

**1 550 nm FOR FTTH  
 InGaAsP MQW-FP LASER DIODE**

### DESCRIPTION

The NX5504 Series is a 1 550 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diodes with InGaAs monitor PIN-PD. These devices are designed and ideal for Fiber To The Home (FTTH).

### ★ APPLICATION

- FTTH (Fiber To The Home)

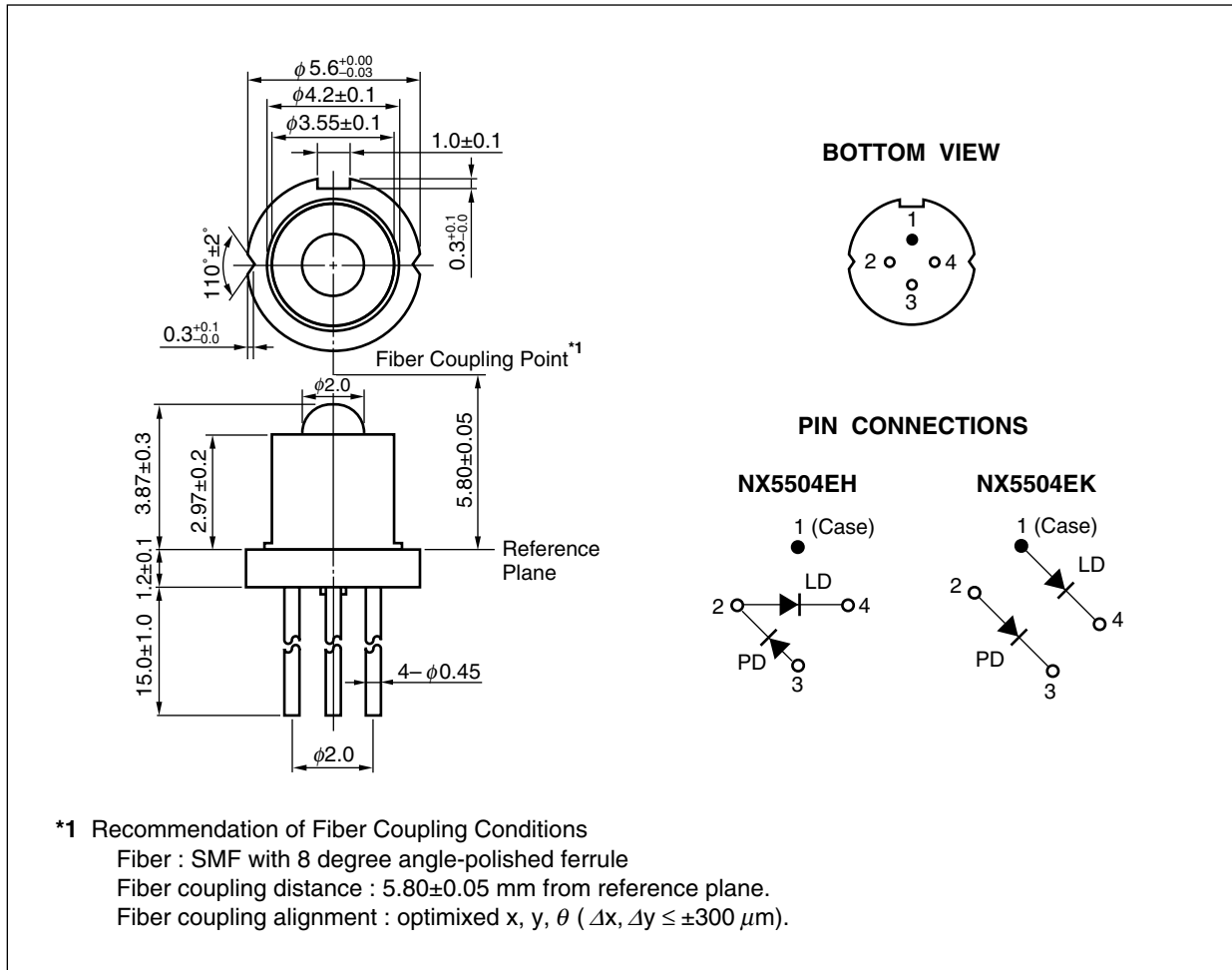
### FEATURES

- Optical output power  $P_o = 5.0 \text{ mW}$
- Low threshold current  $I_{th} = 8 \text{ mA}$
- ★ • Differential efficiency  $\eta_d = 0.3 \text{ W/A}$
- ★ • Wide operating temperature range  $T_c = -40 \text{ to } +85^\circ\text{C}$
- InGaAs monitor PIN-PD
- CAN package  $\phi 5.6 \text{ mm}$
- Fiber coupling point  $5.8 \text{ mm}$

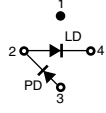
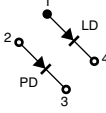


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 Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PACKAGE DIMENSIONS (UNIT: mm)



