

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

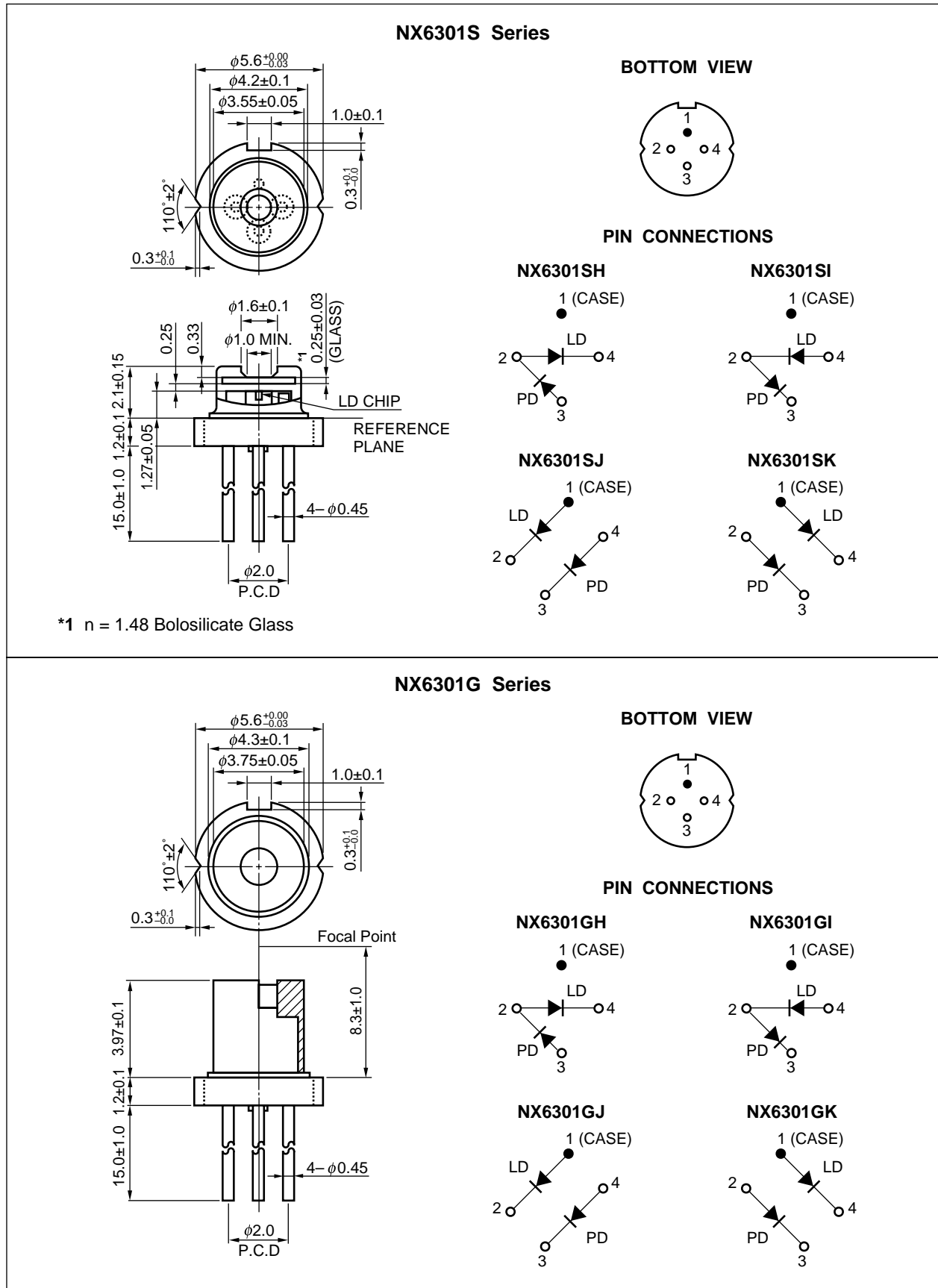
The NX6301 Series is a 1 310 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode with InGaAs monitor PIN-PD. This device is ideal for Synchronous Digital Hierarchy (SDH) system, STM-1, STM-4, ITU-T recommendations.

