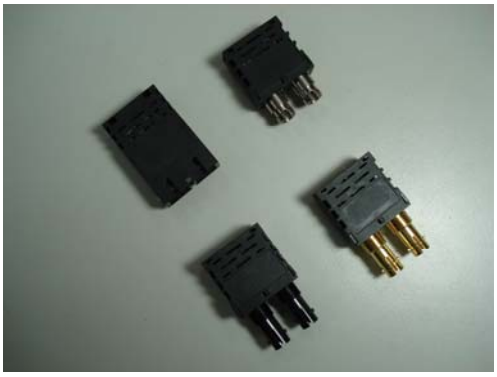
Single-Mode 1.25Gbps Optical Transceiver

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
- PECL/LVPECL logic interface, DC or AC coupling
- Single supply 5V/3.3V
- Low power consumption
- RoHS available



Specifications

Parameter		Symbol	Min.	Typ.	Max.	Unit
Transmitter						
Data Rate (NRZ)		B	-	1250	-	Mb/s
Optical Output Power (avg.) (1) (2) (3)						
-1		P_o	-12	-	-6	dBm
-2		P_o	-6	-	0	dBm
Extinction Ratio		ER	9	-	-	dB
Optical Wavelength						
1310nm FP LD		λ_C	1260	1310	1360	nm
1310nm DFB LD		λ_C	1290	1310	1330	nm
1550nm FP LD		λ_C	1490	1550	1610	nm
1550nm DFB LD		λ_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_r	-	-	0.26	ns
Output Fall Time (20-80%)		t_f	-	-	0.26	ns
Data Input (6)	DC Coupled	V_{IL} V_{IH}	V_{CC} -1.810 V_{CC} -1.165	- -	V_{CC} -1.475 V_{CC} -0.880	V V
	AC Coupled (Differential)	V_I	0.25	-	1.6	V
Supply Voltage		V_{CC}	3.10 4.75	3.3 5.0	3.50 5.25	V
Supply Current		I_{CC}	-	-	110	mA

Parameter		Symbol	Min.	Typ.	Max.	Unit
Receiver						
Data Rate (NRZ)		B	-	1250	-	Mb/s
Optical Input (avg.) Sensitivity (1) (5)						
-1		P_{IN}	-	-	-23	dBm
-2		P_{IN}	-	-	-25	dBm
Saturation		P_{SAT}	-3	0	-	dBm
Optical Wavelength		λ	1100	-	1600	nm
Output Rise Time (20-80%)		t_r	-	-	0.4	ns
Output Fall Time (20-80%)		t_f	-	-	0.4	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	-	-	-23	dBm
Signal Detect Deasserted (avg.)		P_D	-35	-	-	dBm
Hysteresis		P_{HYS}	-	2	-	dB
Supply Voltage		V_{CC}	3.10 4.75	3.3 5.0	3.50 5.25	V
Supply Current		I_{CC}	-	-	100	mA

Notes：

(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 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

