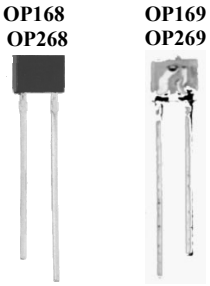
Plastic Infrared Emitting Diode

OP168F, OP169, OP268F, OP269 Series

Features:

- Flat lens for wide radiation angle (OP168, OP268)
- Integral lens for narrow beam angle (OP169, OP269)
- Easily stackable on 0.100" (2.54 mm) hole centers
- Mechanically and spectrally matched to other OPTEK devices



Description:

Each diode in this series is molded into an end-looking plastic package. The package for all **OP168F** and **OP268F** devices is black, whereas the package for all **OP169** and **OP269** packages is clear. **OP168F** and **OP169** devices are GaAs. **OP268F** and **OP269** devices are GaAlAs.

The **OP268FPS** is an 850nm gallium aluminum arsenide infrared emitting diode molded in a end-looking miniature plastic package. The advantage of this emitter is that it emits photons from a 0.004" area that is aligned with the package optical centerline. Unlike other GaAlAs emitters, this device performs more like an ideal point source and is suitable for use with lenses to create collimated light sources that can be used in a variety of applications.

Due to their small size, all diodes in this series offer considerable design flexibility.

The OP168F and OP268F series are mechanically and spectrally matched to the OP508F series phototransistor and the OP538F series photodarlingtons. The OP169 and OP269 series are mechanically and spectrally matched to the OP509 series phototransistors.

Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

For custom screening contact your OPTEK representative.

Applications:

- Space-limited applications
- Excellent design flexibility
- PCBoard mounted slotted switch
- PCBoard interrupter

Ordering Information			
Part Number	LED Peak Wavelength	Total Beam Angle	Lead Length
OP168FA	935 nm	104°	0.50"
OP168FB			
OP168FC			
OP169A	935 nm	18°	
OP169B			
OP169C			
OP268FA	890 nm	104°	
OP268FB			
OP268FC			
OP268FPS	850 nm	50°	
OP269A	890 nm	18"	
OP269B			
OP269C			

RoHS

General Note
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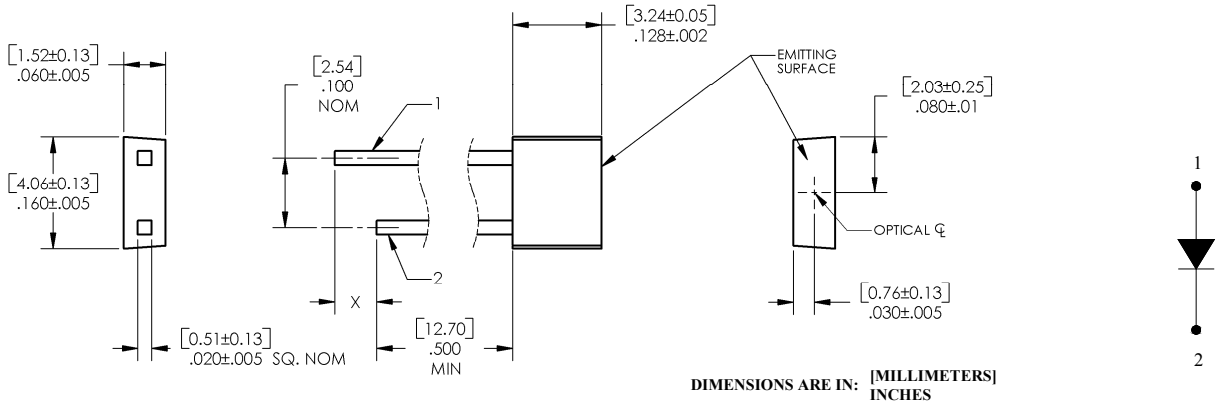
Plastic Infrared Emitting Diode