FEATURES

- Optical output power $P_o = 5.0 \text{ mW}$
- Low threshold current $I_{th} = 13 \text{ mA @ } T_c = 25^\circ\text{C}$
- High speed $t_r, t_f = 0.5 \text{ ns MAX.}$
- SMSR 40 dB
- 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

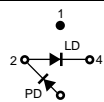
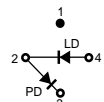

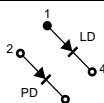
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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PACKAGE DIMENSIONS (UNIT: mm)

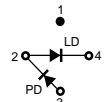
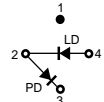

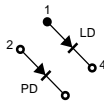


ORDERING INFORMATION

NX6301S Series

Part Number	Package	Pin Connections
NX6301SH	4-pin CAN with flat glass cap	
NX6301SI		
NX6301SJ		
NX6301SK		

NX6301G Series

Part Number	Package	Pin Connections
NX6301GH	4-pin CAN with aspherical lens cap	
NX6301GI		
NX6301GJ		
NX6301GK		

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
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

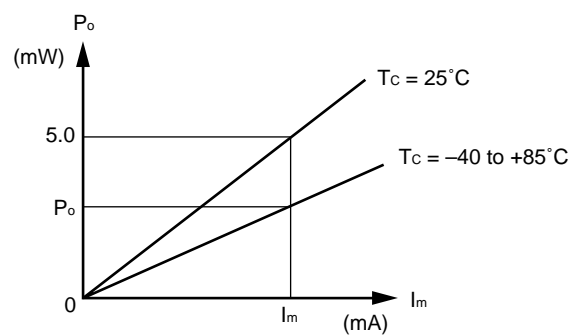
ELECTRO-OPTICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V_{op}	$P_o = 5.0 \text{ mW}$, $T_C = -40 \text{ to } +85^\circ\text{C}$	–	1.2	1.5	V
Threshold Current	I_{th}		–	13	25	mA
		$T_C = 85^\circ\text{C}$	–	40	50	
Threshold Output Power	P_{th}	$T_C = -40 \text{ to } +85^\circ\text{C}$, $I_F = I_{th}$	–	–	200	μW
Differential Efficiency	η_d		0.15	0.25	–	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	-2.3	–	dB
Peak Emission Wavelength	λ_p	$P_o = 5.0 \text{ mW}$, $T_C = -40 \text{ to } +85^\circ\text{C}$	1 280	–	1 335	nm
Side Mode Suppression Ratio	SMSR	$P_o = 5.0 \text{ mW}$, $T_C = -40 \text{ to } +85^\circ\text{C}$	30	40	–	dB
Vertical Beam Angle ^{*1}	θ_L	$P_o = 5.0 \text{ mW}$, FAHM ^{*2}	–	30	40	deg.
Lateral Beam Angle ^{*1}	θ_H	$P_o = 5.0 \text{ mW}$, FAHM ^{*2}	–	25	35	deg.
Rise Time	t_r	10-90%	–	0.05	0.5	ns
Fall Time	t_f	90-10%	–	0.3	0.5	ns
Monitor Current	I_m	$V_R = 5 \text{ V}$, $P_o = 5.0 \text{ mW}$	200	600	–	μA
Monitor Dark Current	I_D	$V_R = 5 \text{ V}$	–	0.1	50	nA
		$V_R = 5 \text{ V}$, $T_C = -40 \text{ to } +85^\circ\text{C}$	–	–	500	
Monitor PD Terminal Capacitance	C_t	$V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$	–	1.0	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 NX6301S 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				Application	Package
			@T _c = 25°C	@T _c				
	T _c (°C)	T _{slg} (°C)	I _{th} (mA)	P _o (mW)	λ (nm)			
			TYP.	TYP.	MIN.	MAX.		
NX5302 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)	
NX6300 Series	0 to +75	−40 to +85	12	10	1 280	1 335	2.5 Gb/s: STM-16 (S-16.1, L-16.1)	CAN
NX6301 Series	−40 to +85	−40 to +85	13	5	1 280	1 335	156 Mb/s: STM-1	CAN
							622 Mb/s: STM-4	
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	

REFERENCE

Document Name	Document No.
Optical semiconductor devices for fiberoptic communications Selection Guide	P12480E
Opto-Electronics Devices Pamphlet	P13623E
Opto-Electronics Devices (CD-ROM)	P12944X
NEC semiconductor device reliability/quality control system ^{*1}	C11159E
Quality grades on NEC semiconductor devices ^{*1}	C11531E
SEMICONDUCTOR SELECTION GUIDE –Products and Packages– ^{*1}	X13769E

^{*1} Published by NEC Corporation

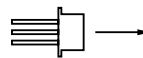
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M8E 00.4-0110

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>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> Do not destroy or burn the product. Do not cut or cleave off any part of the product. Do not crush or chemically dissolve the product. Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p>

► Business issue

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► Technical issue

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