

**CEL****NEC's 1310 nm InGaAsP MQW FP  
LASER DIODE IN CAN PACKAGE  
FOR 155 Mb/s and 622 Mb/s APPLICATIONS****NX5306 SERIES****FEATURES**

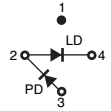

- **OPTICAL OUTPUT POWER:**  
 $P_o = 5.0 \text{ mW}$
- **LOW THRESHOLD CURRENT :**  
 $I_{TH} = 10 \text{ mA}$
- **HIGH SPEED:**  
 $t_r = 0.3 \text{ ns MAX}$   
 $t_f = 0.3 \text{ ns MAX}$
- **WIDE OPERATING TEMPERATURE RANGE:**  
 $T_c = -40 \text{ to } +85^\circ\text{C}$
- **InGaAs MONITOR PIN-PD**
- **CAN PACKAGE:**  
 $\varnothing 5.6 \text{ mm}$
- **BASED ON TELCORDIA RELIABILITY**

**DESCRIPTION**

NEC's NX5306 series is a 1310 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diode with InGaAs monitor PIN-PD. This device is ideal for Synchronous Digital Hierarchy (SDH) systems, long haul STM-1 (L-1.1), short haul STM-4 (S-4.1), and ITU-T recommendations.



**ORDERING INFORMATION**

PART NUMBER	PACKAGE	PIN CONNECTIONS
NX5306EH	4-pin CAN with ball lens cap	 <p>Diagram showing a 4-pin CAN package with pins 1, 2, 3, and 4. Pin 1 is at the top. Pin 2 is on the left, pin 3 is at the bottom, and pin 4 is on the right. Pin 1 is connected to pin 4 (LD). Pin 2 is connected to pin 3 (PD).</p>
NX5306EK		 <p>Diagram showing a 4-pin CAN package with pins 1, 2, 3, and 4. Pin 1 is at the top. Pin 2 is on the left, pin 3 is at the bottom, and pin 4 is on the right. Pin 1 is connected to pin 4 (LD). Pin 2 is connected to pin 3 (PD).</p>

- Remarks**
1. The color of ball lens cap might be observed differently from our can package products.
  2. The hermetic test will be performed as AQL 1.0%.

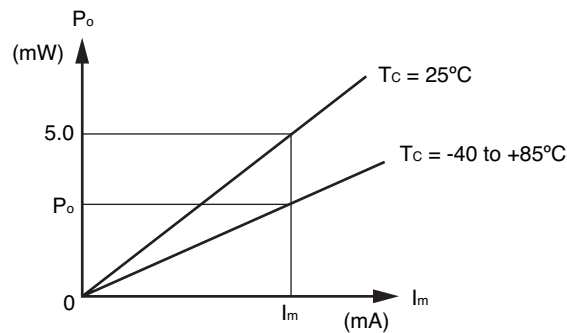
**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	RATINGS	UNIT
Optical Output Power	$P_o$	20	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<sub>C</sub> = -25°C, unless otherwise specified)

