CEL

NEC's 1550 nm InGaAsP MQW DFB LASER DIODE IN COAXIAL PACKAGE FOR 155 Mb/s AND 622 Mb/s APPLICATIONS

NX8503BG-CC
NX8503CG-CC

FEATURES

- **PEAK EMISSION WAVELENGTH:** λ_P = 1550 nm
- **OPTICAL OUTPUT POWER:** P_f = 2.0 mW
- **LOW THRESHOLD CURRENT:** I_{TH} = 15 mA @ T_C = 25°C
- **InGaAs MONITOR PIN-PD**
- **WIDE OPERATING TEMPERATURE RANGE:** T_C = -10 to +85°C
- **WITH SC-UPC CONNECTOR**
- **BASED ON TELCORDIA RELIABILITY**

DESCRIPTION

NEC's NX8503BG-CC and NX8503CG-CC are 1550 nm Coaxial Module DFB (Distributed Feed-Back) laser diode with single mode fiber. Multiple Quantum Well (MQW) structure is adopted to achieve stable dynamic single longitudinal mode operation over a wide temperature range of -10 to +85°C.

The module is ideal as a light source for Synchronous Digital Hierarchy (SDH) system, STM-1, log-haul L-1.2, L-1.3 and STM-4, long-haul L-4.2, L-4.3 ITU-T recommendations.

ELECTRO-OPTICAL CHARACTERISTICS (T_C = -10 to +85°C, unless otherwise specified)

PART NUMBER				NX8300BG-CC, NX8300CG-CC		
SYMBOLS	**PARAMETERS AND CONDITIONS**		**UNITS**	**MIN**	**TYP**	**MAX**
P_f	Optical Output Power from Fiber, CW		mW		2.0	
V_{OP}	Operating Voltage, P_f = 2.0 mW		V		1.1	1.6
I_{TH}	Threshold Current	T_C = +25°C	mA		15	25
			mA	2		50
P_{TH}	Threshold Output Power, $I_F = I_{TH}$		μW			100
I_{MOD}	Modulation Current	P_f = 2.0 mW, T_C = 25°C	mA	15	25	40
		P_f = 2.0 mW	mA	13		60
η_d	Differential Efficiency	P_f = 2.0 mW, T_C = 25°C	W/A	0.050	0.080	0.130
		P_f = 2.0 mW	W/A	0.030		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	-1.6	
Kink	Kink, P_f = Up to 2.4 mW (Refer to defenitions)		%			±20
λ_p	Peak Emission Wavelength, P_f = 2.0 mW		nm	1530	1550	1570
$\Delta\lambda/\Delta T$	Temperature Dependence of Peak Emission Wavelength		nm/°C		0.1	0.12
$\Delta\lambda$	Spectral Width, P_f = 2.0 mW, -20 dB down width		nm		0.3	1.0
SMSR	Side Mode Suppression Ratio, P_f = 2.0 mW		dB	30	40	
f_c	Cut-off Frequency, -3 dB, V_R = 5 V, P_f = 2.0 mW		GHz		2.0	
t_r	Rise Time, 10 to 90%, P_{pk} = 2.0 mW, $I_F = I_{TH}$		ns			0.5
t_f	Fall Time, 90 to 10%, P_{pk} = 2.0 mW, $I_F = I_{TH}$		ns			0.5
I_m	Monitor Current, V_R = 5 V, P_f = 2.0 mW		μA	200	1000	2000
I_D	Monitor Dark Current	V_R = 5 V, T_C = 25 °C	nA		1.0	50
		V_R = 5 V	nA		10	500

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ELECTRO-OPTICAL CHARACTERISTICS cont. (T_C = -10 to +85°C, unless otherwise specified)

	PART NUMBER		NX8503BG-CC, NX8503BG-CC		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
C_t	Monitor PD Terminal Capacitance, V_R = 5 V, f = 1 MHz	pF		1.0	20
LIN_m	Linearity, V_R = 5 V, P_f = 0.2 to 2.0 mW (Refer to defenitions)	%			10
γ	Tracking Error, I_m = const. (Refer to defenitions)	dB		0.5	1.0
RIN	Relative Intensity Noise, Ref = -14dB	dB/Hz		-135	

