

## DATASHEET

### FEATURES:

- Multi-Source Package with Duplex LC Connector
- Up to 155Mb/s Data Rate
- 1310nm FP Single-Mode
- Single +3.3V Power Supply
- Hot-Pluggable
- Compliant with ITU-T G.957,G.958
- Eye Safety Designed to Meet Laser Class1, Compliant with IEC60825-1
- RoHS Compliant Products

### APPLICATIONS:

- SONET OC-3/SDH STM-1
- Fast Ethernet
- Other Optical Links

### SPECIFICATIONS:

**Electrical and Optical Characteristics: (Condition:  $T_a=T_{OP}$ )**

Parameter	Symbol	Min.	Typical	Max.	Unit
Transmitter Differential Input Voltage	+/-TX_DAT	200		1600	mV p-p
Supply Current	I <sub>CC</sub>		200	250	mA
Tx_Disable Input Voltage – Low	V <sub>IL</sub>	0		0.8	V
Tx_Disable Input Voltage – High	V <sub>IH</sub>	2.0		V <sub>CC</sub>	V
Tx_Fault Output Voltage – Low	V <sub>OL</sub>	0		0.8	V
Tx_Fault Output Voltage – High	V <sub>OH</sub>	2.0		V <sub>CC</sub>	V
Receiver Differential Output Voltage	+/-RX_DAT	400		1400	mV p-p
Rx_LOS Output Voltage- Low	V <sub>OL</sub>	0		0.8	V
Rx_LOS Output Voltage- High	V <sub>OH</sub>	2.0		V <sub>CC</sub>	V

**Transmitter:**

Parameter	Symbol	Min.	Typical	Max.	Unit
Data Rate	B	-	155	-	Mb/s
Centre Wavelength	$\lambda_C$	1263	1310	1360	nm
Output Spectral Width	$\Delta\lambda(\text{RMS})$	-	-	3	nm
Average Output Power	$P_o$	-5	-	0	dBm
Extinction Ratio	EXT	10	-	-	dB
Data Input Voltage-High	$V_{IHS}$	$V_{CC}-1.16$	-	$V_{CC}-0.89$	V
Data Input Voltage -Low	$V_{ILS}$	$V_{CC}-1.82$	-	$V_{CC}-1.48$	V
Supply Current	$I_{CC}$	-	90	110	mA
Output Optical Eye	Compliant with ITU-T G.957				

**Receiver:**

Parameter	Symbol	Min.	Typical	Max.	Unit
Receive Sensitivity	$P_{min}$	-	-	-34	dBm
Maximum Input Power	$P_{MAX}$	-3	-	-	dBm
RX_LOS Assert Level	LOS A	-45	-	-	dBm
RX_LOS De Assert Level	LOS D	-	-	-35	dBm
Output High Voltage	$V_{OH}$	$V_{CC}-1.03$	-	$V_{CC}-0.89$	V
Output Low Voltage	$V_{OL}$	$V_{CC}-1.82$	-	$V_{CC}-1.63$	V
Operating Wavelength	$\lambda_C$	1100	-	1600	nm
Supply Current	$I_{CC}$	-	80	110	mA

**Absolute Maximum Ratings: ( $T_c=25^\circ$ )**

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	$T_{ST}$	-40	+85	$^\circ\text{C}$
Operating Temperature	$T_{IP}$	0	+70	$^\circ\text{C}$
Input Voltage	$T_{CC}$	0	+5	V

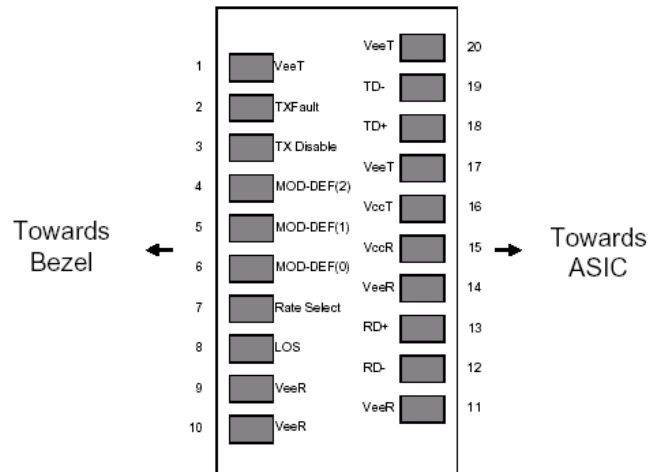
**Recommended Operating Environment:**

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V <sub>CC</sub>	+3.0	+3.3	+3.6	V
Operating Temperature	T <sub>OP</sub>	0	-	+70	°C

