

## HSDL - 4261

High-Power T-1¾ (5mm) AlGaAs Infrared (870nm) Lamp



### Data Sheet



#### Description

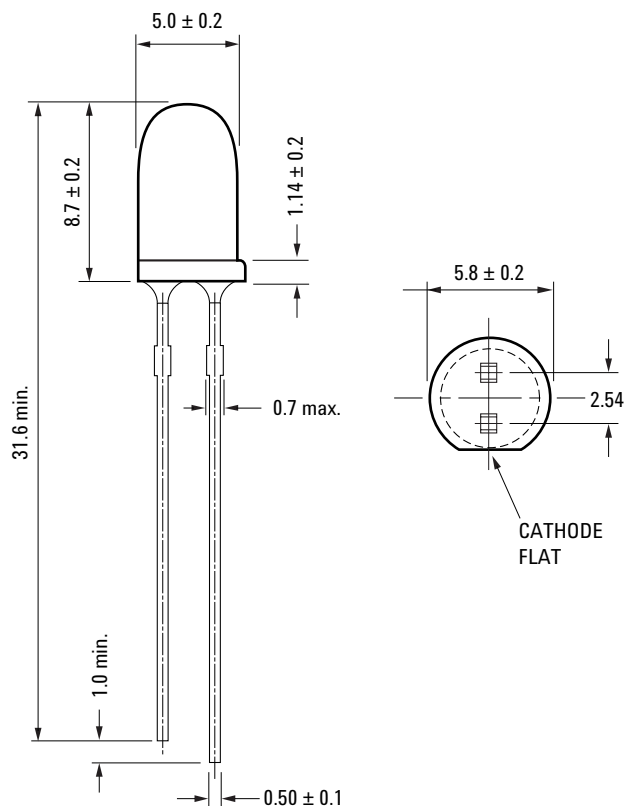
The HSDL-4261 Infrared emitter was designed for applications that require high power, low forward voltage and high speed. It utilizes Aluminum Gallium Arsenide (AlGaAs) LED technology and is optimized for speed and efficiency at emission wavelengths of 870nm. The material used produces high radiant efficiency over a wide range of currents. The emitter is packaged in clear T-1¾ (5mm) package.

#### Features

- Very High Power AlGaAs LED Technology
- 870nm Wavelength
- T-1¾ Package
- Low Cost
- Low Forward Voltage: 1.4V at 20mA
- High Speed: 15ns Rise Times

#### Applications

- Industrial IR Equipments
- IR Portable Instruments
- Consumer Electronics (Optical mouse etc)
- High Speed IR Communications (IR LANs, IR Modems, IR Dongles etc)
- IR Audio
- IR Telephones



|           | Lead Form | Shipping Option |
|-----------|-----------|-----------------|
| HSDL-4261 | Straight  | Bulk            |

**Absolute Maximum Ratings at 25°C**

| Parameter                  | Symbol            | Min. | Max           | Unit | Reference   |
|----------------------------|-------------------|------|---------------|------|-------------|
| DC Forward Current         | I <sub>FDC</sub>  | -    | 100           | mA   | [1], Fig. 2 |
| Power Dissipation          | P <sub>DISS</sub> | -    | 190           | mW   |             |
| Reverse Voltage            | V <sub>R</sub>    | 5    | -             | V    |             |
| Operating Temperature      | T <sub>O</sub>    | -40  | 70            | °C   |             |
| Storage Temperature        | T <sub>S</sub>    | -40  | 100           | °C   |             |
| LED Junction Temperature   | T <sub>J</sub>    | -    | 110           | °C   |             |
| Lead Soldering Temperature |                   | -    | 260 for 5 sec | °C   |             |

Notes:

1. Derate as shown in Figure 6.

**Electrical Characteristics at 25°C**

| Parameter                               | Symbol           | Min. | Typ.         | Max.       | Unit  | Condition                                         | Reference        |
|-----------------------------------------|------------------|------|--------------|------------|-------|---------------------------------------------------|------------------|
| Forward Voltage                         | V <sub>F</sub>   | -    | 1.4<br>1.7   | 1.5<br>1.9 | V     | I <sub>FDC</sub> =20mA<br>I <sub>FDC</sub> =100mA | Fig. 2<br>Fig. 3 |
| Forward VoltageTemperature Coefficient  | DV/DT            | -    | -1.5<br>-1.3 | -          | mV/°C | I <sub>FDC</sub> =20mA<br>I <sub>FDC</sub> =100mA | Fig. 4           |
| Series Resistance                       | R <sub>S</sub>   | -    | 4.1          | -          | Ohms  | I <sub>FDC</sub> =100mA                           |                  |
| Diode Capacitance                       | C <sub>O</sub>   | -    | 80           | -          | pF    | 0V, 1MHz                                          |                  |
| Reverse Voltage                         | V <sub>R</sub>   | 3    | 14           | -          | V     | I <sub>R</sub> =100uA                             |                  |
| Thermal Resistance, Junction to Ambient | R <sub>qja</sub> | -    | 280          | -          | °C/W  |                                                   |                  |

