

Specification

Small Form Factor

Duplex LC Receptacle – SFF

Optical Transceivers

STM-1 / OC-3 / 100BASE
 155.52Mbit/s



Ordering Information

TSP – F x A A 1 – K B M

Voltage/ Temperature

1 : 3.3V / +0°C ~ +70°C

2 : 3.3V / -40 °C ~ +85°C

Model Name	Voltage	Category	Device type	Interface	SD	Temperature	Distance
TSP-F1AA1-KBM	3.3V	W/O DDMI	FP / PIN	DC / DC Coupling	LVPECL	+0°C~+70°C	40Km
TSP-F2AA1-KBM						-40°C~+85°C	

Features

- **SFF Single Mode Duplex LC Transceiver.**
- **Industry Standard 2x5 footprints.**
- **Compliant with SFF MSA-2000.**
- **Transmitter 1310nm FP Laser and Receiver PIN+TIA.**
- **Single +3.3V Power Supply.**
- **LVPECL Differential Inputs and Outputs.**
- **LVPECL Signal Detection Output.**
- **Complies with Telcordia (Bellcore) GR-468-CORE.**
- **Typical data rate 155Mbps.**
- **Maximal reach 40km with SM fiber.**
- **Laser Class 1 Product – IEC60825-1 Compliant.**

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage temperature	T _S	-40		85	°C
Supply voltage	V _{CC}	-0.5		+3.6	V
Input voltage	V _{IN}	GND		V _{CC}	V

Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	3.14	3.30	3.47	V
Operating Case temperature (TSP-F1AA1-KBM)	T _c	0		70	°C
Operating Case temperature (TSP-F2AA1-KBM)		-40		85	
Total Current (Transmitter + Receiver)	I _{CC}		200	300	mA
Hand Lead Soldering Temperature / Time	T _h			260/10	°C /sec
Wave Lead Soldering Temperature / Time	T _w			260/10	°C /sec
Data Rate	DR		155		Mbps
Damage Threshold For Receiver				4	dBm

Transmitter Specifications ($V_{CC}=3.1V\sim 3.5V$; $T_C= 0^{\circ}C\sim 70^{\circ}C$ / $T_C= -40^{\circ}C\sim 85^{\circ}C$)

Parameter	Symbol	Min	Typ	Max	Unit
Optical Characteristics					
Output Optical Power	P_{out}	-5		0	dBm
Extinction Ratio	ER	10			dB
Center Wavelength	λ_C	1275	1310	1345	nm
Spectral Width (RMS)	σ			2.5	nm
Rise/Fall time (10-90%)	$T_{r,f}$			2	ns
Output Eye	Compliant with IEEE 802.3z				
Max. P_{out} TX-DISABLE Asserted	P_{OFF}			-45	dBm
Electrical Characteristics					
Differential Data Input Voltage	$V_{IN-DIFF}$	0.3		1.6	V
Tx_Disable_Input_High	V_{DISH}	2.0		$V_{CC}+0.3$	V
Tx_Disable_Input_Low	V_{DISL}	0		0.8	V

Receiver Specifications ($V_{CC}=3.1V\sim 3.5V$; $T_C= 0^{\circ}C\sim 70^{\circ}C$ / $T_C= -40^{\circ}C\sim 85^{\circ}C$)

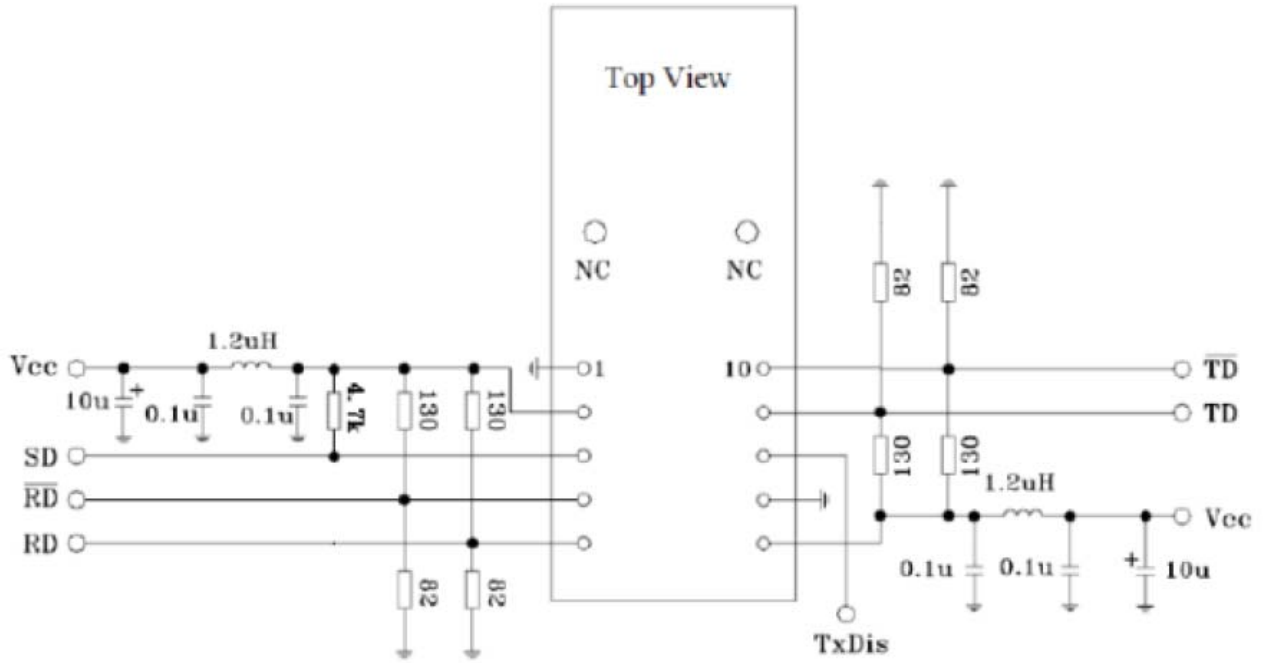
Parameter	Symbol	Min	Typ	Max	Unit
Optical Characteristics					
Optical Input Power-maximum	P_{SATIN}	0			dBm
Receiver Sensitivity (PRBS= $2^{23}-1$; $BER \leq 10^{-10}$)	P_{SEN}			-35	dBm
Operating Center Wavelength	λ_C	1260		1600	nm
Signal Detect – Asserted	P_{SA}			-35	dBm
Signal Detect – De-asserted	P_{SD}	-48			dBm
Signal Detect – Hysteresis	P_{SH}	0.5		5	dB
Electrical Characteristics					
Differential Output Voltage	V_{DIFF}	0.4		1.0	V
Signal Detect Output Voltage - High	V_{LOSH}	-1.16		-0.88	V
Signal Detect Output Voltage - Low	V_{LOSL}	-1.81		-1.48	V

Pin Definition and Descriptions



Pin	Name	Input-Output /Level	Description	Ref.
1	VEER	Input	Receiver ground	
2	VCCR	Input	Receiver power supply	
3	SD	Output/LVPECL	Receiver signal detect. High signal indicates optical signal is present at receiver input.	
4	RD-	Output/LVPECL	Inverted receiver data output	
5	RD+	Output/LVPECL	Non-inverted receiver data output	
6	VCCT	Input	Transmitter power supply	
7	VEET	Input	Transmitter ground	
8	DIS	Input/LVTTL	Transmitter Disable Control	
9	TD+	Input/LVPECL	Transmitter non-inverted data input	
10	TD-	Input/LVPECL	Transmitter inverted data input	

Recommended Circuit Diagram



Mechanical Outlines

(Unit : mm)

