

## LU09xxT090 Industrial Laser Diode Up to 9W Operation Power



The multi mode fiber pigtailed flat pin laser diode module contains an optimized GaAs substrate based quantum well high power laser diode. The extremely stringent reliability requirements are achieved through our patent pending innovative technology. This includes careful design, exactly defined manufacturing and extensive testing. The qualification contains a set of optoelectronic, thermal and mechanical tests. Each laser diode module is individually serialized for traceability and is shipped with a specified set of test data

### Features & Functions:

- Wavelength 915 , 940 or 975 nm
- 105µm core NA 0.15 or 0.22 fiber
- Hermetically sealed single emitter
- Floating anode / cathode
- Direct modulation up to 20 MHz
- Rise / Fall time <20ns

### Options:

- 900µm protective tube
- Flat 0° FC/PC ferrule
- Fiber ferrule fixing nut

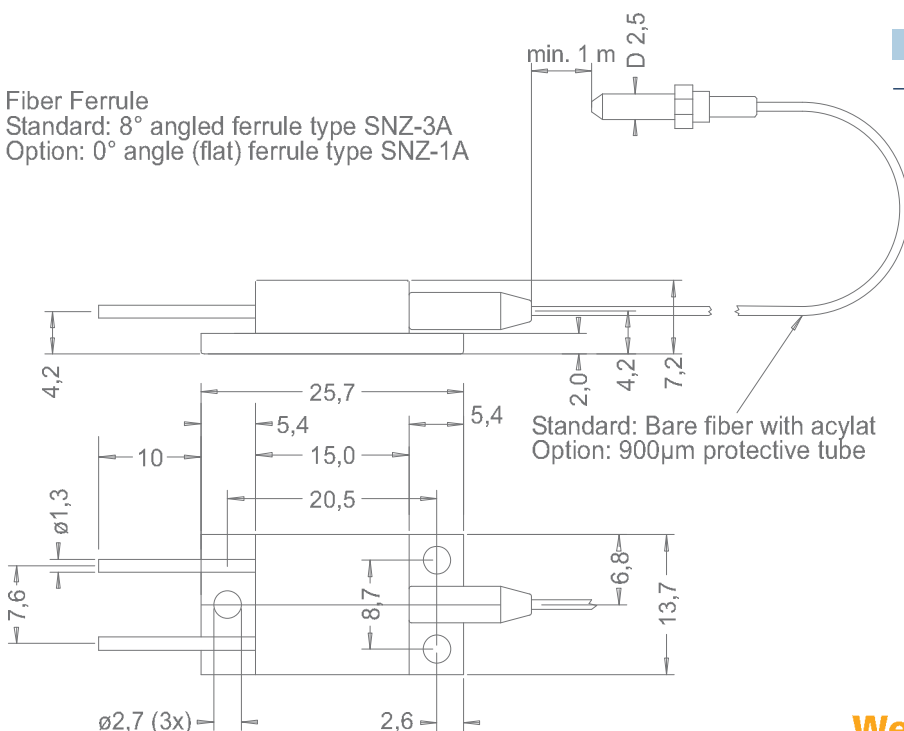
### Benefits:

- Ultra long lifetime
- Burn-in tested
- Cost-effective
- Robust design
- Easy to mount

### Applications:

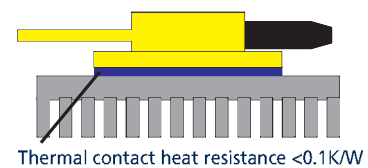
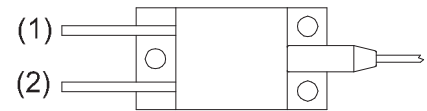
- Pumping
- Materials processing
- Illumination
- Medical Laser treatment

### Module Drawing (dimensions in mm)



### Pin Connections

Pin	Function	Pin	Function
1	LD Anode (+)	2	LD Cathode (-)



