

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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**Phase-out/Discontinued**

LASER DIODE  
**NX7461LE-CC**

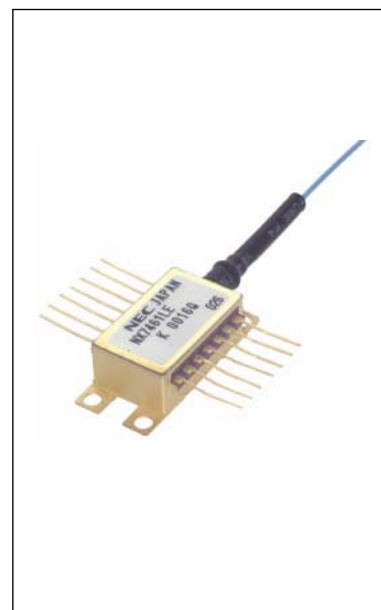
**1 480 nm EDFA APPLICATION  
 InGaAsP MQW-FP LASER DIODE MODULE**

**DESCRIPTION**

The NX7461LE-CC 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.

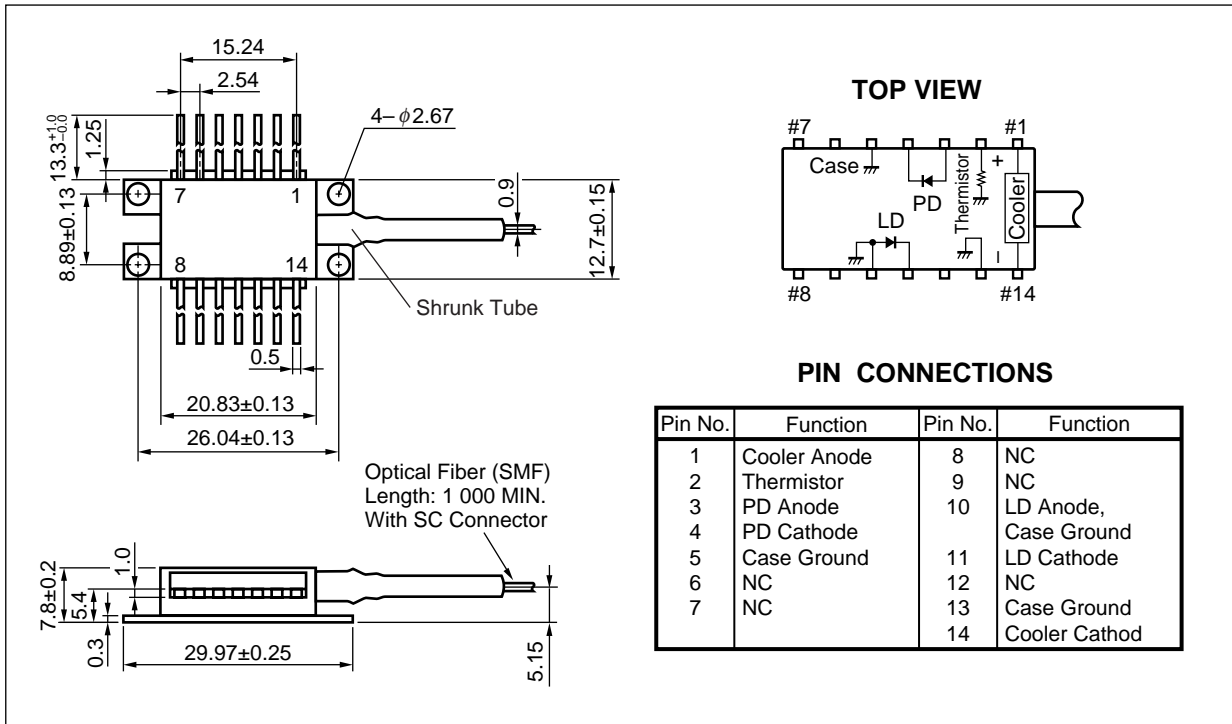
**FEATURES**

- InGaAsP MQW-FP laser diode
- High output power  $P_f = 150 \text{ mW MIN. @ } I_f = 600 \text{ mA CW}$
- Internal optical isolator, thermoelectric cooler and InGaAs monitor photo diode
- Hermetically sealed 14-pin butterfly package
- Single mode fiber pigtail



