

# Multi-mode 1.25Gbps Bi-Directional Single Fiber 2x5 SFF Optical Transceiver

## Features

- Industrial standard 2 x 5 pin footprint
- Single SC/ST/FC connector interface
- Receptacle only with SC
- Receiver signal detect function
- Wide dynamic rang receiver with AGC
- PECL/LVPECL logic interface, DC or AC coupling
- Single supply 5V/3.3V
- Low power consumption



## Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Transmitter</b>					
Data Rate (NRZ)	B	-	1250	-	Mb/s
Optical Output Power (avg.) <sup>(1) (3)</sup>					
-1	P <sub>o</sub>	-9	-	-3	dBm
Extinction Ratio	ER	9	-	-	dB
Optical Wavelength					
TR78R85 (780nm FP LD)	$\lambda_c$	760	780	800	nm
TR85R78 (850nm VCSEL)	$\lambda_c$	820	850	880	nm
Spectral Width	$\Delta\lambda$		1.0	2.5	nm
Output Rise Time (10-90%)	t <sub>r</sub>	-	0.4	0.8	ns
Output Fall Time (10-90%)	t <sub>f</sub>	-	0.4	0.8	ns
Data Input <sup>(6)</sup>	V <sub>IL</sub> V <sub>IH</sub>	V <sub>CC</sub> -1.810 V <sub>CC</sub> -1.165	- -	V <sub>CC</sub> -1.475 V <sub>CC</sub> -0.880	V
Tx Disable Input	V <sub>DIL</sub> V <sub>DIH</sub>	0 2	- -	0.8 V <sub>CC</sub>	V
Supply Voltage	V <sub>CC</sub>	4.75 3.10	5.0 3.3	5.25 3.50	V
Supply Current	I <sub>CC</sub>	-	-	110	mA



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Parameter	Symbol	Min.	Typ.	Max.	Unit
<b>Receiver</b>					
Data Rate (NRZ)	B	-	1250	-	Mb/s
Optical Input (avg.) Sensitivity <sup>(1)</sup> <sup>(5)</sup>					
-1	P <sub>IN</sub>	-	-	-14	dBm
Saturation	P <sub>SAT</sub>	-3	0	-	dBm
Optical Wavelength					
TR78R85	λ	820	850	880	nm
TR85R78		760	780	800	
Output Rise Time (10-90%)	t <sub>r</sub>	-	-	0.4	ns
Output Fall Time (10-90%)	t <sub>f</sub>	-	-	0.4	ns
Data Output <sup>(6)</sup>	V <sub>OL</sub> V <sub>OH</sub>	V <sub>CC</sub> -1.840 V <sub>CC</sub> -1.045	- -	V <sub>CC</sub> -1.62 V <sub>CC</sub> -0.88	V
Signal Detect Asserted (avg.)	P <sub>A</sub>	-	-	-17	dBm
Signal Detect Deasserted (avg.)	P <sub>D</sub>	-25	-	-	dBm
Hysteresis	P <sub>HYS</sub>	-	2	-	dB
Supply Voltage	V <sub>CC</sub>	4.75 3.10	5.0 3.3	5.25 3.50	V
Supply Current	I <sub>CC</sub>	-	-	100	mA
Optical Return Loss	RL	50	-	-	dB
Optical Cross Talk	CT	20	-	-	dB

Notes :

- (1) With 62.5/125μm fiber.
- (2) Driven with a differential signal.
- (3) Class 1 eye safe per FDA and IEC.
- (4) Eye mask diagram is compliant to IEEE802.3z Eye Diagram
- (5) 2<sup>7</sup> -1 PRBS, BER= 10<sup>-12</sup>.
- (6) Compatible with LVPECL and PECL logic levels.
- (7) 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	5V	-0.2	7	V
	3.3V	-0.2	4	V



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## Ordering Information

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**Operating Temperature Range :**

- 1 : 0 ~ 70°C
- 2 : -40 ~ 85°C

**Data Coupling & SD Output Level :**

Symbol	Tx Coupling	Rx Coupling	SD
C	AC	DC	PECL
D	AC	DC	TTL
E	AC	AC	PECL
F	AC	AC	TTL
G	DC	DC	PECL
H	DC	DC	TTL
I	DC	AC	PECL
J	DC	AC	TTL

