

InGaAsP/InP LASER DIODE MODULE

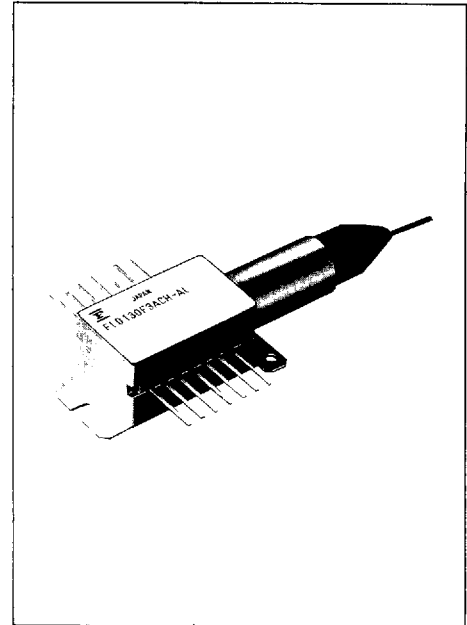
FLD 130F3ACH-AL

FEATURES

- Very low distortions..... CSO = -65dBc (typical)
(good linearity) CTB = -70dBc (typical)
(on 40 channels loading)
- Low noise..... RIN = -155dB/Hz (typical)
- High output power..... $P_f = 4\text{mW}$
- High slope efficiency..... $S = 0.15 \text{ mW/mA}$ (typical)
- Flat frequency response..... +/-1dB within 600MHz min.
- Available in a 14pin hermetic "butterfly" type package (CH) with a built-in optical isolator, a single mode fiber, a monitor photodiode and thermoelectric elements.

APPLICATIONS

- Multi-channel optical analog transmission systems.



DESCRIPTION

The FLD130F3ACH-AL is an InGaAsP/InP distributed feed back (DFB) laser diode module in the 1.3 μm wavelength region, suitably designed for multi-channel analog transmission systems. This module has excellent characteristics of low distortion, low noise and high output power. Composite second order (CSO) and composite triple beat (CTB) are specified for 40 channels loading.

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ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Condition	Ratings	Unit
Storage Temperature	T_{stg}		-40 to +70	$^\circ\text{C}$
Operating Case Temperature	T_{op}		-10 to +65	$^\circ\text{C}$
Optical Output Power	P_f	CW	8	mW
Forward Current	I_F	CW	150	mA
Reverse Voltage	V_R		2	V
Photodiode Reverse Voltage	V_{DR}		20	V
Cooler Voltage	V_C		2.5	V
Cooler Current	I_C		1.4	A

OPTICAL AND ELECTRICAL CHARACTERISTICS ($T_L = 25^\circ\text{C}$, T_L : Laser temperature)

Parameter	Symbol	Test Condition	Limits			Unit
			Min.	Typ.	Max.	
Threshold Current	I_{th}	CW	—	20	35	mA
Forward Voltage	V_F	CW, $I_F = 30\text{mA}$	—	1.2	1.5	V
Optical Output Power	P_f	CW	4.0	—	—	mW
Monitor Current	I_m	CW, $P_f = 4\text{mW}$, $V_{\text{DR}} = 5\text{V}$	20	30	—	μA
Slope Efficiency	S	CW, $P_f = 4\text{mW}$	0.08	0.15	—	mW/mA
Peak Wavelength	λ_p	CW, $P_f = 4\text{mW}$	1290	1310	1330	nm
Relative Intensity Noise	RIN	CW, $P_f = 4\text{mW}$ BW = 45 ~ 550MHz Optical Reflection = -40dB	—	—	-150	dB/Hz
Composite Second Order	CSO	$P_f = 4\text{mW}$, Optical Modulation Index=3.2%/channel 40 unmodulated carriers (55.25 to 313.25MHz; ch. 2 to 39 plus A-1 and A-2) Optical Reflection=-40dB.	—	—	-60	dBc
Composite Triple Beat	CTB	(55.25 to 313.25MHz; ch. 2 to 39 plus A-1 and A-2) Optical Reflection=-40dB.	—	—	-65	dBc
Bandwidth (-1dB)	f_c	$P_f = 4\text{mW}$	600	—	—	MHz
Photodiode Dark Current	I_D	$V_{\text{DR}} = 5\text{V}$	—	20	100	nA
Photodiode Capacitance	C_t	$V_{\text{DR}} = 5\text{V}$, $f = 1\text{MHz}$	—	4	12	pF
Cooling Capacity	ΔT	$I_C = 1\text{A}$	40	—	—	$^\circ\text{C}$
Cooler Current	I_C	$\Delta T = 40^\circ\text{C}$	—	0.5	1.0	A
Cooler Voltage	V_C	$P_f = 4\text{mW}$	—	1.5	2.0	V
Thermistor Resistance	R_{tr}		9.5	10	10.5	K Ω
Optical Isolation	I_S	$T_C = 25^\circ\text{C}$	25	—	—	dB

