



## Product Features

- ◇ Hot pluggable
- ◇ Optical interface compliant to IEEE 802.3ae
- ◇ Up to 300m on 50/125um MMF(2000MHZ.KM)
- ◇ 850nm VCSEL transmitter, PIN photo-detector
- ◇ SFP MSA package with duplex LC connector
- ◇ Low power consumption
- ◇ Very low EMI and excellent ESD protection
- ◇ +3.3V single power supply
- ◇ Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- ◇ Operating case temperature: 0 to 70 °C



## Applications

- ◇ 10GBASE-SR/SW 10G Ethernet
- ◇ 10G Fiber Channel
- ◇ Other optical links

## Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
FH-SP851TCDL03	-7.2 ~ -1db	-11.1db	1.25G~11.1G	850nm	300M



## General

FH-SP851TCDL03 Optical transceivers are designed for 10Gb/s serial optical interfaces for data communications with multimode fiber (MMF). The transceiver can support 1.25Gb/s to 11.1Gb/s.

The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for data-com and storage applications.

## Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	V <sub>cc</sub>	-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	Ethernet			10.3125		Gb/s	
	Fiber Channel			10.518			
Supply Voltage		V <sub>cc</sub>	3.13	3.3	3.47	V	
		V <sub>cc</sub>				V	
Supply Current		I <sub>cc5</sub>				mA	
		I <sub>cc3</sub>			300	mA	
Operating Case Temp.		T <sub>c</sub>	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**

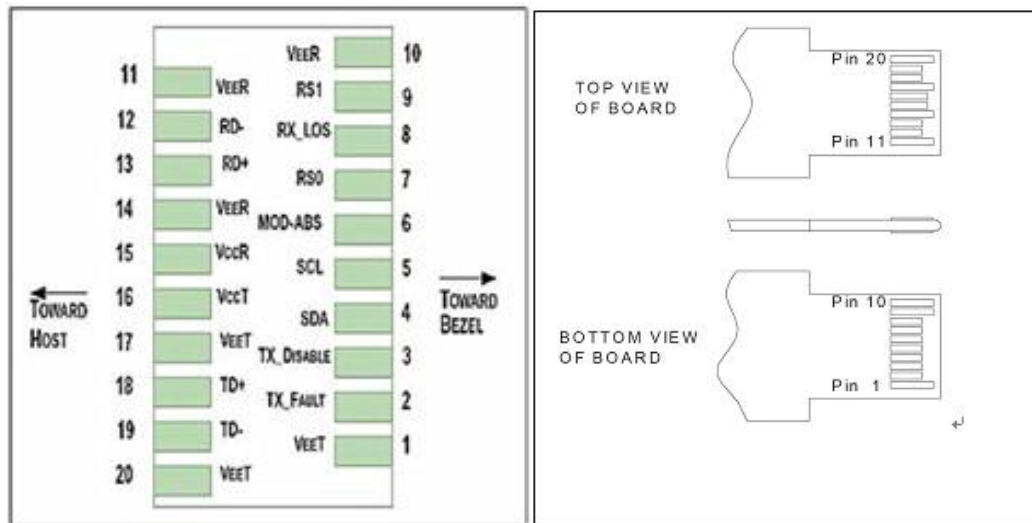
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
<b>Transmitter</b>						
Operating Wavelength			850		nm	
Ave. output power (Enabled)	Po	-6		-1	dBm	1
Extinction Ratio	ER	3.5			dB	1
RMS spectral width	$\Delta\lambda$			0.45	nm	
Rise/Fall time (20%~80%)	Tr/Tf			45	ps	2
Optical modulation amplitude	OMA			-2.8	dBm	
Dispersion penalty				3.9	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					
<b>Receiver</b>						
Operating Wavelength		840		860	nm	
Sensitivity	Psen			-11	dBm	3
Min. overload	Pimax	-1			dBm	
LOS Assert	Pa	-24			dBm	
LOS De-assert	Pd			-12	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS  $2^{31} - 1$  NRZ test pattern.

