

EOL9-1303-T-20 Series

**1310nm Single-Mode 155Mbps
1 x 9 Transmitter
RoHS6 Compliant**



Features

- ◆ SC/FC/ST Single-Mode Transmitter
- ◆ Industry Standard 1 x 9 Footprint
- ◆ 1310nm FP-LD Transmitter
- ◆ 3.3V or 5V single power supply
- ◆ PECL signal input, supporting 125Hz signaling ^{*note1}
- ◆ Wave Solderable and Aqueous Washable with process plug inserted
- ◆ Class 1 FDA and IEC60825-1 laser safety compliant
- ◆ Operating Case Temperature
 - Standard: 0°C~+70°C
 - Industrial:-40°C~+85°C

Applications

- ◆ ATM 155 Mbps Links
- ◆ SONET/SDH Equipment Interconnect
- ◆ Fast Ethernet
- ◆ Switch to Switch Interface
- ◆ Digital video transmission system

Ordering information

Part No.	Input	Connector	Distance	Voltage	Interface	Temp.
EOL9-1303-T-20-xK ^{*note2}	AC	ST Metal	20km	3.3/5V	Note2	Standard
EOL9-1303-T-20-lxK	AC	ST Metal	20km	3.3/5V	Note2	Industrial
EOL9-1303-T-20-xKV	AC	ST Metal	20km	3.3V	Note2	Standard
EOL9-1303-T-20-lxKV	AC	ST Metal	20km	3.3V	Note2	Industrial
EOL9-1303-T-20-xKH	AC	ST Metal	20km	5V	Note2	Standard
EOL9-1303-T-20-lxKH	AC	ST Metal	20km	5V	Note2	Industrial

Note1: 5V for PECL or TTL, 3.3V for LVPECL or LVTTTL

Note2: x refers to interface type, Blank=SC; T=ST Plastics; M = ST Metal; F=FC; N=FC Plastics; P=Pigtail/SC/PC; PF=Pigtail/FC/PC; PT=Pigtail/ST/P

Regulatory Compliance

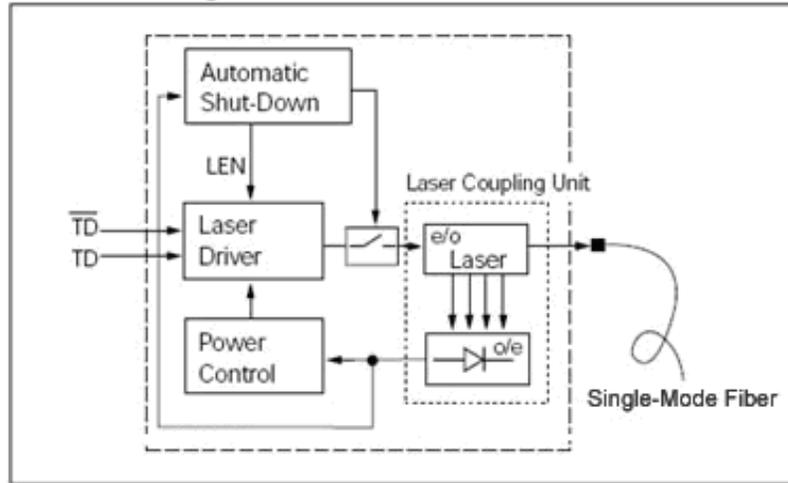
Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compliant with standards Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins are dependent on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compliant with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/receiver performance is detectable between these limits.
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1	CDRH compliant and Class I laser product. TüV Certificate No. 50135086
Component Recognition	UL and CUL EN60950-1:2006	UL file E317337 TüV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards ^{*note3}

Note3: For update of the equipments and strict control of raw materials, EOPTOLINK has the ability to supply the customized products since Jan 1st, 2007, which meet the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union.

In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.

In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item 13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for Eoptolink's transceivers, because Eoptolink's transceivers use glass, which may contain Pb, for optical components such as lenses, isolators, and other electronic components.

