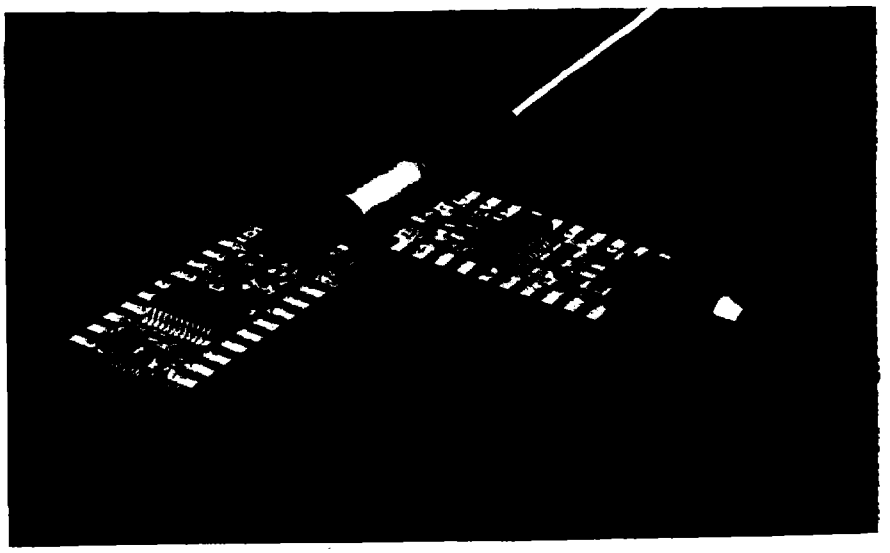
PRELIMINARY

"*AIRPAK*"
SONET Transmitter 52Mb/s, 155Mb/s and 622Mb/s

Light Interface Module
for OC1, OC3, OC12
STM-1 / STM-4



FEATURES

- Fully STM-1, OC3 compliant
  OC 12, STM 4 compliant
- Low threshold FP laser
- Wide operating temperature
- 1300nm and 1550nm options
- Automatic power control
- Transmitter disable
- Optical power monitor
- Laser bias monitor
- 20 pin multisource pinout

APPLICATIONS

- SONET OC1, OC3, OC 12
- SDH STM-1, STM-4
- ATM / FDDI
- Data rates up to 800 Mb/s
- LAN, MAN
- Subscriber loop
- High loss budget links

DESCRIPTION

The TL-2000 series, laser transmitters are full function, high performance, uncooled optical modules designed for applications from 1Mb/s to 800Mb/s including CCITT SDH and ANSI SONET.

The module features a single 5V supply operation and a logic interface which is compatible with either ECL or PECL. The optical source is a low threshold Fabry Perot laser coupled with a single mode fiber. The fully self contained module includes all bias and modulation control circuitry and a disable function to put the laser in standby mode. High and low power versions are available for intermediate and long haul applications. Analog voltage outputs which are proportional to the laser current and the optical power are available to use for system fault alarms. This highly compact transmitter complies with an industry standard, 20 pin, dual-in-line footprint.

Functional Description

High Speed Driver

The high speed driver modulates the laser above threshold to maximize speed and minimize pulse width distortion. The high speed drive current is controlled by a temperature-sensitive network. This network compensates for the reduction in a laser's power slope at higher operating temperatures by increasing the drive current. The result is that a minimum extinction ratio is maintained over all operating conditions.

Laser Status Section

The laser's backfacet monitor network shown (pins 17 & 19) provides an external differential voltage proportional to the optical power emitted. This monitor is useful for determining whether the transmitter is functioning properly when locating faults along the fiber link.

The laser's bias current is also monitored with a differential voltage via pins 2 & 4 . A variation in this voltage is normal when operating the module at temperatures other than room temperature since the automatic control circuit will increase the bias to maintain constant optical power. Any connection to the monitor pins should be high impedance.

Enable/Disable

The disable function completely shuts down the transmitter. This feature may be used in applications where the output power must be off when the transmitter is in standby mode.

Automatic Power Control

The Automatic power control section maintains constant average power over the -40°C to +85°C operating range. The control also compensates for normal increases in the laser's operating current due to normal aging effects.

