MITSUBISHI LASER DIODES

ML9XX13 SERIES

InGaAsP—MQW—DFB LASER DIODES

TYPE NAME

ML99213

DESCRIPTION

ML9XX13 series are MQW*—DFB** laser diodes emitting light beam around 1550nm.

They are well suited for light source in longdistance analog transmission system for example cable television (CATV).The ML99213 are specially designed for fiber modules and mount on flat open packages.

Rear output can be used for automatic power control of the laser.

* MQW : Multiple Quantum Well

** DFB : Distributed Feedback

FEATURES

- Excellent low distortion characteristic
  CSO typical-55dBc/CTB typical-60dBc
  under NTSC 78-channel transmission test
  - Modulation depth m=3.5%/channel
  - Po=10mW to 25mW
  - 20km single mode fiber
- Low relative intensity noise characteristic
  (typical -155dB/Hz)
- Low threshold current (typical 15mA)
- High-side mode suppression ratio (typical 40dB)

APPLICATION

Long-distance analog transmission system, especially for optical CATV

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Ratings	Unit
P_O	Light output power	CW	30	mW
V_{RL}	Reverse Voltage (Laser diode)	—	2	V
T_C	Case temperature	—	+20~+30	℃
T_{stg}	Storage temperature	—	−40~+100	℃

ELECTRICAL/OPTICAL CHARACTERISTICS (T_C = 25℃)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{th}	Threshold current	CW	—	15	30	mA
I_{OP}	Operating current	CW,Po = 10mW	—	55	80	mA
V_{OP}	Operating voltage	CW,Po = 10mW	—	1.2	1.8	V
η	Slope efficiency	CW,Po = 10mW	0.15	0.25	—	mW/mA
λ_P	Peak wavelength	CW,Po = 10mW	1530	1550	1570	nm
$\theta_{//}$	Beam divergence angle (parallel)	CW,Po = 10mW	—	25	35	deg.
$\theta_{\perp}$	Beam divergence angle (perpendicular)	CW,Po = 10mW	—	35	45	deg.
SMSR	Side mode suppression ratio	CW,Po = 10mW	30	40	—	dB
P_m	Monitoring output	CW,Po = 10mW	—	0.5	—	mW
CSO	Composite second order	78-channel transmission test, modulation depth m = 3.5%/channel, Po (average) = 10 to 25mW 20Km single mode fiber	—	−55	—	dBc
CTB	Composite triple beat		—	−60	—	dBc
CNR	Carrier to noise ratio		—	52	—	dB
RIN	Relative intensity noise	CW,Po = 10mW~25mW,measuring frequency fm=550MHz	—	−155	—	dB/Hz

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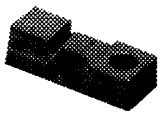
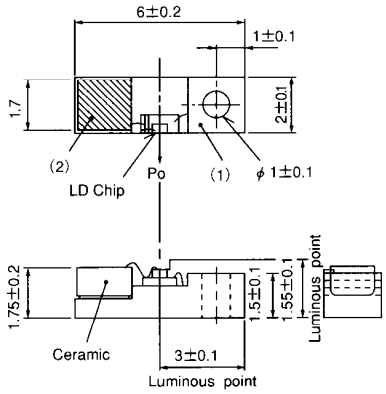
OUTLINE DRAWING

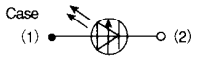
ML99213



Dimension : mm



(Chip carrier type)



