

EOL9-8503-02 Series

**Multi-Mode 155Mbps 850nm
Duplex 1 x 9 Transceiver
RoHS6 Compliant**

Features

- ◆ Duplex SC/FC/ST Multi-Mode Transceiver
- ◆ Industry Standard 1 x 9 Footprint
- ◆ 850nm VCSEL Transmitter
- ◆ 3.3V or 5V single power supply
- ◆ PECL signal input and output
- ◆ Signal detect indicator (PECL or TTL version) ^{*note1}
- ◆ Wave Solderable and Aqueous Washable with process plug inserted
- ◆ Class 1 FDA and IEC60825-1 laser safety compliant
- ◆ 2Km with 50/125 um MMF at Least
- ◆ Operating Case Temperature
Standard: 0°C~+70°C
Extended:-20°C~+85°C



Applications

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

Ordering information

Part No.	Input	Output	Distance	Voltage	Interface	Temperature
EOL9-8503-02-UV ^{*note2}	DC	DC	Up to 2Km	3.3V	SC	Standard
EOL9-8503-02-IUV	DC	DC	Up to 2Km	3.3V	SC	Extended
EOL9-8503-02-FUV	DC	DC	Up to 2Km	3.3V	FC Metal	Standard
EOL9-8503-02-IFUV	DC	DC	Up to 2Km	3.3V	FC Metal	Extended
EOL9-8503-02-TUV	DC	DC	Up to 2Km	3.3V	ST Plastic	Standard
EOL9-8503-02-ITUV	DC	DC	Up to 2Km	3.3V	ST Plastic	Extended

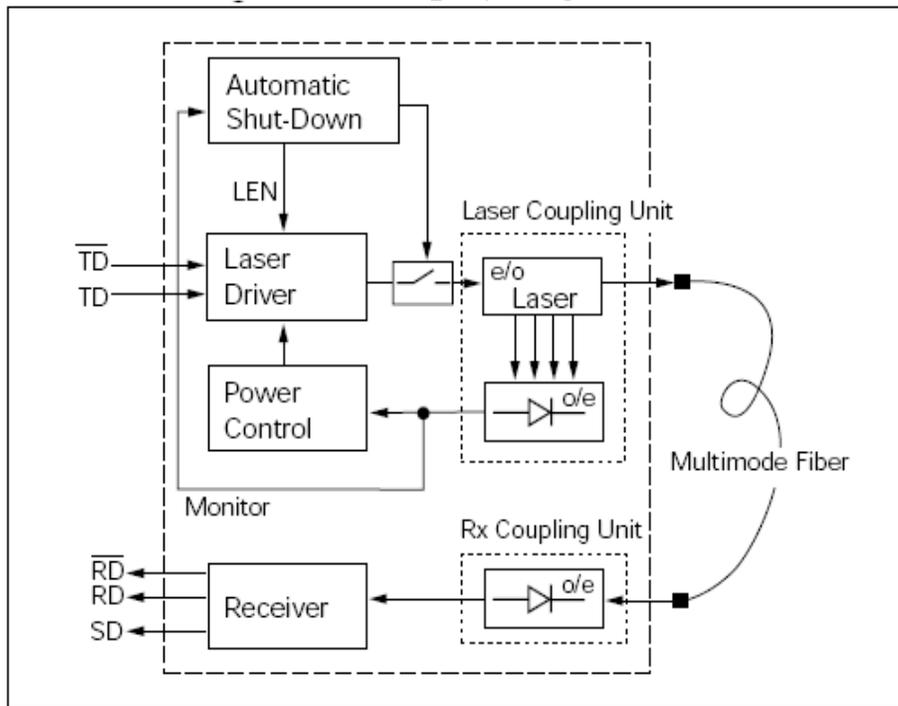
Note1: 5V for PECL or TTL, 3.3V for LVPECL or LVTTTL

Note2: Standard version

Regulatory Compliance

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12
		EN 60825-1:2007
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50135430 0001	EN 55022:2006
		EN 55024:1998+A1+A2
CB	JPTUV-024038-M1	IEC 60825-2
		IEC 60950-1
FCC	WTF13F0503735E	47 CFR PART 15 OCT., 2010
	WTF13F0503732E	47 CFR PART 15 OCT., 2010
FDA	1230816-000	CDRH 1040.10
ROHS	RLSZF00163462	2011/65/EU

Functional Diagram



The Signal Detect (SD, active high), Normal optical input of receiver represents to a logic "1" level, which means asserted.