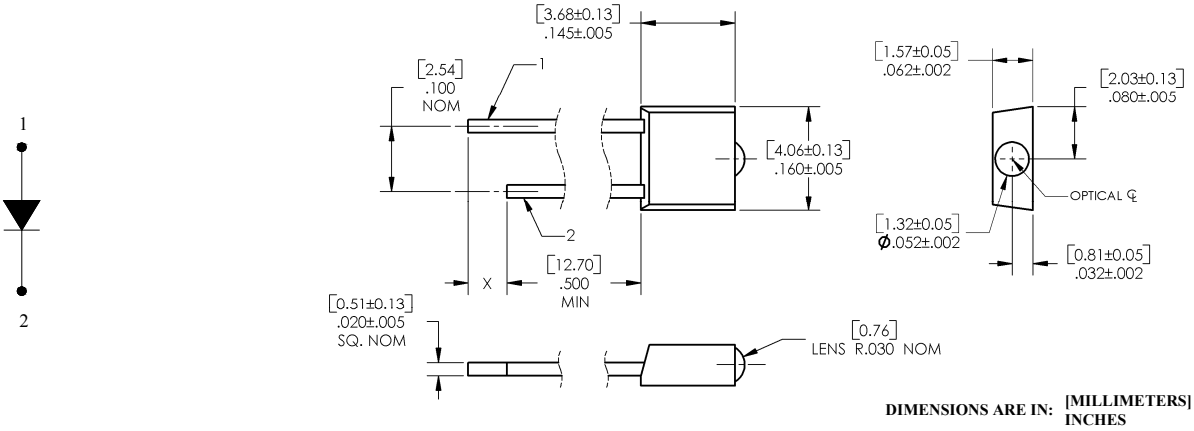
OP168F, OP169, OP268F, OP269 Series

OP168F (A, B, C), OP268F (A, B, C, PS)



Pin #	LED X=0.060" (1.5 mm)
1	Anode
2	Cathode

OP169 (A, B, C), OP269 (A, B, C)



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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)	
Storage and Operating Temperature Range	-40° C to +100° C
Reverse Voltage	2.0 V
Continuous Forward Current	50 mA
Peak Forward Current (1 µs pulse width, 300 pps) OP168, OP169, OP268, OP269 (A, B, C) OP268FPS	 3.0 A 100 mA
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron][1]	260° C
Power Dissipation[2]	100 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
$E_{E\ (APT)}$[3]	Apertured Radiant Incidence OP168FA OP168FB OP168FC OP169A OP169B OP169C OP268FA OP268FB OP268FC OP268FPS OP269A OP269B OP269C	 0.48 0.43 0.27 0.18 0.11 0.03 0.64 0.45 0.36 0.10 0.58 0.42 0.34	 - - - - - - - - - - - - - -	 - 0.73 - - 0.22 - - 0.99 - 0.90 - 0.82 -	mW/cm²	I_F = 20 mA Aperture = .081" dia. Distance = .400" from tip of lens to aperture surface
V_F	Forward Voltage OP168, OP169 OP268, OP269 OP268FPS	 - - -	 - - -	 1.40 1.50 1.80	V	I_F = 20 mA
I_R	Reverse Current OP168, OP169, OP268, OP269 OP268FPS	 - -	 - -	 100 20	µA	V_R= 2.0 V
λ_P	Wavelength at Peak Emission OP168, OP169 OP268, OP269 OP268FPS	 - - -	 935 890 850	 - - -	nm	I_F = 20 mA

Notes:
1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum of 20 grams force may be applied to the leads when soldering.
2. Derate linearly 1.33 mW/° C above 25° C.
3. For OP168 (FA, FB, FC) and OP268 (FA, FB, FC), $E_{E(APT)}$ 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 lens and 0.400" (10.16 mm) from the measurement surface. For OP169 (A, B, C) and OP269 (A, B, C), $E_{E(APT)}$ is a measurement of the average apertured radiant energy incident 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. NOTE: $E_{E\ (APT)}$ 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.