**Optical Characteristics at 25°C**

| Parameter                                         | Symbol                         | Min. | Typ.      | Max. | Unit  | Condition                                         | Reference |
|---------------------------------------------------|--------------------------------|------|-----------|------|-------|---------------------------------------------------|-----------|
| Radiant Optical Power                             | P <sub>O</sub>                 | -    | 9<br>45   | -    | mW    | I <sub>FDC</sub> =20mA<br>I <sub>FDC</sub> =100mA |           |
| Radiant On-Axis Intensity                         | I <sub>E</sub>                 | -    | 36<br>180 | -    | mW/Sr | I <sub>FDC</sub> =20mA<br>I <sub>FDC</sub> =100mA | Fig. 5    |
| Radiant On-Axis Intensity Temperature Coefficient | DI <sub>E</sub> /DT            | -    | -0.22     | -    | %/°C  | I <sub>FDC</sub> =100mA                           |           |
| Viewing Angle                                     | 2q <sub>1/2</sub>              | -    | 26        | -    | deg   | I <sub>FDC</sub> =20mA                            | Fig. 7    |
| Peak wavelength                                   | I <sub>PK</sub>                | -    | 870       | -    | nm    | I <sub>FDC</sub> =20mA                            | Fig. 1    |
| Peak wavelengthTemperature Coefficient            | DI/DT                          | -    | 0.18      | -    | nm/°C | I <sub>FDC</sub> =20mA                            |           |
| Spectral Width                                    | DI                             | -    | 47<br>52  | -    | nm    | I <sub>FDC</sub> =20mA<br>I <sub>FDC</sub> =100mA | Fig. 1    |
| Optical Rise and Fall Time                        | t <sub>r</sub> /t <sub>f</sub> | -    | 15        | -    | ns    | I <sub>FPK</sub> =500mA<br>Duty Factor=33%        |           |
| Bandwidth                                         | f <sub>c</sub>                 | -    | 23        | -    | MHz   | Pulse Width=125ns                                 |           |