Product Description

The EOL9-8503-02 Series Multi-mode transceivers are low power, high performance modules for duplex optical data communications such as SONET OC-3 / SDH STM-1 and Fast Ethernet.

The transmitter section uses a multiple quantum well VCSEL laser and is a class1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

A PECL logic interface simplifies interface to the external circuitry.

Absolute Maximum Ratings*note3

Parameter	Symbol	Min.	Max.	Unit	
Storage Temperature	T_s	-40	+85	°C	
Supply Voltage	VCC	3.3V	-0.5	3.6	V
		5V	-0.5	7.0	
Operating Relative Humidity	-		95	%	
Soldering Conditions Temp/Time			260/10	°C/s	

Note3: 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	
		-20		+85		
Power Supply Voltage	VCC	3.3V	3.15	3.3	3.45	V
		5V	4.75	5	5.25	
Power Supply Current*note4	I _{CC}			220	mA	
Data Rate			155		Mbps	

Note4: Maximum current is specified at Vcc equaling to Maximum @ maximum temperature.

Optical and Electrical Characteristic

(EOL9-8503-02 Series, VCSEL and PIN)

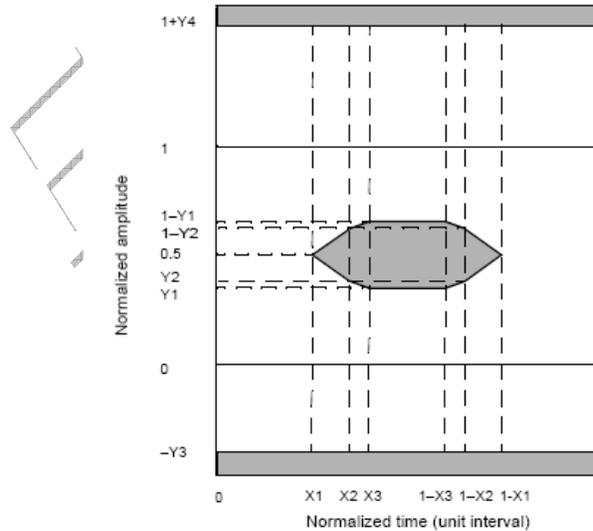
Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter					
Centre Wavelength	λ_c	830	850	860	nm
Average Output Power*note5	P _{out}	-9.5		-4	dBm
Extinction Ratio	ER	9			dB
Rise/Fall Time (20%--80%)	tr/tf			2	ns
Relative Intensity Noise	RIN			-117	dB/Hz
Data Input Swing Differential	V _{in}	400		2000	mV
Input Differential Impedance	Z _{in}	90	100	110	Ω
Input High Voltage	V _H -V _{CC}	-1165		-880	mV

Input Low Voltage	V_L-V_{cc}	-1810		-1475	mV
Eye Diagram	ITU-T G.957 Compliant ^{*(note7)}				
Data Input	PECL ^{*(note1)}				
Receiver					
Receiver Rate	155				Mbps
Input center wavelength	λ_c	770		860	nm
Receiver Sensitivity ^{*(note6)}	Pmin			-17	dBm
Receiver Overload	Pmax	-3			dBm
SD Assert	SDA			-25	dBm
SD De-Assert	SDD	-45			dBm
SD Hysteresis ^{*(note8)}		0.5			dB
Output High Voltage	V_H-V_{cc}	-1165		-880	mV
Output Low Voltage	V_L-V_{cc}	-1810		-1475	mV
SD Voltage(TTL-H) ^{*(note1)}	V_H	2			V
SD Voltage (TTL-L) ^{*(note1)}	V_L			0.8	V
SD Voltage(PECL-H) ^{*(note1)}	V_H-V_{cc}	-1.1		-0.74	V
SD Voltage (PECL-L) ^{*(note1)}	V_L-V_{cc}	-2.0		-1.58	V
Data Output	PECL ^{*(note1)}				

Note5: The optical power is launched into 50/125um MMF.

