Product Features

- ✧ Support IEEE802.3 and Fiber Channel Applicable
- ✧ Support 1.25G GbE and 1.0625G for Fiber-Channel
- ✧ Support to 200km transmission on G.652 SMF
- ✧ 1550nm transmitter with EML laser
- ✧ 1550nm receiver with APD photo-detector
- ✧ Low power consumption, < 1.5W
- ✧ Digital Diagnostic Monitor Interface
- ✧ Compliant with SFP MSA and SFF-8472
- ✧ Very low EMI and excellent ESD protection
- ✧ Operating case temperature: Commercial:0 to 70 °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-S5512CDL200	*+4~ +7db*	*-34db*	*1.25/1.0625Gbps*	*1550nm*	*200KM*

General

FH-S5512CDL200 SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 200km transmission distance with SMF.The transceiver consists of three sections: a EML laser transmitter, a APD photo-diode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.The 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.	Typ.	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			450	mA	
Operating Case Temperature		Tc	0		70	℃	

Electrical Input/Output Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Differential data input swing	VINPP	120		850	mVpp	1
Transmit Disable Voltage	VD	VCC-0.8		Vcc	V	
Transmit Enable Voltage	VEN	0		0.8		
Input differential impedance	Rin		100		Ω	
Receiver						
Differential data output swing	Vout,pp	400		1000	mVpp	2
Output rise time and fall time	Tr, Tf	28			Ps	3
LOS asserted	VLOS_F	VCC-0.8		Vcc	V	4
LOS de-asserted	VLOS_N	0		0.8	V	4

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.

2. Into 100Ω differential termination.

3. 20 – 80%. Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's sequence in the PRBS 9 is an acceptable alternative.

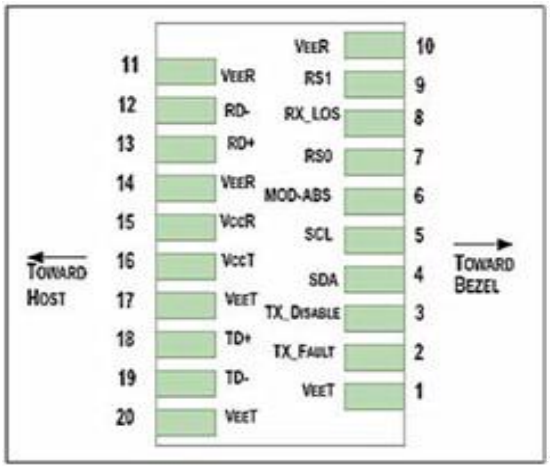
4. LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1.

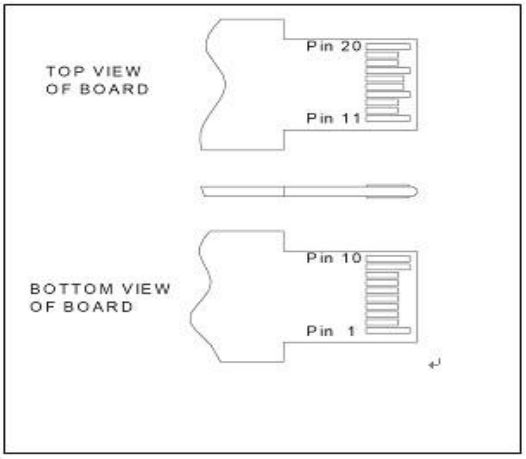
Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Ave. Output Power (Enable)	Po	+5		+7	dBm	1
Extinction Ratio	ER	30			dB	1
Relative Intensity Noise	RIN			-128	dB/Hz	
Wavelength Range		1530	1550	1565	nm	
Spectral Width (RMS)				1	nm	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 aser safety)					
Receiver						
Operating Wavelength		1260	1550	1610	nm	
Sensitivity	Pimin			-34	dBm	2
Min. Overload	Pimax			-7	dBm	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-35	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 1250 Mb/s with PRBS 223 – 1 NRZ test pattern.
2) Measured at 1250 Mb/s with PRBS 223 – 1 NRZ test pattern for BER < 1x10-12

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

1.Module circuit ground is isolated from module chassis ground within the module.

2.should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.

3.Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

4.Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to10 kΩ.Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.

5. RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

Serial Interface for ID and DDM

SFP transceiver support the 2-wire serial communication protocol as defined in the SFP+ MSA. The standard SFP+ serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information. Additionally, This SFP+ transceivers provide an enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

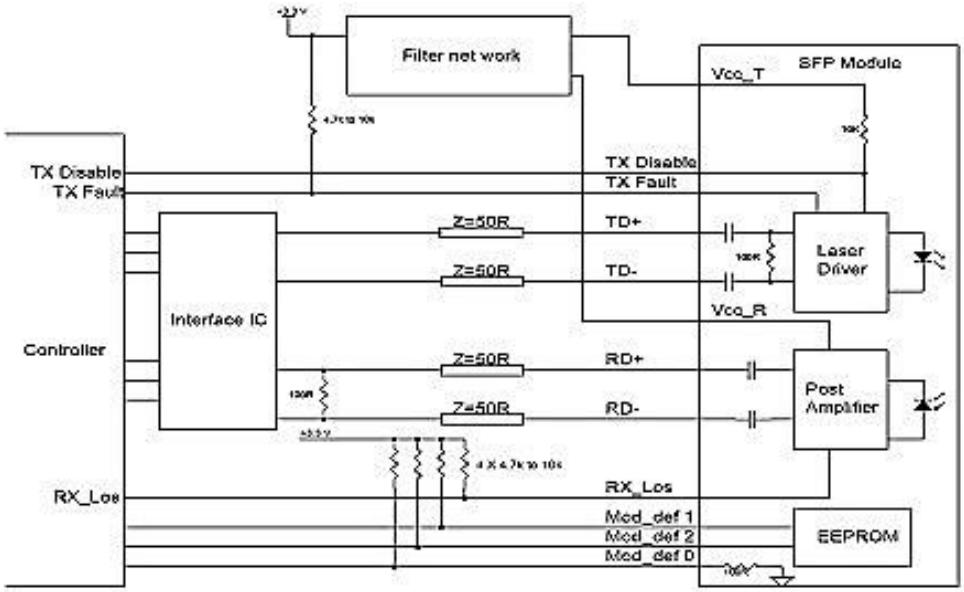
The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X(A0h), so the originally monitoring interface makes use of the 8 bit address(A2h), so the originally defined serial ID memory map remains unchanged. The structure of the memory map is shown in Table1.

