

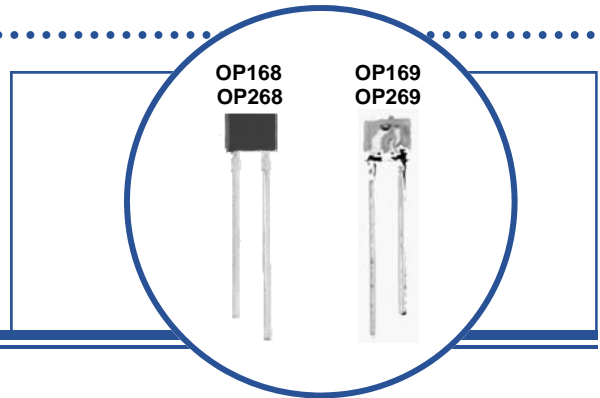
Plastic Infrared Emitting Diode

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 GaAIAs.

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 GaAIAs 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 photodarlington. 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

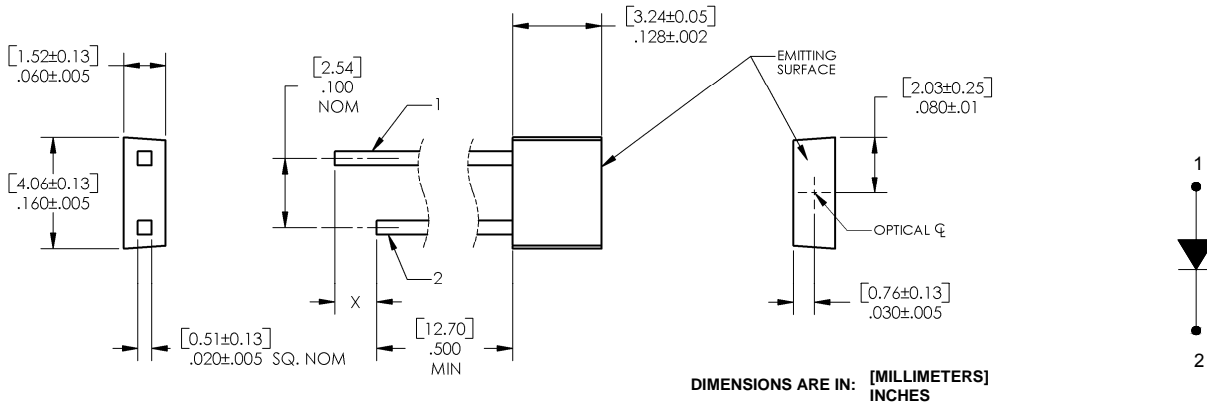
| Ordering Information | | | |
|----------------------|---------------------|------------------|-------------|
| Part Number | LED Peak Wavelength | Total Beam Angle | Lead Length |
| OP168FA | 935 nm | 104° | 0.50" |
| OP168FB | | | |
| OP168FC | | | |
| OP169A | 935 nm | 18° | |
| OP169B | | | |
|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



RoHS

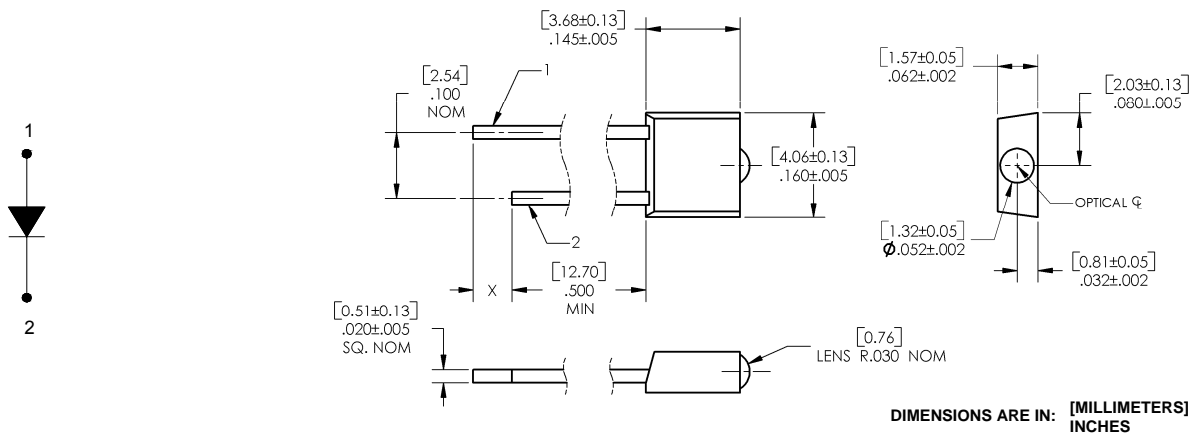
OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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



