Specification

155Mbps 2x5 SFF

Transceiver

T S P - F 2 A A 1 - D A M

Features

- SFF Multi-Mode Duplex LC Transceiver
- Industry Standard 2*5 footprint with LC Receptacle
- Compliant with SFF MSA-2000
- Transmitter 1310nm FP Laser and Receiver PIN+TIA
- Single +3.3 Power Supply
- LVPECL Differential Inputs and Outputs
- LVPECL or LVTTL Signal Detection Output is Optional
- Complies with Telcordia (Bellcore) GR-468-CORE
- Typical data rate 155Mbps
- Maximal reach 2km with Multi-Mode Fiber

Applications

- SONET/SDH, Ethernet
- Routers, Hubs or repeaters

Performance Specifications

Absolute Maximum Ratings				
Parameter	**Symbol**	**Min**	**Max**	**Unit**
Storage Temperature	Tst	-40	+85	°C
Operating Case Temperature	Tc	-40	+85	°C
Input Voltage	-	GND	Vcc	V
Power Supply Voltage	Vcc-Vee	-0.5	+3.6	V

Recommended Operating Conditions						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Note**
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Operating Case Temperature	Tc	-40	-	85	°C	
Data Rate	DR	-	155	-	Mbps	
Total Supply Current	-	-	200	300	mA	1
Damage Threshold For Receiver	-	-	-	4	dBm	-

Optical Specification						
Transmitter						
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Note**
Optical Central Wavelength	λ	1260	1310	1360	nm	-
Spectral Width (RMS)	Δλ	-	-	4.0	nm	-
Average Optical Output Power	Po	-20	-	-8	dBm	
Extinction Ratio	Er	10	-	-	dB	-
Rise/Fall Time	Tr/Tf	-	-	2	ns	-

Average Lauched Power of Off Transmitter	Poff	-	-	-45	dBm	-
Output Eye	Compliant with ITU G.957					

Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operate Wavelength	-	1260	-	1600	nm	-
Sensitivity	Pr	-	-	-32	dBm	1
Saturation	Ps	-14	-	-	dBm	1
SD De-assert Level	-	-45	-	-	dBm	-
SD Assert Level	-	-	-	-32	dBm	-
SD Hysteresis	-	0.5	-	5	dB	-

Notes:

1. The current excludes the output loaded current
2. Minimum Sensitivity and saturation levels for a 2^7 -1 PRBS. BER≤10^{-10}, 155Mbps, ER=11dB

Electrical Specification

Transmitter

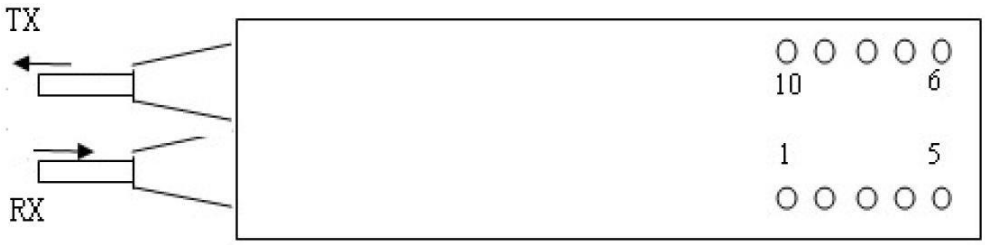
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Differential Input Voltage	VIN-DIF	300	-	1600	mV	-
Tx Input Voltage-Low	V_{IL}-Vcc	-1.81	-	-1.48	V	-
Tx Input Voltage-High	V_{IH}-Vcc	-1.16	-	-0.88	V	-

Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Data Output Voltage Differential	VOUT-DIF	400	-	1000	V	-
Rx Output Voltage-Low	V_{OL}-Vcc	-1.81	-	-1.48	V	-
Rx Output Voltage-High	V_{OH}-Vcc	-1.16	-	-0.88	V	-
Signal Detect Output Voltage-Low	V_{SD-L}-Vcc	-1.81	-	-1.48	V	LVPECL
Signal Detect Output Voltage-High	V_{SD-H}-Vcc	-1.16	-	-0.88	V	
Signal Detect Output Voltage-Low	V_{SD-L}-Vcc	-	-	-0.8	V	LVTTL
Signal Detect Output Voltage-High	VSD-H	-2.0	-	-	V	

