



## **DATA SHEET**

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O K I F I B E R - O P T I C P R O D U C T S

# **OL4121N-120 and OL4121N-140 High-Power Laser Diode Butterfly Modules (1480 nm, 120 mW/140 mW)**

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February 2000



**Oki Semiconductor**



**CONTENTS**

**OL4121N-120 and OL4121N-140 High-Power Laser Diode Butterfly Modules ..... 1**

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## OL4121N-120 and OL4121N-140

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### High-Power Laser-Diode Butterfly Modules

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#### INTRODUCTION

Oki Semiconductor's OL4121N-120/OL4121N-140 family of 1480-nm high-power laser diodes are available in a 14-pin "butterfly" package which is designed for high-performance fiber-optic applications. The OL4121N-120 and OL4121N-140 diodes have a built-in thermo-electric cooler, thermistor, and isolator, and have a single-mode fiber pigtail.

The OL4121N is available in two optional power levels: 120 mW or 140 mW. These laser diodes can be used as a pumping source for an Er- (erbium) doped fiber-optic amplifier. The high power output of the laser diodes in the OL4121N family supports the high-performance demands of Erbium-Doped Fiber-optic Amplifiers in Dense Wavelength Division Multiplex (DWDM-EDFA) systems and long-haul terrestrial networks.

#### FEATURES

- High power output: Pf=120 mW (OL4121N-120)  
Pf=140 mW (OL4121N-140)
- 14-pin "butterfly" package
- Single-mode fiber
- Built-in isolator
- Includes photodiode for power monitoring
- Built-in thermo-electric cooler (TEC)

#### APPLICATION

- WDM/DWDM systems
- Erbium-doped fiber amplifier
- Regeneration of data
- Fiber-optic long-haul terrestrial networks

## ELECTRICAL CHARACTERISTICS

### Absolute Maximum Ratings (ambient temperature Ta = 25°C unless otherwise noted)

Parameter		Symbol	Ratings	Units
Fiber Output Power	OL4121N-120	Pf	130	mW
	OL4121N-140		160	mW
Laser Diode Forward Current	OL4121N-120	I <sub>F(LD)</sub>	750	mA
	OL4121N-140		800	mA
Laser Diode Reverse Voltage		V <sub>R(LD)</sub>	2	V
Photo Diode Reverse Voltage		V <sub>R(PD)</sub>	15	V
Operating Temperature Range		Topr	-20 to +65	°C
Storage Temperature Range		Tstg	-40 to +70	°C

Exceeding these maximum ratings could cause immediate damage or lead to permanent deterioration of the device.

