

## Specification

### 1X9 Form Factor

Duplex SC Receptacle – DSC

### Optical Transceivers

STM-1 / OC-3 / 100BASE

155.52Mbit/s



## Ordering Information

**TSP-DxAA2-H21**



Temperature

1: +0 ~ +70°C

2: -40 ~ +85°C

Model Name	Voltage	Category	Device type	SD/LOS	Temperature	Distance
TSP-D1AA2-H21	3.3 V	W/O DDMI	FP / PIN	LVPECL	+0 ~ +70°C	30km
TSP-D2AA2-H21					-40 ~ +85°C	

## Features

- ROHS Compliant
- Standard 1X9 Form Factor
- SONET/SDH Standard Compliant
- Fast Ethernet Standard Compliant
- Laser Class 1 Product –IEC/EN 60825-1 Compliant
- Standard Duplex SC Receptacle Optical Interface
- Single + 3.3 V Power Supply
- Differential LVPECL Data Input and Output
- LVPECL Signal Detect
- Low Power Consumption

## Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage temperature	T <sub>s</sub>	-40	-	85	°C
Supply voltage	VCC	0	-	4	V
Operating Relative Humidity	-	5	-	95	%
Input voltage	V <sub>IN</sub>	0	-	VCC	V

## Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VCC	3.1	3.3	3.5	V
Operating Case temperature ( TSP-D1AA2-H21 )	Top	0	-	70	°C
Operating Case temperature (TSP-D2AA2-H21 )		-40	-	85	
Current	Icc	-	-	250	mA
Soldering Temperature (10sec)	Tsold	-	-	260	°C

## Transmitter Specifications ( Vcc = 3.1 ~ 3.5V ; Top = 0 ~ 70°C / Top = -40 ~ 85°C )

Parameter	Symbol	Min	Typ	Max	Unit
<b>Optical Characteristics</b>					
Output Optical Power	Pout	-9	--	-3	dBm
Extinction Ratio	ER	9	--	--	dB
Center Wavelength	$\lambda$	1270	1310	1355	nm
Spectral Width (RMS)	$\sigma\lambda$	--	--	3	nm
Rise/Fall time (10-90%)	$T_r / T_f$	--	--	2	ns
Relative Intensity Noise	RIN	--	--	-120	dB/Hz
Output Eye	Compliant with ITU-T G.957				
<b>Electrical Characteristics</b>					
Transmitter Data Input Voltage - High	V <sub>IH</sub> -Vcc	-1.1	--	-0.74	V
Transmitter Data Input Voltage - Low	V <sub>IL</sub> -Vcc	-2.0	--	-1.58	V

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

Parameter	Symbol	Min	Typ	Max	Unit
<b>Optical Characteristics</b>					
Optical Input Power-maximum	$P_{max}$	-3	--	--	dBm
Receiver Sensitivity ( PRBS= $2^{23}-1$ ; $BER \leq 10^{-10}$ )	Sens	--	--	-34	dBm
Operating Center Wavelength	$\lambda$	1260		1610	nm
Signal Detect – Asserted	$P_{SA}$	--	--	-34	dBm
Signal Detect – De-asserted	$P_{SD}$	-45	--	--	dBm
Signal Detect – Hysteresis	$P_{SH}$	0.5		6	dB
<b>Electrical Characteristics</b>					
Differential Output Voltage	$V_{DIFF}$	0.4	--	2.0	V
Signal Detect Output Voltage - High	$V_{OH} - V_{CC}$	-1.1	--	-0.74	V
Signal Detect Output Voltage - Low	$V_{OL} - V_{CC}$	-2.0		-1.58	V