**Timing Characteristics:**

Parameter	Symbol	Min.	Typical	Max.	Unit
TX_DISABLE Assert Time	t <sub>off</sub>		3	10	usec
TX_DISABLE Negate Time	t <sub>on</sub>		0.5	1	msec
Time to Initialize Include Reset of TX_FAULT	t <sub>int</sub>		30	300	msec
TX_FAULT from Fault to Assertion	t <sub>fault</sub>		20	100	usec
TX_DISBEL Time to Start Reset	t <sub>reset</sub>	10			usec
Receiver Loss of Signal Assert Time (Off to On)	T <sub>A,RX_LOS</sub>			100	usec
Receiver Loss of Signal Assert Time (On to Off)	T <sub>d,RX_LOS</sub>			100	usec

**Pin Assignment:**



**Pin out of Connector Block on Host Board**



**155Mb/s Hot Pluggable, Duplex LC**  
**+3.3V, 1310nm, FP-LD**  
**Single-Mode SFP Optical Transceiver without DDMI**  
**PSFP-03-1311S-12F**

**Pin Description:**

Pin	Symbol	Name/Description	Ref.
1	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1
2	T <sub>FAULT</sub>	Transmitter Fault. <b>Low normal operation, High Fault indication</b>	
3	T <sub>DIS</sub>	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
10	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
11	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
15	V <sub>CCR</sub>	Receiver Power Supply	
16	V <sub>CCT</sub>	Transmitter Power Supply	
17	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1

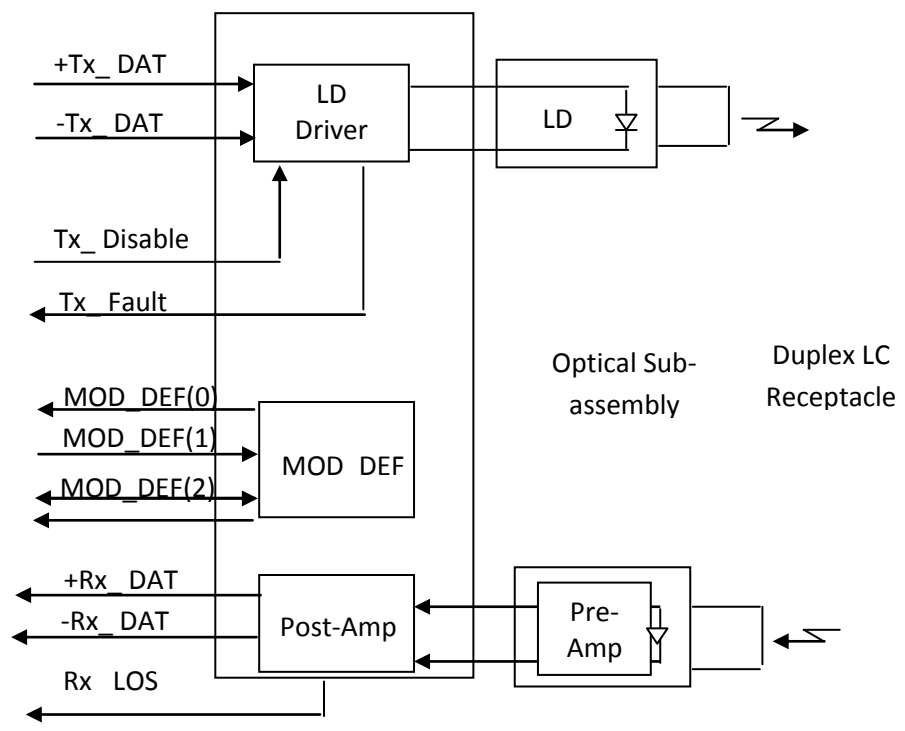
**Notes:**

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.



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**+3.3V, 1310nm, FP-LD**  
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**Block Diagram of Transceiver:**



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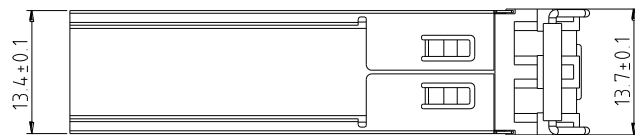
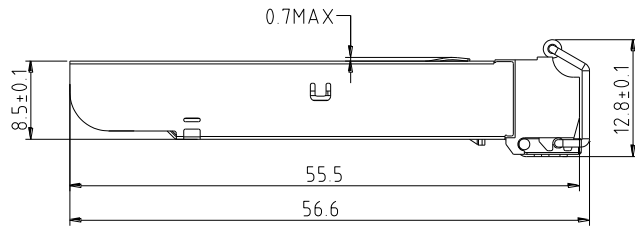
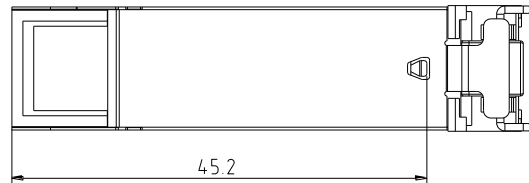
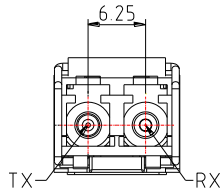
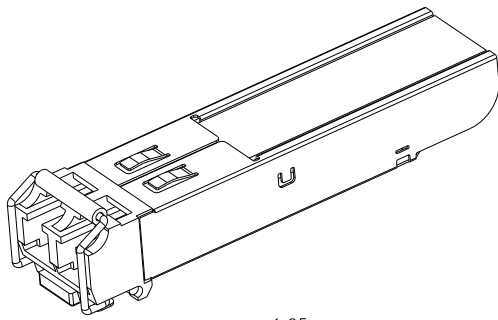
**Serial ID Memory Contents:**