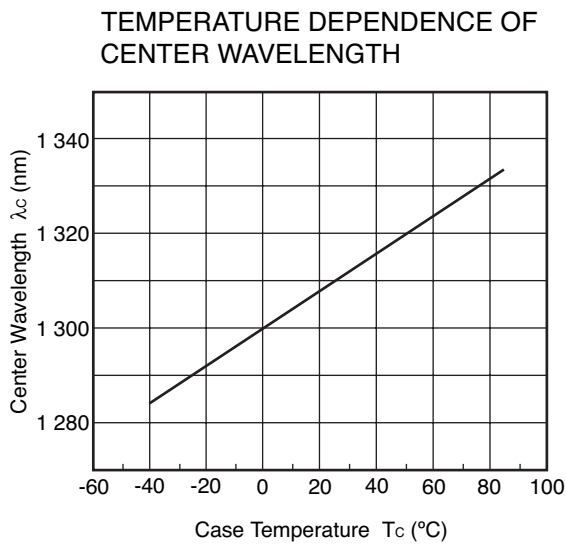
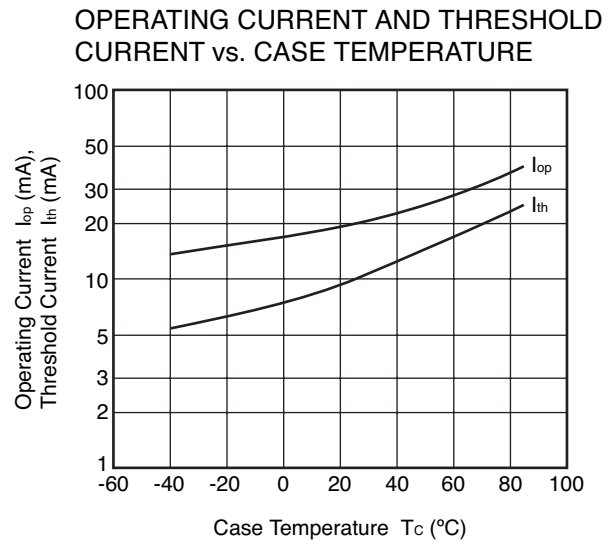
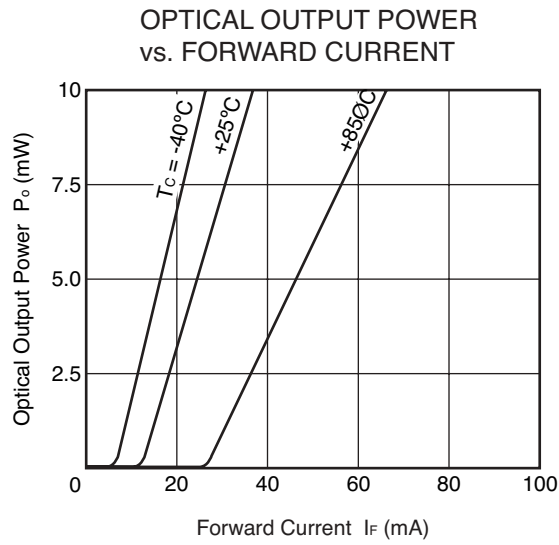
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sub>op</sub>	P <sub>o</sub> = 5.0 mW, T <sub>C</sub> = -40 to +85°C		1.1	1.5	V
Threshold Current	I <sub>th</sub>			10	15	mA
		T <sub>C</sub> = 85°C		25	30	
Threshold Output Power	P <sub>th</sub>	T <sub>C</sub> = -40 to +85°C, I <sub>F</sub> = I <sub>th</sub>		100	200	μW
Differential Efficiency	η <sub>d</sub>		0.32	0.4		W/A
Temperature Dependence of Differential Efficiency	Δη <sub>d</sub>	Δη <sub>d</sub> = 10 log $\frac{\eta_d(@85^\circ\text{C})}{\eta_d(@25^\circ\text{C})}$	-3.0	-1.2		dB
Center Wavelength	λ <sub>c</sub>	P <sub>o</sub> = 5.0 mW, RMS (-20 dB) T <sub>C</sub> = -40 to +85°C	1 263		1 360	nm
Temperature Dependence of Center Wavelength	Δλ/ΔT	T <sub>C</sub> = -40 to +85°C		0.4	0.5	nm/ °C
Spectral Width	σ	P <sub>o</sub> = 5.0 mW, RMS (-20 dB) T <sub>C</sub> = -40 to +85°C		1.0	2.5	nm
Rise Time	t <sub>r</sub>	10-90%		0.15	0.3	ns
Fall Time	t <sub>f</sub>	90-10%		0.15	0.3	ns
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 5 V, P <sub>o</sub> = 5.0 mW	150	300	600	μA
Monitor Dark Current	I <sub>D</sub>	V <sub>R</sub> = 5 V		0.1	10	nA
		V <sub>R</sub> = 5 V, T <sub>C</sub> = -40 to +85°C			500	
Monitor PD Terminal Capacitance	C <sub>t</sub>	V <sub>R</sub> = 5 V, f = 1 MHz		6	20	pF
Tracking Error <sup>*1</sup>	γ	I <sub>m</sub> = const. (@ P <sub>o</sub> = 5.0 mW, T <sub>C</sub> = 25°C) T <sub>C</sub> = -40 to +85°C	-1.0		1.0	dB

