

# Single-mode 2.5Gbps Optical Transceiver

## Features

- Intermediate and long reach
- Industrial standard 1x9 pin footprint
- Duplex SC/ST/FC single mode connector interface
- Receiver signal detect function
- Wide dynamic rang receiver with AGC
- AC coupled LVPECL compatible data input and output
- Single supply 3.3V
- Low power consumption



## Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Transmitter</b>					
Data Rate (NRZ)	B	-	2488.3	-	Mb/s
Optical Output Power (avg.) <sup>(1)(2)(3)</sup>					
-1	P <sub>o</sub>	-12	-	-6	dBm
-2	P <sub>o</sub>	-6	-	0	dBm
Extinction Ratio	ER	8.2	-	-	dB
Optical Wavelength					
1310nm FP LD	$\lambda_c$	1260	1310	1360	nm
1310nm DFB LD	$\lambda_c$	1290	1310	1330	nm
1550nm FP LD	$\lambda_c$	1490	1550	1610	nm
1550nm DFB LD	$\lambda_c$	1530	1550	1570	nm
Spectral Width (RMS, -20dB)					
1310nm FP LD	$\Delta\lambda$	-	1.0	2.0	nm
1550nm FP LD	$\Delta\lambda$	-	1.0	2.5	nm
Side Mode Suppression Ratio					
1310nm DFB LD	SMSR	30	40	-	dB
1550nm DFB LD	SMSR	30	40	-	dB
Output Rise Time (20-80%)	t <sub>r</sub>	-	-	180	ps
Output Fall Time (20-80%)	t <sub>f</sub>	-	-	180	ps
Data Differential Input Voltage	V <sub>i</sub>	500	-	2400	mV <sub>p-p</sub>
Supply Voltage	V <sub>cc</sub>	2.97	3.3	3.63	V
Supply Current	I <sub>cc</sub>	-	-	120	mA
<b>Receiver</b>					
Data Rate (NRZ)	B	-	2488.3	-	Mb/s
Optical Input (avg.) Sensitivity <sup>(1)(5)</sup>	P <sub>IN</sub>	-	-	-18	dBm
Saturation	P <sub>SAT</sub>	-3	0	-	dBm
Optical Wavelength	$\lambda$	1100	-	1600	nm
Output Rise Time (20-80%)	t <sub>r</sub>	-	-	175	ps
Output Fall Time (20-80%)	t <sub>f</sub>	-	-	175	ps
Data Differential Output Voltage	V <sub>o</sub>	600	-	1200	mV <sub>p-p</sub>
Signal Detect Asserted (avg.)	P <sub>A</sub>	-	-	-18	dBm
Signal Detect Deasserted (avg.)	P <sub>D</sub>	-28	-	-	dBm
Hysteresis	P <sub>HYS</sub>	0.5	3	-	dB
Supply Voltage	V <sub>cc</sub>	2.97	3.3	3.63	V
Supply Current	I <sub>cc</sub>	-	-	120	mA

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## Notes :

- (1) With 0.275 NA, 9/125 $\mu$ m fiber.
- (2) Driven with a differential signal.
- (3) Class 1 eye safe per FDA and IEC.
- (4) Transmitter eye mask diagram is compliant to ITU-T G.957 Eye Diagram.
- (5) 2<sup>23</sup> -1 PRBS, BER= 10<sup>-10</sup>.
- (6) The transmitter output should not be viewed directly.

## Absolute Maximum Ratings

Parameter		Min.	Max.	Unit
Operating Temperature	-1	0	70	°C
	-2	-40	85	°C
Storage Temperature		-40	100	°C
Lead Soldering Limits		-	240/10	°C/sec
Supply Voltage		-0.5	4	V

## Ordering Information

T R □ □ S M 4 - □ □ □ □ 3 9 R 1 □ □

### Operating Temperature Range :

1 : 0 ~ 70°C

2 : -40 ~ 85°C

### Data Coupling & SD Output Level :

Symbol	Tx Coupling	Rx Coupling	SD
E	AC	AC	PECL
F	AC	AC	TTL

### Connector Type :

SC : SC Connector

FC : FC Connector

ST : ST Connector

### Laser Type :

L : FP LD

F : DFB LD

### Tx Output Power Grade :

(refer to Specifications)

