

C30122

Infrared-Emitting Diode

Developmental Type

Gallium-Arsenide Type for Pulsed or Continuous DC Operation



H-1760

RCA C30122 is a gallium arsenide solid state diode which emits, when forward biased, a beam of radiant flux at a wavelength of 904 nanometers. The C30122 is assembled using a glass lens to produce a narrow beam pattern.

These infrared emitting diodes are particularly well suited for operation in the pulsed operating mode. They are intended for use in a wide variety of industrial and military applications including high-speed sorting and counting, intrusion alarms, edge indicators, collision protection, optical coupling, data transmission, and photoelectric smoke-detection systems.

Variants of this device can be supplied with a removable cap on special requests.

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Absolute-Maximum Ratings¹

Pulsed Operation

Peak Forward Current, I_{FM} :

At $t_w = 2 \mu s$, $du = 0.2\%$ 10 A

Continuous DC Operation

DC Forward Current, I_{FM} :

At case temperatures up to $+125^\circ C$ 100 mA

Peak Reverse Voltage, V_{RM} 2 V

Temperature

Storage, T_{stg} -40 to $+150^\circ C$

Operating, Case, T_c -40 to $+150^\circ C$

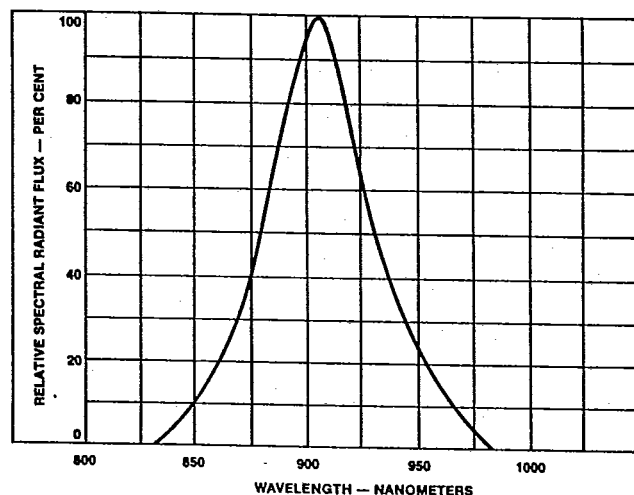
Soldering:

For 5 seconds $200^\circ C$

Limiting Values

¹ These ratings are limiting values of operating and environmental conditions. Exceeding these values can cause damage to the device.

- Wavelength of Peak Radiant Intensity - 904 nanometers
- Total Radiant Flux at $I_F = 100$ mA (Continuous Service) - 0.5 mW minimum
1.0 mW typical
- Hermetically-Sealed Two Lead "TO-18" Packages
- Peak Radiant Flux (Pulsed Service) - 10 mW typical at $I_F = 1$ A
100 mW typical at $I_F = 10$ A
- Half-Angle Beam Spread at 50% Intensity Points - 8 degrees



LS-8171

Figure 1 - Typical Spectral Radiant Flux

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CharacteristicsAt Case Temperature $T_C = 27^\circ \text{C}$ **Pulsed Service**For $t_w = 1 \mu\text{s}$, $du = 0.05\%$,
and $prr = 500 \text{ p/s}$ Peak Radiant Flux, Φ_M :At $I_F = 1 \text{ A}$ - 10 - mWAt $I_F = 10 \text{ A}$ - 100 - mWPeak Forward Voltage, V_{FM} :At $I_F = 10 \text{ A}$ - 7.5 - V**Continuous Service**Forward Voltage Drop, V_F :At $I_F = 100 \text{ mA}$ - 1.3 1.5 VRadiant Flux, Φ :At $I_F = 100 \text{ mA}$ 0.5 1.0 - mW**Switching Characteristics**Rise Time of Emitted Pulse,
 t_r (10% to 90%) - 20 - nsFall Time of Emitted Pulse,
 t_f (90% to 10%) - 20 - ns**Frequency Response**

Bandwidth:

At $I_F = 50 \text{ mA}$ - 15 - MHz $I_F = 25 \text{ mA p-p}$ - - -**Beam Characteristics**

