

#### **Product Features**

- → FP laser transmitter and PIN photo-detector
- ♦ Dual Data-rate of 1.25Gbps Operation
- ♦ Up to 2KM transmission distance on 50& 62.5/125μm MMF
- ♦ Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- ♦ Digital Diagnostic Monitor Interface
- ♦ Very low EMI and excellent ESD protection
- ♦ Compatible with RoHS
- ♦ Operating case 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 transmission systems

## **Ordering Information**

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
FH-S3112CDL2	-9 ~ -3db	-22db	1.25/1.0625Gbps	850/1310nm	2KM
FH-S3112EDL2	-9 ~ -3db	-22db	1.25/1.0625Gbps	850/1310nm	2KM
FH-S3112IDL2	-9 ~ -3db	-22db	1.25/1.0625Gbps	850/1310nm	2KM







FH-S3112CDL2 SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 2km transmission distance with MMF.

The transceiver consists of three sections: a FP laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. Transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA

# **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

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

## **General Operating Characteristics**

Parameter		Symbol	Min.	Тур.	Max.	Unit	Notes
Data Rate	Gigabit Ethernet			1.25		Gb/s	
	Fiber Channel			1.0625			
Supply Voltage		Vcc	3.1	3.3	3.5	V	
Supply Current		Icc			220	mA	
Operating Case Temperature			0		70		
		Тс	-10		80	$^{\circ}$	
			-45		85		



# **Electrical Input/Output Characteristics**

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes	
Transmitter								
Diff. Input Voltage Swing			300		1800	mVpp	1	
Tx Disable Input	Н	VIH	2.0		Vcc+0.3	V		
TX Bisable iliput	L	VIL	0		0.8	v		
Try Facilit Octoor	Н	Vон	2.0		Vcc+0.3	· V	2	
Tx Fault Output	L	Vol	0		0.8			
Input Diff. Impedance		Zin		100		Ω		
Receiver								
Diff. Output Voltage Swing			400		1000	mVpp	3	
Rx LOS Output	Н	Vон	2.0		Vcc+0.3	V	2	
	L	V <sub>OL</sub>	0		0.8	V	2	

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

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

<sup>3)</sup> RD+/- outputs are internally AC coupled, and should be terminated with  $100\Omega$  (differential) at the user SERDES.





# **Optical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Ave. Output Power (Enable)	Ро	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr-Tf			0.26	ns	2
Wavelength Range		1270		1360	nm	
Spectral Width (RMS)				4	nm	
Output Optical Eye		Compliar	nt with IEEE802	2.3 z (class 1 ase	r safety)	
Receiver						
Operating Wavelength		1270		1610	nm	
Sensitivity	Pimin			-22	dBm	3
Min. Overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 1250 Mb/s with PRBS 223 – 1 NRZ test pattern.

<sup>2)</sup> Unfiltered, measured with a PRBS 223-1 test pattern @1.25Gbps

<sup>3)</sup> Measured at 1250 Mb/s with PRBS 223 - 1 NRZ test pattern for BER < 1x10-12

Pin 11

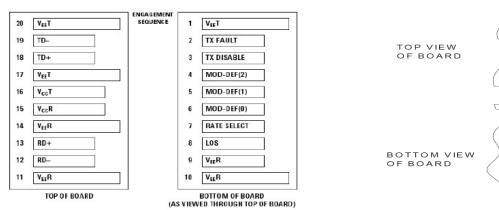




# **Diagnostics**

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	-12 to -1	dBm	±3dB	Internal/ External
RX Power	-25 to 0	dBm	±3dB	Internal/ External

### **Pin Definitions And Functions**



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	3
6	MOD-DEF0	Model present indication	3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	4
9	VeeR	Rx ground	



#### FH-S3112CDL2 1.25G SFP 1310nm LC 2km DDMI

10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	5
13	RD+	Received data out	5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	6
19	TD-	Inverse transmit data in	6
20	VeeT	Tx ground	

Notes: 1) When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7  $-10K\Omega$  resistor on the host board.

Note 2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a  $4.7 - 10 \text{K}\Omega$ resistor. Its states are:

Low (0 - 0.8V): Transmitter on

(>0.8, < 2.0V): Undefined

High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled

Note 3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a  $4.7K - 10K\Omega$  resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.

Mod-Def 0 has been grounded by the module to indicate that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

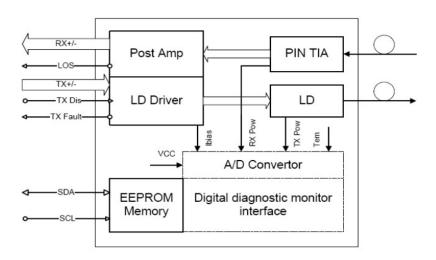
Note 4) When high, this output indicates loss of signal (LOS). Low indicates normal operation.

Note 5) RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with  $100\Omega$  (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

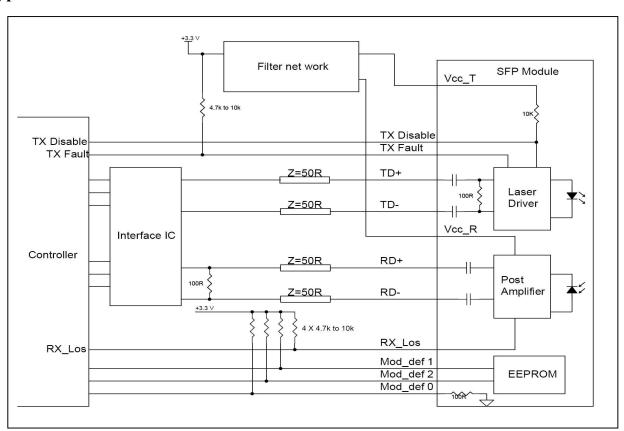
Note 6) TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with  $100\Omega$  differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.



# **Functional Diagram**



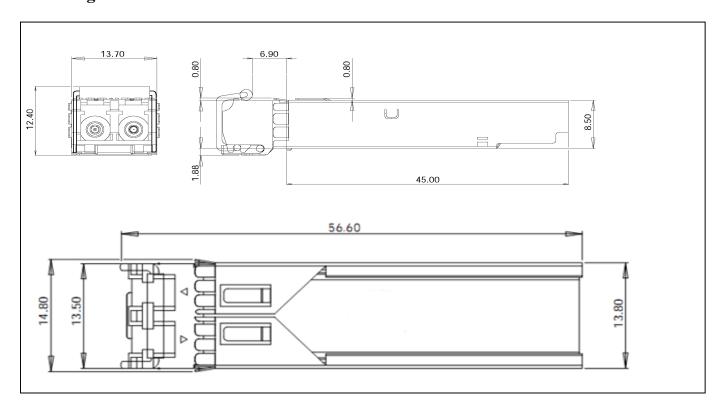
# **Typical Interface Circuit**







# **Package Dimensions**



### **For More Information**

FANG HANG TECH LIMITED

Add: Room 908 Jinyuan Building,28 Bulong Rd , Longgang District, Shenzhen China

Tel: +86-755-89584520 Fax: +86-755-89584520 sales@fanghangtech.com www.fanghangtech.com