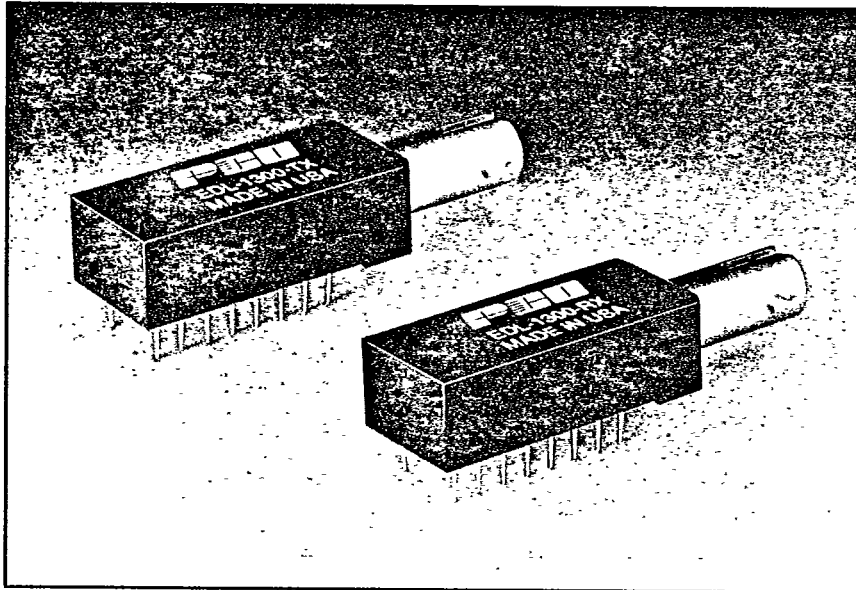




Digital Data Link

EDL-1300 SERIES 1300nm Transmitter/Receiver Modules

T-41-91



Features

- Interfaces Directly with TTL Circuitry
- Single +5 VDC Supply
- Data Rates From 1 to 50 Mb/s
- 2 km Link Length Over Multimode Fiber
- Typical Link Budget of 15 dB
- 16 pin DIP with ST™ Connector Coupling

Description

The EDL-1300 Series Miniature Digital Optical Transmitters/Receivers are designed for applications in local area networks, point-to-point communications, and any application where the interface signal is at a TTL logic level. The modules combine the benefits of high performance, long wavelength optical

communication with the design features of small, low cost packaging.

Each module is housed in a 16-pin DIP plastic package containing an integral ST™ compatible connector coupling.

ST™ is a trademark of AT&T Technologies, Inc.

Transmitter and Receiver Absolute Maximum Ratings	
Supply Voltage (Vcc) 6 Volts	Storage Temperature -20° to +85°C
Input Voltage Must Not Exceed Vcc	Soldering Temperature 240°C for 10 seconds

Transmitter Electrical Characteristics	MIN	MAX	UNIT
High Level Input Voltage	2.0	Vcc	Volts
Low Level Input Voltage	0	0.8	Volts
High Level Input Current		0.02	mA
Low Level Input Current		-0.1	mA
Receiver Electrical Characteristics	MIN	MAX	UNIT
Latch Pin High Input Voltage	2.0	Vcc	Volts
Latch Pin Low Input Voltage	0	0.8	Volts
Latch Pin Low Input Current		0.5	mA
Output High Voltage (I _{out} = 10 mA)	2.4		Volts
Output Low Voltage (I _{sink} = 4 mA)		0.5	Volts

Transmitter Performance

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Electrical Characteristics Ta=25°C

Characteristic	Symbol	Minimum	Typical	Maximum	Unit	Notes
Supply Voltage	V _{cc}	+4.5	+5.0	+5.5	V	--
Supply Current	I _{cc}	--	90	120	mA	--
Power Dissipation	P	--	450	660	mW	--

Optical Characteristics Ta=25°C

Characteristic	Symbol	Minimum	Typical	Maximum	Unit	Notes
Data Rate	B	DC	--	50	Mb/s	--
Optical Output Power	P _o	-18	-16	--	dBm	1
Optical Output Temp. Coefficient	--	--	-.7	-1.0	%/°C	2
Optical Rise/Fall Time	T _f , T _r	--	4	6	nsec	3
Center Wavelength	λ _c	1280	1320	1350	nm	4
Temp. Coefficient Of λ _c	--	--	+0.7	--	nm/°C	4
Spectral Width (FWHM)	Δλ	--	115	150	nm	4
Temp. Coefficient Of Δλ	--	--	+0.2	--	nm/°C	4
On:Off Ratio	--	20:1	--	--	--	--
Temp. Range	T	0	--	+70	°C	--

Notes:

1. Measured average optical output power launched into a 62.5/125μm graded index fiber. The data rate is 50Mb/s with 50% duty cycle.
2. At 0° C the optical output power is typically 0.8dB above that at 25°C. At 70°C the optical output power is typically 1.3dB below that at 25°C.
3. Measured from 10%-90% points.
4. Measured at 50Mb/s with 50% duty cycle.