### Optical and Electrical Characteristics (Ta = 25°C)

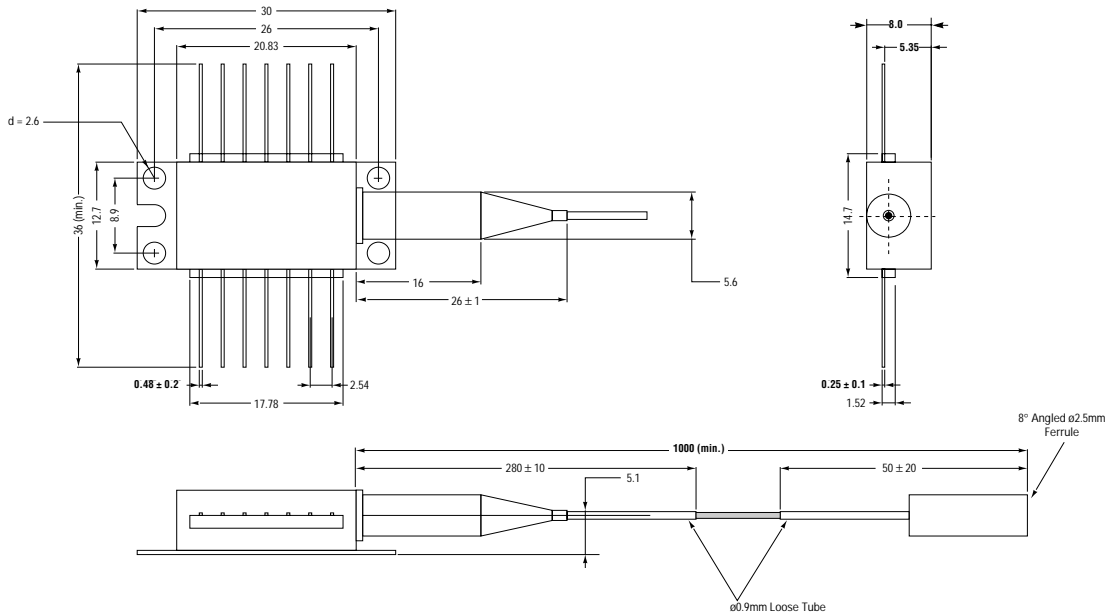
Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Threshold Current		I <sub>TH</sub>	---	---	---	60	mA
Laser Diode Operating Current	OL4121N-120	I <sub>op(LD)</sub>	Pf = 120 mW	---	---	600	mA
	OL4121N-140		Pf = 140 mW			700	mA
Laser Diode Operating Voltage		V <sub>op(LD)</sub>	Pf = 120 / 140 mW	---	---	2.5	V
Center Wavelength		λ <sub>c</sub>	Pf = 120 / 140 mW	1460	---	1490	nm
RMS Spectral Width		σ	Pf = 120 / 140 mW (RMS)	---	---	10	nm
Tracking Error		TER	I <sub>M</sub> = const., 0/ 25/ 65°C	---	---	+/-1.0	dB
PD Dark Current		I <sub>DARK</sub>	V <sub>R(PD)</sub> = 5 V	---	---	100	nA
Monitor Current		I <sub>m</sub>	Pf = 120 / 140 mW, V <sub>R(PD)</sub> = 5 V	100	---	---	μA
Thermoelectric Cooler Capacity		ΔT	Pf = 120 / 140 mW	40	---	---	°C
Thermoelectric Cooler Current		I <sub>TEC</sub>	ΔT = 40°C, Pf = 120 / 140 mW	---	---	1.5	A
Thermoelectric Cooler Voltage		V <sub>TEC</sub>	ΔT = 40°C, Pf = 120 / 140 mW	---	---	4.0	V
Thermistor Resistance		R <sub>th</sub>	---	9	---	11	KΩ

### Fiber Pigtail Specifications

Parameter	Specifications	Units
Type	SM	---
Mode Field Diameter	10 +/-1	μm
Cladding Diameter	125 +/-2	μm
Jacket Diameter	900	μm
Length	1.0 (Minimum)	m
Connector	FC	---

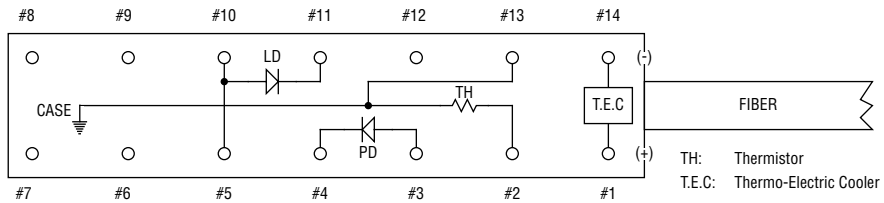
## PACKAGE DIMENSIONS

(Units: mm)



Tolerance = ±0.5 mm (unless noted otherwise)

### TERMINAL CONNECTION (BOTTOM VIEW)



## Pin Configuration

Pin No.	Description	Pin No.	Description
01	Thermo Electric Cooler (+)	08	NC
02	Thermistor	09	NC
03	PD Anode	10	LD Anode
04	PD Cathode	11	LD Cathode
05	LD Anode	12	NC
06	NC	13	Thermistor and Case Ground
07	NC	14	Thermo Electric Cooler Cathode (-)

Notes:

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