

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).

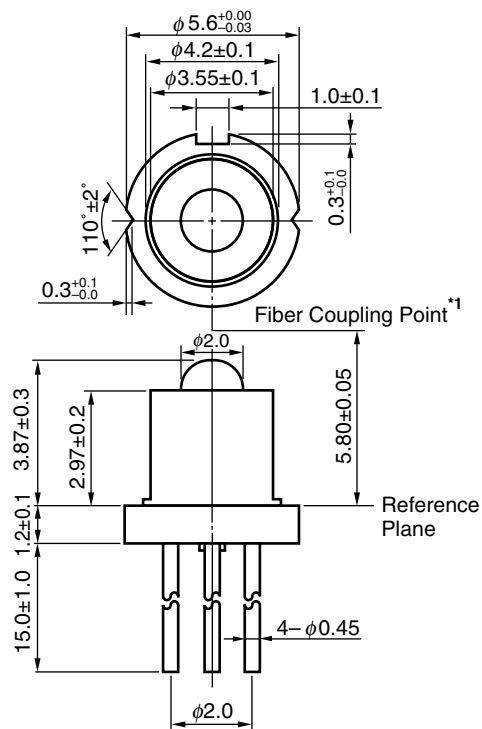
FEATURES

- Optical output power $P_o = 5.0 \text{ mW}$
- Low threshold current $I_{th} = 8 \text{ mA}$
- High speed $t_r = 0.7 \text{ ns MAX.}$
 $t_f = 0.7 \text{ ns MAX.}$
- Wide operating temperature range $T_c = -20 \text{ to } +85^\circ\text{C}$
- InGaAs monitor PIN-PD
- CAN package $\phi 5.6 \text{ mm}$
- Fiber coupling point 5.8 mm

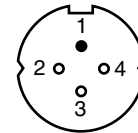


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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PACKAGE DIMENSIONS (UNIT: mm)

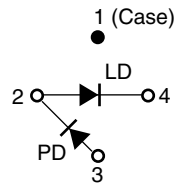


BOTTOM VIEW

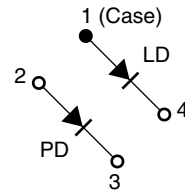


PIN CONNECTIONS

NX5504EH



NX5504EK



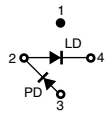

*1 Recommendation of Fiber Coupling Conditions

Fiber : SMF with 8 degree angle-polished ferrule

Fiber coupling distance : 5.80 ± 0.05 mm from reference plane.

Fiber coupling alignment : optimixed x, y, θ ($\Delta x, \Delta y \leq \pm 300 \mu\text{m}$).

ORDERING INFORMATION

Part Number	Package	Pin Connections
NX5504EH	4-pin CAN with ball lens cap	
NX5504EK		

- 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%.

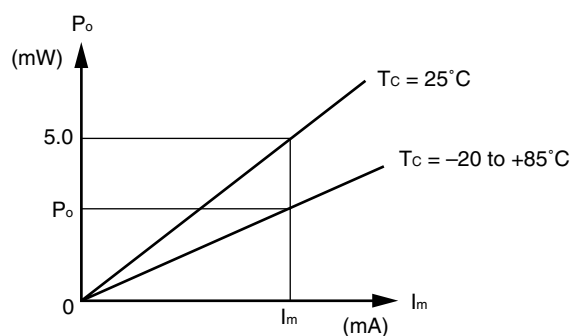
ABSOLUTE MAXIMUM RATINGS

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	-20 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_c = 25°C, unless otherwise specified)

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

*1 Tracking Error: γ



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

LD CAN PACKAGES FAMILY FOR OPTICAL FIBER COMMUNICATIONS

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics (T _c = 25°C)				Application	Package
	T _C (°C)	T _{stg} (°C)	I _{th} (mA)	P _o (mW)	λ (nm)			
			TYP.	TYP.	MIN.	MAX.		
NX5304 Series	−40 to +85	−40 to +85	10	5	1 263	1 360	156 Mb/s: STM-1 (I-1, S-1.1, L-1.1)	CAN
							622 Mb/s: STM-4 (I-4, S-4.1)	
							1.25 Gb/s: GbE	
NX5306 Series	−40 to +85	−40 to +85	10	5	1 263	1 360	156 Mb/s: STM-1 (I-1, S-1.1, L-1.1)	CAN
							622 Mb/s: STM-4 (I-4, S-4.1)	
							1.25 Gb/s: GbE	
NX5307 Series	−40 to +85	−40 to +85	10	10	1 266	1 360	2.5 Gb/s: STM-16	CAN
NX5501 Series	−20 to +85	−40 to +85	8	5	1 480	1 580	For FTTH	CAN
NX5504 Series	−20 to +85	−40 to +85	8	5	1 480	1 580	For FTTH	CAN
NX6306 Series	−40 to +85	−40 to +85	10	5	1 280	1 335	156 Mb/s: STM-1 (I-1, S-1.1, L-1.1)	CAN
							622 Mb/s: STM-4 (I-4, S-4.1, L-4.1)	
							1.25 Gb/s: GbE	
NX6307 Series	−20 to +85	−40 to +85	10	7	1 280	1 335	2.5 Gb/s: STM-16 (S-16.1, L-16.1)	CAN
NX6504 Series	−10 to +85	−40 to +85	12	5	1 530	1 570	156 Mb/s: STM-1	CAN
							622 Mb/s: STM-4	
NX6508 Series	0 to +70	−40 to +85	10	5	λ _p −3 ^{*1}	λ _p +3 ^{*1}	For CWDM	CAN
NX6509 Series	−20 to +85	−40 to +85	10	5	1 530	1 570	2.5 Gb/s: STM-16 (L-16.2)	CAN

*1 λ_p = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

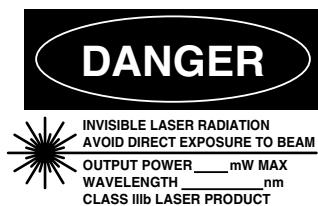
REFERENCE

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

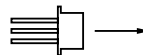
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M8E 00.4 - 0110

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible
Laser Radiation is emitted from
this aperture

<div>Warning</div> <div>Laser Beam</div>	<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"> • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
<div>Caution</div> <div>GaAs Products</div>	<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"> • 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"> 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. 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. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.

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