Singlemode 1.25Gbps Bi-Directional Single Fiber Optical Transceiver

Features

- 1310nm/1550nm operating wavelength
- Industrial standard 1 x 9 pin footprint
- 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
Transmitter					
Data Rate (NRZ)	B	-	1250	-	Mb/s
Optical Output Power (avg.) (1) (3)					
-1	Po	-15	-	-8	dBm
-2	Po	-8	-	-3	dBm
-3	Po	-3	-	0	dBm
Extinction Ratio	ER	8.3	-	-	dB
Optical Wavelength					
TR13R15 (1310nm FP LD)	λ_C	1260	1310	1360	nm
TR31R15 (1310nm DFB LD)	λ_C	1290	1310	1330	nm
TR15R13 (1550nm FP LD)	λ_C	1490	1550	1610	nm
TR55R13 (1550nm DFB LD)	λ_C	1530	1550	1570	nm
Spectral Width					
TR13R15 (RMS) TR15R13 (RMS)	$\Delta\lambda$	-	1.0	2.5	nm
TR31R15 (-20dB) TR55R13 (-20dB)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio					
TR31R15 TR55R13	SMSR	30	40	-	dB
Output Rise Time (20-80%)	t_r	-	-	0.26	ns
Output Fall Time (20-80%)	t_f	-	-	0.26	ns
Data Input (6)	V_{IL} V_{IH}	V_{CC} –1.810 V_{CC} –1.165	- -	V_{CC} –1.475 V_{CC} –0.880	V
Supply Voltage	V_{CC}	4.75 3.10	5.0 3.3	5.25 3.50	V
Supply Current	I_{CC}	-	-	110	mA

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Parameter		Symbol	Min.	Typ.	Max.	Unit
Receiver						
Data Rate (NRZ)		B	-	1250	-	Mb/s
Optical Input Sensitivity (avg.) (1) (5)						
-1		P_{IN}	-	-19	-17	dBm
-2		P_{IN}	-	-23	-20	dBm
Saturation		P_{SAT}	-3	0	-	dBm
Optical Wavelength						
TR13R15 TR31R15		λ	1500	1550	1600	nm
TR15R13 TR55R13		λ	1100	1310	1350	nm
Output Rise Time (10-90%)		t_r	-	0.5	0.8	ns
Output Fall Time (10-90%)		t_f	-	0.5	0.8	ns
Data Output (6)	DC Coupled	V_{OL} V_{OH}	V_{CC} -1.840 V_{CC} -1.045	- -	V_{CC} -1.62 V_{CC} -0.88	V V
	AC Coupled (Differential)	V_I	0.6	-	1.8	V
Signal Detect Asserted (avg.)		P_A	-	-	-17	dBm
Signal Detect Deasserted (avg.)		P_D	-32	-	-	dBm
Hysteresis		P_{HYS}	-	2	-	dB
Supply Voltage		V_{CC}	3.10 4.75	3.3 5.0	3.50 5.25	V V
Supply Current		I_{CC}	-	-	100	mA
Optical Return Loss		RL	50	-	-	dB
Optical Cross Talk		CL	-	TBD	-	dB

Note:

(1) With 0.275 NA, 9/125μm 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^{7-1} PRBS, BER= 10^{-12}
(6) Compatible with PECL and LVPECL 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 (fiber length = 100cm)
R：Receptacle