ABSOLUTE MAXIMUM RATINGS[1]

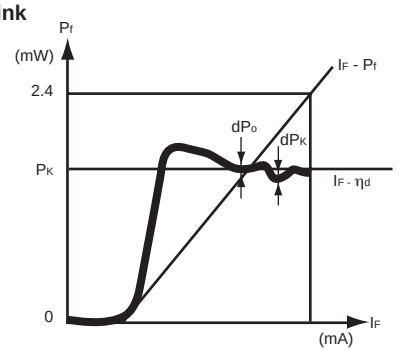
(T_C = -20 to +85°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
I_F	Forward Current of LD	mA	150
P_f	Optical Output Power from Fiber	mW	5.0
V_R	Reverse Voltage of LD	V	2.0
I_F	Forward Current of PD	mA	2.0
V_R	Reverse Voltage of PD	V	15
T_C	Operating Case Temperature	°C	-10 to +85
T_{STG}	Storage Temperature	°C	-40 to +85
T_{SLD}	Lead Soldering Temperature (10 s)	°C	260
RH	Relative Humidity (non-condensing)	%	85

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

PARAMETER DEFINITIONS

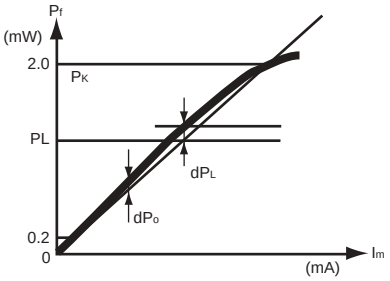
Kink : kink



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

dP_K = dPo MAX
$P_K \leq 2.4$ (mW)

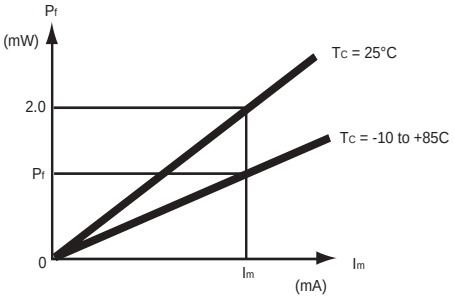
Linearity : LINm



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

dP_L = dPo MAX
$0.2 < P_L < 2.0$ (mW)

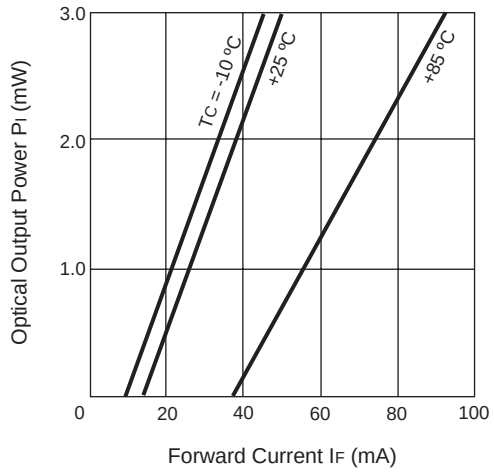
Tracking Error : γ



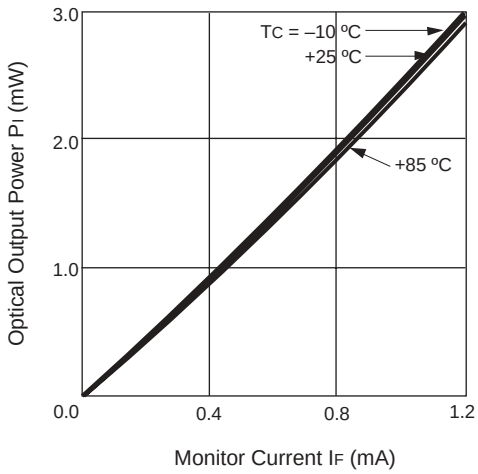
$$\gamma = \left|10 \log \frac{P_f}{2.0}\right| [dB]$$

