

EOL9-1512-T-40 Series

Single-Mode 1.25Gbps 1550nm

1 x 9 Transmitter

RoHS6 Compliant

Features

- ◆ SC/FC/ST Single-Mode Transmitter
- ◆ Industry Standard 1 x 9 Footprint
- ◆ 1550nm DFB-LD Transmitter
- ◆ 3.3V/5V Single Power Supply
- ◆ PECL Signal Input ^{*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

- ◆ Gigabit Ethernet
- ◆ Fiber Channel
- ◆ Switch to Switch Interface
- ◆ Digital Video Transmission System
- ◆ Other Optical Links

Ordering Information

Part No.	Input	Distance	Voltage	Interface	Temp.
EOL9-1512-T-40-XX ^{*note2}	AC	40km	3.3V/5V	Note2	Standard
EOL9-1512-T-40-IXK	AC	40km	3.3V/5V	Note2	Industrial
EOL9-1512-T-40-XXV	AC	40km	3.3V	Note2	Standard
EOL9-1512-T-40-IXKV	AC	40km	3.3V	Note2	Industrial
EOL9-1512-T-40-XXKH	AC	40km	5V	Note2	Standard
EOL9-1512-T-40-IXKH	AC	40km	5V	Note2	Industrial

Note1: 5V for PECL or TTL, 3.3V for LVPECL or LVTTTL, refer the nomenclature.

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/PC, K refers to AC for single or duplex TX or RX.

Regulatory Compliance

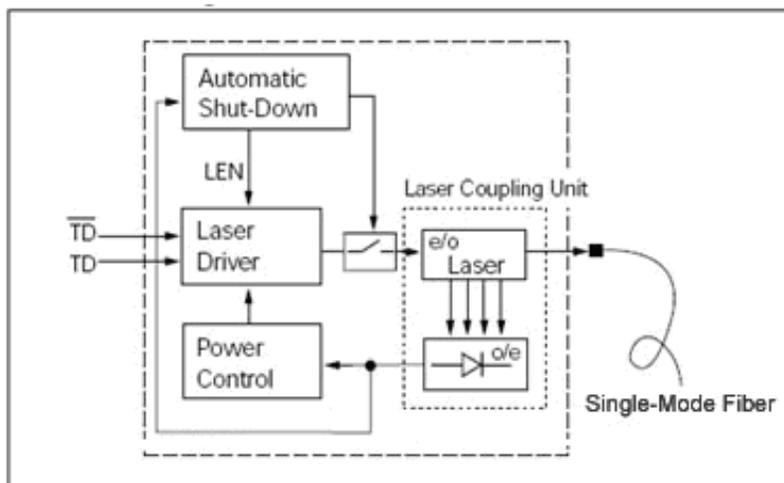
Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compliant with standards Noise frequency range: 30MHz to 6GHz. 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 EOL9-1512-T-X series is high performance module for Gigabit Ethernet and Fiber Channel single fiber communications by using 1550nm transmitter.

The transmitter section uses a multiple quantum well laser and is a class 1 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}	-0.5	7.0	V
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
Operating Case Temperature	T_c	0		+70	°C
		-40		+85	
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			1250		Mbps

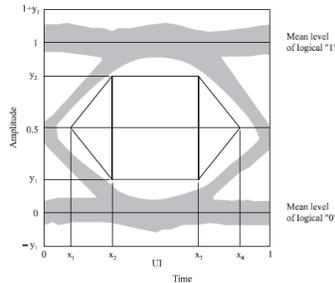
Note4: Maximum current is specified at V_{CC} equaling to Maximum @ maximum temperature.

Optical and Electrical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Center Wavelength	λ_C	1480	1550	1580	nm
Spectral Width(-20dB)	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio SMSR		30			dB
Average Output Power ^{*(note5)}	P_{out}	-5		0	dBm
Extinction Ratio	ER	9			dB
Rise/Fall Time(20%~80%)	tr/tf			0.26	ns
Relative Intensity Noise	RIN			-117	dB/Hz
Total Jitter	TJ			56.5	ps
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	Compliant with IEEE 802.3 ^{*(note6)}				
Data Input	PECL ^{*(note1)}				