Functional Diagram



Product Description

The EOL9-1303-T-X series is high performance module for Fast Ethernet and SDH/SONET single fiber communications by using 1310nm transmitter. The transmitter section uses a FP laser and is a class1 laser compliant according to International Safety Standard IEC-60825. A PECL logic interface simplifies interface to the external circuitry.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	
Storage Temperature	T_s	-40	+85	°C	
Supply Voltage	V_{CC}	5V	-0.5	7.0	V
		3.3V	-0.5	5.5	
Operating Relative Humidity	-		95	%	
Soldering Conditions Temp/Time			260/10	°C/s	

*Exceeding any one of these values may destroy the device immediately.

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V_{CC}	4.75	5	5.25	V
		3.15	3.3	3.45	
Power Supply Current ^{*(note4)}	I_{CC}			300	mA
Data Rate			155		Mbps

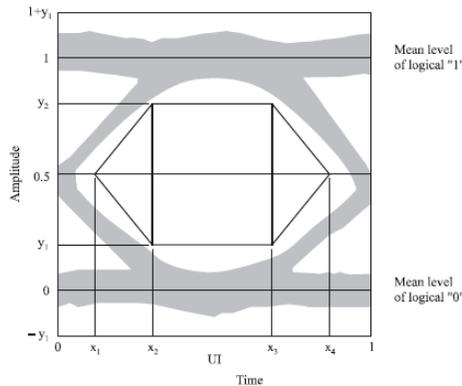
Note4: Maximum current is specified at V_{CC} equaling to Maximum @ maximum temperature.

Optical and Electrical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate		100	155		Mbps
Transmitter					
Centre Wavelength	λ_C	1260	1310	1360	nm
Spectral Width	$\Delta\lambda$			4	nm
Average Output Power*(note5)	P_{out}	-15		-8	dBm
Extinction Ratio	ER	9			dB
Rise/Fall Time (20%---80%)	tr/tf			2	ns
Relative Intensity Noise	RIN			-117	dB/Hz
Total Jitter	TJ			1	ns
Data Input Swing Differential	V_{in}	400		2000	mV
Input Differential Impedance	Z_{in}	90	100	110	Ω
Input High Voltage	V_H	-1165		-880	mV
Input Low Voltage	V_L	-1810		-1475	mV
Eye Diagram	ITU-T G.957 Compliant*(note6)				
Data Input	PECL*(note1)				

Note5: The optical power is launched into 9/125um SMF.