User Connections

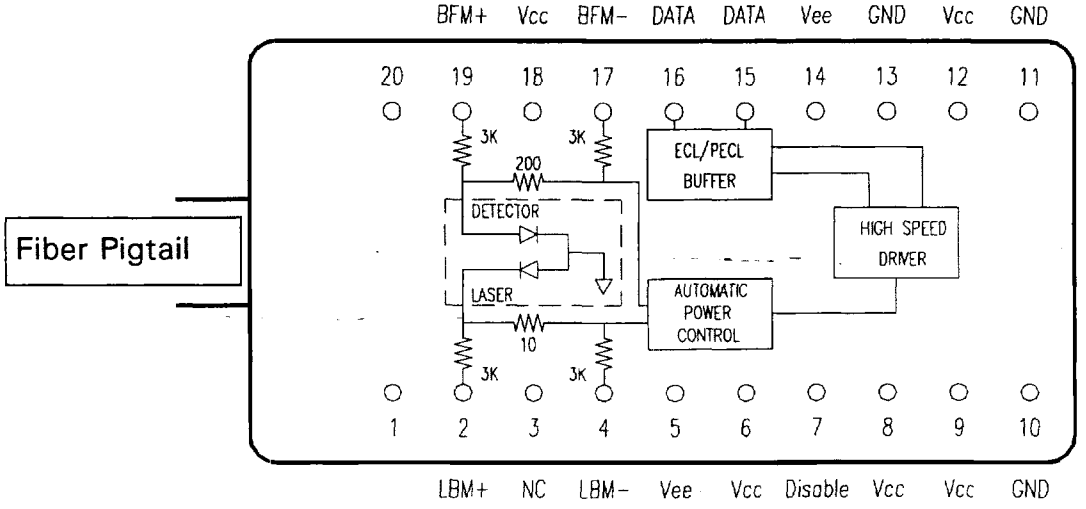
Figs 2 and 3 demonstrate typical connections which the user can implement to interface with ECL and PECL logic. Good high frequency techniques should be used when laying out a PC board to insure good signal quality. A ground plane is recommended with the by-pass capacitors and terminating resistors located as close to the module as possible.

Application of Status Alarms

When implementing an external status alarm, a differential amplifier should be used to convert the differential monitor signal to a single-ended signal. This signal can then be fed to a simple comparator to detect a change in operating status. For example, the laser bias monitor can be used in conjunction with a differential amplifier and comparator to signal an increase in bias current of 50% or more at 25°C indicating a possible malfunction.

Evaluation Board

Test boards are available for simple interfacing to test equipment such as pattern generators. Contact the sales department for information.



Transmitter Functional Diagram Fig 1

PERFORMANCE SPECIFICATIONS

Optical Characteristics

Parameter	Minimum	Typical	Maximum	Units
Central Wavelength (1)				
TL 2063 , TL 2083	1290		1330	nm
TL 2065 , TL 2085	1520		1570	nm
Average Output Power (2)				
TL 2063PT-010 , TL 2065PT-010	-10	-8	-5	dBm
TL 2063PT-003	-5	-3	0	dBm
TL 2083PT-010 , TL 2085PT-010	-10	-8	-5	dBm
TL 2083PT-003	-5	-3	0	dBm
Spectral Width (RMS)			4	nm
Extinction Ratio	10	12		dB
Tx Disable	Vcc- 3.2		Vcc	V
Duty Cycle Distortion		0.4	1	ns

1. Wavelength at 25 °C

2. Over operating temperature range.

Electrical Characteristics

Parameter	Minimum	Typical	Maximum	Units
Supply Voltage [Vcc- Vee]	4.75	5	5.5	V
Supply Current		70	130	mA
Input Data Voltage (1)				
Low		Vcc- 1.8		V
High		Vcc- 0.8		V
Bias Monitor (at 25 °C)	0.01		0.45	V
Back Facet Monitor (50% duty cycle)	0.01		0.2	V

1. When Vee is -5 V, Vcc must be 0 V. With Vcc at +5 V, Vee must be 0 V.

Absolute Maximum Ratings

Parameter	Minimum	Maximum	Units
Supply Voltage		6	V
Storage Temperature	-40	85	°C
Operating Temperature	-40	85	°C
Lead Soldering Temperature/Time		250/10	°C/sec.

