

CEL

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

**NX6301
SERIES****FEATURES**

- **OPTICAL OUTPUT POWER:**
 $P_o = 5.0 \text{ mW}$
- **LOW THRESHOLD CURRENT:**
 $I_{TH} = 13 \text{ mA}$
- **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:**
 $\varnothing 5.6 \text{ mm}$
- **BASED ON TELCORDIA RELIABILITY**

DESCRIPTION

NEC's NX6301 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 Synchronous Digital Hierarchy (SDH) and SONET systems, STM-1/OC-3, STM-4/OC-12 and ITU-T recommendations.

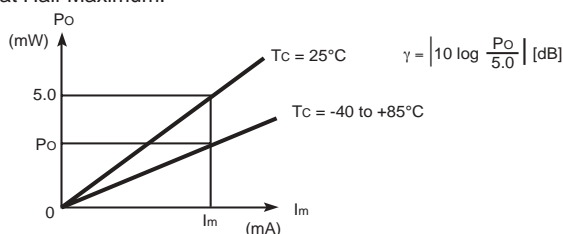
ELECTRO-OPTICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$, unless otherwise specified)

PART NUMBER			NX6301 Series		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
V_{OP}	Operating Voltage, $P_o = 5.0 \text{ mW}$, $T_c = -40 \text{ to } +85^\circ\text{C}$	V	–	1.2	1.5
I_{TH}	Threshold Current		–	13	25
		$T_c = 85^\circ\text{C}$	–	40	50
P_{TH}	Threshold Output Power, $T_c = -40 \text{ to } +85^\circ\text{C}$, $I_F = I_{TH}$	μW	–	–	200
η_d	Differential Efficiency	W/A	0.15	0.25	–
$\Delta\eta_d$	Temperature Dependence of Differential Efficiency $\Delta\eta_d = 10 \log \frac{\eta_d (@ 85^\circ\text{C})}{\eta_d (@ 25^\circ\text{C})}$	dB	-3.0	-2.3	–
λ_p	Peak Emission Wavelength, $P_o = 5.0 \text{ mW}$, $T_c = -40 \text{ to } +85^\circ\text{C}$, RMS (-20 dB)	nm	1280	–	1335
SMSR	Side mode Suppression Ratio $P_o = 5.0 \text{ mW}$, $T_c = -40 \text{ to } +85^\circ\text{C}$	dB	30	40	–
θ_{\perp}	Vertical Beam Angle ¹ , $P_o = 5.0 \text{ mW}$, FAHM ²	deg	–	30	40
θ_{\parallel}	Lateral Beam Angle ¹ , $P_o = 5.0 \text{ mW}$, FAHM ²	deg	–	25	35
t_r	Rise Time, 10 to 90%	ns	–	0.05	0.5
t_f	Fall Time, 90 to 10%	ns	–	0.3	0.5
I_m	Monitor Current, $P_o = 5.0 \text{ mW}$, $V_R = 5 \text{ V}$	μA	200	600	1000
I_D	Monitor Dark Current, $V_R = 5 \text{ V}$	$V_R = 5 \text{ V}$	–	0.1	50
		$V_R = 5 \text{ V}$, $T_c = -40 \text{ to } +85^\circ\text{C}$	–	–	500
C_t	Monitor PD Terminal Capacitance, $V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$	pF	–	1.0	20
γ	Tracking Error ³ $I_m = \text{const}$, (@ $P_o = 5.0 \text{ mW}$, $T_c = 25^\circ\text{C}$) $T_c = -40 \text{ to } +85^\circ\text{C}$	dB	-1.0	–	1.0

Notes:

1. Applicable only to NX6301S Series.

2. FAHM: Full Angle at Half Maximum.

3. Tracking Error: γ 

NX6301 SERIES

ABSOLUTE MAXIMUM RATINGS¹

(T_c = 25°C, unless otherwise specified)