\*1 Tracking Error: γ



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

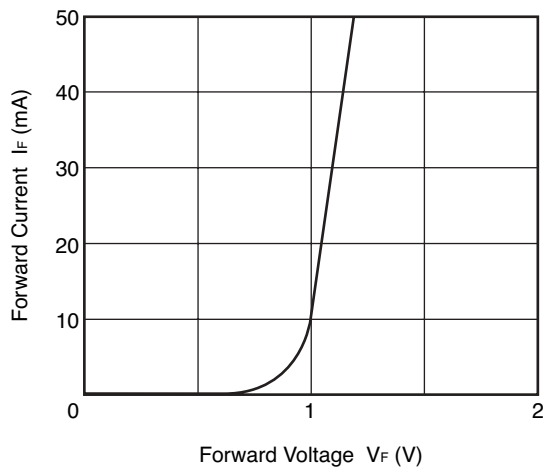
**TYPICAL CHARACTERISTICS** ( $T_c = -40$  to  $+85^\circ\text{C}$ , unless otherwise specified)



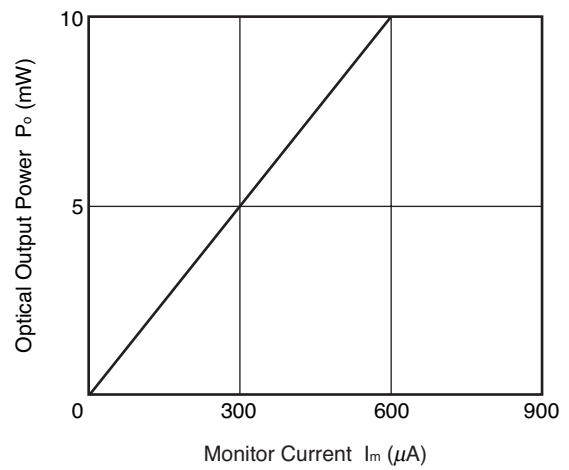
**Remark** The graphs indicate nominal characteristics.

**TYPICAL CHARACTERISTICS** ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

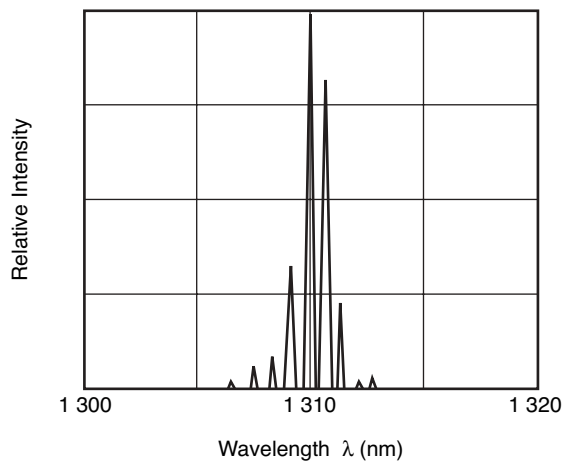
**FORWARD CURRENT vs. FORWARD VOLTAGE**



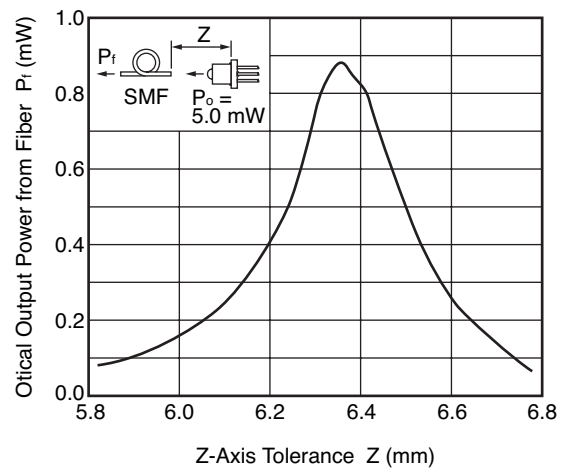
**OPTICAL OUTPUT POWER vs. MONITOR CURRENT**



**SPECTRUM**



**TOLERANCE OF FIBER COUPLING DISTANCE (Z)**



**Remark** The graphs indicate nominal characteristics.

**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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