Receiver Performance

Electrical Characteristics Ta=25°C

Characteristic	Symbol	Minimum	Typical	Maximum	Unit	Notes
Supply Voltage	V _{cc}	+4.5	+5.0	+5.5	V	--
Supply Current	I _{cc}	--	85	110	mA	--
Power Dissipation	P	--	425	610	mW	--

Optical Characteristics Ta=25°C

Characteristic	Symbol	Minimum	Typical	Maximum	Unit	Notes
Data Rate	B	1	--	50	Mb/s	--
Sensitivity (10 ⁻¹² BER)	P _{in}	-31	-33	--	dBm	1
Sensitivity Temp. Derating (0°C to 70°C)	--	-1	0	+1	dB	2
Max. Input Power	P _{in}	-12	-10	--	dBm	2
Wavelength	--	1100	1320	1600	nm	--
Temp. Range	T	0	--	+70	°C	--

Notes:

1. Average incidental optical power measured at 50 Mb/s with a balanced code data (PRBS 2⁷-1). The source is an LED transmitter with a nominal center wavelength of 1320 nm and nominal rise/fall time of less than 6 nsec.
2. Measured under conditions of 50 Mb/s, 50% duty cycle input signal over temperature range 0° C to +70° C. Minimum average sensitivity over temperature range is -30 dBm.

EDL-1300 Series Applications Information

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Transmitter Operation

The transmitter behaves logically as an AND gate which controls a 1300 nm light emitting diode. The ENABLE signal (Pin 1) forces the LED to the OFF state when a LOW level input signal is applied. When the ENABLE

signal is HIGH the DATA input (Pin 15) controls the LED. Table 1 summarizes these relationships.

ENABLE	DATA	LED
0	0	Off
0	1	Off
1	0	Off
1	1	On

TABLE 1

Receiver Operation

The receiver converts optical energy to a photocurrent using a high performance PIN diode. The photocurrent is converted to a proportional analog voltage using a high gain transimpedance amplifier. A high speed comparator converts the analog signal to a differential TTL output. The comparator output follows the optical signal when the ENABLE input (Pin 16) is at a LOW

level. When the $\overline{\text{ENABLE}}$ signal is taken HIGH, the state of the comparator is latched. Table 2 summarizes these relationships. While intended for use with the 1300 nm transmitters, this receiver may be used over the range 800-1600 nm.

ENABLE	OPTICAL SIGNAL	DATA	DATA
0	Off	0	1
0	On	1	0
1	X	Q ₀	Q ₀

TABLE 2

Q₀ represents the state of the DATA output at the time the $\overline{\text{ENABLE}}$ signal went HIGH.

Data Encoding

The receiver circuit utilizes capacitive interstage coupling which limits the permissible duty cycle variations in the serial data. A DC balanced optical signal generated by a scrambling or encoding circuit is optimal for this type of link. Unrestricted NRZ or bursty transmissions may require special precautions.

The transmitter generates switching transients and non-symmetrical power supply requirements. The power supply inputs should be bypassed with RF quality capacitors (0.1 μF) close to the package.

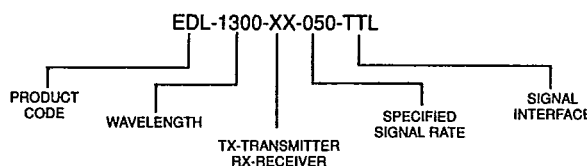
Power Supply Considerations

The receiver contains sensitive analog circuitry and should be isolated from high frequency noise often found on TTL power supply rails.

EMI Susceptibility

The receiver circuit contains sensitive analog circuitry and is housed in a plastic package. It is recommended that the receiver be located away from strong sources of radiated EMI.

Ordering Information

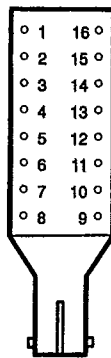


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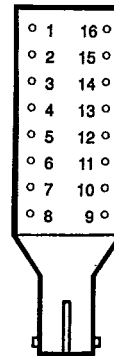
Pin Out Diagram

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TRANSMITTER



RECEIVER

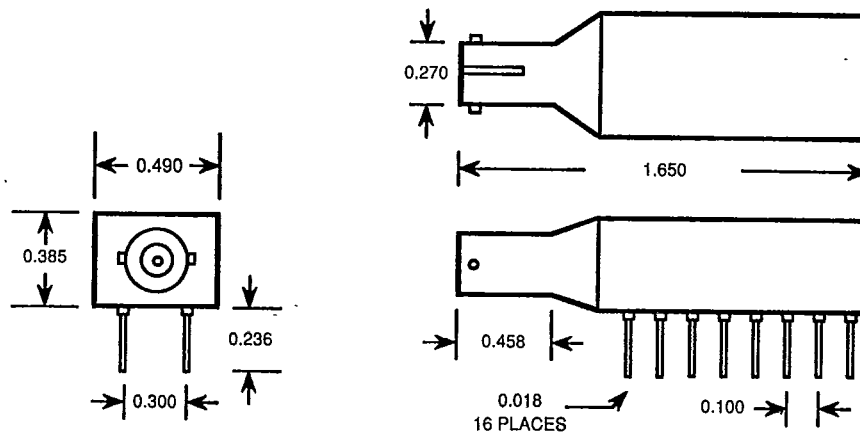


TOP VIEW

#	FUNCTION	#	FUNCTION
1	ENABLE	16	N/C
2	N/C	15	DATA INPUT
3	GND	14	GND
4	GND	13	GND
5	GND	12	Vcc
6	GND	11	Vcc
7	N/C	10	GND
8	GND	9	GND

#	FUNCTION	#	FUNCTION
1	DATA OUTPUT	16	ENABLE
2	DATA OUTPUT	15	N/C
3	GND	14	GND
4	Vcc	13	GND
5	GND	12	GND
6	N/C	11	GND
7	Vcc	10	N/C
8	GND	9	GND

Dimensions In Inches



For further information,
contact your local
PCO technical representative.



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