DATA SHEET

1310 NM FABRY-PEROT (FP) LASER DIODE TO56 PACKAGE

FP-1310-4I-56A

FEATURES:

- Wide operating temperature (-40°C to 100°C)
- Stable threshold current for easy transmitter control (T0 ~ 80K)
- 1310 nm typical emission wavelength FP-LD's
- 5.6 mm TO-can package with flat window
  - Ball-lens version available
- High-speed modulation capability (Up to 4Gb/s)
- Excellent reliability
  - Ultra-low gradual wear-out rates
  - <1% failures in 20 yrs at 55C

APPLICATION

- Source for high-speed data-communication and telecommunication links
  - SONET, Fiber-channel, Giag-bit Ethernet, FTTX

The FP-1310-4I-56A is an MOCVD grown InAlGaAs ridge laser diode with emission wave-length of 1310 nm and standard continuous light output of 5 mW. These lasers provide stable, single transverse mode oscillation. These are hermetically sealed devices in a coaxial package (TO-56) with an integrated monitor photodiode to monitor the optical output. This is a suitable light source for data-com and telecom applications with data rates up to 4 Gb/s.

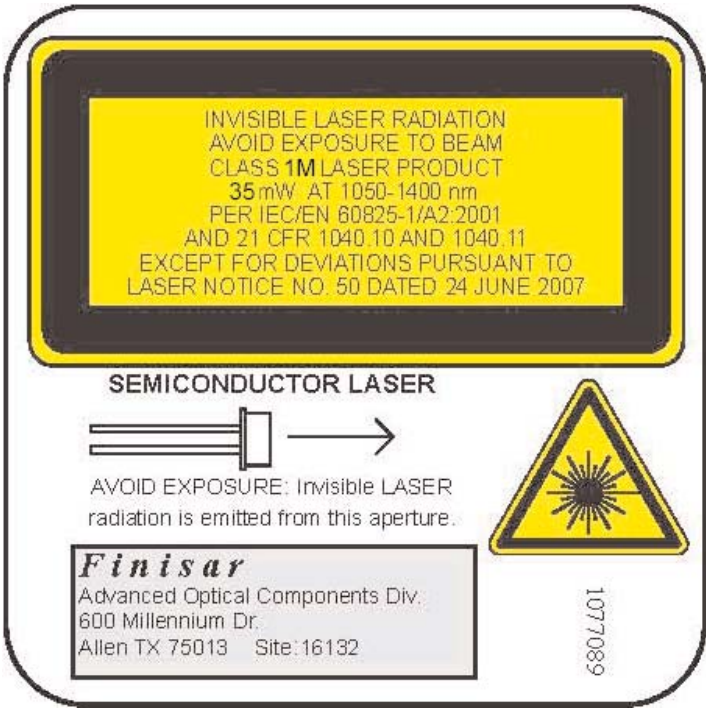
Part Number	Description
FP-1310-4I-56A	1310 nm Fabry-Perot (FP) Laser Diode

Finisar
Advanced Optical Components Division

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Conditions	Rating	Unit
P_0	Output power	CW	10	mW
V_RLD	Reverse voltage (laser diode)	-	2	V
V_RPD	Reverse voltage (monitor photodiode)	-	10	V
I_FPD	Forward current (photodiode)	-	1	mA
T_c	Operation temperature	-	-40 to +100	°C
T_{stg}	Storage temperature	-	-40 to +100	°C