For Continuous or Pulsed Operation

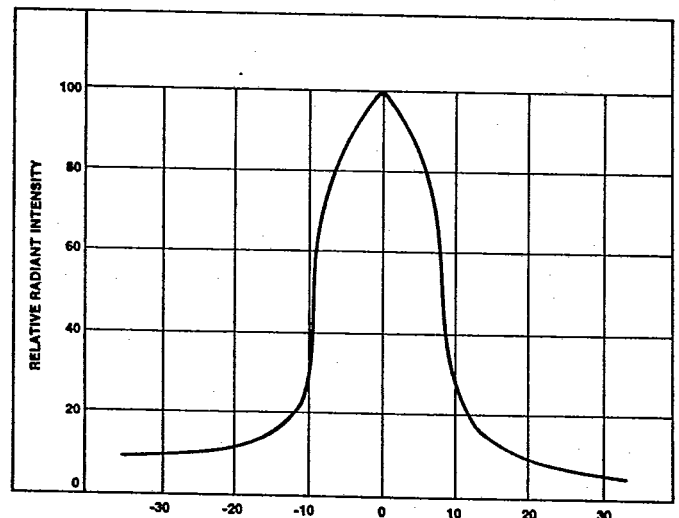
Wavelength of Peak

Radiant Intensity - 904 - nm

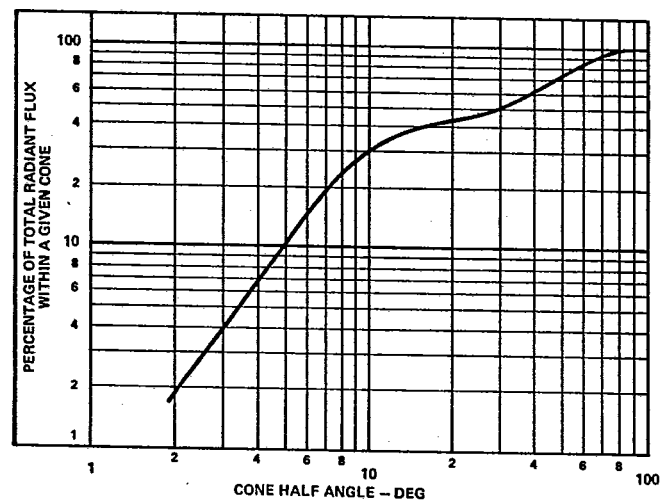
Spectral Line Width Between

Half Intensity Points - 50 - nm

Half-Angle Beam Spread - See Figure 2 - deg



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Figure 2 - Typical Radiant Intensity vs
Angle From Central Axis of Diode

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Figure 3 - Percentage of Total Radiant Flux
Within a Given Cone Angle

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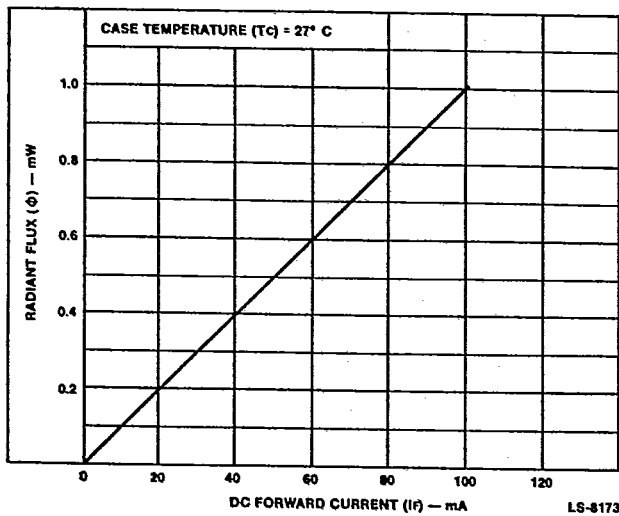