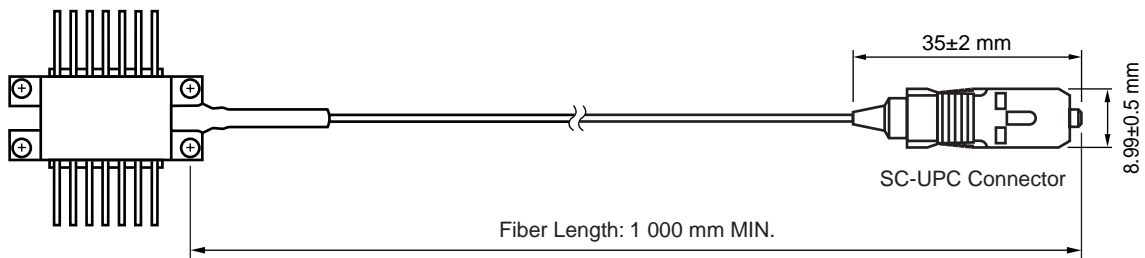
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 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

★ PACKAGE DIMENSIONS (UNIT: mm)



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
NX7461LE-CC	With SC-UPC Connector

**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Forward Current of LD	$I_F$	720	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 +70	°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 ( $T_{LD} = 25^\circ\text{C}$ ,  $T_C = -20$  to  $+70^\circ\text{C}$ , unless otherwise specified)**

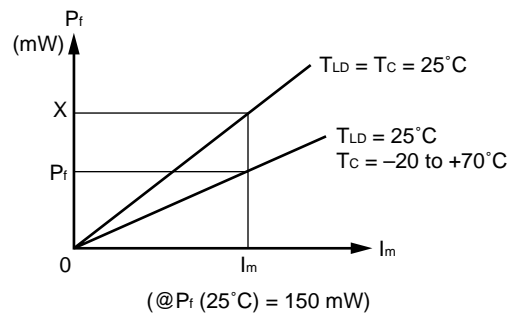
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	$I_{th}$	CW		50	60	mA
Forward Voltage	$V_F$	$I_F = 600$ mA		2.4	2.7	V
★ Optical Output Power from Fiber	$P_r$	$I_F = 600$ mA	150			mW
Center Emission Wavelength	$\lambda_C$	$I_F = 600$ mA, RMS (-20 dB)	1 460	1 480	1 490	nm
Spectrum Width	$\sigma$	$I_F = 600$ mA, RMS (-20 dB)		4.0	8.0	nm
Isolation	$I_s$	1 460 nm to 1 490 nm	25			dB

**ELECTRO-OPTICAL CHARACTERISTICS**

(Applicable to Monitor PD: T<sub>LD</sub> = 25°C, T<sub>C</sub> = -20 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 5 V, I <sub>F</sub> = 600 mA	500	1 300	2 000	μA
Dark Current	I <sub>D</sub>	V <sub>R</sub> = 5 V		2	10	nA
Tracking Error	γ <sup>*1</sup>	I <sub>m</sub> = const.			0.5	dB

$$*1 \gamma = \left| 10 \log \frac{P_f}{150 \text{ mW}} \right|$$



**ELECTRO-OPTICAL CHARACTERISTICS**

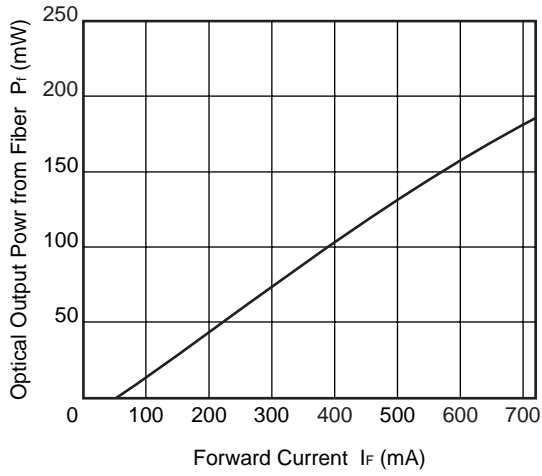
(Applicable to Thermistor and TEC: T<sub>LD</sub> = 25°C, T<sub>C</sub> = -20 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	T <sub>LD</sub> = 25°C	9.5	10.0	10.5	kΩ
B Constant	B		3 350	3 450	3 550	K
Cooler Current	I <sub>c</sub>	ΔT = 45°C, I <sub>F</sub> = 720 mA		1.2	1.4	A
Cooler Voltage	V <sub>c</sub>	ΔT = 45°C, I <sub>F</sub> = 720 mA		3.0	3.6	V
Cooling Capacity	ΔT <sup>-1</sup>	I <sub>c</sub> = 1.4 A, I <sub>F</sub> = 720 mA	45			°C

