

HSDL-4270

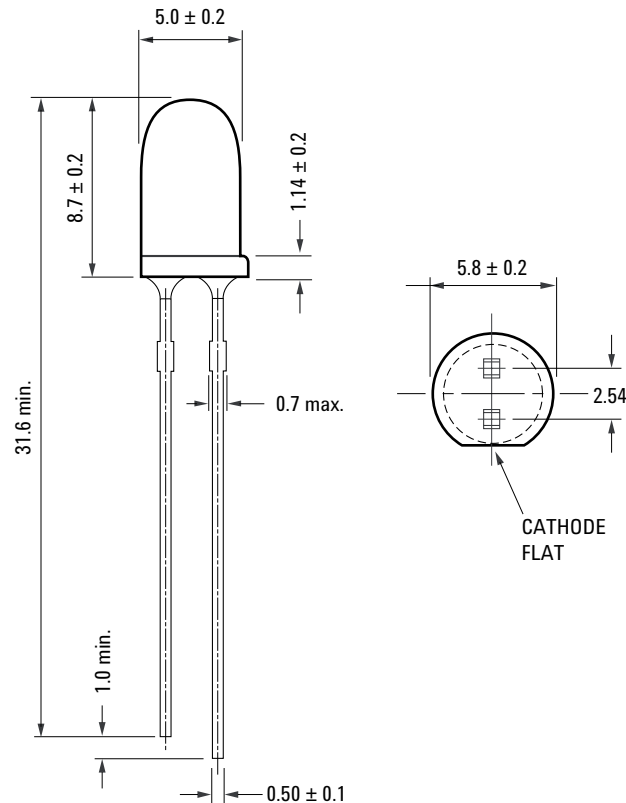
High-Performance T-1 $\frac{3}{4}$ (5mm) AlGaAs Infrared (940nm) Lamp



Datasheet

Description

The HSDL-4270 Infrared emitter was designed for applications that require high power and low forward voltage. It utilizes Aluminum Gallium 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-1 $\frac{3}{4}$ (5mm) package.



Features

- High Power AlGaAs LED Technology
- 940 nm Wavelength
- T-1 $\frac{3}{4}$ 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 Duty cycle = 20% Pulse Width = 100us
Forward Current	I_{FDC}	-	100	mA	[1]
Power Dissipation	P_{DISS}	-	170	mW	
Reverse Voltage	V_{R}	5	-	V	$I_{\text{R}}=100\mu\text{A}$
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 1.5	1.4 1.7	V	$I_{\text{FDC}}=20\text{mA}$ $I_{\text{FDC}}=100\text{mA}$	Figure 2 Figure 3
Forward Voltage Temperature Coefficient	$\Delta V/\Delta T$	-	-1.4	-	mV/°C	$I_{\text{FDC}}=100\text{mA}$	Figure 4
Series Resistance	R_{S}	-	3.0	-	Ohms	$I_{\text{FDC}}=100\text{mA}$	
Diode Capacitance	C_{O}	-	27	-	pF	$V_{\text{bias}}=0\text{V}$, $f=1\text{MHz}$	
Thermal Resistance, Junction to Ambient	$R\theta_{\text{ja}}$	-	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	$I_{\text{FDC}}=100\text{mA}$	Figure 5
Radiant On-Axis Intensity Temperature Coefficient	$\Delta I_{\text{E}}/\Delta T$	-	-0.48	-	%/°C	$I_{\text{FDC}}=100\text{mA}$	
Viewing Angle	$2\theta_{1/2}$	-	15	-	°		Figure 7
Peak Wavelength	λ_{pk}	-	940	-	nm		Figure 1
Peak wavelength Temperature Coefficient	$\Delta \lambda/\Delta T$	-	0.26	-	nm/°C	$I_{\text{FDC}}=100\text{mA}$	
Spectral Width	$\Delta \lambda$		45	-	nm	$I_{\text{FDC}}=20\text{mA}$	Figure 1
Optical Rise and Fall Time	$t_{\text{r}}/t_{\text{f}}$		1.3	-	μs	$I_{\text{FDC}}=100\text{mA}$ Duty Ratio = 50% Pulse Width=10μs	

