CircuLaserÔ Diode
PS045-00 852nm, 50mW

BLUE SKY RESEARCH

Description

The CircuLaser PS045 is an 852nm laser diode combining a quantum well structure and a real-refractive index-guided single mode waveguide to provide high power, narrow spectral width, and a single spatial mode Gaussian far field. A diffraction- limited and circular wavefront is accomplished through the integration of an internal, beam correcting optic. Hermetic sealing of the package assures high reliability.

Features

- Built-in monitor photodiode.
- Circular, diverging beam, NA approximately 0.11
- Diffraction limited performance, wavefront equal or better than λ/4 peak to valley
- 50mW optical power
- Standard 9mm form factor

Absolute Maximum Ratings (T_C=case temperature=25°C) *

Item	Symbol	Rated Value	Unit
Optical output power	P_O	50	mW
LD reverse voltage	$V_{R\,(LD)}$	3	V
PD reverse voltage	$V_{R\,(PD)}$	25	V

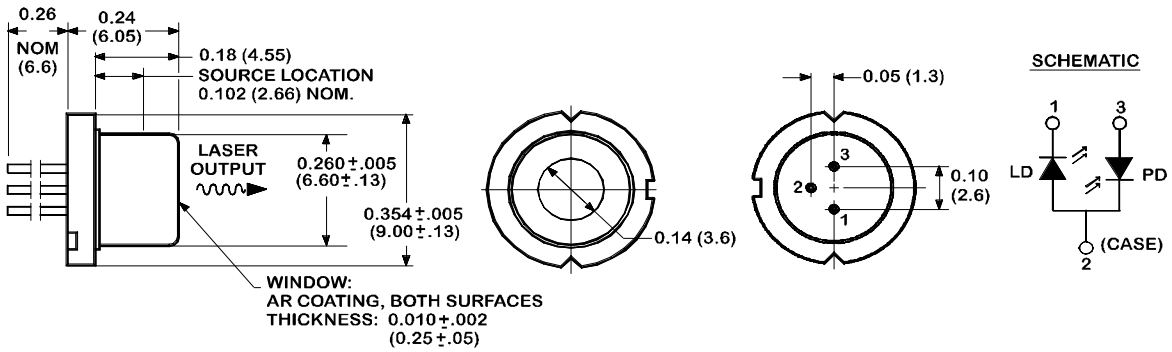
Optical and Electrical Characteristics (T_C=case temperature=25°C) *

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	I_{th}	-	30	45	mA	
Operating current	I_{op}	-	95	105	mA	P_O=50mW
Operating voltage	V_{op}	-	1.9	2.2	V	P_O=50mW
Optical output power	P_O	50	-	-	mW	
Slope Efficiency	dP_O/dI_{op}	0.75	0.85	-	mW/mA	P_O=50mW
Lasing wavelength	λ_p	848	852	856	nm	P_O=50mW
Circularity	ϕ		-	1.2:1.0	ratio	P_O=50mW @e^{-2}
Beam divergence	θ	-	9	-	deg	P_O=50mW, FWHM
Off axis angle	$\Delta\theta$	-	-	±3	deg	
Monitor current	I_S	0.1	-	20	mA	μA/mW
Astigmatism	A_S	-	-	0.25	waves	

** Specifications are subject to change without notice. Each purchased CircuLaser is provided with test data. Please refer to this data before using the CircuLaser.*

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CircuLaser - Package Detail, Mechanical & Electrical – PS045-00



Handling Care and Precautions for Use of CircuLaser Diodes

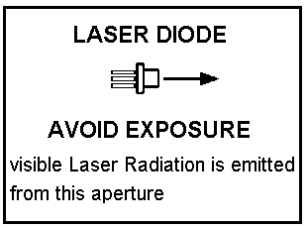
1. Absolute Maximum Ratings
Do not exceed, *even momentarily*, the maximum ratings (see page 1, table). When a CircuLaser diode is driven in excess of it's maximum ratings, it can cause at minimum a considerable reduction in reliability, and potentially instantaneous failure.
a. CircuLaser diodes may be damaged by surge currents generated at power on-off operation. Check on the transient characteristics of the power supply to make sure that such surges do not exceed the maximum ratings.
b. The maximum ratings are specified for a case temperature of 25°C. Designs should be made to work well within this temperature range. As the case temperature goes up, power dissipation as well as maximum light output power is reduced.

2. Soldering Conditions
Maximum solder-tip temperature is 260°C and soldering time must be within 3.0 seconds. A minimum solder clearance of 1.6mm should be maintained from the root of the lead.

3. Prevention of Breakdown due to Static Electricity
CircuLaser diodes may be adversely affected by static electricity and surge currents and, consequently, cause breakdown of the diode and reduction of reliability unless the following precautions are taken:
a. Power supplies, installation and measuring equipment should be grounded. A noise filter or noise-cut transformer should be provided on any power supply inputs.
b. Anyone working with a CircuLaser diode should be grounded through high resistance (500 K Ohm - 1M Ohm) by means of a ground strap and wrist band (for example).
c. Soldering irons should be grounded to protect laser diodes from voltage leaks.
d. During operation of the CircuLaser diode, working clothes, hats, and shoes should be static-protected. Cotton-based clothing is preferred.
e. Any container for carriage and storage should be static-protected.
f. Avoid using laser diodes in an environment where high frequency surge currents may be generated by an inductive electric field (such as a fluorescent lamp). These fields can also cause breakdown or deterioration of the laser diode.

4. **Package Handling**
a. The laser diode package should not be cut off, reworked, or deformed. Do not hold the cap of the CircuLaser diode tightly, otherwise it may induce cracks or damage to the window glass.
b. Do not touch the surface of the window glass. Any scratch or contamination may result in reduction of optical characteristics.
c. Remove small contaminates on the surface softly using a cotton tip stick with a small amount of methyl alcohol.

5. **Safety**
The output light from laser diodes is harmful to a human body even if it is invisible. Avoid looking at the output light of a CircuLaser diode directly, or even indirectly through a lens during operation. Observance of operation should be through an infrared TV camera or related equipment. Refer to IEC 825-1 and 21 CFR 1040.10-1040.11 as a radiation safety standard for laser products.





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