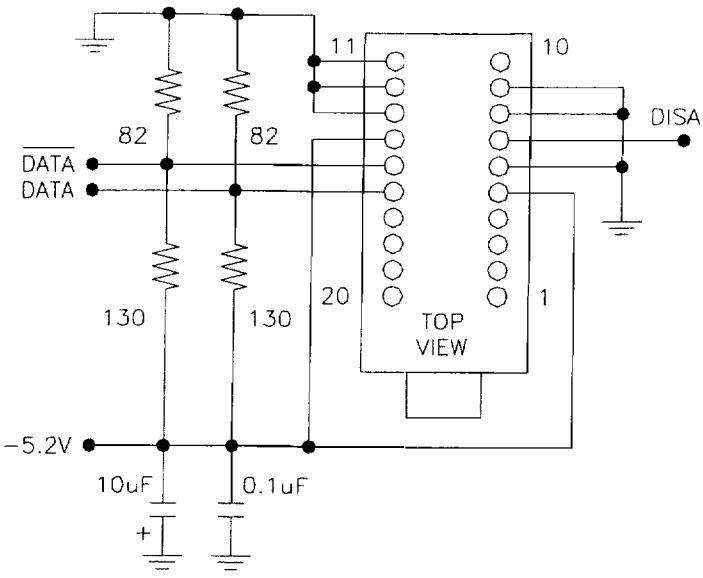
ORDERING INFORMATION

Typical Rate (NRZ) Mb/s	Central Wavelength nm	Typ. $P_{avg.}$ dBm	Interface	Operating Temp. °C	Part Number
155	1310	-8	9/125 Pigtail	-40 to +85	TL 2063PT-010FC
155	1310	-3	9/125 Pigtail	-40 to +85	TL 2063PT-003FC
155	1550	-8	9/125 Pigtail	0 to +65	TL 2065PT-010FC
622	1310	-8	9/125 Pigtail	-40 to +85	TL 2083PT-010FC
622	1310	-3	9/125 Pigtail	-40 to +85	TL 2083PT-003FC
622	1550	-8	9/125 Pigtail	0 to +65	TL 2085PT-010FC

Connector Ordering Guide

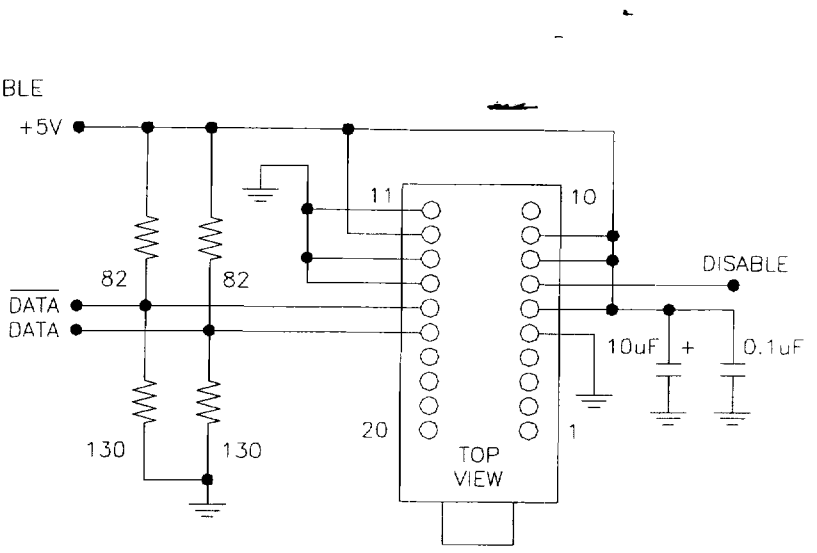
Our modules are fitted with FC/PC connectors on the fiber pigtail as standard. If you require other connector types such as SC/PC, please enquire with the sales department.

Class 1 Laser Product. This product complies with the applicable requirements of 21 CFR 1040



RECOMMENDED TRANSMITTER BIAS FOR ECL APPLICATIONS

Fig. 2.

