

**mitsubishi laser diodes**  
**ML7XX11 SERIES**

**InGaAsP—MQW—DFB LASER DIODES**

**TYPE  
NAME**

**ML776H11F, ML774F11F**

**DESCRIPTION**

ML7XX11 series are MQW\*—DFB\*\* laser diodes emitting light beam around 1310nm.

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

The ML776H11F are hermetically sealed devices having the photodiode for optical output monitoring.

\* MQW : Multiple Quantum Well

\*\* DFB : Distributed Feedback

**FEATURES**

- Low threshold current (typical 10mA)
- Stable single transverse mode oscillation
- High-side mode suppression ratio : typical 40dB  
( $T_c = -40$  to  $+85^\circ\text{C}$ )
- High speed pulse response (rise/fall time typical 0.2nsec)
- Excellent temperature characteristics

**APPLICATION**

Wide temperature range digital transmission system

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Conditions	Ratings	Unit
P <sub>O</sub>	Light output power	CW	6	mW
V <sub>RL</sub>	Reverse Voltage (Laser diode)	—	2	V
V <sub>RD</sub>	Reverse Voltage (Photodiode)	—	20	V
I <sub>FD</sub>	Forward current (Photodiode)	—	2	mA
T <sub>C</sub>	Case temperature	—	-40~+85	°C
T <sub>stg</sub>	Storage temperature	—	-40~+100	°C

**ELECTRICAL/OPTICAL CHARACTERISTICS (T<sub>C</sub> = 25°C)**

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I <sub>th</sub>	Threshold current	CW	—	6	20	mA
I <sub>OP</sub>	Operating current	CW, P <sub>O</sub> = 5mW	—	18	40	mA
V <sub>OP</sub>	Operating voltage	CW, P <sub>O</sub> = 5mW	—	1.1	1.8	V
η	Slope efficiency	CW, P <sub>O</sub> = 5mW	0.3	0.4	—	mW/mA
λ <sub>P</sub>	Peak wavelength	CW, P <sub>O</sub> = 5mW	1290	1310	1330	nm
θ <sub>∥</sub>	Beam divergence angle (parallel)	CW, P <sub>O</sub> = 5mW	—	25	35	deg.
θ <sub>⊥</sub>	Beam divergence angle (perpendicular)	CW, P <sub>O</sub> = 5mW	—	30	40	deg.
I <sub>m</sub>	Monitoring output current (Photodiode)	CW, P <sub>O</sub> = 5mW, V <sub>RD</sub> = 1V, R <sub>L</sub> * = 10Ω	—	0.2	—	mA
t <sub>r</sub> , t <sub>f</sub>	Rise and fall time	I <sub>F</sub> = I <sub>th</sub> , P <sub>O</sub> = 5mW, 10%~90%	—	0.2	0.4	ns
SMSR	Side mode suppression ratio	CW, P <sub>O</sub> = 5mW, -40~+85°C	30	40	—	dB

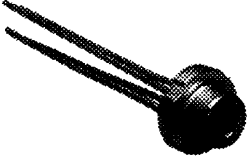
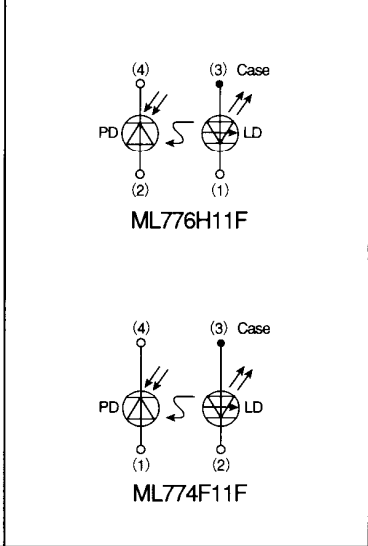
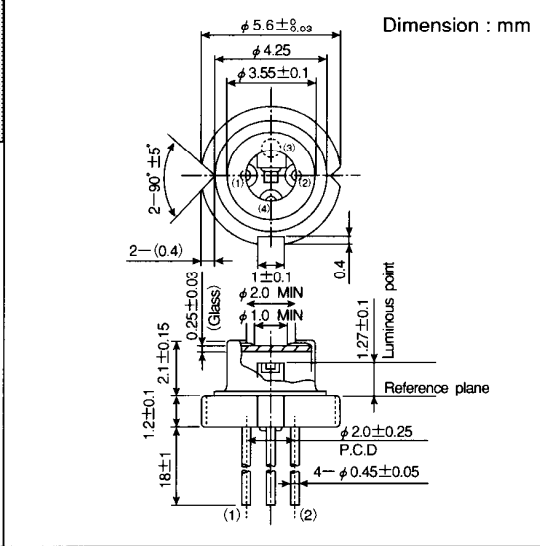
\* R<sub>L</sub> : Load resistance of photodiode

