Plastic Infrared Emitting Diode

OP165 Series, OP166A, OP166B

Features:

- T-1 (3 mm) package style
- Choice of narrow or wide irradiance pattern
- Choice of dome lens or flat lens
- Mechanically and spectrally matched to other OPTEK devices
- 935 nm LED

Description:

Each device in the **OP165** and **OP166** series is a high intensity gallium arsenide (GaAs) infrared emitting diode that is molded in an IR transmissive clear epoxy package with either a dome or flat lens. Devices feature narrow and wide irradiance patterns and a variety of electrical characteristics. The small T-1 package style makes these devices ideal for space-limited applications.

OP165 and OP166 devices are mechanically and spectrally matched to the OP505 and OP535 sensor series devices.

Please refer to Application Bulletin 210 for additional thermal design information.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

Applications:

- Space-limited applications
- Applications requiring coupling efficiency
- Battery-operated or voltage-limited applications

Ordering Information					
Part Number	**LED Peak Wavelength**	**Output Power (mW/cm²) Min / Max**	**I_F (mA) Typ / Max**	**Total Beam Angle**	**Lead Length (Min)**
OP165A	935 nm	1.95 / NA	20 / 50	18°	0.50"
OP165B		1.40 / 2.20			
OP165C		0.85 / 1.60			
OP165D		0.28 / NA			
OP165W		0.50 / NA		90°	
OP166A		1.95 / NA		18°	
OP166B		1.40 / 2.20			

RoHS

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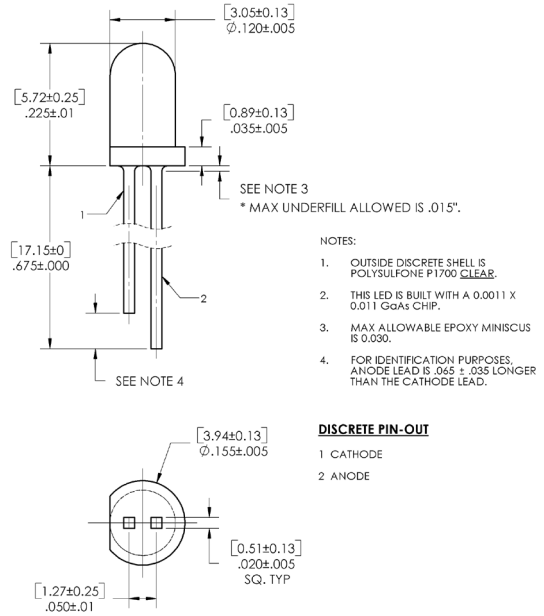
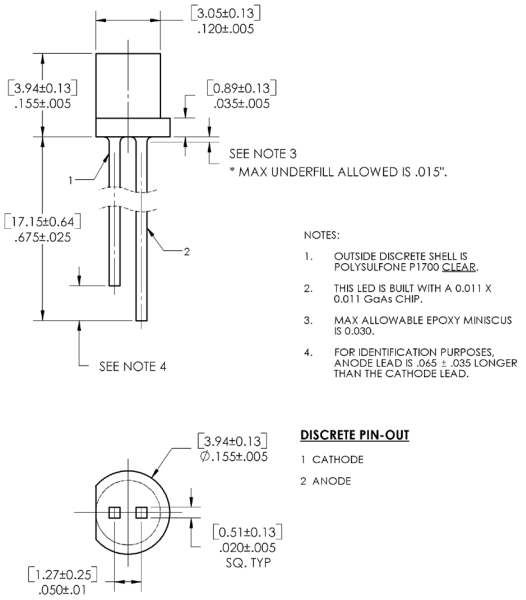
Plastic Infrared Emitting Diode

OP165 Series, OP166A, OP166B

OP165 (A, B, C, D)

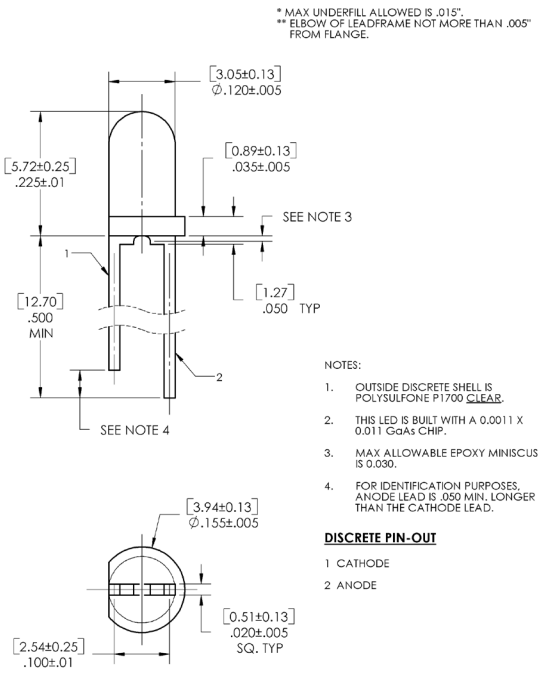


OP165W



DIMENSIONS ARE IN: **[MILLIMETERS]**
INCHES

OP166 (A, B)



