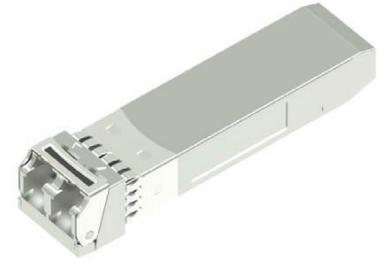


Lightem LSFP28M8507SR 25Gbps 850nm SFP28 Optical Transceiver

Lightem LSFP28M8507SR is a single-Channel, Pluggable, Fiber Optic SFP28 for 25 Gigabit Ethernet and Infiniband EDR Applications. It is a high performance module for short-range data communication and interconnect applications which operate at 25.78125 Gbps up to 70 m using OM3 fiber or 100 m using OM4 fiber. This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 20 contact edge type connector. The optical interface uses duplex LC receptacle. This module incorporates proven circuit and VCSEL technology to provide reliable long life, high performance, and consistent service.



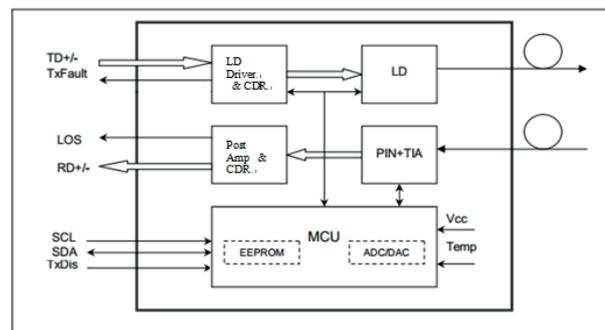
FEATURES

- Hot-pluggable SFP28 form factor
- Supports 25Gbps data rate
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- 850nm VCSEL laser and PIN photo-detector
- Internal CDR on both Transmitter and Receiver channel
- Duplex LC receptacle
- Single 3.3V power supply
- Power dissipation < 1W
- Digital diagnostics functions are available via the I2C interface
- RoHS compliant
- Commercial case temperature range: 0°C to 70°C

APPLICATIONS

- 25GBASE-SR Ethernet

Block Diagram



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	TS	-40	-	+85	°C	
Supply Voltage	VCC	0	-	3.6	V	
Operating Humidity	-	5	-	+85	%	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit
Case operating Temperature	TC	-40		+70 (Commercial)	°C
Supply Voltage	VCCT	3.13	+3.3	3.47	V
Power Supply Current	Icc		-	300 (Industrial)	mA
Fiber Length on 50/125µm high-bandwidth (OM3) MMF				70	m
Fiber Length on 50/125µm high-bandwidth (OM4) MMF				100	m

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OPTICAL AND ELECTRICAL CHARACTERISTICS

Transmitter	Symbol	Min	Typ	Max	Unit	Note
Data rate	BR		25.78		Gbps	
Centre Wavelength	λ_c	840	850	860	nm	
Spectral Width (-20dB)	σ			0.6	nm	
Average Output Power	pavg	-8.4		2.4	dBm	
Optical Power OMA	P _{OMA}	-6.4		3	dBm	
Extinction Ratio	ER	2			dB	
Differential data input swing	V _{IN,PP}	40		1000	mV	
Input Differential Impedance	Z _{IN}	90	100	110	Ω	
TX Disable		2		V _{cc}	mV	
TX Disable Enable		0		0.8	V	
TX Fault		2		V _{cc}	V	
TX Fault Normal		0		0.8	V	

Receiver	Symbol	Min	Typ	Max	Unit	Ref
Data rate	BR		25.78		nm	
Centre Wavelength	λ_c	840	850	860	dBm	
Receiver Sensitivity (OMA)	P _{sens}			-10	dBm	
Stressed Sensitivity (OMA)				-5.2	dBm	
Receiver Power (OMA)				3	dBm	
LOS De-Assert	LOSD			-13	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5			dB	
Differential data output swing	V _{out,PP}	300		850	mV	
LOS High		2		V _{cc}	V	
LOS Low				0.8	V	

Notes: 1. Receive Sensitivity measured with a prbs31 pattern @25.78125Gb/s, BER 1E-5