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

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



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

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Plastic Infrared Emitting Diode
OP168F, OP169, OP268F, OP269 Series



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

Input Diode

| | | | | | | |
|--------------------|--|------|-----|-----------|--------------------|--|
| $E_{E(APT)}^{(3)}$ | Apertured Radiant Incidence | | | | | $I_F = 20\text{ mA}$ Aperture = .081" dia. Distance = .400" from tip of lens to aperture surface |
| | OP168FA | 0.48 | - | - | mW/cm ² | |
| | OP168FB | 0.43 | - | 0.73 | | |
| | OP168FC | 0.27 | - | - | | |
| | OP169A | 0.18 | - | - | | |
| | OP169B | 0.11 | - | 0.22 | | |
| | OP169C | 0.03 | - | - | | |
| | OP268FA | 0.64 | - | - | | |
| | OP268FB | 0.45 | - | 0.99 | | |
| | OP268FC | 0.36 | - | - | | |
| | OP268FPS | 0.10 | - | 0.90 | | |
| | OP269A | 0.58 | - | - | | |
| | OP269B | 0.42 | - | 0.82 | | |
| OP269C | 0.34 | - | - | | | |
| V_F | Forward Voltage | | | | V | $I_F = 20\text{ mA}$ |
| | OP168, OP169 | - | - | 1.40 | | |
| | OP268, OP269 | - | - | 1.50 | | |
| | OP268FPS | - | - | 1.80 | | |
| I_R | Reverse Current | | | | μA | $V_R = 2.0\text{ V}$ |
| | OP168, OP169, OP268, OP269 OP268FPS | - | - | 100 20 | | |
| λ_P | Wavelength at Peak Emission | | | | nm | $I_F = 20\text{ mA}$ |
| | OP168, OP169 | - | 935 | - | | |
| | OP268, OP269 | - | 890 | - | | |
| | OP268FPS | - | 850 | - | | |

Notes:

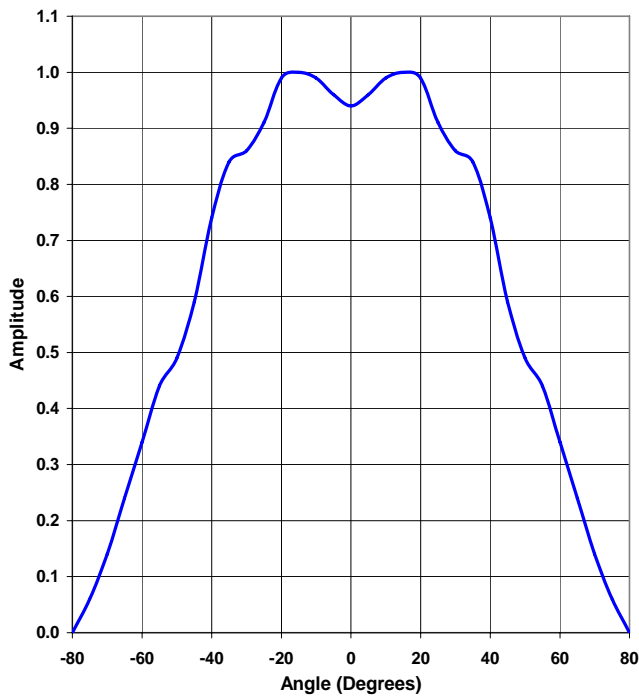
1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. A maximum of 20 grams force may be applied to the leads when soldering.
2. Derate linearly 1.33 mW/° C above 25° C.
3. For OP168 (FA, FB, FC) and OP268 (FA, FB, FC), $E_{E(APT)}$ is a measurement of the average 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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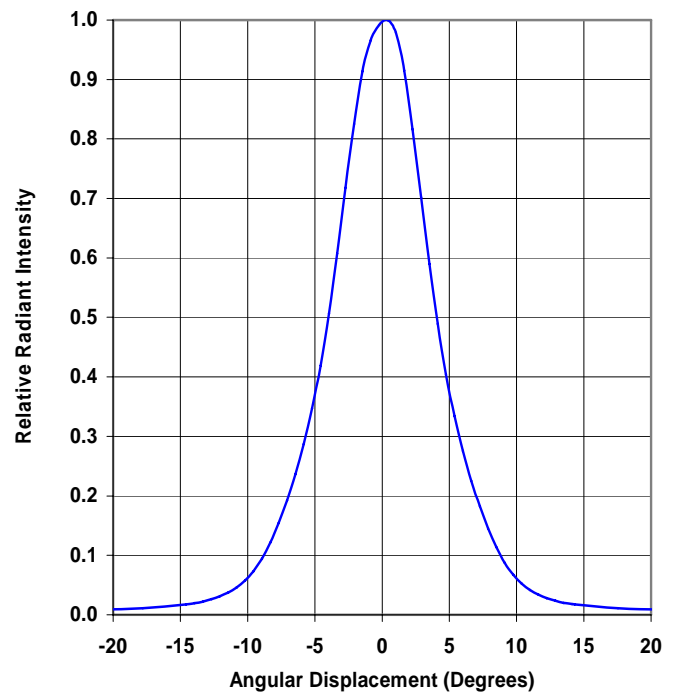
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted — for reference only)