Note6: Minimum average optical power measured at BER less than 1E-12, with a 2²³-1 NRZ PRBS and ER=9 dB.

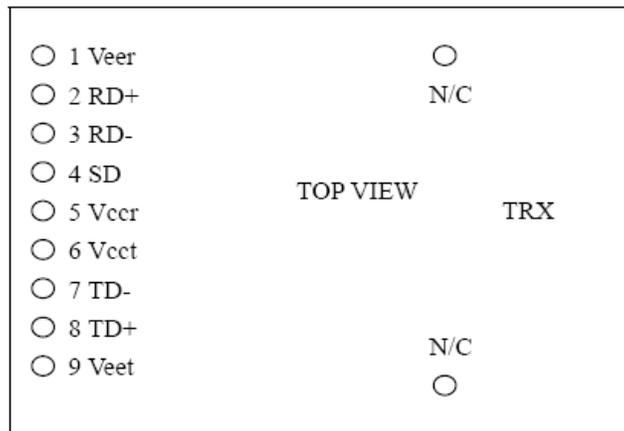
Note7: Eye pattern mask



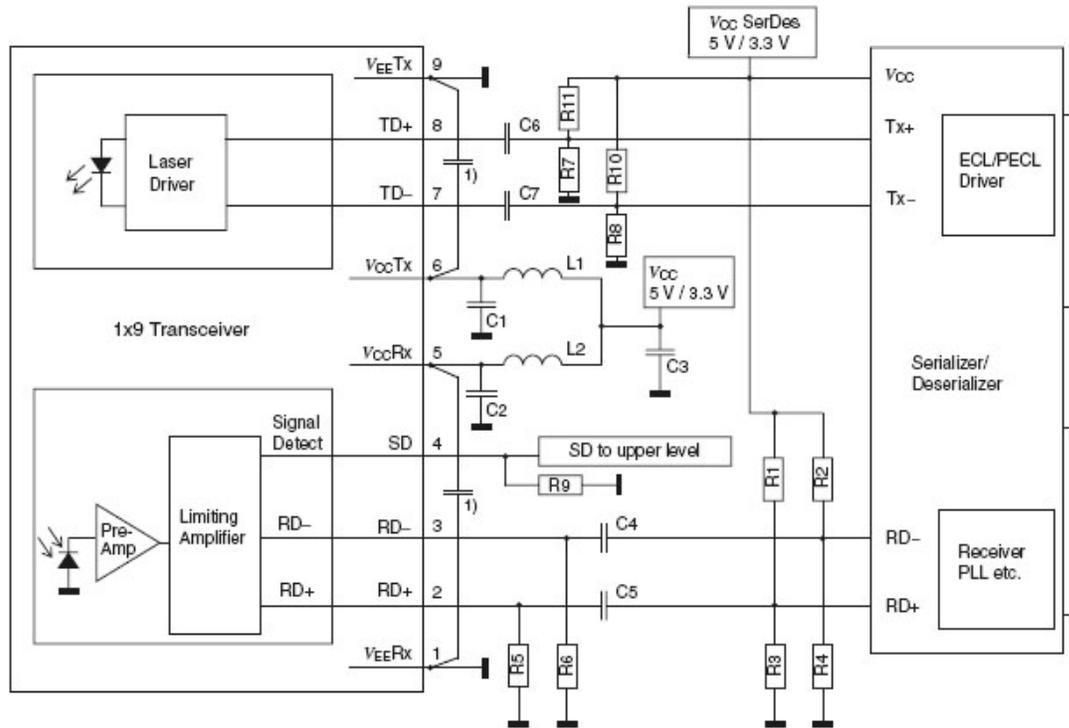
Pin Description

Pin	Name	Level	Description
1	Veer		Receiver Signal Ground, connect to receiver signal ground plane directly
2	RD+	PECL ^{*(note1)}	Receiver data out
3	RD-	PECL ^{*(note1)}	Inverted receiver data out
4	SD	PECL ^{*(note1)}	Signal Detect, TTL (Load resistor > 4.7KΩ)or PECL output, Normal optical input levels to the receiver result in a logic “1” output, asserted. Low input levels to the receiver result in a fault condition indicated by a logic “0”output, de-asserted.
5	Vccr		Receiver Power Supply, provide 3.3V or 5V the recommended receiver power supply filter circuit. Locate the power filter circuit as close as possible to the Vccr pin
6	Vcct		Transmitter Power Supply, provide 3.3V or 5V 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

