NEC

LASER DIODE
NX7460LE

1 480 nm EDFA APPLICATION
InGaAsP MQW-FP LASER DIODE MODULE

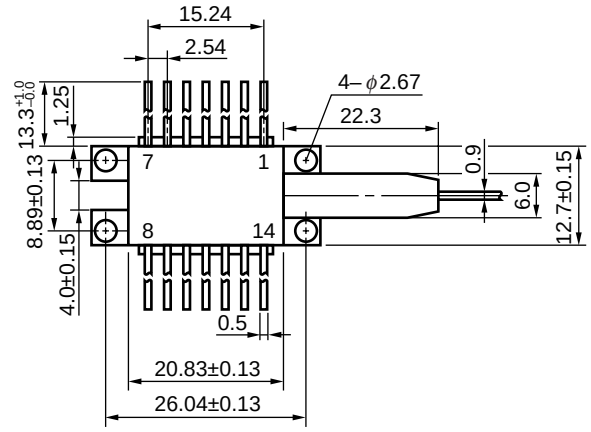
DESCRIPTION

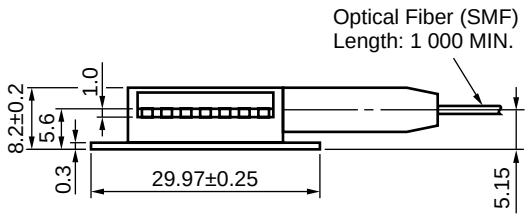
The NX7460LE is a 1 480 nm pumping laser diode module with optical isolator for an EDFA (Er Doped optical Fiber Amplifier) that can expand the transmission span and compensate optical losses. The device is a Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diode that features high output power, high efficiency, and stable fundamental mode.

FEATURES

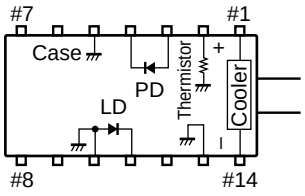
- InGaAsP strained MQW-FP laser diode
- High output power P_f = 120 mW MIN. @ I_F = 550 mA CW
- Internal optical isolator, thermoelectric cooler and InGaAs monitor photo diode
- Hermetically sealed 14-pin butterfly package
- Single mode fiber pigtail

PACKAGE DIMENSIONS (UNIT: mm)





TOP VIEW



PIN CONNECTIONS

Pin No.	Function	Pin No.	Function
1	Cooler Anode	8	NC
2	Thermistor	9	NC
3	PD Anode	10	LD Anode,
4	PD Cathode		Case Ground
5	Case Ground	11	LD Cathode
6	NC	12	NC
7	NC	13	Case Ground
		14	Cooler Cathod

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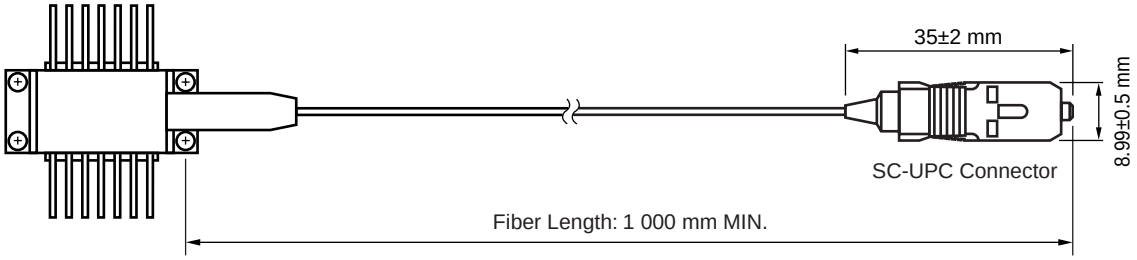
The mark ★ shows major revised points.

