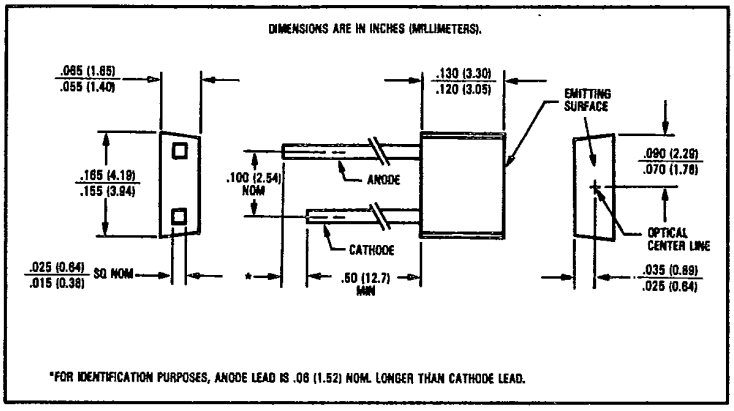
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5051
January 1985

GaAs Plastic Infrared Emitting Diodes
Types OP168F, OP168FC, OP168FB, OP168FA





Features
- Flat lensed for wide radiation angle
- Easily stackable on 0.100 inch (2.54 mm) hole centers
- Mechanically and spectrally matched to the OP508F- series phototransistor and the OP538F series of photodarlingtons

Description
The OP168F series are gallium arsenide infrared emitting diodes molded in an "end emitting" miniature black plastic package. This device has a wide radiation angle due to its flat emitting surface. Small size and 0.100 (2.54 mm) lead spacing allow considerable design flexibility.

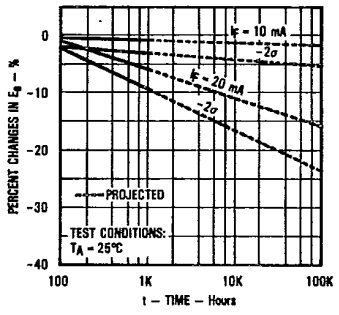
Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Continuous Forward Current	60 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]

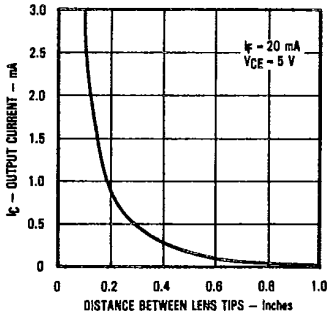
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds max. when flow soldering.
(2) Derate linearly 1.33 mW/°C above 25°C.
(3) $E_{e(APT)}$ is a measurement of the average apertured radiant energy incident upon a sensing area 0.081" (2.06 mm) in diameter perpendicular to and centered on the mechanical axis of the "emitting surface" and 0.400" (10.16 mm) from the measurement surface. $E_{e(APT)}$ is not necessarily uniform within the measured area.

Typical Performance Curves

Percent Changes in Radiant Intensity vs. Time



Coupling Characteristics of OP168F and OP508F/OP538F



Types OP168F, OP168FC, OP168FB, OP168FA

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

Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
$E_{e[APT]}$[3]	Apertured Radiant Incidence	OP168F	0.20			mw/cm²	I_F = 20 mA
		OP168FC	0.34			mW/cm²	I_F = 20 mA
		OP168FB	0.43		0.79	mW/cm²	I_F = 20 mA
		OP168FA	0.48			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
λp	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			+0.20		nm/°C	I_F = Constant
θ_{HP}	Emission Angle at Half Power Points			104		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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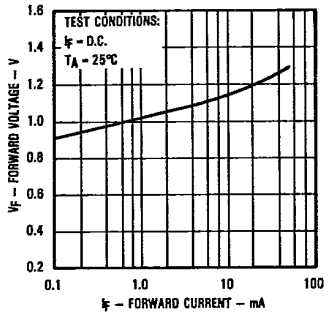
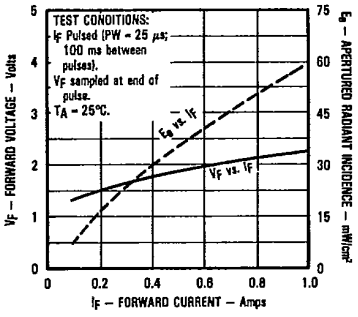
Typical Performance Curves

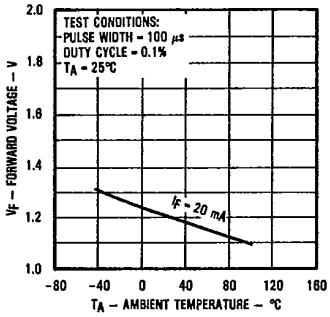
Forward Voltage vs. Forward Current



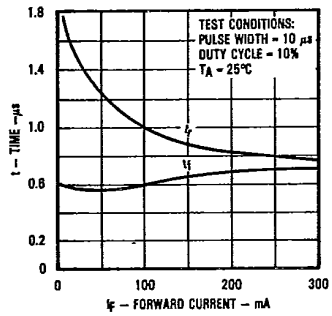
Forward Voltage and Radiant Incidence vs. Forward Current



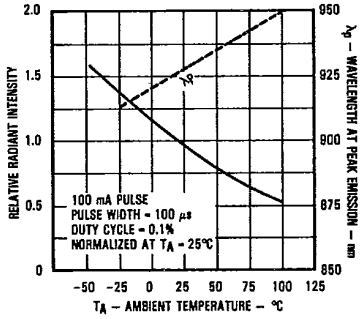
Forward Voltage vs. Ambient Temperature



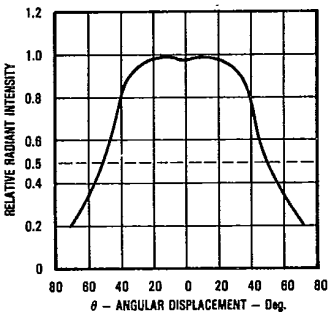
Rise Time and Fall Time vs. Forward Current



Relative Radiant Intensity and Wavelength at Peak Emission vs. Ambient Temperature



Relative Radiant Intensity vs. Angular Displacement



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