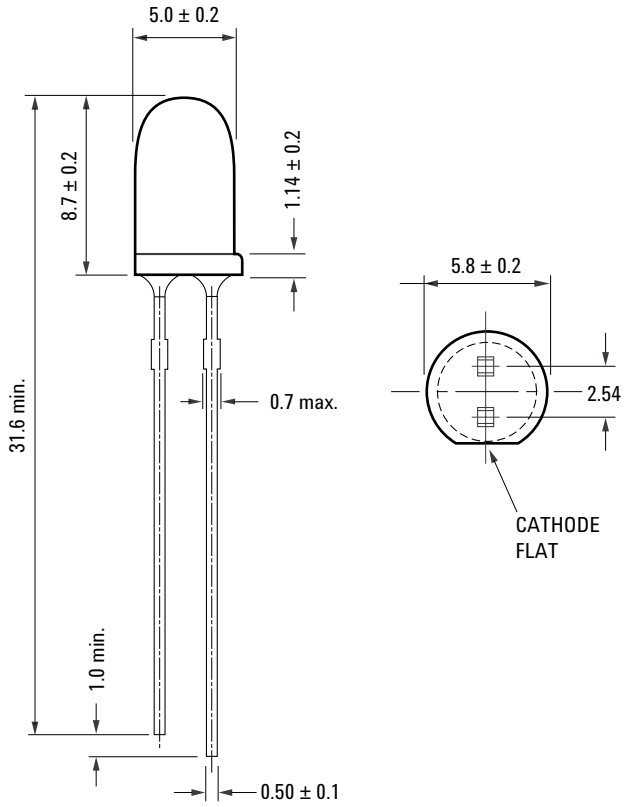
# HSDL-4270

High-Performance T-1¾ (5mm) AlGaAs Infrared (940nm) Lamp

# Datasheet

### Description

The HSDL-4270 Infrared emitter was designed for applications that require high power and low forward voltage. It utilizes Aluminum Galium Arsenide (AlGaAs) LED technology and is optimized for efficiency at emission wavelengths of 940 nm. The material used produces high radiant efficiency over a wide range of currents. The emitter is packaged in clear T-1¾ (5mm) package.




### Features

- **High Power AlGaAs LED Technology**
- **940 nm Wavelength**
- **T-1¾ Package**
- **Low Cost**
- **Low Forward Voltage: 1.3V at 20mA**

### Applications

- **Industrial Infrared Equipments and Applications (Smoke Detectors etc)**
- **Consumer Electronics (Infrared Remote Controller etc)**
- **Infrared spotlight for cameras**
- **Discrete Interrupters**
- **Infrared source for optical counters and card readers**

| Part Number | Lead Form | Shipping Option |
|---|---|---|
| HSDL-4270 | Straight | Bulk |

**Absolute Maximum Ratings at 25°C**

| Parameter | Symbol | Minimum | Maximum | Unit | Reference |
|---|---|---|---|---|---|
| Peak Forward Current | $I_{FPK}$ | - | 500 | mA | Figure 3<br>Duty cycle = 20%<br>Pulse Width = 100us |
| Forward Current | $I_{FDC}$ | - | 100 | mA | [1] |
| Power Dissipation | $P_{DISS}$ | - | 170 | mW | |
| Reverse Voltage | $V_R$ | 5 | - | V | $I_R$=100uA |
| Storage Temperature | $T_S$ | -40 | 100 | °C | |
| LED Junction Temperature | $T_J$ | | 110 | °C | |
| Lead Soldering Temperature | | | 260 for 5 sec | °C | |

Notes:
1. Derate as shown in Figure 6.

**Recommended Operating Conditions**

| Parameter | Symbol | Min | Max | Unit | Reference |
|---|---|---|---|---|---|
| Operating Temperature | $T_O$ | -40 | 85 | °C | |

**Electrical Characteristics at 25°C**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition | Reference |
|---|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | - | 1.3<br>1.5 | 1.4<br>1.7 | V | $I_{FDC}$=20mA<br>$I_{FDC}$=100mA | Figure 2<br>Figure 3 |
| Forward Voltage Temperature Coefficient | $\Delta V/\Delta T$ | - | -1.4 | - | mV/°C | $I_{FDC}$=100mA | Figure 4 |
| Series Resistance | $R_S$ | - | 3.0 | - | Ohms | $I_{FDC}$=100mA | |
| Diode Capacitance | $C_O$ | - | 27 | - | pF | $V_{bias}$=0V,<br>f=1MHz | |
| Thermal Resistance, Junction to Ambient | $R\theta_{ja}$ | - | 300 | - | °C/W | | |

