

PRELIMINARY

Notice: This is not a final specification.
Some parametric limits are subject to change.

**MITSUBISHI LASER DIODES
ML9XX14 SERIES**

InGaAsP DFB-LD with EA modulator

**TYPE
NAME**

ML9XX14

DESCRIPTION

ML9XX14 series are DFB (Distributed Feedback) laser diodes with a monolithically integrated EA (Electro-Absorption) modulator emitting light beam around 1550nm.

They are well suited for light source in longdistance digital transmission systems.

FEATURES

- 1550nm DFB laser diode
- Integrated EA modulator
- High speed modulation capability (10Gbps)
- High-side mode suppression ratio (typical 40dB)
- Low driving voltage (typical 3.0Vpp@Ex=13dB)

APPLICATION

High bit-rate (10Gb/s) digital transmission system

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
I _F	Laser forward current	CW	200	mA
V _{RL}	Laser forward voltage	—	2	V
V _{EA}	Modulator voltage	—	0~-3	V
T _C	Case temperature	—	+20~+30	°C
T _{stg}	Storage temperature	—	-40~+100	°C

ELECTRICAL/OPTICAL CHARACTERISTICS (T_C = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I _{th}	Threshold current	CW, V _{mod} = 0V	—	20	30	mA
I _{OP}	Operating current	CW, P _o = 5mW, V _{mod} = 0V	—	100	150	mA
V _{OP}	Operating voltage	CW, P _o = 5mW, V _{mod} = 0V	—	1.6	2.0	V
η	Slope efficiency	CW, P _o = 5mW, V _{mod} = 0V	—	0.06	—	mW/mA
λ _P	Peak wavelength	CW, P _o = 5mW, V _{mod} = 0V	1530	1550	1570	nm
θ _∥	Beam divergence angle (parallel)	CW, P _o = 5mW, V _{mod} = 0V	—	30	—	deg.
θ _⊥	Beam divergence angle (perpendicular)	CW, P _o = 5mW, V _{mod} = 0V	—	35	—	deg.
P _m	Monitoring output	CW, P _o = 5mW, V _{mod} = 0V	—	1.0	—	mW
f _c	Cutoff frequency	CW, P _o = 5mW, V _{mod} = -1V	—	12	—	GHz
Ex	Extinction Ratio	CW, P _o = 5mW, V _{mod} = -3.0V	10	13	—	dB
t _r , t _f	Rise and fall time	9.95328Gb/s, NRZ, PRBS ²³ -1	—	—	50	psec
SMSR	Side mode suppression ratio	mark ratio = 50%	30	40	—	dB
Δλ ₋₂₀	Spectrum width (20dB down)	I _f = I _{OP} , V _{PP} = 3.0V	—	—	0.25	nm
PP	Power penalty	ditto 1.3 μm ZDF50km @BER = 10 ⁻¹⁰	—	1.0	—	dB

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TYPICAL CHARACTERISTICS

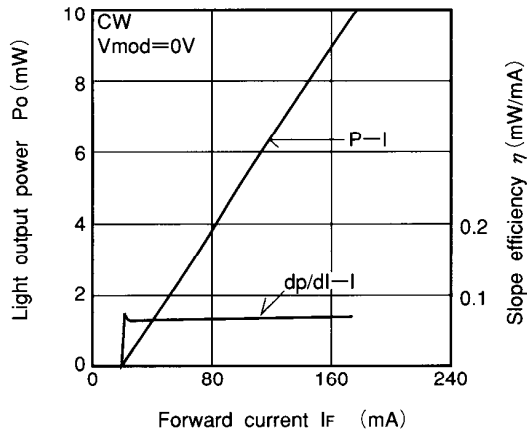


Fig.1 Light output vs. forward current

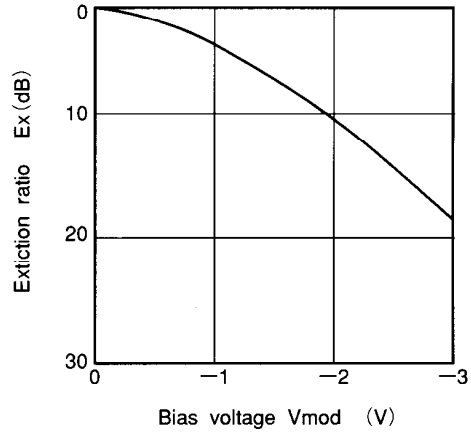


Fig.2 Extinction characteristics (DC)

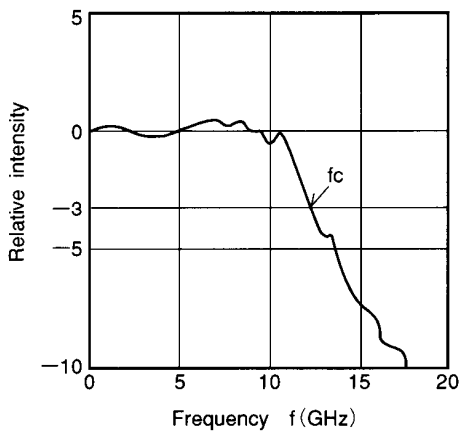


Fig.3 Frequency characteristics

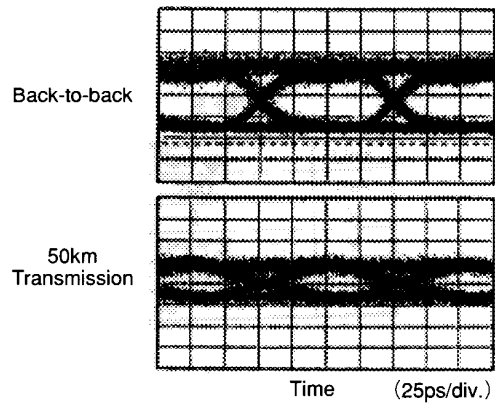


Fig.4 waveform

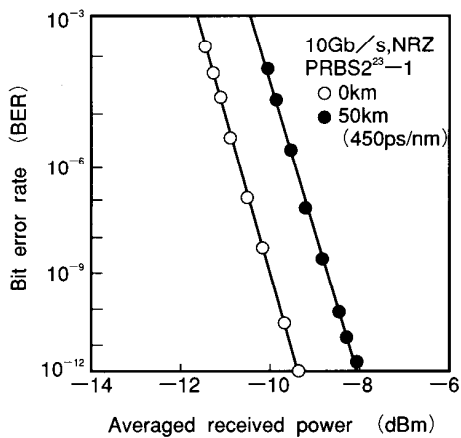


Fig.5 BER characteristics