Pin #	LED
1	Cathode
2	Anode

CONTAINS POLYSULFONE

To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK'S molded plastics.

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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)	3.0 A
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 seconds with soldering iron]	260° C
Power Dissipation (1)	100 mW

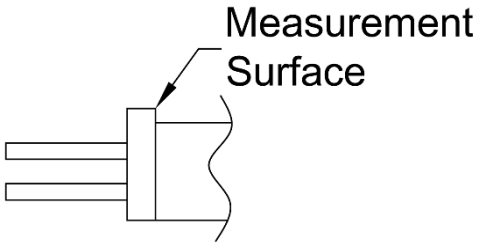
Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
$E_{E(APT)}$ (2)	Apertured Radiant Incidence OP165A, OP166A	1.95	-	-	mW/cm²	I_F = 20 mA
P_O	Radiant Power Output OP165W	0.50	-	-	mW	I_F = 20 mA
V_F	Forward Voltage	1.00	-	1.60	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
λ_P	Wavelength at Peak Emission	-	935	-	nm	I_F = 10 mA
β	Spectral Bandwidth between Half Power Points	-	50	-	nm	I_F = 10 mA
$\Delta\lambda_P/\Delta_T$	Spectral Shift with Temperature OP165 (A, B, C, D), OP166 (A, B) OP165W	- -	±0.30 ±0.30	- -	nm/° C	I_F = Constant
θ_{HP}	Emission Angle at Half Power Points OP165 (A, B, C, D), OP166 (A, B) OP165W	- -	18 90	- -	Degree	I_F = 20 mA
t_r	Output Rise Time	-	1000	-	ns	$I_{F(PK)}$ = 100 mA, PW = 10 µs, D.C. = 10.0 %
t_f	Output Fall Time	-	500	-	ns	

Notes:

(1) Derate linearly 1.07 mW/° C above 25° C.

(2) $E_{E(APT)}$ 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. $E_{E(APT)}$ is not necessarily uniform within the measured areas.



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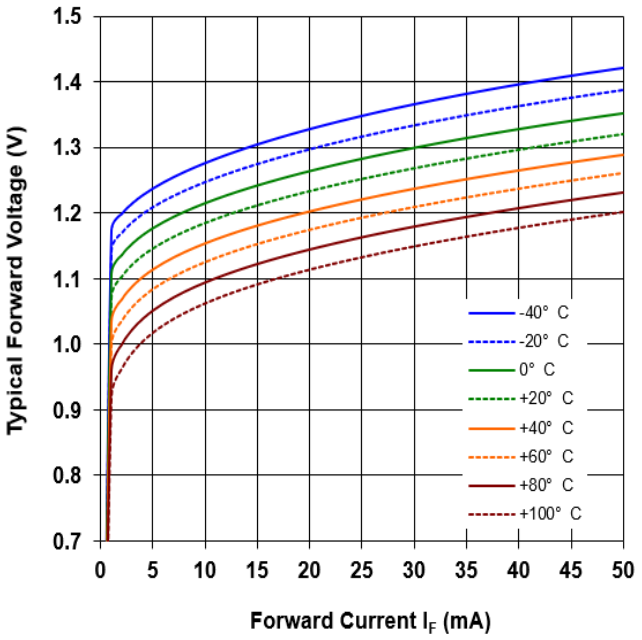
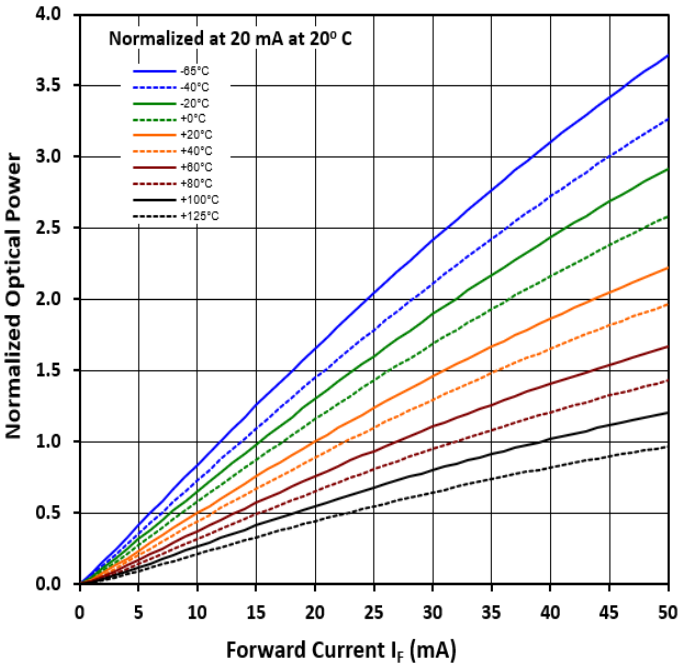
Typical Performance

