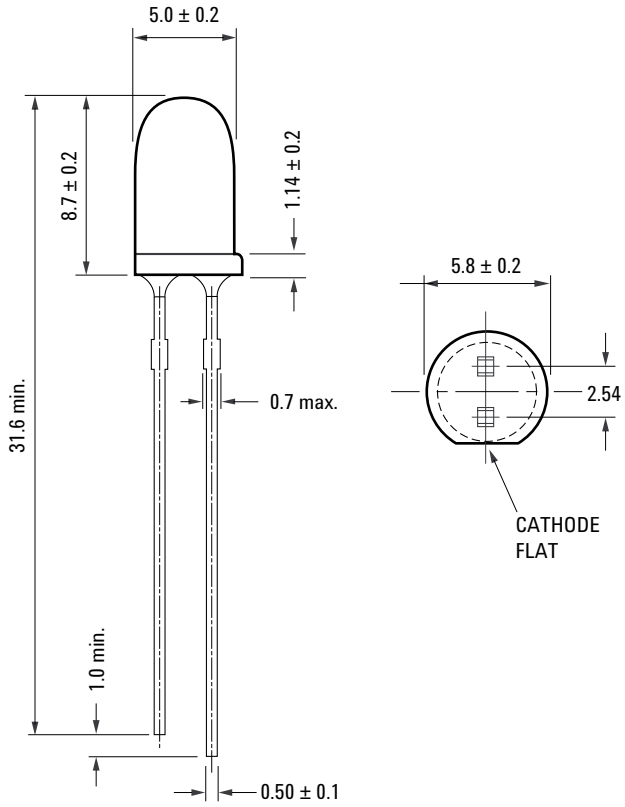
HSDL-4270

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 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_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 1.5	1.4 1.7	V	I_{FDC}=20mA I_{FDC}=100mA	Figure 2 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, 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	λ_{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 Duty Ratio = 50% Pulse Width=10µs	