2 wire address 1010000X (**A0h**)	
Address	**Information**
0~95	Serial ID Defined by SFP MSA (96 bytes)
96~127	Vendor Specific (32 bytes)
128~255	Reserved,SFF8079 (128 bytes)

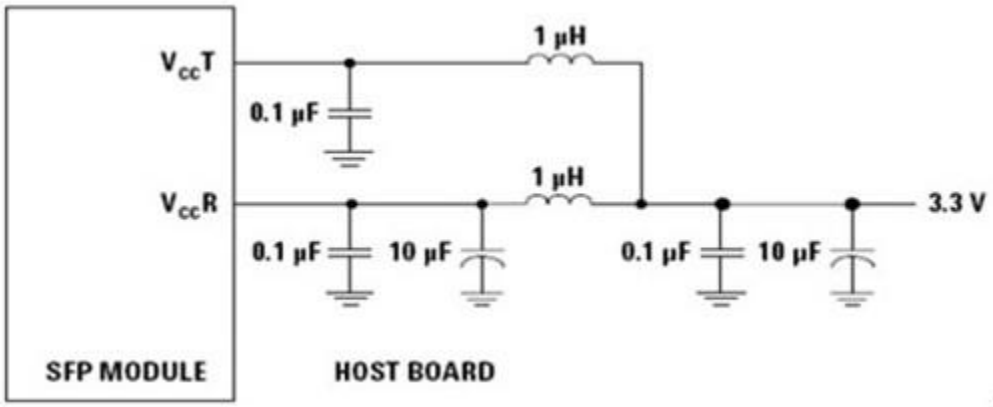
2 wire address 1010001X (**A2h**)	
Address	**Information**
0~55	Alarm and Warning Thresholds (56 bytes)
56~95	Calibration Constants (40 bytes)
96~119	Real Time Diagnostic Interface (24 bytes)
120~127	Vender Specific (8 bytes)
128~247	User Writable EEPROM (120 bytes)
248~255	Vender Specific (8 bytes)

Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)

Typical Interface Circuit



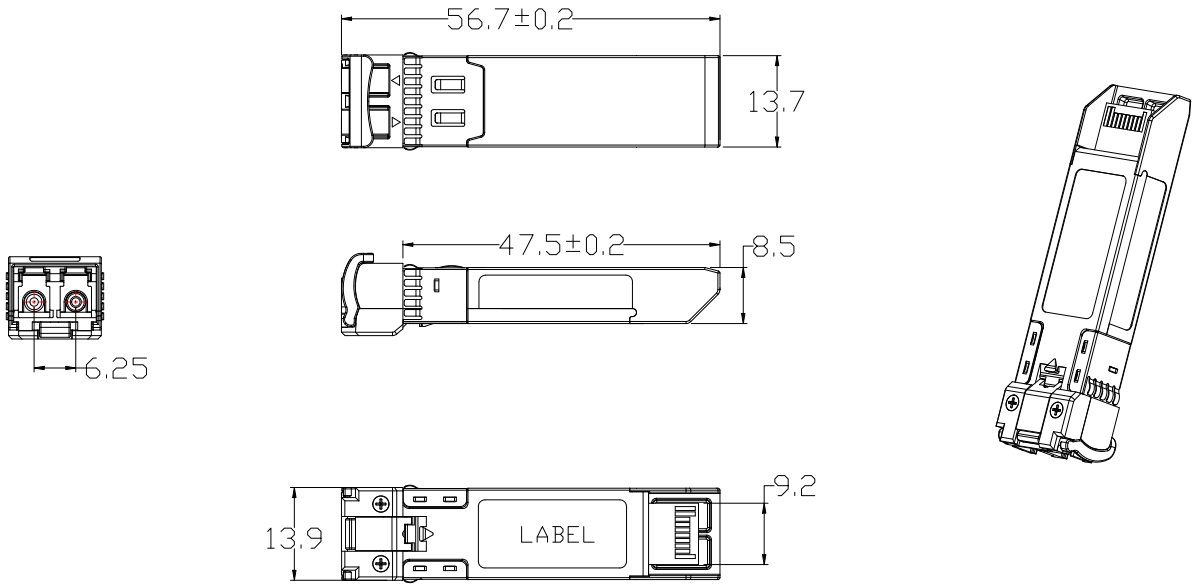
Recommended power supply filter



Note:

Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value

Package Dimensions



Dimensions are in Millimeter

Tolerance without indication is ±0.1mm

For More Information

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