Figure 4 - Typical Radiant Flux vs DC Forward Current

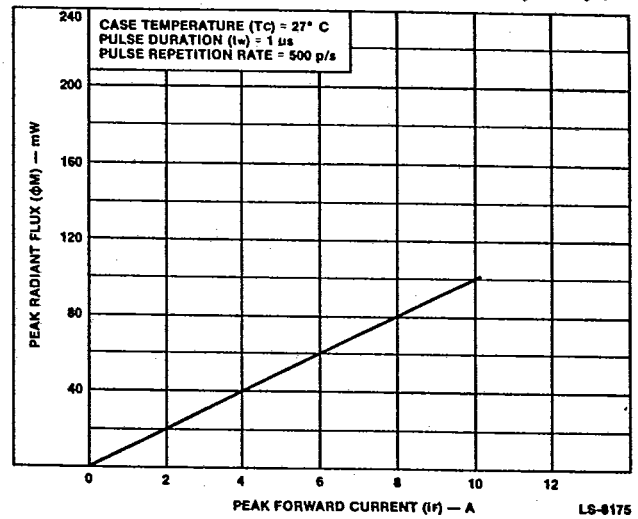


Figure 6 - Peak Radiant Flux vs Peak Forward Current

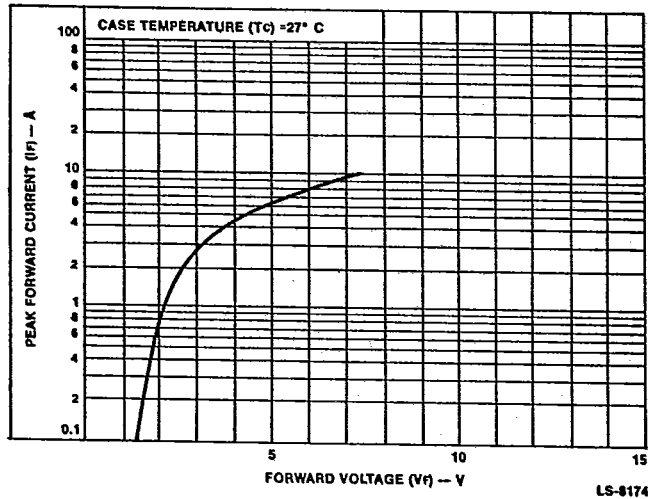


Figure 5 - Typical Forward Current vs Forward Voltage

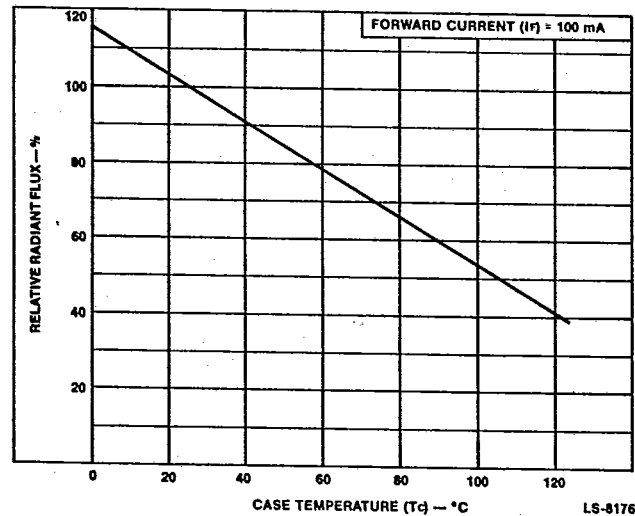


Figure 7 - Typical Relative Radiant Flux vs Case Temperature

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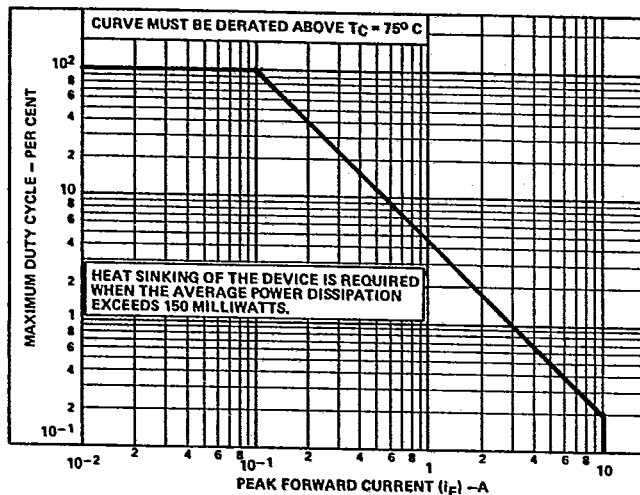


Figure 8 - Maximum Operating Area

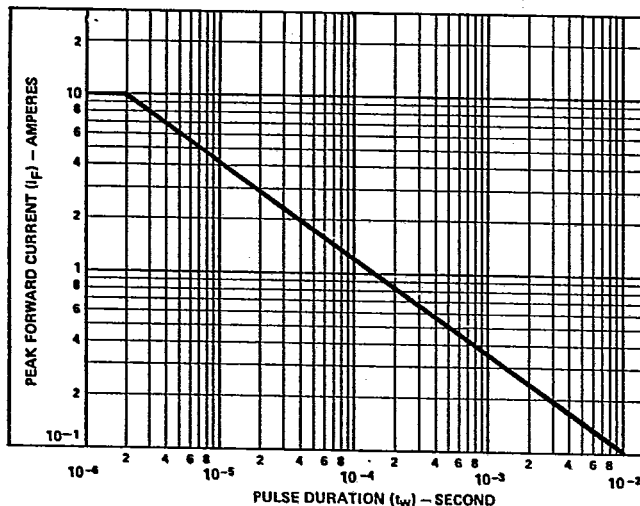
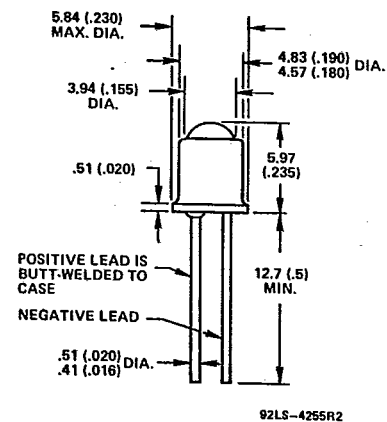


Figure 9 - Maximum Operating Area



Dimensions in millimeters. Dimensions in parentheses are in inches.

Figure 10 - Dimensional Outline

For further information or application assistance on this device, contact your RCA Sales Representative or write Solid State Emitters Marketing, RCA, Lancaster, PA 17604-3140.

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Printed in U.S.A./8-84
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