**Supply Voltage :**

- 5 : 5V
- 3 : 3.3V

**Connector Type :**

- SC : SC Connector
- FC : FC Connector
- ST : ST Connector

**Package Type :**

- P : Pigtail
- R : Receptacle

**Sensitivity Grade :**

- (refer to Specifications)
- 1 : -1

**Tx Output Power Grade :**

- (refer to Specifications)
- 1 : -1

**Receiver Wavelength / Laser Type :**

- 85 : for 850nm
- 78 : for 780nm

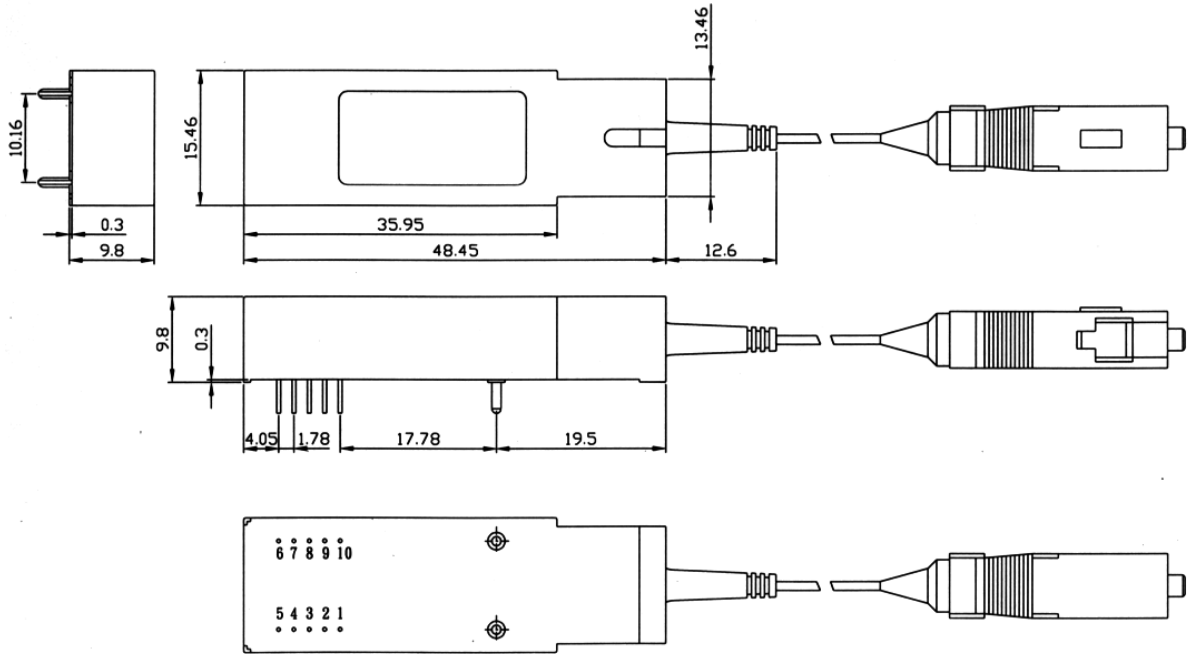
**Transmitter Wavelength / Laser Type :**

- 78 : 780nm (FP LD)
- 85 : 850nm (VCSEL LD)