| 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 | $I_F = 10 \text{ mA}$ |
| $\Delta\lambda_P / \Delta T$ | Spectral Shift with Temperature OP168, OP169, OP268, OP269 | - | ± 0.30 ± 0.18 | - | nm/ $^\circ\text{C}$ | $I_F = \text{Constant}$ |
| θ_{HP} | Emission Angle at Half Power Points OP168 OP169 OP268 OP268FPS OP269 | - | 104 $^\circ$ 46 $^\circ$ 104 $^\circ$ 50 $^\circ$ 46 $^\circ$ | - | Degree | $I_F = 20 \text{ mA}$ |
| t_r | Rise Time OP168, OP169 OP268, OP269 OP268FPS | - | 1000 500 10 | - | ns | $I_{F(PK)} = 100 \text{ mA}$, PW=10 μs , D.C.=10% |
| t_f | Fall Time OP168, OP169 OP268, OP269 OP268FPS | - | 500 250 10 | - | ns | $I_{F(PK)} = 100 \text{ mA}$, PW=10 μs , D.C.=10% |

Beam Angle OP168 & OP268 Package

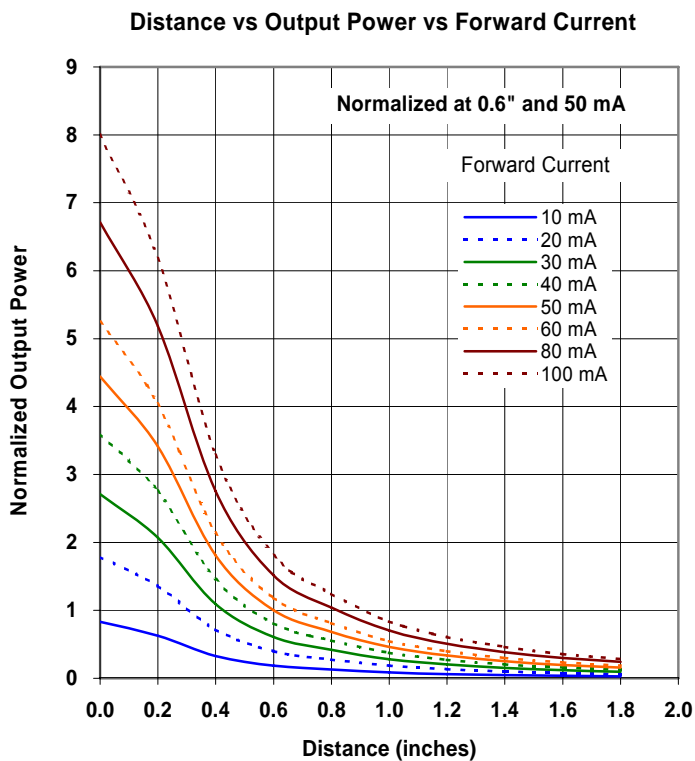
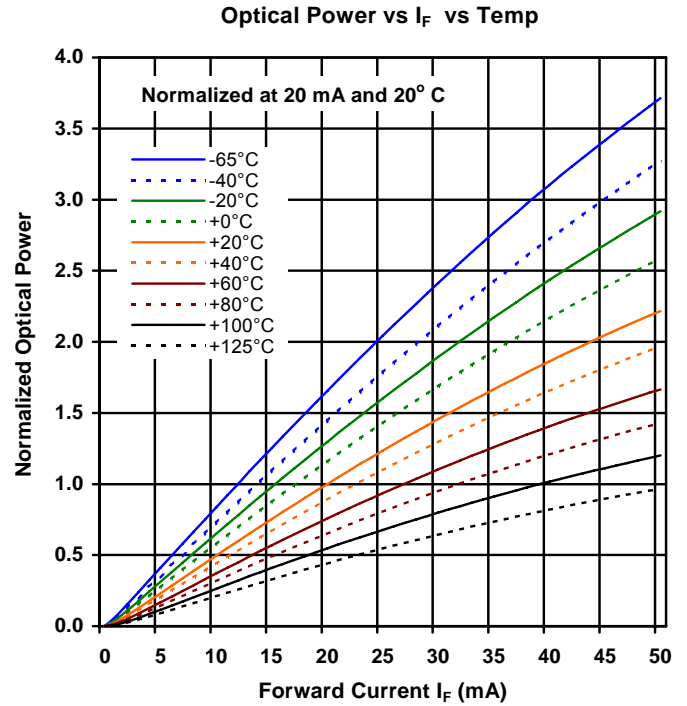
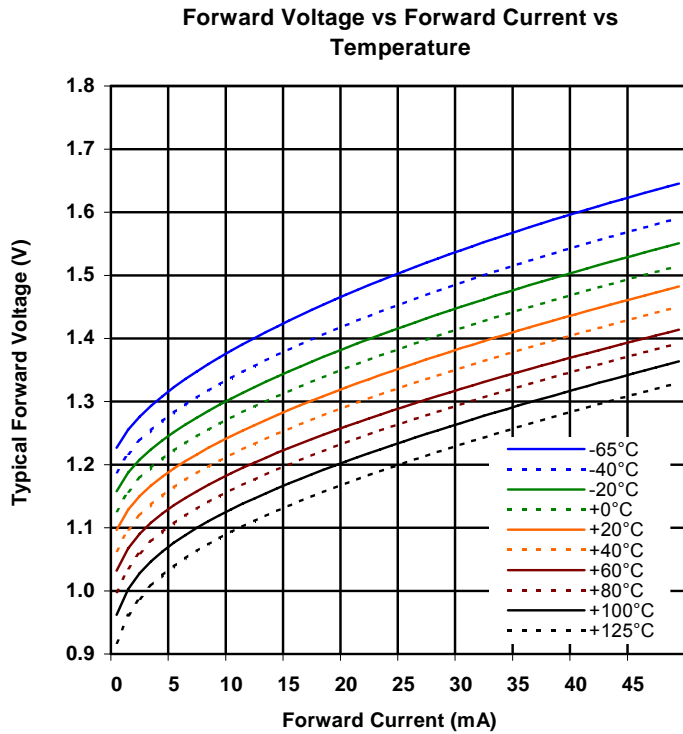