Parameter	Min	Max	Conditions
Tx_Disable assert time		100 μ s	Rising edge of Tx_disable to fall of output signal below 10% of nominal
Tx_Disable negate time		2ms	Falling edge of Tx_disable to rise of output signal above 90% of nominal. This only applies in normal operation, not during start up or fault recovery.
Time to initialize 2-wire interface		300ms	From power on or hot plug after the supply meeting Table 8
Time to initialize		300ms	From power supplies meeting Table 8 or hot plug or Tx_disable negated during power up, or Tx_fault recovery, until non-cooled power level I part (or non-cooled power level II for Tx_fault recovery) is fully operational.
Time to initialize cooled module & time to power up a cooled module to power level II		90s	From power supplies meeting Table 8 or hot plug or Tx_disable negated during power up, or Tx_fault recovery, until cooled power lv.I part is fully operational. Also, from stop bit low-to-high SDA transition enabling Power Lv.II until cooled module is fully operational.
Time to power up from Level II		300ms	From stop bit low-to-high SDA transition enabling power lv.II until non-cooled module is fully operational
Time to power down from Level II		300ms	From stop bit low-to-high SDA transition enabling power lv.II until module is with in power Level I requirement
Tx_fault assert		1ms	From occurrence of fault to assertion of Tx_fault
Tx_fault assert for cooled module		50ms	From occurrence of fault to assertion of Tx_fault
Tx_fault Reset	10 μ s		Time Tx_Disable must be held high to reset Tx_fault
RSO, RSI rate select timing for FC		500 μ s	From assertion till stable output
RSO, RSI rate select timing non FC		24ms	From assertion till stable output
Rx_LOS assert delay		100 μ s	From occurrence of loss signal of Rx_LOS
Rx_LOS negate delay		100 μ s	From occurrence of loss signal of Rx_LOS

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DIGITAL DIAGNOSTIC MONITORING INTERFACE

Parameter	Range	Accuracy	Calibration	Unit
Temperature	0~+70	±3	Internal / External	°C
Voltage	3 to 3.6V	±3%	Internal / External	V
Bias Current	0 to 20	±10%	Internal / External	mA
TX Power	-8 to 3	±3dB	Internal / External	dBm
RX Power	-14 to 0	±3dB	Internal / External	dBm

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA). The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring. The digital diagnostic memory map specific data field defines as following.

2 wire address 1010000X (A0h)		2 wire address 1010001X (A2h)	
0	Serial ID Defined by SFP MSA (96 bytes)	0	Alarm and warning thresholds (56 bytes)
95	Vendor Specific (32 bytes)	55	Cal constants (40 bytes)
127		95	Real Time Diagnostic Interface (24 bytes)
255	Reserved (128 bytes)	119	Vendor Specific (8 bytes)
		127	User Writable EEPROM (120 bytes)
		247	Vendor Specific (8 bytes)
		255	