TYPICAL CHARACTERISTICS (TC = 25 ºC, Unless otherwise specified)

OPTICAL OUTPUT POWER vs. FORWARD CURRENT

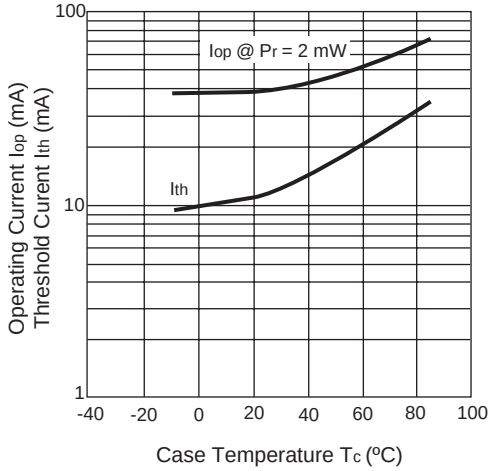


OPTICAL OUTPUT POWER vs. MONITOR CURRENT

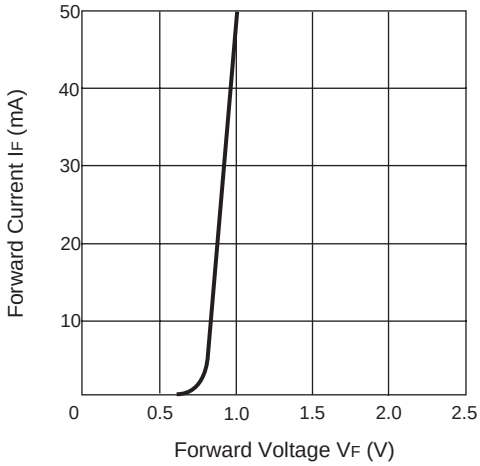


TYPICAL CHARACTERISTICS (TC = 25 ºC, Unless otherwise specified)

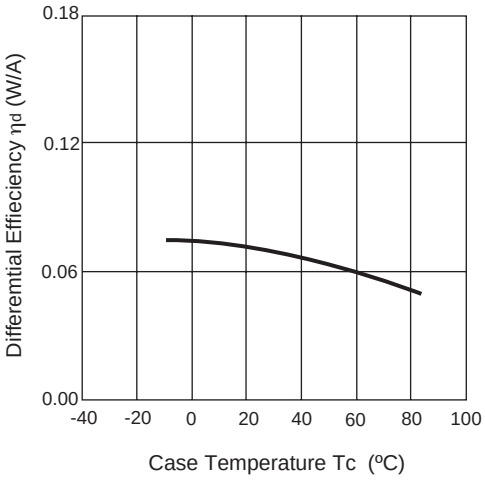
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



