

## Product Features

- ✧ Dual data-rate of 1.25Gbps/1.063Gbps operation
- ✧ TX1310nm FP laser
- ✧ RX1550 PIN photo detector for 20km transmission
- ✧ BIDI LC/UPC type pluggable optical interface
- ✧ Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- ✧ RoHS compliant and lead-free
- ✧ Single +3.3V power supply
- ✧ Support Digital Diagnostic Monitoring interface
- ✧ Case operating temperature Commercial: 0°C to +70°C  
Extended: -10°C to +80°C  
Industrial: -40°C to +85°C



## Applications

- ✧ Gigabit Ethernet
- ✧ Fiber Channel
- ✧ Switch to Switch interface
- ✧ Switched backplane applications
- ✧ Router/Server interface
- ✧ Other Optical Links

## Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
FH-SB3512CDL20 FH-SB3512IDL20	-9 ~ -3 db	-25db	1.25G	TX1310/RX1550nm	20km

## General

FH-SB3512CDL20 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

## General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			1250		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc <sub>5</sub>			220	mA	
Operating Case Temp.	Tc	0		70	°C	

## Electrical Input/Output Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
<b>Transmitter</b>						
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	V <sub>IH</sub>	2.0	V <sub>CC</sub> +0.3	V	
	L	V <sub>IL</sub>	0	0.8		
Tx Fault output	H	V <sub>OH</sub>	2.0	V <sub>CC</sub> +0.3	V	2
	L	V <sub>OL</sub>	0	0.8		
Input Diff. Impedance	Z <sub>in</sub>		100		Ω	
<b>Receiver</b>						
Diff. output voltage swing		340	650	800	mVpp	3
Rx LOS Output	H	V <sub>OH</sub>	2.0	V <sub>CC</sub> +0.3	V	2
	L	V <sub>OL</sub>	0	0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.

Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and V<sub>CC</sub>+0.3V.

Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

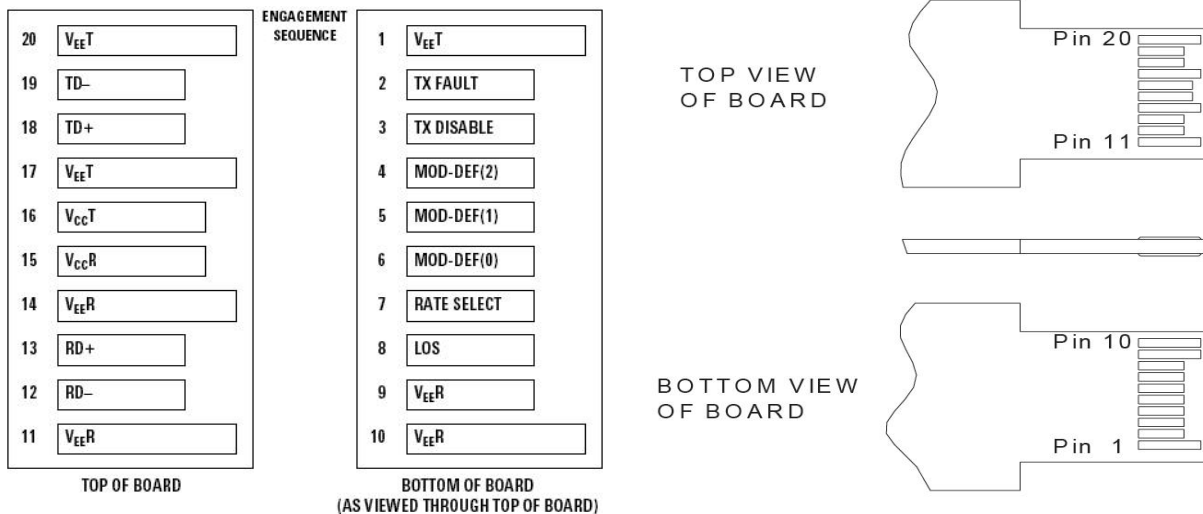
## Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
<b>Transmitter</b>						
Operating Wavelength	λ <sub>C</sub>	1270	1310	1350	nm	
Ave. output power (Enabled)	P <sub>o</sub>	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2

Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1530	1550	1570	nm	
Sensitivity	Psen			-24	dBm	3
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	4
LOS Hysteresis	Pd-Pa	0.5		6	dB	

- Note
- 1 Measure at 2<sup>23</sup>-1 NRZ PRBS pattern
  - 2 Transmitter eye mask definition
  - 3 Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10<sup>-12</sup> @PRBS=2<sup>23</sup>-1 NRZ.
  - 4 When LOS de-asserted, the RX data+/- output is signal output.

