

### Product Overview

The PB4-S3-4103L of Small Form Factor Pluggable (SFP) transceiver module is specifically designed for high performance integrated single data link over single mode optical fiber. The high-speed laser diode and photo diode are provided as a light source and a detector, respectively. An EEPROM contained the detailed product information for the host equipment is accessed by the 2-wire serial CMOS EEPROM protocol. It complies with SFP MSA, SONET/SDH standards, Class 1 laser products, EN60825, and EN60950.

### Features

- RoHS Compliant
- Operation Temperature: -40~85°C
- 1310nm uncooled FP LD
- 1550nm receiver
- 10Km link distance<sub>(indicative only)</sub>
- Hot pluggable
- Metal enclosure, low EMI
- Single 3.3V power supply
- Low Power Dissipation

### Applications

- Metro Access Rings
- Point-to-Point networking
- 1x Fiber Channel
- Gigabit Ethernet
- Suitable for Fast Ethernet and OC3.

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T <sub>S</sub>	-40		85	°C	
Supply Voltage	V <sub>CC</sub> T V <sub>CC</sub> R	0		5.5	V	
Relative Humidity	RH	0		85	%	

### Ordering Information

P	B	4	-	S	3	-	4	1	0	3	L	-																													
a	b	-	X	-	c	-	d	e	f	-	g	-	h																												
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\* Please contact us for the released types

## Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Temperature	T <sub>OP</sub>	<b>-40</b>		<b>85</b>	°C	Case Temperature
Supply Voltage	V <sub>CC T,R</sub>	<b>3.1</b>	<b>3.3</b>	<b>3.5</b>	V	
Supply Current	I <sub>TX +RX</sub>		<b>200</b>	<b>300</b>	mA	

## Transmitter Electro-Optical Interface (T<sub>C</sub> = -40~ 85 , V<sub>CC T,R</sub> = 3.1V < V<sub>CC</sub> < 3.5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter Differential Input Voltage	TD +/-	<b>400</b>		<b>2000</b>	mVp-p	A
Optical Output Power	P <sub>O</sub>	<b>-9</b>		<b>-3</b>	dBm	A
Optical Extinction Ratio	E <sub>R</sub>	<b>9</b>			dB	A
Center Wavelength	λ <sub>C</sub>	<b>1270</b>	<b>1310</b>	<b>1355</b>	nm	A
Spectral Width	Δλ			<b>&lt;4</b>	nm	A
Optical Rise / Fall Time	t <sub>r</sub> / t <sub>f</sub>			<b>0.25</b>	nsec	A,B
Tx_Fault - High	V <sub>Fault H</sub>	<b>2</b>		<b>V<sub>CC</sub></b>	V	A
Tx_Fault - Low	V <sub>Fault L</sub>	<b>V<sub>ee</sub></b>		<b>V<sub>ee</sub>+0.5</b>	V	A
Tx_Disable - High	V <sub>Disable H</sub>	<b>2</b>		<b>V<sub>CC</sub></b>	V	A
Tx_Disable - Low	V <sub>Disable L</sub>	<b>V<sub>ee</sub></b>		<b>V<sub>ee</sub>+0.8</b>	V	A

### Notes:

**A:** All of data is measured at 1250Mbps , PRBS 2<sup>7</sup>-1 , NRZ.

**B:** 20%~80%



# PB4-S3-4103L

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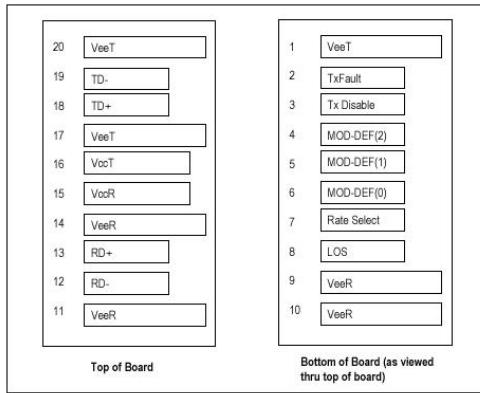
## Receiver Electro-Optical Interface ( $T_C = -40\sim 85$ , $V_{CC,T,R}=3.1V < V_{CC} < 3.5V$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Differential Output Voltage	RD +/-	<b>600</b>	<b>800</b>		mV <sub>p-p</sub>	
Receiver Overload	P <sub>IN</sub> MAX	<b>-3</b>			dBm	A,B
Receiver Sensitivity	P <sub>IN</sub> MIN			<b>-20</b>	dBm	A,B
Operating Center Wavelength	$\lambda_c$	<b>1480</b>		<b>1580</b>	nm	
Receiver LOS Assert Level	P <sub>RX_LOS A</sub>	<b>-35</b>			dBm	B
Receiver LOS Deassert Level	P <sub>RX_LOS D</sub>			<b>-20.5</b>	dBm	B
Receiver Loss of Signal Hysteresis		<b>0.5</b>	<b>2</b>		dB	B