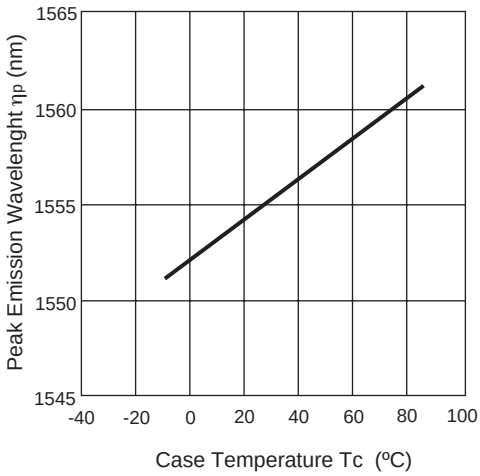
FORWARD CURRENT vs. FORWARD VOLTAGE



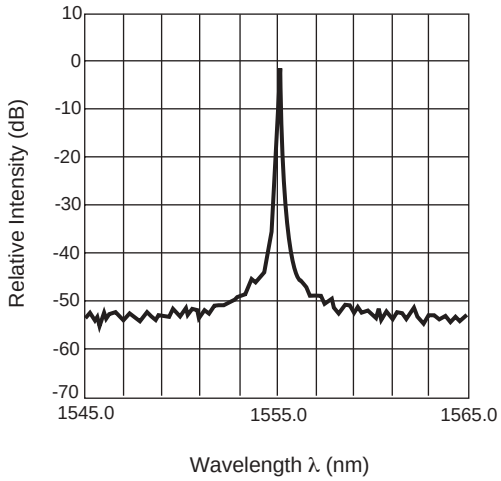
TEMPERATURE DEPENEDENCE OF DIFFERNTIAL EFFICIENCY



TEMPERATURE DEPENEDENCE OF PEAK EMISSION WAVELENGHT



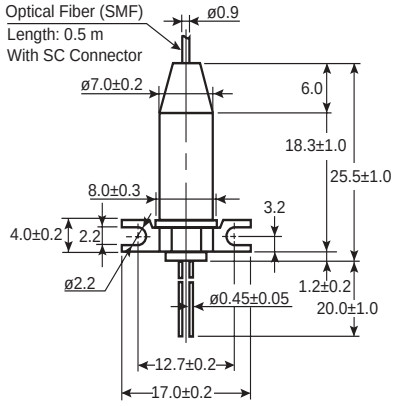
SPECTRUM



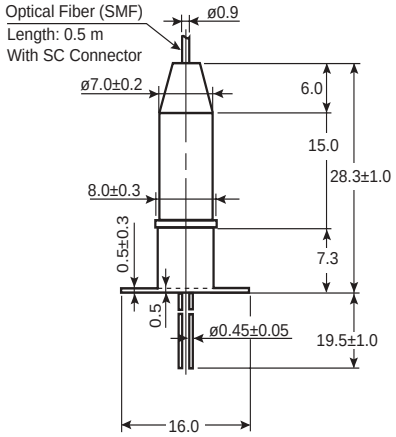
REMARK The graphs indicate nominal charachteristics.

OUTLINE DIMENSIONS (Units in mm)

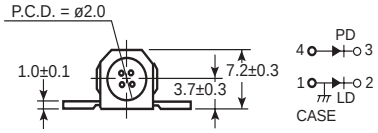
NX8503BG-CC



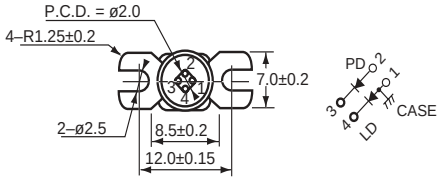
NX8503CG-CC



PIN CONNECTIONS



PIN CONNECTIONS

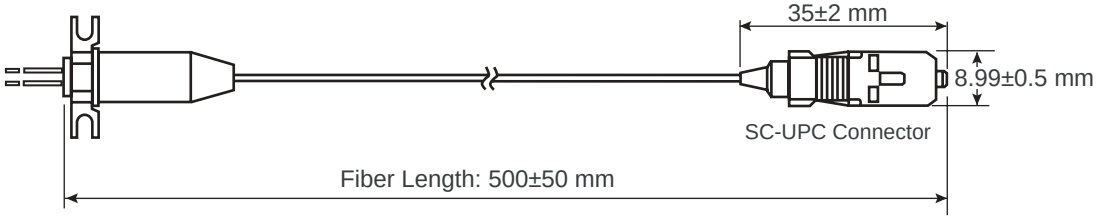


OPTICAL FIBER CHARACTERISTICS

PARAMETER	SPEC	UNIT
Mode Field Doameter	9.5±1	μm
Cladding Diameter	125±2	μm
Maximum Cladding Noncircularity	2	%
Maximum Core/Cladding Concentricity	1.6	%
Outer Diameter	0.9±0.1	mm
Cut-off Wavelength	1100 to 1270	nm
Minimum Fiber Bending Radius	30	mm
Fiber Length	500±50 MIN	mm
Flammability	UL1581 VW-1	

ORDERING INFORMATION

PART NUMBER	AVAILABLE CONNECTOR	FLANGE TYPE
NX8503BG-CC	With SC-UPC Connector	Flat Mount Flange
NX8503CG-CC		Vertical Mount Flange



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.