1 : -1

2 : -2

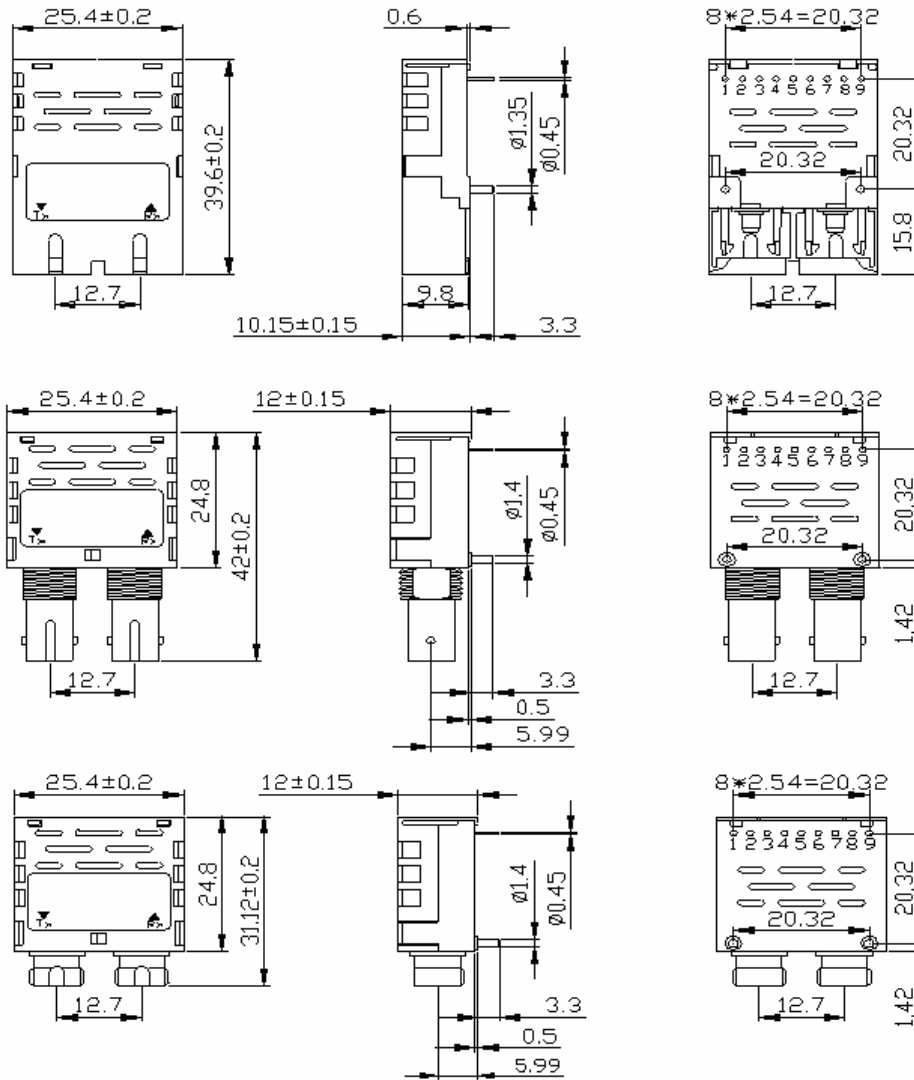
### Wavelength :

13 : 1310nm

15 : 1550nm

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## Outline Drawing



UNIT : mm

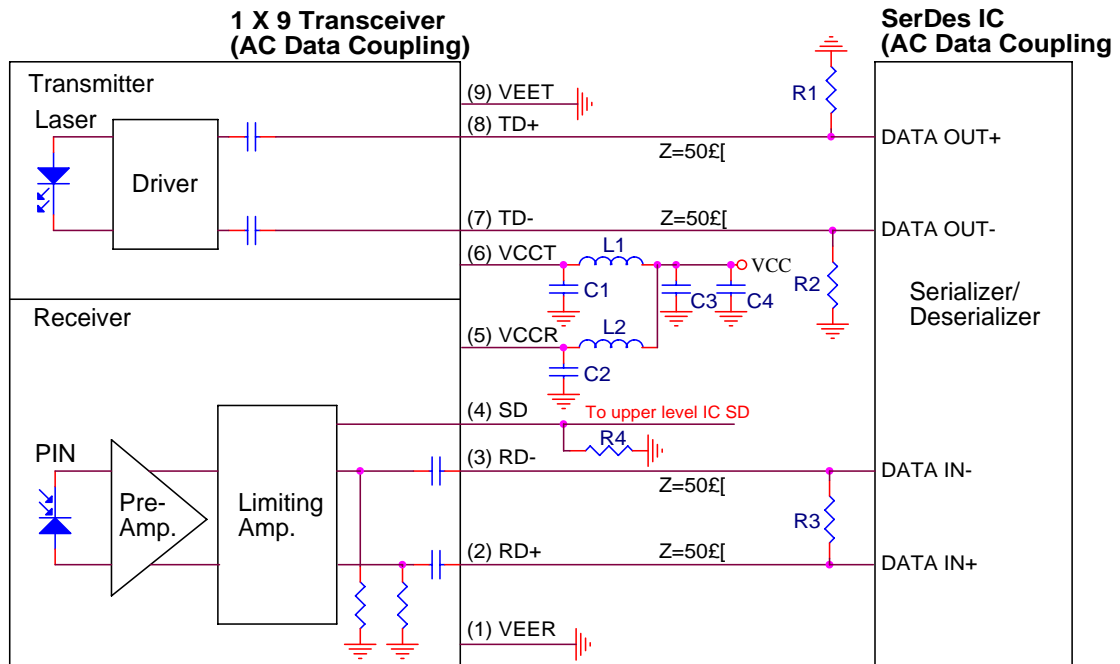
## Pinout Description

Pin No.	Symbol	Description
1	V <sub>EER</sub>	Receiver Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out (Inverted)
4	SD	Receiver Signal Detect
5	V <sub>CCR</sub>	Receiver Power Supply
6	V <sub>CCT</sub>	Transmitter Power Supply
7	TD-	Transmitter Data In (Inverted)
8	TD+	Transmitter Data in
9	V <sub>EET</sub>	Transmitter Ground

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## Application Notes

Recommended Interface Circuit :



$L1=L2=1\text{gH}$  or ferrite bead  
 $C1=C2=C3=0.1\text{gF}$   
 $C4=10\text{gF}$   
 R1, R2, R3 depends on SerDes IC specification.  
 (Consult the SerDes IC application information)  
 $R4=510\Omega$

NOTE<sub>i</sub>G  
 1. Transmission line characteristic impedance  $Z=50\Omega$ .  
 2. R1, R2, R3 as close to SerDes IC as possible.

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