Fiber Pigtail: 8.8 μm /125 μm single mode fiber.

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TYPICAL CHARACTERISTICS

**Fig. 1 Optical Output Power
Monitor Current vs. Forward Current
Slope Efficiency**
 $T_L = 25^\circ\text{C}$

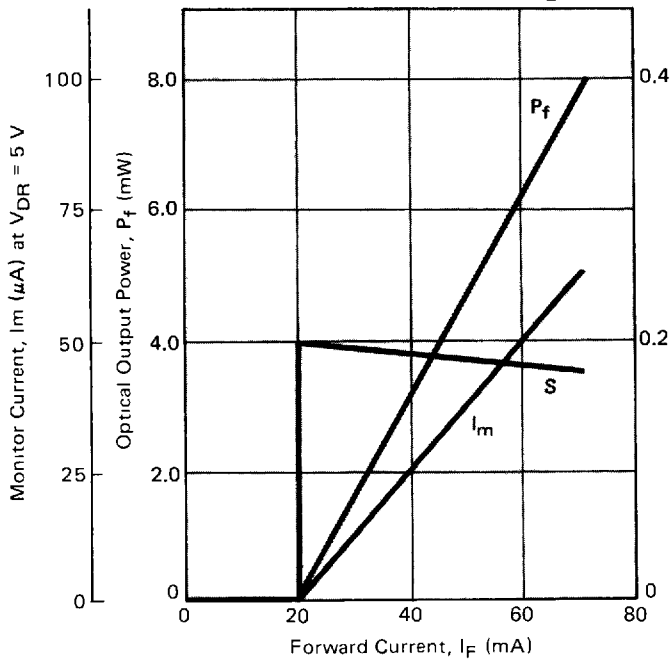


Fig. 2 Forward Current vs. Forward Voltage
 $T_L = 25^\circ\text{C}$

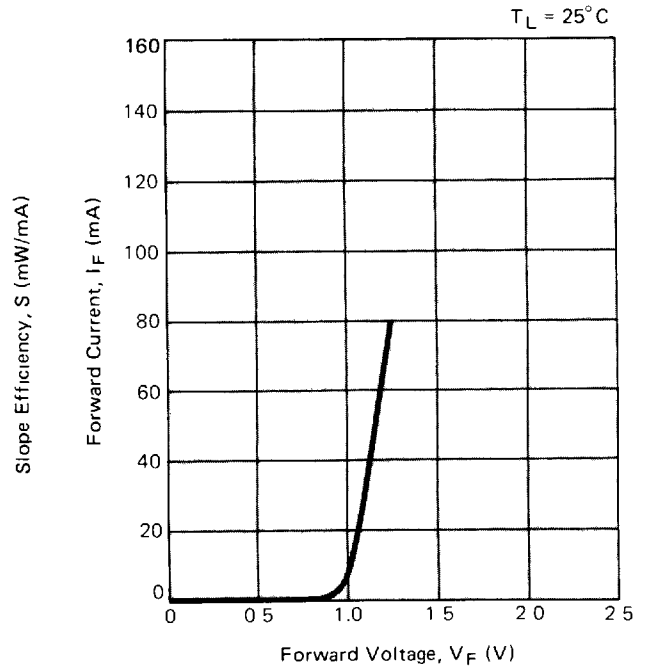


Fig. 3 Temperature Dependence of Threshold Current

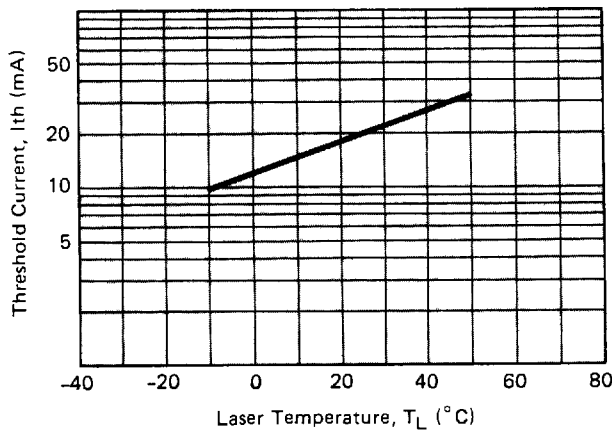
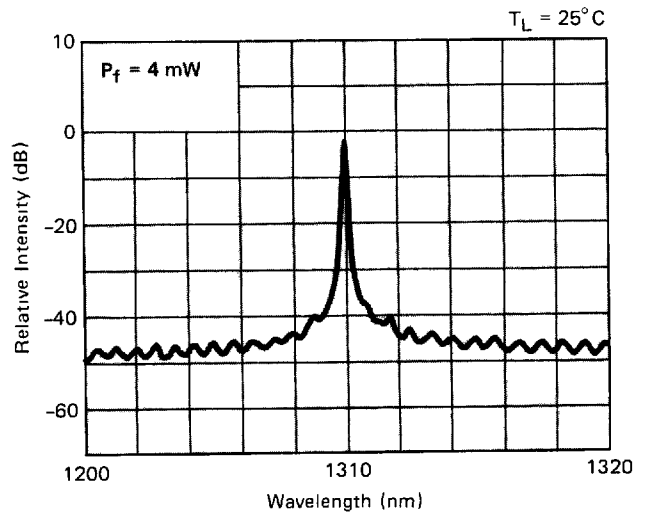


Fig. 4 Lasing Spectrum
 $T_L = 25^\circ\text{C}$



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Fig. 5 Tracking Characteristics