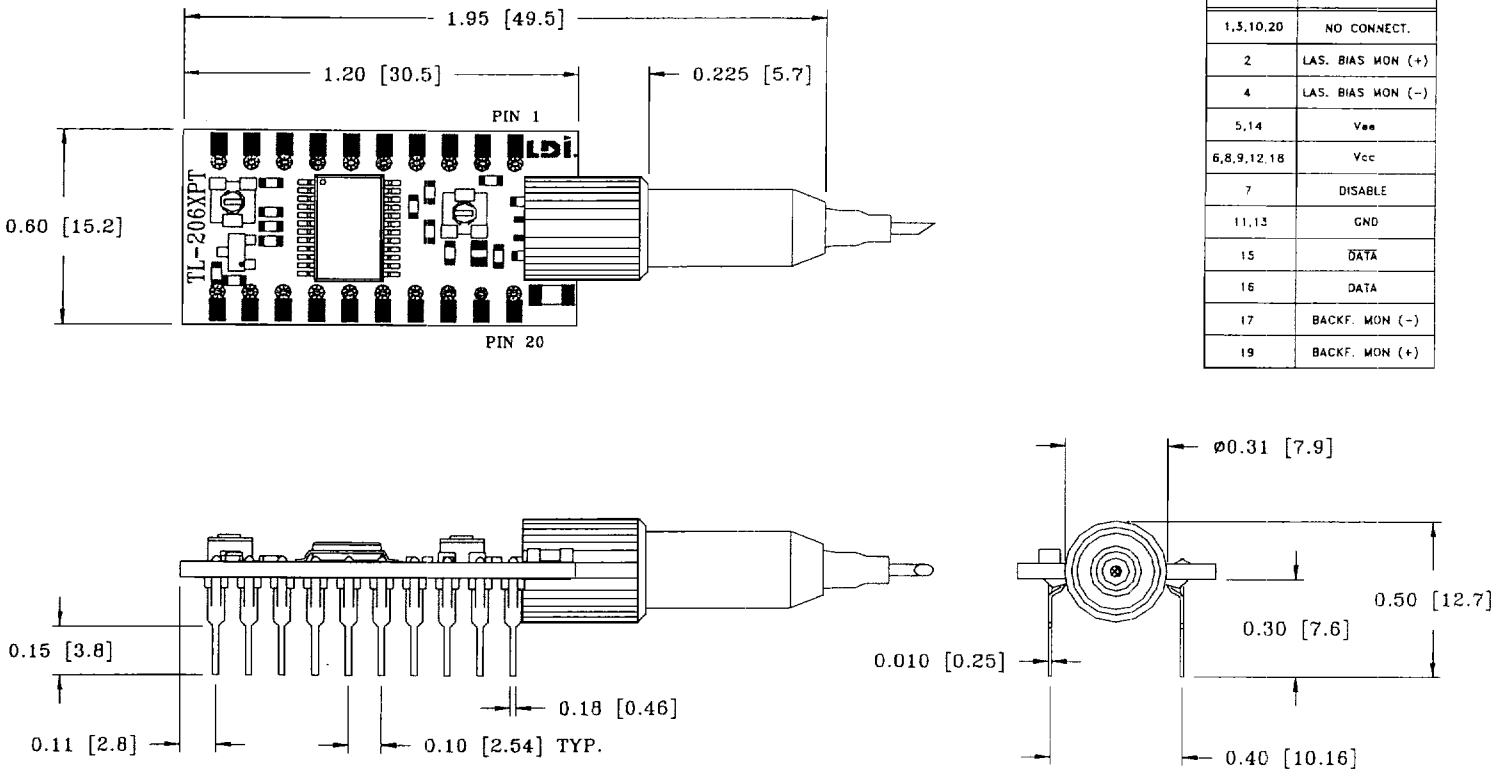


RECOMMENDED TRANSMITTER BIAS FOR PECL APPLICATIONS

Fig. 3.

PIN ASSIGNMENT
(TRANSMITTER MODEL TL206XPT)

PIN No.	DESCRIPTION
1,3,10,20	NO CONNECT.
2	LAS. BIAS MON (+)
4	LAS. BIAS MON (-)
5,14	Vee
6,8,9,12,18	Vcc
7	DISABLE
11,13	GND
15	$\overline{\text{DATA}}$
16	DATA
17	BACKF. MON (-)
19	BACKF. MON (+)



Dimensions in inches and [mm]

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