Agilent HLMP-4100/4101 T-1^3/$_4$ (5 mm) Double Heterojunction AlGaAs Very High Intensity Red LED Lamps

Data Sheet

Features

- 1000 mcd at 20 mA
- Very high intensity at low drive currents
- Narrow viewing angle
- Outstanding material efficiency
- Low forward voltage
- CMOS/MOS compatible
- TTL compatible
- Deep red color

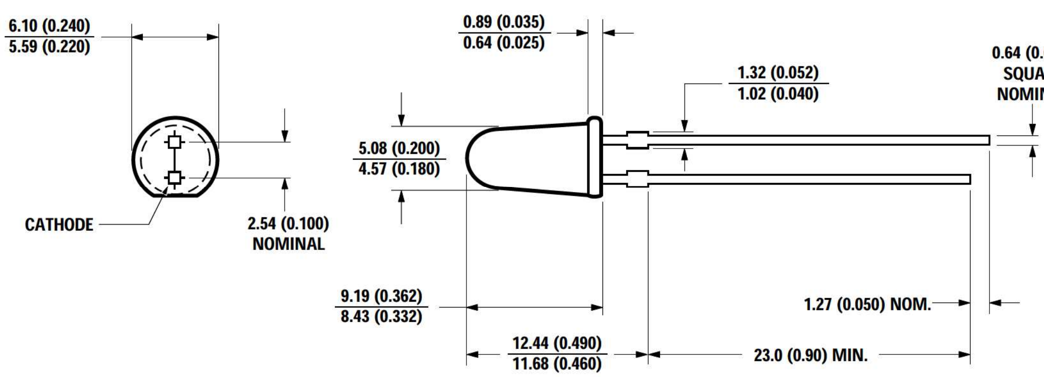
Description

These solid state LED lamps utilize newly developed double heterojunction (DH) AlGaAs/GaAs material technology. This LED material has outstanding light output efficiency over a wide range of drive currents. The lamp package has a tapered lens designed to concentrate the luminous flux into a narrow radiation pattern to achieve a very high intensity. The LED color is deep red at the dominant wavelength of 637 nanometers. These lamps may be DC or pulse driven to achieve desired light output.

Applications

- Bright ambient lighting conditions
- Emitter/detector and signaling applications
- General use

Package Dimensions



Agilent Technologies

Selection Guide

	Luminous Intensity Iv (mcd) at 20 mA			$2\theta_{1/2}$ [1]
Device HLMP-	Min.	Typ.	Max.	Degree
4100	500.0	750.0	–	8
4101	700.0	1000.0	–	8
4101-ST0xx	1400.0	2700.0	4000.0	8

Note:
1. $\theta^{1}/_{2}$ is the angle from optical centerline where the luminous intensity is $^{1}/_{2}$ the optical centerline value.

Part Numbering System

HLMX - 4 1 XX - X X X XX

Mechanical Option
00: Bulk

Color Bin Options
0: Full color bin distribution

Maximum Iv Bin Options
0: Open (No. max. limit)
Others: Please refer to the Iv bin Table

Minimum Iv Bin Options
Please refer to the Iv bin Table

Brightness Level
00: Lower brightness
01: Higher brightness

Notes:
1. '0' indicates no maximum intensity limit.
2. '0' indicates full color distribution.

Absolute Maximum Ratings at T_A = 25°C

Parameter	Maximum Rating	Units
Peak Forward Current[1, 2]	300	mA
Average Forward Current[2]	20	mA
DC Current[3]	30	mA
Power Dissipation	87	mW
Reverse Voltage (I_R = 100 μA)	5	V
Transient Forward Current (10 μs Pulse)[4]	500	mA
Operating Temperature Range	-20 to +100	°C
Storage Temperature Range	-55 to +100	°C
Wave Soldering Temperature [1.59 mm (0.063 in.) from body]	250°C for 3 seconds	
Lead Solder Dipping Temperature [1.59 mm (0.063 in.) from body]	260°C for 5 seconds	

Notes:
1. Maximum I_{PEAK} at f = 1 kHz, DF = 6.7%.
2. Refer to Figure 6 to establish pulsed operating conditions.
3. Derate linerally as shown in Figure 5.
4. The transient peak current is the maximum non-recurring peak current the device can withstand without damaging the LED die and wire bonds. It is not recommended that the device be operated at peak currents beyond the Absolute Maximum Peak Forward Current.

