3.3V Single-Mode LC SFF 2x5 Transceiver
For SONET OC-12/SDH STM-4

ES062-L3Tw-x-y-z
Preliminary Data Sheet

Features

- **1300nm Fabry Perot Laser for Short & Intermediate Reach Applications**
- **Temperature Ranges: 0 to 70°C or -40 to 85°C**
- **Conforms to SONET OC-12/ SDH STM-4 specifications (622 Mbps Data Rate)**
- **Class 1 Laser Safety Conformance (FDA & IEC 60825)**
- **EMI meets FCC Class B Limit**
- **Single +3.3V Power Supply**
- **LV-PECL Data Input and Receiver Output Levels**
- **TTL Signal Detect (PECL can be special ordered)**
- **Industry Standard Duplex LC Optical Connector**
- **Operates with 9/125 µm single mode optical fibers**
- **MSA conforming 2x5 SFF package**
- **Meets Mezzanine Height Standard of 9.8 mm**
- **Wave Solderable / Aqueous Washable**

Product Description

The ES062-L3T from E2O Communications is a duplex-LC transceiver designed for use in SONET OC-12/ SDH STM-4 applications. It operates with a single +3.3V power supply. The transceiver conforms to the industry standard 2x5 footprint and meets the mezzanine height requirement of 9.8 mm. Each transceiver consists of an optical subassembly housing both the transmitter and the receiver, and an electrical subassembly. All are packaged together with a top metal cover and bottom shield.

The optical subassembly consists of 2 parts. The transmitter side has a high-performance 1300-nm FP laser and back facet monitor. The receiver side has an InGaAs PIN and a preamplifier.

All ES062-L3T transceivers also include a Signal Detect circuit, which provides a TTL logic high output when a usable input optical signal level is detected. If a PECL SD version is required, please contact your local representative.

Electromagnetic Interference (EMI)

Most equipment designs utilizing high-speed transceivers will be required to meet the requirements of FCC in the United States, CENELEC EN55022 (CISPR 22) in Europe and VCCI in Japan.

The ES062-L3T transceivers, with their shielded design, perform to the specified limits to assist the designer in the management of the overall equipment EMI performance. They meet the FCC Class B limits.

Immunity

The ES062-L3T transceiver has been designed to provide good immunity to radio-frequency electromagnetic fields. Key components to achieve the good electromagnetic performance (EMC) are the metal cover, and chassis, internal, and bottom shields.

Eye Safety

The ES062-L3T 1300-nm laser-based transceivers have been designed to meet Class 1 eye safety. They conform to FDA 21CFR1040.10 and 1040.11 and IEC 60825-1.

Ordering Information

ES062-L3Tw -x -y -z

- z (Reach)
  - IR1 = Intermediate Reach -1
- y (Laser)
  - F3=FP
- x (Temp)
  - A= -40 to +85 deg C
  - B= 0 to +70 deg C
- w (Coupling)
  - A = AC
  - F = AC/DC

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Storage Temperature	T_S	-40		+85	°C	
Soldering Temperature				260	°C	6 sec. on leads
Supply Voltage	V_{CC}			3.5	V	

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Ambient Operating Temperature	T_A	0		+70	°C	Version "B"
		-40		+85	°C	Version "A"
Supply Voltage	V_{CC}	3.1		3.5	V	
Transmitter Differential Input Voltage	V_D	0.6		2.0	V	
Transmit Disable Input Volt –Lo	TD_{Lo}			0.3	V	
Transmit Disable Input Volt –Hi	TD_{Hi}	2.3			V	

ELECTRICAL CHARACTERISTICS (Over Specified T_{op} Range, V_{CC} = +3.1V to +3.5V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Supply Current	I_{CCT}			150	mA	
RECEIVER						
Supply Current	I_{CCR}			130	mA	
Data Output Voltage Swing (Differential)	Vdiff	0.5		1.9	V	
Data Output Rise & Fall Times	t_r,t_f			0.5	ns	10% - 90%
TTL Signal Detect Output –High	Voh,TTL	2.0		Vcc	V	
TTL Signal Detect Output –Low	Vol,TTL	0.0		0.8	V	