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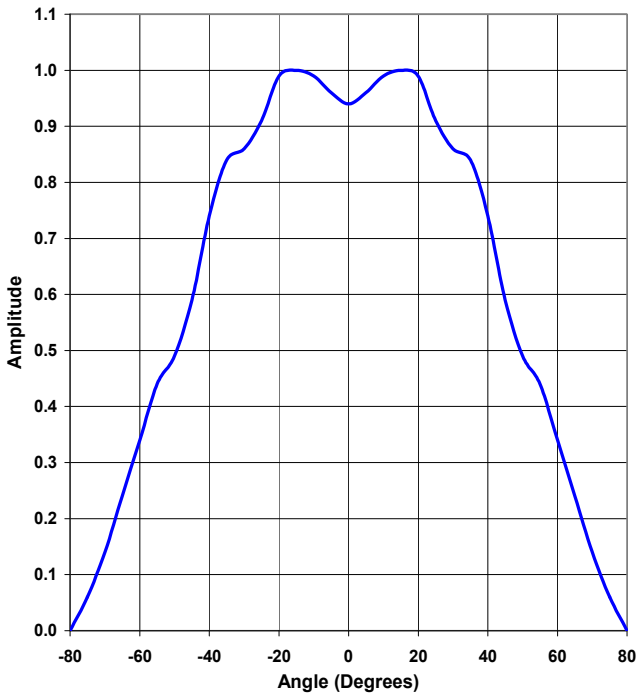
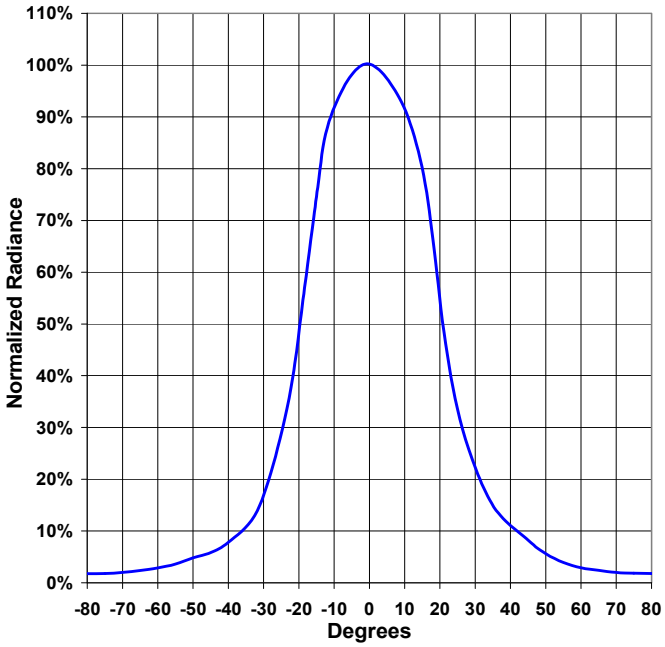
Electrical Characteristics (T_A = 25° C unless otherwise noted— for reference only)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
B	Spectral Bandwidth between Half Power Points OP168, OP169, OP268FPS OP268, OP269	- -	50 80	- -	nm	I_F = 10 mA
$\Delta\lambda_P/\Delta T$	Spectral Shift with Temperature OP168, OP169, OP268, OP269	- -	±0.30 ±0.18	- -	nm/°C	I_F = Constant
θ_{HP}	Emission Angle at Half Power Points OP168 OP169 OP268 OP268FPS OP269	- - - - -	104° 46° 104° 50° 46°	- - - - -	Degree	I_F = 20 mA
t_r	Rise Time OP168, OP169 OP268, OP269 OP268FPS	- - -	1000 500 10	- - -	ns	$I_{F(PK)}$=100 mA, PW=10 µs, D.C.=10%
t_f	Fall Time OP168, OP169 OP268, OP269 OP268FPS	- - -	500 250 10	- - -	ns	$I_{F(PK)}$=100 mA, PW=10 µs, D.C.=10%