PIN DESCRIPTION

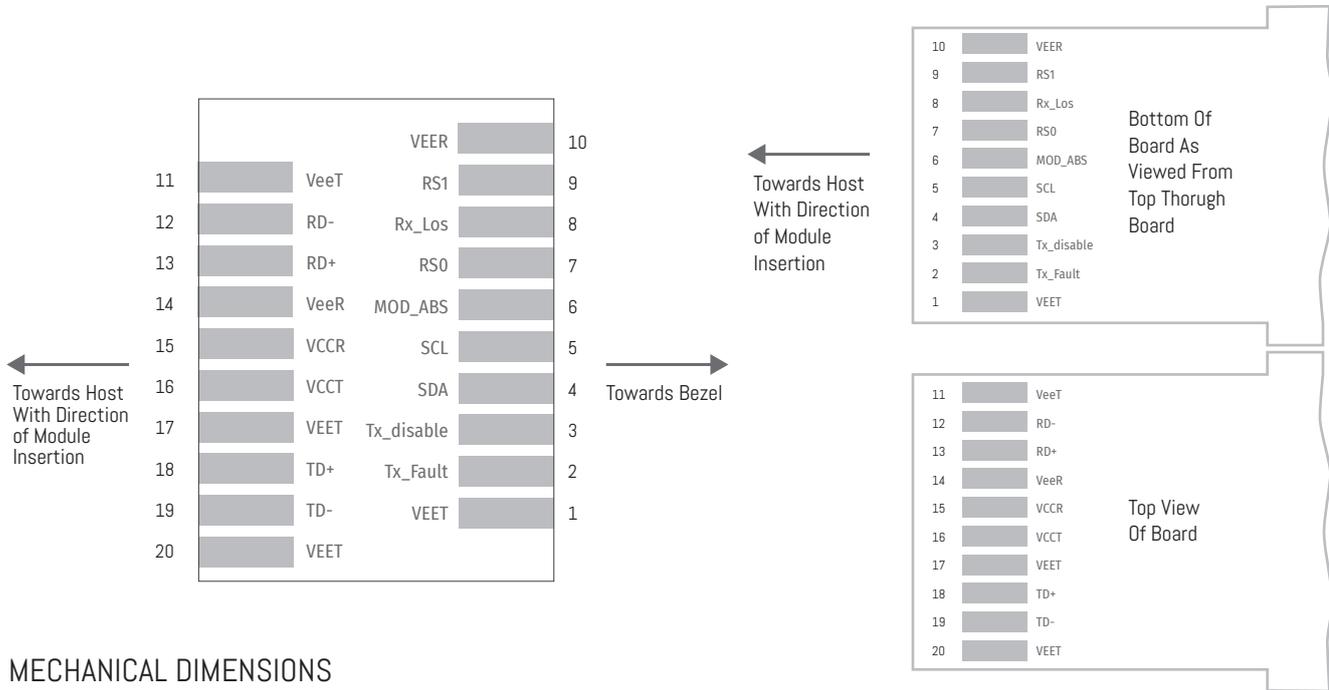
Pin	Symbol	Name /Description	NOTE
1	VeeT	Module Transmitter Ground	1
2	TX_FAULT	Module Transmitter Fault	2
3	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
4	SDA	2-wire Serial Interface Data Line	2
5	SCL	2-wire Serial Interface Clock	2
6	MOD_ABS	Module Definition, Grounded in the module	
7	RS0	Receiver Rate Select	
8	RX_LOS	Receiver Loss of Signal Indication Active LOW	
9	RS1	Transmitter Rate Select (not used)	
10	VEER	Module Receiver Ground	1
11	VEER	Module Receiver Ground	1
12	RD-	Receiver Inverted DATA output	
13	RD+	Receiver Data Output	
14	VEER	Receiver Ground	1
15	VCCR	Receiver 3.3 V Supply	
16	VCCT	Receiver 3.3 V Supply	
17	VEET	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA input	
19	TD-	Transmitter Inverted DATA input	
20	VEET	Transmitter Ground	1

Notes:

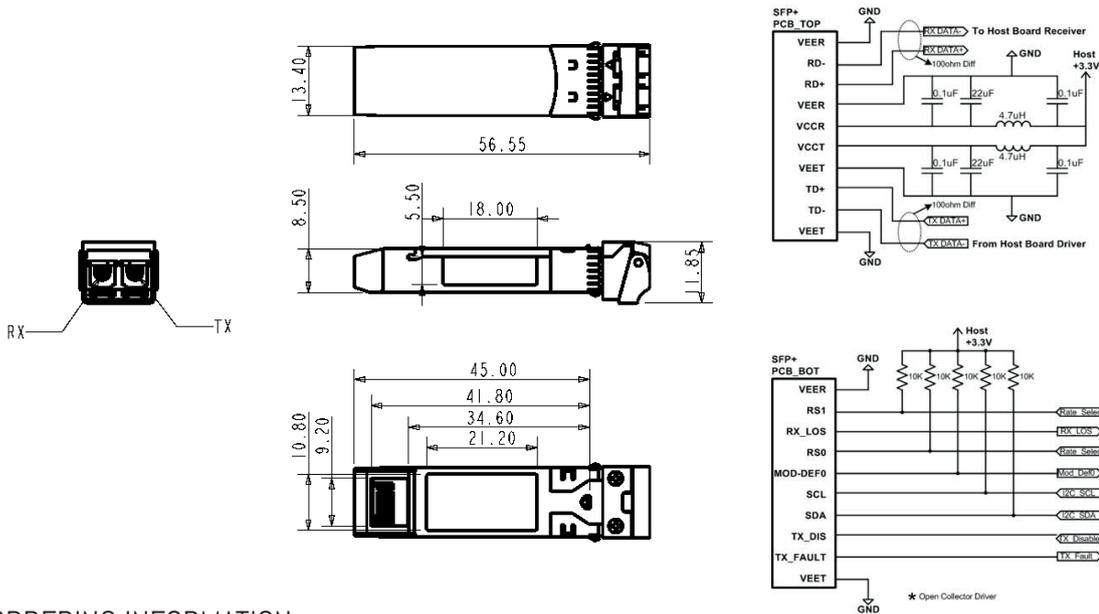
1. Module ground pins GND are isolated from the module case.
2. Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

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PIN OUT OF CONNECTOR BLACK ON HOST BOARD



MECHANICAL DIMENSIONS



ORDERING INFORMATION

PN

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