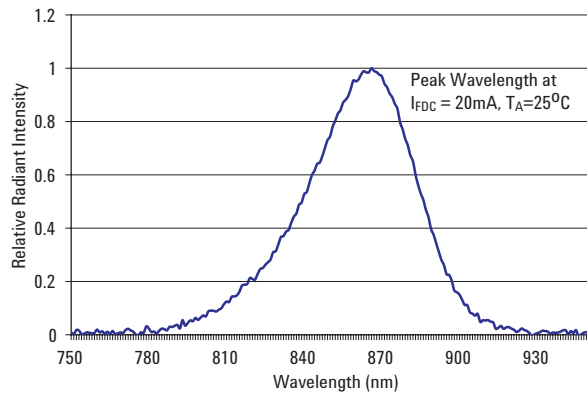


Figure 1. Relative Radiant Intensity vs. Wavelength

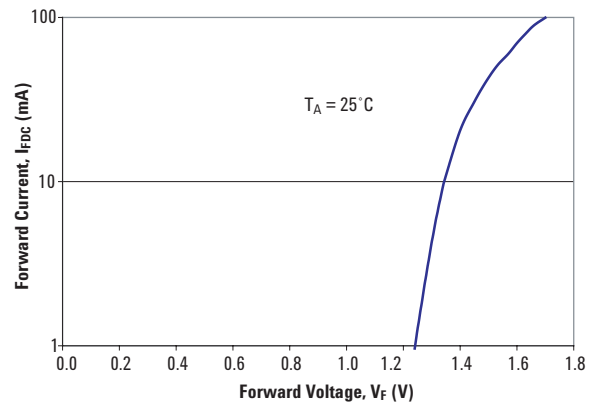


Figure 2. DC Forward Current vs. Forward Voltage

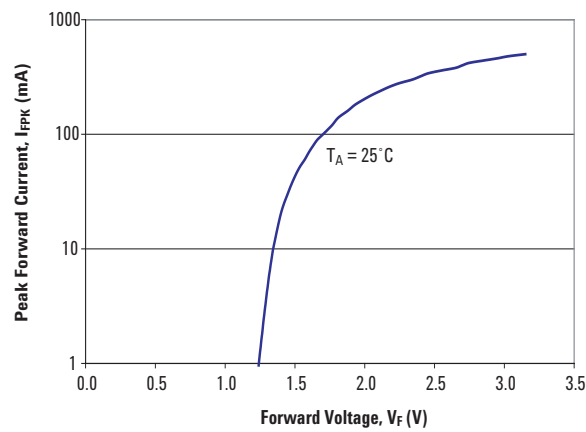


Figure 3. Peak Forward Current vs. Forward Voltage

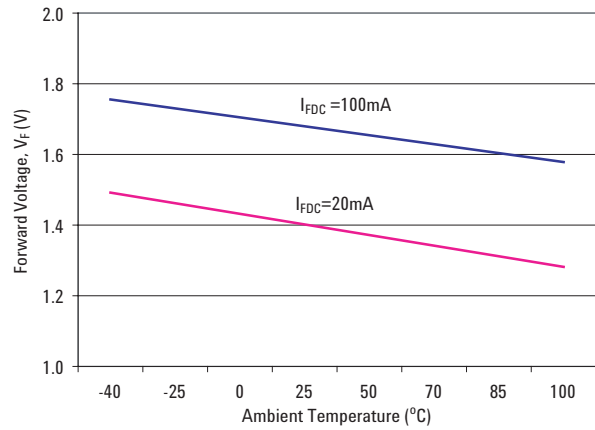


Figure 4. Forward Voltage vs. Ambient Temperature

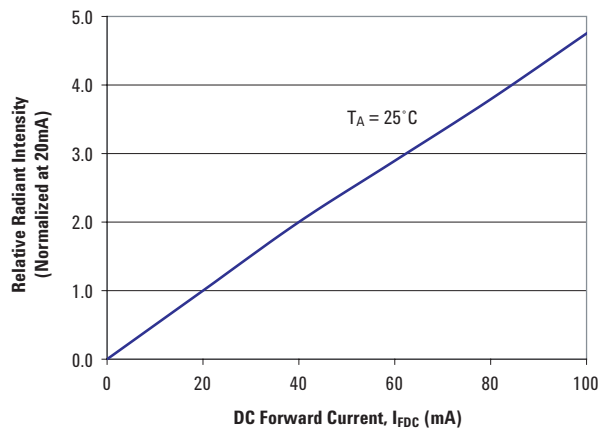


Figure 5. Relative Radiant Intensity vs. DC Forward Current

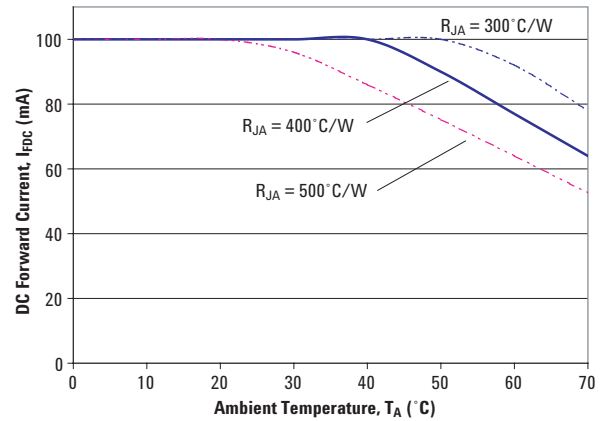
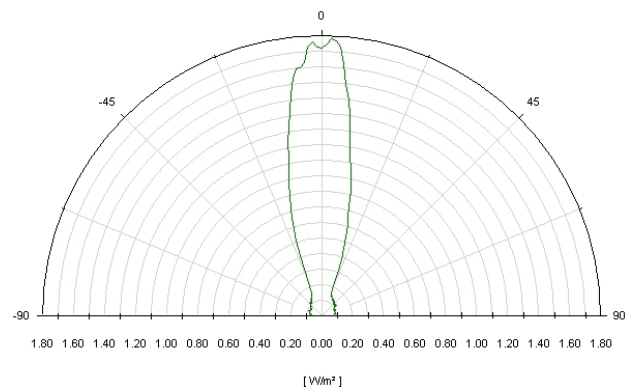


Figure 6. DC Forward Current vs. Ambient Temperature  
Derated Based on  $T_{JMAX}=110^{\circ}\text{C}$



**Figure 7. Radiant Intensity vs. Angular Displacement**

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