CEL

NEC's 1310 nm InGaAsP MQW FP LASER DIODE IN COAXIAL PACKAGE FOR 155 Mb/s APPLICATION

NX7303BA-CC
NX7303CA-CC

FEATURES

- **CENTER WAVELENGTH:** λ_C = 1310 nm
- **OPTICAL OUTPUT POWER:** P_f = 1.0 mW
- **LOW THRESHOLD CURRENT:** I_{TH} = 9 mA
- **HIGH CUTOFF FREQUENCY:** f_C = 2.0 GHz
- **InGaAs MONITOR PIN-PD**
- **WITH SC-UPC CONNECTOR**
- **WIDE OPERATING TEMPERATURE RANGE:** -40 to +85°C
- **BASED ON TELCORDIA RELIABILITY**

DESCRIPTION

NEC's NX7303BA-CC and NX7303CA-CC are 1310 nm Fabry-Perot (FP) laser diode coaxial modules with single mode fiber. They have a Multiple Quantum Well (MQW) structure and a built-in InGaAs monitor photo diode. These modules are ideal as a light source for Synchronous Digital Hierarchy (SDH) systems, STM-1 and long-haul L-1.1 ITU-T recommendations.

ELECTRO-OPTICAL CHARACTERISTICS (T_C = -40 to +85°C, unless otherwise specified)

PART NUMBER				NX7303BA-CC, NX7303CA-CC		
SYMBOLS	**PARAMETERS AND CONDITIONS**		**UNITS**	**MIN**	**TYP**	**MAX**
P_f	Optical Output Power from Fiber		mW		1.0	
V_{OP}	Operating Voltage, P_f = 1.0 mW		V		1.2	1.5
I_{TH}	Threshold Current	T_C = +25°C	mA	4	9	20
			mA	2		50
P_{TH}	Threshold Output Power, $I_F = I_{TH}$		μW			75
I_{MOD}	Modulation Current	P_f = 1.0 mW, T_C = 25°C	mA	8	15	35
		P_f = 1.0 mW	mA	5		60
η_d	Differential Efficiency	P_f = 1.0 mW, T_C = 25°C	W/A	0.030	0.070	0.100
		P_f = 1.0 mW	W/A	0.018		0.150
$\Delta\eta_d$	Temperature Dependence of Differential Efficiency, $\Delta\eta_d = 10 \log \frac{\eta_d (@ T_C °C)}{\eta_d (@ 25 °C)}$		dB	-3	-2	
Kink	Kink, P_f = Up to 1.2 mW (Refer to Definitions)		%			±20
λ_c	Center Wavelength, P_f = 1.0 mW, RMS (-20 dB)		nm	1263	1310	1360
$\Delta\lambda/\Delta T$	Temperature Dependence of Center Wavelength		nm/°C		0.4	0.5
σ	Spectral Width, P_f = 1.0 mW, RMS (-20 dB)		nm		1.3	4.0
f_C	Cut-off Frequency, -3 dB		GHz		2.0	
t_r	Rise Time, 10 to 90%, P_{pk} = 1.0 mW, $I_F = I_{TH}$		ns		0.2	0.5
t_f	Fall Time, 90 to 10%, P_{pk} = 1.0 mW, $I_F = I_{TH}$		ns		0.3	0.5
Applicable to Monitor PD: T_C = -40 to +85 °C unless otherwise specified						
I_m	Monitor Current, V_R = 5 V, P_f = 1.0 mW		μA	100	700	1200
I_D	Dark Current	V_R = 5 V, T_C = 25 °C	nA		0.1	50
		V_R = 5 V	nA		10	500
C_t	Terminal Capacitance, V_R = 5 V, f = 1 MHz		pF			20
LIN_m	Linearity, V_R = 5 V, P_f = 0.1 to 1.0 mW (Refer to Definitions)		%			±10
γ	Tracking Error, Im = const. (Refer to Definitions)		dB		0.5	1.0

