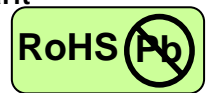


4.25 Gbps Fibre Channel Single Mode Transceiver



SFP, Duplex LC Connector, CWDM LD for Single Mode Fiber, RoHS Compliant

Digital Diagnostics Functions, Power Budget 17.5dB



Features

- CWDM 8 wavelengths Transmitter
- Multi Data Rate: from 1.062 to 4.25Gbps, NRZ
- Single +3.3V Power Supply
- RoHS Compliant and Lead-free
- AC/AC Differential Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Duplex LC Connector
- Compliance with ANSI specifications for Fibre Channel applications
- Eye Safety
Designed to meet Laser Class 1 comply with EN60825-1

Applications

- CWDM
- Fibre Channel Links

Description

The CT-4250TSP-CE6L-D series from Coretek Opto Corp. are the high performance and cost-effective modules for serial optical data communication applications specified for single mode of multi-rate from 1.062 to 4.25 Gb/s.. It operates with +3.3V power supply. The module is intended for single mode fiber, operates at a nominal wavelength of CWDM and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module consists of a transmitter optical subassembly, a receiver optical subassembly and an electrical subassembly. All of them are housed in a metal package and the combination produces a reliable component.

The module is a duplex LC connector transceiver designed to provide Fibre Channel compliant link at 1.062 , 2.125 and 4.25 Gb/s applications. The characteristics are performed in accordance with ANSI Fibre Channel Physical Interface (FC-PI-2) Rev 7.0

EMC

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

- 1) FCC in the United States
- 2) CENELEC EN55022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the transceivers have been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

Eye Safety

The transceivers have been designed to meet Class 1 eye safety and comply with EN 60825-1.

4.25 Gbps Fibre Channel Single Mode Transceiver



Product Information

Model Number	Wavelength	Latch Color	Operating Voltage & SD Output	Distance	Output Power	Sensitivity
CT-4250TSP-CE6L-D	1470 nm	Gray	3.3V TTL AC/AC	40 km	1 ~ +5 dBm	≤ -16.5 dBm
	1490 nm	Violet				
	1510 nm	Blue				
	1530 nm	Green				
	1550 nm	Yellow				
	1570 nm	Orange				
	1590 nm	Red				
	1610 nm	Brown				

ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T _S	-40	85	°C	
Supply Voltage	V _{CC}	0	6	V	
Data Input Voltage	---	0	V _{CC}	V	
Supply Current	I _S		300	mA	

OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Case Operating Temperature	T _A	0		70	°C	
Supply Voltage	V _{CC}	3.1		3.5	V	
Data Input Voltage Swing	V _{ID}	300		1860	mV	

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Transmitter					
Transmitter Supply Current	I _{CC} T		200	mA	
Tx_Disable Input Voltage - Low	V _{IL}	0	0.8	V	
Tx_Disable Input Voltage - High	V _{IH}	2.0	V _{CC}	V	
Tx_Fault Output Voltage - Low	V _{OL}	0	0.8	V	
Tx_Fault Output Voltage - High	V _{OH}	2.0	V _{CC}	V	
Receiver					
Receiver Supply Current	I _{CC} R		100	mA	
Receiver Data Output Differential Voltage	V _{OD}	0.4	1.3	V	
Rx_LOS Output Voltage - Low	V _{OL}	0	0.8	V	
Rx_LOS Output Voltage - High	V _{OH}	2.0	V _{CC}	V	
MOD_DEF (1) , MOD_DEF (2) - Low	V _{IL}	-0.6	V _{CC} × 0.3	V	
MOD_DEF (1) , MOD_DEF (2) - High	V _{IH}	V _{CC} × 0.7	V _{CC} + 0.5	V	

4.25 Gbps Fibre Channel Single Mode Transceiver



TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	P _o	1		5	dBm	1
Optical Modulation Amplitude@4.25Gb/s	OMA	290			μW	
Optical Extinction Ratio	ER	4			dB	
Center Wavelength	λ _c	1464.5	1470	1477.5	nm	
		1484.5	1490	1497.5		
		1504.5	1510	1517.5		
		1524.5	1530	1537.5		
		1544.5	1550	1557.5		
		1564.5	1570	1577.5		
		1584.5	1590	1597.5		
		1604.5	1610	1617.5		
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
RIN	RIN			-120	dB/Hz	
Optical Rise time (20%-80%)	t _r			105	ps	2
Optical Fall time (20%-80%)	t _f			105	ps	2
Total Jitter	TJ			0.25	UI	
Deterministic Jitter	DJ			0.15	UI	

RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	P _{max}	0			dBm	3
Minimum Input Optical Power	P _{min}	4.25Gb/s		-16.5	dBm	3
		2.125Gb/s		-20.0		3
		1.063 Gb/s		-22.0		3
Operating Wavelength	λ	1450		1620	nm	
Loss of Signal - Asserted	P _A	-30			dBm	
Loss of Signal - Deasserted	P _D			-19	dBm	
Loss of Signal - Hysteresis	P _D - P _A	0.5			dB	

Notes:

1. Measured average power coupled into 9/125 μm single mode fiber.
2. These are 20-80% values.
3. Measured with 2⁷-1 PRBS at BER<10⁻¹²

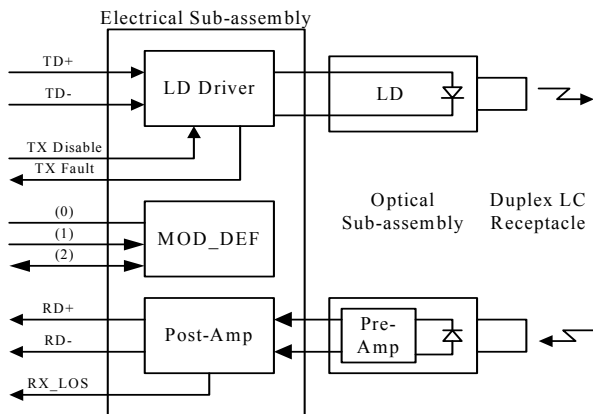
TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
TX_DISABLE Assert Time	t _{off}			10	μs	
TX_DISABLE Negate Time	t _{on}			1	ms	
Time to initialize, include reset of TX_FAULT	t _{init}			300	ms	
TX_FAULT from fault to assertion	t _{fault}			100	μs	
TX_DISABLE time to start reset	t _{reset}	10			μs	
Receiver Loss of Signal Assert Time (off to on)	t _{A,RX LOS}			100	μs	
Receiver Loss of Signal Assert Time (on to off)	t _{D,RX LOS}			100	μs	

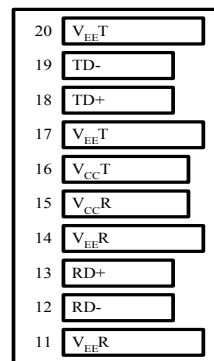
4.25 Gbps Fibre Channel Single Mode Transceiver



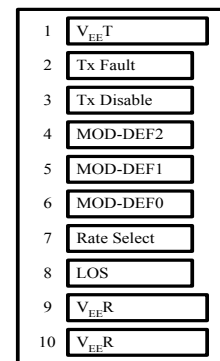
BLOCK DIAGRAM OF TRANSCEIVER



PIN OUT DIAGRAM OF TRANSCEIVER



Top of Board



Bottom of Board (As Viewed through Top of Board)