★ OPTICAL FIBER CHARACTERISTICS

Parameter	Specification	Unit
Mode Field Diameter	9.5±1	μm
Cladding Diameter	125±2	μm
Maximum Cladding Noncircularity	2	%
Maximum Core/Cladding Concentricity	1.6	%
Outer Diameter	0.9±0.1	mm
Cut-off Wavelength	1 100 to 1 270	nm
Minimum Fiber Bending Radius	30	mm
Fiber Length	1 000 MIN.	mm
Flammability	UL1581 VW-1	



ORDERING INFORMATION

Part Number	Available Connector
NX7460LE	Without Connector
NX7460LE-BA	With FC-PC Connector
NX7460LE-CA	With SC-PC Connector

★ ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I_F	700	mA
Reverse Voltage of LD	V_R	2.0	V
Forward Current of PD	I_F	10	mA
Reverse Voltage of PD	V_R	20	V
Operating Case Temperature	T_C	–20 to +65	°C
Storage Temperature	T_{stg}	–40 to +85	°C
Thermistor Current	I_t	0.5	mA
Thermistor Voltage	V_t	12.0	V
Cooler Current	I_C	1.8	A
Cooler Voltage	V_C	6.0	V
Lead Soldering Temperature	T_{sld}	260 (10 sec.)	°C

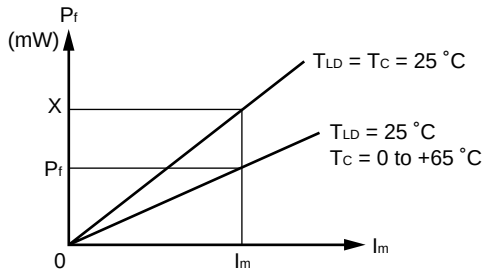
ELECTRO-OPTICAL CHARACTERISTICS (T_{LD} = 25 °C, T_C = 0 to +65 °C)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
	Threshold Current	I_{th}	CW		25	35	mA
	Forward Voltage	V_F	I_F = 550 mA		2.2	2.7	V
	Optical Output Power from Fiber	P_f	I_F = 550 mA	120	140		mW
★	Center Wavelength	λ_C	I_F = 550 mA, RMS (–20 dB)	1 460	1 480	1 490	nm
	Spectrum Width	σ	I_F = 550 mA, RMS (–20 dB)		4.0	8.0	nm
★	Isolation	I_S	1 460 nm to 1 490 nm	20			dB

ELECTRO-OPTICAL CHARACTERISTICS
(Applicable to Monitor PD: T_{LD} = 25 °C, T_C = 0 to +65 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	I_m	V_R = 5 V, I_F = 550 mA	500	1 000	1 500	μA
Monitor Dark Current	I_D	V_R = 5 V		2	10	nA
Tracking Error	γ *1	I_m = const.			0.5	dB

***1** $\gamma = \left| 10 \log \frac{P_f}{120 \text{ mW}} \right|$



(@P_f (25 ˚C) = 120 mW)

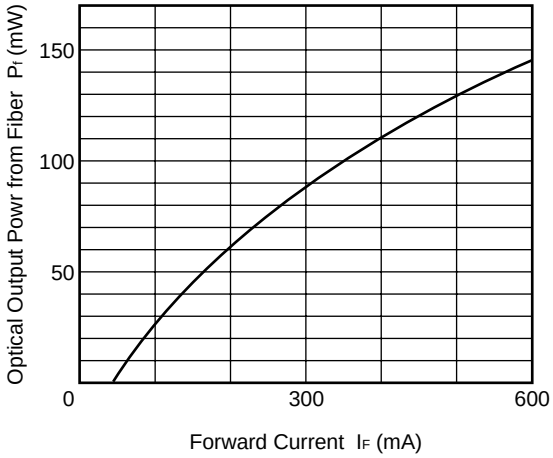
★ **ELECTRO-OPTICAL CHARACTERISTICS**
(Applicable to Thermistor and TEC: T_{LD} = 25 °C, T_C = 0 to +65 °C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	T_{LD} = 25 °C	9.5	10.0	10.5	kΩ
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I_C	ΔT = 40 °C, I_F = 660 mA		1.1	1.25	A
Cooler Voltage	V_C	ΔT = 40 °C, I_F = 660 mA		3.7	4.3	V
Cooling Capacity	ΔT *1	I_C = 1.25 A, I_F = 660 mA	40			K

