



## **AXFT-1713 125Mbps Single Fiber Bi-directional, 2x5 SFF, SC Receptacle, OLT Transceiver**



### **Product Overview**

The AXFT-1713 family of Small Form Factor (SFF) transceiver module is specifically designed for the high performance integrated duplex data link over single-mode optical fiber. These transceiver modules are compliant with the SFF Multisource Agreement (MSA).

The AXFT-1713 BiDi SFF transceivers using a long wavelength (1550nm) FP laser diode and a 1310nm PIN for receiver enable data transmission up to 10km on a single-mode (9/125 $\mu$ m) optical fiber.

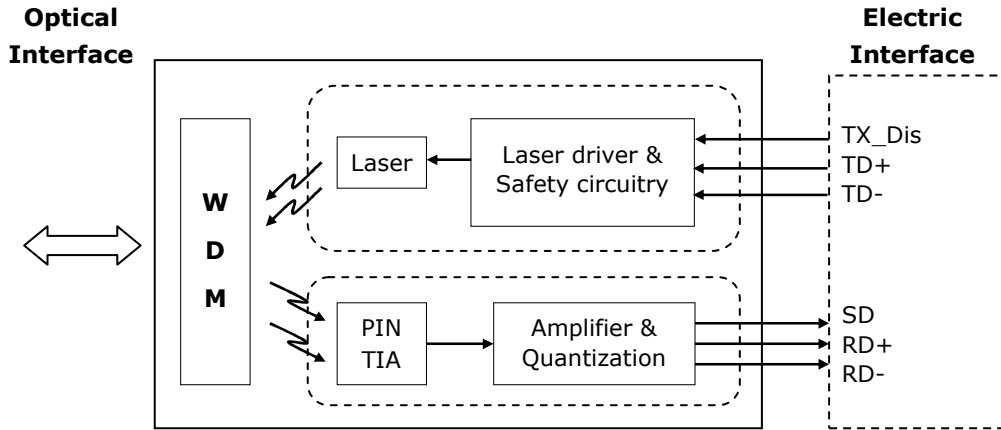
### **Features**

- **125Mbps~155Mbps bi-directional single fiber link**
- **Single SC receptacle**
- **1550nm FP transmitter, 1310nm PIN receiver**
- **10km point-to-point transmission**
- **125Mbps IEEE 802.3ah 100BASE-BX10-D compliant**
- **155Mbps OC-3 IR-1/STM S-1.1 compliant**
- **SFF Multi-Source Agreement compliant**
- **Class 1 laser safety standard IEC 60825 compliant**
- **Low power dissipation**

### **Applications**

- **FTTx**
- **Fast Ethernet**
- **ATM switches and routers**
- **SONET/SDH switch infrastructure**

### Block diagram



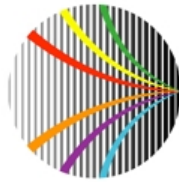
The transceiver is fundamentally consisted by two parts: transmitter and receiver. The transmitter features LVPECL differential data inputs (TD+ and TD-) and an LVTTTL for TX disable control (TX\_Dis). The receiver features LVPECL differential data outputs (RD+ and RD-) and LVPECL for signal detect output (SD).

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Storage Temperature	T <sub>S</sub>	-40	+85	°C	
Supply Voltage	V <sub>CC</sub>	-0.5	+4.0	V	
Storage Relative Humidity	RH	5	95	%	
Soldering Temperature / Time	T <sub>SOLD</sub> / t <sub>SOLD</sub>		260/10	°C/sec	

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T <sub>C</sub>	0		70	°C	Refer to ordering information
		-40		+85		
Supply Voltage	V <sub>CC</sub> T V <sub>CC</sub> R	3.1	3.3	3.5	V	
Supply Current	I <sub>TX</sub> +I <sub>RX</sub>		150	300	mA	



## Transmitter Electro-Optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data Input Voltage – Low	$V_L-V_{CC}$	-1.81		-1.475	V	
Data Input Voltage – High	$V_H-V_{CC}$	-1.165		-0.88	V	
Tx_Disable - High	$V_{Disable\_H}$	2		$V_{CC}T$	V	
Tx_Disable - Low	$V_{Disable\_L}$	$V_{EE}T$		$V_{EE}T+0.8$	V	
Tx_Disable Assert Time	$T_{ASSERT}$			10	$\mu s$	
Tx_Disable Deassert Time	$T_{DEASSERT}$			1.0	ms	
Optical Output Power	$P_o$	-14		-8	dBm	1
Optical Extinction Ratio	$E_R$	8.2			dB	
Center Wavelength	$\lambda_c$	1480	1550	1580	nm	
Spectral Width (RMS)	$\Delta\lambda$			4.6	nm	
Optical Rise Time	$t_r$			2	ns	
Optical Fall Time	$t_f$			2	ns	