Beam Angle OP169 & OP269 Package



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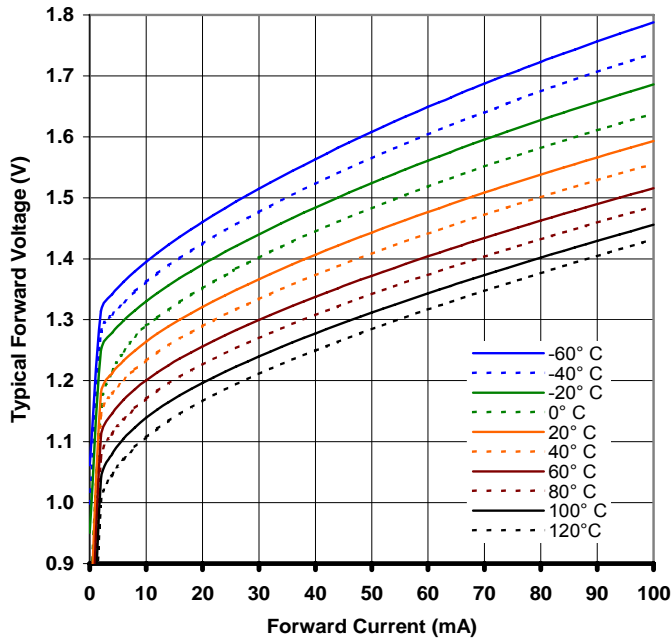
OP168 (FA, FB, FC), OP169 (A, B, C)



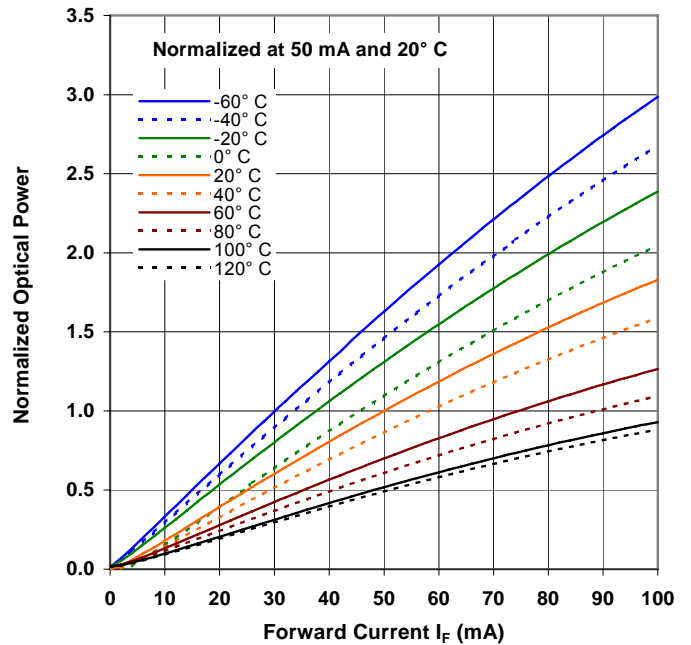
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OP268 (FA, FB, FC, FPS), OP269 (A, B, C)

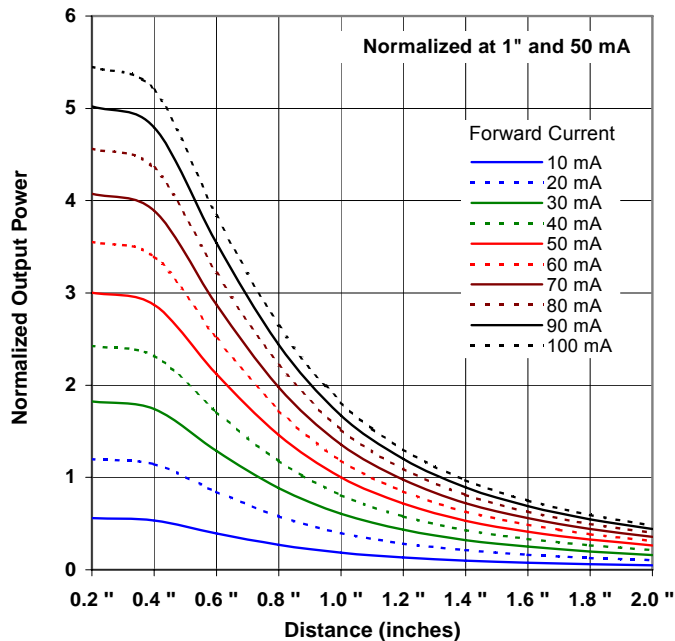
Forward Voltage vs Forward Current vs Temperature



Optical Power vs I_F vs Temperature



Distance vs Output Power vs Forward Current



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