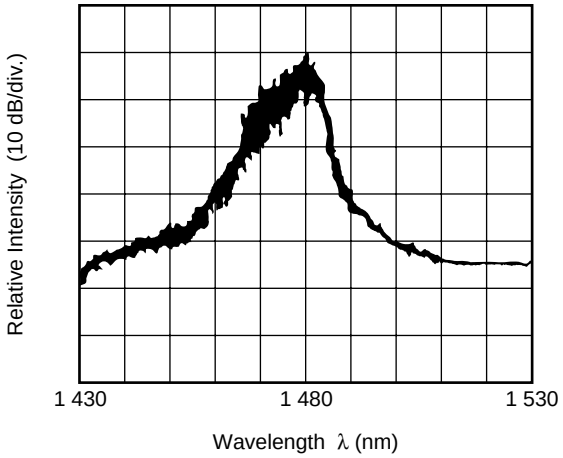
***1** $\Delta T = \left| T_C - T_{LD} \right|$

★ TYPICAL CHARACTERISTICS (T_C = 25 °C)

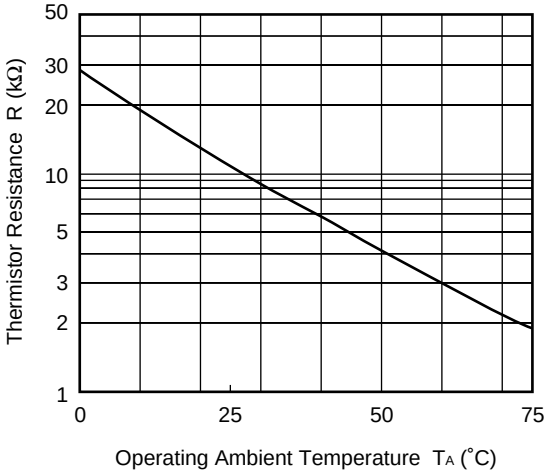
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



LONGITUDINAL MODE



THERMISTOR RESISTANCE vs. OPERATING AMBIENT TEMPERATURE



Remark The graphs indicate nominal characteristics.

★ LD FAMILY FOR DENSE WDM APPLICATION

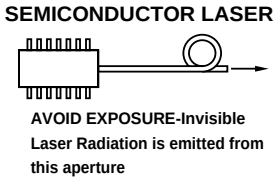
Part Number	Absolute Maximum Ratings		Typical Characteristics (T_C = 25 °C)			Description	Package
	T_C (°C)	T_{stg} (°C)	I_{th} (mA)	P_f (mW)	λ_C (nm)		
			TYP.	MIN.	TYP.		
NX7460LE	−20 to +65	−40 to +85	550	120	1 480	For EDFA pumping	BFY
NX7461LE	−20 to +75	−40 to +85	600	150	1 480	For EDFA pumping	BFY

REFERENCE

Document Name	Document No.
NEC semiconductor device reliability/quality control system	C11159E
Quality grades on NEC semiconductor devices	C11531E
Semiconductor device mounting technology manual	C10535E
SEMICONDUCTOR SELECTION GUIDE Products & Packages (CD-ROM)	X13769X

CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.



NEC Corporation
NEC Building, 7-1, Shiba 5-chome,
Minato-ku, Tokyo 108-01, Japan

Type number: _____
Manufactured: _____
Serial Number: _____

This product conforms to FDA regulations as applicable to standards 21 CFR Chapter 1. Subchapter J.

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