

## Specification

### 1X9 Form Factor

Duplex SC Receptacle – DSC

### Optical Transceivers

1000BASE-SX

1250Mbit/s



## Ordering Information

**T S P - D x C H 2 - C 1 1**

**Voltage / Temperature**

1: 3.3V + 0°C ~ + 70°C

2: 3.3V - 40 °C ~ + 85°C

Model Name	Voltage	Category	Device type	Interface	SD/LOS	Temperature	Distance
TSP-D1CH2-C11	3.3 V	W/O DDMI	VCSEL / PIN	AC / AC Coupling	LVTTTL	+ 0°C~ + 70°C	550m ( Table 1 )
TSP-D2CH2-C11						-40°C~ + 85°C	

Media	Wavelength	Fiber Core Dimension	Bandwidth	Fiber Type	Distance
Multi-Mode Fiber	850nm	50 μ m	500 MHz* km	OM2	550m
		50 μ m	400 MHz* km		500m
		62.5 μ m	200 MHz* km	OM1	275m
		62.5 μ m	160 MHz* km		220m

Table 1

## Features

- **ROHS Compliant**
- **Standard 1X9 Form Factor**
- **Gigabit Ethernet Standard ( IEEE802.3Z 1000BASE-SX ) Compliant**
- **Fibre Channel Standard ( 100-M5-SN-I and 100-M6-SN-I ) Compliant**
- **Laser Class 1 Product – IEC60825-1 Compliant**
- **Standard Duplex SC Receptacle Optical Interface**
- **Single + 3.3 V Power Supply**
- **Differential LVPECL Data Input and Output**
- **LVTTL Signal Detect**
- **Low Power Consumption**

## Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Storage temperature	$T_s$	-40	-	85	°C
Supply voltage	$V_{CC}$	0	-	4	V
Operating Relative Humidity	-	5	-	95	%
Input voltage	$V_{IN}$	0	-	$V_{CC}$	V

## Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	$V_{CC(3.3V)}$	3.1	3.3	3.5	V
Operating Case temperature ( TSP-D1CH2-C11 )	$T_c$	0	-	70	°C
Operating Case temperature ( TSP-D2CH2-C11 )		-40	-	85	
Total Current ( Transmitter + Receiver )	$I_{CC}$	-	-	250	mA
Hand Lead Soldering Temperature / Time	$T_h$	-	-	260/10	°C /sec
Wave Lead Soldering Temperature / Time	$T_w$	-	-	260/10	°C /sec

**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
<b>Optical Characteristics</b>					
Output Optical Power	$P_{out}$	-9	--	-3	dBm
Extinction Ratio	ER	9	--	--	dB
Center Wavelength	$\lambda_C$	830		860	nm
Spectral Width (RMS)	$\sigma$	--	--	0.85	nm
Rise/Fall time (20-80%)	$T_{r,f}$	--	--	260	ps
Relative Intensity Noise	RIN	--	--	-117	dB/Hz
Output Eye	Compliant with IEEE 802.3z				
<b>Electrical Characteristics</b>					
Differential Input Voltage	$V_{DIFF}$	0.4	--	2.0	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
<b>Optical Characteristics</b>					
Optical Input Power-maximum	$P_{SATIN}$	0	--	--	dBm
Receiver Sensitivity ( PRBS= $2^7-1$ ; $BER \leq 10^{-12}$ )	$P_{SAN}$	--	--	-18	dBm
Operating Center Wavelength	$\lambda_C$	770		860	nm
Signal Detect – Asserted	$P_{SA}$	--	--	-18	dBm
Signal Detect – De-asserted	$P_{SD}$	-35	--	--	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 -Low	$V_{SDL}$	0	--	0.8	V
Signal Detect Output Voltage -High	$V_{SDH}$	2	--	$V_{CC}+0.3$	V