MITSUBISHI LASER DIODES  
**ML7XX11 SERIES**

InGaAsP-MQW-DFB LASER DIODES

**OUTLINE DRAWINGS**

ML776H11F  
 ML774F11F

MITSUBISHI LASER DIODES  
ML7XX11 SERIES

InGaAsP-MQW-DFB LASER DIODES

TYPICAL CHARACTERISTICS

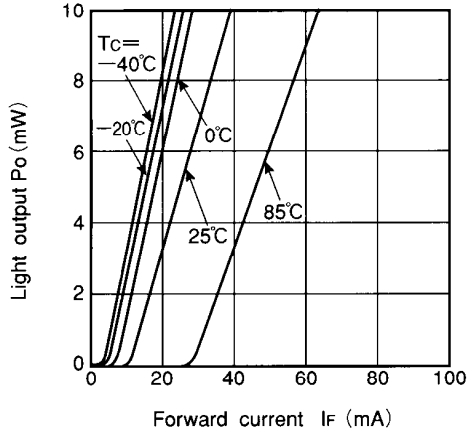


Fig.1 Light output vs. forward current

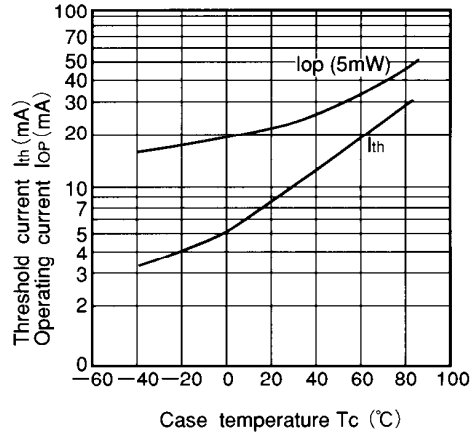


Fig.2 Temperature dependence of  $I_{th}$  and  $I_{op}$

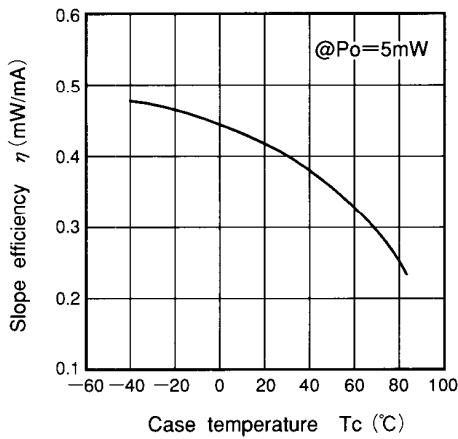


Fig.3 Temperature dependence of slope efficiency

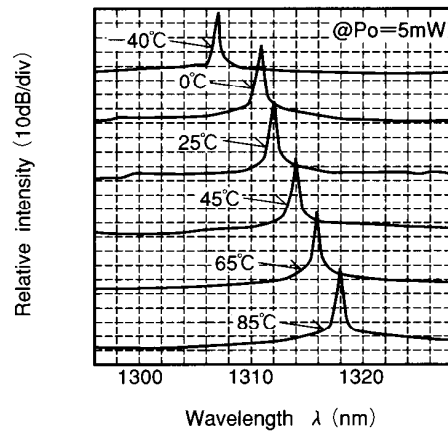


Fig.5 Spectrum

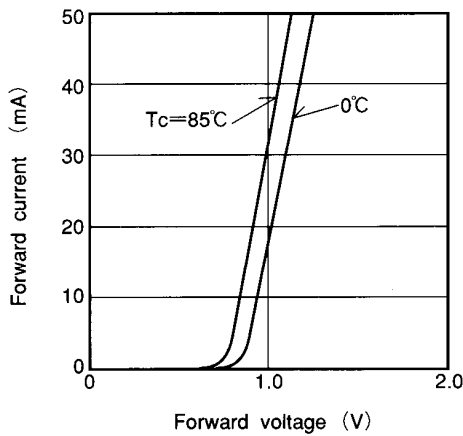


Fig.5-1 Forward current vs. voltage

MITSUBISHI LASER DIODES  
ML7XX11 SERIES

InGaAsP—MQW—DFB LASER DIODES

TYPICAL CHARACTERISTICS (Cont.)