**We manufacture diode lasers.**

## Electrical and Optical Characteristics Typical laser specifications at 25°C

Parameter	Symbol	LU0915T090	LU0940T090	LU0975T090	Unit
Output Power c.w.	$P_{op}$ (c.w.)	9	9	9	W
Peak Wavelength at $P_{op}$	$\lambda_{peak}$	915 ±10	940 ±10	975±10	nm
Spectral Width (FWHM)	$\lambda_{FWHM}$	5	5	5	nm
Threshold Current	$I_{th}$	<700	<700	<700	mA
Operating Current	$I_{op}$	11.5	11.5	11.5	A
Operating Voltage	$V_{op}$	1.8	1.8	1.8	V
Connector Type (optional)		APC ferrule (*SMA, FC/APC, FC/PC connector)			
Heat Resistance LD to bottom of base plate	$R_H$	3.5	3.5	3.5	K / W
Power Conversion Efficiency		47	47	47	%
Recommended Case Temperature		20 - 30	20 - 30	20 - 30	°C
Wavelength Shift vs. Temperature		0.3	0.3	0.3	nm / K
Wavelength Shift vs. Power		0.6	0.6	0.6	nm / W

### Fiber Specifications

Fiber Core Diameter		105	105	105	µm
Fiber Numerical Aperture	NA	0.15 or 0.22	0.15 or 0.22	0.15 or 0.22	
Fiber Cladding Diameter		125	125	125	µm
Fiber Buffer Diameter		250	250	250	µm
Fiber Length		1	1	1	m
Min. Bend Radius	Short / Long Term	>15 / >30	>15 / >30	>15 / >30	mm

### Application Note:

- (1) For pulsed operation max peak power can be  $1.2 \times P_{op}$  if pulse time is  $< 5 \mu\text{sec}$  and average power is lower than  $P_{op}$  (c.w.)
- (2) Keep the heat sink at  $\leq 35^\circ$ . The heat sink should have a flatness of better than 0.02mm and a roughness grade not less than N7 (i.e.  $R_a = 1.6 \mu\text{m}$ )
- (3) A conductive material between TO-220 laser diode module and the module base is highly recommended. The thermally conductive material should have a sufficient thickness and elasticity to compensate for the non-planarity between the module base and the heat sink surface
- (4) Electrostatic discharge (ESD) can lead to latent or catastrophic failure of a multimode laser diode module
- (5) The power supply should have a transient suppression and an over-voltage protection. Before connecting the module to the power supply and during Power-off the power supply output should be short circuited
- (6) By no means should the fiber be touched by hot solder because this can lead to lower output performance and reliability. During the soldering process the fiber temperature should always be below  $85^\circ\text{C}$
- (7) The limits for the bending radius prevents mechanical cracks. The bending radius limit for the optical power loss is higher. Please take into account a possible output power reduction of up to 2% below a bending radius of  $500(1000) \times$  core diameter for NA 0.22(0.15).
- (8) The intensity profile at the fiber end facet and the far field ex fiber may vary between a gaussian shape and a donut shape.

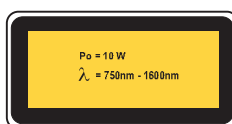
## Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	$T_{max}$	-30	80	°C
Operating Case Temp.	$T_{op, case temp.}$	-10	70	°C
Pin Soldering Temp $_{max}$ 10sec.	$T_{pin, soldering}$		250	°C
LD Forward Current c.w.	$I_{op, max}$		13	A
LD Reverse Voltage	$V_{R, max}$		2	V
Rel. Humidity		0	85	%

### Note:

- (1) Absolute Maximum Ratings may be applied to the laser module for short period of time only. Exposure to maximum ratings for extended period of time or exposure above one or more max ratings may cause damage or affect the reliability of the device
- (2) Improper pin bending can crack the glass sealing between pin and the package and hermeticity of the package may be lost and may damage the laser diode by humidity level below the dew point inside the package. If pin bending is necessary pins must be fixed mechanically over a short length in the original flat position such that the bending force is absorbed by a mechanical fixing tool (claw etc.).

## User Safety



**We manufacture diode lasers.**