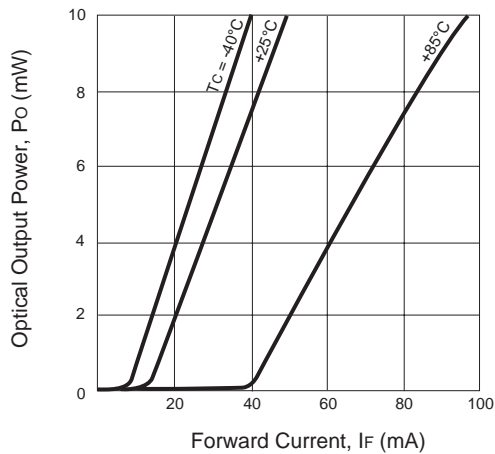
SYMBOLS	PARAMETERS	UNITS	RATINGS
P _f	Optical Output Power	mW	10
I _F	Forward Current of LD	mA	150
V _R	Reverse Voltage of LD	V	2.0
I _F	Forward Current of PD	mA	10
V _R	Reverse Voltage of PD	V	20
T _c	Operating Case Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-40 to +85
T _{SLD}	Lead Soldering Temperature (10 s)	°C	350 (3 sec.)
RH	Relative Humidity (noncondensing)	%	85

Note:

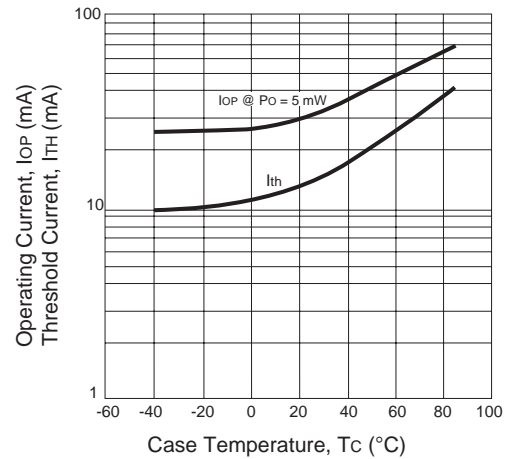
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_c = -40 to +85°C)

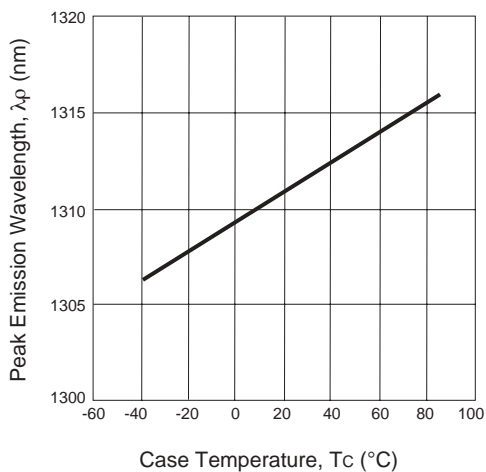
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



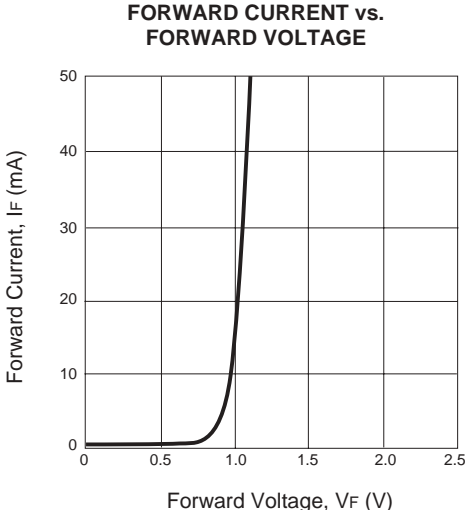
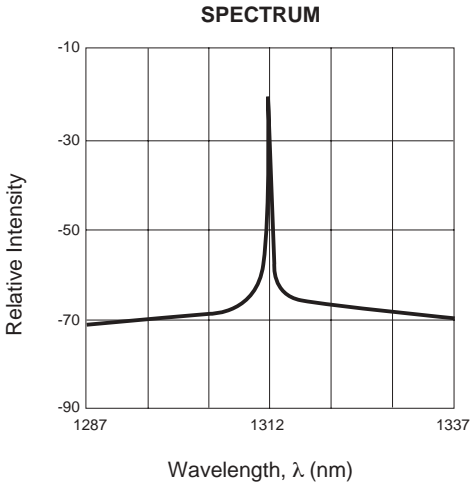
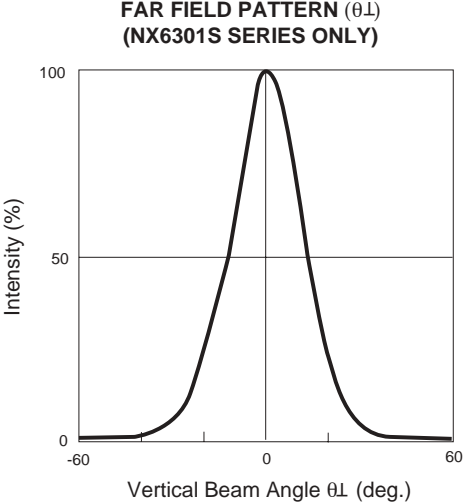
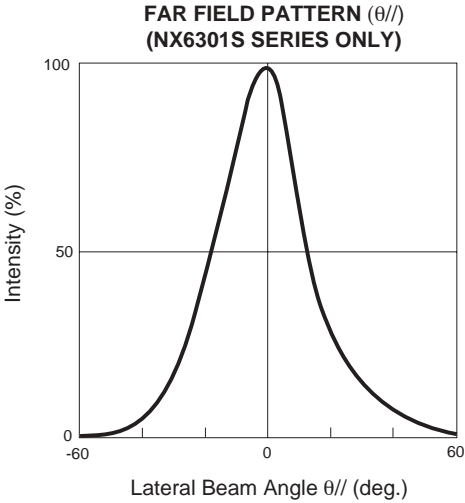
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