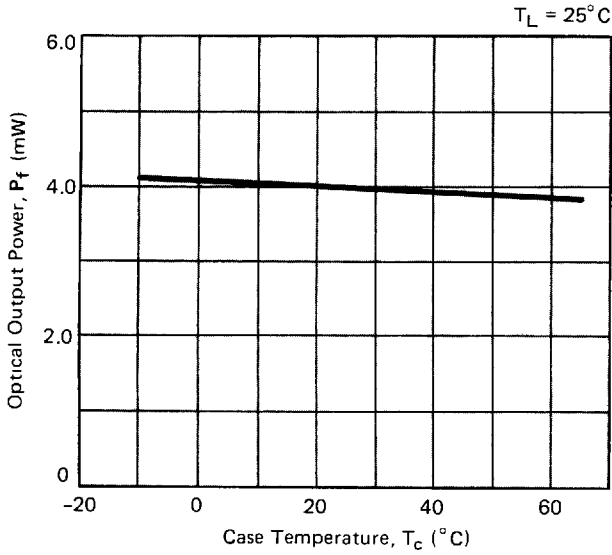


Fig. 6 Frequency Response

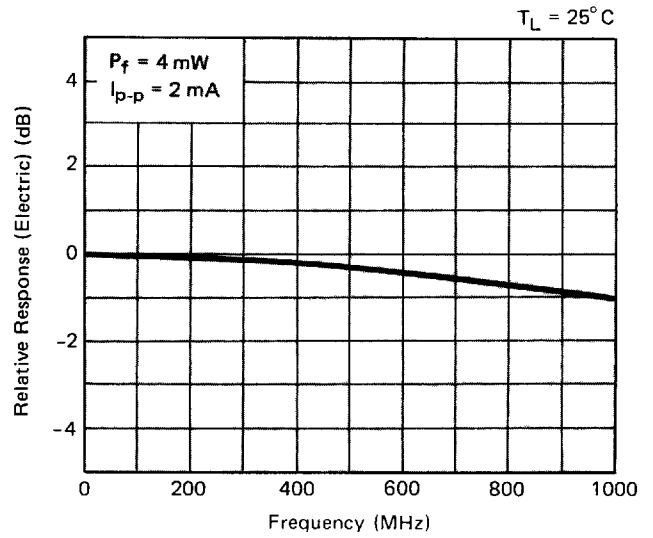


Fig. 7 CSO vs. Optical Modulation Index
CTB

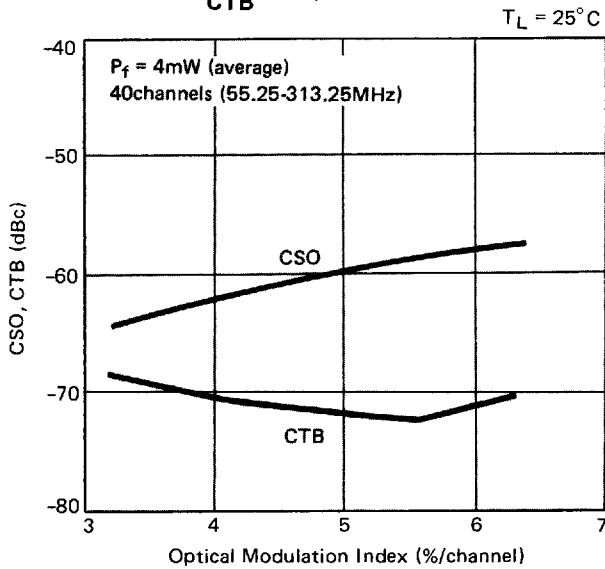
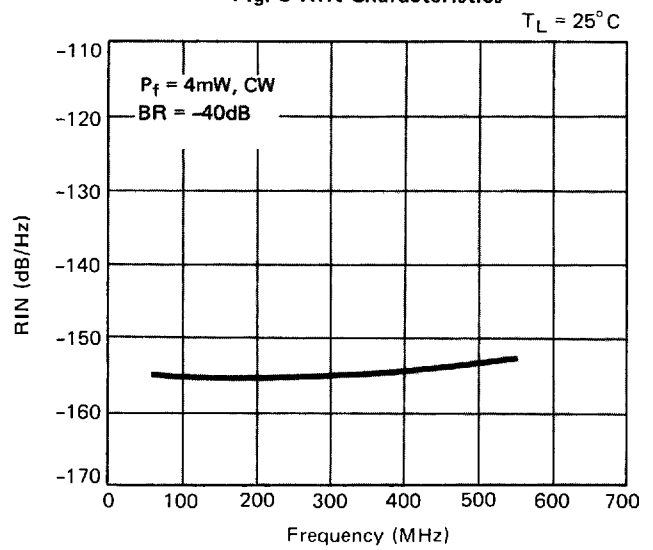