Ordering Information

T R □□ S M 3 - □□□□□ 9 R □□ □ G --for RoHS

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

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

Supply Voltage：
5：5V
3：3.3V

Connector Type：
SC：SC Connector
FC：FC Connector
ST：ST Connector

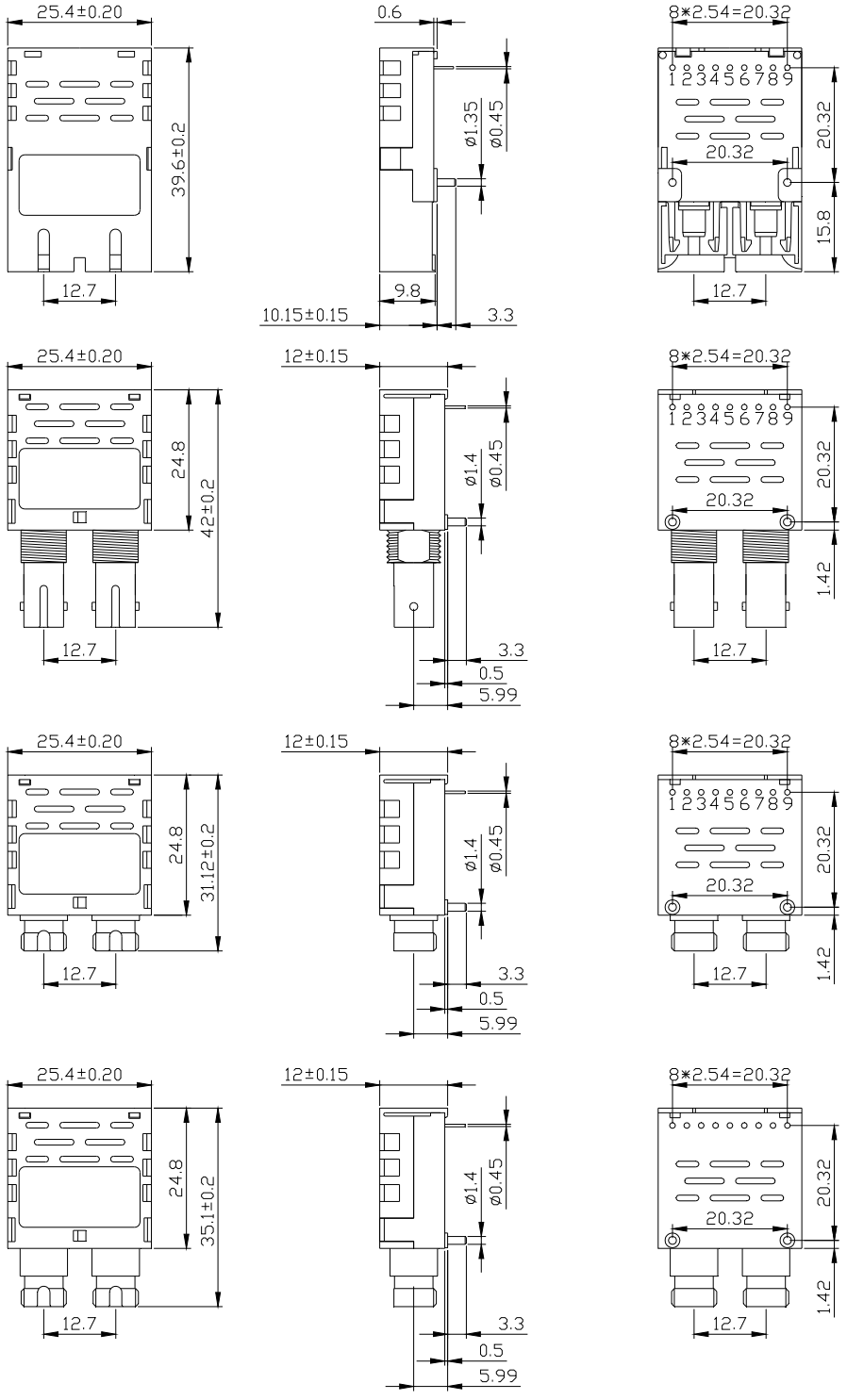
Laser Type：
L：FP LD
F：DFB LD