OPTICAL CHARACTERISTICS (Over Specified T_{op} Range, V_{CC} = +3.1V to +3.5V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Output Optical Power 9/125 µm, NA = 0.10 fiber	P_{OUT}	-15		-8	dBm avg.	
Optical Extinction Ratio		9			dB	
Center Wavelength	λ_C	1290		1330	nm	
Spectral Width – rms	σ			4	nm	
Optical Rise/Fall Time	t_r / t_f			0.5	ns	10-90%
Output Optical Eye						Conforms to eye mask Bellcore TR-NWT-000253
RECEIVER						
Minimum Optical Input Power (Sensitivity)	P_{IN}		-31.5	-28	dBm avg.	
Maximum Optical Input Power (Saturation)	P_{IN}	-8			dBm avg.	
Operating Center Wavelength	λ_c	1270		1380	nm	
Signal Detect – Asserted	P_A			-28	dBm avg.	
Signal Detect – Deasserted	P_D	-42			dBm avg.	
Signal Detect – Hysteresis	P_A - P_D	1.0		5.0	dB	

TABLE 1. PINOUT TABLE

Pin	Symbol	Functional Description
Mounting Posts		The mounting posts are provided for transceiver mechanical attachment to the circuit board. They should not be connected to the circuit ground but can be connected to the chassis ground.
Housing Leads		The housing leads should be connected to circuit ground.
1	V_{EER}	Receiver Signal Ground
2	V_{CCR}	+3.3 Volt Receiver Power Supply
3	SD	Signal Detect is a TTL output. A high level indicates a valid optical signal.
4	RD-	Receiver Data Inverted Differential Output
5	RD+	Receiver Data Non-inverted Differential Output
6	V_{CCT}	+3.3V Transmitter Power Supply
7	V_{EET}	Transmitter Signal Ground
8	TXdis	Transmitter Disable
9	TD+	Transmitter Data Non-inverted Differential Input
10	TD-	Transmitter Data Inverted Differential Input

Mechanical Specs:

Figure 1 - SFF Transceiver Package Dimensions in mm and [inches].

