

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,Po = 5mW,V _{mod} = 0V | — | 100 | 150 | mA |
| V _{OP} | Operating voltage | CW,Po = 5mW,V _{mod} = 0V | — | 1.6 | 2.0 | V |
| η | Slope efficiency | CW,Po = 5mW,V _{mod} = 0V | — | 0.06 | — | mW/mA |
| λ _P | Peak wavelength | CW,Po = 5mW,V _{mod} = 0V | 1530 | 1550 | 1570 | nm |
| θ | Beam divergence angle (parallel) | CW,Po = 5mW,V _{mod} = 0V | — | 30 | — | deg. |
| θ _⊥ | Beam divergence angle (perpendicular) | CW,Po = 5mW,V _{mod} = 0V | — | 35 | — | deg. |
| P _m | Monitoring output | CW,Po = 5mW,V _{mod} = 0V | — | 1.0 | — | mW |
| f _c | Cutoff frequency | CW,Po = 5mW,V _{mod} = −1V | — | 12 | — | GHz |
| Ex | Extinction Ratio | CW,Po = 5mW,V _{mod} = −3.0V | 10 | 13 | — | dB |
| t _r ,t _f | Rise and fall time | 9.95328Gb/s,NRZ,PRBS2 ²³ −1 | — | — | 50 | psec |
| SMSR | Side mode suppression ratio | mark ratio = 50% | 30 | 40 | — | dB |
| △λ ₋₂₀ | Spectrum width (20dB down) | If = I _{OP} ,V _{PP} = 3.0V | — | — | 0.25 | nm |
| P _P | Power penalty | ditto 1.3 μmZDF50km @BER = 10 ^{−10} | — | 1.0 | — | dB |

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

TYPICAL CHARACTERISTICS

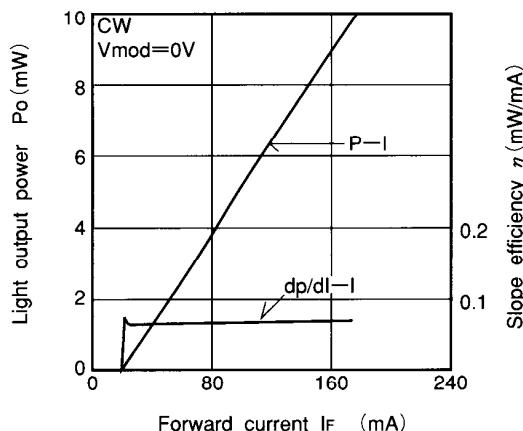


Fig.1 Light output vs. forward current

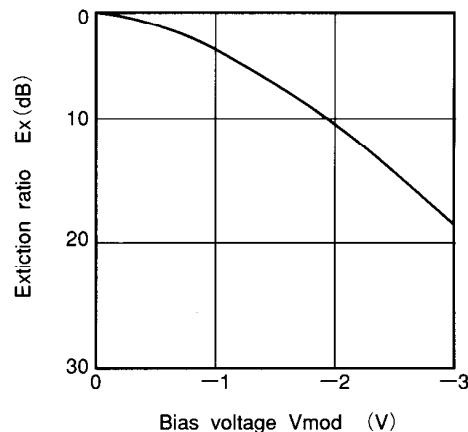


Fig.2 Extinction characteristics (DC)

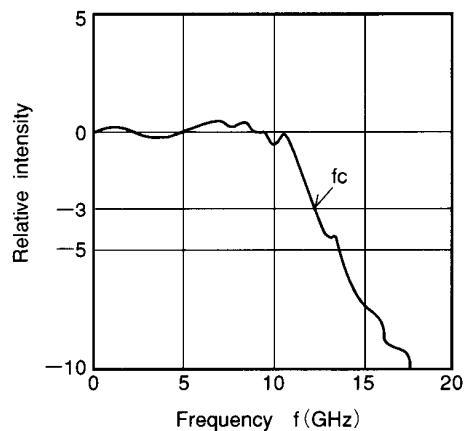


Fig.3 Frequency characteristics

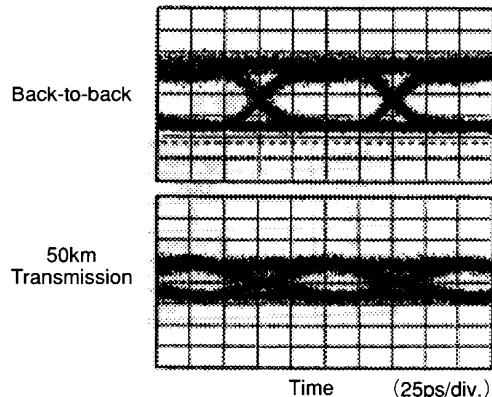


Fig.4 waveform

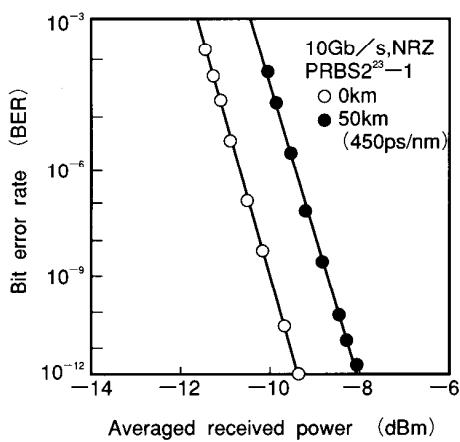


Fig.5 BER characteristics