

1 310 nm FOR 156 Mb/s, 622 Mb/s, 1.25 Gb/s InGaAsP MQW-DFB LASER DIODE

★ DESCRIPTION

The NX6306 Series is a 1 310 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode with InGaAs monitor PIN-PD. This device is ideal for Gigabit Ethernet and Synchronous Digital Hierarchy (SDH) system STM-1 (I-1, S-1.1, L-1.1), STM-4 (I-4, S-4.1, L-4.1), ITU-T recommendations.

APPLICATION

- 156 Mb/s : STM-1 (I-1, S-1.1, L-1.1)
- 622 Mb/s : STM-4 (I-4, S-4.1, L-4.1)

- ★ • 1.25 Gb/s : Gigabit Ethernet

FEATURES

- | | |
|------------------------------------|--|
| • Optical output power | $P_o = 5.0 \text{ mW}$ |
| • Low threshold current | $I_{th} = 10 \text{ mA @ } T_c = 25^\circ\text{C}$ |
| • High speed | $t_r, t_f = 0.5 \text{ ns MAX.}$ |
| • Side mode suppression ratio | $\text{SWSR} = 45 \text{ dB @ TYP.}$ |
| • Wide operating temperature range | $T_c = -40 \text{ to } +85^\circ\text{C}$ |
| • InGaAs monitor PIN-PD | |
| • CAN package | $\phi 5.6 \text{ mm}$ |
| • Based on Telcordia reliability | |

NX6306S Series

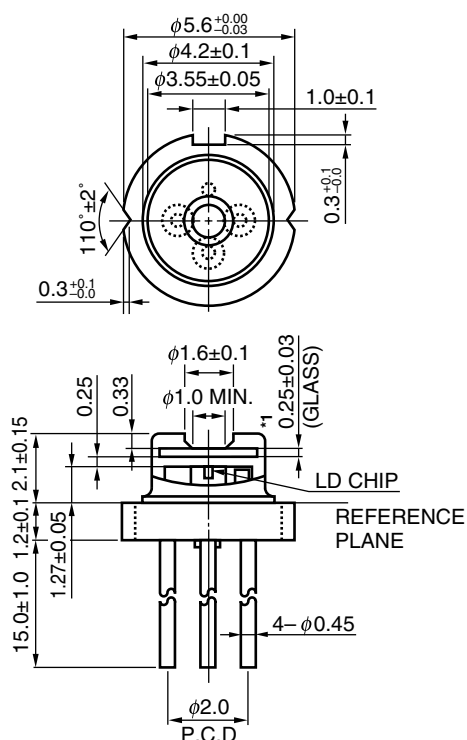


NX6306G Series

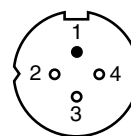
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PACKAGE DIMENSIONS (UNIT: mm)

NX6306S Series

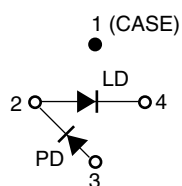


BOTTOM VIEW

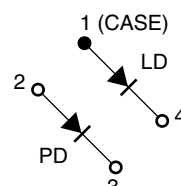


PIN CONNECTIONS

NX6306SH

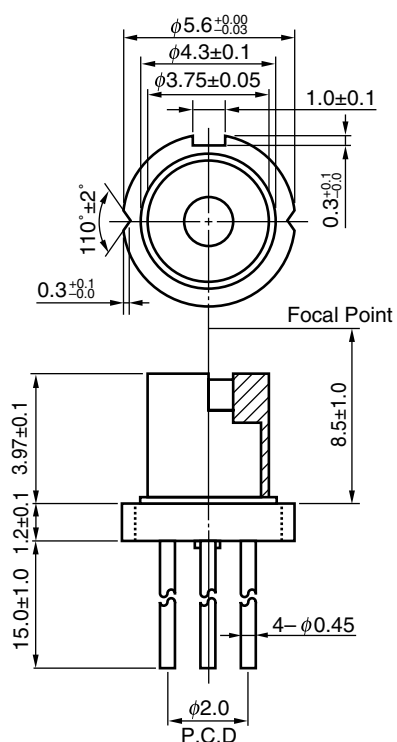


NX6306SK

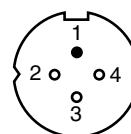


*1 n = 1.48 Bolosilicate Glass

NX6306G Series

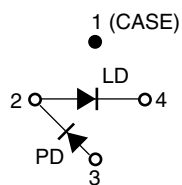


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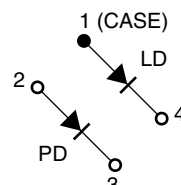