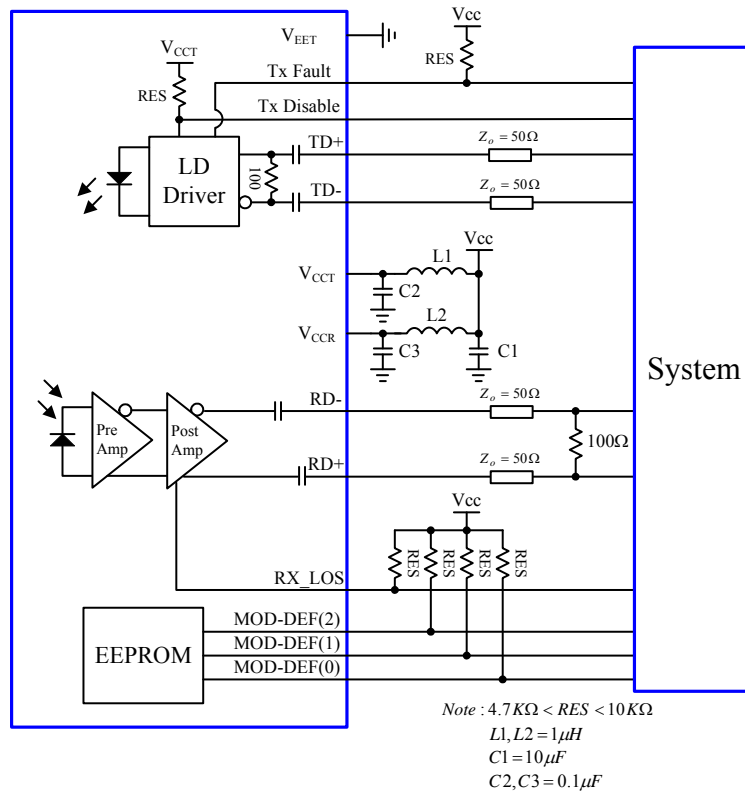
PIN OUT TABLE

Pin	Symbol	Functional Description
1	VeeT	Transmitter Ground
2	Tx Fault	Transmitter Fault Indication
3	Tx Disable	Transmitter Disable – Module disables on high or open
4	MOD-DEF(2)	Module Definition 2 – Two wire serial ID interface (data)
5	MOD-DEF(1)	Module Definition 1 – Two wire serial ID interface (clock)
6	MOD-DEF(0)	Module Definition 0 – Grounded in module
7	Rate Select	Not Connected
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inverse Received Data Out
13	RD+	Received Data Out
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmitter Data In
19	TD-	Inverse Transmitter Data In
20	VeeT	Transmitter Ground

4.25 Gbps Fibre Channel Single Mode Transceiver

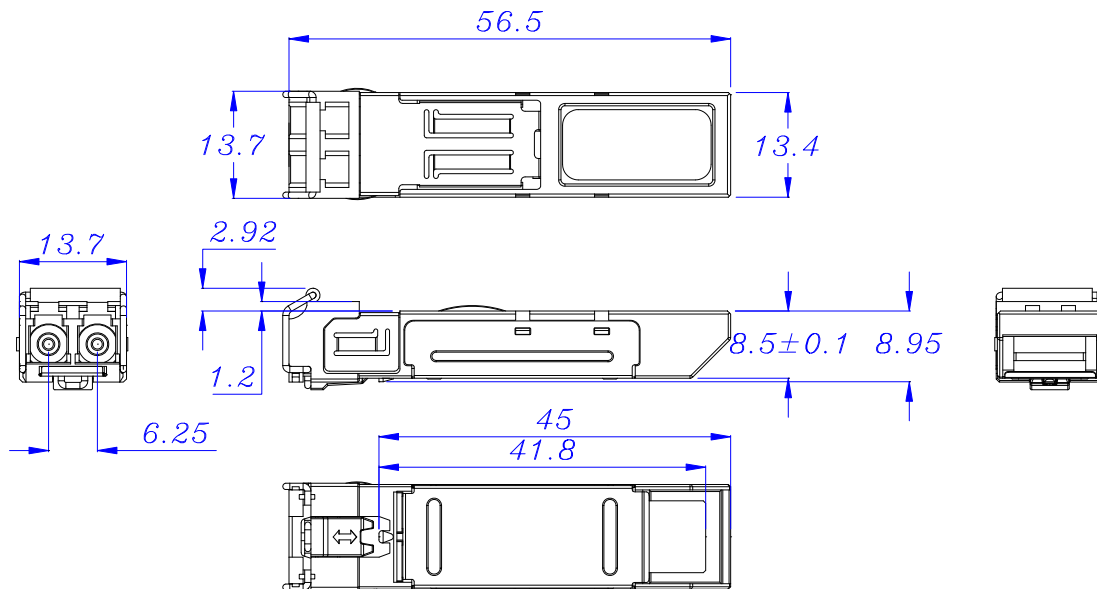


RECOMMENDED CIRCUIT SCHEMATIC



MECHANICAL DIMENSIONS

Units in mm



All dimensions are $\pm 0.2\text{mm}$ unless otherwise specified.

Claim:

CORETEK Opto Corp. reserves the right to make changes in the specification described hereinafter without prior notice.