Fig. 8 RIN Characteristics



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Fig. 9 Thermistor Resistance vs. Temperature

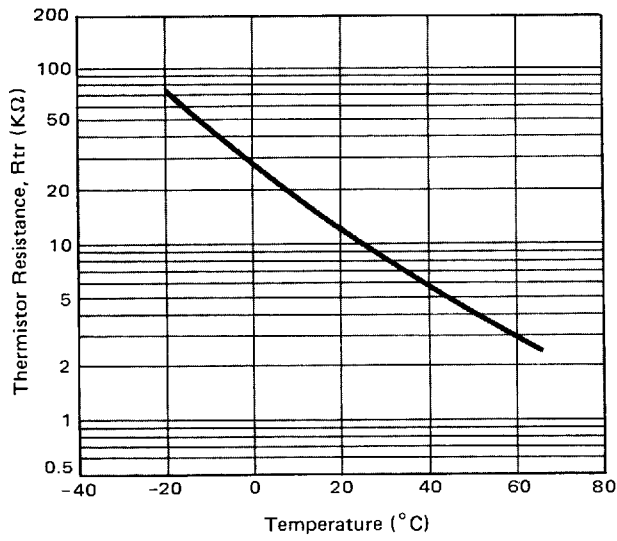


Fig. 10 Cooler Current vs. Case Temperature
Cooler Voltage

