



PB4-S4-4103L

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Product Overview

The PB4-S4-4103L 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
- 1550nm uncooled DFB LD
- 1310nm receiver
- 10Km link distance_(indicative only)
- 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 _s	-40		85	°C	
Supply Voltage	V _{ccT} V _{ccR}	0		5.5	V	
Relative Humidity	RH	0		85	%	

Ordering Information

P	B	4	-	S	4	-	4	1	0	3	L								
a	b		X		c		d		e	f		g	h	Function parameter					
													P: may be Blank, or 000~999→ Pigtail length (unit : cm)						
													C: or 0~9 → Case Color (0: Black, 1: Blue)						
													S: or B/F→ Shield (B: Backward , F: Forward ,X:Non)						
													or 1~4 → Composite Specifications (1: Case Color Blue + Shield Forward ,						
													W: 2: Case Color Blue + Shield Backward(short) , 3: Case Color Blue + Shield Backward(long) , 4:Case Color Black + High Power)						
													Function distinction						
													may be Blank, or P (P→ Pigtail),or C(Case Color),or S (S→ Shield) ,						
													or W (W→ Composite Specifications) , or F (F→POF)						
													Potential energy & temperature						
													I→AC/AC PECL 0°C~70°C						
													O→DC/DC TTL 0°C~70°C						
													J→AC/AC PECL -40°C~85°C						
													P→DC/DC TTL -40°C~85°C						
													K→AC/AC TTL 0°C~70°C						
													Q→AC/AC TTL -10°C~85°C						
													L→AC/AC TTL -40°C~85°C						
													R→DC/DC PECL -10°C~85°C						
													M→DC/DC PECL 0°C~70°C						
													S→AC/AC PECL -10°C~85°C						
													N→DC/DC PECL -40°C~85°C						
													Operating voltage						
													3→3.3V						
													5→5V						
													Distance						
													D1~D9 : D1→100M, D2→200M						
													01~99 : 01→1km, 10→10km						
													00→100km						
													Optical connector						
													1→FC						
													2→SC						
													3→ST						
													4→LC						
													Wavelength						
													M3→Multi-mode 850 nm						
													S1→Single-mode 1310 nm						
													S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm						
													M4→Multi-mode 1310 nm						
													S2→Single-mode 1550 nm						
													S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm						
													00~99 (CWDM Wavelength) :						
													S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm						
													47 → 1470 nm , 61 → 1610 nm						
													S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm						
													Bit rate						
													1→155Mbps						
													3→1.0625Gbps						
													5→2.125 Gbps						
													7→2.7 Gbps						
													2→622Mbps						
													4→1.25 Gbps						
													6→2.5 Gbps						
													8→3.125 Gbps						
													Electric connector						
													TR→Dual Fiber 1×9 Transceiver						
													PT→Dual Fiber SFP Transceiver						
													EUFB→ EPON ONU SFF 2×5 BIDI Transceiver						
													TB→Single Fiber 1×9 Transceiver						
													PB→Single Fiber SFP Transceiver						
													ETFB→ EPON OLT SFF 2×5 BIDI Transceiver						
													FT→Dual Fiber SFF Transceiver						
													PM→Dual Fiber SFP Transceiver (DDM)						
													GUFB→ GPON ONU SFF 2×5 BIDI Transceiver						
													FB→Single Fiber SFF Transceiver						
													UB→Dual Bi-Direction SFP Transceiver						
													GTFB→ GPON OLT SFF 2×5 BIDI Transceiver						

* Please contact us for the released types

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Temperature	T _{OP}	-40		85	°C	Case temperature
Supply Voltage	V _{CC} T,R	3.1	3.3	3.5	V	
Supply Current	I _{TX} +I _{RX}		200	300	mA	

Transmitter Electro-Optical Interface (T_C = -40~85 ,V_{CC}T,R=3.1V<V_{CC}<3.5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter Differential Input Voltage	TD +/-	400		2000	mVp-p	A
Optical Output Power	P _O	-9		-3	dBm	A
Optical Extinction Ratio	E _R	9			dB	A
Center Wavelength	λ _C	1530	1550	1570	nm	A
Spectral Width	Δλ			<1	nm	A
Side Mode Suppression Ratio	SMSR	30			dB	A
Optical Rise / Fall Time	t _r / t _f			0.25	nsec	A,B
Tx_Fault - High	V _{Fault H}	2		V_{CC}	V	A
Tx_Fault - Low	V _{Fault L}	V_{ee}		V_{ee}+0.5	V	A
Tx_Disable - High	V _{Disable H}	2		V_{CC}	V	A
Tx_Disable - Low	V _{Disable L}	V_{ee}		V_{ee}+0.8	V	A

Notes:

A: All of data is measured at 1250Mbps, PRBS 2⁷-1 ,NRZ.