ABSOLUTE MAXIMUM RATINGS[1]

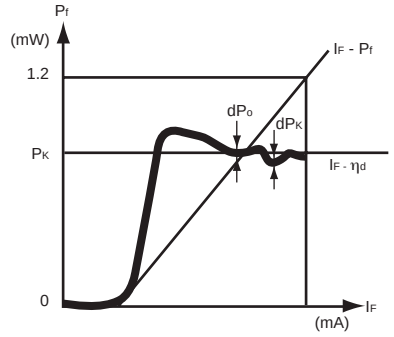
(T_C = 25°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
P_f	Optical Output Power from Fiber	mW	3.0
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	260
RH	Relative Humidity (noncondensing)	%	85

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

PARAMETER DEFINITIONS

Kink : kink

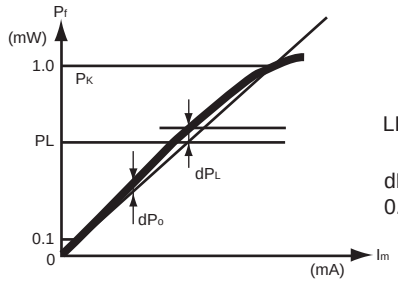


$$kink = \frac{|dP_K|}{P_K} \times 100\ [\%]$$

$dP_K = dP_o$ MAX

$P_K \leq 1.2$ (mW)

Linearity : LINm

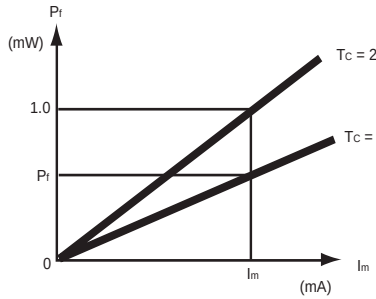


$$LINm = \frac{|dP_L|}{P_L} \times 100\ [\%]$$

$dP_L = dP_o$ MAX

$0.1 < P_K < 1.0$ (mW)

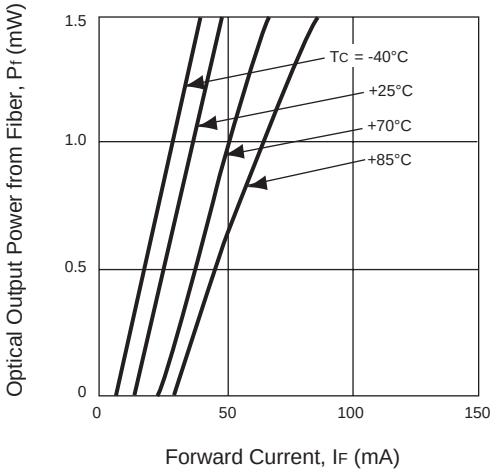
Tracking Error : γ



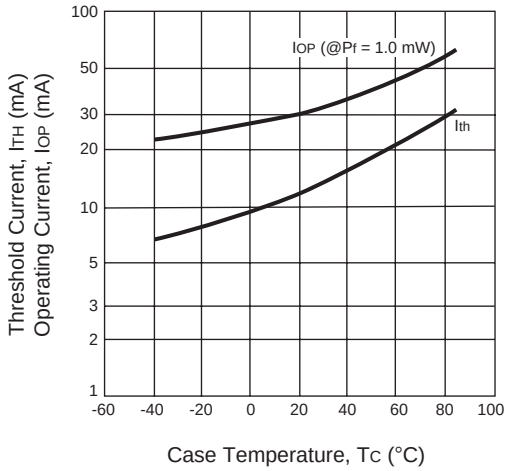
$$\gamma = \left|10 \log \frac{P_f}{1.0}\right| [dB]$$

TYPICAL PERFORMANCE CURVES (Tc = -40 to +85°C, unless otherwise specified)