Note6: Eye pattern mask

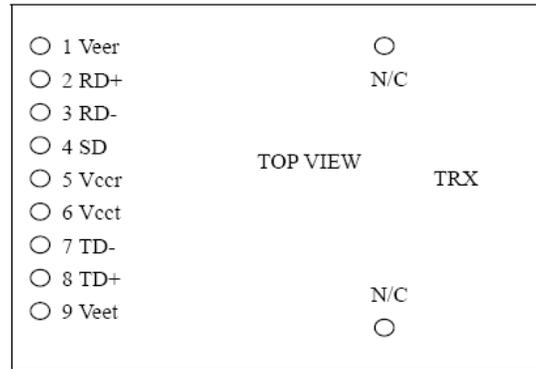


Pin Description

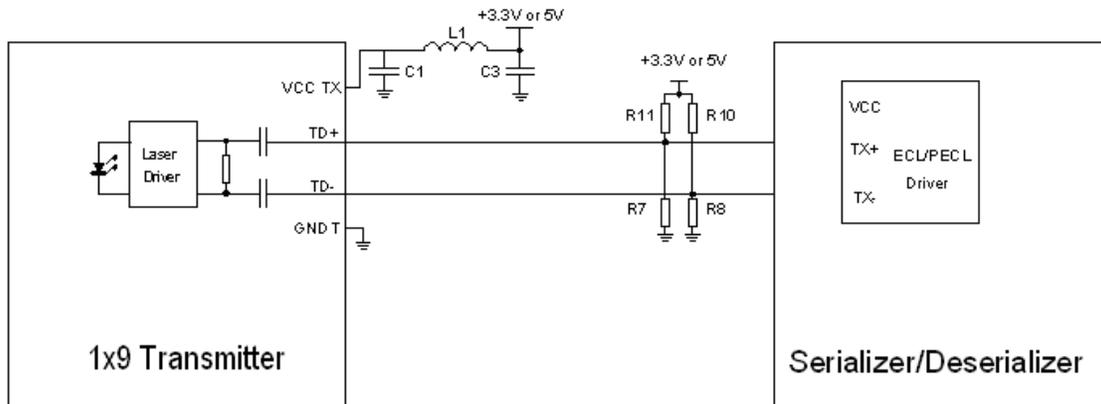
Pin	Name	Level	Description
1	Veer		NC
2	RD+		NC
3	RD-		NC
4	SD		NC
5	Vccr		NC
6	Vcct		Transmitter Power Supply, provide +5V DC(+3.3V) via the recommended transmitter power supply filter circuit. Locate the power filter circuit as close as possible to the Vcct pin
7	TD-	PECL*(not	Inverted transmitter Data in

		e1)	
8	TD+	PECL*(not e1)	Transmitter Data in
9	Veet		Transmitter Signal Ground, connect to the transmitter signal ground planed directly

Pin Definitions



Recommended Circuit

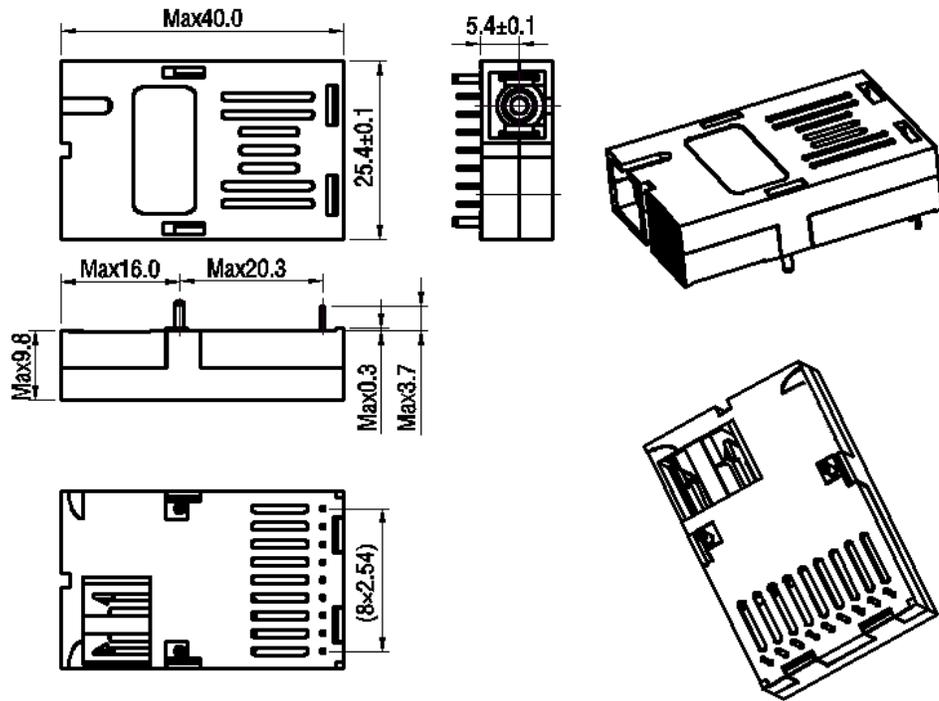


C1 C3=4.7uF
 L1 =1uH
 R5 R6=270Ω(5V)/150Ω(3.3V)
 R7 R8=127Ω(5V)/82Ω(3.3V)
 (Depends on serdes chips used)
 R10 R11=82Ω(5V)/127Ω(3.3V)
 (Depends on serdes chips used)