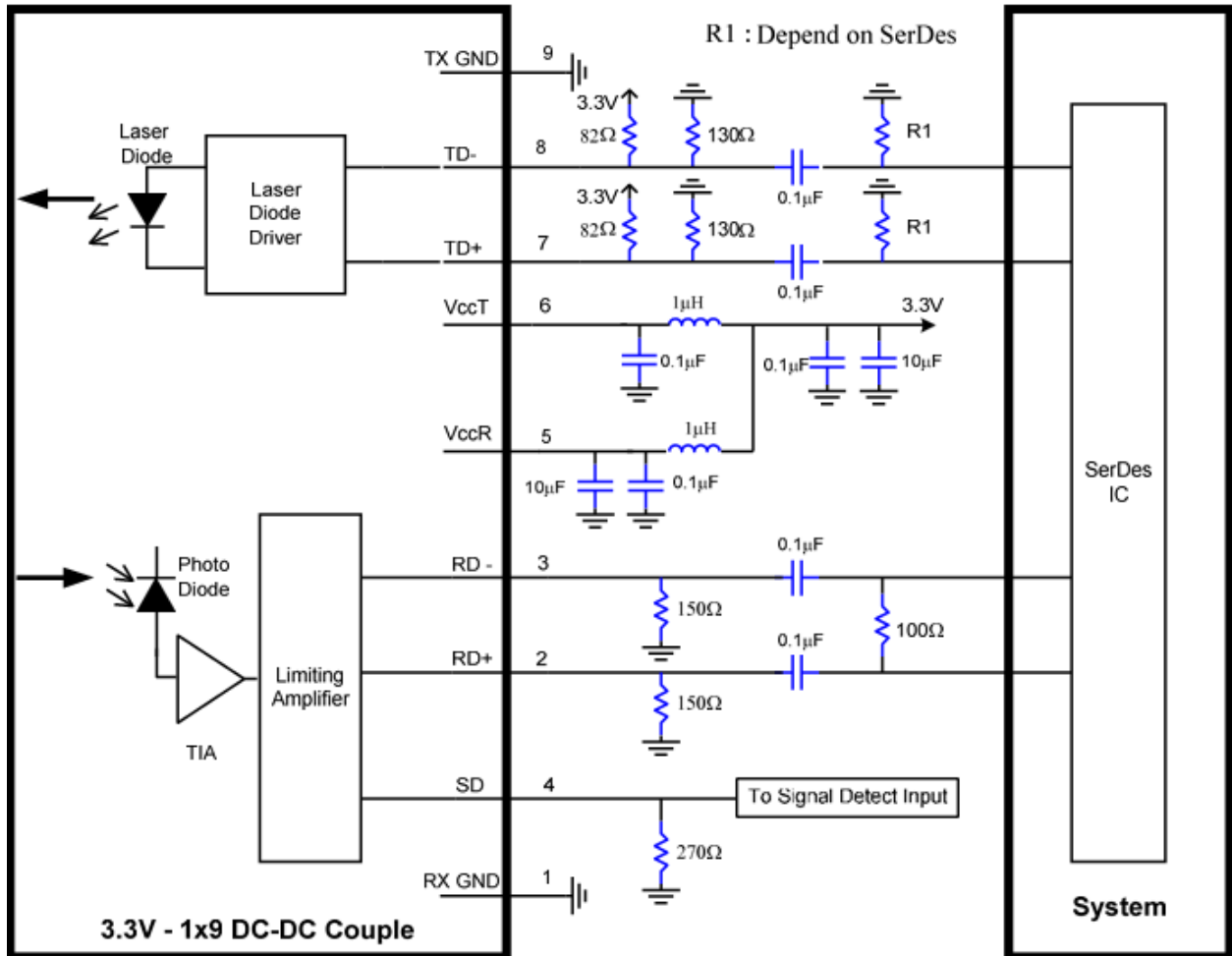
**Pin Definition and Descriptions**

9. TX GND <sub>r</sub>	
8. TD+	N/C
7. TD-	
6. V <sub>CCT</sub>	
5. V <sub>CCR</sub>	
4. SD	
3. RD -	
2. RD +	N/C
1. RX GND	

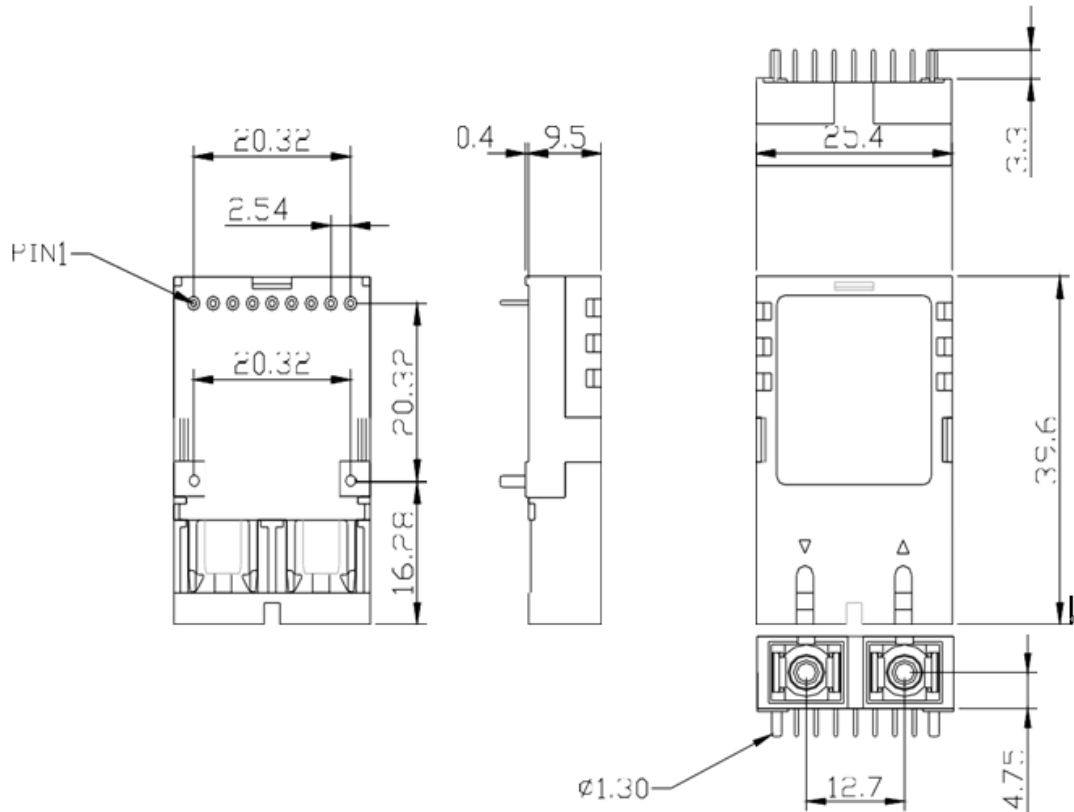
**Bottom VIEW**

Pin	Name	Description
1	RX GND	Receiver Signal Ground
2	RD+	Receiver Data Out
3	RD-	Receiver Data Out Bar
4	SD	Signal Detect
5	VCCR	Receiver Power Supply
6	VCCT	Transmitter Power Supply
7	TD-	Transmitter Data In Bar
8	TD+	Transmitter Data In
9	TX GND	Transmitter Signal Ground

Recommended Circuit Diagram



**Mechanical Outlines ( Unit : mm)**



**ESD**

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

**Contact Information**

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