



# NEC's 1310 nm InGaAsP MQW FP TOSA FOR GIGABIT ETHERNET APPLICATION

## NX7313UA

### FEATURES

- **OPTICAL OUTPUT POWER:**  
 $P_f = 0.6$  mW
- **LOW THRESHOLD CURRENT**  
 $I_{th} = 8$  mA TYP @  $T_c = 25^\circ\text{C}$
- **WIDE OPERATING TEMPERATURE RANGE:**  
 $-40$  to  $+85^\circ\text{C}$
- **InGaAs MONITOR PIN-PD**
- **SMALL PACKAGE**  
 $\varnothing 3.8$  mm (total length 12.0 mm MAX)
- **BASED ON TELCORDIA RELIABILITY GR-468-CORE**

### DESCRIPTION

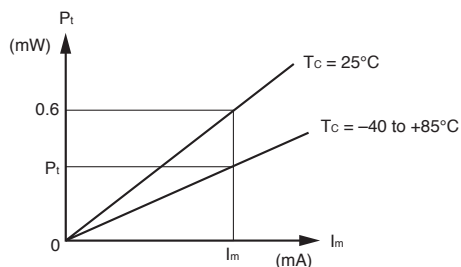
NEC's NX7313UA is a 1310 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diode transmitter optical subassembly (TOSA) with InGaAs monitor PIN-PD in a receptacle type package designed for LC type SFF/SFP transceiver modules. These devices are ideal for Gigabit Ethernet.

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

PART NUMBER			NX7313UA		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
$V_{OP}$	Operating Voltage, CW, $P_f = 0.6$ mW	V	—	1.2	1.5
$I_{TH}$	Threshold Current	CW, $T_c = 25^\circ\text{C}$	4	8	20
		CW	2	—	50
$\eta_d$	Differential Efficiency	CW, $T_c = 25^\circ\text{C}$	0.014	0.024	0.063
		CW	0.010	—	0.100
$P_f$	Optical Output Power, CW	mW	—	0.6	—
$I_{MOD}$	Modulation Current	CW, $P_f = 0.6$ mW, $T_c = 25^\circ\text{C}$	8	25	45
		CW, $P_f = 0.6$ mW	5	—	60
$\lambda_c$	Center Wavelength, CW, $P_f = 0.6$ mW, RMS (-20 dB)	nm	1270	—	1355
$\sigma$	Spectral Width, CW, $P_f = 0.6$ mW, RMS (-20 dB)	nm	—	—	4.0
$t_r$	Rise Time, $I_B = I_{TH}$ , 10 to 90%	ns	—	—	0.3
$t_f$	Fall Time, $I_B = I_{TH}$ , 90 to 10%	ns	—	—	0.3
$I_m$	Monitor Current, CW, $P_f = 0.3$ mW, $V_R = 1.5$ V	$\mu\text{A}$	200	—	1200
$I_D$	Monitor Dark Current	$V_R = 1.5$ V, $T_c = 25^\circ\text{C}$	—	—	50
		$V_R = 1.5$ V	—	—	500
$\gamma$	Tracking Error, CW, $I_m = \text{const.}$ ( $P_f = 0.6$ mW)	dB	-1.5	—	1.5
	Connector Repeatability, master pigtail	dB	-1.0	—	1.0

Note:

1. Tracking Error :  $\gamma$



$$\gamma = \left| 10 \log \frac{P_f}{0.6} \right| [\text{dB}]$$

ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

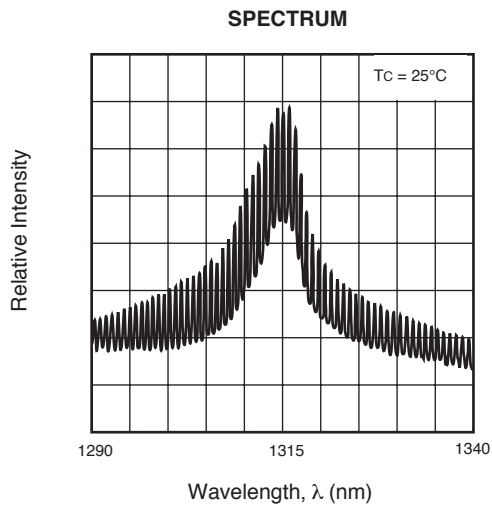
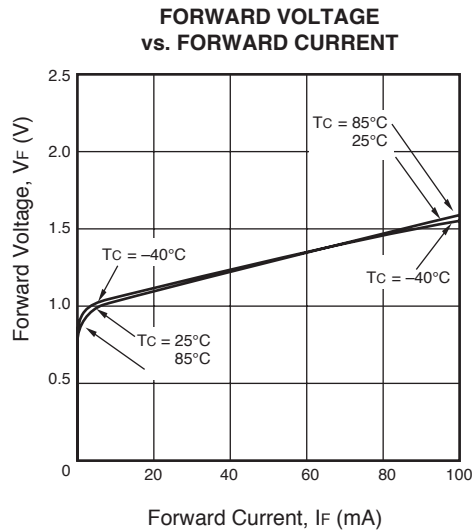
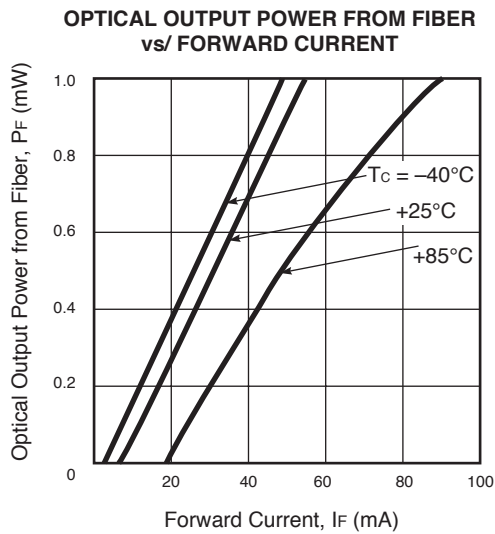
(T<sub>C</sub> = 25°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
P <sub>F</sub>	Optical Output Power	mW	2.0
I <sub>F</sub>	Forward Current of LD	mA	150
V <sub>R</sub>	Reverse Voltage of LD	V	2.0
I <sub>F</sub>	Forward Current of PD	mA	10
V <sub>R</sub>	Reverse Voltage of PD	V	20
T <sub>C</sub>	Operating Case Temperature	°C	-40 to +85
T <sub>STG</sub>	Storage Temperature	°C	-40 to +85
T <sub>SLD</sub>	Lead Soldering Temperature (10 s)	°C	350 (3 sec.)
RH	Relative Humidity (noncondensing)	%	85

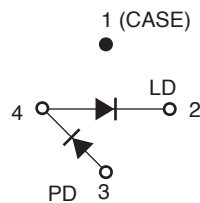
Note:

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

TYPICAL PERFORMANCE CURVES (T<sub>C</sub> = 25°C)



Remark: The graphs indicate nominal characteristics.



PART NUMBER	PACKAGE	PIN CONNECTION
NX7313UA-AZ*	Ø3.8 mm TOSA	<p>Pin 1: Top contact point.</p> <p>Pin 2: LD (Laser Diode) output.</p> <p>Pin 3: PD (Photodiode) output.</p> <p>Pin 4: Bottom contact point.</p>

**NEC**  
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Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (\*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

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