

4.25 Gbps Fibre Channel Multimode Transceiver



SFP, Duplex LC Connector, 850nm VCSEL for Multimode Fiber, RoHS Compliant

Digital Diagnostics Functions, Extended Operating Temperature from -40 to $+85$ °C



Features

- 850nm VCSEL
- 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)
- Compliant with SFF-8472 Digital Diagnostic Monitoring Interface
- Duplex LC Connector
- Compliance with ANSI specifications for Fibre Channel applications
- Eye Safety
Designed to meet Laser Class 1 comply with EN60825-1

Applications

- Fibre Channel Links

Description

The CT-4250NSP-SE1L-E from Coretek Opto Corp. is a high performance and cost-effective module for serial optical data communication applications specified for multimode of multi-rate from 1.062 to 4.25 Gb/s. It operates with +3.3V power supply. The module is intended for multimode fiber, operates at a nominal wavelength of 850nm and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module is integrated digital diagnostics functions via an I²C serial interface.

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 short reach 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.

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Product Information

Model Number	Operating Voltage & SD Output	Wavelength	Output Power	Sensitivity	Distance
CT-4250NSP-SE1L-E	3.3V TTL	850 nm	-9 ~ -2.5 dBm	≤-15 dBm	150 m for 50/125 μm 70 m for 62.5/125 μm

ABSOLUTE MAX RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Storage Temperature	T _S	-40	85	°C	
Supply Voltage	V _{CC}	-0.5	4.0	V	
Data Input Voltage	---	0	V _{CC}	V	
Supply Current	I _S		240	mA	

OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Case Operating Temperature	T _A	-40		85	°C	
Supply Voltage	V _{CC}	3.0	3.3	3.6	V	
Data Input Voltage Swing	V _{ID}	250		2200	mV	

ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT	NOTE
Input					
MOD_DEF (1), MOD_DEF (2), Tx_Disable, Rate Select - Low	V _{IL}	0	0.8	V	
MOD_DEF (1), MOD_DEF (2), Tx_Disable, Rate Select - High	V _{IH}	2.0	V _{CC}	V	
Output					
TX_Fault, LOS , MOD_DEF (2) - Low	V _{OL}	0	0.8	V	
TX_Fault, LOS , MOD_DEF (2) -High	V _{OH}	2.0	V _{CC}	V	

TRANSMITTER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Optical Output Power	P _O	-9		-2.5	dBm	1
Optical Modulation Amplitude	OMA	247			μW	2
Center Wavelength	λ _c	830	850	860	nm	
Spectral Width (RMS)	Δλ			0.85	nm	
RIN	RIN			-118	dB/Hz	
Coupled Power Ratio	CPR	9			dB	2
Optical Rise time (20%-80%)	t _r			90	psec	3
Optical Fall time (20%-80%)	t _f			90	psec	3
Jitter Generation (peak to peak)	TJ			0.44	UI	
Deterministic Jitter	DJ			0.26	UI	

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RECEIVER ELECTRO-OPTICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
Maximum Input Optical Power	P_{max}	0			dBm	4
Minimum Input Optical Power	P_{min}	4.25Gb/s		-15	dBm	4
		2.125Gb/s		-18		
		1.063Gb/s		-20		
Operating Wavelength	λ	770		860	nm	
Optical Return Loss	ORL	12			dB	
Loss of Signal – Asserted	P_A	-30			dBm	5
Loss of Signal – Deasserted	P_D			-17	dBm	6
Loss of Signal –Hysterisis	$P_D - P_A$	0.5			dB	

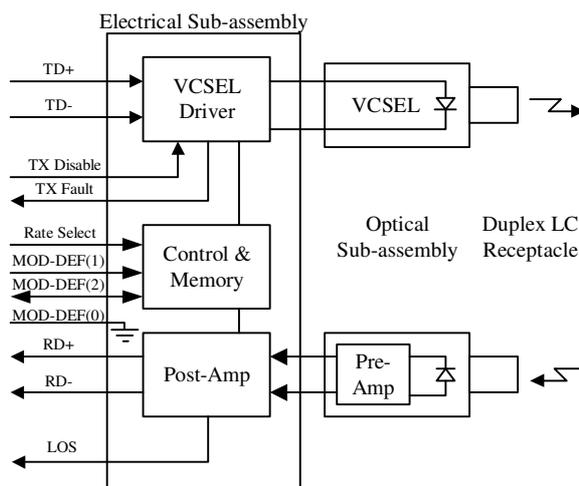
Notes:

1. Measured average power coupled into 50/125 μ m or 62.5/125 multi-mode fiber.
2. Equivalent extinction ratio specification for Fibre Channel. Allows smaller ER at higher average power.
3. These are 20-80% values.
4. Measured with 2^7-1 PRBS at $BER < 10^{-12}$
5. Measured on transition – low to high.
6. Measured on transition – high to low.