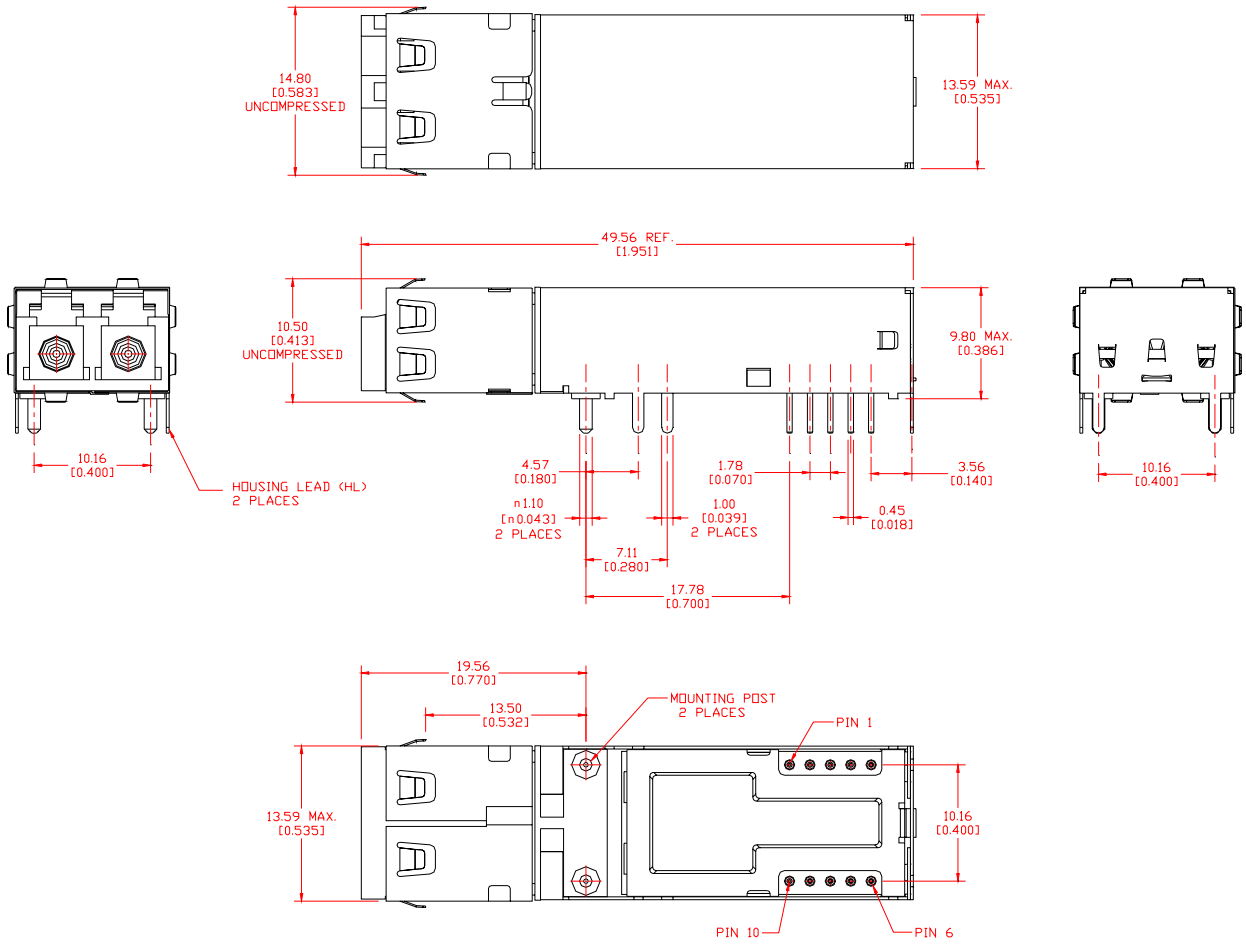
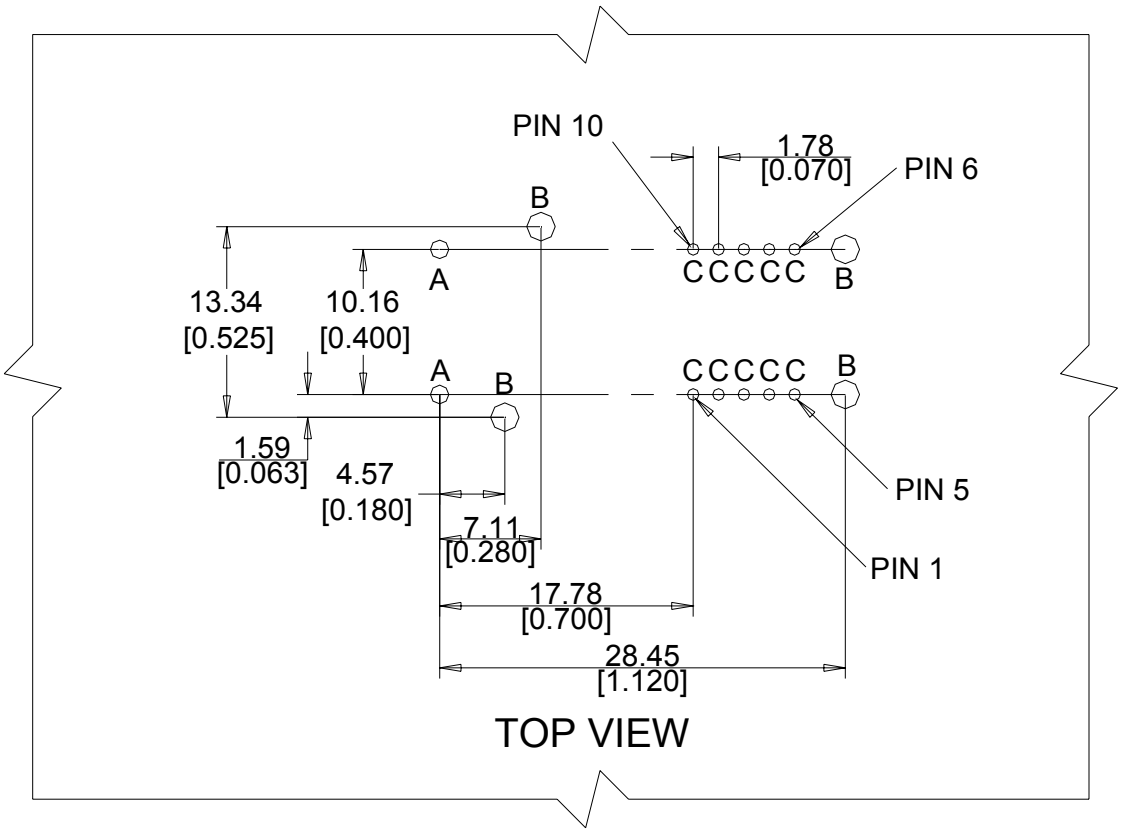


Figure 2 – Recommended PCB Layout in mm and [inches].



RECOMMENDED HOLE SIZES

SYMBOL	QTY	DIAMETER(mm)	DIAMETER[inches]
A	2	1.40±0.1	[0.055±0.004]
B	4	1.40±0.1	[0.055±0.004]
C	10	0.81±0.1	[0.032±0.004]

Figure 3 – Bezel Opening Dimensions in mm and [inches].