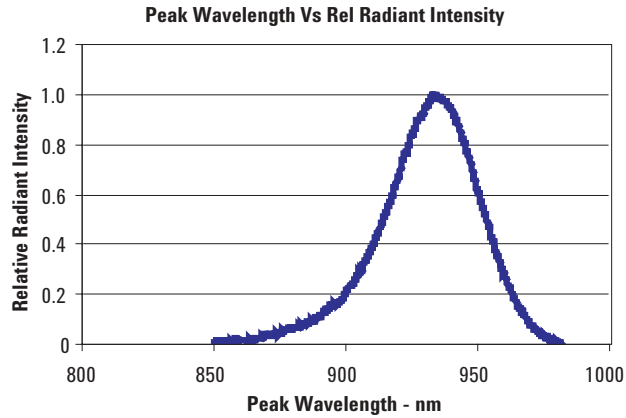


Figure 1. Relative Radiant Intensity vs. Wavelength

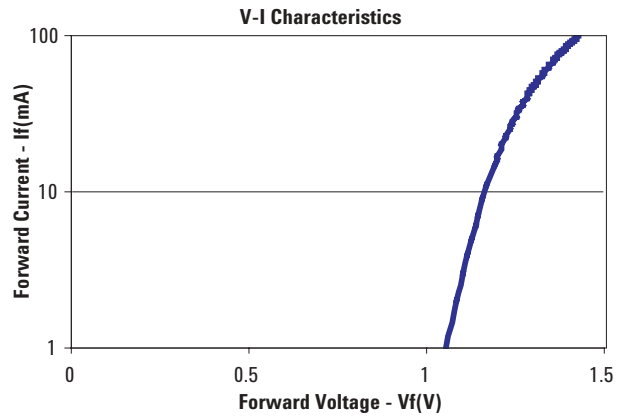


Figure 2. DC Forward Current vs. Forward Voltage

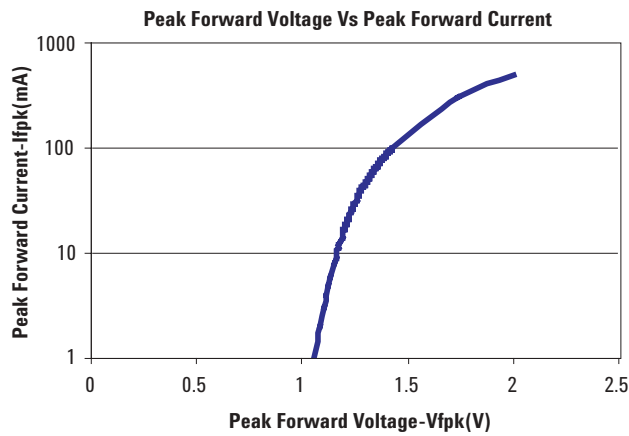


Figure 3. Peak Forward Current vs. Forward Voltage

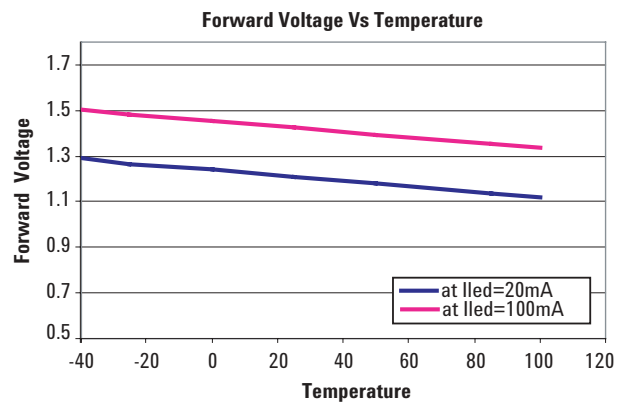


Figure 4. Forward Voltage vs. Ambient Temperature

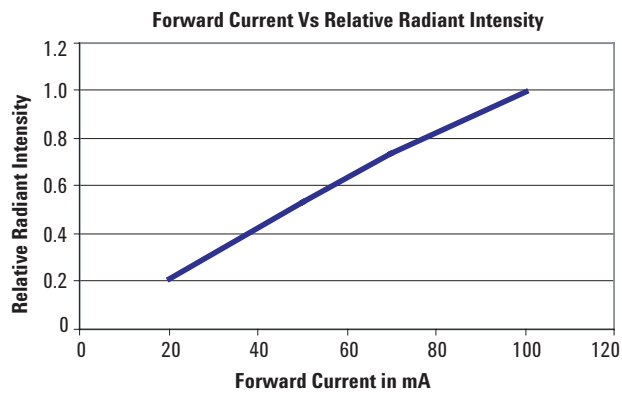


Figure 5. Relative Radiant Intensity vs. DC Forward Current

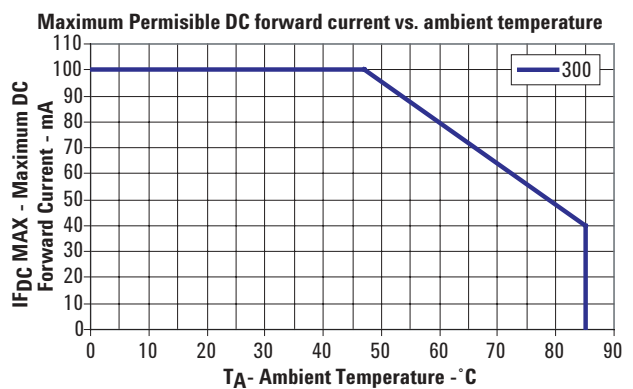


Figure 6. DC Forward Current vs. Ambient Temperature Derated Based on $T_{JMAX}=110^{\circ}C$

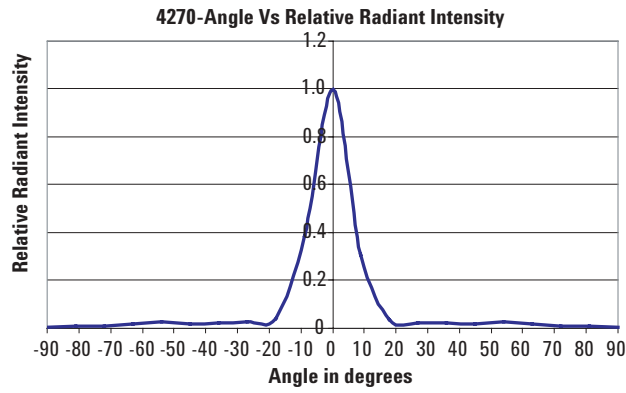
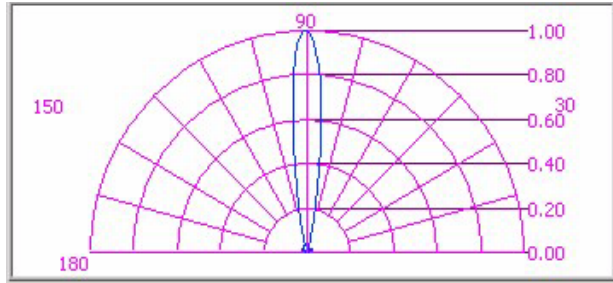


Figure 7. Radiant Intensity vs. Angular Displacement

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