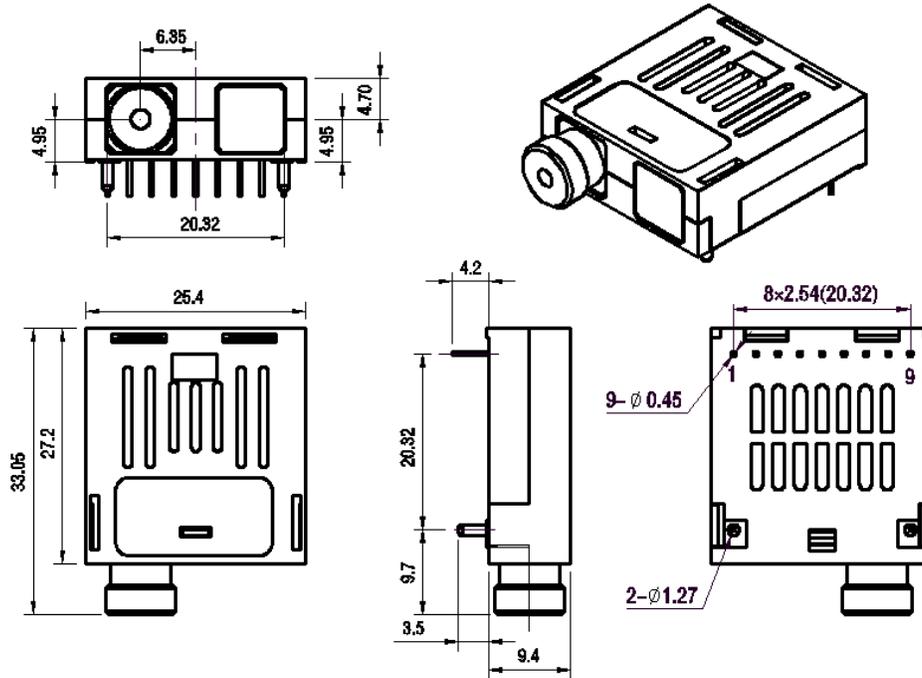
AC couple

AC Coupling Inside

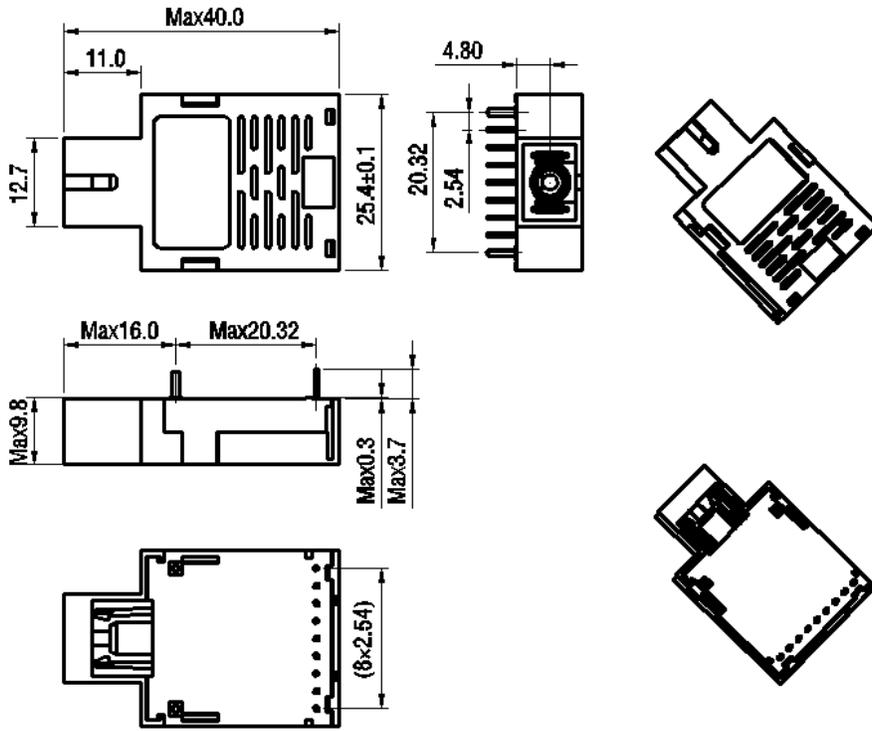
Package outline (Unit: mm)