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	NOTE
TX_DISABLE Assert Time	t_{off}			10	μ s	
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	μ s	
TX_DISABLE time to start reset	t_{reset}	10			μ s	
Receiver Loss of Signal Assert Time (off to on)	t_{A,RX_LOS}			100	μ s	
Receiver Loss of Signal Assert Time (on to off)	t_{D,RX_LOS}			100	μ s	

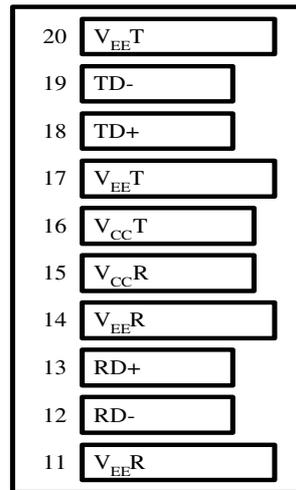
BLOCK DIAGRAM OF TRANSCEIVER



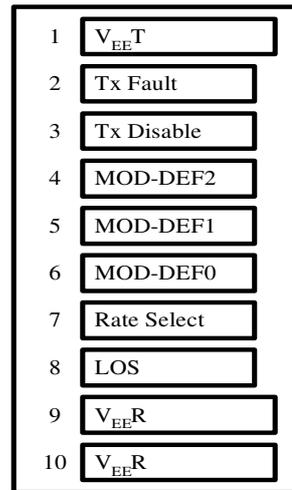
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PIN OUT DIAGRAM OF TRANSCEIVER



Top of Board



Bottom of Board (As Viewed through Top of Board)

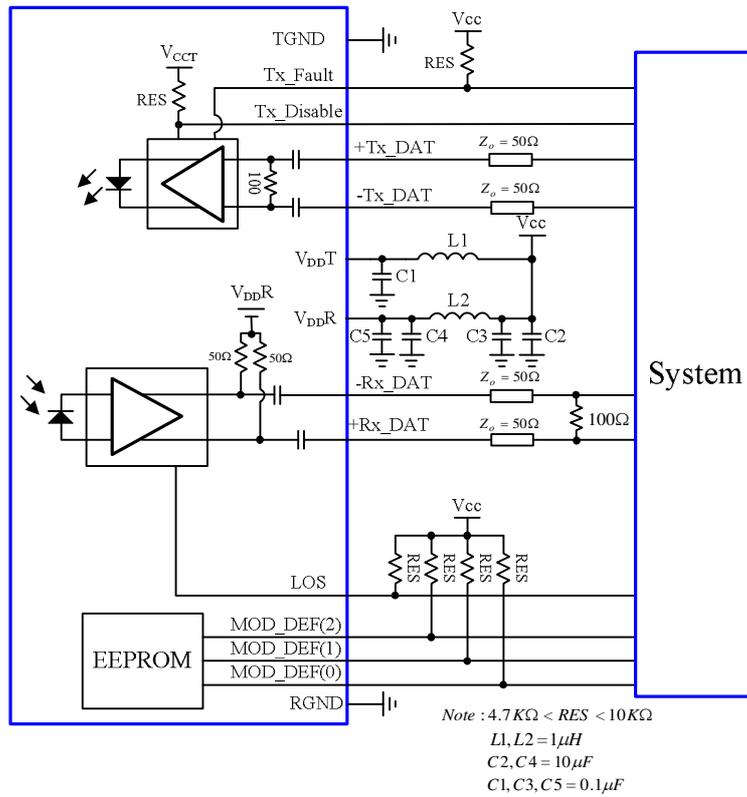
PIN OUT TABLE

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
5	MOD-DEF(1)	Module Definition 1 – Two wire serial ID interface
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

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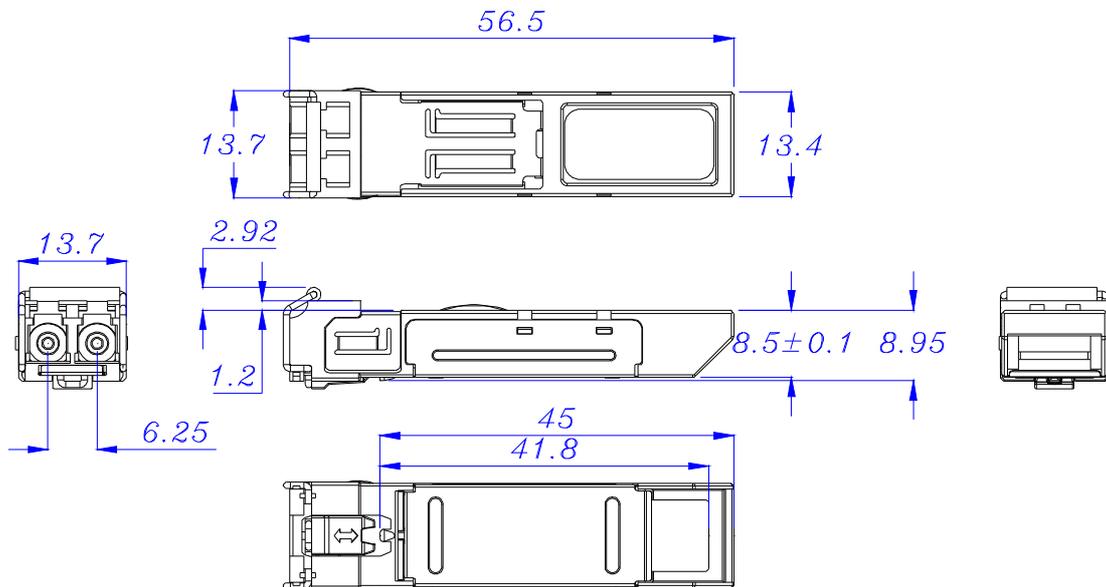


RECOMMENDED CIRCUIT SCHEMATIC



MECHANICAL DIMENSIONS

Units in mm



All dimensions are ± 0.2 mm unless otherwise specified.

Claim:

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