**Optical Characteristics at 25°C**

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition | Reference |
|---|---|---|---|---|---|---|---|
| Radiant On-Axis Intensity | $I_E$ | 76 | 100 | - | mW/Sr | $I_{FDC}$=100mA | Figure 5 |
| Radiant On-Axis Intensity Temperature Coefficient | $\Delta I_E/\Delta T$ | - | -0.48 | - | %/°C | $I_{FDC}$=100mA | |
| Viewing Angle | $2\theta_{1/2}$ | - | 15 | - | ° | | Figure 7 |
| Peak Wavelength | $\lambda_{pk}$ | - | 940 | - | nm | | Figure 1 |
| Peak wavelength Temperature Coefficient | $\Delta\lambda/\Delta T$ | - | 0.26 | - | nm/°C | $I_{FDC}$=100mA | |
| Spectral Width | $\Delta\lambda$ | | 45 | - | nm | $I_{FDC}$=20mA | Figure 1 |
| Optical Rise and Fall Time | $t_r/t_f$ | | 1.3 | - | µs | $I_{FDC}$=100mA<br>Duty Ratio = 50%<br>Pulse Width=10µs | |

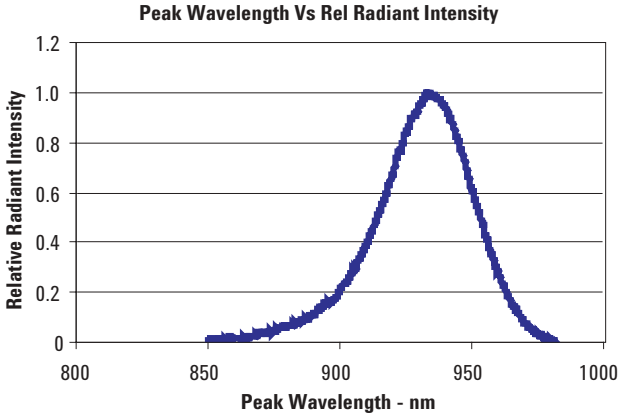



Figure 1. Relative Radiant Intensity vs. Wavelength

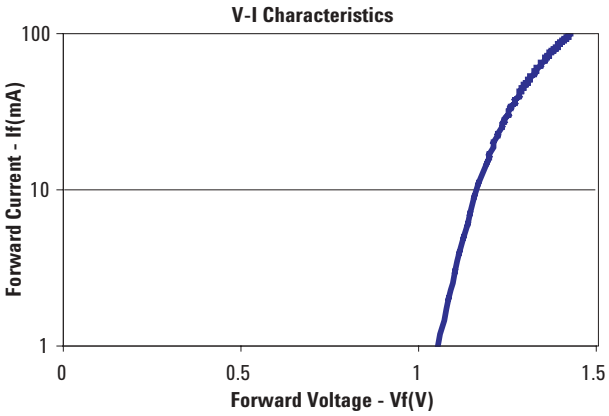



Figure 2. DC Forward Current vs. Forward Voltage

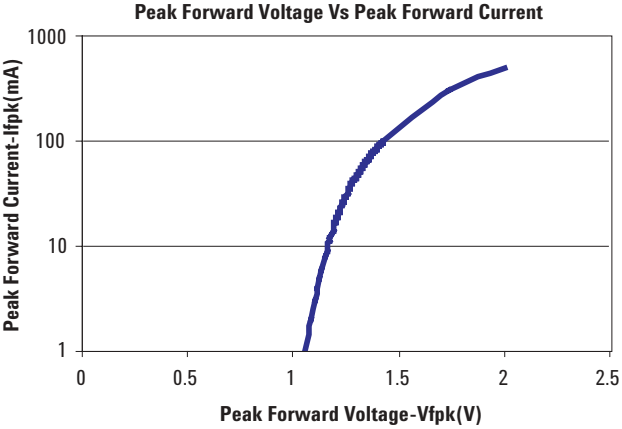



Figure 3. Peak Forward Current vs. Forward Voltage

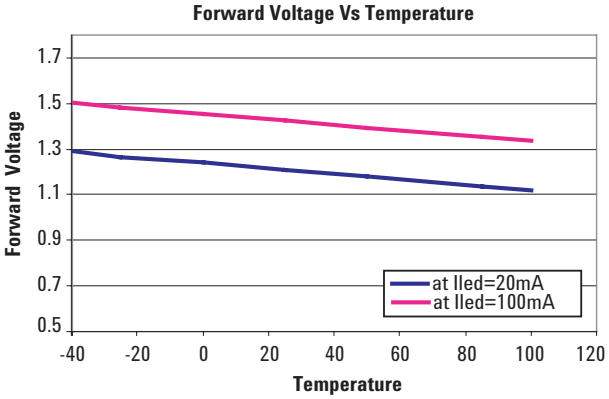



Figure 4. Forward Voltage vs. Ambient Temperature

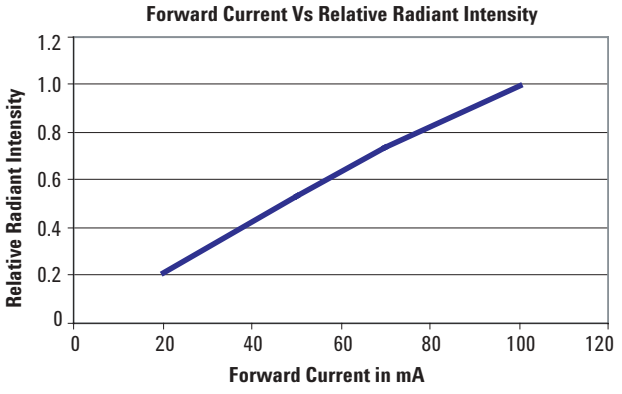



Figure 5. Relative Radiant Intensity vs. DC Forward Curren

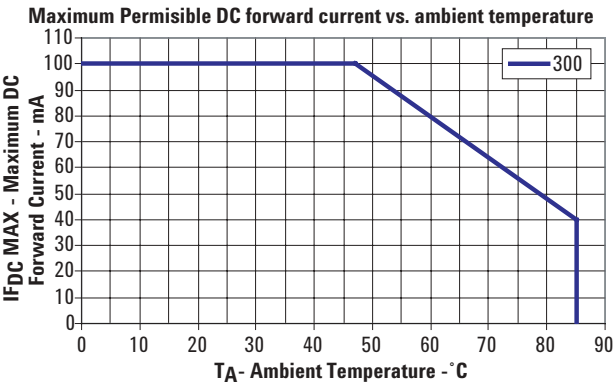



Figure 6. DC Forward Current vs. Ambient Temperature Derated Based on $T_{JMAX}$=110°C

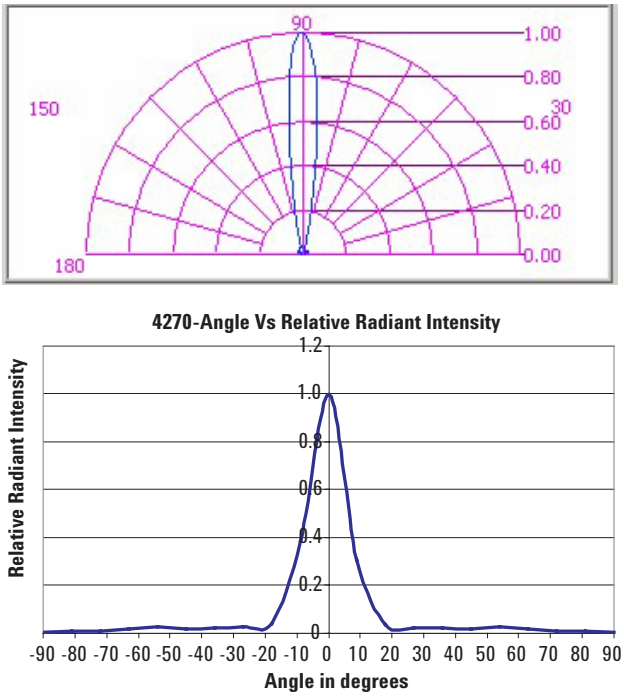



**Figure 7. Radiant Intensity vs. Angular Displacement**

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**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