# Multi-mode 1.25Gbps Bi-Directional Single Fiber 2x5 SFF Optical Transceiver

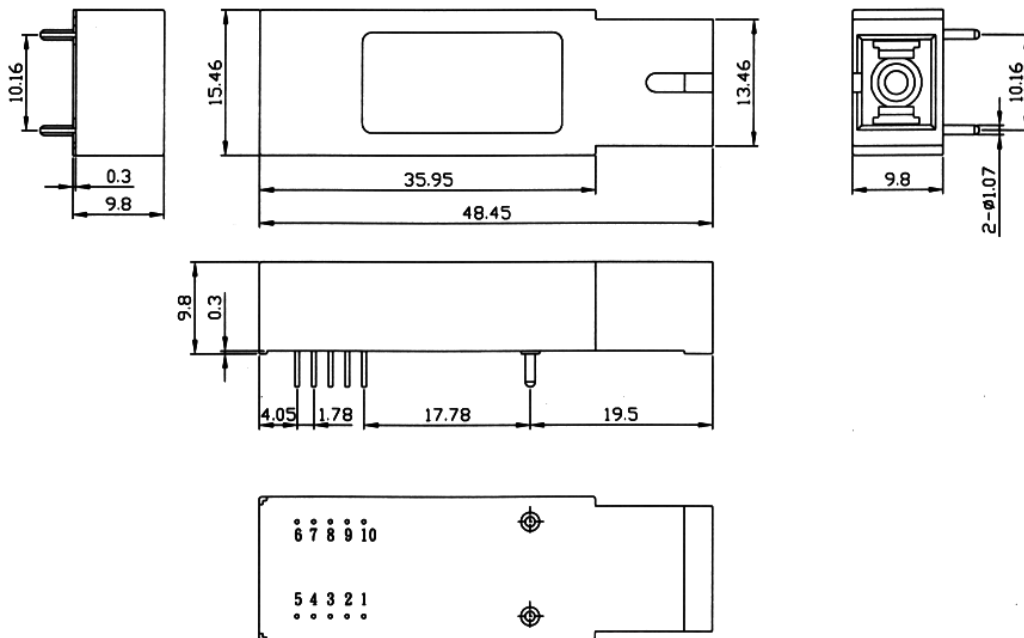
## Outline Drawing

### Pigtail 2x5 pins SFF



UNIT : mm

### Receptacle 2x5 pins SFF



UNIT : mm

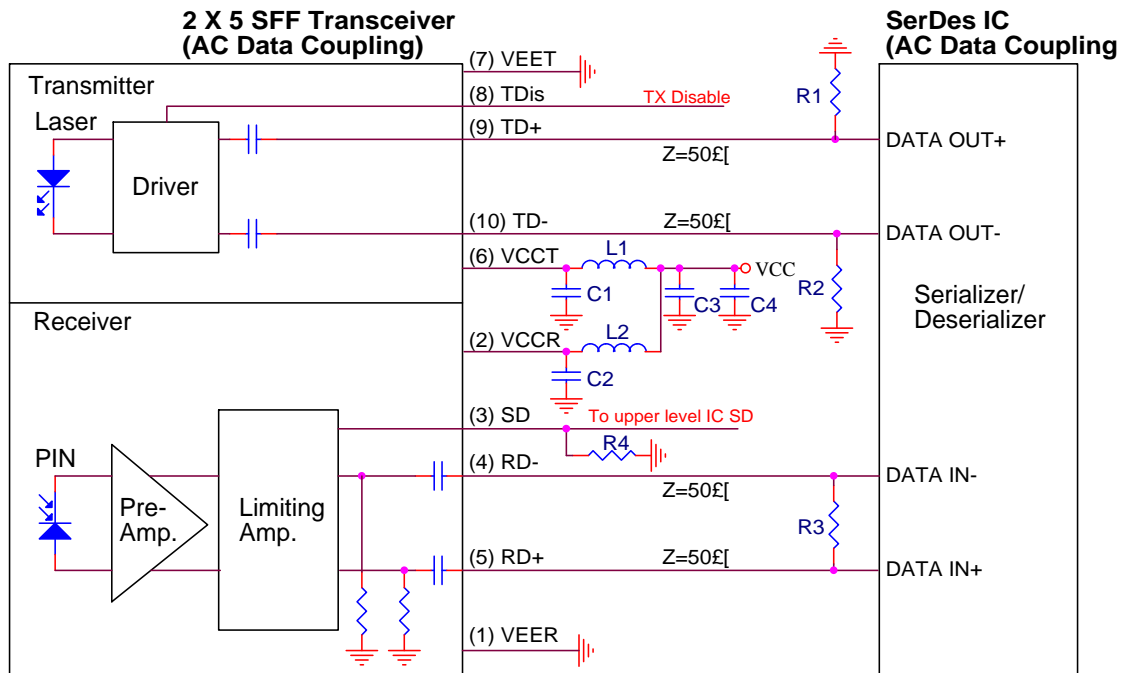
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## Pinout Description