NOTICE: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

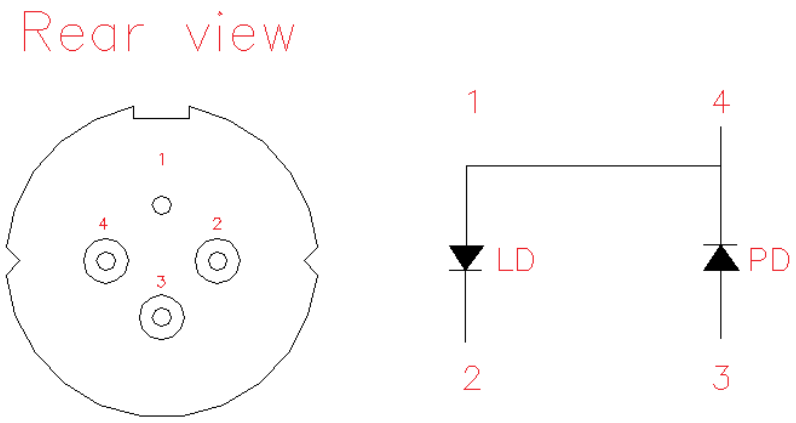


ELECTRICAL-OPTICAL CHARACTERISTICS

Unless otherwise stated, all parameters are at T_{CASE} = 25°C

Symbol	Parameter	Test Conditions	Minimum	Typical	Maximum	Unit
I_{th}	Threshold current	CW	4	8	12	mA
I_{thH}	Threshold current at 100 C	CW, T_c=100°C	16	21	30	mA
T0	Temperature dependence of threshold current		-	80	-	K
I_{op}	Operating current	For P_O = 5mW (CW)	-	28	40	mA
V_{op}	Operating voltage	CW Voltage at I_{op}	-	1.15	1.25	V
R_{op}	Differential series resistance (laser diode)	CW dV/dI at T = 25° C between 15 mA and 25 mA	4	6	10	Ω
SE	Slope efficiency		0.15	0.25	0.35	W/A
SER	SE Ratio		0.7	0.9	1	
λc	Lasing wavelength		1290	1310	1330	nm
Δλ	Spectral width under modulation	PRBS 2^7-1 ER =10 dB; Ib = 1.8*I_{th}; RMS (sigma)	-	1.5	2.75	nm
dλc/dT	Temperature dependence of lasing wavelength		0.40	0.45	0.55	nm/K
$\Theta_{\parallel}$	FWHM of beam divergence (parallel)		10	15	20	degree
$\Theta_{\perp}$	FWHM of beam divergence (perpendicular)		35	40	45	degree
t_r	Rise time	20% - 80% ; T_c = 85°C; ER = 10 dB; Ib = 1.8*I_{th}	-	-	140	ps
t_f	Fall time	20% - 80% ; T_c = 85°C; ER =10 dB; Ib = 1.8*I_{th}	-	-	140	ps
d	Droop	T_c = 85°C; I = I_{th}+36 mA; 0-6 GHz range	-2	-1	-	dB
f_R	Relaxation oscillation frequency	T_c = 85°C; I = I_{th}+36 mA	5	5.5	-	GHz
C_d	Capacitance for monitor photodiode		-	50	-	pF
I_{mon}	Monitor photodiode current		50	140	250	mA
Δ_{TRACK}	Tracking error		-1.5	-	+1.5	dB
I_{m0}	Dark current for Monitor photodiode		-	-	0.1	mA

