

# XSM851-M5Lx – 1.25 Gbps SFP 550 m Reach Optical Transceiver



- A VCSEL laser transmitter.
- A PIN photodiode with an integrated trans-impedance preamplifier (TIA).
- A microcontroller unit (MCU) for precise control and monitoring.

All units adhere to Class I laser safety standards for reliable and safe operation. Additionally, the transceivers comply with the SFP Multi-Source Agreement (MSA) and the SFF-8472 standard. For detailed specifications, refer to the SFP MSA documentation.

## APPLICATIONS

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interfaces
- Switched backplane applications
- Router/Server interfaces
- Other optical transmission systems

## DESCRIPTION

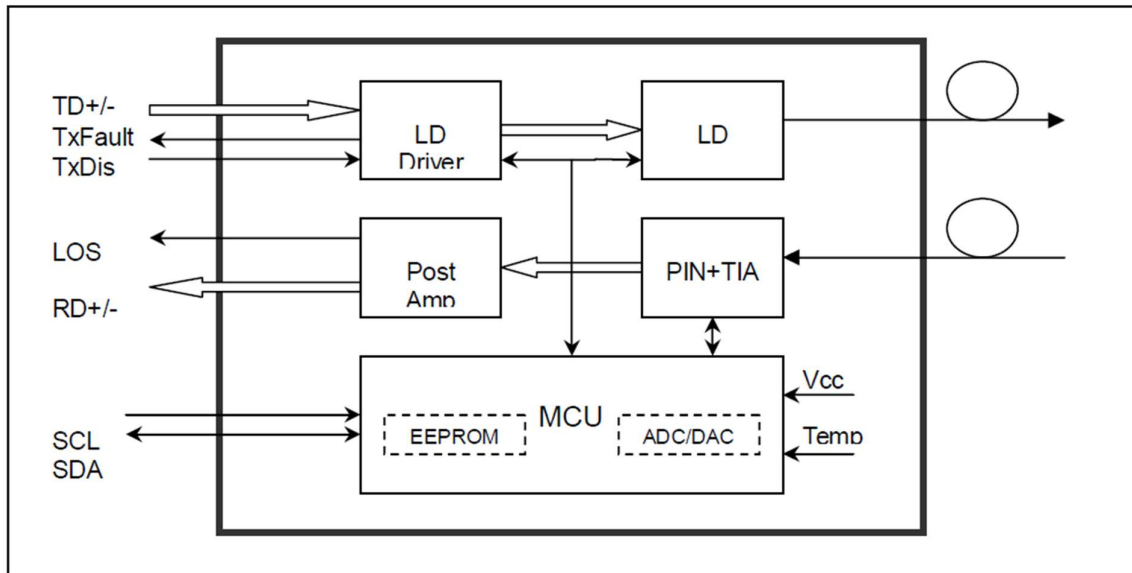
The XSM851-M5Lx SFP transceiver is a high-performance, cost-effective optical module designed to support a data rate of 1.25 Gbps with transmission distances of up to 550 meters over multimode fiber (MMF).

This module integrates three key components:

## FEATURES

- Compliant with 100GBASE-ER1 BIDI standards
- Data Rate: 1.25 Gbps operation.
- Laser Technology: 850 nm VCSEL laser and PIN photodetector.
- Connectivity: Compliant with SFP MSA and SFF-8472 standards, featuring a duplex LC receptacle.
- Monitoring Capabilities: Supports Digital Diagnostic Monitoring with internal or external calibration options.
- Transmission Range:
  - Up to 550 m over 50/125  $\mu$ m multimode fiber (MMF).
  - Up to 300 m over 62.5/125  $\mu$ m MMF.
- Environmental Compliance: Fully compatible with RoHS standards.
- Power Requirements: Operates on a single +3.3 V power supply.
- Operating Temperature Ranges:
  - Standard: 0°C to +70°C.
  - Extended: -20°C to +85°C.
  - Industrial: -40°C to +85°C.

## MODULE BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Typical	Max	Unit
Power Supply Voltage	VCC	-0.5	-	4.5	V
Storage temperature	TST	-40	-	85	°C
Operating Humidity	RH	5	-	85	%

## RECOMMENDED OPERATING ENVIRONMENT

Parameters	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc			300	mA
Operating Case temperature - Std	Tc	0		70	°C
Operating Case temperature - Ext	Tc	-20		85	°C
Operating Case temperature - Ind	Tc	-40		85	°C
Data Rate			1.25		Gbps

## OPTICAL AND ELECTRICAL SPECIFICATIONS

XSM851-M5Lx: (VCSEL and PIN, 500 m Reach)

Parameters	Symbol	Min.	Typical	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_c$	830	850	860	nm	
Spectral Width (RMS)	$\Delta\lambda$			0.85	nm	
Average Output Power	$P_{out}$	-9.5		-3.5	dBm	1
Extinction Ratio	ER	9			dB	
Optical Rise/Fall Time (20%~80%)	tr/tf			0.26	ns	
Data Input Swing Differential	$V_{IN}$	400		1800	mV	2
Input Differential Impedance	$Z_{IN}$	90	100	110	$\Omega$	
TX Disable	Enable	2.0	$V_{cc}$	V	V	
	Disable	0	0.8	V	V	
TX Fault	Fault	2.0	$V_{cc}$	V	V	
	Normal	0	0.8	V	V	
<b>Receiver</b>						
Centre Wavelength	$\lambda_c$	770		860	nm	
Receiver Sensitivity				-18	dBm	3
Receiver Overload		0			dBm	3
LOS De-Assert	$LOS_b$			-18	dBm	
LOS Assert	$LOS_a$	-30			dBm	
LOS Hysteresis		1		4	dB	
Data Output Swing Differential	$V_{out}$	370		1800	mV	4
LOS	Enable	High	2.0	$V_{cc}$	V	
	Disable	Low		0.8	V	

### Notes

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Measured with a PRBS 2<sup>7</sup>-1 test pattern @1250Mbps, BER  $\leq 1 \times 10^{-12}$ .
4. Internally AC-coupled.

## ORDERING INFORMATION<sup>1</sup>

Part Number	Product Description
XSM851-M5LN	850 nm, 1.25 Gbps, 550 m, 0°C ~ +70°C
XSM851-M5LY	850 nm, 1.25 Gbps, 550 m, 0°C ~ +70°C, with Digital Diagnostic Monitoring
XSM851-M5LD	850 nm, 1.25 Gbps, 550 m, -20°C ~ +85°C
XSM851-M5LE	850 nm, 1.25 Gbps, 550m, -20°C ~ +85°C, with Digital Diagnostic Monitoring
XSM851-M5LL	850 nm, 1.25 Gbps, 550 m, -40°C ~ +85°C
XSM851-M5LM	850 nm, 1.25 Gbps, 550 m, -40°C ~ +85°C, with Digital Diagnostic Monitoring

### Note

1. For accurate order specification please contact XenOpt reseller before placing an order.

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