



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**



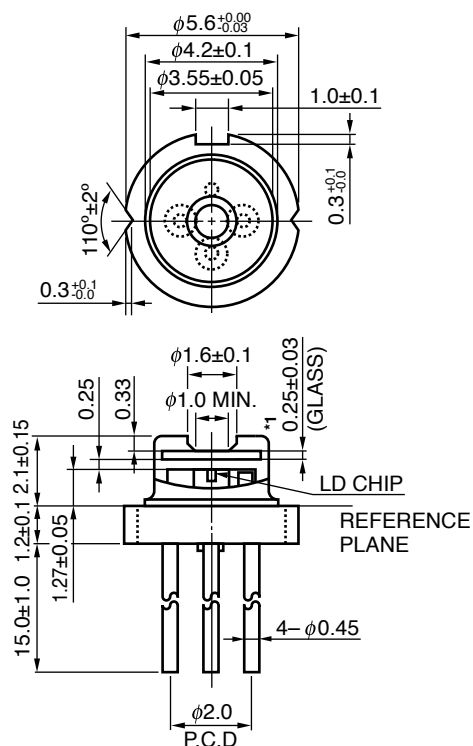
APPLICATIONS

- 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

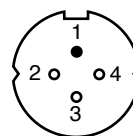
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PACKAGE DIMENSIONS (UNIT: mm)

NX6306S Series

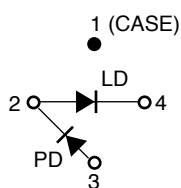


BOTTOM VIEW

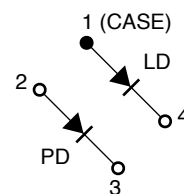


PIN CONNECTIONS

NX6306SH

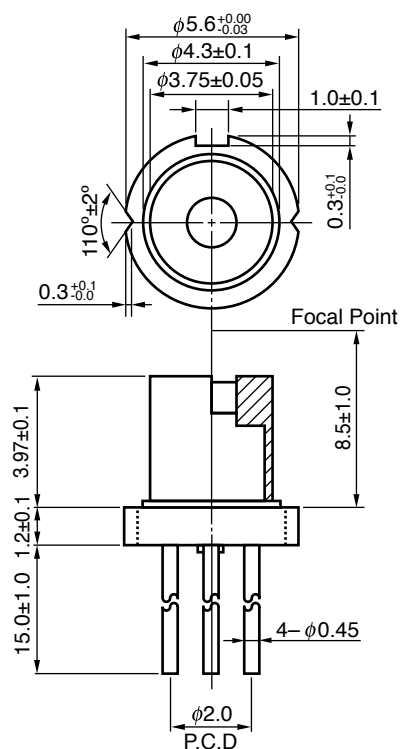


NX6306SK

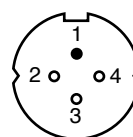


*1 n = 1.48 Bolosilicate Glass

NX6306G Series

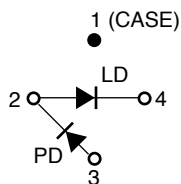


BOTTOM VIEW

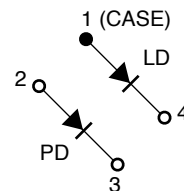


PIN CONNECTIONS

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	%

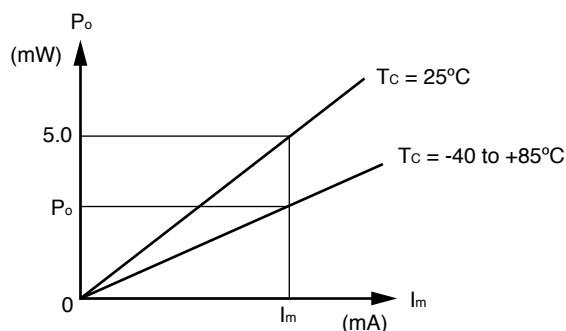
ELECTRO-OPTICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

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	$\theta_\perp$	$P_o = 5.0 \text{ mW}$, FAHM *2		35	40	deg.
Lateral Beam Angle *1	$\theta_\parallel$	$P_o = 5.0 \text{ mW}$, 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



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

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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01/25/2005

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