Sensitivity Grade：
(refer to Specifications)
1：-1
2：-2

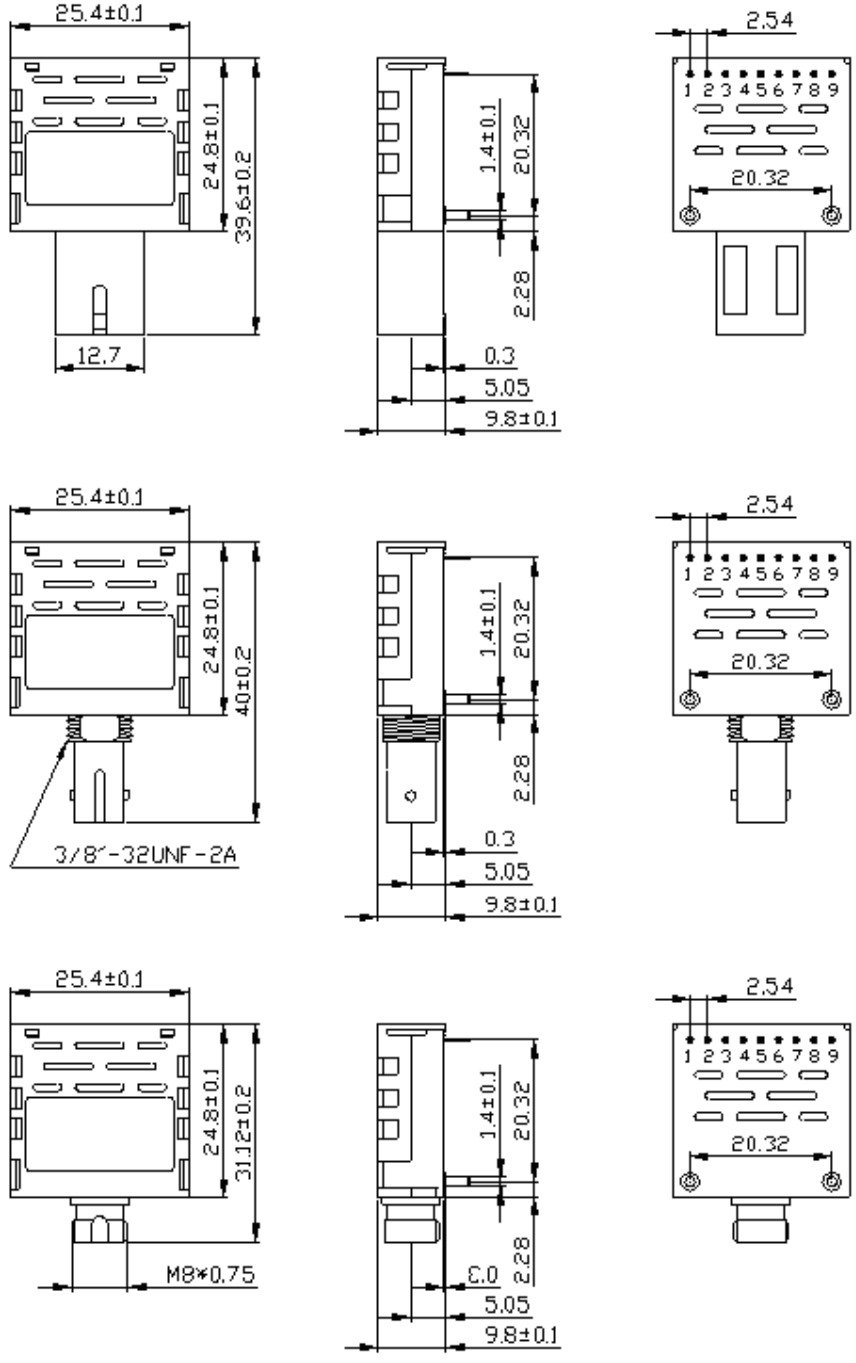
Tx Output Power Grade：
(refer to Specifications)
1：-1
2：-2
3：-3

Receiver Wavelength / Laser Type：
13：1310nm (FP LD)
15：1550nm (FP LD)
31：1310nm (DFB LD)
55：1550nm (DFB LD)

Transmitter Wavelength / Laser Type：
13：1310nm (FP LD)
15：1550nm (FP LD)
31：1310nm (DFB LD)
55：1550nm (DFB LD)