Data Address	Length (Byte)	Name of Length	Description and Contents
<b>Base ID Fields</b>			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	SONET
11	1	Encoding	NRZ (03h)
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: PeakOptical®
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "PSFP-xxxxxx" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
<b>Extended ID Fields</b>			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	PeakOptical®'s Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
<b>Vendor Specific ID Fields</b>			
96-127	32	Readable	PeakOptical® specific date, read only

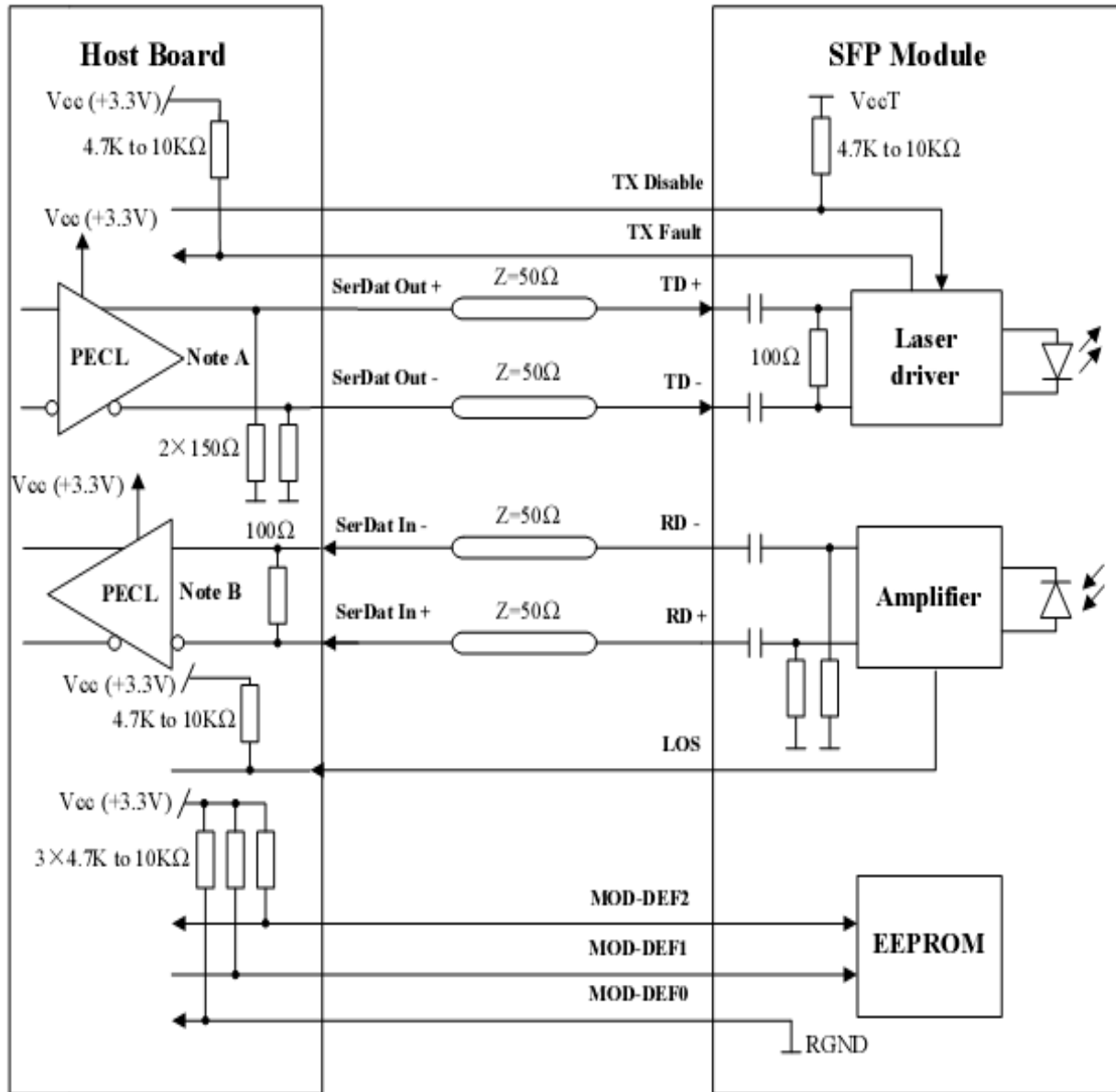
**Mechanical Dimensions:**

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**Mechanical Dimensions:**



**Recommended Circuit:**



**Note A:** Circuit assumes open emitter output

**Note B:** Circuit assumes high impedance internal bias @Vcc-1.3V