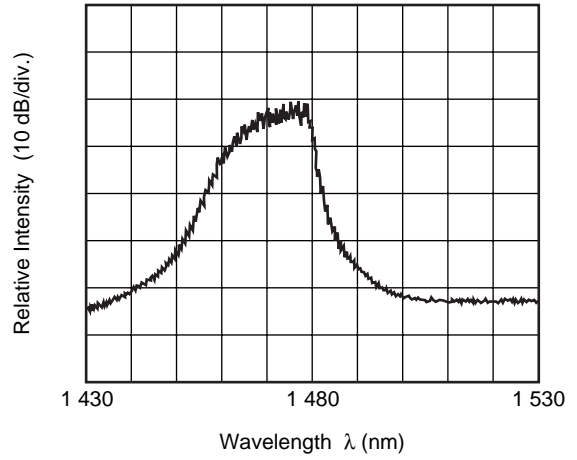
$$*1 \Delta T = |T_C - T_{LD}|$$

**TYPICAL CHARACTERISTICS (T<sub>c</sub> = 25°C, unless otherwise specified)**

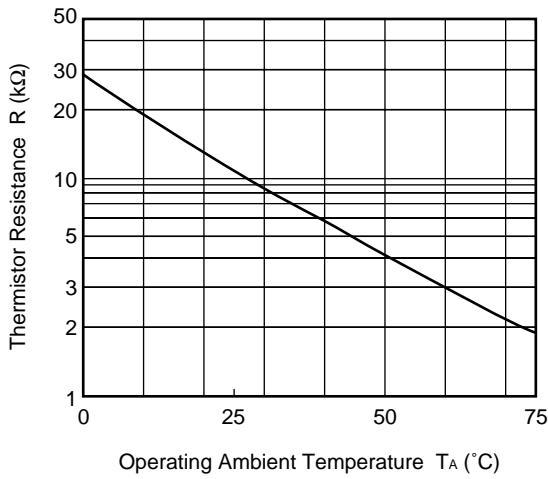
**OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT**



**SPECTRUM**



**THERMISTOR RESISTANCE vs. OPERATING AMBIENT TEMPERATURE**



**Remark** The graphs indicate nominal characteristics.

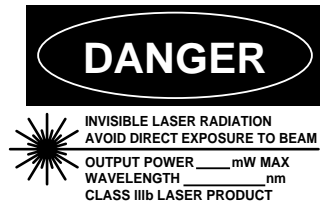
★ REFERENCE

Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

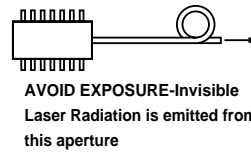
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M8E 00.4-0110

**SAFETY INFORMATION ON THIS PRODUCT**



**SEMICONDUCTOR LASER**



<p><b>Warning</b> Laser Beam</p>	<p>A laser beam is emitted from this diode during operation. The laser beam, visible or invisible, directly or indirectly, may cause injury to the eye or loss of eyesight.</p> <ul style="list-style-type: none"> <li>• Do not look directly into the laser beam.</li> <li>• Avoid exposure to the laser beam, any reflected or collimated beam.</li> </ul>
<p><b>Caution</b> GaAs Products</p>	<p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none"> <li>• Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.                     <ol style="list-style-type: none"> <li>1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.</li> <li>2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.</li> </ol> </li> <li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li> <li>• Do not lick the product or in any way allow it to enter the mouth.</li> </ul>
<p><b>Caution</b> Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> <li>• When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.</li> </ul>

► For further information, please contact

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