TEMPERATURE DEPENDENCE OF PEAK EMISSION WAVELENGTH



TYPICAL PERFORMANCE CURVES (T_C = -40 to +85°C)

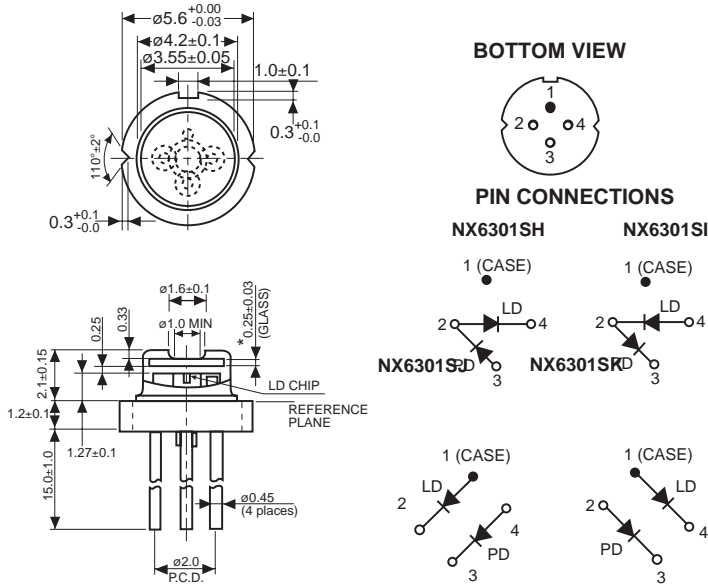


Note: The graphs indicate nominal characteristics.

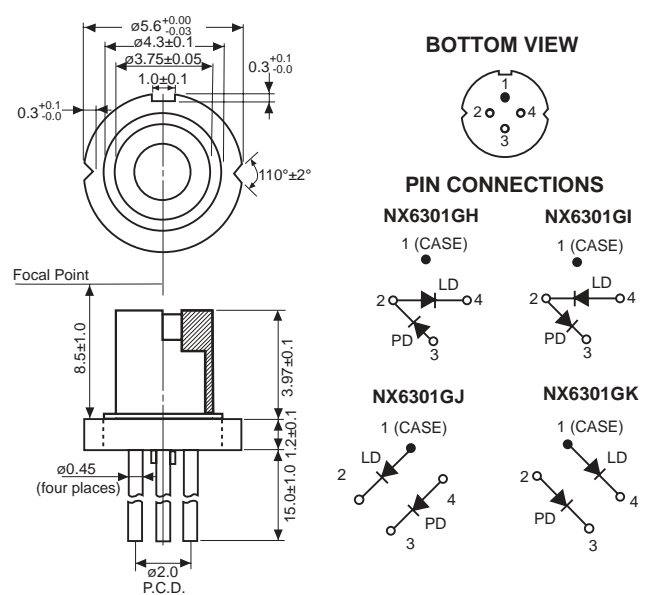
NX6301 SERIES

OUTLINE DIMENSIONS (Units in mm)

NX6301S SERIES



NX6301G SERIES



*n = 1.48 Bolosilicate Glass

ORDERING INFORMATION

PART NUMBER	PACKAGE
NX6301SH	4-pin CAN with flat glass cap
NX6301SI	
NX6301SJ	
NX6301SK	
NX6301GH	4-pin with aspherical lens cap
NX6301GI	
NX6301GJ	
NX6301GK	

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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