SFP-2MM-850-05

Product Features

- 850nm VCSEL laser and PIN photodetector
- Up to 1.25Gbps data rate operation
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- 500m transmission with 50/125μm MMF
- 300m transmission with 62.5/125μm MMF
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- RoHS compliant
- Case operating temperature :
- Commercial: 0°C to +70°C / Extended: -10°C to +80°C / Industrial: -40°C to +85°C

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Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched back plane applications
- Router/Server interface
- Other optical transmission systems

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-2MM-850-05	-11 ~ 1db	-18db	1.25/1.0625Gbps	850nm	550M

General

SFP-2MM-850-05 Transceivers are high performance, cost effective modules supporting data-rate of 1.25Gbps and 550m transmission distance with MMF.

The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode 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.

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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 modul

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			220	mA	
Operating Case Temperature		Tc	0		70	℃	
			-10		80		
			-45		85		

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter							
Diff. Input Voltage Swing			300		1600	mVpp	1
Tx Disable Input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault Output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

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Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. Output Voltage Swing			400		1000	mVpp	3
Rx LOS Output	H	VOH	2.0		Vcc+0.3	V	2
	L	V_{OL}	0		0.8		

Note

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

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 Vcc+0.3V.

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

Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Ave. Output Power (Enable)	Po	-11		-1	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr-Tf			0.26	ns	2
Wavelength Range		840	850	860	nm	
Spectral Width (RMS)				0.65	nm	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 aser safety)					
Receiver						
Operating Wavelength		770		860	nm	
Sensitivity	Pimin			-18	dBm	3
Min. Overload	Pimax	0			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-19	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note: 1) Measured at 1250 Mb/s with PRBS 2^7 – 1 NRZ test pattern.

2) Unfiltered, measured with a PRBS 2^7-1 test pattern @1.25Gbps

3) Measured at 1250 Mb/s with PRBS 2^7 – 1 NRZ test pattern for BER < $1x10^{-12}$

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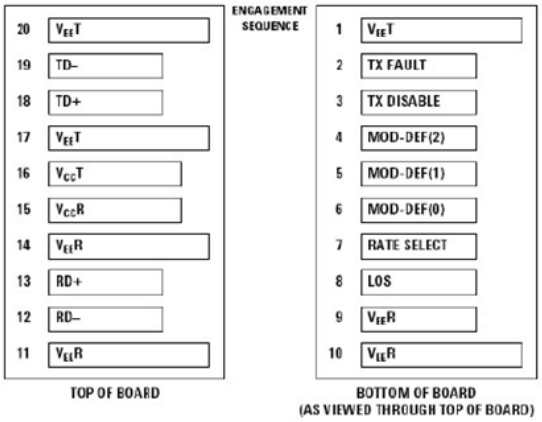
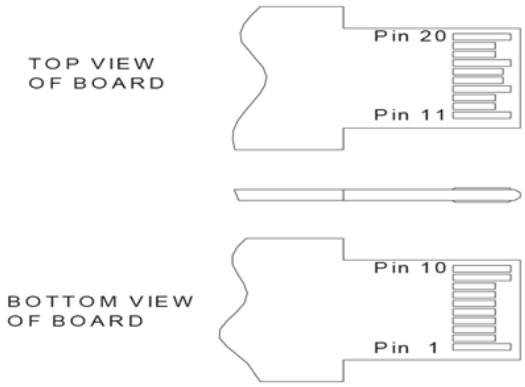
Diagnostics

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 15	mA	±10%	Internal/ External
TX Power	-13 to -1	dBm	±3dB	Internal/ External
RX Power	-21 to 0	dBm	±3dB	Internal/ External

Pin Definitions And Functions





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PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active “H”	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on “H”	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active “H”	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 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 – 10KΩ 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 – 10KΩ 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

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Note 3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ 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

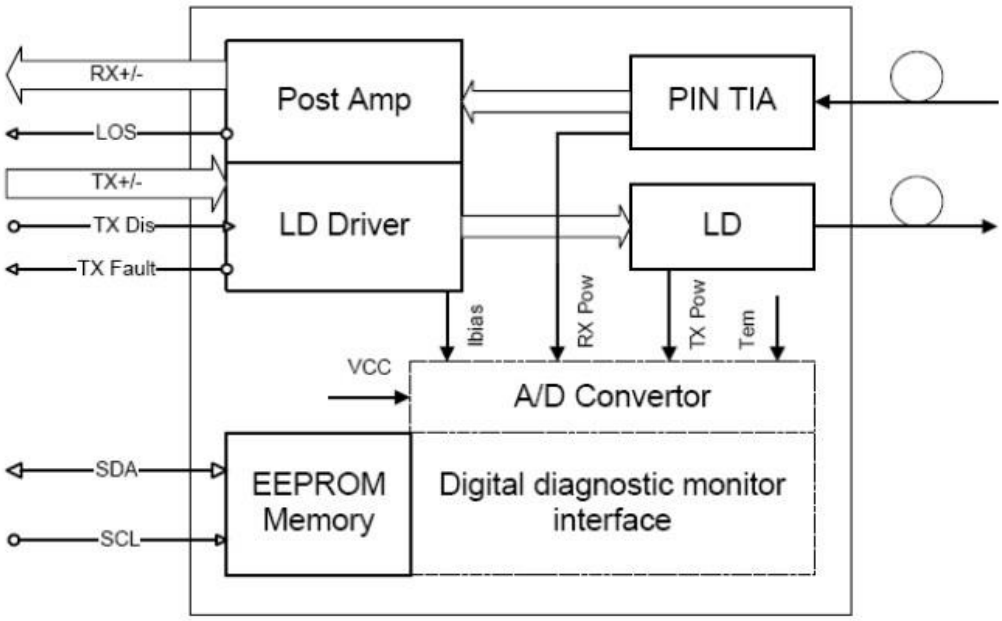
Mod-Def 2 is the data line of two wire serial interface for serial ID