OP165 (A, B, C, D), OP166 (A, B)

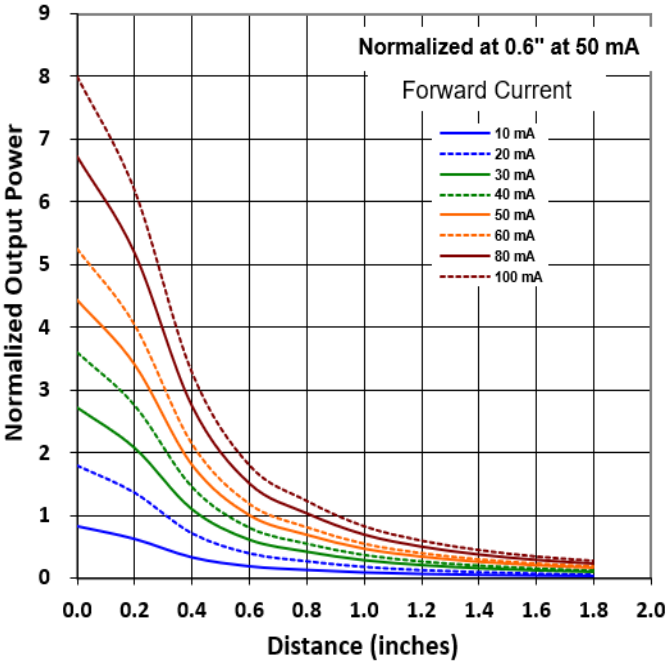
LED Forward Current vs Forward Voltage vs Temp