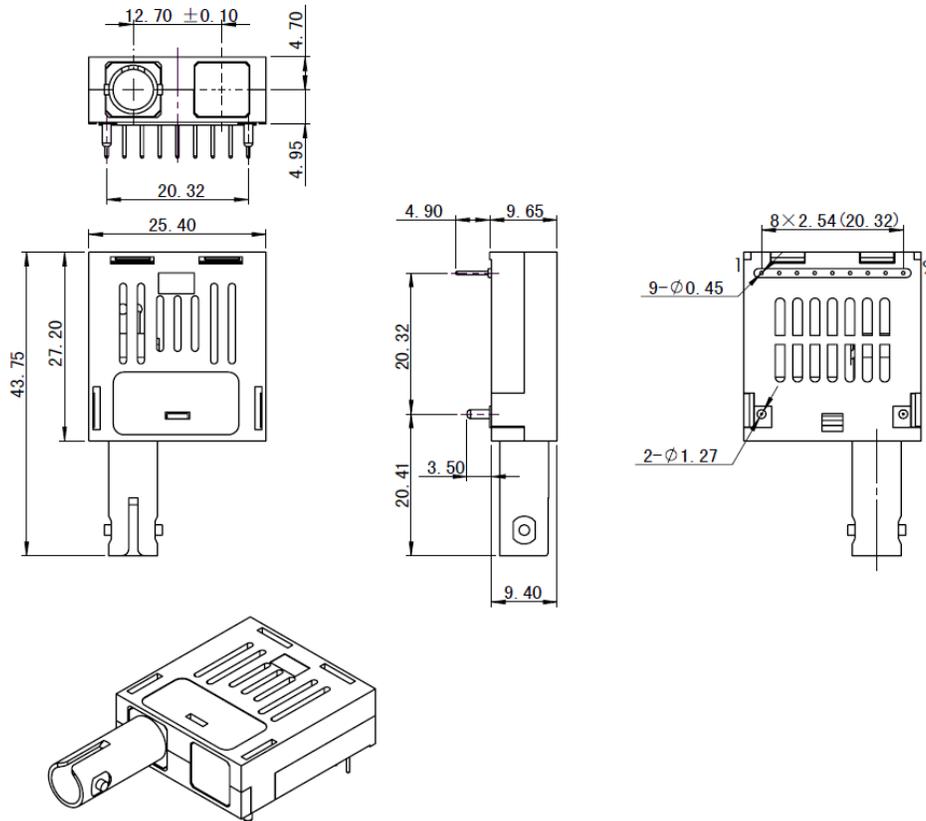
SC receptacle side output



FC receptacle



SC receptacle middle output



ST receptacle side output

Laser Emission Data

Wavelength	1310nm
Total output power (as defined by FDA: 7mm aperture at 20cm distance)	< 0.195mW
Total output power (as defined by IEC: 7mm aperture at 10cm distance)	< 15.6mW
Beam divergence	12.5°

Obtaining Document

You can visit our website:

<http://www.eoptolink.com>

Or contact Eoptolink Technology Inc., Ltd. listed at the end of the documentation to get the latest documentation.

Revision History

Revision	Initiated	Reviewed	Approved	Revision History	Release Date
V1.a	Angela	Kelly		New released.	Sep 14,2012

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