B: 20%~80%



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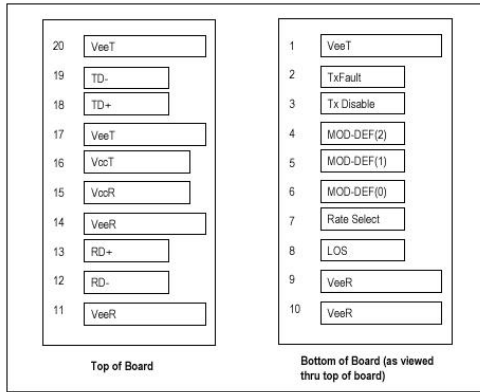
Receiver Electro-Optical Interface ($T_C = -40 \sim 85$, $V_{CC,T,R} = 3.1V < V_{CC} < 3.5V$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver Differential Output Voltage	RD +/-	600	800		mV _{p-p}	
Receiver Overload	P _{IN} MAX	-3			dBm	A,B
Receiver Sensitivity	P _{IN} MIN			-20	dBm	A,B
Operating Center Wavelength	λ_c	1260		1360	nm	
Receiver LOS Assert Level	P _{RX_LOS A}	-35			dBm	B
Receiver LOS Deassert Level	P _{RX_LOS D}			-20.5	dBm	B
Receiver Loss of Signal Hysteresis		0.5	2		dB	B

Notes:

- A. With BER better than or equal to 1×10^{-12}
- B. measured in the center of the eye opening with 2⁷-1 PRBS, NRZ

Pin Description



SFP Transceiver Electric Pad Layout

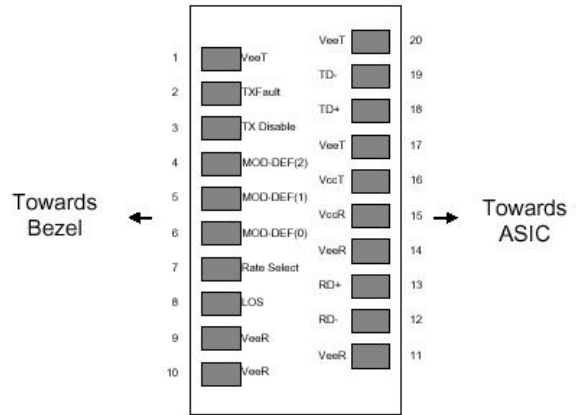


Diagram of Host Board Connector Block Pin Numbers and Names



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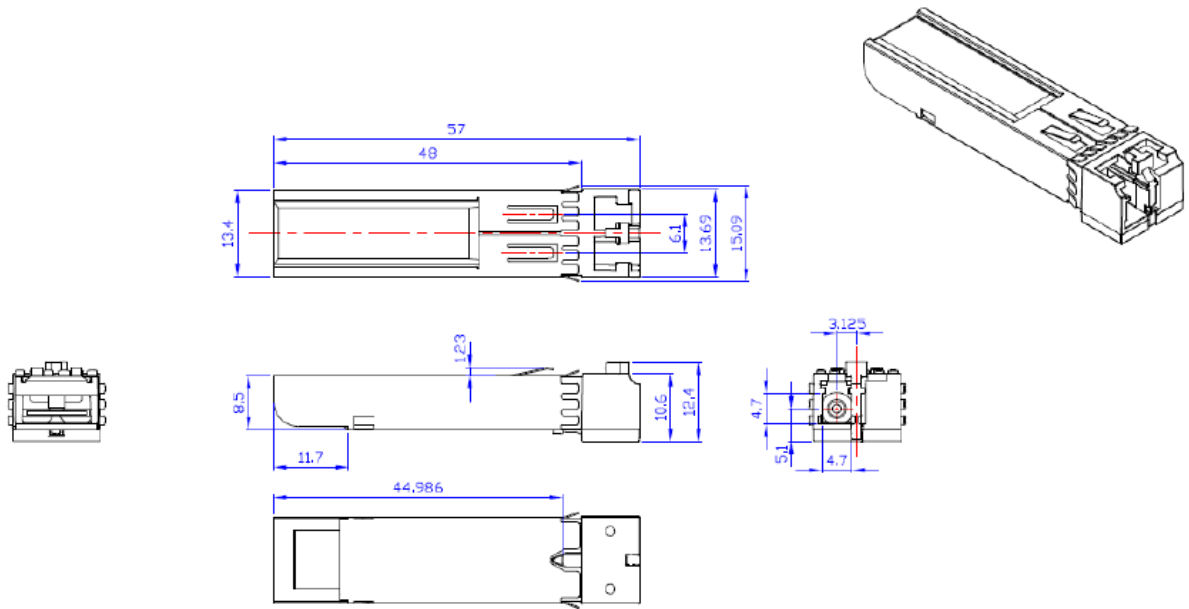
Pin No.	Pin Name	Function	Plug Seq.	Notes
1	V _{ee} T	Transmitter Ground	1	1
2	TX Fault	Transmitter Fault Indication	3	2
3	TX Disable	Transmitter Disable	3	3
4	MOD_DEF 2	Module Definition 2	3	4
5	MOD_DEF 1	Module Definition 1	3	4
6	MOD_DEF 0	Module Definition 0	3	4
7	Rate Select	Select between full or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