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 100Ω (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 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Functional Diagram



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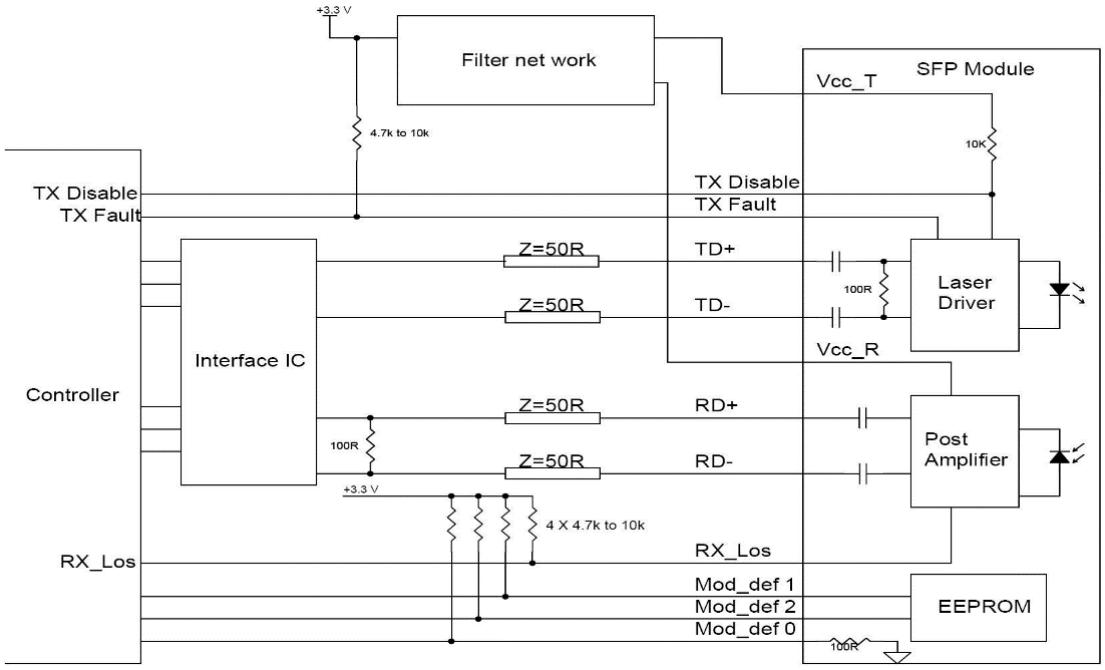
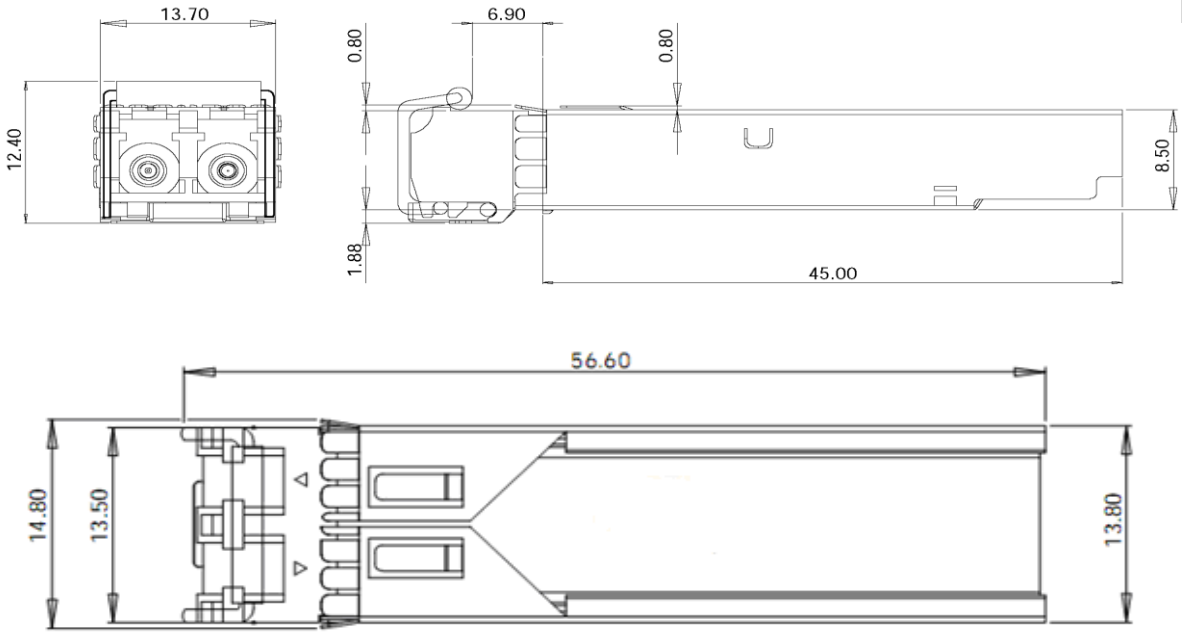
Typical Interface Circuit



Package Dimensions



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For More Information

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