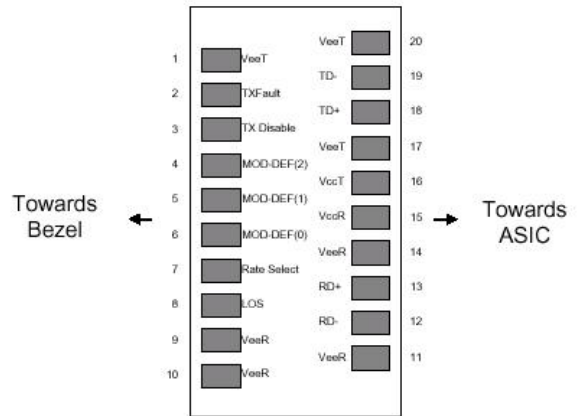
**Notes:**

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

### Pin Description



**SFP Transceiver Electric Pad Layout**



**Diagram of Host Board Connector Block Pin Numbers and Names**



## PB4-S3-4103L

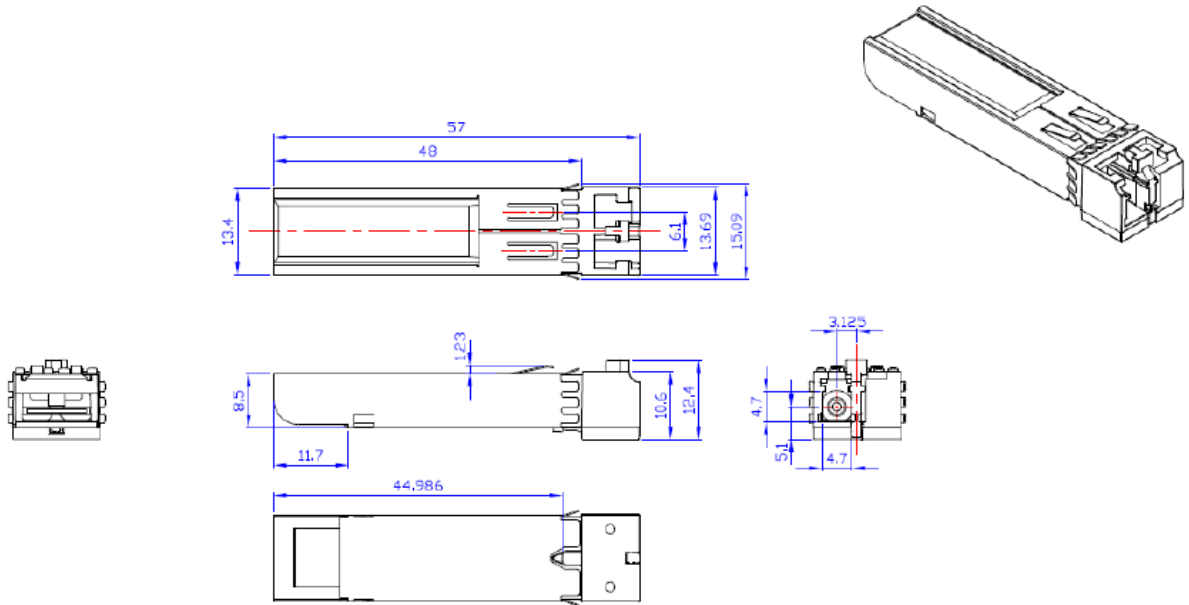
[www.palconnusa.com](http://www.palconnusa.com)