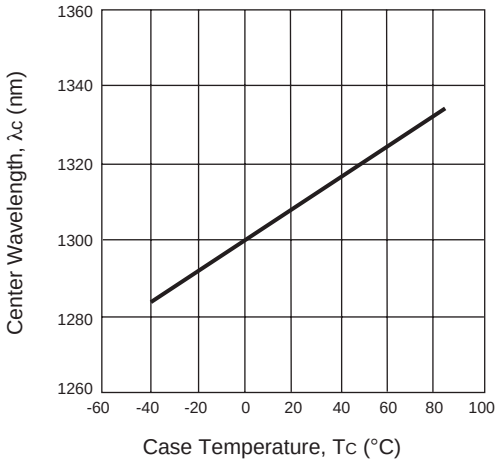
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



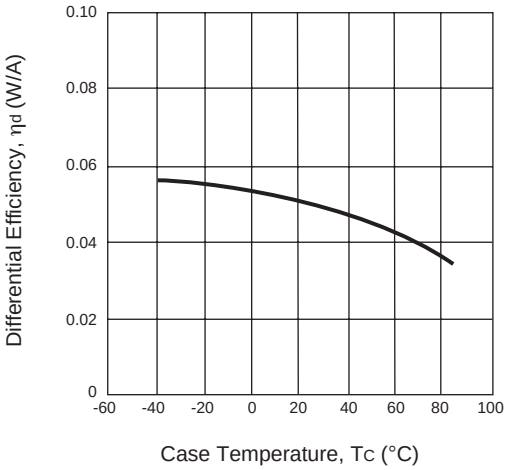
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



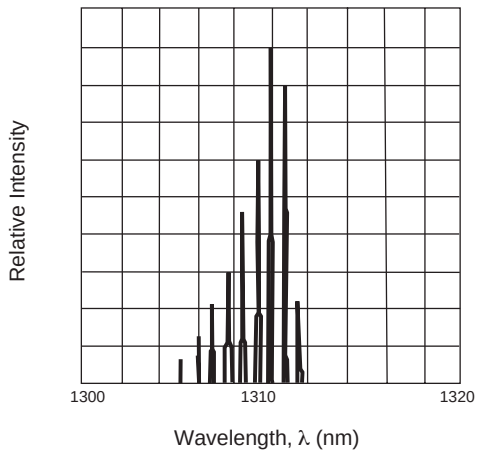
TEMPERATURE DEPENDENCE OF CENTER WAVELENGTH



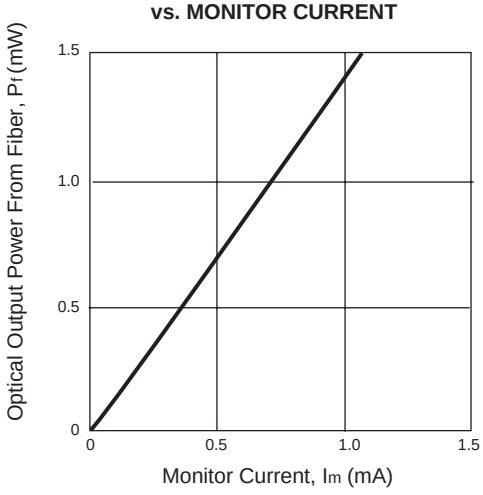
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY



LONGITUDINAL MODE



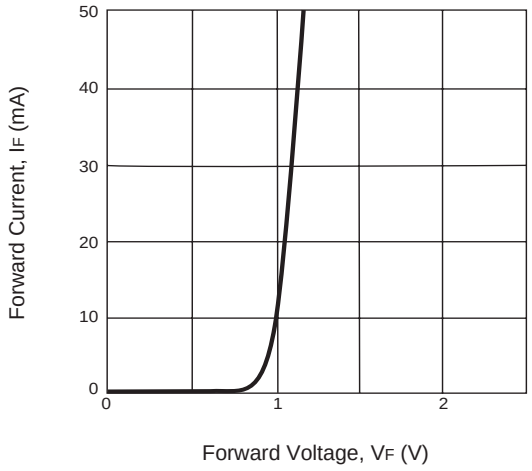
OPTICAL OUTPUT POWER FROM FIBER vs. MONITOR CURRENT