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.

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Mechanical Dimensions (Units in mm)



Application Circuit

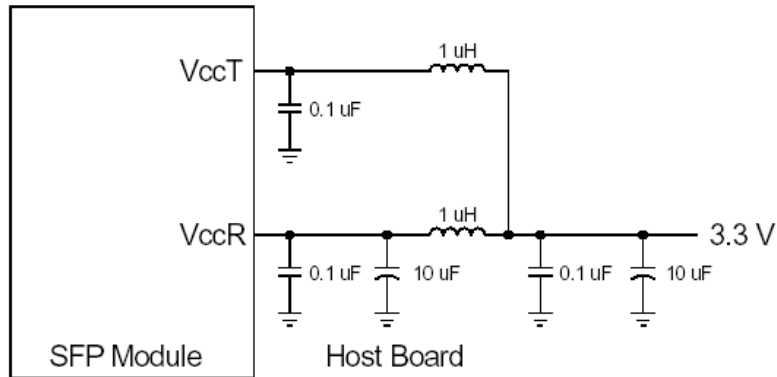


Figure 2A. Recommended Host Board Supply Filtering Network

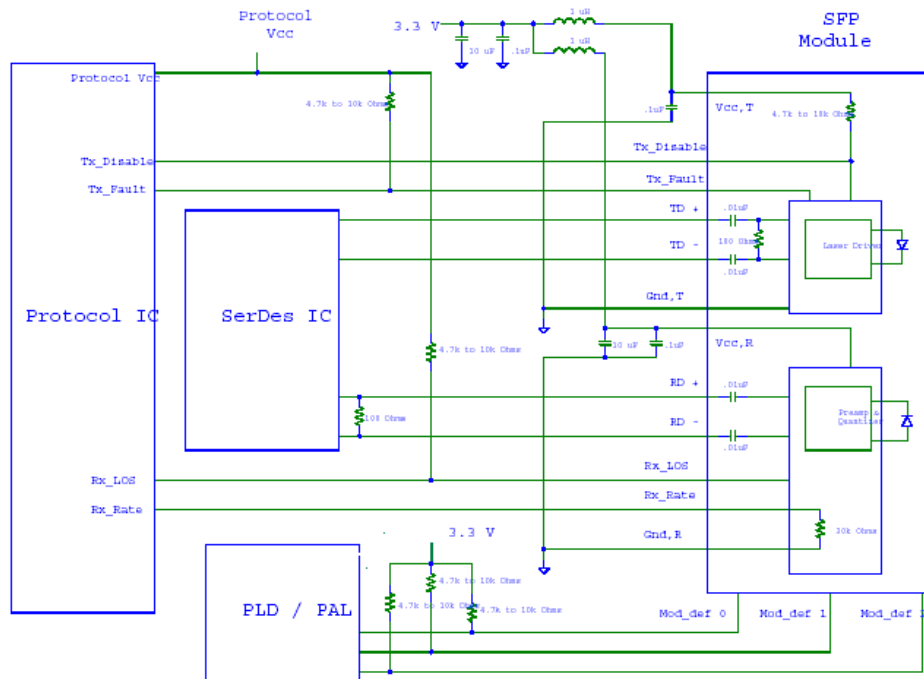


Figure 2B. Example SFP Host Board Schematic