## Pin Definitions And Functions



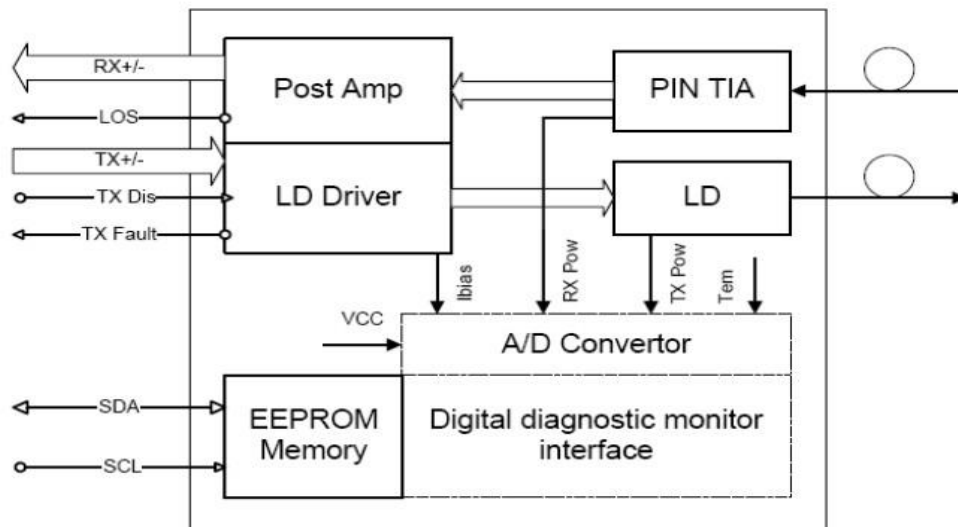
PIN	Name	Function	Notes
1	VeeT	Tx ground	



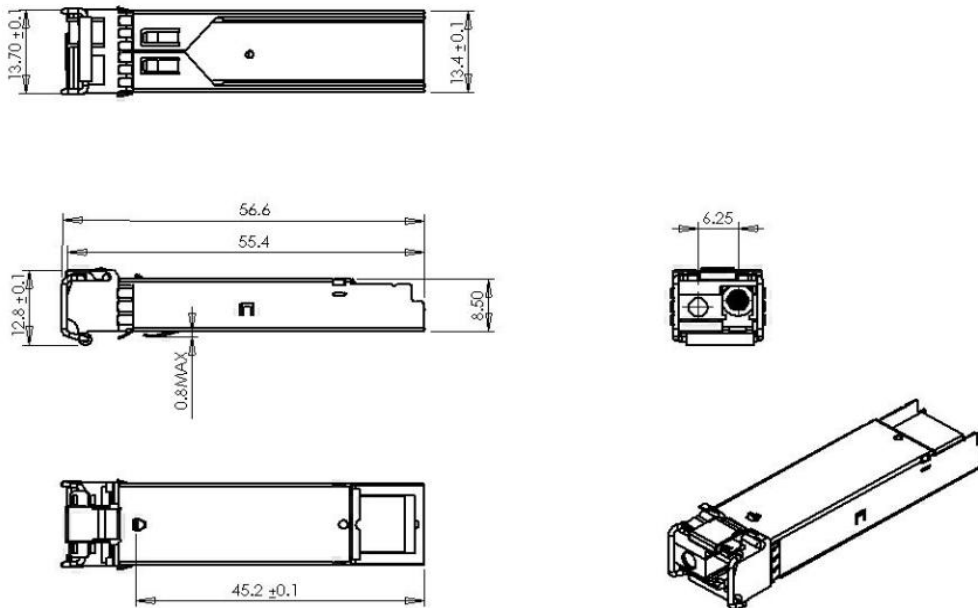
## Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70 -40 to +85	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11 to -1	dBm	±3dB	Internal/ External
RX Power	-25 to 0	dBm	±3dB	Internal/ External

## Functional Diagram



## Package Dimensions



## For More Information

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