TYPICAL PERFORMANCE CURVES

(T_C = -40 to +85°C, unless otherwise specified)

FORWARD CURRENT vs. FORWARD VOLTAGE

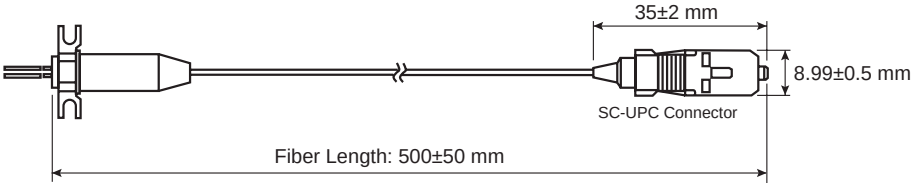


ORDERING INFORMATION

PART NUMBER	AVAILABLE CONNECTOR	FLANGE TYPE
NX7303BA-CC	With SC-UPC Connector	Flat Mount Flange
NX7303CA-CC	With SC-UPC Connector	Vertical Mount Flange

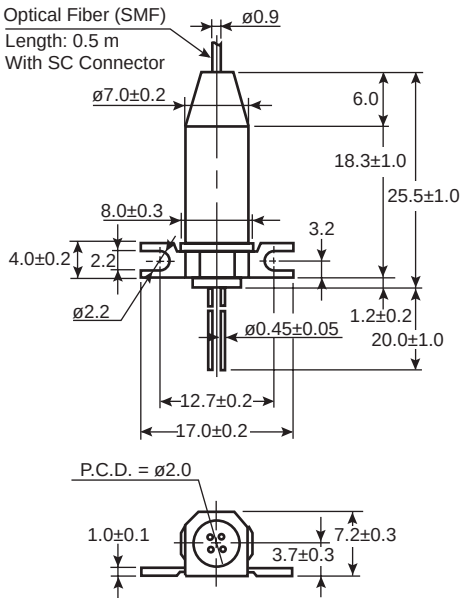
OPTICAL FIBER CHARACTERISTICS

PARAMETER	UNITS	SPECIFICATION
Mode Field Diameter	μm	9.5±1
Cladding Diameter	μm	125±2
Maximum Cladding Noncircularity	%	2
Maximum Core/Cladding Concentricity	%	1.6
Outer Diameter	mm	0.9±0.1
Cut-off Wavelength	nm	1100 to 1270
Minimum Fiber Bending Radius	mm	30
Fiber Length	mm	500±50
Flammability	UL 1581 VW-1	

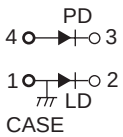


OUTLINE DIMENSIONS (Units in mm)

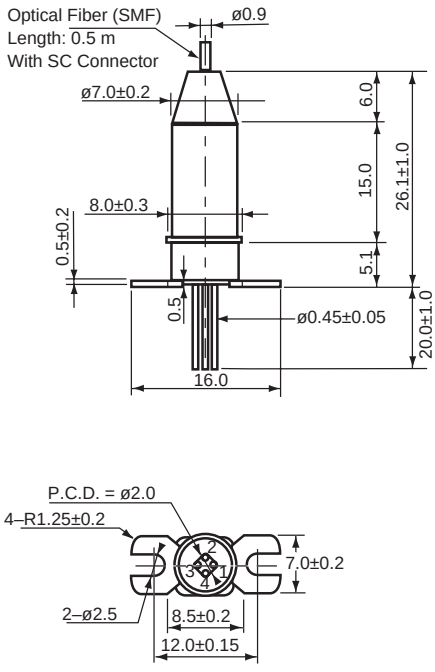
NX7303BA-CC



PIN CONNECTIONS



NX7303CA-CC



PIN CONNECTIONS