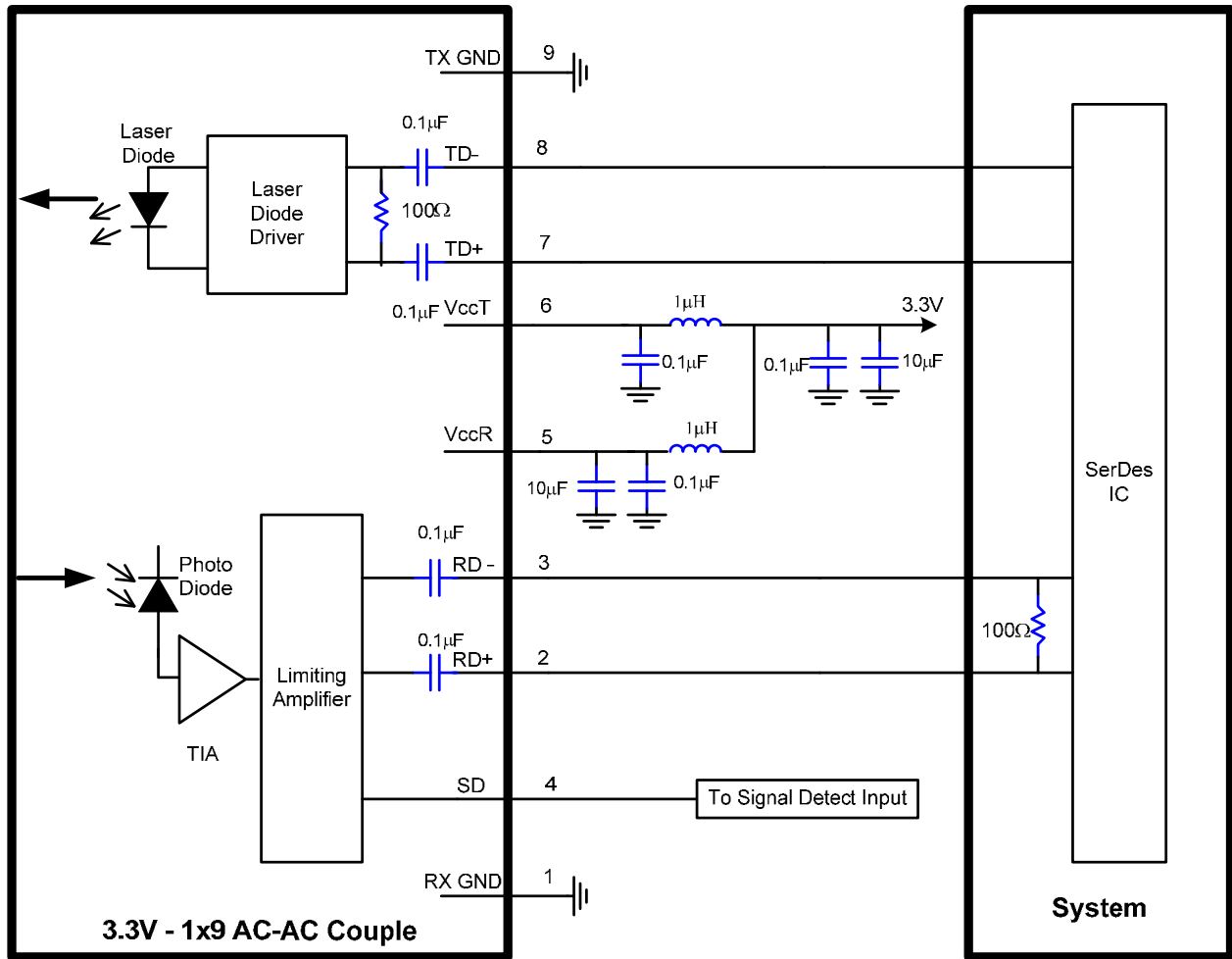
**Pin Definition and Descriptions**

9. TX GND <sub>T</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	V <sub>CCR</sub>	Receiver Power Supply
6	V <sub>CCT</sub>	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 )