### Notes:

1. Coupling into a 9/125 $\mu m$  single-mode fiber.

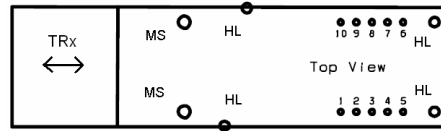
## Receiver Electro-Optical Interface

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Overload	$P_{INMAX}$	0			dBm	1
Receiver Sensitivity	$P_{INMIN}$			-32	dBm	1
Operating Center Wavelength	$\lambda_c$	1260		1360	nm	
Return Loss	RL	12			dB	
Receiver Output Voltage - Low	$V_{OL}-V_{CC}$	-2		-1.58	V	
Receiver Output Voltage - High	$V_{OH}-V_{CC}$	-1.1		-0.74	V	
Signal Detect - Asserted	$P_{SDA}$			-32	dBm	
Signal Detect - Deasserted	$P_{SDD}$	-45			dBm	
Signal Detect - Hysteresis	$P_{SDH}$	0.5			dB	
Signal Detect Output Voltage - Low	$V_{SDL}-V_{CC}$	-2		-1.58	V	
Signal Detect Output Voltage - High	$V_{SDH}-V_{CC}$	-1.1		-0.74	V	

### Notes:

1. With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with PRBS 2<sup>7</sup> -1

## Pin Description



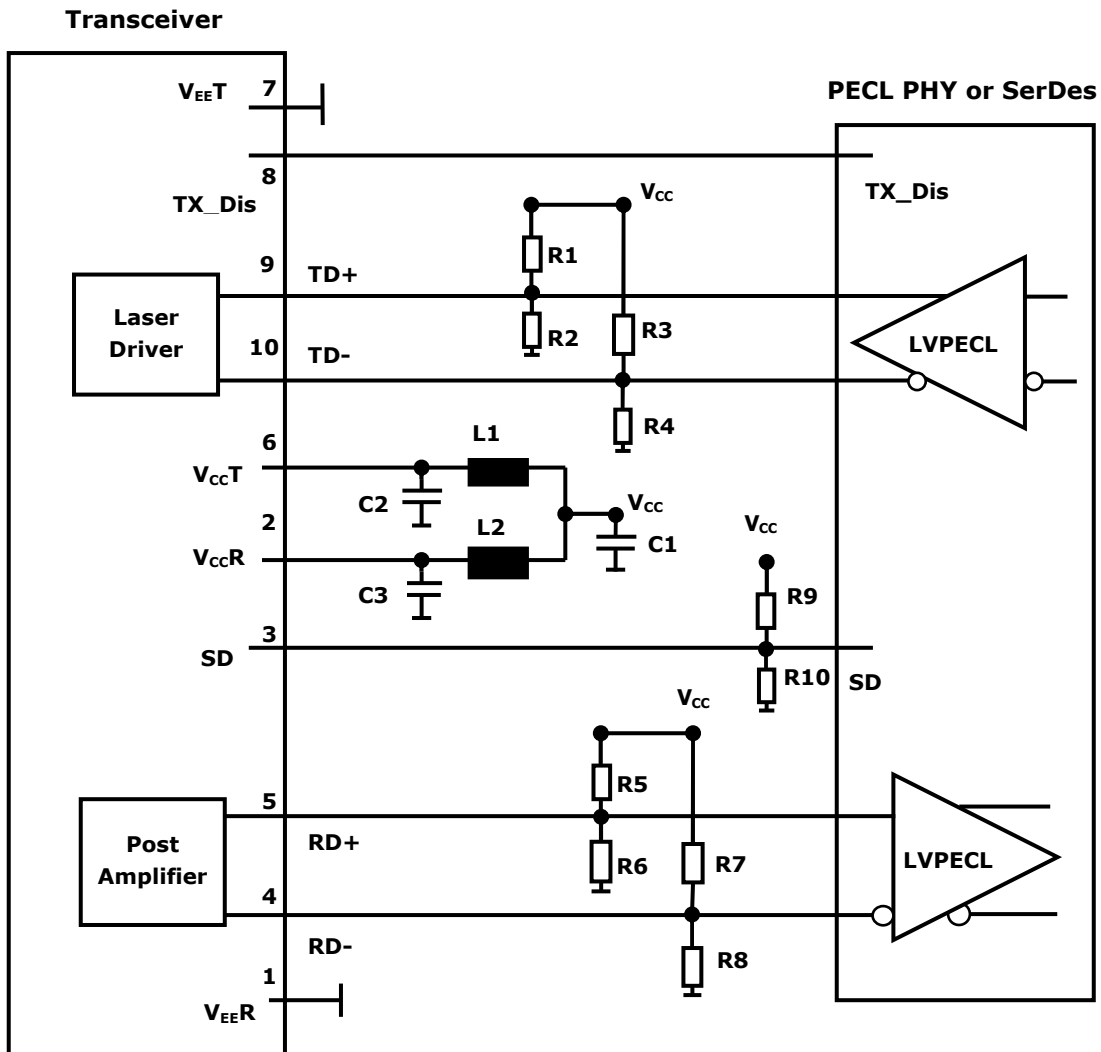
Pin No.	Pin Name	Function	Notes
MS	MS	Mounting Stubs	1
HL	HL	Housing Leads	2
1	V <sub>EE</sub> R	Receiver Signal Ground	
2	V <sub>CC</sub> R	Receiver Power Supply	
3	SD	Signal Detect	3
4	RD-	Receiver Data Out Bar	4
5	RD+	Receiver Data Out	4
6	V <sub>CC</sub> T	Transmitter Power Supply	
7	V <sub>EE</sub> T	Transmitter Signal Ground	
8	TX_Dis	Transmitter Disable Control	5
9	TD+	Transmitter Data In	6
10	TD-	Transmitter Data In Bar	6