Electrical/Optical Characteristics at T_A = 25°C

Symbol	Description	Min.	Typ.	Max.	Unit	Test Condition
V_F	Forward Voltage		1.8	2.2	V	20 mA
V_R	Reverse Breakdown Voltage	5.0	15.0		V	I_R = 100 μA
λ_{PEAK}	Peak Wavelength		650		nm	Measurement at peak
λ_d	Dominant Wavelength		642		nm	Note 1
$\Delta\lambda\ ^1/_2$	Spectral Line Halfwidth		20		nm	
τ_S	Speed of Response		30		ns	Exponential Time Constant, $e^{-t/2}$
C	Capacitance		30		pF	V_F = 0, f = 1 MHz
θ_{jc}	Thermal Resistance		220		°C/W	Junction to Cathode Lead
ηv	Luminous Efficacy		80		1 m/W	Note 2

Notes:
1. The dominant wavelength, λ_d, is derived from the CIE chromaticity diagram and represents the color of the device.
2. The radiant intensity, I_e, in watts per steradian, may be found from the equation $I_e = I_V/\eta_V$, where I_V is the luminous intensity in candelas and η_V is luminous efficacy in lumens/watt.
3. The approximate total luminous flux output within a cone angle of 2θ about the optical axis, $\phi_V(2\theta)$, may be obtained from the following formula: $\phi_V(2\theta) = [\phi_V(\theta)/I_V(0)]I_V$; Where: $\phi_V(\theta)/I_V(0)$ is obtained from Figure 7.

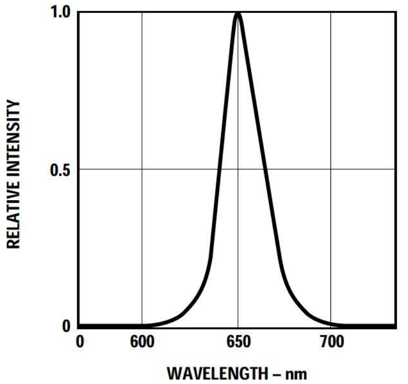


Figure 1. Relative intensity vs. wavelength.

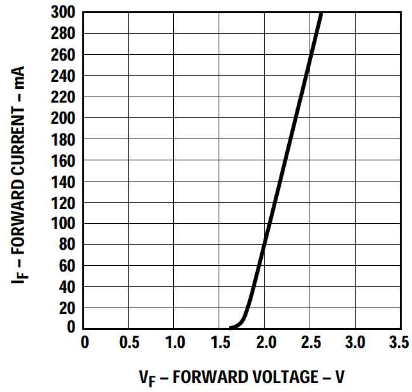


Figure 2. Forward current vs. forward voltage.

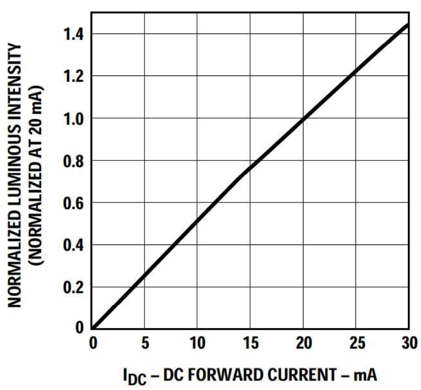


Figure 3. Relative luminous intensity vs. dc forward current.

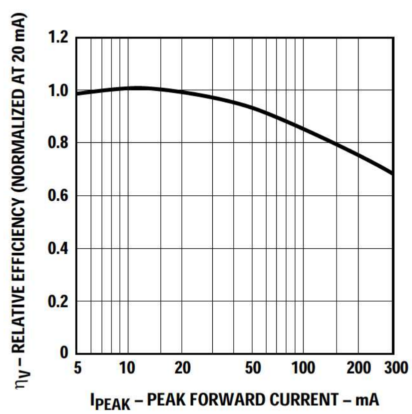


Figure 4. Relative efficiency vs. peak forward current.

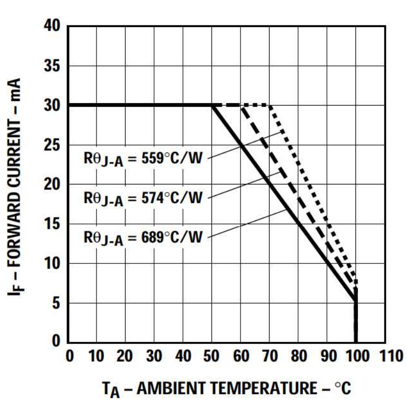


Figure 5. Maximum forward dc current vs. ambient temperature derating based on T_J MAX. = 110°C.

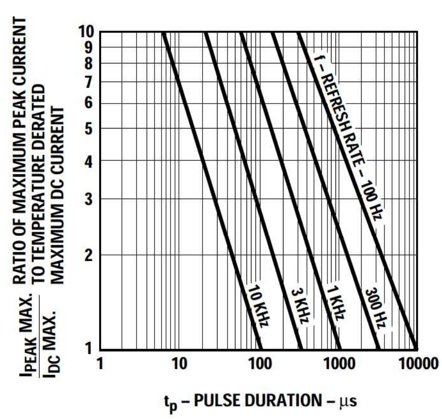


Figure 6. Maximum tolerable peak current vs. peak duration (I_{PEAK} MAX. determined from temperature derated I_{DC} MAX.).