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

Wavelength：
13：1310nm
15：1550nm

Outline Drawing

UNIT：mm

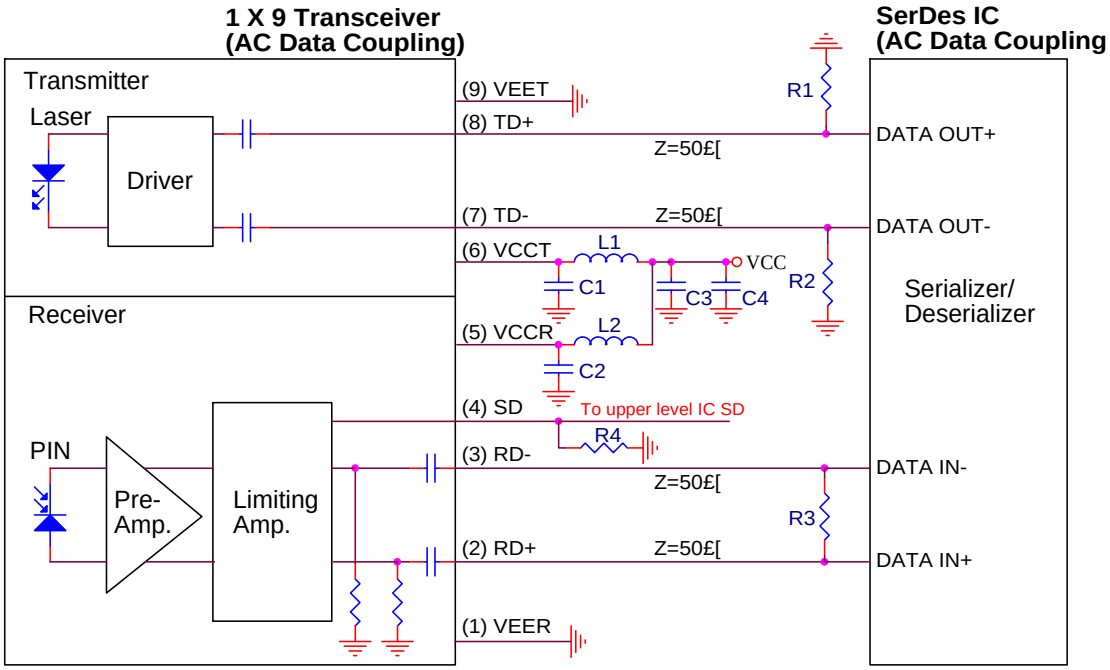


Pinout Description

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

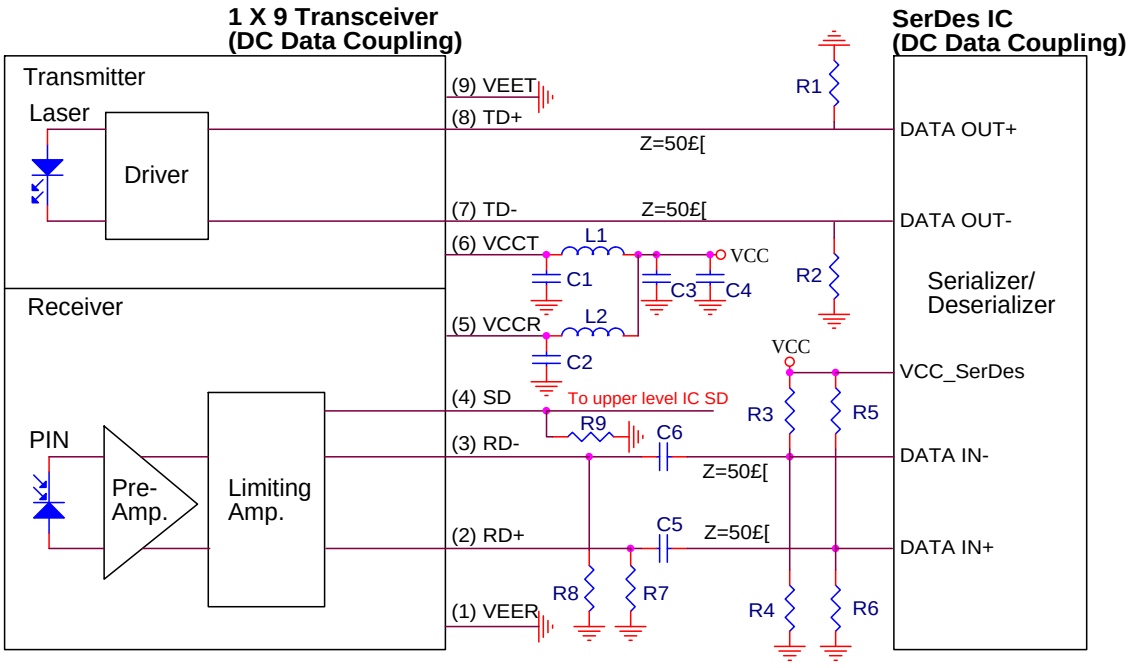
Recommended AC Coupling Interface Circuit：



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.