**ORDERING INFORMATION**

Part Number	Package	Pin Connections
NX5504EH	4-pin CAN with ball lens cap	 <p>Diagram showing a 4-pin CAN package with pins 1, 2, 3, and 4. Pin 1 is at the top, pin 2 on the left, pin 3 at the bottom, and pin 4 on the right. Pin 1 is connected to pin 4 (LD), and pin 2 is connected to pin 3 (PD).</p>
NX5504EK		 <p>Diagram showing a 4-pin CAN package with pins 1, 2, 3, and 4. Pin 1 is at the top, pin 2 on the left, pin 3 at the bottom, and pin 4 on the right. Pin 1 is connected to pin 4 (LD), and pin 2 is connected to pin 3 (PD).</p>

- Remarks**
1. The color of ball lens cap might be observed differently from our can package products.
  2. The hermetic test will be performed as AQL 1.0%.

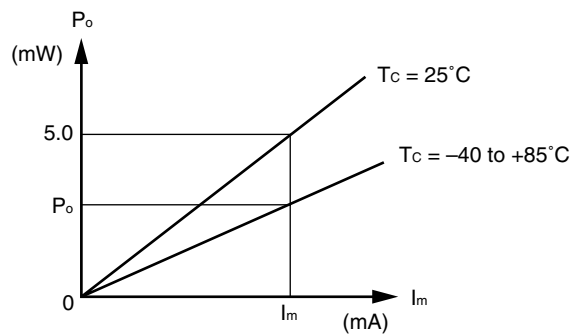
**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Optical Output Power	$P_o$	10	mW
Forward Current of LD	$I_F$	150	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	$T_C$	-40 to +85	°C
Storage Temperature	$T_{stg}$	-40 to +85	°C
Assembly Temperature	$T_{asb}$	150 (15 Hr)	°C
Lead Soldering Temperature	$T_{sld}$	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

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

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
★ Operating Voltage	V <sub>op</sub>	P <sub>o</sub> = 5.0 mW, T <sub>c</sub> = -40 to +85°C		1.1	1.5	V
★ Threshold Current	I <sub>th</sub>			8	20	mA
		T <sub>c</sub> = 85°C		20	40	
★ Threshold Output Power	P <sub>th</sub>	T <sub>c</sub> = -40 to +85°C, I <sub>F</sub> = I <sub>th</sub>		100	200	μW
Differential Efficiency	η <sub>d</sub>		0.15	0.3		W/A
Temperature Dependence of Differential Efficiency	Δη <sub>d</sub>	Δη <sub>d</sub> = 10 log $\frac{\eta_d (@ 85^\circ\text{C})}{\eta_d (@ 25^\circ\text{C})}$	-3.0	-1.5		dB
★ Center Wavelength	λ <sub>c</sub>	P <sub>o</sub> = 5.0 mW, RMS (-20 dB) T <sub>c</sub> = -40 to +85°C	1 480		1 580	nm
★ Temperature Dependence of Center Wavelength	Δλ/ΔT	T <sub>c</sub> = -40 to +85°C		0.5		nm/°C
★ Spectral Width	σ	P <sub>o</sub> = 5.0 mW, RMS (-20 dB) T <sub>c</sub> = -40 to +85°C		1.5	3.0	nm
Rise Time	t <sub>r</sub>	10-90%			0.7	ns
Fall Time	t <sub>f</sub>	90-10%			0.7	ns
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 5 V, P <sub>o</sub> = 5.0 mW	200			μA
★ Monitor Dark Current	I <sub>D</sub>	V <sub>R</sub> = 5 V		0.1	10	nA
		V <sub>R</sub> = 5 V, T <sub>c</sub> = -40 to +85°C			500	
★ Monitor PD Terminal Capacitance	C <sub>t</sub>	V <sub>R</sub> = 5 V, f = 1 MHz		6	20	pF
★ Tracking Error* <sup>1</sup>	γ	I <sub>m</sub> = const. (@ P <sub>o</sub> = 5.0 mW, T <sub>c</sub> = 25°C) T <sub>c</sub> = -40 to +85°C	-1.0		1.0	dB

★ \*1 Tracking Error: γ



$$\gamma = \left| 10 \log \frac{P_o}{5.0} \right| \text{ [dB]}$$

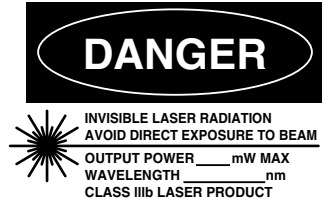
**REFERENCE**

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

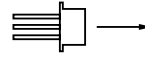
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M8E 00.4-0110

**SAFETY INFORMATION ON THIS PRODUCT**



**SEMICONDUCTOR LASER**



**AVOID EXPOSURE-Invisible**  
 Laser Radiation is emitted from  
 this aperture

<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>

► For further information, please contact

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