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

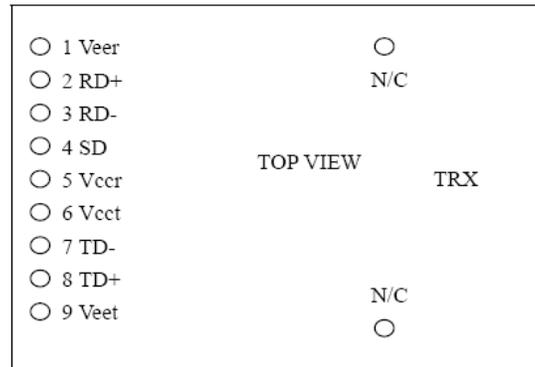
Note6: Eye Pattern Mask



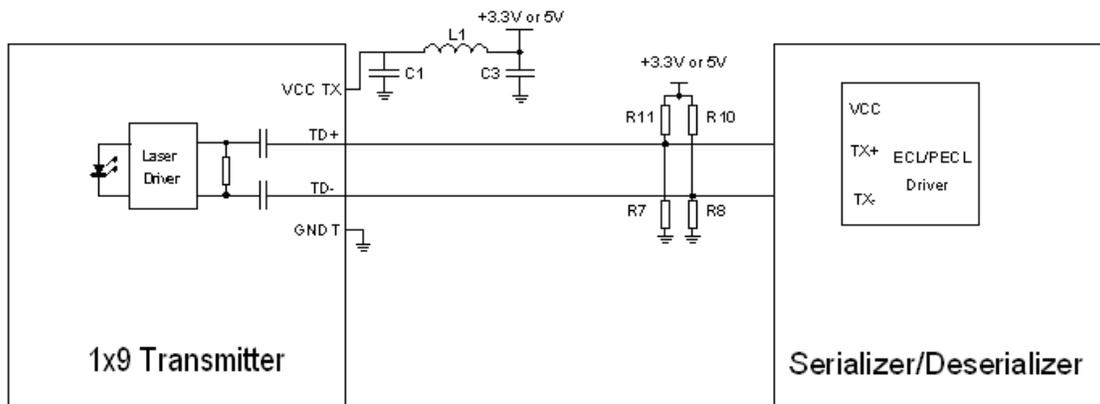
Pin Description

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 ^{*(note1)}	Inverted transmitter Data in
8	TD+	PECL ^{*(note1)}	Transmitter Data in
9	Veet		Transmitter Signal Ground, connect to the transmitter signal ground planed directly

Pin Definitions



Recommended Circuit

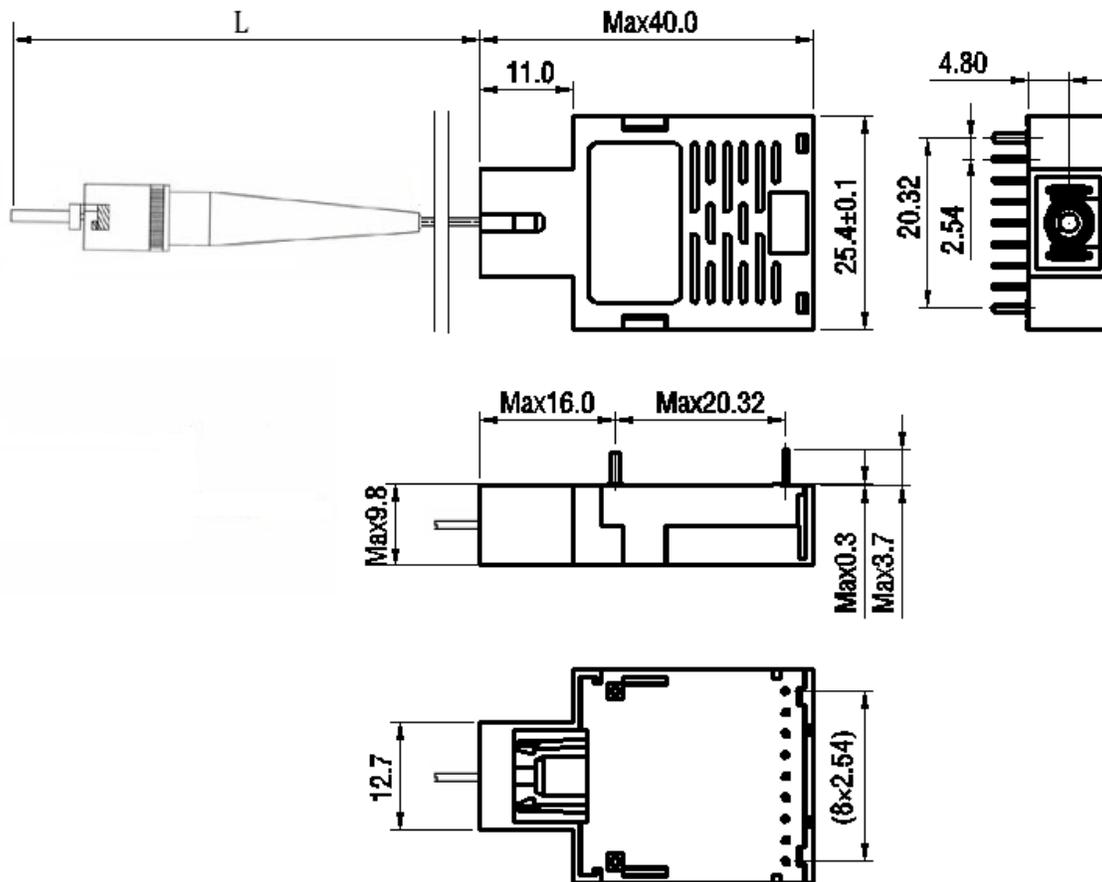


C1 C3=4.7uF
 L1 =1uH
 R5 R6=270Ω(5V)/150Ω(3.3V)
 R7 R8=127Ω(5V)/82Ω(3.3V)
 (Depends on serdes chips used)
 R10 R11=82Ω(5V)/127Ω(3.3V)
 (Depends on serdes chips used)

AC couple

AC Coupling Inside

Package Outline (Unit: mm)



ST Pigtail

Laser Emission Data

Wavelength	1550nm
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/Xavi	Lyn/Nygai /Jason/Walt	Alex	released.	July 24, 2013

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