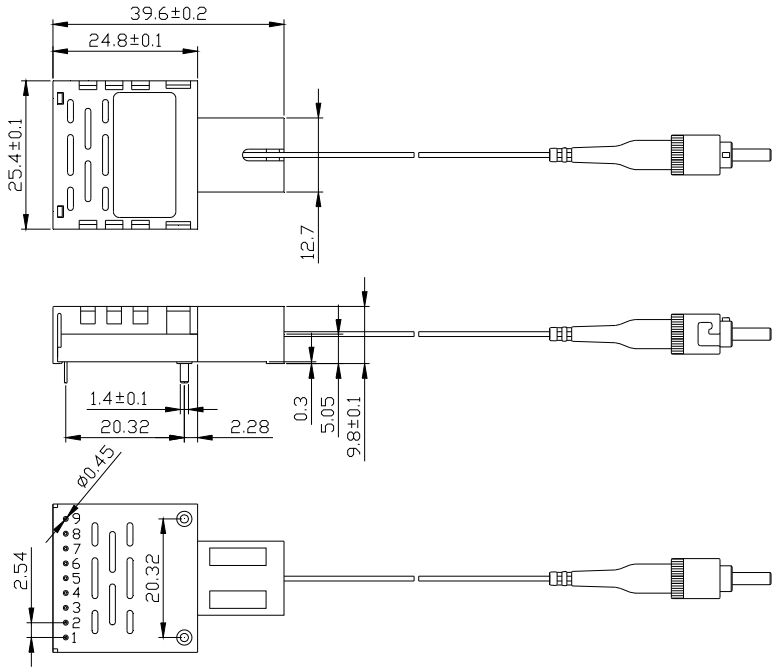
Outline Drawing

Receptacle Type：



UNIT：mm

Pigtail Type：



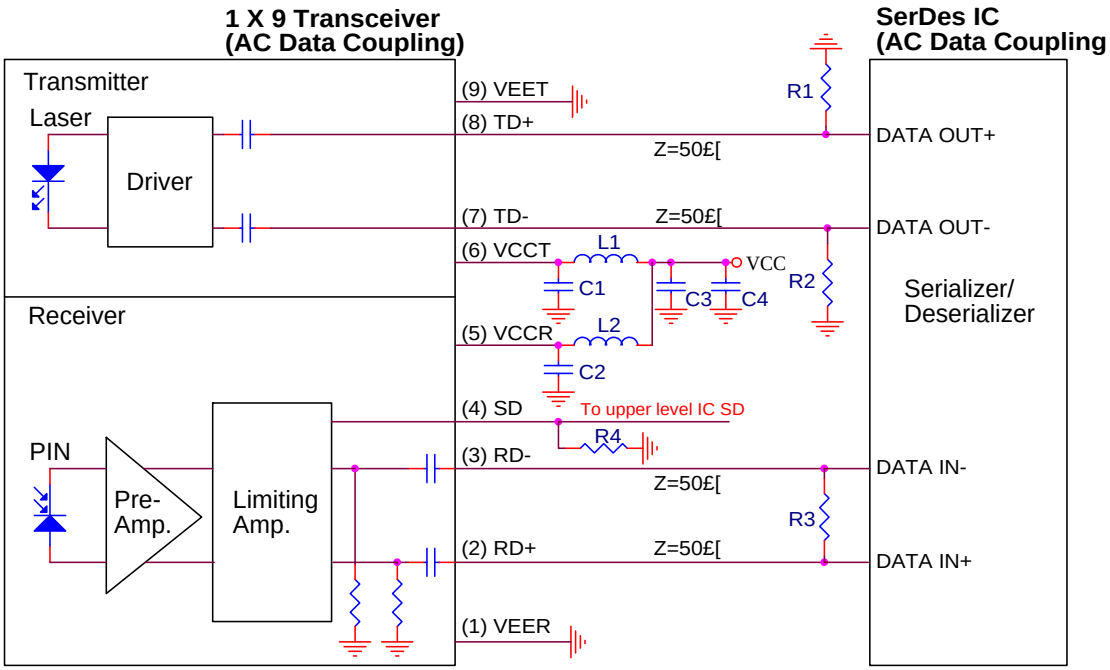
UNIT：mm

Pinout Description

Pin No.	Symbol	Description
1	V_{EER}	Receiver Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out (Inverted)
4	SD	Receiver Signal Detect
5	V_{CCR}	Receiver Power Supply (5V/3.3V)
6	V_{CCT}	Transmitter Power Supply (5V/3.3V)
7	TD-	Transmitter Data In (Inverted)
8	TD+	Transmitter Data in
9	V_{EET}	Transmitter Ground

Application Notes

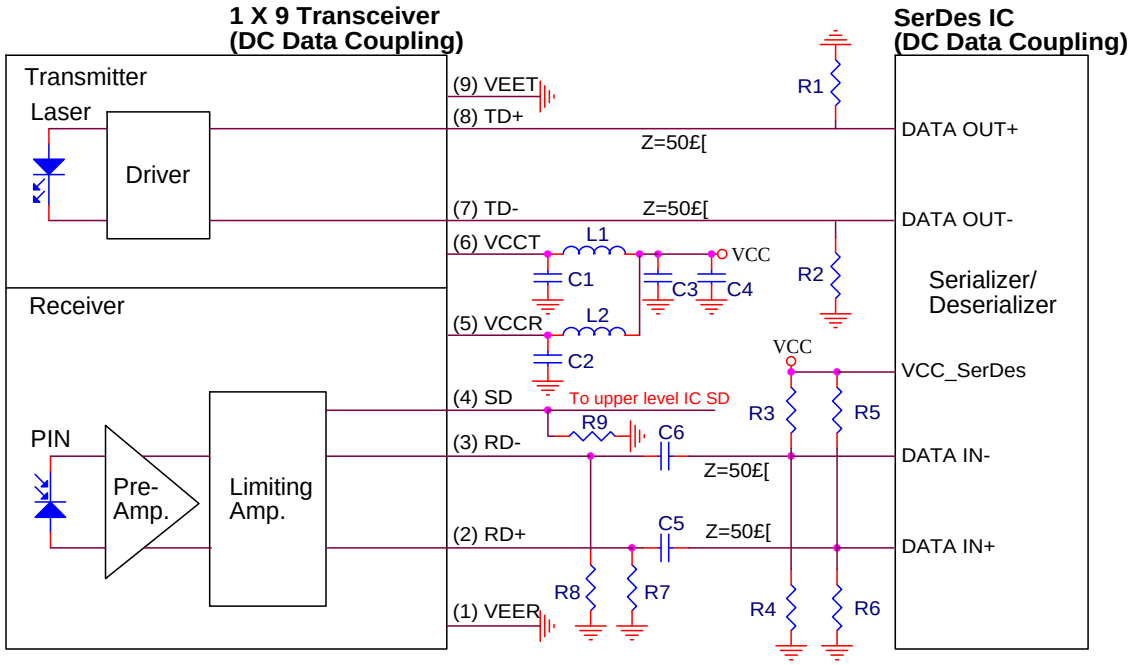
Recommended AC Coupling Interface Circuit：



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

NOTE¡G
1. Transmission line characteristic impedance Z=50£[.
2. R1, R2, R3 as close to SerDes IC as possible.

Recommended DC Coupling Interface Circuit：



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

NOTE¡G
1. Transmission line characteristic impedance Z=50£[.
2. R1, R2, R3, R4, R5, R6 as close to SerDes IC as possibl
3. R7, R8 as close to 1X9 Transceiver as possible.