Beam Angle OP168 & OP268 Package



Beam Angle OP169 & OP269 Package



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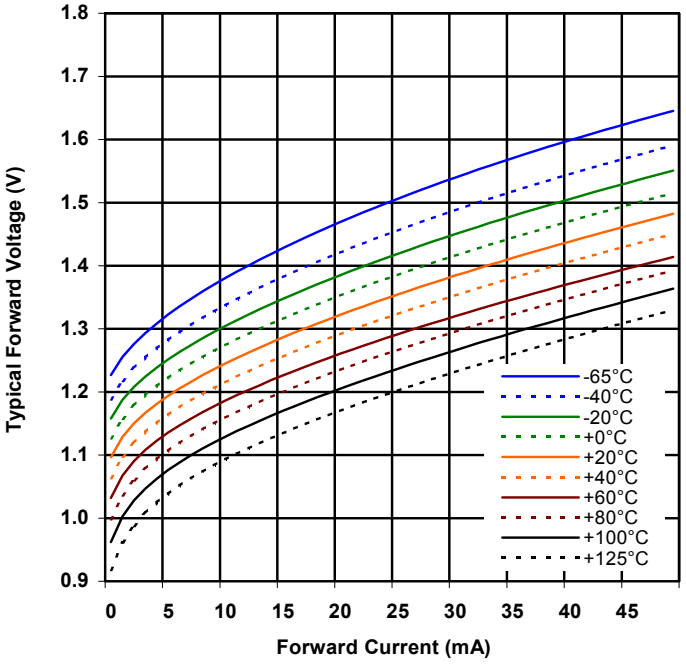
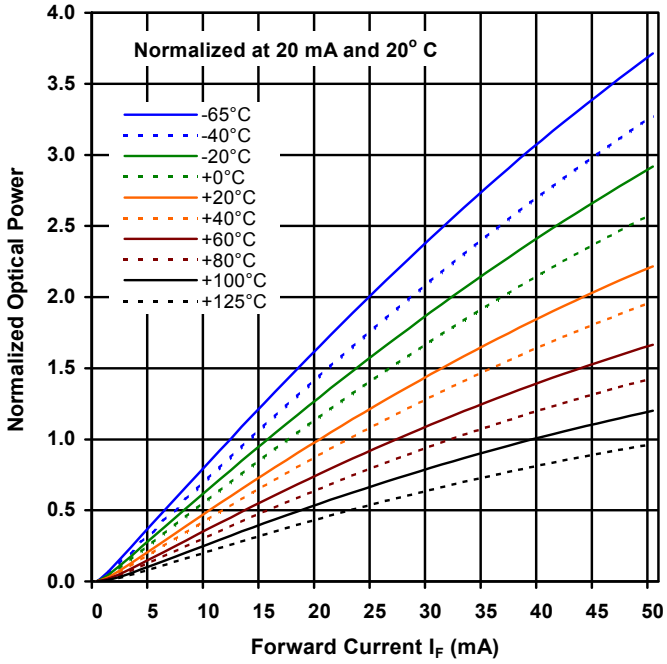
Performance

OP168 (FA, FB, FC), OP169 (A, B, C)

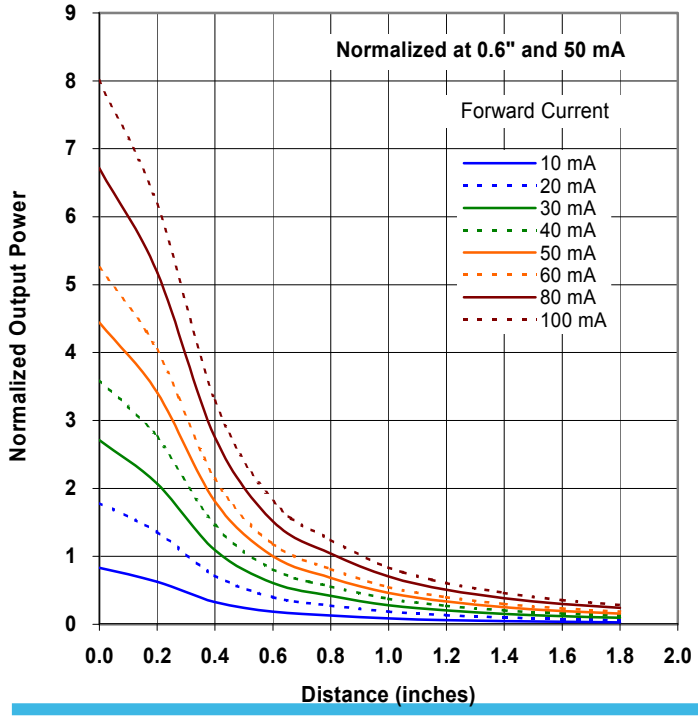
Forward Voltage vs Forward Current vs Temperature