PIN Diagram

PIN	FUNCTION	PIN	FUNCTION
1	VEER	6	VCCT
2	VCCR	7	VEER
3	SD	8	Tx_Disable
4	Rx_DATA-	9	TX_DATA+
5	Rx_DATA+	10	TX_DATA-

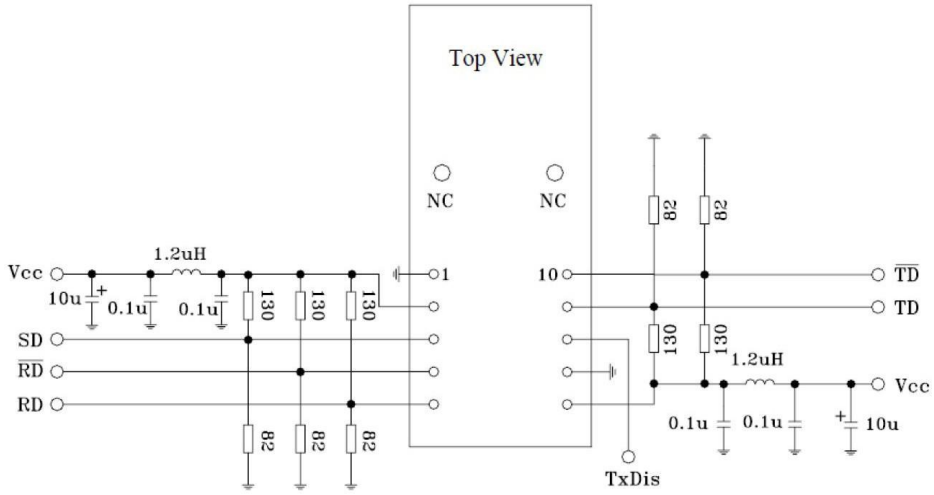


PIN Description

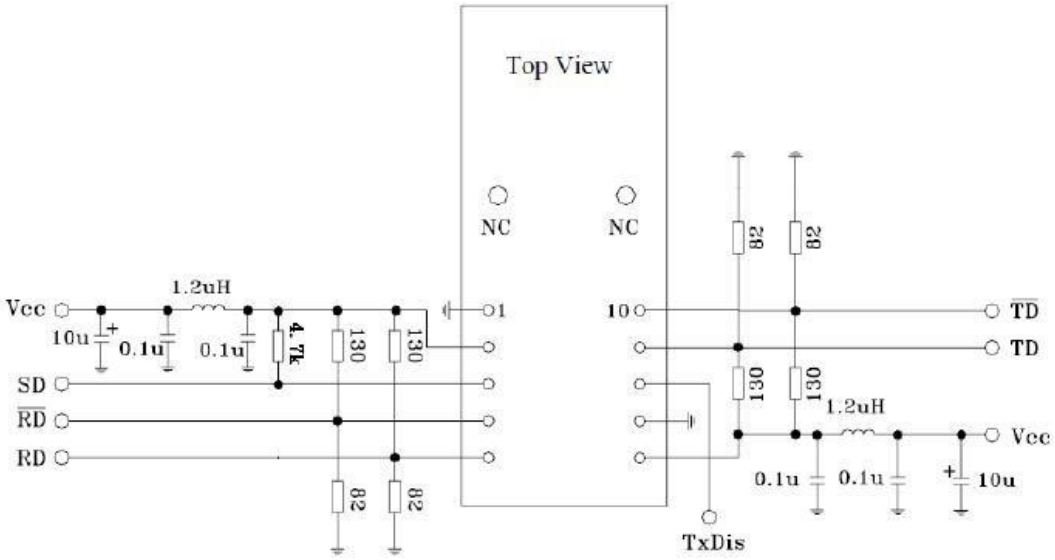
Pin No.	Name	Description
1	VEER	Receiver Ground
2	VCCR	Receiver Power Supply
3	SD	Signal Detect Output. H--Normal Operation; L--Los Of Signal
4	Rx_DATA-	Receiver Data Output Negative
5	Rx_DATA+	Receiver Data Output Positive
6	VCCT	Transmitter Power Supply
7	VEET	Transmitter Ground
8	TX_Disable	Transmitter Enable Control. High Level Transmitter On
9	TX_DATA+	Transmitter Data Input Positive
10	TX_DATA-	Transmitter Data Input Negative

Recommended Circuit

- This if for SD LVPECL.