### Notes:

1. The mounting stubs are provided for transceiver mechanical attachment to the circuit board. They may also provide an optional connection of the transceiver to the equipment chassis ground.
2. The optional transceiver housing leads may be provided for additional signal grounding. These additional grounds may improve signal integrity, EMC, or ESD performance.
3. Normal Operation: Logic "1" Output; Fault Condition: Logic "0" Output.
4. No internal terminations will be provided.
5. Transmitter Disabled:  $(V_{CC}T - 1.3V) < V < V_{CC}T$   
Transmitter Enabled:  $V_{EE}T < V < (V_{EE}T + 0.8V)$  or open circuit
6. An internal 50ohm termination will be provided.

### Recommended Interface Circuit

#### TX DC Coupling / RX DC Coupling, PECL Signal Detect



**Notes:**

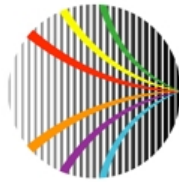
R1/R3/R5/R7/R9=130 ohm (Depends on SerDes chip used.)

R2/R4/R6/R8/R10=82 ohm (Depends on SerDes chip used.)

C1=10uF

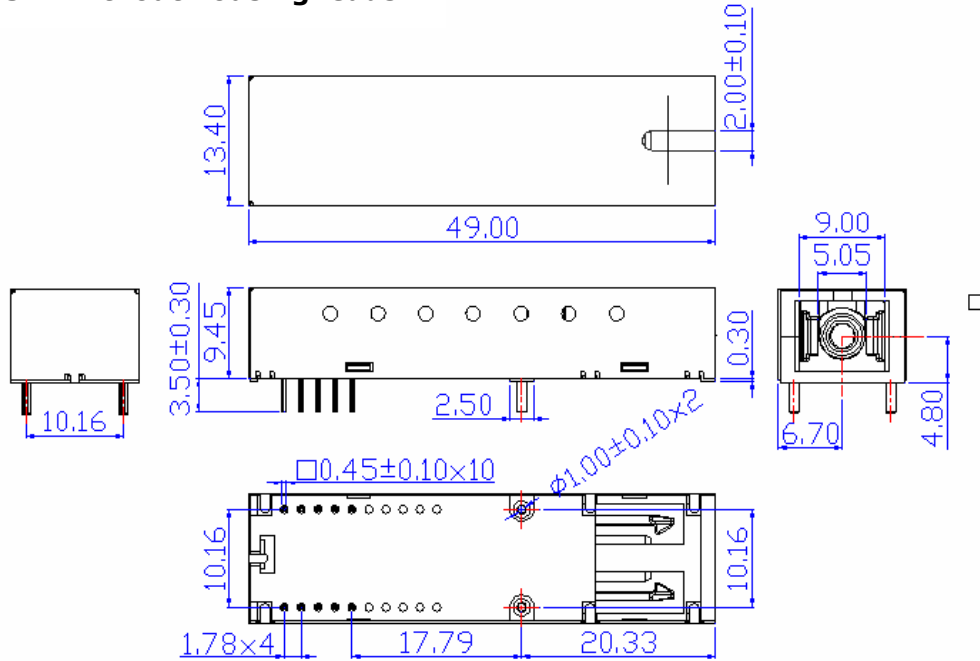
C2=C3=0.1uF

L1=L2=1uH



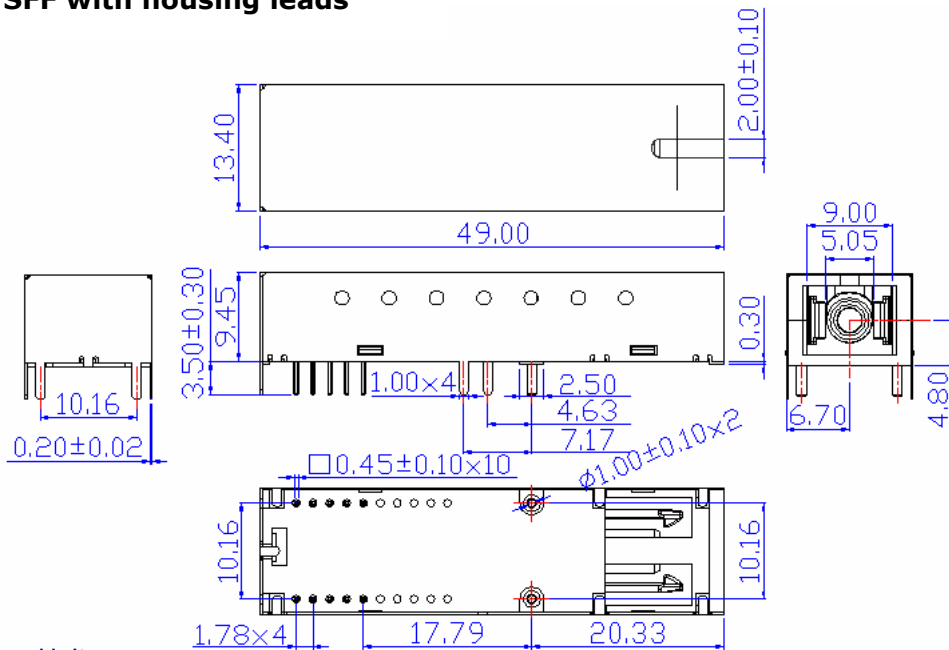
## Mechanical Dimensions (Units in mm)

### 2x5 SFF without housing leads

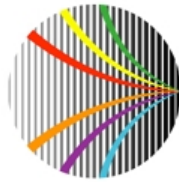


Unit : mm  
All dimensions are  $\pm 0.20$ mm unless otherwise specified

### 2x5 SFF with housing leads

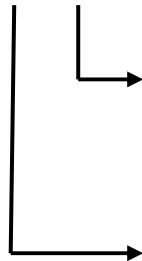


Unit : mm  
All dimensions are  $\pm 0.20$ mm unless otherwise specified



## Ordering Information

**AXFT-1713-x13y**



**Operating Temperature**

- 1: 0~70°C
- 3: -40~85°C

**Case Type**

- 2: Without Housing Leads
- 3: With Housing Leads

Model No.	Tx	LD	Rx	I/O	SD	Case	Link	Temp.
AXFT-1713-2131	1550nm	FP	1310nm	DC/DC	PECL	W/o Leads	10km	0~70°C
AXFT-1713-3131	1550nm	FP	1310nm	DC/DC	PECL	With Leads	10km	0~70°C
AXFT-1713-2133	1550nm	FP	1310nm	DC/DC	PECL	W/o Leads	10km	-40~85°C
AXFT-1713-3133	1550nm	FP	1310nm	DC/DC	PECL	With Leads	10km	-40~85°C