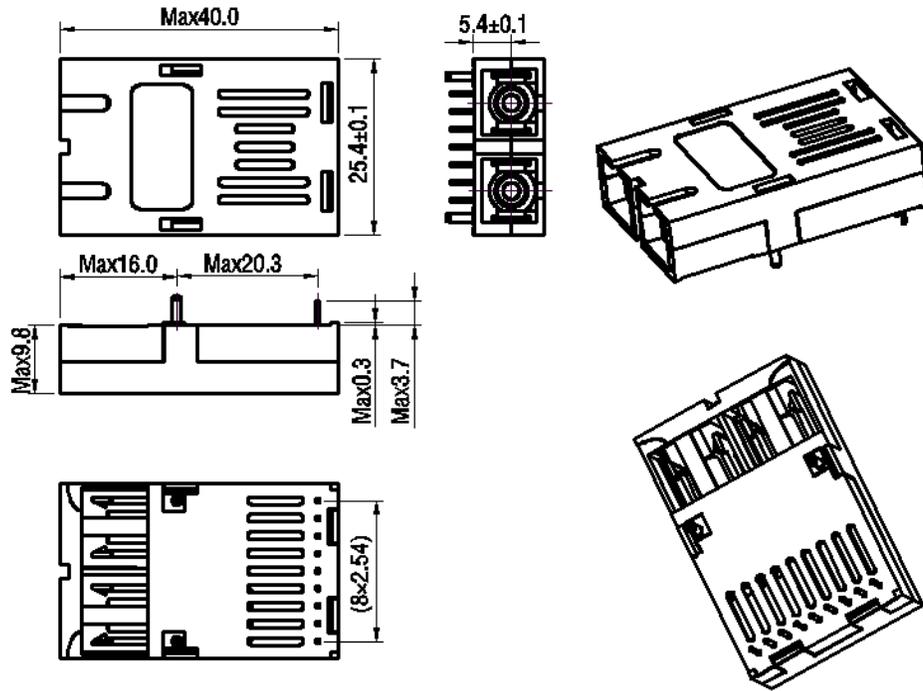


- C1/2/3 = 4.7 μ F
- C4/5/6/7 = 100 nF
- L1/2 = 1 μ H
- R5/6 = 270 Ω (5 V)
- = 150 Ω (3.3 V)
- R7/8 = 127 Ω (5 V)
- = 82 Ω (3.3 V)
- (depends on SerDes chip used)
- R9 = 510 Ω (5 V)
- = 270 Ω (3.3 V)

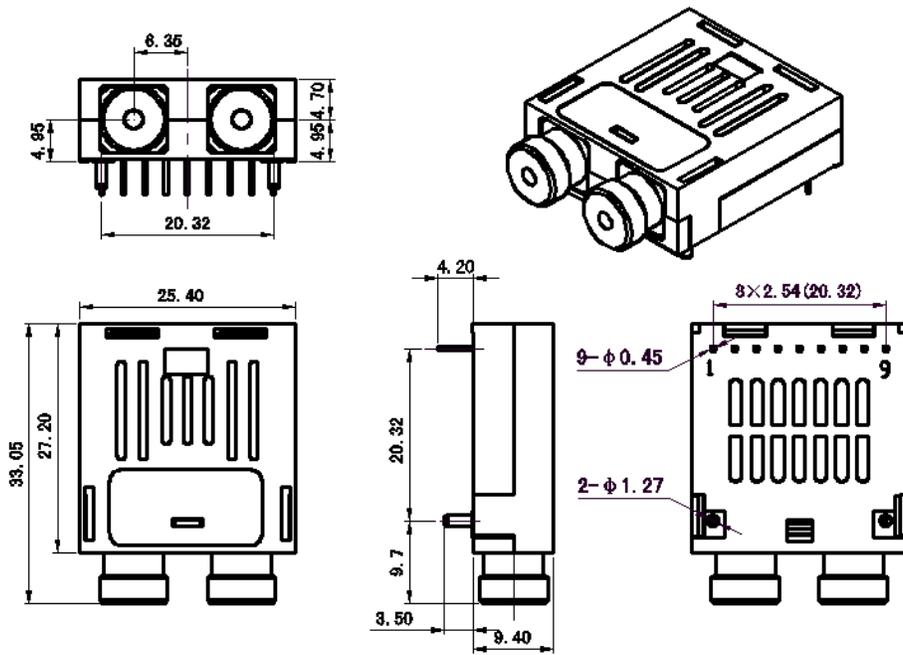
- R10/11 = 82 Ω (5 V)
- = 127 Ω (3.3 V)
- (depends on SerDes chip used)
- Place R1/2/3/4 close to SerDes chip, depends on SerDes chip used.
- Place R5/6/7/8/10/11 close to 1x9 transceiver.