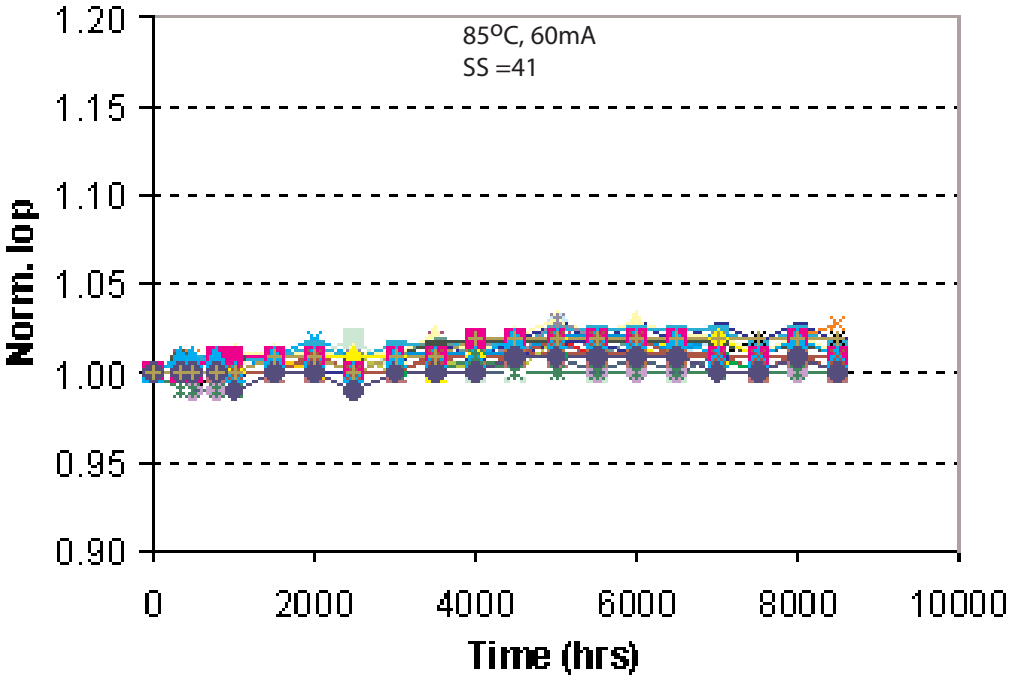
PIN-OUT



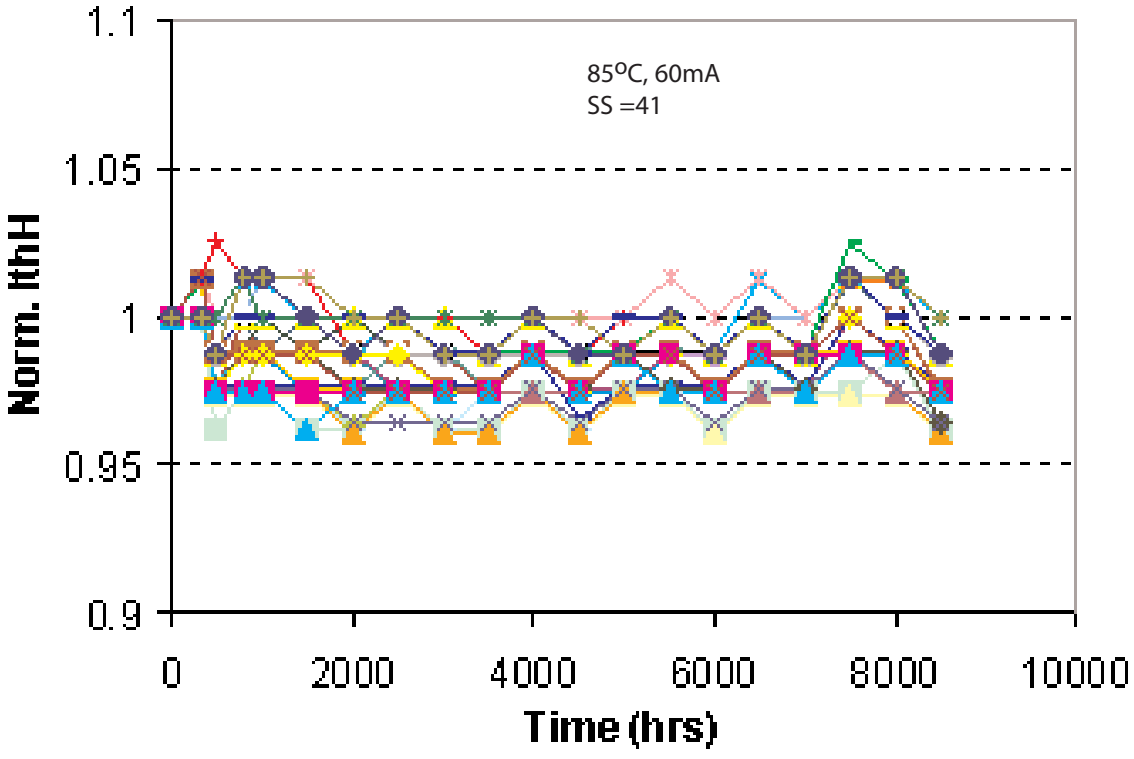
1 = Case (isolated)
2 = Laser diode cathode
3 = Photodiode anode
4 = Photodiode cathode / laser diode anode