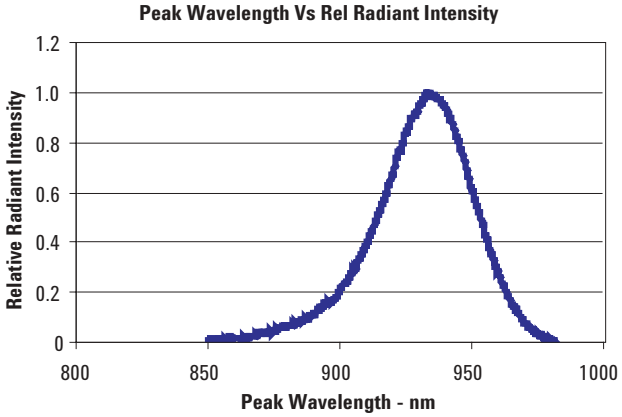


Figure 1. Relative Radiant Intensity vs. Wavelength

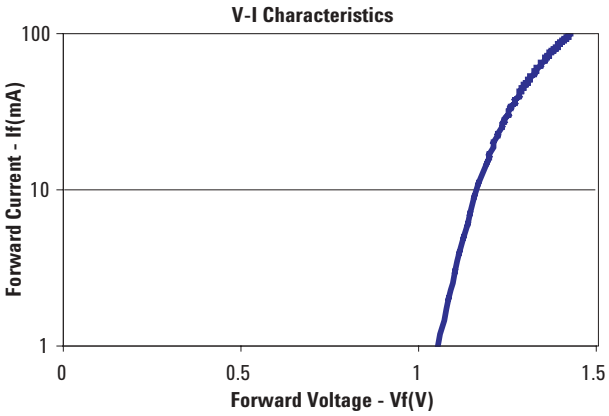


Figure 2. DC Forward Current vs. Forward Voltage

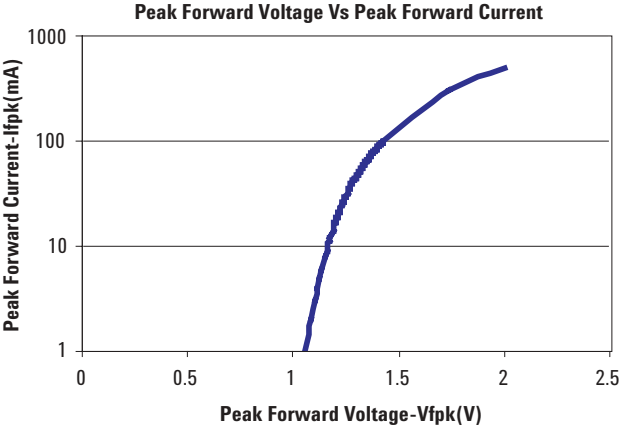


Figure 3. Peak Forward Current vs. Forward Voltage

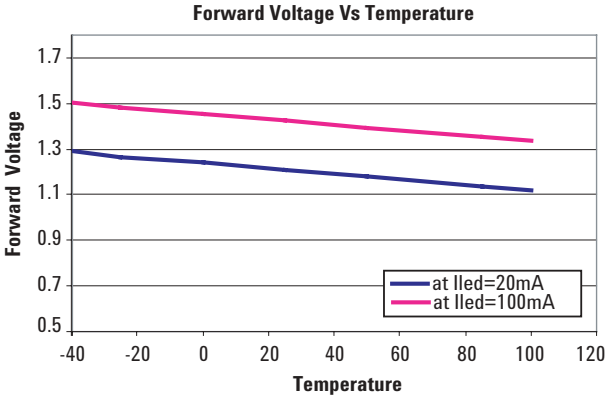


Figure 4. Forward Voltage vs. Ambient Temperature

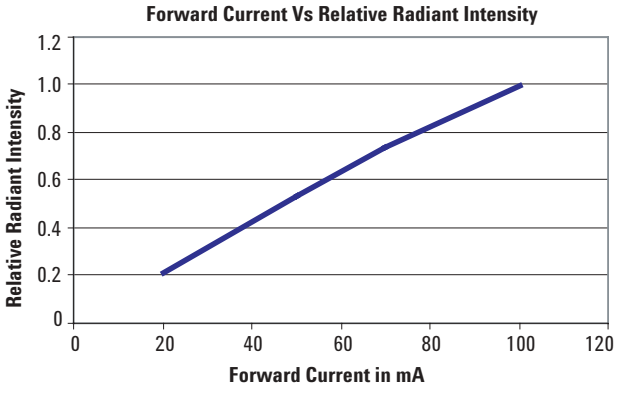


Figure 5. Relative Radiant Intensity vs. DC Forward Curren

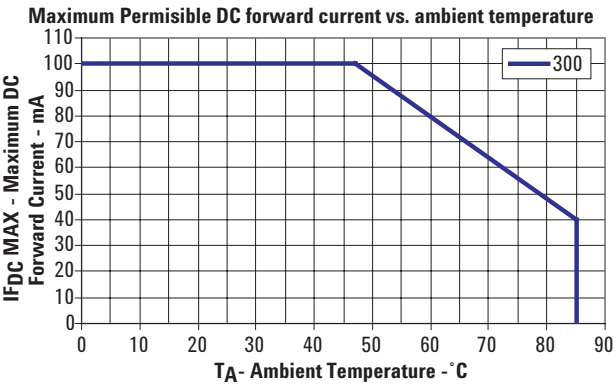


Figure 6. DC Forward Current vs. Ambient Temperature Derated Based on T_{JMAX}=110°C

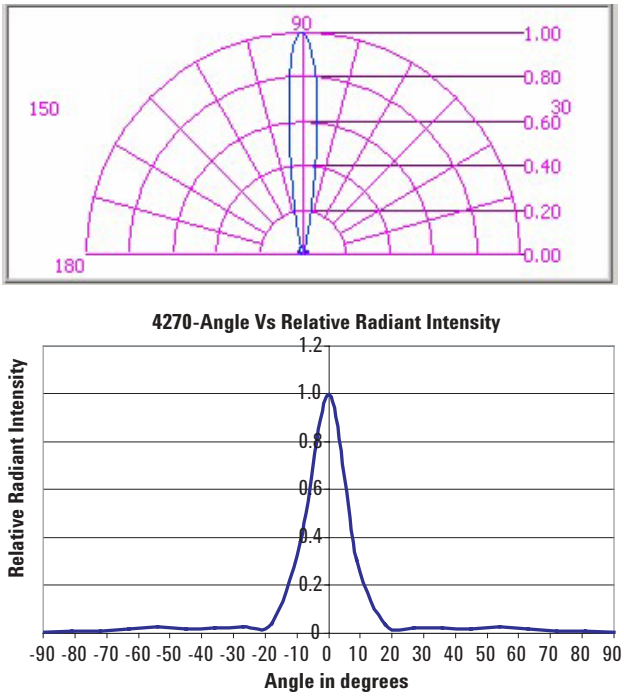


Figure 7. Radiant Intensity vs. Angular Displacement

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