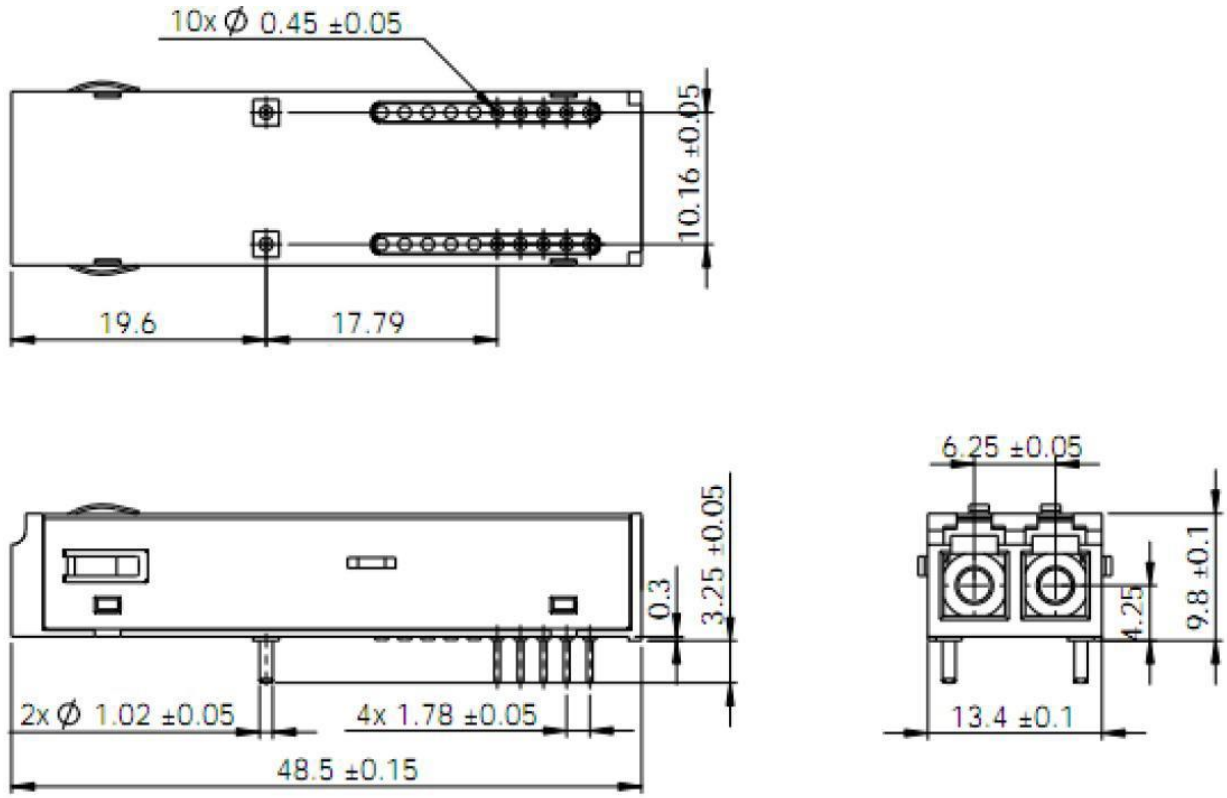


- This is for SD LVTTL



Package Diagram

Unit: mm



Ordering information

Product Description	Part Number
155Mbps 2x5 SFF Transceiver	TSD-F2AA1-DAM

Contact Information

Formerica OptoElectronics Inc.
5F-11, No.38, Taiyuan St., Zhubei City,
Hsinchu County 30265, Taiwan
Tel: +886-3-5600286
Fax: +886-3-5600239

inquiry@formericaoe.com

www.formericaoe.com

Revision History

Date	Version	Description
12/30/2024	1.0	Initial release