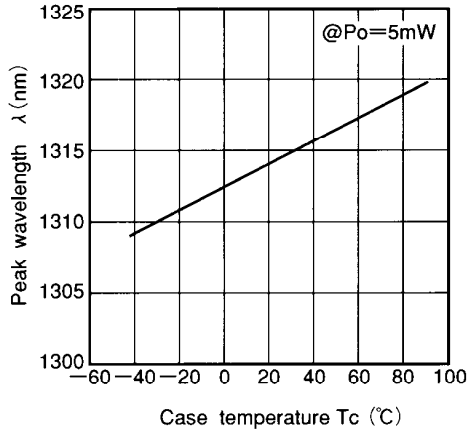


Fig.6 Temperature dependence of peak wavelength

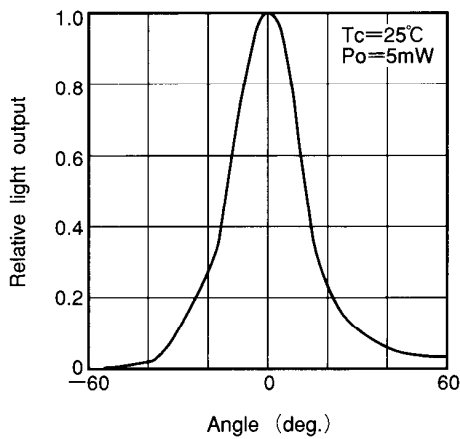


Fig.7-1 Far field pattern  $\theta //$

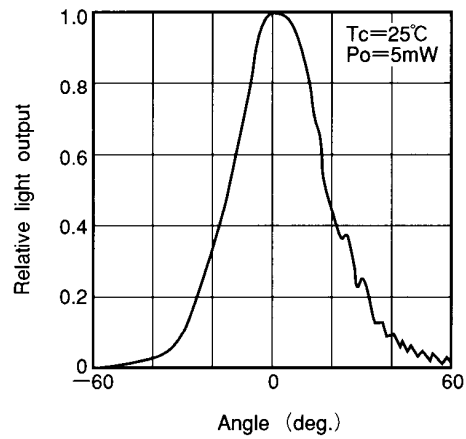


Fig.7-2 Far field pattern  $\theta \perp$

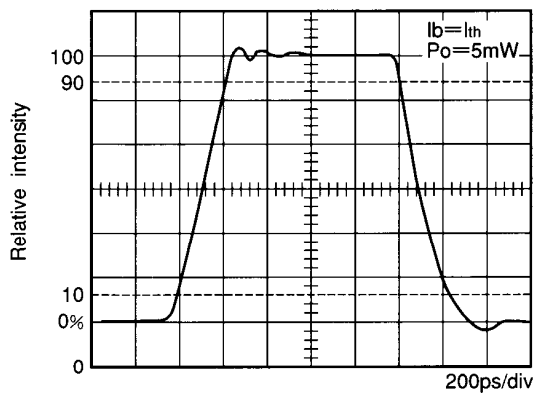


Fig.8 Pulse response characteristics

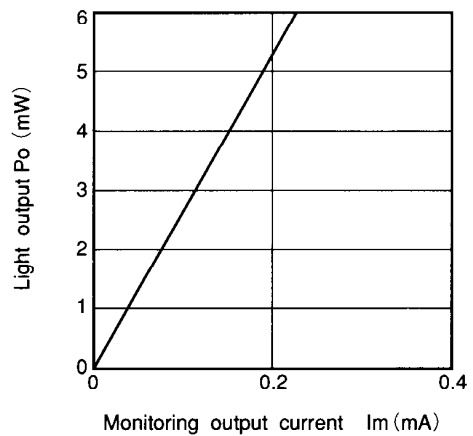


Fig.9 Light output vs. monitoring output current