RELIABILITY

Normalized operating current at 5mW, 25C after aging at 85C

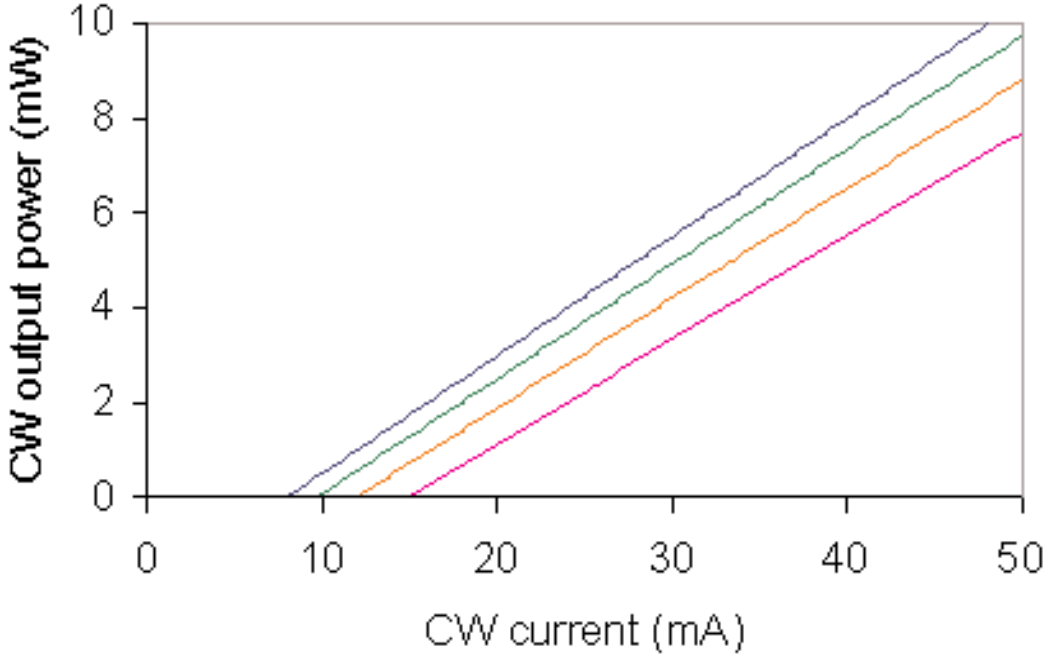


Normalized threshold current at 100C

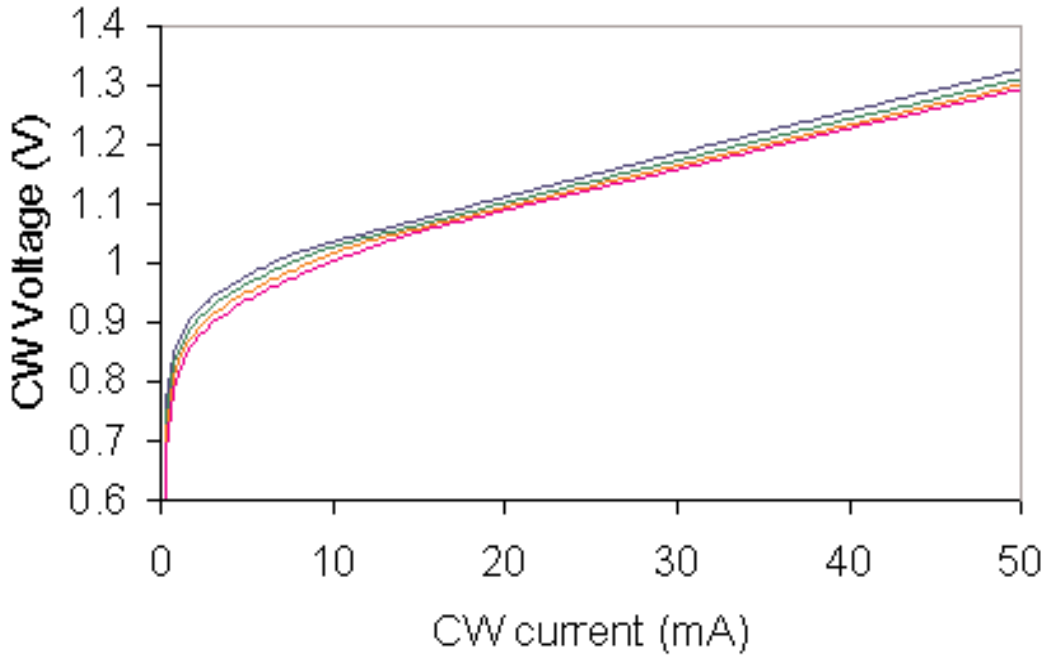


TYPICAL CHARACTERISTICS

Typical LI curve at T_C=25°C, 45°C, 65°C and 85°C

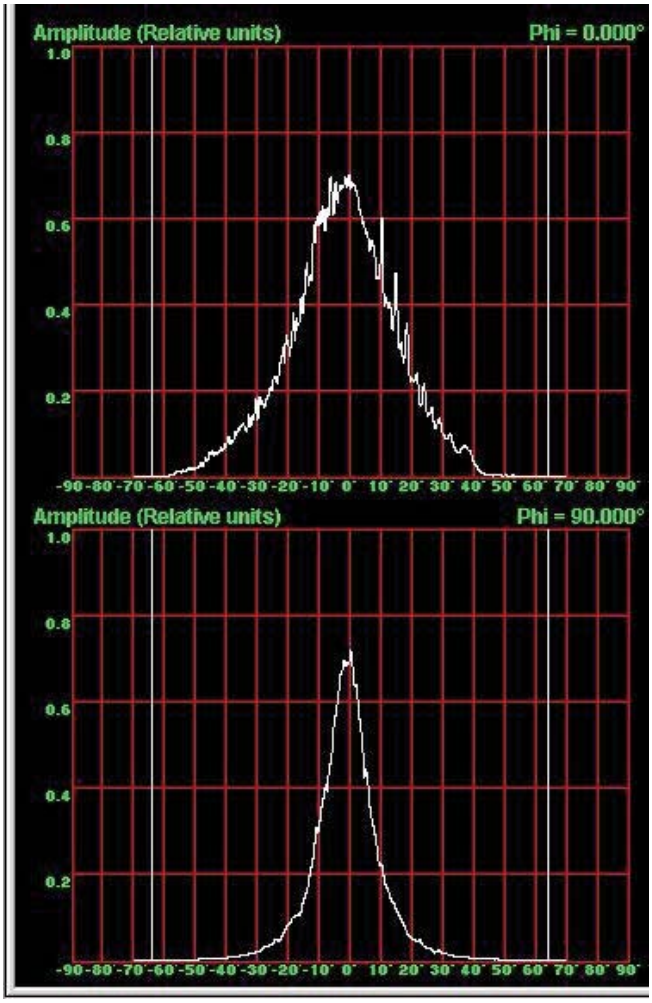


Typical IV curve at T_C=25°C, 45°C, 65°C and 85°C

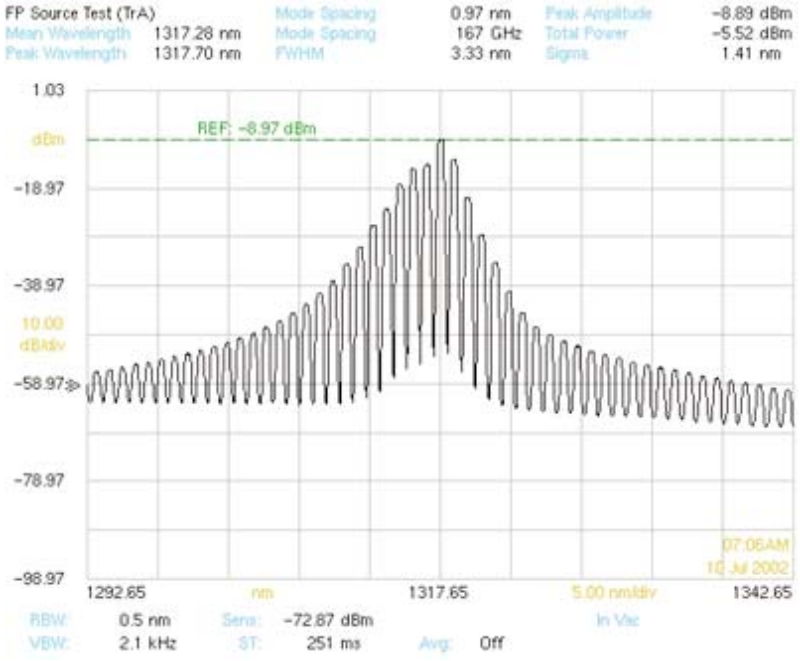


TYPICAL CHARACTERISTICS

Far-filed at T=25^{O}C and I=35mA

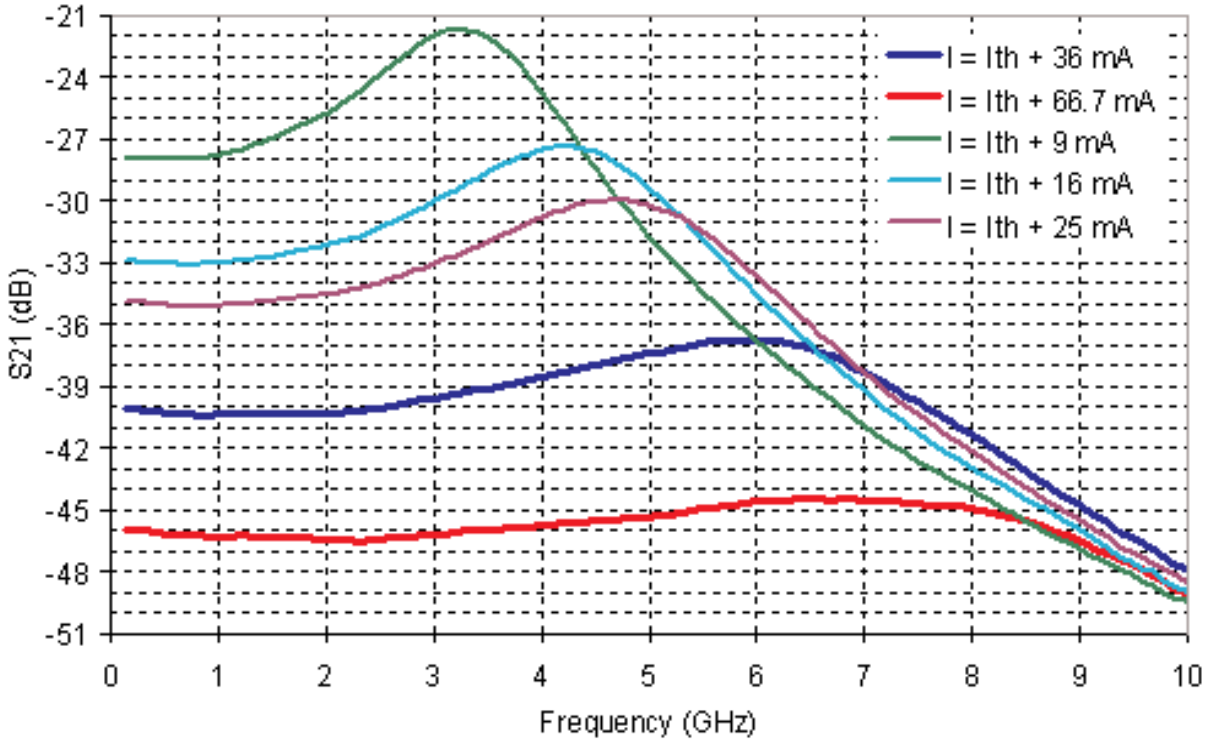


Modulation spectrum at T=25^{O}C

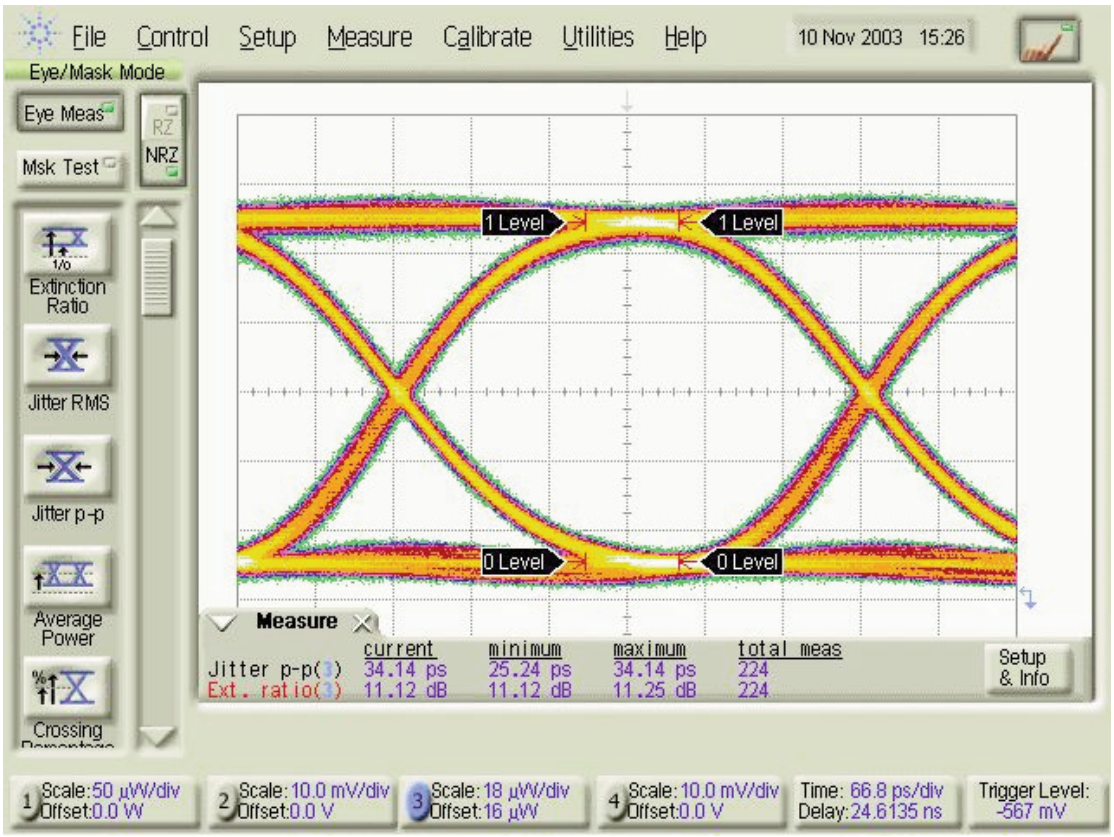


TYPICAL CHARACTERISTICS

Typical S21 curve at T_C=25^{o}C



Typical 2.5Gb/s eye diagram at T_C=85^{o}C and ER=11dB



ADVANCED OPTICAL COMPONENTS