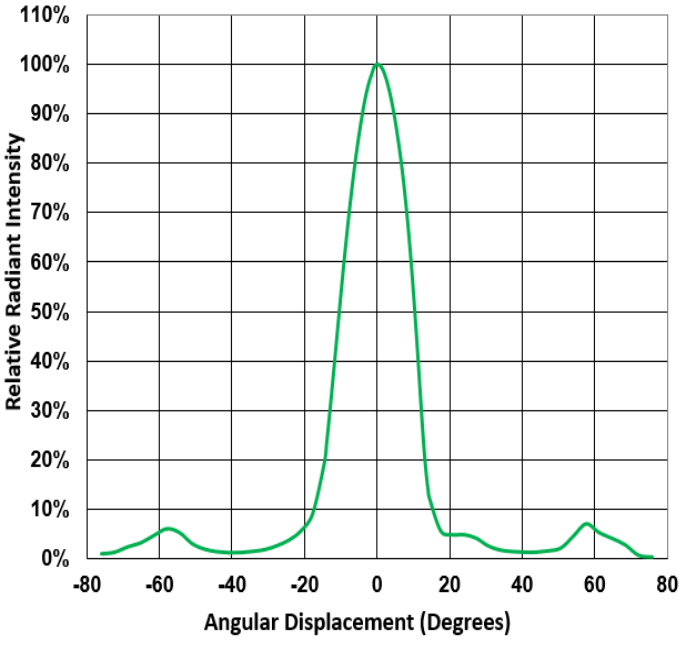
Optical Power vs I_F vs Temperature



Distance vs Output Power vs I_F



Radiant Intensity vs Angular Displacement



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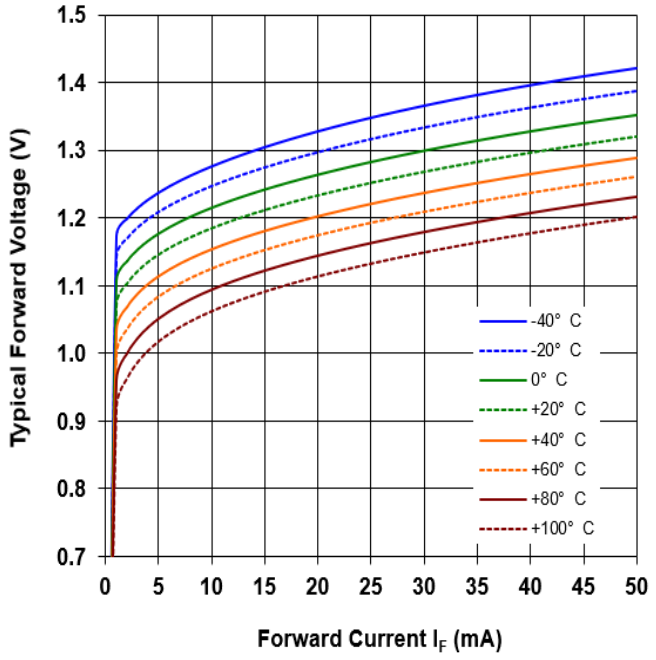
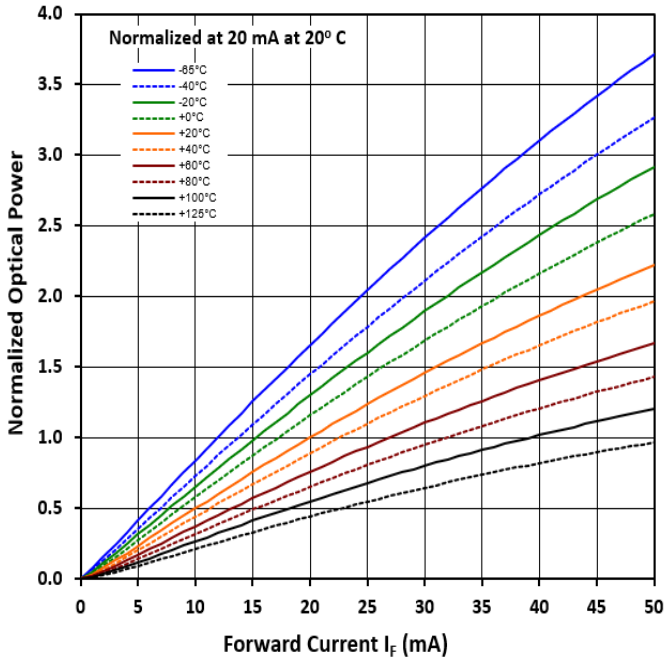
Typical Performance

OP165 (W)

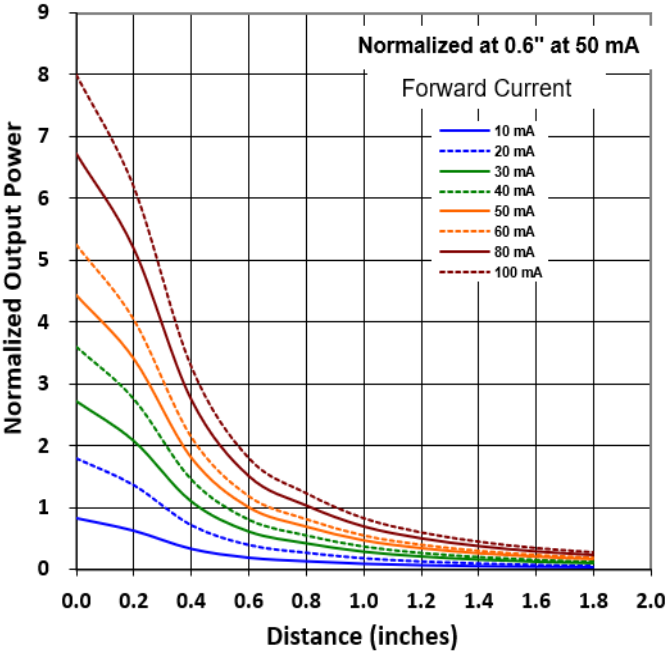
LED Forward Current vs Forward Voltage vs Temp