Note 2) 20%~80%

Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS  $2^{31} - 1$  NRZ test pattern for BER <  $1 \times 10^{-12}$

## Pin Definitions And Functions



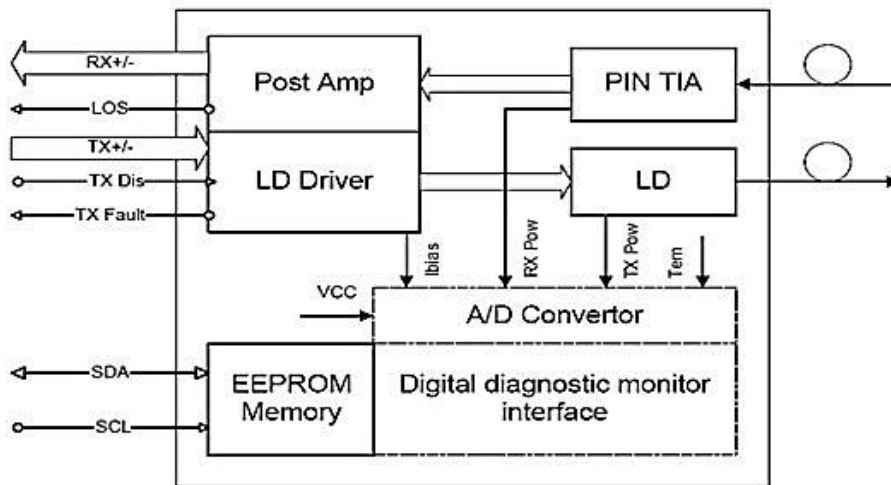
Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled



13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

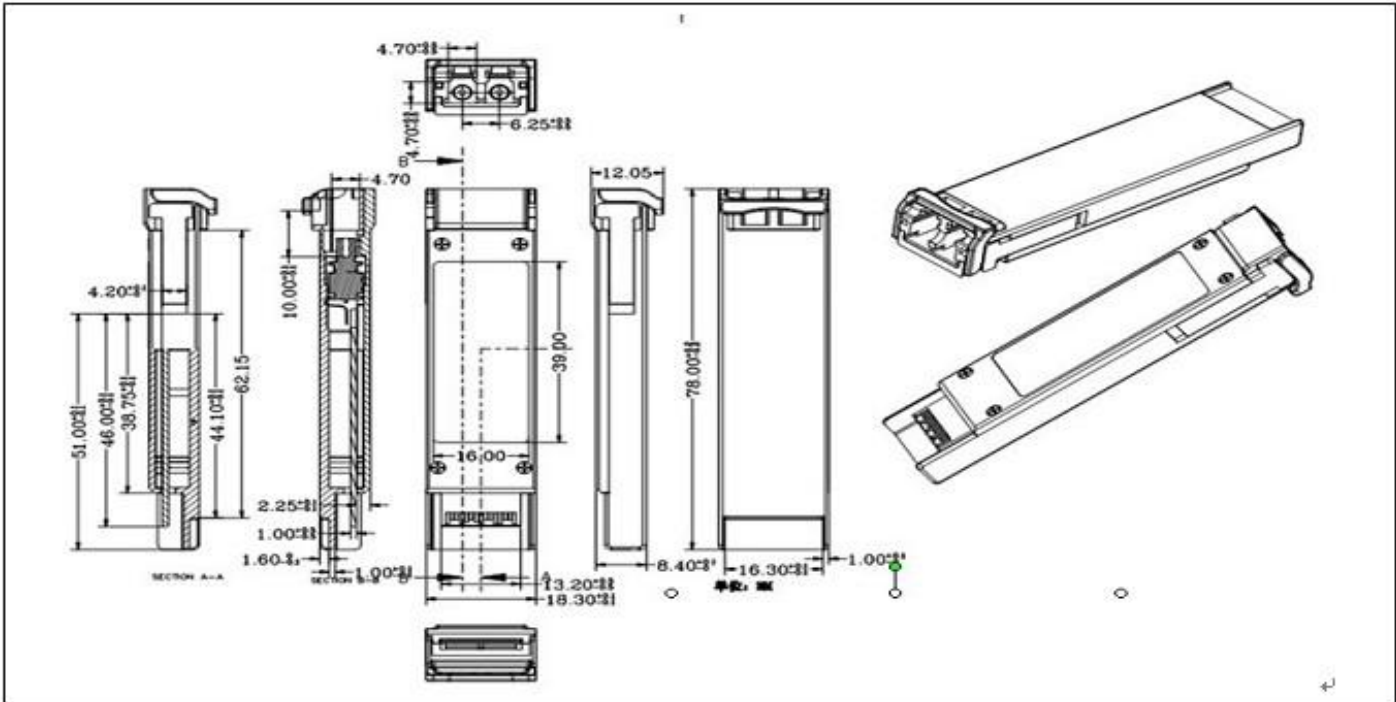
- Notes: 1. Module circuit ground is isolated from module chassis ground within the module.  
 2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.  
 3. Reference Clock input is not required.

## Functional Diagram





## Package Dimensions



## For More Information

FANG HANG TECH LIMITED

Room 908, Jingyuan Building, 28 Bulong Rd, Longgang District, Shenzhen China

Tel: +86-755-89584520

Fax: +86-755-89584520

sales@fanghangtech.com

www.fanghangtech.com