DC- DC COUPLING

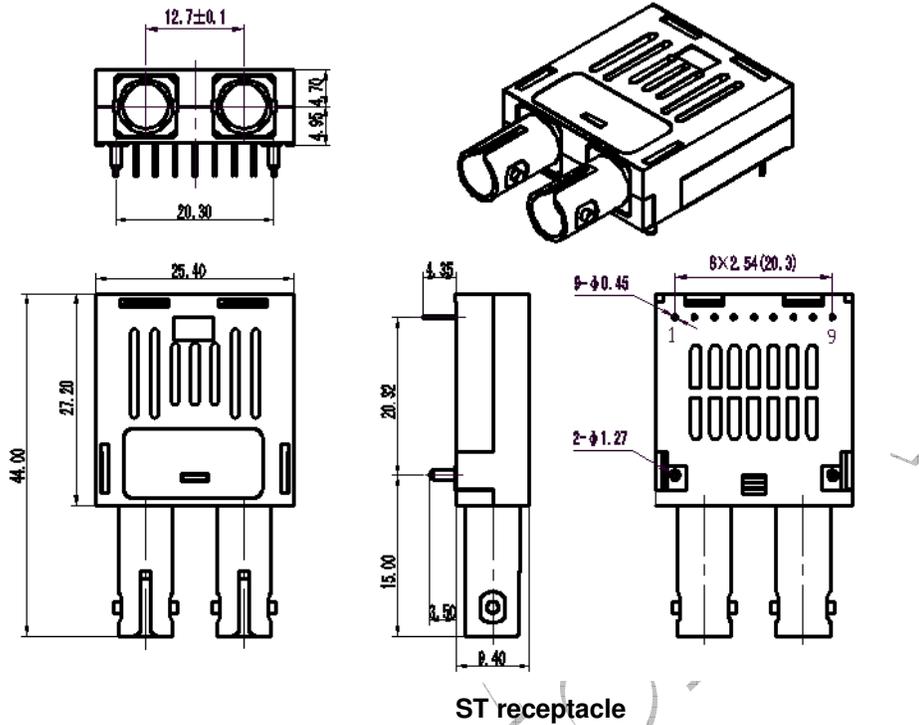
Package outline (Unit: mm)



SC receptacle

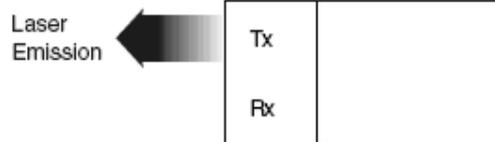


FC receptacle



ST receptacle

Laser Emission



Obtaining Document

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<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	DCN	Release Date
V2.a	Tim.Liang	Kelly.Cao		Released.	2007-3-21
V3.a	Hunter	David, Kelly		Update logo & photo.	2011-11-8
V3.b	Xavi/Angela	Lyn/Jason/ Walt/Nygai	Alex	Delete nomenclature. Update temperature range, regulatory compliance and receiver Sensitivity.	Sep 24,2013

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