Pin No.	Symbol	Description
1	V <sub>EER</sub>	Receiver Ground
2	V <sub>CCR</sub>	Receiver Power Supply (5V/3.3V)
3	SD	Receiver Signal Detect
4	RD-	Receiver Data Out (Inverted)
5	RD+	Receiver Data Out
6	V <sub>CCT</sub>	Transmitter Power Supply (5V/3.3V)
7	V <sub>EET</sub>	Transmitter Ground
8	TDis	Input Logic Low Level to Switch Laser "ON" Input Logic High Level to Switch Laser "OFF"
9	TD+	Transmitter Data in
10	TD-	Transmitter Data In (Inverted)

## Application Notes

Recommended AC Coupling Interface Circuit :

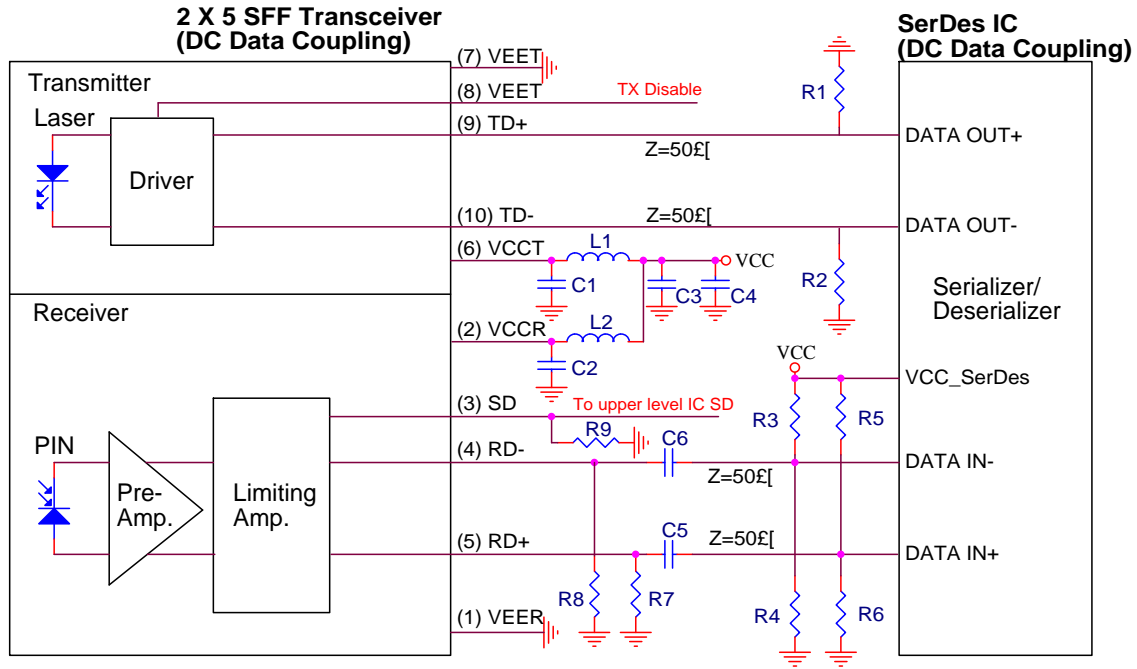


L1=L2=1 $\mu$ H or ferrite bead  
 C1=C2=C3=0.1 $\mu$ F  
 C4=10 $\mu$ F  
 R1, R2, R3 depends on SerDes IC specification.  
 (Consult the SerDes IC application information)  
 R4=510 $\Omega$

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

# Multi-mode 1.25Gbps Bi-Directional Single Fiber 2x5 SFF Optical Transceiver

Recommended DC Coupling Interface Circuit :



$L1=L2=1\text{ }\mu\text{gH}$  or ferrite bead  
 $C1=C2=C3=C5=C6=0.1\text{ }\mu\text{gF}$   
 $C4=10\text{ }\mu\text{gF}$   
 $R1, R2, R3, R4, R5, R6$  depends on SerDes IC specification.  
 (Consult the SerDes IC application information)  
 $R7=R8=270\text{ }\Omega$  ( $VCC=3.3\text{V}$ )  
 $=510\text{ }\Omega$  ( $VCC=5\text{V}$ )  
 $R9=510\text{ }\Omega$

**NOTE<sub>j</sub>G**

1. Transmission line characteristic impedance  $Z=50\text{ }\Omega$ .
2.  $R1, R2, R3, R4, R5, R6$  as close to SerDes IC as possible
3.  $R7, R8$  as close to 1X9 Transceiver as possible.