Pin No.	Pin Name	Function	Plug Seq.	Notes
1	V <sub>ee</sub> T	Transmitter Ground	1	<b>1</b>
2	TX Fault	Transmitter Fault Indication	3	<b>2</b>
3	TX Disable	Transmitter Disable	3	<b>3</b>
4	MOD_DEF 2	Module Definition 2	3	<b>4</b>
5	MOD_DEF 1	Module Definition 1	3	<b>4</b>
6	MOD_DEF 0	Module Definition 0	3	<b>4</b>
7	Rate Select	Select between full or reduced receiver bandwidth	3	<b>5</b>
8	LOS	Loss of Signal	3	<b>6</b>
9	V <sub>ee</sub> R	Receiver Ground	1	<b>1</b>
10	V <sub>ee</sub> R	Receiver Ground	1	<b>1</b>
11	V <sub>ee</sub> R	Receiver Ground	1	<b>1</b>
12	RD -	Inv. Receiver Data Out	3	
13	RD +	Receiver Data Out	3	
14	V <sub>ee</sub> R	Receiver Ground	1	<b>1</b>
15	V <sub>cc</sub> R	Receiver Power	2	
16	V <sub>cc</sub> T	Transmitter Power	2	
17	V <sub>ee</sub> T	Transmitter Ground	1	<b>1</b>
18	TD +	Transmitter Data In	3	
19	TD -	Inv. Transmitter Data In	3	
20	V <sub>ee</sub> T	Transmitter Ground	1	<b>1</b>

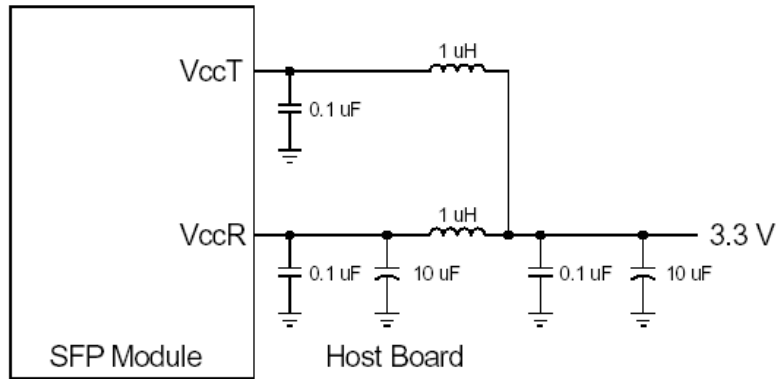
Note:

- 1, Circuit ground is internally isolated from chassis ground
- 2, Open-Collector outputs, asserted when LD and/or APC function fail.
- 3, Disable when high voltage (>2.0V or Open)
- 4, Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 5.5V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
- 5, No connection required
- 6, LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 5.5V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

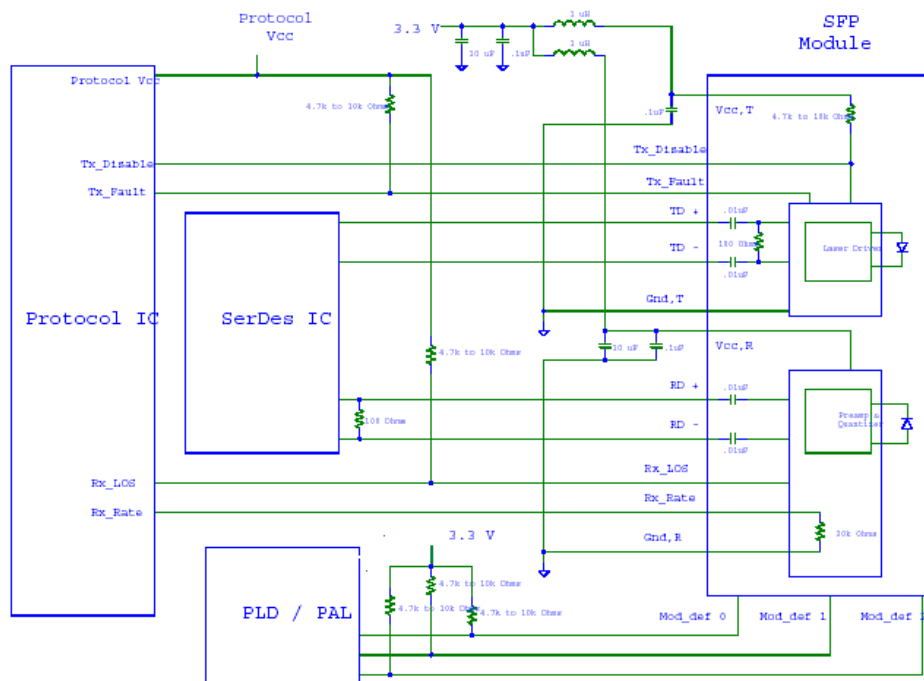
### Mechanical Dimensions (Units in mm)



### Application Circuit



**Figure 2A. Recommended Host Board Supply Filtering Network**



**Figure 2B. Example SFP Host Board Schematic**