

**CEL**

**NEC's 1310 nm InGaAsP MQW DFB  
LASER DIODE IN CAN PACKAGE  
FOR 155 Mb/s and 622 Mb/s APPLICATIONS**

**NX6306 SERIES****DESCRIPTION**

NEC's NX6306 Series is a 1310 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.

**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:**  
 $t_r, t_f = 0.5 \text{ ns MAX.}$
- **40% REDUCTION OF MOUNTING AREA:**  
5-pin SOP  $\times$  2
- **SIDE MODE SUPPRESSION RATIO:**  
SWSR = 45 dB @ TYP.
- **InGaAs MONITOR PIN-PD**
- **CAN PACKAGE:**  
 $\phi 5.6 \text{ mm}$
- **BASED ON TELCORDIA RELIABILITY**

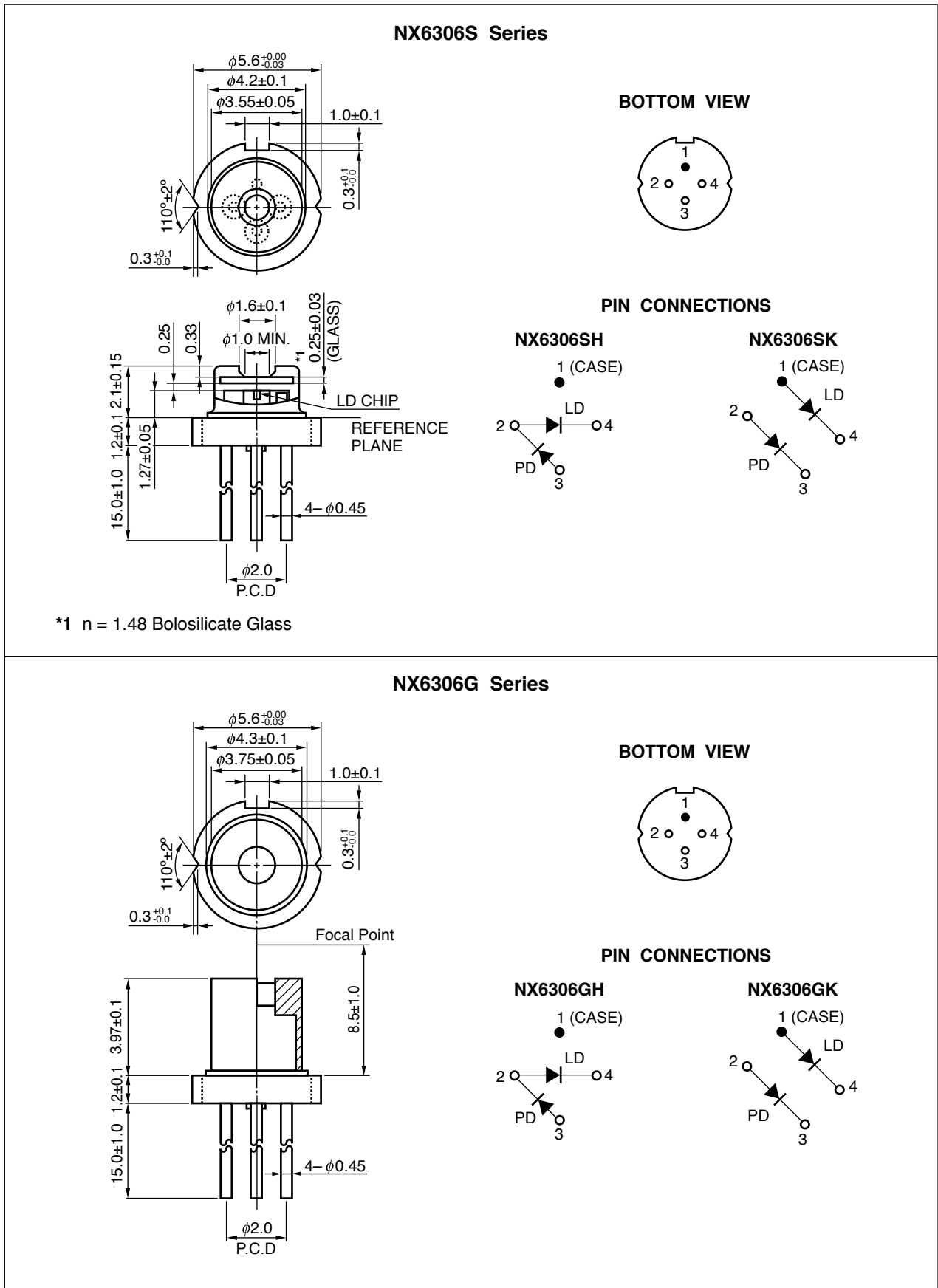
**APPLICATIONS**

- 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

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# NX6306 Series

## PACKAGE DIMENSIONS (UNIT: mm)



**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		

## NX6306 Series

### 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	$T_{slid}$	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

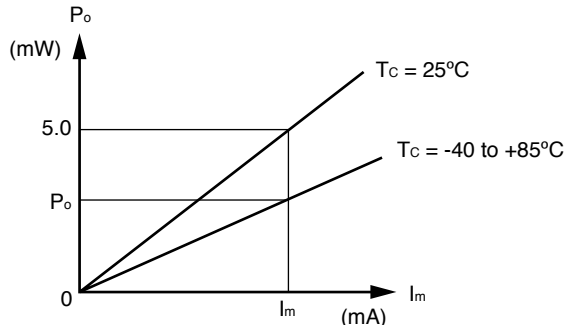
### ELECTRO-OPTICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

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	$\mu\text{W}$
Differential Efficiency	$\eta_d$	(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	$\lambda_p$	$P_o = 5.0 \text{ mW}$ , 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	$\theta_{\perp}$	$P_o = 5.0 \text{ mW}$ , FAHM *2		35	40	deg.
Lateral Beam Angle *1	$\theta_{//}$	$P_o = 5.0 \text{ mW}$ , 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	$\mu\text{A}$
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	$\gamma$	$I_m = \text{const.} (@ P_o = 5.0 \text{ mW}, T_C = 25^\circ\text{C})$ $T_C = -40 \text{ to } +85^\circ\text{C}$	-1.0		1.0	dB

\*1 Applicable to only NX6306S Series

\*2 FAHM: Full Angle at Half Maximum

3 Tracking Error:  $\gamma$



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

Life Support Applications

These NEC products are not intended for use in life support devices, appliances, or systems where the malfunction of these products can reasonably be expected to result in personal injury. The customers of CEL using or selling these products for use in such applications do so at their own risk and agree to fully indemnify CEL for all damages resulting from such improper use or sale.

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