Distance

## CTM-LC0500-MM 1.25 SFP 850nm LC 550m DDMI

## **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

#### General

CTM-LC0500-MM 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.

#### **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	
	4.1				

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

#### General Operating Characteristics

00110101	zonoral operating enaractories						
Parameter		Symbol	Min.	Тур	Max.	Unit	Note
Data Rate	Gigabit Ethernet			1.25		Gb/s	
	Fiber Channel			1.0625			
Suppl	y Voltage	Vcc	3.1	3.3	3.5	V	
Suppl	y Current	lcc			220	mA	
	,		0		70		
Operating Ca	ase Temperature	Tc	-10		80	°C	
	·		-45		85		

## **Electrical Input/Output Characteristics**

Param	eter	Symbol	Min.	Тур	Max.	Unit	Note
Transmitter							
Diff. input volt	age swing		300		1600	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	Н	VOH	2.0		Vcc+0.3	V	2
·	L	VOL	0		0.8		
Input Diff. Im	pedance	Zin		100		Ω	
Receiv	/er						
Diff. output vol	tage swing		400		1000	mVpp	3
Tx Disable input	Н	VOH	2.0		Vcc+0.3		2
	L	VOL	0		0.8	V	

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

2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with to  $10k\Omega$  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.	Тур	Max.	Unit	Note
Transmitter						
Ave. Output Power (Enable)	Po	-11		1-1	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr/Tf			0.26	ns	
Wavelength Range		840	850	860	nm	2
Spectral Width (RMS)				0.65	nm	
Output Optical Eye	Complia	nt with IE	EE802	.3 z (class	1 laser s	afety)
Receiver						
Operating Wavelength		750		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 27 - 1 NRZ test pattern.

2) Unfiltered, measured with a PRBS 27-1 test pattern @1,25Gbps

3) Measured at 1250 Mb/s with PRBS 27 - 1 NRZ test pattern for BER < 1x10-12

### **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 | CTM-LC0500-MM

- I I - I UD	-1000	1.20/ 1.0020 Obp3	00011111	Jookiii
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

**Data Rate** 

SFP-100FX85-MM SFP 155M 850nm 2KM SN:S0185071120103

CE FC

Wavelength

# Pin Definitions And Functions

Rec. Sens

29 V <sub>II</sub> T	SOURNE 1 VILT	Pin 20
19 13-	2 TX FAULT	TOP VIEW
10 12+	3 TX DESAULE	OFBOARD
17 V <sub>B</sub> T	4 MOD-DEF(2)	Pin 11E
16 V <sub>EC</sub> T	S MOD-DEF(1)	
15 V <sub>EC</sub> R	6 MOD-DEF(II)	
14 V <sub>H</sub> R	7 RATE SELECT	
13 RD+	B 105	Pin 10p
12 RD-	5 V <sub>11</sub> R	BOTTOM VIEW )
11 V <sub>H</sub> R	11 V <sub>II</sub> R	OF BOARD Pin 1

	TOP OF BOARD	DOTTOM OF BOARD)  LES YEAVES THROUGH TOP OF SOLERO)	
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	Note 6
17	VeeT	Tx ground	Note 6
18	TD+	Transmit data in	
19	TD-	Inverse transmit data in	
20	VeeT	Tx ground	

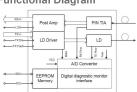
Notes: 1) When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 - 10K $\Omega$  resistor on the host board. 2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a  $4.7 - 10K\Omega$  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

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 .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

4) When high, this output indicates loss of signal (LOS). Low indicates normal operation. 5) RD+/-: These are the differential receiver outputs. They are AC coupled  $100\Omega$  differential lines which should be terminated with  $100\Omega$  (differential) at the user SERDES. The AC

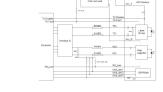
coupling is done inside the module and is thus not required on the host board. 6)  $\overrightarrow{TD}+\overrightarrow{J}-:$  These are the differential transmitter inputs. They are AC-coupled, differential lines with  $100\Omega$  differential termination inside the module. The AC coupling is done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

## **Functional Diagram**



module and is thus not required on the host board.

# Package Dimensions



**Typical Interface Circuit** 