PIN CONNECTIONS

NX6306GH

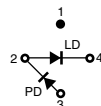
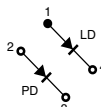


NX6306GK

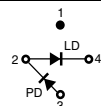
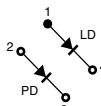


ORDERING INFORMATION

NX6306S Series

Part Number	Package	Pin Connections
NX6306SH	4-pin CAN with flat glass cap	
NX6306SK		

NX6306G Series

Part Number	Package	Pin Connections
NX6306GH	4-pin CAN with aspherical lens cap	
NX6306GK		

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	%

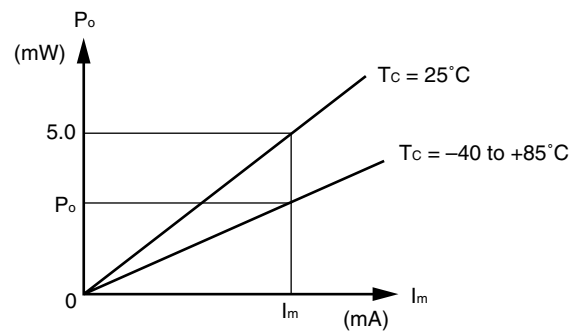
ELECTRO-OPTICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V_{op}	$P_o = 5.0 \text{ mW}$, $T_C = -40 \text{ to } +85^\circ\text{C}$		1.1	1.6	V
Threshold Current	I_{th}			10	20	mA
		$T_C = 85^\circ\text{C}$		30	40	
Threshold Output Power	P_{th}	$T_C = -40 \text{ to } +85^\circ\text{C}$, $I_F = I_{th}$		100	200	μW
Differential Efficiency	η_d	(Flat glass type: NX6306S Series)	0.2	0.35		W/A
		(Aspherical lens type: NX6306G Series)	0.2	0.3		W/A
Temperature Dependence of Differential Efficiency	$\Delta\eta_d$	$\Delta\eta_d = 10 \log \frac{\eta_d (@ 85^\circ\text{C})}{\eta_d (@ 25^\circ\text{C})}$	-3.0	-2.5		dB
Peak Emission Wavelength	λ_p	$P_o = 5.0 \text{ mW}$, RMS (-20 dB), $T_C = -40 \text{ to } +85^\circ\text{C}$	1 280		1 335	nm
Side Mode Suppression Ratio	SMSR	$P_o = 5.0 \text{ mW}$, RMS (-20 dB), $T_C = -40 \text{ to } +85^\circ\text{C}$	30	45		dB
Vertical Beam Angle ^{*1}	θ_L	$P_o = 5.0 \text{ mW}$, FAHM ^{*2}		35	40	deg.
Lateral Beam Angle ^{*1}	θ_l	$P_o = 5.0 \text{ mW}$, FAHM ^{*2}		30	35	deg.
Rise Time	t_r	10-90%			0.5	ns
Fall Time	t_f	90-10%			0.5	ns
Monitor Current	I_m	$V_R = 5 \text{ V}$, $P_o = 5.0 \text{ mW}$	200	600	1 000	μA
Monitor Dark Current	I_D	$V_R = 5 \text{ V}$		0.1	10	nA
		$V_R = 5 \text{ V}$, $T_C = -40 \text{ to } +85^\circ\text{C}$			500	
Monitor PD Terminal Capacitance	C_t	$V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$		6	20	pF
Tracking Error ^{*3}	γ	$I_m = \text{const.} (@ P_o = 5.0 \text{ mW}, T_C = 25^\circ\text{C})$ $T_C = -40 \text{ to } +85^\circ\text{C}$	-1.0		1.0	dB

*1 Applicable to only NX6306S Series

*2 FAHM: Full Angle at Half Maximum

*3 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

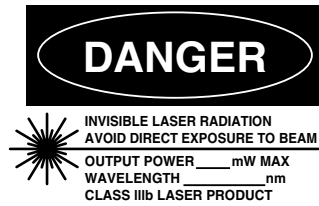
REFERENCE

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

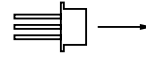
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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible
Laser Radiation is emitted from
this aperture

Warning Laser Beam	<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.
Caution GaAs Products	<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.

► For further information, please contact

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