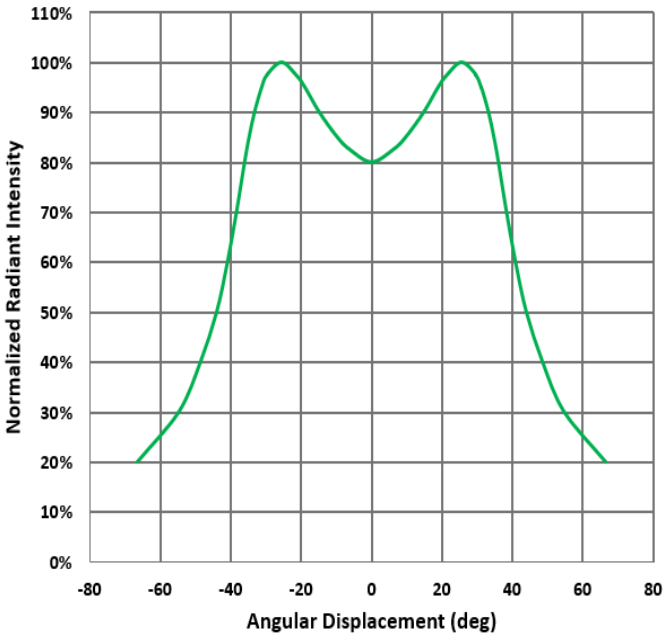
Optical Power vs I_F vs Temperature



Distance vs Output Power vs I_F



Radiant Intensity vs Angular Displacement



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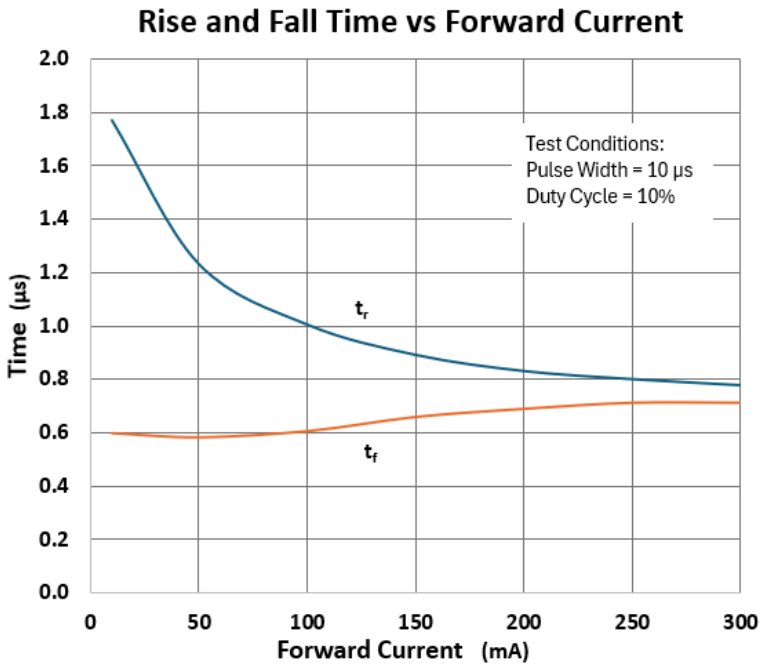
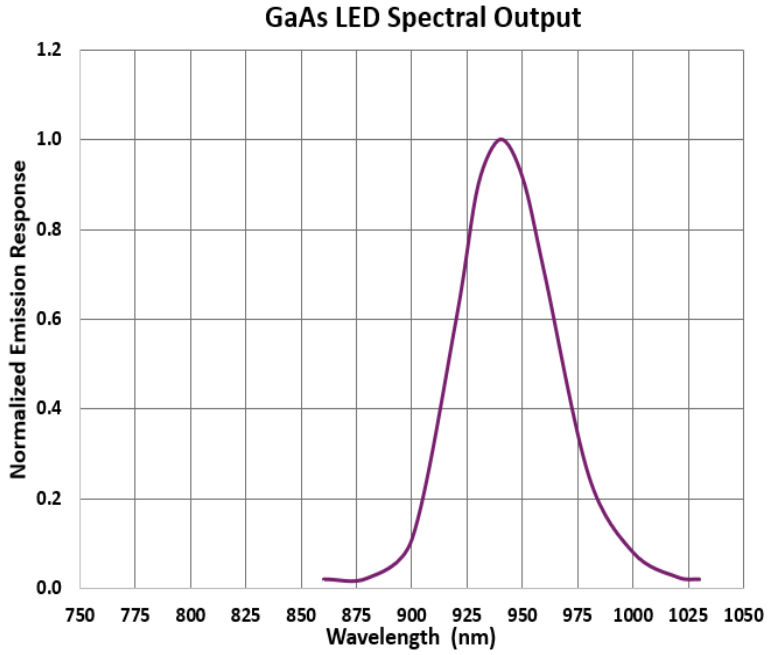
Typical Performance

OP165, OP166, OP165W





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