Optical Power vs I_F vs Temp



Distance vs Output Power vs Forward Current



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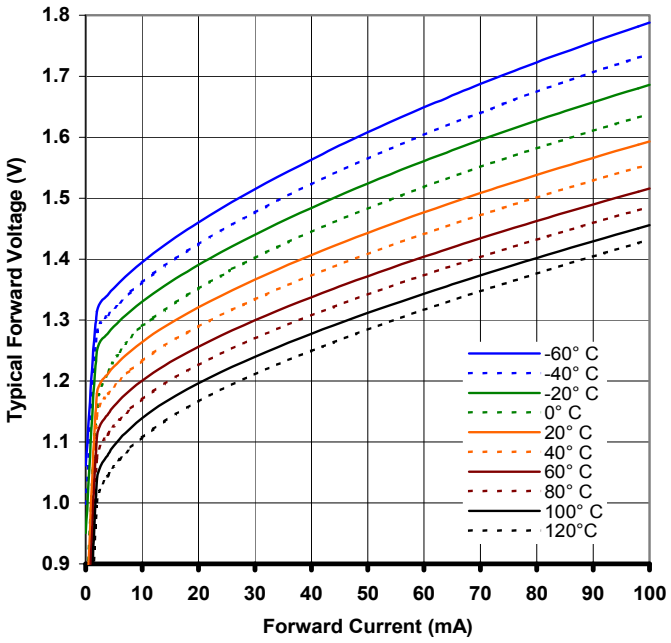
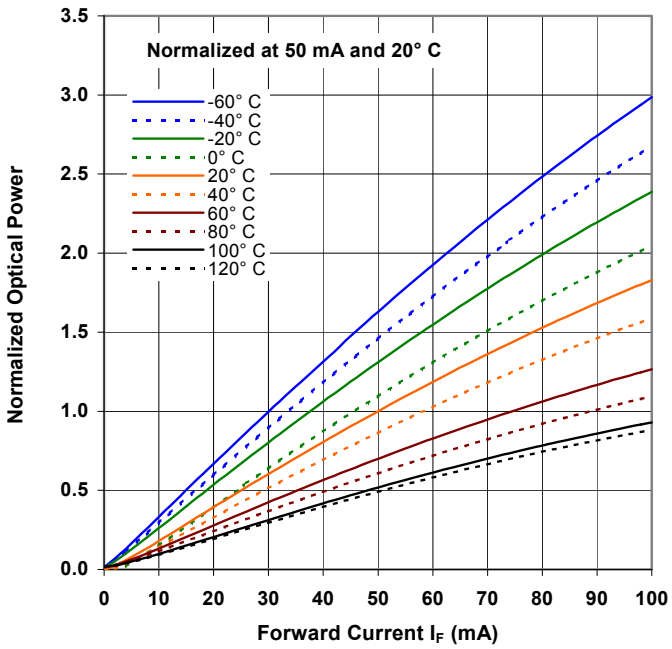
Performance

OP268 (FA, FB, FC, FPS), OP269 (A, B, C)

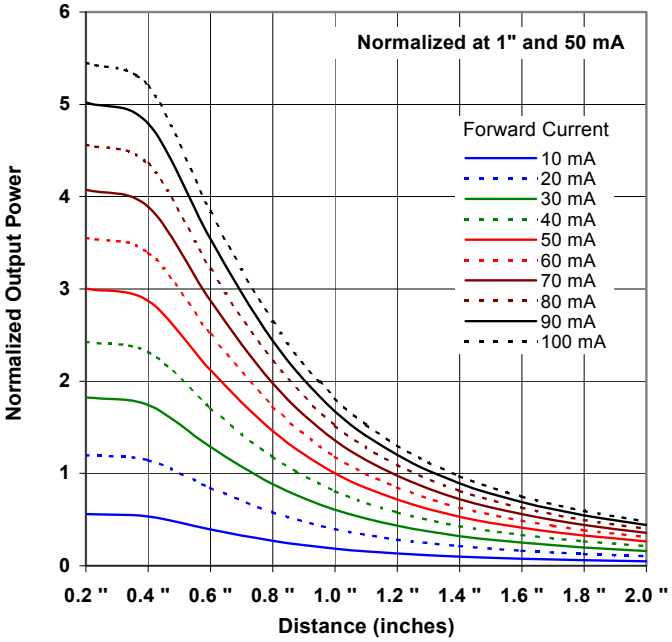
Forward Voltage vs Forward Current vs Temperature



Optical Power vs I_F vs Temperature



Distance vs Output Power vs Forward Current



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