TYPICAL CHARACTERISTICS

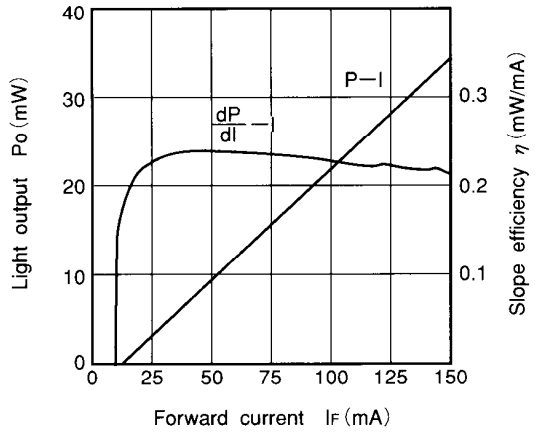


Fig.1 Light output vs. forward current

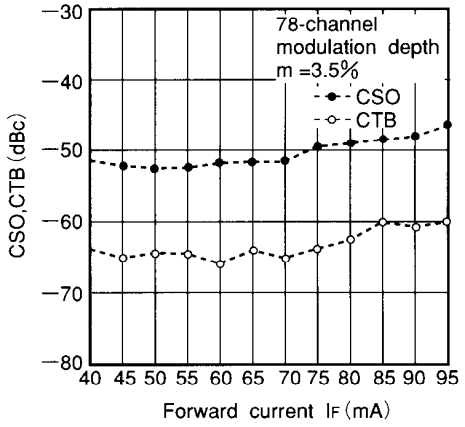


Fig.2 CSO/CTB vs. forward current

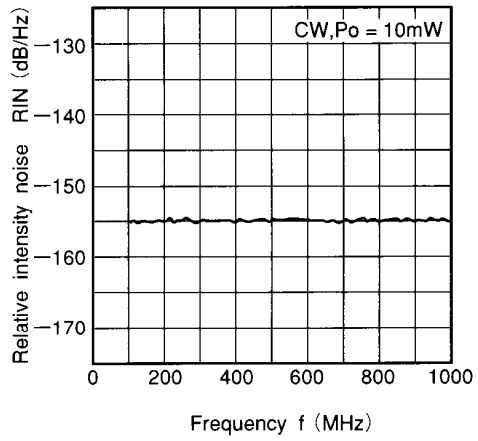


Fig.3 Relative intensity noise vs. frequency

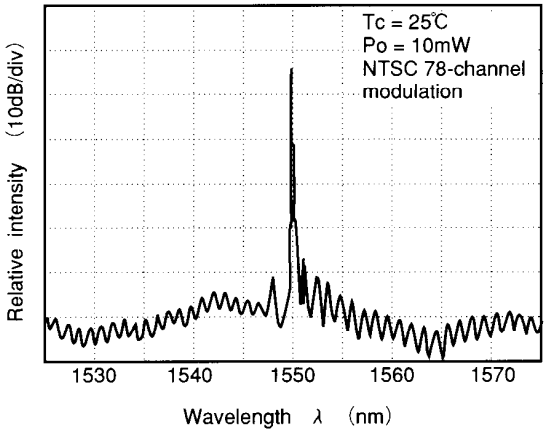


Fig.4 Spectrum under modulated operation

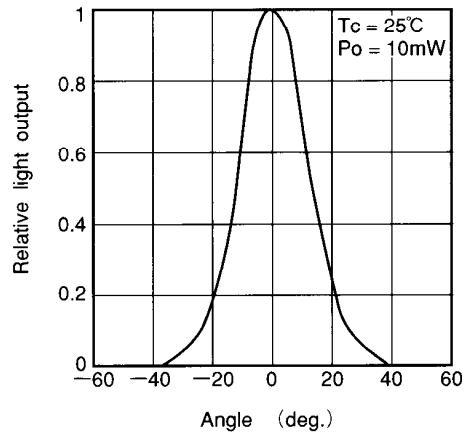


Fig.5-1 Far field pattern $\theta_{//}$

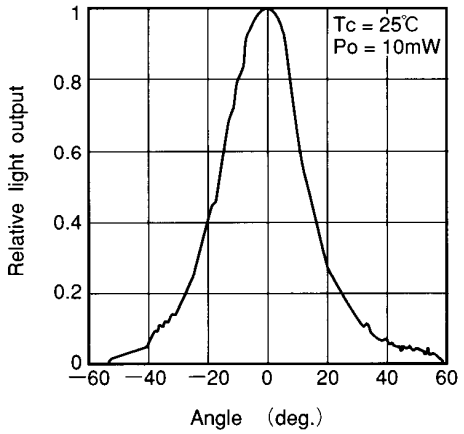


Fig.5-2 Far field pattern $\theta_{\perp}$