Finisar's ADVANCED OPTICAL COMPONENTS division was formed through strategic acquisition of key optical component suppliers. The company has led the industry in high volume Vertical Cavity Surface Emitting Laser (VCSEL) and associated detector technology since 1996. VCSELs have become the primary laser source for optical data communication, and are rapidly expanding into a wide variety of sensor applications. VCSELs' superior reliability, low drive current, high coupled power, narrow and circularly symmetric beam and versatile packaging options (including arrays) are enabling solutions not possible with other optical technologies. ADVANCED OPTICAL COMPONENTS is also a key supplier of Fabrey-Perot (FP) and Distributed Feedback (DFB) Lasers, and Optical Isolators (OI) for use in single mode fiber data and telecommunications networks

LOCATION

- Allen, TX - Business unit headquarters, VCSEL wafer growth, wafer fabrication and TO package assembly.
- Fremont, CA – Wafer growth and fabrication of 1310 to 1550nm FP and DFB lasers.
- Shanghai, PRC – Optical passives assembly, including optical isolators and splitters.

SALES AND SERVICE

Finisar's ADVANCED OPTICAL COMPONENTS division serves its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact a nearby sales office or call the number listed below.

AOC CAPABILITIES

ADVANCED OPTICAL COMPONENTS' advanced capabilities include:

- 1, 2, 4, 8, and 10Gbps serial VCSEL solutions
- 1, 2, 4, 8, and 10Gbps serial SW DETECTOR solutions
- VCSEL and detector arrays
- 1, 2, 4, 8, and 10Gbps FP and DFB solutions at 1310 and 1550nm
- 1, 2, 4, 8, and 10Gbps serial LW DETECTOR solutions
- Optical Isolators from 1260 to 1600nm range
- Laser packaging in TO46, TO56, and Optical subassemblies with SC, LC, and MU interfaces for communication networks
- VCSELs operating at 670nm, 780nm, 980nm, and 1310nm in development
- Sensor packages include surface mount, various plastics, chip on board, chipscale packages, etc.
- Custom packaging options

Finisar
Advanced Optical Components Division

Phone:1-866-MY-VCSEL USA (toll free)
1-214-509-2700 USA (Direct dial)
44 (0) 174 336 5533 Europe
886-935-409898 China & Taiwan
81-90-4437-1130 Japan
82-11-220-6153 Asia Pacific & Korea

Fax: 1-214-509-3709 USA

Email: support@adopco.com
WEB: www.finisar.com/aoc.php